Dear Customer,

Following the continuous improvement of our service and in order to increase Front-end Capacity, this document is announcing the new 8” wafer line for MDmesh™ M2 Technology of Power MOSFET Transistors in ST’s Ang Mo Kio (Singapore) FAB.

MDmesh™ M2 Technology manufactured in 8" wafer size of Ang Mo Kio (Singapore) FAB, guarantees the same quality and electrical characteristics as per current production.

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

Product Family	Technology	Part Number
Power MOSFET Transistors	MDmesh™ M2	STxxxN65M2

Any other Product related to the above series, 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 37-2018.
Any other sample request will be processed and scheduled by Power Transistor Division upon request.

Product Family	Package	Part Number - Test Vehicle
Power MOSFET Transistors	D²PAK TO-220FP PowerFLAT™ 5x6 HV TO-247	STB28N65M2 STF11N65M2 STL16N65M2 STW70N65M2

Change implementation schedule:

The production start and first shipments will be implemented after week 44 of 2018.

Marking and traceability:

Unless otherwise stated by customer specific requirement, traceability of 8” wafer size, manufactured in ST’s Ang Mo Kio (Singapore) FAB, will be ensured by internal code (Finished Good) and Q.A. number.

Yours faithfully.

Reliability report for Capacity Extension of MDmesh™ M2 Technology on 8” Wafer Fab in Ang Mo Kio (Singapore)

Process Transfer

General Information	
Commercial Product	*: STF11N65M2, STL16N65M2, STB28N65M2 STW70N65M2*
Product Line	*: MQF101, MQF301, MQF601, MQF901*
Product Description	: Power MOSFET
Package	*: TO-220FP, PowerFLAT™ 5x6, D²PAK, TO-247*
Silicon Technology	: MDmesh™ M2
Division	*:Power Transistor Division*

Traceability	
Diffusion Plant	: SG8” (Singapore)
Assembly Plant	: Shenzhen (China)
Reliability Lab	: Catania (Italy)
Reliability Assessment	
Passed	☒
Failed	☐

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	26-July-2018	A.SETTINIERI	FINAL REPORT

APPROVED BY:
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1. RELIABILITY EVALUATION OVERVIEW

1.1 Objective

Reliability report for Capacity Extension of MDmesh™ M2Technology on 8” Wafer Fab in Ang Mo Kio (Singapore)

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.

1.2.1 Test Plan

#	Stress	Abrv	Reference	Test Flag	Comments
1	Pre and Post-Stress Electrical Test	TEST	User specification or supplier’s standard Specification	Y	
2	Pre-conditioning	PC	JESD22A-113	Y	
3	External Visual	EV	JESD22B-101	Y	
4	High Temperature Reverse Bias	HTRB	JESD22A-108	Y	
5	High Temperature Gate Bias	HTGB	JESD22A-108	Y	
6	Pre-conditioning	PC	JESD22A-113	Y	
7	Temperature Cycling	TC	JESD22A-104	Y	
8	Autoclave	AC	JESD22A-102	Y	
9	High Humidity High Temperature Reverse Bias	H3TRB	JESD22A-101	Y	
10	Intermittent Operational Life / Thermal Fatigue	IOL / TF	MIL-STD-750 Method 1037	Y	
11	ESD Characterization	ESD (HBM, CDM)	ESDA-JEDEC JES-001 and AINSI-ESD S5.3.1	Y	

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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 die and package oriented test showed a good stability of the main electrical monitored parameters.

On the basis of the overall results obtained, we can give a positive judgment on the reliability evaluation for Capacity Extension of MDmesh™ M2Technology on 8” Wafer Fab in Ang Mo Kio (Singapore) in agreement with JESD47 and ST internal spec 0061692.

2. DEVICE/TEST VEHICLE CHARACTERISTICS

2.1 Generalities

Power MOSFET MDmesh™ M2

2.2 Pin connection

2.3 Traceability

	STF11N65M2
Wafer/Die fab. information	
Wafer fab manufacturing location	SG8” (Singapore)
Technology	MDmesh™ M2
Process family	Power MOSFET
Die finishing back side	Ti-Ni-Ag
Die size	2860 x 2430 µm²
Bond pad metallization layers	AlSi
Passivation type	SiN (Nitride)
Poly silicon layers	1
Wafer Testing (EWS) information	
Electrical testing manufacturing location	SG8” (Singapore)
Tester	Tesec
Assembly information	
Assembly site	Shenzhen (China)
Package description	TO-220FP
Frame material	Copper, Selected Ni/NiP
Die attach process	Soft Solder
Die attach material	PREFORM Pb/Ag/Sn
Wires bonding materials/diameters	Al/Mg wire 5mils (Gate) – Al 10mils (Source)
Molding compound	HF Molding compound
Final testing information	
Testing location	Shenzhen (China)

