PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-PWR/07/2362
Notification Date 03/19/2007

Package change from TO218 to TO247 for Power Bipolar products

PWR - PWR BIP/ IGBT/ RF

Table 1. Change Identification

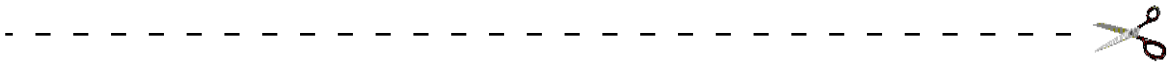
Product Identification (Product Family/Commercial Product)	Power Bipolar assembled in TO218
Type of change	Package assembly process change
Reason for change	To improve performances
Description of the change	To improve the product performance and offer a package mechanically compatible with the high runners in the market, the ST decided to move the products listed in the enclosed file, from TO218 to TO247 package, already in use for several different products .. The package TO247 is manufactured in our qualified locations, who are perfectly compliant with STMicroelectronics Quality Standard . We underline that the products in TO247 guarantee the same electrical parameters as the product in TO218 package. Attached mechanical drawing for both TO218 and TO247.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	The change is identified by the different package
Manufacturing Location(s)	

Table 2. Change Implementation Schedule

Forecasted implementation date for change	12-Jun-2007
Forecasted availabillity date of samples for customer	12-Mar-2007
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	12-Mar-2007
Estimated date of changed product first shipment	18-Jun-2007

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN APM-PWR/07/2362**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 03/19/2007**

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

Remark

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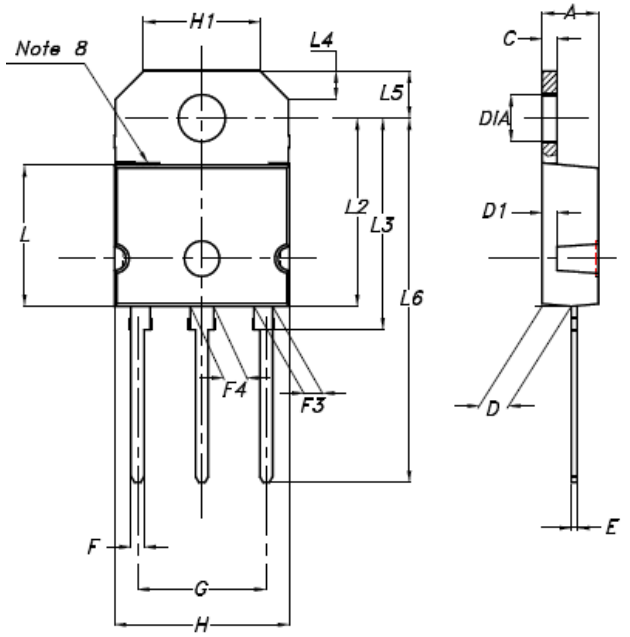
DOCUMENT APPROVAL

Name	Function
Lanzafame, Alfio Salvator	Division Marketing Manager
Porto, Michele Claudio	Division Product Manager
Falcone, Giuseppe	Division Q.A. Manager

TITLE : POA TO-218 IN LINE

PACKAGE CODE : LA - LE
PACKAGE WEIGHT : 4,7 g / unit Typ
JEDEC/EIAJ REFERENCE NUMBER : NO JEDEC (See note 11)

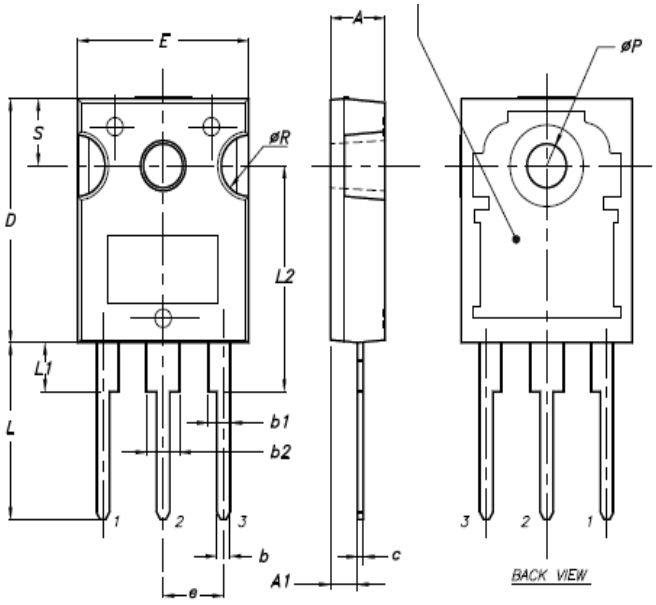
DIMENSIONS				
REF.DIM.	DATA BOOK (mm)			NOTES
	NOM	MIN	MAX	
A		4.70	4.90	
C		1.17	1.37	
D	2.50			
D1	1.27			
E		0.50	0.78	
F		1.10	1.30	
F3	1.75			
F4	2.10			
G		10.80	11.10	
H		14.70	15.20	
H1	10			
L			12.20	
L2			16.20	
L3	18			
L4	2.40			
L5		3.95	4.15	
L6	31			
Dia		4	4.10	



