SENTECH

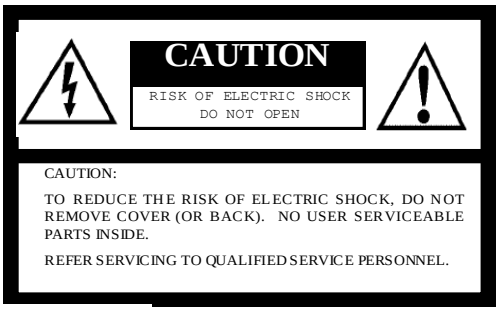
VGA / XGA / SXGA / UXGA CCD
Color / Monochrome

Digital Output Camera Module

STC-B33A	**(VGA, Monochrome)**
STC-BC33A	**(VGA, Color)**
STC-B83A	**(XGA, Monochrome)**
STC-BC83A	**(XGA, Color)**
STC-B152A	**(SXGA, Monochrome)**
STC-BC152A	**(SXGA, Color)**
STC-B202A	**(UXGA, Monochrome)**
STC-BC202A	**(UXGA, Color)**

Product Specifications

Safety Precautions



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A.

Warning:

This equipment generates and uses radio frequency energy and if not installed and used properly, I.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For Canada

Warning:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Product Precautions

- Handle the camera with care. Do not abuse the camera. Avoid striking or shaking it. Improper handling or storage could damage the camera.
- Do not pull or damage the camera cable.
- During camera use, do not wrap he unit in any material. This will cause the internal temperature of the unit to increase.
- Do not expose the camera to moisture, or do not try to operate it in wet areas.
- Do not operate the camera beyond its temperature, humidity and power source ratings.
- While the camera is not being used, keep the lens or lens cap on the camera to prevent dust or contamination from getting in the CCD or filter area and scratching or damaging this area.
- Do not keep the camera under the following conditions:
    - In wet, moist, and high humidity areas
    - Under hot direct sunlight
    - In high temperature areas
    - Near an object that releases a strong magnetic or electric field
    - Areas with strong vibrations
- Use a soft cloth to clean the camera. Use pressured air spray to clean the surface of the glass. DO not scratch the surface of the glass.

Content

I. Specifications

A. Electronic Specifications / Mechanical Specifications / Environmental Specifications

1. STC-BC202A / STC-B202A (2.0 Mega)

Product			STC-BC202A	STC-B202A
Electronic Specifications	Imager		1/1.8" Interline UXGA Color Progressive CCD: ICX274AQ	1/1.8" Interline UXGA Monochrome Progressive CCD: ICX274AL
	Total Picture Elements		1688 (H) x 1248 (V)	
	Active Picture Elements		UXGA: 1620 (H) x 1220 (V)	
	Chip Size		8.5 (H) x 6.8 (V) mm	
	Cell Size		4.4 (H) x 4.4 (V) µm	
	Scanning System		Progressive	
	Scanning Method		Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning	Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning, Binning, Binning Partial Scanning, Binning ½ Partial Scanning, Binning ¼ Partial Scanning, Binning Variable Partial Scanning
	Vertical Frequency (Frame Rate)		15.3164 Hz	
	Horizontal Frequency		19.176 kHz	
	Pixel Frequency		36.8181 MHz	
	S/N Ratio (Standard Deviation)	@ 8bit output	≤ 3 Digit (Gain 0 dB)	
		@ 10bit output	≤ 10 Digit (Gain 0 dB)	
	Minimum Scene Illumination		0.08 Lux at F1.2	0.06 Lux at F1.2
	Sync. System		Internal / External	
	Video Output		Digital 8 or 10 bit parallel low voltage output	
	Tap		1 Tap	
	Shutter Speed		OFF, ¼ to 1/120,000 seconds (Variable at every H and clock)	
	Gain		0 to 27 dB	
	Gamma		1.0	
	Power	Input Voltage	12Vdc ± 10%	
		Consumption	Less than 3.0 W	
	Trigger Mode		Edge Preset Trigger (V-reset, Non-reset) Pulse Width Trigger (V-reset, Non-reset)	
	Communication		RS232 via DF12-36DS-0.5V connector	
Mechanical Specifications	Dimensions		28 (W) x 28 (H) x 33 (D) mm	
	Optical Filter		No IR Cut Filter	
	Optical Center Accuracy		Positional Accuracy in H and V Directions: +/- 0.31 mm Rotational Accuracy of H and V: +/- 2.1 deg.	
	Materials	Case	Aluminum Die Cast (ADC12)	
		Tripod	Polycarbonate ABS	
	Lens Mount		C Mount	
	Interface Connector		DF12-36DS-0.5V (Hirose)	
	Tripod		Tripod can be attached with 4 screws to the bottom plate	
	Weight		Approximately 26g	
Environmental Specifications	Temperature & Humidity	Operational	It depends on 1) how the system is assembled and 2) how heat conditions are managed w/in the system.	
		Storage	Temperature: -30 to 65ºC; Relative Humidity: 0 to 90% (No Condensation)	
	RoHS		RoHS Compliant	

