

BRF5N50

Rev.A Aug.-2022

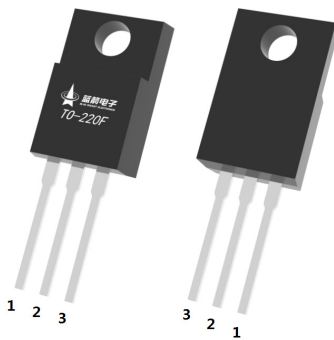
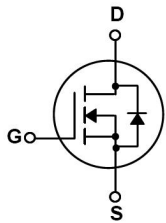
50V 5A N-CHANNEL MOSFET

TO-220F N

N-CHANNEL MOSFET in a TO-220F Plastic Package.

Low gate charge, low crss, fast switching.

DC/DC ,
These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies.



PIN1 G

PIN 2 D

PIN 3 S

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	650	V
Drain Current	$I_D(T_C=25)$	5	A
	$I_D(T_C=100)$	3.3	A
Drain Current - Pulsed	I_{DM}	16	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy(L=10mH)	E_{AS}	176	mJ
Avalanche Current	I_{AS}	6.3	A
Power Dissipation	$P_D(T_C=25)$	28	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Junction-to-Ambient	$R_{\theta JA}$	65	/W
Junction-to-Case	$R_{\theta JC}$	4.5	/W

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V$ $V_{GS}=0V$			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2	3.3	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.5A$		1.35	1.5	Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_{SD}=1A$ $T_J=25$			1.2	V
Gate Resistance	R_g	$V_{GS}=0V$ $f=1.0MHz$		4.1		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		585		pF
Output Capacitance	C_{oss}			190		pF
Reverse Transfer Capacitance	C_{rss}			23		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=250V$ $I_D=5A$ $R_G=25\Omega$ $V_{GS}=10V$		15		ns
Turn-On Rise Time	t_r			32		ns
Turn-Off Delay Time	$t_{d(off)}$			35		ns
Turn-Off Fall Time	t_f			25		ns

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Total Gate Charge	Q_g	$V_{DS}=400V$ $I_D=5A$ $V_{GS}=10V$		16		nC
Gate-Source Charge	Q_{gs}			3.5		nC
Gate-Drain Charge	Q_{gd}			7.3		nC

/ Electrical Characteristic Curve

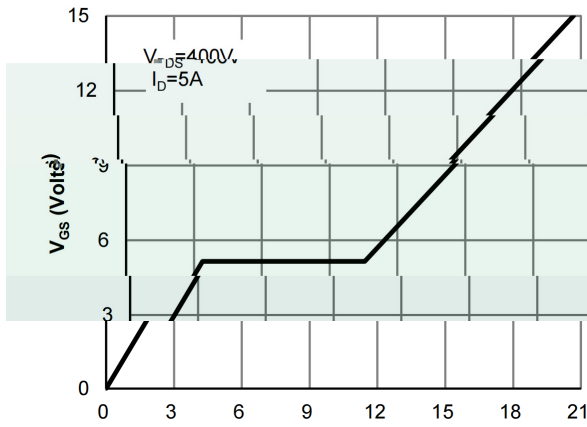


Figure 7: Gate-Charge Characteristics

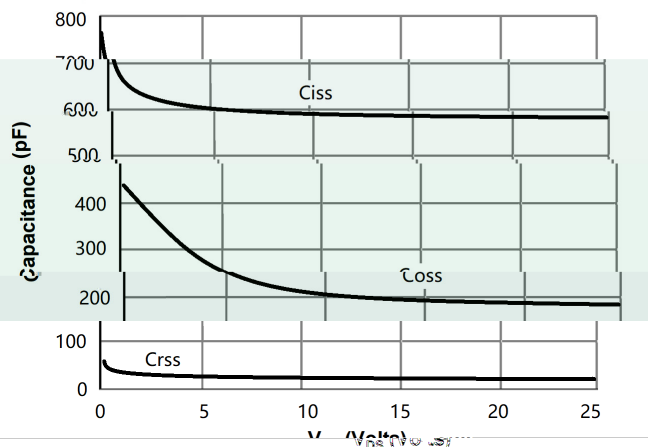


Figure 8: Capacitance Characteristics

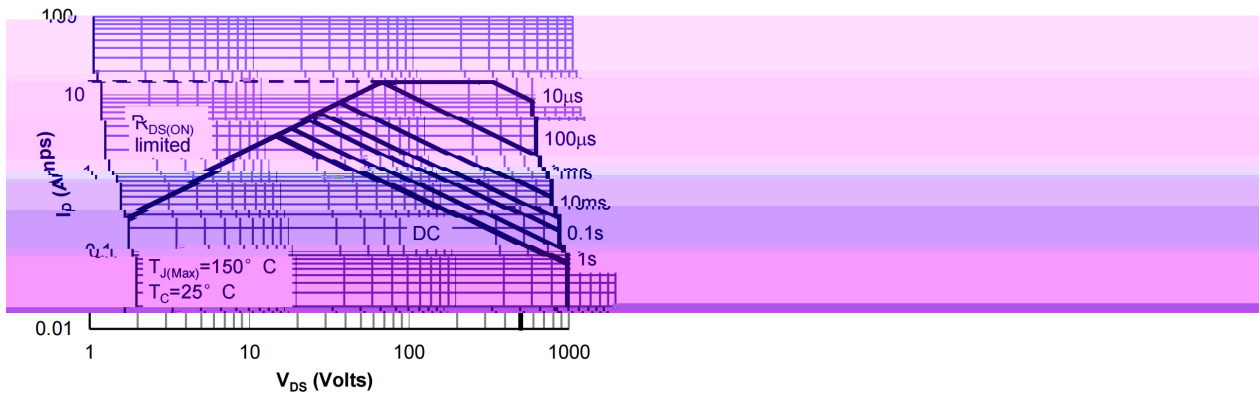


Figure 9: Maximum Forward Bias Safe Operating Area (FSOA)

