

SuperMOS –PDFN5*6-8L 100V BV_{DSS} , 7.1m Ω $R_{DS(ON)}$, N-channel MOSFET

1. Description

The BSC070N10NS3G-ES is N-Channel enhancement MOS Field Effect Transistor. Using advanced shielded gate trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product BSC070N10NS3G-ES is Pb-free.

2. Features

- 100V, $R_{DS(ON)}=7.1m\Omega(TYP.) @V_{GS}=10V$
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

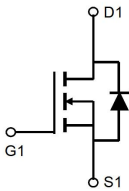
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packin g	Quantit y per reel	Flammabilit y Rating	Reel Size
BSC070N10NS3G-E S	PDFN5*6-8 L	GNJ10R08/lo t	Haloge n free	Tape & Reel	5,000 PCS	UL 94V-0	13 inche s

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
4	Gate		
1/2/3	Source		
5/6/7/8	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^{\circ}C$	I_D	83	A
	$T_C=75^{\circ}C$		64	
Maximum Power Dissipation		P_D	100	W
Pulsed Drain Current		I_{DM}	332	A
Avalanche Current, Single Pulsed ^a		I_{AS}	23	A
Avalanche Energy, Single Pulsed ^a		E_{AS}	132	mJ
Operating Junction Temperature		T_J	150	$^{\circ}C$
Lead Temperature		T_L	260	$^{\circ}C$
Storage Temperature Range		T_{stg}	-55 to 150	$^{\circ}C$

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		1.25	$^{\circ}C/W$

Note:

a: $T_J=25^{\circ}C$, $V_{DD}=50V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$

BSC070N10NS3G-ES

Rev-1.3

Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		7.1	8.0	mΩ
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =30A		65		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, f=1MHz, V _{DS} =50V		1895		pF
Output Capacitance	C _{OSS}			575		
Reverse Transfer Capacitance	C _{RSS}			12		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =10V, V _{DS} =50V, I _D =30A		28.5		nC
Gate-to-Source Charge	Q _{GS}			10		
Gate-to-Drain Charge	Q _{GD}			4.2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =50V, I _D =30A, R _G =3Ω		17		ns
Rise Time	t _r			20		
Turn-Off Delay Time	t _{d(OFF)}			68		
Fall Time	t _f			21		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A		0.9	1.5	V

