



TPDV640 ---> TPDV1240

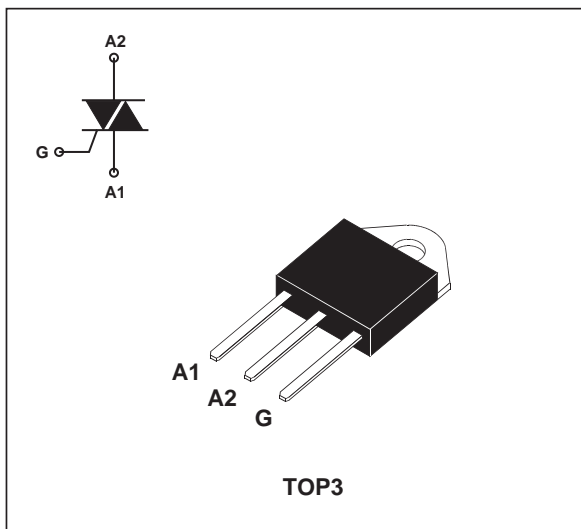
ALTERNISTORS

FEATURES

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

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) | T _c = 75°C | 40 A |
| I _{TSM} | Non repetitive surge peak on-state current (T _j initial = 25°C) | tp = 2.5ms | 590 A |
| | | tp = 8.3ms | 370 A |
| | | tp = 10ms | 350 A |
| I ² t | I ² t value | tp = 10ms | 610 A ² s |
| 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 A/μs |
| T _{stg} T _j | Storage and operating junction temperature range | -40 to +150 -40 to +125 | °C |
| TI | 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 T _j = 125°C | 600 | 800 | 1000 | 1200 | V |

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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)

$P_{G(AV)} = 1W$ $P_{GM} = 40W$ ($t_p = 20\mu s$) $I_{GM} = 8A$ ($t_p = 20\mu s$) $V_{GM} = 16V$ ($t_p = 20\mu s$)

ELECTRICAL CHARACTERISTICS

| Symbol | Test conditions | Quadrant | | Value | Unit |
|------------------------|---|---------------------|--------------|-------|----------------|
| I_{GT} | $V_D = 12V$ (DC) $R_L = 33\Omega$ | $T_j = 25^\circ C$ | I - II - III | MAX. | 200 mA |
| V_{GT} | $V_D = 12V$ (DC) $R_L = 33\Omega$ | $T_j = 25^\circ C$ | I - II - III | MAX. | 1.5 V |
| V_{GD} | $V_D = V_{DRM}$ $R_L = 3.3k\Omega$ | $T_j = 125^\circ C$ | I - II - III | MIN. | 0.2 V |
| tgt | $V_D = V_{DRM}$ $I_G = 500mA$ $di_G/dt = 3A/\mu s$ | $T_j = 25^\circ C$ | I - II - III | TYP. | 2.5 μs |
| I_L | $I_G = 1.2I_{GT}$ | $T_j = 25^\circ C$ | I - III | TYP. | 100 mA |
| | | | II | | 200 |
| I_H^* | $I_T = 500mA$ Gate open | $T_j = 25^\circ C$ | | TYP. | 50 mA |
| V_{TM}^* | $I_{TM} = 60A$ $t_p = 380\mu s$ | $T_j = 25^\circ C$ | | MAX. | 1.8 V |
| I_{DRM} I_{RRM} | V_{DRM} rated V_{RRM} rated | $T_j = 25^\circ C$ | | MAX. | 0.02 mA |
| | | $T_j = 125^\circ C$ | | MAX. | 8 |
| dV/dt * | Linear slope up to $V_D = 67\% V_{DRM}$ gate open | $T_j = 125^\circ C$ | | MIN. | 500 V/ μs |
| (di/dt)c* | (dV/dt)c = 200V/ μs | $T_j = 125^\circ C$ | | MIN. | 35 A/ms |
| | (dV/dt)c = 10V/ μs | | | | 142 |

* For either polarity of electrode A₂ voltage with reference to electrode A₁.

Fig. 1: Maximum RMS power dissipation versus RMS on-state current ($F = 50\text{Hz}$). (Curves are cut off by $(di/dt)_c$ limitation)

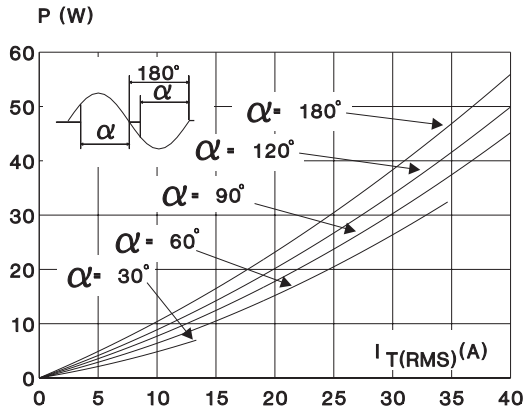


Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact.

