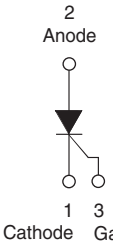
Phase Control SCR, 8 A

D²PAK



FEATURES

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- Designed and qualified for industrial level

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Input rectification and crow-bar (soft start)
- Vishay input diodes, switches and output rectifiers which are available in identical package outlines

DESCRIPTION

The VS-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.

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
VS-12TTS08SPbF	800	800	1.0

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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 ms 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	

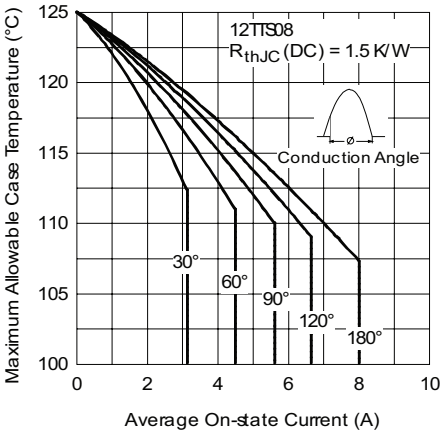

Fig. 1 - Current Rating Characteristics

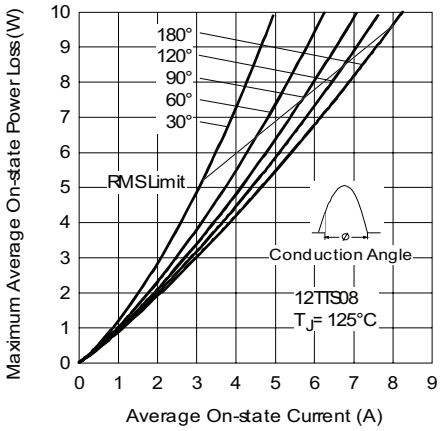

Fig. 3 - On-State Power Loss Characteristics

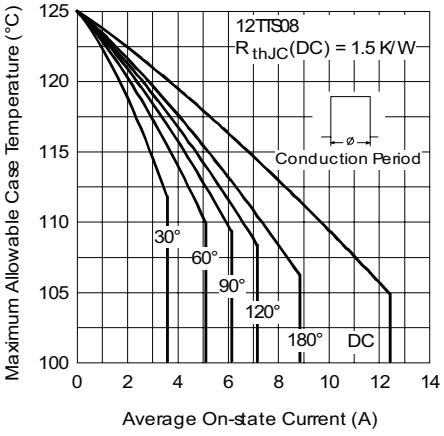

Fig. 2 - Current Rating Characteristics

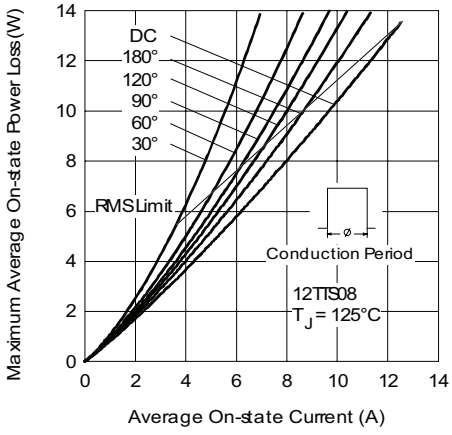

Fig. 4 - On-State Power Loss Characteristics

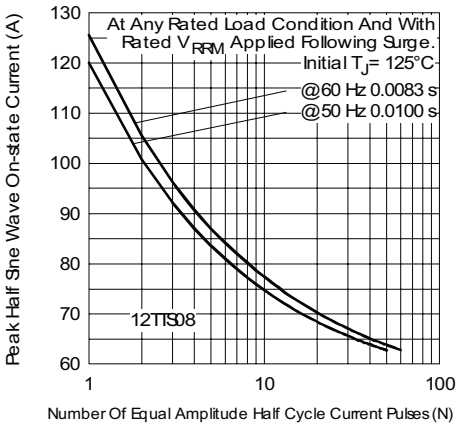

Fig. 5 - Maximum Non-Repetitive Surge Current

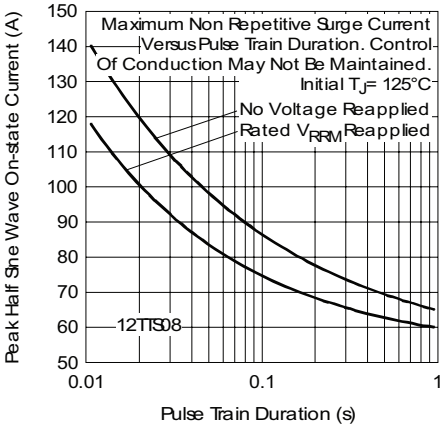

Fig. 6 - Maximum Non-Repetitive Surge Current

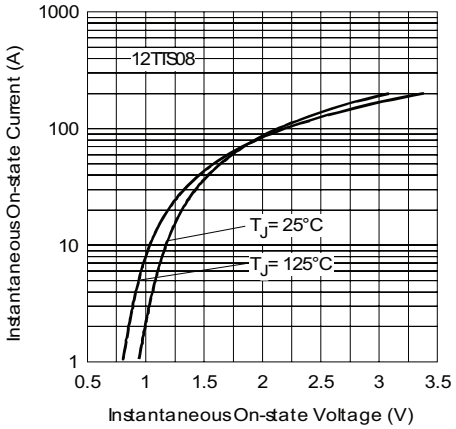

Fig. 7 - On-State Voltage Drop Characteristics

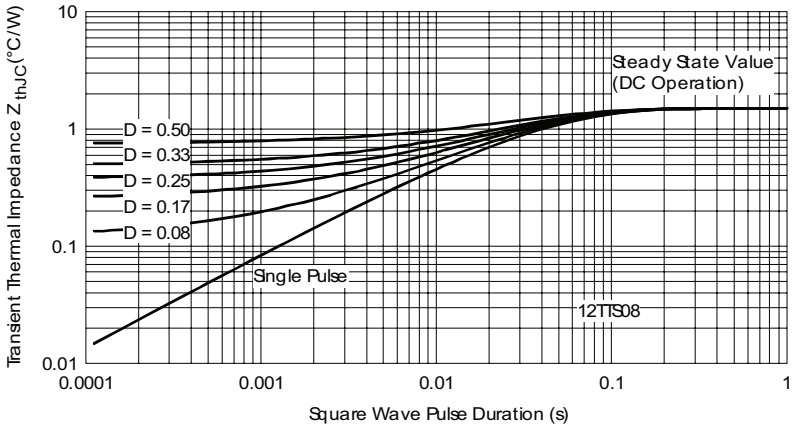

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code

VS-	12	T	T	S	08	S	TRL	PbF
1	2	3	4	5	6	7	8	9

1 - HPP product suffix

2 - Current rating (12.5 A)

3 - Circuit configuration:
T = Single thyristor

4 - Package:
T = TO-220AC

5 - Type of silicon:
S = Standard recovery rectifier

6 - Voltage rating (08 = 800 V)

7 - S = TO-220 D^2PAK (SMD-220) version

8 - • None = Tube
• TRL = Tape and reel (left oriented)
• TRR = Tape and reel (right oriented)

9 - PbF = Lead (Pb)-free

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

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