



# TPDV640 ---> TPDV1240

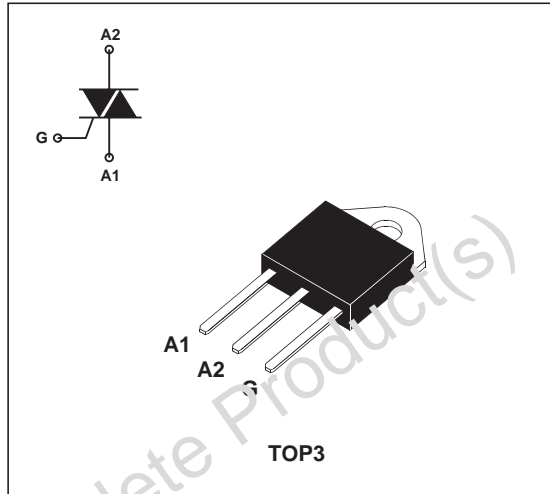
## ALTERNISTORS

### FEATURES

- High commutation: > 142A/ms (400Hz)
- Insulating voltage = 2500V<sub>(RMS)</sub>  
(UL Recognized: EB81734)
- High voltage capability: V<sub>DRM</sub> = 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 <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 = 2.5ms	590	
		tp = 8.3ms	370	
		tp = 10ms	350	
I <sup>2</sup> t	I <sup>2</sup> t value	tp = 10ms	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 = 50Hz	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	
T <sub>i</sub>	Maximum lead soldering temperature during 10s at 4.5mm from case	260	°C	

Symbol	Parameter	TPDV				Unit
		640	840	1040	1240	
V <sub>DRM</sub> V <sub>RRM</sub>	Repetitive peak off-state voltage T <sub>j</sub> = 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)

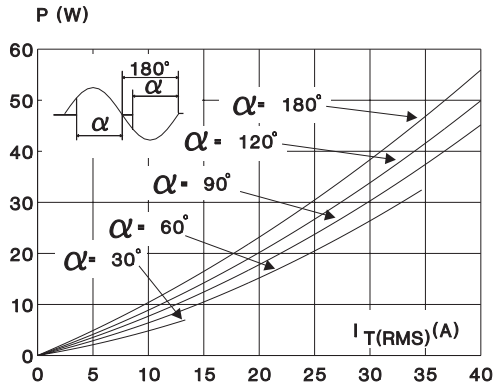
$P_{G(AV)} = 1W$   $P_{GM} = 40W$  ( $t_p = 20\mu s$ )  $I_{GM} = 8A$  ( $t_p = 20\mu s$ )  $V_{GM} = 16V$  ( $t_p = 20\mu s$ )

### ELECTRICAL CHARACTERISTICS

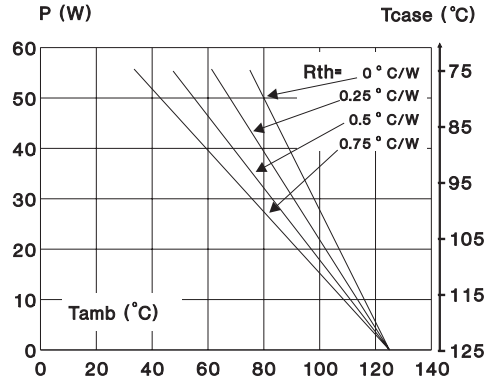
Symbol	Test conditions	Quadrant		Value	Unit	
$I_{GT}$	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$	I - II - III	MAX.	200	mA
$V_{GT}$	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$	I - II - III	MAX.	1.5	V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3k\Omega$	$T_j = 125^\circ C$	I - II - III	MIN.	0.2	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	$\mu s$
$I_L$	$I_G = 1.2I_{GT}$	$T_j = 25^\circ C$	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/ $\mu s$
(dI/dt)c*	(dV/dt)c = 200V/ $\mu s$	$T_j = 125^\circ C$		MIN.	35	A/ms
	(dV/dt)c = 10V/ $\mu s$				142	

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

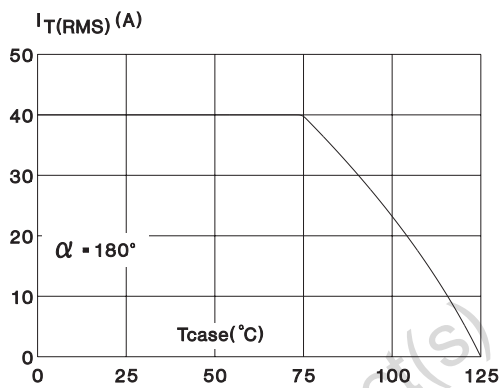
**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current ( $F = 50\text{Hz}$ ). (Curves are cut off by  $(di/dt)_c$  limitation)



