

WMD008M120G1AA

N-Channel SiC Power MOSFET

V_{DS}	=	1200	V
$R_{DS(on),typ}(T_J=25^{\circ}C)$	=	8.0	m Ω
$I_D(T_H=80^{\circ}C)$	=	150	A

Features

- High current density
- Low switching losses
- Low diode forward voltage
- Full-Bridge Module

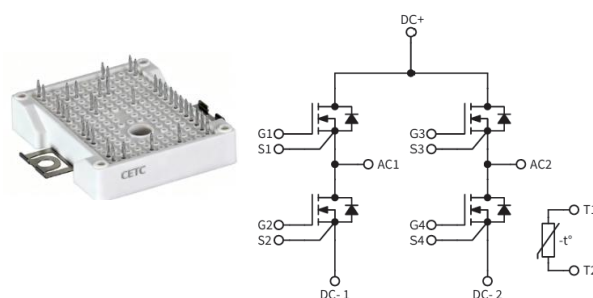
Benefits

- AlN ceramic substrate with low thermal resistance
- Press-FIT contact technology
- Integrated NTC temperature sensor
- Rugged mounting due to integrated mounting clamps

Applications

- EV Chargers
- High-Efficiency Converters/Inverters
- Renewable Energy
- Smart-Grid/Grid-Tied Distributed Generation

Package



Part Number	Package
WMD008M120G1AA	E2B

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	1200	V	$V_{GS}=0V, I_D=1mA$	
V_{GSmax}	Gate-Source Voltage	-10/+23	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5/+18	V	Recommended operational values	
I_D	Continuous Drain Current	190	A	$V_{GS}=18V, T_H=25^{\circ}C$	
		150		$V_{GS}=18V, T_H=80^{\circ}C$	
$I_{D(pulse)}$	Pulsed Drain Current	300	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	470	W	$T_H=25^{\circ}C, T_J=175^{\circ}C$	
T_J	Operating Junction Temperature	-40 to +175	$^{\circ}C$		
T_{STG}	Storage Temperature	-40 to +175	$^{\circ}C$		

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{GS(th)}$	Gate Threshold Voltage	2.0	2.8	4.0	V	$V_{DS}=V_{GS}, I_D=50\text{mA}$	
		/	2.0	/		$V_{DS}=V_{GS}, I_D=50\text{mA}, T_J=175^{\circ}\text{C}$	
I_{DSS}	Zero Gate Voltage Drain Current	/	/	100	μA	$V_{DS}=1200\text{V}, V_{GS}=0\text{V}$	
I_{GSS+}	Gate-Source Leakage Current	/	/	500	nA	$V_{DS}=0\text{V}, V_{GS}=23\text{V}$	
I_{GSS-}	Gate-Source Leakage Current	/	/	500	nA	$V_{DS}=0\text{V}, V_{GS}=-10\text{V}$	
$R_{DS(on)}$	Drain-Source On-State Resistance	/	7.5	9.8	$\text{m}\Omega$	$V_{GS}=18\text{V}, I_D=150\text{A}$	
		/	12.5	/		$V_{GS}=18\text{V}, I_D=150\text{A}, T_J=175^{\circ}\text{C}$	
g_{fs}	Transconductance	/	80	/	S	$V_{DS}=20\text{V}, I_{DS}=150\text{A}$	
		/	70	/		$V_{DS}=20\text{V}, I_{DS}=150\text{A}, T_J=175^{\circ}\text{C}$	
C_{iss}	Input Capacitance	/	9.0	/	nF	$V_{GS}=0\text{V}$	
C_{oss}	Output Capacitance	/	300	/	pF	$V_{DS}=800\text{V}$	
C_{rss}	Reverse Transfer Capacitance	/	20	/		$f=100\text{kHz}$	
E_{oss}	C_{oss} Stored Energy	/	152	/	μJ	$V_{AC}=25\text{mV}$	
$R_{G(int)}$	Internal Gate Resistance	/	0.65	/	Ω	$f=1\text{MHz}, V_{AC}=25\text{mV}$	
Q_{GS}	Gate to Source Charge	/	84	/	nC	$V_{DS}=800\text{V}$	
Q_{GD}	Gate to Drain Charge	/	42	/		$V_{GS}=-5\text{V}/18\text{V}$	
Q_G	Total Gate Charge	/	276	/		$I_D=150\text{A}$	

