

BRD4N50F

Rev.A Apr.-2024



蓝箭电子
BLUE ROCKET ELECTRONICS

DATA SHEET

TO-252 N MOS

N-CHANNEL MOSFET in a TO-252 Plastic Package.

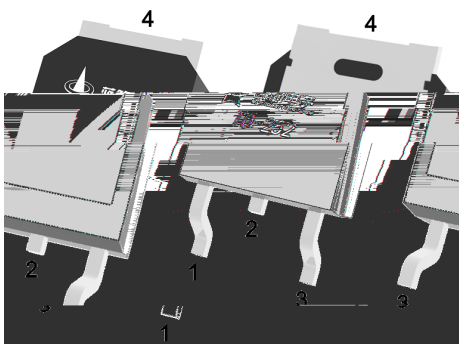
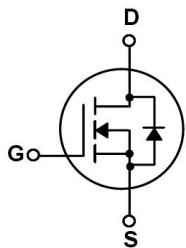
$V_{DS}=500V$ $I_D=4A$

$R_{DS(ON)}@10V \leq 2.2\Omega$ (Typ. 1.7Ω)

Fast Switching.

HF Product.

These devices are well suited for power switch circuit of adaptor and charger, intergrate fast recovery diode.



PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

/ Marking

See Marking Instructions.

PIN

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	500	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	4	A
Drain Current - Pulsed	I_{DM}	8	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}	176.4	mJ
Avalanche Current	I_{AS}	6.3	A
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	50	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Junction to Ambient	$R_{\theta JA}$	110	/W
Junction to Case	$R_{\theta JC}$	2.5	/W

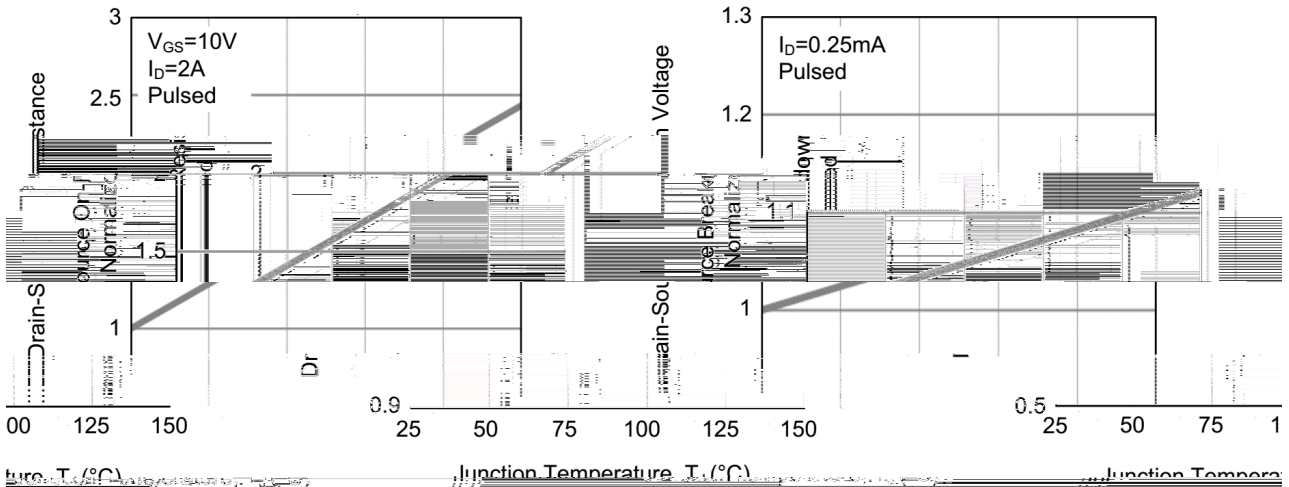
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	500			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V$ $V_{GS}=0V$			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A$		1.7	2.2	Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$			1.4	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		350		pF
Output Capacitance	C_{oss}			145		
Reverse Transfer Capacitance	C_{rss}			5		
Total Gate Charge	Q_G	$V_{DS}=400V$ $I_D=4.0A$ $V_{GS}=10V$		8.5		nC
Gate-Source Charge	Q_{GS}			3.2		
Gate-Drain Charge	Q_{GD}			1.5		

/ **Electrical Characteristics**(Ta=25)

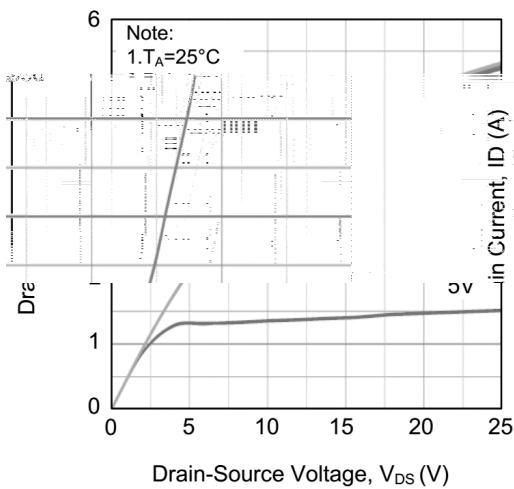
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=100V$ $I_D=4.0A$ $V_{GS}=10V$ $R_G=25\Omega$		4.3		ns
Turn-On Rise Time	t_r			17.2		
Turn-Off Delay Time	$t_{d(off)}$			22		
Turn-Off Fall Time	t_f			23.2		
Maximum Continuous Drain-Source Diode Forward Current	I_S				4	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				8	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V$ $I_S=5.0A$ $dI_F/dt=100 A/\mu s$		92		ns
Reverse Recovery Charge	Q_{rr}			1.45		μC

