

Clock generator

BU2185F

This IC generates the different clock used for DVD. Generates clocks for CD use, sound use, and MPEG use.

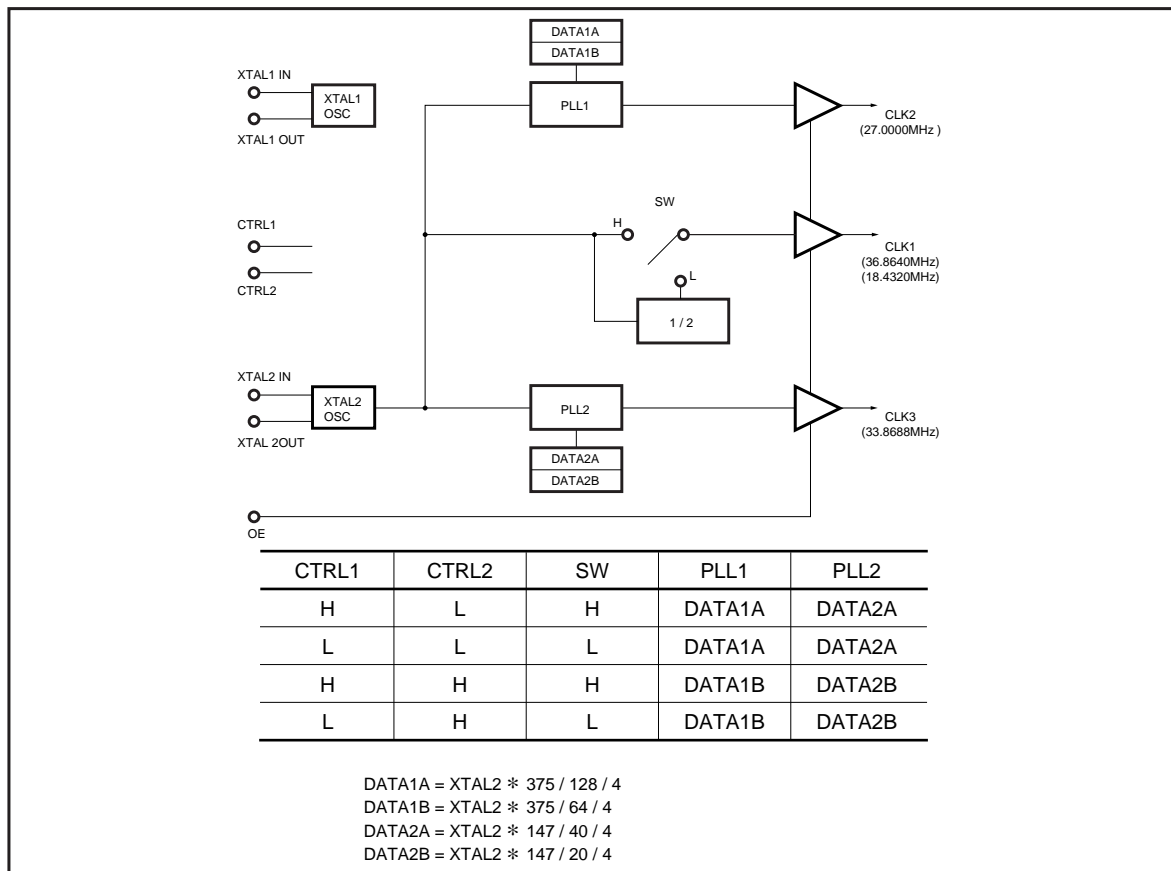
●Applications

DVD players

●Features

- 1) By connecting a crystal oscillating element, the different clock signals are generated.
- 2) Enables selection of the reference clock directly or with 1 / 2 output.
- 3) SOP 16-pin package.
- 4) Single 3.3V power supply.
- 5) With the standard clock output, an independent 5V power supply can be applied for a 5V output.

