100V 33A N-Channel Enhancement Mode Power MOSFET

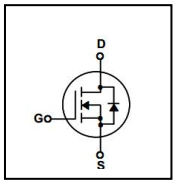
General Description

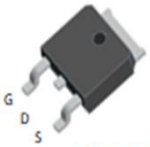
This Power MOSFET has been developed using advanced low voltage process which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

FEATURES

- RDSON≤38mΩ @Vgs=10V, Id=15A
- Ultra Low On-Resistance
- Lead free product is acquired
- Fast Switching

SYMBOL





TO-252

ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXF380N10D	BXF540	TO-252	Tube/Reel

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

Parameter		Symbol	Rating	Unit
			TO-252	
Drain-Source Voltage		V_{DSS}	100	V
Drain Current	Continuous (T_C = 25°C)	I_D	33	A
	Continuous (T_C = 100°C)		23	A
Drain Current	Pulsed (Note1)	I_{DM}	132	A
Gate-Source Voltage		V_{GSS}	±20	V
Power Dissipation	T_C =25°C	P_D	110	W
Avalanche Energy	Single Pulse	E_{AS}	335	mJ
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
		TO-252	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.14	°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	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=10V, ID=15A		30	38	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	VDS=25V, VGS=0V, f=1.0MHz	-	1330	-	pF
Output Capacitance	C_{OSS}		-	275	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	88	-	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	VDD=50V, ID=10A, VGS = 10V, RG=1Ω	-	38	-	ns
Turn-ON Rise Time	t_R		-	44	-	ns
Turn-OFF Delay Time	$t_{D(OFF)}$		-	206	-	ns
Turn-OFF Fall-Time	t_F		-	62	-	ns
Total Gate Charge(Note2)	Q_G	VDS =80V, VGS =10V, ID =33A	-	52	-	nC
Gate Source Charge	Q_{GS}		-	6	-	nC
Gate Drain Charge	Q_{GD}		-	28	-	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	IS=15A, VGS=0V	-		1.5	V
Diode Continuous Forward Current	I_S		-		33	A
Reverse Recovery Time	t_{RR}	VGS = 0 V, I_F = 10A di/dt=100 A/μs (Note4,5)	-	101	-	nS
Reverse Recovery Charge	Q_{RR}		-	400	-	nC

