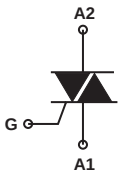
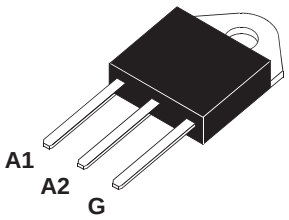
# TPDV640 ---> TPDV1240

## ALTERNISTORS

### FEATURES

- High commutation: > 142A/ms (400Hz)
- Insulating voltage = 2500V(RMS) (UL Recognized: EB81734)
- High voltage capability: $V_{DRM}$ = 1200V




TOP3

### DESCRIPTION

The TPDV640 ---> TPDV1240 use a high performance passivated glass alternistor technology. Featuring very high commutation levels and high surge current capability, this family is well adapted to power control on inductive load (motor, transformer...)

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (360° conduction angle) | Tc = 75°C | 40 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current (Tj initial = 25°C) | tp = 2.5ms | 590 | A |
| | | tp = 8.3ms | 370 | |
| | | tp = 10ms | 350 | |
| $I^2t$ | $I^2t$ value | tp = 10ms | 610 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply: $I_G$ = 500mA $dI_G/dt$ = 1A/µs | Repetitive F = 50Hz | 20 | A/µs |
| | | Non repetitive | 100 | |
| Tstg Tj | Storage and operating junction temperature range | | -40 to +150 -40 to +125 | °C |
| Tl | Maximum lead soldering temperature during 10s at 4.5mm from case | | 260 | °C |

| Symbol | Parameter | TPDV | | | | Unit |
|---|---|---|---|---|---|---|
| | | 640 | 840 | 1040 | 1240 | |
| $V_{DRM}$ $V_{RRM}$ | Repetitive peak off-state voltage Tj = 125°C | 600 | 800 | 1000 | 1200 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| Rth (j-a) | Contact to ambient | 50 | °C/W |
| Rth (j-c) DC | Junction to case for DC | 1.2 | °C/W |
| Rth (j-c) AC | Junction to case for 360° conduction angle (F = 50Hz) | 0.9 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{G(AV)}$ = 1W $P_{GM}$ = 40W (tp = 20µs) $I_{GM}$ = 8A (tp = 20µs) $V_{GM}$ = 16V (tp = 20µs)

## ELECTRICAL CHARACTERISTICS

| Symbol | Test conditions | | Quadrant | | Value | Unit |
|---|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III | MAX. | 200 | mA |
| $V_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III | MAX. | 1.5 | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3kΩ | Tj =125°C | I - II - III | MIN. | 0.2 | V |
| tgt | $V_D = V_{DRM}$ $I_G$ = 500mA<br>$dI_G/dt$ = 3A/µs | Tj = 25°C | I - II - III | TYP. | 2.5 | µs |
| $I_L$ | $I_G = 1.2I_{GT}$ | Tj = 25°C | I - III | TYP. | 100 | mA |
| | | | II | | 200 | |
| $I_H$* | $I_T$ = 500mA Gate open | Tj = 25°C | | TYP. | 50 | mA |
| $V_{TM}$* | $I_{TM}$ = 60A tp = 380µs | Tj = 25°C | | MAX. | 1.8 | V |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ rated<br>$V_{RRM}$ rated | Tj = 25°C | | MAX. | 0.02 | mA |
| | | Tj = 125°C | | MAX. | 8 | |
| dV/dt * | Linear slope up to<br>$V_D$ = 67% $V_{DRM}$ gate open | Tj = 125°C | | MIN. | 500 | V/µs |
| (dI/dt)c* | (dV/dt)c = 200V/µs | Tj = 125°C | | MIN. | 35 | A/ms |
| | (dV/dt)c = 10V/µs | | | | 142 | |

* For either polarity of electrode $A_2$ voltage with reference to electrode $A_1$.

