



General Description

The BSC109N10NS3G use advanced SGT MOSFET technology to provide low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable.

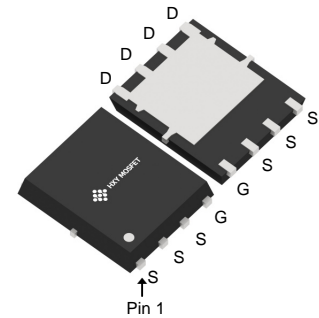
General Features

$V_{DS} = 100V$ $I_D = 75A$

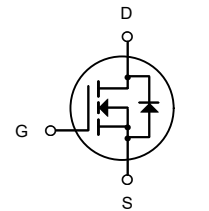
$R_{DS(ON)} < 9.2m\Omega @ V_{GS} = 10V$

Applications

Consumer electronic power supply Motor control
Synchronous-rectification Isolated DC
Synchronous-rectification applications



DFN5X6-8L
(PSDN-8(5.2x6.2))



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
BSC109N10NS3G	DFN5X6-8L (PDFN-8(5.2x6.2))	HXY MOSFET	5000

Absolute Maximum Ratings at $T_J = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾	I_D	75	A
Pulsed drain current ²⁾	I_D, pulse	300	A
Power dissipation ³⁾	P_D	97	W
Single pulsed avalanche energy ⁵⁾	EAS	90	mJ
Operation and storage temperature	T_{stg}, T_J	-55 to 150	$^\circ C$
Thermal resistance, junction-case	$R_{\theta JC}$	1.3	$^\circ C/W$



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=20A$	-	7.3	9.2	m Ω
		$V_{GS}=4.5V, I_D=8A$	-	9	13.5	m Ω
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V,$ $f=1.0MHz$	-	2046	-	pF
C_{oss}	Output Capacitance		-	865	-	pF
C_{rss}	Reverse Transfer Capacitance		-	25	-	pF
Q_g	Total Gate Charge	$V_{DS}=50V, I_D=30A,$ $V_{GS}=10V$	-	39.4	-	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	9.8	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, I_D=25A,$ $R_G=6\Omega, V_{GS}=10V$	-	20	-	ns
t_r	Turn-on Rise Time		-	5.2	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	49	-	ns
t_f	Turn-off Fall Time		-	12	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	75	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	300	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	-	-	1	V
t_{rr}	Body Diode Reverse Recovery Time	$T_J=25^{\circ}\text{C},$ $I_F=12A, di/dt=100A/\mu s$	-	49	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	85	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, R_G=25\Omega, L=0.5mH, I_{AS}=19A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$



