

# CATALOG

LENSATION  
smart lenses. smart solutions.

Sマウントレンズ  
2025



太平貿易株式会社

# TABLE OF CONTENT

## S-MOUNT LENSES (M12X0.5)

|                                                      |   |
|------------------------------------------------------|---|
| 8/10/14 Megapixel Board Lenses .....                 | 3 |
| 5 Megapixel Board Lenses .....                       | 4 |
| 4 Megapixel Board Lenses .....                       | 5 |
| 3 Megapixel Board Lenses .....                       | 5 |
| 1-2 Megapixel Board Lenses .....                     | 6 |
| Board Lenses up to 1 Megapixel .....                 | 7 |
| VGA and below Megapixel High Resolution Lenses ..... | 7 |
| Pinhole Board Lenses .....                           | 8 |
| Time-of-Flight Board Lenses .....                    | 8 |
| M16 CCTV Lenses .....                                | 8 |
| Waterproof Automotive Board Lenses .....             | 9 |
| Fisheye Board Lenses .....                           | 9 |

## ACCESSORIES

|                                               |       |
|-----------------------------------------------|-------|
| S-Mount to C-Mount Scheimpflug Adapter .....  | 3     |
| Adapters, Holders, Extension-/Lockrings ..... | 10    |
| Optical Glossary .....                        | 12    |
| Optical Formulas .....                        | 13-14 |

# ABOUT LENSATION



Our mission is to keep  
our customers excited.

**With this goal in mind, we provide:**

- Free consultancy
- Exceptionally good value for money
- Best performance
- OEM design and development
- Unique solutions
- Products tailored especially according to your demands

## 8/10/14 MEGAPIXEL BOARD LENSES

For 4k cinema resolution cameras.

Supports sensors like

- ON MT9J00x/MT9F00x/AR133x/AR1820
- Perfect for Sony IMX213/286/374/377/486/663/708
- Also suits for the Omnivision OV128xx/OV138xx series

Crystal clear images with pixel sizes down to the 1.25µm class.

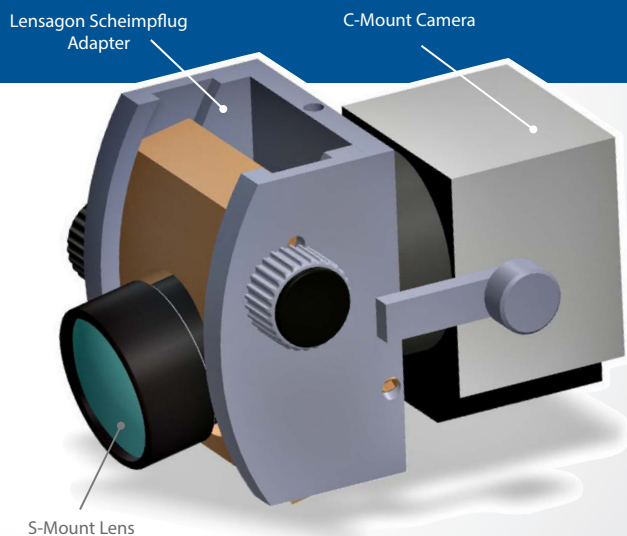


|                       | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Distortion (%) | Weight (g) | Mega Pixel | IR corr. | IR cut filter / option |
|-----------------------|-------------------|---------------------|--------------|---------|----------|-------------|----------------|------------|------------|----------|------------------------|
| <b>B8M2624S125ND</b>  | 2.6               | 2.4                 | 1/2.5"       | 0.2     | 2.52     | 106°        | -0.12          | -          | <b>8</b>   | •        | B8M2624S125NDC         |
| <b>B14M28620S123</b>  | 2.86              | 2.0                 | 1/2.3"       | 0.1     | 5.71     | 170°        | -25            | 15.0       | <b>14</b>  |          | B14M28620S123C         |
| <b>B8M3025S125ND</b>  | 3.0               | 2.5                 | 1/2.5"       | 0.2     | 3.74     | 97°         | 2              | -          | <b>8</b>   | •        | B8M3025S125NDC         |
| <b>B8M4028S118ND</b>  | 4.0               | 2.8                 | 1/1.8"       | 0.25    | 5.7      | 92.4°       | -3             | 16         | <b>8</b>   |          | B8M4028S118NDC         |
| <b>B8M4418S23</b>     | 4.41              | 1.8                 | 2/3"         | 0.1     | 7.33     | 139.6       | -18            | 8.0        | <b>8</b>   |          | B8M4418S23C            |
| <b>B10M45545ND</b>    | 4.55              | 4.5                 | 1/2.3"       | 0.1     | 3.44     | 81.7°       | <0.5           | 8.2        | <b>10</b>  |          | B10M45545NDC           |
| <b>B10M5425</b>       | 5.4               | 2.5                 | 1/2.3"       | 0.2     | 6.6      | 70°         | -2             | 6.0        | <b>10</b>  | •        | B10M5425C              |
| <b>B10M7224V2</b>     | 7.2               | 2.4                 | 1/2.3"       | 0.3     | 7.23     | 57°         | -1.8           | 12.6       | <b>10</b>  | •        | B10M7224V2C            |
| <b>B8M8020S118ND</b>  | 8.0               | 2.0                 | 1/1.7"       | 0.1     | 6.06     | 60.8        | -2             | -          | <b>8</b>   |          | B8M8020S118NDC         |
| <b>B8M12020S118ND</b> | 12.0              | 2.0                 | 1/1.8"       | 0.15    | 5.64     | 44.9        | -2             | -          | <b>8</b>   |          | B8M12020S118NDC        |

## S-MOUNT TO C-MOUNT SCHEIMPFLUG ADAPTER

The tilt mechanism allows overall image sharpness to be controlled in a different way than conventional lenses. Used in conjunction with aperture, the tilt feature of these lenses allows objects or features within an image plane to be kept in focus. This is helpful when imaging objects at oblique angles.

If absolute sharpness in the foreground and background is required, it is necessary to first focus on the closest foreground object and then tilt the lens until the background object is focus. After selecting the correct aperture, both objects will be sharp. Using such tilt mechanisms provides an additional means of controlling depth of field and allows greater freedom over the aperture and shutter speed combinations.



<http://www.optowiki.info/glossary/scheimpflug-principle/>

(CAD image)

# S-MOUNT LENSES (M12X0.5)

## 5 MEGAPIXEL BOARD LENSES

Our broad portfolio of high resolution lenses.

Perfect for the new Sony Starvis, the On Semi AR series or the Omnivision image sensors.

