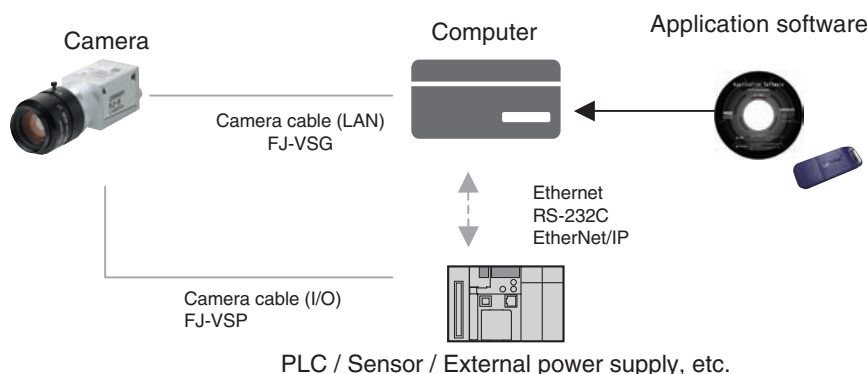


Camera & Software Vision Package

- Built-in high-quality image processing in a PC system
- Resolving a variety of applications with highly robust and advanced measurement algorithm
- Gigabit Ethernet camera that can be readily connected to the FJ application software (the connectivity tested and verified)
- Building an ideal machine vision using a customized sample in no time



System Configuration



Ordering Information

| Type | | | | Model | Operating environment |
|--|------------|--|------------|---------------------|---|
| Camera & Software Vision Package | | 300,000 pixels | Monochrome | FJ-SG-S | <ul style="list-style-type: none"> • CPU: Intel Pentium Processor (SSE2 or higher) • OS: Windows 7 Professional (32/64bit) or Enterprise (32/64bit) or Ultimate (32/64bit), Windows 8 Pro (32/64bit) or Enterprise (32/64bit), Windows 8.1 Pro (32/64bit) or Enterprise (32/64bit) • .NET Framework: .NET Framework 3.5 or higher • Memory: At least 2 GB RAM • Available disk space: At least 2 GB • Camera interface: Ethernet 1000BASE-T • Display: XGA (1024 × 768), True Color (32-bit) or higher • Optical drive: CD/DVD drive |
| | | 300,000 pixels | Color | FJ-SCG-S | |
| | | 2 million pixels | Monochrome | FJ-S2MG-S | |
| | | 2 million pixels | Color | FJ-SC2MG-S | |
| | | 5 million pixels | Monochrome | FJ-S5MG-S | |
| | | 5 million pixels | Color | FJ-SC5MG-S | |
| Camera (Single unit) | | 300,000 pixels | Monochrome | FJ-SG | — |
| | | 300,000 pixels | Color | FJ-SCG | |
| | | 2 million pixels | Monochrome | FJ-S2MG | |
| | | 2 million pixels | Color | FJ-SC2MG | |
| | | 5 million pixels | Monochrome | FJ-S5MG | |
| | | 5 million pixels | Color | FJ-SC5MG | |
| Camera cable (LAN) | | Cable length: 3 m, 5 m, 10 m, 20 m, 40 m | | FJ-VSG □M *2 | |
| Camera cable (Power, I/O) | | Cable length: 3 m, 5 m, 10 m *1 | | FJ-VSP □M *2 | |
| Development environment Application Producer | Media only | CD-ROM | | FH-AP1 | <ul style="list-style-type: none"> • CPU: Intel Pentium Processor (SSE2 or higher) • OS: Windows 7 Professional (32/64bit) or Enterprise (32/64bit) or Ultimate (32/64bit), Windows 8 Pro (32/64bit) or Enterprise (32/64bit), Windows 8.1 Pro (32/64bit) or Enterprise (32/64bit) • .NET Framework: .NET Framework 3.5 or higher • Memory: At least 2 GB RAM • Available disk space: At least 2 GB • Browser: Microsoft® Internet Explorer 6.0 or later • Display: XGA (1024 × 768), True Color (32-bit) or higher • Optical drive: CD/DVD drive • The following operating environment is required to use the camera FJ-S□□□G. • Camera interface: Ethernet 1000BASE-T • The following software is required to customize the software: <ul style="list-style-type: none"> Microsoft® Visual Studio® 2010 Professional, or Microsoft® Visual Studio® 2008 Professional, or Microsoft® Visual Studio® 2012 Professional |
| | 1 license | — | | FH-AP1L | |

*1. 10-m cable can be used with 300,000-pixel cameras FJ-SCG/SG and 2-million pixel cameras FJ-SC2MG/S2MG.

