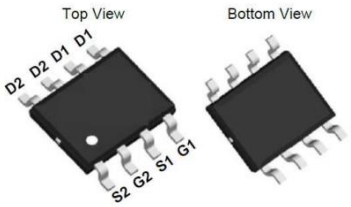
20V 6A Dual N-Channel Enhancement Mode Power MOSFET

General Description

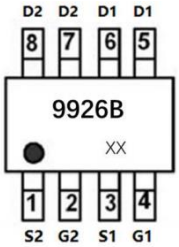
The BXT280N02B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V while retaining a 12V $V_{GS(MAX)}$ rating. This device is suitable for use as a uni-directional or bi-directional load switch.

FEATURES

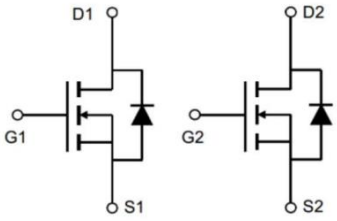
- RDSON≤28mΩ @Vgs=4.5V, Id=6A
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired



SOP-8(Dual)



Marking and pin Assignment



Schematic Diagram

ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXT280N02B	9926B	SOP-8	Reel

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Parameter		Symbol	Rating	Unit
			SOP-8	
Drain-Source Voltage		V_{DSS}	20	V
Drain Current	Continuous (T_C = 25°C)	I_D	6	A
	Continuous (T_C = 100°C)		4	A
Drain Current	Pulsed (Note1)	I_{DM}	24	A
Gate-Source Voltage		V_{GSS}	±12	V
Power Dissipation	T_C =25°C	P_D	1.6	W
Maximum Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C

Note： 1. Repetitive Rating: Pulse width limited by maximum junction temperature

THERMAL CHARACTERISTICS

Parameter	Symbol	Max.	Unit
		SOP-8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	78	°C / W

ELECTRICAL CHARACTERISTICS（T_J=25℃,unless otherwise Noted）

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V, ID=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=20V, VGS=0V			1	uA
Gate-Body Leakage Current, Forward	I_{GSS}	VGS=12V			100	nA
Gate-Body Leakage Current, Reverse		VGS=-12V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	VDS=VGS, ID=250μA	0.4	0.7	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=4.5V, ID=6A		20	28	mΩ
		VGS=2.5V, ID=5A		25	38	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	VDS=15V, VGS=0V, f=1.0MHz		524		pF
Output Capacitance	C_{OSS}			96		pF
Reverse Transfer Capacitance	C_{RSS}			75		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	VDD=15V, ID=6A, VGS = 4.5V, RG=3Ω		3		ns
Turn-ON Rise Time	t_R			7.4		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			21		ns
Turn-OFF Fall-Time	t_F			6		ns
Total Gate Charge(Note2)	Q_G	VDS =15V, VGS =10V, ID =3A		5.5		nC
Gate Source Charge	Q_{GS}			0.9		nC
Gate Drain Charge	Q_{GD}			1		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	IS=6A, VGS=0V			1.2	V
Diode Continuous Forward Current	I_S				6	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				24	A
Body Diode Reverse Recovery Time	trr	IF=6A,dI/dt=100A/μs		14		ns
Body Diode Reverse Recovery Charge	Qrr			6		nC

