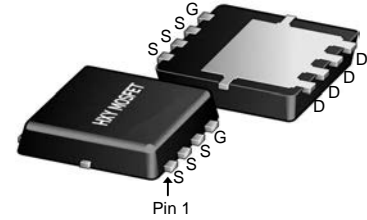




## General Description

The BSC123N08NS3G use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable.



DFN5X6-8L

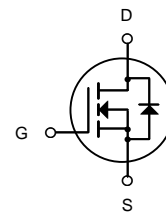
## General Features

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

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

## Applications

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



N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
BSC123N08NS3G	DFN5X6-8L	HXY MOSFET	5000

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

Parameter	Symbol	Value	Unit
Drain source voltage	V <sub>DS</sub>	100	V
Gate source voltage	V <sub>GS</sub>	±20	V
Continuous drain current <sup>1)</sup>	I <sub>D</sub>	75	A
Pulsed drain current <sup>2)</sup>	I <sub>D, pulse</sub>	300	A
Power dissipation <sup>3)</sup>	P <sub>D</sub>	97	W
Single pulsed avalanche energy <sup>5)</sup>	E <sub>AS</sub>	90	mJ
Operation and storage temperature	T <sub>stg</sub> , T <sub>j</sub>	-55 to 150	°C
Thermal resistance, junction-case	R <sub>θJC</sub>	1.3	°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	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	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 $\Omega$
		$V_{GS}=4.5V, I_D=8A$	-	9	13.5	m $\Omega$
$C_{iss}$	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

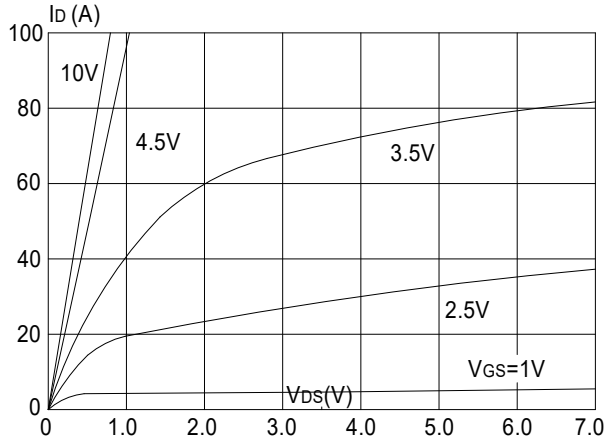
2. EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, R_G=25\Omega, L=0.5mH, I_{AS}=19A$

