1. Description

The BSC040N10NS5(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 BSC040N10NS5(ES) is Pb-free.

2. Features

- 100V, $R_{DS(ON)}$=3mΩ(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

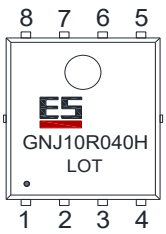
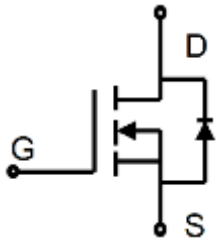
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
BSC040N10NS5 (ES)	PDFN5*6-8L	.GNJ10R040H/ LOT	Halogen free	Tape & Reel	5,000 PCS	UL 94V-0	13 inches

5. Pin Configuration and Functions

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

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6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ℃ 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°C	I_D	138	A
	T_C=100°C		82.8	
Maximum Power Dissipation		P_D	139	W
Pulsed Drain Current		I_{DM}	552	A
Avalanche Current, Single Pulsed [a]		I_{AS}	37	A
Avalanche Energy, Single Pulsed [a]		E_{AS}	342	mJ
Operating Junction Temperature		T_J	-55 to 150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$		0.9	°C/W

Note:

a: Tj=25℃,V_{DD}=100V, V_G=10V, L=0.5mH,Rg=25Ω.

Electrical Characteristics

At TA = 25℃ 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	2.4	2.7	3.6	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=30A		3	3.9	mΩ
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=1MHz, V_{DS}=50V		4050		pF
Output Capacitance	C_{OSS}			1525		
Reverse Transfer Capacitance	C_{RSS}			30		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=0 to 10V, V_{DS}=50V, I_D=20A		49		nC
Gate-to-Source Charge	Q_{GS}			17		
Gate-to-Drain Charge	Q_{GD}			6		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DD}=50V, I_D=48A, R_G=6Ω		26		ns
Rise Time	t_r			15		
Turn-Off Delay Time	$t_{d(OFF)}$			28		
Fall Time	t_f			12		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A			1.2	V

