

20V N-Channel Power MOSFET

UM2302S SOT23-3

UM2302P SOT323

General Description

The UM2302 is a low threshold N-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.

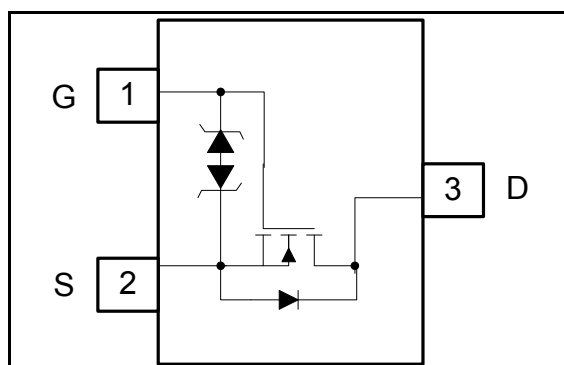
Applications

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

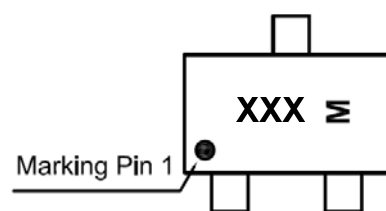
Features

- Drain-Source Voltage(max): 20V
- Low On-Resistance:
90mΩ@V_{GS}=4.5V
150mΩ@V_{GS}=2.5V
- Continuous Drain Current(max):
2A@25°C (SOT23-3)
1.6A@25°C (SOT323)

Pin Configurations



Top View



M: Month Code
XXX: UM2302S 10B
UM2302P VLC

Ordering Information

Part Number	Packaging Type	Marking Code	Shipping Qty
UM2302S	SOT23-3	10B	3000pcs/7 Inch Tape & Reel
UM2302P	SOT323	VLC	

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	2
		SOT323	1.6
I _{DP}	Drain Current Pulsed (Pulse Width ≤ 10μs, Duty Cycle ≤ 1%)	5	A

P _D	Power Dissipation	SOT23-3	0.86	W
		SOT323	0.5	
T _J	Junction Temperature		-55~150	°C
T _{stg}	Storage Temperature		-55~150	°C
R _{θJA}	Thermal Resistance, Junction-to-Ambient (≤5s)	SOT23-3	145	°C/W
		SOT323	250	
ESD	ESD Method 3015.8		2000	V

