

BURST LOCK CLOCK GENERATOR

The μ PC1862 is an LSI incorporating a PLL circuit to generate nfsc clocks (fsc: color subcarrier frequency), ideal for the processing of digital video signals as in extended definition television (EDTV) systems.

FEATURES

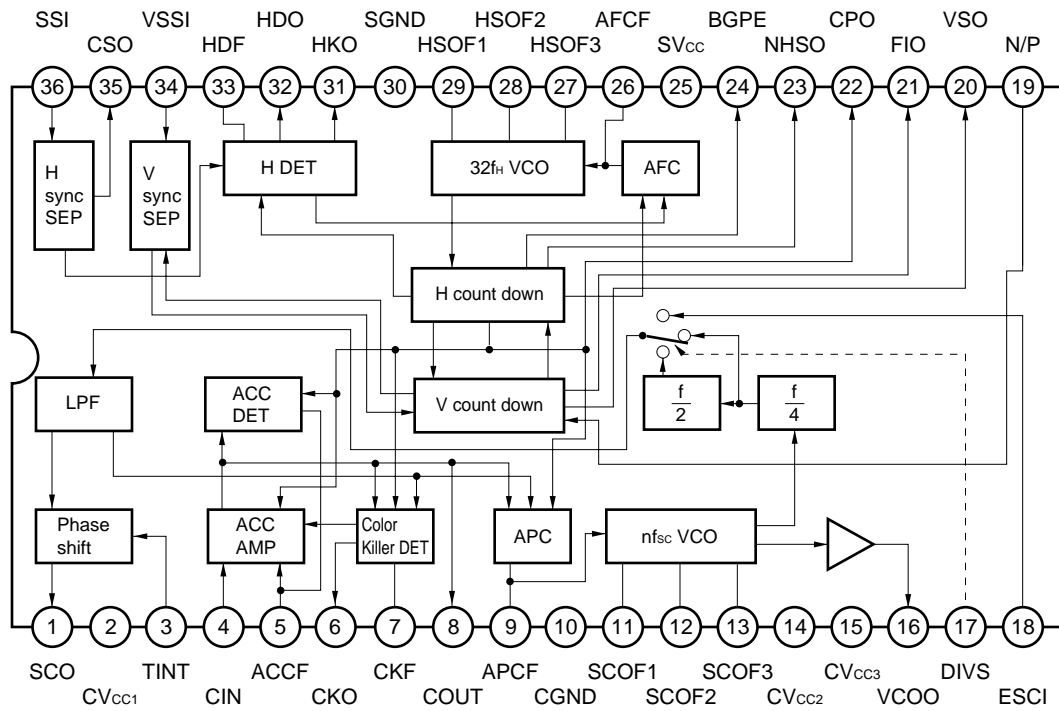
- VCO is incorporated.
- Horizontal and vertical sync separation circuits are incorporated (with output pins).
- Horizontal and vertical sync output pulses (TTL level)
- ACC amplifier and killer detector circuits are incorporated.
- 1/4 and 1/8 ($1/2 \times 1/4$) frequency dividers are incorporated.
- fsc phase control circuits is incorporated.
- Applicable to both NTSC and PAL systems.
- Possible to input burst gate pulse from external

★ ORDERING INFORMATION

Part number	Package
μ PC1862GS	36-pin plastic shrink SOP (300 mil)

The information in this document is subject to change without notice.

BLOCK DIAGRAM



Remark AFC : Automatic Frequency Control
 ACC : Automatic Color saturation level Control
 APC : Automatic Phase Control

Selecting divide ratio by DIVS pin

DIVS	Divide ratio
H	1/8
Open	EXT IN with pin 18
L	1/4

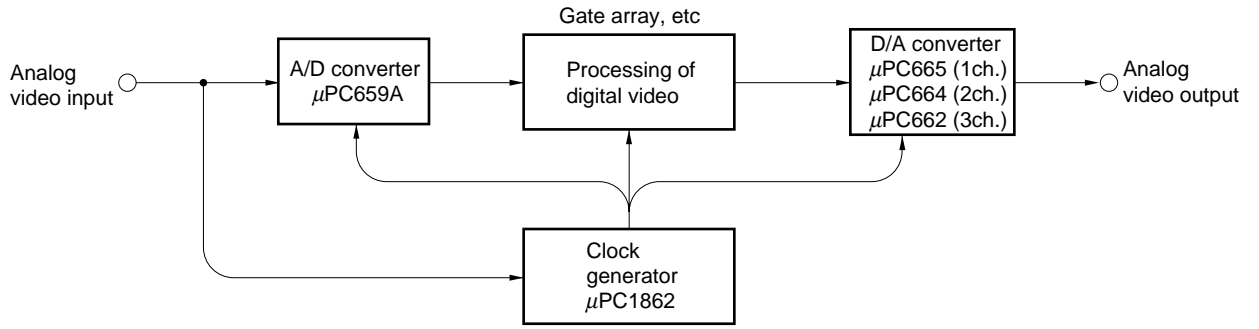
Selecting TV transmission by N/P pin

N/P pin	TV transmission
H	PAL
L	NTSC

In PAL, only correspond 4f_{sc} (DIVS = L).

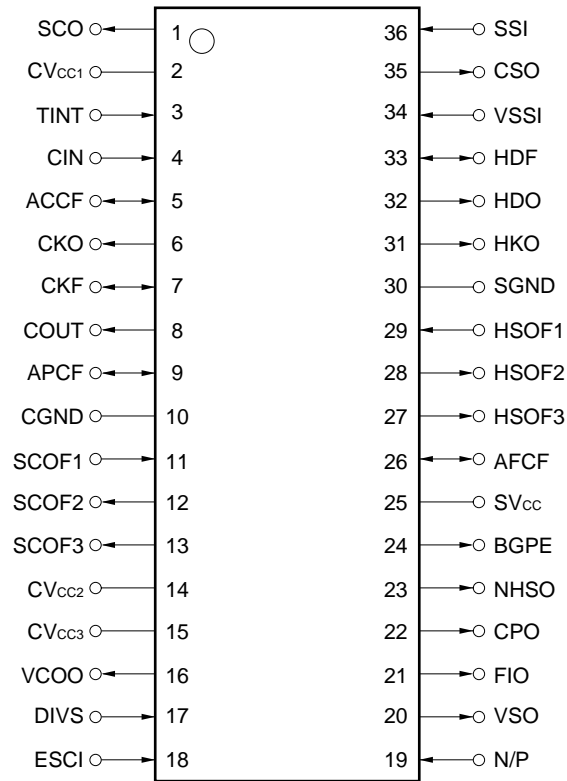
System Block Diagram

Application to Process of Digital Video Signal



PIN CONFIGURATION (Top View)

