

-20V P-Channel MOSFET

MOSFET Product Summary

V_{DS}	$R_{DS(ON)}(Typ.)$	I_D
-20V	80m Ω @ $V_{GS}=-4.5V$	-4.5A
	105m Ω @ $V_{GS}=-2.5V$	

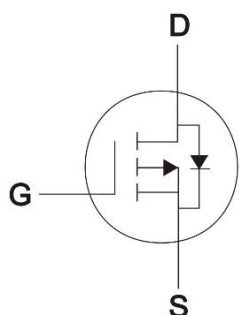
Description

The PM2301AL uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gatecharge. The package form is SOT-23, which accord with the RoHS standard and Halogen Free standard.

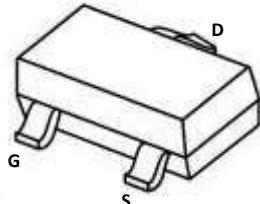
Features

- Surface Mount Package
- P-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive

Dimensions and Pin Configuration



Circuit diagram



SOT-23

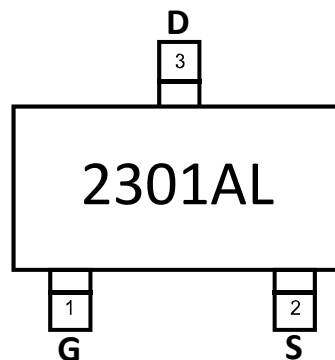
Mechanical Characteristics

- Package: SOT-23
- Case Material: "Green" Molding Compound
- Marking Information: See Below

Applications

- Load Switch for Portable Devices
- DC/DC Converter
- PA Switch

Marking Information



2301AL = Device Marking Code

Ordering Information

Part Number	Shipping	Reel Size
PM2301AL	3000/Tape & Reel	7 inch

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ^(Note1)	I_D	-4.5	A
Pulsed Drain Current ^(Note2)	I_{DM}	-18	A
Power Dissipation	P_D	1.5	W

Thermal Resistance from Junction to Ambient ^(Note3)	$R_{\theta JA}$	83	°C/W
Junction Temperature	T_J	-55~ +150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

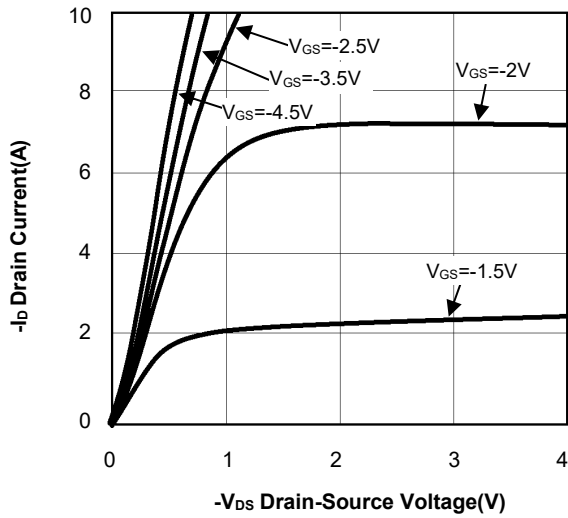
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.6	-1.0	V
Drain-source on-resistance	$R_{DS(ON)}$	$V_{GS} = -4.5V, I_D = -1.5A$	-	80	95	m Ω
		$V_{GS} = -2.5V, I_D = -1.5A$	-	105	125	
Diode Forward voltage ^(note1)	V_{SD}	$I_S = -2A, V_{GS} = 0V$	-	-	-1.2	V
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1MHz$	-	427	-	pF
Output Capacitance	C_{oss}		-	52	-	
Reverse Transfer Capacitance	C_{rss}		-	44	-	
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10V, V_{GS} = -4.5V,$ $R_G = 1\Omega, R_L = 10\Omega$	-	9	-	nS
Turn-on rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	35	-	
Turn-off fall time	t_f		-	20	-	
Total Gate Charge	Q_g	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -3A$	-	5.7	-	nC
Gate Source Charge	Q_{gs}		-	1.0	-	
Gate Drain Charge	Q_{gd}		-	1.7	-	

