# IMAGING PERFORMANCE SPECIFICATION

# FLIR CHAMELEON®3

## USB3 Vision

USB3 VISION™

**Version 4.1**

**Revised 1/26/2017**



FLIR® The World's Sixth Sense®

## FCC Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

## Korean EMC Certification

The KCC symbol indicates that this product complies with Korea's Electrical Communication Basic Law regarding EMC testing for electromagnetic interference (EMI) and susceptibility (EMS).

## Hardware Warranty

The warranty for the Chameleon3 camera is 3 years. For detailed information on how to repair or replace your camera, please see the terms and conditions on our website.

## WEEE

The symbol indicates that this product may not be treated as household waste. Please ensure this product is properly disposed as inappropriate waste handling of this product may cause potential hazards to the environment and human health. For more detailed information about recycling of this product, please contact us.

## Trademarks

Names and marks appearing on the products herein are either registered trademarks or trademarks of FLIR Systems, Inc. and/or its subsidiaries.

## Licensing

To view the licenses of open source packages used in this product please see What open source packages does firmware use?

# 1 Specifications

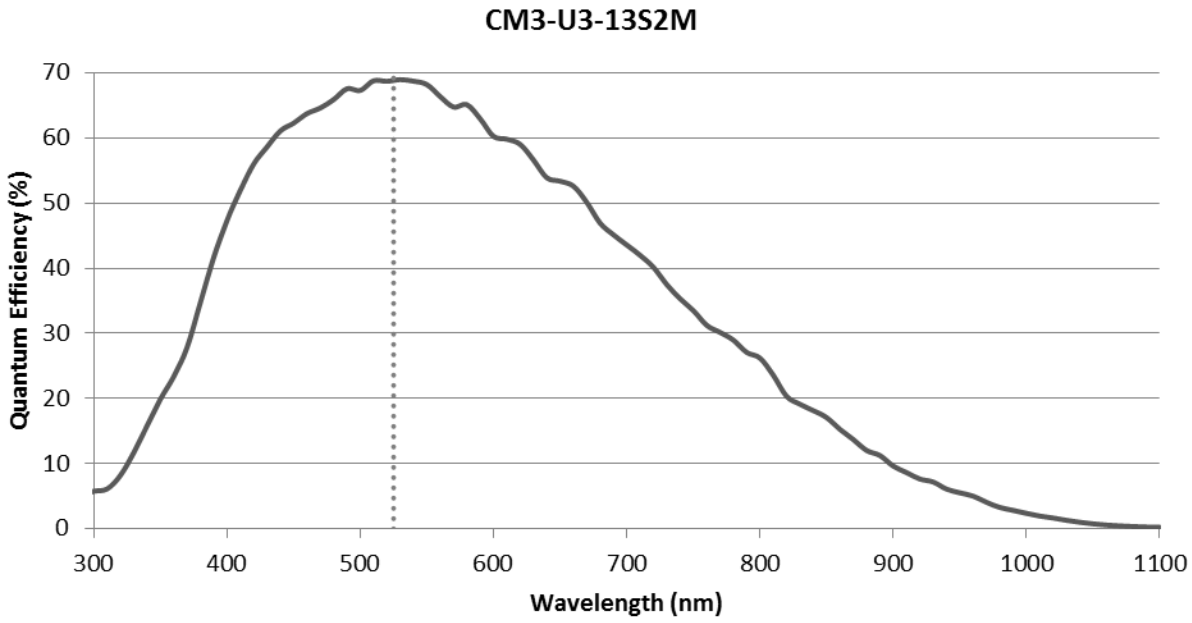
| Model | Sensor | Maximum Resolution | Pixel Size | Firmware | Results |
|---|---|---|---|---|---|
| CM3-U3-13S2M | Sony ICX445, 1/3", Mono | 1288 x 964 | 3.75 µm | 1.2.3.0 | page 2 |
| CM3-U3-13S2C | Sony ICX445, 1/3", Color | 1288 x 964 | 3.75 µm | 1.2.3.0 | page 3 |
| CM3-U3-13Y3M | On Semi P1300, 1/2", Mono | 1280 x 1024 | 4.8 µm | 1.13.3.0 | page 4 |
| CM3-U3-13Y3C | On Semi P1300, 1/2", Color | 1280 x 1024 | 4.8 µm | 1.13.3.0 | page 5 |
| CM3-U3-28S4M | Sony ICX818, 1/1.8", Mono | 1928 x 1448 | 3.69 µm | 1.3.3.1 | page 6 |
| CM3-U3-28S4C | Sony ICX818, 1/1.8", Color | 1928 x 1448 | 3.69 µm | 1.3.3.1 | page 7 |
| CM3-U3-31S4M | Sony IMX265, 1/1.8", Mono | 2048 x 1536 | 3.45 µm | 1.12.3.0 | page 8 |
| CM3-U3-31S4C | Sony IMX265, 1/1.8", Color | 2048 x 1536 | 3.45 µm | 1.12.3.0 | page 9 |
| CM3-U3-50S5M | Sony IMX264, 2/3", Mono | 2448 x 2048 | 3.45 µm | 1.12.3.0 | page 10 |
| CM3-U3-50S5C | Sony IMX264, 2/3", Color | 2448 x 2048 | 3.45 µm | 1.12.3.0 | page 11 |