*2. The boxes in the model numbers are replaced by the cable length: 3 m = 3, 5 m = 5, 10 m = 10, 20 m = 20 and 40 m = 40

Lenses

High-resolution, Low-distortion Lenses

| Model | 3Z4S-LE SV-0614H | 3Z4S-LE SV-0814H | 3Z4S-LE SV-1214H | 3Z4S-LE SV-1614H | 3Z4S-LE SV-2514H | 3Z4S-LE SV-3514H | 3Z4S-LE SV-5014H | 3Z4S-LE SV-7525H | 3Z4S-LE SV-10028H |
|-----------------------------------|---|---|---|---|---|--|---|---|---|
| Appearance/ Dimensions (mm) |  |  |  |  |  |  |  |  |  |
| Focal length | 6mm | 8mm | 12mm | 16mm | 25mm | 35mm | 50mm | 75mm | 100mm |
| Brightness | F1.4 | F1.4 | F1.4 | F1.4 | F1.4 | F1.4 | F1.4 | F2.5 | F2.8 |
| Filter size | M40.5 P0.5 | M35.5 P0.5 | M27 P0.5 | M27 P0.5 | M27 P0.5 | M35.5 P0.5 | M40.5 P0.5 | M34.0 P0.5 | M37.5 P0.5 |

CCTV Lenses

| Model | 3Z4S-LE SV-03514V | 3Z4S-LE SV-04514V | 3Z4S-LE SV-0614V | 3Z4S-LE SV-0813V | 3Z4S-LE SV-1214V | 3Z4S-LE SV-1614V | 3Z4S-LE SV-2514V | 3Z4S-LE SV-3518V | 3Z4S-LE SV-5018V | 3Z4S-LE SV-7527V | 3Z4S-LE SV-10035V |
|-----------------------------------|---|---|---|---|---|--|---|---|---|---|---|
| Appearance/ Dimensions (mm) |  |  |  |  |  |  |  |  |  |  | |
| Focal length | 3.5mm | 4.5mm | 6mm | 8mm | 12mm | 16mm | 25mm | 35mm | 50mm | 75mm | 100mm |
| Brightness | F1.4 | F1.4 | F1.4 | F1.3 | F1.4 | F1.4 | F1.4 | F1.8 | F1.8 | F2.7 | F3.5 |
| Filter size | — | — | M27 P0.5 | M25.5 P0.5 | M27 P0.5 | M27 P0.5 | M27 P0.5 | M27 P0.5 | M30.5 P0.5 | M30.5 P0.5 | M30.5 P0.5 |

Extension Tubes

| Model | 3Z4S-LE SV-EXR |
|----------|---|
| Contents | Set of 7 tubes(40 mm, 20 mm, 10 mm, 5 mm, 2.0 mm, 1.0 mm, and 0.5 mm) Maximum outer diameter: 30 mm dia. |

- Do not use the 0.5-mm, 1.0-mm, and 2.0-mm Extension Tubes attached to each other. Since these Extension Tubes are placed over the threaded section of the Lens or other Extension Tube, the connection may loosen when more than one 0.5-mm, 1.0-mm or 2.0-mm Extension Tube are used together.
- Reinforcement is required to protect against vibration when Extension Tubes exceeding 30 mm are used.

