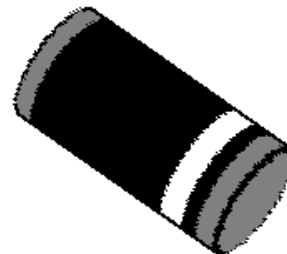


DESCRIPTION

This series of 500 W Transient Voltage Suppressors (TVSs) provides the highest level of Peak Pulse Power (P_{PP}) in the industry for the DO-213AB size MELF package. These P_{PP} levels offer protection from switching transients, induced RF, secondary lightning, as well as ESD or EFT where these devices are also compliant to IEC61000-4-2 and IEC61000-4-4. In addition to unidirectional TVS configurations, this series also offers bidirectional options with C or CA suffix. Its configuration in a MELF package prevents lead damage to terminals and also reduces inductive parasitics for minimal transient voltage overshoots.

APPEARANCE



DO-213AB

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

FEATURES

- Economical series for 500 Watt Surface Mount transient voltage suppressor.
- Available in Both Unidirectional and Bidirectional Construction. Bidirectional has a C or CA suffix.
- 6.8 to 200 Volts Available.
- 500 Watts Peak Power Dissipation.
- Fast Response Time: Subnanosecond Response (Unipolar) or 5.0 ns (Bipolar).
- Plastic package has flame retardant epoxy meeting UL94V-0

APPLICATIONS / BENEFITS

- For Surface Mount Applications
- Protection from switching transients, induced RF, secondary lightning, as well as ESD, and EFT per IEC 61000-4-2 and IEC 6100-4-4
- Very low inductive parasitics with minimal Ldi/dt voltage overshoots for fast-rise-time transients
- Robust package for pick-and-place handling

MAXIMUM RATINGS @ 25°C*

- Peak Pulse Power Dissipation (P_{PP}) - 500 W (Note 1 & 5).
- Peak Forward Surge Current (I_{FSM}) - 40 A (Note 3)
- Peak Pulse Current (I_{PP}) at 10/1000 μ s waveform - see Table 1 (Note 1)
- Steady-State Power Dissipation, $P_{(AV)}$ - 3.0W (Note 2, 4)
- Operating and Storage temperatures, T_{OP} , T_{STG} - (-55°C to +150°C)
- Thermal Resistance junction to end cap ($R_{\theta JEC}$) - 15°C/W

MECHANICAL AND PACKAGING

- Molded epoxy package meets UL94V-0
- End-Cap terminals solderable per MIL-STD-750, Method 2026 (max 260°C for 10 seconds).
- Polarity is indicated by cathode band. Bidirectional devices have no polarity band.
- Body marked with P/N without TGL41 prefix.
- Weight: 0.06 grams (approximate)
- Tape and Reel packaging per EIA-481-2 with 12 mm tape with 5000 per 13 inch reel.

* Unless otherwise specified.

NOTES:

1. Non-repetitive current pulse, per Figure 3 and derated above $T_A = 25^\circ\text{C}$ per Figure 2.
2. Mounted on 4.0 mm² copper pads to each terminal. (See Figure 3)
3. 8.3 ms single half-sine wave duty cycle = 4 pulses per minute max. Peak forward voltage at 40 A is 3.5 volts (unipolar only)
4. Derate linearly above 100°C to zero at 150°C for dc steady-state power. Also see Figure 2 for transient derating.
5. Peak pulse current waveform is 10/1000 μ s, with maximum duty cycle of 0.01%. (See Figure 4)



