

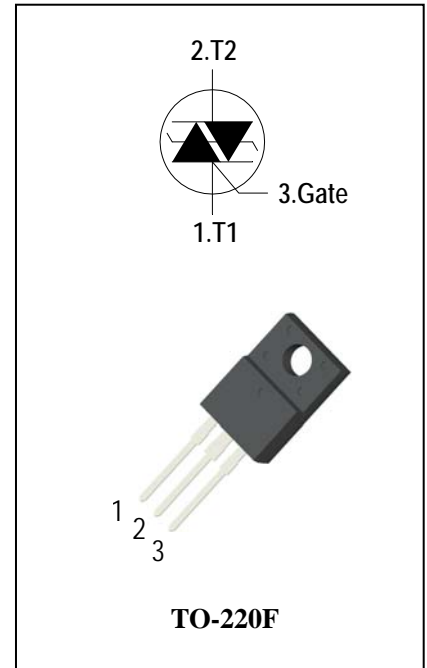
AC Thyristor Triac power switch

General Description

Available either in through-hole or surface-mount packages, the AACT12 suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers,...

Features

- ◆ Repetitive Peak Off-State Voltage: 800V and 1000V
- ◆ R.M.S On-State Current ($I_{T(RMS)} = 12A$)
- ◆ Very high immunity to false turn-on by dV/dt
- ◆ Triggering in three quadrants only
- ◆ Pin compatible with standard triacs
- ◆ Safe clamping capability for low energy over-voltage transients
- ◆ 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	$T_j = 25^{\circ}C$	AACT1208F	800	V
			AACT1210F	1000	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 92^{\circ}C$		12	A
I_{TSM}	Surge On-State Current	$t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$		120/126	A
I^2t	I^2t for fusing	$t_p=10ms$		78	A^2s
dl/dt	Critical rate of rise of on-state current	$F = 120\text{ Hz}$ $T_j = 125^{\circ}C$ $I_G = 2 \times I_{GT}$, $tr \leq 100\text{ ns}$		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($T_j=125^{\circ}C$)			0.1	W
P_{GM}	Peak Gate Power Dissipation($t_p=20\mu s,T_j=125^{\circ}C$)			5	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		AACT1208F/10F		Unit
					S	Blank	
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.	1.65		V
V_{GD}	Q1-Q2-Q3	Non–Trigger Gate Voltage	$V_{\text{D}} = 2/3V_{\text{DRM}}\text{ }R_{\text{L}} = 3.3\text{ k}\Omega$ $T_{\text{j}} = 125^{\circ}\text{C}$	0.2	0.2		V
V_{GT}	Q1-Q2-Q3	Gate Trigger Voltage	$V_{\text{D}} = 12\text{V}\text{ }\text{,}\text{ }R_{\text{L}} = 33\Omega$	1.5	1.5		V
I_{GT}	Q1-Q2-Q3	Gate Trigger Current		10	10	35	mA
I_{H}	Q1-Q2-Q3	Holding Current	$I_{\text{T}} = 0.1\text{A}$	15	15	45	mA
I_{L}	Q1-Q3	Latching Current	$I_{\text{G}} = 1.2\text{ }I_{\text{GT}}$	20	20	50	mA
	Q2			30	30	70	
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.	1000	1500	V/ μs
$R_{\text{th(j-c)}}$	Junction to case (AC)			Max.	2.3		$^{\circ}\text{C/W}$
$R_{\text{th(j-a)}}$	Junction to ambient			Max.	60		$^{\circ}\text{C/W}$

