

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

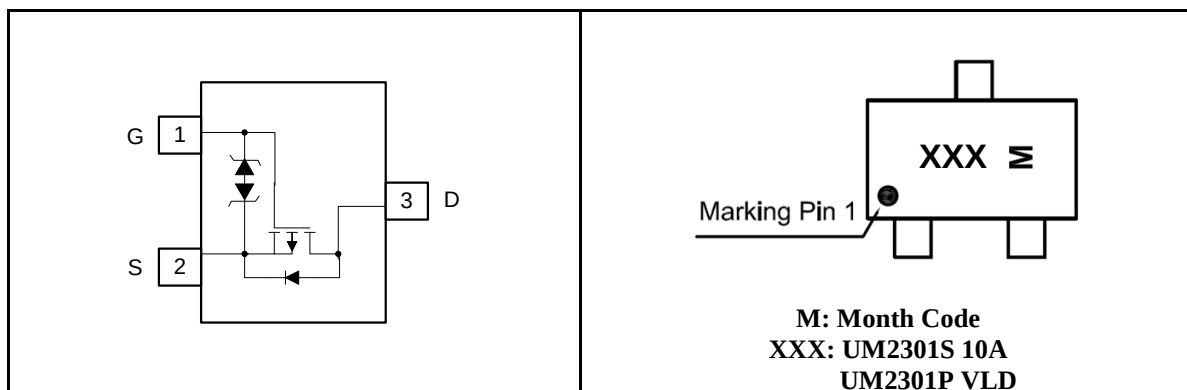
- Battery Packs
- Battery-Powered Portable Equipment
- Cellular and Cordless Telephones

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	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Continuous Drain Current (5s)	SOT23-3	A
		SOT323	
I_{DP}	Drain Current Pulsed (Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 1\%$)	-5	A
P_D	Power Dissipation	SOT23-3	W
		SOT323	
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	$^{\circ}C/W$
		SOT323	
ESD	ESD Method 3015.8	2000	V

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

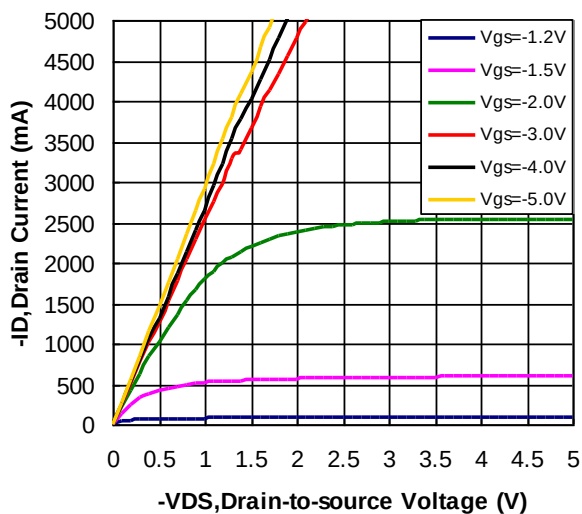
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-0.1	μA
I _{GSS}	Gate-to-Source Leakage Current	V _{GS} = ±8V, V _{DS} =0V			±10	μA
On Characteristics						
R _{DS(ON)}	Static Drain-to-Source On-Resistance(Note 1)	V _{GS} =-4.5V, I _D =-1.0A		200	350	mΩ
		V _{GS} =-2.5V, I _D =-1.0A		250	400	
V _{GS(TH)}	Gate-Source Threshold Voltage	V _{DS} = V _{GS} , I _D =-250μA	-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)						
td(on)	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _D =-1A, V _{GEN} =-4.5V, R _G =1Ω		11	20	ns
tr	Rise Time			35	60	
td(off)	Turn-off Delay Time			80	150	
tf	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 $\leq 2\%$.

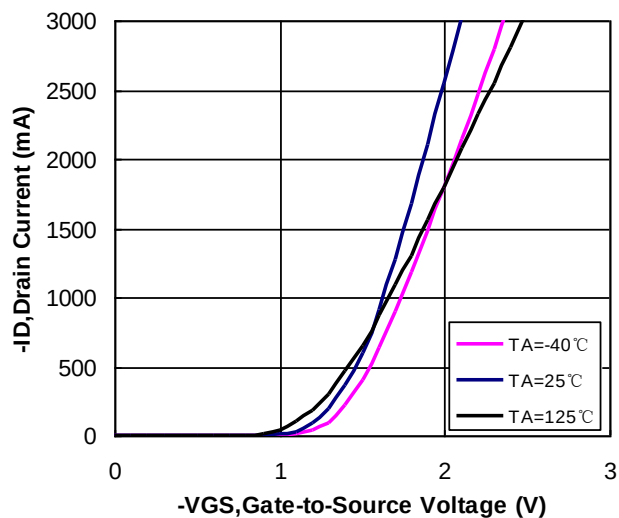
Note 2: Guaranteed by design, not subject to production testing.

