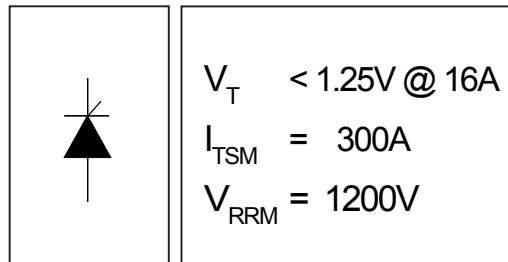


PHASE CONTROL SCR
Lead-Free ("PbF" suffix)

Description/Features

The 25TTS.. **SAFEIR** 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 125°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.



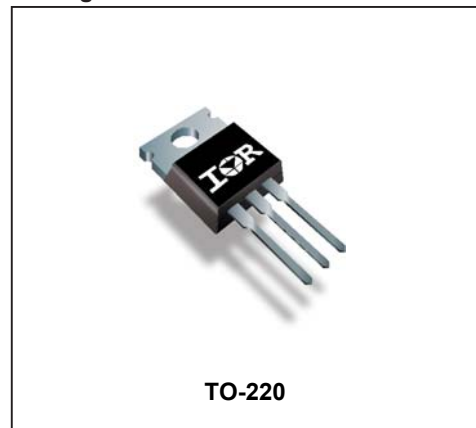
Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter $T_A = 55^\circ C, T_J = 125^\circ C,$ common heatsink of $1^\circ C/W$	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
$V_T @ 16A, T_J = 25^\circ C$	1.25	V
dv/dt	500	V/ μs
di/dt	150	A/ μs
T_J	-40 to 125	$^\circ C$

Package Outline



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
25TTS12PbF	1200	1200	10

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{T(AV)}$ Max. Average On-state Current	16	A	@ $T_C = 93^\circ\text{C}$, 180° conduction half sine wave
I_{RMS} Max. RMS On-state Current	25		
I_{TSM} Max. Peak One Cycle Non-Repetitive Surge Current	300 350		10ms Sine pulse, rated V_{RRM} applied 10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t for fusing	450 630	A^2s	10ms Sine pulse, rated V_{RRM} applied 10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	6300		$A^2\sqrt{s}$
V_{TM} Max. On-state Voltage Drop	1.25	V	@ 16A, $T_J = 25^\circ\text{C}$
r_t On-state slope resistance	12.0	$m\Omega$	$T_J = 125^\circ\text{C}$
$V_{T(TO)}$ Threshold Voltage	1.0	V	
I_{RM}/I_{DM} Max. Reverse and Direct Leakage Current	0.5 10	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_{RRM} / V_{DRM}$
I_H Holding Current	Typ. Max. -- 100		mA
I_L Max. Latching Current	200	mA	
dv/dt Max. Rate of Rise of off-state Volt.	500	V/ μs	
di/dt Max. Rate of Rise of turned-on Curr.	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. peak positive Gate Current	1.5	A	
$-V_{GM}$ Max. peak negative Gate Voltage	10	V	
I_{GT} Max. required DC Gate Current to trigger	60	mA	Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$
	45		Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$
	20		Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$
V_{GT} Max. required DC Gate Voltage to trigger	2.5	V	Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$
	2.0		Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$
	1.0		Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$
V_{GD} Max. DC Gate Voltage not to trigger	0.25		$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$
I_{GD} Max. DC Gate Current not to trigger	2.0	mA	$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$

Switching

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

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T_J Max. Junction Temperature Range	-40 to 125	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-40 to 125		
R_{thJC} Max. Thermal Resistance Junction to Case	1.1	$^\circ\text{C}/\text{W}$	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient	62		
R_{thCS} Typ. Thermal Resistance Case to Heatsink	0.5		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		
Marking Device	25TTS12		

