



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000703

Date: 01-03-2022

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Semtech Corporation, 200 Flynn Road, Camarillo CA 93012			
Change Details			
Part Number(s) Affected: TS13102-QFNR		Customer Part Number(s) Affected: ☒ N/A	
Description, Purpose and Effect of Change: Assembly transfer - For Device TS13102-QFNR Assembly Transfer from Carsem Suzhou to Carsem Malaysia Qualification and Reliability report attached			
Change Classification	☒ Major ☐ Minor	Impact to Form, Fit, Function	☐ Yes ☒ No
Impact to Data Sheet	☐ Yes ☒ No	New Revision or Date	☒ N/A
Impact to Performance, Characteristics or Reliability: No Impact to performance , Characteristics or Reliability			
Implementation Date	01/03/2022	Work Week	WW01
Last Time Ship (LTS) Of unchanged product	N/A	Affecting Lot No. / Serial No. (SN)	N/A
Sample Availability	-	Qualification Report Availability	Yes
Supporting Documents for Change Validation/Attachments: • TS13102-QFNR – Qual Data (attached to letter) • TS13102-QFNR – Assembly Qual Data (attached to letter)			

Issuing Authority		
Semtech Business Unit:	Power Management	
Semtech Contact Info:	Carlos Sierra 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		



TS13102-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.

TS13102-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.	 TS102-QFNR_216842.1_10PCS_33X.zip
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 Pareto) - Wafer map;	PASS Done. Attached is the data and summary. All samplings are matching for Bin to Bin Summary vs Physical	 Bin to Bin 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. For 1 Qualification lot Attached is the data and summary. All 100% Inline QA sampling test is PASS	 QA

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TS13102-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: - GR<=10% Acceptable; - GR<=33% Waiver required; - GR >33% reject;	PASS Done. All within spec. Using Site 1 and Site2 from same tester.	 GR&R

TS13102-QFNR– Qual Data

CPK Carsem Ipoh VS Carsem Suzhou



T#	name	units	SUZHOU				IPOH			
			excess	mean	stddev	cpk	excess	mean	stddev	cpk
400001	SW1_STRESS	VOLTS	1809	64.7643605	0.123346898	0.836777272	1488	64.72608805	0.087972175	1.037871527
400002	SW2_STRESS	VOLTS	1586	64.95802579	0.134005072	0.104409506	1487	64.91951998	0.078221605	0.342957336
600006	IVSG_PST_Sp2SV	uAMPS	934	1.770594703	0.3133069	0.19650765	1412	1.802055829	0.288573791	0.926459548
1400002	TOLK_MIN_ON	USECONDS	906	0.849971988	0.022668138	0.294510849	1392	0.84218627	0.0249545	0.371526016
1400005	TRIT_MIN	USECONDS	906	6.796775908	0.18134494	0.368035613	1392	6.737490159	0.199636002	0.438314289
1500001	VGG	VOLTS	906	5.423539218	0.012533509	0.703730128	1392	5.41967281	0.012412581	0.83441285

Conclusion:

- From the Cpk data comparison most of test parameter are Good.
- Critical parameters looks good.
- 6 Test parameters with CPK lower than 1.33
- However these test are comparable between Carsem Ipoh and Carsem Suzhou. Ipoh results are better.

Overall result is acceptable.



TS13102-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.



TS13102-QFNR– Qual Data- Other Summary



- ☐ No changes do to the Test Program, Limits:
FT Program: EF1310204 (FTP-TS13102-QFNR-ETS-Rev04 (ECO-049930))
QA Program: EF1310204 (QTP-TS13102-QFNR-ETS-Rev04 (ECO-049930))
- ☐ 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. 000703
Qualification of Carsem Ipoh for TS13102-QFNR products

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Introduction



- ☐ TS13102-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:
TS13102-QFNR
- ☐ Qualification Vehicles selected are ZSPM4561CI1R
- ☐ Schedule for Implementation
Passing REL qualification MSL 1 under Rel job# 7197.

