

## Emberion VS20 Compact Evaluation

# Preliminary Data Sheet

### Broaden your vision

- Wide spectral range from VIS to SWIR up to 2000 nm with one image sensor from Emberion
- Lightweight and compact
- High Dynamic Range (HDR) without saturation and capability for optical power measurement are targeted for a variety of imaging application needs
- Scalability, affordability and customizability is enabled by monolithic integration of colloidal quantum dots (CQD) using in-house designed CMOS readout IC

#### Image sensor specifications

Image sensor type	Emberion colloidal quantum dot (CQD) photodiode
Spectral range	400 to 2000 nm
Pixel pitch	20.0 $\mu\text{m}$ x 20.0 $\mu\text{m}$
Resolution in pixels	640 x 512
Image size	12.80 mm x 10.24 mm
Image diameter	16.39 mm
Fill factor	90 %
Operable pixels	> 99.9%
Shutter	Global, built-in electronic
Cooling	Built-in thermoelectric cooler (TEC)

#### Camera specifications

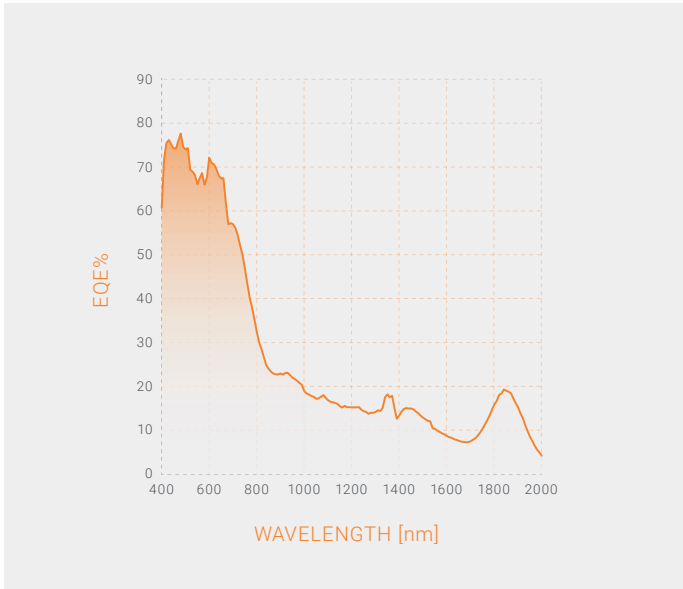
A/D conversion	14 bits
Image processing	Non-uniformity correction, linearisation, defect pixel correction
Exposure time	Min 0.1 ms, adjustable with 1 $\mu\text{s}$ resolution
Ambient operating temperature	-20 to +40 $^{\circ}\text{C}$
Power consumption	

#### Mechanics

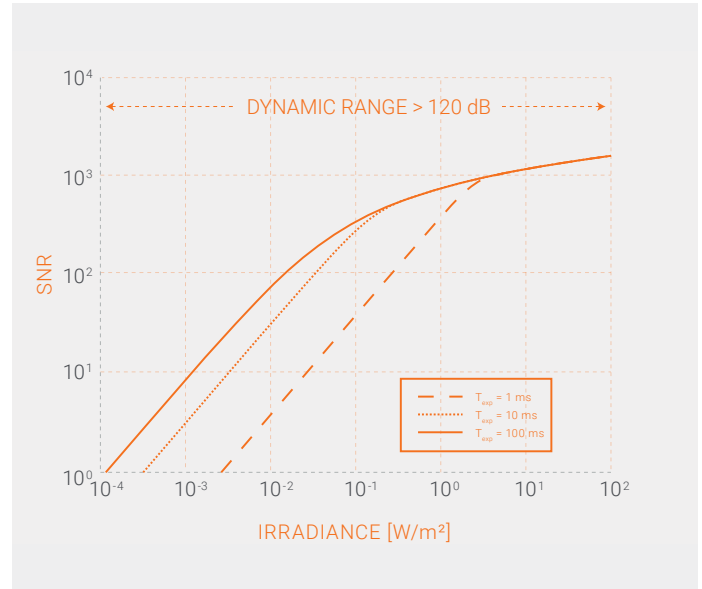
Dimensions (L x W x H)	98.8 mm x 50.0 mm x 50.0 mm
Weight	450 g
Lens mount	C-mount with full thread

### Interfaces

Image data	GigE Vision, RJ45 connector
Communications	GenICam compatible
Firmware update	through GigE interface
Max frame rate (full VGA)	200 fps for evaluation units
Trigger	2 HW triggers (Opto-isolated and non-isolated), Trigger over Ethernet (IEEE 1588 PTP)
Power input	12 VDC



Camera external quantum efficiency (EQE) vs. wavelength at 0°C sensor temperature



Camera signal-to-noise (SNR) ratio vs. irradiance at 1850 nm wavelength and F#=#1

### Image sensor performance at sensor temperature 0°C

Dynamic range (optical input)	120 dB
Responsivity	$1.5 \times 10^9$ V/W at 10 ms exposure time and 1850 nm wavelength
Input referred voltage noise	200 $\mu$ V
Saturation current density	$1 \times 10^{-4}$ mA/cm <sup>2</sup>
Noise equivalent irradiance (NEI)	$3 \times 10^{-4}$ W/m <sup>2</sup> at 10 ms exposure time and 1850 nm wavelength

### Mechanics design, dimensions and connectors

