



No. ※ 5571

LA7172M

UHF Band RF Modulator

Preliminary

Overview

The LA7172M is a monolithic IC for an RF modulator which generates RF TV channel signal in UHF band, from a baseband video and audio signal.

Audio FM carrier is controlled by PLL system and generated without L/C tank.

Features

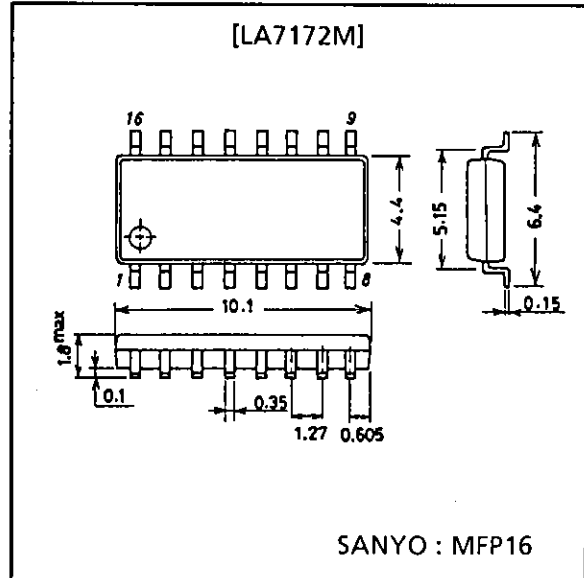
- 5 V operation
- Less supply current
- Balanced RF VCO
- Wide bandwidth
- PLL controlled and tankless audio FM (4 sound intercarrier frequency capability)
- Small package
- Package : MFP16 (SOP16)

Functions

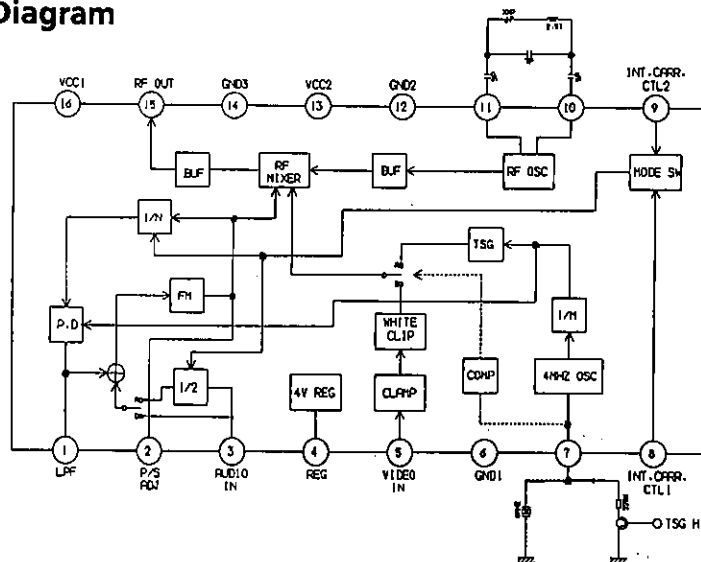
- RF VCO
- Video modulator
- Sound carrier converter
- RF buffer
- Video clamp
- White clip
- Audio FM
- 4 V regulator
- Reference oscillator
- TSG (test signal generator)

Package Dimensions

unit : mm
3035A-SOP16



Equivalent Circuit Block Diagram



LA7172M

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

				Unit
Maximum supply voltage	V_{CCmax}		7	V
Allowable power dissipation	P_{dmax}	$T_a \leq 75^\circ\text{C}$	250	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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

				Unit
Recommended supply voltage	V_{CC}		5	V
Operating voltage range	V_{CCop}		4.5 to 5.5	V