ELECTRICAL CHARACTERISTICS @ 25°C

| MICROSEMI PART NUMBER | BREAKDOWN VOLTAGE V _(BR) | | | TEST CURRENT I _(BR) mADC | RATED STAND-OFF VOLTAGE V _{WM} V | MAX REVERSE LEAKAGE CURRENT I _D @ V _{WM} mA | MAX. CLAMPING VOLTAGE V _C @ I _{PP} V | MAX. PEAK PULSE CURRENT I _{PP} A | MAX. TEMP COEFFICIENT αV _(BR) %/°C |
|-----------------------|--|-----------|-----------|---|---|---|--|---|---|
| | MIN. V | NOM. V | MAX. V | | | | | | |
| TGL41-6.8 | 6.12 | 6.8 | 7.48 | 10 | 5.5 | 1000 | 10.8 | 46.3 | .057 |
| TGL41-6.8A | 6.45 | 6.8 | 7.14 | 10 | 5.8 | 1000 | 10.5 | 47.6 | .057 |
| TGL41-7.5 | 6.75 | 7.5 | 8.25 | 10 | 6.05 | 500 | 11.7 | 42.7 | .061 |
| TGL41-7.5A | 7.13 | 7.5 | 7.88 | 10 | 6.4 | 500 | 11.3 | 44.2 | .061 |
| TGL41-8.2 | 7.38 | 8.2 | 9.02 | 10 | 6.63 | 200 | 12.5 | 40.0 | .065 |
| TGL41-8.2A | 7.79 | 8.2 | 8.61 | 10 | 7.02 | 200 | 12.1 | 41.3 | .065 |
| TGL41-9.1 | 8.19 | 9.1 | 10 | 1 | 7.37 | 50 | 13.8 | 36.2 | .068 |
| TGL41-9.1A | 8.65 | 9.1 | 9.55 | 1 | 7.78 | 50 | 13.4 | 37.3 | .068 |
| TGL41-10 | 9.0 | 10 | 11 | 1 | 8.1 | 10 | 15 | 33.3 | .073 |
| TGL41-10A | 9.5 | 10 | 10.5 | 1 | 8.55 | 10 | 14.5 | 34.5 | .073 |
| TGL41-11 | 9.9 | 11 | 12.1 | 1 | 8.92 | 5 | 16.2 | 30.9 | .075 |
| TGL41-11A | 10.5 | 11 | 11.6 | 1 | 9.4 | 5 | 15.6 | 32.1 | .075 |
| TGL41-12 | 10.8 | 12 | 13.2 | 1 | 9.72 | 5 | 17.3 | 28.9 | .078 |
| TGL41-12A | 11.4 | 12 | 12.6 | 1 | 10.2 | 5 | 16.7 | 29.9 | .078 |
| TGL41-13 | 11.7 | 13 | 14.3 | 1 | 10.5 | 5 | 19 | 26.3 | .081 |
| TGL41-13A | 12.4 | 13 | 13.7 | 1 | 11.1 | 5 | 18.2 | 27.5 | .081 |
| TGL41-15 | 13.5 | 15 | 16.5 | 1 | 12.1 | 5 | 22 | 22.7 | .084 |
| TGL41-15A | 14.3 | 15 | 15.8 | 1 | 12.8 | 5 | 21.2 | 23.6 | .084 |
| TGL41-16 | 14.4 | 16 | 17.6 | 1 | 12.9 | 5 | 23.5 | 21.3 | .086 |
| TGL41-16A | 15.2 | 16 | 16.8 | 1 | 13.6 | 5 | 22.5 | 22.2 | .086 |
| TGL41-18 | 16.2 | 18 | 19.8 | 1 | 14.5 | 5 | 26.5 | 18.5 | .088 |
| TGL41-18A | 17.1 | 18 | 18.9 | 1 | 15.3 | 5 | 25.2 | 19.8 | .088 |
| TGL41-20 | 18 | 20 | 22 | 1 | 16.2 | 5 | 29.1 | 17.2 | .090 |
| TGL41-20A | 19 | 20 | 21 | 1 | 17.1 | 5 | 27.7 | 18.1 | .090 |