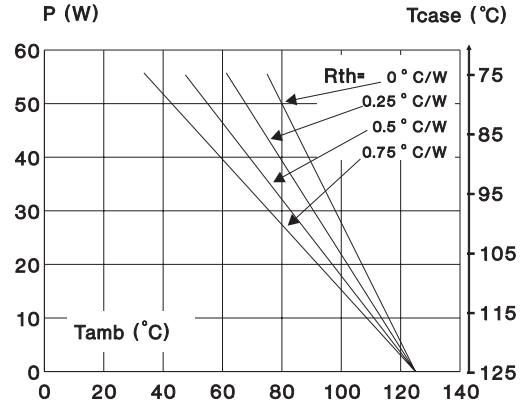


Fig. 3: RMS on-state current versus case temperature.

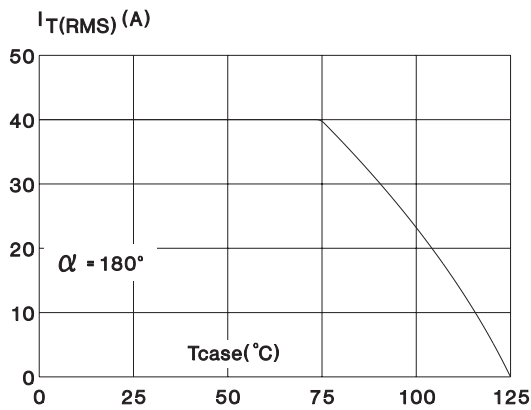


Fig. 4: Relative variation of thermal impedance versus pulse duration.

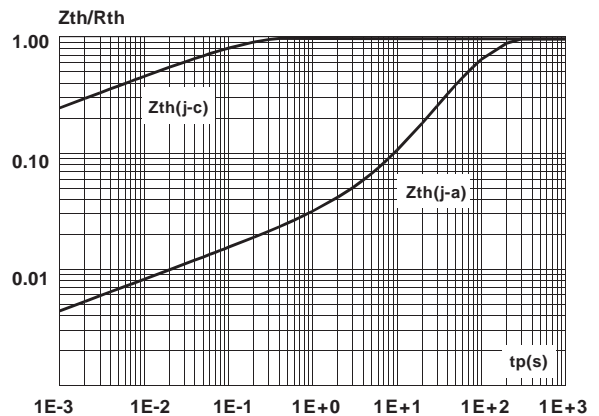


Fig. 5: Relative variation of gate trigger current and holding current versus junction temperature.

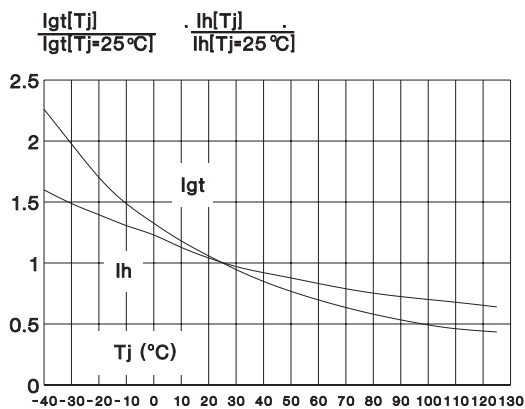


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

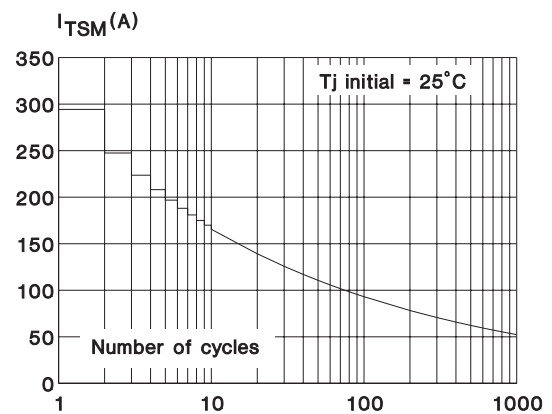


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t \leq 10\text{ms}$, and corresponding value of I^2t .

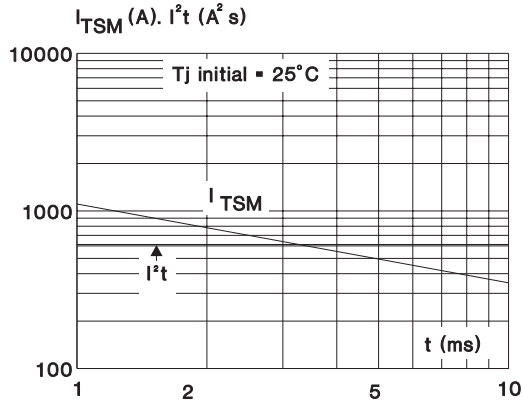


Fig. 8: On-state characteristics (maximum values).

