

10

Starting from 2004

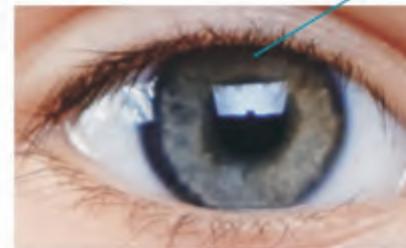
10 years Compact Camera Module (CCM)
Manufacturing History
World-class Manufacturer of CCM

◎ Advantages of Truly CCM

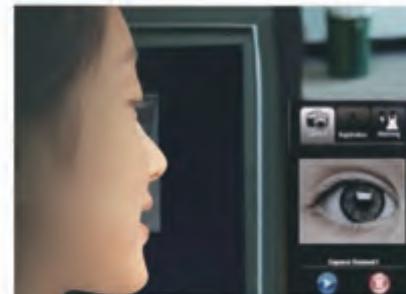
Complete Range of Products	Rich Experience	Leading Technology	Stable Supply
Truly supplies featured camera module including OIS\Closed Loop\Iris Recognition\3D\Large Aperture\Wide Field of View, etc. Truly camera module resolution range covers VGA to 20M pixels.	Truly has been focusing on CCM R&D and production since 2004, which has years experience.	Truly has the world's leading CSP and automatic COB chip packaging technology, high precise wafer cutting technology and high resolution stain control technology.	More than 70% staffs are local people, low employee turnover rate ensures stable shipment.

Camera » Iris Recognition Camera Module

- Iris recognition is one of the biometric identification systems with high accuracy , which has higher safety level. It is mainly applied to financial payment (E-wallet, credit card, ATM withdrawals, etc.), identity ID recognition (home\office\business activities, cloud computing, network backup, network personal information identification, etc.).



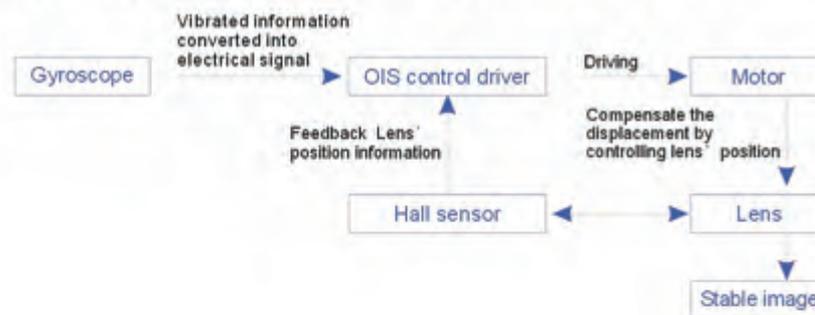
Iris
Biological Recognition
High Safety Grade



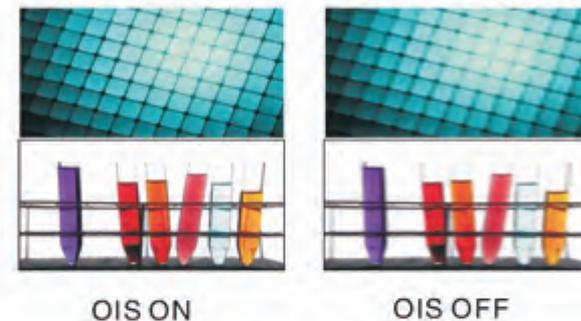
Camera » Optical Image Stabilization (OIS) Camera Module

- When shooting with jitter, the vibrated information will be converted into electrical signals by gyroscope and sent to OIS control driver, OIS control driver drives the motor to control the lens moving in order to compensate the effects of jitter. Hall Sensor feeds back the position information of lens to OIS control driver. Therefore, it generates close-loop control to maintains the stabilization and definition of image.

Operating principle of Optical Image Stabilization Camera:



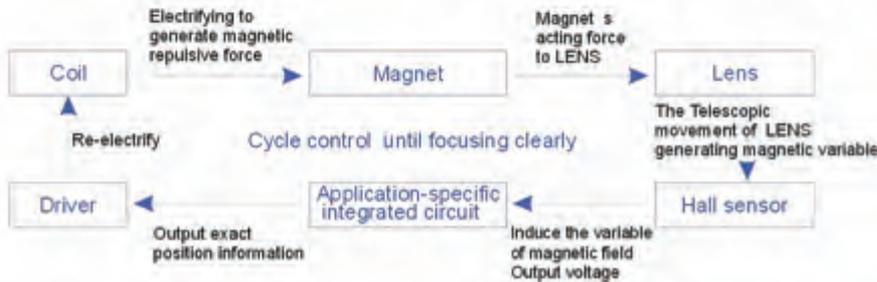
Effect Demonstration of OIS



Camera » Closed Loop Auto Focusing Camera Module

- Compared with ordinary focusing motors, closed loop auto focusing motors are with more fast and accurate focusing and lower power consumption, which is the first choice of high-end smart-phone cameras.

