

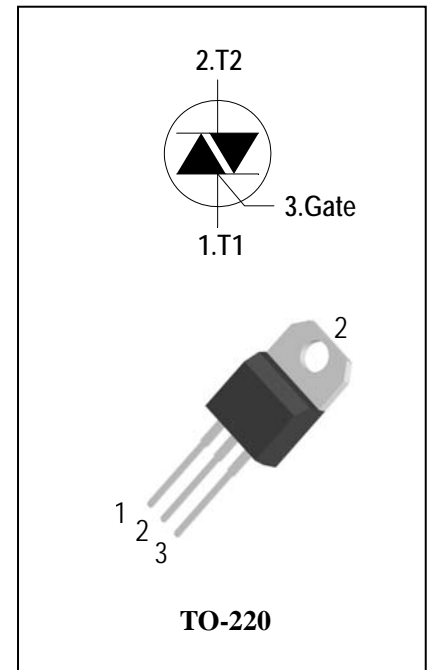
## 3 Quadrants Triacs

### General Description

High current density due to mesa technology .the ADT12C 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 (  $I_{T(RMS)} = 12\text{ A}$  )
- ◆ High Commutation  $dv/dt$
- ◆ These Devices are Pb-Free and are RoHS Compliant



### Absolute Maximum Ratings

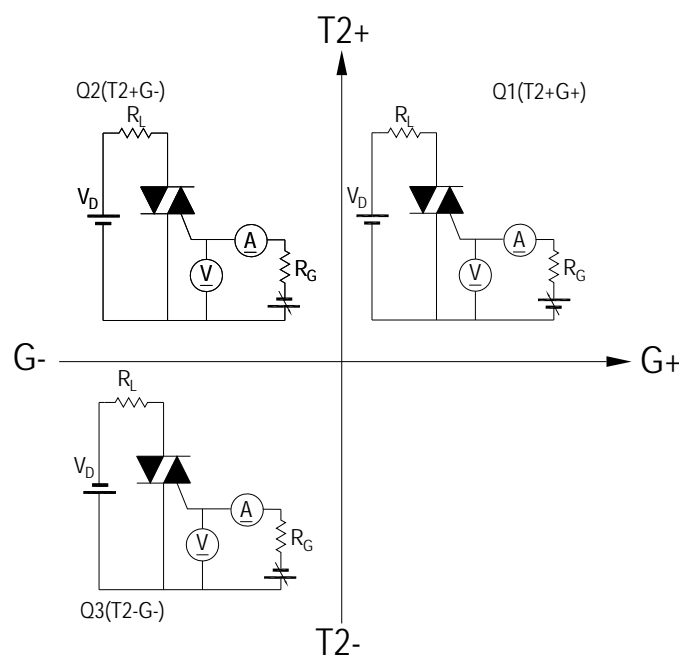
Symbol	Items	Conditions	Ratings	Unit
$V_{DRM}$ $V_{RRM}$	Repetitive Peak Off-State Voltage	$T_j = 25^\circ\text{C}$	ADT12C60 600 ADT12C80 800	V V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 105^\circ\text{C}$	12	A
$I_{TSM}$	Surge On-State Current	$t_p = 20\text{ms}(50\text{Hz}) / t_p = 16.7\text{ms}(60\text{Hz})$	140/146	A
$I^2t$	$I^2t$ for fusing	$t_p = 10\text{ms}$	78	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current	$F = 120\text{ Hz}$ $T_j = 125^\circ\text{C}$ $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$	50	$\text{A}/\mu\text{s}$
$I_{GM}$	Peak Gate Current	$t_p = 20\text{ }\mu\text{s}$ $T_j = 125^\circ\text{C}$	4	A
$P_{G(AV)}$	Average Gate Power Dissipation( $T_j = 125^\circ\text{C}$ )		1	W
$P_{GM}$	Peak Gate Power Dissipation( $t_p = 20\text{ }\mu\text{s}$ , $T_j = 125^\circ\text{C}$ )		10	W
$T_j$	Operating Junction Temperature		- 40 ~ 125	$^\circ\text{C}$
$T_{STG}$	Storage Temperature		- 40 ~ 150	$^\circ\text{C}$



