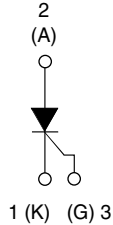


Phase Control SCR, 40 A



TO-220AB



DESCRIPTION/FEATURES

The 40TTS12PbF 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 140 °C junction temperature. Low Igt parts available.



Available
RoHS*
COMPLIANT

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.

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

PRODUCT SUMMARY	
V_T at 80 A	< 1.6 V
I_{TSM}	350 A
V_{RRM}	1200 V

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	25	A
I_{RMS}		40	
V_{RRM}/V_{DRM}		1200	V
I_{TSM}		350	A
V_T	$T_J = 25\text{ }^\circ\text{C}$	1.6	V
dV/dt		500	V/ μs
dI/dt		150	A/ μs
T_J		- 40 to 140	$^\circ\text{C}$

VOLTAGE RATINGS			
PART NUMBER	V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V	V_{DRM} , MAXIMUM PEAK DIRECT VOLTAGE V	T_J $^\circ\text{C}$
40TTS12PbF	1200	1200	- 25 to 140

* 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	$I_{T(AV)}$	$T_C = 93\text{ }^\circ\text{C}$, 180° conduction half sine wave		25	A
Maximum RMS on-state current	I_{RMS}			40	
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	V_{TM}	80 A, $T_J = 25\text{ }^\circ\text{C}$		1.6	V
Low level value of on-state slope resistance	r_t	$T_J = 140\text{ }^\circ\text{C}$		11.4	$m\Omega$
Low level value of threshold voltage	$V_{T(TO)}$			0.96	V
Maximum reverse and direct leakage current	I_{RRM}/I_{DRM}	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	0.5	mA
		$T_J = 140\text{ }^\circ\text{C}$		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, $T_J = 25\text{ }^\circ\text{C}$		35	mA
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$		1.3	V
Maximum DC gate voltage not to trigger	V_{GD}	$T_J = 140\text{ }^\circ\text{C}$, $V_{DRM} = \text{Rated value}$		0.2	
Maximum DC gate current not to trigger	I_{GD}			1.5	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}	$T_J = 140\text{ }^\circ\text{C}$		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 140	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.8	°C/W
Maximum thermal resistance, junction to ambient	R_{thJA}		60	
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 TO-220AB	40TTS12	

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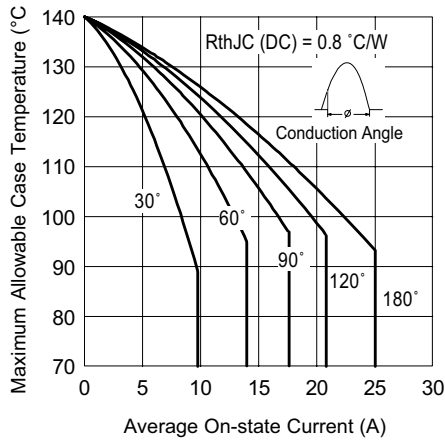


