

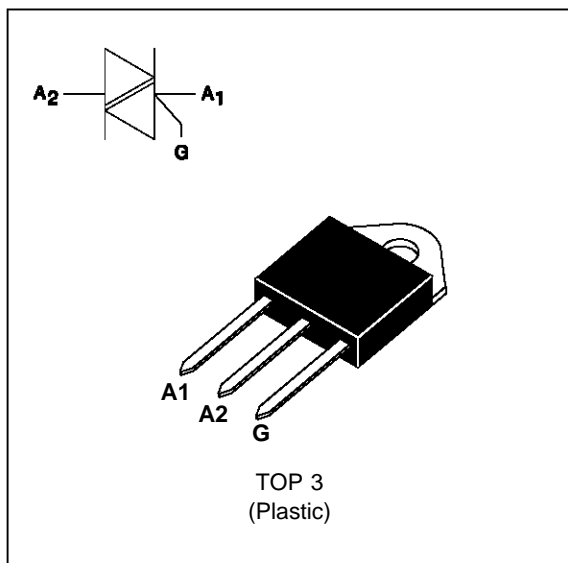
## ALTERNISTORS

### FEATURES

- HIGH COMMUTATION : > 142 A/ms (400Hz)
- INSULATING VOLTAGE = 2500V<sub>(RMS)</sub>  
(UL RECOGNIZED : EB81734)
- HIGH VOLTAGE CAPABILITY : V<sub>DRM</sub> = 1200 V

### DESCRIPTION

The TPDV 640 ---> 1240 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 <sub>T(RMS)</sub>	RMS on-state current (360° conduction angle)	T <sub>c</sub> = 75 °C	40	A
I <sub>TSM</sub>	Non repetitive surge peak on-state current ( T <sub>j</sub> initial = 25°C )	tp = 2.5 ms	590	A
		tp = 8.3 ms	370	
		tp = 10 ms	350	
I <sup>2</sup> t	I <sup>2</sup> t value	tp = 10 ms	610	A <sup>2</sup> s
di/dt	Critical rate of rise of on-state current Gate supply : I <sub>G</sub> = 500mA di <sub>G</sub> /dt = 1A/μs	Repetitive F = 50 Hz	20	A/μs
		Non Repetitive	100	
T <sub>stg</sub> T <sub>j</sub>	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	°C °C
TI	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260	°C

Symbol	Parameter	TPDV				Unit
		640	840	1040	1240	
V <sub>DRM</sub> V <sub>R</sub> RM	Repetitive peak off-state voltage T <sub>j</sub> = 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= 50 Hz)	0.9	°C/W

**GATE CHARACTERISTICS** (maximum values)

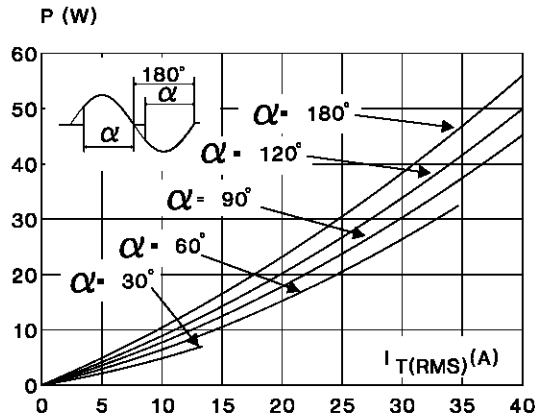
$P_G$  (AV) = 1W     $P_{GM}$  = 40W (tp = 20 μs)     $I_{GM}$  = 8A (tp = 20 μs)     $V_{GM}$  = 16V (tp = 20 μs).

**ELECTRICAL CHARACTERISTICS**

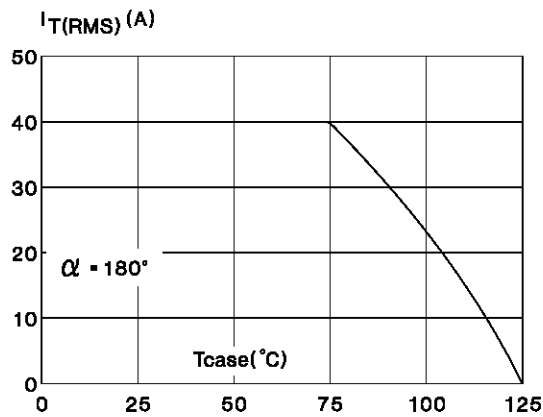
Symbol	Test Conditions	Quadrant		Value	Unit
$I_{GT}$	$V_D=12V$ (DC) $R_L=33\Omega$	$T_j=25^\circ C$	I-II-III	MAX	200 mA
$V_{GT}$	$V_D=12V$ (DC) $R_L=33\Omega$	$T_j=25^\circ C$	I-II-III	MAX	1.5 V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3k\Omega$	$T_j=125^\circ C$	I-II-III	MIN	0.2 V
tgt	$V_D=V_{DRM}$ $I_G = 500mA$ $di_G/dt = 3A/\mu s$	$T_j=25^\circ C$	I-II-III	TYP	2.5 μs
$I_L$	$I_G=1.2 I_{GT}$	$T_j=25^\circ C$	I-III	TYP	100 mA
			II		200
$I_H$ *	$I_T= 500mA$ gate open	$T_j=25^\circ C$		TYP	50 mA
$V_{TM}$ *	$I_{TM}= 60A$ tp= 380μs	$T_j=25^\circ C$		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 A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

