

International IOR Rectifier

Preliminary Data Sheet I2145 12/97


SAFEIR Series 10TTS08S

SURFACE MOUNTABLE PHASE CONTROL SCR

Description/Features

The 10TTS08S **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.

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

Output Current in Typical Applications

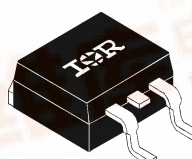
Applications	Single-phase Bridge	Three-phase Bridge	Units
NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz (140µm) copper	2.5	3.5	A
Aluminum IMS, $R_{thCA} = 15^\circ C/W$	6.3	9.5	
Aluminum IMS with heatsink, $R_{thCA} = 5^\circ C/W$	14.0	18.5	

$T_A = 55^\circ C, T_J = 125^\circ C, \text{footprint } 300\text{mm}^2$

Major Ratings and Characteristics

Characteristics	10TTS08S	Units
$I_{T(AV)}$ Sinusoidal waveform	6.5	A
I_{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	°C

Package Outline



D² PAK (SMD-220)



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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
10TTS08S	800	800	1.0

Absolute Maximum Ratings

Parameters	10TTS08S	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	10TTS08S	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	10TTS08S	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	10TTS08S	Units	Conditions
T_J Max. Junction Temperature Range	-40 to 125	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-40 to 125	$^\circ\text{C}$	
	Soldering Temperature	240	$^\circ\text{C}$ for 10 seconds (1.6mm from case)
R_{thJC} Max. Thermal Resistance Junction to Case	1.5	$^\circ\text{C}/\text{W}$	DC operation
R_{thJA} Typ. Thermal Resistance Junction to Ambient (PCB Mount)**	40	$^\circ\text{C}/\text{W}$	
wt Approximate Weight	2(0.07)	g(oz.)	
T Case Style	D ² Pak(SMD-220)		

**When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4oz (140 μm) copper 40 $^\circ\text{C}/\text{W}$
 For recommended footprint and soldering techniques refer to application note #AN-994

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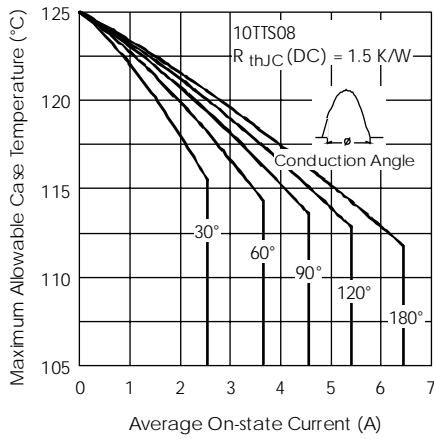


