

# VEO\_JM SAPPHIRE 1.67 × / F3.0

For TDI Line Scan

## Key Features

- Optimized for 82 mm line scan sensors
- High resolution over the entire field
- Resolves 3.35  $\mu\text{m}$  in object space
- With beam splitter for axial in-line illumination
- Low chromatic focal shift
- No relative illumination loss at the edge
- Best azimuth marking

## Applications

- FPD (OLED / LED) inspection
- PCB inspection
- Wafer inspection
- High resolution defect detection
- Quality assurance systems

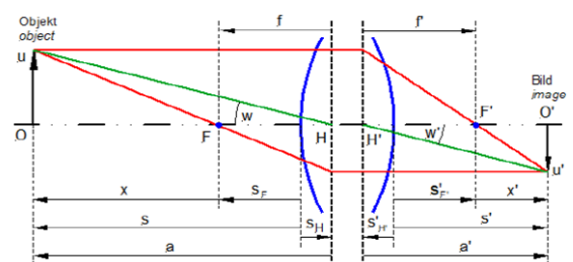


## Performance

Parameter	Specification	Remarks
Magnification range	1.67 (1.62...1.72)	
F/# range	F/3.0 ... F/5.6	Optimum F/3.0
Numerical aperture	0.101	Object Plane
Max. sensor size [mm]	82	
Infinite F/#	F/3.0	
Focal length [mm]	118	
Depth of field [ $\mu\text{m}$ ]	57.4	@ P. CoC 10 $\mu\text{m}$
Distortion	< 0.05%	
Wavelength [nm]	400 ... 700	Visible
Working distance [mm]	50 (51 ... 49)	B/S ... Object
Beam splitter size	25 × 25 × 125	
Total length [mm]	495 ± 2	from Object to Sensor
Interface	V90 mount	0.75 pitch
Iris	Changeable	
Relative illumination	Less than 5%	
Weight [g]	1847	

## Optical Parameters

Contents	Parameter	Value
Chief Ray Angle (Max.) in object plane	CRA	7.3
Effective focal length	f'eff [mm]	117.88
Front focal length	SF [mm]	19.35
Back focal length	S'F' [mm]	69.92
Principal plane distance	HH' [mm]	-7.88
Pupil magnification	$\beta'P$	0.972
Entrance pupil position	SEP [mm]	140.59
Exit pupil position	S'AP [mm]	-44.70
Vertex width	$\Sigma d$ [mm]	177.32



