

## 2-CH AUDIO POWER AMPLIFIER(2W X 2)

### DESCRIPTION

The SA7496L is a monolithic two channels power amplifier, it is a stereo 2W+2W class AB output stage in the DIP20 and SOP20 package, specially designed for high quality sound, TV applications.

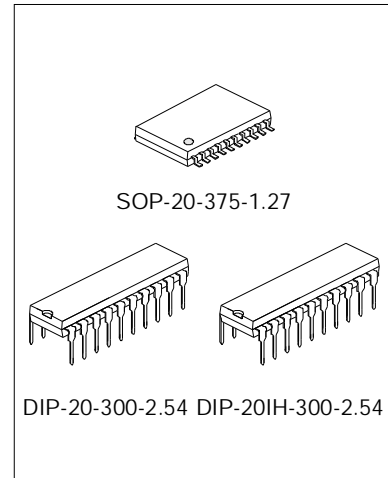
It also has the features of linear volume control, stand-by and mute functions.

### FEATURES

- \* Max output power: 2W+2W(RL=8Ω)
- \* ST-BY & MUTE functions
- \* Linear volume control DC Coupled with power OP.AMP
- \* Short circuit protection
- \* Thermal overload protection
- \* Internally fixed gain
- \* Variable output after volume control circuit

### APPLICATIONS

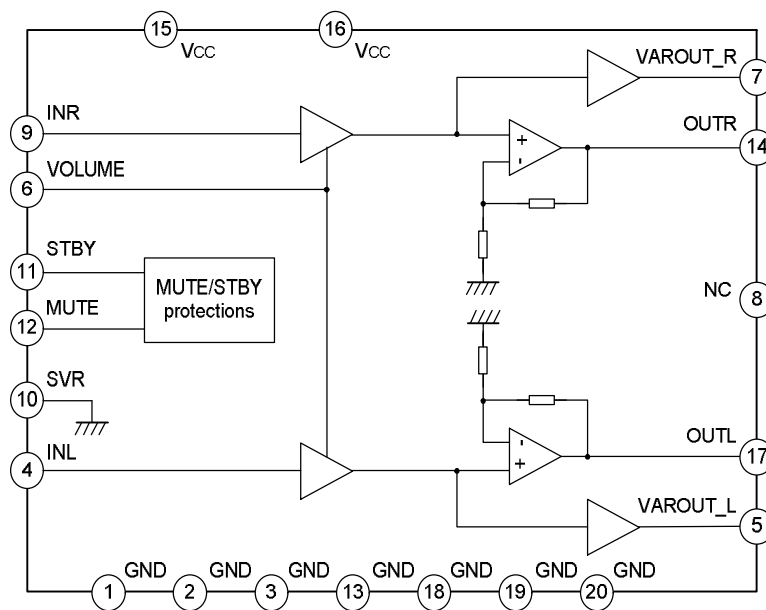
- \* Quality sound
- \* TV applications
- \* PC Speakers
- \* Sound processors
- \* Mini and micro audio receivers



### ORDERING INFORMATION

Device	Package
SA7496	DIP-20IH-300-2.54
SA7496L	DIP-20-300-2.54
SA7496LS	SOP-20-375-1.27

### BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS**

Characteristics		Symbol	Ratings	Unit
DC Supply Voltage		V <sub>CC</sub>	26	V
Maximum Input Voltage		V <sub>IN</sub>	8	V <sub>PP</sub>
Operating Temperature		T <sub>opr</sub>	0 ~ + 70	°C
Storage Temperature		T <sub>stg</sub>	-40 ~ +150	°C
Junction Temperature		T <sub>j</sub>	-40 ~ +150	°C
Volume Control DC Voltage		V <sub>6</sub>	7	V
Thermal Resistance	SA7496	R <sub>th(j-a)1</sub>	50	°C/W
	SA7496L	R <sub>th(j-a)2</sub>	70	°C/W
	SA7496LS	R <sub>th(j-a)3</sub>	80	°C/W

