

# Sync Detector Monolithic IC MM1069

## Outline

This IC is a sync detection circuit for obtaining the best reception state on VCR and TV channel selection systems. A system with high detection precision and no adjustment required can be configured due to the PLL format using a ceramic resonator. It can also be used in OSD circuits for blue-back switching and the like.

## Features

1. Can be used in VCR and TV channel selection systems, and also for blue-back, etc.
2. High precision due to use of PPL format
3. Ceramic resonator means no adjustment required
4. Ceramic resonator can be selected for use in either PAL or NTSC
5. Power supply voltage  $V_{CC}=5V$

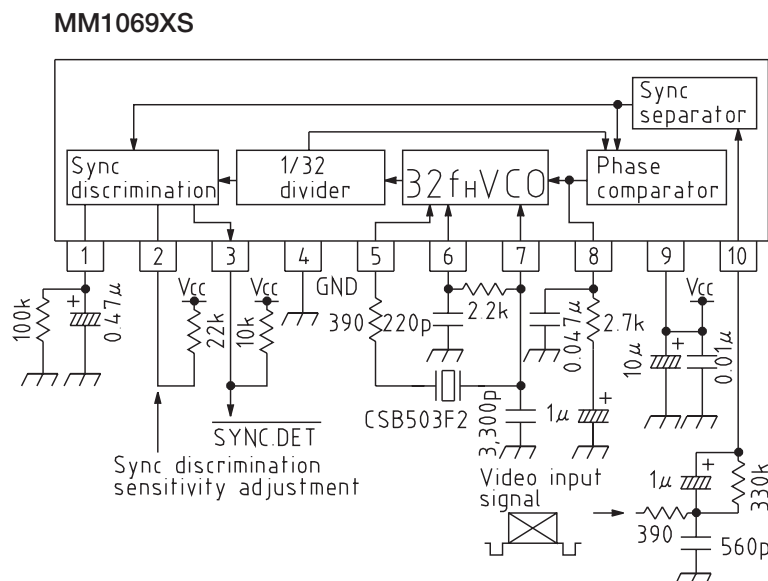
## Package

SIP-10A (MM1069XS)

## Applications

1. TV
2. VCR
3. Other video equipment

## Block Diagram



Pin Description

Pin no.	Pin name	Internal equivalent circuit diagram	Pin no.	Pin name	Internal equivalent circuit diagram
1	CR		6	VIDEO IN	
2	GAIN		7	OSC IN1	
3	SYNC.DET		8	OSC IN2	
4	GND		9	LPF	
5	OSC OUT				
			10	V <sub>CC</sub>	

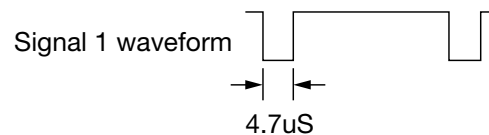
Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T <sub>STG</sub>	-40~+125	°C
Operating temperature	T <sub>OPR</sub>	-20~+75	°C
Power supply voltage	V <sub>CC</sub> max.	7	V
Allowable loss	P <sub>d</sub>	500	mW

**Electrical Characteristics** (Except where noted otherwise,  $T_a=25^{\circ}\text{C}$ ,  $V_{CC}=5.0\text{V}$ ,  $X=\text{CSB503F2}$ ,  $R=390\text{ [OHM]}$ ,  $C=3300\text{pF}$ ,  $\text{SW1}=\text{OFF}$ )

Item	Symbol	Measurement circuit	Measurement conditions	Min.	Typ.	Max.	Units
Operating power supply voltage	$V_{CC}$	$V_{CC}$		4.7	5.0	5.3	V
Consumption current	$I_d$	$I_d$			7.5	11.0	mA
32fH VCO free-running frequency NTSC	$f_{o1}$	TP3		497.1	503.5	509.9	kHz
Horizontal sync signal acquisition range NTSC	$f_{CAP}$	$V_{IN}$	$V_{IN}$ : signal 1 *1 *2	300	500		Hz
32fH VCO free-running frequency PAL	$f_{o2}$	TP3	$X=\text{CSB500F40}$ , $R=200\text{OHM}$ , $C=4700\text{pF}$	493.6	500.0	506.4	kHz
Horizontal sync signal acquisition range PAL	$f_{CAP2}$	$V_{IN}$	$X=\text{CSB500F40}$ , $R=200\text{OHM}$ , $C=4700\text{pF}$ , $V_{IN}$ : signal 1 *1 *3	300	500		Hz
LPF pin DC level	$V_{LFP}$	TP4	$\text{SW1} : \text{ON}$	0.9	1.4	1.9	V
Sync separation level	$V_{SEPA}$	$V_{IN}$	$V_{IN}$ : staircase wave $1V_{P-P}$ *4	20	50	80	mV
Sync discrimination output voltage L	$V_{L4}$	TP2	$V_{IN}$ : staircase wave $1V_{P-P}$ *5		0.2	0.4	V
Sync discrimination output voltage H	$V_{H4}$	TP2	$V_{IN}$ : no input signal *5	4.8	5.0		V
Sync discrimination switching voltage L	$V_{THL4}$	TP1	TP1 : DC voltage $5\text{V} \rightarrow \text{Low}$ *5	2.0	2.3	2.6	V
Sync discrimination switching voltage H	$V_{THH4}$	TP1	TP1 : DC voltage $0\text{V} \rightarrow \text{High}$ *5	2.7	3.0	3.3	V

\*1 Signal 1 : Pulse signal with 0.3V amplitude and pulse width 4.7 $\mu\text{s}$



\*2 Measuring horizontal sync signal pull-in range for NTSC

Adjust signal 1 frequency toward 15.734kHz. The measurement value is the smaller of signal 1 frequency when TP2 level switches from high to low, and the difference from 15.734.

