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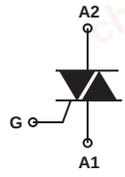
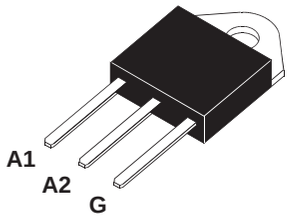
TPDV640 ---> TPDV1240

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

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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 (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 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} I_{RRM}	V_{DRM} rated V_{RRM} rated	Tj = 25°C		MAX.	0.02	mA
		Tj = 125°C		MAX.	8	
dV/dt *	Linear slope up to 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.

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

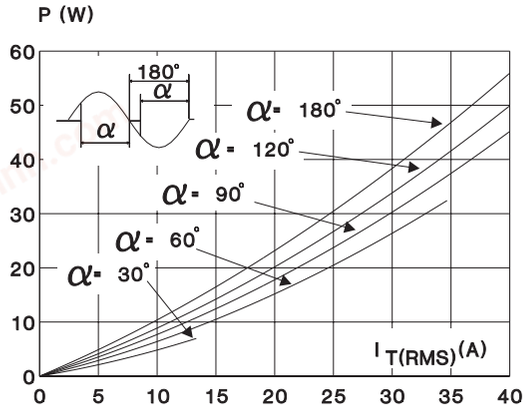

Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

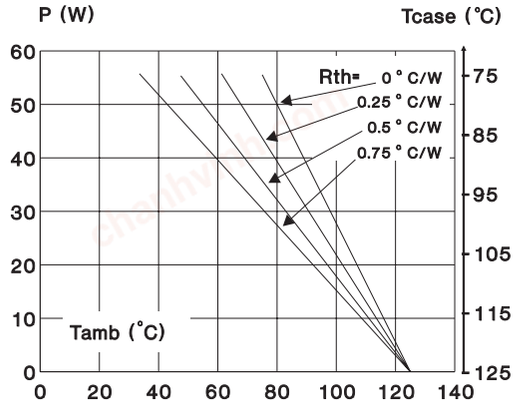

Fig. 3: RMS on-state current versus case temperature.

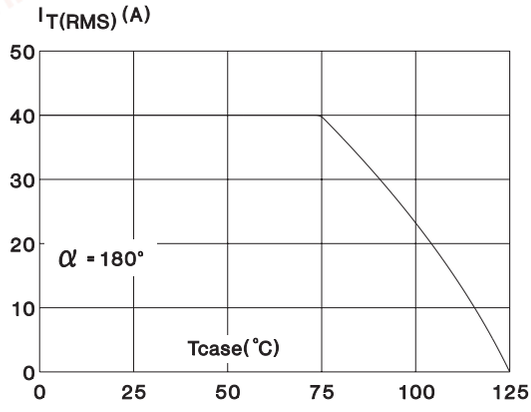

Fig. 4: Relative variation of thermal impedance versus pulse duration.

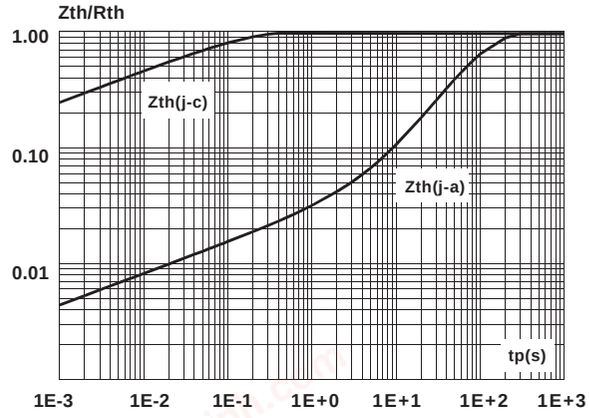

Fig. 5: Relative variation of gate trigger current and holding current versus junction temperature.