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

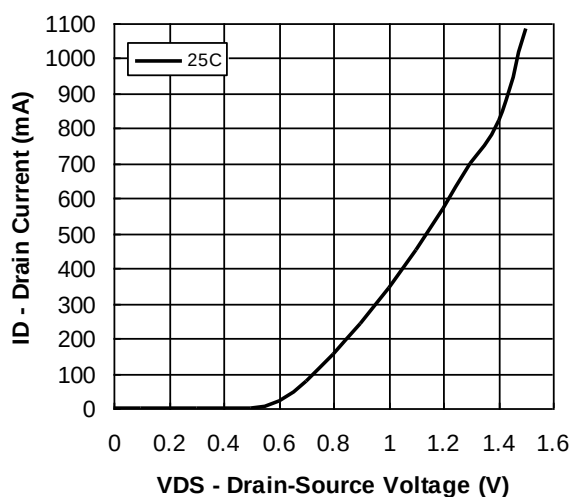
Output Characteristics



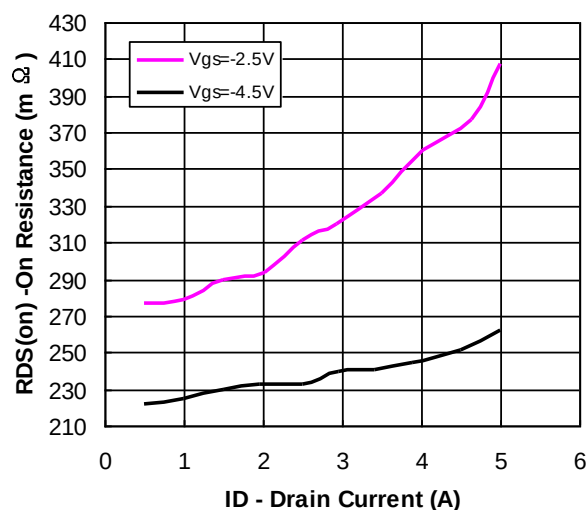
Transfer Characteristics



Source-Drain Diode Forward Voltage

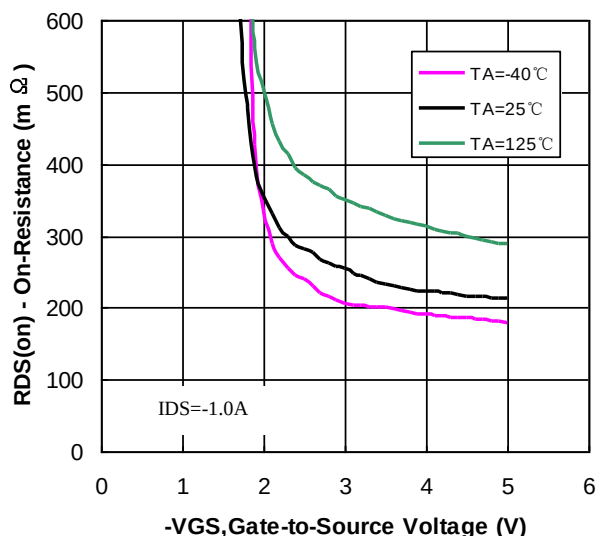


On Resistance vs. Drain Current

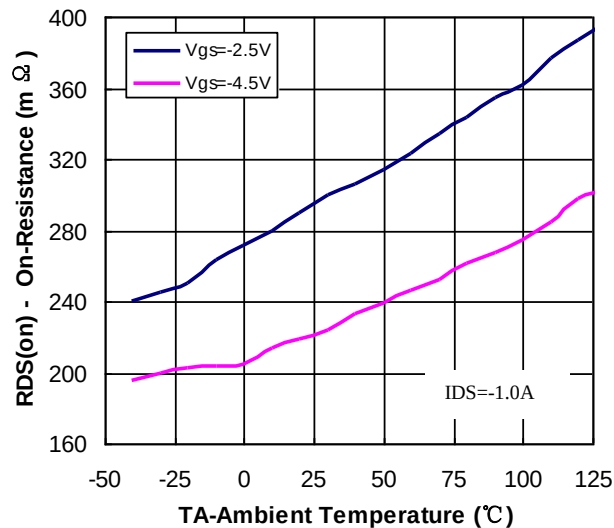


Typical Characteristics ($T_J=25^\circ\text{C}$, Unless otherwise noted)

