

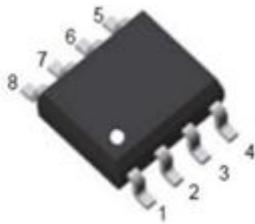
100V 14A N-Channel Enhancement Mode Power MOSFET

FEATURES

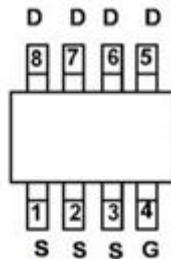
- $R_{DS(ON)} \leq 10.5m\Omega$ @ $V_{GS}=10V, I_D=14A$
- Advanced SGT process
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

APPLICATION

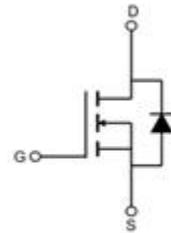
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification



SOP-8 top view



pin Assignment



Schematic Diagram

ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXS105N10B	BX105N10B	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}	100	V	
Drain Current	I_D	Continuous ($T_C = 25^\circ C$)	14	A
		Continuous ($T_C = 100^\circ C$)	10.8	A
Drain Current	Pulsed (Note1)	I_{DM}	56	A
Gate-Source Voltage	V_{GSS}	± 20	V	
Power Dissipation	$T_C = 25^\circ C$	P_D	3.5	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	$R_{\theta JA}$	36	°C / 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}	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=20V$			100	nA
Gate-Body Leakage Current, Reverse		$V_{GS}=-20V$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.6	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=14A$		8.8	10.5	m Ω
		$V_{GS}=4.5V, I_D=14A$		11	14.5	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=50V, V_{GS}=0V,$ $f=1.0MHz$		3640		pF
Output Capacitance	C_{OSS}			310		pF
Reverse Transfer Capacitance	C_{RSS}			21		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=50V, I_D=14A, V_{GS} =$ $10V, R_G=1.8\Omega$		16		ns
Turn-ON Rise Time	t_R			10		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			34		ns
Turn-OFF Fall-Time	t_F			8.5		ns
Total Gate Charge(Note2)	Q_G	$V_{DS} =50V, V_{GS} =10V, I_D$ $=14A$		71		nC
Gate Source Charge	Q_{GS}			15		nC
Gate Drain Charge	Q_{GD}			17		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=14A, V_{GS}=0V$			1.4	V
Diode Continuous Forward Current	I_S				14	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				56	A

