

Dear Customer,

Following the continuous improvement of our Quality and Reliability, we are going to change the Die Attach process and compound from Power Glue to Solder Paste of Power MOSFET Transistors listed in this PCN. Products with new process/material, guarantee the same electrical characteristics as reported in the relevant data sheets. Devices used for qualification are available as Samples.

The involved product series and affected packages are listed in the table below:

Product Family	Package	Commercial Product / Series
Power MOSFET Transistors	PowerFLAT™ 8x8 HV	STLxxxxxxx

Any other Product related to the above series, manufactured in PowerFLAT™ 8x8 HV Package, even if not expressly included or partially mentioned in the attached table, is affected by this change.

Qualification program and results availability:

The reliability test report is provided in attachment to this document.

Samples availability:

Samples of the test vehicle devices will be available on request starting from week 28-2018. Any other sample request will be processed and scheduled by Power Transistor Division upon request.

Product Family Description	Part Number - Test Vehicle
Power MOSFET Transistors	STL57N65M5 STL33N60M2

Change implementation schedule:

The production start and first shipments will be implemented according to our work in progress and materials availability:

Product Family Description	1st Shipments
Power MOSFET Transistors	From Week 41-2018

Lack of acknowledgement of the PCN within 30 days will constitute acceptance of the change. After acknowledgement, lack of additional response within the 90 days period will constitute acceptance of the change (Jedec Standard No. 46-C). In any case, first shipment may start earlier with customer written agreement.

Marking and traceability:

Unless otherwise stated by customer specific requirement, traceability of PowerFLAT™ 8x8 HV Package manufactured with new process/material, will be identified by internal code and the additional in-fo “P” marked on the package.

Sincerely Yours.



RELIABILITY EVALUATION REPORT

New Die Attach process and material evaluation
 from Power Glue to Solder Paste on PowerFLAT™ 8x8 HV
 in ASE WEIHAI (China) Subcontractor
Process Change

General Information	
Commercial Product	: STL57N65M5 STL33N60M2
Product Line	: M5FM01 – MQ6701
Product Description	: Power MOSFET
Package	: PowerFLAT™ 8x8 HV
Silicon Technology	: MDmesh™ M5 MDmesh™ M2
Division	: Power Transistor Division

Traceability	
Diffusion Plant	: CT8" Catania (Italy) SG6" (Singapore)
Assembly Plant	: ASE WEIHAI (China)
Reliability Lab	: Catania (Italy)
Reliability Assessment	
Passed	<input checked="" type="checkbox"/>

Disclaimer: this report is a summary of the qualification plan results performed in good faith by STMicroelectronics to evaluate the electronic devices conformance to its specific mission profile for Automotive Application. This report and its contents shall not be disclosed to a third party, except in full, without previous written agreement by STMicroelectronics or under the approval of the author (see below)

REVISION HISTORY

Version	Date	Author	Changes description
1.0	23 May 2018	A.SETTINIERI	FINAL REPORT

APPROVED BY:

Corrado CAPPELLO
 ADG Q&R department - Catania
 STMicroelectronics

TABLE OF CONTENTS

1. RELIABILITY EVALUATION OVERVIEW.....	3
1.1 OBJECTIVE	3
1.2 RELIABILITY TEST PLAN.....	3
1.3 CONCLUSION	3
2. DEVICE/TEST VEHICLE CHARACTERISTICS	4
2.1 GENERALITIES	4
2.2 PIN CONNECTION.....	4
2.3 TRACEABILITY	4
3. TESTS RESULTS SUMMARY	6
3.1 LOT INFORMATION	6
3.2 TEST RESULTS SUMMARY	6

1. RELIABILITY EVALUATION OVERVIEW

1.1 Objective

Reliability evaluation to verify the new die attach process and material from Power Glue to Solder Paste on PowerFLAT™ 8x8 HV assembled in ASE WEIHAI (China) Subcontractor.

1.2 Reliability Test Plan

Reliability tests performed on this device are in agreement with JESD47 and internal spec 0061692 and are listed in the Test Plan.

For details on test conditions, generic data used and spec reference see test results summary at Par.3 .

