

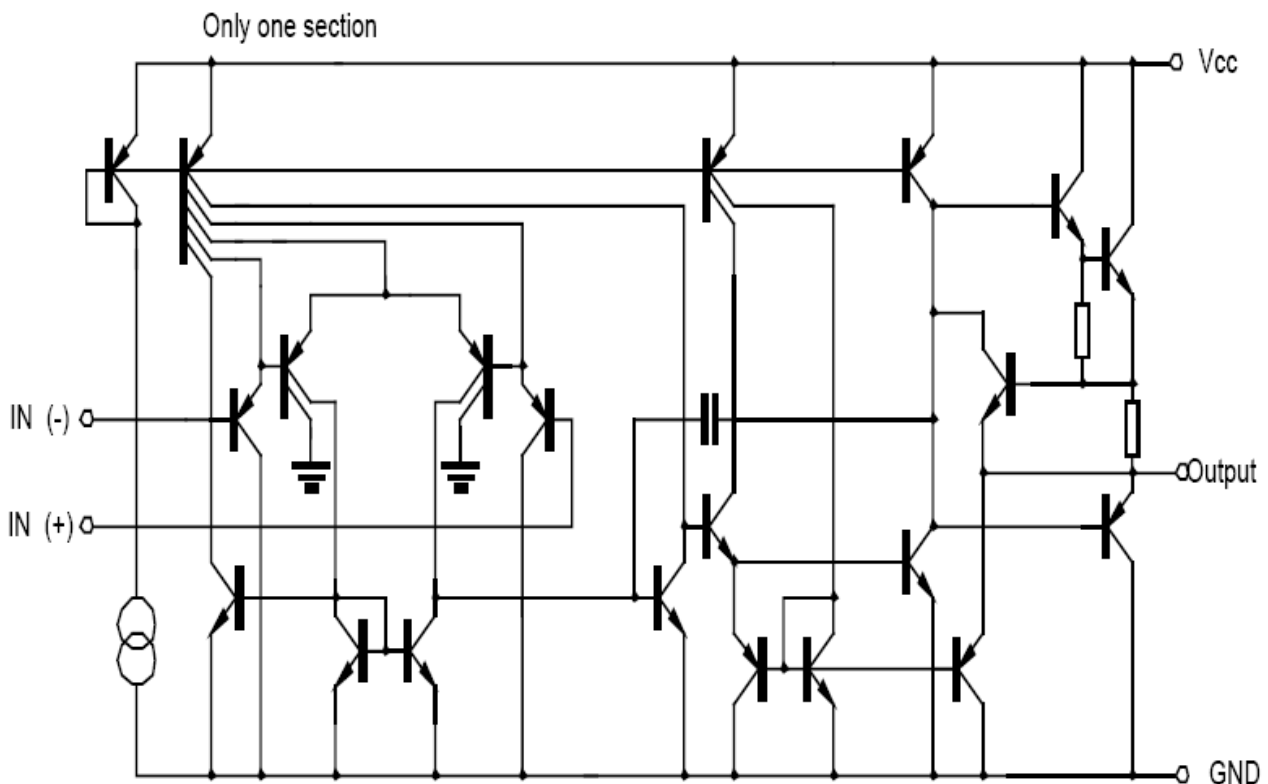
GENERAL DESCRIPTION

The LM324 consists of four independent, high gain, internally frequency compensated operational amplifiers. Which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies the magnitude of the power supply voltage. Application areas include Transducer amplifiers, DC gain blocks and all the conventional op amp circuits.