Ratings and Performance

| | | FJ-SCG/SG | FJ-SC2MG/S2MG | FJ-SC5MG/S5MG |
|--|------|--|---------------------------------------|---------------------------------------|
| Imaging element | | Progressive scan 1/3-inch CCD | Progressive scan 1/1.8-inch CCD | Progressive scan 2/3-inch CCD |
| Effective pixels | | 656 (H) × 492 (V): Color | 1616 (H) × 1234 (V): Color | 2448 (H) × 2056 (V): Color |
| | | 656 (H) × 494 (V): Monochrome | 1616 (H) × 1236 (V): Monochrome | 2448 (H) × 2058 (V): Monochrome |
| Pixel size | | 7.4 (μm) × 7.4 (μm) | 4.4 (μm) × 4.4 (μm) | 3.45 (μm) × 3.45 (μm) |
| Synchronous system | | Internal synchronous | | |
| Frame rate | | 90fps | 20fps | 17fps |
| Number of uptake lines | | Min 2 line to Effective pixels (V) (2 lines interval) | | |
| Gain | | 0dB to +25dB | 0dB to +18dB | 0dB to +14dB |
| Shutter speed | | 17 μs to 1 s | 25 μs to 1 s | 29 μs to 10 s |
| Video output | | Digital 8 bit | | |
| Trigger input | | External trigger / Software trigger (Ethernet) | | |
| External output | | Strobe trigger / Trigger READY | | |
| I/F | | Gigabit Ethernet (1 Gbit/s) | | |
| Lens mount | | C mount | | |
| Power voltage | | PoE/12VDC±10% | | 11.3 to 13.2VDC |
| Pick-up voltage when camera cable FJ-VSP is used | 3 m | 11.3 to 13.2VDC | | 11.8 to 13.8VDC |
| | 5 m | | | |
| | 10 m | | | Cannot be used. |
| Power consumption | | PoE supply: 3.6 W | PoE supply: 3.8 W | Power and I/O connector supply: 6.4 W |
| | | Power and I/O connector supply: 3.1 W | Power and I/O connector supply: 3.2 W | |
| Vibration resistance | | 10 to 150 Hz, Half amplitude 0.35 mm (Acceleration: Max. 50 m/s²), 3 directions (X/Y/Z) 8 minutes each, 10 times | | |
| Impact resistance | | 150 m/s², 6 directions (Up and Down, Right and Left, Back and Forth) 3 times each | | |
| Ambient temperature | | In operation: 0 to 40°C (Chassis surface temperature should be 55°C or lower.) | | |
| | | In storage: -25 to +65°C (no freezing or condensation) | | |
| Ambient humidity | | In operation and storage: 35 to 85% RH each (no condensation) | | |
| Ambient environment | | No corrosive gas | | |
| Protective structure | | IEC60529 standard IP30 | | |
| Weight | | Approx. 90 g | | Approx. 220 g |