2. STC-BC152A / STC-B152A (1.5 Mega)

Product			STC-BC152A	STC-B152A
Electronic Specifications	Imager		1/2" Interline SXGA Color Progressive CCD: ICX205AK	1/2" Interline SXGA Monochrome Progressive CCD: ICX205AL
	Total Picture Elements		1434 (H) x 1050 (V)	
	Active Picture Elements		SXGA: 1360 (H) x 1040 (V)	
	Chip Size		7.6 (H) x 6.2 (V) mm	
	Cell Size		4.65 (H) x 4.65 (V) µm	
	Scanning System		Progressive	
	Scanning Method		Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning	Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning, Binning, Binning Partial Scanning, Binning ½ Partial Scanning, Binning ¼ Partial Scanning, Binning Variable Partial Scanning
	Vertical Frequency (Frame Rate)		15.28 (15fps) / 19.3 (19fps) Hz	
	Horizontal Frequency		15.998 (15fps) / 20.57 (19fps) kHz	
	Pixel Frequency		28.6363 (15fps) / 36.8181 (19fps) MHz	
	S/N Ratio (Standard Deviation)	@ 8bit output	≤ 3 Digit (Gain 0 dB)	
		@ 10bit output	≤ 10 Digit (Gain 0 dB)	
	Minimum Scene Illumination		0.13 Lux at F1.2	0.11 Lux at F1.2
	Sync. System		Internal / External	
	Video Output		Digital 8 or 10 bit parallel low voltage output	
	Tap		1 Tap	
	Shutter Speed		OFF, 1/3 to 1/93,000 seconds (Variable at every H and clock) (15fps) OFF, 1/5 to 1/120,000 seconds (Variable at every H and clock) (19fps)	
	Gain		0 to 27 dB	
	Gamma		1.0	
	Power	Input Voltage	12Vdc ± 10%	
		Consumption	Less than 2.5 W	
	Trigger Mode		Edge Preset Trigger (V-reset, Non-reset) Pulse Width Trigger (V-reset, Non-reset)	
	Communication		RS232 via DF12-36DS-0.5V connector	
Mechanical Specifications	Dimensions		28 (W) x 28 (H) x 33 (D) mm	
	Optical Filter		No IR Cut Filter	
	Optical Center Accuracy		Positional Accuracy in H and V Directions: +/- 0.31 mm Rotational Accuracy of H and V: +/- 2.1 deg.	
	Materials	Case	Aluminum Die Cast (ADC12)	
		Tripod	Polycarbonate ABS	
	Lens Mount		C Mount	
	Interface Connector		DF12-36DS-0.5V (Hirose)	
	Tripod		Tripod can be attached with 4 screws to the bottom plate	
	Weight		Approximately 26g	
Environmental Specifications	Temperature and Humidity	Operational	It depends on 1) how the system is assembled and 2) how heat conditions are managed w/in the system.	
		Storage	Temperature: -30 to 65ºC; Relative Humidity: 0 to 90% (No Condensation)	
	RoHS		RoHS Compliant	

