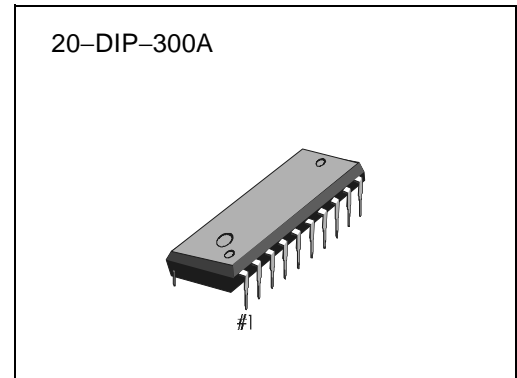


## INTRODUCTION

The KA9270 is a monolithic integrated circuit designed for an audio filter. It is used in compact disc player, digital audio tape recorders, etc.

## FEATURES

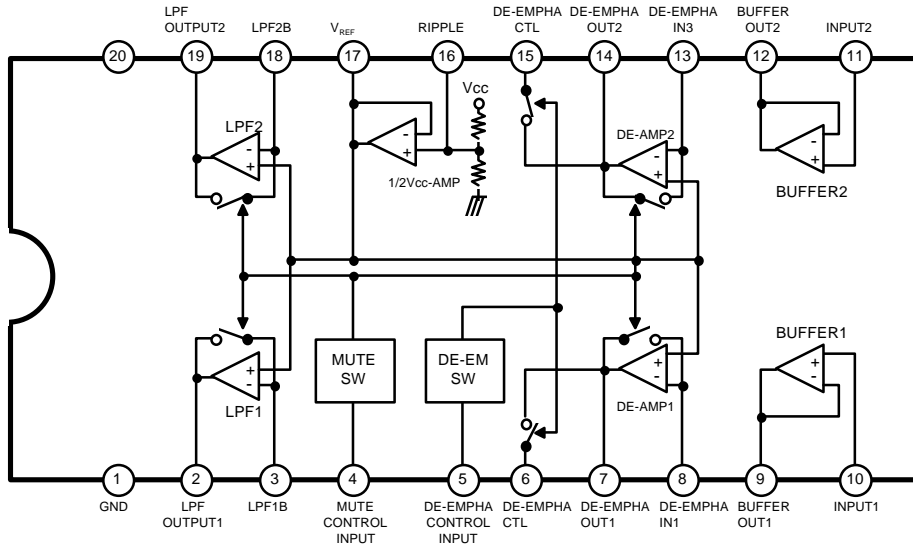
- Functions:
  - Buffer for impedance matching
  - -Low pass filter
  - -De - emphasis control
  - Mute control
  - -Reference voltage circuit (  $1/2 V_{CC}$  AMP )
- Gain adjustable of audio output
- Minimum number of external parts required
- Recommend operation supply voltage range : 5.0 to 12.0 V



## ORDERING INFORMATION

Device	Package	Operating Temperature
KA9270	20-DIP-300A	20°C to + 75°C
KA9270D	20-SOP- 375	

**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS (TA = 25°C)**

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	16	V
Power Dissipation	P <sub>D</sub>	550	mW
Operating Temperature	T <sub>OPR</sub>	-20 ~ + 75	°C
Storage Temperature	T <sub>STG</sub>	-45 ~ + 150	°C

