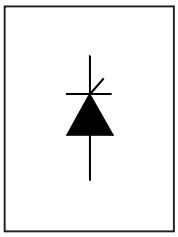
Bulletin I2162 rev. A 06/03

International
IOR Rectifier

*SAFE**IR*** Series
40TPS16

PHASE CONTROL SCR



V_T < 1.45V @ 40A
I_{TSM} = 500A
V_{RRM} = 1600V

Description/Features

The 40TPS16 *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. Low Igt parts available.

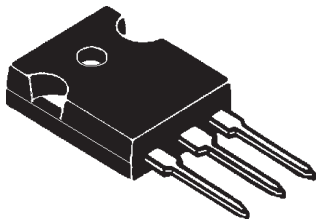
Typical applications are in input rectification (soft start) and these products are designed to be used with International Rectifier input diodes, switches and output rectifiers which are available in identical package outlines.

Major Ratings and Characteristics

Characteristics	40TPS16	Units
$I_{T(AV)}$ Sinusoidal waveform	35	A
I_{RMS}	55	A
V_{RRM}/V_{DRM} Range (*)	1600	V
I_{TSM}	500	A
V_T @40 A, T_J = 25°C	1.45	V
dv/dt	1000	V/µs
di/dt	100	A/µs
T_J	-40 to 125	°C

(*) Contact Factory

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
40TPS16	1600	1700	10

Absolute Maximum Ratings

	Parameters	40TPS16	Units	Conditions	
$I_{T(AV)}$	Max. Average On-state Current		35	A @ T_C = 79° C, 180° conduction half sine wave	
$I_{T(RMS)}$	Max. Continuous RMS On-state Current As AC switch	55			
I_{TSM}	Max. Peak One Cycle Non-Repetitive Surge Current	500	A	10ms Sine pulse, rated V_{RRM} applied	Initial T_J = T_J max.
		600		10ms Sine pulse, no voltage reapplied	
I^2t	Max. I^2t for Fusing	1250	A^2s	10ms Sine pulse, rated V_{RRM} applied	
		1760		10ms Sine pulse, no voltage reapplied	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for Fusing	12500	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied	
$V_{T(TO)1}$	Low Level Value of Threshold Voltage	1.02	V	T_J = 125°C	
$V_{T(TO)2}$	High Level Value of Threshold Voltage	1.23			
r_{t1}	Low Level Value of On-state Slope Resistance	9.74	mΩ		
r_{t2}	High Level Value of On-state Slope Resistance	7.50			
V_{TM}	Max. Peak On-state Voltage	1.85	V	@ 110A, T_J = 25°C	
di/dt	Max. Rate of Rise of Turned-on Current	100	A/µs	T_J = 25°C	
I_H	Max. Holding Current	150	mA		
I_L	Max. Latching Current	300			
I_{RRM}/ I_{DRM}	Max. Reverse and Direct Leakage Current	0.5		T_J = 25°C	V_R = rated V_{RRM}/ V_{DRM}
		10		T_J = 125°C	
dv/dt	Max. Rate of Rise of Off-state Voltage	1000	V/µs	T_J = T_J max., linear to 80% V_{DRM}, R_g-k = open	

Triggering

Parameters		40TPS16	Units	Conditions	
P_{GM}	Max. peak Gate Power	10	W		
$P_{G(AV)}$	Max. average Gate Power	2.5			
I_{GM}	Max. peak Gate Current	2.5	A		
$-V_{GM}$	Max. peak negative Gate Voltage	10	V		
V_{GT}	Max. required DC Gate Voltage to trigger	4.0		T_J = - 40°C	Anode supply = 6V resistive load
		2.5		T_J = 25°C	
		1.7		T_J = 125°C	
I_{GT}	Max. required DC Gate Current to trigger	270	mA	T_J = - 40°C	
		150		T_J = 25°C	
		80		T_J = 125°C	
		40		T_J = 25°C, for 40TPS08A	
V_{GD}	Max. DC Gate Voltage not to trigger	0.25	V	T_J = 125°C, V_{DRM} = rated value	
I_{GD}	Max. DC Gate Current not to trigger	6	mA		

Thermal-Mechanical Specifications

Parameters			40TPS16	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		0.6	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient		40		
R_{thCS}	Max. Thermal Resistance Case to Heatsink		0.2		Mounting surface, smooth and greased
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		

