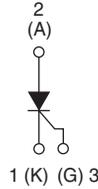




Phase Control SCR, 10 A



TO-220AB



DESCRIPTION/FEATURES

The 10TTS08PbF 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 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.

Also available in SMD-220 package (series 10TTS08SPbF).

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

PRODUCT SUMMARY	
V_T at 6.5 A	< 1.15 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 $T_A = 55\text{ °C}$, $T_J = 125\text{ °C}$, common heatsink of 1 °C/W	13.5	17	A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	6.5	A
$I_{T(RMS)}$		10	
V_{RRM}/V_{DRM}		800	V
I_{TSM}		140	A
V_T	6.5 A, $T_J = 25\text{ °C}$	1.15	V
dV/dt		150	V/ μ s
dI/dt		100	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
10TTS08PbF	800	800	1.0

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

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ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum average on-state current	$I_{T(AV)}$	$T_C = 112\text{ }^\circ\text{C}$, 180° conduction half sine wave	6.5	A	
Maximum RMS on-state current	$I_{T(RMS)}$		10		
Maximum peak, one-cycle, non-repetitive surge current	I_{TSM}	10 ms sine pulse, rated V_{RRM} applied, $T_J = 125\text{ }^\circ\text{C}$	120		
		10 ms sine pulse, no voltage reapplied, $T_J = 125\text{ }^\circ\text{C}$	140		
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied, $T_J = 125\text{ }^\circ\text{C}$	72	A^2s	
		10 ms sine pulse, no voltage reapplied, $T_J = 125\text{ }^\circ\text{C}$	100		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied, $T_J = 125\text{ }^\circ\text{C}$	1000	$A^2\sqrt{s}$	
Maximum on-state voltage drop	V_{TM}	6.5 A, $T_J = 25\text{ }^\circ\text{C}$	1.15	V	
On-state slope resistance	r_t	$T_J = 125\text{ }^\circ\text{C}$	17.3	$m\Omega$	
Threshold voltage	$V_{T(TO)}$		0.85	V	
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	$T_J = 25\text{ }^\circ\text{C}$	0.05	mA
			$T_J = 125\text{ }^\circ\text{C}$	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	$T_J = 25\text{ }^\circ\text{C}$	150	$V/\mu s$	
Maximum rate of rise of turned-on current	dI/dt		100	$A/\mu s$	

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, $T_J = -65\text{ }^\circ\text{C}$	20	mA
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$	15	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$	10	
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = -65\text{ }^\circ\text{C}$	1.2	V
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$	1	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$	0.7	
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}		0.1	mA

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



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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	0.5	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum		6 (5)	kgf · cm
	maximum		12 (10)	(lbf · in)
Marking device		Case style TO-220AB	10TTS08	

