

GCS200F170BM

1.7kV, 11m All-Silicon Carbide Half-Bridge Module

V_{DS}	1700 V
$I_D(@25^{\circ}C)$	220 A
$R_{DS(on)}$	11 m

Features

- Low On-Resistance and High Current Density
- Low Capacitance for High Frequency Operation
- Normally-off ,fail-safe Device Operation
- Positive Temperature Coefficient Device
- RoHS Compliant

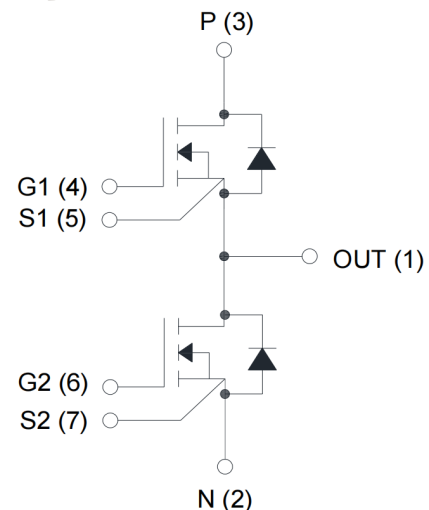
Benefits

- Higher System Efficiency
- Increase Parallel Device Convenience
- Temperature Independent Switching Behavior
- Allow High Frequency Operation
- Realize Compact and Lightweight Systems

Applications

- Induction Heating
- EV/HEV Motor Drives
- Motion/servo control
- Traction
- UPS and SMPS
- Solar/Wind Renewable Energy

Product Overview



Absolute Maximum Ratings ($T_c = 25^{\circ}C$ unless otherwise specified)

SiC MOSFET-inverter

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{DS, max}$	Drain – Source Voltage	1700	V	$V_{GS}=0V, I_{DS}=400\mu A$	
I_D	Continuous Drain Current	220	A	$V_{GS}=20V, T_c=25^{\circ}C$	
		154		$V_{GS}=20V, T_c=100^{\circ}C$	
P_{D_MOS}	Power Dissipation	TBD	W	$T_c=25^{\circ}C$	
$V_{GS, op}$	Recommend Gate Source Voltage	-5 to 20	V	Static, recommended DC operating values	
$V_{GS, max}$	Maximum Gate Source Voltage	-10 to 25		Transient operating limit (AC f > 1Hz, duty cycle < 1%)	

SiC MOSFET-inverter Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_{DS}=400\mu A$	1700			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_{DS}=200mA$		2.6		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1700V, V_{GS}=0V$		<4	400	μA
		$V_{DS}=1700V, V_{GS}=0V$ $T_j=175^\circ C$		40	2000	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$			1000	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=20V, I_{DS}=120A$		11	17.5	m Ω
		$V_{GS}=20V, I_{DS}=120A,$ $T_j=175^\circ C$		25		
Transconductance	g_{fs}	$V_{DS}=8.5V, I_{DS}=120A$		64		S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=1000V$ $f=1MHz, V_{AC}=25mV$		16.6		nF
Output Capacitance	C_{oss}			0.6		
Reverse Transfer Capacitance	C_{rss}			0.1		
Turn On Delay Time	$t_{d(on)}$	$V_{DS}=1200V, V_{GS}=-4/20V,$ $I_D=120A, R_L=6.7\Omega,$ $R_{G(ext)}=2.7\Omega$		TBD		ns
Rise Time	t_r			TBD		
Turn Off Delay Time	$t_{d(off)}$			TBD		
Fall Time	t_f			TBD		
C_{oss} Stored Energy	E_{oss}	$V_{GS}=0V, V_{DS}=1200V$ $f=1MHz, V_{AC}=25mV$		TBD		mJ
Turn-on Switching Energy	E_{on}	$V_{DS}=1200V, V_{GS}=0/20V,$ $I_D=120A,$		TBD		
Turn-off Switching Energy	E_{off}	$R_{G(ext)}=2.7\Omega$		TBD		
Internal Gate Resistance	$R_{G(int.)}$	$f=1MHz, V_{AC}=25mV$		0.175		Ω
Gate to Source Charge	Q_{GS}	$V_{DS}=1200V,$		316		nC
Gate to Drain Charge	Q_{GD}	$V_{GS}=-5/+20V,$		396		
Total Gate Charge	Q_G	$I_D=120A$		1216		

