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

● FEATURES

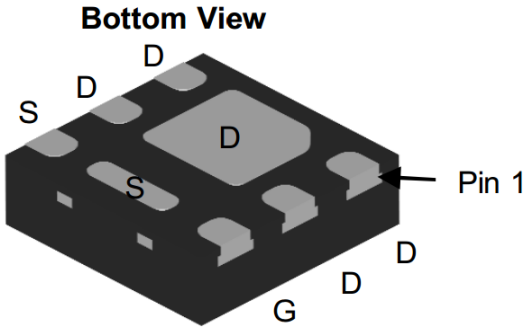
RDS(ON) 21mΩ@VGS=-4.5V
RDS(ON) 26mΩ@VGS=-2.5V

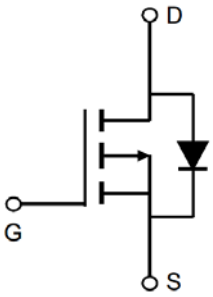
high density cell design for extremely low RDS(ON)
Exceptional on-resistance and maximum DC current capability

● GENERAL DESCRIPTION

The FS1256 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

● PIN CONFIGURATION





Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous	I_D	-3.5	A
Drain Current -Pulsed (Note)	I_{DM}	-20	A
Maximum Power Dissipation	P_D	18	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

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Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	RqJC	6.9	℃/W

NOTE:

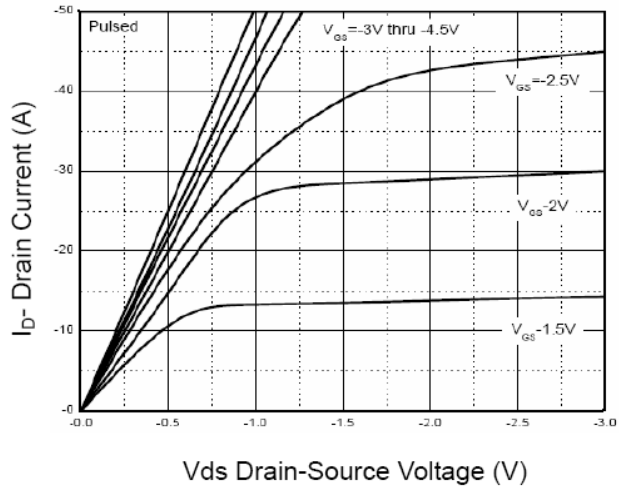
A: Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.
B: Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.
C: Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%
D: Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

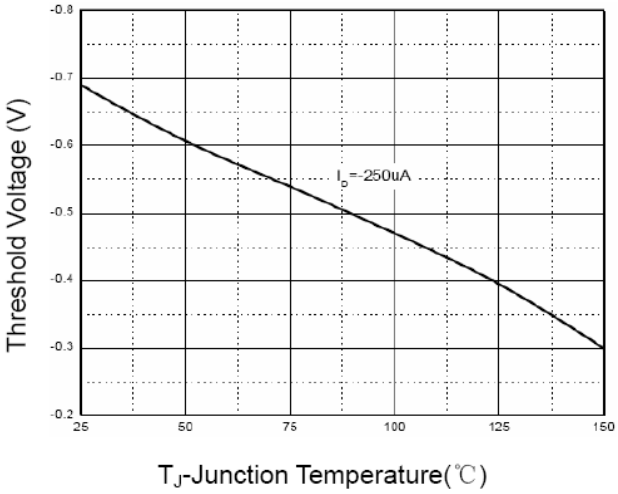
Electrical Characteristics (T_J=25°C unless otherwise noted)

