FOV120° Low Distortion Camera Lens

M12 for 1/3" 4M Pixel Sensor

Key Properties

Image Diameter 6.6mm for <1/2.9" Sensor (OV4689)
HD Resolution: 2MP~4MP / 1520p
Field of View(FOV): D:117.7°, H:110°, V:76.5°(for OV4689 16:9)
Wide Angle Low Distortion: <3%
F/No.: 2.0
Lens Mount for M12 x 0.5P
IR Cut Filter Built in, Others Optical Filter Optional

Application

Wide View Camera Module/ Image Sensor Module
Image Recognition Application/ Video Surveillance / Car Camcorder

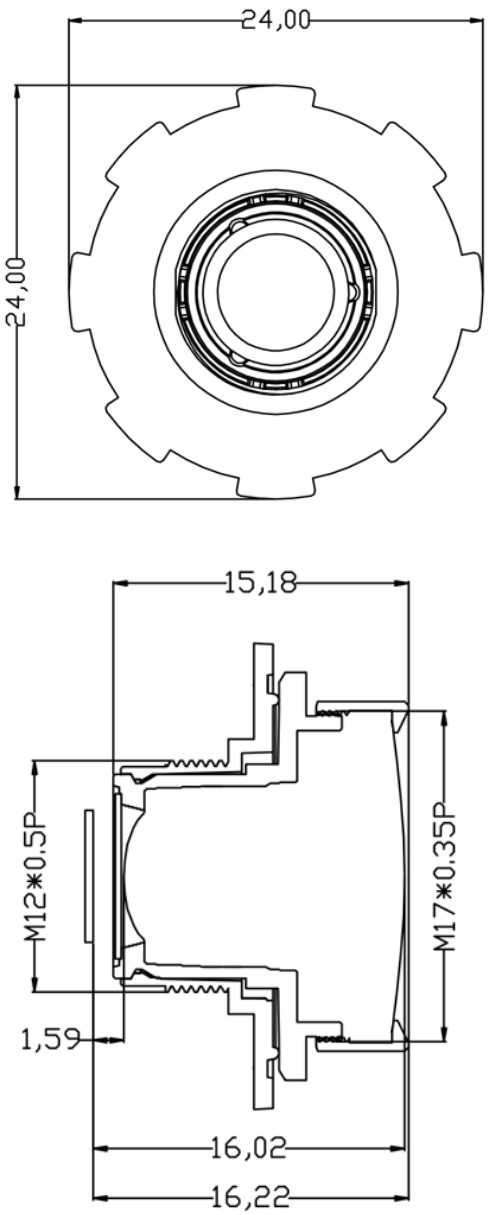
Feature

- FOV 117.7° wide view angle and glass lens material with good reliability.
  - FOV D: 117.7°, H:110°, V:76.5° (for 16:9)
  - Low Distortion <3%
- Image diameter 6.6mm can be used for 1/3", 1/4" or smaller dimension size sensors.
  - The sensor pixel resolution suitable around 2MP~4MP or below.
- M12 x 0.5P is convenient for standard S-Mount M12 holder.
- IR cut filter built-in to cut the infrared light for the outdoor environment.
  - The other optical filters optional as your requirement like IR pass filter for IR sensing system or special wavelength band customized.

Introduction

CL12S3P2V120 is a 1G4P elements lens designed for 1/3" 4MP sensor also can be used for smaller dimension size sensors in range around 2MP ~ 4MP. The wide view angle is designed to 120 degree FOV for low distortion suitable for surveillance, security, car camcorder etc. applications need the wide view image and low distortion of environment or image recognition system.
This lens has good wide angle image with low distortion advantages for wide view range image quality performanc. The M12 designed convenient for the standard S-Mount holder of camera module. If you are looking for a wide view angle lens, it would be a good choice.