TITLE : POA TO-247 IN LINE

PACKAGE CODE : LW
PACKAGE WEIGHT : 4,43 g. /unit Typ
JEDEC/EIAJ REFERENCE NUMBER : TO-247 /VARIATIONS "AC" Issue D date 6/90

DIMENSIONS				
REF. DIM	DATA BOOK (mm)			NOTES
	TYP	MIN	MAX	
A		4.85	5.15	
A1		2.20	2.60	
b		1.0	1.40	
b1		2.0	2.40	
b2		3.0	3.40	
c		0.40	0.80	
D		19.85	20.15	5
E		15.45	15.75	
e	5.45			
L		14.20	14.80	
L1		3.70	4.30	
L2	18.50			
øP		3.55	3.65	4
øR		4.50	5.50	
S	5.50			



Reliability evaluation

on

TIP35CW in TO-247 package

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Introduction

This report is aimed to qualify the bipolar devices TIP35CW in TO-247 package made in Casablanca

The Qualification Reliability test trials have been performed in ST Catania Site.

The evaluation results meet ST products qualification targets, therefore the bipolar device TIP35CW in TO-247 package made in Casablanca is qualified.

Test Vehicles :

Product Line	Sales Type	Package
B505	TIP35CW	TO-247

Failure Criteria :

A failed component is a device which becomes inoperative during the test or it fails on meeting the end limits foreseen in the device specification, for one or more than the parameters here below reported

Parameter Power BIPOLAR Main Parameter

Collector Leakage Current (Icbo or Iceo or Ices, etc...)
Emitter Leakage (Iebo)
$H_{FE,}$ Vcesat, Vbesat, Vf
Breakdown Voltage (BVcbo, BVceo,Vbces, Bvebo)

Reliability Evaluation Plan and results

D.U.T.: TIP35CW LINE: B505 PACKAGE: TO-247

Test	Conditions	S.S.	Requirement	Results
H.T.S.	TA=150℃	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
T.H.B.	TA=85℃ - RH=85% Vbias= 50V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
H.T.R.B.	T.A.=150℃ Vdd=80V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
PRESSURE POT	TA=121℃ - PA=2Atm	77 x 1 Lot	Parameter deviation within spec. limits at 96 hours.	No parameter deviation out of spec. limits at 96 hours.
THERMAL CYCLES AIR TO AIR	TA=-65℃ TO 150℃ 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	No parameter deviation out of spec. limits at 500 cy
THERMAL FATIGUE	ΔTC=70℃ - Pd=24W	77 x 1 Lot	Parameter deviation within spec. limits at 10k cycles.	No parameter deviation out of spec. limits at 10Kcy.

Technological Characteristics

D.U.T.: TIP35CW LINE: B505 PACKAGE: TO247

DIE	*Technology:* Epibase NPN *Material:* Silicon *Metallization – Front :* Al/Si (1%) *- Back :* Ti/Ni/Au		*Passivation :* NO *Dimensions :* 4190 x 4190 um	
DIE ATTACH	Soft Solder	**FRAME**	*Frame and lead material:* *Frame coating :* *Lead coating :*	Cu Ni/NiP Tin Dipping
WIRE BOND	Ultrasonic	**WIRE**	*Material :* *Diameter :*	Al/Mg Base Al Emitter 7 mils Base 15 mils Emitter
SEALING	Molding	**PACKAGING**	*Material :*	Epoxy Resin

PRODUCTION PLACES : WAFER PROCESSING : SINGAPORE
ASSEMBLY LOCATION : MAROCCO
Q.A. LOCATION : MAROCCO

Reliability Test Description

High Temperature Reverse Bias (HTRB)

This test is performed in order to demonstrate the quality and reliability of devices subjected to an elevated temperature and simultaneously reverse biased. The purpose of this test is to detect surface defects such as poor passivation, presence of contaminants, etc...

High Temperature Storage (HTS)

This stress test is performed to check the device life in a high temperature ambient. Specimens are put for a period of time inside a stove in free air. Detectable failure mechanisms are presence of contaminants and metal corrosion.

Temperature Humidity Bias (THB)

This test is performed to check the device life in a high humidity ambient. Specimens are subjected to a permanent bias in a climatic chamber in the presence of steam. Detectable failure mechanisms are metal corrosion and molding defects.

Pressure Pot

This test is performed in order to check device life in a high humidity ambient in an accelerated way. Specimens are subjected for a period of time inside an autoclave in the presence of steam and pressure. Detectable failure mechanism is metal corrosion.

Thermal Fatigue

This test is performed to demonstrate the quality and reliability of devices exposed to cyclic variation in electrical stress between "on" and "off" conditions and resultant cyclic variation in device and case temperatures (thermo-mechanical stress). The purpose of this test is to detect assembly defects: improper die-attach, bonding weakness and thermal mismatch among various components of the package.

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