

20V P-Channel Power MOSFET

UM2301S SOT23-3
UM2301P SOT323

General Description

The UM2301 is a low threshold P-channel MOSFET, have extremely low on-resistance. This benefit provides the designer with an extremely efficient device for use in battery and load management applications. The device uses a space-saving, small-outline SOT23-3 or SOT323 package.

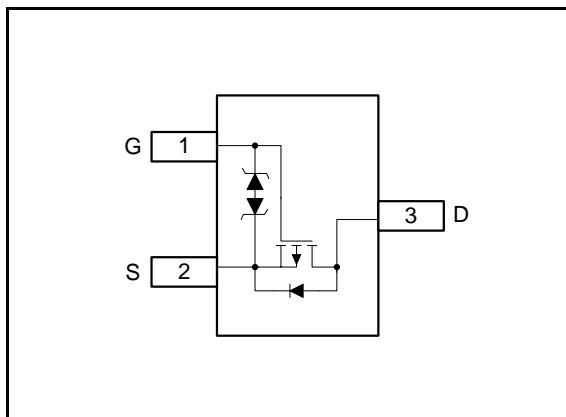
Applications

- Battery Packs
- Battery-Powered Portable Equipments
- Cellular and Cordless Telephones

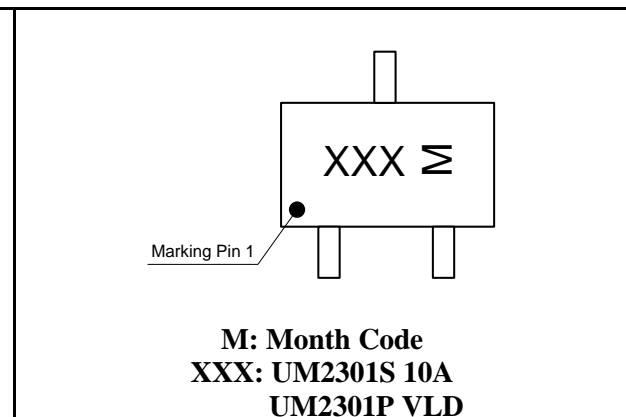
Features

- Drain-Source Voltage (Max): -20V
- Low On-Resistance:
200mΩ@V_{GS}=-4.5V
250mΩ@V_{GS}=-2.5V
- Continuous Drain Current (Max) :
-1.5A@25°C (SOT23-3)
-1.1A@25°C (SOT323)

Pin Configurations



Top View



Ordering Information

Part Number	Packaging Type	Marking Code	Shipping Qty
UM2301S	SOT23-3	10A	3000pcs/7 Inch Tape & Reel
UM2301P	SOT323	VLD	

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Continuous Drain Current (5s)	SOT23-3	-1.5
		SOT323	-1.1
I_{DP}	Drain Current Pulsed (Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 1\%$)	-5	A
P_D	Power Dissipation	SOT23-3	0.86
		SOT323	0.5
T_J	Junction Temperature	-55~150	$^{\circ}C$
T_{STG}	Storage Temperature	-55~150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ($\leq 5s$)	SOT23-3	145
		SOT323	250
ESD	ESD Method 3015.8	2000	V

Electrical Characteristics ($T_J=25^{\circ}C$, unless otherwise noted)

