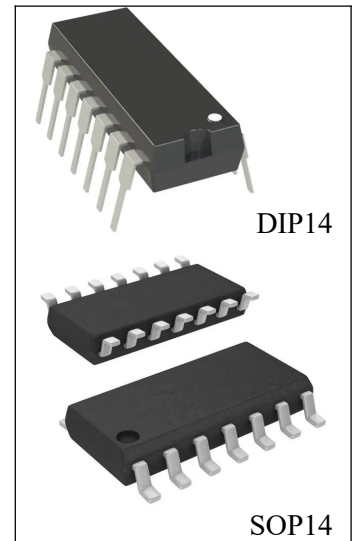


General Description

The SL5020 contains two variable gain circuits configured for compressing and expanding the dynamic range of an audio signal. One circuit is configured as an expander, while the other circuit can be configured as a compressor or expander. Each circuit has a full wave rectifier to provide average value information to a variable gain cell located in either the input stage or the feedback path.

An internal temperature stable bandgap reference provides the necessary precision voltages and currents required. It contains also compressor and expander mute circuit.

SL5020 is available in DIP14 or SOP14 packages.



Features

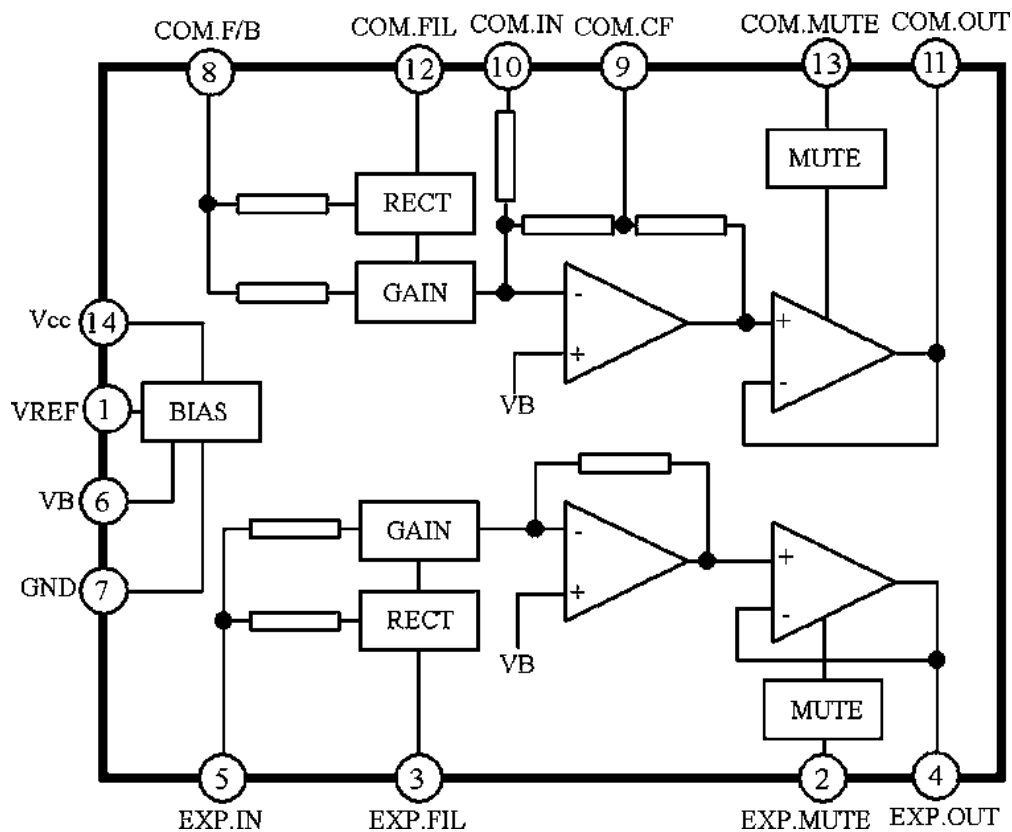
- Low voltage operation $V_{opr} = 1.8 \sim 5.0V$
- Decreasing external component
- Built in compressor and expander mute circuit
- Unity gain level set a 100mVrms
- Response time adjustable

Package Information

Part NO.	Package Description	Package Marking	Package Option
SL5020(F)	SOP14	CHMC SXXXX SL5020	50/Tube 4000/Reel
SL5020	DIP14	CHMC SXXXX SL5020	25/Tube

CHMC:Trademark SL5020:Part NO. SXXXX:Lot NO.

