

30V 50A N-Channel Enhancement Mode Power MOSFET

Features

- $R_{DS(on)} \leq 4.7m\Omega$ @ $V_{GS}=10V$
- Advanced trench technology
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Lead free product is acquired

Application

- Load Switch
- PWM Application
- Power management

SYMBOL



ASSEMBLY MESSAGE

Product Name	Marking	Package	Packaging
BXT047N03E	50N03A	DFN3.3*3.3	Reel

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

Parameter		Symbol	Rating	Unit
			DFN3.3*3.3	
Drain-Source Voltage		V _{DSS}	30	V
Drain Current	Continuous (T _C = 25°C)	I _D	50	A
	Continuous (T _C = 100°C)		32	A
Drain Current	Pulsed (Note1)	I _{DM}	200	A
Single Pulsed Avalanche Energy		EAS	198	mJ
Gate-Source Voltage		V _{GSS}	±20	V
Power Dissipation	T _C = 25°C	P _D	40	W
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
		DFN3.3*3.3	
Thermal Resistance, Junction to Case	R _{θJC}	3.125	°C / W

ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise Noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V, ID=250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	VDS=30V, 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	1.5	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	VGS=10V, ID=30A		3.5	4.7	mΩ
		VGS=4.5V, ID=20A		7	10	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	VDS=15V, VGS=0V, f=1.0MHz		2089		pF
Output Capacitance	C _{OSS}			321		pF
Reverse Transfer Capacitance	C _{RSS}			290		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	VDD=15V, ID=30A, VGS = 10V, RG=3Ω		22		ns
Turn-ON Rise Time	t _R			31		ns
Turn-OFF Delay Time	t _{D(OFF)}			61		ns
Turn-OFF Fall-Time	t _F			35		ns
Total Gate Charge(Note2)	Q _G	VDS =15V, VGS =10V, ID=30A		46		nC
Gate Source Charge	Q _{GS}			4		nC
Gate Drain Charge	Q _{GD}			13		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =30A, VGS=0V			1.4	V
Diode Continuous Forward Current	I _S				50	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				200	A