| TGL41-22 | 19.8 | 22 | 24.2 | 1 | 17.8 | 5 | 31.9 | 15.7 | .092 |
| TGL41-22A | 20.9 | 22 | 23.1 | 1 | 18.8 | 5 | 30.6 | 16.3 | .092 |
| TGL41-24 | 21.6 | 24 | 26.4 | 1 | 19.4 | 5 | 34.7 | 14.4 | .094 |
| TGL41-24A | 22.8 | 24 | 25.2 | 1 | 20.5 | 5 | 33.2 | 15.1 | .094 |
| TGL41-27 | 24.3 | 27 | 29.7 | 1 | 21.8 | 5 | 39.1 | 12.8 | .096 |
| TGL41-27A | 25.7 | 27 | 28.4 | 1 | 23.1 | 5 | 37.5 | 13.3 | .096 |
| TGL41-30 | 27 | 30 | 33 | 1 | 24.3 | 5 | 43.5 | 11.5 | .097 |
| TGL41-30A | 28.5 | 30 | 31.5 | 1 | 25.6 | 5 | 41.4 | 12.1 | .097 |
| TGL41-33 | 29.7 | 33 | 36.3 | 1 | 26.8 | 5 | 47.7 | 10.5 | .098 |
| TGL41-33A | 31.4 | 33 | 34.7 | 1 | 28.2 | 5 | 45.7 | 10.9 | .098 |
| TGL41-36 | 32.4 | 36 | 39.6 | 1 | 29.1 | 5 | 52 | 9.6 | .099 |
| TGL41-36A | 34.2 | 36 | 37.8 | 1 | 30.8 | 5 | 49.9 | 10.0 | .099 |
| TGL41-39 | 35.1 | 39 | 42.9 | 1 | 31.6 | 5 | 56.4 | 8.9 | .100 |
| TGL41-39A | 37.1 | 39 | 41 | 1 | 33.3 | 5 | 53.9 | 9.3 | .100 |
| TGL41-43 | 38.7 | 43 | 47.3 | 1 | 34.8 | 5 | 61.9 | 8.1 | .101 |
| TGL41-43A | 40.9 | 43 | 45.2 | 1 | 36.8 | 5 | 59.3 | 8.4 | .101 |
| TGL41-47 | 42.3 | 47 | 51.7 | 1 | 38.1 | 5 | 67.8 | 7.4 | .101 |
| TGL41-47A | 44.7 | 47 | 49.4 | 1 | 40.2 | 5 | 64.8 | 7.7 | .101 |
| TGL41-51 | 45.9 | 51 | 56.1 | 1 | 41.3 | 5 | 73.5 | 6.8 | .102 |
| TGL41-51A | 48.5 | 51 | 53.6 | 1 | 43.6 | 5 | 70.1 | 7.1 | .102 |
| TGL41-56 | 50.4 | 56 | 61.6 | 1 | 45.4 | 5 | 80.5 | 6.2 | .103 |
| TGL41-56A | 53.2 | 56 | 58.8 | 1 | 47.8 | 5 | 77 | 6.5 | .103 |
| TGL41-62 | 55.8 | 62 | 68.2 | 1 | 50.2 | 5 | 89 | 5.6 | .104 |
| TGL41-62A | 58.9 | 62 | 65.1 | 1 | 53 | 5 | 85 | 5.9 | .104 |
| TGL41-68 | 61.2 | 68 | 74.8 | 1 | 55.1 | 5 | 98 | 5.1 | .104 |
| TGL41-68A | 64.6 | 68 | 71.4 | 1 | 58.1 | 5 | 92 | 5.4 | .104 |
| TGL41-75 | 67.5 | 75 | 82.5 | 1 | 60.7 | 5 | 108 | 4.6 | .105 |
| TGL41-75A | 71.3 | 75 | 78.8 | 1 | 64.1 | 5 | 103 | 4.9 | .105 |
| TGL41-82 | 73.8 | 82 | 90.2 | 1 | 66.4 | 5 | 118 | 4.2 | .105 |
| TGL41-82A | 77.9 | 82 | 86.1 | 1 | 70.1 | 5 | 113 | 4.4 | .105 |
| TGL41-91 | 81.9 | 91 | 100 | 1 | 73.7 | 5 | 131 | 3.8 | .106 |
| TGL41-91A | 86.5 | 91 | 95.5 | 1 | 77.8 | 5 | 125 | 4.0 | .106 |