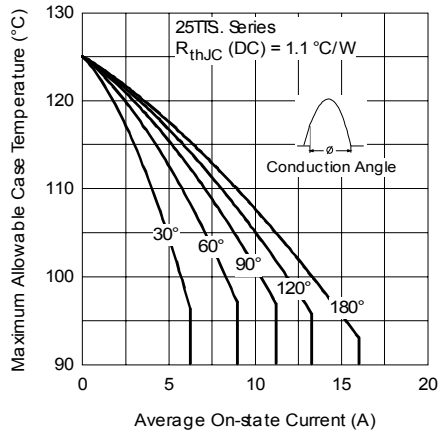


Fig. 1 - Current Rating Characteristics

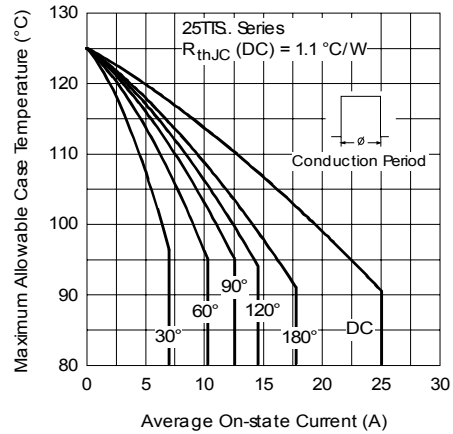


Fig. 2 - Current Rating Characteristics

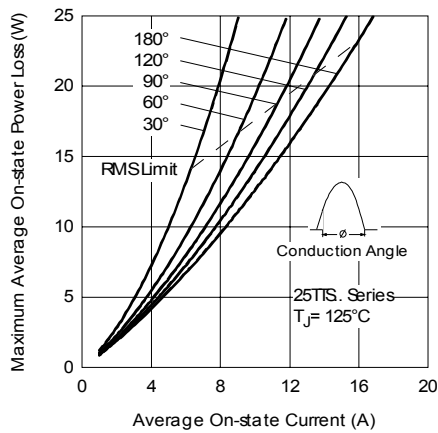


Fig. 3 - On-state Power Loss Characteristics

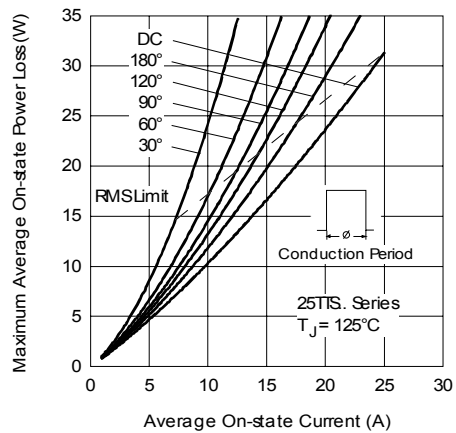


Fig. 4 - On-state Power Loss Characteristics

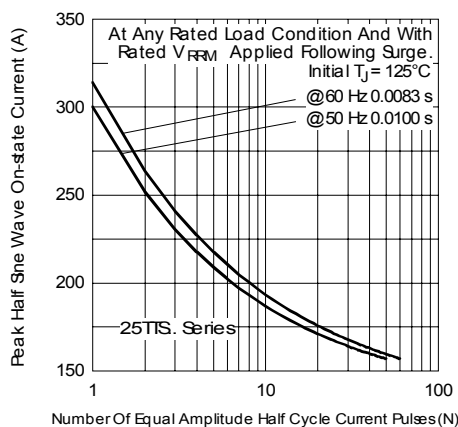


Fig. 5 - Maximum Non-Repetitive Surge Current

