

Clock generator for digital still camera

BU2385KN

BU2385KN is a clock generator IC that can generate multiple frequencies (clocks) from one oscillator. Excellent jitter characteristic is achieved through the built-in high-performance 3-channel PLL. High-quality sound and image equivalent to the oscillating module are the result of this feature. Clocks can be easily changed for other applications. The internal dividing control allows the frequency to be switched outside.

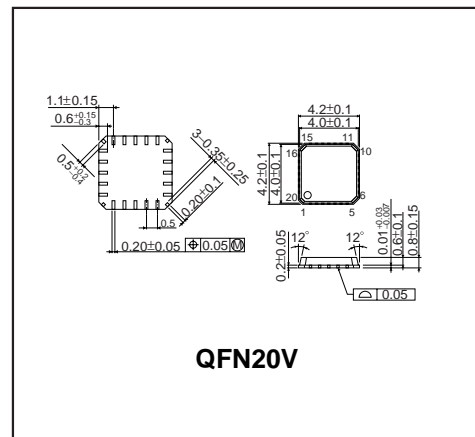
●Applications

Digital still camera

●Features

- 1) Multiple frequency clock signals can be generated by the built-in 3-channel PLL through connecting crystal oscillator.
- 2) QFN20V package
- 3) 3.3V single power supply
- 4) For crystal 14.318182MHz • 28.636363MHz
- 5) No need additional components.
(BU2385KN have PLL loop filter in side).

●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}	-0.3 to V _{DD} +0.3	V
Storage temperature range	T _{stg}	-30 to +125	°C
Power dissipation	P _d	530	mW

* An operation is not guaranteed.

* In case it is used at Ta=25°C or more, 5.3mW is reduced at every 1°C.

* Radiation resistance design is not used.

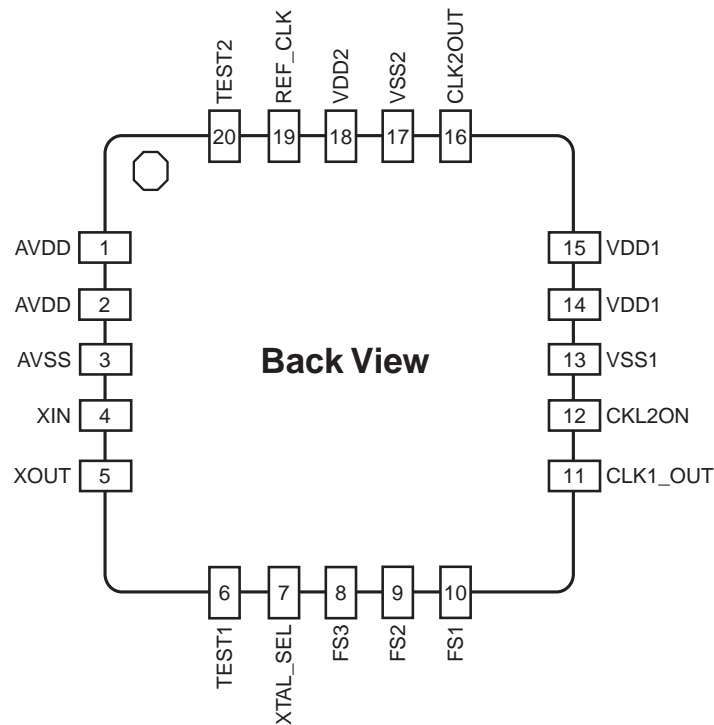
* Power dissipation is measured when BU2385KN is placed in the board.