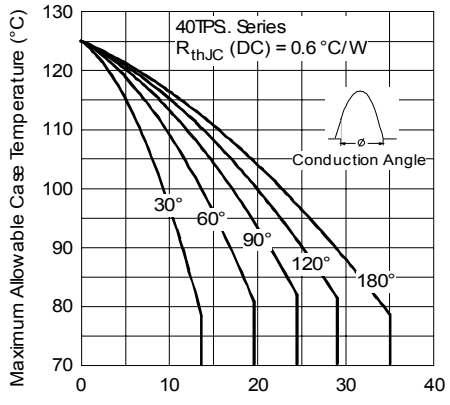


Fig. 1 - Current Rating Characteristics

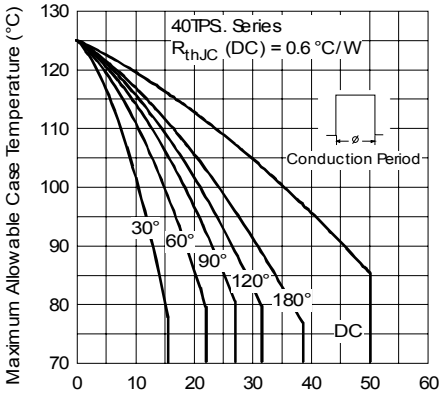


Fig. 2 - Current Rating Characteristics

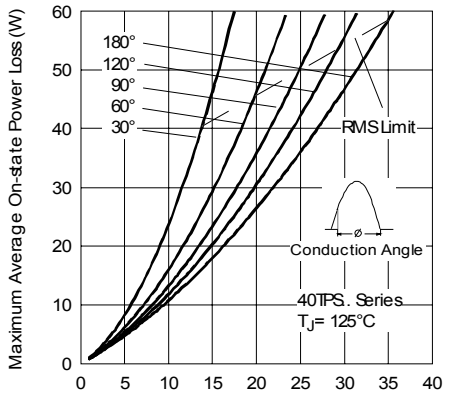


Fig. 3 - On-state Power Loss Characteristics

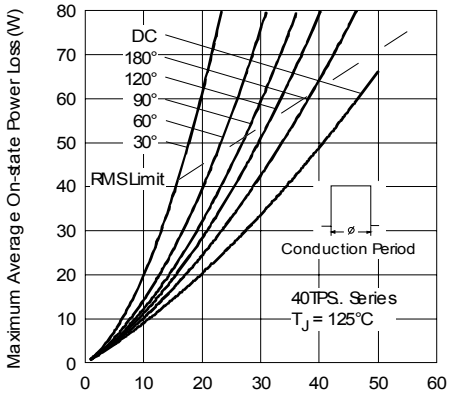


Fig. 4 - On-state Power Loss Characteristics

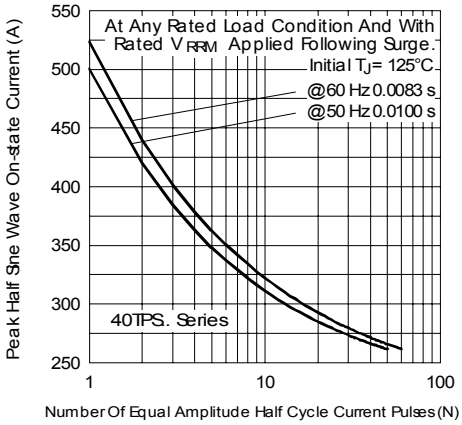


Fig. 5 - Maximum Non-Repetitive Surge Current

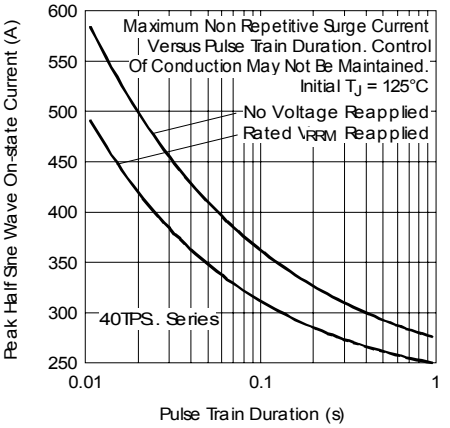


Fig. 6 - Maximum Non-Repetitive Surge Current

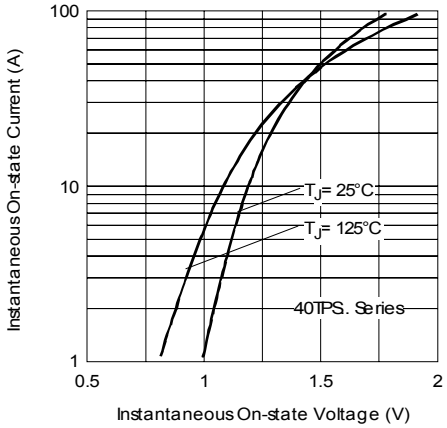


Fig. 7 - On-state Voltage Drop Characteristics

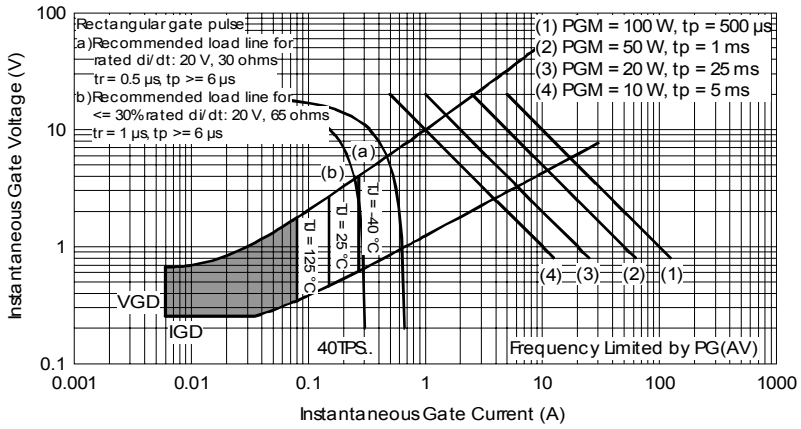


Fig. 8 - GateCharacteristics

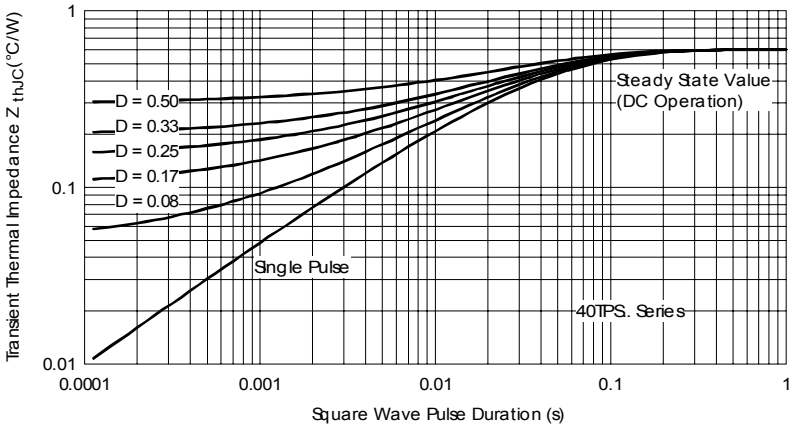