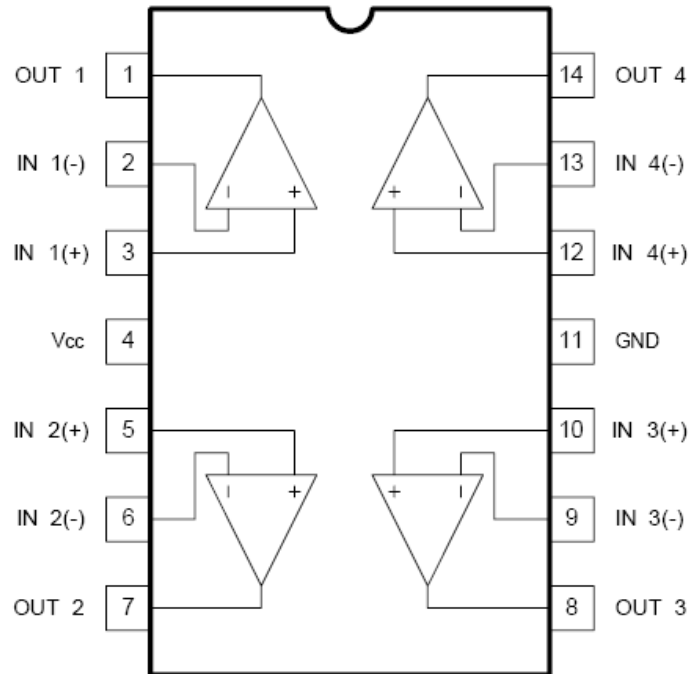
FEATURES

- ◆ Internally frequency compensated for unity gain.
- ◆ Large DC voltage gain: 100dB,
- ◆ Wide power supply range: 3V~30V (or $\pm 1.5V \sim \pm 15V$)
- ◆ Input common-mode voltage range includes ground.
- ◆ Large output voltage swing: 0V DC to $V_{CC} - 1.5V$ DC
- ◆ Power drain suitable for battery operation

Block Diagram



Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{CC}	Power supply Voltage	30 or ± 15	V
V _{I(DIFF)}	Differential Input Voltage	30	V
P _D	Power Dissipation	570	mW
T _{OPR}	Operating Temperature Range	0 to 80	°C
T _{STG}	Storage Temperature	-40 to +150	°C
T _L	Lead Temperatur, 1mm from Case for 10 Seconds	280	°C

Electrical Characteristics (VCC=5.0V, All voltage referenced to GND unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Offset	V _{IO}	V _{CC} =5V to MAX, V _{IC} =VICR Min, V _O =1.4V	25°C	3	7	mV
			FULL range		9	
Input Offset Current	I _{IO}	V _O =1.4V	25°C	5	50	nA
Input Bias Current	I _{BIAS}	V _O =1.4V	25°C	-20	-250	nA
Common-mode input voltage range	V _{I(R)}	V _{CC} =5V to MAX	25°C	0	V _{CC} -1.5	V
High-level output voltage	V _{O(H)}	V _{CC} =MAX, R _L =2KΩ		26		V
		V _{CC} =MAX, R _L =10KΩ	FULL range	27	28	
LOW-LEVEL OUTPUT VOLTAGE	V _{O(L)}	V _{CC} =5V, R _L =10K Ω	FULL range	5	20	mV
Large-signal differential voltage amplification	A _{VD}	V _{CC} =15V , V _O =1V to 11V	25°C	25	100	V/mv
		R _L =2K Ω	Full range	15		
Common-mode rejection ratio	CMRR	V _{CC} =15v to MAX V _{IC} =VICR min	25°C	65	85	dB
K _{SVR} Supply voltage rejection ratio	PSRR	V _{CC} =15v, R _L ≥2KΩ, V _O =1V to 11V	25°C	65	100	dB
Crosstalk attenuation	V01/V02	f=1 kHz to 20 kHz	25°C		120	dB
Crosstalk attenuation	I _O	V _{IN+} =1V, V _{IN-} =0V, V _{CC} =15V, V _O =2V	25°C	-20	-30	mA
			Full range	-10		
		V _{IN+} =0V, V _{IN-} =1V, V _{CC} =15V, V _O =2V	25°C	10	20	
			Full range	5		
		V _{IN-} =-1V, V _O =200mA	25°C	12	30	mA
Short-circuit output current	I _{OS}	V _{CC} at 5V GND at -5V, V _O =0	25°C	+40	+60	mA
supply current (four amplifiers)	I _{CC}	V _O =2.5V, No load	Full	0.7	1.2	mA
		V _{CC} =MAX, V _O = 0.5V _{CC} , No load	Range	1.1	3	