\*3 Measuring horizontal sync signal pull-in range for PAL

Adjust signal 1 frequency toward 15.625kHz. The measurement value is the smaller of signal 1 frequency when TP2 level switches from high to low, and the difference from 15.625.

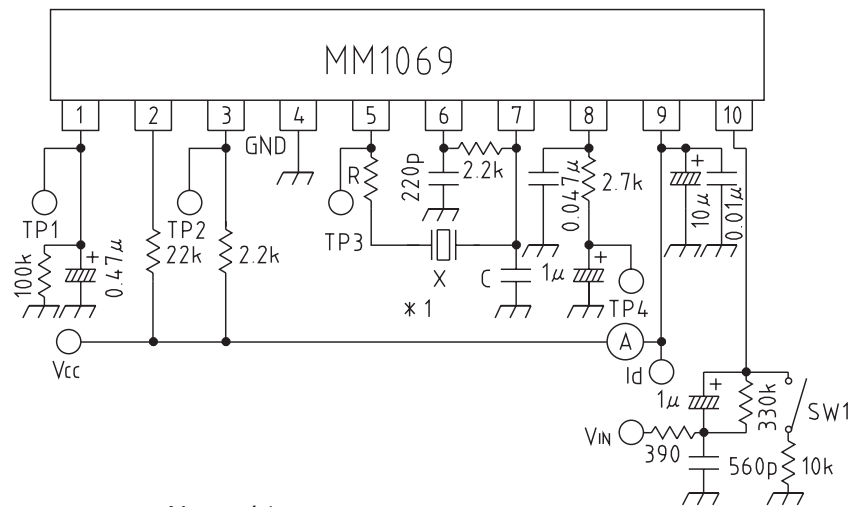
\*4 Measuring sync separation level

Gradually lower staircase wave signal sync tip level, and measure sync tip level when TP2 level switches from low to high.

\*5 Sync discrimination switching voltage measurement

Gradually change the voltage impressed on TP1, and measure TP5 voltage when TP2 output switches.

Measuring Circuit

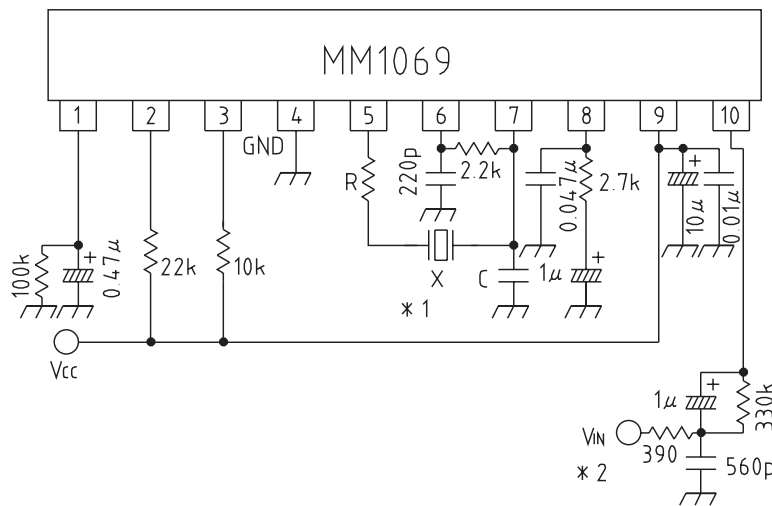


Note : \*1

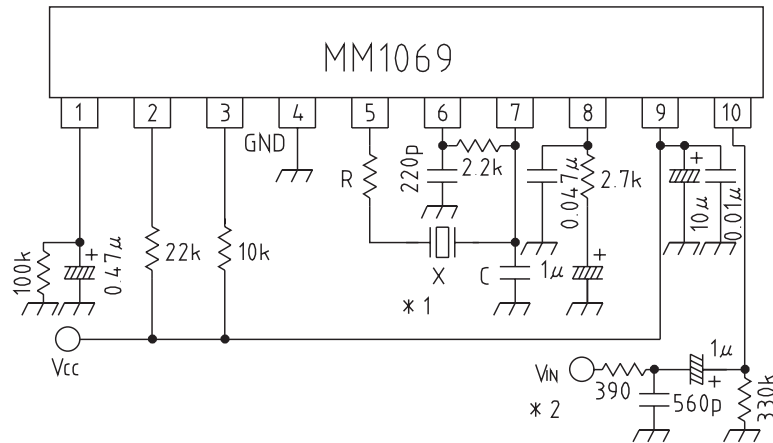
	NTSC	PAL
X	CSB503F2	CSB500F40
R	390Ω	220Ω
C	3300pF	4700pF

Application Circuits

Application Circuit 1



■ Application Circuit 2



Note 1 : 1. \*1

	NTSC	PAL
X	CSB503F2	CSB500F40
R	390Ω	220Ω
C	3300pF	4700pF

Note 2 : \*2

1. Input signal sync tip must be less than 1V for application circuit 1 Pin 10 external circuit.
2. The above 1. does not apply for application circuit 2 Pin 10 external circuit. Pin 10 is clamped at approximately 2.5V.