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

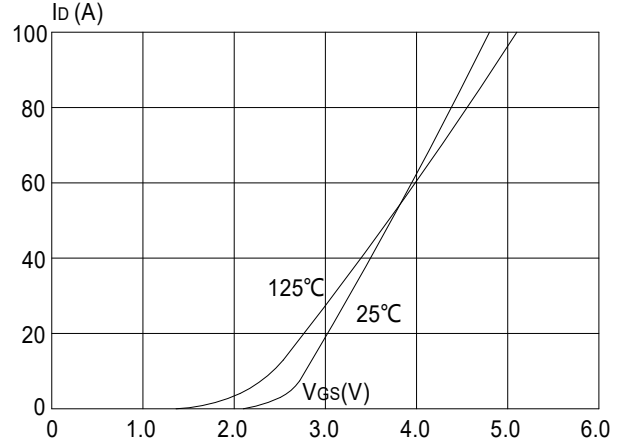


## Typical Performance Characteristics

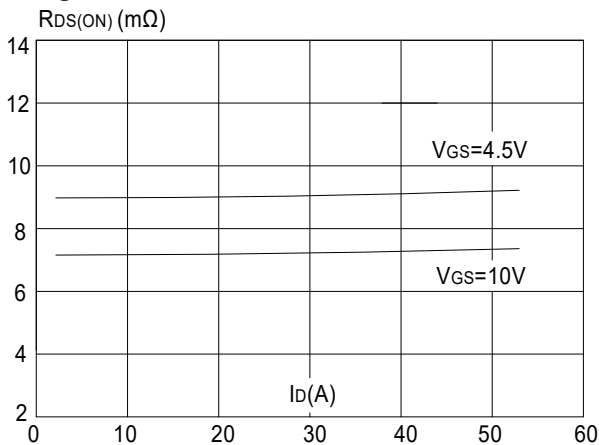
**Figure 1: Output Characteristics**



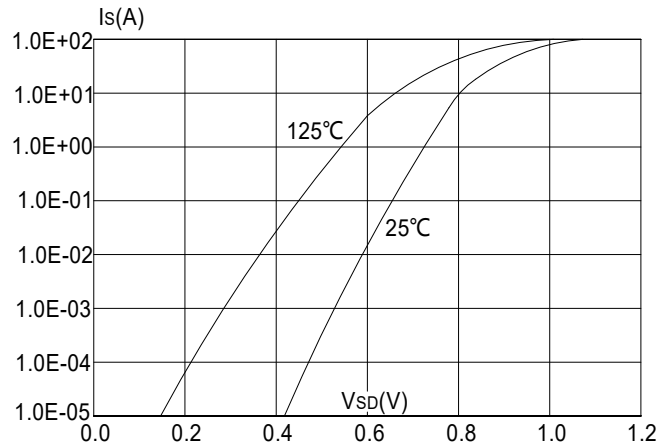
**Figure 2: Typical Transfer Characteristics**



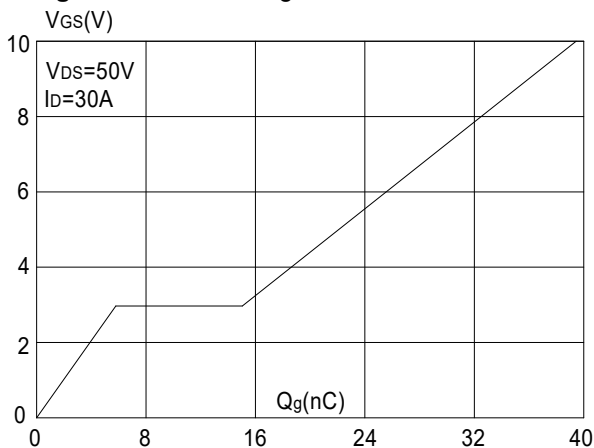
**Figure 3: On-resistance vs. Drain Current**



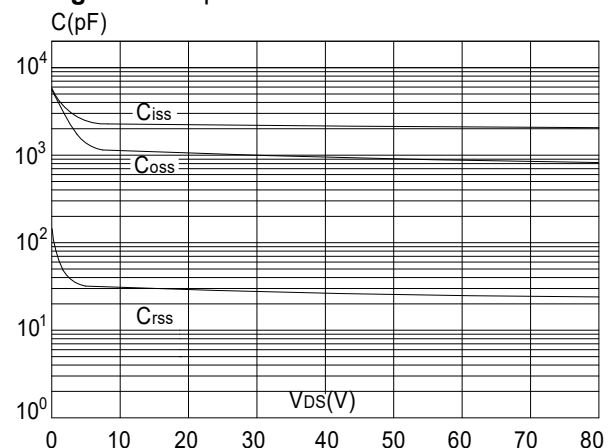
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

