LUXELL SERIES
Linear arrays and high-speed scanning modules

NiT
New Infrared Technologies

LUXELL FPAs

*Components with no readout electronics*

LUXELL FPA (64/128/256 px)

The **LUXELL FPA** is a linear array of detectors, and it's available in three different sizes: 64, 128 and 256 pixels. The FPA has detection in the MWIR range (1 - 5 microns), and is operational at room temperature with no need of cooling system.

The **LUXELL FPA** is suitable for scanning applications where high speeds of detection are required, as it is capable of acquiring thousands lines per second.

The pixel geometry is dependant on the FPA size: 1,000 microns (100 microns pitch) for the 64&128 pixel versions, and 600 microns (60 microns pitch) for the 256 pixel version. **Readout electronics are not included in the packaging.**

LUXELL 256 FPA
(256 px model)
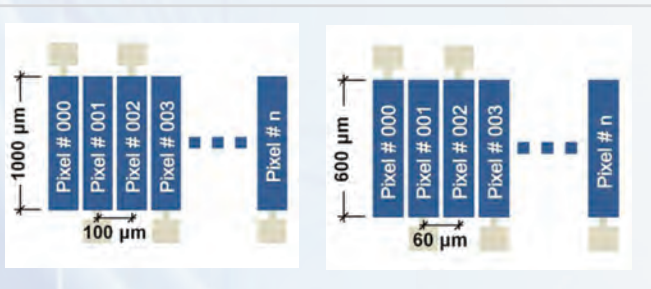
LUXELL FPA pixel geometries
(left - 64/128 px model; right - 256 px model)

LUXELL 128 FPA for MWIR SPECTROSCOPY (3.0-4.6 μm)

The **LUXELL 128 FPA WITH LINEAR VARIABLE FILTER** is a 128-pixel linear array that incorporates a linear variable filter allowing spectral discrimination, as each pixel behaves as a bandpass filter. The FPA has hyperspectral detection in the MWIR range (3.0 - 4.6 microns), and is operational at room temperature with no need of cooling system. The spectral information is provided simultaneously in all the band (3.0 - 4.6 microns).

The **LUXELL 128 FPA WITH LVF** is suitable for spectroscopic applications, as for example, gas detection.

The pixel has a rectangular geometry (1,000 microns size, 100 microns pitch) and a spectral resolution of 60 nm. **Readout electronics are not included in the packaging.**

LUXELL 128 FPA WITH LVF
INCORPORATED
Main applications are
measurements with spectral
discrimination

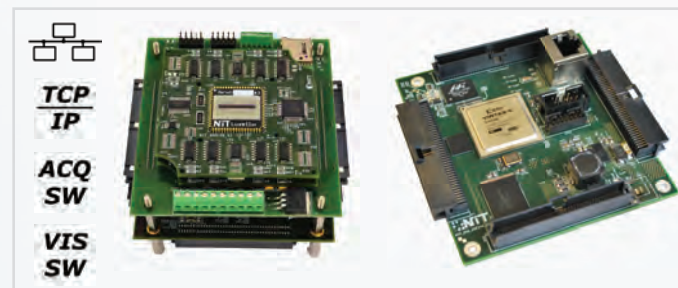## LUXELL CORE MODULES

Modules for integration

LUXELL CORE-HS

The **LUXELL CORE-HS** is an electronic device based on a VIRTEX 4 FPGA that includes the FPA, the high-speed readout electronics required to achieve the best FPA performance, and Ethernet communications.

The **LUXELL CORE-HS** is compatible with any of the **LUXELL FPA** versions, including the model **LUXELL 128 FPA WITH LVF** for spectroscopy.

Each module has an IP-address which allows the transmission of the IR data captured to a host computer. The **LUXELL SOFTWARE SUITE** included makes very easy to acquire data in multiple applications. An specific software version is available for spectroscopic measurements using the FPA with LVF.

Optimal system for integration

The LUXELL CORE-HS module
is compatible with all
the LUXELL FPA models and
allows high acquisition
speeds (up to 20000 lines
per second).

