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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level 1 Control AP	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sev# by (S)	Occ# assg (O)	Det# assg (D)	Level 1 Control AP	PFMEA AP	Remarks				INET	OPT
	JOV-2G1-40C/2002 02/15/2019						"Requirements"	"Failure Effects (FE)"		"Failure Mode (FM)"	"Failure Cause (FC)"			First Piece Inspection during device setup and clip																						
1		Incoming Materials	Transport of raw materials from pre assy to production	Material Handler	Your Plant: Transports materials being used during Die Attach and Clip attach assembly Ship to Plant: None End User: None	Transports of raw materials from pre assy to production	Loads direct materials on pushcart and operator will pick-up and transports the materials from pre ASSY to passbox	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials	Inattentive to handling procedure	Work Instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Visual Inspection Material check prior loading	6	L																		226	
2				Solder Paste			Correct solder paste with correct shelf/floor life clearly indicated on syringe sticker according to control plan (JOV-2G2-040/2008)	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged / Broken Solder Paste Syringe	Wrong transport handling procedure	Work Instruction (Standard labeling of solder paste) Automatic thawing timer for solder paste	2	Material and Document checking prior use Visual Inspection	6	L			Update WI to include LAP Solder Re-train and re-certify operators of change	Update material and document checkpoints to include LAP solder No change in VI	A. Villanueva/c. Superficial	1-Feb-21	Done												226	
3							Correct specification of solder paste to be used - viscosity, metal loading, and solder type	Your Plant : Production Delay Scrappage of materials Ship to Plant: None End User : None	2	Insufficient / Excessive Solder dispense	Out of specifications - viscosity, metal loading, and solder type	NA	2	Process Technician set-up verification (COI) AOI response Machine auto vision / PIB per machine recipe 100% AOI/SPI	4	L	5		Update CMMS to include viscosity specs, metal loading specs, and solder type specs	CMMS	R. Encarnaue		Done												224	
4				Pushcart			Holds and secures direct materials during transport	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe / solder paste	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
5				Leadframe / Bottomframe			Correct leadframe with correct shelf/floor life clearly indicated on the box ticker according to control plan (JOV-2G2-040/2008)	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe	Wrong transport handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
6				Clipframe			Contains clip lot no., 12NC, and specifications of the clipframe for traceability	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials	Wrong transport handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
7			Transport of bottomframe from 2D to DACA N2 Cabinet	Material Handler (2D leadframe marking)		Transports bottomframe with 2D barcode from 2D leadframe marking station to DACA N2 Cabinet	Loads 2D bottomframes on pushcart and transports to DACA station through passbox	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials (2D lead	Wrong transport handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
8							Loads buffer 2D leadframes on slotted cabinet	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials (2D leadframe)	Wrong arrangement & handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
9				DACA Slotted cabinet (for buffer)			Holds and secures buffer 2D bottomframes arriving from 2D leadframe marking station	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials (2D leadframe)	Wrong arrangement & handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
10				N2 Supply			Prevents oxidation of bottomframes stored in buffer cabinet	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Oxidized bottomframe	No N2 supply from facilities	OCAP (RH of N2 cabinet) Regular Operator Requalification (JOV-2G2-990/2001) Material FIFO system	2	Material and Document checking prior use Visual Inspection N2 level gauge	6	L																		226	
11				Passbox			Serves as passage for incoming materials	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Oxidized/Contamination bottomframe	Open/Leak passbox after the materials are placed inside	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050) Material FIFO system	2	Material and Document checking prior use Visual Inspection	6	L																		226	
12				Pushcart			Holds and secures 2D bottomframes during transport	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
13				2D Leadframe Printed			Leadframe material for Die and Clip assembly	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe	Material fell on the floor due to wrong arrangement/stacking of leadframe	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
14			Transport of bottomframe from N2 cabinet to DACA machine	Material Handler		Transports bottomframe with 2D code from DACA N2 Cabinet to DACA machine	Loads 2D bottomframes on pushcart and transports to DACA machine from N2 cabinet	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials (2D lead	Wrong transport handling procedure	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura-Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Score By (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA,AP	Overall Criticalities	Filter Codes (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Criticalities	PFMEA,AP	Remarks				INET	OPT
15				DACA Slotted cabinet (for buffer)			Holds and secures buffer 2D bottomframes arriving from 2D leadframe marking station	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged materials (2D leadframe)	Wrong arrangement & handling procedure	Work Instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
16				N2 Supply			Prevents oxidation of bottomframes stored in buffer cabinet	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Oxidized bottomframe	No N2 supply from facilities	OCAP (RH of N2 cabinet) Regular Operator Requalification (JOV-2G3-990/2001) Material FIFO system	2	Material and Document checking prior use Visual Inspection N2 level gauge	6	L																		226	
17				Pushcart			Holds and secures 2D bottomframes during transport	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
18				2D Leadframe Printed			Leadframe material for Die and Clip assembly	Your Plant: Production Delay Scrappage of materials Ship to Plant: None End User: None	2	Damaged leadframe	Material fell on the floor due to wrong arrangement/stacking of leadframe	Work Instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	2	Material and Document checking prior use Visual Inspection	6	L																		226	
19			Transport of Wafer from DACA passbox to wafer N2 Cabinet	Material Handler (DACA)		Transports wafers loaded in wafer cassette from DACA passbox to wafer N2 cabinet	Loads wafers loaded in wafer cassette on pushcart and transports to wafer N2 cabinet from DACA passbox	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Wrong transport handling procedure	Work Instruction Handling Procedure Wafers are placed in alternate slots on the wafer cassette	2	Material and Document checking prior use Visual Inspection	6	M																		726	
20							Loads buffer wafers on wafer N2 cabinet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Wrong transport handling procedure	Work Instruction Handling Procedure Wafers are placed in alternate slots on the wafer cassette	2	Material and Document checking prior use Visual Inspection	6	M																		726	
21				Wafer N2 cabinet			Holds and secures buffer wafers arriving from CDP station	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Wrong transport handling procedure	Work Instruction Handling Procedure Wafers are placed in alternate slots on the wafer cassette	2	Material and Document checking prior use Visual Inspection	6	M																		726	
22				N2 Supply			Prevents oxidation of wafers stored in buffer cabinet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidation / Contamination on wafer	No N2 supply from facilities	OCAP (RH of N2 cabinet) Regular Operator Requalification (JOV-2G3-990/2001) Material FIFO system	2	Material and Document checking prior use Visual Inspection N2 level gauge	6	M																		726	
23				Passbox			Serves as passage for incoming materials	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized/Contamination bottomframe	Open/Leak passbox after the materials are placed inside	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050) Material FIFO system	2	Material and Document checking prior use Visual Inspection	6	M																		726	
24				Pushcart			Holds and secures wafers loaded on wafer cassette during transport	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection	6	M																		726	
25				Wafer cassette			Holds and secures loaded wafers	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Material fell on the floor due to defective wafer cassette lock	Work Instruction Handling Procedure	3	Material and Document checking prior use Visual Inspection	6	M																		736	
26			Transport of Wafer from wafer N2 cabinet to DACA machine	Material Handler (DACA)		Transports wafers loaded in wafer cassette from wafer N2 cabinet to DACA machine	Loads wafers loaded in wafer cassette on pushcart and transports to DACA machine from N2 cabinet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Wrong transport handling procedure	Work Instruction Handling Procedure Wafers are placed in alternate slots on the wafer cassette	2	Material and Document checking prior use Visual Inspection	6	M																		726	
27				Wafer N2 cabinet			Holds and secures buffer wafers arriving from CDP station	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Wrong transport handling procedure	Work Instruction Handling Procedure Wafers are placed in alternate slots on the wafer cassette	2	Material and Document checking prior use Visual Inspection	6	M																		726	
28				N2 Supply			Prevents oxidation of wafers stored in buffer cabinet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidation / Contamination on wafer	No N2 supply from facilities	OCAP (RH of N2 cabinet) Regular Operator Requalification (JOV-2G3-990/2001) Material FIFO system	2	Material and Document checking prior use Visual Inspection N2 level gauge	6	M																		726	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA-RP	Overall FC Criticality	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall FC Criticality	FMEA-RP	Remarks				INET	OPT
29				Pushcart			Holds and secures wafers loaded on wafer cassette during transport	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection	6	M																			726	
30				Wafer cassette			Holds and secures loaded wafers	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged wafers	Material fell on the floor due to defective wafer cassette lock	Work Instruction Handling Procedure	3	Material and Document checking prior use Visual Inspection	6	M																			736	
31				Sawn wafer			Contains singulated dies to be picked and attached onto the bottomframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Torn wafer tape as received	Wrong handling during removal of lint free paper on top of the wafers	Work Instruction Handling Procedure	2	Material and Document checking prior use Visual Inspection	6	M																			726	
32		Machine Preparation	Material and Tooling Preparation Material and Tooling Preparation (wafer, bottomframe, clipframe, solder paste, dispense tool, rubber tip, needle, wiring diagram) (wafer, bottomframe, clipframe, solder paste, dispense tool, rubber tip, needle, wiring diagram)	Operator	Your Plant : Preparation of direct and indirect material required to process the femly type / device Ship to Plant: None End User: None	Withdraws and prepares required wafer, bottomframe, clipframe, solder paste, dispense tool, rubber tip, needle and wiring diagram to be used for production	Checks MWO and gets the required wiring diagram(WIDI) from cabinet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong materials used	Wrong bonding diagram (WIDI) used due to inattentive to document used per MWO	Work Instruction - Wafer Preperation (JOV-280-040/3050)	3	Visual Inspection Check every set-up (eCOI -077-280-040/40351) Machine auto vision / PRI per machine recipe 100% ADI/SPI	4	L																			234	
33							Requests, receives and checks with respect to wiring diagram and CAMSTAR the required direct and indirect materials to be used for production	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong preparation of Bottomframe, Solder Paste and Clip Frame	Inattentive to material requirement on WIDI	Work Instruction (Proper bottomframe, Solder Paste and clip frame preparation) Regular requalification of operators of the work instruction	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% ADI/SPI	4	L			Update WIDI and WI (material portion) to include LAP Solder Re-train and re-certify operators of change		W. Cazarinilin and F. Alcones A. Villanueva/c. Superficial	Jun-21	Done															234	
34								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong clipframe used for Tailko Devices	Inattentive to material requirement for Tailko devices	Certification of operator on Tailko devices	3	Material and Document checking prior use Visual Inspection Machine auto vision / PRI per machine recipe 100% ADI/SPI	4	L																			234	
35								Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong bottomframe with 2D Barcode with corresponding SO number	Poor familiarity with 2D barcode system	SO number are marked on the upper right corner of the bottomframe Training and certification of Operator	3	Visual Inspection of SO number on bottom frame Machine auto stop	2	L																			232	
36								Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong bottomframe used without additional hole on end rail (SOT 1021A)	Poor familiarity with SOT 1023A bottomframe design	Updated WIDI indicates additional hole for SOT1021A Dyson devices Training and certification of operator	2	Material and Document checking prior use WIDI Check prior loading Visual Inspection	6	L																			226	
37							Withdraws required tools from tooling	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong tools (Rubber Tip Collet, Needle and Dispense Tool) prepared	Inattentive to tooling requirement	Work Instruction (Dispense tool cleaning, machine setting check) Standardize rubber tip Provision of Dispense tool label Use of needle jig Training and certification of operator Dispense tool matrix	3	Set-up qualification (Visual after clip attach) Machine auto vision / PRI per machine recipe 100% ADI/SPI Process Technician set up verification (COI)	4	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/c. Superficial	1-Jun-21	Done															234	
38							Proper handling of wafer, bottom and clip frame (including loading to cassette) and solder paste (including loading)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Torn wafer	Inattentive to material handling	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050) Work instruction (Proper handling of solder paste material)	3	Visual Inspection Material check prior loading Machine PRS Auto Detect	2	L																			732	
39								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Scratch on wafer	Inattentive to material handling	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050) Work instruction (Proper handling of solder paste material)	3	Visual Inspection Material check prior loading Machine PRS Auto Detect Reflow+FT1/FT2 at Test	4	L																			734	
40								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Scratch on wafer	Manual insert of wafer to wafer table during loading	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050)	4	Machine error during loading of wafer Machine PRS Auto Detect Reflow+FT1/FT2 at Test	4	M																				
41								Your Plant: Production Delay Ship to Plant: None End User: None	2	Damaged bottom and clip frame (including loading to cassette) and solder paste (including loading)	Inattentive to material handling	Work instruction (Proper handling and loading orientation) Regular Operator Requalification (JOV-280-040/3050) Work instruction (Proper handling of solder paste material)	3	Visual Inspection Material check prior loading Machine auto vision / PRI per machine recipe 100% ADI/SPI	4	L																			234	
42							Withdraws required direct materials	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Expired, under thawed, or wrong direct material prepared (solder paste, bottom/ clip frame, crystal) due to inattentive to material requirement	Inattentive to material requirement	Work Instruction (Standard labeling of solder paste) Automatic thawing timer for solder paste Training and certification of operator	3	Material and Document checking prior use Visual Inspection	6	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/c. Superficial	1-Feb-21	Done															236	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
	Sebastian Nocio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura-Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

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43							Processes bottomframe and clipframe requests from operator	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Incorrect material requested (bottomframe, clipframe)	Incorrect material inputted on MOBS	Work Instruction - MOBS (JOV-2B0-040/3050) Operator Training and certification	4	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI	4	L																			244	
44							Specifies dispense station (post, leads, source, gate) and machine no. where solder paste will be used in reference to CAMSTAR 12NC requirement	Your Plant: Production Delay Ship to Plant: None End User: None	2	Mismatch material wrt device requirement	Wrong material inputted on MIS	Operator training on MIS	4	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L				Update WI01, MIS Database, and CAMSTAR to include LAP Solder Re-train and re-certify operators of change		W. Cacanindin / Flor Alconenes (WI01) R. Encarges (MIS and CAMSTAR)		Done											244	
45							Records floor life and expiration date of the solder paste with auto inhibit mechanism upon detection of exceeded floor life and/or expiration date	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Insufficient Solder	Wrong floor life and expiration inputted on machine	Work Instruction - Setting of expiration on solder paste and dispense tool Operator training and certification	3	Check every set-up Visual Inspection Material Inquiry System Machine auto stop	2	L				Update WI01, MIS Database, and CAMSTAR to include LAP Solder Re-train and re-certify operators of change		W. Cacanindin / Flor Alconenes (WI01) R. Encarges (MIS and CAMSTAR)		Done											232	
46				Tooling Custodian			Cleans, prepares, and issues required toolings and paste to the operator	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong tooling issued	Inattentive to tooling requirements	Work Instruction (Dispense tool cleaning, machine setting check) Standardize rubber tip Provision of Dispense tool label Use of needle jig Training and certification of operator	3	Set-up qualification (Visual after clip attach) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L				Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/s Superfical	1-Jun-21	Done											234	
47							Processes solder paste, Rubber Tip, Dispense Tool and Needle requests from operator	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Incorrect material requested (Solder Paste, Dispense Tool, Rubber Tip and Needle)	Wrong material inputted on MIS	Operator training on MIS	4	Check every set-up Visual Inspection Re-train and re-certify Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L				Update WI01, MIS Database, and CAMSTAR to include LAP Solder Re-train and re-certify operators of change		W. Cacanindin / Flor Alconenes (WI01) R. Encarges (MIS and CAMSTAR)		Done											244	
48				Pre Assy Operator			Receives and prepares materials requests from MOBS	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong material issued	Inattentive to material requested on MOBS	Work Instruction on Bottomframe preparation (JOV-2B0-040/3050)	2	Visual Inspection Material check prior loading Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			224	
49				Alignment of materials and tools with device requirements indicated in Wiring Diagram and special instructions indicated in Assembly tracking sheet			Aligns prepared materials and toolings to those indicated on wiring diagram, CAMSTAR, and special instructions on assembly tracking sheet	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong direct materials and tools prepared	Un-updated WI01 issued in the production line	Change management checklist	4	Visual Inspection CAMSTAR (as reference) Envoia Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			244	
50				Tool maintenance and cleaning			Cleans and maintains dispense tool condition in compliance to specifications based on VI criteria	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Insufficient Solder	Clogged/Unbalanced dispense tool	Work Instruction - Dispense Tool (gate) cleaning every 4days	5	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L				Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/s Superfical	1-Jun-21	Done											252	
51								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Excessive solder	Clogged/Unbalanced dispense tool	Work Instruction - Dispense Tool (gate)cleaning every 4days Scrap set-up strip	4	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	L	5			Update Die and Clip Attach Tool Matrix (JOV-2B0-040/3033) to include LAP Solder Nozzle Re-train and re-certify handlers of change	No change, same criteria for inspection	A. Villanueva	Dec'2020	Done											245	
52				Tool Document			Specifies the tools required per device	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong tools (Rubber Tip Collet, Needle and Dispense Tool) prepared	outdated tooling document	Standardized tool nomenclature DACA tool matrix	4	Process Technician set up verification (CCR) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			244	
53			Load Recipe	Operator/Setter		Loads the required recipe for the family type/device to be processed	Prepares runcard/ATS Logs to AWACS Accesses machine menu Navigates Recipe Downloads recipe	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect recipe loaded	Wrong selection of wiring diagram for the family type/device	Work Instruction (Wafer preparation) (JOV-2B0-040/3050) Training and certification of operator	3	Checking of wiring diagram with respect to family type and crucial type indicated on MWO Machine PRS Auto Detect	2	L				Update Parameter Settings of Power Die Attach (JOV-2B0-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/s Superfical	1-Sep-21	Done											232	
54				Recipe/Program			Saves & Retrieves all process parameters and mechanical coordinates	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong die position	Incorrect recipe loaded / used due to outdated recipe based on specifications	Password protected access level Auto vision calibration using solder drop model Setup Process Verification	3	Visual inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			232	
55				Set up procedure			Instructs procedure during set-up	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong dispense Z level due to incorrect set-up / installation of dispense tool	Work Instruction - Solder Paste and Dispense Tool Installation Set-up (JOV-2B0-040-3035)	4	Setup Qualification (visual top solder wetting x-ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L				Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/s Superfical	1-Feb-21	Done											242	
56								Your Plant: Production Delay Ship to Plant: None End User: None	2	Inconsistent Solder Paste dispensed Solder Splatter	Wrong dispense Z level due to incorrect set-up / installation of dispense tool	Work Instruction - Solder Paste and Dispense Tool Installation Set-up (JOV-2B0-040-3035) Scrap set-up strip	4	Setup Qualification (visual top solder wetting x-ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L				Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/s Superfical	1-Feb-21	Done											242	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastien Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Critical Characteristic	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sev (S)	Occ (O)	Det (D)	Critical Characteristic	PFMEA AP	Remarks				INET	OPT
57								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong alignment and orientation due to incorrect set-up of Rubber Tip Collet	Work Instruction - Bond head Assembly Set-up (JOV-280-040-3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-240-040/3067> Regular requalification of operators of the work instruction	3	First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual inspection) Checking of Rubber Tip mark on the Teflon every after set-up Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	L																						732	
58								Your Plant: Production Delay Ship to Plant: None End User: None	2	Unpicked Die	Incorrect set-up of Needle Wrong alignment, orientation, and ejector cap level of needle	Work Instruction - Bond head Assembly and Ejector Set-up (JOV-280-040-3035) Regular requalification of operators of the work instruction	3	Set-up Qualification (Parameter Check) Machine auto vision / PBI per machine recipe 100% AOI/SPI Machine auto vision	2	L																						232	
59									7	Unpicked Die	Incorrect set-up of Needle due to wrong alignment, orientation, and ejector cap level of needle	Work Instruction - Bond head Assembly and Ejector Set-up (JOV-280-040-3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-240-040/3067> Regular requalification of operators of the work instruction	2	First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Checking of Rubber Tip mark on the Teflon every after set-up Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	L																						722	
60								Your Plant: Production Delay Ship to Plant: None End User: None	7	Missing Clip	Incorrect set-up of bridge pick-up tool due to wrong alignment, orientation, and learn Z level of bridge pick-up tool	Semi-Annual PM Activity - bridge pick up tool condition	4	Checking of bridge pick-up tool every PM Set-up Qualification (Parameter Check) Machine auto vision / PBI per machine recipe	2	M																						742	
61								Your Plant: Production Delay Ship to Plant: None End User: None	7	Clip position problem	Incorrect set-up of bridge pick-up tool due to wrong alignment, orientation, and learn Z level of bridge pick-up tool	Semi-Annual PM Activity - bridge pick up tool condition Scrap set-up strip	3	Set-up Qualification (Parameter Check) Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	M	S			Check PPM level at test and ASSY																	735	
62				Control Panel and Monitor			Displays and controls the parameters and pre/post bond responses	Your Plant: Production Delay Ship to Plant: None End User: None	2	No display of control parameters and pre/post bond inspection responses	Defective control panel and monitor	Semi-Annual PM Activity - Control panel and monitor condition	2	Checking of control panel and monitor condition every set up Machine auto stop	2	L																					222	
63				Wiring diagram			Contains product information and materials (solder paste , bottomframe, crystal types), clip frame, die X/Y placement) required to process the device	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong material requested (Paste, Bottomframe and Clipframe)	Wrong material specified on WI/DI due to document was not updated during change qualification	Change management checklist	2	CAMSTAR Enovia Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update WI/DI and WI (material portion) to include LAP Solder Re-train and re-certify operators of change	Update Enovia and CAMSTAR to include LAP Solder	W. Cacanindin and F. Alcones A. Villanueva/J. Superficial	Jun-21	Done														234	
64			Loading of Wafer maps	Engineer		Loads wafer maps during change device set-up or change of wafer	Generates dot map wafer map	Your Plant: Production Delay Ship to Plant: None End User: None	2	No dot map loaded on the machine	Dot map not yet uploaded on the machine	No loading of family types with no dot map available	4	Machine auto stop	2	L																				242	
65				Tachnician/Setter			Sets the SECSGEM during set-up	Your Plant: Production Delay Ship to Plant: None End User: None	2	No Reject map in the server	Improper setting of SECSGEM due to wrong input of configurations and/or settings	Work Instruction - Setting Up SECSGEM (JOV-280-040/3035)	4	Machine auto stop	2	L																				242	
66							Loads the device wafer map during change device set-up	Your Plant: Production Delay Ship to Plant: None End User: None	2	No dot map loaded on the machine	Dot/Wafer map not yet uploaded on the machine	No loading of family types with no dot map available	4	Machine auto stop	2	L																				242	
67				Operator			Loads wafer map every change of wafer	Your Plant: Production Delay Ship to Plant: None End User: None	2	No dot map loaded on the machine	Dot/Wafer map not yet uploaded on the machine	No loading of family types with no dot map available	4	Machine auto stop	2	L																				242	
68				IT (e-map)			Maintains and settles wafer maps connectivity and repository	Your Plant: Production Delay Ship to Plant: None End User: None	2	No e-map loaded on AWACS	E-map not provided by Fab	No loading of family types with no e-map available *Confirm with IQC*	4	Machine auto stop	2	L																				242	
69			Strip map Activation (DACA machine, reading)	Tachnician/Setter		Activates strip map to generate leadframe mapping	Activates LMDC	Your Plant: Production Delay Ship to Plant: None End User: None	3	No 2D Reject map is created	Failure to activate LMDC function and select production mode due to inattentive on proper LMDC activation procedure	Work Instruction (JOV-280-040-3035) Training of technician	4	aCOI (Checking of 2D reject map activation) (JOT-280-040/4035) Check every Per batch CAMSTAR transaction	3	L																				343	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIP/BONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Ringlon / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Score by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA LAP	Lessons Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Lessons Characteristics	PFMEA/LAP	Remarks				iNIT	OPT
70				LMDC FSE			Maintains/Set LMDC functionality	Your Plant: Production Delay Ship to Plant: None End User: None	3	No 2D Reject map is created	Inattentive on proper LMDC activation procedure	Work Instruction (JOV-280-040-3035) Training of technician	4	eCOI (Checking of 2D reject map activation) (JOT-280-040/4035) Check every Per batch CAMSTAR transaction	3	L																			343	
71				LMDC Activation			Activates/Enables LMDC functionality	Your Plant: Production Delay Ship to Plant: None End User: None	3	No 2D Reject map is created	Communication port is not working	Work Instruction (JOV-280-040-3035) Training of the software	4	eCOI (Checking of 2D reject map activation) (JOT-280-040/4035) Check every Per batch CAMSTAR transaction	3	L																			343	
72								Your Plant: Production Delay Ship to Plant: None End User: None	3	No 2D Reject map is created	OFF 2D Reject Mapping software on LMDC PC	Work Instruction (JOV-280-040-3035) Training of the application software	4	eCOI (Checking of 2D reject map activation) (JOT-280-040/4035) Check every Per batch CAMSTAR transaction	3	L																			343	
73								Your Plant: Production Delay Ship to Plant: None End User: None	3	No 2D Reject map is created	OFF LMDC client	Work Instruction (JOV-280-040-3035) Training of the application software	4	eCOI (Checking of 2D reject map activation) (JOT-280-040/4035) Check every Per batch CAMSTAR transaction	3	L																			343	
74				2D code scan delay			Sets the appropriate barcode scanning speed	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect identification of 2D code (2d code error)	Wrong scan speed parameter used	Semi-Annual PM Activity - 2D Code scanner condition	2	Check every set-up Machine Auto Stop	2	L																			222	
75				2D code position			Sets the position of barcode scanner	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect identification of 2D code (2d code error)	Wrong scan position set-up	Semi-Annual PM Activity - 2D Code scanner condition	2	Check every set-up Machine Auto Stop	2	L																			222	
76				2D code scanner			Reads the 2D mark of the bottom frame	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect identification of 2D code (2d code error)	Defective 2D code scanner	Semi-Annual PM Activity - 2D Code scanner condition	2	Check every set-up Machine Auto Stop	2	L																			222	
77				Bottomframe (2D code quality/clarity)			any	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect identification of 2D code (2d code error)	Dirty / Contaminated / Oxidized 2D code	2D Bottomframe N2 Storage	2	Check every set-up Machine Auto Stop	2	L																			222	
78		Pre-process	Machine Mode Set up	Operator/Setter	Your Plant: Prepares the machine in terms of the recipe to be used for the device to be processed Ship to Plant: None End User: None	Sets machine to production mode	Selects autobond process	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Prebond inspection not activated due to twibond was pressed instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI	4	L																			234	
79								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Prebond inspection not activated due to twibond was pressed instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI	4	L	S																			234	
80				Technician			Selects autobond process	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Prebond inspection not activated due to twibond was pressed instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			234	
81								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Prebond inspection not activated due to twibond was pressed instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S																			234	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastien Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Critical Characteristic	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Critical Characteristic	PFMEA AP	Remarks				INET	OPT
82				Mode selection			Sets Autobond during production mode	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Prebond inspection not activated due to testbond was set instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			234	
83								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Prebond inspection not activated due to testbond was set instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S																			234	
84			CAMSTAR transaction	Operator		Records and tracks batch information	Transacts all required materials	Your Plant: Production Delay Ship to Plant: None End User: None	3	Wrong data inputted	Inattentive to inputting of data	Work Instruction on proper CAMSTAR transaction (JOV-280-040/3050)	1	Visual inspection	6	L																			336	
85				CAMSTAR System			Records batch information upon transaction of operator	Your Plant: Production Delay Ship to Plant: None End User: None	3	Delay in transaction	Down CAMSTAR system	CAMSTAR maintenance	3	System Application stop	6	L																			336	
86				Assembly Tracking Sheet			Contains relevant batch information/special instructions including raw materials to be used as reference in succeeding batch processing	Your Plant: Production Delay Ship to Plant: None End User: None	3	Delay in transaction	Swapping of ATS	Work Instruction on ATS Preparation (JOV-280-040/3050)	3	Visual inspection	6	L			Update ATS to include special instructions to use LAP Solder Re-train and re-certify operators of change		F. Alcones & R. Macahilig	Jun-21	Done												336	
87			MWO Scanning	Operator		Scans MWO for alignment of bottomframe lot# with LMDC strip mapping requirement	Scans MWO for alignment of bottomframe lot# with LMDC strip mapping requirement	Your Plant: Production Delay Ship to Plant: None End User: None	3	Incorrect WIDI prepared	Inattentive to MWO requirement	Work Instruction on Wafer Preparation (JOV-280-040/3050)	3	Visual inspection	6	L																			336	
88				Barcode scanner			Scans MWO	Your Plant: Production Delay Ship to Plant: None End User: None	3	Cannot scan MWO	Defective barcode scanner	Replace barcode	2	Check every loading of recipe Machine auto stop	2	L																			322	
89				MWO			Contains relevant information about the device/product including batch number	Your Plant: Production Delay Ship to Plant: None End User: None	3	Cannot scan MWO	Defective barcode lines	Reprint MWO	2	Check every loading of recipe Machine auto stop	2	L																			322	
90			Electronic Control of Intervention (eCDI) transaction	Operator		Provides and records check items defined in Controls of Interventions encountered during batch processing	Records and performs all check items including visual inspection define in Controls of Interventions encountered during batch processing	Your Plant: Production Delay Ship to Plant: None End User: None	3	No record of set-up	Inattentive to Production Run requirement (JOV-280-040/3050)	Work Instruction on Production Run (JOV-280-040/3050)	1	Visual inspection	6	L																			336	
91				Process technician			Validates accomplished check items by operator per intervention requirement	Your Plant: Production Delay Ship to Plant: None End User: None	3	No record of set-up / intervention	Inattentive to Production Run requirement (JOV-280-040/3050)	Work Instruction on Production Run (JOV-280-040/3050)	3	Visual inspection	6	L																			336	
92				Equipment technician			Performs and records check items per intervention requirement	Your Plant: Production Delay Ship to Plant: None End User: None	3	No record of set-up / intervention	Inattentive to Production Run requirement (JOV-280-040/3050)	Work Instruction on Production Run (JOV-280-040/3050)	3	Visual inspection	6	L																			336	
93				Quality Inspector			Validates recorded measurements and visual inspection per intervention requirement	Your Plant: Production Delay Ship to Plant: None End User: None	3	No record of measurements and visual inspection	Inattentive to Production Run requirement (JOV-280-040/3050)	Work Instruction on Production Run (JOV-280-040/3050)	1	Visual inspection	6	L																			336	
94				eCDI			Serves as data management and storage system	Your Plant: Production Delay Ship to Plant: None End User: None	3	No record of set-up, intervention, measurements and visual inspection	No available eCDI form	Work Instruction on Production Run (JOV-280-040/3050)	3	Visual inspection	6	L																			336	
95				Barcode Scanner			Scans ATS for relevant batch information	Your Plant: Production Delay Ship to Plant: None End User: None	3	Incorrect identification of barcode	Defective barcode scanner	Replace barcode	2	Check every set-up Machine auto stop	2	L																			322	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Neoperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Neoperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarael / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of DC/FM	FMEA AP	Special Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Special Characteristics	FMEA AP	Remarks				INET	OPT
96				Assembly tracking sheet			Contains relevant batch information/special instructions including raw materials to be used as reference in succeeding batch processing	Your Plant: Production Delay Ship to Plant: None End User: None	3	Delay in transaction	Swapping of ATS	Work Instruction on ATS Preparation (JOV-280-040/3050)	3	Visual inspection	6	L																			336	
97		Loading of materials and toolings	Rubber tip installation	Operator/Setter	Your Plant: Loads/installs to machine required direct and indirect materials to be used during production as per device's requirement Ship to Plant: None End User: None	Installs correct rubber tip on bond head shaft per tool matrix	Withdraws correct rubber tip from tooling room and installs rubber tip during reached tool life limit intervention	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-2H0-040/3067> Regular requalification of operators of the work instruction	3	First Piece Inspection during setup. Set-up Qualification (Techs/QA - Visual inspection) Checking of Rubber Tip mark on the Teflon every after set-up Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	L																							732	
98								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-2H0-040/3067> Regular requalification of operators of the work instruction	3	First Piece Inspection during setup. Set-up Qualification (Techs/QA - Visual inspection) Checking of Rubber Tip mark on the Teflon every after set-up Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	L																							732	
99				Technician			Installs rubber tip during change device set up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-2H0-040/3067> Regular requalification of operators of the work instruction	3	First Piece Inspection during setup. Set-up Qualification (Techs/QA - Visual inspection) Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																							732	
100								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-2H0-040/3067> Regular requalification of operators of the work instruction	3	First Piece Inspection during setup. Set-up Qualification (Techs/QA - Visual inspection) Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																							732	
101				Rubber tip orientation, planarity, alignment			Correct orientation, planarity, and alignment of rubber tip based on WI	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong alignment and orientation during rubber tip set-up	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
102								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong alignment and orientation during rubber tip set-up	Work Instruction - Proper insertion of rubber tip on the bond head assembly (JOV-280-040/3035)	2	Check every set-up Visual Inspection Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722	
103				Centering of rubber tip			Centered rubber tip to die during pick-up based on WI	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong centering during rubber tip set-up	Work Instruction - Proper centering of rubber tip on the bond head assembly (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
104								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong centering during rubber tip set-up	Work Instruction - Proper centering of rubber tip on the bond head assembly (JOV-280-040/3035)	2	Check every set-up Visual Inspection Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722	
105				Rubber tip			Picks-up the die from wafer and carries it to bond position	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unpicked Die	Wrong rubber tip issued	Work Instruction - Prepares rubber tip as per tool matrix (JOV-280-040/3050)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
106			Needle Assembly installation	Technician		Installs correct needle/s, needle chuck, and pepper pot as parts of whole needle assembly	Installs and sets up needle assembly correctly during change device set up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			732	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)					OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) or FC or FM	Detection (D) of FC/FM	PFMEA AP	Lowest Risk Priority	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Lowest Risk Priority	PFMEA AP	Remarks				INET	OPT
107								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Inattentive to set-up procedure (alignment and orientation)	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	2	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722	
108				Ejector configuration (location of needle)			Correct ejector configuration based on parameter settings	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong needle configuration during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
109								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong needle configuration during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Scrap set-up strip DACA Tool Matrix (JOV-280-040/3050) Algorithm of moving range needle x/y offset with machine auto-inhibition	2	First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	M																							725
110				Number of needles (1,2,4,5)			Correct number of needles based on tool matrix <JOV-280-040/3035.>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong # of needle during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232
111								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong # of needle during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Scrap set-up strip DACA Tool Matrix (JOV-280-040/3050)	2	First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	M																							725
112				Stability of needle ejection (centering)			Centered/stable needle ejection based on WI <JOV-280-040/3035>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Uncentered needle during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Checking of needle centering with respect to die (+/-100) every needle assembly intervention	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232
113								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Uncentered needle during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Checking of needle centering with respect to die (+/-100) every needle assembly intervention	2	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722
114								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Crack Die	Uncentered needle during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Checking of needle centering with respect to die (+/-100) every needle assembly intervention	4	Check every set-up Visual Inspection	6	M																Complaint C201545				746	
115				Installation of needle chuck screw			Correct orientation of needle chuck screw upon installation based on WI <JOV-280-040/3035.>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong needle chuck screw installation during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	6	L																			236
116								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong needle chuck screw installation during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	2	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722
117				Needle coplanarity			Correct planarity of needle upon installation based on WI <JOV-280-040/3035.>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Die Position problem	Wrong needle coplanarity during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232
118								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong needle coplanarity during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Scrap set-up strip	2	First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Machine auto vision / PRI per machine recipe Machine auto stop 100% AOI/SPI Reflow+FT1/FT2 at Test	3	L																							723