Typical Performance Characteristics

Figure 1: Output Characteristics

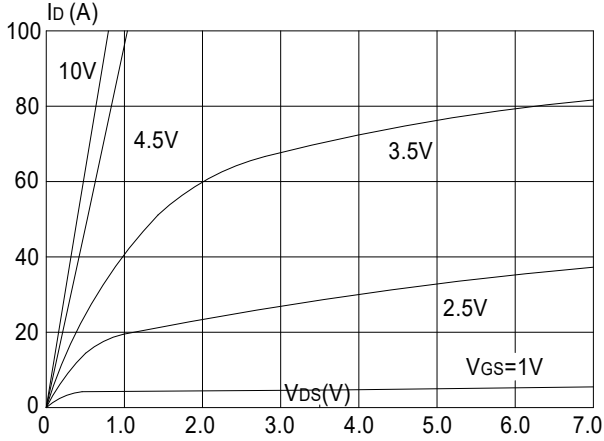


Figure 2: Typical Transfer Characteristics

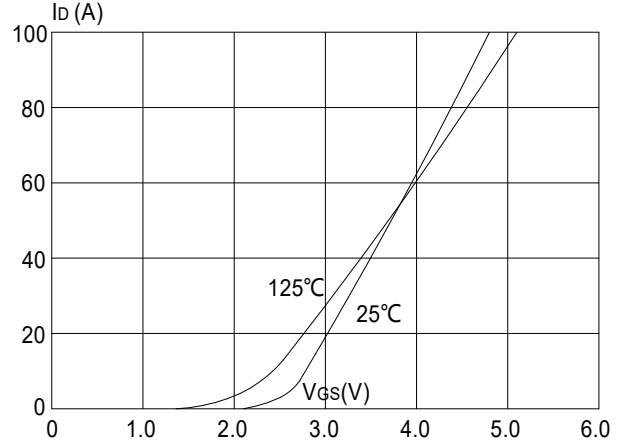


Figure 3: On-resistance vs. Drain Current

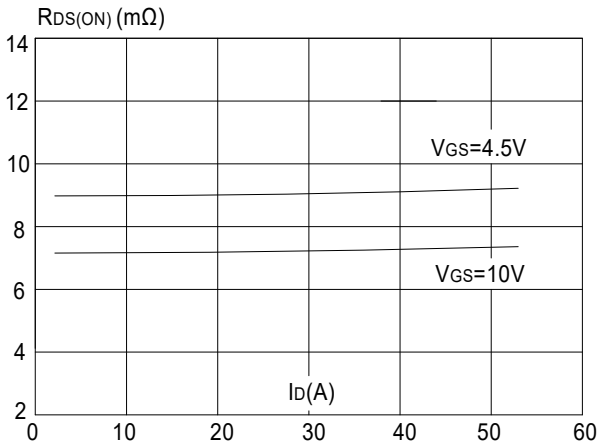


Figure 4: Body Diode Characteristics

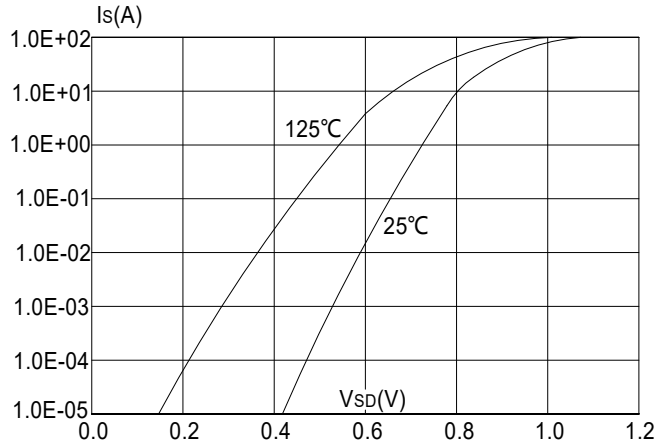


Figure 5: Gate Charge Characteristics

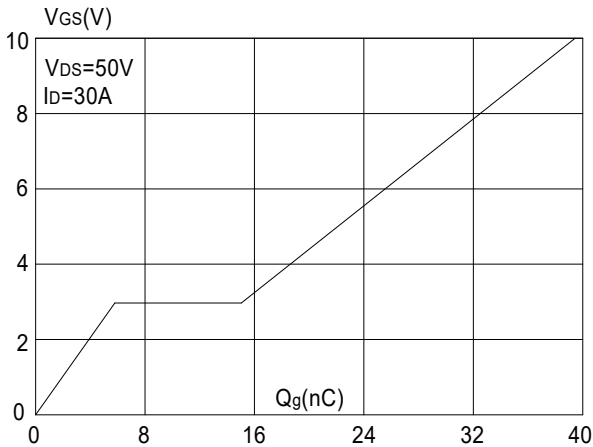


Figure 6: Capacitance Characteristics