*Left - The CORE module
Right - The CORE digital
electronics board*

LUXELL CORE-S

The **LUXELL CORE-S** is an electronic device based on a microcontroller architecture, which includes the linear FPA, 2-channel readout electronics (1200 lines per second max), USB 2.0 output and the **LUXELL SOFTWARE SUITE**.

The system is plug and play, ready to read the FPA signal and optimum for the development of very cost-effective solutions based on the **LUXELL FPA**.

The **LUXELL CORE-S** is compatible with any of the **LUXELL FPA** versions, including the model **LUXELL 128 FPA WITH LVF** for spectroscopy.

Optimal system for low cost solutions
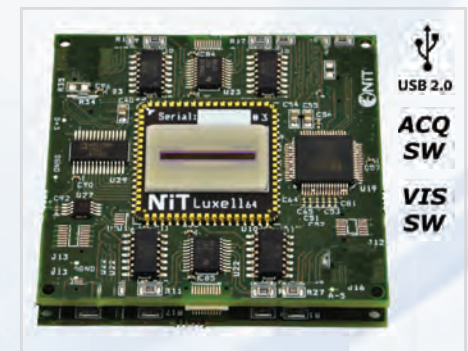
The LUXELL CORE-S module is a plug-
and-play device, includes the readout
electronics for the FPA and uses a
USB interface for control and data
transmission

LUXELL FPA
Uncooled VPD PbSe, linear array

- FPA formats available: *64, 128 and 256 pixels*
- Biasing voltage (typ): *5 V*
- Pixel size:
  - LUXELL 64, 128 FPA: *1000 µm*
  - LUXELL 256 FPA: *600 µm*
- Pixel pitch:
  - LUXELL 64, 128 FPA: *100 µm*
  - LUXELL 256 FPA: *60 µm*
- Pixel resistance (typ):
  - LUXELL 64, 128 FPA: *300 - 800 kΩ*
  - LUXELL 256 FPA: *250 - 700 kΩ*
- Spectral response (typ): *1-5 microns*
- Spectral response (LVF version): *3.0 - 4.6 microns*
- Peak wavelength of detection: *3.7 microns*
- D*(λpeak) (typ): *2·10^9 Jones*
- Responsivity (@V$_b$=0.5V)(A/W):
  - LUXELL 64, 128 FPA: *0.025*
  - LUXELL 256 FPA: *0.090*
- Quantum efficiency: *2%*
- Packaging: *SMD, LCC68 footprint*
- Dimensions (mm): *24 x 24 x 2.2*
- Operating temperature: *5C - 70 C*
- Response time: *2 microseconds*
- Readout electronics: *not included*
- Readout method: *multiplexed (blocks of 16 px)*

LUXELL CORE-S
Compatible with all LUXELL FPA versions

- Integration time: 2 - 100 µs, selectable
- Frame rate (max):
  - LUXELL 64 FPA version: 1,200 lines per second
  - LUXELL 128 FPA version: 600 lines per second
  - LUXELL 256 FPA version: 300 lines per second
- Intelligent dark current substraction
- Start-up time: < 5 seconds
- Dimensions (mm): 60 x 60 x 40
- Microcontroller: ARM CORTEX M3
- System communication and control: USB 2.0 full speed, raw format, 14 bits
- USB powered (5 VDC, 0.5 A)
- Software: LUXELL SW SUITE (Acq+Vis)

