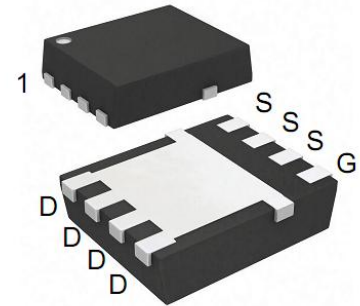


N-Channel Enhancement Mode MOSFET

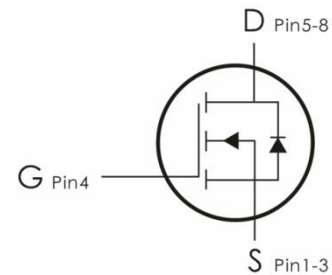
Description:

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.



Features:

- 1) $V_{DS}=150V, I_D=50A, R_{DS(ON)} < 18m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
BSC190N15NS3G	190N15	DFN5*6-8	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	50	A
I_{DM}	Pulsed Drain Current ²	200	
P_D	Power Dissipation ³	110	W
E_{AS}	Single pulse avalanche energy ⁵	29	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55--+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.14	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁴	62	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	150	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=135V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
V_{GS(th)}	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	2.5	---	4.5	V
R_{DS(ON)}	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	14	18	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	3339	---	pF
C_{oss}	Output Capacitance		---	1099	--	
C_{rss}	Reverse Transfer Capacitance		---	104	---	
Switching Characteristics						
t_{d(on)}	Turn-On Delay Time	$V_{DS}=80V, I_D=40A,$ $R_{ENG}=2\ \Omega, V_{GS}=10V$	---	17.4	---	ns
t_r	Rise Time		---	12.2	---	ns
t_{d(off)}	Turn-Off Delay Time		---	29.7	---	ns
t_f	Fall Time		---	10.2	---	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=80V,$ $I_D=40A$	---	42	---	nc
Q_{gs}	Gate-Source Charge		---	16	---	nc
Q_{gd}	Gate-Drain "Miller" Charge		---	9	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=20A$	---	---	1.3	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	50	A
I_{SM}	Pulsed Drain Current		---	---	200	A
T_{rr}	Reverse Recovery Time	$I_F=40A, T_J=25^\circ\text{C}$	---	101	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu\text{s}$	---	254	---	nc

Notes:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.
4. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
5. V_{DD}=50 V, V_{GS}=10 V, L=0.3 mH, starting T_j=25 °C.

Typical Characteristics: (T_C=25 °C unless otherwise noted)