Supporting pixel sizes down to 2.2µm.



|                       | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Distortion (%) | Weight (g) | Mega Pixel | IR corr. | IR cut filter or option |
|-----------------------|-------------------|---------------------|--------------|---------|----------|-------------|----------------|------------|------------|----------|-------------------------|
| <b>B5M2524</b>        | 2.5               | 2.4                 | 1/2.5"       | 0.1     | 4.98     | 166°        | -83            | 6.1        | 5          |          | B5M2524C                |
| <b>B5M2916</b>        | 2.9               | 2.0                 | 1/2.5"       | 0.1     | 4.47     | 152°        | -63            | 7.2        | 5          | •        | B5M2916C                |
| <b>B5M2920S118</b>    | 2.95              | 2.8                 | 1/1.8"       | 0.3     | 6.81     | 180°        | -4.3           | 15.6       | 5          | •        | B5M2920S118C            |
| <b>B5M29740ND</b>     | 2.97              | 4.0                 | 1/2.5"       | 0.2     | 2.97     | 102°        | < 1            | 3.5        | 5          |          | B5M29740NDC             |
| <b>B5M3428S123</b>    | 3.4               | 2.8                 | 1/2.3"       | 0.1     | 6.3      | 150°        | -12            | 8.2        | 5          |          | B5M3428S123C            |
| <b>B5M3618</b>        | 3.6               | 1.8                 | 1/2.5"       | 0.2     | 7.25     | 128°        | -0.5           | 5.0        | 5          |          | B5M3618C                |
| <b>BK5M3920 (MOQ)</b> | 3.9               | 2.0                 | 1/2"         | 0.8     | 6.1      | 127°        | -              | 11.0       | 5          | •        |                         |
| <b>B5M4018</b>        | 4.0               | 1.8                 | 1/2.5"       | 0.2     | 7.72     | 112°        | -41.5          | 5.0        | 5          |          | B5M4018C                |
| <b>B5M4020</b>        | 4.0               | 2.0                 | 1/2.5"       | 0.3     | 6.7      | 114°        | -62.9          | 5.0        | 5          |          | B5M4020C                |
| <b>B5M41430ND</b>     | 4.14              | 3.0                 | 1/2.5"       | 0.2     | 5.25     | 82°         | < 0.2          | 8.3        | 5          |          | B5M41430NDC             |
| <b>B5M6018</b>        | 6.0               | 1.8                 | 1/2.5"       | 0.2     | 9.58     | 75°         | -21.4          | 6.5        | 5          |          | B5M6018C                |
| <b>B5M6020</b>        | 6.0               | 2.0                 | 1/2.5"       | 0.3     | 7.3      | 67°         | -19.6          | 6.0        | 5          |          | B5M6020C                |
| <b>B5M6532S123ND</b>  | 6.0               | 3.2                 | 1/2.3"       | 0.3     | 7.55     | 62°         | 0.8            | 3.1        | 5          |          | B5M6532S123NDC          |
| <b>B5M7630</b>        | 7.6               | 3.0                 | 1/1.8"       | 0.2     | 5.38     | 58°         | 1.9            | 6.0        | 5          |          | B5M7630C                |
| <b>B5M8018</b>        | 8.0               | 1.8                 | 1/2"         | 0.2     | 7.8      | 56°         | -14.4          | 6.5        | 5          |          | B5M8018C                |
| <b>B5M8020</b>        | 8.0               | 2.0                 | 1/2.5"       | 0.3     | 8.0      | 50°         | -7.7           | 5.0        | 5          |          | B5M8020C                |
| <b>B5M12020</b>       | 12.0              | 2.0                 | 1/2.5"       | 0.3     | 7.6      | 35°         | -4.4           | 5.0        | 5          | •        | B5M12020C               |
| <b>B5M12028</b>       | 12.0              | 2.8                 | 1/1.8"       | 0.1     | 8.57     | 41°         | -1.75          | 7.0        | 5          |          | B5M12028C               |
| <b>B5M12056</b>       | 12.0              | 5.6                 | 1/1.8"       | 0.1     | 8.57     | 41°         | -1.75          | 7.0        | 5          |          | B5M12056C               |
| <b>B5M16020V2</b>     | 16.0              | 2.0                 | 1/2.5"       | 0.3     | 7.1      | 28°         | 0.24           | 5.0        | 5          | •        | B5M16020V2C             |
| <b>B5M25020S23ND</b>  | 25.0              | 2.0                 | 2/3"         | 0.25    | 5.2      | 25°         | 0.05           | 8.4        | 5          |          |                         |
| <b>B5M25024V2</b>     | 25.0              | 2.4                 | 1/2"         | 0.3     | 11.98    | 18.8°       | 1.13           | 5.0        | 5          | •        | B5M25020V2C             |
| <b>B5M35020S23ND</b>  | 35.0              | 2.0                 | 2/3"         | 0.35    | 5.5      | 21.3°       | 0.05           | 14.5       | 5          |          |                         |

### 4 MEGAPIXEL BOARD LENSES

Our f=1.93mm offers the widest low distortion Field Of View of all M12 lenses. The unique 50mm M12 lens is perfect for 2k x 2k cameras.



|                     | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Distortion (%) | Weight (g) | Mega Pixel | IR corr. | IR cut filter / option |
|---------------------|-------------------|---------------------|--------------|---------|----------|-------------|----------------|------------|------------|----------|------------------------|
| <b>B4M1920NDC</b>   | 1.93              | 2.0                 | 1/2.9"       | -       | 1.137    | 117°        | -5 (opt.)      | 5.7        | <b>4</b>   |          | •                      |
| <b>B4M3516S12</b>   | 3.5               | 1.6                 | 1/2"         | 0.85    | 4.8      | 160°        | -13.9 (TV)     | 7.7        | <b>4</b>   |          | B4M3516S12C            |
| <b>B4M50028S117</b> | 50                | 2.8                 | 1/1.7"       | 1.0     | 18.7     | 18.7°       | -0.1 (opt.)    | 34.3       | <b>4</b>   |          | B4M50028S117C          |

### 3 MEGAPIXEL BOARD LENSES

High resolution lenses for the popular Full HD resolution of 1920x1080 or 1920x1200 pixels

Also perfect for the classic 2048x1536 format.