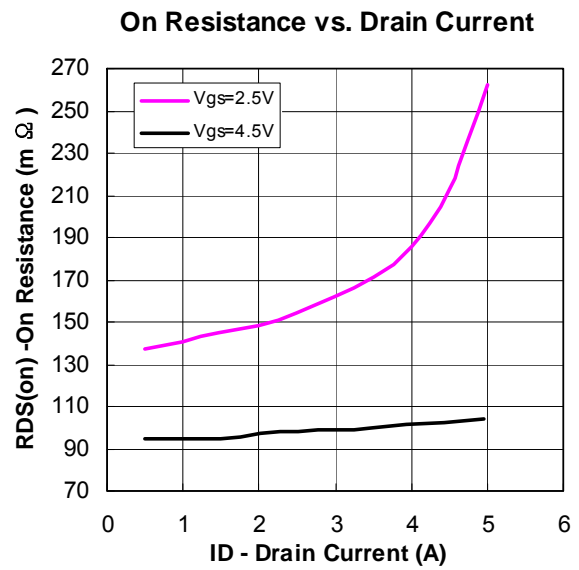
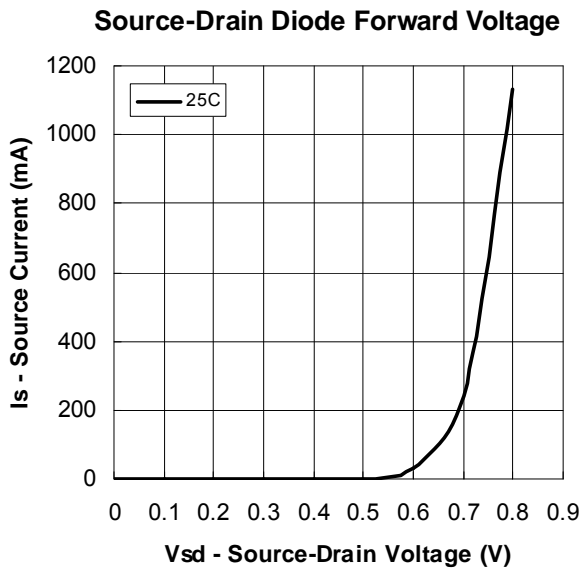
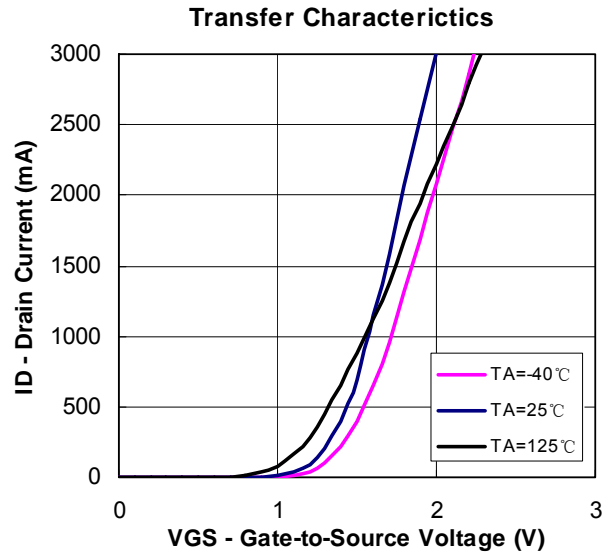
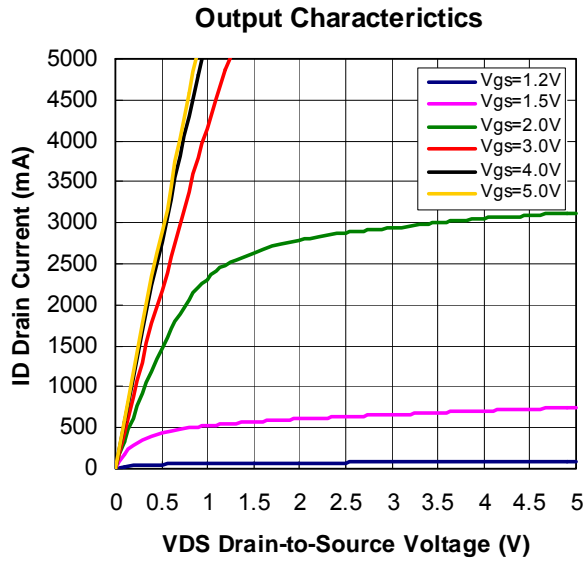
Electrical Characteristics (T_J=25°C, Unless otherwise noted)

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 ^a	V _{GS} =4.5V, I _D =1.0A		90	150	mΩ
		V _{GS} =2.5V, I _D =1.0A		150	200	
V _{GS(TH)}	Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.40		0.90	V
g _{fs}	Forward Transconductance ^a	V _{DS} =5V, I _D =2A		4.5		S
Dynamic Characteristics^b						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, f=1.0MHz		150		pF
C _{oss}	Output Capacitance			50		
C _{rss}	Reverse Transfer Capacitance			40		
Switching Characteristics^b						
td(on)	Turn-on Delay Time	V _{DD} =10V, R _L =2.78Ω, I _D =3.6A, V _{GEN} =4.5V, R _G =1Ω		8	15	ns
tr	Rise Time			10	25	
td(off)	Turn-off Delay Time			30	45	
tf	Fall Time			25	40	
Drain-Source Diode Characteristics and Maximum Ratings						
V _{SD}	Forward Diode Voltage	I _S =0.95A, V _{GS} =0V		0.7	1.2	V

a: Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.

