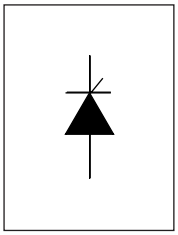
Bulletin I2136 04/97

International
IOR Rectifier

*SAFE**IR*** Series
30TPS..

PHASE CONTROL SCR



V_T < 1.3V @ 20A
I_{TSM} = 300A
V_{RRM} 800 to 1600V

Description/Features

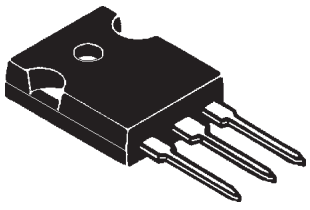
The 30TPS.. *SAFE**IR*** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature.

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.

Major Ratings and Characteristics

Characteristics	30TPS..	Units
$I_{T(AV)}$ Sinusoidal waveform	20	A
I_{RMS}	30	A
V_{RRM}/V_{DRM}	up to 1600	V
I_{TSM}	300	A
V_T @ 20 A, T_J = 25°C	1.3	V
dv/dt	500	V/µs
di/dt	150	A/µs
T_J	-40 to 125	°C

Package Outline



TO-247AC

Voltage Ratings

Part Number	V_{RRM}/V_{DRM}, max. repetitive peak and off-state voltage V	V_{RSM}, maximum non repetitive peak reverse voltage V	I_{RRM}/I_{DRM} 125°C mA
30TPS08	800	900	10
30TPS12	1200	1300	
30TPS16	1600	1700	

Absolute Maximum Ratings

Parameters		30TPS..	Units	Conditions	
$I_{T(AV)}$	Max. Average On-state Current	20	A	@ T_C = 95° C, 180° conduction half sine wave	
I_{RMS}	Max. RMS On-state Current	30			
I_{TSM}	Max. Peak One Cycle Non-Repetitive	250		10ms Sine pulse, rated V_{RRM} applied	
	Surge Current	300		10ms Sine pulse, no voltage reapplied	
I^2t	Max. I^2t for Fusing	310	A^2s	10ms Sine pulse, rated V_{RRM} applied	
		442		10ms Sine pulse, no voltage reapplied	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for Fusing	4420	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied	
V_{TM}	Max. On-state Voltage Drop	1.3	V	@ 20A, T_J = 25°C	
r_t	On-state Slope Resistance	12	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	Max. Holding Current	100	mA	Anode Supply = 6V, Resistive load, Initial I_T=1A	
I_L	Max. Latching Current	200	mA	Anode Supply = 6V, Resistive load	
dv/dt	Max. Rate of Rise of off-state Voltage	500	V/µs		
di/dt	Max. Rate of Rise of turned-on Current	150	A/µs		

Triggering

	Parameters	30TPS..	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	60	mA	Anode supply = 6V, resistive load, T_J = - 10°C
	to Trigger	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	2.5	V	Anode supply = 6V, resistive load, T_J = - 10°C
	to Trigger	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	30TPS..	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		30TPS..	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		0.8	°C/W	DC operation
	to Case				
R_{thJA}	Max. Thermal Resistance Junction		40		
	to Ambient				
R_{thCS}	Max. Thermal Resistance Case		0.2		Mounting surface, smooth and greased
	to Heatsink				
wt	Approximate Weight		6 (0.21)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm	
		Max.	12 (10)	(lbf-in)	
	Case Style		TO-247AC		Jedec (Modified)

