

BSC020N03LSG-TP

N-Channel Enhancement MOSFET

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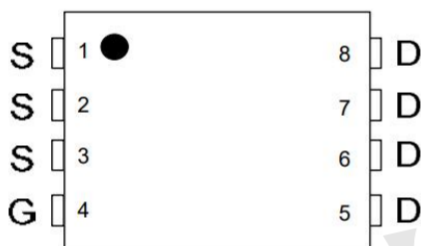
Product Summary

- V_{DS} 30 V
- I_{DS} (at $V_{GS}=10V$) 160A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $\leq 1.4m\Omega$ (TYP)

Application

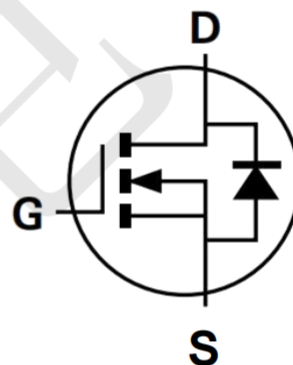
- Load switch
- High Frequency Switching and Synchronous Rectification
- Active Clamp in Intermediate
- DC/DC Power Supplies

Package and Pin Configuration



PDFN5X6-8

Circuit diagram



Absolute Maximum Ratings

($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	160
		$T_C=100^\circ\text{C}$	100
Pulsed Drain Current	I_{DM}	640	A
Single Pulse Avalanche Energy	EAS	870	mJ
Total Power Dissipation	P_{DTOT}	$T_C=25^\circ\text{C}$	57
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.2	$^\circ\text{C/W}$

Note : The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	30	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.5	2.2	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	I_{DSS}	--	0.1	1.0	μA
	$V_{DS}=30V, T_J=55^{\circ}C$		--	1.0	5.0	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	--	1.4	2.2	m Ω
	$V_{GS}=4.5V, I_D=15A$		--	2.1	3.2	
Forward Transconductance (Note 2)	$V_{DS}=5V, I_D=20A$	g_{fs}	--	75	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}=30V, I_D=30A, V_{GS}=10V$	Q_g	--	142	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	92	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	18	--	
Input Capacitance	$V_{DS}=30V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	7428	--	pF
Output Capacitance		C_{oss}	--	664	--	
Reverse Transfer Capacitance		C_{rss}	--	544	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DD}=20V, I_D=1A, V_{GS}=10V, R_G=10\Omega$	$t_{d(on)}$	--	18	--	nS
Rise Time (Note 3)		t_r	--	10	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	64	--	
Fall Time (Note 3)		t_f	--	16	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}=0V, I_F=10A$	V_{SD}	--	0.7	1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	160	A
Pulsed Current (Note 1)		I_{SM}	--	--	640	A

Notes:

