



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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企业微信二维码



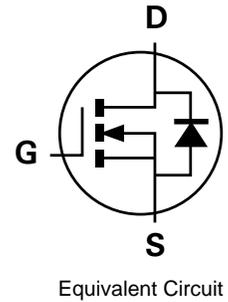
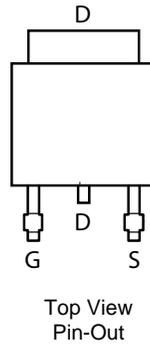
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## Features

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

## Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.33 grams (approximate)



**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 25$	V
Continuous Drain Current (Note 5)	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	10.0	A
		$T_A = +85^\circ\text{C}$		6.5	
Pulsed Drain Current (Note 6)			$I_{DM}$	48	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	1.71	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	72.9	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{DSS}$	-	-	1.0	$\mu\text{A}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	-	1.6	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	12	17	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 9\text{A}$
			16	24		$V_{GS} = 4.5\text{V}, I_D = 7\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	-	10	-	S	$V_{DS} = 10\text{V}, I_D = 9\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.7	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	-	798	-	pF	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	128	-	pF	
Reverse Transfer Capacitance	$C_{rss}$	-	122	-	pF	
Gate Resistance	$R_g$	-	1.37	-	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_g$	-	8.7	-	nC	$V_{GS} = 5\text{V}, V_{DS} = 15\text{V}, I_D = 9\text{A}$
Gate-Source Charge	$Q_{gs}$	-	1.7	-	nC	
Gate-Drain Charge	$Q_{gd}$	-	2.4	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	5.03	-	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 15\Omega, R_G = 6\Omega, I_D = 1\text{A}$
Turn-On Rise Time	$t_r$	-	4.50	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	26.33	-	ns	
Turn-Off Fall Time	$t_f$	-	8.55	-	ns	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Repetitive rating, pulse width limited by junction temperature.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