Supports a pixel size down to the 2.5µm class.



|                      | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Distortion (%) | Weight (g) | Mega Pixel | IR corr. | IR cut filter / option |
|----------------------|-------------------|---------------------|--------------|---------|----------|-------------|----------------|------------|------------|----------|------------------------|
| <b>B3M21835ND</b>    | 2.18              | 3.5                 | 1/4"         | 0.1     | 1.30     | 94°         | <0.6           | 4.0        | <b>3</b>   |          | B3M21835NDC            |
| <b>B3M2818</b>       | 2.8               | 2.2                 | 1/2.5"       | 0.3     | 6.2      | 147°        | < 1.9          | 5.0        | <b>3</b>   | •        |                        |
| <b>BM3516ND</b>      | 3.5               | 1.6                 | 1/3"         | 0.2     | 5.97     | 81°         | < 1.9          | 10.0       | <b>3</b>   | •        | BM3516NDC              |
| <b>BM3518S125ND</b>  | 3.5               | 1.8                 | 1/2.5"       | 0.2     | 5.97     | 90°         | < 1.9          | 12.0       | <b>3</b>   | •        | BM3518S125NDC          |
| <b>BM3524S12ND</b>   | 3.5               | 2.4                 | 1/2"         | 0.1     | 6.09     | 97°         | <-3.1          | 21.8       | <b>3</b>   | •        | BM3524S12NDC           |
| <b>B3M4016</b>       | 4.0               | 2.2                 | 1/2.5"       | 0.2     | 7.28     | 112°        | -12            | 5.4        | <b>3</b>   | •        |                        |
| <b>BM4018S118</b>    | 4.0               | 1.8                 | 1/1.8"       | 0.2     | 8.0      | 126°        | -45            | 10.0       | <b>3</b>   | •        | BM4018S118C            |
| <b>BM4518S125ND</b>  | 4.5               | 1.8                 | 1/2.5"       | 0.2     | 6.14     | 76.4°       | < 1.9          | 13.0       | <b>3</b>   | •        | BM4518S125NDC          |
| <b>BM5518S12ND*</b>  | 5.5               | 1.8                 | 1/1.8"       | 0.2     | 6.87     | 76°         | < 1.9          | 10.0       | <b>2</b>   | •        | BM5518S12NDC           |
| <b>BM5822S118ND</b>  | 5.8               | 2.2                 | 1/1.8"       | 0.3     | 6.5      | 76.2°       | -2.4           | 12.15      | <b>2</b>   |          | BM5822S118ND           |
| <b>BM6020ND</b>      | 6.0               | 2.0                 | 1/3"         | 0.2     | 6.27     | 57°         | <-2.6          | 5.9        | <b>3</b>   | •        | BM6020NDC              |
| <b>B3M6016</b>       | 6.0               | 2.2                 | 1/2.5"       | 0.3     | 6.8      | 72°         | -19            | 5.8        | <b>3</b>   | •        |                        |
| <b>B3M6020S12</b>    | 6.0               | 2.0                 | 1/2"         | 0.5     | 8.3      | 81°         | -              | 9.9        | <b>3</b>   |          |                        |
| <b>B3M8016</b>       | 8.0               | 2.2                 | 1/2.5"       | 0.4     | 8.0      | 54°         | -3.8           | 5.0        | <b>3</b>   |          |                        |
| <b>B3M8018S12</b>    | 8.0               | 1.8                 | 1/2"         | 0.5     | 7.9      | 57.7°       | -              | 10.7       | <b>3</b>   |          |                        |
| <b>B3M8556S118ND</b> | 8.5               | 5.6                 | 1/1.8"       | 0.1     | 2.9      | 54.3°       | -1.15          | 6.6        | <b>3</b>   |          | B3M8556S118NDC         |
| <b>B3M12016</b>      | 12.0              | 2.3                 | 1/2.5"       | 0.3     | 6.44     | 35°         | -6             | 5.0        | <b>3</b>   | •        |                        |
| <b>B3M16018V2</b>    | 16.3              | 1.83                | 1/2"         | 0.5     | 7.35     | 28.8°       | -0.72          | -          | <b>3</b>   | •        |                        |
| <b>B3M25024</b>      | 25.0              | 2.4                 | 1/2"         | 0.4     | 10.26    | 18°         | 3.3            | 7.1        | <b>3</b>   | •        | B3M25024C              |
| <b>B3M35025V2</b>    | 35.0              | 2.8                 | 1/1.7"       | 0.5     | 14.42    | 15.5°       | 0.1            | 15.5       | <b>3</b>   | •        | B3M35025CV2            |

\* Limited

# S-MOUNT LENSES (M12X0.5)

## 1-2 MEGAPIXEL BOARD LENSES

Broad portfolio for cameras in the 1.2 / 1.3 and 2.0 Megapixel class.

For common resolutions like

- 1280x 960
- 1280x1024
- 1600x1200
- 1920x1080
- 1920x1200

For Sony Starvis / Pregius image sensors. Also for Teledyne Ruby / Sapphire and Snappy image sensors. Perfect for a pixel size down to 3µm.



|                         | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Distortion (%) | Weight (g) | Mega Pixel | IR corr. | IR cut filter / option |
|-------------------------|-------------------|---------------------|--------------|---------|----------|-------------|----------------|------------|------------|----------|------------------------|
| <b>BMK2119C</b>         | 2.1               | 1.9                 | 1/3"         | 0.2     | 2.2      | 160°        | -73            | 2.8        | <b>1</b>   |          | SLAR coating 550nm     |
| <b>BM2118V2</b>         | 2.1               | 2.2                 | 1/3"         | 0.2     | 6.3      | 170°        | -88.1          | 6.5        | <b>1</b>   | •        | BM2118V2C              |
| <b>BMK2320C</b>         | 2.3               | 2.0                 | 1/3"         | 0.16    | 2.3      | 140°        | -              | 2.8        | <b>1</b>   |          | SLAR coating 550nm     |
| <b>BM2420</b>           | 2.4               | 2.0                 | 1/3"         | 0.15    | 4.56     | 132°        | -25            | 6.0        | <b>1</b>   | •        | BM2420C                |
| <b>BM2820</b>           | 2.8               | 2.0                 | 1/3"         | 0.2     | 5.29     | 122°        | -40            | 6.0        | <b>1</b>   | •        | BM2820C                |
| <b>BM3618</b>           | 3.6               | 1.8                 | 1/3"         | 0.2     | 6.59     | 100°        | 34.1           | 6.0        | <b>1</b>   | •        | BM3618C                |
| <b>B2M3814</b>          | 3.85              | 1.4                 | 1/2.5"       | 0.2     | 6.76     | 122°        | -              | 9.0        | <b>2</b>   |          | B2M3814C               |
| <b>BM4218</b>           | 4.2               | 1.8                 | 1/3"         | 0.2     | 7.21     | 89°         | -29            | 7.0        | <b>1</b>   | •        | BM4218C                |
| <b>BM4518S118ND-810</b> | 4.5               | 1.8                 | 1/1.8"       | 0.1     | 6.4      | 90°         | <2.8           | 14.0       | <b>1</b>   | •        | 810nm Coating          |
| <b>BM4525S118ND</b>     | 4.5               | 2.5                 | 1/1.8"       | 0.1     | 6.4      | 90°         | -2.8           | 15.0       | <b>1</b>   |          |                        |
| <b>BM4620DN</b>         | 4.6               | 2.0                 | 1/3"         | 0.2     | 5.63     | 80°         | -22            | 6.0        | <b>1</b>   | •        | BM4620DNC              |
| <b>BM6018</b>           | 6.0               | 1.8                 | 1/3"         | 0.2     | 9.33     | 60°         | -17            | 6.0        | <b>1</b>   | •        | BM6018C                |
| <b>BSM6016S12</b>       | 6.0               | 1.8                 | 1/2"         | 0.2     | 8.73     | 88°         | -32            | 4.5        | <b>2</b>   | •        |                        |
| <b>BM8021S118ND</b>     | 7.84              | 2.1                 | 1/1.8"       | 0.5     | 7.8      | 60°         | -2.9 (opt.)    | 14.3       | <b>1</b>   | •        | BM8021S118NDC          |
| <b>BM8018</b>           | 8.0               | 1.8                 | 1/3"         | 0.2     | 5.4      | 45°         | -8.3           | 6.0        | <b>1</b>   | •        | BM8018C                |
| <b>BSM8016S12</b>       | 8.0               | 1.9                 | 1/2"         | 0.2     | 5.4      | 62°         | -12            | 6.0        | <b>2</b>   | •        |                        |
| <b>BM9040</b>           | 9.0               | 4.0                 | 1/3"         | 0.1     | 8.0      | 34°         | -              | 3.9        | <b>1.3</b> | •        |                        |
| <b>BM9050</b>           | 9.0               | 5.0                 | 1/3"         | 0.1     | 8.0      | 34°         | 1.0            | 3.9        | <b>1.3</b> | •        |                        |
| <b>BM10028S12</b>       | 10.0              | 2.8                 | 1/2"         | 0.4     | 8.0      | 44°         | 1.0            | 6.0        | <b>1.2</b> |          | BM10028S12C            |
| <b>BSM12016S12</b>      | 12.0              | 2.0                 | 1/2"         | 0.2     | 6.54     | 39°         | -              | 6.0        | <b>2</b>   | •        |                        |
| <b>BM16018</b>          | 16.0              | 1.8                 | 1/3"         | 0.2     | 6.59     | 21°         | 3.4            | 6.0        | <b>1</b>   | •        | BM16018C               |
| <b>BT25020S12</b>       | 25.0              | 2.0                 | 1/2"         | 0.2     | 8.29     | 18.6°       | -              | 7.0        | <b>1-2</b> |          | BT25020S12C            |

