



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!



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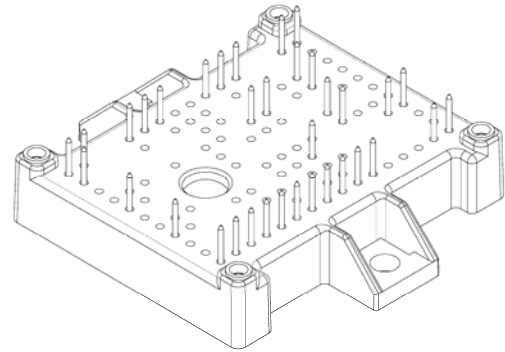
GCMS040A120B3C1

1.2kV 40 mohm SiC MOSFET 6-Pack Module



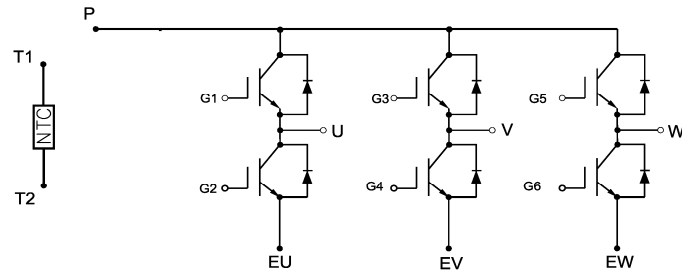
Features:

- Ultra Low Loss
- High-Frequency Operation
- Zero Reverse Recovery Current from SiC SBDs
- Small Turn-off Tail Current from SiC MOSFETs
- Normally-off Device Operation
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- Industrial Motor Drivers
- Solar Inverters
- UPS and SMPS
- Three-Phase PFC



Maximum Rated Values ($T_C=25^{\circ}\text{C}$ Unless otherwise specified)

Parameters	Symbol	Conditions	Specifications	Units
Drain - Source Voltage	V_{DS}		1200	V
Continuous Drain Current (Q1-Q4)	I_D	$V_{GS}=20\text{V}, T_C = 25^{\circ}\text{C}$	80	A
		$V_{GS}=20\text{V}, T_C = 80^{\circ}\text{C}$	40	A
Gate - Source Voltage	V_{GS}		+25/-10	V
Pulsed Drain Current	I_{DS}	Limited by T_{j_max}	150	A
Maximum Power Dissipation	P_D	$T_C = 25^{\circ}\text{C}$	220	W
		$T_C = 100^{\circ}\text{C}$	TBD	W
Operating Junction Temperature	T_j		-40 ~ +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}		-40 ~ +125	$^{\circ}\text{C}$
Solder Temperature	T_L	Max for 10 sec	260	$^{\circ}\text{C}$

Electrical Characteristics of MOSFETs ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Parameters	Symbol	Conditions	Min	Typ	Max	Units
OFF						
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 1200\text{V}, V_{GS} = 0\text{V}$	--	1	100	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = 20\text{V}$	--	--	± 250	nA
ON						
Gate-Source Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = 10\text{V}, I_D = 1\text{mA}$	1.9	2.2	--	V
On State Resistance	$R_{DS(ON)}$	$V_{GS} = 20\text{V}, I_D = 40\text{A}, T_j = 25^{\circ}\text{C}$	--	40	--	$\text{m}\Omega$
		$V_{GS} = 20\text{V}, I_D = 40\text{A}, T_j = 150^{\circ}\text{C}$	--	84	--	$\text{m}\Omega$
DYNAMIC						
Input Capacitance	C_{ISS}	$V_{DS} = 800\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	--	1893	--	pF
Output Capacitance	C_{OSS}		--	150	--	pF
Reverse Transfer Capacitance	C_{RSS}		--	10	--	pF
Module Stray Inductance	L_{\square}		--	TBD	--	nH
Module Lead Resistance	R_{mod}		--	TBD	--	$\text{m}\Omega$
SWITCHING						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 800\text{V}, I_D = 40\text{A}$ $R_G = 2.5\Omega, V_{GS} = -5/20\text{V}$ Inductive Load, $T_j = 25^{\circ}\text{C}$	--	15	--	ns
Rise Time	t_r		--	35	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	32	--	ns
Fall Time	t_f		--	26	--	ns
Turn-On Switching Energy Loss	E_{ON}		--	1.5	--	mJ
Turn-Off Switching Energy Loss	E_{OFF}		--	0.7	--	mJ
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 800\text{V}, I_D = 40\text{A}$ $R_G = 2.5\Omega, V_{GS} = -5/20\text{V}$ Inductive Load, $T_j = 125^{\circ}\text{C}$	--	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	$V_{DD} = 800\text{V}, I_D = 40\text{A}$ $V_{GS} = -5/20\text{V}$	--	115	--	nC
Gate-Source Charge	Q_{GS}		--	28	--	nC
Gate-Drain Charge	Q_{GD}		--	37	--	nC
Short Circuit Withstanding Time	t_{sc}	$V_{CC} = 800\text{V}, V_{GS} = 20\text{V}$ $T_j = 125^{\circ}\text{C}$	10	--	--	μs