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

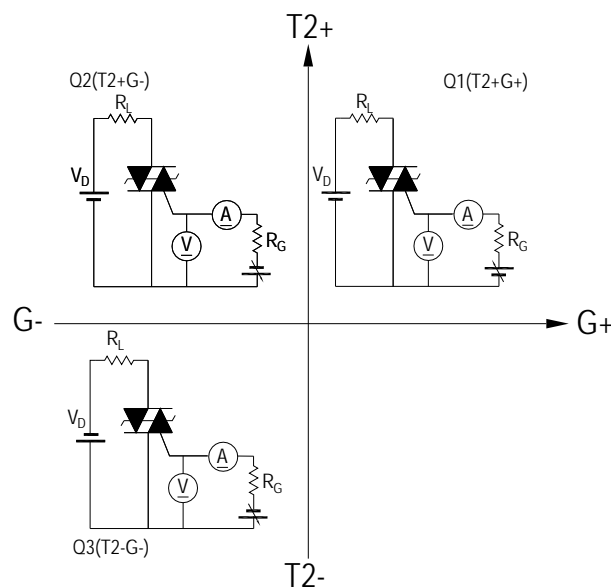


FIG.2: Maximum on-state power dissipation

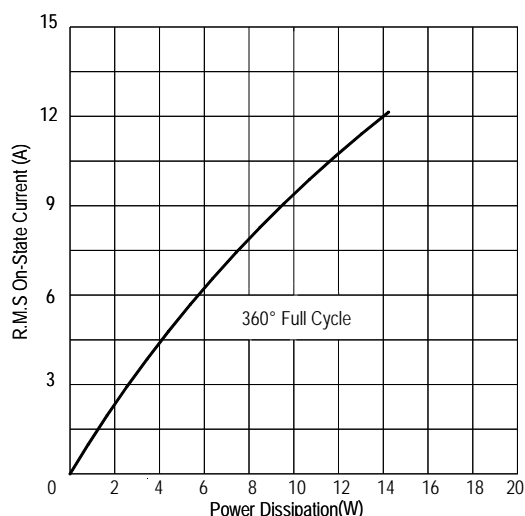


FIG.4: Maximum transient thermal impedance

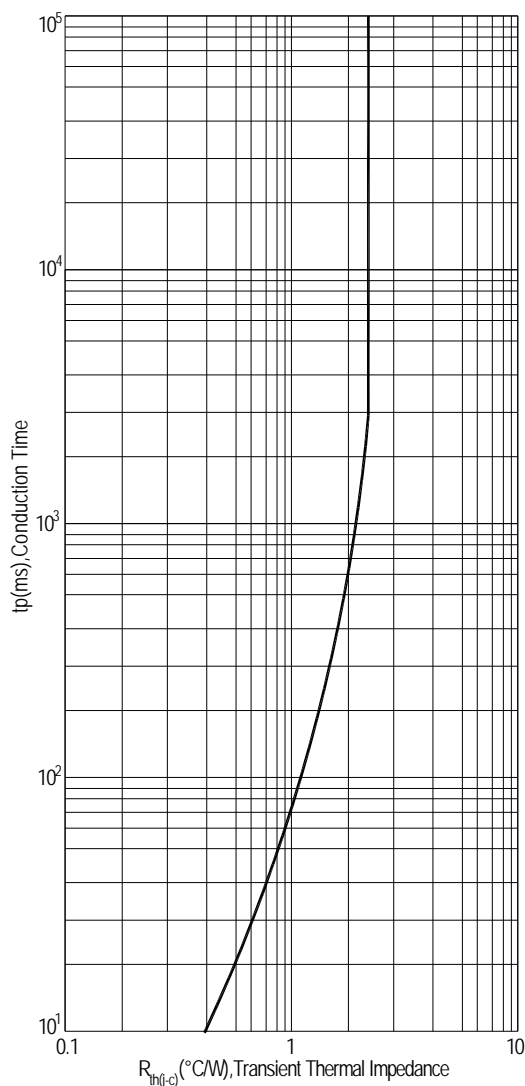


FIG.3: Typical RMS on-state current VS Allowable case Temperature

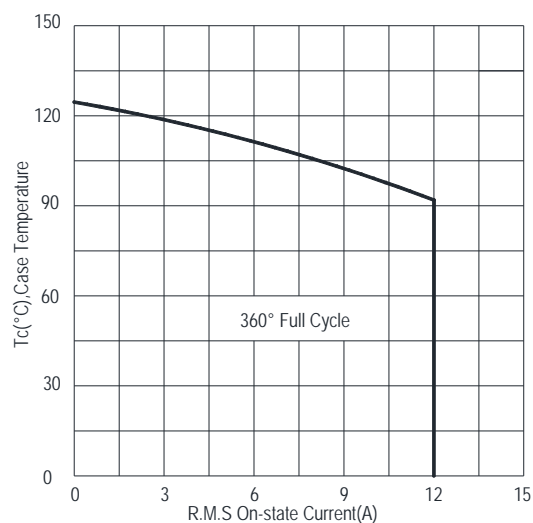


FIG.5: Rated surge on-state current (Non-Repetitive)