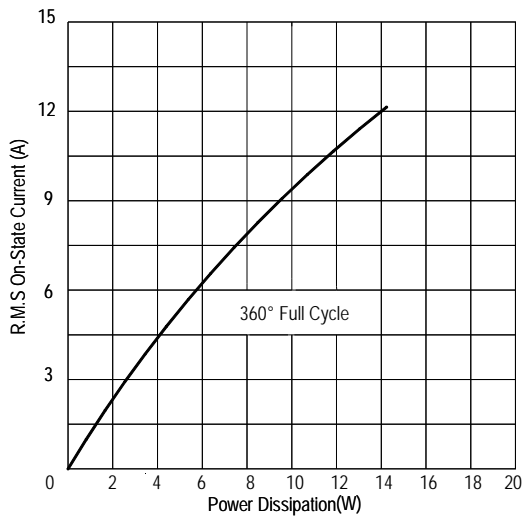
## Electrical Characteristics ( $T_j = 25^\circ\text{C}$ unless otherwise specified )

Symbol	Items		Conditions		ADT12C60/80				Unit
					T	S	Blank	B	
$I_{DRM}$ $I_{RRM}$	Peak Forward Reverse Blocking Current		$V_{DRM} = V_{RRM}, T_j = 25^\circ\text{C}$	Max.	5				$\mu\text{A}$
			$V_{DRM} = V_{RRM}, T_j = 125^\circ\text{C}$		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	Non-Trigger Gate Voltage	$V_D = V_{DRM} \quad R_L = 3.3 \text{ k}\Omega$ $T_j = 125^\circ\text{C}$	Min.	0.2				$\text{V}$
$V_{GT}$	Q1-Q2-Q3	Gate Trigger Voltage	$V_D = 12\text{V}, R_L = 33\Omega$	Max.	1.3				$\text{V}$
$I_{GT}$	Q1-Q2-Q3	Gate Trigger Current		Max.	5	10	35	50	$\text{mA}$
$I_H$	Q1-Q2-Q3	Holding Current	$I_T = 0.1\text{A}$	Max.	10	15	35	50	$\text{mA}$
$I_L$	Q1-Q3	Latching Current	$I_G = 1.2 I_{GT}$	Max.	10	25	50	70	$\text{mA}$
	Q2				15	30	70	80	
$dV/dt$	Critical Rate of Rise of Off-State Voltage		$V_D = 2/3V_{DRM}$ gate open $T_j = 125^\circ\text{C}$	Min.	20	40	500	1000	$\text{V}/\mu\text{s}$
$(dV/dt)_c$	Rate of Change of Commutating Current,		$(dI/dt)_c = -5.3\text{A}/\text{ms}$ $T_j = 125^\circ\text{C}$	Min.	0.5	1	10	25	$\text{V}/\mu\text{s}$
$R_{th(j-c)}$	Junction to case (AC)			Max.	1.4				$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient			Max.	60				$^\circ\text{C}/\text{W}$

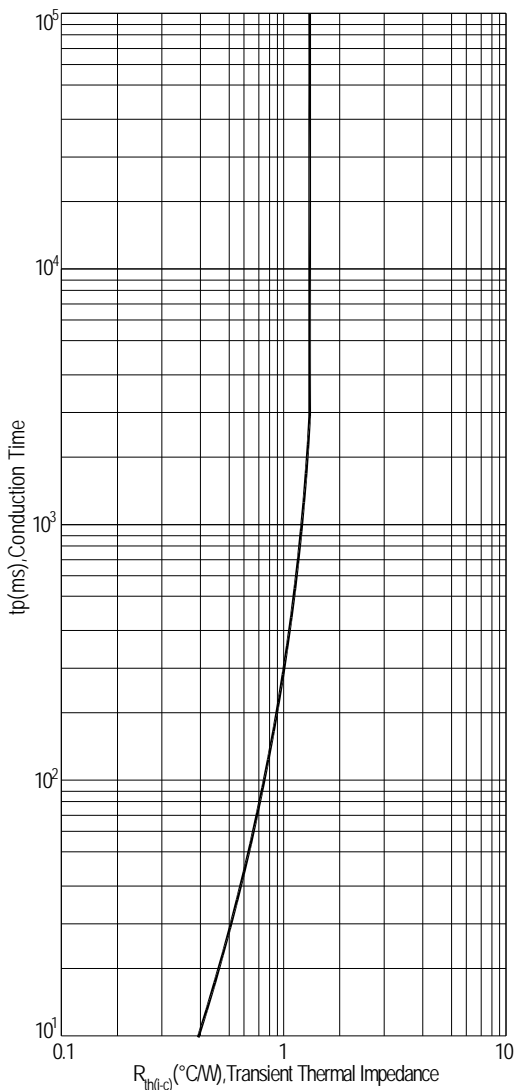
**FIG.1: Triac quadrant are defined and the gate trigger test circuit**



