

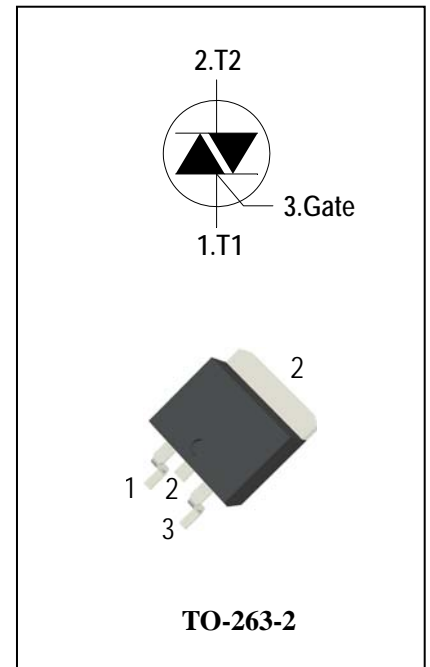
## 4 Quadrants Triacs

### General Description

High current density due to mesa technology . the ADT12D triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, High power motor controls e.g. washing machines and vacuum cleaners, Rectifier-fed DC inductive loads e.g. DC motors and solenoids , motor speed controllers.

### Features

- ◆ Repetitive Peak Off-State Voltage: 600V and 800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 12 A$  )
- ◆ These Devices are Pb-Free and are RoHS Compliant



### Absolute Maximum Ratings

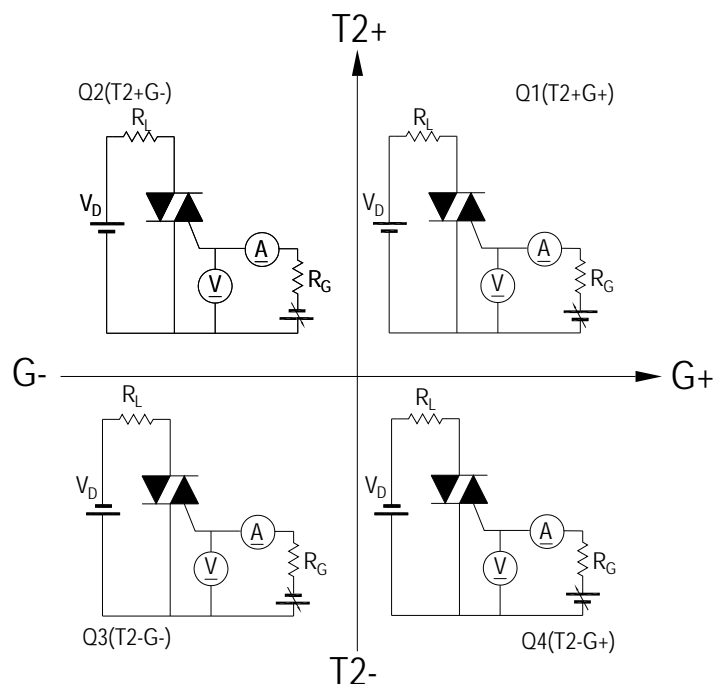
Symbol	Items	Conditions	Ratings	Unit
$V_{DRM}$ $V_{RRM}$	Repetitive Peak Off-State Voltage	$T_j = 25^\circ C$	ADT12D60G 600 ADT12D80G 800	V V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 105^\circ C$	12	A
$I_{TSM}$	Surge On-State Current	$t_p = 20ms(50Hz) / t_p = 16.7ms(60Hz)$	140/146	A
$I^2t$	$I^2t$ for fusing	$t_p = 10ms$	78	$A^2s$
$di/dt$	Critical rate of rise of on-state current	$F = 120 Hz$ $T_j = 125^\circ C$ $I_G = 2 \times I_{GT}$ , $t_r \leq 100 ns$	50	$A/\mu s$
$I_{GM}$	Peak Gate Current	$t_p = 20 \mu s$ $T_j = 125^\circ C$	4	A
$P_{G(AV)}$	Average Gate Power Dissipation( $T_j = 125^\circ C$ )		1	W
$P_{GM}$	Peak Gate Power Dissipation( $t_p = 20\mu s, T_j = 125^\circ C$ )		10	W
$T_j$	Operating Junction Temperature		- 40 ~ 125	$^\circ C$
$T_{STG}$	Storage Temperature		- 40 ~ 150	$^\circ C$