# S-MOUNT LENSES (M12X0.5)

## BOARD LENSES UP TO 1 MEGAPIXEL

- For cameras up to 1024x768 (4:3) and 1280x720 (16:9) resolution
- Pixel size class down to 3µm

|                  | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Mega Pixel | IR cut filter or option |
|------------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|------------|-------------------------|
| <b>BK1820</b>    | 1.8               | 2.0                 | 1/4"         | 0.2     | 3.65     | 160°        | 5.5        | <b>1</b>   | BK1820C                 |
| <b>BT1922</b>    | 1.9               | 2.2                 | 1/4"         | 0.05    | 4.7      | 156°        | 3.5        | <b>1</b>   | BT1922C                 |
| <b>BT2120</b>    | 2.1               | 2.0                 | 1/3"         | 0.2     | 4.92     | 151°        | 6.5        | <b>1</b>   | BT2120C                 |
| <b>BT2520</b>    | 2.5               | 2.0                 | 1/3"         | 0.2     | 5.18     | 140°        | 5.3        | <b>1</b>   | BT2520C                 |
| <b>BT2920</b>    | 2.9               | 2.0                 | 1/3"         | 0.2     | 5.02     | 138°        | 4.5        | <b>1</b>   | BT2920C                 |
| <b>BT3020</b>    | 3.0               | 2.0                 | 1/3"         | 0.2     | 5.35     | 124°        | 3.5        | <b>1</b>   | BT3020C                 |
| <b>BT3620</b>    | 3.6               | 2.0                 | 1/3"         | 0.2     | 5.00     | 100°        | 4.1        | <b>1</b>   | BT3620C                 |
| <b>BT6020V2</b>  | 6.1               | 2.0                 | 1/3"         | 0.2     | 8.03     | 62°         | 6.5        | <b>1</b>   | BT6020V2C               |
| <b>BT12020</b>   | 12.0              | 2.0                 | 1/3"         | 0.4     | 8.97     | 29°         | 3.2        | <b>1</b>   | BT12020C                |
| <b>B16020S12</b> | 16.0              | 2.0                 | 1/2"         | 0.2     | 12.3     | 27.8°       | 4.2        | <b>1</b>   |                         |
| <b>B25020S12</b> | 25.0              | 2.0                 | 1/2"         | 0.2     | 11.8     | 18.2°       | 17.6       | <b>1</b>   |                         |
| <b>B35020S12</b> | 35.0              | 2.0                 | 1/2"         | 0.2     | 18.9     | 13.0°       | 15.4       | <b>1</b>   |                         |
| <b>B50020S12</b> | 50.0              | 2.0                 | 1/2"         | 0.4     | 33.9     | 9.2°        | 27.1       | <b>1</b>   |                         |

## VGA AND BELOW MEGAPIXEL HIGH RESOLUTION LENSES

- Perfect for standard image applications
- Entry level pricing
- Suited for standard resolution cameras
- Pixel size class down to 4µm



|                    | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Mega Pixel | IR cut filter or option |
|--------------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|------------|-------------------------|
| <b>BK1220</b>      | 1.2               | 2.0                 | 1/4"         | 0.2     | 3.4      | 192°        | 5.2        | <b>0.3</b> | BK1220C                 |
| <b>BHR2125</b>     | 2.1               | 2.5                 | 1/3"         | 0.2     | 4.25     | 165.7°      | 6.1        | <b>0.7</b> |                         |
| <b>BHR2525</b>     | 2.5               | 2.5                 | 1/3"         | 0.2     | 5.04     | 142.7°      | 6.8        | <b>0.7</b> |                         |
| <b>BHR3020</b>     | 3.0               | 2.0                 | 1/3"         | 0.2     | 5.67     | 126.0°      | 5.9        | <b>0.7</b> |                         |
| <b>BHR4318</b>     | 4.3               | 1.8                 | 1/3"         | 0.2     | 6.16     | 83.1°       | 4.0        | <b>0.7</b> |                         |
| <b>BHR5620</b>     | 5.6               | 2.0                 | 1/3"         | 0.2     | 8.07     | 65.3°       | 4.0        | <b>0.7</b> |                         |
| <b>BT8020N</b>     | 8.0               | 2.0                 | 1/3"         | 0.2     | 8.25     | 44°         | 3.5        | <b>0.3</b> | BT8020NC                |
| <b>BHR8020</b>     | 8.0               | 2.0                 | 1/3"         | 0.2     | 7.6      | 43.0°       | 6.0        | <b>0.7</b> |                         |
| <b>BHR12020</b>    | 12.0              | 2.0                 | 1/3"         | 0.2     | 6.7      | 28.0°       | 4.5        | <b>0.7</b> |                         |
| <b>BHR16012S12</b> | 16.0              | 1.2                 | 1/2"         | 0.3     | 7.2      | 21.8°       | 11.0       | <b>0.7</b> |                         |

