TCCX350-G | DATASHEET

OPTO ENGINEERING

Coaxial telecentric lens for 2/3" detectors, WD 132.3 mm, magnification 3.500x, C mount, green



KEY ADVANTAGES

Large numerical aperture
For small pixel size camera resolution.

Long working distance
Tailored for electronic components inspection.

Compact built-in illumination
Ideal for high-end applications in semiconductor industry.

Easy rotational phase adjustment
Robust and precise tuning of the camera phase.

Detailed test report with measured optical parameters.

TCCX series is a range of lenses designed for measurement and defect detection on flat surfaces. They feature the same magnifications and working distance of TCLWD series while adding integrated coaxial light.

SPECIFICATIONS

Optical specifications

Magnification		3.500
Image circle	(mm)	11.0
Max sensor size		2/3"
Working distance[1]	(mm)	132.3
wF/N[2]		24
Telecentricity typical (max)[3]	(°)	< 0.04 (0.06)
Distortion typical (max)[4]	(%)	< 0.05 (0.10)
Field depth[5]	(mm)	0.1
Resolution (max)[6]	(µm)	4

Electrical specifications

Light color, peak wavelength		green, 525 nm
Spectral FWHM	(nm)	40
Supply voltage	(V)	12-24
Max power consumption	(W)	2.5
LED forward voltage typ (max)[7]	(V)	3.3 (4.0)
Max LED forward current[8]	(mA)	350
Max LED pulse Current[9]	(mA)	2000
Connector		M8
Included cable		CB244P1500

[1] Working distance: distance between the front end of the mechanics and the object. Set this distance within $\pm 3\%$ of the nominal value for maximum resolution and minimum distortion.
[2] working f/N: the real f/N of a lens in operating conditions.
[3] Maximum angle between chief rays and optical axis on the object side. Typical (average production) values and maximum (guaranteed) values are listed.

Mechanical specifications

Mount		C
Phase adjustment		Yes
Length[10]	(mm)	181.5
Front diameter	(mm)	37.7
Mass	(g)	593

Environment

Operating temperature	(°C)	0-40
Storage temperature	(°C)	0-50
Operating relative humidity	(%)	20-85, non condensing
Installation		Indoor use only

Eye safety

Risk group (CEI EN 62471:2010)	Risk group 1

[4] Percent deviation of the real image compared to an ideal, undistorted image. Typical (average production) values and maximum (guaranteed) values are listed.
[5] At the borders of the field depth the image can be still used for measurement but, to get a very sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 3.45 µm.
[6] Object side, calculated with the Rayleigh criterion with λ= 520 nm
[7] Used in continuous (not pulsed) mode.
[8] At max forward current. Tolerance is ±0.06V on forward voltage measurements.
[9] At pulse width <= 10 ms, duty cycle <= 10% condition. Built-in electronics board must be bypassed (see tech info).
[10] Measured from the front end of the mechanics to the camera flange.

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. Data are reported by design, actual lens performance may vary due to manufacturing tolerances.

FIELD OF VIEW

Sensors	(mm x mm)
1/3” (4.8 x 3.6 mm x mm)	1.37 x 1.03
1/2.5” (5.70 x 4.28 mm x mm)	1.63 x 1.22
1/2” (6.4 x 4.8 mm x mm)	1.83 x 1.37
1/1.8” (7.13 x 5.33 mm x mm)	2.04 x 1.52
2/3” (8.50 x 7.09 mm x mm)	2.43 x 2.03

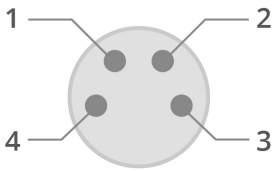
COMPATIBLE PRODUCTS

Full list of compatible products available *here*.



A wide selection of innovative machine vision components.

CONNECTOR PINOUT

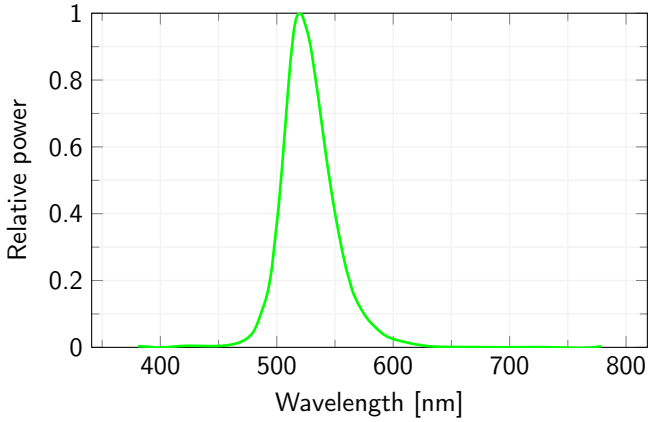


Device side

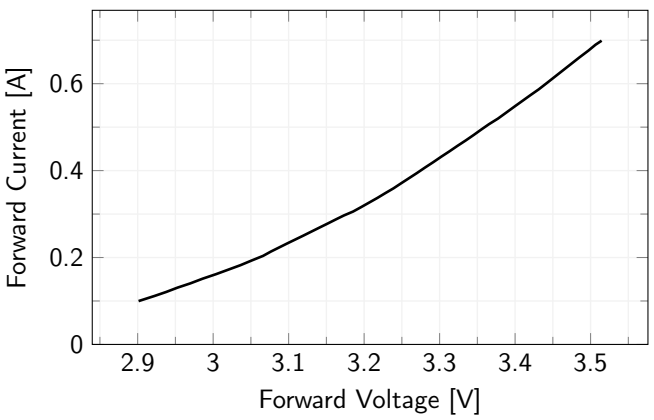
Pin	Function	Cable color
1	Earth	Yellow/green
2	Ground	Black
3	LED anode	Blue
4	Power supply (+12/24 V)	Brown

