

BSSC03NL018SS1

N-Channel SGT Power MOSFET

30 V, 181 A, 1.8 mΩ

Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency. It has been optimized for low gate charge, low $R_{DS(on)}$, fast switching speed.

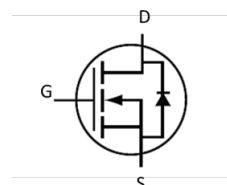
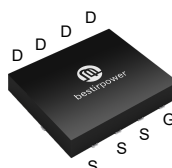
Features

BV_{DSS}	I_D	$R_{DS(on),max}$	$Q_{rr,typ}$
30 V	181 A	1.8 mΩ	61 nC

- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handing capability
- Lead free product is acquired

Applications

- DC/DC Converter
- Load Switching, Quick/Wireless Charging, Motor Driving



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DS}	Drain to Source Voltage		30	V
V_{GS}	Gate to Source Voltage		± 20	V
I_D	Continuous Drain Current, Silicon Limited ($T_c = 25^\circ\text{C}$)		181	A
	Continuous Drain Current, Silicon Limited ($T_c = 100^\circ\text{C}$)		115	
I_{DM}	Drain Current (Note 1)	Pulsed	724	A
E_{AS}	Single Pulsed Avalanche Energy (Note 2)		484	mJ
P_D	Power Dissipation	($T_c = 25^\circ\text{C}$)	96	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.3	$^\circ\text{C/W}$

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30V 1.8mΩ SGT Power MOSFET

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
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Off Characteristics

BV _{DSS}	Drain to Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250uA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V	-	-	±100	nA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 250 μA	1.0	-	2.5	V
R _{DS(on)}	Static Drain to Source On Resistance	V _{GS} = 10 V, I _D = 20A	-	1.4	1.8	mΩ
		V _{GS} = 4.5 V, I _D = 20A	-	2	2.7	mΩ
R _G	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	1.5	-	Ω

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 15 V f = 1 MHz	-	2570	-	pF
C _{oss}	Output Capacitance		-	1080	-	pF
C _{rss}	Reverse Transfer Capacitance		-	131	-	pF
Q _{g(tot)}	Gate Charge Total	V _{GS} = 10V, V _{DS} = 15V, I _D = 20A	-	37.5	-	nC
Q _{gs}	Gate to Source Charge		-	8.5	-	nC
Q _{gd}	Gate to Drain Charge		-	4.3	-	nC

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 15V R _L = 0.75Ω, R _G = 3Ω	-	24	-	ns
t _r	Turn-On Rise Time		-	50	-	ns
t _{d(off)}	Turn-Off Delay Time		-	35	-	ns
t _f	Turn-Off Fall Time		-	30	-	ns

Source-Drain Diode Characteristics

V _{SD}	Diode Forward Voltage	V _{GS} = 0 V, I _S = 20A (Note 3)	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _F = 20 A, di _F /dt = 100 A/μs	-	55	-	ns
Q _{rr}	Reverse Recovery Charge		-	61	-	nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: T_J=25 °C, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Performance Characteristics

