SpectrumLogic
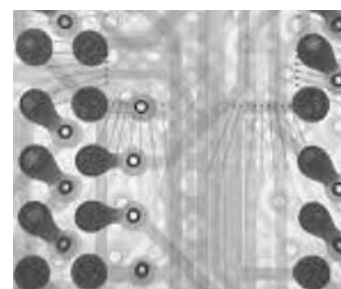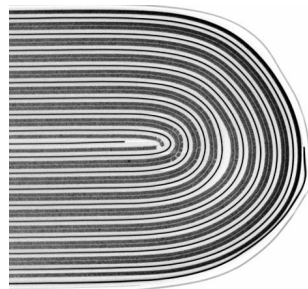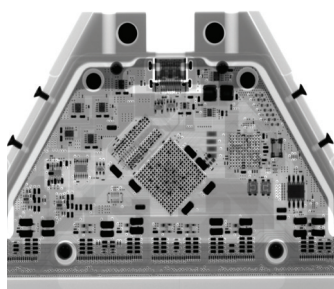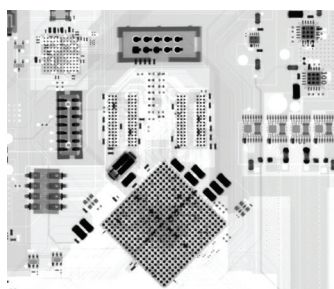
INNOVATION IN IMAGING

CMOS X-Ray Detectors

For Industrial Non-Destructive Testing

X-ray Solutions for Non-Destructive Testing

Spectrum Logic CMOS X-ray detectors for non-destructive testing

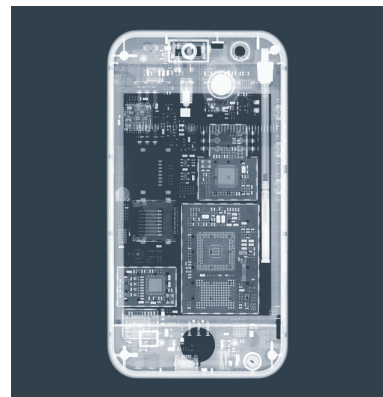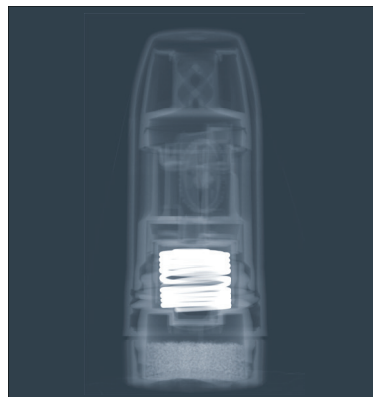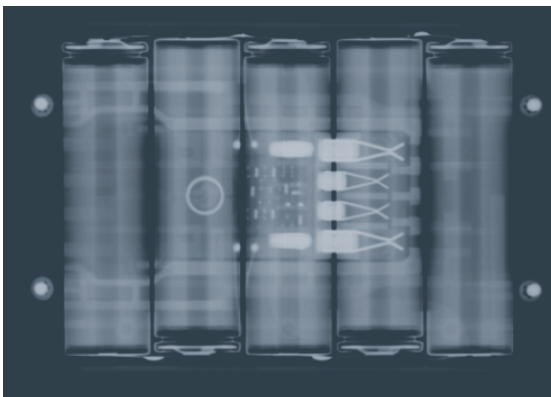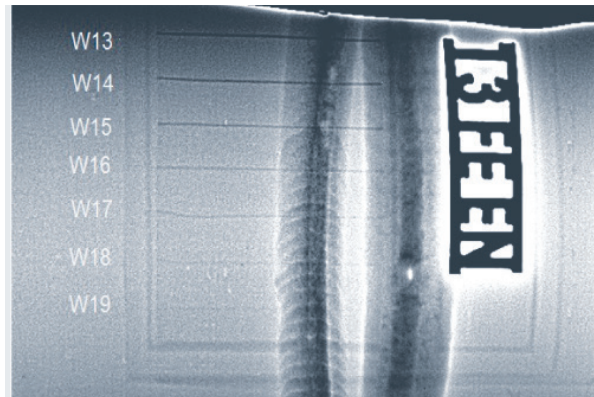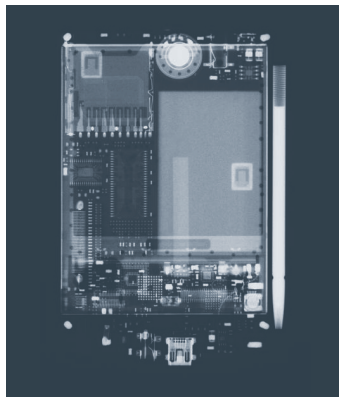**Spectrum Logic has developed a range of radiation hard CMOS X-ray detectors.**

