

LA7550



3067

Monolithic Linear IC

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

©2654

The LA7550 is a full sync detection method VIF+SIF monolithic linear IC using a PLL. It has excellent 920kHz beat and buzz beat characteristics, making it ideal for audio multiplexing and high-quality AV equipment.

Functions

- . VIF Section
 - . VIF amp
 - . AFT
- . SIF Section
 - . SIF limiter amp
- . Audio Section
 - . DC attenuator
 - . Muting
 - . Audio muting (pin 2)
 - . AFT defeat (pin 14)
- . Video sync detection
- . VCO
- . FM quadrature detection
- . AF driver
- . IF AGC
- . APC DET
- . B/W NC
- . Lock DET
- . RF AGC
- . Audio-Video simultaneous muting (pins 10, 13)

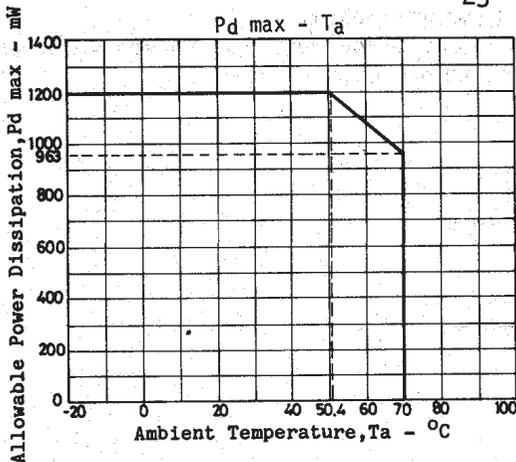
Features

- . 24-pin DIP shrink package being the smallest one for PLL ICs
- . Excellent 920kHz beat characteristics
- . Excellent buzz beat characteristics
- . High-gain VIF amp
- . High-speed AGC possible

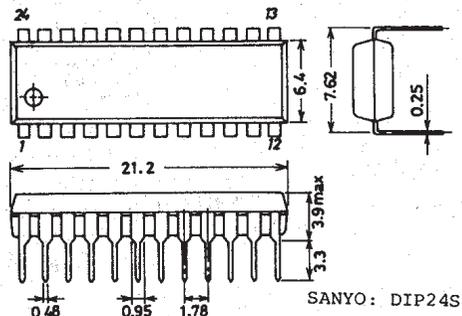
Maximum Ratings at Ta=25°C

			unit
Maximum Supply Voltage	V _{CC} max	13.8	V
Allowable Power Dissipation	P _d max	1200	mW
Operating Temperature	Topg	-20 to +70	°C
Storage Temperature	Tstg	-55 to +150	°C
Circuit Voltage	V ₁₂ , V ₁₃	V _{CC}	V
	V ₁₆	V _{CC}	V
	V ₂₂	V _{CC}	V
	V ₂₃	V _{CC}	V

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Case Outline 3067-D24SIC (unit:mm)



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Circuit Current	I_5	-3	mA	unit
	I_{21}	-5	mA	
	I_{22}	2	mA	

Note: Assumes that the current to the IC is positive (no sign) and current from the IC is negative.

Operating Conditions at $T_a=25^\circ\text{C}$			unit
Recommended Supply Voltage	V_{CC}	12	V
Operating Voltage Range	V_{CC} op	10 to 13.2	V