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciton / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of RC,FM	PFMEA RAP	Severity Classification	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity Classification	PFMEA RAP	Remarks				INIT	OPT
119								Your plant: Production delay Yield Loss Customer Complaint Ship to Plant: None End User: None	7	Die Crack	Wrong needle coplanarity during set-up	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Scrap set-up strip	5	First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual inspection)	6	M			Assess use of alignment jig for alphawem ejector assembly	Include alignment check of needle coplanarity as part of Set-up buy-off	H. Gutlay / R. Jereza	P: 22-Apr-22 D: 25-Mar-22	Done		P: 22-Apr-22 D: 25-Mar-22	7	2	6		M	Ref #: Complaint C2200097					726
120				Needle Assembly (Needle, needle chuck, pepper pot)			Performs its function as needle assembly properly	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unpicked Die	Intermittent ejection due to defective ejection motor	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
121								Your Plant: Production Delay Ship to Plant: None End User: None	7	Ejection error	Intermittent ejection due to defective ejection motor	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	2	Check every set-up Visual Inspection Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L																			722	
122				Ejector needle chuck Screw			Ejector screw must be in good condition to have proper tightening of the needles based on set criteria	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unpicked Die	Worn-out needle chuck screw	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035)	3	Check every set-up Visual Inspection Machine auto stop	2	L																			232	
123								Your Plant: Production Delay Ship to Plant: None End User: None	7	Unpicked Die	Loose screw	Work Instruction - Proper ejector needle set-up (JOV-280-040/3035) Scrap set-up strip Implement the use of torque wrench during tightening of set screw of ejector needle.	2	First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual inspection) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	M																			725	
124			Dispense tool installation	Operator		Installs correct dispense tool per tool matrix	Withdraws and installs correct dispense tool during normal production	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong dispense tool used due to Poor familiarity with dispense tool designs	Dispense Tool Matrix Training and certification of operator	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update MIS database to include LAP solder dispense tool. Update dispense tool matrix to include LAP Solder dispense tool Re-train and re-certify operators of change		R. Encarguez (MIS) (info to be provided by project team) A. Villanueva (Tool Matrix)		Done												224	
125								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Wrong dispense tool used due to Poor familiarity with dispense tool designs	Dispense Tool Matrix Training and certification of operator	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Update MIS database to include LAP solder dispense tool. Update dispense tool matrix to include LAP Solder dispense tool Re-train and re-certify operators of change		R. Encarguez (MIS) (info to be provided by project team) A. Villanueva (Tool Matrix)		Done												224	
126								Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong dispense tool used due to outdated dispense tool matrix	Standardized tool nomenclature	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
127								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Wrong dispense tool used due to outdated dispense tool matrix	Standardized tool nomenclature	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI	4	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
128								Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong dispense tool used due to wrong tool nomenclature	Standardized tool nomenclature	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
129								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Wrong dispense tool used due to wrong tool nomenclature	Standardized tool nomenclature	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
130				Technician/Setter			Installs correct dispense tool during change device set up	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong dispense tool used due to Poor familiarity with dispense tool designs	Dispense Tool Matrix Training and certification of operator	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
131								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Wrong dispense tool used due to Poor familiarity with dispense tool designs	Dispense Tool Matrix Training and certification of operator	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Jun-21	Done												224	
132				Dispense tool set up			Correct Dispense tool set-up based on WI	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Dispense pressure (too low) was not updated after change of Dispense Tool	Work Instruction Solder Paste and Dispense Tool Installation (JOV-280-040/3035)	2	Process Technician set up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Sep-21	Done												224	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Lowest Controls Level	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Lowest Controls Level	PFMEA AP	Remarks				INET	OPT
133								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Dispense pressure (too high) was not updated after change of Dispense Tool	Work Instruction Solder Paste and Dispense Tool Installation (JOV-280-040/3035)	2	Process Technician set-up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												224	
134				Dispense tool holder			Good planarity of dispense tool holder based on WI	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Wrong alignment of dispense tool	Work Instruction - Solder Paste and Dispense Tool Installation Set-up (JOV-280-040-3035)	2	Checking of alignment every set-up Process Technician set-up verification (COI) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												224	
135								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Wrong alignment of dispense tool	Work Instruction - Solder Paste and Dispense Tool Installation Set-up (JOV-280-040-3035)	2	Checking of alignment every set-up Process Technician set-up verification (COI) AOI response Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												224	
136				Dispense tool			Dispense tool is in good condition based on set criteria	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Clogged Dispense Tool	Visual Criteria for front line tools Physical check under 10-50x	1	Process Technician set-up verification (COI) AOI response Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			234	
137								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Worn-out Dispense Tool	Visual Criteria for front line tools Physical check under 10-50x	3	Process Technician set-up verification (COI) AOI response Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S																			234	
138								Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Defective dispense tool	Dispense Tool Cleaning procedure to be performed on designated tool crib or tool room. Visual Criteria for front line tools Physical check under 10-50x	3	Process Technician set-up verification (COI) AOI response Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			234	
139								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Defective dispense tool	Dispense Tool Cleaning procedure to be performed on designated tool crib or tool room. Visual Criteria for front line tools Physical check under 10-50x	3	Process Technician set-up verification (COI) AOI response Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S																			234	
140			Loading of Wafer	Operator		Loads wafer cassette holding sawn wafers onto cassette elevator	Loads wafer cassette holding sawn wafers onto cassette elevator	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unable to load wafers	Inattentive to wafer handling and orientation procedure	WI - Wafer Preparation (JOV-280-040/3050) Training and Certification of the operator	3	Checking of cassette loading every device Set-up change of MWO - Machine Auto stop when not in correct orientation	2	L																			232	
141				Orientation of loading of wafer cassette			Loads wafer cassette in correct orientation according to WI doc	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unable to load wafers	Wrong handling/loading orientation of the cassette on the platform	WI - Wafer Preparation (JOV-280-040/3050) Training and Certification of the operator	3	Checking of cassette loading every device Set-up change of MWO - Machine Auto stop when not in correct orientation	2	L																			232	
142				Wafer loader motor			Performs its function as wafer loader motor properly	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unable to load wafers	Defective loader motor	Semi-annual PM activity - Wafer Loader Motor condition	2	Check every set-up Machine auto stop	2	L																			222	
143				Wafer gripper			Picks the wafer from the cassette and loads it on the wafer table	Your Plant: Production Delay Ship to Plant: None End User: None	2	Unable to load wafers	Defective gripper motor	Semi-annual PM activity - Gripper Motor condition	2	Check every set-up Machine auto stop	2	L																			222	
144								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Misalignment of Gripper and Wafer Elevator	Set-up Verification - Gripper Alignment	7	Machine Error Machine Auto Stop	2	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutley	Q3'2021	Done	JOT-2HO-040/4059	Q3'2021	2	4	1		L	Equipment-centric				272	242
145								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Misalignment of cassette elevator guides	Set-up Verification - Gripper Alignment Added checking and alignment of guides during Preventive maintenance	7	Machine Error Machine Auto Stop	2	L																				

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novo - FMEA Owner Shara Michel Berairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Berairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Overall Criticalness	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Criticalness	PFMEA AP	Remarks				INET	OPT
146								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Grip Sensor Cannot Detect Wafer Error	Defective gripper sensor	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	2	L			Include functionality test of sensor and sensor position during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				222	222
147								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Worn-out LM guides	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include lubrication and condition checking of guides during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
148								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Worn-out belt and pulley assembly	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include condition check and replacement of belt during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
149								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Defective solenoid valve	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include functionality test for solenoid valve/ cleaning of solenoid valve during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
150								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong get position parameter	Set-up Verification - Gripper Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
151								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong magazine position parameter	Set-up Verification - Gripper Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
152				Motor drive belt			Motor drive belt must be in good condition base on set criteria <JOV-2H0-040/1067>	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to expand wafers	Defective drive belt	Semi-annual PM activity - Drive Belt condition	2	Check every set-up Machine auto stop	2	L																			222	
153				Wafer table / expander			Receives the wafer	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to expand wafers	Defective expander motor	Semi-annual PM activity - Expander condition	2	Check every set-up Machine auto stop	2	L																			222	
154								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	No Wafer Detected in Wafer Table	Defective/ Misaligned Wafer Exist sensor	Semi-annual PM activity - Wafer Table - Wafer Exist Sensor Check	4	Machine Error Machine Auto Stop	3	L			Include wafer exist sensor check during PM activities and MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
155								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Small gap of wafer table	Set-up Verification - Wafer Table Alignment	4	Machine Error Machine Auto Stop	3	L			Include wafer table plenarity check during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
156								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	No wafer ring aligner	N/A	4	Machine Error Machine Auto Stop	3	L			Include wafer ring aligner check during PM activities and MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
157								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Unable to Load to Wafer	Worn-out idle gear	Semi-annual PM activity - Wafer Table - Idle Gear Condition	3	Machine Error Machine Auto Stop	3	L			Include idle gear condition check during PM activities.		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				233	223
158								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Unplanar Wafer Table	Set-up Verification - Wafer Table Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
159								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Broken encoder shafting	Semi-annual PM activity - Encoder Shaft Condition Check	4	Machine Error Machine Auto Stop	3	L			Define correct handling of part during troubleshooting and repair		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
160				Wafer cassette elevator			Transports wafer cassette from bottom to top	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to move wafers from bottom to top	Defective Elevator motor	Semi-annual PM activity - Expander condition	2	Check every set-up Machine auto stop	2	L																			222	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)															
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FC	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Current Controls	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Current Controls	PFMEA AP	Remarks				INET	OPT
161								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	No Cassette in Wafer Loader	Defective photosensor	Semi-annual PM activity - Photosensor Sensor Check	2	Machine Error Machine Auto Stop	2	L			Include elevator photosensor check during PM activities and MKAK		H. Gutlay	Q2'2021	Done	JO7-2H0-040/4059	Q2'2021	2	2	2		L	Equipment-centric				222	222
162								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Misaligned wafer guides	Set-up Verification	5	Machine Error Machine Auto Stop	3	L			Define position and alignment of wafer guides. Include checking of screws and position of guides during MKAK		H. Gutlay	Q2'2021	Done	JO7-2H0-040/4059	Q2'2021	2	2	5		L	Equipment-centric				253	223
163								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong first position parameter	Set-up Verification - Elevator Slot Position	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q2'2021	Done	JO7-2H0-040/4059	Q2'2021	2	2	3		L	Equipment-centric				253	223
164								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong slot pitch parameter	Set-up Verification - Elevator Pitch Parameter	3	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q2'2021	Done	JO7-2H0-040/4059	Q2'2021	2	2	3		L	Equipment-centric				333	223
165				Sawn Wafer			Contains singulated dies to be picked and attached onto the bottomframe	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to process sawn wafers	Wafers observed having chipped / cracked die as received from CDP	Work Instruction - Wafer Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
166				Wafer Ring			Contains singulated dies to be picked and attached onto the bottomframe	Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Deformed Wafer Ring	Ring Planarity Check at Magazine Wash	2	Machine Error Machine Auto Stop	2	L			Go no go jig for wafer ring (already in place)												Equipment-centric				222	
167				Wafer cassette			Holds and secures loaded wafers	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to load wafer cassette	Defective wafer cassette	Work Instruction - Wafer cassette Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
168			Loading of bottomframe	Operator		Loads the bottomframe on stack loader in correct orientation and alignment	Loads the bottomframe on stack loader	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to pick-up bottomframe	Inattentive to correct bottomframe alignment and orientation	Work Instruction - Bottomframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
169				Bottomframe alignment and orientation			Aligns and orients bottomframe correctly	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to pick-up bottomframe	Incorrect bottomframe alignment and orientation	Work Instruction - Bottomframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
170				Bottomframe design/type			Corrects bottomframe design/type according to MWO	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	2D code error	Incorrect bottomframe design/type loaded	Work Instruction - Bottomframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
171				Stack loader			Stack loader stacks the bottomframes loaded by the operator	Your Plant: Production Delay Ship-to-Plant: None End User: None	2	Unable to pick-up bottomframe	Incorrect alignment of stack loader	Work Instruction - Bottomframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
172				Machine (Vacuum Pad)			Contacts with leadframe to create vacuum	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Pick LF Failed	Misaligned vacuum pad	Semi-annual PM activity - Pick head Check	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				222	
173								Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Pick LF Failed	Worn out vacuum pad	Semi-annual PM activity - Pick head Check	4	Machine Error Machine Auto Stop	2	L			Define life of vacuum pad Create WI on condition check and installation of vacuum pad												Equipment-centric				242	
174				Machine (Proximity Sensor)			Detects presence of leadframe	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Pick LF Failed	Defective proximity sensor	Semi-annual PM activity - Proximity Sensor	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				222	
175				Machine (Cross Roller Way)			Permits Z axis movement to Stack Loder Assy	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Z search fail	Worn-out/damaged rollers	Semi-annual PM activity - LM Guides	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				222	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIP/BONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanzion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Local Characteristic	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	PFMEA AP	Local Characteristic	Remarks				INET	OPT
176				Machine (Stack Loader Home Sensor)			Detects position of stack loader ASSY	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Z contact sensor	Misaligned home sensors	Semi-annual PM activity - Proximity Sensor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
177								Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Z contact sensor	Defective home sensors	Semi-annual PM activity - Proximity Sensor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
178				Machine (Sucker Body)			Provides passage for vacuum air to flow	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Pick LF Failed	Defective sucker body	Semi-annual PM activity - Pick head Check	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
179				Machine (LM Guide)			Permits Y axis movement to Stack Loader Assy	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Y search fail	Worn-out/damaged LM guides	Semi-annual PM activity - LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
180				Machine (Leadscrew Assy)			Transfers rotation movement of motor to Y linear movement	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Y search fail	Worn-out/damaged Leadscrew	Semi-annual PM activity - Leadscrew	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
181				Machine (Stack Loader Motor Assy)			Moves the leadscrew or timing belts	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Y/Z search fail	Defective Loader Motor	Functionality Check during set-up	4	Machine Error Machine Auto Stop	2	L			Addition of Loader Motor Condition Check to PM activities	N/A		Q2'2021	Closed								Equipment-centric				242	
182				Machine (Timing Belt)			Transfers rotation movement of motor to Z linear movement	Your Plant: Machine Stoppage (Unable to load bottomframe) Ship-to-Plant: None End User: None	2	Stack Loader Z search fail	Broken timing belt	Semi-annual PM activity - Timing Belt	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
183			Loading of clipframe	Operator		Loads clipframe reel on bridge frame input reel in correct orientation	Loads clipframe reel on bridge frame input reel	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Inattentive to correct clipframe alignment and orientation	Work Instruction - Clipframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
184							Aligns clipframe wrt to bottomframe	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Inattentive to correct clipframe alignment and orientation	Work Instruction - Clipframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
185							Loads clipframe reel on bridge frame input reel	Your Plant: Production delay Yield loss Customer complaint Ship to Plant: None End User: None	8	Tilted Clip	Handling of clip frame during changing will result to gate clip bending	Work Instruction - Clipframe Preparation (JOV-280-40C/3003)	4	Check every set-up Machine auto stop First piece AOI - SLF BOM and document verification	5	M			Enhance clip frame replacement procedure to remove the clips in the reel that was handled manually at DACA and IQC.	Activation of clip height detection and measurement in the existing AOI setting.	R. Jereza / A Villaruel	Jul'2021	Done	Specification Update	Jul'2021	8	3	4	L		Ref #: Complaint C2100733 C2100836				845	
186				Clipframe reel orientation during loading			Orients clipframe reel correctly based on WI during loading	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Wrong clipframe alignment and orientation	Work Instruction - Clipframe Preparation (JOV-280-040/3050)	2	Check every set-up Machine auto stop	2	L																			222	
187				Clipframe installation procedure			Installs clipframe reel correctly based on WI	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Wrong alignment during setup and change of clipframe reel	Clip attach setup alignment check	2	Check every set-up Machine auto stop	2	L																			222	
188								Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Machine Limitation -Manual (mechanical) X and Y setting of coordinates.	Use PRS (pattern recognition system) reference in attaching clip - All SOT1205 will run only in ASM DACA machines only	2	Check every set-up Machine auto stop	2	L																			222	
189				Bridge frame input reel			Holds clipframe reel and controls feeding	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Defective feeding motor	Semi-annual PM activity - Feeder motor condition	2	Check every set-up Machine auto stop	2	L																			222	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Nevis - FMEA Owner Shara Michel Berario - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-20	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Berario/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Process Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of PC/FM	PFMEA AP	Second Occurrence	FFOP Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Second Occurrence	PFMEA AP	Remarks				RNET	OPT
190			Loading of solder paste	Operator		Loads thawed correct solder paste according to WIDI	Withdraws correct solder paste required through MIS	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong Solder Paste loaded	Inattentive to material requirement in WIDI	Work Instruction (Proper Solder Paste preparation) Regular requalification of operators of the work Instruction	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
191							Installs withdrawn solder paste during change device set up and change solder paste intervention	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Inattentive to Solder Paste installation procedure	Work Instruction (Proper Solder Paste preparation) Regular requalification of operators of the work Instruction	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI First piece AOI - SLF BOM and document verification Reflow+FT1/FT2 at Test	4	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
192								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Inattentive to Solder Paste installation procedure	Work Instruction (Proper Solder Paste preparation) Regular requalification of operators of the work Instruction	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
193				Tooling Custodian			Receives solder paste requests through MIS	Your Plant: Production Delay Ship to Plant: None	2	Wrong Solder Paste loaded	Inattentive to Solder Paste requested on MIS	Work Instruction (Proper Solder Paste preparation) Regular requalification of operators of the work	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray)	4	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
194							Issues correct solder paste based on received request	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect Solder Paste issued	Inattentive to Solder Paste requested on MIS	Work Instruction (Proper Solder Paste preparation) Regular requalification of operators of the work Instruction	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update WI (JOV-280-040-3031) to include LAP Solder in the list of materials (photo) Update MIS database to include LAP solder Re-train and re-certify operators of change		J. Superficial / R. Encarguez		Done													234	
195				Type of solder paste			Correct solder paste type according to Wiring diagram	Your Plant: Production Delay Ship to Plant: None End User: None	2	Incorrect Solder Paste issued	Un-updated WIDI issued in the production line	Change management checklist	3	Set-up qualification (Visual after clip attach) Visual Top Solder wetting (X ray) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Review WIDI during ECO implementation	MIS and CAMSTAR	F. Alcoreas / M. Gapa	Jun-21	Done													234	
196				Solder paste preparation			Thaws solder paste completely	Your Plant: Production Delay Ship to Plant: None End User: None	2	Inconsistent solder paste	Incorrect thawing procedure	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Thawing Time as per Control plan document (JOV-2G2-040/2008)	2	Automated Thawing and Floor Life monitoring. CMMS triggers change of Solder Paste Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			224	
197				Syringe holder			Maintains good planarity of syringe holder	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Loose Syringe holder	Semi-annual PM activity - Syringe holder condition	3	Check holder every set-up Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																			234	
198				Solder paste			Serves as bonding agent during die and clip bonding onto bottomframe	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder	Incorrect Solder Paste used	Work Instruction on Material Preparation (JOV-280-040/3050)	3	Check holder every set-up Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
199								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive solder	Incorrect Solder Paste used	Work Instruction on Material Preparation (JOV-280-040/3050)	3	Check holder every set-up Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													234	
200		Parameter Set-up	Wiring Diagram Preparation	Operator/Setter	Your Plant: Sets up parameter settings on machine based on parameter specifications document/standard / FSE recommendation Ship to Plant: None	Prepares required wiring diagram according to MWO	Withdraws required wiring diagram according to MWO	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong recipe loaded	Inattentive to wiring diagram requirements	Work Instruction (Document checking of diagram) MISD Controlled (no releasing of new diagram unless old are retrieved) Training and certification of operator	3	Set-up qualification (Visual after clip attach) Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													232	
201				Wiring diagram			Contains product information and materials (solder paste , bottomframe, crystal type/s, clip frame, die X/Y placement) required to process the device	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Clip / Die position problem	Un-updated WIDI issued in the production line	Change management checklist	2	Visual Inspection CAMSTAR (as reference) Enovia Machine auto vision / PRI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	2	L	S																			732	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura-Process Engineering Allen Canete-Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/ FM	PFMEA AP	Severity Occurrence Detection	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity Occurrence Detection	PFMEA AP	Remarks				INET	OPT
202				MWO			Contains relevant information about the device/product	Your Plant: Production Delay Ship to Plant: None End User: None	2	Cannot scan MWO	Defective barcode lines	Reprint MWO	2	Check every loading of recipe Machine auto stop	2	L																			222
203			Loading of Recipe	Setter		Loads correct device recipe	Loads active recipe per device requirement	Your Plant: Production Delay Ship to Plant: None End User: None	2	Pattern Recognition System error	Inattentive to Load Recipe procedure	Work Instruction - Load Recipe (JOV-280-040/3035) Training and certification of operator	3	Checking of family type / device and crystal type indicated on MWO every set-up Loading of recipe through AWACS Machine auto stop	2	L																			232
204				Technician			Loads active and new recipe per device requirement	Your Plant: Production Delay Ship to Plant: None End User: None	2	Pattern Recognition System error	Inattentive to Load Recipe procedure	Work Instruction - Load Recipe (JOV-280-040/3035) Training and certification of operator	3	Checking of family type / device and crystal type indicated on MWO every set-up Loading of recipe through AWACS Machine auto stop	2	L																			232
205				Recipe Management System			Stores all device recipes in the machine memory	Your Plant: Production Delay Ship to Plant: None End User: None	2	Pattern Recognition System error	outdated recipe saved on machine drive / server	Work Instruction - Load Recipe (JOV-280-040/3035) Training and certification of operator	3	Checking of family type / device and crystal type indicated on MWO every set-up Loading of recipe through AWACS Machine auto stop	2	L																			232
206								Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong Die Position (Dummy/Set-up units)	outdated recipe saved on machine drive / server	Work Instruction - Load Recipe (JOV-280-040/3035) Training and certification of operator	3	Checking of family type / device and crystal type indicated on MWO every set-up Loading of recipe through AWACS Machine auto vision / PRI per machine recipe 100% ADI/SPI Reflow+FT1/FT2 at Test	4	L																			234
207				MWO			Contains relevant information about the device/product	Your Plant: Production Delay Ship to Plant: None End User: None	2	Cannot scan MWO	Defective barcode lines	Reprint MWO	2	Check every loading of recipe Machine auto stop	2	L																			222
208			Die PR set up (ink die vs good die; reference die)	Technician		Sets up die pattern recognition for distinguishing good, ink, and reference dies	Teaches correct die PR	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Unfamiliar to PR requirement of the die (Man-related error, ESD)	Work Instruction (Die PR setup)	4	Setup Qualification (X-Y placement, visual after clip attach) Setup Process Verification Check every new device set-up Machine PRS auto vision	2	L																			242
209				Good Die			Normal good die to be learned as reference pattern	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Wrong PRS set-up	Work Instruction - PRS procedure (JOV-280-040/3035)	4	Check every new device set-up Machine PRS auto vision Machine auto stop	2	L																			242
210				Unique Reference Die (URD)			Serves as reference point during wafer map set up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong die picked	Wrong set-up of reference die	1. Include reference die coordinates setting on recipe 2.Unique Reference Die features of wafer for accurate map alignment 3.Using 2 reference die during map set up	4	Check URD every set-up Machine auto vision / PRI per machine recipe 100% ADI/SPI Reflow+FT1/FT2 at Test	4	M																			244
211								Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Wrong wafer used / wrong wafer lay-out	Unique reference die feature of wafer for accurate map alignment	3	Check URD every set-up Machine Auto Stop (PRS error)	2	L																			232
212								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong die picked (Dummy/Set-up units)	Wrong wafer orientation	Unique reference die feature of wafer for accurate map alignment	2	Check URD every set-up Machine auto vision / PRI per machine recipe 100% ADI/SPI Reflow+FT1/FT2 at Test	4	L																			724
213				Wafer map			Serves as reference for good and bad bin of the wafer	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong die picked (Dummy/Set-up units)	Wrong input of configurations and/or settings	Work Instruction on Wafer map set-up (JOV-280-040/3050)	2	Machine auto vision / PRI per machine recipe 100% ADI/SPI Reflow+FT1/FT2 at Test	4	L																			724
214								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong die picked (Dummy/Set-up units)	Incorrect wafer map loaded (Simple wafer map was loaded)	Work Instruction on Wafer preparation and Wafer map set-up (JOV-280-040/3050)	2	Machine auto vision / PRI per machine recipe Visual inspection of barcode Sticker on wafer Reflow+FT1/FT2 at Test	4	L																			724
215				Sawn Wafer			Contains singulated dies to be picked and attached onto the bottomframe	Your Plant: Production Delay Ship to Plant: None End User: None	2	Inked Fault	Faded ink on bad die	Work Instruction on Wafer PRS set up (JOV-280-040/3035)	4	Visual inspection of wafer every set up Reflow+FT1/FT2 at Test	4	L																			244