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	STL16N65M2
Wafer/Die fab. information	
Wafer fab manufacturing location	SG8” (Singapore)
Technology	MDmesh™ M2
Process family	Power MOSFET
Die finishing back side	Ti-Ni-Ag
Die size	3980 x 2900 μm^2
Bond pad metallization layers	AlSi
Passivation type	SiN (Nitride)
Poly silicon layers	1
Wafer Testing (EWS) information	
Electrical testing manufacturing location	SG8” (Singapore)
Tester	Tesec
Assembly information	
Assembly site	Shenzhen (China)
Package description	Power FLAT™ 5x6
Frame material	Copper, Selected Ag
Die attach process / Material	Soft Solder / PREFORM Pb/Ag/Sn
Wires bonding materials/diameters	Cu 2mils (Gate – Source)
Molding compound	HF Molding compound
Final testing information	
Testing location	Shenzhen (China)

	STB28N65M2
Wafer/Die fab. information	
Wafer fab manufacturing location	SG8” (Singapore)
Technology	MDmesh™ M2
Process family	Power MOSFET
Die finishing back side	Ti-Ni-Ag
Die size	4910 x 4310 μm^2
Bond pad metallization layers	AlSi
Passivation type	SiN (Nitride)
Poly silicon layers	1
Wafer Testing (EWS) information	
Electrical testing manufacturing location	SG8” (Singapore)
Tester	Tesec
Assembly information	
Assembly site	Shenzhen (China)
Package description	D^2PAK
Frame material	Copper, Selected Ni/NiP
Die attach process / Material	Soft Solder / PREFORM Pb/Ag/Sn
Wires bonding materials/diameters	Al/Mg 5mils (Gate) Al 10mils (Source)
Molding compound	HF Molding compound
Final testing information	
Testing location	Shenzhen (China)

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	STW70N65M2
Wafer/Die fab. information	
Wafer fab manufacturing location	SG8” (Singapore)
Technology	MDmesh™ M2
Process family	Power MOSFET
Die finishing back side	Ti-Ni-Ag
Die size	10390 x 6850 µm²
Bond pad metallization layers	AlSi
Passivation type	SiN (Nitride)
Poly silicon layers	1
Wafer Testing (EWS) information	
Electrical testing manufacturing location	SG8” (Singapore)
Tester	Tesec
Assembly information	
Assembly site	Shenzhen (China)
Package description	TO-247
Frame material	Copper, Selected Ni/NiP
Die attach process / Material	Soft Solder / PREFORM Pb/Ag/Sn
Wires bonding materials/diameters	Al/Mg 5mils (Gate) Al 10mils (Source)
Molding compound	HF Molding compound
Final testing information	
Testing location	Shenzhen (China)

Reliability testing information

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

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3. TESTS RESULTS SUMMARY

3.1 Lot Information

Lot #	Product Line	Package	Resin	Comments
1	MQF101	TO-220FP	HF Molding compound	
2	MQF301	Power FLAT™ 5x6		
3	MQF601	D²PAK		
4	MQF901	TO-247		

3.2 Test results summary

Stress (Abrv)	PC	Std ref.	Test conditions	Sample Size (S.S)	Steps	Failure/SS			
						LOT1	LOT2	LOT3	LOT4
TEST		User specification	All qualification parts tested per the requirements of the appropriate device specification.			190	190	190	190
External visual		JESD22 B-101	All devices submitted for testing			190	190	190	190
Die Oriented Tests									
HTRB		JESD22 A-108	TA=150°C ; BIAS=520V	180	1000H	0/45	0/45	0/45	0/45
HTGB		JESD22 A-108	TA=150°C ; BIAS=25V	180	1000H	0/45	0/45	0/45	0/45
Package oriented Tests									
PC		JESD22A-113	Dryng 24H @ 125°C Store 168H @ TA=85°C RH=85% Oven Reflow @ Tp=245°C 3 times	All devices to be subjected to H3TRB, TC,IOL,AC	Final			Pass	
			Dryng 24H @ 125°C Store 168H @ TA=85°C RH=85% Oven Reflow @ Tp=260°C 3 times				Pass		
H3TRB	Y	JESD22 A-101	TA=85°C - RH=85% ; BIAS=100V	100	1000H	0/25	0/25	0/25	0/25
AC	Y	JESD22 A-102	TA=121°C ; PA=2ATM	100	96H	0/25	0/25	0/25	0/25
TC	Y	JESD22 A-104	TA=-65°C TO 150°C 1 HOURS / CYCLE	100	500Cy	0/25	0/25	0/25	0/25
IOL	Y	MIL-STD-750 Method 1037	ΔTj ≥ 100°C	100	10Kcy	0/25	0/25	0/25	0/25
ESD		ESDA–JEDEC JES–001 ANSI – ESD S5.3.1	CDM / HBM	24		0/3 0/3	0/3 0/3	0/3 0/3	0/3 0/3

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