Note: 2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

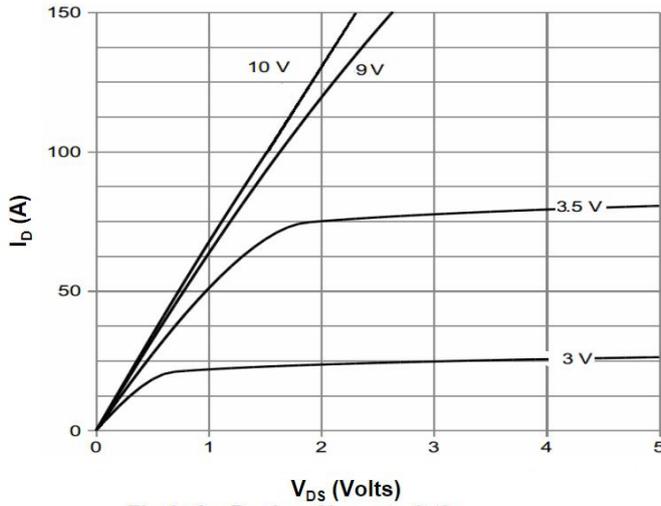


Fig 1: On-Region Characteristics

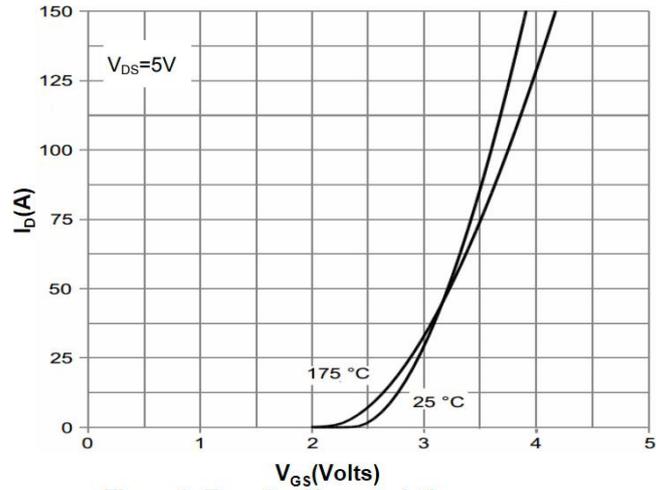


Figure 2: Transfer Characteristics

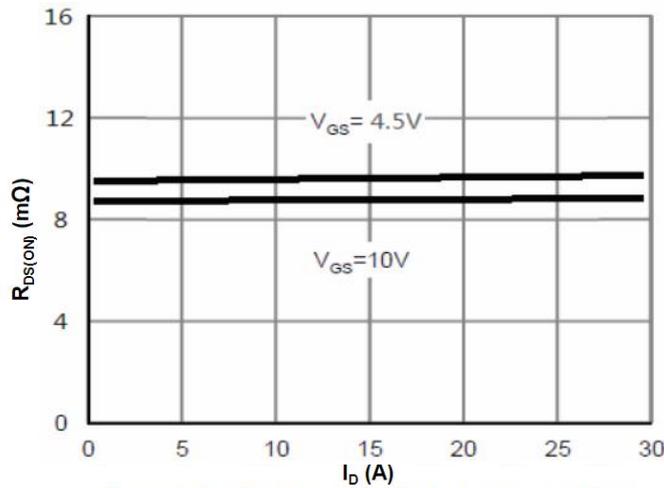


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

