

Bulletin I2198 rev. A 09/05

International IOR Rectifier

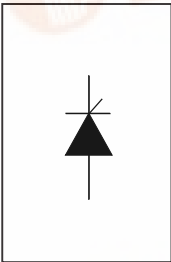
SAFEIR Series 12TTS08PbF

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

Description/ Features

The 12TTS08... **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 and crow-bar (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.



V_T	$< 1.2V @ 8A$
I_{TSM}	$= 140A$
V_{RRM}	$= 800V$

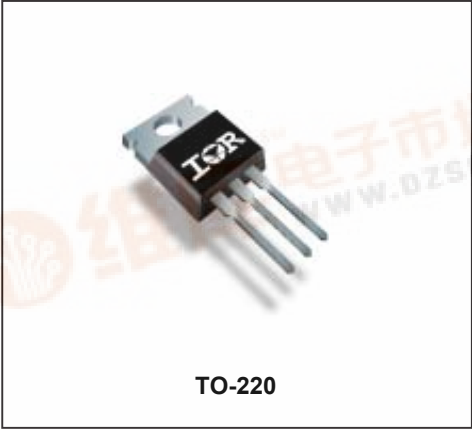
Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter $T_A = 55^\circ C$, $T_J = 125^\circ C$, common heatsink of $1^\circ C/W$	13.5	17	A

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{T(AV)}$ Sinusoidal waveform	8	A
$I_{T(RMS)}$	12.5	A
V_{RRM}/V_{DRM}	800	V
I_{TSM}	140	A
$V_T @ 8A, T_J = 25^\circ C$	1.2	V
dv/dt	150	V/ μs
di/dt	100	A/ μs
T_J range	-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
12TTS08PbF	800	800	1.0

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{T(AV)}$ Max. Average On-state Current	8	A	@ $T_C = 108^\circ\text{C}$, 180° conduction half sine wave
$I_{T(RMS)}$ Max. RMS On-state Current	12.5		
I_{TSM} Max. Peak One Cycle Non-Repetitive Surge Current	120	A	10ms Sine pulse, rated V_{RRM} applied, $T_J = 125^\circ\text{C}$
	140		10ms Sine pulse, no voltage reapplied, $T_J = 125^\circ\text{C}$
I^2t Max. I^2t for fusing	72	A ² s	10ms Sine pulse, rated V_{RRM} applied, $T_J = 125^\circ\text{C}$
	100		10ms Sine pulse, no voltage reapplied, $T_J = 125^\circ\text{C}$
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1000	A ² √s	t = 0.1 to 10ms, no voltage reapplied, $T_J = 125^\circ\text{C}$
V_{TM} Max. On-state Voltage Drop	1.2	V	@ 8A, $T_J = 25^\circ\text{C}$
r_t On-state slope resistance	16.2	mΩ	$T_J = 125^\circ\text{C}$
$V_{T(TO)}$ Threshold Voltage	0.87	V	
I_{RM}/I_{DM} Max. Reverse and Direct Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$
	1.0		$T_J = 125^\circ\text{C}$
			$V_R = \text{rated } V_{RRM} / V_{DRM}$
I_H Typ. Holding Current	30	mA	Anode Supply = 6V, Resistive load, Initial $I_T = 1\text{A}$
I_L Max. Latching Current	50	mA	Anode Supply = 6V, Resistive load
dv/dt Max. rate of rise of off-state Voltage	150	V/μs	$T_J = 25^\circ\text{C}$
di/dt Max. rate of rise of turned-on Current	100	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	20	mA	Anode supply = 6V, resistive load, $T_J = -65^\circ\text{C}$
	15		Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$
	10		Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$
V_{GT} Max. required DC Gate Voltage to trigger	1.2	V	Anode supply = 6V, resistive load, $T_J = -65^\circ\text{C}$
	1		Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$
	0.7		Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$
V_{GD} Max. DC Gate Voltage not to trigger	0.2	mA	$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$
I_{GD} Max. DC Gate Current not to trigger	0.1		$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$

Switching

Parameters	Values	Units	Conditions
t_{gt} Typical turn-on time	0.8	μs	$T_J = 25^\circ\text{C}$
t_{rr} Typical reverse recovery time	3		$T_J = 125^\circ\text{C}$
t_q Typical turn-off time	100		

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		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			12TTS08		Case style TO-220

12TTS08PbF *SAFEIR* Series

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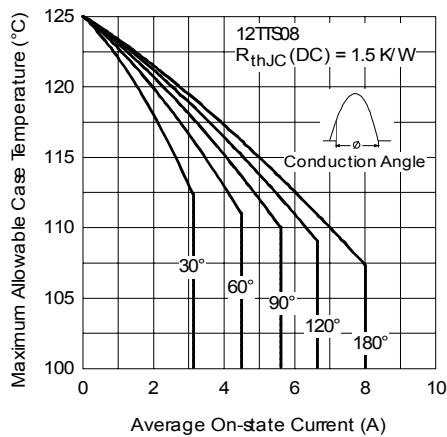


