

BSSC03NL008SS1

N-Channel SGT Power MOSFET

30 V, 306 A, 0.8 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.

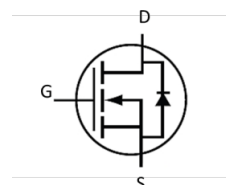
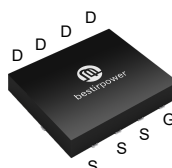
Features

BV_{DSS}	I_D	$R_{DS(on),max}$	$Q_{rr,typ}$
30 V	306 A	0.8 mΩ	75 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 ($T_C = 25^\circ\text{C}$)		306	A
	Continuous Drain Current, Silicon Limited ($T_C = 100^\circ\text{C}$)		193	
I_{DM}	Drain Current (Note 1)	Pulsed	1224	A
E_{AS}	Single Pulsed Avalanche Energy (Note 2)		1600	mJ
P_D	Power Dissipation	($T_C = 25^\circ\text{C}$)	114	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.	1.1	$^\circ\text{C/W}$

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30V 0.8mΩ SGT Power MOSFET

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	-	-	± 100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{A}$	-	0.6	0.8	mΩ
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{A}$	-	1.1	1.5	mΩ
R_G	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1.0\text{MHz}$	-	2.1	-	Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}$ $f = 1\text{ MHz}$	-	7020	-	pF
C_{oss}	Output Capacitance		-	2600	-	pF
C_{rss}	Reverse Transfer Capacitance		-	198	-	pF
$Q_{g(tot)}$	Gate Charge Total	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V},$ $I_D = 15\text{A}$	-	88	-	nC
Q_{gs}	Gate to Source Charge		-	20	-	nC
Q_{gd}	Gate to Drain Charge		-	10	-	nC

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}$ $R_L = 1\Omega, R_G = 3\Omega$	-	30	-	ns
t_r	Turn-On Rise Time		-	54	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	40	-	ns
t_f	Turn-Off Fall Time		-	27	-	ns

Source-Drain Diode Characteristics

V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 20\text{A}$ (Note 3)	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 20\text{ A}, di_F/dt = 100\text{ A}/\mu\text{s}$	-	65	-	ns
Q_{rr}	Reverse Recovery Charge		-	75	-	nC

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

Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=30\text{V}, V_G=10\text{V}, R_g=25\Omega, L=0.5\text{mH}$.