| MICROSEMI PART NUMBER | BREAKDOWN VOLTAGE $V_{(BR)}$ | | | TEST CURRENT $I_{(BR)}$ mA | RATED STAND-OFF VOLTAGE V_{WM} V | MAX REVERSE LEAKAGE CURRENT $I_D @ V_{WM}$ mA | MAX. CLAMPING VOLTAGE $V_C @ I_{PP}$ V | MAX. PEAK PULSE CURRENT I_{PP} A | MAX. TEMP COEFFICI ENT $\alpha V_{(BR)}$ %/°C |
|-----------------------------|------------------------------------|------|------|-------------------------------------|--|--|--|---|--|
| | MIN. | NOM. | MAX. | | | | | | |
| | V | V | V | | | | | | |
| TGL41-100 | 90 | 100 | 110 | 1 | 81 | 5 | 144 | 3.5 | .106 |
| TGL41-100A | 95 | 100 | 105 | 1 | 85.5 | 5 | 137 | 3.6 | .106 |
| TGL41-110 | 99 | 110 | 121 | 1 | 89.2 | 5 | 158 | 3.2 | .107 |
| TGL41-110A | 105 | 110 | 116 | 1 | 94 | 5 | 152 | 3.3 | .107 |
| TGL41-120 | 108 | 120 | 132 | 1 | 97.2 | 5 | 173 | 2.9 | .107 |
| TGL41-120A | 114 | 120 | 126 | 1 | 102 | 5 | 165 | 3.0 | .107 |
| TGL41-130 | 117 | 130 | 143 | 1 | 105 | 5 | 187 | 2.7 | .107 |
| TGL41-130A | 124 | 130 | 137 | 1 | 111 | 5 | 179 | 2.8 | .107 |
| TGL41-150 | 135 | 150 | 165 | 1 | 121 | 5 | 215 | 2.3 | .108 |
| TGL41-150A | 143 | 150 | 158 | 1 | 128 | 5 | 207 | 2.4 | .108 |
| TGL41-160 | 144 | 160 | 176 | 1 | 130 | 5 | 230 | 2.2 | .108 |
| TGL41-160A | 152 | 160 | 168 | 1 | 136 | 5 | 219 | 2.3 | .108 |
| TGL41-170 | 153 | 170 | 187 | 1 | 138 | 5 | 244 | 2.0 | .108 |
| TGL41-170A | 161 | 170 | 179 | 1 | 145 | 5 | 234 | 2.1 | .108 |
| TGL41-180 | 162 | 180 | 198 | 1 | 146 | 5 | 258 | 1.9 | .108 |
| TGL41-180A | 171 | 180 | 189 | 1 | 154 | 5 | 246 | 2.0 | .108 |
| TGL41-200 | 180 | 200 | 220 | 1 | 162 | 5 | 287 | 1.7 | .108 |
| TGL41-200A | 190 | 200 | 210 | 1 | 171 | 5 | 274 | 1.8 | .108 |

