1700V 3A N-Channel SiC MOSFET

Features

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

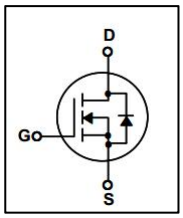
BENEFITS

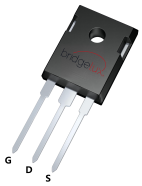
- Higher System Efficiency
- Parallel Device Convenience
- High Temperature Application
- High Frequency Operation

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，VGS=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		$R_{\theta JC}$	1.81	°C / W

ELECTRICAL CHARACTERISTICS（T_J=25℃,unless otherwise Noted）

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V, ID=250μA	1700			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=1200V, VGS=0V			10	uA
Gate-Body Leakage Current, Forward	I_{GSS}	VGS=20V,VDS = 0V			250	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	VDS=10V, ID=1mA	2.5		4.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=20V, ID=1.5A		1.1	1.32	Ω
		VGS=18V, ID=1.5A		1.14	1.37	
		VGS=15V, ID=1.5A		1.23	1.48	
		VGS=20V, ID=1.5A, TJ=150℃		1.69		
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	VDS=1000V,VGS=0V, f=1MHz,VAC=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	VDS =1200V, VGS =-3/+20 V, ID=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	$t_{D(ON)}$	VDS=800V, ID=3A, VGS = -3/+20 V ,RG=25Ω		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, VAC=25mV		6		Ω
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	IS=1.5A, VGS=-3V		5.5		V
Continuous Diode Forward Current	I_S	VGS = -3V		3		A
Reverse Recovery Time	t_{rr}	VGS = -3/+20V,IF = 3A, VDS=400V, di/dt =300A /μs		8		ns
Reverse Recovery Charge	Q_{rr}			5.5		nC
Peak Reverse Recovery Current	I_{rrm}			1		A

