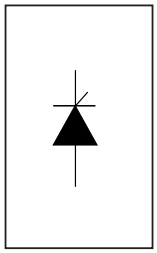
International
IOR Rectifier

SAFEIR Series
25TTS12FPPbF

PHASE CONTROL SCR
TO-220 FULLPAK
Lead-Free ("PbF" suffix)



V_T < 1.25V @ 16A
I_{TSM} = 200A
V_{RRM} = 1200V

Description/ Features

The 25TTS12FPPbF *SAFE**IR*** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 140° C junction temperature.Typical applications are in input rectification (soft start) and these products are designed to be used with International Rectifier input diodes, switches and output rectifiers which are available in identical package outlines.
Fully isolated package (V_{INS} = 2500 V_{RMS})
Plastic material 94V_{RO}

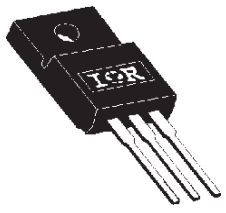
Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter T_A = 55°C, T_J = 125°C, common heatsink of 1°C/W	18	22	A

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{T(AV)}$	Sinusoidal waveform	16	A
I_{RMS}		25	A
V_{RRM}/V_{DRM}		1200	V
I_{TSM}		300	A
V_T	@ 16 A, T_J = 25°C	1.25	V
dv/dt		500	V/µs
di/dt		150	A/µs
T_J		- 40 to 125	°C

Package Outline



TO-220 FULLPAK

Voltage Ratings

Part Number	V_{RRM}, maximum peak reverse voltage V	V_{DRM}, maximum peak direct voltage V	I_{RRM}/I_{DRM} 125°C mA
25TTS12FPPbF	1200	1200	10

Absolute Maximum Ratings

	Parameters	Values		Units	Conditions	
$I_{T(AV)}$	Max. Average On-state Current	16		A	@ T_C = 85° C, 180° conduction half sine wave	
I_{RMS}	Max. RMS On-state Current	25				
I_{TSM}	Max. Peak One Cycle Non-Repetitive	300			10ms Sine pulse, rated V_{RRM} applied	
	Surge Current	350			10ms Sine pulse, no voltage reapplied	
I^2t	Max. I^2t for fusing	450		A^2s	10ms Sine pulse, rated V_{RRM} applied	
		630			10ms Sine pulse, no voltage reapplied	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	6300		$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied	
V_{TM}	Max. On-state Voltage Drop	1.25		V	@ 16A, T_J = 25°C	
r_t	On-state slope resistance	12.0		mΩ	T_J = 125°C	
$V_{T(TO)}$	Threshold Voltage	1.0		V		
I_{RM}/I_{DM}	Max.Reverse and Direct	0.5		mA	T_J = 25 °C	V_R = rated V_{RRM}/V_{DRM}
	Leakage Current	10			T_J = 125 °C	
I_H	Holding Current	Typ.	Max.		Anode Supply = 6V, Resistive load, Initial I_T=1A	
		--	100	mA		
I_L	Max. Latching Current	200		mA	Anode Supply = 6V, Resistive load	
dv/dt	Max. Rate of Rise of off-state Volt.	500		V/µs		
di/dt	Max. Rate of Rise of turned-on Curc.	150		A/µs		

Triggering

Parameters		Values	Units	Conditions
P_{GM}	Max. peak Gate Power	8.0	W	
$P_{G(AV)}$	Max. average Gate Power	2.0		
$+ I_{GM}$	Max. paek positive Gate Current	1.5	A	
$- V_{GM}$	Max. paek negative Gate Voltage	10	V	
I_{GT}	Max. required DC Gate Current to trigger	60	mA	Anode supply = 6V, resistive load, T_J = - 10°C
		45		Anode supply = 6V, resistive load, T_J = 25°C
		20		Anode supply = 6V, resistive load, T_J = 125°C
V_{GT}	Max. required DC Gate Voltage to trigger	2.5	V	Anode supply = 6V, resistive load, T_J = - 10°C
		2.0		Anode supply = 6V, resistive load, T_J = 25°C
		1.0		Anode supply = 6V, resistive load, T_J = 125°C
V_{GD}	Max. DC Gate Voltage not to trigger	0.25		T_J = 125°C, V_{DRM} = rated value
I_{GD}	Max. DC Gate Current not to trigger	2.0	mA	T_J = 125°C, V_{DRM} = rated value

Switching

Parameters		Values	Units	Conditions
t_{gt}	Typical turn-on time	0.9	µs	T_J = 25°C
t_{rr}	Typical reverse recovery time	4		T_J = 125°C
t_q	Typical turn-off time	110		

Thermal-Mechanical Specifications

Parameters			Values	Units	Conditions
T_J	Max. Junction Temperature Range		-40 to 125	°C	
T_{stg}	Max. Storage Temperature Range		-40 to 125		
R_{thJC}	Max. Thermal Resistance Junction to Case		1.5	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient		62		
R_{thCS}	Typ. Thermal Resistance Case to Heatsink		1.5		Mounting surface, smooth and greased
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		
	Case Style		TO-220 FULLPAK		(94/V0)
	Marking Device		25TTS12FP		

