PRODUCT/PROCESS CHANGE NOTIFICATION

PCN MMS-MIC/10/5572
Notification Date 05/28/2010

Polyimide removal on STM32F100x, STM32F101x, STM32F102x, STM32F103x, STM32F105x and STM32F107x families

Table 1. Change Implementation Schedule

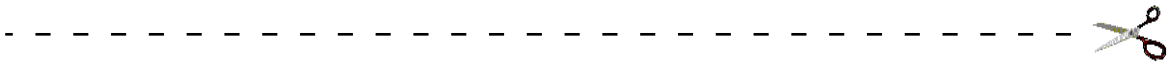
Forecasted implementation date for change	21-Aug-2010
Forecasted availabillity date of samples for customer	21-May-2010
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	21-May-2010
Estimated date of changed product first shipment	21-Aug-2010

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	All STM32F100/101/102/103/105/107x devices
Type of change	Waferfab material change
Reason for change	N Methyl Pyrrolidone (NMP) classified as "reprotoxic" substance
Description of the change	Following classification of N Methyl Pyrrolidone (NMP) as a "reprotoxic" substance by the European commission (European directive 2009/2/EC), Microcontroller Division is pleased to announce the qualification of a new waferfab process optimization for all STM32F101/2/3/5/7x devices in fab 3. This process optimization results in polyimide wafer coating removal, as explained starting page 5. All STM32F101/102/103x medium density devices produced in fab 11 as per PCN MMS-MIC/10/5476 are already qualified with this new process. All datasheet parameters remain unchanged.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	No marking change, internal traceability only
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN MMS-MIC/10/5572**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 05/28/2010**

☐ Qualification Plan Denied	Name:
☐ Qualification Plan Approved	Title:
	Company:
☐ Change Denied	Date:
☐ Change Approved	Signature:

Remark

.....

.....

.....

.....

.....

.....

.....

.....

DOCUMENT APPROVAL

Name	Function
Colonna, Daniel	Division Marketing Manager
Buffa, Michel	Division Product Manager
Narche, Pascal	Division Q.A. Manager

List of part numbers affected by PCN PCN MMS-MIC/10/5572			
STM32F1006DIE1A	STM32F101VBT6TR	STM32F103RBT7TR	STM32F105RCT6
STM32F100C4T6A	STM32F101VCT6	STM32F103RCSPS	STM32F105RCT7
STM32F100C6T6A	STM32F101VDT6	STM32F103RCT6	STM32F105V8T6
STM32F100C8T6	STM32F101VDT6TR	STM32F103RCT6TR	STM32F105VBT6
STM32F100CBT6	STM32F101VET6	STM32F103RCT7	STM32F105VCT6
STM32F100R4T6A	STM32F101ZCT6	STM32F103RCUVWTR	STM32F105VCT7
STM32F100R6T6A	STM32F101ZDT6	STM32F103RDT6	STM32F107RBT6
STM32F100R8T6	STM32F101ZET6	STM32F103RDT6TR	STM32F107RCT6
STM32F100RBT6	STM32F102C4T6A	STM32F103RET6	STM32F107VBT6
STM32F100RCT6	STM32F102C6T6A	STM32F103RET6TR	STM32F107VCMIC
STM32F100RCT6TR	STM32F102C6T6ATR	STM32F103RET7	STM32F107VCT6
STM32F100RDT6	STM32F102C6TUVA	STM32F103T4U6A	STM32F107VCT7
STM32F100RET6	STM32F102C8STU	STM32F103T6U6	STM32P101CBABD
STM32F100V8T6	STM32F102C8T6	STM32F103T6U6A	STM32P102C6TUVA
STM32F100VBT6	STM32F102C8T6TR	STM32F103T6U7A	STM32P102C8STUTR
STM32F100VCT6	STM32F102CBT6	STM32F103T8U6	STM32P103C8MAM
STM32F100VDT6	STM32F102CBT6TR	STM32F103T8U7	STM32P103RBMAXTR
STM32F100VET6	STM32F102R4T6A	STM32F103TBU6	STM32P103T8ABC
STM32F101C4PQRA	STM32F102R6T6A	STM32F103V8H6	STM32P103VCMAOTR
STM32F101C4T6A	STM32F102R8T6	STM32F103V8T6	
STM32F101C6T6A	STM32F102RBT6	STM32F103VBH6	
STM32F101C6T6ATR	STM32F1036DIE1A	STM32F103VBH7	
STM32F101C8GAL	STM32F103BDIE1	STM32F103VBT6	
STM32F101C8T6	STM32F103C4T6A	STM32F103VBT6TR	
STM32F101C8T6TR	STM32F103C6T6A	STM32F103VBT7	
STM32F101C8U6	STM32F103C6T6ATR	STM32F103VBT7TR	
STM32F101C8U6TR	STM32F103C6T7A	STM32F103VCH6	
STM32F101CBT6	STM32F103C6U6A	STM32F103VCT6	
STM32F101CBT6TR	STM32F103C8T6	STM32F103VCT6TR	
STM32F101R4T6A	STM32F103C8T6TR	STM32F103VDH6	
STM32F101R6T6A	STM32F103C8T7	STM32F103VDH6TR	
STM32F101R6T6ATR	STM32F103CBT6	STM32F103VDT6	
STM32F101R8T6	STM32F103CBT6TR	STM32F103VDXYZTR	
STM32F101R8T6TR	STM32F103CBT7	STM32F103VEH6	
STM32F101RBH6	STM32F103CBT7TR	STM32F103VEH7	
STM32F101RBT6	STM32F103EDIE1	STM32F103VET6	
STM32F101RBT6TR	STM32F103R4H6A	STM32F103VET6TR	
STM32F101RCT6	STM32F103R4T6A	STM32F103VET7	
STM32F101RCT6TR	STM32F103R6H6A	STM32F103ZCCINTR	
STM32F101RDT6	STM32F103R6T6	STM32F103ZCH6	
STM32F101RDWOW	STM32F103R6T6A	STM32F103ZCT6	
STM32F101RDWOWTR	STM32F103R6T7A	STM32F103ZCT7	
STM32F101RET6	STM32F103R8H6	STM32F103ZDH6	
STM32F101T4U6A	STM32F103R8H7	STM32F103ZDT6	
STM32F101T6U6	STM32F103R8T6	STM32F103ZEH6	
STM32F101T6U6A	STM32F103R8T6TR	STM32F103ZEH6TR	
STM32F101T8U6	STM32F103R8T7	STM32F103ZEH7	
STM32F101T8U6TR	STM32F103RBH6	STM32F103ZET6	
STM32F101TBU6	STM32F103RBSPS	STM32F103ZET6TR	
STM32F101V8T6	STM32F103RBT6	STM32F103ZET7	
STM32F101V8T6TR	STM32F103RBT6TR	STM32F105R8T6	
STM32F101VBT6	STM32F103RBT7	STM32F105RBT6	