# S-MOUNT LENSES (M12X0.5)

## PINHOLE BOARD LENSES

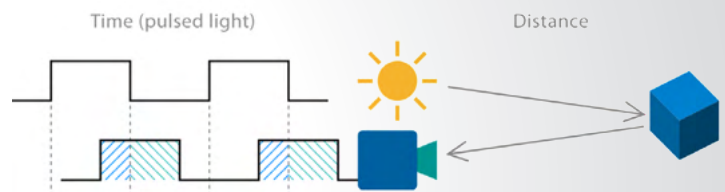
- Suited for standard resolution cameras
- Easy to clean
- Wide field-of-view
- Perfect for LED Illumination with a ring light



|                     | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Mega Pixel | IR cut filter or option |
|---------------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|------------|-------------------------|
| <b>BP2824S13</b>    | 2.8               | 2.4                 | 1/3"         | 0.1     | 3.1      | 125°        | 1.5        |            | BP2824S13C              |
| <b>BPM3725C</b>     | 3.7               | 2.5                 | 1/3"         | 0.2     | 3.64     | 106°        | 1.7        | <b>1</b>   | •                       |
| <b>BP3M3728S127</b> | 3.7               | 2.8                 | 1/2.7"       | 0.3     | 3.7      | 108.4°      | 1.8        | <b>3</b>   | BP3M3728S127C           |

## TIME-OF-FLIGHT BOARD LENSES


- Light sensitive lenses including a special bandpass filter for Time-of-Flight 3D Cameras
- Ideal for factory automation, robotics and logistics



|                        | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Chief ray | Optical Distortion % | bandpass filter |
|------------------------|-------------------|---------------------|--------------|---------|----------|-------------|-----------|----------------------|-----------------|
| <b>BTOF2512-850</b>    | 2.5               | 2.0                 | 1/3"         | 0.2     | 5.18     | 140°        | 13.07°    | -53                  | 850nm           |
| <b>BTOF2512-940</b>    | 2.5               | 2.0                 | 1/3"         | 0.2     | 5.18     | 140°        | 13.07°    | -53                  | 940nm           |
| <b>BTOF1114S12-850</b> | 11.3              | 1.4                 | 1/2"         | 0.1     | 5.96     | 38.1°       | 12.6°     | 2.1                  | 850nm           |
| <b>BTOF1114S12-940</b> | 11.3              | 1.4                 | 1/2"         | 0.1     | 5.96     | 38.1°       | 12.6°     | 2.1                  | 940nm           |

## M16 CCTV LENSES

- Light sensitive lenses with 16mm thread
- Applications are inspection of bottles, caps and tubes
- Up to 4 times more light sensitive compared to a conventional M12 lens
- All lenses including a 2-hole mount M16 lens holder

|                        | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Mega Pixel | IR cut filter or option |
|------------------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|------------|-------------------------|
| <b>M16B6M4010S125</b>  | 4.0               | 1.0                 | 1/2.5"       | 1.0     | 5.36     | 106°        | 9          | <b>6</b>   |                         |
| <b>M16B4M5009S118C</b> | 5.0               | 0.9                 | 1/1.8"       | 0.5     | 6.48     | 118°        | -          | <b>4</b>   | • (inside holder)       |
| <b>M16B8M54310S118</b> | 5.43              | 1.0                 | 1/1.8"       | 1.0     | 5.98     | 105°        | 10         | <b>8</b>   |                         |

# S-MOUNT LENSES (M12X0.5)

## WATERPROOF AUTOMOTIVE BOARD LENSES

Protected against dust and humidity. Compact size, wide FOV.

- Waterproof with IP54 classification
- Hard-coating against oil, fog and pollution



|                  | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Megapixel | IR cut filter |
|------------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|-----------|---------------|
| <b>BA1520WPC</b> | 1.5               | 2.0                 | 1/4"         | 0.2     | 2.2      | 163.0°      | 5.5        | <1        | •             |
| <b>BA1825WPC</b> | 1.8               | 2.5                 | 1/4"         | 0.2     | 2.2      | 160.0°      | 5.5        | <1        | •             |
| <b>BA2325WPC</b> | 2.3               | 2.5                 | 1/3"         | 0.2     | 2.7      | 163.0°      | 6.0        | <1        | •             |

## FISHEYE BOARD LENSES

### Lenses for a wide field-of-view.

For image sensors up to 16 Megapixels. Typical applications are surround view, inspection of tubes and pipes. We also offer software for unwarped images or to simulate rectified PTZ Cameras.

**Important:** The image circle diameter you need depends on your application. Choose the image circle larger than the equivalent sensor dimension (h/v/d)



