International
IOR Rectifier

SERIES T50AC.A

TRIAC

T-Modules

50A

Features

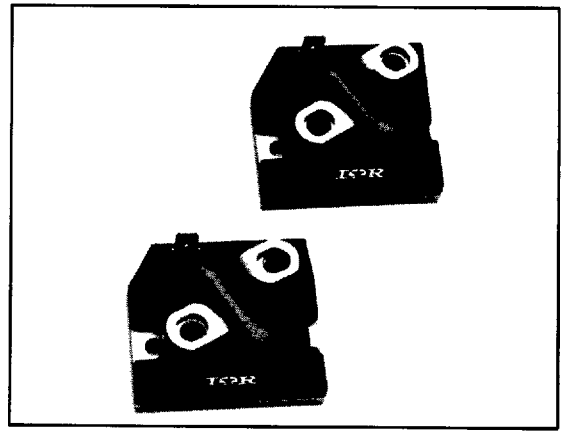
- Electrically isolated base plate
- 3500 V_{RMS} isolating voltage
- Standard JEDEC package
- Simplified mechanical designs, rapid assembly
- Large creepage distances
- UL E 78996 approved

Description

These T50AC.A series of T- modules consist of power TRIAC configured in a single package. With their isolating base plate, mechanical designs are greatly simplified giving advantages of cost reduction and reduced size.
Applications include power supplies, control circuits, light dimmers and battery chargers.

Major Ratings and Characteristics

Parameters		T50AC.A	Units
$I_{T(RMS)}$		50	A
	@ T_C	75	A
I_{TSM}	50Hz	620	A
	60Hz	650	A
I^2t	50Hz	1900	A^2s
	60Hz	1760	A^2s
$I^2\sqrt{t}$		19100	$A^2\sqrt{s}$
V_{DRM} - V_{RRM}		400 to 1200	V
T_J		-40 to 125	°C



ELECTRICAL SPECIFICATIONS

Voltage Ratings

Part number	Volatge Code	V_{RRM}, V_{DRM} maximum repetitive peak reverse and off-state voltage gate open circuit V	V_{RSM} maximum non-repetitive peak reverse voltage V
T50AC.A	40	400	500
	60	600	700
	80	800	900
	100	1000	1100
	120	1200	1300

On-state Conduction

	Parameter	Value	Units	Conditions		
$I_{T(RMS)}$	Max. RMS on-state current	50	A	180° cond. full sine wave, T_C=75°C		
I_{TSM}	Maximum peak one cycle non repetitive surge current	440	A	20ms	100% V_{RRM} reapplied	Sinusoidal full-wave Initial T_J=125°C
		460	A	16.6ms		
I_{TSM}	Maximum peak one half cycle non repetitive surge current	620	A	10ms	No voltage reapplied	Sinusoidal half Wave Initial T_J=125°C
		650	A	8.3ms		
		520	A	10ms	100% V_{RRM} reapplied	Either direction
		550	A	8.3ms		
I^2t	Maximum I^2t for fusing	1900	A^2s	10ms	No voltage reapplied	Initial T_J=125°C
		1760	A^2s	8.3ms		
		1350	A^2s	10ms	100% V_{RRM} reapplied	Either direction
		1250	A^2s	8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing (1)	19100	$A^2\sqrt{s}$	t=0 to 10ms, no voltage reapplied, Initial T_J=125°C		
V_{TM}	Maximum peak on-state voltage	2.0	V	T_J=25°C, I_{TM}=70Apk, either direction		
I_H	Maximum holding current	90	mA	T_J=25°C anode supply = 22V, Initial I_T = 2A, either direction		

Switching

	Parameter	Value	Units	Conditions
$di/_{dt}$	Maximum rate of rise of of turned-on current	100	A/µs	T_J=125°C, V_{DRM}=rated V_{DRM}, I_{TM}=100A, gate pulse: 20V, 15Ω, tp>10µs. Per JEDEC standard RS - 397, 5.2.2.6

