100V 65A N-Channel Enhancement Mode Power MOSFET

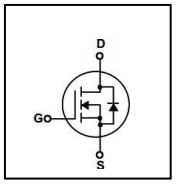
FEATURES

- RDSON≤10.5mΩ @Vgs=10V, Id=20A
- 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

SYMBOL



TO-220

ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXS105N10P	BX105N10P	TO-220	Tube

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

Parameter		Symbol	Rating	Unit
			TO-220	
Drain-Source Voltage		V_{DSS}	100	V
Drain Current	Continuous (T_C = 25°C)	I_D	65	A
	Continuous (T_C = 100°C)		45	A
Drain Current	Pulsed (Note1)	I_{DM}	260	A
Gate-Source Voltage		V_{GSS}	±20	V
Power Dissipation	T_C =25°C	P_D	100	W
Maximum Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C

Note1. Repetitive Rating: Pulse width limited by maximum junction temperature

THERMAL CHARACTERISTICS

Parameter	Symbol	Max.	Unit
		TO-220	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.25	°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	100			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=100V, VGS=0V			1	uA
Gate-Body Leakage Current, Forward	I_{GSS}	VGS=20V			100	nA
Gate-Body Leakage Current, Reverse		VGS=-20V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	VDS=VGS, ID=250μA	1.2	1.8	2.6	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=10V, ID=20A		8.8	10.5	mΩ
		VGS=4.5V, ID=10A		11	14.5	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	VDS=50V, VGS=0V, f=1.0MHz		2155		pF
Output Capacitance	C_{OSS}			288		pF
Reverse Transfer Capacitance	C_{RSS}			20		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	VDD=50V, ID=32.5A, VGS = 10V, RG=1.6Ω		13		ns
Turn-ON Rise Time	t_R			10		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			31		ns
Turn-OFF Fall-Time	t_F			8		ns
Total Gate Charge(Note2)	Q_G	VDS =50V, VGS =10V, ID =32.5A		50		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}	IS=32.5A, VGS=0V			1.2	V
Diode Continuous Forward Current	I_S				65	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				260	A

