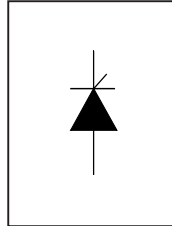


International
IR Rectifier

SAFEIR Series
30TPS16PbF

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



$$V_T < 1.3V @ 20A$$

$$I_{TSM} = 300A$$

$$V_{RRM} = 1600V$$

Description/ Features

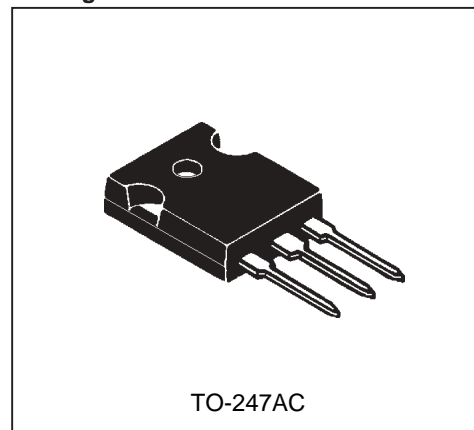
The 30TPS16PbF **SAFEIR** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature.

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.

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{T(AV)}$ Sinusoidal waveform	20	A
I_{RMS}	30	A
V_{RRM}/V_{DRM}	1600	V
I_{TSM}	300	A
V_T @ 20 A, $T_J = 25^\circ C$	1.3	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}/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
30TPS16PbF	1600	1700	10

Absolute Maximum Ratings

Parameters	30TPS..	Units	Conditions	
$I_{T(AV)}$ Max. Average On-state Current	20	A	@ $T_C = 95^\circ\text{C}$, 180° conduction half sine wave	
I_{RMS} Max. RMS On-state Current	30			
I_{TSM} Max. Peak One Cycle Non-Repetitive Surge Current	250 300		10ms Sine pulse, rated V_{RRM} applied 10ms Sine pulse, no voltage reapplied	
I^2t Max. I^2t for Fusing	310 442	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	4420		$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied
V_{TM} Max. On-state Voltage Drop	1.3	V	@ 20A, $T_J = 25^\circ\text{C}$	
r_t On-state Slope Resistance	12	mΩ	$T_J = 125^\circ\text{C}$	
$V_{T(TO)}$ 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 Max. Holding Current	100		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 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	30TPS..	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	30TPS..	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	0.8	$^\circ\text{C/W}$	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient	40		
R_{thCS} Max. Thermal Resistance Case to Heatsink	0.2		
wt Approximate Weight	6 (0.21)	g (oz.)	
T Mounting Torque	Min.	6 (5)	
	Max.	12 (10)	
Case Style	TO-247AC		Jedec (Modified)
Marking Device	30TPS16		

