

185V 2A N-Channel Enhancement Mode Power MOSFET

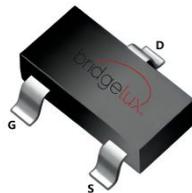
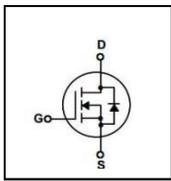
General Description

BXP2N20 is Bridgelux high voltage MOSFET family based on advanced DMOS technology. This advanced MOSFET family has optimized on-state resistance, and also provides superior switching performance and higher avalanche energy strength. This device family is suitable for high efficiency switch mode power supplies.

FEATURES

- $R_{DS(ON)} \leq 1.80 \Omega$ @ $V_{GS}=10V, I_D=1A$
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Fast switching capability
- Lead free product is acquired

SYMBOL



SOT-23L

ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXP2N20L	2N20 X	SOT-23L	Reel

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

Parameter	Symbol	Rating	Unit	
		BXP2N20L		
Drain-Source Voltage	V_{DSS}	185	V	
Drain Current	Continuous ($T_C = 25^\circ\text{C}$)	I_D	2	A
			Continuous ($T_C = 100^\circ\text{C}$)	1.2
Drain Current	Pulsed (Note1)	I_{DM}	8	A
Gate-Source Voltage	V_{GSS}	± 30	V	
Avalanche Energy	Single Pulse (Note2)	E_{AS}	25	mJ
Peak Diode Recovery dv/dt (Note3)	dv/dt	5	V/ns	
Power Dissipation (Note 2)	$T_C = 25^\circ\text{C}$	P_D	2	W
	Derate above 25°C		0.02	W/ $^\circ\text{C}$
Maximum Junction Temperature	T_J	150	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$	

- Note:**
1. Repetitive Rating: Pulse width limited by maximum junction temperature
 2. $L=10\text{mH}$, $V_{DD}=50\text{V}$, $R_G=25 \Omega$, Starting $T_J = 25^\circ\text{C}$
 3. $I_{SD} \leq 2.0\text{A}$, $di/dt \leq 300\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

THERMAL CHARACTERISTICS

Parameter	Symbol	Max.	Unit
		BXP2N20L	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C} / \text{W}$

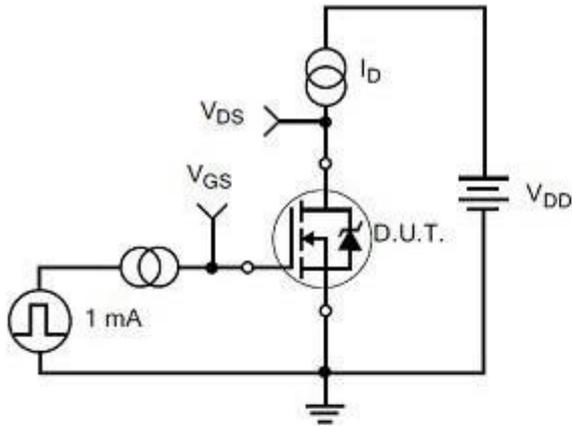
ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise Noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	185	188		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=180V, V_{GS}=0V$			1	μA
		$V_{DS}=140V, T_C = 125^{\circ}\text{C}$			100	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=30V$			100	nA
Gate-Body Leakage Current, Reverse		$V_{GS}=-30V$			-100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D = 250 \mu A$		0.25		$V/^{\circ}\text{C}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$		1.15	1.80	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$		125		pF
Output Capacitance	C_{OSS}			30		pF
Reverse Transfer Capacitance	C_{RSS}			5.6		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=100V, I_D=2A, V_{GS} = 10V, R_G=10\Omega$ (Note4,5)		7		ns
Turn-ON Rise Time	t_R			13		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			26		ns
Turn-OFF Fall-Time	t_F			8		ns
Total Gate Charge(Note5)	Q_G	$V_{DS} = 160V, V_{GS} = 10V, I_D = 2A$ (Note4,5)		4.5		nC
Gate Source Charge	Q_{GS}			1.5		nC
Gate Drain Charge	Q_{GD}			2		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=2A, V_{GS}=0V$			1.4	V
Diode Continuous Forward Current	I_S				2	A
Pulsed Drain-Source Current	I_{SM}				8	A
Reverse Recovery Time	t_{RR}	$V_{GS} = 0V, I_{SD} = 2A$		100		ns
Reverse Recovery Charge	Q_{RR}	$di/dt=100A/\mu s$ (Note4,5)		0.3		μC

