

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

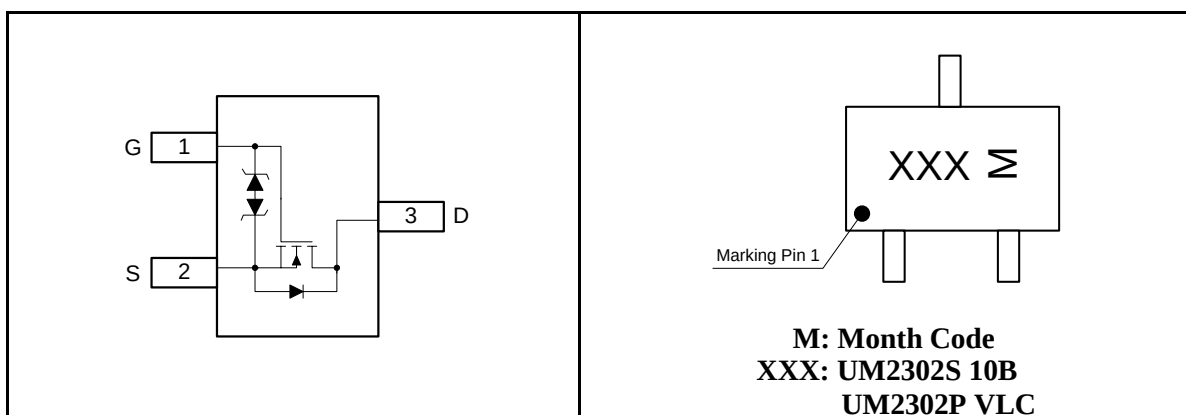
- Battery Packs
- Battery-Powered Portable Equipments
- Cellular and Cordless Telephones

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



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	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)

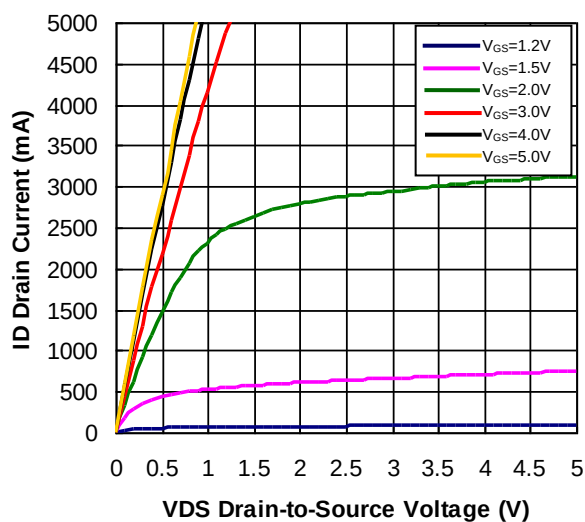
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-to-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			0.1	μA
I _{GSS}	Gate-to-Source Leakage Current	V _{GS} = ±8V, V _{DS} =0V			±10	μA
On Characteristics						
R _{DS(ON)}	Static Drain-to-Source On-Resistance (Note 1)	V _{GS} =4.5V, I _D =1.0A		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 (Note 1)	V _{DS} =5V, I _D =2A		4.5		S
Dynamic Characteristics (Note 2)						
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 (Note 2)						
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

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

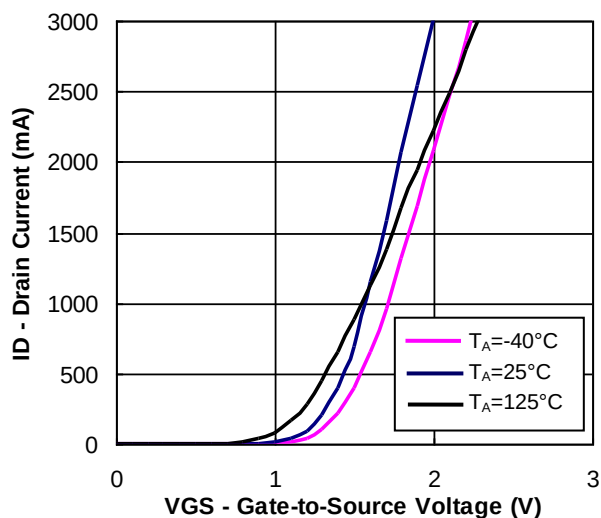
Note 2: Guaranteed by design, not subject to production testing.