36-pin plastic shrink SOP (300 mil)



ACCF	: Chroma ACC Filter
AFCF	: Horizontal Sync AFC Filter
APCF	: Chroma APC Filter
BGPE	: Burst Gate Pulse from External
CGND	: Chroma GND
CIN	: Chroma Input
CKF	: Color Killer Filter
CKO	: Color Killer Output
COU	: Chroma Output
CPO	: Clamp Pulse Output
CSO	: Composite Sync Output
CV _{cc1} -CV _{cc3}	: Chroma V _{cc}
DIVS	: Divider Setting Input
ESCI	: External Subcarrier Input
FIO	: Field ID Output
HDF	: Horizontal Sync Detect Filter
HDO	: Horizontal Sync Detect Output
HKO	: Horizontal Sync Killer Output
HSOF1-HSOF3	: 32f _H VCO Filter
NHSO	: Negative Horizontal Sync Output
N/P	: NTSC/PAL Mode Select
SCO	: Subcarrier Output
SCOF1-SCOF3	: f _{sc} VCO Filter
SGND	: Sync GND
SSI	: Horizontal Sync Separation Input
SV _{cc}	: Sync V _{cc}
TINT	: Tint Control
VCOO	: VCO Output
VSO	: Vertical Sync Output
VSSI	: Vertical Sync Separation Input

PIN FUNCTIONS

(1/12)

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
1	SCO	Sub Carrier Output		Burst locked sub carrier output
			DC voltage of a standard	2.9 V
2	CVcc1	Chroma Vcc1		Power supply for chroma signal processing circuit (pin 1 to pin 18) This power supply must be isolated from the power supply for sync processing circuit use.
3	TINT	Tint Control		Tint control input (DC voltage) This pin adjusts the tint of sub carrier output (SCO pin).
			Internal bias voltage of a standard	2.5 V

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
4	CIN	Chroma Signal Input		Chroma signal input
			Internal bias voltage of a standard	3.2 V
5	ACCF	Chroma ACC Filter		Pin for connecting filter of ACC (Automatic Color Control) detector
			DC voltage of a standard ^{Note}	1.0 V
6	CKO	Color Killer Output		Color Killer Detection output When Killer (without burst) signal: Low level output When color signal: High level output

Note Chroma burst amplitude from pin 4: 150 mV_{p-p}

(3/12)

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
7	CKF	Chroma Killer Filter		Pin for connecting filter of Color killer detector
			DC voltage of a standard ^{Note}	2.2 V
8	COUT	Chroma Signal Output		Automatic color controlled chroma output
			DC voltage of a standard	2.4 V

Note Chroma burst amplitude from pin 4: 150 mV_{p-p}

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
9	APCF	APC Filter		Pin for connecting filter of APC (Automatic Phase Control) detector
10	CGND	Chroma GND		Ground for chroma signal processing circuit (pin 1 to pin 18)
11	SCOF1	nfsc VCO Filter (1)		Pin for connecting filter of nfsc VCO
			Bias voltage of a standard	3.0 V

Note Chroma burst amplitude from pin 4: 150 mV_{p-p}

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
12	SCOF2	nfsc VCO Filter (2)		Pin for connecting filter of nfsc VCO
			Internal bias voltage of a standard	3.0 V
13	SCOF3	nfsc VCO Filter (3)		Pin for connecting filter of nfsc VCO
			DC voltage of a standard	2.9 V
14	CV _{CC2}	Chroma V _{CC} 2		Power supply for chroma signal processing circuit (pin 1 to pin 18) This power supply must be isolated from the power supply for sync processing circuit use.
15	CV _{CC3}	Chroma V _{CC} 3		Power supply for chroma signal processing circuit (pin 1 to pin 18) This power supply must be isolated from the power supply for sync processing circuit use.

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
16	VCOO	VCO Output		Burst locked VCO output
17	DIVS	Dividing ratio selection		Divider ratio selection input When 1/4: Low level input When 1/8: High level input When external dividing: Middle level input
18	ESCI	External subcarrier Input (External Divide)		External subcarrier input. When no use (pin 17 is not middle level): Low level input

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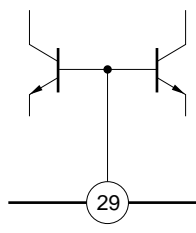
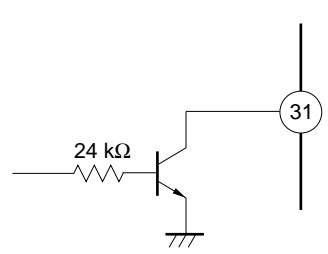
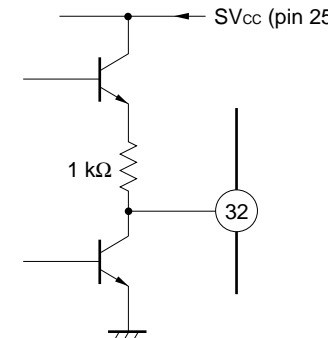
Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
19	N/P	NTSC/PAL selection		NTSC/PAL system selection input When NTSC system: Low level input When PAL system: High level input
20	VSO	Vertical Sync Output		Negative polarity vertical sync output
21	FIO	Field ID Output		Odd/Even field ID output When Odd ID: Low level output When Even ID: High level output When a input is non-standard signal, this pin outputs an indefiniteness.
22	CPO	Clamp Pulse Output		Pedestal Clamp pulse (burst gate pulse) output

