



Public Products List

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PCN Title : BOM Changes (LF plating and DA) on selected VIPER products (TFME subcon as assy plant).

PCN Reference : AMS/22/13142

Subject : Public Products List

Dear Customer,

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

VIPER37LE	VIPER38LE	VIPER38HE
VIPER37HE		



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Reliability Report

RR004921CO6410

General Information		Traceability	
Product Line	<i>MT19 (UI01 + ZP82)</i>	Diffusion Plant	<i>Catania Ang Mo Kio (Singapore)</i>
Product Description	<i>Off-line Converter</i>	Assembly Plant	<i>TFME</i>
Package	<i>SDIP10</i>	Reliability Assessment	
Silicon Technology	<i>BCD6 (UI01A) Supermesh (ZP82)</i>	Pass	<input checked="" type="checkbox"/>
		Fail	<input type="checkbox"/>

Note: this report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the electronic device conformance to its specific mission profile. This report and its contents shall not be disclosed to a third party without previous written agreement from STMicroelectronics or under the approval of the author (see below).

Version	Content description	Date	Author	Function
1.0	Initial Revision	21-Sep-21	P. Teruzzi/G. Capodici	Reliability Engineer

APPROVED BY:

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Table of Contents

1	RELIABILITY EVALUATION OVERVIEW	3
1.1	OBJECTIVE	3
1.2	RELIABILITY STRATEGY	3
1.3	CONCLUSION	3
2	PRODUCT OR TEST VEHICLE CHARACTERISTICS	4
2.1	GENERALITIES	4
2.2	PIN CONNECTION	4
2.3	BLOCK DIAGRAM	5
2.4	BONDING DIAGRAM	6
2.5	PACKAGE OUTLINE / MECHANICAL DATA	7
2.6	TRACEABILITY	8
2.6.1	Wafer fab information	8
2.6.2	Assembly information	8
2.6.3	Reliability information	9
3	TESTS RESULTS SUMMARY	10
3.1	LOT INFORMATION	10
3.2	TEST PLAN AND RESULTS SUMMARY	11
4	APPLICABLE AND REFERENCE DOCUMENTS	14
5	GLOSSARY	15

1 RELIABILITY EVALUATION OVERVIEW

1.1 Objective

MT19 is an already qualified device. This report contains the reliability evaluation of MT19 device diffused in Catania/Ang Mo Kio and assembled in SDip10 in TFME, in the overall plan of 8200T Glue and SDIP10LB(S-Ag) with Cu Ring lead frame qualification including also other test vehicle.

1.2 Reliability Strategy

Reliability trials performed as part of this reliability evaluation are in agreement with **ST 0061692** specification and are listed in below Test Plan. For details on test conditions, generic data used and specifications references, refer to test results summary in section 3.

1.3 Conclusion

All reliability tests have been completed with positive results.
Neither functional nor parametric rejects were detected at final electrical testing.

