Ordering number:ENN3045

Monolithic Linear IC

LA7533

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

Overview

The LA7533 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 LA7530N, the LA7533 is improved in characteristics when it is operated at supply voltage 9V (DG, DP, RF AGC temperature characteristics).

The LA7533 is applicable to the circuit designed for the LA7530N.

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.

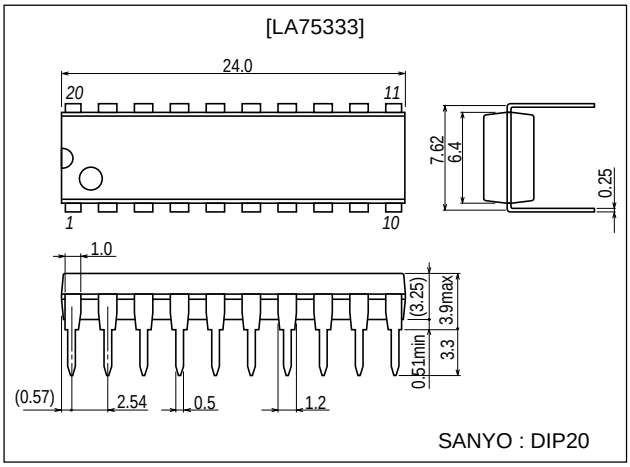
Features

- 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.
- Operated at supply voltage 9V.

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
External flow-out current	I_{16} max		5	mA
Pin 20 maximum supply 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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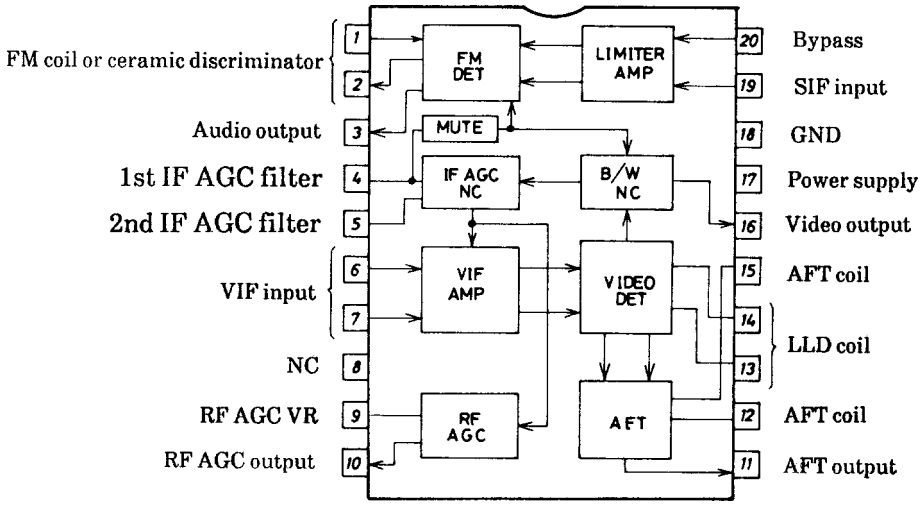
Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		9	V
Operating voltage range	V_{CC} op		8.1 to 13.2	V

