MCM - SSCL1500V700A4KVB

Power Semiconductor Half-Bridge Module

Data Sheet (Rev 0 - 02/06/09)

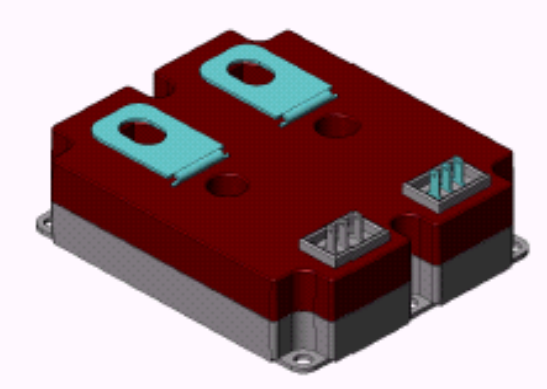
Description

This module contains 4 Current Controlled 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.

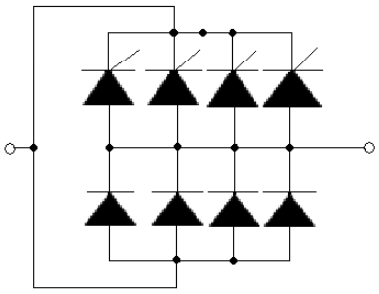
The gate drive for the SGTOs are integrated into the module and is powered by an external isolated 15V DC supply.

The 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.

Package



Schematic Symbol



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

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
I^2t for 8.3 ms, half-sine wave, Ipeak = 4kA	I^2t		A^2s
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
5,532,635	5,135,890	5,166,773	5,569,957	5,184,206	4,476,671	5,468,668	4,648,174	

CAO 05-28-09

SGTOs (TJ=25°C unless otherwise specified)

Performance Ratings		Measurements				
Parameters	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Peak Off-State Forward Voltage	V_{DRM}	4			kV	60 Hz, 3 pulse, TJ=140°C
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, TJ=25°C
			10		uA	TJ=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	Ls=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, TJ=25oC
			1.2		V	Ig = 500 mA, TJ=140oC
Operating Case Temp.	Tc		100		°C	
Thermal Resistance	R_{JC}			0.042	°C/W	

S Diodes (TJ=25°C unless otherwise specified)

Performance Ratings		Measurements				
Parameters	Symbol	Min.	Typ.	Max.	Units	Test Conditions
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.

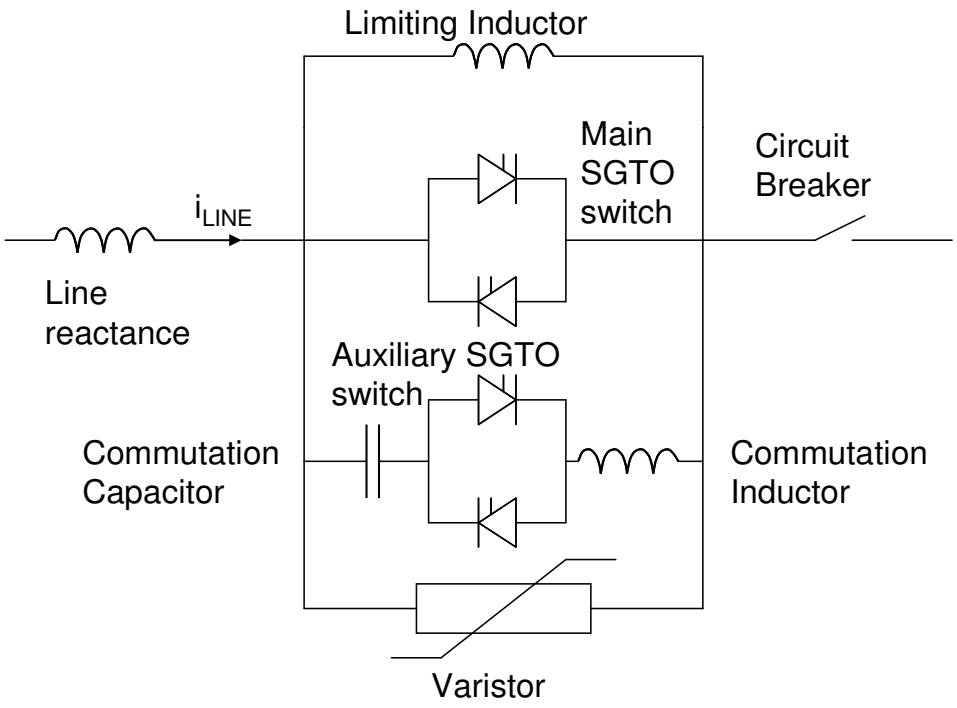
2.) Case Exterior Assummed to be 0.002" of 63Sn/37Pb solder applied directly to cathode bond area of ThinPak.

