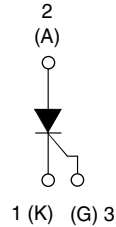


Phase Control SCR TO-220AB FULL-PAK, 25 A



TO-220AB FULL-PAK



DESCRIPTION/FEATURES

The 25TTS...FP 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.

The fully isolated package ($V_{INS} = 2500 V_{RMS}$) is UL E78996 approved. Plastic material 94V_{RO}.

This product has been designed and qualified for industrial level.

PRODUCT SUMMARY	
V_T at 16 A	< 1.25 V
I_{TSM}	300 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	18	22	A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	16	A
I_{RMS}		25	
V_{RRM}/V_{DRM}		800/1200	V
I_{TSM}		300	A
V_T	16 A, $T_J = 25\text{ °C}$	1.25	V
dV/dt		500	V/ μ s
dI/dt		150	A/ μ s
T_J		- 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
25TTS08FP	800	800	10
25TTS12FP	1200	1200	

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ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS	
			TYP.	MAX.		
Maximum average on-state current	$I_{T(AV)}$	$T_C = 85\text{ }^\circ\text{C}$, 180° conduction half sine wave	16		A	
Maximum RMS on-state current	I_{RMS}		25			
Maximum peak, one-cycle, non-repetitive surge current	I_{TSM}	10 ms sine pulse, rated V_{RRM} applied	300			
		10 ms sine pulse, no voltage reapplied	350			
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	450		A^2s	
		10 ms sine pulse, no voltage reapplied	630			
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied	6300		$A^2\sqrt{s}$	
Maximum on-state voltage drop	V_{TM}	16 A, $T_J = 25\text{ }^\circ\text{C}$	1.25		V	
On-state slope resistance	r_t	$T_J = 125\text{ }^\circ\text{C}$	12.0		$m\Omega$	
Threshold voltage	$V_{T(TO)}$		1.0		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 $I_T = 1$ A	-	100		
Maximum latching current	I_L	Anode supply = 6 V, resistive load	200			
Maximum rate of rise of off-state voltage	dV/dt		500		$V/\mu s$	
Maximum rate of rise of turned-on current	dI/dt		150		$A/\mu s$	

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, $T_J = -10\text{ }^\circ\text{C}$	60		mA
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$	45		
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$	20		
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = -10\text{ }^\circ\text{C}$	2.5		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}	$T_J = 125\text{ }^\circ\text{C}$, $V_{DRM} = \text{Rated value}$	0.25		
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	



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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)	25TTS08FP	
			25TTS12FP	

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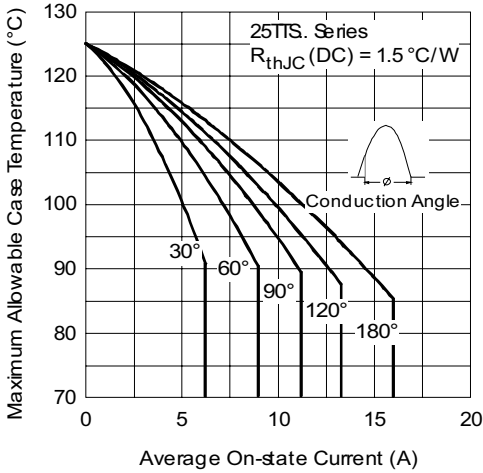