1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

Typical Electrical and Thermal Characteristics

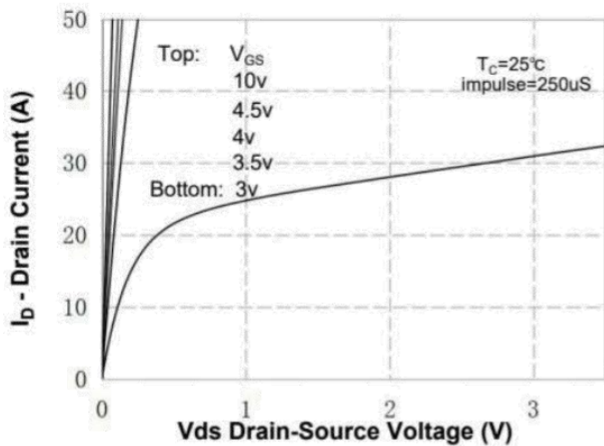


Figure 1. On-Region Characteristics

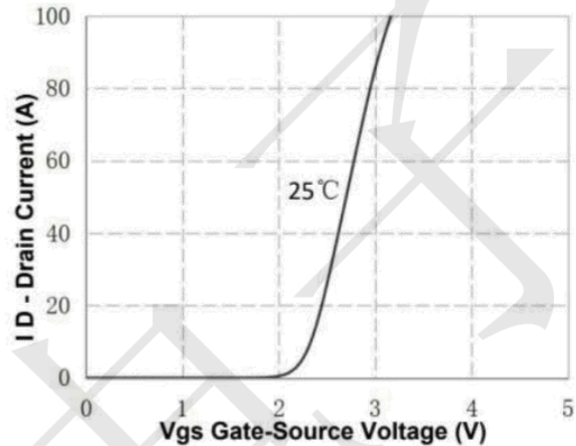


Figure 2. Transfer Characteristics

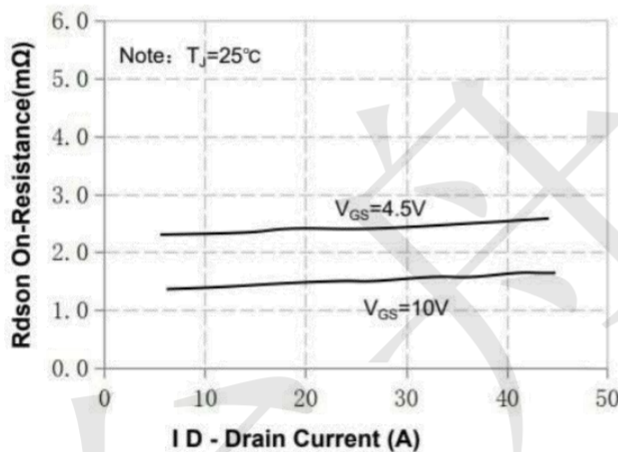


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

