BC018SG12SWSD

N-Channel Silicon Carbide Power MOSFET

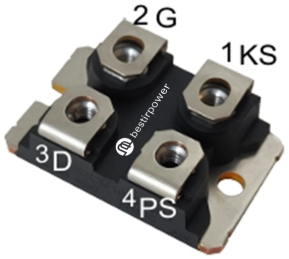
1200 V, 110 A , 18mΩ

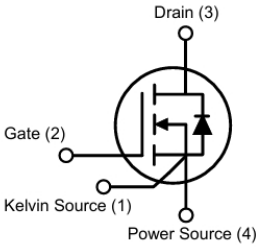
bestirpower

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

$BV_{DSS,Tc=25℃}$	$I_{D,Tc=25℃}$	$R_{DS(on),typ.Tc=25℃}$	$Q_{g,typ}$
1200 V	110 A	18 mΩ	204 nC





Benefits

- System efficiency improvement
- Higher frequency applicability
- Increased power density
- Reduced cooling effort

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Motor Drives
- Pulsed Power applications

RoHS compliant

HF

Absolute Maximum Ratings (T_J = 25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage		1200	V
V_{GSmax}	Gate to Source Voltage		-8 / +22	V
V_{GSop}	Recommended Operation Value		-5 / +18	V
I_D	Drain Current	Continuous (V_{GS}=18V, T_C = 25℃)	110	A
		Continuous (V_{GS}=18V, T_C = 100℃)	85	
I_{DM}	Drain Current	Pulsed (Note1)	400	A
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 175	℃

※Note 1 : Limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.27	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	32	
Tsold	Soldering temperature, wave soldering only allowed at leads	260	℃

Electrical Characteristics (T_J = 25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D = 100 μA	1200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 1200 V, V_{GS} = 0 V	-	10	100	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = 18 V, V_{DS} = 0 V	-	20	200	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS} = 20 mA, T_C = 25℃	2.0	3.0	4.0	V
		V_{GS} = V_{DS}, I_{DS}= 20 mA, T_C = 175℃	-	2.3	-	
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 18 V, I_D= 60 A, T_C = 25℃	-	18	25	mΩ
		V_{GS} = 18 V, I_D = 60 A, T_C = 175℃	-	26	-	
g_{fs}	Transconductance	V_{DS} = 20 V, I_D = 60 A, T_J = 25℃	-	50	-	S
		V_{DS} = 20 V, I_D = 60 A, T_J = 175℃	-	48	-	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 1000 V, V_{GS} = 0V, f = 1 MHz, V_{AC}=25mV	-	5880	-	pF
C_{oss}	Output Capacitance		-	192	-	
C_{rss}	Reverse Capacitance		-	10	-	
$Q_{g(tot)}$	Total Gate Charge	V_{DD}=800V, V_{GS}=-5/18V,I_D= 60A	-	204	-	nC
Q_{gs}	Gate to Source Charge		-	65	-	
Q_{gd}	Gate to Drain “Miller” Charge		-	80	-	
R_G	Internal Gate Resistance	f = 1 MHz, V_{AC}=25mV open drain	-	1.0	-	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=800V, V_{GS}=-5/18V, I_D= 60A, $R_{G(ext)}$ = 10Ω	-	50	-	ns
t_r	Turn-On Rise Time		-	80	-	
$t_{d(off)}$	Turn-Off Delay Time		-	100	-	
t_f	Turn-Off Fall Time		-	60	-	
E_{on}	Turn-on Switching Energy	V_{DS}=800V, V_{GS}=-5/18V, I_D= 60A, $R_{G(ext)}$ = 10Ω	-	1650	-	μJ
E_{off}	Turn-off Switching Energy		-	400	-	
Source-Drain Diode Characteristics						
I_S	Maximum Continuous Diode Forward Current		-	-	110	A
V_{SD}	Diode Forward Voltage	V_{GS} = -5V, I_{SD} = 60 A, T_J = 25℃	-	4.2	-	V
		V_{GS} = -5V, I_{SD} = 60 A, T_J = 175℃	-	3.6	-	
t_{rr}	Reverse Recovery Time	V_R = 800 V, V_{GS}=-5V, I_{SD} = 60 A, di_f/dt = 1200 A/μs	-	200	-	ns
Q_{rr}	Reverse Recovery Charge		-	1250	-	nC
I_{rrm}	Peak Reverse Recovery Current		-	25	-	A