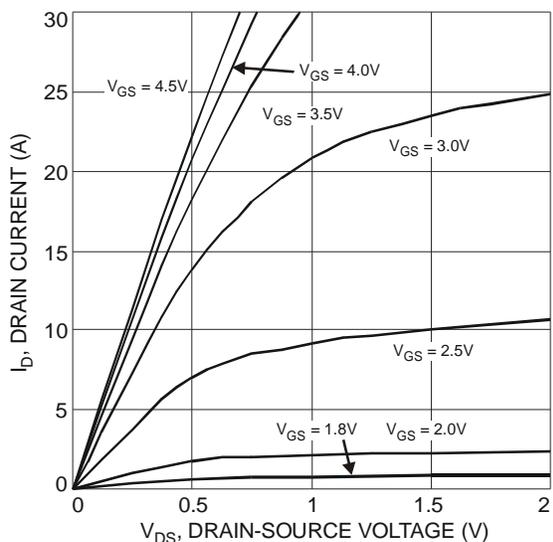


Fig. 1 Typical Output Characteristics

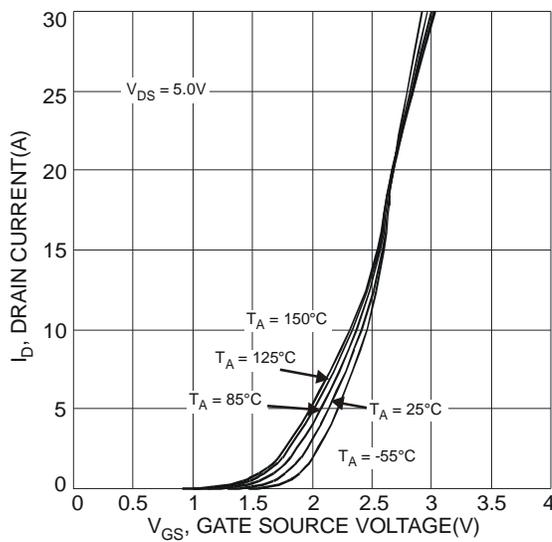


Fig. 2 Typical Transfer Characteristics

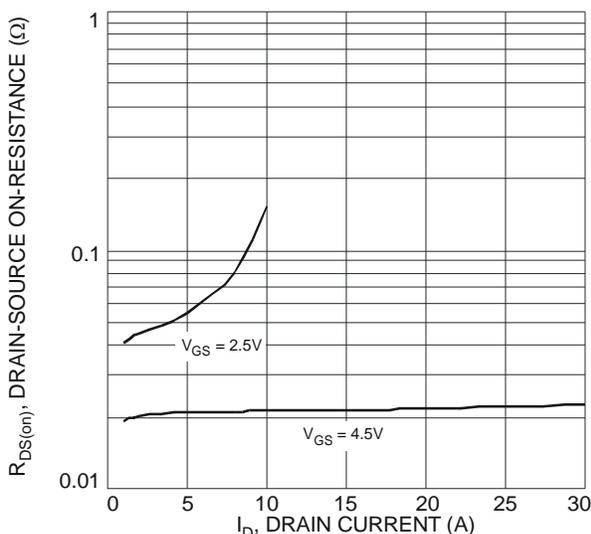


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

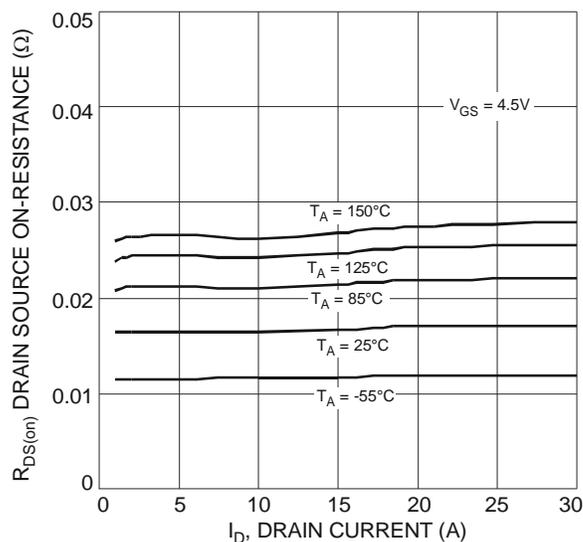


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

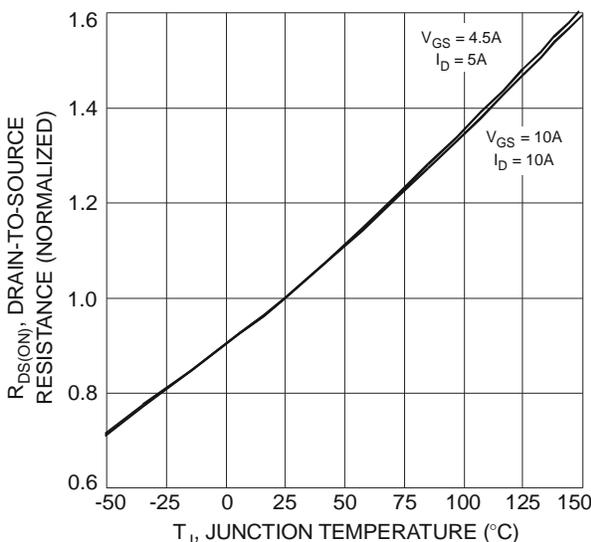


Fig. 5 On-Resistance Variation with Temperature

