

General Description

The MY2301 is the high cell density trenched P-CH MOSFET, which provide excellent $R_{DS(ON)}$ and efficiency for most of the small power switching and load switch applications.

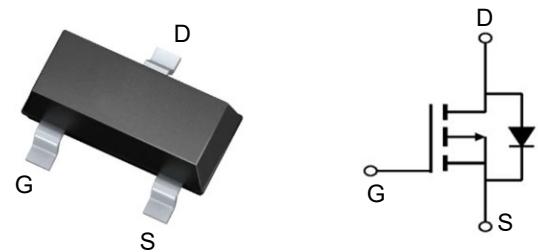


Features

V_{DSS}	-20	V
I_D	-2	A
$R_{DS(ON)}$ (at $V_{GS} = -10V$)	90	$m\Omega$
$R_{DS(ON)}$ (at $V_{GS} = -4.5V$)	115	$m\Omega$

Application

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY2301	SOT-23	A1SHB	3000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current ^a	I_D	$T_C=25^\circ\text{C}$	-2.0
		$T_C=25^\circ\text{C}, t \leq 5\text{s}$	-2.4
		$T_C=70^\circ\text{C}$	-1.1
Drain Current – Pulsed ^a	I_{DM}	-8.0	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	1.56	W
Power Dissipation – Derate Above 25°C		0.012	$\text{W}/^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient ¹	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$

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

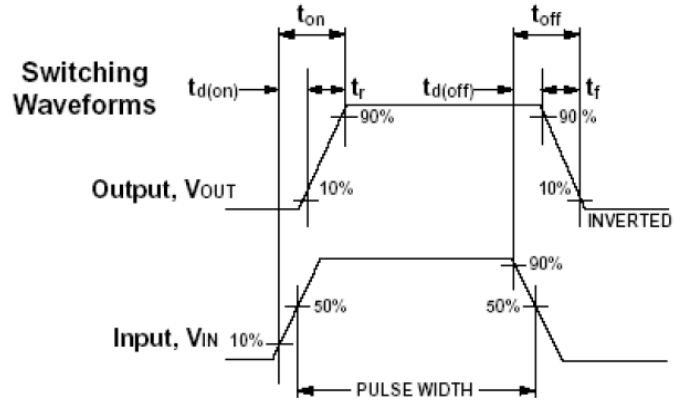
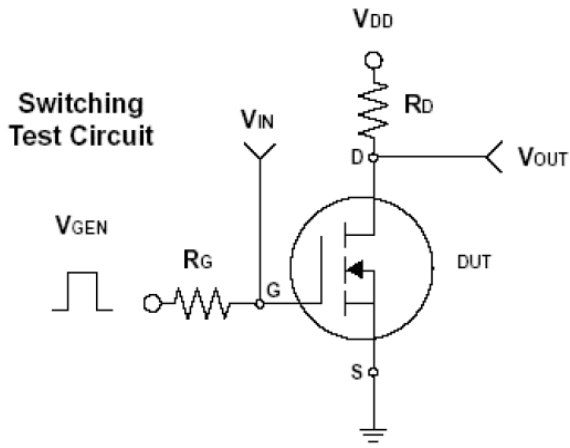
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20	---	---	V
Zero Gate Voltage Drain Current	I _{DSS}	T _J =25°C V _{DS} =-16V, V _{GS} =0V	---	---	-1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	---	---	±100	nA
On Characteristics ^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.3	---	-1.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-2.0A	---	90	125	mΩ
		V _{GS} =-2.5V, I _D =-1.5A	---	115	165	
		V _{GS} =-1.8V, I _D =-1.0A	---	170	250	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =1A				S
Drain-Source Diode Characteristics ^a						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	-2.0	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A	---	---	-1.3	V
Dynamic Characteristics ^b						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	---			pF
Output Capacitance	C _{oss}		---			
Reverse Transfer Capacitance	C _{rss}		---			
Switching Characteristics ^b						
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-2A	---			nC
Gate-Source Charge	Q _{gs}		---			
Gate-Drain Charge	Q _{gd}		---			
Turn-On Delay Time	T _{d(on)}	V _{DD} =-10V, V _{GS} =-4.5V, R _G =25Ω, I _D =-1A	---			ns
Rise Time	T _r		---			
Turn-Off Delay Time	T _{d(off)}		---			
Fall Time	T _f		---			

Notes: a. Repetitive Rating: Pulsed width limited by maximum junction temperature.

b. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.

c. Guaranteed by design, not subject to production testing.

