

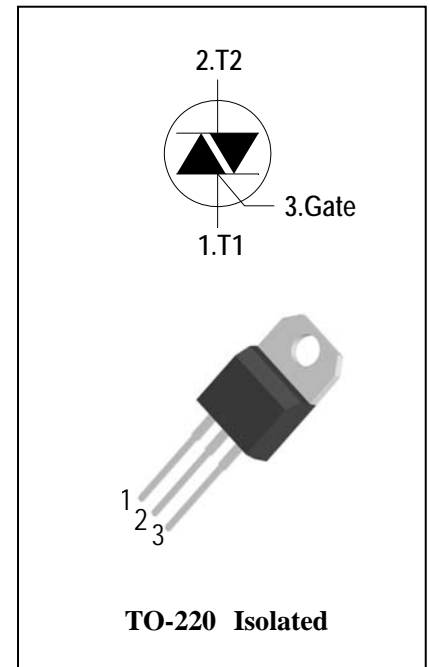
4 Quadrants Triacs

General Description

High current density due to mesa technology .the AIT12D 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 ($I_{T(RMS)} = 12A$)
- ◆ These Devices are Pb-Free and are RoHS Compliant
- ◆ Isolated heatsink mounted , Isolation Voltage ($V_{ISO} = 2500V AC$)



Absolute Maximum Ratings

Symbol	Items	Conditions		Ratings	Unit
V_{DRM} V_{RRM}	Repetitive Peak Off-State Voltage	$T_j = 25^\circ C$	AIT12D60	600	V
			AIT12D80	800	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 90^\circ C$		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		AIT12D60/80				Unit
				T	S	Blank	B	
I_{DRM} I_{RRM}	Peak Forward Reverse Blocking Current	$V_{DRM} = V_{RRM}, T_j = 25^\circ\text{C}$ $V_{DRM} = V_{RRM}, T_j = 125^\circ\text{C}$	Max.	5 1				μA mA
V_{TM}	Peak On-State Voltage	$I_{TM} = 17\text{A}, t_p = 380 \mu\text{s}$	Max.	1.55				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				V
V_{GT}	Q1-Q2-Q3-Q4 Gate Trigger Voltage	$V_D = 12\text{V}, R_L = 33\Omega$	Max.	1.3				V
I_{GT}	Q1-Q2-Q3 Q4 Gate Trigger Current		Max.	5 10	10 25	35 70	50 100	mA
I_H	Q1-Q2-Q3-Q4 Holding Current	$I_T = 0.1\text{A}$	Max.	10	15	35	50	mA
I_L	Q1-Q3-Q4 Q2 Latching Current	$I_G = 1.2 I_{GT}$	Max.	10 15	25 30	50 70	70 80	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.	2.3				$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient		Max.	60				$^\circ\text{C}/\text{W}$

