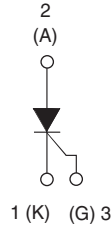


Phase Control SCR TO-220AB FULL-PAK, 16 A



TO-220AB FULL-PAK



DESCRIPTION/FEATURES

The 16TTS..FPPbF High Voltage 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.



RoHS*
COMPLIANT

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

Fully isolated package ($V_{INS} = 2500 V_{RMS}$) is UL E78996 approved

This product has been designed and qualified for industrial level and lead (Pb)-free ("PbF" suffix).

PRODUCT SUMMARY	
V_T at 10 A	1.4 V
I_{TSM}	200 A
V_{RRM}	800/1200 V

OUTPUT CURRENT IN TYPICAL APPLICATIONS			
APPLICATIONS	SINGLE-PHASE BRIDGE	THREE-PHASE BRIDGE	UNITS
Capacitive input filter $T_A = 55\text{ °C}$, $T_J = 125\text{ °C}$, common heatsink of 1 °C/W	13.5	17	A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	10	A
I_{RMS}		16	
V_{DRM}/V_{RRM}	Range, for higher voltage up to 1600 V contact factory	800/1200	V
I_{TSM}		200	A
V_T	10 A, $T_J = 25\text{ °C}$	1.4	V
dV/dt		500	V/ μ s
dI/dt		150	A/ μ s
T_J	Range	- 40 to 125	°C

VOLTAGE RATINGS			
PART NUMBER	V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V	V_{DRM} , MAXIMUM PEAK DIRECT VOLTAGE V	I_{RRM}/I_{DRM} AT 125 °C mA
16TTS08FPPbF	800	800	10
16TTS12FPPbF	1200	1200	

* Pb containing terminations are not RoHS compliant, exemptions may apply

16TTS..FPPbF High Voltage Series



Vishay High Power Products Phase Control SCR
TO-220AB FULL-PAK, 16 A

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS	
			TYP.	MAX.		
Maximum average on-state current	$I_{T(AV)}$	$T_c = 95\text{ }^\circ\text{C}$, 180° conduction, half sine wave	10		A	
Maximum RMS on-state current	I_{RMS}		16			
Maximum peak, one-cycle, non-repetitive surge current	I_{TSM}	10 ms sine pulse, rated V_{RRM} applied	170			
		10 ms sine pulse, no voltage reapplied	200			
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	144		A ² s	
		10 ms sine pulse, no voltage reapplied	200			
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied	2000		A ² √s	
Maximum on-state voltage drop	V_{TM}	10 A, $T_J = 25\text{ }^\circ\text{C}$	1.4		V	
On-state slope resistance	r_t	$T_J = 125\text{ }^\circ\text{C}$	24.0		mΩ	
Threshold voltage	$V_{T(TO)}$		1.1		V	
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	$T_J = 25\text{ }^\circ\text{C}$	0.5		mA
			$T_J = 125\text{ }^\circ\text{C}$	10		
Holding current	I_H	Anode supply = 6 V, resistive load, initial $I_T = 1\text{ A}$ 16TTS08FP, 16TTS12FP	-	100		
Maximum latching current	I_L	Anode supply = 6 V, resistive load	200		mA	
Maximum rate of rise of off-state voltage	dV/dt		500		V/μs	
Maximum rate of rise of turned-on current	dI/dt		150		A/μs	

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS
Maximum peak gate power	P_{GM}		8.0		W
Maximum average gate power	$P_{G(AV)}$		2.0		
Maximum peak positive gate current	+ I_{GM}		1.5		A
Maximum peak negative gate voltage	- V_{GM}		10		V
Maximum required DC gate current to trigger	I_{GT}	Anode supply = 6 V, resistive load, $T_J = -10\text{ }^\circ\text{C}$	90		mA
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$	60		
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$	35		
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = -10\text{ }^\circ\text{C}$	3.0		V
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$	2.0		
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$	1.0		
Maximum DC gate voltage not to trigger	V_{GD}	$T_J = 125\text{ }^\circ\text{C}$, $V_{DRM} = \text{Rated value}$	0.2		
Maximum DC gate current not to trigger	I_{GD}		2.0		mA

SWITCHING					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS
Typical turn-on time	t_{gt}	$T_J = 25\text{ }^\circ\text{C}$	0.9		μs
Typical reverse recovery time	t_{rr}	$T_J = 125\text{ }^\circ\text{C}$	4		
Typical turn-off time	t_q		110		



16TTS..FPPbF High Voltage Series

Phase Control SCR Vishay High Power Products
TO-220AB FULL-PAK, 16 A

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 40 to 125	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	1.5	°C/W
Maximum thermal resistance, junction to ambient	R_{thJA}		62	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	1.5	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-220AB FULL-PAK (94/V0)	16TTS08FP	
			16TTS12FP	

