



YOUSHANG SEMICONDUCTOR

**设计研发新型功率器件**

**各类小信号开关**

**中低压及高压大电流等场效应管**

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## Features

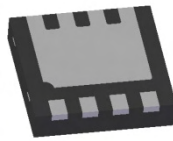
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

## Mechanical Data

- Case: U-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - NiPdAu over Copper lead frame. Solderable per MIL-STD-202, Method 208 <sup>(e4)</sup>
- Polarity: See Diagram
- Weight: 0.0172 grams (approximate)



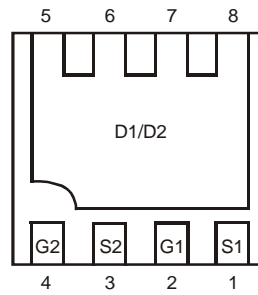
U-DFN3030-8



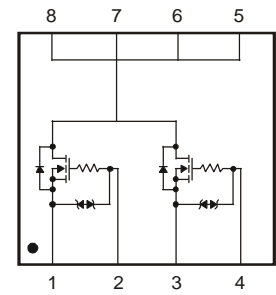
Top View



Bottom View



Bottom View  
Pin Configuration



Top View  
Equivalent Circuit

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5)	Steady State	TA = +25°C	I <sub>D</sub>	6.1	A
		TA = +70°C		5.2	
Pulsed Drain Current			I <sub>DM</sub>	27	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	0.92	W
Thermal Resistance, Junction to Ambient @TA = +25°C	R <sub>θJA</sub>	136	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = 25°C	I <sub>DSS</sub>	-	-	1.0	μA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
Gate-Source Breakdown Voltage	BV <sub>GSS</sub>	±12	-	-	V	V <sub>DS</sub> = 0V, I <sub>G</sub> = ±250μA
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.35	-	1.05	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	17	23	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.5A
		-	20	27		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5.5A
		-	25	34		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 3.5A
Forward Transfer Admittance	Y <sub>fs</sub>	-	10	-	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 5A
Diode Forward Voltage	V <sub>SD</sub>	-	0.7	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	-	143	-	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	74	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	29	-	pF	
Gate Resistance	R <sub>g</sub>	-	202	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	-	8.8	-	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 6.5A
Gate-Source Charge	Q <sub>gs</sub>	-	1.4	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	3.0	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	53	-	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V, R <sub>L</sub> = 10Ω, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	-	78	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	562	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	234	-	ns	

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout.  
 6. Short duration pulse test used to minimize self-heating effect.