Note: 2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

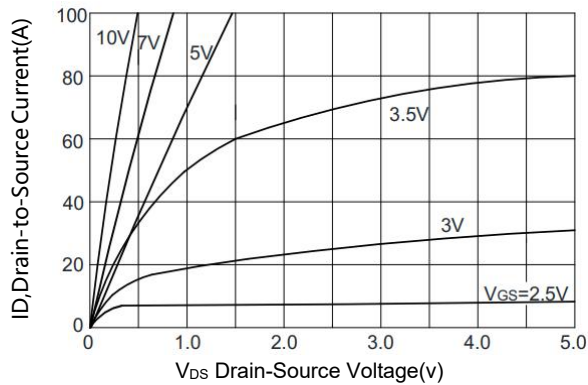


Figure1. Typical Output Characteristics

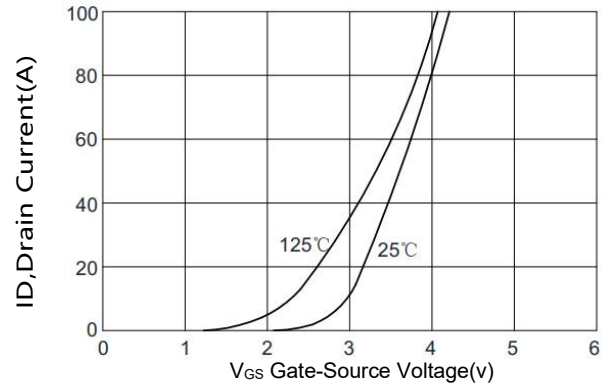


Figure2. Typical Transfer Characteristics

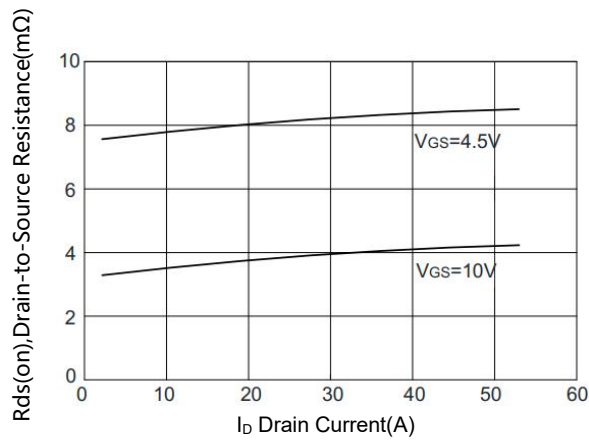


Figure3. On-Resistance versus Drain Current

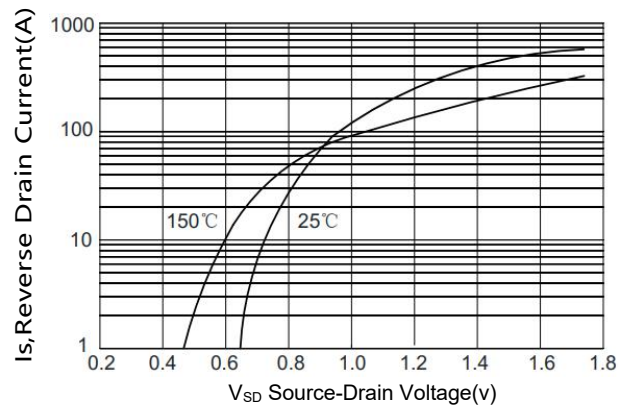


Figure4. Diode forward voltage versus Current

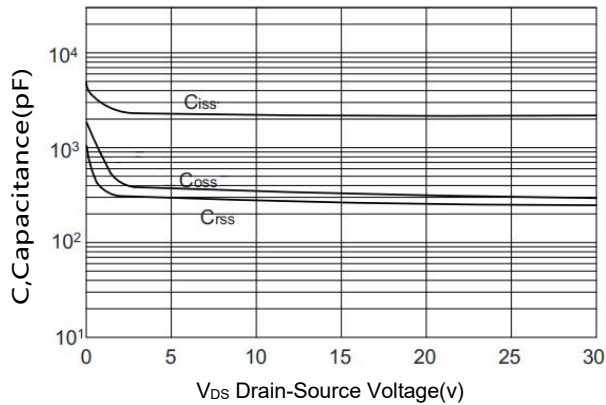


Figure5. Typical Capacitance versus V_{DS}

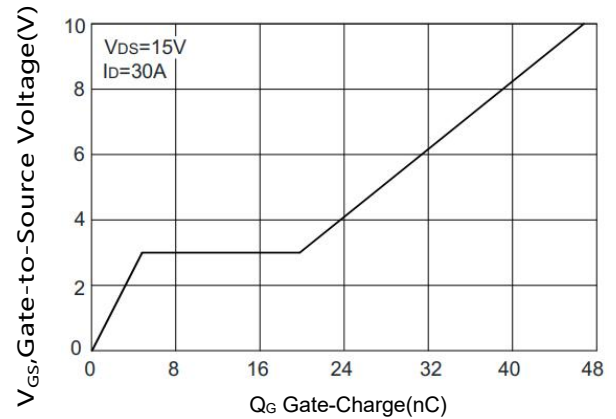


Figure6. Typical Gate Charge versus V_{GS}

TYPICAL CHARACTERISTICS(Cont.)