Operating principle of closed loop focusing motor camera:



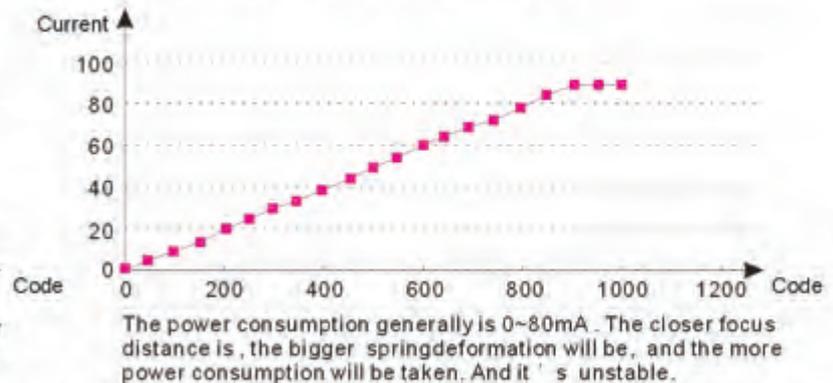
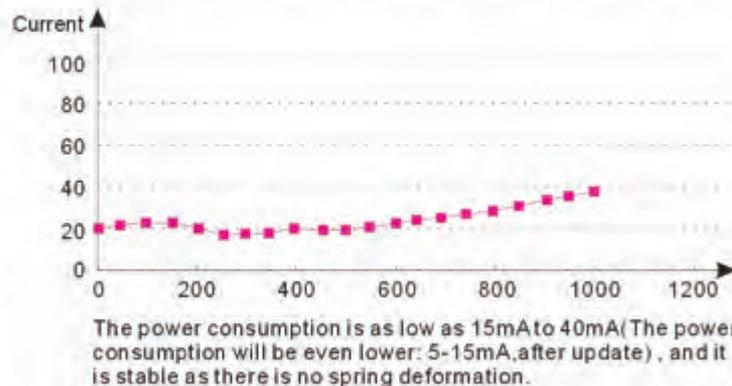
The advantages of closed loop focusing motor camera:

1. Faster focusing



2. Lower power consumption and more stable focusing

power consumption comparison between closed loop(left) and normal motor(right)



Camera » Ultra-high Pixel Camera Module

Visual impact brought by 20Mega pixels camera

- 1.It can carry more than 6 pieces precision lens sets and the blue glass filter, providing better definition and restoring real color ;
- 2.It can shoot 4K ultra-high definition video, sharing 4K TV for synchronized broadcast.



Camera » 3D Camera Module

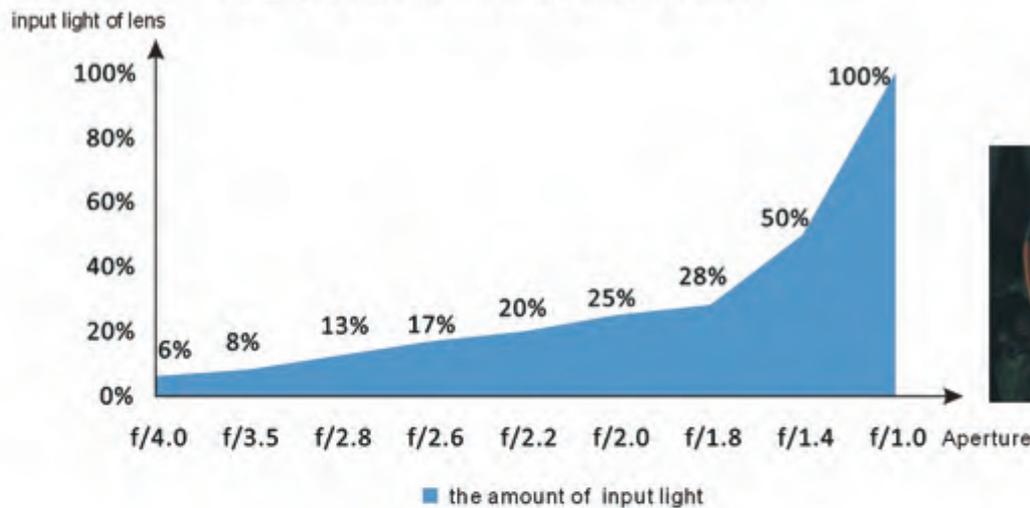
- ### 3D Camera Module
- The data of double 5Mega Pixel auto-focusing camera is compounded to 3D format data by 301H chip and output to 3D display formatting module to refresh screen for realizing naked 3D display effect.



