

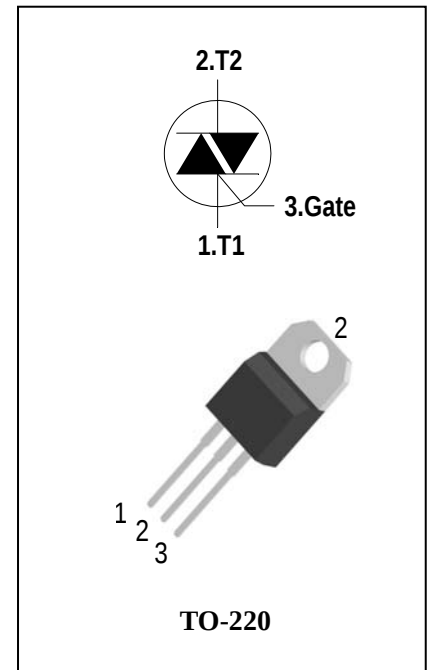
4 Quadrants Triacs

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 ($I_{T(RMS)} = 12\text{ A}$)
- ◆ These Devices are Pb-Free and are RoHS Compliant



Absolute Maximum Ratings ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Items	Conditions		Ratings	Unit
V_{DRM}	Repetitive Peak Off-State Voltage	$T_j = 25^{\circ}\text{C}$	ADT12D60	600	V
V_{RRM}			ADT12D80	800	V
$I_{\text{T(RMS)}}$	R.M.S On-State Current	$T_{\text{C}} = 105^{\circ}\text{C}$		12	A
I_{TSM}	Surge On-State Current	$T_{\text{p}}=20\text{ms}(50\text{Hz})/t_{\text{p}}=16.7\text{ms}(60\text{Hz})$		140/146	A
I^2t	I^2t for fusing	$t_{\text{p}}=10\text{ms}$		78	A^2s
di/dt	Critical rate of rise of on-state current	$F = 120\text{ Hz } T_j = 125^{\circ}\text{C}$ $I_{\text{G}} = 2 \times I_{\text{GT}} , t_{\text{r}} \leq 100\text{ ns}$		50	$\text{A}/\mu\text{s}$
I_{GM}	Peak Gate Current	$t_{\text{p}} = 20\text{ }\mu\text{s } T_j = 125^{\circ}\text{C}$		4	A
$P_{\text{G(AV)}}$	Average Gate Power Dissipation($T_j=125^{\circ}\text{C}$)			1	W
P_{GM}	Peak Gate Power Dissipation($t_{\text{p}}=20\mu\text{s}, T_j=125^{\circ}\text{C}$)			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		ADT12D60/80				Unit
					T	S	Blank	B	
I_{DRM}	Peak Forward Reverse Blocking Current		$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{j}} = 25^{\circ}\text{C}$	Max.	5				μA
I_{RRM}			$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{j}} = 125^{\circ}\text{C}$		1				mA
V_{TM}	Peak On-State Voltage		$I_{\text{TM}} = 17\text{A}, t_{\text{p}} = 380\text{ }\mu\text{s}$	Max.	1.55				V
V_{GD}	Q1-Q2-Q3-Q4	Non – Trigger Gate Voltage	$V_{\text{D}} = V_{\text{DRM}}\text{ } R_{\text{L}} = 3.3\text{ k}\Omega$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	0.2				V
V_{GT}	Q1-Q2-Q3-Q4	GateTrigger Voltage	$V_{\text{D}} = 12\text{V} \text{ , } R_{\text{L}} = 33\Omega$	Max.	1.3				V
I_{GT}	Q1-Q2-Q3	GateTrigger Current		Max.	5	10	35	50	mA
	Q4				10	25	70	100	
I_{H}	Q1-Q2-Q3-Q4	Holding Current	$I_{\text{T}} = 0.1\text{A}$	Max.	10	15	35	50	mA
I_{L}	Q1-Q3-Q4	Latching Current	$I_{\text{G}} = 1.2\text{ } I_{\text{GT}}$	Max.	10	25	50	70	mA
	Q2				15	30	70	80	
dV/dt	Critical Rate of Rise of Off-State Voltage		$V_{\text{D}} = 2/3V_{\text{DRM}}\text{ } \text{gate open}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	20	40	200	400	$\text{V}/\mu\text{s}$
$(dV/dt)_c$	Rate of Change of Commutating Current,		$(dI/dt)_c = -5.3\text{A/ms}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	0.5	1	5	10	$\text{V}/\mu\text{s}$
$R_{\text{th(j-c)}}$	Junction to case (AC)			Max.	1.4				$^{\circ}\text{C/W}$
$R_{\text{th(i-a)}}$	Junction to ambient			Max.	60				$^{\circ}\text{C/W}$