7. Typical Characteristic

Figure 1. On-Region Characteristics

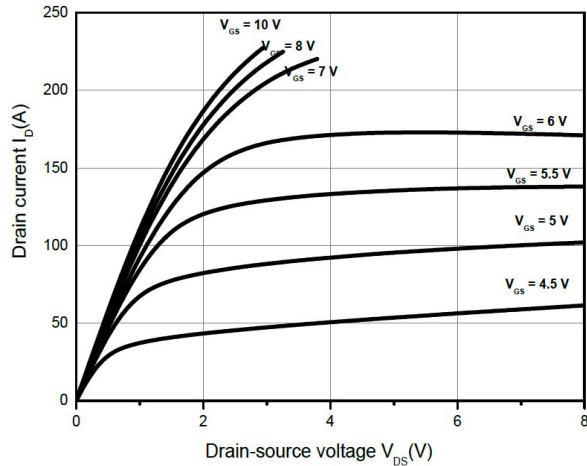


Figure 2. Transfer Characteristics

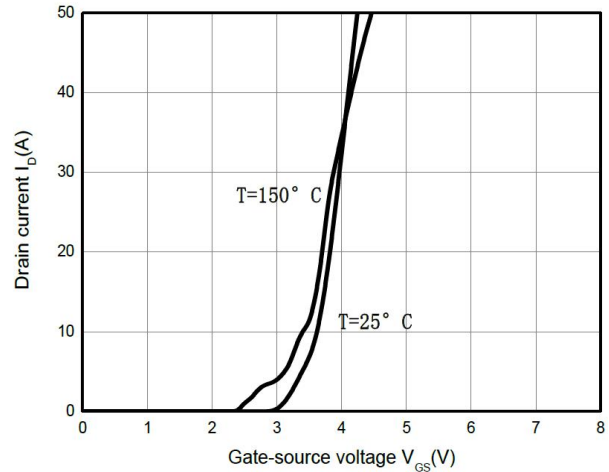


Figure 3. Body-Diode Characteristics

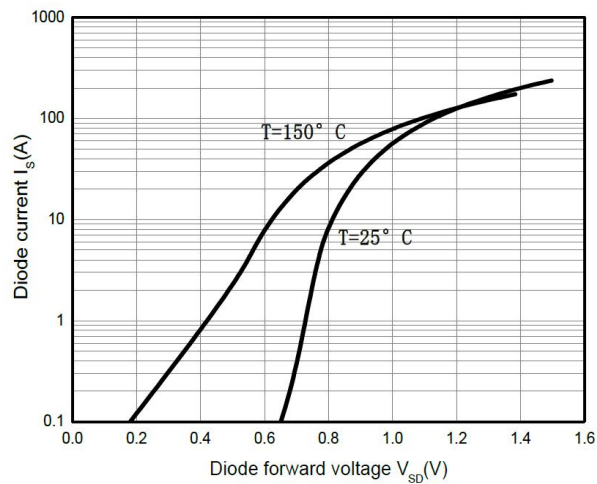


Figure 4. On-Resistance Variation vs. Drain Current

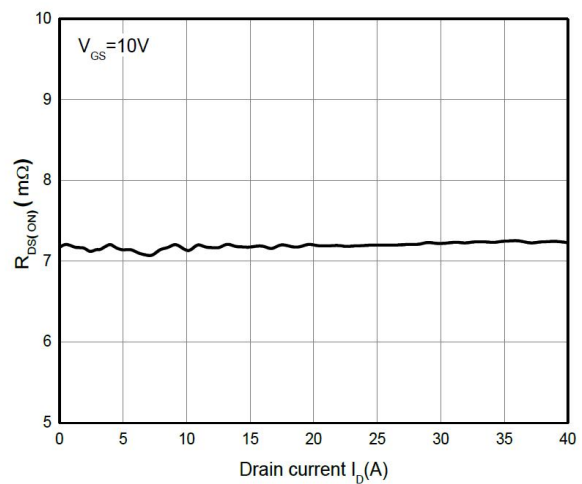
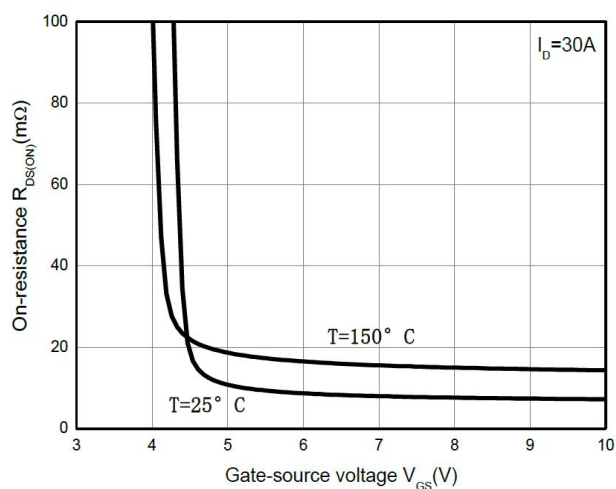
Figure 5. $R_{DS(on)}$ vs. Gate Voltage

