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Find the *FLIR Systems / Point Grey Research Grasshopper2 GS2-FW-14S5M* at our website: *Click HERE*



CAMERA CATALOG AND SENSOR REVIEW

USB VISION GiGE VISION FireWire CAMERA Link USB 2.0



flir.com/mv

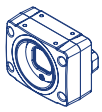
FLIR® | MACHINE VISION

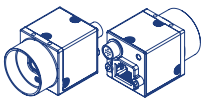


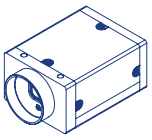


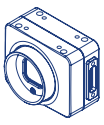
FLIR is a global leader in the design and manufacture of innovative, high-performance digital cameras for industrial, medical and life science, traffic, biometric, GIS, and people counting applications. We offer a unique and comprehensive portfolio of USB 3.1, 10 GigE, GigE, FireWire, and USB 2.0 products known for their outstanding quality, ease of use, and unbeatable price-performance.







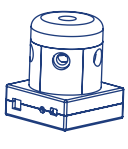


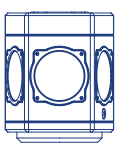


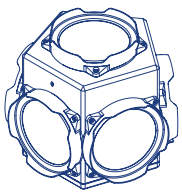
2000	2001	2002	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First IEEE 1394 stereo vision camera Digiclops	First IEEE 1394 imaging camera Firefly	First spherical vision camera Ladybug	First IEEE 1394b camera Dragonfly Express	New products Dragonfly2 Ladybug2	New products Flea2 Firefly MV	New products Grasshopper FirePRO	New product USB 2.0 camera Chameleon New product Ladybug3	World's first USB 3.0 Camera	New product Flea3 New product GigE camera Grasshopper2	First Camera Link camera Gazelle First USB 3.0 camera Flea3 World's smallest GigE camera Flea3 New product Grasshopper Express	New Product IP camera Zebra2 World's Smallest PoE GigE Camera Blackfly	New USB3 products Ladybug5 Grasshopper3	New USB3 product Blackfly USB 3.0 New GigE product Grasshopper3	New USB3 product Chameleon 3	New USB3 and GigE Vision product Blackfly S	10 GigE Camera Oryx

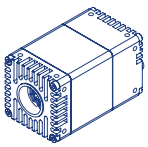
QUICK FACTS

- FLIR acquired Point Grey in Nov 2016
- **ISO 9001:2008** registered
- **200k/yr** machine vision camera capacity
- Designed and manufactured in **Canada**
- **3 year warranty** on most products
- **Global offices** & distribution network









USB 3.1 Camera Features:

- Largest selection of CMOS and CCD sensors
- FPGA and frame buffer-based architecture for optimal reliability
- Proprietary USB 3.1 link layer and driver stack
- Industry-standard C- and CS- mount
- Fully tested USB 3.1 Gen 1 accessories: interface cards, hubs, and cables



BLACKFLY® S

UP TO 20MP CMOS IN AN ICE CUBE



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
BFS-U3-13Y3C/M-C	1.3MP	ON Semi PYTHON 1300 CMOS	1/2"	4.8µm Global	1280 x 1024	170 fps
BFS-U3-32S4C/M-C	3.2MP	Sony IMX252 CMOS*	1/1.8"	3.45 µm Global	2048 x 1536	118 fps
BFS-U3-51S5C/M-C	5.0MP	Sony IMX250 CMOS*	2/3"	3.45 µm Global	2448 x 2048	75 fps
BFS-U3-89S6C/M-C[1]	8.9MP	Sony IMX255 CMOS*	1"	3.45 µm Global	4096 x 2160	43 fps
BFS-U3-123S6C/M-C[1]	12.3MP	Sony IMX253 CMOS*	1.1"	3.45 µm Global	4096 x 3000	30 fps
BFS-U3-200S6C/M-C[1]	20MP	Sony IMX183 CMOS**	1"	2.4 µm Rolling	5472 x 3648	18 fps

[1]Coming Soon *High performance Sony Pregius™ Global Shutter CMOS ***Sony Exmor R™ CMOS

CHAMELEON®3

FLEXIBLE FORM FACTOR

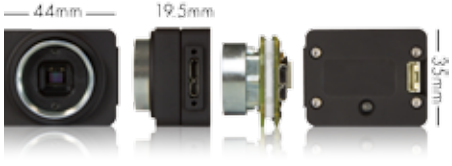


Model#	Sensor Specifications			Shutter	Max Res	Max FPS
CM3-U3-13S2C/M-CS	1.3MP	Sony ICX445 CCD**	1/3"	3.75 µm Global	1288 x 964	30 fps
CM3-U3-13S2C/M-CS-BD	1.3MP	Sony ICX445 CCD**	1/3"	3.75 µm Global	1288 x 964	30 fps
CM3-U3-13Y3C/M-CS	1.3MP	ON Semi PYTHON 1300 CMOS	1/2"	4.8 µm Global	1280 x 1024	149 fps
CM3-U3-13Y3C/M-S-BD	1.3MP	ON Semi PYTHON 1300 CMOS	1/2"	4.8 µm Global	1280 x 1024	149 fps
CM3-U3-28S4C/M-CS	2.8MP	Sony ICX818 CCD**	1/1.8"	3.69 µm Global	1928 x 1448	13 fps
CM3-U3-31S4C/M-CS[1]	3.2MP	Sony IMX265 CMOS*	1/1.8"	3.45 µm Global	2048 x 1536	55 fps
CM3-U3-50S5C/M-CS[1]	5.0MP	Sony IMX264 CMOS*	2/3"	3.45 µm Global	2448 x 2048	35 fps

*High performance Sony Pregius™ Global Shutter CMOS **High sensitivity Sony EXview HAD CCD™

	BFS-U3	CM3-U3
INTERFACE	USB 3.1 Gen 1 interface with screw locks for camera control, data, and power	USB 3.1 Gen 1 interface with screw locks for camera control, data, and power
GPIO	6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output. 1 bi-directional I/O pin, 1 input pin.	9-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power 1 opto-isolated input, 1 opto-isolated output
ADC	12-bit • 10-bit (BFS-U3-13Y3)	12-bit • 10-bit (CM3-U3-13Y3)
IMAGE DATA FORMATS	Mono8, Mono16, Bayer8, Bayer16, RGB8, YCbCr8, YCbCr411_8, YCbCr422_8	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAMMA	0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table
TRIGGER MODES	External trigger and software trigger	Standard, bulb, multi-shot, overlapped, low smear mode (CCD models only)
IMAGE BUFFER	240 MB	16 MB frame buffer
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	29 x 29 x 30 mm excluding lens holder (metal case)	44 x 35 x 19.5 mm excluding lens holder (metal case)
MASS	36g (Without optics or tripod mounting bracket)	55g (Without optics or tripod mounting bracket)
POWER	8-24 V via GPIO or 5 V via USB 3.1 interface, <3 W	5 V, <3 W, via GPIO or USB 3.1 interface
LENS MOUNT	C-mount	CS-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 50°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	3 years	3 years







