Ordering number : EN3994D

SANYO Semiconductors
DATA SHEET

LA7975 — Monolithic Linear IC For TV and VCR Multi-system PAL SIF Converter Circuit

Overview

The LA7975 is an IC that converts PAL SIF signals (5.5MHz, 6MHz, and 6.5MHz) to 6MHz. For the sake of high sound quality, this IC uses a unique mixer technique to supress interference from NICAM signals.

Features

- Resistant to interference by NICAM signals.
- Small SIP-5 package.
- Wide range of usage voltage (5V to 12V).

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	Pd max	Ta ≤ 70°C	200	mW
Operating temperature	Topr		-20 to +70	°C
Storage temperature	Tstg		-40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		9	V
Operating voltage range	V_{CC} op		5 to 12	V

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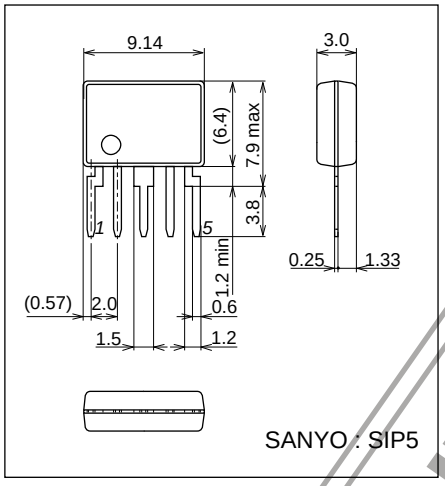
Electrical Characteristics at Ta = 25°C, V_{CC} = 9V

Parameter		Symbol	Conditions	Test point	Ratings			Unit
					min	typ	max	
Current drain		I_{CC}		Pin 2	5	6.5	9	mA
Conversion gain	5.5MHz	G5.5	80dB/μV input	Pin 5	10	13.5	17	dB
	6.5MHz	G6.5	80dB/μV input	Pin 5	10	13.5	17	dB
	6.0MHz	G6.0	80dB/μV input, Pin 4 grounded with 10kΩ	Pin 5	18.5	22	25.5	dB
Oscillation level		V_{OSC}		Pin 4	15	36	80	mVp-p
Maximum output level		V_O max	5.5MHz 100dB/μV input	Pin 5	109	112	115	dB/μV
Input impedance		Ri	5.5MHz input			4.8		kΩ
Pin voltages		V1		Pin 1	2.6	3	3.4	V
		V4		Pin 4	7.6	8	8.4	V
		V5		Pin 5	7.2	7.6	8	V
500 kHz level difference relative to 6 MHz		OSC leak		Pin 5	30	44		dB
Maximum input level		V_{IN} max			90			dB/μV
Oscillation stop current		I_4		Pin 4			300	μA

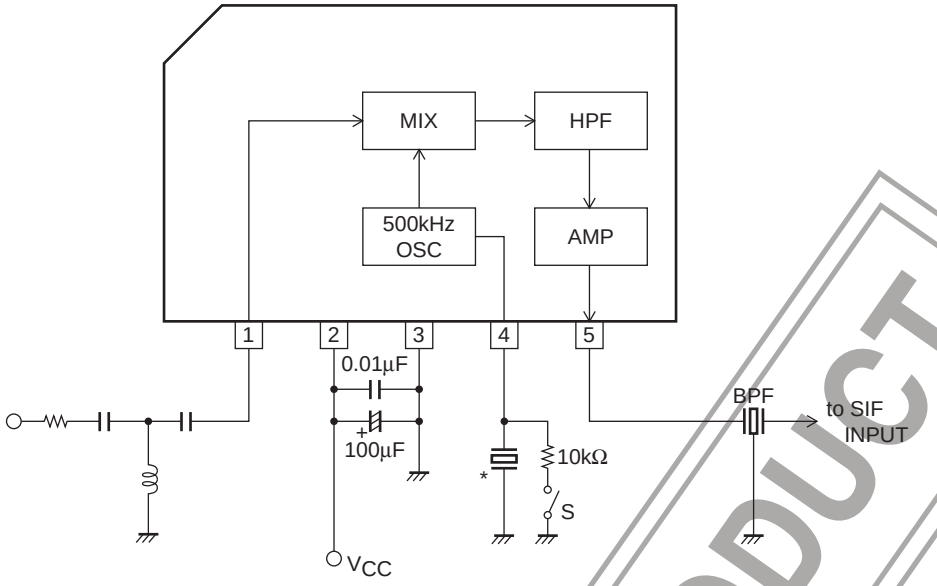
Package Dimensions

unit : mm (typ)

