

1700V 3A N-Channel SiC MOSFET

Features

- Low On-Resistance
- Low Capacitance
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

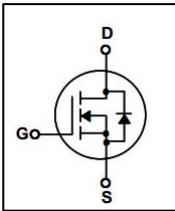
BENEFITS

- Higher System Efficiency
- Parallel Device Convenience
- High Temperature Application
- High Frequency Operation

Application

- Switch Mode Power Supply (SMPS)
- Power Factor Correction (PFC)
- Uninterruptible Power Supply (UPS)
- EV Charging station & Motor Drives
- Solar/ Wind Renewable Energy
- Power Inverters & DC/DC Converters

SYMBOL



TO-247

ASSEMBLY MESSAGE

Product Name	Package	Packaging
BXW3M1K7H	TO-247	Tube

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Parameter		Symbol	Rating	Unit
			TO-247	
Drain-Source Voltage		V _{DSS}	1700	V
Continuous Drain Current	T _C = 25°C, V _{GS} =20V	I _D	3	A
Single Pulse Avalanche Energy	L=10mH	E _{AS}	88	mJ
	L=10mH	I _{AS}	4.2	A
Pulsed Drain Current		I _{DM}	12	A
Recommend Gate Source Voltage(Static)		V _{GS,op}	-3/+20	V
Maximum Gate Source Voltage(AC (f > 1Hz))		V _{GS,max}	-5/+25	V
Power Dissipation	T _C =25°C	P _D	69	W
Soldering Temperature		T _L	260	°C
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	150,-55~150	°C
Thermal Resistance, Junction to Case		R _{θJC}	1.81	°C / W

ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise Noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	1700			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$			10	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$			250	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=10V, I_D=1mA$	2.5		4.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=20V, I_D=1.5A$		1.1	1.32	Ω
		$V_{GS}=18V, I_D=1.5A$		1.14	1.37	
		$V_{GS}=15V, I_D=1.5A$		1.23	1.48	
		$V_{GS}=20V, I_D=1.5A, T_J=150^{\circ}\text{C}$		1.69		
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=1000V, V_{GS}=0V,$ $f=1MHz, V_{AC}=25mV$		125		pF
Output Capacitance	C_{OSS}			17.6		pF
Reverse Transfer Capacitance	C_{RSS}			4.4		pF
SWITCHING PARAMETERS						
Total Gate Charge(Note2)	Q_G	$V_{DS}=1200V,$ $V_{GS}=-3/+20V,$ $I_D=3A$		15		nC
Gate Source Charge	Q_{GS}			3		nC
Gate Drain Charge	Q_{GD}			9		nC
Gate plateau voltage	V_{pl}			7.2		V
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=800V, I_D=3A,$ $V_{GS}=-3/+20V, R_G=25\Omega$		36		ns
Turn-ON Rise Time	t_R			55		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			30		ns
Turn-OFF Fall-Time	t_F			46		ns
Internal Gate Resistance	$R_{G(int.)}$	$f=1MHz, V_{AC}=25mV$		6		Ω
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=1.5A, V_{GS}=-3V$		5.5		V
Continuous Diode Forward Current	I_S	$V_{GS}=-3V$		3		A
Reverse Recovery Time	t_{rr}	$V_{GS}=-3/+20V, I_F=3A,$ $V_{DS}=400V,$ $di/dt=300A/\mu s$		8		ns
Reverse Recovery Charge	Q_{rr}			5.5		nC
Peak Reverse Recovery Current	I_{rrm}			1		A