**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

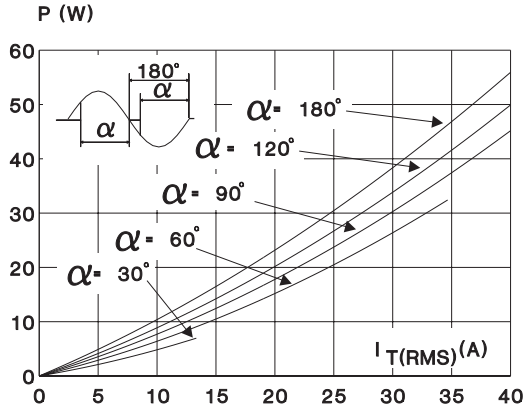



**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

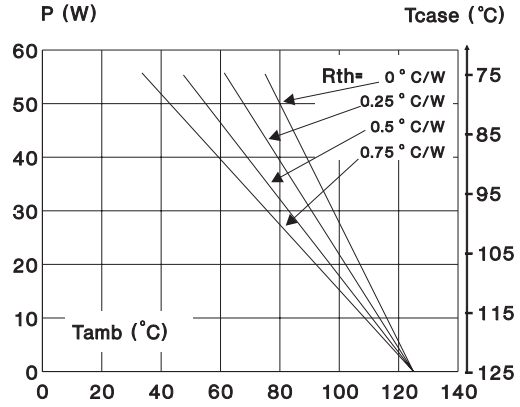



**Fig. 3:** RMS on-state current versus case temperature.

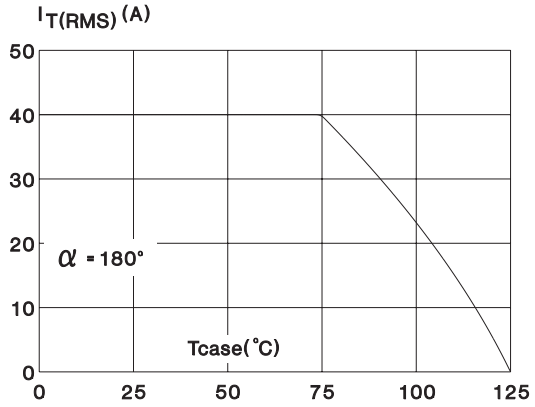



**Fig. 4:** Relative variation of thermal impedance versus pulse duration.

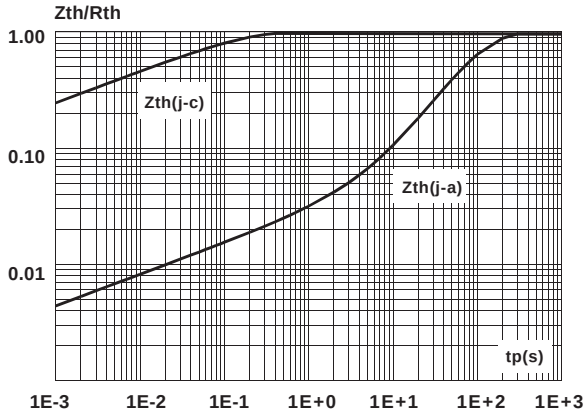



**Fig. 5:** Relative variation of gate trigger current and holding current versus junction temperature.

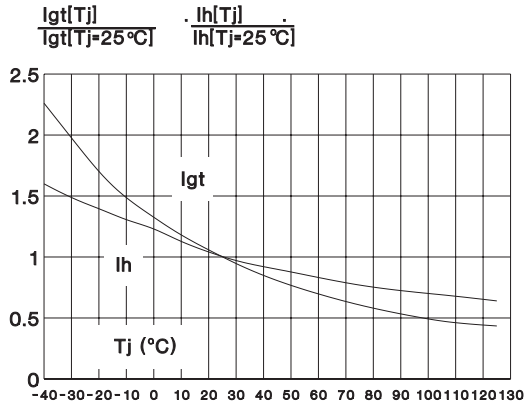



**Fig. 6:** Non repetitive surge peak on-state current versus number of cycles.

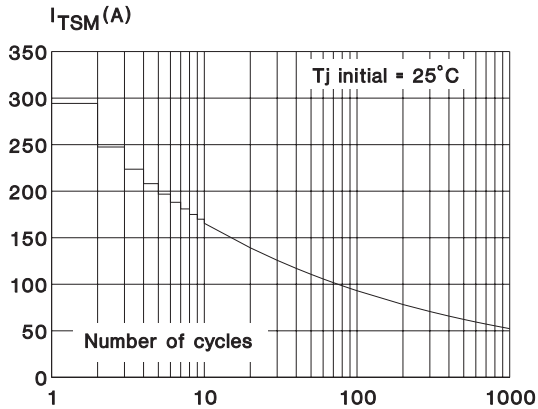


**Fig. 7:** Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of $I^2t$.

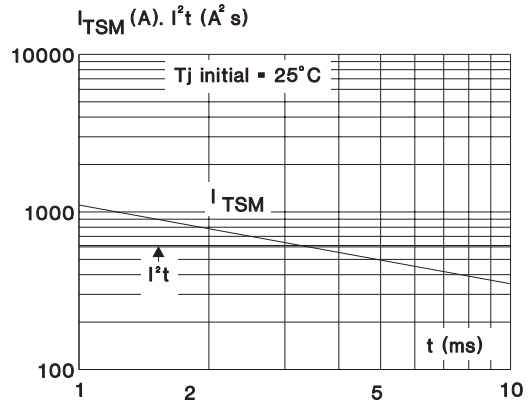



**Fig. 8:** On-state characteristics (maximum values).

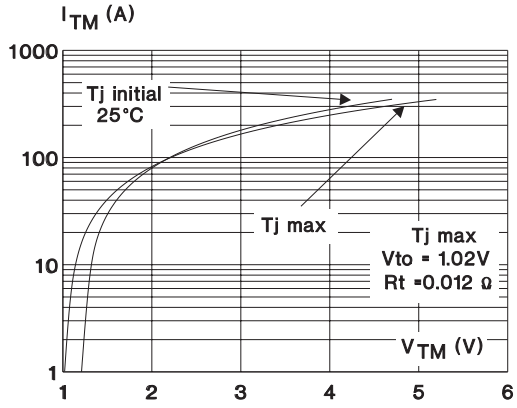