STM32 - POLYIMIDE REMOVAL

RELIABILITY REPORT

April 14th, 2010 V1.0

STMicroelectronics

POLYIMIDE REMOVAL – PRODUCT VEHICLES

2 TEST VEHICLES HAVE BEEN USED TO QUALIFY POLYIMIDE REMOVAL

TEST VEHICLE	STM32F10XXE	STM32F10XXB
PACKAGE ASSEMBLY SITE	LQFP144 20*20 MALTA	LQFP100 14*14 MUAR
QUALIFICATION LOTS	2 LOTS	1 LOT

POLYIMIDE REMOVAL – RELIABILITY RESULTS (1/2)

DIE ORIENTED RELIABILITY TRIALS

TEST	SPECIFICATIONS	NUMBER OF PARTS			ACCEPTANCE CRITERIA
		LOT 1	LOT 2	LOT 3	
EARLY FAILURE RATE	AEC Q100 Method 008	0/500	0/500	0/500	24 HRS / 140°C / 4V No reject with std Final Test
HIGH TEMPERATURE OPERATING LIFE TEST	MIL Std 883E Method 1005	0/77	0/77	0/77	500 HRS / 140°C / 4V No reject with std Final Test
HIGH TEMPERATURE STORAGE BAKE	ADCS 0061692	0/77	0/77	0/77	BAKE 1000 HRS @ 150°C No reject with std Final Test

POLYIMIDE REMOVAL – RELIABILITY RESULTS (2/2)

PACKAGE ORIENTED RELIABILITY TRIALS

TEST	SPECIFICATIONS	NUMBER OF PARTS			ACCEPTANCE CRITERIA
		LOT 1	LOT 2	LOT 3	
PRECONDITIONING	JEDEC J-STD-20	0/300	0/300	0/300	JEDEC LEVEL 3
TEMPERATURE AND HUMIDITY BIAS (1)	CECC 90000	0/77	0/77	ongoing	1000 HRS / 85°C / 85% R.H. / 5.5V
THERMAL CYCLING (1)	Mil Std 883E Method 1010	0/77	0/77	ongoing	1000 CYCLES / -40°C TO 150°C
PRESSURE POT (1)	JA 102	0/77	0/77	0/77	240 HRS / 121°C / 2 ATM / 100% R.H.

