

Clock generator

BU2185F

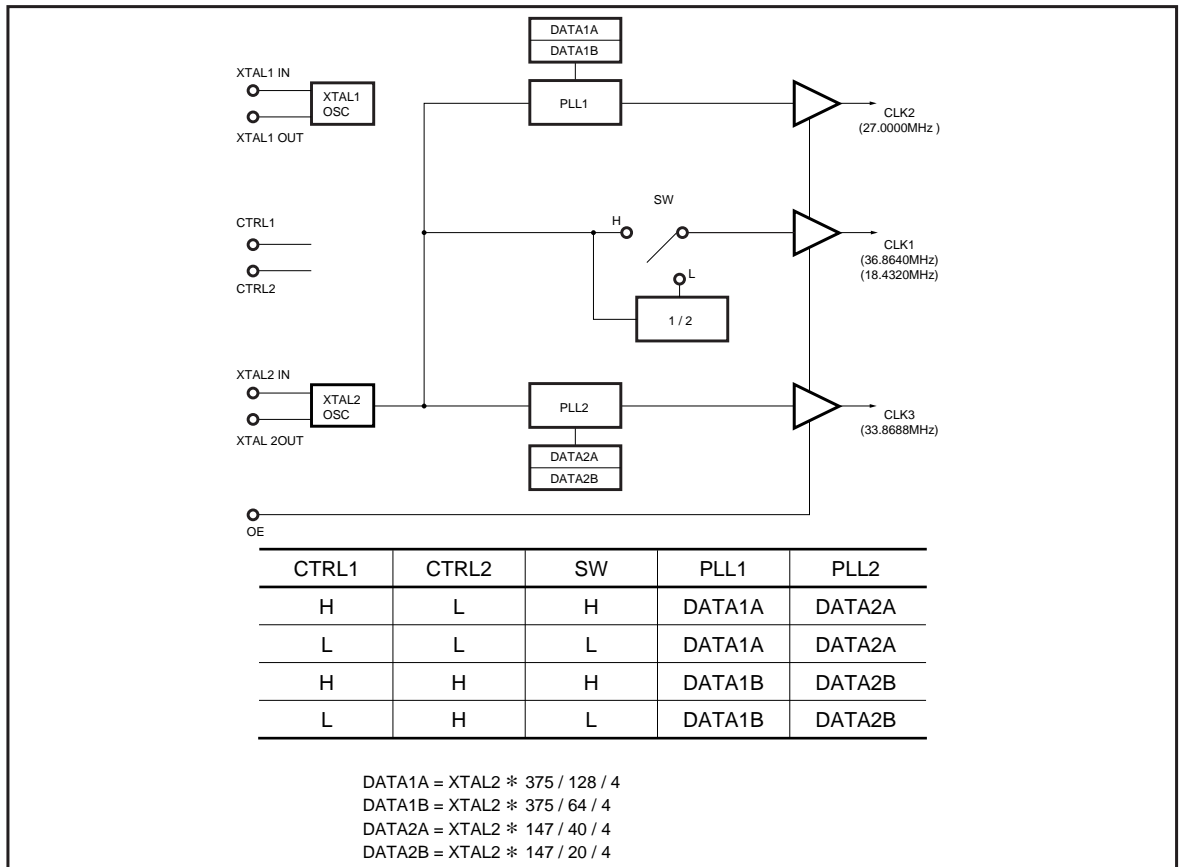
This IC generates the different clock used for DVD. Generates clocks for CD use, sound use, and MPEG use.

●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.