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7. Typical Characteristics

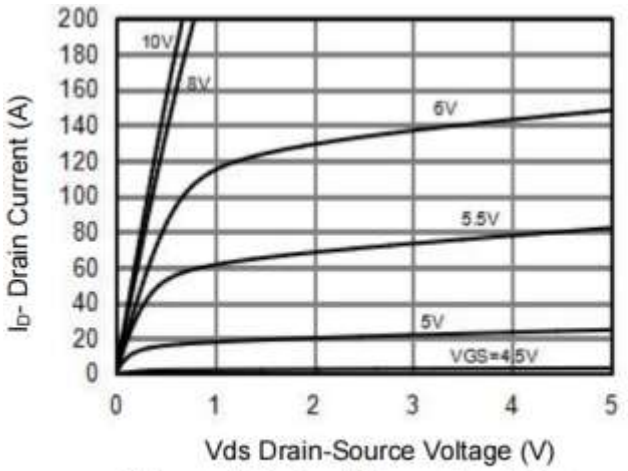


Figure 1 Output Characteristics

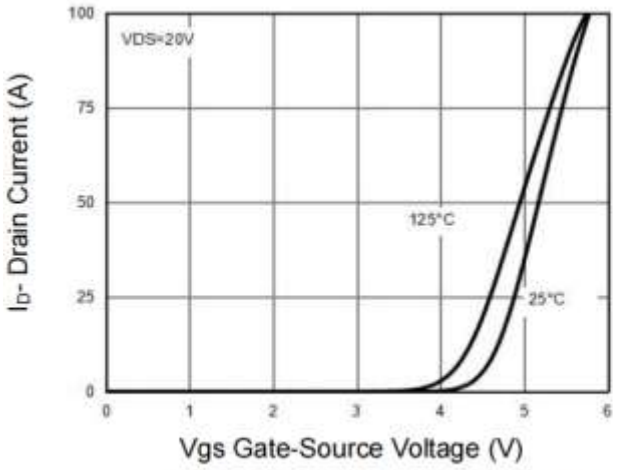


Figure 2 Transfer Characteristics

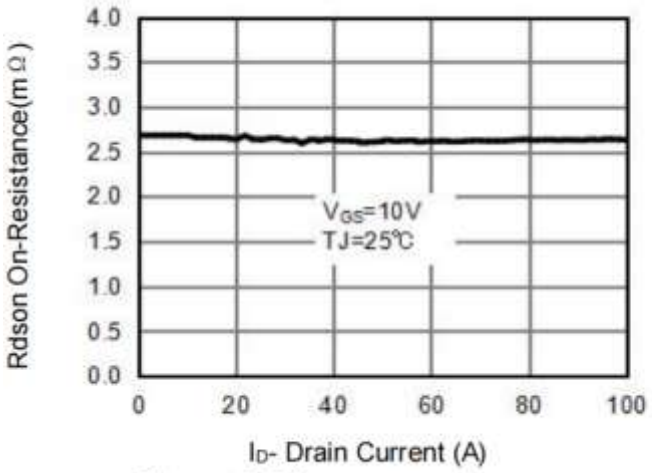


Figure 3 Rdson- Drain Current

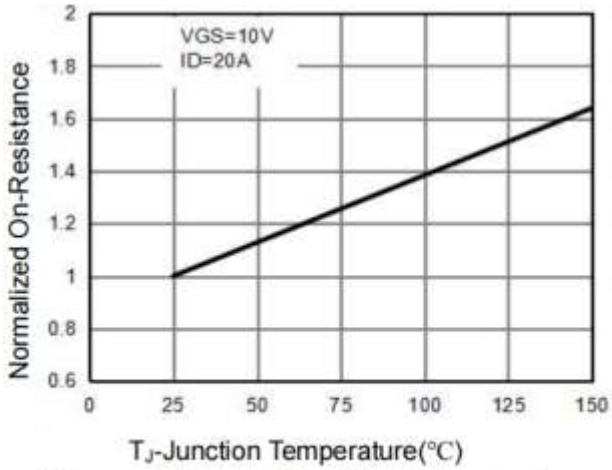


Figure 4 Rdson-Junction Temperature

