Inf iRay

Website   WeChat Official Account

10 μm

A Leading Manufacturer of Uncooled IRFPA
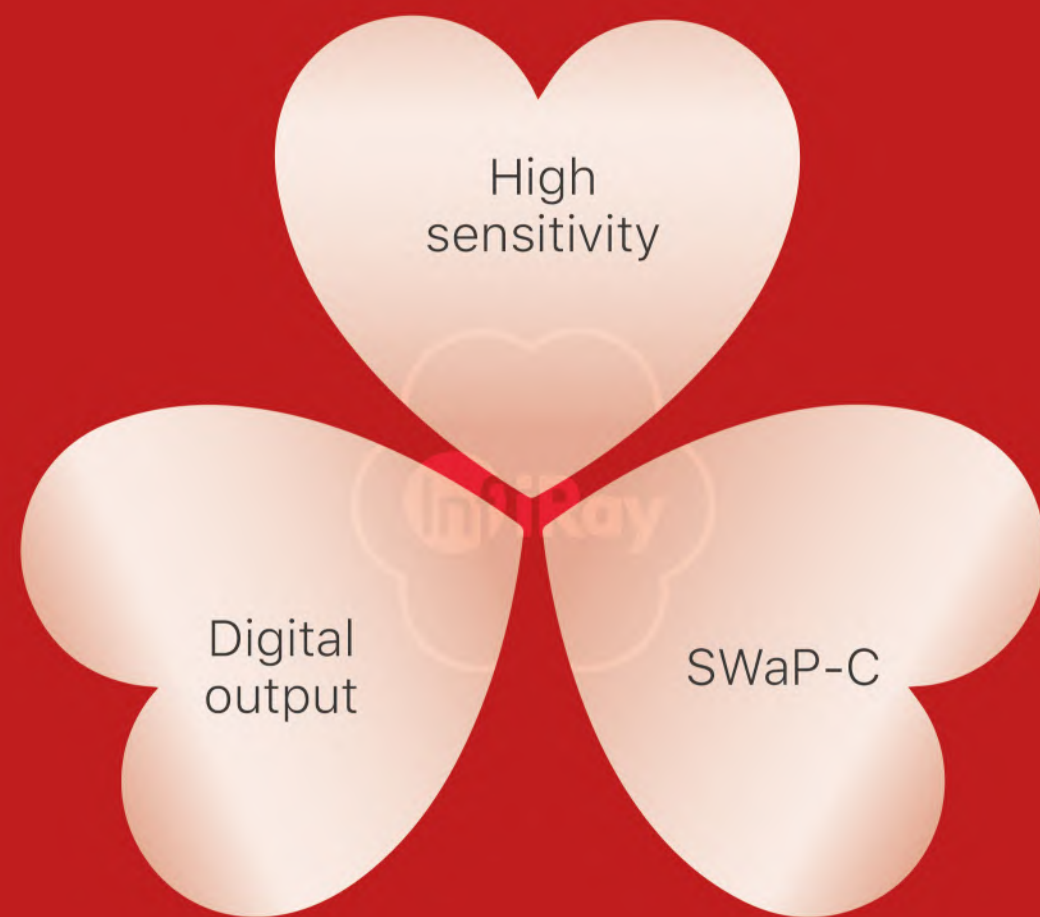
Company introduction

IRay Technology Co., Ltd. is a wholly-owned subsidiary of Raytron Technology Co., Ltd. (SSE: 688002). As a high-tech enterprise, IRay Technology develops and manufactures infrared FPA detectors, thermal imaging modules, and other products, with completely independent intellectual property rights. We are committed to providing global customers with professional thermal imaging products and solutions. The main products include IRFPA detectors, thermal imaging cores, and terminal products for application.

With R&D personnel accounts for 51% of all employees, IRay Technology owns 311 patented technologies in multiple fields, such as the development of integrated circuit, the design and manufacture of MEMS sensor, and Matrix Ⅲ image processing algorithms.

IRay products have been applied in various fields, such as aerospace, disease control and prevention, industrial temperature measurement, intelligent surveillance, outdoor observation, ADAS, AIoT, AI, and machine vision.

High sensitivity
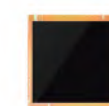
Digital output

SWaP-C
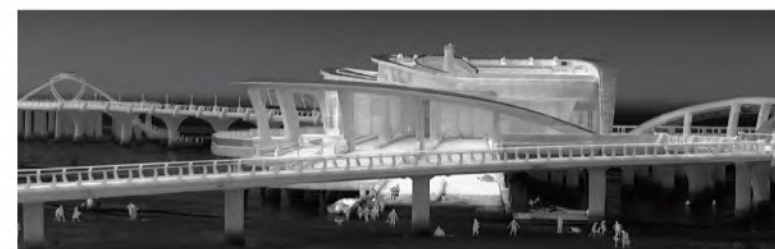
InfiRay Technology Industry Chain

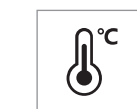| Integrated circuit design	FPA sensor array design	Detector packaging and testing	Infrared imaging modules assembling	Terminal applications

Explore
Perceive the Future

2010-2011

IRay was established in Yantai, Shandong Province, China. (2010)

IRay's industrial production of infrared detector was listed as the First Strategic Emerging Industry Projects in Shandong Province. (2011)

2012-2013

Released 384×288 35μm uncooled infrared FPA detector. (2012)

Released 640×512/384×288 25μm uncooled infrared FPA detector. (2013)

2014

Released 640×512/384×288 20μm uncooled infrared FPA detector.

2015

Released 640×512/384×288 17μm high-performance uncooled infrared FPA detector.

Released 25mm×25mm VGA Micro series module.

Released 1024×768 14μm uncooled infrared FPA detector with large array, high sensitivity, and high resolution.

2016

Released 640×512/384×288 17μm ultra-sensitive uncooled infrared FPA detector (NETD≤30mK).

Released 640×512 17μm wide-spectra (3~14μm) uncooled infrared FPA detector.

2017

Released WLP (wafer level packaging) uncooled infrared FPA detector.

Released 640×512 12μm uncooled infrared FPA detector (ceramic packaging & digital output).

2018

Released 12μm megapixels uncooled infrared FPA detector (ceramic packaging & digital output).

Released Nano series module (Power consumption ≤0.5W & Weight≤15g).

2019

Released the 1st 1280×1024 10μm VOx uncooled infrared FPA detector in China.

Released 256×192 12μm WLP (wafer level package) sensor and imaging module.

Released 12μm high-accuracy temperature measurement module.

Released IRay's first VOx shutter-less module.

Released 12μm thermal imaging monocular for outdoor application.

