

**20V P-Channel MOSFET**

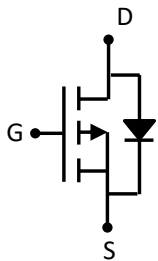
**Description**

The PM2301 uses advanced Trench technology and designs to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

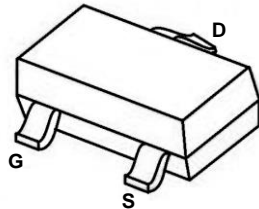
**Features**

- TrenchFET Power MOSFET

**Dimensions and Pin Configuration**



Circuit diagram

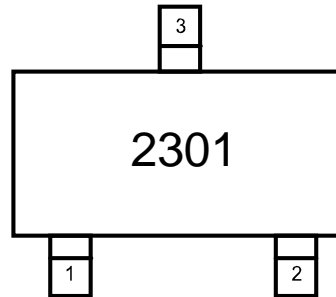


SOT-23

**Applications**

- PA Switch
- Load Switch

**Marking Information**



2301 = Device Marking Code

**MOSFET Product Summary**

$V_{(BR)DSS}$	$R_{DS(ON) MAX}$	$I_D$
-20V	103mΩ@-4.5V	-2.8A
	140mΩ@-2.5V	

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	±12	V
Continuous Drain Current	$I_D$	-2.8	A
Pulsed Drain Current	$I_{DM}$	-12	A
Continuous Drain Current	$I_S$	-0.59	A
Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$

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

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -16V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			$\pm 100$	nA
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.1	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -2.8A$		103	140	m $\Omega$
		$V_{GS} = -2.5V, I_D = -2A$		140	200	
Forward tranconductance	$g_{FS}$	$V_{DS} = -5V, I_D = -3.3A$	3			S
<b>Dynamic characteristics</b>						
Input Capacitance <sup>a,b</sup>	$C_{iss}$	$V_{DS} = -6V, V_{GS} = 0V, f = 1MHz$		715		pF
Output Capacitance <sup>a,b</sup>	$C_{oss}$			170		pF
Reverse Transfer Capacitance <sup>a,b</sup>	$C_{rss}$			120		pF
Total Gate Charge <sup>a</sup>	$Q_g$	$V_{DS} = -6V, V_{GS} = -4.5V, I_D = -3.3A$			13	nC
Gate-Source Charge <sup>a</sup>	$Q_{gs}$			1.2		nC
Gate-Drain Charge <sup>a</sup>	$Q_{gd}$			1.6		nC
<b>Switching<sup>a,b</sup></b>						
Turn-on delay time	$t_{d(on)}$	$V_{GEN} = -4.5V, V_{DD} = -6V, I_D = -1.0A, R_G = 6\Omega, R_L = 6\Omega$			25	ns
Turn-on rise time	$t_r$				55	ns
Turn-off delay time	$t_{d(off)}$				90	ns
Turn-off fall time	$t_f$				60	ns
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = -1.6A$			-1.2	V

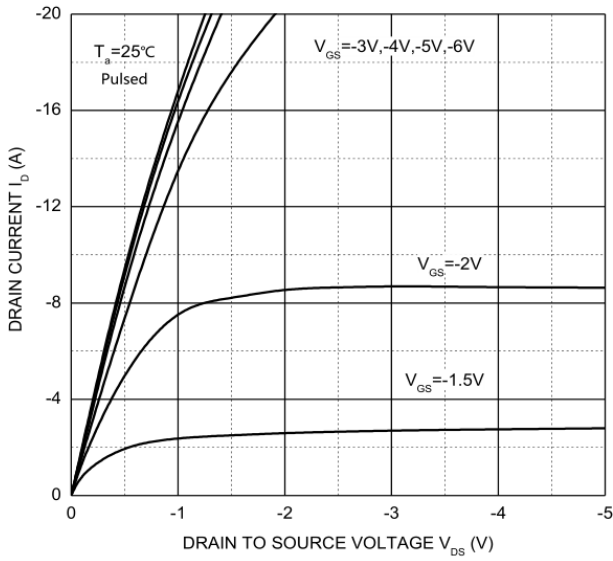
Notes:

 a. Pulse test; pulse width  $\leq 300 \mu s$ , duty cycle  $\leq 2\%$ .