Note2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

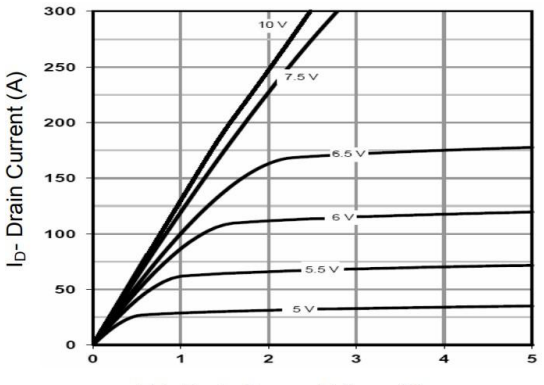


Figure 1 Output Characteristics

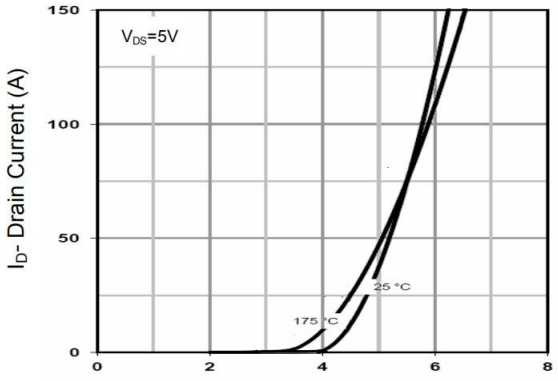


Figure 2 Transfer Characteristics

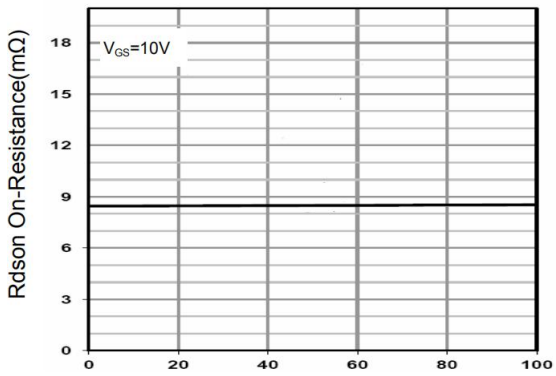


Figure 3 Rdson- Drain Current

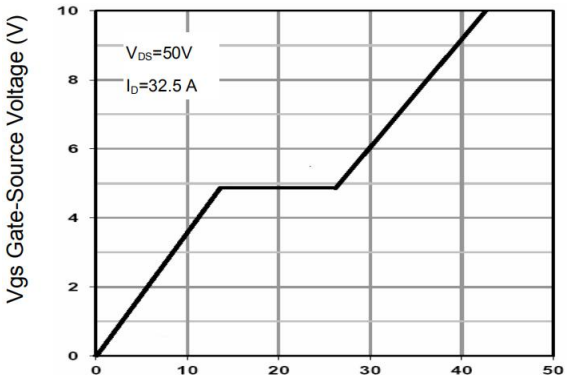


Figure 4 Gate Charge

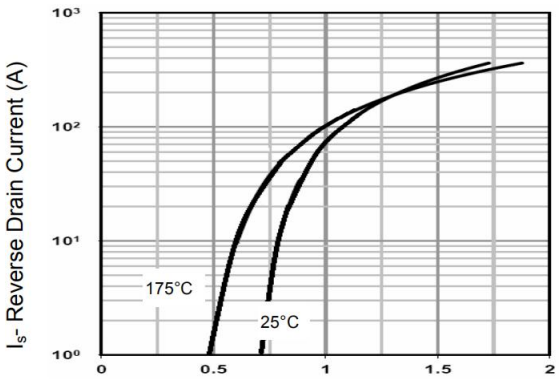


Figure 5 Source- Drain Diode Forward

