优尚

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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Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D T_A = +25°C
-50V	10Ω @ V_{GS} = -5V	-130mA

Features and Benefits

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

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and is ideal for use in:

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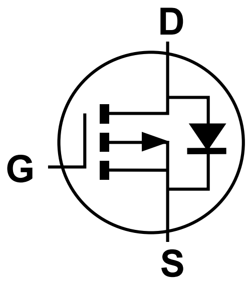
- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

Mechanical Data

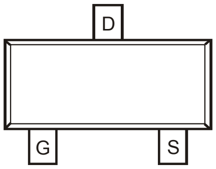
- Case: SOT23
- Case Material: UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (Lead Free Plating) Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

SOT23

Top View



Equivalent Circuit



Top View

Maximum Ratings (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-50	V
Drain-Gate Voltage $R_{GS} \leq 20k\Omega$	V_{DGR}	-50	V
Gate-Source Voltage Continuous	V_{GSS}	±20	V
Drain Current (Note 5) Continuous	I_D	-130	mA
Pulsed Drain Current	I_{DM}	-1.2	A

Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	-50	—	—	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current	I_{DSS}	— — —	— — —	-1 -2 -100	μA μA nA	V_{DS} = -50V, V_{GS} = 0V, T_J = +25°C V_{DS} = -50V, V_{GS} = 0V, T_J = +125°C V_{DS} = -25V, V_{GS} = 0V, T_J = +25°C
Gate-Body Leakage	I_{GSS}	—	—	±10	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.8	—	-2.0	V	V_{DS} = V_{GS}, I_D = -1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.2	10	Ω	V_{GS} = -5V, I_D = -0.100A
Forward Transconductance	g_{FS}	0.05	—	—	S	V_{DS} = -25V, I_D = -0.1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	24.6	45	pF	V_{DS} = -25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	4.7	25	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.8	12	pF	
Gate Resistance	R_g	—	916	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	0.28	—	nC	V_{DS} = -10V, I_D = -0.1A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	0.59	—	nC	
Gate-Source Charge	Q_{gs}	—	0.09	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.08	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	10	—	ns	V_{DD} = -30V, I_D = -0.27A, R_{GEN} = 50Ω, V_{GS} = -10V
Turn-Off Delay Time	$t_{D(OFF)}$	—	18	—	ns	