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

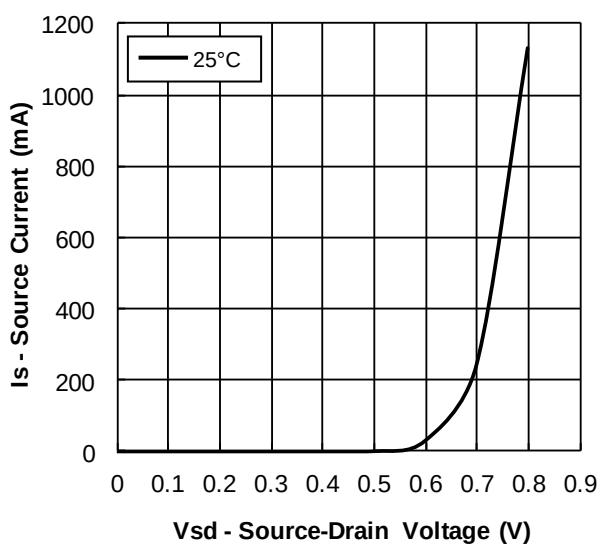
Output Characteristics



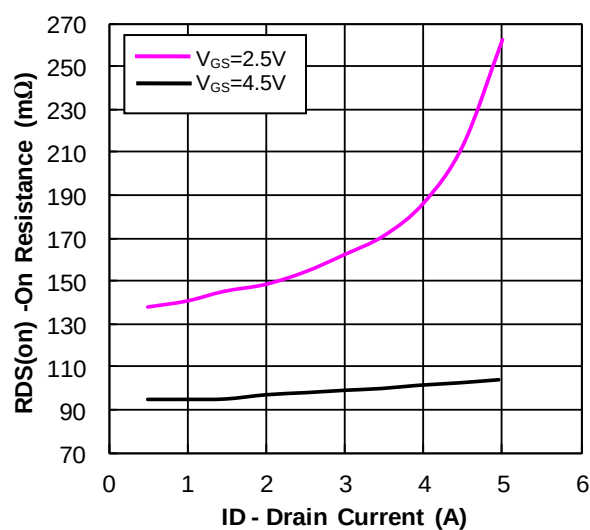
Transfer Characteristics



Source-Drain Diode Forward Voltage

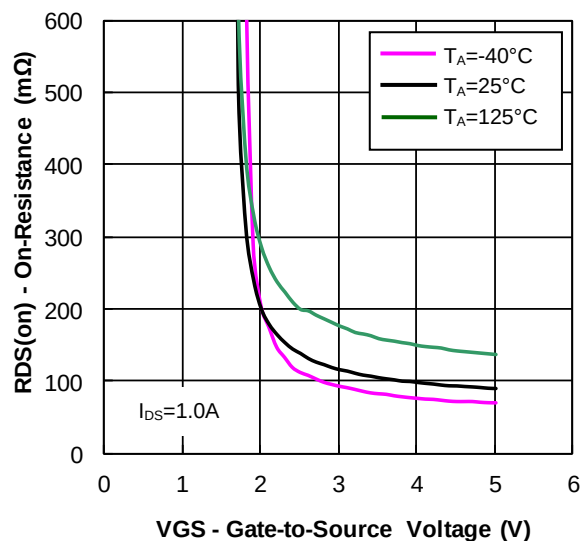


On Resistance vs. Drain Current

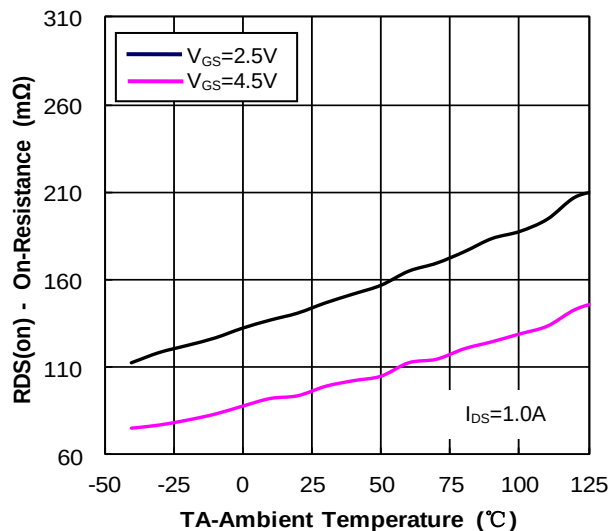


Typical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

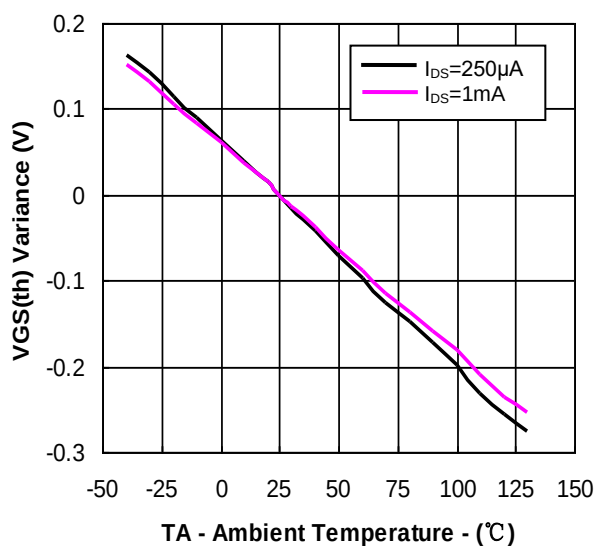
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Ambient Temperature