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
23	NHSO	Negative Horizontal Sync Output		Negative polarity horizontal sync output
24	BGPE	Burst Gate Pulse from External		<p>Burst gate pulse input</p> <p>In inside burst gate pulse generation mode: Low level fix</p> <p>In external burst gate pulse input mode:</p> <p>When Non-burst period: Middle level input</p> <p>When burst period: High level input</p>
25	SV _{cc}	Sync V _{cc}		<p>Power supply for sync signal processing circuit (pin 19 to pin 36)</p> <p>This power supply must be isolated from the power supply for chroma processing circuit use.</p>

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
26	AFCF	AFC Filter		Pin for connecting filter of horizontal AFC (Automatic Frequency Control) detector
			DC voltage of a standard ^{Note}	3.2 V
27	HSOF3	32f _H VCO Filter (3)		Pin for connecting filter of 32f _H VCO
			DC voltage of a standard	2.4V
28	HSOF2	32f _H VCO Filter (2)		Pin for connecting filter of 32f _H VCO
			Internal bias voltage of a standard	3.8 V

Note When only 0.3 V_{p-p} sync signal is input to pin 36

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Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
29	HSOF1	32f _H VCO Filter (1)		Pin for connecting filter of 32f _H VCO
			Bias voltage of a standard	
30	SGND	Sync GND		Ground for sync processing circuit (pin 19 to pin 36)
31	HKO	Horizontal Killer Output		Horizontal killer output (Open Corrector) When No sync: High impedance output When sync: Low level output
32	HDO	Horizontal Sync Detection Output		Horizontal sync detection signal output When No sync: High level output When sync: Low level output

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
33	HDF	Horizontal Sync Detection Filter		Pin for connecting filter of Horizontal sync detector
			Bias voltage of a standard ^{Note}	4.1 V
34	VSSI	Vertical Sync Separator Input		Vertical sync separation input pin
35	CSO	Composite Sync Separator Output		Negative polarity composite sync output

Note When only 0.3 V_{p-p} sync signal is input to pin 36

(12/12)

Pin No.	Symbol	Pin Name	Equivalent Circuit	Function
36	SSI	Horizontal Sync Separator Input		Horizontal sync separation input pin

ELECTRICAL SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Supply voltage	V _{CC}	7	V
Input signal voltage (Chroma signal)	e _{i4}	3	V _{p-p}
Input signal voltage (H sync separation)	e _{i36}	3	V _{p-p}
Input signal voltage (V sync separation)	e _{i34}	3	V _{p-p}
Input signal voltage (EXT)	e _{i18}	V _{CC}	V _{p-p}
Tint control signal voltage	e _{c3}	V _{CC}	V
Output current	I _O	-7	mA
Permissible package power dissipation (when mounted on PCB)	P _D	570 (T _A = 75°C)	mW
Operating ambient temperature	T _A	-10 to +75	°C
Storage temperature	T _{stg}	-40 to +125	°C

Caution Expose to Absolute Maximum Rating for extended periods may affect device reliability; exceeding the ratings could cause permanent damage. The parameters apply independently. The device should be operated within the limits specified under DC and AC Characteristics.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply voltage	V _{CC}	4.5	5.0	5.5	V
Input signal voltage (Chroma signal)	e _{i4}		150		mV _{p-p}
Input signal voltage (H sync separation)	e _{i36}		1.0		V _{p-p}
Input signal voltage (V sync separation)	e _{i34}		1.0		V _{p-p}
Input signal voltage (EXT IN HIGH voltage)	e _{iH18}	2.0			V
Input signal voltage (EXT IN LOW voltage)	e _{iL18}			0.8	V
Divider selector voltage 1 (1/8)	V ₁₇₍₈₎	4.8			V
Divider selector voltage 2 (1/4)	V ₁₇₍₄₎			0.2	V
Tint control voltage	V ₃		2.5		V
NTSC/PAL select voltage (PAL)	V _{19P}	4.5			V
NTSC/PAL select voltage (NTSC)	V _{19N}			0.5	V

ELECTRICAL CHARACTERISTICS (at $T_A = 25 \pm 3$ °C, $RH \leq 70$ %, $V_{CC} = 5$ V, unless otherwise specified)

Chroma section

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Supply current of chroma section	$I_{CC(C)}$	$V_{CC(C)} = 5$ V No current on pin 2, 14 and 15	17	21	25	mA
ACC amplitude characteristic 1	ACC ₁	Fluctuation of chroma output level at +6 dB change of chroma input burst signal (0 dB = 150 mV _{p-p})	-2.0	0	+2.0	dB
ACC amplitude characteristic 2	ACC ₂	Fluctuation of chroma output level at -20 dB change of chroma input burst signal (0 dB = 150 mV _{p-p})	-5.0	-1.0	+1.0	dB
Color killer set point	e _{KS}	Input level at killer ON with chroma input burst sig. (0 dB = 150 mV _{p-p}) being attenuated	-45	-39	-33	dB
Color residual of color killer	e _{KR}	Residual level of chroma output in Killer ON state when chroma input burst signal of 150 mV _{p-p} is input	-	-	15	mV _{p-p}
Chroma output level	E _{COU} T	Chroma output level when chroma input burst signal of 150 mV _{p-p} is input	1.1	1.3	1.5	V _{p-p}
Color killer output High level (1)	E _{CKOH(1)}	High level of color killer output at color killer OFF $I_{OH} = -400$ μA	2.7	3.5	-	V
Color killer output High level (2)	E _{CKOH(2)}	High level of color killer output at color killer OFF $I_{OH} = -20$ μA	3.5	4.0	-	V
Color killer output Low level	E _{CKOL}	Low level of color killer output at color killer ON $I_{OL} = +2$ mA	-	0.2	0.4	V
APC lock-in range	f _P	Frequency pulled by APC with chroma input burst frequency changed (f _{SC} conversion)	±400	±600	-	Hz
VCO control sensitivity	β _P	Rate of variation of frequency when APC filter pin is changed from -0.025 V to +0.025 V (f _{SC} conversion)	8.0	10.0	12.0	Hz/mV
Phase variable range	θ _{CONT}	Amount of phase shift when voltage of phase control pin is set at 2.5 V + 1 V	±40	±55	-	deg
VCO output level	e _{VCOO}	VCO output level when chroma input burst signal of 150 mV _{p-p} is input	1.0	1.3	1.6	V _{p-p}
f _{SC} output level	e _{SCO}	f _{SCO} output level when chroma input burst signal of 150 mV _{p-p} is input	210	300	390	mV _{p-p}
Divider select voltage	V _{DIVSL}	1/4 freq. division if $V_{DIVS} < V_{DIVSL}$ EXT IN with V_{DIVS} : OPEN	-	-	0.5	V
	V _{DIVSH}	1/8 freq. division if $V_{DIVSH} < V_{DIVS}$	4.5	-	-	V
NTSC/PAL select voltage	V _{N/PT}	f _V = 60 Hz if $V_{N/PT} < V_{N/PT}$ f _V = 50 Hz if $V_{N/PT} < V_{N/PT}$	1.7	2.0	2.3	V