(1) I^2t for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}$

Blocking

Parameter	Value	Units	Conditions
I_{RRM} I_{DRM} Max. peak leakage current	10	mA	T_J=125°C
I_{RRM} I_{DRM} Max. peak leakage current	100	µA	T_J = 25°C

Off-state

	Parameter	T50AC.A	Units	Conditions
$dv/_{dt}$	Minimum critical rate-of-rise of commutation voltage	15	V/µs	T_J= 125°C, rated V_{DRM} Either direction
$dv/_{dt}$	Minimum critical rate-of-rise of on-state voltage	200	V/µs	T_J= 125°C, Exponential to 100% rated V_{DRM} Either direction
I_{DM}	Max. peak off-state current	20	mA	T_J= 125°C, rated V_{DRM}, either direction
V_{INS}	RMS Isolation voltage	3500	V	50Hz, circuit to base, all terminals shorted TJ = 25°C, t = 1 s

Triggering

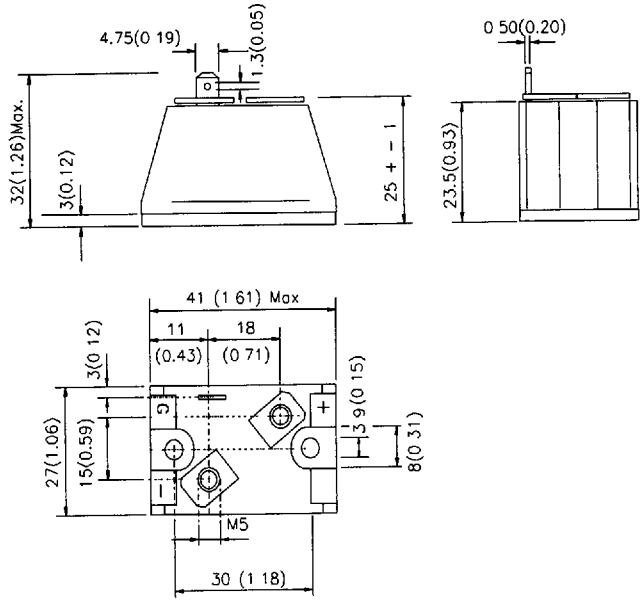
	Parameter	T50AC.A	Units	Conditions	
P_{GM}	Maximum peak gate power	20	W	2.0ms pulse width	
$P_{G(AV)}$	Maximum average gate power	2.0	W		
$+I_{GM}$	Maximum peak gate current	3	A		
$-V_{GM}$	Maximum peak negative gate voltage	20	V		
V_{GT}	Maximum required DC gate current to trigger	2.5	V	T_J= 25°C, 12V MT1 to MT2	
I_{GT}	Maximum required DC gate current to trigger	200	mA	MT2 + gate +	T_J= 25°C, 12V MT1 to MT2 for other temperatures refer to Fig. 7
		200	mA	MT2 - gate -	
		200	mA	MT2 + gate -	
		200	mA	MT2 - gate +	
V_{GD}	Maximum gate voltage that will not trigger	0.2	V	@ T_J=125°C, rated V_{DRM} applied	
I_{GD}	Maximum gate current that will not trigger	2.0	V	@ T_J=125°C, rated V_{DRM} applied	

Thermal and Mechanical Specifications

	Parameter		T50AC.A	Units	Conditions
T_J	Junction temperature range		-40 to 125	°C	
T_{stg}	Storage temperature range		-40 to 125	°C	
R_{thJC}	Maximum thermal resistance, junction to case		0.70	K/W	DC operation
R_{thC-S}	Max. thermal resistance case to heatsink		0.20	K/W	Mounting surface smooth flat and greased
T	Mounting torque±10%	Module to heatsink	1.3±10%	Nm	M3.5 mounting screws (2) Non-lubricated threads
		Terminals MT1 and MT2	3±10%	Nm	M5 screw terminals; non-lubricated threads
wt	Approximate weight		54	g(oz)	
	Case style		"T" Type		See outline table

(2)A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound

Outline Table



All dimensions in millimeters (inches)

