

SANYO	No. 2866A	Monolithic Linear IC
		LA7510
Quasi-Parallel Inter-carrier Detector		

Overview

The Sanyo LA7510 is a 4.5MHz to 6.5MHz intercarrier audio IF detector for high-quality multi-channel TV and VCR sound systems. It is designed for use in quasi-parallel circuit configurations to eliminate audio buzz and minimize other side-effects present in conventional detection circuits.

The LA7510 includes a 3-stage IF amplifier, IF AGC circuit and transistor intercarrier audio detection circuit. It operates from a single 8 to 10 power supply.

A compact 9-pin single-in-line package and coil-less circuit simplifies the design of low-cost detection circuitry.

Features

- Compact package
- Excellent audio S/N characteristics
- Coil-less circuit

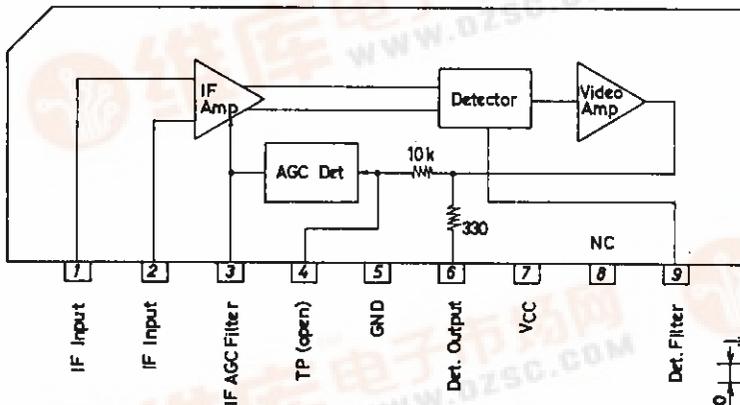
Maximum Ratings at Ta = 25°C

Maximum Supply Voltage	V _{CC} max	12	V
	V ₃ max	12	V
Allowable Power Dissipation	P _d max	540	mW
Operating Temperature	T _{opr}	-10 to +65	°C
Storage Temperature	T _{stg}	-55 to +125	°C
Maximum Output Current	I ₆ max	3	mA

Operating Conditions at Ta = 25°C

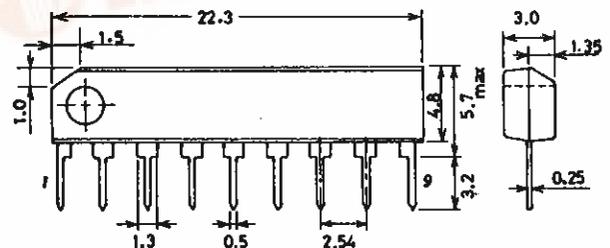
Recommended Supply Voltage	V ₇	9	V
Operating Voltage Range	V _{7 op}	8 to 10	V

Equivalent Circuit Block Diagram



Unit (resistance:Ω)

Package Dimensions
(unit : mm)
3017C



SANYO : SIP9

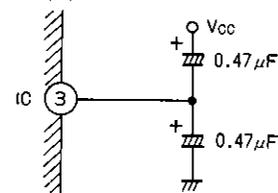


LA7510

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 9\text{V}$				min	typ	max	unit
Supply Current	I_7	V_3 (IF AGC) = 4V		17	22	32	mA
Input Sensitivity	V_i	IF input level for 0.35V _{p-p} detector output with 40% modulation.		34	42	50	dB μ
AGC Range	GR	(Maximum input for $V_o = 0.35$ V _{p-p}) - V_i		60	70		dB
Maximum Input Level	V_i max	IF input level for detector output increase of 1dB		100	120		dB μ
Detector Output Amplitude	V_{06}	4.5MHz output level, P/S = 13 dB		90	130	180	mVrms
Audio S/N	S/N	$f_p = 58.75\text{MHz}$, 87.5% staircase modulation $f_s = 54.25\text{MHz}$, $\left\{ \begin{array}{l} \text{S: FM } \pm 25\text{kHz} \\ \text{fm} = 400\text{Hz} \\ \text{N: Non-modulation} \end{array} \right.$ P/S = 13dB		50	56		dB

Pin Descriptions

Unit (resistance: Ω)		
Pin No.	Internal Circuit	Description
1,2		<p>IF amplifier balanced inputs. Should be decoupled with a $\cong 0.01\mu\text{F}$ capacitor.</p>
3		<p>IF AGC filter pin. The filter capacitor should be $1\mu\text{F}$. A capacitor with good $\tan \delta$ temperature characteristics should be used, such as an ALSi capacitor. If power supply ripple is high, ripple on the detector output can be reduced by using the following circuit.</p>



Continued on next page.

LA7510

Continued from preceding page.

Unit (resistance:Ω)

Pin No.	Internal Circuit	Description
6		<p>Detector output. The output stage is an emitter-follower. The external resistance R is required to match impedances with the following 4.5MHz ceramic band-pass filter. Note that the LA7510 has an internal 330Ω resistor on the output pin.</p>
9		<p>Transistor detector filter pin. The filter capacitor should be selected for optimum audio signal-to-noise. Its value should be less than 85pF, since the 4.5MHz signal drops as the capacitance increases, increasing the picture/sound carrier level ratio and degrading audio S/N performance.</p>

Functional Description

1. IF Amplifier

As shown in figure 1, the IF amplifier is a 3-stage balanced circuit. The AGC detector output controls the gain of all three stages.