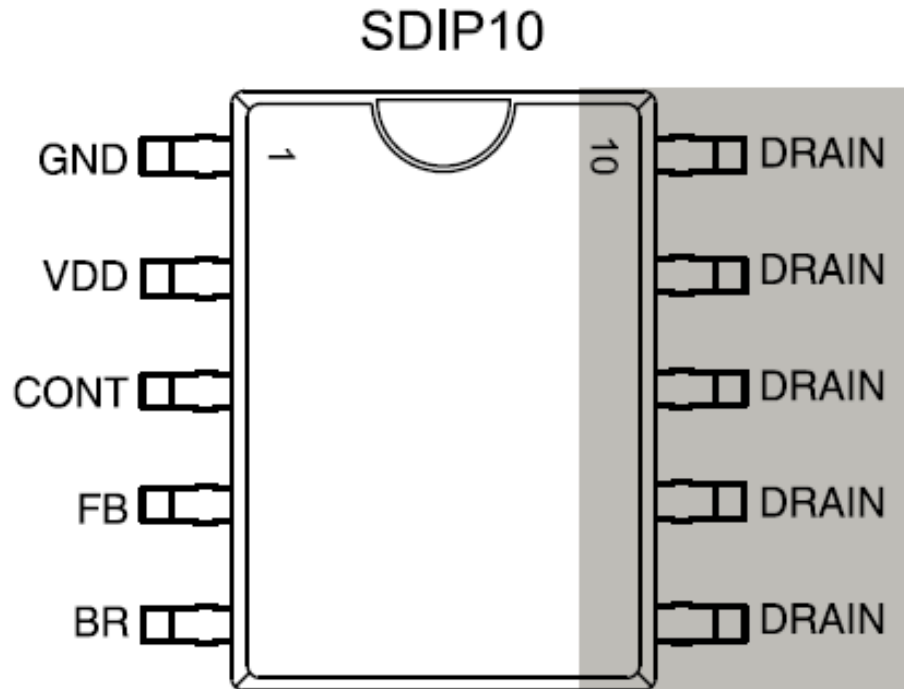
Based on the overall results obtained, MT19 device diffused in Catania/Ang Mo Kio and assembled in SDip10 in TFME, has positively passed reliability evaluation.

2 PRODUCT OR TEST VEHICLE CHARACTERISTICS

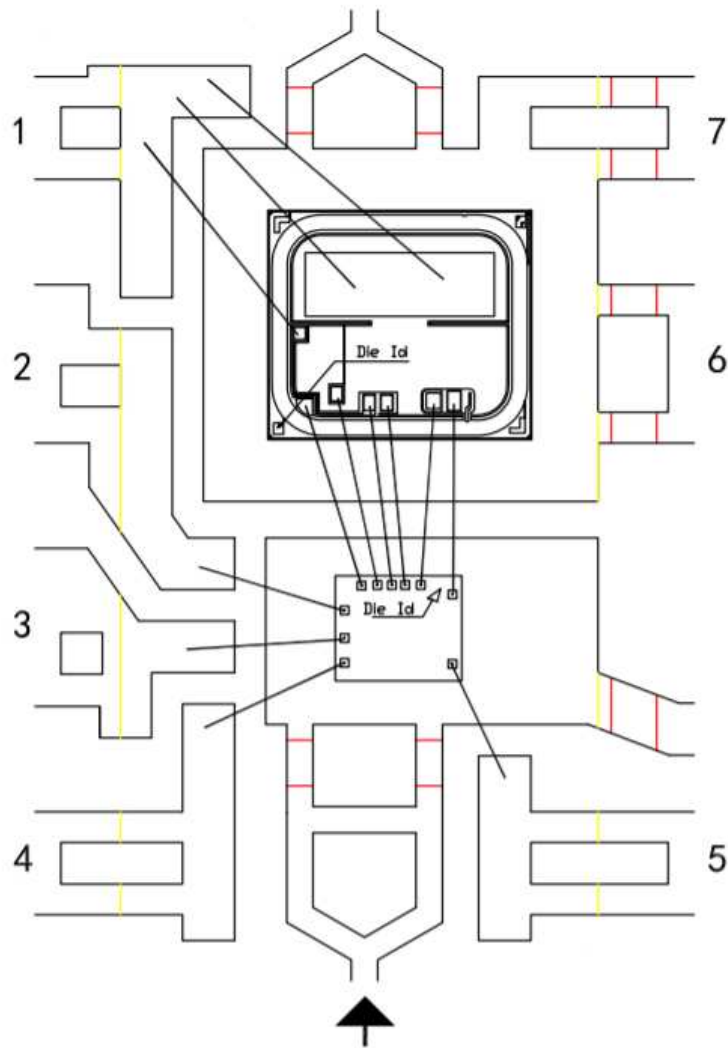
2.1 Generalities

This device is an offline converter with an 800 V rugged power section, a PWM control, two levels of overcurrent protection, overvoltage and overload protection, hysteretic thermal protection, soft-start, and safe auto-restart after the removal of any fault condition.