#	Stress	Abrv	Reference	Test Flag	Comments
1	Pre and Post-Stress Electrical Test	TEST	User specification or supplier's standard Specification		
2	External Visual	EV	JESD22B-101	1	
3	Pre-conditioning	PC	JESD22A-113	1	
4	Temperature Cycling	TC	JESD22A-104	1	
5	Autoclave	AC	JESD22A-102	1	
6	Intermittent Operating Life Test	IOL	MIL-STD-750 Method 1037	1	

1.3 Conclusion

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

Parameter drift analysis performed on samples submitted to package oriented test showed a good stability of the main electrical monitored parameters.

Package oriented tests have not put in evidence any criticality.

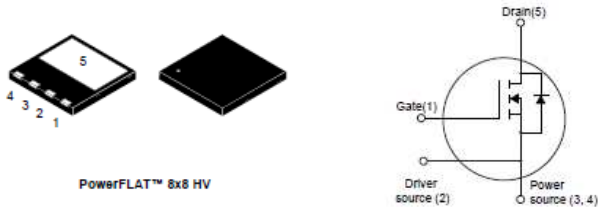
On the basis of the overall results obtained, we can give a positive judgment on the reliability evaluation for New Die Attach process with Solder Paste on medium/large die size assembled in Power FLAT™ 8x8 HV of ASE WEIHAI (China) Subcontractor, in agreement with JESD47 and internal spec 0061692

2. DEVICE/TEST VEHICLE CHARACTERISTICS

2.1 Generalities

Power MOSFET MDmesh™ M5 / MDmesh™ M2

2.2 Pin Connection



2.3 Traceability

Reference “Product Baseline” document if existing, else provide following chapters/information:

D.U.T.: STL57N65M5

PACKAGE: PowerFLAT™ 8x8 HV

Wafer fab information

Wafer fab information	
Wafer fab manufacturing location	CT8” Catania (Italy)
Wafer diameter (inches)	8”
Silicon process technology	Power MOSFET MDmesh™ M5
Die finishing front side (passivation)	Nitride
Die finishing back side	Ti/Ni/Ag
Die area (Stepping die size)	7340 x 4750 μm^2
Metal levels/Materials	AlCu/Ti/TiN

Assembly information

Assembly Information	
Assembly plant location	ASE WEIHAI (China)
Package code description	PowerFLAT™ 8x8 HV
Leadframe/Substrate	Copper
Die attach material	Solder Paste
Wires bonding materials/diameters	Cu / 2 mils
Molding compound	HF Molding compound

D.U.T.: STL33N60M2**PACKAGE: PowerFLAT™ 8x8 HV**

Wafer fab information

Wafer fab information	
Wafer fab manufacturing location	SG6" (Singapore)
Wafer diameter (inches)	6"
Silicon process technology	Power MOSFET MDmesh™ M2
Die finishing front side (passivation)	Nitride
Die finishing back side	Ti/Ni/Ag
Die area (Stepping die size)	5630 x 4580 µm ²
Metal levels/Materials	AlSi

Assembly information

Assembly Information	
Assembly plant location	ASE WEIHAI (China)
Package code description	PowerFLAT™ 8x8 HV
Leadframe/Substrate	Copper
Die attach material	Solder Paste
Wires bonding materials/diameters	Cu / 2 mils
Molding compound	HF Molding compound

Reliability testing information

Reliability Testing Information	
Reliability laboratory location	Catania (Italy)
Electrical testing location	Catania (Italy)

3. TESTS RESULTS SUMMARY

3.1 Lot Information

Lot #	Product line	Package	Wafer Fab	Assembly plant	Note
1	M5FM01	PowerFLAT™ 8x8 HV	CT8" - M5 Catania (Italy)	ASE WEIHAI (China)	
2					
3	MQ6701		SG6" (Singapore)		

3.2 Test results summary

Test plan results are summarized in the following template.

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS			
						Lot 1	Lot 2	Lot 3	
TEST		User specification	All qualification parts tested per the requirements of the appropriate device specification.			75	75	75	
External visual		JESD22 B-101	All devices submitted for testing			75	75	75	
Package Oriented Tests									
PC		JESD22 A-113	40 H @ Ta=60°C Rh=60% Over Reflow @ Tpeak=260°C 3 times	All devices to be subjected to TC, IOL, AC	FINAL	Pass	Pass	Pass	
TC	Y	JESD22 A-104	TA = -65°C to 150°C	75	500 cy	0/25	0/25	0/25	
IOL	Y	MIL-STD-750 Method 1037	ΔTC=105°C	75	10kcy	0/25	0/25	0/25	
AC	Y	JESD22 A-102	Pa=2Atm / TA=121°C	75	96 H	0/25	0/25	0/25	