Note： 2. Essentially independent of operating temperature-

TYPICAL CHARACTERISTICS

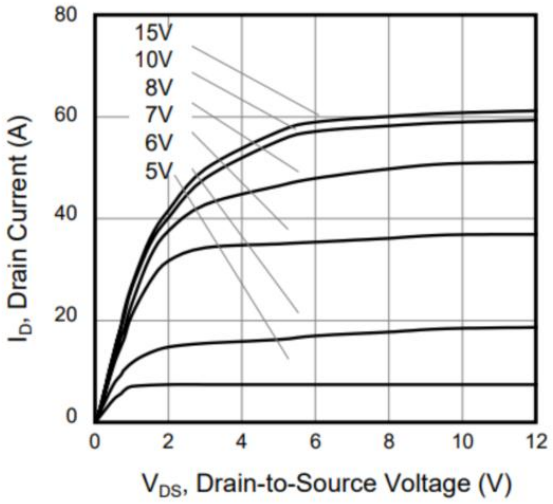


Figure 1. Output Characteristics

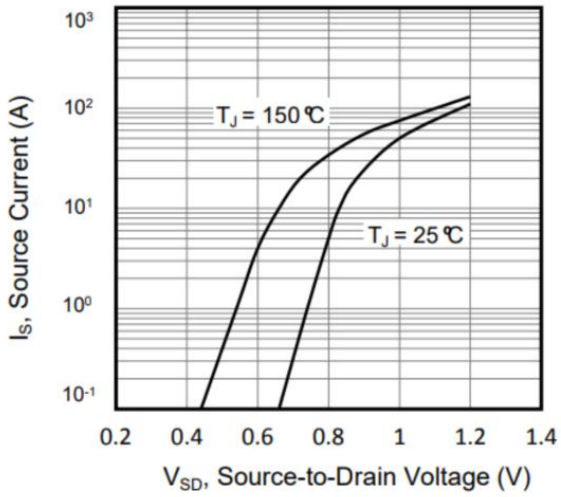


Figure 2. Body Diode Forward Voltage

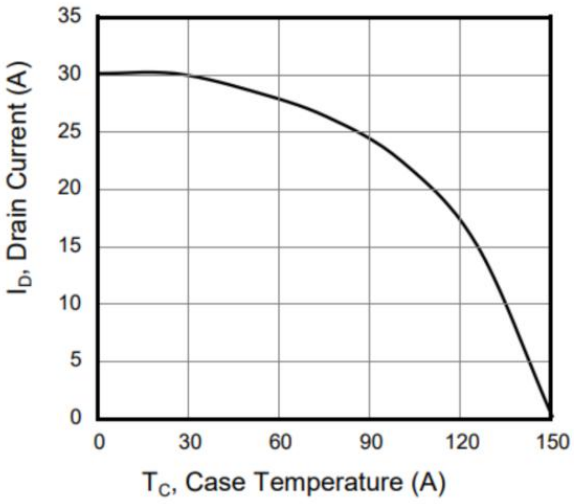


Figure 3. Drain Current vs. Temperature

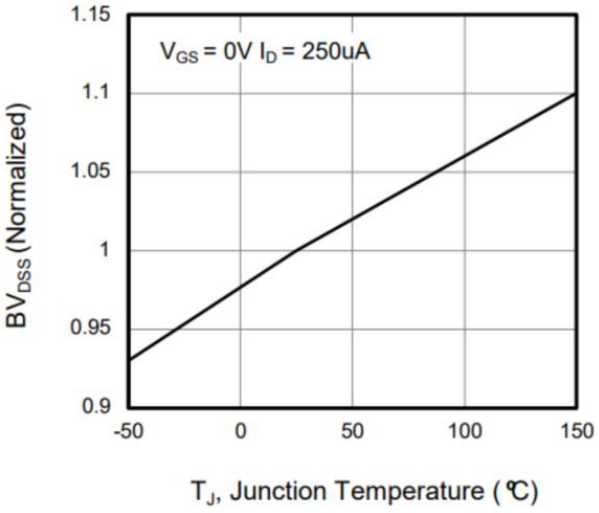


Figure 4. BV_{DSS} Variation vs. Temperature

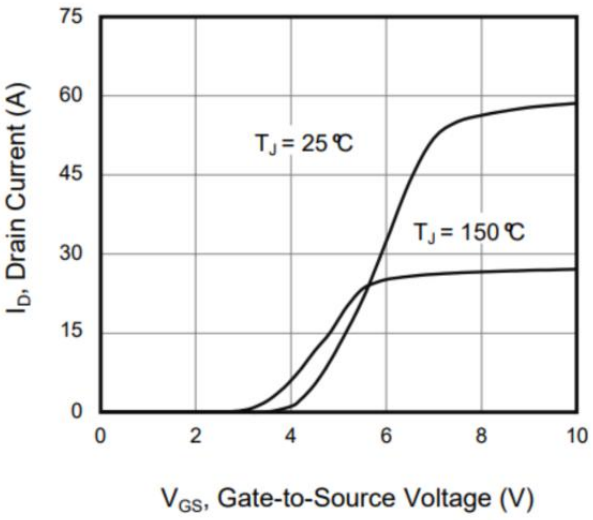


Figure 5. Transfer Characteristics

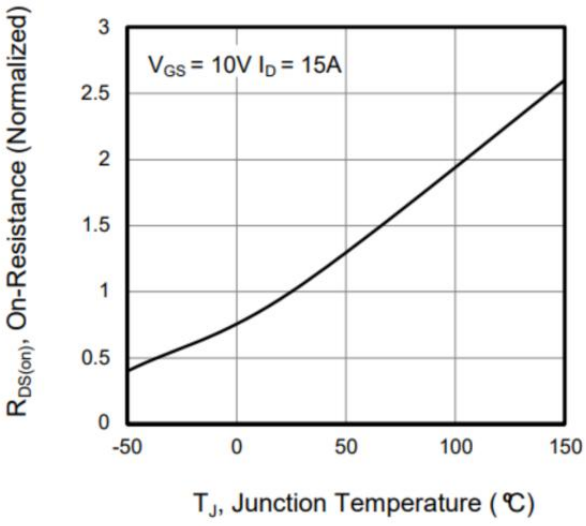


Figure 6. On-Resistance vs. Temperature

TYPICAL CHARACTERISTICS(Cont.)