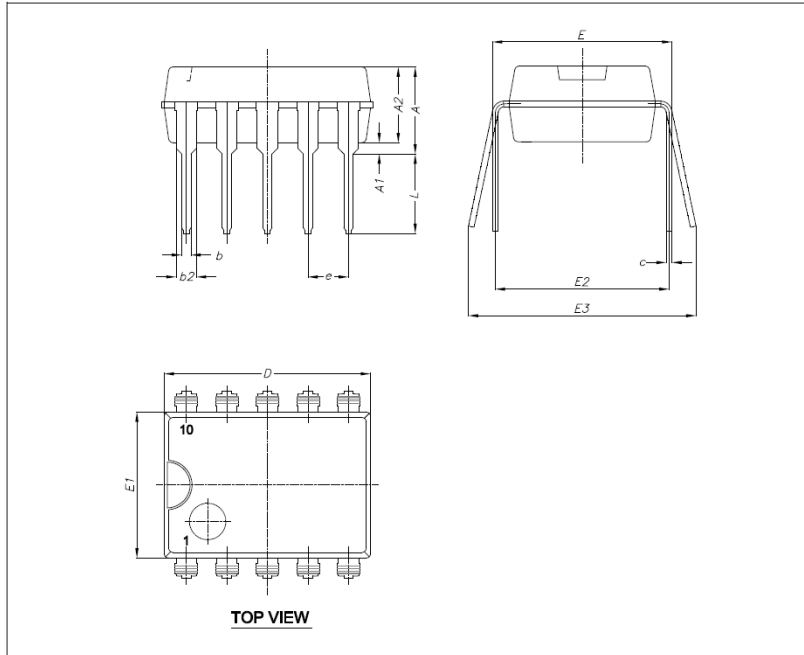
2.2 Pin connection



2.4 Bonding diagram



2.5 Package Outline / Mechanical data



Dim.	mm		
	Min.	Typ.	Max.
A			5.33
A1	0.38		
A2	2.92		4.95
b	0.36		0.56
b2	0.51		1.15
c	0.2		0.36
D	9.02		10.16
E	7.62		8.26
E1	6.1		7.11
E2		7.62	
E3			10.92
e		1.77	
L	2.92		3.81

2.6 Traceability

2.6.1 Wafer fab information

Table 1

Wafer fab information	
UI01	
Wafer fab name / location	CATANIA
Wafer diameter (inches)	8
Die thickness (µm)	725
Silicon process technology	BCD6
Die finishing front side (passivation)	TEOS/SiN/Polymide
Die finishing back side	RAW SILICON
Die area (X,Y) (µm)	1320,1112
Metal levels	3
Bond Pad Material	Ti/AlCu/TiNARC

Table 2

Wafer fab information	
ZP82	
Wafer fab name / location	Ang Mo Kio – Singapore
Wafer diameter (inches)	6
Die thickness (µm)	280
Silicon process technology	Supermesh
Die finishing front side (passivation)	SiN (nitride)
Die finishing back side	Ti/Ni/Au
Die area (X,Y) (µm)	2830,2640
Metal levels	1
Bond Pad Material	AlSi

2.6.2 Assembly information

Table 3

Assembly Information	
DIP7	
Assembly plant name	TFME
Lead frame finishing (material)	Sn
Die attach material	8200T
Wire bonding material/diameter	Au / 1.0 mil
Molding compound material	EMG-400-1F (HHCK)

2.6.3 Reliability information

Table 4

Reliability Information	
Reliability laboratory name / location	Agrate-Cornaredo / Italy (lot 1,2,3,7) Muar / Malaysia (lot 4,5,6)

Note: ST is ISO 9001 certified. This induces certification of all internal and subcontractor labs.