TYPICAL CHARACTERISTICS

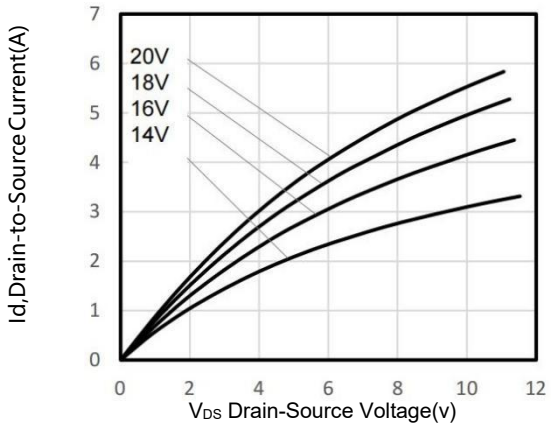


Figure1. Typical Output Characteristics

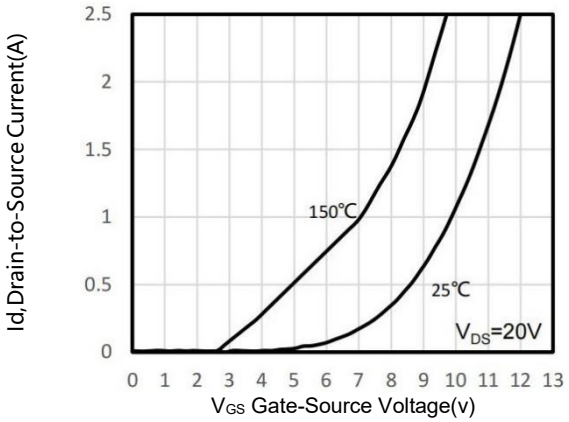


Figure2. Typical Transfer Characteristics

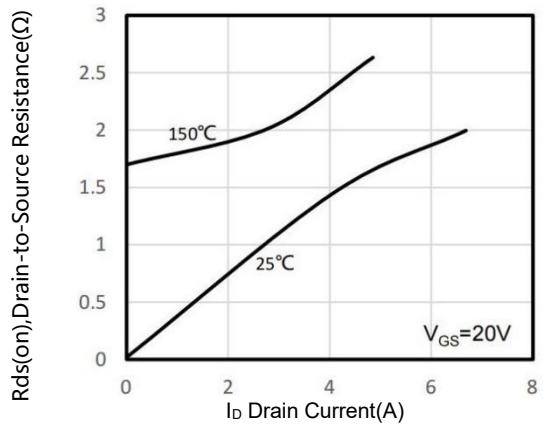


Figure3. On-Resistance versus Drain Current

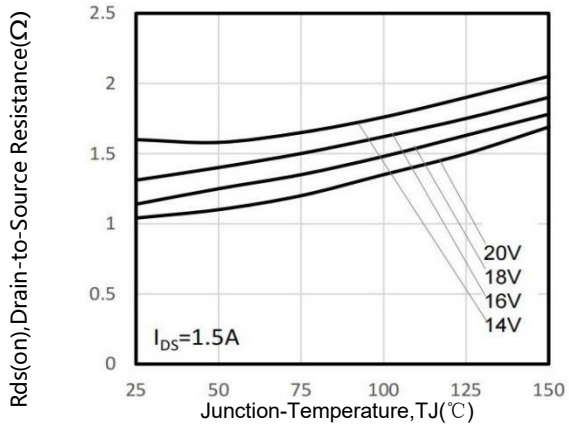


Figure4. On-Resistance versus Temperature for Various Gate Voltage

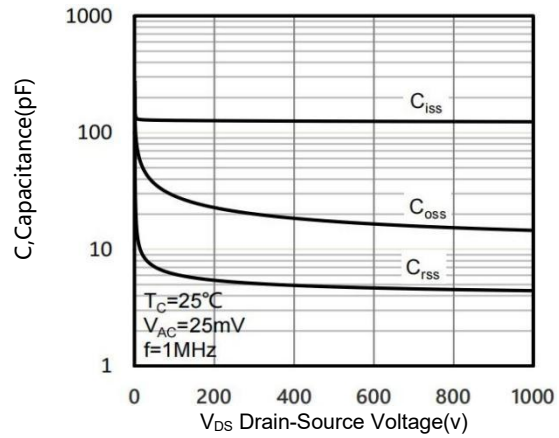


Figure5. Typical Capacitance versus V_{DS}

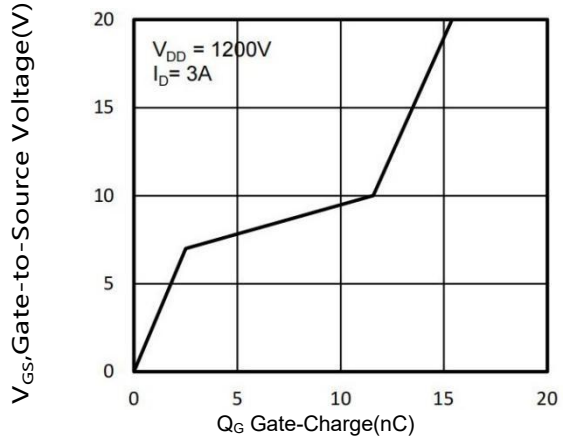


Figure6. Typical Gate Charge versus V_{GS}

TYPICAL CHARACTERISTICS(Cont.)

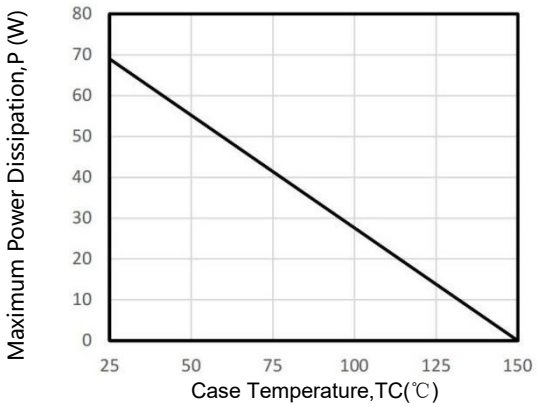


Figure7. Maximum Power Dissipation Derating versus Case Temperature

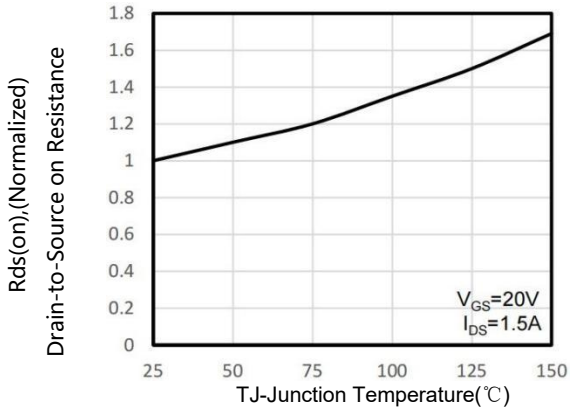


Figure8. On-Resistance Variation with Temperature

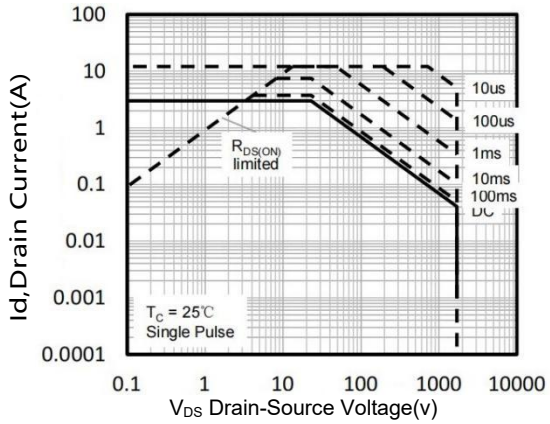


Figure9. Maximum Safe Operating Area

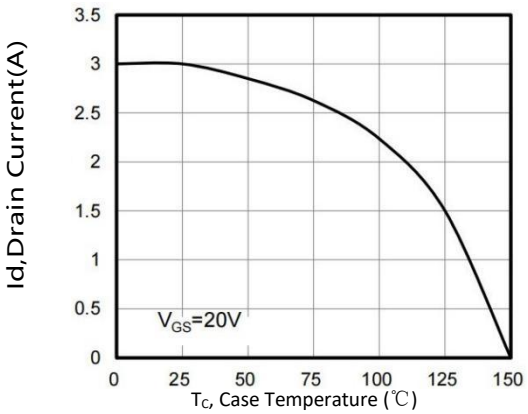


Figure10. Maximum Continuous Drain Current versus Case Temperature

Revision history

Document revision history

Date	Revision	Changes
12-Mar-2022	1.0	First release

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