

MSP430F2618TPM

Quality, reliability & packaging data download

Status: ACTIVE

Report date: 06/09/2021



Assembly site: **TI PHILIPPINES A/T**

RoHS	Yes
REACH	Yes
Device marking	M430F2618T
Lead finish/Ball material	NIPDAU
MSL rating/Peak reflow	Level-3-260C-168 HR
Rating	Catalog

Material content

Homogeneous Material Level Component Level							
Component	Substance	CAS Number	Amount (mg)	Percentage %	ppm	Percentage %	ppm
Bond Wire							
Aluminum and Its Alloys	Aluminum	7429-90-5	0.000001	0.000213	2	0.000000	0
Copper and Its Alloys	Copper	7440-50-8	0.468888	99.989338	999893	0.094305	943
Copper and Its Alloys	Iron	7439-89-6	0.000002	0.000426	4	0.000000	0
Not Categorized	Proprietary Materials	—	0.000037	0.007890	79	0.000007	0
Other Nonferrous Metals and Alloys	Calcium	7440-70-2	0.000002	0.000426	4	0.000000	0
Precious Metals	Silver	7440-22-4	0.000008	0.001706	17	0.000002	0
Sub-total	—	—	0.468938	100	1000000	0.094315	943
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	3.407935	75.000006	750000	0.685418	6854
Thermoplastics	Epoxy	85954-11-6	1.135978	24.999994	250000	0.228473	2285
Sub-total	—	—	4.543913	100	1000000	0.913891	9139
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	230.101668	97.050000	970500	46.279008	462790
Copper and Its Alloys	Iron	7439-89-6	6.164496	2.600000	26000	1.239829	12398
Copper and Its Alloys	Phosphorus	7723-14-0	0.355644	0.150000	1500	0.071529	715
Zinc and Its Alloys	Zinc	7440-66-6	0.474192	0.200000	2000	0.095371	954
Sub-total	—	—	237.096000	100	1000000	47.685738	476857
Lead Frame Plating							
Nickel and Its Alloys	Nickel	7440-02-0	0.783789	95.120024	951200	0.157639	1576
Precious Metals	Gold	7440-57-5	0.006427	0.779976	7800	0.001293	13
Precious Metals	Palladium	7440-05-3	0.033784	4.100000	41000	0.006795	68
Sub-total	—	—	0.824000	100	1000000	0.165726	1657
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	209.149525	88.000000	880000	42.065026	420650
Other Organic Materials	Chlorine	7782-50-5	0.002377	0.001000	10	0.000478	5
Other Plastics and Rubber	Carbon Black	1333-86-4	0.71301	0.300000	3000	0.143404	1434
Thermoplastics	Epoxy	85954-11-6	27.805003	11.699000	116990	5.592258	55923
Sub-total	—	—	237.669915	100	1000000	47.801166	478012
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	16.602504	100.000000	1000000	3.339165	33392
Sub-total	—	—	16.602504	100	1000000	3.339165	33392
Total	—	—	497.205270	—	—	100	1000000

Assembly site: TI TAIWAN A/T

RoHS	Yes
REACH	Yes
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				Homogeneous Material Level		Component Level	
Component	Substance	CAS Number	Amount (mg)	Percentage %	ppm	Percentage %	ppm
Bond Wire							
Copper and Its Alloys	Copper	7440-50-8	0.464209	99.997415	999974	0.136574	1366
Copper and Its Alloys	Iron	7439-89-6	0.000002	0.000431	4	0.000001	0
Nickel and Its Alloys	Nickel	7440-02-0	0.000001	0.000215	2	0.000000	0
Other Inorganic Materials	Sulfur	7704-34-9	0.000001	0.000215	2	0.000000	0
Other Nonferrous Metals and Alloys	Manganese	7439-96-5	0.000001	0.000215	2	0.000000	0
Precious Metals	Silver	7440-22-4	0.000007	0.001508	15	0.000002	0
Sub-total	—	—	0.464221	100	1000000	0.136577	1366
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	2.806535	69.999995	700000	0.825703	8257
Thermoplastics	Epoxy	85954-11-6	1.202801	30.000005	300000	0.353873	3539
Sub-total	—	—	4.009336	100	1000000	1.179576	11796
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	90.20166	97.410000	974100	26.537996	265380
Copper and Its Alloys	Iron	7439-89-6	2.2224	2.400000	24000	0.653847	6538
Copper and Its Alloys	Phosphorus	7723-14-0	0.02778	0.030000	300	0.008173	82
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.02778	0.030000	300	0.008173	82
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.02778	0.030000	300	0.008173	82
Zinc and Its Alloys	Zinc	7440-66-6	0.0926	0.100000	1000	0.027244	272
Sub-total	—	—	92.60000	100	1000000	27.243605	272436
Lead Frame Plating							