12μm Series Infrared detectors

High sensitivity

High reliability

TEC-less

Digital output
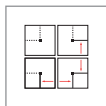
**Small pixel pitch**

Low power consumption

Model	S121	6122	3122	2121
Detector type	Uncooled VOₓ microbolometer			
Array size	1280×1024 (1024×768 optional)	640×512	384×288	256×192
Pixel pitch	12μm			
Spectral response	LWIR, 8~14μm			
NETD	≤40mK (@f/1.0, 30Hz, 300K)	Standardized≤40mK/Customized≤30mK (@f/1.0, 50Hz, 300k)		≤40mK (@f/1.0, 25Hz, 300k)
Output signal	Digital Output			
Thermal time constant	10ms			
Frame rate	30Hz	60Hz		30Hz
Power consumption	350mW (@30Hz, 300K, excluding TEC)	170mW (@50Hz, 300K)	110mW (@50Hz, 300K)	50mW (@25Hz, 300K)
Package type	Metallic	Ceramic/WLP		WLP
Package size (L×W×H)	46.0×40.7×8.3 (mm)	Ceramic：22×22×4.6 (mm) WLP：16.5×16.5×2.7 (mm)		10.0×10.0×1.9 (mm)
Weight	50g	Ceramic：5g/WLP：2.2g		1.5g
Operating temperature range	-40℃~+60℃	-40℃~+85℃		

Metallic　　Ceramic　　WLP

SXGA　|　VGA　|　QVGA　|　SCIF

HD Series

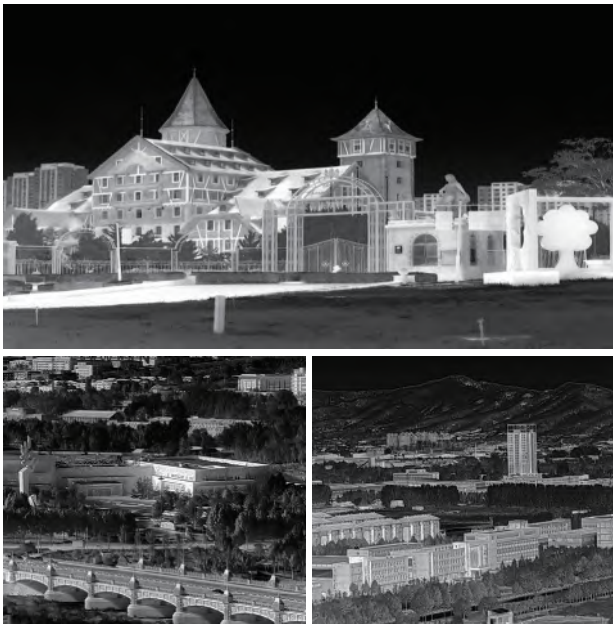## Uncooled thermal imaging module
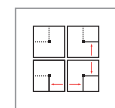
12μm   1280×1024

30/60Hz   2w

Frame rate   Low power consumption

HD uncooled thermal imaging module is specially designed for high resolution and wide FOV applications. Its maximum resolution is 1280×1024. It has multiple serial communication and video output interfaces. A variety of lightweight infrared lenses are selectable.

HD modules can be applied in various fields, such as photoelectric pod, visual enhancement equipment, machine vision, and scientific research.

Model	HD1280	HD1024
Performance		
Detector type	Uncooled VOx microbolometer	
Resolution	1280×1024	1024×768
Pixel pitch	12μm	
Detector frame rate	60Hz/30Hz	
Spectral band	8~14μm	
NETD	≤60mK@25℃	
TEC	Yes	
Image adjustment		
Brightness and contrast	Manual/Auto	
Polarity	Black hot/White hot	
Color palettes	Optional (14 species)	
Reticle	Display/Hide/Move	
Digital zoom	1.0~4.0× continous zoom	
Image processing	Digital filtering denoise/Digital detail enhancement	
Mirror image	Horizontal/Vertical/Diagonal mirror image	
Power supply		
Power supply	4~6V DC	
	User extension components support 5~24V DC	
Typical working voltage	5V DC	
Power protection	Overvoltage, Undervoltage, Reverse connection (Adaptive extension board)	
Typical power consumption@25℃	＜2W (Without extension board)	＜1.8W (Without extension board)
Interface		
Video output	14-bit or 8-bit LVCMOS/LVDS	
Serial communication interface	RS-232/UART (3.3V)	
Button	4 Buttons	
Extension board	USB3.0/HDMI/SDI/LAN/LVDS	
Physical characteristics		
Weight	142g±3g	
Size	55×55×26 (mm)	
Environment adaptability		
Operating temperature	-40℃ ~ +80℃	
Storage temperature	-45℃ ~ +85℃	
Humidity	5~95%, Non-condensing	
Vibration	6.06g, Random vibration, All the axial	
Mechanical shock	80g, 4ms, Rear peak sawtooth, 3 axial 6 direction	
Environmental directive		
RoHS2.0	Support	

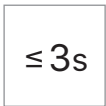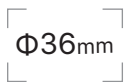# Micro Ⅱ Series

TEC-less module
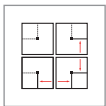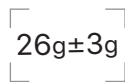

12μm

Low power consumption

DDE

≤ 3s
Start-up time

Φ36mm
Small size

26g±3g
Light weight

Micro Ⅱ uncooled thermal imaging module is superior in SWaP. It is specially designed for applications, such as UAVs, handheld observation equipment, head-mounted observation equipment. It comes in two resolutions -- 384×288 and 640×512 with embedded IRay's latest 12μm high-performance uncooled infrared detector. It can provide excellent infrared image while observing targets in various complex conditions, integrated with the 4th generation full-automatic infrared image processing algorithm.