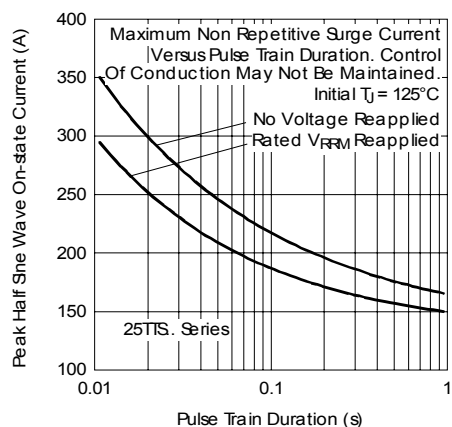


Fig. 6 - Maximum Non-Repetitive Surge Current

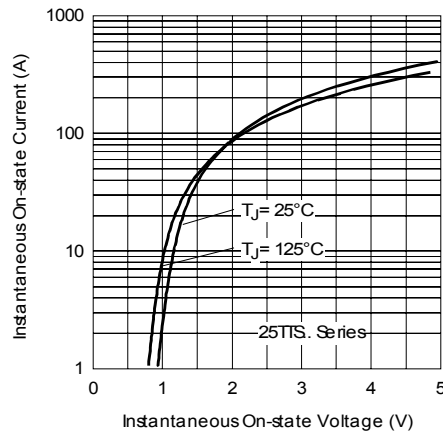


Fig. 7 - On-state Voltage Drop Characteristics

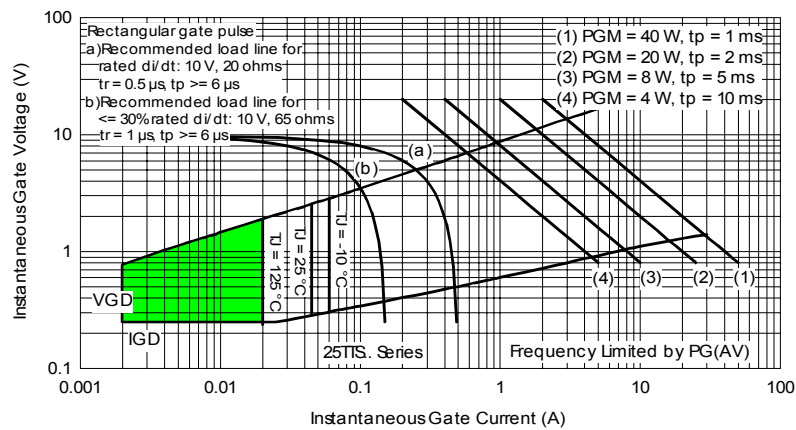


Fig. 8 - Gate Characteristics

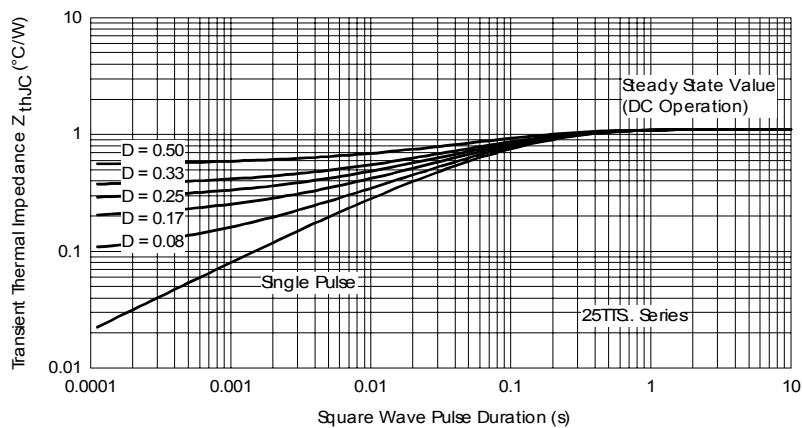
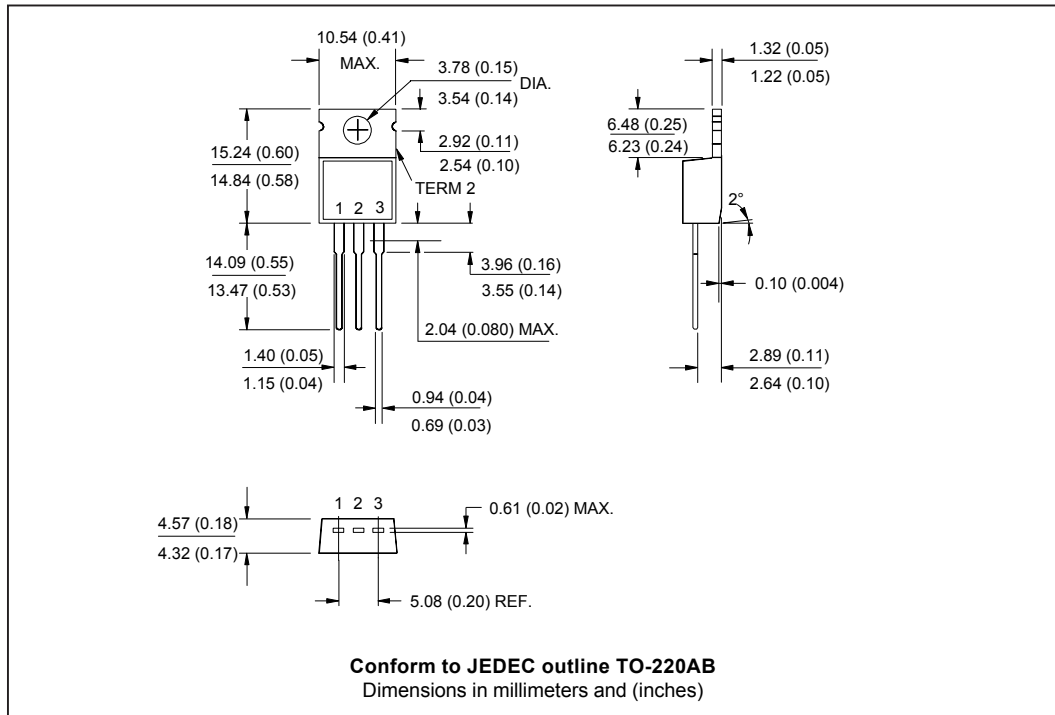
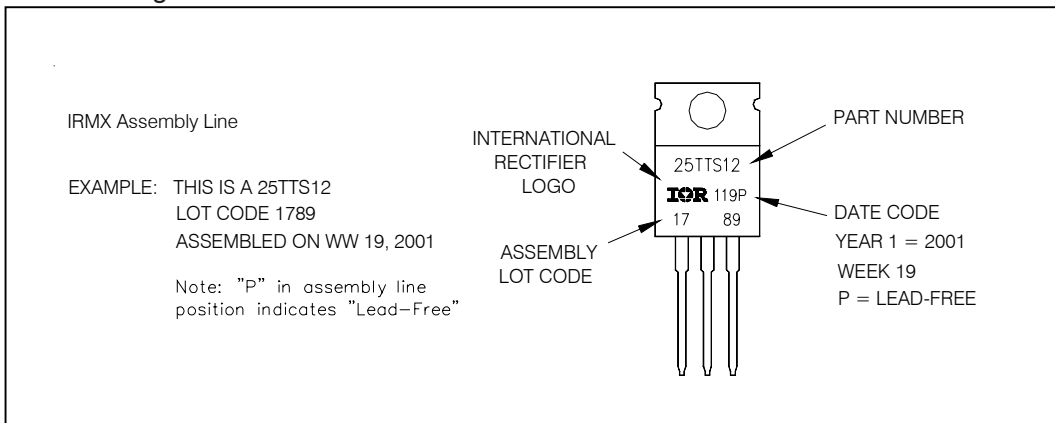


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Part Marking Information



Ordering Information Table

Device Code					
25	T	T	S	12	PbF
①	②	③	④	⑤	⑥
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	- • none = Standard Production • PbF = Lead-Free				

The diagram shows a thyristor symbol with three terminals. Terminal 2 is labeled (A) and is the top terminal. Terminal 1 is labeled (K) and is the bottom terminal. Terminal 3 is labeled (G) and is the right terminal.

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.