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.9	/	V	$V_{GS}=-5\text{V}, I_{SD}=75\text{A}, T_J=25^{\circ}\text{C}$	
		3.6	/		$V_{GS}=-5\text{V}, I_{SD}=75\text{A}, T_J=175^{\circ}\text{C}$	
I_S	Continuous Diode Forward Current	/	75	A	$T_H=80^{\circ}\text{C}$	

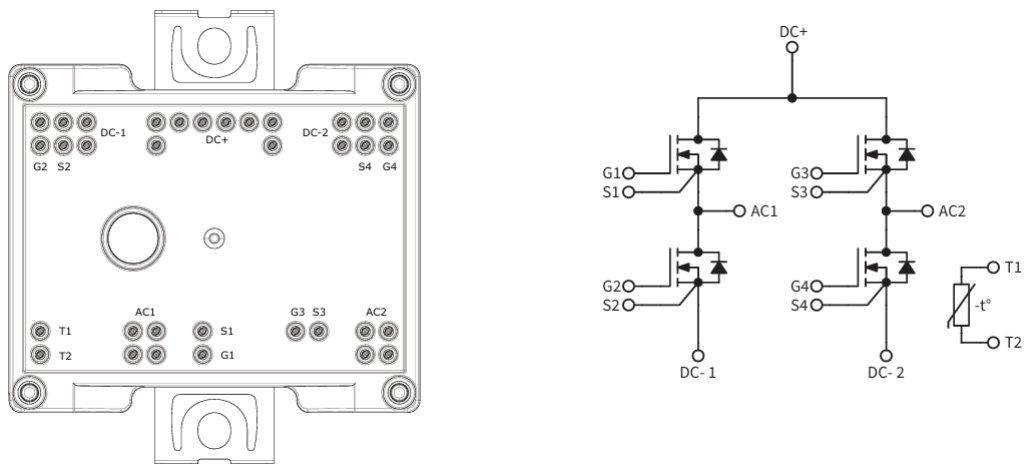
Package Characteristics

Symbol	Parameter	Note or test condition	Characteristics			Unit
			Min.	Typ.	Max.	
	Internal isolation	Basic insulation	/	AIN	/	
CTI	Comperative tracking index		200	/	/	
L_p	Stray inductance module		/	16	/	nH
R_{pkg}	Package Resistance	$T_H=80^{\circ}\text{C}$		0.5		$\text{m}\Omega$
V_{ISOL}	Isolation test voltage	RMS, f=50Hz, t=1min	3	/	/	kV
$R_{\theta JH}$	Thermal Resistance from Junction to Heatsink		/	0.32	/	$^{\circ}\text{C}/\text{W}$
d_{Creep}	Creepage distance	terminal to heatsink	/	11.5	/	mm
		terminal to terminal	/	6.3	/	
d_{Clear}	Clearance	terminal to heatsink	/	10.0	/	
		terminal to terminal	/	5.0	/	
F	Mounting force per clamp		40	/	80	N
G	Weight		/	40	/	g

NTC-Thermistor Characteristics

Symbol	Parameter	Value	Unit	Test Conditions	Note
T_{NTC}	NTC operating temperature range	-40 ~ +180	$^{\circ}\text{C}$		
R_{25}	NTC R25-value	$10 \pm 1\%$	$\text{k}\Omega$	$T_{NTC} = 25 \pm 1^{\circ}\text{C}$	
$B_{25/85}$	B-value	$3610 \pm 1\%$	K		

Schematic and Pin Out



Package information

