

SANYO

No. 3994B

LA7975**PAL SIF Converter Circuit
for TV and VCR Multi-system****Overview**

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

Functions

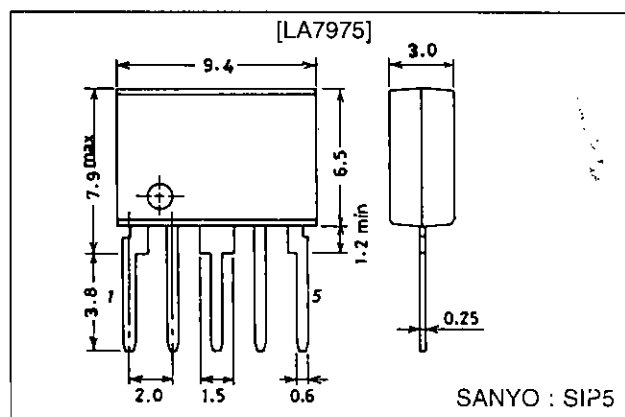
- Mixer, amplifier, oscillator, oscillator mute

Features

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

Package Dimensions

unit : mm

3042C-SIP5**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	T _a ≤ 70°C	200	mW
Operating temperature	T _{opr}		-20 to +70	°C
Storage temperature	T _{stg}		-40 to +150	°C

Operating Conditions at Ta = 25°C

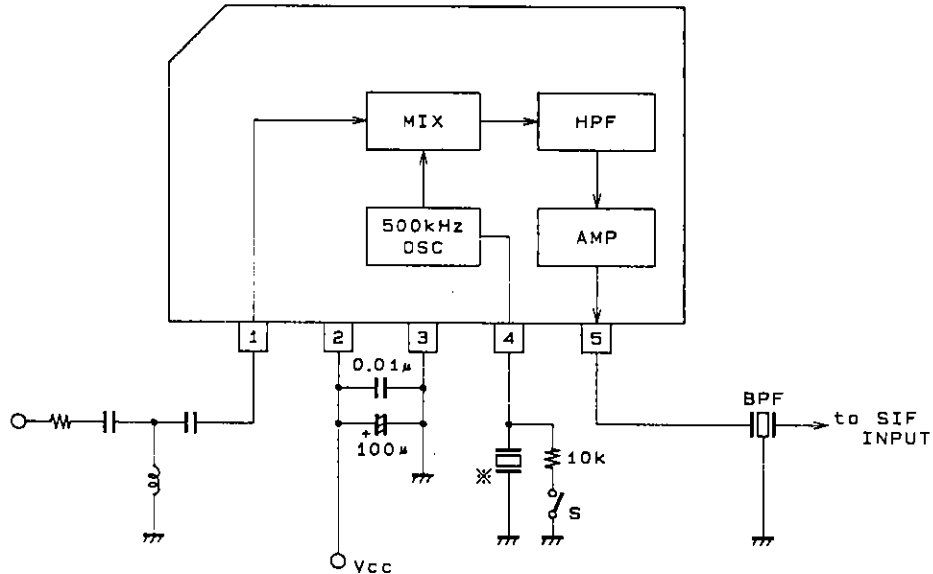
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V _{CC}		9	V
Operating voltage range	V _{CC} op		5 to 12	V

LA7975

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

Parameter	Symbol	Conditions	Test point	min	typ	max	Unit	
Current drain	I_{CC}		Pin 2	5	6.5	9	mA	
Conversion gain	5.5 MHz	G5.5	80 dB/ μV input	Pin 5	10	13.5	17	dB
	6.5 MHz	G6.5	80 dB/ μV input	Pin 5	10	13.5	17	dB
	6.0 MHz	G6.0	80 dB/ μV input, Pin 4 grounded with 10 k Ω	Pin 5	18.5	22	25.5	dB
Oscillation level	V_{OSC}		Pin 4	15	36	80	mVp-p	
Maximum output level	$V_{O\text{ max}}$	5.5 MHz 100 dB/ μV input	Pin 5	109	112	115	dB/ μV	
Input impedance	R_i	5.5 MHz input			4.8		k Ω	
Pin voltages	V_1		Pin 1	2.6	3	3.4	V	
	V_4		Pin 4	7.6	8	8.4	V	
	V_5		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	$V_{IN\text{ max}}$			90			dB/ μV	
Oscillation stop current	I_4		Pin 4			300	μA	

