



Quark

Longwave Infrared Thermal Core Camera

Key Features:

- Available in 336 × 256 and 640 × 512 resolution, both with 17-micron pixels
- Smallest volume camera in the industry and low mass enables new applications
- Low power consumption
- No moving parts provide for high shock and vibration tolerance
- 30/60 Hz field-switchable frame rates
- Common serial commands, GUI & SDK
- Designed for high-volume manufacturing and to provide low cost for customers

Quark

The World's Smallest Thermal Camera

FLIR® Quark™ is the smallest and lightest fully-integrated uncooled camera in existence. It is designed for thermal imaging applications that require minimum volume and weight, yet Quark is rated for extreme shock and operating temperature environments. Several lens options are available for Quark, as well as a lens-less camera body for OEM customers.

SSN: Silent shutterless NUC

17 μm VOx FPA pixels for greater image detail

Digital Detail Enhancement for clearer imagery and edge sharpening

High sensitivity: $<50 \text{ mK @ f/1.0}$

User-definable options: b/w polarity, color video palettes, 2x & 4x zoom, dynamic zoom & pan, symbology (256 grayscale and 256 colors), video output format and many others

Light weight: $<28 \text{ grams}$
(most lens models)

Multiple lens options available

Four M1.6 \times 0.35 threaded mounting holes

Sealed, coated lens

Expansion boards provide additional functionality.

Low power consumption: $\sim 1.0 \text{ W}$



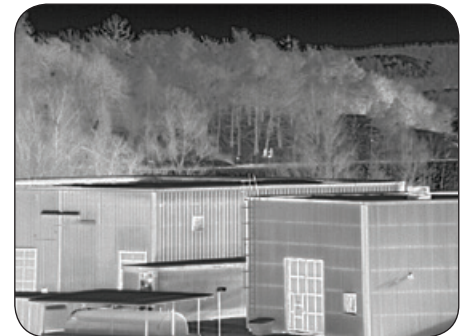
Rugged, environmental coating on lens flange

See What Quark Sees

DIGITAL DETAIL ENHANCEMENT (DDE)



DDE OFF



DDE ON

2x ZOOM (QUARK CAPABLE OF UP TO 4x ZOOM)



No Zoom



2x Zoom

6.3 mm 9 mm 13 mm 14 mm 17 mm 19 mm 25 mm 35 mm 35 mm

Choose Your FOV

LENS DATA

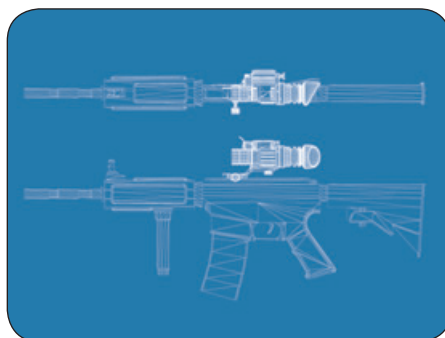
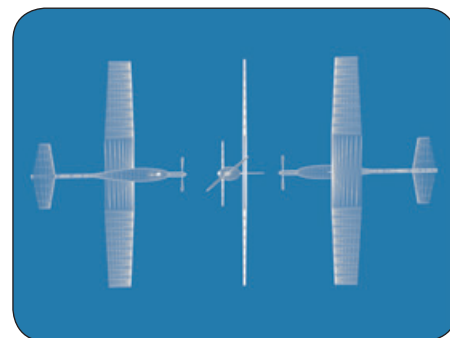
| Focal Length | 6.3 mm | 9 mm | 13 mm | 14 mm | 17 mm | 19 mm | 25 mm | 35 mm | 35 mm |
|---------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|
| f/ number | 1.4 | 1.4 | 1.25 | 1.25 | 1.25 | 1.25 | 1.2 | 1.5 | 1.2 |
| Quark 640 FOV | N/A | 69° x 56° | 45° x 37° | 43° x 35° | 36° x 29° | 32° x 26° | 25° x 20° | 18° x 14° | 18° x 14° |
| Quark 336 FOV | 50° x 40° | 35° x 27° | 24° x 19° | 23° x 18° | 19° x 15° | 16° x 13° | 13° x 10° | 9.3° x 7.1° | 9.3° x 7.1° |
| IFOV (milliradians) | 2.698 | 1.889 | 1.308 | 1.214 | 1.000 | 0.895 | 0.680 | 0.496 | 0.486 |
| Min Focus | 5 cm | 9 cm | 15 cm | 20 cm | 10 cm | 30 cm | 20 cm | 2 m | 60 cm |
| Weight (Lens & Mount Only) | 8.2 g | 17.2 g | 12.1 g | 12.9 g | 14 g | 12.2 g | 34 g | 17.2 g | 107.8 g |
| Weight (Lens + Camera) | 18.3 g | 27.3 g | 23.7 g | 23 g | 24.1 g | 23.8 g | 44.1 g | 27.3 g | 115.8 g |
| Diameter (max) | 20.6 mm | 20.6 mm | 20.6 mm | 20.6 mm | 26.9 mm | 20.6 mm | 28 mm | 26.9 mm | 42 mm |