Switching Time Test Circuit and Waveforms



Soldering Methods For Products

1. Storage environment : Temperature=10°C~35°C, Humidity=65%±15%
2. Reflow soldering of surface mount devices

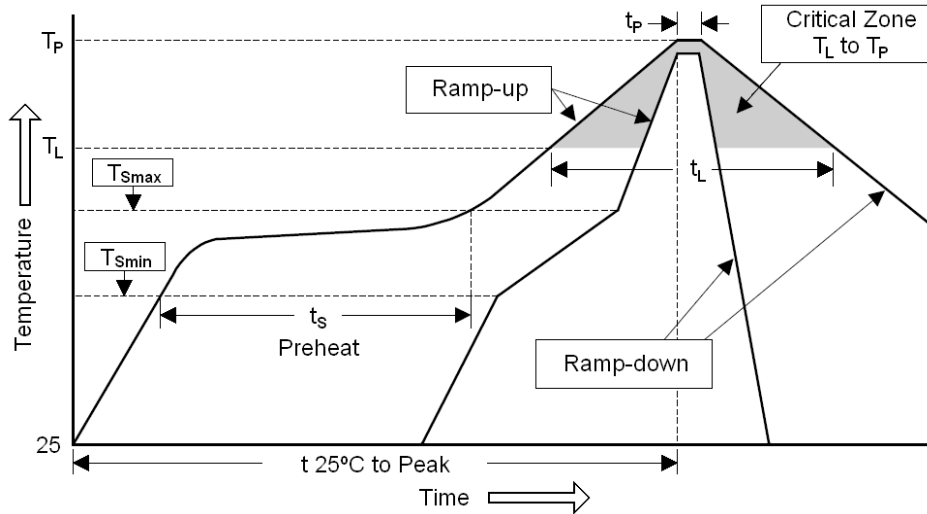


Figure : Temperature Profile

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T _L to T _P)	< 3°C/sec	< 3°C/sec
Preheat		
- Temperature Min (T _{Smin})	100°C	100°C
- Temperature Max (T _{Smax})	150°C	200°C
- Time (Min to Max) (t _s)	60 ~ 120 sec	60 ~ 180 sec
T _{Smax} to T _L		
- Ramp-up rate	< 3°C/sec	< 3°C/sec
Time maintained above:		
- Temperature (T _L)	183°C	217°C
- Time (t _L)	60 ~ 150 sec	60 ~ 150 sec
Peak Temperature (T _P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t _p)	10 ~ 30 sec	20 ~ 40 sec
Ramp-down rate	< 6°C/sec	< 6°C/sec
Time 25°C to Peak Temperature	< 6 minutes	< 8 minutes

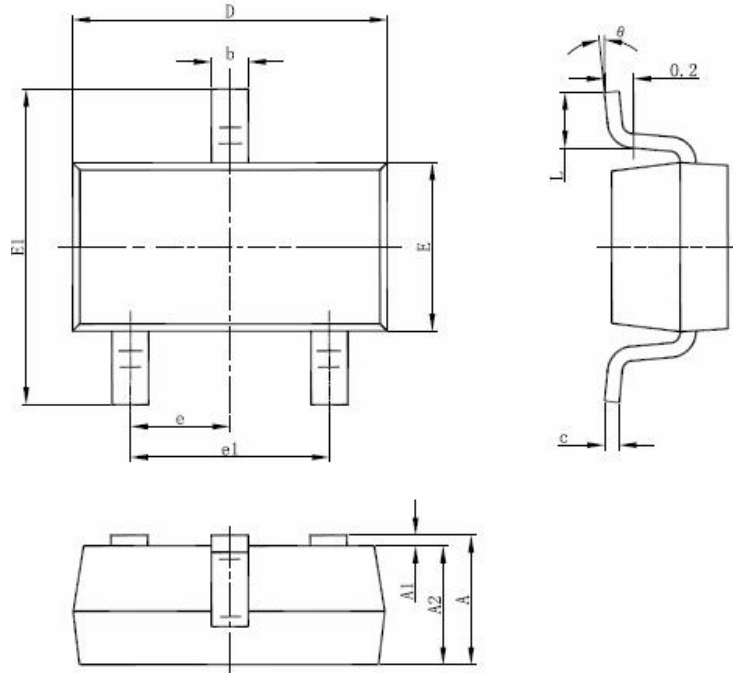
3. Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb devices	245°C ±5°C	5sec ±1sec
Pb-Free devices	260°C +0/-5°C	5sec ±1sec

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- MOS 管电路是静电敏感元器件，且对生产环境要求较严，建议在存放、运输及生产操作时一定要避免静电干扰。
- 由于每个 PCB 版图和设计都不同，每个 MOSFET 的结构也不同，因此，没有通用的流程可用来计算每个应用的最大允许电流，建议在选用 MOS 管器件时考虑到余量，以免 MOS 管因此而造成损坏。

Package Mechanical Data-SOT-23



Symbol	Dimensions In Millimeters		Dimensions In 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	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°