

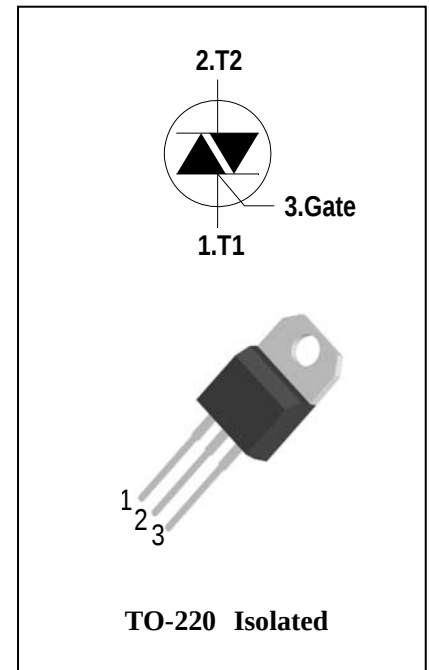
3 Quadrants Triacs

General Description

High current density due to mesa technology .the AIT12C 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 ($I_{T(RMS)} = 12A$)
- ◆ High Commutation dv/dt
- ◆ 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	$T_j = 25^{\circ}C$	AIT12C60	600	V
			AIT12C80	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	$F = 120\text{ Hz}$ $T_j = 125^{\circ}C$ $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$		50	$A/\mu s$
I_{GM}	Peak Gate Current	$t_p = 20\text{ }\mu s$ $T_j = 125^{\circ}C$		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		AIT12C60/80				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	Non—Trigger Gate Voltage	$V_{\text{D}} = V_{\text{DRM}}\quad R_{\text{L}} = 3.3\text{ k}\Omega$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	0.2				V
V_{GT}	Q1-Q2-Q3	Gate Trigger Voltage	$V_{\text{D}} = 12\text{V}\text{ , } R_{\text{L}} = 33\Omega$	Max.	1.3				V
I_{GT}	Q1-Q2-Q3	Gate Trigger Current		Max.	5	10	35	50	mA
I_{H}	Q1-Q2-Q3	Holding Current	$I_{\text{T}} = 0.1\text{A}$	Max.	10	15	35	50	mA
I_{L}	Q1-Q3	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		$V_{\text{D}} = 2/3V_{\text{DRM}}\quad \text{gate open}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	20	40	500	1000	$\text{V}/\mu\text{s}$
(dV/dt)c	Rate of Change of Commutating Current,		$(\text{dI}/\text{d}t)\text{c}=-5.3\text{A}/\text{ms}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	0.5	1	10	25	$\text{V}/\mu\text{s}$
$R_{\text{th(j-c)}}$	Junction to case (AC)			Max.	2.3				$^{\circ}\text{C}/\text{W}$
$R_{\text{th(j-a)}}$	Junction to ambient			Max.	60				$^{\circ}\text{C}/\text{W}$

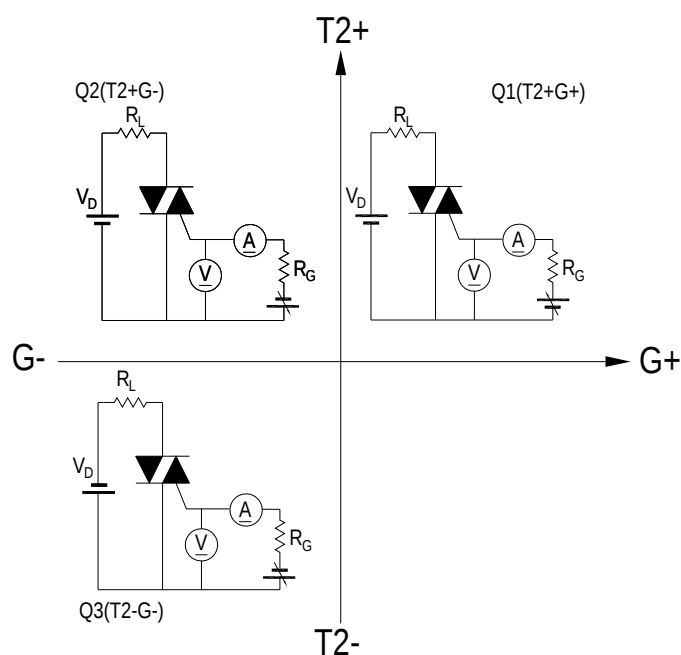
FIG.1: Triac quadrant are defined and the gate trigger test circuit