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA RP	Lead Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Lead Characteristics	PFMEA RP	Remarks				INET	OPT
216				PRS			Recognizes the visual image of the die to be displayed to the monitor.	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Cannot recognize the visual image of the die due to defective PRS PCBoard	Semi-annual PM activity - PRS PCBoard condition	3	Checks visual image of the die every set-up Machine auto stop	2	L																				232	
217				Camera			Records/captures visual images of the die	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Failure to record visual images of the die to defective / damage camera	Semi-annual PM activity - Camera condition	3	Checks visual image of the die every set-up Machine auto stop	2	L																				232	
218				Lens			Focuses the visual image of the die	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Failure to focus visual images of the die due to defective / broken Lens	Semi-annual PM activity - Lens condition	3	Checks focusing every set-up Machine auto stop	2	L																				232	
219				Halogen lamps			Provides lighting contrast for the visual image of the die	Your Plant: Production Delay Ship to Plant: None End User: None	2	Skipped die (Dummy/Set-up units)	Failure to provide lighting contrast for the visual images of the die due to defective / Busted Halogen lamps	Semi-annual PM activity - Halogen lamps condition	3	Check lighting contrast every set-up, Machine auto stop	2	L																				232	
220				Monitor			Displays the captured visual images of the die	Your Plant: Production Delay Ship to Plant: None End User: None	2	Cannot continue set-up activity	Failure to display the captured image of the die due to defective monitor	Semi-annual PM activity - Halogen lamps condition	3	Check display every set-up,	2	L																				232	
221			Die placement PR Set up	Technician		Sets up die pattern recognition for correct X/Y die placement	Teaches correct die placement PR	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong die positioning set-up (X-Y positioning) (Dummy/Set-up strip)	Inattentive to correct die placement during PR set up	Die set-up is saved in the appropriate recipe file. Work Instruction (Proper X-Y die positioning) Parameter Setting (die position specification)	5	Setup Qualification (X-Y placement, visual after clip attach) Setup Process Verification Scrap dummy/set-up strip Machine auto vision / PRB per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																				254	
222				Die placement parameter (X/Y)			Sets correct X/Y die placement coordinates according to Wiring diagram	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong die positioning set-up (X-Y positioning) (Dummy/Set-up strip)	Machine Encoder Problem, ESD	Die set-up is saved in the appropriate recipe file. Work Instruction (Proper X-Y die positioning) Parameter Setting (die position specification)	5	Setup Qualification (X-Y placement, visual after clip attach) Setup Process Verification Scrap dummy/set-up strip Machine auto vision / PRB per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																				254	
223								Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong die positioning set-up (X-Y positioning) (Dummy/Set-up strip)	Machine backlash/ mechanical offset	Semi-Annual PM Activities - Machine mechanical condition	5	Setup Qualification (X-Y placement, visual after clip attach) Setup Process Verification Scrap dummy/set-up strip Machine auto vision / PRB per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																				254	
224				Leadframe PR			Checks and verifies correct leadframe alignment prior dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor set-up of leadframe PR	Work Instruction - Teach Bond PR (JOV-280-040/3035)	3	Machine Auto stop Visual Inspection 100% SPI/AOI	3	L																				233	
225				Lighting Setting			Provides correct lighting setting for PR inspection	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor lighting set up of leadframe PR	Work Inspection (JOV-280-040/3035) Semi-annual PM activity - Lighting condition	3	Machine Auto stop Visual Inspection 100% SPI/AOI	3	L																				233	
226				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for PR inspection	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor LED lighting set up of leadframe PR	Work Inspection (JOV-280-040/3035) Semi-annual PM activity - LED Lighting condition	3	Machine Auto stop Visual Inspection 100% SPI/AOI	3	L																				233	
227				Auto Vision System			Inspects actual die placement as basis for die placement PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect wrong die position	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Machine auto stop Weekly Camera Focus calibration 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																				724	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Critical / Important	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Critical / Important	PFMEA AP	Remarks				INET	OPT
228								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Failed to detect wrong die position	Disabled auto vision system	Work Instruction (Operate on Prode Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator. 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		224	
229								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		724	
230								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done													724	
231								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		724	
232				Wiring Diagram			Contains product information and materials (solder paste , bottomframe, crystal type/s, clip frame, die X/Y placement) required to process the device	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong Die Position (Dummy/Set-up units)	Un-updated WIDI issued in the production line	Change management checklist	3	Visual Inspection CAMSTAR (as reference) Enovia Scrap Dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		234	
233				Material Online Booking System (Keeping to DACA)			Records date and time of leadframe withdrawal for ensuring good quality of leadframe (not oxidized)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized bottomframe	Incorrect date and time inputted on MO&S	Work Instruction - Bottomframe and magazine preparation (JOV-280-040/3050)	2	Machine auto stop Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		734	
234				Solder paste dispense			Dispenses correct solder dispense area and placement <JOV-280-40C/3005>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder (Dummy/set-up strip)	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done													234	
235								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive Solder (Dummy/set-up strip)	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done													234	
236				Anvil Block			Holds bottomframe in place using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		724	
237								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S																		724	
238				Anvil Block vacuum Hose			Aids in providing vacuum to hold the bottom in place through the anvil block	Your Plant: Production Delay Ship to Plant: None End User: None	7	Wrong die position	Low vacuum due to leak on air hose	Semi-Annual Activity - Anvil block vacuum hose condition	2	Setup Qualification (X-Y placement, visual after clip attach) Setup Process Verification Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																		724	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Risk Consequence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Risk Consequence	PFMEA AP	Remarks				INET	OPT
239			Solder dispense PR set up	Technician		Sets up solder dispense pattern recognition for correct dispense area and X/Y placement	Teaches correct solder dispense PR	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder (Dummy/set-up strip)	Inattentive to Solder dispense PR	Work Instruction - Dispense and Die Placement set-up (JOV-280-040/3035)	4	Setup Qualification (Solder Paste dispense quality) Setup Process Verification Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												243	
240								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Excessive Solder (Dummy/set-up strip)	Inattentive to Solder dispense PR	Work Instruction - Dispense and Die Placement set-up (JOV-280-040/3035)	4	Setup Qualification (Solder Paste dispense quality) Setup Process Verification Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												243	
241				Dispense pressure parameter			Correct dispense pressure parameter according to parameter settings <JOV-280-40C/3005>	Your Plant: Production Delay Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	4	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	M			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												742	
242								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	4	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	M	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												742	
243								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Solder splatter	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												722	
244				Dispense location parameter			Correct dispense location parameter according to parameter settings <JOV-280-40C/3005>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder (Dummy/set-up strip)	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L			Update WI:DI Re-train and re-certify operators of change		W. Cacarindin and F. Alcones	Jun-21	Done												233	
245								Your Plant: Production Delay Ship to Plant: None End User: None	2	Excessive Solder (Dummy/set-up strip)	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) Scrap dummy/set-up strip Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L			Update WI:DI Re-train and re-certify operators of change		W. Cacarindin and F. Alcones	Jun-21	Done												233	
246				Leadframe PR			Checks and verifies correct leadframe alignment prior bonding	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor set up of leadframe PR	Work Instruction - Teach Bond PR (JOV-280-040/3035)	3	Auto Vision System Visual Inspection 100% SPI/AOI	3	L																			233	
247				Lighting Setting			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Poor lighting conditions	Parameter Settings (JOV-280-40C/3005)	3	Checking during PR set up Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			733	
248								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Poor lighting conditions	Parameter Settings (JOV-280-40C/3005)	2	Checking during PR set up Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	S																			733	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA_RP	Risk Priority(RP)	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Risk Priority(RP)	PFMEA_RP	Remarks				INET	OPT
249				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Busted LED light	Semi-Annual PM Activity - LED lighting condition	2	Checking during PR set up Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			723	
250								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Busted LED light	Semi-Annual PM Activity - LED lighting condition	2	Checking during PR set up Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5																			723	
251				Auto Vision System			Inspects actual solder dispense as basis for solder dispense PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Machine auto stop Weekly Camera focus calibration Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5																			723	
252								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator. Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done													723	
253								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			723	
254								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected) Parameter Settings fof LAP Solder (JOV-280-40C/3005)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5			Update WI (JOV-280-040/3035) for pre-bond search box (position) specification with respect to solder dispense		S. Motas	17/03/2025	Open													723	
255								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L				Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done													723	
256				Material Online Booking System (Keeping to DACA)			Records date and time of leadframe withdrawal for ensuring good quality of leadframe (not oxidized)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Voids	Incorrect date and time inputted on MOBS	Work Instruction - Bottomframe and Magazine preparation (JOV-280-040/3050)	3	Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5																			733	
257				Anvil Block			Holds bottomframe in place using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			723	
258								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L	5																			723	
259				Solder paste dispense			Dispenses correct solder dispense area and placement <JOV-280-40C/3005>	Your Plant: Production Delay Ship to Plant: None End User: None	2	Insufficient Solder (Dummy/set-up strip)	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done													233	
260			Clipframe bonding PR set up	Tiechnician		Sets up clipframe bonding pattern recognition for correct clip placement	Teaches correct clipframe bonding PR	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong clip position (Dummy/set-up strip)	Inattentive to Bond PR on Clip Attach	Work Instruction - Bond PR on Clip Attach (JOV-280-040/3035)	4	Visual Inspection Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			243	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vee Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarael / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA-AP	Action Taken	Filter Codes (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Action Taken	FMEA-AP	Remarks				INET	OFT
261				Index track width parameter			Sets the correct index track width parameter according to -spec LF drawings-	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Incorrect index track width parameter	One-time calibration using one common leadframe width Semi-Annual PM activities - Index track width condition	3	Machine auto stop	3	L																			233	
262				Clip placement parameter			Inspects actual clip placement on processed units with respect to defined/taught PR	Your Plant: Production Delay Ship to Plant: None End User: None	7	Clip position problem	Wrong clip placement parameter	Work Instruction - Process on Clip Attach (JOV-280-040/3035) Scrap set-up strip	3	Visual inspection Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	
263								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed Clip	Wrong clip placement parameter	Work Instruction - Process on Clip Attach (JOV-280-040/3035)	3	Visual inspection Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	
264				Leadframe PR			Checks and verifies correct leadframe alignement prior bonding	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor set up of leadframe PR	Work Instruction - Teach Band PR (JOV-280-040/3035)	3	Auto Vision System Machine auto vision 100% AOI/SPI/PARMI	3	L																			233	
265				Lighting Setting			Provides correct lighting setting for PR inspection	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor lighting conditions	Lighting Parameter (PR Teaching) (JOV-280-40C/3005)	4	Checking during PR set up Machine auto stop	3	L																			243	
266				LED Lighting (Coaxial and side Illumination)			Provides correct lighting setting for PR inspection	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF PRS error	Poor LED lighting conditions	Lighting Parameter (PR Teaching) (JOV-280-40C/3005)	4	Checking during PR set up Machine auto stop	3	L																			243	
267				Auto Vision System			Inspects actual clip placement as basis for clip bonding PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Weekly Camera focus calibration Machine auto vision Tagged as reject at 2D amp 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																			724	
268								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of Swayed clip	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Weekly Camera focus calibration Machine auto vision Tagged as reject at 2D amp 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																			724	
269								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator. Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S																			724	
270								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Swayed clip	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator. Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S																			724	
271								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit (Pre-bond)	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Sep-21	Done														724	
272								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit (Pre-bond)	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Sep-21	Done														724	
273				Anvil Block			Holds bottomframe in place using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Sep-21	Done														724	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Controlled Parameters	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Controlled Parameters	PFMEA AP	Remarks				INET	OPT
274								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Machine auto vision 100% ADI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											724	
275				Material Online Booking System (Keeping to DACA).			Records date and time of leadframe and clipframe withdrawal for ensuring good quality of leadframe (not oxidized) and clipframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized Clipframe	Incorrect date and time inputted on MOBS	Work Instruction - Clipframe preparation (JOV-280-040/3050)	2	Machine auto stop (LF PR) Machine auto vision 100% ADI/SPI/PARMI Reflow+FT1/FT2 at Test	3	L																			733	
276				Solder paste dispense			Dispenses correct solder dispense area and placement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop Machine auto vision 100% ADI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											734	
277		Die Attach (DA) Assembly Line	Loading of bottomframe	Operator	Your plant: Assembly of die & solder paste onto the bottomframe Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Loads the correct bottomframe in correct orientation and alignment from stack loader using pick-up arm and transports the bottomframe to the index track	Loads the correct bottomframe #(12NC) per requirement	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect bottomframe orientation and alignment during loading	WI - 2D Leadframe Printed Preparation (JOV-280-040/3050) 2D code is checked by LMDC/strip map Leadframe pattern sensor recognition saved in RMS Training and Certification of the operator	2	Check every batch loading (Track in) thru CAMSTAR Machine auto stop feature if LF PRS is not ok.	2	L																			222	
278				Bottomframe alignment and orientation			Aligns and orients bottomframe properly	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect bottomframe orientation and alignment during loading	WI - 2D Leadframe Printed Preparation (JOV-280-040/3050) Semi-Annual Activity - Leadframe Pick-up Teaching Pick up position setting saved in RMS	2	Check every loading of bottomframe Machine auto stop feature that can detect unpicked LF	2	L																			222	
279				Pick up position parameter settings			Corrects pick up position according	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect pick up position parameter setting	WI - 2D Leadframe Printed Preparation (JOV-280-040/3050) Semi-Annual Activity - Leadframe Pick-up Teaching Pick up position setting saved in RMS	2	Check every loading of bottomframe Machine auto stop feature that can detect unpicked LF	2	L																			222	
280								Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Damaged bottomframes	Unsuccessful pick up due to incorrect pick up position parameter setting	WI - 2D Leadframe Printed Preparation (JOV-280-040/3050) Semi-Annual Activity - Leadframe Pick-up Teaching Pick up position setting saved in RMS	2	Check every loading of bottomframe Machine auto stop feature that can detect unpicked LF	2	L																			222	
281				Z level pick up			Corrects Z level pick up	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect Z level pick up parameter setting	Semi-Annual Activity - Leadframe Pick-up Teaching Z level pick up setting saved in RMS	2	Check every PM activities Check every set up for package conversion Machine auto stop feature that can detect unpicked LF	2	L																			222	
282								Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Damaged bottomframes	Unsuccessful pick up due to incorrect Z level pick up parameter setting	Semi-Annual Activity - Leadframe Pick-up Teaching Z level pick up setting saved in RMS	2	Check every PM activities Check every set up for package conversion Machine auto stop feature that can detect unpicked LF	2	L																			222	
283				Place position parameter settings			Corrects place position parameter	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Offset bottomframes placement	Incorrect place position parameter setting	Semi-Annual Activity - Leadframe Pick-up Teaching Place position setting saved in RMS	2	Check every PM activities Check every set up for package conversion Machine auto stop feature that can detect unpicked LF	2	L																			222	
284				Suction cap installation			Corrects installation of suction cap	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect placement of suction caps	Semi-Annual Activity - Suction Cap condition	2	Check every PM activities Machine auto stop feature	2	L																			222	
285				Bottomframe design/type			Corrects bottomframe design/type according to MWO	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Wrong bottomframe	Wrong bottomframe design/type used	WI - 2D Leadframe Printed Preparation (JOV-280-040/3050) Leadframe pattern sensor recognition saved in RMS	3	Check every batch loading (Track in) thru CAMSTAR Check every set up for package conversion Machine auto stop (2D barcode error)	2	L																			232	
286				Stack loader			Stacks the bottomframes loaded by the operator	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect stack loader position due to defective Stack loader	Semi-Annual Activity - Stack Loader condition	2	Check every set-up Machine auto stop	2	L																			222	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
	Sebastien Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Scan Classification	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Scan Classification	PFMEA AP	Remarks				INET	OPT
287								Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Damaged bottomframes	Incorrect stack loader position due to defective Stack loader	Semi-Annual Activity - Stack Loader condition	2	Check every set-up Machine auto stop	2	L																			222	
288				Pick up arm			Picks the bottomframe from stack loader	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Mis-aligned pick-up arm due to Damage/Defective mechanical arm	Semi-Annual Activity - Pick-up Arm mechanical condition	2	Check every set-up Machine auto stop	2	L																			222	
289				Y/Z Motor			Moves pick up arm to correct Y/Z position	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect pick-up position due to defective Y/Z motor	Semi-Annual Activity - Y/Z Motor condition	2	Check every set-up Machine auto stop	3	L																			223	
290								Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Incorrect pick-up position due to defective Sensor	Semi-Annual Activity - Sensor condition	2	Check every set-up Machine auto stop	2	L																			222	
291								Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Misaligned bottomframes due to incorrect pick-up position due to defective Y / Z motor	Semi-Annual Activity - Y/Z Motor condition	2	Check every set-up Machine auto stop	2	L																			222	
292				Fittings			Aids in supplying vacuum for holding bottomframe	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Insufficient vacuum pressure due to Faulty fittings	Semi-Annual Activity - Fittings condition	2	Check every set-up Machine auto stop	2	L																			222	
293				SMC / Solenoid Valve			Controls vacuum supply	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Insufficient vacuum pressure due to Defective SMC	Semi-Annual Activity - Fittings condition	2	Check every set-up Machine auto stop	2	L																			222	
294				Vacuum line			Aids in supplying vacuum for holding bottomframe	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Insufficient vacuum pressure due to clogged/leaking vacuum line	Semi-Annual Activity - Vacuum line condition	2	Check every set-up Machine auto stop	2	L																			222	
295				Suction cap			Comes in contact with the bottomframe during pick up using vacuum to hold the frame during transport from stack loader to index track position	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Unpicked bottomframes	Worn out suction cap	Semi-Annual Activity - Suction Cap condition	2	Check every set-up Machine auto stop	2	L																			222	
296				Index track			Receives the picked up bottomframe	Your plant: Production delay due to machine error and assist Ship to Plant: None End User: None	2	Index jamming	Dirty index track	Semi-Annual PM Activities - Cleaning of index track Machine 5S cleaning every start of shift (JOV-28D-040/3050)	2	Clean every start of shift Machine auto stop	2	L																			222	
297				Y-pusher aligner			Pushes the leadframe and align it with the index track	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	7	Wrong die position	Misaligned Y-pusher aligner	Semi-Annual PM Activities	3	100% Postbond inspection 100% AOI/SPI/PARMI	4	L																			734	
298			Scanning of bottomframe 2D code (input)	Operator		Scans 2D code on bottomframe surface for frame identification per lot	Activates LMDC	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong bottomframe identification	LMDC not activated	DACA WI (JOV-28D-040/3035) Training and Certification of the operator	4	On-screen display implicating LMDC activated status Comparison of machine output quantity and actual unit count	6	L																			246	
299							Operates the machines and presses autobond button	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	7	Insufficient/Excessive Solder	Failure to generate 2D reject map from prebond inspection due to autobond not activated	WI - Machine Mode setting : "Production" (JOV-28D-040/3035) Machine Mode setting : "Production" saved on RMS	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run	6	M	S		Update WI to include LAP solder Re-train and re-certify operators of change	No change, same criteria for inspection															736	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanzion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detect on (D) of FC/FM	PFMEA AP	Level Criticality	Filter Color (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Level Criticality	PFMEA AP	Remarks				INET	OPT
300				LMIDC FSE			Sets up 2D code scanning parameters	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	2	Wrong bottomframe identification	Failure to scan 2D code due to wrong parameters setting	Checking of parameters during full machine set up	2	Machine auto-stop	2	L																			222	
301				2D code scan delay			Sets the appropriate barcode scanning speed	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	2	Wrong bottomframe identification	Incorrect scan delay parameter setting	Checking of parameters during full machine set up	2	Machine auto-stop	2	L																			222	
302				2D code position			Sets the position of barcode scanner	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong bottomframe identification	Incorrect scan code position setting	Checking of parameters during full machine set up	2	Machine auto-stop	2	L																			222	
303				2D code reader			Reads the 2D mark of the bottom frame	Your Plant: Production Delay Ship to Plant: None End User: None	2	Invalid barcode error	Unable to scan 2D mark due to defective code reader	Semi-Annual PM - 2D code reader condition	2	Machine auto-stop	2	L															Equipment-centric				222	
304				LMIDC			Recognizes bottomframe identification lot in accordance with batch number	Your Plant: Production Delay Ship to Plant: None End User: None	2	Wrong bottomframe identification	LMIDC System error	Checking of parameters during full machine set up	1	Machine auto-stop	2	L																			232	
305								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Failure to recognize the bottomframe identification	Communication port is not working	WI - 2D Reject Map Setting (JOV-2B0-040/3035)	3	Machine error LMIDC displays status of barcode	2	L																			232	
306				Bottomframe (2D code quality/clarity)			Satisfies good marking quality	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Wrong bottomframe identification	Scratch and contamination on 2D mark surface due to mishandling	WI - Handling of bottomframe (JOV-2B0-040/3035) Leadframe storage in N2 cabinet	3	Machine auto stop	2	L																			232	
307								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Unrecognized 2D Barcode Mark on Lead Frame	1. Unclear 2D Barcode marking 2. Solder splatter on 2D barcode mark 3. Abnormality on 2D Barcode mark	1. Lead frame 2D barcode marker has a built in vision system that automatically compare actual mark against required mark 2. Correlate lead frame marker machine vision against ASM 2D barcode reader	3	Machine auto stop	2	L																					232	
308			Solder Paste Dispense Process (die pad and leads)	Operator		Dispenses correct amount of the correct solder paste on correct X/Y location on die pad and leads area	Loads the correct Solder Paste (12NC) per requirement	Your plant: Production delay Yield Loss Scrappage Reliability Ship to Plant: None End User: None	7	Cold Solder / Voids	Wrong Solder Paste# (12NC) used due to unfamiliar on system withdrawal (High Temp Solder - Low Temp Reflow)	MIS 2 system processes operator's solder paste request MIS 2 is linked to CAMSTAR to get correct 12NC material requirement Training and Certification of the operator	3	Automated systems (MIS 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S		Update MIS database to include LAP solder Re-train and re-certify operators of change		R. Encarguez (MIS) (info to be provided by project team)		Done												734	
309							Installs correct dispense tool per requirement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense tool used due to unfamiliarity with dispense tool designs /matrix	Tool matrix document (JOV-2B0-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-2B0-040/4035) Machine auto Vision	3	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done													733	
310								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense tool used due to unfamiliarity with dispense tool designs /matrix	Tool matrix document (JOV-2B0-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-2B0-040/4035) Machine auto Vision	3	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done													733	
311								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Outdated tool matrix	Tool matrix document (JOV-2B0-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-2B0-040/4035) Machine auto Vision	3	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done													733	
312								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Outdated tool matrix	Tool matrix document (JOV-2B0-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-2B0-040/4035) Machine auto Vision	3	L	S		Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done													733	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Neoperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura-Process Engineering Allen Canete-Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vee Garcia
Customer Name:	All Neoperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA AP	Initial Classification	Filter Codes (optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Revised Classification	FMEA AP	Remarks				INET	OPT
313							Follows correct criteria for Solder Voids	Your plant: Production delay Yield Loss Scrappage Reliability Customer complaint Ship to Plant: None	7	Voids	Wrong criteria used during set-up/ machine qualification	Product Visual Criteria for Clpbonded Package (JOV-200-04Q/3005) Training and Certification of the operator	3	Machine auto vision and auto stop for low solder amount dispensed SPC Solder Voids Measurement	10	M	S		Redefine solder voids rejection criteria for 50um die thickness during set-up		R. Jereza	Sep'2021	Done	Specification Update	Sep'2021	7	3	4		L	Ref # Complaint C2100878				7310	
314				Dispense tool set up			Corrects Dispense tool set-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to misaligned dispense tool set up	Set up and Qualification (MPMF - JOT-28D-040/4035)	3	Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L	S																		733	
315								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Offset in dispense location due to misaligned dispense tool set up	Set up and Qualification (MPMF - JOT-28D-040/4035)	3	Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L	S																		733	
316				Dispense pressure parameter			Corrects dispense pressure parameter <JOV-28D-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-28D-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	4	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	M	S		Update Parameter Settings of Power Die Attach (JOV-28D-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												742	
317								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-28D-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	4	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	M	S		Update Parameter Settings of Power Die Attach (JOV-28D-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												742	
318								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Solder splatter	Wrong dispense pressure parameter used	Parameter Settings document (JOV-28D-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	L			Update Parameter Settings of Power Die Attach (JOV-28D-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												722	
319								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Too small range of AOI limit for die pad and top solder	Implemented optimized AOI limits	3	Machine Auto vision and top solder coverage x-ray inspection - Machine Auto Stop	3	L	S		Update Parameter Settings of Power Die Attach (JOV-28D-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
320								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Too wide range of AOI limit for die pad and top solder	Implemented optimized AOI limits	3	Machine Auto vision and top solder coverage x-ray inspection - Machine Auto Stop	3	L	S		Update Parameter Settings of Power Die Attach (JOV-28D-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
321				Dispense location parameter			Corrects dispense location parameter	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L	S		Update X/Y Placement Values in RMS for LAP solder Re-train and re-certify operators of change		L. Arciga for RMS update	Oct-21	Done												733	
322								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L	S		Update X/Y Placement Values in RMS for LAP solder Re-train and re-certify operators of change		L. Arciga for RMS update	Oct-21	Done												733	
323				Solder paste syringe installation			Installs solder paste syringe correctly as per work instruction <JOV-28D-04Q/3035>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect installation procedure of syringe causing unintended dripping of solder paste on clip top	Work Instruction - Procedure on removal of the whole tool assembly out of the work holder during change of syringe	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												733	
324								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excess solder on clip top	Incorrect installation procedure of syringe causing unintended dripping of solder paste on clip top	Work Instruction - Procedure on removal of the whole tool assembly out of the work holder during change of syringe	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done												733	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA RPN	Overall Criticality Assessment	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Criticality Assessment	FMEA RPN	Remarks				INET	OPT
325				Type of solder paste			Corrects solder paste type according to MWO	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Cold Solder / Voids	Wrong type of solder paste used	MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement Color coding on solder paste label Work Instruction	3	Automated systems (MES 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal Check correct solder based on WIOI Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L	S		Update MES database to include LAP solder Re-train and re-certify operators of change		R. Encarguez (MES) (Info to be provided by project team)		Done													734	
326				Type of solder paste (Indium LAP)			Correct solder paste type according to MWO	Your plant: Production delay Yield loss Reliability Failure Ship to Plant: None. End User: None.	8	Idss shift after HTGB Rel test Partial Bedss loss after HTGB Rel test	Wrong type of solder paste used	MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement Color coding on solder paste label Work Instruction	7	HTGB Rel Test (FM) MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement Color coding on solder paste label Work Instruction (FC)	5	H			Checking of CoC from supplier	Include in routine monitoring	JD Perez	Jun-21	Done													875	
327				Solder paste preparation			Thaws solder paste completely	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong thawing procedure	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Thawing Time as per Control plan document (JOV-2G2-04G/2008)	1	Automated Thawing and Floor Life monitoring. CMMS triggers change of Solder Paste Checking of expiration date every change of solder paste	3	L	S																		723	
328				Archer Fish Dispenser			Releases correct amount of dispense pressure to dispense correct amount of solder paste	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Pressure leak due to worn out/oversized O-ring	Semi-Annual Activity - O-Ring Dispenser condition	2	- Checking of Archer Fish Dispenser condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
329								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low Air pressure	Semi-Annual PM - Archer Fish Dispenser condition	2	- Checking of Archer Fish Dispenser condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
330								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Defective air pressure regulator	Semi-Annual PM - Archer Fish Dispenser condition	2	- Checking of Archer Fish Dispenser condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
331								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	High Air Supply	Semi-Annual PM - Archer Fish Dispenser condition	2	- Checking of Archer Fish Dispenser condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
332				Dispenser X/Y/Z motor			Moves to dispense solder paste on correct X/Y location from correct Z level on die pad and leads	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to Dispenser X/Y/Z motor issues	Semi-Annual PM - Dispenser motor condition	2	- Checking of Dispenser motor condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
333								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Offset in dispense location due to Dispenser X/Y/Z motor issues	Semi-Annual PM - Dispenser motor condition	2	- Checking of Dispenser motor condition every PM - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	S																		723	
334								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Defective Dispenser X/Y/Z axis motor and Gear	Semi-Annual PM - Dispenser X/Y motor and Gear condition	2	- Checking of dispenser X/Y motor and Gear condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																		723	
335								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Defective Dispenser X/Y/Z axis motor and Gear	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				722	
336								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Defective Dispenser X/Y/Z axis motor and Gear	Semi-Annual PM - Dispenser X/Y motor and Gear condition	2	- Checking of dispenser X/Y motor and Gear condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																		723	
337				Machine (Dispenser X/Y/Z Linear Encoder)			Reads position of dispenser on machine	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Defective Dispenser X/Y/Z Linear Encoder	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	M																Equipment-centric				742	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Risk Ranking	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Risk Ranking	PFMEA AP	Remarks				INET	OPT
338				Dispense tool holder			Maintains good planarity of dispense tool holder	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to wrong planarity of dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense tool holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
339								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Offset in dispense location due to wrong planarity of dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense tool holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
340								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Unbalanced dispense due to loose screw dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense tool holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
341								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Unbalanced dispense due to loose screw dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense tool holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
342				Machine (Epoxy Writing Assy)			Provides lighting onto leadframe during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Unable to search PR template	Defective or dim epoxy writing ASSY	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
343				Machine (Dispensing Optics Assy)			Provide camera feed to machine during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Unable to search PR template	Defective dispense optics	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
344				Machine (Cross Roller Way)			Provide Z axis movement to machine during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Worn-out of Cross Roller Way	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
345				Syringe holder			Maintains good planarity of syringe holder	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Unbalanced dispense due to loose screw syringe holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense syringe holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
346								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Unbalanced dispense due to loose screw syringe holder	Semi-Annual PM - Dispense tool holder condition	2	- Checking of dispense syringe holder condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
347				Paste level sensor			Performs its function as paste level sensor to detect near empty level	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low solder paste level due to disabled/malfunctioned paste level sensor	Semi-Annual PM - Paste Level Sensor condition	2	- Checking of Paste Level Sensor condition every PM - Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S																	723	
348								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Syringe Epoxy Low Error	Low solder paste level due to disabled/malfunctioned paste level sensor	Semi-Annual PM - Paste Level Sensor condition	2	- Checking of Paste Level Sensor condition every PM - Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L															Equipment-centric				723	
349				Venturi Vacuum			Provides sufficient Venturi Vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low Vacuum / CDA Supply	Semi-Annual PM Activity - Vacuum condition	2	- Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S																	723	
350								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Low Vacuum / CDA Supply	Semi-Annual PM Activity - Vacuum condition	2	- Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S																	723	
351								Your Plant: Production Delay Ship to Plant: None End User: None	7	No Compressed Air	Low Vacuum / CDA Supply	Set-up Validation - Availability	4	Machine Error Machine Auto Stop Pacman Gauge Check	3	M															Equipment-centric				743	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PTMEA,AP	Current Prevention	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Current Prevention	PTMEA,AP	Remarks				INET	OPT
352				Hose			Hose is clean and in good condition	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged hose	Semi-Annual PM Activity - Hose condition	2	- Checking of hose condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																723	
353								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Damaged/Worn-out hose	Semi-Annual PM - Hose condition	2	- Checking of hose condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																723	
354								Your Plant: Production Delay Ship to Plant: None End User: None	7	No Compressed Air	Damaged/Worn-out hose	Semi-Annual PM Activity - Hose condition	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
355				Solder paste			Solder paste is within shelf and floor life based on control plan <JOV-280-040/3050>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Expired Solder Paste used	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Solder Paste Preparation - verification of paste expiration date (JOV-2G2-040/2008 , JOV-280-/3050) Sticker for expiration date	1	Automated systems (MIS 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal Checking of expiration date every change of solder paste	3	L	S		Update CMMS to include LAP Solder Re-train and re-certify operators of change		R. Encarguez		Done										733	
356				Dispense tool			Dispense tool is in good condition based on set criteria <JOV-280-040/3050>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Defective dispense tool	WI - Dispense Tool cleaning (JOV-280-040/3050)	3	- Cleaning every 4 days. (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done										733	
357								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive Solder / Solder Splatter	Defective dispense tool	WI - Dispense Tool cleaning (JOV-280-040/3050)	3	- Cleaning every 4 days. (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done										733	
358								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged-up dispense tool	WI - Dispense Tool cleaning (JOV-280-040/3050)	3	- Cleaning every 4 days. (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done										733	
359				Dispense Solenoid Valve			Controls ON and OFF on the dispense pressure	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Dispense solenoid valve failure (defective solenoid valve)	Semi-Annual PM - Dispense Solenoid Valve condition	2	Checking of dispense solenoid valve condition every PM - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	L	S																723	
360			Loading of wafer cassette	Operator		Places wafers in wafer cassette which is loaded on cassette platform Cassette elevator moves the platform up and down Wafer gripper loads wafer from wafer cassette to wafer table Wafer expansion unit holds and expands the wafer film for more efficient chip removal Wafer map file is loaded to ensure correct die pick up	Operates the machine and press the autobond button	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafers	Wrong handling/loading orientation of the cassette on the platform due to lack in visual aid instruction on proper loading of cassette	WI - Wafer Preparation (JOV-280-040/3050) Training and Certification of the operator	2	Checking of cassette loading every device Set-up change of MWO - Machine Auto stop when not in correct orientation	3	L																	223	
361							Loads the wafer cassette with wafers on the cassette platform in correct orientation	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafers	Wrong handling/loading orientation of the cassette on the platform due to lack in visual aid instruction on proper loading of cassette	WI - Wafer Preparation (JOV-280-040/3050) Training and Certification of the operator	2	Checking of cassette loading every device Set-up change of MWO - Machine Auto stop when not in correct orientation	3	L																	223	
362							Loads the correct wafer map file	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	7	Wrong die pick up	Loading of wrong wafer map file	WI - Auto Wafer Map loading (JOV-280-040/3035) DCR system for full wafer map	4	Checking of wafer remnants vs Electronic map Auto checking of wafer map	3	M																	743	
363							Proper setting of wafer map on Monoid (Alphasem Machines)	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	7	Wrong die pick up	Improper setting of wafer map on Monoid (Alphasem Machines) due to wrong input of configurations and/or settings	WI - Auto Wafer Map loading (JOV-280-040/3035) DCR system for full wafer map	3	Checking of wafer remnants vs Electronic map Auto checking of wafer map	3	L																	733	
364							Enabling of Barcode reader	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafer map	Failure to enable Barcode reader due to wrong input of configurations and/or settings	WI - Setting Up of Barcode (JOV-280-040/3035)	3	Checking of barcode every set-up Machine auto stop	3	L																	233	
365							Proper teaching of barcode reader	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafer map	Wrong teaching of barcode reader due to Unaware of procedure	WI - Setting Up of Barcode (JOV-280-040/3035)	3	Checking of barcode every set-up Machine auto stop	3	L																	233	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level 1 Control AP	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sever Ky (S)	Occurrence (O)	Detection (D)	Level 1 Control AP	PFMEA AP	Remarks				INET	OPT
366							Operates to expand the wafer to have sufficient die to die gap	Your plant: Production delay (Wafer loading error) Customer complaint Ship to Plant: None End User: None	8	Chipped-out / Cracked Die	Colliding of die to die due to multiple expansion as a result of machine error assist	OCAP of Power Die Clip Attach (JOV-2G1-040/2089) Parameter Setting of Power Die and Clip Attach	6	Machine alarms - auto stop and logs Checking of parameters every set-up Machine parameter range lock Reflow+FT1/FT2 at Test	3	H			Implement blower pre and post open delay setting. Generate procedure on Wafer Map Time Out error handling, this is to prevent unloading of wafer on the expander table.	Perform FT2 for lots that encountered unloading of partial wafers for Taiko devices.	R. Jereza	Oct'2021	Closed											863	
367				Close distance parameter			Corrects close distance parameter <JOV-280-40C/3005>	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	7	Damaged wafers (ripped wafer films)	Wrong close distance parameter	Parameter Settings of Power die and Clip Attach (JOV-280-40C/3005)	2	Checking of parameters every set-up Machine auto stop	3	L																			723	
368								Your plant: Production delay (Wafer loading error) Yield Loss Ship to Plant: None End User: None	7	Chipped out	Wrong close distance parameter	Parameter Settings of Power die and Clip Attach (JOV-280-40C/3005) Parameters saved on Recipe	2	Checking of parameters every set-up Reflow + FT1 / FT2 at Test	5	M																			725	
369				Wafer Cassette Loader Sensor			Performs its function properly to detect wafer cassette	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to detect wafer cassette	Mis-aligned wafer cassette loader sensor	Semi-Annual PM Activity - Wafer cassette loader sensor condition	2	Checking of Wafer cassette loader sensor condition every PM	3	L																			223	
370				Wafer cassette loader motor			Performs its function properly as wafer loader motor	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafers - Failure to load wafer correctly to the wafer handler	Defective wafer cassette loader motor Cassette stepper assembly failure -stepper motor problem (X-Y, Sft) -Misaligned wafer loader with respect to X-Y table Misaligned/defective/improper sensitivity setting of wafer present sensor -Worn-out/defective grabber assembly -Hot air blower problem -ESD	Semi-Annual PM Activity - Wafer loader motor condition	2	Checking of Wafer loader motor condition every PM	3	L																					223	
371				Wafer Theta			Performs its function properly as wafer theta correction	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Mis-aligned Die placement	Wafer theta malfunction, ESD	Semi-Annual PM Activity - Wafer Theta condition	2	Checking of Wafer Theta condition every PM - Machine Auto vision - Machine auto stop feature if die placement is outside the criteria)	3	L																			223	
372				Wafer gripper			Picks the wafer from the cassette and loads it on the wafer table	Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Misalignment of Gripper and Wafer Elevator	Set-up Verification - Gripper Alignment	7	Machine Error Machine Auto Stop	2	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	4	2		L	Equipment-centric				272	242
373								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Grip Sensor Cannot Detect Wafer Error	Defective gripper sensor	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	2	L			Include functionality test of sensor and sensor position during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	2		L	Equipment-centric				222	222
374								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Worn-out LM guides	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include lubrication and condition checking of guides during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
375								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Worn-out belt and pulley assembly	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include condition check and replacement of belt during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
376								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Defective solenoid valve	Semi-annual PM activity - Wafer Loading	2	Machine Error Machine Auto Stop	3	L			Include functionality test for solenoid valve/ cleaning of solenoid valve during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				223	223
377								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong get position parameter	Set-up Verification - Gripper Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
378								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong magazine position parameter	Set-up Verification - Gripper Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
379								Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafers	Defective wafer gripper	Semi-Annual PM Activity - Wafer gripper motor condition	2	Checking of Wafer gripper motor condition every set-up	3	L																			223	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Nevis - FMEA Owner Shara Michel Berario - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Berario/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Novel Controls/Actions	FT for Critical (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Novel Controls/Actions	PFMEA AP	Remarks				NET	OPT
380				Machine (Wafer table)			Receives the wafer and expands the wafer	Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	No Wafer Detected in Wafer Table	Defective/ Misaligned Wafer Exist sensor	Semi-annual PM activity - Wafer Table - Wafer Exist Sensor Check	4	Machine Error Machine Auto Stop	3	L			Include wafer exist sensor check during PM activities and MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
381								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Small gap of wafer table	Set-up Verification - Wafer Table Alignment	4	Machine Error Machine Auto Stop	3	L			Include wafer table planarity check during PM activities		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
382								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	No wafer ring aligner	N/A	4	Machine Error Machine Auto Stop	3	L			Include wafer ring aligner check during PM activities and MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
383								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Unable to Load to Wafer	Worn-out idle gear	Semi-annual PM activity - Wafer Table - Idle Gear Condition	3	Machine Error Machine Auto Stop	3	L			Include idle gear condition check during PM activities.		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				233	223
384								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Unplanar Wafer Table	Set-up Verification - Wafer Table Alignment	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
385								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Broken encoder shafting	Semi-annual PM activity - Encoder Shaft Condition Check	4	Machine Error Machine Auto Stop	3	L			Define correct handling of part during troubleshooting and repair		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				243	223
386				Machine (Wafer Cassette Elevator)			Indexes wafer cassette from bottom to top	Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	No Cassette in Wafer Loader	Defective photosensor	Semi-annual PM activity - Photosensor Sensor Check	2	Machine Error Machine Auto Stop	2	L			Include elevator photosensor check during PM activities and MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	2		L	Equipment-centric				222	222
387								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Misaligned wafer guides	Set-up Verification	5	Machine Error Machine Auto Stop	3	L			Define position and alignment of wafer guides. Include checking of screws and position of guides during MKAK		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
388								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong first position parameter	Set-up Verification - Elevator Slot Position	5	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				253	223
389								Your Plant: Machine Stoppage (Unable to Load to Wafer) Ship-to-Plant: None End User: None	2	Gripper Motor Missing Steps Error	Wrong slot pitch parameter	Set-up Verification - Elevator Pitch Parameter	3	Machine Error Machine Auto Stop	3	L			Include alignment of gripper, wafer table, and wafer elevator during PM activities and Re-setup		H. Gutlay	Q3'2021	Done	JOT-2H0-040/4059	Q3'2021	2	2	3		L	Equipment-centric				233	223
390				Motor drive belt			Motor drive belt must be in good condition	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to load wafers	Worn out motor drive belt	Semi-Annual PM Activity - Wafer motor drive belt condition	2	Checking of Wafer loader motor condition every set-up	3	L																			223	
391				Engage sensor			Performs its function properly as engage sensor	Your plant: Production delay (Wafer loading error) Ship to Plant: None End User: None	2	Unable to expand wafer	Defective engage sensor	Semi-Annual PM Activity - Wafer engage sensor condition	2	Checking of Wafer engage sensor condition every set-up	3	L																			223	
392			Prebond Inspection	Operator		Inspects solder dispense based on defined Pattern Recognition reference	Stabilizes solder dispense condition	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Incorrect stabilization of solder paste	Wrong purging and stabilization procedure	WI - Solder paste preparation (JOV-2B0-040/3050)	5	Auto Vision System	3	M			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											753	
393				Technician			Defines pattern recognition reference based on stabilized solder dispense	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Incorrect inspection of dispensed solder paste	Poor set up of prebond PR	WI - AOI Window Set up (JOV-2B0-040/3035)	5	Auto Vision System Machine auto stop	3	M	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											753	
394				Leadframe PR			Checks and verifies correct leadframe alignment prior dispensing	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Poor set up of leadframe PR	WI (JOV-2B0-040/3035)	3	Auto Vision System	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											733	
395								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Poor set up of leadframe PR	WI (JOV-2B0-040/3035)	3	Auto Vision System	3	L	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PRIPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Nevin - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)								OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA AP	Severity x Occurrence	Filter Code (O,optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity x Occurrence	FMEA AP	Remarks				INET	OPT
396				PR (Solder dispense - position and area)			Compares actual solder dispense versus defined solder dispense pattern	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong set up of PR	WI - ACI Window Set up (JOV-280-040/3035)	5	Auto Vision System	3	M	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											753	
397								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong set up of PR	WI - ACI Window Set up (JOV-280-040/3035)	5	Auto Vision System	3	M	S		Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Feb-21	Done											753	
398				Lighting Setting			Provides correct lighting setting for solder dispense PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Poor lighting conditions	Parameter Settings (JOV-280-40C/3005)	4	Checking during PR set up Auto Vision System	3	M	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											743	
399								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Poor lighting conditions	Parameter Settings (JOV-280-40C/3005)	4	Checking during PR set up Auto Vision System	3	M	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											743	
400								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe PRS assist	Leadframe oxidation	Material Online Booking System (Keeping to DACA)	4	Checking during PR set up Parameter Lock in RMS	3	M																			743	
401				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for solder dispense PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Busted LED light	Semi-Annual PM Activity - LED lighting condition	2	Checking during PR set up Auto Vision System	3	L	S																		723	
402								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Busted LED light	Semi-Annual PM Activity - LED lighting condition	2	Checking during PR set up Auto Vision System	3	L	S																		723	
403								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unable to search PR template	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L																Equipment-centric				723	
404								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Inspection Status Erro	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L																Equipment-centric				723	
405								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Too Large/Small Error	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L																Equipment-centric				723	
406				Auto Vision System			Inspects actual solder dispense on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Machine auto stop Weekly Camera Focus calibration	3	L	S																		723	
407								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator.	3	L	S																		723	
408								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design	3	L					Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
409								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design	3	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
410								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected) Parameter revisit of vision system Theoretical computation of solder volume	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Visual inspection (X-ray Top solder wetting)	3	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navia - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres – Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																				
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Visual Criticality Index	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Visual Criticality Index	PFMEA AP	Remarks				RNET	OPT
411								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected) Parameter revisit of vision system Theoretical computation of solder volume	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design Visual Inspection (X-ray Top solder wetting)	3	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
412								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
413				Machine (Bond Optics XY Motor)			Moves bond optics assembly XY position	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
414								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
415								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
416								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
417				Machine (Bond Optics LM Guides			Provides guide for which bond optics ASSY moves upon	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
418								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
419								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
420								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
421				Machine (Bond Optics Home Sensor)			Senses home position of bond optics	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optics Home Sensor	Semi-Annual Activity - Sensor Condition	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
422				Anvil Block			Holds bottomframe in place using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	5	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																			723	
423								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	5	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																			723	
424				Solder paste dispense			Dispenses correct solder dispense area and placement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop	3	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											733	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)					OPTIMIZATION (STEP 6)																				
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Local Criticality	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sev by (S)	Occur even (O)	Detect ion (D)	Local Criticality	PFMEA AP	Remarks				INIT	OPT
425								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop	3	L	S		Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superficial	1-Sep-21	Done										733	
426			Die Eject	Operator		Uses needle/s underneath wafer film to push the chip off the film without causing damage or markings on the wafer film and chip	Operates the machine and presses the autobond button Installs required number of needles per device	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Installation of incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Scrap set-up strip Needle Tool Matrix (JOV-280-040/3033)	5	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	5	M																					755	
427								Your Plant: Production delay Yield loss Scrap lots Ship-to-Plant: None End User: None	7	Chipped out	Installation of incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	3	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Machine auto vision / PBI per machine recipe 100% AOI/SPI Reflow+FT1/FT2 at Test	4	L																					734	
428								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Installation of incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-280-040/3067> Regular requalification of operators of the work instruction	3	Checking every device set-up and change of needle set up Checking of needle mark at the side of the die every start of shift First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	L																					732	
429								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Missing die	Installation of incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																					734	
430				Tiechnician			Installs / assembles required number of needles per device	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Inattentive to required number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Scrap set-up strip Regular requalification of operators of the work instruction Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	5	M																					725	
431								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Inattentive to required number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techn/QA : Visual Inspection) Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	4	L																					734	
432				Tooling Custodian			Monitors the Needle tool life	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Surface Damage	Incorrect or no record of tool count Man-related [non compliance]	MPMF (Change needle assembly)(JOT-280-040/4035)	2	Checking of consumables every start of shift Reflow + FT1 / FT2 at Test	5	M																					725	
433								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect or no record of tool count Man-related [non compliance]	MPMF (Change needle assembly)(JOT-280-040/4035)	3	Checking of consumables every start of shift Reflow + FT1 / FT2 at Test	4	L																					734	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Good Case assessing	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Good Case assessing	PFMEA AP	Remarks				INET	OPT
434				Technician/Setter			Performs needle centering / 3-point alignment	Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Unpicked Die	Uncentered needle-to-die alignment	WI - Ejector Needle Set-up (JOV-280-040/3035)) MPMF (3-Point alignment)(JOT-280-040/4035)	2	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	5	M																			725	
435								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out/Die Crack	Uncentered needle-to-die alignment	WI - Ejector Needle Set-up (JOV-280-040/3035)); Ejector needle assembly visual centering reference (C2401526 and C24014999) MPMF (3-Point alignment)(JOT-280-040/4035)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																			734	
436								Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Unpicked Die	Uncentered needle-to-die alignment	WI - Ejector Needle Set-up ((JOV-280-040/3035)) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-240-040/3067> Regular requalification of operators of the work instruction MPMF (3-Point alignment)(JOT-280-040/4035)	4	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	M																			742	
437							Performs needle-cap reference auto learn	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Unpicked Die	Wrong auto learn procedure performed	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) Scrap set-up strip MPMF (JOT-280-040/4035)	2	Checking every device set-up and change of needle set up First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	5	M																			725	
438								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Wrong auto learn procedure performed	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) MPMF (JOT-280-040/4035)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																			734	
439								Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Unpicked Die	Wrong auto learn procedure performed	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) MPMF (JOT-280-040/4035)	4	First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual Inspection) Checking every device set-up and change of needle set up Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	2	M																			742	
440				Ejector configuration (location of needle)			Correct ejector configuration	Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Die Position problem	Incorrect ejector configuration (location of needle)	WI - Ejector Needle Set-up (JOV-280-040/3035) Scrap set-up strip Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	5	M																			725	
441								Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Chipped out	Incorrect ejector configuration (location of needle)	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																			734	
442								Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Unpicked Die	Incorrect ejector configuration (location of needle)	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																			722	
443				Number of needles (1,2,4,5)			Correct number of needles	Your Plant: Production delay Yield loss Ship-to Plant: None End User: None	7	Die Position problem	Incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Scrap set-up strip Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	5	M																			725	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level Concurrence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Level Concurrence	PFMEA AP	Remarks				INET	OPT
444								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																		734	
445								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Incorrect number of needles	WI - Ejector Needle Set-up (JOV-280-040/3035) Needle Tool Matrix (JOV-280-040/3033)	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																		722	
446				Ejection cap reference parameter			Correct ejector cap reference parameter	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Dice fly-off	Incorrect Ejector Cap Reference parameter	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) Scrap set-up strip MPMF (JOT-280-040/4035)	2	Checking every device set-up and change of needle set up First Piece Inspection during setup: Set-up Qualification (Techs/QA : Visual inspection) Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	5	M																					725	
447								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect Ejector Cap Reference parameter	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) MPMF (JOT-280-040/4035)	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																				734	
448								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Incorrect Ejector Cap Reference parameter	WI - Set-up Ejector Cap / Level Reference Auto Learn (JOV-280-040/3035) MPMF (JOT-280-040/4035)	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																		722	
449	Leading indicators c/o Emaid S.			Needle up level parameter			Correct needle up level parameter	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	8	Cracked die	Incorrect needle up level parameter (Customer Complaint)	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	5	Checking every device set-up and change of needle set up Machine parameter range lock Auto detect of parameter breach 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test Wafer remnants Inspection (100% all wafers) First piece inspection (Dummy LF) every machine intervention Postbond PR error	4	M				Evaluation of Needle Ejector Up Level	None	Gilbert N.	Dec. 2020	Done		Dec. 2020	8	3	4		L						854	834
450								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Incorrect needle up level parameter	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking every device set-up and change of needle set up Machine parameter range lock Auto detect of parameter breach Reflow + FT1 / FT2 at Test	4	L																				734	
451								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Incorrect needle up level parameter	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	2	Checking every device set-up and change of needle set up Machine parameter range lock Auto detect of parameter breach Machine auto stop	2	L																				722	
452				Stability of needle ejection (centering)			Centered/stable needle	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Unstable needle ejection (center / not center)	WI - Ejector Needle Set-up ((JOV-280-040/3035))	4	Checking every device set-up and change of needle set up Machine auto stop	2	M																				742	
453								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Unstable needle ejection (center / not center)	WI - Ejector Needle Set-up ((JOV-280-040/3035))	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																				734	
454				Installation of needle chuck screw			Correct orientation of needle chuck screw upon installation	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Wrong installation of needle chuck screw (inverted)	WI - Ejector Needle Set-up ((JOV-280-040/3035))	4	Checking every device set-up and change of needle set up Machine auto stop	2	M																				742	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC / FM	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	TYPE/RAJP	SHIPS / CRITICALITY	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	SHIPS / CRITICALITY	TYPE/RAJP	Remarks				INET	OPT
455								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Wrong installation of needle chuck screw (inverted)	WI - Ejector Needle Set-up ((JOV-280-040/3035))	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																		734	
456				Needle coplanarity			Correct coplanarity of multi needle configuration	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Non-coplanar multi-needle configuration	WI - Ejector Needle Set-up ((JOV-280-040/3035))	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																		722	
457								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Non-coplanar multi-needle configuration	WI - Ejector Needle Set-up ((JOV-280-040/3035))	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																		734	
458				Die ejector motor			Ejects the die with and consistent ejector needle up movement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Inconsistent ejector needle up movement due defective die ejector motor	Semi-Annual PM Activity - Ejector motor condition	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																		722	
459								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Inconsistent ejector needle up movement due defective die ejector motor	Semi-Annual PM Activity - Ejector motor condition	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																		734	
460				Machine (Die Ejector Motor)			Ejects the die with and consistent ejector needle up movement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Ejector Not Motor On	Defective Die Ejector Motor	Semi-Annual PM Activity - Ejector motor condition	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				722	
461								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Ejector Motion Timeout	Defective Die Ejector Motor	Semi-Annual PM Activity - Ejector motor condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
462								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector search fail	Defective Die Ejector Motor	Semi-Annual PM Activity - Ejector motor condition	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				722	
463								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector Hipec DAC Limit	Defective Die Ejector Motor	Semi-Annual PM Activity - Ejector motor condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
464				Machine (Die Ejector LM Guides)			Provides guide for which ejector ASSY moves	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Ejector Motion Timeout	Worn out Die Ejector LM Guides	Semi-Annual PM Activity - Die Ejector LM Guides condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
465								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector search fail	Worn out Die Ejector LM Guides	Semi-Annual PM Activity - Die Ejector LM Guides condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
466								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector Hipec DAC Limit	Worn out Die Ejector LM Guides	Semi-Annual PM Activity - Die Ejector LM Guides condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
467				Machine (Die Ejector Home Sensor			Senses home position of die ejector	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector search fail	Defective Ejector Home Sensor	Semi-Annual PM Activity - Sensor condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
468								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector search fail	Defective Ejector Home Sensor	Semi-Annual PM Activity - Sensor condition	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	
469				Machine (Die Ejector Linear Encoder)			Reads position of Die Ejector on guides	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Ejector Hit Limit Sensor	Defective Ejector Linear Encoder	Set-up Validation - Functionality	3	Machine Error Machine Auto Stop	4	L																Equipment-centric				734	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novo - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Severe Effect Warning	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severe Effect Warning	PFMEA AP	Remarks				INET	OPT
470								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Ejector Motion Timeout	Defective Ejector Linear Encoder	Set-up Validation - Functionality	3	Machine Error Machine Auto Stop	4	L															Equipment-centric				734	
471				Machine (Die Ejector Cross Roller Way)			Provides Z-axis movement of die ejector	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector search fail	Defective/Worn-out Cross Roller Way	Set-up Validation - Functionality	3	Machine Error Machine Auto Stop	4	L															Equipment-centric				734	
472								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Ejector Hipec DAC Limit	Defective/Worn-out Cross Roller Way	Set-up Validation - Functionality	3	Machine Error Machine Auto Stop	4	L															Equipment-centric				734	
473				Needle Assembly (Needle, needle chuck, pepper pot)			Performs its function properly as needle assembly	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Malfunctioning needle assembly	Semi-Annual PM Activity - Ejector motor condition	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																			722	
474								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Chipped out	Malfunctioning needle assembly	Semi-Annual PM Activity - Ejector motor condition	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																			734	
475				Ejector Set Screw			Ejector screw must be in good condition based on set criteria	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Worn-out ejector needle screw	Semi-Annual PM Activity - Ejector motor condition	2	Checking every device set-up and change of needle set up Machine auto stop	2	L																			722	
476								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Worn-out ejector needle screw	Semi-Annual PM Activity - Ejector motor condition	3	Checking every device set-up and change of needle set up Reflow + FT1 / FT2 at Test	4	L																			734	
477			Die Pick-up	Operator		The bond head with rubber tip moves down to the pick level above the wafer. The vacuum activates and picks the die. The die is transported by the bond head to the bond position level	Operates the machine and presses the autobond button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Incorrect rubber tip size (color-coded) used due to wrong rubber tip size (color-coded) withdrawn	Tool matrix document (JOV-280-040/3033) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Machine auto stop	2	L																			722	
478								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect rubber tip size (color-coded) used due to wrong rubber tip size (color-coded) withdrawn	Tool matrix document (JOV-280-040/3033) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	
479							Installs new rubber tip collet with correct rubber tip size (color-coded) (Once Pick/bond tool life limit is reached)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Mis-orientation/Mis-aligned of rubber tip during installation	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto stop	2	L																			732	
480								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Mis-orientation/Mis-aligned of rubber tip during installation	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	
481							Performs Pick Z-height Auto Teach (Every change of rubber tip)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Did not perform Pick Z-height auto teach	DACA WI (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto stop	2	L																			732	
482								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Did not perform Pick Z-height auto teach	DACA WI (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Initial Characteristic	Filter Code (optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Initial Characteristic	PFMEA AP	Remarks				INET	OPT
483	Leading indicators c/o Ernald S.			Pick force parameter			Picks die from wafer using correct pick force parameter	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	8	Cracked die	Incorrect pick force parameter due to wrong and/or outdated recipe loaded (Customer Complaint)	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	5	Checking of parameters every set-up DACA traffic light system 100% ADI/SPI/PARMI Reflow+FT1/FT2 at Test Wafer remnants inspection (100% all wafers) First piece inspection (Dummy LF) every machine intervention Postbond PR error Set up error (pick tool problem) every machine set up	4	M			Qualification of using Digital Force Gauge during PM Calibration	None	Gilbert N. / Jess B.	Dec.-2020	Done		Dec.-2020	8	3	4		L					854	834
484								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick force parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	4	L																			734	
485								Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick force parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto stop	2	L																			732	
486				Pick level parameter			Picks die from wafer using correct pick level parameter <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick level parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto stop	2	L																			732	
487								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick level parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	4	L																			734	
488				Pick delay parameter			Picks die from wafer using correct pick delay parameter	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick delay parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto stop	2	L																			732	
489								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick delay parameter due to wrong and/or outdated recipe loaded	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	4	L																			734	
490				Single attempt of die pick-up			Sets the number of pick-up tries during pick-up	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Machine settings set to multiple pick-up attempts	Lock the pick-up attempts to be set to only one try on the parameter settings.	3	Parameter lock on RMS Machine auto stop	2	L																			732	
491								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Machine settings set to multiple pick-up attempts	Lock the pick-up attempts to be set to only one try on the parameter settings.	3	Parameter lock on RMS Machine auto stop Reflow + FT1 / FT2 at Test	4	L																			734	
492				Rubber tip orientation, planarity, alignment			Correct orientation, planarity, and alignment of rubber tip (JOV-280-040/3035)	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect rubber tip orientation, planarity, and alignment	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Rubber tip impression check Machine auto stop	2	L																			732	
493								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect rubber tip orientation, planarity, and alignment	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
	Sebastien Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarsel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																				
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Critical Characteristic	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Critical Characteristic	PFMEA AP	Remarks				INET	OPT
494				Centering of rubber tip			Centered rubber tip to die during pick-up (JOV-2BD-040/3035)	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-2BD-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Rubber tip impression check Machine auto stop	2	L																			732	
495								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-2BD-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	
496				Bond head			Picks the die with correct & stable pick level & pick alignment	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick-up level due to defective mechanical part/s (slider, LVDT Rod)	Semi-Annual PM Activity - Pick Assembly	2	Checking every change device set up and change rubber tip Rubber tip impression check Machine auto stop	2	L																			722	
497	Leading indicators c/o Emaid S.							Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	8	Cracked Die	Incorrect pick-up level due to defective mechanical part/s (slider, LVDT Rod) (Customer Complaint)	Semi-Annual PM Activity - Pick Assembly	3	Checking every device set-up and change of rubber tip set-up Set-up Qualification (Techs/QA : Visual inspection) Machine auto stop 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test Wafer remnants inspection (100% all wafers) First piece inspection (Dummy LF) every machine intervention Postbond PR error Set up error (pick tool problem) every machine set up	4	L			Include on Semi-Annual PM Activity - Checking of LVDT rod condition	Sustain. Checking every device set-up and change of rubber tip set-up First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual inspection) Machine auto stop (Micro Z Encoder)	Gilbert N. / Jess B.	Dec'2020	Done		Dec'2020											834	
498								Your Plant: Production delay Yield loss Scrap lots Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick-up level due to defective mechanical part/s (slider, LVDT Rod)	Semi-Annual PM Activity - Pick Assembly	2	Checking every device set-up and change of rubber tip set-up First Piece Inspection during setup. Set-up Qualification (Techs/QA : Visual inspection) Machine auto stop Machine Auto Vision / Post Bond inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	4	L																			724	
499								Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick-up level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Pick Assembly	2	Checking every change device set up and change rubber tip Rubber tip impression check Machine auto stop	2	L																			722	
500								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick-up level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Pick Assembly	3	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	
501								Your plant: Production delay (Wafer loading error) Ship-to-Plant: None End User: None	2	Mis-aligned Die placement	Bond slider problem (LVDT)	Semi-Annual PM Activity - Wafer Theta condition	5	Checking of Wafer Theta condition every PM - Machine Auto vision / Machine auto stop feature (if die placement is outside the criteria)	3	L																			223	
502								Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Unpicked Die	Incorrect pick-up level due to bugged software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	2	Checking every change device set up and change rubber tip Rubber tip impression check Machine auto stop	2	L																			722	
503								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect pick-up level due to bugged software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	3	Checking every change device set up and change rubber tip Rubber tip impression check Reflow + FT1 / FT2 at Test	4	L																			734	
504				Machine (Bond Head Voice Coil)			Bonds the die with correct & stable bond level & bond alignment	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Bond Head Z Micro Z encoder Error	Defective Bond Head Voice Coil	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L																Equipment-centric				722	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Overall Assessment	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Assessment	PFMEA AP	Remarks				INET	OPT
505								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Z Hipec Error	Defective Bond Head Voice Coil	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
506				Machine (Bond Head XYZ Motor)			Moves bond head assembly XYZ position	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Not Motor On	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
507								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Motion Timeout	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
508								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head search fail	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
509								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Hipec DAC Limit	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
510				Machine (Bond Head LM Guides)			Provides guide for which bond head ASSY moves upon	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Motion Timeout	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
511								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head search fail	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
512								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Hipec DAC Limit	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
513				Machine (Collet Mount)			Holds tool shank and rubber tip	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Die	Defective Collet mount	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
514				Machine (LVDT)			Detects position of bond head	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Die	Defective LVDT and Conditioner Assembly	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
515				Rubber tip			Picks-up the die from wafer and carry it to bond position.	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked Die	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	3	Checking and recording of collet tool count (eCDI) Machine collet tool counter with auto-inhibit feature Machine auto stop	2	L																			732
516								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	3	Checking and recording of collet tool count (eCDI) Machine collet tool counter with auto-inhibit feature Reflow + FT1 / FT2 at Test	4	L																			734
517				Vacuum Hose			Hose is clean and in good condition	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked die	Clogged hose	Semi-Annual PM Activity - Hose condition	2	Visual inspection every set-up Machine Auto Stop feature if die was not picked	2	L																			722
518				Solenoid Valve			Controls ON and OFF on the dispense pressure	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked die	Vacuum solenoid valve failure (defective solenoid valve)	Semi-Annual PM Activity - Vacuum Solenoid Valve condition	2	Visual inspection every set-up Machine Auto Stop feature if die was not picked	2	L																			722
519				Venturi Vacuum / Facilities Supply			Provides sufficient Venturi Vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unpicked die	Insufficient Venturi Vacuum	Semi-Annual Activity - Vacuum line condition	4	Visual inspection every set-up Machine Auto Stop feature if die was not picked	2	M																			742

