

Dual 600mA Low Dropout Regulators

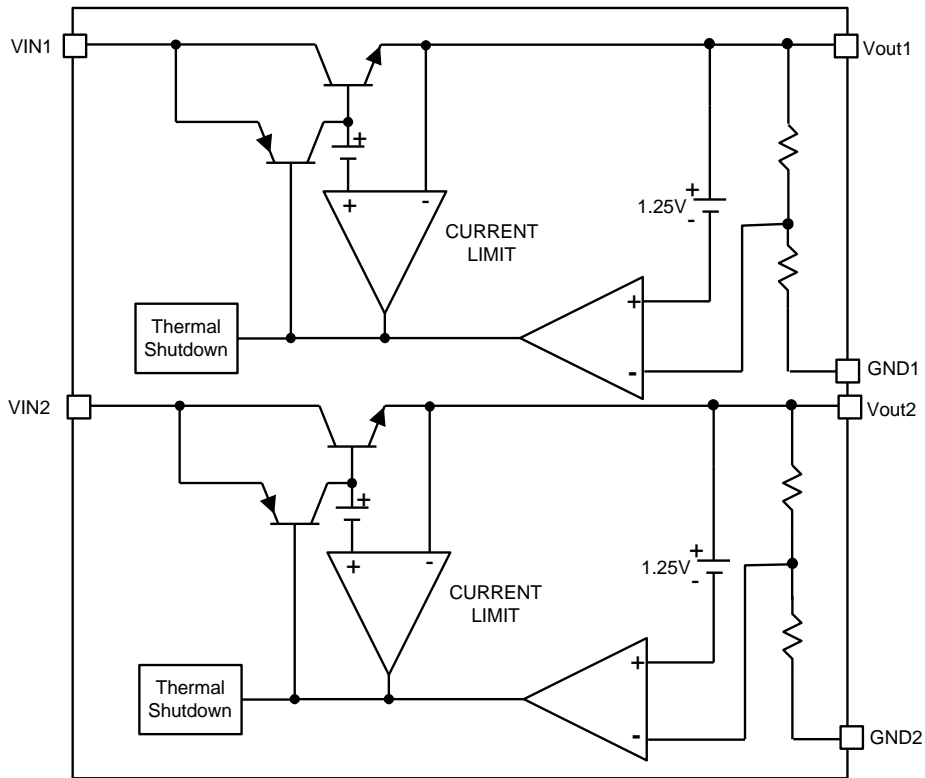
❖ GENERAL DESCRIPTION

AX1120 is dual low dropout positive regulator with minimum of 600mA output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current logic supply. AX1120 series are guaranteed to have <1.3V dropout at full load current making it ideal to provide well regulated outputs dual channels with up to 12V input supply, but depend on Power Dissipation Limitation for using. To prevent oscillation, it is recommended to use minimum 1uF dielectric capacitors for Input/Output Capacitors, In general, the input capacitor in the range of 1uF to 10uF sufficient. The AX1120 is available in the TO252-5L and SOP-8L with exposed pad packages.

❖ FEATURES

- Input voltage range :2.75V to 12V
- 1.3V maximum dropout at full load current
- Built-in thermal shutdown
- Output current limiting for each channel
- Dual output voltage:
VOUT1 is 3.3V/600mA
VOUT2 is 1.8V/600mA
(Depend on layout thermal pad size and VIN voltage)
- Good noise rejection
- Fast transient response
- Low-ESR Ceramic Capacitor(MLCC) Required for Stability
- Available in the TO252-5L and SOP-8L with exposed pad packages

❖ BLOCK DIAGRAM



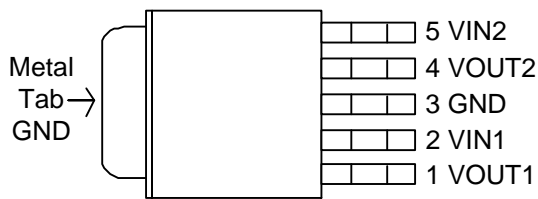
❖ PIN ASSIGNMENT

The packages of AX1120 are TO252-5L and SOP-8L-EP; the pin assignment is given by:

(Side View)

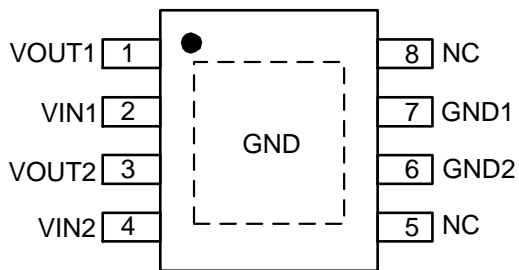


(Top View)