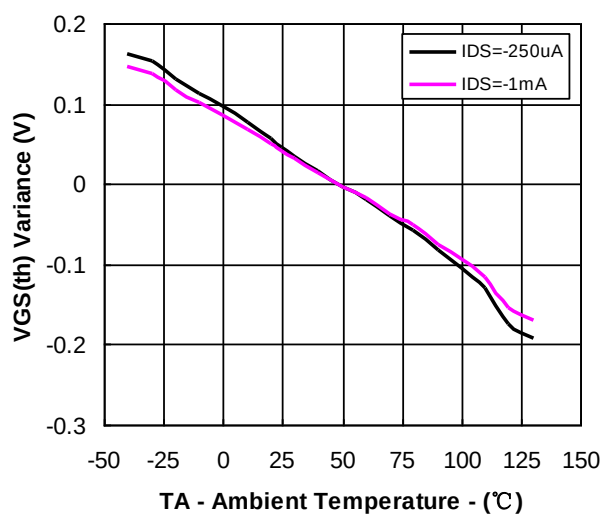
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Ambient Temperature



Threshold Voltage vs. Ambient Temperature



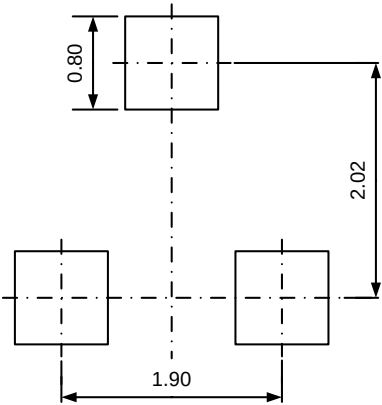
Package Information

UM2301S SOT23-3

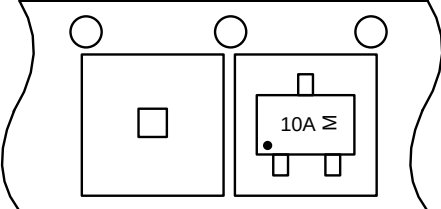
Outline Drawing

DIMENSIONS				
Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950REF		0.037REF	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Land Pattern

	<p>NOTES:</p> <ol style="list-style-type: none"> Compound dimension: 2.92×1.60; Unit: mm; General tolerance $\pm 0.05\text{mm}$ unless otherwise specified; The layout is just for reference.
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Tape and Reel Orientation

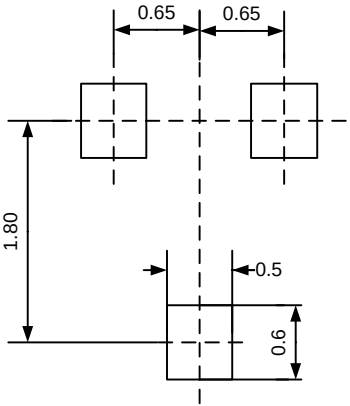


UM2301P SOT323

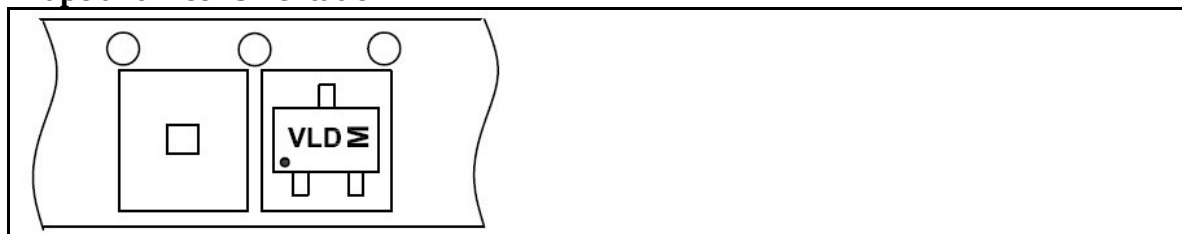
Outline Drawing

DIMENSIONS				
Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
D	1.80	2.20	0.072	0.088
E	1.15	1.35	0.006	0.054
HE	1.80	2.40	0.072	0.050
b	0.25	0.40	0.010	0.016
e	0.65BSC		0.026BSC	
Q1	0.10	0.40	0.004	0.016
A	0.80	1.10	0.032	0.044
A1	0.00	0.10	0.00	0.004
A2	0.80	1.00	0.032	0.040
c	0.10	0.18	0.004	0.007
L	0.10	0.30	0.004	0.012
L1	0.425TYP		0.017TYP	

Land Pattern

	<p>NOTES:</p> <ol style="list-style-type: none"> Compound dimension: 2.00×1.25; Unit: mm; General tolerance ± 0.05mm unless otherwise specified; The layout is just for reference.
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Tape and Reel Orientation



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