(1) PRECONDITIONING IS PERFORMED PRIOR TO THB, TMCL AND PPOT TRIALS

CONCLUSION

REMOVING THE POLYIMIDE LAYER HAS NO IMPACT ON INTEGRITY AND RELIABILITY ON STM32 PRODUCTS FAMILY.

BASED ON THESE RESULTS, THE CHANGE IS QUALIFIED AND CAN BE APPLIED ON STANDARD PRODUCTION.

Parametrical behavior assessment of polyimide removal

Author: Eric CHEVIN

Approver: D.Meunier

Sept, 15th 2009

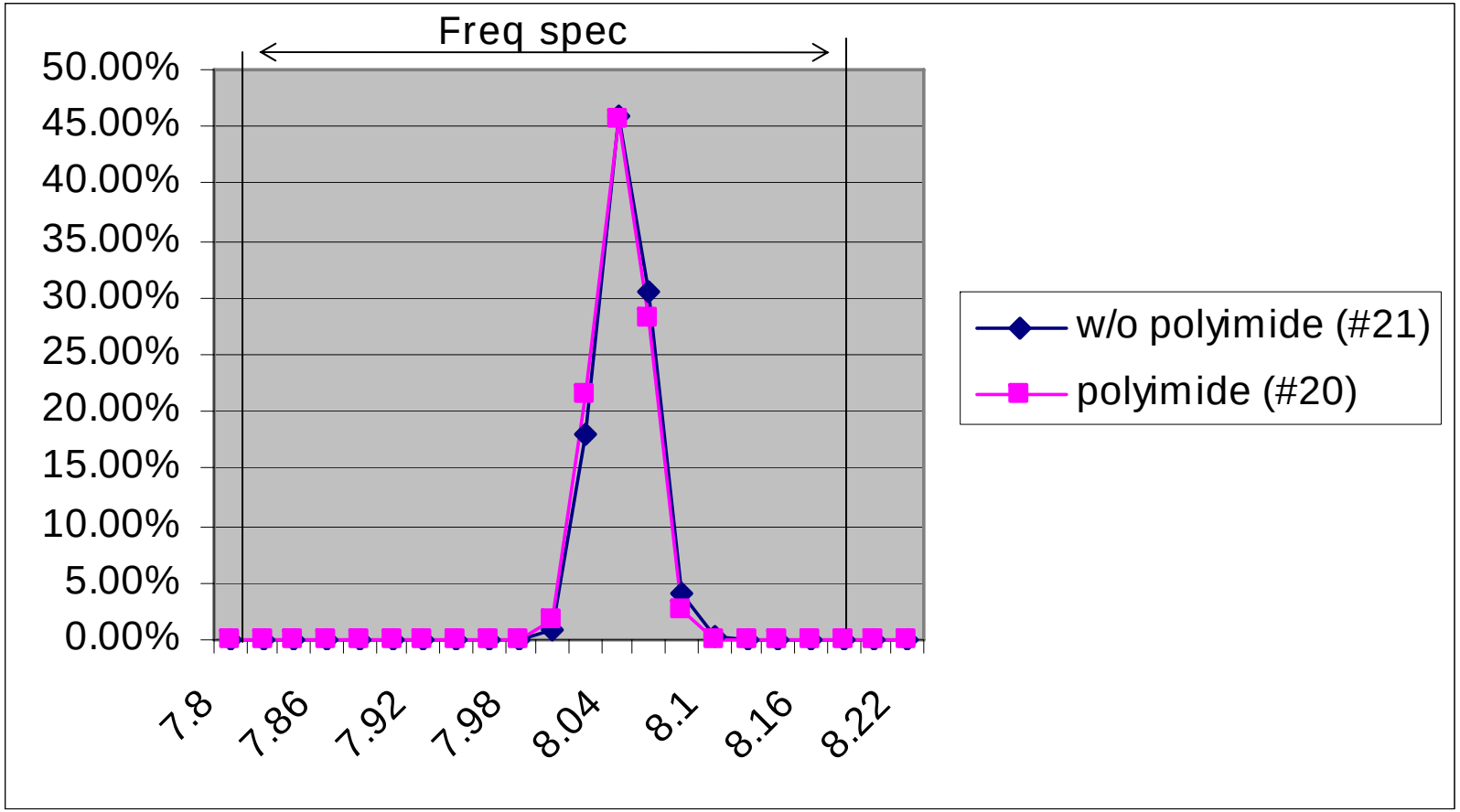
Scope

The project is to remove on STM32 family the polyimide wafer coating.

