

Approval Sheet

Bi-Telecentric Lens

Model: CC-12MTC20C-110

Company	Approval	Date
Chen Hsuan Optics	Davis Lin	2020/8/20

Version D	CHEN HSUAN Optics CO.,LTD. Address:No. 56-17, Alley 12, Lane 225, Section 3, Zhongqing Road, Xitun District, Taichung City Tel: +886 4 24263929 Fax: +886 4 22569849	CONFIDENTIAL
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Revision History

Date	Rev.	Changes and additions	By
2020/8/13	A	Version A Released	Davis
2020/8/20	B	Renew WF# and change cubic prism location	Davis
2020/10/8	C	Update Mechanical Drawing	Davis
2021/2/24	D	Update Inspection criteria/Package	Davis

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1 Main Items

1.1 Optical Specifications

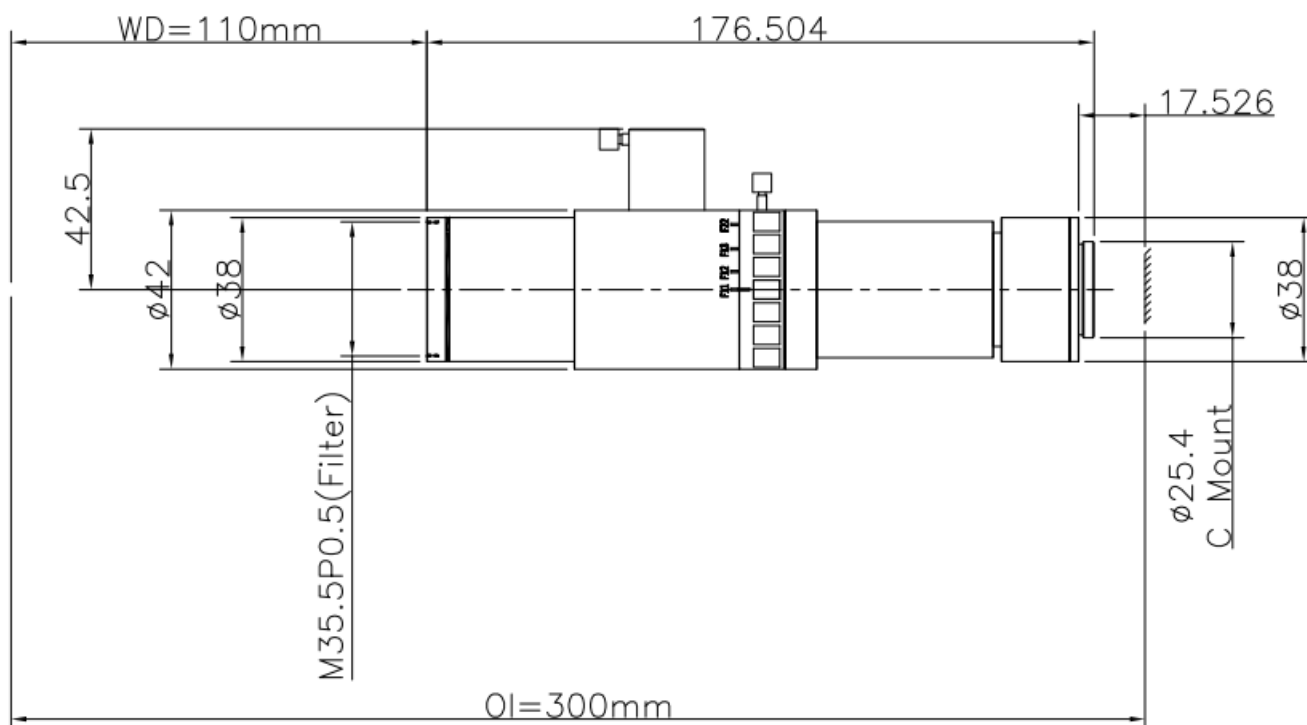
No.	Items	Description	Remark
Camera			
1	Model	IMX253 1.1"	
2	Resolution	12MP	
3	Pixel Size	3.45 μ m/3.45 μ m	
4	Mount	C mount	
Lens			
1	Optical Magnification	2.0	
2	Sensor	14.19 mm x 10.34 mm ϕ 17.6	Design ϕ 18
3	Working Distance	WD = 110mm OI = 300mm	
4	FOV	H=7.0mm * V=5.1mm	
5	Effective F/#	F11~F22	
6	NAO	0.09 @F11 0.083@F12 0.077@F13 0.071@F14	
7	EFL	1334	
8	Resolution	3.53 μ m	
9	Axial color	< 10 μ m	
10	Lateral color	Max 2.4 μ m	
11	DOF	220 μ m @F11 240 μ m @F12 260 μ m @F13 280 μ m @F14	COC=0.04mm
12	Optical Distortion	< 0.012%	
13	RI	1.0 field >98	
14	MTF @80 lp/mm	>0.3	
15	CRA	< 0.1 degree	
16	Wavelength	465nm ~ 642nm (White light)	

