

## -60V -13A P-Channel Enhancement Mode Power MOSFET

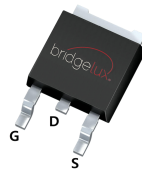
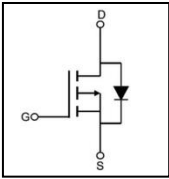
### Features

- $R_{DS(on)} \leq 90m\Omega$  @ $V_{gs} = -10V$
- Advanced trench technology
- Excellent  $R_{DS(on)}$  and Low Gate Charge
- Lead free product is acquired

### Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

### SYMBOL


**TO-252**

### ASSEMBLY MESSAGE

Product Name	Package	Packaging
BXT900P06D	TO-252	Reel

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

Parameter	Symbol	Rating	Unit	
		TO-252		
Drain-Source Voltage	$V_{DS}$	-60	V	
Drain Current	Continuous ( $T_C = 25^\circ C$ )	-13	A	
		Continuous ( $T_C = 100^\circ C$ )	-8.2	A
Drain Current	Pulsed (Note1)	$I_{DM}$	-52	A
Single Pulsed Avalanche Energy	EAS	29.8	mJ	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Power Dissipation	$T_C = 25^\circ C$	$P_D$	31	W
Maximum Junction Temperature	$T_J$	175	$^\circ C$	
Storage Temperature Range	$T_{STG}$	-55 to 175	$^\circ C$	

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

### THERMAL CHARACTERISTICS

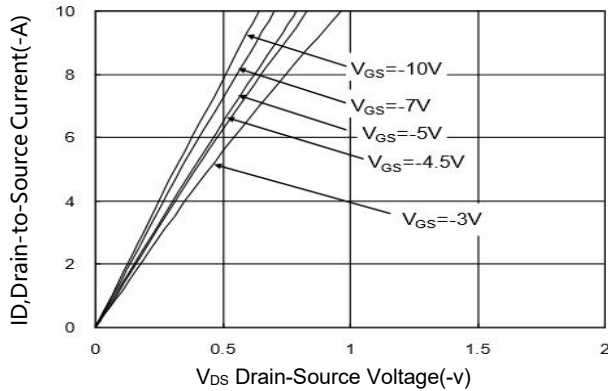
Parameter	Symbol	Max.	Unit
		TO-252	
Thermal Resistance, Junction to Caset	$R_{\theta JC}$	4	$^\circ C / W$

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

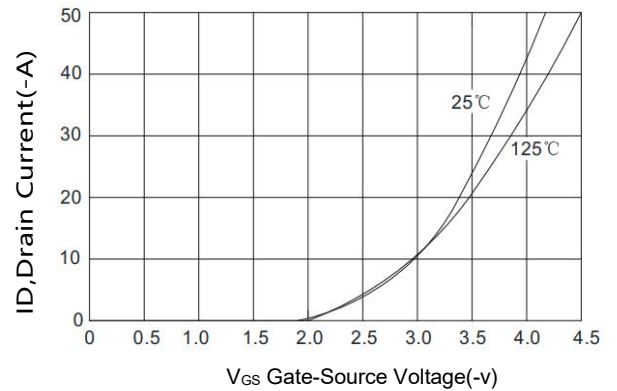
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-48V, V_{GS}=0V$			-1	$\mu A$
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=20V$			100	nA
Gate-Body Leakage Current, Reverse		$V_{GS}=-20V$			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-10A$			90	m $\Omega$
		$V_{GS}=-4.5V, I_D=-5A$			132	
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-15V, V_{GS}=0V,$ $f=1.0MHz$		1020		pF
Output Capacitance	$C_{OSS}$			70		pF
Reverse Transfer Capacitance	$C_{RSS}$			51		pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-15V, I_D=-13A, V_{GS}$ $= -10V, R_G=3.3\Omega$		9		ns
Turn-ON Rise Time	$t_R$			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			47		ns
Turn-OFF Fall-Time	$t_F$			10		ns
Total Gate Charge(Note2)	$Q_G$	$V_{DS}=-20V, V_{GS}=4.5V,$ $I_D=-6A$		12		nC
Gate Source Charge	$Q_{GS}$			2		nC
Gate Drain Charge	$Q_{GD}$			7		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-13A, V_{GS}=0V$			-1.5	V
Diode Continuous Forward Current	$I_S$				-13	A
Maximum Pulsed Drain to Source Diode Forward Current	$I_{SM}$				-52	A