3. STC-BC83A / STC-B83A (0.8 Mega)

Product			STC-BC83A	STC-B83A
Electronic Specifications	Imager		1/3" Interline XGA Color Progressive CCD: ICX204AK	1/3" Interline XGA Monochrome Progressive CCD: ICX204AL
	Total Picture Elements		1077 (H) x 788 (V)	
	Active Picture Elements		XGA: 1024 (H) x 768 (V)	
	Chip Size		5.8 (H) x 4.92 (V) mm	
	Cell Size		4.65 (H) x 4.65 (V) µm	
	Scanning System		Progressive	
	Scanning Method		Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning	Full Scanning, Partial Full Scanning, ½ Partial Scanning,¼ Partial Scanning, Variable Partial Scanning, Binning, Binning Partial Scanning, Binning ½ Partial Scanning, Binning ¼ Partial Scanning, Binning Variable Partial Scanning
	Vertical Frequency (Frame Rate)		29.59 Hz	
	Horizontal Frequency		23.23 kHz	
	Pixel Frequency		29.5 MHz	
	S/N Ratio (Standard Deviation)	@ 8bit output	≤ 3 Digit (Gain 0 dB)	
		@ 10bit output	≤ 10 Digit (Gain 0 dB)	
	Minimum Scene Illumination		0.14 Lux at F1.2	
	Sync. System		Internal / External	
	Video Output		Digital 8 or 10 bit parallel low voltage output	
	Tap		1 Tap	
	Shutter Speed		OFF, 1/5 to 1/96,000 seconds (Variable at every H and clock)	
	Gain		0 to 27 dB	
	Gamma		1.0	
	Power	Input Voltage	12Vdc ± 10%	
		Consumption	Less than 1.8 W	
	Trigger Mode		Edge Preset Trigger (V-reset, Non-reset) Pulse Width Trigger (V-reset, Non-reset)	
	Communication		RS232 via DF12-36DS-0.5V connector	
Mechanical Specifications	Dimensions		28 (W) x 28 (H) x 33 (D) mm	
	Optical Filter		No IR Cut Filter	
	Optical Center Accuracy		Positional Accuracy in H and V Directions: +/- 0.31 mm Rotational Accuracy of H and V: +/- 2.1 deg.	
	Materials	Case	Aluminum Die Cast (ADC12)	
		Tripod	Polycarbonate ABS	
	Lens Mount		C Mount	
	Interface Connector		DF12-36DS-0.5V (Hirose)	
	Tripod		Tripod can be attached with 4 screws to the bottom plate	
	Weight		Approximately 26g	
Environmental Specifications	Temperature and Humidity	Operational	It depends on 1) how the system is assembled and 2) how heat conditions are managed w/in the system.	
		Storage	Temperature: -30 to 65ºC; Relative Humidity: 0 to 90% (No Condensation)	
	RoHS		RoHS Compliant	