Sample Application Circuit



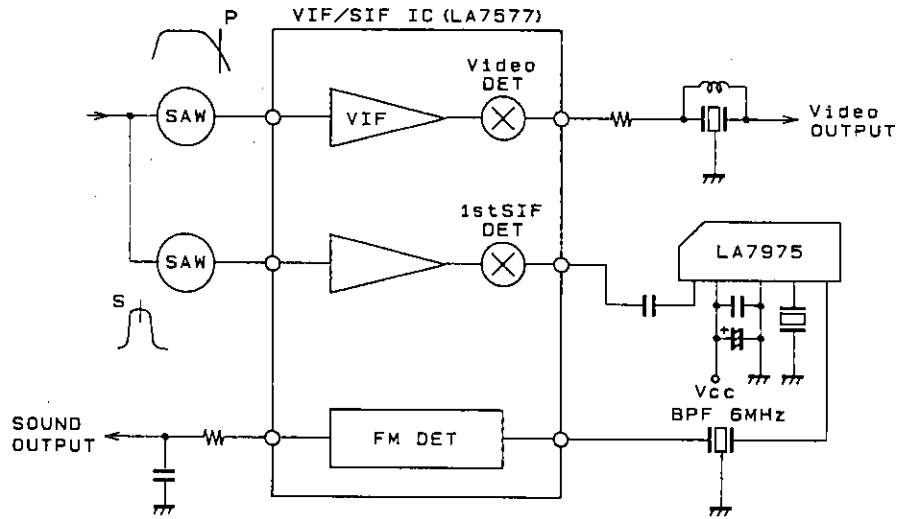
A00870

- ※ Oscillator
 500 kHz CSB503E5 Murata Industries, Ltd.
 1.5 MHz CSA1.500MK2 Murata Industries, Ltd.
 500 kHz EFOA500K04S Matsushita Electric, Ltd.

Unit (resistance: Ω , capacitance: F)

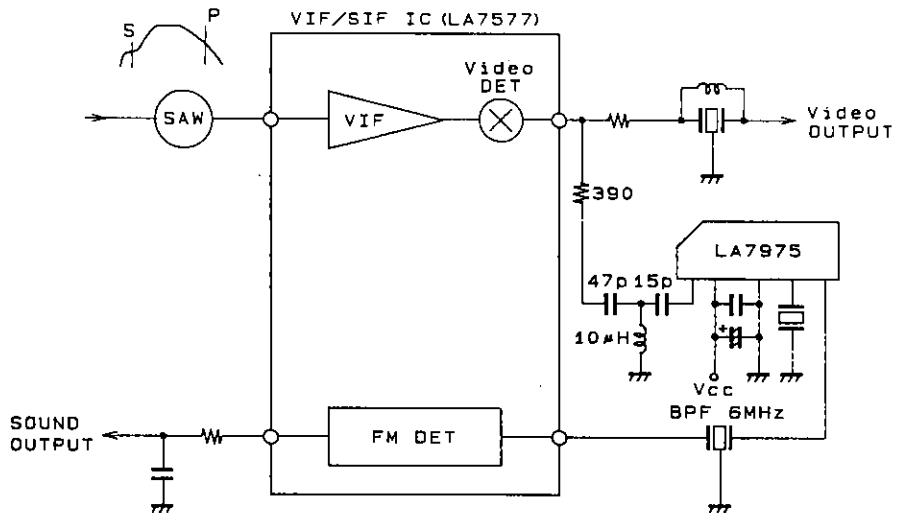
LA7975

Reference Example 1



A00671

Reference Example 2



Unit (resistance: Ω , capacitance: F)

