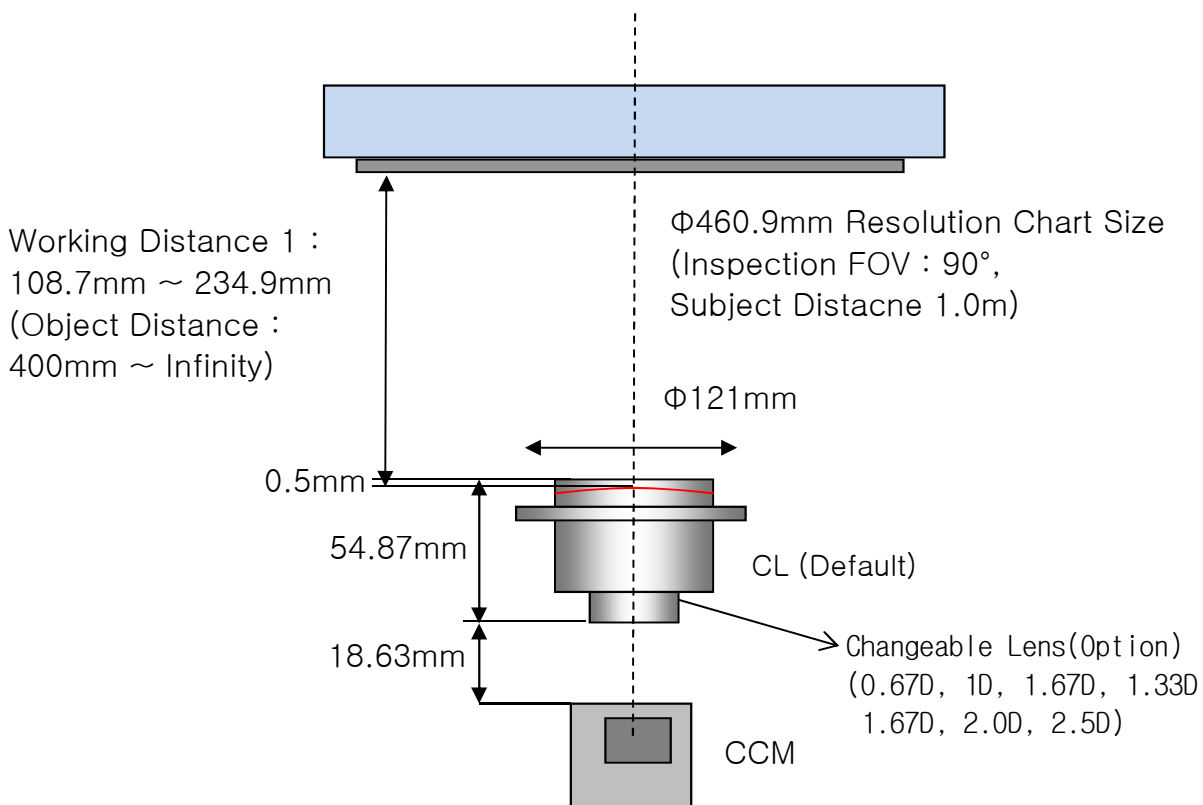


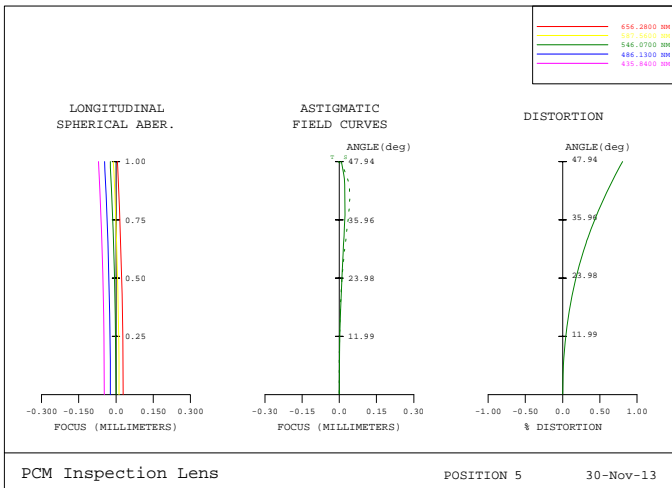
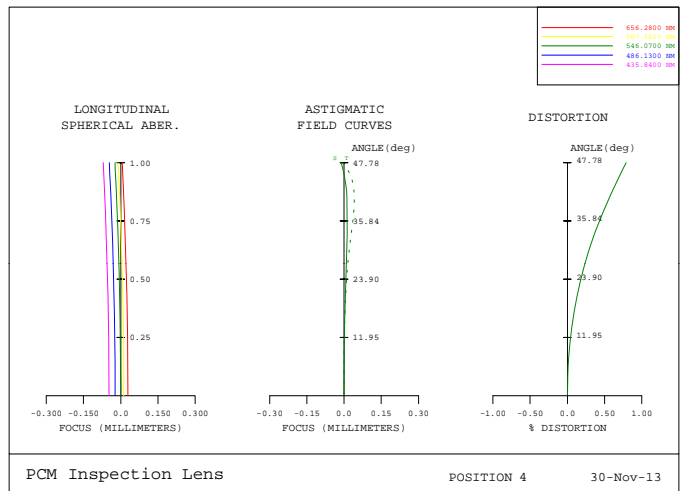
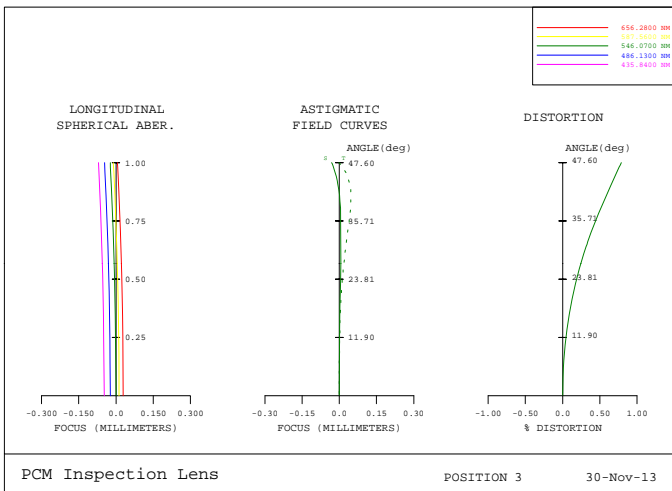
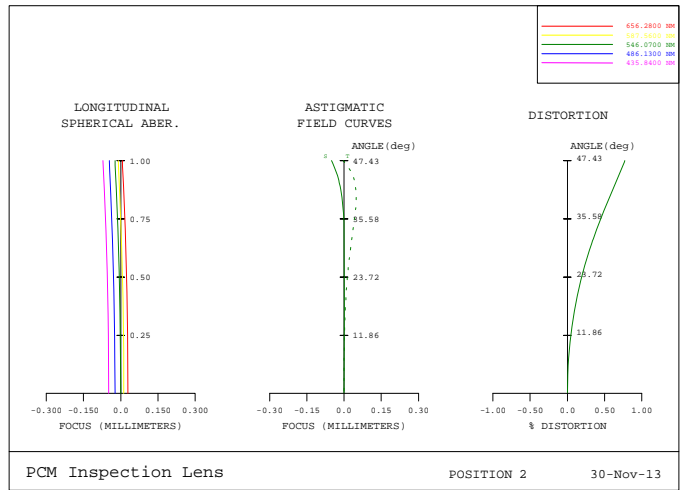
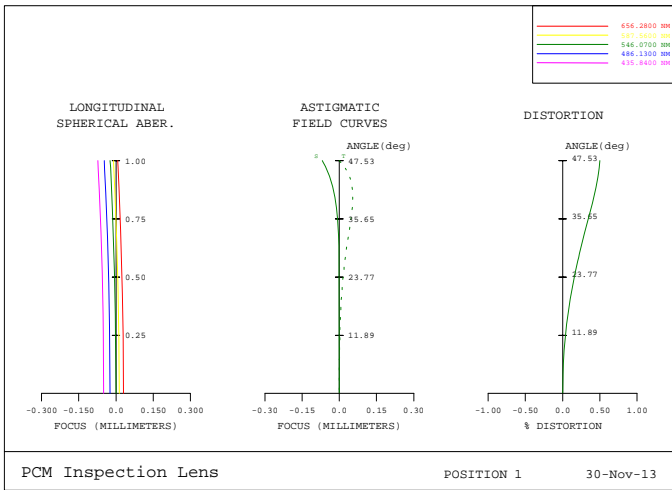
CL-921D Collimator Lens Specification

2016-05-25
OneStone

Model name	CL-921D (Designed by OneStone)
Characteristic of CL-921D	Changeable Lens
Main Lens	CL-921D (Main)
Sub Lens Sets	CL-921D (Sub 0.67D), CL-921D (Sub 1.0D) CL-921D (Sub 1.33D), CL-921D (Sub 1.67D) CL-921D (Sub 2.0D), CL-921D (Sub 2.5D)
Main plus each Sub set	ex) CL-921D (Main+Sub 0.67D)
EFL	300.0mm
Inspectable FOV of CCM	90°
Inspectable Resolution of CCM	8~20Mega Camera Lens
Ass'y Size	Φ121mm X L54.87mm
Exit Pupil Size	Φ4.5mm
Exit Pupil Position	21.0mm (from Vertex of CL CCM side to CCM)
Working Distace 1	
(from CL 1st Lens R1 surface to Chart)	162.9mm at Object Distance 1m (1D) 125.9mm at Object Distance 0.5m (2D)