1288 EMVA Standard Compliant

Measurements are taken based on guidelines in the EMVA 1288 standard; the full definition can be found at EMVA.org. Camera settings are at maximum bit depth unless otherwise noted. Temporal Dark Noise is measured at minimum exposure time. The center wavelength is 525 nm unless otherwise noted. The pixel format is Raw 16 or Mono 16 for mono cameras and Raw 16 for color cameras. Results are captured at room temperature (20°C).

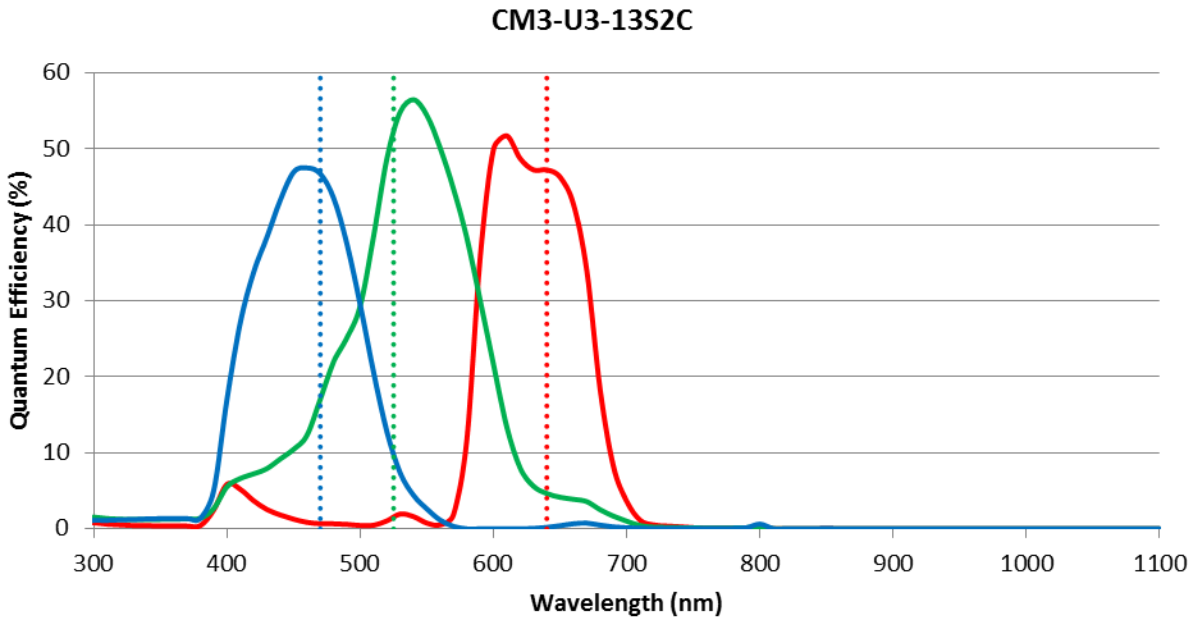
# 2 CM3-U3-13S2M Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 45 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency (% at 525 nm) | 68 |
| Temporal Dark Noise (Read Noise) (e-) | 10.09 |
| Signal to Noise Ratio Maximum (dB) | 39.65 |
| Signal to Noise Ratio Maximum (Bits) | 6.59 |
| Absolute Sensitivity Threshold (γ) | 15.67 |
| Saturation Capacity (Well Depth) (e-) | 9231 |
| Dynamic Range (dB) | 58.81 |
| Dynamic Range (Bits) | 9.77 |
| Gain (e-/ADU) | 0.15 |