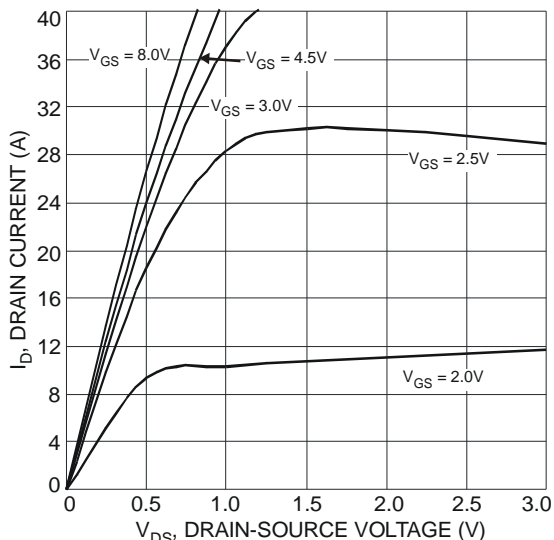


Fig. 1 Typical Output Characteristic

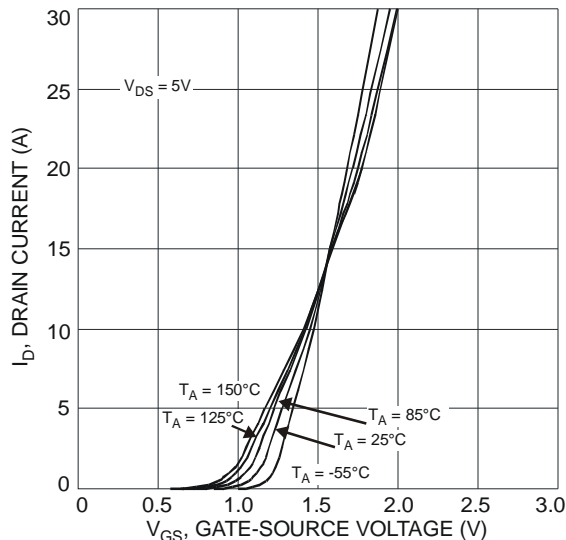


Fig. 2 Typical Transfer Characteristic

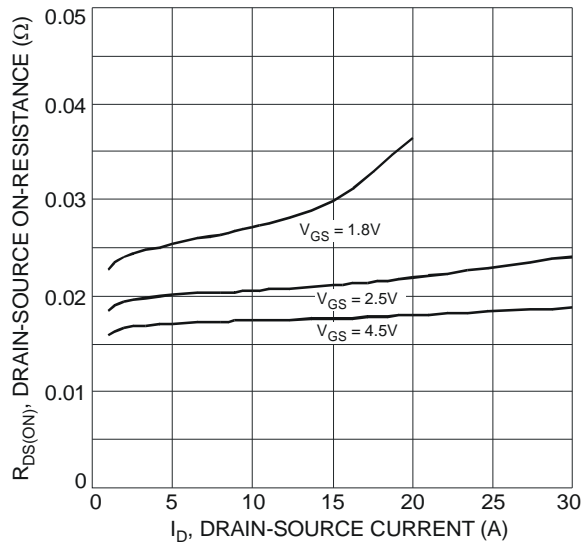


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

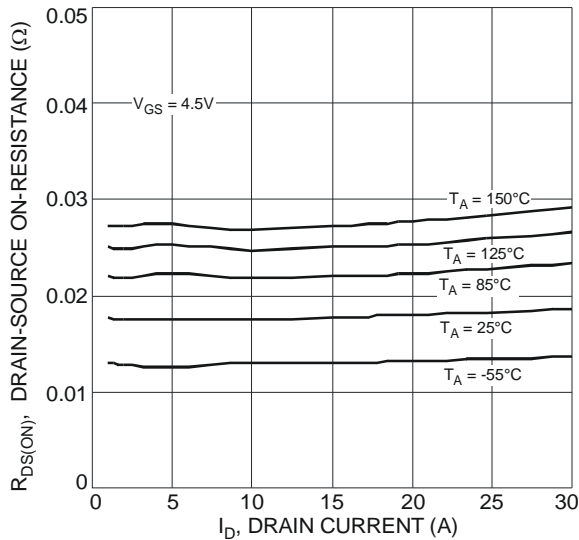


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

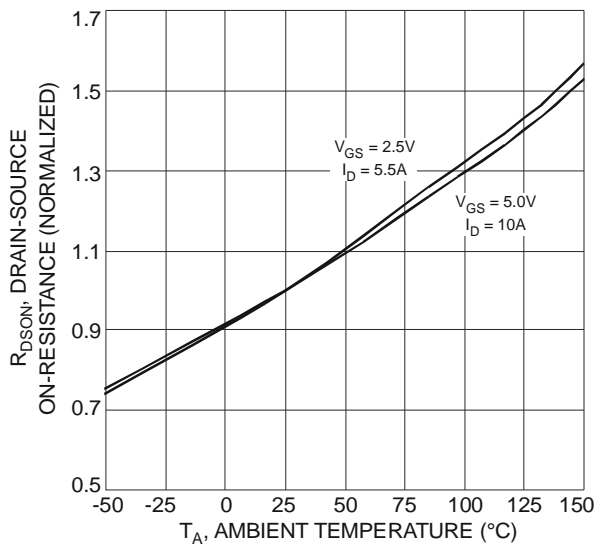


Fig. 5 On-Resistance Variation with Temperature

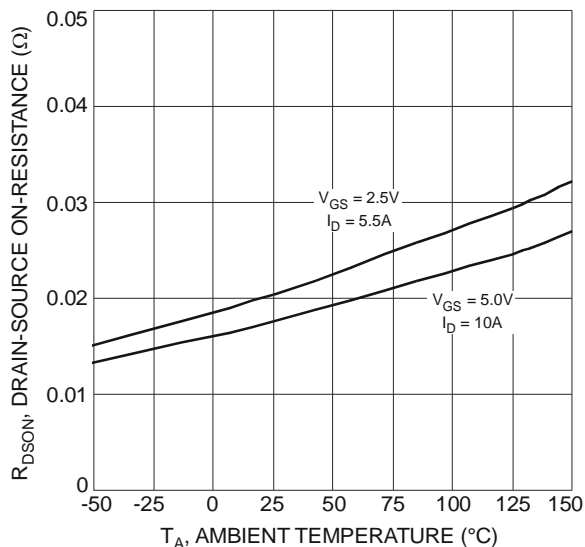


