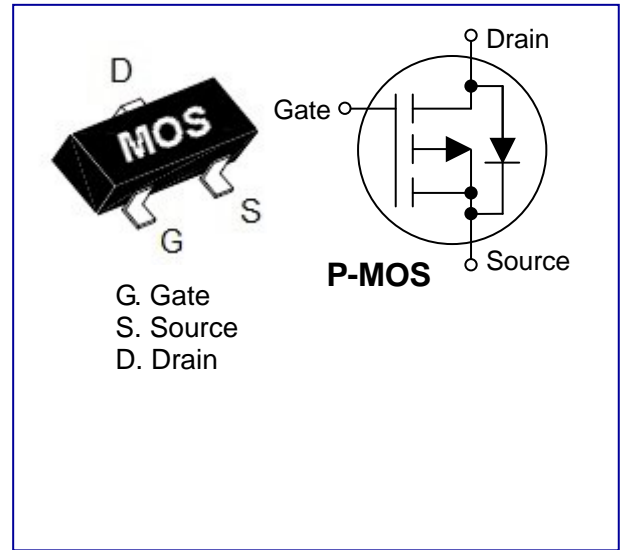


**General Description**

- $I_D = -2.8A @ V_{GS} = -4.5V$
- $R_{DS(on)} = 69m\Omega (Typ.) @ V_{GS} = -4.5V$
- $R_{DS(on)} = 94m\Omega (Typ.) @ V_{GS} = -2.5V$
- $R_{DS(on)} = 130m\Omega (Typ.) @ V_{GS} = -1.8V$
- Low Gate charge
- Fast switching speed
- Improved dv/dt capability
- Suit for -1.8V gate drive applications
- Application:
  - Note Book
  - Load Switch
  - Hand Held Instruments
  - Switching Appliance
  - Power Management
- Lead free and green devices are available
- Package: SOT23-3L


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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 10$	V
Drain Current <sup>a</sup>	$T_C = 25^\circ C$	$I_D$	-2.6	A
	$T_C = 25^\circ C, t \leq 5s$		-3.3	
	$T_C = 70^\circ C$		-1.56	
Drain Current – Pulsed <sup>a</sup>		$I_{DM}$	-10.4	A
Power Dissipation ( $T_C = 25^\circ C$ )		$P_D$	1.56	W
Power Dissipation – Derate Above $25^\circ C$			0.012	
Storage Temperature Range		$T_{STG}$	-55 ~ +150	$^\circ C$
Operating Junction Temperature Range		$T_J$	-55 ~ +150	$^\circ C$
Thermal Resistance, Junction-to-Ambient1		$R_{\theta JA}$	100	$^\circ C/W$

**Electrical Characteristics ( $T_J = 25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	---	---	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$T_J = 25^\circ C, V_{DS} = -16V, V_{GS} = 0V$	---	---	-1	$\mu A$
Gate-Body Leakage	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$	---	---	$\pm 100$	nA
<b>On Characteristics <sup>a</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.3	-0.6	-1.0	V

