

1000W, 10V - 100V Surface Mount Transient Voltage Suppressor

FEATURES FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps from 0 volt to BV min
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- TV
- Monitor

MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.11 g (approximately)

| KEY PARAMETERS | | |
|----------------------------|----------------|------|
| PARAMETER | VALUE | UNIT |
| V_{WM} | 8.55 – 85.5 | V |
| V_{BR} (uni-directional) | 9.5 - 105 | V |
| V_{BR} (bi-directional) | 9.5 - 105 | V |
| P_{PPSM} | 1000 | W |
| T_{JMAX} | 175 | °C |
| Package | DO-214AA (SMB) | |
| Configuration | Single die | |



DO-214AA (SMB)

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | |
|---|------------|-------------|------|
| PARAMETER | SYMBOL | PART NUMBER | UNIT |
| Non-repetitive peak impulse power dissipation with 10/1000us waveform | P_{PPSM} | 1000 | W |
| Steady state power dissipation at $T_A=25^\circ\text{C}$ ⁽¹⁾ | P_{tot} | 5 | W |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | A |
| Forward Voltage @ $I_F=50\text{A}$ for Uni-directional only ⁽²⁾ | V_F | 3.5/5.0 | V |
| Junction temperature | T_J | -55 to +175 | °C |
| Storage temperature | T_{STG} | -55 to +175 | °C |

Notes:

1. Non-repetitive Current Pulse Per Fig. 3 and Derated above $T_A=25^\circ\text{C}$ Per Fig. 2
2. $V_F=3.5\text{V}$ for Devices of $V_{BR} \leq 50\text{V}$ and $V_F=5.0\text{V}$ Max. for Devices $V_{BR} > 50\text{V}$

Devices for Bipolar Applications

1. For Bidirectional use CA suffix

| THERMAL PERFORMANCE | | | |
|--|-----------------|--------------|-------------|
| PARAMETER | SYMBOL | LIMIT | UNIT |
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 20 | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 100 | °C/W |

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Device | Device Marking Code | Breakdown Voltage $V_{BR@I_T}$ (V) | | Test Current I_T (mA) | Stand-Off Voltage @ V_{WM} (V) | Maximum Reverse Leakage @ V_{WM} (μA) | Maximum Peak imp current I_{PP} (A) (Note 2) | Maximum Clamping Voltage $V_C@I_{PP}$ (V) |
|-----------|---------------------|------------------------------------|------|-------------------------|----------------------------------|--|--|---|
| | | Min. | Max. | | | | | |
| 1KSMB10A | A10E | 9.5 | 10.5 | 1.0 | 8.55 | 10.0 | 69.0 | 14.5 |
| 1KSMB10CA | N10E | | | | | | | |
| 1KSMB11A | A10F | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 64.1 | 15.6 |
| 1KSMB11CA | N10F | | | | | | | |
| 1KSMB12A | A10G | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 59.9 | 16.7 |
| 1KSMB12CA | N10G | | | | | | | |
| 1KSMB13A | A10H | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 54.9 | 18.2 |
| 1KSMB13CA | N10H | | | | | | | |
| 1KSMB15A | A10I | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 47.2 | 21.2 |
| 1KSMB15CA | N10I | | | | | | | |
| 1KSMB16A | A10J | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 44.4 | 22.5 |
| 1KSMB16CA | N10J | | | | | | | |
| 1KSMB18A | A10K | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 39.2 | 25.5 |
| 1KSMB18CA | N10K | | | | | | | |
| 1KSMB20A | A10L | 19.0 | 21.0 | 1.0 | 17.1 | 1.0 | 36.1 | 27.7 |
| 1KSMB20CA | N10L | | | | | | | |
| 1KSMB22A | A10M | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 32.7 | 30.6 |
| 1KSMB22CA | N10M | | | | | | | |
| 1KSMB24A | A10N | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 30.1 | 33.2 |
| 1KSMB24CA | N10N | | | | | | | |
| 1KSMB27A | A10O | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 26.7 | 37.5 |
| 1KSMB27CA | N10O | | | | | | | |
| 1KSMB30A | A10P | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 24.2 | 41.4 |
| 1KSMB30CA | N10P | | | | | | | |
| 1KSMB33A | A10Q | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 21.9 | 45.7 |
| 1KSMB33CA | N10Q | | | | | | | |
| 1KSMB36A | A10R | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 20.0 | 49.9 |
| 1KSMB36CA | N10R | | | | | | | |
| 1KSMB39A | A10S | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 18.6 | 53.9 |
| 1KSMB39CA | N10S | | | | | | | |
| 1KSMB43A | A10T | 40.9 | 45.2 | 1.0 | 36.8 | 1.0 | 16.9 | 59.3 |
| 1KSMB43CA | N10T | | | | | | | |
| 1KSMB47A | A10U | 44.7 | 49.4 | 1.0 | 40.2 | 1.0 | 15.4 | 64.8 |
| 1KSMB47CA | N10U | | | | | | | |
| 1KSMB51A | A10V | 48.5 | 53.6 | 1.0 | 43.6 | 1.0 | 14.3 | 70.1 |
| 1KSMB51CA | N10V | | | | | | | |
| 1KSMB56A | A10W | 53.2 | 58.8 | 1.0 | 47.8 | 1.0 | 13.0 | 77.0 |
| 1KSMB56CA | N10W | | | | | | | |
| 1KSMB62A | A10X | 58.9 | 65.1 | 1.0 | 53.0 | 1.0 | 11.8 | 85.0 |
| 1KSMB62CA | N10X | | | | | | | |
| 1KSMB68A | A10Y | 64.6 | 71.4 | 1.0 | 58.1 | 1.0 | 10.9 | 92.0 |
| 1KSMB68CA | N10Y | | | | | | | |