Processing Items

| Group | Icon | Processing Item | |
|-------------|------|-----------------------------|---|
| Measurement | | Search | Used to identify the shapes and calculate the position of measurement objects. |
| | | Flexible Search | Recognizing the shapes of workpieces with variation and detecting their positions. |
| | | Sensitive Search | Search a small difference by dividing the search model in detail, and calculating the correlation. |
| | | ECM Search | Used to search the similar part of model from input image. Detect the evaluation value and position. |
| | | EC Circle Search | Extract circles using "round" shape information and get position, radius and quantity in high preciseness. |
| | | Shape Search II | Used to search the similar part of model from input image regardless of environmental changes. Detect the evaluation value and position. |
| | | Shape Search III | Robust detection of positions is possible at high-speed and with high precision incorporating environmental fluctuations, such as differences in individual shapes of the workpieces, pose fluctuations, noise superimposition and shielding. |
| | | EC Corner | This processing item measures a corner position (corner) of a workpiece. |
| | | EC Cross | The center position of a crosshair shape is measured using the lines created by the edge information on each side of the crosshair. |
| | | Classification | Used when various kinds of products on the assembly line need to be sorted and identified. |
| | | Edge Position | Measure position of measurement objects according to the color change in measurement area. |
| | | Edge Pitch | Detect edges by color change in measurement area. Used for calculating number of pins of IC and connectors. |
| | | Scan Edge Position | Measure peak/bottom edge position of workpieces according to the color change in separated measurement area. |
| | | Scan Edge Width | Measure max/min/average width of workpieces according to the color change in separated measurement area. |
| | | Circular Scan Edge Position | Measure center axis, diameter and radius of circular workpieces. |
| | | Circular Scan Edge Width | Measure center axis, width and thickness of ring workpieces. |
| | | Intersection | Calculate approximate lines from the edge information on two sides of a square workpiece to measure the angle formed at the intersection of the two lines. |
| | | Color Data | Used for detecting presence and mixed varieties of products by using color average and deviation. |
| | | Gravity and Area | Used to measure area, center of gravity of workpieces by extracting the color to be measured. |
| | | Labeling | Used to measure number, area and gravity of workpieces by extracting registered color. |
| | | Label Data | Selecting one region of extracted Labeling, and get that measurement. Area and Gravity position can be got and judged. |
| | | Defect | Used for appearance measurement of plain-color measurement objects such as defects, stains and burrs. |
| | | Precise Defect | Check the defect on the object. Parameters for extraction defect can be set precisely. |
| | | Fine Matching | Difference can be detected by overlapping and comparing (matching) registered fine images with input images. |
| | | Character Inspect | Recognize character according correlation search with model image registered in [Model Dictionary]. |
| | | Date Verification | Reading character string is verified with internal date. |
| | | Model Dictionary | Register character pattern as dictionary. The pattern is used in [Character Inspection]. |
| | | 2DCode *2 | Recognize 2D code and display where the code quality is poor. |
| | | Barcode *1 | Recognize barcode, verify and output decoded characters. |
| | | OCR | Recognize and read characters in images as character information. |
| | | OCR User Dictionary | Register dictionary data to use for OCR. |
| | | Circle Angle | Used for calculating angle of inclination of circular measurement objects. |
| | | Glue Bead Inspection | You can inspect coating of a specified color for gaps or runoffs along the coating path. |
| Input Image | | Camera image input GigE | Capture images from a GigE camera. |
| | | Camera Image Input HDR | Create high-dynamic range images by acquiring several images with different conditions. |
| | | Camera Switch | To switch the cameras used for measurement. Not input images from cameras again. |
| | | Measurement Image Switching | To switch the images used for measurement. Not input images from camera again. |

| Group | Icon | Processing Item | |
|---------------------|------|---------------------------|---|
| Compensate image | | Position Compensation | Used when positions are differed. Correct measurement is performed by correcting position of input images. |
| | | Filtering | Used for processing images input from cameras in order to make them easier to be measured. |
| | | Background Suppression | To enhance contrast of images by extracting color in specified brightness. |
| | | Brightness Correct Filter | Track brightness change of entire screen and remove gradual brightness change such as uneven brightness. |
| | | Color Gray Filter | Color image is converted into monochrome images to emphasize specific color. |
| | | Extract Color Filter | Convert color image to color extracted image or binary image. |
| | | Anti Color Shading | To remove the irregular color/pattern by uniformizing max.2 specified colors. |
| | | Stripes Removal Filter II | Remove the background pattern of vertical, horizontal and diagonal stripes. |
| | | Polar Transformation | Rectify the image by polar transformation. Useful for OCR or pattern inspection printed on circle. |
| | | Trapezoidal Correction | Rectify the trapezoidal deformed image. |
| | | Machine Simulator | How the alignment marks would move on the image when each stage or robot axis is controlled can be checked. |
| | | Image Subtraction | The registered model image and measurement image are compared and only the different pixels are extracted and converted to an image. |
| Support measurement | | Advanced filter | Process the images acquired from cameras in order to make them easier to measure. This processing item consolidates existing image conversion filtering into one processing item and adds extra functions. |
| | | Panorama | Combine multiple image to create one big image. |
| | | Unit Macro | Advanced arithmetic processing can be easily incorporated into workflow as Unit Macro processing items. |
| | | Unit Calculation Macro | This function is convenient when the user wants to calculate a value using an original calculation formula or change the set value or system data of a processing item. |
| | | Calculation | Used when using the judge results and measured values of Procltem which are registered in processing units. |
| | | Line Regression | Used for calculating regression line from plural measurement coordinate. |
| | | Circle Regression | Used for calculating regression circle from plural measurement coordinate. |
| | | Precise Calibration | Used for calibration corresponding to trapezoidal distortion and lens distortion. |
| | | User Data | Used for setting of the data that can be used as common constants and variables in scene group data. |
| | | Set Unit Data | Used to change the Procltem data (setting parameters, etc.) that has been set up in a scene. |
| | | Get Unit Data | Used to get one data (measured results, setting parameters, etc.) of Procltem that has been set up in a scene. |
| | | Set Unit Figure | Used for re-setting the figure data (model, measurement area) registered in an unit. |
| | | Get Unit Figure | Used for get the figure data (model, measurement area) registered in an unit. |
| | | Trend Monitor | Used for displaying the information about results on the monitor, facilitating to avoid NG and analyze causes. |
| | | Image Logging | Used for saving the measurement images to the memory and USB memory. |
| | | Image Conversion Logging | Used for saving the measurement images in JPEG and BMP format. |
| | | Data Logging | Used for saving the measurement data to the memory and USB memory. |
| | | Elapsed Time | Used for calculating the elapsed time since the measurement trigger input. |
| | | Wait | Processing is stopped only at the set time. The standby time is set by the unit of [ms]. |
| | | Focus | Focus setting is supported. |
| | | Iris | Focus and aperture setting is supported. |
| | | Parallelize | A part of the measurement flow is divided into two or more tasks and processed in parallel to shorten the measurement time. This processing item is placed at the top of processing to be performed in parallel. |
| | | Parallelize Task | A part of the measurement flow is divided into two or more tasks and processed in parallel to shorten the measurement time. This processing item is placed immediately before processing to be performed in parallel between Parallelize and Parallelize End. |
| | | Statistics | Used when you need to calculate an average of multiple measurement results. |