Fig. 1 - Current Rating Characteristics

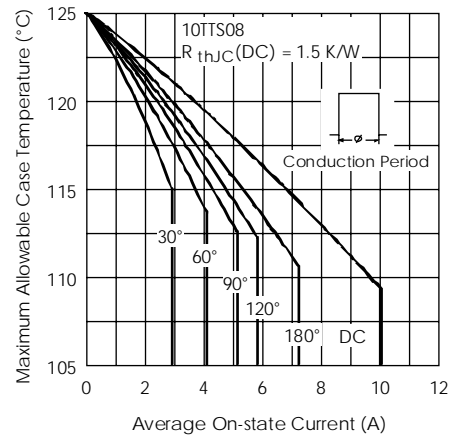


Fig. 2 - Current Rating Characteristics

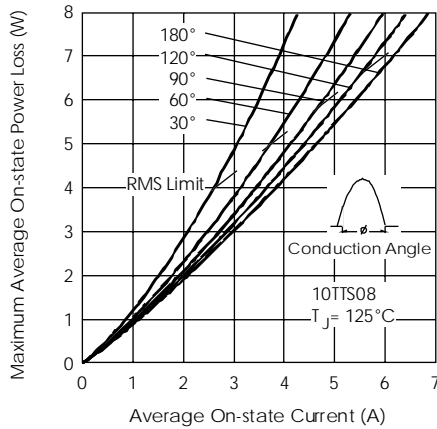


Fig. 3 - On-state Power Loss Characteristics

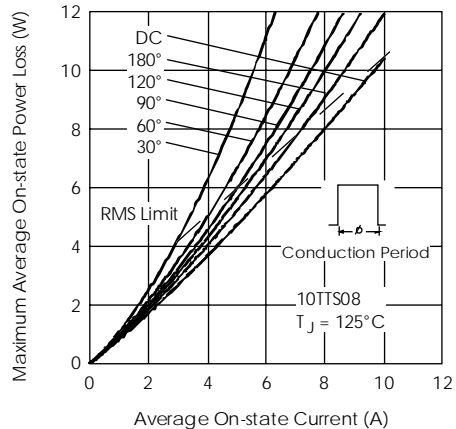


Fig. 4 - On-state Power Loss Characteristics

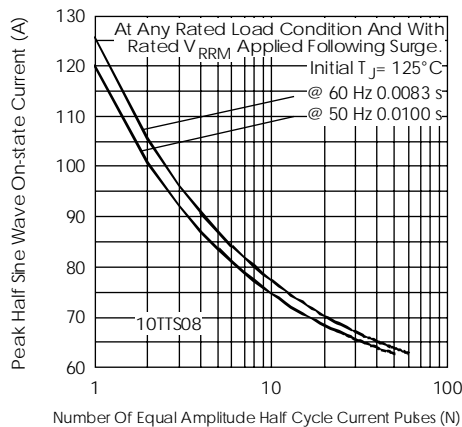


Fig. 6 - Maximum Non-Repetitive Surge Current

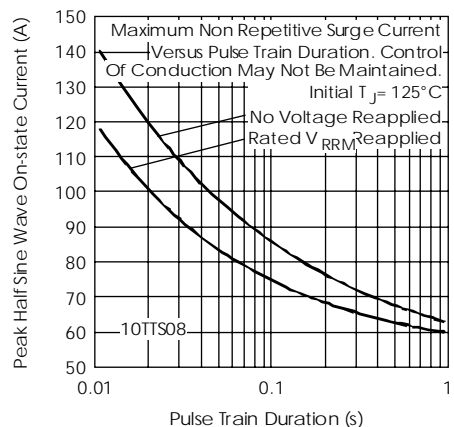


Fig. 7 - Maximum Non-Repetitive Surge Current