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines — Sebastian Novio - FMEA Owner; Shara Michal Barairo - Process Engineering; Nerio Tura -Process Engineering; Allen Canete- Process Engineering; Harold Gutlay - Process Engineering; Leo Belandres - Equipment Engineering; Angelo Viaje - Quality Engineering; Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level Excess risk	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sev Rp (S)	Occur recep (O)	Detect rcp (D)	Level Excess risk	PFMEA AP	Remarks				INET	OPT
520				Sawn Wafer			Contains singulated dies to be picked and attached onto the bottomframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Cracked die	Strong die-tape adherence due to smooth die backside roughness (Customer Complaint)	N/A	4	Visual inspection every set-up Machine Auto Stop feature if die was not picked FT1,FT2 at Test IQC roughness measurement check incoming wafers CoC; BUK71R0-40H allowable wafer backside roughness (>0.02Ra)	7	H																			747	
521			Die Bond Placement Process	Operator		Bonds the die on the leadframe with pad solder	Operates the machine and presses the autobond button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Incorrect rubber tip size (color-coded) used due to wrong rubber tip size (color-coded) withdrawn	Tool matrix document (JOV-280-040/3033) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	5	M																			725	
522								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect rubber tip size (color-coded) used due to wrong rubber tip size (color-coded) withdrawn	Tool matrix document (JOV-280-040/3033) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	4	L																			734	
523								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect rubber tip size (color-coded) used due to wrong rubber tip size (color-coded) withdrawn	Tool matrix document (JOV-280-040/3033) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	3	L																			733	
524							Changes/installs rubber tip using correct rubber tip size (color-coded)	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Die Position problem	Wrong installation of the rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	5	M																			725	
525								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Wrong installation of the rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	4	L																			734	
526								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Wrong installation of the rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	3	L																			733	
527							Performs Bond Z-height Auto Teach (Every change of rubber tip)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Did not perform Bond Z-Level Auto Teach	DACA WI Bond Z-Level (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	5	M																			725	
528								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Did not perform Bond Z-Level Auto Teach	DACA WI (JOV-280-040/3035) Training and Certification of the operator	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	4	L																			734	
529								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Did not perform Bond Z-Level Auto Teach	DACA WI (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	3	L																			733	
530	Leading indicators c/o Emaiil S.			Bond force parameter			Bonds die to the frame die paddle using correct bond force parameter <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	8	Cracked die	Incorrect bond force parameter (Customer Complaint)	Parameter Setting (JOV-280-40C/3005) Parameter range on RMS	5	Checking of parameters every set-up DACA traffic light system 100% ADI/SPI/PARMI Reflow+FT1/FT2 at Test Wafer remnants inspection (100% all wafers) First piece inspection (Dummy LF) every machine intervention Postbond PR error	4	M					Qualification of using Digital Force Gauge during PM Calibration	None	Gilbert N. / Jess B.	Dec.'2020	Done		Dec.'2020	8	3	4		L					854	834