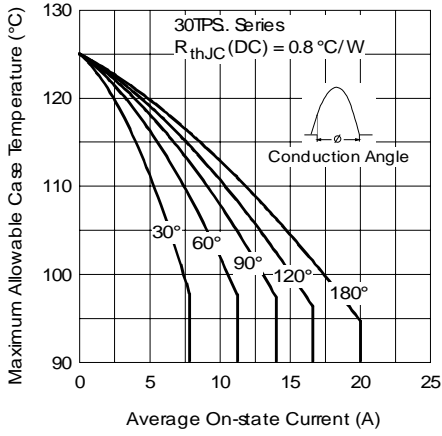


Fig. 1 - Current Rating Characteristics

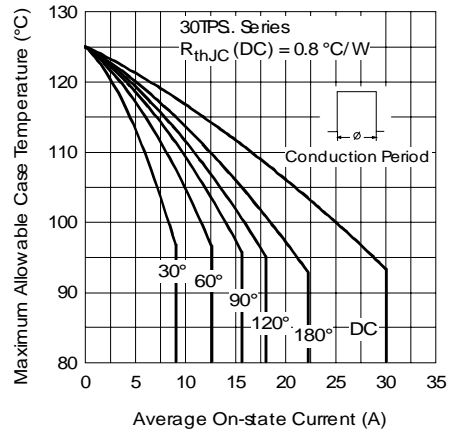


Fig. 2 - Current Rating Characteristics

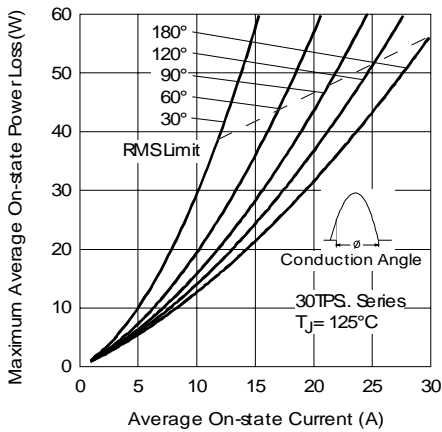


Fig. 3 - On-state Power Loss Characteristics

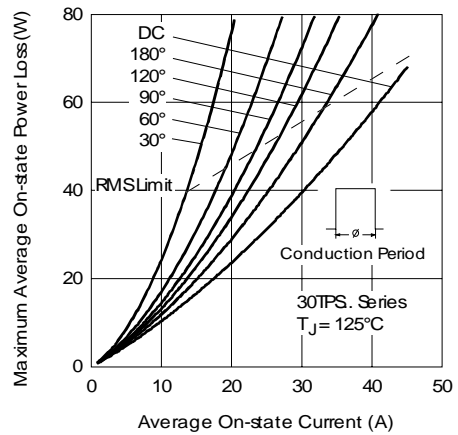


Fig. 4 - On-state Power Loss Characteristics

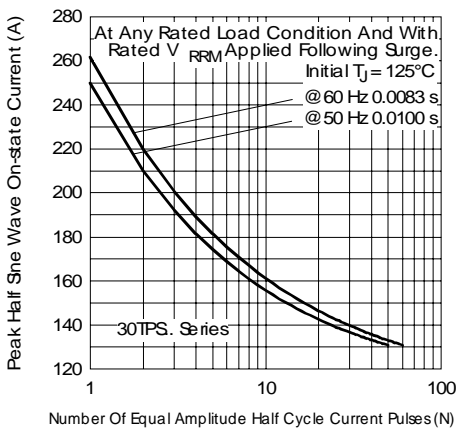


Fig. 5 - Maximum Non-Repetitive Surge Current

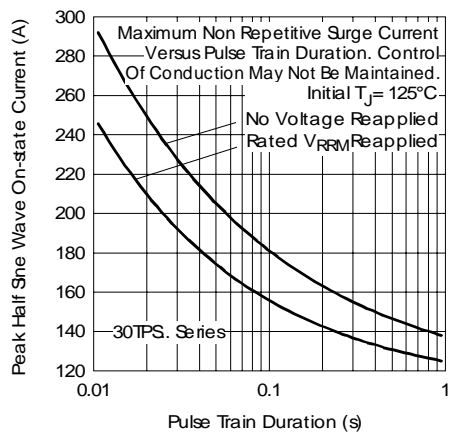


Fig. 6 - Maximum Non-Repetitive Surge Current

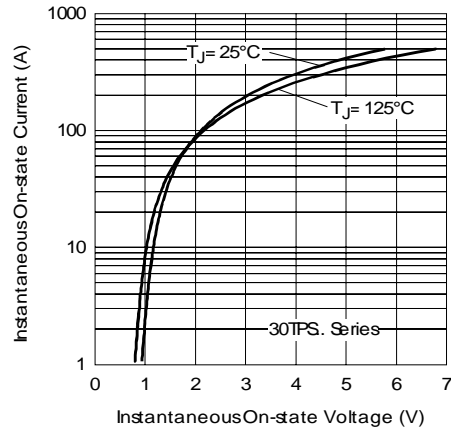


Fig. 7 - On-state Voltage Drop Characteristics