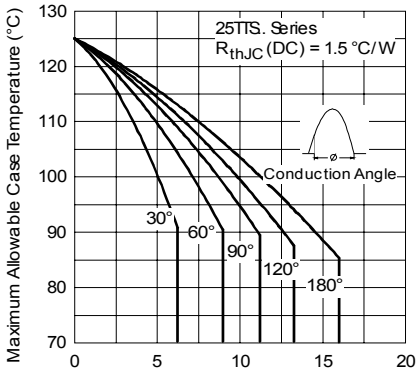


Fig. 1 - Current Rating Characteristics

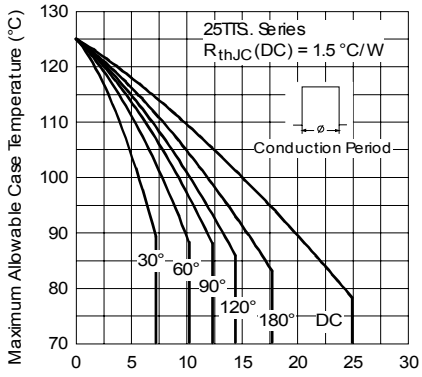


Fig. 2 - Current Rating Characteristics

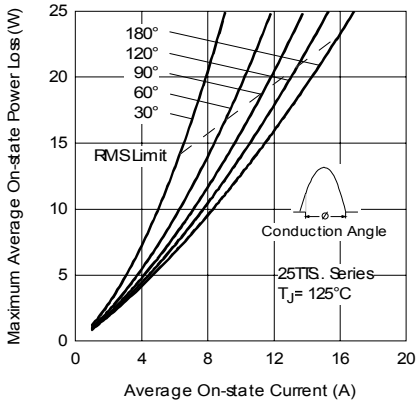


Fig. 3 - On-state Power Loss Characteristics

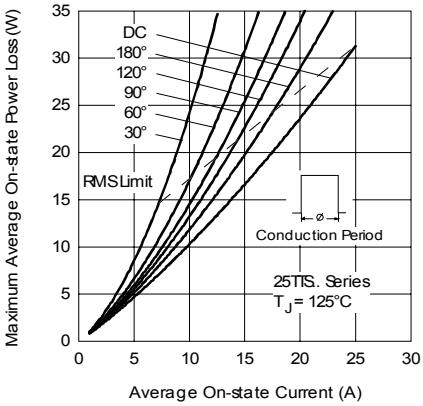


Fig. 4 - On-state Power Loss Characteristics

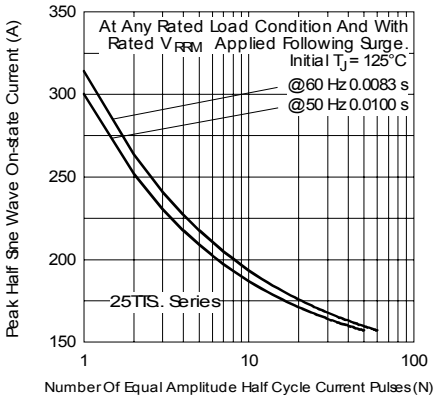


Fig. 5 - Maximum Non-Repetitive Surge Current

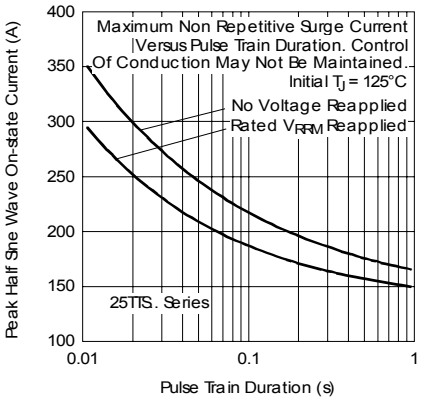


Fig. 6 - Maximum Non-Repetitive Surge Current

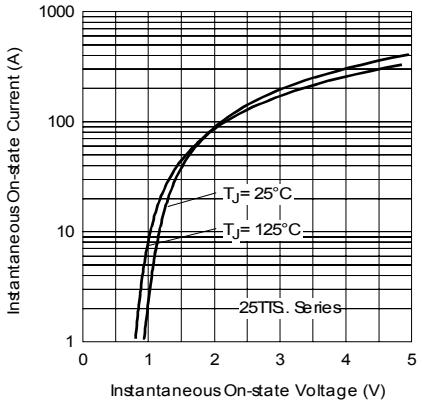


Fig. 7 - On-state Voltage Drop Characteristics

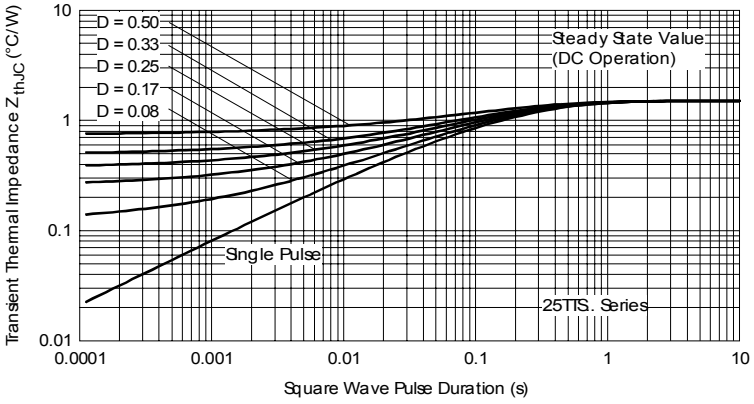


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

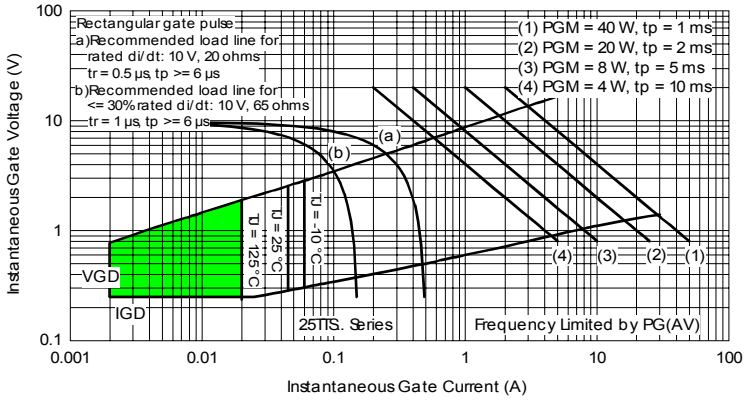
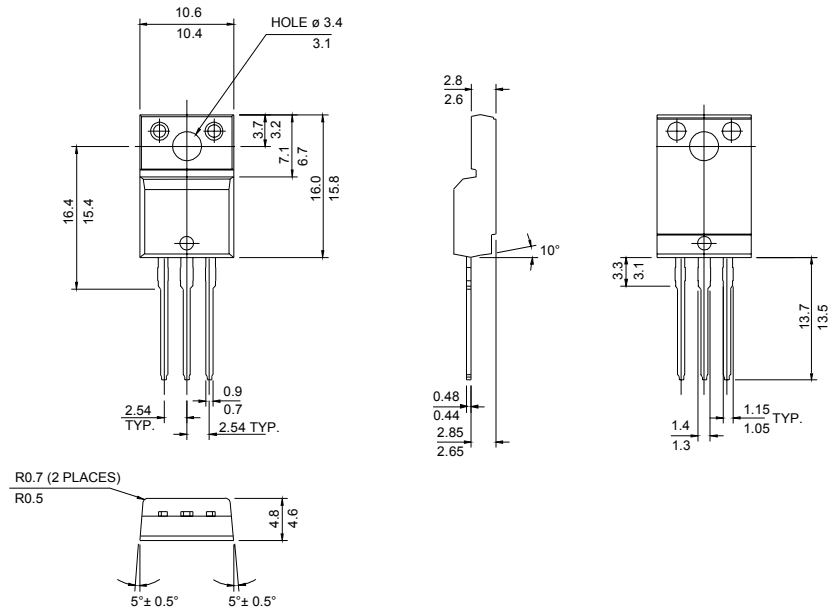


Fig. 9 - Gate Characteristics

Outline Table

