

1200V 60A N-Channel SiC MOSFET

Features

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

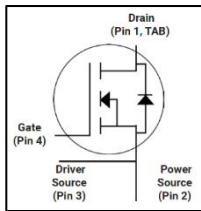
BENEFITS

- 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-247-4L

ASSEMBLY MESSAGE

Product Name	Package	Packaging
BXW60M1K2J	TO-247-4L	Tube

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

Parameter	Symbol	Rating	Unit
		TO-247-4L	
Drain-Source Voltage	V _{DSS}	1200	V
Continuous Drain Current	T _C = 25°C, V _{GS} =18V I _D	60	A
Single Pulse Avalanche Energy	L=10mH E _{AS}	460	mJ
	L=10mH I _{AS}	9.6	A
Pulsed Drain Current	I _{DM}	240	A
Recommend Gate Source Voltage(Static)	V _{GS,op}	-3/+18	V
Maximum Gate Source Voltage(AC (f > 1Hz))	V _{GS,max}	-5/+22	V
Power Dissipation	T _C =25°C P _D	271.7	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}	0.46	°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}	$V_{GS}=0V, I_D=250\mu A$	1200			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$			10	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=18V, V_{DS}=0V$			250	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=10V, I_D=5mA$	1.5		3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=20V, I_D=30A$		36	43	m Ω
		$V_{GS}=18V, I_D=30A$		40	48	
		$V_{GS}=15V, I_D=30A$		50	60	
		$V_{GS}=18V, I_D=30A, T_J=150^{\circ}\text{C}$		80		
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=1000V, V_{GS}=0V,$ $f=1MHz, V_{AC}=25mV$		2400		pF
Output Capacitance	C_{OSS}			120		pF
Reverse Transfer Capacitance	C_{RSS}			18		pF
SWITCHING PARAMETERS						
Total Gate Charge(Note2)	Q_G	$V_{DD}=800V,$ $V_{GS}=-3/+18V,$ $I_D=30A$		170		nC
Gate Source Charge	Q_{GS}			10		nC
Gate Drain Charge	Q_{GD}			48		nC
Gate plateau voltage	V_{pl}			2.6		V
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=800V, I_D=30A,$ $V_{GS}=-3/+18V, R_G=25\Omega$		45		ns
Turn-ON Rise Time	t_R			119		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			123		ns
Turn-OFF Fall-Time	t_F			145		ns
Internal Gate Resistance	$R_{G(int.)}$	$f=1MHz, V_{AC}=25mV$		2.4		Ω
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=30A, V_{GS}=-3V$		4.6		V
Continuous Diode Forward Current	I_S	$V_{GS}=-3V$		60		A
Reverse Recovery Time	t_{rr}	$V_{GS}=-3/+18V, I_F=60A,$ $V_{DS}=400V,$ $di/dt=500A/\mu s$		62		ns
Reverse Recovery Charge	Q_{rr}			298		nC
Peak Reverse Recovery Current	I_{rrm}			10		A