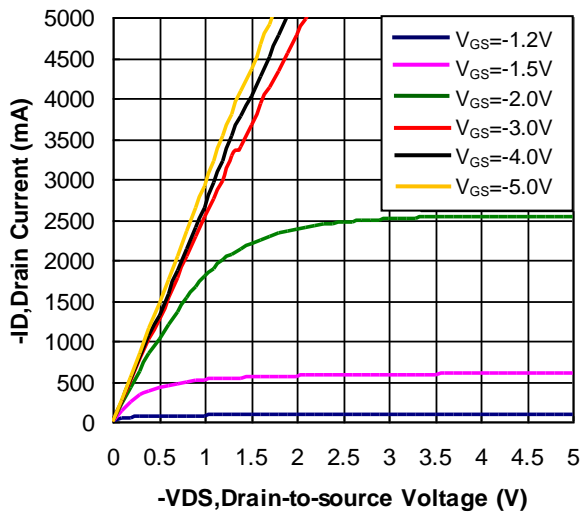
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-to-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$			-0.1	μA
I_{GSS}	Gate-to-Source Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
On Characteristics						
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance (Note 1)	$V_{GS}=-4.5V, I_D=-1.0A$		200	350	m Ω
		$V_{GS}=-2.5V, I_D=-1.0A$		250	400	
$V_{GS(TH)}$	Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.6	-1	V
g_{fs}	Forward Transconductance (Note 1)	$V_{DS}=-5V, I_D=-2.0A$		4.5		S
Dynamic Characteristics (Note 2)						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V, f=1.0MHz$		405		pF
C_{oss}	Output Capacitance			150		
C_{rss}	Reverse Transfer Capacitance			55		
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=10\Omega, I_D=-1A, V_{GEN}=-4.5V, R_G=1\Omega$		11	20	ns
t_r	Rise Time			35	60	
$t_{d(off)}$	Turn-off Delay Time			80	150	
t_f	Fall Time			50	90	
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Forward Diode Voltage	$I_S=-0.7A$		-0.8	-1.2	V

Note 1: Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

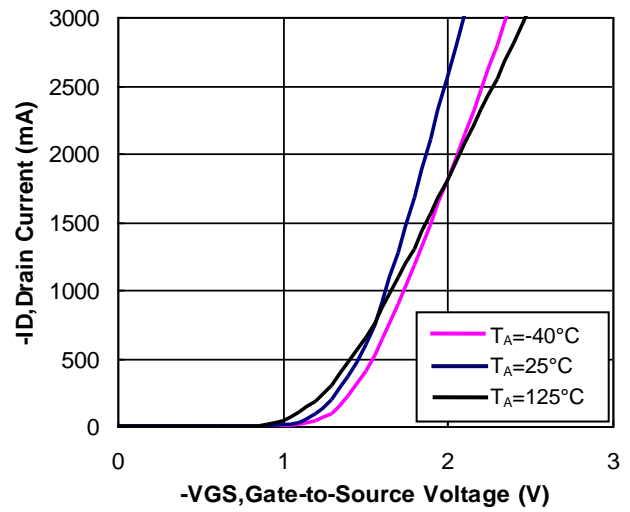
Note 2: Guaranteed by design, not subject to production testing.

