

Clock generator IC

BU2294AF

The BU2294AF is an IC which produces dual clocks required for a game machine from an external crystal oscillator for PAL and built-in 2-channel PLL. Three kinds of frequencies ; 53.203425MHz, 67.735842MHz and 4.433619MHz can be outputted with low jitter and high S/N.

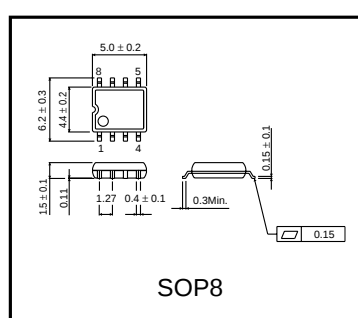
●Applications

Game machines

●Features

- 1) Available with three output clock signals required for a game machine in one chip.
- 2) All output with low jitter, high S/N.
- 3) No need for additional components, Built-in a PLL loop filter.
- 4) 3.3V single power supply.

●External dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	V_{DD}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{DD}+0.5$	V
Storage temperature range	Tstg	-30 to +125	°C
Power dissipation	Pd	450	mW

*An operation is not guaranteed.

*In case it is used at Ta=25°C or more, 4.5mW is reduced at every 1°C.

*Radiation resistance design is not used.

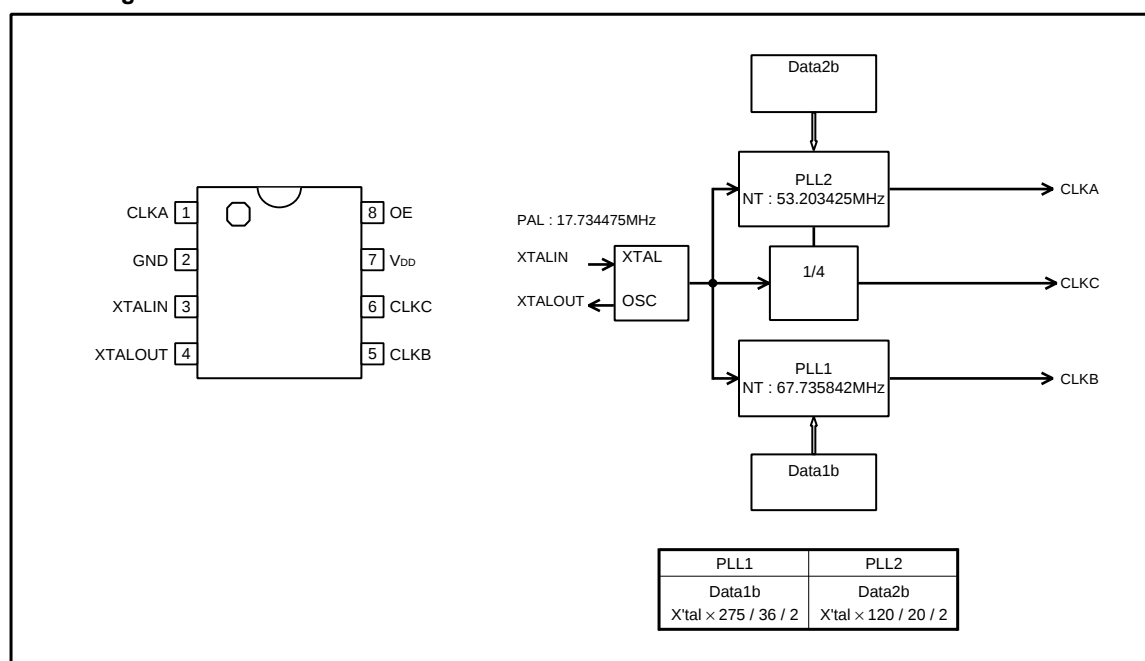
*Power dissipation is measured when BU2294AF is placed on the board.

●Recommended operating conditions (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{DD}	3.0 to 3.6	V
Input "H" voltage range	V_{IH}	0.8 V_{DD} to V_{DD}	V
Input "L" voltage range	V_{IL}	0 to +0.2 V_{DD}	V
Operation temperature range	Topr	-5 to +70	°C
Output load	CL	15 (Max.)	pF

Multimedia ICs

●Block diagram

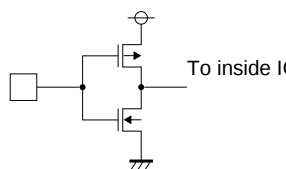
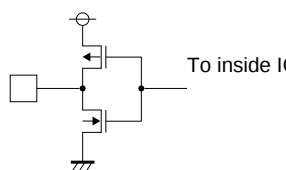
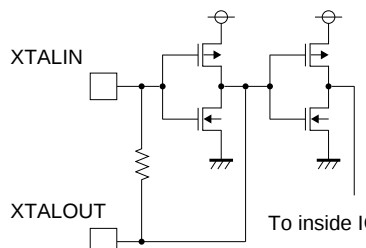


●Pin descriptions

Pin No.	Pin name	Functions
1	CLK A	PLL2 oscillation output
2	GND	GROUND
3	XTAL IN	Crystal input terminal
4	XTAL OUT	Crystal output terminal
5	CLK B	PLL1 oscillation output
6	CLK C	Crystal 1/4 output
7	V _{DD}	Power supply
8	OE	Output enable H : enable

Multimedia ICs

●Input output circuits

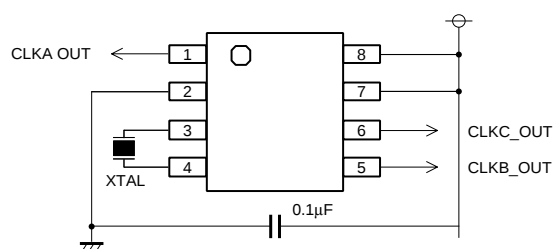
Pin No.	Equivalent circuit
Input pin 8 : pull_up resistance about 50k Ω	
Output pin 1, 5, 6	
Crystal pin 3, 4	

●Electrical characteristics (Unless specified otherwise Ta=25°C, VCC=3.3V Crystal frequency=17.734475MHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output "L" voltage	V _{OL}	–	–	0.4	V	I _{OL} =4.0mA
Output "H" voltage	V _{OH}	2.4	–	–	V	I _{OH} =–4.0mA
Power supply current	I _{DD}	–	30	50	mA	No load
CLKC PAL	FCLKC_P	–	4.433619	–	MHz	X'tal 1/4
CLKB PAL	FCLKB_P	–	67.735842	–	MHz	X'tal $\times$ 275 / 36 / 2
CLKA PAL	FCLKA_P	–	53.203425	–	MHz	X'tal $\times$ 120 / 20 / 2
Duty	Duty	45	50	55	%	1/2V _{DD} test
Jitter 1sigma	J _s	–	200	–	psec	Short time jitter 1sigma
Jitter absolute	J _{abs}	–	600	–	psec	Short time jitter absolute
Rise time	t _r	–	2.5	–	nsec	Time between 0.2V _{DD} to 0.8V _{DD}
Fall time	t _f	–	2.5	–	nsec	Time between 0.2V _{DD} to 0.8V _{DD}
Negative resistance	R _{neg}	300	–	–	Ω	*

* Output frequency is determined by the operation expression (Frequency divide) input to XTALIN.
Output when input frequency at PAL is 17.734475 MHz is shown above.
JITTER is mean value using time interval analyzer with 10,000 sampling.

●Application example



●Note

The BU2294AF is basically placed on the board. Decoupling bypass capacitor (0.1μF) need to be place between pin7(VDD) and pin2 (GND).