

# MC4K150X-F

Macro lens for 4k line scan cameras, magnification 1.50x, F-mount

## SPECIFICATIONS

### Optical specifications

Focusing (1)		near	nominal	far
Magnification	(x)	1.543	1.5	1.455
Image circle Ø	(mm)	28.7		
Working distance (2)	(mm)	89.90	91.40	93.00
Focal length	(mm)	79.8		
f/# (wF/#) (3)		6.8 (17)		
Distortion typical (max) (4)	(%)	< 0.01 (0.03)		
Field depth (5)	(mm)	0.30	0.32	0.34
CTF @ 50 lp/mm	(%)	> 35		
Image side numerical aperture		0.029		
Object side numerical aperture		0.045		

### Object field of view (mm x mm)

with IMX253/IMX304 17.6 mm diag w x h 14.16 x 10.37	9.20 x 6.74	9.47 x 6.93	9.76 x 7.15
with 2k x 10 µm detector 20.48	13.29	13.67	14.09
with IMX387 21.7 mm diag w x h 18.9 x 10.6	12.24 x 6.90	12.59 x 7.09	12.98 x 7.31
with APS-C IMX342 27.9 mm diagonal w x h 22.36 x 16.77	14.49 x 10.87	14.90 x 11.18	15.36 x 11.53
with 4k x 7 µm detector 28.67	18.60	19.13	19.73

### Mechanical specifications

Length (6)	(mm)	178.6	...	...
Diameter	(mm)	64.0	...	...
Mass	(g)	684	...	...
Phase adjustment		Yes		
Mount		F	...	...

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## NOTES

- Maximum and minimum magnification changes when focusing.
- Working distance: distance between the front end of the mechanics and the object. Set this distance within +/- 3% of the nominal value for maximum resolution and minimum distortion.
- Working F-number: the real F-number of a lens in operating conditions.
- Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) values and maximum (guaranteed) values are listed.
- At the borders of the field depth the image can be still used for measurement but, to get a perfectly sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 7 µm.
- Measured from the front end of the mechanics to the camera flange.

## COMPATIBLE PRODUCTS

Despite the efforts made to generate an error-free compatibility list, we always recommend to consult the Opto Engineering® technical support department before purchasing a compatible product. Opto Engineering® shall not be liable for any damage or malfunctioning caused by the incorrect selection of a compatible product.



LTBC series

Continuous LED backlight

LTBC054054-W

Continuous LED backlight, 54x54 illumination area, white



All product specifications and data are subject to change without notice to improve reliability, functionality, design or other. Photos and pictures are for illustration purposes only.



## LTBFC series

Continuous flat side-emitting LED backlights

[LTPVRG25X36-00-1-W-24V](#) Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, white, 24V

[LTPVRG25X36-00-1-R-24V](#) Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, red, 24V

[LTPVRG25X36-00-1-G-24V](#) Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, green, 24V

[LTPVRG25X36-00-1-B-24V](#) Flat side-emitting LED backlight, thin borders, 25X36 mm illumination area, blue, 24V



## LTLAIC series (discontinued models)

Continuous LED low angle diffused ring lights

[LT2RZF070-60-2-W-24V](#) LED ring light, 2 LED rows, 76.2 mm outer diameter, 60°, white, 24V

[LT2RZF070-60-2-R-24V](#) LED ring light, 2 LED rows, 76.2 mm outer diameter, 60°, red, 24V

[LT2RZF070-60-2-G-24V](#) LED ring light, 2 LED rows, 76.2 mm outer diameter, 60°, green, 24V

[LT2RZF070-60-2-B-24V](#) LED ring light, 2 LED rows, 76.2 mm outer diameter, 60°, blue, 24V



## LTRNDC series

Continuous LED direct ring lights

[LTZGK070-45-3-R-24V](#) LED ring light, 3 LED rows, outer diameter 70 mm, 45°, red, 24V

[LTZGK070-45-3-G-24V](#) LED ring light, 3 LED rows, outer diameter 70 mm, 45°, green, 24V

[LTZGK070-45-3-B-24V](#) LED ring light, 3 LED rows, outer diameter 70 mm, 45°, blue, 24V

[LTZGK070-45-3-W-24V](#) LED ring light, 3 LED rows, outer diameter 70 mm, 45°, white, 24V



## LTLA series

High power strobed LED low angle diffused ring lights

[LTLAB2-R](#) Diffusive strobed low angle ring light illuminator - medium size high power red

[LTLAB2-G](#) Diffusive strobed low angle ring light illuminator - medium size high power green

[LTLAB2-W](#) Diffusive strobed low angle ring light illuminator - medium size high power white

[LTLAC1-W](#) Diffusive strobed low angle ring light illuminator - large size medium power white

[LTLAC2-R](#) Diffusive strobed low angle ring light illuminator - large size high power red