Head-mounted observation equipment

Miniaturized photoelectric pod for UAV

Handheld observation equipment

Product Features

- New 3D digital noise reduction (DNR) and digital detail enhancement (DDE) algorithms
- Unique non-uniformity correction algorithms
- Available control interfaces: RS-232, RS-422, UART, 4 buttons
- Support multiple video outputs: PAL/NTSC, BT.656, LVDS, LVCMOS
- Lens: 4.1mm, 5.8mm, 9.1mm, 13mm, 19mm, 25mm, 35mm, 50mm, 75mm, 100mm

- Resolution: 640×512/384×288
- Sensitivity: NETD≤50mK
- Start-up time: ≤3s
- Weight: 26g±3g
- Size: Φ36mm×17.25mm

Model	Micro Ⅱ 640P	Micro Ⅱ 384
Performance		
Detector type	Uncooled VOx microbolometer	
Resolution	640×512	384×288
Pixel pitch	12μm	17μm
Detector frame	50Hz	
Rate spectral band	8~14μm	
NETD	≤50mK@25℃, F#1.0 (≤40mk is applicable)	
Image adjustment		
Brightness and contrast	Manual/Auto 0/Auto 1	
Polarity	Black hot/White hot	
Color palettes	Optional (9 species)	
Reticle	Display/Hide/Move	
Digital zoom	1.0~8.0× continous coom (Step size 0.1)	
Image processing	Non-uniformity correction/Digital filtering denoise/Enhancement	
Mirror image	Horizontal/Vertical/Diagonal mirror image	
Power supply		
Power supply	4~6V DC	
	User extension components support 5~24V DC	
Typical working voltage	4V DC	
Power protection	Overvoltage, Undervoltage, Reverse connection (Adaptive extension board)	
Typical power consumption@25℃	<1.3W (Without extension board)	<1.0W (Without extension board)
	<1.6W (With extension board)	<1.2W (With extension board)
Physical characteristics		
Weight	31g ± 3g (No lens & flange)	
Size	Φ36×17.25 mm (No lens/ Extension board)	
Environment adaptability		
Operating temperature	-40℃～+80℃	
Storage temperature	-45℃～+85℃	
Humidity	5~95%, Non-condensing	
Vibration	6.06g, Random vibration, 3 axial	
Mechanical shock	80g, 4ms, Rear peak sawtooth, 3 axial 6 direction	

Micro Ⅲ Series

Small-size shutter-less module

Shutter-less	-20℃~+550℃	26×26mm
Shutter-less algorithms	temperature measurement range	Small size

<20g	<1w	(display icon)
Light weight	Low power consumption	2.6° Long focus~86° wide angle

Micro Ⅲ uncooled thermal imaging module is superior in SWaP. It is specially designed for the applications, such as UAVs, miniaturized hand-held observation equipment, head-mounted observation equipment, multi-spectral systems, industrial electric power temperature detection, security temperature measurement, and machine vision equipment.

■ Micro Ⅲ S shutter-less thermal imaging module

It can provide excellent infrared image while observing targets in various complex conditions, with a new generation of shutter-less uniform correction algorithms and IRay's 4th generation full-automatic infrared image processing algorithm.

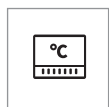### ■ Micro Ⅲ T temperature measuring module

It comes in two temperature measurement modes of -20℃~+150℃ and 0℃~+550℃, that is automatically switchable online. It supports full-screen temperature data output with the accuracy of ±3℃ or ±3%, temperature information output interface, and multiple image output interfaces, such as BT.656, LVDS, LVCMOS, analog video, and USB.

Model	Temperature measuring	Shutter-less	Basic	Temperature measuring	Shutter-less	Basic
	Micro Ⅲ 640T	Micro Ⅲ 640S	Micro Ⅲ 640	Micro Ⅲ 384T	Micro Ⅲ 384S	Micro Ⅲ 384
Performance						
Detector type	Uncooled VOx microbolometer					
Resolution	640×512			384×288		
Pixel pitch	12μm					
Detector frame rate	50Hz/30Hz					
Spectral band	8~14μm					
NETD	≤50mK@25℃（≤40mK optional）					
Image control						
Brightness and contrast	Manual/ Auto/ Linear / Horizon/ Search					
Color palettes	Optinal (18 types)					
Reticle	Display/ Fade/ Move (Support for customization)					
Digital zoom	1.0~8.0× Continuous zoom(Step size 0.1)					
Image precessing	Shutter-less non-uniformity correction/ Digital filtering noise reduction/ Digital detail enhancement					
Power supply						
Power supply	4~6V DC					
	Expansion board support 5~24V DC					
Power protection	Expansion board support over voltage, Under voltage and reverse					
Typical power consumption@25℃	<1.0W（Without expansion board）			<0.9W（Without expansion board）		
	<1.2W（With expansion board）			<1.1W（With expansion board）		
Interface						
Video output	Analog video	1 Channel (PAL/NTSC)				
	Digital video	BT.656/ 14-bit or 8-bit LVCMOS/ LVDS				
Serial communication interface	RS-232/UART（3.3V)					
USB3.0	Typical voltage 5V, Support image and temperature data transmission, Support control protocol					
Button	4 Buttons (M, +, -, C)					
Thermography(tseries)						
Measuring range	-20℃~+150℃, 0℃~+550℃					
Measuring accuracy	±3℃ or ±3% of reading (Take lager) @ Enviroment temperature -20℃~+60℃					
Measuring tools	10 settable fixed points/Full screen max/ Low temperature capture/Central point temperature measurement/12 lines/Areas analysis tools/1 isothermal Analysis tool					
Secondary development						
Support	Language customize supported / Reticle customize supported					
SDK	Support					
Physical characteristics						
Weight	20g ± 3g (Without lens and expansion board)					
Size	26 × 26 × 22 (mm) (Without lens and expansion board)					
Environment adaptability						
Operating temperature	-40℃~+80℃					
Storage temperature	-45℃~+85℃					
Humidity	5~95%, Non-condensing					
Vibration	6.06g, Random vibration, All the axes					
Mechanical shock	80g, 4ms, Rear peak sawtooth wave, 3 axis and 6 directions					
Environmental directive						
RoHS2.0	Support					

LT Series

High-accuracy temperature measurement module

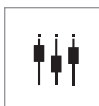|		
℃	-20℃~+550℃	±2℃
Full matrix measurement data output	Temperature measurement range	High accuracy
SDK	18	┇
SDK secondary calibration	18 pseudo-color modes	6 video output interfaces

LT temperature measurement uncooled thermal imaging module offers non-contact infrared temperature measurement with high accuracy. It comes in three resolutions -- 384×288、640×512、1280×1024, and provides two temperature measurement modes of -20℃~+150℃ and 0℃~+550℃, that is automatically switchable online. It supports full-screen temperature data output with the accuracy of ±2℃ or ±2%, and multiple image output interfaces, such as BT.1120, BT.656, LVDS, LVCMOS, analog video, USB and Internet. Meanwhile, it is loaded with a series of infrared temperature measurement lens -- 4mm, 6.2mm, 7.8mm, 9.7mm, 13mm, 19mm, 25mm, 35mm, 50mm. With its rapid and stable capability of temperature measurement, comprehensive analysis function, and all-round user interfaces, it can meet the needs of users to develop various infrared temperature measurement systems.

