

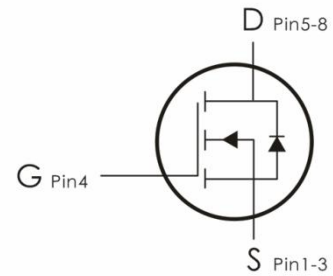
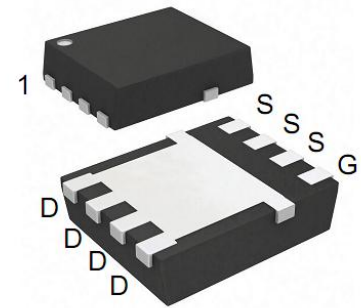
N-Channel Enhancement Mode MOSFET

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) $V_{DS}=80V, I_D=130A, R_{DS(ON)} < 3.3m\ \Omega @ V_{GS}=10V$
- 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.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	130	A
I_{DM}	Pulsed Drain Current ²	390	
E_{AS}	Single Pulse Avalanche Energy ⁵	194	mJ
P_D	Power Dissipation ³	132	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ²	0.95	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to mbient ²	62	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
BSC030N08NS5	030N08	DFN5*6-8

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	$V_{GS}=0V, I_D=250 \mu A$	80	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=80V$	---	---	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	$V_{GS}=V_{DS}, I_D=250 \mu A$	2	---	4	V
$R_{DS(ON)}$	Drain-Source On Resistance ⁴	$V_{GS}=10V, I_D=50A$	---	3	3.3	$m\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	5660	---	pF
C_{oss}	Output Capacitance		---	1630	---	
C_{rss}	Reverse Transfer Capacitance		---	95.1	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=40V, I_D=50A,$ $R_G=2\Omega, V_{GS}=10V$	---	27	---	ns
t_r	Rise Time		---	9	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	60.1	---	ns
t_f	Fall Time		---	13	---	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=40V,$ $I_D=50A$	---	71.4	---	nC
Q_{gs}	Gate-Source Charge		---	20	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	9	---	nC
Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	---	---	1.3	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	130	A

I_{SM}	Pulsed Drain Curren	V _D =V _G =0V	---	---	390	A
Q_{rr}	Reverse Recovery Charge	I _{DS} = 50 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	---	87.9	---	nC
T_{rr}	Reverse Recovery Time		---	67.2	---	ns

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 in 2 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)