★ All characteristics are measured under open loop conditions with zero common-mode input voltage unless otherwise specified. "MAX" V_{CC} for testing purposes is 30 V. Full range is 0°C to 80 °C

Typical Performance Characteristics

Fig.1 Input Voltage Range

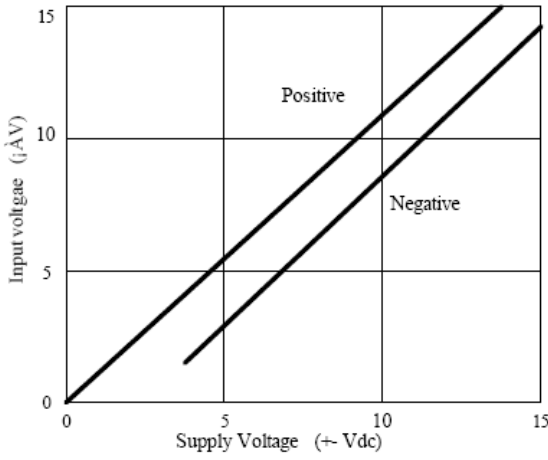


Fig.2 Input Current

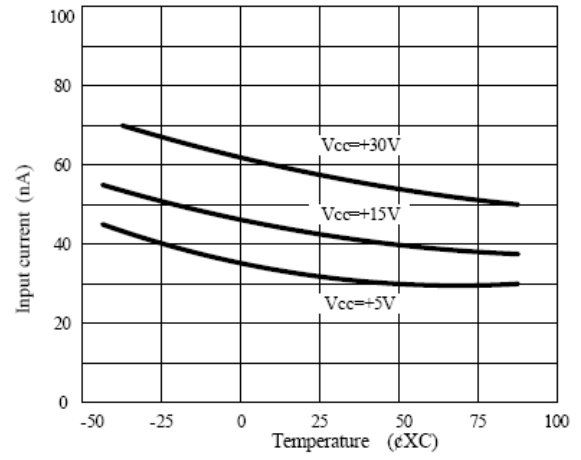


Fig.3 Supply Current

