



PRODUCT / PROCESS CHANGE NOTIFICATION
PCN-000702
Date: 01-19-2022 P1/9

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012

Change Details

Part Number(s) Affected: TS13101-QFNR	Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A
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Description, Purpose and Effect of Change:
 Assembly transfer - For Device TS13101-QFNR
 Assembly Transfer from Carsem Suzhou to Carsem Malaysia
 Qualification and Reliability report attached

Change Classification	<input checked="" type="checkbox"/> Major <input type="checkbox"/> Minor	Impact to Form, Fit, Function	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Impact to Data Sheet	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Revision or Date	<input checked="" type="checkbox"/> N/A


Impact to Performance, Characteristics or Reliability:
 No Impact to performance , Characteristics or Reliability

Implementation Date	01/19/2022	Work Week	WW03
Last Time Ship (LTS) <small>Of unchanged product</small>	N/A	Affecting Lot No. / Serial No. (SN)	N/A
Sample Availability	-	Qualification Report Availability	Yes

Supporting Documents for Change Validation/Attachments:

- TS13101-QFNR – Qual Data (attached to letter)
- TS13101-QFNR – Assembly Qual Data (attached to letter)

Issuing Authority

Semtech Business Unit:	Power Management	
Semtech Contact Info:	<i>Carlos Sierra</i> Quality Assurance Semtech Corporation 200 Flynn Road Camarillo, CA, 93012 csierra@semtech.com	Digital signature 

FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: <http://www.semtech.com/contact/index.html#support>






TS13101-QFNR Carsem Ipoh Qualification Report

The information in this presentation contains CONFIDENTIAL SEMTECH INFORMATION.
NOTE: all company non-public information must be kept confidential and should not be disclosed.


TS13101-QFNR– Qual Data



Description	Acceptance Criteria	Remarks	Data
Test Repeatability: - 3-5 Devices loop run 30 times;	Pass or Fail 100% match	PASS Done. 10 Units 33X – PASS Consistently. Data as in attached file.	 loop33x data
Bin-to-Bin Correlation: - For each production test insertion, a minimum sample of 300 units must be used. - Minimum 15 reject units.	100% Bin-to-Bin correlation for all good and reject units - Pass/fail correlation; - Bin Swap/flip - Yield difference (Bin Paretos) - Wafer map;	PASS Done. Attached is the data and summary. All samplings are matching for Bin to Bin Summary vs Physical	 correlation
QA gate validation: -Good units from 3 different wafer lots shall be tested 100% at QA gate after these lots have been processed through final production test flow.	No QA Gate failures.	PASS Done. Attached is the data and summary. All 100% Inline QA sampling test is PASS	 QA

TS13101-QFNR– Qual Data



Description	Acceptance Criteria	Remarks	Data
Tester-to-tester variation: GR&R - Perform tester to tester variation analysis for selected parameters; - Tester 1, Tester 2; - DIB1, DIB2; - Test site 1 to test site n;	Tester-to-Tester variation (GR&R) for selected parameters: - GRR<=10% Acceptable; - GRR<=33% Waiver required; - GRR >33% reject;	PASS Done. All within spec. Using Site 1 and Site2 from same tester.	

TS13101-QFNR– Qual Data



CPK Carsem Ipoh VS Carsem Suzhou

Conclusion:
 CPK for both Suzhou and Carsem more than 1.33 for all test.
The CPK result is acceptable.



TS13101-QFNR– Qual Data
SPIKE CHECK



- Spike Check done ETS, while loop testing the device.
- No ripple found and no device damaged during the loop test.
- All the waveform captured within acceptable range
- Details are in the spike plot check attached.
- Spike check for both Carsem Suzhou and Carsem Ipoh are compatible



TS13101-QFNR– Qual Data- Other
Summary



- No changes do to the Test Program, Limits:
FT Program: *EF1310101 (TP-001394)*
QA Program: *EF1310101 (TP-001394)*
- Both Carsem Suzhou and Ipoh uses the same Tester Platform (ETS)
- Both Carsem Suzhou and Ipoh uses the same QC flow diagram
100% FT and Sample QA.
- No Changes required in Control Plan and FMEA.