Industrial inspection

Petroleum and petrochemical

Electric power inspection

Product Features

- 6 temperature measurement modes: automatic capture of the highest and the lowest point, matrix average temperature, line measurement, rectangular region measurement, isothermal analysis
- Multiple temperature data output interfaces: RS-232, LVCMOS, LVDS
- Multiple communication interfaces: RS-232, UART
- Multiple video outputs: PAL/NTSC, BT.656, BT.1120, LVCMOS, LVDS
- USB3.0, Network interface, HDMI
- Lens: 4mm, 6.2mm, 9.7mm, 13mm, 19mm, 25mm, 35mm, 50mm

Model	LT1280	LT640	LT384
Performance			
Detector type	Uncooled VOx microbolometer		
Resolution	1280×1024	640×512	384×288
Pixel pitch	12μm	14μm	17μm
Detector frame rate	30Hz		50Hz
Spectral band	8~14μm		
Image adjustment			
Brightness and contrast	Manual/Auto 0/Auto 1		
Polarity	Black hot/White hot		
Color palettes	Support (18 types)		
Digital zoom	1.0~4.0×continous zoom	1.0~8.0×continous zoom (Step size 0.1)	
Mirror image	Horizontal/Vertical/Diagonal mirror image		
Area-of-interest	Support		
Image processing	Non-uniformity correction/Digital filtering denoise/Digtial detail enhancement		
Thermography			
Measuring range	-20℃~+150℃, 0℃~+550℃		
Gain switch	High gain/Low gain/Auto switch		
Measuring accuracy	±2℃ or ±2% of reading		
Measuring tools	10 Fixed dots measurement；Maximum/Minimum temperature dots capture；Full frame measurement；Center dot measurement；12 Line/Rectangle analysis；Isotherm analysis		
Measurement settling time	≤10s (mini)		
Temperature correction	Manual/Auto		
Lens			
Lens	4mm, 6.2mm, 9.7mm, 13mm, 19mm, 25mm, 35mm, 50mm		
Power supply			
Power supply range	4~6V DC/ Expansion board support 5~24V DC		
Typical working voltage	4V DC/Expansion board support 12V DC		
Boot time	≤15s	≤12s	≤3s
Power protection	Overvoltage, Undervoltage, Reverse connection (Adaptive expansion board)		
Typical power Consumption@25℃	<2.2W (Without expansion board)	<1.4W (Without expansion board)	<1.3W (Without expansion board)
	<2.5W (With expansion board)	<1.7W (With expansion board)	<1.6W (With expansion board)
Interface			
Analog video output	--	1 Channel (PAL)/NTSC	
Digital video output	LVCMOS、LVDS	BT.656/BT.1120/14-bit or 10-bit LVCMOS/14-bit or 10-bit LVDS-H/F	
Serial communication interface	RS-232/UART (3.3V)		
Physical characteristics			
Weight (No lens)	<150g	<76g	
Size (No lens)	55×55 (mm) (Width × Height)	44.5 × 43.0 (mm) (Width × Height)	
Environment adaptability			
Operating temperature	-40℃~+80℃		
Storage temperature	-45℃~+85℃		
Humidity	5 ~ 95%, Non-condensing		
Vibration	4.3g, Random vibration		
Mechanical shock	11ms, Final peak sawtooth wave, 3 axial 6 direction		

FT Series

Alarming uncooled thermal imaging module

≤0.2s	⚠	≤50mK
Alarm response time	Grayscale alarm	NETD

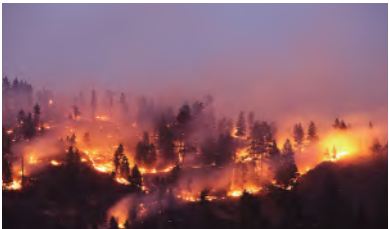| ⊡	🚨	🖥
Auto focus	3 alarming modes	XGA/VGA/QVGA

FT alarming uncooled thermal imaging module comes in three resolutions: 384×288, 640×512, 1024×768. Equipped with industry-grade detectors, the FT series can work with stability and reliability in various complex conditions to output excellent thermal images and grayscale alarms. It has multiple image output interfaces, such as BT.1120, BT.656, LVDS, analog video, and network, adding efficiency to the connection to mainstream security monitoring back-end hardware platforms. Meanwhile, this series can be equipped with the whole series of athermalized dynamoelectric prime lens (13mm, 25mm, 35mm, 50mm, 75mm, 100mm, 150mm, etc.) and continuous zooming infrared lens (3×, 5×, 10×). It supports high-efficiency autofocus function, meeting the demand in key area monitoring, forest fire- prevention, railway safety, and other industrial applications.


Key area monitoring

Forest fire prevention

Industrial safety

Model	FT1024	FT640	FT384
Performance			
Detector type	Uncooled VOx microbolometer		
Resolution	1024×768	640×512	384×288
Pixel pitch	14µm	17µm	
Detector frame rate	30Hz	50Hz	
Spectral band	8~14µm		
NETD	≤50mK@25℃, F#1.0		
Image contral			
Brightness and contrast	Manual/Auto 0/Auto 1		
Polarity	Black hot/White hot		
Color palettes	--	Support （9 types)	
Reticle	Display/Hide/Move		
Digital zoom	1.0~8.0×Continous zoom (step size 0.1)		
Image processing	Non-uniformity correction/Digital filtering denoise/Digtial detail enhancement		
Mirror image	Horizontal/ Vertical/Diagonal mirror image		
Grayscale alarm function			
Grayscale alarm	Image alarm box mark/LVTTL alarm signal/serial alarm command		
Alarm threshold setting	Available		
Alarm response time	≤0.2s		
Lens control			
Lens type	Fixed Field of View/Continuous Zoom		
Athermal lens	13mm, 19mm, 25mm, 35mm, 50mm, and customized lenses are supportable		
Motorized lens	75mm,25-75mm,30-150mm, 25-225mm,and customized lenses are supportable	50mm, 75mm, 100mm, 20-100mm, 30-150mm, 25-225mm, and customized lenses are supportable	
Lens drive — Drive interface	2 channels		
Lens drive — Electric zoom	Continuous adjustment/Step adjustment (Step 0-32 can be set)		
Lens drive — Electric focus	Continuous adjustment/Step adjustment (Step 0-32 can be set)		
Lens drive — Auto focus	Auto focus time≤5s (With potentiometer)		
Power supply			
Power supply range	5~24V DC		
Typical working voltage	12V DC		
Power protection	Overvoltage, Undervoltage, Reverse connection		
Typical power consumption@25℃	＜3.2W	＜2.3W	＜1.8W
Video interface			
Analog video output	VGA	1 Channel (PAL)	
Digital video output	10-bit or 14-bit LVDS-F, HDMI	10-bit or 14-bit LVDS-H/F,1 0-bit or 14-bit LVCMOS, BT.656, BT.1120	
Control interface			
Serial communication interface	RS-232/RS-485/UART/RS-422		
Button	4 Buttons		
Physical characteristics			
Weight	<120g (Excluding lens)		
Environment adaptability			
Operating temperature	-40℃~+75℃		
Storage temperature	-45℃~+85℃		
Humidity	5 ~ 95% , Non-condensing		
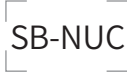
S2 Series
VOx shutter-less module

