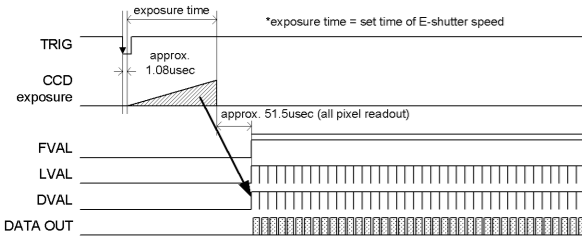


(5) Random trigger shutter **Address: 0x91, Bit: 0, Value: 1**
In the random trigger shutter mode, you can shoot and grab an image at an arbitrary timing by trigger signal input from the external.

- External trigger signals can be input from the camera link I/F CC1.
- If polarity is set to negative polarity, exposure starts at the falling edge of the trigger. **Address: 0x93, Bit: 0, Value: 0 is Negative Polarity, Value: 1 is Positive Polarity**
- The random trigger shutter of this camera can be operated in two types of mode: fixed mode and pulse width mode. How to determine the exposure time differs depending on the mode.

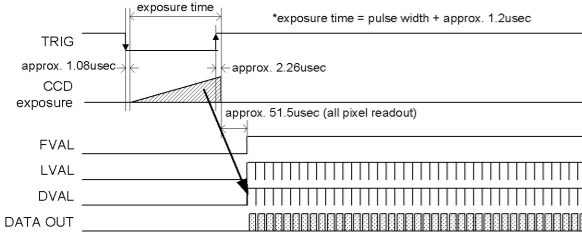
(5-1) Fixed mode **Address: 0x92, Bit: 0, Value: 0**

The exposure time is determined by the setting value for the shutter speed.



(5-2) Pulse width mode **Address: 0x92, Bit: 0, Value: 1**

The exposure time is determined by the pulse width.

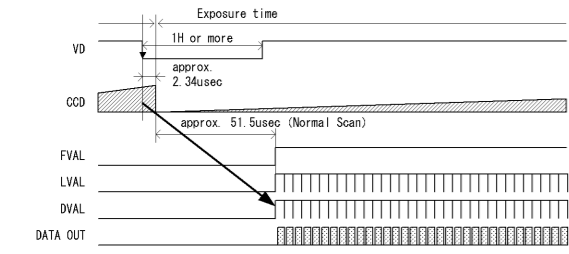


(6) Restart Reset **Address: 0x91, Bit: 0 to 1, Value: 2**

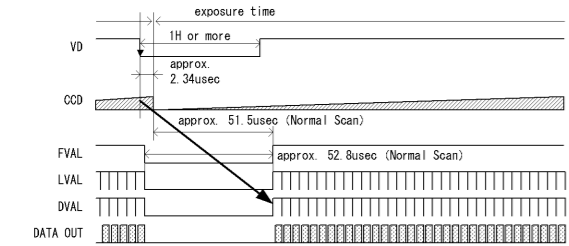
The restart / reset function is available with the ext. VD signal. You can get an arbitrary slower shutter speed than normal shutter and random trigger shutter.

- External VD signals can be input from the camera link I/F CC1.
- If polarity is set to negative polarity, exposure starts at the falling edge of the trigger. **Address: 0x93, Bit: 0, Value: 0 is Negative Polarity, Value: 1 is Positive Polarity**
- The shutter speed (exposure time) is determined by ext. VD signal interval.

When VD is input the camera during the low period FVAL.



When VD is input the camera during the high period FVAL.



(7) Output bit **Address: 0x87, Bit: 0 to 3, Value: 8 or 10**

You can set gray scale per pixel. Value:8 is 8bit, Value:10 is 10bit

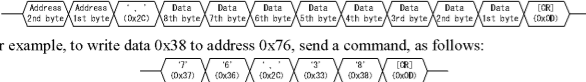
7-2. Command Communication Protocol

The command communication protocol is the telc standard method (method in which parameters are set in the registers in the camera).

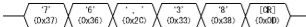
In command send/receive operation, hexadecimal address and data are converted to ASCII data. All ASCII alphabetic characters used are uppercase characters.