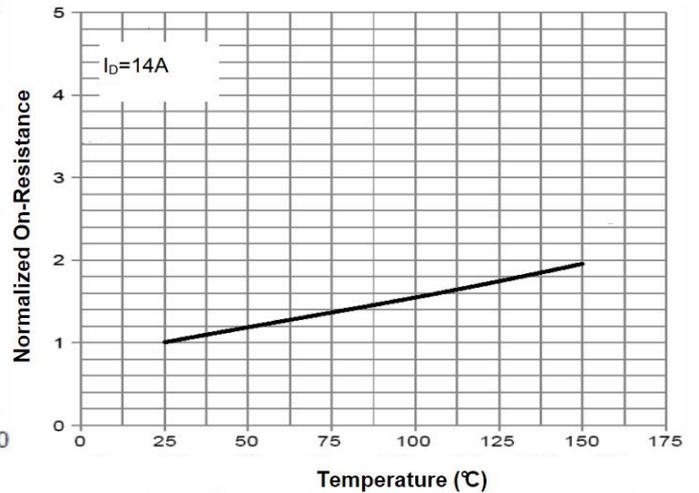


Figure 4: On-Resistance vs. Junction Temperature

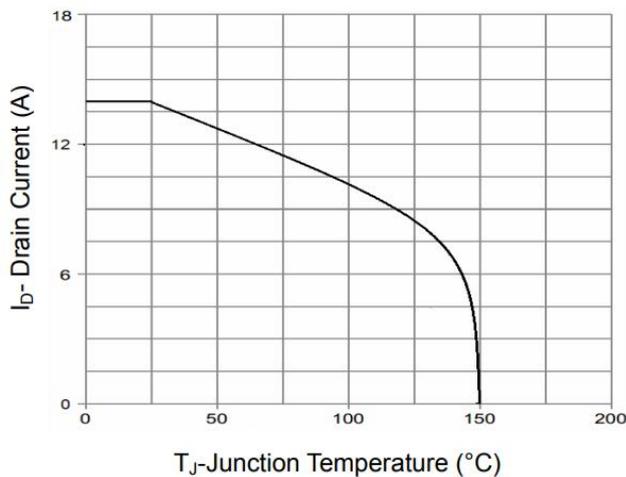


Figure 5: Current De-rating

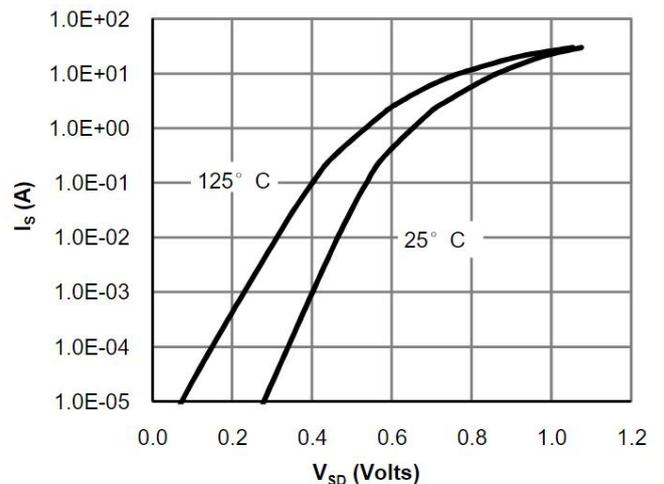


Figure 6: Body-Diode Characteristics

TYPICAL CHARACTERISTICS(Cont.)

