Ordering number : EN5646

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA7218M — Sync Separator IC with AFC and Sync Detection Functions

Overview

The LA7218M is a sync separator IC with AFC designed for use in video cameras, VCRs, TVs, and similar products. It also provides a sync detection function. This IC can implement an adjustment-free system with high detection precision using a ceramic oscillator VCO and a PLL-based horizontal sync detection circuit.

Functions

- Sync separator
- Vertical sync separator
- Horizontal AFC
- VCO ($32f_H$)
- Sync detector

* : Since the pin functions are fixed, this ICs performance cannot be adjusted with external signals. Furthermore, since this IC includes no EPROM or other memory, its software cannot be rewritten.

Features

- Ceramic oscillator adopted for adjustment-free manufacturing
- Negative outputs
- High-impedance video signal inputs
- Supply voltage : 5V

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		7	V
Allowable power dissipation	Pd max	Ta ≤ 65°C	150	mW
Operating temperature	Topr		-15 to +65	°C
Storage temperature	Tstg		-40 to +125	°C

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Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5.0	V
Operating supply voltage range	V_{CC} op		4.5 to 5.5	V

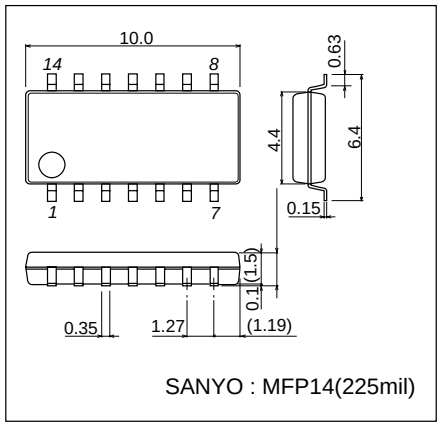
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CC}	Standard color bar input	4.9	7	9.1	mA
Sync separator minimum input level	V_I min		-15	-11	-8	dB
HD output delay time	T_{HD}	Compare pins 2 and 9	0	0.4	0.8	μs
HD output pulse width	T_{HW}		3.5	4.9	5.3	μs
VD output delay time	T_{VD}	Compare pins 2 and 5	9	13	17	μs
VD output pulse width	T_{VW}		0.16	0.21	0.26	ms
Free-running frequency	FO	With switch SW1 off	15.4	15.75	16.1	kHz
Capture range 1	F_{CH}	Discriminated by comparing pins 2 and 9	300	500		Hz
Capture range 2	F_{CL}	Discriminated by comparing pins 2 and 9	1000	1500		Hz
SYNC output high level	V_{SH}	Read from the pin 4 waveform	3.9	4.2		V
SYNC output low level	V_{SL}	Read from the pin 4 waveform		0.8	1.0	V
HD output high level	V_{HH}	Read from the pin 9 waveform	3.9	4.2		V
HD output low level	V_{HL}	Read from the pin 9 waveform		0.8	1.0	V
VD output high level	V_{VH}	Read from the pin 5 waveform	3.9	4.2		V
VD output low level	V_{VL}	Read from the pin 5 waveform		0.8	1.0	V
DET output high level	V_{DH}		4.8	5.0		V
DET output low level	V_{DL}	SW1 off		0.1	0.3	V
Comparator threshold high level	V_{TH}	SW2-a	2.7	2.95	3.2	V
Comparator threshold low level	V_{TL}	SW2-a	2.4	2.7	3.0	V
Threshold width	V_{TW}	V_{TH}-V_{TL}	0.10	0.22	0.40	V
DET operating current (high)	I_{DH}	SW2-b	40	65	90	μA
DET operating current (low)	I_{DL}	SW2-b	40	65	90	μA