BLACKFLY®

PERFORMANCE AND VALUE



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
BFLY-U3-03S2C/M-CS	0.3MP	Sony ICX424 CCD	1/3″ 7.4 µm	Global	648 x 488	84 fps
BFLY-U3-05S2C/M-CS	0.5MP	Sony ICX693 CCD	1/3″ 6.0 µm	Global	808 x 608	50 fps
BFLY-U3-13S2C/M-CS	1.3MP	Sony ICX445 CCD**	1/3″ 3.75 µm	Global	1288 x 964	30 fps
BFLY-U3-20S4C/M-CS	2.0MP	Sony ICX274 CCD**	1/1.8″ 4.4 µm	Global	1624 x 1224	15 fps
BFLY-U3-23S6C/M-C	2.3MP	Sony IMX249 CMOS*	1/1.2″ 5.86 µm	Global	1920 x 1200	41 fps
BFLY-U3-50H5C/M-C	5.0MP	Sharp RJ32S4/S3AA0DT	2/3″ 3.45 µm	Global	2448 x 2048	7.5 fps

*High performance Sony Pregius™ Global Shutter CMOS **High sensitivity Sony EXview HAD CCD™

FLEA®3

ULTRA-COMPACT, ULTRA-FAST CMOS



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
FL3-U3-13S2C/M-CS	1.3MP	Sony IMX035 CMOS*	1/3″ 3.63µm	Rolling	1328 x 1048	120 fps
FL3-U3-13Y3M-C	1.3MP	ON Semi VITA 1300 CMOS	1/2″ 4.8 µm	Global	1280 x 1024	150 fps
FL3-U3-13E4C/M-C	1.3MP	e2v EV76C560 CMOS	1/1.8″ 5.3 µm	Global	1280 x 1024	60 fps
FL3-U3-20E4C/M-C	2.0MP	e2v EV76C5706F CMOS	1/1.8″ 4.5 µm	Global	1600 x 1200	59 fps
FL3-U3-32S2C/M-CS	3.2MP	Sony IMX036 CMOS*	1/2.8″ 2.5 µm	Rolling	2080 x 1552	60 fps
FL3-U3-120S3C-C	12MP	Sony IMX172 CMOS**	1/2.3″ 1.55 µm	Rolling	4000 x 3000	15 fps

*High performance Sony Exmor CMOS™ **Low Light Sensitivity Sony STARVIS™ CMOS

USB 3.1 Gen 1 interface with screw locks for camera control, data, and power	USB 3.1 Gen 1 interface with screw locks for camera control, data, and power	**INTERFACE**
6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O: 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins	**GPIO**
12-bit	12-bit (FL3-U3-13S2, FL3-U3-32S2, FL3-U3-120S3) / 10-bit (FL3-U3-13Y3, FL3-U3-13E4, FL3-U3-20E4)	**ADC**
Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)	**IMAGE DATA FORMATS**
Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes	**PARTIAL IMAGE MODES**
0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table	**GAMMA**
Standard, bulb, multi-shot, overlapped, low smear mode (CCD models only)	Standard, bulb (except FL3-U3-13E4, FL3-U3-20E4), multi-shot	**TRIGGER MODES**
16 MB frame buffer	32 MB frame buffer	**IMAGE BUFFER**
2 memory channels for custom camera settings	2 memory channels for custom camera settings	**USER SETS**
29 x 29 x 30 mm excluding lens holder (metal case)	29 x 29 x 30 mm excluding lens holder (metal case)	**SIZE (WxHxD)**
36g (Without optics or tripod mounting bracket)	41 g (Without optics or tripod mounting bracket)	**MASS**
5-24 V via GPIO or 5 V via USB 3.1 interface, <2.5W	5-24 V via GPIO or 5 V via USB 3.1 interface, <3 W	**POWER**
CS-mount, C-mount	CS-mount, C-mount	**LENS MOUNT**
-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)	**TEMPERATURE**
3 years	3 years	**WARRANTY**





GRASSHOPPER®3

HIGH PERFORMANCE CMOS AND CCD



Model#	Sensor Specifications		Shutter	Max Res	Max FPS
GS3-U3-14S5C/M-C	1.4MP	Sony ICX285 CCD 2/3"	6.45 µm Global	1384 x 1036	30 fps
GS3-U3-15S5C/M-C	1.4MP	Sony ICX825 CCD 2/3"	6.45 µm Global	1384 x 1036	45 fps
GS3-U3-23S6C/M-C	2.3MP	Sony IMX174 CMOS* 1/1.2"	5.86 µm Global	1920 x 1200	163 fps
GS3-U3-28S4C/M-C	2.8MP	Sony ICX687 CCD** 1/1.8"	3.69 µm Global	1928 x 1448	26 fps
GS3-U3-28S5C/M-C	2.8MP	Sony ICX674 CCD** 2/3"	4.54 µm Global	1920 x 1440	26 fps
GS3-U3-32S4C/M-C	3.2MP	Sony IMX252 CMOS* 1/1.8"	3.45 µm Global	2048 x 1536	121 fps
GS3-U3-41S4C/M-C	4.1MP	Sony ICX808 CCD** 1/1.8"	3.1 µm Global	2016 x 2016	18 fps
GS3-U3-41C6NIR-C	4.1MP	CMOSIS CMV4000-3E12 CMOS 1"	5.5 µm Global	2048 x 2048	90 fps
GS3-U3-41C6C/M-C	4.1MP	CMOSIS CMV4000-3E5 CMOS 1"	5.5 µm Global	2048 x 2048	90 fps
GS3-U3-50S5C/M-C	5.0MP	Sony ICX625 CCD 2/3"	3.45 µm Global	2448 x 2048	15 fps
GS3-U3-51S5C/M-C	5.0MP	Sony IMX250 CMOS* 2/3"	3.45 µm Global	2448 x 2048	75 fps
GS3-U3-60S6C/M-C	6.0MP	Sony ICX694 CCD** 1"	4.54 µm Global	2736 x 2192	13 fps
GS3-U3-60QS6C/M-C	6.0MP	Sony ICX694 CCD** 1"	4.54 µm Global	2736 x 2192	25 fps
GS3-U3-89S6C/M-C	8.9MP	Sony IMX255 CMOS* 1"	3.45 µm Global	4096 x 2160	43 fps
GS3-U3-91S6C/M-C	9.1MP	Sony ICX814 CCD** 1"	3.69 µm Global	3376 x 2704	9 fps
GS3-U3-120S6C/M-C	12MP	Sony ICX834 CCD** 1"	3.1 µm Global	4240 x 2824	7 fps
GS3-U3-123S6C/M-C	12.3MP	Sony IMX253 CMOS* 1.1"	3.45 µm Global	4096 x 3000	30 fps

*High performance Sony Pregius™ Global Shutter CMOS **High sensitivity Sony EXview HAD CCD II™

INTERFACE	USB 3.1 Gen 1 interface with screw locks for camera control, data, and power
GPIO	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O: 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins
ADC	14-bit • 10/12-bit (GS3-U3-23S6, 32S4, 51S5, 89S6, 123S6) • 10-bit (GS3-U3-41C6)
IMAGE DATA FORMATS	Mono8, Mono12, Mono16 (all models) RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes
GAMMA	0.50 to 4.00, programmable lookup table
TRIGGER MODES	Standard, bulb, multi-shot, overlapped, low smear mode (CCD models only)
IMAGE BUFFER	128 MB frame buffer
USER SETS	2 memory channels for custom camera settings
SIZE (WxHxD)	44 x 29 x 58 mm excluding lens holder (metal case)
MASS	90 g (Without optics or tripod mounting bracket)
POWER	5 V via USB 3.1 interface or 8-24 V via GPIO (external power is recommended for this model)
LENS MOUNT	C-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 50°C (operating)
WARRANTY	3 years