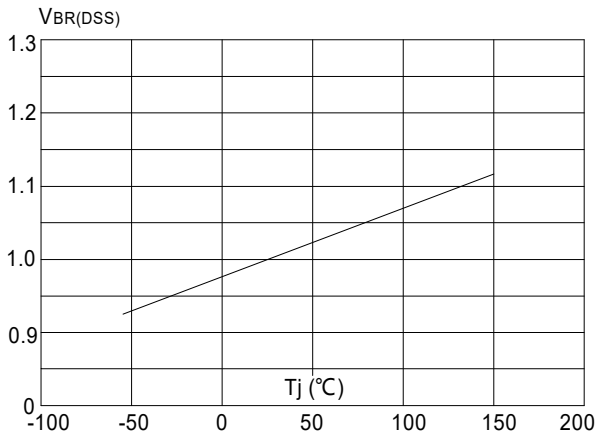


**Figure 6: Capacitance Characteristics**

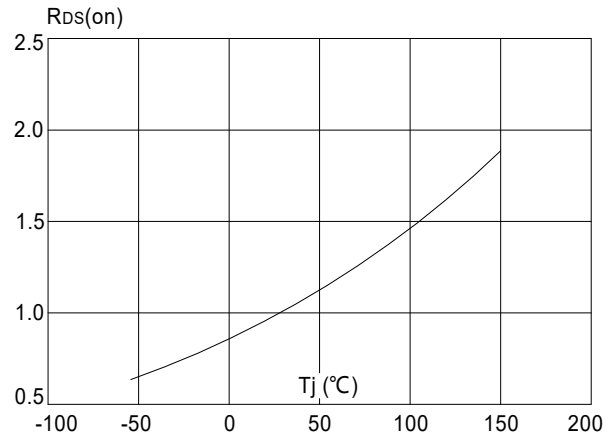




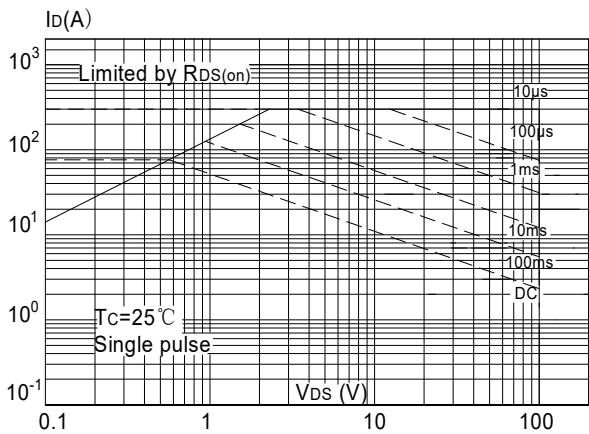
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



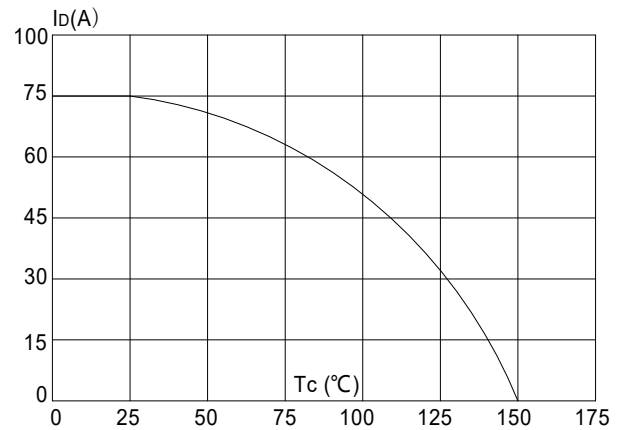
**Figure 8:** Normalized on Resistance vs. Junction Temperature



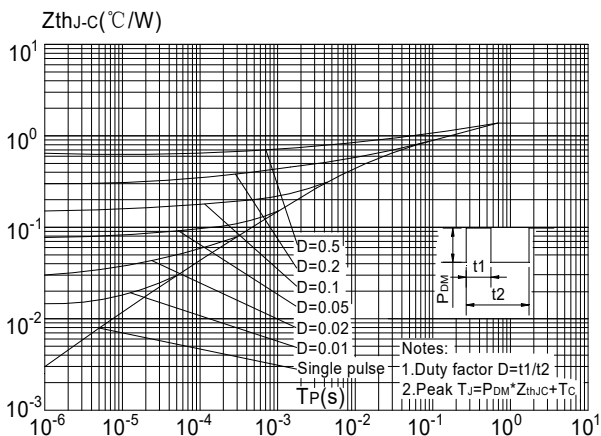
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