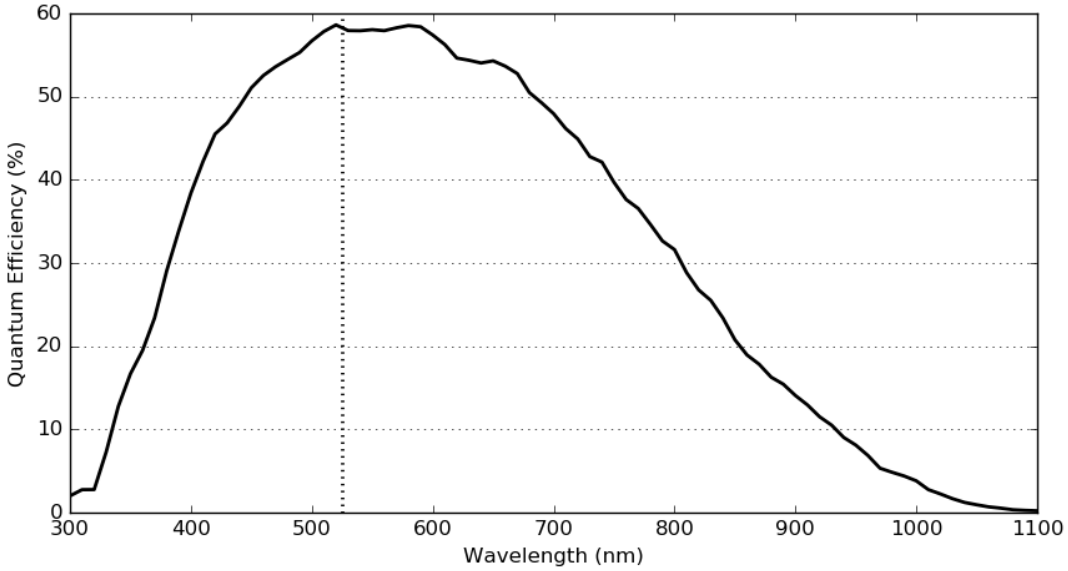
# 3 CM3-U3-13S2C Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 45 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency Blue (% at 470 nm) | 46 |
| Quantum Efficiency Green (% at 525 nm) | 51 |
| Quantum Efficiency Red (% at 640 nm) | 47 |
| Temporal Dark Noise (Read Noise) (e-) | 9.82 |
| Signal to Noise Ratio Maximum (dB) | 39.52 |
| Signal to Noise Ratio Maximum (Bits) | 6.56 |
| Absolute Sensitivity Threshold (γ) | 20.97 |
| Saturation Capacity (Well Depth) (e-) | 8960 |
| Dynamic Range (dB) | 58.77 |
| Dynamic Range (Bits) | 9.76 |
| Gain (e-/ADU) | 0.15 |



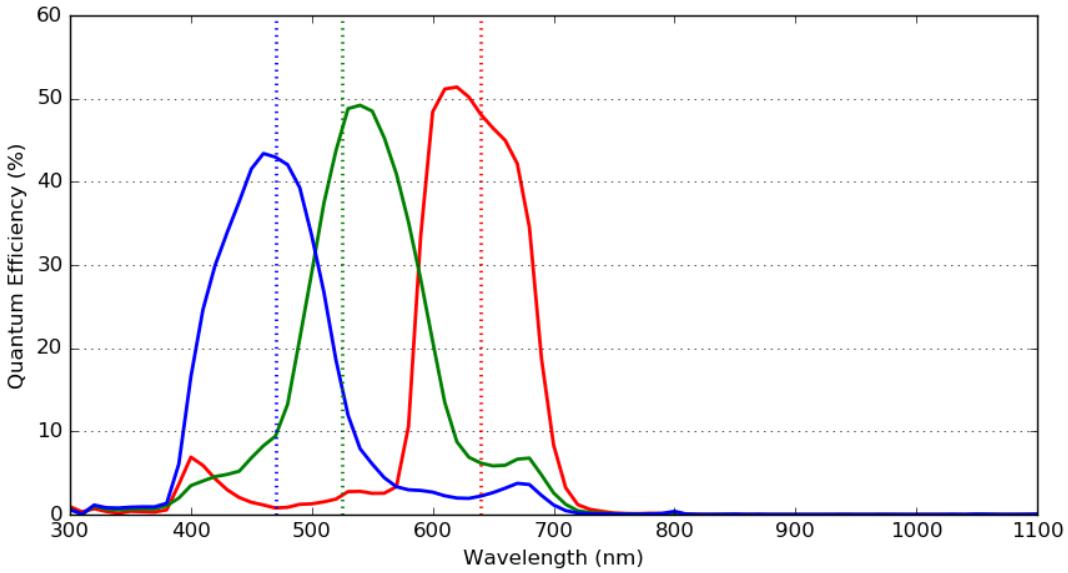
# 4 CM3-U3-13Y3M Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| ADC (Bits) | 10-bit |
| Quantum Efficiency (% at 525 nm) | 58 |
| Temporal Dark Noise (Read Noise) (e-) | 9.14 |
| Signal to Noise Ratio Maximum (dB) | 38.09 |
| Signal to Noise Ratio Maximum (Bits) | 6.33 |
| Absolute Sensitivity Threshold (γ) | 16.58 |
| Saturation Capacity (Well Depth) (e-) | 11084 |
| Dynamic Range (dB) | 56.50 |
| Dynamic Range (Bits) | 9.39 |
| Gain (e-/ADU) | 0.14 |