Nickel and Its Alloys	Nickel	7440-02-0	1.489579	95.119987	951200	0.438245	4382
Precious Metals	Gold	7440-57-5	0.012215	0.780013	7800	0.003594	36
Precious Metals	Palladium	7440-05-3	0.064206	4.100000	41000	0.018890	189
Sub-total	—	—	1.566000	100	1000000	0.460729	4607
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	189.473364	84.340000	843400	55.744466	557445
Other Nonferrous Metals and Alloys	Metal Hydroxide	Trade Secret	11.232711	5.000000	50000	3.304747	33047
Other Plastics and Rubber	Carbon Black	1333-86-4	0.381912	0.170000	1700	0.112361	1124
Thermoplastics	Epoxy	85954-11-6	23.566227	10.490000	104900	6.933358	69334
Sub-total	—	—	224.654214	100	1000000	66.094933	660949
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	16.602504	100.000000	1000000	4.884580	48846
Sub-total	—	—	16.602504	100	1000000	4.884580	48846
Total	—	—	339.896275	—	—	100	1000000

MTBF/FIT estimates

MTBF / FIT				MTBF / FIT supporting data					
MTBF	FIT	Usage temp (°C)	Conf level (%)	Activation energy (eV)	Test temp (°C)	Test duration (hours)	Sample size	Fails	Additional comments
3.43×10^8	2.9	55	60	0.7	125	1000	4003	0	—

Qualification summary

Stress	Reference	Min lot qty	SS / lot	Condition	Duration	Result
HTOL	JESD22-A108	3	77	Life test, 125C	1000 hours	Pass
HTSL	JESD22-A103	3	25	High temp storage bake 150C	1000 hours	Pass
AC/UHAST	JESD22-A102/JESD22-A118	3	25	Autoclave 121C or unbiased HAST 130C / 85% RH	96 hours	Pass
THB/HAST	JESD22-A101/JESD22-A110	3	25	THB 85C/85%RH or HAST 130C/110C/85%RH	1000 hours or 96 hours	Pass
TC	JESD22-A104	3	25	Temperature cycle -65/150C	500 cycles	Pass
SD	J-STD-002	3	22	Per specification	>95% lead coverage	Pass
HBM	JS-001	1	3	ESD - HBM	Classification	See data sheet
CDM	JESD22-C101	1	3	ESD - CDM	Classification	See data sheet
LU	JESD78	1	3	Latch-up	Per JESD78	Pass
MSL	J-STD-020	—	—	Per J-STD-020	Classification	See data sheet

Ongoing reliability monitoring

FAB process reliability data

Fab Process	Reliability Test	Rolling Year (2Q20 - 1Q21) Sample Size	Cumulative Sample Size	Disposition
CMOS	High Temperature Operating Life, 125C, 1000 Hours (or Equivalent)	616	51342	Pass

Assembly process reliability data

Package Family	Reliability Test	Rolling Year (2Q20 - 1Q21) Sample Size	Cumulative Sample Size	Disposition
QFP (without Thermal Pad)	Autoclave, 121C, 96 Hours	766	26439	Pass
QFP (without Thermal Pad)	Biased HAST, 110C/85%RH, 264 Hours	0	541	Pass
QFP (without Thermal Pad)	Biased HAST, 130C/85%RH, 96 Hours	311	8065	Pass
QFP (without Thermal Pad)	High Temperature Storage Life, 150C, 1000 Hours	508	12901	Pass
QFP (without Thermal Pad)	High Temperature Storage Life, 170C, 420 Hours	0	6675	Pass
QFP (without Thermal Pad)	Temperature Cycle, -55/125C, 700 Cycles	0	2927	Pass
QFP (without Thermal Pad)	Temperature Cycle, -65/150C, 500 Cycles	900	31971	Pass
QFP (without Thermal Pad)	Temperature-Humidity Bias Test (85C/85%RH), 1000 Hours	0	2257	Pass
QFP (without Thermal Pad)	Unbiased HAST, 130C/85%RH, 96 Hours	0	2749	Pass

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