

**Report Date:** January 23, 2024

## Product Details:

|                          |                                          |                               |                 |
|--------------------------|------------------------------------------|-------------------------------|-----------------|
| <b>Supplier:</b>         | Taiwan Semiconductor Co., Ltd.           |                               |                 |
| <b>Test Vehicle/s:</b>   | TSCDH40065G1, TSCDT08065G1, TSCDF06065G1 |                               |                 |
| <b>Reason for Rel:</b>   | New Product Qualification                |                               |                 |
| <b>Part Description:</b> | 650V Silicon Carbide Schottky Diode      |                               |                 |
| <b>Package Type:</b>     | TO-247; TO-220; ITO-220                  |                               |                 |
| <b>Assembly Site:</b>    | (3864) China                             | <b>General Specification:</b> | AEC-Q101 Rev. E |

## Product Series Covered:

TSCDH40065G1, TSCDT08065G1, TSCDF06065G1, TSCDF08065G1, TSCDF10065G1, TSCDF12065G1, TSCDF16065G1, TSCDF20065G1, TSCDT06065G1, TSCDT10065G1, TSCDT12065G1, TSCDT16065G1, TSCDT20065G1, TSCDH16065G1, TSCDH20065G1, TSCDH30065G1

## Reliability Test Results Summary:

| Stress Test                             | Abbrev    | Test Methods      | Test Conditions                         | Final<br>Readpoint | Requirements |        | Results |         |
|-----------------------------------------|-----------|-------------------|-----------------------------------------|--------------------|--------------|--------|---------|---------|
|                                         |           |                   |                                         |                    | SS           | # Lots | Rej/SS  | Remarks |
| Environmental and Lifetime Stress Tests |           |                   |                                         |                    |              |        |         |         |
| Pre- and Post-Stress Electrical Test    | TEST      | Product Datasheet | Test at room temp                       | -                  | 557          | 3      | 0/1671  | PASS    |
| Extrenal Visual                         | EV        | JESD22-B101       | per reference standard                  | -                  | 557          | 3      | 0/1671  | PASS    |
| Temperature Cycle                       | TC        | JESD22-A104       | -55°C to +150°C; 15 mins dwell          | 500 cycs           | 77           | 3      | 0/231   | PASS    |
| Unbiased HAST                           | UHAST     | JESD22-A118       | 130°C/85% RH; unbiased                  | 96 hrs             | 77           | 3      | 0/231   | PASS    |
| High Humidity High Temp Reverse Bias    | H3TRB     | JESD22-A101       | 85°C/85% RH; Vin=80% rated V (100V max) | 1000 hrs           | 77           | 3      | 0/231   | PASS    |
| Resistance to Solder Heat               | RSH       | JESD22-B106       | PTH (Pb free): 270°C; 7 sec             | 7 secs             | 10           | 3      | 0/30    | PASS    |
| High Temp Storage Life                  | HTSL      | JESD22-A103       | 175°C                                   | 1000 hrs           | 77           | 3      | 0/231   | PASS    |
| High Temp Reverse Bias                  | HTRB      | MIL-STD-750-1     | 175°C; V=100% rated V                   | 1000 hrs           | 77           | 3      | 0/231   | PASS    |
| Intermittent Operating Life             | IOL       | MIL-STD-750       | Ta=25°C; ΔTj=100°C; 5.0 min on/off      | 6000 cycs          | 77           | 1      | 0/77    | PASS    |
|                                         |           |                   | Ta=25°C; ΔTj=100°C; 3.5 min on/off      | 8572 cycs          | 77           | 2      | 0/154   | PASS    |
| Package Assembly Integrity Tests        |           |                   |                                         |                    |              |        |         |         |
| Destructive Physical Analysis           | DPA       | AEC-Q101-004      | Post-TC                                 | results            | 2            | 3      | 0/6     | PASS    |
| Destructive Physical Analysis           | DPA       | AEC-Q101-004      | Post-H3TRB                              | results            | 2            | 3      | 0/6     | PASS    |
| Wire Bond Pull                          | WBP       | MIL-STD-750-2     | per assembly spec                       | results            | 12           | 3      | 0/36    | PASS    |
| Wire Bond Shear                         | WBS       | AEC Q101-003      | per assembly spec                       | results            | 24           | 3      | 0/72    | PASS    |
| Die Shear                               | DS        | MIL-STD-750-2     | per assembly spec                       | results            | 12           | 3      | 0/36    | PASS    |
| Electrical Verification Tests           |           |                   |                                         |                    |              |        |         |         |
| Parametric Verification                 | PV        | TSC Datasheet     | per product datasheet                   | results            | 25           | 3      | 0/75    | PASS    |
| ESD - Human Body Model                  | ESD - HBM | AEC-Q101-001      | per product spec                        | results            | 30           | 3      | 8kV     | PASS    |
| ESD - Charged Device Model              | ESD - HBM | AEC-Q101-005      | per product spec                        | results            | 30           | 3      | 1kV     | PASS    |

**Conclusion:** TSCDH40065G1, TSCDT08065G1, TSCDF06065G1 successfully passed qualification per AEC-Q101.

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