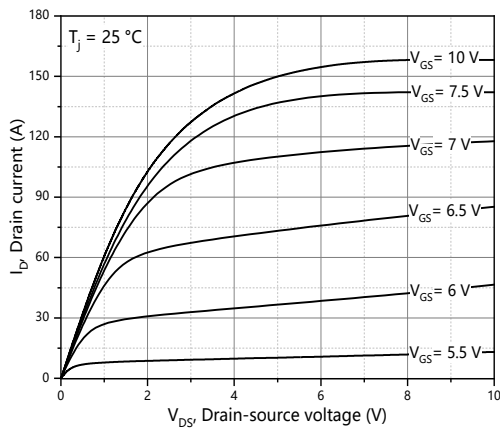


Figure 1. Typ. output characteristics

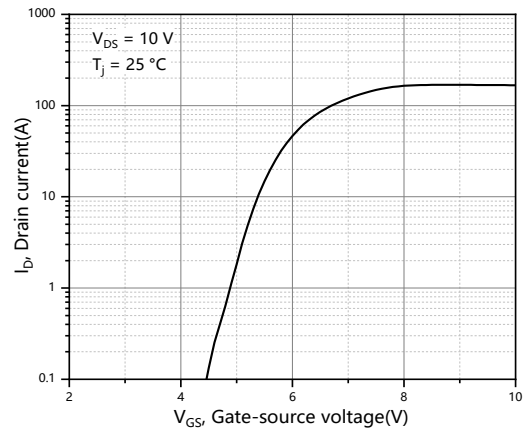


Figure 2. Typ. transfer characteristics

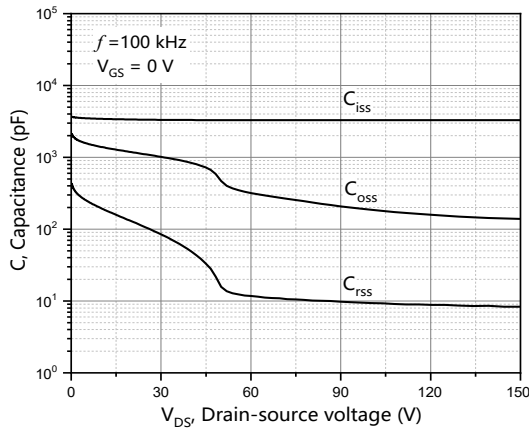


Figure 3. Typ. capacitances

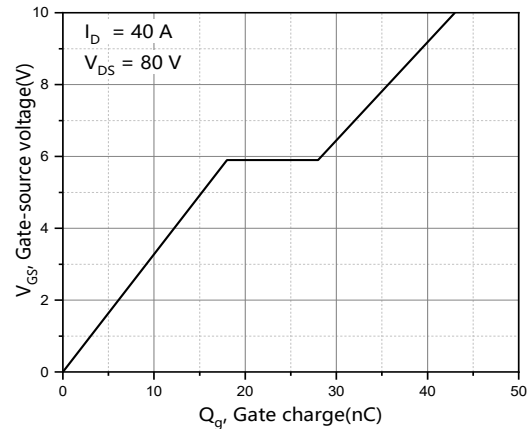


Figure 4. Typ. gate charge

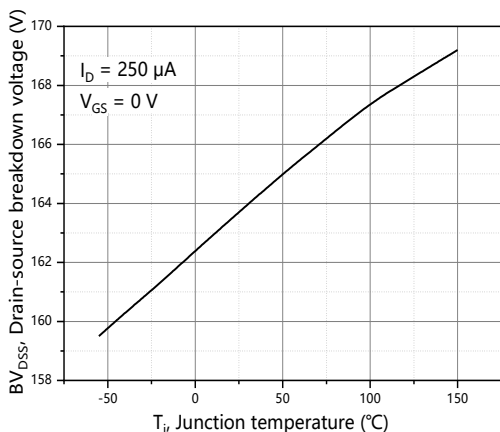


Figure 5. Drain-source breakdown voltage

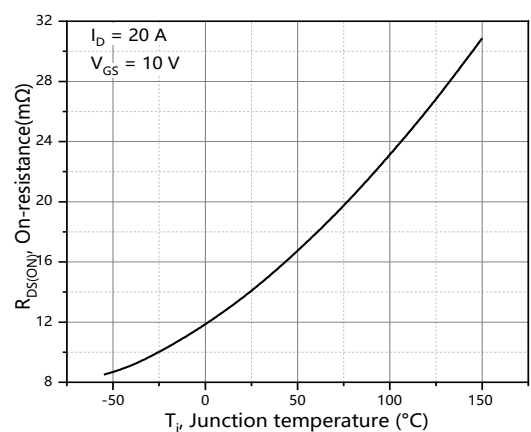


Figure 6. Drain-source on-state resistance

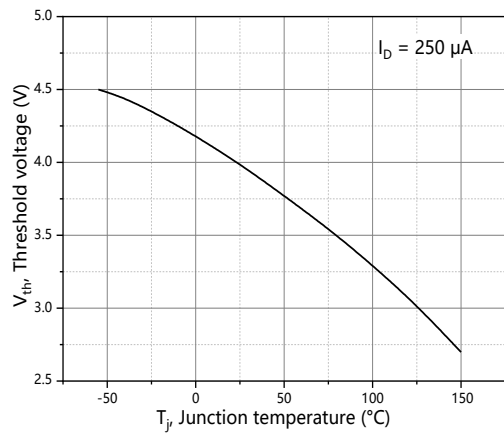