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

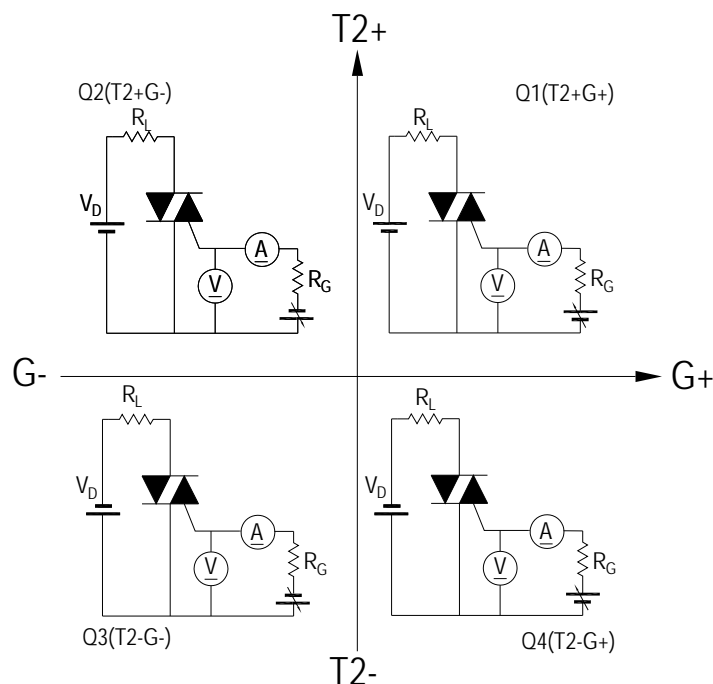


FIG.2: Maximum on-state power dissipation

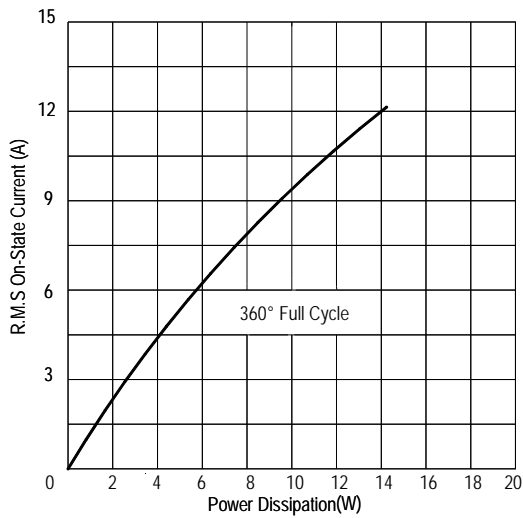


FIG.4: Maximum transient thermal impedance

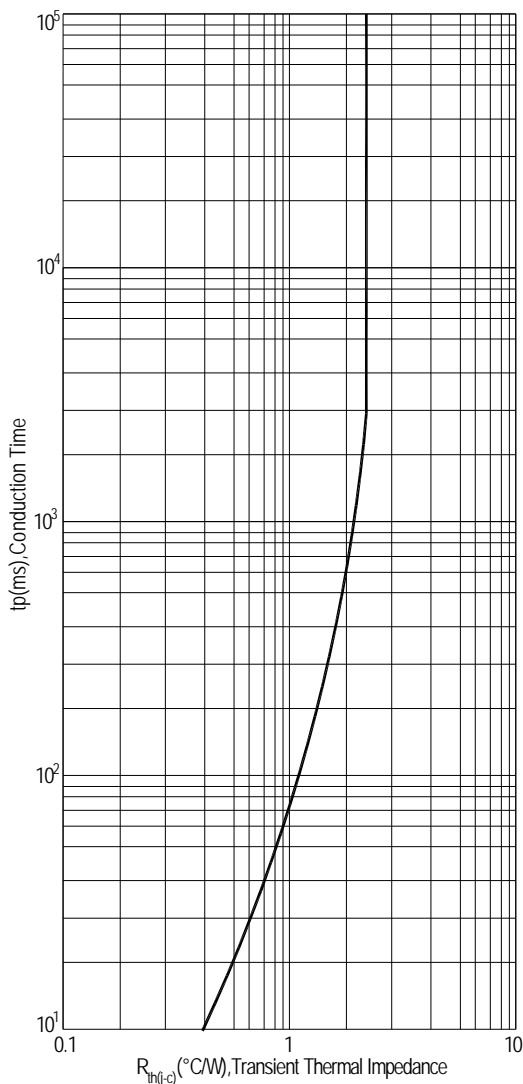


FIG.3: Typical RMS on-state current VS Allowable case Temperature

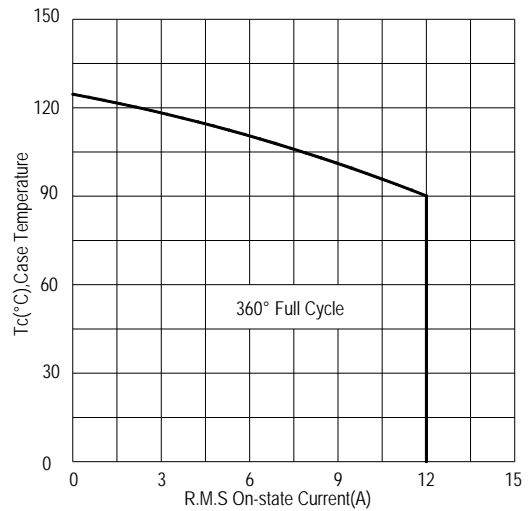


FIG.5: Rated surge on-state current (Non-Repetitive)