Typical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

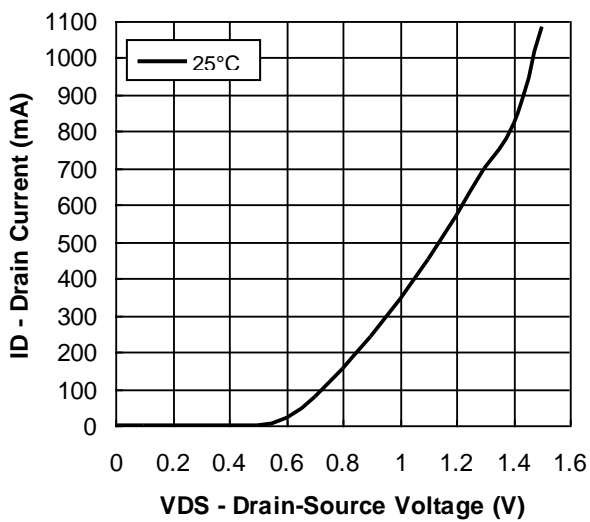
Output Characteristics



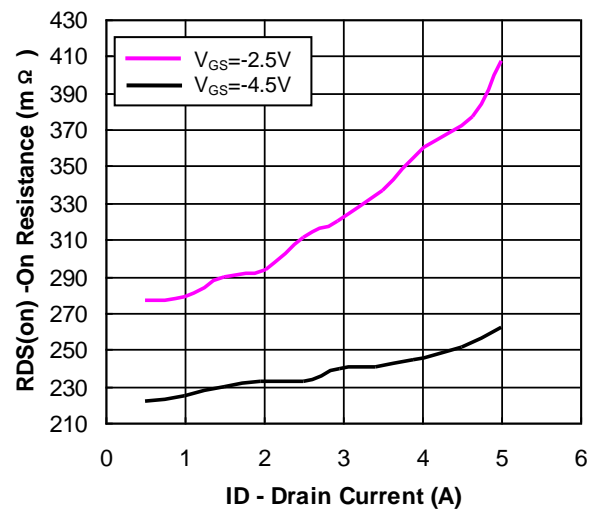
Transfer Characteristics



Source-Drain Diode Forward Voltage

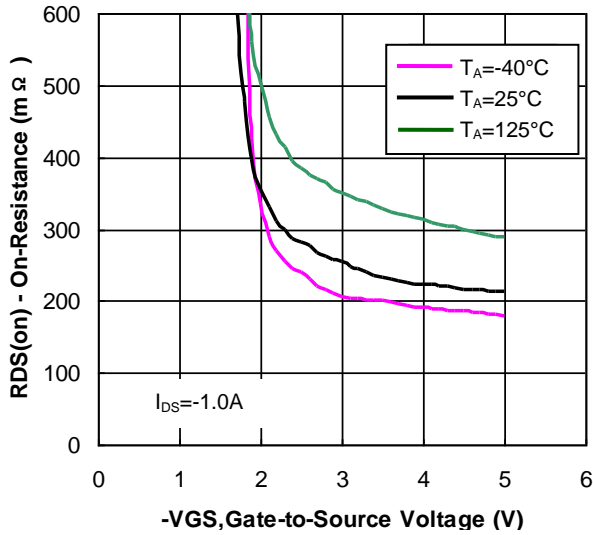


On Resistance vs. Drain Current

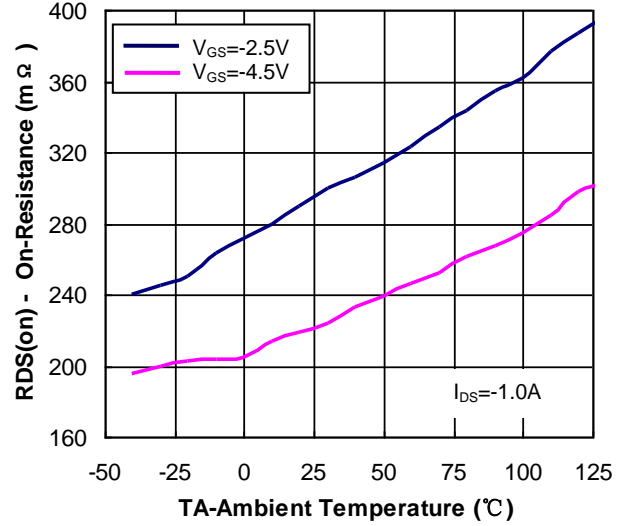


Typical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

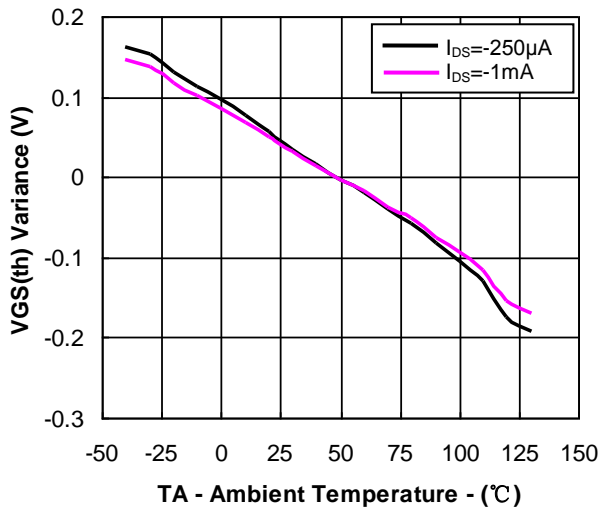
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Ambient Temperature