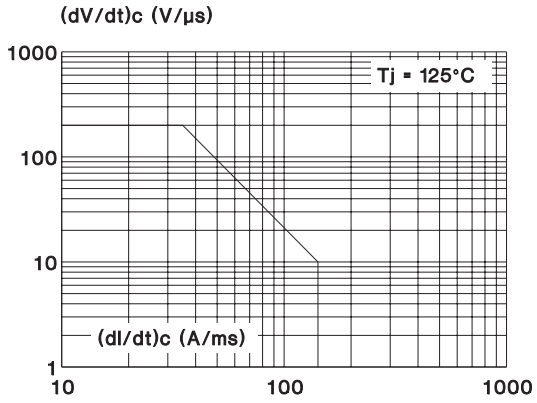
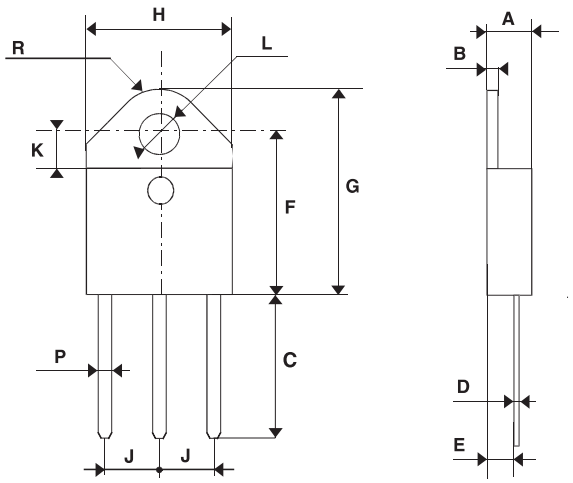



**Fig. 9:** Safe operating area.



## PACKAGE MECHANICAL DATA

TOP3 (Plastic)




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.4 | 4.6 | 0.173 | 0.181 |
| B | 1.45 | 1.55 | 0.057 | 0.061 |
| C | 14.35 | 15.60 | 0.565 | 0.614 |
| D | 0.5 | 0.7 | 0.020 | 0.028 |
| E | 2.7 | 2.9 | 0.106 | 0.114 |
| F | 15.8 | 16.5 | 0.622 | 0.650 |
| G | 20.4 | 21.1 | 0.815 | 0.831 |
| H | 15.1 | 15.5 | 0.594 | 0.610 |
| J | 5.4 | 5.65 | 0.213 | 0.222 |
| K | 3.4 | 3.65 | 0.134 | 0.144 |
| L | 4.08 | 4.17 | 0.161 | 0.164 |
| P | 1.20 | 1.40 | 0.047 | 0.055 |
| R | 4.60 Typ. | | 0.181 Typ. | |

## OTHER INFORMATION

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| TPDVx40 | TPDVx40 | TOP3 | 4.5 g | 120 | Bulk |

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.