MAXIMUM RATINGS

Rating	Symbol	Value	Unit
SiC MOSFET			
Drain Source Voltage	V_{DSS}	1200	V
Gate Source Voltage	V_{GS}	+22/ 10	V
Continuous Drain Current @ T_c = 80°C (T_J = 175°C)	I_D	145	A
Pulsed Drain Current (T_J = 150°C)	I_{Dpulse}	436	A
Maximum Power Dissipation (T_J = 175°C)	P_{tot}	382	W
Minimum Operating Junction Temperature	T_{JMIN}	40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C
THERMAL PROPERTIES			
Storage Temperature Range	T_{stg}	40 to 150	°C
INSULATION PROPERTIES			
Isolation Test Voltage, t = 1 s, 60 Hz	V_{is}	4800	V_{RMS}
Creepage Distance		12.7	mm
CTI		600	
Substrate Ceramic Material		Al_2O_3	
Substrate Ceramic Material Thickness		0.32	mm

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/or APPLICATION INFORMATION for Safe Operating parameters.

RECOMMENDED OPERATING RANGES

Rating	Symbol	Min	Max	Unit
Module Operating Junction Temperature	T_J	40	150	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
SiC MOSFET CHARACTERISTICS						
Zero Gate Voltage Drain Current	V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 25°C	I_{DSS}	–		400	μA
Drain Source On Resistance	V_{GS} = 18 V, I_D = 120 A, T_J = 25°C	$R_{DS(ON)}$	–	7.7	10.9	mΩ
	V_{GS} = 18 V, I_D = 120 A, T_J = 125°C			12.6		
	V_{GS} = 18 V, I_D = 120 A, T_J = 150°C		–	14.4	–	
	V_{GS} = 18 V, I_D = 120 A, T_J = 175°C			18.1		
Gate Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 60 mA	$V_{GS(TH)}$	2.04	2.4	4.4	V
Internal Gate Resistance		R_{GINT}		0.8		Ω
Gate Leakage Current	V_{GS} = 10 V / 22 V, V_{DS} = 0 V	I_{GSS}	–4			

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted) (continued)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
SiC MOSFET CHARACTERISTICS						
Turn on Delay Time	T_J = 25°C V_{DS}= 800 V, I_D = 120 A V_{GS} = 3 V / 18 V, R_G = 2 Ω	$t_{d(on)}$	–	17	–	ns
Rise Time		t_r	–	17	–	
Turn off Delay Time		$t_{d(off)}$	–	97	–	
Fall Time		t_f	–	12	–	
Turn on Switching Loss per Pulse		E_{ON}	–	1760	–	μJ
Turn off Switching Loss per Pulse		E_{OFF}	–	588	–	
Turn on Delay Time	T_J = 150°C V_{DS}= 800 V, I_D = 120 A V_{GS} = 3 V / 18 V, R_G = 2 Ω	$t_{d(on)}$	–	15	–	ns
Rise Time		t_r	–	15	–	
Turn off Delay Time		$t_{d(off)}$	–	110	–	
Fall Time		t_f	–	13	–	
Turn on Switching Loss per Pulse		E_{ON}	–	2155	–	μJ
Turn off Switching Loss per Pulse		E_{OFF}	–	745	–	
Diode Forward Voltage	V_{GS} = 3 V, I_{SD} = 120 A, T_J = 25°C	V_{SD}	–	4.67	6.2	V
	V_{GS} = 3 V, I_{SD} = 120 A, T_J = 125°C		–	4.45	–	
	V_{GS} = 3 V, I_{SD} = 120 A, T_J = 150°C					

