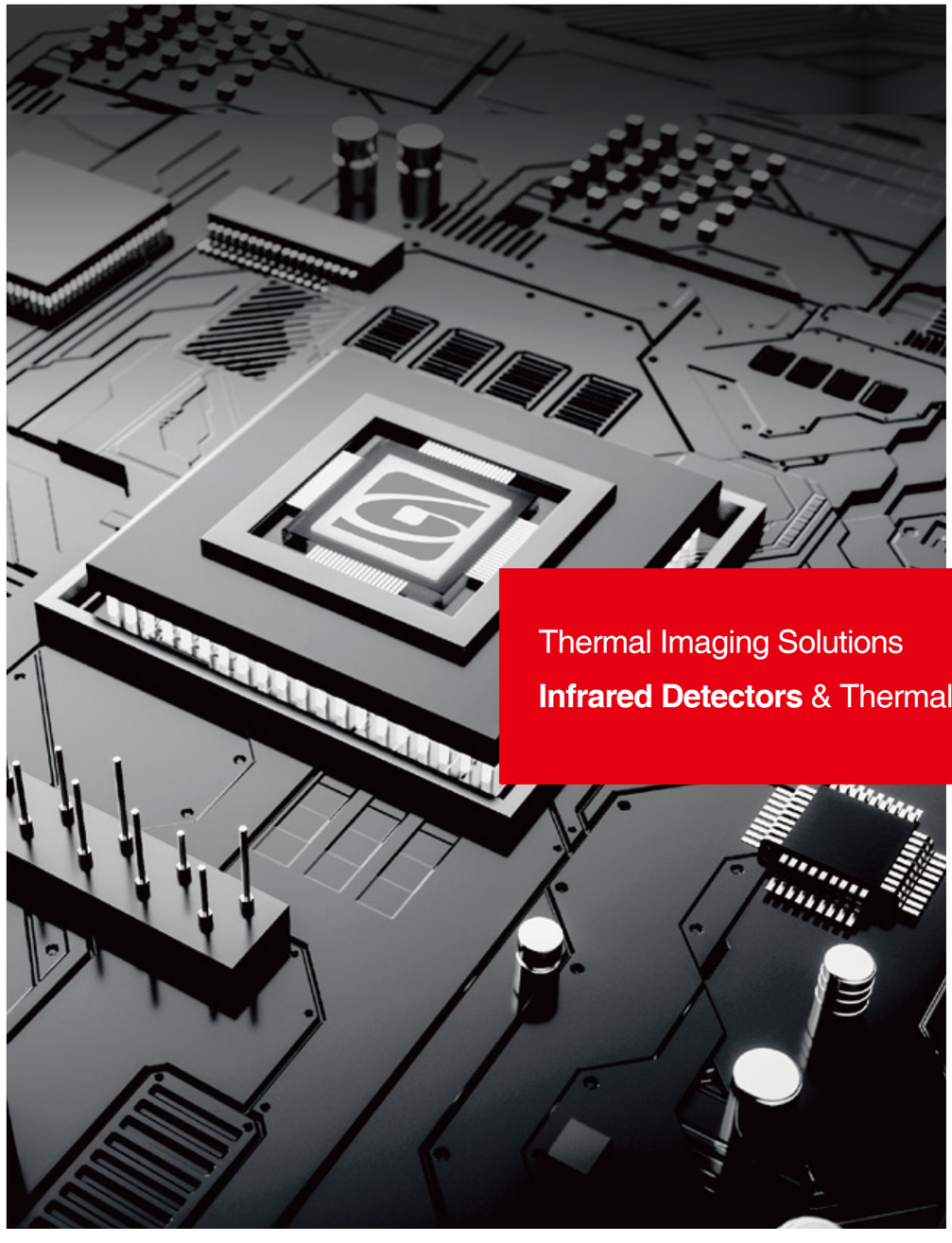
GSTiR



Thermal Imaging Solutions

Infrared Detectors & Thermal Modules

20220610_Version 1.0 Specifications are subject to change without prior notice.

GSTiR

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CONTENTS

Good Sense To Invisible Reality

Company Profile

Global Sensor Technology is the world leading infrared detector manufacturer and solution provider. It is willing to provide customers all over the world with high performance uncooled and cooled thermal imaging detectors and share its professional application experience.

Global Sensor Technology is located at Optics Valley, China. The company covers an area of 30 thousand square meters with 20 thousand square meters clean room settled for its three 8-inch fabrication lines. Thanks to the innovative and experienced staff, advanced fabrication facilities, and cutting-edge technique level, all key fabrication processes such as element purification, epitaxy growth, chip tape-out and fabrication, vacuum packaging can be done in house. The company successfully launched state-of-the-art VOx uncooled detectors, MCT and T2SL cooled detectors with full intellectual property. The product portfolio covers many different array formats, various pixel size and multiple spectral band combination, all products with high thermal sensitivity and reliability.

GST IR detectors have been widely used in thermography, security & surveillance, personal vision, automotive and consumer infrared products. The volume production capability of GST enables it to meet the growing demand from all existing and emerging markets.

Honors & Certificates

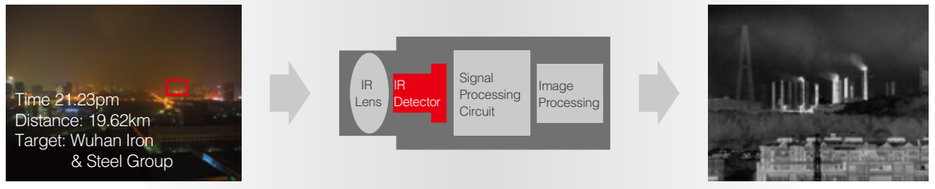
Intellectual Property

Patent Certificates

What is Thermal Imaging?

BEYOND VISIBLE VISION

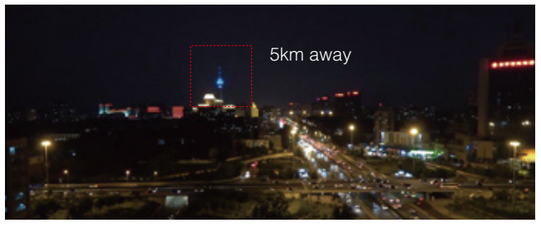
Thermal imaging technology converts invisible infrared radiation into visible thermal images. Infrared detector is the core component of the infrared industry chain and the key to detecting, identifying and analyzing infrared characteristic information of any target. The performance of infrared detector determines the performance of infrared thermal imaging system.