Note： 2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

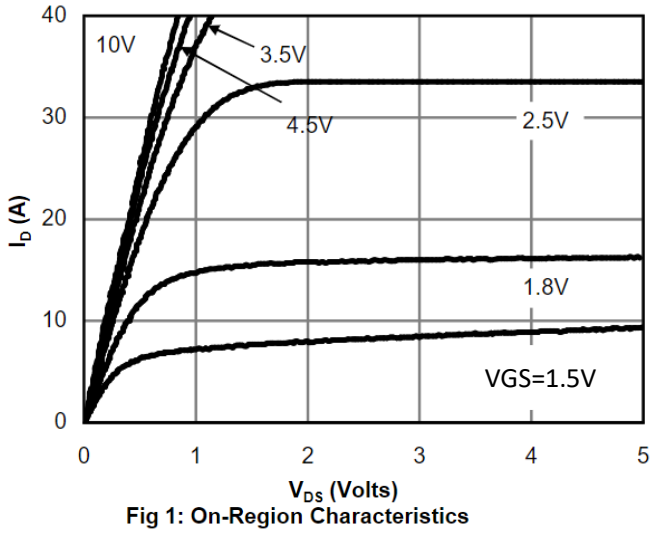


Fig 1: On-Region Characteristics

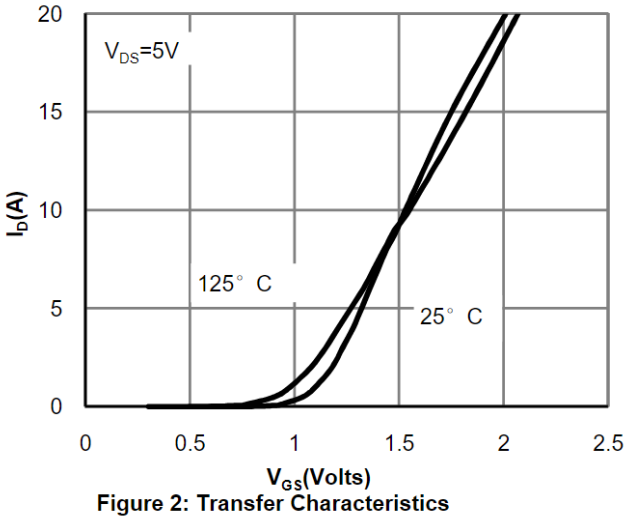


Figure 2: Transfer Characteristics

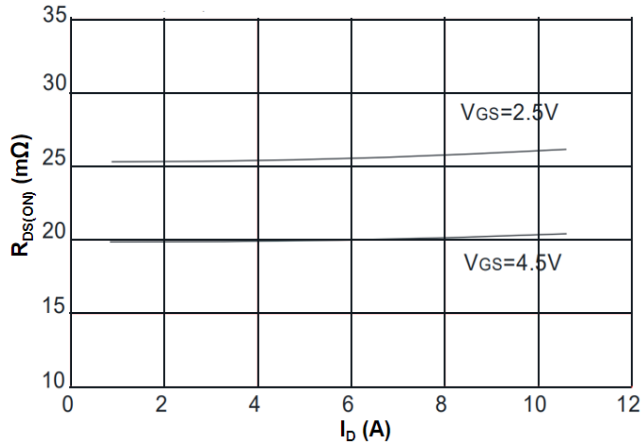


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

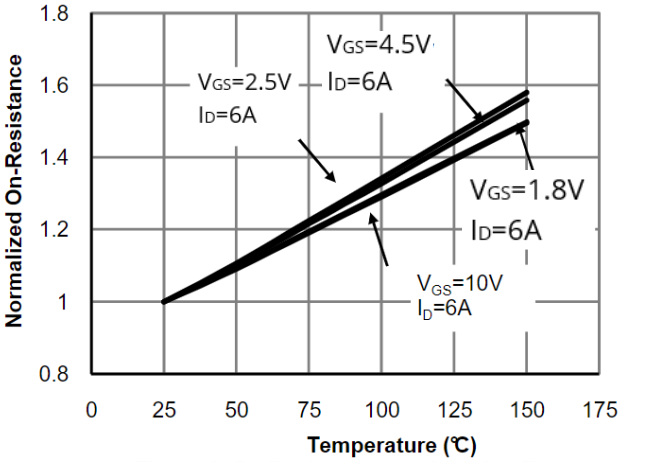


Figure 4: On-Resistance vs. Junction Temperature

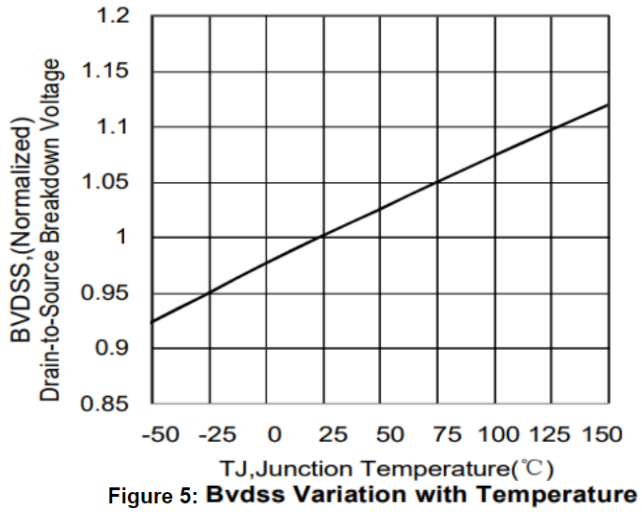