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA_RP	Risk Priority (RP)	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sever (S)	Occurrence (O)	Detection (D)	Risk Priority (RP)	PFMEA_RP	Remarks				INET	OPT
531								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect bond force parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	4	L																		734	
532								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect bond force parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	3	L																		733	
533								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Die	Incorrect bond force parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	2	L																		732	
534				Bond level parameter			Bonds die to the frame die paddle using correct bond level parameter <JOV-28D-40C/3005>	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Die Position problem	Incorrect bond level parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	2	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	5	M																		725	
535								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect bond level parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Reflow + FT1 / FT2 at Test	4	L																		734	
536								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect bond level parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	2	L																		732	
537								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect bond level parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	2	L																		732	
538				Bond Z-height Level			Picks die from wafer using correct taught pick level <JOV-28D-040/3035>	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Die Position problem	Incorrect Teaching of bond level	WI - Auto Learn Z-height Level (JOV-28D-040/3035)	2	Teaching of bond level every set-up Reflow + FT1 / FT2 at Test	5	M																		725	
539								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out / Die Crack	Incorrect Teaching of bond level	WI - Auto Learn Z-height Level (JOV-28D-040/3035)	5	Teaching of bond level every set-up Reflow + FT1 / FT2 at Test	4	M			Include set-up items list on MPMF spec		R. Jereza	09-Jul-22	Done								Ref #: Complaint C2200227				754	
540								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect Teaching of bond level	WI - Auto Learn Z-height Level (JOV-28D-040/3035)	3	Teaching of bond level every set-up Machine auto vision	3	L																		733	
541								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect Teaching of bond level	WI - Auto Learn Z-height Level (JOV-28D-040/3035)	3	Teaching of bond level every set-up Machine auto vision	2	L																		732	
542								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Pad solder displacement due to die tilting due to unequal Z-level of the pad across rows	WI - Auto Learn Z-height Level (JOV-28D-040/3035)	5	Teaching of bond level every set-up Machine auto vision	2	M	S																		752	
543				Bond delay parameter			Bonds die to the frame die paddle using correct bond delay parameter <JOV-28D-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Incorrect bond delay parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	3	L																		733	
544								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect bond delay parameter	Parameter Setting (JOV-28D-40C/3005) Parameter range on RMS	3	Checking of parameters every set-up DACA traffic light system Machine auto vision	3	L																		733	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Nevin - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Second Occurrence AP	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Second Occurrence AP	PPMEA AP	Remarks				INET	OPT
545				Centering of rubber tip			Centers rubber tip to die during correct bonding	Your Plant: Production delay Yield loss Ship-to-Plant: None End User: None	7	Die Position problem	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-280-040/3035) Scrap set-up strip Training and Certification of the operator	2	Checking every change device set up and change rubber tip Rubber tip impression check First Piece Inspection during setup. Set-up Qualification (Techs/QA - Visual inspection) Machine auto stop Machine Auto Vision / Post Bond Inspection (PBI) per machine recipe 100% AOI/SPI Open/Short Test Reflow+FT1/FT2 at Test	5	M																		725	
546								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped Die	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	4	L																		734	
547								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	2	L																		732	
548								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect centering of rubber tip during set-up	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	2	L																		732	
549				Rubber tip orientation, planarity, alignment			Correct orientation, planarity, and alignment of rubber tip <JOV-280-040/3035>	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Die Position problem	Incorrect orientation, planarity, and alignment of rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Scrap set-up strip Semi-Annual PM Activity - WI - Calibration 3 Point Alignment of Wafer, Collet, and Die Ejector <JOV-2H0-040/3067> Regular requalification of operators of the work instruction	2	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	2	L																			722	
550								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect orientation, planarity, and alignment of rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Reflow + FT1 / FT2 at Test Rubber tip impression check	4	L																		734	
551								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect orientation, planarity, and alignment of rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	2	L																		732	
552								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect orientation, planarity, and alignment of rubber tip	WI - Rubber tip Installation (JOV-280-040/3035) Training and Certification of the operator	3	Checking every change device set up and change rubber tip Machine auto vision Rubber tip impression check	2	L																		732	
553				Bond head			Bonds the die with correct & viable bond level & bond alignment	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Bonding error	Incorrect bond level due to defective mechanical part/s (slider)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	2	L	S																		722	
554								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect bond level due to defective mechanical part/s (slider)	Semi-Annual PM Activity - Bond head assembly	3	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	4	L	S																		734	
555								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect bond level due to defective mechanical part/s (slider)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																		722	
556								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect bond level due to defective mechanical part/s (slider)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																		722	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002	
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia	
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL	
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarual / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje			