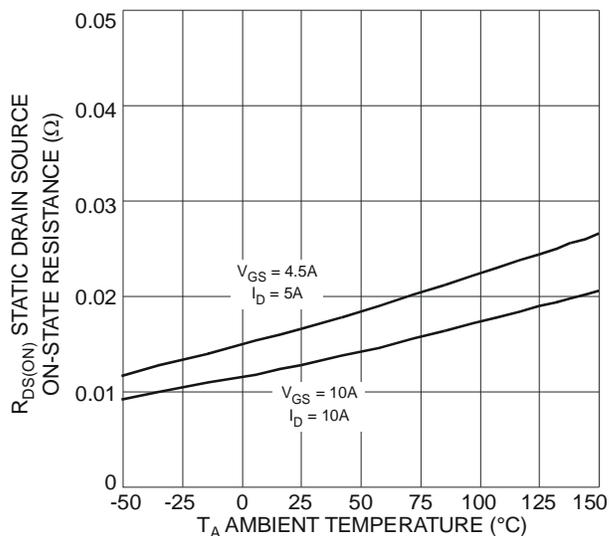


Fig. 6 Typical Static Drain-Source On-State Resistance vs. Ambient Temperature

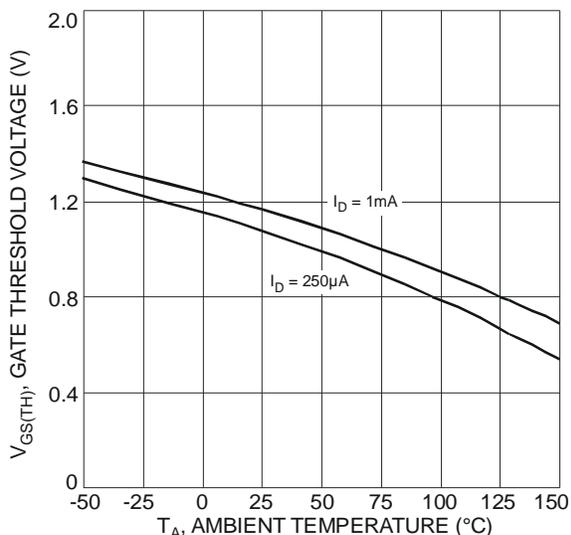


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

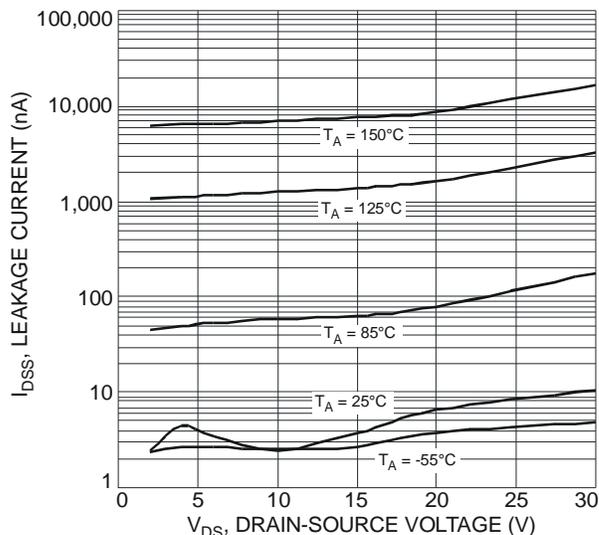


Fig. 8 Typical Drain-Source Leakage Current vs Voltage

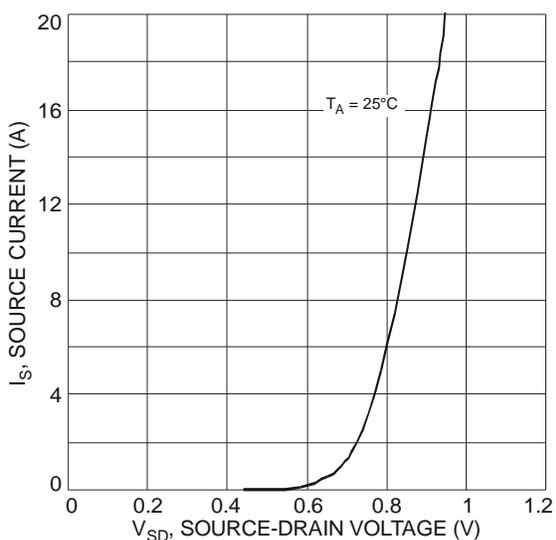


Fig. 9 Diode Forward Voltage vs. Current

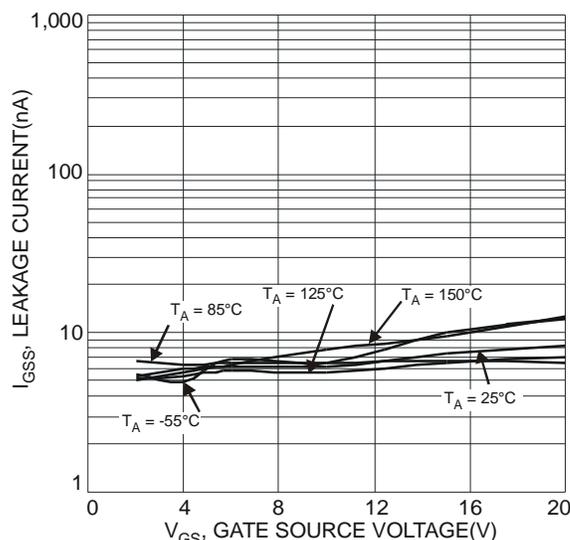