Lens		4.1mm F1.2	5.8mm F1.2	9.1mm F1.0	13mm F1.2	19mm F1.0	25mm F1.0	35mm F1.0	55mm F1.0
FOV (H×V)	384×288	59°×46°	44°×33°	28°×21°	20°×15°	13°×10°	10°×7.9°	7.5°×5.6°	4.8°×3.6°
	640×512	89°×75°	70°×57°	48°×38°	33°×26°	22°×18°	17°×14°	12.5°×10°	8°×6.4°

Model	InfiSense S2
Performance	
Detector type	Uncooled VOx Microbolometer
Resolution	384×288/640×512
Pixel pitch	12μm
Detector frame rate	50Hz
Spectral band	8~14μm
NETD	≤50mK@25℃, F#1.0 （≤40mk is applicable)
Image adjustment	
Brightness and contrast	Adjustable in grade 0~grade 20
Polarity	Black hot/White hot
Color palettes	Optional (4 species)
Reticle	Display/Hide/Move
Digital zoom	1.0~4.0× Continous zoom (Step size 0.1)
Image processing	Scene-based non-uniformity correction/Digital filtering denoise/Enhancement
Mirror image	Horizontal/Vertical/Diagonal Mirror image
Power supply	
Power supply range	5~12V DC
Typical working voltage @25℃	384×288	<1.2W (with extension board)
	640×512	<1.5W (with extension board)
Interface	
Analog video output	1 channel (PAL or NTSC)
Digital video output	BT.656/14-bit or 10-bit LVCMOS
Serial communication interface	UART
Button	4 buttons
Physical characteristics	
Weight	33g ± 3g (No lens/ Extension board)
Size	Φ38×22 (mm) (No lens/ Extension board)
Environment adaptability	
Operating temperature	-40℃ ~ +80℃
Storage temperature	-50℃ ~ +85℃
Humidity	5~95%, Non-condensing
Vibration	6.06g, Random cibration, All the axial
Mechanical shock	80g, 4ms, Rear peak sawtooth, 3 axial 6 direction

12μm

SB-NUC
Correction based on the scene

Image consistency

Automotive

UAV

Handheld device

InfiSense Silence (S) uncooled thermal imaging module replaces traditional shutter correction by NUC algorithms based on the scene (Shutter-less), avoiding image lagging caused by opening and closing shutter. It has significant advantages in the application of video with high consistency requirements.

It can be configured on vehicles, UAVs, and mobile handheld devices. S2 module is featured with reliability, sensitivity, and high extensibility, on account of its 12μm VOx IRFPA, which is developed independently, integrated image processing technologies, various SDK interfaces.
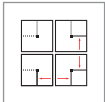
Micro Module Series

12μm WLP temperature measurement micro module S0

Product Features

■ High frame rate, high image quality, low power consumption

■ Various optional products and lenses

■ Real-time temperature output, high temperature measurement accuracy

■ Unified user interface

■ Provide SDK for various platforms
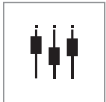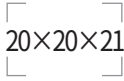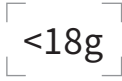
12μm	Wafer level package	Abundant interfaces
20×20×21	<18g	<0.2W
Ultra-small volume	Ultra-light weight	Ultra-low power consumption

Temperature measurement thermal imag-ing module Xmodule S0 is a high-perfor-mance thermal imaging product developed based on the InfiRay® WLP infrared detec-tor. It can be adapted and accessed to a variety of intelligent processing platforms due to its parallel digital interface output/USB output and abundant control interfac-es. With the superiority of high perfor-mance, low power consumption, small volume, and easy to develop and integrate, it can meet the secondary development re-quirements of various infrared temperature measurement applications.

| Models	212-40	212-68
Resolution	256×192	
Pixel pitch	12μm	
FOV	42.0°×32.1°	25.5°×19.2°
Frame rate	25Hz/15Hz	
NETD	≤60mK@f#1.0	
Operating temperature	-15℃～+60℃	
Supply voltage	3.8V～5.5V DC	
Power consumption	<200mW（Using DVP interface）	
Weight	<18g	
Dimension	20×20×21（mm）	
Data interface	Parallel interface/USB	
Control interface	SPI/I2C/USB	
Image enhancement	Multi-stage detail enhancement	
Image correction	Shutter correction	
Palette	White hot/ Black hot/ Multiple palettes	
Temperature measurement range	-20℃~+120℃(Expandable to 600℃)	
Temperature measurement accuracy	±3℃/3% of the measurement range	
Temperature correction	Manual/auto	
Temperature data output	Real-time parallel data output	
Temperature measurement statistics	Supports max/min statistics, temperature analysis	