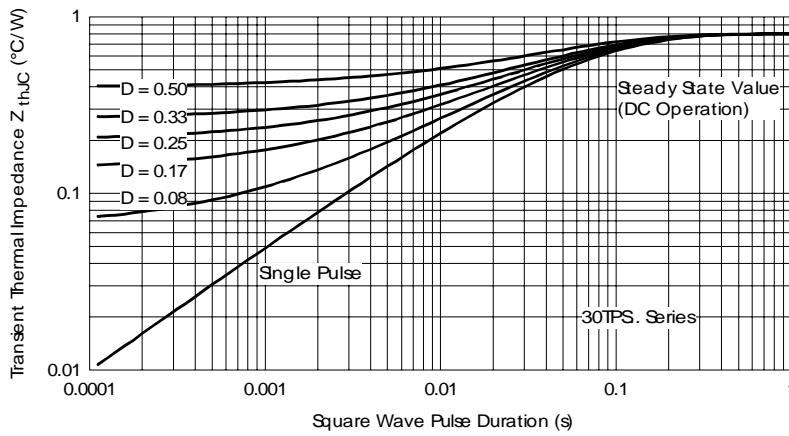


Fig. 8 - Thermal Impedance Z_{thjC} Characteristics

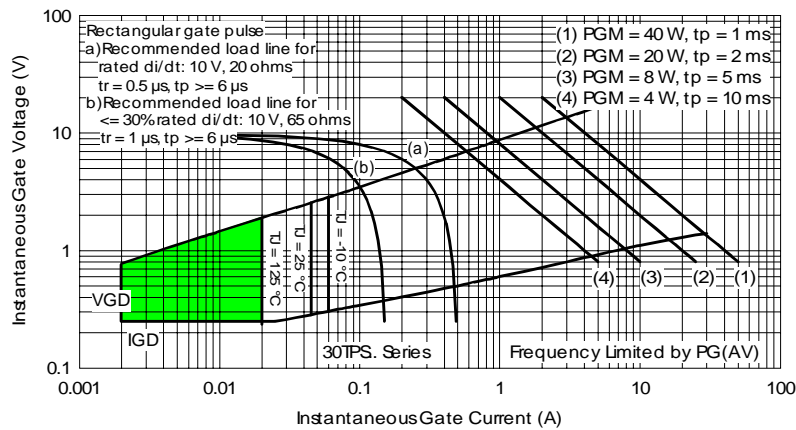
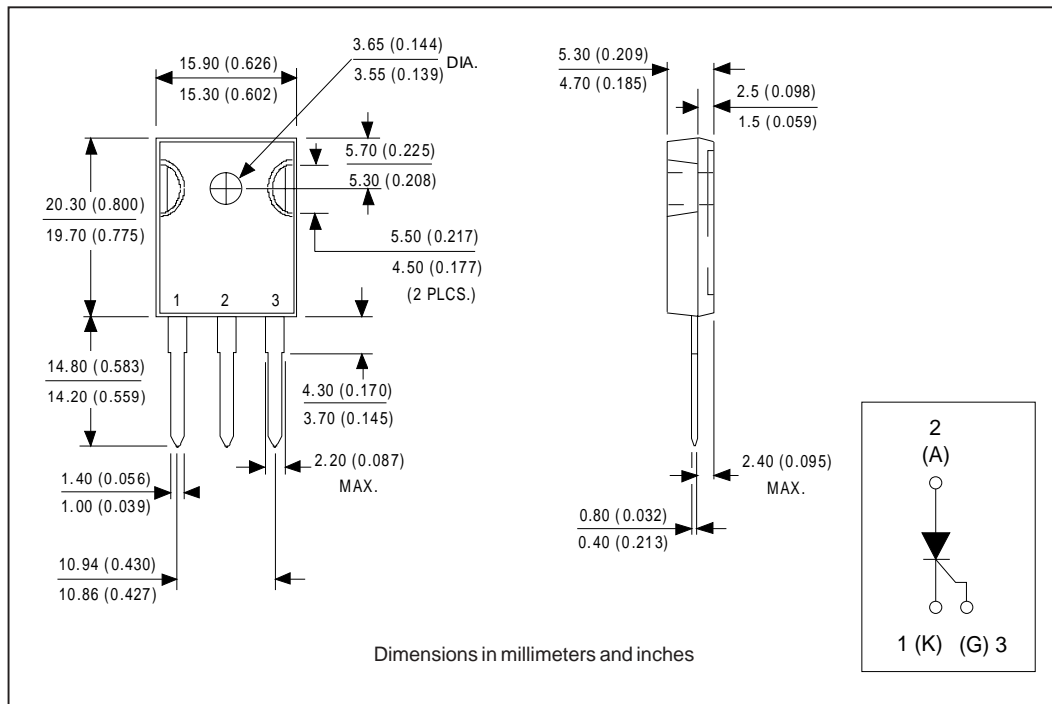
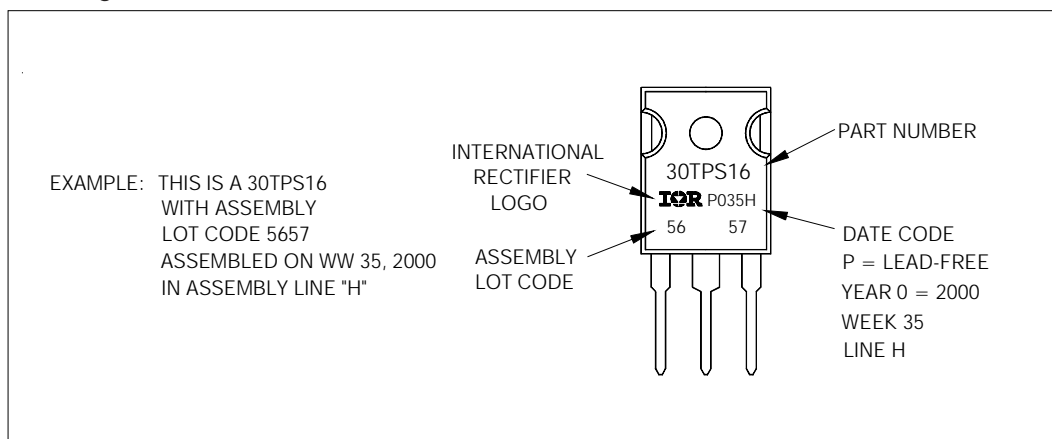


Fig. 9 - Gate Characteristics

Outline Table



Marking Information



Ordering Information Table

Device Code	
30	T
①	②
P	S
③	④
16	PbF
⑤	⑥
1	- Current Rating (30 = 30A)
2	- Circuit Configuration: T = Thyristor
3	- Package: T = TO-247
4	- Type of Silicon: S = Standard Recovery Rectifier
5	- Voltage Rating (16 = 1600V)
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.