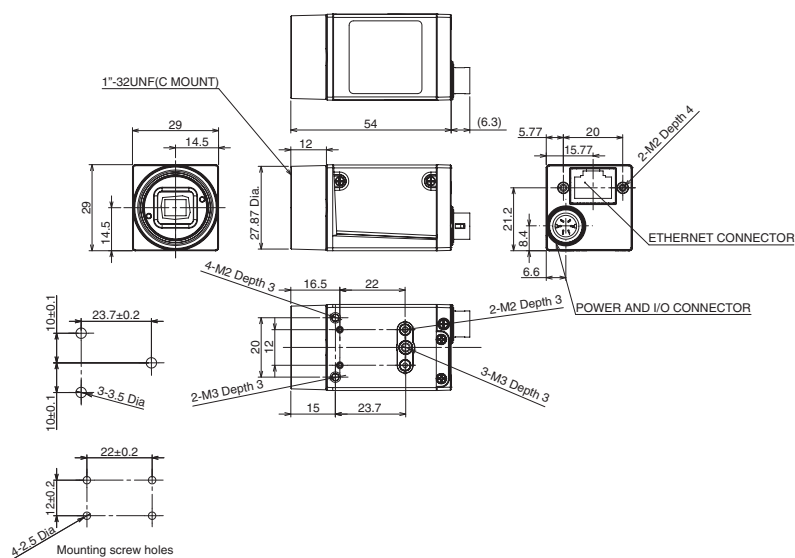
| Group | Icon | Processing Item | |
|---------------------|------|---------------------------|---|
| Support measurement | | Reference Calib Data | Calibration data and distortion compensation data held under other processing items can be referenced. |
| | | Position Data Calculation | The specified position angle is calculated from the measured positions. |
| | | Stage Data | Sets and stores data related to stages. |
| | | Robot Data | Sets and stores data related to robots. |
| | | Vision Master Calibration | This processing item automatically calculates the entire axis movement amount of the control equipment necessary for calibration. |
| | | PLC Mastroer Calibration | Calibration data is created using a communication command from PLC. |
| | | Convert Position Data | The position angle after the specified axis movement is calculated. |
| | | Movement Single Position | The axis movement that is required to match the measured position angle to the reference position angle is calculated. |
| | | Movement Multi Points | The axis movements that are required to match the measured position angles to the corresponding reference position angles are calculated. |
| | | Detection Point | Obtains position/angle information by referring to the coordinate values measured with the Measurement Processing Unit. |
| | | Camera Calibration | By setting the camera calibration, the measurement result can be converted and output as actual dimensions. |
| | | Data Save | The set data can be saved in the controller main unit or as scene data. The data is held even after the FH/FZ power is turned off. |
| Branch | | Conditional Branch | Used where more than two kinds of products on the production line need to detected separately. |
| | | End | This Procltem must be set up as the last processing unit of a branch. |
| | | DI Branch | Same as Procltem "Branch". But you can change the targets of conditional branching via external inputs. |
| | | Control Flow Normal | Set the measurement flow processing into the wait state in which the specific no-protocol command can be executed. |
| | | Control Flow PLC Link | Set the measurement flow processing into the wait state in which the specific PLC Link command can be executed. |
| | | Control Flow Parallel | Set the measurement flow processing into the wait state in which the specific parallel command can be executed. |
| | | Control Flow Fieldbus | Set the measurement flow processing into the wait state in which the specific Fieldbus command can be executed. |
| | | Selective Branch | Easily branch to multiple destinations. |
| Output results | | Data Output | Used when you need to output data to the external devices such as PLC or PC via serial ports. |
| | | Parallel Data Output | Used when you need to output data to the external devices such as PLC or PC via parallel ports. |
| | | Parallel Judgement Output | Used when you need to output judgement results to the external devices such as PLC or PC via parallel ports. |
| | | Fieldbus Data Output | Outputs data to an external device, such as a Programmable Controller, through a fieldbus interface. |
| Output result | | Result Display | Used for displaying the texts or the figures in the camera image. |
| | | Display Image File | Display selected image file. |
| | | Display Last NG Image | Display the last NG images. |

