



**QUANTUM RED**

Vision, beyond the limits.

HANWHA SYSTEMS Thermal Engine Module

Hanwha Systems Co., Ltd

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### Hanwha Systems, a global leader of defense and integrated solution industry

With cutting-edge defense technology, it now contributes to public safety and industrial development.

#### Defense Division

##### No.1 in Defense Electronics

Land System  
Naval System  
Aerospace System

Convergence of  
Advanced Defense  
Electronics Technology  
& IT Smart Technology

#### ICT Division

##### Total IT Service Provider

System Integration  
Artificial Intelligence  
Blockchain  
Big Data

Leading the field of advanced defense electronics and ICT technology,  
Provides differentiated solutions to finance, manufacturing, construction and service industries



Land



Naval



Aerospace



Total Defense



Smart Biz



Creative Biz



System Integration



IT Outsourcing

### Hanwha, the reliable global partner, embodies the innovative technology of Hanwha Systems.

Hanwha Systems is the representative company of the ROK ranging with the world-class companies in various business areas based on avionics and space, security and safety, and information systems service. Furthermore, it is positioned as the representative avionics, defense, and ICT specialty company of the nation as the member company of Hanwha Group possessing 320 or more global business bases. Hanwha Systems maintain the strong reliability and partnership with numerous global customers and is recognized as the global partner. Hanwha Systems provides the various service solutions based on the ICT technology such as advanced sensors and networks.

1980's	1990's	2000's	2016	2018	2019
Samsung Air	Samsung Electronics	Samsung Thales	Hanwha Systems	Hanwha Systems Defense/ICT Division Integrated Corporation	Hanwha Systems KOSPI stock market listing

- Electron optics (night vision, laser range finder)
- Naval Gun Fire Control System (WSA-423)

- Land Weapon System (K1 FCS)
- Naval Combat System (KDX-II)
- Surveillance and Reconnaissance (TOD)
- Tactical Communication System (SPIDER)

- Anti-aircraft defense system (Cheonma, Cheongung)
- Submarine Combat System (Jang Bogo-II)
- Tactical Information Communication Network (TICN)
- Army/Navy/Air Force Satellite Information System (ANASIS)

- Precision-guided weapon (explorer, altimeter, navigation device)

- Unmanned system (UAV, USV, UUV)

## Hanwha Systems Intelligent Thermal Engine Module & TRSM Summary



### Applications

- Security & Surveillance
- Firefighting
- Nightvision
- Thermo-graphy

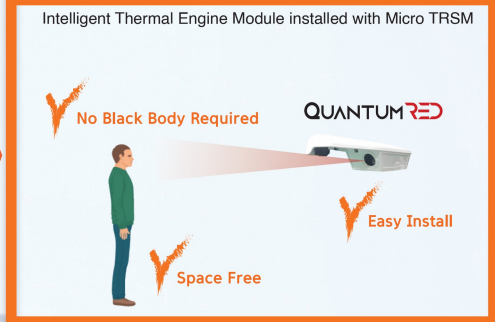
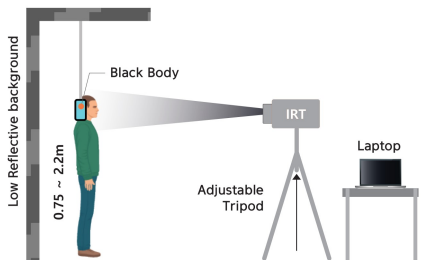
### Competitive Advantage

#### US FDA Recommends Thermal Imaging Camera installation and Operation for preventing COVID-19

The FDA have issued new guidance on non-contact infrared thermometers and their use during the COVID-19 pandemic where the systems include an infrared thermal camera and may have a temperature reference source. Hanwha System's Quantum Red Thermal Engine Module capable with TRSM (Temperature Reference Source Module), the complete all-in-one system offers the most efficient performance, without using a temperature reference. Experience the cutting edge technology and lift up the quality of your business.



[FDA] Method of measuring surface skin temperature using Thermal Imaging Camera + Black Body



## Hanwha Systems Intelligent Thermal Engine Module & TRSM Product Details

### Hanwha Systems QUANTUM RED

**High Performance Edge Processor**  
High quality imaging  
On-device AI (Embedded GPU Core)

**Supports Various Video Formats**  
MIPI/BT656/BT1120  
Camera Link  
RS-170

**Optical Lens**  
Athermal lens design  
User selected FOV (Standard C-Mount applied)

Internal shutter included

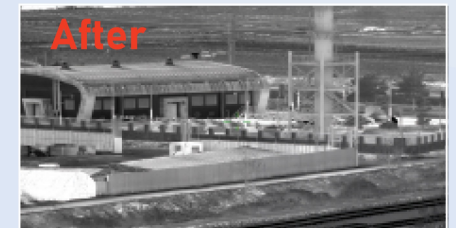


### Hanwha Systems TRSM

TRSM Stability & Accuracy ( $\pm 0.01^\circ$ )



### Digital Detailed Enhancement(DDE)



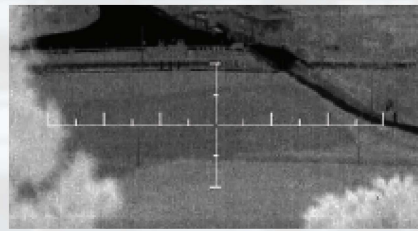
## Hanwha Systems Intelligent Thermal Engine Module Providing Optimal Performance for All Industries

QUANTUM RED provides accurate temperature measurement and clear image quality for multiple applications.