ADDITIONAL INFORMATION

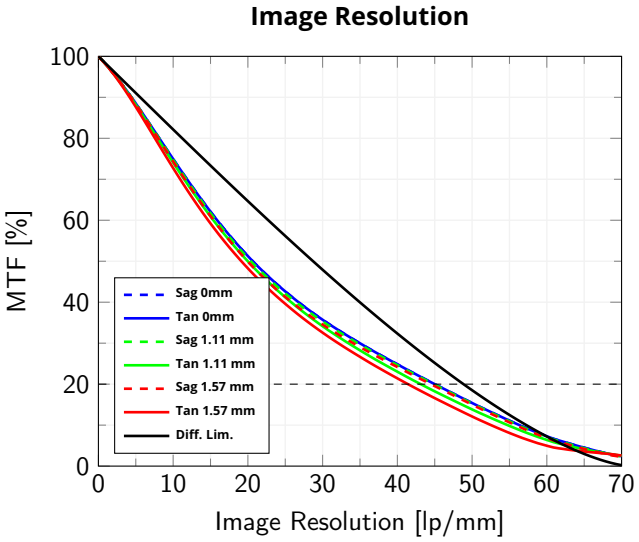
LED color spectrum



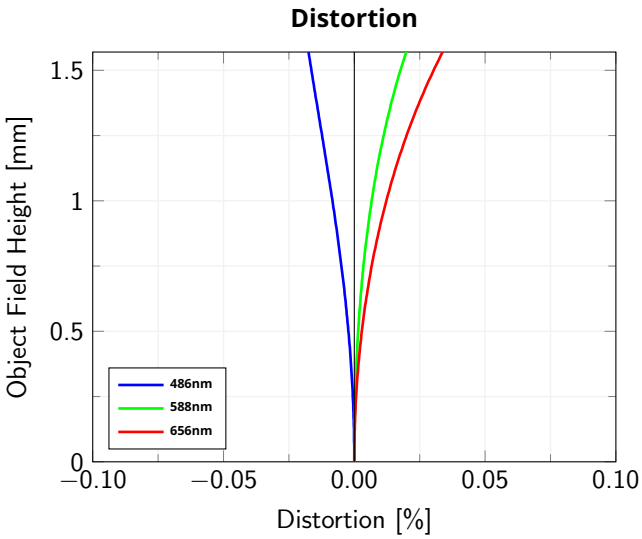
Forward Current Characteristics



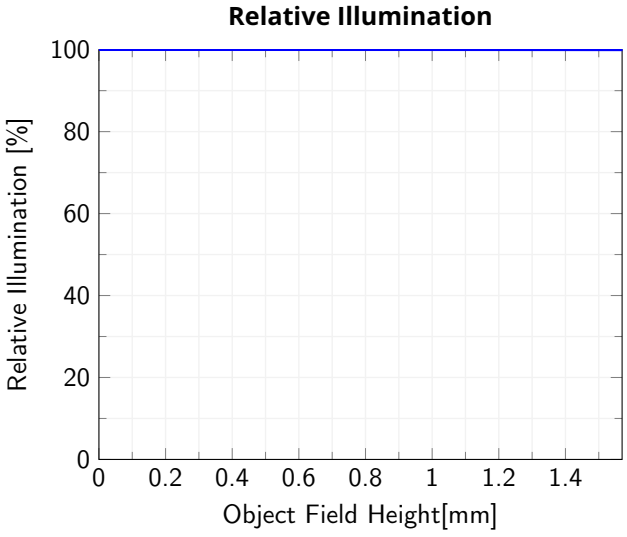
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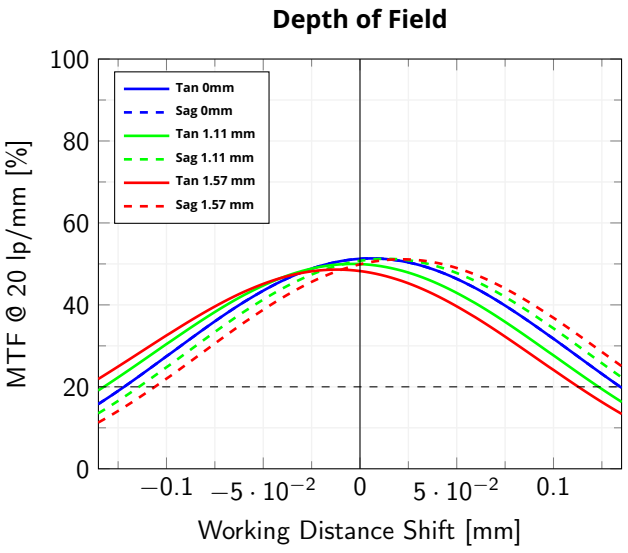
Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm



Object Field Height vs. Distortion, from the optical axis to the corner of the field of view



Relative illumination vs. Object Field Height, from the optical axis to the corner of the field of view



Modulation Transfer Function (MTF) @ 20 lp/mm vs. Working Distance Shift from the best focus Working Distance, wavelength range 486 nm - 656 nm

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