Figure 5: **Bvdss Variation with Temperature**

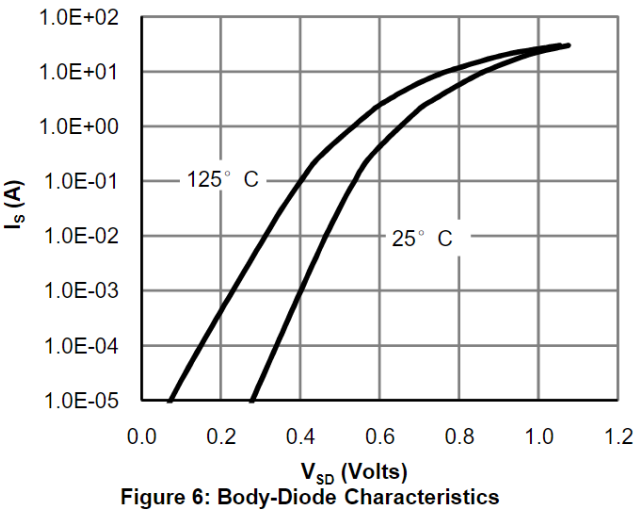


Figure 6: Body-Diode Characteristics

TYPICAL CHARACTERISTICS(Cont.)

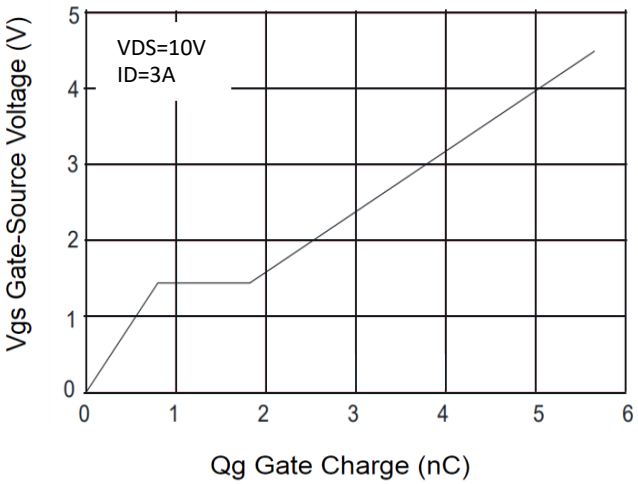


Figure 7: Gate-Charge Characteristics

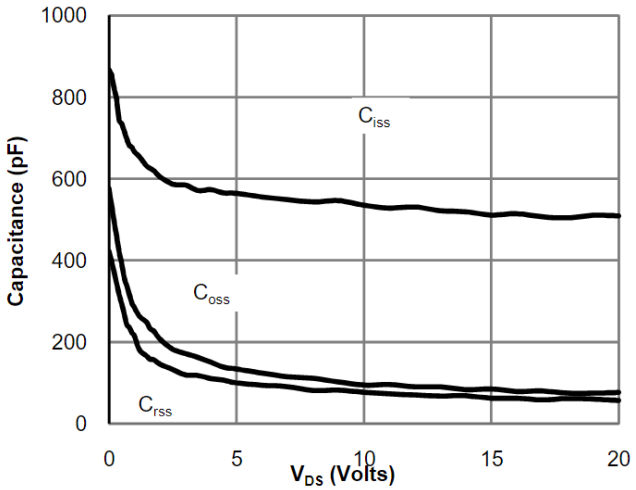


Figure 8: Capacitance Characteristics

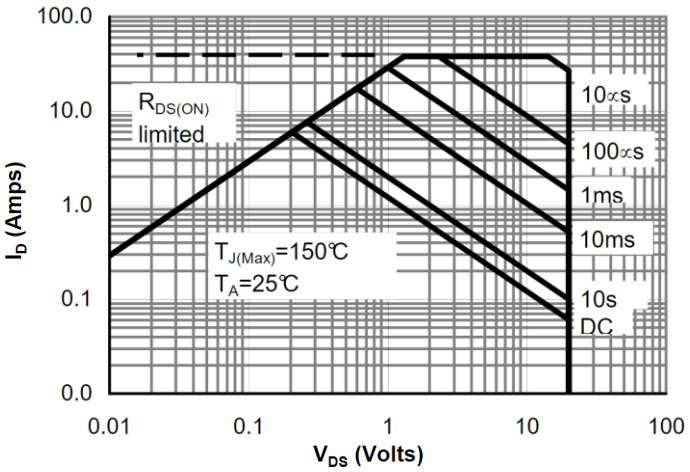
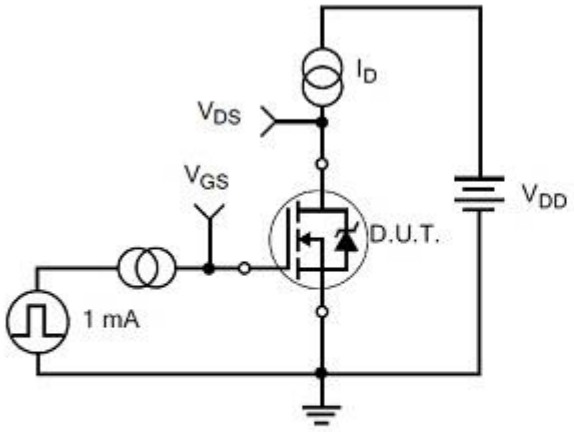
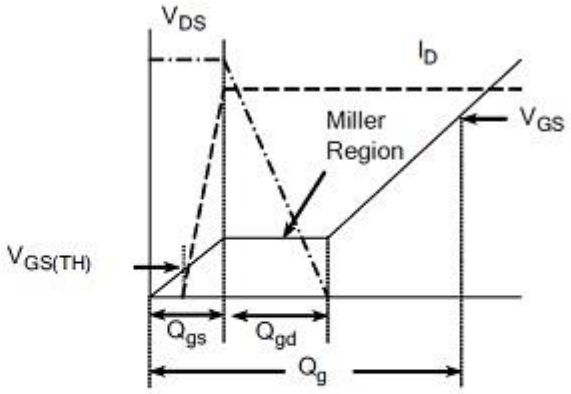