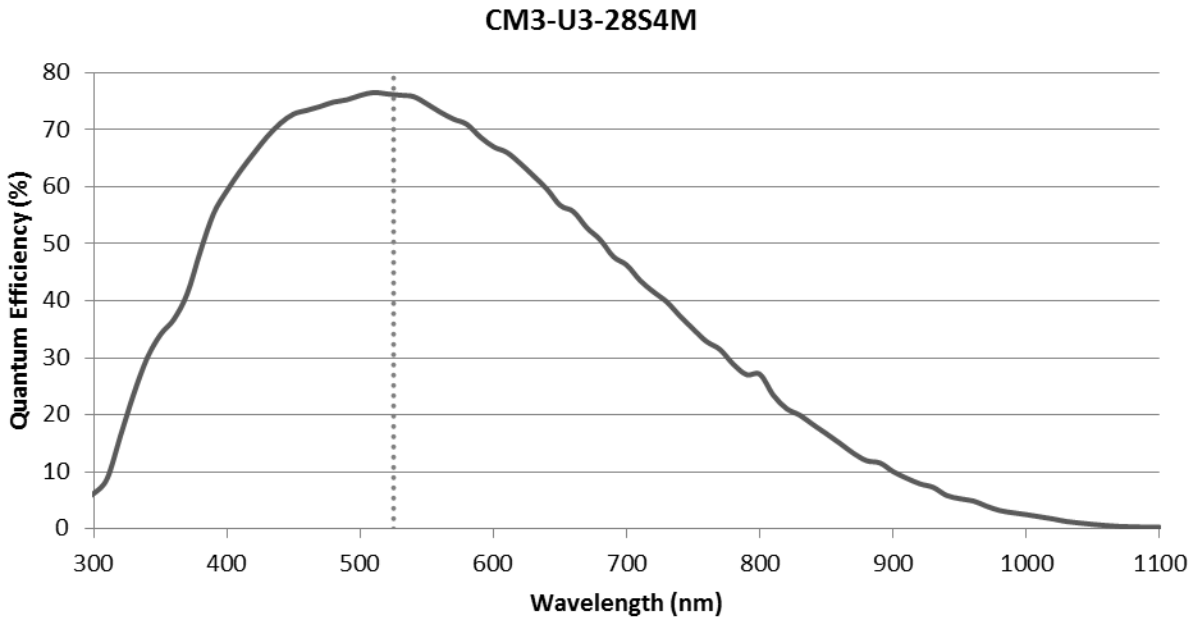
# 5 CM3-U3-13Y3C Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| ADC (Bits) | 10-bit |
| Quantum Efficiency Blue (% at 470 nm) | 40 |
| Quantum Efficiency Green (% at 525 nm) | 45 |
| Quantum Efficiency Red (% at 640 nm) | 49 |
| Temporal Dark Noise (Read Noise) (e-) | 9.33 |
| Signal to Noise Ratio Maximum (dB) | 37.68 |
| Signal to Noise Ratio Maximum (Bits) | 3.26 |
| Absolute Sensitivity Threshold (γ) | 21.76 |
| Saturation Capacity (Well Depth) (e-) | 5866 |
| Dynamic Range (dB) | 55.52 |
| Dynamic Range (Bits) | 9.22 |
| Gain (e-/ADU) | 0.14 |