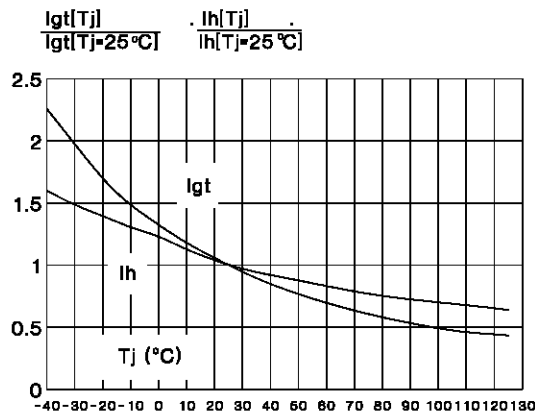
**Fig.1 :** Maximum RMS power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



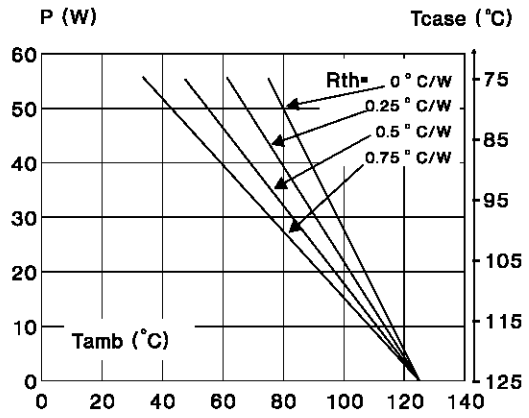
**Fig.3 :** RMS on-state current versus case temperature.



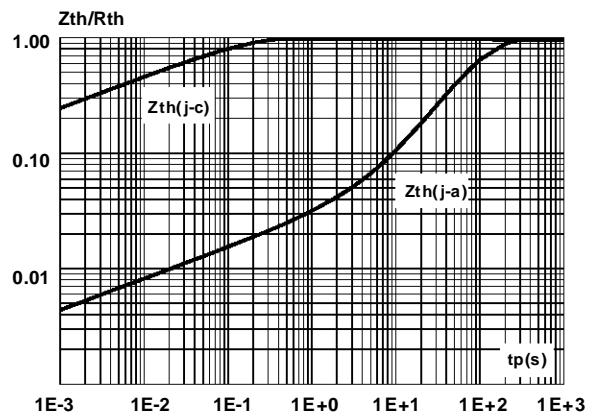
**Fig.5 :** Relative variation of gate trigger current and holding current versus junction temperature.



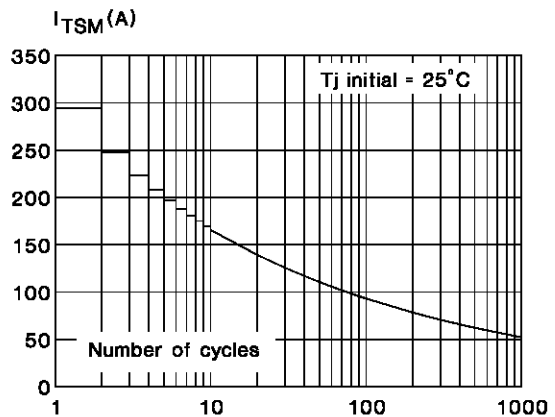
**Fig.2 :** Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.



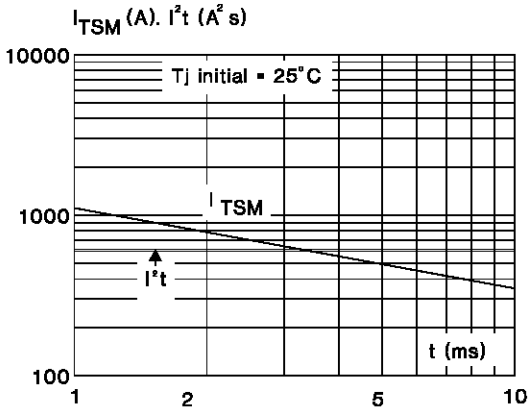
**Fig.4 :** Relative variation of thermal impedance versus pulse duration.