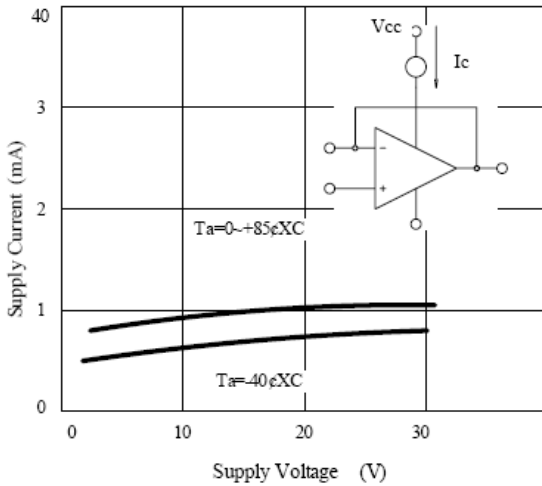


Fig.4 Voltage Gain

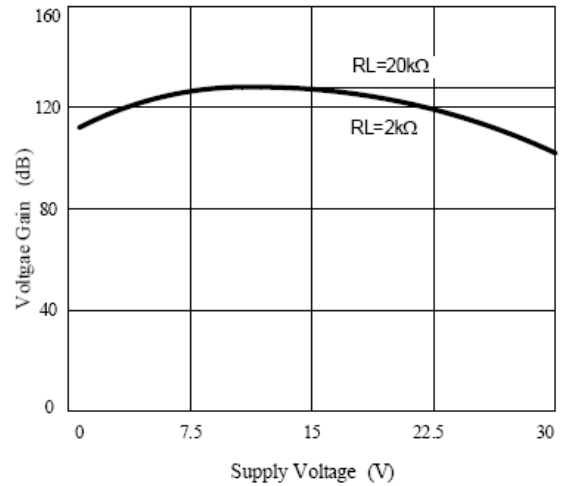


Fig.5 Open Loop Frequency response

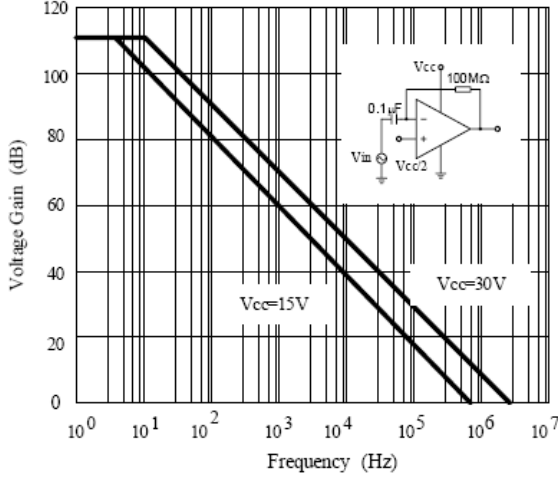
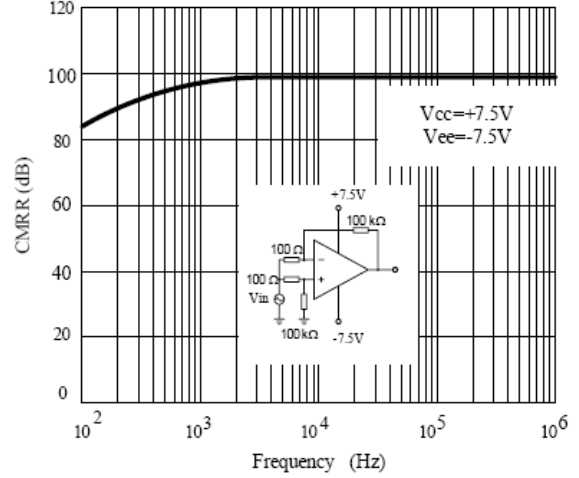


Fig.6 Common-mode rejection Ratio



Typical Performance Characteristics(cont.)

Fig.7

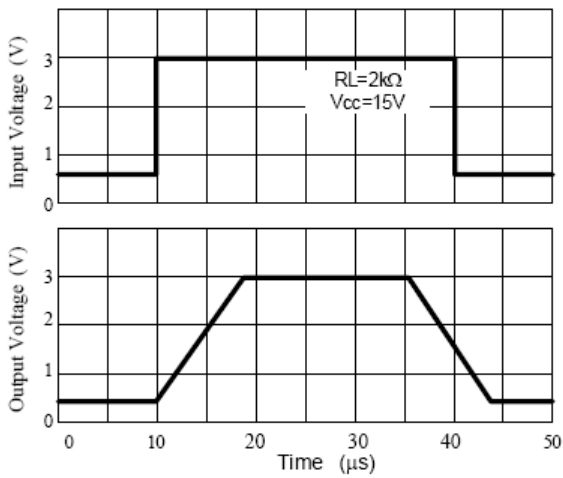


Fig.8 Voltage Follower pulse response (small signal)

