Clock generator for HDD

BU2191F

The BU2191F is a clock generator IC for hard disk drives, and uses a single crystal resonator to generate the three clock signals needed for hard disk drives.

●Applications

Hard disk drives

●Features

1) Clock signals of three different frequencies can be generated with a single attached crystal resonator.
2) Internal loop filter, eliminating the need for an attached loop.
3) Single 5.0V power supply.
4) SOP 8-pin package.

●Absolute maximum ratings (Ta=25℃)

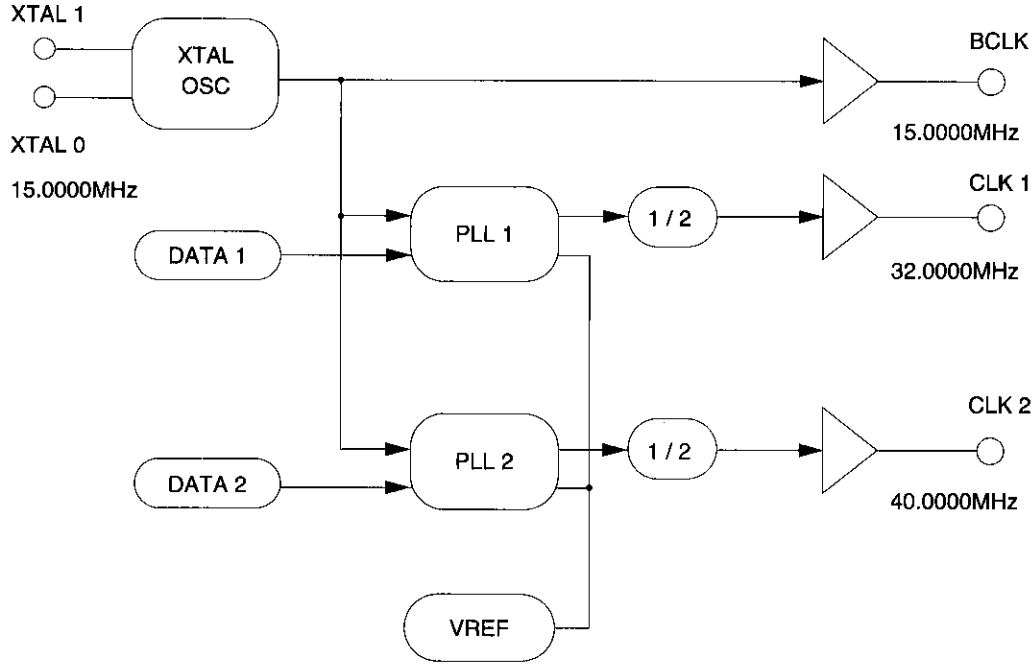
Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	−0.5~7.0	V
Input voltage	VIN	−0.5~V_{DD}+0.5	V
Storage temperature	Tstg	−30~125	℃
Power dissipation	P_D	450	mW

* Does not represent guaranteed performance
* Reduced by 4.5 mW for each increase in Ta of 1℃ over 25℃.
◎ Not designed for radiation resistance.

●Recommended operating conditions (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	4.5~5.5	V
Input voltage, high level	VIH	0.8V_{DD}~V_{DD}	V
Input voltage, low level	VIL	0.0~0.2V_{DD}	V
Operating temperature	Topr	−5~70	℃
Output load	CL	15 (Max.)	pF

●Block diagram

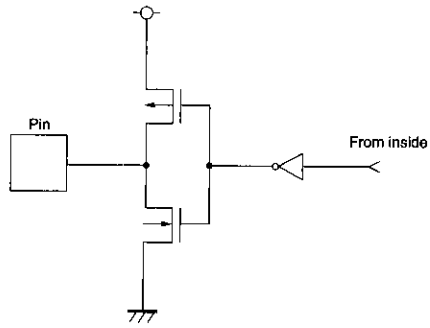


●Pin descriptions

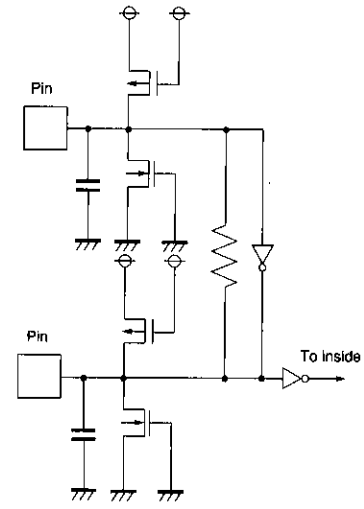
Pin No.	Pin name	Function	Circuit
1	CLK2	Clock output 2 (f2=40 MHz)	A
2	GND	Ground	—
3	XTALI	Reference oscillation input	B
4	XTALO	Reference oscillation output	B
5	BCLK	Reference oscillation buffer output (fBCLK=15 MHz)	A
6	CLK1	Clock output 1 (f1=32 MHz)	A
7	VDD	VDD	—
8	AVDD	Analog power supply	—