PCN No. 000702
Qualification of Carsem Ipoh for TS13101-QFNR products

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Introduction

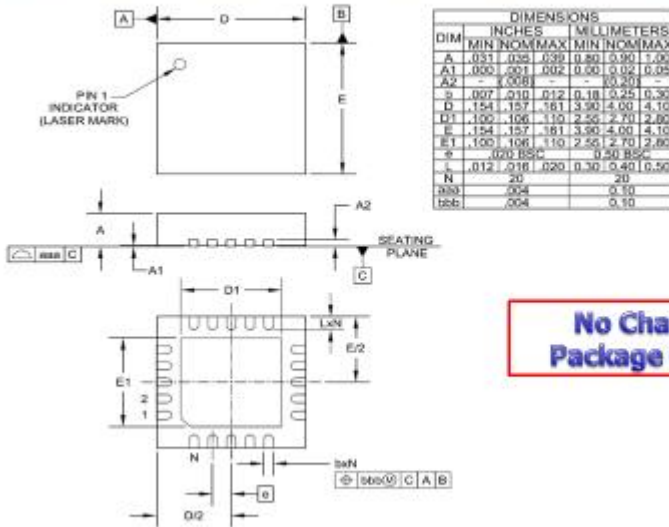


- TS13011-QFNR is been qualified in carsem Ipoh, Malaysia as a site for assembly. Current Assembly is performed in Carsem SuZhou, China.
- The change affect applicable to products:
TS13101-QFNR
- Qualification Vehicles selected are 21-01-0014-A2
- Schedule for Implementation
Passing REL qualification MSL 1 under Rel job# 7196.

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2

SEMTECH Package Outline on TS13101-QFNR CarsemSZ (Old) and CarsemIPH (New)



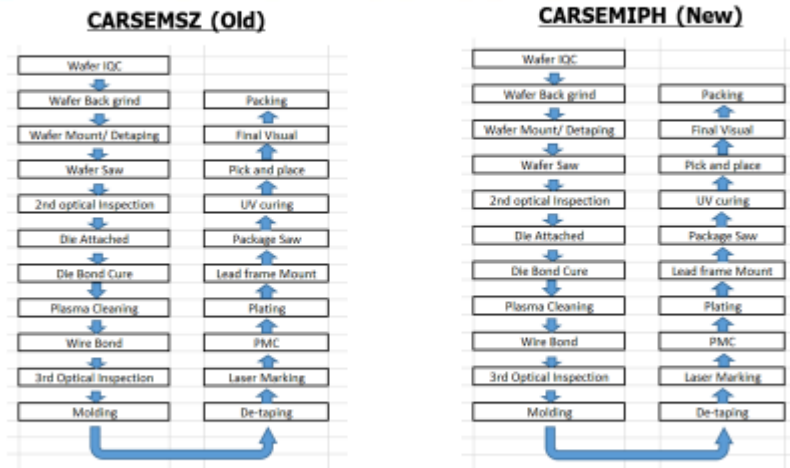
No Change in Package Outline.

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Assembly Process Flow Comparison for CarsemSZ (Old) vs. CarsemIPH (New)



Assembly Process Flow:



- No Change in manufacturing Flow for both Assembly site CarsemSZ versus CarsemIPH.

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BOM Comparison CarsemSZ (Old) vs CarsemIPH (New)



CarsemSZ (Old)				CarsemIPH (New)			
Epoxy	Leadframe	Wire Type	Mold compound	Epoxy	Leadframe	Wire Type	Mold compound
Henkel QMI-519 Conductive epoxy	ASM Spore AgCu LDF	1.2 mils PdCu wire	Sumitomo G770HCD	Henkel QMI-519 Conductive epoxy	ASM Msia AgCu LDF	1.2 mils PdCu wire	Sumitomo G770HCD

- BOM for both supplier CarsemSZ and CarsemIPH are no difference.
- Lead frame base material and finishing is identical for both supplier. Both ASM Spore and ASM Msia are using the same lead frame mask set and equipment.