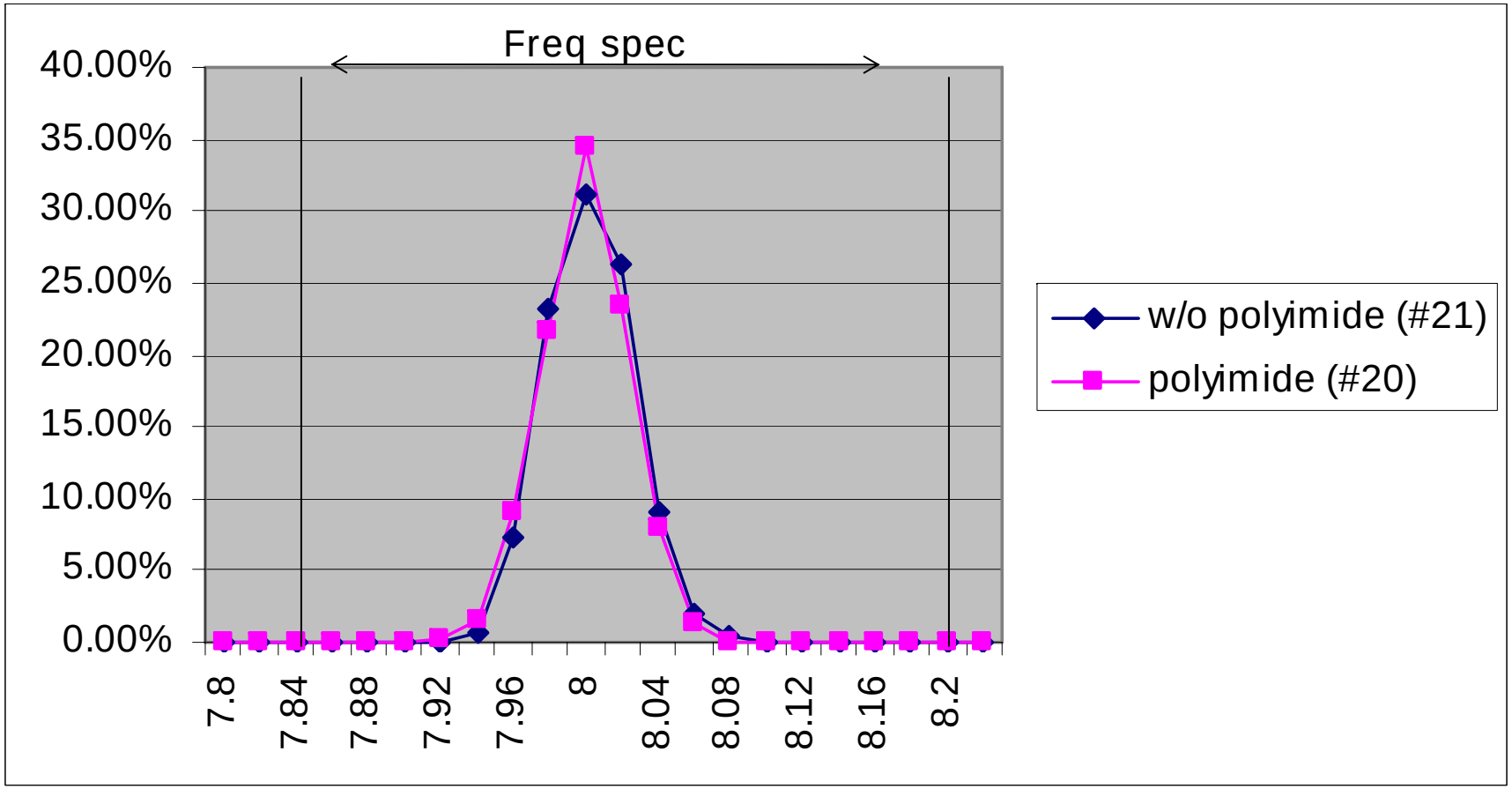
Above reliability trials, it has been assessed that the RC 8Mhz internal oscillator may suffer of this change, so some characterization trials have been decided:

- Product chosen is STM32F103ZET6 - LQFP144 20*20
- Lot number is C0H160, wafers 1 to 20 (standard process) and wafers 21 to 25 (process w/o polyimide). Wafers 20 and 21 have been assembled for the trial.
- Sample size : 2 times 1K (same lot, 1K with polyimide coating, 1K w/o polyimide coating).
- Trial : with a special Test Program ➔ datalog of X,Y, wafer, lot ID + RC8 oscillator measurement value. Measurement at -40, 25 and 110°C.