Micro Module Series

12μm micro thermal imaging module

High sensitivity

Direct connection to MCU
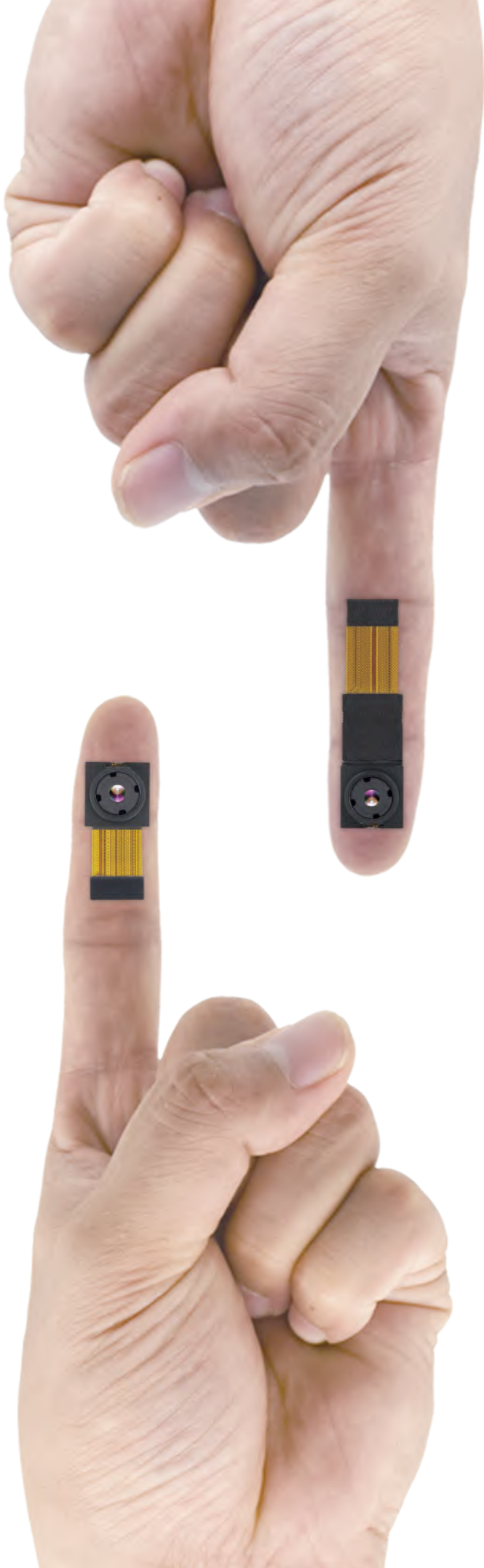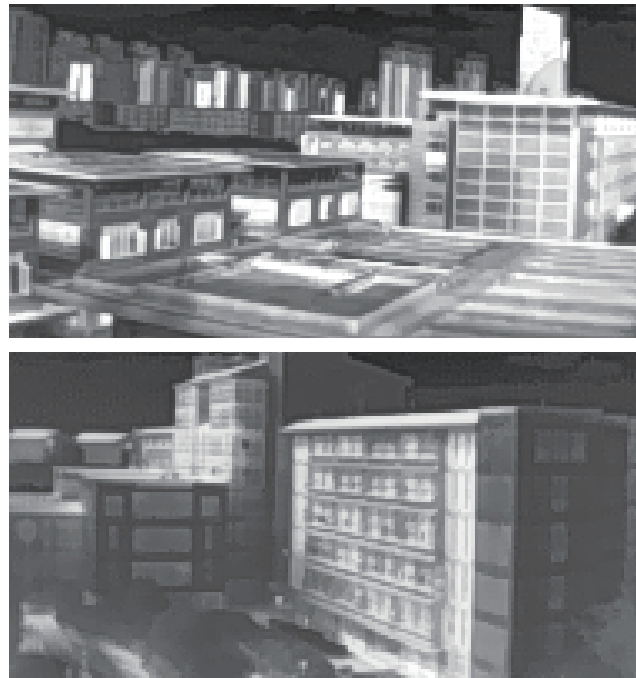
Low power consumption

Small dimension

Built-in shutter

Stable and clear image

Tiny1-A is a LWIR (8~14μm) micro thermal imaging module that can transform the heat radiation of objects into image and temperature data. The module focuses on the consumer-grade thermal imaging market for its high cost effectiveness.

Models	Tiny1-A	Tiny1-B
Pixel pitch	12μm	12μm
Resolution	256×192/160×120	256×192/160×120
Detector type	VOx uncooled infrared FPA detector	VOx uncooled infrared FPA detector
Response spectrum	8~14 μm	8~14 μm
NETD	＜50mK @25℃, F#1.0，25Hz	＜50mK @25℃, F#1.0, 25Hz
Thermal time constant	＜10ms	＜10ms
Frame rate	≤30Hz	≤25Hz
Non-uniformity correction	Support shutter correction	Automatic shutter correction
Image output	14-bit digital output	14-bit digital output
Focus mode	Athermal prime lens	Athermal prime lens
Temperature measurement range	----	-15℃～+150℃（Expandable to 550℃）
Temperature measurement accuracy	----	±2℃ or 2% of the reading
Input voltage	1.8V, 3.3V (Optional), 5V	1.8V, 3.3V, 5V
Input clock	10～50MHz, 3.3V/1.8V (Unified IO voltage)	----
Data interface	Parallel interface output 3.3V/1.8V (Unified IO voltage)	UVC (USB video class)
Control interface	I2C, 3.3V/1.8V (Unified IO voltage)	USB
Power consumption at room temperature	Normal operation：＜40 mW (IO 1.8V) Shutter correction：＜640 mW (IO 1.8V)	Normal operation：680 mW (Typical value) Shutter correction：1.3W (Typical value)
Dimension (w*l*h)	13×13×7.3 (mm)	13×28×10 (mm)
Weight	＜2g	＜3g
Operating temperature	-40℃～+80℃	-40℃～+80℃（Imaging)* -10℃～+75℃（Temperature measuring)*
Storage temperature	-45℃～+85℃	-45℃～+85℃
Impact	25g, 11ms, half-sine wave, total of three axis	25g, 11ms, half-sine wave, total of three axis

*The performance will decrease when the operating temperature is over 75℃.

T3 Module

Uncooled infrared temperature measurement module

<0.3W	25/50Hz	Mini
Ultra-low power consumption	Full-frame temperature output	Ultra-small volume
TCA+	±0.5℃	
Temperature compensation	Temperature measurement accuracy[1]	Abundant interfaces

The new generation, T3H temperature measurement module reaches an accuracy of±0.5℃[1].

It can bring excellent imaging effect, thanks to its full-screen temperature data output with a maximum of 16.38 million per second and its ultra-low power consumption less than 0.3W. It has professional temperature measurement function with a small size of two coins. The multiple interfaces brings more convenience to integration and secondary development. It can meet the needs of most infrared applications, such as electric power, petrochemical, rail transportation, photovoltaic detection, UAV, head-mounted thermal camera, portable thermal camera, on-line thermal camera, etc.

Electric power inspection

Petrochemical and metallurgy

Photovoltaic detection

Product Features

- Resolution: 640×512/384×288/240×180
- Pixel pitch: 12μm/17μm
- Frame rate: 25Hz/50Hz
- Ultra-low power consumption：The minimum is less than 0.3W
- Standard video data interface, abundant control interface
- Provide SDK, support user's secondary development

Model	T3-612	T3-317	T3-217
Performance index			
Detector type	VOx uncooled infrared FPA detector		
Resolution	640×512	384×288	240×180
Pixel pitch	12μm	17μm	
Response spectrum	8~14μm		
Frame rate	25Hz/50Hz		
NETD	≤60mK@f#1.0		
Operating temperature	-15℃~+60℃		
Supply voltage	3.8V-5.5V DC		
Power consumption	<0.6W*	<0.3W*	
Weight	<30g		
Dimension	43.7×22.4×27.6 (mm)		
Data interface	Parallel interface/USB		
Control interface	SPI/I2C/USB		
Image enhancement	Multi-stage detail enhancement		
Image correction	Shutter correction		
Palette	White hot/ Black hot/ Multiple palettes		
Temperature measurement range	-20℃~+120℃(expandable to 400℃)		
Temperature measurement accuracy	±3℃/±3% of the measurement range		
Temperature correction	Manual/Auto		
Temperature output	Real-time parallel data output		
Temperature measurement statistics	Max/Min/Temperature analysis		

*Parallel interface in 25Hz output mode

Phoenix Series

Cooled thermal imaging module

Low noise

Low power consumption

High frame rate

High quality images

Clear details

Easy to be integrated

The Phoenix cooled thermal imaging module is equipped with MCT cooled thermal imaging detectors. It is featured with high definition, high sensitivity, small size, and is easy to be integrated. It can shorten the development cycle of the infrared imaging products and add convenience to secondary development.