4. STC-BC33A / STC-B33A (0.3 Mega)

Product			STC-BC33A	STC-B33A
Electronic Specifications	Imager		1/3" Interline VGA Color Progressive CCD: ICX424AQ	1/3" Interline VGA Monochrome Progressive CCD: ICX424AL
	Total Picture Elements		692 (H) x 504 (V)	
	Active Picture Elements		VGA: 648 (H) x 494 (V)	
	Chip Size		5.79 (H) x 4.89 (V) mm	
	Cell Size		7.4 (H) x 7.4 (V) µm	
	Scanning System		Progressive	
	Scanning Method		Full Scanning, Partial Full Scanning, ½ Partial Scanning, ¼ Partial Scanning, Variable Partial Scanning	Full Scanning, Partial Full Scanning, ½ Partial Scanning,¼ Partial Scanning, Variable Partial Scanning, Binning, Binning Partial Scanning, Binning ½ Partial Scanning, Binning ¼ Partial Scanning, Binning Variable Partial Scanning
	Vertical Frequency (Frame Rate)		31.47 (30fps) / 62.94 (60fps) / 94.784 (90fps) Hz	
	Horizontal Frequency		15.7343 (30fps) / 31.4685 (60fps) / 47.2028 (90fps) kHz	
	Pixel Frequency		12.2727 (30fps) / 24.5454 (60fps) / 36.8181 (90fps) MHz	
	S/N Ratio (Standard Deviation)	@ 8bit output	≤ 3 Digit (Gain 0 dB)	
		@ 10bit output	≤ 10 Digit (Gain 0 dB)	
	Minimum Scene Illumination		0.13 Lux at F1.2	0.12 Lux at F1.2
	Sync. System		Internal / External	
	Video Output		Digital 8 or 10 bit parallel low voltage output	
	Tap		1 Tap	
	Shutter Speed		OFF, 1/3 to 1/40,000 seconds (Variable at every H and clock) (30fps) OFF, 1/7 to 1/80,000 seconds (Variable at every H and clock) (60fps) OFF, 1/11 to 1/120,000 seconds (Variable at every H and clock) (90fps)	
	Gain		0 to 27 dB	
	Gamma		1.0	
	Power	Input Voltage	12Vdc ± 10%	
		Consumption	Less than 1.8 W	
	Trigger Mode		Edge Preset Trigger (V-reset, Non-reset) Pulse Width Trigger (V-reset, Non-reset)	
	Communication		RS232 via DF12-36DS-0.5V connector	
Mechanical Specifications	Dimensions		28 (W) x 28 (H) x 33 (D) mm	
	Optical Filter		No IR Cut Filter	
	Optical Center Accuracy		Positional Accuracy in H and V Directions: +/- 0.31 mm Rotational Accuracy of H and V: +/- 2.1 deg.	
	Materials	Case	Aluminum Die Cast (ADC12)	
		Tripod	Polycarbonate ABS	
	Lens Mount		C Mount	
	Interface Connector		DF12-36DS-0.5V (Hirose)	
	Tripod		Tripod can be attached with 4 screws to the bottom plate	
	Weight		Approximately 26g	
Environmental Specifications	Temperature & Humidity	Operational	It depends on 1) the assembly of the system and 2) how that system manages heat conditions	
		Storage	Temperature: -30 to 65ºC; Relative Humidity: 0 to 90% (No Condensation)	
	RoHS		RoHS Compliant	

B. Connector Specifications

The connector on the Camera: DF12-36DS-0.5V (Hirose)

1. Pin Assignment

No.	Signal	I/O	Voltage
1	+12V	In	DC12V
2	+12V	In	DC12V
3	N.C.		
4	GND		
5	SP1	I/O	3.3V TTL
6	SP2	I/O	3.3V TTL
7	SP3	I/O	3.3V TTL
8	SP4	I/O	3.3V TTL
9	TXD	Out	3.3V TTL
10	RXD	In	3.3V TTL
11	GND		
12	DATA0	Out	3.3V TTL
13	DATA1	Out	3.3V TTL
14	DATA2	Out	3.3V TTL
15	DATA3	Out	3.3V TTL
16	DATA4	Out	3.3V TTL
17	DATA5	Out	3.3V TTL
18	DATA6	Out	3.3V TTL

No.	Signal	I/O	Voltage
19	DATA7	Out	3.3V TTL
20	DATA8	Out	3.3V TTL
21	DATA9	Out	3.3V TTL
22	IO0	I/O	3.3V TTL
23	SPARE	Out	3.3V TTL
24	LVAL	Out	3.3V TTL
25	FVAL	Out	3.3V TTL
26	DVAL	Out	3.3V TTL
27	TXCLK	Out	3.3V TTL
28	GND		
29	CC1 (TRG)	In	3.3V TTL
30	CC2 (HD)	In	3.3V TTL
31	CC3 (VD)	In	3.3V TTL
32	CC4	In	3.3V TTL
33	+3.3V	Out	DC3.3V
34	+3.3V	Out	DC3.3V
35	GND		
36	GND		

