MN67621F

Color Video Camera Synchronizing Signal Generator LSI

■ Overview

The MN67621F generates color video camera synchronizing signals for the NTSC, PAL, and SECAM video systems.

It divides the reference frequency to generate the horizontal synchronizing signal f_H, the vertical synchronizing signal f_V, and the composite synchronizing signal.

A built-in $4f_{SC}$ crystal oscillator circuit divides the frequency by four to generate the color subcarrier frequency signals SC1 and SC2.

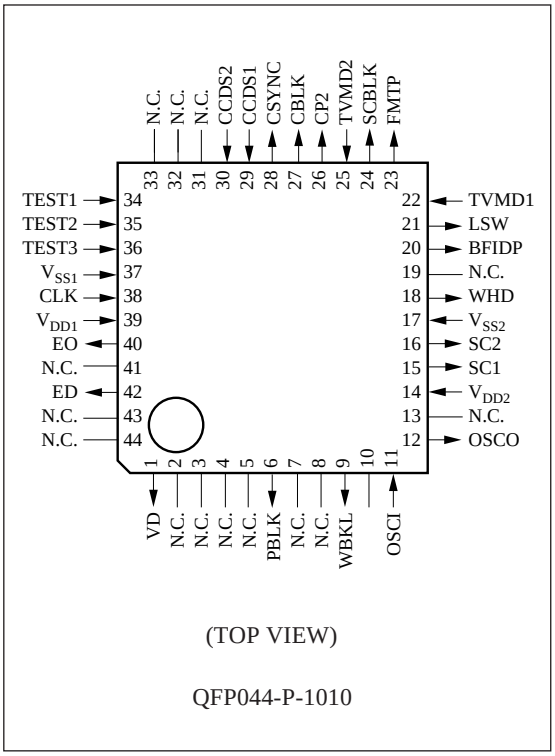
■ Features

- Supports CCDs with 420, 510, 590, and 670 H pixels
- Supports NTSC, PAL, and SECAM video systems
- PAL system 25Hz offset
- Includes built-in oscillator circuit using external crystal
- Generates 14 signals, including the horizontal and vertical synchronizing signals and the color subcarrier frequency signals.

■ Applications

- Color video cameras

■ Pin Assignment



(TOP VIEW)