**ELECTRICAL CHARACTERISTICS**

 (Unless otherwise specified, V<sub>CC</sub> =14V, R<sub>L</sub>=8Ω, R<sub>g</sub> =50Ω, f=1KHz, T<sub>amb</sub>=25°C)

Characteristics	Symbol	Test condition	Min.	Typ.	Max.	Unit
Supply Voltage Range	V <sub>CC</sub>	SA7496L/SA7496LS	10	--	16	V
		SA7496*	10	--	18	V
Supply Current	I <sub>CC</sub>	Class AB	--	25	50	mA
Output DC Offset Referred to SVR Potential	DCV <sub>os</sub>	No input Signal	--	200	--	mV
Quiescent Output Voltage	V <sub>O</sub>	--	--	7	--	V
Output Power	P <sub>O</sub>	THD=10%; R <sub>L</sub> =8Ω	1.6	2	--	W
		THD=1%; R <sub>L</sub> =8Ω	--	1.3	--	W
Closed Loop Gain	G <sub>v</sub>	Vol Ctrl > 4.5V	28.5	30	31.5	dB
Monitor Out Gain	G <sub>vline</sub>	Vol Ctrl > 4.5V; Z <sub>load</sub> >30kΩ	-1.5	0	1.5	dB
Attenuation at Minimum Volume	A <sub>min Vol</sub>	Vol Ctrl <0.5V	80	--	--	dB
Total Harmonic Distortion	THD	G <sub>v</sub> =30dB; P <sub>o</sub> =1W; f=1KHz	--	--	0.4	%
Output Peak Current	I <sub>peak</sub>	(Internally limited)	0.7	0.9	--	A
Bandwidth	BW	--	--	0.6	--	MHz
Slew Rate	SR	--	5	8	--	V/us
Input Resistance	R <sub>i</sub>	--	22.5	30	--	kΩ
Variable Output Resistance	R <sub>var out</sub>	--	--	30	100	Ω
Thermal Muting	TM	--	--	150	--	°C
Thermal Shut-down	TS	--	--	160	--	°C
Supply Voltage Rejection	SVR	f= 1kHz; max volume CSVR=470μF; V <sub>RIP</sub> =1V <sub>rms</sub>	35	39	--	dB
		f= 1kHz; max attenuation CSVR=470μF; V <sub>RIP</sub> =1V <sub>rms</sub>	55	65	--	dB

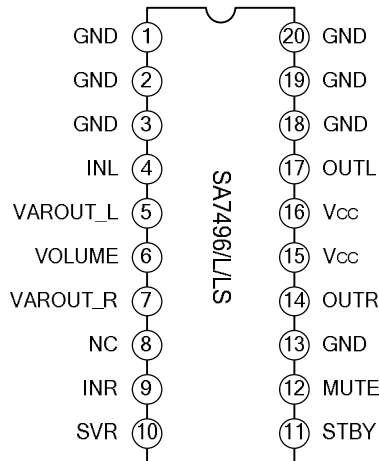
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Characteristics	Symbol	Test condition	Min.	Typ.	Max.	Unit
Total Output Noise	eN	f=20Hz ~22KHz Play, max volume	--	500	800	μV
		f=20Hz ~22KHz Play, max attenuation	--	100	250	μV
		f=20Hz ~22KHz, Mute	--	60	150	μV
MUTE STAND-BY & INPUT SELECTION FUNCTIONS						
Stand-by ON Threshold	VST ON	--	3.5	--	--	V
Stand-by OFF Threshold	VST OFF	--	--	--	1.5	V
Mute ON Threshold	VM ON	--	3.5	--	--	V
Mute OFF Threshold	VM OFF	--	--	--	1.5	V
Mute Attenuation	AMUTE	--	50	65	--	dB
Quiescent Current @ Stand-by	IqST-BY	--	--	0.6	1	mA
Mute Bias Current	ImuteBIAS	Mute	--	1	5	μA
		Play	--	0.2	2	μA
Standby Bias Current	ImuteBIAS	Standby on VST-BY=5V, VMUTE=5V	--	1	5	μA
		Play or Mute	--	0.2	2	μA

\* Because the heat dispersion of package DIP-20IH-300-2.54 is better the other two, the maximum operating voltage of SA7496 is higher than that of SA7496L/SA7496LS. But it is advisable not over 18V advisable.

