

N-Channel Enhancement Mode Field Effect Transistor

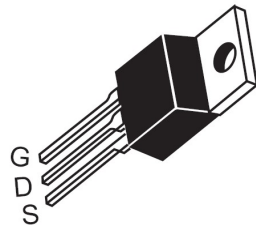
● Features

- N-channel, normal level
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC for target application
- Ideal for high-frequency switching and synchronous rectification

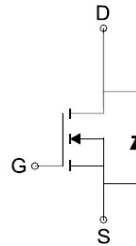
● Product Summary

V_{DS}	V_{GS}	Test Conditions	$R_{DS(on)}$
60V	±20V	5.5A@VGS=10V	30mR
		4.5A@ VGS=4V5	35mR

● Pin Configurations(TO220)



Top View



N-Channel MOSFET

● Absolute Maximum Ratings $T_A=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	Continuous	I_D 6 ^(1A) 26 ^(1B)	A
	Pulse	I_{DM} 80	
Total Power Dissipation ^(note1)	P_D	2.5 ^(1A)	W
		50 ^(1B)	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes

1A、 Surface Mounted on 1x1FR4 Board.

1B、 Pulse width limited maximum junction temperature Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$

2、 The value of P_D is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design. The current rating is based on the DC thermal resistance rating and PCB layout: A. Minimum footprint; B. With additional heat sink.

3、 Repetitive rating, pulse width limited by junction temperature

FS2230BF

● Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter ^(note2)	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
Gate–Body Leakage	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1	1.4	3	V
Static Drain–Source On–Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}$	--	30	41	mR
		$V_{GS} = 4.5\text{ V}, I_D = 4.5\text{ A}$	--	35	52	
Input Capacitance	C_{ISS}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V},$ $F = 1\text{ MHz}$	--	1180	--	pF
Output Capacitance	C_{OSS}		--	170	--	
Reverse Transfer Capacitance	C_{RSS}		--	100	--	
Turn–On Delay Time	$T_{D(ON)}$	$V_{GS} = 10\text{ V}, V_{DS} = 30\text{ V},$ $R_L = 5.4\text{ R},$ $R_{GEN} = 3\text{ R}, I_D = 5.5\text{ A}$	--	--	25	nS
Turn–On Rise Time	T_R		--	--	70	
Turn–Off Delay Time	$T_{D(OFF)}$		--	--	300	
Turn–Off Fall Time	T_F		--	--	150	
Diode Forward Voltage	V_{SD}		$V_{GS} = 0\text{ V}, I_S = 2\text{ A}$	0.5	0.77	

1、 The value of PD is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application depends on the user's specific board design. The current rating is based on the DC thermal resistance rating and PCB layout: A. Minimum footprint; B. With additional heat sink.

2、 Repetitive rating, pulse width limited by junction temperature

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● **TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