Specifications		
Lens Mount Type		M12 x P0.5
Dimension(mm)		Φ24 x 15.18
Element		1G4P + IR
Image Circle(mm)		Φ6.6
For Sensor Size		< 1/3"
Focal Length (EFL)		1.93mm ±3%
Back Focal Length (BFL)		1.59mm ±3%
F/No. (Infinite)		2.0 ±5%
Field of View (FOV)	D	117.7° ±3°
	H	110° ±3°
	V	76.5° ±3°
Optical Distortion		3%(Max)
Resolution	Pixel	2~4MP / 1520p
	Center	180 lp/mm
	Edge	125 lp/mm
Chief Ray Angle (CRA)		<10°
Relative Illumination		40%
IR Filter Spec. (Built-in, Others available)		
Tavg≧82% @470nm-650nm, T=50% @650nm Tavg≦3% @700nm-1020nm, T<5% @1050nm		
Working Temperature		-25°C ~ +60°C



Specifications are subject to change without notice.

RoHS

MTF Design Value

The MTF is indicated at full aperture at infinity. MTF is shown at 125 lp/mm over the whole field of view, averaged for tangential and sagittal structures, in white light.

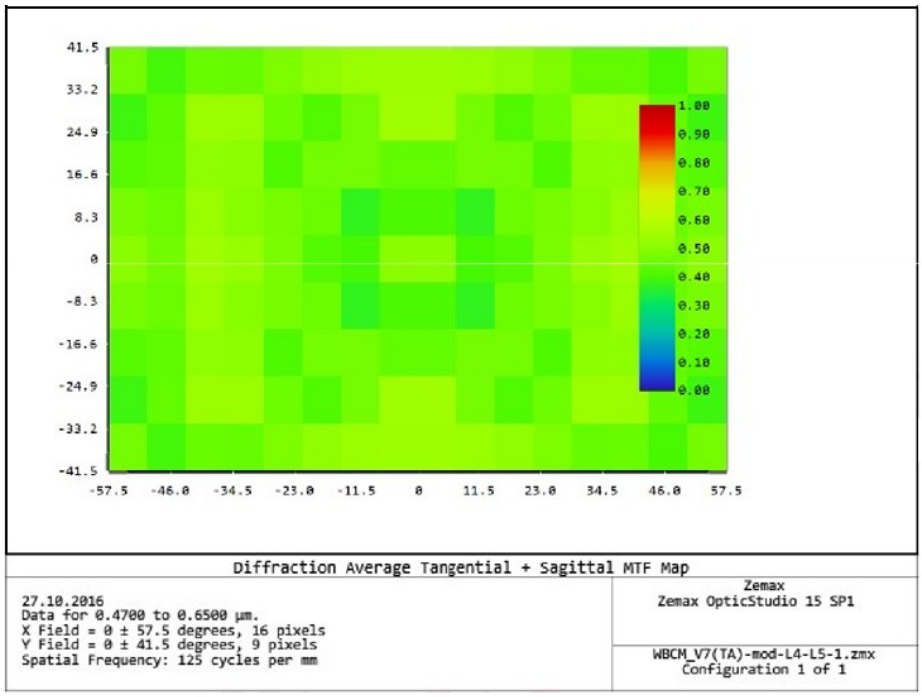


Figure 1: MTF map

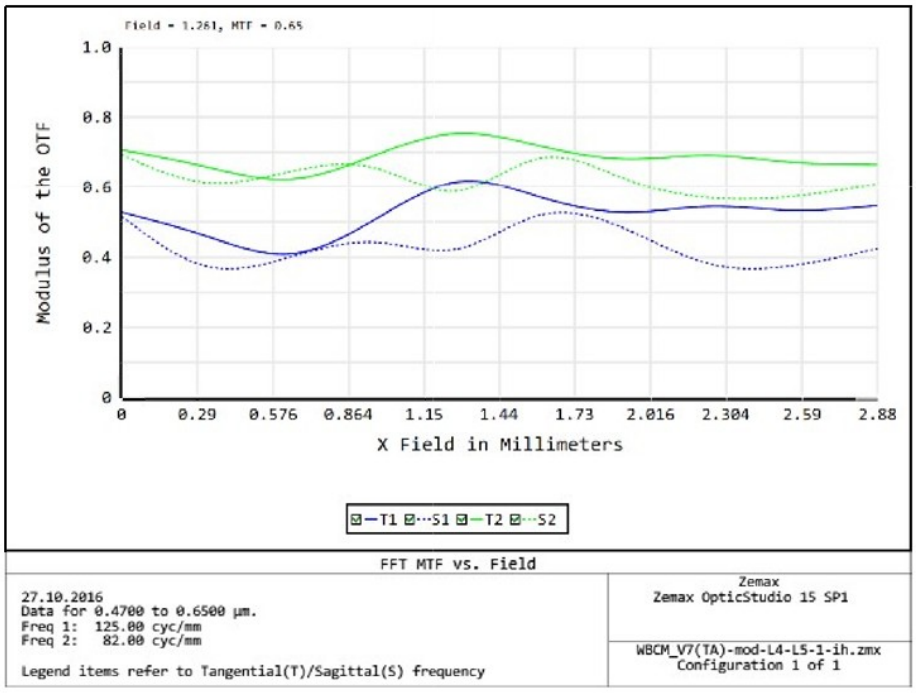


Figure 2: FFT MTF vs. Field

Relative and Effective Distortion

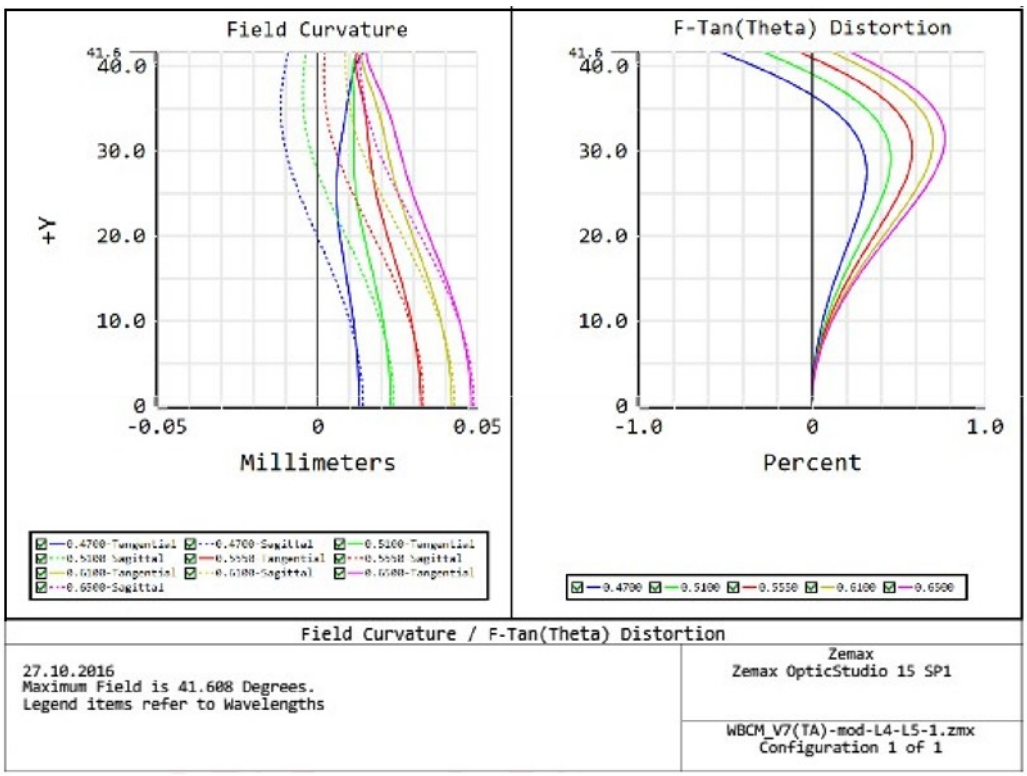


Figure 3. Maximum field is 41.491 degrees
Wavelengths: 0.470, 0.510 , 0.555, 0.610 and 0.650 (mm)