TYPICAL CHARACTERISTICS

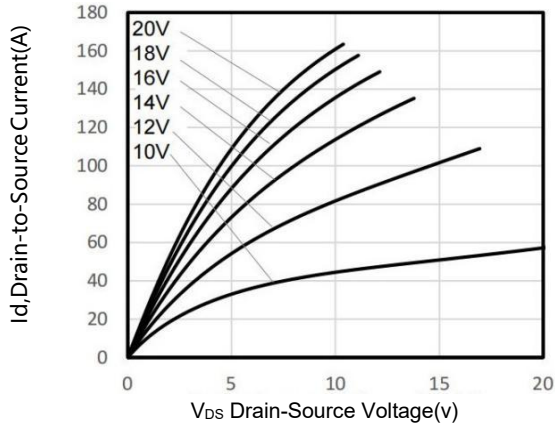


Figure1. Typical Output Characteristics

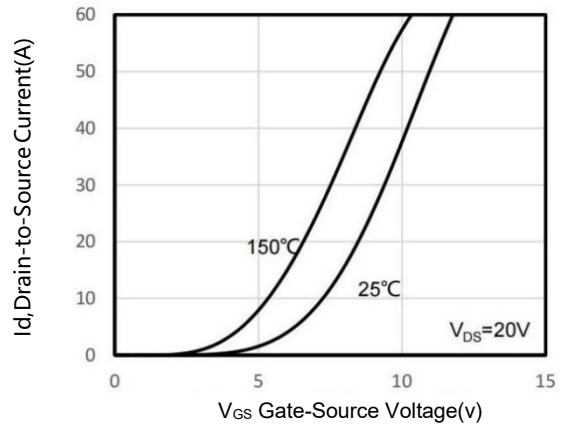


Figure2. Typical Transfer Characteristics

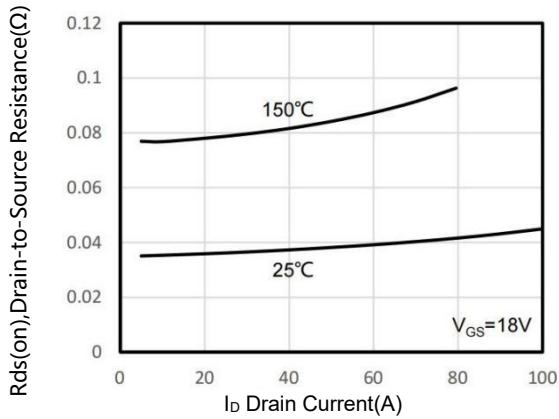


Figure3. On-Resistance versus Drain Current

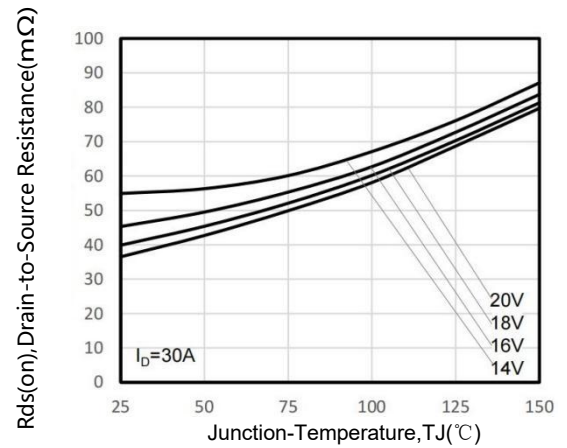


Figure4. On-Resistance versus Temperature for Various Gate Voltage

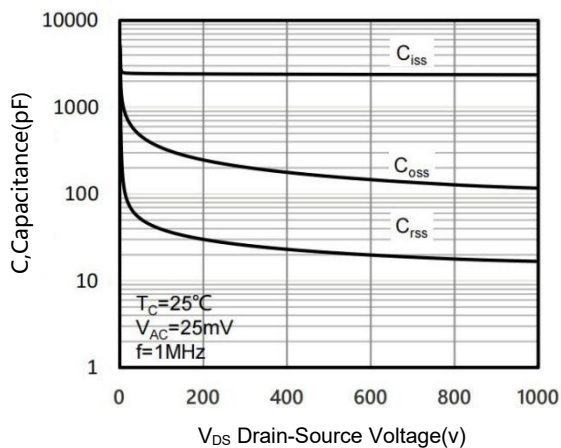


Figure5. Typical Capacitance versus VDS

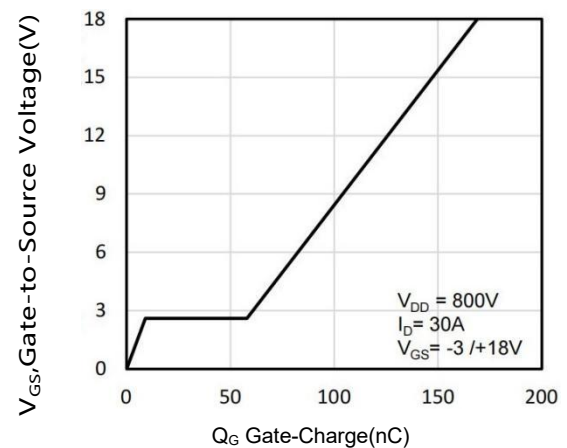


Figure6. Typical Gate Charge versus VGS

TYPICAL CHARACTERISTICS(Cont.)