Figure 7. Threshold voltage

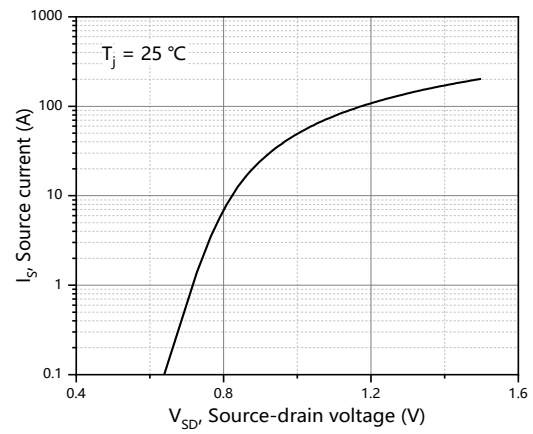


Figure 8. Forward characteristic of body diode

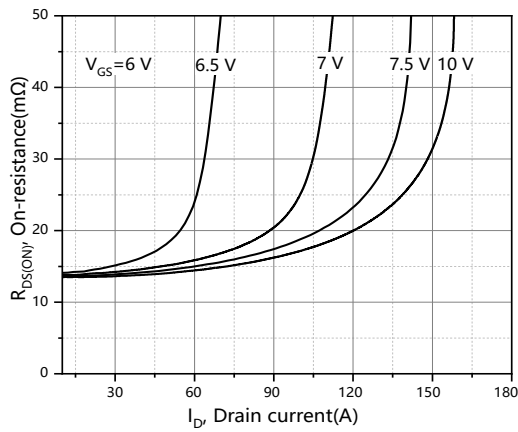


Figure 9. Drain-source on-state resistance

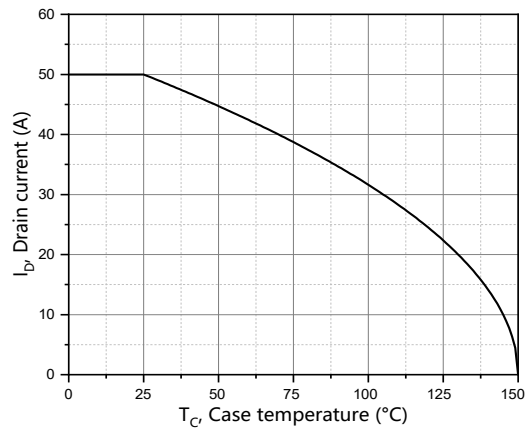


Figure 10. Drain current

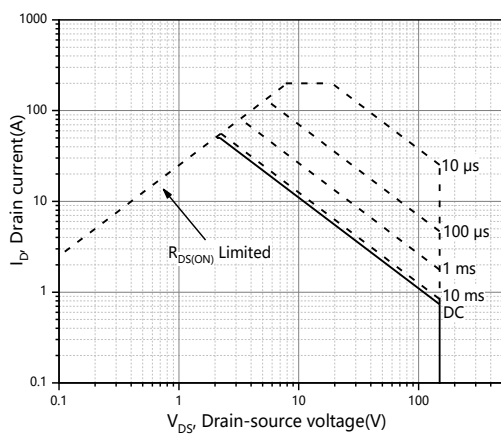


Figure 11. Safe operation area $T_C=25^\circ\text{C}$

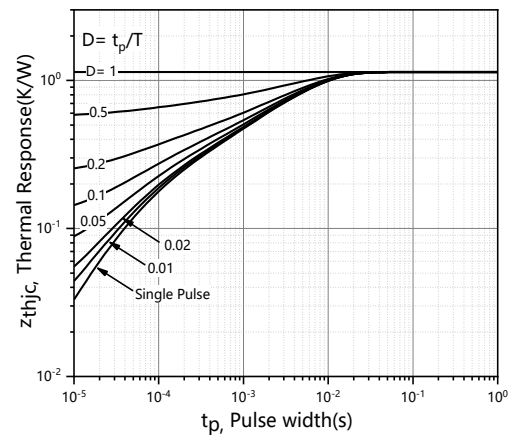


Figure 12. Max. transient thermal impedance

DFN5x6-8Package Information:

