



SANYO Semiconductors

# DATA SHEET

# LA7976

## Monolithic Linear IC For TV and VCR Multi-system PAL SIF Converter IC

### Overview

The LA7976 is an IC that converts PAL SIF signals (5.5MHz, 6MHz, and 6.5MHz) to 6MHz.

### Functions

- Mixer, amplifier, oscillator, oscillator mute

### Specifications

#### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC}$ max		13.2	V
Maximum feed current	$I_5$ max		3	mA
	$I_4$ max		1	mA
Allowable power dissipation	$P_d$ max	Ta ≤ 85°C	200	mW
Operating temperature	Topr		-20 tp +85	°C
Storage temperature	Tstg		-40 to +150	°C

#### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$ max		9	V
Operating voltage range	$V_{CC}$ op		4.5 to 12	V

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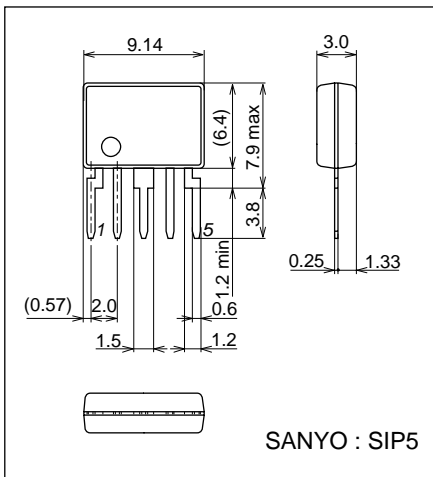
# LA7976

**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 9\text{V}$

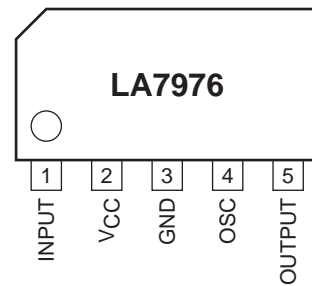
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}$		5	6.5	9	mA
Conversion gain	G5.0	5.0MHz, 80dB $\mu\text{V}$ input	10	13.5	17	dB
	G5.5	5.5MHz, 80dB $\mu\text{V}$ input	10	13.5	17	dB
	G6.0	6.0MHz, 80dB $\mu\text{V}$ input	10	13.5	17	dB
Oscillation level	VO SC		15	48	80	mVp-p
Maximum output level	$V_O$ max	5.5MHz, 100 dB $\mu\text{V}$ input	104	108	112	dB/ $\mu\text{V}$
Input impedance	$R_i$	5.5MHz input		4.8		$\Omega$
Pin voltages	$V_1$	Pin 1	2.6	3.0	3.4	V
	$V_4$	Pin 4	7.3	7.7	8.1	V
	$V_5$	Pin 5	7.2	7.6	8.0	V
500kHz level difference relative to 6MHz	OSC leak		30	40		dB
Maximum input level	$V_{IN}$ max			85		dB/ $\mu\text{V}$

