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 IGBT Trench Technology in ST’s Ang Mo Kio (Singapore) FAB.

IGBT Trench 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
IGBT & IPM	IGBT Trench	See involved product list

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 plan report is provided in attachment to this document.

Samples availability:

Samples of the test vehicle devices will be available as per below table.
Any other sample request will be processed and scheduled by Power Transistor Division upon request.

Part Number - Test Vehicle	Package	Samples Availability	Qual. Report Avail.	Implementation Schedule	Technology
STGW40H65FB	TO-247	Week 47/18	Week 50/18	Week 07/19 (tbc)	IGBT, TFS, HB series
STGW80H65DFB	TO-247	Week 46/18	Week 50/18	Week 07/19 (tbc)	IGBT, TFS, HB series
STGW80H65FB	TO-247	Week 46/18	Week 50/18	Week 07/19 (tbc)	IGBT, TFS, HB series
STGIB15CH60TS-L	SDIP2B-26L	Week 24/19	Week 26/19	Week 46/19 (tbc)	IGBT, TFS, S series
STGW80V60DF	TO-247	Week 24/19	Week 26/19	Week 46/19 (tbc)	IGBT, TFS, V series
STGWA40HP65FB2	TO-247 long leads	Week 38/19	Week 40/19	Week 52/19 (tbc)	IGBT, TFS, HB2 series

Change implementation schedule:
The production start and first shipments will be implemented as per above table.

Marking and traceability:

Traceability of products involved in this PCN will be ensured by internal code (Finished Good) and Q.A. number.

Yours faithfully.

INTERIM
Reliability report and plan on IGBT Trench Technology 8” Wafer Front - end Capacity Extension - Ang Mo Kio (S'Pore) – INDUSTRIAL

General Information	
Commercial Product	:STGW80H65FB-STGW80H65DFB STGW40H65FB - STGW80V60DF STGWA40HP65FB2-STGIB15CH60TS-L
Silicon Line	: EWFR - EWF6- EVFR - JWFE - RI64
Product Description	: IGBT Trench
Package	*: TO-247 – TO-247 long lead SDIP2B-26L*
Silicon Technology	: IGBT Trench
Division	*:Power Transistor Division*

Traceability	
Diffusion Plant	: SG 8” (Singapore)
Assembly Plant	: Shenzhen / TFME (China)
Reliability Lab	: Catania (Italy)
Reliability Assessment	
Passed	☒

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	08 October 2018	A.SETTINIERI	FINAL REPORT

APPROVED BY:
Corrado CAPPELLO
ADG Q&R department - Catania
ST Microelectronics

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1. RELIABILITY EVALUATION OVERVIEW

1.1 Objective

Reliability evaluation for Capacity Extension of Industrial Product in IGBT Trench Technology diffused in SG8" Ang Mo Kio (Singapore) Fab.

1.2 Reliability Test Plan

Reliability tests for 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 (Mandatory)	Comments
1	Pre and Post-Stress Electrical Test	TEST	User specification or supplier's standard Specification	Y	
2	External Visual	EV	JESD22B-101	Y	
3	High Temperature Storage Life	HTSL	JESD22B-101	Y	
4	High Temperature Gate Bias	HTGB	JESD22A-108	Y	
5	High Temperature Reverse Bias	HTRB	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 Interim comment

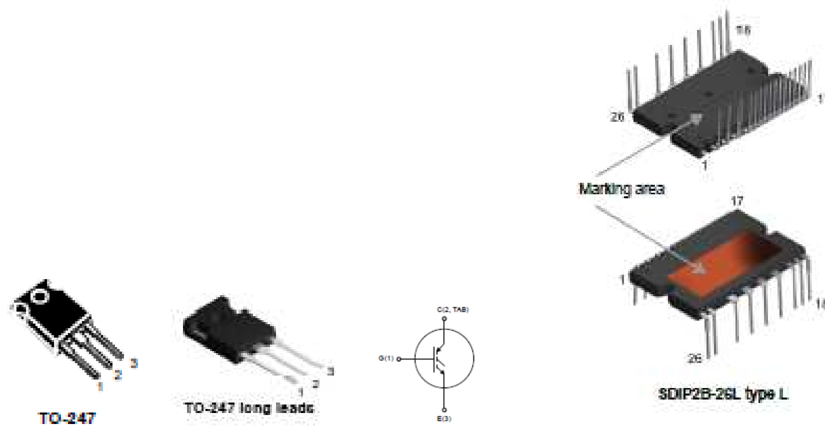
Interim reliability tests have been completed with positive results. Neither functional nor parametric rejects were detected at final electrical testing.
Parameter drift analysis performed on samples submitted to die and package oriented test showed a good stability of the main electrical monitored parameters.
Package oriented tests have not put in evidence any criticality.

