

Features

3000A, 4500V
40kA Pulse Current Capability
Fast Turn-off Time
Light Weight Package

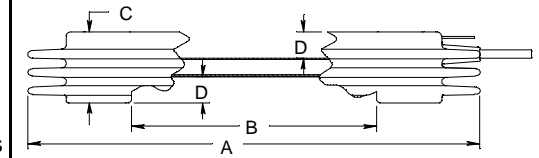
Description

The SPT312 reverse blocking thyristor is suitable for inverter applications up to 200Hz. The silicon junction is manufactured by the proven multi-diffusion process and utilizes the exclusive eight (8) arms involute gate structure for lower switching losses.

The design utilizes the revolutionary "Light Silicon Sandwich" or LSS technology, a new termination technique which eliminates heavy refractory metal as a substrate but still employs the alloyed anode interface necessary for high surge current duty. The light weight plastic package allows the insertion of liquid cooled chillers closer to the silicon junction. Copper inserts can be supplied for adjoining commercially available flat surfaced heat dissipators.

Package

A=5.375in, B=3.204in, C=0.792in, D=0.2902in
Notes - 1, 2 & 3



MODEL RATING AVAILABILITY

PART NUMBER	V _{DRM}	V _{RRM}
SPT312HK	4500	4500
SPT312HH	4400	4400
SPT312HF	4300	4300
SPT312HD	4200	4200
SPT312HB	4100	4100
SPT312FT	4000	4000

Limiting Characteristics and Ratings

At T_J = 125°C, Unless Otherwise Specified

	SYMBOL		UNITS
Repetitive Peak Off State Voltage.....	V _{DRM}	4500	V
Repetitive Peak Reverse Voltage.....	V _{RRM}	4500	V
Average On-State Current (T _C =70°C)	I _{T(AV)}	3000	A
Peak Half-Cycle Non-Repetitive Surge Current (8.3ms / 10ms).....	I _{TSM}	40 / 37.5	kA
For Fusing (8.3ms / 10ms)	I ² t	6.6 / 7	MA ² s
Critical Gate Trigger Voltage (V _D = 12V, T _J = 25°C).....	V _{GT}	4.5	V
Critical Gate Trigger Current (V _D = 12V, T _J = 25°C)	I _{GT}	300	mA
Non-Trigger Gate Voltage (V _D = 2000V)	V _{GD}	0.8	V
Non-Trigger Gate Current (V _D = 2000V)	I _{GD}	15	mA
Open Circuit Gate Voltage	V _{OC}	50	V
Short Circuit Gate Current	I _{SS}	5	A
Gate Pulse Duration and Rise Time		10 μs duration / 0.5 μs rise time	
Turn-Off Time (5A/μs, >100V, 400V/μs to 2000V)	T _{off}	400	μs
Turn-On Delay (V _D = 50%V _{DRM})	t _d	4	μs
Rate of Change of Voltage (V _D =70% V _{DRM})	dv/dt	1000	V/μs
Rate of Change of Current (V _D =50% V _{DRM})	di/dt	300	A/μs
Operating and Storage Temperature.....	T _J , T _{STG}	0 to +125	°C
Mounting Force.....	F	13000-16000	lbs

Notes

- Optional external posts dwg. # 0215B8331; Ni plated copper, 0.35" thick each.
- Compressed thickness including external posts is 0.88" - 0.89" (22.35mm - 22.61mm).
- Weight 14 oz., 2.7 lbs with posts.

Electrical Specifications

At T_J = 125°C, Unless Otherwise Specified

PARAMETERS	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Peak Off State Blocking	I _{DRM}	V _D = 80%V _{DRM}			450	mA
Forward & Reverse Current	I _{RRM}				350	mA
On State Voltage	V _{TM}	I _T = 4kA Pulse			2.0	V
Max. Peak Recovery Current	I _{RM}	di/dt = 10A/μs Snap. S = .5-.33			310	A
Thermal Resistance	R _{θJC}	Double Side Cooling			0.0049	°C/W