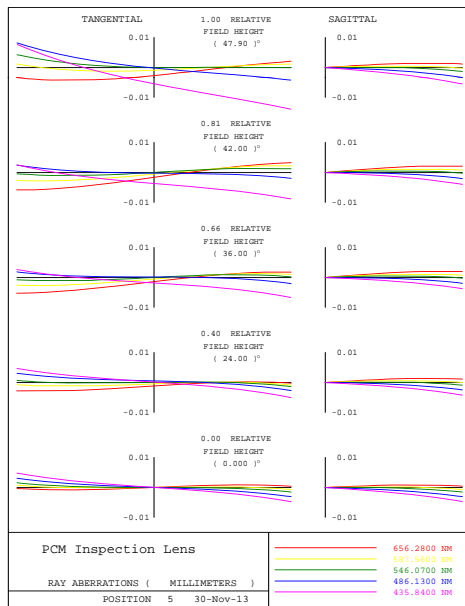
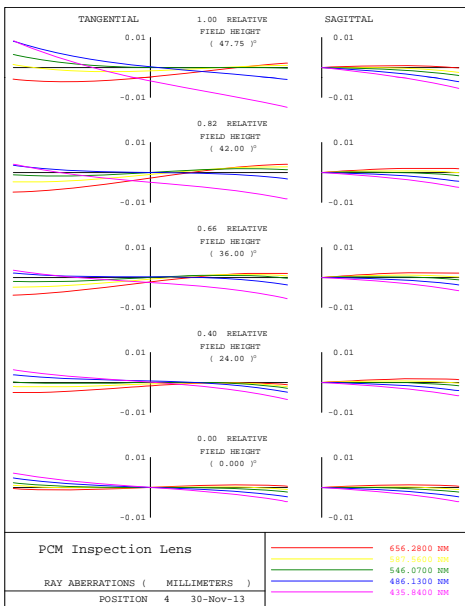
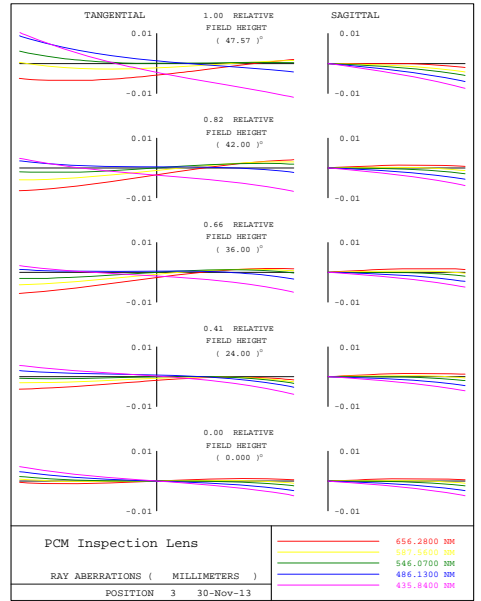
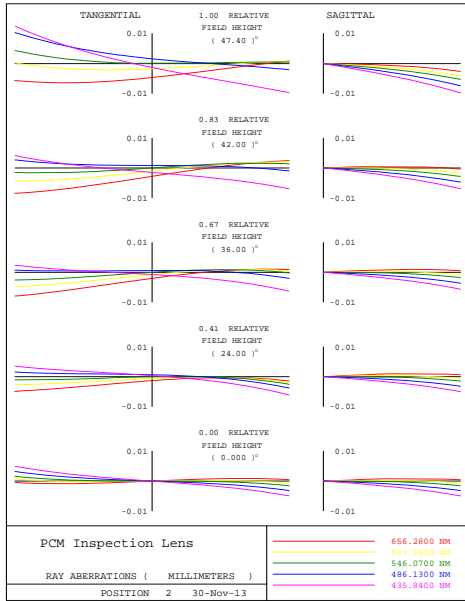
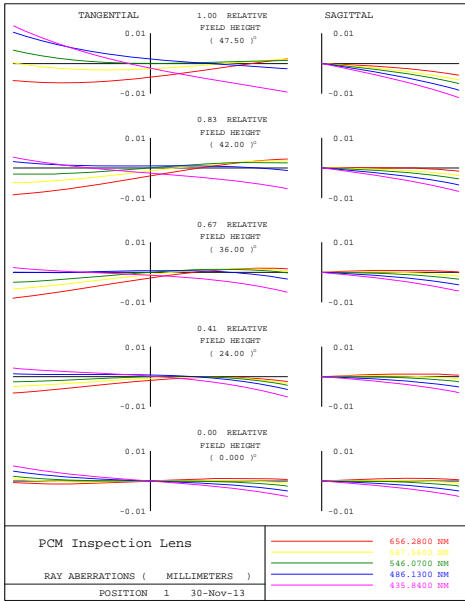


Optical Performance of CL-921D Lens



Astigmatism : less than 0.04D
 Field Curvature : less than 0.03D
 Distortion : less than 1%

Optical Performance of CL-921D Lens



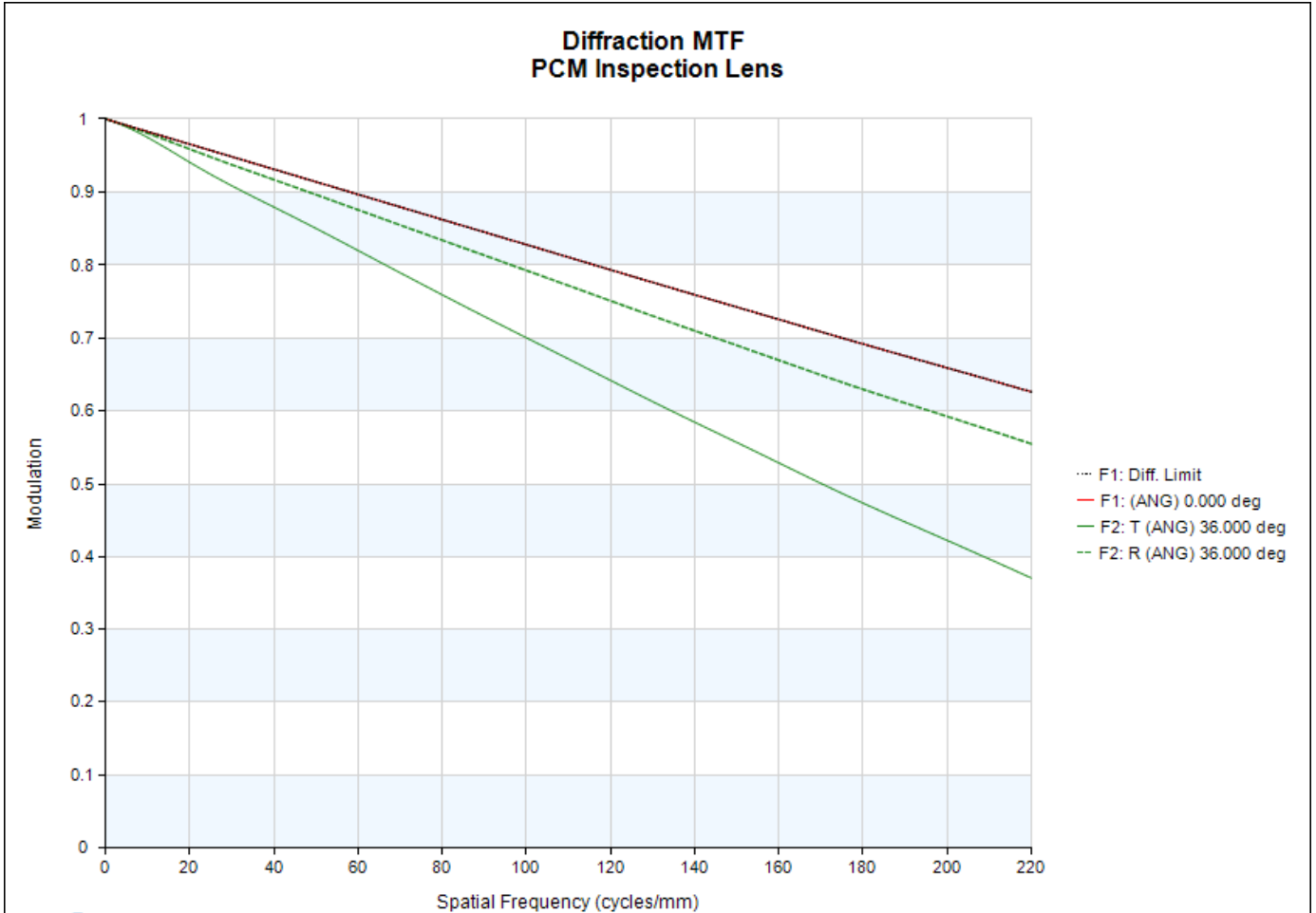
Longitudinal Chromatic Aberration : less than 0.09D
 Lateral Chromatic Aberration : less than 0.01D