ST certification document can be downloaded under the following link:

http://www.st.com/content/st_com/en/support/quality-and-reliability/certifications.html

3 TESTS RESULTS SUMMARY

3.1 Lot Information

Table 5

Lot #	Diffusion Lot Trace code	Die Revision (Cut)	Raw Line	Package	Note
1	V584258M	BE6	FEJG*MV61BE6	DIP7	Equivalent Test vehicle
2	V5840WY9	BG6	RFJG*MV34BG6	DIP7	Equivalent Test vehicle
3	V5819UU6	AEX	FU(E*MT19AEX	SDIP10	Equivalent Test vehicle
4	V5030UYW	AEX	3U(E*MT19AEX	SDIP10	
5		AEX	FU(E*MT19AEX	DIP7	Equivalent Test vehicle

3.2 Test plan and results summary

Table 6 – ACCELERATED LIFETIME SIMULATION TESTS

Test code	Stress method	Stress Conditions	Lots	S.S.	Total	Results/ Lot Fail/S.S.	Comments: (N/A =Not Applicable)
HTOL	JESD22 A108	VCC=23V TJ=150°C Duration= 1000hrs <input type="checkbox"/> After PC <input checked="" type="checkbox"/> Testing at Room	3	45	135	Lot 1: 0 / 45 Lot 2: 0 / 45 Lot 3: 0 / 45	
HTRB	JESD22 A108	VDRAIN=640V VCC=23V TJ=150°C Duration= 1000hrs <input type="checkbox"/> After PC <input checked="" type="checkbox"/> Testing at Room	3	45	135	Lot 1: 0 / 45 Lot 2: 0 / 45 Lot 3: 0 / 45	

Note: Test method revision reference is the one active at the date of reliability trial execution.

Table 7 – ACCELERATED ENVIRONMENT STRESS TESTS

Test code	Stress method	Stress Conditions	Lots	S.S.	Total	Results/ Lot Fail/S.S.	Comments: (N/A =Not Applicable)
THB	JESD22 A101	VDRAIN=100V VCC=23V Ta=85°C, 85%RH, Duration= 1000hrs	2	40	80	Lot 1: 0 / 40 Lot 2: 0 / 40	
		<input type="checkbox"/> After PC <input checked="" type="checkbox"/> Testing at Room	1	25	25	Lot 3: 0 / 25	
TC	JESD22-A104	Ta= Duration= 500cy	3	25	75	Lot 1: 0 / 25 Lot 2: 0 / 25 Lot 3: 0 / 25	
		<input type="checkbox"/> After PC <input checked="" type="checkbox"/> Testing at Room	1	77	77	Lot 4: 0 / 77	
AC	JESD22 A102	P=2.08atm Ta=121°C, Duration = 96hrs	3	25	75	Lot 1: 0 / 25 Lot 2: 0 / 25 Lot 3: 0 / 25	
HTSL	JESD22 A103	Ta= 150°C Duration= 1000hrs	3	25	75	Lot 1: 0 / 25 Lot 2: 0 / 25 Lot 3: 0 / 25	
		<input type="checkbox"/> After PC <input checked="" type="checkbox"/> Testing at Room					

Note: Test method revision reference is the one active at the date of reliability trial execution.

Table 8 – ELECTRICAL VERIFICATION TESTS

Test code	Stress method	Stress Conditions	Lots	S.S.	Total	Results Fail/S.S.	Comments: (N/A =Not Applicable)
CDM	ANSI/ESD STM 5.3.1-2009	CDM=+/-1500V <input checked="" type="checkbox"/> Testing at Room	1	3	3	Lot 3 :0 / 3	
HBM	ANSI/ESDA/JEDEC JS001-2014	HBM=+/-4000V <input checked="" type="checkbox"/> Testing at Room	1	3	3	Lot 5 :0 / 3	
LU	JESD78	Current Injection Class II - Level B (+/- 100mA) Overvoltage Class II - Level B (1,5 x Vmax) <input type="checkbox"/> Testing at Room	1	6	6	Lot 5 :0 / 6	

Note: Test method revision reference is the one active at the date of reliability trial execution.