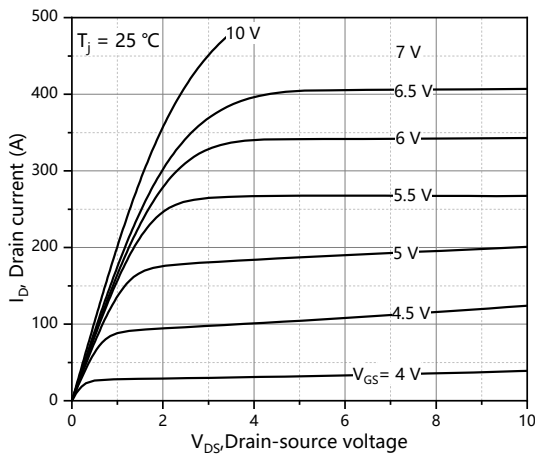


Figure 1. Typ. output characteristics

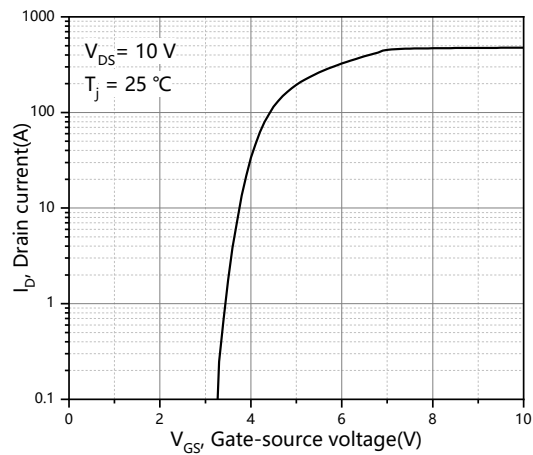


Figure 2. Typ. transfer characteristics

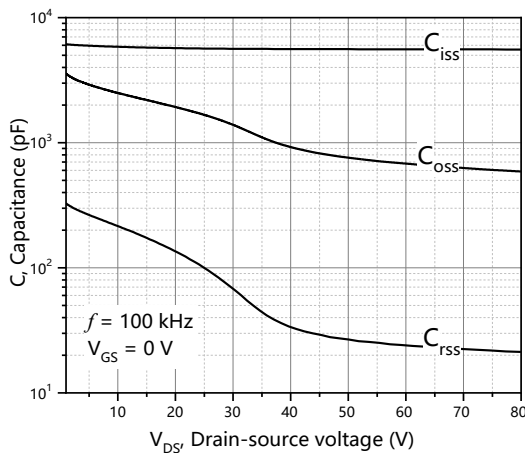


Figure 3. Typ. capacitances

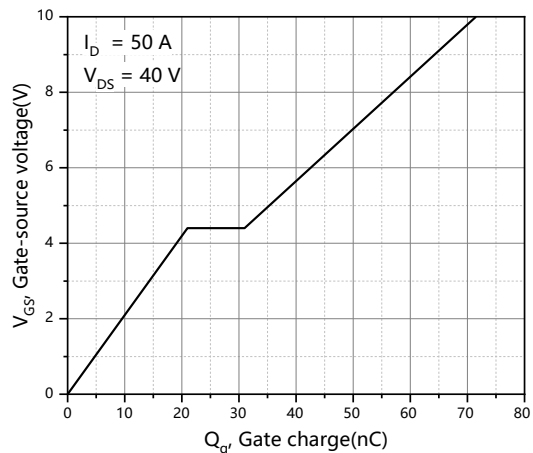


Figure 4. Typ. gate charge

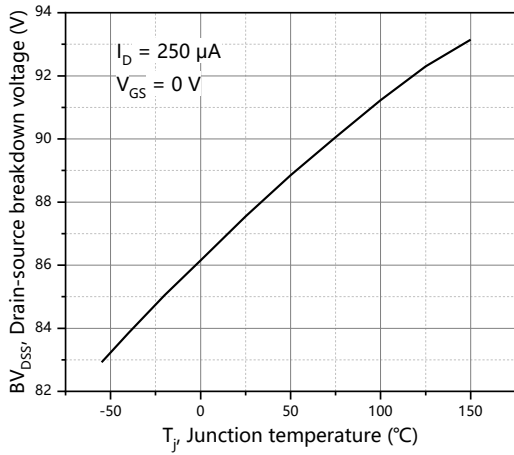


Figure 5. Drain-source breakdown voltage

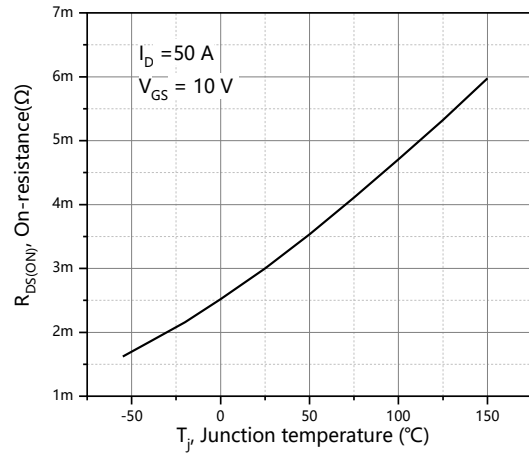


Figure 6. Drain-source on-state resistance