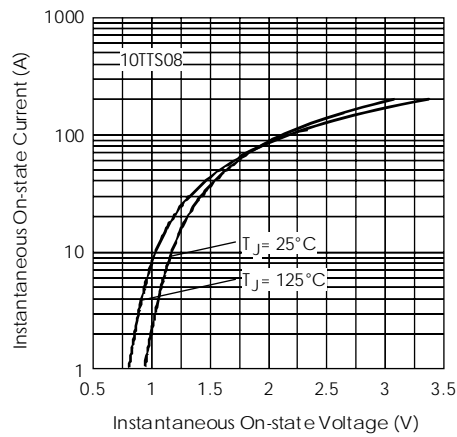


Fig. 7 - On-state Voltage Drop Characteristics

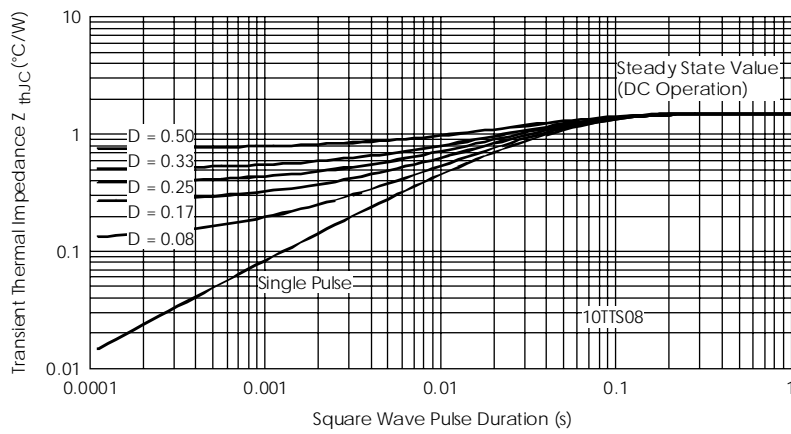


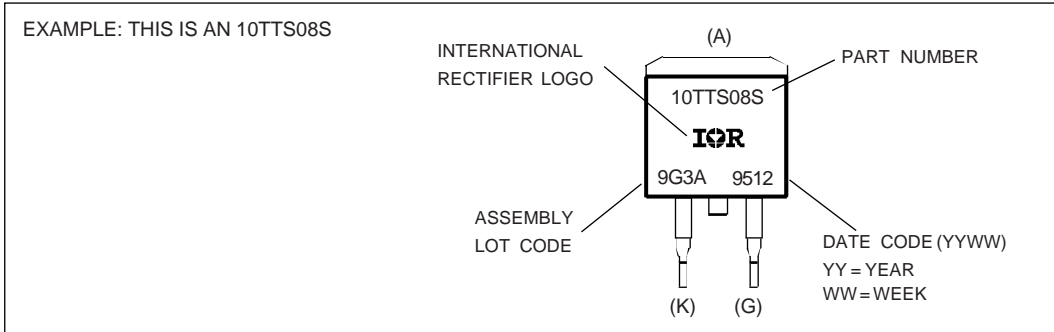
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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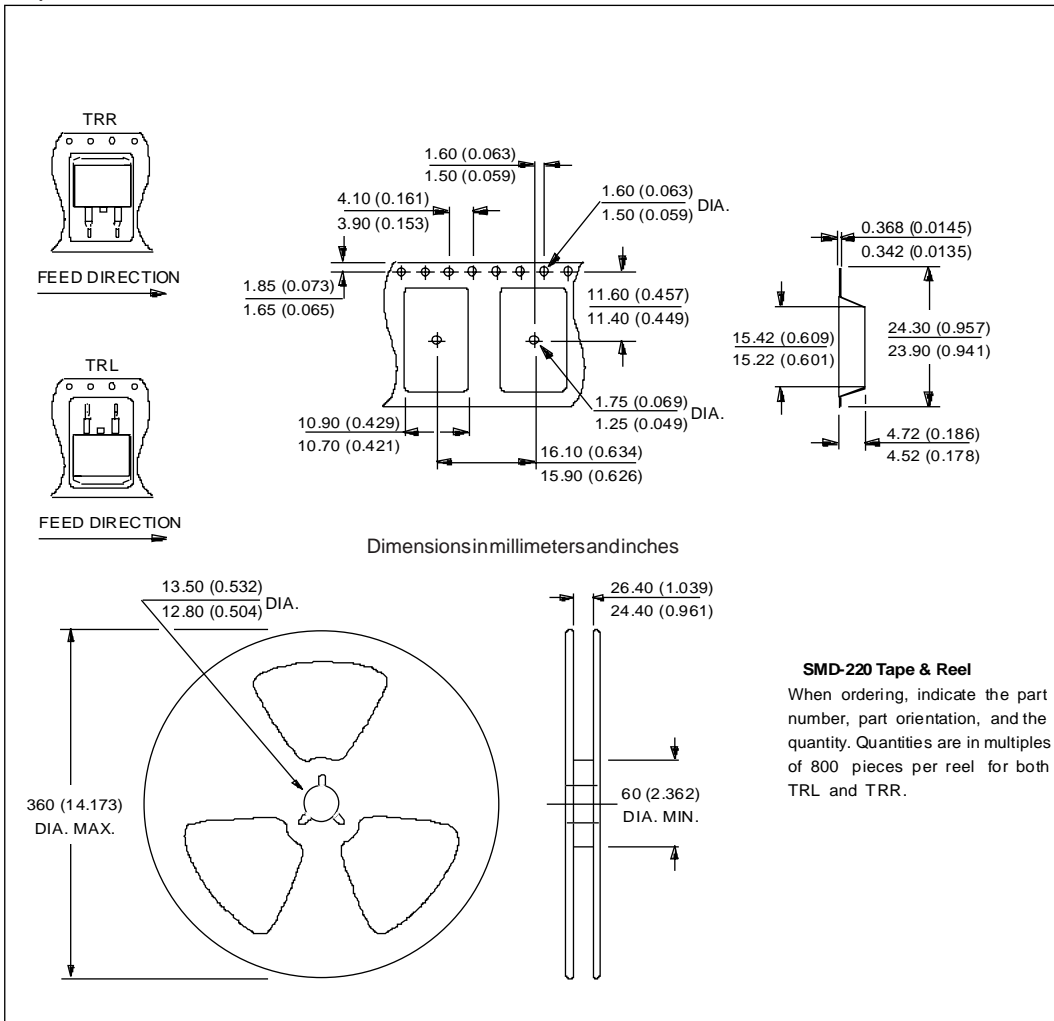
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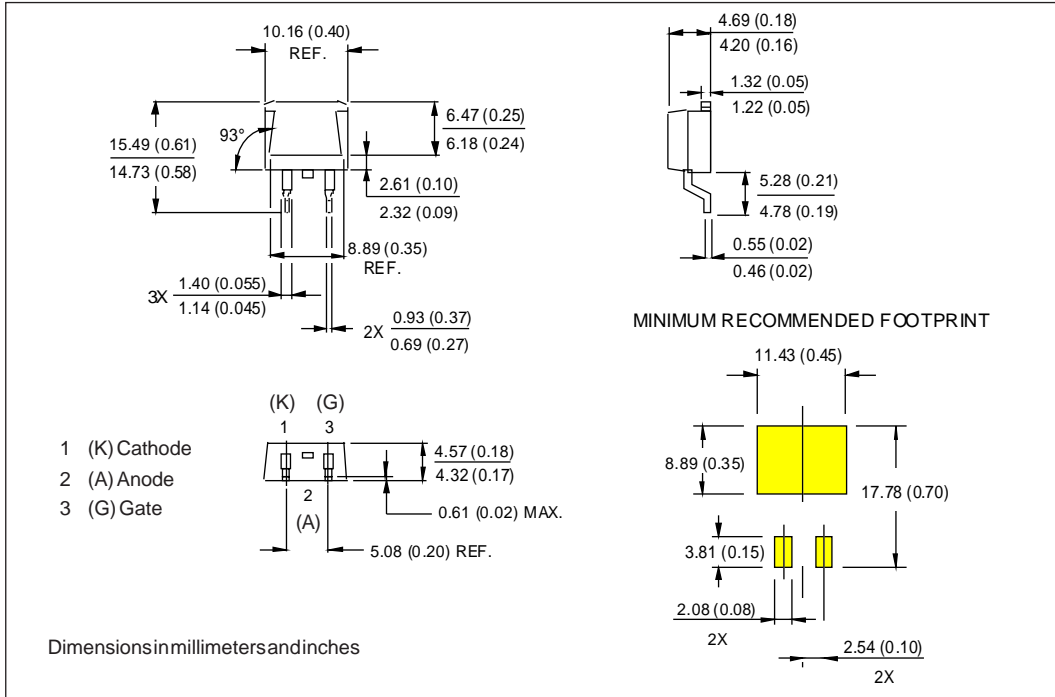
Marking Information