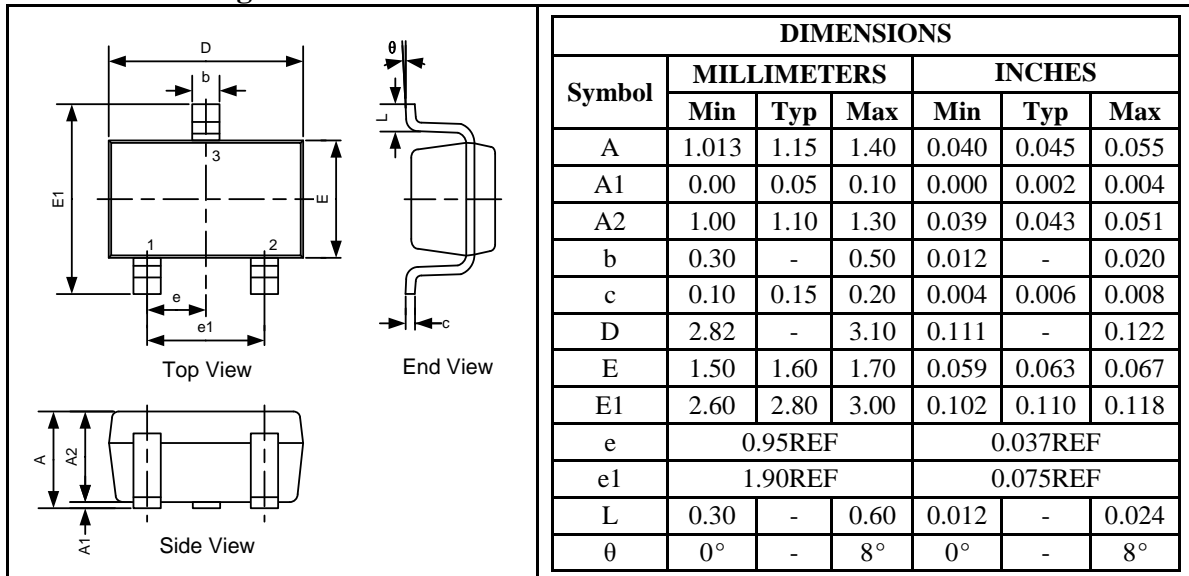
Threshold Voltage vs. Ambient Temperature