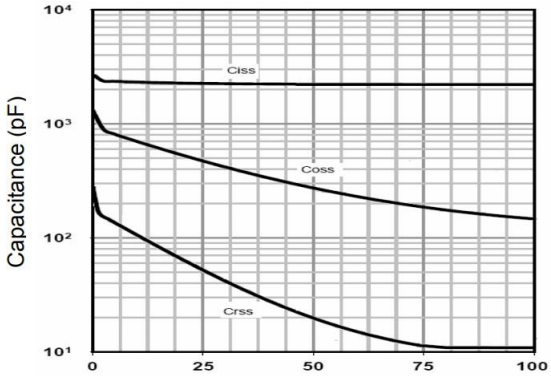


Figure 6 Capacitance vs Vds

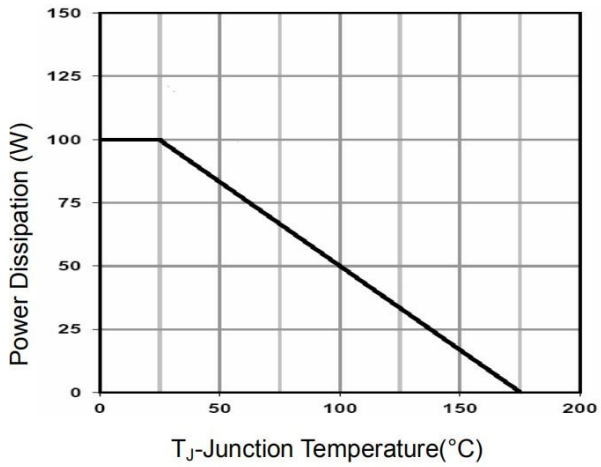


Figure 7 Power De-rating

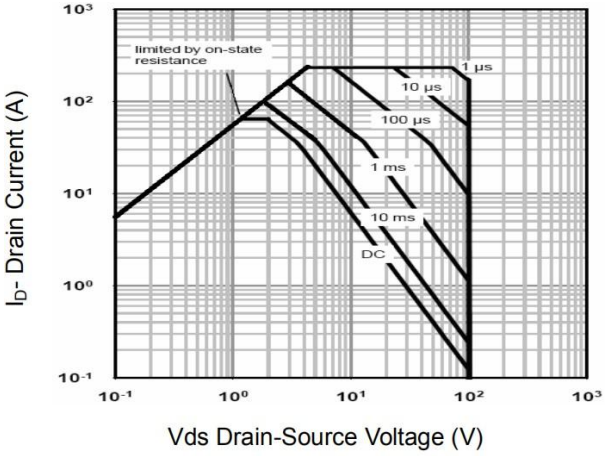


Figure 8 Safe Operation Area

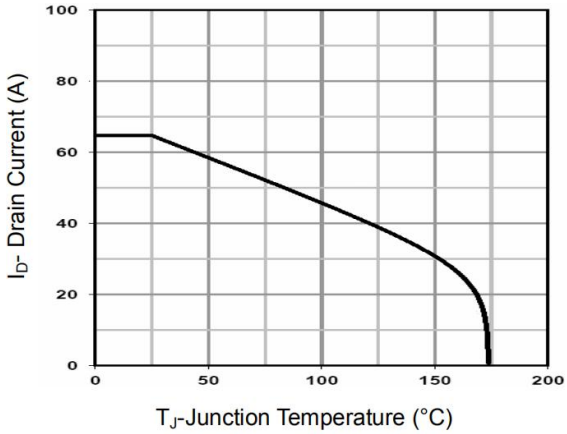


Figure 9 Current De-rating

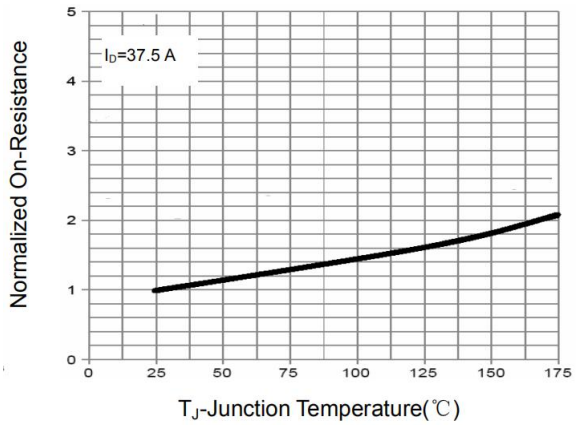
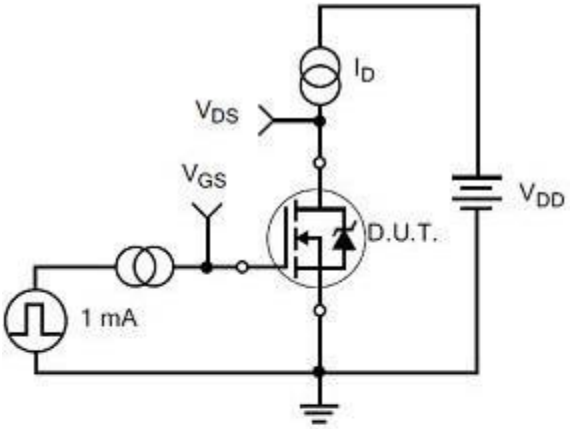
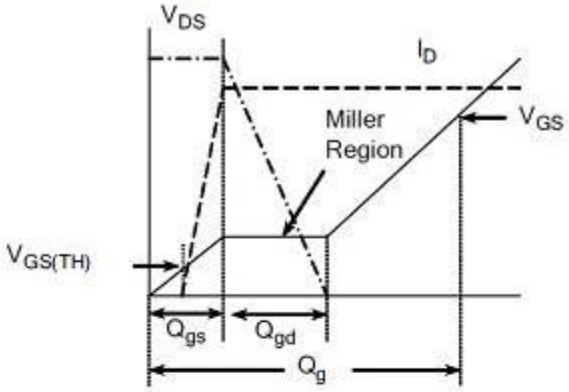