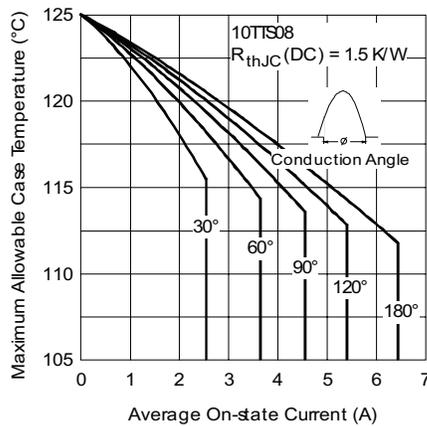


Fig. 1 - Current Rating Characteristics

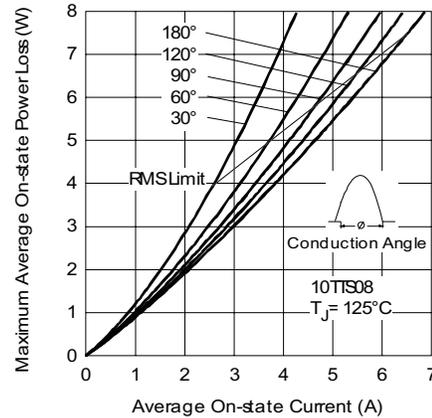


Fig. 3 - On-State Power Loss Characteristics

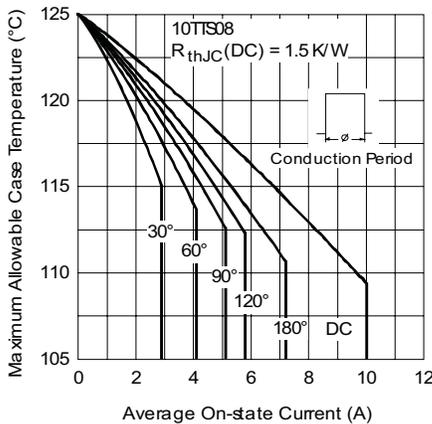


Fig. 2 - Current Rating Characteristic

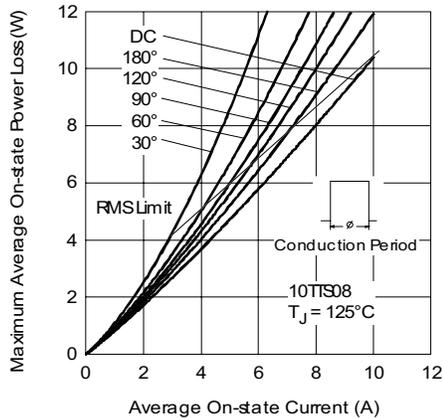


Fig. 4 - On-State Power Loss Characteristics

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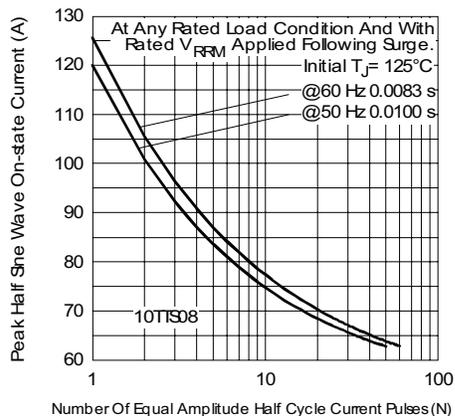


Fig. 5 - Maximum Non-Repetitive Surge Current

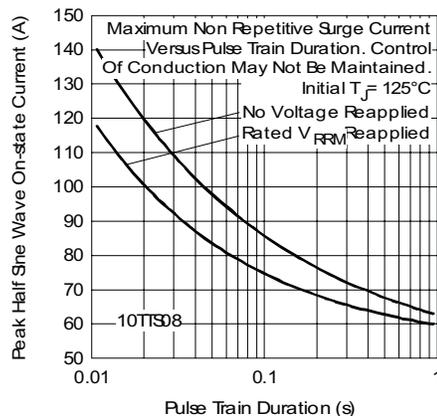


Fig. 6 - Maximum Non-Repetitive Surge Current

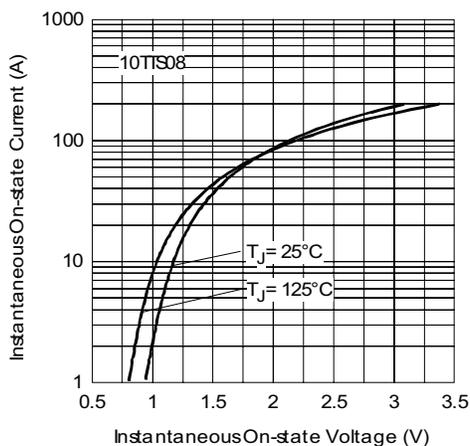


Fig. 7 - On-State Voltage Drop Characteristics

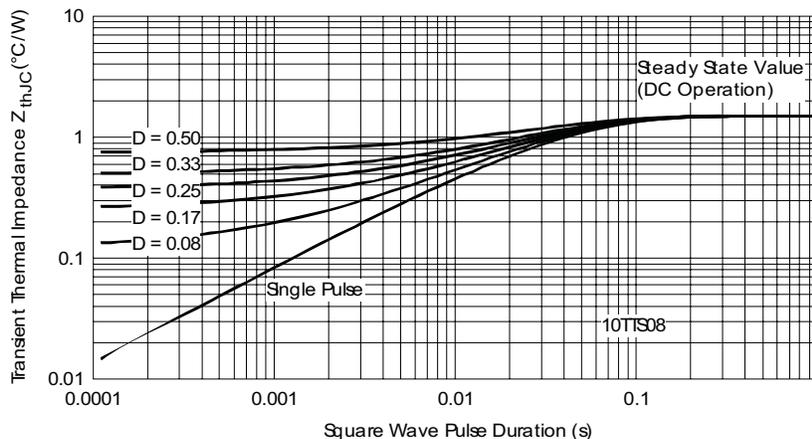


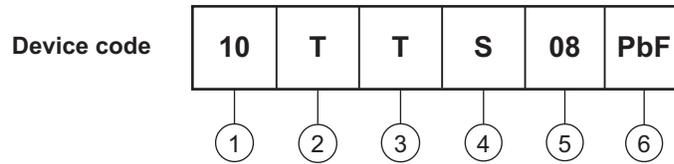
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