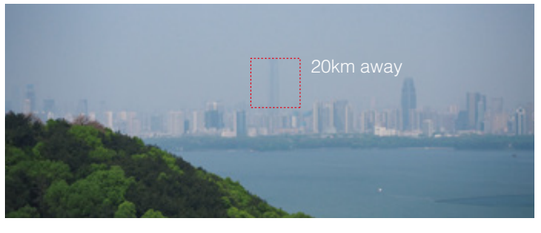
Visible Image

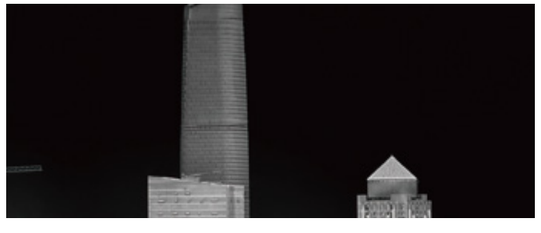
Thermal Image

Penetrate Darkness



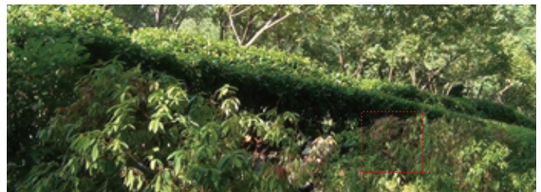
Long Range Detection

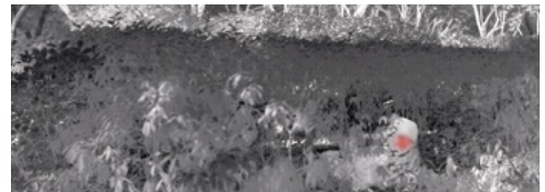




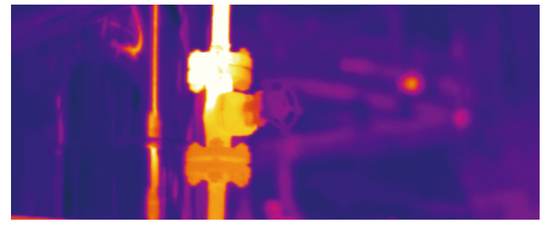
Without Interference

Identify Camouflage

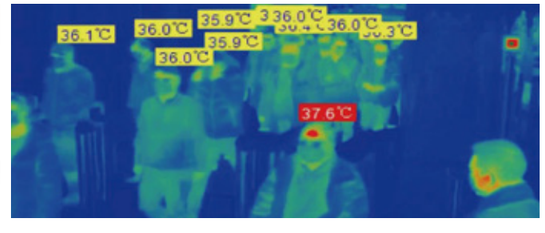




Heat Distribution



Temperature Measurement



Why Global Sensor Technology?