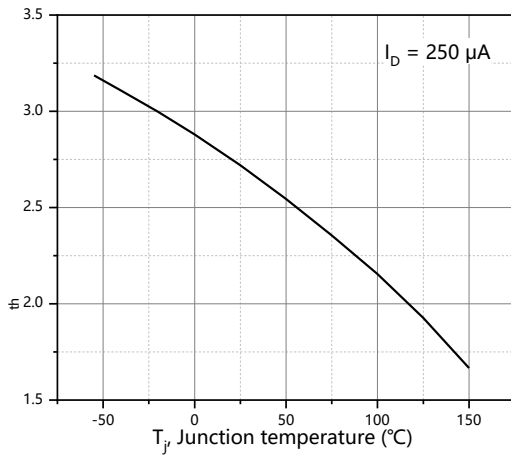


Figure 7. Threshold voltage

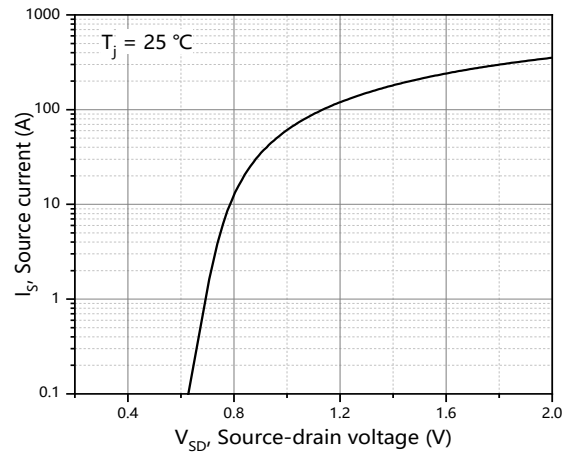


Figure 8. Forward characteristic of body diode

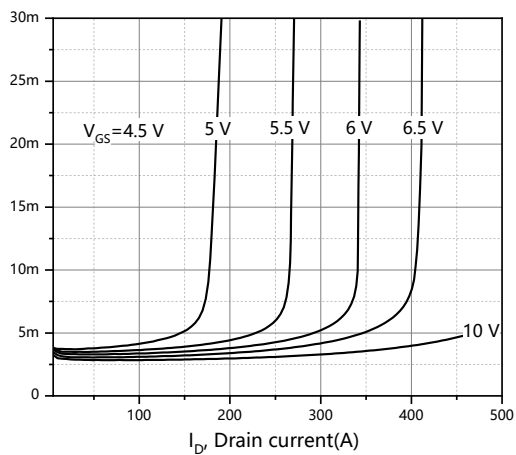


Figure 9. Drain-source on-state resistance

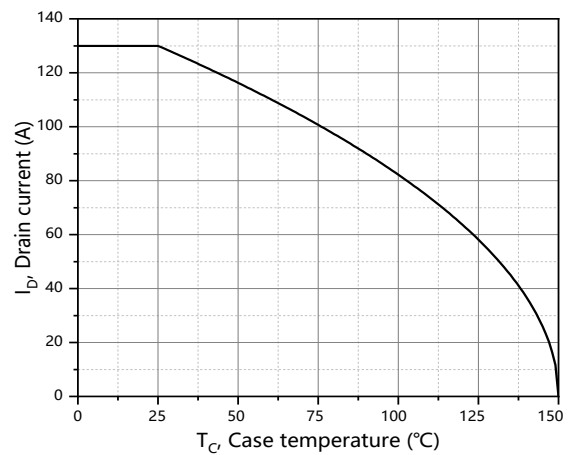


Figure 10. Drain current

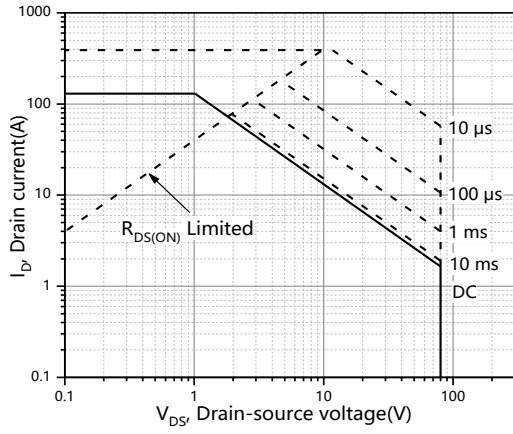


Figure 11. Safe operation area $T = 25\text{ }^\circ\text{C}$

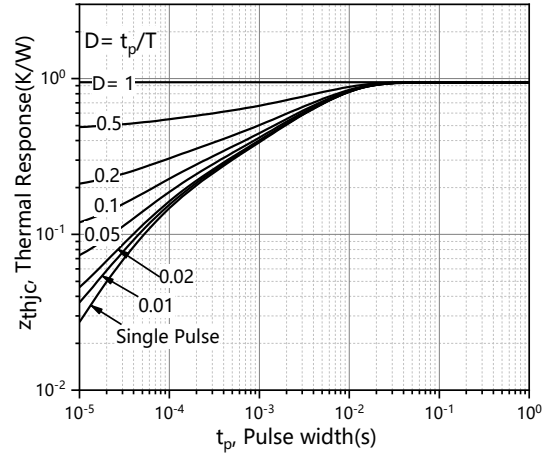


Figure 12. Max. transient thermal impedance