



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

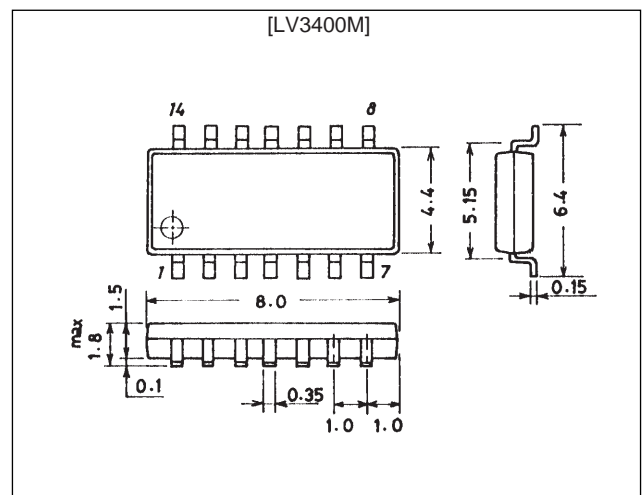
Features

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

Package Dimensions

unit: mm

3111-MFP14S



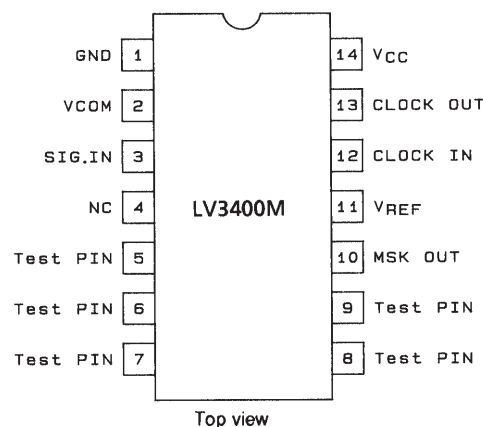
SANYO: MFP14S

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 | T _{opr} | | -40 to +85 | °C |
| Storage temperature | T _{stg} | | -55 to +125 | °C |

Pin Assignment



A05604

LV3400M

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

| 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 |
| | | $f_{IN} = 76\text{ kHz, CW}$ | 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 $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$, $f_{CK} = 3.6\text{ MHz}$, $V_{CK} = 1\text{ Vp-p}$

| 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 | R_{in3} | The pin 3 input resistance | | 36 | | k Ω |
| Clock input resistance | R_{in12} | The pin 12 input resistance | | 100 | | k Ω |
| [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} | $V_{IN} = 76\text{ kHz, } 4\text{ mVrms, CW}$ | 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 |