Typical Performance Curves

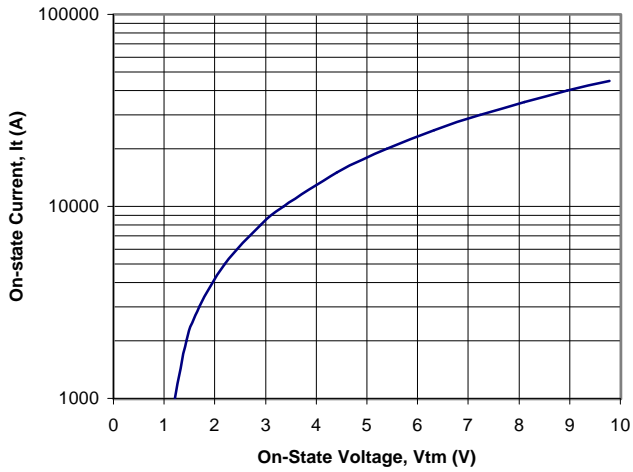


FIGURE 1. ON-STATE CURRENT vs ON-STATE VOLTAGE

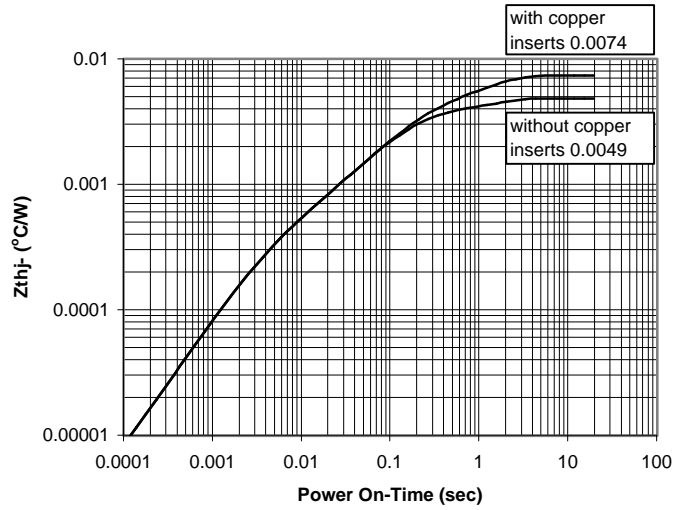


FIGURE 2. THERMAL IMPEDANCE vs POWER ON TIME

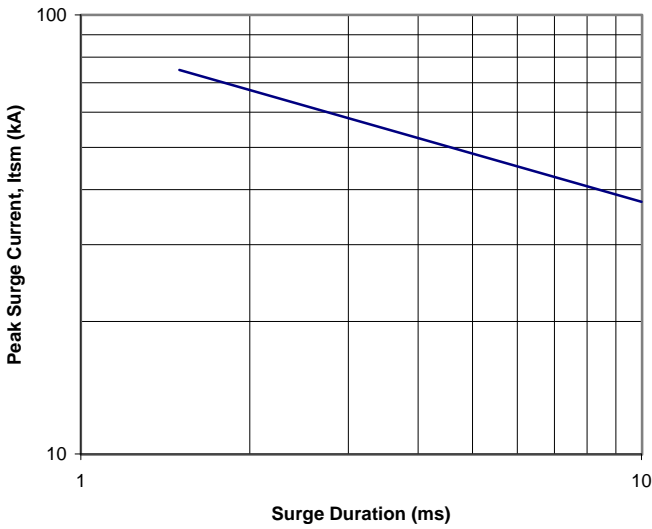


FIGURE 3. PEAK I_{TSM} vs PULSE DURATION FOR HALF SINE CURRENT

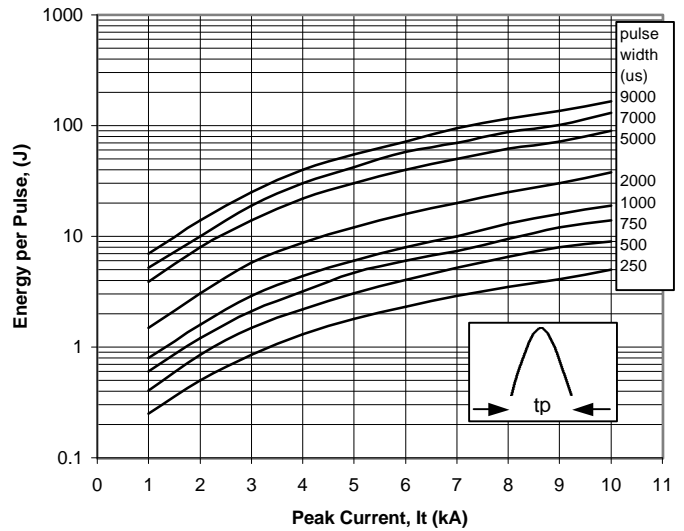


FIGURE 4. ON-STATE ENERGY vs ON-STATE CURRENT

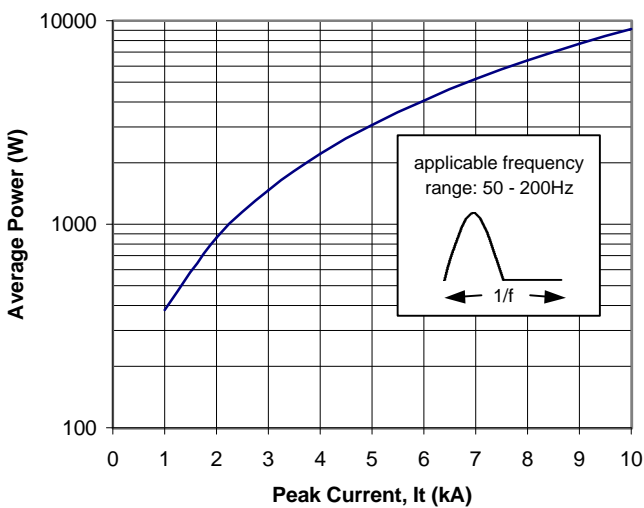


FIGURE 5. AVERAGE FULL CYCLE POWER LOSS vs ON-STATE CURRENT

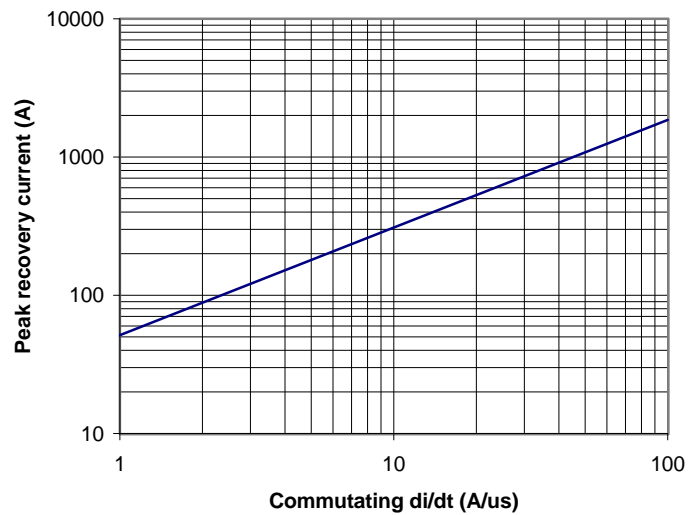


FIGURE 6. PEAK I_{REC} vs COMMUTATING di/dt