PRODUCT/PROCESS CHANGE NOTIFICATION

PCN IPG-DIS/14/8287
Dated 04 Feb 2014

LCP12-150B1RL - Copper wire conversion

Table 1. Change Implementation Schedule

Forecasted implementation date for change	28-Jan-2014
Forecasted availability date of samples for customer	28-Jan-2014
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	28-Jan-2014
Estimated date of changed product first shipment	06-May-2014

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	LCP12-150B1RL
Type of change	Package assembly material change
Reason for change	to optimize the industrial process and material
Description of the change	see attached
Change Product Identification	QA number, date code and internal codification
Manufacturing Location(s)	

DOCUMENT APPROVAL

Name	Function
Paris, Eric	Marketing Manager
Nopper, Christian	Product Manager
Cazaubon, Guy	Q.A. Manager

STMicroelectronics
IPG - ASD & IPAD™ Division[1]
BU Protection

(1) IPG: Industrial & Power Group - ASD: Application Specific Device – IPAD™: Integrated Passive and Active Devices

PCN
Product/Process Change Notification

LCP12-150B1RL & LCP02-150B1RL - Copper wire conversion

Notification number:	IPG-DIS/14/8287	**Issue Date**	28/01/2014
Issued by	Aline AUGIS		

Product series affected by the change	LCP12-150B1RL & LCP02-150B1RL
Type of change	package assembly material change

Description of the change

Change: copper wire bonding

	Before Change	After Change
Wire	Au 2 mils	Cu 2 mils

Reason for change

The copper wire bonding is performed in order to optimize our industrial process and material.

Former versus changed product:	The changed products do not present modified electrical, dimensional or thermal parameters, leaving unchanged the current information published in the product datasheet The Moisture Sensitivity Level of the part (according to the IPC/JEDEC JSTD-020D standard) remains unchanged. The footprint recommended by ST remains the same. There is no change in the packing modes and the standard delivery quantities either. The products remain in full compliance with the ST ECOPACK®2 grade ("halogen-free").

Disposition of former products

Deliveries of former product will continue while the conversion is brought to completion and as long as former product stocks last.

Marking and traceability

Date code, QA number and internal codification

Qualification complete date	Week 51-2013

Forecasted sample availability

Product family	Sub-family	Commercial part Number	Availability date
Protection	Lightning surge protection	LCP12-150B1RL	W11-14
Protection	Lightning surge protection	LCP02-150B1RL	W11-14

Change implementation schedule

Sales types	Estimated production start	Estimated first shipments
LCP12-150B1RL	**W11-14**	**W18-14**

Comments:	

Customer's feedback

Please contact your local ST sales representative or quality contact for requests concerning this change notification.
Absence of acknowledgement of this PCN within 30 days of receipt will constitute acceptance of the change
Absence of additional response within 90 days of receipt of this PCN will constitute acceptance of the change

Qualification program and results	QRP13400 Attached

Reliability Report

LCP12-150B1RL & LCP02-150B1RL - Copper wire conversion

General Information	
Product Line	*PROTECTION (BU80)*
Product Description	*LCP12-150B1RL* *LCP02-150B1RL*
Product Group	*IPG*
Product division	*ASD & IPAD*
Package	*SO8 wide*
Maturity level step	*QUALIFIED*

Locations	
Wafer fab	*ST Tours*
Assembly plant	*Subcontractor China*
Reliability Lab	*ST Tours*
Reliability assessment	*PASS*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Validated by	Comment
1.0	19 December 2013	9	Marc Verchiani	Jean Paul Rebrassé	PCN 8287

TABLE OF CONTENTS

1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits
RER	1239002
FMEA	8419771

2 GLOSSARY

SS	Sample Size
PC	Preconditioning
HTRB	High Temperature Reverse Bias
THB	Temperature Humidity Bias
TC	Temperature Cycling
SD	Solderability

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

The objective of this report is to qualify the LCP12-150B1RL and LCP02-150B1RL using copper wire.

Description of the change:

	Before Change	After Change
Wire	Au 2 mils	Cu 2 mils

The reliability test methodology used follows the JESD47-H: « Stress Test Driven Qualification Methodology ».

3.2 Conclusion

Qualification Plan requirements have been fulfilled without exception. 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 robustness of the products and safe operation, which is consequently expected during their lifetime.

4 DEVICE CHARACTERISTICS

4.1 Device description

Features

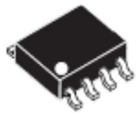
- Protection IC recommended for ringing SLICs
- Wide firing voltage range: -120 V to +120 V
- Low gate triggering current: I_G = 5 mA max
- Peak pulse current: I_{PP} = 45 A (10/1000 µs)
- Holding current: I_H = 150 mA min

Applications

- Dual battery supply voltage SLICs
  - negative battery supply configuration
  - negative and positive battery supply configuration
- Central office (CO)
- Private branch exchange (PBX)
- Digital loop carrier (DLC)
- Digital subscriber line access multiplexer (DSLAM)
- Fiber in the Loop (FITL)
- Wireless local loop (WLL)
- Hybrid fiber coax (HFC)
- ISDN terminal adapter
- Cable modem

Description

The LCP12-150B1 has been developed to protect SLICs operating on both negative and positive battery supplies, as well as high voltage SLICs. It provides crowbar mode protection for both TIP and RING lines. The surge suppression is assumed for each wire by two thyristor structures, one dedicated to positive surges the second one for negative surges. Both positive and negative threshold levels are programmable by two gates (Gn and Gp). The use of transistors decreases the battery currents during surge suppression.