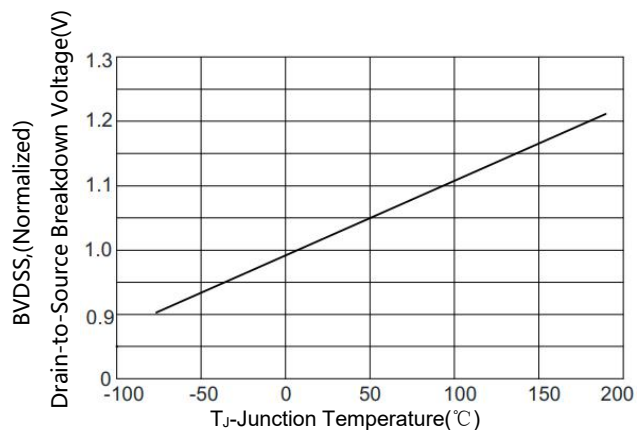


Figure7. BV_{DSS} Variation with Temperature

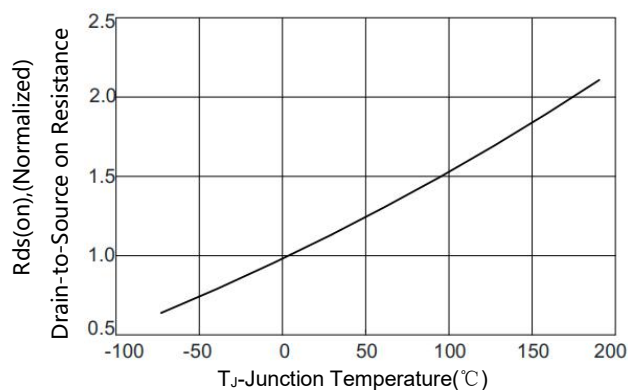


Figure8. On-Resistance Variation with Temperature

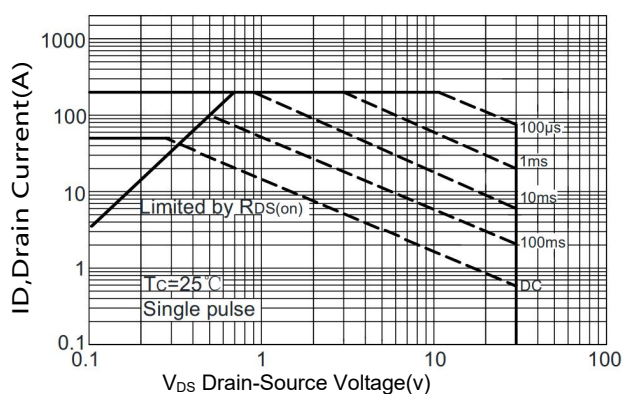


Figure9. Maximum Safe Operating Area

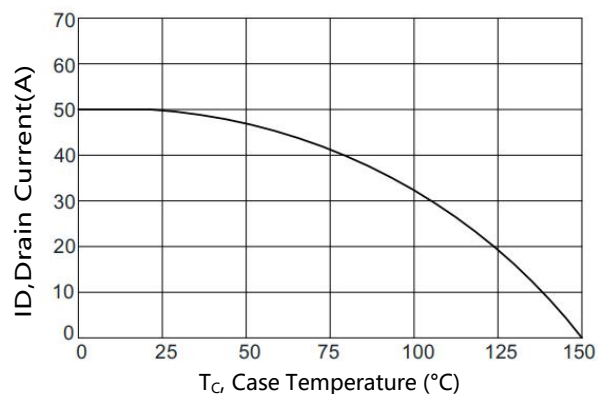
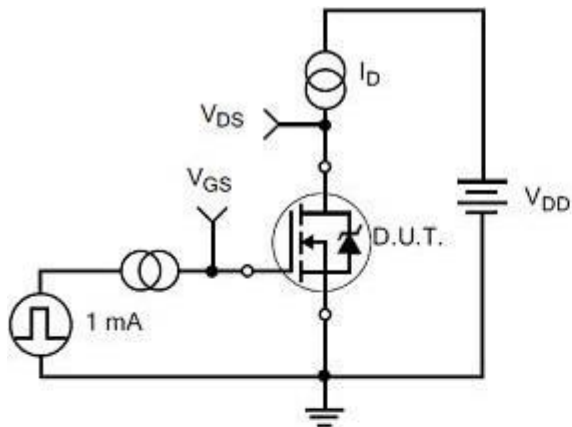
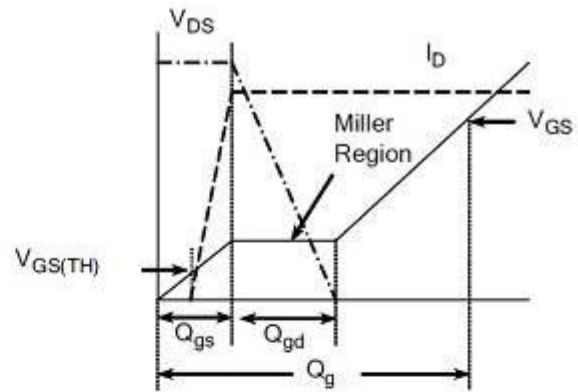


