PCI
Product/Process Change Information

Datasheet update for Maximum Operating Junction Temperature from 150°C to 175°C

Notification number:	ADG/20/12358	**Issue Date**	2020 Nov 25th
Issued by	Isabelle BALLON		
Product series affected by the change		STPS200170TV1Y	

Reason for change

Datasheet update for Maximum Operating Junction Temperature (Tj max) from 150°C to 175°C

Effects of change

Allowing Tj max 175°C will give more margin for thermal customer design.

Product identification and traceability

No changes from existing marking.
Traceability will refer to the assembly date codes beginning of production schedule start.

Qualification complete date	W46-2020

Forecasted sample availability

Not applicable

Change implementation schedule

Sales types	Estimated production start	Estimated first shipments
STPS200170TV1Y	**Already in production** **Only datasheet update**	

Reliability Evaluation Report

Upgrade of STPS200170TV1Y
maximum junction temperature (Tj max) at 175°C

General Information	
Product Line	*Rectifiers*
Product Description	*Power Schottky rectifiers*
Product perimeter	*STPS200170TV1Y*
Product Group	*ADG*
Product division	*Discrete & Filter*
Package	*ISOTOP*
Maturity level step	*QUALIFIED*

Locations	
Wafer fab	*ST SINGAPORE*
Assembly plant	*ST BOUSKOURA - MOROCCO*
Reliability Lab	*ST TOURS - FRANCE*
Reliability assessment	*PASS*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comments
1.0	13-Nov-2020	6	Christophe GOIN	Julien MICHELON	Initial release

TABLE OF CONTENTS

1 APPLICABLE AND REFERENCE DOCUMENTS 3
2 GLOSSARY 3
3 RELIABILITY EVALUATION OVERVIEW 4
3.1 OBJECTIVES 4
3.2 CONCLUSION 4
4 DEVICE CHARACTERISTICS 5
4.1 DEVICE DESCRIPTION 5
4.2 CONSTRUCTION NOTE 6
5 TESTS RESULTS SUMMARY 6
5.1 TEST VEHICLES 6
5.2 TEST PLAN AND RESULTS SUMMARY 6

1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD 47	Stress-Test-Driven Qualification of Integrated Circuits
JESD 94	Application specific qualification using knowledge based test methodology
JESD 22	Reliability test methods for packaged devices
MIL-STD-750C	Test method for semiconductor devices
AEC-Q005	Pb-Free Test Requirements

2 GLOSSARY

SS	Sample Size
PC	Pre-Conditioning
HTRB	High Temperature Reverse Bias
TC	Temperature Cycling
H3TRB	High Humidity High Temperature Reverse Bias
IOLT	Intermittent Operating Life Test
UHAST	Unbiased Highly Accelerated Stress Test
DPA	Destructive Physical Analysis (after TC and THB)
GD	Generic Data
SD	Solderability test
RSH	Resistance to Soldering Heat
THS	Temperature Humidity Storage
TJ max	Maximum junction temperature

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

The objective of this report is to validate that STPS200170TV1Y product can reach a maximum junction temperature of 175°C.

The involved products are listed in the table here below:

Product	Product Family	Package	Wafer Fab	Assembly Location
STPS200170TV1Y	POWER SCHOTTKY	ISOTOP	ST SINGAPORE	ST BOUSKOURA – MOROCCO

The test methodology follows ST internal procedure:

- Wafer level test to guarantee that there will be no deterioration of the products characteristics after exploring a maximum junction temperature of 175°C
- Package level test to guarantee that package materials can sustain an exploration of the maximum junction temperature of 175°C at die level

3.2 Conclusion

Qualification Plan requirements have been fulfilled without exception. Tests have shown that the devices behave correctly after exploring a maximum junction temperature of 175°C.

4 DEVICE CHARACTERISTICS

4.1 Device description

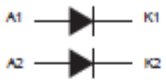
ST specification:

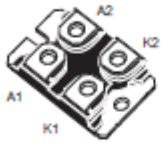
life.augmented

STPS200170TV1Y

Datasheet

Automotive 170 V, 2 x 100 A, high voltage power Schottky rectifier





ISOTOP

Features

- AEC-Q101 qualified
- PPAP capable
- Operating T_j from -40 °C to +175 °C
- Negligible switching losses
- Low leakage current
- Avalanche rated
- Good trade-off between leakage current and forward voltage drop
- Insulated package ISOTOP comply with UL1557 insulation:
  - Insulated voltage: 2500 V_{RMS} sine
- ECOPACK2 compliant component

Applications

- DC/DC converter, especially in hybrid or electrical vehicles
- Secondary rectification
- LLC topologies
- Phase shift topologies

Product status link
STPS200170TV1Y

Product summary	
Symbol	**Value**
$I_{F(AV)}$	2 x 100 A
V_{RRM}	170 V
T_j (max.)	175 °C
V_F (typ.)	0.63 V

Description

This high voltage Schottky rectifier is suitable for high frequency switch mode power supplies.

Packaged in ISOTOP, the STPS200170TV1Y is intended for use in secondary rectification applications and more precisely in DC/DC converters in hybrid and electrical vehicles.

4.2 Construction Note

	STPS200170TV1Y
Wafer/Die fab. information	
Wafer fab manufacturing location	ST SINGAPORE
Technology / Process family	Power Schottky Rectifier
Wafer Testing (EWS) information	
Electrical testing manufacturing location	ST SINGAPORE
Assembly information	
Assembly site	ST BOUSKOURA - MOROCCO
Package description	ISOTOP
Final testing information	
Testing location	ST BOUSKOURA - MOROCCO

5 TESTS RESULTS SUMMARY

5.1 Test vehicles

Lot #	Part Number	Package	Comments
L1	STPS200170TV1Y	ISOTOP	Qualification lot

Detailed results in below chapter will refer to these references.

5.2 Test plan and results summary

Test	Std ref.	Conditions	Steps / Duration	SS	Failure/SS
					L1
Die Oriented Tests					
Wafer level test to guarantee Tj max	ST internal specification	Ir, Vf parameters after 175°C exploration	-	30	0/30
Package Oriented Tests					
Package level test to guarantee Tj max	UL Certification 1557 (File E81734)	201°C	5Khrs	21	0/21