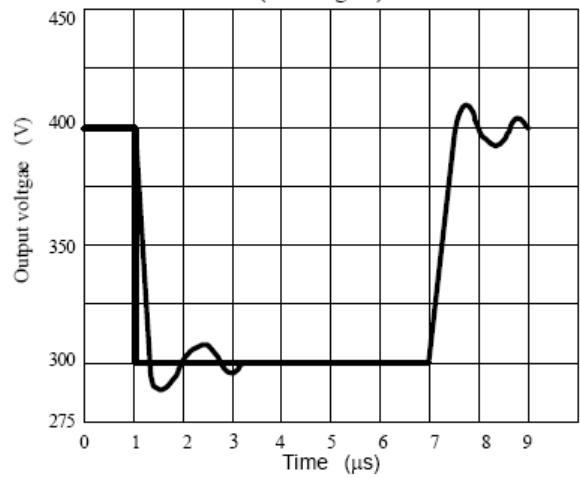


Fig.9 Large signal Frequency Response

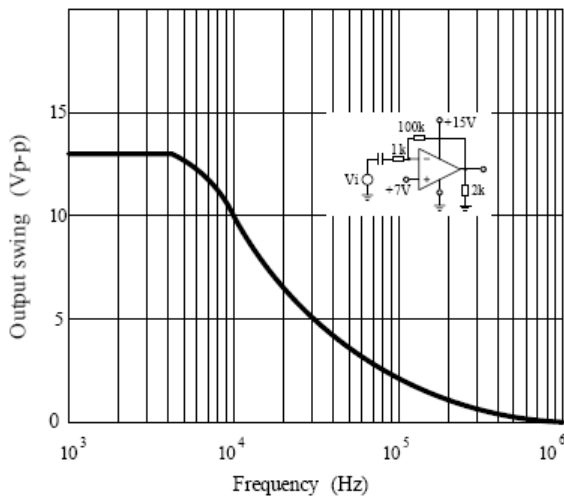


Fig.10 Output Characteristics current sourcing