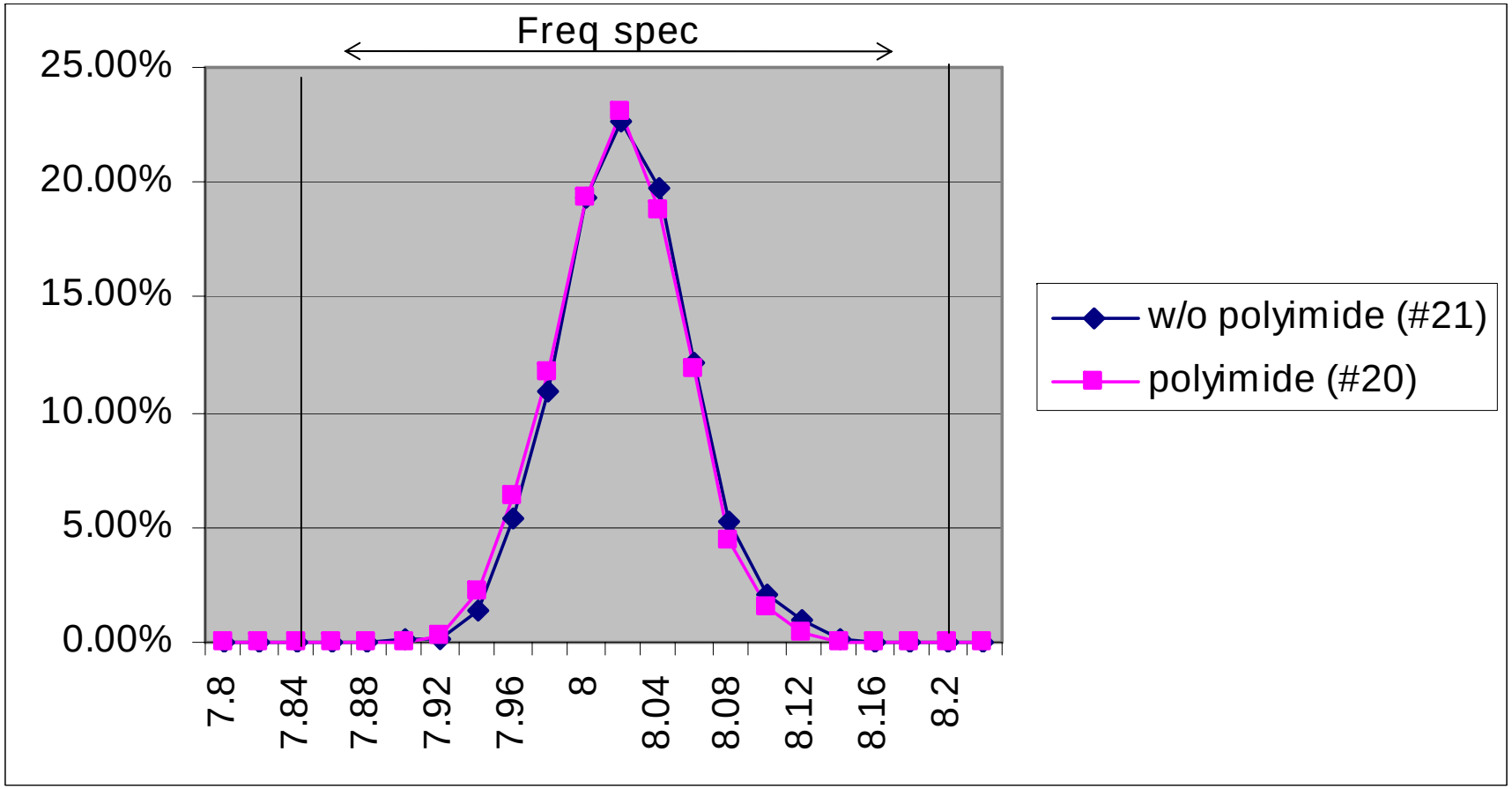
STM32F103ZET6 / C0H160 / RC 8Mhz distribution at 25°C



STM32F103ZET6 / C0H160 / RC 8Mhz distribution at 110°C



STM32F103ZET6 / C0H160 / RC 8Mhz distribution at -45°C



Conclusion

- As expected package & temperature affect RC frequency calibration
- **There is no influence of the polyimide on the RC frequency variation.**
- **The polyimide removal qualification plan can continue with reliability trials.**