



Product Change Notification



Product Group: Vishay Siliconix/Aug 15, 2014/PCN- SIL-0522014 Rev1

Fab Site Transfer

DESCRIPTION OF CHANGE: For the 300M cell products listed in this notification we are changing the Fab site from Santa Clara, California, USA and Global Foundries, Singapore to Vishay Siliconix Itzehoe GmbH (VSIG) located at Fraunhoferstraße 1, 25524 Itzehoe, Germany. VSIG has been an automotive Fab with ISO14001 and TS16949 certifications for more than 10 years.

No changes have been made to the silicon process technology, wafer test, assembly process and final test. ***Production of the affected part from Santa Clara Fab and Global Foundries will be terminated per the time schedule in this notification and last time buy orders must be received within the specified timeframe.***

CLASSIFICATION OF CHANGE: Fab Site Transfer

REASON FOR CHANGE: Closure of Santa Clara Fab and Global Foundries

EXPECTED INFLUENCE ON QUALITY/RELIABILITY/PERFORMANCE: None

PRODUCT CATEGORY: Automotive MOSFETs

VISHAY PART NUMBERS AFFECTED: Affected part numbers are listed on the following page

VISHAY BRAND(s): Vishay-Siliconix

TIME SCHEDULE: Last time buy orders are required by 01-Oct-2014 for Global Foundries and 28-Feb-2015 for Santa Clara Fab. Last shipments should be scheduled before 30-Aug-2015.

QUALIFICATION DATA: All products listed in this notification are manufactured using 300M cell process technology which is AEC Q101 qualified. Please refer to the subsequent pages to see summary of qualification report for the lead 300M product from VSIG Fab. Qualification report for individual part type will be provided in PPAP and upon request.

SAMPLE AVAILABILITY: Schedule of availability of qualified samples from VSIG Fab is listed on following page. For samples, please email automos.pcn@Vishay.com with subject PCN-SIL-0522014 and include date by which samples are needed, required quantity and ship-to address.

ISSUED BY: Shishir Rai, Product Marketing Manager (E-mail: Shishir.Rai@Vishay.com)

For further information, please contact your regional Vishay office.

The Americas

Vishay Americas
2201 Laurelwood Road
Santa Clara, Ca 95054
T: 408-988-8000
F: 408-567-8500

Europe

Vishay Electronic GmbH
Geheimrat-Rosenthal-Strasse 100
D-95100
Selb, Germany
T: 49-9287-71 0
F: 49-9287-70435

Asia

Vishay Intertechnology Asia Pte. Ltd
37A Tampines Street 92
#07-00 Keppel Building
Singapore 528886
T: 65-6788-6668
F: 65-6788-0988

Vishay Intertechnology, Inc.

Corporate Headquarters 63 Lincoln Highway, Malvern, PA 19355-2143 U.S.A. Phone (610) 644-1300 Fax (610) 296-0657 www.vishay.com

ONE OF THE WORLD'S LARGEST MANUFACTURERS OF DISCRETE SEMICONDUCTORS AND PASSIVE COMPONENT



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VISHAY PART NUMBERS AFFECTED:

| Affected Vishay Part Number | Qualified Sample Availability from VSIG Fab |
|-----------------------------|---|
| SQD50N04-5M6-GE3 | Available |
| SQD50N04-5M6-T4GE3 | Available |
| SQM100N04-2M7-GE3 | Available |
| SQM120N06-3M5L-GE3 | Available |
| SQS420EN-T1-GE3 | Available |
| SQD100N04-3M6-GE3 | September |
| SQJ412EP-T1-GE3 | October |
| SQJ412EP-T2-GE3 | October |
| SQS482EN-T1-GE3 | October |

QUALIFICATION REPORT:

Qualification report for lead product SQM120N04-1m7L-GE3 manufactured using 300M cell process technology at VSIG Fab is provided in subsequent pages. Qualification report for the individual parts listed above will be provided in PPAP and upon request.

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Production Part Approval - Environmental Test Summary

| Supplier: | | Vishay Siliconix | General Specification: | | | AEC-Q101 | |
|-----------------------|--|---|------------------------|------|----------|-------------------------|--------------------------------------|
| Supplier Part Number: | | SQM120N04-1M7L-GE3 | Assembly Site: | | | Kaohsiung, Taiwan ROC | |
| Process Technology: | | 300M Cell N-Channel G4 | Fab Site: | | | VSIG, Itzehoe Germany | |
| Item | Test | Test Conditions | # of Lots | S.S. | # Failed | Additional Requirements | Remarks |
| 1 | Pre- and Post Stress Electrical Test | | * | All | 0 | | |
| 2 | Pre-conditioning: Performed on surface mount devices (SMDs) prior to Temp Cycle, Autoclave, HAST, Power Cycle stresses only | J-STD-020C | * | All | 0 | @260 C | |
| 3 | External Visual: Inspect device construction, marking and workmanship. Electrical test not required. | Electricals per drawing | * | All | 0 | | |
| 4 | Parametric Verification | | 3 | 30 | 0 | | Evaluation 1. 2. 3. |
| 5 | High Temperature Reverse Bias (HTRB): 1000 hours max rated junction temperature specified in the user/supplier specification with device reverse biased to 100% of maximum breakdown voltage specified or max junction temperature to avoid thermal runaway. TEST before, at 500 hours, and 1000 hours. JESD22 A108 | 175C 1000 HRS | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 6 | High Temperature Gate Bias (HTGB): 1000 hours at Ta = device maximum rated junction temperature with gate biased at 100% of maximum gate voltage rating indicated in the detail specification with device OFF. TEST before, at 500 hours, and 1000 hours. JESD22 A108 | 175C 1000 HRS | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 7 | Temperature Cycling: JESD22 A-104, Air to air. (See Reliability Product Data Summary): | 1000CYC -65C ~ 150C | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 8 | Autoclave (Pressure Pot) | Ta = 121C, RH = 100%, 15psig, 96 hrs: Test before and after AC. | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 9 alt | HAST | 130C, 85% RH, 100 HRS | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 10 | Intermittent Operational Life (Power Cycle) Delta Tj = 100C | 8572 CYC | 1 | 77 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |



