PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000891

Date: JUN-01-2023

Change Details	
Part Number(s) Affected: AVP1000-IBE3 AVP2000-IBE3 AVP2000T-IBE3	**Customer Part Number(s) Affected:** ☒ N/A

Description, Purpose and Effect of Change:

ALTERNATIVE PACKAGE SUBSTRATE SUPPLIER

Toshiba, Semtech supplier, will begin using KCC as an alternative package substrate supplier for the above-mentioned part numbers. This change is necessary to help boost production capacity as a result of increasing customer demand.

Current supplier	Alternative supplier
Kyocera	**KCC**

Please refer to the following pages for more details.

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:

- There is no impact to form, fit, function, performance, characteristics, or reliability.

Implementation Date	**JUL-01-2023**	**Work Week**	**26**
Last Time Ship (LTS) **Of unchanged product**	**N/A**	**Affecting Lot No. / Serial No. (SN)**	**N/A**
Sample Availability	**JUN-01-2023** **AVP2000T-IBE3**	**Qualification Report Availability**	**JUN-01-2023**

Supporting Documents for Change Validation/Attachments:

- PRODDOC029036 Reliability Qualification Report for KCC Substrate in BlueRiver Product Family

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Date: JUN-01-2023

Quality Assurance		
Semtech Business Unit	Signal Integrity Product Group	
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FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: http://www.semtech.com/contact/index.html#support

Comparison

- No change in machines, production line, operator, and manufacturing procedures.
- Minor difference in materials and thickness. Please see below.

Supplier	Current supplier **Kyocera**		Alternative supplier **KCC**	
Package type	*25x25*		*25x25*	
Substrate	*Material*	*Thickness (um)*	*Material*	*Thickness (um)*
Core	CR1	400	CR2	410
BU	ABF1	33	ABF1	30
SR	SR1	21 (FC side) 25 (BGA side)	SR1	21
Pre coat	SAC305	SAC305	SAC305	SAC305
Layer	6		6	

Reliability Qualification Report for KCC Substrate in BlueRiver Product Family

Revision History

Version	ECO	Date	Modifications
0	ECO-067136	May 2023	New Release

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1 Background

Semtech’s BlueRiver family products were currently manufactured at Toshiba with substrate from Kyocera. However, due to the critical supply constraints from Kyocera, Toshiba proposed to add substrate vendor, KCC, as a second source for Semtech’s BlueRiver product family. The purpose of this qualification is to qualify the use of substrate from KCC for Semtech’s devices at Toshiba.

2 Product Scope

All product(s) affected in this qualification and package information is listed in table 1.

Table 1: all products covered in this qualification.

Products	Package type
AVP1000-IBE3	576 ball BGA/ 25mm x25mm/ 1.0mm pad pitch
AVP2000-IBE3	
AVP2000T-IBE3	

3 Qualification Approach

All products listed in table 1 have already been fully qualified. The reliability qualification reports are available upon request (PRODDOC016239). Out of the three products, AVP2000T is the test vehicle for qualification. AVP2000 and AVP1000 are considered a subset of AVP2000T are considered qualified by similarity. This qualification only intends to assess the reliability impact of having substrate from KCC. Thus, die-level reliability stresses (HTOL, ESD-HBM and LU) were not planned. TC, UHAST, THB HTS and ESD-CDM were carried out. For more information about the conditions of the qualification stresses and sample size, please refer to section 4 and 5.

4 Reliability Qualification Stresses

Table 2: Reliability qualification stresses for AVP2000T

Stress Test	Conditions	Duration	Qualification Vehicle	Sample Size	Result
Pre-conditioning (MSL 4)	J-STD-020 MSL 4	N/A	AVP2000T	32 pcs	Pass
High Temperature Storage (HTS)	JESD22-A103 T=150 ºC	1000 hours	AVP2000T	32 pcs	Pass
UHAST	JESD22-A118 MSL4 preconditioning 110˚C, 85 % RH,	264hrs	AVP2000T	32 pcs	Pass
Temperature Humidity Bias	JESD22-A101 MSL4 preconditioning	85 °C, 85 % RH, Vdd max	AVP2000T	32 pcs	Pass
TC	JESD22-A104 MSL4 preconditioning -55˚C to +125˚C (Condition B)	700 cycles	AVP2000T	32 pcs	Pass

5 Electrostatic Discharge Tests

Table 3: Electrostatic Discharge Tests

Stress	Conditions	Qualification Vehicle	Stress Level	Sample Size	Results
Charged Device Model ESD	JESD22-C101	AVP2000T	500V (PMA≥250 V)	3	Pass

6 Conclusion

In conclusion, AVP2000T from Toshiba using substrate from KCC successfully passed required reliability stresses. Thus, substrate from KCC can be considered qualified to be used in BlueRiver Family devices.