TO252-5L

(Top View)



SOP-8L-EP

Name	Pin Number		Description
	TO252	SOP8	
VIN1	2	2	Channel 1 Power input
VOUT1	1	1	Channel 1 Output Voltage
GND1	-	7	Channel 1 Ground
VIN2	5	4	Channel 2 Power input
VOUT2	4	3	Channel 2 Output Voltage
GND2	-	6	Channel 2 Ground
GND	3	-	Dual Channel Common Ground

❖ ORDER/MARKING INFORMATION (at $T_A=25^\circ\text{C}$)

Order Information	Top Marking (SOP-8L-EP/TO252-5L)
<p>AX1120 XX X</p> <p>Package Packing</p> <p>ES : SOP-8L-EP A : Taping</p> <p>D5 : TO252-5L</p>	<p>AX 1 1 2 0 → Part number</p> <p>Y Y W W X → ID code: internal</p> <p> → WW: 01~ 52</p> <p> → Year: 10=2010</p> <p> 11=2011</p>

❖ ABSOLUTE MAXIMUM RATINGS (at $T_A=25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
V_{IN} Pin Voltage	$V_{IN1/2}$	GND - 0.3 to + 15	V
Power Dissipation	PD	Internally Limited	mW
Storage Temperature Range	T_{ST}	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	T_{OPJ}	0 to +125	$^\circ\text{C}$
Thermal Resistance from Junction to case	SOP-8L-EP	15	$^\circ\text{C/W}$
	TO252	10	
Thermal Resistance from Junction to ambient	SOP-8L-EP	40	$^\circ\text{C/W}$
	TO252	45	

Note: θ_{JA} is measured with the PCB copper area of approximately 1.5 in²(Multi-layer). That need connect to Tap or Exposed pad pin.

❖ **ELECTRICAL CHARACTERISTICS** $T_A=25^{\circ}\text{C}$ (unless otherwise noted)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Input Voltage	$V_{IN1/2}$		2.75	-	12	V
Output Voltage	V_{OUT1}	$I_{OUT1} = 10\text{mA}$, $T_J = 25^{\circ}\text{C}$, $4.8\text{V} \leq V_{IN1} \leq 12\text{V}$	3.235	3.300	3.365	V
	V_{OUT2}	$I_{OUT2} = 10\text{mA}$, $T_J = 25^{\circ}\text{C}$, $4.0\text{V} \leq V_{IN2} \leq 12\text{V}$	1.764	1.800	1.836	V
Line Regulation	$\Delta V_{LINE1/2}$	$I_O = 10\text{mA}$, $V_{OUT} + 1.5\text{V} < V_{IN} < 12\text{V}$, $T_J = 25^{\circ}\text{C}$ (Note 1,2)	-	-	0.3	%
Load Regulation	$\Delta V_{LOAD1/2}$	$V_{IN} = V_{OUT} + 1.5\text{V}$, $10\text{mA} \leq I_{OUT} \leq 0.6\text{A}$, $T_J = 25^{\circ}\text{C}$ (Note 1,2)	-	-	1	%
Dropout Voltage ($V_{IN} - V_{OUT}$)	$V_{DROP1/2}$	$I_{OUT} = 0.6\text{A}$, $\Delta V_{OUT} = 1\% V_{OUT}$	-	1.1	1.3	V
Current Limit	$I_{LIMIT1/2}$	$(V_{IN1/2} - V_{OUT1/2}) = 3\text{V}$	0.8	1.1	-	A
Minimum Load Current	$I_{OUT(Min)1/2}$	$0^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$ (Note 3)	-	5	10	mA
Ripple Rejection	$PSRR1/2$	$F = 120\text{Hz}$, $C_{OUT} = 10\mu\text{F}$, $I_{OUT1/2} = 0.6\text{A}$	60	70	-	dB
Temperature Stability		$I_{OUT1/2} = 10\text{mA}$	-	0.5	-	%
Thermal Shutdown Temperature	T_{ST}		-	150	-	$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	T_{SH}		-	20	-	$^{\circ}\text{C}$