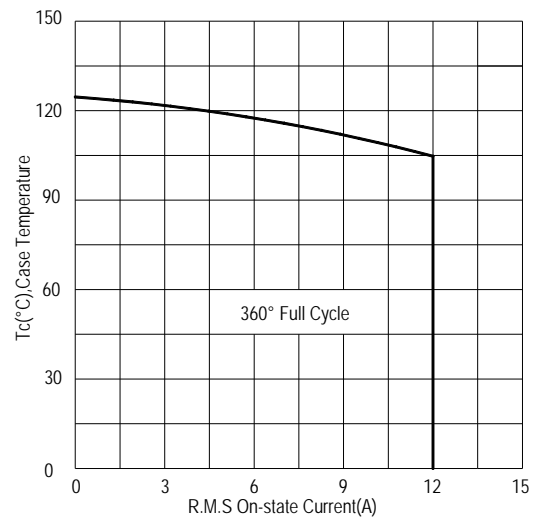
**FIG.2: Maximum on-state power dissipation**



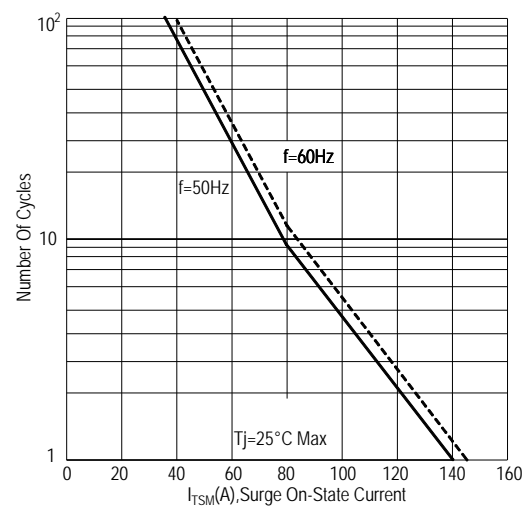
**FIG.4: Maximum transient thermal impedance**



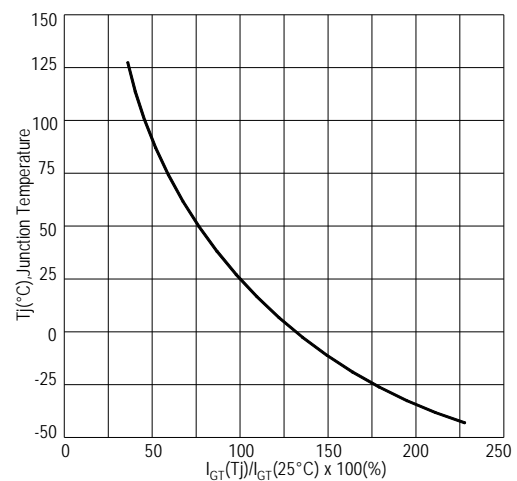
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



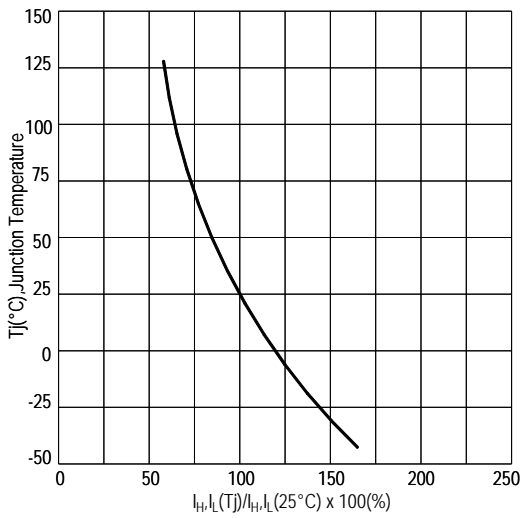
**FIG.5: Rated surge on-state current (Non-Repetitive)**



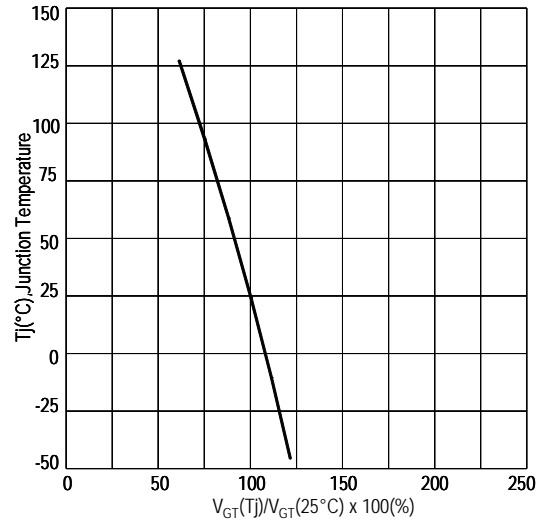
**FIG.6: Gate trigger current VS Junction temperature**