Operating Characteristics at $T_a=25^\circ\text{C}$

[VIF Section]		Test					unit
		Point	min	typ	max		
Circuit Current	I_6+I_{17}	S1=on, $V_{13}=11\text{V}$	Pins6,17	45	57	71	mA
Quiescent Video	V_{21}	S1=on, $V_{13}=11\text{V}$	Pin21	5.8	6.2	6.6	V
Output Voltage							
Maximum RF AGC Voltage	V_{11H}	S1=off, $V_{13}=11\text{V}$	Pin11	10.6	11	11.4	V
Minimum RF AGC Voltage	V_{11L}	S1=on, $V_{13}=11\text{V}$	Pin11		0	0.5	V
Quiescent AFT	V_{16}	S1=on, $V_{13}=11\text{V}$	(B)	3.5	6.5	7.5	V
Output Voltage							
Input Sensitivity	V_i	S1→off, S2→(a)	(A)	33	39	45	dB/uV
AGC Range	GR	S1→on, S2→(a)	(A)	60	65		dB
Maximum Allowable Input	V_i max	S1→on, S2→(a)	(A)	100	200		mVrms
Video Output Amplitude	V_o (video)	S1→on, S2→(a)	(A)	1.9	2.2	2.5	Vp-p
Output S/N	S/N	S1→on, S2→(a)	(A)	49	53		dB
Sync Signal Tip Voltage	V_{21} tip	$V_i=10\text{mV}$, S1=on	(A)	3.4	3.65	3.9	V
920kHz Beat Level	I_{920}	P=0, S1=on, C=-4dB, S=-14dB(2Vp-p)	(A)	38	46		dB
Frequency Characteristic	f_c	P=0, S=-14dB	(A)	6	7		MHz
SIF Output Signal Voltage	V_o (SIF)	P=0, S=-20dB	(A)	110	180	260	mVrms
Differential Gain	DG	fp=58.75MHz, $V_i=10\text{mV}$, mod 87.5%, video signal	(A)		5	10	%
Differential Phase	DP	fp=58.75MHz, $V_i=10\text{mV}$, mod 87.5%, video signal	(A)		3	10	deg
White Noise	V_{WTH}		(A)	6.4	6.8	7.2	V
Threshold Voltage							
White Noise	V_{WCL}		(A)	4.2	4.6	5.0	V
Clamping Voltage							
Black Noise	V_{BTH}	S1→on, S2→(a)	(A)	2.3	2.6	2.9	V
Threshold Voltage							
Black Noise	V_{BCL}	S1→on, S2→(a)	(A)	4.1	4.5	4.9	V
Clamping Voltage							
Maximum AFT Voltage	V_{16H}	S2→(a)	(B)	11.0	11.5	12.0	V
Minimum AFT Voltage	V_{16L}	S2→(a)	(B)	0	0.5	1.0	V
AFT Detection Sensitivity	S_f	S2→(a)	(B)	37	50	70	mV/kHz
Input Resistance	r_i	f=58.75MHz		0.8	1.3	1.75	kohm
Input Capacity	c_i	f=58.75MHz			3.0	6.0	pF
APC Pull-in Range(U)1	f_{PU-1}	S1→on, S2→(b)	(A)	+0.5	0.8		MHz
APC Pull-in Range(L)1	f_{PL-1}	S1→on, S2→(b)	(A)		-0.8	-0.5	MHz
APC Pull-in Range(U)2	f_{PU-2}	S1→on, S2→(a)	(A)	+0.6	+2		MHz
APC Pull-in Range(L)2	f_{PL-2}	S1→on, S2→(a)	(A)		-2-1.25		MHz

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			Test Point	min	typ	max	unit
Lock Detection Threshold Voltage	V_{13TH}	S3→(b)	Pin22	11	11.5		V
VCO Maximum Variable Range	Δf_U	S1=on, $V_{20}=4V$	(A)	0.5	2.1		MHz
VCO Maximum Variable Range	Δf_L	S1=on, $V_{20}=8V$	(A)		-2.1	-1.2	MHz
VCO Control Sensitivity [SIF Section]	β	$V_{20}=6V$ to $5.6V$	(A)	1.4	2.8	5.6	kHz/mV
SIF Limiting Voltage	$V_i(lim)$	$V_{13}=10V$	(C)		250	500	μV_{rms}
FM Detection	V_o	$V_{13}=10V$	(C)	-5.1	-1.5	+0.5	dBs*
Output Voltage AM Rejection	AMR	$V_{13}=10V$	(C)	40	55		dB
Distortion [Audio Section]	THD(Det)	$V_{13}=10V$	(C)		0.5	1	%
DC VR Maximum Attenuation	A_{TT}	$V_{23}=8V \rightarrow 0V, V_{13}=10V$	(D)	70	75		dB
AF Amp Voltage Gain	G_{AF}	$V_{23}=8V, V_{13}=10V$	(D)	18	20	22	dB
AF Amp Distortion	THD(AF)	$V_{23}=8V, V_{13}=10V, f=400Hz$	(D)		0.5	1	%
AF Amp Maximum Output Voltage	$V_o \max(AF)$	$V_{23}=8V, V_{13}=10V$	(D)	3	4		Vrms

*: 0dBs=0.7745Vrms

Equivalent Circuit Block Diagram