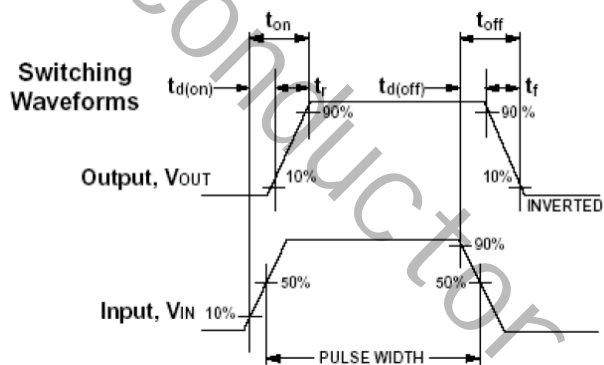
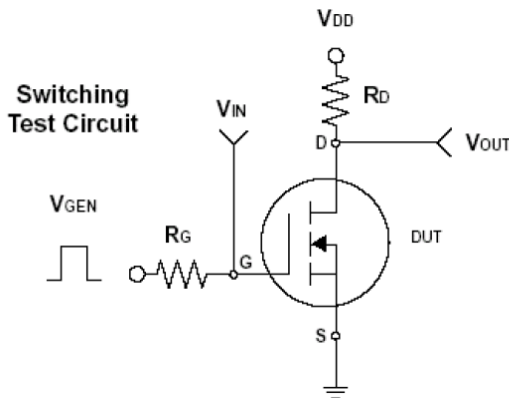
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.0A$	---	69	85	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2.0A$	---	94	120	
		$V_{GS}=-1.8V, I_D=-1.0A$	---	130	170	
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-1A$	---	2.2	---	S
<b>Drain-Source Diode Characteristics <sup>a</sup></b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V$ , Force Current	---	---	-2.6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A$	---	---	-1.3	V
<b>Dynamic Characteristics <sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, F=1MHz$	---	350	510	pF
Output Capacitance	$C_{oss}$		---	65	95	
Reverse Transfer Capacitance	$C_{rss}$		---	50	75	
<b>Switching Characteristics <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-2.6A$	---	4.8	8	nC
Gate-Source Charge	$Q_{gs}$		---	0.5	1	
Gate-Drain Charge	$Q_{gd}$		---	1.9	4	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=25\Omega, I_D=-1A$	---	3.5	7	ns
Rise Time	$T_r$		---	12.6	24	
Turn-Off Delay Time	$T_{d(off)}$		---	32.5	62	
Fall Time	$T_f$		---	8.4	16	

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

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

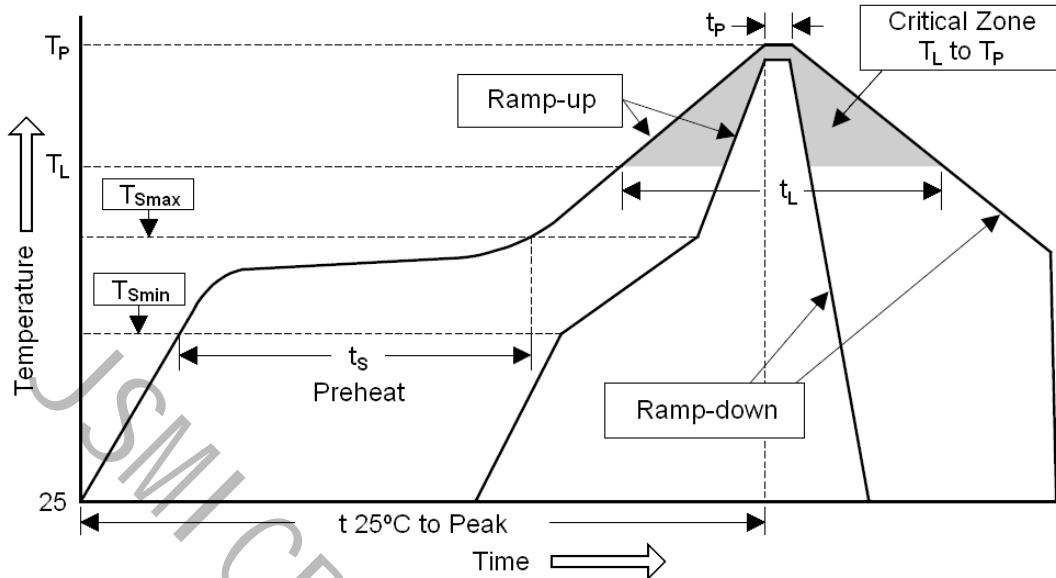
c. Guaranteed by design, not subject to production testing.