MTF Analysis for FOV 89.5° Lens of A-Company

e_{fl} = 1.22mm F_{no} = 2.45

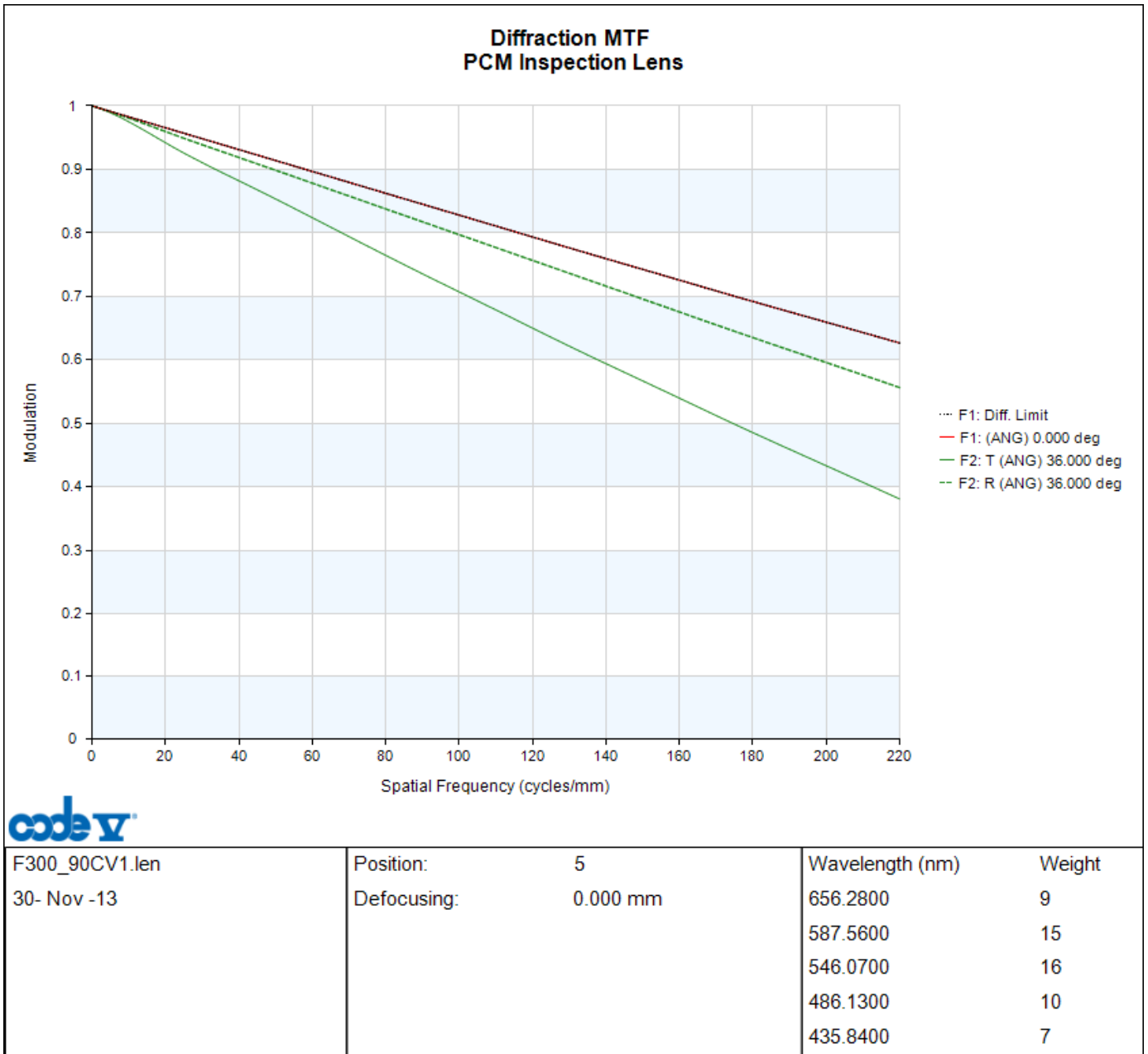
EPD = 0.498mm (= e_{fl}/F_{no})