They are ideally suited for industrial applications:

| 3D CBCT | Casting and electronics inspection | Metrology and material science | Weld and pipeline inspection |

Key Features

- Broad product portfolio: active area from 60 × 54 mm^2 to 310 × 307 mm^2, 50 and 100 μm pixel pitch
- Fibre Optic Plate (FOP) – protects the sensor from radiation damage and reduces noise
- Rad hard image sensor design
- Fastest frame rates in 50 μm and 100 μm detectors
- Lower noise than aSi, IGZO or passive pixel CMOS
- Dual gain modes
- ROI modes with high frame rates
- Customisation of scintillator is available to optimise the performance for the customer's application
- No measurable image lag from CMOS sensor
- 5 GigE and 10 GigE available
- Windows SDK provided for rapid design-in

APPLICATIONS

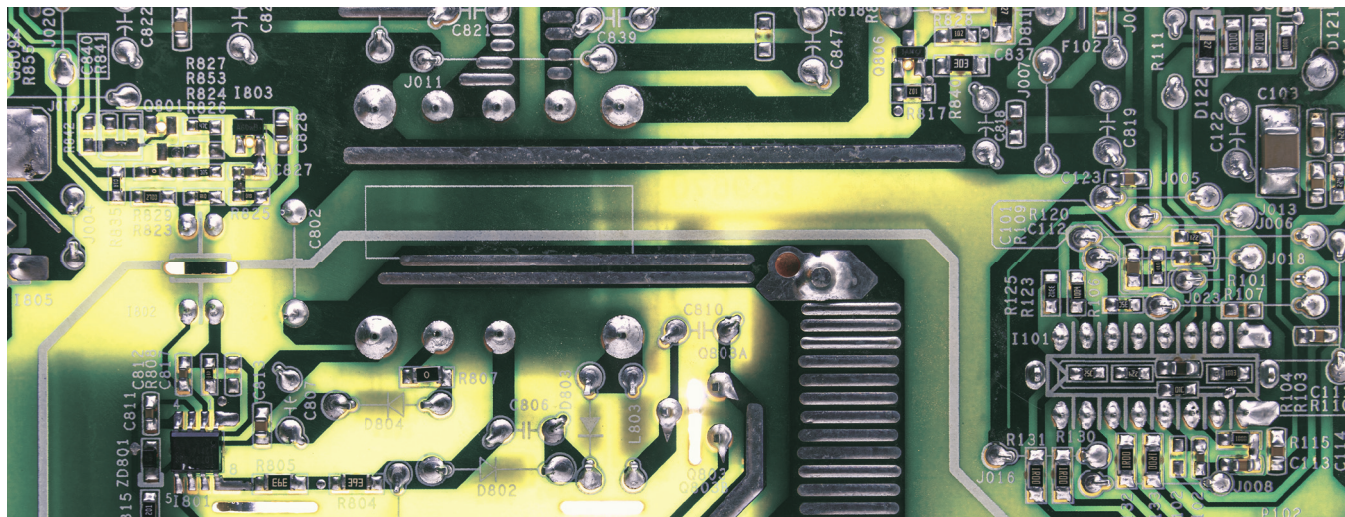|	
Automotive	Semiconductors
Electronics	X-ray diffraction
Oil & Gas	Petrochemicals
Aerospace	Metals

Advantages of CMOS for Non-Destructive Testing

HIGH SPEED IMAGING

Due to the high electron mobility of crystalline silicon and our high-speed electronics, Spectrum Logic CMOS detectors achieve high frame rate over the full active area and at full resolution, reaching frame rates of >100 fps. Higher frame rates are possible in ROI modes. Our detectors are free of image lag generated in the sensor and electronics although scintillators do have some afterglow.

HIGH RESOLUTION

Spectrum Logic's proprietary active pixel sensor designs ensure low read noise and excellent image quality even at low signal levels.

INNOVATIVE DESIGN

Our sensors have radiation hard pixel design, with adjustable saturation dose, allowing the sensor to be used for high or low radiation levels, making our detectors suitable for a wide range of industrial NDT applications.

HIGH IMAGE QUALITY

CMOS FPDs have a higher readout speed and lower noise than a-Si and IGZO due to the much higher electrical charge mobility in crystalline silicon and the CMOS active pixel sensor (APS) architecture. Due to the low noise level of CMOS, the low dose Detective Quantum Efficiency (DQE) is significantly improved and X-ray detection is achieved even at very low dose levels.

