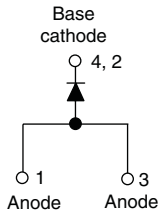
Phase Control SCR, 8 A



D²PAK



DESCRIPTION/FEATURES

The 12TTS08SPbF 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 and crow-bar (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.

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

PRODUCT SUMMARY	
V_T at 8 A	< 1.2 V
I_{TSM}	140 A
V_{RRM}	800 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	8	A
$I_{T(RMS)}$		12.5	
V_{RRM}/V_{DRM}		800	V
I_{TSM}		140	A
V_T	8 A, T_J = 25 °C	1.2	V
dV/dt		150	V/µs
dI/dt		100	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
12TTS08SPbF	800	800	1.0

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	T_C = 108 °C, 180° conduction, half sine wave	8	A
Maximum RMS on-state current	$I_{T(RMS)}$		12.5	
Maximum peak one-cycle non-repetitive surge current	I_{TSM}	10 ms sine pulse, rated V_{RRM} applied, T_J = 125 °C	120	
		10 ms sine pulse, no voltage reapplied, T_J = 125 °C	140	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied, T_J = 125 °C	72	A^2s
		10 ms sine pulse, no voltage reapplied, T_J = 125 °C	100	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied, T_J = 125 °C	1000	$A^2\sqrt{s}$
Maximum on-state voltage drop	V_{TM}	8 A, T_J = 25 °C	1.2	V
On-state slope resistance	r_t	T_J = 125 °C	16.2	mΩ
Threshold voltage	$V_{T(TO)}$		0.87	V
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	T_J = 25 °C, V_R = Rated V_{RRM}/V_{DRM}	0.05	mA
		T_J = 125 °C, V_R = Rated V_{RRM}/V_{DRM}	1.0	
Typical holding current	I_H	Anode supply = 6 V, resistive load, initial I_T = 1 A	30	
Maximum latching current	I_L	Anode supply = 6 V, resistive load	50	
Maximum rate of rise of off-state voltage	dV/dt	T_J = 25 °C	150	V/µs
Maximum rate of rise of turned-on current	dI/dt		100	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 = - 65 °C	20	mA
		Anode supply = 6 V, resistive load, T_J = 25 °C	15	
		Anode supply = 6 V, resistive load, T_J = 125 °C	10	
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, T_J = - 65 °C	1.2	V
		Anode supply = 6 V, resistive load, T_J = 25 °C	1	
		Anode supply = 6 V, resistive load, T_J = 125 °C	0.7	
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}		0.1	mA

SWITCHING

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Typical turn-on time	t_{gt}	T_J = 25 °C	0.8	µs
Typical reverse recovery time	t_{rr}	T_J = 125 °C	3	
Typical turn-off time	t_q		100	

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	0.5	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style D^2PAK (SMD-220)	12TTS08S	