Block Diagram



Absolute Maximum Ratings (Ta=25 °C)

Characteristic	Symbol	Value	Unit
Maximum Supply Voltage	Vcc	10	V
Power Dissipation	PD	410	mW
Storage Temperature Range	Tstg	-55~150	°C

Operating Conditions

- Operating Supply Voltage : 1.8 ~ 5.0 V
- Operating Temperature Range : -20 ~ 70°C
- Input frequency Range : 100Hz ~ 20kHz
- Input Voltage : Compressor Input = 600mVrms
(Vcc=3V) Expander Input = 260mVrms

Pin Voltage and Descriptions

Pin NO	Symbol	Voltage	Description
1	V _{REF}	1.3	Bandgap Voltage
2	EX P. MUTE	1.4	Expander mute adjust
3	EX P. FILTER	0~0.6	Expander Filter. Connect to an external capacitor to filter the full wave rectifier 's output. This capacitor affects attack & delay times, as well as low frequency accuracy.
4	EX P. OUTPUT	1.5	Output of the expander amplifier.
5	EX P. INPUT	1.5	Expander input. Nominally signal range is 3.16m Vrms to 260mVrms. Must be capacitor coupled to the signal source
6	V _B	2.2	An internal reference voltage. This is an AC ground, and must be well filtered to obtain high power supply rejection and low crosstalk.
7	GND	GND	Ground
8	COM.FEEDBACK	1.5	Input to the compressor Variable gain stage and rectifier.
9	COM.CF	1.5	Normally, this is connected to the compressor 's output through filtered DC feedback path.
10	COM.INPUT	1.5	Compressor input, Normally, Signal range is 100μVrms to 1. 0Vrms. Must be capacitor coupled to the signal source.
11	COM.OUTPUT	1.5	Output of the compressor amplifier.
12	COM.FILTER	0~0.6	Compressor filter. Connect to an external capacitor to filter the full wave rectifier 's output. This capacitor affects attack & decay times, and low frequency accuracy
13	COM.MUTE	1.4	Compressor mute adjust.
14	V _{cc}	3	Power supply pin. Connect to power supply providing between 1.8 and 5.0 V.

Electrical Characteristics (Unless otherwise specified: $T_a=25\text{ }^\circ\text{C}$, $V_{cc}=3\text{ V}$, $f=1\text{ kHz}$)