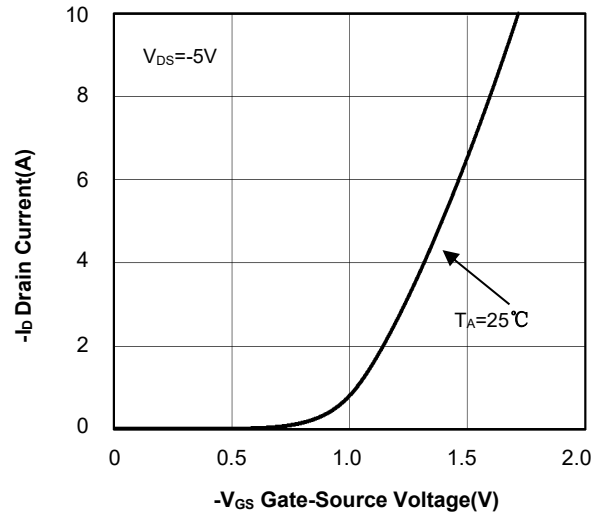
Notes:

1. This current is chip limited, which is calculated based on $R_{\theta JA}$.
2. This current is calculated on single pulse with 10 μs Pulse & Duty Cycle = 1%.
3. The value of $R_{\theta JA}$, which is steady state, is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, with $T_A = 25^{\circ}\text{C}$.

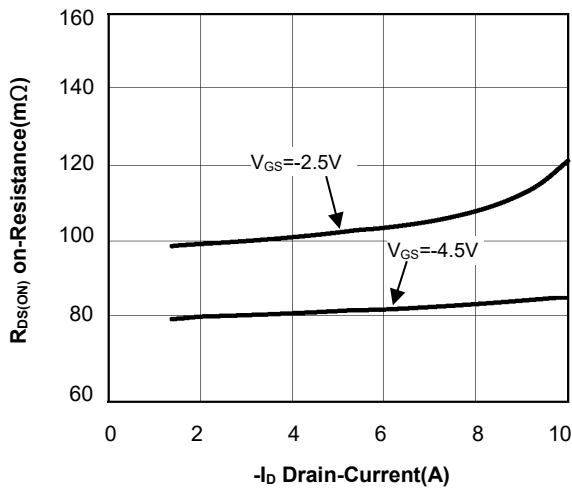
Typical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)