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Good Concerning	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	PFMEA AP	Remarks				INET	OPT
557								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Motor error	Incorrect bond level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	2	L	S																	722	
558								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect bond level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Bond head assembly	3	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	4	L	S																	734	
559								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect bond level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																	722	
560								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect bond level due to defective Linear motor (Voice Coil)	Semi-Annual PM Activity - Bond head assembly	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																	722	
561								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond head error	Incorrect bond level due to corrupted software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	2	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	2	L	S																	722	
562								Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Chipped out	Incorrect bond level due to corrupted software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	3	Visual inspection every set-up Reflow + FT1 / FT2 at Test Solder thickness measurement monitoring	4	L	S																		734	
563								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Incorrect bond level due to corrupted software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																	722	
564								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Incorrect bond level due to corrupted software	Semi-Annual PM Activity - Main software condition Available back up software for DACA machines	2	Visual inspection every set-up Machine auto vision Solder thickness measurement monitoring	2	L	S																	722	
565				Machine (Bond Head Voice Coil)			Bonds the die with correct & stable bond level & bond alignment	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Z Micro Z encoder Error	Defective Bond Head Voice Coil	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
566								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Z Hipec Error	Defective Bond Head Voice Coil	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
567				Machine (Bond Head XYZ Motor)			Moves bond head assembly XYZ position	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Not Motor On	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
568								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Motion Timeout	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
569								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head search fail	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
570								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Hipec DAC Limit	Defective Bond Head XYZ Motor	Semi-Annual PM Activity - Bond head XYZ Motor	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
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571				Machine (Bond Head LM Guides)			Provides guide for which bond head ASSY moves upon	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Motion Timeout	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
572								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head search fail	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
573								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Hipec DAC Limit	Defective Bond Head LM Guides	Semi-Annual PM Activity - Bond head LM Guides	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
574				Machine (Collet Mount)			Holds tool shank and rubber tip	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Die	Defective Collet mount	Semi-Annual PM Activity - Bond head assembly	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
575				Machine (LVDT)			Detects position of bond head	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Die	Defective LVDT and Conditioner Assembly	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
576				Venturi Vacuum			Provides sufficient Venturi Vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Insufficient Venturi Vacuum	Semi-Annual Activity - Vacuum line condition	2	Visual inspection every set-up Machine auto stop	2	L																			722	
577								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Insufficient Venturi Vacuum	Semi-Annual Activity - Vacuum line condition	2	Visual inspection every set-up Machine auto stop	2	L																			722	
578				Chip Prevence Sensor			Provides detection of die at the tip of the Rubber Tip Collet	Your Plant: Production Delay Ship to Plant: None End User: None	7	Machine die presence sensor error/assist	Defective / Malfunctioned Chip presence sensor	Semi-Annual Activity - Chip presence sensor condition	2	Machine auto vision Visual inspection Machine auto stop feature if no die at the tip of the rubber tip collet	2	L																			722	
579				Rubber tip			Picks-up the die from wafer and carry it to bond position.	Your Plant: Production delay Yield loss Scrap lots Reliability Failure Ship-to-Plant: None End User: None	7	Die surface damage	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	2	Checking and recording of collet tool count (eCDI) Reflow+FT1/FT2 at Test Machine collet tool counter with auto-inhibit feature	4	L																			724	
580								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die Position problem	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	2	Visual inspection every set-up Machine auto vision	2	L																			722	
581								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	2	Visual inspection every set-up Machine auto vision	2	L																			722	
582								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing die	Early damage / wear-out of rubber tip	Rubber tip tool life as per Control plan document (JOV-2G2-040/2008)	2	Visual inspection every set-up Machine auto vision	2	L																			722	
583			Postbond Inspection	Technician		Inspects die placement based on defined model or golden sample with auto-correct X/Y axes placement stated on wiring diagram and provides auto-correction function	Defines/teaches postbond PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of die positioning	Inattentive to correct PRS teaching	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																			743	
584								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Under-detection/rejection of die positioning	Inattentive to correct PRS teaching	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																			743	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarael / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/ FM	PFMEA AP	Special Char. Symbols	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Special Char. Symbols	PFMEA AP	Remarks			INET	OPT
585				Die placement PRS			Inspects actual die placement on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of die positioning	Wrong Die placement PRS set-up	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																	743	
586								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Under-detection/rejection of die positioning	Wrong Die placement PRS set-up	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																	743	
587				Leadframe PR			Checks and verifies correct leadframe alignment prior bonding	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong Leadframe PRS set-up	Work Instruction - Teach Bond PR (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																	743	
588				Lighting setting			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong PRS Lighting set-up	Work Instruction - Dispense and Die placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																	743	
589				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unable to search PR template	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
590								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Inspection Status Erro	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
591								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	PostBond Die Placement Check	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
592								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong PRS Lighting set-up	Work Instruction - Dispense and Die placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																	743	
593				Auto Vision System			Inspects actual die placement on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator.	3	L	S																	723	
594								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design	3	L				Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
595								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design	3	L				Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done											723	
596				Machine (Bond Optics XY Motor)			Moves bond optics assembly XY position	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
597								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
598								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	
599								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric			723	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novo - FMEA Owner Shara Michel Berario - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Berario/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Overall Prioritization	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Prioritization	PFMEA AP	Remarks				INET	OPT
600				Machine (Bond Optics LM Guides			Provides guide for which bond optics ASST moves upon	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
601								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
602								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
603								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
604				Machine (Bond Optics Home Sensor)			Senses home position of bond optics	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optics Home Sensor	Semi-Annual Activity - Sensor Condition	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
605				Material Online Booking System (MOBS) (keeping to DACA)			Records date and time of leadframe withdrawal for ensuring good quality of leadframe (not oxidized)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized bottomframe	Incorrect date and time inputted on MOBS	Work Instruction - Bottomframe and magazine preparation (JOV-280-040/3050)	3	Machine auto stop	3	L																			733	
606				Anvil Block			Supports die-bonded leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																			723	
607								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																			723	
608								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die Position	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																			723	
609			Leadframe Indexing from DA to CA	Index track width parameter		Transports of bottomframe from die attach to clip attach station	Sets the correct index track width parameter according to <per LF drawing>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect index track width parameter	One-time calibration using one common leadframe width Semi-Annual PM activities - index track width condition	3	Machine auto stop	3	L																			733	
610				Clamp force parameter			Sets the correct clamp force	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect clamp force parameter	One-time calibration Semi-Annual PM activities - clamp force condition	3	Machine auto stop	3	L																			733	
611				Clamp Timing parameter			Sets the correct clamp timing	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect clamp timing parameter	One-time calibration Semi-Annual PM activities - clamp timing condition	3	Machine auto stop	3	L																			733	
612				Machine (Indexer Sensor)			Senses leadframe after indexing	Your Plant: Production Delay Ship to Plant: None End User: None	2	No LF on work holder error / No LF found on index track	Index sensor problem -defective sensor -dirty sensor	Semi-Annual PM activities - index sensor condition	2	Check every set-up Machine auto stop	2	L																Equipment-centric				222	
613				Leadframe pusher/kicker (Input alignment)			Pushes the Frame from Input track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Malfunctioning leadframe pusher (motor/pneumatic)	Semi-annual PM activities - leadframe pusher condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection) 2D code scanner	2	L																			222	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Caneta- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Caneta / Aura Mae Villarael / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA AP	Special Characteristics	FT for Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Special Characteristics	PFMEA AP	Remarks				INET	OPT
614								Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Defective leadframe pusher assembly (malfunctioning PCB board)	Semi-Annual PM activities - leadframe pusher condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection) 2D code scanner	2	L																			222	
615				Index Clamp (DA)			Holds & Indexes the frame from input to output track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Defective gripper motor	Semi-Annual PM activities - gripper assembly condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
616								Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Machine index track not aligned with succeeding machine track,	Semi-Annual PM activities - index track alignment condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
617								Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Uncalibrated gripper assembly	Semi-Annual PM activities - gripper assembly condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
618								Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Worn-out Leadframe Gripper	Semi-Annual PM activities - gripper assembly condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
619				Leadframe pusher (CA Input alignment)			Pushes the Frame in Y-direction to align with the index rail	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Defective pneumatic solenoid valve	Semi-Annual PM activities - leadframe pusher condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
620				Index Clamp (CA)			Receives, Holds & Indexes the frame from input Die Top Solder Dispense.	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Defective linear motor	Semi-Annual PM activities - index clamp (CA) condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
621				Machine (Indexer Linear Encoder)			Reads position of indexer on track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Indexer Hipec Limit Error	Defective Linear Read Head Encoder	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	L															Equipment-centric				242	
622				Machine (Scale)			Encodes position of indexer on track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Indexer Hipec Limit Error	Dirty/Defective Scale	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
623				Machine (Compression Spring)			Pushes the input pusher assembly during LF input	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Worn-out compression spring	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
624				Machine (Input Pusher Linear Slide)			Permits movement of pusher assembly	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Worn-out linear slide	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
625				Machine (Indexer Voice Coil)			Initiates clamping of indexer	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Defective indexer voice coil	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	#N/A																			
626				Workholder-Indexer Clamp Planarity			Sets leadframe planar within the workholder and the unit component in place during module to module indexing	Your Plant: Production Delay Yield Loss Ship to Plant: None End User: None	7	Displaced solder in lead locking post	Leadframe lifting during indexing	N/A	2	Downstream detection on Plating Area. (Sampling per batch) Clipframe lead post 100% inspection at SPI/ACI	4	L			To include WH Indexer Clamp planarity check in PM Semi-annual Activity	Checking of planarity every WH-indexer clamp related intervention	A. Cafeteé/ E. Capicio	Mar 28, 2025	Open									Equipment-centric				724	
627		Clip Attach (CA) Assembly Line	Scanning of bottomframe 2D code (Head 2)	Operator	Your plant: Assembly of clip onto the bottomframe with die and solder paste Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Scans 2D code on bottomframe surface for generation of DA map	Activates LMDC at CA station	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	No strip map generated	LMDC not activated	DACA WI (JOV-28D-040/3035) Training and Certification of the operator	4	On-screen display implicating LMDC activated status Comparison of machine output quantity and actual unit count eCOI (JOV-28D-040/4035)	6	M																			746	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Neoperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Neoperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of DC/FM	PFMEA AP	Special Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Special Characteristics	PFMEA AP	Remarks				INET	OFT
628							Operates the machines and presses autobond button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient / Excessive Solder dispense	Prebond inspection not activated due to testbond selected instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of the operator	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection Top Solder X-ray inspection	6	M			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												736	
629				LMDC FSE			Sets up 2D code scanning parameters	Your Plant: Production delay Yield loss Ship to Plant: None	7	No strip map generated	Wrong LMDC settings	Machine buy-off eCDI - Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035)	6	M																			726	
630				2D code scan delay			Sets the appropriate barcode scanning speed	Your plant: Production Delay Machine error Ship to Plant: None End User: None	2	Failure to read 2D code	Incorrect scan delay parameter setting	Machine buy-off eCDI - Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035) Machine auto stop	2	L																			222	
631				2D code position			Sets the position of barcode scanner	Your plant: Production Delay Machine error Ship to Plant: None End User: None	2	Failure to read 2D code	Misaligned position of 2D scanner wrt leadframe 2D code location	Machine buy-off eCDI - Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035) Machine auto stop	2	L																			222	
632				LMDC			Generates 2D strip map	Your plant: Production Delay Machine error Ship to Plant: None End User: None	7	Failure to generate DA map	Failed to transfer data from DACA ACI to 2D reject map due to defective machine communication	Machine buy-off eCDI - Qualification of 2D map generation (JOT-280-040/4035)	4	Machine auto-strip due to communication error Machine output quantity does not match actual unit count	6	M																			746	
633				2D code reader			Reads the 2D mark of the bottom frame	Your plant: Production Delay Machine error Ship to Plant: None End User: None	2	Failure to read 2D code	Defective 2D code reader	Semi-Annual PM Activity - 2D Code scanner condition	2	Check every set-up Machine Auto Stop	2	L																			222	
634				Bottomframe (2D code quality/clarity)			Satisfies good marking quality	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	7	Unrecognized 2D Barcode Mark on Lead Frame	Scratch and contamination on 2D mark surface due to mishandling	WI - Handling of bottomframe (JOV-280-040/3035) Leadframe storage in N2 cabinet	3	Check every set-up Machine Auto Stop	2	L																			732	
635								Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	7	Unrecognized 2D Barcode Mark on Lead Frame	1. Unclear 2D Barcode marking 2. Solder splatter on 2D barcode mark 3. Abnormality on 2D Barcode mark	1. Lead frame 2D barcode marker has a built in vision system that automatically compare actual mark against required mark 2. Correlate lead frame marker machine vision against ASM 2D barcode reader	3	Check every set-up Machine Auto Stop	2	L																					732	
636			Solder Paste Dispense Process (source and gate)	Operator		Dispenses correct amount of the correct solder paste on correct X,Y location on die pad and leads area	Loads the correct Solder Paste (12NC) per requirement	Your plant: Production delay Yield Loss Scrappage Reliability Ship to Plant: None End User: None	7	Cold Solder / Voids	Wrong Solder Paste# (12NC) used due to unfamiliar on system withdrawal (High Temp Solder - Low Temp Reflow)	MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement Training and Certification of the operator	3	Automated systems (MES-2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal	3	L	S		Update MES database to include LAP solder Re-train and re-certify operators of change		R. Encarguez (MES) (info to be provided by project team)		Done												733	
637							Installs correct dispense tool per requirement	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense tool used due to unfamiliarity with dispense tool designs	Tool matrix document (JOV-280-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-280-040/4035) Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done												733	
638								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense tool used due to unfamiliarity with dispense tool designs	Tool matrix document (JOV-280-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-280-040/4035) Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done												733	
639								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Outdated tool matrix	Tool matrix document (JOV-280-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-280-040/4035) Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done												733	
640								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Outdated tool matrix	Tool matrix document (JOV-280-040/3033)	3	Checking of dispense tool ID as per CDI (JOV-280-040/4035) Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L			Include new dispense tool for LAP Solder in the dispense tool matrix Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Jun-21	Done												733	
641				Dispense tool set up			Correct Dispense tool set-up <JOV-280-040/3035>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to misaligned dispense tool set up	Set up and Qualification (MPMF - JOT-280-040/4035)	3	Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L																			733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)					OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FTIR/LAP	Severity x Occurrence x D	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity x Occurrence x D	FTIR/LAP	Remarks				INET	OPT
642								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Offset in dispense location due to misaligned dispense tool set up	Set up and Qualification (MPMF - JOT-280-040/4026)	3	Checking of Solder Dot if within the Search Box - Machine Auto Stop	3	L																			733	
643				Dispense pressure parameter			Correct dispense pressure parameter <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												722	
644								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												722	
645								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Solder Splatter	Wrong dispense pressure parameter used	Parameter Settings document (JOV-280-40C/3005) Parameter limits saved in RMS Auto Vision System Auto-compensation	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	2	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												722	
646								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Too small range of AOI limit for die pad and top solder	Implemented optimized AOI limits	3	Machine Auto vision and top solder coverage x-ray inspection - Machine Auto Stop -Parameter setting check every setup and intervention Inclusion of "eye" (idsu, igsu, ldgsu) parameter at last	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
647								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Too wide range of AOI limit for die pad and top solder	Implemented optimized AOI limits	3	Machine Auto vision and top solder coverage x-ray inspection - Machine Auto Stop -Parameter setting check every setup and intervention Inclusion of "eye" (idsu, igsu, ldgsu) parameter at last	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
648				Dispense Auto Compensation			Enables dispense auto compensation	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Auto-compensation feature was disabled prior production (ASM)	Implementation of machine auto-stop during production when the auto-compensation is disabled	3	100% AOI/SPI inspection Machine auto vision Visual inspection (X-ray Top solder wetting)	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
649								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Auto-compensation feature was disabled prior production (ASM)	Implementation of machine auto-stop during production when the auto-compensation is disabled	3	100% AOI/SPI inspection Machine auto vision Visual inspection (X-ray Top solder wetting)	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
650				Purging Time of Solder			Sets the time that the machine prompts to perform purging	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Prolong staging time of solder paste during machine stoppages	Machine prompt to perform purging defined at defined time.	3	Machine auto alarm at a defined time of prolong staging	3	L																			733	
651				Dispense location parameter			Correct dispense location parameter <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	2	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L			Update X/Y Placement Values in RMS for LAP solder Re-train and re-certify operators of change		L. Arciga for RMS update	Oct-21	Done												733	
652								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense location parameter used	X/Y placement values saved in RMS (target position) X/Y placement values indicated on wiring diagram Auto Vision System (search window)	3	100% Auto Vision System for solder dispense - Machine Auto Stop Top solder coverage X-ray (every start of shift and change device set up) AOI for solder coverage check	3	L			Update X/Y Placement Values in RMS for LAP solder Re-train and re-certify operators of change		L. Arciga for RMS update	Oct-21	Done												733	
653				Dispense Search Window			Correct dispense Search Window during PR teaching (JOV-280-040/3015)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong search window size established during PR teaching	Establish procedure in creating search windows for two dots. (Alphasem) Implementation of digital input of search window during PR teaching (ASM)	3	100% AOI inspection Visual inspection (X-ray Top solder wetting) 20% x-ray inspection Change of clip design from overhang to finger lead type	3	L																			733	
654								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong search window size established during PR teaching	Establish procedure in creating search windows for two dots. (Alphasem) Implementation of digital input of search window during PR teaching (ASM)	3	100% AOI inspection Visual inspection (X-ray Top solder wetting) 20% x-ray inspection Change of clip design from overhang to finger lead type	3	L																			733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA_RP	Severity x Occurrence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity x Occurrence	FMEA_RP	Remarks				INET	OPT
655				Dispense dot area inspection			Sets the individual dot inspection on AOI	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	AOI is based on total area of the 2 dots	Individual dot inspection through AOI (for D2 50 um)	1	Parameter setting check every setup and intervention Inclusion of "eye" (Idxs, Ipss, Idgs) parameter at test	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
656								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	AOI is based on total area of the 2 dots	Individual dot inspection through AOI (for D2 50 um)	3	Parameter setting check every setup and intervention Inclusion of "eye" (Idxs, Ipss, Idgs) parameter at test	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
657				Type of solder paste			Correct solder paste type according to MWO	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong type of solder paste used	MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement	2	Automated systems (MES 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal	3	L			Update MES database to include LAP solder Re-train and re-certify operators of change		R. Encarguez (MES) (info to be provided by project team)		Done												723	
658								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong type of solder paste used	MES 2 system processes operator's solder paste request MES 2 is linked to CAMSTAR to get correct 12NC material requirement	2	Automated systems (MES 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal	3	L			Update MES database to include LAP solder Re-train and re-certify operators of change		R. Encarguez (MES) (info to be provided by project team)		Done												723	
659				Solder paste preparation			Thaws solder paste completely	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong thawing procedure	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Thawing Time as per Control plan document (J2V-2G2-040/2008)	2	Automated Thawing and Floor Life monitoring. CMMS triggers change of Solder Paste Checking of expiration date every change of solder paste	3	L			Update CMMS to include LAP solder Re-train and re-certify operators of change		R. Encarguez		Done												723	
660								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong thawing procedure	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Thawing Time as per Control plan document (J2V-2G2-040/2008)	2	Automated Thawing and Floor Life monitoring. CMMS triggers change of Solder Paste Checking of expiration date every change of solder paste	3	L			Update CMMS to include LAP solder Re-train and re-certify operators of change		R. Encarguez		Done												723	
661				Archer Fish Dispenser			Releases correct amount of dispense pressure to dispense correct amount of solder paste	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Pressure leak due to worn out/oversized O-ring	Semi-Annual Activity - O-Ring Dispenser condition	2	- Visual Inspection - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto Stop feature	3	L	5																	723	
662								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low Air pressure Defective air pressure regulator	Semi-Annual PM - Archer Fish Dispenser condition	2	- Visual Inspection - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto Stop feature	3	L	5																	723	
663				Dispenser X/Y/Z motor			Moves to dispense solder paste on correct X/Y location from correct Z level on die pad and leads	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to Dispenser X/Y/Z motor issues	Semi-Annual PM - Dispenser motor condition	2	- Visual Inspection - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	5																	723	
664								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Offset in dispense location due to Dispenser X/Y/Z motor issues	Semi-Annual PM - Dispenser motor condition	2	- Visual Inspection - Machine Auto vision - Machine Auto Stop - Solder thickness - Machine Auto stop feature	3	L	5																	723	
665								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Mechanical movement of the solder dot due to intervention on the dispense assembly	Semi-Annual PM - Dispenser mechanical assembly condition	3	Implementation of shape and placement check (ASM) 100% AOI inspection Visual Inspection (X-ray Top solder wetting) 20% x-ray inspection Change of clip design from overhang to finger lead type	3	L																			733	
666								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Mechanical movement of the solder dot due to intervention on the dispense assembly	Semi-Annual PM - Dispenser mechanical assembly condition	3	Implementation of shape and placement check (ASM) 100% AOI inspection Visual Inspection (X-ray Top solder wetting) 20% x-ray inspection Change of clip design from overhang to finger lead type	3	L																			733	
667								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Defective Dispenser X/Y/Z axis motor and Gear	Semi-Annual PM - Dispenser X/Y motor and Gear condition	5	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	5																		723	
668								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Defective Dispenser X/Y/Z axis motor and Gear	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L																			722	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura - Process Engineering Allen Caneta- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Caneta / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA RAP	Severe Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severe Characteristics	PFMEA RAP	Remarks				INIT	OPT
669								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Defective Dispenser X/Y/Z axis motor and Gear	Semi-Annual PM - Dispenser X/Y motor and Gear condition	2	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
670				Machine (Dispenser X/Y/Z Linear Encoder)			Reads position of dispenser on machine	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Defective Dispenser X/Y/Z Linear Encoder	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	M															Equipment-centric				742	
671				Dispense tool holder			Maintains good planarity of dispense tool holder	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Offset in dispense location due to wrong planarity of dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
672								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Offset in dispense location due to wrong planarity of dispense tool holder	Semi-Annual PM - Dispense tool holder condition	2	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
673								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Unbalanced dispense due to loose screw dispense tool holder	Semi-Annual PM - Dispense tool holder condition	3	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	733	
674								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Unbalanced dispense due to loose screw dispense tool holder	Semi-Annual PM - Dispense tool holder condition	1	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	733	
675				Machine (Epoxy Writing Assy)			Provides lighting onto leadframe during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Unable to search PR template	Defective or dim epoxy writing ASSY	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
676				Machine (Dispensing Optics Assy)			Provide camera feed to machine during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Unable to search PR template	Defective dispense optics	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
677				Machine (Cross Roller Way)			Provide Z axis movement to machine during dispensing	Your Plant: Production Delay Ship to Plant: None End User: None	7	Dispenser Hipec Error/Cannot Home Error	Worn-out of Cross Roller Way	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				722	
678				Syringe holder			Maintains good planarity of syringe holder	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Unbalanced dispense due to loose screw syringe holder	Semi-Annual PM - Dispense tool holder condition	2	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
679								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Unbalanced dispense due to loose screw syringe holder	Semi-Annual PM - Dispense tool holder condition	2	- Visual Inspection - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
680				Paste level sensor			Performs its function as paste level sensor to detect near empty level	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low solder paste level due to disabled/malfunctioned paste level sensor	Semi-Annual PM - Paste Level Sensor condition	3	- Visual Inspection - Solder Thickness Measurement - Machine Auto vision - Machine Auto Stop	3	L	S																	733	
681								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Syringe Epoxy Low Error	Low solder paste level due to disabled/malfunctioned paste level sensor	Semi-Annual PM - Paste Level Sensor condition	2	- Checking of Paste Level Sensor condition every PM - Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S															Equipment-centric				723	
682				Venturi Vacuum			Provides sufficient Venturi Vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Low Vacuum / CDA Supply	Semi-Annual PM Activity - Vacuum condition	3	- Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S																	733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura-Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres – Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-20	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC/FM	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Local Severity (LS)	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sever (S)	Occurrence (O)	Detection (D)	Local Severity (LS)	PFMEA AP	Remarks				INET	OPT
683								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Low Vacuum / CDA Supply	Semi-Annual PM Activity - Vacuum condition	1	- Visual Inspection - Solder Thickness Measurement - Machine auto vision - Machine Auto Stop	3	L	S																	733	
684								Your Plant: Production Delay Ship to Plant: None End User: None	7	No Compressed Air	Low Vacuum / CDA Supply	Set-up Validation - Availability	4	Machine Error Machine Auto Stop Pacman Gauge Check	3	M															Equipment-centric				743	
685				Hose			Hose is clean and in good condition	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged hose	Semi-Annual PM Activity - Hose condition	2	- Checking of hose condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
686								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Worn-out hose	Semi-Annual PM - Hose condition	2	- Checking of hose condition every PM - Machine Auto stop - Machine auto vision - Solder Voids measurement - SPI Clip Height Measurement	3	L	S																	723	
687								Your Plant: Production Delay Ship to Plant: None End User: None	7	No Compressed Air	Damaged/Worn-out hose	Semi-Annual PM Activity - Hose condition	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
688				Solder paste			Solder paste is within shelf and floor life based on control plan <JOV-280-040/3050>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder /Cold Solder	Expired Solder Paste used	CMMS (Central Material Management System) for thawing time monitor and floor life monitor Solder Paste Preparation - verification of paste expiration date (JOV-2G2-040/2008 , JOV-280-040/3050)	2	Automated systems (MES 2, CAMSTAR) counter-checks required solder paste 12NC during withdrawal Checking of expiration date every change of solder paste	3	L	S		Update CMMS to include LAP solder Re-train and re-certify operators of change		R. Encarnaez		Done											723	
689				Dispense tool			Dispense tool is in good condition based on set criteria <JOV-280-040/3050>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Defective dispense tool (Worn-out , un-even)	WI - Dispense Tool cleaning (JOV-280-040/3050) Tool maintenance (provision of specs for nozzle stand-off)	4	- Cleaning every 4 days (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement - 100% AOI inspection Visual Inspection (X-ray Top solder wetting) 20% x-ray inspection	3	M	S																			743	
690								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Defective dispense tool (Worn-out , un-even)	WI - Dispense Tool cleaning (JOV-280-040/3050) Tool maintenance (provision of specs for nozzle stand-off)	4	- Cleaning every 4 days (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement - 100% AOI inspection Visual Inspection (X-ray Top solder wetting) 20% x-ray inspection	3	M	S																			743	
691								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged-up dispense tool/Unbalance dispense	WI - Dispense Tool cleaning (JOV-280-040/3050) - Implement Dual Syringe Dispense on Clip Attach dispense to further improve the dispense consistency / capability -Implement Type 4, 88% metal loading for PS solder paste	4	- Cleaning every 4days (JOV-280-040/3050) - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	M	S																			743	
692								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	No defined dispense tool cleaning frequency	Defined cleaning time for gate tool (every 4days.) - CCI: Dispense Tool Cleaning (4x/week - gate only)	2	Replaced and cleaned every 4 days	3	L																	723	
693								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	No defined dispense tool cleaning frequency	Defined cleaning time for gate tool (every 4days.) - CCI: Dispense Tool Cleaning (4x/week - gate only)	2	Replaced and cleaned every 4 days	3	L																	723	
694				Dispense Solenoid Valve			Controls ON and OFF on the dispense pressure	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Dispense solenoid valve failure (defective solenoid valve)	Semi-Annual PM - Dispense Solenoid Valve condition	2	- Visual Inspection - Machine Auto vision - Machine Auto Stop - Solder Voids, Stacking - Height measurement -SPI Clip Height Measurement	3	L	S																	723	
695			Leadframe indexing	Index track width parameter		Transports of bottomframe	Sets the correct index track width parameter	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect index track width parameter	One-time calibration using one common leadframe width Semi-Annual PM activities - Index track width condition	1	Machine auto stop	3	L																	733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novo - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viape - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viape	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Special Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Sevev by (S)	Occurrence (O)	Detectio (D)	Special Characteristics	PFMEA AP	Remarks				INET	OPT
696				Clamp force parameter			Sets the correct clamp force	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect clamp force parameter	One-time calibration Semi-Annual PM activities - clamp force condition	3	Machine auto stop	3	L																			733	
697				Clamp timing parameter			Sets the correct clamp timing	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe index jamming	Incorrect clamp timing parameter	One-time calibration Semi-Annual PM activities - clamp timing condition	3	Machine auto stop	3	L																			733	
698				Leadframe pusher (input alignment)			Pushes the Frame from input track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Malfunctioning leadframe pusher (motor/pneumatic)	Semi-annual PM activities - leadframe pusher condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection) 2D code scanner	2	L																			222	
699				Index Clamp/gripper			Holds & Indexes the frame from input to output track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Defective gripper motor	Semi-Annual PM activities - gripper assembly condition	2	Check every set up Machine auto stop (leadframe sensor orientation detection)	2	L																			222	
700				Kicker			Kicks the frame	Your Plant: Production Delay Ship to Plant: None End User: None	2	Leadframe index jamming	Mis-aligned kicker with respect to Leadframe	Semi-Annual PM activities - Kicker alignment condition	2	Check every set up Machine auto stop (index sensor)	2	L																			222	
701			Prebond inspection	Operator		Inspects solder dispense based on defined Pattern Recognition reference	Stabilizes solder dispense condition	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect stabilization of solder paste due to wrong purging and stabilization procedure	WI - Solder paste preparation (JOV-280-040/3050)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
702								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect stabilization of solder paste due to wrong purging and stabilization procedure	WI - Solder paste preparation (JOV-280-040/3050)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
703				Technician			Defines pattern recognition reference based on stabilized solder dispense	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect inspection of dispensed solder paste due to poor set up of prebond PR	WI - AOI Window Set up (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Sep-21	Done													753	
704								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect inspection of dispensed solder paste due to poor set up of prebond PR	WI - AOI Window Set up (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Sep-21	Done													753	
705				Leadframe PR			Checks and verifies correct leadframe alignment prior dispensing	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect PR due to poor set up of leadframe PR	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
706								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect PR due to poor set up of leadframe PR	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
707				PR (Solder dispense - position and area)			Compares actual solder dispense versus defined solder dispense pattern	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect PR due to poor set up of leadframe PR	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
708								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect PR due to poor set up of leadframe PR	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	
709				Lighting Setting			Provides correct lighting setting for solder dispense PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect PR due to poor set up of lighting	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M					A. Villanueva/J. Superfical	1-Feb-21	Done													753	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novo - FMEA Owner Shara Michal Berario - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viape - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Berario/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viape		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Initial Criticality	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Initial Criticality	PFMEA AP	Remarks				INET	OPT
710								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect PR due to poor set up of lighting	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Feb-21	Done												753	
711				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for solder dispense PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unable to search PR template	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
712								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Inspection Status Erro	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
713								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Too Large/Small Error	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
714								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Incorrect PR due to poor set up of lighting	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Feb-21	Done												753	
715								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Incorrect PR due to poor set up of lighting	WI (JOV-280-040/3035)	5	Auto Vision System Machine auto stop	3	M			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Feb-21	Done												753	
716				Auto Vision System			Inspects actual solder dispense on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Machine auto stop 100% AOI/SPI Weekly Camera focus calibration	4	L																			724	
717								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator.	3	L			Update WI to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Feb-21	Done												723	
718								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient detection of dispensed solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! Machine auto vision Machine AOI settings recording on the MPMF every setup change device / design	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Sep-21	Done												723	
719								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! Machine auto vision Machine AOI settings recording on the MPMF every setup change device / design	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Sep-21	Done												723	
720								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected) Parameter revisit of vision system Theoretical computation of solder volume	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design Visual Inspection (X-ray Top solder wetting)	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Sep-21	Done												723	
721								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CO! AOI settings recording on the MPMF every setup change device / design	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/L. Superfical	1-Sep-21	Done												723	
722				Machine (Bond Optics XY Motor)			Moves bond optics assembly XY position	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
723								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres – Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Severity x Occurrence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity x Occurrence	PFMEA AP	Remarks				INET	OPT
724								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
725								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Defective Bond Optic XY Motor	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
726				Machine (Bond Optics LM Guides			Provides guide for which bond optics ASSY moves upon	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY motion failed	Defective Bond Optic XY Motor	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
727								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics XY missing steps	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
728								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
729								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Hipec DAC Limit	Worn out Bond Optic LM Guides	Semi-Annual Activity - LM Guides Condition and lubrication	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
730				Machine (Bond Optics Home Sensor)			Senses home position of bond optics	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Optics Search Home Fail	Defective Bond Optics Home Sensor	Semi-Annual Activity - Sensor Condition	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
731				Anvil Block			Holds bottomframe in place using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																		723	
712								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Clogged anvil block	Semi-Annual Activity - Anvil block condition	2	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement AOI/SPI Sampling Postbond inspection	3	L	S																		723	
733				Material Online Booking System (Keeping to DACA)			Records date and time of leadframe withdrawal for ensuring good quality of leadframe (not oxidized)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized bottomframe	Incorrect date and time inputted on MC85	Work Instruction - Bottomframe and magazine preparation (JOV-280-040/3050)	1	Machine auto stop	3	L																		733	
734				Solder paste dispense			Dispenses correct solder dispense area and placement <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
735								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
736			Clipframe indexing	Operator		Feeds the clip frame using sprocket wheel that uses locating pin and sensor to ensure correct feed length	Operates the machine and presses autobond button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipframe	Wrong clip frame # (12NC) / clip design loaded due to wrong clipframe withdrawn/issued	Wiring Diagram Training and certification of operator	4	Visual inspection as per control plan (JOV-2G2-040/2008) Top Solder X-ray as per control plan (JOV-2G2-040/2008)	6	M																		746	
737							Loads clipframe reel with correct clipframe # (12NC) / clip design after clipframe material consumption	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipframe	Wrong installation procedure of clipframe	WI - Clipframe installation and clip feeder index distance singulator set up (JOV-280-040/3035) Training and certification of operator	2	Checking of clipframe loading every change of clipframe reel Machine auto-stop feature to detect index hole reference	3	L																		723	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Score by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	(Detection (D)) of FC/FM	PFMEA KAP	Control Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Control Characteristics	PFMEA KAP	Remarks				INIT	OPT
738				Purging of clipframe			Purges the first 200 clips	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipframe	Incorrect clipframe purging procedure	Work Instruction (purging of 1st 200 clips prior singulation)	2	Visual Inspection 100% SPI Machine auto-stop feature to detect index hole reference	3	L																			723	
739				Clipframe set up			Sets up clipframe correctly according to Work Instruction and Wiring Diagram	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Offset loading	Wrong installation procedure of clipframe	WI - Clipframe installation and clip feeder index distance singulator set up (JOV-28G-040/3035) Training and certification of operator	2	Checking of clipframe loading every change of clipframe reel Machine auto-stop feature to detect index hole reference	3	L																			223	
740								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Contamination due to dirty gloves	Wrong installation procedure of clipframe	WI - Clipframe installation and clip feeder index distance singulator set up (JOV-28G-040/3035) Training and certification of operator	2	Checking of clipframe loading every change of clipframe reel Machine auto-stop feature to detect index hole reference	3	L																			223	
741				Blower			Removes any loose metal particle present on clipframe	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	7	Pad bridging/Short (Gate-Source terminal bridging/short)	Unremoved loose metal particles on clipframe due to Low pressure	Basic Machine Condition (BMC) Checklist (JOT-28G-400/4013) Semi-Annual PM - Blower condition	3	Checking of blower every start of shift as per BMC checklist Checking of blower condition during PM activities Test X-ray inspection	4	L																			734	
742				Clip Reel Induction Motor			Rotates the clip to de-reel the clip to CA	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	2	Feeder Motor Error	Defective Induction Motor	Semi-Annual Activity - Clip feeder - Check and Clean	2	Machine Error Machine Auto-stop	2	L															Equipment-centric				222	
743				Clip Exist Continuity Guide			Rotates the clip to de-reel the clip to CA	Your plant: Production Delay Yield loss Scrappage Ship to Plant: None End User: None	2	No Clipframe Detected	Disconnected continuity guide	Semi-Annual Activity - Clip feeder - Check and Clean	2	Machine Error Machine Auto-stop	2	L															Equipment-centric				222	
744				Clip reel indexer			Feeds the clipframe from the bridge frame input reel to the clip singulator	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming	Incorrect indexing of clipframe reel due to Defective index sensor	Basic Machine Condition (BMC) Checklist (JOT-28G-400/4013) Semi-Annual PM - Index sensor condition	2	Checking of index sensor every start of shift as per BMC checklist Checking of index sensor condition during PM activities Machine auto-stop	3	L																			223	
745				Manual Search feeder			Ensures clipframe indexing hole is at correct position	Your Plant: Production Delay Ship to Plant: None End User: None	2	Clipframe jamming (pin hit)	Failure to perform manual search feeding	WI - Manual search feeding (JOV-28G-040/3035)	2	Machine auto-stop	3	L																			223	
746			Clip singulation	Operator		Singulates the clipframe into 10 individual clip units using clip singulator	Operates the machine and presses auto bond button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	No Reject map created	Failure to generate 2D reject map from prebond inspection due to autobond not activated	WI - Auto bond (JOV-28G-040/3035)	4	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run	6	M																			746	
747				Tiechnician			Sets and verifies parameters	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Wrong parameter settings	Parameter Settings (JOV-28G-40C/3005) Parameter lock on RMS	3	Check parameters every set up MPMF (JOT-28G-040/4035) Machine parameter lock	5	M	S																			735	
748								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Wrong parameter settings	Parameter Settings (JOV-28G-40C/3005) Scrap set-up strip Parameter lock on RMS	2	Check parameters every set up MPMF (JOT-28G-040/4035) Machine parameter lock Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			725	
749				Clip punch parameter (clip punch ejection level and delay)			Correct clip punch parameters according to <JOV-28G-40C/3005>	Your Plant: Production Delay Ship to Plant: None End User:	2	Uncut clip	Out of specification clip punch ejection level	Parameter Settings (JOV-28G-40C/3005) Parameter lock on RMS	2	Check parameters every set up MPMF (JOT-28G-040/4035) Machine parameter lock	2	L																			222	
750				Clipframe alignment			Manually aligns clipframe to rail guide track to ensure smooth feeding of clipframe	Your Plant: Production Delay Ship to Plant: None	2	Damaged clipframe	Misaligned rail guide track	WI- Clipframe installation and clip feeder index distance singulator set up (JOV-28G-040/3035)	3	Machine auto-stop feature upon clipframe index error	3	L																			233	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vee Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Action Observations	Filter Codes (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Action Observations	PFMEA AP	Remarks				INET	OPT
751				Locating pin			Ensures alignment of clipframe with rail guide track	Your Plant: Production Delay Ship to Plant: None End User: None	7	Offset clip cutting	Worn out locating pin	Semi-Annual PM Activity - Hose condition	2	Checking of locating pin during device set up First Piece Inspection during device setup and clip change SPI_ACII Inspection 2D Reject Mapping	6	M																			726	
752				Clip singulation tool (Punch)			Singulates clipframe into individual clip units	Your Plant: Production Delay Ship to Plant:	2	Uncut clip	Worn out/broken singulation tool	Semi-Annual PM Activity - singulation tool condition	2	Checking of singulation tool every set up	3	L																			223	
753								Your Plant: Production Delay Ship to Plant: None	2	Uncut clip	Punch drive motor failure	Semi-Annual PM Activity - Punch Drive Motor condition	2	Visual inspection Machine auto stop	3	L																			223	
754				Pick and Place Assembly			Picks and places clip	Your Plant: Production Delay Ship to Plant: None End User:	2	Unpick clip	Pick & Place Assembly problem -transfer arm motor, sensor -vacuum problem -clogged pick up tool	Semi-Annual PM Activity - Bond head assembly	2	Machine auto stop Stacking Height measurement AOI/SPI Sampling	3	L	S																			223	
755				Clip rail guide			Ensures correct alignment of clipframe during loading	Your Plant: Production Delay	2	Uncut clip	Clip frame and cutting plate has no gap	Semi-Annual PM Activity - clipframe - cutting plate gap	2	Checking of clipframe - cutting plate gap every set up	3	L																			223	
756								Your Plant: Production Delay	2	Damaged clipframe	Defective rail guide track	Semi-Annual PM Activity - rail guide track condition	2	Checking of clipframe - rail guide track condition every set up	3	L																			223	
757				Motor Feeder			Controls clipframe reel motion with correct motor speed	Your Plant: Production Delay Ship to Plant: None	2	Damaged clipframe	Out of specs motor speed based on original machine condition	Setting during machine qualification set up	2	Machine auto stop upon clipframe jamming error Ground sensor to detect presence of clipframe and stop motor feeder	3	L																			223	
758								Your Plant: Production Delay Ship to Plant:	2	Clipframe jamming	Clip frame Feeding assembly problem -motor, sensor	Semi-Annual PM Activity - Motor Feeder condition	2	Checking of Motor Feeder condition every PM	3	L																			223	
759				Singulation Motor			Rotates cam for singulation	Your Plant: Production Delay	2	Motor Z Motion Timeout	Defective singulation motor	Semi-Annual PM Activity - Motor Feeder condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
760								Your Plant: Production Delay	2	Motor Z Power Not On	Defective singulation motor	Semi-Annual PM Activity - Motor Feeder condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
761								Your Plant: Production Delay	2	Motor Z Search Home Failed	Defective singulation motor	Semi-Annual PM Activity - Motor Feeder condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
762								Your Plant: Production Delay	2	Motor Z Move Error	Defective singulation motor	Semi-Annual PM Activity - Motor Feeder condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
763				Camera			Moves punches up for singulation	Your Plant: Production Delay Ship to Plant:	2	Missing Clip	Defective pin sensor	Semi-Annual PM Activity - singulation tool condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
764								Your Plant: Production Delay Ship to Plant:	2	Singulator Retry failed	Defective pin sensor	Semi-Annual PM Activity - singulation tool condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
765				Pin Sensor			Detects presence of pin aligner	Your Plant: Production Delay Ship to Plant:	2	Pin Sensor Detection Failed	Defective pin sensor	Semi-Annual PM Activity - singulation tool condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
766				Ground sensor			Detect presence of clipframe to stop motor feeder	Your Plant: Production Delay Ship to Plant:	2	Damaged clipframe	Continuous clipframe feeding due to malfunctioning ground sensor	Semi-Annual PM Activity - ground sensor condition	2	Machine auto stop upon clipframe jamming error	3	L																			223	
767				Sprocket Wheel			Drives the clipframe during indexing	Your Plant: Production Delay Ship to Plant:	2	Search Indexing Hole Sensor Error	Clipframe jamming due to defective sprocket wheel	Semi-Annual PM Activity - sprocket wheel condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
768								Your Plant: Production Delay Ship to Plant:	2	Singulator search LF failed	Clipframe jamming due to defective sprocket wheel	Semi-Annual PM Activity - sprocket wheel condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
769								Your Plant: Production Delay Ship to Plant:	2	Clip Reel Search Fail	Clipframe jamming due to defective sprocket wheel	Semi-Annual PM Activity - sprocket wheel condition	2	Machine Error Machine Auto-stop	3	L																Equipment-centric				223	
770								Your Plant: Production Delay Ship to Plant:	2	Damaged clipframe	Clipframe jamming due to defective sprocket wheel	Semi-Annual PM Activity - sprocket wheel condition	2	Machine auto stop upon clipframe jamming error	3	L																			223	
771				Clipbonded material			Materials to be cured	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Copper slug residue stuck on punch and die that cause uneven Source and Gate coplanarity	Semi-Annual PM Activity - Punch and Die condition Conduct inspection and cleaning of punch and die area by Vacuum and Brush every set-up	5	Setup Qualification (visual top solder wetting x-ray, visual after clip attach, solder voids) -SPI Clip Height Measurement Open/Short at Test Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	M	S																				752	
772			Clip Pick up	Operator		Picks up singulated clip units from singulation tool and transports to clip-bonding area	Operates the machine and presses auto bond button	Your plant: Yield Loss Production delay Mold problem (plastic leak) Ship to Plant: None End User: None	7	No Reject map created	Failure to generate 2D reject map from prebond inspection due to autobond not activated	WI - Machine Mode setting - "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run AOI/SPI Auto Stop	4	L																			734	
773				Technician			Verifies parameters	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Wrong parameter settings	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	1	Check parameters every set up MPMF (JOT-280-040/4035) Machine parameter lock Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
774								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Wrong parameter settings	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	3	Check parameters every set up MPMF (JOT-280-040/4035) Machine parameter lock Stacking Height AOI/SPI Sampling	5	M	S																			735	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production				
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level 1 Risk Priority	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	PFMEA AP	Remarks				INET	OPT
775				Bridge pick Z level parameter			Sets correct bridge pick Z level parameter according to <JOV-2B0-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Out of specs bridge pick Z level parameter	Parameter Settings (JOV-2B0-40C/3005) Parameter lock on RMS	3	Check parameters every set up MPMF (JOT-2B0-040/4035) Machine parameter lock Stacking Height	5	M	S																		735	
776								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Out of specs bridge pick Z level parameter	Parameter Settings (JOV-2B0-40C/3005) Parameter lock on RMS	3	Check parameters every set up MPMF (JOT-2B0-040/4035) Machine parameter lock Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M																		735	
777				Bridge pick up tool			Picks up singulated clip units from clip singulator using vacuum	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Wrong bridge pick up tool used (normal vs. DS clipframe)	Use of new universal singulation punch and bridge tool	3	Check parameters every set up MPMF (JOT-2B0-040/4035) Machine parameter lock Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	
778								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Wrong bridge pick up tool used (normal vs. DS clipframe)	Use of new universal singulation punch and bridge tool	3	Check parameters every set up MPMF (JOT-2B0-040/4035) Machine parameter lock Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M																		735	
779								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	
780								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Auto-Inspection - AOI/SPI Sampling	5	M	S																		735	
781								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Look-up camera error	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Auto-Inspection - AOI/SPI Sampling	2	L	S																		732	
782				Machine (BH Rotary Motor Assy)			Controls movement of Theta of bridge pick-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Theta Position Error	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
783								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head T Motor Not ON	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
784								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Theta DAC Limit	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
785				Bond head Assembly			Controls the movement (X/Y/Z/Theta) of bridge pick up tool during clip pick up and transfer	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Bond head Assembly problem -transfer arm x-y motor failure -angle motor failure -sensor problem	Semi-Annual PM Activity - Bond head assembly	3	Checking of bond head assembly condition every set up Stacking Height Auto-Inspection - AOI/SPI Sampling/100% Machine auto-stop due to bond head error	5	M	S																		735	
786								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Pick and Place machine error	Bond head Assembly problem -transfer arm x-y motor failure -angle motor failure -sensor problem	Semi-Annual PM Activity - Bond head assembly	3	Checking of bond head assembly condition every set up Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	L																		732	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vee Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	2. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level of Cross-Functional Impact	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	PFMEA AP	Remarks				INET	OPT
787				Machine (Bond Head XYZ Linear Motor)			Controls movement of XYZ of bridge pick-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motor Not On	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L														Equipment-centric				732	
788								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motion Error	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L														Equipment-centric				732	
789								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motor Commutate Fail	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L														Equipment-centric				732	
790				Uplook Camera			Checks the presence of clip underneath bridge pick up tool	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Offset pick up of clipframe	Semi-Annual PM Activity - Uplook camera condition Uplook Pattern Recognition	3	Checking of uplook camera condition every set up Machine auto stop Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																735	
791								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Offset pick up of clipframe	Semi-Annual PM Activity - Uplook camera condition Uplook Pattern Recognition	3	Checking of uplook camera condition every set up Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																735	
792								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Offset pick up of clipframe	Semi-Annual PM Activity - Uplook camera condition Uplook Pattern Recognition	2	Checking of uplook camera condition every set up Machine auto stop Auto-inspection - AOI/SPI Sampling/100%	5	M	S																725	
793								Your plant: Yield Loss Production delay Mold problem (plastic leak) Ship to Plant: None End User:	7	Missing Clip	Improper alignment of Clip and Bottomframe during set-up	Use setup LF for proper alignment of clip	2	First Piece Inspection during device setup and clip change SPI Clip Height Measurement Auto-inspection - AOI/SPI Sampling	5	M																725	
794				Clip Alignment Set-up			Sets the correct alignment of Clip and Bottomframe during set-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Improper alignment of Clip and Bottomframe during set-up	Use setup LF for proper alignment of clip	3	First Piece Inspection during device setup and clip change SPI Clip Height Measurement VI of 1 magazine during device setup and clip change 2D Reject Mapping Include the x-y placement during x-ray monitoring every clip frame change 20% x-ray inspection Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	
795								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Improper alignment of Clip and Bottomframe during set-up	Use setup LF for proper alignment of clip	3	First Piece Inspection during device setup and clip change SPI Clip Height Measurement VI of 1 magazine during device setup and clip change 2D Reject Mapping Include the x-y placement during x-ray monitoring every clip frame change 20% x-ray inspection Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																		735	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA RPN	Overall Criticality	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Criticality	PFMEA RPN	Remarks				INET	OPT
796								Your plant: Yield Loss Production delay Mold problem (plastic leak) Ship to Plant: None End User: None	7	Clip position problem	Improper alignment of Clip and Bottomframe during set-up	Use setup LF for proper alignment of clip Scrap all set-up strips	3	First Piece inspection during device setup and clip change SPI Clip Height Measurement Auto-inspection - AOI/SPI Sampling VI of 1 magazine during device setup and clip change 2D Reject Mapping (include the x-y placement during x-ray monitoring every clip frame change 20% x-ray inspection	S	M	S																			735	
797			Clip bonding	Operator		Bonds singulated clip units onto the bottomframe with correct alignment	Operates the machine and presses auto bond button	Your plant: Yield Loss Production delay Mold problem (plastic leak) Ship to Plant: None	7	No Reject map created	Failure to generate 2D reject map from prebond inspection due to autobond not activated	WI - Machine Mode setting : "Production" (JOV-280-040/3025) Machine Mode setting : "Production" saved on RMS	7	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run AOI/SPI Auto Stop	4	L																			734	
798				Technician			Verifies parameters	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Wrong parameter settings	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	3	Check parameters every set up eCOI Machine parameter lock Machine auto stop Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																			735	
799								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Incorrect XY coordinates	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	2	Check parameters every set up eCOI Machine parameter lock Machine auto stop Stacking Height AOI/SPI Sampling/100%	S	M	S																			725	
800								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Wrong parameter settings	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	3	Check parameters every set up eCOI Machine parameter lock Machine auto stop Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M																			735	
801				Bridge bond Z level parameter			Correct bridge bond parameters according to <JOV-280-40C/3005>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Out of specs bridge bond Z level parameter	Parameter Settings (JOV-280-40C/3005) Parameter lock on RMS	3	Check parameters every set up eCOI Machine parameter lock Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																			735	
802								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Incorrect bridge bond Z level	Semi-annual PM activity - checking of Clip pick/bond Z level condition	3	First Piece inspection during device setup and clip change eCOI Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	L																			734	
803				Clip alignment wrt to bottomframe			Correct alignment of Clip wrt to the bottomframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Ineffective clip to leadframe interlocking.	Implemented modified clip frame with improved frontal & lateral centering guide.	3	Check parameters every set up eCOI Machine parameter lock Machine auto stop Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																			735	
804								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	8	Tilted clip	Ineffective clip to leadframe interlocking. (Customer complaint : Non-engagement of bottom frame and clip frame locking mechanism) (Customer Complaint)	Implemented modified clip frame with improved frontal & lateral centering guide.	5	Setup Qualification (Visual after clip attach, XY-Placement) Stacking Height measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	H			Qualification of bottomframe with burr-down stamping	100% AOI/SPI/PARMI. Sustain	N. Laqui	Dec'2020	Done		Dec'2020	8	3	4		L						864	
805				Machine (BH Rotary Motor Assy)			Controls movement of Theta of bridge pick-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Theta Position Error	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura - Process Engineering Allen Caneta- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Caneta / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)					RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Current Risk Assessment	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Current Risk Assessment	PFMEA AP	Remarks				INIT	OPT
B06								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head T Motor Not ON	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
B07								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head Theta DAC Limit	Defective BH Rotary Motor Assy	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
B08				Machine (Bond Head XYZ Linear Motor)			Controls movement of XYZ of bridge pick-up	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motor Not On	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
B09								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motion Error	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
B10								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Bond Head XYZ Motor Commutate Fail	Defective BH XYZ Linear Motor	Semi-Annual PM Activity - Bond head assembly	3	Machine Error Machine Auto-stop	2	L															Equipment-centric				732	
B11				Bond head Assembly			Controls the movement (X/Y/Z/Theta) of bridge pick up tool during clip pick up and transfer	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Bond head Assembly problem -transfer arm x/y/z motor failure -angle motor failure -sensor problem	Semi-Annual PM Activity - Bond head assembly	3	Checking of bond head assembly condition every set up Stacking Height measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B12								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Pick and Place machine error	Bond head Assembly problem -transfer arm x/y/z motor failure -angle motor failure -sensor problem	Semi-Annual PM Activity - Bond head assembly	3	Checking of bond head assembly condition every set up Stacking Height measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B13								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Machine Limitation -Manual (mechanical) X and Y setting of coordinates.	Use PRS (pattern recognition system) reference in attaching clip - All SOT1205 will run only in ASM DACA machines only	3	Stacking Height Measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B14								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Machine Limitation -Manual (mechanical) X and Y setting of coordinates.	Use PRS (pattern recognition system) reference in attaching clip - All SOT1205 will run only in ASM DACA machines only	3	Stacking Height Measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B15				Bridge pick up tool			Bonds singulated clip units onto bottomframe at correct Z bond level	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Wrong bridge pick up tool used (normal vs. DS clipframe)	Use of new universal singulation punch and bridge tool	3	Stacking Height Measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B16								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Wrong bridge pick up tool used (normal vs. DS clipframe)	Use of new universal singulation punch and bridge tool	2	Stacking Height Measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	2	L	S																			722	
B17								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B18								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing Clip	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	S																			735	
B19								Your Plant: Production delay Yield loss Ship to Plant: None End User:	7	Clip position problem	Contaminated/Worn out bridge pick up tool	Semi-Annual PM Activity - bridge pick up tool	3	Checking of bridge pick up tool condition every set up Stacking Height Auto-inspection - AOI/SPI Sampling/100%	5	M	S																			735	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navio - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-20	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																			
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FMEA RPN	Risk Priority Number (RPN)	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	FMEA RPN	Risk Priority Number (RPN)	Remarks				INET	OPT
B20								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Cracked die	Contaminated Bridge Pick Tool	Semi-Annual PM Activity - bridge pick up tool Bridge pick-up tool design with 50um recess on die side	2	Checking of bridge pick up tool condition every set up SBL / RBA Hits	4	L																			724	
B21				Venturi Vacuum Assembly			Holds clipframe in place during clip bonding	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Insufficient Venturi Vacuum	Semi-Annual Activity - Vacuum line condition	3	Checking of vacuum line condition every set up CDA pressure machine auto alarm Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B22								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing clip	Insufficient Venturi Vacuum	Semi-Annual Activity - Vacuum line condition	3	Checking of vacuum line condition every set up CDA pressure machine auto alarm Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B23								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Defective/Damage Venturi Vacuum	Semi-Annual PM Activity - Vacuum Assembly condition	3	Checking of vacuum line condition every set up CDA pressure machine auto alarm Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B24								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Missing clip	Defective/Damage Venturi Vacuum	Semi-Annual PM Activity - Vacuum Assembly condition	3	Checking of vacuum line condition every set up CDA pressure machine auto alarm Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B25								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	No Compressed Air	Defective/Damage Venturi Vacuum	Set-up Validation - Functionality	3	Machine Error Machine Auto-stop	S	M															Equipment-centric				735	
B26				Anvil block			Holds bottomframe in place using vacuum during clip bonding	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	Clogged anvil block	Semi-Annual Activity - Anvil block condition	3	Checking of vacuum line condition every set up CDA pressure machine auto alarm Stacking Height Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B27								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed Clip	Clogged anvil block	Semi-Annual Activity - Anvil block condition	3	Checking of anvil block condition every set up Leadframe PR Stacking Height Measurement Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B28								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	8	Tilted clip	Unstable PRS image due to Shiny anvil block surface (Customer Complaint)	Semi-Annual PM Activity - Anvil Block Surface Condition	7	First Piece Inspection during device setup and clip change 2D Reject Mapping Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	4	H			Evaluate black chrome coating (matte finish)	100% AOI/SPI/PARMI. Sustain	N. Laqui	Dec'2020	Done		Dec'2020	8	3	4		L					874	
B29				Clipframe			Serves as connection from die pads to the external terminal	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	New weight of the clip due to removal of overhang (From D2 to D2FL, D3RO to D3FL and D4 to D4FL)	Work Instruction - Use setup LF for proper alignment of clip	3	First Piece Inspection during device setup and clip change 2D Reject Mapping Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	
B30								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip position problem	New weight of the clip due to removal of overhang (From D2 to D2FL, D3RO to D3FL and D4 to D4FL)	Work Instruction - Use setup LF for proper alignment of clip Scrap set-up strip	3	First Piece Inspection during device setup and clip change 2D Reject Mapping Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	S	M	S																	735	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines — Sebastian Novio - FMEA Owner; Shara Michal Barairo - Process Engineering; Nerio Tura - Process Engineering; Allen Caneta- Process Engineering; Harold Gutlay - Process Engineering; Leo Belandres - Equipment Engineering; Angelo Viaje - Quality Engineering; Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Caneta / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# by (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Lessons Learned/Remarks	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Lessons Learned/Remarks	PFMEA AP	Remarks				INIT	OPT
B31								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	8	Lifted clip	Hooked by knitted gloves (Customer Complaint)	Work Instruction - Use setup LF for proper alignment of clip	2	First Piece Inspection during device setup and clip change AOI/SPI Sampling/100% Postbond inspection 2D Reject Mapping	5	M			Evaluate thermal glove and replace knitted gloves	100% AOI/SPI/PARMI. Sustain	N. Laqui	Dec'2020	Done		Dec'2020	8	1	5		L					825	815
B32								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Source clip has overhang beyond the die edge	Reduce the clip overhang that is shorter than the die edge	3	First Piece Inspection during device setup and clip change Stack Height Measurement 2D Reject Mapping 20% sampling x-ray Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	5																	735	
B33								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip shorting the die edge	Source clip has overhang beyond the die edge	Reduce the clip overhang that is shorter than the die edge	1	First Piece Inspection during device setup and clip change Stack Height Measurement 2D Reject Mapping 20% sampling x-ray Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	5																	735	
B34								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Swayed clip	Clipframe overhang touching the edge of the die ESD (For die size 3.9x2.06 & 75 V- 150V, clip and die shorting Clip tilting)	Modified existing clip to remove the overhang portion (release of D3 RO).	3	First Piece Inspection during device setup and clip change Stack Height Measurement 2D Reject Mapping 20% sampling x-ray Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	5																	735	
B35								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Clip shorting the die edge	Clipframe overhang touching the edge of the die ESD (For die size 3.9x2.06 & 75 V- 150V, clip and die shorting Clip tilting)	Modified existing clip to remove the overhang portion (release of D3 RO).	3	First Piece Inspection during device setup and clip change Stack Height Measurement 2D Reject Mapping 20% sampling x-ray Machine auto vision 100% AOI/SPI/PARMI Reflow+FT1/FT2 at Test	5	M	5																	735	
B36			Postbond Inspection	Technician		Inspects clip placement based on defined model or golden sample with auto-correct X/Y axes placement and provides auto-correction function	Defines/teaches postbond PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of die positioning	Inattentive to correct PRS teaching	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	
B37								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Under-detection/rejection of die positioning	Inattentive to correct PRS teaching	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	
B38				Clip placement PR			Inspects actual clip placement on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of die positioning	Wrong Die placement PRS set-up	Work Instruction - Bond PR on Clip Attach (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	
B39								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Under-detection/rejection of die positioning	Wrong Die placement PRS set-up	Work Instruction - Teaching of placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	
B40				Leadframe PR			Checks and verifies correct leadframe alignment prior bonding	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong Leadframe PRS set-up	Work Instruction - Teach Bond PR (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	
B41				Lighting Setting			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong PRS Lighting set-up	Work Instruction - Dispense and Die placement set-up (JOV-280-040/3035)	4	Visual Inspection 100% SPI/AOI	3	M																				743	