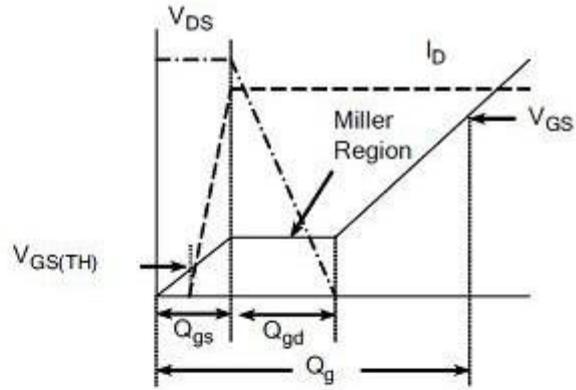
Note: 4. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

5. Essentially independent of operating temperature

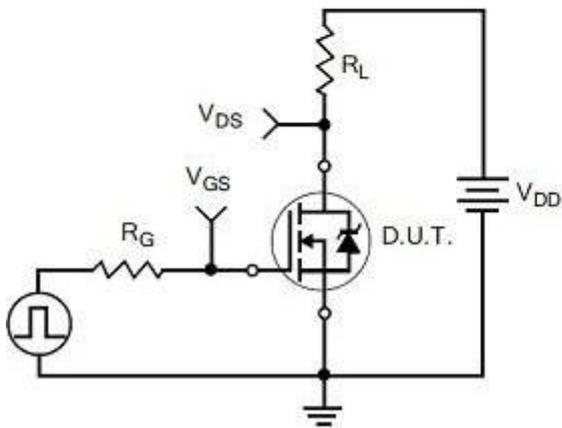
TEST CIRCUITS AND WAVEFORMS



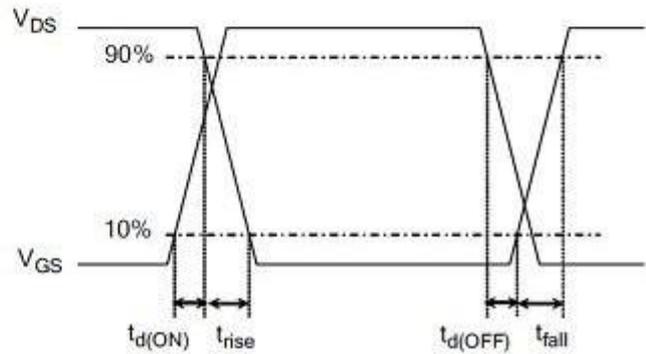
Gate Charge Test Circuit



Gate Charge Waveform

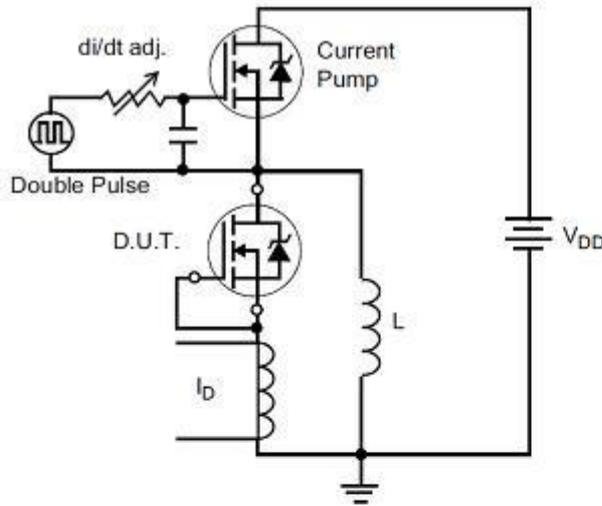


Resistive Switching Test Circuit

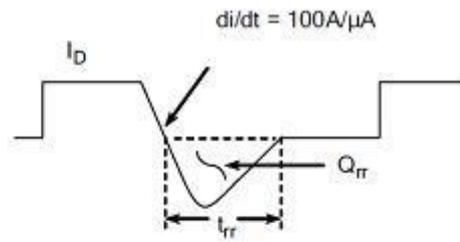


Resistive Switching Waveforms

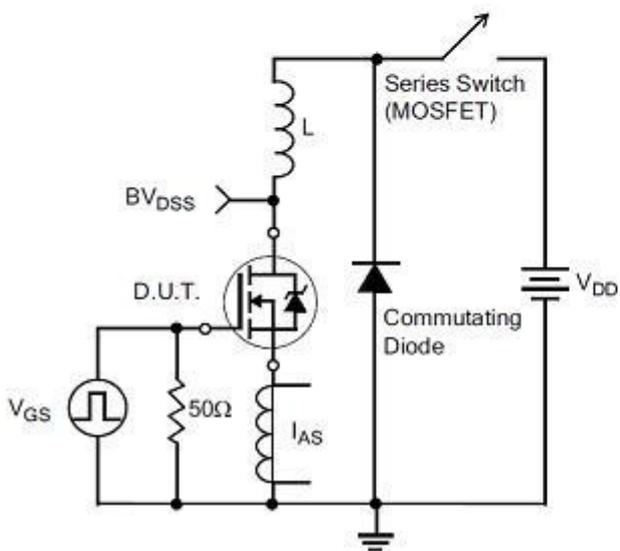
TEST CIRCUITS AND WAVEFORMS(Cont.)