2. DEVICE/TEST VEHICLE CHARACTERISTICS

2.1 Generalities

IGBT Trench

2.2 Pin Connection



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2.3 Traceability

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

D.U.T.: STGW40H65FB PACKAGE: TO-247

Wafer fab information	
Wafer fab manufacturing location	SG 8" (Singapore)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	SiN (Nitride)
Die finishing back side	Al/Ti/NiV/Ag
Die area (Stepping die size)	5440 x 4000 µm2
Metal levels/Materials	1 – AlCu/W

Assembly Information	
Assembly plant location	ST Shenzhen (China)
Package code description	TO-247
Lead frame/Substrate	FRAME TO247 3L
Die attach material	PREFORM PbAgSn
Wires bonding materials/diameters	Gate: Al/Mg 5 mils - Source: Al 15mils
Molding compound	Halogen Free Molding compound

D.U.T.: STGW80H65FB PACKAGE: TO-247

Wafer fab information	
Wafer fab manufacturing location	SG 8" (Singapore)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	SiN (Nitride)
Die finishing back side	Al/Ti/NiV/Ag
Die area (Stepping die size)	6500 x 6300 μm^2
Metal levels/Materials	1 – AlCu/W

Assembly Information	
Assembly plant location	ST Shenzhen (China)
Package code description	TO-247
Lead frame/Substrate	FRAME TO247 3L
Die attach material	PREFORM PbAgSn
Wires bonding materials/diameters	Gate: Al/Mg 5 mils - Source: Al 15mils
Molding compound	Halogen Free Molding compound

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D.U.T.: STGW80H65DFB PACKAGE: TO-247

Wafer fab information	
Wafer fab manufacturing location	SG 8" (Singapore)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	IGBT: SiN (Nitride) DIODE: DURIMIDE
Die finishing back side	IGBT:Al/Ti/NiV/Ag DIODE: Ti/Ni/Au
Die area (Stepping die size)	IGBT: 6500 x 6300 μm^2 DIODE: 6800 x 3400 μm^2
Metal levels/Materials	1 – AlCu/W

Assembly Information	
Assembly plant location	ST Shenzhen (China)
Package code description	TO-247
Lead frame/Substrate	FRAME TO247 3L
Die attach material	PREFORM PbAgSn
Wires bonding materials/diameters	Gate: Al/Mg 5 mils - Source: Al 15mils
Molding compound	Halogen Free Molding compound

D.U.T.: STGW80V60DF PACKAGE: TO-247

Wafer fab information	
Wafer fab manufacturing location	SG 8" (Singapore)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	IGBT: SiN (Nitride) DIODE: DURIMIDE
Die finishing back side	IGBT:Al/Ti/NiV/Ag DIODE: Ti/Ni/Au
Die area (Stepping die size)	IGBT: 6500 x 6300 μm^2 DIODE: 6800 x 3400 μm^2
Metal levels/Materials	1 – AlCu/W

Assembly Information	
Assembly plant location	ST Shenzhen (China)
Package code description	TO-247
Lead frame/Substrate	FRAME TO247 3L
Die attach material	PREFORM PbAgSn
Wires bonding materials/diameters	Gate: Al/Mg 5 mils - Source: Al 15mils
Molding compound	Halogen Free Molding compound

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D.U.T.: STGWA40HP65FB2 PACKAGE: TO-247 long lead

Wafer fab information	
Wafer fab manufacturing location	SG 8" (Singapore)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	SiN (Nitride)
Die finishing back side	Ti/Ni/Au
Die area (Stepping die size)	6500 x 6300 μm^2
Metal levels/Materials	1 – AlCu/W