10 Gigabit Ethernet Camera Features:

- The latest Global shutter CMOS sensors at their maximum frame rates
- High density 12 pin GPIO
- IEEE 1588 Precision Time Protocol
- Designed and tested for continuous operation at 50°C

ORYX™

10 Gigabit Ethernet Camera

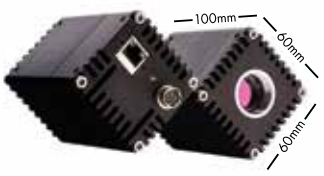




Model#	Sensor Specifications			Shutter	Max Res	Max FPS
ORX-10GE-51S5M/C-C[1]	5.0MP	Sony IMX250 CMOS*	2/3"	3.45 µm Global	2448 x 2048	163 fps
ORX-10GE-89S6M/C-C[1]	8.9MP	Sony IMX255 CMOS*	1"	3.45 µm Global	4096 x 2160	93 fps
ORX-10GE-123S6M/C-C[1]	12.3MP	Sony IMX253 CMOS*	1.1"	3.45 µm Global	4096 x 3000	68 fps

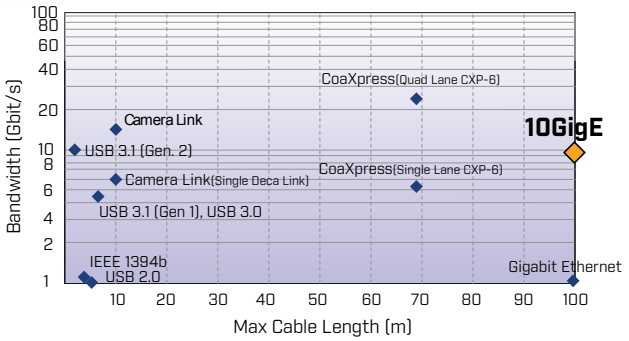
[1]Coming Soon *High performance Sony Pregius™ Global Shutter CMOS

INTERFACE	10 Gigabit Ethernet (10GBASE-T)
MACHINE VISION STANDARD	GigE Vision
GPIO	12 Pin Hirose GPIO connector for power, trigger strobe 1 Opto-isolated input, and output, 1 non-isolated bi-directional, serial port over non-isolated I/O, Auxiliary output (3.3V, 150 mA max)
ADC	8-bit • 10-bit • 12-bit
PARTIAL IMAGE MODES	Pixel Binning, Decimation, and Region of Interest
IMAGE PROCESSING	Color correction Matrix, gamma, hue, saturation, and sharpness
GAMMA	0.5 to 4, programmable lookup table
TRIGGER MODES	External Trigger, Software Trigger
TRIGGER LOGIC	Logic Blocks, Counter and Timers, Sequencer with 8 user sets
TIME SYNCHRONIZATION PROTOCOL	IEEE 1588 Precision Time Protocol
IMAGE BUFFER	256MB
USER SETS	2 memory channels for custom camera settings
SIZE (WXHXD)	60x60x100mm excluding lens holder, without optics (metal case)
POWER	Externally Powered over GPIO (8 - 24V) 12W Max
LENS MOUNT	C-mount
TEMPERATURE	-30°C to 60°C (storage) • 0°C to 50°C (operating)
WARRANTY	3 years



NEW POSSIBILITIES WITH 10 GIGE

The new standard in single-link interface speed, 10 Gigabit Ethernet (10 GigE) enables users to take full advantage of the latest generation of high-performance sensors with their higher resolution, frame rates, bit depth and dynamic range.



Quick and Easy

The 10 Gbit/s transfer speed isn't the only thing about Oryx that is fast. With no frame grabbers or link aggregation to configure, set-up is a snap.

Go Long!

CAT6A cabling allows for 10 GigE speeds at cable lengths up to 100m without repeaters, hubs or optical fiber extensions.

Established and Reliable

10 Gigabit Ethernet has been used for many years in network infrastructure. It has a very large install base and a mature hardware ecosystem.

GigE Vision Compliant

10 Gigabit Ethernet is fully compatible with GigE Vision hardware and software. 10 Gigabit Ethernet's GenICam support gives it out of box compatibility with third-party libraries such as NI, Matrox etc.

Backward Compatibility

10 Gigabit Ethernet devices on Gigabit Ethernet hardware will automatically step down to gigabit speed. This enables a simple upgrade path.

GigE Camera Features:

- Unique selection of CMOS and CCD sensors
- Supports GigE Vision 1.2
- Industry's most compact sizes
- GigE image filter driver for reduced latency and maximized bandwidth
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED

BLACKFLY® S

TRUE IMAGE CAPTURE



Model#	Sensor	Specifications		Shutter	Max Res	Max FPS
BFS-PGE-13Y3C/M-C	1.3MP	ON Semi PYTHON 1300 CMOS	1/2"	4.8 µm Global	1280 x 1024	84 fps
BFS-PGE-50S5C/M-C	5.0MP	Sony IMX264 CMOS*	2/3"	3.45 µm Global	2448 x 2048	24 fps

*High performance Sony Pregius™ Global Shutter CMOS

BLACKFLY®

WORLD'S SMALLEST POE CAMERA



Model#	Sensor	Specifications		Shutter	Max Res	Max FPS
BFLY-PGE-03S2C/M-CS	0.3MP	Sony ICX424 CCD	1/3"	7.4 µm Global	648 x 488	84 fps
BFLY-PGE-03S3C/M-CS	0.3MP	Sony ICX414 CCD	1/2"	9.9 µm Global	648 x 488	90 fps
BFLY-PGE-05S2C/M-CS	0.5MP	Sony ICX693 CCD	1/3"	6.0 µm Global	808 x 608	50 fps
BFLY-PGE-09S2C/M-CS	0.9MP	Sony ICX692 CCD**	1/3"	4.08 µm Global	1288 x 728	30 fps
BFLY-PGE-12A2C/M-CS	1.2MP	Aptina AR0134 CMOS	1/3"	3.75 µm Global	1280 x 960	52 fps
BFLY-PGE-13S2C/M-CS	1.3MP	Sony ICX445 CCD*	1/3"	3.75 µm Global	1288 x 964	30 fps
BFLY-PGE-13H2C/M-CS	1.3MP	Sharp RJ33J3/RJ33J4 CCD	1/3"	3.75 µm Global	1288 x 964	30 fps
BFLY-PGE-13E4C/M-CS	1.3MP	e2v EV76C560 CMOS	1/1.8"	5.3 µm Global	1280 x 1024	60 fps
BFLY-PGE-14S2C-CS	1.4MP	Sony IMX104 CMOS	1/3"	3.75 µm Rolling	1296 x 1032	60 fps
BFLY-PGE-20E4C/M-CS	2.0MP	e2v EV76C570 CMOS	1/1.8"	4.5 µm Global	1600 x 1200	50 fps
BFLY-PGE-23S2C-CS	2.3MP	Sony IMX136 CMOS	1/2.8"	2.8 µm Rolling	1920 x 1200	27 fps
BFLY-PGE-23S6C/M-C	2.3MP	Sony IMX249 CMOS***	1/1.2"	5.86 µm Global	1920 x 1200	41 fps
BFLY-PGE-31S4M/C-C[1]	3.2MP	Sony IMX265 CMOS***	1/1.8"	3.45 µm Global	2048 x 1536	35 fps
BFLY-PGE-50A2C/M-CS	5.0MP	Aptina MT9P006/031 CMOS	1/2.5"	2.2 µm Rolling	2592 x 1944	13 fps
BFLY-PGE-50H5C/M-C	5.0MP	Sharp RJ32S4/S3AA0DT CCD	2/3"	3.45 µm Global	2448 x 2048	7.5 fps
BFLY-PGE-50S5M/C-C[1]	5.0MP	Sony IMX264 CMOS***	2/3"	3.45 µm Global	2448 x 2048	22 fps