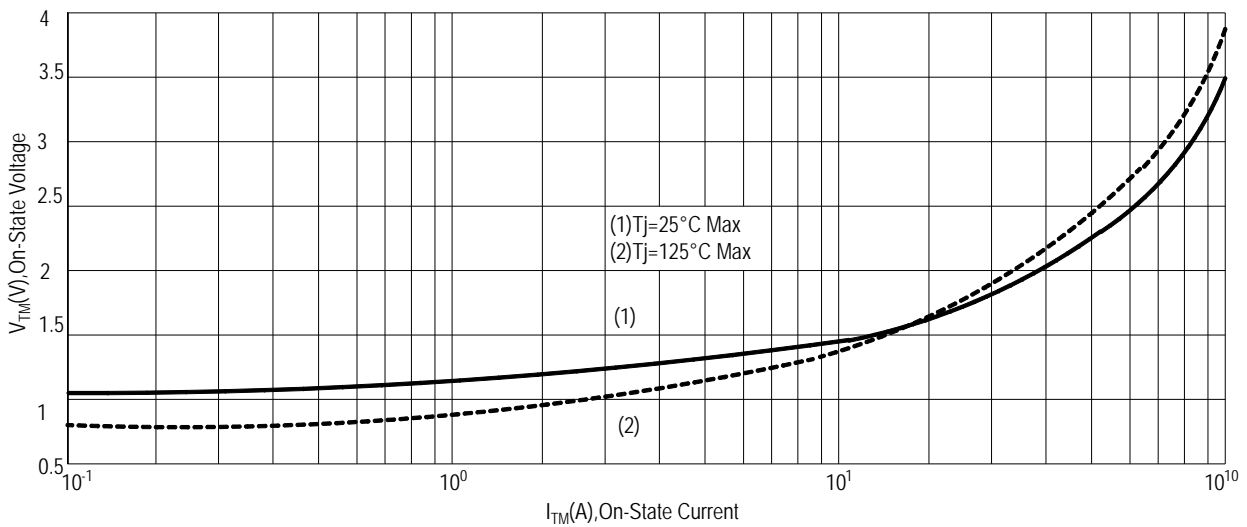
**FIG.7: Holding current and Latching current VS Junction temperature**



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

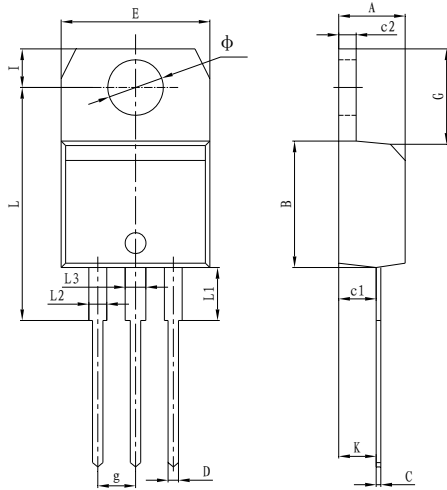


**FIG.9: On-state characteristics(Max)**



## PACKAGE MECHANICAL DATA

### TO-220 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
B	9.00	9.30	0.354	0.366
C	0.40	0.60	0.015	0.023
c1	2.00	2.60	0.078	0.102
c2	1.23	1.32	0.048	0.051
D	0.70	1.00	0.027	0.039
E	10.00	10.40	0.393	0.409
g	2.40	2.70	0.094	0.106
G	6.20	6.80	0.244	0.267
I	2.65	2.95	0.104	0.116
L	15.80	16.80	0.622	0.661
L1	3.75		0.147	
L2	1.14	1.70	0.044	0.066
L3	1.14	1.70	0.044	0.066
Phi	3.60	3.90	0.141	0.153
K	2.60TYP		0.102TYP	

### Making Diagram

ADV: Logo  
 ADT12C80S: Part number  
 X: Internal control code  
 H: Halogen Free

AD T 12 C 80 # T(S)(B)

ADVANCED	Sensitivity and type: T=5mA S=10mA Blank=35mA B=50mA	
Internal control code		Package explain: Blank=TO-220
Current: 12=12A		
Quadrant: C=3Q		
Voltage: 60=600V 80=800V		

### Ordering information

Part number	Package	Marking	Packing	Quantity
ADT12C60#	TO-220	ADT12C60#	Tube	50pcs
ADT12C80#	TO-220	ADT12C80#	Tube	50pcs

Note: # = Gate Trigger Current Sensitivity and type

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