●Recommended operating conditions (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V _{DD}	3.0	-	3.6	V
Input H voltage range	V _{IH}	0.8V _{DD}	-	V _{DD}	V
Input L voltage range	V _{IL}	0.0	-	0.2V _{DD}	V
Operation temperature range	T _{opr}	-5	-	+70	°C
Output maximum load	C _L	-	-	15	pF

Multimedia ICs

●Block diagram

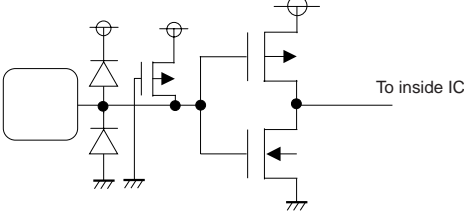
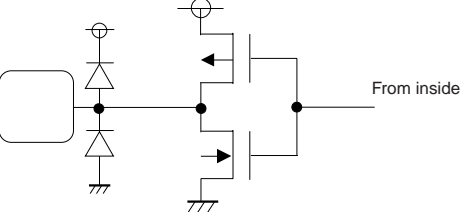
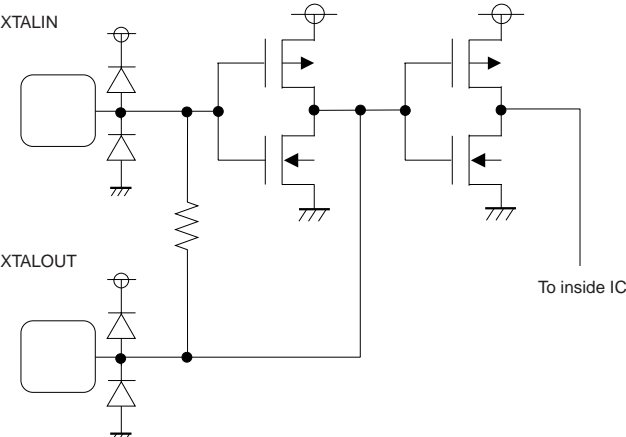


●Explanation for terminal function

PIN No.	PIN NAME	Function
1	AVDD	Analog VDD
2	AVDD	Analog VDD
3	AVSS	Analog GND
4	XIN	Standard crystal input
5	XOUT	Standard crystal output
6	TEST 1	Input for test mode (normally open) with pull-down
7	XTAL_SEL	Crystal select with pull up H : 28.636363MHz L : 14.318182MHz
8	FS3	CLK1,2 output select with pull up
9	FS2	CLK1,2 output select with pull up
10	FS1	REFCLK output select with pull up
11	CLK1OUT	71.877274M / 90.314686M / 96.016044M / 114.54546M clock output
12	CLK2ON	CLK2 output control with pull up H : enable L : disable
13	VSS 1	GND for CLK 1, 2 clock output and Logic circuit
14	VDD 1	VDD for CLK 1, 2, clock output and Logic circuit
15	VDD 1	VDD for CLK 1, 2, clock output and Logic circuit
16	CLK2OUT	96.016044M / 48.008022M clock output
17	VSS 2	REF_CLK GND
18	VDD 2	REF_CLK VDD
19	REF_CLK	14.318182M / 17.734450M clock output
20	TEST2	Input for test mode (normally open) with pull-down

Multimedia ICs

●PIN Input / Output equivalent circuit

PIN No.	Equivalent circuit
<p>Input PIN 7, 8, 9, 10, 12 with pull-up</p> <p>(6 : TEST1, 20 : TEST2 with pull down)</p>	
<p>Output PIN 11, 16, 19</p>	
<p>Crystal PIN 4, 5</p>	

Multimedia ICs

●Electrical characteristics (Unless otherwise noted, Ta=25°C, V_{CC}=3.3V)