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ORDERING INFORMATION TABLE

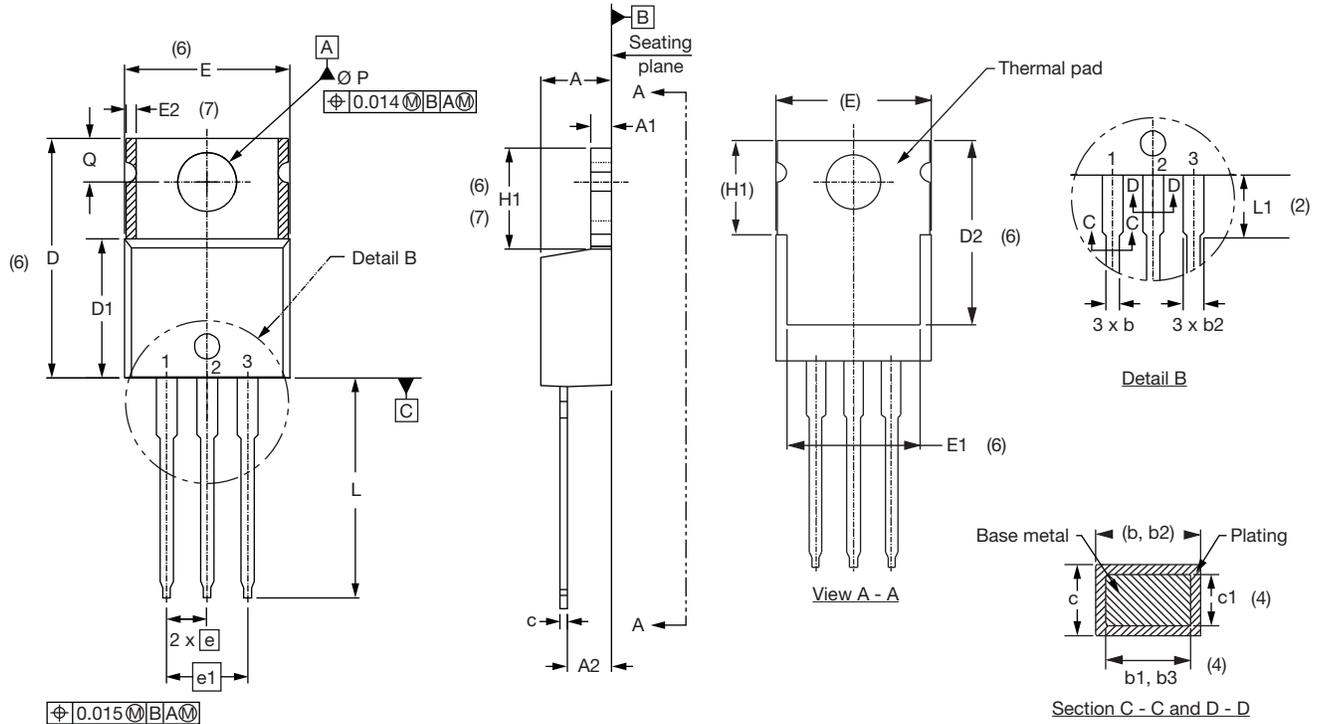


- 1** - Current rating
- 2** - Circuit configuration:
T = Single thyristor
- 3** - Package:
T = TO-220AB
- 4** - Type of silicon:
S = Converter grade
- 5** - Voltage code x 100 = V_{RRM}
- 6** -
 - None = Standard production
 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95225

TO-220AB

DIMENSIONS in millimeters and inches



Lead assignments

Diodes

- 1. - Anode/open
- 2. - Cathode
- 3. - Anode

Conforms to JEDEC outline TO-220AB

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.25	4.65	0.167	0.183	
A1	1.14	1.40	0.045	0.055	
A2	2.56	2.92	0.101	0.115	
b	0.69	1.01	0.027	0.040	
b1	0.38	0.97	0.015	0.038	4
b2	1.20	1.73	0.047	0.068	
b3	1.14	1.73	0.045	0.068	4
c	0.36	0.61	0.014	0.024	
c1	0.36	0.56	0.014	0.022	4
D	14.85	15.25	0.585	0.600	3
D1	8.38	9.02	0.330	0.355	
D2	11.68	12.88	0.460	0.507	6
E	10.11	10.51	0.398	0.414	3, 6
E1	6.86	8.89	0.270	0.350	6
E2	-	0.76	-	0.030	7
e	2.41	2.67	0.095	0.105	
e1	4.88	5.28	0.192	0.208	
H1	6.09	6.48	0.240	0.255	6, 7
L	13.52	14.02	0.532	0.552	
L1	3.32	3.82	0.131	0.150	2
Ø P	3.54	3.73	0.139	0.147	
Q	2.60	3.00	0.102	0.118	
θ	90° to 93°		90° to 93°		

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1 and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Dimension b1, b3 and c1 apply to base metal only
- (5) Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2 and E1
- (7) Dimensions E2 x H1 define a zone where stamping and singulation irregularities are allowed
- (8) Outline conforms to JEDEC TO-220, except A2 (maximum) and D2 (minimum) where dimensions are derived from the actual package outline



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