3042D

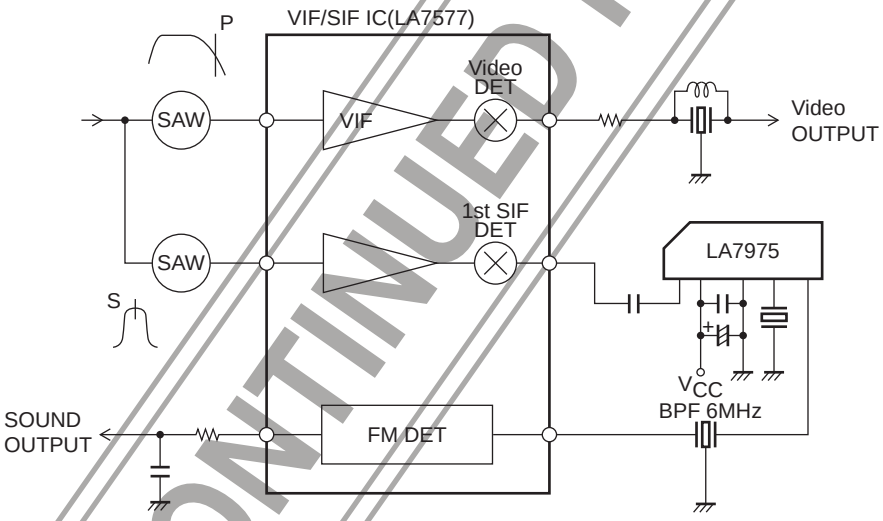


Sample Application Circuit

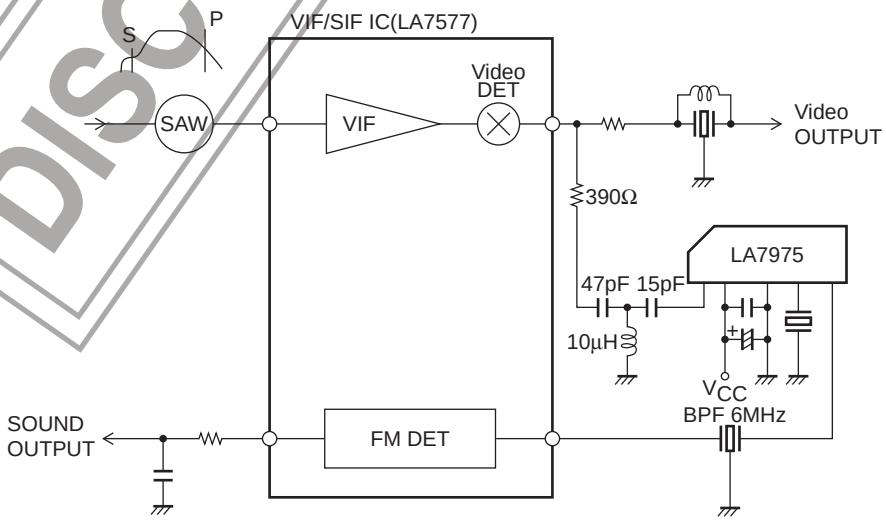


* Oscillator
500kHz CSB503E5Murata Industries, Ltd.
1.5MHz CSA1.500MK2Murata Industries, Ltd.
500kHz EFOA500K04SMurata Industries, Ltd.