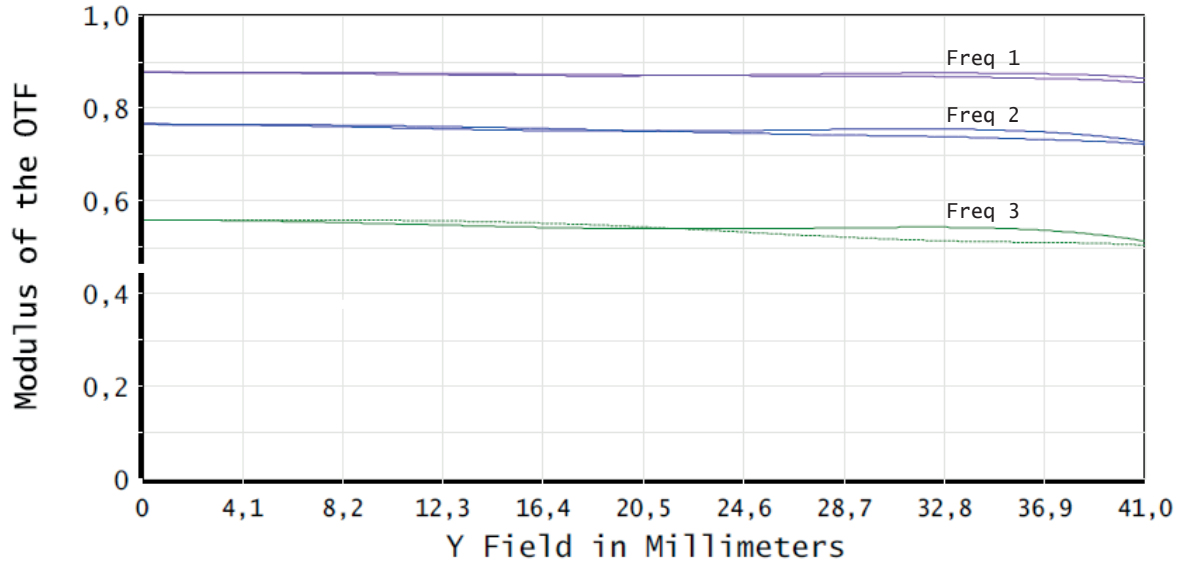
**VIEWWORKS**

vision.viewworks.com

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## MTF



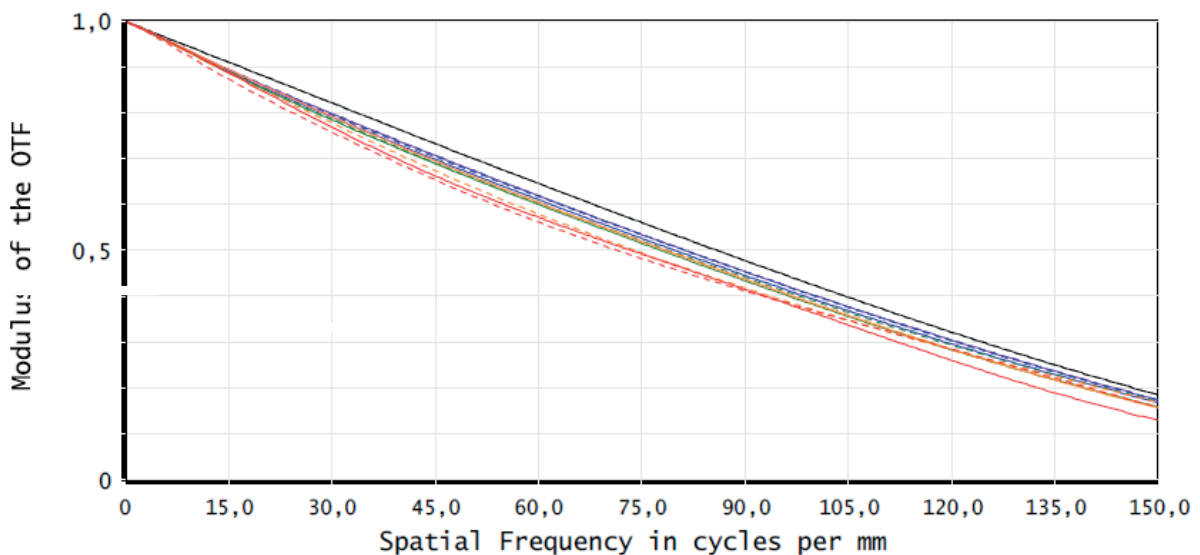
—T1 - -S1 —T2 - -S2 —T3 - -S3

FFT MTF vs. Field

Data for 436 to 645 nm

Freq 1: 18.00 cyc/mm      Freq 2: 36.00 cyc/mm      Freq 3: 72.00 cyc/mm

Legend items refer to Tangential (T) / Sagittal (S) frequency



— Diff. Limit-Tangential    - - Diff. Limit-Sagittal    — 0,00 mm-Tangential    - - 0,00 mm-Sagittal  
 — 10,25 mm-Tangential    - - 10,25 mm-Sagittal    — 20,50 mm-Tangential    - - 20,50 mm-Sagittal  
 — 30,75 mm-Tangential    - - 30,75 mm-Sagittal    — 41,00 mm-Tangential    - - 41,00 mm-Sagittal

Polychromatic Diffraction MTF

Data for 436 to 645 nm

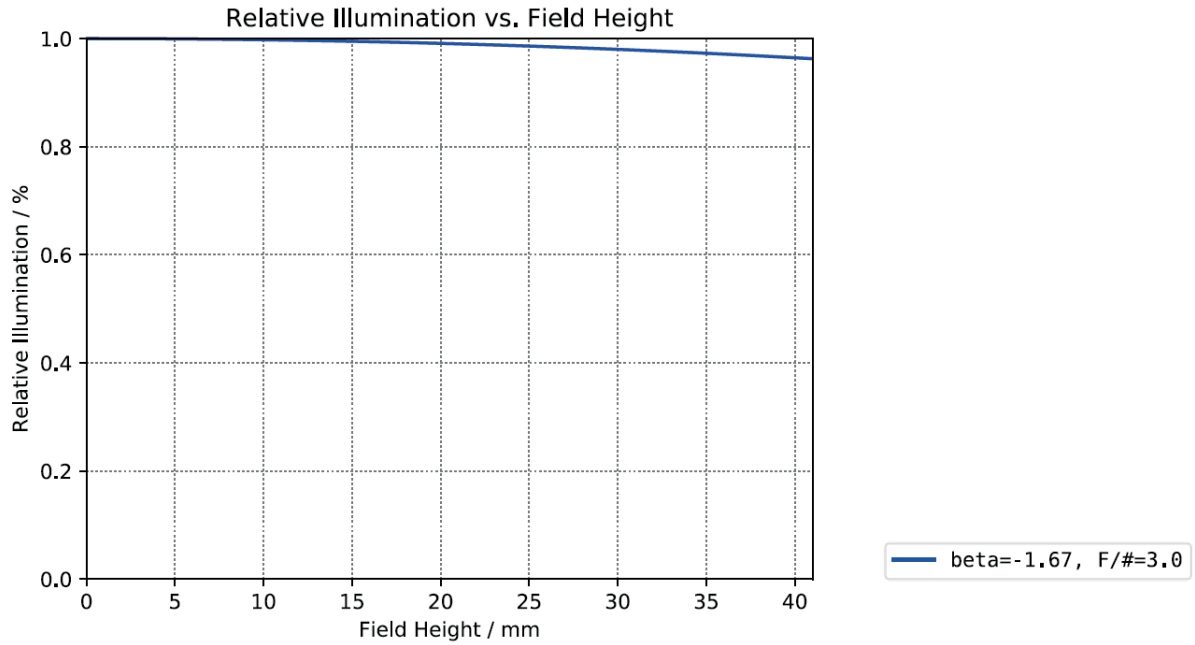
Surface: Image (image level)

Legend items refer to Field positions

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## Relative Illumination



## Distortion