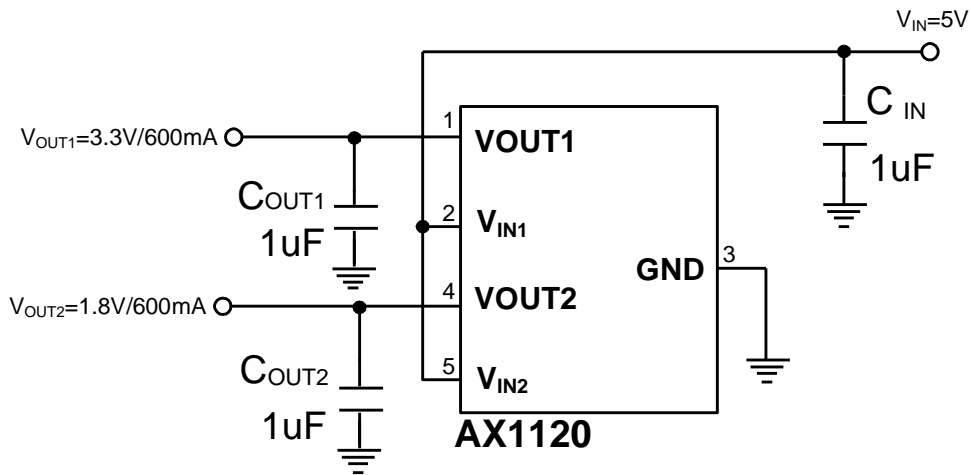
Note 1: See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.

Note 2: Line and load regulation are guaranteed up to the maximum power dissipation of 2W. Power dissipation is determined by the difference between input and output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

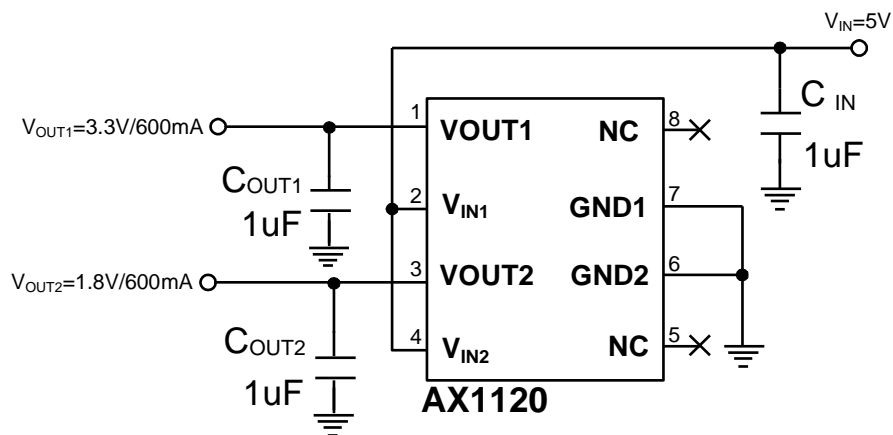
Note 3: Quiescent current is defined as the minimum output current required in maintaining regulation. At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.