Fig. 1 - Current Rating Characteristics

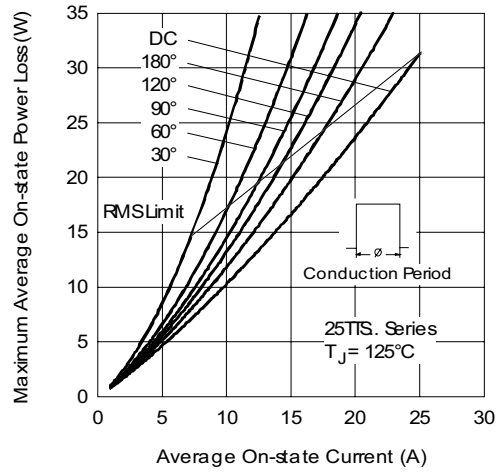


Fig. 4 - On-State Power Loss Characteristics

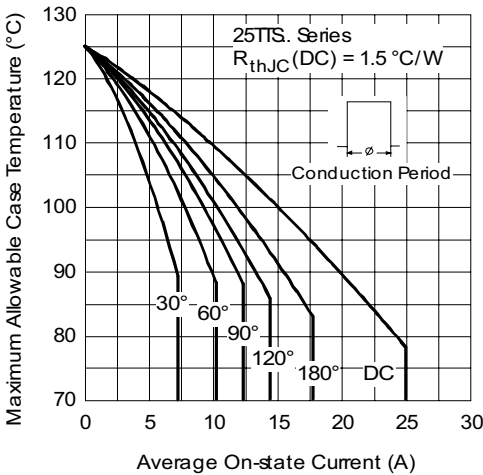


Fig. 2 - Current Rating Characteristics

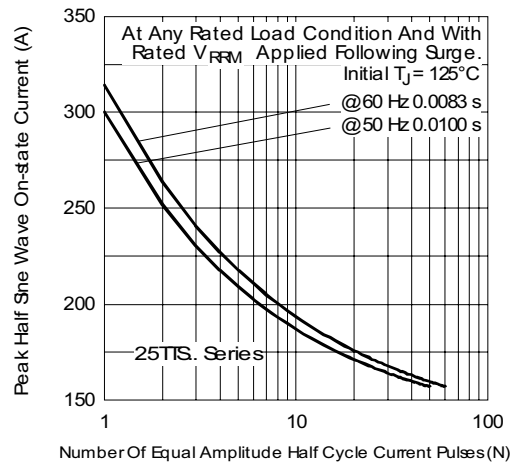


Fig. 5 - Maximum Non-Repetitive Surge Current

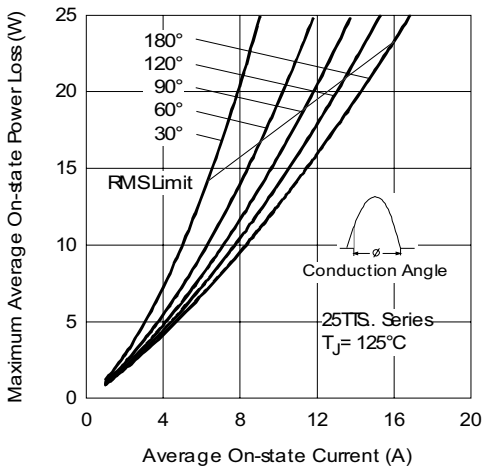


Fig. 3 - On-State Power Loss Characteristics

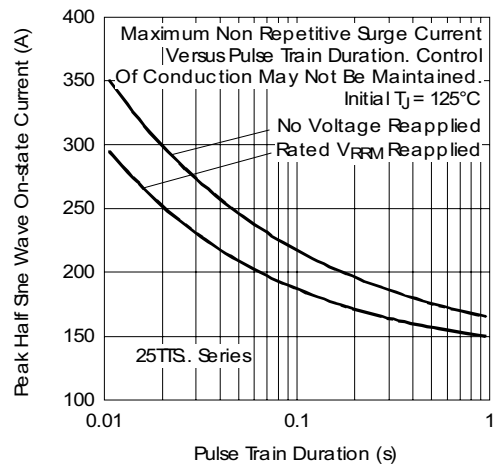


Fig. 6 - Maximum Non-Repetitive Surge Current



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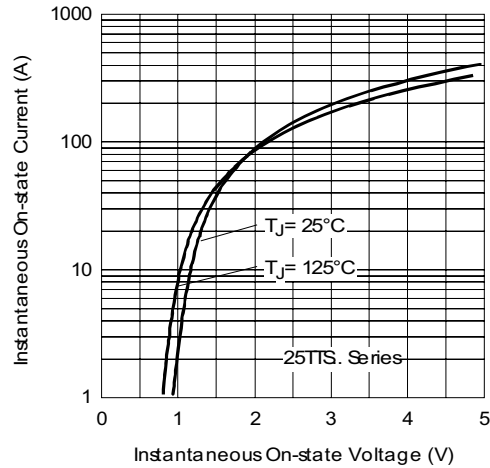