For Bidirectional construction, indicate a C or CA suffix after part number. Capacitance will be 1/2 that shown in Fig 3.
Forward Voltage (Vf) @ 40 amps peak 8.3 ms halfsine wave equal to 3.5 volts max (For Unidirectional only).

SYMBOLS & DEFINITIONS

| Symbol | Definition | Symbol | Definition |
|----------|-------------------------|------------|-------------------|
| V_{WM} | Rated Stand-Off voltage | $V_{(BR)}$ | Breakdown Voltage |
| I_{PP} | Peak Pulse Current | $I_{(BR)}$ | Breakdown Current |
| P_{PP} | Peak Pulse Power | I_D | Standby Current |

OUTLINE AND CIRCUIT

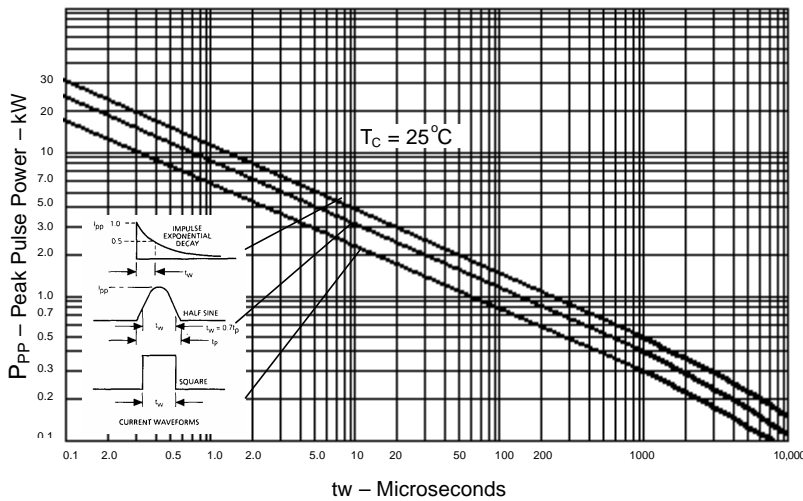


FIGURE 1
Peak Pulse Power vs. Pulse Width

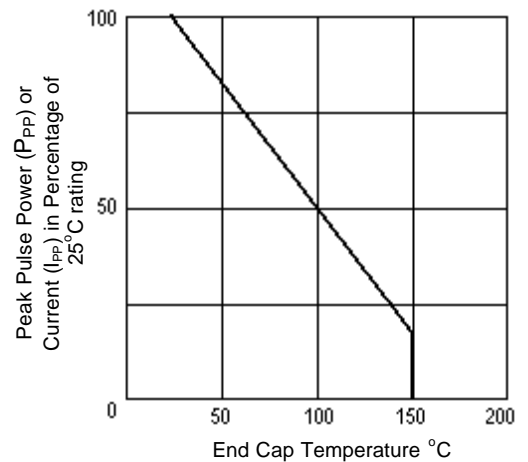


FIGURE 2
Derating Curve

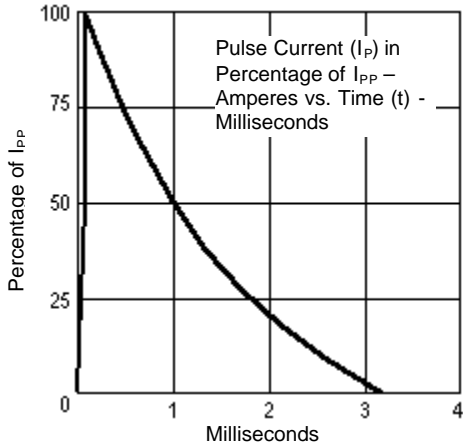


FIGURE 3

Pulse Waveform for Exponential Surge

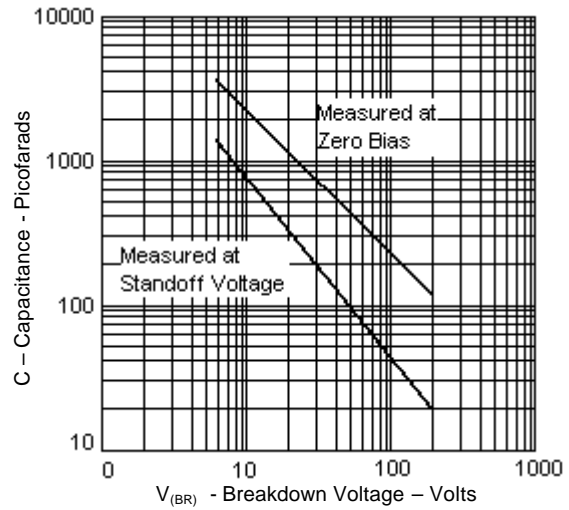
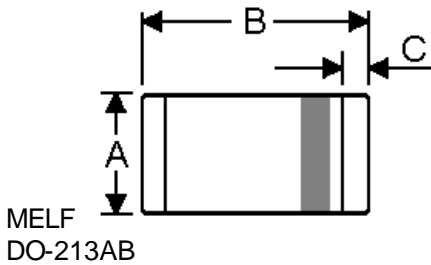


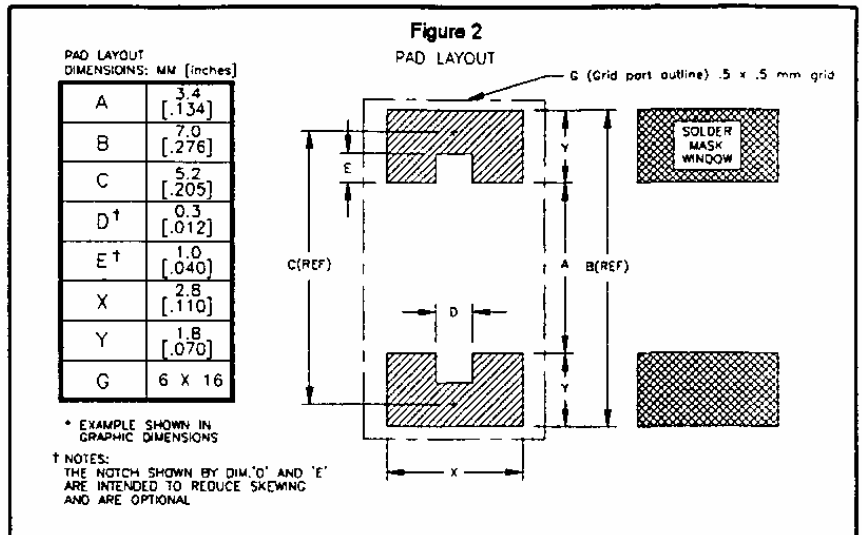
FIGURE 4

Typical Capacitance vs. Breakdown Voltage (Unidirectional only)
Bidirectional Suffix C devices are 1/2 that shown.

DIMENSIONS AND LAYOUT



| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 2.39 | 2.66 | 0.094 | 0.102 |
| B | 4.80 | 5.20 | 0.189 | 0.205 |
| C | 0.41 | 0.55 | 0.016 | 0.022 |



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