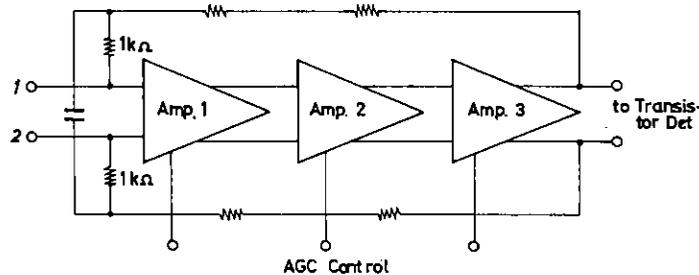


Figure 1

2. AGC Detector

The AGC detector, shown in figure 2, is a peak-detection type circuit. Pin 3 is the peak-detection filter capacitor connection.

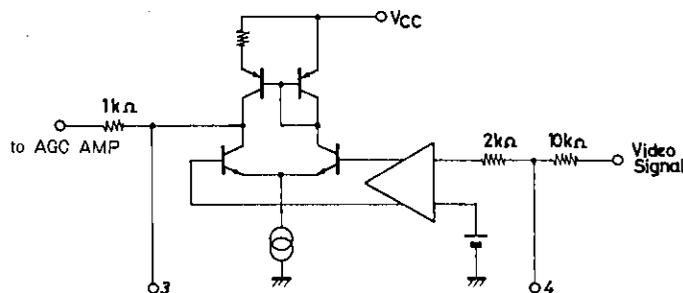


Figure 2

3. Transistor Detector and Video Amp

The detector circuit is shown in figure 3. The balanced IF signals from the IF amplifier are applied separately to the bases of the differential pair.

The detector output is taken from the emitters of the differential pair, smoothed by the filter on pin 9, and amplified by the video amplifier. The video signal ($\approx 0.85/V_{p-p}$) and sound IF signal are output on pin 6 via a 330Ω resistor.

LA7510

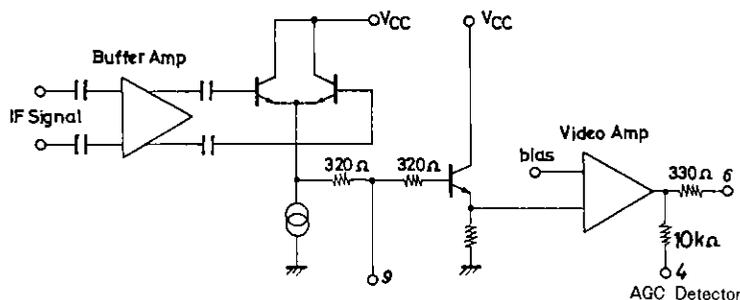
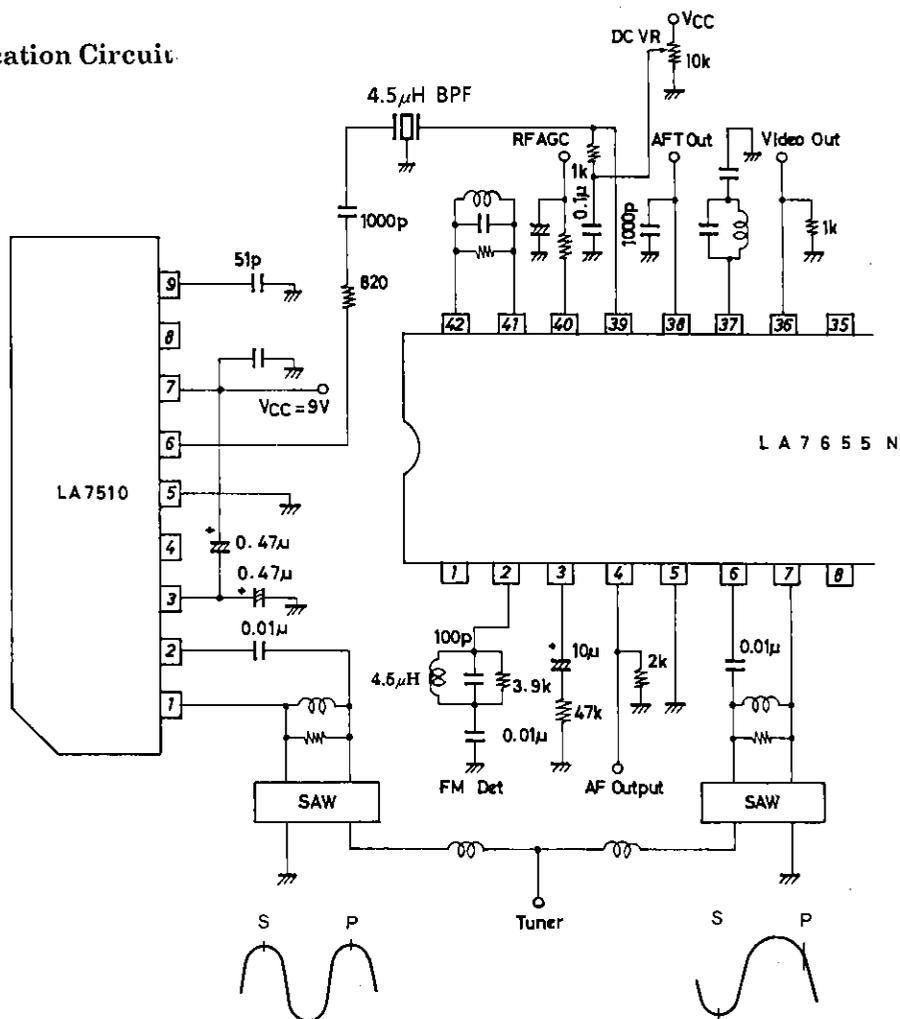


Figure 3

Sample Application Circuit



Unit (resistance:Ω, capacitance:F)

- 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.