Object Distance : 1m (Center, 0.7F)

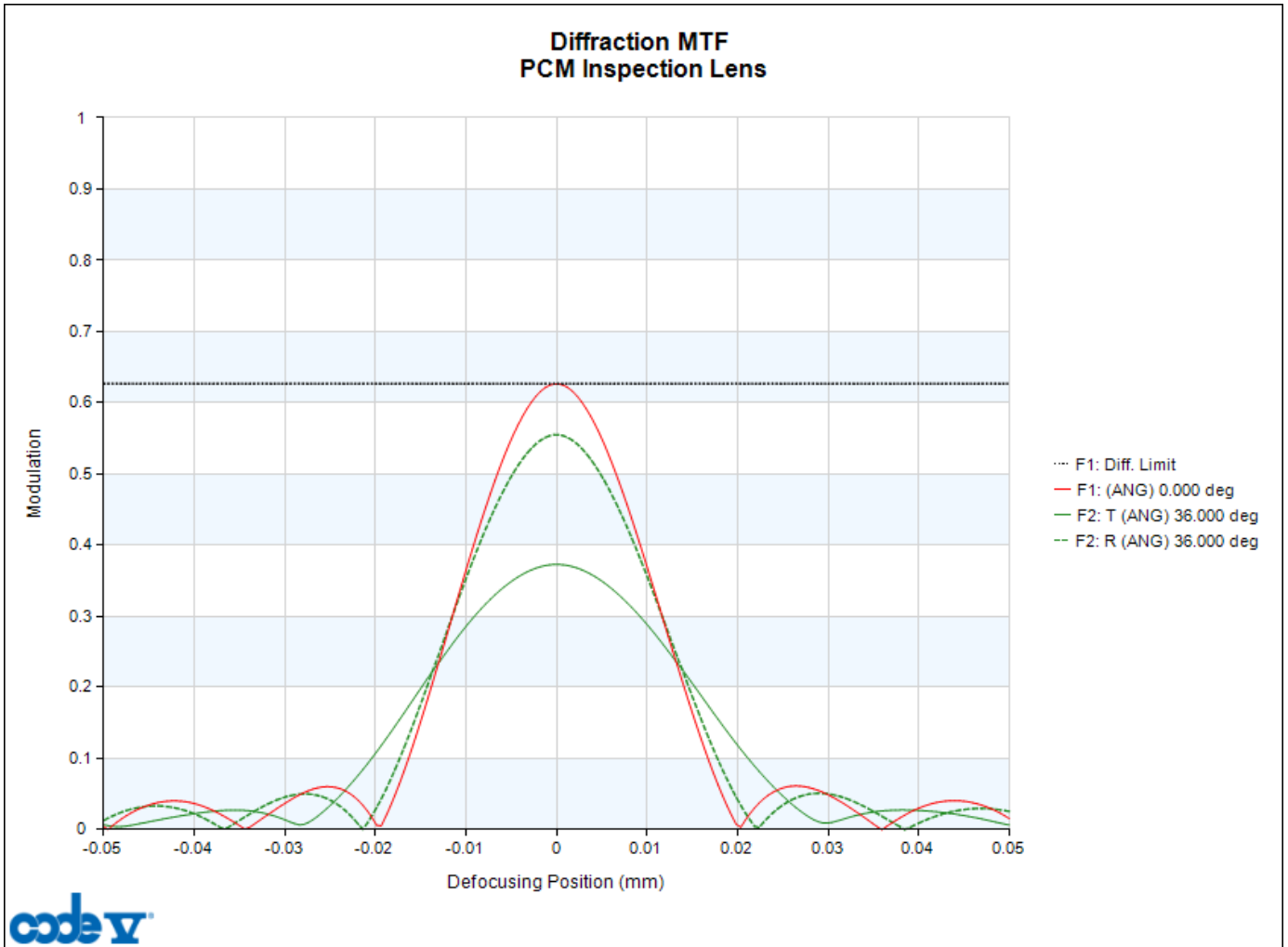


F300_90CV1.len 30- Nov -13	Position:	2	Wavelength (nm)	Weight
	Defocusing:	0.000 mm	656.2800	9
			587.5600	15
			546.0700	16
			486.1300	10
			435.8400	7

Object Distance : 0.5m (Center, 0.7F)