*1 Bar Codes that can be read : JAN/EAN/UPC (including add-on codes), Code 39, Codabar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code 128, GS1-128, GS1 DataBar (RSS-14 / RSS Limited / RSS Expanded), Pharmacode

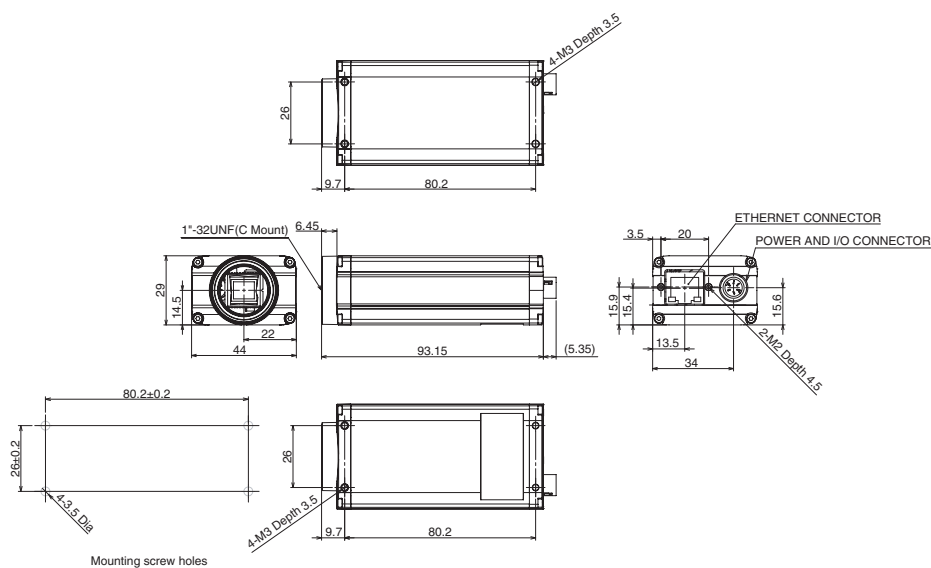
*2 2D Codes that can be read : Data Matrix (ECC200), QR Code