Fig. 1 - Current Rating Characteristics

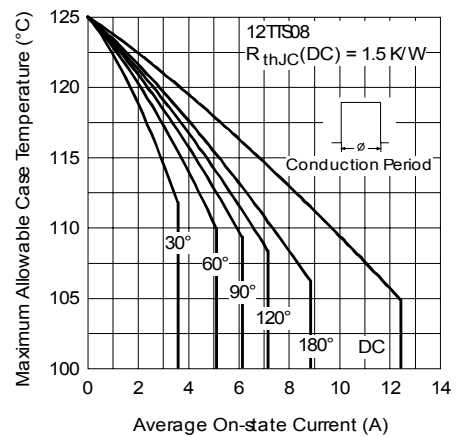


Fig. 2 - Current Rating Characteristics

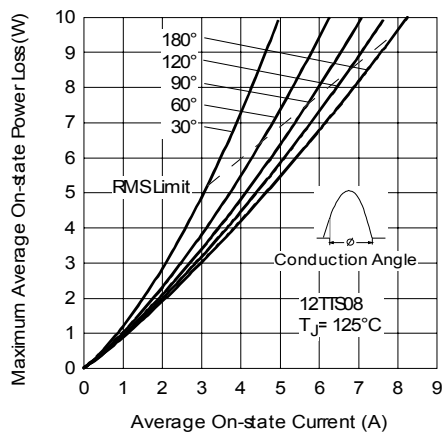


Fig. 3 - On-state Power Loss Characteristics

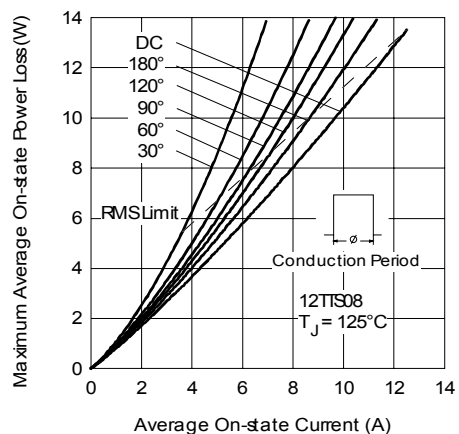


Fig. 4 - On-state Power Loss Characteristics

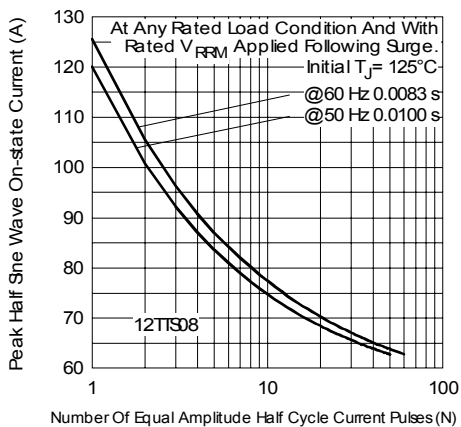


Fig. 6 - Maximum Non-Repetitive Surge Current

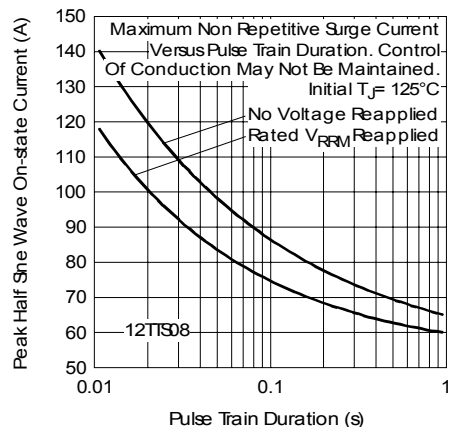


Fig. 7 - Maximum Non-Repetitive Surge Current

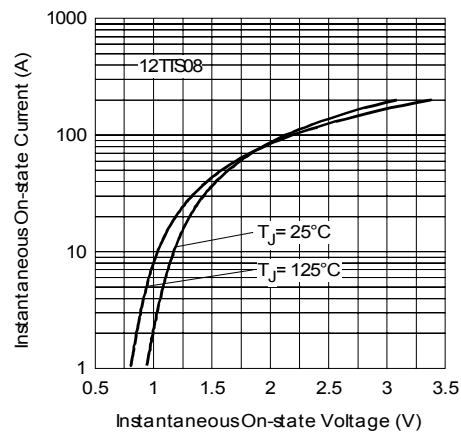


Fig. 7 - On-state Voltage Drop Characteristics

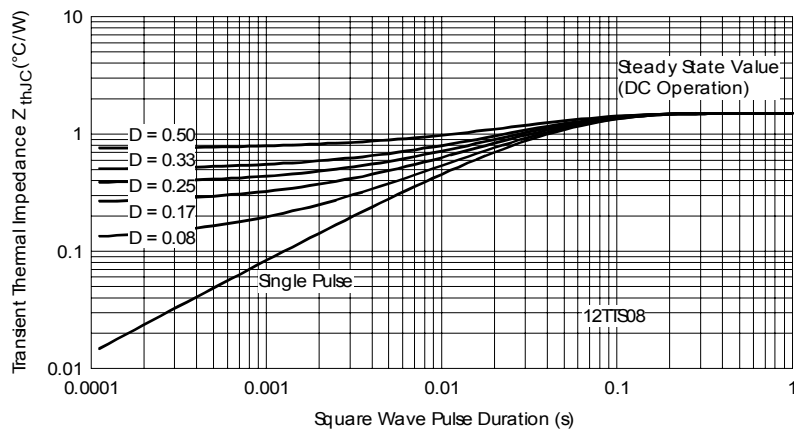


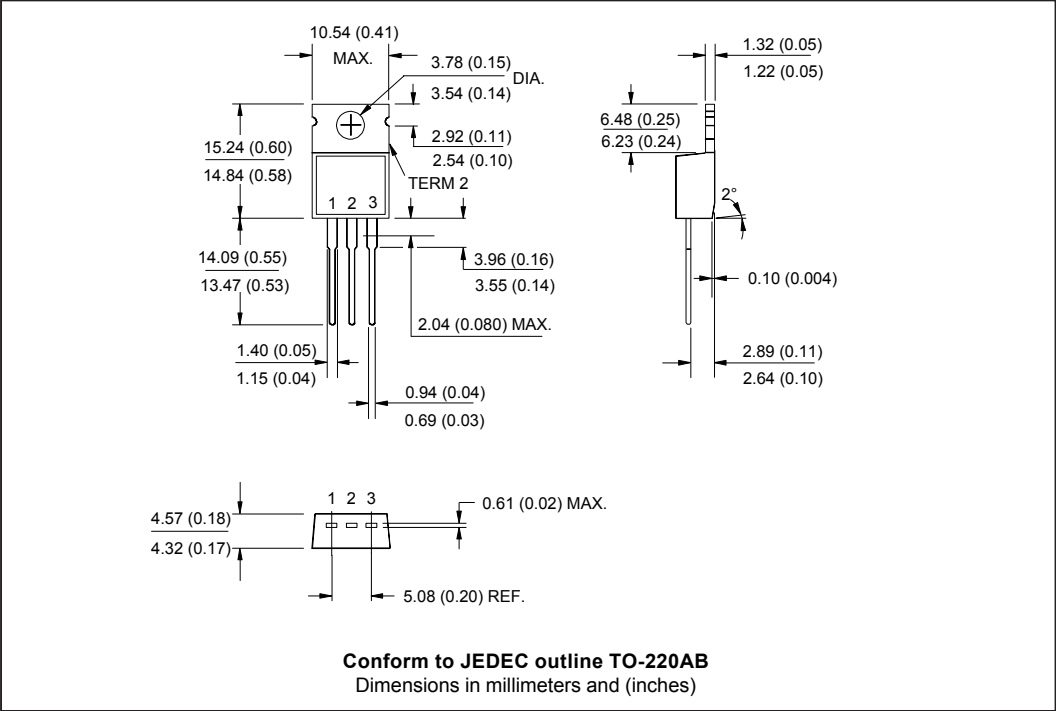