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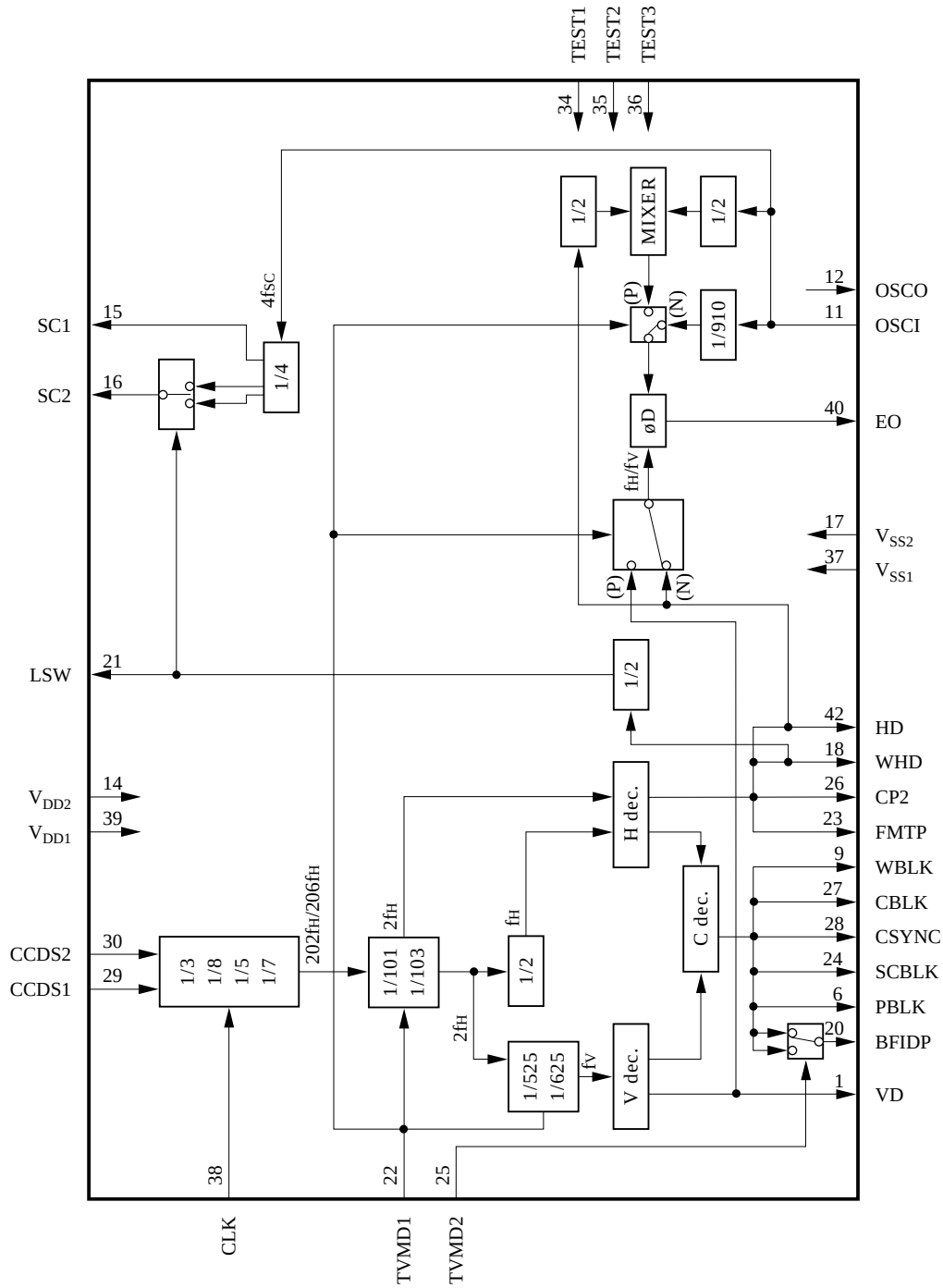
■ Block Diagram



■ Pin Descriptions

Pin No.	Symbol	Pin Name	Function Description
39	V_{DD1}	Power supply	"H" level (5 V) power supply for horizontal and vertical synchronizing signal circuits
37	V_{SS1}	Power supply	"L" level (0 V) power supply for horizontal and vertical synchronizing signal circuits
14	V_{DD2}	Power supply	"H" level (5 V) power supply for color subcarrier circuits
17	V_{SS2}	Power supply	"L" level (0 V) power supply for color subcarrier circuits
11	OSCI	Crystal oscillation input	Connect these pins to a $4f_{SC}$ crystal oscillator. The pins have built-in feedback resistors. If using an external clock, supply it to the OSCI pin and leave the OSCO pin open.
12	OSCO	Crystal oscillation input	
38	CLK	Clock input	Supply the reference clock for the horizontal and vertical synchronizing signals.
22	TVMD1	Television system selection input	NTSC PAL SECAM TVMD1 "H" "L" "L" TVMD2 — "H" "L" The pins include built-in pull-up resistors.
25	TVMD2		
29	CCDS1	CCD scan lines selection input	420H 510H 590H 670H CCDS1 "H" "H" "L" "L" CCDS2 "H" "L" "H" "L" The pins include built-in pull-up resistors.
30	CCDS2		
34	TEST1	Test input	Test inputs Keep these pins at "L" level. The pins include built-in pull-down resistors.
35	TEST2		
36	TEST3		
15	SC1	f_{SC} (B-Y) output	This color subcarrier signal is formed by dividing the crystal oscillator frequency ($4f_{SC}$) by four.
16	SC2	f_{SC} (R-Y) output	Color subcarrier signal If SC1 is the 180° signal, this signal has the following phase. NTSC system: 90° PAL system: 90° when LSW is at "L" level 270° when LSW is at "H" level
28	CSYNC	Composite synchronizing signal output	Composite blanking signal
1	VD	Vertical drive output	Vertical drive signal
18	WHD	Wide HD output	Wide HD signal Preblanking signal
27	CBLK	Composite blanking output	Composite blanking signal Signal for erasing video signal
42	HD	Horizontal drive output	Horizontal drive signal
26	CP2	Clamp pulse output	Clamp pulses for luminance and color difference signals Horizontal deflection start pulses