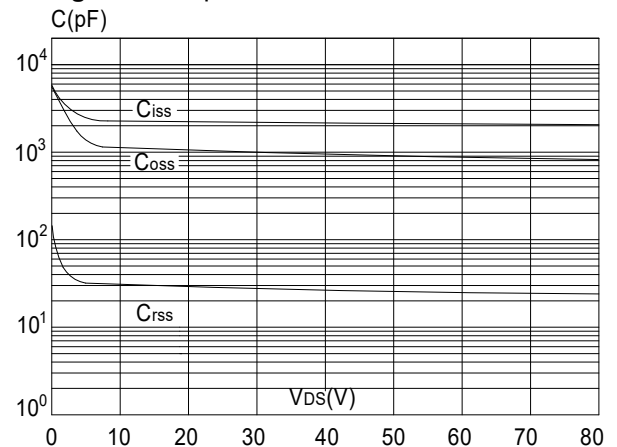




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

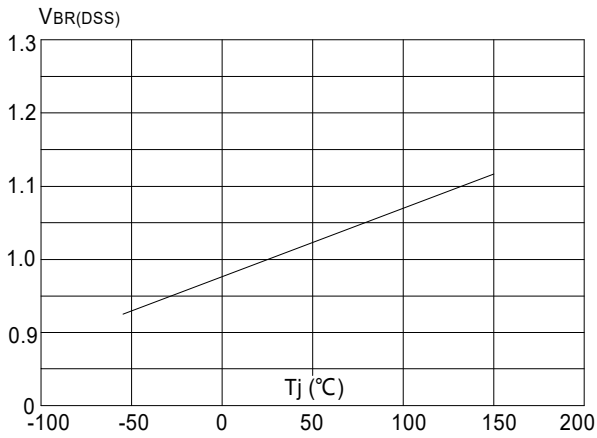


Figure 8: Normalized on Resistance vs. Junction Temperature

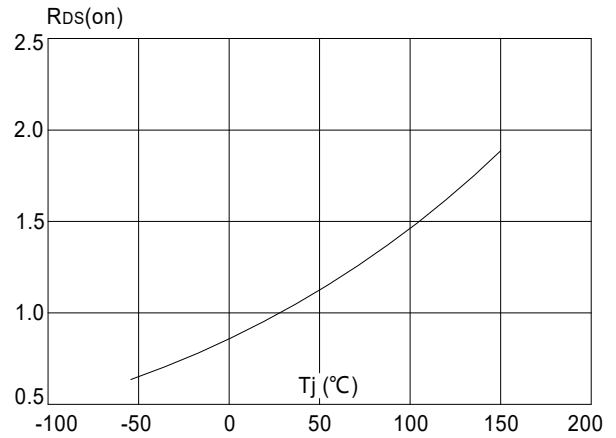


Figure 9: Maximum Safe Operating Area

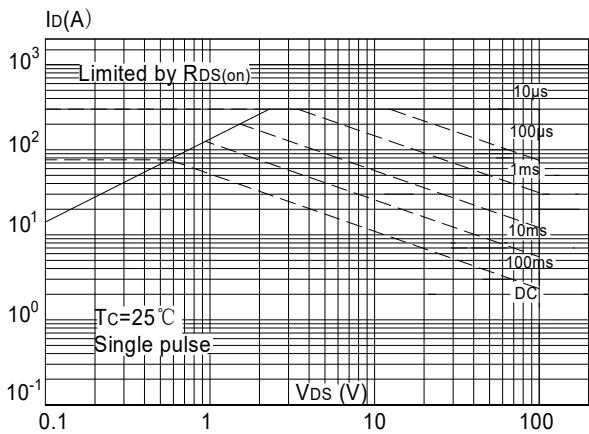


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

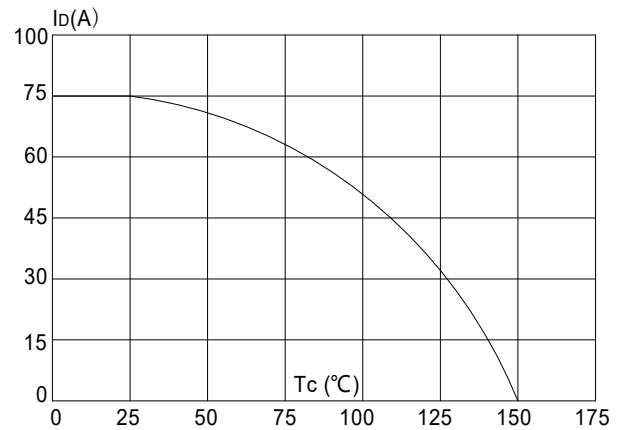
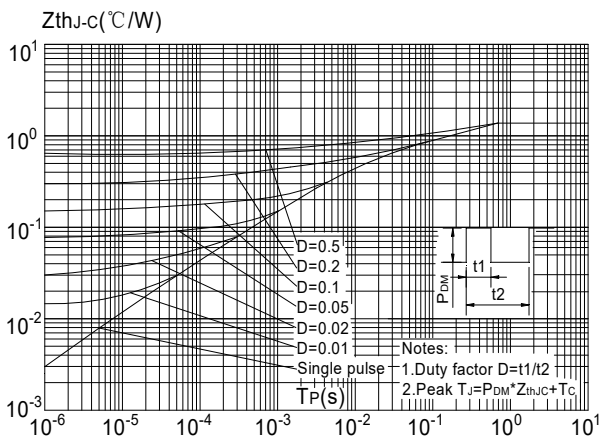