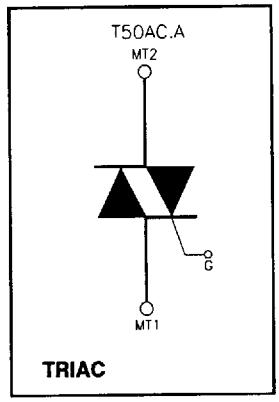
Ordering Information Table

Device Code

T	50	AC	120	A
①	②	③	④	①

1 - Module type
2 - Max. RMS on-state current
3 - Circuit configuration * *
4 - Voltage code: Code X 10 = V_{RRM}
(See Voltage Ratings Table)

Circuit configuration * *



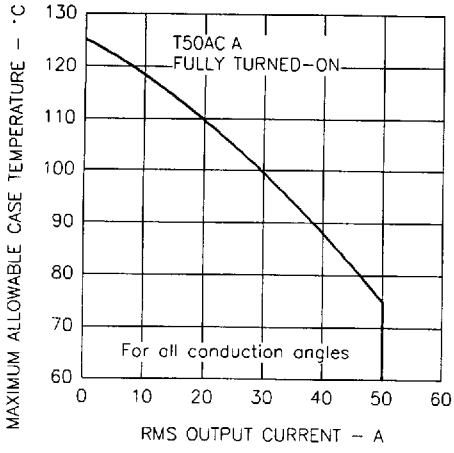


Fig. 1 - Current Ratings Characteristics

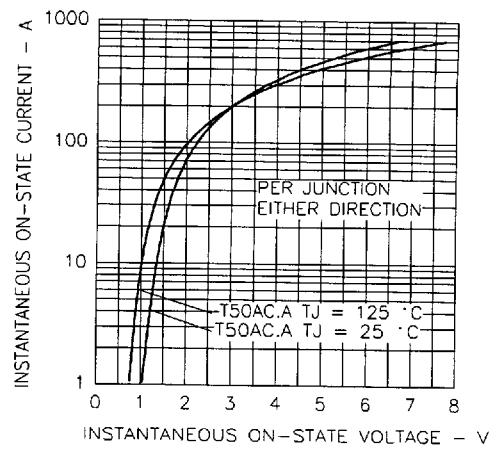


Fig. 2 - On-state Voltage Drop Characteristics