■ Pin Descriptions (continued)

Pin No.	Symbol	Pin Name	Function Description
9	WBLK	Composite wide blanking output	Composite wide blanking signal This pin produces blanking pulses wider than the CELK pulses for both horizontal and vertical synchronization.
20	BFIDP	Output for burst flag/ identification signal	For NTSC and PAL systems, this is the burst flag (BF) output, which gates the color subcarrier signal. For the SECAM system, this is the identification (IDP) signal, which switches the subcarrier waveform.
6	PBLK	Composite preblanking output	Composite preblanking signal This pin produces blanking pulses narrower than the CBLK pulses for both horizontal and vertical synchronization.
21	LSW	Line switch signal output	Line switch signal The chip generates this signal for each horizontal scan line. During NTSC operation, this pin remains at "L" level.
23	FMTP	Trigger signal output	This pin provides the FM demodulator trigger signal for the SECAM system. During NTSC operation, this pin remains at "L" level.
24	SCBLK	Subcarrier blanking signal output	This pin provides the signal for erasing the subcarrier signal for the SECAM system. During NTSC operation, this pin remains at "L" level.
40	EO	Phase comparator output	Phase comparator output

■ Operating Modes

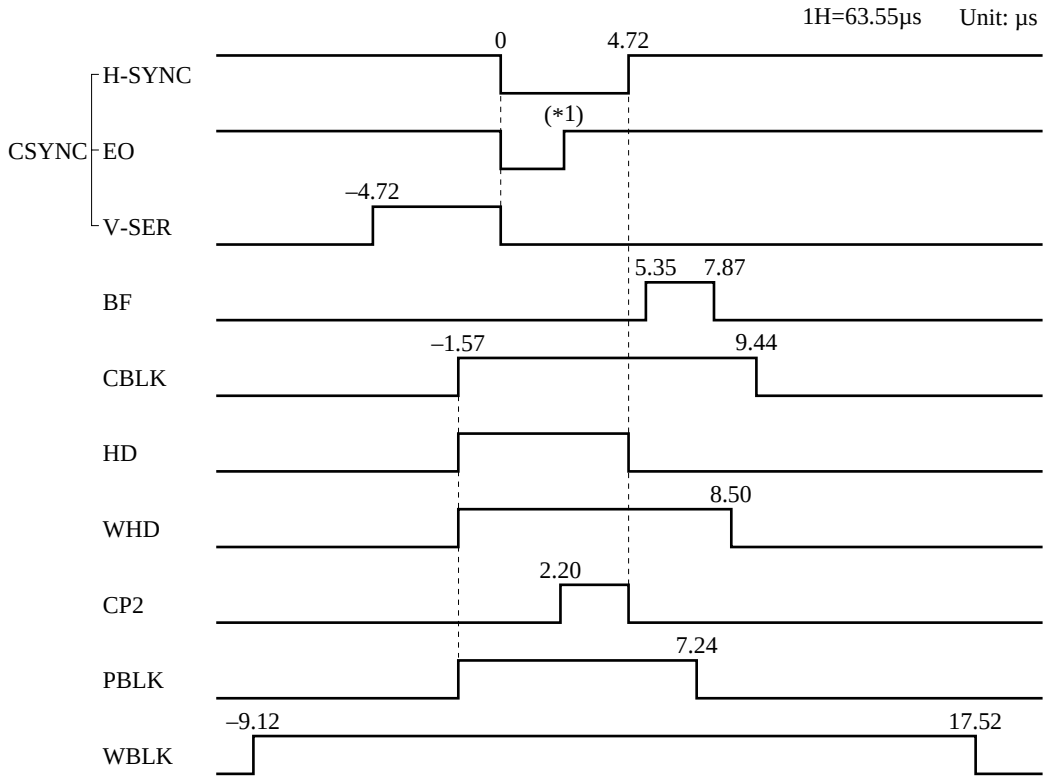
(1) Television system

	TVMD1	TVMD2
NTSC	H	—
PAL	L	H
SECAM	L	L

(2) CCD pixels and reference clock (CLK) frequencies

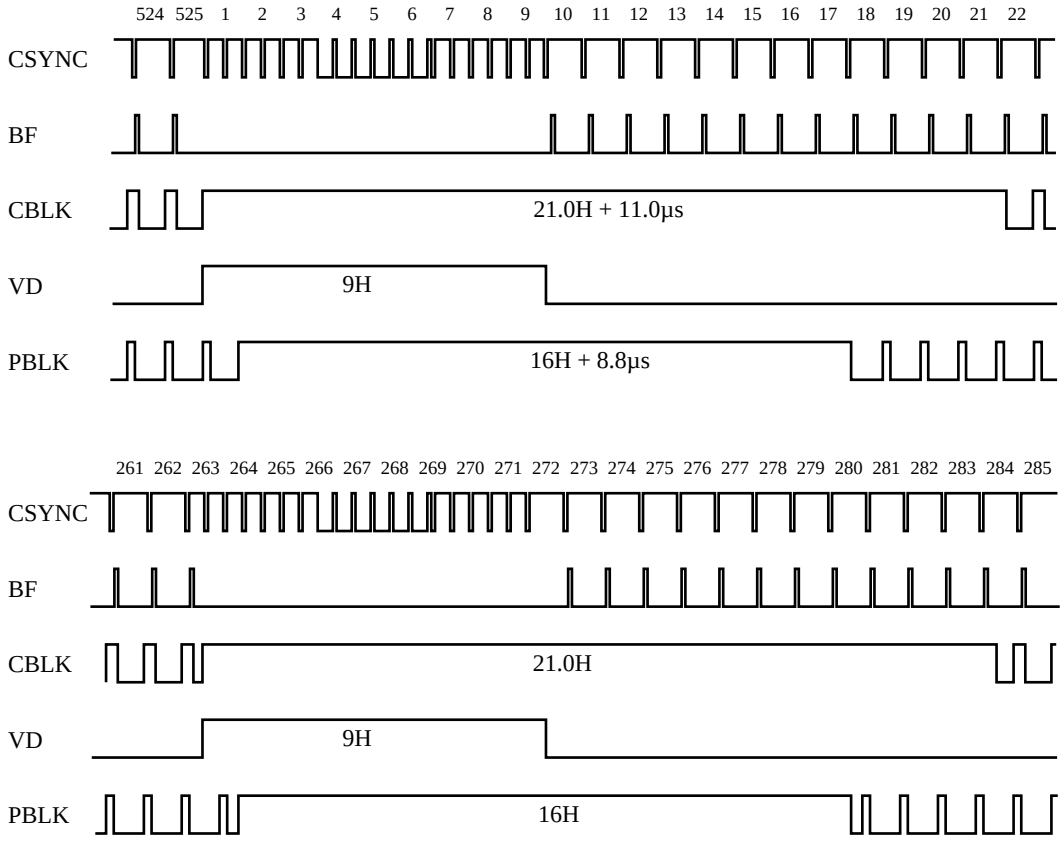
CCD pixels	CCDS1	CCDS2	CLK frequency (MHz)		Frequency divider ratio for first stage
			NTSC	PAL/SECAM	
420H	H	H	15.891606 ($1010f_H$)	16.09375 ($1030f_H$)	1/5
510H	H	L	9.534964 ($606f_H$)	9.65625 ($618f_H$)	1/3
590H	L	H	22.248249 ($1414f_H$)	22.53125 ($1442f_H$)	1/7
670H	L	L	25.426570 ($1616f_H$)	25.75000 ($1648f_H$)	1/8