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

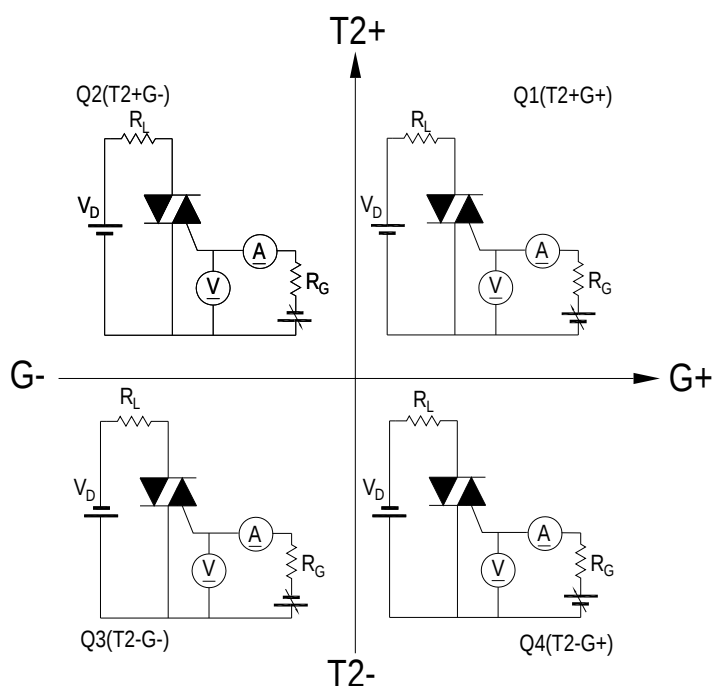


FIG.2: Maximum on-state power dissipation

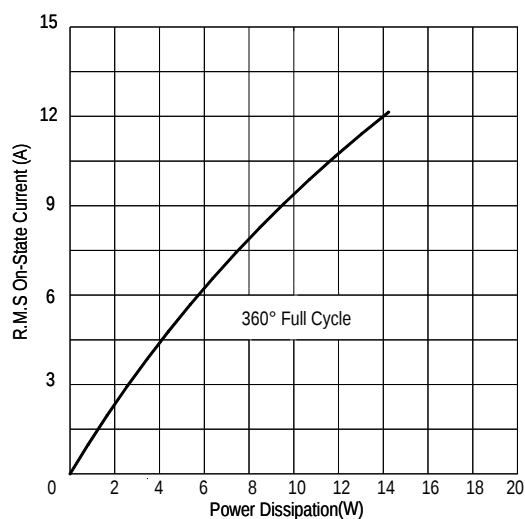


FIG.4: Maximum transient thermal impedance

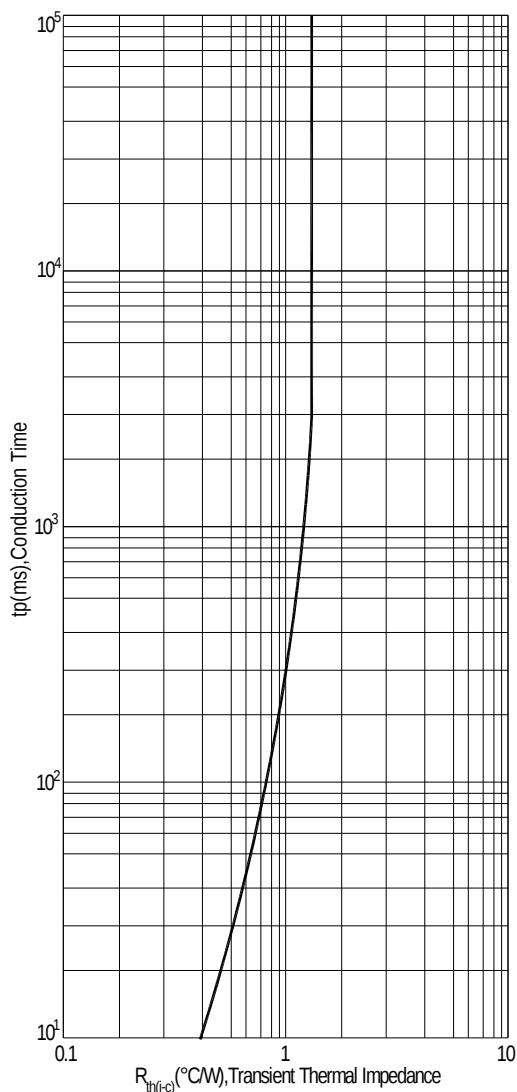


FIG.3: Typical RMS on-state current VS Allowable case Temperature

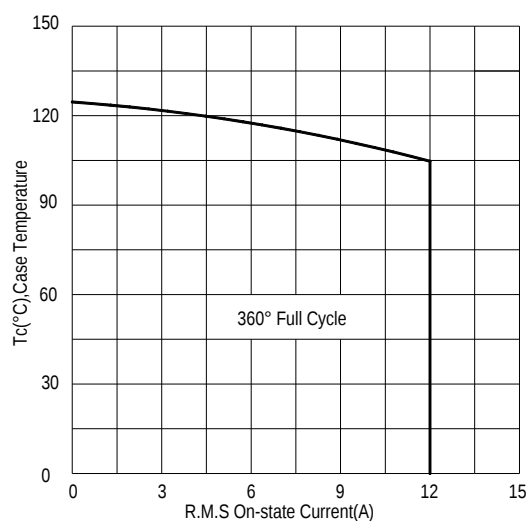


FIG.5: Rated surge on-state current (Non-Repetitive)