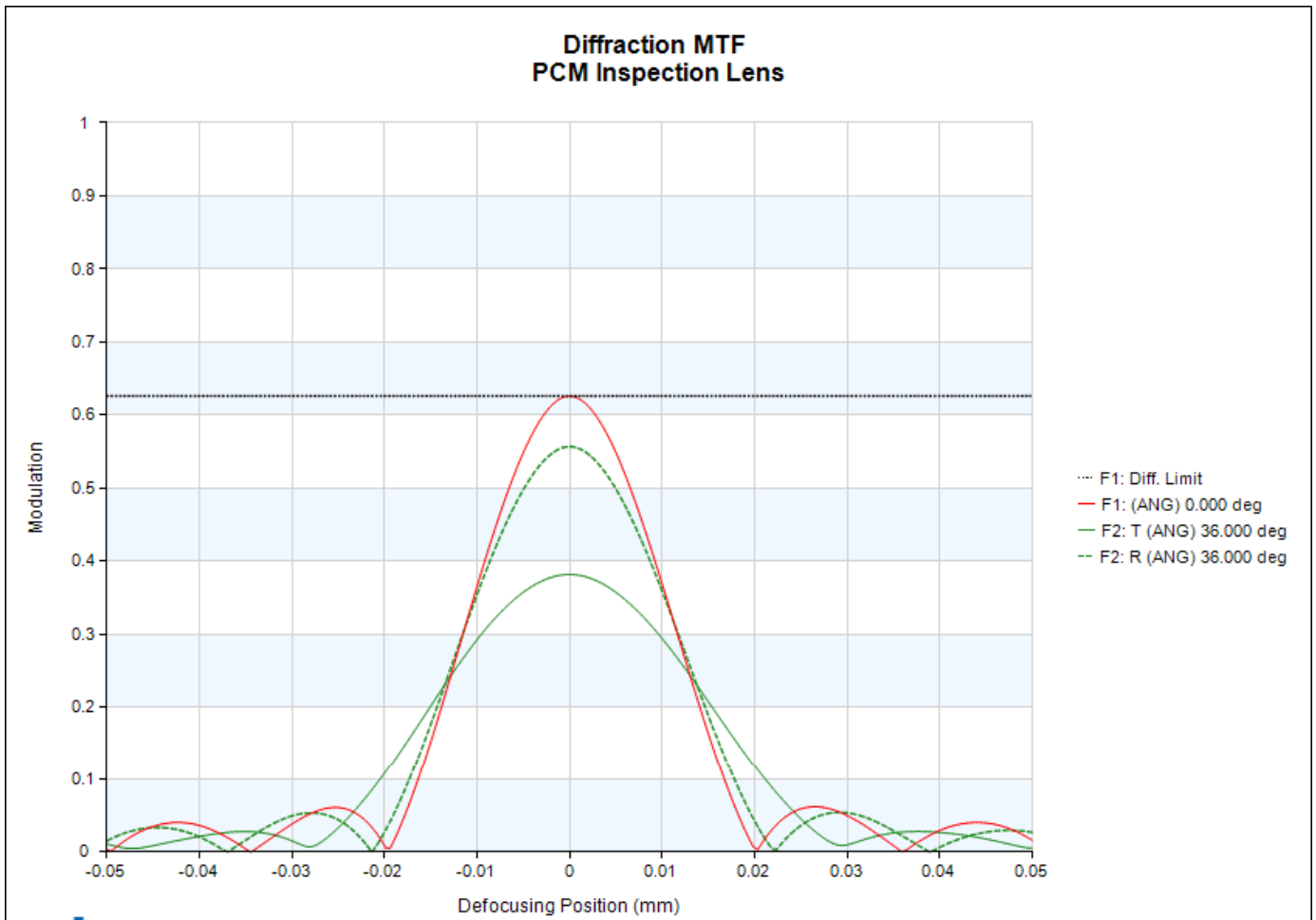


Object Distance : 1m (Center, 0.7F)