■ H Decoder Pulse Timing Chart for NTSC

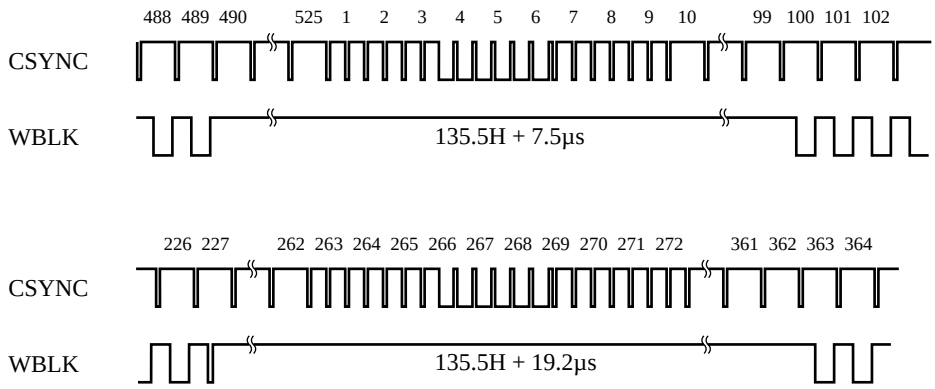


*1
420 H : 2.33
510 H : 2.31
590 H : 2.34
670 H : 2.36

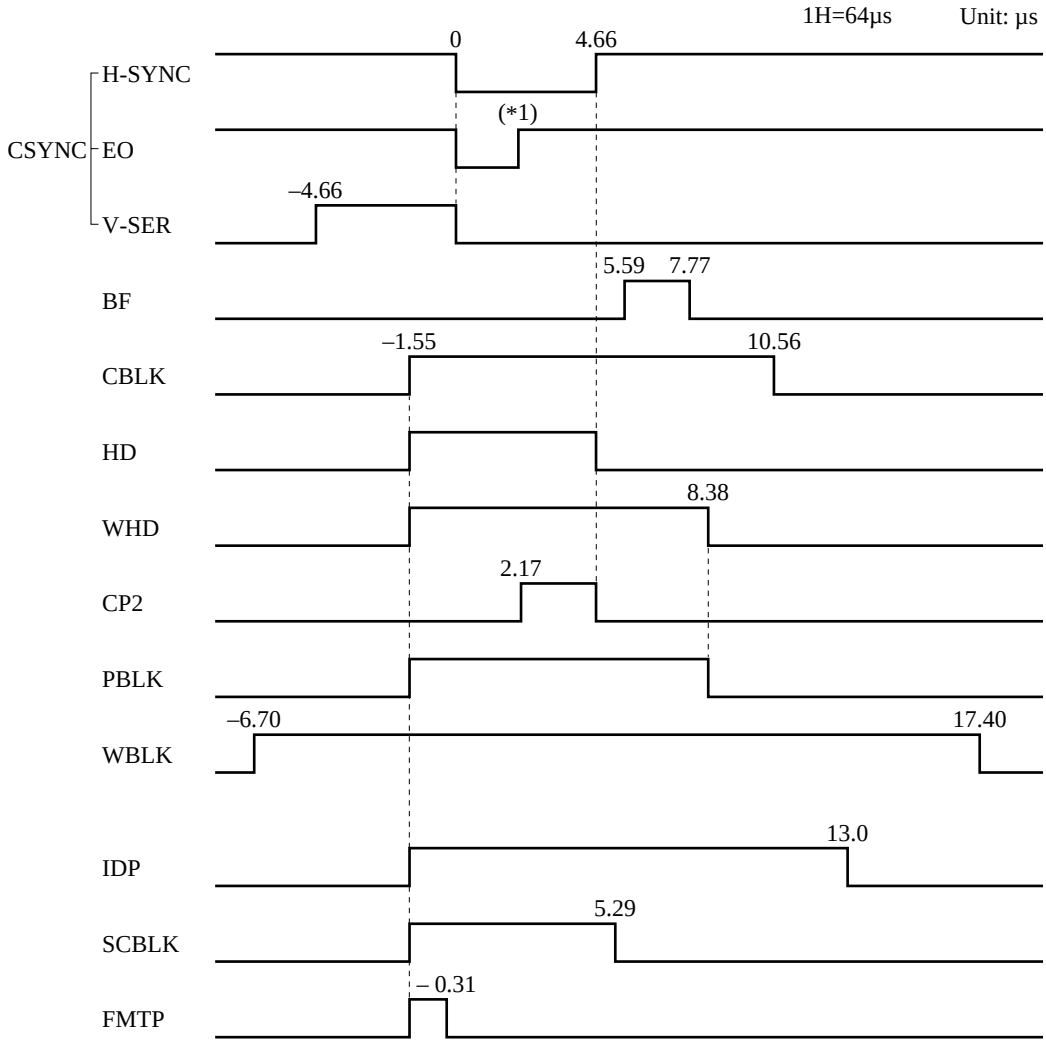
■ Pulse Timing Chart for NTSC Composite and Vertical Synchronizing Signals (1/2)



