Cores and components
for thermal imaging applications

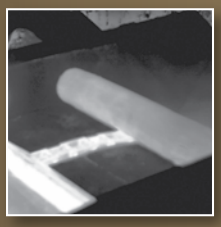
# Photon™ 120
# Photon™ 80

Low-resolution infrared sensor in a small, light, and affordable package

*Photon 120 and Photon 80 are high sensitivity, high reliability, uncooled long wave thermal imagers. The compact design of Photon makes them well-suited for OEM packaging and integration.*

**Good image quality**
Both models incorporate an uncooled Vanadium Oxide (VOx) focal plane array detector. This maintenance free systems delivers crisp video images (120 x 120 pixels for Photon 120 or 80 x 60 pixels for Photon 80) which can be displayed on any monitor that accepts composite video.

**Accessory Kit**
The accessory kit provides an easy way to operate the Photon 160 core until a more direct interface to the 30-pin SAMTEC connector on the back of the unit is developed by the end-user.



**Lens options**
The Photon 80 comes with a 6.3 mm lens. The Photon 120 can be equipped with either a 6.3 mm or a 19 mm lens. A version without lens is available for both the Photon 80 and the Photon 120.

**Compact, easy to integrate**
The Photon 120 and Photon 80 are very compact and lightweight packages. Their core weight is only 97 grams, not including rear cover or lens. They can easily be integrated in small locations.

**Advanced video processing**
A choice of 8- or 14-bit digital video is output simultaneously with the analog format. The digital data protocol is serial LVDS. Video processing features include multiple automatic, dynamic image optimization algorithms, as well as polarity control (white-hot/black-hot), image orientation control (invert / revert), and freeze-frame capability.

**Wide operating temperature range**
The Photon 120 and Photon 80 surpasse the requirements of the most demanding ambient temperature requirements with an operating temperature range between -40°C to +80°C.

**Software Developers Kit (SDK) to create applications for camera control and/or acquiring digital data**
The Photon SDK enables customers to create their own applications for camera control as well as data acquisition using one of several interfaces. Languages supported include VB6, VB.net, C#, and C++ (MFC). The Photon SDK also works on Linux.

**Advanced image processing**
Both versions contain an advanced Digital Detail Enhancement (DDE) video processing algorithm. This is a sharpening filter which aids in making edges and other image details more distinct in both night or daytime conditions.

**No Thermo-Electric Cooler (TEC)**
The Photon 120 and Photon 80 employ a novel combination of on-FPA circuitry and non-uniformity compensation (NUC) processing to eliminate the thermo-electric cooler (TEC). FLIR's patented approach to TEC-less operation enables the camera to operate over a wide temperature range while maintaining excellent dynamic range and image uniformity.

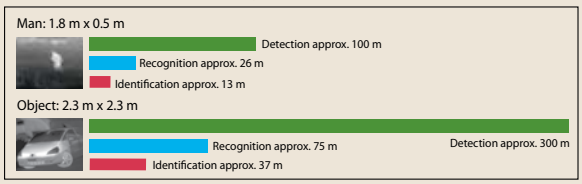
# Photon™ 120 / Photon™ 80

## Technical specifications

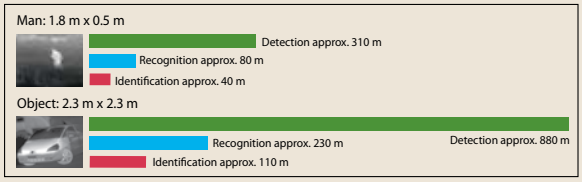
| | |
|---|---|
| ***IMAGING PERFORMANCE*** | |
| *Detector type* | Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer<br>80 x 60 pixels for Photon 80<br>120x120 pixels for Photon 120 |
| *Spectral range* | 7.5 to 13.5µm |
| *Field of view* | Photon 80: 27° (H) x 21° (V) with 6.3 mm lens<br>Photon 120: 40° (H) x 40° (V) with 6.3 mm lens<br>Photon 120: 14° (H) x 14° (V) with 19 mm lens<br>Lenses not interchangeable. Lens must be specified at time of order. |
| *Lens coating* | High durability coating |
| *Spatial resolution (IFOV)* | Photon 80: 6 mrad with 6.3 mm lens<br>Photon 120: 6 mrad with 6.3 mm lens<br>Photon 120: 2 mrad with 19 mm lens |
| *Thermal sensitivity* | <85 mK at f/1.6 |
| *Image frequency ** | 7.5 Hz (NTSC) or 8.3 Hz (PAL) * |
| *Focus* | Factory-set at infinity focus; lens thread mount allows focus adjustment |
| *Image processing* | Digital Detail Enhancement (DDE). |
| ***IMAGE PRESENTATION*** | |
| *Video output* | RS170 EIA/NTSC or CCIR/PAL composite video.<br>Video format must be specified at time of order.<br>14-bit serial LVDS Data stream |
| *Connector types* | 30-pin SAMTEC connector for video,<br>power, communications and digital data<br>15-pin D-Sub connector optionally available |
| ***POWER*** | |
| *Requirements* | 5 - 24 V DC |
| *Consumption* | 1.6 W Steady State |
| ***ENVIRONMENTAL SPECIFICATION*** | |
| *Operating temperature range* | -40°C to +80°C |
| *Storage temperature range* | -50°C to +85°C |
| *Humidity* | Non-condensing humidity in the range 5% to 95% |
| *Shock* | 70 g shock pulse with a 11ms half-sine profile |
| *Vibration* | 4.3 g rms random vibration for 8 hours (three axes) |
| ***PHYSICAL CHARACTERISTICS*** | |
| *Camera weight (camera core + lens)* | 115 grams with 6.3 mm lens<br>130 grams with 19 mm lens (Photon 120 only) |
| *Camera size (camera core + lens) L x W x H* | 42.3 mm x 51.40 mm x 49.72 mm with 6.3 mm lens<br>53.5 mm x 51.40 mm x 49.72 mm with 19 mm lens (Photon 120 only) |
| ***INTERFACES*** | |
| *RS-232* | Command and control all functions |

** 30 Hz NTSC or 25 Hz PAL available. Subject to approval of the US Department of Commerce for use outside the USA.*

**Photon 120 / Photon 80: range performance 6.3 mm lens**




**Photon 120: range performance 19 mm lens**




Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.

*Assumptions:*
50 % probability of achieving objective at specified distance given 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

### FLIR Systems:
### a full range of infrared cameras for thermal night vision applications

Whatever your application, FLIR Systems offers a solution to make you see clearly at night and in the most diverse weather conditions.

FLIR Systems has more than 50 years of experience in the development and production of infrared cameras for night vision applications. Recent technological developments have made it possible that know-how, which was reserved for military and high-end scientific users only, has made its way to many more applications.

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