PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000385

Date: 05/30/2016

☐	Semtech Corporation, 200 Flynn Road, Camarillo CA 93012
☐	Semtech Canada Corporation, 4281 Harvester Road, Burlington, Ontario L7L 5M4 Canada
☐	Semtech Irvine, 5141 California Ave., Suite 100, Irvine CA 92617
☐	Semtech Neuchatel Sarl, Route des Gouttes d'Or 40, CH-2000 Neuchatel Switzerland
☐	Nanotech Semiconductor, Semtech Corporation, 2 West Point Court, Bristol, United Kingdom, BS32 4PY
☐	Semtech Corpus Christi SA de CV, Carretera Matamorros Edificio 7, Reynosa, Tamaulipas, Mexico 88780
☒	Semtech Triune, 1101 Resource Drive, Suite 121, Plano TX 75074
☐	

Change Details

Part Number(s) Affected:

SC442ULTRT
SC196ULTRT
SC196AMLTRT
SC2616MLTRT
SC4624MLTRT

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

Description, Purpose and Effect of Change:

1) **Ablestik/Henkel produces 2600AT HT epoxy. Their supplier discontinued one of the raw materials in the formulation. Ablestik has issued an EOL notification to all of their customers. Semtech's supplier, Carsem is affected. Product assembled at Carsem are identified and impacted by this change.**

2) **The replacement epoxy for the 2600AT epoxy for MLP is QM1529HT-LV. It passed qualification testing at Carsem and Semtech. The thermal performance of QM1529HT-LV is equivalent to the 2600AT epoxy.**

3) **Semtech has completed reliability testing of this change and it meets Semtech's reliability requirements and meets JEDEC guidelines.**

4) **The short implementation time is due to the limited and short supply of existing Ablestik 2600AT epoxy.**

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 product form, fit, function, quality, application, performance, characteristics or reliability.
- No Change to data sheet content or package dimensions.

PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000385

Date: 05/30/2016

Implementation Date	**07/19/2016**	**Work Week**	**WW30**
Last Time Ship (LTS) Of unchanged product	**08/19/2016**	**Affecting Lot No. / Serial No. (SN)**	**N/A**
Sample Availability	**Yes**	**Qualification Report Availability**	**Yes**

Supporting Documents for Change Validation/Attachments:

- **Ablestik Technical Data Sheet; ABLETHERM 2600AT-EN**
- **Technical Data sheet; QM1529HT-LV**
- **QMI529HT-LV2C1.5-EN**
- **QMI529HT (Br, Cl, F & I) Jan 2016**
- **QMI529HT (Sb) Jan 2016**

Issuing Authority

Semtech Business Unit:	Power MGT	
Semtech Contact Info:	***Randy Biddle*** *Engineer Sr., Product Quality* *Semtech Corporation* 1101 Resource Dr. Suite 121 Plano, Texas 75074 *rbiddle@semtech.com* *Voice: (469) 277-6078*	

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

ABLETHERM 2600AT

July 2010

PRODUCT DESCRIPTION

ABLETHERM 2600AT provides the following product characteristics:

Technology	Thermal Management
Appearance	Silver
Cure	Heat cure
Product Benefits	• High thermal conductivity • High electrical conductivity • Low bleed • Long work life
Application	Die attach
Filler Type	Silver
pH	4.4

ABLETHERM 2600AT adhesive is designed for thermal management applications requiring high heat extraction from the die, such as high power and discrete devices. This adhesive uses a unique suspension system containing silver and resin particles suspended in solvent carrier. Once the material is fully cured and the solvent is evaporated, the adhesive has an extremely high silver loading.

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TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	6.0
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	8,500
Work Life @ 25°C, hours	24
Shelf Life @ -40°C, year	1
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

30 minute ramp to 200°C + 15 minutes @ 200°C

Alternative Cure Schedule

30 minute ramp to 175°C + 1 hour @ 175°C

Weight Loss on Cure

10 x 10 mm Si die on glass slide, %	9.19

The above cure profiles are guideline recommendations. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

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TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion ppm/°C:	
Below Tg, ppm/°C	35
Above Tg, ppm/°C	118
Glass Transition Temperature (Tg) by TMA, °C	84
Thermal Conductivity, W/mK	20
Tensile Modulus, DMTA :	
@ -65 °C	N/mm² 5,262 (psi) (763,000)
@ 25 °C	N/mm² 3,648 (psi) (529,000)
@ 150 °C	N/mm² 297 (psi) (43,000)
@ 250 °C	N/mm² 214 (psi) (31,000)
Extractable Ionic Content, @ 100°C ppm:	
Chloride (Cl-)	<20
Sodium (Na+)	<20
Potassium (K+)	<10
Water Extract Conductivity, µmhos/cm	22
Moisture Absorption @ Saturation, wt.% @ 85°C/85°RH	0.25

Electrical Properties:

Volume Resistivity, ohms-cm	0.00005
Bond Joint Resistance, ohms/0.5 sq.in. Cu to Cu joint 25 µm bondline thickness	0.00005

TYPICAL PERFORMANCE OF CURED MATERIAL

Die Shear Strength:

2 x 2 mm Si die on Ag/Cu leadframe, kg-f @ 25°C	8.1

Die Shear Strength vs Temperature, kg-f:

@25°C	@200°C	@250°C	3 x 3 mm Si die on:
18.3	1.3	1.1	Ag/Cu leadframe
12.7	1.2	1.1	Cu leadframe
16.4	1.2	0.9	Pd/Ni leadframe
9.7	2.3	2.1	Au flash leadframe

Chip Warpage vs Chip Size:

0.38 mm thick Si die on Ag/Cu leadframe @25°C, µm

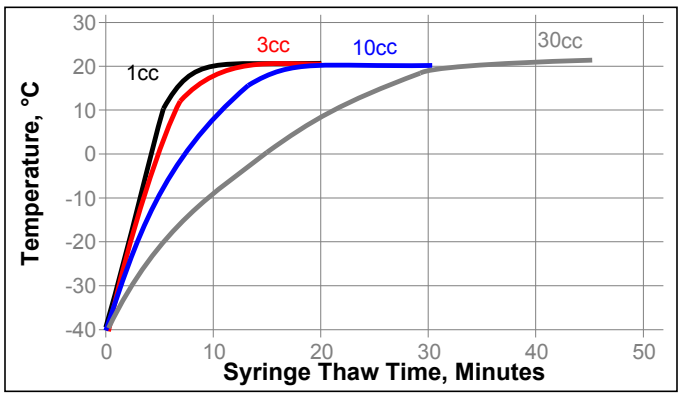
Chip Size:	Warpage:
7.6 x 7.6 mm	15
12.7 x 12.7 mm	58

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

THAWING:

1. Allow container to reach room temperature before use.
2. After removing from the freezer, set the syringes to stand vertically while thawing.
3. Refer to the Syringe Thaw time chart for the thaw time recommendation.
4. DO NOT open the container before contents reach 22°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.
5. DO NOT re-freeze. Once thawed to 22°C, the adhesive should not be re-frozen.



DIRECTIONS FOR USE

This adhesive is a unique suspension system that contains polymer and conductive particles in a solvent carrier. These particles can sometimes agglomerate and could make dispensing difficult for some applications. Due to the unique rheology of this adhesive, clogging of longer dispense tubes may occur due to particle packing. Use of short dispense tubes is recommended.

For consistent and uniform dispensing, a 457mm (18 mil) or greater ID needle is suggested for this adhesive. For sizes smaller than 2 x 2mm and thinner dies, a smaller ID needle may be used.

Solvent bleed-out that appears after dispensing will vilatilize during the oven cure process. Once it volatilizes, it will not redeposit onto the leadframes. For best results, our recommended cure profile is suggested.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: -40 °C. Storage below minus (-)40 °C or greater than minus (-)40 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Except as otherwise noted, all marks used above on this data sheet are trademarks and/or registered trademarks of Henkel and/or its affiliates in Germany and elsewhere.

Reference 0.3

Hysol

QMI529HT-LV2C1.5

September 2011

PRODUCT DESCRIPTION

QMI529HT-LV2C1.5 provides the following product characteristics:

Technology	BMI Hybrid
Appearance	Silver
Cure	Heat cure
Product Benefits	• Electrically conductive • Thermally conductive • Good adhesion • Hydrophobic • Stable at high temperatures
Spacer Size	1.5 mil
Filler Type	Silver
Application	Die attach

QMI529HT-LV2C1.5 electrically conductive adhesive is designed for die attach applications. It is recommended for use in the attachment integrated circuits and components onto metallic leadframes.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	3.9
Viscosity, Cone & Plate, mPa·s (cP)	16,500
Work Life @ 25°C, hours	24
Shelf Life @ -40°C (from date of manufacture), year	1
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

30 minute ramp to 175°C + 1 hour @ 175°C

The above cure profiles are guideline recommendations. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

DSC:	
Onset, ºC	140
Peak, ºC	146
Thermal Conductivity, W/mK	8.0

Electrical Properties:

Volume Resistivity, ohms-cm	0.00005

TYPICAL PERFORMANCE OF CURED MATERIAL

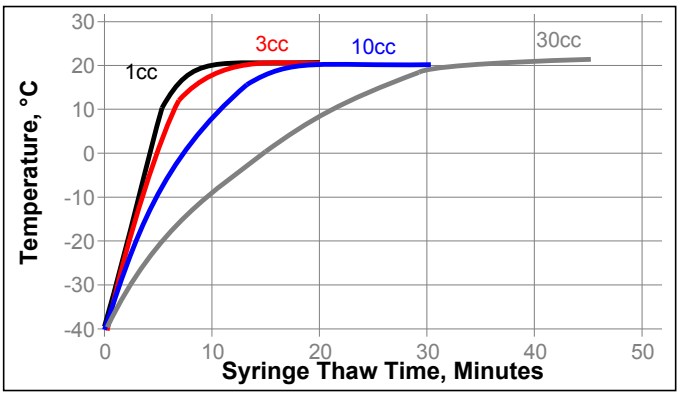
Die Shear Strength, kg-f/die:	
3 x 3 mm (120 x 120mil) Si die on Ag/Cu Leadframe:	
@ 25ºC, Kg	13.3
@ 250ºC, Kg	3.8

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

THAWING:

1. Allow container to reach room temperature before use.
2. After removing from the freezer, set the syringes to stand vertically while thawing.
3. Refer to the Syringe Thaw time chart for the thaw time recommendation.
4. DO NOT open the container before contents reach 22°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.
5. DO NOT re-freeze. Once thawed to 22°C, the adhesive should not be re-frozen.



DIRECTIONS FOR USE

1. Thawed adhesive should immediately be placed on dispense equipment for use.
2. If the adhesive is transferred to a final dispensing reservoir, care must be exercised to avoid entrapment of contaminants and/or air into the adhesive.
3. Adhesive must be completely used within the product's recommended work life.
4. Apply enough adhesive to achieve a 1.5 µm wet bondline thickness, dispensed with approximately 25 to 50 % filleting on all sides of the die.
5. Silver-resin separation may occur if the adhesive is left out at 22°C beyond the recommended work life.
6. Alternate dispense amounts may be used depending on the application requirements.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Henkel

Storage
Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: -40°C. Storage below -40°C or above -40 °C can adversely affect product properties.
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Trademark usage

Reference 0.0