



40 A high voltage Triacs

Features

- On-state current (I_{T(RMS)}): 40 A
- Max. blocking voltage (V_{DRM}/V_{RRM}): 1200 V
- Gate current (I_{GT}): 200 mA
- Commutation @ 10 V/µs: up to 142 A/ms
- Noise immunity: 500 V/µs
- insulated package:
 - 2,500 V rms (UL recognized: E81734).

Description

The TPDVxx40 series use a high performance 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...)

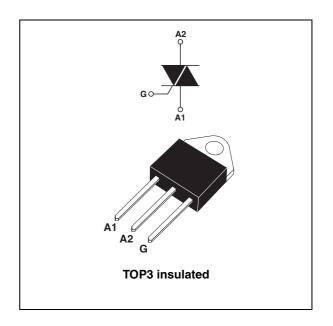


Table 1. Device summary

Parameter	TPDV640RG	TPDV840RG	TPDV1240RG	
Blocking voltage V _{DRM} /V _{RRM}	600 V	800 V	1200 V	
On-state current I _{T(RMS)}	40 A			
Gate current I _{GT}	200 mA			

Characteristics TPDVxx40

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit	
I _{T(RMS)}	On-state rms current (180° conduction a	n angle) $T_c = 75 ^{\circ}\text{C}$		40	Α	
		$t_p = 2.5 \text{ ms}$		590		
I _{TSM}	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	T _j = 25 °C	370	Α	
		t _p = 10 ms		350		
I ² t	I ² t value for fusing	t _p = 10 ms	= 10 ms $T_j = 25 ^{\circ}\text{C}$		A ² S	
dl/dt	Critical rate of rise of on-state current	Repetitive F = 50 Hz		20	- A/μs	
ui/ut	$I_G = 500 \text{ mA}$, $dI_G/dt = 1 \text{ A/}\mu\text{s}$	Non repetitive		100	Ανμδ	
	Repetitive peak off-state voltage	TPDV640		600	V	
V _{DRM} V _{RRM}		TPDV840	T _j = 125 °C	800		
* KKIVI		TPDV1240		1200		
T _{stg} T _j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	°C	
T _L	Maximum lead temperature for soldering during 10s at 2mm from case			260	°C	
V _{INS(RMS)} ⁽¹⁾	Insulation rms voltage			2500	V	

^{1.} A1, A2, gate terminals to case for 1 minute

Table 3. Electrical Characteristics ($T_j = 25$ °C, unless otherwise specified)

Symbol	Test conditions		Quadrant		Value	Unit
I _{GT}	V 10 V DC D 20 C			MAX.	200	mA
V _{GT}	$V_D = 12 \text{ V DC}, R_L = 33 \Omega$		1 - 11 - 111	MAX.	1.5	V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3 \text{ k}\Omega$ $T_j = 125 \text{ °C}$		1 - 11 - 111	MIN.	0.2	V
t _{gt}	$V_D = V_{DRM} I_G = 500 \text{ mA}$ $dI_G/dt = 3 \text{ A/}\mu\text{s}$		1 - 11 - 111	TYP.	2.5	μs
I _H ⁽¹⁾	I _T = 500 mA Gate open			MAX.	50	mA
	I_L $I_G = 1.2 \times I_{GT}$		1 - 111	TYP.	100	mA
'L			II		200	
dV/dt	Linear slope up to: $V_D = 67 \% V_{DRM}$ Gate open $T_j = 125 \ ^{\circ}C$			MIN.	500	V/µs
V _{TM} ⁽¹⁾	$I_{TM} = 35 \text{ A}$ $t_p = 380 \mu\text{s}$			MAX.	1.8	V
I _{DRM}	$V_{DRM} = V_{RRM}$	T _j = 25 °C		MAX.	20	μΑ
I _{RRM}		$T_j = 125$ °C			8	mA
(dl/dt)c (1)	(dV/dt)c = 200 V/μs	T. = 125 °C	MINI	MIN.	35	A/ms
(ui/ut)C · /	$T_{j} = 125 \text{ °C}$ $(dV/dt)c = 10 \text{ V/}\mu\text{s}$			IVIIIN.	142	7/11/2

^{1.} For either polarity of electrode A_2 voltage with reference to electrode A_1 .