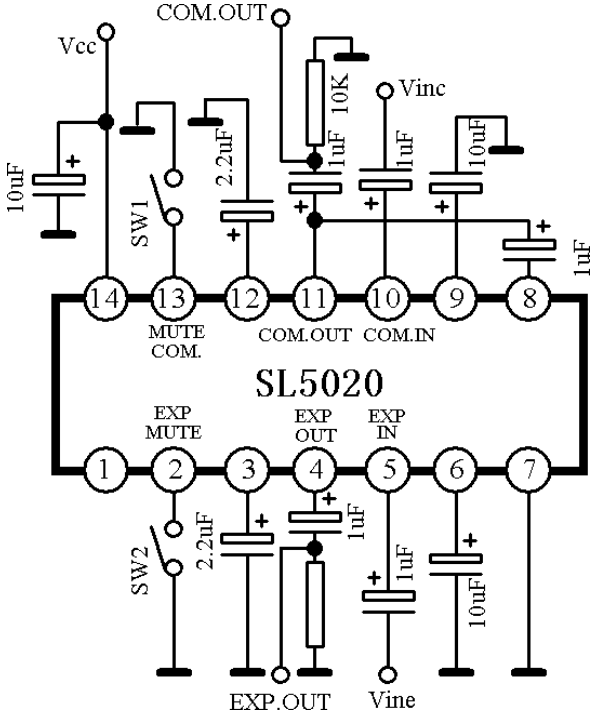
Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Supply current	I _{cc}	No Signal		3.1		mA
Compressor Section						
0dB Gain	G _{c 0}	V _{inc} =100mV _{rms} , 0dB	-1.5	0	1.5	d B
Gain Error (Note 1)	G _{c 1}	V _{inc} =316mV _{rms} , 10dB	-1	0	1	dB
	G _{c 2}	V _{inc} =10mV _{rms} , -20dB	-1	0	1	dB
	G _{c 3}	V _{inc} =1mV _{rms} , -40dB	-1	0	1	dB
	G _{c 4}	V _{inc} =100 μV _{rms} , -60dB	-1	0	1	dB
Distortion	THD _c	V _{inc} =100mV _{rms} , f=1kHz		0.3	1.5	%
Noise Output	V _{noc}	R _g =600 Ω		0.8	5	mV _{rms}
Ripple Rejection Ratio	RR _c	V _{cc} =3V(DC), 1kHz, 100mV _{rms}		-25	-18	d B
Crosstalk(C→E)	CT _c	V _{inc} =100mV _{rms} , Exp Output		-72	-50	d B
Muting Attenuation	Att _c	V _{inc} =100mV _{rms} , V _{pin13} =GND		-65	-50	d B
Input Impedance	R _{inc}	PIN 10		20		kΩ
Expander Section						
0dB Gain	G _{e 0}	V _{inc} =100mV _{rms} , 0dB	-1.5	0	1.5	d B
Gain Error (Note 1)	G _{e 1}	V _{inc} =178mV _{rms} , 5dB	-1	0	1	dB
	G _{e 2}	V _{inc} =31.6mV _{rms} , -10dB	-1	0	1	dB
	G _{e 3}	V _{inc} =10mV _{rms} , -20dB	-1	0	1	dB
	G _{e 4}	V _{inc} =3.16mV _{rms} , -30dB	-1	0	1	dB
Distortion	THD _e	V _{inc} =100mV _{rms} , f=1kHz		0.4	1.5	%
Noise Output	V _{noe}	R _g =600 Ω		0.06	5.0	mV _{rms}
Ripple Rejection Ratio	RR _e	V _{cc} =3V(DC), 1kHz, 100mV _{rms}		-58	-38	d B
Crosstalk(E→C)	CT _e	V _{inc} =100mV _{rms} , Com Output		-34	-24	d B
Muting Attenuation	Att _e	V _{inc} =316mV _{rms} , V _{pin2} =GND		-70	-50	d B
Input Impedance	R _{inc}	PIN 4		4.3		kΩ

(Note 1) Gain Error= (V_{OUT} -20dBV)-V_{IN} ×K K:

