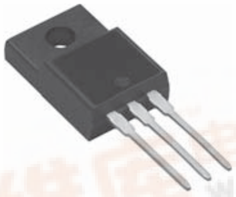
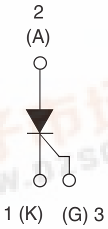
Phase Control SCR
TO-220AB FULL-PAK, 16 A



TO-220AB FULL-PAK



DESCRIPTION/FEATURES

Available
RoHS*
COMPLIANT

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.

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 °C, T_J = 125 °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 °C	1.4	V
dV/dt		500	V/µs
dI/dt		150	A/µs
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	

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS
			TYP.	MAX.	
Maximum average on-state current	$I_{T(AV)}$	T_c = 95 °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^2s
		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		$A^2\sqrt{s}$
Maximum on-state voltage drop	V_{TM}	10 A, T_J = 25 °C	1.4		V
On-state slope resistance	r_t	T_J = 125 °C	24.0		mΩ
Threshold voltage	$V_{T(TO)}$		1.1		V
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	T_J = 25 °C V_R = Rated V_{RRM}/V_{DRM}	0.5		mA
		T_J = 125 °C	10		
Holding current	I_H	Anode supply = 6 V, resistive load, initial I_T = 1 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 °C	90	mA
		Anode supply = 6 V, resistive load, T_J = 25 °C	60	
		Anode supply = 6 V, resistive load, T_J = 125 °C	35	
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, T_J = - 10 °C	3.0	V
		Anode supply = 6 V, resistive load, T_J = 25 °C	2.0	
		Anode supply = 6 V, resistive load, T_J = 125 °C	1.0	
Maximum DC gate voltage not to trigger	V_{GD}	T_J = 125 °C, V_{DRM} = 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 °C	0.9	µs
Typical reverse recovery time	t_{rr}	T_J = 125 °C	4	
Typical turn-off time	t_q		110	

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)
Mounting torque maximum			12 (10)	
Marking device		Case style TO-220AB FULL-PAK (94/V0)	16TTS08FP	
			16TTS12FP	