Production Part Approval - Environmental Test Summary

| Supplier: | | Vishay Siliconix | General Specification: | | AEC-Q101 | | |
|-----------------------|---|--|------------------------|------|-----------------------|---------------------------------------|--------------------------------------|
| Supplier Part Number: | | SQM120N04-1M7L-GE3 | Assembly Site: | | Kaohsiung, Taiwan ROC | | |
| Process Technology: | | 300M Cell N-Channel G4 | Fab Site: | | VSIG, Itzehoe Germany | | |
| Item | Test | Test Conditions | # of Lots | S.S. | # Failed | Additional Requirements | Remarks |
| 11 | ESD Characterization - NOTE: Unless protected by internal ESD-specific protection circuitry, MOSFETs only have intrinsic protection that is dependent on the size of die and other environmental and physical factors, making them very sensitive to potential ESD damage and industry standard precautions should be taken not to expose them to any ESD. Due to the small size of MOSFET packages, these devices are generally not affected by the Charged Device Model, and we therefore substitute Machine Model testing. | Human Model | 1 | 10 | 0 | Passed 7.00KV MIL-STD-883D | Evaluation 1. 1340321 |
| | | Machine Model | 1 | 10 | 0 | Passed 1.30KV MIL-STD-883D | |
| 12 | Destructive Physical Analysis | AEC-Q101-004 Section 4 | 1 | 2X2 | 0 | | Evaluation 1. 1340321 |
| 13 | Physical Dimensions: Verify physical dimensions to the applicable user device packaging specification for dimensions and tolerances. | Siliconix Print Dimensions | N/A | N/A | N/A | | See PPAP |
| 14 | Terminal Strength | | N/A | N/A | N/A | | SMD Device |
| 15 | Resistance to Solvent | | N/A | N/A | N/A | | Laser Marked |
| 16 | Constant Acceleration | | N/A | N/A | N/A | | SMD Device |
| 17 | Vibration Variable Frequency | | N/A | N/A | N/A | | SMD Device |
| 18 | Mechanical Shock | | N/A | N/A | N/A | | SMD Device |
| 19 | Hermiticity | | N/A | N/A | N/A | | SMD Device |
| 20 | Resistance to Solder Heat (Solder Dunk) | JESD22 B-106-A, 260C, 10sec. Test before and after RSH. SMD devices shall be fully submerged during test | 1 | 50 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 21 | Solderability | Pb-Free - JESD201 | 1 | 15 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 22 | Thermal Resistance | JESD24-3 | 1 | 10 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1440135 2. 3. |
| 23 | Wire Bond Strength | MIL-STD-750 Method 2037 | 1 | 40 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 24 | Bond Shear | AEC-Q101-003 | N/A | N/A | N/A | Periodic sampling on production units | See Cpk data in PPAP |



Production Part Approval - Environmental Test Summary

| Supplier: | | Vishay Siliconix | | | | General Specification: | AEC-Q101 |
|------------------------------|----------------------|-------------------------|-----------|------|----------|-------------------------------|--------------------------------------|
| Supplier Part Number: | | SQM120N04-1M7L-GE3 | | | | Assembly Site: | Kaohsiung, Taiwan ROC |
| Process Technology: | | 300M Cell N-Channel G4 | | | | Fab Site: | VSIG, Itzehoe Germany |
| Item | Test | Test Conditions | # of Lots | S.S. | # Failed | Additional Requirements | Remarks |
| 25 | Die Shear | MIL-STD-750 Method 2017 | 1 | 10 | 0 | DEVICE SPECIFIC: | Evaluation 1. 1380274 2. 3. |
| 26 | UIS Testing | Non-destructive mode | 100% | 100% | 0 | | 100% tested at Final Test |
| 27 | Dielectric Integrity | Non-destructive mode | 100% | 100% | 0 | | 100% tested at Final Test |

Note: * = Samples taken from many lots

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| Prepared by: Julian Chen Reliability Engineer | 5/16/2014 |
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| Approved by: Arthur Director of Reliability | 5/16/2014 |
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