

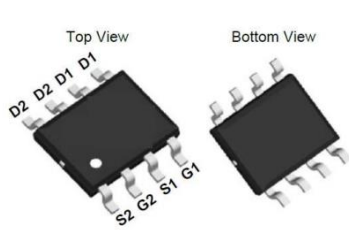
## 20V 6A Dual N-Channel Enhancement Mode Power MOSFET

### General Description

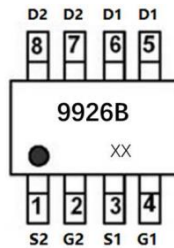
The BXT280N02B uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 1.8V while retaining a 12V  $V_{GS(MAX)}$  rating. This device is suitable for use as a uni-directional or bi-directional load switch.

### FEATURES

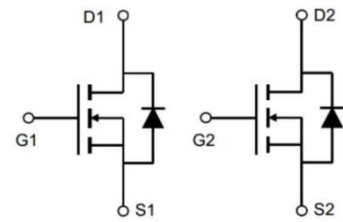
- $R_{DS(ON)} \leq 28m\Omega$  @  $V_{GS}=4.5V, I_D=6A$
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired



SOP-8(Dual)



Marking and pin Assignment



Schematic Diagram

### ASSEMBLY MESSAGE

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

### ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ C$ unless otherwise noted)

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

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** ( $T_J=25^{\circ}\text{C}$ , unless otherwise Noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=12V$			100	nA
Gate-Body Leakage Current, Reverse		$V_{GS}=-12V$			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.7	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=6A$		20	28	m $\Omega$
		$V_{GS}=2.5V, I_D=5A$		25	38	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V,$ $f=1.0MHz$		524		pF
Output Capacitance	$C_{OSS}$			96		pF
Reverse Transfer Capacitance	$C_{RSS}$			75		pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=15V, I_D=6A, V_{GS} =$ $4.5V, R_G=3\Omega$		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)	$Q_G$	$V_{DS} =15V, V_{GS} =10V, I_D$ $=3A$		5.5		nC
Gate Source Charge	$Q_{GS}$			0.9		nC
Gate Drain Charge	$Q_{GD}$			1		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=6A, V_{GS}=0V$			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	$t_{rr}$	$I_F=6A, di/dt=100A/\mu s$		14		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$			6		nC