*High sensitivity Sony EXview HAD CCD™ **High sensitivity Sony EXview HAD CCD II™ ***High performance Sony Pregius™ Global Shutter CMOS

	BFS-PGE-13Y3C/M-C, BFS-PGE-50S5C/M-C	BFLY-PGE-03S2C/M-CS, BFLY-PGE-03S3C/M-CS, BFLY-PGE-05S2C/M-CS, BFLY-PGE-09S2C/M-CS, BFLY-PGE-12A2C/M-CS, BFLY-PGE-13S2C/M-CS, BFLY-PGE-13H2C/M-CS, BFLY-PGE-13E4C/M-CS, BFLY-PGE-14S2C-CS, BFLY-PGE-20E4C/M-CS, BFLY-PGE-23S2C-CS, BFLY-PGE-23S6C/M-C, BFLY-PGE-31S4M/C-C[1], BFLY-PGE-50A2C/M-CS, BFLY-PGE-50H5C/M-C, BFLY-PGE-50S5M/C-C[1]
INTERFACE	Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet	Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet
GPIO	6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output. 1 bi-directional I/O pin, 1 input pin.	6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output
ADC	12-bit • 10-bit (BFS-PGE-13Y3)	10-bit (BFLY-PGE-13E4, BFLY-PGE-20E4) • 12-bit
IMAGE DATA FORMATS	Mono8, Mono16, Bayer8, Bayer16, RGB8, YCbCr8, YCbCr411_8, YCbCr422_8	Mono8, Mono12, Mono16, Raw8, Raw12, Raw16 (all models) / RGB, YUV411, YUV422, YUV 444 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAMMA	0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table
TRIGGER MODES	External trigger and software trigger	Standard, bulb (except BFLY-PGE-05S2, BFLY-PGE-09S2, BFLY-PGE-12A2, BFLY-PGE-13E4, BFLY-PGE-20E4) overlapped (except BFLY-PGE-12A2, BFLY-PGE-13E4, BFLY-PGE-14S2, BFLY-PGE-20E4, BFLY-PGE-50A2), multi-shot, low smear mode (CCD models only)
IMAGE BUFFER	240 MB	16 MB frame buffer
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	29 x 29 x 30 mm excluding lens holder (metal case)	29x29x30 mm excluding lens holder, without optics (metal case)
MASS	36g (Without optics or tripod mounting bracket)	36 grams (without optics or tripod mounting bracket)
POWER	Standard voltage via Power over Ethernet (PoE) or 8 - 24 V via GPIO interface, < 2.5 W	Standard voltage via Power over Ethernet (PoE) or 5 - 16 V via GPIO interface, < 2.5 W
LENS MOUNT	C-mount	CS-mount (5 mm C-mount adapter sold separately) / C-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 50°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	3 years	3 years







FLEA®3

WORLD'S SMALLEST GIGE CAMERA



Model#	Sensor Specifications				Shutter	Max Res	Max FPS
FL3-GE-03S1C/M-C	0.3MP	Sony ICX618 CCD*	1/4"	5.6 µm	Global	648 x 488	120 fps
FL3-GE-03S2C/M-C	0.3MP	Sony ICX424 CCD	1/3"	7.4 µm	Global	648 x 488	82 fps
FL3-GE-08S2C/M-C	0.8MP	Sony ICX204 CCD	1/3"	4.65 µm	Global	1032 x 776	31 fps
FL3-GE-13S2C/M-C/CS	1.3MP	Sony ICX445 CCD*	1/3"	3.75 µm	Global	1288 x 964	31 fps
FL3-GE-14S3C/M-C	1.4MP	Sony ICX267 CCD	1/2"	4.65 µm	Global	1384 x 1032	18 fps
FL3-GE-20S4C/M-C	2.0MP	Sony ICX274 CCD	1/1.8"	4.4 µm	Global	1624 x 1224	15 fps
FL3-GE-28S4C/M-C	2.8MP	Sony ICX687 CCD**	1/1.8"	3.69 µm	Global	1928 x 1448	14 fps
FL3-GE-50S5C/M-C	5.0MP	Sony ICX655 CCD	2/3"	3.45 µm	Global	2448 x 2048	8 fps

*High sensitivity Sony EXview HAD CCD™ **High sensitivity Sony EXview HAD CCD II™

GRASSHOPPER®3

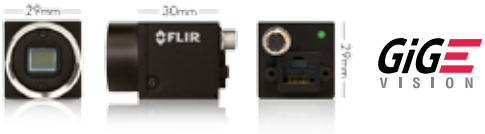
POE, FAST, HIGH-RESOLUTION IMAGING



Model#	Sensor Specifications				Shutter	Max Res	Max FPS
GS3-PGE-23S6C/M-C	2.3MP	Sony IMX174 CMOS*	1/1.2"	5.86 µm	Global	1920 x 1200	45 fps
GS3-PGE-50S5C/M-C	5.0MP	Sony ICX625 CCD	2/3"	3.45 µm	Global	2448 x 2048	15 fps
GS3-PGE-60S6C/M-C	6.0MP	Sony ICX694 CCD**	1"	4.54 µm	Global	2736 x 2192	13 fps
GS3-PGE-91S6C/M-C	9.1MP	Sony ICX814 CCD**	1"	3.69 µm	Global	3376 x 2704	9 fps