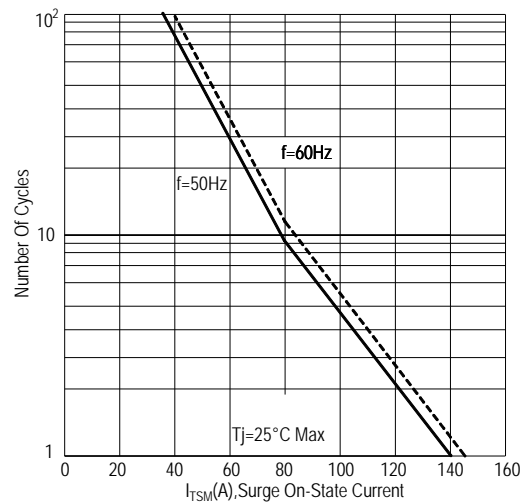


FIG.6: Gate trigger current VS Junction temperature

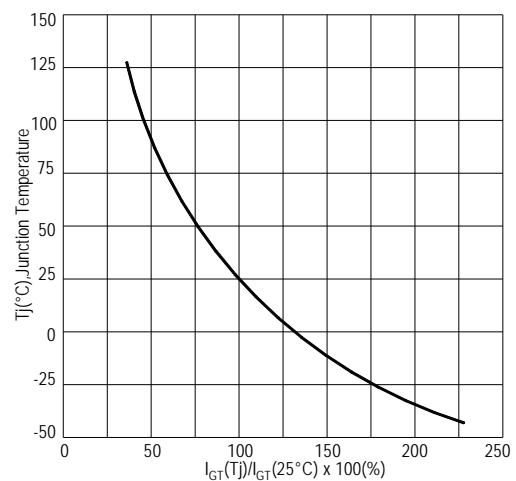


FIG.7: Holding current and Latching current VS Junction temperature

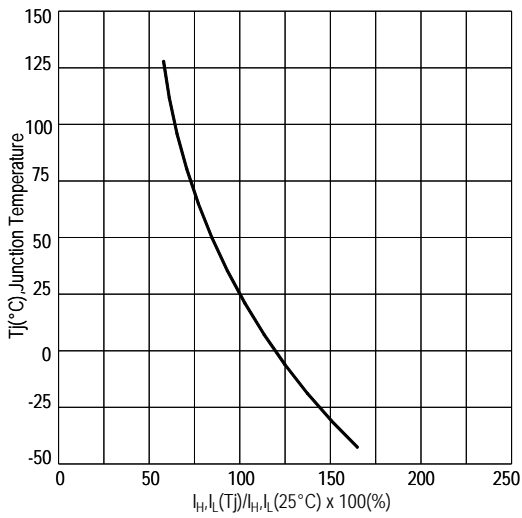


FIG.8: Gate trigger voltage VS Junction temperature

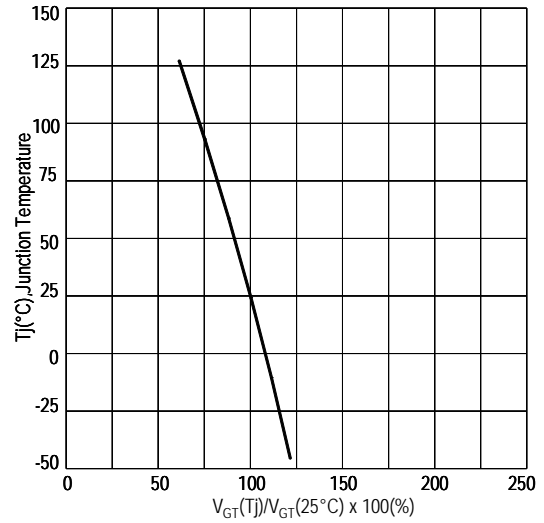
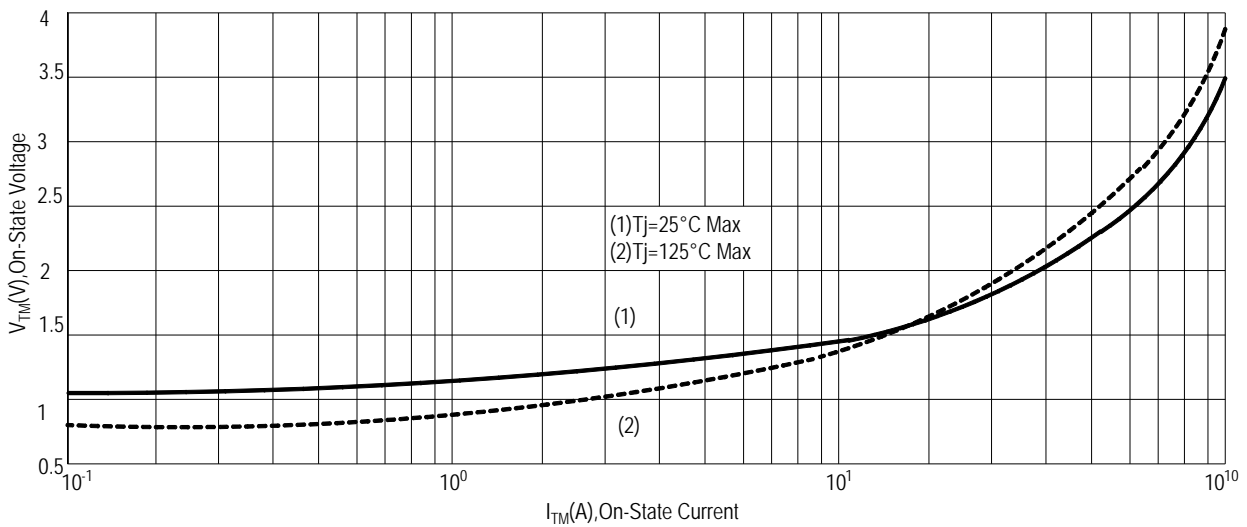
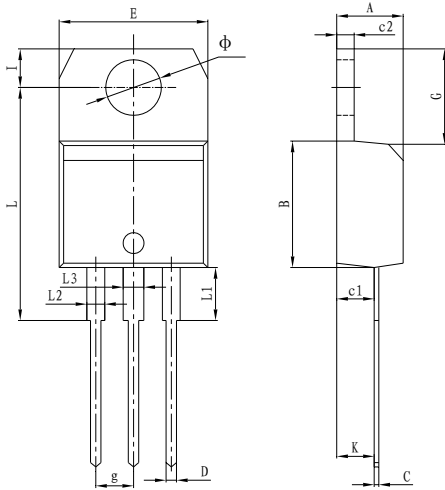


FIG.9: On-state characteristics(Max)



PACKAGE MECHANICAL DATA TO-220(isolated) 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

ADV xxxx
 AIT12D80S
 XXXH ○ XX

ADV: Logo
 AIT12D80S: Part number
 X: Internal control code
 H: Halogen Free

A I T 1 2 D 8 0 # T(S)(B)

ADVANCED
isolated

Internal control code

Current: 12=12A

Quadrant: D=4Q

Sensitivity and type:
T=5mA
S=10mA
Blank=35mA
B=50mA

Package explain: Blank=TO-220

Voltage: 60=600V 80=800V

Ordering information

Part number	Package	Marking	Packing	Quantity
AIT12D60#	TO-220 isolated	AIT12D60#	Tube	50pcs
AIT12D80#	TO-220 isolated	AIT12D80#	Tube	50pcs

Note: # = Gate Trigger Current Sensitivity and type

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