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

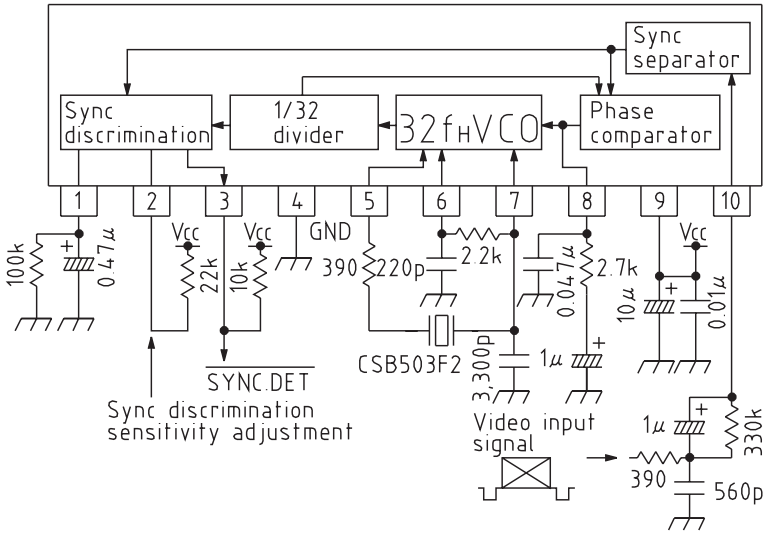
SIP-10A (MM1069XS)

Applications

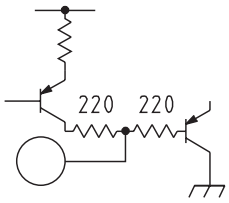
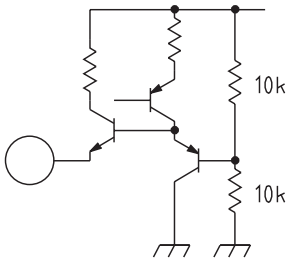
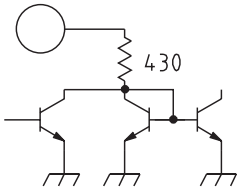
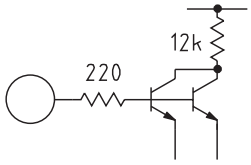
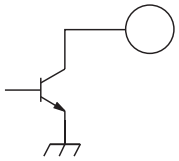
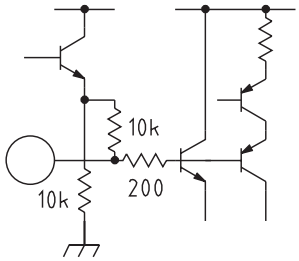
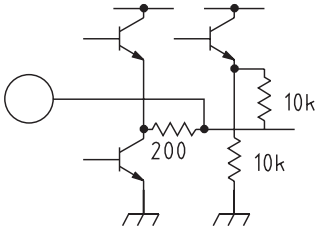
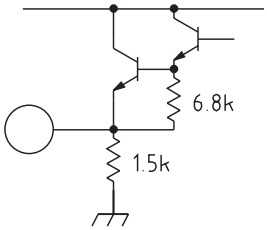
1. TV
2. VCR
3. Other video equipment

Block Diagram

MM1069XS



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	Vcc	

Absolute Maximum Ratings (Ta=25°C)

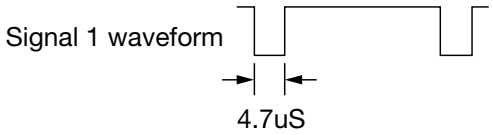
Item	Symbol	Ratings	Units
Storage temperature	TSTG	–40~+125	°C
Operating temperature	TOPR	–20~+75	°C
Power supply voltage	Vcc max.	7	V
Allowable loss	Pd	500	mW

Electrical Characteristics

(Except where noted otherwise, Ta=25°C, V_{CC}=5.0V, X=CSB503F2, R=390 [OHM], C=3300pF, SW1=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	Id	Id			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=CSB500F40, R=200OHM, C=4700pF	493.6	500.0	506.4	kHz
Horizontal sync signal acquisition range PAL	f_{CAP2}	V_{IN}	X=CSB500F40, R=200OHM, C=4700pF, V_{IN} : signal 1 ＊1 ＊3	300	500		Hz
LPF pin DC level	V_{LPF}	TP4	SW1 : 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 5V→Low ＊5	2.0	2.3	2.6	V
Sync discrimination switching voltage H	V_{THH4}	TP1	TP1 : DC voltage 0V→High ＊5	2.7	3.0	3.3	V