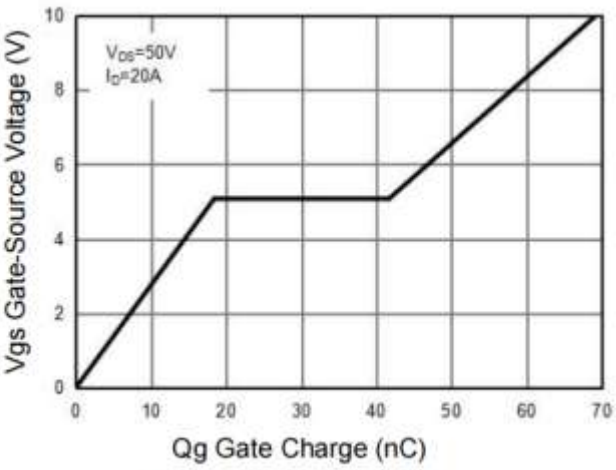


Figure 5 Gate Charge

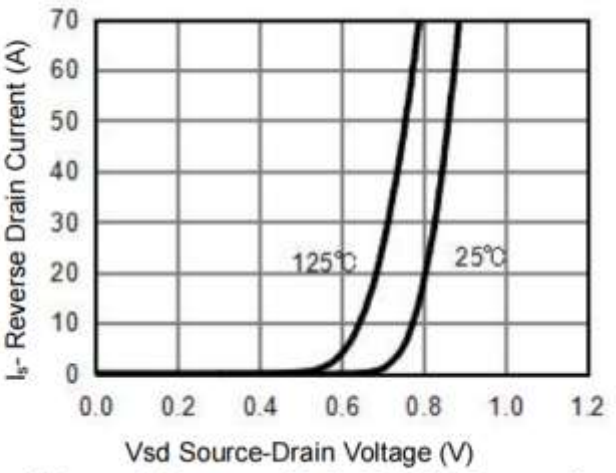


Figure 6 Source- Drain Diode Forward

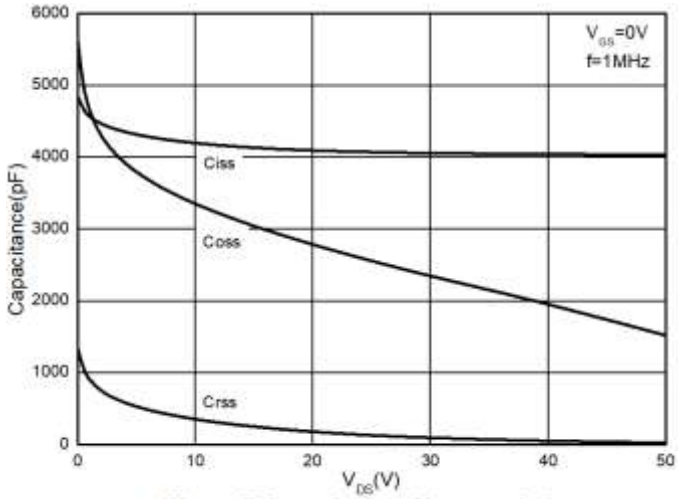


Figure 7 Capacitance Characteristics

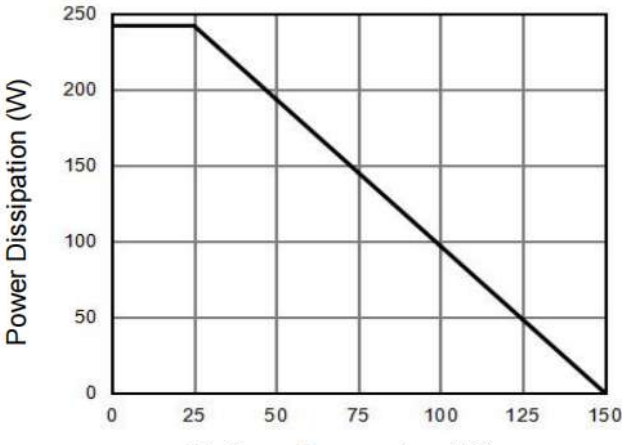


Figure 9 Power De-rating

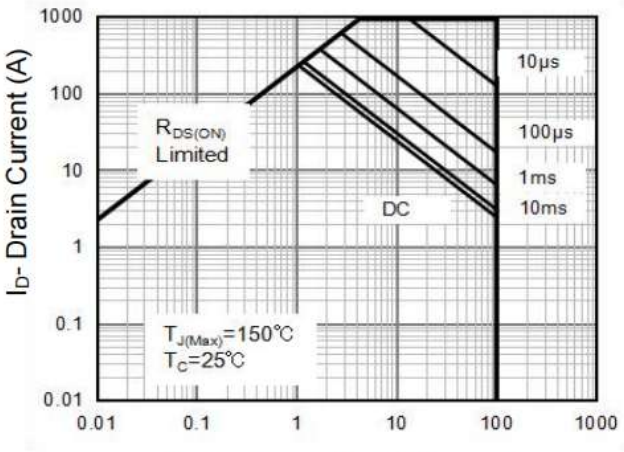


Figure 8 Safe Operation Area (Note3)