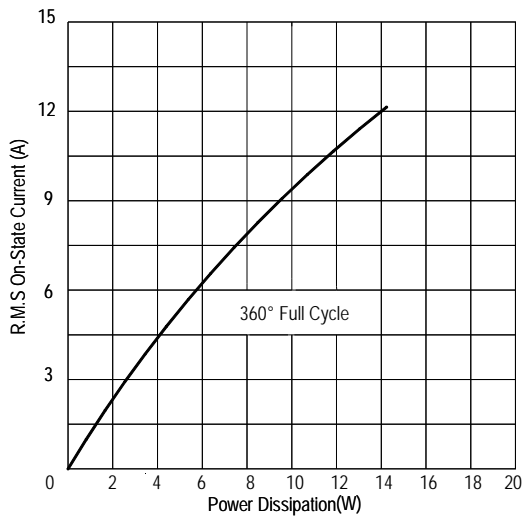
## Electrical Characteristics ( $T_j = 25^\circ\text{C}$ unless otherwise specified )

Symbol	Items	Conditions		ADT12D60G/80G				Unit
				T	S	Blank	B	
$I_{DRM}$	Peak Forward Reverse Blocking Current	$V_{DRM} = V_{RRM}, T_j = 25^\circ\text{C}$	Max.	5				$\mu\text{A}$
$I_{RRM}$		$V_{DRM} = V_{RRM}, T_j = 125^\circ\text{C}$		1				$\text{mA}$
$V_{TM}$	Peak On-State Voltage	$I_{TM} = 17\text{A}, t_p = 380 \mu\text{s}$	Max.	1.55				$\text{V}$
$V_{GD}$	Q1-Q2-Q3-Q4 Non – Trigger Gate Voltage	$V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$ $T_j = 125^\circ\text{C}$	Min.	0.2				$\text{V}$
$V_{GT}$	Q1-Q2-Q3-Q4 Gate Trigger Voltage	$V_D = 12\text{V}, R_L = 33\Omega$	Max.	1.3				$\text{V}$
$I_{GT}$	Q1-Q2-Q3 Q4 Gate Trigger Current		Max.	5	10	35	50	$\text{mA}$
$I_H$	Q1-Q2-Q3-Q4 Holding Current	$I_T = 0.1\text{A}$	Max.	10	15	35	50	$\text{mA}$
$I_L$	Q1-Q3-Q4 Q2 Latching Current	$I_G = 1.2 I_{GT}$	Max.	10	25	50	70	$\text{mA}$
$dV/dt$	Critical Rate of Rise of Off-State Voltage	$V_D = 2/3V_{DRM}$ gate open $T_j = 125^\circ\text{C}$	Min.	20	40	200	400	$\text{V}/\mu\text{s}$
$(dV/dt)_c$	Rate of Change of Commutating Current,	$(dI/dt)_c = -5.3\text{A/ms}$ $T_j = 125^\circ\text{C}$	Min.	0.5	1	5	10	$\text{V}/\mu\text{s}$
$R_{th(j-c)}$	Junction to case (AC)		Max.	1.4				$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient(Copper surface under tab:S=1cm <sup>2</sup> )		Max.	45				$^\circ\text{C}/\text{W}$

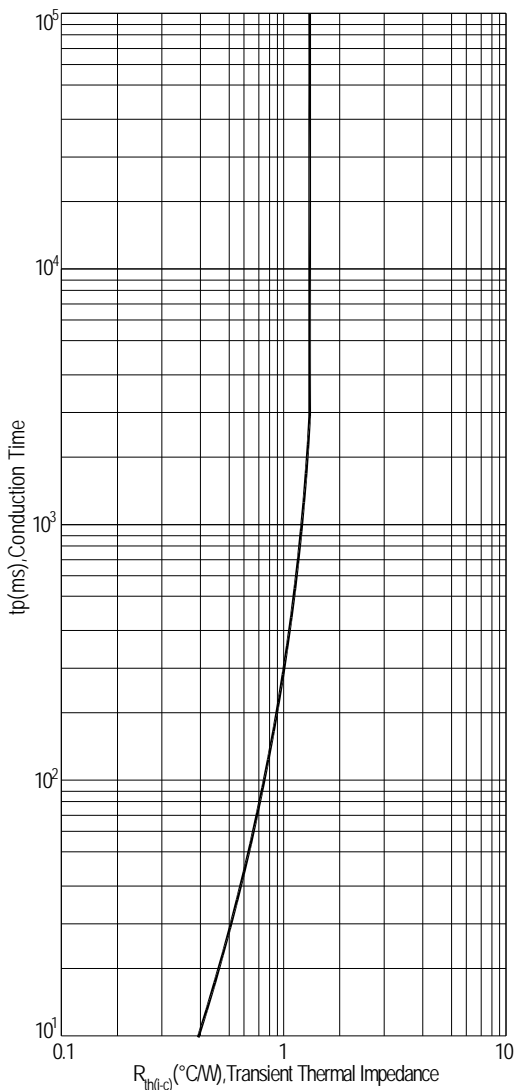
**FIG.1:Triac quadrant are defined and the gate trigger test circuit**