❖ APPLICATION CIRCUIT

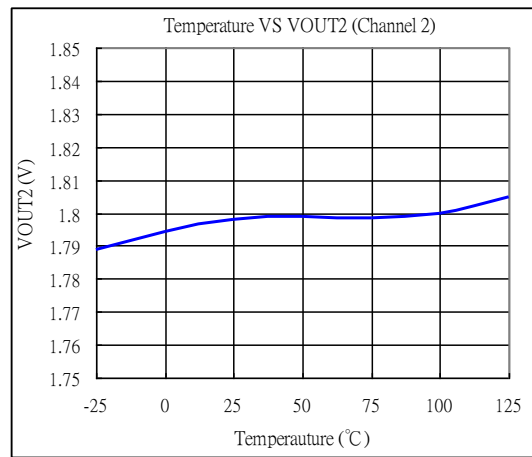
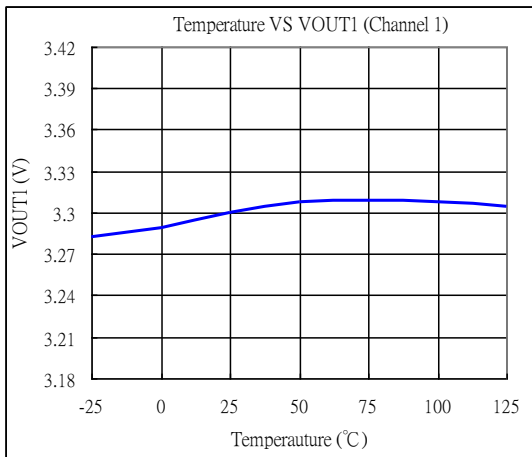
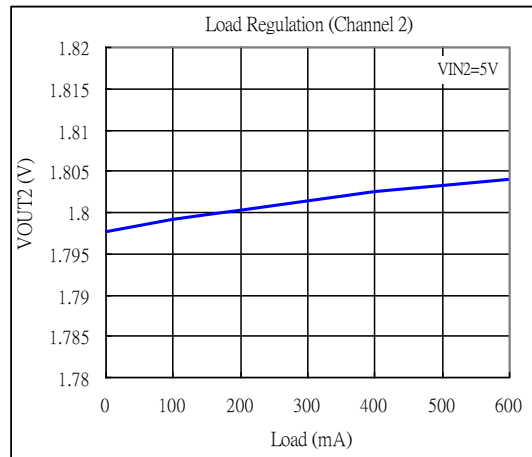
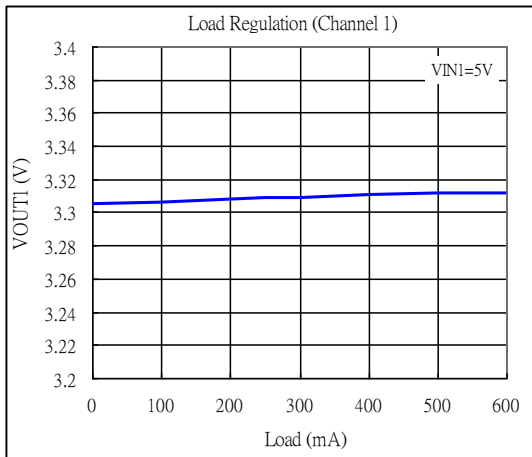
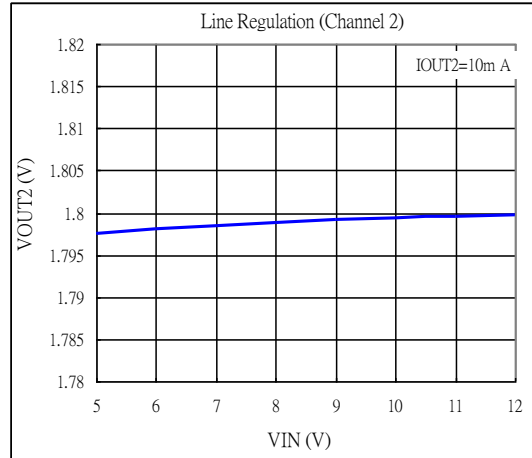
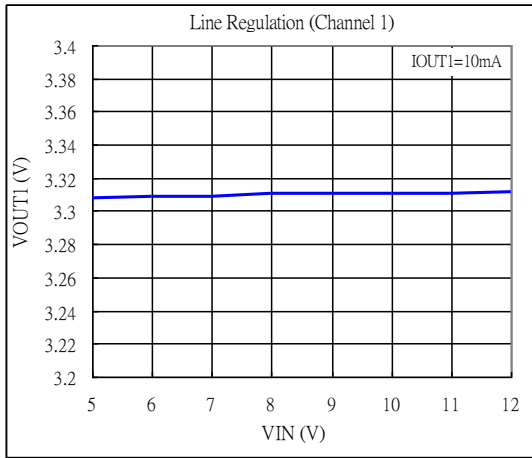
(1) T0252-5L



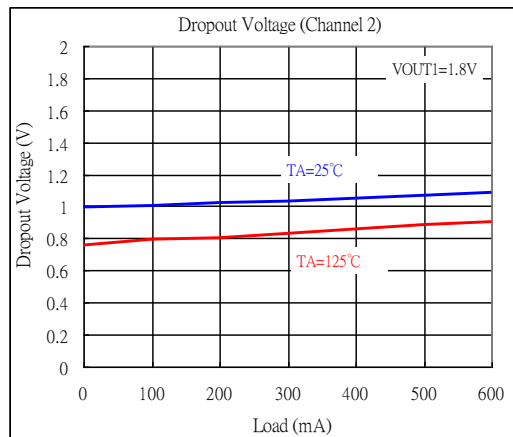
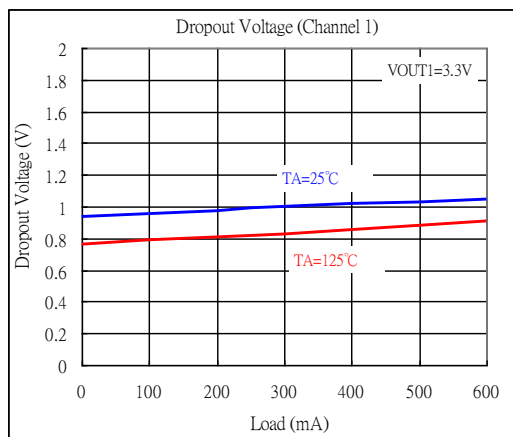
(2) SOP-8L-EP