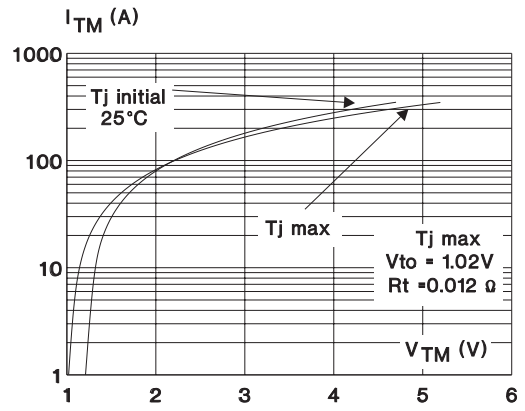
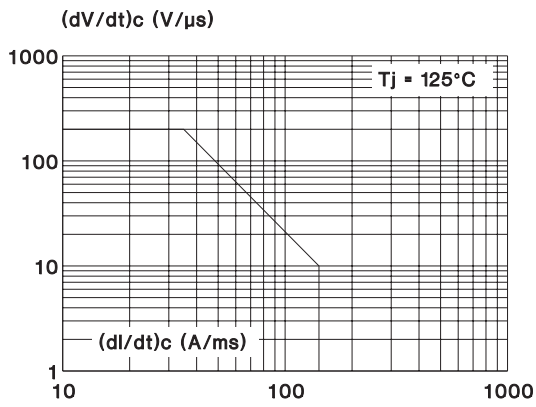
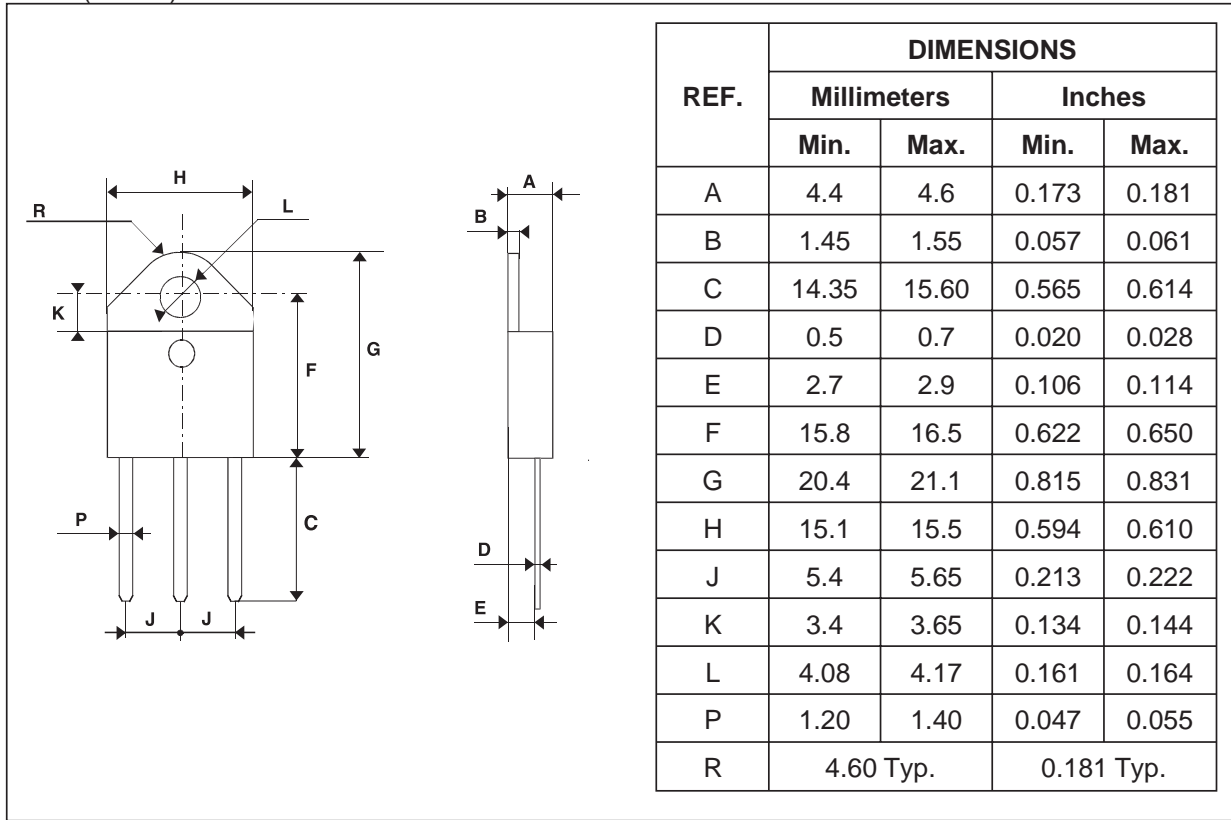


Fig. 9: Safe operating area.



PACKAGE MECHANICAL DATA
TOP3 (Plastic)



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.

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