[LTLAC2-G](#) Diffusive strobed low angle ring light illuminator - large size high power green

[LTLAC2-W](#) Diffusive strobed low angle ring light illuminator - large size high power white



## LTLAIC series

Continuous LED low angle diffused ring lights

[LT3RZF080-60-1-W-24V](#) LED ring light, 1 LED row, 81 mm outer diameter, 60°, white, 24V

[LT3RZF080-60-1-R-24V](#) LED ring light, 1 LED row, 81 mm outer diameter, 60°, red, 24V

[LT3RZF080-60-1-G-24V](#) LED ring light, 1 LED row, 81 mm outer diameter, 60°, green, 24V

[LT3RZF080-60-1-B-24V](#) LED ring light, 1 LED row, 81 mm outer diameter, 60°, blue, 24V



## LTLADC series

Continuous LED low angle direct ring lights

[LTZZO130-75-3-W-24V](#) LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°, white, 24V

[LTZZO130-75-3-R-24V](#) LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°, red, 24V

[LTZZO130-75-3-G-24V](#) LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°, green, 24V

[LTZZO130-75-3-B-24V](#) LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°, blue, 24V



## LTBRDC series

Continuous LED bar lights

[LTZPFL040-00-6-R-24V](#) LED bar light, 6 LED rows, 40X26.3 illumination area, red, 24V

[LTZPFL040-00-6-G-24V](#) LED bar light, 6 LED rows, 40X26.3 illumination area, green, 24V

LTZPFL040-00-6-B-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, blue, 24V
LTZPFL040-00-6-W-24V	LED bar light, 6 LED rows, 40X26.3 illumination area, white, 24V



#### LTCXC series

Continuous LED coaxial lights

LT2QOG025-00-X-W-24V	LED coaxial light, 25x25.6 mm light emitting area, white, 24V
LT2QOG025-00-X-R-24V	LED coaxial light, 25x25.6 mm light emitting area, red, 24V
LT2QOG025-00-X-G-24V	LED coaxial light, 25x25.6 mm light emitting area, green, 24V
LT2QOG025-00-X-B-24V	LED coaxial light, 25x25.6 mm light emitting area, blue, 24V



#### LTLNC series

Continuous LED line lights

LTLNC100-W	LED line light 100 mm, white
LTLNC100-R	LED line light 100 mm, red
LTLNC100-G	LED line light 100 mm, green
LTLNC100-B	LED line light 100 mm, blue
LTLNC100-IR850	LED line light 100 mm, IR 850 nm
LTLNC150-W	LED line light 150 mm, white
LTLNC150-R	LED line light 150 mm, red
LTLNC150-G	LED line light 150 mm, green
LTLNC150-B	LED line light 150 mm, blue
LTLNC150-IR850	LED line light 150 mm, IR 850 nm
LTLNC200-W	LED line light 200 mm, white
LTLNC200-R	LED line light 200 mm, red
LTLNC200-G	LED line light 200 mm, green
LTLNC200-B	LED line light 200 mm, blue
LTLNC200-IR850	LED line light 200 mm, IR 850 nm
LTLNC300-W	LED line light 300 mm, white
LTLNC300-R	LED line light 300 mm, red
LTLNC300-G	LED line light 300 mm, green
LTLNC300-B	LED line light 300 mm, white
LTLNC300-IR850	LED line light 300 mm, IR 850 nm



#### LTLNM series

Flicker free high power focused modular LED line lights

LTLNM-0200-N-FC-W	Modular LED line light, 200mm length, near field focusing, fan cooling, white
LTLNM-0200-N-D-FC-W	Modular LED line light, 200mm length, near field focusing, diffuser, fan cooling, white
LTLNM-0200-F-FC-W	Modular LED line light, 200mm length, far field focusing, fan cooling, white
LTLNM-0200-F-D-FC-W	Modular LED line light, 200mm length, far field focusing, diffuser, fan cooling, white
LTLNM-0200-C-FC-W	Modular LED line light, 200mm length, collimated, fan cooling, white
LTLNM-0200-C-D-FC-W	Modular LED line light, 200mm length, collimated, diffuser, fan cooling, white
LTLNM-0400-N-FC-W	Modular LED line light, 400mm length, near field focusing, fan cooling, white
LTLNM-0400-N-D-FC-W	Modular LED line light, 400mm length, near field focusing, diffuser, fan cooling, white
LTLNM-0400-F-FC-W	Modular LED line light, 400mm length, far field focusing, fan cooling, white
LTLNM-0400-F-D-FC-W	Modular LED line light, 400mm length, far field focusing, diffuser, fan cooling, white
LTLNM-0400-C-FC-W	Modular LED line light, 400mm length, collimated, fan cooling, white
LTLNM-0400-C-D-FC-W	Modular LED line light, 400mm length, collimated, diffuser, fan cooling, white
LTLNM-0600-N-FC-W	Modular LED line light, 600mm length, near field focusing, fan cooling, white
LTLNM-0600-N-D-FC-W	Modular LED line light, 600mm length, near field focusing, diffuser, fan cooling, white
LTLNM-0600-F-FC-W	Modular LED line light, 600mm length, far field focusing, fan cooling, white
LTLNM-0600-F-D-FC-W	Modular LED line light, 600mm length, far field focusing, diffuser, fan cooling, white
LTLNM-0600-C-FC-W	Modular LED line light, 600mm length, collimated, fan cooling, white
LTLNM-0600-C-D-FC-W	Modular LED line light, 600mm length, collimated, diffuser, fan cooling, white