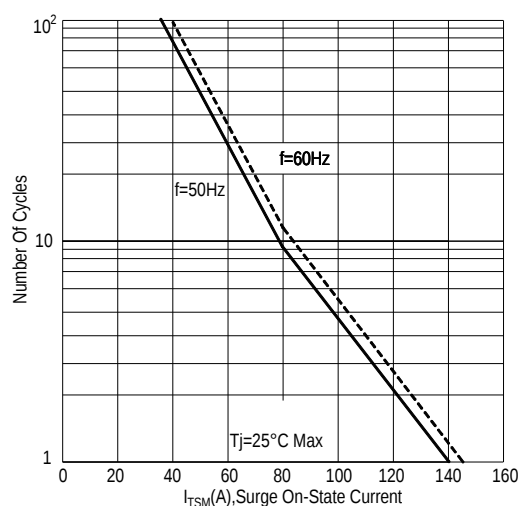


FIG.6: Gate trigger current VS Junction temperature

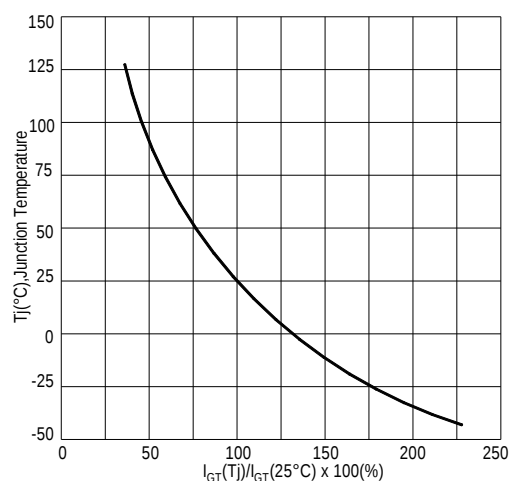


FIG.7:Holding current and Latching current VS Junction temperature

