



◆ **DESCRIPTION**

The MT2301 is the P-Channel logic enhancement mode power field effect transistor are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

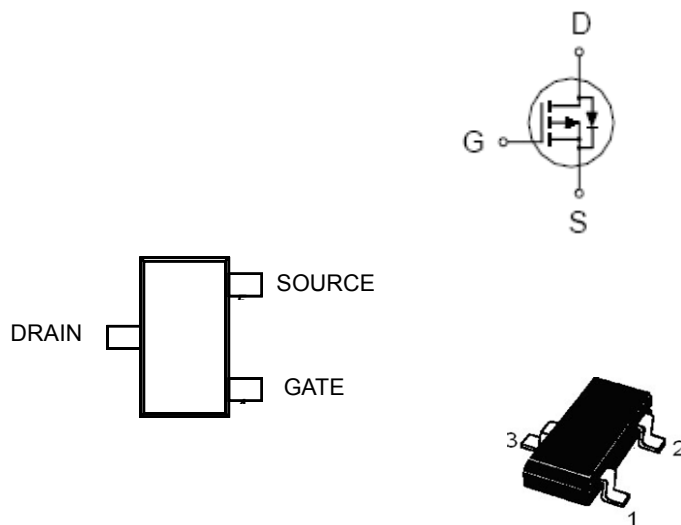
◆ **FEATURES**

- -20V/-2.8A,  $R_{DS(ON)} = 120m\Omega @ V_{GS} = -4.5V$
- -20V/-2.5A,  $R_{DS(ON)} = 170m\Omega @ V_{GS} = -2.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

◆ **APPLICATIONS**

- POWER Management in Note
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC

◆ **PIN CONFIGURATION**




**◆ ABSOLUTE MAXIMUM RATINGS**

 ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_A = 25^{\circ}\text{C}$	-2.5
		$T_A = 70^{\circ}\text{C}$	-1.5
Pulsed Drain Current	$I_{DM}$	-10	A
Continuous Source Current (Diode Conduction)	$I_S$	-1.6	A
Power Dissipation	$P_D$	$T_A = 25^{\circ}\text{C}$	1.25
		$T_A = 70^{\circ}\text{C}$	0.8
Operating junction temperature range	$T_J$	150	$^{\circ}\text{C}$
Storage temperature range	$T_{STG}$	- 55 to 150	$^{\circ}\text{C}$

