N-Channel Enhancement Mode Field Effect Transistor

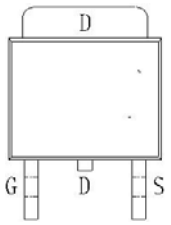
Features

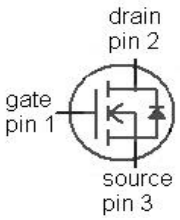
- N-channel, normal leve
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC for target application
- Ideal for high-frequency switching and synchronous rectification

Product Summary

V_{DS}	V_{GS}	Test Conditions	$R_{DS(on)}$
60V	±20V	20A@VGS=10V	12mR
		10A@ VGS=4V5	15mR

Pin Configurations(TO252)





Top View

Absolute Maximum Ratings TA=25°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	50(1A) 150(1B)	A
	Pulse	I_{DM}	80	
Total Power Dissipation (note1)		P_D	2.5(1A) 50(1B)	W
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≤300 us duty cycle ≤2%

2、 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 TA =25° 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

Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter (note2)	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}= 0 V, I_D= 250 uA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60 V, V_{GS}= 0 V	--	--	1	uA
Gate–Body Leakage	I_{GSS}	V_{GS} = ± 20 V, V_{DS}= 0 V	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D= 250 uA	1	1.6	3	V
Static Drain–Source On–Resistance	$R_{DS(ON)}$	V_{GS}= 10 V, I_D= 20A	--	10	12	mR
		V_{GS}= 4.5 V, I_D= 10 A	--	15	19	
Input Capacitance	C_{ISS}	V_{DS} = 10 V, V_{GS}= 0 V, F = 1MHz	--	2250	--	pF
Output Capacitance	C_{OSS}		--	550	--	
Reverse Transfer Capacitance	C_{RSS}		--	220	--	
Turn–On Delay Time	$T_{D(ON)}$	V_{GS}=10V, V_{DS}=30V, R_L=5.4R, R_{GEN}=3R, I_D=5.5A	--	--	50	nS
Turn–On Rise Time	T_R		--	--	150	
Turn–Off Delay Tim	$T_{D(OFF)}$		--	--	600	
Turn–Off Fall Time	T_F		--	--	300	
Diode Forward Voltage	V_{SD}	V_{GS}= 0 V, I_S= 2 A	0.5	0.77	1.0	V

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 TA =25° 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