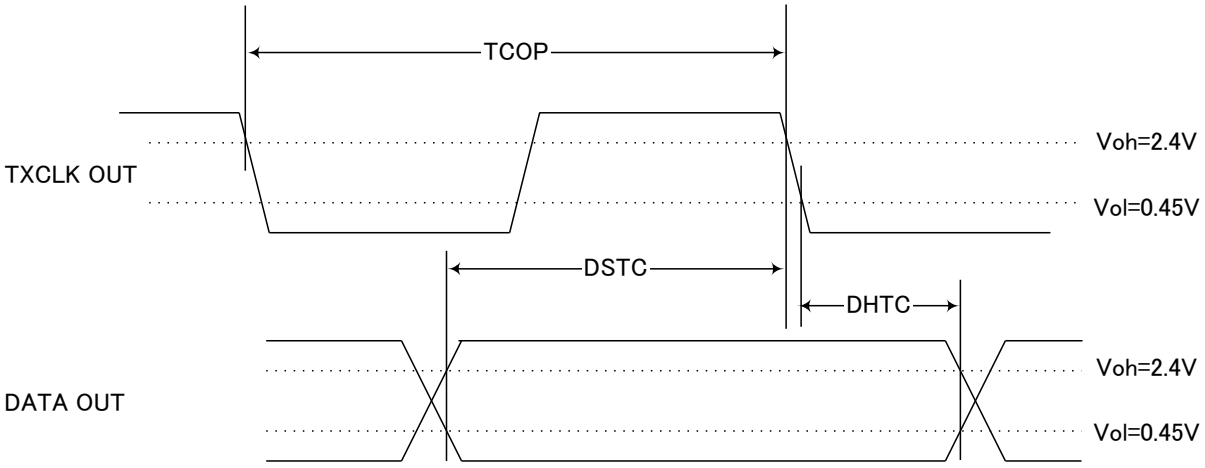
Note. 1: Please make the power for the board or system connected to this connector.

Note. 2: Please use less than 100 mA power consumption with +3.3V output from pin No. 33 and 34, when +3.3V output has to be used in the board or the system.
The main FPGA of the camera also uses this +3.3V power. The camera will not work correctly if the power consumption of +3.3V is over 100 mA.

C. The Digital Data Output Timing Chart

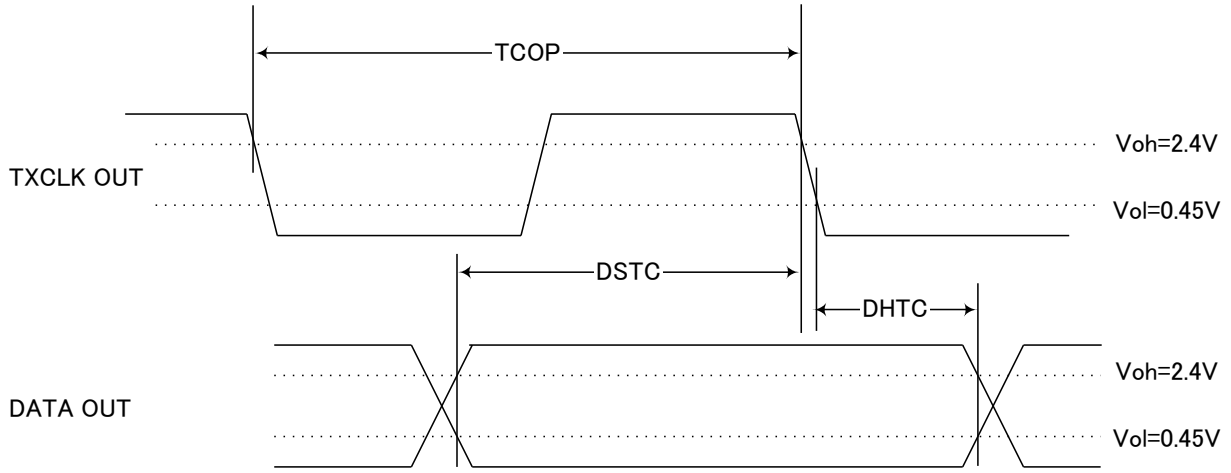
Please use the falling edge of the TXCLK clock to take the data.

