



TPDV640 ---> TPDV1240

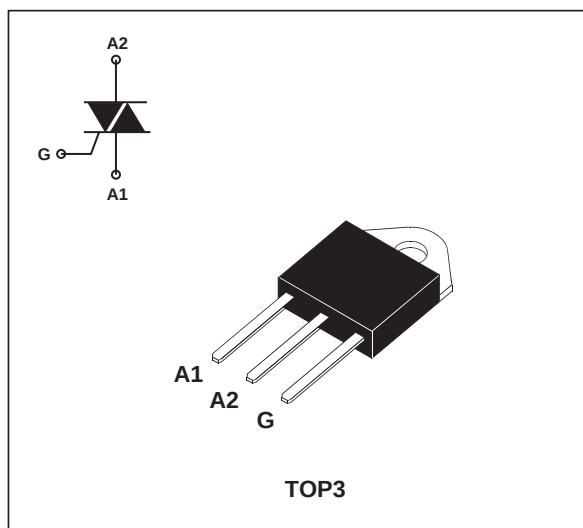
ALTERNISTORS

FEATURES

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

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
$I_{\text{T(RMS)}}$	RMS on-state current (360° conduction angle)		$T_c = 75^\circ\text{C}$ 40	A
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)		$t_p = 2.5\text{ms}$ 590	A
			$t_p = 8.3\text{ms}$ 370	
			$t_p = 10\text{ms}$ 350	
I^2t	I^2t value		$t_p = 10\text{ms}$ 610	A^2s
di/dt	Critical rate of rise of on-state current Gate supply: $I_G = 500\text{mA}$ $di_G/dt = 1\text{A}/\mu\text{s}$		Repetitive $F = 50\text{Hz}$ 20	$\text{A}/\mu\text{s}$
			Non repetitive 100	
T_{stg} T_j	Storage and operating junction temperature range		-40 to +150 -40 to +125	$^\circ\text{C}$
T_l	Maximum lead soldering temperature during 10s at 4.5mm from case		260	$^\circ\text{C}$

Symbol	Parameter	TPDV				Unit
		640	840	1040	1240	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$	600	800	1000	1200	V

TPDV640 ---> TPDV1240

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) $R_L = 33\Omega$ $T_j = 25^\circ C$	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	$V_D = V_{DRM}$ $I_G = 500mA$ $dl_G/dt = 3A/\mu s$ $T_j = 25^\circ C$	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}^*	$I_{TM} = 60A$ 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
			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)

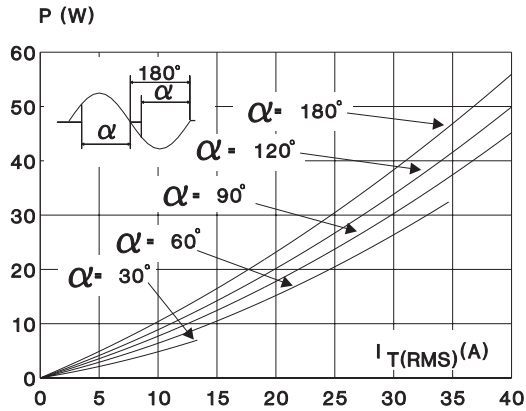


Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact.

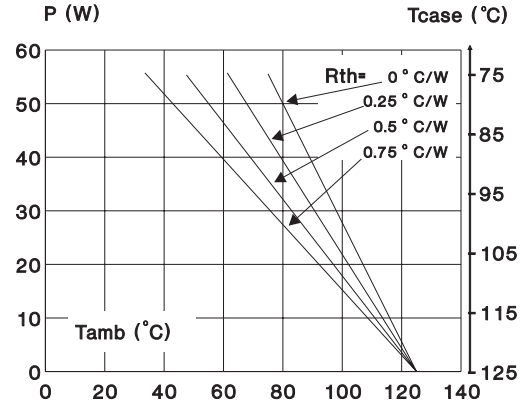


Fig. 3: RMS on-state current versus case temperature.

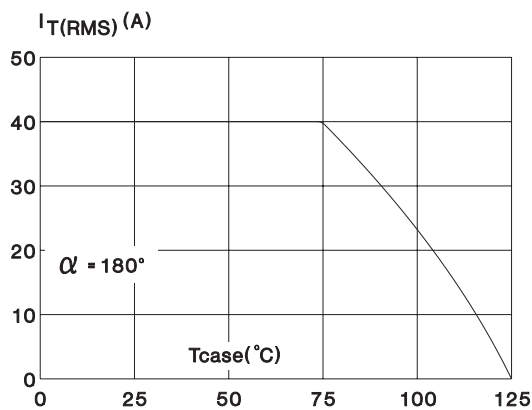


Fig. 4: Relative variation of thermal impedance versus pulse duration.