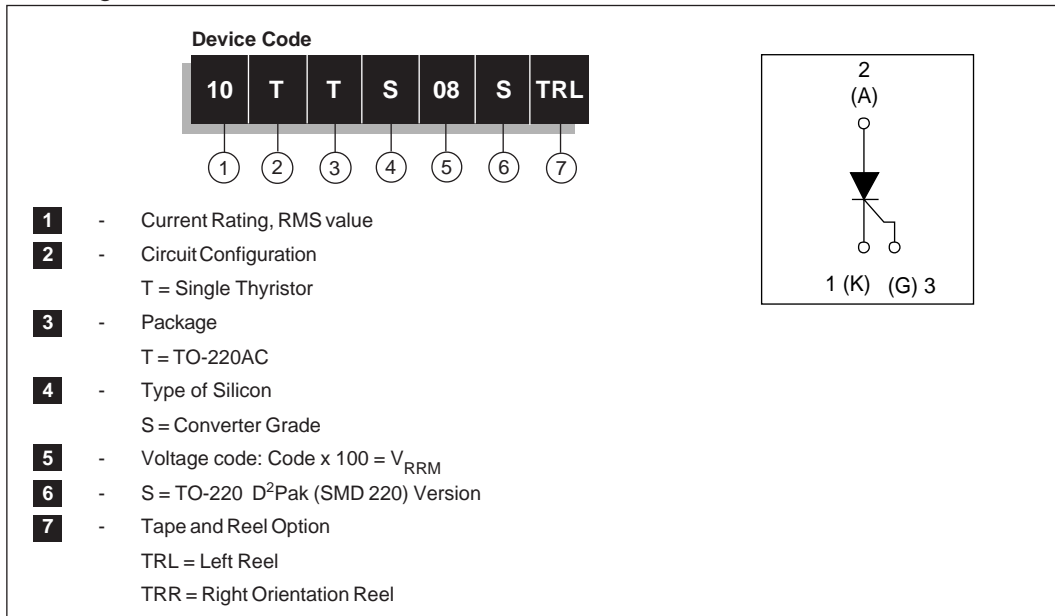
Tape & Reel Information



Outline Table



Ordering Information Table



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Data and specifications subject to change without notice

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