



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000837

Date: 06-06-2022

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Semtech Corporation, 200 Flynn Road, Camarillo CA 93012			
Change Details			
Part Number(s) Affected: TS32101-QFNR		Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A	
Description, Purpose and Effect of Change: Final test - For Device TS32101-QFNR FT transfer from Carsem Suzhou to Carsem Malaysia Qualification and Reliability reports 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	05/02/2022	Work Week	WW18
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: <ul style="list-style-type: none"> TS32101-QFNR – FT Qual Data (attached to Letter) TS32101-QFNR - Assembly data (attached to letter) 			

Issuing Authority	
Semtech Business Unit:	Power Management
Semtech Contact Info:	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p><i>Carlos Sierra</i> Quality Assurance Semtech Corporation 200 Flynn Road Camarillo, CA, 93012 csierra@semtech.com</p> </div> <div style="width: 35%; text-align: center;"> </div> </div>
FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: http://www.semtech.com/contact/index.html#support	

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TS32101-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.

TS32101--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.	 10pcs_loop_33X
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	 FT_Yield sum
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	 FT_Yield sum


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TS32101--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.	 GRR

TS32101--QFNR-- Qual Data



CPK Carsem Ipoh VS Carsem Suzhou

T#	Name	units	SUZHOU			IPOH				
			Execs	Mean	Stdev	CPK	Execs	Mean	Stdev	CPK
90011100	ls_ilm_trim		2230	0.623766816	0.500824593	0.415159868	1124	0.665480427	0.471822242	0.470149114
93030702	ls_ilm		2233	0.616659203	0.491695604	0.418049431	1124	0.665480427	0.471822242	0.470149114
90011200	ls_ilm_meas	mAMPS	2230	695.6157283	40.62271928	1.194862702	1124	691.5925226	42.25673164	1.116922718
91620200	vout_ov_meas	VOLTS	2225	1.239835795	0.003266706	1.248537861	1124	1.240783612	0.003443528	1.124469657

Conclusion:

- From the CPK , most parameters are above 1.33, expect for 4 Test.
- The baseline between Suzhou and Carsem is similar for the test and acceptable. These are not critical Parameters.



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TS32101--QFNR-- Qual Data

SPIKE CHECK



- Spike Check done ETS, while loop testing the device.
- No ripple found and no device damaged during the 1000X 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.



Spike check data

TS32101--QFNR-- Qual Data- Other Summary



- No changes do to the Test Program, Limits:
FT Program: EF3210104 (TP-001062(EF3210104_0323))
QA Program: EF3210104 (TP-001062(EF3210104_0323))
- 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.

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Qualification of Carsem Ipoh for TS32101-QFNR products

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Introduction



- TS32101-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:
TS32101-QFNR
- Qualification Vehicles selected are ZSPM4561CI1R
- Schedule for Implementation
Passing REL qualification MSL 1 under Rel job# 7197.

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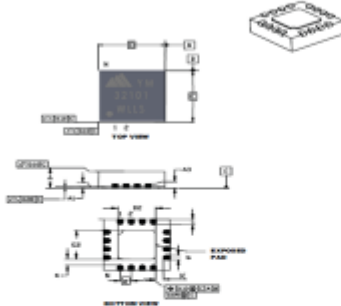
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SEMTECH Package Outline on TS32101-QFNFR CarsemSZ (Old) and CarsemIPH (New)



No Change in Package Outline.

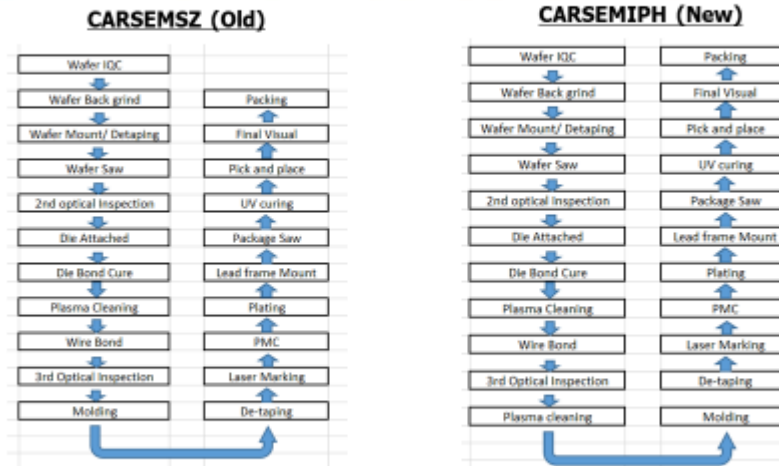
	Units		MILLIMETERS	
	Dimension	Limits	MIN	MAX
Number of Pins	N		16	
Pitch	a		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		3.00 BSC	
Exposed Pad Width	E2	1.55	1.70	1.80
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.55	1.70	1.80
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.20	0.30	0.40
Contact-to-Exposed Pad	K	0.20	-	-

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



Assembly Process Flow:



- 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

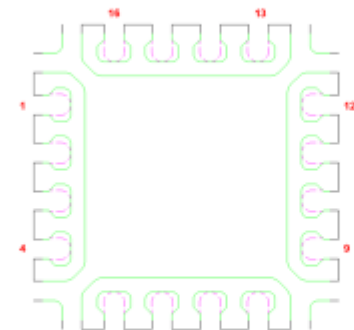
- BOM for both supplier CarsemSZ and CarsemIPH are no difference.

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



Lead frame Outline



Die Pad : 2.1 x 2.1mm
Exposed Pad : 1.7 x 1.7mm

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

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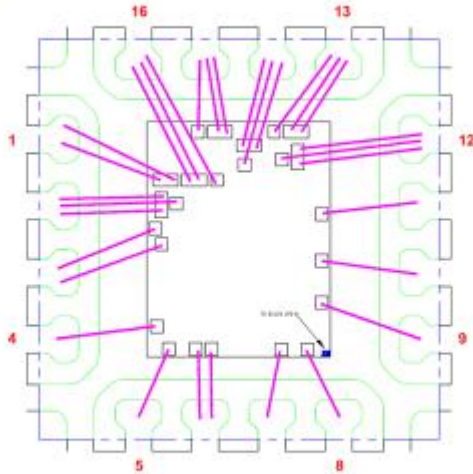
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Bonding Layout (CarsemSZ vs CarsemIPH)



No Change in Bonding Layout.