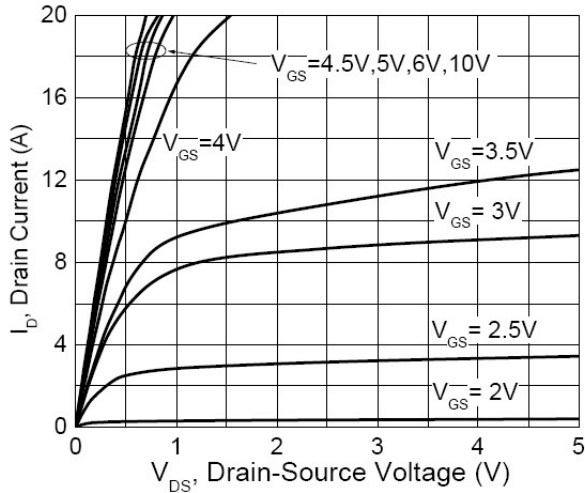


Figure 1. Output Characteristics

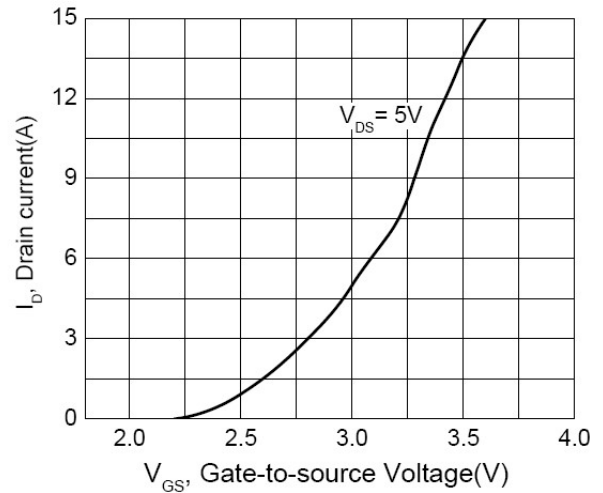


Figure 2. Transfer Characteristics

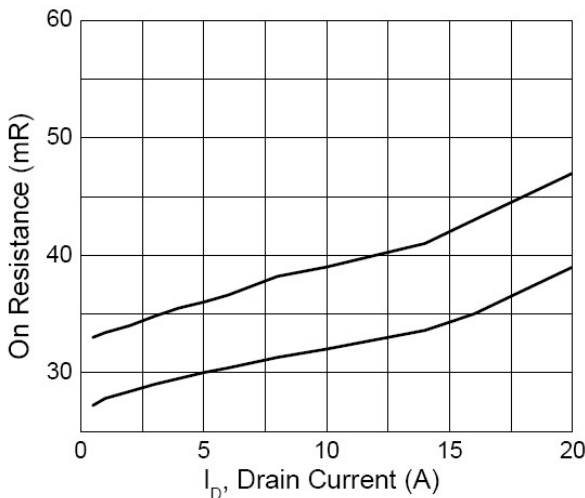


Figure 3. On-Resistance

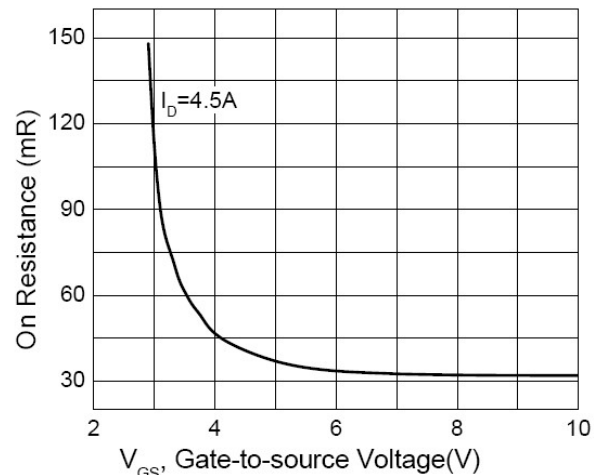


Figure 4. On-Resistance vs. Threshold Voltage

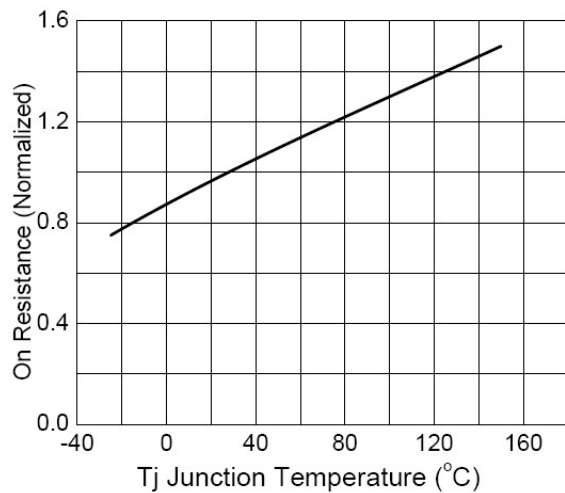


Figure 5. On-Resistance vs. Temperature

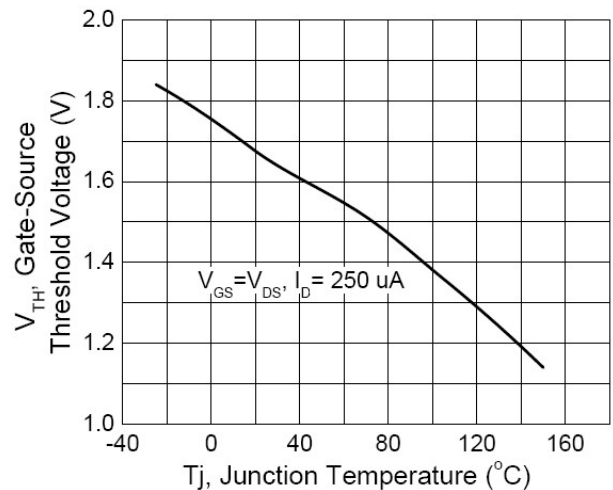
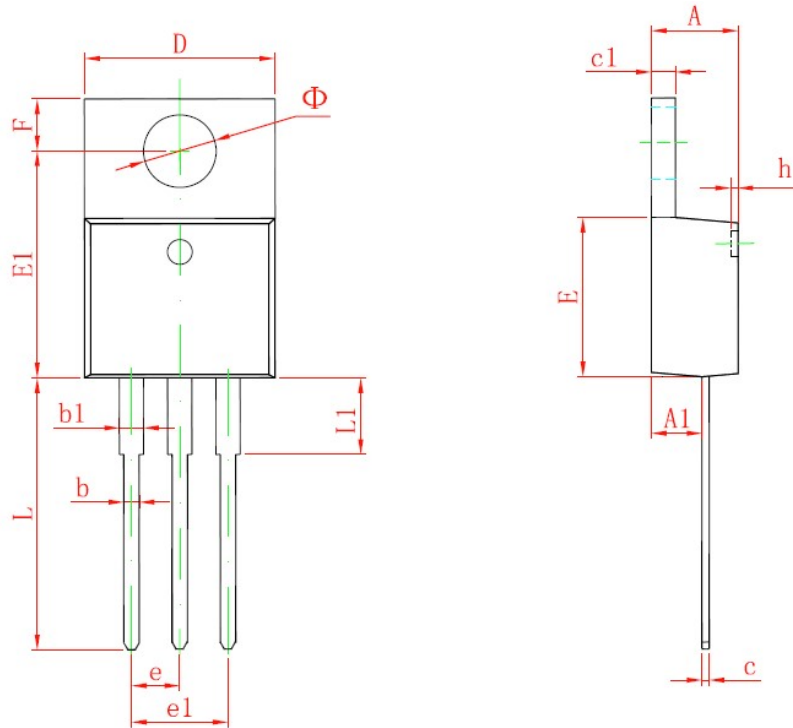


Figure 6. Gate Threshold Vs. Temperature

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- **Package Information**

TO220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155