Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

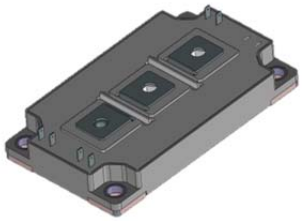
We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

1200V 7mΩ SiC MOSFETs Half Bridge Module

RoHS



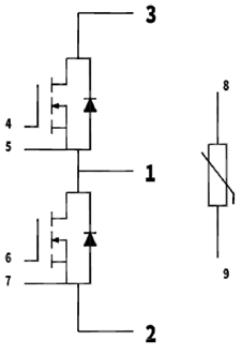
Package: 62mm x 106mm x 17mm

Features

- Ultra Low Loss with SiC MOSFETs
- Zero Reverse Recovery Current with SiC SBDs
- Zero Turn-off Tail Current
- High-Frequency Operation
- Positive Temperature Coefficient on VDS(on)
- Cu baseplate with Si_3N_4 AMB DBC substrate

Applications

- UPS and SMPS
- Fast DC/DC Converter
- Solar and Wind Inverter
- Induction Heating/Welding



Benefits

- Outstanding performance at high frequency operation
- Low switching losses
- Better EMI noise with low parasitic inductance
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_C of R_{DS_ON}
- RoHS Compliant

Absolute Maximum Ratings (T_j=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Specifications	Units
Drain - Source Voltage	V_{DS}		1200	V
Continuous Drain Current	I_D	V_{GS}=20V, T_C = 25 °C	360	A
		V_{GS}=20V, T_C = 90 °C	240	A
Gate - Source Voltage	V_{GS}		+25/-10	V
Pulsed Drain Current	I_{DS}	Limited by Tj_max	960	A
Maximum Power Dissipation	P_D	T_C = 25 °C	1000	W
		T_C = 100 °C	TBD	W
Operating Junction Temperature	T_j		-55 ~ 150	°C
Storage Temperature	T_{STG}		-55 ~ 125	°C
Solder Temperature	T_L	Max for 10 sec	260	°C

Electrical Characteristics of MOSFETs (T_j=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF						
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 1200V, V_{GS} = 0V	--	250	1000	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = 20V	--	--	±1	μA
ON						
Gate-Source Threshold Voltage	$V_{GS(TH)}$	V_{DS} = 10V, I_D = 10mA, T_j = 25 °C	2.4	2.8	--	V
		V_{DS} = 10V, I_D = 10mA, T_j = 150 °C		2.0		
On State Resistance	$R_{DS(ON)}$	V_{GS} = 20V, I_D = 240A, T_j = 25 °C	--	7	7.3	mΩ
		V_{GS} = 20V, I_D = 240A, T_j = 150 °C	--	13	--	mΩ
Transconductance	g_{fs}	V_{DS} = 20V, I_D = 240A, T_j = 25 °C		90		S
		V_{DS} = 20V, I_D = 240A, T_j = 150 °C		78		
DYNAMIC						
Input Capacitance	C_{ISS}	V_{DS} = 600V, V_{GS} = 0V, f = 1 MHz, V_{AC} = 25mV	--	11.4	--	nF
Output Capacitance	C_{OSS}		--	1.5	--	nF
Reverse Transfer Capacitance	C_{RSS}		--	66	--	pF
Internal Gate Resistance	$R_{G(INT)}$	f = 1 MHz, V_{AC} = 25mV		0.3		Ω
External Gate Resistance	$R_{G(EXT)}$			TBD		Ω
Module Stray Inductance	L_σ	Between terminal 2 and 3	--	8.2	--	nH
Module Lead Resistance	R_{mod}		--	TBD	--	mΩ
SWITCHING						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 600V, I_D =240A R_G= 2.5Ω, V_{GS}= -5/20V Inductive Load, T_j=25 °C	--	25	--	ns
Rise Time	t_r		--	63	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	36	--	ns
Fall Time	t_f		--	42	--	ns
Turn-On Switching Energy Loss	E_{ON}		--	TBD	--	mJ
Turn-Off Switching Energy Loss	E_{OFF}		--	TBD	--	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 600V, I_D =240A R_G= 2.5Ω, V_{GS}=-5/20V Inductive Load, T_j=150 °C	--	TBD	--	ns
Rise Time	t_r		--	TBD	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	TBD	--	ns
Fall Time	t_f		--	TBD	--	ns
Turn-On Switching Energy Loss	E_{ON}		--	TBD	--	mJ
Turn-Off Switching Energy Loss	E_{OFF}		--	TBD	--	mJ
Total Gate Charge	Q_G	V_{DD}= 600V, I_D =240A V_{GS}= -5/20V	--	690	--	nC
Gate-Source Charge	Q_{GS}		--	180	--	nC
Gate-Drain Charge	Q_{GD}		--	222	--	nC

Maximum Rated Values of SiC Freewheeling SBDs (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_j=25 °C	1200	V
Diode Continuous Forward Current	I_F	T_C=100 °C, T_j=150 °C	200	A
Surge Non-repetitive Forward Current	$I_{F,SM}$	T_C=100 °C, t_p=8.3 ms sine half wave	800	A

