

PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	IPD/15/9476	
1.3 Title of PCN	Introduction of Junction Capacity for L78 Standard Voltage Regulator Family in HBIP40 Technology	
1.4 Product Category	Standard Voltage Regulators	
1.5 Issue date	2015-11-05	

2. PCN Team

2.1 Contact supplier	
2.1.1 Name	ROBERTSON HEATHER
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2.2 Change responsibility	
2.2.1 Product Manager	Lorenzo NASO
2.1.2 Marketing Manager	Antonio RIVIERA
2.1.3 Quality Manager	Paolo MORETTI

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Die redesign	Active element design change with no product functionality or reliability impact	AMK Singapore

4. Description of change

	Old	New
4.1 Description	HBIP40 Technology	HBIP40 Technology with Junction Capacitor
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	Quality improvement. No changes of the Electrical Characteristics.	

5. Reason / motivation for change

5.1 Motivation	Following Divisional Commitments towards a continuous improvement philosophy, we have replaced the old Oxide Capacitor structure with the new integrated Junction Capacitor, as a consequence of an improved product quality.
5.2 Customer Benefit	QUALITY IMPROVEMENT

6. Marking of parts / traceability of change

6.1 Description	The traceability of the parts assembled in the new subcontractor will be ensured by different internal codification and QA number.
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7. Timing / schedule

7.1 Date of qualification results	2015-10-26
7.2 Intended start of delivery	2016-01-26
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	REL-6088-79-W-15-LX0501-L7805CV-TO220.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2015-11-05

9. Attachments (additional documentations)

9476PpPrdtLst.pdf
REL-6088-79-W-15-LX0501-L7805CV-TO220.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
497-1170-2-ND	L7805ABD2T-TR	
L7805ABD2T-TR	L7805ABD2T-TR	
497-4226-5-ND	L7805ABP	
L7805ABP	L7805ABP	
497-2947-5-ND	L7805ABV	
L7805ABV	L7805ABV	
	L7805ABV-DG	
497-1441-5-ND	L7805ACV	
L7805ACV	L7805ACV	
	L7805ACV-DG	
497-1171-2-ND	L7805CD2T-TR	
L7805CD2T-TR	L7805CD2T-TR	
L7805CDT-TR	L7805CDT-TR	
497-1443-5-ND	L7805CV	
L7805CV	L7805CV	
	L7805CV-DG	
L7812ABD2T-TR	L7812ABD2T-TR	
	L7812ABV-DG	
L7812ACD2T-TR	L7812ACD2T-TR	
497-1450-5-ND	L7812ACV	
L7812ACV	L7812ACV	
	L7812ACV-DG	
497-1178-2-ND	L7812CD2T-TR	
L7812CD2T-TR	L7812CD2T-TR	
497-1452-5-ND	L7812CV	
L7812CV	L7812CV	
	L7812CV-DG	
L7815ABD2T-TR	L7815ABD2T-TR	
L7815ACD2T-TR	L7815ACD2T-TR	
L7815ACV	L7815ACV	
L7815CD2T-TR	L7815CD2T-TR	

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Public Products List

PCN Title : Introduction of Junction Capacity for L78 Standard Voltage Regulator Family in HBIP40 Technology

PCN Reference : IPD/15/9476

PCN Created on : 26-Oct-2015

Subject : Public Products List

Dear Customer,

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

L7815ACV-DG	L7815CV-DG	L7812ACV
L7805CDT-TR	L7805ACV	L7805CP
L7812ABV-DG	L7815CD2T-TR	L7815ABV-DG
L7812ABD2T-TR	L7805ABD2T-TR	L7812ACD2T-TR
L7815CV	L7815ACD2T-TR	L7805ACD2T-TR
L7805CV	L7805ABP	L7805ABV
L7815ABD2T-TR	L7812CV	L7805CV-DG
L7805ACV-DG	L7812ACV-DG	L7812CV-DG
L7812ABV	L7815CP	L7812CD2T-TR
L7805ABV-DG	L7815ACV	L7805CD2T-TR
L7815ABV	L7812CP	L7805ACP