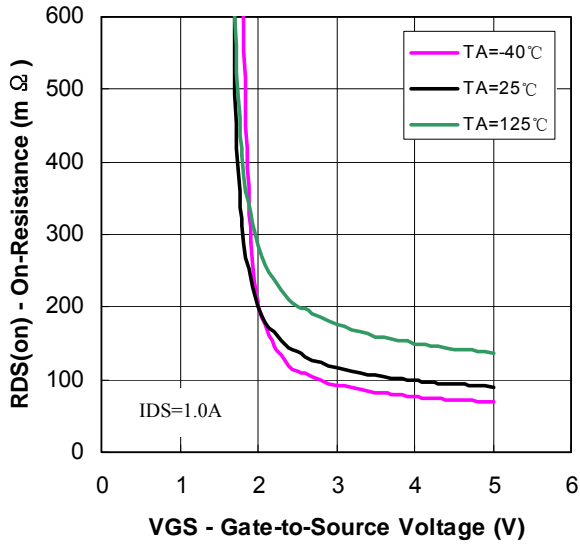
b: Guaranteed by design, not subject to production testing.

Typical Characteristics (T_J=25°C, Unless otherwise noted)

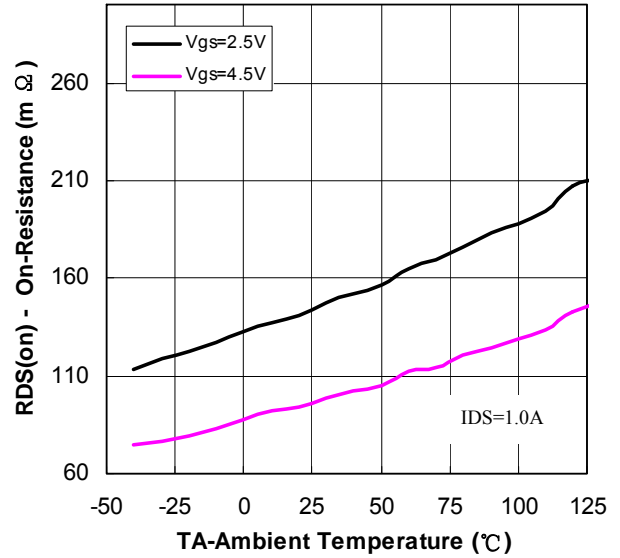


Typical Characteristics ($T_J=25^\circ\text{C}$, Unless otherwise noted)

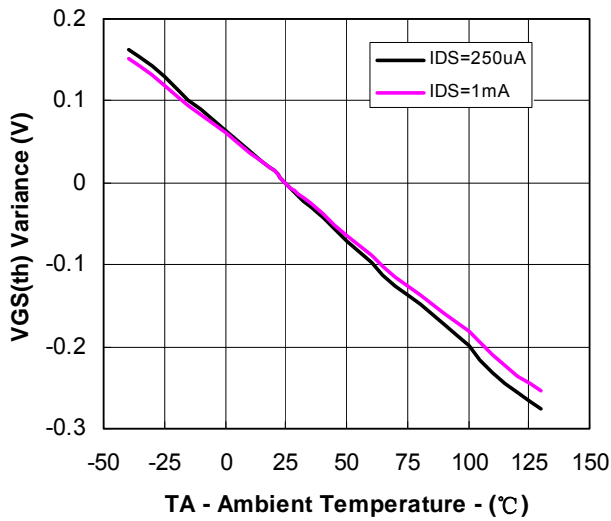
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Ambient Temperature