＊1 Signal 1 : Pulse signal with 0.3V amplitude and pulse width 4.7μS



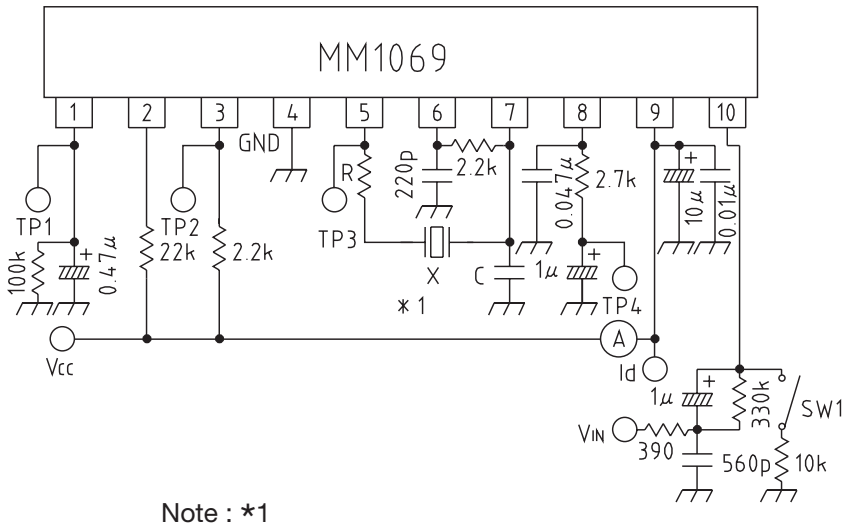
＊2 Measuring horizontal sync signal pull-in range for NTSC
Adjust signal 1 frequency toward 15.734kHz. The measurement value is the smaller of signal 1 frequency when TP2 level switches from high to low, and the difference from 15.734.

＊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

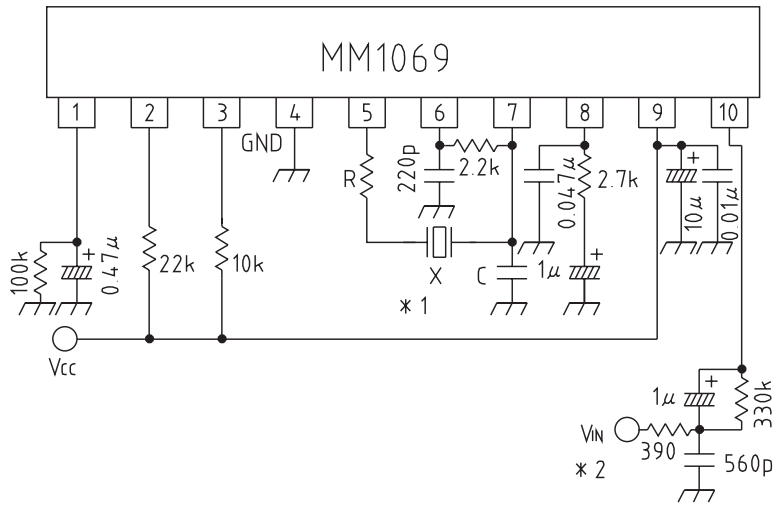


Note : *1

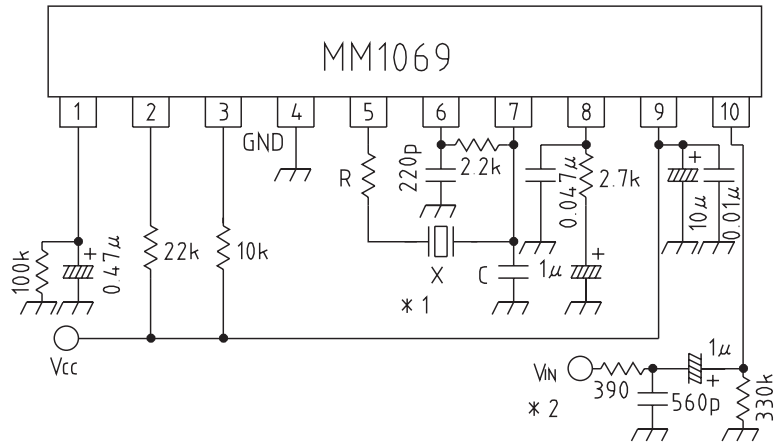
	NTSC	PAL
X	CSB503F2	CSB500F40
R	390Ω	220Ω
C	3300pF	4700pF

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.