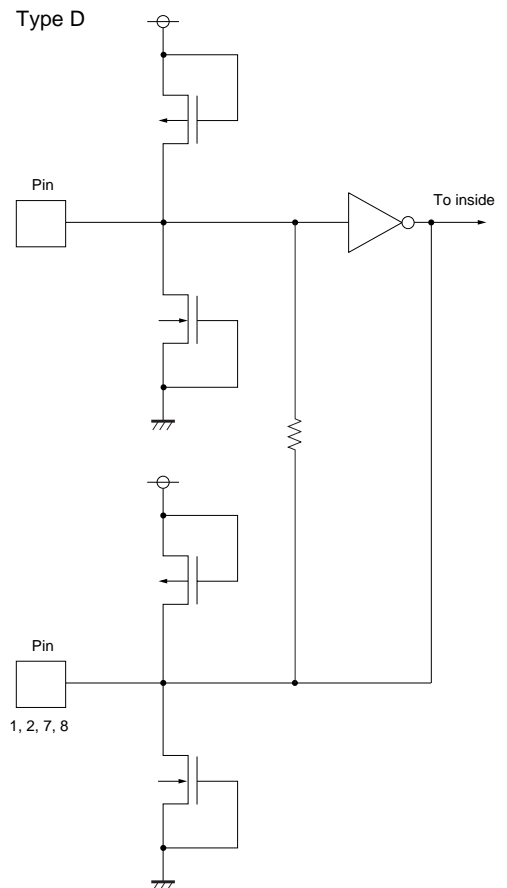
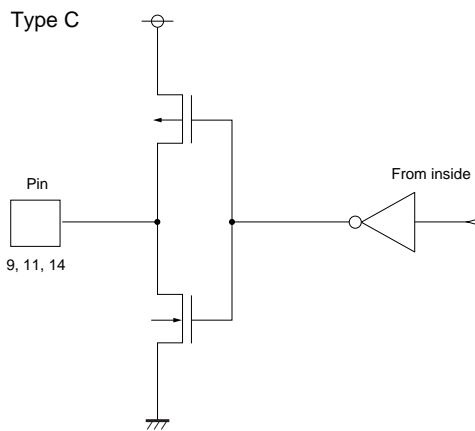
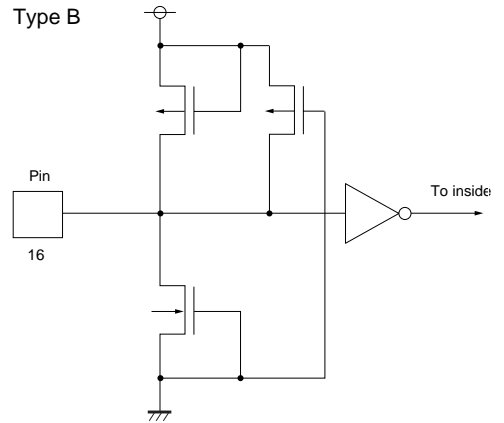
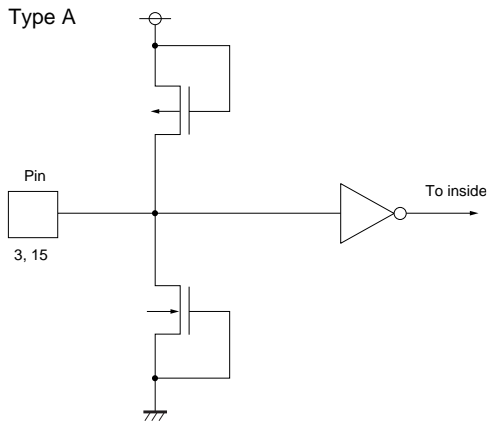
● Recommended operating conditions (Ta = 25°C)

| 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} = 4.0mA CLK1, CLK2, CLK3 |
| Output high level voltage | V_{OH} | 2.4 | — | — | V | I _{OH} = - 4.0mA CLK1, CLK2, CLK3 |
| Output low level voltage | V_{OL} | — | — | 0.4 | V | I _{OL} = 0.5mA XTAL1OUT, XTAL2OUT |
| Output high level voltage | V_{OH} | $DV_{DD}-0.5$ | — | — | V | I _{OH} = - 0.5mA XTAL1OUT, XTAL2OUT |
| Operating circuit current | I_{DD} | — | 40 | 60 | mA | No load |

