

Preliminary Data Sheet I2143 11/97

International IOR Rectifier


SAFEIR Series 10TTS08

PHASE CONTROL SCR

Description/Features

The 10TTS08 **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.

	$V_T < 1.15V @ 6.5A$
	$I_{TSM} = 140A$
	$V_{RRM} = 800V$

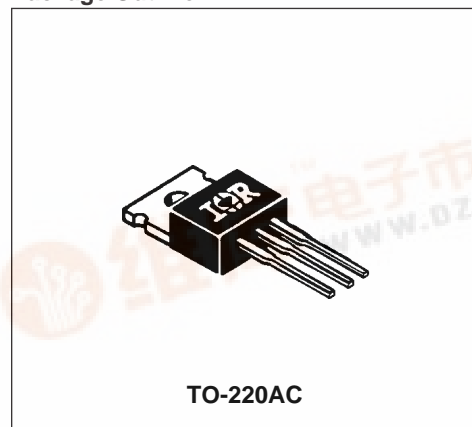
Output Current in Typical Applications

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	10TTS08	Units
$I_{T(AV)}$ Sinusoidal waveform	6.5	A
$I_{T(RMS)}$	10	A
V_{RRM}/V_{DRM}	800	V
I_{TSM}	140	A
$V_T @ 6.5A, T_J = 25^\circ C$	1.15	V
dv/dt	150	V/ μs
di/dt	100	A/ μs
T_J range	-40 to 125	$^\circ C$

Package Outline



Also available in SMD-220 package (series 10TTS08S)



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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
10TTS08	800	800	1.0

Absolute Maximum Ratings

Parameters	10TTS08	Units	Conditions	
$I_{T(AV)}$ Max. Average On-state Current	6.5	A	@ $T_C = 112^\circ\text{C}$, 180° conduction half sine wave	
$I_{T(RMS)}$ Max. RMS On-state Current	10			
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^2s	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	$\text{A}^2\sqrt{\text{s}}$	$t = 0.1$ to 10ms, no voltage reapplied, $T_J = 125^\circ\text{C}$	
V_{TM} Max. On-state Voltage Drop	1.15	V	@ 6.5A, $T_J = 25^\circ\text{C}$	
r_t On-state slope resistance	17.3	$\text{m}\Omega$	$T_J = 125^\circ\text{C}$	
$V_{T(TO)}$ Threshold Voltage	0.85	V		
I_{RM}/I_{DM} Max. Reverse and Direct Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_{RRM}/V_{DRM}$
	1.0		$T_J = 125^\circ\text{C}$	
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	$\text{V}/\mu\text{s}$	$T_J = 25^\circ\text{C}$	
di/dt Max. rate of rise of turned-on Current	100	$\text{A}/\mu\text{s}$		

Triggering

Parameters	10TTS08	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		$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$
I_{GD} Max. DC Gate Current not to trigger	0.1	mA	$T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$

Switching

Parameters	10TTS08	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	10TTS08	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	1.5	$^\circ\text{C/W}$	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-220AC		

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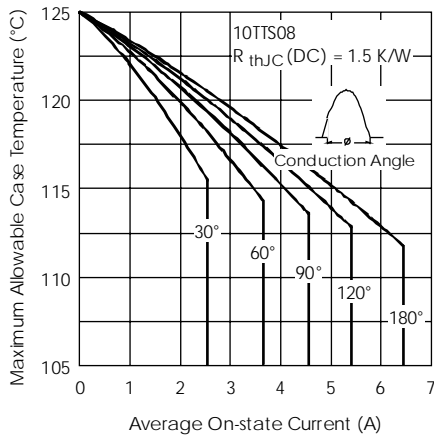


Fig. 1 - Current Rating Characteristics

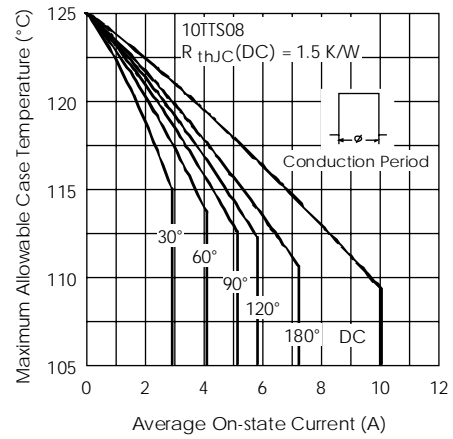


Fig. 2 - Current Rating Characteristics

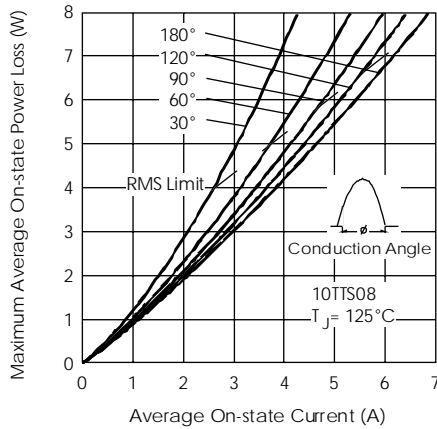


Fig. 3 - On-state Power Loss Characteristics

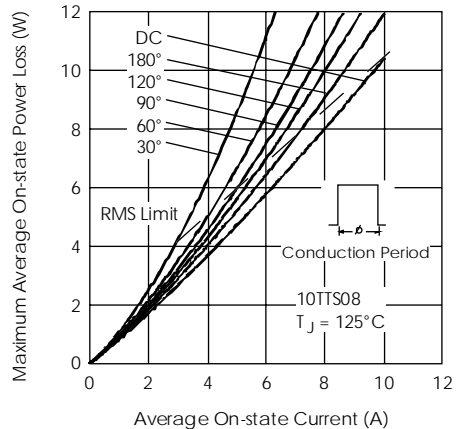


Fig. 4 - On-state Power Loss Characteristics

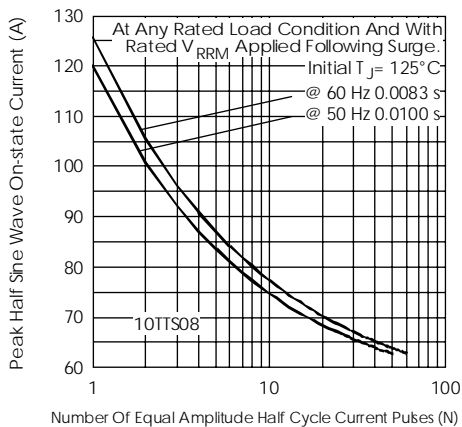


Fig. 6 - Maximum Non-Repetitive Surge Current

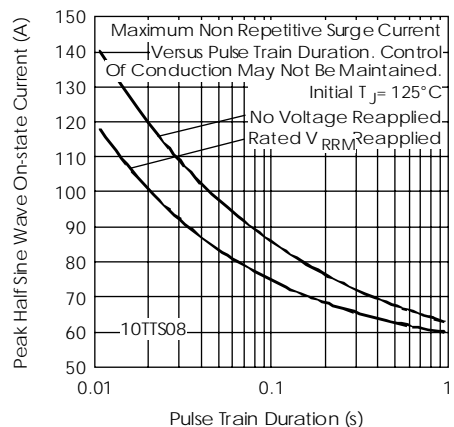


Fig. 7 - Maximum Non-Repetitive Surge Current

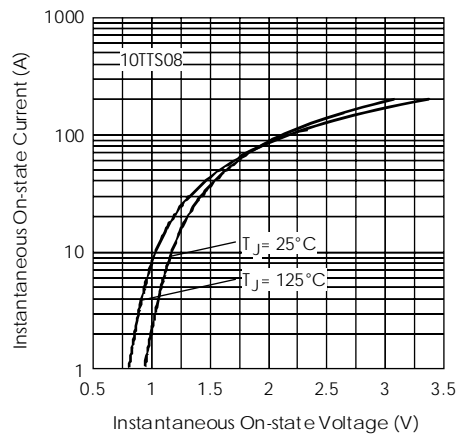


Fig. 7 - On-state Voltage Drop Characteristics

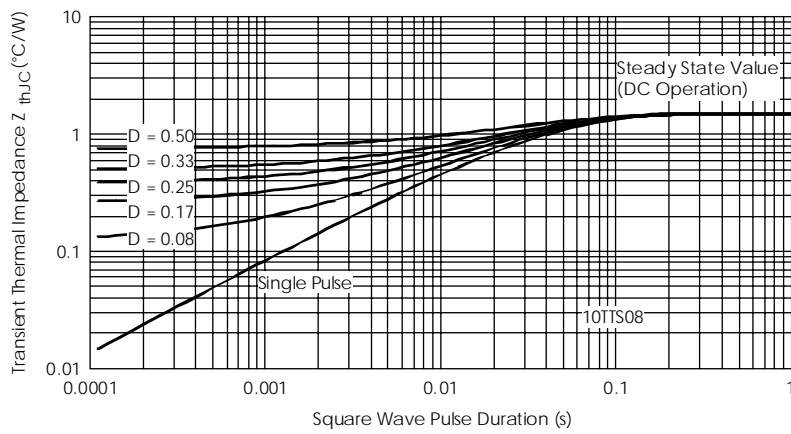


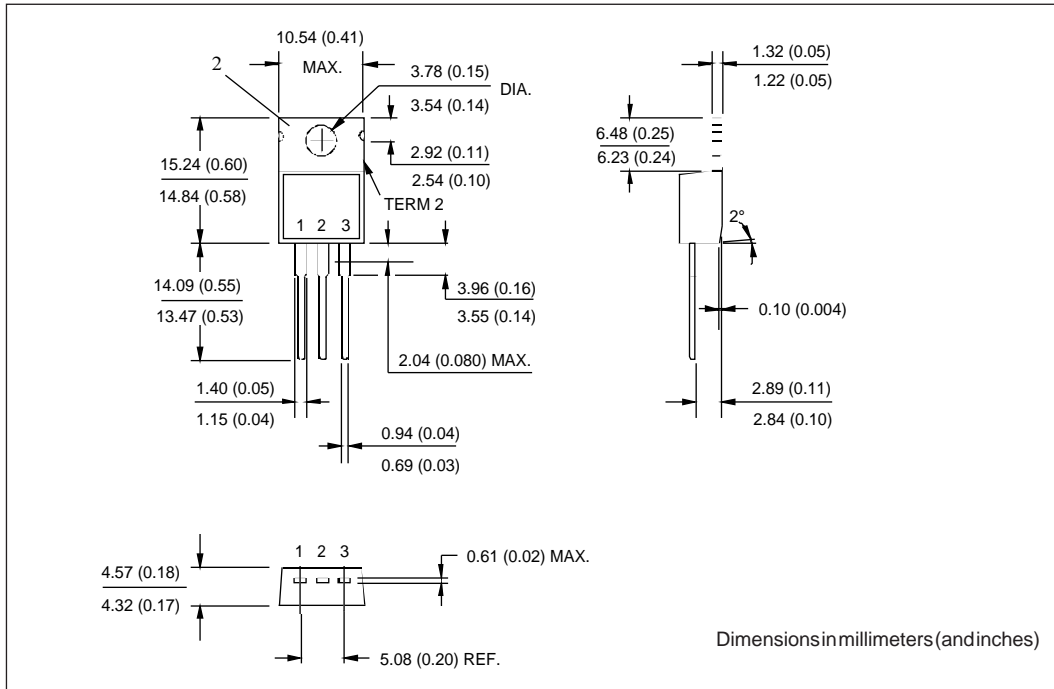