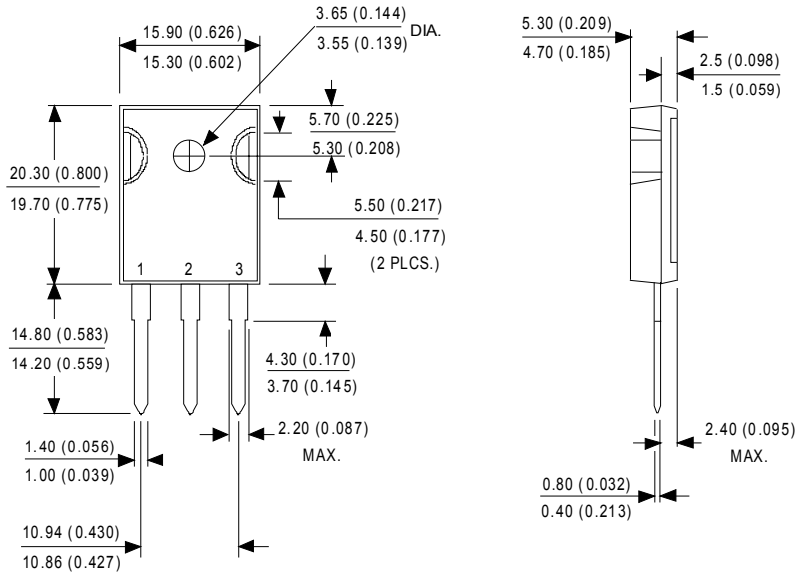


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

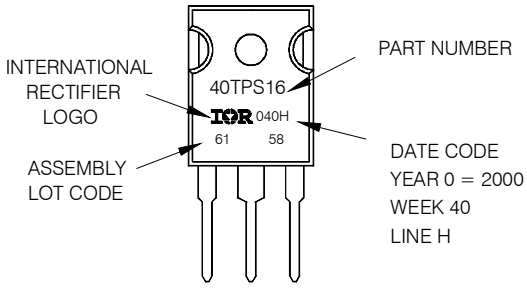
Outline Table



Dimensions in millimeters and inches

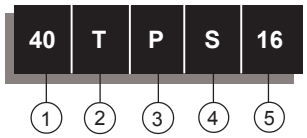
Marking Information

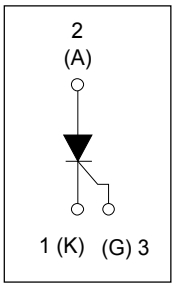
EXAMPLE: THIS IS A 40TPS16
WITH ASSEMBLY
LOT CODE 6158
ASSEMBLED ON WW 40, 2000
IN THE ASSEMBLY LINE "H"



Ordering Information Table

Device Code





1	-	Current Rating
2	-	Circuit Configuration: T = Thyristor
3	-	Package: P = TO-247
4	-	Type of Silicon: S = Standard Recovery Rectifier
5	-	Voltage code: Code x 100 = V_{RRM} — 16 = 1600V (*)

(*) Contact Factory

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

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