

WMD025M330G1AA

N-Channel SiC Power MOSFET

V_{DS}	=	3300	V
$R_{DS(on),typ}(T_J=25^{\circ}C)$	=	25	m Ω
$I_D(T_H=80^{\circ}C)$	=	85	A

Features

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

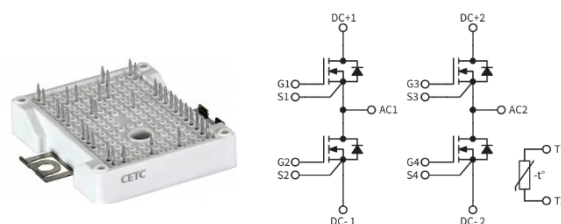
Benefits

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

Applications

- Solid State Transformers
- High-Efficiency Converters/Inverters
- Energy Storage Systems
- Renewable Energy
- DC Fast Chargers

Package



Part Number	Package
WMD025M330G1AA	E2B

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	3300	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	105	A	$V_{GS}=18V, T_H=25^{\circ}C$	
		85		$V_{GS}=18V, T_H=80^{\circ}C$	
$I_{D(pulse)}$	Pulsed Drain Current	210	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	680	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	2.6	4.0	V	V _{DS} =V _{GS} , I _D =36mA	
		/	1.8	/		V _{DS} =V _{GS} , I _D =36mA, T _J =175°C	
I _{DSS}	Zero Gate Voltage Drain Current	/	2	200	μA	V _{DS} =3300V, V _{GS} =0V	
I _{GSS+}	Gate-Source Leakage Current	/	20	500	nA	V _{DS} =0V, V _{GS} =23V	
I _{GSS-}	Gate-Source Leakage Current	/	20	500	nA	V _{DS} =0V, V _{GS} =-10V	
R _{DS(on)}	Drain-Source On-State Resistance	/	25	35	mΩ	V _{GS} =18V, I _D =100A	
		/	60	80		V _{GS} =18V, I _D =100A, T _J =175°C	
g _{fs}	Transconductance	/	42.8	/	S	V _{DS} =20V, I _{DS} =100A	
		/	40.4	/		V _{DS} =20V, I _{DS} =100A, T _J =175°C	
C _{iss}	Input Capacitance	/	10.1	/	nF	V _{GS} =0V V _{DS} =1700V f=1MHz V _{AC} =25mV	
C _{oss}	Output Capacitance	/	720	/	pF		
C _{rss}	Reverse Transfer Capacitance	/	36	/			
R _{G(int)}	Internal Gate Resistance	/	0.6	/	Ω	f=1MHz, V _{AC} =25mV	
Q _{GS}	Gate to Source Charge	/	144	/	nC	V _{DS} =1700V	
Q _{GD}	Gate to Drain Charge	/	108	/		V _{GS} =-5V/18V	
Q _G	Total Gate Charge	/	524	/		I _D =80A	

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.2	/	V	$V_{GS}=-5\text{V}, I_{SD}=50\text{A}, T_J=25^{\circ}\text{C}$	
		3.8	/		$V_{GS}=-5\text{V}, I_{SD}=50\text{A}, T_J=175^{\circ}\text{C}$	
I_S	Continuous Diode Forward Current	/	100	A	$T_H=80^{\circ}\text{C}$	

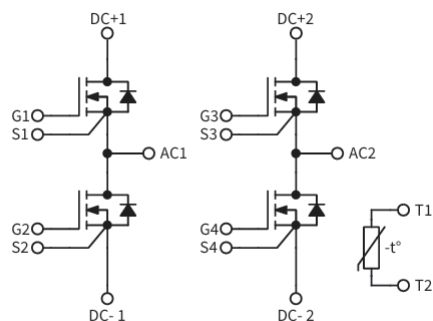
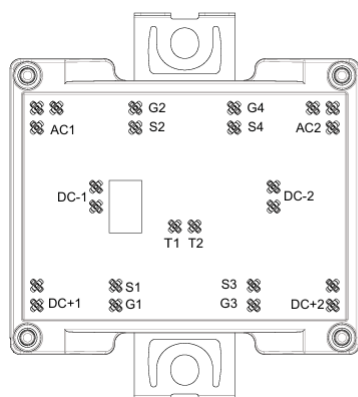
Package Characteristics

Symbol	Parameter	Note or test condition	Characteristics			Unit
			Min.	Typ.	Max.	
	Internal isolation	Basic insulation	/	AIN	/	
CTI	Comperative tracking index		600	/	/	
L _p	Stray inductance module		/	14	/	nH
R _{pkg}	Package Resistance	T _H =80°C		0.5		mΩ
V _{ISOL}	Isolation test voltage	RMS, f=50Hz, t=1min	6	/	/	kV
R _{θJH}	Thermal Resistance from Junction to Heatsink		/	0.22	/	°C/W
d _{Creep}	Creepage distance	terminal to heatsink	/	12.5	/	mm
		terminal to terminal	/	11.5	/	
d _{Clear}	Clearance	terminal to heatsink	/	12.5	/	
		terminal to terminal	/	10.0	/	
F	Mounting force per clamp		40	/	80	N
G	Weight		/	40	/	g

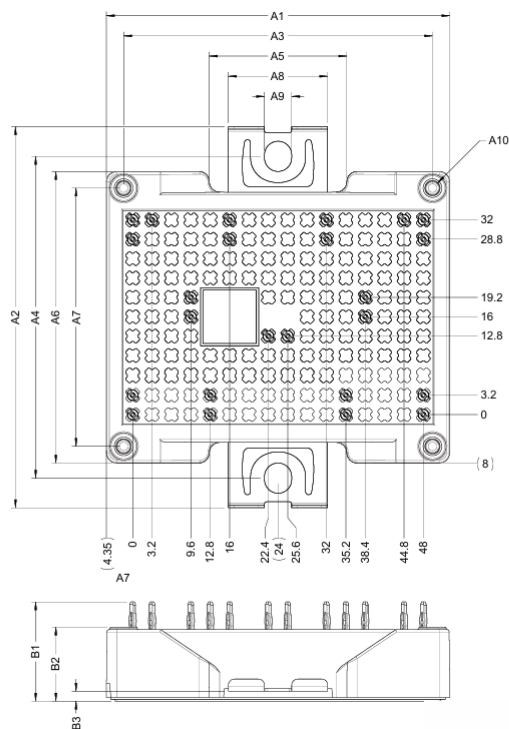
NTC-Thermistor Characteristics

Symbol	Parameter	Value	Unit	Test Conditions	Note
T _{NTC}	NTC operating temperature range	-40 ~ +180	°C		
R ₂₅	NTC R25-value	10 ± 1%	kΩ	T _{NTC} = 25 ± 1%°C	
B _{25/85}	B-value	3610 ± 1%	K		

Schematic and Pin Out



Package information



DIMENSION TABLE		
SYMBOL	DIMENSION	TOLERANCE
A1	56.7	±0.30
A2	62.8	±0.50
A3	51	±0.15
A4	(53)	REF.
A5	22.7	±0.30
A6	48	±0.30
A7	42.5	±0.15
A8	16.4	±0.20
A9	4.5	±0.10
A10	22.7	$\phi: \begin{matrix} +0 \\ -0.10 \end{matrix}$ $\Psi: \pm 0.30$
B1	16.4	±0.50
B2	12.25	±0.35
B3	1.65	±0.20
ALL PIN LOCATIONS		
		±0.40