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

12TTS08PbF **SAFEIR** Series

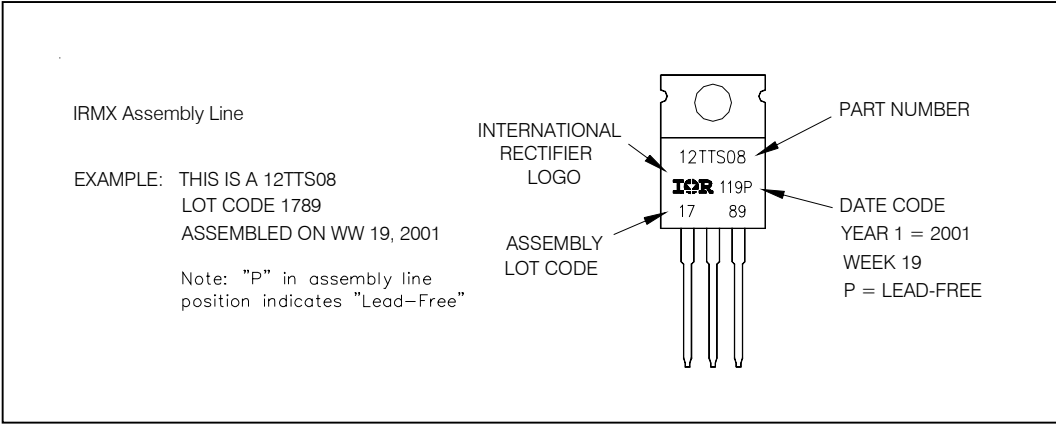
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Outline Table

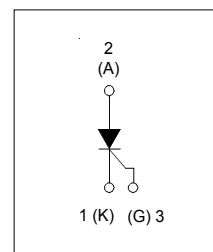


Part Marking Information



Ordering Information Table

Device Code					
12	T	T	S	08	PbF
1	2	3	4	5	6
1	Current Rating (12 = 12.5A)				
2	Circuit Configuration				
	T = Single Thyristor				
3	Package				
	T = TO-220				
4	Type of Silicon				
	S = Standard Recovery Rectifier				
5	Voltage Rating (08 = 800V)				
6	• 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
IR Rectifier

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