1. STC-B33A / STC-BC33A



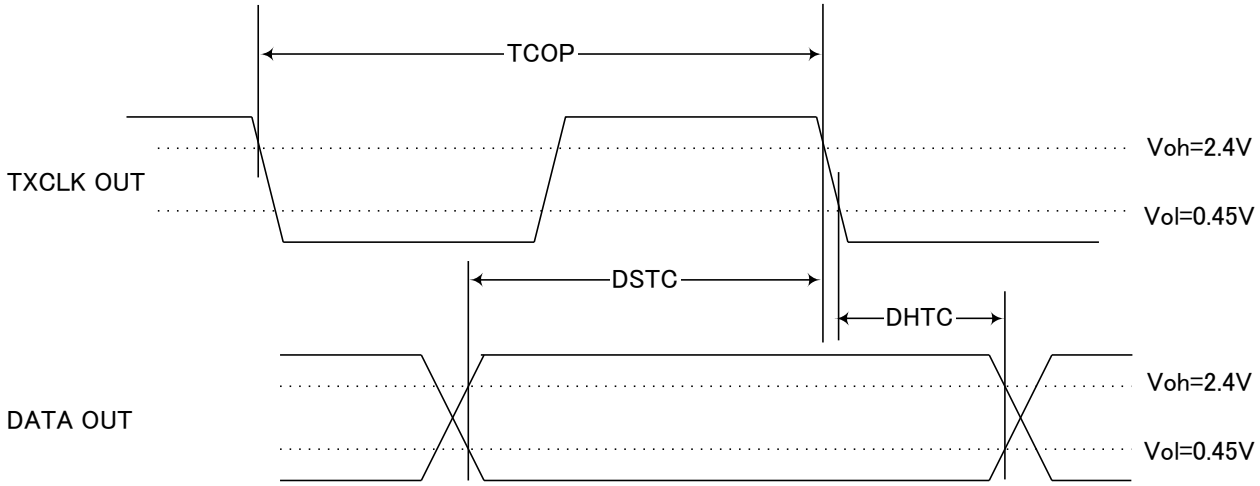
Symbol	Description	Frame Rate	TXCLK Speed	Min.	Typ.	Max.
		(fps)	(MHz)	(nseconds)		
DSTC	Data setup to TXCLK	90	36.8181	7.1		
		60	24.5454	13.9		
		30	12.2727	34.2		
DHTC	Data hold to TXCLK out	90	36.8181	13.6		
		60	24.5454	20.4		
		30	12.2727	40.7		
TCOP	TXCLK out period	90	36.8181		27.2	
		60	24.5454		40.7	
		30	12.2727		81.5	

2. STC-B83A / STC-BC83A



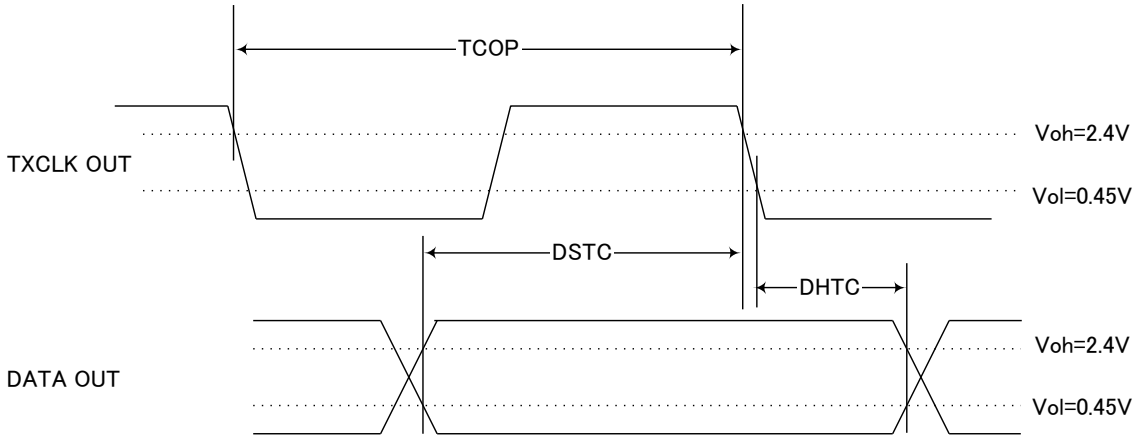
Symbol	Description	Frame Rate	TXCLK Speed	Min.	Typ.	Max.
		(fps)	(MHz)	(nseconds)		
DSTC	Data setup to TXCLK	30	29.5	8.8		
DHTC	Data hold to TXCLK out	30	29.5	17.0		
TCOP	TXCLK out period	30	29.5		33.9	

