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SM05

DUAL SURFACE MOUNT TVS

Features

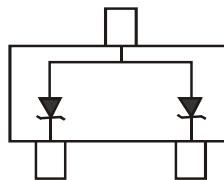
- 300 Watts Peak Pulse Power ($t_p = 8 \times 20 \mu\text{s}$)
- IEC 61000-4-2 (ESD): Air – 15kV, Contact – 8kV
- Dual Common Anode TVS
- SOT-23 Package Allows Either Two Separate Unidirectional Configurations or a Single Bidirectional Configuration
- **Lead Free/RoHS Compliant (Note 3)**
- “Green” Device (Note 4)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic, “Green” Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Ordering Information: See Page 2
- Marking Information: See Page 2
- Weight: 0.0089 grams (approximate)



Top View



Device Schematic

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|----------------|-------------|------|
| Peak Pulse Power ($t_p = 8 \times 20 \mu\text{s}$) (Note 6) $T_A = 25^\circ\text{C}$ | P_{pk} | 300 | W |
| Thermal Resistance, Junction to Ambient (Note 6) $T_A = 25^\circ\text{C}$ | $R_{0,JA}$ | 417 | °C/W |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | °C |

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified (Note 7)

| Reverse Standoff Voltage | Breakdown Voltage $V_{BR} @ I_T$ | | Test Current | Max. Reverse Leakage @ V_{RWM} (Note 5) | Max. Clamping Voltage @ $I_{PP} = 5\text{A}$ (Note 2) | Max. Clamping Voltage $V_c @ I_{PP}$ (Note 2) | | Typical Capacitance C_T (Note 1) |
|--------------------------|----------------------------------|---------|--------------|---|---|---|--------------|------------------------------------|
| V_{RWM} (V) | Min (V) | Max (V) | I_T (mA) | I_R (μA) | V_c (V) | V_c (V) | I_{PP} (A) | (pF) |
| 5 | 6.2 | 7.3 | 1.0 | 10 | 9.8 | 20.6 | 17 | 230 |

Notes:

1. $V_R = 0\text{V}$, $f = 1\text{MHz}$.
2. Clamping voltage value is based on an $8 \times 20 \mu\text{s}$ peak pulse current (I_{PP}) waveform.
3. No purposefully added lead.
4. Diodes Inc.’s “Green” policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
5. Short duration pulse test used to minimize self-heating effect.
6. Device mounted on FR-4 PC board with suggested pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>. Measured across pin 1 and pin 2.



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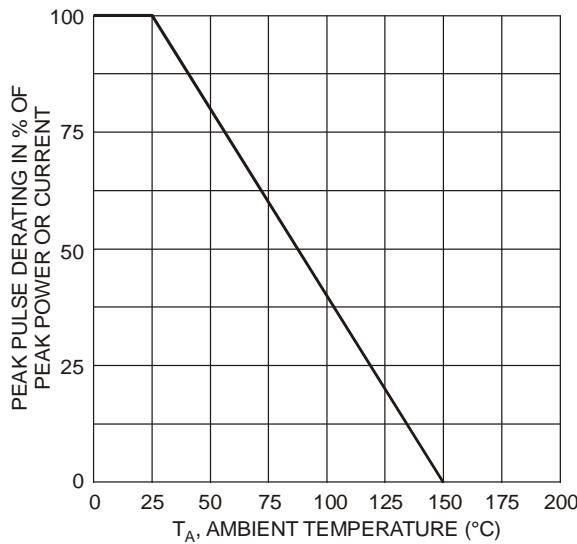