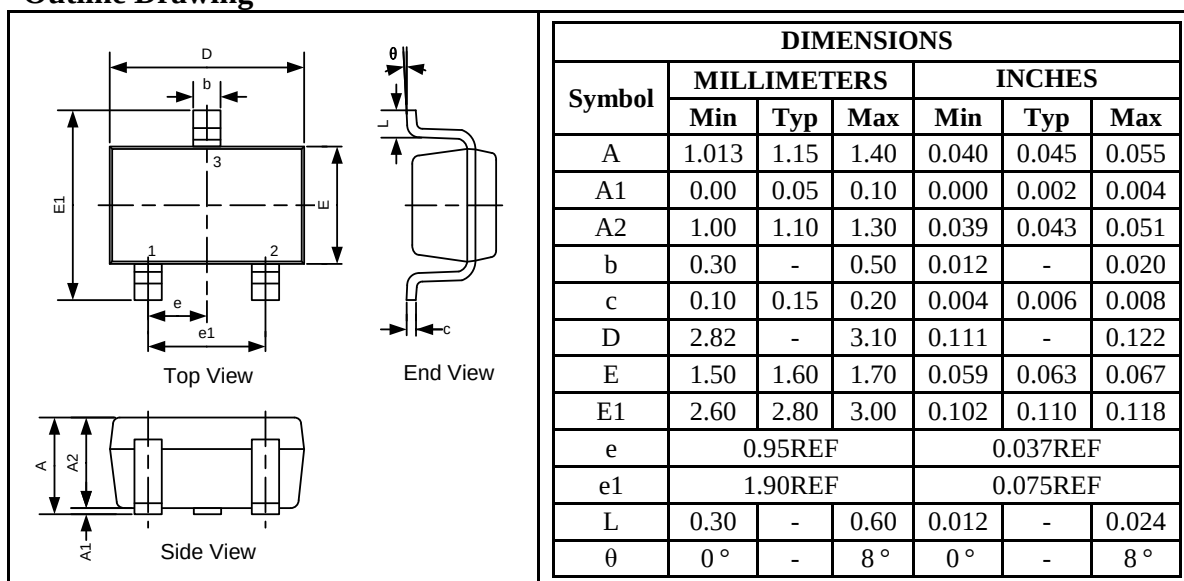
Threshold Voltage vs. Ambient Temperature