3. STC-B152A / STC-BC152A



Symbol	Description	Frame Rate	TXCLK Speed	Min.	Typ.	Max.
		(fps)	(MHz)	(nseconds)		
DSTC	Data setup to TXCLK	19	36.8181	7.1		
		15	28.6363	11.0		
DHTC	Data hold to TXCLK out	19	36.8181	13.6		
		15	28.6363	17.5		
TCOP	TXCLK out period	19	36.8181		27.2	
		15	28.6363		35.0	

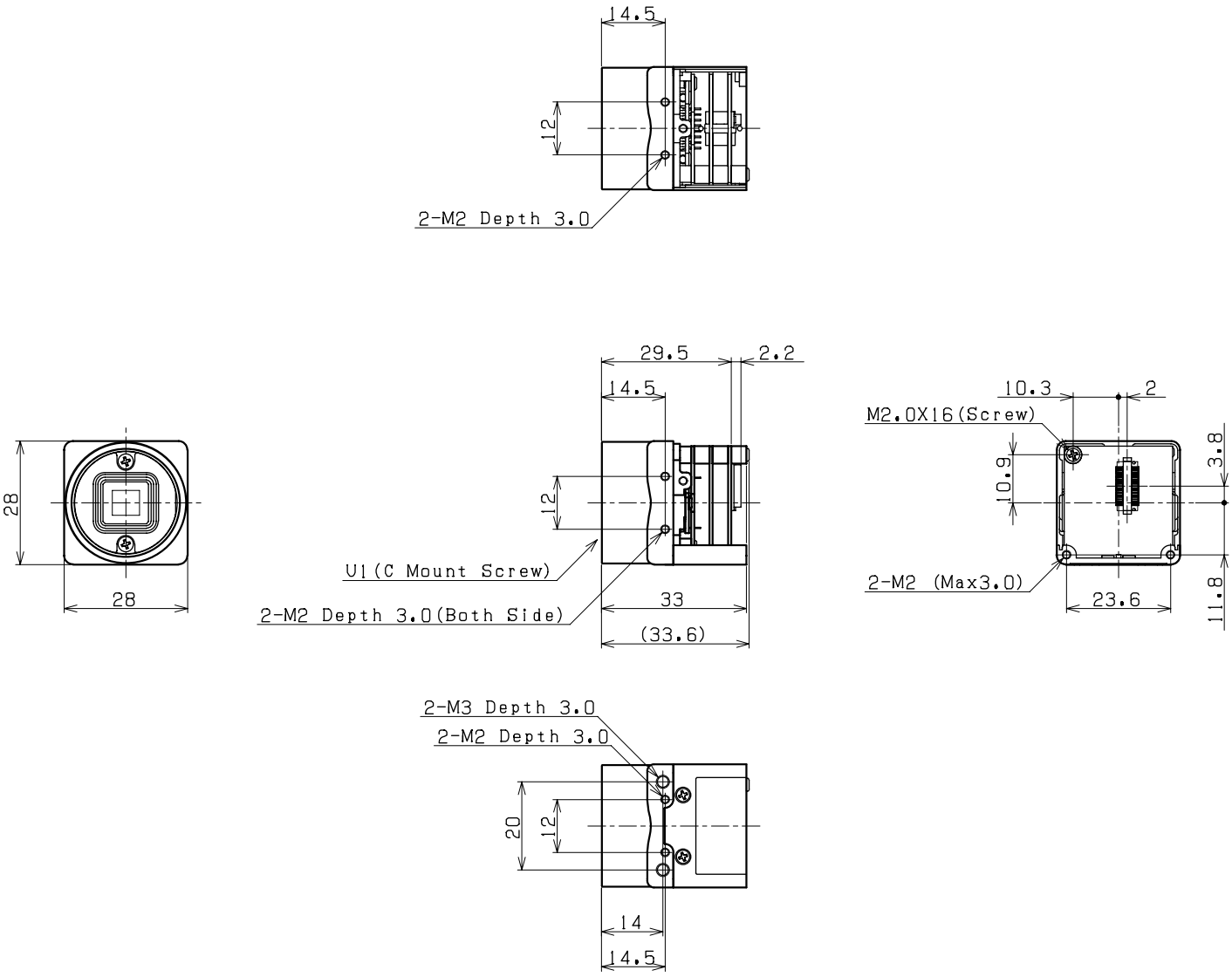
4. STC-B202A / STC-BC202A



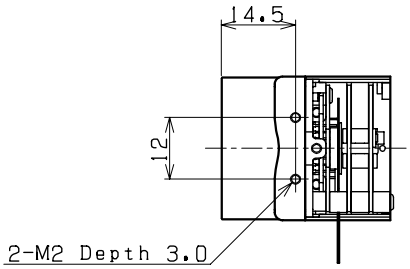
Symbol	Description	Frame Rate	TXCLK Speed	Min.	Typ.	Max.
		(fps)	(MHz)	(nseconds)		
DSTC	Data setup to TXCLK	15	36.8181	7.1		
DHTC	Data hold to TXCLK out	15	36.8181	13.6		
TCOP	TXCLK out period	15	36.8181		27.2	

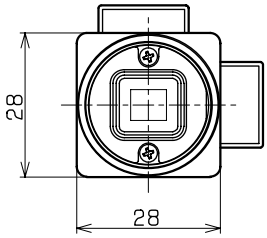
III. Dimensions

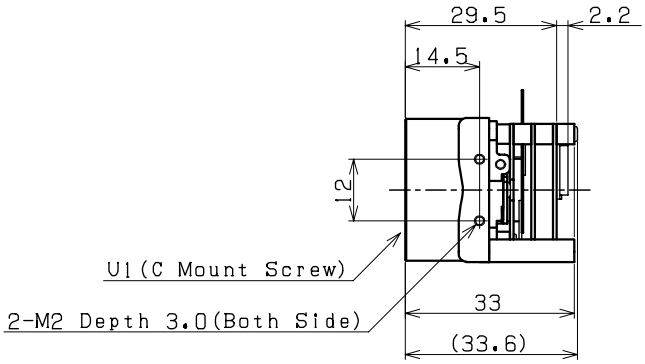
A. STC-B33A, STC-BC33A, STC-B83A, STC-BC83A

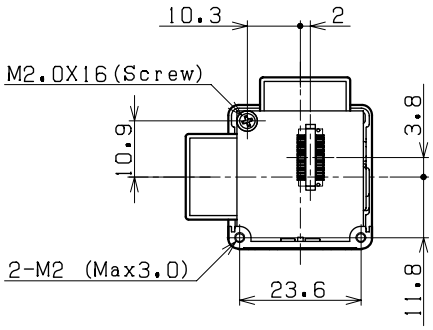


