

# AP2312

## N-Channel Power MOSFET

### 描述 / Descriptions

SOT23 塑封封装 N 道 MOS 场效应管。N- CHANNEL MOSFET in a SOT23 Plastic Package.

### 特征 / Features

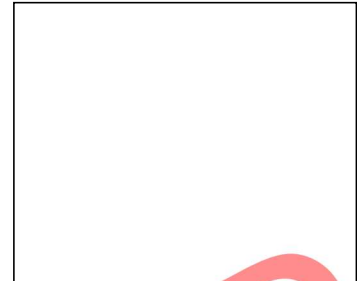
$V_{DS} = 20V$

$I_D = 5.0A (V_{GS} = 4.5V)$

$R_{DS(ON)} < 32m\Omega (V_{GS} = 4.5V)$

$R_{DS(ON)} < 38m\Omega (V_{GS} = 2.5V)$

$R_{DS(ON)} < 42m\Omega (V_{GS} = 1.8V)$

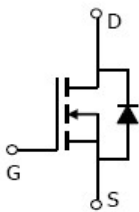


### 用途 / Applications

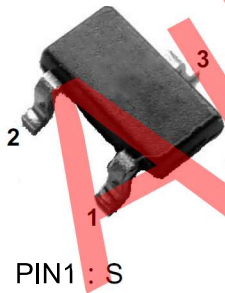
适用于作负载开关或脉宽调制应用。

This device is suitable for use as a load switch or in PWM applications.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN 1 : S

PIN 2 : G

PIN 3 : D

### Maximum ratings ( $T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8.0$	
Continuous Drain Current	$I_D$ (t=5s)	5	A
Pulsed Drain Current	$I_{DM}$	20	
Continuous Source-Drain Diode Current	$I_S$	1.04	
Maximum Power Dissipation	$P_D$ (t=5s)	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{stg}$	-50 ~+150	

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Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Gate-source leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 8V$			$\pm 100$	nA
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1.0	$\mu A$
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.7	1.0	V
Drain-source on-state resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 5.0A$		0.018	0.0318	$\Omega$
		$V_{GS} = 2.5V, I_D = 4.7A$		0.023	0.0356	
		$V_{GS} = 1.8V, I_D = 4.3A$		0.030	0.0414	
Forward transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10V, I_D = 5.0A$		6		S
<b>Dynamic<sup>b</sup></b>						
Input capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		865		pF
Output capacitance	$C_{oss}$			105		
Reverse transfer capacitance	$C_{rss}$			55		
Gate resistance	$R_g$	$f = 1MHz$	0.5		4.8	$\Omega$
Turn-on delay Time	$t_{d(on)}$	$V_{GEN} = 5V, V_{DD} = 10V,$ $I_D = 4A, R_G = 1\Omega, R_L = 2.2\Omega$			10	ns
Rise time	$t_r$				20	
Turn-off Delay time	$t_{d(off)}$				32	
Fall time	$t_f$				12	
<b>Drain-source body diode characteristics</b>						
Forward diode voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 4A$		0.75	1.2	V

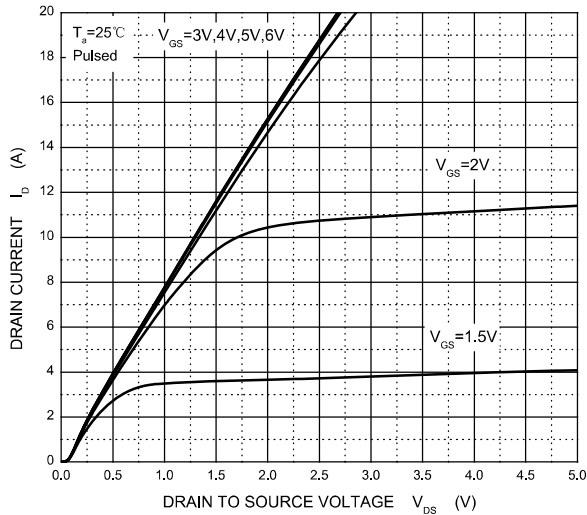
**Notes :**

- Pulse Test : pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- These parameters have no way to verify.

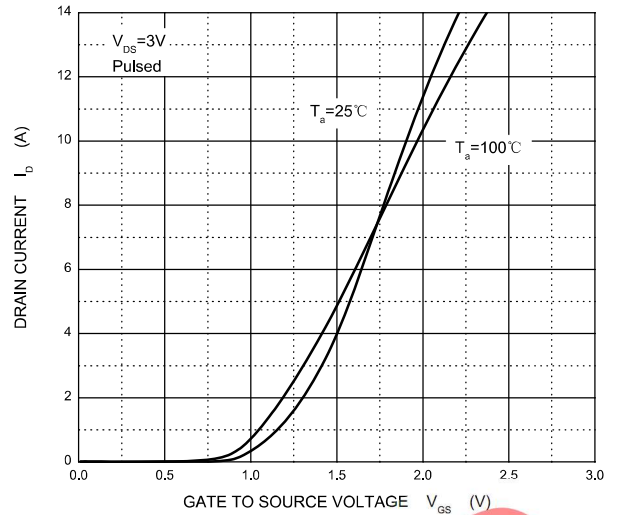
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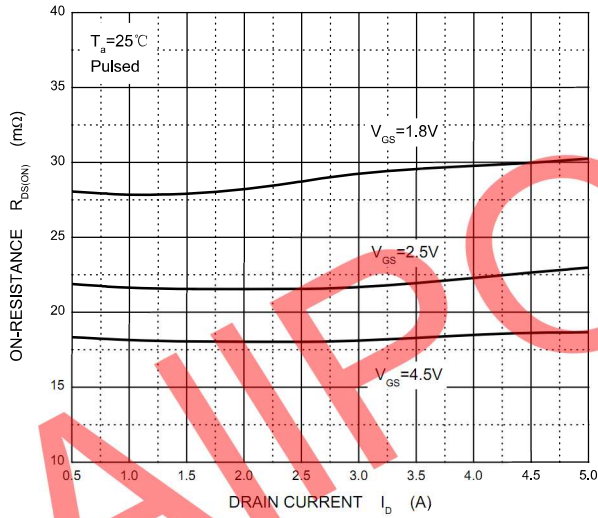
**Output Characteristics**