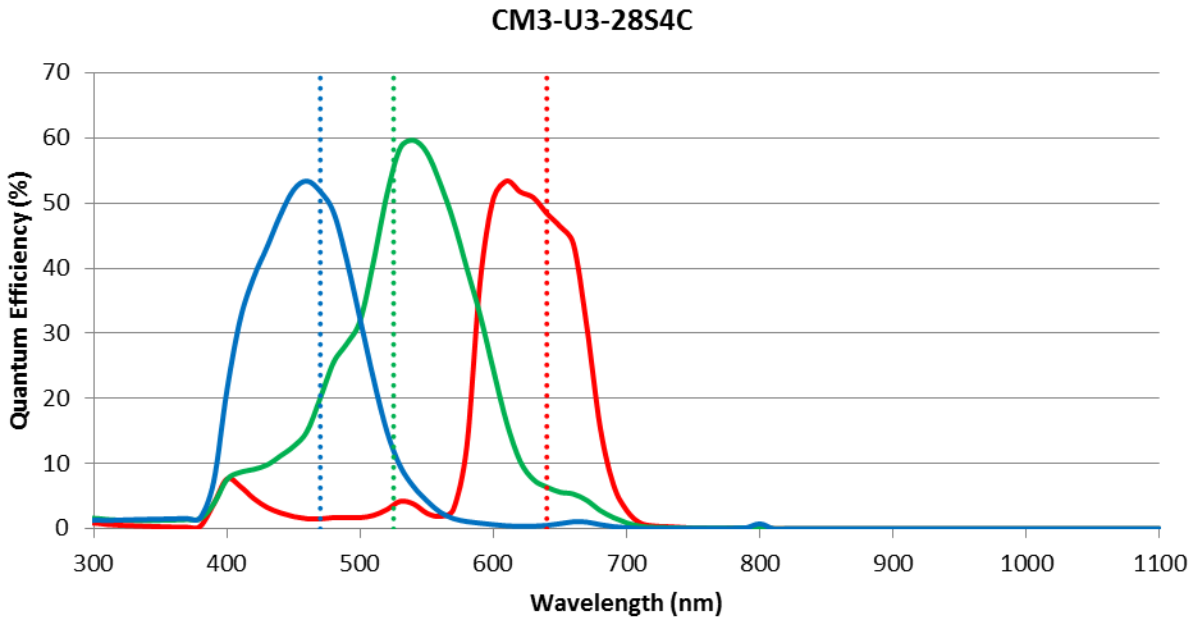
# 6 CM3-U3-28S4M Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 45 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency (% at 525 nm) | 76 |
| Temporal Dark Noise (Read Noise) (e-) | 10.48 |
| Signal to Noise Ratio Maximum (dB) | 40.39 |
| Signal to Noise Ratio Maximum (Bits) | 6.71 |
| Absolute Sensitivity Threshold (γ) | 14.67 |
| Saturation Capacity (Well Depth) (e-) | 10936 |
| Dynamic Range (dB) | 59.96 |
| Dynamic Range (Bits) | 9.96 |
| Gain (e-/ADU) | 0.18 |