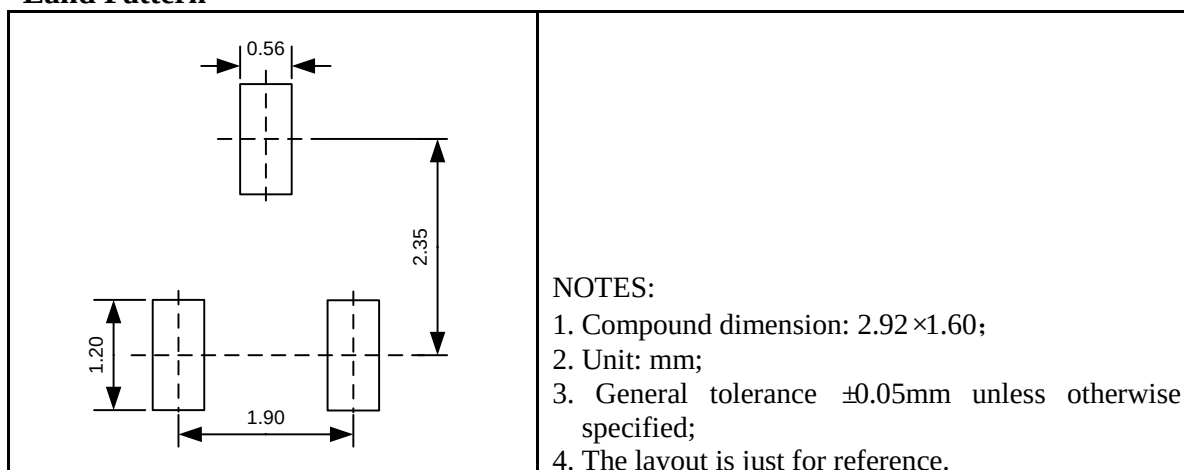
Package Information

UM2302S SOT23-3

Outline Drawing



Land Pattern

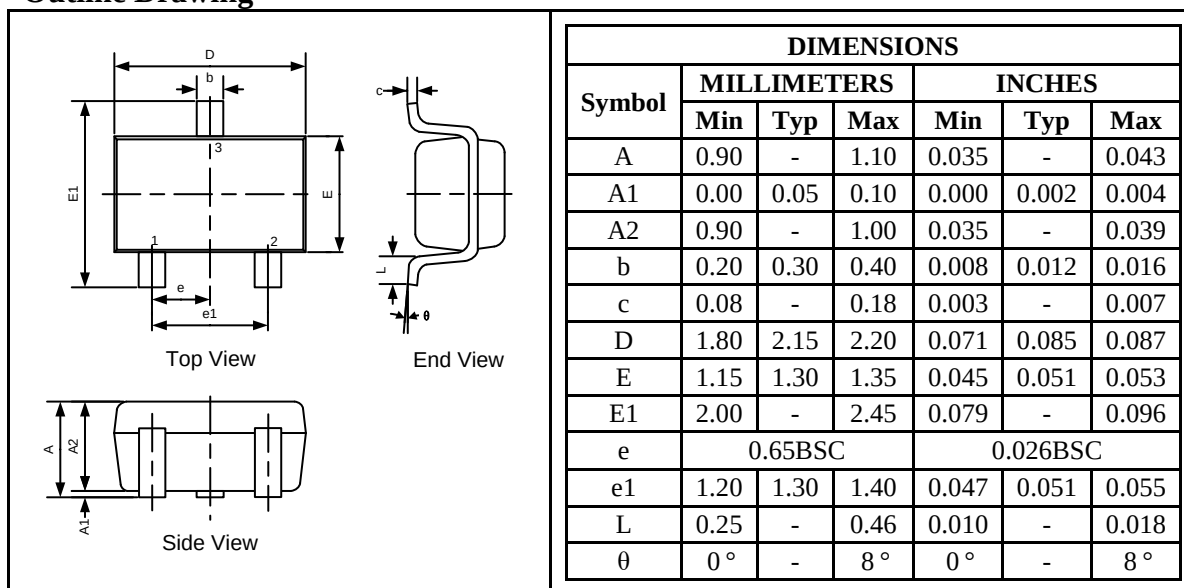


Tape and Reel Orientation

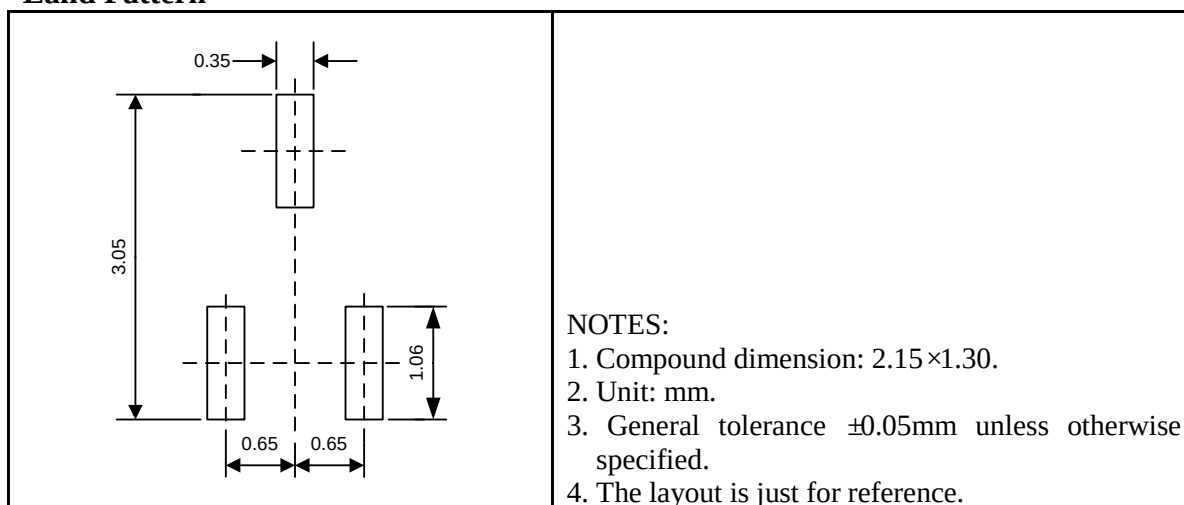


UM2302P SOT323

Outline Drawing



Land Pattern



Tape and Reel Orientation



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