Typical Performance Characteristics

Figure 1. Output Characteristics T_J =25 °C

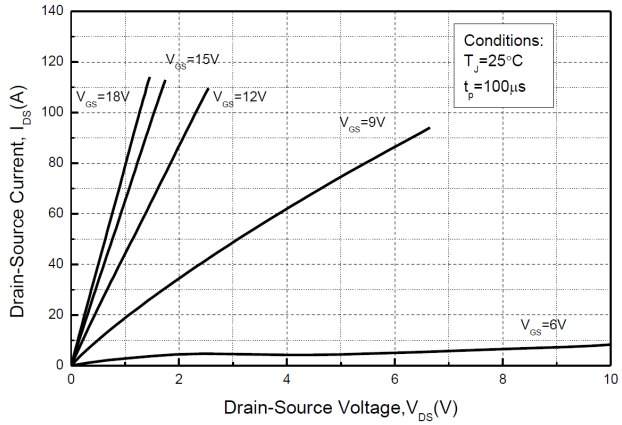


Figure 2. Output Characteristics T_J = 175 °C

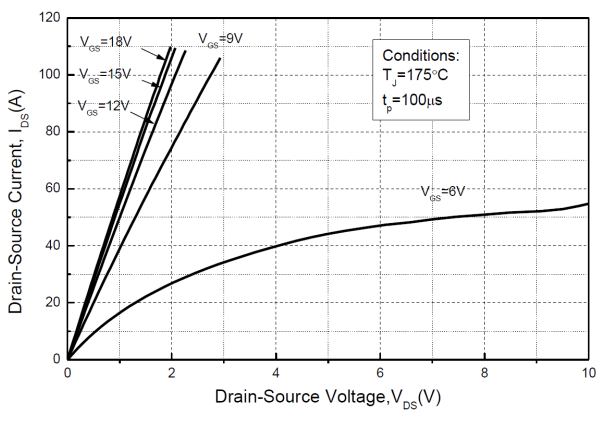


Figure 3. Capacitances vs. Drain-Source Voltage