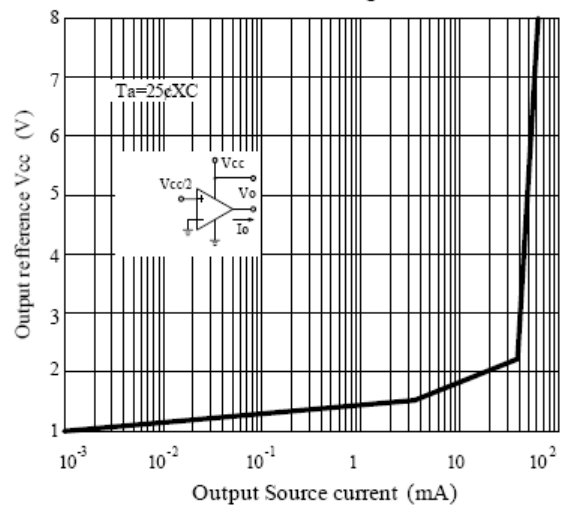


Fig.11 Output Characteristics Current sinking

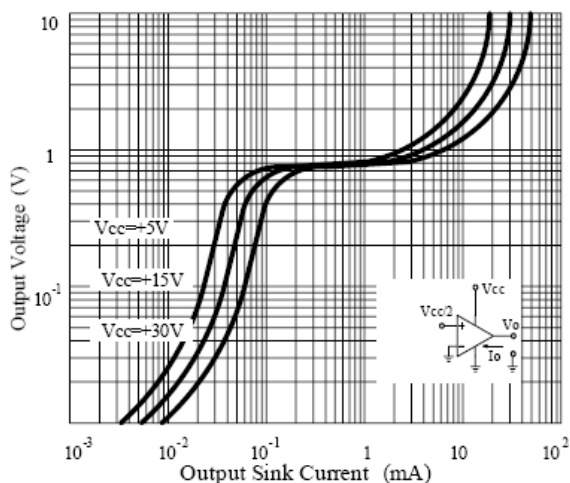
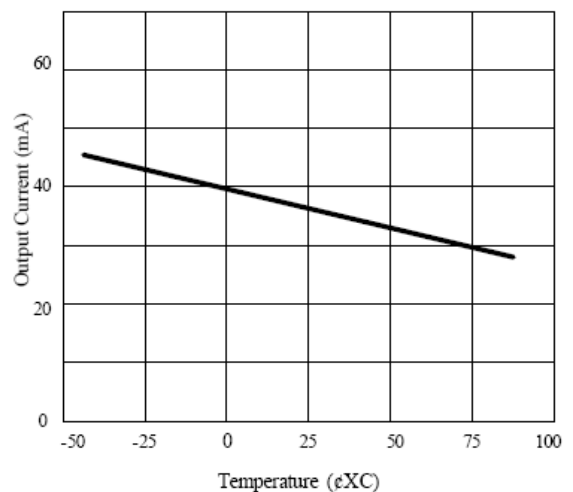
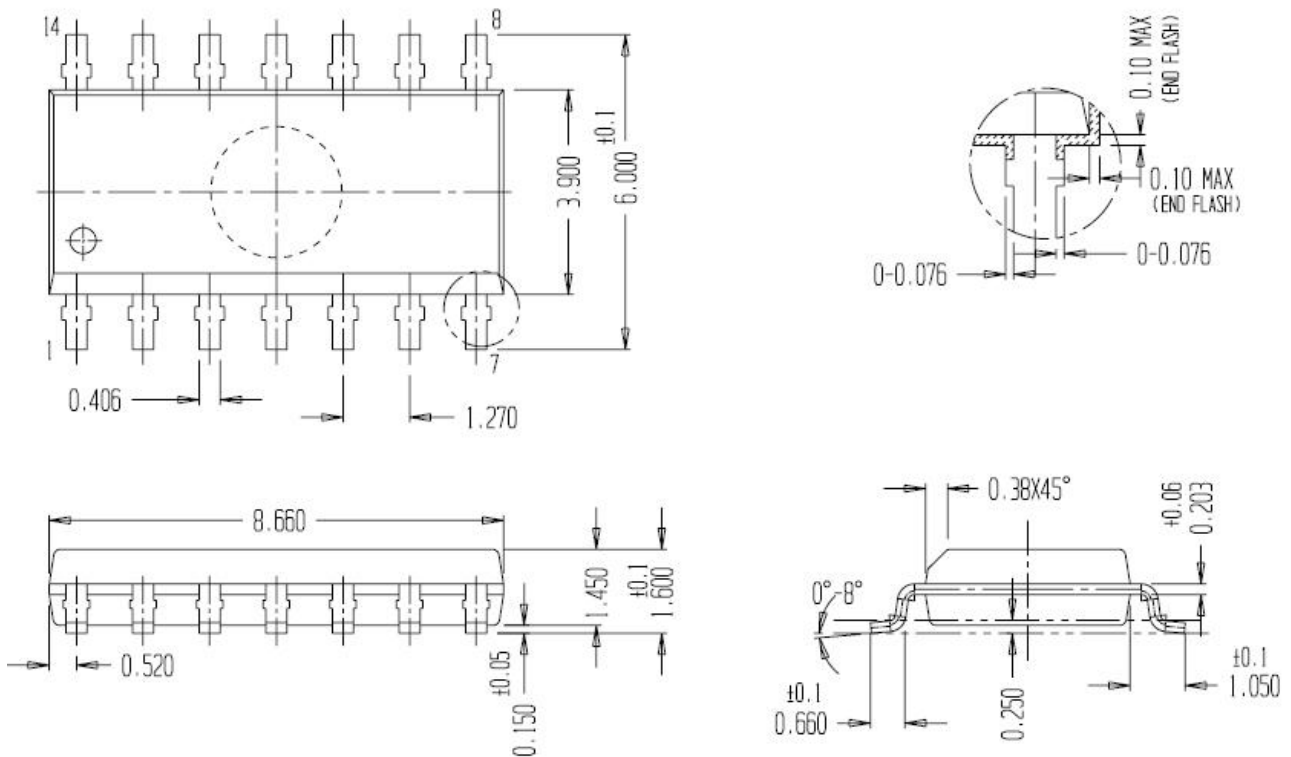