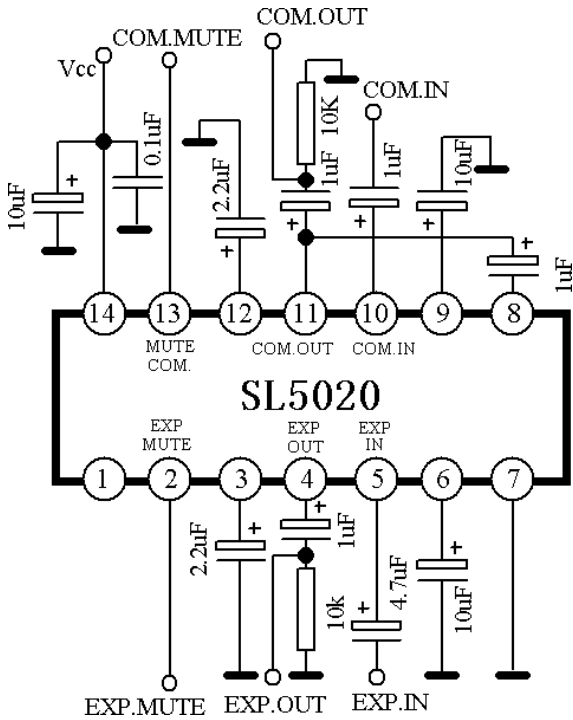
Compressor=0.5

Expander=2

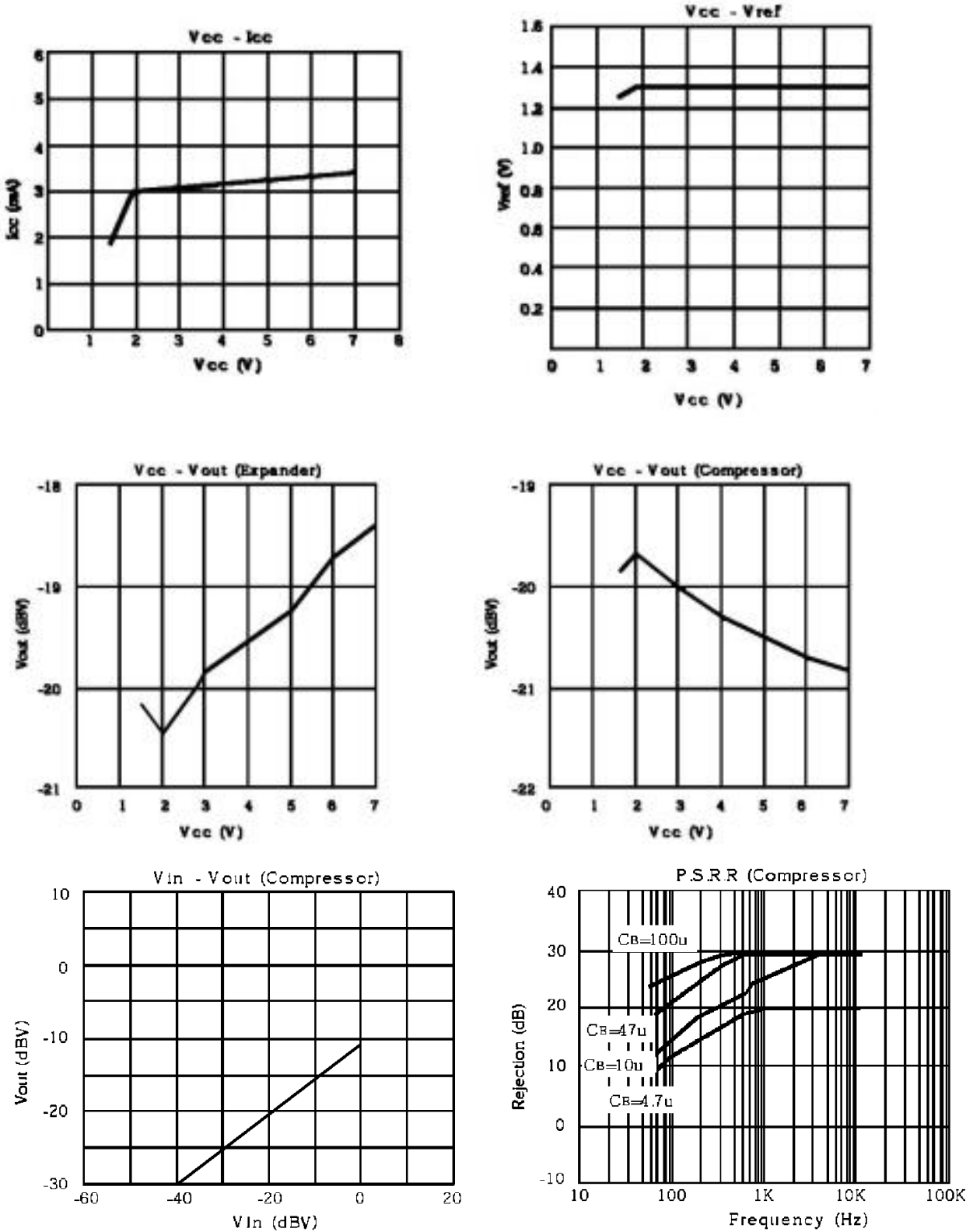
Test Circuit