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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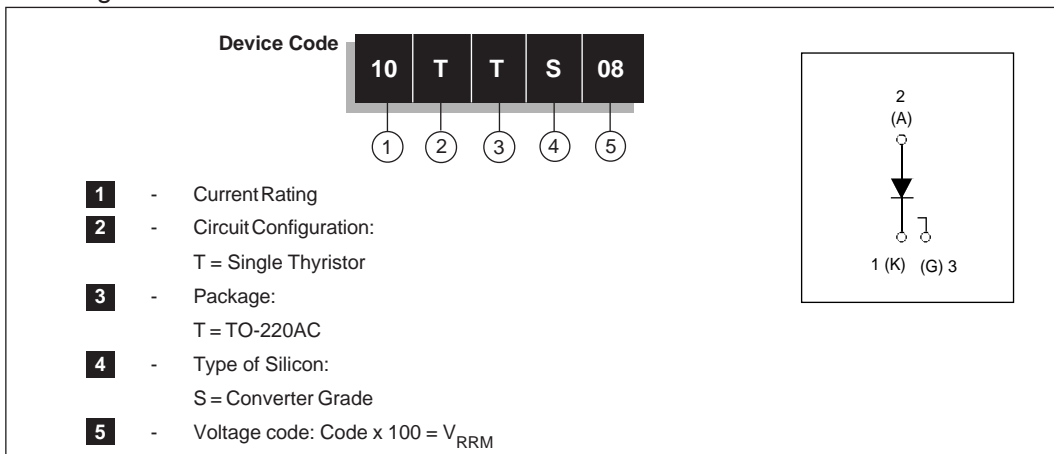
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Outline Table



Ordering Information Table



WORLDHEADQUARTERS: 233 Kansas St., El Segundo, California 90245 U.S.A Tel: (310) 322-3331 Fax: (310) 322-3332
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IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590 Fax: ++ 49 6172 965933
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 4510111 Fax: ++ 39 11 4510220
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171 Tel: 81 3 3983 0086 Fax: 81 3 3983 0642
IR SOUTHEAST ASIA: 315 Outram Road, # 10-02 Tan Boon Liat Building, SINGAPORE 0316. Tel: 65 221 8371. Fax: 65 221 8372.