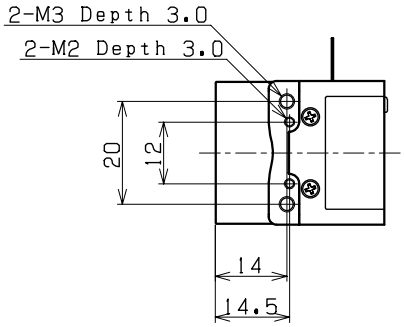
B. STC-B152A, STC-BC152A, STC-B202A, STC-BC202A











Revisions

Rev	Date	Changes	Notes
1.0	2009/03/26	New document	
	2009/04/01	Edited English	
	2009/06/02	Video Output was corrected	
1.1	2009/07/04	Update: Changed the minimum scene illumination	
1.2	2009/08/24	Update: Changed the dimensions (pg 1, 2, 3, 4) Changed the S/N ratio (pg 1, 2, 3, 4) Changed the spec drawings (pg 9, 10)	
1.3	2010/01/13	Update Add notes for the connector specifications (pg 9) Delete the effective picture elements (Pg 5, 6, 7, 8)	
	2010/06/14	Update Changed the Video Output as follows: "*Digital 8 or 10 bit Camera Link (Base Configuration)*" → Digital 8 or 10 bit parallel low voltage output	

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