Sync section

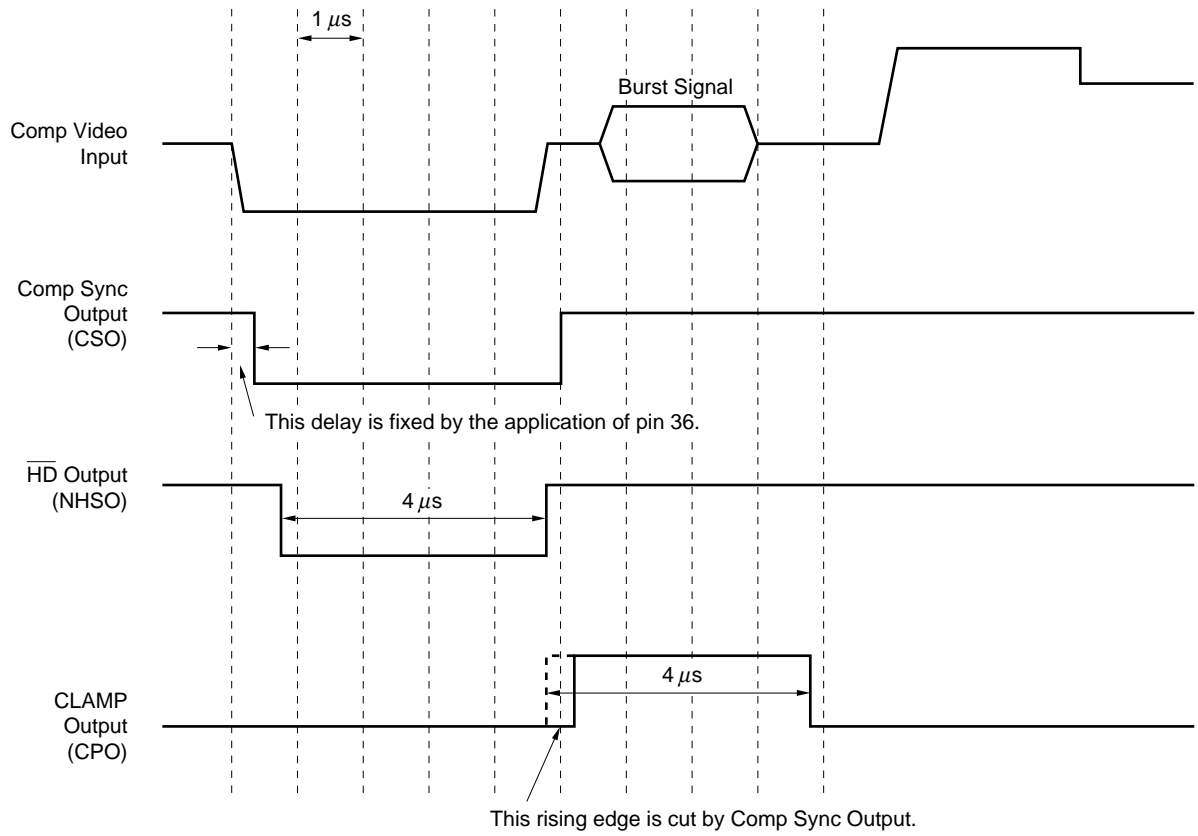
Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Supply current of Sync section	$I_{CC(1)}$	$V_{CC(1)} = 5\text{ V}$ No current on pin 25	12	15	18	mA
DC level of H sync separation input	V_{SSI}	Voltage of pin 36 when connected to GND via 10 k Ω resistor	1.9	2.2	2.5	V
DC level of V sync separation input	V_{VSI}	Voltage of pin 34 when connected to GND via 10 k Ω resistor	1.9	2.2	2.5	V
Sync separation output High level (1)	E_{CSOH1}	High level of sync separation output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -400\ \mu\text{A}$	2.7	3.8	-	V
Sync separation output High level (2)	E_{CSOH2}	High level of sync separation output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -20\ \mu\text{A}$	3.5	4.3	-	V
Sync separation output Low level	E_{CSOL}	Low level of sync separation output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OL} = +2\ \text{mA}$	-	0.1	0.4	V
$\overline{\text{HD}}$ output High level (1)	E_{NHSH1}	High level of synchronized $\overline{\text{HD}}$ output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -400\ \mu\text{A}$	2.7	3.8	-	V
$\overline{\text{HD}}$ output High level (2)	E_{NHSH2}	High level of synchronized $\overline{\text{HD}}$ output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -20\ \mu\text{A}$	3.5	4.3	-	V
$\overline{\text{HD}}$ output Low level	E_{NHSOL}	High level of synchronized $\overline{\text{HD}}$ output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OL} = +2\ \text{mA}$	-	0.1	0.4	V
VD output High level (1)	E_{VSOH1}	High level of synchronized VD output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -400\ \mu\text{A}$	2.7	3.8	-	V
VD output High level (2)	E_{VSOH2}	High level of synchronized VD output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -20\ \mu\text{A}$	3.5	4.3	-	V
VD output Low level	E_{VSOL}	High level of synchronized VD output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OL} = +2\ \text{mA}$	-	0.1	0.4	V
Clamp output High level (1)	E_{CPOH1}	High level of synchronized Clamp output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -400\ \mu\text{A}$	2.7	3.8	-	V
Clamp output High level (2)	E_{CPOH2}	High level of synchronized Clamp output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OH} = -20\ \mu\text{A}$	3.5	4.3	-	V
Clamp output Low level	E_{CPOL}	High level of synchronized Clamp output when only 0.3 V_{p-p} sync signal is input to pin 36 $I_{OL} = +2\ \text{mA}$	-	0.1	0.4	V