1.2 Inspection Criteria

1	MTF	Condition: - Line width= 5 μ m - Inspection chart is made by Delta Criteria: Focus on center best - MTF(@corner) \geq 0.2 - Corner MTF(Max-Min) \leq 0.2	
2	Cosmetics	60/40	

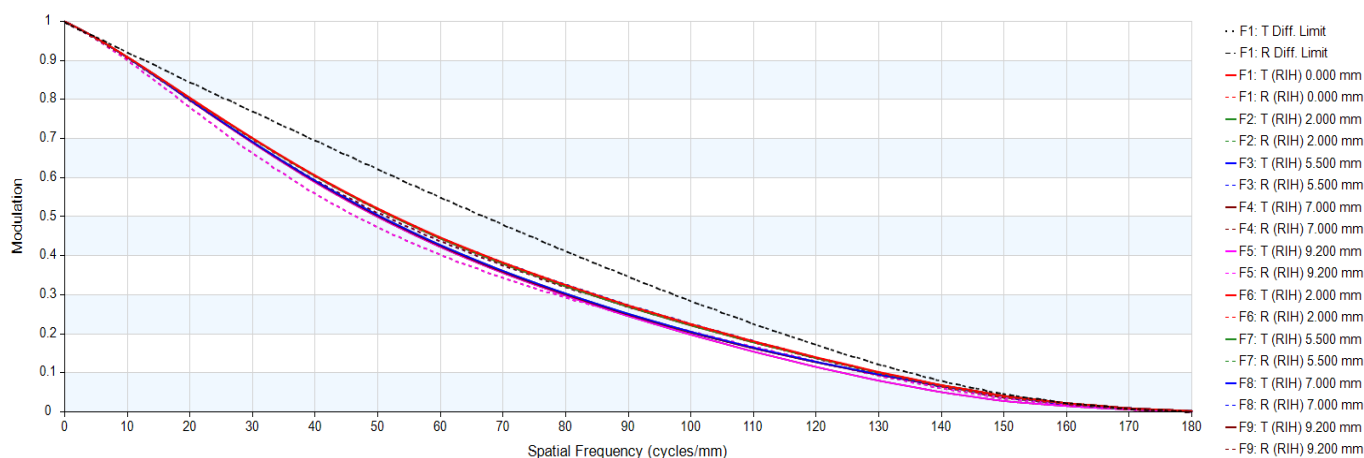
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1.3 Mechanical Drawing