### PIN CONFIGURATION



### PIN DESCRIPTION

Pin No.	Pin name	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground

(To be continued)

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Pin No.	Pin name	Description
4	INL	Left input
5	VAROUT_L	Left output_1
6	VOLUME	Volume control
7	VAROUT_R	Left output_2
8	NC	Not connect
9	INR	Right input
10	SVR	Supply voltage rejection
11	STBY	Stand by pin
12	MUTE	MUTE pin
13	GND	Ground
14	OUTR	Right output
15	Vcc	Supply voltage
16	Vcc	Supply voltage
17	OUTL	Left output
18	GND	Ground
19	GND	Ground
20	GND	Ground

## FUNCTION DESCRIPTION

The SA7496L is a semiconductor integrated circuit consisting of two channel power amplifiers, which is a stereo class AB power amplifier, specially designed for high quality sound, TV applications, which include linear volume control, stand-by and mute functions.

There are the MUTE and STAND-BY turn on and off conversion circuit in order to eliminate the plops noise. When the both voltages are low and the operation will be normal. While the STAND-BY is high, the circuit will turn off the bias current, so it will be the stand-by state. Also when the STAND-BY is low and the MUTE is high, the circuit will be the mute state, in this operation, the bias current of the signal channels will be shutdown.

The SA7469L built-in a DC volume control circuit. While the voltage of pin6 is 0, the output voltage will be 0; and the gain will be increased as the pin6's voltages go up.

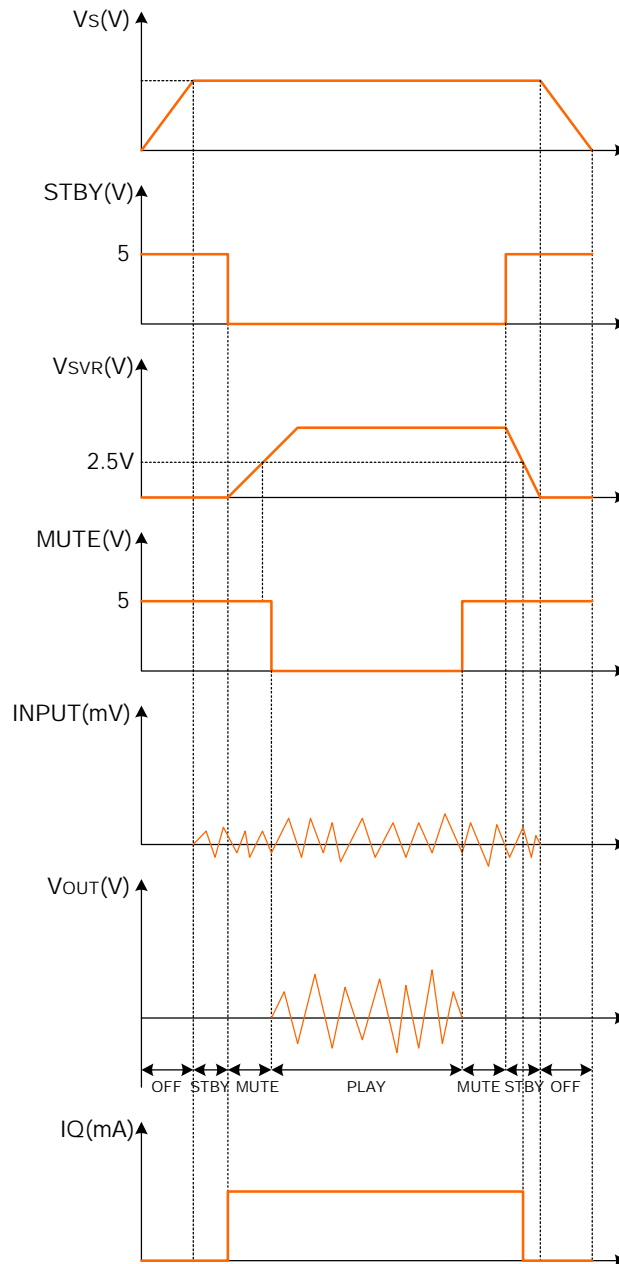
In this circuit, as the operation temperature's increase, the transistor's threshold limit value will decrease, when the temperature up to 150 °C, the thermal protection circuit will turn on and the signal channel will be shutdown.