Figure10. Maximum Continuous Drain Current versus Case Temperature

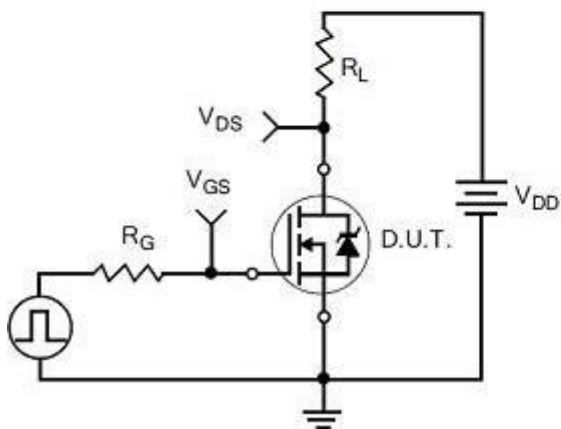
TEST CIRCUITS AND WAVEFORMS



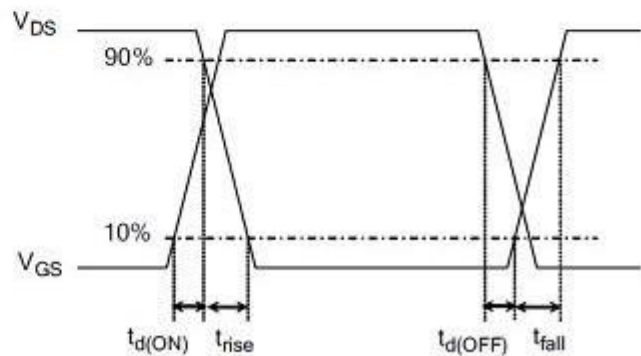
Gate Charge Test Circuit



Gate Charge Waveform

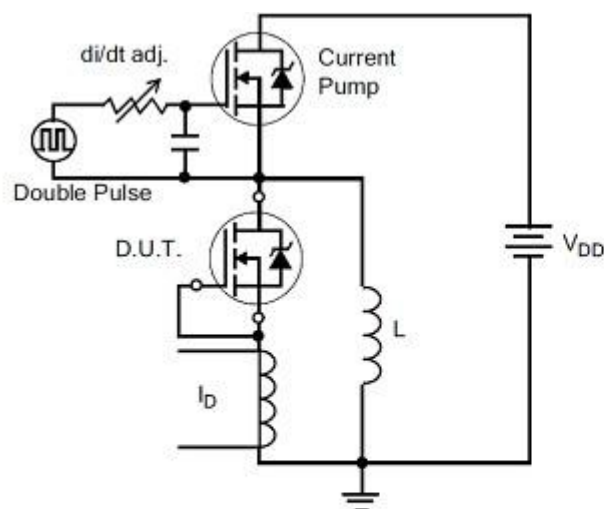


Resistive Switching Test Circuit

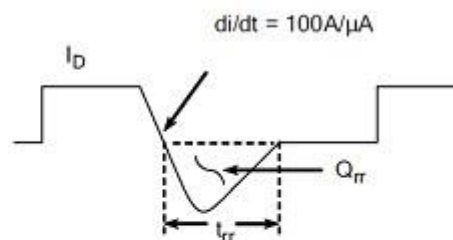


Resistive Switching Waveforms

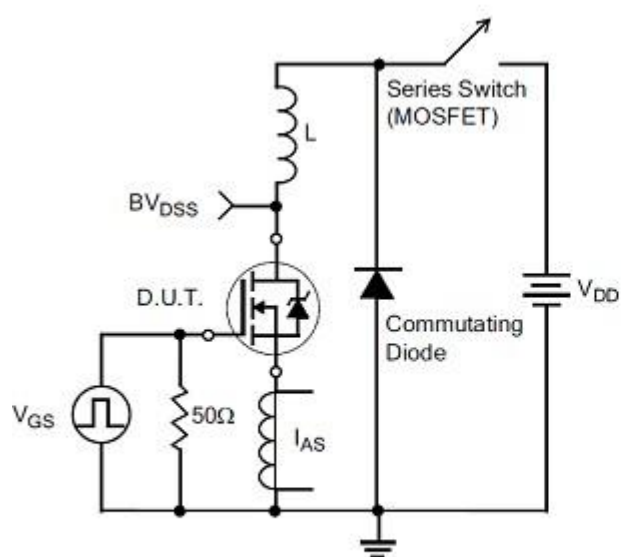
TEST CIRCUITS AND WAVEFORMS(Cont.)



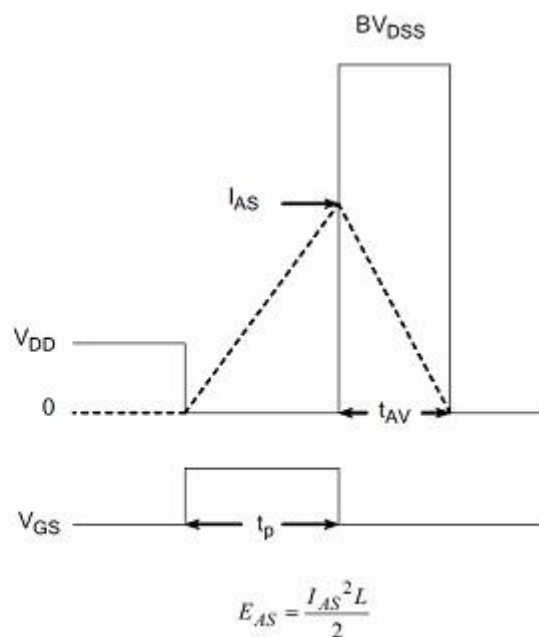
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Revision history

Document revision history

Date	Revision	Changes
26-Oct-2021	1.0	First release

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