Figure 9: Maximum Forward Biased Safe Operating Area

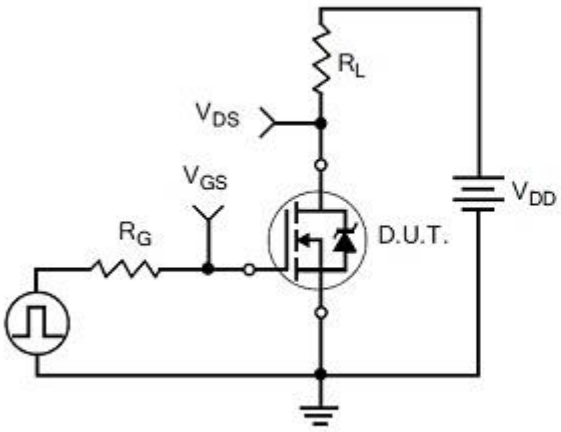
TEST CIRCUITS AND WAVEFORMS



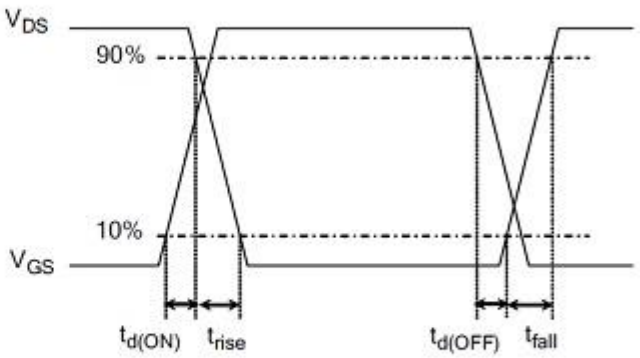
Gate Charge Test Circuit



Gate Charge Waveform

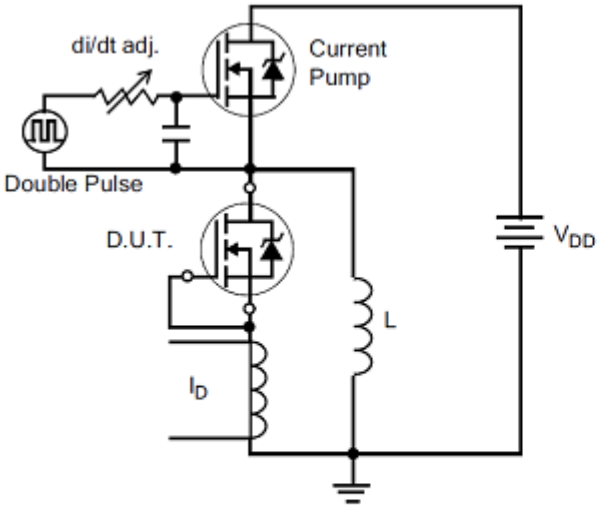


Resistive Switching Test Circuit

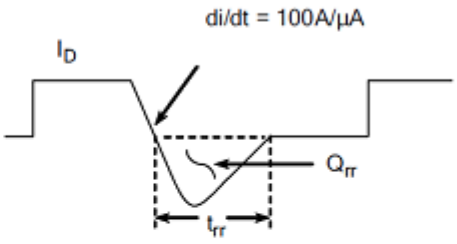


Resistive Switching Waveforms

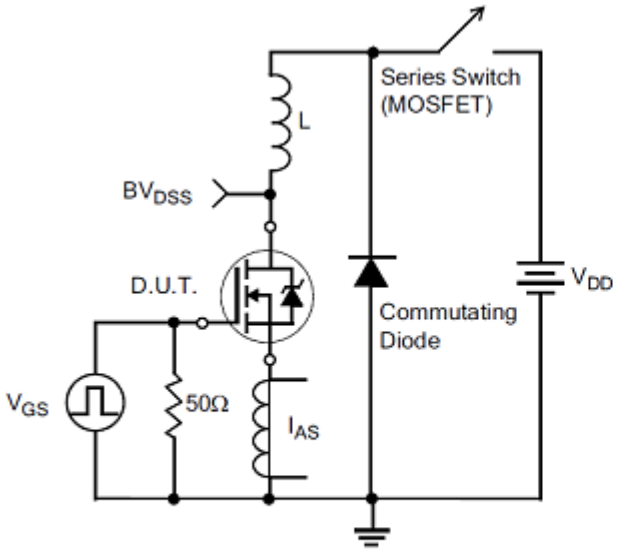
TEST CIRCUITS AND WAVEFORMS(Cont.)



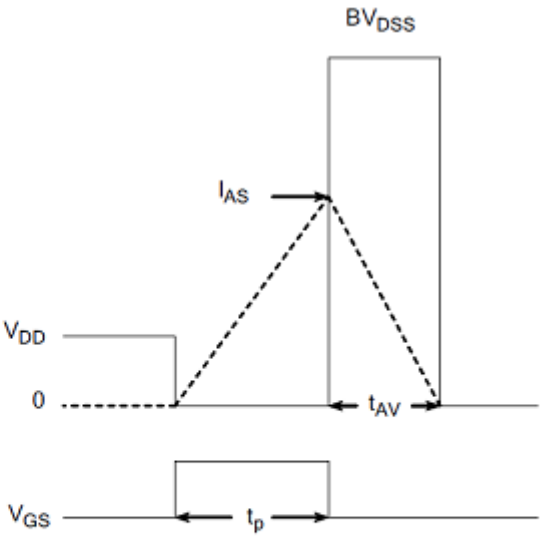
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



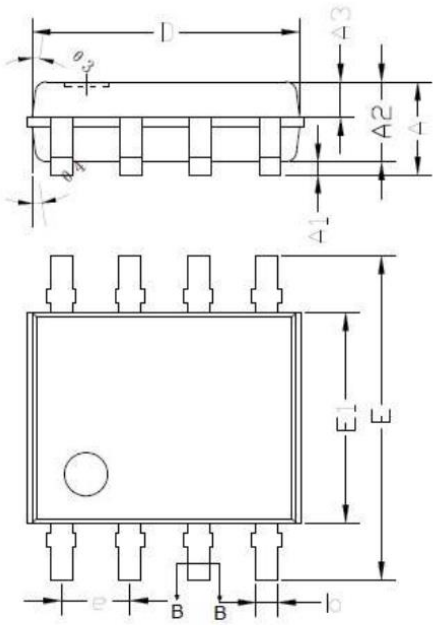
Unclamped Inductive Switching Test Circuit