Figure 6. On-Resistance vs. Temperature

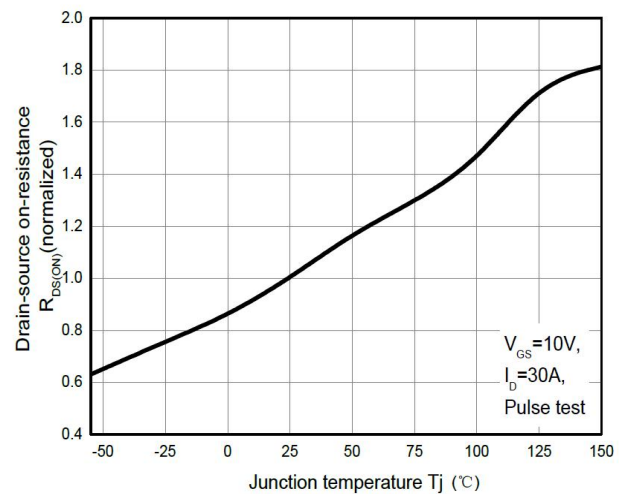


Figure 7. Threshold Voltage vs. Temperature

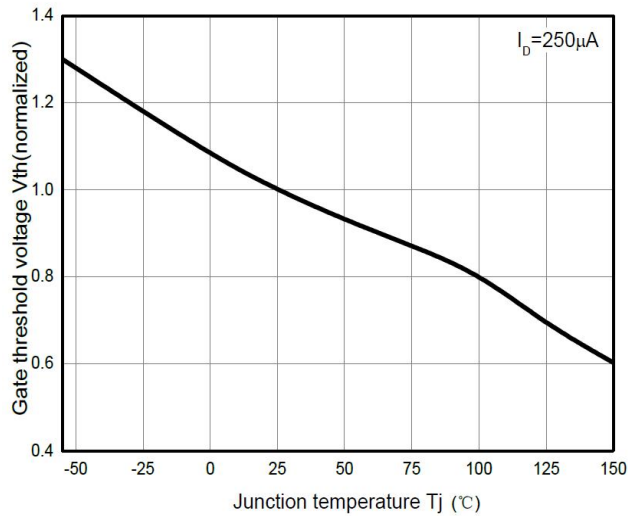


Figure 8. Breakdown Voltage vs. Temperature

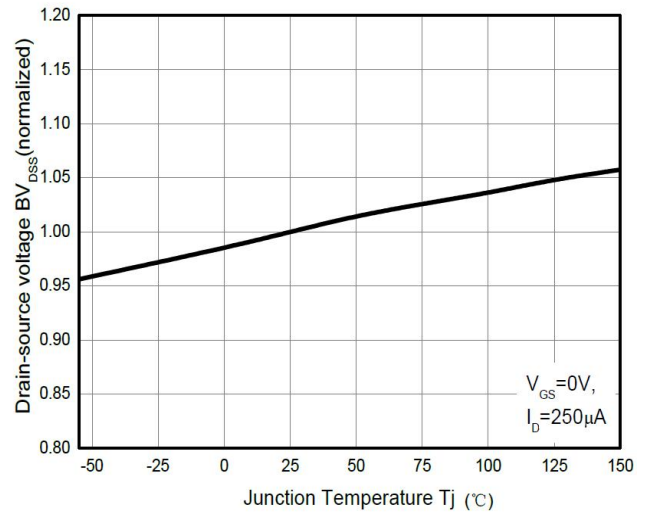


Figure 9. Capacitance Characteristics

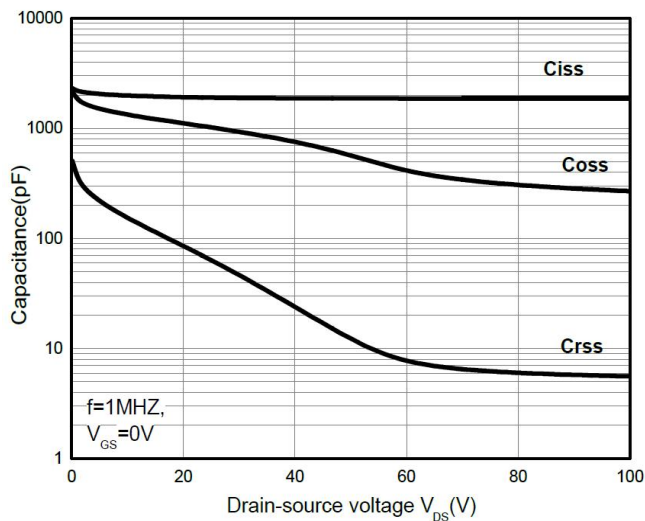


Figure 10. Gate Charge Characteristics

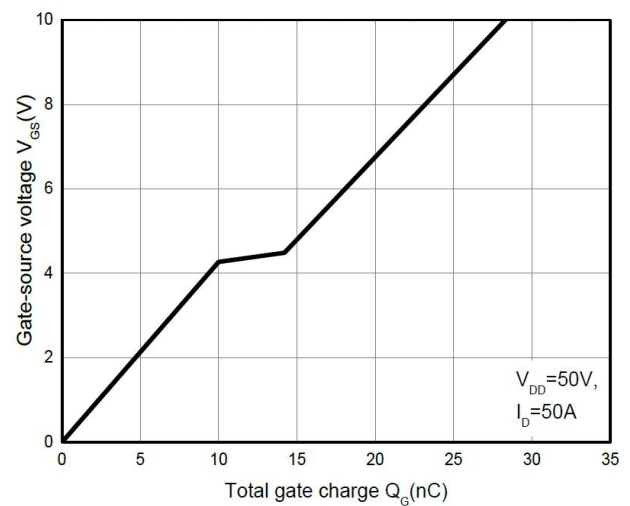


