Ordering number : EN4862C

Bi CMOS LSI

LV3400M

FM Multiplex Filter

Overview

The LV3400M is a filter IC designed for FM multiplex broadcast reception and is used in combination with the Sanyo LC72700 demodulation/error correction IC. The adoption of switched capacitor (SCF) technology means that frequency adjustment is not required and that the LV3400M provides stable operation.

Functions

- 76 kHz band-pass filter (Gaussian filter)
- 54 kHz high-pass filter
- 125 kHz low-pass filter
- Anti-aliasing filter
- Limiter circuit

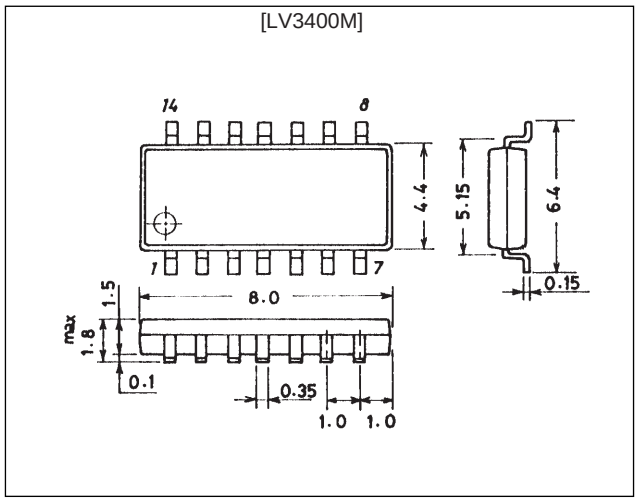
Features

- Adjustment-free, due to the use of SCF technology.
- Few external components are required.

Package Dimensions

unit: mm

3111-MFP14S



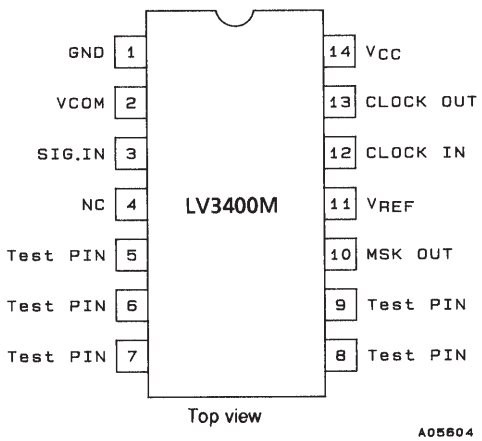
SANYO: MFP14S

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		6	V
Maximum input voltage	V_3, V_7, V_{12}		–0.3 to V_{CC} + 0.3	V
Allowable power dissipation	Pd max		180	mW
Operating temperature	Topr		–40 to +85	°C
Storage temperature	Tstg		–55 to +125	°C

Pin Assignment



Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Operating supply voltage range	V_{CC}		4.5 to 5.5	V
Input signal voltage range	V_{IN}	A composite signal corresponding to a 100% FM modulation level	200 to 300	mVrms
		f_{IN} = 76 kHz, CW	8 to 30	mVrms
Clock frequency	f_{CK}		3.60	MHz
Clock input voltage	V_{CK}		1.0 to V_{CC}	Vp-p

Operating Characteristics at Ta = 25°C, V_{CC} = 5 V, f_{CK} = 3.6 MHz, V_{CK} = 1 Vp-p

Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	I_{CCO}	The pin 14 current for a no-signal input to V_{IN}	3.8	6	8	mA
SCF block common voltage	V_2	The pin 2 voltage for a no-signal input to V_{IN}	2.1	2.3	2.5	V
Signal input resistance	Rin3	The pin 3 input resistance		36		kΩ
Clock input resistance	Rin12	The pin 12 input resistance		100		kΩ
[MSK Output]						
MSK input sensitivity	V_{3S}	The input level such that an MSK output with the same frequency is acquired when a 76-kHz CW is applied as V_{IN}.			4	mVrms
MSK output high level	V_{10H}	V_{IN} = 76 kHz, 4 mVrms, CW	4			V
MSK output low level	V_{10L}				0.4	V

Reference Characteristics

Parameter	Symbol	Conditions	Ratings	Unit
AAF cutoff frequency			300	kHz
HPF corner frequency			54	kHz
LPF cutoff frequency			125	kHz
BPF center frequency			76	kHz
BPF -3 dB frequency			19	kHz
Maximum in-band group delay time difference			±5	μs

