Ordering number:ENN1774E

Monolithic Linear IC

LA7530N

IF Signal Processing (VIF+SIF) Circuit for TV / VCR Use

Overview

The LA7530N is an IC containing the VIF section and SIF section on a single chip in the DIP20 package. The use of the small-sized package serves to make VCR tuner units smaller.

As compared with the LA7530, the LA7530N is provided with 2 pins for IF AGC, permitting higher AGC speed. The LA7530N can substitute for the LA7530, but the LA7530 cannot substitute for the LA7530N. For 9V supply, use the LA7533.

Functions

- VIF section : VIF AMP, VIDEO DET, PEAK IF AGC, B/W NOISE CANCELLER, RF AGC, AFT, VIDEO MUTE.
- SIF section : SIF LIMITER AMP, FM DET, SND MUTE.

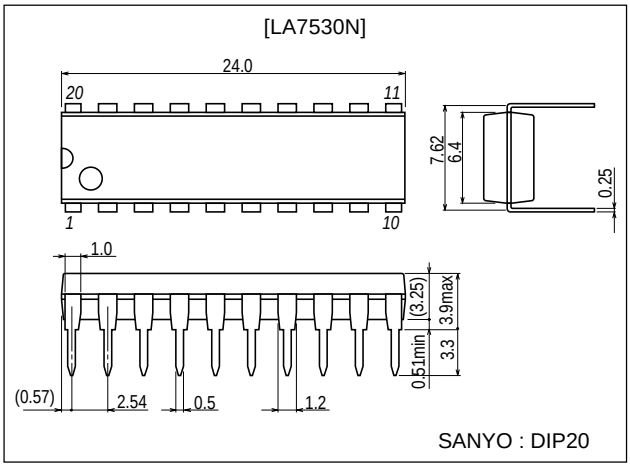
Features

- High-gain VIF amplifier requiring no preamplifier.
- Higher AGC speed.
- Adjustment-free FM detector because of ceramic discriminator-used quadrature detection.
- Possible to mute video, sound for VCR.
- Small-sized package.
- Minimum number of external parts required.

Package Dimensions

unit:mm

3021C-DIP20



Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		14	V
Flow-out current	I_{16} max		5	mA
Maximum applied voltage	V_{20} max		V_{CC}	V
Allowable power dissipation	Pd max	Ta≤40˚C	1.1	W
Operating temperature	Topr		–20 to +70	˚C
Storage temperature	Tstg		–55 to +125	˚C

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Operating Conditions at Ta = 25˚C

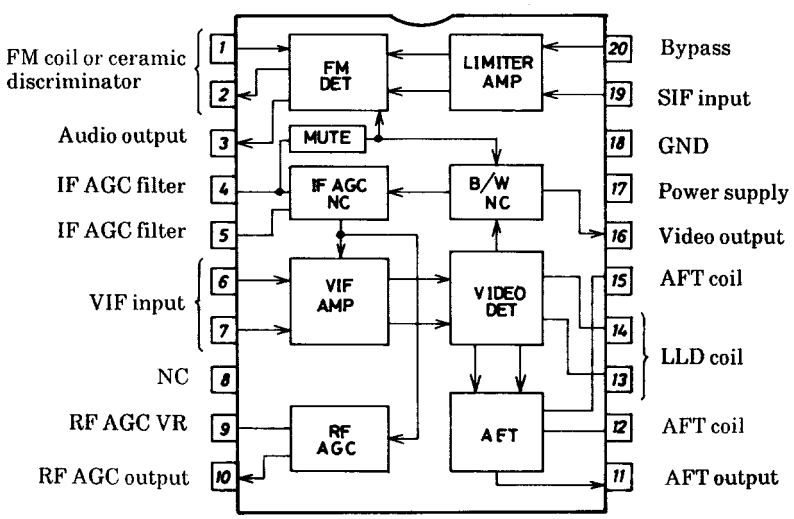
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		12	V
Operating voltage range	V_{CC} op		9 to 13.2	V