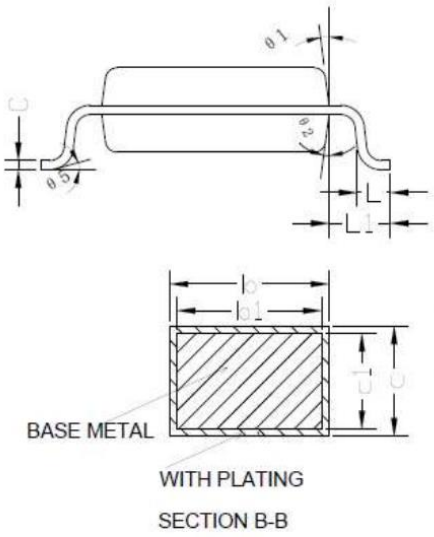


$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

Unclamped Inductive Switching Waveforms

SOP-8 Package





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.65
A1	0.10	--	0.25
A2	1.40	1.42	1.50
A3	0.60	0.65	0.70
b	0.33	--	0.47
b1	0.32	0.41	0.44
c	0.20	--	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.90	6.00	6.20
E1	3.85	3.90	4.00
e	1.27(BSC)		
L	0.50	0.60	0.70
L1	1.05(BSC)		
θ1	6°	~	12°
θ2	6°	~	12°
θ3	5°	~	10°
θ4	5°	~	10°
θ5	0°	~	6°

Revision history

Document revision history

Date	Revision	Changes
22-Mar-2021	1.0	First release

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