Ordering number : ENA0306

SANYO Semiconductors
DATA SHEET

LV3401M — Bi-CMOS IC FM Multiplex Filter

Overview

The LV3401M is a filter IC for FM multiplex broadcasting reception which is used in combination with demodulation and error correction IC (LC72700 series). The use of switched capacitor filter (SCF) technique obviates the need for frequency adjustment and ensures stable operation.

Functions

- 76kHz BPF (Gaussian filter)
- 54kHz HPF
- 125kHz LPF
- Anti-aliasing filter
- Limiter circuit

Specifications

Maximum Ratings at Ta = 25°C

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

* Mounted on a board:114.3×76.1×1.6mm^3 Glass epoxy

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5.0	V
Allowable operating range	V_{CC} op		3 to 5.5	V
Input signal voltage range	V_{IN}	Baseband signal for FM : 100% modulation	200 to 300	mVrms
		f_{in} = 76kHz, CW	8 to 30	mVrms
Clock frequency	f_{ck}	Rectangular wave	3.60	MHz
Clock input voltage	V_{ck}	Rectangular wave	1.0 to V_{CC}	Vp-p

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I_{CCO}	Pin 14 current when V_{IN} = no signal	3.8	6	8	mA
SCF block common voltage	V_2	Pin 2 voltage when V_{IN} = no signal	2.2	2.4	2.6	V
Signal input resistance	$R_{IN}3$	Pin 3 input resistance		36		kΩ
Clock input resistance	$R_{IN}12$	Pin 12 input resistance		5		kΩ
[MSK output]						
MSK input sensitivity	V_3S	Input level at which an MSK output having a frequency of 76kHz is obtained when V_{IN} = 76kHz, CW is applied.			4	mVrms
MSK output H level	$V_{10}H$	V_{IN} = 76kHz, 4mVrms, CW	4			V
MSK output L level	$V_{10}L$				0.4	V

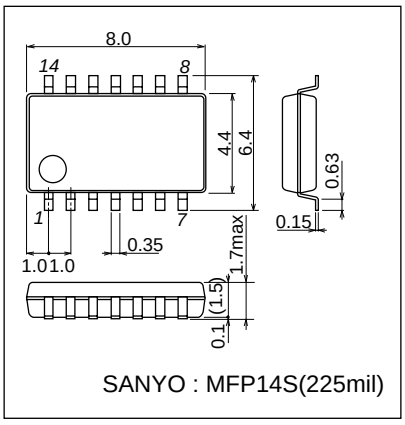
Reference Characteristics

Parameter	Symbol	Conditions	Ratings	Unit
AAF cutoff frequency	f_{AAF}		300	kHz
HPF corner frequency	f_{HPF}		54	kHz
LPF cutoff frequency	f_{LPF}		125	kHz
BPF center frequency	f_{BPF}		76	kHz
BPF-3dB frequency	f_{BPF}-3dB		19	kHz
In-band maximum group delay time difference	B_{DL}		±5	μs

Package Dimensions

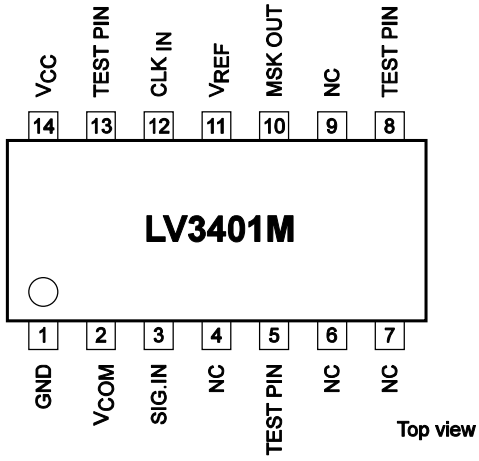
unit :mm

3111A

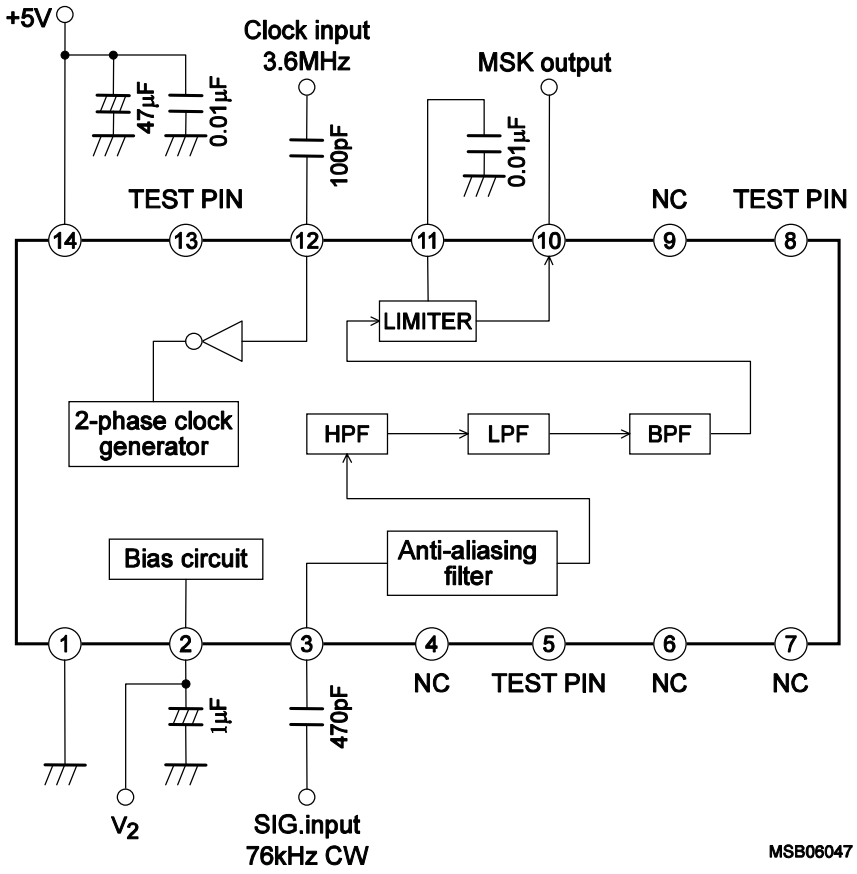


SANYO : MFP14S(225mil)

Pin Assignment



Block Diagram and Test Circuit



Pin Description

Pin No.	Pin name	Description
1	GND	Ground pin
2	VCOM	SCF block common pin. Decoupling capacitor connection.
3	SIG.IN	Signal input pin. FM demodulation signal (composite signal) input. Demodulation signal 200 to 300mVrms input. When 76kHz only is input, input sensitivity is 4mVrms or less.
10	MSK OUT	MSK output (CMOS output)
11	V_{REF}	Limiter reference pin. Internal resistor and external capacitor are used to form LPF.
12	CLK_{IN}	3.6MHz clock input. Since limiter amplifier provides DC bias, clock is input through capacitive coupling.
14	V_{CC}	Power supply pin.
5, 8, 13	TEST PIN	Test pin. Left open.
4, 6, 7, 9	NC	Idle pin.

Usage Notes

(1) Leave pins 4 to 9 and pin 13 open.

(2) Input the clock to pin 12, as such, through a capacitor (100pF) from the decoder(LC72700 series) clock output pin or input the clock to pin 12 through a capacitor after making the rising/trailing edge less steep by inserting a CR-formed LPF en route if it is desirable to reduce spurious radiation from the clock line.

(3) 5ms or less are recommended at the rising time of the power supply.