Note: 2. Essentially independent of operating temperature

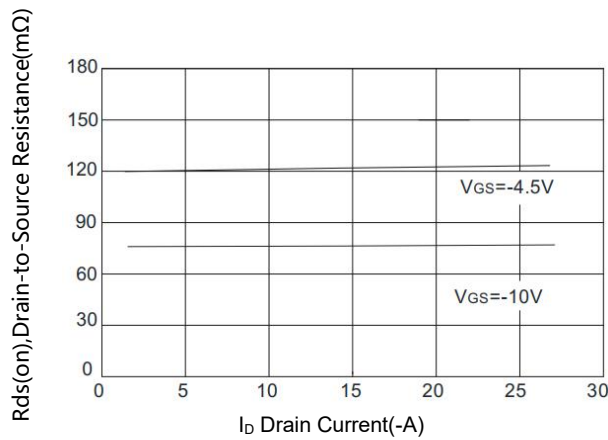
**TYPICAL CHARACTERISTICS**



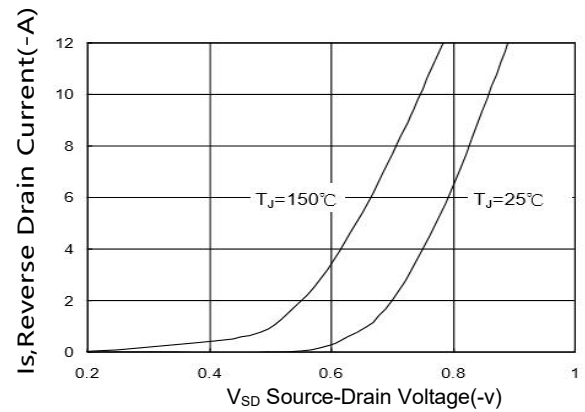
**Figure1. Typical Output Characteristics**



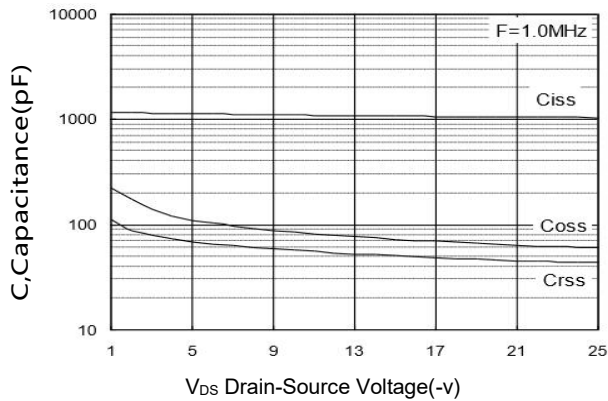
**Figure2. Typical Transfer Characteristics**



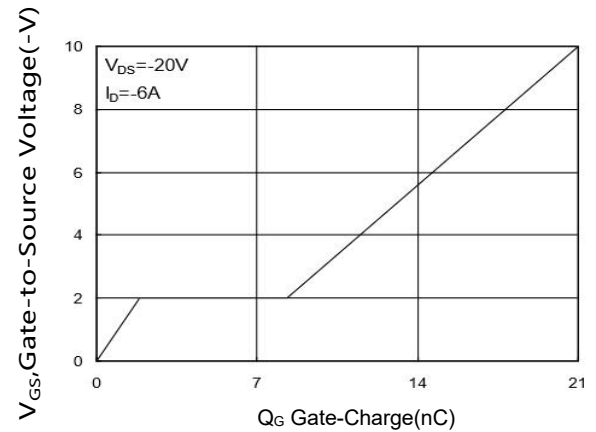
**Figure3. On-Resistance versus Drain Current**