Fig. 6 On-Resistance Variation with Temperature

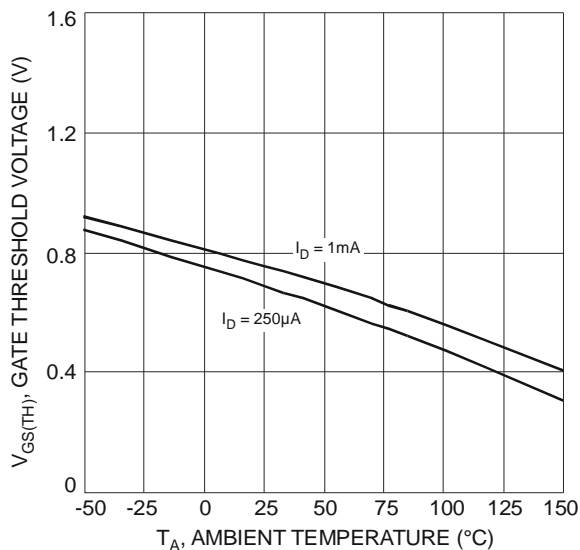


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

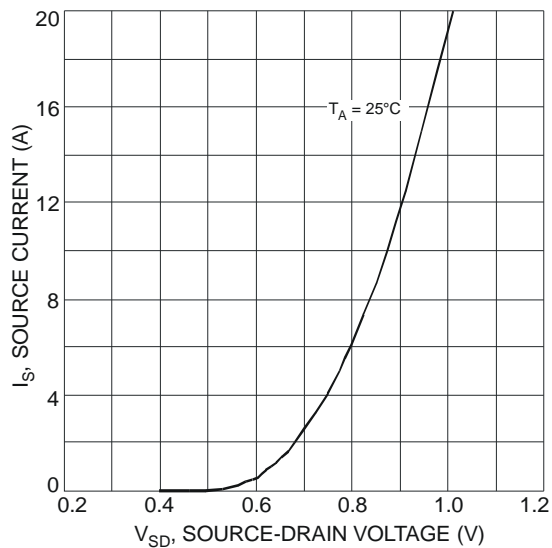


Fig. 8 Diode Forward Voltage vs. Current

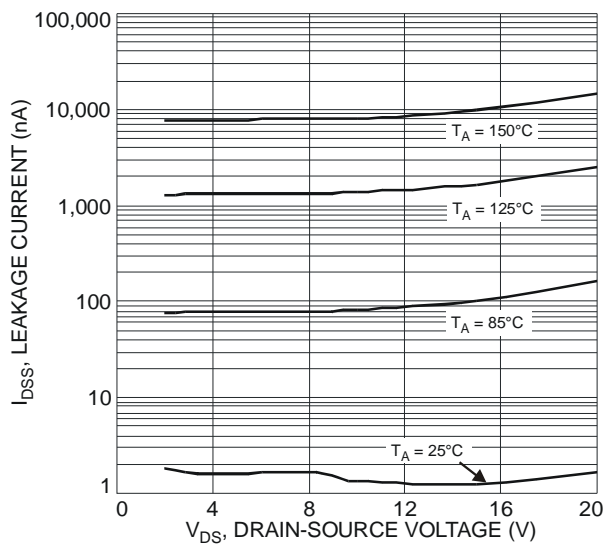


Fig. 9 Typical Leakage Current vs. Drain-Source Voltage

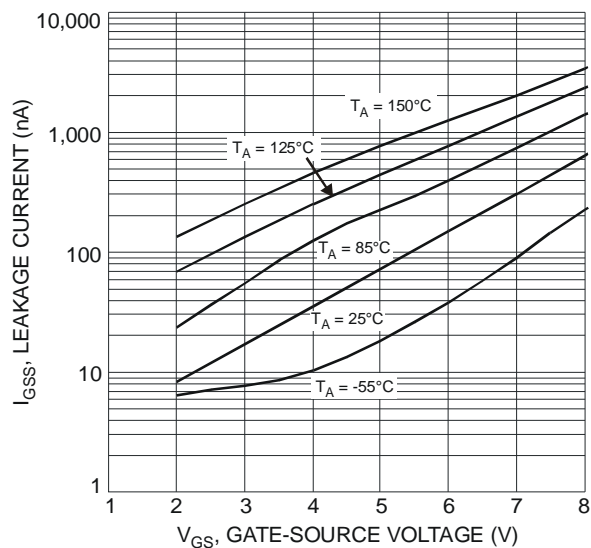


Fig. 10 Gate-Source Leakage Current vs. Voltage

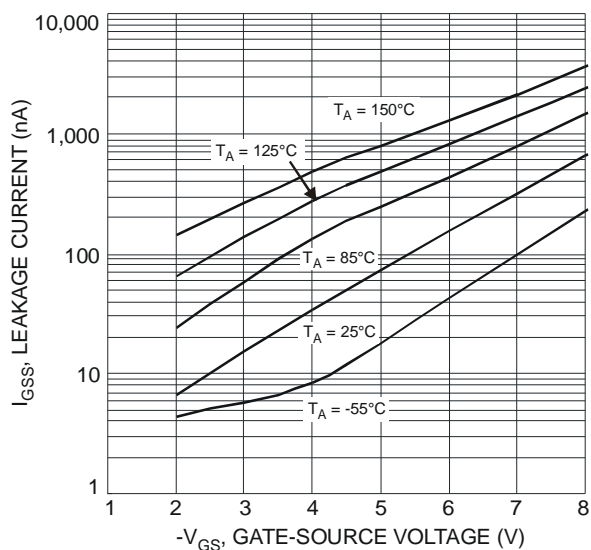


Fig. 11 Gate-Source Leakage Current vs. Voltage