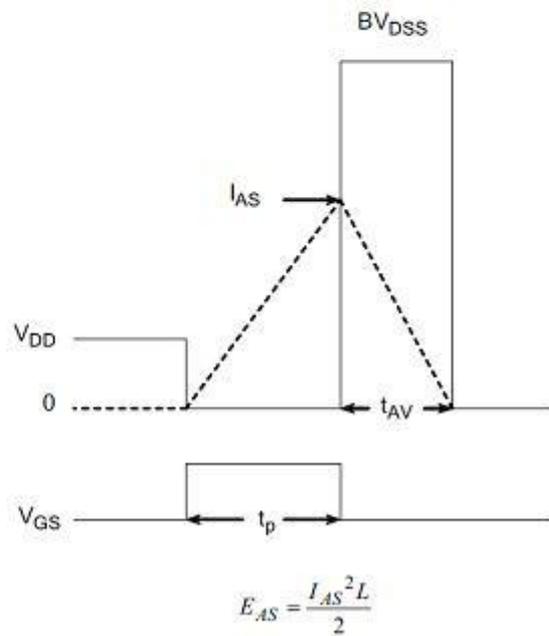
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform

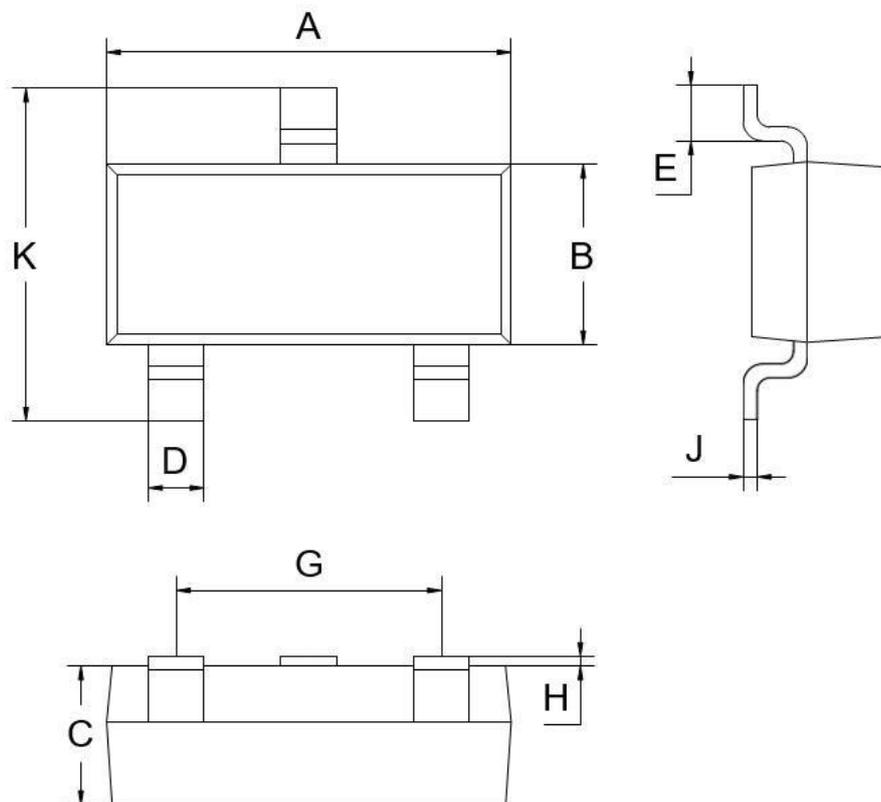


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

SOT-23L Package



SOT-23L		
Dim	Min	Max
A	2.80	3.02
B	1.50	1.70
C	1.05	1.15
D	0.28	0.5
E	0.28	0.6
G	1.80	2.00
H	0.02	0.10
J	0.1	0.2
K	2.70	3.00
All Dimensions in mm		

Revision history

Document revision history

Date	Revision	Changes
1-Sep-2021	2.0	First release
5-Jan-2022	2.1	Update parameter

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