Note: 2. Essentially independent of operating temperature

**TYPICAL CHARACTERISTICS**

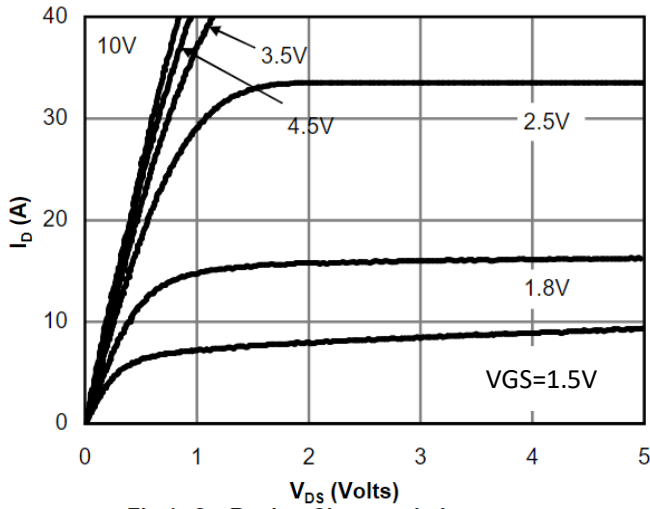


Fig 1: On-Region Characteristics

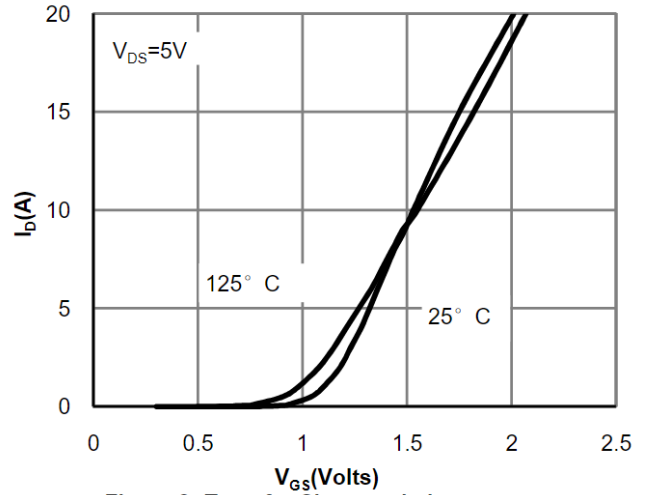


Figure 2: Transfer Characteristics

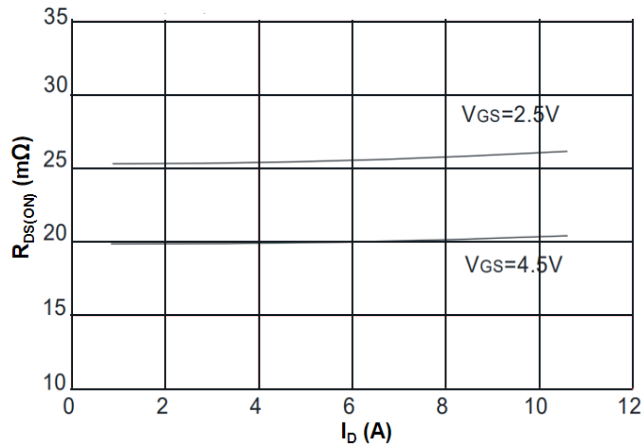


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

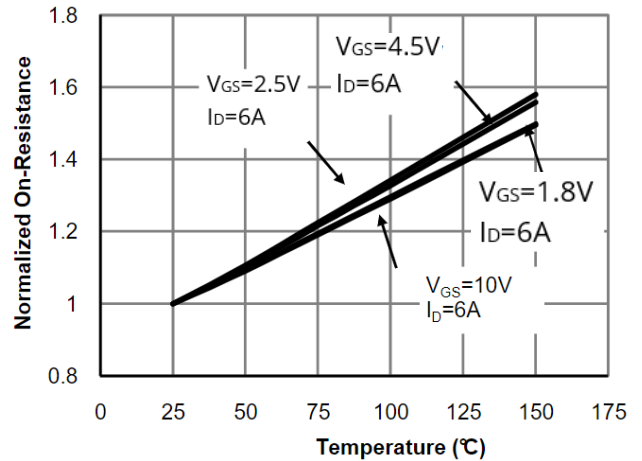


Figure 4: On-Resistance vs. Junction Temperature

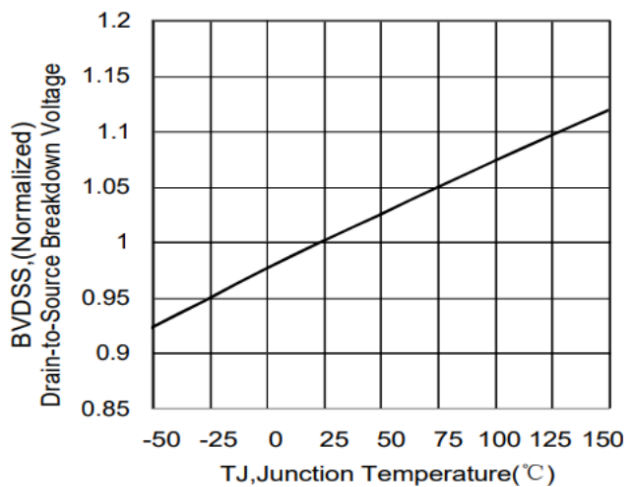