**◆ THERMAL RESISTANCE RATINGS**

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$



### ◆ ELECTRICAL CHARACTERISTICS

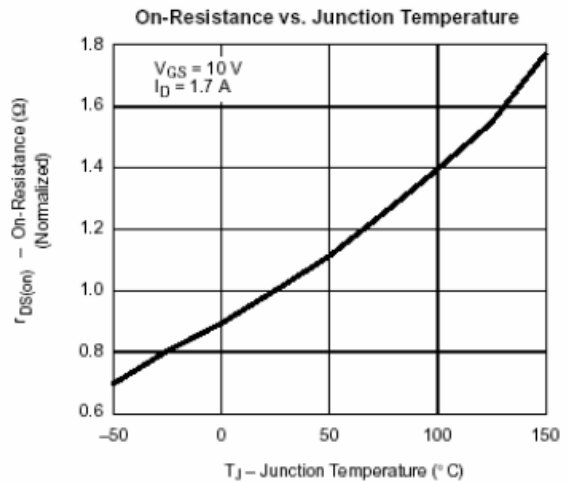
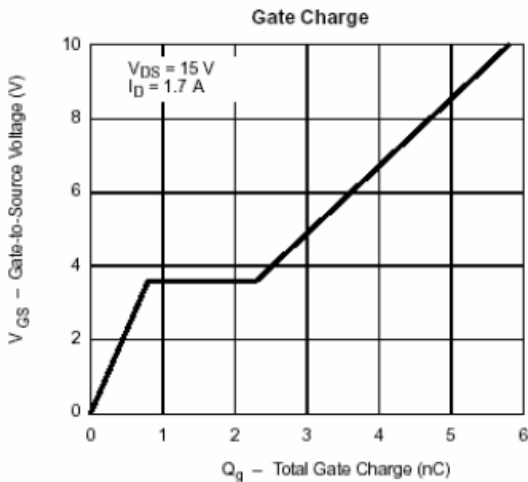
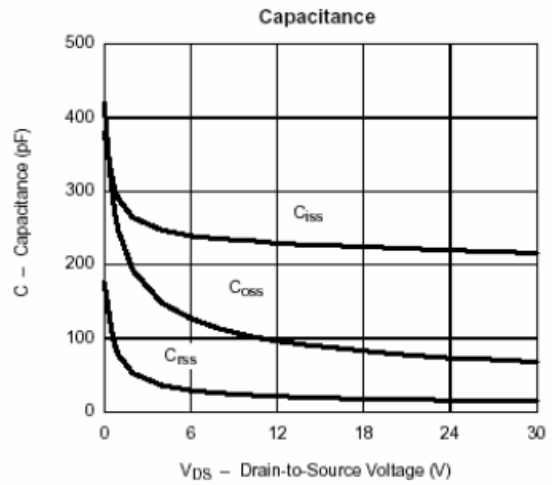
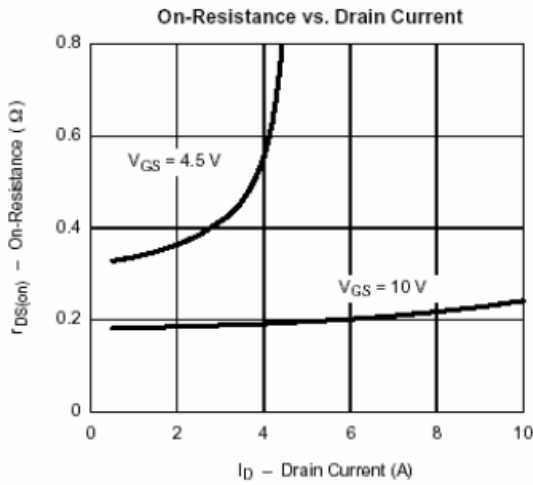
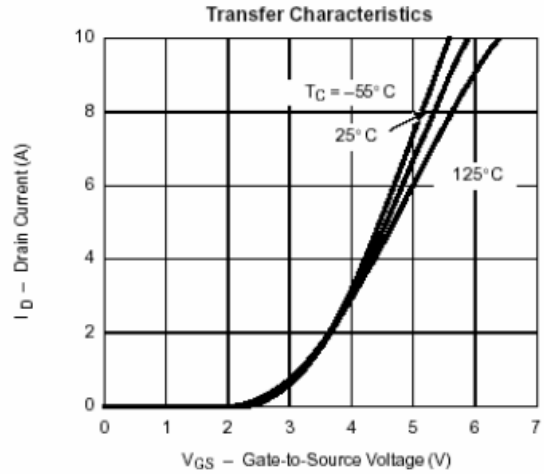
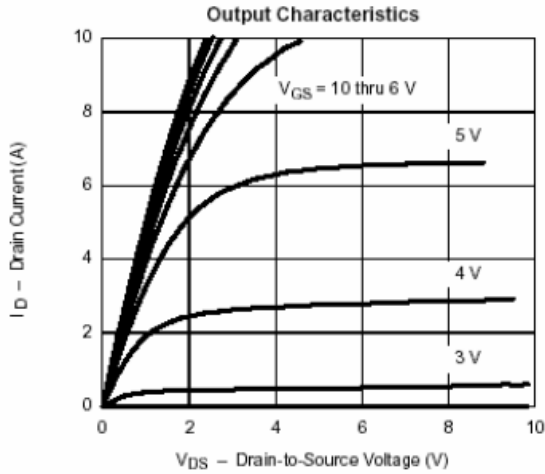
(T<sub>A</sub>=25°C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250μA	-0.45	-	-1.5	V
Gate Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ± 8 V	-	-	±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0 V	-	-	-1	μA
		V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C	-	-	-10	
Forward Trans conductance	g <sub>fs</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -2.8A	-	6.5	-	s
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> ≤ -5V, V <sub>GS</sub> = -4.5V	-6	-	-	A
		V <sub>DS</sub> ≤ -5V, V <sub>GS</sub> = -2.5V	-3	-	-	
Drain-Source On Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.8A	-	90	120	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.0A	-	145	170	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.6A, V <sub>GS</sub> = 0V	-	-0.8	-1.2	V
<b>Dynamic Parameters</b>						
Input Cap.	C <sub>iss</sub>	V <sub>DS</sub> = -6V, V <sub>GS</sub> = 0V, F = 1MHz	-	415	-	pF
Output Cap.	C <sub>oss</sub>		-	223	-	
Reverse Transfer Cap.	C <sub>rss</sub>		-	23	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.8A	-	5.8	10	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.85	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.7	-	
Turn-On Time	T <sub>D(ON)</sub>	V <sub>DS</sub> = -6V, R <sub>L</sub> = 6Ω, I <sub>D</sub> = -1A, V <sub>GEN</sub> = -4.5V, R <sub>G</sub> = 6Ω	-	13	25	nS
	t <sub>r</sub>		-	36	60	
Turn-Off Time	T <sub>D(OFF)</sub>		-	42	70	
	t <sub>f</sub>		-	34	60	



