◆Structure Silicon monolithic integrated circuit

◆Product Single Channel 16-bit CIS/CCD Analog Front End

◆Type **BU6574FV**

◆Features
- Correlated double sampling (CDS)
- Programmable gain amplifier (8bit resolution)
- 16bit 6MSPS ADC
- Serial control interface
- Offset calibration DAC (8bit resolution)
- Internally generated voltage references
- 4bit wide multiplexed data output format

◆Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Ratings	Unit
Supply voltage 1	V_{AVDD}	−0.2 to 4.0	V
Supply voltage 2	V_{DVDD}	−0.2 to 4.0	V
I/O supply voltage	V_{VDDIO}	−0.2 to 4.0	V
Digital input voltage *1	V_{ID}	−0.2 to V_{VDDIO} + 0.3	V
Digital output voltage *2	V_{OD}	−0.2 to V_{VDDIO} + 0.3	V
Analog input voltage *3	V_{IA}	−0.2 to V_{AVDD} + 0.3	V
Analog output voltage *4	V_{OA}	−0.2 to V_{AVDD} + 0.3	V
Storage temperature	Tstg	−25 to 125	℃
Power dissipation *5	Pd	400	mW

*1 : Pin No.3,4,6,8,9 *2 : Pin No.10,11,12,13 *3 : Pin No.20 *4 : Pin No.16,17,18,19
*5 : Reduced by 4mW for each increase in Ta of 1℃ over 25℃

◆Operating conditions (Ta = 0℃ to 70℃)

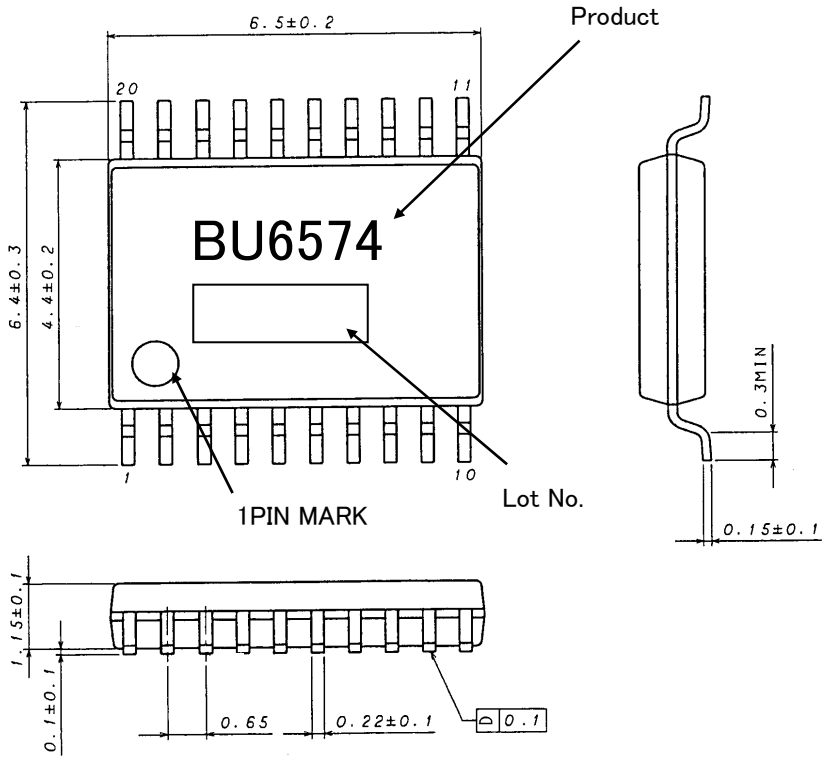
Parameter	Symbol	MIN	TYP	MAX	Unit
Supply voltage 1	V_{AVDD}	3.135	3.3	3.465	V
Supply voltage 2	V_{DVDD}	3.135	3.3	3.465	V
I/O supply voltage	V_{VDDIO}	3.0	3.3	3.6	V

This product is not designed for protection against radioactive rays

◆Electrical characteristics (Unless otherwise noted, VAVDD=VDVDD=VVDDIO = 3.3V, Ta = 25℃)