●Input/output circuits

Type A



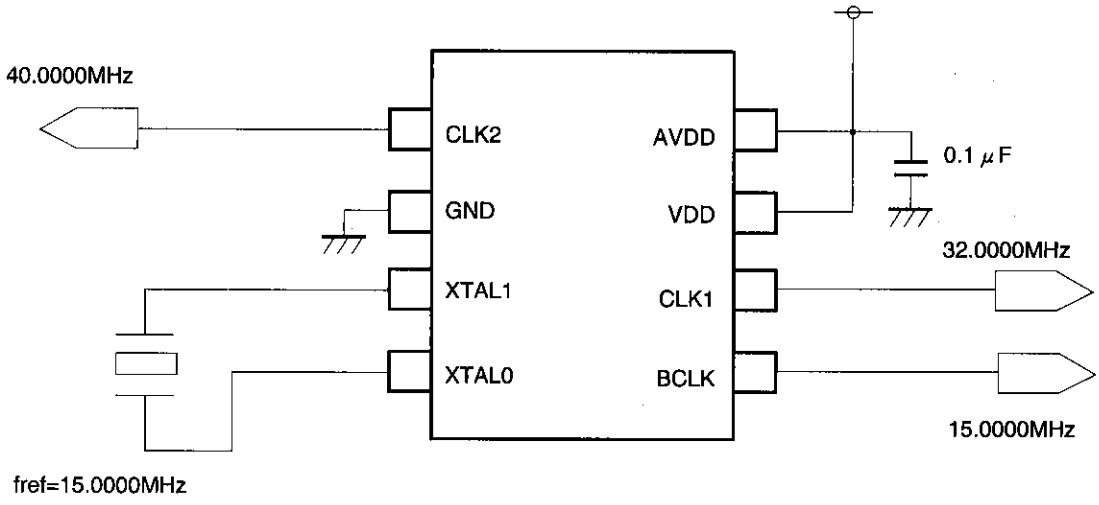
Type B



●Electrical characteristics (unless otherwise noted, Ta=25℃, AVDD=5.0V, DVDD=5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage, low level	VOL	—	—	0.4	V	IOL=4.0mA
Output voltage, high level	VOH	VDD−0.5	—	—	V	IOL=−4.0mA
Circuit current	IDD	—	30	50	mA	fXTAL = 15.0000 MHz, no load
Reference frequency (1)	fREF	—	15.0000	—	MHz	
Output frequency (1)	fBCK	14.997	15.0000	15.003	MHz	
Output frequency (2)	f1	31.994	32.0000	32.006	MHz	fREF×128 / 15 / 4
Output frequency (3)	f2	39.992	40.0000	40.008	MHz	fREF×16 / 3 / 2
Rise time	fR	—	—	5	nsec	VDD×0.2 to VDD×0.8
Fall time	fF	—	—	5	nsec	VDD×0.8 to VDD×0.2
Jitter	Jcy	−250	—	250	psec	
Jitter 3s	J3s	—	—	1	nsec	
Power up time	tPT	—	—	10	msec	*
Duty	Duty	45	50	55	%	Measure at 1.4 V (Vth)

●Application example



fref=15.0000MHz

●Attached components

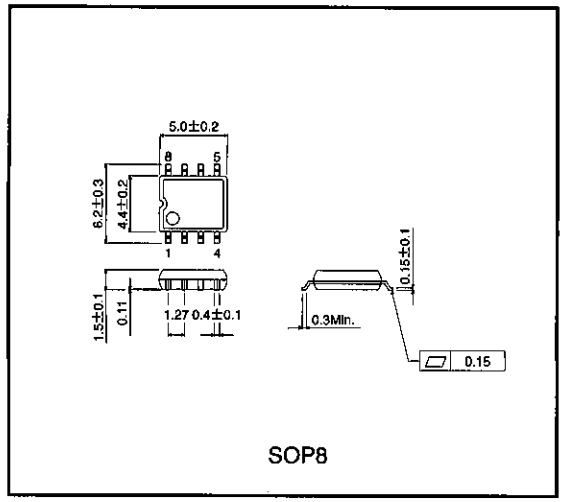
(1) Crystal resonator

A crystal resonator with an oscillation frequency of 15,000MHz is usually sufficient. However, if f_0 precision is necessary, adjust by attaching a capacity to each end of the crystal resonator.

(2) Power supply

VDD bypass capacitor.

●External dimensions (Units: mm)



SOP8

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