Fig. 1 Output characteristics

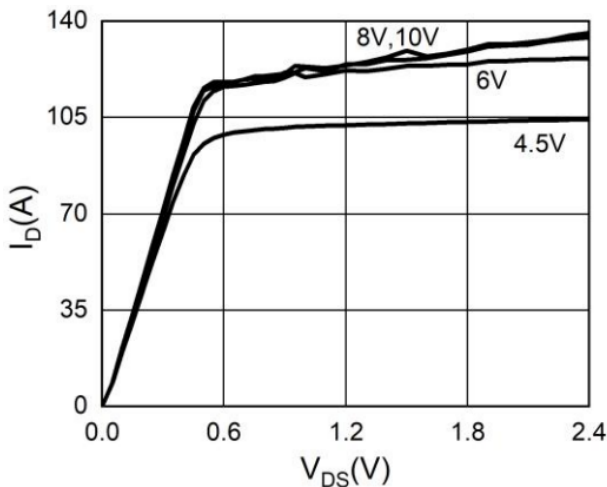


Fig. 2 Transfer characteristics

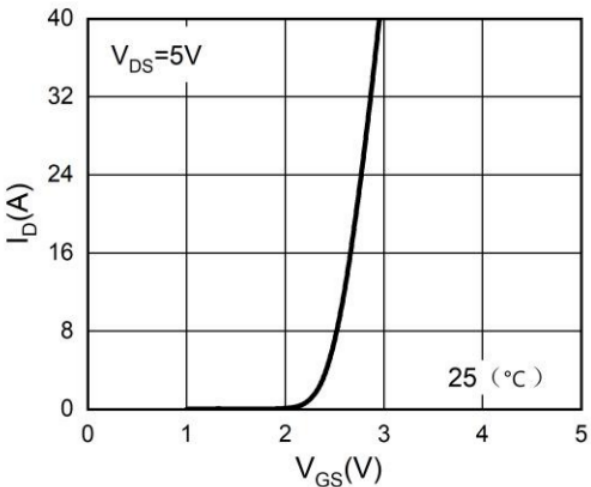


Fig.3 Power Dissipation

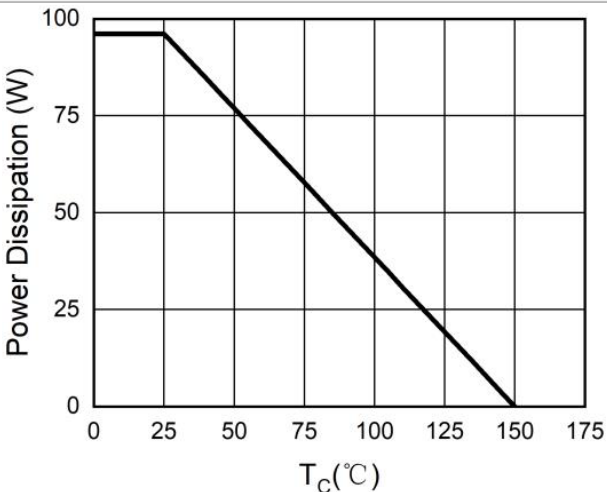


Fig.4 Drain Current

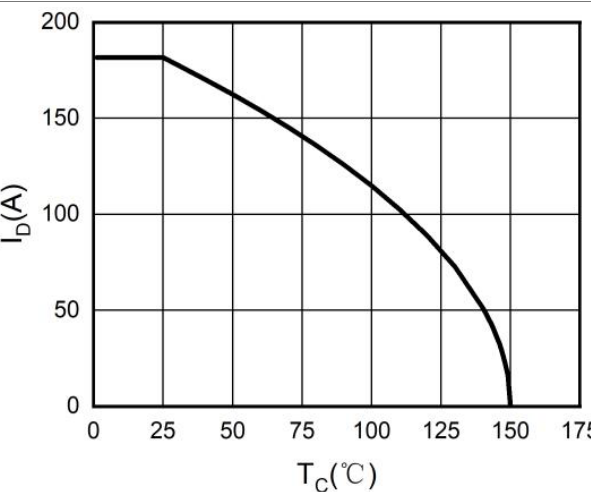


Fig.5 BV_{DSS} vs Junction Temperature

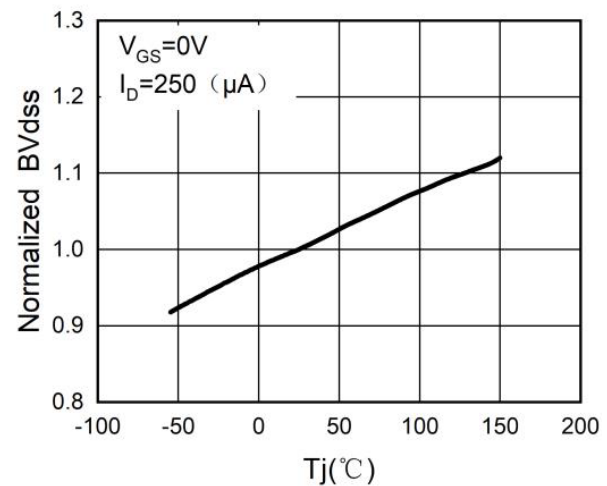
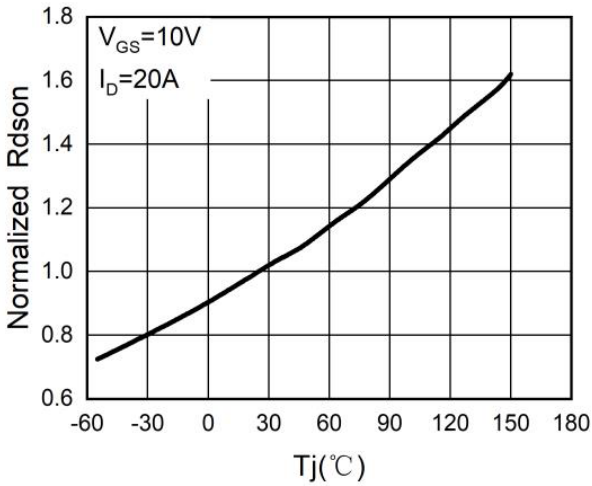


