

## ● Lens characteristics

Lens	Model	Focal length [mm]	Aperture value [F No.]	Angle-of-view (degrees)		Angle-of-view (degrees)		Closest approach distance [m]		
				With 1/3 inch sensor KCX-M6541-00 (300,000 pixel camera) KCX-M6541-10 (1,300,000 pixel camera)					With 1/1.8 inch sensor KCX-M6541-20 (2,000,000 pixel camera)	
				Vertical	Horizontal	Vertical	Horizontal			
8 mm	KCX-M7214-00	8	F1.3-CLOSE	25.21	33.2	37.08	47.59	0.2		
12 mm	KCX-M7214-10	12	F1.4-CLOSE	16.48	21.86	24.51	31.88	0.3		
16 mm	KCX-M7214-20	16	F1.4-CLOSE	12.57	16.71	18.77	24.51	0.4		
25 mm	KCX-M7214-30	25	F1.4-CLOSE	8.18	10.89	12.25	16.06	0.5		
8 mm (megapixel support)	KCX-M7214-40	8	F1.4-F16	25.36	33.4	37.3	47.86	0.1		
12 mm (megapixel support)	KCX-M7214-50	12	F1.4-F16	16.65	22.08	24.76	32.2	0.1		
16 mm (megapixel support)	KCX-M7214-60	16	F1.4-F16	12.68	16.85	18.92	24.72	0.1		
25 mm (megapixel support)	KCX-M7214-70	25	F1.4-F16	8.24	10.97	12.33	16.16	0.15		

\* This table shows the angle-of-view for Yamaha's standard lenses. If the angle-of-view is greater, there might be more distortion at the edge of the image.

## ● Angle-of-view size, WD, and magnification when close-up ring is used

\* WD is the lens tip reference.