■ Pulse Timing Chart for NTSC Composite and Vertical Synchronizing Signals (2/2)

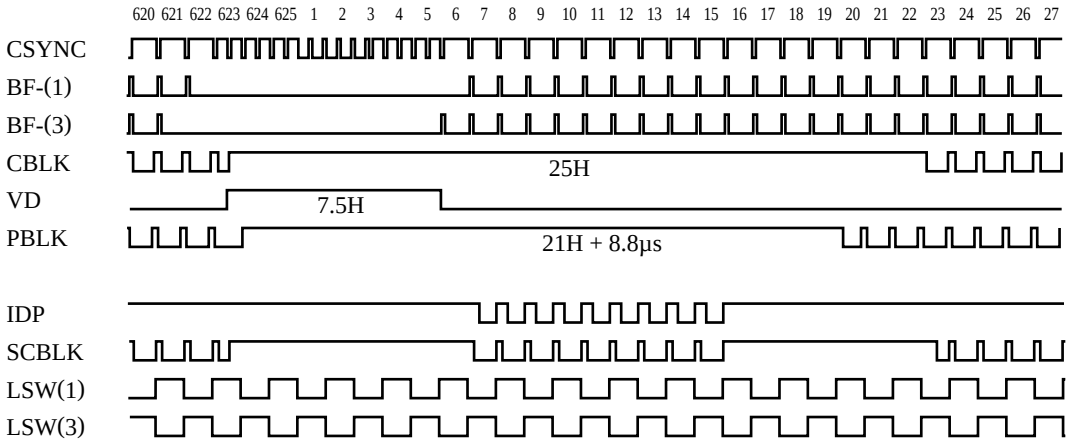


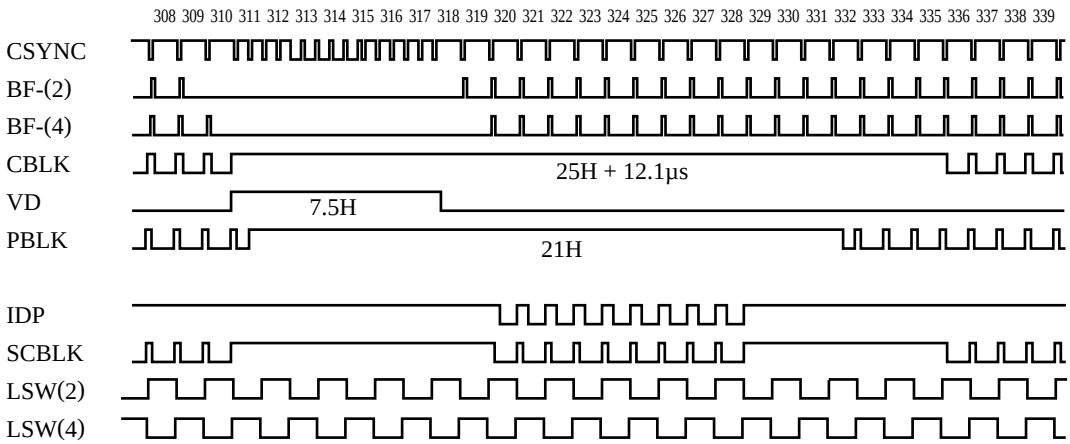
■ H Decoder Pulse Timing Chart for PAL/SECAM