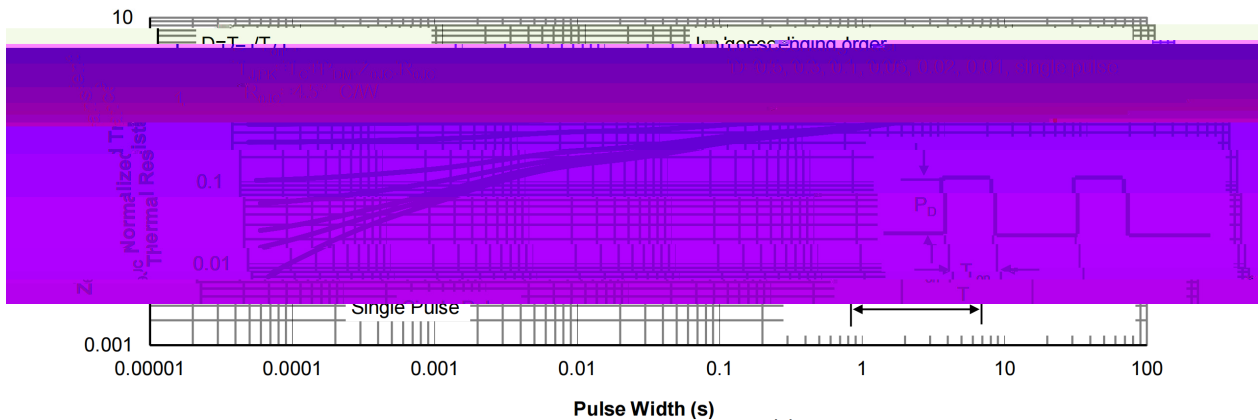
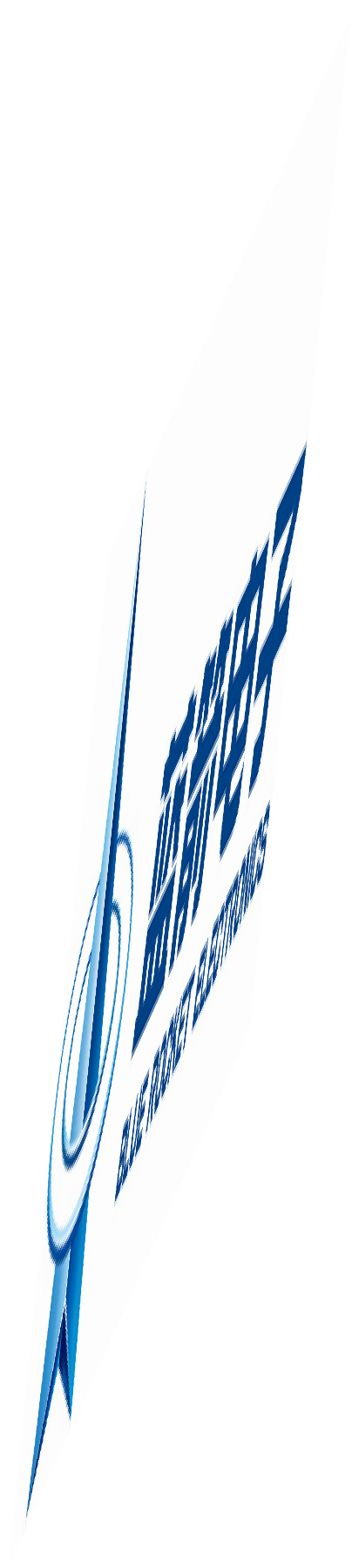
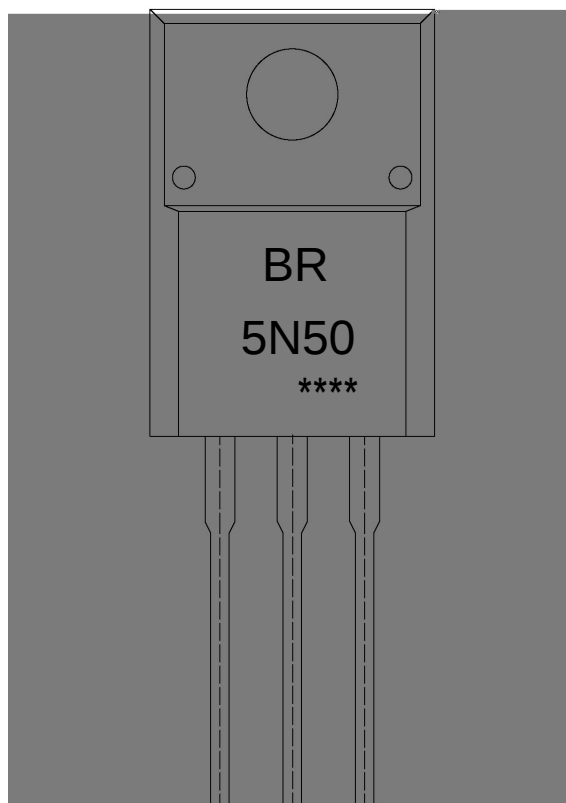


Figure 10: Normalized Maximum Transient Thermal Impedance



/ Marking Instructions



BR

5N50

Note:

BR: Company Code

5N50: Product Type

****: Lot No. Code, code change with Lot No