### ◆ TYPICAL CHARACTERISTICS

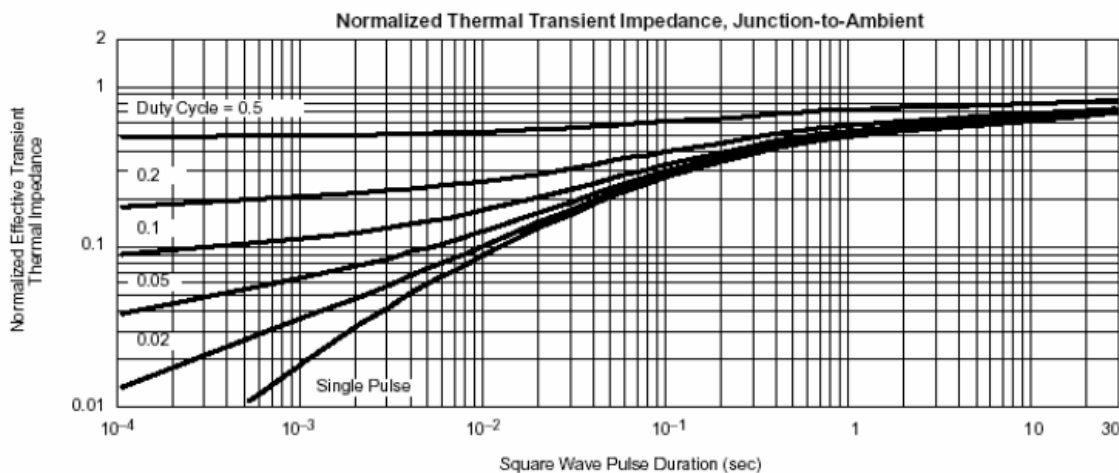
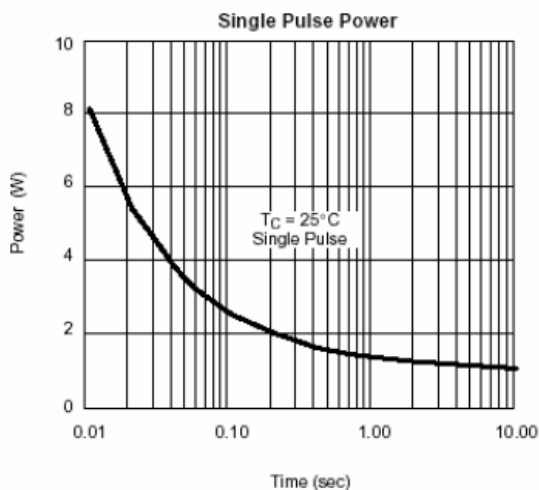
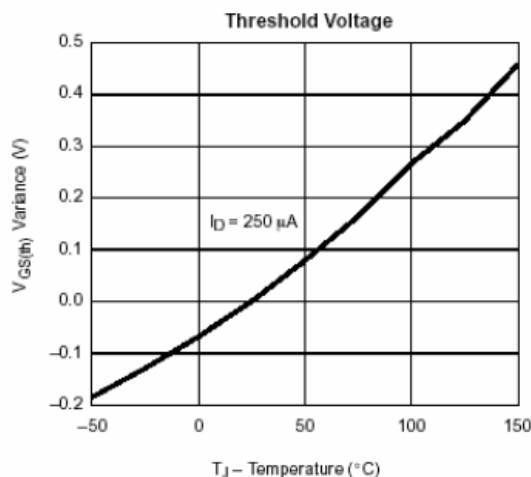
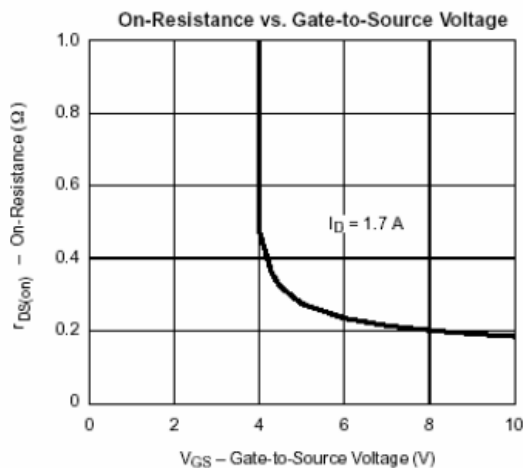
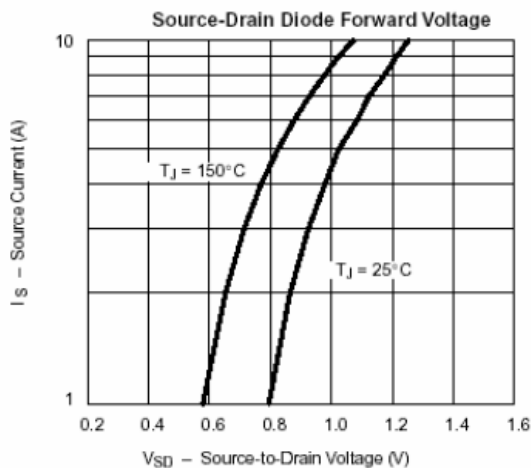
(25°C Unless Noted)