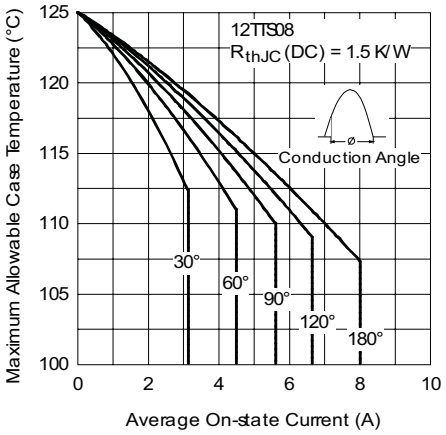


Fig. 1 - Current Rating Characteristics

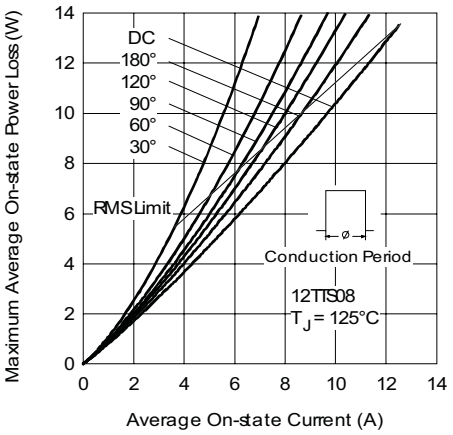


Fig. 4 - On-State Power Loss Characteristics

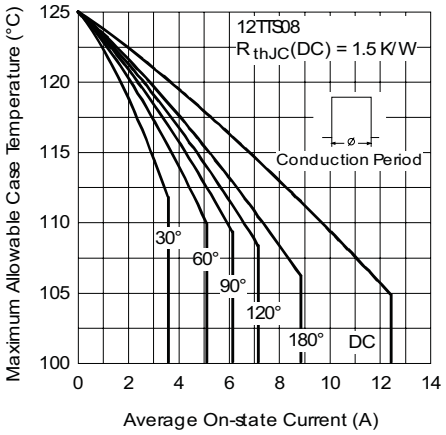


Fig. 2 - Current Rating Characteristics

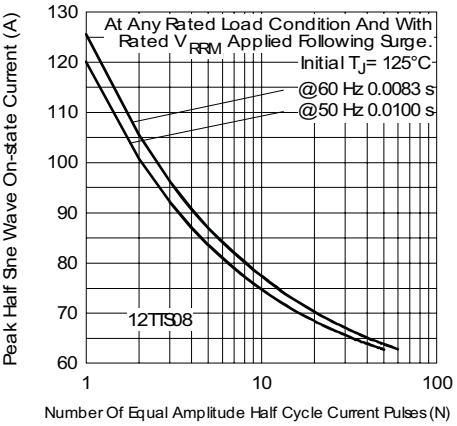


Fig. 5 - Maximum Non-Repetitive Surge Current

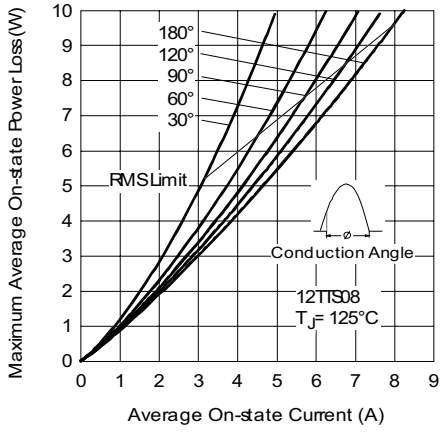


Fig. 3 - On-State Power Loss Characteristics

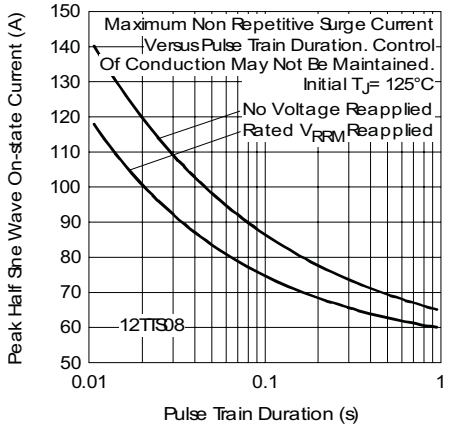


Fig. 6 - Maximum Non-Repetitive Surge Current

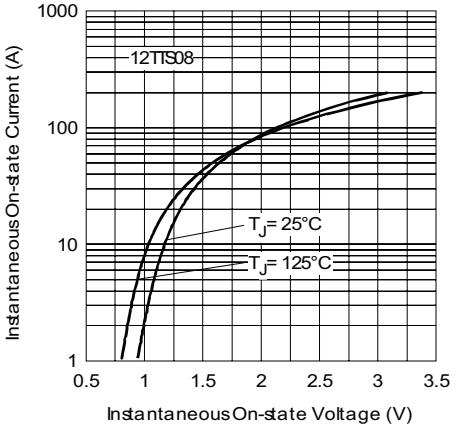


Fig. 7 - On-State Voltage Drop Characteristics

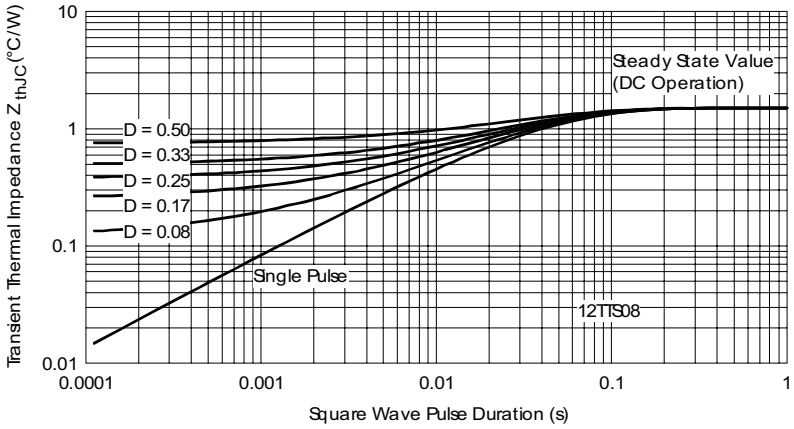


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

12	T	T	S	08	S	TRL	PbF
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

- 1 - Current rating (12.5 A)
- 2 - Circuit configuration:
  T = Single thyristor
- 3 - Package:
  T = TO-220AC
- 4 - Type of silicon:
  S = Standard recovery rectifier
- 5 - Voltage rating (08 = 800 V)
- 6 - S = TO-220 D^2PAK (SMD-220) version
- 7 - • None = Tube
  • TRL = Tape and reel (left oriented)
  • TRR = Tape and reel (right oriented)
- 8 - • None = Standard production
  • PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95046
Part marking information	http://www.vishay.com/doc?95054
Packaging information	http://www.vishay.com/doc?95032

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