Reference Example 1



Reference Example 2



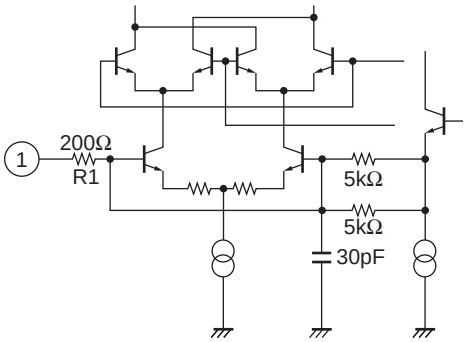


Figure 1

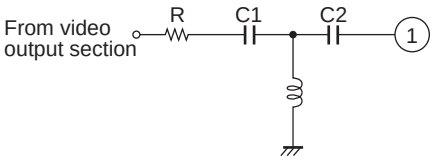


Figure 2

- Pin 1 is the SIF input pin.
  The filter in Figure 2 can be connected to the input section to improve the buzz characteristic.
  Figure 3 shows the characteristics for the filter in Figure 2.
  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.
  Use C1 ≈ 20pF to 47pF.

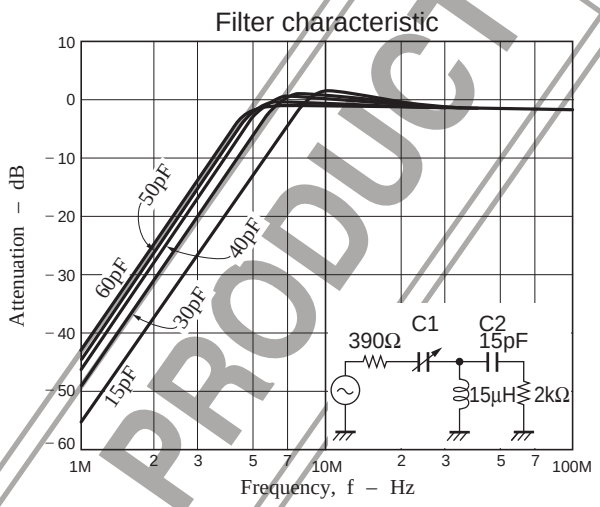


Figure 3

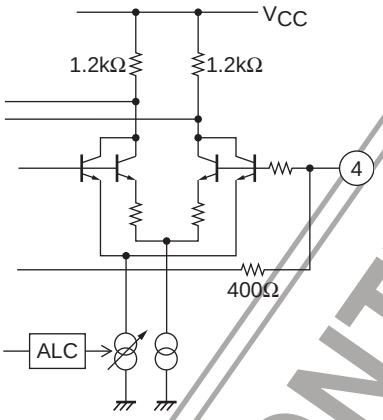


Figure 4

Figure 5
(Pin 4 oscillation waveform)

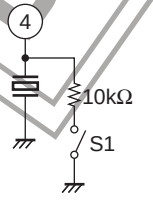


Figure 6

- Pin 4 is the ceramic oscillator pin.
  To make the oscillation waveform approach a sine wave,the oscillation level is controlled internally.
  Oscillation levels of 15 to 80mVp-p at Pin 4 give the waveform shown in Figure 5.
  To stop oscillation, attach an external resistor as in Figure 6 and switch S1 on.

Here are the conditions for handling multiple systems.

Input frequency	Oscillator	Pin 5 output
5.5MHz	500kHz	6MHz
6.0MHz	Oscillation stop	6MHz (pass through)
6.5MHz	500kHz	6MHz
4.5MHz	1.5MHz	6MHz