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





Test Circuit

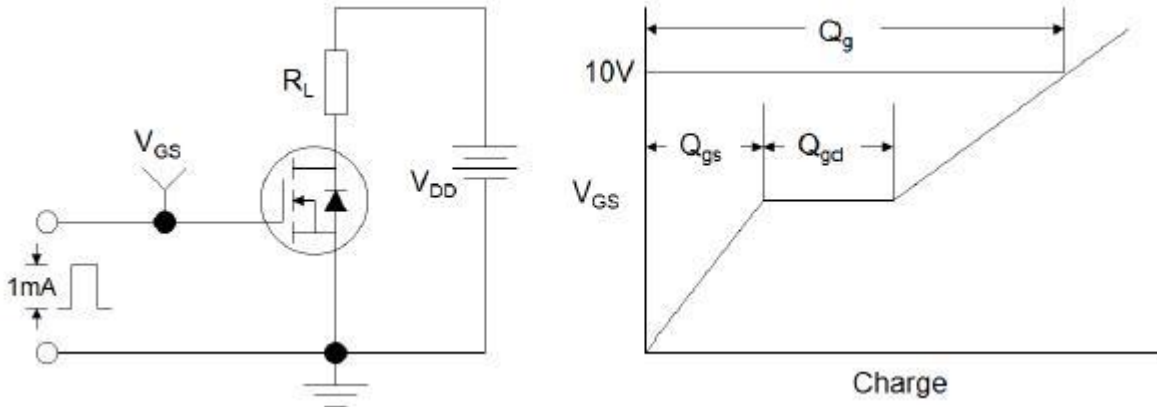


Figure1:Gate Charge Test Circuit & Waveform

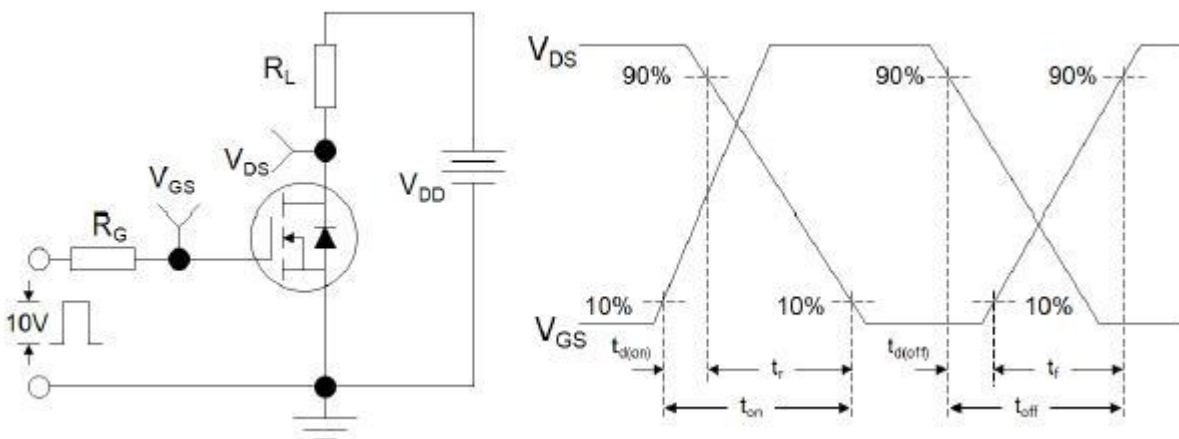


Figure 2: Resistive Switching Test Circuit & Waveforms

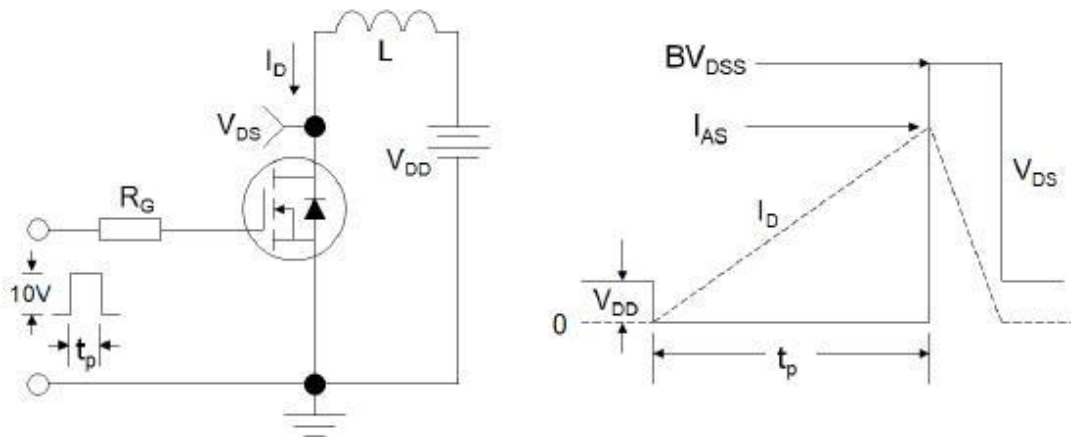