|                               | Image Circle | Focal length (mm) | Aperture (f-number) | Image format | MOD (m) | BFL (mm) | FOV (diag.) | Weight (g) | Megapixel  | IR corr. | IR cut filter or option |
|-------------------------------|--------------|-------------------|---------------------|--------------|---------|----------|-------------|------------|------------|----------|-------------------------|
| <b>BF5M12721</b>              | 2.8          | 1.27              | 2.1                 | 1/4.0"       | 0.1     | 4.18     | 185°        | 4.7        | <b>5</b>   | •        | BF5M12721C              |
| <b>BF13M0922S13C</b>          | 2.9          | 0.9               | 2.2                 | 1/3.2"       | 0.1     | 2.01     | 200°        | 5.6        | <b>13</b>  |          | •                       |
| <b>BF5M11920</b>              | 3.24         | 1.19              | 2.0                 | 1/3.2"       | 0.2     | 6.44     | 180°        | 14.7       | <b>5</b>   | •        | BF5M11920C              |
| <b>BF10M10526S132</b>         | 3.5          | 1.05              | 2.6                 | 1/3.2"       | 0.1     | 3.2      | 200°        | 13.7       | <b>10</b>  | •        | BF10M10526S132C         |
| <b>BFM1220C</b>               | 3.84         | 1.2               | 2.0                 | 1/3.0"       | 0.2     | 2.91     | 190°        | 7.5        | <b>1.3</b> |          | •                       |
| <b>BF5M15828S125</b>          | 4.1          | 1.58              | 2.8                 | 1/2.5"       | 0.1     | 5.75     | 180°        | 10.9       | <b>5</b>   | •        | BF5M15828S125C          |
| <b>NEW</b> <b>BF16M220DV2</b> | 4.2          | 1.2               | 2.5                 | 1/2.3"       | 0.1     | 2.94     | 220°        | 26         | <b>16</b>  |          | BF16M220DV2C            |
| <b>BF9M1422</b>               | 4.5          | 1.41              | 2.2                 | 1/2.3"       | 0.1     | 3.69     | 183°        | 24.0       | <b>9</b>   | •        | BF9M1422C               |
| <b>BF10M14522S18</b>          | 4.6          | 1.45              | 2.2                 | 1/1.8"       | 0.1     | 4.62     | 190°        | 14.0       | <b>10</b>  | •        | BF10M14522S18C          |
| <b>BFM1524S125</b>            | 4.7          | 1.49              | 2.4                 | 1/2.5"       | 0.06    | 2.94     | 183°        | 4.0        | <b>1.3</b> |          | BFM1524S125C            |
| <b>BF3M2122S13</b>            | 4.8          | 2.1               | 2.2                 | 1/3.0"       | 0.1     | 3.67     | 184°        | 3.9        | <b>3</b>   | •        | BF3M2122S13C            |
| <b>BF5M19622</b>              | 5.6          | 1.96              | 2.2                 | 1/2.5"       | 0.1     | 2.77     | 180°        | 2.3        | <b>5</b>   | •        | BF5M19622C              |
| <b>BF10M19828S118</b>         | 5.6          | 1.98              | 2.8                 | 1/1.8"       | 0.1     | 6.32     | 180°        | 15.6       | <b>10</b>  | •        | BF10M19828S118C         |
| <b>BF5M2223S129</b>           | 6.2          | 2.2               | 2.3                 | 1/2.9"       | 0.1     | 4.71     | 195°        | 4.8        | <b>5</b>   | •        | BF5M2223S129C           |
| <b>NEW</b> <b>BF5M2023S23</b> | 6.6          | 2.0               | 2.3                 | 2/3          | 0.1     | 6.11     | 195°        | 18.8       | <b>5</b>   | •        | BF5M2023S23C            |
| <b>BF10M2628S123</b>          | 8.0          | 2.6               | 2.8                 | 1/2.3"       | 0.1     | 3.67     | 150°        | 6.8        | <b>10</b>  |          | BF10M2628S123C          |

## ACCESSORIES

## S-MOUNT (M12X0.5)



ST05

**M12 Extension ring 5mm**

Material: Aluminium, Height: 5 mm



ST10

**M12 Extension ring 10mm**

Material: Aluminium, Height: 10 mm

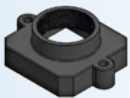


M12TM14

**M12 to M14 Adapter**

Material: Aluminium. For using M12x0.5 lenses in M14x0.5 mounts

NEW



SH04F85

**S-mount lens holder 8.5mm**

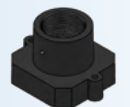
Material: Plastic, mounting hole distance 22mm, Height: 8.9 mm, Base width: 19.8 mm



SH02M13V3

**S-mount lens holder 13mm**

Material: Plastic, mounting hole distance 22mm, Height: 13 mm, Width: 20.3 mm



SH03H16V4

**S-mount lens holder 16mm**

Material: Plastic, mounting hole distance 22mm, side hole for lock screw. Inner height 5mm



LRM12V2

**M12 x 0.5 Lock Ring**

Material: Aluminium, Black anodized, Height: 2 mm, Diameter: 15.8 mm



FAM12D14H08

**Iris/Filter adapter for M12x0.5**

allows to add a filter to standard S-Mount (M12x0.5) Lenses or to modify the F-Number.

NEW



SHM16

**M16 to S-Mount Lens Holder**

Material: Plastic

NEW



DC-D27H11 / DC-D46H27

**Scratch Resistant Dome Cover**

Hard coating 1.2 or 2 inch dome with plating, 3.5/7.6cm, PE film

## C-MOUNT



ADCTS

**C-Mount to CS-Mount Adapter**

with male and female thread, 5mm effective height, for use of c-mount lenses with cs-mount cameras



CT40

**Extension Tube 40mm**Material: Aluminium, Height: 40 mm  
40mm extension tube for C-Mount lenses.

AD02F

**S-Mount to C-Mount Adapter Flat**

Male c-mount thread and female M12x0.5 thread, for use of s-mount lenses in c-mount cameras.



AD03H

**S-Mount to C-Mount Adapter High**

Male c-mount thread and female M12x0.5 thread, for use of s-mount lenses in c-mount cameras.



AD01S

**S-Mount to C-Mount Adapter Standard**

Male c-mount thread and female M12x0.5 thread, for use of s-mount lenses in c-mount cameras.



AD04M

**S-Mount to C-Mount Adapter Medium**

Male c-mount thread and female M12x0.5 thread, H: 6mm, for s-mount lenses in c-mount cameras.



LRICM / LROCM

**C-Mount Lock Rings**Outside thread: Dia.: 20mm, H: 2.5mm  
Inside thread: Dia.: 31mm, Height 2mm

ADM16TCF / ADM16TCM

**M16 to C-Mount Adapters**Outside thread: C-Mount (1-32 UN 2A)  
Inside thread: M16x0.5mm

We like to move it!



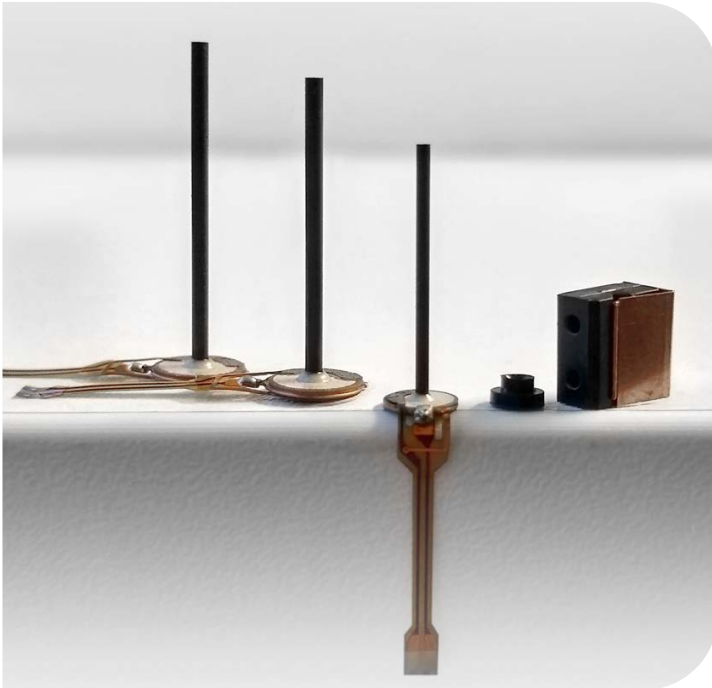
## PIEZOLUTION

You can find with ease your motion solutions with our piezoelectric linear drives. They are quick-responsive, highly accurate and very simple to control.

Be it the basic piezoelectric drives, focus-modules or micro-stages. Camera modules for smartphones, code scanners, medical devices, haptic devices, scientific instruments, robotics are just some of the potential applications.