NOT ONLY IR DETECTORS BUT ONE-STOP SOLUTIONS

Uncooled

Production Line ▸▸ 8-inch 0.11μm **VOx** Uncooled Infrared Detector

Infrared Detectors ▸▸

Wafer Level Package

Ceramic Package

Metal Package

Thermal Modules (Standard) ▸▸

TIMO Series

COIN Series

TWIN Series

PLUG Series

Thermal Modules (Industrial) ▸▸

iLC Series

iTL Series

iHA Series

iDAS Series

Cooled

8-inch 0.5μm **MCT/T2SL** Cooled Infrared Detector

Mid Wave

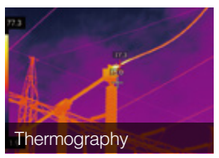
Long Wave

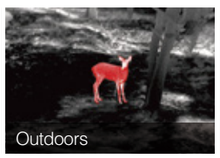
Dual-band

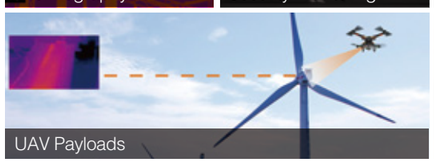
EYAS AD Modules

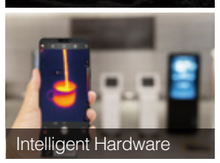
GAVIN Series

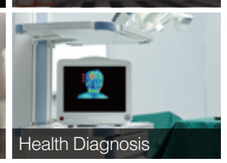
GAS Series

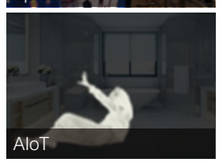


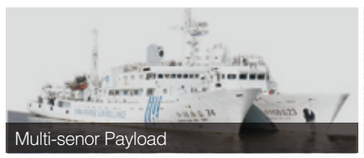


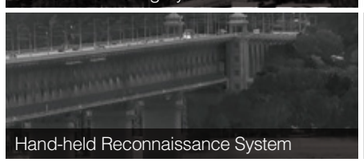


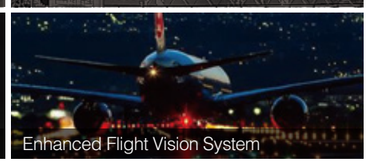




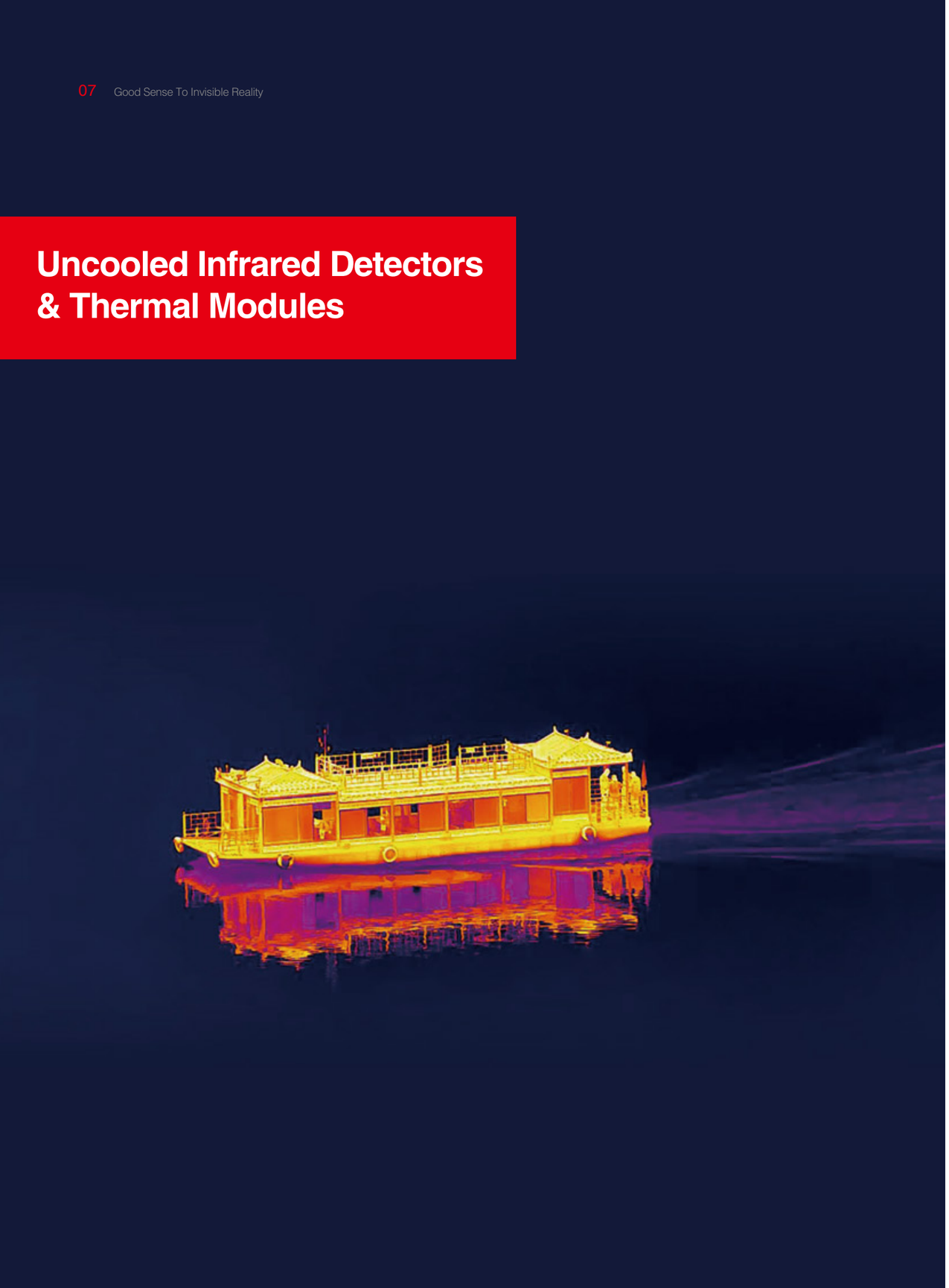








Uncooled Infrared Detectors & Thermal Modules



Uncooled Infrared Detectors

Diversified Infrared Detector Solutions

Global Sensor Technology (GST) has mastered a complete set of technologies for vanadium oxide uncooled infrared detectors, from the design and simulation of readout integrated circuit to the MEMS design, processing, packaging, testing and application. Adopting metal, ceramic and wafer level packaging, GST IR detector has been steadily put into volume production. Its resolution varies from 120x90 to 1280x1024, with high thermal sensitivity and typical NETD as low as 30mk. GST IR detectors can be integrated into various uncooled thermal modules, cores and infrared cameras that require small size, low weight, high performance, low power consumption and low price (SWaP3). They are suitable for entry-level to scientific research-level thermal imaging applications.

Resolution	Model	Main Features	Specifications
256x192	GST212W 	• Miniature Size • Light Weight • High Volume Production	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <40mK Size (mm): 10.53×7.44×1.45 (Without PCB Board) Weight: <0.5g
400×300	GST417W 	• Optimized SWaP-C • Low Power Consumption • For Consumer Electronics Applications	Pixel Size: 17μm Spectral Response: 8-14μm Typical NETD: <40mK Size (mm): 18×16×2.75 (Without Interface) Weight: <2g
	GST412C 	• Small Size • Light Weight • Smooth Images	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <40mk (Optional: ⩽30mk) Size (mm): 18.5×18.5×3.8 (Without Pin) Weight: <4.5g
	GST417M 	• High Thermal Sensitivity • Strong Adaptability • Good Image Quality	Pixel Size: 17μm Spectral Response: 8-14μm Typical NETD: <30mK Size (mm): 30×19.8×7.32 (Without Pin) Weight: <15g
640x512	GST612W 	• Wide Applications • Fast Supply Chain • Excellent Image Quality	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <40mK Size (mm): 18×16×2.75 (Without Interface) Weight: <2g
	GST612C 	• A Variety of Applications • High Stability • Sharp Image Presentation	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <40mk (Optional: ⩽30mk) Size (mm): 18.5×18.5×3.8 (Without Pin) Weight: <4.5g
	GST612M 	• Stable Performance • Mature Technology • Clear Imaging	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <40mK Size (mm): 30×19.8×7.32 (Without Pin) Weight: <20g
800x600	GST817M 	• High Thermal Sensitivity • High Reliability • Long Operating Life	Pixel Size: 17μm Spectral Response: 8-14μm Typical NETD: <30mK Size: 35x25x7.4mm (Without Pin Size) Weight: <20g
1280x1024	GST1212M 	• Ultra Clear Image • Strong Adaptability • Stable Performance	Pixel Size: 12μm Spectral Response: 8-14μm Typical NETD: <50mK Size (mm): 45×28.5×8 (Without Pin) Weight: <57g

TIMO Series Uncooled Miniature Thermal Modules

Thermal Imaging Application in Consumer Electronics Market

TIMO series miniature thermal module integrates wafer-level optical lens, wafer-level package infrared detector, micro solenoid valve shutter and basic image processing circuit. It can achieve accurate temperature data and heat distribution and is easy to be integrated into mobile terminals or smart devices that have strict requirements on cost, size and weight.

On the basis of TIMO series thermal module, TIMO256AF series are equipped with the first high-precision PM motor and the thinnest solenoid valve shutter, realizing the function of near-far focal adjustment and auto focus temperature measurement.

Smart Security | Intelligent Hardware | Smart Home | Smart Building | Machine Vision | AIoT | Outdoors

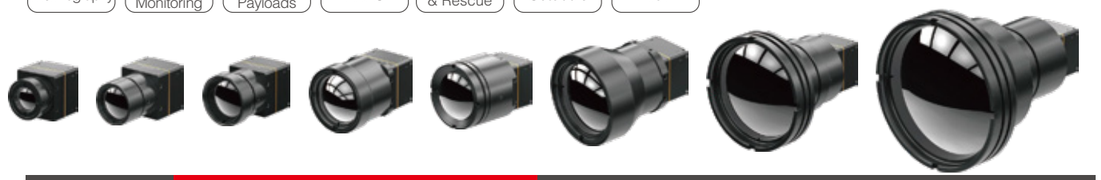
Model	Main Features	Specifications
TIMO120 	**Low Cost & Fast Integration** • Minimum WLP infrared module • DVP Interface, compatible with various embedded platforms • Visible camera module equivalent for directly integration • Provide software development kit **Long Operating Time** • Ultra-low power consumption, as low as 10mW	IR Detector: 120x90/17μm Spectral Response: 8-14μm Typical NETD: ⩽60mK Frame Rate: 25Hz (Customizable 1～30Hz) Focusing Mode: Free FOV: 50°±1°/ 90°±5° Temperature Measurement Range: ① Industrial Thermography: -20℃～150℃, 100℃～400℃ (Auto Shift) ② Body Temperature Screening: 20℃～50℃ (Accurate Range: 28～40℃) Temperature Measurement Accuracy: ① Industrial Thermography: Greater of ±2℃ or ±2% ② Body Temperature Screening: ±0.5℃
TIMO256 		IR Detector: 256x192/12μm Spectral Response: 8-14μm Typical NETD: ⩽50mK Frame Rate: 25Hz (Customizable 1～30Hz) Focusing Mode: Free FOV: 56°±1° Temperature Measurement Range: ① Industrial Thermography: -20℃～150℃, 100℃～550℃ (Auto Shift) ② Body Temperature Screening: 20℃～50℃ (Accurate Range: 28～40℃) Temperature Measurement Accuracy: ① Industrial Thermography: Greater of ±2℃ or ±2% ② Body Temperature Screening: ±0.5℃
TIMO256AF Series 	**Top Level Configuration** • Equipped with high-precision PM motor and the thinnest solenoid valve shutter **Fast to Focus** • Realize the function of near-far focal adjustment and auto focus temperature measurement **Temperature Measurement** • High accuracy, customizable temperature measurement range **ITA SDK** • Special software development kit, support cross-platform and rich features	IR Detector: 256x192/12μm Spectral Response: 8-14μm Typical NETD: ⩽50mK Frame Rate: 25Hz Focusing Mode: Electric FOV: 25°±1°/56°±1° Temperature Measurement Range: ① Industrial Thermography: -20℃～150℃, 100℃～550℃ (Auto Shift) ② Body Temperature Screening: 20℃～50℃ (Accurate Range: 28～40℃) Temperature Measurement Accuracy: ① Industrial Thermography: Greater of ±2℃ or ±2% ② Body Temperature Screening: ±0.5℃

COIN Series Uncooled Thermal Modules (Standard)

New Trend of Lightweight Infrared Products

COIN series uncooled thermal modules utilize wafer-level package detector developed by GST, ASIC chip for imaging processing, standard optical interfaces and a full set of optical lenses. Its ultra compact structure is suitable for the integration of thermal imager in various applications and beneficial for OEM customers to start fast secondary development.