FIG.2: Maximum on-state power dissipation

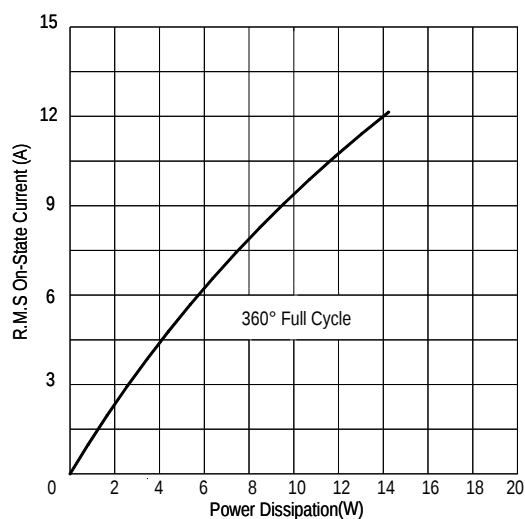


FIG.4: Maximum transient thermal impedance

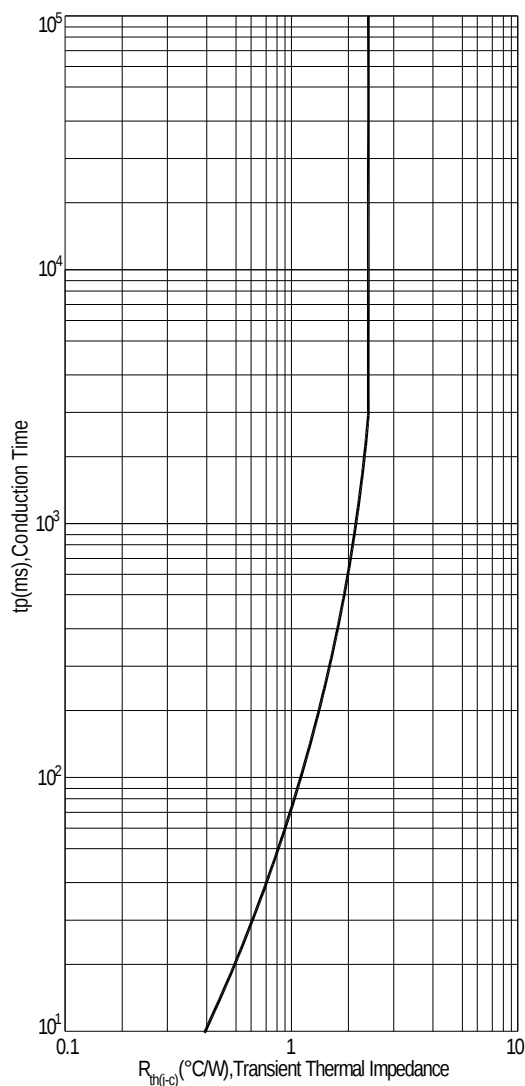


FIG.3: Typical RMS on-state current VS Allowable case Temperature

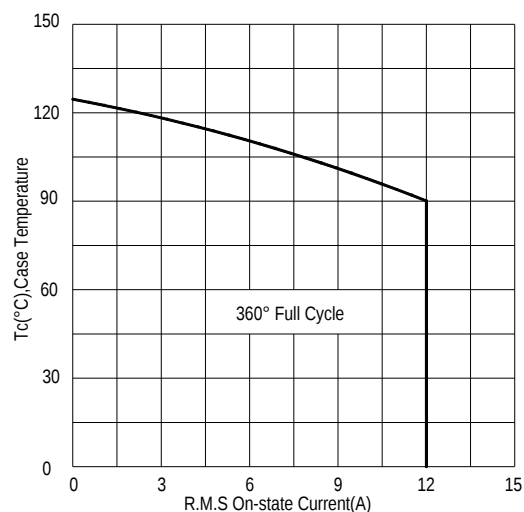


FIG.5: Rated surge on-state current (Non-Repetitive)