Electrical Characteristics of SiC SBD (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
DC Blocking Voltage	V_R	I_R=100 uA		1200			V
Forward Voltage	V_F	I_F =240A, V_{GE} = 0V	T_J = 25℃		1.8	2.0	V
			T_J = 150℃		2.3		
Total Capacitive Charge	Q_C	V_R=1200V	T_J = 25℃		776		nC

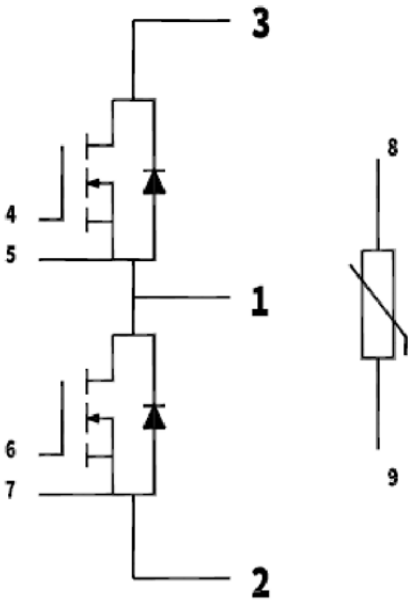
Thermal Characteristics (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
MOSFET Thermal Resistance: Junction-To-Case	$R_{\theta JCM}$	Tc = 90 ˚C, PD = 150 W		0.072	0.11	℃/W
Diode Thermal Resistance: Junction-To-Case	$R_{\theta JCD}$	Tc = 90 ˚C, PD = 130 W		0.08	0.118	℃/W

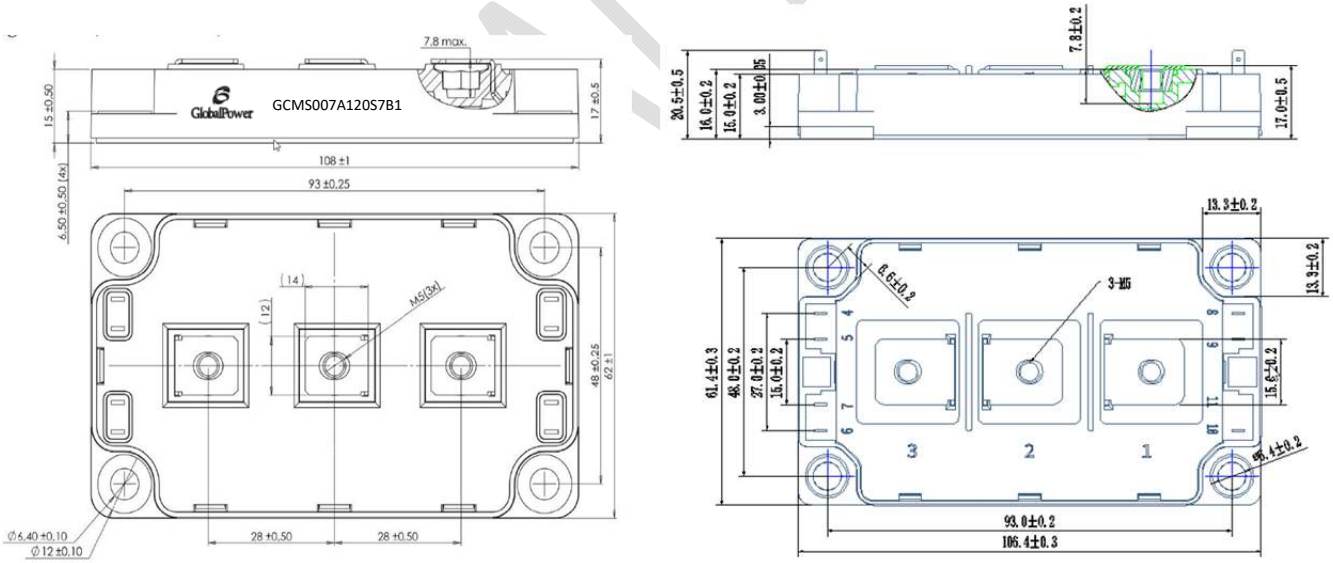
Module Characteristics (T_j=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Mounting Torque	M_d				5	N-m
Clearance		Terminal to terminal		12		mm
Package Weight	W_t			250		g
Isolation Voltage	V_{ISOL}	I_{ISOL} < 1mA, 50/60Hz, t=1 min			2500	V

Internal Circuit:



Preliminary Package Outline (Unit: mm):



Revision History

Date	Revision	Notes
03/04/2016	0.1	Initial release
10/05/2016	0.2	Revised the substrate material and other electrical parameters

Global Power Technologies Group
20692 Prism Place
Lake Forest, CA 92630
TEL (949) 207-7500
FAX (949) 613-7600
E-mail: info@gptechgroup.com
Web site: www.gptechgroup.com

Notes

- **RoHS Compliance**
  The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of www.gptechgroup.com.

- **REACh Compliance**
  REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemi- cal Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact our office at GPTG Headquarters in Lake Forest, California to insure you get the most up-to-date REACh SVHC Declaration.
  REACh banned substance information (REACh Article 67) is also available upon request.
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