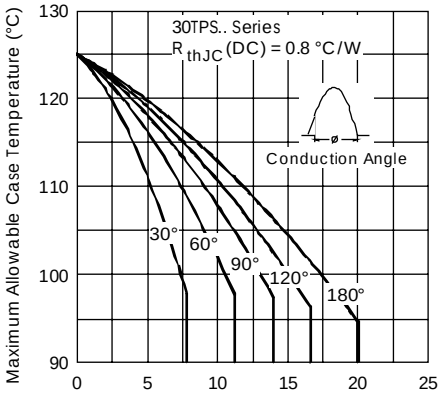


Fig. 1 - Current Rating Characteristics

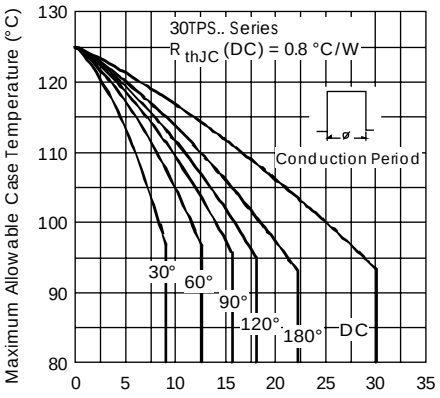


Fig. 2 - Current Rating Characteristics

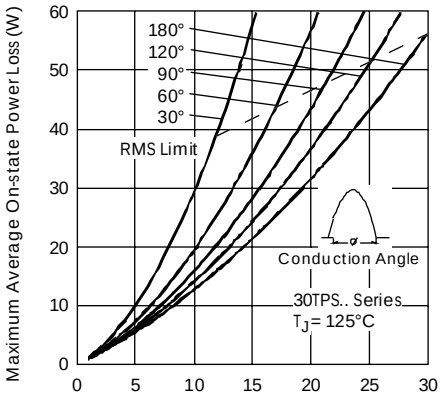


Fig. 3 - On-state Power Loss Characteristics

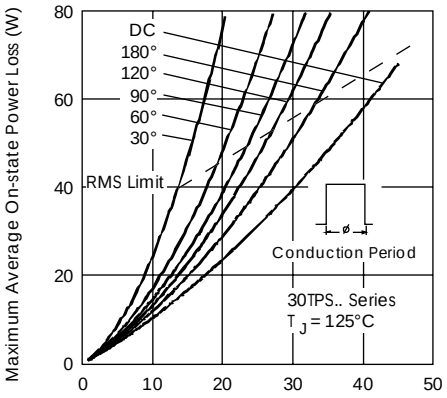


Fig. 4 - On-state Power Loss Characteristics

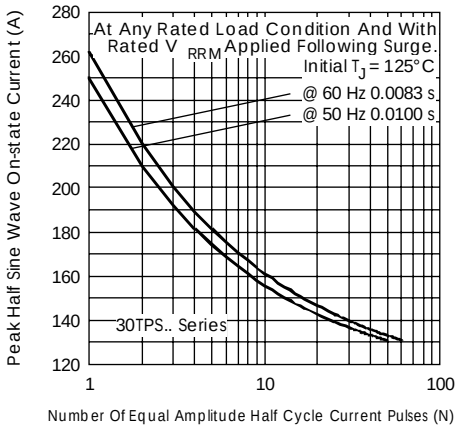


Fig. 5 - Maximum Non-Repetitive Surge Current

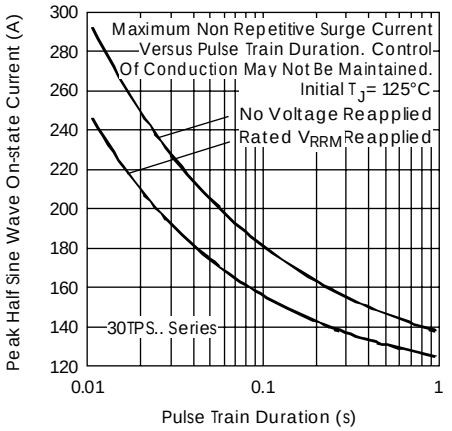


Fig. 6 - Maximum Non-Repetitive Surge Current

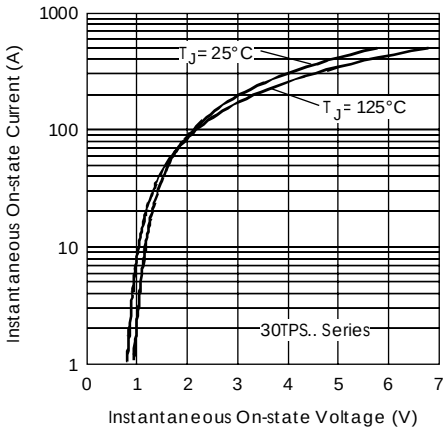


Fig. 7 - On-state Voltage Drop Characteristics