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

Typical Performance Characteristics

Fig. 1 Output characteristics

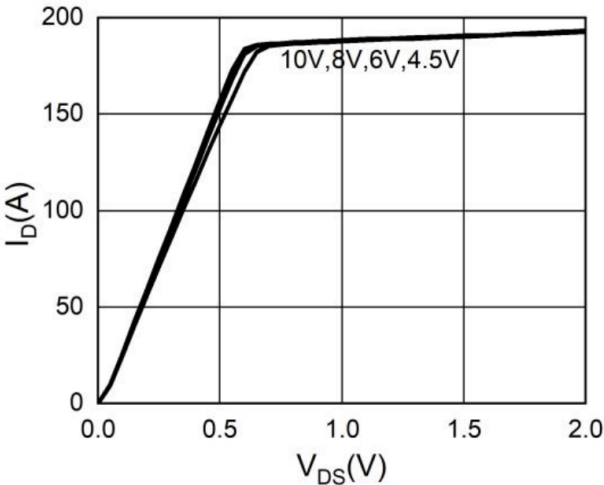


Fig. 2 Transfer characteristics

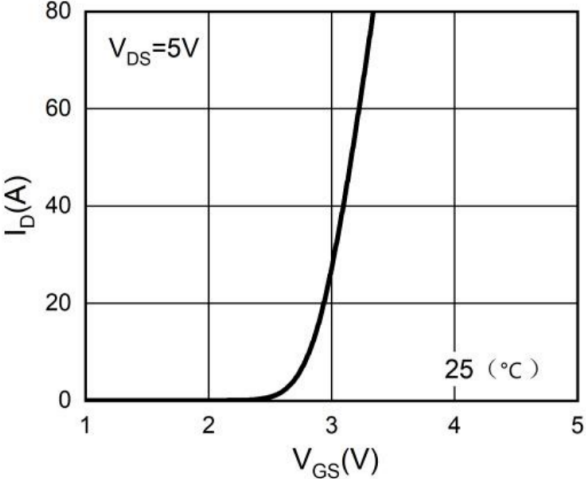


Fig.3 Power Dissipation

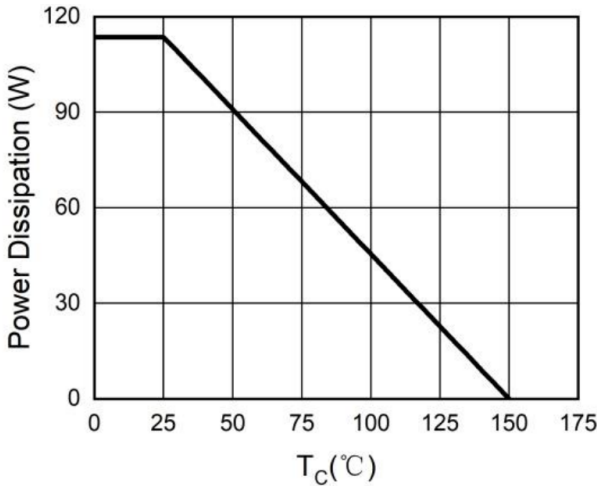


Fig.4 Drain Current

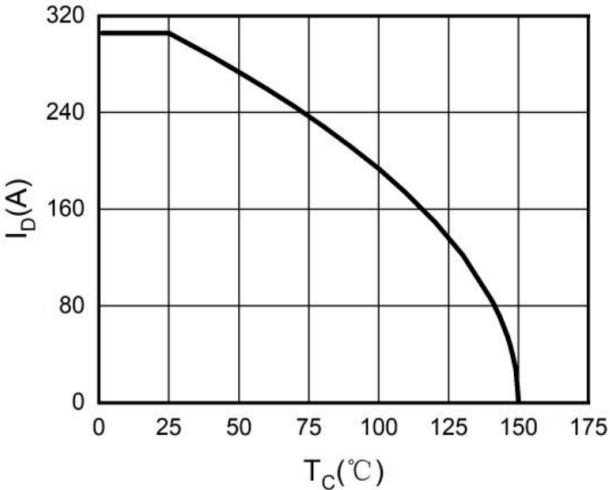


Fig.5 BV_{DSS} vs Junction Temperature

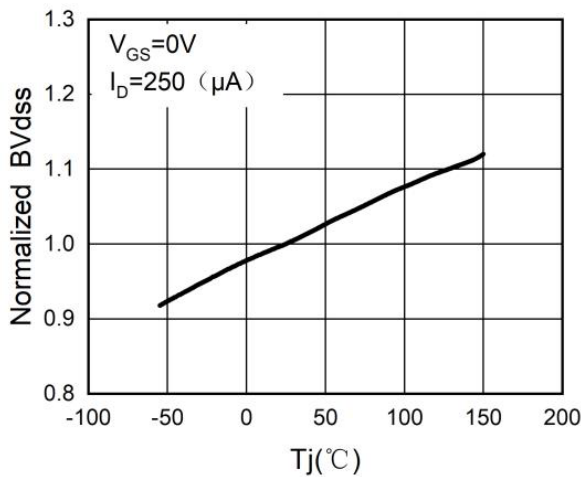
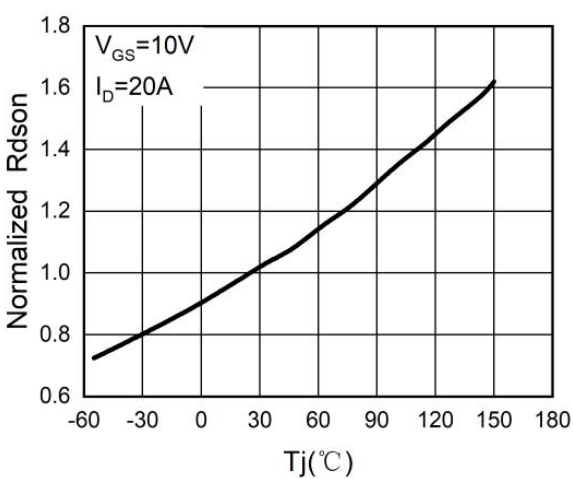