### Switching Time Test Circuit and Waveforms



**Soldering Methods For Products**

- Storage environment : Temperature=10°C~35°C, Humidity=65%±15%
- 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

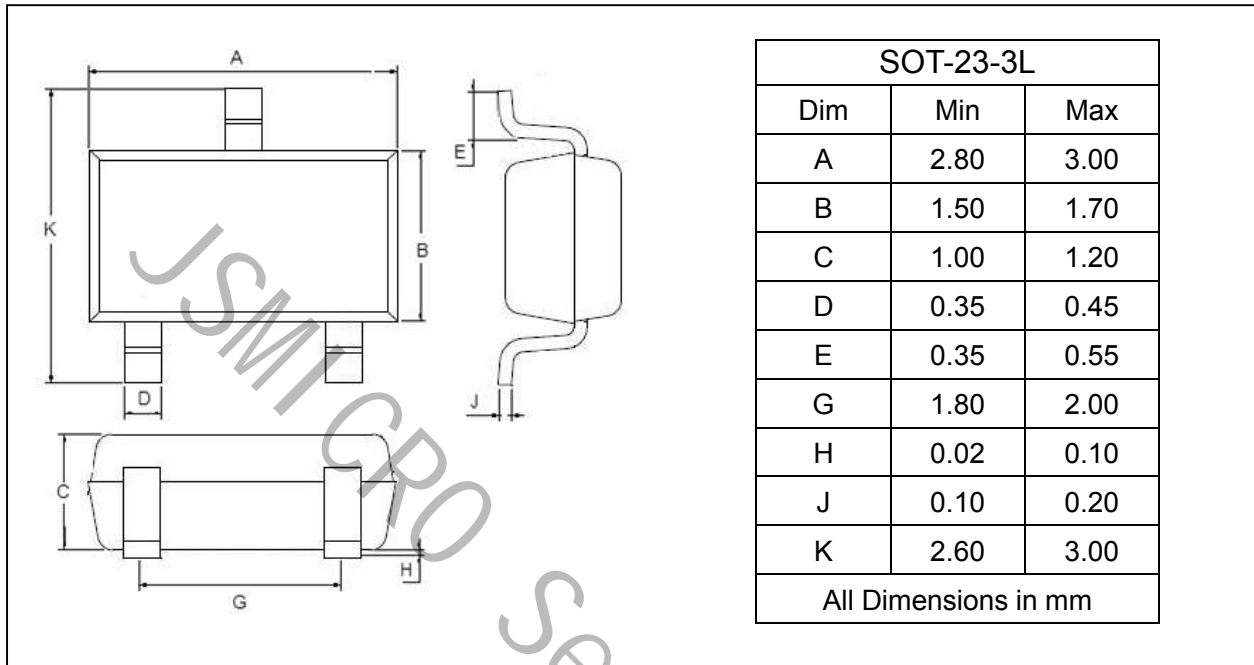
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- MOS 管电路是静电敏感元器件，且对生产环境要求较严，建议在存放、运输及生产操作时一定要避免静电干扰。
- 经锡炉或回焊炉的温度切勿超过 260 °C。

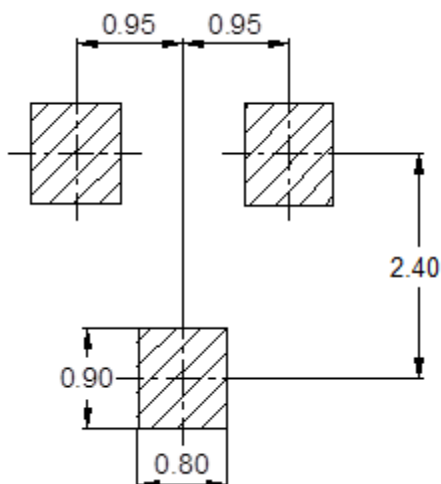
## PACKAGE OUTLINE

Plastic surface mounted package

SOT-23-3L



## SOLDERING FOOTPRINT



Unit : mm

## PACKAGE INFORMATION

Device	Package	Shipping
JSM2301SL	SOT-23-3L	3000/Tape&Reel