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit	
Field ident. output High level (1)	E _{FIOH1}	High level of synchronized Field ident. output when only 0.3 V _{p-p} sync signal is input to pin 36 I _{OH} = -400 μA	2.7	3.8	-	V	
Field ident. output High level (2)	E _{FIOH2}	High level of synchronized Field ident. output when only 0.3 V _{p-p} sync signal is input to pin 36 I _{OH} = -20 μA	3.5	4.3	-	V	
Field idnet. output Low level	E _{FIOl}	High level of synchronized Field ident. output when only 0.3 V _{p-p} sync signal is input to pin 36 I _{OL} = +2 mA	-	0.1	0.4	V	
H detection output High level (1)	E _{FIOH1}	High level of asynchronized H detect output without H sync input I _{OH} = -400 μA	2.7	3.8	-	V	
H detection output High level (2)	E _{FIOH2}	High level of asynchronized H detect output without H sync input I _{OH} = -20 μA	3.5	4.3	-	V	
H detection output Low level	E _{FIOl}	High level of synchronized H detect output when only 0.3 V _{p-p} sync signal is input to pin 36 I _{OL} = +2 mA	-	0.1	0.4	V	
H sync lock-in range	f _{HP}	Frequency range that can be pulled when only 0.3 V _{p-p} sync signal is input to pin 36 and H sync frequency is varied (f _{SC} conversion)	±400	±500	-	Hz	
Horizontal VCO control sensitivity	β _H	Rate of variation of frequency when APC filter pin is changed form 3.0 V to 3.4 V without H sync input (f _{SC} conversion)	-1.6	-1.3	-0.9	Hz/mV	
Horizontal VCO free-run frequency	f _{HO}	Frequency difference of HD output from f _H when H sync input is not applied	-100	-25	+50	Hz	
Pulse width of HD output	P _{WNHSD}	Pulse width of synchronized HD output when only 0.3 V _{p-p} sync signal is input to pin 36	3.8	4.0	4.2	μs	
Pulse width of VD output	P _{WVSO1}	Pulse width of synchronized VD output when only 0.3 V _{p-p} sync signal is input to pin 36	ODD	-	6.0	-	H ^{Note}
	P _{WVSO2}		EVEN	-	5.5	-	H ^{Note}
Pulse width of Clamp output	P _{WCPO}	Pulse width of synchronized Clamp output when only 0.3 V _{p-p} sync signal is input to pin 36	3.4	3.6	3.8	μs	
Oscillation start voltage of horizontal VCO	V _{ST}	Output voltage at HD when V _{CC} is gradually increased from 0 V without H sync input	-	-	4.2	V	
H killer output Low level	E _{HKOL}	Low level of synchronized H killer output when only 0.3 V _{p-p} sync signal is input to pin 36 Change value of Chroma output	-	-	0.4	V	
Burst gate input Threshold level 1	V _{BGPE1}	Burst gate pulse input voltage when Clamp voltage begins Low level is gradually increased from 0 V without signal input	1.6	1.9	2.0	V	