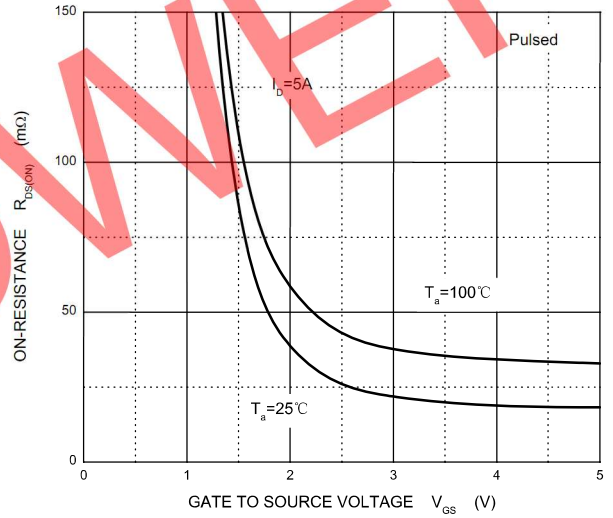
**Transfer Characteristics**



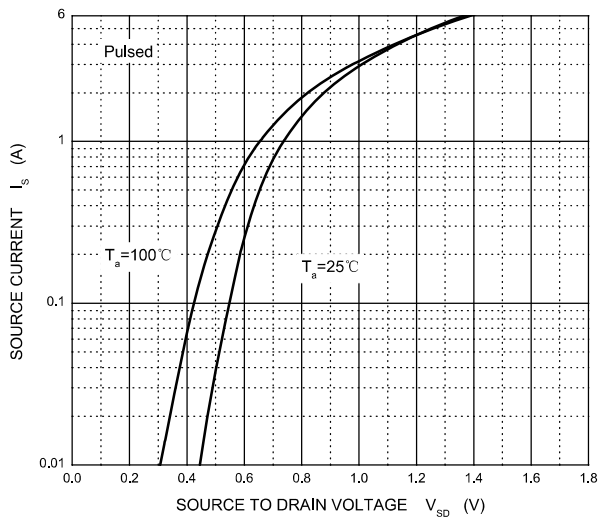
**$R_{DS(ON)}$  —  $I_D$**



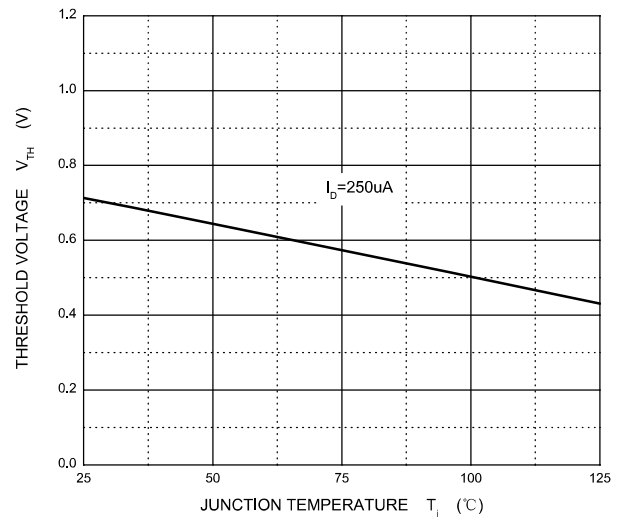
**$R_{DS(ON)}$  —  $V_{GS}$**



**$I_S$  —  $V_{SD}$**



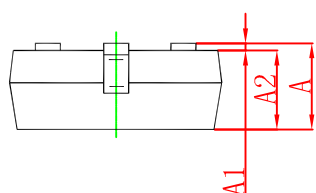
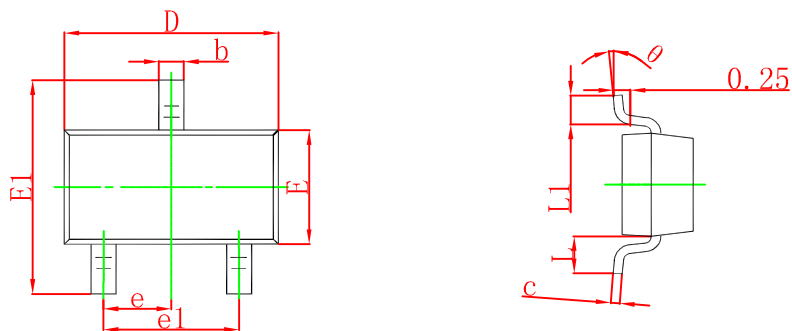
**Threshold Voltage**



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**SOT-23 Package Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
theta	0° - 8°		0° - 8°	

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