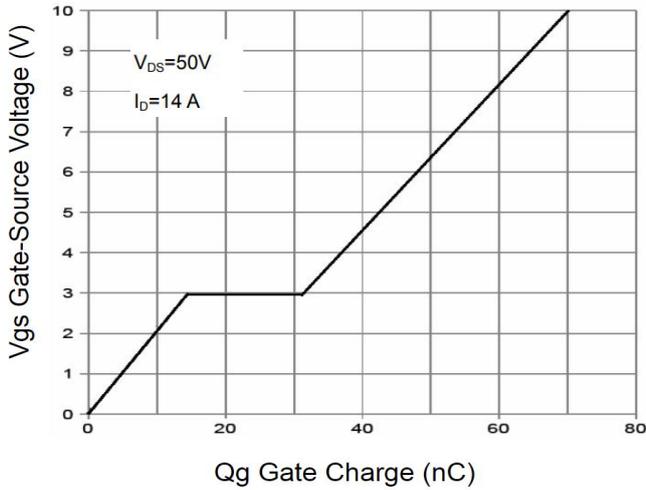


Figure 7: Gate-Charge Characteristics

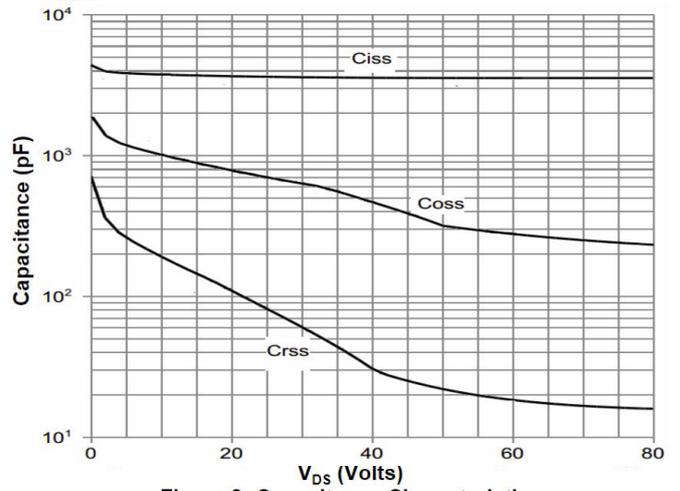


Figure 8: Capacitance Characteristics

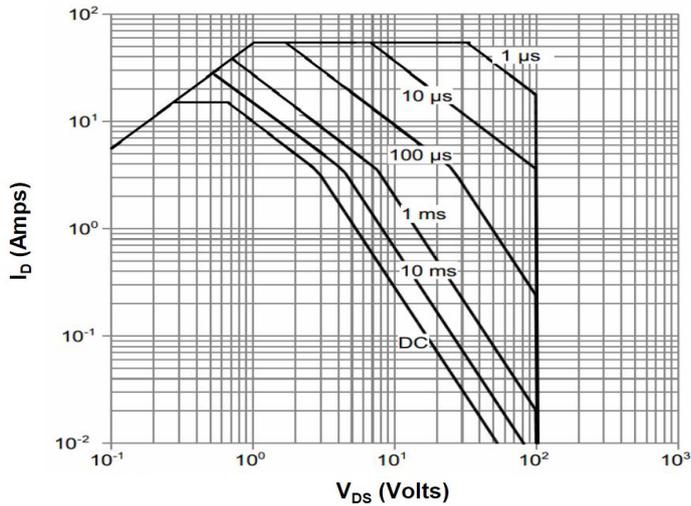
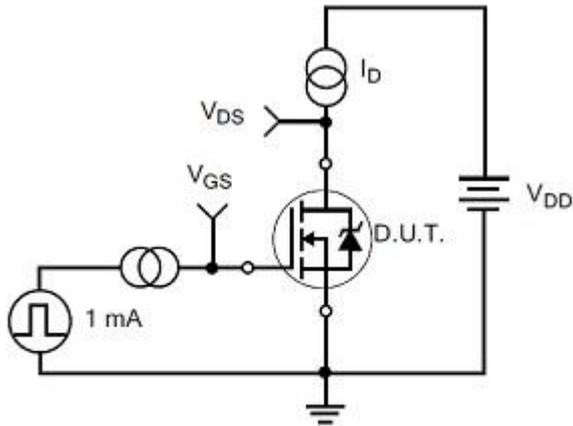
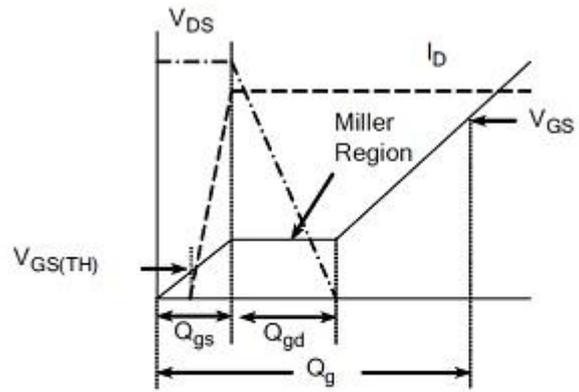


