

光电系统与工程

基于ZEMAX的手机摄像镜头设计

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摘要:

在光学工程软件ZEMAX的辅助下, 配套采用像元大小为1.75μm的CMOS图像传感器, 设计了一款500万像素的手机镜头, 镜头视场角60°, F/#2.8, 半像高2.87mm, 镜头总长为6mm, 镜头为3P1G结构, 第1、3、4片镜片采用非球面塑料, 第2片镜片采用球面透镜。各个视场的横向像差均小于20μm, 均方根半径(RMS Radius)都在艾利斑之内, 在1/2奈奎斯特频率处绝大部分视场MTF值都大于0.6, 可以获得优质的成像效果。

关键词: 手机镜头 ZEMAX 500万像素 调制传递函数 像差校正

Design of mobile phone camera lens based on ZEMAX

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Abstract:

By the aid of optical engineering software ZEMAX, a five mega pixel mobile phone camera lens matched with one CMOS image sensor of 1.75μm pixel size was designed, whose FOV is 60°, F number is 2.8, half image height is 2.87mm, total length is 6mm and structure is 3P1G. Aspheric plastic was used for the first, third and fourth lenses. Sphere glass was used for the second lens. Transverse aberration of all the FOVs is less than 20μm, RMS radius are less than Airy disk, and MTFs of most FOVs at half the Nyquist frequency (285lp/mm)of CMOS are greater than 0.6. This lens assembly has an excellent imaging performance.

Keywords: mobile phone lens ZEMAX 5 mega-pixel camera MTF aberration correction

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