Fig. 10 Gate-Source Leakage Current vs. Voltage

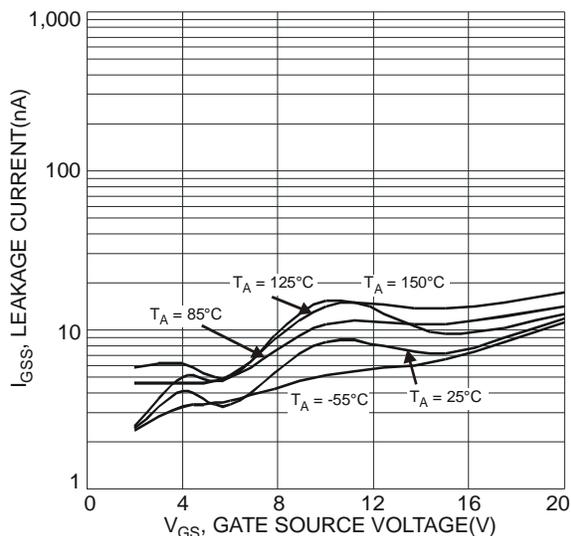


Fig. 11 Gate-Source Leakage Current vs. Voltage

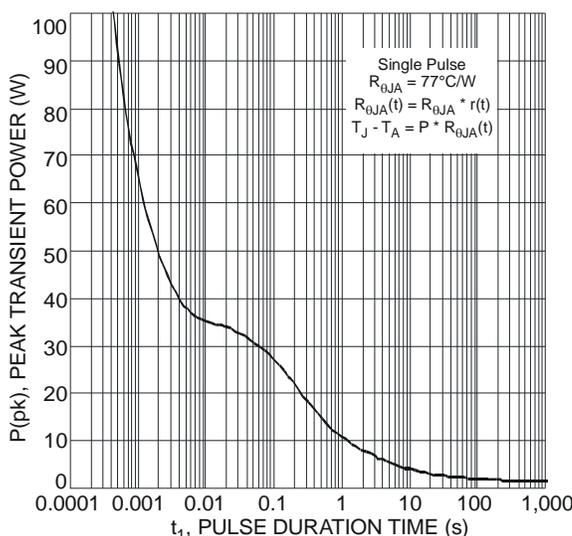
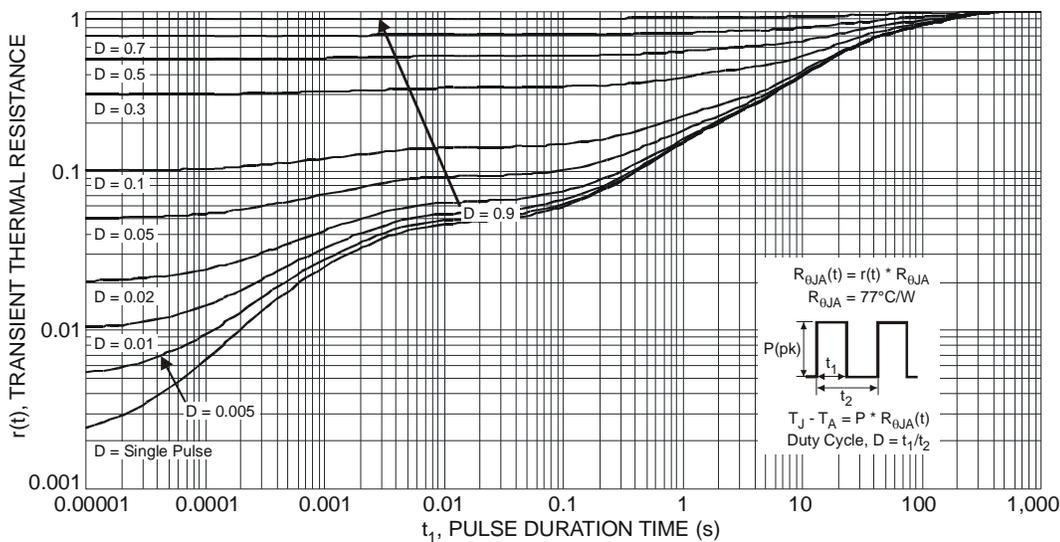
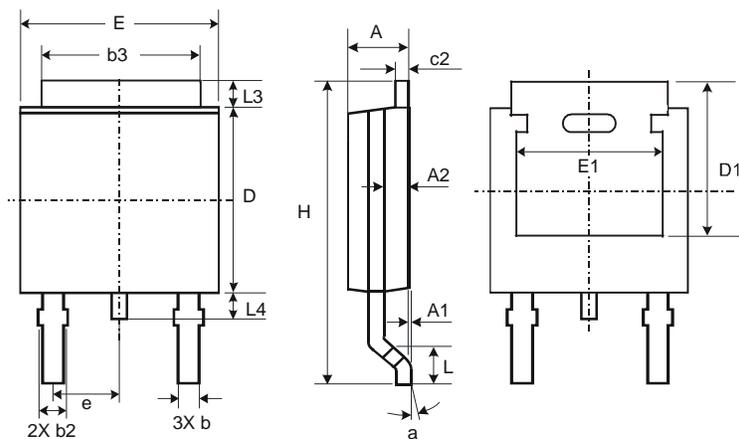


Fig. 12 Single Pulse Maximum Power Dissipation

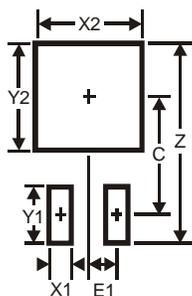


**Package Outline Dimensions**



TO252			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3