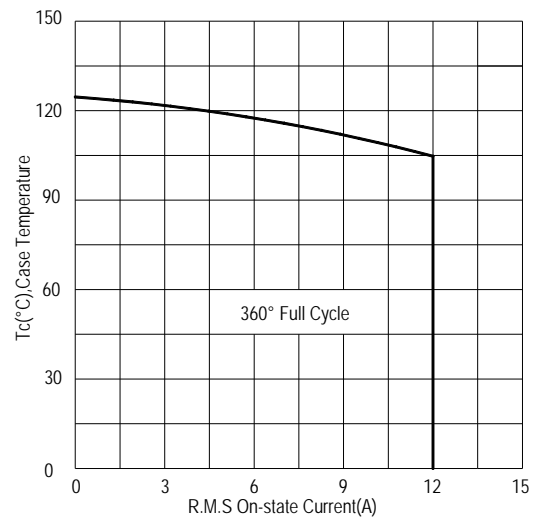
**FIG.2: Maximum on-state power dissipation**



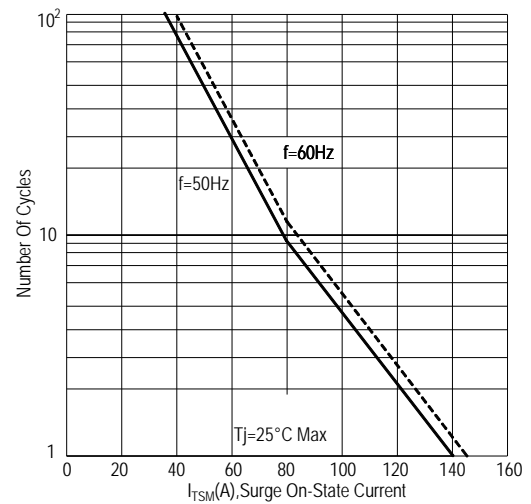
**FIG.4: Maximum transient thermal impedance**



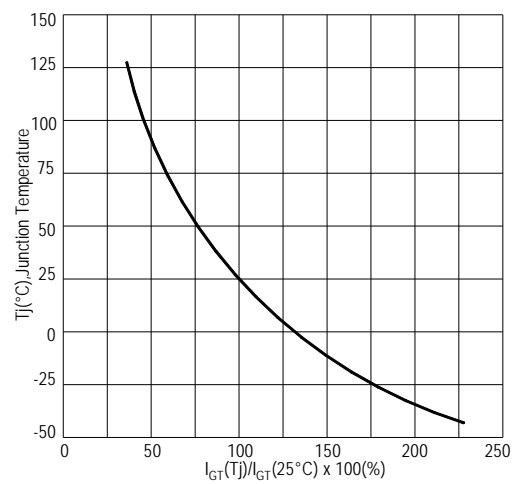
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



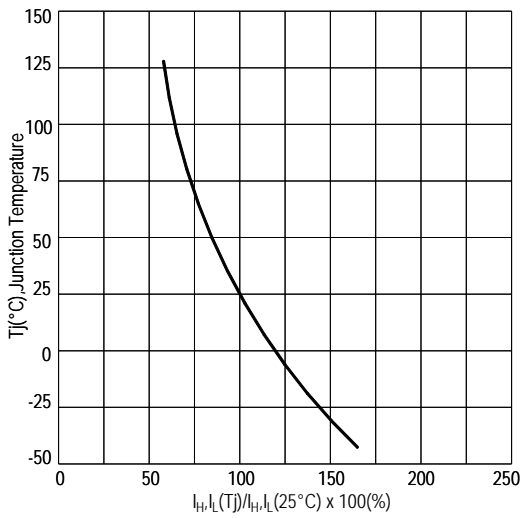
**FIG.5: Rated surge on-state current (Non-Repetitive)**



