

Transient Voltage Suppressor Diode

TGL41-10A

(TGL41-6.8 thru TGL41-200CA Series)

Breakdown-Voltage 6.8 to 200V

Peak Pulse Power 400W

DATASHEET

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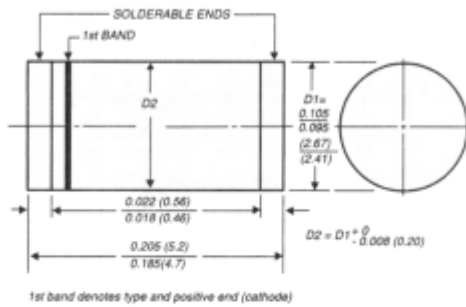
OEM – General Semiconductor

Source: General Semiconductor Databook 1998

TGL41-6.8 THRU TGL41-200CA

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR
Breakdown Voltage - 6.8 to 200 Volts Peak Pulse Power - 400 Watts

DO-213AB



FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- For surface mounted applications
- Glass passivated junction
- Excellent clamping capability
- Low incremental surge resistance
- Fast response time typically less than 1.0ps from 0 Volts to $V_{(BR)}$ for unidirectional and 5.0ns for bidirectional types
- 400W peak pulse capability with a 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- For devices with $V_{(BR)} \geq 10V$, I_D are typically less than 1.0 μ A
- High temperature soldering guaranteed: 250°C/10 seconds at terminals



MECHANICAL DATA

Case: JEDEC DO-213AB molded plastic body over passivated junction

Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Polarity: Blue bands denotes positive end (cathode) for unidirectional and a yellow band in the middle for bidirectional types

Mounting Position: Any

Weight: 0.116 gram, 0.0046 ounce

DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional applications use suffix letters C or CA for types TGL41-10 thru TGL41-200A (e.g. TGL41-10C, TGL41-200CA). Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| RATINGS | SYMBOL | VALUE | UNITS |
|--|----------------|-------------|-------|
| Peak pulse power dissipation with a 10/1000 μ s waveform (NOTE 1, FIG. 1) | PPPM | Minimum 400 | Watts |
| Steady state power dissipation at $T_T=75^\circ C$ (NOTE 2) | $P_{M(AV)}$ | 1.0 | Watt |
| Peak pulse current with a 10/1000 μ s waveform (NOTE 1, FIG. 3) | IPPM | SEE TABLE 1 | Amps |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load for unidirectional only (JEDEC Method) (NOTE 3) | IFSM | 40.0 | Amps |
| Maximum instantaneous forward voltage at 25A (NOTE 3) for unidirectional only | V_F | 3.5 | Volts |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | °C |

NOTES:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ C$ per Fig. 2
- (2) Mounted on copper pads to each terminal of 0.31 in² (8.0 mm²) per Fig. 5
- (3) Measured at 8.3ms single half sine-wave or equivalent square wave duty cycle=4 pulses per minute maximum

ELECTRICAL CHARACTERISTICS at (TA=25°C unless otherwise noted)

| Device Type | Breakdown Voltage V _(BR) (Volts) (NOTE 1) | | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (NOTE 4) (Volts) | Maximum Reverse Leakage at V _{WM} I ₀ (µA) (NOTE 4) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _c (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|------|--|--|--|--|---|---|
| | MIN | MAX | | | | | | |
| *TGL41-6.8 | 6.12 | 7.48 | 10.0 | 5.50 | 1000 | 37.0 | 10.8 | 0.060 |
| *TGL41-6.8A | 6.45 | 7.14 | 10.0 | 5.80 | 1000 | 38.1 | 10.5 | 0.060 |
| *TGL41-7.5 | 6.75 | 8.25 | 10.0 | 6.05 | 500 | 34.2 | 11.7 | 0.064 |
| *TGL41-7.5A | 7.13 | 7.88 | 10.0 | 6.40 | 500 | 35.4 | 11.3 | 0.064 |
| *TGL41-8.2 | 7.38 | 9.02 | 10.0 | 6.63 | 200 | 32.0 | 12.5 | 0.068 |
| *TGL41-8.2A | 7.79 | 8.61 | 10.0 | 7.02 | 200 | 33.1 | 12.1 | 0.068 |
| *TGL41-9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50.0 | 29.0 | 13.8 | 0.071 |
| *TGL41-9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50.0 | 29.9 | 13.4 | 0.071 |
| TGL41 -10 | 9.00 | 11.0 | 1.0 | 8.10 | 10.0 | 26.7 | 15.0 | 0.076 |
| TGL41 -10A | 9.50 | 10.5 | 1.0 | 8.55 | 10.0 | 27.6 | 14.5 | 0.076 |
| TGL41 -11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 24.7 | 16.2 | 0.078 |
| TGL41 -11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 25.6 | 15.6 | 0.078 |
| TGL41-12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 23.1 | 17.3 | 0.081 |
| TGL41-12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 24.0 | 16.7 | 0.081 |
| TGL41-13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 21.1 | 19.0 | 0.084 |
| TGL41-13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 22.0 | 18.2 | 0.084 |
| TGL41-15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 18.2 | 22.0 | 0.087 |
| TGL41-15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 18.9 | 21.2 | 0.087 |
| TGL41-16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 17.0 | 23.5 | 0.089 |
| TGL41-16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 17.8 | 22.5 | 0.089 |
| TGL41-18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 15.1 | 26.5 | 0.091 |
| TGL41-18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 15.9 | 25.2 | 0.091 |
| TGL41-20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 13.7 | 29.1 | 0.093 |
| TGL41-20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 14.4 | 27.7 | 0.093 |
| TGL41-22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 12.5 | 31.9 | 0.095 |
| TGL41-22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 13.1 | 30.6 | 0.095 |
| TGL41-24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 11.5 | 34.7 | 0.097 |
| TGL41-24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 12.0 | 33.2 | 0.097 |
| TGL41-27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 10.2 | 39.1 | 0.099 |
| TGL41-27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 10.7 | 37.5 | 0.099 |
| TGL41-30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 9.2 | 43.5 | 0.100 |
| TGL41-30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 9.7 | 41.4 | 0.100 |
| TGL41-33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 8.4 | 47.7 | 0.101 |
| TGL41-33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 8.8 | 45.7 | 0.101 |
| TGL41-36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 7.7 | 52.0 | 0.102 |
| TGL41-36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.0 | 49.9 | 0.102 |
| TGL41-39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.1 | 56.4 | 0.103 |
| TGL41-39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.4 | 53.9 | 0.103 |
| TGL41-43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.5 | 61.9 | 0.104 |
| TGL41-43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 6.7 | 59.3 | 0.104 |
| TGL41-47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 5.9 | 67.8 | 0.104 |