Figure 5: Bvdss Variation with Temperature

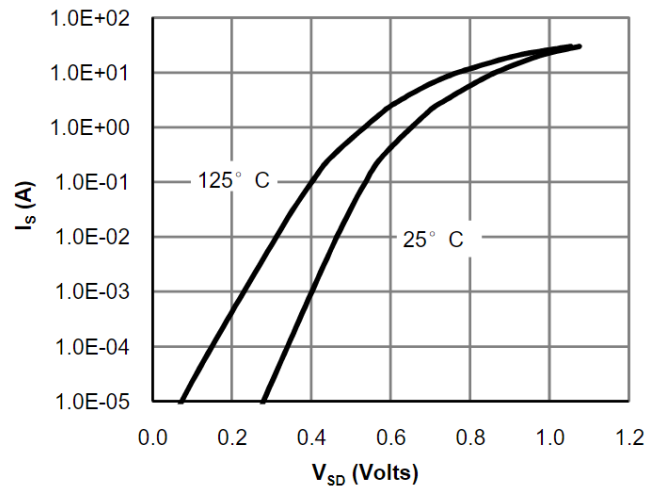


Figure 6: Body-Diode Characteristics

**TYPICAL CHARACTERISTICS(Cont.)**

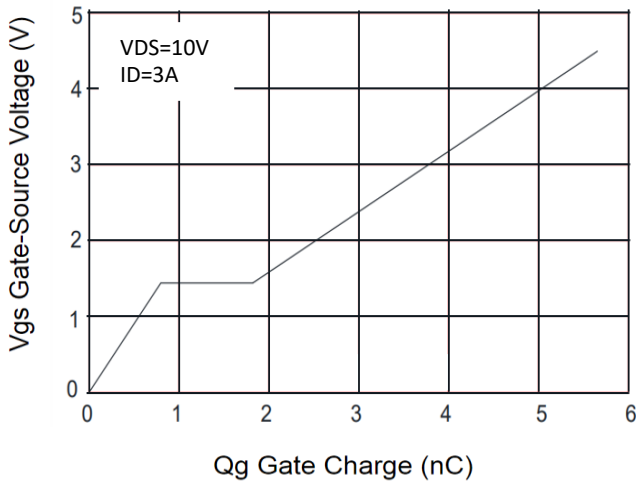


Figure 7: Gate-Charge Characteristics

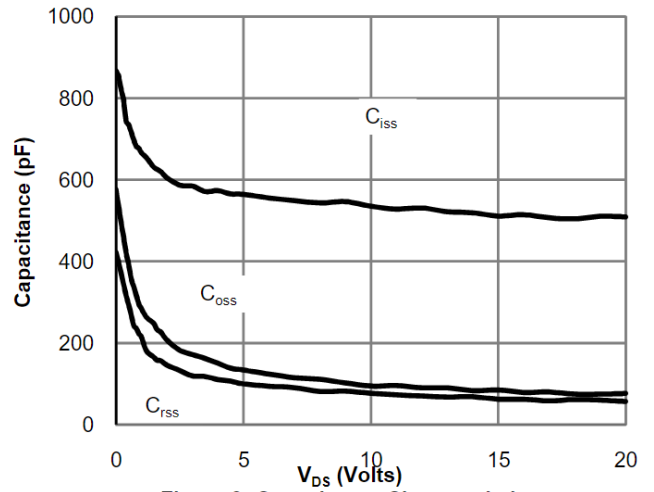


Figure 8: Capacitance Characteristics

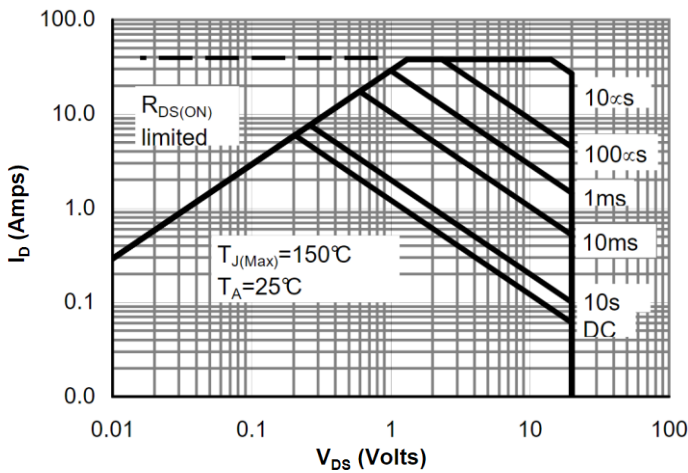
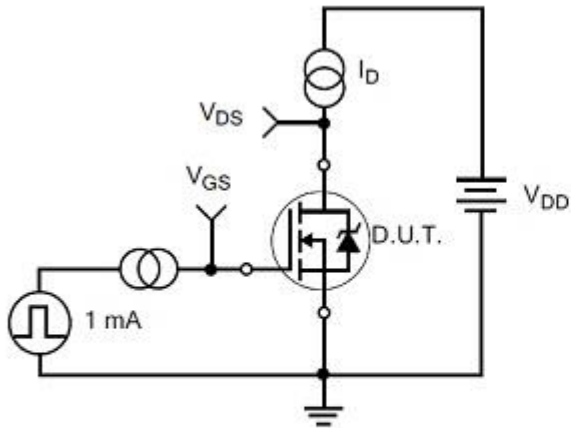
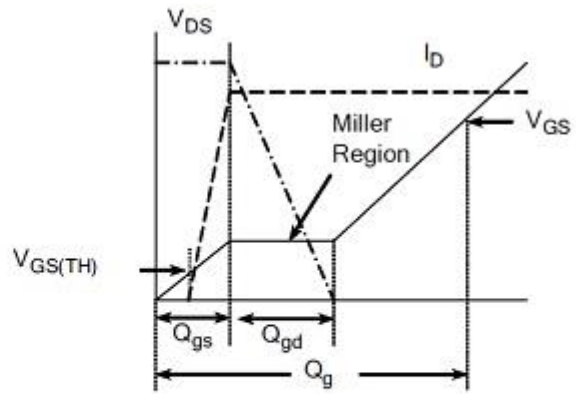