Thermography | Security Monitoring | UAV Payloads | ADAS | Firefighting & Rescue | Outdoors | AIoT



Type	Main Features	Model	Specifications
Imaging	**Optimal SWaP** • Mini size: 25.4×25.4×14.1mm (with shutter) • Light Weight: as low as 11.2g • Power consumption: as low as 0.75W **Good Image Quality** • High thermal sensitivity, typical NETD⩽40mK • New generation image processing algorithm: NUC/3DNR/DNS/DRC/EE **Easy & Fast Integration** • USB2.0/DVP/LVDS multi-mode image output interface; RAW/YUV image data output; serial port control	COIN612	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Frame Rate: 25/30Hz Typical Power Consumption: 0.8W Size (mm): 25.4×25.4×28.9 (With 9.1mm Lens) Weight: 29g (With 9.1mm Lens) Optional Lens: Fixed Athermal 4.9/9.1/13/19/25/35/50/70mm
		COIN417[02]	IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Frame Rate: 25/30/50Hz Typical Power Consumption: 0.75W Size (mm): 25.4×25.4×29.3 (With 9.1mm Lens) Weight: 29±2g (With 9.1mm Lens) Optional Lens: Fixed Athermal 4.9/9.1/13/19/25mm
Thermography	**Efficient & Accurate** • Wide Range: -20°C～150°C, 0～550°C (support expansion & customization) • High Accuracy: Greater of ±3°C or ±3% • Provide ARM/windows/Linux SDK to achieve full screen temperature measurement **Strong Analysis Function** • Full screen • Regional analysis • High temperature alarm • Hot spot automatic tracking • Isotherm	COIN612R	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Frame Rate: 25/30Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±3°C or ±3% Optional Lens: 9.1/13/19mm
		COIN417[02]R	IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Frame Rate: 25/30/50Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±3°C or ±3% Optional Lens: Fixed Athermal 9.1/13/19/25mm

TWIN Series Uncooled Thermal Modules (Standard)

Compact Design, High Sensitivity

TWIN series uncooled thermal modules integrate GST self-developed ceramic package infrared detector, high performance signal processing circuit and enhanced image algorithm to output clear, sharp images and accurate temperature data. Its compact design and light weight structure could satisfy customers' strict integration requirements on size, weight and power consumption.

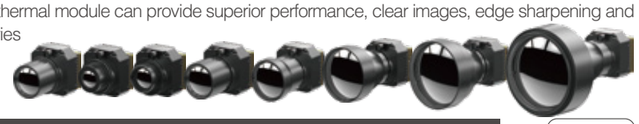
Security Monitoring | UAV Payloads | Thermography | Outdoors | ADAS | Machine Vision | Helmet Mounted

Type	Main Features	Model	Specifications
Imaging	**Optimal SWaP** • Mini Size: 25.4x25.4x22mm • Light weight as low as 20g • Power consumption as low as 0.8W **Excellent Image Quality** • High thermal sensitivity, typical NETD ＜30mK • New generation image processing algorithm: NUC/3DNR/DNS/DRC/EE **Easy & Fast Integration** • USB2.0/DVP/LVDS multi-mode image output interface; RAW/YUV image data output; serial port control **Strong Adaptability** • Stable work in complex environments	TWIN612	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: ＜30mK Frame Rate: 25/30Hz Typical Power Consumption: 0.8W Size (mm): 25.4×25.4×22 (Without Lens) Weight: 20±2g (Without Lens) Optional Lens: Fixed Athermal 13/19/25/35/50/70mm
		TWIN412	IR Detector: 384x288/12μm Spectral Response: 8-14μm Typical NETD: ＜30mK Frame Rate: 25/30/50Hz Typical Power Consumption: 0.8W Size (mm): 25.4×25.4×22mm (Without Lens) Weight: 20±2g (Without Lens) Optional Lens: Fixed Athermal 13/19/25/35/50/70mm
Thermography	**Efficient & Accurate** • Wide Range: -20°C～150°C, 0～550°C (support expansion & customization) • High Accuracy: Greater of ±2°C or ±2% • Provide Windows/Linux SDK to achieve video stream analysis and conversion from gray to temperature **Strong Analysis Function** • Full screen • Regional analysis • High temperature alarm • Hot spot automatic tracking • Isotherm	TWIN612R	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: ＜30mK Frame Rate: 25/30Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±2°C or ±2% Optional Lens: Fixed Athermal 13/19/25mm
		TWIN412R	IR Detector: 384x288/12μm Spectral Response: 8-14μm Typical NETD: ＜30mK Frame Rate: 25/30/50Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±2°C or ±2% Optional Lens: Fixed Athermal 13/19/25mm

PLUG Series Uncooled Thermal Modules (Standard)

PLUG and Play, Stable and Reliable

The PLUG Series uncooled thermal modules integrate GST metal package infrared detector, unique image processing algorithm and professional hardware platform. With high performance IR detector, the thermal module can provide superior performance, clear images, edge sharpening and enhanced details at any harsh environments. The PLUG series thermal modules are equipped with various common industrial interfaces and optical lenses, which cater for all specific integration requirements.



Security Monitoring | Predictive Maintenance | UAV Payloads | Machine Vision | Metallurgical Petrochemical | Firefighting & Rescue | Building Inspection | Outdoors | Rail Traffic

Type	Main Features	Model	Specifications
Imaging	**Plug & Play for Easy Integration** • DVP/LVDS multi-mode image output interfaces • Standard optical interfaces; a full set of lenses **Clear Images & Rich Details** • High thermal sensitivity, NETD＜30mK • IDE/AGC intelligent image algorithm **Good Stability** • Adapt to various harsh environments **Various Expansion Components** • USB3.0/VPC/Cameralink/HDMI/Gig-E network port	PLUG1212	IR Detector: 1280x1024/12μm Spectral Response: 8-14μm Typical NETD: <50mK Frame Rate: 25Hz Typical Power Consumption: 2.0W Size (mm): 56×56×44 Weight: 220±5g Optional Lens: Fixed Focus Athermal 14/19/25mm Continuous Zoom 30-90mm，30-180mm
		PLUG612	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: <40mK Frame Rate: 9/25/30/50Hz Typical Power Consumption: 1.4W Size (mm): 44.5×44.5×36.6 Weight: 85±3g Optional Lens: Fixed Focus Athermal 13/19/24mm
		PLUG617	IR Detector: 640x512/17μm Spectral Response: 8-14μm Typical NETD: <30mK Frame Rate: 9/25/30/50Hz Typical Power Consumption: 1.4W Size (mm): 44.5×45.95×37.3 Weight: 90±3g Optional Lens: Fixed Focus Athermal 7.5/13/19/25/35/50/60/100mm Motorized Lens 75/100/150mm Continuous Zoom 30-150mm
		PLUG417	IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: <30mK Frame Rate: 9/25/30/50/60Hz Typical Power Consumption: 1.4W Size (mm): 44.5×44.5×36.6 Weight: 85±3g Optional Lens: Fixed Focus Athermal 7.5/13/19/25/35/50/60/100mm
Thermography	**Efficient & Accurate** • Wide Range: -20℃～150℃, 0℃～550℃ • High Accuracy: Greater of ±2°C or ±2% • Complete SDK for Continuous Update & Optimization **Strong Analysis Function** • Full screen • Regional analysis • High temperature alarm • Hot spot automatic tracking • Isotherm	PLUG1212R	IR Detector: 1280x1024/12μm Spectral Response: 8-14μm Typical NETD: <50mK Frame Rate: 25Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±3°C or ±3% Optional Lens: Fixed Focus Athermal 14/25mm
		PLUG617R	IR Detector: 640x512/17μm Spectral Response: 8-14μm Typical NETD: <30mK Frame Rate: 25/30Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±2°C or ±2% Optional Lens: Fixed Focus Athermal 7.5/13/19/25mm
		PLUG417R	IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: <30mK Frame Rate: 25/30/50/60Hz Temperature Measurement Range: -20°C～150°C，0°C～550°C Temperature Measurement Accuracy: Greater of ±2°C or ±2% Optional Lens: Fixed Focus Athermal 7.5/13/19/25mm

iLC Series Thermal Modules (For Consumer Electronics)