## Package Dimensions

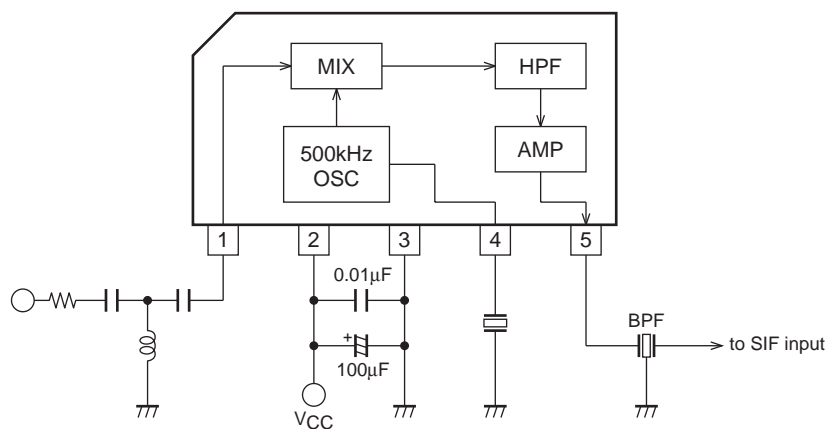
unit : mm (typ)  
3042D



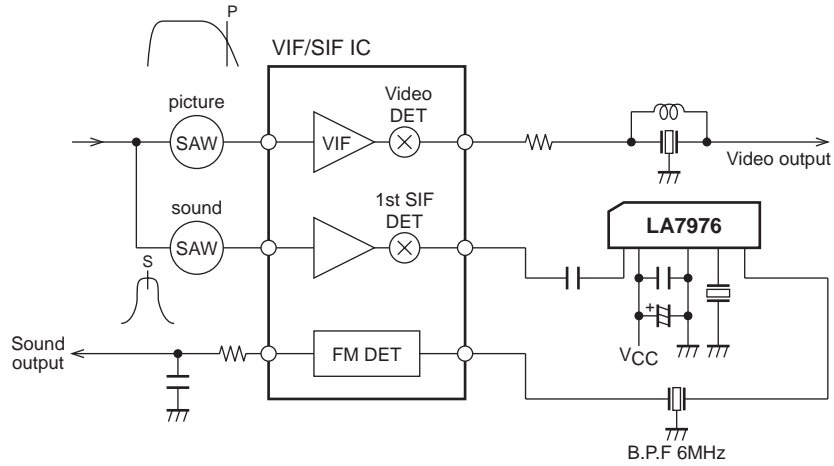
## Pin Assignment



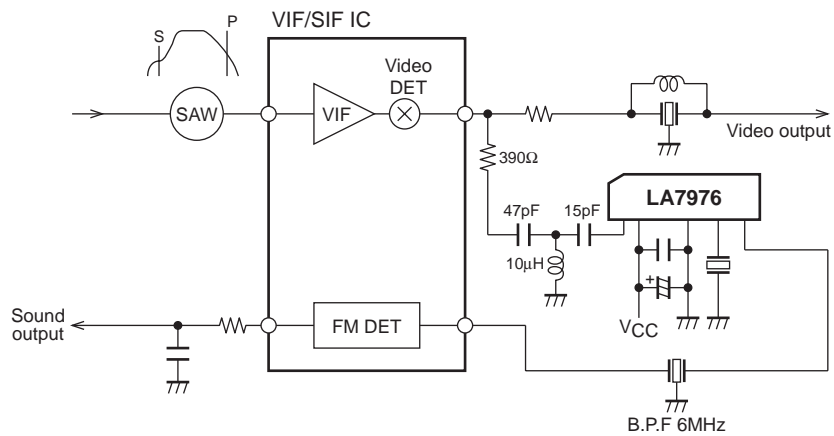
## Application Circuit Example



## Reference Example 1



## Reference Example 2


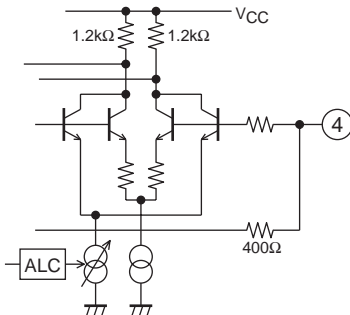
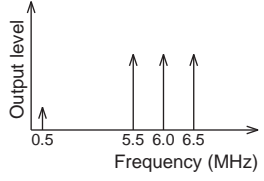
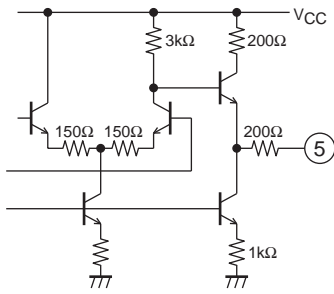


## Pin Description

Pin No.	Pin name	Description	Equivalent circuit
1	INPUT	<p>SIF input pin.</p> <p>The filter in Fig.1 can be connected to the input section to improve the buzz characteristic.</p> <p>If C1 is too small, the buzz characteristic improves for normal input, but the filter cuts into the sound carrier and the buzz characteristic deteriorates for the P/S (picture/sound carrier) ratio.</p> <div style="text-align: center;"> <p>From video output section — R — C1 — C2 — (1)</p> <p style="margin-left: 150px;">L</p> </div> <p><b>Fig.1</b></p>	
2	VCC	Power supply pin.	
3	GND	Ground pin.	

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Pin No.	Pin name	Description	Equivalent circuit
4	OSC	<p>Ceramic oscillator pin.</p> <p>To make the oscillation waveform approach a sine wave, the oscillation level is controlled internally.</p> <p>Oscillation levels of 15 to 80mVp-p at Pin 4 give the waveform shown in Fig.2.</p> <div style="text-align: center;">  <p><b>Fig.2</b> (Pin 4 oscillation waveform)</p> </div>	
5	OUTPUT	<p>Output pin.</p> <p>The output from Pin 5 is input to the SIF via a 6MHz band-pass filter (BPF).</p> <p>When 5.5MHz is input to Pin 1, the spectrum shown in Fig.3 is obtained at Pin 5.</p> <div style="text-align: center;">  <p><b>Fig.3</b></p> </div>	

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