❖ TYPICAL CHARACTERISTICS

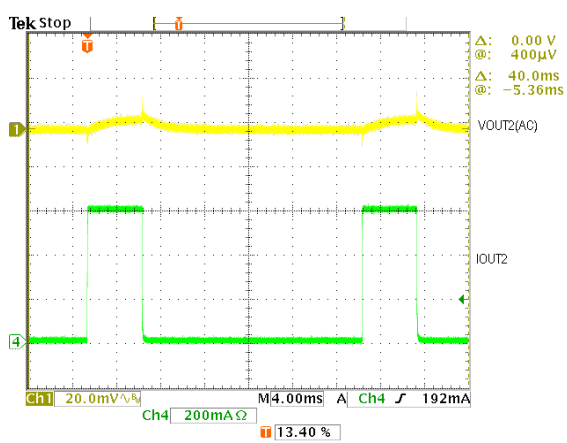
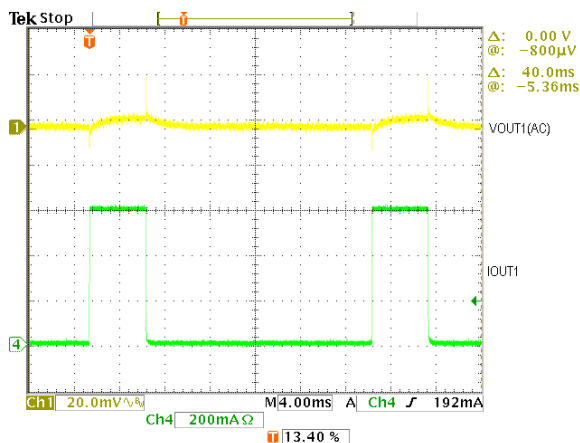


❖ TYPICAL CHARACTERISTICS (CONTINUED)



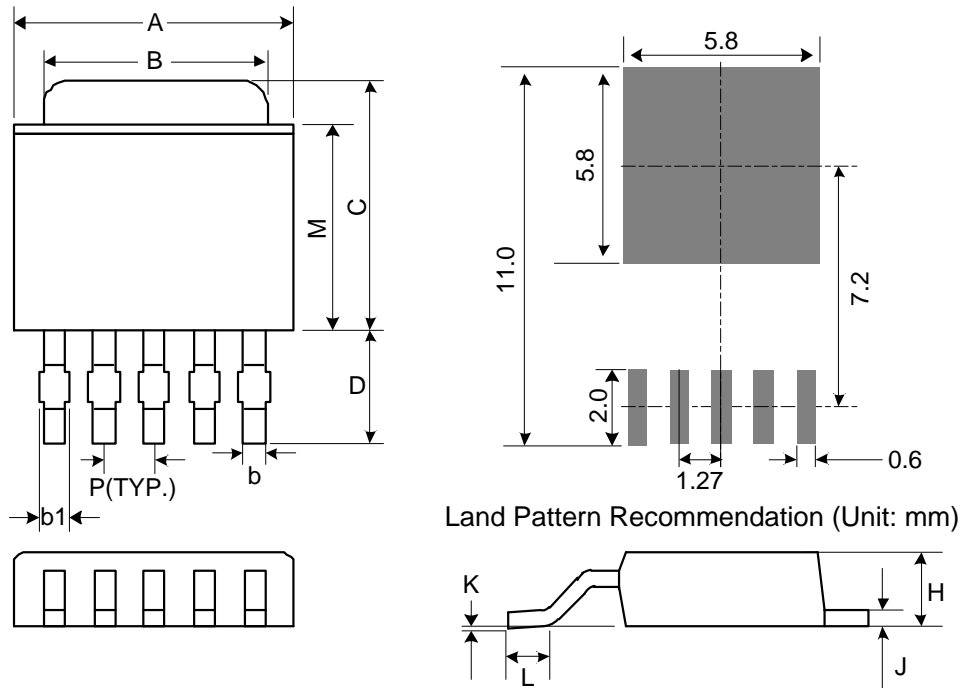
Load Transient (VOUT1)