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





## Test Circuit

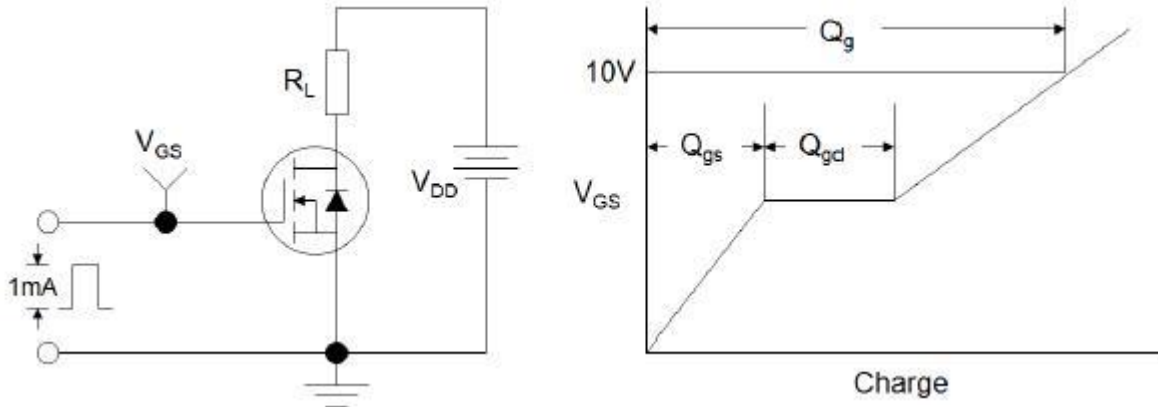


Figure1:Gate Charge Test Circuit & Waveform

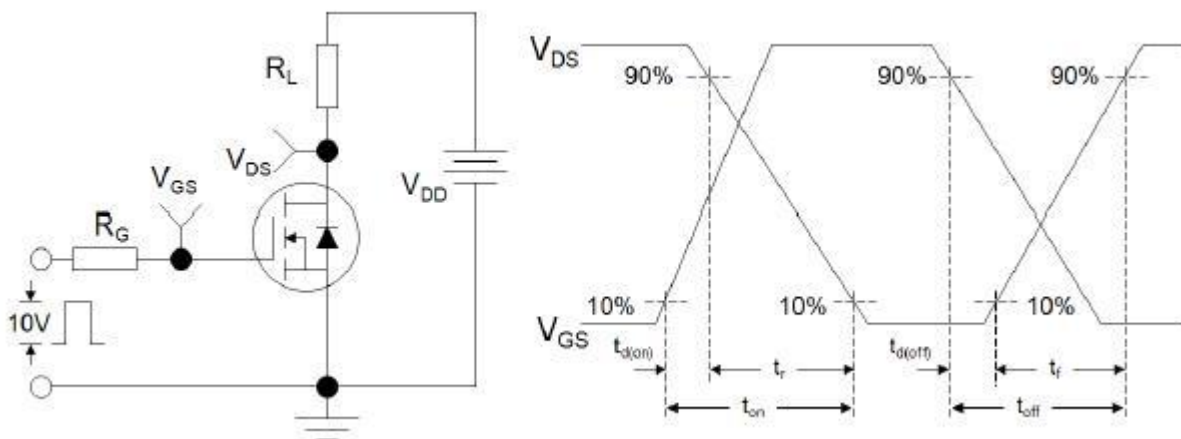


Figure 2: Resistive Switching Test Circuit & Waveforms

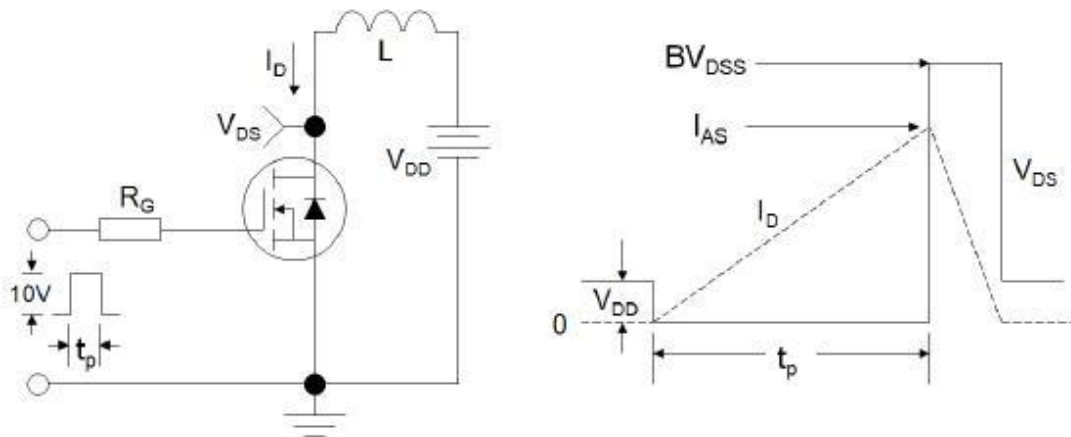