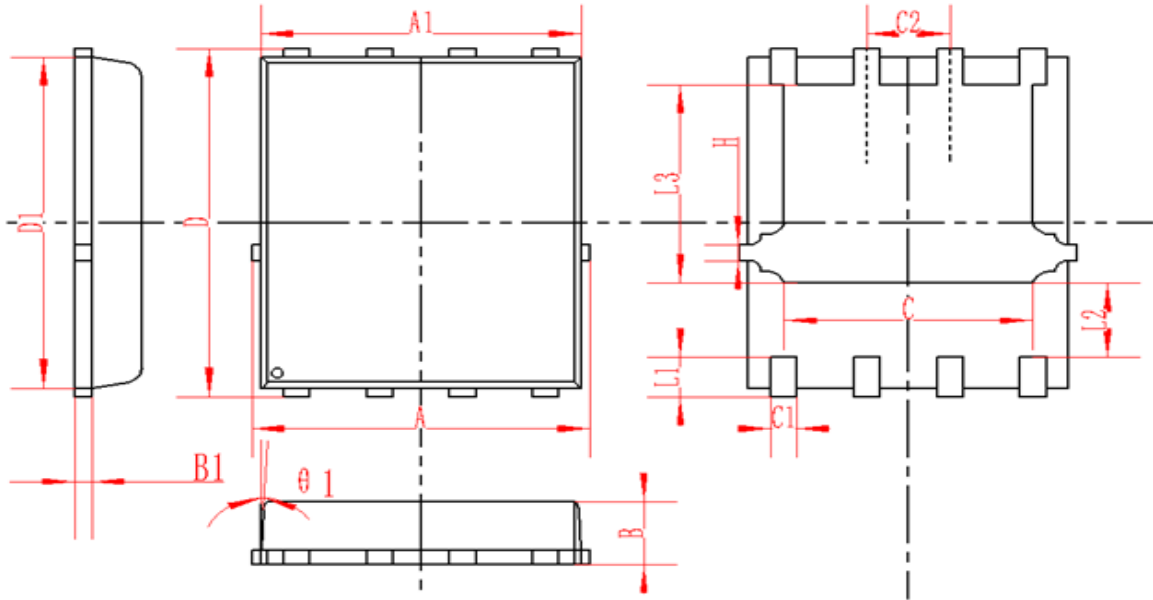


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



DFN5X6-8L(PDFN-8(5.2x6.2))Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
$\theta 1$	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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