/ Electrical Characteristic Curve

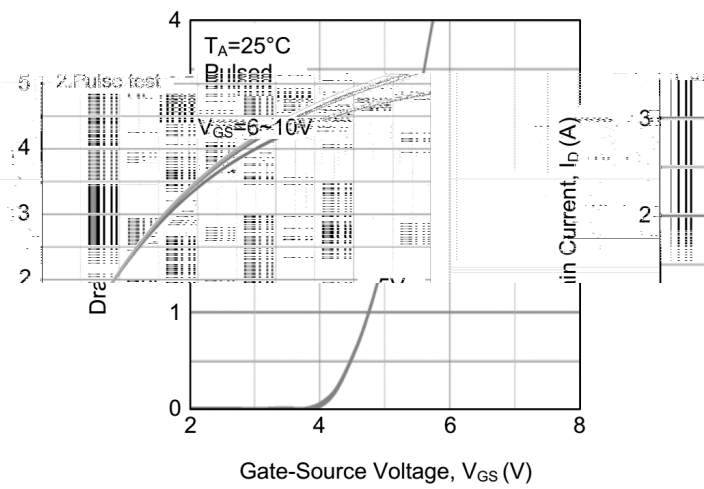


1. Drain-Source On-Resistance vs. Junction Temperature

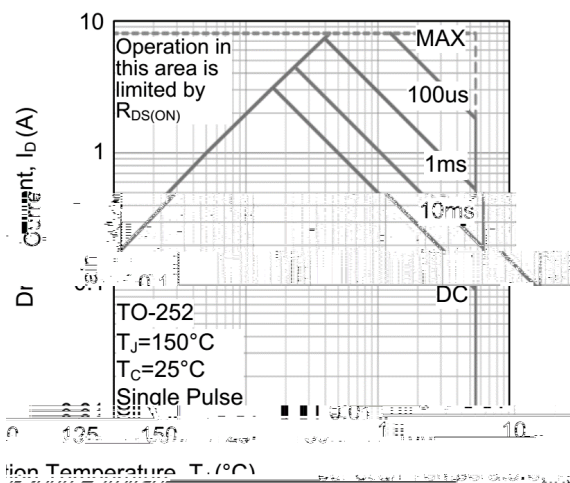
2. Breakdown Voltage vs. Junction Temperature



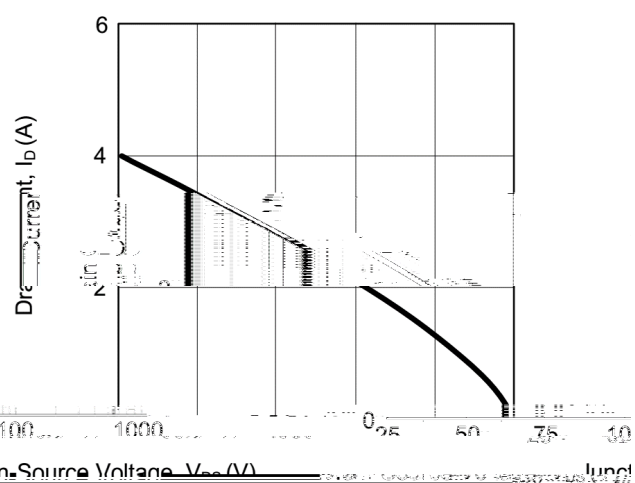
3. Drain Current vs. Drain-Source Voltage



4. Drain Current vs. Gate-Source Voltage



6. Drain Current vs. Junction Temperature



5. Safe Operating Area

Technical drawing of a mechanical part, showing a cross-section and a side view.

Dimensions and Features:

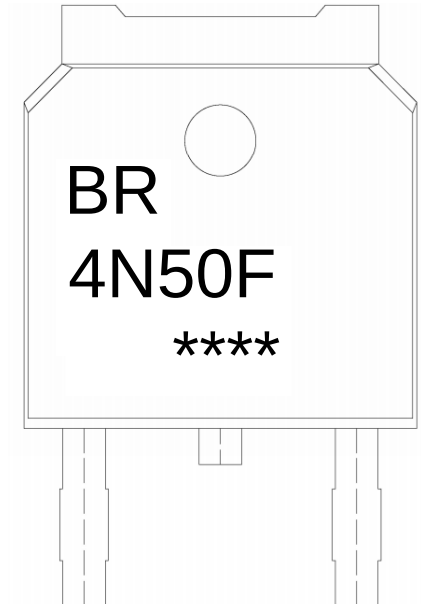
- Top View (Cross-section):**
 - Overall width: D
 - Inner hole diameter: $D1$
 - Central section length: A
 - Section thickness: C
 - Chamfer angle: 45°
- Side View (Profile):**
 - Overall height: $L1$
 - Section height: $L2$
 - Section width: $L3$
 - Section thickness: $e1$
 - Section width: $e2$
 - Section thickness: K

单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
	A	2.20		E	5.95
	B	0.95		e1	2.24
	J	0.70		e2	4.43
	51mm	0.45		L1	9.85
	C	0.45		?	1.70
	13mm	0.60		6.45mm	6.75
	5.50mm	0.00		DL	5.10
		0.10			

TO-252

/ Marking Instructions



BR

Note:

BR: Company Code

4N50F: Product Type Code

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

() / Temperature Profile for IR Reflow Soldering(Pb-Free)

Note:

- 1

150 180

60 90sec;

1.Preheating:150~180 , Time:60~90sec.
- 2

245 5

5 0.5sec;

2.Peak Temp.:245 5 , Duration:5 0.5sec.
- 3

2 10

/sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260 5

10 1 sec.

Temp.:260±5

Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