While crystal shows 28.636363MHz, XTAL_SEL=H, in case of 14.31818MHz, TXAL_SEL=L

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply current	I _{DD}	-	40	50	mA	No load
output frequency						
CLK1 FS2:H FS3:H	Fclk1-1	-	96.016044	-		Xtal * (228/17)/2
FS2:H FS3:L	Fclk1-2	-	71.877274	-		Xtal * (251/25)/2
FS2:L FS3:L	Fclk1-3	-	114.54546	-	MHz	Xtal * (224/14)/2
FS2:L FS3:H	Fclk1-4	-	90.314686	-	MHz	Xtal * (164/13)/2
CLK2 FS2:L FS3:L	Fclk2-1	-	96.016044	-	MHz	Xtal * (228/17)/2
FS2,3:HL LH HH	Fclk2-2	-	48.008022	-	MHz	Xtal * (228/17)/4
REFCLK FS1:H	Fref1-1	-	14.318182	-	MHz	Crystal direct output
FS1:L	Fref1-2	-	17.734450	-	MHz	Xtal * (706/57)/10
Duty1 at under 100MHz	Duty1	45	50	55	%	Measured at 1/2V _{DD}
Duty2 at upper 100MHz	Duty2	-	50	-	%	Measured at 1/2V _{DD}
Rise time	T _r	-	2.5	-	nsec	Time between 0.2V _{DD} and 0.8V _{DD}
Fall time	T _f	-	2.5	-	nsec	Time between 0.2V _{DD} and 0.8V _{DD}
Period Jitter 1σ	P-J1σ	-	30	-	psec	*1
Period Jitter MIN-MAX	P-J MINMAX	-	180	-	psec	*2
Output Lock time	T _{lock}	-	-	1	msec	*3

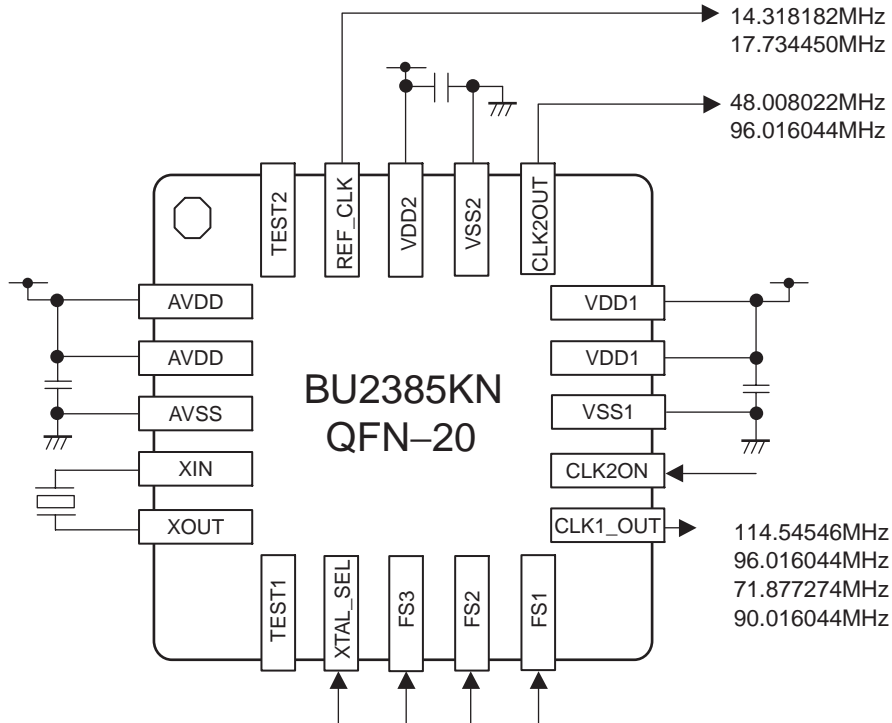
Note) When input frequency is 14.31818MHz, output frequency is above rated value.

*1 Period Jitter 1σ : This value is the standard deviation of an output period when using Time Interval Analyzer with 10,000 sampling.

*2 Period Jitter MIN-MAX : This value is the max range of an output period when using Time Interval Analyzer with 10,000 sampling.

*3 Output Lock time : Time between voltage supply leads to 3.0V and output clock gets stable.

●Application circuit



Note) BU2385KN is placed on the board normally.

A decoupling capacitor (0.1μF) needs to be placed between Pin1,2 and Pin3, Pin13 and Pin14,15, Pin17 and Pin18.

The decoupling capacitor is as close to the above pins as possible.

Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document use silicon as a basic material.
Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.