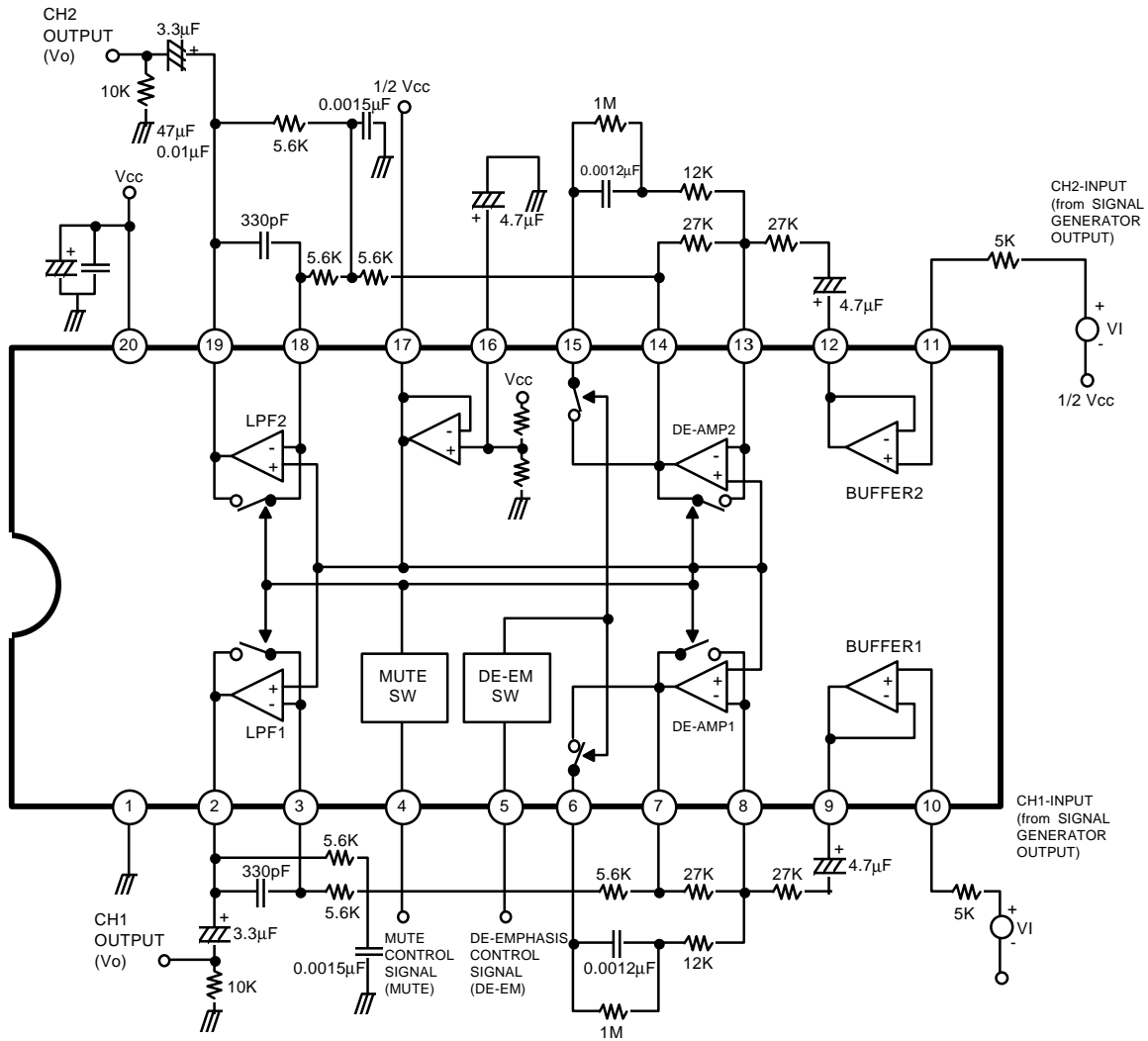
## ELECTRICAL CHARACTERISTICS

(Ta = 25°C, V<sub>CC</sub> = 8V, f = 1kHz, R<sub>L</sub> = 10KΩ, De-emphasis; off, Mute; off, S1 & S2; off, unless otherwise specified)

