



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000899

Date: NOV-08-2023

Change Details							
Part Number(s) Affected: GN1444SINE3 GN1444SINTE3D GN2044SINE3 GN2044SINTE3D GS6151-INE3 GS6151-INTE3 GS6151-INTE3Z		Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A					
Description, Purpose and Effect of Change: DUAL SOURCING In order to improve supply chain security and efficiency, Semtech has qualified GREATEK in Taiwan as a second assembly source for the affected part numbers listed above. This change applies to 32MLPQ 4x4mm packages, currently assembled by ASEM in Malaysia. Final test is still performed by ASE in Malaysia for GS6151 and KYEC in Taiwan for GN1444S and GN2044S. There are no changes to the test platform or test programs. The comparisons between ASEM and GREATEK on the next pages show that there are few differences in materials and equipment. <table border="1" data-bbox="318 1465 1333 1570"><thead><tr><th>Current assembly source</th><th>Secondary assembly source</th></tr></thead><tbody><tr><td>ASEM</td><td>GREATEK</td></tr></tbody></table>				Current assembly source	Secondary assembly source	ASEM	GREATEK
Current assembly source	Secondary assembly source						
ASEM	GREATEK						
Change Classification	<input type="checkbox"/> Major <input checked="" 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: <ul style="list-style-type: none">Overall qualification meets the requirements for assembly, testing, and reliability. The change has no effect on performance, characteristics, or reliability.							



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000899

Date: NOV-08-2023

Implementation Date	JAN-31-2024	Work Week	05
Last Time Ship (LTS) Of unchanged product	N/A	Affecting Lot No. / Serial No. (SN)	N/A
Sample Availability	OCT-13-2023 GN1444SINE3	Qualification Report Availability	OCT-13-2023

Supporting Documents for Change Validation/Attachments:

- PRODDOC029958 Reliability Qualification Report

Quality Assurance		
Semtech Business Unit	Signal Integrity Product Group	
Semtech Contact Info:	Pedro Jr. Bernas pbernas@semtech.com (289) 856-9326 x 1162	
FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: http://www.semtech.com/contact/index.html#support		

COMPARISONS

➤ MATERIAL

Material	Current Source ASEM	Second Source GREATEK
Lead frame	QPL	Chang Wah Elec. (Sumitomo)
Epoxy	Hitachi HR-5104T	Nitto EM430
Mold compound	EME G770HCD	EME G700H
Wire	1.0mil CuPd	1.0mil CuPd

* The BOM (Bill of Material) for Greatek is qualified and running at high volume in mass production.



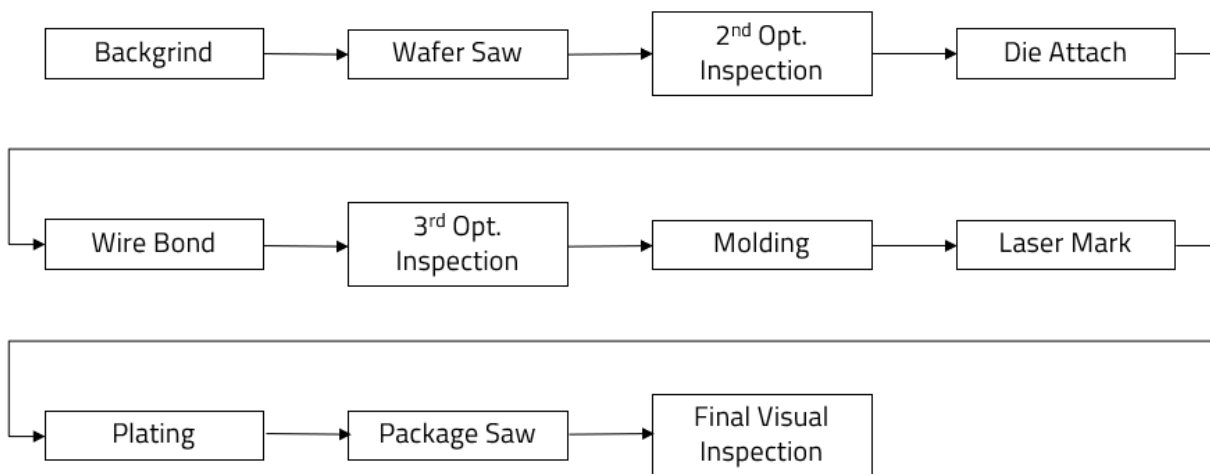
PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000899

Date: NOV-08-2023

➤ PROCESS FLOW

- GREATEK and ASEM follow the same process flow, which is outlined below.