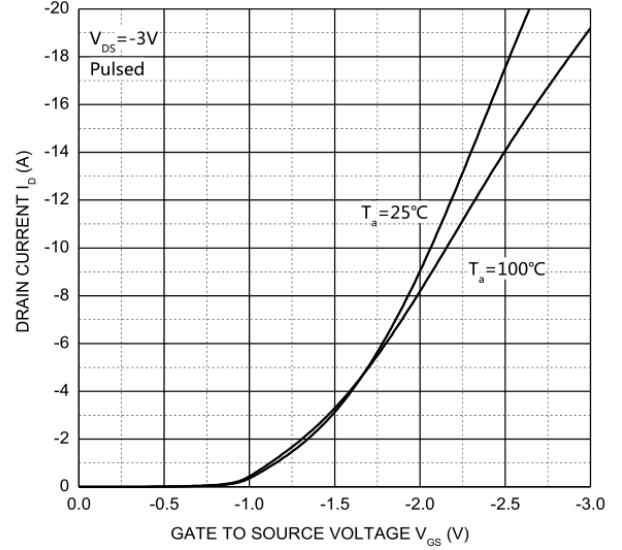
b. These parameters have no way to verify.

**Typical Characteristics**

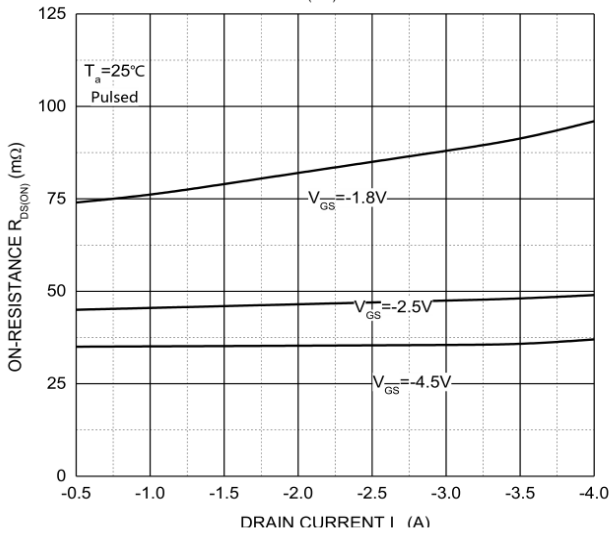
Output Characteristics



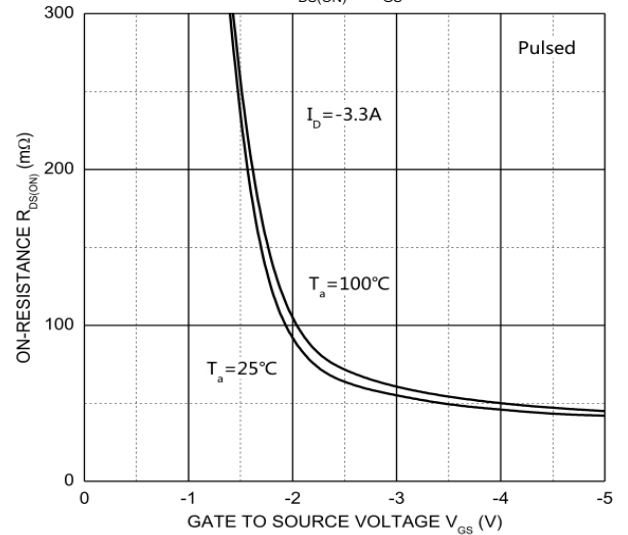
Transfer Characteristics



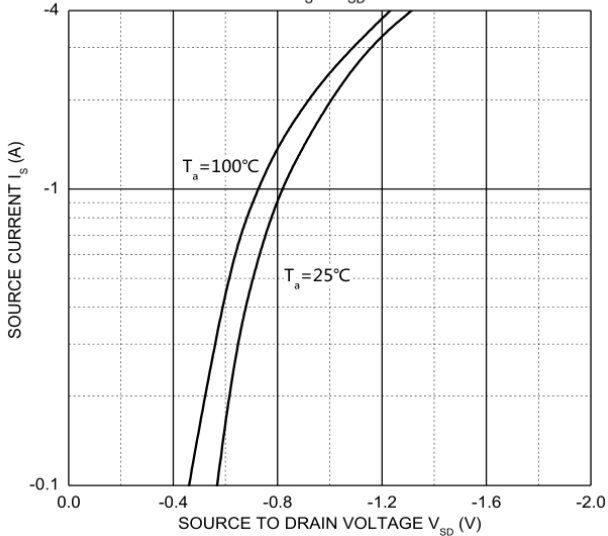
$R_{DS(ON)} - I_D$



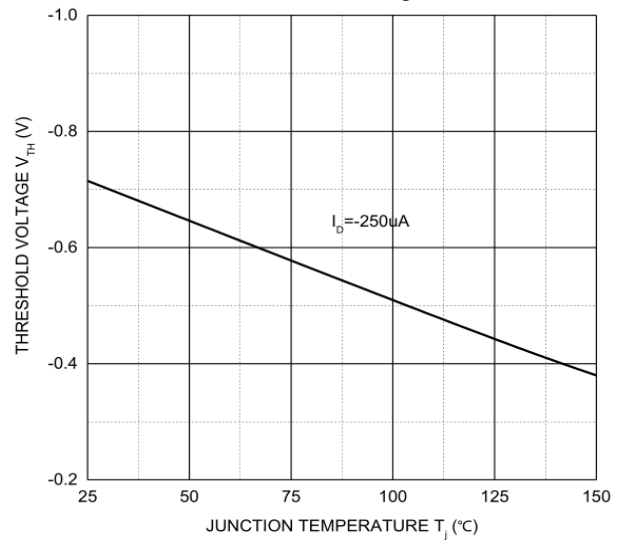
$R_{DS(ON)} - V_{GS}$



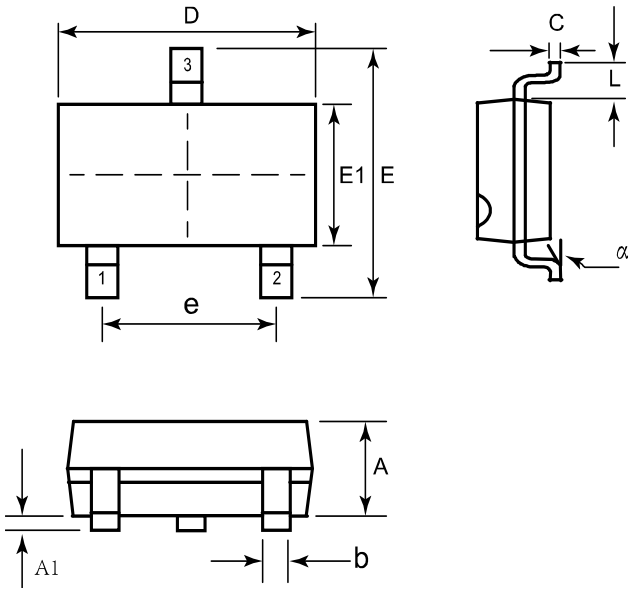
$I_S - V_{SD}$