Accelerate the Application of Infrared Technology in Emerging Markets

Oriented for optimal Size-Weight-and-Performance-Cost (SWaP-C), the iLC212R thermal module delivers smooth thermal images and provides various standard interfaces to facilitate the secondary development of OEM customers. Its cost control accelerates the popularization of thermal imaging technology in the consumer electronics market, such as Community Fireproof & Theftproof, Smart Building, Smart Breeding, Home Care etc.

Security Monitoring | Thermography | Wearable Devices | Vehicle Electronics | Smart Home | Living Creatures Detection

Model	Main Features	Specifications
iLC212R 3.2mm 	**Optimal SWaP-C** • Self-developed WLP 256×192/12μm infrared detector with high annual output • Powerful image processing algorithm: NUC, 3DNR, DNS, DRC, EE • Non-contact temperature measurement with range of -20°C~150°C, 0°C～+550°C and accuracy of ±8°Cor ±8% (or Customizable: ±3°C or ±3%) **Miniature Structure** • Compact Size: 21×21×12.8mm • Light Weight as low as 8.6±1g **Fast Integration** • Provide Windows/Linux/ARM SDK • Various interfaces: 30pin-HRS/RS232-TTL/ USB2.0/DVP • Digital video output: RAW/YUV/BT656 **Protection Level** • Reserved installation position for sealing ring, with the module up to IP67	IR Detector: 256x192/12μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Focal Length: 3.2mm FOV: 51°x39° Frame Rate: 25/30Hz Typical Power Consumption: 0.7W Size (mm) & Weight: 21×21×12.8 (With 3.2mm Lens); 8.6g 21×21×17.4 (With 3.2mm Lens IP67); 13g Temperature Measurement Range: -20°C～+150°C, 0°C～+550°C (Support Customization and Expansion) Temperature Measurement Accuracy: Greater of ±8℃ or ±8% (@23℃±3℃)(IP67) Greater of ±3℃ or ±3% (@23℃±3℃) Detect Distance: 1.5m SDK: Support Windows/Linux/ARM; Achieve video stream analysis and conversion from gray to temperature Lens: Fixed focus athermal 3.2mm/F1.1; Coating: AR
iLC212R 7mm 		IR Detector: 256x192/12μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Focal Length: 7mm FOV: 24°x18° Frame Rate: 25/30Hz Typical Power Consumption: 0.7W Size (mm): 21×21×22.6 (With Lens) Weight:17.3±1g (With Lens) Temperature Measurement Range: -20°C～+150°C, 0°C～+550°C (Support Customization and Expansion) Temperature Measurement Accuracy: Greater of ±8°C or ±8% (@23°C±3°C); Greater of ±3°C or ±3% (@23°C±3°C)(Customizable) Detect Distance: 1.5m SDK: Support Windows/Linux/ARM; Achieve video stream analysis and conversion from gray to temperature Lens: Fixed focus athermal 7mm/F1.0; Coating: HD/DLC

iTL Series Thermal Modules (For Drones/Wearable Devices)

A New Level of Compact & Lightweight Structure

The iTL612/R uncooled thermal module is small in size and light in weight, which provides a reliable solution for infrared system integration with limited space. Its compact structure has reached the top level of the same specification module. It is specially developed for the field of electric power inspection, photovoltaic inspection, environmental protection detection, scientific research, aerial photography, police investigation, disaster relief & rescue, forest fire prevention, urban safety etc.

UAV Payloads | Portable Devices | Wearable Device

Model	Main Features	Specifications
iTL612/R 	**Compact & Lightweight Design** • Size: 21x22.3x27.3mm (With 9.1mm Lens) • Weight: 20.8g (With 9.1mm Lens) • Power consumption as low as 0.7W, single power supply, simpler system design **Clear Image & Fast Integration** • Brand new image process algorithm: NUC/3DNR/DNS/DRC/EE • DVP/LVDS/USB2.0 interfaces, RAW/YUV/BT656 image data output, serial port control **Accurate Temperature Measurement** • Support regional analysis, spot temperature measurement, isotherm • Support Windows/Linux/ARM SDK	IR Detector: 640x512/12μm Spectral Response: 8-14μm Typical NETD: ⩽40mK Size: 21x22.3x27.3mm (With 9.1mm Lens) Weight: 20.8g (With 9.1mm Lens) Typical Power Consumption: 0.7W Frame Rate: 30Hz Temperature Measurement Range: -20°C～150°C, 0°C～550°C (Support customization and expansion) Temperature Measurement Accuracy: Greater of ±2°C or ±2% (@23°C±3°C) Optional Lens: Fixed focus athermal 9.1mm

iHA Series Thermal Modules (For Temperature Screening)

Solution for Epidemic Prevention & Health Diagnosis

iHA417W/iHA417 thermal module is mainly composed of 384x288/17 μm infrared detector, optical lens and SDK for temperature measurement with accuracy up to ±0.5°C. The captured temperature data and heat distribution of target can be used to achieve radiation-free, non-invasive early disease diagnosis and long-distance, large-scale body temperature screening. Customers can quickly develop and integrate various temperature measuring systems like medical diagnosis and epidemic prevention.

Health Diagnosis | Epidemic Prevention | Animal Thermography

Model	Main Features	Specifications
iHA417W 	**Special for Non-contact Temperature Measurement** • ±0.5°C high precision temperature measurement without external black body • Detect distance: 0.5m (for medical diagnosis); 5m (for epidemic prevention and animal thermography) **Fast Integration into System** • An all-in-one standard Type-C interface with power supply, data transmission and control • Support Windows/Android/Linux SDK; Realize video stream analysis, module control, comprehensive array temperature measurement, temperature imaging, temperature window setting, multiple integration **Compact & Light Structure** • Small size: 25.4×25.4×30.3mm (With lens) • Light weight as low as 32.2g	IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: <40mK Frame Rate: 25Hz Typical Power Consumption: 0.85W Size: ⩽25.4x25.4x30.3mm (With 9.1mm Lens) Weight: 32.2±3g (With 9.1mm Lens) Temperature Measurement Range: 15°C~50°C Temperature Measurement Accuracy: ⩽±0.5°C (No wind indoor, target temperature range 32°C~42°C) Temperature Uniformity: ⩽±0.3℃ Detect Distance: 0.5m or 5m SDK: Provide Windows/Android/Linux SDK; Realize video stream analysis, module control, comprehensive array temperature measurement, temperature imaging, temperature window setting, multiple integration Optional Lens: Fixed focus athermal 9.1mm; FOV 39.5°x30.1°
iHA417 		IR Detector: 384x288/17μm Spectral Response: 8-14μm Typical NETD: <30mK Frame Rate: 25Hz Typical Power Consumption: 1.5W Size (mm): 44.5×42.5×58.9 (With 7mm Lens) Weight: 123g (With 7mm Lens) Temperature Measurement Range: 20°C~50°C Temperature Measurement Accuracy: ⩽±0.5°C (No wind indoor, target temperature range 32°C~42°C) Detect Distance: 0.5m or 5m SDK：Provide Windows/Android/Linux SDK; Achieve Full Screen Thermography Optional Lens: Fixed focus athermal 7/9.7mm