➤ EQUIPMENT

- Equipment in GREATEK and ASEM is standard mass production equipment that can meet package requirements.

Process step	Current Source ASEM	Second Source GREATEK
Backgrind	Disco PG300RMA	Disco DFG 850, 8540, 8560
Wafer saw	Disco D641	Disco DFD-6340, 6361, 6560
Die attach	ASM 898	BESI 2100 series
Wire bond	KNS Maxum series	KNS & ESEC Iconn, ProCu, 3100, 3200
Molding	Daiichi GP-PRO8	TOWA Y1
Package Sawing	Disco D6340	TOWA FMS 3040



Reliability Qualification Report for 4x4mm 32L QFN package Products at Greatek

Revision History

Version	ECO	Date	Modifications
0	ECO-068750	October 2023	New Release

Contents

Revision History	2
Contents	2
1 Background	3
2 Product Scope	3
3 Qualification Approach	4
4 Reliability Qualification Stresses	5
5 Conclusion	6

1 Background

Semtech's 4x4mm 32L QFN package products are currently being assembled in ASEM, and FT at KYEC. To meet customer demand and to ensure timely delivery, a dual source qualification at Greatek was initiated. The purpose of this qualification is to qualify Greatek as a second assembly site for 4x4mm 32L QFN products.

2 Product Scope

A total of 7 products will be affected by this process change. The products affected, and their package type, are listed in table 1

Table 1: all products covered in this qualification and their package type.

Products	Package type	Qualification Vehicle
GN1444SINE3	4x4mm 32L QFN	GN1444S-IE3
GN1444SINTE3D	4x4mm 32L QFN	
GN2044SINE3	4x4mm 32L QFN	
GN2044SINTE3D	4x4mm 32L QFN	
GS6151-INE3	4x4mm 32L QFN	
GS6151-INTE3	4x4mm 32L QFN	
GS6151-INTE3Z	4x4mm 32L QFN	

3 Qualification Approach

All products listed in table 1 have already been fully qualified previously (see table 2 for product document number of each qualification report). Out of all affected products, GN1444S-IE3 was selected as qualification vehicle based on their package size/type and sales volume. This qualification only intends to assess the reliability impact of having 4x4mm 32L QFN products assembled at Greatek. Thus, die-level reliability stresses (HTOL, ESD and LU) were not planned. TC, UHAST and HTS were carried out on three lots of each product. CSAM was performed on 22 randomly selected parts from each lot and stresses at T0, post MSL (if applicable) and post stresses. For more information about the conditions of the qualification stresses and sample size, please refer to table 3 in section 4.

Table 2: product document number of qualification reports for all product affected by this process change.

Product	Qualification Report
GN1444SINE3	PRODDOC009414
GN1444SINTE3D	
GN2044SINE3	
GN2044SINTE3D	
GS6151-INE3	PRODDOC010454
GS6151-INTE3	
GS6151-INTE3Z	

4 Reliability Qualification Stresses

Table 3: Reliability qualification stresses for GN1444S-IE3 assembled at Greatek

Stress Test	Conditions	Duration	Qualification Vehicle	Sample Size	Result
High Temperature Storage (HTS)	JESD22-A103 MSL1 preconditioning and CSAM T=150 °C	500 hours	GN1444S-IE3	80 pcs/lots (3 lots)	Pass
UHAST	JESD22-A118 MSL1 preconditioning and CSAM 130°C, 85 % RH,	96hrs	GN1444S-IE3	80 pcs/lots (3 lots)	Pass
TC	JESD22-A104 MSL1 preconditioning and CSAM -40°C to +125°C	500 cycles	GN1444S-IE3	80 pcs/lots (3 lots)	Pass

5 Conclusion

In conclusion, GN1444S-IE3 assembled at Greatek successfully passed required reliability stresses. Thus, Greatek can be considered as a qualified assembly site for Semtech's 4x4mm 32L QFN products.