

PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	AMS/19/11709	
1.3 Title of PCN	New molding compound for TO220 package to replace SAMSUNG SDI under termination phase	
1.4 Product Category	See product list	
1.5 Issue date	2019-09-09	

2. PCN Team

2.1 Contact supplier	
2.1.1 Name	KELLY MURPHY
2.1.2 Phone	
2.1.3 Email	kelly.murphy@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Lorenzo NASO
2.1.2 Marketing Manager	Salvatore DI VINCENZO
2.1.3 Quality Manager	Sergio Tommaso SPAMPINATO

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	New direct material part number (same supplier, different supplier or new supplier), Encapsulation/sealing material	ST SHENZHEN CHINA

4. Description of change

	Old	New
4.1 Description	Molding compound = Samsung (SG-8200DTA and SI-7200DXC)	Molding compound = Replacement of current mold compounds with alternative material from different supplier
4.2 Anticipated Impact on form, fit, function, quality, reliability or processability?	No impact	

5. Reason / motivation for change

5.1 Motivation	As anticipated by ST Corporate PCI No. CRP/19/11478, this PCN to announce the replacement of current Samsung SDI mold compound for TO 220 package assembled in ST SHENZHEN - CHINA Plant with alternative material from different supplier. The changed products do not present modified electrical, dimensional or thermal parameters, leaving unchanged the current information published in the product datasheet. There is no change in the packing modes and the standard delivery quantities either.
5.2 Customer Benefit	SERVICE CONTINUITY

6. Marking of parts / traceability of change

6.1 Description	By internal codification and traceability code
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7. Timing / schedule

7.1 Date of qualification results	2019-08-02
7.2 Intended start of delivery	2019-12-03
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	11709 W749-2019-XL05-L317-LTAD-LF05_reliability report.pdf
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8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2019-09-09
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9. Attachments (additional documentations)
11709 Public product.pdf 11709 W749-2019-XL05-L317-LTAD-LF05_reliability report.pdf

10. Affected parts		
10.1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
L7805ABV	L7805ABV	
L7805ACV	L7805ACV	
L7805CV	L7805CV	
L7812CV	L7812CV	
L7815CV	L7815CV	
LM317T	LM317T	
	LM317T-DG	
L7824CV	L7824CV	
	LD1117AV33	
L7905CV	L7905CV	

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Public Products List

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PCN Title : New molding compound for TO220 package to replace SAMSUNG SDI under termination phase

PCN Reference : AMS/19/11709

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

L7809ABV	LD1117V	LF33CV-DG
L7805CV	LD1117V-DG	L7805CV-DG
L7815CV-DG	L7812ABV-DG	L7812ABV
L7824ABV	LF60CV	L7815ACV
L7915ACV-DG	LF90CV	LD1086V-DG
L7815ABV-DG	L7809CV	L7815CV
L7905CV	L7805ACV	L78M05CV
L7824CV-DG	LM317T-DG	L7812CV
LD1117V50	L7912CV	LF33ABV
LM217T	L7905ACV-DG	L7824ACV
L7815ACV-DG	L7905CV-DG	L7809ACV
L78M05ABV	L7808CV	L7812ACV-DG
LF60ABV	L7915ACV	PB137ACV
L7824ACV-DG	LD1117V33C	L78S10CV
L78S05CV	LD1117V33	LD1086V33-DG
L4940V85	L78M08CV-DG	L78M05CV-DG
L7912ACV-DG	LM317BT	L7885CV
L7912CV-DG	LD1117V33C-DG	L4940V5
LF50ABV	LD1085V50	L78M15ABV-DG
L7805ABV-DG	L7808ACV	L7812CV-DG
LD1117V50-DG	LD1085V	L7805ABV
LF33CV	L7812ACV	L7805ACV-DG
L7809CV-DG	LD1086BV-DG	L7815ABV
LD1117V33-DG	L4941BV	LM337SP
LF50CV	LF33ABV-DG	L78M08CV
L7808CV-DG	L7808ACV-DG	L7806CV-DG
L7806ABV	L7915CV-DG	L78M09CV
L7818CV-DG	LD1117V50C	L78S12CV
LD1117AV33	L7824ABV-DG	L78M12CV
L7915CV	LM317T	L78M09CV-DG
LF50CV-DG	L7905ACV	L78S24CV
L78M05ABV-DG	L78M24CV	L7806CV
LD1086V18-DG	L78M15ABV	L7912ACV
L7806ACV	L78M24CV-DG	LD1117V18
L7908CV-DG	L7806ABV-DG	L78M15CV-DG
L7818CV	L7806ACV-DG	L78S18CV



Public Products List

L7808ABV	L7809ABV-DG	L78S09CV
L78M12CV-DG	L7824CV	LD1084V
L78M15CV	L7908CV	L78S75CV
L78S15CV	L7808ABV-DG	LF50ABV-DG



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Reliability Evaluation Report