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

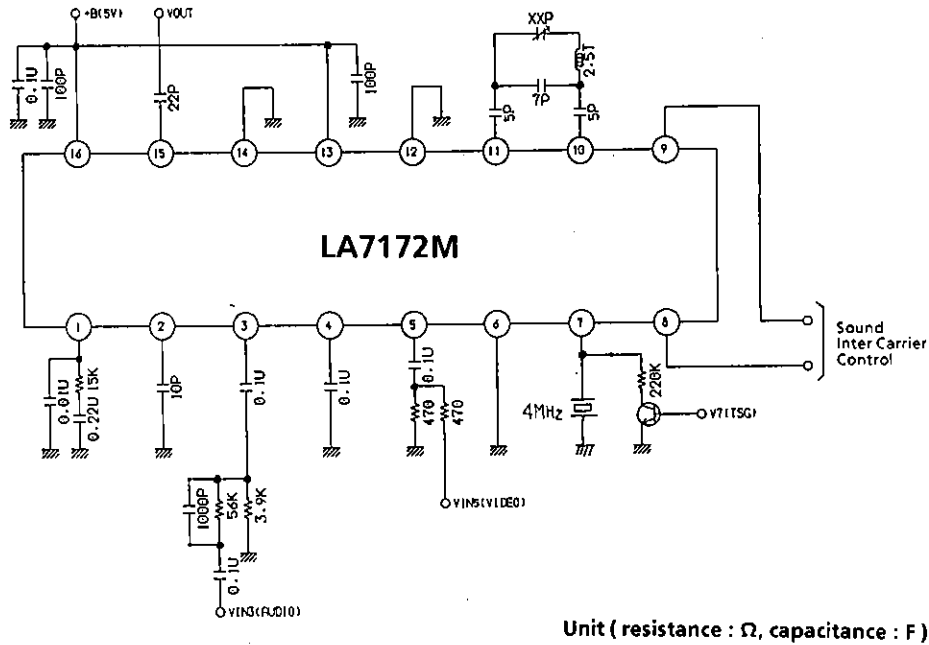
			min	typ	max	Unit
Supply current	I_{CC}	No signal	24	30	36	mA
Regulator voltage	V_{reg}	No signal	3.7	3.9	4.1	V
RF output	P	No signal	77	79.5	82	dB μ
P/S ratio	P/S	S : fp + 4.5 MHz	12.5	15	17.5	dB
Sound 2nd harmonics	P/S2	S2 : fp + 2 \times fs MHz	*	*	-	dB
Sound 3rd harmonics	P/S3	S3 : fp + 3 \times fs MHz	*	*	-	dB
Chrominance beat	P/CB	$V_{IN5} = f_{sc}$, 0.4 Vp-p CB : fp + fs - fsc	65	75	-	dB
Video harmonics	P/V2	$V_{IN5} = 1\text{ MHz}$, 1 Vp-p V2 : fp + 2 MHz	50	62	-	dB
Video modulation	M_p	$V_{IN5} = \text{Stair step}$, 1 Vp-p	73	80	87	%
White clip level	WCL	$V_{IN5} = \text{Stair step}$, 1.5 Vp-p	88	93	98	%
Differential gain	DG	$V_{IN5} = \text{Stair step}$, 1 Vp-p	-5	-	5	%
Differential phase	DP	$V_{IN5} = \text{Stair step}$, 1 Vp-p	-6	-	6	Deg
TSG modulation	M_p TSG	V7 : high	70	80	90	%
TSG VS ratio	V/S	V7 : high, video/sync.	6.3/ 3.7	6.8/ 3.2	7.3/ 2.7	
TSG period	TS	V7 : high	63.7	64.0	64.3	μs
TSG sync. width	HS	V7 : high	3.6	4.0	4.4	μs
TSG white width	HV	V7 : high	3.6	4.0	4.4	μs
TSG 1st white rise	TV1	V7 : high, Width between sync. and 1st white rise	22	24	26	μs
TSG 2nd white rise	TV2	V7 : high, Width between sync. and 2nd white rise	38	40	42	μs
Audio FM modulation	M_{sFM}	$V_{IN3} = 1\text{ kHz}$, 1.66 Vp-p $\pm 50\text{ kHz DEV} : 100\%$	90	100	110	%
Max audio modulation	M_{smx}	THD < 3%	400	-	-	%
Audio FM THD	THDFM	$V_{IN3} = 1\text{ kHz}$, 1Vp-p	-	0.5	2	%
Audio FM S/N	S/NFM	$V_{IN3} = 1\text{ kHz}$, 1Vp-p $V_{IN5} = \text{Color bar}$, 1Vp-p	43	55	-	dB

* : TBD

Note

fp : picture RF carrier, fs : sound intercarrier (B/G 5.5 MHz), fsc : sub carrier (4.43 MHz)

Sample Application Circuit



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