TYPICAL CHARACTERISTICS

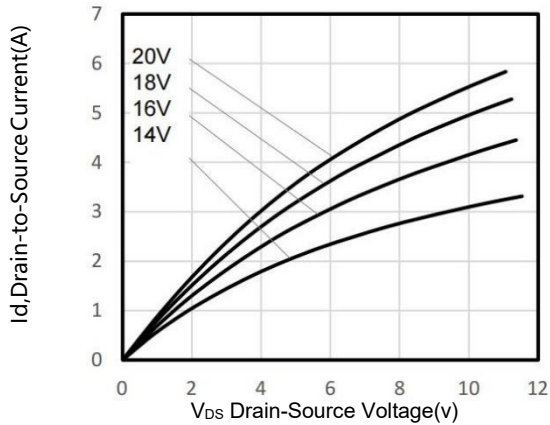


Figure1. Typical Output Characteristics

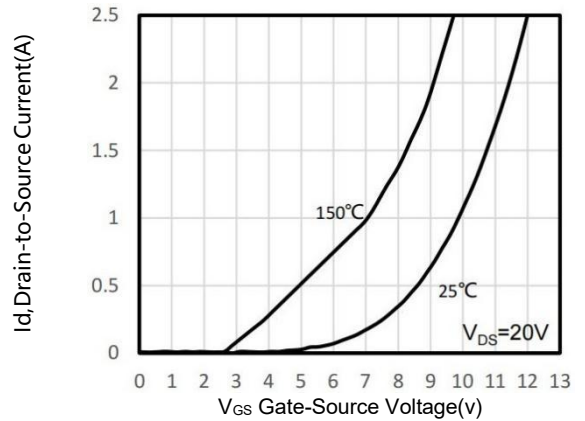


Figure2. Typical Transfer Characteristics

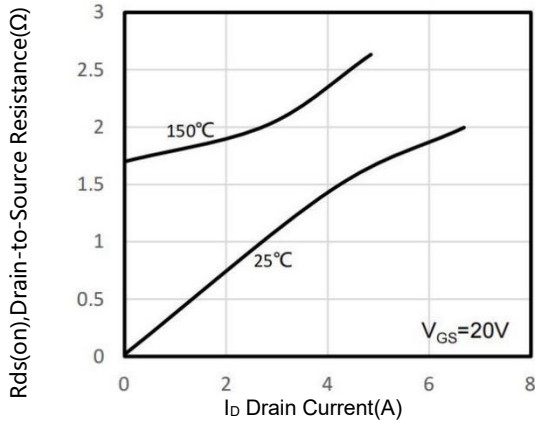


Figure3. On-Resistance versus Drain Current

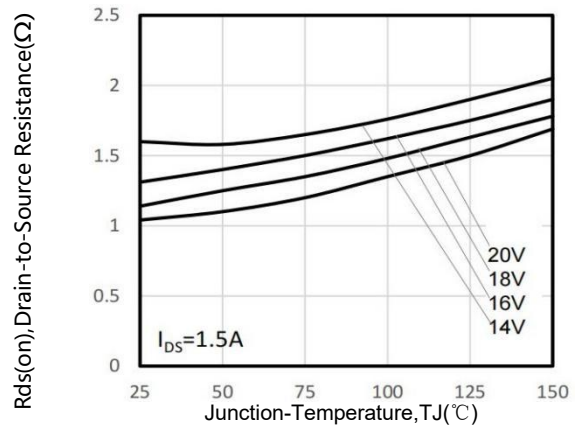


Figure4. On-Resistance versus Temperature for Various Gate Voltage

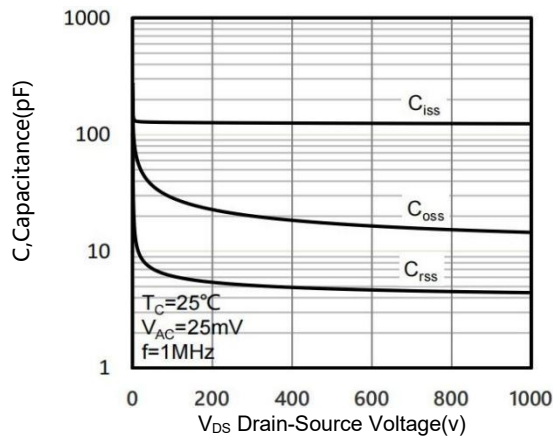


Figure5. Typical Capacitance versus VDS

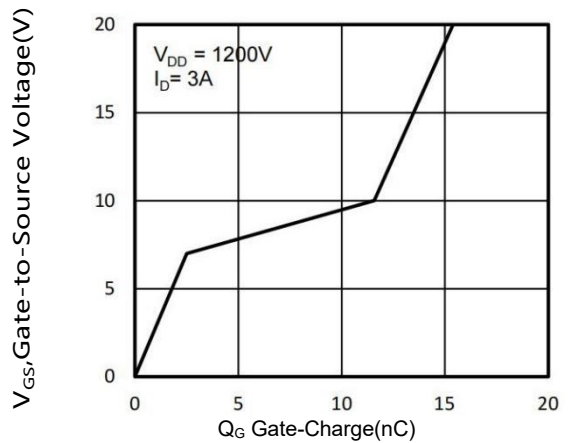


Figure6. Typical Gate Charge versus VGS