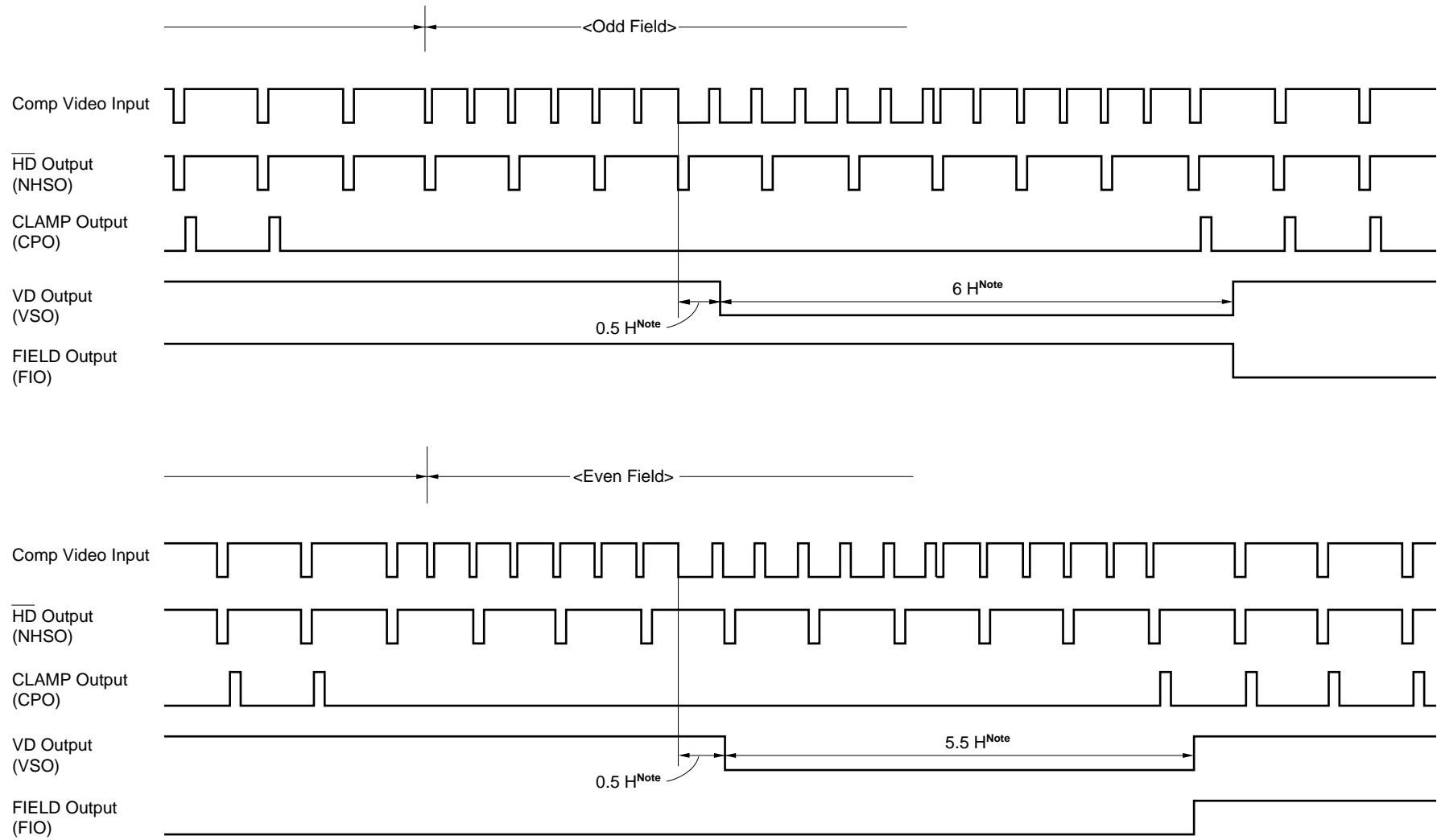
Note H: Horizontal scanning period

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Burst gate input Threshold level 2	V_{BGPE2}	Burst gate pulse input voltage when Clamp voltage begins High level is gradually increased from V_{BGPE1} without signal input	3.8	4.0	4.2	V
Vertical free-running frequency 1	$f_{V1(50)}$	Frequency ratio of HD output to VD output H sync input: No signal	-	$f_H/352$	-	Hz
	$f_{V1(60)}$	Pin 33 input: V_{CC} V sync input: V_{CC}	-	$f_H/288$	-	Hz
Vertical free-running frequency 2	$f_{V2(50)}$	Same as f_{V1} with the following exception	-	$f_H/288$	-	Hz
	$f_{V2(60)}$	V sync input: GND	-	$f_H/240$	-	Hz
Vertical free-running frequency 3	$f_{V3(50)}$	Same as f_{V1} with the following exception	-	$f_H/368$	-	Hz
	$f_{V3(60)}$	Pin 33 input: GND	-	$f_H/296$	-	Hz
Vertical free-running frequency 4	$f_{V4(50)}$	Same as f_{V1} with the following exception	-	$f_H/272$	-	Hz
	$f_{V4(60)}$	Pin 33 input: GND V sync input: GND	-	$f_H/232$	-	Hz

TIMING CHARTS (Horizontal Period)



TIMING CHARTS (Vertical Period)



Note H: Horizontal scanning period

CAUTION AT DESIGNING

Resonators

NEC evaluates μPC1862 using resonators which are shown below in design and development process.

If the different product is used as a resonator, electrical specification value described in this document is not assured.

And when connecting resonator to external circuit, there is need to consider temperature specification, voltage fluctuation and product variation. In this case, normal operation is not assured in the application circuit including the different product.

Use the resonators which are shown below when you design circuit.

32 f_H VCO resonator X₁ : in application example circuit

X₁ (PAL) : CSB500F2 (MURATA)

(NTSC) : CSB503F2 (MURATA)

nfsc VCO resonator X₂

X₂ : HC-49/U (KINSEKI, μPC1860 adoption)

Reference data of 4f_{sc}, 8f_{sc} VCO resonator (KINSEKI)

Item	NTSC for 4f _{sc}	NTSC for 8f _{sc}	PAL for 4f _{sc}
Name	HC-49/U		
Frequency	14.31818 MHz	28.63636 MHz	17.34475 MHz
Overtone Order	Fundamental (AT cut)	Fundamental (BT cut)	Fundamental (AT cut)
Operating Temperature	-10 to +70°C		
Frequency Permitted Tolerance (25±5°C)	±30 × 10 ⁻⁶	±50 × 10 ⁻⁶	±30 × 10 ⁻⁶
Frequency Temperature Specification (to 25°C)	±30 × 10 ⁻⁶	±100 × 10 ⁻⁶	±30 × 10 ⁻⁶
Equivalent Serial Resistance	50 Ω or less		
Parallel Capacitance	7.0 pF or less		
3rd harmonic standard	3rd harmonic frequency is over 3f _o (42.95454 MHz) + 7.5 kHz	—	3rd harmonic frequency is over 3f _o (53.203425 MHz) + 7.5 kHz