**Figure4. Diode forward voltage versus Current**

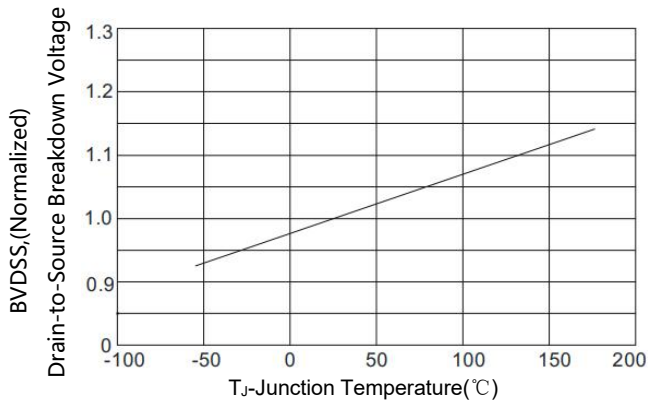


**Figure5. Typical Capacitance versus VDS**

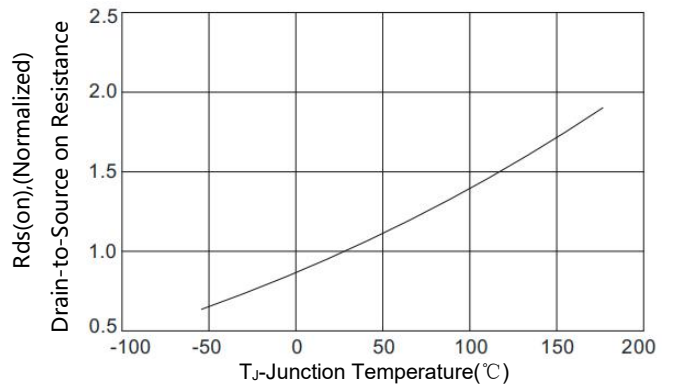


**Figure6. Typical Gate Charge versus VGS**

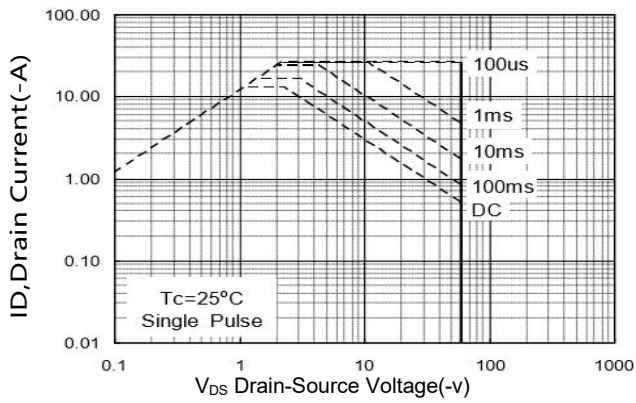
**TYPICAL CHARACTERISTICS(Cont.)**



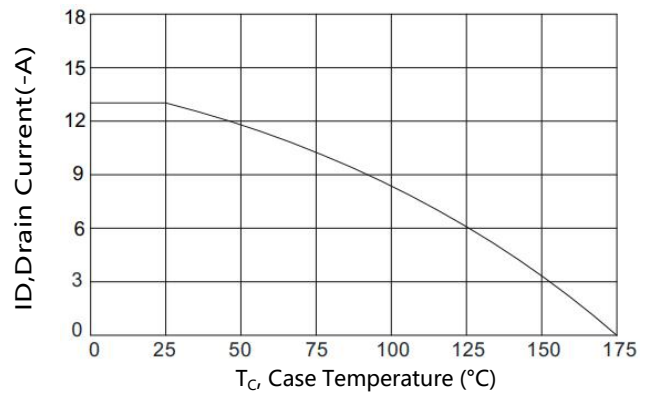
**Figure7. BV<sub>DSS</sub> Variation with Temperature**