Operating Characteristics at Ta = 25˚C, V_{CC}=12V, f_P=58.75MHz, fs=54.25MHz (VIF), fo=4.5MHz (SIF)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total circuit current	I_{17}	DC	47	58	74	mA
Maximum RF AGC voltage	V_{10H}	DC	8.5	8.9	9.2	V
Minimum RF AGC voltage	V_{10L}	DC			0.5	V
Quiescent video output voltage	V_{16}	DC	5.7	6.1	6.5	V
Quiescent AFT output voltage	V_{11}	DC	4.5	6.5	7.5	V
Input sensitivity	Vi	fm=400Hz, 40%AM, V_O=0.8Vp-p	30	36	42	dBμ
AGC range	GR	fm=400Hz, 40%AM, V_O=0.8Vp-p	57	65		dB
Maximum allowable input	Vi max	fm=15kHz, 78%AM, V_O=±1dB	100	200		mVrms
Video output amplitude	V_O(VIDEO)	Vi=10mVrms, fm=15kHz, 78%AM	1.9	2.2	2.5	Vp-p
Output S/N	S/N	Vi=10mVrms CW	48	54		dB
Carrier leakage	CL	Vi=100mVrms, fm=15kHz, 78%AM	50	55		dB
Maximum AFT voltage	V_{11H}	Vi=10mVrms CW SWEEP	11	11.4		V
Mimimum AFT voltage	V_{11L}	Vi=10mVrms CW SWEEP		0.5	1.0	V
AFT detection sensitivity	Sf	Vi=10mVrms CW SWEEP	80	110	150	mV/kHz
White noise threshold level	V_{WTH}	Vi=10mVrms SWEEP	6.4	6.8	7.2	V
White noise clamp level	V_{WCL}	Vi=10mVrms SWEEP	4.2	4.6	5.0	V
Black noise threshold level	V_{BTH}	Vi=10mVrms SWEEP	2.1	2.4	2.7	V
Black noise clamp level	V_{BCL}	Vi=10mVrms SWEEP	3.8	4.2	4.6	V
SIF output signal voltage	V_O(SIF)	P/S=20dB	80	140	210	mVrms
Frequency characteristic	f_C	–3dB	5	7		MHz
Differential gain	DG	Vi=–27dBm (peak) 87.5% VIDEOMOD		3		%
Differential phase	DP	Vi=–27dBm (peak) 87.5% VIDEOMOD		3		deg
Input resistance	Ri		1.0	1.5	2.0	kΩ
Input capacitance	Ci			3.0	6.0	pF
SIF limiting voltage	Vi(lim)	–3dB		200	500	μVrms
Detection output voltage	V_O(DET)	Vi=100mVrms, fm=400Hz, Δf=±25kHz	450	680	850	mVrms
Total harmonic distortion	THD(DET)	Vi=100mVrms, fm=400Hz, Δf=±25kHz		0.5	1.3	%
AM rejection	AMR	Vi=100mVrms, fm=400Hz, Δf=±25kHz, 30% AM	50	60		dB

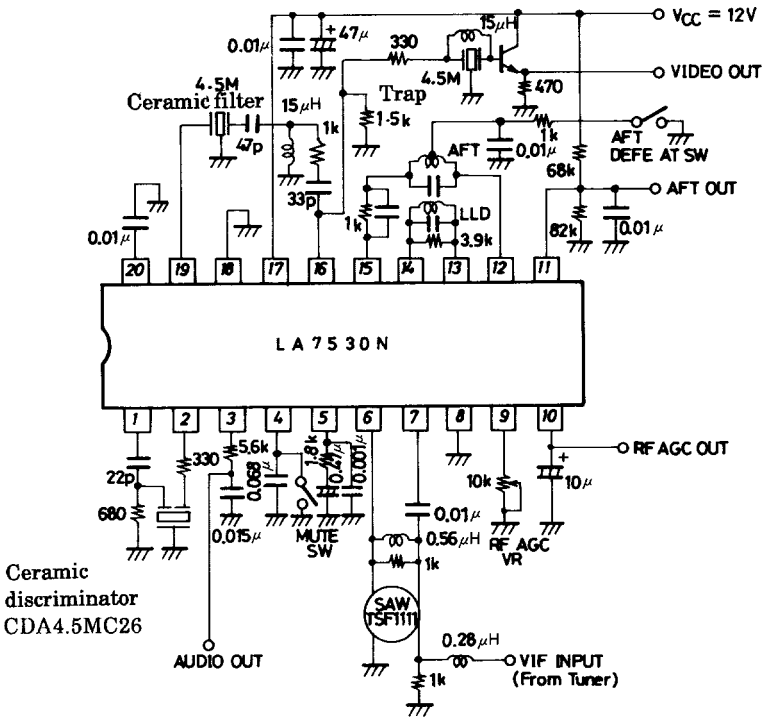
Usage Note : 1. Protective circuits must be inserted when using this IC with lines directly connecting the IC pins to external circuits. (For example, this applies to pins 12 and 15.)
2. A 1000pF capacitor must be connected between either pin 5 and ground or between pin 5 and pin 8 to prevent VIF amplifier oscillation.

Equivalent Circuit Block Diagram



Sample Application Circuit (Japan)

* The LA7530N differs from the LA7530 in the circuit externaly connected to pins 5, 8.



Unit (resistance:Ω, capacitance:F)