Recommended pattern

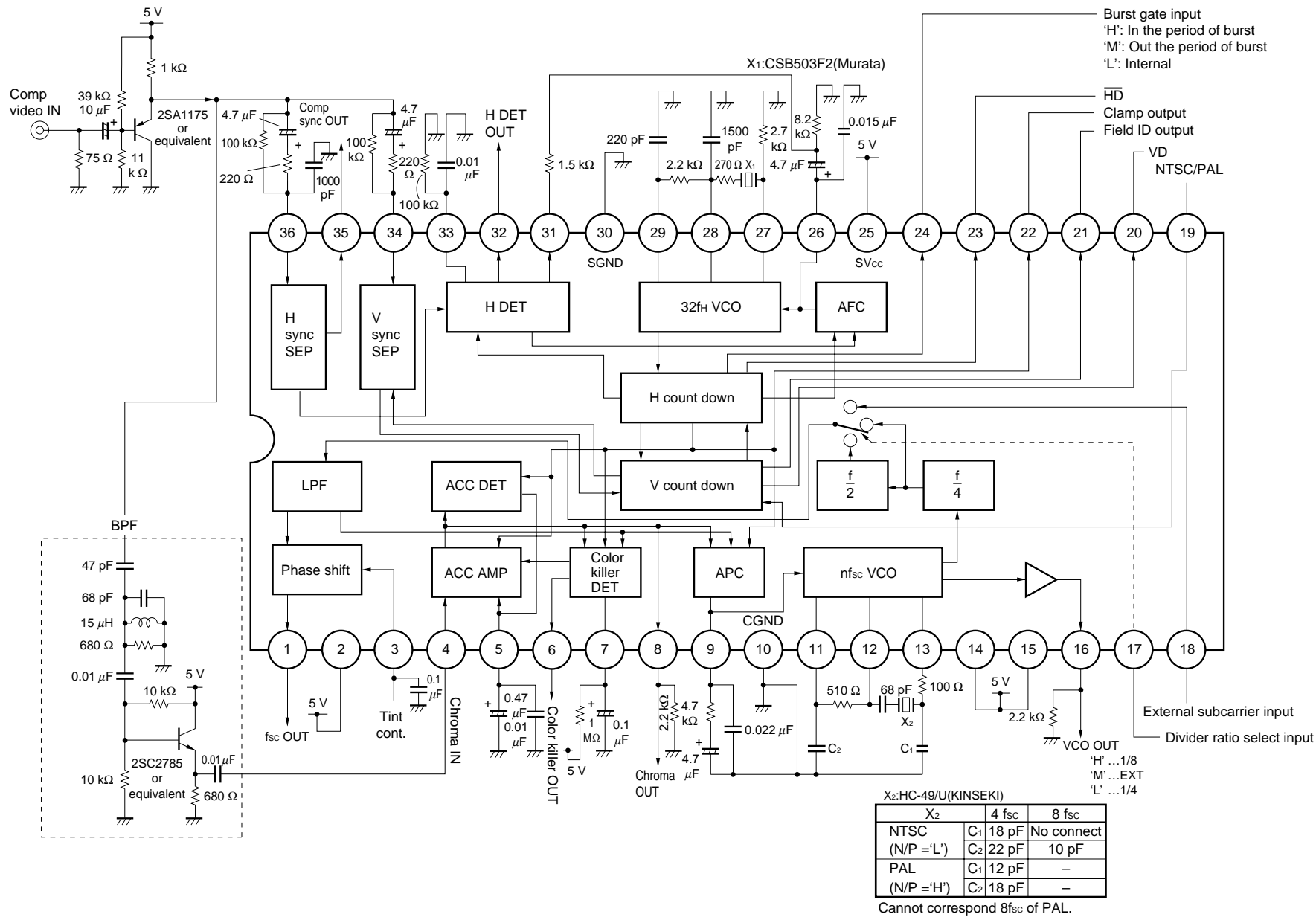
The μ PC1862 generates system clock for synchronous signal processing and clock generate processing.

If the supply voltage, line placement and routing are not set appropriately that the μ PC1862 cannot generate correct system clock.

Though the recommended pattern is not shows in this document, note points shown below at designing.

1. For synchronous section and chroma section, each power supply must be isolated.
2. Lines to pin 9 to pin 13 should be as thick and short as possible.
3. Connect resonator as near IC as possible. Don't put GND line between resonator pins for parasitism capacitance.

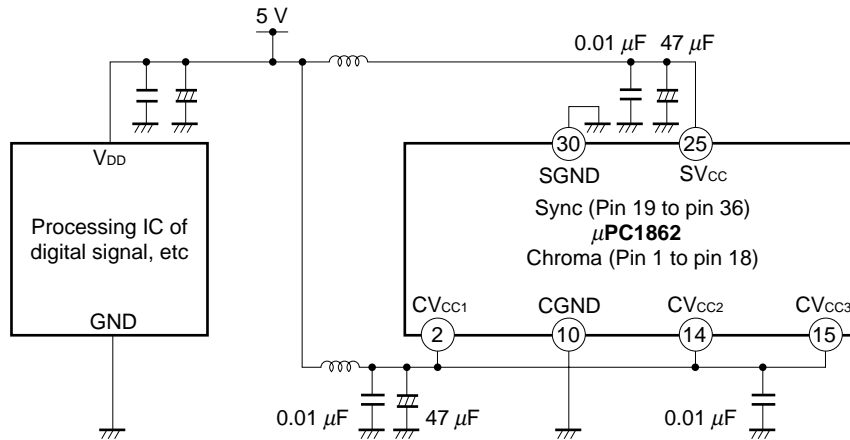
APPLICATION CIRCUIT



Care Point for Planning of Application Circuit

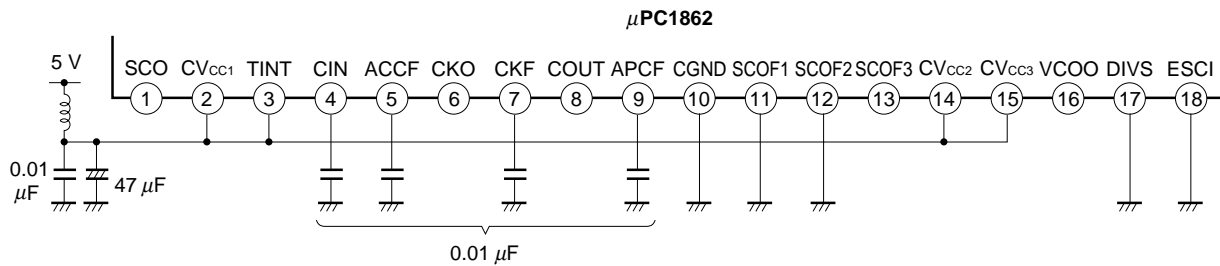
1. Processing of V_{CC} pin

Please isolate Chroma. V_{CC} from Sync. V_{CC} as follows. If you have external processing block of digital signal, don't directly supply of the block's V_{DD}.