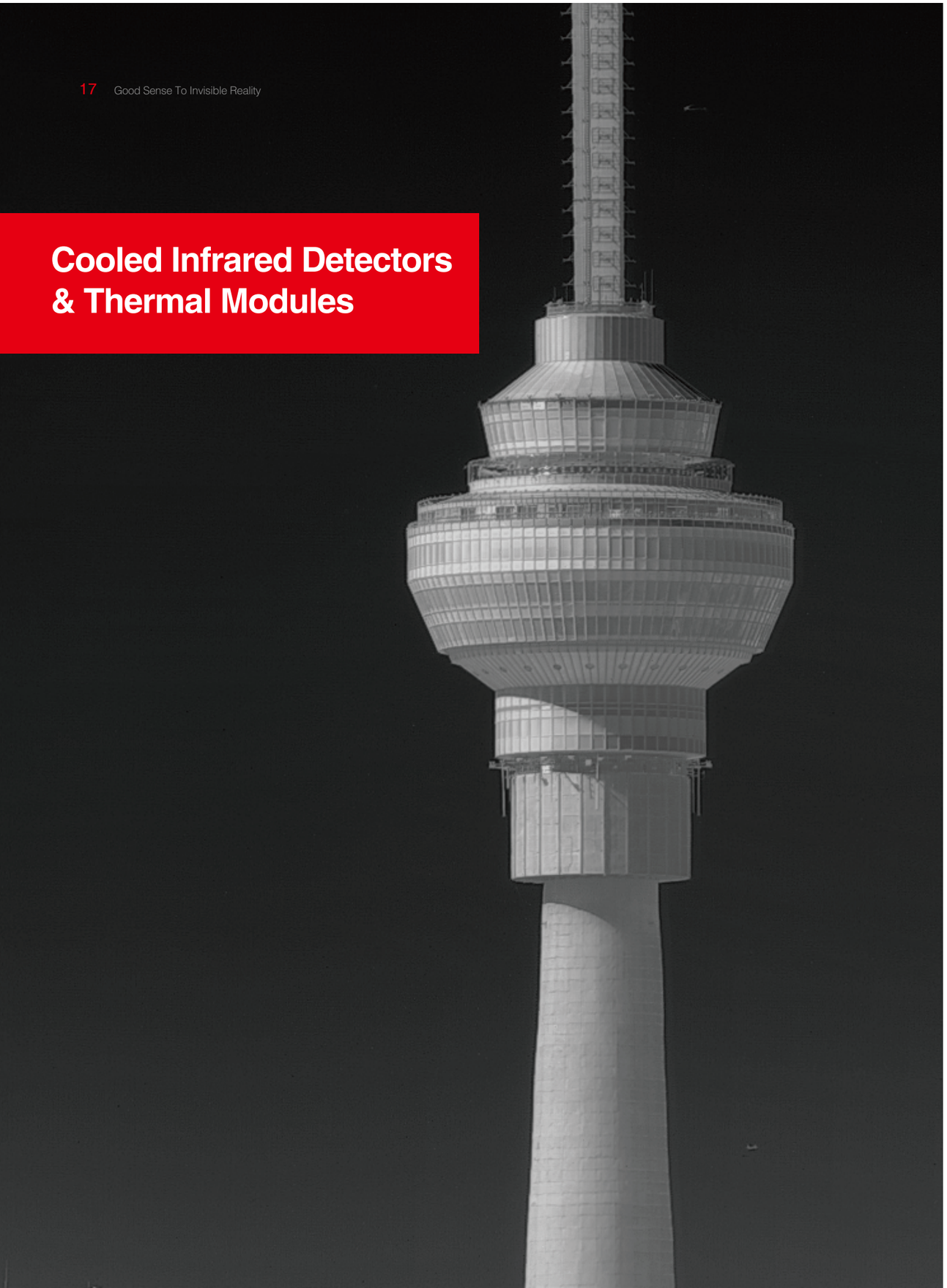
iDAS Series Thermal Modules (For Vehicle Electronics)

Enhance Driver's Visual Perception

Automotive night vision products are effective to eliminate the interference of high beams from oncoming vehicles, increasing drivers' perception towards the surrounding environment and seeing distance in darkness or bad weather, such as rain, snow, haze and dust, so that the safety of drivers, passengers, pedestrians and vehicles can be guaranteed.

ADAS | Autonomous Driving

Model	Main Features	Specifications
iDAS 384 	**A Great Distance of View** • See clear image 300 meters away beyond the reach of vehicles' headlights • Enhance drivers' field of view so as to better identify targets and avoid obstacles **Intelligent Alarm** • Base on a lot of model trainings and own a set of mature AI algorithms • Identify pedestrians, cyclists, vehicles and give warning in advance **All-weather Application** • Anti-glare interference from oncoming vehicles in dark night • Get clear image in harsh environment such as rain, snow, fog and dust **Support UDSonCAN Protocol (iDAS 384S)** • Support UDSonCAN Protocol (N-driver 384S) **High Reliability & Stability** • Meet IP67 protection level	IR Detector: 384×288/17μm Spectral Response: 8-14μm Typical NETD: <40mK Focal Length: 9.7mm FOV: 37°x28° Video Format: CVBS Image Frame Rate & Resolution: PAL 768×576@25Hz Identification Range: People: 1.8x0.5m ⩾150m Car: 2.3x2.3m ⩾300m Size (mm): 40×40×60 (Without Cable) Weight: 125±3g (Without Cable) Power Consumption: ⩽2W(@24V Power Supply, Window Heating is off) ⩽6W(@24V Power Supply, Window Heating is on) Certification: EMC Test Certification (ISO10605, ISO11452-4, ISO11452-2, ISO7637-2)
iDAS 384S 		



Cooled Infrared Detectors & Thermal Modules

Cooled Infrared Detectors

High Sensitivity, Multi-band Detection

GST has mastered the complete manufacturing process of cooled infrared detector, such as element purification, substrate, epitaxy, FPAs, ROIC, coolers, package and testing etc. With response range covering MW, LW and dual-band, the MCT/T2SL infrared detectors have high thermal sensitivity, typical NETD as low as 9mK, high quantum efficiency and good response rate. GST cooled infrared detectors have already achieved mass production and continuous supply in various mid-to-high-end thermal imaging fields.