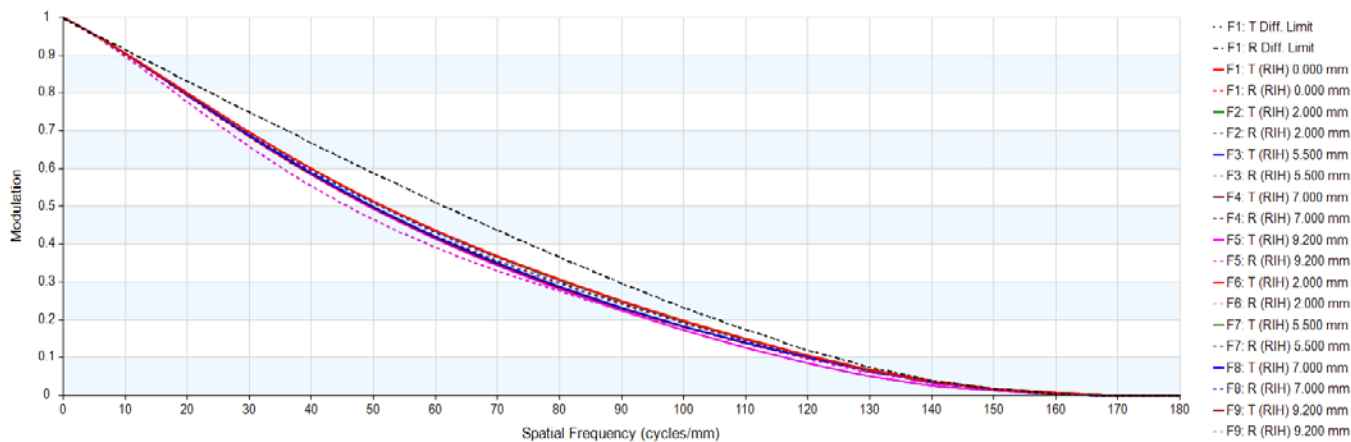
1.4 Optical Simulation Data

全頻 MTF F#11

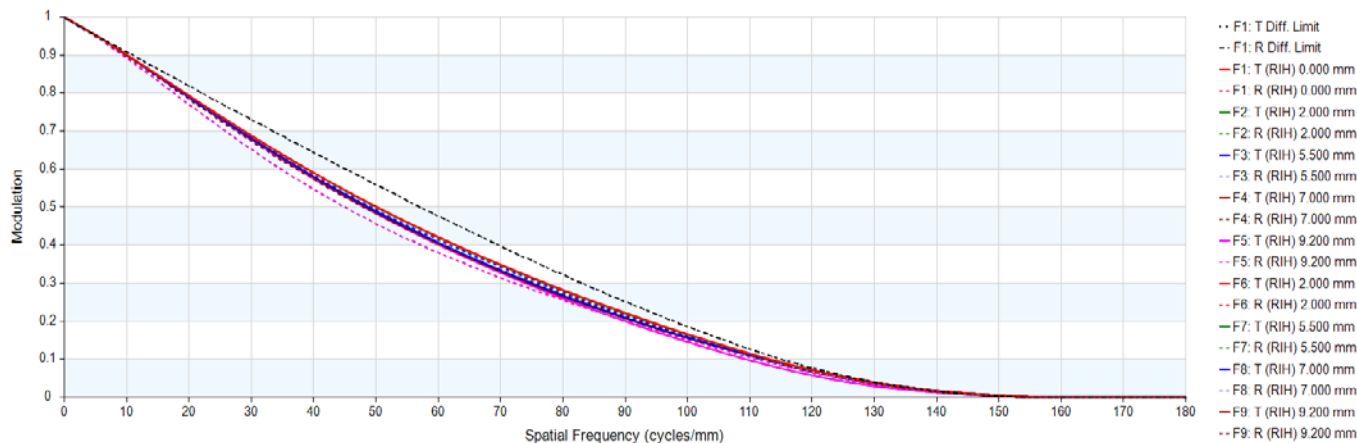


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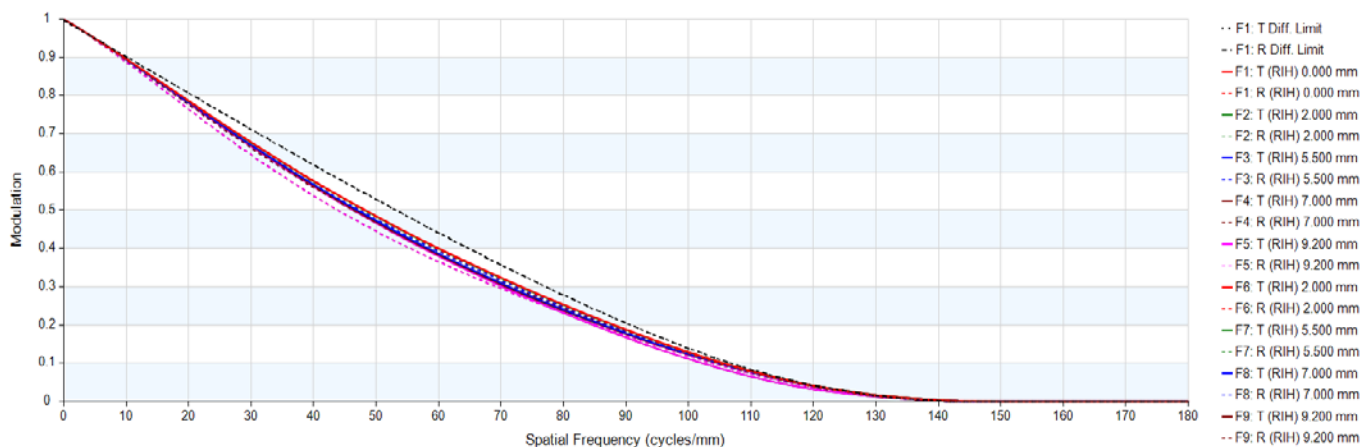
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全頻 MTF F#13