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

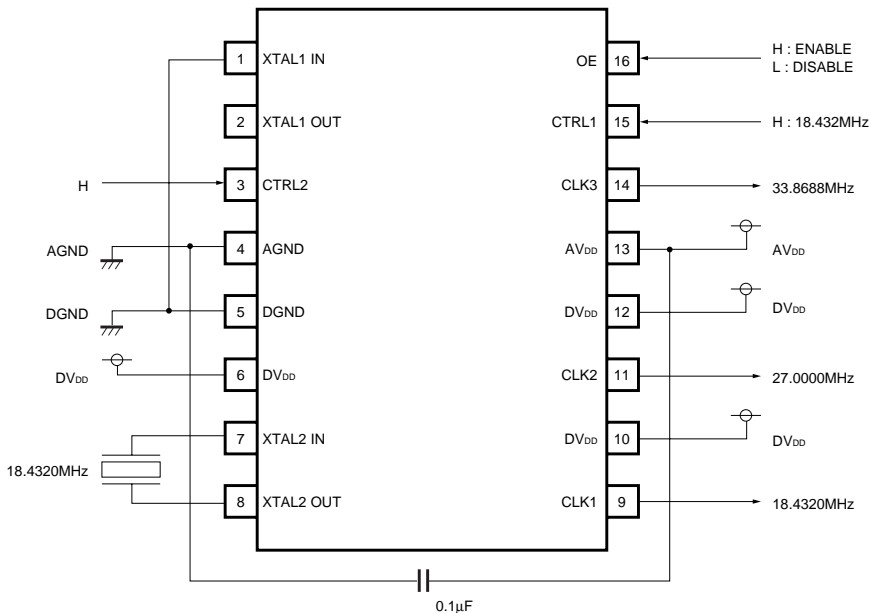
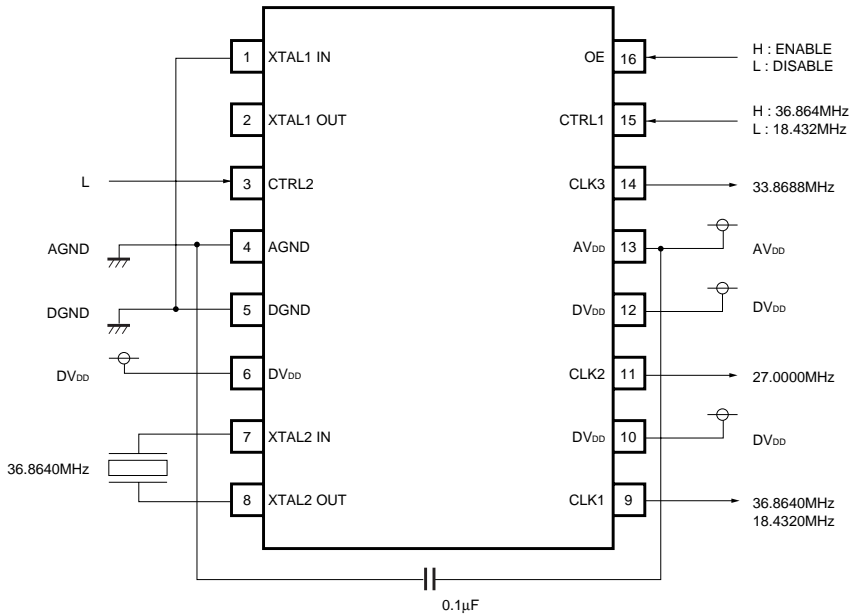
| | | | | | | |
|-----------------|--------|---|---------|---|-----|--|
| CLK1 frequency1 | CLK1-1 | — | 36.8640 | — | MHz | XTAL2 output CTRL1 = H, CTRL2 = L |
| CLK1 frequency2 | CLK1-2 | — | 18.4320 | — | MHz | XTAL2 1 / 2 output CTRL1 = L, CTRL2 = L |
| CLK2 frequency | CLK2 | — | 27.0000 | — | MHz | 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 | 27MHz \pm 20kHz 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)