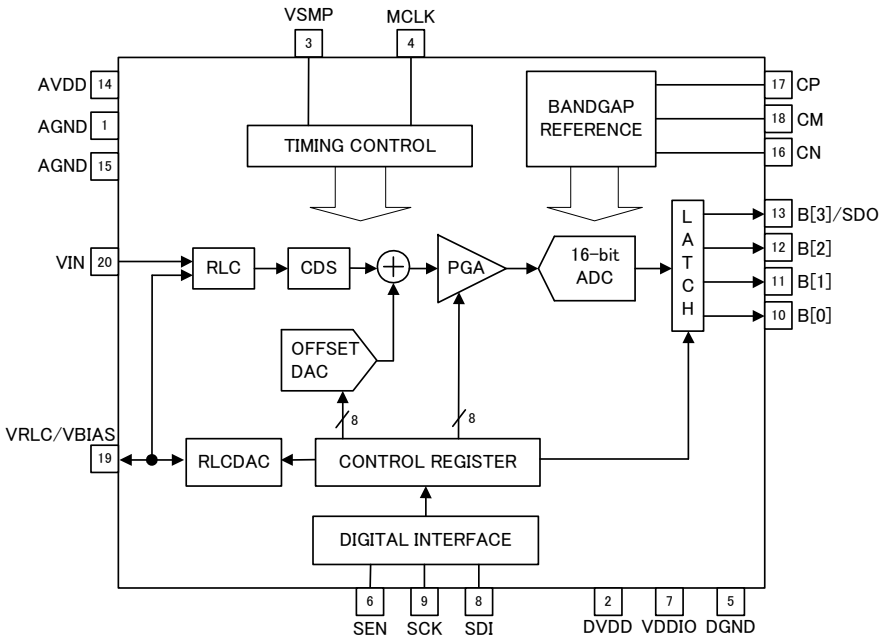
Parameter	Symbol	MIN	TYP	MAX	Unit	Conditions
Overall System Specification						
Input signal limits	V_{IN}	0.26	–	2.7	V	
Conversion Rate	RATE	–	–	6	MSPS	
Digital Inputs						
High level input voltage	V_{IH}	0.7*V_{VDDIO}	–	–	V	
Low level input voltage	V_{IL}	–	–	0.2*V_{VDDIO}	V	
High level input current	I_{IH}	–	–	1	uA	
Low level input current	I_{IL}	–	–	1	uA	
Digital Outputs						
High level output voltage	V_{OH}	V_{VDDIO}−0.5	–	–	V	I_{OH} = 1mA
Low level output voltage	V_{OL}	–	–	0.5	V	I_{OL} = 1mA
Supply Currents						
Total supply current - active	I_{TOTAL}	–	35.7 41.7	70	mA	MCLK = 12MHz MCLK = 24MHz
Total Analog AVDD, Supply current - active	I_{AVDD}	–	32 34	50	mA	MCLK = 12MHz MCLK = 24MHz
Total digital DVDD, Supply current - active	I_{DVDD}	–	1.5 3.0	10	mA	MCLK = 12MHz MCLK = 24MHz
Total digital I/O, Supply current - active	I_{VDDIO}	–	2.2 4.4	10	mA	MCLK = 12MHz MCLK = 24MHz
Supply current – full power down mode	I_{PD}	–	30	60	uA	MCLK=Low

◆Package outline



SSOP-B20 (Unit:mm)

◆Block diagram



◆Pin description

Pin Number	Pin Name
1	AGND
2	DVDD
3	VSMP
4	MCLK
5	DGND
6	SEN
7	VDDIO
8	SDI
9	SCK
10	B[0]
11	B[1]
12	B[2]
13	B[3]/SDO
14	AVDD
15	AGND
16	CN
17	CP
18	CM
19	VRLC/VBIAS
20	VIN

●Cautions on use

(1) Absolute Maximum Ratings

An excess in the absolute maximum ratings, such as supply voltage, temperature range of operating conditions, etc., can break down devices, thus making impossible to identify breaking mode such as a short circuit or an open circuit. If any special mode exceeding the absolute maximum ratings is assumed, consideration should be given to take physical safety measures including the use of fuses, etc.

(2) Power supply and GND line

Design PCB pattern to provide low impedance for the wiring between the power supply and the GND lines. Pay attention to the interference by common impedance of layout pattern when there are plural power supplies and GND lines. Especially, when there are GND pattern for small signal and GND pattern for large current included the external circuits, separate each GND pattern. Furthermore, for all power supply terminals to ICs, mount a capacitor between the power supply and the GND terminal. At the same time, in order to use a capacitor, thoroughly check to be sure the characteristics of the capacitor to be used present no problem including the occurrence of capacity dropout at a low temperature, thus determining the constant.

(3) GND voltage

Make setting of the potential of the GND terminal so that it will be maintained at the minimum in any operating state. Furthermore, check to be sure no terminals are at a potential lower than the GND voltage including an actual electric transient.

(4) Short circuit between terminals and erroneous mounting

In order to mount ICs on a set PCB, pay thorough attention to the direction and offset of the ICs. Erroneous mounting can break down the ICs. Furthermore, if a short circuit occurs due to foreign matters entering between terminals or between the terminal and the power supply or the GND terminal, the ICs can break down.

(5) Operation in strong electromagnetic field

Be noted that using ICs in the strong electromagnetic field can malfunction them.

(6) Input terminals

In terms of the construction of IC, parasitic elements are inevitably formed in relation to potential. The operation of the parasitic element can cause interference with circuit operation, thus resulting in a malfunction and then breakdown of the input terminal. Therefore, pay thorough attention not to handle the input terminals, such as to apply to the input terminals a voltage lower than the GND respectively, so that any parasitic element will operate. Furthermore, do not apply a voltage to the input terminals when no power supply voltage is applied to the IC. In addition, even if the power supply voltage is applied, apply to the input terminals a voltage lower than the power supply voltage or within the guaranteed value of electrical characteristics.

(7) External capacitor

In order to use a ceramic capacitor as the external capacitor, determine the constant with consideration given to a degradation in the nominal capacitance due to DC bias and changes in the capacitance due to temperature, etc.

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