Close-up ring [mm]			Lens							
			8 mm KCX-M7214-00		12 mm KCX-M7214-10		16 mm KCX-M7214-20		25 mm KCX-M7214-30	
None	Angle-of-view size X × Y [mm]	WD [mm]	200		300		400		500	
		KCX-M6541-00 (300,000 pixels)	96.2 × 126.2		91.4 × 119.9		91.4 × 119.9		71.7 × 94.1	
		KCX-M6541-10 (1,300,000 pixels)	95.4 × 126.4		90.6 × 120		90.6 × 120		71.1 × 94.2	
		KCX-M6541-20 (2,000,000 pixels)	143.2 × 188.1		136 × 178.7		136 × 178.7		106.7 × 140.1	
	Optical magnification	0.038		0.040		0.040		0.051		
0.5	Angle-of-view size X × Y [mm]	WD [mm]	69.5	118.6	143	296.8	222	524.1	358.5	1269.4
		KCX-M6541-00 (300,000 pixels)	36.6 × 48	59 × 77.4	45.7 × 60	91.4 × 119.9	51.5 × 67.6	118 × 154.7	51.5 × 67.6	182.8 × 239.8
		KCX-M6541-10 (1,300,000 pixels)	36.3 × 48	58.5 × 77.5	45.3 × 60	90.6 × 120	51.1 × 67.7	116.9 × 154.9	51.1 × 67.7	181.1 × 240
		KCX-M6541-20 (2,000,000 pixels)	54.4 × 71.5	87.8 × 115.3	68 × 89.4	136 × 178.7	76.6 × 100.7	175.5 × 230.5	76.6 × 100.7	271.9 × 357.3
	Optical magnification	0.100	0.062	0.080	0.040	0.071	0.031	0.071	0.020	
1.0	Angle-of-view size X × Y [mm]	WD [mm]	38.7	53.8	91.3	142.3	152	257.1	280.8	635.9
		KCX-M6541-00 (300,000 pixels)	22.6 × 29.6	29.5 × 38.7	30.5 × 40	45.7 × 60	36.2 × 47.5	60 × 78.7	40.2 × 52.7	91.4 × 119.9
		KCX-M6541-10 (1,300,000 pixels)	22.4 × 29.7	29.3 × 38.8	30.2 × 40	45.3 × 60	35.9 × 47.6	59.4 × 78.7	39.9 × 52.8	90.6 × 120
		KCX-M6541-20 (2,000,000 pixels)	33.6 × 44.2	43.9 × 57.7	45.4 × 59.6	68 × 89.4	53.9 × 70.8	89.2 × 117.2	59.8 × 78.6	136 × 178.7
	Optical magnification	0.162	0.124	0.120	0.080	0.101	0.061	0.091	0.040	
1.5	Angle-of-view size X × Y [mm]	WD [mm]			65.4	90.8	114.5	168.1	230.9	424.7
		KCX-M6541-00 (300,000 pixels)			22.8 × 29.8	30.3 × 39.7	27.7 × 36.4	39.8 × 52.2	33 × 43.2	61 × 80
		KCX-M6541-10 (1,300,000 pixels)			22.5 × 29.9	30 × 39.7	27.5 × 36.4	39.4 × 52.2	32.7 × 43.3	60.4 × 80
		KCX-M6541-20 (2,000,000 pixels)			33.8 × 44.4	45 × 59.1	41.2 × 54.2	59.2 × 77.7	49 × 64.4	90.7 × 119.1
	Optical magnification			0.161	0.121	0.132	0.092	0.111	0.060	
2.0	Angle-of-view size X × Y [mm]	WD [mm]			50	65.1	91.2	123.6	196.3	319.1
		KCX-M6541-00 (300,000 pixels)			18.2 × 23.9	22.8 × 29.8	22.6 × 29.6	30 × 39.4	28.2 × 36.9	46.3 × 60.7
		KCX-M6541-10 (1,300,000 pixels)			18.1 × 23.9	22.5 × 29.9	22.4 × 29.7	29.7 × 39.4	27.9 × 37	45.9 × 60.8
		KCX-M6541-20 (2,000,000 pixels)			27.1 × 35.6	33.8 × 44.4	33.6 × 44.2	44.6 × 58.6	41.9 × 55	68.9 × 90.5
	Optical magnification			0.201	0.161	0.162	0.122	0.130	0.079	
5.0	Angle-of-view size X × Y [mm]	WD [mm]							104.2	129
		KCX-M6541-00 (300,000 pixels)							14.7 × 19.2	18.4 × 24.1
		KCX-M6541-10 (1,300,000 pixels)							14.5 × 19.2	18.3 × 24.2
		KCX-M6541-20 (2,000,000 pixels)							21.8 × 28.6	27.4 × 36
	Optical magnification							0.250	0.199	