*High performance Sony Exmor CMOS™ **High sensitivity Sony EXview HAD CCD II™

FLEA®3	GRASSHOPPER®3	
Gigabit Ethernet interface with screw locks for camera control and data	Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet	**INTERFACE**
8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O 1 opto-isolated input,1 opto-isolated output, 2 bi-directional I/O pins	**GPIO**
12-bit	10/12-bit (GS3-PGE-23S6) • 14-bit	**ADC**
Y8, Y16, Mono8, Mono12, Mono16 (all models) / RGB, YUV411, YUV422, YUV 444, Raw8, Raw12, Raw16 (color models)	Mono8, Mono12, Mono16 (all models) RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)	**IMAGE DATA FORMATS**
Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes	**PARTIAL IMAGE MODES**
0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table	**GAMMA**
Standard, bulb, skip frames, multi-exposure preset, multi-exposure pulse width, overlapped, multi-shot	Standard, bulb, overlapped, multi-shot, low smear mode (CCD models only)	**TRIGGER MODES**
32 MB frame buffer	128 MB frame buffer	**IMAGE BUFFER**
2 memory channels for custom camera settings	2 memory channels for custom camera settings	**USER SETS**
29x29x30 mm excluding lens holder, without optics (metal case)	44x29x58 mm excluding lens holder and connectors (metal case)	**SIZE (WxHxD)**
38 grams (without optics or tripod mounting bracket)	90 grams (without optics or tripod mounting bracket)	**MASS**
Standard voltage via Power over Ethernet (PoE) or 5 - 24 V via GPIO interface, < 2.5 W	Standard voltage via Power over Ethernet (PoE) or 5 - 24 V via GPIO interface, < 2.5 W	**POWER**
C-mount (FL3-GE-13S2 also available with CS-mount)	C-mount	**LENS MOUNT**
-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 50°C (operating)	**TEMPERATURE**
3 years	3 years	**WARRANTY**





USB 2.0

USB 2.0 Camera Features:

- Cost effective
- Industry-standard CS- mount
- Includes CS-C 5 mm adapter
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED
- Board-level and custom options available for OEMs

CHAMELEON®

COMPACT, COST EFFECTIVE, CCD QUALITY



Model#	Sensor Specifications		Shutter	Max Res	Max FPS
CMLN-13S2C/M-CS	1.3MP	Sony ICX445 CCD* 1/3" 3.75 µm	Global	1296 x 964	18 fps

*High sensitivity Sony EXview HAD CCD™

FIREFLY® MV

SMALL, AFFORDABLE, VERSATILE CMOS



Model#	Sensor Specifications		Shutter	Max Res	Max FPS
FMVU-03MTC/M-CS	0.3MP	Micron MT9V022 CMOS 1/3" 6.0 µm	Global	752 x 480	60 fps
FMVU-13S2C-CS	1.3MP	Sony IMX035 CMOS* 1/3" 3.63 µm	Rolling	1328 x 1048	23 fps

*High speed Sony Exmor™ CMOS

	CHAMELEON®	FIREFLY® MV
INTERFACE	Mini-B USB2.0 for camera control, video data, and power	Mini-B USB2.0 for camera control, video data, and power
GPIO	7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power	7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power
ADC	12-bit	10-bit (FMVU-03MT) • 10/12-bit (FMVU-13S2)
IMAGE DATA FORMATS	Y8, Y16 (mono) 8-bit and 16-bit Raw Bayer data (color)	Y8, Y16 (mono) 8-bit and 16-bit raw Bayer data (color)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAMMA	0.50 to 4.00, programmable lookup table	0 to 1 (FMVU-03MT)/0.50 to 4.00 (FMVU-13S2)
TRIGGER MODES	Standard, bulb, skip frames, overlapped	Standard, skip frames
IMAGE BUFFER	N/A	N/A
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	39x31mm (board level) / 25.5x44x41 mm excluding lens holder, without optics (plastic case)	39x24 mm (board level) / 24.4x44x34 mm excluding lens holder, without optics (plastic case)
MASS	22 g (board level) / 37 g (plastic case) (without optics or tripod mounting bracket)	14 g (board level) / 37 g (plastic case) (without optics or tripod mounting bracket)
POWER	2 W, 4.745 to 5.25 V via USB 2.0 interface or JST 7-pin GPIO connector	8-30 V, 1 W at 12 V via 1394a interface
LENS MOUNT	CS-mount (5 mm C-mount adapter included)	CS-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	1 year	1 year





IEEE 1394 Camera Features:

- Compact sizes including board level options
- Supports IIDC v1.32
- Industry-standard C- mount
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED
- Automatic synchronization

Camera Link Camera Features:

- 2 SDR connectors with screw locks
- Industry-standard C- mount
- 8- and 10- bit image modes
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED

FLEA®3

ULTRA-COMPACT, CCD FAMILY



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
FL3-FW-03S1C/M-C	0.3MP	Sony ICX618 CCD*	1/4" 5.6 µm	Global	648 x 488	120 fps
FL3-FW-03S3C/M-C	0.3MP	Sony ICX414 CCD	1/2" 9.9 µm	Global	648 x 488	76 fps
FL3-FW-14S3C/M-C	1.4MP	Sony ICX267 CCD	1/2" 4.65 µm	Global	1384 x 1032	16 fps
FL3-FW-20S4C/M-C	2.0MP	Sony ICX274 CCD	1/1.8" 4.4 µm	Global	1624 x 1224	15 fps

*High sensitivity Sony EXview HAD CCD ™

GAZELLE®

HIGH RESOLUTION, FAST FRAME RATES



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
GZL-CL-22C5M-C	2.2MP	CMOSIS CMV2000 CMOS	2/3" 5.5 µm	Global	2048 x 1088	280 fps
GZL-CL-41C6M-C	4.1MP	CMOSIS CMV4000-2E5 CMOS	1" 5.5 µm	Global	2048 x 2048	150 fps

IEEE 1394b interface with screw locks for camera control, data, and power	Camera Link LVDS for camera control and video data transmission.Base (2-tap) and Full (8-tap) configurations	**INTERFACE**
8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins	8-pin Hirose HR25 GPIO connector; opto-isolated pins for trigger and strobe	**GPIO**
12-bit	10-bit	**ADC**
Y8, Y16 (all models) RGB, YUV411, YUV422, Raw8, Raw16 (color models)	Mono8, Mono10	**IMAGE DATA FORMATS**
Pixel binning and region of interest (ROI) modes	Single or multiple region of interest modes	**PARTIAL IMAGE MODES**
0.50 to 4.00, programmable lookup table	N/A	**GAMMA**
Standard, bulb, skip frames, overlapped, multiple exposure, multi-shot	Single-shot, bulb, software trigger	**TRIGGER MODES**
32 MB frame buffer	N/A	**IMAGE BUFFER**
2 memory channels for custom camera settings	2 memory channels for custom camera settings	**USER SETS**
29x29x30 mm excluding lens holder, without optics (metal case)	44x29x59.5 mm excluding lens holder, without optics (metal case)	**SIZE (WxHxD)**
58 g (without optics or tripod mounting bracket)	90 g (without optics or tripod mounting bracket)	**MASS**
8-30 V, <2.5 W via GPIO or 1394b interface	12 V, 6 W at 12 V	**POWER**
C-mount	C-mount	**LENS MOUNT**
-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • -10° to 50°C (operating)	**TEMPERATURE**
3 years	3 years	**WARRANTY**





SPINNAKER SDK

SPINNAKER SDK IS A GENICAM3 API LIBRARY BUILT FOR MACHINE VISION DEVELOPERS. It features an intuitive SpinView GUI, rich example code, and comprehensive documentation designed to help you build your application faster. Spinnaker is recommended for new projects.

MULTIPLE PLATFORM

- **WINDOWS**® 32/64-bit XP, 7, 8, 10
- **LINUX**®
  Ubuntu® 32/64-bit
  ARM*
  *Coming Soon

MULTIPLE INTERFACES

This SDK provides the same programming interface across USB3 Vision and GigE Vision cameras.