Fig. 1 - Current Rating Characteristics

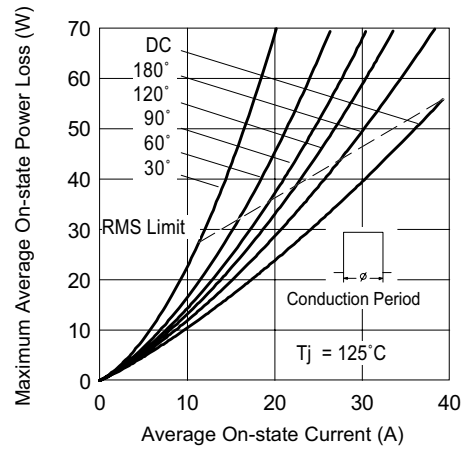


Fig. 4 - On-State Power Loss Characteristics

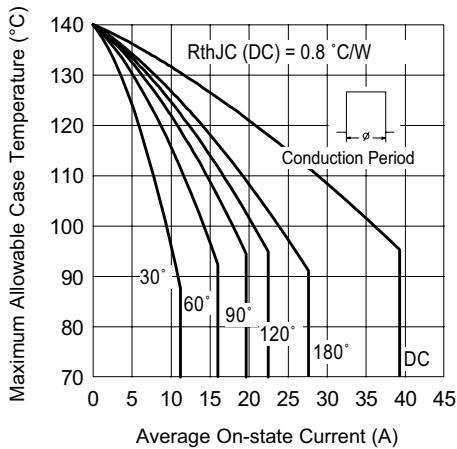


Fig. 2 - Current Rating Characteristics

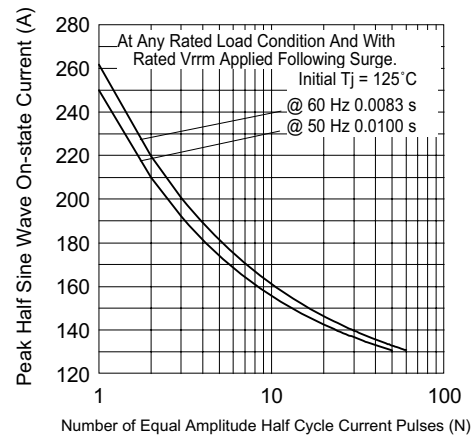


Fig. 5 - Maximum Non-Repetitive Surge Current

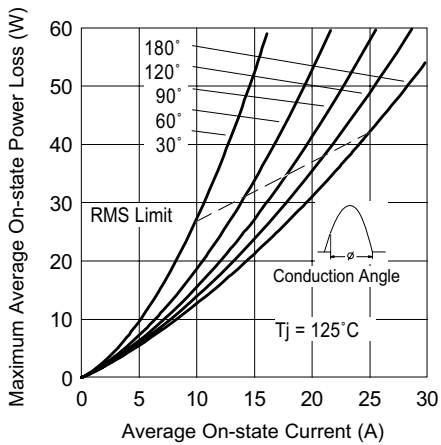


Fig. 3 - On-State Power Loss Characteristics

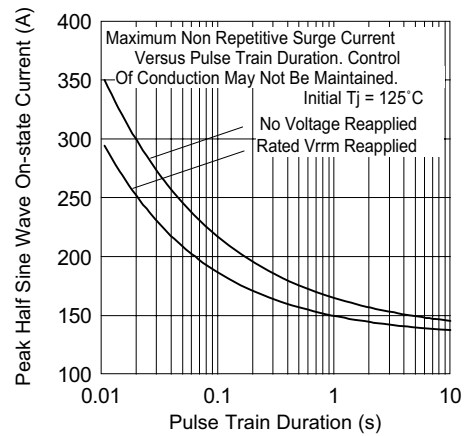


Fig. 6 - Maximum Non-Repetitive Surge Current



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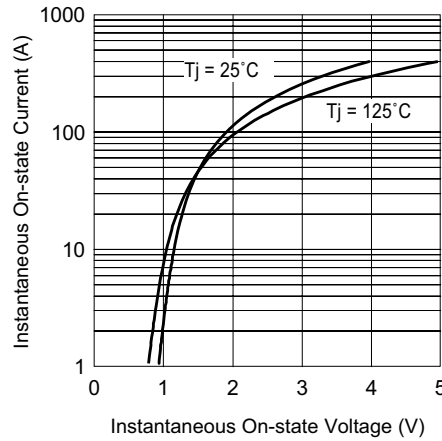


Fig. 7 - On-State Voltage Drop Characteristics

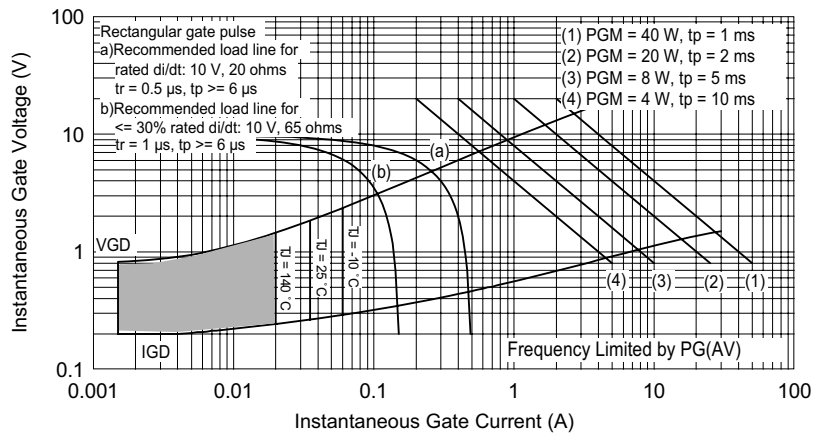


Fig. 8 - Gate Characteristics

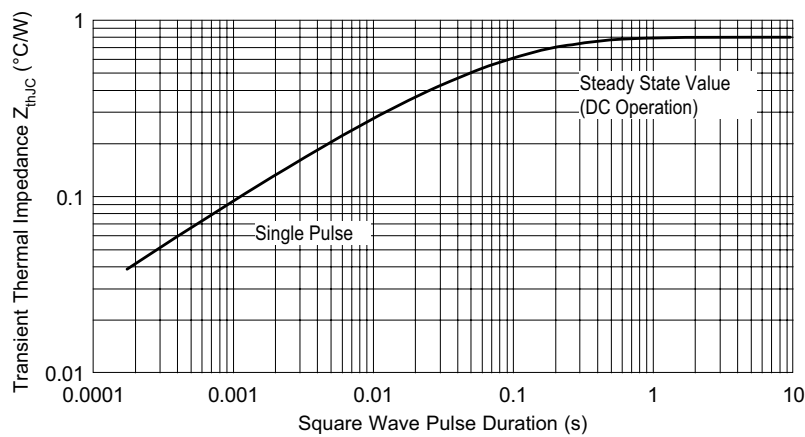


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code	40	T	T	S	12	PbF
	1	2	3	4	5	6
	1	-	Current rating, RMS value			
	2	-	Circuit configuration: T = Single thyristor			
	3	-	Package: T = TO-220			
	4	-	Type of silicon: S = Standard recovery rectifier			
	5	-	Voltage rating (12 = 1200 V)			
	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



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