### Thermography



### Security & Surveillance



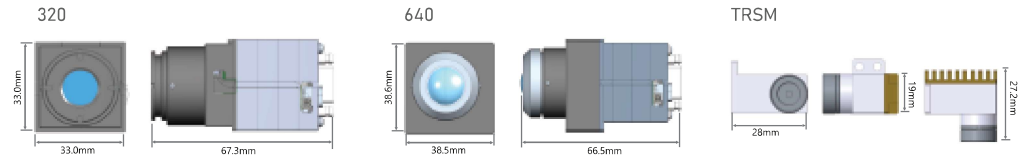
### Firefighting



### Automotive Night Vision



## Product Dimensions



## Technical Specifications

### Focal Plane Array

<b>Detector Type</b>	Uncooled LWIR Thermal Imager
<b>Array Size</b>	VGA(640x480), QVGA(320x240)
<b>Pixel Pitch</b>	12µm
<b>Spectral Band</b>	8 ~ 14µm
<b>Sensitivity (NETD)</b>	≤ 60mK @ F/1.0 @ Room Temperature

### Configurations

<b>BASE</b>	Detector, Detector Interface board Vision Processing Board, Power Board (BT656, BT1120, RGB, RS-170)
<b>Video Interface Option</b>	Camera Link(LVDS), USB3.0, MIPI Optical Lens, Tripod Mount

### Video

<b>Frame Rates</b>	30Hz
<b>Video Format</b>	RS-170, Camera Link(LVDS), BT656, BT1120, RGB, MIPI
<b>NUC</b>	Factory Calibrated
<b>E - Zoom</b>	x2, x4, x8
<b>Time to image</b>	≤ 3 seconds

### Power

<b>Input Voltage</b>	5.0V
<b>Power Dissipation (nominal)</b>	Varies by Configuration as low as 1.2W (BASE)

### Mechanical (W/O Optic)

<b>Dimensions</b>	Varies by configuration, as small as 33 x 33 x 30mm
<b>Weight</b>	Varies by configuration, as light as 55g

### Environmental

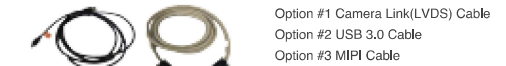
<b>Operating Temp. Range</b>	- 40°C ~ + 80°C
<b>Storage Temp. Range</b>	- 45°C ~ + 85°C

## Accessories

### Video Interface Options

<b>Camera Link (LVDS)</b>	Power Supply: USB3.0 Video Interface: Camera Link(LVDS) Control Channel: USB3.0 (UART, I2C, SPI)
<b>MIPI</b>	Power Supply: USB3.0 Video Interface: MIPI Control Channel: USB3.0 (UART, I2C, SPI)

### Camera Interface Cable



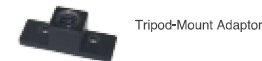
### Temperature Reference Source Module (TRSM)

<b>Operating Temp. Range</b>	+10°C ~ +30°C
<b>Target Temp. Range</b>	+35°C ~ +40°C
<b>Accuracy</b>	±0.3° @ +15°C ~ +25°C (±0.5° @ other ranges)

### Optical Lens (Athermalized)

<b>QVGA</b>	HFOV 36° HFOV 33° HFOV 28° HFOV 11.5°	<b>VGA</b>	HFOV 75° HFOV 22.8°
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### Tripod-mount



## Configuration

1		2		3				4		5		6		7	
Resolution		Lens		HFOV				Frame Rate		Grade		Interface Option		TRSM Module Option	
Type	Mark	Type	Mark	QVGA	VGA	Type	Mark	Type	Mark	Type	Mark	Type	Mark	Type	Mark
640 (640x480)	640	O	A	HFOV 36°	360	HFOV 75°	750	60Hz	6	Performance: ≤ 50 mK	P	Camera Link	C	with TRSM	T
320 (320x240)	320	X	X	HFOV 33°	330	HFOV 22.8°	228	30Hz	3	Mainstream: ≤ 60 mK	M	USB3.0	U	without TRSM	S
				HFOV 28°	280							MIPI	M		
				HFOV 11.5°	115										

Part-Numbering sample : 640A2806PMT

1	2	3	4	5	6	7
640	A	280	6	P	M	T

The specifications above are subject to change without prior notice for quality improvement.