SiC Freewheeling Diode Characteristics

Parameters	Symbol	Conditions	Min	Typ	Max	Units
Max continuous drain-source diode forward current	I_S			40		A
Max pulsed drain-source diode forward current	I_{SM}			120		A
Diode forward voltage	V_{SD}	$V_{GS}=-5V, I_{SD}=40A$		1.7		V
Reverse recovery charge	Q_C	$V_{GS}=-5V, I_{SD}=40A, T_j=25^\circ C$		203		nC

Thermal Characteristics

Parameters	Symbol	Conditions	Min	Typ	Max	Units
Thermal Resistance Junction to Case: MOSFET	R_{thJM}	$T_C=80^\circ C$		0.34		$^\circ C/W$
Thermal Resistance Junction to Case: SBD	R_{thJD}	$T_C=80^\circ C$		0.37		$^\circ C/W$

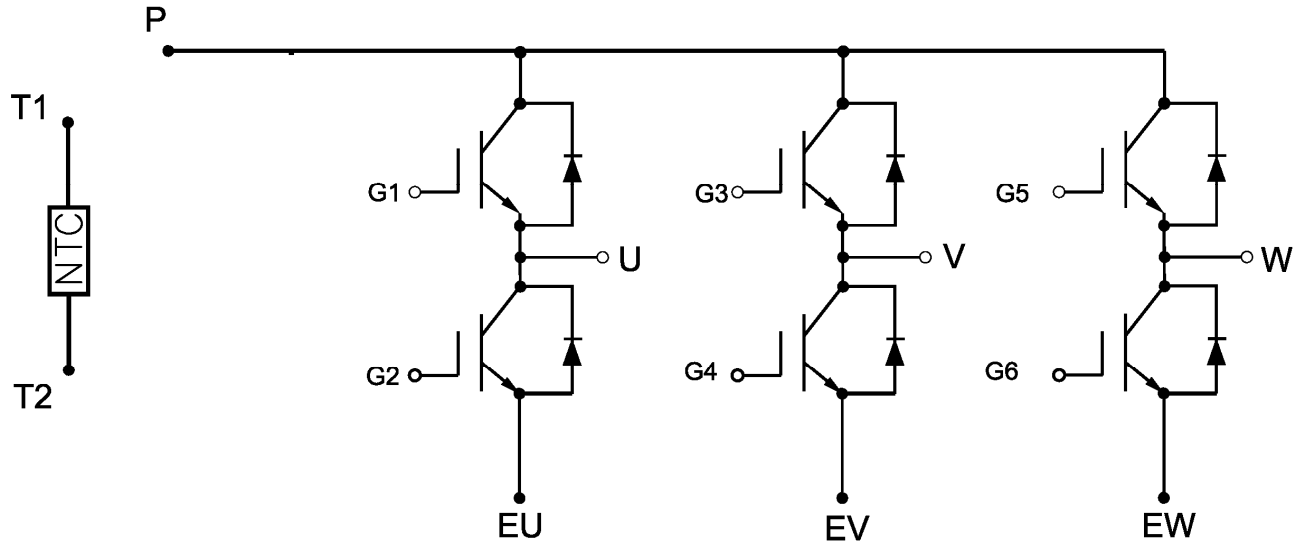
Internal NTC-Thermistor Characteristic

Symbol	Description	Min	Typ	Max	Unit
R_{25}	$T_C = 25^\circ C$		5		k Ω
$\Delta R/R$	$T_C = 100^\circ C, R_{100} = 481\Omega$			± 5	%
P_{25}	$T_C = 25^\circ C$		50		mW
$B_{25/50}$	$R_2 = R_{25} \exp[B_{25/50}(1/T_2 - 1/(298.15K))]$		3380		K
$B_{25/80}$	$R_2 = R_{25} \exp[B_{25/80}(1/T_2 - 1/(298.15K))]$		3440		K