Figure 7

Figure 8 shows a proposed multi-system

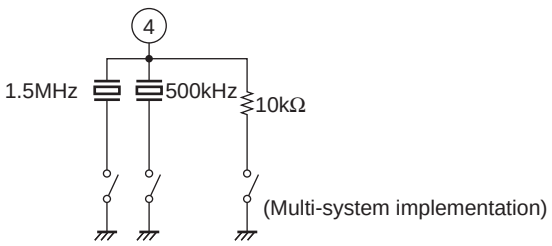


Figure 8

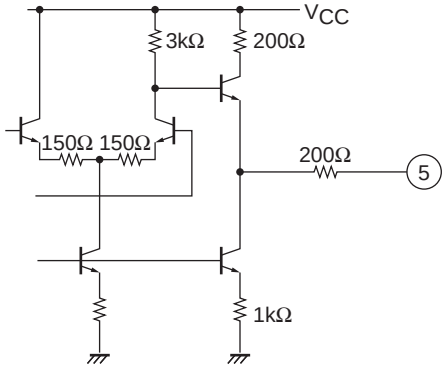


Figure 9

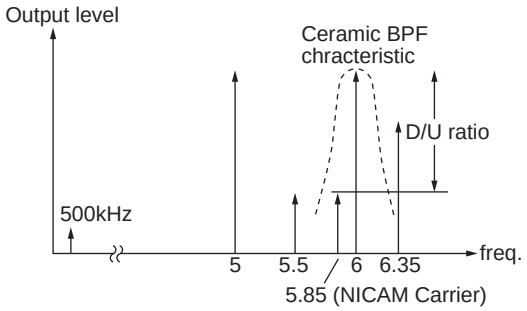


Figure 10 (5.5MHz input)

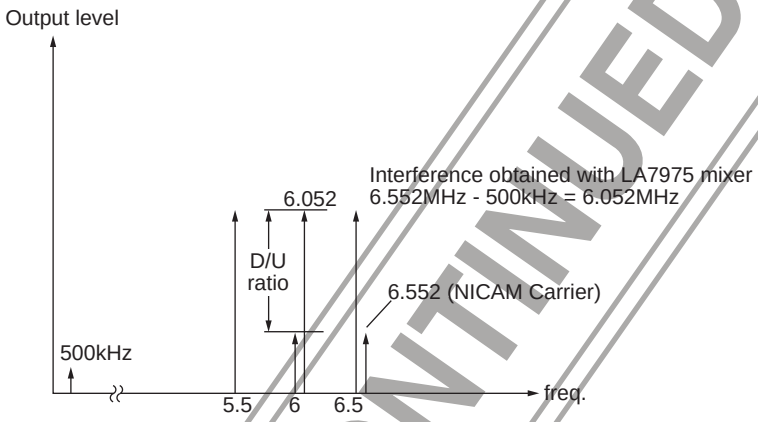
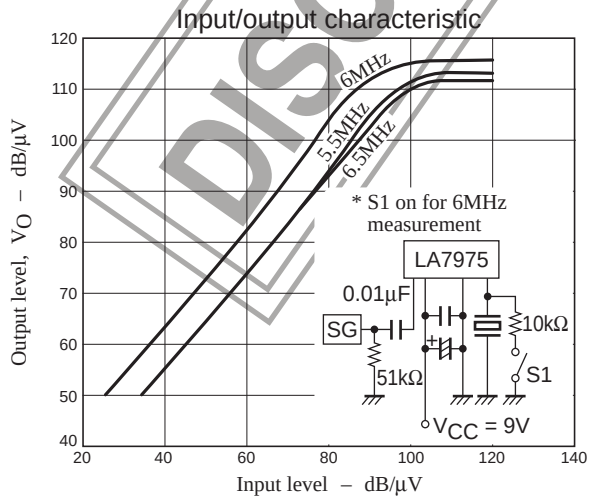


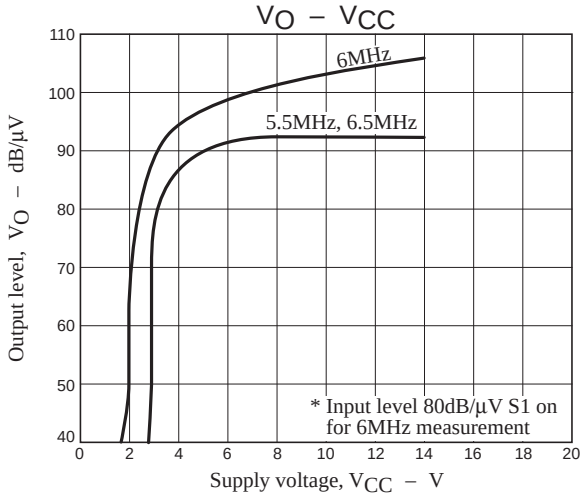
Figure 11 (6MHz input)