16TTS..FPPbF High Voltage Series



Vishay High Power Products

Phase Control SCR
TO-220AB FULL-PAK, 16 A

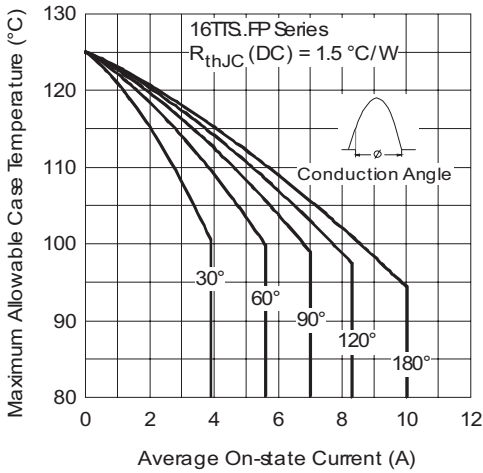


Fig. 1 - Current Rating Characteristics

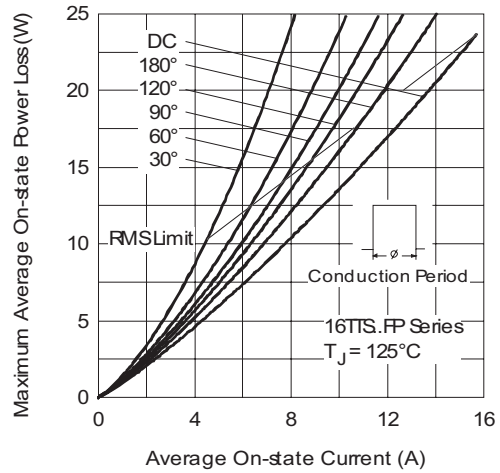


Fig. 4 - On-State Power Loss Characteristics

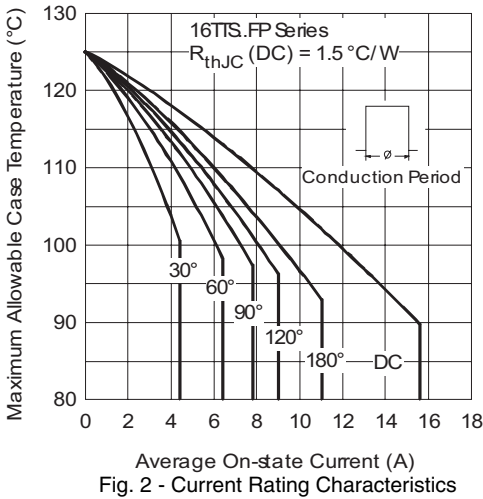


Fig. 2 - Current Rating Characteristics

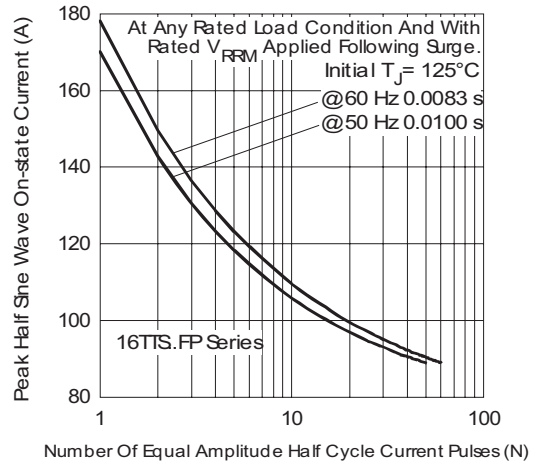


Fig. 5 - Maximum Non-Repetitive Surge Current

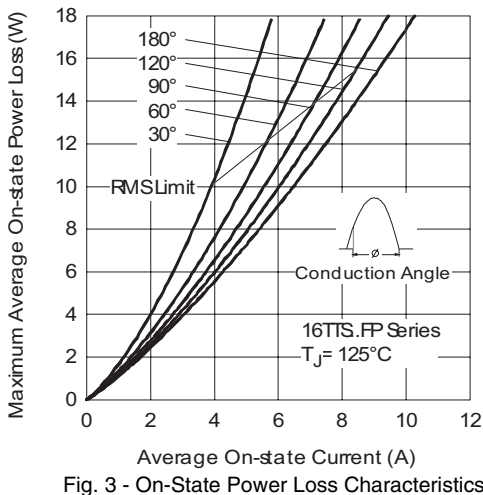


Fig. 3 - On-State Power Loss Characteristics

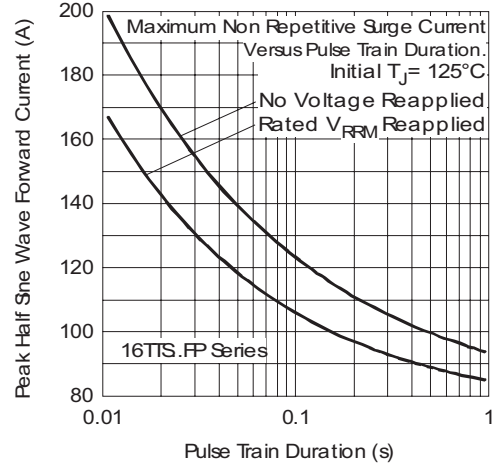


Fig. 6 - Maximum Non-Repetitive Surge Current



16TTS..FPPbF High Voltage Series

Phase Control SCR Vishay High Power Products
TO-220AB FULL-PAK, 16 A

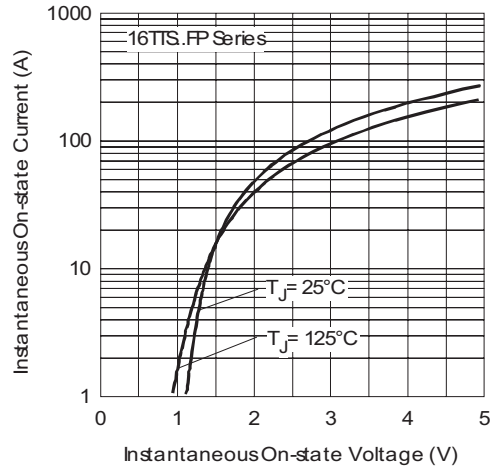


Fig. 7 - On-State Voltage Drop Characteristics

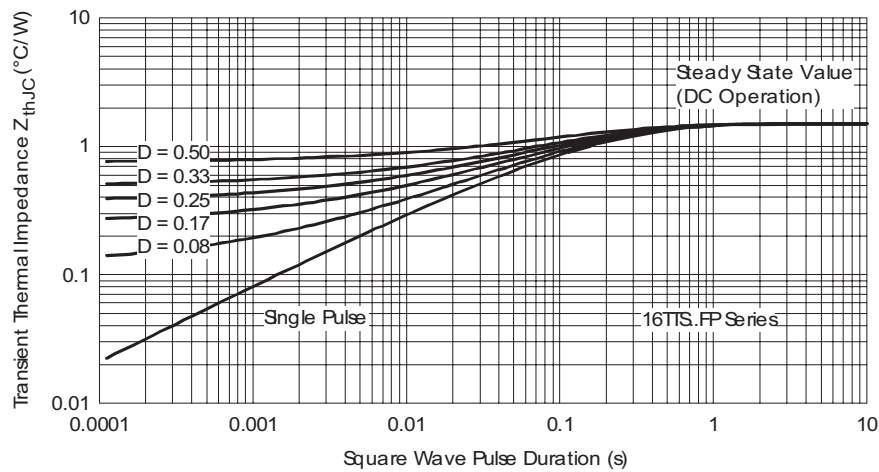