Wave Band	Main Features	Model	Specifications
Mid Wave	**Sharp & Clear Imaging** • Good uniformity, effective pixel rate ＞99.5% •High thermal sensitivity **Guarantee Continuous Supply** • Interchangeable standard interface • Mass production, good consistency **Design for Specific Applications** •Wavelength can be customized • F number can be customized • Mounting surface can be customized • Multiple cryocoolers available	C1212M 	IR Detector: 1280x1024/12μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD:16mK(F2); 18mK(F4) Cryocooler: RS058 Cooling Time: ⩽6mins Steady Power Consumption: ⩽7W
		C615M 	IR Detector: 640x512/15μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: 16mK(F2); 18mK(F4) Cryocooler: RS058/RS046/LS734 Cooling Time: ⩽6min(RS058); ⩽5min30s(RS046); ⩽5min(LS734 Linear) Steady Power Consumption: ⩽6W(RS058); ⩽5W(RS046); ⩽10W(LS734 Linear)
		C330M 	IR Detector: 320x256/30μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: 9mK(F2); 15mK(F4) Cryocooler: RS058/RS046H Cooling Time: ⩽6min(RS058); ⩽5min30s(RS046H) Steady Power Consumption: ⩽6W
Long Wave	**Long Wave Detection** • Strong ability to penetrate sand and dust •Capable of detecting cryogenic objects •Without fear of interference in complex environments, such as sunlight and reflect light in the sea **T2SL Technology** • High quantum efficiency, high thermal sensitivity • Excellent performance in LWIR & dual-color • High FPA operation temperature • Large array, good uniformity, high yield	C615S LWIR 	IR Detector: 640x512/15μm T2SL Spectral Response: 7.7μm±0.2μm ～ 9.4μm±0.3μm Typical NETD: 22mK (F2/Interlace & Binning) 25mK (F2/ITR) Cryocooler: RS058 Cooling Time: ⩽5min30s Steady Power Consumption: ⩽8W
		C330S LWIR 	IR Detector: 320x256/30μm T2SL Spectral Response: 7.7μm±0.2μm ～ 9.4μm±0.3μm Typical NETD: 20mK (F2) Cryocooler: RS058 Cooling Time: ⩽5min30s Steady Power Consumption: ⩽8W
Dual Wave	**Dual-band for Target Information** • Reduce false alarm rate • Meet the target detection needs of complex backgrounds to improve detection capabilities and anti-interference capabilities	C330S MW/LW 	IR Detector: 320x256/30μm T2SL Spectral Response MW: 3.7μm±0.2μm ～ 4.8μm±0.2μm LW: 7.7μm±0.2μm ～ 9.4μm±0.3μm Typical NETD: 20mK(MW);25mK(LW) Cryocooler: RS058 Cooling Time: ⩽8min Steady Power Consumption: ⩽9W

EYAS Series Cooled AD Module

Accelerator for Cooled Infrared Detector Integration

Equipped with high performance signal processing circuit and standard cameralink interface that could output 16 bits raw data, EYAS series cooled AD module is applicable to all MCT&T2SL cooled infrared detectors by GST. It is easy for OEM customers to start rapid secondary development and shorten their development period of thermal modules and infrared products based on cooled infrared detectors.

Hand-held Reconnaissance System | Enhanced Flight Vision System | Remote Monitoring System | Electro-Optical Payload | Search & Tracking System

Wave Band	Main Features	Model	Specifications
Mid Wave	**High Performance Cooled Infrared Detector** • High thermal sensitivity with typical NETD as low as 9mk **Easy to Develop & Integrate** • Cameralink interface output 16bit raw data, serial port control • Integrated structure that has consistent dimension with detector • 5V single-supply **Capture High Speed Moving Target** • Output frame frequency up to 200Hz	EYAS1212 	IR Detector: 1280x1024/12μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽18mK Cooling Time: ⩽6min Frame Rate: 1～100Hz Adjustable Steady Power Consumption: 9W Cryocooler: RS058
		EYAS615A 	IR Detector: 640x512/15μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽17mK Cooling Time: ⩽6min Frame Rate: 1～120Hz Adjustable Steady Power Consumption: 7W Cryocooler: RS058
		EYAS615B 	IR Detector: 640x512/15μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽18mK Cooling Time: ⩽5.5min Frame Rate: 1～50Hz Adjustable Steady Power Consumption: 8W Cryocooler: RS046
		EYAS330 	IR Detector: 320x256/30μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽9mK Cooling Time: ⩽6min Frame Rate: 1～200Hz Adjustable Steady Power Consumption: 7W Cryocooler: RS058
Long Wave	**Long Wave Detection** • Strong ability to penetrate sand and dust • Capable of detecting cryogenic objects • Without fear of interference in complex environments, such as sunlight and reflect light in the sea • High quantum efficiency and good consistency **Easy to Develop & Integrate** • Cameralink interface output 16bit raw data, serial port control • Integrated structure that has consistent dimension with detector • 5V single-supply	EYAS615L 	IR Detector: 640x512/15μm T2SL Spectral Response: 7.7μm±0.2μm～9.4μm±0.3μm Typical NETD: ⩽25mK Cooling Time: ⩽5.5min Frame Rate: 1～160Hz Adjustable Steady Power Consumption: 9W Cryocooler: RS058

GAVIN Series Cooled Thermal Modules (Standard)

See Through the Darkness Far Away

GAVIN series cooled thermal modules utilize GST MCT &T2SL cooled IR detectors and integrate various image processing algorithms to output clear infrared images in the total darkness or bad weather conditions. It can detect and recognize risks and threats at long distance while present more target details at short distance.

Hand-held Reconnaissance System | Enhanced Flight Vision System | Remote Monitoring System | Electro-Optical Payload | Search & Tracking System

Wave Band	Main Features	Model	Specifications
Mid Wave	**Meet Long Range Detection** • High thermal sensitivity with NETD as low as 9mK • Long range detection, aircraft can be detected at 60 km away • Wide field of view, resolution up to1280×102 **Easy Integration into the System** • Cameralink/DVP/USB/Gig-E interface,RAW/YUV image output • A variety of continuous optical zoom lenses are available	GAVIN1212 	IR Detector: 1280x1024/12μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽20mK Cooling Time: ⩽8min Frame Rate: 50/100Hz Steady Power Consumption: 16W Cryocooler: RS058 Lens: Continuous Zoom 37.5～750mm/F4 Fixed Focus 19mm/F2; 40mm/F2; 240mm/F2
		GAVIN615A 	IR Detector: 640x512/15μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽15mK Cooling Time: ⩽7min Frame Rate: 50/100Hz Steady Power Consumption: 12W Cryocooler: RS058 Lens: Continuous Zoom 30～240mm/F4; 15～300mm/F4; 21～420mm/F4; 35～690mm/F4
		GAVIN615B 	IR Detector: 640x512/15μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽20mK Cooling Time: ⩽7min Frame Rate: 50/100Hz Steady Power Consumption: 12W Cryocooler: RS046 Lens: Continuous Zoom 60～240mm/F4; 15～300mm/F4; 21～420mm/F4; 35～690mm/F4
		GAVIN330 	IR Detector: 320x256/30μm MCT Spectral Response: 3.7μm±0.2μm～4.8μm±0.2μm Typical NETD: ⩽10mK Cooling Time: ⩽7min Frame Rate: 50/100/200Hz Steady Power Consumption: 12W Cryocooler: RS058 Lens: Continuous Zoom 30～240mm/F4 15～300mm/F4 21～420mm/F4 35～690mm/F4
Long Wave	**Long Wave Detection** • Strong ability to penetrate sand and dust • Capable of detecting cryogenic objects • Without fear of interference in complex environments, such as sunlight and reflect light in the sea • High quantum efficiency and good consistency **Easy to Develop & Integrate** • Cameralink/DVP/USB/Gig-E interface, RAW/YUV image output	GAVIN615L 	IR Detector: 640x512/15μm T2SL Spectral Response: 7.7μm±0.2μm～9.4μm±0.3μm Typical NETD: ⩽25mK Cooling Time: ⩽7min Frame Rate: 50/100Hz Steady Power Consumption: 14W Cryocooler: RS058 Lens: Fixed Focus 25mm/F2