Threshold Voltage vs. Ambient Temperature



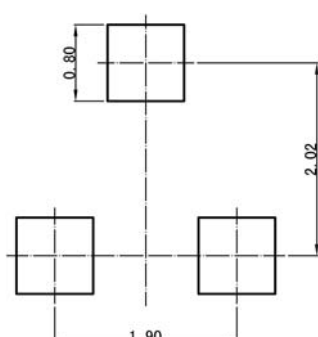
Package Information

UM2302S 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

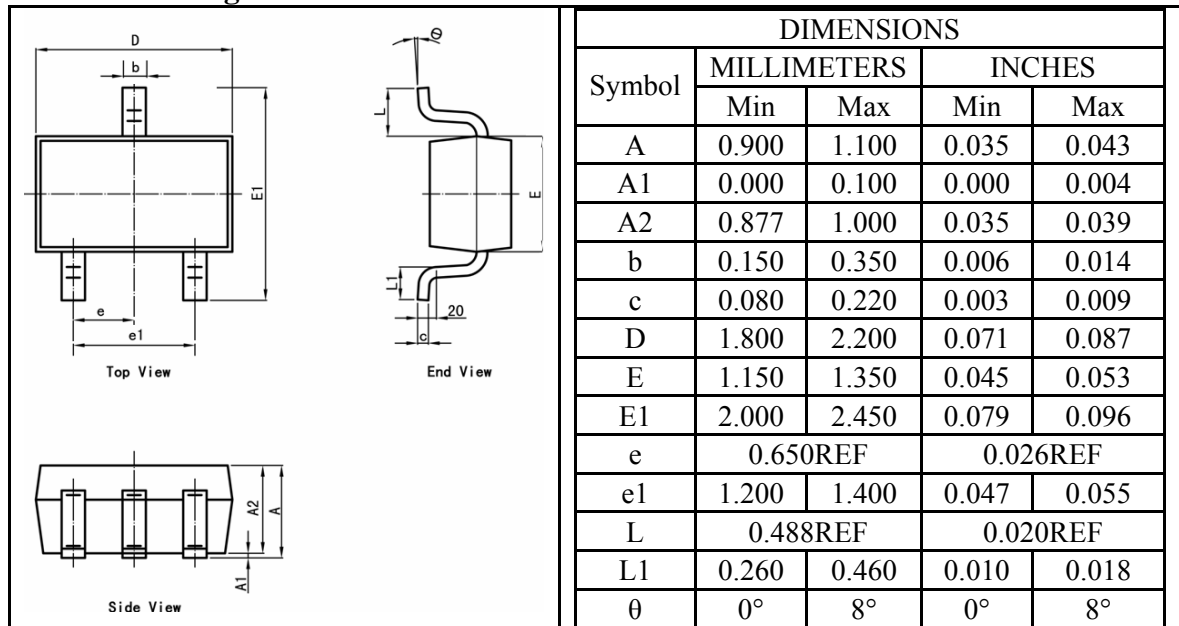
	<p>NOTES:</p> <ol style="list-style-type: none"> Compound dimension: 2.92×1.60; Unit: mm; General tolerance ±0.05mm unless otherwise specified; The layout is just for reference.
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Tape and Reel Orientation

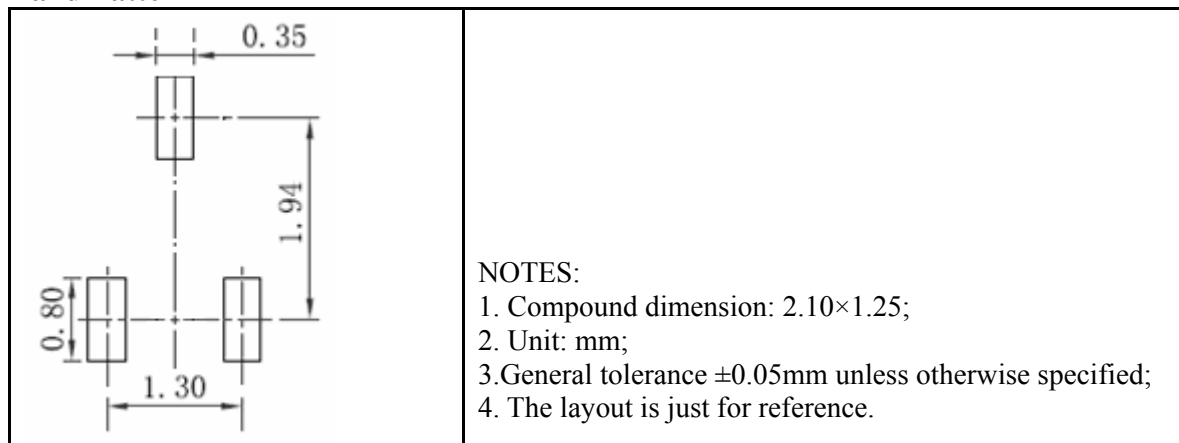


UM2302P SOT323

Outline Drawing



Land Pattern



Tape and Reel Orientation



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