External Dimensions

FJ-SCG/SG/SC2MG/S2MG

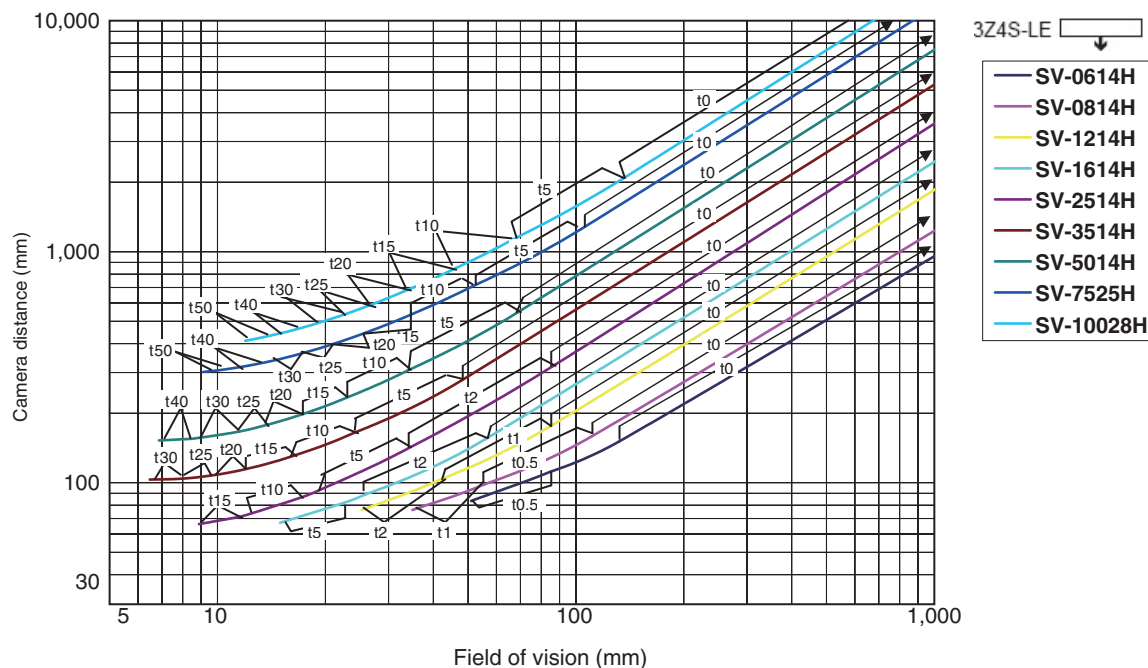


FJ-SC5MG/S5MG

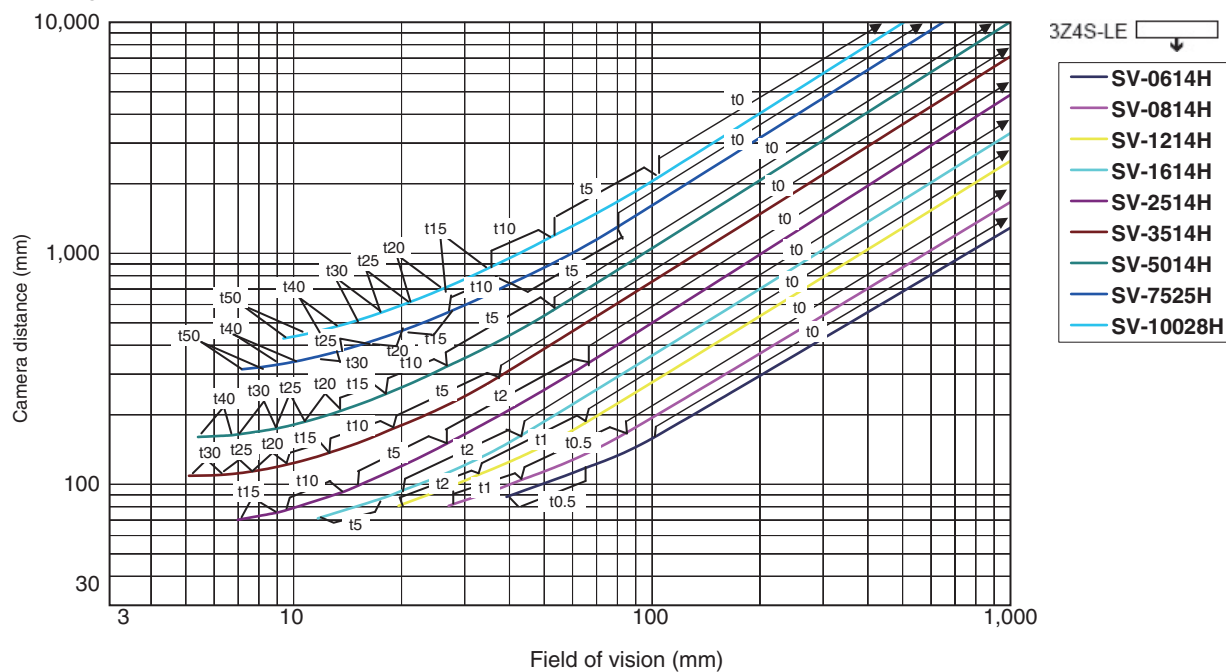


Optical Chart

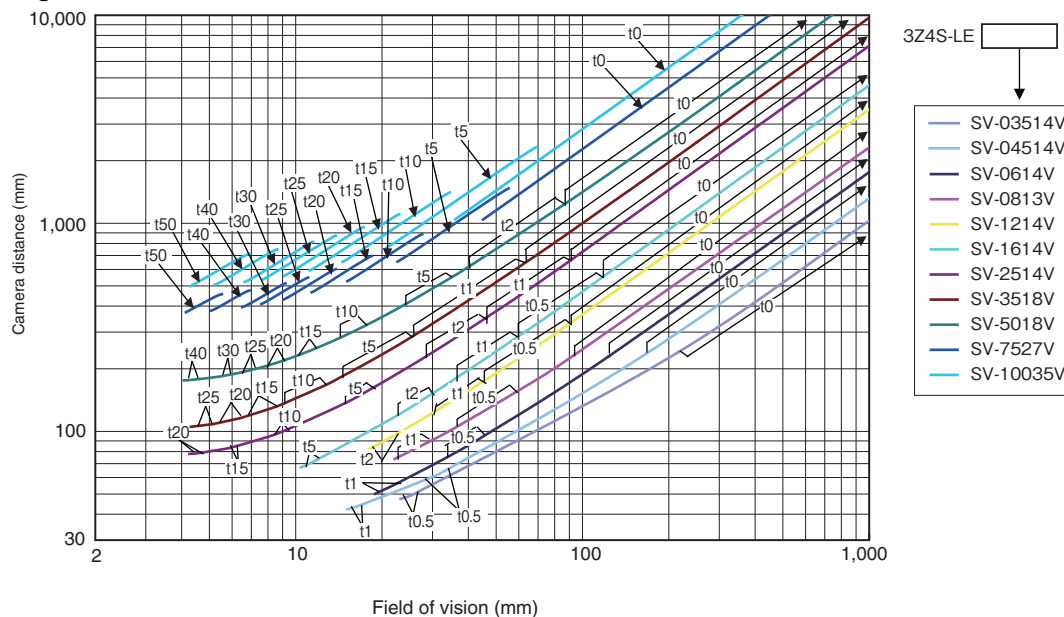
5 million-pixel digital camera FJ-SC5MG/S5MG



2 million-pixel digital camera FJ-SC2MG/S2MG

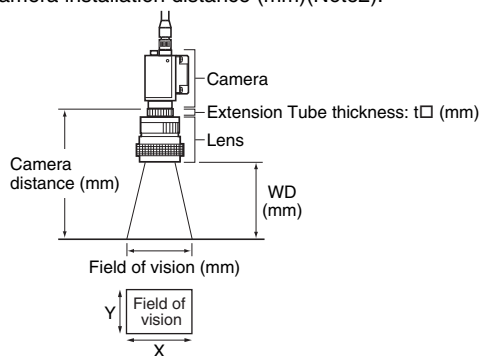


300,000-pixel digital camera FJ-SCG/SG



Meaning of Optical Chart

The X axis of the optical chart shows the field of vision (mm)(Note1),
and the Y axis of the optical chart shows the camera installation distance (mm)(Note2).



- Note: 1.** The lengths of the fields of vision given in the optical charts are the lengths of the Y axis.
2. The vertical axis represents WD for small cameras.

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Mouser Electronics

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[FJ-VSG 5M](#) [FJ-VSP 3M](#) [FJ-VSP 10M](#) [FJ-VSG 20M](#) [FJ-VSG 10M](#) [FJ-VSG 40M](#) [FJ-VSG 3M](#) [FJ-VSP 5M](#)

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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