Navigation night vision

Maritime activity

Product Features

- Frame rate up to 100Hz
- High sensitivity：NETD≤25mK
- Auto Focus/Electric zoom
- Small size, light weight, high stability
- Multiple interfaces; frame rate can be customized

Model		FX640I	FX640E	FX320E
Performance				
Detector type		InSb IDDCA	HgCdTe IDDCA	
Resolution		640×512		320×256
Pixel Pitch		15μm		30μm
Detector frame rate	Default frame rate	30Hz		
	Top frame rate	100Hz	50Hz	100Hz
Spectral band		3.7～4.8μm		
NETD		≤25mK		≤20mK
Cooling time		≤7.5min		
Image adjustment				
Brightness and contrast		Manual/Auto 0/Auto 1		
Polarity		Black hot/White hot		
Reticle		Display/Hide/Move		
Digital zoom		1.0~8.0×continous zoom (step size 0.1)		
Image processing		Non-uniformity correction		
		Digital Filtering denoise		
		Digtial detail enhancement		
Mirror image		Horizontal/Vertical/Diagonal mirror image		
Power supply				
Power supply range		20～36V DC		
Typical working voltage		24V DC		
Typical power consumption @25℃/40V		Stabilized stage≤ 17W	Stabilized stage≤ 18W	Stabilized stage≤ 16W
		During cooling process ≤24W	During cooling process ≤22W	During cooling process ≤21W
Interface				
Analog video output		1 Channel PAL/ NTSC Video		
Digital video output		Camera link		
Serial communication interface		RS-422		
External synchronization		RS-422/LVTTL (可选)		
Physical characteristics				
Weight		≤840g	≤875g	≤835g
Size		138×68.4×86.4 (mm)	146×71.6×86 (mm)	140.6×71.7×85.7 (mm)
Environment adaptability				
Operating temperature		-40℃～+70℃		-40℃～+60℃
Storage temperature		-45℃～+70℃		
Humidity		5 ~ 95% Non-condensing		
Vibration		20Hz~2000Hz, Random vibration 6.06g		
Mechanical shock		30g, 11ms, 3 Times per axis		

AT300/600

Precise Body Temperature Measurement Thermal Camera

±0.3℃	Motorized	640×512	POE
Measurement accuracy	Motorized wide-angle lens	Professional image quality	POE support

Auto focus	Multi-lenses option	Professional analysis software	SDK support

AT300/600 accurate temperature measurement infrared thermal camera can be widely used in medical temperature measurement, scientific research temperature measurement, machine vision, high-accuracy power detection, high-accuracy industrial detection, and other industries. It can achieve real-time temperature information transmission, accurate detection, and rapid diagnosis.

- Frequency 50Hz, Gigabit network: support temperature data transmitting realtime
- Auto focus, fast and precise temperature measuring
- Spot/line/area/isotherm analysis tools, simpler and more flexible to retrieve temperature data
- Patented intelligent compensated temperature measurement algorithm: accuracy of ±0.3℃
- Compact size: easily install in small spzce
- Support multi-protocols: TCP, UDP, ICMP, DHCP, RTSP

Model	AT600	AT300
Specification		
Detector	Uncooled VOx Microbolometer	
Resolution	640×512	384×288
NETD	≤40mK@25℃, F#1.0	
Temperature Measurement		
Measurement range	0℃～60℃	
Accuracy	±0.3℃@33℃~42℃ of target temperature	
Flux	>100 people/minute	
Measurement mode	Intelligent human face tracking and measuring	
High temperature alarm	Pop out window, audible alarm, capture alarm	
Connector		
Network protocol	TCP, UDP, ICMP, IGMP, DHCP, RTSP	
Network connector	RJ45	
Lens		
Focal length	15mm	7.8mm
Focus	Auto focus/manual focus	
Power supply		
Network — Power voltage	10~36V DC	≤3W
Network — @25℃Typical consumption	≤3.3W	
Network — Power protection	Support over-voltage, under-voltage, reverse connection protection	
Network — POE	Support	
Physical character		
Dimension	55×55×119(mm) (length×width×height)	
Environment Adaptation		
Working temperature	-10℃～+60℃	
Storange temperature	-20℃～+65℃	
Shock	30g, 11ms, all axes	
Vibration	4.3grandom vibration, all axes	
Humidity	5~95%, non-condensing	
Software Support		
SDK	Support	
Professional analysis software	Support	

A8 Online temperature measurement thermal imaging camera

Get the global temperature in real-time.

Provide advanced infrared thermal imaging solutions for actual condition monitoring: using IRay new VOx detector to distinguish more details; 25Hz frame rate network interface; more advanced Matrix III image algorithms; reducing the size and power consumption, easy to install; compatible with a variety of industrial protocols, easy to achieve automatic alarms.

IP67 — Waterproof and dustproof

<140g — Light-weight

SDK — Secondary development

Temperature report

| Model	A8z3
Detector type	Uncooled VOx microbolometer
Resolution	384×288
NETD	<50mk
Frame rate	25Hz
FOV	51.3°×39.6°
Focusing	Fixed
Color palette	At least 6(Black hot/White hot/Red hot and so on)
Optical	
Resolution	1920×1080
Fill light	Build-in LED
Thermography	
Range	-20℃~+ 120℃(Support wide dynamic range : -20℃~ +400℃)
Accuracy	±2℃ or 2% of measuring range
Dot/Line/ Area measurement	6 movable temperature measuring dots which can be compared with the maximum/ Minimum/Average temperature of other measuring dots or areas
Preset value	Included
Temperature difference	One temperature difference value between measured value and reference value can be set
Atmospheric transfer correction	Included
Emissivity correction	0.01 to1.0
Reflection correction	Auto/Input value based on the distance, Atmospheric temperature and relative humidity.
Alarm	
ONVIF	The highest/Lowest/Average temperature of all the measurement dots/ Areas can be configured to output alarm separately
GB/28181	I/O Output/ Log/ File Transmition(FTP)/Email(SMTP)/Notification(Ethernet)
Protocol	ONVIF, GB/28181
Stream	
Stream format	H.264
Manul/Auto	Support
Storage	
Storage medium	Internal memory, Optional TF card, Support maximum 64GB
Image storage mode	Infrared/Visible light image storage seperately infrared and visible light image storage at the same time/ visible light and infrared fusion image storage
File format	JPEG, MP4
Transmission mode	Network
Setting	
B/S	Support
C/S	Support
SDK	Provide SDK which outputs original data for user's secondary development
Power supply and interface	
External power supply	DC12V
Video interface	Analog video
Network interface	Include Ethernet & POE
Alam interface	Assigned I/O
Environment adaptability	
Encapsulation	IP67
Operating temperature	-10℃~+50℃
Storage temperature	-30℃~+70℃
Humidity	≤95% Non-condensing
Dimension	54×25×79 (mm) (Exclude connector)/54×25×95 (mm) (Indude connector)