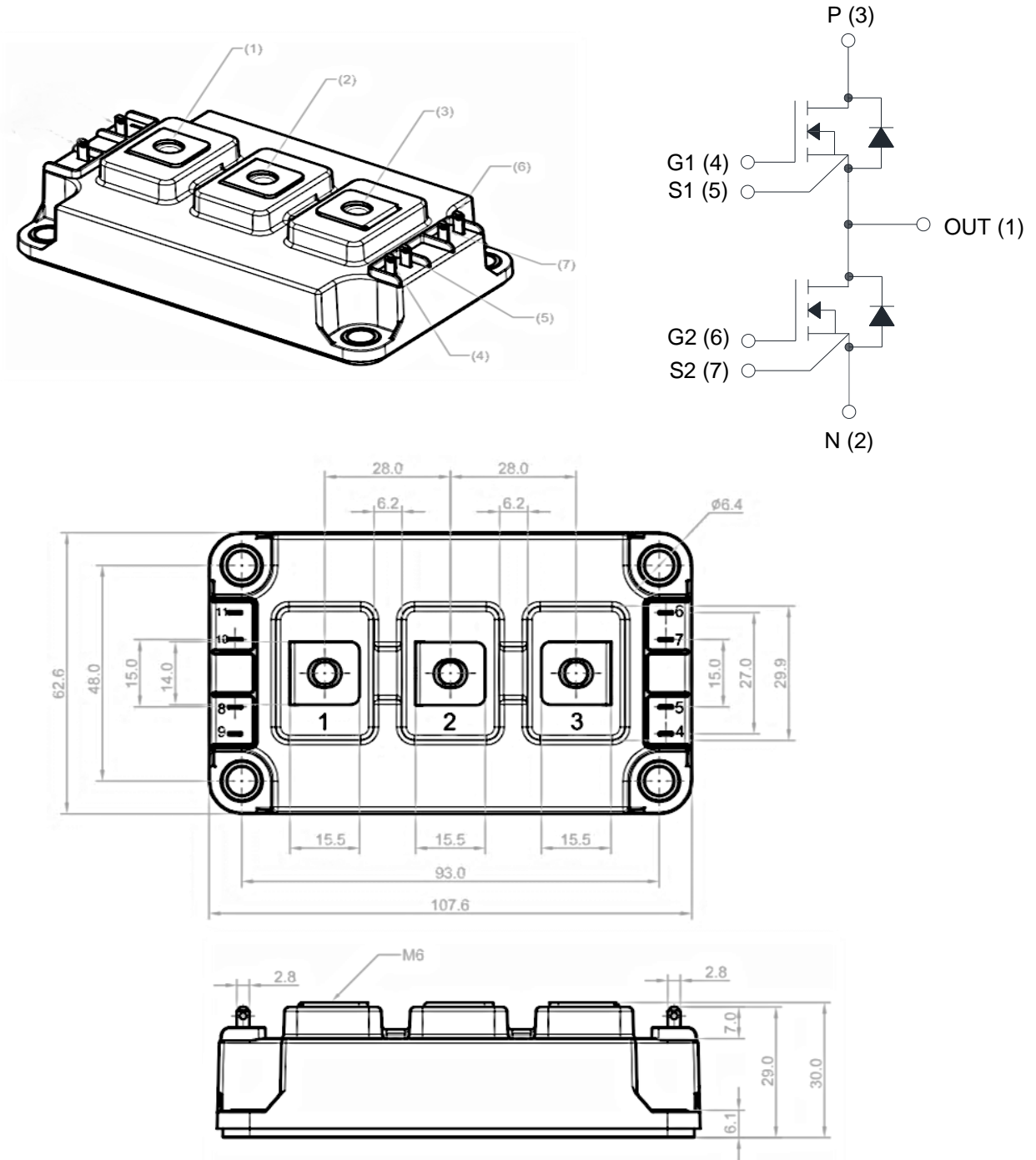
Thermal Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit
Max. MOSFET Junction Temperature	T_{Jmax_MOS}		175	°C
Operating Temperature	T_{Jop}		-55~150	
Storage Temperature	T_{stg}		-55~150	
MOSFET Thermal Resistance, Junction to Case	$R_{th_MOS(j-c)}$	JESD51-14	250	°C/kW

Mechanical Characteristics

Parameter	Symbol	Test Conditions	Value	Unit
Isolation Breakdown Voltage	V_{iso}	AC, 50Hz (R.M.S), t=1minute	3000	V
Mounting Torque to heat-sink	τ_h	Recommended (M5 screw)	2.5~5	Nm
Terminal connection Torque	τ_{tc}	Recommended (M6 screw)	3~5	
Weight	W		350	g

Package Dimensions



Notes

- The information provided herein is subject to change without notice.
- For other information that does not show on this datasheet, please contact us for inquiry.