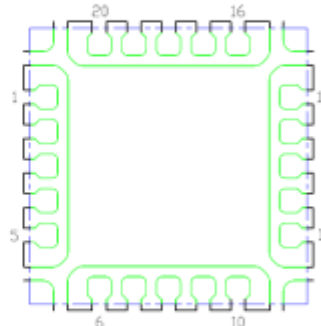
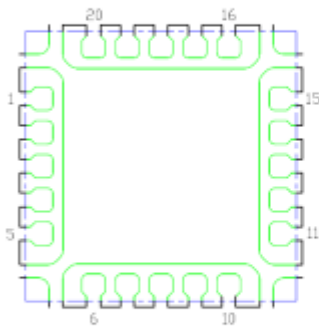
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Lead frame outline Comparison ASM Spore (OLD) Vs ASM Msia (NEW)



OLD Lead frame (ASM Spore)

NEW Lead frame (ASM Msia)



Die Pad : 2.9 x 2.9mm
Exposed Pad : 2.7 x 2.7mm

Die Pad : 2.9 x 2.9mm
Exposed Pad : 2.7 x 2.7mm

No Difference on lead frame outline for ASM Spore and ASM Malaysia

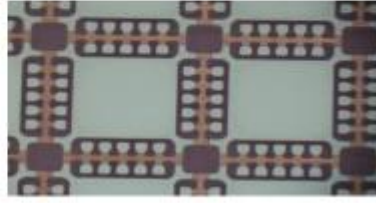
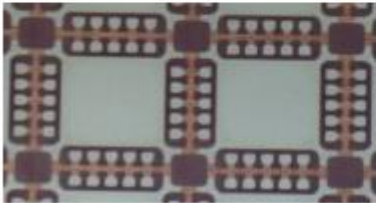
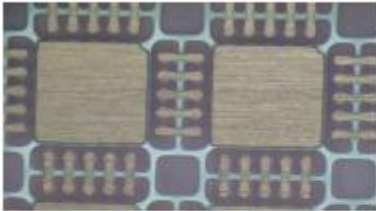
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**Lead frame outline Comparison ASM Spore (OLD)
Vs ASM Msia (NEW)**



OLD Lead frame (ASM Spore)

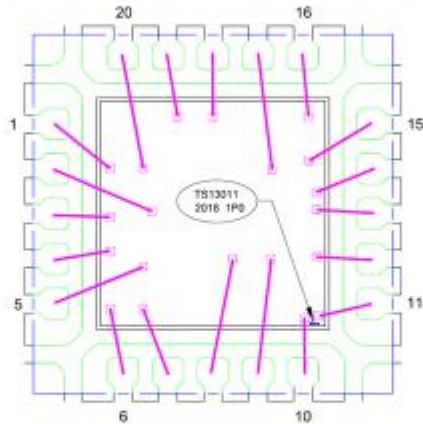
NEW Lead frame (ASM Msia)



No Difference on lead frame outline for ASM Spore and ASM Malaysia

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**Bonding Layout (CarsemSZ vs
CarsemIPH)**





No Change in Bonding Layout.

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**Solder ability test Comparison CarsemSZ
(Old) vs CarsemIPH (New)**



	Carsem - IPH	Carsem - SZ
A.) Without Steam Aging (0hr)	Passed	Passed
B.) With Steam Aging (8hr)	Passed	Passed
Solderability	Carsem-IPH	Carsem SZ
Without Steam aging (0 hrs)		
	Passed	Passed
With Steam aging (8 hrs)		
	Passed	Passed

Solder ability test for both supplier is passed.