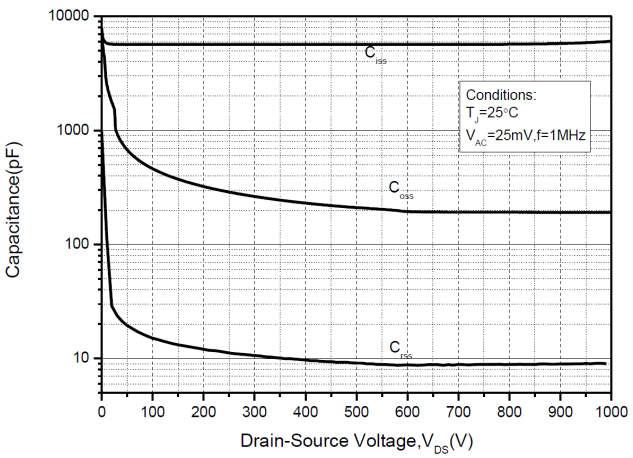


Figure 4. On-Resistance Characteristics vs. Temperature

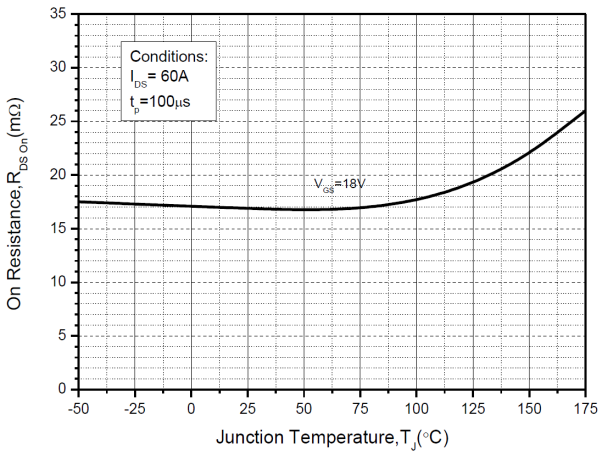


Figure 5. Threshold Voltage vs. Temperature

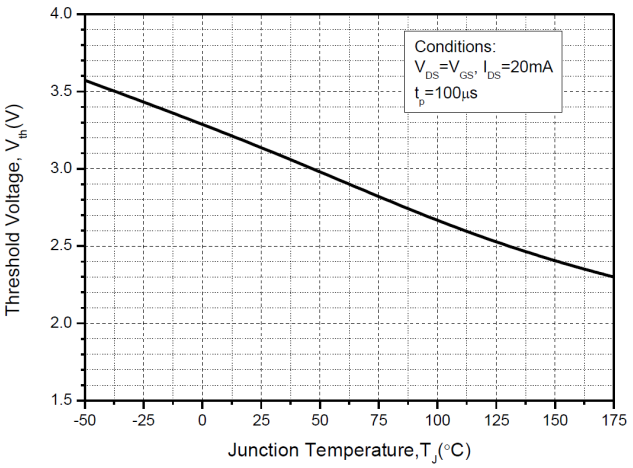
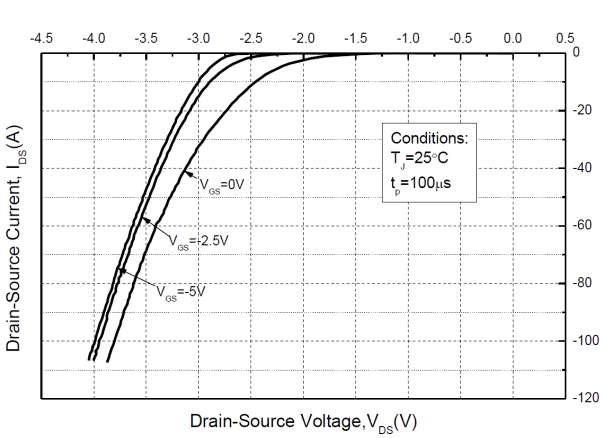