MULTIPLE LANGUAGES

- **C, C++, C#**
- **Visual Basic .NET**
- **DirectShow**
- **Cognex**

BUILD FASTER

Engineered for faster development into your application and better forward compatibility.

ACCELERATED INTEGRATION

Unlock the power of GenICam3. Quickly build your own software and have UI customizations. Minimize future development time with Spinnaker's API forward compatibility.

DYNAMIC FEATURES

Simplify and improve performance by enabling camera events, imaging sequencer and programmable logic. Use chunk data to gather image metadata and validate system performance.

TRANSMISSION RELIABILITY

Superior image transfer control and bandwidth management offers greater flexibility and insight into all transmission pipeline layers. Review detailed diagnostics and take command of our advanced logging functionality.

FLYCAPTURE SDK

THE FLYCAPTURE SOFTWARE DEVELOPMENT KIT (SDK) provides a common software interface to control and acquire images from FLIR USB 3.1*, GigE, FireWire, and USB 2.0 cameras using the same API under 32- or 64-bit Windows or Linux. FlyCapture supports ActiveX and DirectShow interfaces, and includes the FirePRO low-level 1394b interface driver, enhanced USB 3.1 interface driver, and the GigE image filter driver.

A complete software API library, ready-to-use demo programs, and comprehensive source code examples enable users to easily build custom imaging applications.

*Excluding Blackfly S camera

MULTIPLE PLATFORMS

- **WINDOWS**® 32/64-bit XP, 7, 8, 10
- **LINUX**®
  Ubuntu® 32/64-bit
  Arm 32/64 bit
- **macOS** (API only)

MULTIPLE INTERFACES

The SDK provides the same programming interface across USB 3.1*, USB 2.0, GigE and FireWire products.

MULTIPLE LANGUAGES

- **C, C++, C#**
- **Visual Basic .NET**
- **ActiveX**
- **DirectShow**
- **Python**

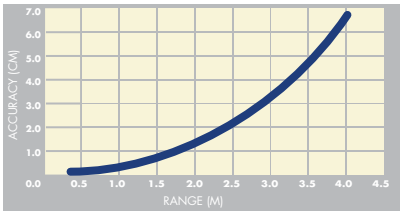


KEY FEATURES

- Proprietary USB 3.1 and FireWire driver stacks for robust diagnostics and, with complete end-to-end control, faster issue resolution
- GigE image filter driver for reduced latency and dropped frames, and maximized bandwidth
- Support for IIDC 1.32 features such as frame buffering and lookup table functionality
- OpenGL and Direct 2D support for better display performance and CPU usage
- Managed interface to decrease development time
- Simple (API) - only 3 function calls required to grab an image
- Example programs and source code

Bumblebee Family Key Features

- Highly accurate, passive 3D sensing – no lasers or projectors required
- Over one mil 3D points per second
- Full featured Triclops® SDK provides access to all levels of the stereo processing pipeline
- Pre-calibration for lens distortion and misalignments



RANGE VS ACCURACY
This chart shows the accuracy of 3D point calculations versus the range to the point. Results are dependent on image resolution, lens focal length and calibration accuracy.

BUMBLEBEE® XB3

3-SENSOR AND MULTI-BASELINE



Model#	Sensor Specifications			Shutter		Max Res	Max FPS	Focal Length
BBX3-13S2C/M-38	1.3MP	Sony ICX445 CCD	1/3"	3.75 µm	Global	1280 x 960	16 fps	3.8 mm
BBX3-13S2C/M-60	1.3MP	Sony ICX445 CCD	1/3"	3.75 µm	Global	1280 x 960	16 fps	6 mm

BUMBLEBEE® 2

COMPACT SIZE



Model#	Sensor Specifications			Shutter		Max Res	Max FPS	Focal Length
BB2-03S2C/M-25	0.3MP	Sony ICX424 CCD	1/3"	7.4 µm	Global	648 x 488	48 fps	2.5 mm
BB2-03S2C/M-38	0.3MP	Sony ICX424 CCD	1/3"	7.4 µm	Global	648 x 488	48 fps	3.8 mm
BB2-03S2C/M-60	0.3MP	Sony ICX424 CCD	1/3"	7.4 µm	Global	648 x 488	48 fps	6 mm
BB2-08S2C/M-25	0.8MP	Sony ICX204 CCD	1/3"	4.65 µm	Global	1032 x 776	20 fps	2.5 mm
BB2-08S2C/M-38	0.8MP	Sony ICX204 CCD	1/3"	4.65 µm	Global	1032 x 776	20 fps	3.8 mm
BB2-08S2C/M-60	0.8MP	Sony ICX204 CCD	1/3"	4.65 µm	Global	1032 x 776	20 fps	6 mm

Two IEEE-1394b interfaces for camera camera control, data, and power	IEEE-1394a interfaces for camera camera control, data, and power	**INTERFACE**
4 general-purpose digital input/output pins	4 general-purpose digital input/output pins	**GPIO**
12-bit	12-bit	**ADC**
YUV411, YUV422, and RGB formats	YUV411, YUV422, and RGB formats	**IMAGE DATA FORMATS**
8, 12, 16 and 24-bit digital data	8, 12, 16 and 24-bit digital data	**IMAGE DATA OUTPUT**
Automatic/Manual/One-Push Gain modes, 0 dB to 24 dB	Automatic/Manual/One-Push Gain modes, 0 dB to 24 dB	**GAIN**
12 cm and 24 cm	12 cm	**BASELINE**
3.8 mm with 66° HFOV, 6 mm with 43° HFOV	2.5 mm with 97° HFOV, 3.8 mm with 66° HFOV, 6 mm with 43° HFOV	**FIELD OF VIEW**
f/2.0 (2.5 mm and 3.8 mm focal length), f/2.5 (6.0 mm focal length)	f/2.0 (2.5 mm and 3.8 mm focal length), f/2.5 (6.0 mm focal length)	**APERTURE**
54 dB	60 dB	**SIGNAL TO NOISE RATIO**
Standard, bulb, skip frames, overlapped	Standard, bulb, skip frames, overlapped	**TRIGGER MODES**
277 x 37 x 41.8 mm	157 x 36 x 47.4 mm	**SIZE (WXHXD)**
505 g	342 g	**MASS**
4 W at 12 V via IEEE-1394 interface or GPIO connector	2.5 W at 12 V via IEEE-1394 interface or GPIO connector	**POWER**
3 x M12 microlens mount	2 x M12 microlens mount	**LENS MOUNT**
-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)	**TEMPERATURE**
2 years	2 years	**WARRANTY**



FireWire



FireWire

Ladybug Family Key Features

- 360° degree video streaming
- Covers 90% of visual sphere; 6 sensors each camera
- Full featured SDK including dynamic stitching & image stabilization
- Independent imaging control CMOS and CCD settings controlled individually or in unison
- Pre-calibrated for ease of use
- High dynamic range mode continuously cycles through a series of camera shutter and gain settings

Complete Development Accessory Kit included:



LADYBUG® 5+

30MP. 12-BIT RAW. IP65



Model#	Sensor Specifications	Shutter	Max Res Per Sensor	Max FPS
LD5P-U3-51S5C-R LD5P-U3-51S5C-B	30MP Sony IMX264 CMOS 2/3" 3.45 µm	Global	2448 x 2048	2448 x 2048 @ 30 FPS 2448 x 1024 @ 60 FPS

LADYBUG® 3

12MP, WATER RESISTANT



Model#	Sensor Specifications	Shutter	Max Res Per Sensor	Max FPS
LD3-20S4C-33	12MP Sony ICX274 CCD 1/1.8" 4.4 µm	Global	1600 x 1200	16 FPS Compressed, 6.5 FPS Uncompressed
			1600 x 800	32 FPS

	LADYBUG® 5+	LADYBUG® 3
INTERFACE	USB 3.1 Gen 1 interface with screw locks for camera control and data	IEEE 1394b interface with screw locks for camera control, data, and power
GPIO	12-pin GPIO connector for external trigger input, strobe output, and camera power	8-pin GPIO connector for external trigger, strobe, serial port, or external power
OPTICS	Six high quality f2.5, 4.4 mm focal length lenses	Six high quality 3.3 mm focal length lenses
SPHERICAL DISTANCE	Calibrated from 2 m to infinity	Calibrated at 20 m
FOCUS DISTANCE	~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity	~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity
ADC	12-bit	12-bit
IMAGE DATA FORMATS	Raw8, Raw12 in uncompressed and JPEG	Raw8, Mono8, JPEG8
IMAGE DATA OUTPUT	8-, 12-, or 16-bit, Raw or JPEG compressed	8-bit raw Bayer (color) digital data
GAIN RANGE	Automatic/manual/one-push modes for 8-bit formats; manual mode for 12-bit formats; 0 - 18 dB	Automatic/manual/one-push/ 0dB to 24dB
GAMMA	0.50 to 4.00	0.50 to 4.00
TRIGGER MODES	Standard, bulb, skip frames, overlapped, multi-shot	Standard, bulb, skip frames, overlapped, multi-shot
HIGH DYNAMIC RANGE	Cycle 4 gain and exposure presets	Cycle 4 gain and exposure presets
EXPOSURE RANGE	Global shutter; Automatic/manual/one-push/extended shutter modes 0.02 ms to 2 seconds (extended shutter)	Global shutter; Automatic/manual/one-push/extended shutter modes 0.01 ms to 4.2 s (extended shutter mode)
IMAGE PROCESSING	Shutter, gain, white balance, gamma and JPEG compression, are programmable via software	Shutter, gain, white balance, gamma & JPEG compression, programmable via software
CASE TYPE	Single unit, water resistant	Single unit, water resistant
CASE MATERIAL	Machined aluminum housing, anodized red or black	Machined aluminum housing, anodized red or black
ENVIRONMENTAL SENSORS	Temperature, Barometer, Humidity, Accelerometer, Compass	N/A
SIZE (WXHXD)	197 mm diameter, 160 mm height (with lens hoods)	122 x 141 x 133 mm
MASS	3000 g	2414 g
POWER	12-24 V, 13 W via GPIO (external power required)	8-30 V, 7.2 W at 12 V via IEEE 1394b
TEMPERATURE	-30° to 60°C (storage) • -20° to 50°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	2 years	1 year

FREQUENTLY ASKED QUESTIONS

What is included with my camera?

During your camera selection please be mindful of which accessories are included and which accessories are not included with the camera.

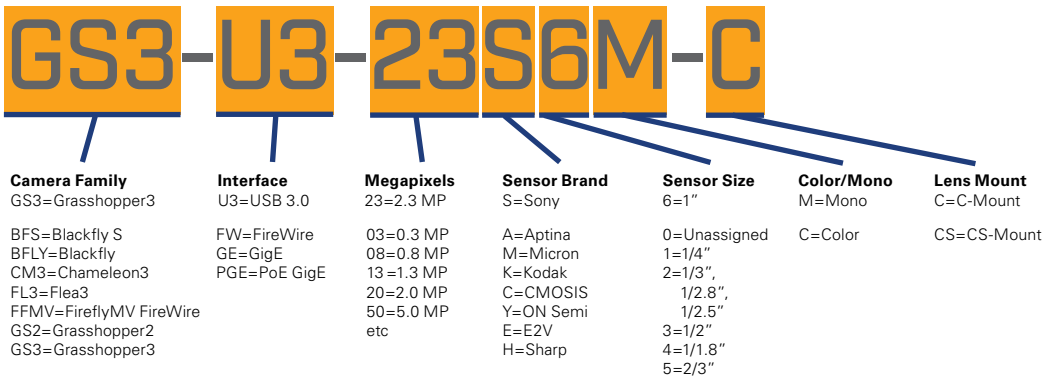
Here is a quick table guide for your reference:

USB3 VISION CAMERAS	Tripod Adapter	5mm C-Mount Adapter	Cables	Lens
Blackfly S USB3	No	No	No	No
Blackfly USB3	No	No	No	No
Chameleon3 USB3	No	No	No	No
Flea3 USB3	Yes	Yes for CS-mount models	No	No
Grasshopper3 USB3	Yes	N/A (no CS-mount models)	No	No

GIGE VISION CAMERAS	Tripod Adapter	5mm C-Mount Adapter	Cables	Lens
Blackfly GigE	No	No	No	No
Flea3 GigE	Yes	Yes for CS-mount models	No	No
Grasshopper2 GigE	Yes	N/A (no CS-mount models)	No	No
Grasshopper3 GigE	Yes	N/A (no CS-mount models)	No	No
Zebra2 GigE Vision/HD-SDI	No	No	No	No
Cricket IP Security Camera	Yes	No	No	No

What do your model numbers mean?

Here is one example of our model numbers and what each section means. Understanding this will give you a quick explanation of the model's specifications and help you when comparing models.



Where can I get more technical support?

You can search our online Knowledge Base for answers to camera issues here: www.flir.com/knowledgebase
You can contact our support team directly and email them your issue. We have support teams staffed at our North America, Germany, China and Japan offices ready to assist with your cameras.

Where can I get more sales assistance?

