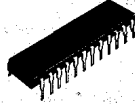


LA7550



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)

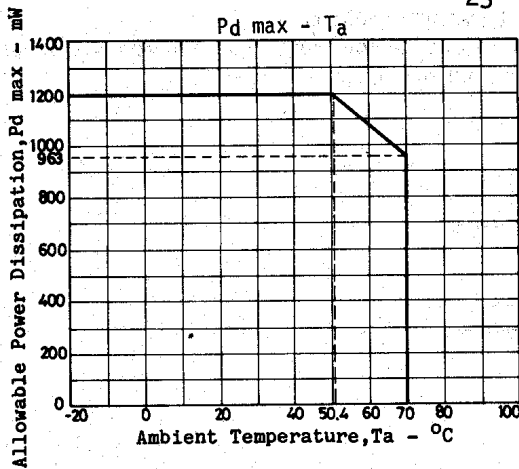
Features

- . 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

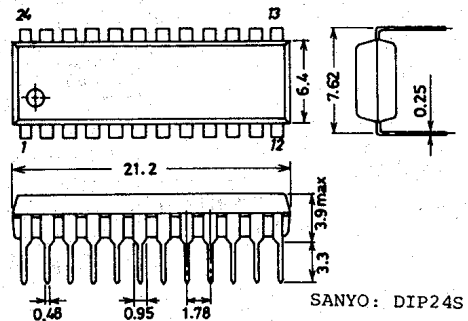
Maximum Ratings at Ta=25°C

Parameter	Symbol	Value	Unit
Maximum Supply Voltage	V _{CC} max	13.8	V
Allowable Power Dissipation	P _d max	1200	mW
Operating Temperature	T _{op}	-20 to +70	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Circuit Voltage	V _{12, V13}	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)



9187TA, TS No.2654-1/10

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Continued from preceding page.

		unit
Circuit Current	I_5	-3 mA
	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 Ta=25°C		unit
Recommended Supply Voltage	V_{CC}	12 V
Operating Voltage Range	V_{CC} op	10 to 13.2 V

Operating Characteristics at Ta=25°C

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

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			Test Point	min	typ	max	unit
Lock Detection Threshold Voltage	V_{13TH}	S3→(b)	Pin22	1.1	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 Output Voltage	V_o	$V_{13}=10V$	(C)	-5.1	-1.5	+0.5	dBs*
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		V_{rms}

*: $0dBs=0.7745V_{rms}$

Equivalent Circuit Block Diagram