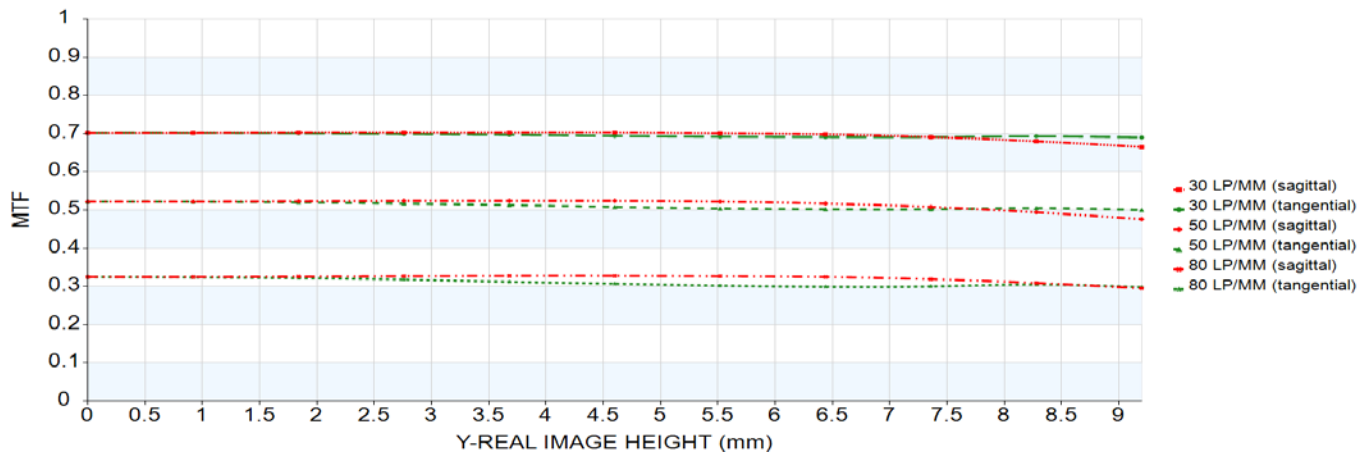


全頻 MTF F#14

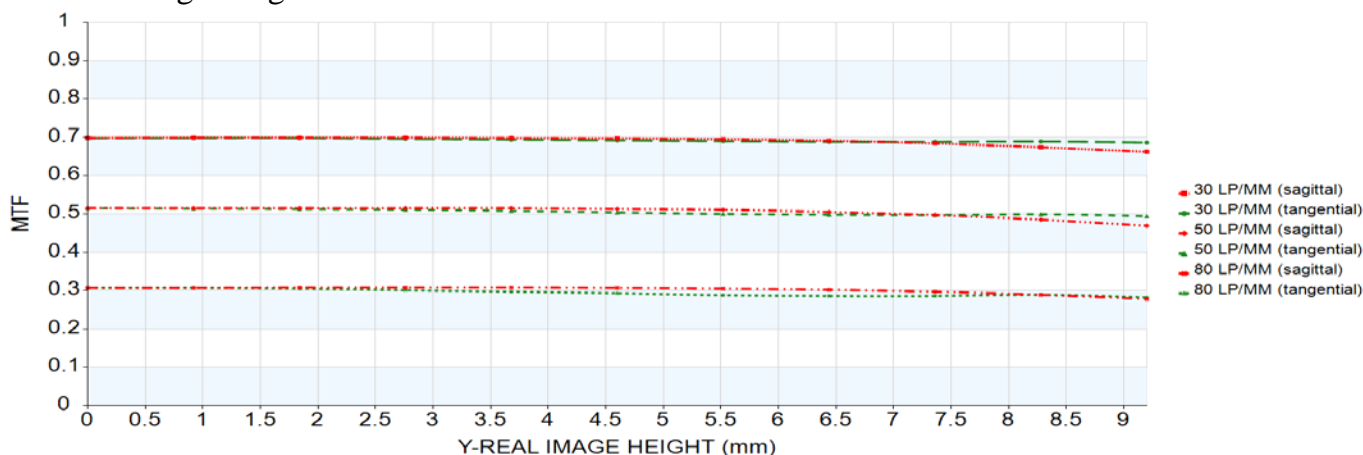


MTF vs Image Height F#11