*Available in unidirectional only

ELECTRICAL CHARACTERISTICS at (T_A=25°C unless otherwise noted)

| Device Type | Breakdown Voltage V _(BR) Volts (NOTE 1) | | Test Current at I _T (mA) | Stand-off Voltage V _{WS} (Volts) | Maximum Reverse Leakage at V _{WS} I ₀ (µA) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _C (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|-------|--|--|--|--|---|---|
| | MIN | MAX | | | | | | |
| TGL41-47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.2 | 64.8 | 0.104 |
| TGL41-51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.4 | 73.5 | 0.105 |
| TGL41-51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 5.7 | 70.1 | 0.105 |
| TGL41-56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.0 | 80.5 | 0.106 |
| TGL41-56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.2 | 77.0 | 0.106 |
| TGL41-62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.5 | 89.0 | 0.107 |
| TGL41-62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 4.7 | 85.0 | 0.107 |
| TGL41-68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.1 | 98.0 | 0.107 |
| TGL41-68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.3 | 92.0 | 0.107 |
| TGL41-75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.7 | 108 | 0.108 |
| TGL41-75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 3.9 | 103 | 0.108 |
| TGL41-82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.4 | 118 | 0.108 |
| TGL41-82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.5 | 113 | 0.108 |
| TGL41-91 | 81.9 | 100.0 | 1.0 | 73.7 | 5.0 | 3.1 | 131 | 0.109 |
| TGL41-91A | 86.5 | 95.50 | 1.0 | 77.8 | 5.0 | 3.2 | 125 | 0.109 |
| TGL41-100 | 90.0 | 110.0 | 1.0 | 81.0 | 5.0 | 1.39 | 144 | 0.109 |
| TGL41-100A | 95.0 | 105.0 | 1.0 | 85.5 | 5.0 | 1.46 | 137 | 0.109 |
| TGL41-110 | 99.0 | 121.0 | 1.0 | 89.2 | 5.0 | 1.27 | 158 | 0.110 |
| TGL41-110A | 105.0 | 116.0 | 1.0 | 94.0 | 5.0 | 1.32 | 152 | 0.110 |
| TGL41-120 | 108.0 | 132.0 | 1.0 | 97.2 | 5.0 | 1.16 | 173 | 0.110 |
| TGL41-120A | 114.0 | 126.0 | 1.0 | 102.0 | 5.0 | 1.21 | 165 | 0.110 |
| TGL41-130 | 117.0 | 143.0 | 1.0 | 105.0 | 5.0 | 1.07 | 187 | 0.110 |
| TGL41-130A | 124.0 | 137.0 | 1.0 | 111.0 | 5.0 | 1.12 | 179 | 0.110 |
| TGL41-150 | 135.0 | 165.0 | 1.0 | 121.0 | 5.0 | 0.93 | 215 | 0.111 |
| TGL41-150A | 143.0 | 158.0 | 1.0 | 128.0 | 5.0 | 0.97 | 207 | 0.111 |
| TGL41-160 | 144.0 | 176.0 | 1.0 | 130.0 | 5.0 | 0.87 | 230 | 0.111 |
| TGL41-160A | 152.0 | 168.0 | 1.0 | 136.0 | 5.0 | 0.91 | 219 | 0.111 |
| TGL41-170 | 153.0 | 187.0 | 1.0 | 138.0 | 5.0 | 0.82 | 244 | 0.111 |
| TGL41-170A | 162.0 | 179.0 | 1.0 | 145.0 | 5.0 | 0.85 | 234 | 0.111 |
| TGL41-180 | 162.0 | 198.0 | 1.0 | 146.0 | 5.0 | 0.78 | 258 | 0.111 |
| TGL41-180A | 171.0 | 189.0 | 1.0 | 154.0 | 5.0 | 0.81 | 246 | 0.111 |
| TGL41-200 | 180.0 | 220.0 | 1.0 | 162.0 | 5.0 | 0.70 | 287 | 0.111 |
| TGL41-200A | 190.0 | 210.0 | 1.0 | 171.0 | 5.0 | 0.73 | 274 | 0.111 |