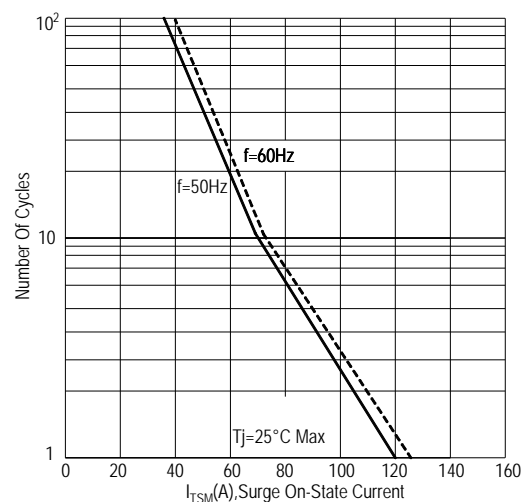


FIG.6: Gate trigger current VS Junction temperature

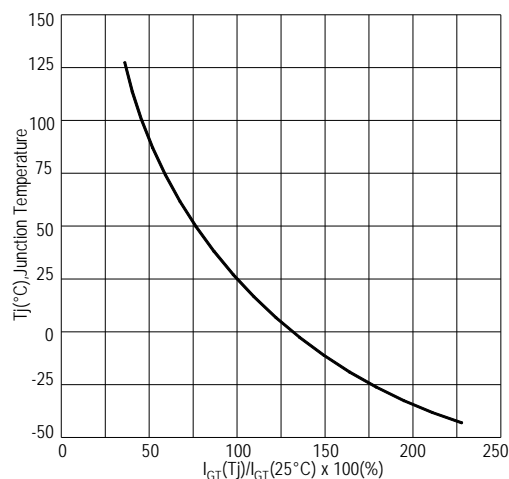


FIG.7: Holding current and Latching current VS Junction temperature

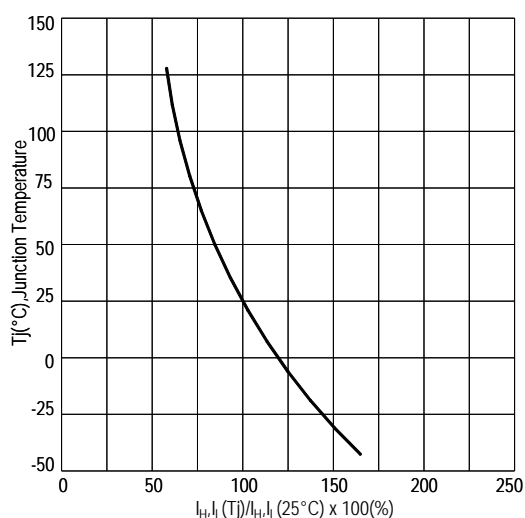


FIG.8: Gate trigger voltage VS Junction temperature

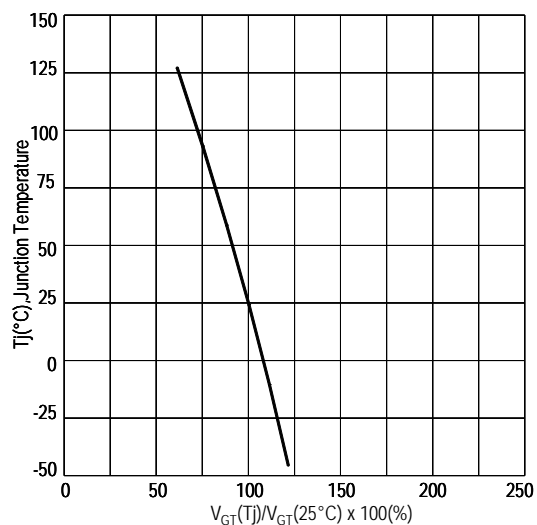
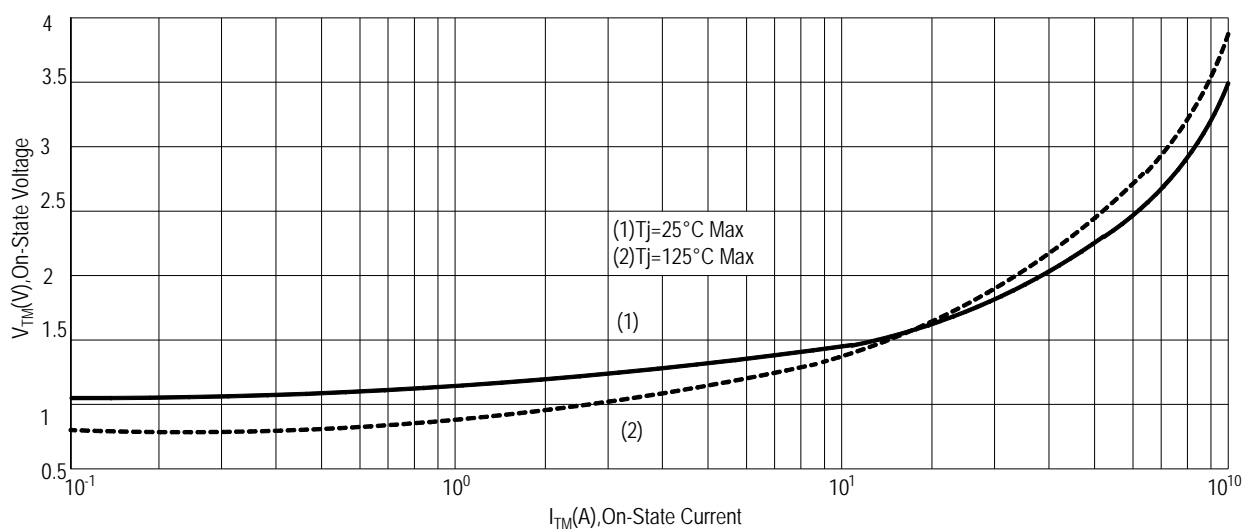
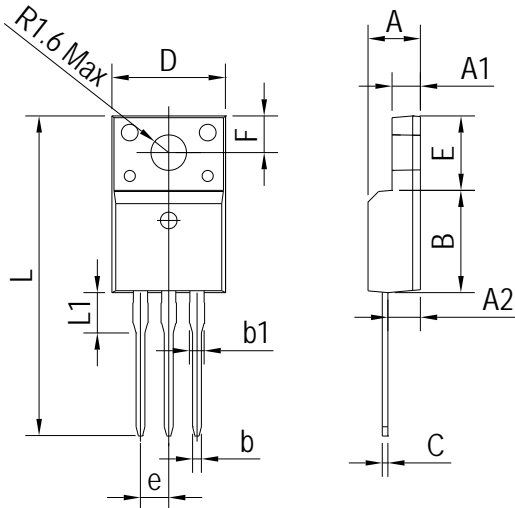