Lens Coating Diamond-like coated for superior abrasion resistance

For DRI information, please visit www.FLIR.com/Quark

Macro Thermal Performance for Micro Payloads

Quark outputs 14-bit digital data in LVDS and CMOS formats, as well as 8-bit BT.656. With a simple expansion board accessory, the camera provides basic "power-in, video-out" capability using standard USB to generate a user-selectable NTSC or PAL analog video signal. Common camera controls are available in FLIR's free camera control software GUI – connected via USB – or a low-cost SDK.



Specifications



SYSTEM OVERVIEW

| | |
|----------------------|------------------------------|
| System Type | Uncooled LWIR Thermal Imager |
| Quark 640: | 640 x 512 VOx Microbolometer |
| Quark 336: | 336 x 256 VOx Microbolometer |
| Pixel Size | 17 µm |
| Spectral Band | 7.5 - 13.5 µm |
| Performance | <50 mK @ f/1.0 |

OUTPUTS

| | |
|----------------------|--|
| Analog Video | Field-switchable between NTSC and PAL |
| Quark 640: | 30 Hz (NTSC); 25 Hz (PAL); <9Hz option for export |
| Quark 336: | 30/60 Hz (NTSC); 25/50 Hz (PAL) ; <9Hz export option |
| Digital Video | 8- or 14-bit serial LVDS; 8- or 14-bit parallel CMOS; 8-bit BT.656 |

OPERATION & CONTROL

| | |
|-------------------------|--|
| Image Control | Invert, revert, 2x & 4x digital zoom, polarity, false color or monochrome, AGC, digital detail enhancement (DDE) |
| Camera Control | Autonomous; Manual via GUI or serial command |
| Signal Interface | 60-pin SAMTEC connector: power, comm., video, digital data, external sync, discrete commands |
| Accessories | Video, Power & Communication (VPC) expansion board |

PHYSICAL ATTRIBUTES

| | |
|---------------------------|--|
| Size / Weight | 22 x 22 x 12 mm (less lens) / 8 g (camera body only) |
| Mounting Interface | 4 M1.6 x 0.35 on rear of camera frame |

POWER

| | |
|--------------------------|--|
| Input Voltage | 3.3 +/- 0.1 VDC |
| Power Dissipation | <1.0 W (Quark 336); <1.2 W (Quark 640) |
| Time to Image | <4 seconds (Quark 336); <5 seconds (Quark 640) |

ENVIRONMENTAL

| | |
|------------------------------------|--|
| Operating Temperature Range | -40° C to +80° C external temp |
| Storage Temperature Range | -55° C to +105° C external temp |
| Scene Temp Range | To 150° C standard |
| Shock / Temperature Shock | 500 g; 0.8 msec shock pulse (all axes)/5/min |
| Vibration | 4.3 g 3 axes, 8 hours each |
| Humidity | 5 - 95% non-condensing |
| Operational Altitude | +40,000 feet |
| ROHS, REACH, and WEEE | Compliant |



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