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Reliability Report

QUALIFICATION PROCESS CHANGE FE

*New DIE IN HBIP40,
Capacity Change from Oxide to junction*

TV: LX0501 – L7805CV – TO220 SINGLE GAUGE

General Information	
Product Line	LX0501
Product Description	Positive Voltage Regulator
P/N	lcs L7805CV
Product Group	IPD IPC
Product division	IND.& POWER CONV. Voltage Vregulator & Vref
Package	TO220 SG
Silicon Process technology	HBIP40

Locations	
Wafer fab	Ang Mo Kio (Singapore)
Assembly plant	ST Shenzhen
Reliability Lab	IPD Catania Reliability Lab
Reliability assessment	Pass

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	MAY-2015	7	Vito Gisabella Giuseppe Giacobello	Giovanni Presti	Final report

Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.

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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

3.1 Objectives

Following Divisional Commitments towards a continuous improvement philosophy, we have replaced the old Oxide Capacitor structure with the new integrated Junction Capacitor, as a consequence of an improved product quality.

TV: L7805CV, TO220 SG, HBIP40 (new integrated Junction Capacitor).

3.2 Conclusion

Qualification Plan requirements have been fulfilled without exception. It is stressed that reliability tests have shown that the devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the ruggedness of the products and safe operation, which is consequently expected during their lifetime.

4 DEVICE CHARACTERISTICS

4.1 Device description

The L78xx series of three-terminal positive regulators is available in several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shutdown and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1 A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable

4.1 Construction note

L7805CV-LX0501	
Wafer/Die fab. information	
Wafer fab manufacturing location	Singapore Ang Mo Kio
Technology	HBIP40V
Die finishing back side	Cr/NiV/Au
Die size	1320, 1630 micron
Passivation type	P-Vapox/Nitride
Wafer Testing (EWS) information	
Electrical testing manufacturing location	Ang Mo Kio EWS
Tester	ETS 300
Assembly information	
Assembly site	Shenzhen B/E
Package description	TO220 SG
Molding compound	Epoxy
Frame material	Bare copper
Die attach material	PREFORM
Wires bonding materials/diameters	WIRE Cu D2
Final testing information	
Testing location	Shenzhen B/E

5 TESTS RESULTS SUMMARY

5.1 Test vehicle

Lot #	Package	Product Line	Comments
1	TO220 SG	LX0501	

5.2 Test plan and results summary

Test	Std ref.	Conditions	SS	Steps	Failure/SS	Note
					1*LOTTO	
Die Oriented Tests						
HTOL	JESD22 A-108	Tj = 125°C Vcc= +35V		168 H	0/77	
				500 H	0/77	
				1000 H	0/77	
HTSL	JESD22 A-103	Ta = 150°C		168 H	0/45	Engineering Evaluation
				500 H	0/45	
				1000 H	0/45	
Package Oriented Tests						
AC	JESD22 A-102	Pa=2Atm / Ta=121°C		96 H	0/77	Engineering Evaluation
				168 H	0/77	
TC	JESD22 A-104	Ta = -65°C to 150°C		100 CY	0/77	
				200 CY	0/77	
				500 CY	0/77	
THB	JESD22 A-101	Ta = 85°C, RH = 85%, Vcc1= +24V		168 H	0/77	
				500 H	0/77	
				1000 H	0/77	
Other Tests						
ESD	ANSI/ESDA/JEDEC JS001	HBM +/- 2000V	3	Pass		
	ANSI/ESD S5.3.1	CDM 500V	3	Pass		

6 ANNEXES

6.1 Tests Description

Test name	Description	Purpose
Die Oriented		
HTOL High Temperature Bias	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.
Other Test		
ESD Electro Static Discharge	The device is submitted to a high voltage peak on all his pins simulating ESD stress according to different simulation models. CDM: Charged Device Model HBM: Human Body Model	To classify the device according to his susceptibility to damage or degradation by exposure to electrostatic discharge.