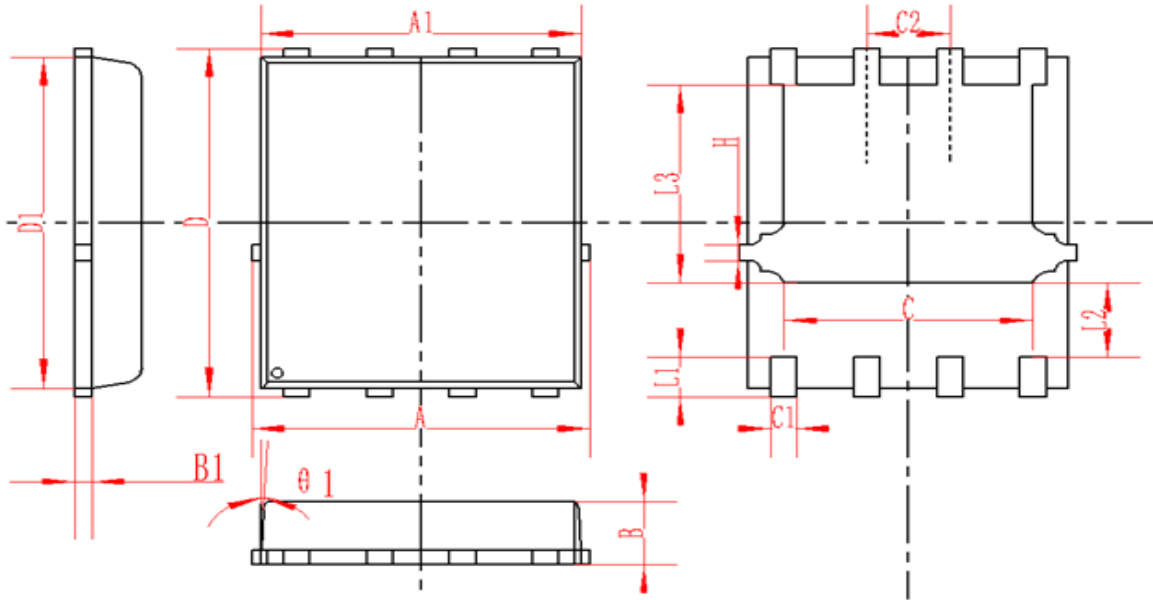


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



### DFN5X6-8L 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		
θ1	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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