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Device | Device Marking Code | Breakdown voltage $V_{BR}@I_T$ (V) (Note 1) | | Test current I_T (mA) | Stand-Off Voltage @ V_{WM} (V) | Maximum Reverse leakage @ V_{WM} (μA) | Maximum peak impulse current I_{PP} (A) (Note 2) | Maximum clamping voltage $V_C@I_{PP}$ (V) |
|------------|---------------------|---|------|-------------------------|----------------------------------|--|--|---|
| | | Min. | Max. | | | | | |
| 1KSMB75A | A10Z | 71.3 | 78.8 | 1.0 | 64.1 | 1.0 | 9.7 | 103 |
| 1KSMB75CA | N10Z | | | | | | | |
| 1KSMB82A | B10A | 77.9 | 86.1 | 1.0 | 70.1 | 1.0 | 8.8 | 113 |
| 1KSMB82CA | O10A | | | | | | | |
| 1KSMB91A | B10B | 86.5 | 95.5 | 1.0 | 77.8 | 1.0 | 8.0 | 125 |
| 1KSMB91CA | O10B | | | | | | | |
| 1KSMB100A | B10C | 95 | 105 | 1.0 | 85.5 | 1.0 | 7.3 | 137 |
| 1KSMB100CA | O10C | | | | | | | |

Notes:

- V_{BR} measure after I_T applied for $300\mu\text{s}$, I_T =square wave pulse or equivalent.
- All terms and symbols are consistent with ANSI/IEEE C62.35.
- For Bidirectional use CA suffix

ORDERING INFORMATION

| PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX(*) | PACKAGE | PACKING |
|-----------------------|-----------------|--------------|------------------------|---------|--------------------------|
| 1KSMBxxxx (Note 1) | H | R5 | G | SMB | 850 / 7" Plastic reel |
| | | R4 | | SMB | 3,000 / 13" Paper reel |
| | | M4 | | SMB | 3,000 / 13" Plastic reel |

Note :

- "xxxx" defines voltage from 10V (1KSMB10A) to 100V (1KSMB100CA)

*: Optional available

EXAMPLE P/N

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|--------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| 1KSMB39AHR5G | 1KSMB39A | H | R5 | G | AEC-Q101 qualified Green compound |

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig1. Peak Pulse Power Rating Curve



Fig2. Pulse Derating Curve



Fig3. Clamping Power Pulse Waveform



Fig4. Maximum Non-Repetitive Forward Surge Current Unidirectional Only



Fig5. Typical Junction Capacitance



PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | 1.95 | 2.20 | 0.077 | 0.087 |
| B | 4.05 | 4.60 | 0.159 | 0.181 |
| C | 3.30 | 3.95 | 0.130 | 0.156 |
| D | 1.95 | 2.65 | 0.077 | 0.104 |
| E | 0.75 | 1.60 | 0.030 | 0.063 |
| F | 5.10 | 5.60 | 0.201 | 0.220 |
| G | 0.05 | 0.20 | 0.002 | 0.008 |
| H | 0.15 | 0.31 | 0.006 | 0.012 |

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 2.3 | 0.091 |
| B | 2.5 | 0.098 |
| C | 4.3 | 0.169 |
| D | 1.8 | 0.071 |
| E | 6.8 | 0.268 |

MARKING DIAGRAM



P/N = Marking Code
G = Green Compound
YW = Date Code
F = Factory Code

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