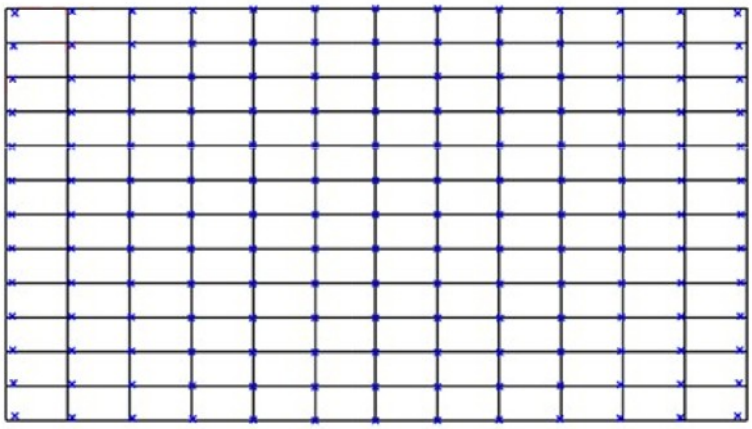


Figure 4: Grid Distortion Simulation

Image Simulation: Checkerbox Comparison

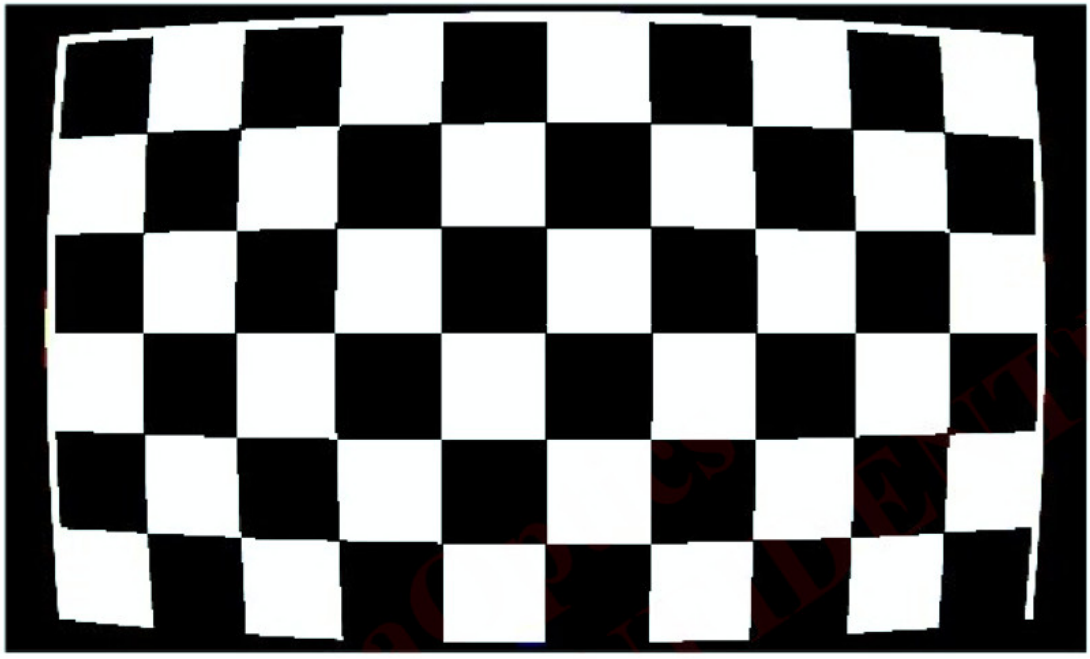


Figure 5: Checkerbox with typical 12% distortion

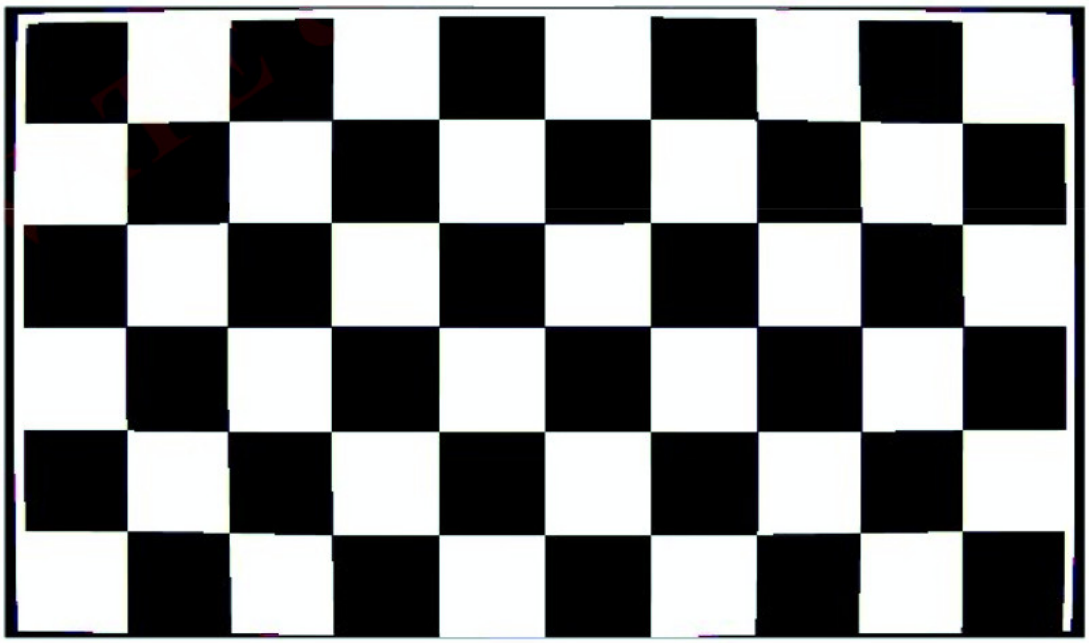


Figure 6: Checkerbox with WALA design <5% distortion

Image Simulation: Distortion Comparisons

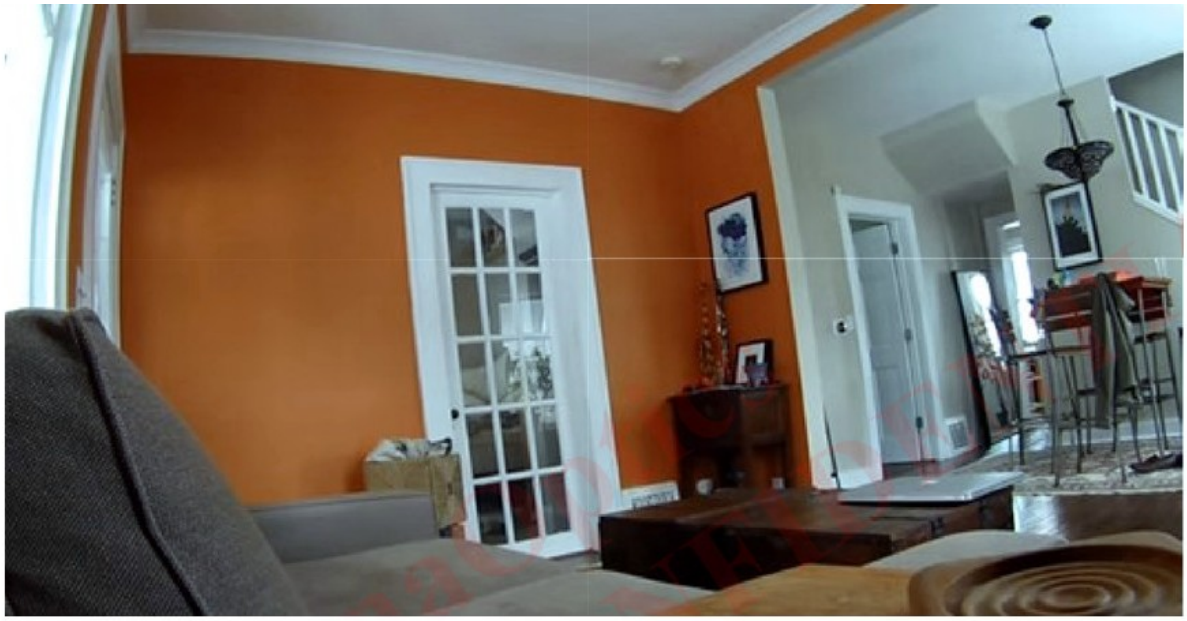


Figure 7: Wide FOV camera with typical 12% distortion.

Figure 8: WALA enables wide FOV with <5% distortion.

MTF Spec & Test Result

Specification	VALUE			
Back Focal Length	1.04 ±0.1 mm			
Minimum Measured MTF at best focus, Sag & Tan (75 lp/mm) Use the All-in-one test chart.	Field	0	±0.3	±0.8
	white	> 60%	> 48%	> 20%
Transmission of lens assembly which supports IR cut coating, 0° angle of incidence	Average	> 82% 470 - 650 nm		
	Minimum	> 75% 470 – 650 nm		
	Average	< 1% 740 - 1020 nm		
	Maximum	< 3% 740 - 1020 nm		
	Average	< 2% 1020 - 1100 nm		
	Maximum	< 6% 1020 - 1100 nm		
	T= 50%	650 ±10 mm		

Test Results