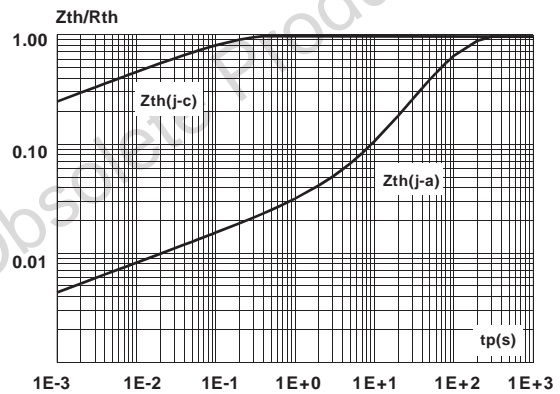
**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances  $R_{th}$  heatsink + contact.



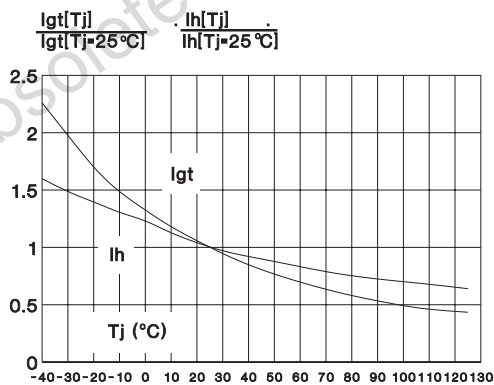
**Fig. 3:** RMS on-state current versus case temperature.



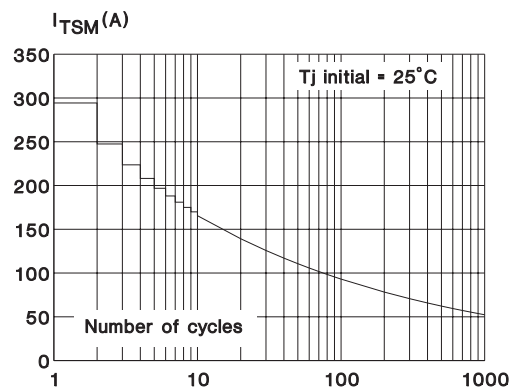
**Fig. 4:** Relative variation of thermal impedance versus pulse duration.



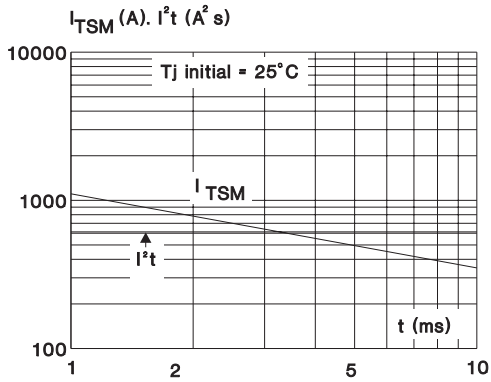
**Fig. 5:** Relative variation of gate trigger current and holding current versus junction temperature.



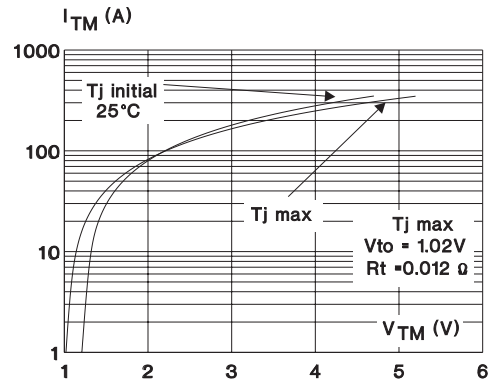
**Fig. 6:** Non repetitive surge peak on-state current versus number of cycles.



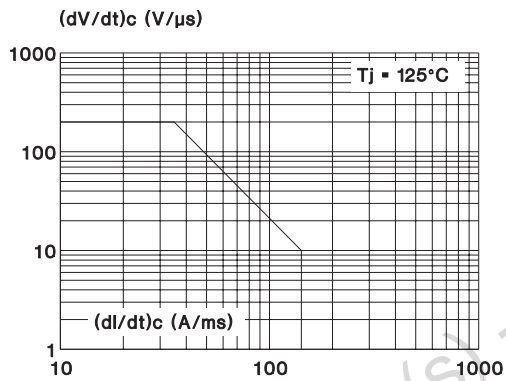
**Fig. 7:** Non repetitive surge peak on-state current for a sinusoidal pulse with width:  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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



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



**PACKAGE MECHANICAL DATA**  
TOP3 (Plastic)

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.

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