## MUTE & STAND-BY TRUTH TABLE

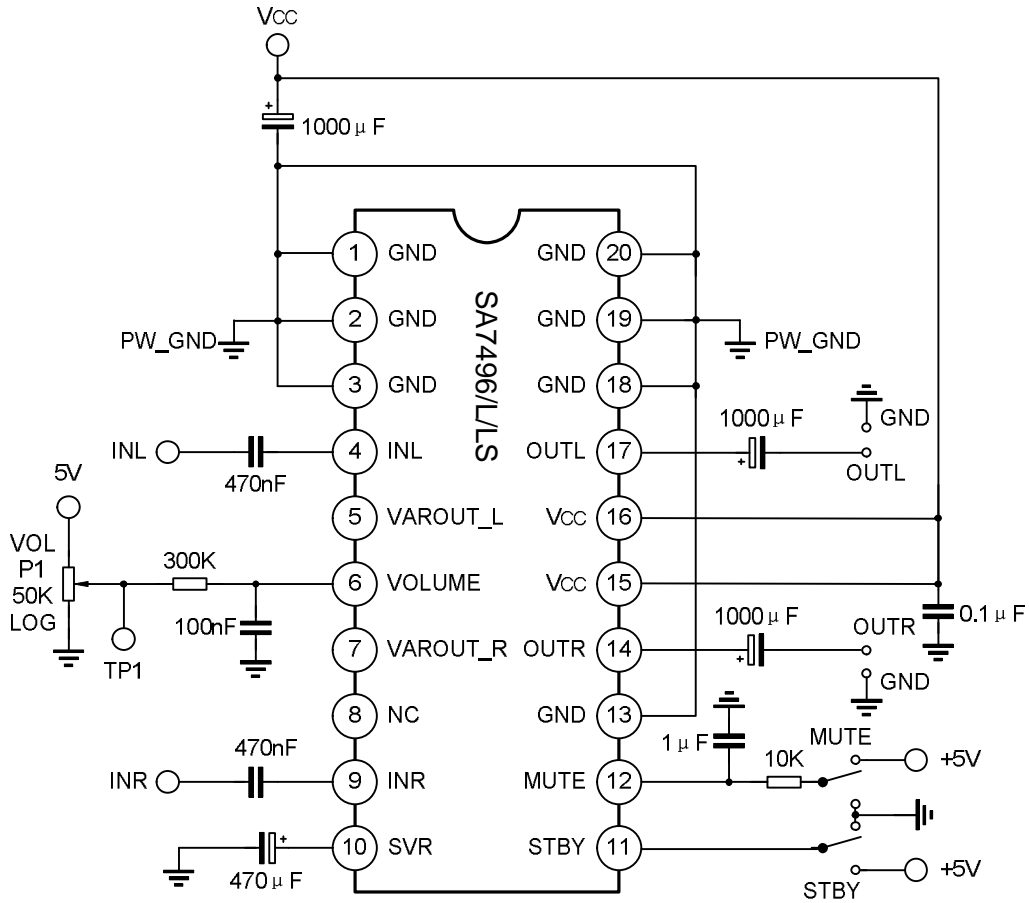
MUTE	ST-BY	Operating State
H	H	STANDBY
L	H	STANDBY
H	L	MUTE
L	L	PLAY

Note: "H" denotes the voltage is larger than 3.5V, and "L" denotes the voltage is lower than 1.5V.