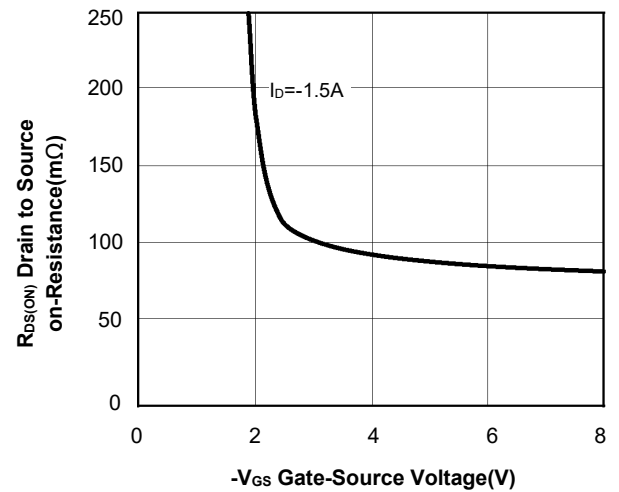
Drain Current vs. Drain-Source Voltage



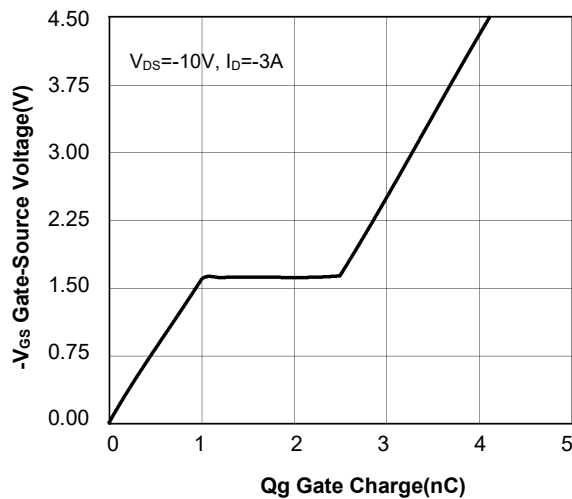
Drain Current vs. Gate-Source Voltage



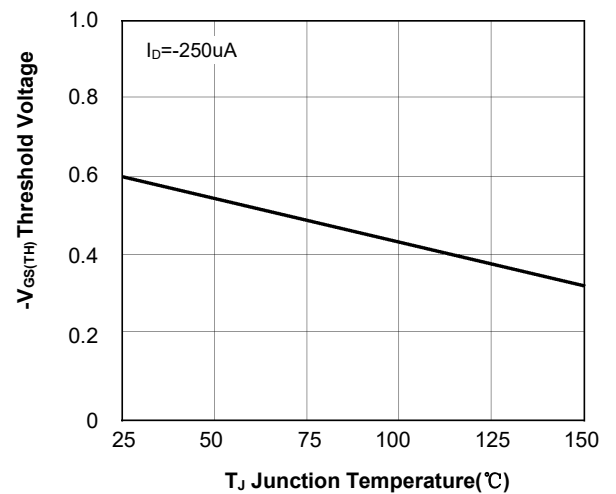
$R_{DS(ON)}$ On-Resistance vs. Drain-Current



On-Resistance vs. Gate-Source Voltage

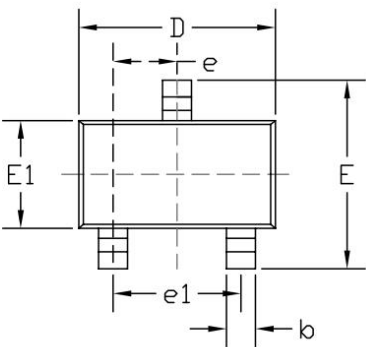


Drain Current vs. Drain-Source Voltage

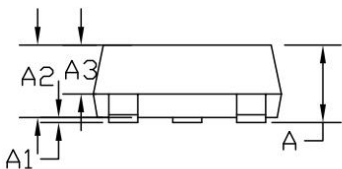


Threshold Voltage vs. Temperature

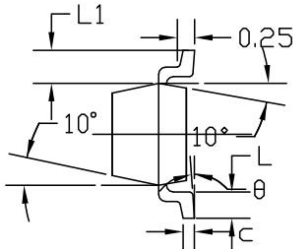
SOT-23 Package Outline Drawing



TOP VIEW



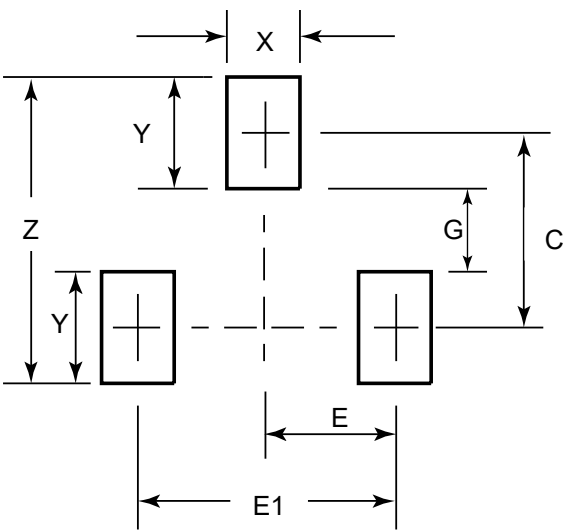
FORNT VIEW



SIDE VIEW

SYM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.01	0.05	0.10
A2	0.90	0.95	1.00
A3	0.50	0.55	0.60
b	0.30	0.35	0.40
c	0.07	0.125	0.18
D	2.80	2.90	3.00
E	2.25	2.40	2.55
E1	1.20	1.30	1.40
e	0.95BSC		
e1	1.80	1.90	2.00
L	0.30	0.40	0.50
L1	0.55REF		
θ	0°	4°	8°