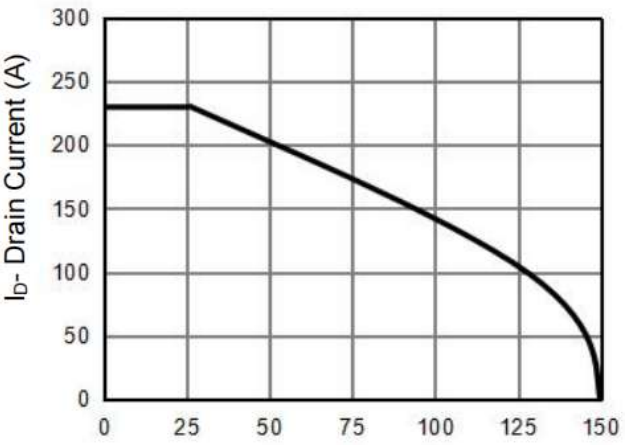


Figure 10 Current De-rating

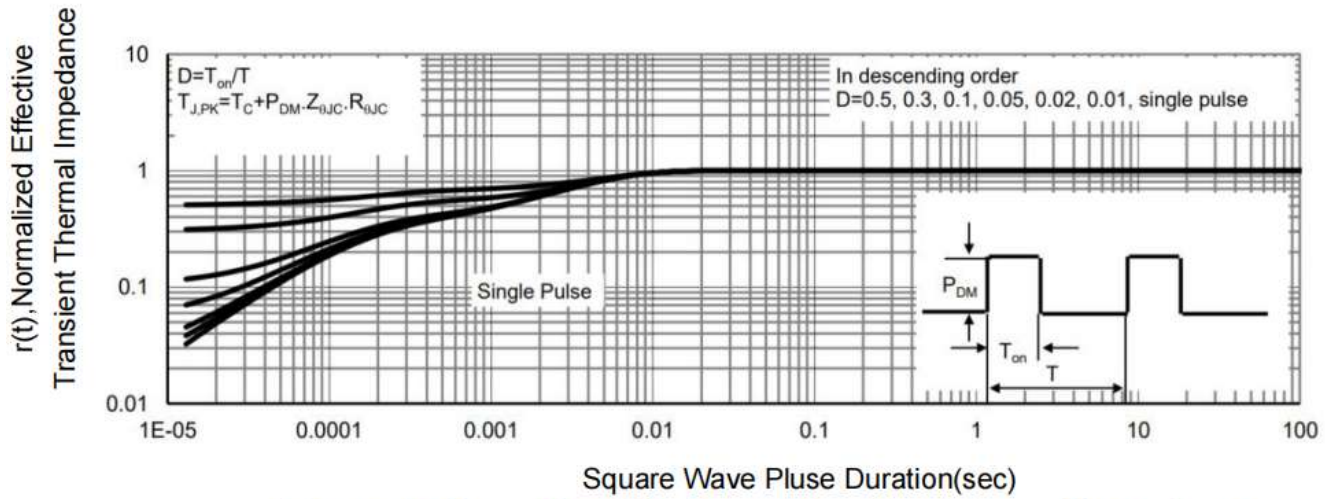
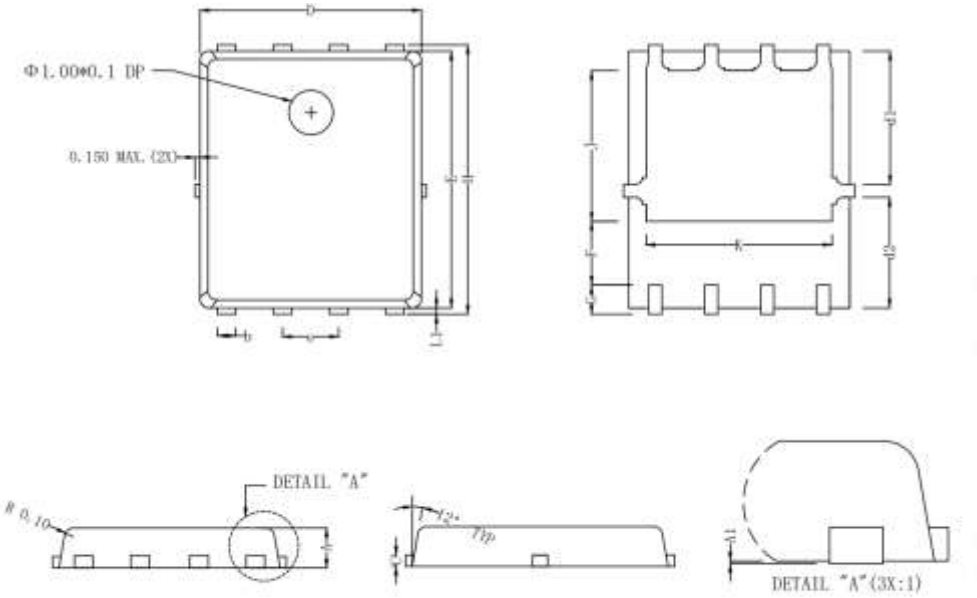


Figure 11 Normalized Maximum Transient Thermal Impedance

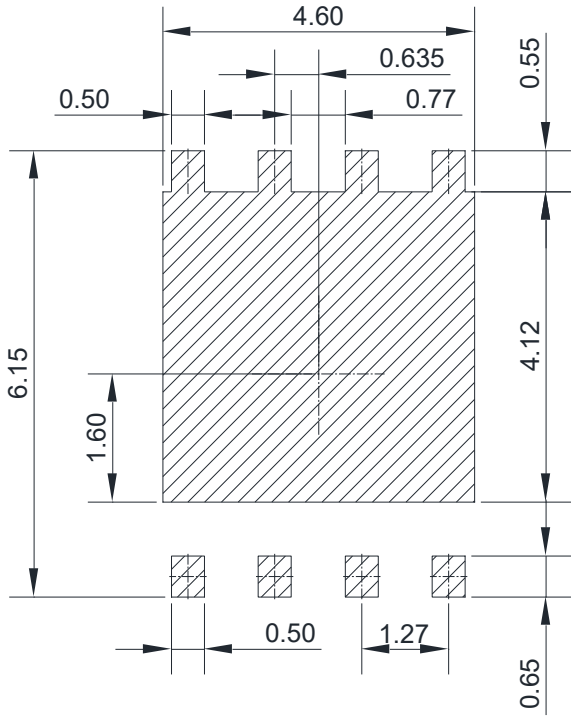
8. Dimension (PDFN5*6-8L)

POD (F)



	DIM.	MILLIMETER		
	Symbol	MIN	TYP	MAX
	A	0.90	1.00	1.10
	A1	0.00	0.03	0.05
*	b	0.25	0.30	0.35
	c	0.254 REF		
*	D	4.80	4.90	5.00
	d1	3.00 REF		
	d2	2.50 REF		
	F	1.35 REF		
*	E	5.65	5.75	5.85
	e	1.27 BSC		
*	H	5.90	6.00	6.10
*	L1	0.10	0.13	0.16
	G	0.535	0.635	0.735
	K	4.10	4.20	4.30
	J	3.40	3.55	3.65

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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