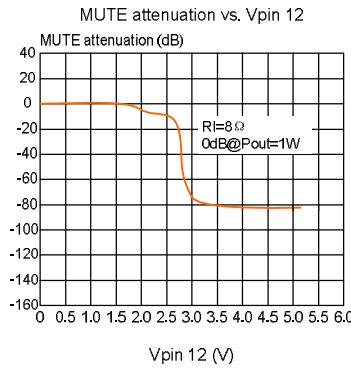
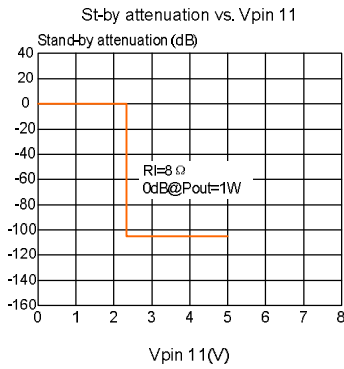
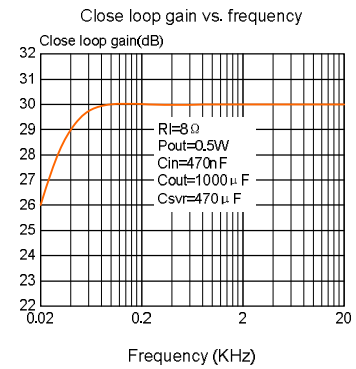
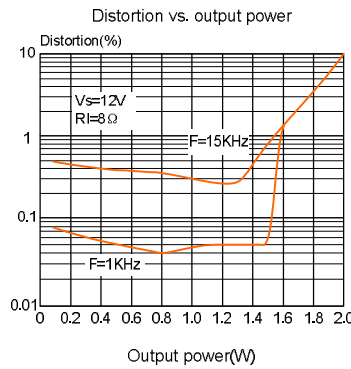
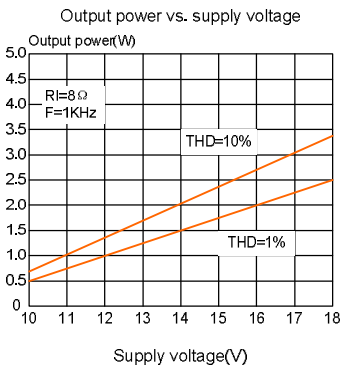
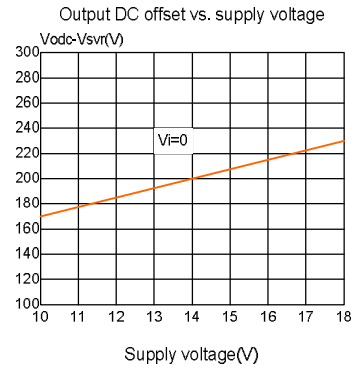
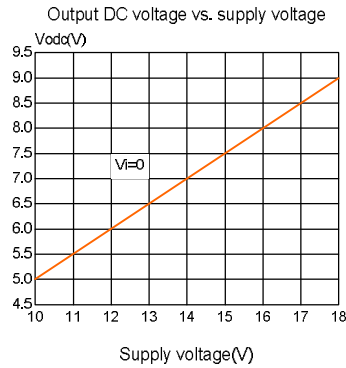
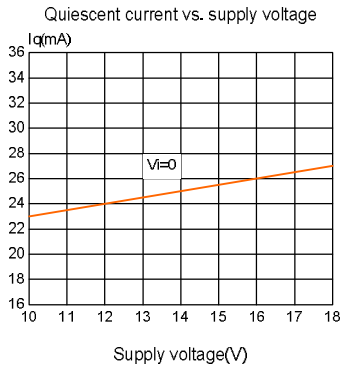
STAND-BY AND MUTE FUNCTIONS DIAGRAM