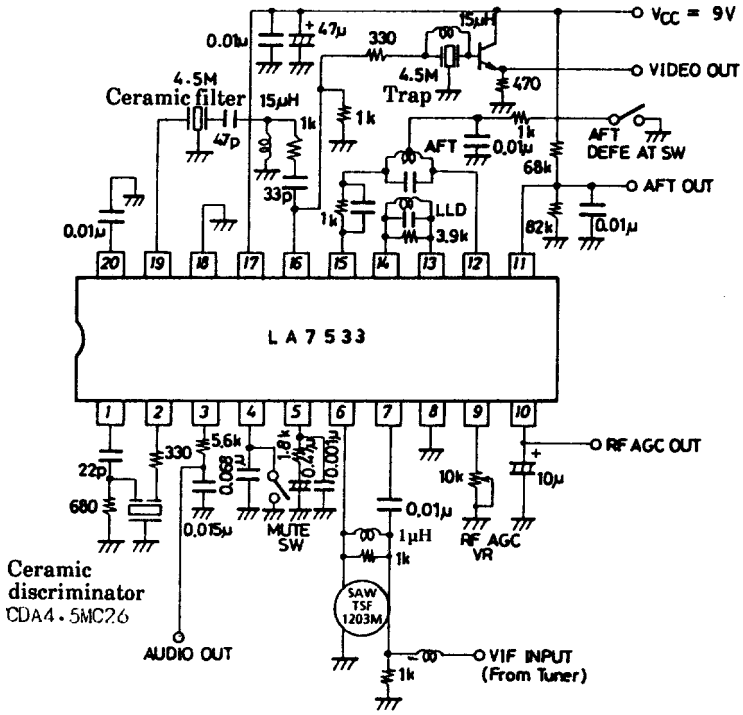
Operating Characteristics at Ta = 25˚C, V_{CC}=9V, f_P=58.75MHz, fs=54.25MHz (VIF), f_O=4.5MHz (SIF)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total circuit current	I_{17}	DC	40	49	63	mA
Maximum RF AGC voltage	V_{10H}	DC	6.2	6.5	6.8	V
Minimum RF AGC voltage	V_{10L}	DC		0.1	0.5	V
Quiescent video output voltage	V_{16}	DC	4.2	4.6	5.0	V
Quiescent AFT output voltage	V_{11}	DC	2.9	4.9	5.9	V
Input sensitivity	Vi	fm=400Hz, 40%AM, Vo=0.8Vp-p	31	37	42	dBμ
AGC range	GR	fm=400Hz, 40%AM, Vo=0.8Vp-p	57	63		dB
Maximum allowable input	Vi max	fm=15kHz, 78%AM, Vo=±1dB	90	130		mVrms
Video output amplitude	Vo(VIDEO)	Vi=10mVrms, fm=15kHz, 78%AM	1.4	1.65	1.9	Vp-p
Output S/N	S/N	Vi=10mVrms CW	48	53		dB
Carrier leakage	CL	Vi=100mVrms, fm=15kHz, 78%AM	50	55		dB
Maximum AFT voltage	V_{11H}	Vi=10mVrms SWEEP	8.1	8.5	8.9	V
Mimimum AFT voltage	V_{11L}	Vi=10mVrms SWEEP	0.1	0.4	0.9	V
AFT detection sensitivity	Sf	Vi=10mVrms SWEEP	45	70	90	mV/kHz
White noise threshold level	V_{WTH}	Vi=10mVrms SWEEP	4.7	5.1	5.5	V
White noise clamp level	V_{WCL}	Vi=10mVrms SWEEP	2.9	3.3	3.7	V
Black noise threshold level	V_{BTH}	Vi=10mVrms SWEEP	1.6	1.85	2.1	V
Black noise clamp level	V_{BCL}	Vi=10mVrms SWEEP	2.6	2.9	3.2	V
SIF output signal voltage	Vo(SIF)	P/S=20dB	70	100	140	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
VIF input resistance	ri			1.5		kΩ
VIF input capacitance	ci			3.0		pF
SIF limiting voltage	Vi(lim)	–3dB		300	600	μVrms
Detection output voltage	Vo(DET)	Vi=100mVrms, fm=400Hz, Δf=±25kHz	440	670	800	mVrms
Total harmonic distortion	THD(DET)	Vi=100mVrms, fm=400Hz, Δf=±25kHz		0.6	1.5	%
AM rejection	AMR	Vi=100mVrms, fm=400Hz, Δf=±25kHz 30%AM	50	60		dB
Noise output voltage	V_N				3.5	mVrms
Pin 4 muting start voltage	$V_{M(4)}$		0.3	0.5		V
Pin 20 muting attenuation	$ATT_{M(20)}$		60			dB

Equivalent Circuit Block Diagram



Sample Application Circuit (USA)



Unit (resistance:Ω, capacitance:F)