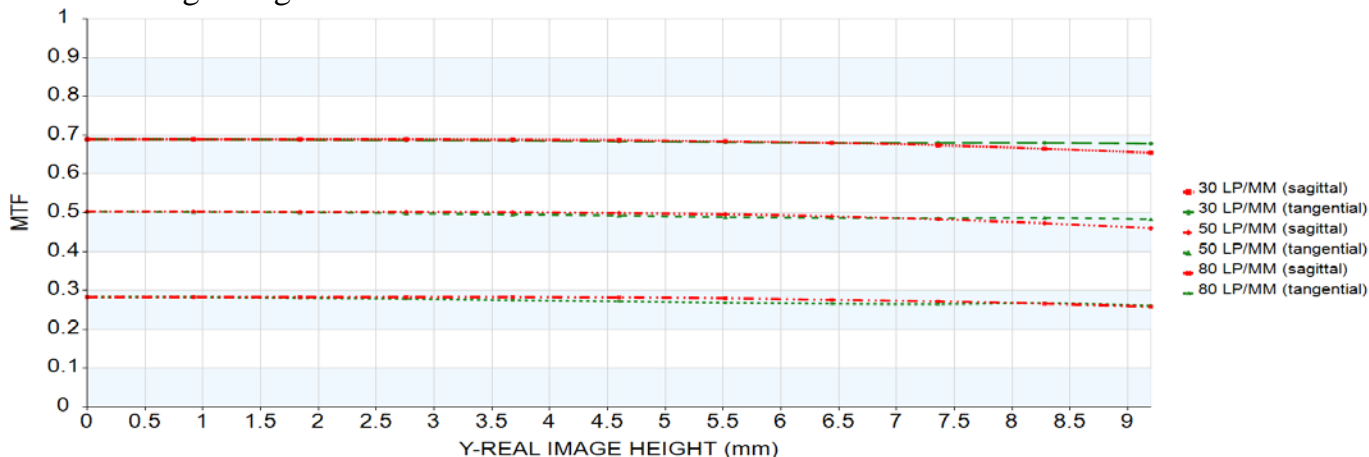
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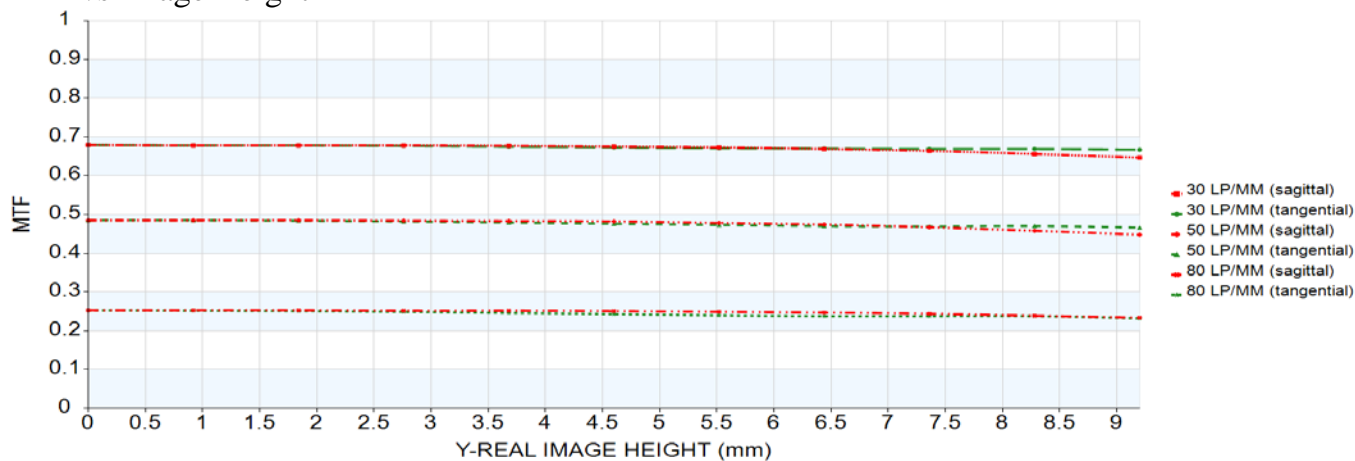