TYPICAL APPLICATION CIRCUIT



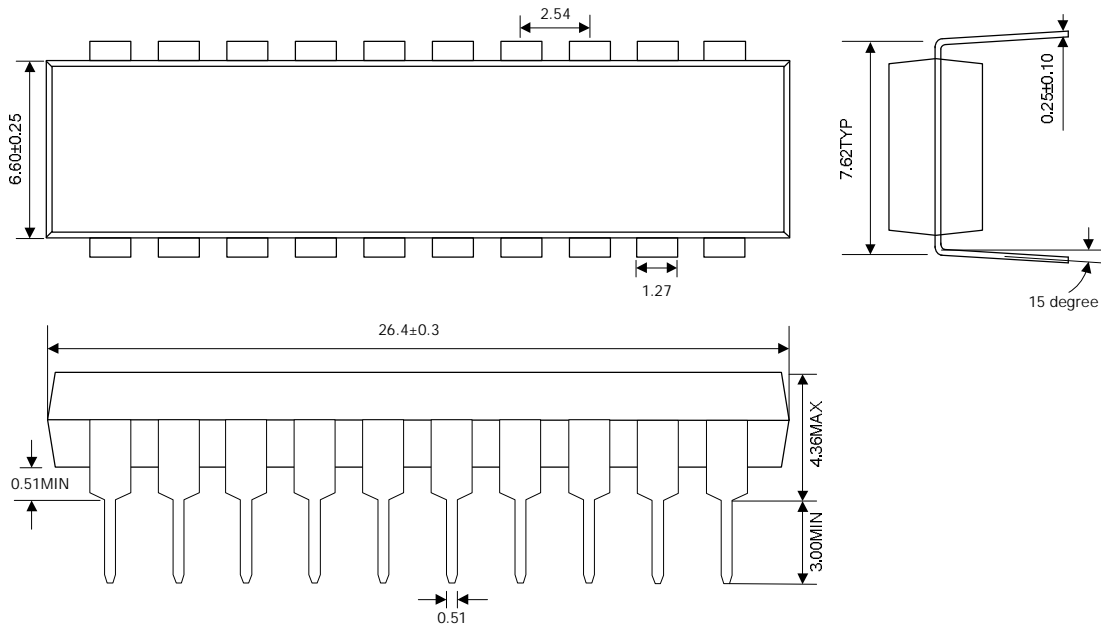
ELECTRICAL CHARACTERISTICS CURVES



PACKAGE OUTLINE

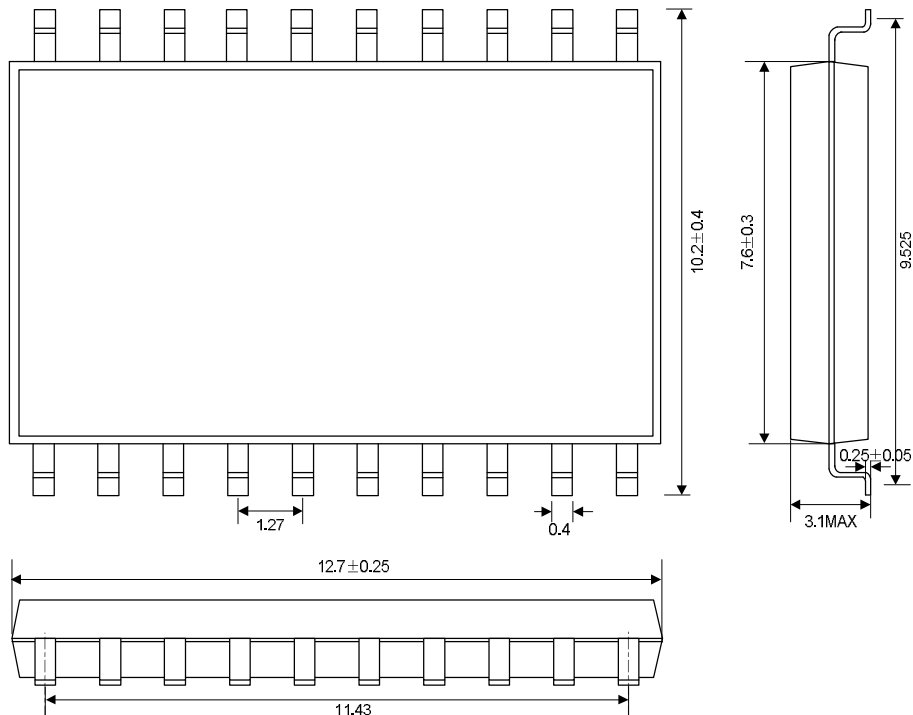
DIP-20-300-2.54

Unit: mm



SOP-20-375-1.27

Unit: mm

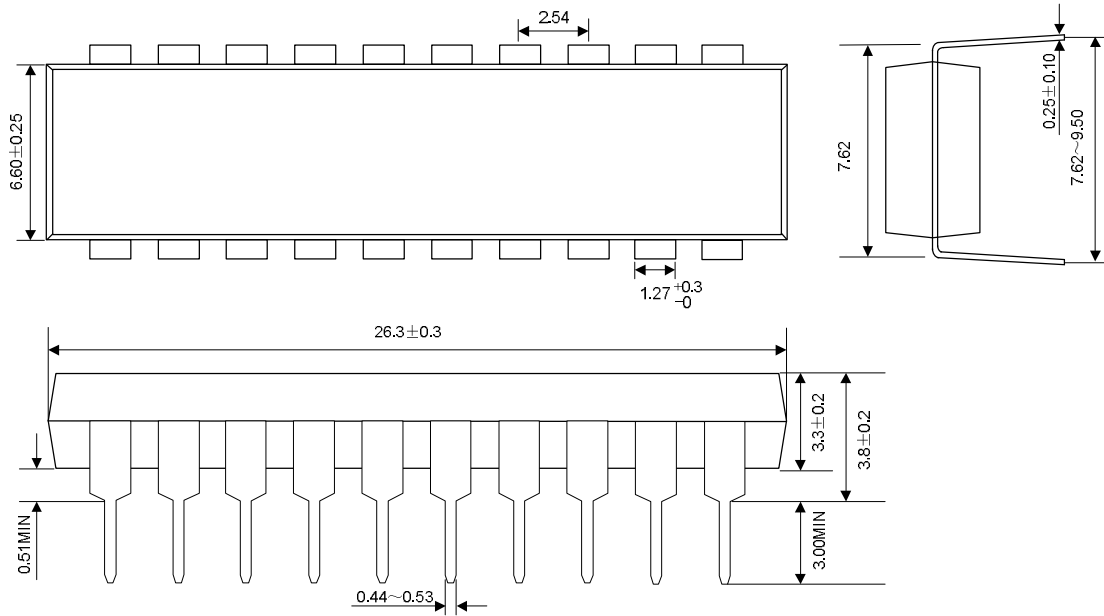




PACKAGE OUTLINE Continued)

DIP-20IH-300-2.54

Unit: mm



## ATTACHMENT

## Revision History

Data	REV	Description	Page
2006.03.02	1.0	Original	
2006.07.24	1.1	Modify the "ELECTRICAL CHARACTERISTICS"	
2006.12.31	1.2	Modify the "ABSOLUTE MAXIMUM RATINGS" Modify the "ELECTRICAL CHARACTERISTICS" Add the package of "DIP-20IH-300-2.54"	