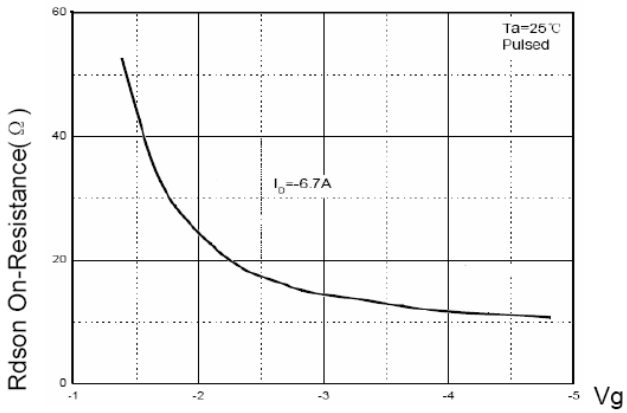
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)\ DSS}$	V_{GS}=0V I_D=-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-8V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-6.6A	-	21	29	mΩ
		V_{GS}=-2.5V, I_D=-3.5A	-	26	39	mΩ
		V_{GS}=-1.8V, I_D=-2.0A	-	35	47	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-6.7A	20	-	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{lss}	V_{DS}=-10V,V_{GS}=0V, F=1.0MHz	-	2100	-	PF
Output Capacitance	C_{oss}		-	540	-	PF
Reverse Transfer Capacitance	C_{rss}		-	470	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,I_D=-1A V_{GS}=-4.5V,R_{GEN}=10Ω	-	11	-	nS
Turn-on Rise Time	t_r		-	35	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	V_{DS}=-6V,I_D=-10A, V_{GS}=-4.5V	-	35	48	nC
Gate-Source Charge	Q_{gs}		-	5	-	nC
Gate-Drain Charge	Q_{gd}		-	10	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-1.6	A

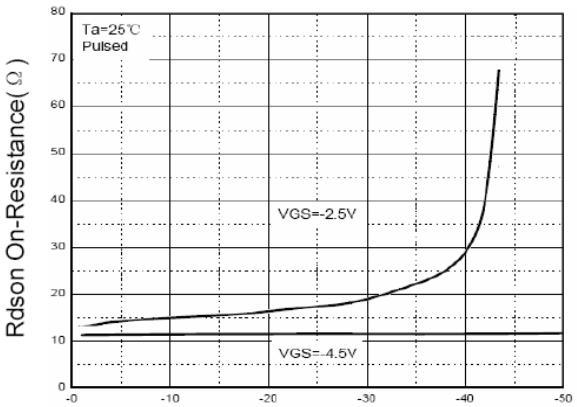
Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

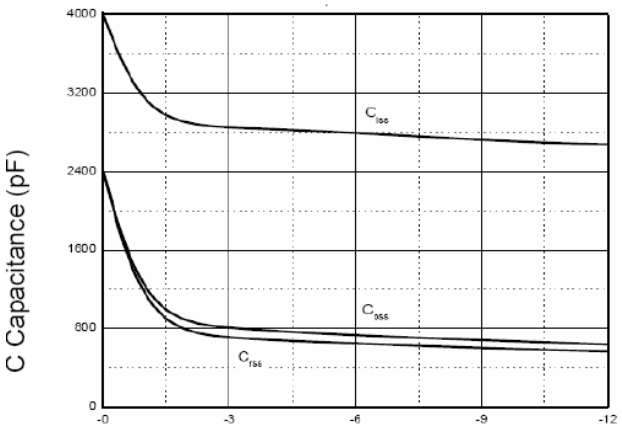
- **Typical Performance Characteristics** (T =25℃)