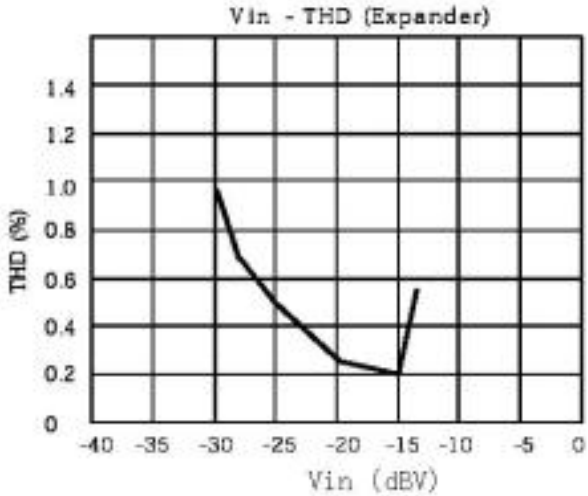
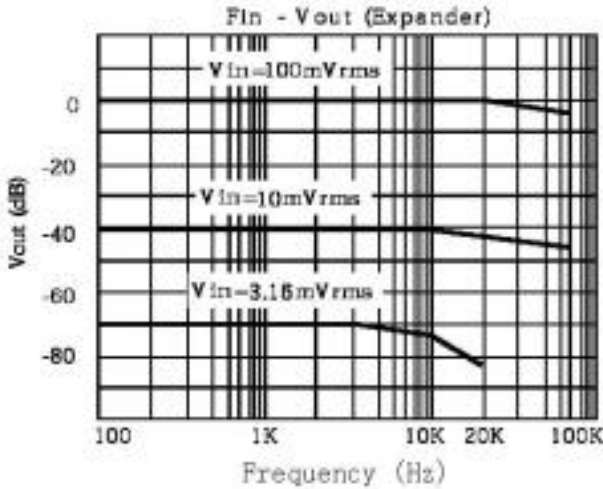
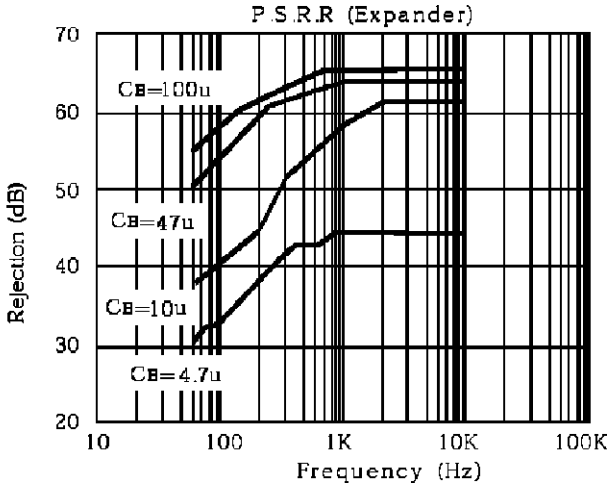