A00672

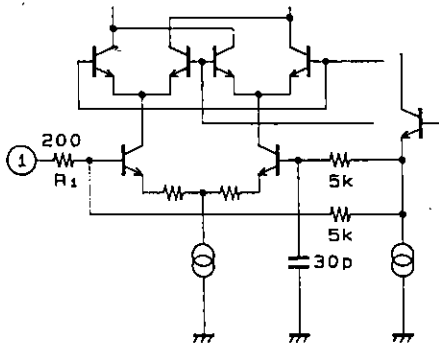


Figure 1 A00673

Unit (resistance: Ω, capacitance: F)

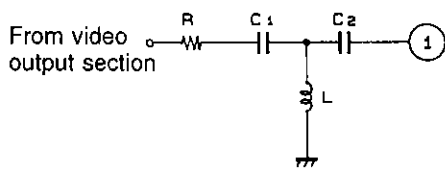


Figure 2 A00674

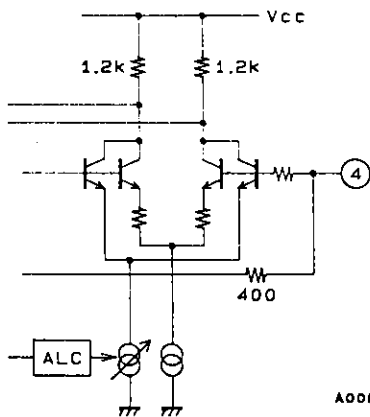


Figure 4 Unit (resistance: Ω)

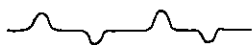


Figure 5 (Pin 4 oscillation waveform)

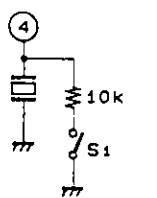


Figure 6 Unit (resistance: Ω)

- 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 $C1 \approx 20 \text{ pF}$ to 47 pF .

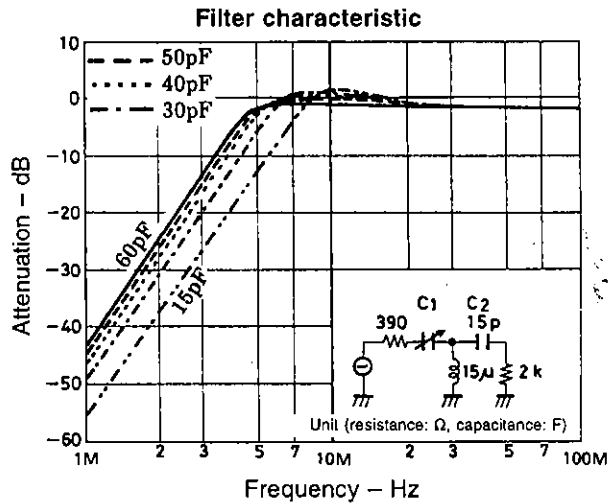


Figure 3

- 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 80 mVp-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
5.5 MHz	500 kHz	6 MHz
6.0 MHz	Oscillation stop	6 MHz (pass through)
6.5 MHz	500 kHz	6 MHz
4.5 MHz	1.5 MHz	6 MHz

Figure 7

Figure 8 shows a proposed multi-system

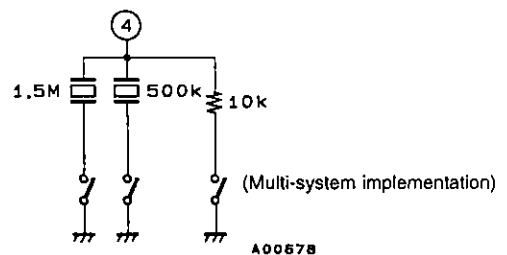


Figure 8 Unit (resistance: Ω)