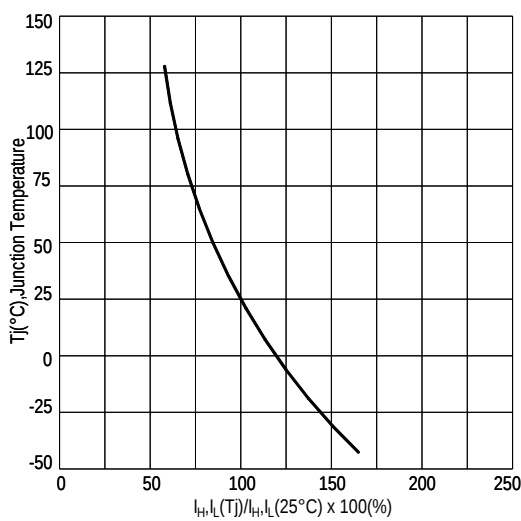


FIG.8: Gate trigger voltage VS Junction temperature

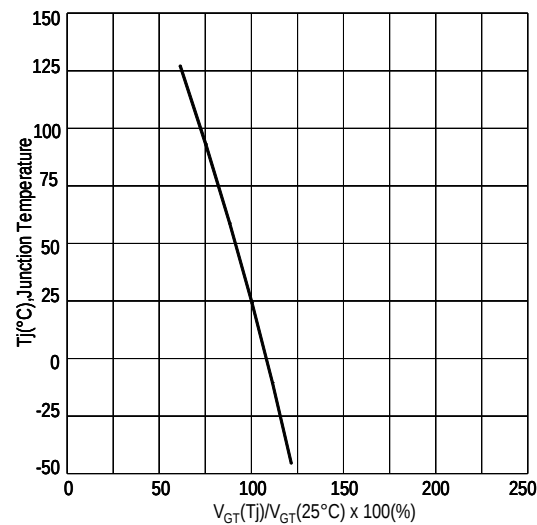
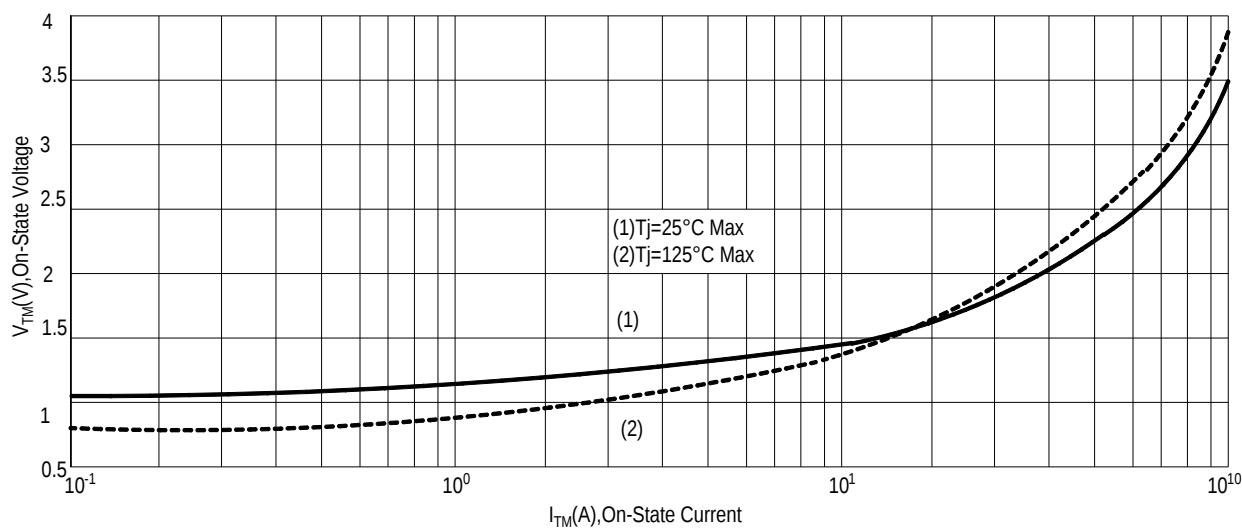
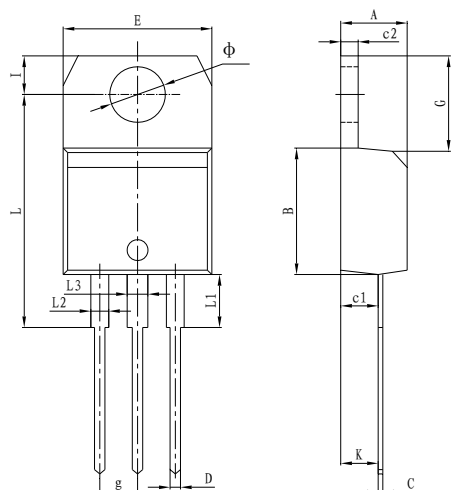