Figure 9: Maximum Forward Biased Safe Operating Area

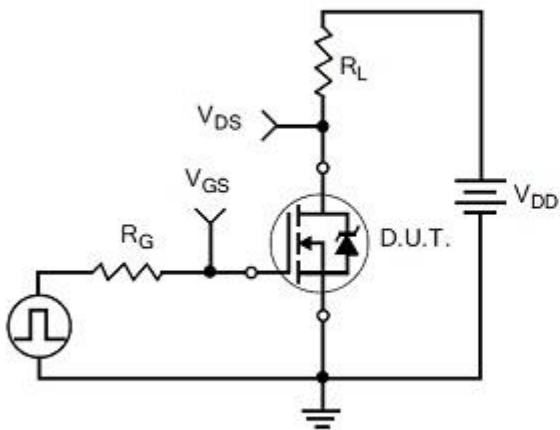
TEST CIRCUITS AND WAVEFORMS



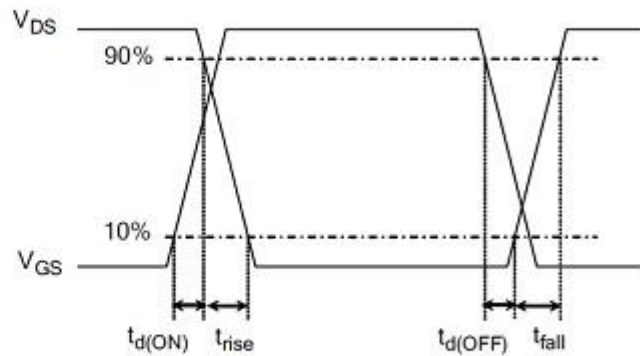
Gate Charge Test Circuit



Gate Charge Waveform

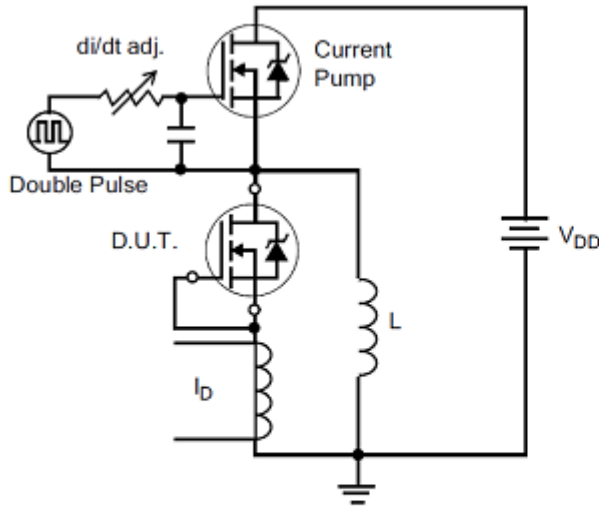


Resistive Switching Test Circuit

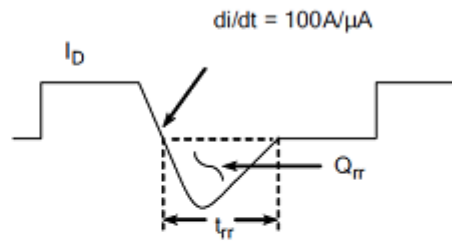


Resistive Switching Waveforms

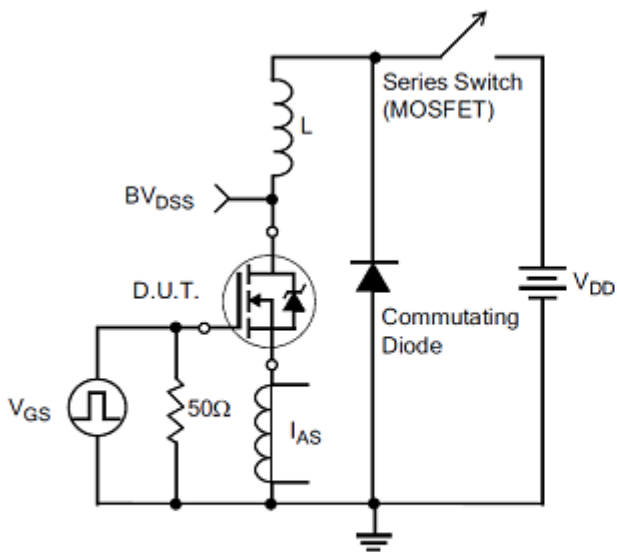
TEST CIRCUITS AND WAVEFORMS(Cont.)