Threshold Voltage

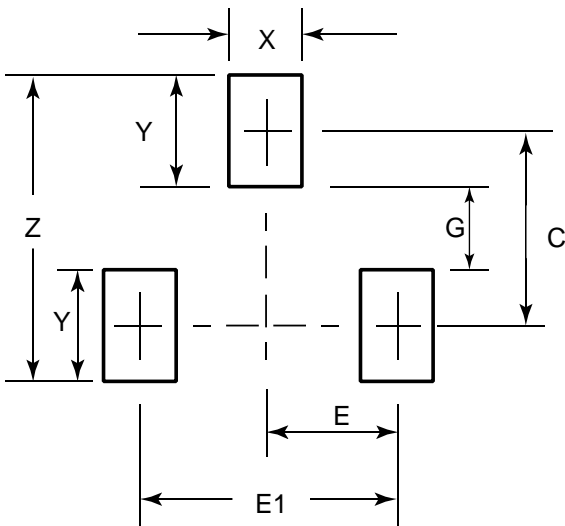


**SOT-23 Package Outline Drawing**



SYM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	0.037	0.040	0.88	0.95	1.02
A1	0.000	-	0.004	0.01	-	0.10
b	0.012	-	0.020	0.30	-	0.51
C	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	0.055	1.20	1.30	1.40
e	0.075 BSC			1.90 BSC		
L	0.022 BSC			0.55 BSC		
α	0°		8°	0°		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