Xsafe Series

Automotive infrared night vision system

Faster `3S` , to discover hazards.

IATF16949 Certification

See clearly, for safety in journey

InfiRay® new-generation automotive infrared night vision system
Regardless of night, haze, and glare, keep your driving safer
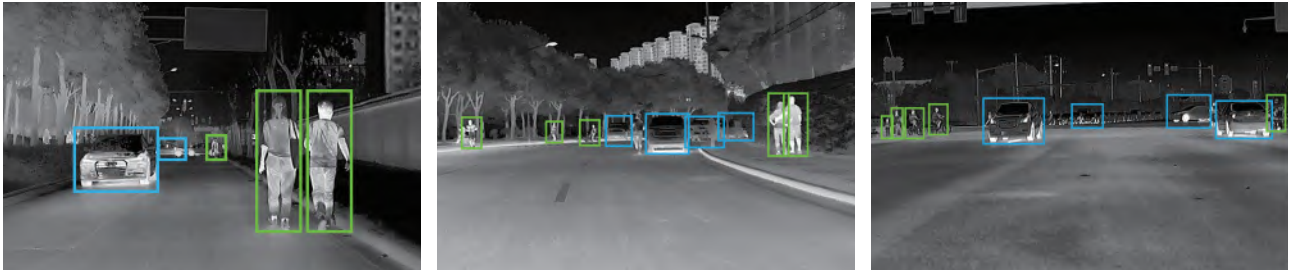
|			
Anti-dazzle	See through haze	See through dust	Pedestrian recognition
Automatic defrosting	Vehicle regulation level	Low power consumption	High frame rate
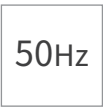
Model	A6S	A3S
Resolution	640×512	384×288
Pixel pitch	12μm	17μm
Spectral band	8~14μm	
NETD	≤50mK	
Angle of field	31°×25°	28°×21°
Voltage	12V	
Consumption	3.75W (7.75W when heater on)	3.5W (7.5W when heater on)
Analog video	PAL / NTSC	
Digital video	25Hz differential output	50Hz differential output
Operating temperature	-40℃~+85℃	
Degrees of protection	IP69K	
Lens protection	Equipped with eplaceable protection window and automatic heating function	
Size	53×53×68.93 (mm)	
Weight	188g	
ECU size	128.80×95.83×27.50 (mm)	
ECU weight	265g	

Ranging module

S-Series

Field-equipment

Photoelectric pod

Optoelectronic system

Self-developed	Seriation (3km\4km\6km\10km)	
10Hz High frequency	1m High accuracy	

YFR-LRF S-Series Eye Safety ranging module is developed based on 1535nm erbuim-glass laser independently devoloped by our company. It belongs to level I eye safety product. The product adpots monopulse ranging, the maximum range is 10KM. Support RS232 and RS422 electrical interface, provide upper computer software, Specifies the set and communication protocol. The advantages are stable operation functions, small size and light weight.

Parameter Model	YFR-LRF0325S	YFR-LRF0425S	YFR-LRF0630S	YFR-LRF1050S
Eye-safe	Class1/1M			
Max range	≥3000m [1]	≥4000m [2]	≥6000m [3]	≥10000m [3]
Mini range	≤50m			
Accuracy	≤1m			
Resolution	30m			
Detection probability	≥98%			
False alarm rate	≤1%			
Multi-target	≥3			
Frequency	1~10Hz			
Optical aperture	Φ25mm		Φ30mm	Φ50mm
Divergence	≤0.65mrad		≤0.45mrad	
Dimention(L×W×H)	≤71×60×46mm	≤67×53×41mm	≤74×56×40mm	≤89×70×61mm
Weight	≤100g		≤110g	≤200g
Wavelength	1535±5nm			
Connector	RS232/RS422			
Supply	DC 9~15V			
Standby power	≤50mW			
Peak consumption	≤5W			
Operating temperature	-40℃~+60℃			
Storage temperature	-55℃~+70℃			
Vibration	0.01~0.04g2/Hz，20~2000Hz			
Shock	75g，6ms			
Waterproof level	IP67/Optical window waterproofing			

Notes：

1) Target size 2.3m×2.3m，Reflectivity 30%，Conspicurity≥8Km

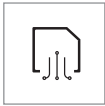2) Target size2.3m×2.3m，Reflectivity30%，Conspicurity≥10Km

3) Target size2.3m×4.6m，Reflectivity30%，Conspicurity≥15Km

Eye safety laser

Series

	Mini size	Low power consumption	High peak power
	Narrow pulse width	Operation over temperature	Eye-safety

The laser is LD pumped solid state laser, operates at 1.535μm wavelength and it's an eye-safety laser. The beam quality approaches the diffraction limit.

Range finder

Laser irradiation

Laser radar

Laser designator

Product model	YFR-P-1535-200u-L	YFR-R-1535-200u-M
Wavelength	1535±5 nm	
Energy	~200 μJ	
Energy stability（RMS）	≤2%	
Frequency	1~10 Hz	
Pulse width	4ns±2 ns	
Divergence	<13mrad	~0.4 mrad ±0.05mrad
Weight	＜10 g	＜30 g
Operating temperature	-40 ℃~+65 ℃	
Storage temperature	-40 ℃~+70 ℃	
Supply	~ 2 V，9 A，~2 msec	
Consumption	<60mW/Hz	
Optical axis angle deviation	<1.5mrad	
Optical axis center deviation	<0.2mm	
Dimention		

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Guangzhou office

Shenzhen office

Wuxi R&D center

Hefei R&D center

Hangzhou office

Suzhou R&D center

Chengdu R&D center

Beijing office

Patents and qualifications

Our products are exported to more than 40 countries. We are committed to building a global infrared industrialization platform.