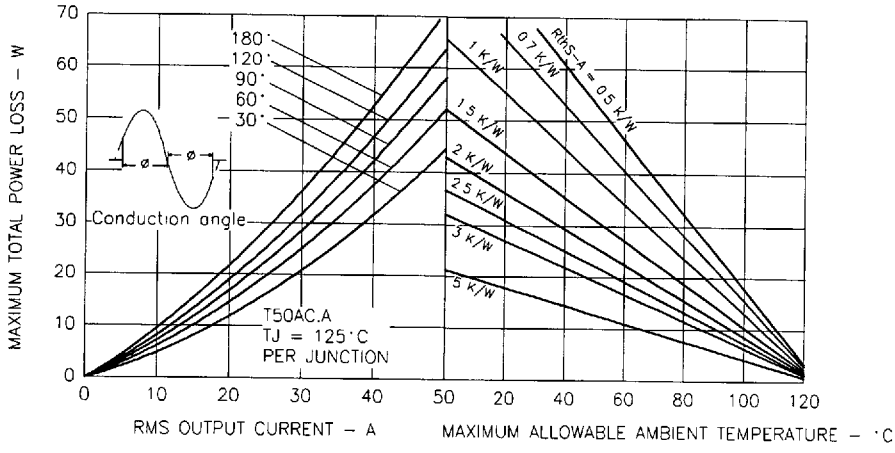


Fig. 3 - On-state Power Loss Characteristics

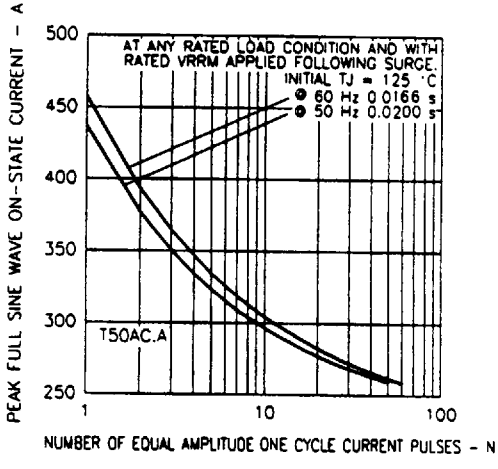


Fig. 4 - Maximum Non-Repetitive Surge Current

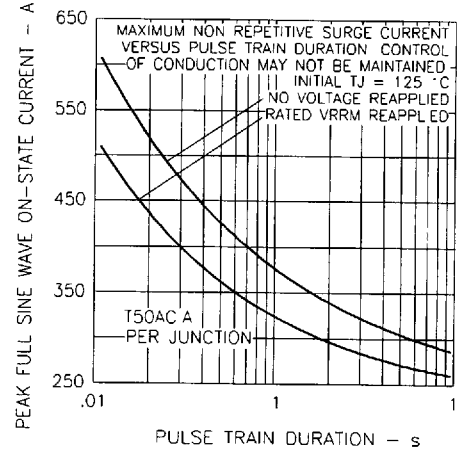


Fig. 5 - Maximum Non-Repetitive Surge Current

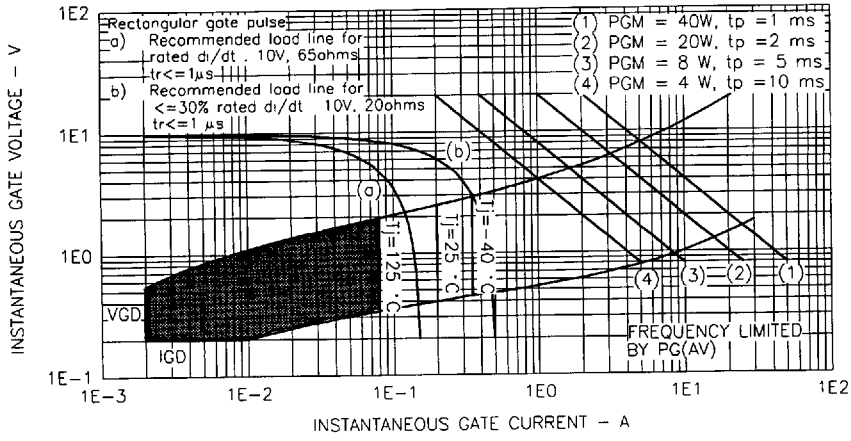


Fig. 6 - Gate Characteristics

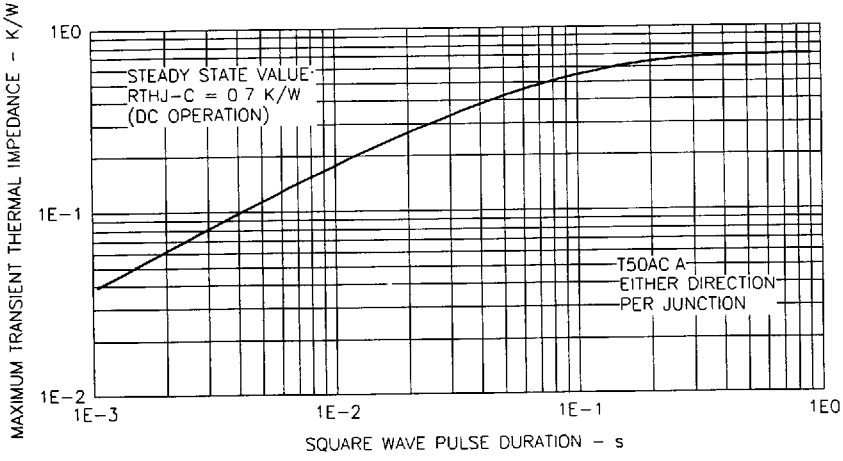


Fig. 7 - Thermal Impedance ZthJC Characteristics