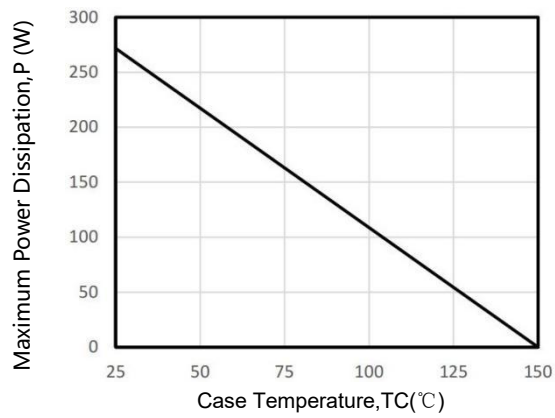


Figure7. Maximum Power Dissipation Derating versus Case Temperature

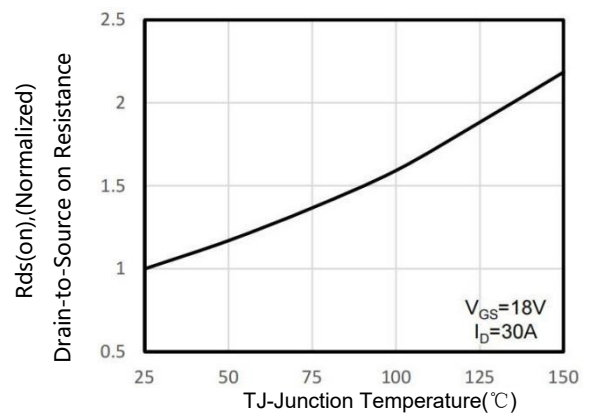


Figure8. On-Resistance Variation with Temperature

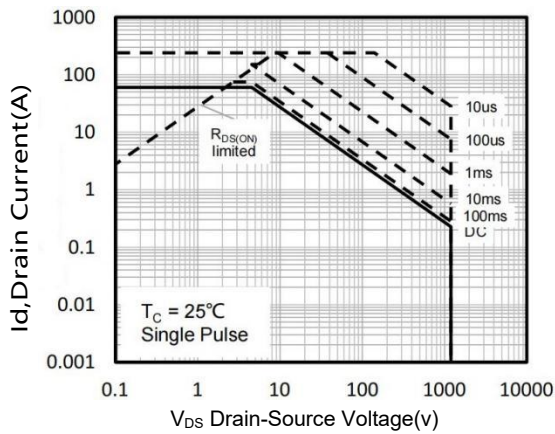


Figure9. Maximum Safe Operating Area

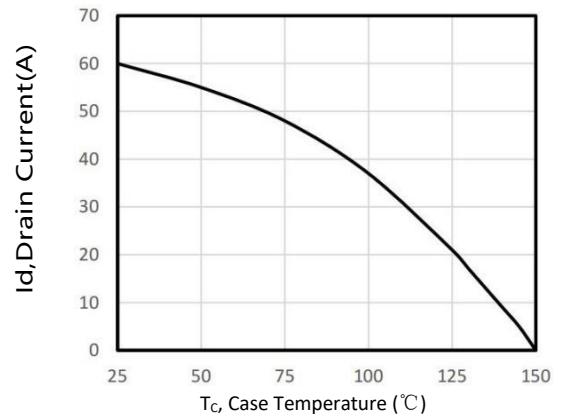
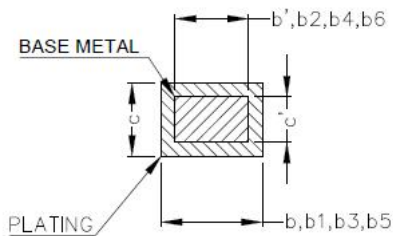
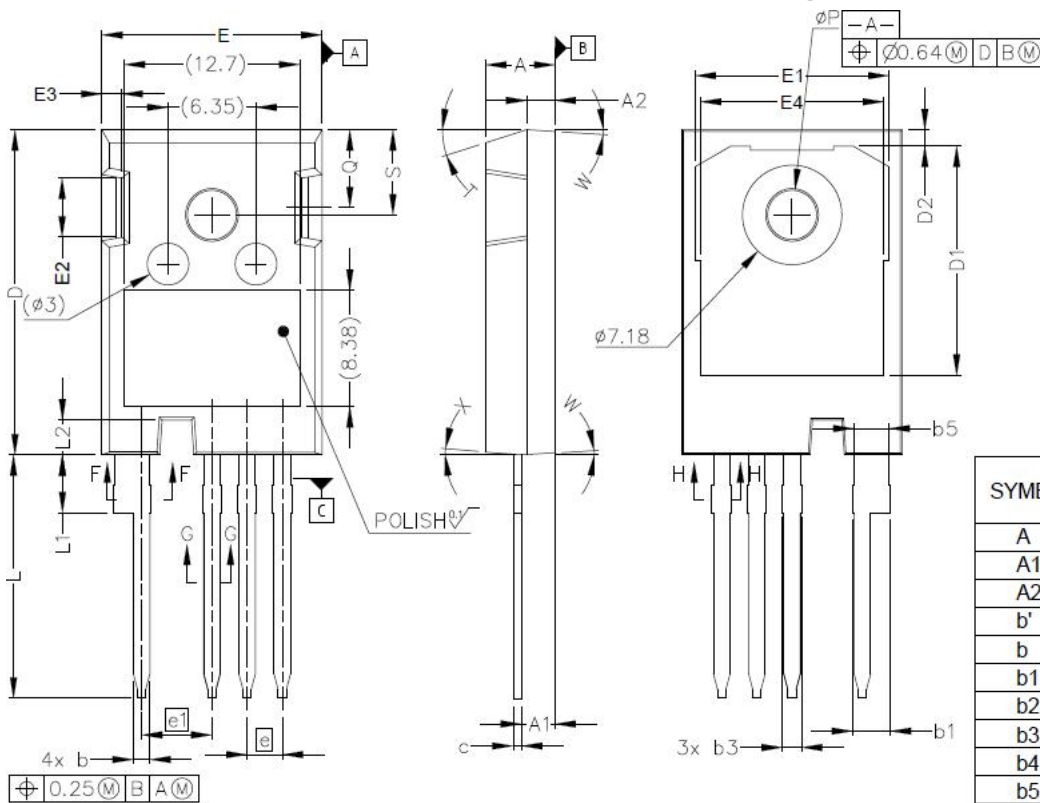


Figure10. Maximum Continuous Drain Current versus Case Temperature

TO-247-4L Package



SYMBOL	MILLIMETERS	
	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	2.39	2.94
b2	2.39	2.84
b3	1.07	1.60
b4	1.07	1.50
b5	2.39	2.69
b6	2.39	2.64
c'	0.55	0.65
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
N	4	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
øP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5° REF.	
X	4° REF.	

Revision history**Document revision history**

Date	Revision	Changes
22-Jan-2022	1.0	First release

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