TPDVxx40 Characteristics

Table 4. Gate characteristics (maximum values)

Symbol	Parameter	Value	Unit	
P _{G(AV)}	Average gate power dissipation		1	W
P _{GM}	Peak gate power dissipation	t _p = 20 μs	40	W
I _{GM}	Peak gate current	t _p = 20 μs	8	Α
V_{GM}	Peak positive gate voltage	t _p = 20 μs	16	V

Table 5. Thermal resistance

Symbol	Parameter	Value	Unit
R _{th(j-a)}	Junction to ambient	50	°C/W
R _{th(j-c)} DC	Junction to case for DC	1.2	°C/W
R _{th(j-c)} AC	Junction to case for 360 °Conduction angle (F = 50 Hz)	0.9	°C/W

Figure 1. Max. rms power dissipation versus Figure 2. on-state rms current (F = 50 Hz). (curves limited by (dl/dt)c)

Max. rms power dissipation and max. allowable temperatures (T_{amb} and T_{case}) for various R_{th}

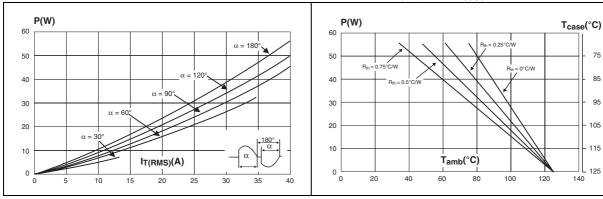
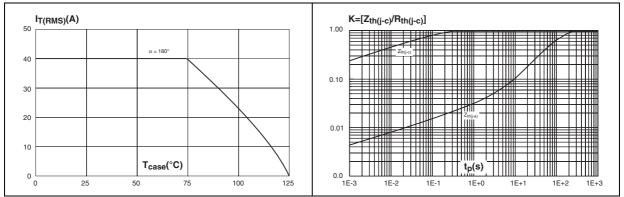


Figure 3. On-state rms current versus case temperature

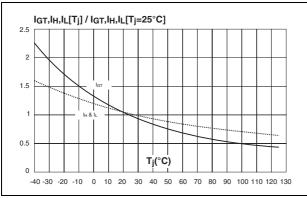
Figure 4. Relative variation of thermal impedance versus pulse duration



Characteristics TPDVxx40

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

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



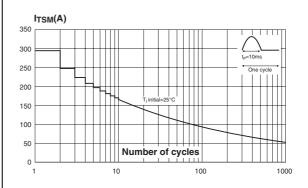
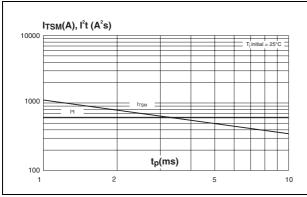


Figure 7. Non-repetitive surge peak on-state Figure 8. current for a sinusoidal pulse and corresponding values of I²t

Figure 8. On-state characteristics (maximum values)



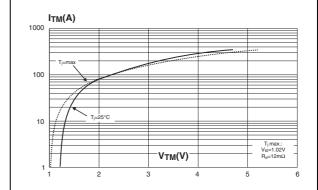
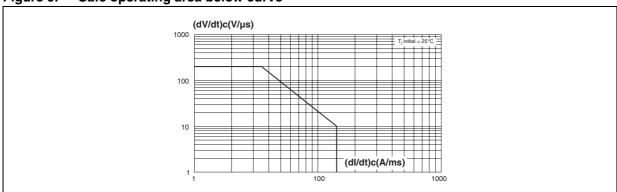


Figure 9. Safe operating area below curve

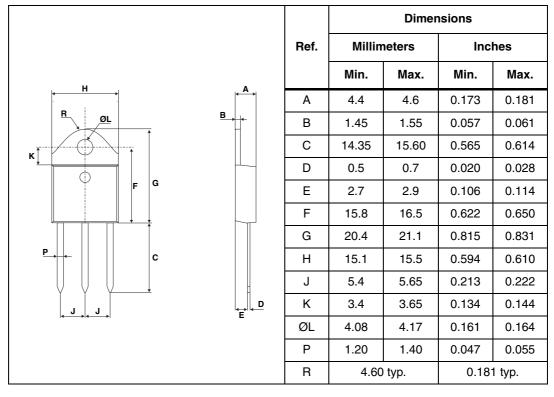


2 Package information

- Epoxy meets UL94,V0
- Cooling method: C (by conduction)
- Recommended torque value: 0.9 to 1.2 N⋅m

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Table 6. TOP3 insulated dimensions



Ordering information TPDVxx40

3 Ordering information

 Table 7.
 Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
TPDV640RG	TPDV640				
TPDV840RG	TPDV840	TOP3 insulated	4.5 g	30	Tube
TPDV1240RG	TPDV1240				

4 Revision history

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Table 8. Document revision history

Date	Revision	Changes
30-mar-2011	1	First issue.

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