◆ **TYPICAL CHARACTERISTICS**

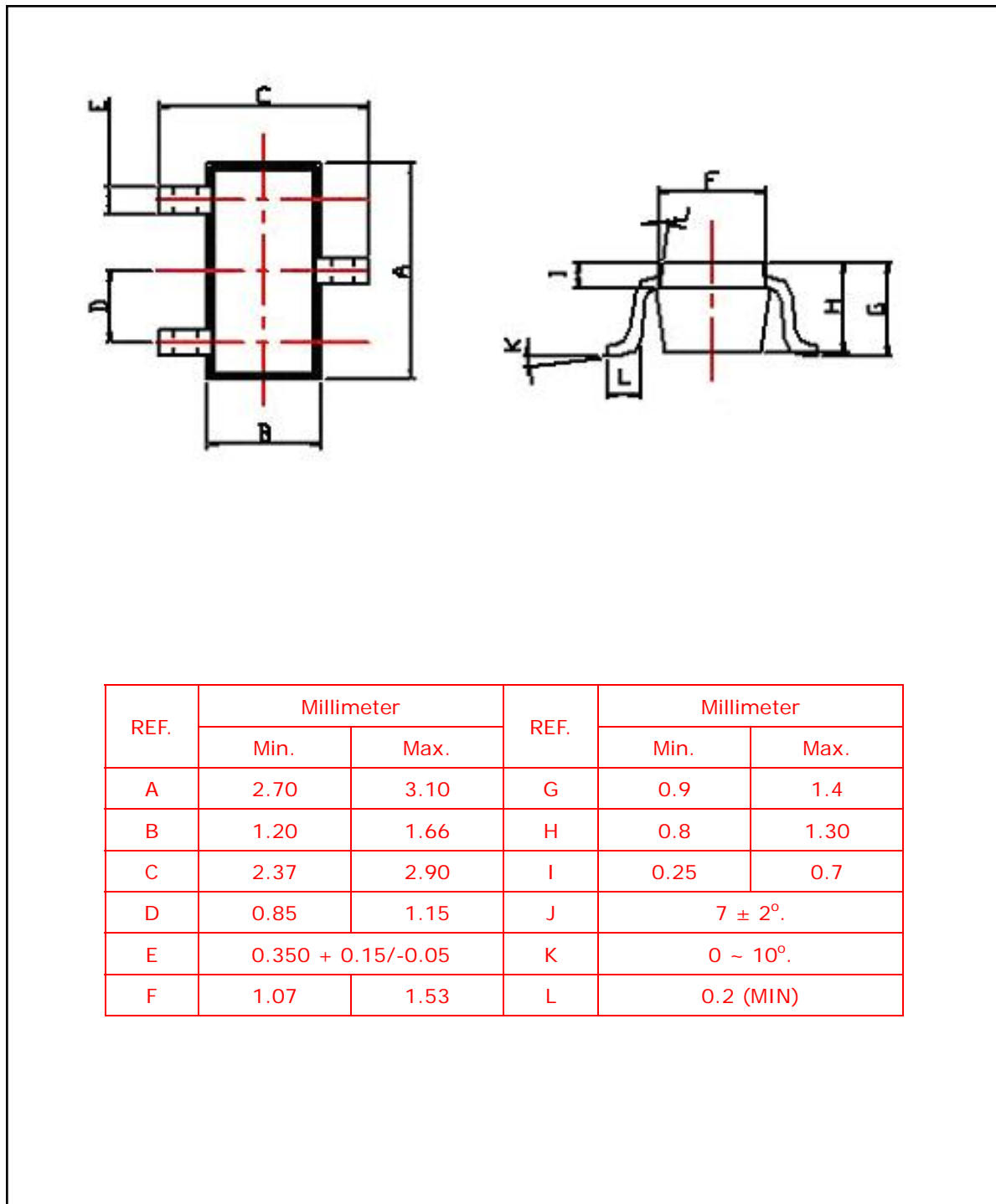
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◆ **PHYSICAL DIMENSIONS**

3-Pin surface Mount SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.9	1.4
B	1.20	1.66	H	0.8	1.30
C	2.37	2.90	I	0.25	0.7
D	0.85	1.15	J	7 ± 2°	
E	0.350 + 0.15/-0.05		K	0 ~ 10°	
F	1.07	1.53	L	0.2 (MIN)	