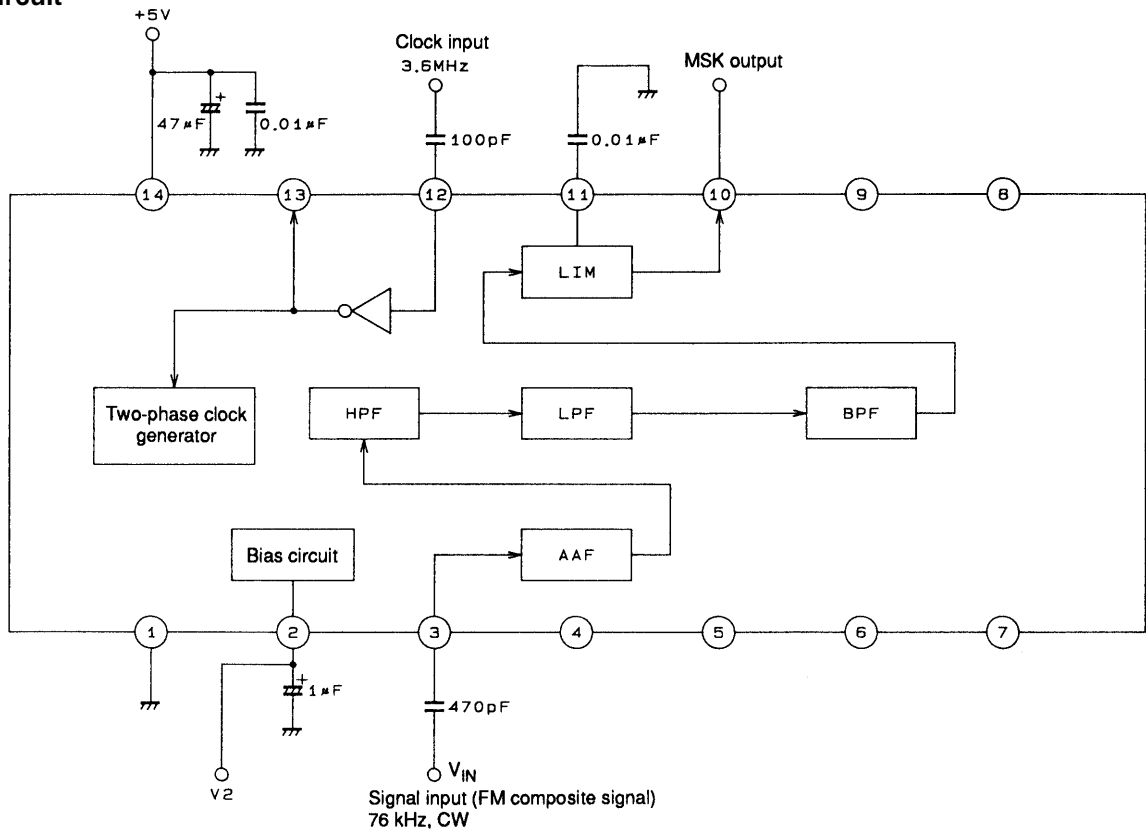
Pin Functions

| 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 k Ω) and an external capacitor. |
| 12 | CLK IN | 3.6-MHz clock input. The DC bias at the CMOS inverter input, to which a 100-k Ω 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

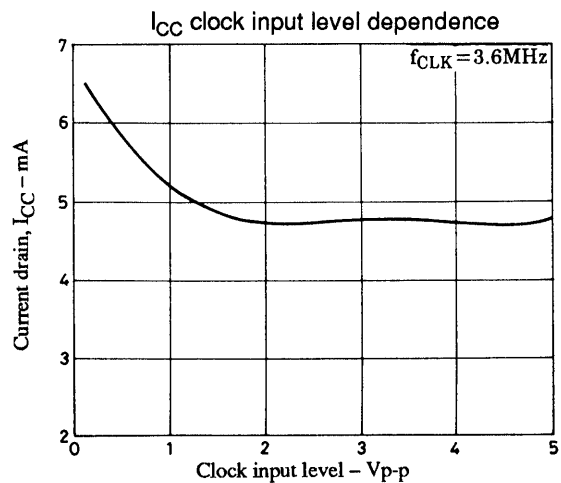
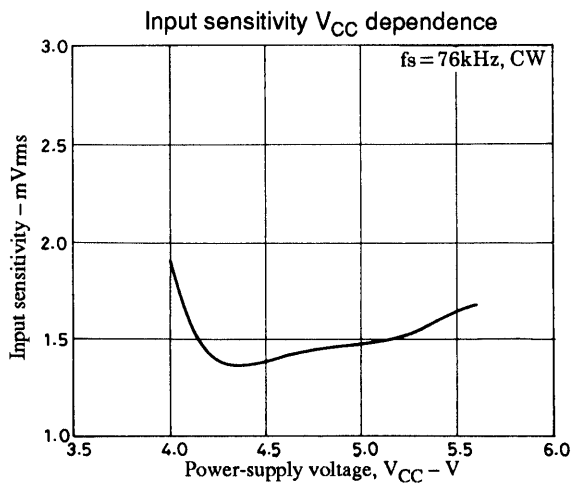
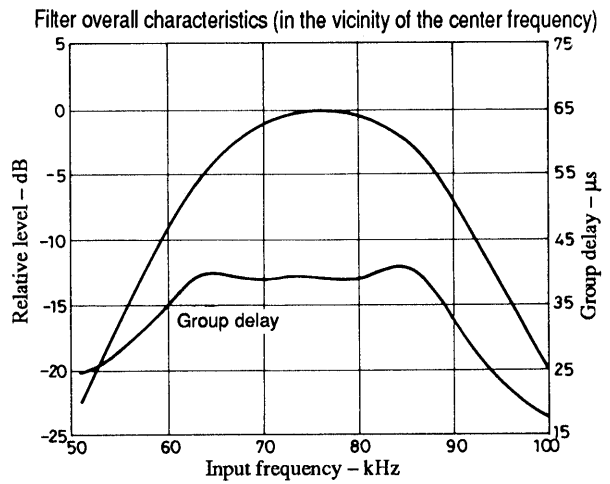
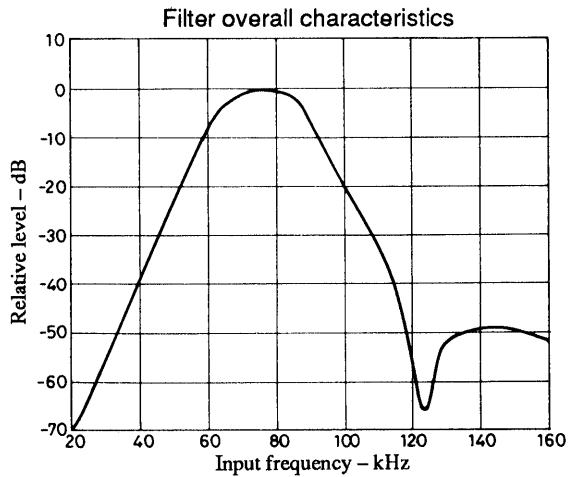
- Pins 4 to 9 and pin 13 are left open in normal use.
- The clock should be taken from the decoder (LC72700) clock output pin and input to pin through a capacitor of about 100 pF. Spurious radiation from the clock line can be reduced by inserting a resistor in the line and thus smoothing the rising and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