Figure 11. Drain Current Derating

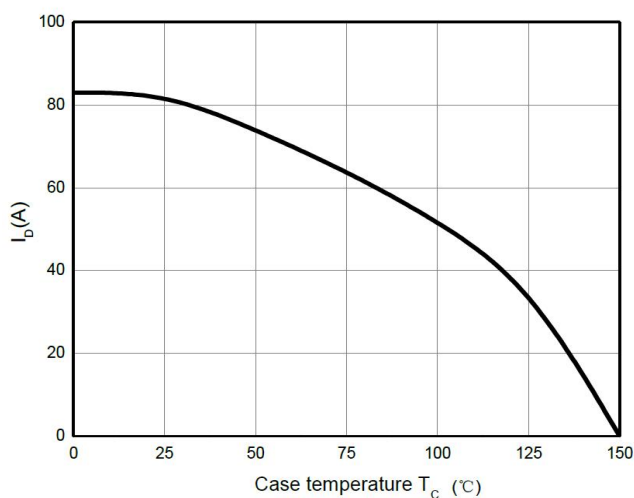


Figure 12. Power Dissipation vs. Temperature

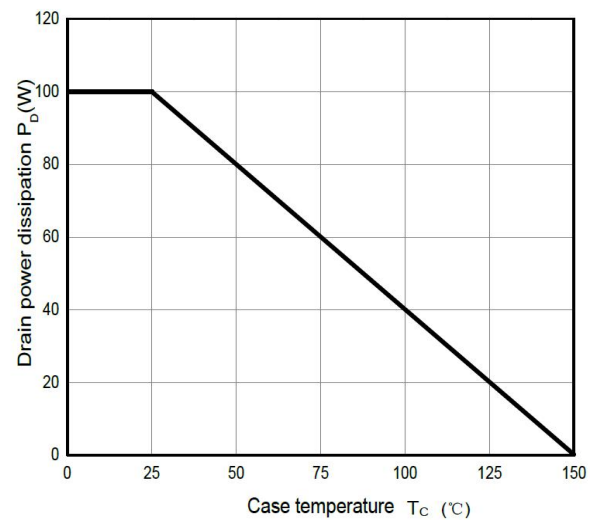


Figure 13. Maximum Safe Operating Area

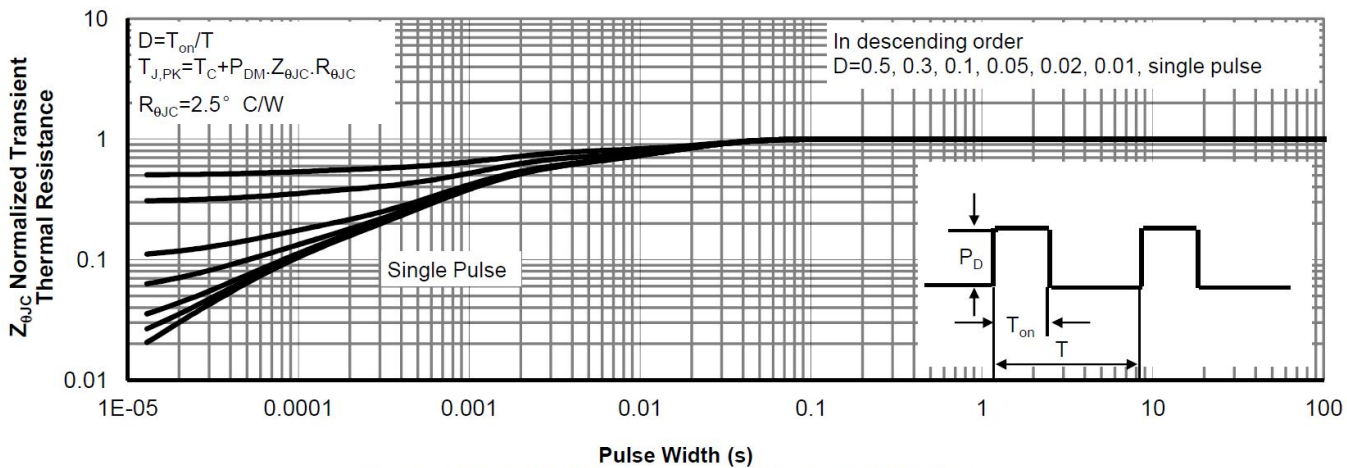
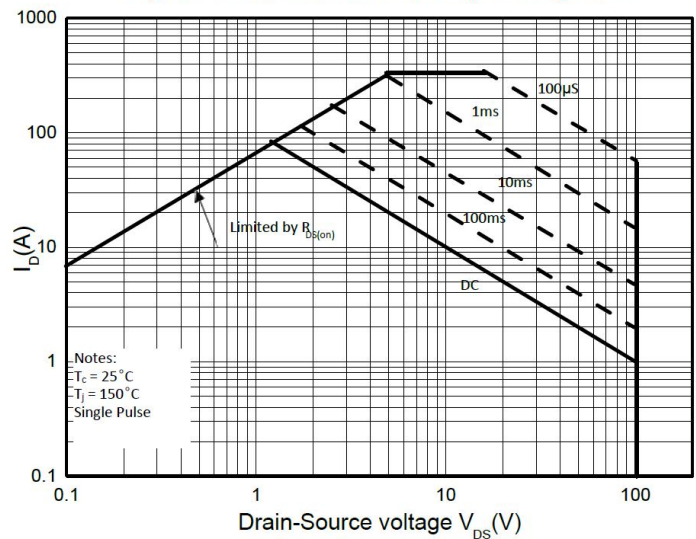
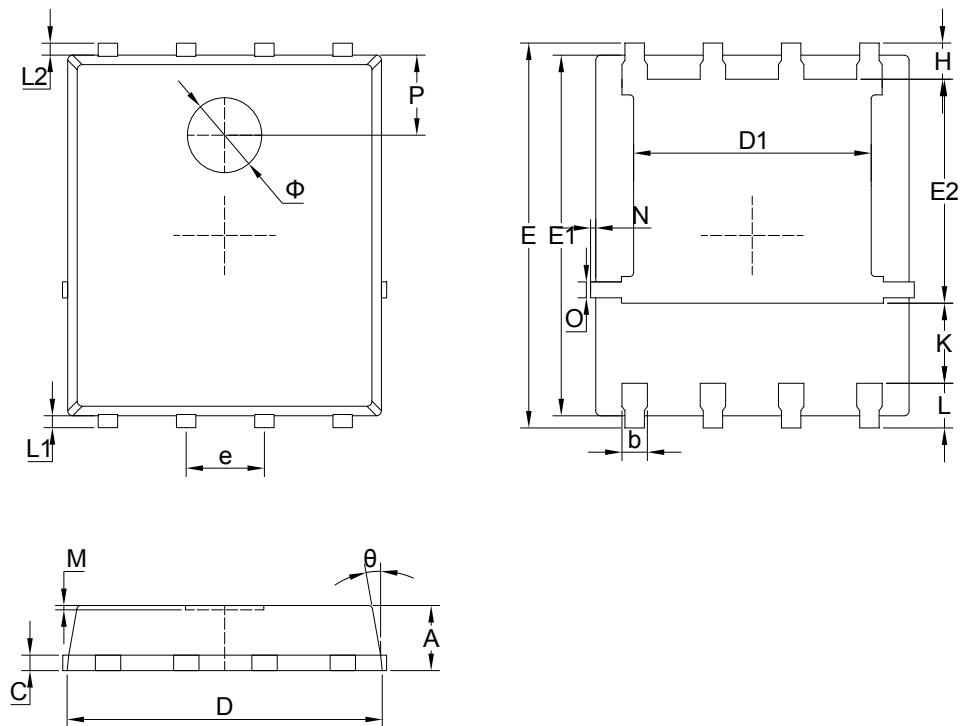


Figure 14: Normalized Maximum Transient Thermal Impedance

8. Dimension (PDFN5*6-8L)



Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.90	1.05	1.20	H	0.48	0.58	0.68
b	0.35	0.40	0.50	K	1.17	1.27	1.37
C	0.20	0.25	0.35	L	0.64	0.74	0.84
D	4.90	5.05	5.20	L1/L2	0.20 REF.		
D1	3.72	3.82	3.92	θ	8°	10°	12°
E	6.00	6.15	6.30	M	0.08 REF.		
E1	5.60	5.75	5.90	N	0	-	0.15
E2	3.47	3.57	3.67	O	0.25 REF.		
e	1.27 BSC.			P	1.28 REF.		
Φ	1.20 REF						

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