FIG.9: On-state characteristics(Max)



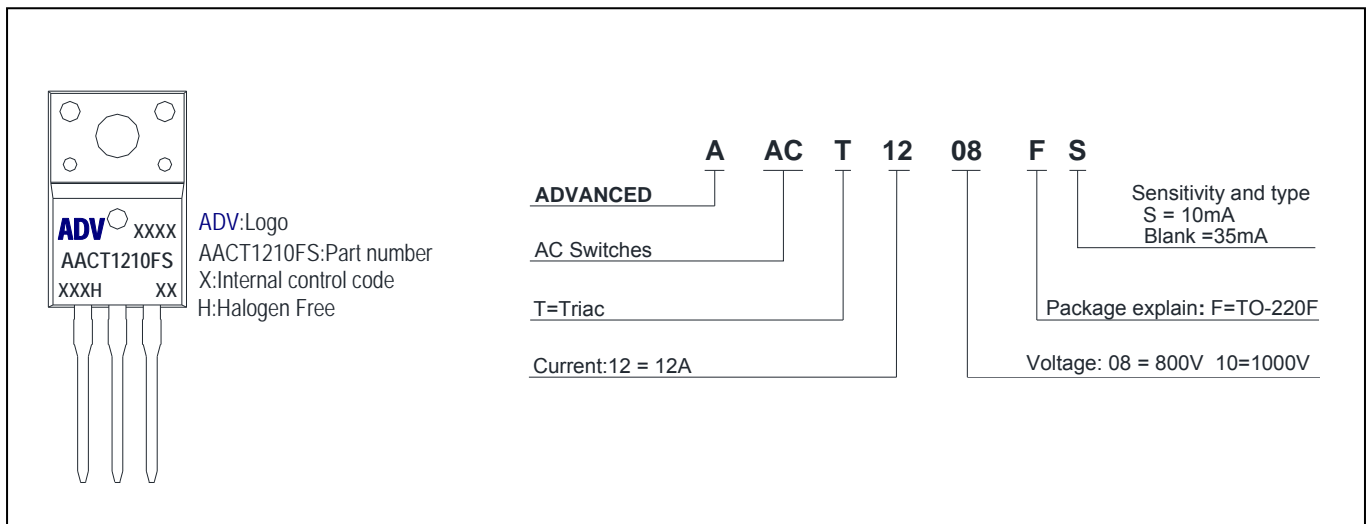
PACKAGE MECHANICAL DATA

TO-220F Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.800	0.169	0.189
A1	2.400	2.700	0.094	0.106
A2	2.500	3.000	0.098	0.118
B	8.800	9.300	0.346	0.367
b	0.600	0.950	0.023	0.037
b1	1.100	1.700	0.043	0.067
C	0.500	0.750	0.020	0.030
D	9.700	10.360	0.382	0.408
E	6.400	6.800	0.252	0.268
e	2.540 TYP		0.100 TYP	
F	3.300 REF		0.130 REF	
L	28.000	30.000	1.102	1.181
L1	2.900	3.630	0.114	0.143

Making Diagram



Ordering information

Part number	Package	Marking	Packing	Quantity
AACT1208F#	TO-220F	AACT1208F#	Tube	50pcs
AACT1210F#	TO-220F	AACT1210F#	Tube	50pcs

Note: # = Gate Trigger Current Sensitivity and type

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