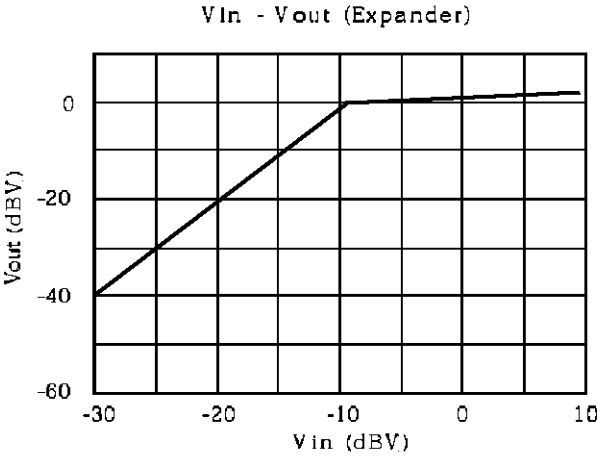
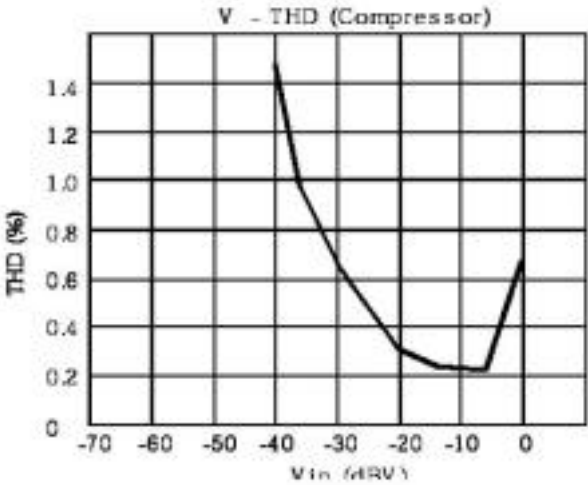
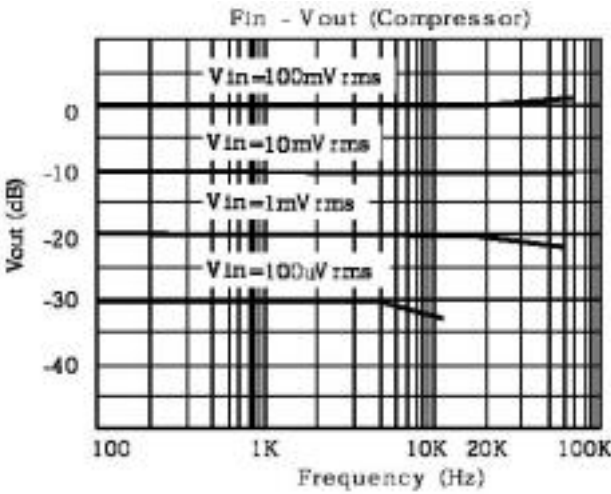