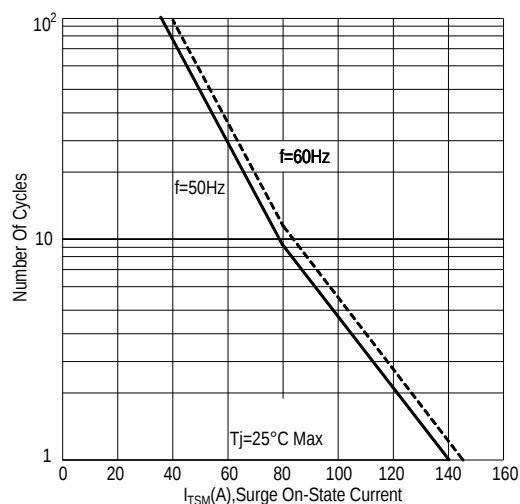


FIG.6: Gate trigger current VS Junction temperature

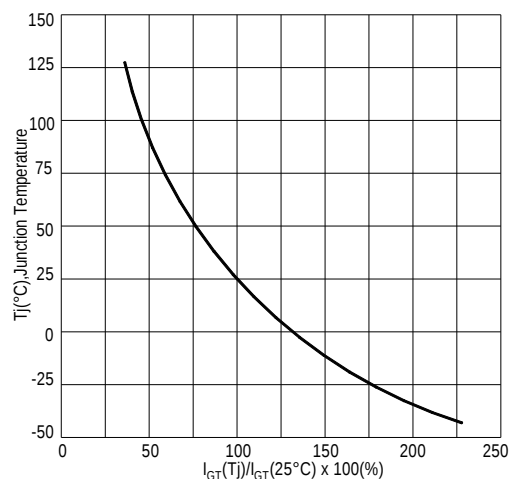


FIG.7:Holding current and Latching current VS Junction temperature

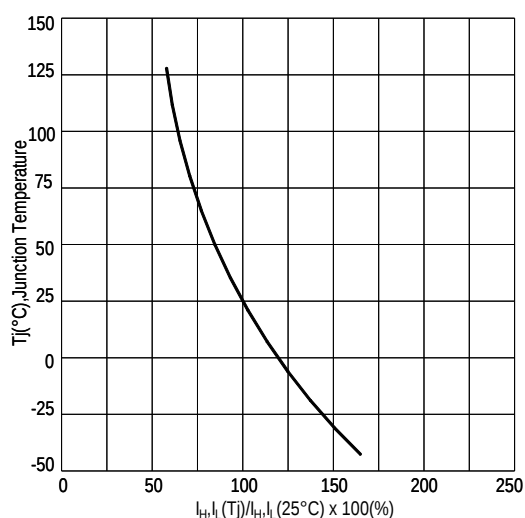


FIG.8: Gate trigger voltage VS Junction temperature

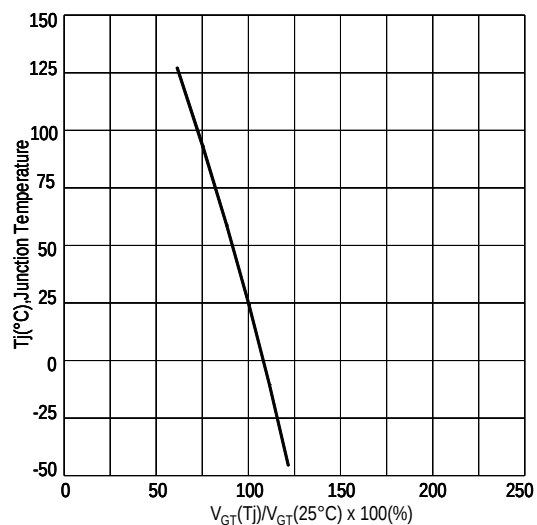
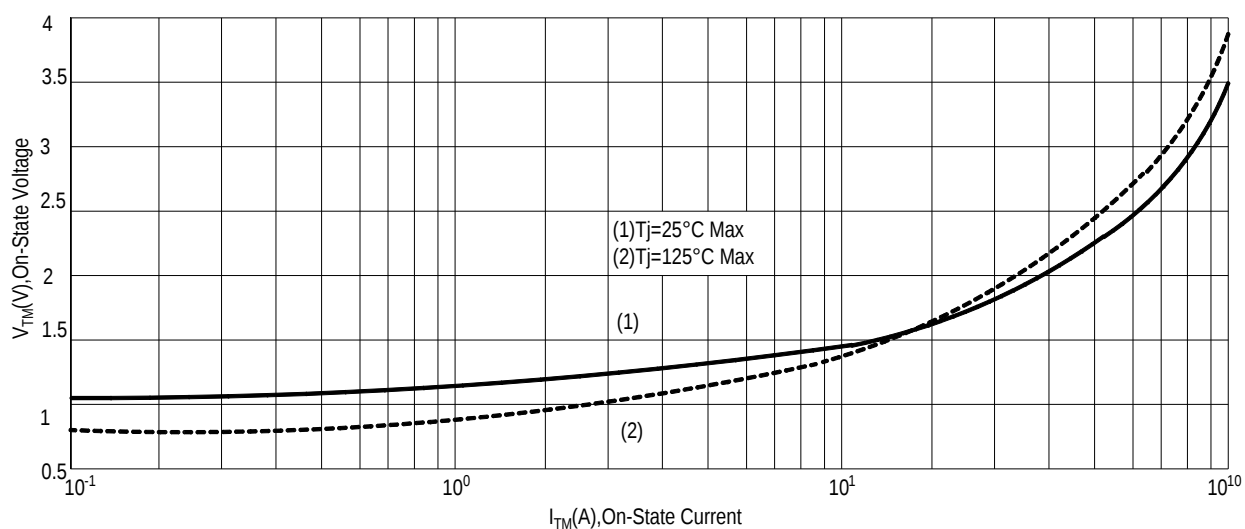
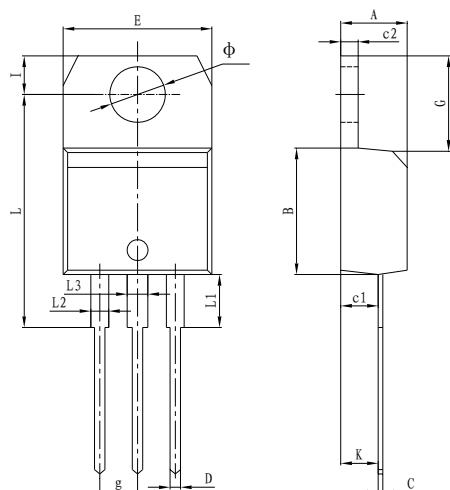