Assembly Information	
Tongfu Microelectronics Co Ltd	Tongfu Microelectronics Co Ltd
Package code description	TO-247
Lead frame/Substrate	FRAME TO247 3L
Die attach material	SnAgSb
Wires bonding materials/diameters	Gate: Al 5 mils - Source: Al 20mils
Molding compound	Halogen Free Molding compound

D.U.T.: STGIB15CH60TS-L PACKAGE: SDIP2B-26L

Wafer fab information	
Wafer fab manufacturing location	IGBT: SG8" (Singapore) Diode: Tours (France) Driver1: Catania (Italy) Driver2: Agrate (Italy)
Wafer diameter (inches)	8"
Silicon process technology	IGBT Trench
Die finishing front side (passivation)	IGBT : Nitride DIODE: Probimide DRIVER1: TEOS/Nitride/Polyimide DRIVER2: HDP/TEOS/Nitride
Die finishing back side	IGBT: Al/Ti/NiV/Ag DIODE: Ti/Ni/Au DRIVER1: Cr/Ni/Au DRIVER2: Cr/NiV/Au
Die area (Stepping die size)	IGBT:3200 x 2880 μm^2 DIODE: 2300 x 2300 μm^2 DRIVER1: 2919 x 918 μm^2 DRIVER2: 4130 x 2180 μm^2
Metal levels/Materials	IGBT: AlCu/W DIODE: Al DRIVER1: Ti/AlCu/TiN ARC DRIVER2: Ti/AlCu/TiN ARC + NiPd

Assembly Information	
Assembly plant location	Shenzhen (China)
Package code description	SDIP-2B 26L
Lead frame/Substrate	FRAME SSDIP 25/26L
Die attach material	IGBT / DIODE: SOLDER PASTE PbSnAg DRIVER: GLUE
Wires bonding materials/diameters	Gate :Cu 2 mils ; Source: Al 12mils ; NTC: Au 1mil
Molding compound	Halogen Free Molding compound

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

3. TESTS RESULTS SUMMARY

3.1 Lot Information

Lot #	Commercial Product	Silicon line	Package	Wafer Fab	Assembly plant	Note
1	STGW80H65FB	EWFR	TO-247	Singapore	Shenzhen	
2	STGW80H65DFB					
3	STGW40H65FB	EWF6				
4	STGW80V60DF	EVFR				
5	STGWA40HP65FB2	JWFE	TO-247 long lead		TFME	
6						
7						
8	STGIB15CH60TS-L	RI64	SDIP2B-26L		Shenzhen	

3.2 Test results summary

Test	Std ref.	Conditions	SS	Steps	Failure/SS							
					Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6	Lot 7	Lot 8
TEST	User specification	All qualification parts tested per the requirements of the appropriate device specification.			115	Week 51/18	190	Week 26/19	Week 40/19	Week 40/19	Week 40/19	Week 26/19
External visual	JESD22 B-101	All devices submitted for testing			115	Week 51/18	190	Week 26/19	Week 40/19	Week 40/19	Week 40/19	Week 26/19
HTRB	JESD22 A-108	Tj = 175°C, BIAS = 520V	90	1000 h	0/45	Week 51/18	0/45	Week 26/19	Week 40/19	Week 40/19	Week 40/19	
		Tj = 125°C, BIAS = 360V		1000 h								Week 26/19
HTGB	JESD22 A-108	Tj = 175°C, BIAS = 30V	90	1000 h	0/45	Week 51/18	0/45		Week 40/19	Week 40/19	Week 40/19	
TC	JESD22 A-104	TA=-65°C TO 150°C (1 hours / cycle)	50	500cy	0/25	Week 51/18	0/25		Week 40/19	Week 40/19	Week 40/19	
		TA=-40°C TO 125°C (1 hours / cycle)		500cy								Week 26/19
AC	JESD22 A-102	TA=121°C ; PA=2ATM	50	96h	0/25	Week 51/18	0/25		Week 40/19	Week 40/19	Week 40/19	Week 26/19
H3TRB	JESD22 A-101	TA=85°C ; RH=85% BIAS= 100V	50	1000 h	0/25	Week 51/18	0/25					Week 26/19
IOL	MIL-STD-750 Method 1037	ΔTj ≥100°C	50	10Kcy	0/25	Week 51/18	0/25		Week 40/19	Week 40/19	Week 40/19	

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