The SPOT™ BOOST™ BT 1900 back illuminated EMCCD camera has single photon detection capability without an image intensifier, combined with greater than 90% QE of a back illuminated sensor. Containing a 128x128 L3Vision™ Frame Transfer CCD sensor from E2V Technologies, it utilizes a unique electron multiplying structure that is built into the silicon. This enables charge from each pixel to be multiplied on the sensor before it is read out, while utilizing the full QE performance of the CCD sensor. This camera is capable of greater than 500 full frames/sec, with much faster speeds available through use of sub-array and/or binning. The system offers up to 10 MHz pixel readout rate and benefits from negligible dark current with unequaled thermoelectric cooling down to −100ºC.

**Camera Specs**

- **EMCCD Technology**
- **True Linear gain**
- > 90% QE back-illuminated sensor
- Variable readout rates up to 10 MHz
  - 515 full frames/sec possible
- Vacuum sealed cooling
- Thermoelectric cooling to −100º C possible
- High dynamic range
- Built-in C-mount compatible shutter
- EM protect

**Camera Overview**

- **Active Pixels** 128 x 128
- **Pixel Size (WxH; µm)** 24 x 24
- **Image Area (mm)** 3.1 x 3.1
- **Active Area pixel well depth (e-, typical)** 200,000
- **Gain Register pixel well depth (e-, typical)** 800,000²
- **Max Readout Rate (MHz)** 10
- **Frame Rate (frames per sec)** 515 up to ~5,000
- **Read Noise (e-)** <1 EM gain < 50 conventional @ 10 MHz

**System Characteristics**

- **Peak QE** > 92%
- **Pixel Readout Rate (MHz)**
  - Electron Multiplying Amplifier 10, 5, 3, 1
  - Conventional Amplifier 3 and 1
- **Digitization @ 10, 5, 3 & 1 MHz readout rate** True 14-bit (16-bit available-Special Order Only)
- **Vertical Clock Speed (µs)** 0.0875 to 0.45 (variable)
- **Linear Electron Multiplier Gain (software controlled)** 1 – 1000 times
- **Non-Linearity** <1%
- **Triggering** Internal, external, external start
- **Camera window type** Single window with double-sided AR coating–standard for BV model
Typical
49
40
30
with Electron
Multiplication
<1
<1
<1
System Readout
Noise (typical; e-) Typical
with Electron
Multiplication
10 MHz through
EMCCD amplifier 49 <1
5 MHz through
EMCCD amplifier 40 <1
3 MHz through
EMCCD amplifier 30 <1
Noise & EMCCD Gain
Cooling Temperature
Air-cooled (ambient air @ 20ºC) -85ºC
Water cooled using Re-circulator (RC180) (ambient air @ 20ºC) -90ºC
Water-cooled using Chiller (water @ 12ºC, 0.75 l / min) -100ºC
Quantum Efficiency
Quantum Efficiency at 575 nm and –20ºC
Full Frame Rate
Max Frames per sec (0.3 µs vertical clocking)
Array size 128 x 128 64 x 64 32 x 32 128 H x 50 V
Binning (full frame) 1x1 515 943 1613 1163
1x2 943 1613 2500 1923
2x2 943 1613 2500 1923
1x4 1613 2500 3571 2941
4x4 1613 2500 3571 2941
Boost Model: BT 1900 128 x 128 7.27.06

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BOOST™
dimensions

Model: BT 1900
128 x 128
7.27.06