●Block diagram



● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	V _{DD}	- 0.5 ~ + 7.0	V
Input voltage	V _{IN}	- 0.5 ~ V _{DD} + 0.5	V
Power dissipation	P _d	450*	mW
Storage temperature	T _{stg}	- 30 ~ + 125	°C

○ Does not represent guaranteed performance.

* Reduced by 4.5mW for increase in Ta of 1°C over 25°C.

○ Not designed for radiation resistance.

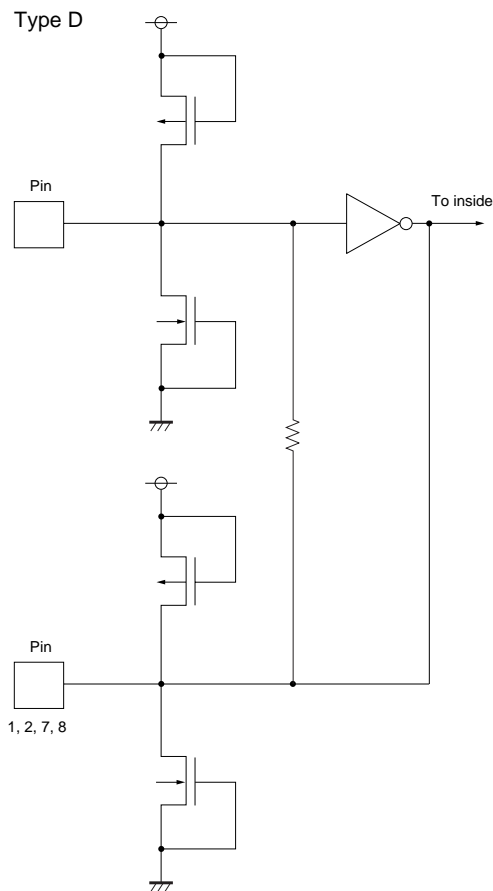
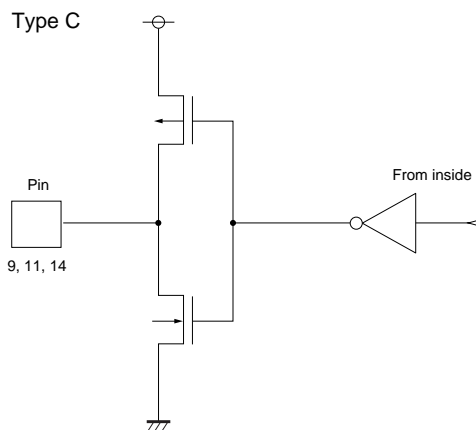
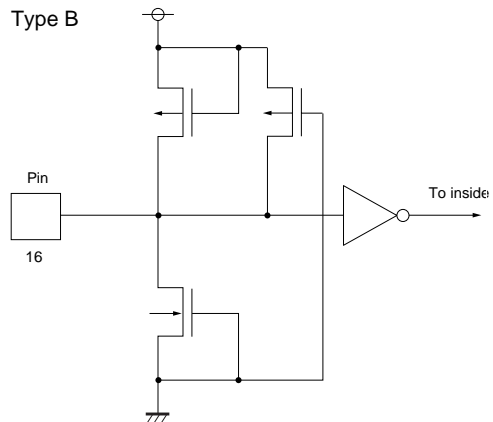
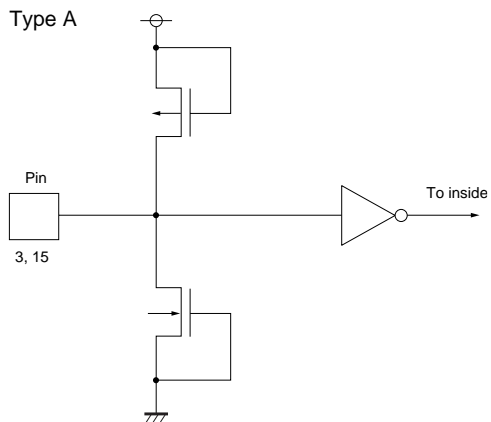
● Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{DD}	3.0 ~ 3.6	V
Input high level voltage	V _{IH}	0.8 × V _{DD} ~ V _{DD}	V
Input low level voltage	V _{IL}	0.0 ~ 0.2 × V _{DD}	V
Operating temperature	T _{opr}	- 5 ~ + 70	°C
Output load	C _L	15 (Max.)	pF

