



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-IPC/10/5960
Notification Date 10/13/2010

HBIP40 Technology for L78xx Linear Voltage Regulator series

Table 1. Change Implementation Schedule


Forecasted implementation date for change	04-Jan-2011
Forecasted availability date of samples for customer	06-Oct-2010
Forecasted date for STMicroelectronics change Qualification Plan results availability	06-Oct-2010
Estimated date of changed product first shipment	12-Jan-2011

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	see attached list
Type of change	Product design change
Reason for change	New equipments utilization, production capacity optimization
Description of the change	Following Divisional commitments towards a continuous improvement philosophy a more fine geometry Bipolar technology has been qualified in ST called HBip40. ST is going to use this improved technology to redesign all the L78xx Linear Voltage Regulator series. Quality and electrical performances are guaranteed and samples of L78xxCV are already available, while other versions are available on request.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Digits "H4" are marked on the physical parts on the right side of LOGO and ecolevel info
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	

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Customer Acknowledgement of Receipt		PCN APM-IPC/10/5960
Please sign and return to STMicroelectronics Sales Office		Notification Date 10/13/2010
<input type="checkbox"/> Qualification Plan Denied <input type="checkbox"/> Qualification Plan Approved <input type="checkbox"/> Change Denied <input type="checkbox"/> Change Approved	Name:	
	Title:	
	Company:	
	Date:	
	Signature:	
Remark		

DOCUMENT APPROVAL

Name	Function
Riviera, Antonio	Division Marketing Manager
Naso, Lorenzo	Division Product Manager
Motta, Antonino	Division Q.A. Manager



Reliability Evaluation Report

New Product Qualification

L7805

*Hbip40V technology
To220 Single Gauge package*

General Information

Product Line	<i>LX05</i>
Product Description	<i>Positive voltage regulators</i>
P/N	<i>L7805CV</i>
Product Group	<i>VR</i>
Package	<i>TO220 Single Gauge</i>
Silicon Process technology	<i>HBIP40V</i>

Locations

Wafer fab	<i>AMK 5</i>
Assembly plant	<i>Shenzhen</i>
Reliability Lab	<i>IMS-APM Catania Reliability Lab</i>
Reliability assessment	<i>Pass</i>

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0		9	AlfioRiciputo	Giovanni Presti	

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
AEC-Q100	Stress test qualification for automotive grade integrated circuits
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

DUT	Device Under Test
SS	Sample Size

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

To qualify the *L7805CV* (LX05B63 line), using HBIP40V technology.

3.2 Conclusion

The final reliability results are positive.



4 DEVICE CHARACTERISTICS

4.1 Device description

The L78xx series is three-terminal positive voltage regulator. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down 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 voltage and currents.

4.2 Construction note

L7805CV	
Wafer/Die fab. information	
Wafer fab manufacturing location	AMK 6
Technology	HBIP40V
Process family	30 HBIP40V
Die finishing back side	Cr/Ni/Au
Die size	1.32x1.63mmq
Bond pad metallization layers	Al/Si/Cu
Passivation type	PSG+NITRIDE
Wafer Testing (EWS) information	
Electrical testing manufacturing location	AMK5
Tester	QT200
Test program	STD testing program L78
Assembly information	
Assembly site	SHENZHEN
Package description	TO220 Single Gauge
Molding compound	RESIN SUMITOMO EME-E210 D14mm W6.8g
Frame material	FRAME TO220 SG Ve1 Bare copper
Die attach material	PREFORM Pb/Ag/Sn 95.5/2.5/2 D.76mm SSD
Die pad size	150umx150um
Wire bonding process	Ball and stich
Wires bonding materials/diameters	WIRE Cu D2 BL40-55g EL15-25% 500m
Lead finishing process	Dipping
Lead finishing/bump solder material	Pure tin
Final testing information	
Testing location	Shenzhen
Tester	QT200
Test program	Standard for L78XX



TESTS RESULTS SUMMARY

4.3 Test vehicle

Lot #	Diffusion Lot	Assy Lot	Technical Code	Process/ Package	Product Line	Comments
1	6930PX1	GK9451Q8	mz)K lx05b63	HBIP40V/ TO220 Single Gauge	LX05	

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

4.4 Test plan and results summary

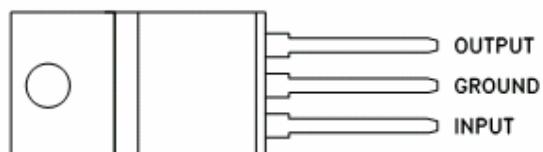
L7805CV

Test	PC	Std ref.	Conditions	SS	Steps	Failur e/SS	Note
						Lot 1	
Die Oriented Tests							
HTB	N	JESD22 A-108	Tj = 125°C, Vcc= +35V	77	168 H	0/77	
					500 H	0/77	
					1000 H	0/77	
HTSL	N	JESD22 A-103	Ta = 150°C	45	168 H	0/45	
					500 H	0/45	
					1000 H	0/45	
Package Oriented Tests							
AC	N	JESD22 A-102	Pa=2Atm / Ta=121°C	77	168 H	0/77	
TC	N	JESD22 A-104	Ta = -65°C to 150°C	77	100 cy	0/77	
					200 cy	0/77	
					500 cy	0/77	
THB	N	JESD22 A-101	Ta = 85°C, RH = 85%, Vcc= +24V	77	168 H	0/77	
					500 H	0/77	
					1000 H	0/77	