**We are both, passionate developer and stock-keeping custom manufacturer.**

Together, we'll find an piezo-driven solution for you.



### M12 FOCUS MODULE

A compact one-chip focus module for M12 lenses, driven by piezoelectric ultrasonic linear motor. Precise, quick-responsive and simple to integrate.



Connection with 5Pin flat cable, communication over UART or I<sup>2</sup>C. The 6mm stroke in Z-axis enables a wide scope of motorized solutions.

Customizing available on demand.



- **Linear Motors**
- **Driver Boards**
- **Linear Stages**
- **OEM Design**
- **Consulting**



### Resolution(μm)

Resolution is a measure of how closely spaced two points may be before they cannot be distinguished. For example, 1μm resolution means that two points that are 1μm away from each other can be distinguished. Resolution values in this catalog are lenses' theoretical resolutions. The following is a formula to calculate theoretical resolution based on an aplanatic lens's ray diffraction. (Rayleigh formula)  $\text{Wavelength } 0.61 \times \text{NA}$

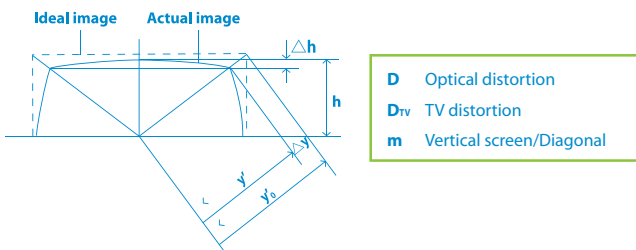
### Resolving power(line/mm)

Resolving power indicates the number of black and white lines distinguished within 1mm in an image through a black and white grid-like chart lens. It is expressed by line/mm. For example, 100 line/mm means that black and white pitch 1/100mm(10μ) can be distinguished. The width of both the black and white lines is 1/200mm(5μ).

### Horizontal TV resolution

The total number of black and white horizontal stripes on a TV monitor screen. It is expressed in TV lines. For example, 200TV lines of horizontal TV resolution means that 100 white horizontal lines is counted as one line. However, for TV lines, one pair is counted as 2 TV lines. For example, if a 1/2-inch CCD camera is used with a lens of 50 lines/mm resolving power, horizontal TV resolution on a TV monitor screen is calculated as follows;  $50 \times 6.4(\text{CCD width}) \times 2 = 640\text{TV}$

### Distortion



**Optical distortion**  
Lens's aberration where a straight object outside of the optical axis appears curved.

$$\frac{y' - y'_0}{y'_0} \times 100\%$$

Positive distortion of a straight line is called pincushion distortion. Negative distortion is called barrel distortion.

**TV distortion**  
Image distortion on a TV monitor. The closer to zero, the better the performance.

$$D_{TV} = \frac{\Delta h}{2h} \times 100\% \quad D_{TV} = \frac{1}{2} (1 - m^2) D \quad m = 0.6 \quad D_{TV} = 0.32D$$

| Object | Pincushion distortion | Barrel distortion |
|--------|-----------------------|-------------------|
|        |                       |                   |

### Aperture efficiency / Marginal light quantity (%)

Aperture efficiency indicates the brightness difference between the optical axis of the image formation plane and its surrounding area when an evenly bright object is captured with a lens. It is expressed by percent(%) assuming that the center brightness is 100. It is one of a lens's optical characteristics.

### Shading

Shading is the brightness difference between TV monitor's center and its edges when an evenly bright object is captured with a lens and CCD-TV camera. Shading indicates comprehensive performance of a lens and TV camera.

### Chromatic aberration

In lenses' optional systems, positions where images are formed and image magnification differ according to light's wavelength. Rays with different wavelengths have different colors. This is called chromatic aberration. Aberration on the optical axis is called chromatic aberration on the axis and magnification difference is called magnification chromatic aberration.

### F Number (F No)

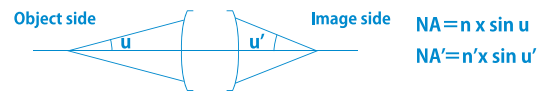
The value indicates a lens's brightness. It is calculated by dividing the lens's focal length by the lens's effective diameter(entrance pupil D mm) looking from object side. It can be also calculated by NA and lens's optical magnification(.). The smaller the number, the brighter the lens is.  $F\text{ No} = f/D$

### Effective F No

The value indicates a lens's brightness. It is calculated by dividing the lens's focal length by the lens's effective diameter(entrance pupil D mm) looking from object side. It can be also calculated by NA and lens's optical magnification(.). The smaller the number, the brighter the lens is.  $\text{Effective F No} = (1 + M) \times F\text{ No}$

### Numerical aperture

The higher the NA, the greater the resolution and brightness are. When the half angle that an image makes on exit pupil is u' and refractive index is n', n' x sin u' is called image side numerical aperture, NA'. NAs in this catalog indicate object side numerical apertures.



$NA = M/2xF, NA' = 1/2xF.$   
Relation of NA and NA' is  $NA = NA' \times \text{Optical magnification}$  or  $NA' = NA / \text{optical magnification}.$

### MTF

It provides a graph analyzing a lens's ability to resolve sharp details in very fine sets of parallel lines, and a lens's contrast or ability to provide a sharp transfer between light and dark areas in sets of thicker parallel lines.

### Depth of field

Images through lenses theoretically form as points. Acceptable blur on an acceptably clear image is called the permissible circle of confusion. Depth is the distance between the nearest and farthest points that appear in acceptably sharp focus when an object is shifted back and force from the best focal point. Depth range of the object side is called depth of field.  $\text{Depth of field} = 2(\text{Permissible circle of confusion} \times \text{Effective F No} / \text{Magnification}^2)$

### Depth of focus

Depth is the distance between the nearest and farthest points that appear in acceptably sharp focus when a CCD is shifted back and force from the best focal point. Depth range of the image side is called depth of focus.

### Angle of view

The angle formed by imaginary lines connecting the lens second principal point with both ends of the image diagonal. Angle of view is directly associated with lens focal length. As the focal length is longer, the angle of view is narrower.  $\text{Angle of view } 2x \tan^{-1} D / 2f$  Focal length

### WD

Distance from the front end of a lens system to the object under inspection.

### OI

Distance from the object to the image sensor.

### Focal length

Focal length is the distance from the optical system's principle point to the focal point. Distance from the vertex of the last lens to the back focal point is called back length. Distance from the vertex of the first lens to the front focal point is called front focal length.

### Image size

The diameter of the sharp image circle formed by a lens. Area sensor is expressed by inch, and diameter of image circle is equal to diagonal of sensor. Image circle of diameter for line sensor is equal to the maximum sensor size. It is expressed by pixel size x resolution.