Figure 6. Body Diode Characteristics T_J =25 °C



Typical Performance Characteristics

Figure 7. .Body Diode Characteristics T_J =175 °C

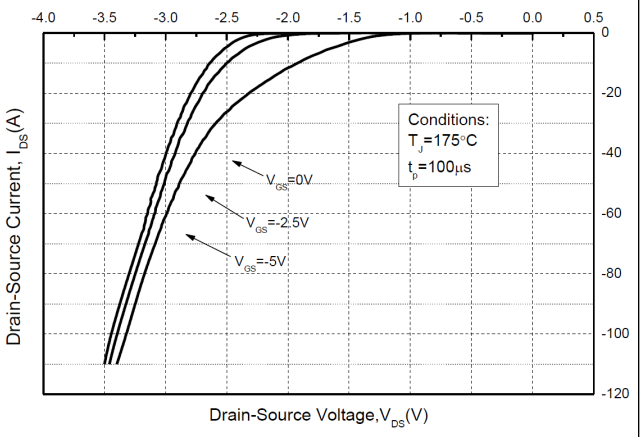


Figure 8. Gate Charge Characteristics

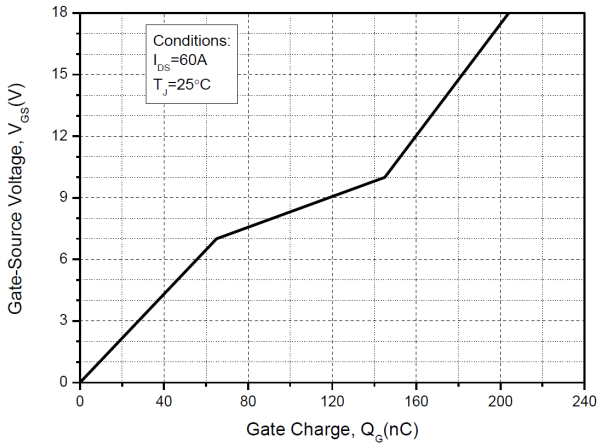
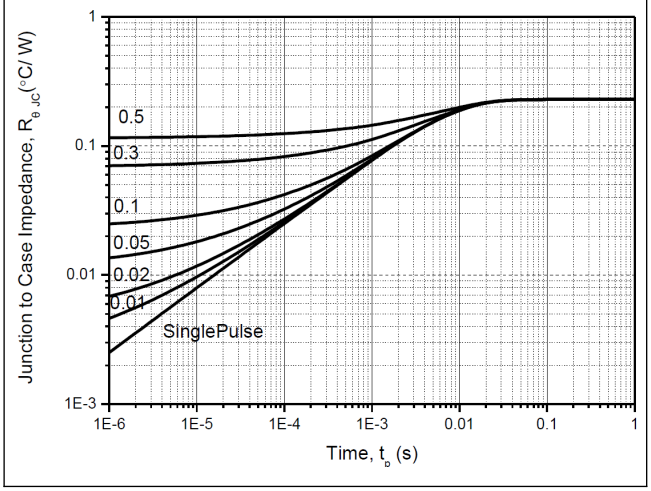


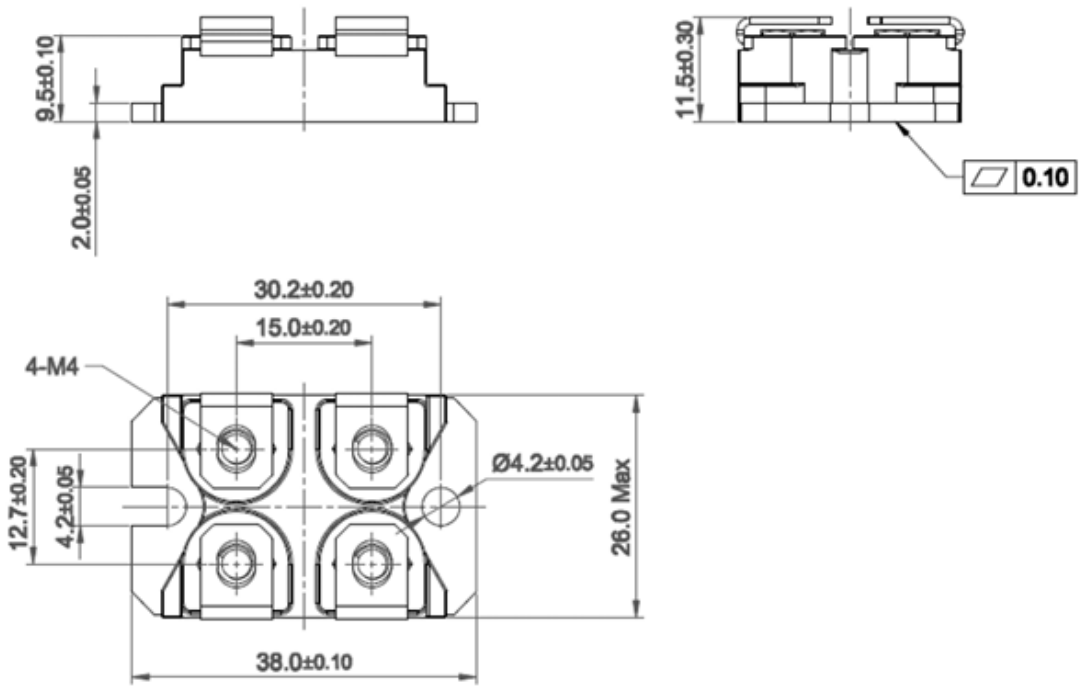
Figure 9. Transient Thermal Impendence



Package Outlines

SOT-227

Package Drawing and Dimensions（ UNIT：mm）



Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BC018SG12SWSD	BC018SG12SWSD	SOT-227	Tube	10 units

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