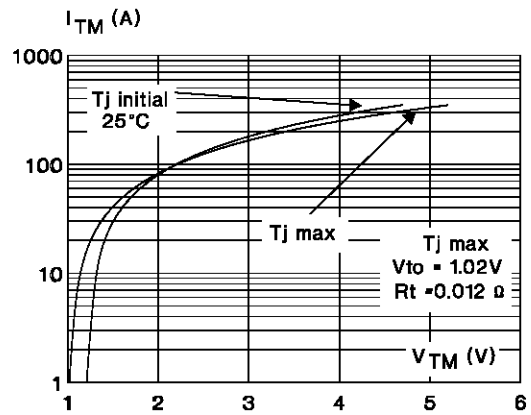
**Fig.6 :** Non Repetitive surge peak on-state current versus number of cycles.



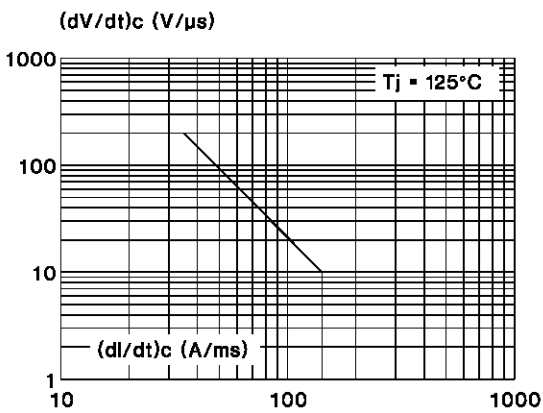
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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

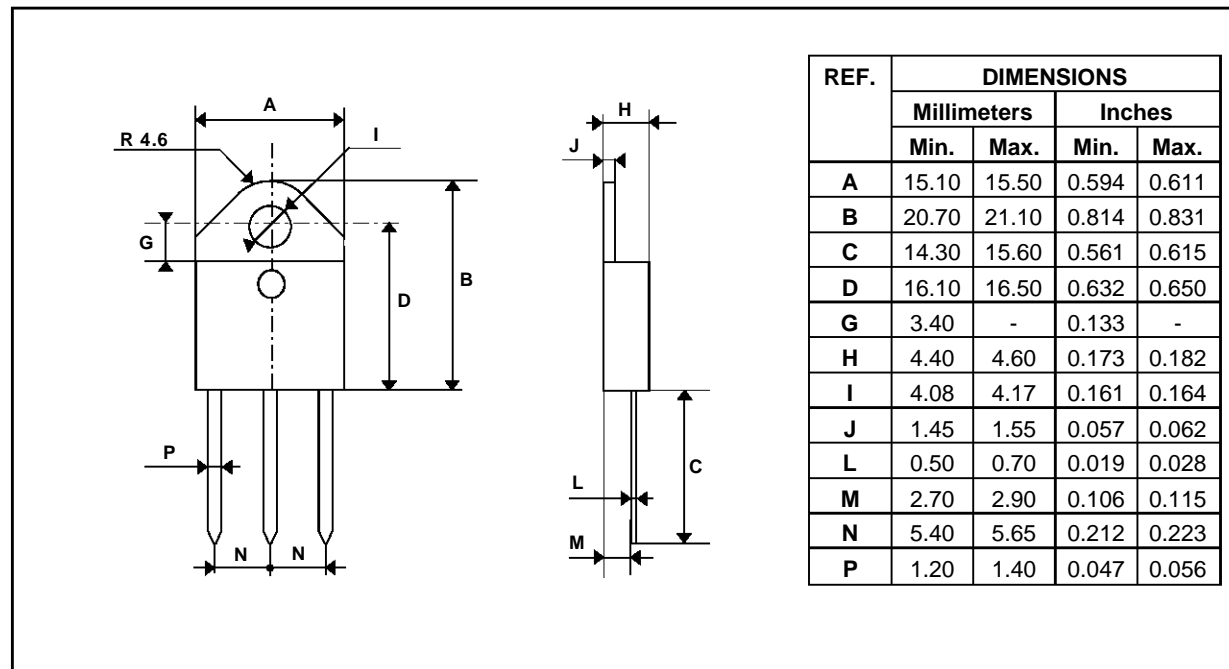


**Fig.9 :** Safe operating area.



**PACKAGE MECHANICAL DATA**

TOP 3 Plastic



Cooling method : C

Marking : type number

Weight : 4.7 g

Recommended torque value : 0.8 m.N.

Maximum torque value : 1 m.N.

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