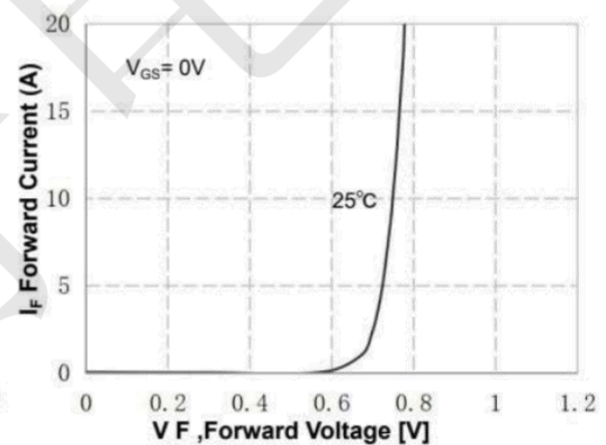


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

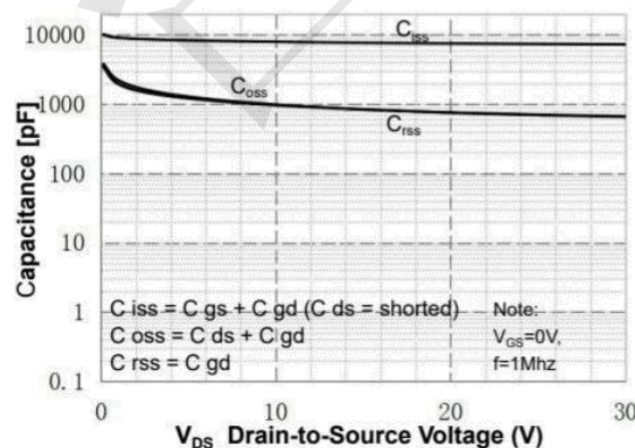


Figure 5. Capacitance Characteristics

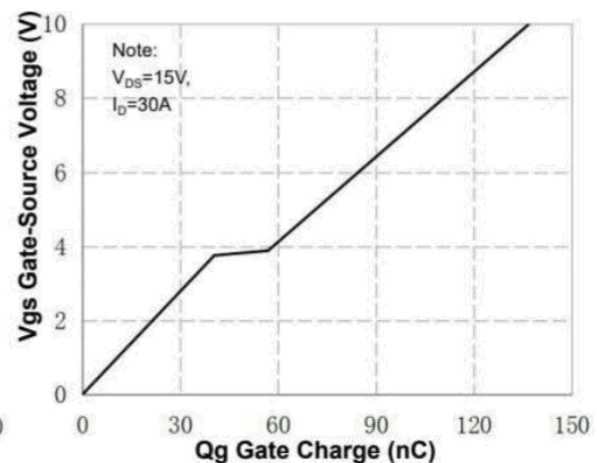
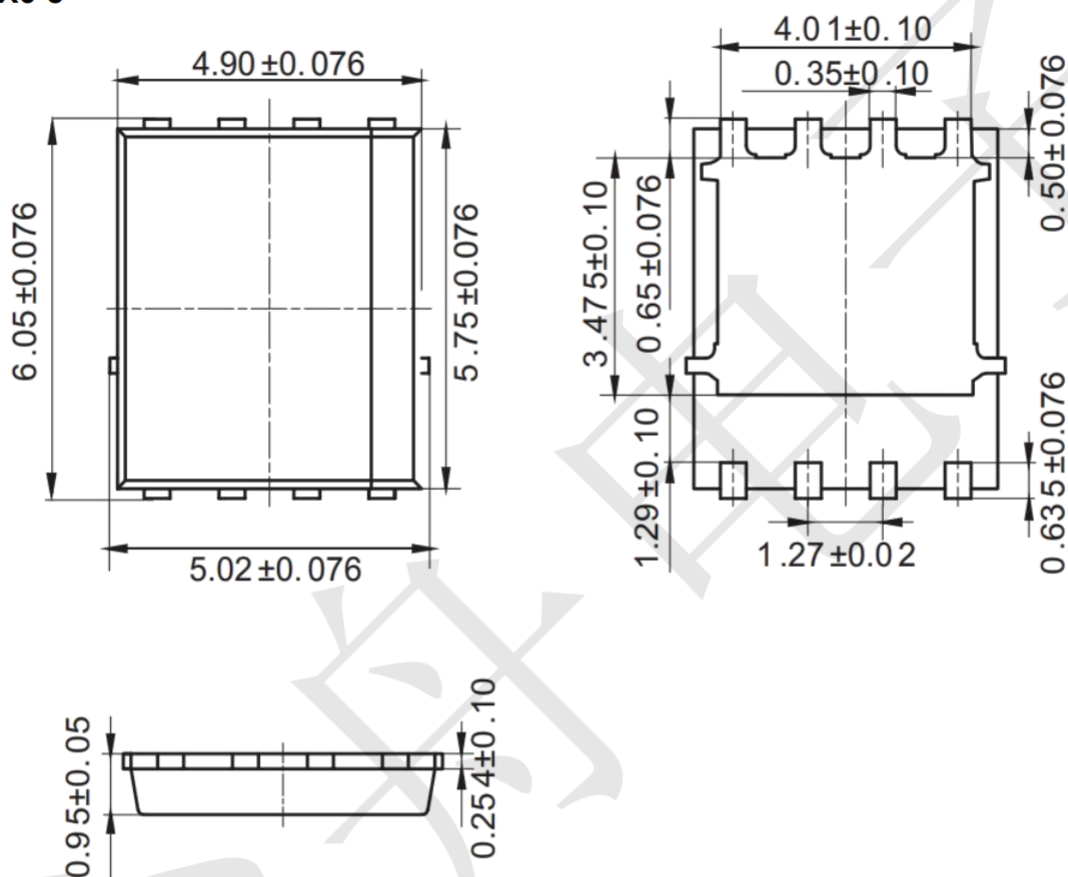


Figure 6. Gate Charge Characteristics

Package Information

PDFN5X6-8



Mounting Pad Layout (unit: mm)