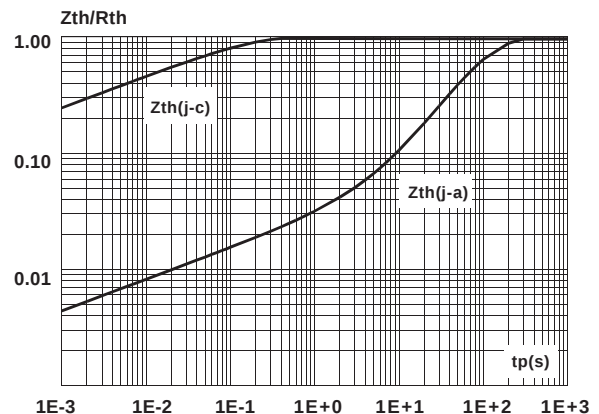


Fig. 5: Relative variation of gate trigger current and holding current versus junction temperature.

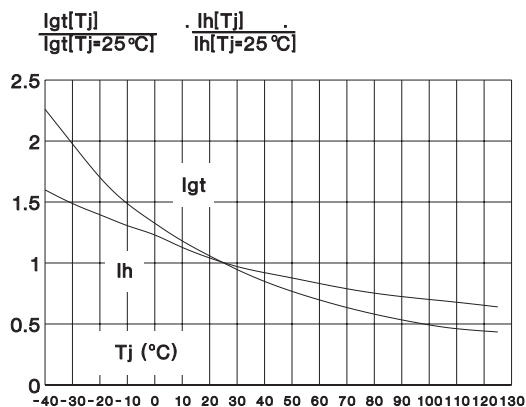


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

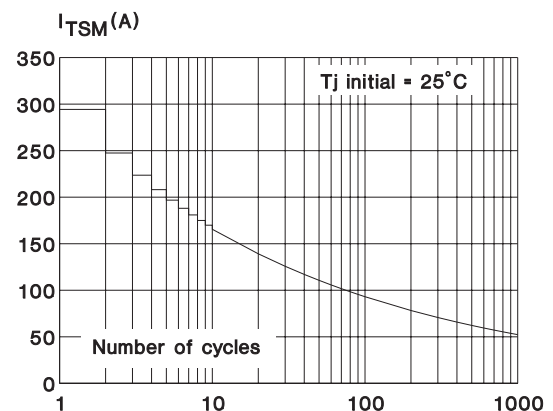


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t \leq 10\text{ms}$, and corresponding value of I^2t .

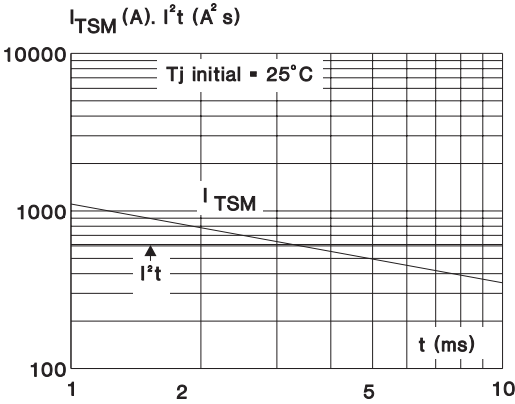


Fig. 8: On-state characteristics (maximum values).

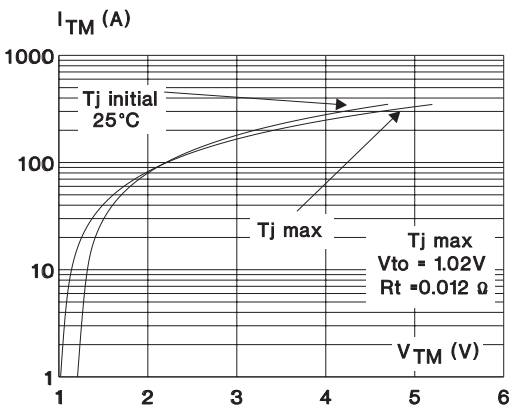
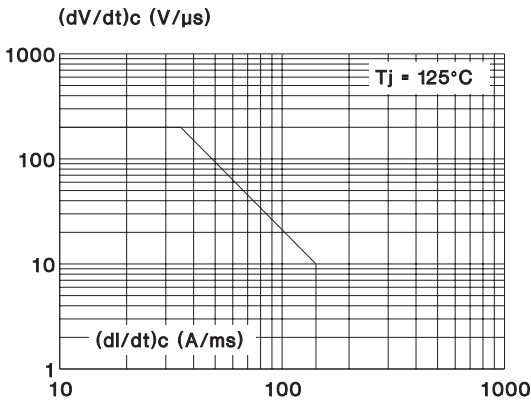


Fig. 9: Safe operating area.



PACKAGE MECHANICAL DATA
 TOP3 (Plastic)

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.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics
 © 2001 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES
 Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia
 Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>