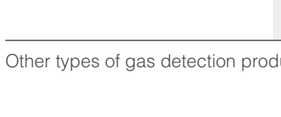
GAS Series Infrared Solutions (For Optical Gas Imaging)

Gas can Leak but can't Escape

GAS series cooled thermal modules are developed on the basis of GST mid-wave cooled infrared detector for easier integration into gas thermal imager to detect VOCs leakage in the production and transportation process of petrochemical enterprises, so that safety production, environmental protection supervision and cost saving can be guaranteed.

Nearly 400 hydrocarbons can be detected

Alkanes	Olefins	Aromatic hydrocarbons	Alcohols	Ketones
Methane/Ethane/Propane Butane/Pentane/Hexane Heptane/Octane	Ethylene/Propylene Lsoprene	Benzene/Toluene Ethylbenzene/Xylene	Methanol Ethanol	Acetone Methyl isobutyl ketone •••

Type	Main Features	Specifications
C330M-B3T Infrared Detector 	**Superior Performance** • Equipped with 3.2μm±0.1μm～3.5μm±0.1μm narrow-band filter, suitable for VOCs detection • High Sensitivity with typical NETD 10mK • Good uniformity, effective pixel rate＞99.5% **Designed for Users' Requirements** • Support 12V power supply, which is conducive to passing explosion-proof certification • Various cryocoolers available for light weight, low power, long life and high reliability • Spectral range: 3μm~5μm MWIR (customizable)	IR Detector: 320x256/30μm MCT Spectral Response: 3.2μm±0.1μm～3.5μm±0.1μm Typical NETD: 10mK (F1.5) Working Mode: Snapshot; ITR Integration Mode; Windows Mode; Anti-blooming Dynamic Range: ⩾80dB Cryocooler: RS058/RS058I/LS734 Linear Steady Power Consumption: ⩽7W (RS058) ⩽7W (RS058I) ⩽10W (LS734 Linear)
EYAS330G Cooled AD Module 	**Shorten Development Cycle** • Adopt high-performance signal processing circuits to realize the conversion of analog signal to digital signal • Support 12V power supply; explosion proof **Easy & Fast Integration** • Cameralink interface output 16-bit RAW data, serial port control • Integrated structure that has consistent dimension with detector	IR Detector: 320x256/30μm MCT Spectral Response: 3.2μm±0.1μm～3.5μm±0.1μm Typical NETD: 10mK （F1.5） Frame Rate: 1～200Hz Adjustable Cryocooler: RS058/RS058I Steady Power Consumption: 7W
GAS330 Cooled Thermal Module 	**High Sensitivity** • High sensitive cooled infrared detector, NETD⩽15mK • Quite efficient in application of low gas concentration and slow gas flow • Effective leak detection includes Alkanes, Alkenes, Alcohols, Benzenes, Ketones and other types **Explosion-proof (GAS330^{G2})** • Obtain the explosion-proof certificate (Ex ic IIC T4 GC) **Easy Integration** • Long range non-contact temperature measurement: range of -20°C~400°C • Support point and regional analysis, high temperature alarm, hot spot tracking and other temperature algorithms • Cameralink/DVP/USB/Gig-E image output interfaces, compatible with a variety of development environments • Multiple lens configurations, more optional fields of view, more scenes available	IR Detector: 320x256/30μm MCT Spectral Response: 3.2μm±0.1μm～3.5μm±0.1μm Typical NETD: ⩽15mK@25±3°C Frame Rate: 30Hz Cryocooler: RS058/RS058I/LS734 Linear Steady Power Consumption: 12W Temperature Measurement Range: -20°C~400°C (GAS330^{G2}) Optional Lens: Fixed Focus 23mm/F1.5, FOV 23.58°x18.96°; 55mm/F1.5, FOV 9.97°x7.99°

Other types of gas detection products such as CO, CO_2, SF6 etc. can also be customized according to the needs of customers.

Cryocoolers

Match all kinds of Cooled IR Detectors

Cryocooler is an indispensable part of the cooled infrared detector. It provides a cryogenic working environment for the focal plane array and ensures the normal operation of cooled infrared detectors.

Type	Main Features	Model	Specifications
Integral Rotary Stirling Cryocooler	**Principle** Adopt key technologies such as high-efficiency brushless DC motor drive, high-efficiency wear-resistant coating, and high-precision miniature bearing support **Features** Compact structure, small size, light weight,adapt to various harsh environments **Application** Widely used in various electro-optical systems such as handheld imagers, pods,turrets, security monitoring, ADAS etc.	RS058 	MTTF: ⩾10000hrs Cooling Power: (@77K@20°C)⩾550mW Cooling Time: ⩽5min(250J@77K@20°C) Stable Power Consumption: ⩽5.5W (220mW@77K@20°C) Maximum Size (mm): 116x58.5x71 Weight: ⩽430g
		RS079 	MTTF: ⩾10000hrs Cooling Power: (@77K@20°C)⩾750mW Cooling Time: ⩽5min(500J@77K@20°C) Stable Power Consumption: ⩽12W (550mW@77K@20°C) Maximum Size (mm): 120x59x78 Weight: ⩽500g
		RS046 	MTTF: ⩾10000hrs Cooling Power: (@77K@20°C)⩾400mW Cooling Time: ⩽5min(150J@77K@20°C) Stable Power Consumption: ⩽4.5W (130mW@77K@20°C) Maximum Size (mm): 99x81.5x46.5 Weight: ⩽260g
Split Rotary Stirling Cryocooler	**Principle** Based on the rotary integral engineering that arranges the compressor and the expander separately and connects them by connecting pipes **Features** Small size, light weight, flexible layout according to application, high system space utilization **Application** Systems with strict requirements on size and power consumption, such as handheld imagers and pods	RS046H 	MTTF: ⩾10000hrs Cooling Power: (@100K@20°C)⩾400mW ooling Time: ⩽4min(150J@100K@20°C) Stable Power Consumption: ⩽5W (120mW@100K@20°C) Maximum Size (mm): Compressor 45x35x68 Expander Φ33x75 Weight: ⩽250g
Linear Stirling Cryocooler	**Principle** Adopt high efficiency moving-magnet linear motor drive, symmetrical compression piston and external coil **Features** Fast cooling, wide operating temperature range, low vibration, low noise and high reliability; meet the needs of 7*24H long-time operation **Application** Gas Leak Monitoring, Security Monitoring and other scenarios that require long-term operation	LS734 	MTTF: ⩾20000hrs Cooling Power: (@77K@20°C)⩾1300mW Cooling Time: ⩽4min(450J@77K@20°C) Stable Power Consumption: ⩽10W (430mW@77K@20°C) Maximum Size (mm): Compressor Φ46×122 Expander Φ40×88 Weight: ⩽1.0kg