LA7975

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

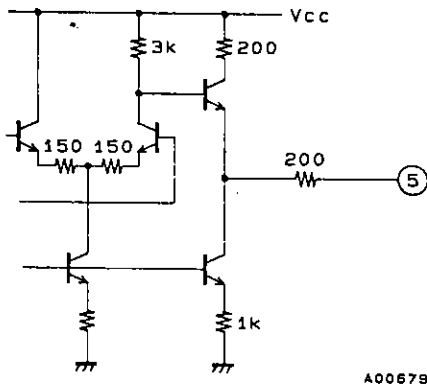


Figure 9 Unit (resistance: Ω)

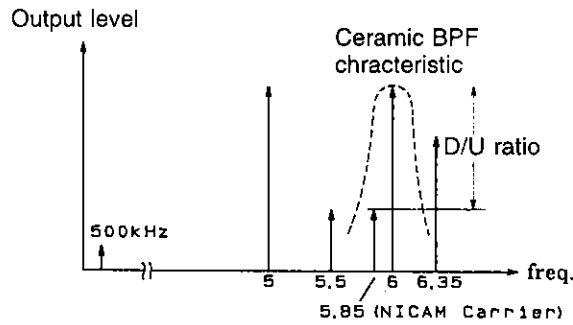


Figure 10 (5.5 MHz input)