QUALIFICATION of NEW RESIN on TO220

Shenzhen

General Information		Locations	
Product Lines	TV1: XL05 TV2: L317 TV3: LTAD TV4: LF05	Wafer fab	Singapore 6
P/N Positive voltage regulators	TV1: L7805 TV2: LM217 TV3: LD1086 TV4: LF50	Assembly plant	SHENZHEN
Product Group	AMG	Reliability Lab	Catania Reliability LAB
Product division	General Purpose Analog & RF Division		
Package	TO220DG / TO220SG		
Silicon Process technology	TV1: HBIP40V TV2: BIPOLAR TV3: BIPOLAR TV4: BIPOLAR		

DOCUMENT INFORMATION

Version	Date	Pages	Handled by	Comment
1	August 2019	8	Antonio Russo Giuseppe Giacopello	Final Report



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1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

DUT	Device Under Test
SS	Sample Size

3 RELIABILITY EVALUATION OVERVIEW OBJECTIVES

In order to qualify new molding compound for TO220DG and TO220SG assembled in SHENZHEN, three assy lots of TO220SG and three assy lots of TO220DG have been requested.

4 CONCLUSION

Qualification plan has been fulfilled without exception. Reliability tests have shown that those devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the robustness of those products and safe operation, which is consequently expected during their lifetime.

5 DEVICE CHARACTERISTIC

5.1 Change description

Qualification of new supplier of Halogen-Free Molding Compound for TO220 package in SHENZHEN in replacement of current resin.

5.2 Construction note

P/N	L7805	LM217	LD1086	LF50
Wafer/Die fab. information				
Wafer fab manufacturing location	Ang Mo Kio 6"			
Technology	HBIP40V	BIPOLAR	BIPOLAR	BIPOLAR
Die finishing back side	Lapped Silicon			
Die size	1.320 X 1.630	2.410 X 1.920	2.320 X 2.340	2.230 X 2.190
Passivation type	SiN (nitride)			
Assembly information				
Assembly Site	SHENZHEN			
Package description	TO220			
Molding compound	Epoxy			
Die attach material	Epoxy			
Wires bonding materials/diameters	Cu 2mil			



AMG (Analog & MEMS Group)
General Purpose Analog & RF Division
Signal Conditioning & Interface

Quality and Reliability

[REL.6088-749-2019](#)

6 TEST VEHICLE & TEST PLAN

Lot #	T.V.	Process/ Package	Product Line	Comments
1	L7805	TO220	XL05	
2	LM217		L317	
3	LD1086		LTAD	
4	LF50		LF05	



AMG (Analog & MEMS Group)
 General Purpose Analog & RF Division
 Signal Conditioning & Interface

Quality and Reliability

REL.6088-749-2019

Test	PC	Std ref.	Conditions	SS	Steps h=hours cy=cycles	Failure/SS					
						L7805 TO220DG	L7805 TO220SG	LM217 TO220DG	LM217 TO220SG	LD1086 TO220DG	LF50 TO220SG
Die Oriented Tests											
HTOL		JESD22 A-108	Ta=125°C Vbias= Vmax	231	168 h		0/77		0/77	0/77	
					500 h		0/77		0/77	0/77	
HTSL		JESD22 A-103	Ta=150°C	462	168 h	0/77	0/77	0/77	0/77	0/77	0/77
					500 h	0/77	0/77	0/77	0/77	0/77	0/77
					1000 h	0/77	0/77	0/77	0/77	0/77	0/77
Package Oriented Tests											
THB		JESD22 A-101	Ta = 85°C, RH=85%, BIAS +24V	75	168 h		0/25		0/25	0/25	
					500 h		0/25		0/25	0/25	
TC		JESD22 A-104	Ta = -65°C to +150°C	462	100 cy	0/77	0/77	0/77	0/77	0/77	0/77
					500 cy	0/77	0/77	0/77	0/77	0/77	0/77
					1000 cy	0/77	0/77	0/77	0/77	0/77	0/77
AC		JESD22 A-102	Pa=2Atm / Ta=121°C	462	96h	0/77	0/77	0/77	0/77	0/77	0/77
					168h	0/77	0/77	0/77	0/77	0/77	0/77
NOTE:											

7 ANNEXES

7.1 Devices details

7.1.1 Pin connections

Refer to products datasheet

7.1.2 Package Mechanical data

Refer to products datasheet

8 TEST DESCRIPTION

Test name	Description	Purpose
Die Oriented		
HTOL High Temperature Operative Life	The device is stressed in static or dynamic configuration, approaching the operative max. absolute ratings in terms of junction temperature and bias condition.	To determine the effects of bias conditions and temperature on solid state devices over time. It simulates the devices' operating condition in an accelerated way. The typical failure modes are related to, silicon degradation, wire-bonds degradation, oxide faults.
HTSL High Temperature Storage Life	The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.	To investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.
Package Oriented		
AC Auto Clave (Pressure Pot)	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity.
TC Temperature Cycling	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, molding compound delamination, wire-bonds failure, die-attach layer degradation.
THB Temperature Humidity Bias	The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.