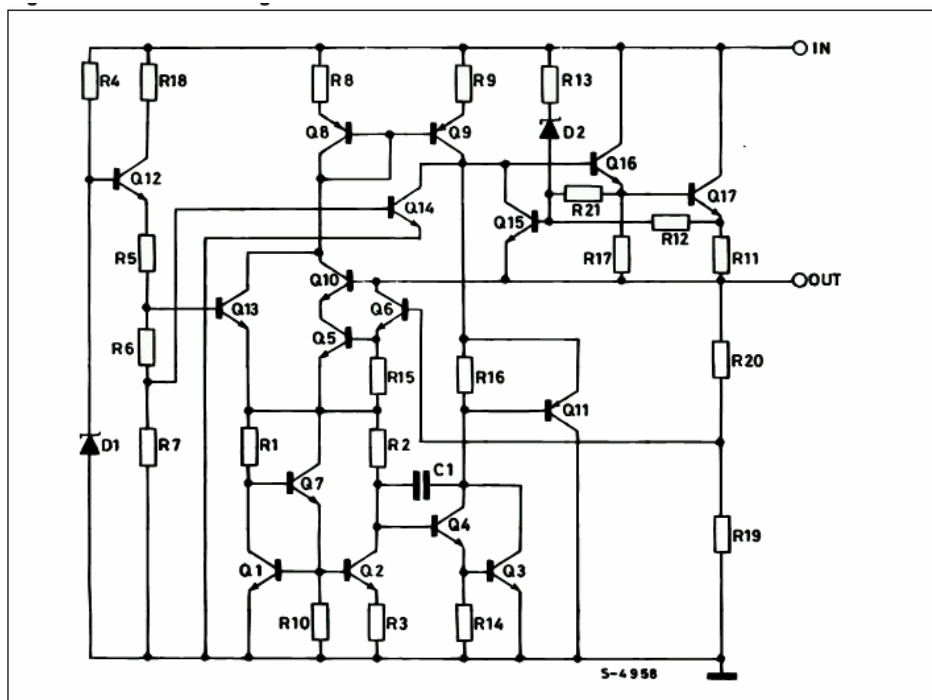
5 ANNEXES

5.1 Device details

5.1.1 Pin connection



5.1.2 Block diagram



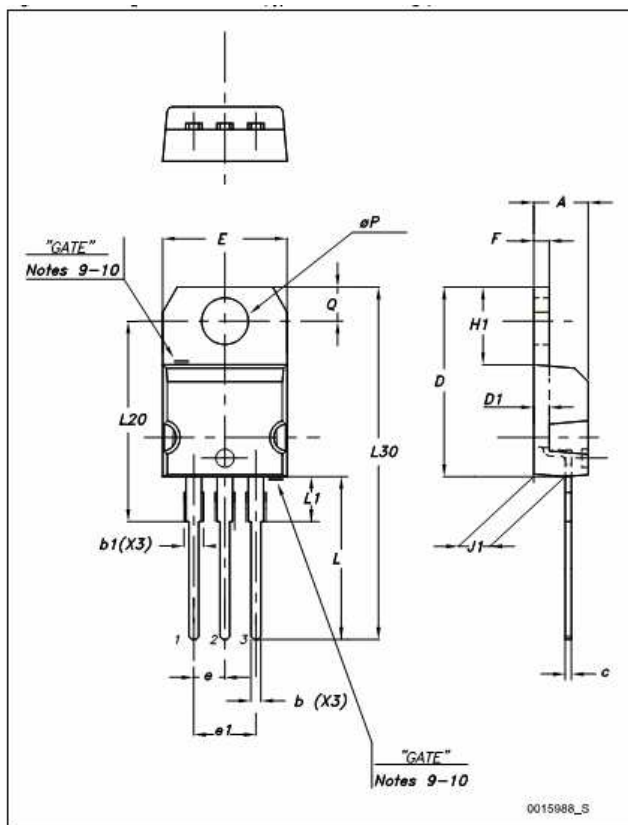


5.1.3 Package outline/Mechanical data

Dim.	Type STD - ST Dual Gauge			Type STD - ST Single Gauge		
	mm.			mm.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	4.40		4.60
b	0.61		0.88	0.61		0.88
b1	1.14		1.70	1.14		1.70
c	0.48		0.70	0.48		0.70
D	15.25		15.75	15.25		15.75
D1		1.27				
E	10.00		10.40	10.00		10.40
e	2.40		2.70	2.40		2.70
e1	4.95		5.15	4.95		5.15
F	1.23		1.32	0.51		0.60
H1	6.20		6.60	6.20		6.60
J1	2.40		2.72	2.40		2.72
L	13.00		14.00	13.00		14.00
L1	3.50		3.93	3.50		3.93
L20		16.40			16.40	
L30		28.90			28.90	
ØP	3.75		3.85	3.75		3.85
Q	2.65		2.95	2.65		2.95



Linear Voltage Regulators & Vref
Quality and Reliability





5.2 Tests Description

Test name	Description	Purpose
Die Oriented		
HTB 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.

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