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

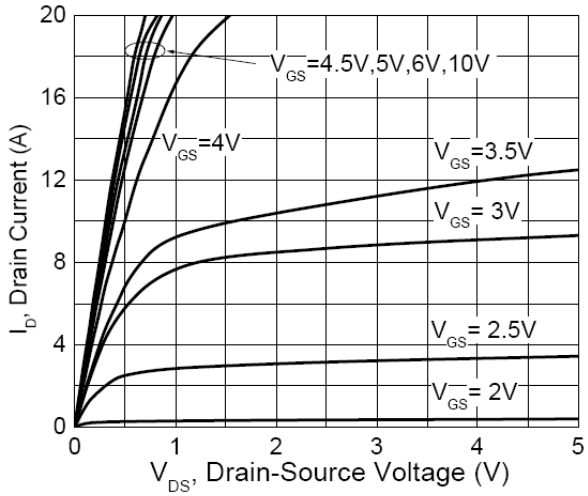


Figure 1. Output Characteristics

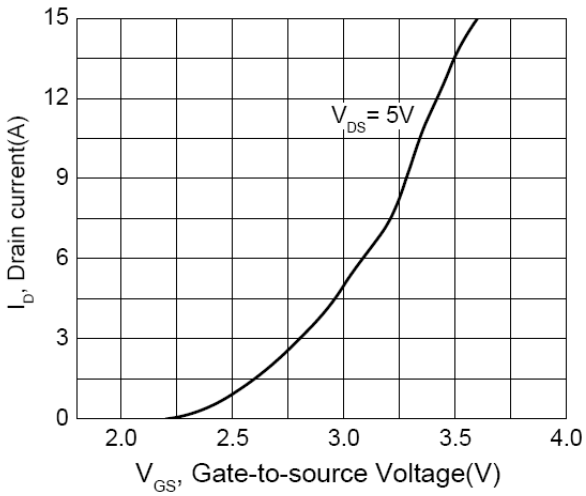


Figure 2. Transfer Characteristics

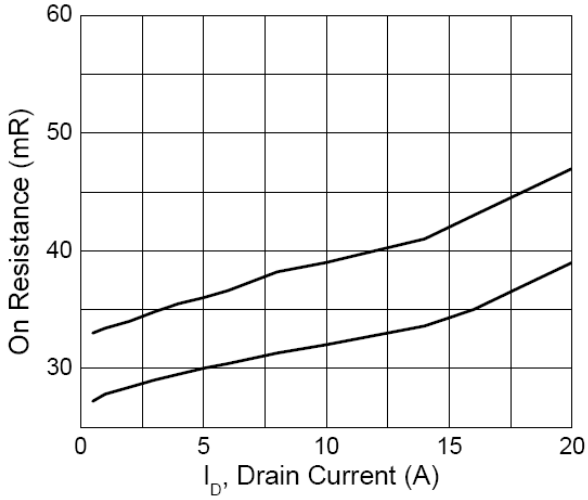


Figure 3. On-Resistance

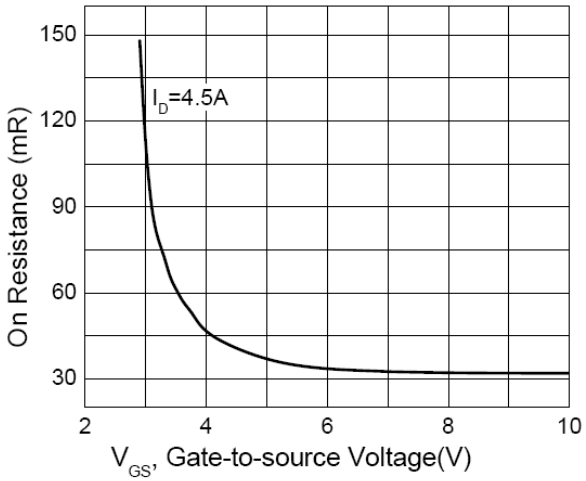


Figure 4. On-Resistance vs. Threshold Voltage

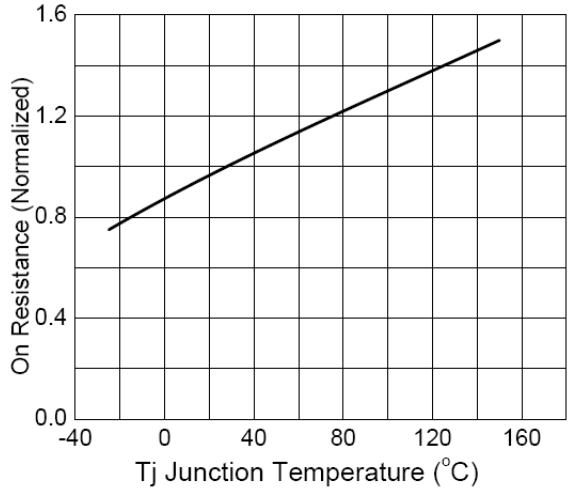


Figure 5 . On-Resistance vs. Temperature

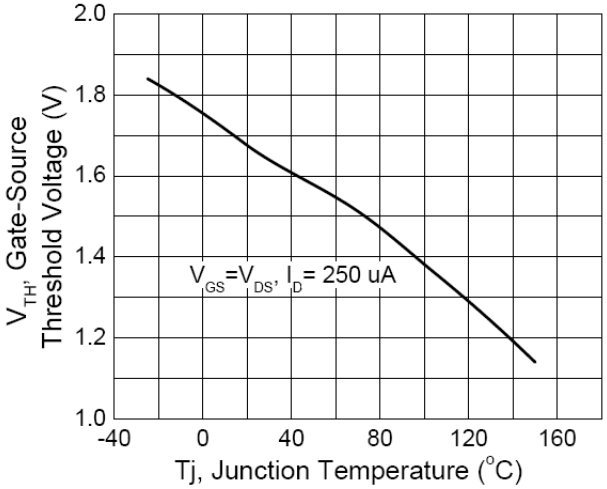
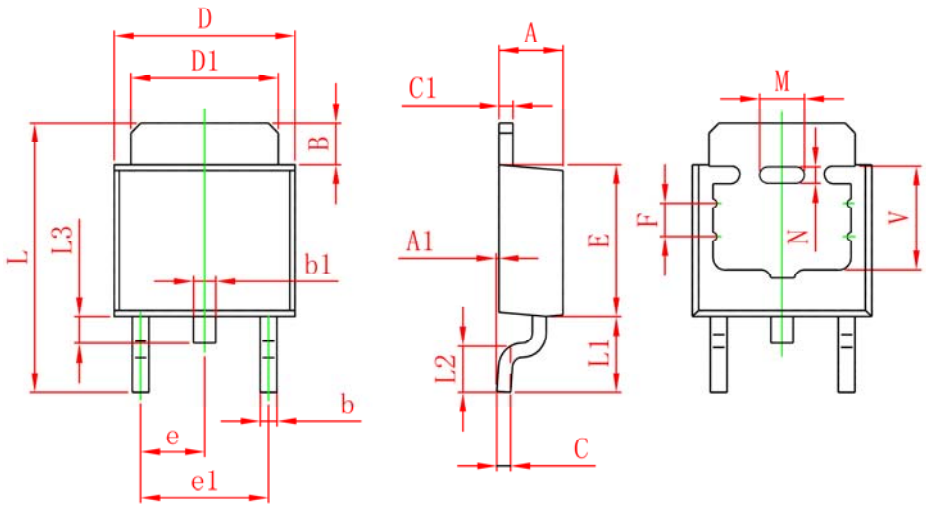


Figure 6. Gate Threshold Vs. Temperature

- **Package Information**

TO-252C-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
F	1.200REF.		0.047REF.	
M	1.600REF.		0.063REF.	
N	0.450REF.		0.018REF.	
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF		0.150 REF	