LIFETIME DURABILITY

Our CMOS detector design has built-in radiation hardness both in the active pixel design and by virtue of the use of FOPs, which shield and protect the sensors and electronics. This design significantly improves the product reliability and enables a long operating life.

Spectrum Logic X-ray Detectors:

✔ Fast, low noise imaging with minimal image lag

✔ CMOS sensor bonded to fibre optic plate (FOP)

✔ High Sensitivity and High Dynamic Range modes

✔ High speed, flexible region of interest

✔ Choice of high resolution / high sensitivity CsI scintillator

✔ Standard Data Interface

✔ Spectrum Logic provides a Windows SDK for rapid design-in

Comparison of two types of scintillator
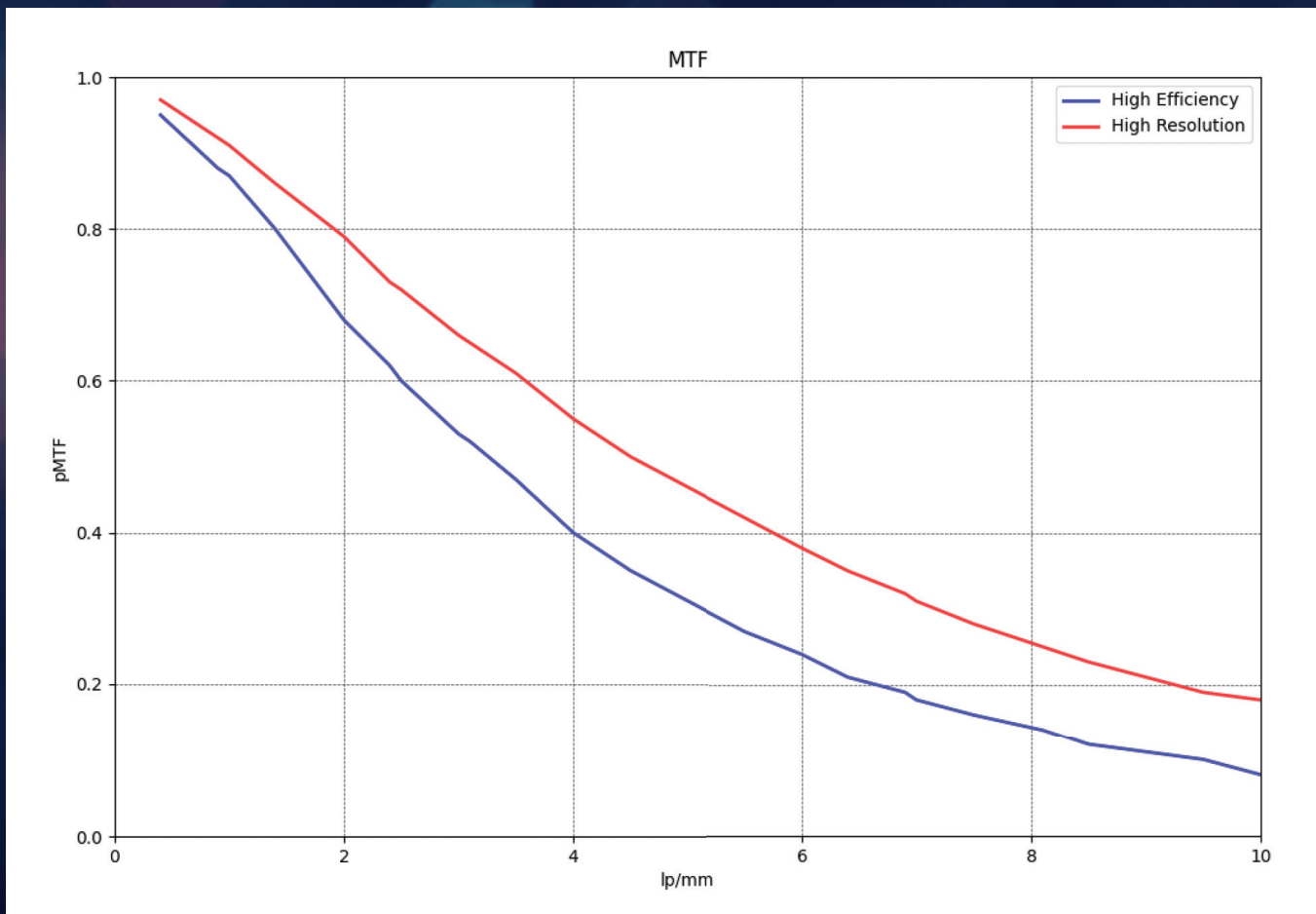
Product Families