TYPICAL CHARACTERISTICS(Cont.)

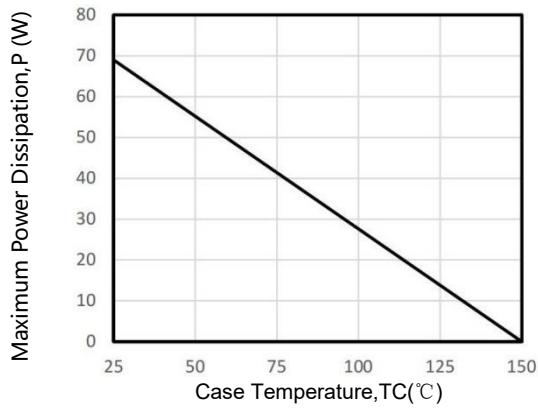


Figure7. Maximum Power Dissipation Derating versus Case Temperature

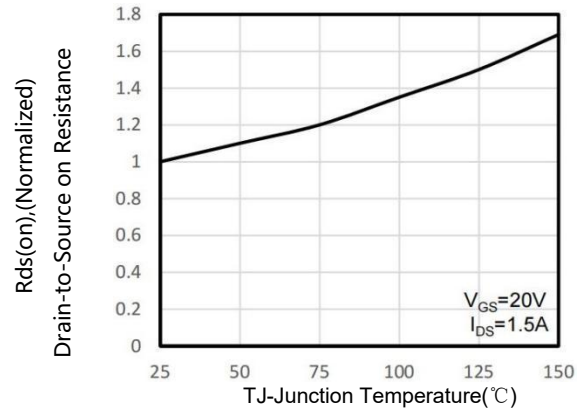


Figure8. On-Resistance Variation with Temperature

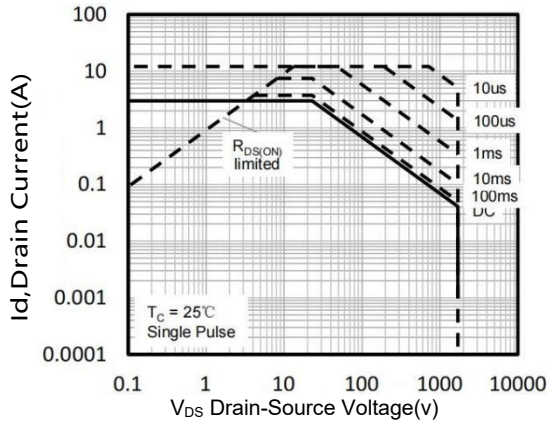


Figure9. Maximum Safe Operating Area

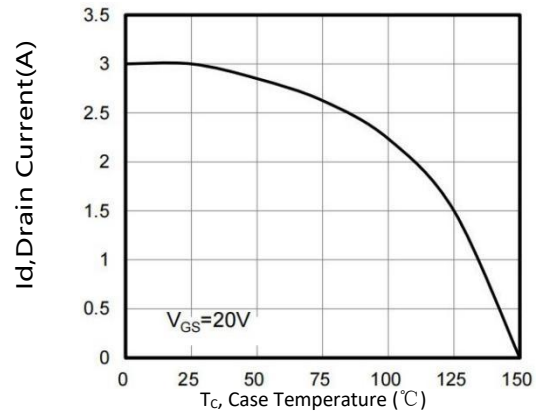


Figure10. Maximum Continuous Drain Current versus Case Temperature

Revision history**Document revision history**

Date	Revision	Changes
12-Mar-2022	1.0	First release

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