**Figure8. On-Resistance Variation with Temperature**

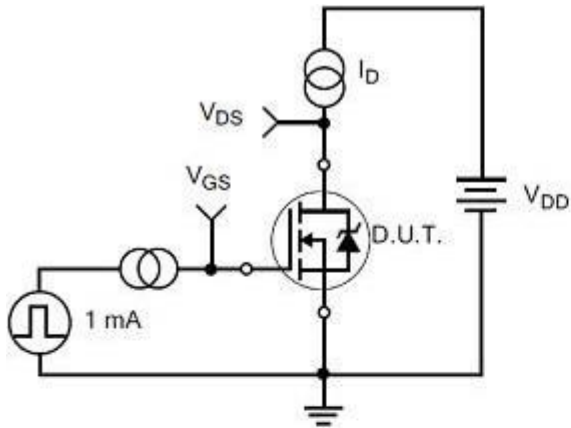


**Figure9. Maximum Safe Operating Area**

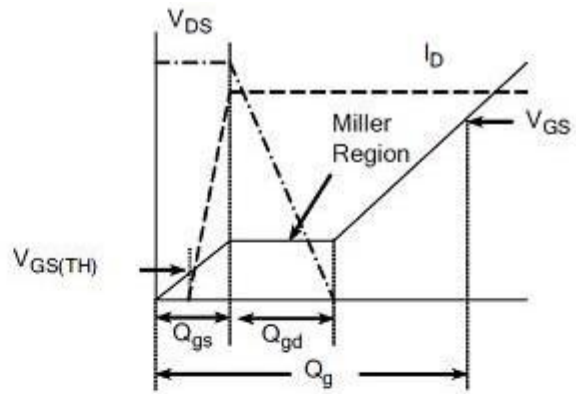


**Figure10. Maximum Continuous Drain Current versus Case Temperature**

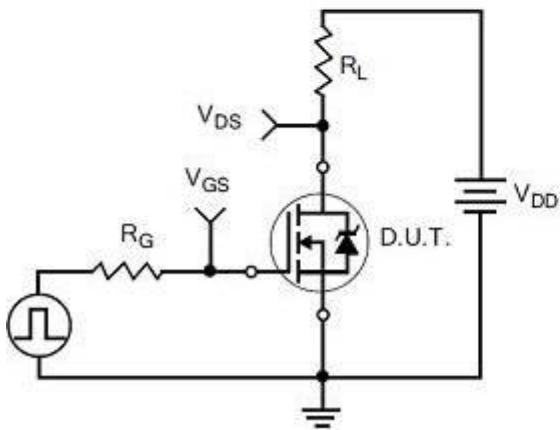
**TEST CIRCUITS AND WAVEFORMS**



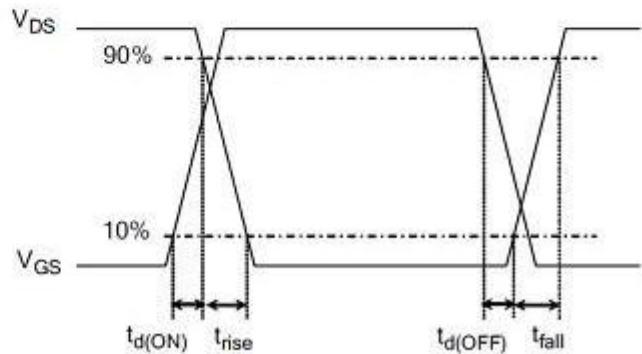
Gate Charge Test Circuit



Gate Charge Waveform

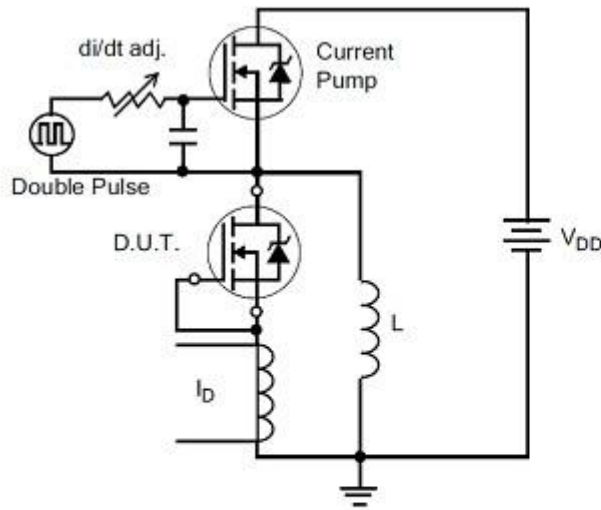