● Pin descriptions

Pin No.	Pin name	Pin descriptions	Circuit
1	XTAL1-IN	Reference oscillation input 1 (not used)	D
2	XTAL1-OUT	Reference oscillation output 1	D
3	CTRL2	XTAL setting (Low: XTAL = 36.8MHz mode; High: XTAL = 18.4MHz mode)	A
4	AGND	Analog GND	—
5	DGND	Digital GND	—
6	DV _{DD}	Independent power supply for XTAL2-IN and XTAL2-OUT pins	—
7	XTAL2-IN	Reference oscillation input 2 (36.864MHz or 18.432MHz)	D
8	XTAL2-OUT	Reference oscillation output 2	D
9	CLK1	Reference clock output (36.864MHz or 18.432MHz)	C
10	DV _{DD}	Independent power supply for CLK1 output buffer	—
11	CLK2	Clock output 2 (27.000MHz)	C
12	DV _{DD}	Digital V _{DD}	—
13	AV _{DD}	Analog V _{DD}	—
14	CLK3	Clock output 3 (33.8688MHz)	C
15	CTRL1	CLK1 output selector (High: 36.864MHz; Low: 18.432MHz)	A
16	OE	Output enable (High: enable; Low: disable)	B

● Input / output circuits



- Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{DD} (AV_{DD}) = 3.3\text{V}$, $CL \leq 15\text{pF}$, XTAL1 = shorted to GND, XTAL2 = 36.864MHz, 18.43MHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input low level voltage	V_{IL}	—	—	$0.3 \times V_{DD}$	V	CTRL1, CTRL2, OE
Input high level voltage	V_{IH}	$0.7 \times V_{DD}$	—	—	V	CTRL1, CTRL2, OE
Output low level voltage	V_{OL}	—	—	0.4	V	$I_{OL} = 4.0\text{mA}$ CLK1, CLK2, CLK3
Output high level voltage	V_{OH}	2.4	—	—	V	$I_{OH} = -4.0\text{mA}$ CLK1, CLK2, CLK3
Output low level voltage	V_{OL}	—	—	0.4	V	$I_{OL} = 0.5\text{mA}$ XTAL1OUT, XTAL2OUT
Output high level voltage	V_{OH}	$DV_{DD}-0.5$	—	—	V	$I_{OH} = -0.5\text{mA}$ XTAL1OUT, XTAL2OUT
Operating circuit current	I_{DD}	—	40	60	mA	No load

⟨When XTAL2 = 36.864MHz⟩ (XTAL1 is shorted to GND)