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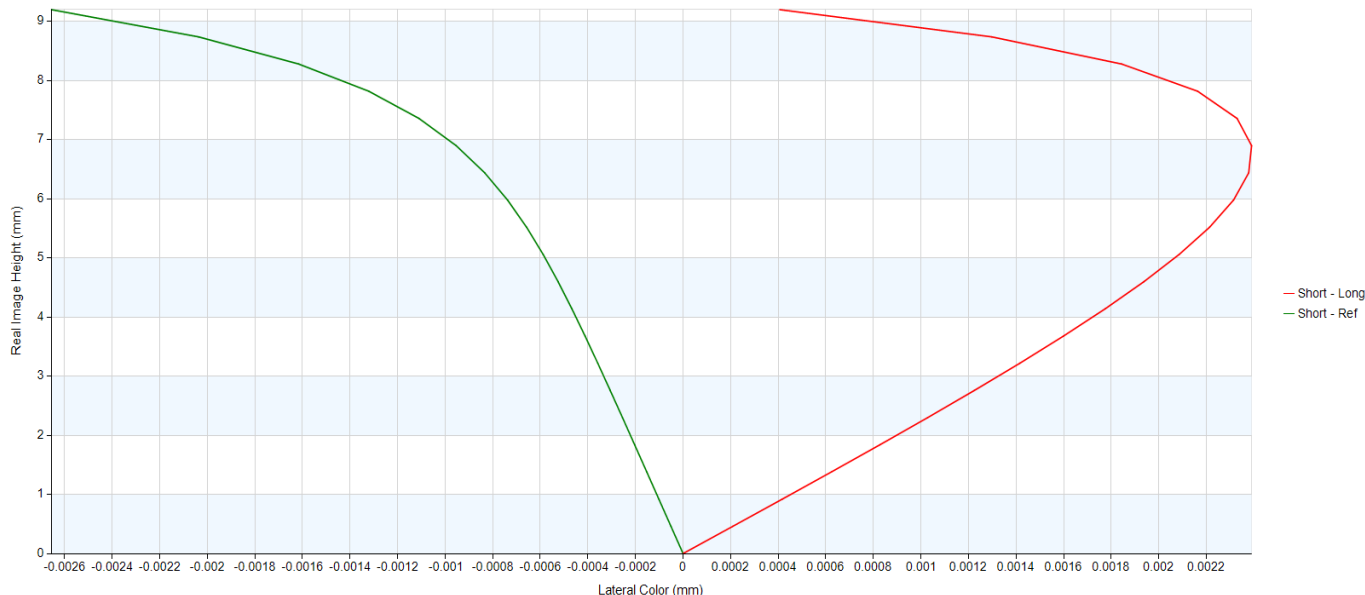
MTF vs Image Height F#13