NOTES:

- (1) V_(BR) measured after I_T applied for 300µs I_T=square wave pulse or equivalent
- (2) Surge current waveform per Figure 3 and derate per Fig.2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35
- (4) For bidirectional types having V_{WS} of 10 Volts and less, the I_p limit is doubled

RATINGS AND CHARACTERISTIC CURVES TGL41-6.8A THRU TGL41-200CA

FIG. 1 - PEAK PULSE POWER RATING CURVE

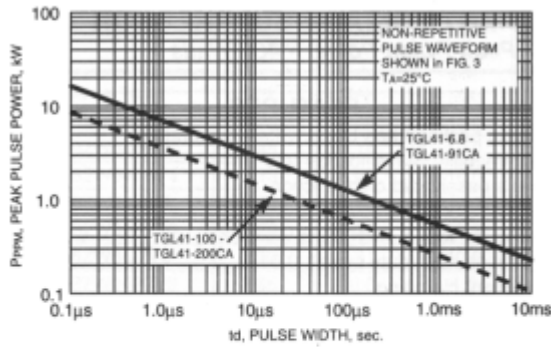


FIG. 2 - PULSE DERATING CURVE

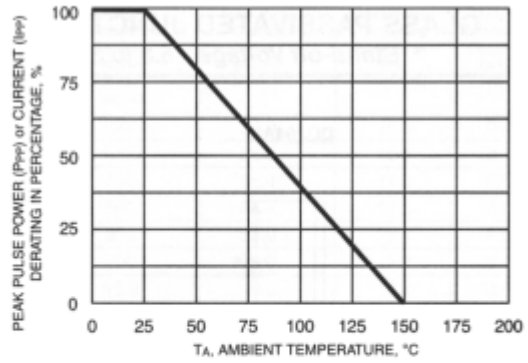


FIG. 3 - PULSE WAVEFORM

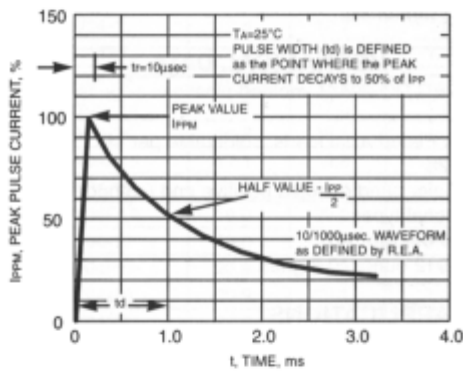


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

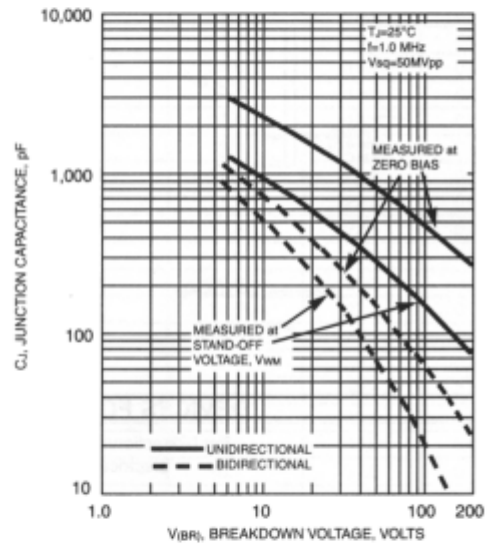


FIG. 5 - STEADY STATE POWER DERATING CURVE

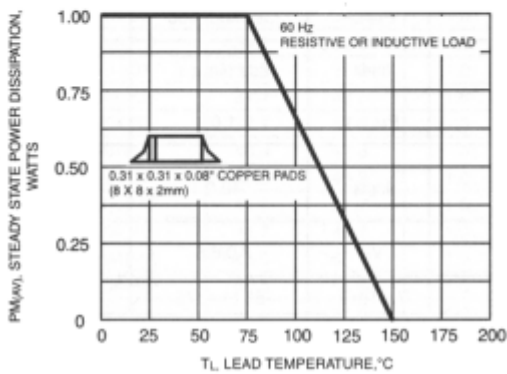


FIG. 6 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