Fig. 7 - On-State Voltage Drop Characteristics

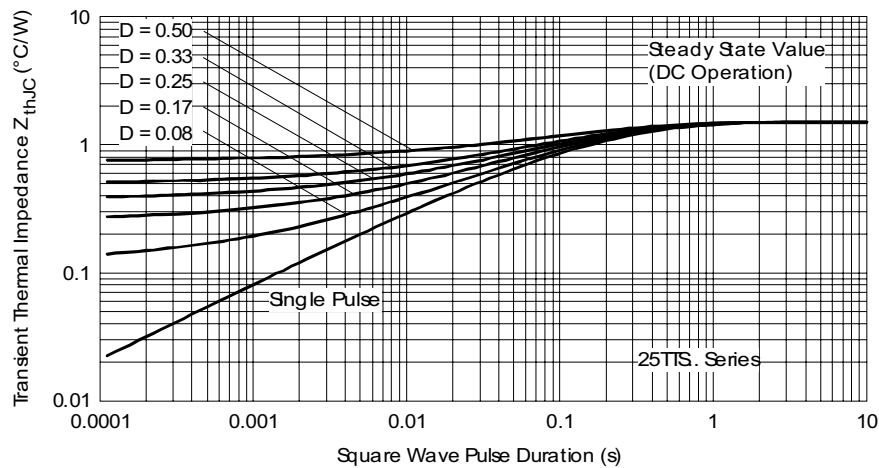


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

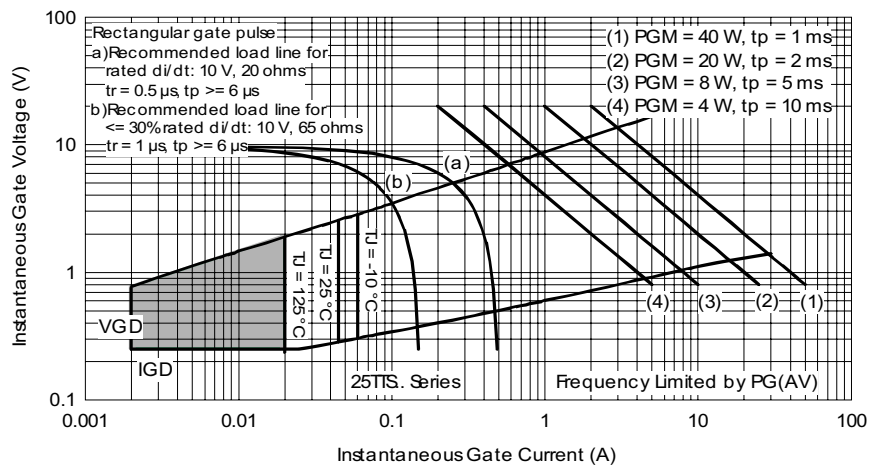


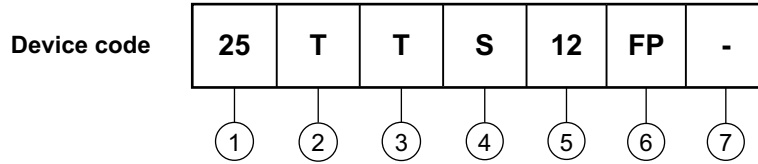
Fig. 9 - Gate Characteristics

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ORDERING INFORMATION TABLE



- 1** - Current rating (25 = 25 A)
- 2** - Circuit configuration:
T = Single thyristor
- 3** - Package:
T = TO-220AB
- 4** - Type of silicon:
Standard recovery rectifier
- 5** - Voltage code x 100 = V_{RRM}

08 = 800 V
12 = 1200 V
- 6** - FULL-PAK
- 7**
 - None = Standard production
 - PbF = Lead (Pb)-free

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



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