(1) Writing to the register

To write data in a register, send a command, as follows. (Address' max-length is 2 bytes, and Data's max-length is 8 bytes)



For example, to write data 0x38 to address 0x76, send a command, as follows:

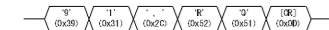


The camera responds to the write command with No Error (ACK) or Error (NAK), as follows:

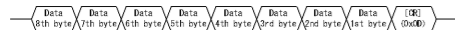


(2) Reading the register

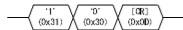
To read data from a register, send ', (comma)', 'R', 'Q' and [CR] code following the address. For example, to read data in address 0x91, send a command, as follows:



The camera responds to the read request, as follows (Data's max-length is 8 bytes):



Actually, the camera responds to the read request as minimum data length: For example, to read data 0x10 to address 0x91, the camera responds as follows:



7-2. Error Status

If NAK is returned to the sent command, you can obtain detailed information on the error by accessing the status register (Address:0x69) and the expansion status register (Address:0x6A).

Table with columns: Error type, Status [0x69], Expansion Status [0x6A], Contents of error, Expansion Status [0x6A], Contents of error. Rows include No error, Protocol, Register, Memory bank, Digital process, Scan mode, Shutter mode, and Partial Scan.

8. SPECIFICATIONS

- [Basic specification] (1) Image sensor, (2) Total pixels, (3) Active pixel, (4) Video output pixels, (5) Scanning area, (6) Unit cell size, (7) Scan method, (8) Synchronization method, (9) Aspect ratio, (10) Video Output, (11) Data, (12) Readout mode, (13) Sensitivity, (14) Minimum subject illuminance, (15) Gain, (16) Setup Level, (17) Gamma correction, (18) Power supply voltage, (19) Power consumption.

[Electrical shutter specification]

- (1) Shutter Speed, (2) Random Trigger Shutter, (3) Restart-Reset. Includes details on exposure time and switching.

[Internal sync signal specification]

- (1) Driving frequency, (2) Horizontal sync frequency, (3) Vertical sync frequency. Includes frequency values and maximum frequency on all pixel readout mode.

[Input signal specification]

- (1) TRIG/VD. Includes Camera Link interface input, polarity, and pulse width.

[Notes of trigger mode or Restart Reset mode.]

When the trigger signal (TRIG/VD) is noisy, there is a possibility of causing the malfunction. In this case, please input a proper trigger signal (TRIG/VD).

[Mechanical spec]

- (1) Lens mount, (2) Flange back, (3) Dimensions, (4) Mass, (5) Camera body grounding. Includes details on C-mount, dimensions, mass, and grounding.

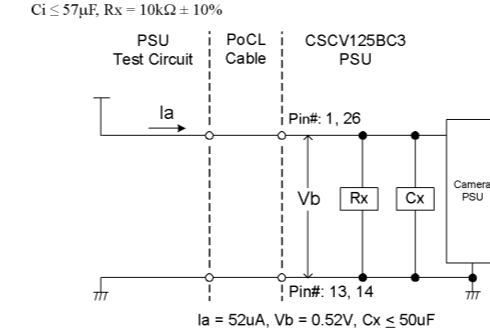
[Operating ambient conditions]

- (1) Performance assurance, (2) Operation guaranteed, (3) Storage, (4) EMC conditions (Electro-Magnetic Compatibility), (5) FCC. Includes temperature, humidity, and EMC/EMI specifications.