Load Transient (VOUT1)



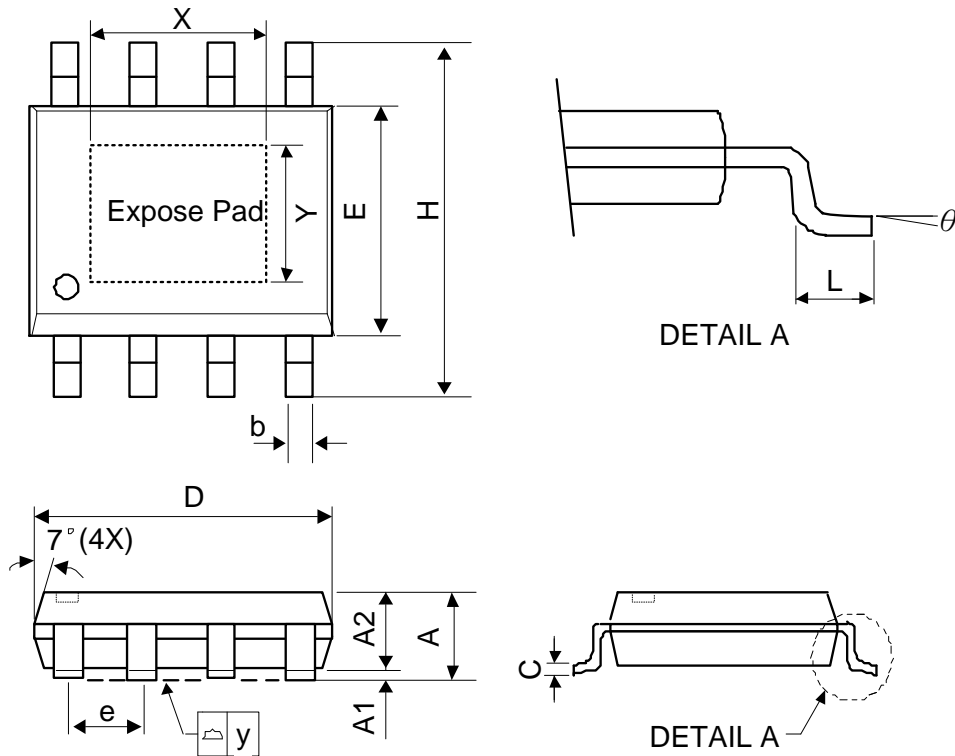
❖ PACKAGE OUTLINES

(1) T0252-5L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	6.35	6.6	6.73	0.25	0.26	0.265
B	5.21	5.33	5.46	0.205	0.21	0.215
C	6.86	7.24	7.62	0.27	0.285	0.3
D	2.67 REF			0.105 REF		
P	1.27 REF			0.050 REF		
H	2.18	2.29	2.39	0.086	0.09	0.094
J	0.46	0.51	0.58	0.018	0.02	0.023
K	0	0.08	0.13	0	0.003	0.005
L	1.4	1.6	1.78	0.055	0.063	0.07
M	5.33	5.46	5.59	0.21	0.215	0.22
b	0.38	0.56	0.71	0.015	0.022	0.028
b1	0.38	0.53	0.66	0.015	0.021	0.026

Mold flash shall not exceed 0.005inch per side

(2)SOP-8L-EP


Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.75	-	-	0.069
A1	0	-	0.15	0	-	0.06
A2	1.25	-	-	0.049	-	-
C	0.1	0.2	0.25	0.0075	0.008	0.01
D	4.7	4.9	5.1	0.185	0.193	0.2
E	3.7	3.9	4.1	0.146	0.154	0.161
H	5.8	6	6.2	0.228	0.236	0.244
L	0.4	-	1.27	0.015	-	0.05
b	0.31	0.41	0.51	0.012	0.016	0.02
e	1.27 BSC			0.050 BSC		
y	-	-	0.1	-	-	0.004
X	-	2.34	-	-	0.092	-
Y	-	2.34	-	-	0.092	-
theta	0°	-	8°	0°	-	8°

Mold flash shall not exceed 0.25mm per side
JEDEC outline: MS-012 BA