Fig. 1 Pulse Derating Curve

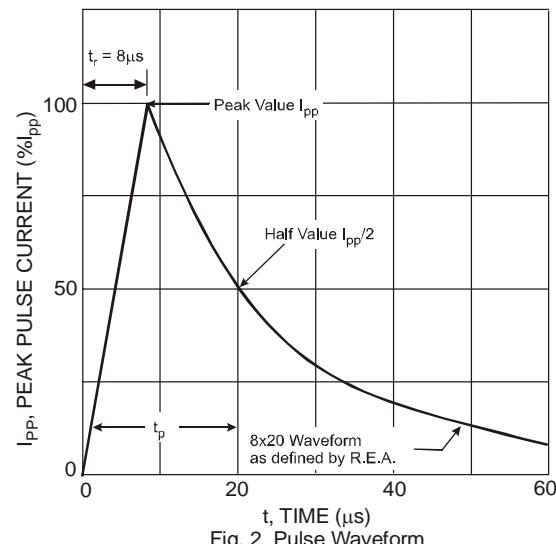


Fig. 2 Pulse Waveform

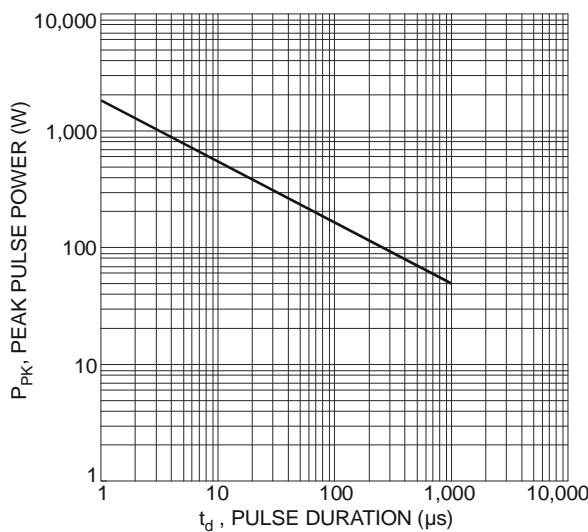


Fig. 3 Max. Peak Pulse Power vs. Pulse Duration

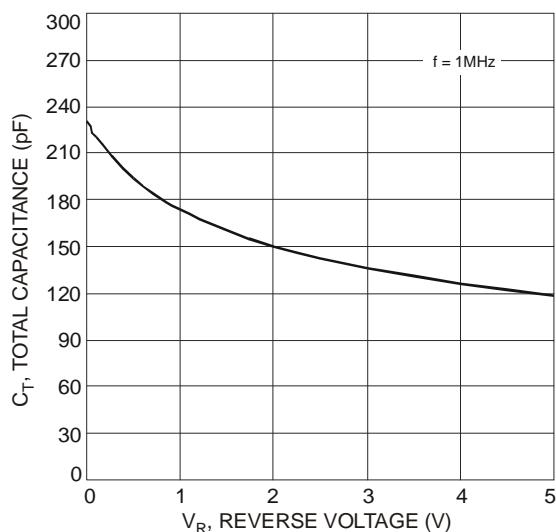


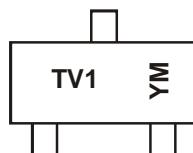
Fig. 4 Typical Total Capacitance vs. Reverse Voltage

Ordering Information (Note 8)

| Part Number | Case | Packaging |
|-------------|--------|------------------|
| SM05-7 | SOT-23 | 3000/Tape & Reel |

Notes: 8. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



TV1 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: X = 2010)
M = Month (ex: 9 = September)

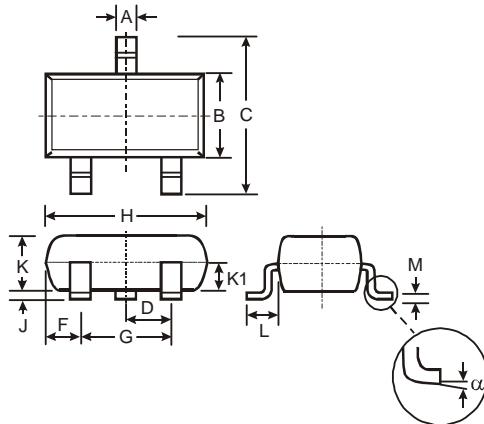
Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | | | | | |
|-------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| Code | X | Y | Z | A | B | C | D | | | | | |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |



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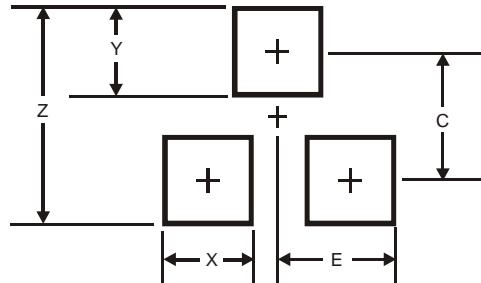
Package Outline Dimensions



| SOT-23 | | | |
|-----------|-------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.903 | 1.10 | 1.00 |
| K1 | - | - | 0.400 |
| L | 0.45 | 0.61 | 0.55 |
| M | 0.085 | 0.18 | 0.11 |
| α | 0° | 8° | - |

All Dimensions in mm

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.9 |
| X | 0.8 |
| Y | 0.9 |
| C | 2.0 |
| E | 1.35 |

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