Application Circuit

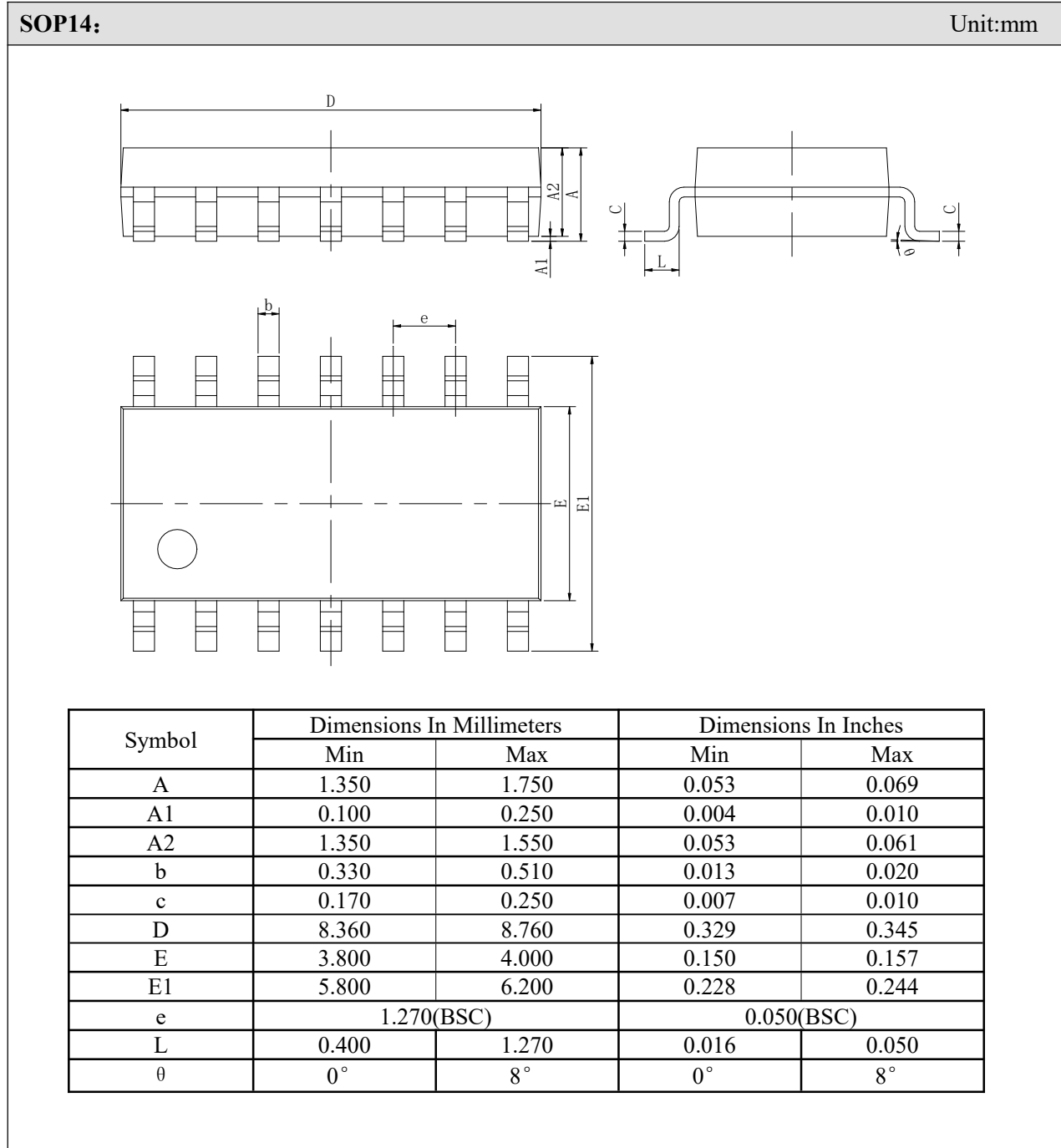


Characteristics Curves



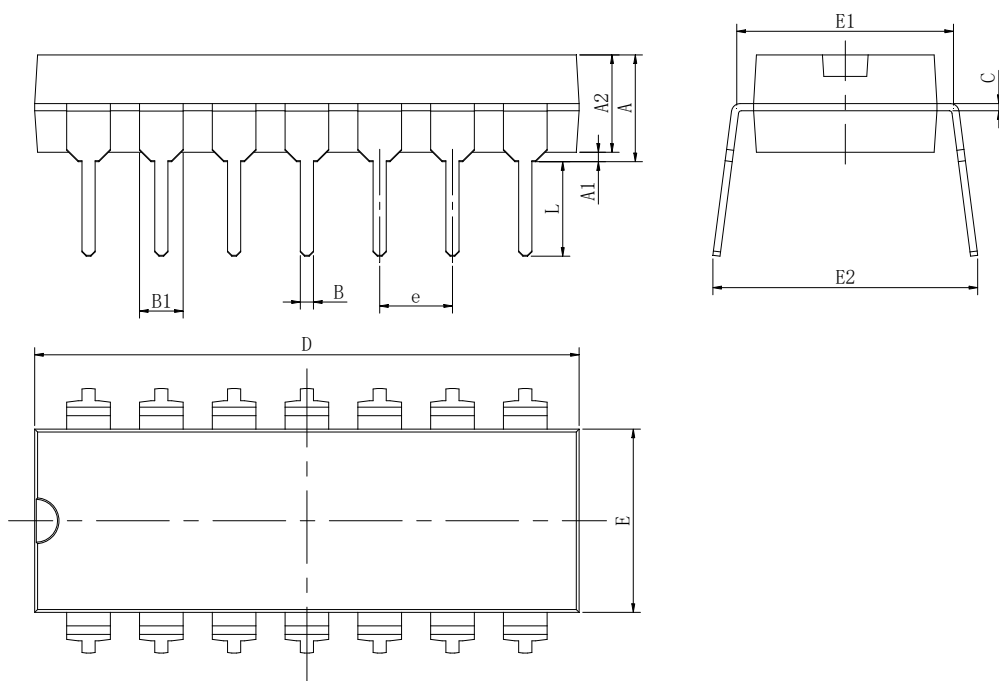


Outline Dimensions



DIP14:

Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

Statements

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