FIG.9: On-state characteristics(Max)



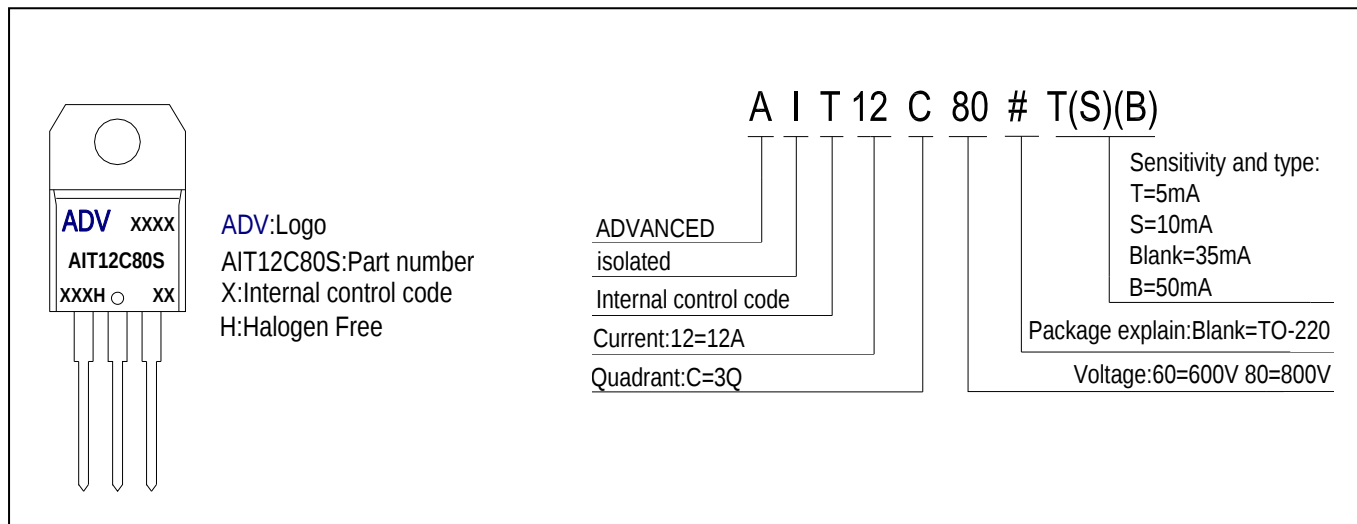
PACKAGE MECHANICAL DATA

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



Ordering information

Part number	Package	Marking	Packing	Quantity
AIT12C60#	TO-220 isolated	AIT12C60#	Tube	50pcs
AIT12C80#	TO-220 isolated	AIT12C80#	Tube	50pcs

Note:# = Gate Trigger Current Sensitivity and type

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