Fig.6 R_{DS(ON)} vs Junction Temperature



Typical Performance Characteristic

Fig.7 Gate Charge Waveforms

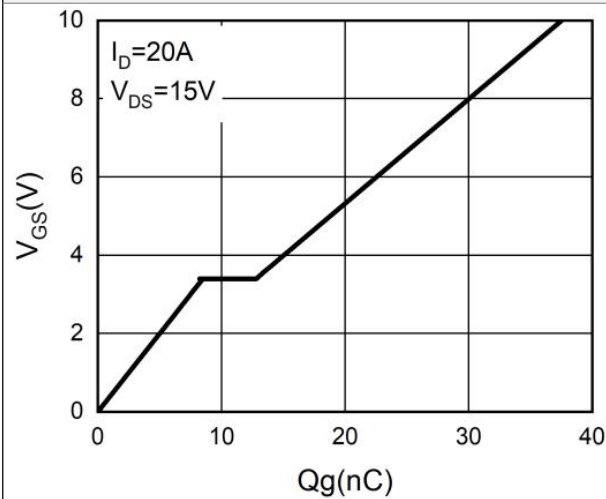


Fig.8 Capacitance

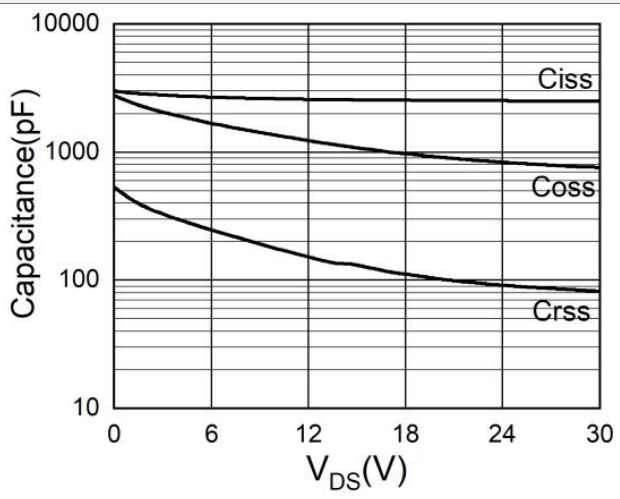


Fig.9. Body-Diode Characteristics

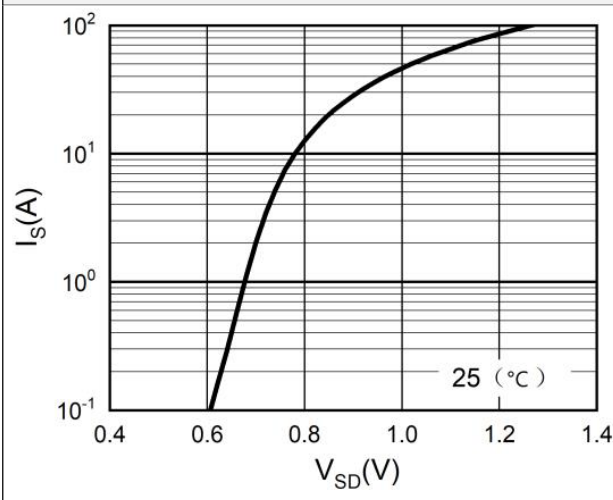
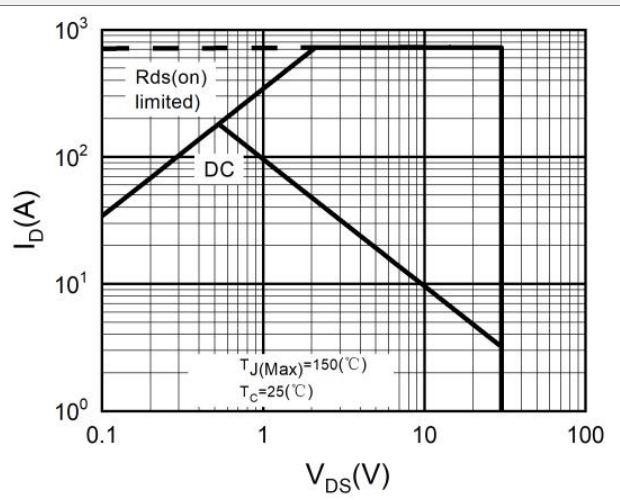
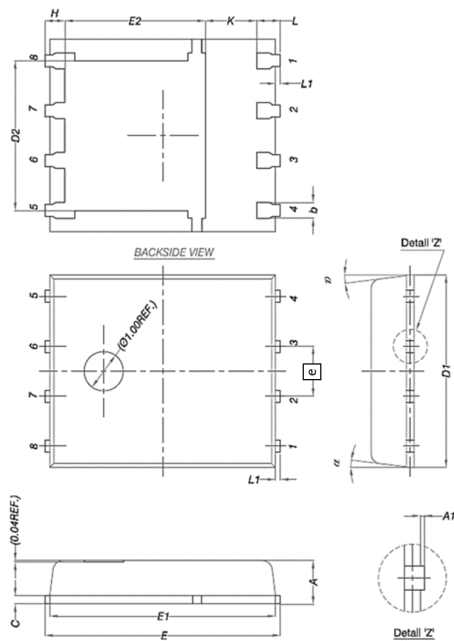


Fig.10. Maximum Safe Operating Area



Package Outlines

DFN 5x6



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.10	1.20
A1	0.00	-	0.05
b	0.30	0.40	0.50
c	0.15	0.25	0.35
D1	5.05	5.25	5.45
D2	3.80	4.10	4.25
E	5.95	6.15	6.35
E1	5.66	5.86	6.06
E2	3.52	3.72	3.92
e	1.27 BSC		
H	0.40	0.50	0.60
K	1.34	-	-
L	0.30	0.60	0.70
L1	0.05	0.15	0.25
α	0°	-	12°

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BSSC03NL018SS1	BSSC03NL018SS1	DFN 5×6	Tape & Reel	5000 units

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