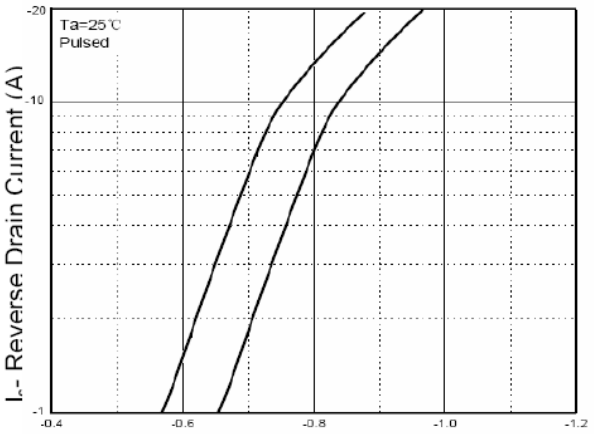




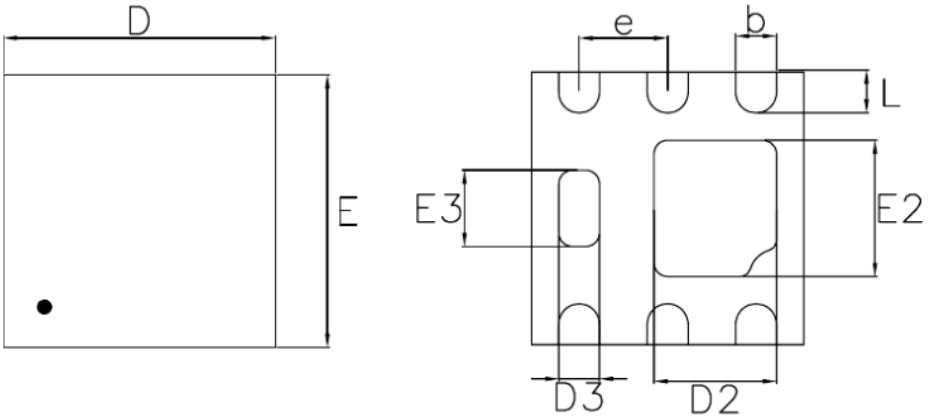






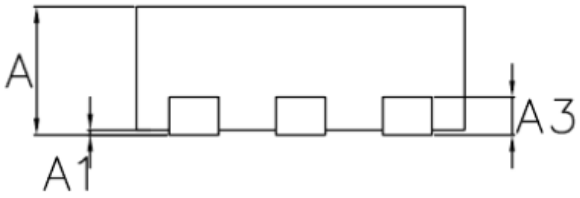


DFN2X2-6L Package Information



Top view

Bottom view



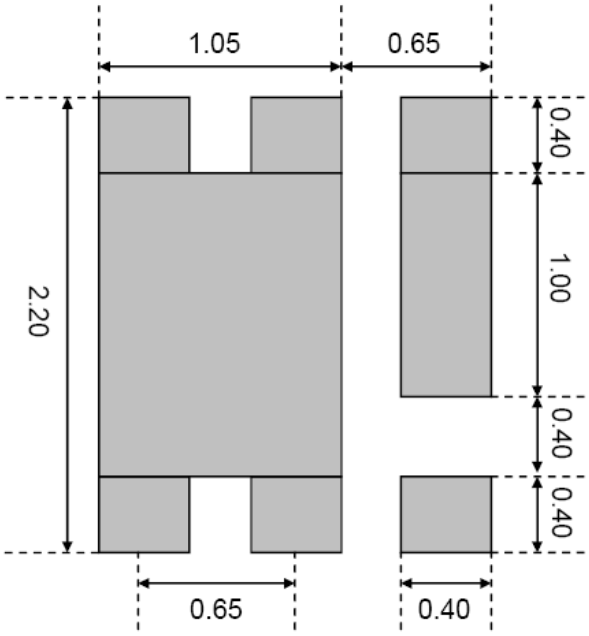
Side View

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.		

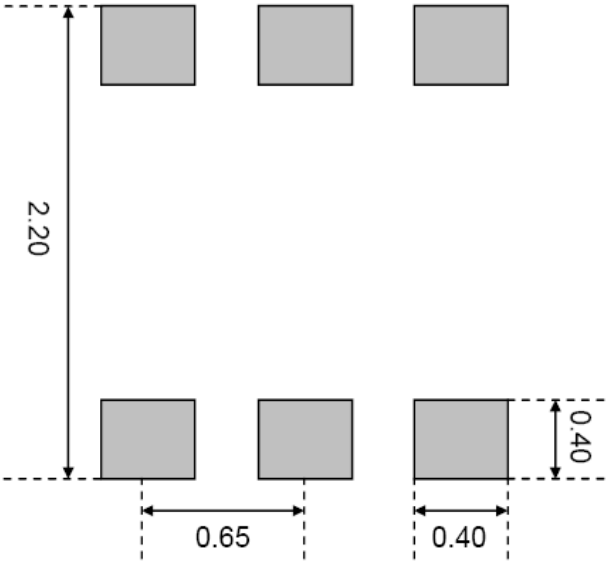
Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (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