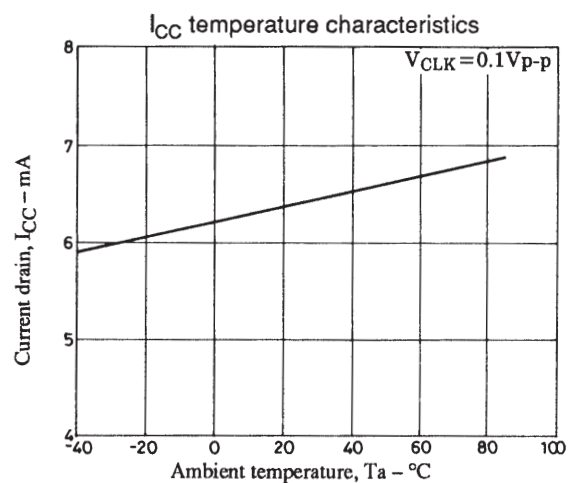
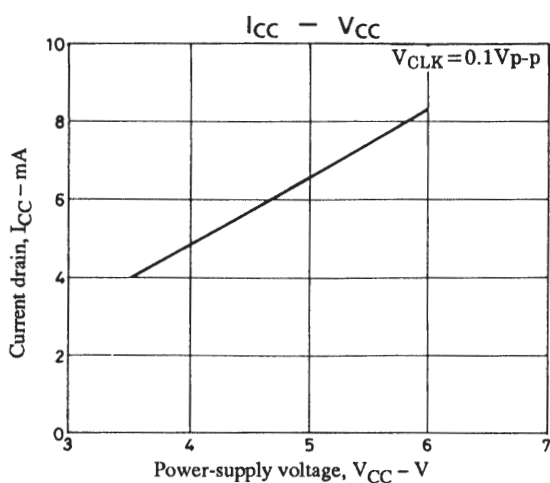
Test Circuit



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Note: Pins 4 to 9 are left open.





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