Package Dimensions

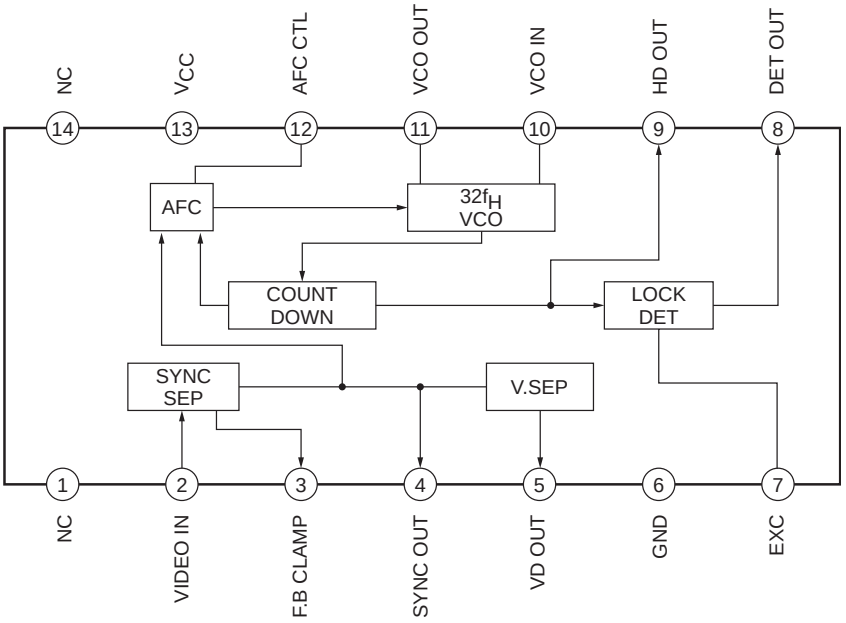
unit : mm (typ)

3034B

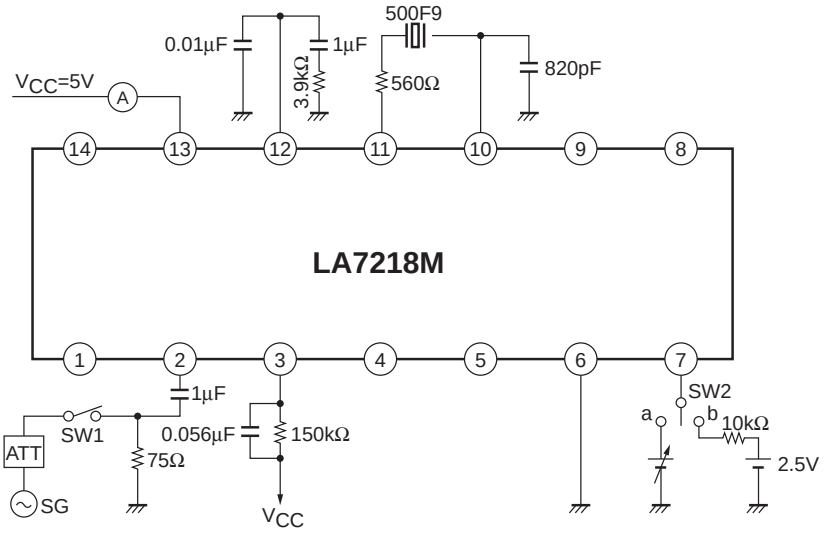


SANYO : MFP14(225mil)

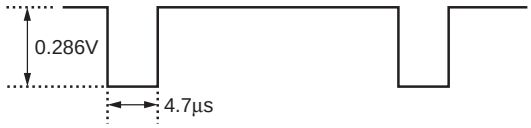
Equivalent Circuit Block Diagram



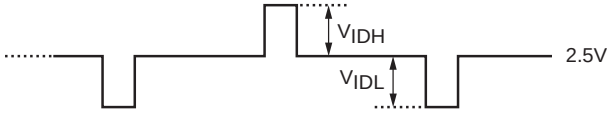
Test Circuit Diagram



- Set switch SW1 off only for f0 and V_{DL} measurement. Set it on for all other measurements.
- Switch SW2 has a neutral position, and is set to the "a" position for the V_{TH} and V_{TL} measurements, to the "b" position for the I_{DH} and I_{DL} measurements, and to neutral for all other measurements.
- Use a 1Vp-p standard color bar signal for the SG signal, use an attenuator for the V_I min measurement, and use the waveform shown below for the f_{CH} and f_{CL} measurements.



- A square wave, such as that shown above, is used for the I_{DH} and I_{DL} measurement. It's frequency is 31.5kHz.
- The f_{CH} (and f_{CL}) measurement is performed by setting the SG signal frequency high (or low) so that lock is lost and lowering (raising) the frequency from those points and measuring the two frequencies at which the circuit locks. The difference between these frequencies and f0 is f_{CH} (and f_{CL}).
- The V_{TH} (and V_{TL}) measurement is performed by setting the pin 7 applied voltage V1 to 0V (or 5V) and raising (or lowering) the voltage from those points and measuring the V1 voltages at the points pin 8 switches (inverts) from low (high) to high (low). Those voltages are V_{TH} and V_{TL}, respectively.
- I_{DH} and I_{DL} are calculated from the pin 7 waveform as shown in the figure below.



$$I_{DH} = \frac{1}{10k\Omega} \cdot V_{IDH},\ I_{DL} = \frac{1}{10k\Omega} \cdot V_{IDL}$$