Resistive Switching Test Circuit

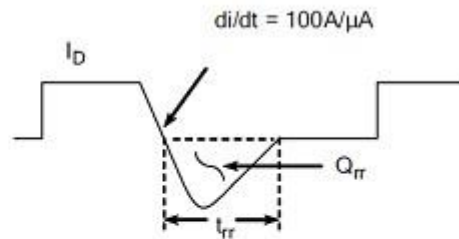


Resistive Switching Waveforms

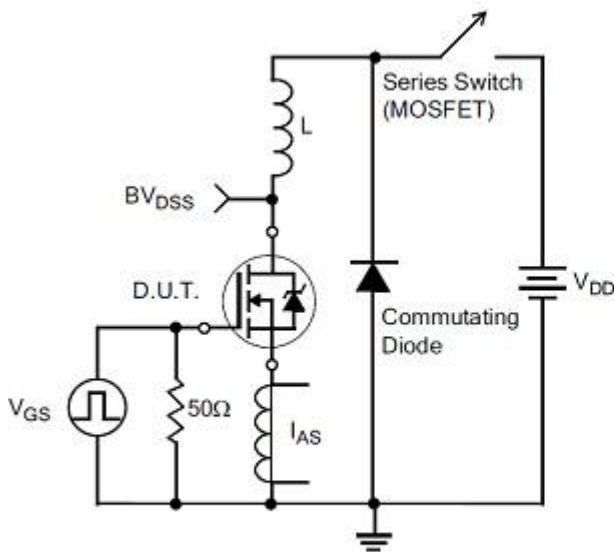
**TEST CIRCUITS AND WAVEFORMS(Cont.)**



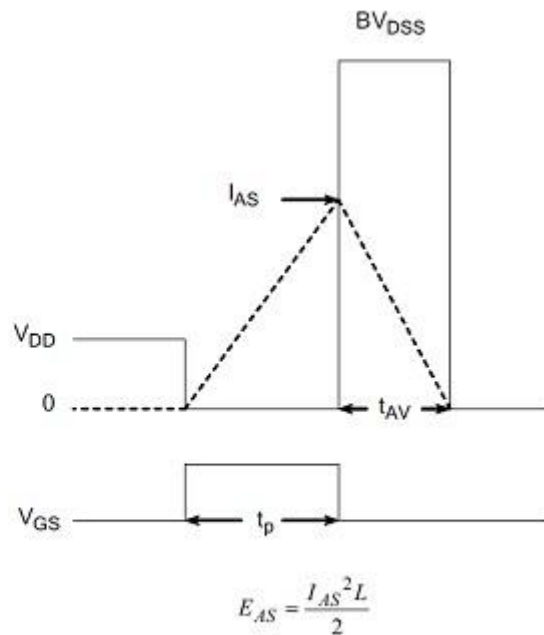
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



**Revision history**

**Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
13-Jan-2022	1.0	First release

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