Characteristic	Symbol	Test Conditions		Min	Typ	Max	Unit
Quiescent Circuit Current	I <sub>CC</sub>	V <sub>I</sub> = 0		1	4	6	mA
Maximum Output Voltage	V <sub>OM</sub>	THD = 1%		1.8	2.1	–	V <sub>rms</sub>
Total Harmonic Distortion	THD	V <sub>O</sub> = 0 dBm	f = 100Hz	–	0.01	0.05	%
			f = 1kHz	–	0.01	0.05	
			f = 10kHz	–	0.05	0.1	
			f = 16kHz	–	0.1	0.2	
			f = 20kHz	–	0.1	0.2	
Frequency Characteristics	fv	V <sub>O</sub> = 6 dBm	f = 100Hz	–0.1	0	0.1	dB
			f = 1kHz	0	0	0	
			f = 10kHz	–0.5	0	0.5	
			f = 16kHz	–1.0	0	1.0	
			f = 20kHz	–1.5	0	1.5	
Cross Talk	CT	V <sub>O</sub> = 0dBm	f = 100Hz	70	80	–	dB
			f = 1kHz	65	75	–	
			f = 10kHz	60	65	–	
Signal to Noise Ratio	S/N	V <sub>O</sub> = 0dBm, R <sub>G</sub> = 600Ω 20kHz LPF		73	80	–	dB
Channel Balance	CB	V <sub>O</sub> = 0dBm		–1.0	0	1.0	dB
Open Loop Gain	G <sub>VO</sub>	V <sub>I</sub> = 900mV <sub>rms</sub>		–2.6	–0.6	1.0	dB
Gain Adjusting Range	G <sub>VR</sub>	V <sub>I</sub> = 900mV, S1, S2; ON		4.5	6	–	dB
Mute Attenuation Ratio	ATT <sub>MUTE</sub>	V <sub>I</sub> = 900mV, Mute SW; ON		40	50	–	dB
De-emphasis	DE <sub>EMPH</sub>	De-emphasis: ON	f = 1kHz	–0.87	–0.37	0.13	dB
			f = 5kHz	–6.03	–4.53	–3.03	
			f = 16kHz	–10.53	–9.03	–7.53	

**NOTE:** De-emphasis input conditions: V<sub>O</sub> = 0dBm De-emphasis off position.

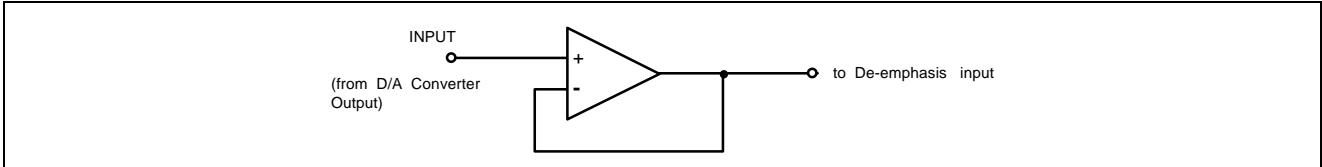
TEST CIRCUIT



**APPLICATION INFORMATION**

**BUFFER2**

It is used for impedance matching, between the D/A converter output and the de-emphasis input.

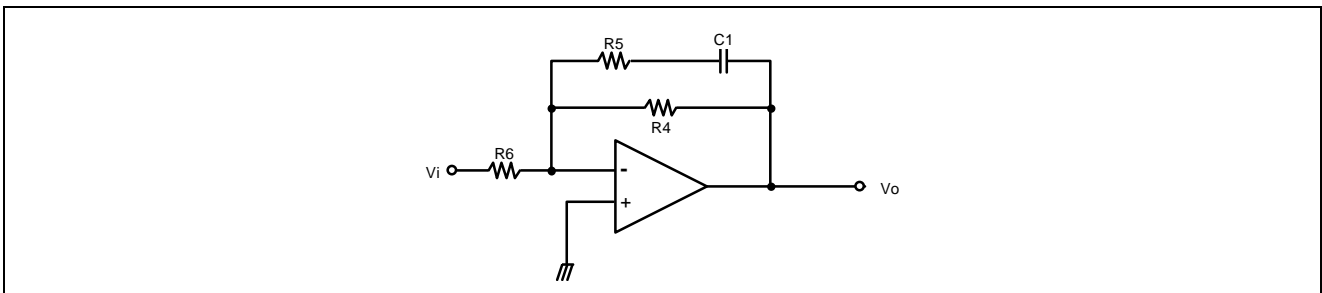


**DE-EMPHASIS**

De-emphasis operation condition

Control Input	De-emphasis Operation
High	ON
Low	OFF

De-emphasis characteristic when the de-emphasis is on.



**Figure 1. Equevalent Circuit of De-emphasis ON Mode**

$$A_v \approx R_4 / R_6$$

$$T1 = C1 (R_4 + R_5)$$

$$T2 = C1 \times R_5$$

The de-emphasis characteristics are dependent upon the external parts value.