Fig.6 R_{DS(ON)} vs Junction Temperature



Typical Performance Characteristic

Fig.7 Gate Charge Waveforms

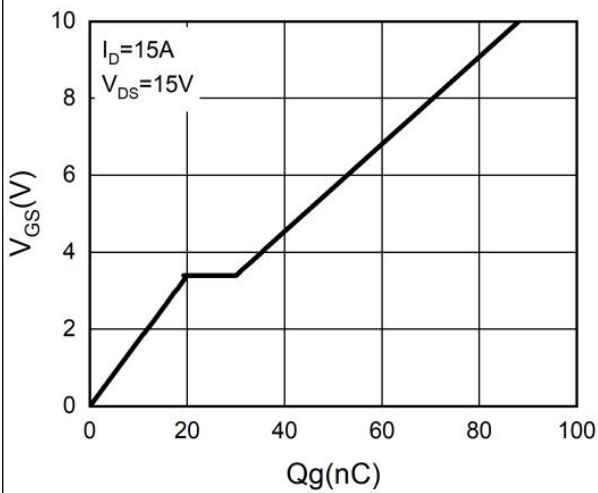


Fig.8 Capacitance

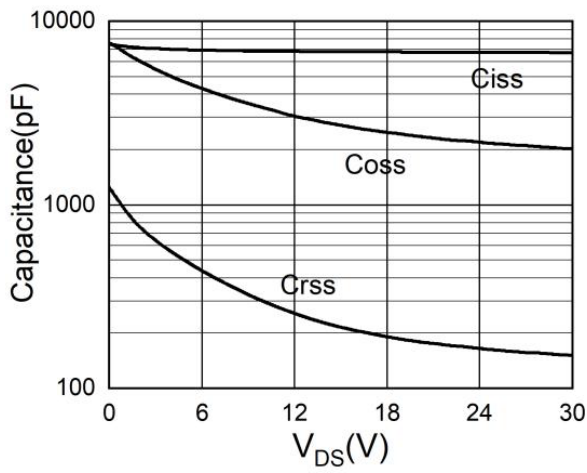


Fig.9. Body-Diode Characteristics

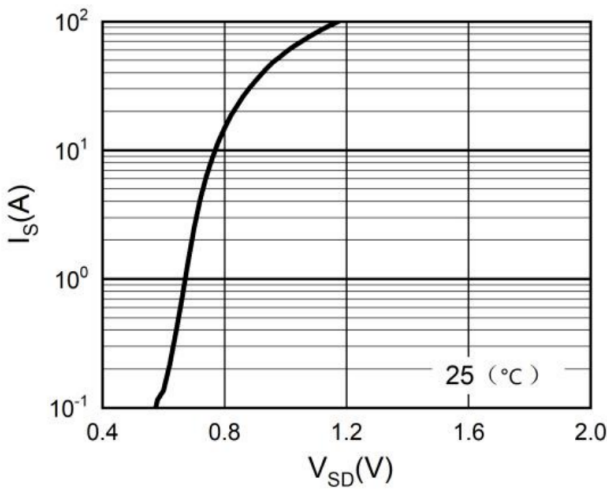
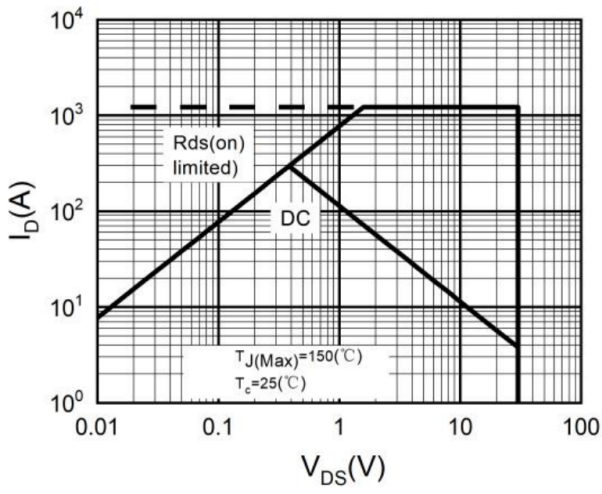
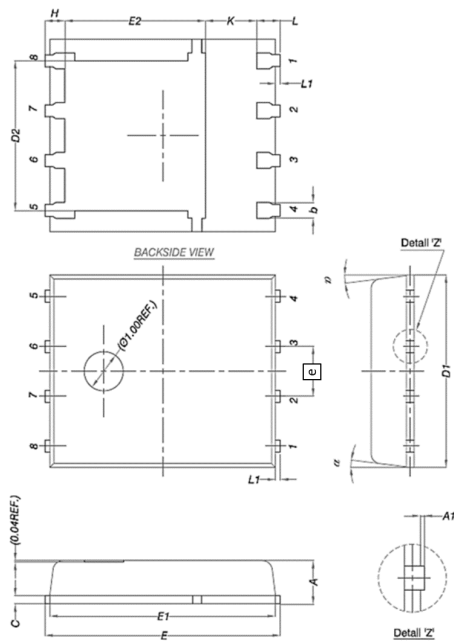


Fig.10. Maximum Safe Operating Area



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
BSSC03NL008SS1	BSSC03NL008SS1	DFN 5×6	Tape & Reel	5000 units

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