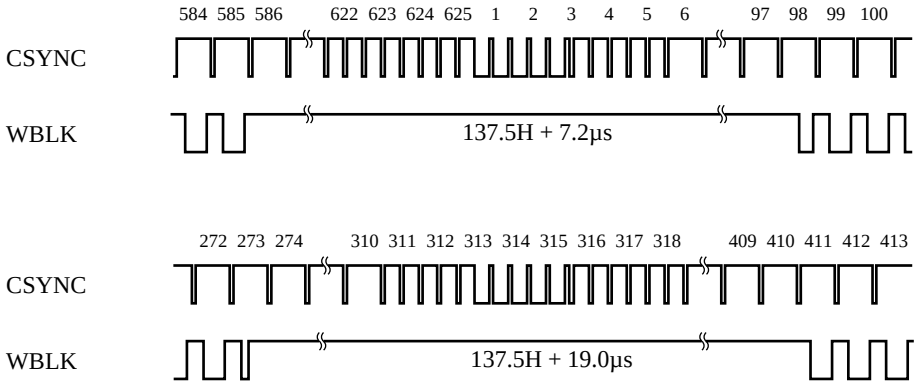
*1
420 H : 2.30
510 H : 2.28
590 H : 2.31
670 H : 2.33

■ Pulse Timing Chart for PAL/SECAM Composite and Vertical Synchronizing Signals (1/2)

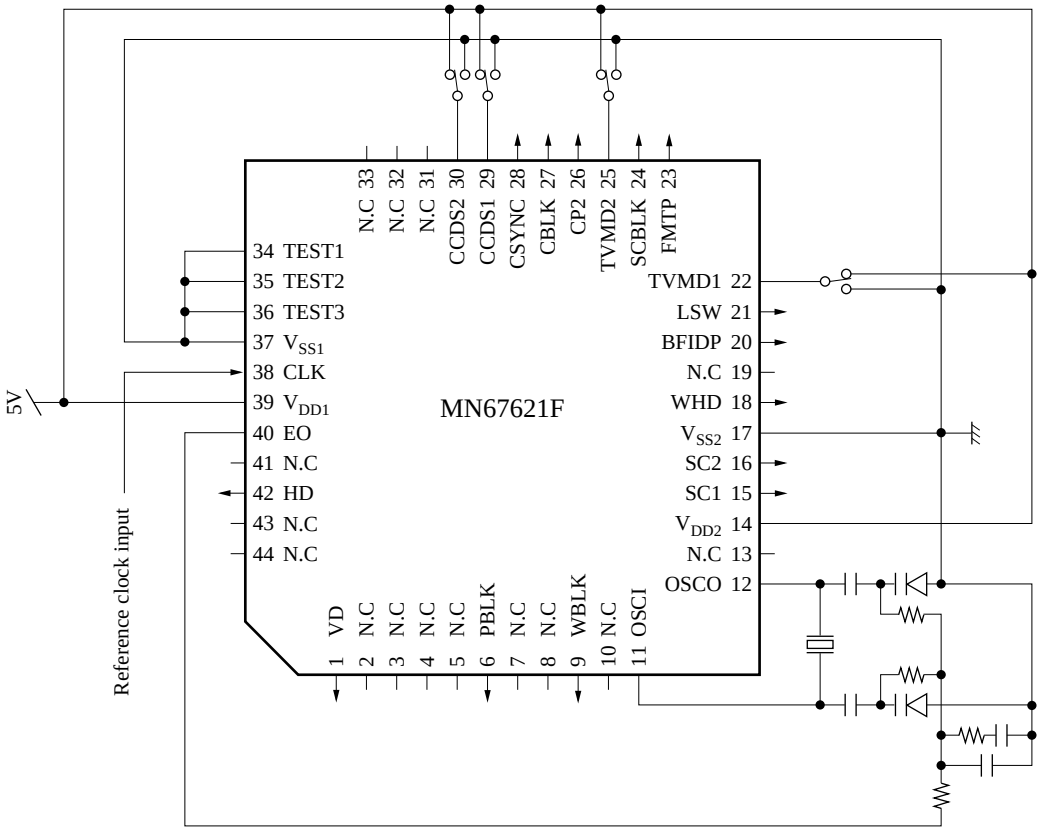




■ Pulse Timing Chart for PAL/SECAM Composite and Vertical Synchronizing Signals (2/2)



