

PSM80BA10

Power Semiconductor Half-Bridge Module Data Sheet (Rev 01- 05/28/09)

Description

This module contains 4 Solidtron (CCS) Size 12 SGTOs and 4 Size 12 S-Diodes, packaged for use in a solid state current limiter or similar applications. This module provides connections for the AC input and output bus. The module includes an electrically conductive base-plate. The module is typically used at 60Hz.

The gate drive for the SGTOs are integrated into the module and is powered by an external isolated 15V DC supply.

The current controlled Solidtron (CCS) SGTO is an n-type Thyristor in a high performance ThinPak™ package. The device gate is similar to that found on a traditional GTO Thyristor. The CCS features the high peak current capability and low On-state voltage drop common to SCR thyristors combined with high di/dt capability.

Application Specific Operating Conditions

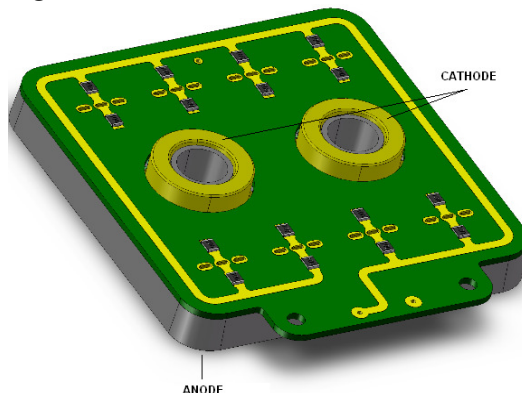
For Each Module:

- Frequency = 60 Hz
- Blocking Voltage (peak) = 4 kV
- Current (rms) = 700A, 50% duty cycle

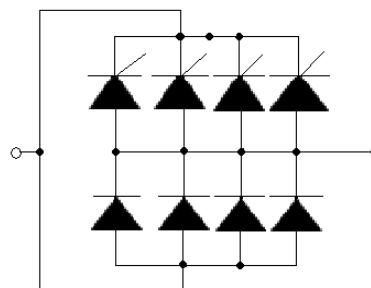
Features

- Low On-State Voltage
- Low trigger current
- Low Inductance Package

Package



Schematic Symbol



Module Operating Characteristics

	SYMBOL	VALUE	UNITS
Peak Off-State Voltage (60Hz, 3 pulse)	VDRM	4	kV
Off-State Rate of Change of Voltage Immunity	dv/dt	1	kV/uSec
Repetitive Peak Anode Current (Pulse Width=30 uSec)	IASM	15	kA
Gate Assisted Turn-off	tqq	< 15	uSec
Operating Junction Temperature	TJO	125	oC
Maximum Junction Temperature	TJM	140	oC
I2t for 8.3 ms, half-sine wave, Ipeak = 4kA	I2t		A2s
Anode-Cathode On-State Voltage at Tj = 140 C,	VT	1.2	V

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5,521,436	5,446,316	5,105,536	5,209,390	4,958,211	5,206,186	4,857,983	5,082,795	4,644,637
5,585,310	5,557,656	5,777,346	5,139,972	5,111,268	5,757,036	4,888,627	4,980,741	4,374,389
5,248,901	5,564,226	5,446,316	5,103,290	5,260,590	5,777,346	4,912,541	4,941,026	4,750,666
5,366,932	5,517,058	5,577,656	5,028,987	5,350,935	5,995,349	5,424,563	4,927,772	4,429,011
5,497,013	4,814,283	5,473,193	5,304,847	5,640,300	4,801,985	5,399,892	4,739,387	5,293,070

SGTOs (T_J=25oC unless otherwise specified)

Performance Ratings		Measurements				Test Conditions
Parameters	Symbol	Min.	Typ.	Max.	Units	
Peak Off-State Forward Voltage	V _{DRM}	4			kV	60 Hz, 3 pulse, T _J =140oC
Off-State rate of Change of Voltage Immunity	dv/dt			>1	kV/us	
Anode-Cathode Off-State Forward Leakage Current	I _D		50	100	uA	V _{GK} =0V, V _{AK} =3.5kV, T _J =25oC
			10		uA	T _J =140oC, Note: 3 & 4
Peak Anode Current (8mSec)	I _P at 8ms		5		kA	
Pk Rate of Change of Current (measured)	di/dt			60	kA/us	
Turn-on Delay Time	t _{D(ON)}		100		ns	L _s =8.2nH
Turn-off Delay Time	t _{D(OFF)}		TBD			C=0.15 uF Capacitor discharge
Anode-Cathode On-State Voltage	V _T		1.1			I _T =700A, T _J =25oC
			1.2		V	I _g = 500 mA, T _J =140oC
Operating Case Temp.	T _C		100		°C	
Thermal Resistance	R _{JC}			0.042	°C/W	

S Diodes (T_J=25oC unless otherwise specified)

Performance Ratings		Measurements				Test Conditions
Parameters	Symbol	Min.	Typ.	Max.	Units	
Repetitive Peak Reverse Voltage	V _{RRM}	4			kV	
Off-State rate of Change of Voltage Immunity	dv/dt			>1	kV/us	
RMS Forward Current	I _{F(AVG)}		700		A	T _C = 140°C
Forward Voltage	V _F		1.1			I _F = 700 A, T _J = 25°C
			1.2		V	I _F = 700 A, T _J = 140°C
Operating Junction and Storage Temperature	T _J , T _{STG}		125		°C	
Thermal Resistance from Junction to Case (Per Diode)	R _{JC}			0.042	°C/W	

Notes

- 1.) Measurements made with a 10 Ohm shorting resistor connected between the gate and cathode.
- 2.) Case Exterior Assumed to be 0.002" of 63Sn/37Pb solder applied directly to cathode bond area of ThinPak.
- 3.) Performance guaranteed by design only.
- 4.) Production testing is limited to 2KV prior to encapsulation.
- 5.) Characterization accomplished using $R_{gk}=10$ ohms.

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