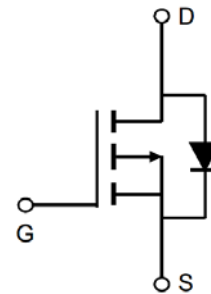
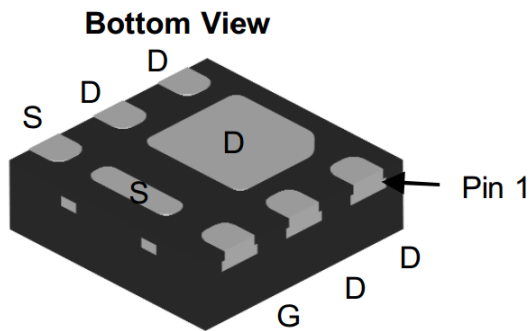


## P-Channel -20V (D-S) MOSFET

● FEATURES	● GENERAL DESCRIPTION
<p>RDS(ON) 21mΩ@VGS=-4.5V RDS(ON) 26mΩ@VGS=-2.5V</p> <p>high density cell design for extremely low RDS(ON) Exceptional on-resistance and maximum DC current capability</p>	<p>The FS1256 combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON). This device is ideal for load switch and battery protection applications.</p>

### ● PIN CONFIGURATION



### Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±10	V
Drain Current-Continuous	I <sub>D</sub>	-3.5	A
Drain Current -Pulsed (Note )	I <sub>DM</sub>	-20	A
Maximum Power Dissipation	P <sub>D</sub>	18	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 To 150	°C

### Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	R <sub>qJC</sub>	6.9	°C/W

#### NOTE:

- A: Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.
- B: Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.
- C: Repetitive rating, pulse width limited by junction temperature, t<sub>p</sub>=10μs, Duty Cycle=1%
- D: Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.

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## ● Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