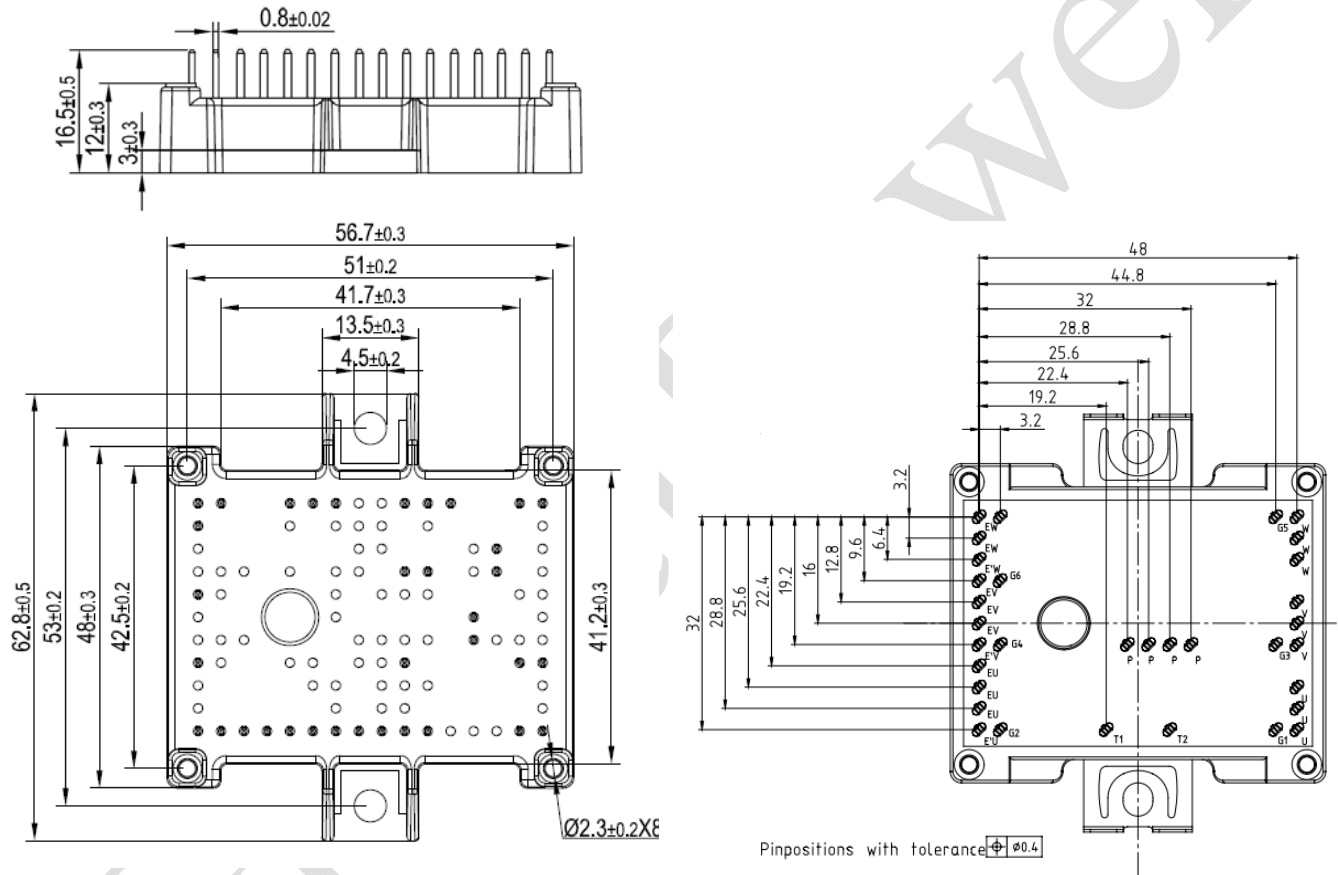
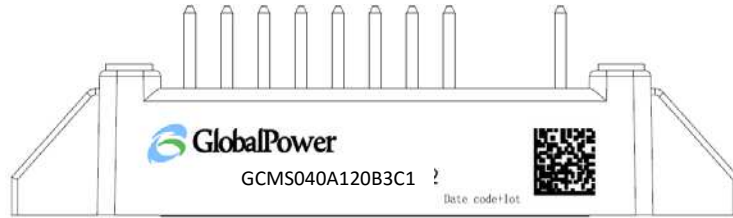
Module

Symbol	Description	Min	Typ	Max	Unit
V_{iso}	Isolation Voltage(All Terminals Shorted)			2500	V
	$f = 50Hz, 1minute$				
T_{JOP}	Maximum Operating Junction Temperature Range	-40		+150	$^\circ C$
T_{stg}	Storage Temperature	-40		+125	$^\circ C$
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)		0.05		$^\circ C/W$
T	Mounting Screw:M4	1.0		1.5	N·m
G	Weight		40		g

Internal Circuit:



Package Outline (Unit: mm):



Revision History

Date	Revision	Notes
4/13/2015	1.0	Initial release

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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 Chemical 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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