PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000604

Date: Jan-30-2020

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☒	Semtech Canada Corporation, 4281 Harvester Road, Burlington, Ontario L7L 5M4 Canada
☐	Semtech Irvine, 5141 California Ave., Suite 100, Irvine CA 92617
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☐	Semtech Bristol - EMEA Limited, Block B, St James Court, Great Park Road, Bristol BS32 4QJ, UK
☐	Semtech Corpus Christi SA de CV, Carretera Matamorros Edificio 7, Reynosa, Tamaulipas, Mexico 88780
☐	Semtech Plano, 1101 Resource Drive, Suite 121, Plano TX 75074
☐	

Change Details

Part Number(s) Affected:

GN1411AINE3
GN1411AINTE3D
GN1412AINE3
GN1412BINE3
GN1412BINTE3D
GN1444-INE3
GN1444-INTE3D
GN2010D-INE3
GN2010D-INTE3D
GN2010EAINE3
GN2010EAINTE3D
GN2012AINE3
GN2017AINE3
GN2017AINTE3Z
GN2017AINTE3Z-K
GN2040-INE3
GN2040-INTE3D
GN2042-INE3
GN2042-INTE3D
GN2044-INE3
GN2044-INTE3D
GN7152-INE3
GN7152-QFN-TR
GN7152-QFN-TR-K
GX4002-INE3

Customer Part Number(s) Affected: ☐ N/A

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Description, Purpose and Effect of Change:

Semtech is advising that a new alternative source Greatek has now been qualified for assembly of 5x5mm 32L QFN package. The main objective is for mass production capacity expansion and sustainability.

This family of products are currently assembled by Semtech's contact manufacturers Unisem & ASEM.
Greatek is Semtech's approved contract manufacturer for many other products and packages.

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:

Qualification vehicles GN2010D and GN1444 have passed series of stress test, no impact to product performance, characteristics and reliability.

Implementation Date	April 30 2020	**Work Week**	
Last Time Ship (LTS) **Of unchanged product**		**Affecting Lot No. / Serial No. (SN)**	
Sample Availability		**Qualification Report Availability**	

Supporting Documents for Change Validation/Attachments:

- Reliability qualification report
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Issuing Authority		
Semtech Business Unit:	Signal Integrity Products	
Semtech Contact Info:	Dusanka Hewlett QMS Engineer, Quality Assurance Semtech Canada Corporation 289-856-9272 dhewlett@semtech.com	DHewlett

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

5X5 32L QFN from Greatek Reliability Qualification Report

Revision History

Version	ECR	Date	Modifications
0	ECO-050151	Jan 2020	New Release
1	ECO-050292	Jan 2020	Correcting Typos

Contents

1 Background

GN2010 family devices (5x5 32L QFNs) are currently being assembled in Unisem and ASEM. However, the assembly are being relocated to Greatek to achieve a better cost solution. This qualification intends to make sure the change in assembly site would not result in reduced quality or reliability of Semtech IC devices.

2 Product Scope

Out of all the products in GN2010 family, GN2010D and GN1444 were selected as qualification vehicle for each BOM group respectively. The others were determined to be similar to either one of the two products selected and, thus, can be bridged to one of them. All of the products covered by this qualification are listed in table 1.

Table 1: All products in GN2010 family covered in this qualification

Product	Qualification Vehicle
GN1411A, GN1412A, GN1412B, GN2010D, GN2010EA, GN2012A, GGN2017A, GX4002	GN2010D
GN7152, GN1444, GN2040, GN2042, GN2044	GN1444

3 Qualification Approach

Since the change was only package assembly site and the entire product listed in table 1 had been previously qualified, HTOL, ESD and LU were not required. Three lots of GN1444 and GN21010D were selected and package level stress (TC, uHAST and HTS) were carried out to assess the impact from the assembly site change. TC and uHAST parts were treated with their corresponding level of preconditioning (MSL1 for GN1444 and MSL3 for GN2010D) prior to the stress. In addition, pre and post C-SAM/X-Ray were performed to examine if delamination occurred during stresses. Furthermore, cross section analysis was carried out on one GN1444 devices in order to verify the BOM.

Note 1: Due to limited quantity, less than 30 units per lot per stress level was used in this qualification.

4 Reliability Qualification Stresses

Table 2: Reliability qualification stresses for GN2010D

Stress	Conditions	Duration	Vehicle	Sample Size	Result
X-sectional analysis	BOM verification via X-Ray, EDX and SEM	NA	GN2010D	1	Pass
Temp Cycling	JESD22-A104 -40°C, +125°C (Condition G) MSL3 preconditioning	850 cycles	GN2010D	25, 27, 27 from each of 3 lots (total:79)	Pass
HTS	JESD22-A103 150ºC, Condition B	1000 hours	GN2010D	25, 27, 27 from each of 3 lots (total:79)	Pass
Unbiased HAST	JESD22-A118 130 ºC, 85% RH (Condition A) MSL3 preconditioning	96 hours	GN2010D	25, 27, 27 from each of 3 lots (total:79)	Pass
C-SAM	Pre and post C-SAM	NA	GN2010D	75, 81,81 from each of 3 lots	Pass
X-Ray	Pre and post X-ray	NA	GN2010D	75, 81,81 from each of 3 lots	Pass

Table 3: Reliability qualification stresses for GN1444

Stress	Conditions	Duration	Vehicle	Sample Size	Result
Temp Cycling	JESD22-A104 -40°C, +125°C (Condition G) MSL1 preconditioning	850 cycles	GN1444	27 units X 3 lots	Pass
HTS	JESD22-A103 150ºC, Condition B	1000 hours	GN1444	27 units X 3 lots	Pass
Unbiased HAST	JESD22-A118 130 ºC, 85% RH (Condition A) MSL1 preconditioning	96 hours	GN1444	27 units X 3 lots	Pass
C-SAM	Pre and post C-SAM	NA	GN1444	81 units X 3 lots	Pass
X-Ray	Pre and post X-ray	NA	GN1444	81 units X 3 lots	Pass

5 Conclusion

In conclusion, all parts passed qualification. Therefore, the assembly site change to Greatek for products in GN2010 family has been qualified.