# 7 CM3-U3-28S4C Imaging Performance

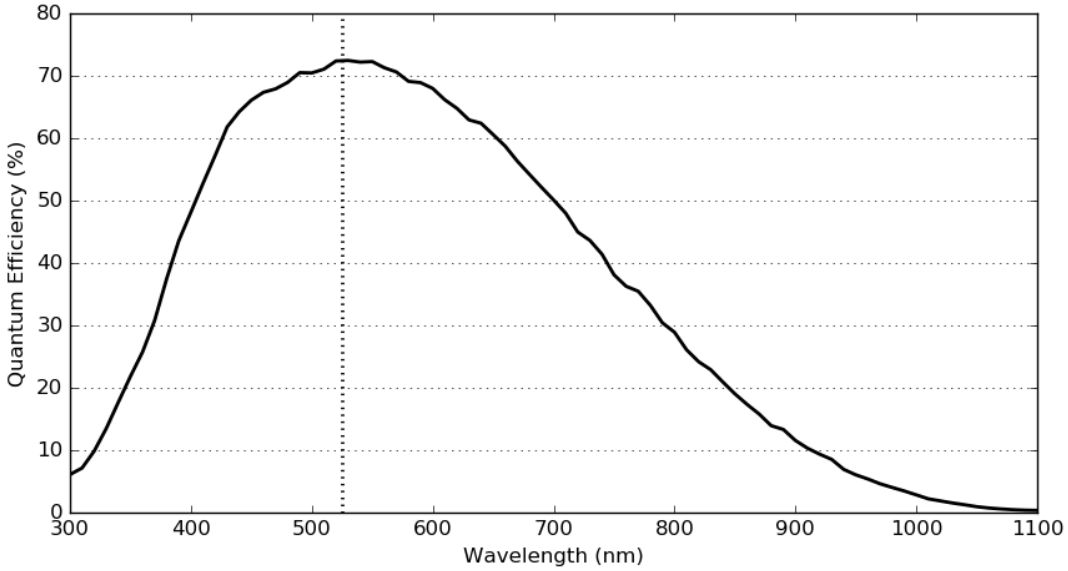
| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 45 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency Blue (% at 470 nm) | 51 |
| Quantum Efficiency Green (% at 525 nm) | 54 |
| Quantum Efficiency Red (% at 640 nm) | 48 |
| Temporal Dark Noise (Read Noise) (e-) | 10.08 |
| Signal to Noise Ratio Maximum (dB) | 39.76 |
| Signal to Noise Ratio Maximum (Bits) | 6.60 |
| Absolute Sensitivity Threshold (γ) | 20.00 |
| Saturation Capacity (Well Depth) (e-) | 9462 |
| Dynamic Range (dB) | 59.03 |
| Dynamic Range (Bits) | 9.80 |
| Gain (e-/ADU) | 0.18 |



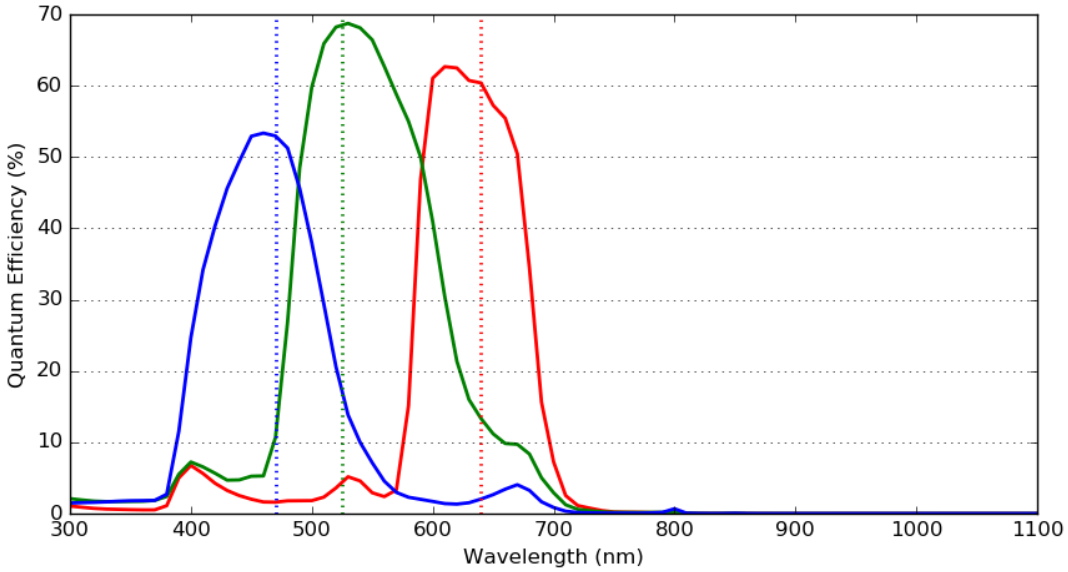
# 8 CM3-U3-31S4M Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 37.24 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency (% at 525 nm) | 72 |
| Temporal Dark Noise (Read Noise) (e-) | 2.28 |
| Signal to Noise Ratio Maximum (dB) | 40.26 |
| Signal to Noise Ratio Maximum (Bits) | 6.69 |
| Absolute Sensitivity Threshold (γ) | 3.87 |
| Saturation Capacity (Well Depth) (e-) | 10607 |
| Dynamic Range (dB) | 71.62 |
| Dynamic Range (Bits) | 11.90 |
| Gain (e-/ADU) | 0.17 |