■ Application Circuit Example



■ Package Dimensions (Unit: mm)

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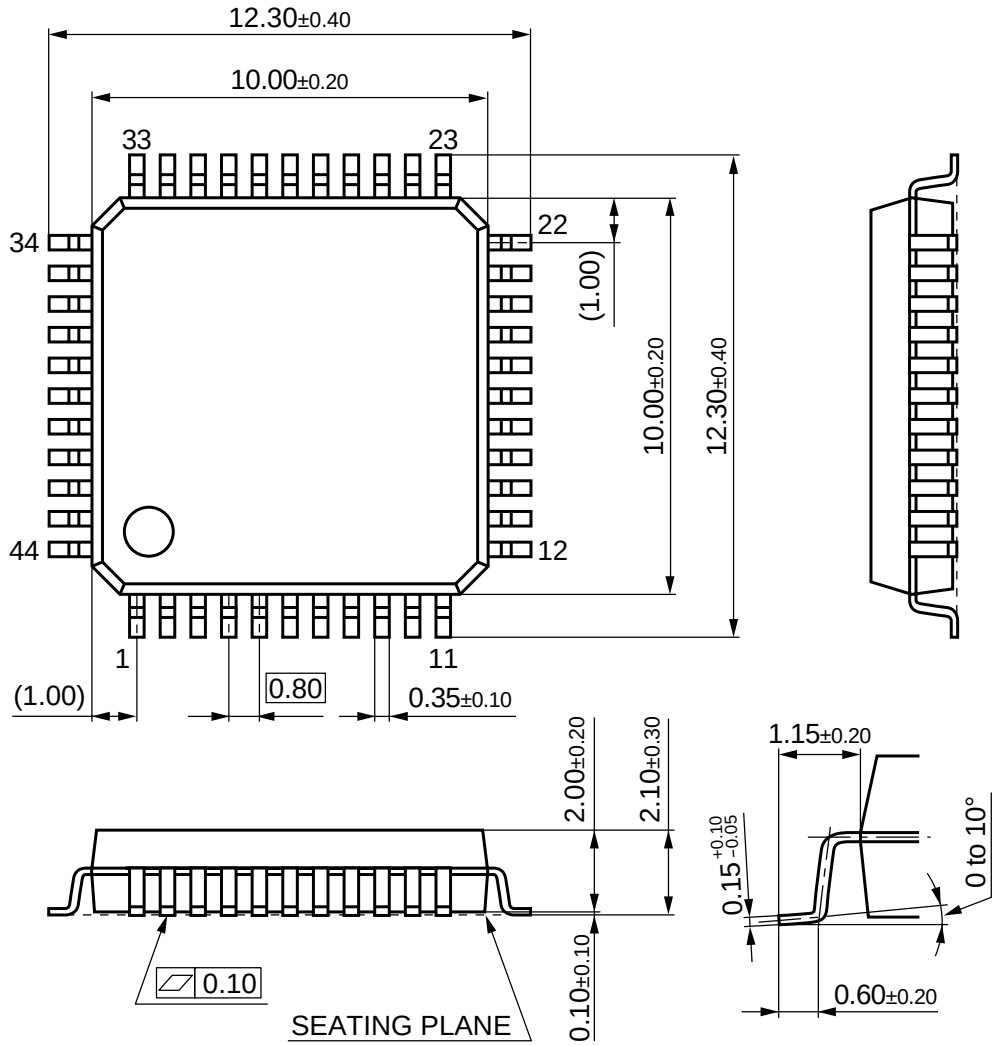

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