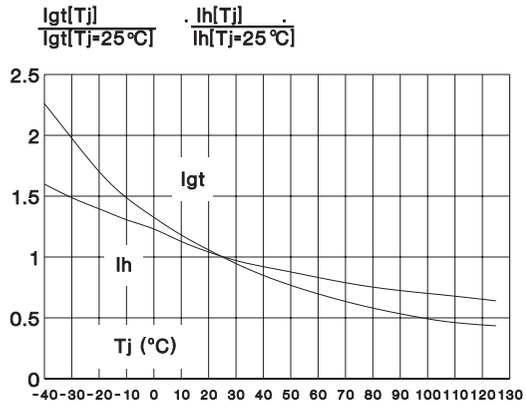

Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

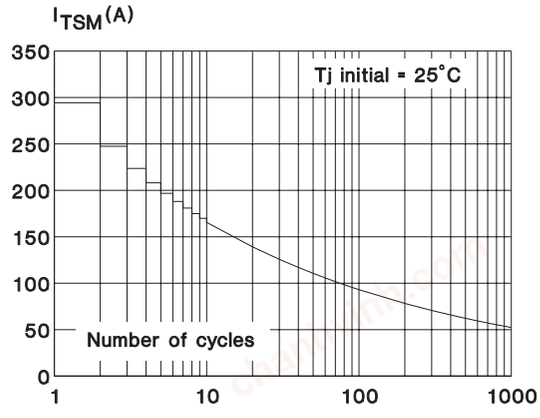

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Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of I^2t.

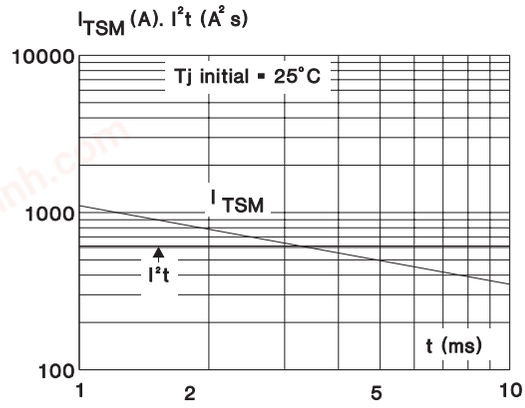


Fig. 8: On-state characteristics (maximum values).

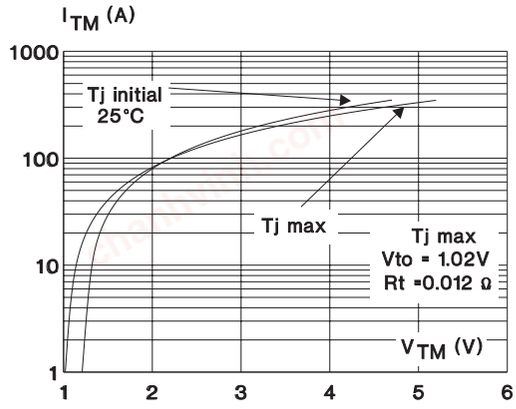
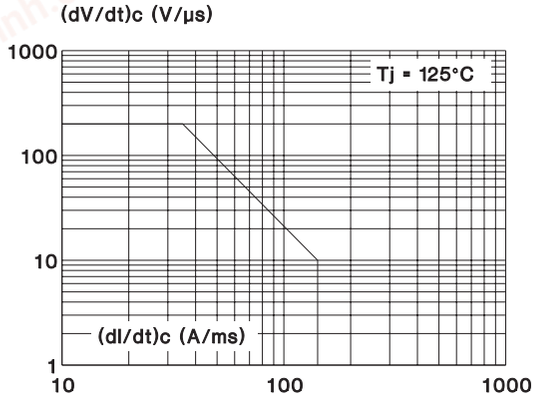


Fig. 9: Safe operating area.



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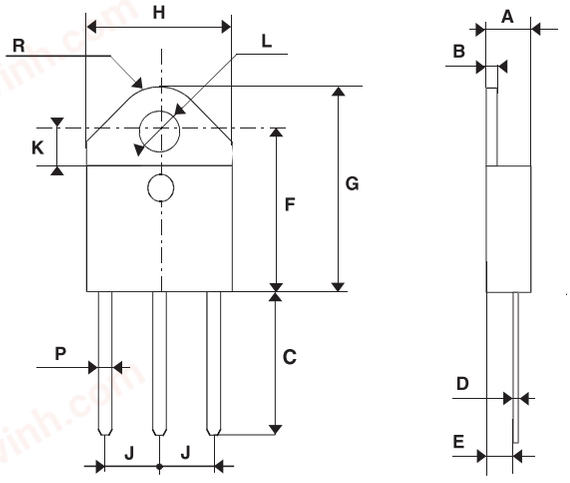
PACKAGE MECHANICAL DATA

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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