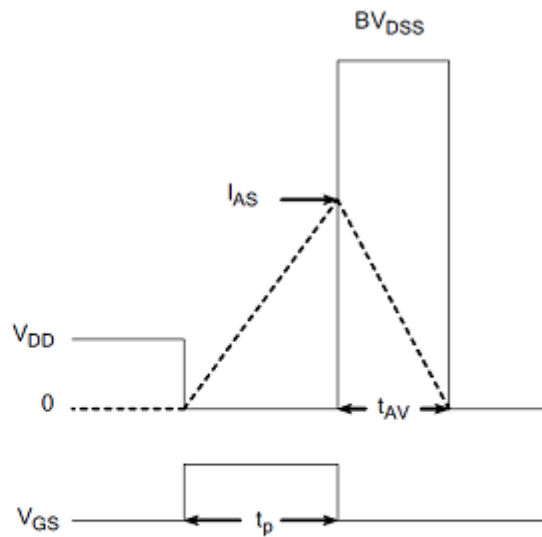
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



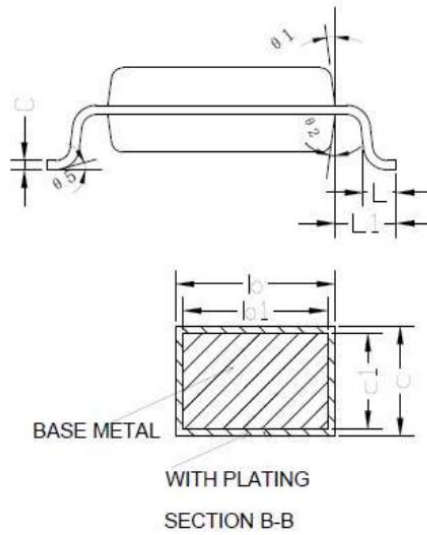
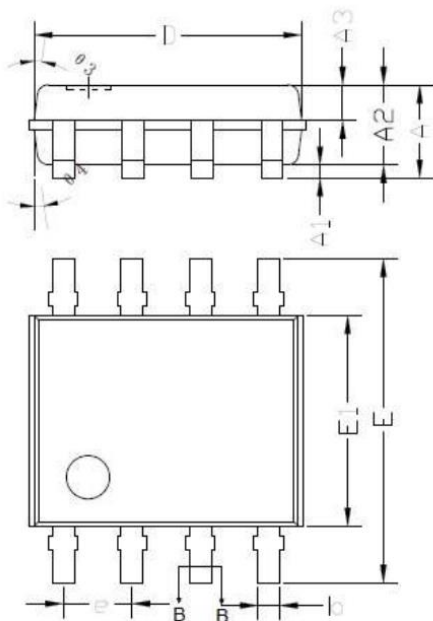
Unclamped Inductive Switching Test Circuit



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

Unclamped Inductive Switching Waveforms

### SOP-8 Package



SYMBOL	MILLIMETER		
	MIN	NDM	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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