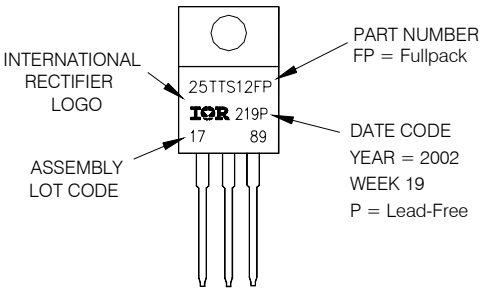


Dimensions in millimeters (and inches)

Part Marking Information

EXAMPLE: THIS IS A 25TTS12FP
LOT CODE 1789
ASSEMBLED ON WW 19, 2002
IN THE ASSEMBLY LINE "C"

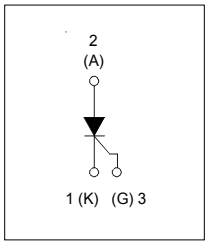
Note: "P" in assembly line position indicates "Lead-Free"



Ordering Information Table

Device Code

25	T	T	S	12	FP	PbF
1	2	3	4	5	6	7



- **1** - Current Rating (25 = 25A)
- **2** - Circuit Configuration:
  T = Single Thyristor
- **3** - Package:
  T = TO-220AC
- **4** - Type of Silicon:
  S = Standard Recovery Rectifier
- **5** - Voltage Rating (12 = 1200V)
- **6** - Fullpak
- **7** - • none = Standard Production
  • PbF = Lead-Free

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

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09/05

Notice

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