MTF vs Image Height F#14



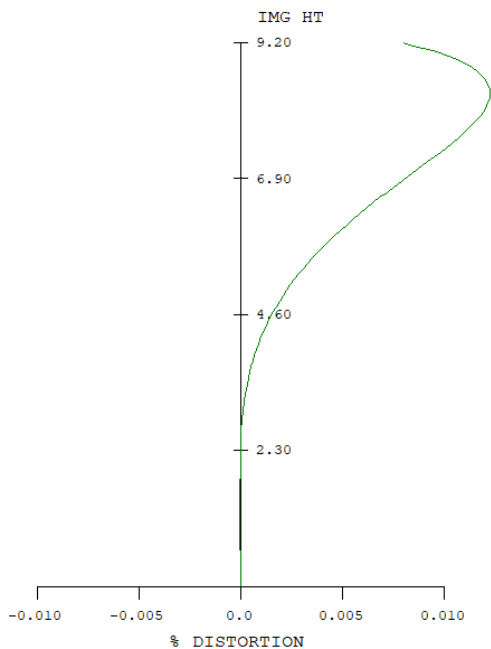
Laernal color



Distortion

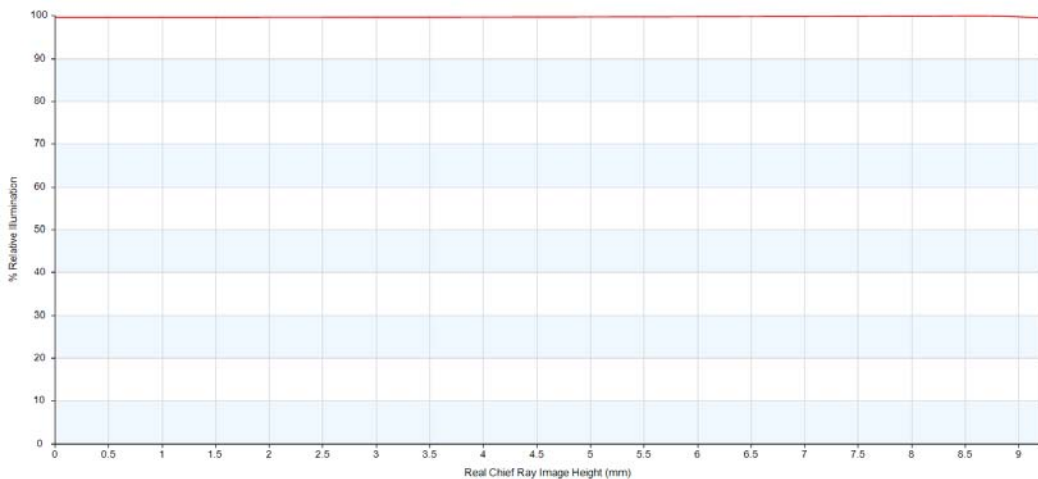
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DISTORTION



WAVELENGTH	542.0 NM		
RELATIVE FIELD HEIGHT	IMG HT	DISTORTION (PER CENT)	
0.00	0.00	0.00000	
0.10	0.92	-0.00002	
0.20	1.84	-0.00004	
0.30	2.76	0.00006	
0.40	3.68	0.00050	
0.50	4.60	0.00153	
0.60	5.52	0.00343	
0.70	6.44	0.00634	
0.80	7.36	0.00988	
0.90	8.28	0.01226	
1.00	9.20	0.00796	

RI



Field	Rel. Illum.
0.0000	99.6321
0.4600	99.6348
0.9200	99.6397
1.3800	99.6465
1.8400	99.6516
2.3000	99.6632
2.7600	99.6704
3.2200	99.6815
3.6800	99.6923
4.1400	99.7042
4.6000	99.7229
5.0600	99.7462
5.5200	99.7670
5.9800	99.7939
6.4400	99.8247
6.9000	99.8565
7.3600	99.8852
7.8200	99.9263
8.2800	99.9667
8.7400	100.0000
9.2000	99.4954

1.5 Package

Lens was packed in the carton box with EPE packing material.

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Dimension is 210*90*80mm

1.6 Reliability Test

#	Testing Items	Testing Conditions
1	Package Vibration	Sine, 2G, 10~100Hz, 3 primary axis, 30 min per orientation.
2	Package Drop	106 cm, 1 corner, 3 edges and 6 primary surfaces, total 10 drops.

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