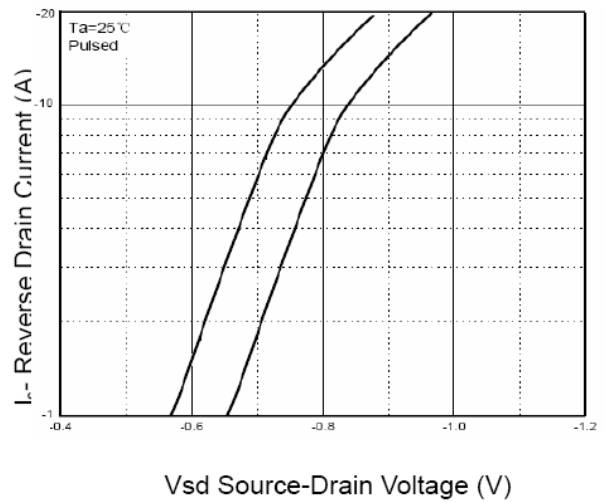
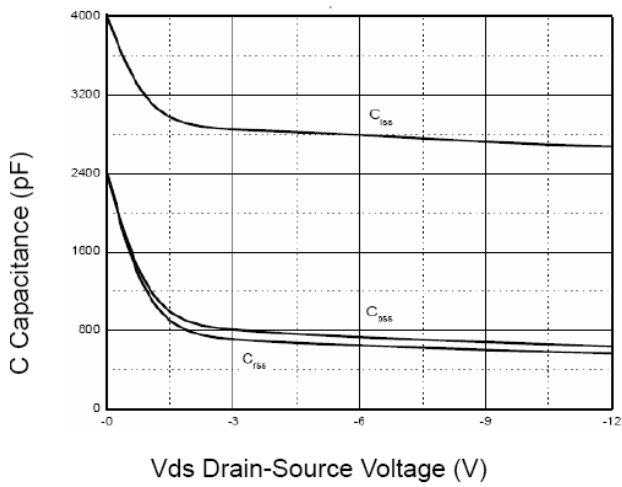
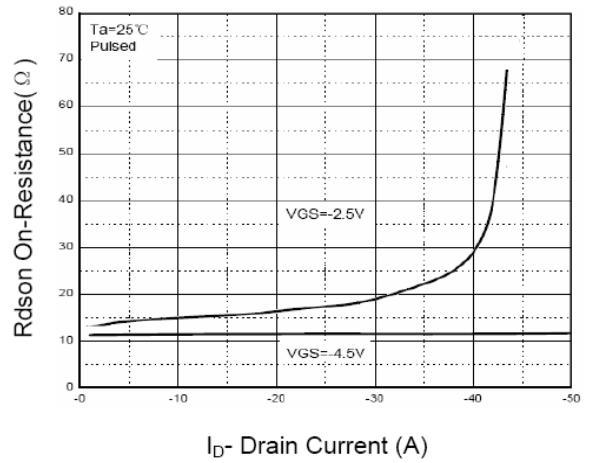
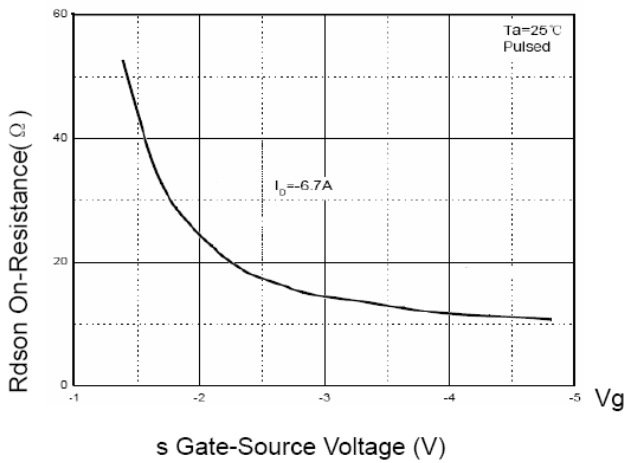
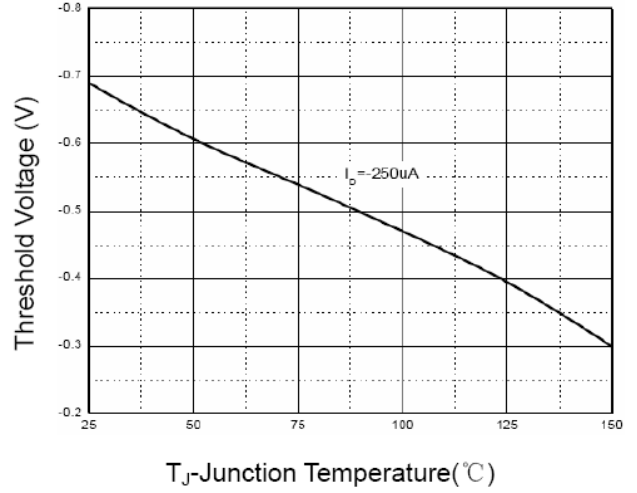
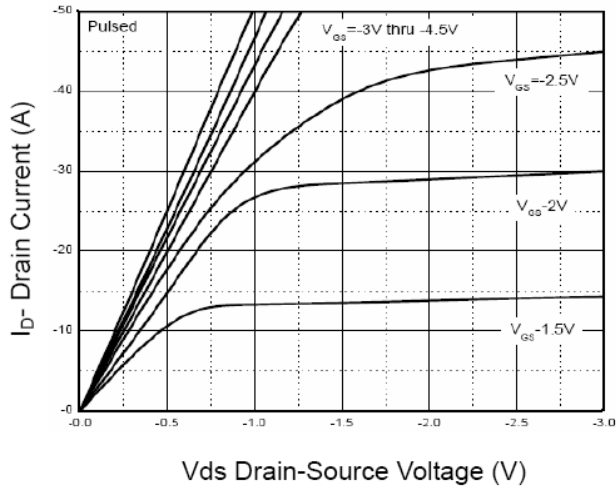
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR) DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-8V, V <sub>GS</sub> =0V	-	-	-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6.6A	-	21	29	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.5A	-	26	39	mΩ
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.0A	-	35	47	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6.7A	20	-	-	S
<b>Dynamic Characteristics</b> (Note4)						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, F=1.0MHz	-	2100	-	PF
Output Capacitance	C <sub>oss</sub>		-	540	-	PF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	470	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-1A V <sub>GS</sub> =-4.5V, R <sub>GEN</sub> =10Ω	-	11	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	35	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	30	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	10	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-10A, V <sub>GS</sub> =-4.5V	-	35	48	nC
Gate-Source Charge	Q <sub>gs</sub>		-	5	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	10	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage(Note 3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A	-	-	-1.2	V
Diode Forward Current (Note 2)	I <sub>S</sub>		-	-	-1.6	A

### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

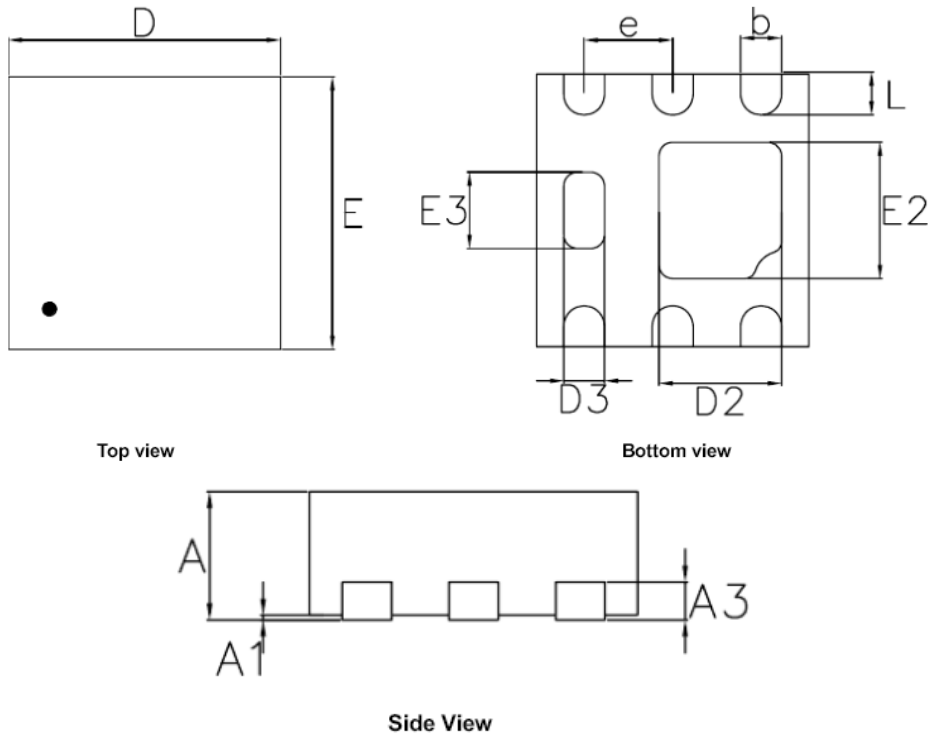
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● Typical Performance Characteristics (T = 25°C)



# FS1256

## ● DFN2X2-6L Package Information

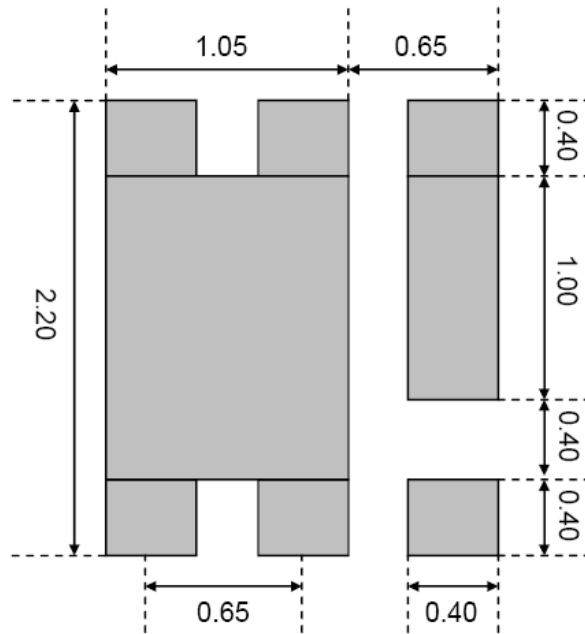


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.20 Ref.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D2	0.85	0.90	0.95
E2	0.95	1.00	1.05
D3	0.25	0.30	0.35
E3	0.51	0.56	0.61
b	0.25	0.30	0.35
L	0.25	0.30	0.30
e	0.65 BSC.		

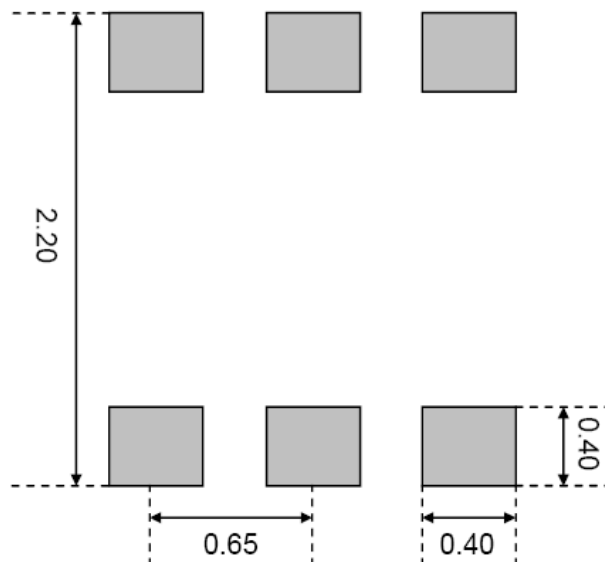
### Notes

1. All dimensions are in millimeters.
2. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

## Recommend PCB Layout (Unit: mm)



**Option 1: High power applications**



**Option 2: Normal applications**