## How to calculate optical magnification

Most of Lensagon lens series are designed at finite distance. Optical magnification is the image size (CCD) ratio against the object size (FOV) and the most important for selection of a lens.

### Sensor size

#### Area Sensor

Examples of area sensor used for machine vision.  
It is expected that various sensors will be available for next generation.

| Image Size inch | 1/4 | 1/3 | 1/2 | 1/1.8 | 2/3 | 1    | 1.1 |
|-----------------|-----|-----|-----|-------|-----|------|-----|
| Vertical mm     | 2.7 | 3.6 | 4.8 | 5.35  | 6.6 | 9.6  | 12  |
| Horizontal mm   | 3.6 | 4.8 | 6.4 | 7.14  | 8.8 | 12.8 | 12  |
| Diagonal mm     | 4.5 | 6   | 8   | 8.93  | 11  | 16   | 17  |

#### Line Sensor

Length of line sensor is formed, depended on pixel size and resolution. As the line sensor is larger, the dimension of a lens becomes larger. Design and manufacture of lenses for the large line sensors are required for high specification.

| Image Size mm            | 10.24 | 14.34 | 20.48 | 28.67 | 28.67 | 35   | 36   | 57.34 | 61.44 |
|--------------------------|-------|-------|-------|-------|-------|------|------|-------|-------|
| Pixel size $\mu\text{m}$ | 10    | 14    | 10    | 14    | 7     | 4.7  | 7    | 7     | 5     |
| Resolution pixel         | 1024  | 1024  | 2048  | 2048  | 4096  | 7450 | 5150 | 8192  | 12288 |

### Formula of optical magnification

#### FOV

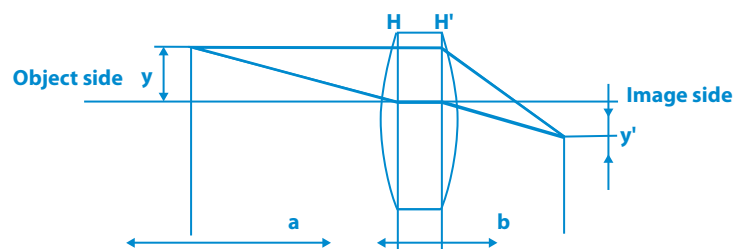
Field of view (FOV) The actual size of a viewed object that can be taken when the lens is attached to the camera.  
Ex. Optical magnification: 0.5x Sensor: 1/2"

Vertical FOV  $4.8 \div 0.5$  9.6mm Horizontal FOV  $6.4 \div 0.5$  12.8mm

#### Magnification

Optical magnification (M) = Sensor size/FOV

$$M = y' / y = b / a$$



### Electronic magnification and monitor magnification

#### Electronic magnification

Magnification of an image on a sensor when it is displayed on a monitor screen.

#### Monitor magnification

Magnification of an object displayed on a monitor screen through a lens.

Ex. Optical magnification: 0.5x Sensor: 1/2 Monitor size: 15 inch (1 inch = 25.4mm)

Electronic magnification  $15 \times 25.4 \div 8$  47.6x

Monitor magnification  $0.5 \times 47.65$  23.8x



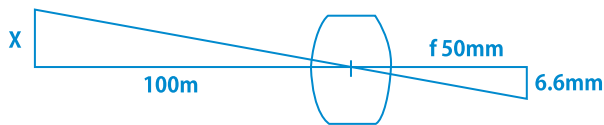
# OPTICAL FORMULAS

## How to calculate focal length and photographic range

### Formula of photographic range

$$X = \frac{\text{Distance from lens to object} \times \text{Image size}}{\text{Focal length}}$$

Ex. Object distance: 100mm Focal length: 50mm CCD: 2/3



$$X = \frac{100,000 \times 6.6}{50} = 13,200 \text{ (mm)} \quad \text{Height: 13.2m}$$

### Formula of Focal length

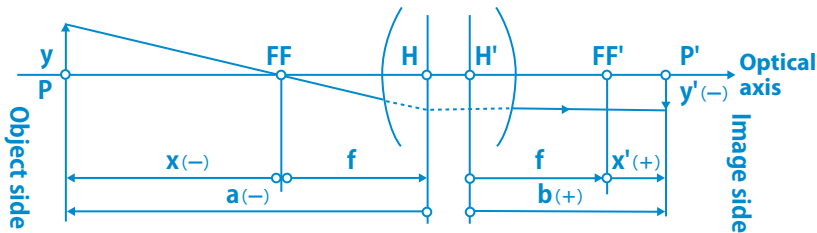
$$f = \frac{\text{Distance from lens to object} \times \text{Image size}}{\text{Height}}$$

Ex. Object distance: 20m Height: 6.6m CCD: 2/3



$$f = \frac{20,000 \times 6.6}{2,000} = 66 \text{ (mm)} \quad \text{Focal length: 66mm}$$

## Formula of conjugation relationship



#### Basics formula

$$-\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$$

#### Horizontal magnification

$$M = \frac{y'}{y} = \frac{b}{a}$$

#### Object point distance

$$-a = (1 - \frac{1}{M}) \times f$$

#### Image point distance

$$b = (1 - M) \times f$$

f : Focal length

FF : Front side focal point

FF' : Rear side focal point

H : Front side principal point

H' : Rear side principal point

P : Object point

P' : Image point

a : Distance from front side point to object point

b : Distance from rear side principal point to image point

x : Distance from front side focal point to object point

x' : Distance from rear side focal point to image side point

M : Magnification

### F No./NA Formula

Relationship of object side NA and image side NA (NA')

$$NA' = \frac{NA}{M}$$

Relationship of F No. and Effective F no.(Ef)

$$Fe = (1 - M) F$$

Relationship of NA and Effective F No.

$$NA' = \frac{1}{2Fe}$$

$$NA = \frac{M}{2Fe}$$

$$NA' = \frac{1}{2(1-M)F}$$

$$NA = \frac{M}{2(1-M)F}$$

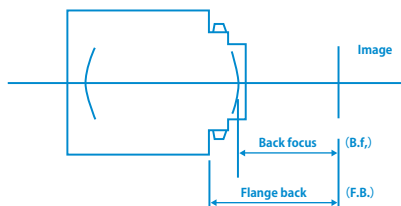
## Camera mount and flange back

Back focus

Distance from the vertex of the last lens to the back focal point.

Flange back

Distance from the camera's lens mount reference surface to the focal plane.



| Name     | Flange back | Screw size          |
|----------|-------------|---------------------|
| C Mount  | 17.526mm    | 25.4mm 32tpi thread |
| CS Mount | 12.5mm      | 25.4mm 32tpi thread |
| F Mount  | 46.5mm      | Bayonet             |
| K Mount  | 45.5mm      | Bayonet             |





Catalog 2025

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このカタログの記載内容は2025年6月現在のものです。