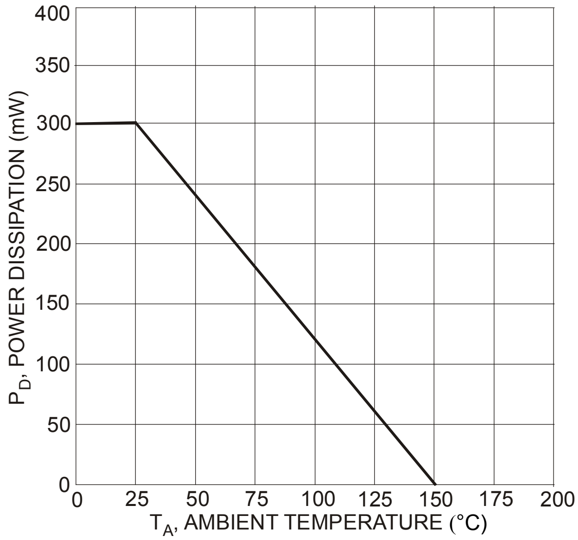


Fig. 1 Max Power Dissipation vs. Ambient Temperature

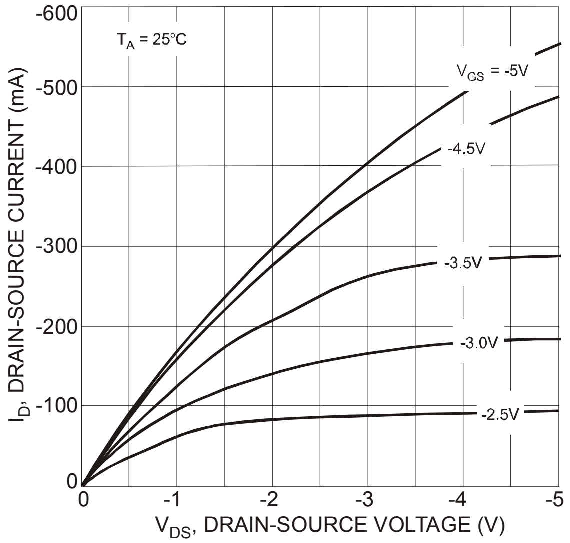


Fig. 2 Drain-Source Current vs. Drain-Source Voltage

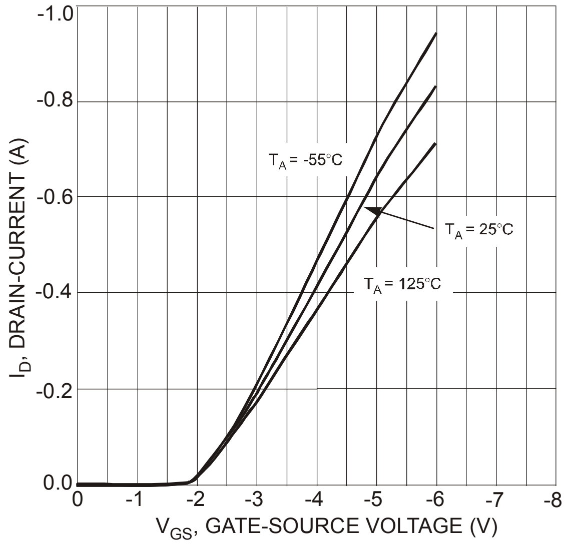


Fig. 3 Drain-Current vs. Gate-Source Voltage

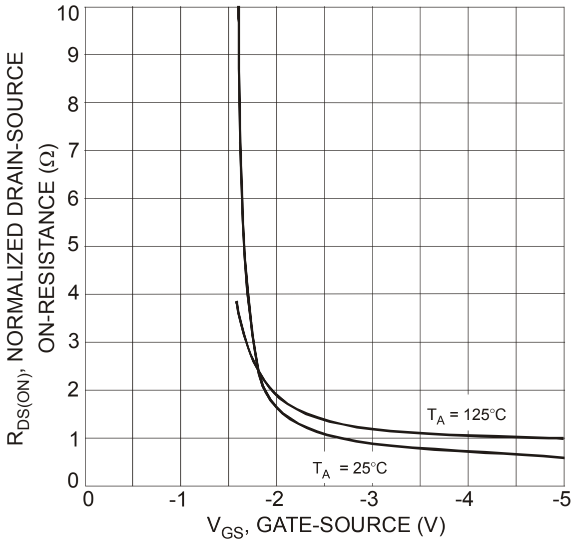


Fig. 4 On-Resistance vs. Gate-Source Voltage

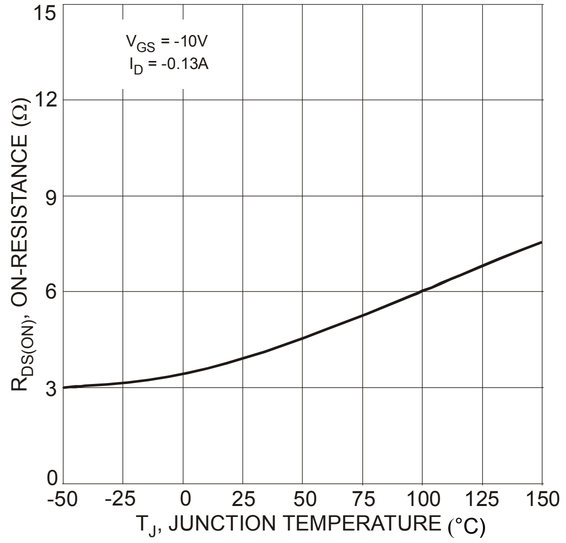


Fig. 5 On-Resistance vs. Junction Temperature