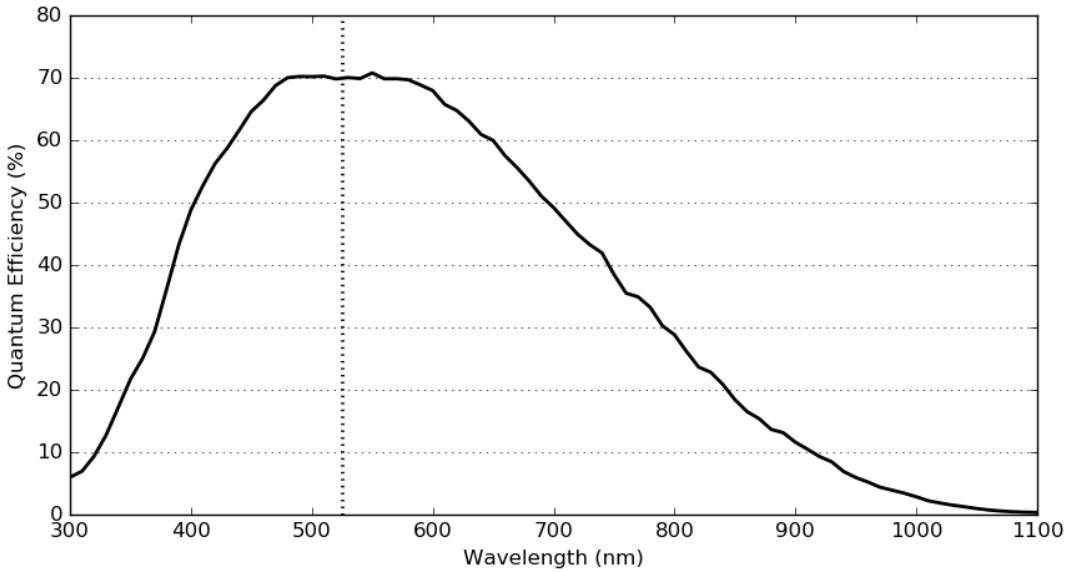
# 9 CM3-U3-31S4C Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 37.24 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency Blue (% at 470 nm) | 49 |
| Quantum Efficiency Green (% at 525 nm) | 66 |
| Quantum Efficiency Red (% at 640 nm) | 61 |
| Temporal Dark Noise (Read Noise) (e-) | 2.27 |
| Signal to Noise Ratio Maximum (dB) | 39.84 |
| Signal to Noise Ratio Maximum (Bits) | 6.62 |
| Absolute Sensitivity Threshold (γ) | 4.19 |
| Saturation Capacity (Well Depth) (e-) | 9644 |
| Dynamic Range (dB) | 70.84 |
| Dynamic Range (Bits) | 11.77 |
| Gain (e-/ADU) | 0.17 |



# 10 CM3-U3-50S5M Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 37.24 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency (% at 525 nm) | 70 |
| Temporal Dark Noise (Read Noise) (e-) | 2.34 |
| Signal to Noise Ratio Maximum (dB) | 39.99 |
| Signal to Noise Ratio Maximum (Bits) | 6.64 |
| Absolute Sensitivity Threshold (γ) | 4.05 |
| Saturation Capacity (Well Depth) (e-) | 9987 |
| Dynamic Range (dB) | 70.93 |
| Dynamic Range (Bits) | 11.78 |
| Gain (e-/ADU) | 0.17 |



# 11 CM3-U3-50S5C Imaging Performance

| Measurement | Video Mode 0 |
|---|---|
| Pixel Clock (MHz) | 37.24 |
| ADC (Bits) | 12-bit |
| Quantum Efficiency Blue (% at 470 nm) | 48 |
| Quantum Efficiency Green (% at 525 nm) | 65 |
| Quantum Efficiency Red (% at 640 nm) | 59 |
| Temporal Dark Noise (Read Noise) (e-) | 2.26 |
| Signal to Noise Ratio Maximum (dB) | 39.78 |
| Signal to Noise Ratio Maximum (Bits) | 6.61 |
| Absolute Sensitivity Threshold (γ) | 4.24 |
| Saturation Capacity (Well Depth) (e-) | 9498 |
| Dynamic Range (dB) | 70.72 |
| Dynamic Range (Bits) | 11.75 |
| Gain (e-/ADU) | 0.17 |