Fig. 8 - Thermal impedance Z_{thJC} Characteristics

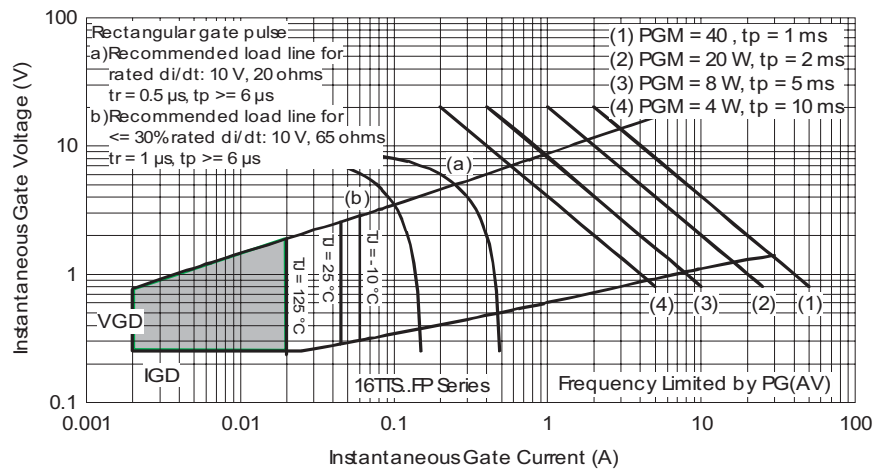


Fig. 9 - Gate Characteristics

16TTS..FPPbF High Voltage Series



Vishay High Power Products Phase Control SCR
TO-220AB FULL-PAK, 16 A

ORDERING INFORMATION TABLE

Device code	16	T	T	S	12	FP	PbF
	①	②	③	④	⑤	⑥	⑦
1	- Current rating, RMS value						
2	- Circuit configuration: T = Single thyristor						
3	- Package: T = TO-220AB						
4	- Type of silicon: S = Converter grade						
5	- Voltage code x 100 = V_{RRM}						08 = 800 V 12 = 1200 V
6	- FULL-PAK						
7	- • None = Standard production • PbF = Lead (Pb)-free						

Note: For higher voltage up to 1600 V contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95072
Part marking information	http://www.vishay.com/doc?95069



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.