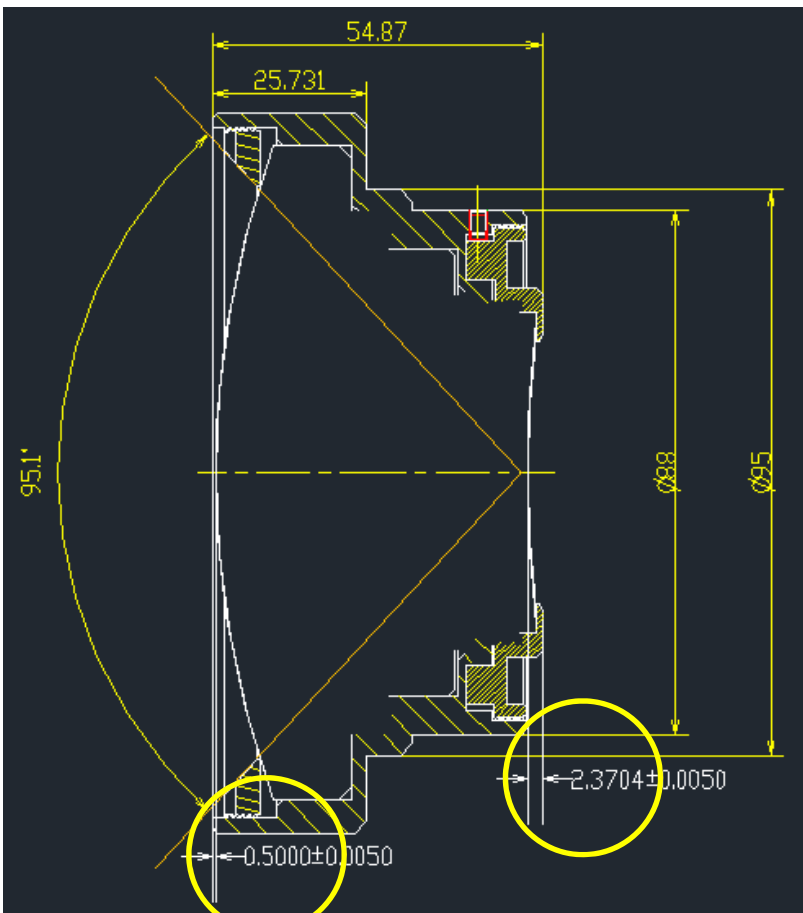
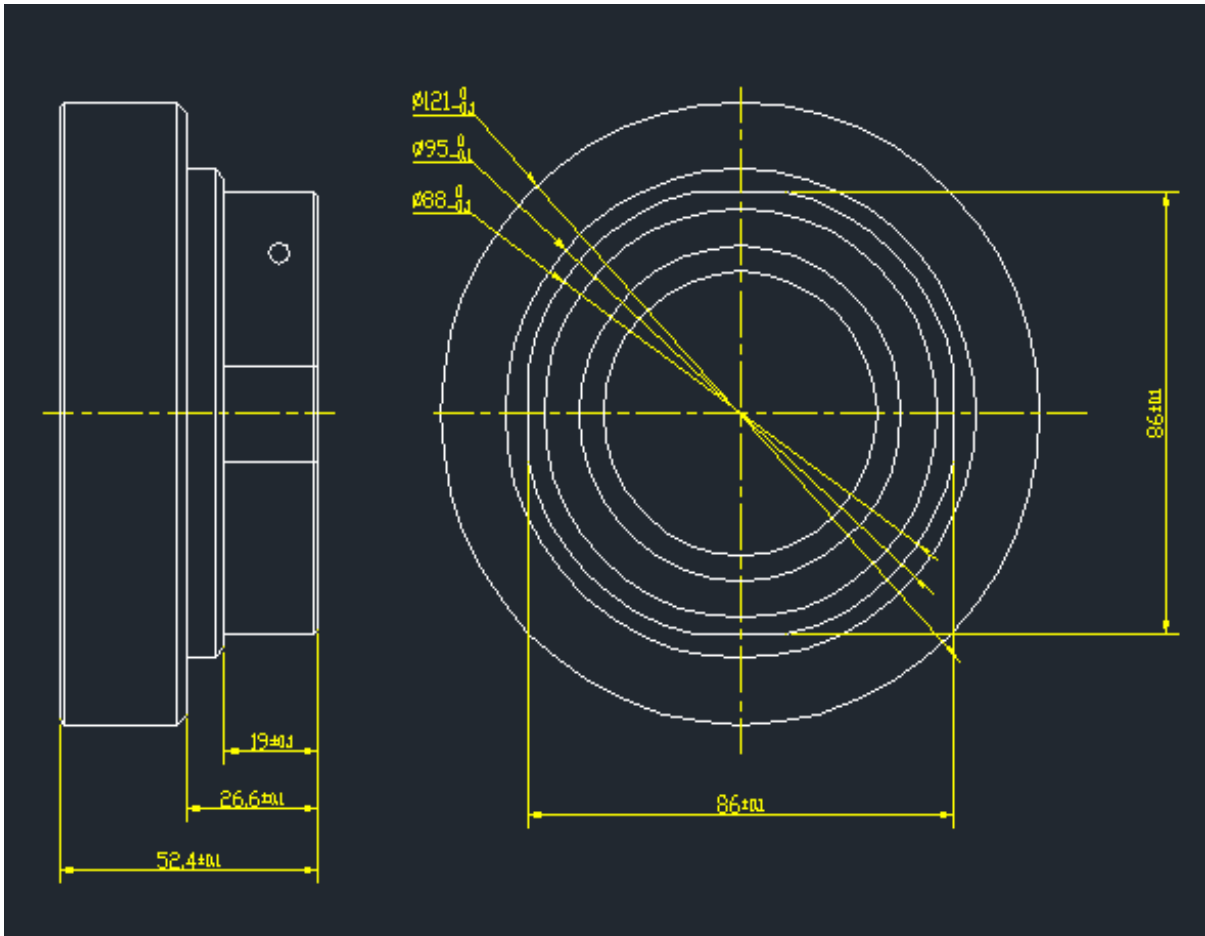
F300_90CV1.len	Position: 2	Wavelength (nm)	Weight
30- Nov -13	Frequency: 220.0 cycles/mm	656.2800	9
		587.5600	15
		546.0700	16
		486.1300	10
		435.8400	7

Object Distance : 0.5m (Center, 0.7F)



F300_90CV1.len	Position: 5	Wavelength (nm)	Weight
30- Nov -13	Frequency: 220.0 cycles/mm	656.2800	9
		587.5600	15
		546.0700	16
		486.1300	10
		435.8400	7

