

17-micron pixels



# Put A Quark In It

Go ahead - it'll fit.

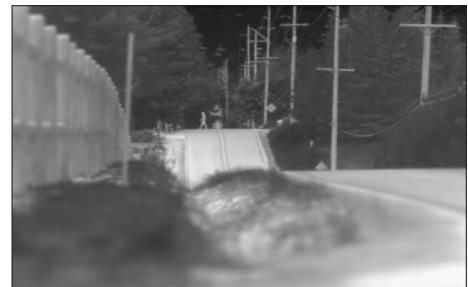
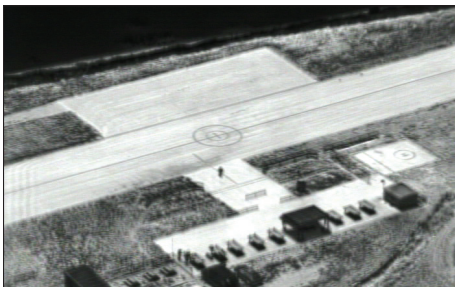


FLIR is proud to announce the new Quark. A quantum leap ahead in the design and capability of longwave thermal camera cores, Quark provides leading-edge imaging performance and reliability in a compact, lightweight package.

Quark's innovative design is enabled by wafer-level packaging of the microbolometer sensor.

Key features include:

- **Available in 336 x 256 and 640 x 512 resolution (digital output)**  
Both with 17-micron pixels
- **Ultra-Small Volume & Low Mass**  
Enables new applications in smaller packages
- **Low Power Consumption**  
Gets the most out of available power
- **High Shock And Vibration Tolerance**  
Designed for years of maintenance-free operation
- **30/60 Hz Field-Switchable Frame Rates (Quark 336 only)**  
Versatility for a wide range of applications
- **Affordable**  
Low prices in both large and small quantities



# Range Chart

## Quark 336/640

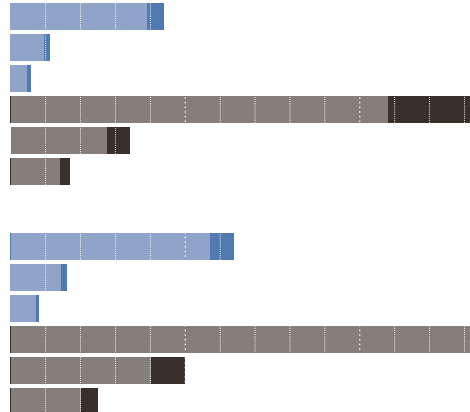
### Typical Conditions: Best Conditions:

#### 13 mm, f/1.25 Lens

<b>Man:</b>	Detect = 390 m	Detect = 440 m
	Recognize = 95 m	Recognize = 112 m
	Identify = 47 m	Identify = 56 m
<b>Vehicle:</b>	Detect = 1080 m	Detect = 1340 m
	Recognize = 275 m	Recognize = 340 m
	Identify = 140 m	Identify = 170 m

#### 19 mm, f/1.25 Lens

<b>Man:</b>	Detect = 570 m	Detect = 640 m
	Recognize = 144 m	Recognize = 160 m
	Identify = 72 m	Identify = 80 m
<b>Vehicle:</b>	Detect = 1550 m	Detect = 1950 m
	Recognize = 400 m	Recognize = 500 m
	Identify = 200 m	Identify = 250 m



### Typical Best

	<b>Man:</b> 1.8 m x 0.5 m
	<b>Vehicle:</b> 4.0 m x 1.5 m

Ranges shown are estimates. Actual range performance may vary depending on camera setup, environmental conditions, user experience, and the type of equipment used to display the image.

Quark Feature	Performance
<b>Overview</b>	
<b>Thermal Sensor</b>	Uncooled VOx Microbolometer
<b>Display Formats, Analog Output</b>	320 x 240 (NTSC); 320 x 256 (PAL) 640 x 480 (NTSC); 640 x 512 (PAL)
<b>Analog Video Output; NTSC or PAL</b>	User Selectable
<b>Pixel Size</b>	17 $\mu$ m
<b>Spectral Band</b>	7.5 - 13.5 $\mu$ m
<b>Full Frame Rates</b>	Quark 336: 30/60 Hz (NTSC); 25/50 Hz (PAL) Quark 640: 30 Hz (NTSC); 25 Hz (PAL)
<b>Exportable Frame Rates (no license required)</b>	7.5 Hz (NTSC); 8.3 Hz (PAL)
<b>Input Power</b>	3.3 VDC, +/- 0.1 VDC
<b>Power Dissipation</b>	<1.0 W
<b>Sensitivity (NE<math>\Delta</math>T)</b>	<50 mK at f/1.0 with FLIR's proprietary noise reduction
<b>Time to Image</b>	<3.5 sec (336)
<b>Physical Attributes</b>	
<b>Size (w/o lens)</b>	17 x 22 x 22 mm
<b>Weight (w/ lens)</b>	<25 g
<b>Precision Mounting Holes</b>	4 x M1.6 holes on rear surface
<b>Interfaces and Controls</b>	
<b>Parallel CMOS (14-bit or 8-bit)</b>	Y
<b>BT.656</b>	Y
<b>Serial LVDS (14-bit or 8-bit)</b>	Y
<b>AGC</b>	Factory Set, User-Selectable
<b>Digital Detail Enhancement (DDE)</b>	Y
<b>Invert/Revert</b>	Y
<b>Polarity Control</b>	Y
<b>2x, 4x, &amp; 8x Digital Zoom</b>	Y
<b>Symbology (256 shades) 336 or 640 resolution</b>	Y
<b>Color &amp; Monochrome Palettes (LUTs)</b>	Y
<b>Connectivity</b>	
<b>RS-232 Compatible Communication</b>	57,600 & 921,600 baud
<b>USB to RS-232 Accessory</b>	Y
<b>User Configurability via SDK &amp; GUI</b>	Y
<b>Environmental</b>	
<b>Operating Temperature Range</b>	-40°C to +80°C
<b>Non-Operating Temperature Range</b>	-55°C to +105°C
<b>Vibration</b>	4.3 g RMS: 10 - 1000Hz, all axes
<b>Shock</b>	800 g; 1 msec pulse (all axes)
<b>Temperature Shock</b>	5%/min
<b>Operational Altitude</b>	12 km
<b>Humidity</b>	Non-condensing between 5% and 95%
<b>EMC Radiation</b>	Tested to FCC/CE Class B
<b>ROHS, REACH, and WEEE Compliant</b>	Y

Lens Data		
<b>Quark 336</b>		
<b>Focal Length</b>	13 mm	19 mm
<b>f/#</b>	1.25	1.25
<b>Field of View</b>	24° x 19°	16° x 13°
<b>IFoV (milliradians)</b>	1.308	0.895
<b>Quark 640</b>		
<b>Focal Length</b>	13 mm	19 mm
<b>f/#</b>	1.25	1.25
<b>Field of View</b>	45° x 37°	32° x 26°
<b>IFoV (milliradians)</b>	1.308	0.895



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