3.) Performance guarenteed by design only.

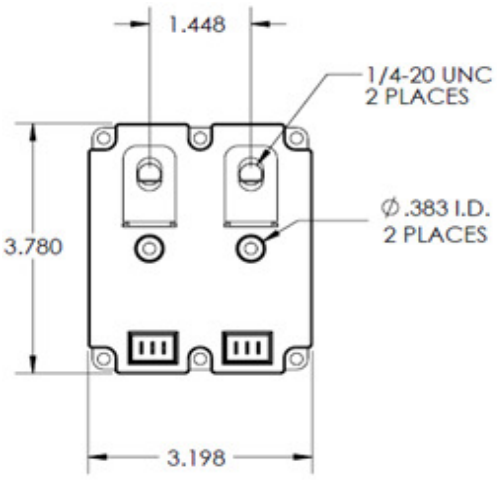
4.) Production testing is limited to 2KV prior to encapsulation.

5.) Characterization accomplished using Rgk=10 ohms.

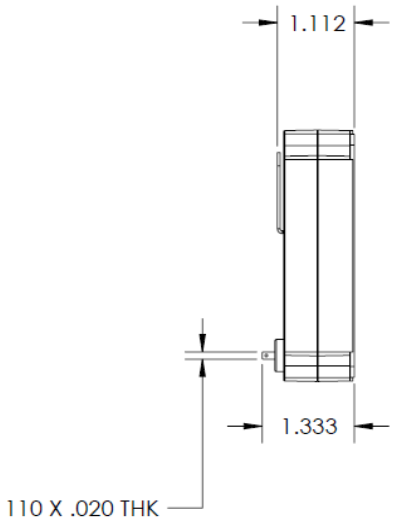
Application Note: Solid State Current Limiter



Module Dimensions

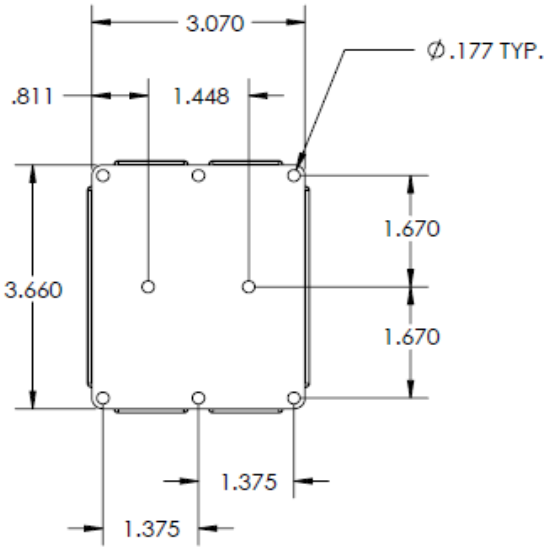


TOP VIEW



SIDE VIEW

"BASE PLATE DIMENSIONS"



BOTTOM VIEW

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Packaging and Handling of MCM Module

1. Do not handle the module without finger cots, or when handling module. Oils and salts in human secretions such as figure prints and saliva contain salts and ionic contamination that will degrade the device performance.

2. Assembly the device in your application using the bolt down pattern.

Revision History

Rev	Date	EA#	Nature of Change
0	2/6/2009	04272009-NB-0020	Initial Change

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