TYPICAL CHARACTERISTICS

M1/M2 SIC MOSFET CHARACTERISTIC

Figure 8. Switching on Loss vs. Drain Current V_{DS} = 600 V

Figure 9. Switching on Loss vs. Gate Resistance V_{DS} = 600 V

Figure 10. Switching off Loss vs. Drain Current V_{DS} = 600 V

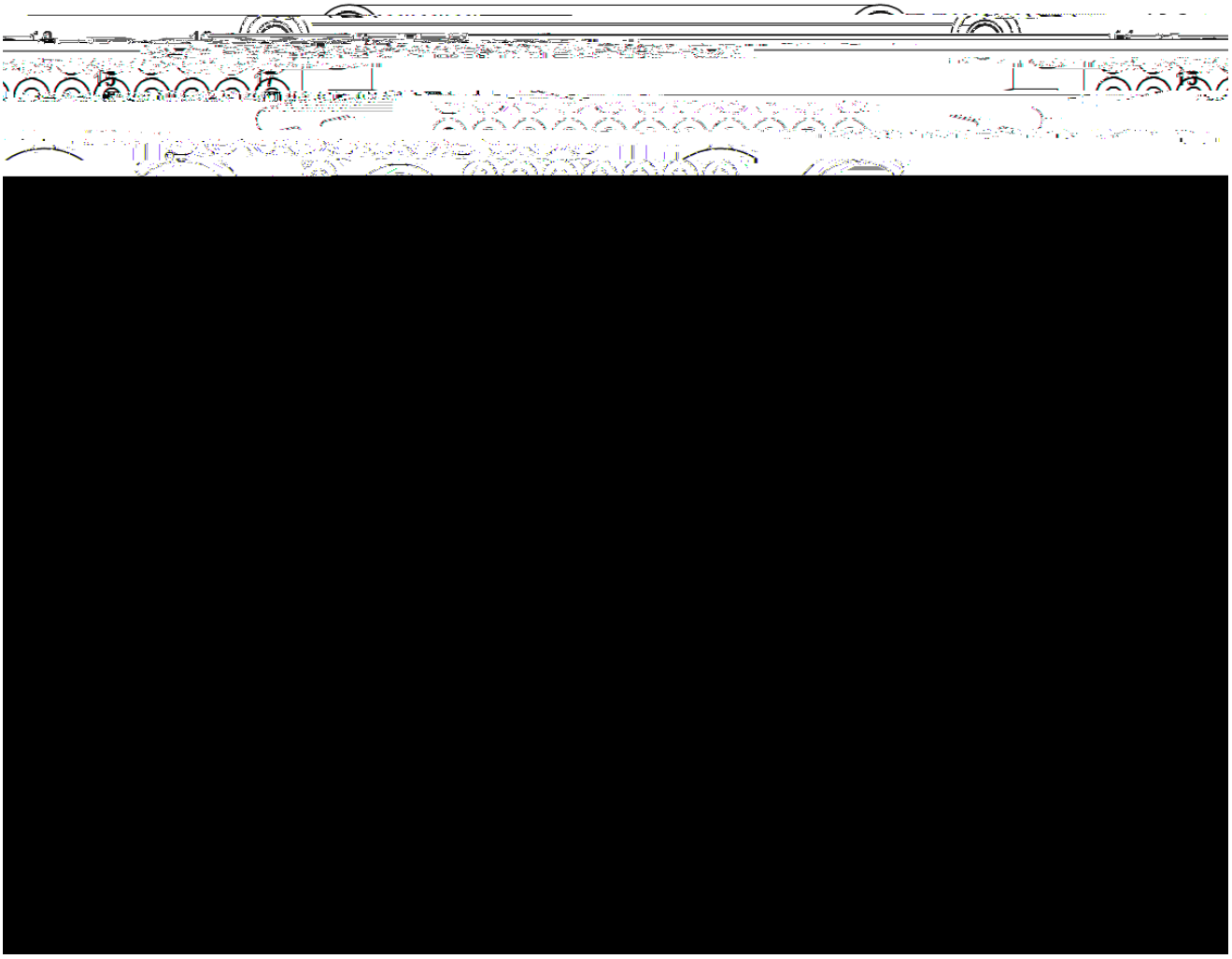
Figure 11. Switching off Loss vs. Gate Resistance V_{DS} = 600 V

Figure 12. Switching on Loss vs. Drain Current V_{DS} = 800 V

Figure 13. Switching on Loss vs. Gate Resistance V_{DS} = 800 V

PIN POSITION INFORMATION

scale = 2.5 : 1



PIM18 33.8x42.5 (PRESS FIT)
CASE 180BW
ISSUE B

DATE 30 APR 2021

GENERIC
MARKING DIAGRAM*