[Communication specification]

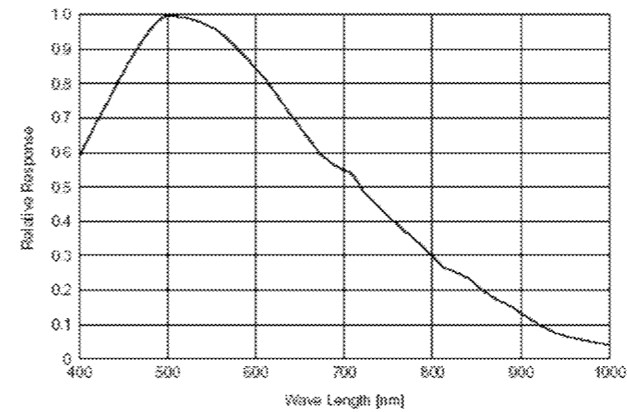
- (1) Communication speed, (2) Start bit, (3) Data bit, (4) Parity, (5) Stop bit, (6) Handshake. Includes 9600 bps, 1 start bit, 8 data bits, and 1 stop bit.

[Camera PSU input impedance]



[Typical Spectral Response]

*The lens characteristics and light source characteristics are not reflected in table.



9. BEFORE DETERMINING IT AS BEING A FAULT

If any trouble occurs in use, check the following first. If the trouble persists, contact your distributor or our sales representatives.

Table with 2 columns: Phenomena, Check item. Includes troubleshooting steps for power, shooting image, frame drop, and camera control.

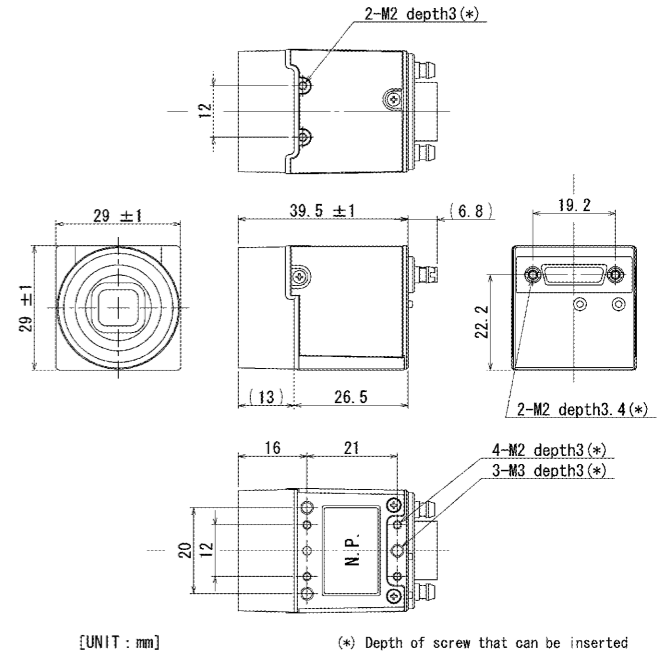
10. Guarantee

The term of guarantee is one year after the product delivery. If by any chance trouble by responsibility of our company occurs before an above period, TELI repairs it free of charge. During terms of a guarantee, when the trouble cause is the case of below, TELI charges the repair costs.

11. Repair

(1) Condition for repair: Basically, has to return it to our company when the user requests us to repair product. (2) The period of repairing product: Repair free of charge. (3) Charged repair: Refer to Clause 10.

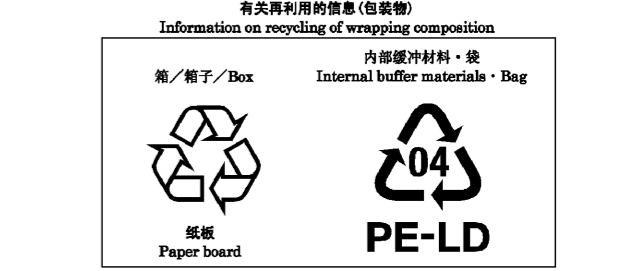
12. EXTERNAL VIEW DRAWING



[UNIT : mm] (*) Depth of screw that can be inserted

Environmental compliance information including a 10-year environmental use period, a warning symbol, and text in Chinese and English regarding hazardous substances and recycling.

Table with columns for hazardous substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers) and their presence in camera body parts.



TOSHIBA TELI CORPORATION

Head Office: 7-1, 4 chome, Asahigaoka, Hino-shi, Tokyo, 191-0065, Japan. Phone: +81-42-589-8771. URL: http://www.toshiba-teli.co.jp