Close-up ring [mm]			Lens							
			8 mm lens for megapixel KCX-M7214-40		12 mm lens for megapixel KCX-M7214-50		16 mm lens for megapixel KCX-M7214-60		25 mm lens for megapixel KCX-M7214-70	
None	Angle-of-view size X × Y [mm]	WD [mm]	100		100		100		150	
		KCX-M6541-00 (300,000 pixels)	52.3 × 68.5		36.6 × 48		26.9 × 35.3		24.6 × 32.2	
		KCX-M6541-10 (1,300,000 pixels)	51.8 × 68.6		36.3 × 48		26.7 × 35.3		24.4 × 32.3	
		KCX-M6541-20 (2,000,000 pixels)	77.7 × 102.1		54.4 × 71.5		40 × 52.6		36.5 × 48	
	Optical magnification	0.070		0.100		0.136		0.149		
0.5	Angle-of-view size X × Y [mm]	WD [mm]	46	113.6	66.1	283.2	77.8	505.4	130.3	1232.2
		KCX-M6541-00 (300,000 pixels)	27.7 × 36.4	58.1 × 76.2	25.4 × 33.3	89.2 × 117	22.1 × 28.9	118 × 154.7	21.7 × 28.4	182.8 × 239.8
		KCX-M6541-10 (1,300,000 pixels)	27.5 × 36.4	57.5 × 76.2	25.2 × 33.4	88.4 × 117.1	21.9 × 29	116.9 × 154.9	21.5 × 28.5	181.1 × 240
		KCX-M6541-20 (2,000,000 pixels)	41.2 × 54.2	86.4 × 113.5	37.8 × 49.7	132.7 × 174.3	32.8 × 43.1	175.5 × 230.5	32.2 × 42.3	271.9 × 357.3
	Optical magnification	0.132	0.063	0.144	0.041	0.166	0.031	0.169	0.020	
1.0	Angle-of-view size X × Y [mm]	WD [mm]			47.2	131.9	62.6	243	114.6	607.2
		KCX-M6541-00 (300,000 pixels)			19.8 × 26	45.2 × 59.2	18.6 × 24.4	59 × 77.4	19.4 × 25.4	91.4 × 119.9
		KCX-M6541-10 (1,300,000 pixels)			19.6 × 26	44.8 × 59.3	18.4 × 24.4	58.5 × 77.5	19.2 × 25.4	90.6 × 120
		KCX-M6541-20 (2,000,000 pixels)			29.4 × 38.7	67.2 × 88.3	27.7 × 36.3	87.8 × 115.3	28.8 × 37.9	136 × 178.7
	Optical magnification			0.185	0.081	0.197	0.062	0.189	0.040	
1.5	Angle-of-view size X × Y [mm]	WD [mm]			35.2	81.4	51.5	155.5	102	398.9
		KCX-M6541-00 (300,000 pixels)			16.3 × 21.4	32.7 × 42.9	16.1 × 21.1	39.4 × 51.6	17.5 × 23	61 × 80
		KCX-M6541-10 (1,300,000 pixels)			16.1 × 21.4	32.4 × 42.9	15.9 × 21.1	39 × 51.7	17.4 × 23	60.4 × 80
		KCX-M6541-20 (2,000,000 pixels)			24.2 × 31.8	48.6 × 63.8	23.9 × 31.4	58.5 × 76.9	26.1 × 34.2	90.7 × 119.1
	Optical magnification			0.225	0.112	0.228	0.093	0.209	0.060	
2.0	Angle-of-view size X × Y [mm]	WD [mm]			26.9	56.2	43	111.7	91.5	294.7
		KCX-M6541-00 (300,000 pixels)			13.8 × 18.1	22.5 × 29.5	14.2 × 18.6	29.8 × 39	16 × 21	45.7 × 60
		KCX-M6541-10 (1,300,000 pixels)			13.7 × 18.1	22.3 × 29.5	14 × 18.6	29.5 × 39.1	15.9 × 21	45.3 × 60
		KCX-M6541-20 (2,000,000 pixels)			20.5 × 26.9	33.4 × 43.9	21 × 27.6	44.3 × 58.1	23.8 × 31.3	68 × 89.4
	Optical magnification			0.266	0.163	0.259	0.123	0.229	0.080	
5.0	Angle-of-view size X × Y [mm]	WD [mm]							53.9	107.2
		KCX-M6541-00 (300,000 pixels)							10.5 × 13.8	18.3 × 24
		KCX-M6541-10 (1,300,000 pixels)							10.4 × 13.8	18.2 × 24
		KCX-M6541-20 (2,000,000 pixels)							15.6 × 20.5	27.2 × 35.8
	Optical magnification							0.349	0.200	

\* The above table shows the field of view when the standard lens and close-up ring are used. (Closest distance value is shown in No Close-up Ring column).

\* If a close-up ring is not used, a WD less than the value shown in this table cannot be used.

\* If a close-up ring is used, only WD in the region of this value can be used.

\* Values in this table are for reference only; Actual values may vary.

\* 5 megapixel camera is scheduled to be released in March 2016. Contact a Yamaha representative for details.