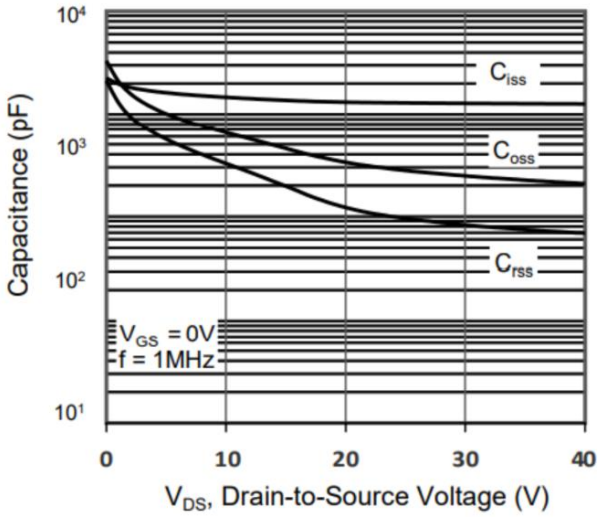


Figure 7. Capacitance

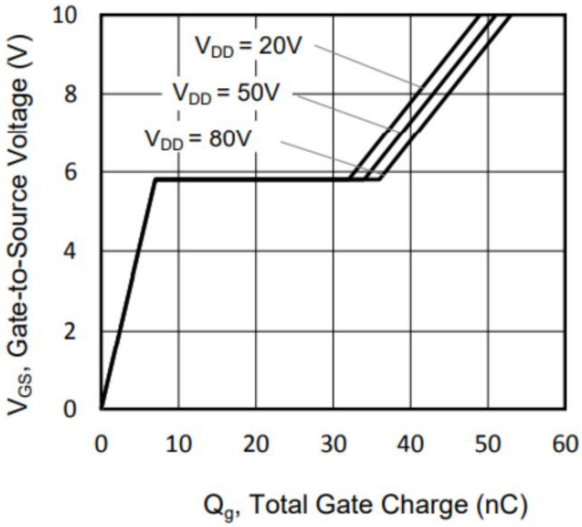


Figure 8. Gate Charge

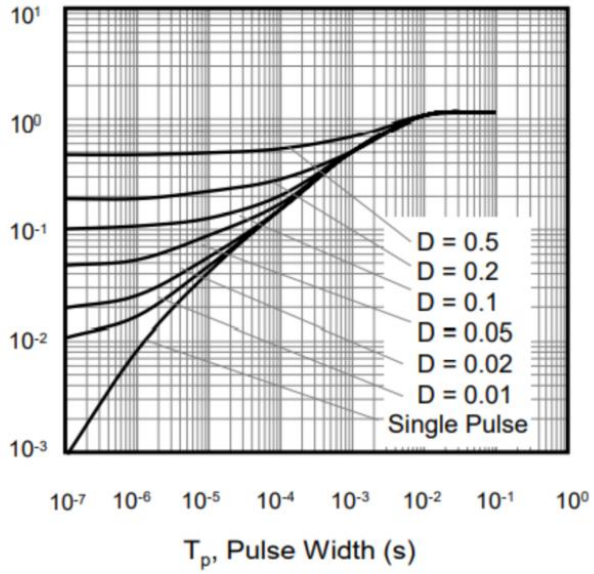
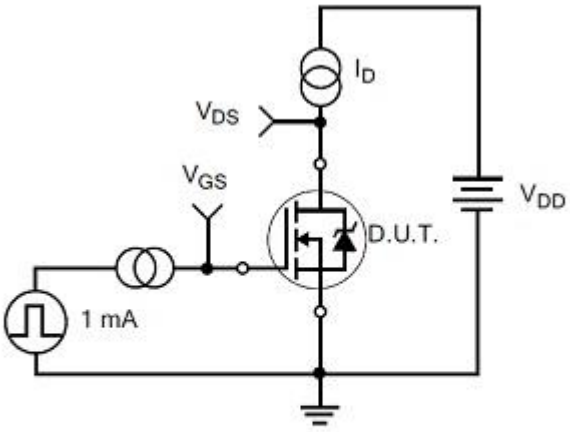
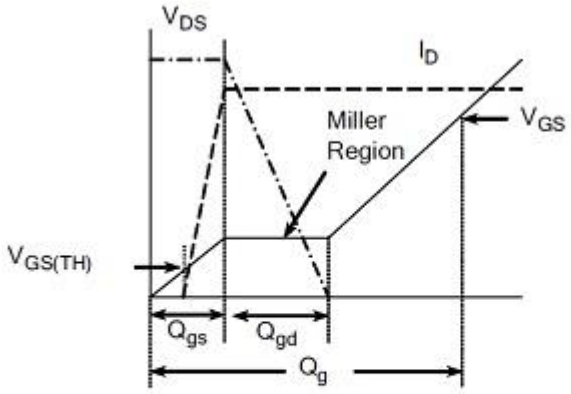