SO-8 wide
LCP12-150B1RL

Figure 1. Functional diagram

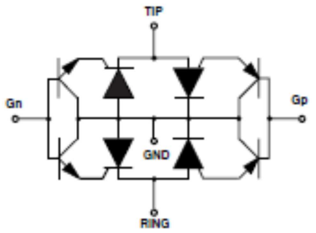
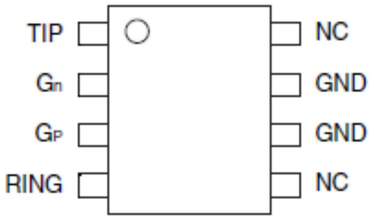


Figure 2. Pin-out configuration



LCP12-150B1 is used to help equipment to meet various standards such as UL1950, IEC 60950 / CSAC22.2, UL1459 and TIA-968-A (formerly FCC part68). Trisils have UL94 V0 resin approved (Trisils are UL497B approved - file: E136224).

4.2 Construction note

	LCP12-150B1RL
Wafer/Die fab. information	
Wafer fab manufacturing location	ST TOURS
Technology	TRISIL
Wafer Testing (EWS) information	
Electrical testing manufacturing location	ST TOURS
Assembly information	
Assembly site	SUBCO CHINA
Package description	SO8 WIDE
Molding compound	**ECOPACK®2** (“Halogen-free”)
Lead finishing process	Tin (Sn)
Final testing information	
Testing location	SUBCO CHINA

5 TESTS RESULTS SUMMARY

5.1 Test vehicle

Lot #	Commercial Product	Package	Assembly plant	Comments
Lot 1	LCP22-150B1HRL	SO8W	Subco China	Same Front-End technology / Same die size / Same package using copper wire
Lot 2				
Lot 3				

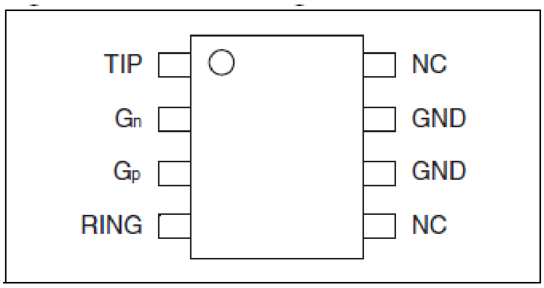
Detailed results in below chapter will refer to P/N and Lot #.

5.2 Test plan and results summary

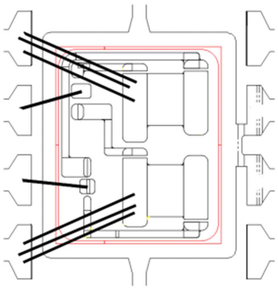
Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS			Note
						Lot 1	Lot 2	Lot 3	
Package Oriented Tests									
THB	Y	JESD22 A-113	Ta = 85°C; RH = 85% VR = 100V	72	168h	0/24	0/24	0/24	
					504h	0/24	0/24	0/24	
					1000h	0/24	0/24	0/24	
TC	Y	JESD22 A-104	[-65°C / +150°C] 2 cycles / hour	75	500C	0/25	0/25	0/25	
					1000C	0/25	0/25	0/25	
Repetitive Surge	Y	ADCS0060282	10/1000 µs surge IPP = 45A	54	Visual Inspection	0/18	0/18	0/18	

6 ANNEXES

6.1 Pin connection

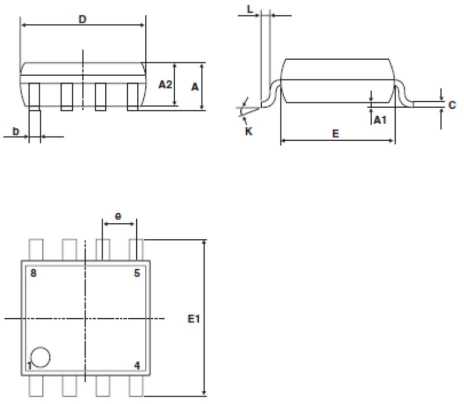
Package	Product	Pin connection
SO8 WIDE	**LCP12-150B1HRL**	

6.2 Bonding diagram

Package	Product	Bonding diagram
SO8 WIDE	**LCP12**	

Note : Generic scheme (die / wire bonding sizes and die design given as example)

6.3 Package outline/Mechanical data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			2.10			0.083
A1	0.05		0.25	0.002		0.010
A2	1.65		1.75	0.065		0.069
b	0.38	0.43	0.48	0.015	0.017	0.019
c	0.15	0.20	0.25	0.006	0.008	0.010
D			5.34			0.210
E	5.20		5.40	0.204		0.212
E1	7.70		8.25	0.303		0.324
e		1.27			0.05	
K			8°			8°
L	0.55		0.85	0.021		0.033

6.4 Tests Description

Test name	Description	Purpose
Die Oriented		
RS Repetitive Surge	The device is submitted to the maximum Ipp repetitively	To check that repetitive surge does not degrade the device.
Package Oriented		
PC Preconditioning	The device is submitted to a typical temperature profile used for surface mounting devices, after a controlled moisture absorption.	As stand-alone test: to investigate the moisture sensitivity level. As preconditioning before other reliability tests: to verify that the surface mounting stress does not impact on the subsequent reliability performance. The typical failure modes are "pop corn" effect and delamination.
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.
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.

Public Products List

PCN Title : LCP12-150B1RL - Copper wire conversion
PCN Reference : IPG-DIS/14/8287
PCN Created on : 06-FEB-2014

Subject : Public Products List

Dear Customer,

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

ST COMMERCIAL PRODUCT

LCP02-150B1RL

LCP12-150B1RL

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