test

Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																	
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	FTIME/LAP	Severity (S)xOxD	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Overall Criticalities	FTIME/LAP	Remarks				INET	OPT
B42				LED Lighting (Coaxial and side illumination)			Provides correct lighting setting for PR inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unable to search PR template	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
B43								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Epoxy Inspection Status Erro	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
B44								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Postbond Die Placement Check	Busted LED light	Semi-Annual PM Activity - LED lighting condition and calibration	2	Machine Error Machine Auto Stop	3	L															Equipment-centric				723	
B45								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong Die position	Wrong PRS Lighting set-up	Work Instruction - Dispense and Die placement set-up (JOV-280-040/3035)	4	Visual inspection 100% SPI/AOI	3	M																			743	
B46				Auto Vision System			Inspects actual clip placement on processed units with respect to defined/taught PR	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Out of focus camera	Semi-Annual PM Activity - Camera condition	2	Machine auto stop Weekly Camera Focus calibration Machine Postbond inspection auto stop	3	L																			723	
B47								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Disabled auto vision system	Work Instruction (Operate on Prodn Mode)	2	Checking of Auto vision setting (Production Mode) per batch by the second operator.	3	L																			723	
B48								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												723	
B49								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												723	
B50								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failed to detect Dispensed Solder	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected) Parameter revisit of vision system Theoretical computation of solder volume	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Visual Inspection (X-ray Top solder wetting) Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												723	
B51								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Over-detection/rejection of dispensed solder paste	Wrong parameter Auto Vision limit	Auto Vision parameter setting access level restricted to Process Engr (Password protected)	2	Process Engr verification every set-up or CDI AOI settings recording on the MPMF every setup change device / design Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												723	
B52				Material Online Booking System (Keeping to DACA)			Records date and time of leadframe and clipframe withdrawal for ensuring good quality of leadframe (not oxidized)	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Oxidized bottomframe	Incorrect date and time inputted on MOBS	Work Instruction - Bottomframe and magazine preparation (JOV-280-040/3050)	3	Machine auto stop	3	L																			733	
B53				Solder paste dispense			Dispenses correct solder dispense area and placement<parameter settings docx>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Insufficient Solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
B54								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Excessive solder	Wrong dispense area and placement	Parameter Settings (JOV-280-40C/3005)	3	Machine postbond auto stop	3	L			Update Parameter Settings of Power Die Attach (JOV-280-40C/3005) to include LAP Solder Re-train and re-certify operators of change		A. Villanueva/J. Superfical	1-Sep-21	Done												733	
B55			Scanning of bottomframe 2D code (Head 3)	Operator		Scans 2D code on bottomframe surface for generation of CA map	Activates LMDC at CA station	Your Plant: Production delay Yield loss Ship to Plant: None End User:	7	No strip map generated	LMDC not activated	DACA WI (JOV-280-040/3035) Training and Certification of the operator	4	On-screen display implicating LMDC activated status Comparison of machine output quantity and actual unit count	6	M																			746	
B56							Operates the machines and presses autobond button	Your Plant: Production delay Yield loss Ship to Plant: None End User:	7	Insufficient / Excessive Solder dispense	Prebond inspection not activated due to twinbond selected instead of autobond	WI - Machine Mode setting : "Production" (JOV-280-040/3035) Machine Mode setting : "Production" saved on RMS Training and Certification of	3	Manual checking by process technicians Checking of 2D map generation by operator at the start of production run Visual inspection	6	M																					736	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navia - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutley - Process Engineering Leo Belandres – Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutley / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Severity x Occurrence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severity x Occurrence	PFMEA AP	Remarks				INET	OPT
B57				LMDC FSE			Sets up 2D code scanning parameters	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	No strip map generated	Wrong LMDC settings	Machine buy-off eCDI – Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035)	6	M																			726	
B58				2D code scan delay			Sets the appropriate barcode scanning speed	Your plant: Production Delay Machine error Ship to Plant: None End User: None	2	Failure to read 2D code	Incorrect scan delay parameter setting	Machine buy-off eCDI – Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035) Machine auto stop	2	L																			222	
B59				2D code position			Sets the position of barcode scanner	Your plant: Production Delay Machine error Ship to Plant: None End User: None	2	Failure to read 2D code	Misaligned position of 2D scanner wrt leadframe 2D code location	Machine buy-off eCDI – Qualification of 2D map generation (JOT-280-040/4035)	2	Checking of 2D map generation every set up (JOT-280-040/4035) Machine auto stop	2	L																			222	
B60				LMDC			Generates 2D strip map	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failure to generate DA map	Failed to transfer data from DACA AOI to 2D reject map due to defective machine communication	Machine buy-off eCDI – Qualification of 2D map generation (JOT-280-040/4035)	6	Machine auto-strip due to communication error Machine output quantity does not match actual unit count	6	M																			746	
B61				2D code reader			Reads the 2D mark of the bottom frame	Your Plant: Production Delay Ship to Plant: None End User: None	2	Failure to read 2D code	Defective 2D code reader	Semi-Annual PM Activity – 2D Code scanner condition	2	Check every set-up Machine Auto Stop	2	L																			222	
B62				Bottomframe (2D code quality/clarity)			Satisfies good marking quality	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unrecognized 2D Barcode Mark on Lead Frame	Scratch and contamination on 2D mark surface due to mishandling	WI - Handling of bottomframe (JOV-280-040/3035) Leadframe storage in N2 cabinet	3	Check every set-up Machine Auto Stop	2	L																			732	
B63								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Unrecognized 2D Barcode Mark on Lead Frame	1. Unclear 2D Barcode marking 2. Solder splatter on 2D barcode mark 3. Abnormality on 2D Barcode mark	1. Lead frame 2D barcode marker has a built in vision system that automatically compare actual mark against required mark 2. Correlate lead frame marker machine vision against ASM 2D barcode reader	3	Check every set-up Machine Auto Stop	2	L																			732	
B64			Leadframe indexing from CA to reflow	Operator		Transports of bottomframe from clip attach to reflow	Operates machine and presses autobond button Assists index jamming error	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Inattentive to proper machine assist activity	Machine training and certification	2	Visual Inspection Machine auto stop	2	L																			722	
B65				Tiechnician			Repairs/assists index jamming error	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Inattentive to proper machine assist activity	Machine training and certification	2	Visual Inspection Machine auto stop	2	L																			722	
B66				Index track width parameter			Sets the correct index track width parameter according to -spec LF drawing-	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Incorrect index track width parameter	One-time calibration using one common leadframe width Semi-Annual PM activities - index track width condition	2	Machine auto stop	2	L																			722	
B67				Clamp force parameter			Sets the correct clamp force	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Incorrect clamp force parameter	One-time calibration Semi-Annual PM activities - clamp force condition	2	Machine auto stop	2	L																			722	
B68				Clamp timing parameter			Sets the correct clamp timing	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Incorrect clamp timing parameter	One-time calibration Semi-Annual PM activities - clamp timing condition	2	Machine auto stop	2	L																			722	
B69				Machine (Indexer Sensor)			Senses leadframe after indexing	Your Plant: Production Delay Ship to Plant: None End User: None	2	No LF on work holder error / No LF found on index track	index sensor problem -defective sensor -dirty sensor	Semi-Annual PM activities - index sensor condition	2	Check every set-up Machine auto stop	2	L																Equipment-centric				222	
B70				Leadframe index clamp (input alignment)			Pushes the Frame from input track	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Defective leadframe index clamp/pusher assembly	Semi-Annual PM Activities - Pusher condition	2	Machine Auto Stop	2	L																			722	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002	
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia	
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL	
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarueel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lencion / Harold Gutlay / Angelo Viaje			