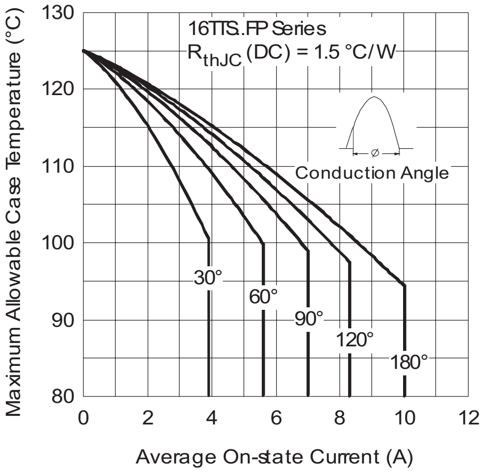

Fig. 1 - Current Rating Characteristics

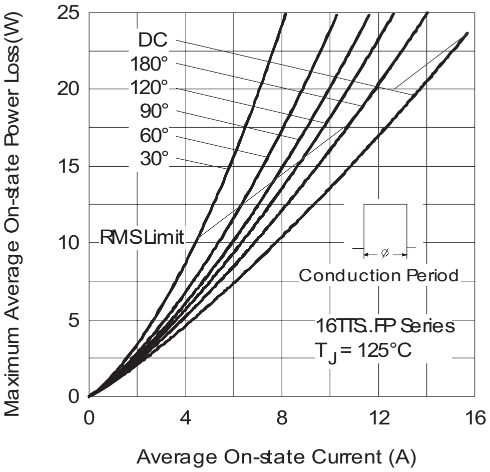

Fig. 4 - On-State Power Loss Characteristics

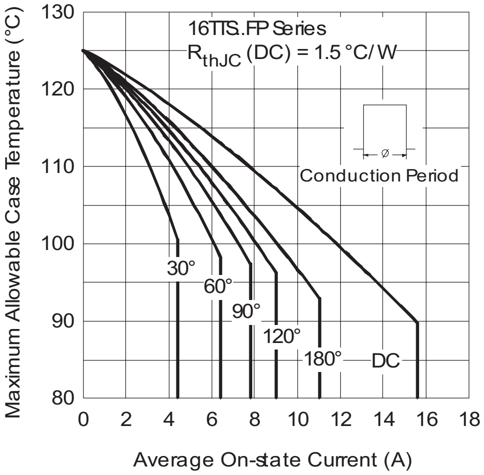

Fig. 2 - Current Rating Characteristics

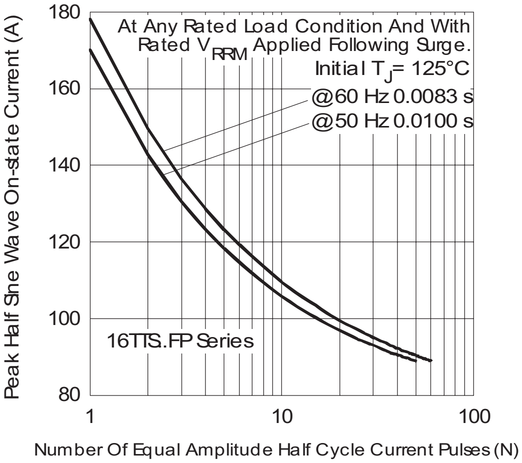

Fig. 5 - Maximum Non-Repetitive Surge Current

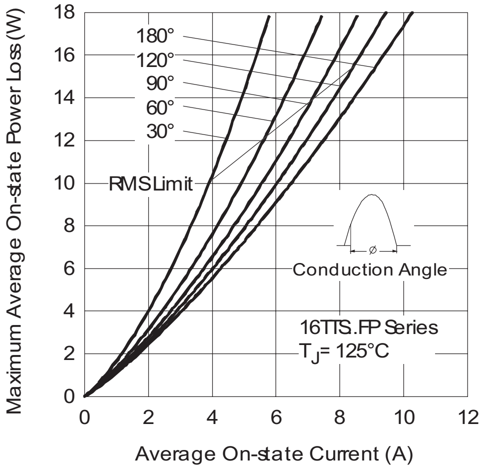

Fig. 3 - On-State Power Loss Characteristics

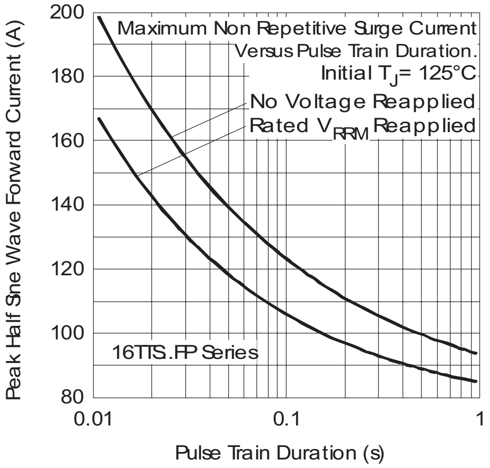

Fig. 6 - Maximum Non-Repetitive Surge Current

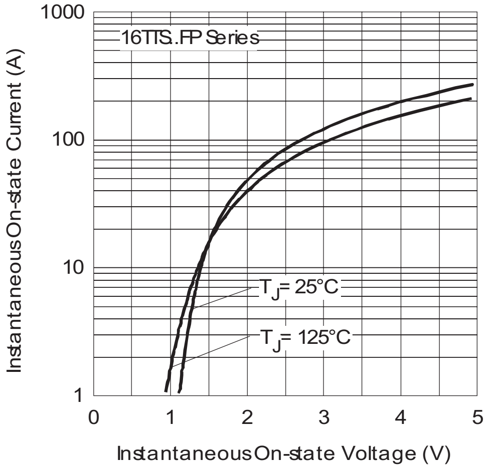

Fig. 7 - On-State Voltage Drop Characteristics

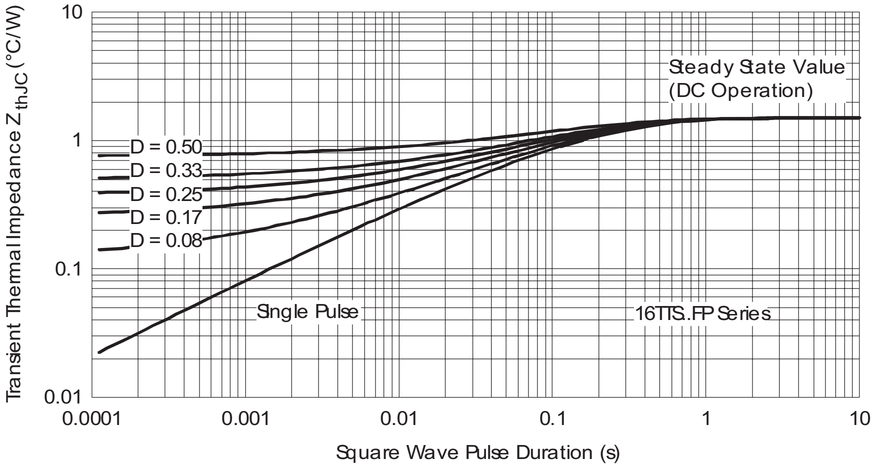

Fig. 8 - Thermal impedance Z_{thJC} Characteristics

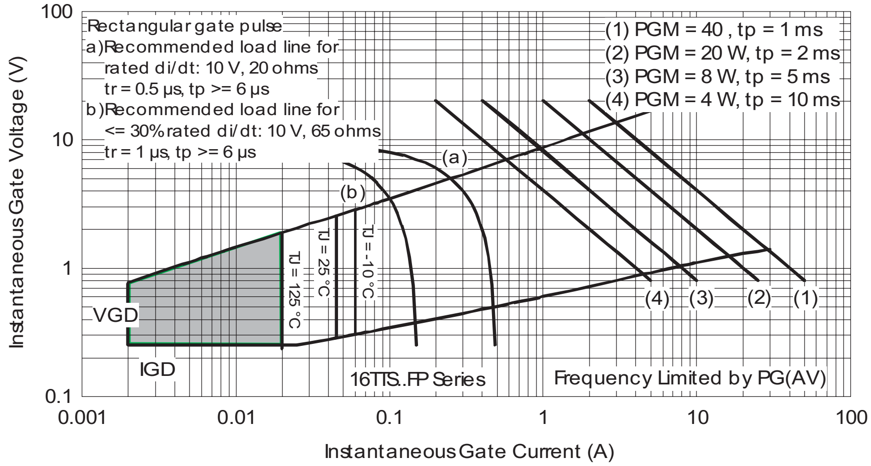

Fig. 9 - Gate Characteristics

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

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