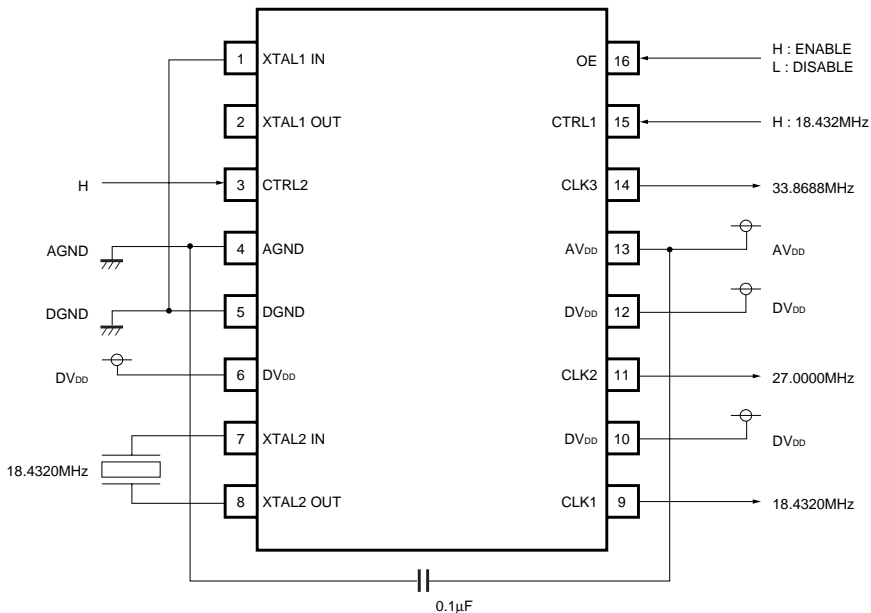
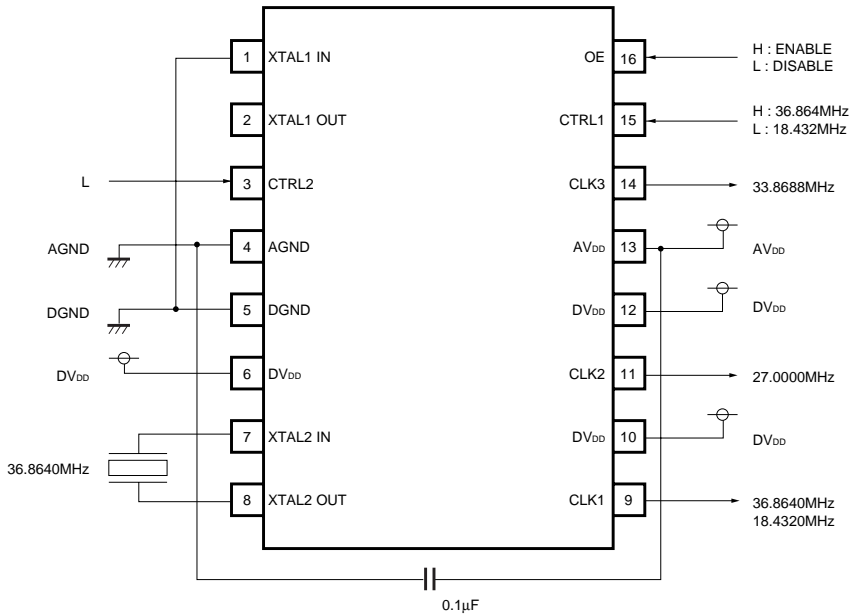
CLK1 frequency1	CLK1-1	—	36.8640	—	MHz	XTAL2 output CTRL1 = H, CTRL2 = L
CLK1 frequency2	CLK1-2	—	18.4320	—	MHz	XTAL2 1 / 2 output CTRL1 = L, CTRL2 = L
CLK2 frequency	CLK2	—	27.0000	—	MHz	$XTAL2 \times 375 / 128 / 4$ — CTRL2 = L
CLK3 frequency	CLK3	—	33.8688	—	MHz	$XTAL2 \times 147 / 40 / 4$ — CTRL2 = L

⟨When XTAL2 = 18.432MHz⟩ (XTAL1 is shorted to GND)

CLK1 frequency1	CLK1	—	18.4320	—	MHz	XTAL2 output CTRL1 = H, CTRL2 = H
CLK2 frequency	CLK2	—	27.0000	—	MHz	$XTAL2 \times 375 / 64 / 4$ — CTRL2 = H
CLK3 frequency	CLK3	—	33.8688	—	MHz	$XTAL2 \times 147 / 20 / 4$ — CTRL2 = H

DUTY	DUTY	45	50	55	%	$1 / 2V_{DD}$
JITTER	J1s	—	100	—	psec	Reference value (1sigma)
JITTER	Jabs	—	600	—	psec	Reference value (min.-to-max. width for jitter)
27MHz S / N	CLK2SN	—	65	—	dB	$27\text{MHz} \pm 20\text{kHz}$ RBW = 1kHz, SPAN = 200kHz

●Application example



●Attached components

Since high frequencies are handles, use this IC mounted on a PC board. If used mounted by a socket, the proper characteristics may not be able to be obtained. Be sure to connect a 0.1µF capacitor between the analog power supply and analog GND.

●External dimensions (Units: mm)