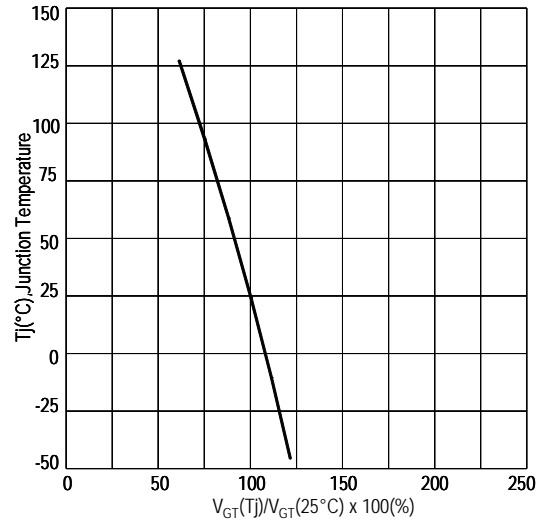
**FIG.6: Gate trigger current VS Junction temperature**



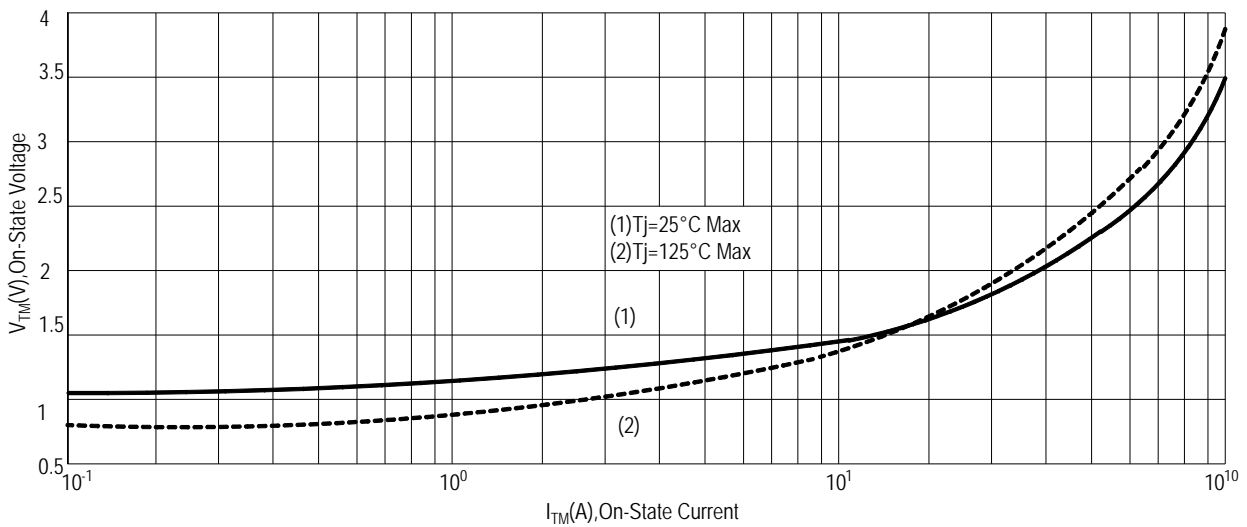
**FIG.7: Holding current and Latching current VS Junction temperature**



**FIG.8: Gate trigger voltage VS Junction temperature**

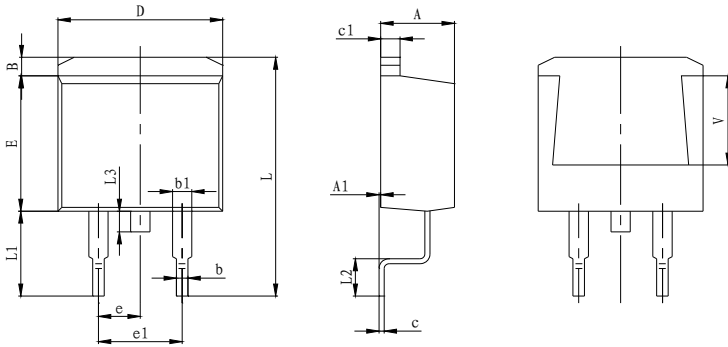


**FIG.9: On-state characteristics(Max)**



## PACKAGE MECHANICAL DATA

### TO-263-2 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	

### Making Diagram

**ADV** Logo  
**ADT12D80GS**: Part number  
**XXXH**: Internal control code  
**XX**: Halogen Free

AD T 12 D 80 G T(S)(B)

ADVANCED	Internal control code	Sensitivity and type: T=5mA S=10mA Blank=35mA B=50mA
Current:12=12A	Quadrant:D=4Q	Package explain:G=TO263-2
Voltage:60=600V 80=800V		

### Ordering information

Part number	Package	Marking	Packing	Quantity
ADT12D60G#	TO-263-2	ADT12D60G#	Tube	50pcs
			Embossed tape	800pcs
ADT12D80G#	TO-263-2	ADT12D80G#	Tube	50pcs
			Embossed tape	800pcs

Note:# = Gate Trigger Current Sensitivity and type

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