

## Reliability Evaluation Report

STLQ020PUR, L7986TR, LD59100PUR, L7981TR,  
SR1UARU  
QFN in CARSEM - CHINA

General Information		Location	
Product Line	U1Q301, UA5001, UAY701, UQ7301, W6BA01	Wafer Fab	Catania CTM8 8, AM6F
P/N	STLQ020PUR, L7986TR, LD59100PUR, L7981TR	Assembly plant	CARSEM - CHINA
Product Division	AMS	<b>Results</b>	
Package	VFQFPN 2X2 6L, VDFPN 3x3 10L/8L, UFDFPN 1X1.45 6L		
Silicon Process Technology	BCD6S, BCD8, HCMOS4TZ	Reliability Assessment	PASS

### DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	12/2/2022	4	Antonio Russo	Ivan Grasso	Intermediate Report
1.1	12/7/2022	4	Claudine Larato	Stephane Bellenger	Intermediate Report

Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.

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## 1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

## 2 GLOSSARY

	Short description
T <sub>j</sub>	Temperature at junction of the device
T <sub>A</sub>	Temperature of ambient air
RH	Relative Humidity
V <sub>cc max</sub>	Max Operative Voltage

## 3 RELIABILITY EVALUATION OVERVIEW

### 3.1 Objectives

This document is intended to provide reliability evaluation report of New Assembly plant CARSEM - CHINA for small QFN (VFQFPN 2X2 6L, VDFPN 3x3 10L/8L, UDFPN 1X1.45 6L ) package

### 3.2 Conclusion

Qualification requirements have been fulfilled without exception. Reliability tests have shown that the devices behave correctly against environmental tests (no failure). The stability of electrical parameters during the accelerated tests demonstrates the ruggedness of the products and safe operation, which is consequently expected during their lifetime.

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## 4 TESTS RESULTS SUMMARY

ST refers to the JEDEC standard JESD47 when conducting reliability tests for the qualification of new product.

### 4.1 Test plan and results summary

Table 1. Package qualification tests

Stress (Abb.)	Ref.	Conditions	Requirements				Notes
			# Lot	SS	Duration	Pass Criteria (Fails / Tested)	
MSL Preconditioning Must be performed prior to: THB, HAST, TC, AC, & UHAST	JESD22 A113 J-STD-020	Preconditioning: (Test @ Rm) SMD only; Moisture Preconditioning for THB/HAST, AC/UHST, TC, & PTC; Peak Reflow Temp = 260C	MSL1/MSL3				2
High Temperature Storage Life (HTSL)	JESD22 A103	T <sub>A</sub> ≥ 150°C	9	720	168hrs 500hrs 1000hrs	0/720 0/720 Running	3
Unbiased HAST (UHAST)	JESD22 A118	130 °C / 85% RH	9	720	96hrs	0/720	1,3
Temperature Cycling (TC)	JESD22 A104	-65°C to +150°C	9	720	500 cycles 1000 cycles	0/720 Running	1,3
Temperature Humidity bias (THB)	JESD22-A101	85 °C, 85 % RH, Vcc max	3	240	168hrs 500hrs 1000hrs	0/231 Running	1,4

Table 2. Assembly integrity Tests

Stress (Abb.)	Ref.	Conditions	Requirements			Notes
			# Lot	SS	Pass Criteria (Fails / Tested)	
Solderability	J-STD-002	>95% Lead coverage	9	40 units / All Lead	PASS	3
WBP	Mil-STD-883, Method 2011	30 wires, characterization	9	40 units / All bonds	PASS Cpk>1.67	3
WBS	JESD22-B116	30 balls, characterization	9	40 units / All bonds	PASS Cpk>1.67	3

Notes:

1. Preconditioning with soak per J-STD-020 at rated moisture sensitivity level prior to acceleration stress testing.
2. MSL1 has been performed on STLQ020PUR, LD59100PUR and SR1UARU. MSL3 has been performed on L7981TR and L7986TR
3. It has been performed on 3 lots of STLQ020PUR, STLQ020PUR and 1 lot of L7981TR, L7986TR and SR1UARU.
4. It has been performed on STLQ020PUR

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**PCN Title** : Small QFN Testing: Transfer from ST Calamba to Carsem China.

**PCN Reference** : AMS/23/13821

**Subject** : Public Products List

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

STKNXTR	SR1LARU	STLQ020PU19R
L7986TR	SR1UARU	SR1PBBU
STM6519APARUB6F	STM6519AUARUB6F	L7985TR
STM6519APAAUB6F	STM6519APBBUB6F	STM6519AHARUB6F
STLQ020PUR	LD59100PUR	STLQ020PU28R
L7980TR	SR1HARU	STM6519ALARUB6F
SR1PAAU	STKNX	L7981TR
SR1CARU	STM6519ACARUB6F	SR1PARU

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