4 APPLICABLE AND REFERENCE DOCUMENTS

Reference	Short description
AEC-Q100	Failure Mechanism Based Stress Test Qualification for Integrated Circuits in automotive applications
JESD47	Stress-Test-Driven Qualification of Integrated Circuits
DMS 0061692	Reliability Tests and Criteria for Product Qualification

5 GLOSSARY

List update based on applicable items.

AC	Autoclave	MR	Multiple Reflow
ACBV	AC Blocking Voltage	MS	Mechanical Shock
ASER	Accelerated Soft Error Rate	MSeq	Mechanical sequence
AST	Adhesion Shear Test	MSL	Moisture Sensitivity Level
BI	Burn-In	NVM	Non Volatile Memory
BT3P	Board 3 points Bending Test	PC	Preconditioning
BT4P	Board 4 points Bending Test	PD	Physical Dimensions
CA	Constant Acceleration	PTC	Power Temperature Cycling
CDM	Electrostatic Discharge – Charged Device Model	RS	Repetitive Surge Test
ConA	Construction Analysis	TSH	Resistance to Solder Heat
CVS	Constant Voltage Stress	RTSER	Real-Time Soft Error Rate
DBT	Dead Bug Test	SAM	Scanning Acoustic Microscopy
DPA	Destructive Physical Analysis	SBP	Solder Ball Pull
DROP	Package drop	SBS	Solder Ball Shear
DS	Die Shear	SC	Short Circuit Characterization
DToB	Drop Test on Board	SCCSS	Smartcard – Constant Supply Stress
EDR	NVM Program/Erase Endurance & Data Retention Stress Test	SCMCMS	Smartcard – MasterCard Mechanical Stress
ELFR	Early Life Failure Rate	SCMF	Smartcard – Magnetic Field Stress
EMC	Electromagnetic Compatibility	SCPOOS	Smartcard – Power Off/On Stress
EOS	Electrical Overstress characterization	SCRFC	Smartcard – RF On/Off Cyclic Stress
ESeq	Environmental sequence	SCRFS	Smartcard – RF On Static Stress
EV	External Visual	ScrT	Screw Test
GFF		SCSA	Smartcard – Salt Atmosphere
GFL	Gross/Fine Leak	SCUV	Smartcard – UV Test
GL	Electro-thermally Induced Gate Leakage	SCXRAY	Smartcard – XRAY Test
GStress	Gate Stress	SD	Solderability
GUN	Electrostatic Discharge – System Level Test	SSOP	Steady State Operational
H3TRB	High Humidity High Temperature Reverse Bias	SToB	Shock Test on Board
HAST	Biased HAST (Highly Accelerated Stress Test)	TC	Temperature Cycling
HBM	Electrostatic Discharge – Human Body Model	TCDT	Temperature Cycling Delamination Test
HER	Hermeticity	TCHT	Temperature Cycling Hot Test
HMM	Electrostatic Discharge – Human Metal Model	TCoB	Temperature Cycling on Board
HTFB	High Temperature Forward Bias	THB	Temperature Humidity Bias
HTGB	High Temperature Gate Bias	THS	Temperature Humidity Storage
HTHHB	High Temperature High Humidity Bias	TLP	Electrostatic Discharge – Transmission Line Pulse
HTOL	High Temperature Operating Life	TS	Thermal Shocks
HTRB	High Temperature Reverse Bias.	TStr	Terminal Strength
HTSL	High Temperature Storage Life	Tumb	Tumbler Test
IOL	Intermittent Operating Life	UHAST	Unbiased HAST (Highly Accelerated Stress Test)
IWV	Internal Water Vapor	VToB	Vibration Test on Board
LF	Lead Free	VFV	Variable Frequency Vibration
LI	Lead Integrity	WAT	Tin (Sn) Whisker Acceptance Testing
LT	Lid Torque	WBI	Wire Bond Integrity
LTOL	Low Temperature Operating Life	WBP	Wire Bond Pull
LTSL	Low Temperature Storage Life	WBS	Wire Bond Shear
LU	Latch-Up	WBSr	Wire Bond Strength
MM	Electrostatic Discharge – Machine model	XRAY	X ray inspection

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