Figure 9: Maximum Forward Biased Safe Operating Area

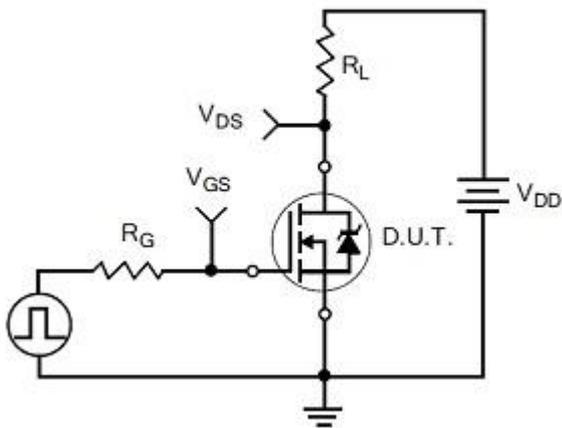
TEST CIRCUITS AND WAVEFORMS



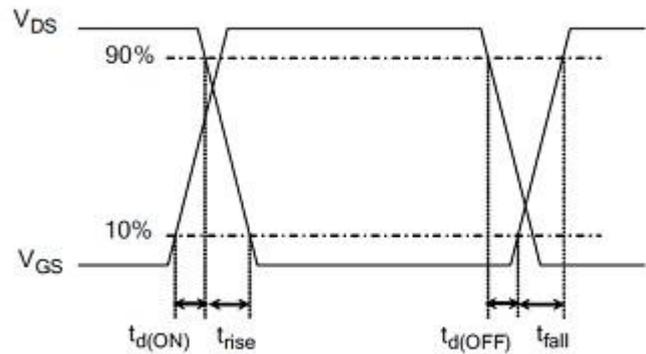
Gate Charge Test Circuit



Gate Charge Waveform

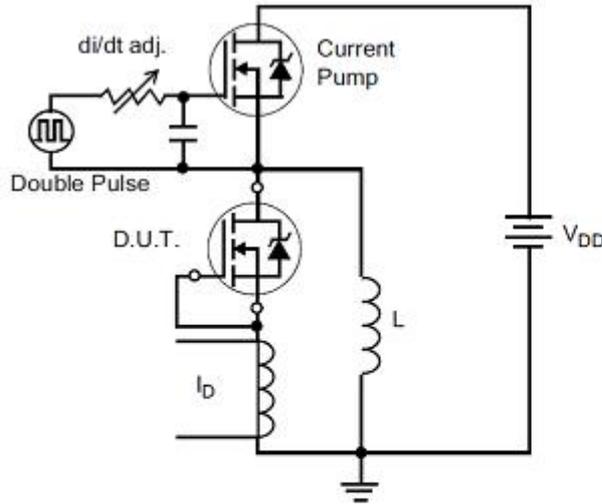


Resistive Switching Test Circuit

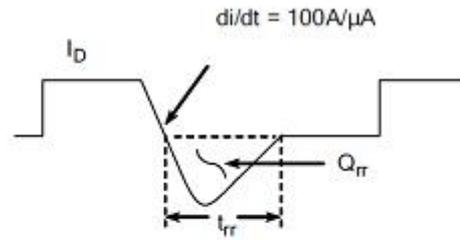


Resistive Switching Waveforms

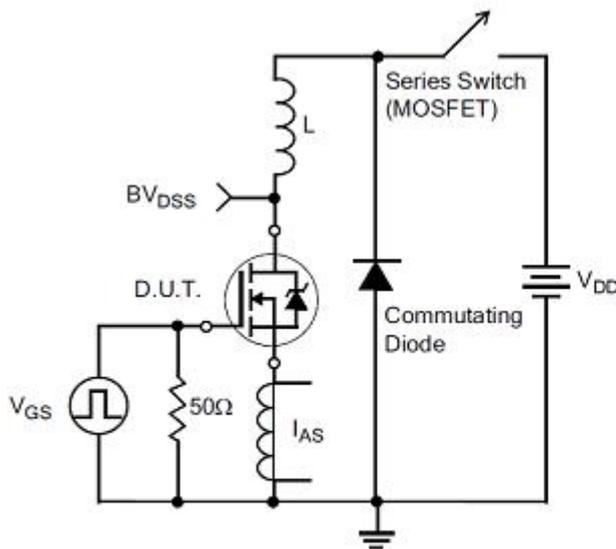
TEST CIRCUITS AND WAVEFORMS(Cont.)



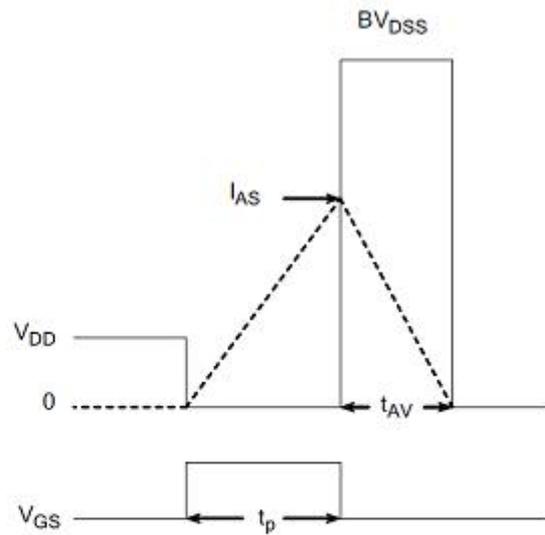
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



Unclamped Inductive Switching Test Circuit



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

Unclamped Inductive Switching Waveforms

Revision history

Document revision history

Date	Revision	Changes
5-Jul-2021	1.0	First release

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