LTLNE-300-N-D-FC-W	LED line light, direct, 300mm length, near field focusing, diffuser, fan cooling, white
LTLNE-300-F-PC-W	LED line light, direct, 300mm length, far field focusing, passive cooling, white
LTLNE-300-F-FC-W	LED line light, direct, 300mm length, far field focusing, fan cooling, white
LTLNE-300-F-D-PC-W	LED line light, direct, 300mm length, far field focusing, diffuser, passive cooling, white
LTLNE-300-F-D-FC-W	LED line light, direct, 300mm length, far field focusing, diffuser, fan cooling, white
LTLNE-300-C-PC-W	LED line light, direct, 300mm length, collimated, passive cooling, white
LTLNE-300-C-FC-W	LED line light, direct, 300mm length, collimated, fan cooling, white
LTLNE-300-C-D-PC-W	LED line light, direct, 300mm length, collimated, diffuser, passive cooling, white
LTLNE-300-C-D-FC-W	LED line light, direct, 300mm length, collimated, diffuser, fan cooling, white
LTLNE-300-CX-N-PC-W	LED line light, coaxial, 300mm length, near field focusing, passive cooling, white
LTLNE-300-CX-N-FC-W	LED line light, coaxial, 300mm length, near field focusing, fan cooling, white
LTLNE-300-CX-N-D-PC-W	LED line light, coaxial, 300mm length, near field focusing, diffuser, passive cooling, white
LTLNE-300-CX-N-D-FC-W	LED line light, coaxial, 300mm length, near field focusing, diffuser, fan cooling, white
LTLNE-300-CX-F-PC-W	LED line light, coaxial, 300mm length, far field focusing, passive cooling, white
LTLNE-300-CX-F-FC-W	LED line light, coaxial, 300mm length, far field focusing, fan cooling, white
LTLNE-300-CX-F-D-PC-W	LED line light, coaxial, 300mm length, far field focusing, diffuser, passive cooling, white
LTLNE-300-CX-F-D-FC-W	LED line light, coaxial, 300mm length, far field focusing, diffuser, fan cooling, white
LTLNE-300-CX-C-PC-W	LED line light, coaxial, 300mm length, collimated, passive cooling, white
LTLNE-300-CX-C-FC-W	LED line light, coaxial, 300mm length, collimated, fan cooling, white
LTLNE-300-CX-C-D-PC-W	LED line light, coaxial, 300mm length, collimated, diffuser, passive cooling, white
LTLNE-300-CX-C-D-FC-W	LED line light, coaxial, 300mm length, collimated, diffuser, fan cooling, white
LTLNE-300-MR-N-PC-W	LED line light, 45° mirror, 300mm length, near field focusing, passive cooling, white
LTLNE-300-MR-N-FC-W	LED line light, 45° mirror, 300mm length, near field focusing, fan cooling, white
LTLNE-300-MR-N-D-PC-W	LED line light, 45° mirror, 300mm length, near field focusing, diffuser, passive cooling, white
LTLNE-300-MR-F-PC-W	LED line light, 45° mirror, 300mm length, far field focusing, passive cooling, white
LTLNE-300-MR-F-FC-W	LED line light, 45° mirror, 300mm length, far field focusing, fan cooling, white
LTLNE-300-MR-F-D-PC-W	LED line light, 45° mirror, 300mm length, far field focusing, diffuser, passive cooling, white
LTLNE-300-MR-F-D-FC-W	LED line light, 45° mirror, 300mm length, far field focusing, diffuser, fan cooling, white
LTLNE-300-MR-C-PC-W	LED line light, 45° mirror, 300mm length, collimated, passive cooling, white
LTLNE-300-MR-C-FC-W	LED line light, 45° mirror, 300mm length, collimated, fan cooling, white
LTLNE-300-MR-C-D-PC-W	LED line light, 45° mirror, 300mm length, collimated, diffuser, passive cooling, white
LTLNE-300-MR-C-D-FC-W	LED line light, 45° mirror, 300mm length, collimated, diffuser, fan cooling, white