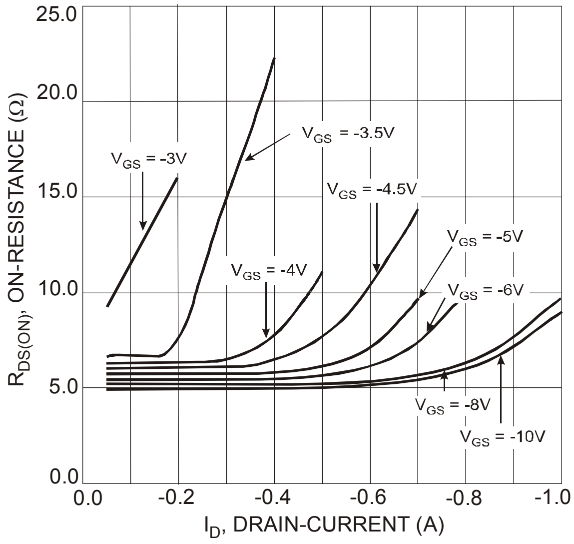


Fig. 6 On-Resistance vs. Drain-Current

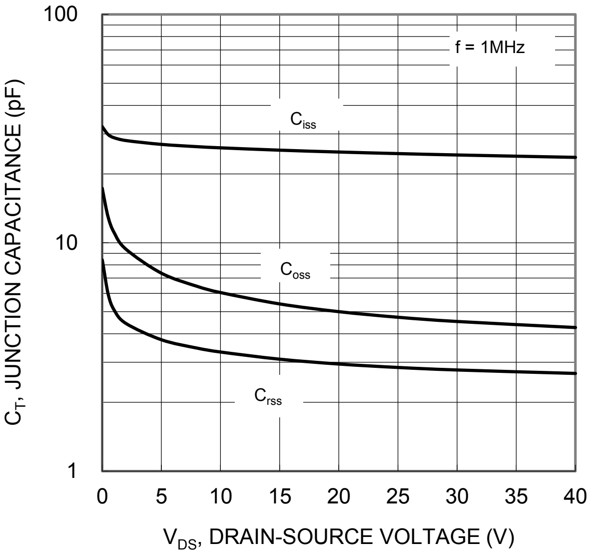


Fig. 7 Typical Junction Capacitance

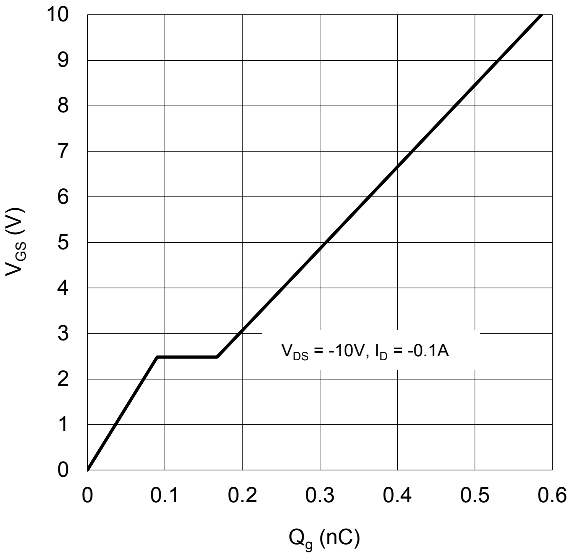


Fig. 8 Gate Charge

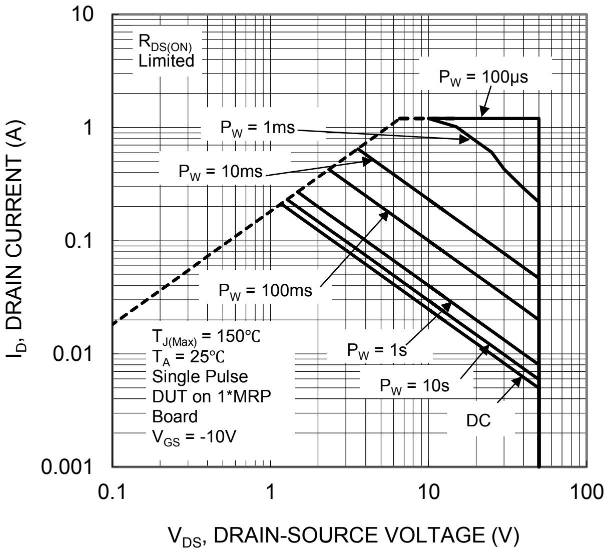
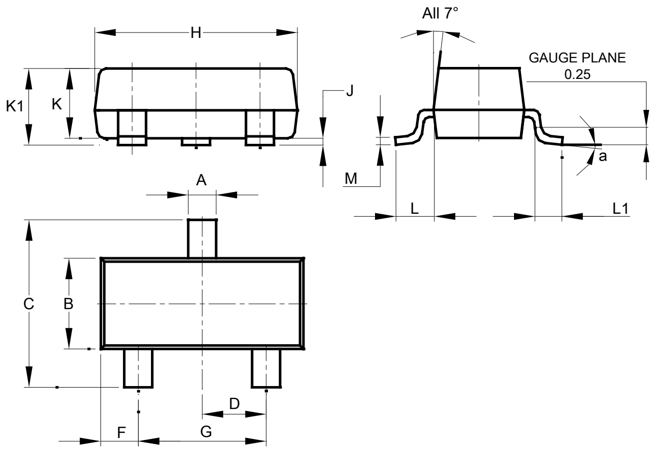


Fig. 9 SOA, Safe Operation Area

Package Outline Dimensions

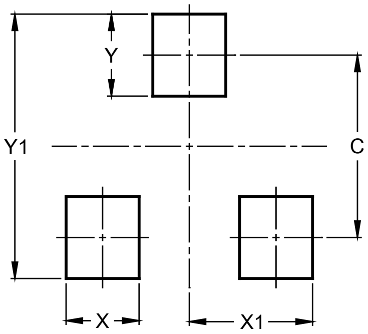
SOT23



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9