LUXELL CORE-HS
Compatible with all LUXELL FPA versions

- Dimensions (mm): 109 x 100 x 73
- Weight: < 500 grams
- FPGA: XILINX VIRTEX 4 (PowerPC + Linux OS embedded)
- Integration time: > 4.10 µs, selectable
- Frame rate in lines per second (max):
  - LUXELL 64 FPA: 20,000
  - LUXELL 128 FPA: 10,000
  - LUXELL 256 FPA: 5,000
- Intelligent dark current substraction
- Start-up time: < 20 seconds
- Optimum temperature detection range: > 70 C
- System communication and control: Ethernet 10/100
- Data transmission: TCP/IP, raw format, 16 bits
- Control: UDP
- Power: 12 VDC, 1 A
- Software: LUXELL SOFTWARE SUITE (Acqusition+Visualization SW)
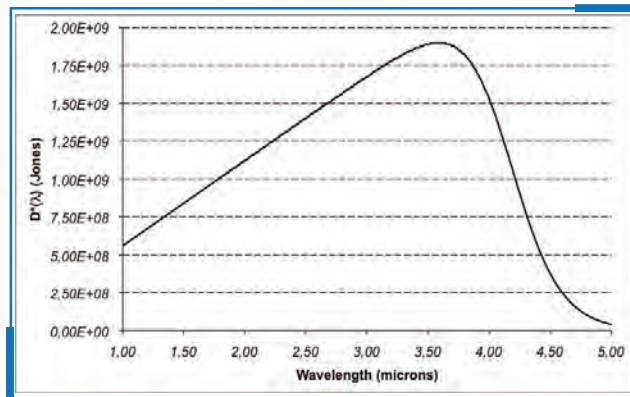
*Typical detector spectral response [D*(λ_{peak})(500 K, 1000 Hz, 1 Hz)]*
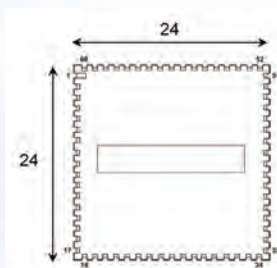
The LUXELL FPA footprint is LCC68 compatible and is packaged as an SMD component to allow a perfect integration into your circuitry. It has a sapphire window that is replaced with an LVF in the spectroscopy version
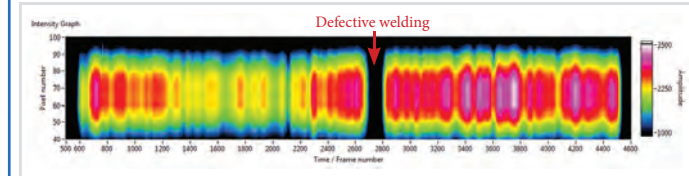
Left - FPA dimensions in mm

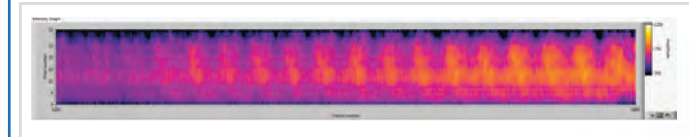## LUXELL SERIES
Typical applications

Quality inspection in production lines: glass container industry
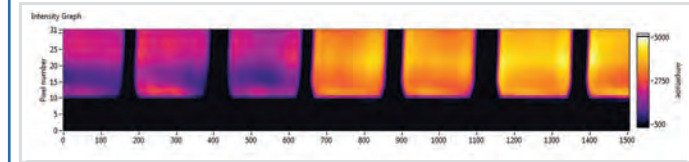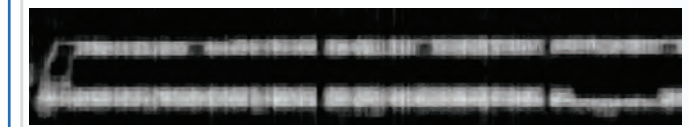

Welding inspection and defect detection: steel industry
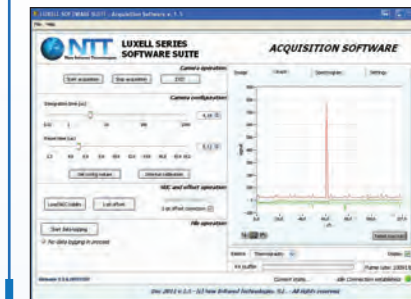

High-speed gas flow study and characterization

Railway industry: hot-boxes and hot-wheel inspection

LUXELL ACQUISITION SOFTWARE

As a part of the LUXELL SOFTWARE SUITE, it allows control of the CORE system and data acquisition to your PC, maximizing the performance of the LUXELL FPA series.

NiT New Infrared Technologies

ISO 9001 ISO 14001 BUREAU VERITAS Certification

BUREAU VERITAS 1828