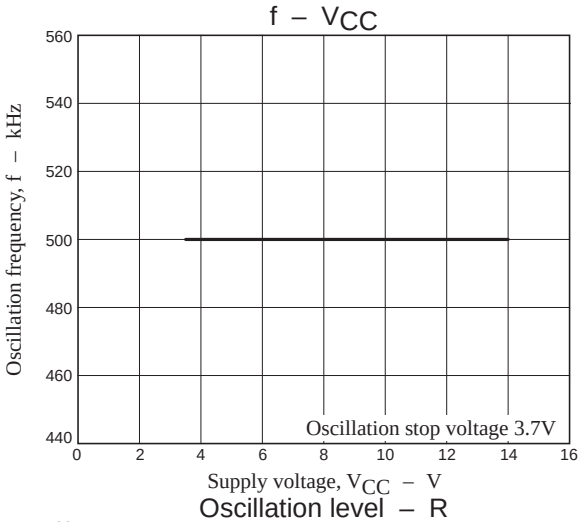
- Pin 5 is the output pin. The output from Pin 5 is input to the SIF via a 6MHz bandpass filter (BPF).
  When 5.5MHz is input to Pin 1, the spectrum shown in Figure 10 is obtained at Pin 5. Even if there is a 5.85MHz NICAM signal, the D/U (desirable/undesirable) ratio at Pin 5 increases and the buzz characteristic does not deteriorate.

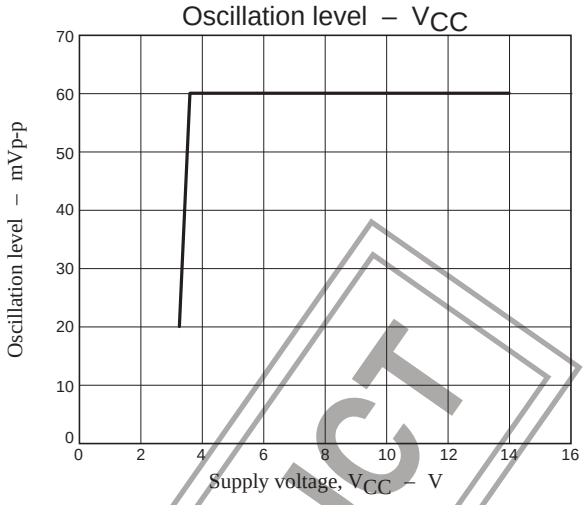
  When 6MHz is input at Pin 1 and there is a 6.552MHz NICAM signal, then 6.552MHz is mixed with 500kHz to make 6.052MHz. This becomes an interference signal and is within the band for 6MHz. Therefore,for 6MHz input, Pin 4 is grounded with 10kΩ to stop the oscillation and pass through the input signal 6MHz as is.

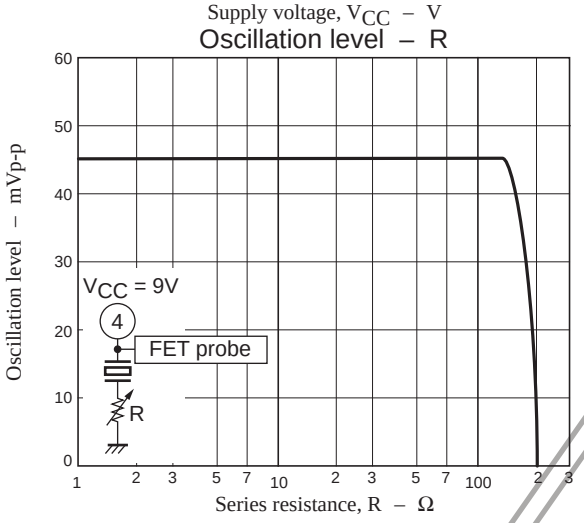
Reference Characteristic Diagram











This catalog provides information as of June, 2008. Specifications and information herein are subject to change without notice.