HS Family: Industrial CT, AXI & Weld Inspection
High Sensitivity - 100 µm Pixel Pitch

	3131HS	**2824HS**	**2121HS**	**1615HS**	**1510HS**	**1412HS**
Active area (mm)	309.5 x 307.3	280 x 240	205 x 205	161 x 150	153.6 x 103.1	140.1 × 120
Image Resolution	3095 x 3073	2803 x 2401	2063 x 2048	1610 x 1500	1536 x 1030	1401 × 1200
Frame Rate (fps) 1x1	60	45 (CL) 90 (10GigE)	84	83	66	100
Dimensions (mm)	341 × 380 × 45	315 × 316 × 53	245 × 280 × 47	201 × 187 × 35	229 × 107 × 10	171 × 171 × 49
ROI mode supported	✔	✔	✔	✔	✔	✔
Max Energy (kV)	160	225	160	120	225	225
Interface	10GigE	10GigE, CL	10GigE	10GigE	USB	10GigE

Product Families

HR Family: Pre-Clinical, Industrial NDT and PCB inspection
High Resolution with 50 µm CMOS sensors

|	2824HR	1412HR	1206HR	0606HR
Active area (mm)	280 x 240	140 x 120	120 x 60	60 x 53.5
Image Resolution	5606 x 4802	2802 x 2400	2392 x 1200	1200 x 1072
Frame Rate (fps)	12(CL) 22(10GigE)	29	59	60 (USB)
ROI mode supported	✔	✔	✔	✔
Max Energy (kV)	225	225	225	225
Dimensions (mm)	315 x 316 x 53	171 x 171 x 49	171 x 171 x 49	108 x 77 x 35
Interface	CL, 10GigE, USB	CL, 10GigE	CL, 10GigE	GigE, USB

Spectrum Logic is a London based innovator and manufacturer of detection and imaging products using CMOS image sensors. Spectrum Logic is part of the ISDI group.

ISDI is a leader in the design and manufacture of very large area CMOS image sensors for X-ray applications. It has IP and expertise related to all aspects CMOS X-ray detectors.

Global provider of Design, Engineering and Manufacturing

- ✔ Image Sensor Product Solutions
- ✔ Medical/Dental X-Ray
- ✔ Non-Destructive Testing
- ✔ Industrial & Scientific X-Ray
- ✔ Design, Development and Manufacturing
- ✔ Customer Applications Support
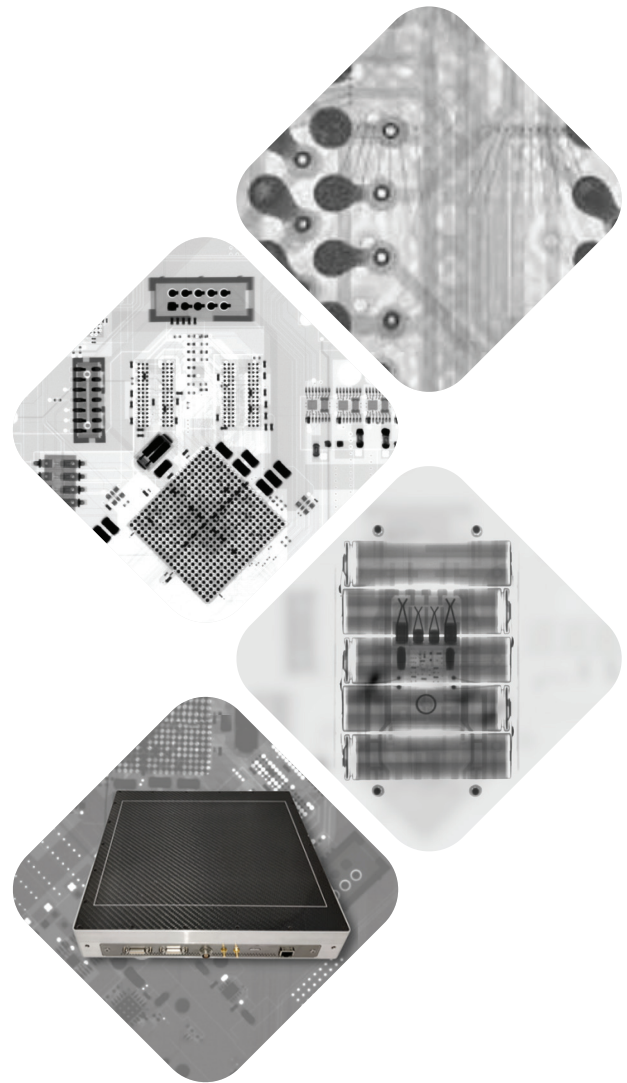
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