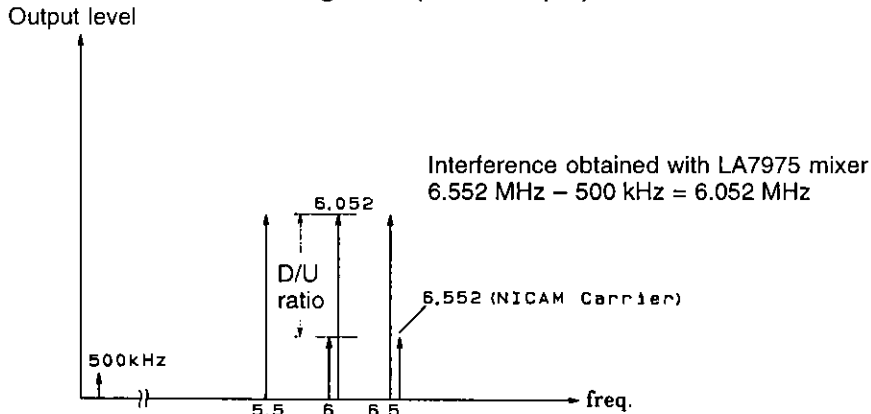
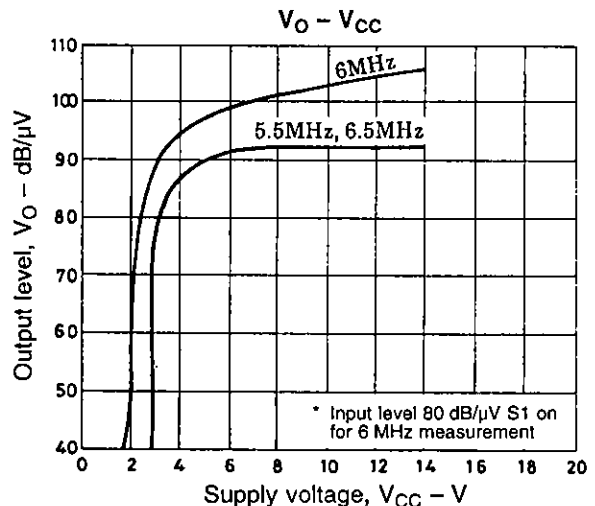
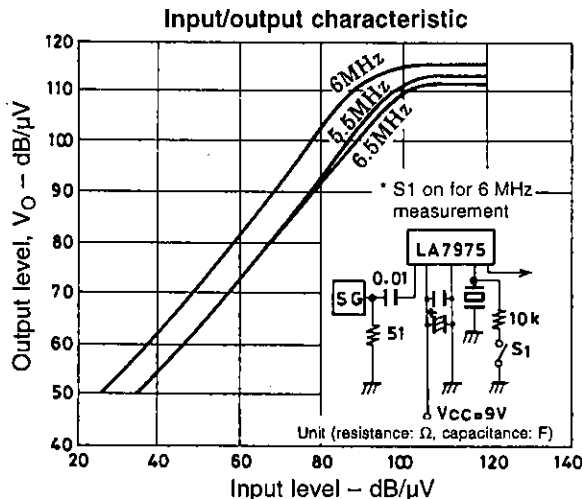
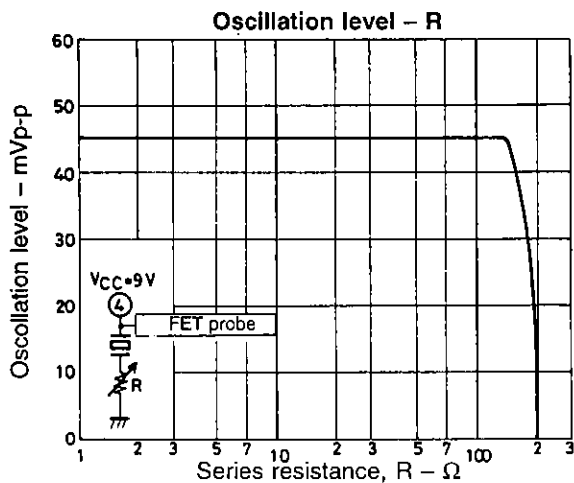
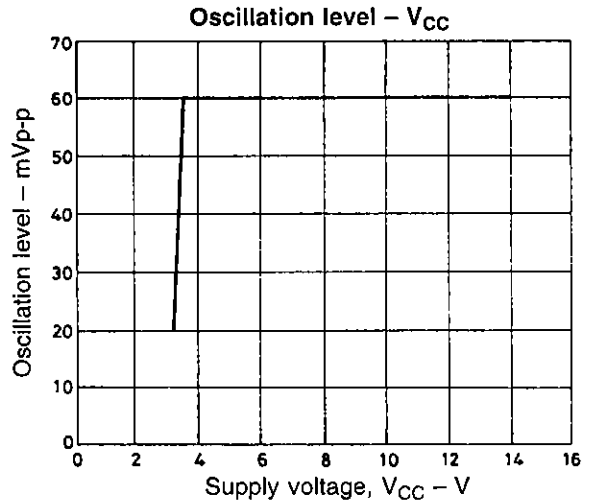
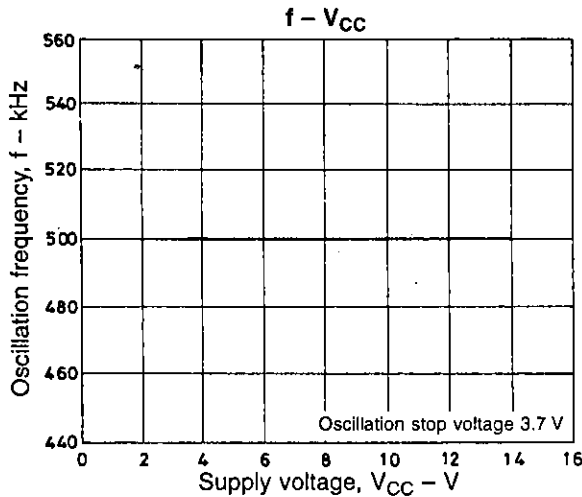


Figure 11 (6 MHz input)

Reference Characteristic Diagram



LA7975



- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
 - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
 - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of July, 1996. Specifications and information herein are subject to change without notice.