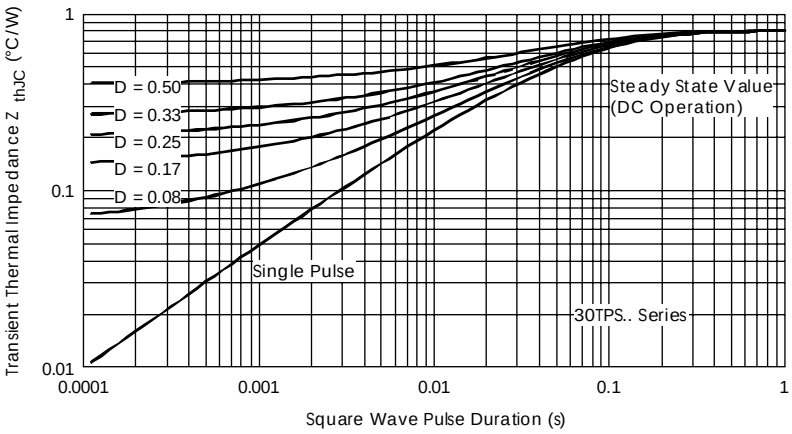


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

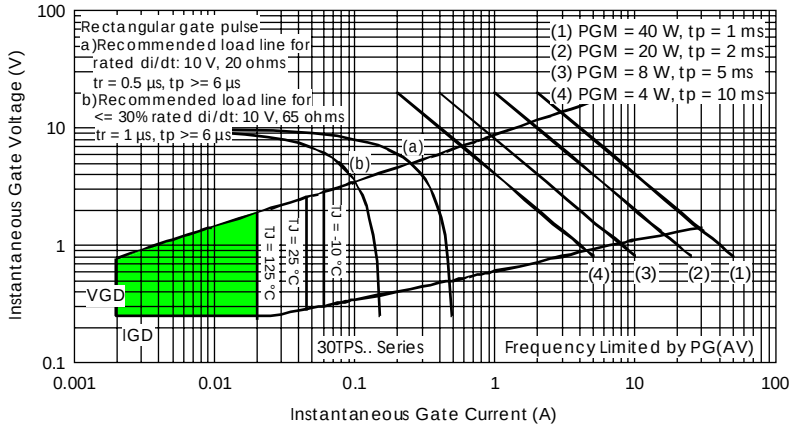
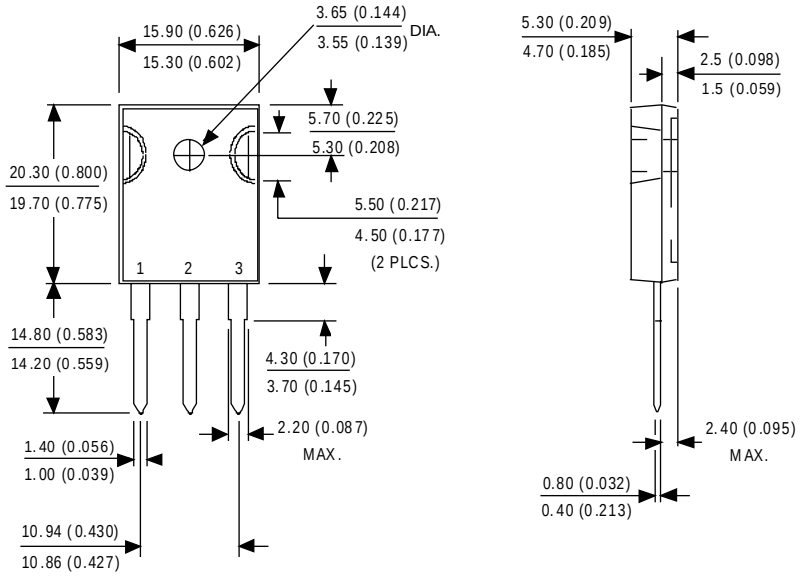


Fig. 9 - GateCharacteristics

Outline Table



Dimensions in millimeters and inches

Ordering Information Table

Device Code

30	T	P	S	16
(1)	(2)	(3)	(4)	(5)

1 - Current Rating

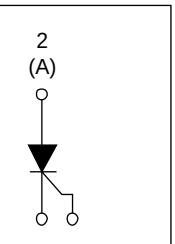
2 - Circuit Configuration:
T = Thyristor

3 - Package:
T = TO-247

4 - Type of Silicon:
S = Standard Recovery Rectifier

5 - Voltage code: Code x 100 = V_{RRM}

08	=	800V
12	=	1200V
16	=	1600V



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