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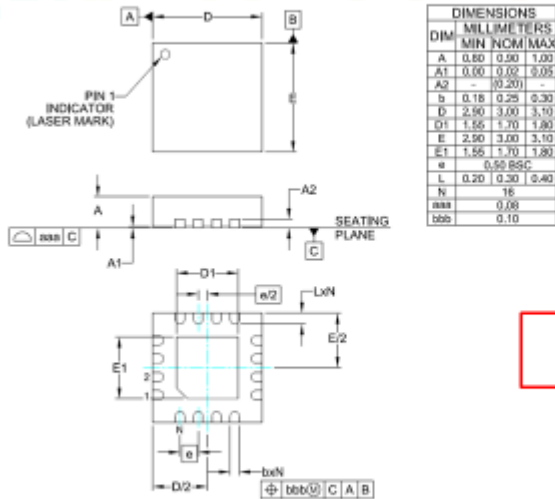
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SEMTECH Package Outline on TS13102-QFNR CarsemSZ (Old) and CarsemIPH (New)



**No Change in
Package Outline.**

- NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
 2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

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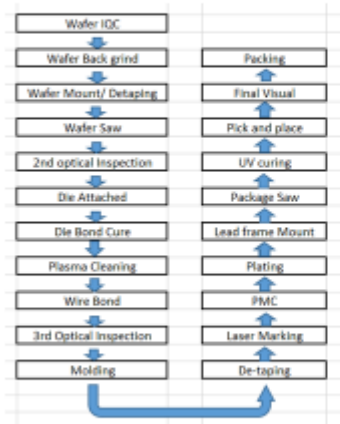
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Assembly Process Flow Comparison for CarsemSZ (Old) vs. CarsemIPH (New)



Assembly Process Flow:

CARSEMSZ (Old)



CARSEMIPH (New)



- No major Change in manufacturing Flow for both Assembly site CarsemSZ versus CarsemIPH except additional process step for plasma cleaning before mold for CarsemIPH.

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BOM Comparison CarsemSZ (Old) vs CarsemIPH (New)



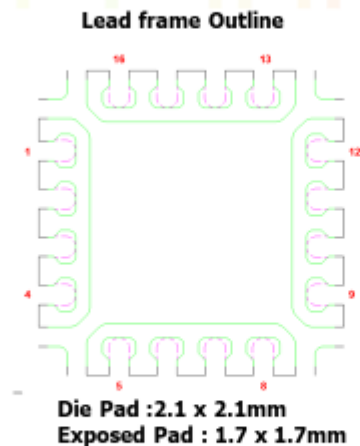
CarsemSZ (Old)				CarsemIPH (New)			
Epoxy	Leadframe	Wire Type	Mold compound	Epoxy	Leadframe	Wire Type	Mold compound
Henkel QMI-519 Conductive epoxy	DCI AgCu LDF	1.2 mils PdCu wire	Sumitomo G770HCD	Henkel QMI-519 Conductive epoxy	DCI AgCu LDF	1.2 mils PdCu wire	Sumitomo G770HCD

- BOM for both supplier CarsemSZ and CarsemIPH are no difference.

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Lead frame outline Comparison CARSEMSZ (OLD) Vs CARSEMIPH(NEW)

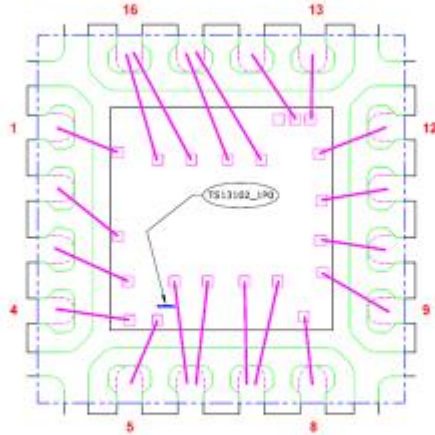


No Difference on lead frame outline for CARSEMSZ and CARSEMIPH as both are using the same lead frame.

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**Bonding Layout (CarsemSZ vs
CarsemIPH)**



No Change in Bonding Layout.