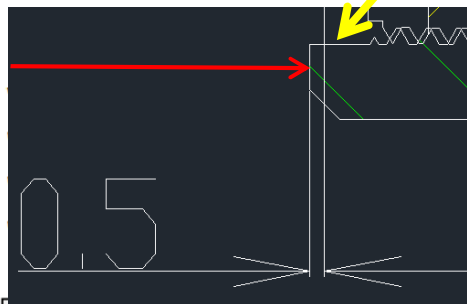
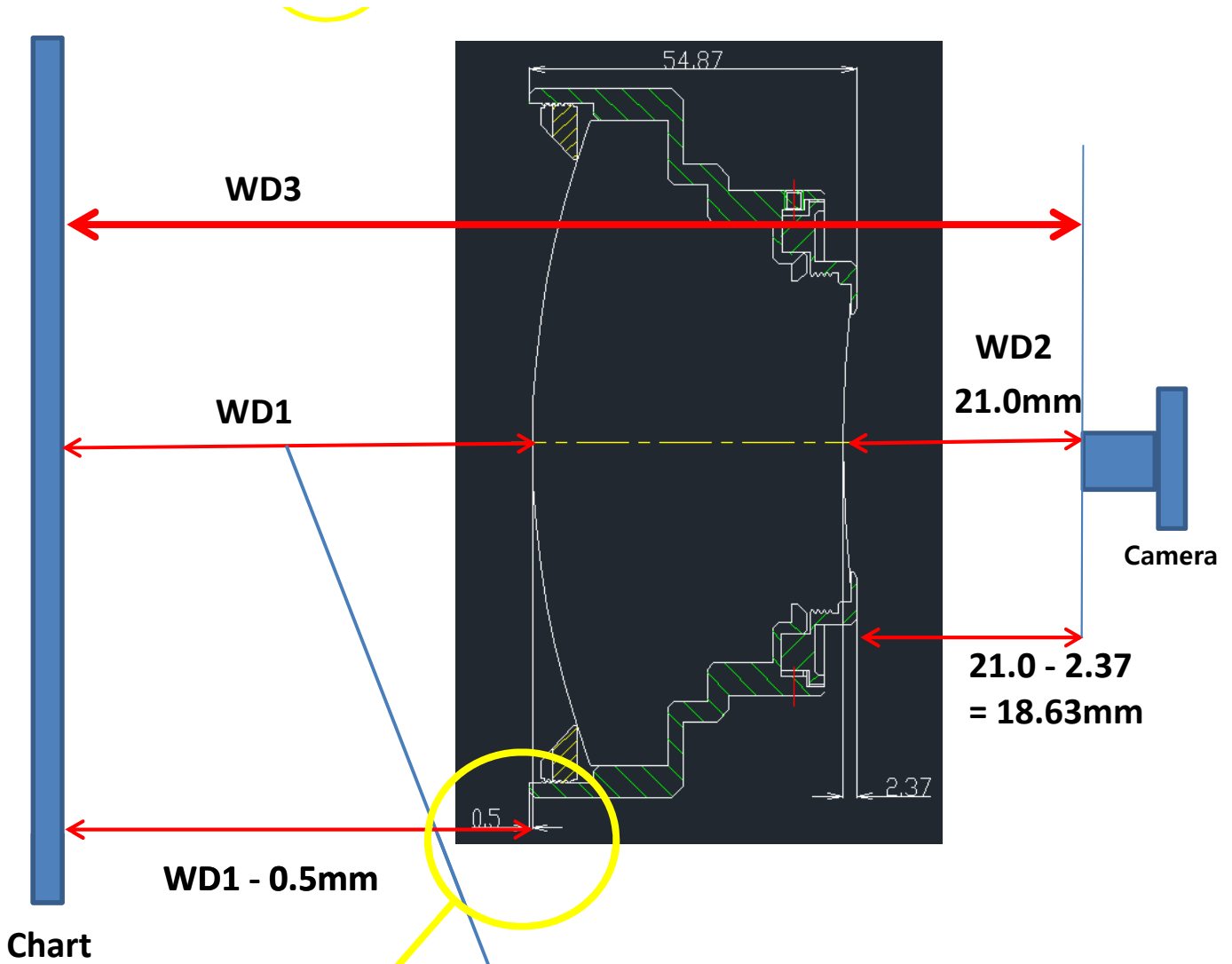
CL-921D Outer Mechanical Drawings



Main Barrel



Main + Sub Barrel



Distance of Phone Camera
 from Vertex of CL Chart side to Chart
 from Vertex of CL CCM side to CCM (WD3-WD1=WD2, 73mm)
 from Chart to CCM

PCM Module	
FOV	90

※ This Chart Size Table is based on and made by FOV of CCM Lens.

Virtual Distance (Object ~ CCM)	Sub Lens (Recom)	Working Distance 1 (Chart~C/L Vertex, Real)	Working Distance 3 (Chart~CCM, Real)	Chart Size (Φ, mm)
1.00E+100	2D	258.2	331.2	679.1
10000	2D	247.0	320.0	654.5
9000	2D	245.9	318.9	651.9
8000	2D	244.4	317.4	648.6
7000	2D	242.5	315.5	644.5

Chart Size at Full Angle 90° of CL-921D (using with Sub Lens 1D, 2D)

Virtual Distance : Subject Distance of Phone Camera

Working Distance 1 : Distance from Vertex of CL Chart side to Chart

Working Distance 2 : Distance from Vertex of CL CCM side to CCM (21mm)

Working Distance 3 : Distance from Chart to CCM

PCM Module	
FOV	90

※ This Chart Size Table is based on and made by FOV of CCM Lens.

** Both of 1D, 2D available

Virtual Distance (Object ~ CCM)	Sub Lens (Recom)	Working Distance 1 (Chart~C/L Vertex, Real)	Working Distance 3 (Chart~CCM, Real)	Chart Size (Φ, mm)
1.00E+100	1.0D	234.9	307.9	617.5
10000	1.0D	225.6	298.6	597.2
9000	1.0D	224.6	297.6	595.1
8000	1.0D	223.3	296.3	592.4
7000	1.0D	221.8	294.8	589.0
6000	1.0D	219.7	292.7	584.5
5000	1.0D	216.9	289.9	578.3
4500	1.0D	215.0	288.0	574.2
4000	1.0D	212.7	285.7	569.3
3500	1.0D	209.8	282.8	563.0
3000	1.0D	206.1	279.1	554.8
2500	1.0D	201.0	274.0	543.8
2000	1.0D	193.7	266.7	528.0
1900	1.0D	191.9	264.9	524.0
1800	1.0D	189.9	262.9	519.6
1700	1.0D	187.6	260.6	514.8
1600	1.0D	185.2	258.2	509.5
1500	1.0D	182.5	255.5	503.6
1400	1.0D	179.5	252.5	497.0
1300	1.0D	176.1	249.1	489.6
1200	1.0D	172.3	245.3	481.3
1100	1.0D	167.9	240.9	471.8
1000	1.0D	162.9	235.9	460.9
900	1.0D	157.0	230.0	448.2
800	1.0D	150.2	223.2	433.3
** 700	1.0D	142.0	215.0	415.5
** 700	2D	150.5	223.5	440.9
600	2D	139.5	212.5	416.4
500	2D	125.9	198.9	386.3
400	2D	108.7	181.7	348.3

Lens Pictures