2. Application of no using Chroma pin

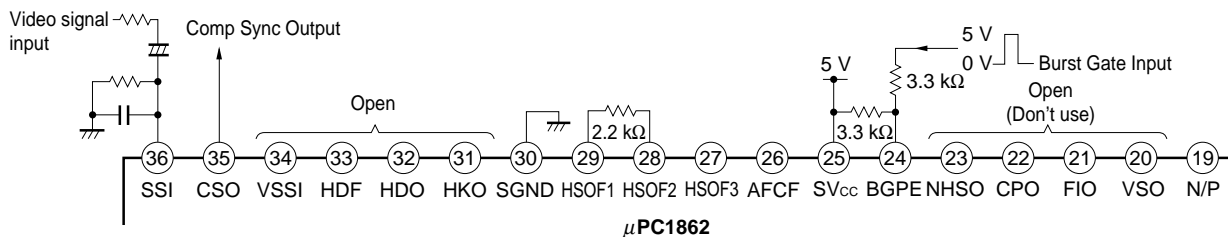
If you don't use Chroma pin but use Sync pin on μPC1862, you process pin 1 to pin 18 as follows.



3. Application of no using Sync pin

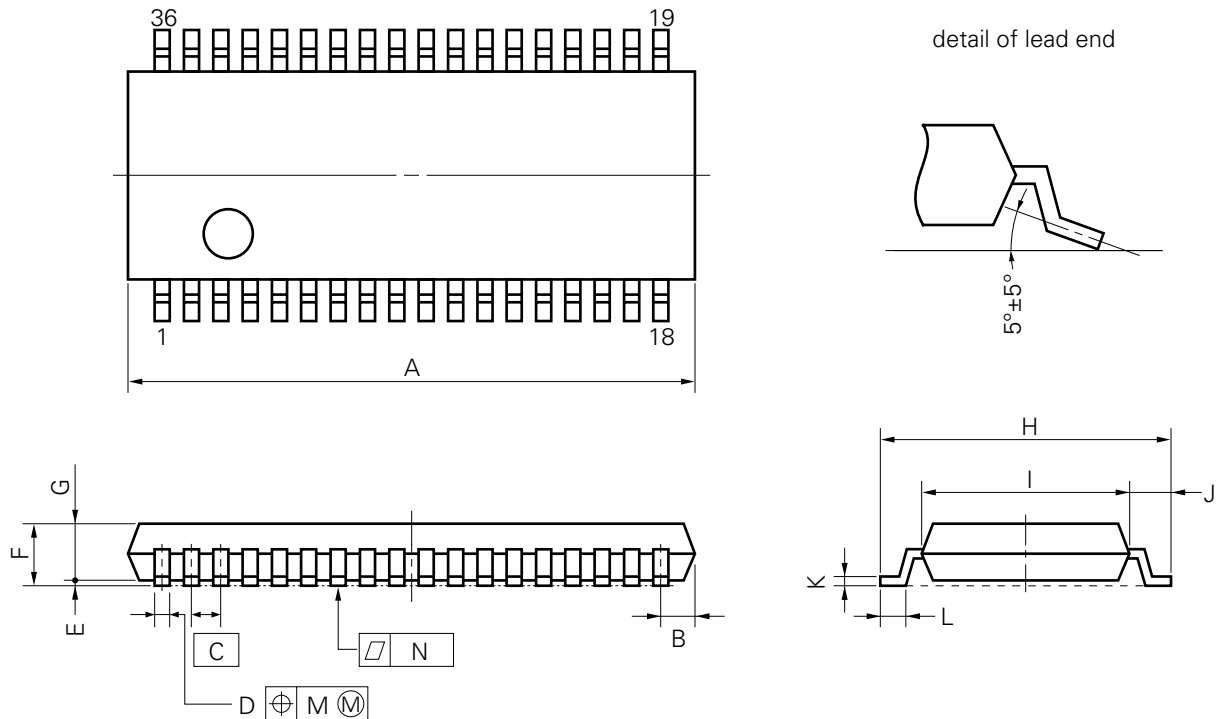
If you don't use Sync pin but use Chroma pin on μPC1862, you process pin 19 to pin 36 as follows. In this case, you need to input a pin 24 with burst gate pulse from external.

In this application, you can't use output of pin 20 to pin 23.



PACKAGE DRAWING

36 PIN PLASTIC SHRINK SOP (300 mil)



NOTE

Each lead centerline is located within 0.10 mm (0.004 inch) of its true position (T.P.) at maximum material condition.

P36GM-80-300B-3

ITEM	MILLIMETERS	INCHES
A	15.54 MAX.	0.612 MAX.
B	0.97 MAX.	0.039 MAX.
C	0.8 (T.P.)	0.031 (T.P.)
D	0.35 ^{+0.10} _{-0.05}	0.014 ^{+0.004} _{-0.003}
E	0.125±0.075	0.005±0.003
F	1.8 MAX.	0.071 MAX.
G	1.55	0.061
H	7.7±0.3	0.303±0.012
I	5.6	0.220
J	1.1	0.043
K	0.20 ^{+0.10} _{-0.05}	0.008 ^{+0.004} _{-0.002}
L	0.6±0.2	0.024 ^{+0.008} _{-0.009}
M	0.10	0.004
N	0.10	0.004

RECOMMENDED SOLDERING CONDITIONS

When soldering this product, it is highly recommended to observe the conditions as shown below. If other soldering processes are used, or if the soldering is performed under different conditions, please make sure to consult with our sales offices.

For more details, refer to our document “**SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL**” (C10535E).

Surface Mount Device

μPC1862GS: 36-pin plastic shrink SOP (300 mil)

Process	Conditions	Symbol
Infrared ray reflow	Peak temperature: 235 °C or below (Package surface temperature), Reflow time: 30 seconds or less (at 210 °C or higher), Maximum number of reflow processes: 2 times.	IR35-00-2
VPS	Peak temperature: 215 °C or below (Package surface temperature), Reflow time: 40 seconds or less (at 200 °C or higher), Maximum number of reflow processes: 2 times.	VP15-00-2
Wave Soldering	Solder temperature: 260 °C or below, Flow time: 10 seconds or less, Maximum number of flow process: 1 time, Pre-heating temperature: 120 °C or below (Package surface temperature).	WS60-00-1
Partial heating method	Pin temperature: 300 °C or below, Heat time: 3 seconds or less (Per each side of the device).	—

Caution Apply only one kind of soldering condition to a device, except for “Partial heating method”, or the device will be damaged by heat stress.

[MEMO]

[MEMO]

The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.