FIG.9: On-state characteristics(Max)



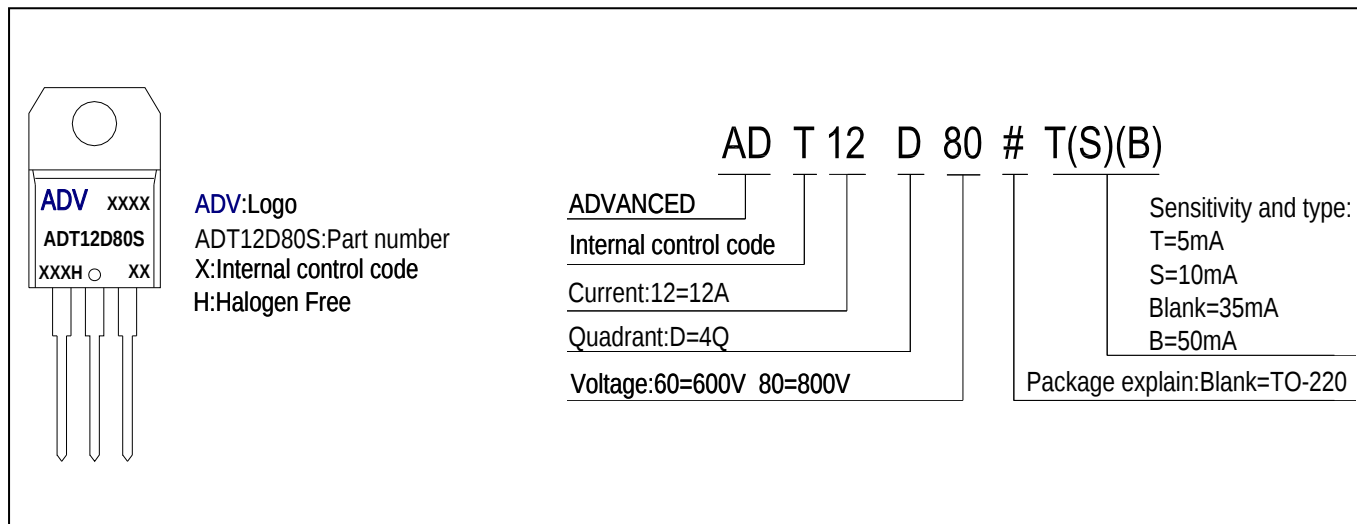
PACKAGE MECHANICAL DATA

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
Φ	3.60	3.90	0.141	0.153
K	2.60TYP		0.102TYP	

Making Diagram



Ordering information

Part number	Package	Marking	Packing	Quantity
ADT12D60#	TO-220	ADT12D60#	Tube	50pcs
ADT12D80#	TO-220	ADT12D80#	Tube	50pcs

Note: # = Gate Trigger Current Sensitivity and type

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