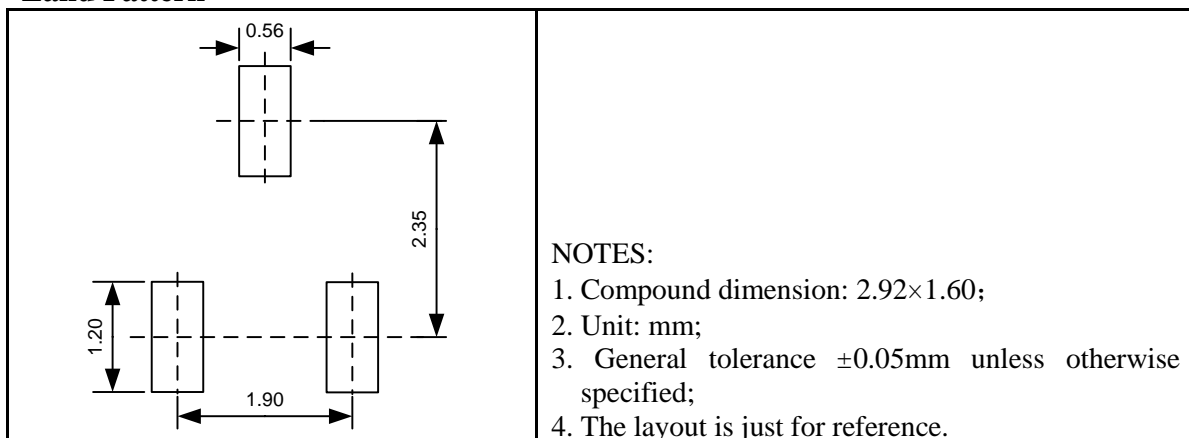
Package Information

UM2301S SOT23-3

Outline Drawing



Land Pattern

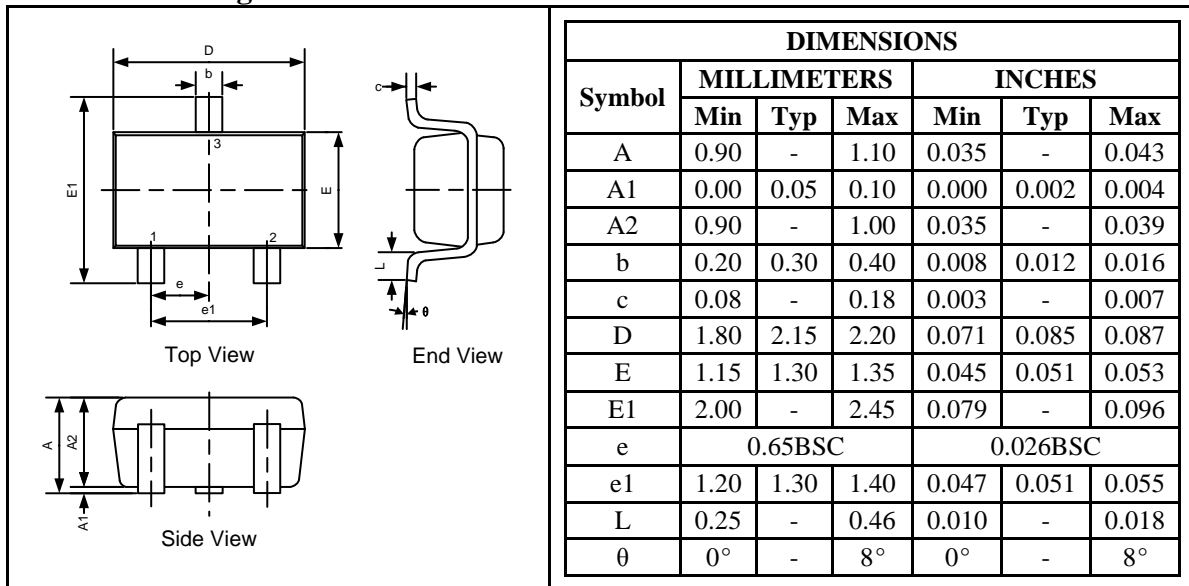


Tape and Reel Orientation

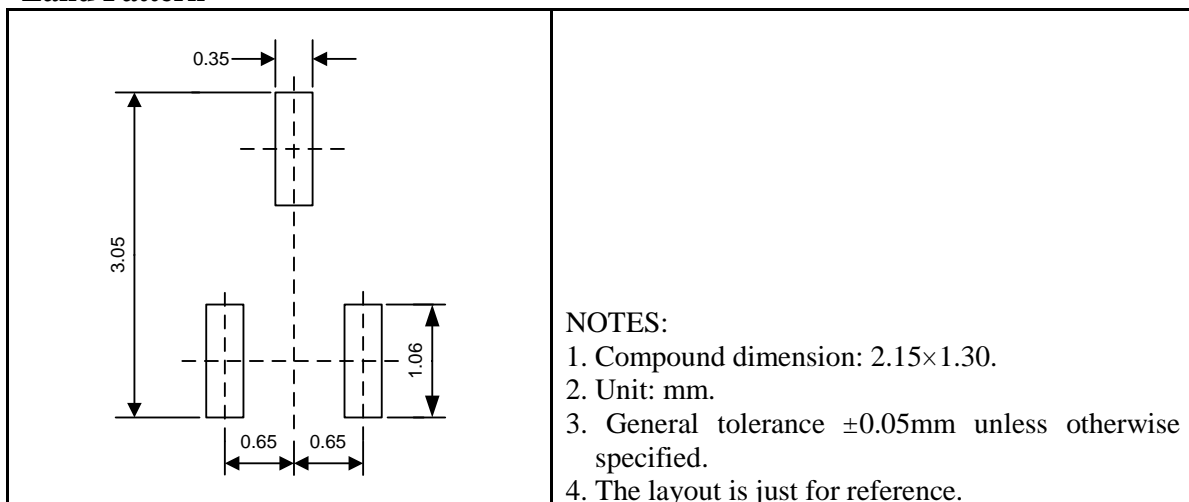


UM2301P SOT323

Outline Drawing



Land Pattern



Tape and Reel Orientation



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