MUTE

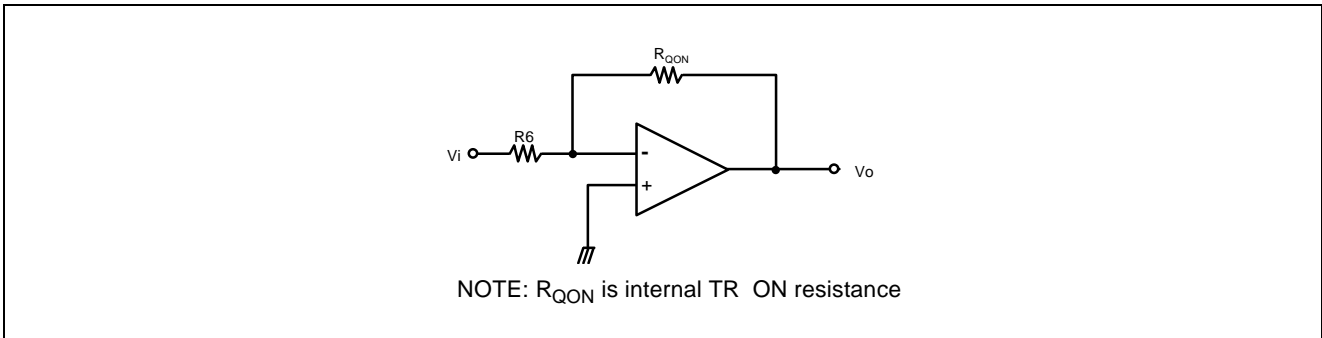


Figure 2. Equivalent Circuit of Mute Switch ON Mode

Mute attenuation [M (att)] ratio is as follow:

$$M \text{ (att)} = 20 \log \frac{V_0}{V_i}$$

$$= 20 \log \frac{V_{QON}}{V_6} \text{ (dB)}$$

LOW PASS FILTER

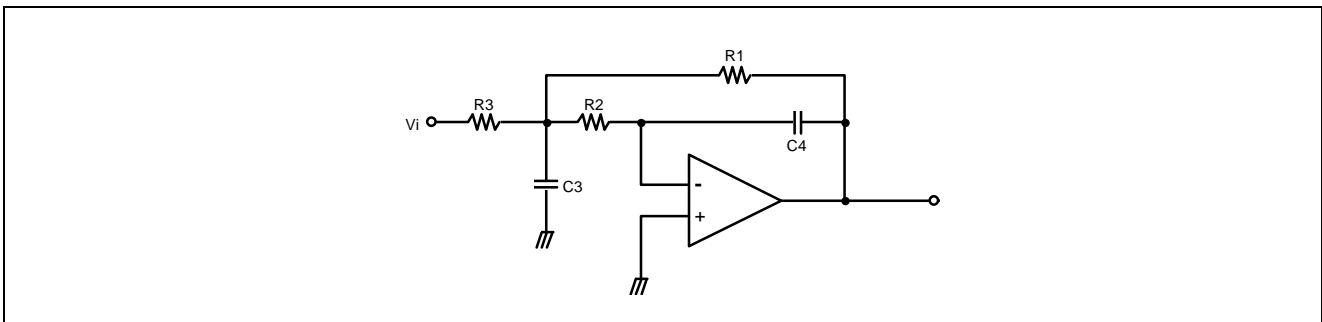
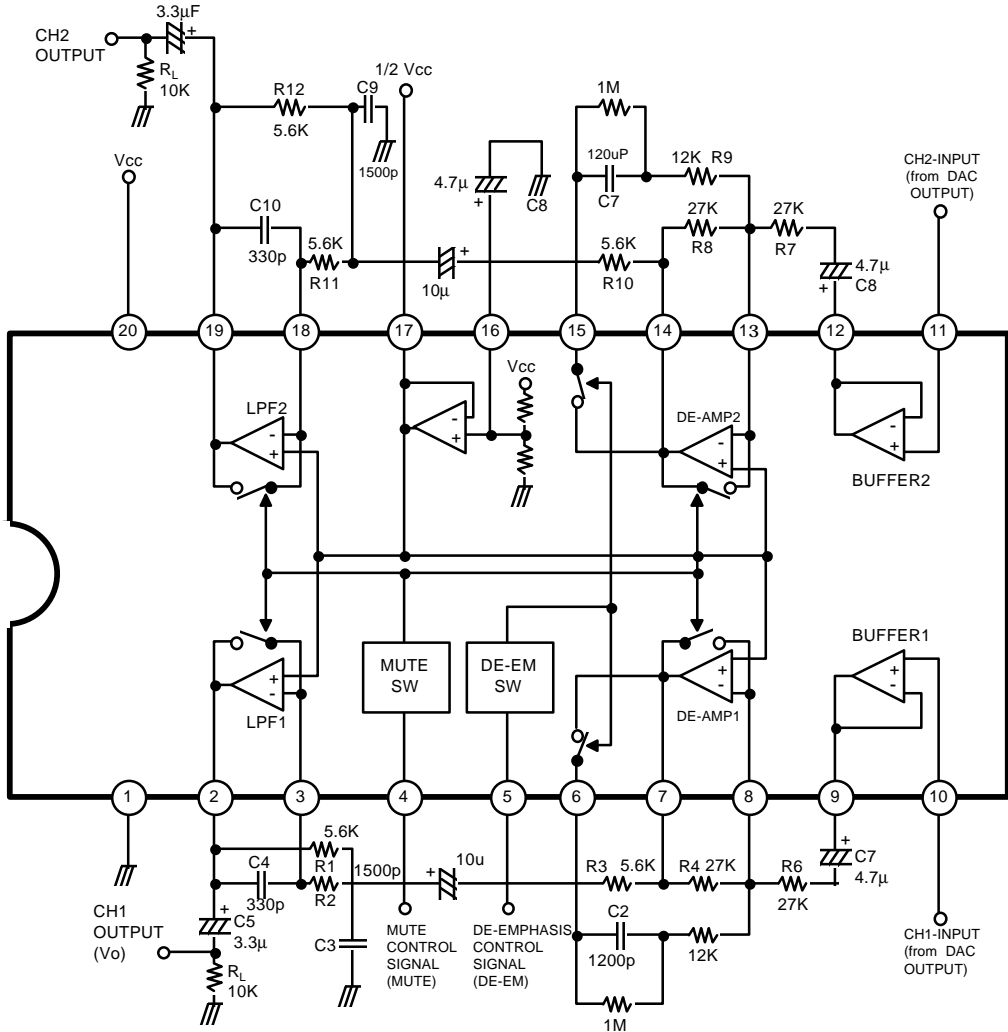


Figure 3. Equivalent Circuit of LPF

Cut off frequency (F<sub>C</sub>) is as follow:

$$f_c = \frac{1}{2\pi\sqrt{R_2R_1C_3C_4}} \text{ (Hz)}$$

APPLICATION CIRCUIT



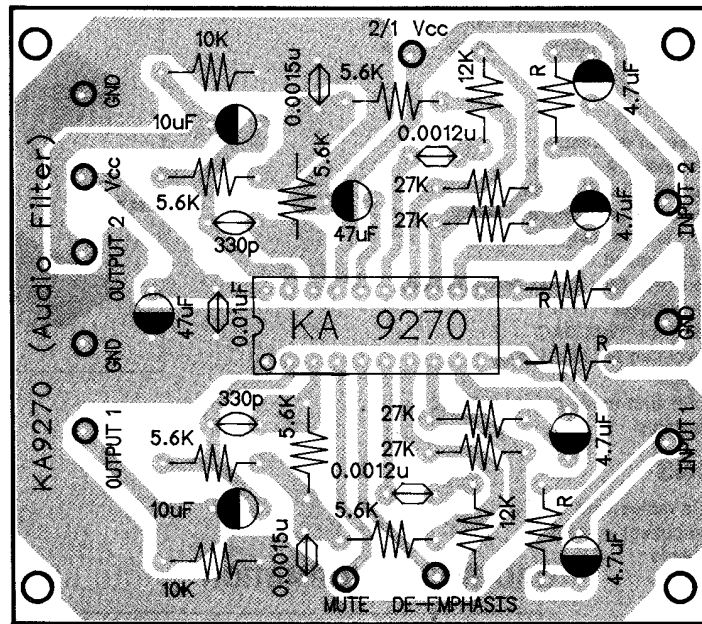
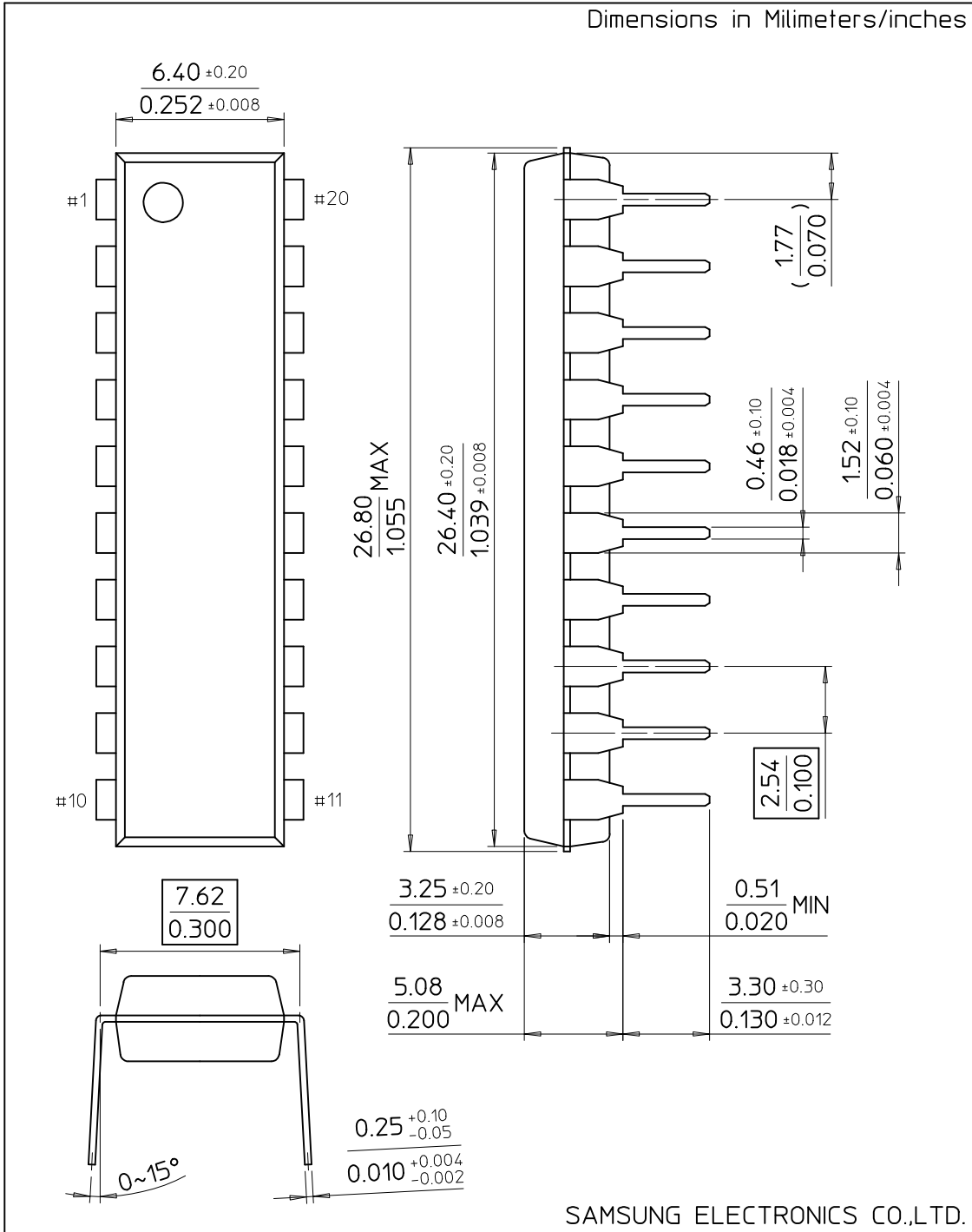


Figure 4. PCB PATTERN



# 20-DIP-300A

Dimensions in Millimeters/inches



SAMSUNG ELECTRONICS CO.,LTD.

# 20-SOP-375