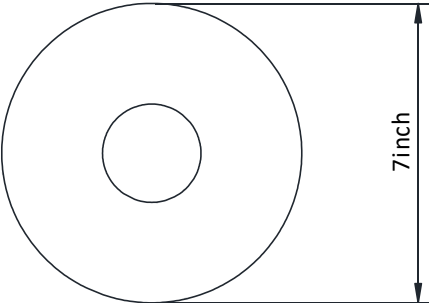
Suggested Land Pattern



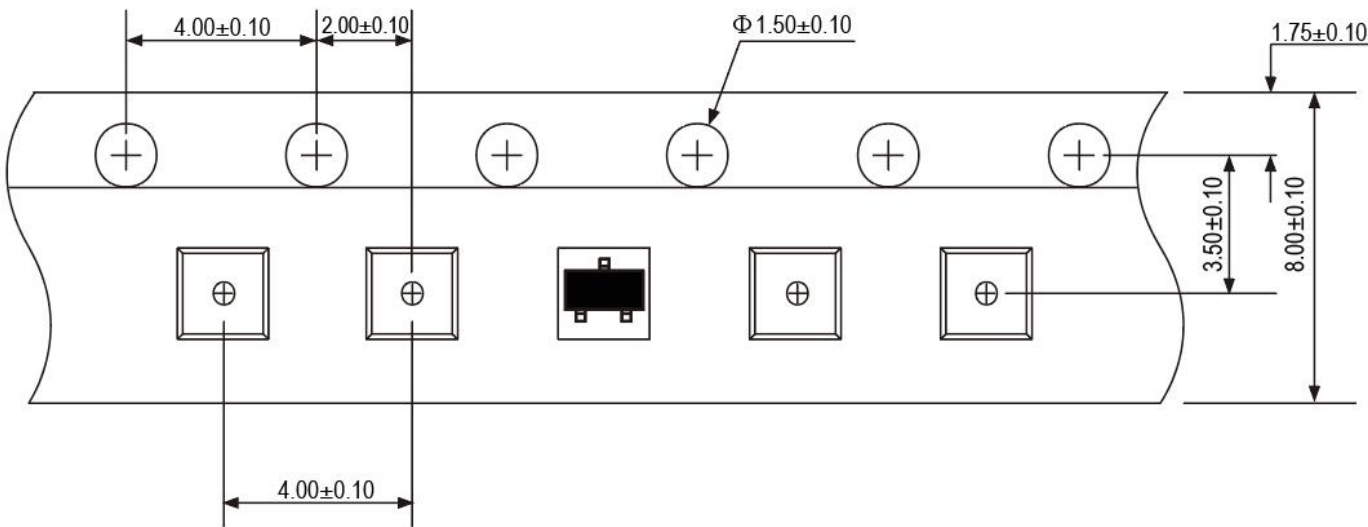
SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E	0.95	0.037
E1	1.90	0.075
G	0.80	0.031
X	1.00	0.039
Y	1.40	0.055
Z	3.60	0.141

TAPE AND REEL INFORMATION

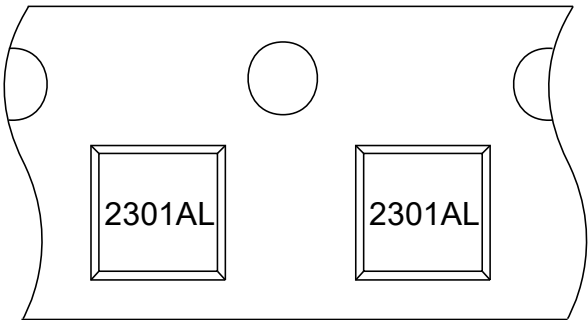
Reel Dimensions



Tape Dimensions



Unit:mm



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