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC / FM	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	TYPE/RA/P	SAFETY/CRITICALITY	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	SAFETY/CRITICALITY	TYPE/RA/P	Remarks				INET	OPT
871								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	MalFunctioning leadframe index clamp/pusher (motor/pneumatic)	Semi-annual PM activities - leadframe pusher condition	2	Machine Auto Stop	2	L																			722	
872				Machine (Indexer Linear Encoder)			Reads position of indexer on track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Indexer Hipec Limit Error	Defective Linear Read Head Encoder	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	L															Equipment-centric				242	
873				Machine (Scale)			Encodes position of indexer on track	Your Plant: Production Delay Ship to Plant: None End User: None	2	Indexer Hipec Limit Error	Dirty/Defective Scale	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
874				Machine (Compression Spring)			Pushes the input pusher assembly during LF input	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Worn-out compression spring	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
875				Machine (Input Pusher Linear Slide)			Permits movement of pusher assembly	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Worn-out linear slide	Set-up Validation - Functionality	2	Machine Error Machine Auto Stop	2	L															Equipment-centric				222	
876				Machine (Indexer Voice Coil)			Initiates clamping of indexer	Your Plant: Production Delay Ship to Plant: None End User: None	2	LF Jam on WH Error	Defective indexer voice coil	Set-up Validation - Functionality	4	Machine Error Machine Auto Stop	2	L															Equipment-centric				242	
877				Index Clamp/gripper			Holds & Indexes the frame from input to output track	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Defective index clamp/gripper motor	Semi-Annual PM activities - gripper assembly condition	2	Machine Auto Stop	2	L																			722	
878								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Machine index track not aligned with succeeding machine track,	Semi-Annual PM activities - Index track alignment condition	2	Machine Auto Stop	2	L																			722	
879								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Uncalibrated clamp/gripper assembly	Semi-Annual PM activities - gripper assembly condition	2	Machine Auto Stop	2	L																			722	
880								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Worn-out Leadframe clamp/Gripper	Semi-Annual PM activities - gripper assembly condition	2	Machine Auto Stop	2	L																			722	
881				Kicker (Index Clamp)			Kicks the frame from CA output track to reflow input track	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Mis-aligned kicker(index clamp) with respect to Leadframe	Semi-Annual PM activities - Kicker alignment condition	2	Machine Auto Stop	2	L																			722	
882				Index Roller			Transport / Indexes leadframe from CA to Reflow input track	Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Leadframe index jamming	Defective roller assembly -motor problem -broken belt	Semi-Annual PM Activities - Index roller condition	2	Machine Auto Stop	2	L																			722	
883								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	Input roller motion error	Defective roller assembly -motor problem -broken belt	Semi-Annual PM Activities - Index roller condition	2	Machine Auto Stop	2	L															Equipment-centric				722	
884								Your plant: Production Delay Yield loss (scrappage of affected leadframe within the track due to clear index) Ship to plant: None End User: None	7	No leadframe found on input track	Defective roller assembly -motor problem -broken belt	Semi-Annual PM Activities - Index roller condition	2	Machine Auto Stop	2	L															Equipment-centric				722	
885			Map Generation	UMDC		Creates 2D reject map	Records and processes the 2D reject map	Your plant: Production Delay Yield loss (scrappage of affected shifted map) Ship to plant: None End User: None	7	Wrong reject map generated	Shifted map	Map is created after processing the whole lead frame	3	Machine will prompt a window that will tell the user that map is incomplete Machine auto stop if 100 units were rejected	3	L																			733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers	PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	RPN(B.A)*	Severity (S) of RPN(B.A)*	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	RPN(B.A)*	Remarks				INET	OPT
886			Map Transfer	LMDC		Transfers map from LMDC to Server	Provides complete transfer of map to server	Your plant: Production Delay (Map id saved on machine but failed to transfer to server) Ship to plant: None End User: None	2	Processing delay due to no map transferred	Network problem (Connectivity issue)	Map is save on local server then transfer to server when lead fame is processed completely	3	Machine error prompts	3	L																		233	
887			Batch summary generation	LMDC		Generates the processing summary of the batch	Correct display of summary output	Your plant: Production Delay (Map id saved on machine but wrong display to the monitor) Ship to plant: None End User: None	2	Processing delay due to incorrect display of summary output	Software error Machine error	Data is transferred after completion of Die attached and clip attached.	3	Machine error prompts	3	L																		233	
888			Reflow process	Operator		Cures solder paste used during die and clip bonding	Operates the machine and presses auto bond button Loads magazine	Your Plant: Production delay Yield loss Ship to Plant: None End User:	7	Damaged leadframe	Inattentive to lock the magazine.	Work Instruction - Output Magazine preparation (JOV-280-040/3050	3	Visual detection	6	M																		736	
889							Verifies loaded recipe	Your Plant: Production Delay Ship to Plant: None End User: None	7	Wrong recipe used	Inattentive to load the correct recipe per device	Work Instruction - Load recipe (JOV-280-040/3050	3	Visual detection	6	M																		736	
890				Technician			Verifies parameters per <JOT-2H0-040/4067>	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Contamination on clipbonded leadframe	Dirty oven	DACA Reflow Oven and Filter Cleaning Checklist (JOT-2H0-040/4067)	3	Visual detection 100% AOI/SPI	4	L																		734	
891							Verifies parameters per <JOT-2H0-040/4067>	Your Plant: Production delay Yield loss Customer complaint Ship to Plant: None End User:	8	Missing Clip	Copper Debris (Contamination) remains in oven cable that touches clipframe	DACA Reflow Oven and Filter Cleaning Checklist (JOT-2H0-040/4067)	3	Visual detection 100% AOI/SPI	4	L																		834	
892				Reflow parameters			Correct reflow parameters per <JOV-2G2-040/2008>	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder	Low Temperature	Control Plan (Temperature parameters) (JOV-2G2-040/2008) Temperature Profile (JOV-2G0-040/3037) Parameter Settings (JOV-280-40C/3005)	2	Machine Auto Stop Temperature Profile (1/month) Forced decap Solder Voids measurement -SPI Clip Height Measurement	3	L	S																		723	
893								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Solder Splatter	High Temperature	Control Plan (Temperature parameters) (JOV-2G2-040/2008) Temperature Profile (JOV-2G0-040/3037) Parameter Settings (JOV-280-40C/3005)	2	Machine Auto Stop Temperature Profile (1/month) Forced decap Solder Voids measurement -SPI Clip Height Measurement	3	L	S																		723	
894								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Excessive solder	High Temperature	Control Plan (Temperature parameters) (JOV-2G2-040/2008) Temperature Profile (JOV-2G0-040/3037) Parameter Settings (JOV-280-40C/3005)	2	Machine Auto Stop Temperature Profile (1/month) Forced decap Solder Voids measurement -SPI Clip Height Measurement	3	L	S																		723	
895				Oven Transport Motor			Ensures transport of the leadframe during curing	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	WH Indexer Hipec Timeout Error	Defective motor breakdown	Semi-Annual PM Activity - oven transport motor condition	2	Checking of transport motor every set-up Machine Auto Stop	3	L														Equipment-centric				723	
896								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder	Defective motor breakdown	Semi-Annual PM Activity - oven transport motor condition	2	Checking of transport motor every set-up Machine Auto Stop	3	L	S																		723	
897				Index Cable transport			Indexes leadframe inside reflow oven	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Damaged on LF/Clip surface	Clip touches upper chamber of the oven during indexing due to out of spec. cable up height	Checking of cable up height every after temp. profile and oven repair	2	First Piece Inspection every intervention at reflow 100% AOI/SPI	4	L																		724	
898				Machine (Oven Heaters)			Heats up oven surface	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Heater Breakage CHX Error	Defective Heater	Semi-Annual PM Activity - Temperature controller condition	2	Checking of temperature every set-up Machine Auto Stop	3	L														Equipment-centric				723	
899								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Temperature out of range error	Defective Heater	Semi-Annual PM Activity - Temperature controller condition	2	Checking of temperature every set-up Machine Auto Stop	3	L														Equipment-centric				723	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura - Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level / Risk Priority	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Level / Risk Priority	PFMEA AP	Remarks				INIT	OPT
900				Oven temperature controller			Controls the required oven temperature	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Temperature out of range error	Defective temp-controller	Semi-Annual PM Activity - Temperature controller condition	2	Checking of temperature every set-up Machine Auto Stop	3	L																Equipment-centric				723	
901								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder	Defective temp-controller	Semi-Annual PM Activity - Temperature controller condition	2	Checking of temperature every set-up Machine Auto Stop	3	L	S																		723	
902								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder	Busted heater	Semi-Annual PM Activity - Temperature controller condition	2	Checking of temperature every set-up Machine Auto Stop	3	L	S																		723	
903				Oven Sealing			Secures reflow oven environment from oxygen	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder	Leaking of reflow chamber due to improper sealing	Semi-Annual PM Activity - Oven Sealing condition	2	Setup Qualification (visual top solder wetting; x-ray, visual after clip attach, solder voids) Machine Temperature auto alarm	3	L	S																		723	
904				Oven surface			Transfers heat to leadframe surface	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder/ Solder Voids/ Oxidation/ Discoloration/ Contamination/ Delamination/ Missing Clip/ Tilted Clip/ Lifted Clip	Accumulated flux inside the oven/ Foreign Materials	Semi-Annual PM Activity - Oven surface condition Condition- based Reflow oven cleaning.	2	Setup Qualification (visual top solder wetting; x-ray, visual after clip attach, solder voids)	3	L	S																		723	
905								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Cold Solder/ Solder Voids/ Oxidation/ Discoloration/ Contamination/ Delamination/ Missing Clip/ Tilted Clip/ Lifted Clip	Excessive Flux Residue on Reflow Heater Block	Semi-Annual PM Activity - Oven surface condition Weekly oven checking/ monitoring Condition- based Reflow oven cleaning.	2	Exhaust tube location box (side and downward flow), Machine autostop -SPI Clip Height Measurement Setup Qualification (visual top solder wetting; x-ray, visual after clip attach, solder voids)	3	L	S																		723	
906								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Contamination/ Oxidation/ Delamination	Vigon RC 303 used was past floor life	Semi-Annual PM Activity - Oven surface condition Weekly oven checking/ monitoring Condition- based Reflow oven cleaning.	2	Parmi AOI Setup Qualification (visual top solder wetting; x-ray, visual after reflow oven)	3	L																				
907								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Contamination/ Oxidation/ Delamination	Vigon RC 303 was not stored in cool, dry conditions in well sealed receptacles.	Semi-Annual PM Activity - Oven surface condition Weekly oven checking/ monitoring Condition- based Reflow oven cleaning.	2	Parmi AOI Setup Qualification (visual top solder wetting; x-ray, visual after reflow oven)	3	L																				
908								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Contamination/ Oxidation/ Delamination	Wrong chemical used	Semi-Annual PM Activity - Oven surface condition Weekly oven checking/ monitoring Condition- based Reflow oven cleaning.	2	Parmi AOI Setup Qualification (visual top solder wetting; x-ray, visual after reflow oven)	3	L																				
909				Oven Exhaust			Removes fumes from reflow oven	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Oxidized/Contamination bottomframe/ Solder Voids/ Cold Solder/ Discoloration/ Delamination/ Missing Clip/ Tilted Clip/ Lifted Clip	Under suction of fumes in the front/ main hose of the oven	Semi-Annual PM Activity - Exhaust system condition Weekly oven checking/ monitoring	2	Exhaust Filter Box (Filled indicator) Machine Autostop Weekly oven checking/ monitoring SPI Clip Height Measurement Setup Qualification (visual top solder wetting; x-ray, visual after clip attach, solder voids)	2	L																				722	
910								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Oxidized/Contamination bottomframe/ Solder Voids/ Cold Solder/ Discoloration/ Delamination/ Missing Clip/ Tilted Clip/ Lifted Clip	Over suction of fumes in the front/ main area of the oven	Semi-Annual PM Activity - Exhaust system condition Weekly oven checking/ monitoring	2	Exhaust Filter Box (Filled indicator) Machine Autostop Weekly oven checking/ monitoring SPI Clip Height Measurement Setup Qualification (visual top solder wetting; x-ray, visual after clip attach, solder voids)	3	L																				

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number: JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay – Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility: Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level: CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villanuel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje	

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)					RISK ANALYSIS (STEP 5)							OPTIMIZATION (STEP 6)															
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Sev# for (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC,FM	PFMEA RPN	Severe Occurrence	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Severe Occurrence	PFMEA RPN	Remarks				INIT	OPT
911								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Die Crack	Solder voids occurrence under the gate dimple	Semi-Annual PM Activity - Exhaust system condition Weekly oven checking/ monitoring of exhaust flow rate/vacuum flow of oven./	2	Exhaust Filter Box (Filled indicator) Machine Autostop Weekly oven checking/ monitoring Setup Qualification (visual top solder wetting x-ray, visual after clip attach, solder voids) Control criteria for solder voids underneath the gate clip area of die for BUK71/80-40H); Reject if voids cover the whole gate dimple area.	3	L																			723	
912				VOC Oven Flexible SST hose			Removes fumes from reflow oven	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Filter Alarm Detected	Clogged SST Hose	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
913				VOC Oven Venturi Ducts			Transfers fumes from hose to voc filters, regulate exhaust flow rate	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Filter Alarm Detected	Clogged Venturi Duct	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
914								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	CH - Heater Out of Temperature Range Error	Defective Thermocouple	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
915								Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	CH - Heater Out of Temperature Range Error	Defective Heater	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
916				VOC Oven Jar Sealing			Secures reflow oven jar from leaks	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Filter Alarm Detected	Worn-out jar seal	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
917				VOC Oven Filter			Filters fumes before release to facility	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Oxidized/Contamination bottomframe/ Solder Voids/ Cold Solder	Mixed gas supply interruption	Semi-Annual PM Activity;	2	Protective Gas Flow Alarm (Heat Zone)	2	L															Equipment-centric				722	
918				Mixed Gas			Protects the product from oxidation to ensure good solder wetting.	Your Plant: Production delay Yield loss of affected LF High RDSon Ship to plant: None. End User : None.	7	Filter Alarm Detected	Clogged Filter	Semi-Annual PM Activity - Exhaust system condition	2	Exhaust Filter Box (Filled indicator) Machine Autostop	2	L															Equipment-centric				722	
919		Clip Attach	Clip Indexing	Machine (Soft Bristles)	Attach clip to top of die with solder	Index clip reel from reel to machine singulation	Induces mechanical contact on clip reel to remove loose copper foreign material	Your Plant: Yield Losses Machine Stoppages Ship-to-Plant: None End User: None	7	Tilted Clip/Sway Clip	Misaligned Soft Bristles Assembly	Alignment procedure of bristles during set-up Modification of brush bracket to fixed type with screw mounts	3	Visual Inspection AOI Inspection by control of intervention Added as MKAK/PM Check Item	5	M					H.Gutlay												735	
920									7	Lifted Clips			3		4	L					H.Gutlay												734	
921									7	Copper Foreign Material			3	Monthly monitoring of brush condition and alignment. SBL/RBA Hits	4	L					H.Gutlay												734	
922					Index clip reel from reel to machine singulation	Induces mechanical contact on clip reel to remove loose copper foreign material			4	Scratches on Clip	Embedded Foreign Material on Brush	Monthly monitoring and cleaning of brush	2	Visual Inspection of leadframe every magazine	5	L					H.Gutlay												425	
923									7	Copper Foreign Material	Worn-out Soft Bristles	Alignment procedure of bristles during set-up	2	Monthly monitoring of brush condition and alignment. SBL/RBA Hits	4	L					H.Gutlay												724	
924									6	Nylon Foreign Material			2		5	L					H.Gutlay												425	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Nexperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Nexperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	RPN/AP	Special Characteristics	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Special Characteristics	RPN/AP	Remarks				INET	OPT
925		Reflow	Unloading of leadframe from oven to magazine	Operator	Your plant: Cures the solder paste used during die and clip bonding Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Unloads leadframe from reflow oven to magazine	Operates the machine and presses auto cycle button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Index Jamming	Wrong loading of magazine	Work Instruction on proper loading of magazine	1	Machine auto stop	2	L																			732	
926				Pusher parameter (distance)			Correct push distance parameters	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Index jamming	Offset pusher wrt to leadframe	Semi-annual PM activities - Pusher alignment condition	3	Machine auto stop	2	L																			732	
927				Sequence of un/loading of leadframe from oven to magazine			Un/loads Leadframe from oven to magazine top to bottom	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Foreign particle on units	Scrape material from LF and magazine due to bottom to top sequence of loading and unloading of LF to magazine (from bottom to top)	Machine set up PM Activities	3	Visual Inspection First piece inspection (dummy LF) every machine intervention Blow and vacuum error 100% AOI/SPI	4	L																			734	
928				Machine (Output Elevator LF Eaist Sensor)			Aligns bottomframe with respect to magazine	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Output LF sensor detection failed	Misaligned/Defective output sensor	Semi-annual PM activities - output sensor	3	Machine auto stop	2	L																Equipment-centric				732	
929				Rail guide			Aligns bottomframe with respect to magazine	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Index jamming	Offset rail guide during set-up	Semi-annual PM activities - Rail guide condition	3	Machine auto stop	2	L																			732	
930				Leadframe pusher			Pushes bottomframe towards magazine entry with correct push distance	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Index jamming	Defective motor / pneumatic	Semi-annual PM activities - Motor / Pneumatic condition	3	Machine auto stop	2	L																			732	
931							Completely unloads LF from reflow to magazine	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Failure to unload leadframe	Defective pusher assembly -sensor, motor -defective pusher	Semi-annual activities - Sensor, motor and pusher condition	3	Machine Auto Stop	2	L																			732	
932								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Crumpled LF	Pusher assembly problem	Semi-annual activities - Pusher assembly condition	3	Machine Auto Stop	2	L																			732	
933				Machine (Precision Linear Slide)			Permits movement of pusher assembly	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Leadframe Jammed at Output Kicker	Pusher assembly problem	Semi-annual activities - Pusher assembly condition	1	Machine Auto Stop	2	L																Equipment-centric				732	
934				Machine (Output Elevator Timing Belt)			Holds and moves the magazine during unloading of leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Leadframe Jammed at Output Kicker	Worn-out timing belt	Semi-annual activities - Timing Belt Condition	3	Machine Auto Stop	3	L																Equipment-centric				233	
935				Output magazine assembly			Holds and moves the magazine during unloading of leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Output magazine jamming	Output magazine assembly problem -motor, sensor problem -communication error	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L																			233	
936				Machine (Output Elevator YZ Motor)			Holds and moves the magazine during unloading of leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	YZ motor search home sensor fail	Defective output elevator XY Motor	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L																Equipment-centric				233	
937								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	OElev YZ Missing Steps	Defective output elevator XY Motor	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L																Equipment-centric				233	
938				Machine (Mag Z Holder)			Holds and moves the magazine during unloading of leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Leadframe Jammed at Output Kicker	Worn-out holder ASSY	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L																Equipment-centric				233	
939				Magazine slot / pitch			Loads bottomframe to correct magazine slot	Your Plant: Production Delay Ship to Plant: None End User: None	7	Damaged leadframe	Offset leadframe wrt to magazine slot/pitch centering	Semi-annual PM activities - Leadframe to magazine slot / pitch centering condition	3	Machine Auto Stop	3	L																			733	

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.		Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines	Sebastian Novio - FMEA Owner Shara Michal Barairo - Process Engineering Nerio Tura- Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers		PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach		Cross-Functional Team:	Shara Michal Barairo/ Nerio Tura/Allen Canete / Aura Mae Villaruel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lanciton / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA AP	Level Classification	Filter Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Saved by (S)	Occurrence (O)	Detection (D)	Level Classification	PFMEA AP	Remarks				INIT	OPT
940								Your plant: Production delay Yield Loss Customer complaint Ship to Plant: None End User: None	8	Foreign particle on units	Scrape material from LF and magazine insufficient magazine cleaning	Designated location for cleaned magazine. Only newly cleaned magazines will be used	3	Visual Inspection First piece inspection (dummy LF) every machine intervention Blow and vacuum error 100% AOI/SPI	4	L															Ref #: Complaint C1900360				834	
941				Magazine (magazine stopper)			Prevents overshooting of bottomframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Magazine stopper was open	Work Instruction on proper set-up of magazine stopper	3	Machine Auto Stop	3	L																			733
942		Post-process	Unloading of magazine	Operator	Your plant: Prepares to unload the material from the output of Reflow Oven(RO) Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Unloads magazine from output elevator	Operates the machine and presses auto cycle button	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Inattentive to unloading procedure	Work Instruction on proper unloading of clipbonded leadframe	3	Machine Auto Stop 100% AOI/SPI	4	L																			734
943				Elevator			Holds magazine during unloading of bottomframes	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Magazine jamming	Defective elevator motor	Work Instruction on proper unloading of clipbonded leadframe	3	Machine Auto Stop 100% AOI/SPI	4	L																			734
944							Transports magazine to unloading station	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Fallen magazine due to the new magazine bump with other magazine at the unloading station	Work Instruction on proper unloading of clipbonded leadframe	3	Machine Auto Stop 100% AOI/SPI	4	L																			734
945				Machine (Output Elevator YZ Motor)			Controls movement of YZ of output elevator	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	YZ motor search home sensor fail	Defective output elevator XY Motor	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L															Equipment-centric				233	
946								Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	OElev YZ Missing Steps	Defective output elevator XY Motor	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L															Equipment-centric				233	
947				Machine (Mag Z Holder)			Holds and moves the magazine during unloading of leadframe	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	2	Leadframe jammed at Output Kicker	Worn-out holder ASSY	Semi-annual activities - Output motor, sensor and communication condition	3	Machine Auto Stop	3	L															Equipment-centric				233	
948				Magazine			Receives unloaded leadframe from reflow oven	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Fallen magazine due to defective magazine used	Work Instruction on proper unloading of clipbonded leadframe	3	Machine Auto Stop 100% AOI/SPI	4	L																			734
949		Post-process	Visual Inspection	Operator	Your plant: Prepares to unload the material from the output of Reflow Oven(RO) Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Inspects die clipbonded units for any DACA-related defects using low power microscope and inspection jig	Inspects die clipbonded units for any DACA-related defects using low power microscope and inspection jig	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Inattentive to handling procedure	Work Instruction on proper handling of clipbonded leadframe Use of leadframe inspection jig during visual inspection	3	Visual inspection 100% AOI/SPI	4	L																			734
950				Low power microscope			Magnifies die clipbonded units to be inspected	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Under rejection of defective units	Defective lens of microscope	Work Instruction on proper handling of clipbonded leadframe Use of leadframe inspection jig during visual inspection	3	Visual inspection 100% AOI/SPI	4	L	5																		734
951				Inspection jig			Holds die clipbonded units during inspection	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Defective / Worn-out inspection jig used	Work Instruction on proper handling of clipbonded leadframe Use of leadframe inspection jig during visual inspection	3	Visual inspection 100% AOI/SPI	4	L																			734
952				Magazine			Holds and protects die clipbonded leadframes	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged leadframe	Defective / Worn-out magazine used	Work Instruction on proper handling of clipbonded leadframe Use of leadframe inspection jig during visual inspection	3	Visual inspection 100% AOI/SPI	4	L																			734

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Process Failure Mode and Effects Analysis (Process FMEA)

PLANNING & PREPARATION (STEP 1)

Company Name:	Newperia Phils. Inc.	Subject:	PFMEA OF POWER CLIPBONDED PACKAGES DIE AND CLIP ATTACH	PFMEA ID Number:	JOV-2G1-40C/2002
Plant Location:	Cabuyao, Laguna, Philippines Sebastian Navas - FMEA Owner Shara Michel Barairo - Process Engineering Nerio Tura -Process Engineering Allen Canete- Process Engineering Harold Gutlay - Process Engineering Leo Belandres - Equipment Engineering Angelo Viaje - Quality Engineering Arthur Lamentac - Production	PFMEA Start Date:	2004-10-13	Process Responsibility:	Grace Vea Garcia
Customer Name:	All Newperia Customers	PFMEA Revision Date:	2025-06-25	Confidentiality Level:	CONFIDENTIAL
Model Year / Platform:	2020 / Die Attach Clip Attach	Cross-Functional Team:	Shara Michel Barairo/ Nerio Tura/Allen Canete / Aura Mae Villarusel / Leo Belandres / Mylene Rington / Arthur Lamentac / Mark Arthur Lancion / Harold Gutlay / Angelo Viaje		

	CONTINUOUS IMPROVEMENT	STRUCTURE ANALYSIS (STEP 2)			FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)				RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)																		
Item	History / Change Authorization (as applicable) (This column is optional)	1. Process Item System, Subsystem, Part Element or Name of Process	2. Process Step Station No. and Name of Focus Element	3. Process Work Element 4M Type	1. Function of the Process Item Function of System, Subsystem, Part Element, or Process	2. Function of the Process Step and Product Characteristics (Quantitative value is optional)	3. Function of the Process Work Element and Process Characteristic	1. Failure Effects (FE)	Severity (S) of FE	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	Occurrence (O) of FC	Current Detection Control (DC) of FC or FM	Detection (D) of FC/FM	PFMEA_RP	Risk Evaluation	If Ever Code (Optional)	Preventive Action	Detection Action	Responsible Person's Name	Target Completion Date	Status:	Action Taken with Pointer to Evidence	Completion Date	Severity (S)	Occurrence (O)	Detection (D)	Risk Evaluation	PFMEA_RP	Remarks				INET	OPT
953								Your plant: Production delay Yield Loss Customer complaint Ship to Plant: None End User: None	8	Foreign particle on units	Scrape material from LF and magazine insufficient magazine cleaning	Designated location for cleaned magazine. Only newly cleaned magazines will be used	3	Visual inspection First piece inspection (dummy LF) every machine intervention 100% AOI/SPI	4	L														Ref #: Complaint C1300360				834	
954			Wafer Remnant Inspection	Operator	Your plant: Prepares to unload the wafer cassette with remnants from input loader at DA. Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Inspects wafer remnant for any indication of wafer crack, out-of-specs chip-out remnants or other abnormalities.	Inspects wafer remnant for any indication of wafer crack, out-of-specs chip-out remnants or other abnormalities.	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Die defect non-detection	Inattentive to inspection procedure and remnant safekeeping	Work Instruction	3	Visual inspection 100% AOI/SPI	4	L														Reference Complaint #: C2200380 C2200096 C2200103 C2200237				734	
955				Wafer Remnant			Remnant of mounted wafer after die attach process. Contains reject units from inking or wafer map as well as chip-out remains.		7	Die defect non-detection	Remnant not properly safekeeped	Designated remnant safekeeping location and procedure	3	Visual inspection 100% AOI/SPI	4	L																		734	
956				Low Power Microscope			Magnifies wafer remnants to be inspected		7	Die defect non-detection	Defective lens of microscope	Work Instruction	3	Visual inspection 100% AOI/SPI	4	L																		734	
957			Visual Inspection	Pen marker	Your plant: Prepares to unload the material from the output of Reflow Oven(RO) Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Inspects die clipbonded units for any DACA-related defects using low power microscope and inspection jig	Marks the defective die clipbonded units	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Contamination on clipbonded leadframe	Defective / Worn-out pen marker tip	Work Instruction on marker preparation (JOV-280-040/3050)	3	Visual inspection 100% AOI/SPI	4	L																		734	
958			Solder thickness measurement	Mitutoyo Digimatic Indicator		Measures the solder thickness of quality control sample leadframe	Measures the solder thickness of pad solder during which a needle tip comes in contact with the surface of the die	Your Plant: Production delay Yield losses Ship to Plant: None End User: None	7	Die Scratch	Quality Control sample for scrap is not removed from the mother lot	Work Instruction on creation of qualification sample	3	Visual inspection 100% AOI/SPI Final test	4	L																		734	
959			Die Tilt Measurement (Set up buy off)	Mitutoyo Digimatic Indicator / Smart Scope		Measures the die tilt (using Solder Thickness as reference) of quality control sample leadframe	Follows correct criteria for Die Tilt		7	Die Tilt Failure resulting to Die Crack	Current control for die tilt only required for SOT669 D2 Clip Type	None	10	None	10	H				Include Die Tilt as part of Set-up monitoring for SOT1023 Stencil Print		R. Jereza	31-Jan-22	Done	Specification Update	31-Jan-22	7	3	4							
960			CAMSTAR transaction	Operator		Records and tracks batch information	Transacts the batch information through CAMSTAR and move the lot to the next process station	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Wrong quantity inputted	Inattentive to inputting of data	Work Instruction on proper CAMSTAR transaction (JOV-280-040/3050)	3	Visual inspection 100% AOI/SPI	4	L																		734	
961				CAMSTAR System			Records batch information upon transaction of operator	Your Plant: Production Delay Ship to Plant: None End User: None	2	Delay in transaction	Down CAMSTAR system	CAMSTAR maintenance	3	System Application stop	2	L																		232	
962				Assembly Tracking Sheet			Contains relevant batch information/special instructions including raw materials to be used as reference in succeeding batch processing	Your Plant: Production Delay Ship to Plant: None End User: None	2	Delay in transaction	Swapping of ATS	Work Instruction on ATS Preparation (JOV-280-040/3050)	3	Visual inspection CAMSTAR System	4	L																		234	
963		Post-process	Transport to Flux Clean	Operator	Your plant: Prepares to unload the material from the output of Reflow Oven(RO) Ship to Plant: Transmission control ASSY End User: Automobile Transmission	Transports material from DACA machine to Flux Clean	Transports die clipbonded units to flux clean station using pushcarts	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Inattentive to transport handling procedure	Work Instruction Handling Procedure	2	Material and Document checking prior use Visual Inspection 100% AOI/SPI	4	L																		724	
964				Pushcart			Holds and secures trays of die clipbonded units in magazines	Your Plant: Production delay Yield loss Ship to Plant: None End User: None	7	Damaged clipbonded leadframe	Material fell on the floor due to defective pushcart wheel	Work Instruction (Auxiliary Maintenance)	2	Material and Document checking prior use Visual Inspection 100% AOI/SPI	4	L																		724	
965				Batch tag			Indicates device and lot number information on tray	Your Plant: Production Delay Ship to Plant: None End User: None	2	Cannot process new batch of materials	Missing batch tag	Work Instruction on proper handling of batch tag	2	Material and Document checking prior use Visual Inspection 100% AOI/SPI	4	L																		224	
966				Assembly Tracking Sheet			Contains relevant batch information/special instructions including raw materials to be used as reference in succeeding batch processing	Your Plant: Production Delay Ship to Plant: None End User: None	2	Delay in transaction	Swapping of ATS	Work Instruction on ATS Preparation (JOV-280-040/3050)	3	Visual inspection CAMSTAR System	4	L																		234	