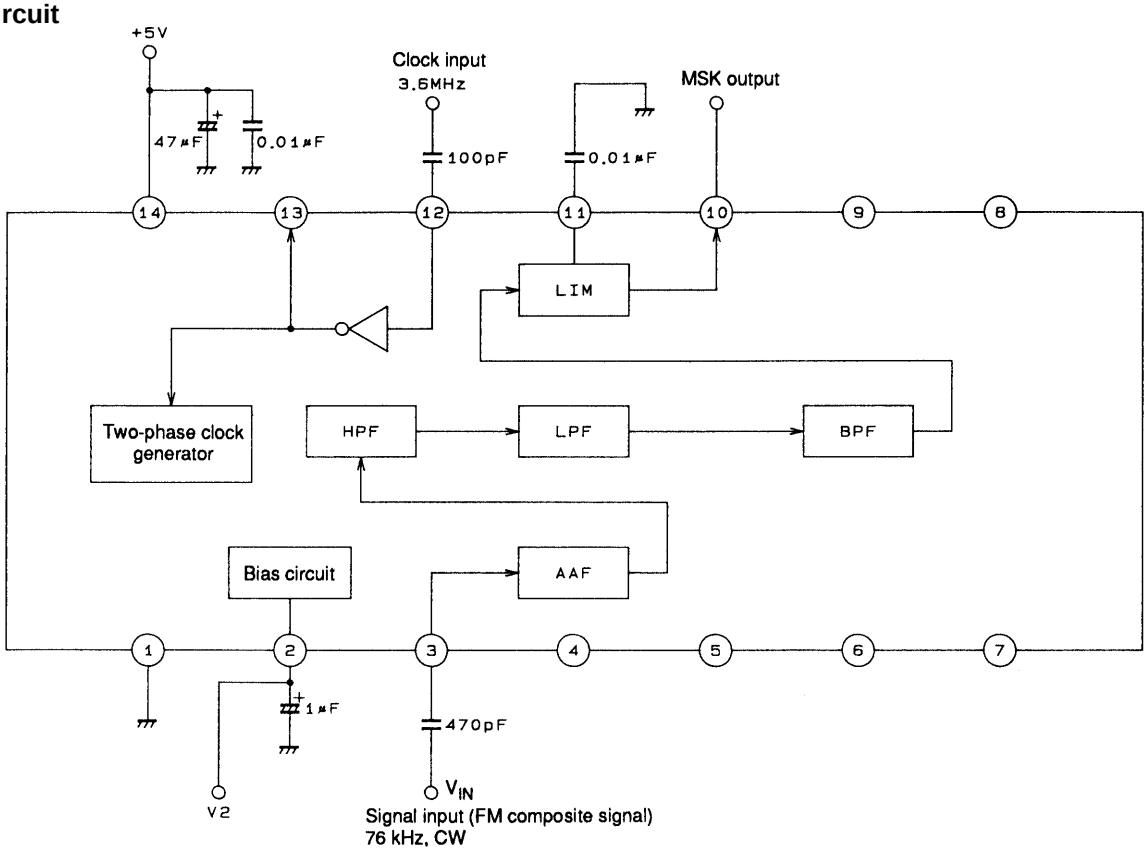
Pin Functions

PinNo.	Symbol	Description
1	GND	Ground
2	VCOM	SCF block common. A decoupling capacitor must be used.
3	SIG. IN	Signal input. Input an FM modulated signal (composite signal). A modulated signal between 200 and 300 mVrms should be input. The input sensitivity for a pure 76-kHz signal is 4 mVrms or lower.
10	MSK OUT	MSK output (CMOS output)
11	V_{REF}	Limiter reference voltage. A low-pass filter is formed by the internal resistance (which is about 10 kΩ) and an external capacitor.
12	CLK IN	3.6-MHz clock input. The DC bias at the CMOS inverter input, to which a 100-kΩ feedback resistor is connected, is about V_{CC}/2. The clock signal is input through a capacitor.
13	CLK OUT	The clock output that was wave-shaped by an inverter. This pin is normally left open.
14	V_{CC}	Power supply
4 to 9	NC, Test PIN	This pin must be left open.

Usage Notes

1. Pins 4 to 9 and pin 13 are left open in normal use.
2. The clock should be taken from the decoder (LC72700) clock output pin and input to pin through a capacitor of about 100 pF. Spurious radiation from the clock line can be reduced by inserting a resistor in the line and thus smoothing the rising and falling edges. This signal is then input to pin 12 through a capacitor.

Test Circuit



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Note: Pins 4 to 9 are left open.