Figure 9 Effective Transient Thermal Impedance

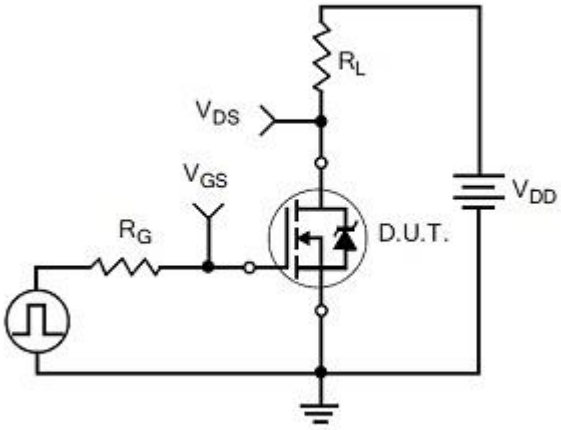
TEST CIRCUITS AND WAVEFORMS



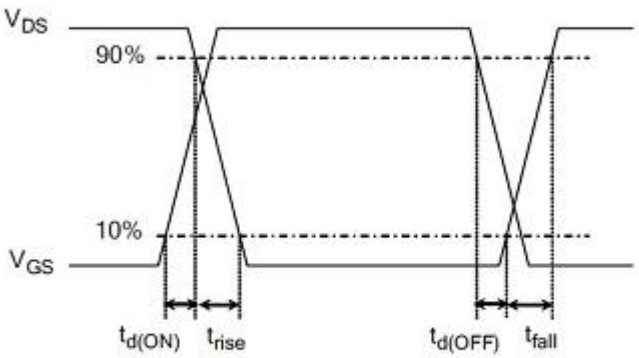
Gate Charge Test Circuit



Gate Charge Waveform

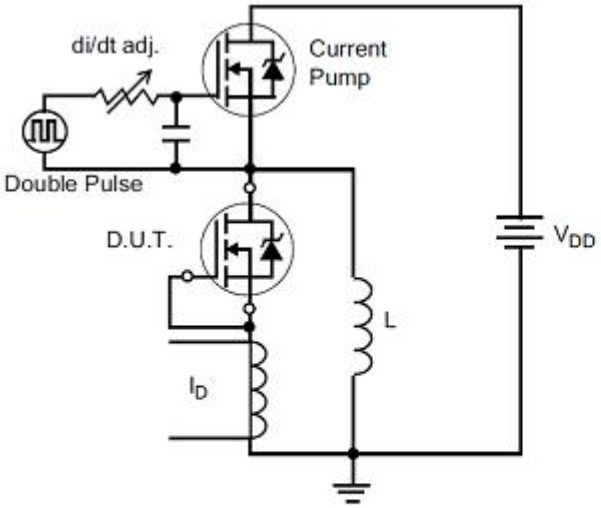


Resistive Switching Test Circuit

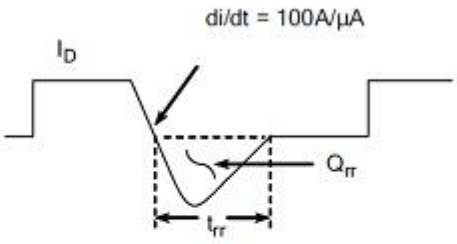


Resistive Switching Waveforms

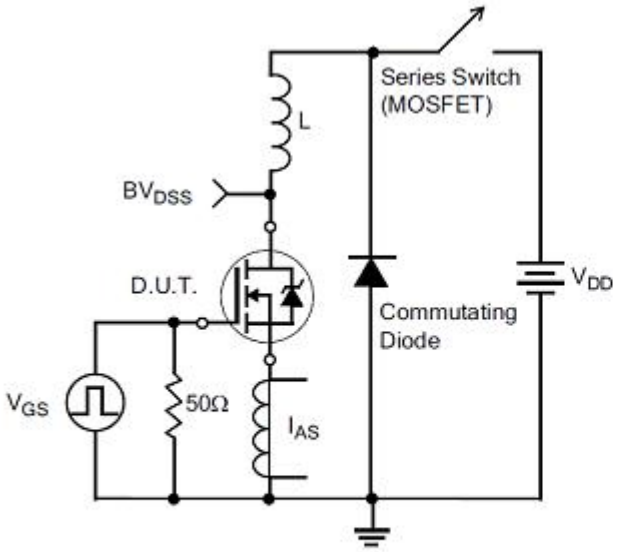
TEST CIRCUITS AND WAVEFORMS(Cont.)



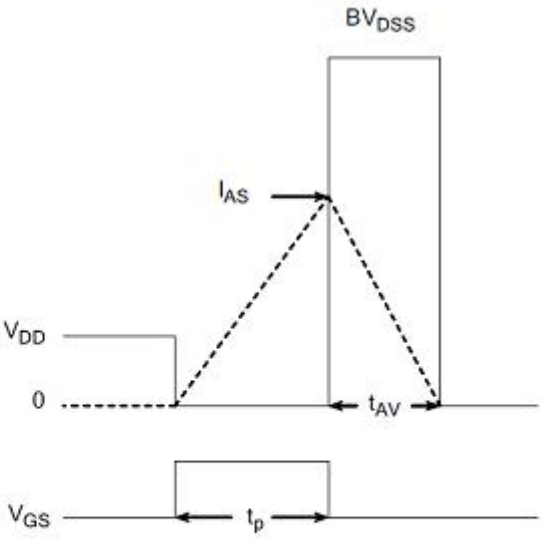
Diode Reverse Recovery Test Circuit



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
10-Mar-2021	1.0	First release

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