Fig.12 Current Limiting

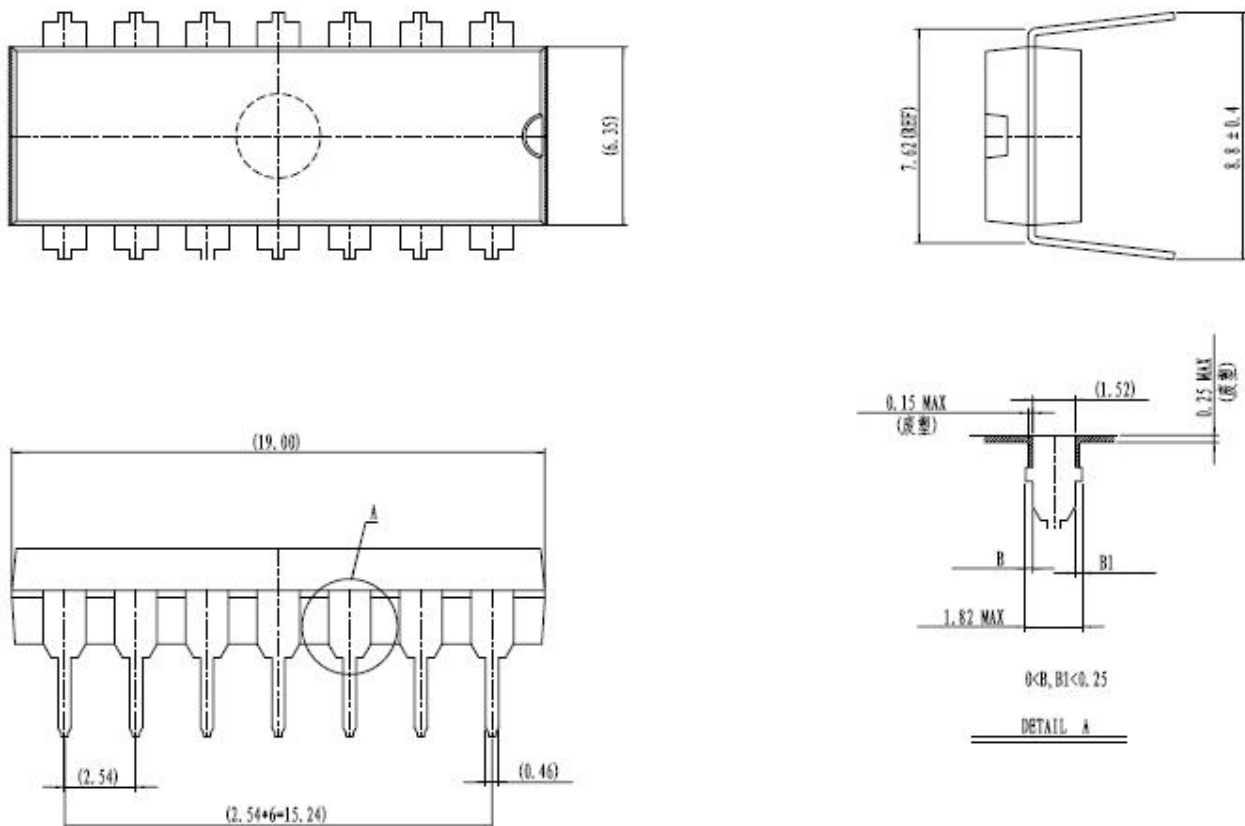


Package Description

SOP14 PACKAGE OUTLINE DIMENSIONS



DIP14 PACKAGE OUTLINE DIMENSIONS



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