Figure 10 Rdson-Junction Temperature

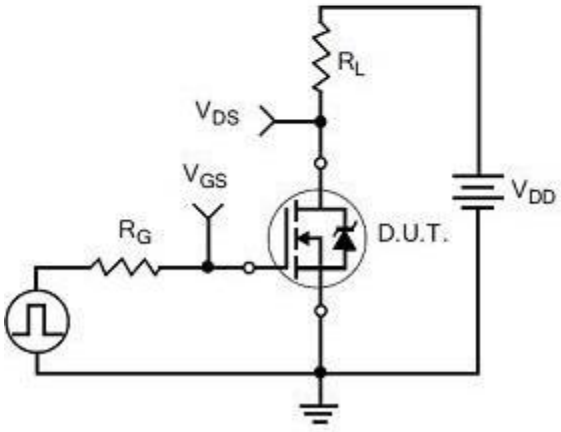
TEST CIRCUITS AND WAVEFORMS



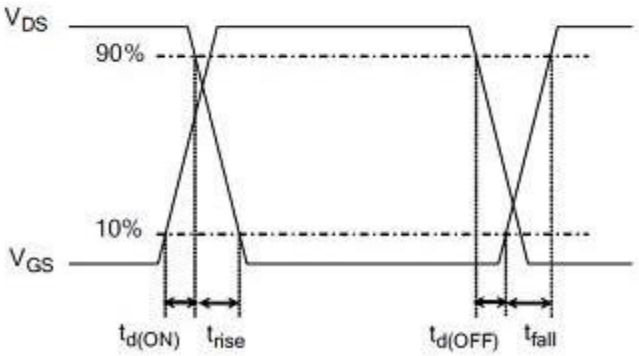
Gate Charge Test Circuit



Gate Charge Waveform

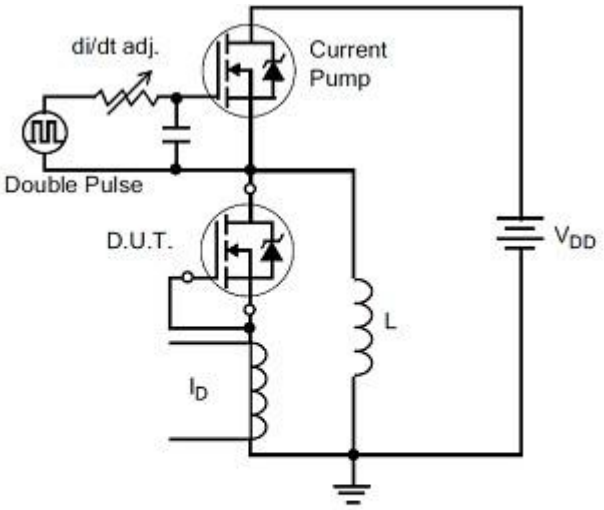


Resistive Switching Test Circuit

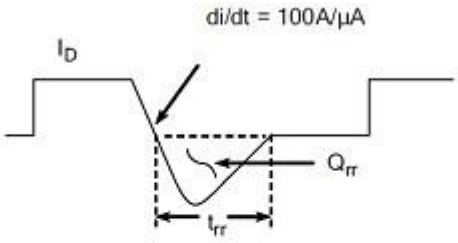


Resistive Switching Waveforms

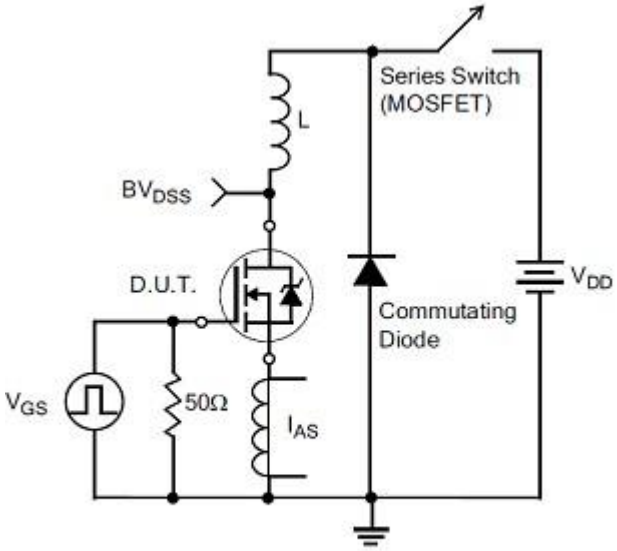
TEST CIRCUITS AND WAVEFORMS(Cont.)



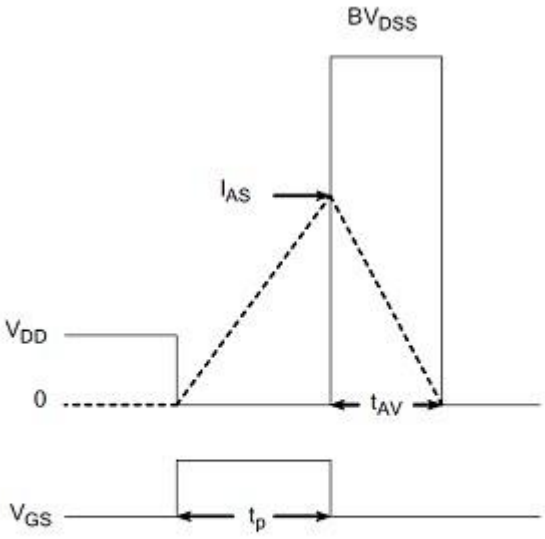
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



Unclamped Inductive Switching Test Circuit



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

Unclamped Inductive Switching Waveforms

Revision history

Document revision history

Date	Revision	Changes
3-Sep-2021	1.0	First release

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