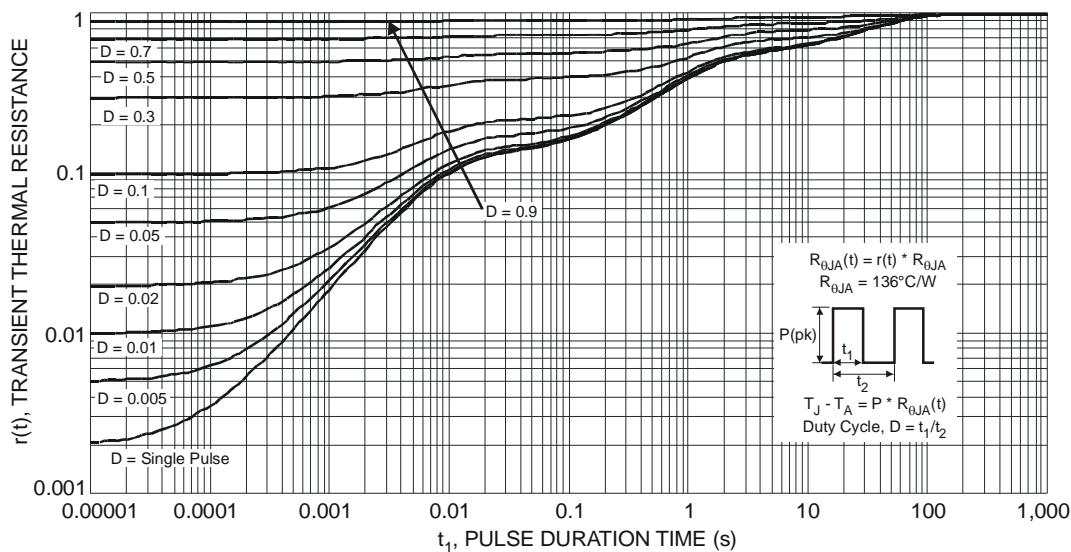
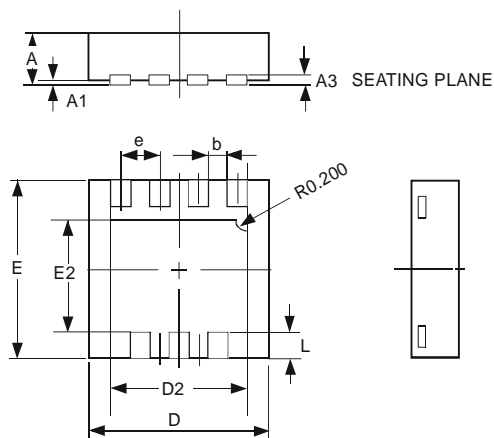


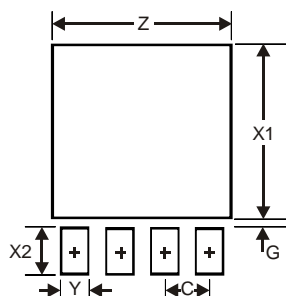
Fig. 12 Transient Thermal Response

### Package Outline Dimensions



U-DFN3030-8			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	—	—	0.15
b	0.29	0.39	0.34
D	2.90	3.10	3.00
D2	2.19	2.39	2.29
e	—	—	0.65
E	2.90	3.10	3.00
E2	1.64	1.84	1.74
L	0.30	0.60	0.45
All Dimensions in mm			

### Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.59
G	0.11
X1	2.49
X2	0.65
Y	0.39
C	0.65