Camera » Large Aperture Camera Module

- Large aperture camera enlarges the amount of light input to enhance the shooting quality under low-light shooting situation; Enhance Bokeh to get professional photographing effect.
- Truly can supply compact camera module with F1.8\2.0\2.2, and other size of aperture.

the relationship between Aperture and input light as below, the bigger the aperture is, the larger the amount of input light will be



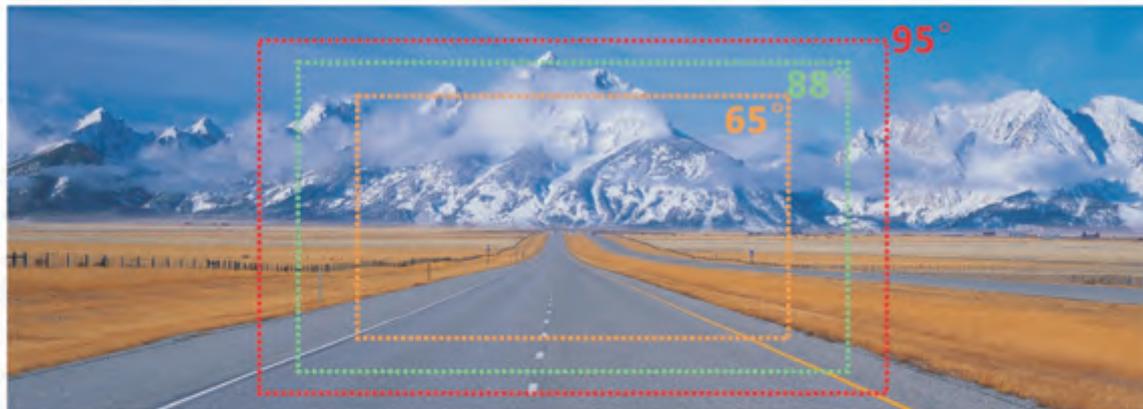
the comparison between 1.8 large aperture and 2.4 aperture under dark state of 5lux



Camera » Wide View Angle Camera Module

- ◎ **Field angle** : Included angle of camera central point to two diagonal endpoints of imaging plane.
The advantages : The bigger field angle is , the more content the photo can contain.
- ◎ Truly can provide front/rear cameras in 5 Mega pixel with 80° , 88° field angle , and 8 Mega pixel with 84° field angle.

As following picture: the bigger field angle is , the bigger photo is.



Camera » Smart Automotive Camera

- ◎ High reliable , High frame rate , Multi-functional wireless , Ethernet interface
- ◎ The advantages of Truly Automotive Camera:
 - Complete camera type : Lane departure warning, surround view , rear-view , camera, rear view camera, night view camera car driving recoder camera.
 - Product specification : Products are made of automotive-class material.
 - Reliable products : Adopting foreign advanced reliability test equipment and certifications.

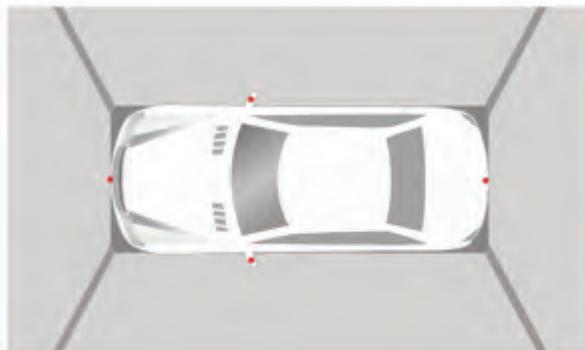


Camera » Surround View Camera Module with Ethernet Interface

- ◎ Ethernet interface, as a transmission path, is applied to automotive related products. Under the condition of maintaining low EMI , adopting low-cost single-pair unshielded twisted pair can satisfy the requirement of high resolution, higher antijamming capability and huge amount of information. Meantime, integrated easily with consumer electronics , it is the best solution for automotive high bandwidth bus.



The comparison between Ethernet and LVDS interface automotive camera technologies:



Product Interface Comparison item	ethernet	LVDS
Resolution	High	High
antijamming capability	Strong	Weak
transmission bandwidth	≥100Mbps	1Gbps
Cable cost	Low (single-pair unshielded twisted pair)	high (needing thick shielded twisted pair. connector costs high too)

Camera » Other Application Areas

Smart home



Household cleaning machine



Smart air condition



Smart refrigerator



Smart TV

Security detection



Monitoring camera



Detection for colliery tunnel and sewer



Smart terminal



Pad/ Padphone



Laptop



Smart Watch



Smart Glasses