Product pricing is available online after you've registered on our website. To register visit: www.flir.com/register
For online price quotes visit: www.flir.com/request-for-quote

		MODEL NUMBER	INTERFACE	SENSOR TYPE	OPTICAL FORMAT	PIXEL SIZE	MAX RES	MAX FPS
USB3 VISION	**BLACKFLY S** Page 3	BFS-U3-13Y3C/M-C	USB 3.1 Gen 1	ON Semi PYTHON 1300 CMOS	1/2″	4.8µm	1280 x 1024	170 fps
		BFS-U3-32S4C/M-C	USB 3.1 Gen 1	Sony IMX252 CMOS	1/1.8″	3.45 µm	2048 x 1536	118 fps
		BFS-U3-51S5C/M-C	USB 3.1 Gen 1	Sony IMX250 CMOS	2/3″	3.45 µm	2464 x 2048	75 fps
		BFS-U3-89S6C/M-C	USB 3.1 Gen 1	Sony IMX255 CMOS	1″	3.45 µm	4096 x 2160	43 fps
		BFS-U3-123S6C/M-C	USB 3.1 Gen 1	Sony IMX253 CMOS	1.1″	3.45 µm	4096 x 3000	30 fps
		BFS-U3-200S6C/M-C	USB 3.1 Gen 1	Sony IMX183 CMO	1″	2.4 µm	5472 x 3648	19 fps
	CHAMELEON3 Page 3	CM3-U3-13S2C/M-CS	USB 3.1 Gen 1	Sony ICX445 CCD	1/3″	3.75µm	1288 x 964	30 fps
		CM3-U3-13Y3C/M-CS	USB 3.1 Gen 1	ON Semi PYTHON 1300 CMOS	1/2″	4.8µm	1280 x 1024	149 fps
		CM3-U3-28S4C/M-CS	USB 3.1 Gen 1	Sony ICX818 CCD	1/1.8″	3.69µm	1928 x 1448	13 fps
		CM3-U3-31S4C/M-CS	USB 3.1 Gen 1	Sony IMX265 CMOS	1/1.8″	3.45 µm	2048 x 1536	55 fps
		CM3-U3-50S5C/M-CS	USB 3.1 Gen 1	Sony IMX264 CMOS	2/3″	3.45 µm	2448 x 2048	35 fps
	BLACKFLY Page 4	BFLY-U3-03S2C/M-CS	USB 3.1 Gen 1	Sony ICX424 CCD	1/3″	7.4µm	648 x 488	84 fps
		BFLY-U3-05S2C/M-CS	USB 3.1 Gen 1	Sony ICX693 CCD	1/3″	6.0µm	808 x 608	50 fps
		BFLY-U3-13S2C/M-CS	USB 3.1 Gen 1	Sony ICX445 CCD	1/3″	3.75µm	1288 x 964	30 fps
		BFLY-U3-20S4C/M-CS	USB 3.1 Gen 1	Sony ICX274 CCD	1/1.8″	4.4 µm	1624 x 1224	15 fps
		BFLY-U3-23S6C/M-C	USB 3.1 Gen 1	Sony IMX249 CMOS	1/1.2″	5.86 µm	1920 x 1200	41 fps
		BFLY-U3-50H5C/M-C	USB 3.1 Gen 1	Sharp RJ32S3AA0DT CCD	2/3″	3.45 µm	2448 x 2048	7.5 fps
	FLEA3 Page 4	FL3-U3-13S2C/M-CS	USB 3.1 Gen 1	Sony IMX035 CMOS	1/3″	3.63µm	1328 x 1048	120 fps
		FL3-U3-13Y3M-C	USB 3.1 Gen 1	ON Semi VITA1300 CMOS	1/2″	4.8µm	1280 x 1024	150 fps
		FL3-U3-13E4C/M-C	USB 3.1 Gen 1	e2v EV76C560 CMOS	1/1.8″	5.3µm	1280 x 1024	60 fps
		FL3-U3-20E4C/M-C	USB 3.1 Gen 1	e2v EV76C5706F CMOS	1/1.8″	4.5µm	1600 x 1200	59 fps
		FL3-U3-32S2C/M-CS	USB 3.1 Gen 1	Sony IMX036 CMOS	1/2.8″	2.5µm	2080 x 1552	60 fps
		FL3-U3-120S3C-C	USB 3.1 Gen 1	Sony IMX172 CMOS	1/2.3″	1.55µm	4000 x 3000	15 fps
	GRASSHOPPER3 Page 5	GS3-U3-14S5C/M-C	USB 3.1 Gen 1	Sony ICX285 CCD	2/3″	6.45µm	1384 x 1036	30 fps
		GS3-U3-15S5C/M-C	USB 3.1 Gen 1	Sony ICX825 CCD	2/3″	6.45µm	1384 x 1032	45 fps
		GS3-U3-23S6C/M-C	USB 3.1 Gen 1	Sony IMX174 CMOS	1/1.2″	5.86µm	1920 x 1200	163 fps
		GS3-U3-28S4C/M-C	USB 3.1 Gen 1	Sony ICX687 CCD	1/1.8″	3.69µm	1928 x 1448	26 fps
		GS3-U3-28S5C/M-C	USB 3.1 Gen 1	Sony ICX674 CCD	2/3″	4.54µm	1920 x 1440	26 fps
		GS3-U3-32S4C/M-C	USB 3.1 Gen 1	Sony IMX252 CMOS	1/1.8″	3.45µm	2048 x 1536	121 fps
		GS3-U3-41S4C/M-C	USB 3.1 Gen 1	Sony ICX808 CCD	1/1.8″	3.1µm	2016 x 2016	18 fps
		GS3-U3-41C6NIR-C	USB 3.1 Gen 1	CMOSIS CMV4000-3E12 CMOS	1″	5.5µm	2048 x 2048	90 fps
		GS3-U3-41C6C/M-C	USB 3.1 Gen 1	CMOSIS CMV4000-3E5 CMOS	1″	5.5µm	2048 x 2048	90 fps
		GS3-U3-50S5C/M-C	USB 3.1 Gen 1	Sony ICX625 CCD	2/3″	3.45µm	2448 x 2048	15 fps
		GS3-U3-51S5C/M-C	USB 3.1 Gen 1	Sony IMX250 CMOS	2/3″	3.45µm	2448 x 2048	75 fps
		GS3-U3-60S6C/M-C	USB 3.1 Gen 1	Sony ICX694 CCD	1″	4.54µm	2736 x 2192	13 fps
		GS3-U3-60QS6C/M-C	USB 3.1 Gen 1	Sony ICX694 CCD	1″	4.54µm	2736 x 2192	25 fps
		GS3-U3-89S6C/M-C	USB 3.1 Gen 1	Sony IMX255 CMOS	1″	3.45µm	4096 x 2160	43 fps
		GS3-U3-91S6C/M-C	USB 3.1 Gen 1	Sony ICX814 CCD	1″	3.69µm	3376 x 2704	9 fps
		GS3-U3-120S6C/M-C	USB 3.1 Gen 1	Sony ICX834 CCD	1″	3.1µm	4240 x 2824	7 fps
		GS3-U3-123S6C/M-C	USB 3.1 Gen 1	Sony IMX253 CMOS	1.1″	3.45µm	4096 x 3000	30 fps
GiGE VISION	**ORYX** Page 6	ORX-10GE-51S5M/C-C	10 Gigabit Ethernet	Sony IMX250 CMOS	2/3″	3.45µm	2448 x 2048	163 fps
		ORX-10GE-89S6M/C-C	10 Gigabit Ethernet	Sony IMX255 CMOS	1″	3.45µm	4096 x 2160	93 fps
		ORX-10GE-123S6M/C-C	10 Gigabit Ethernet	Sony IMX253 CMOS	1.1″	3.45µm	4096 x 3000	68 fps
	BLACKFLY S Page 7	BFS-PGE-13Y3C/M-C	GigE PoE	ON Semi PYTHON 1300 CMOS	1/2″	4.8 µm	1280 x 1024	84 fps
		BFS-PGE-50S5C/M-C	GigE PoE	Sony IMX264 CMOS	2/3″	3.45 µm	2448 x 2048	24 fps
	BLACKFLY Page 7	BFLY-PGE-03S2C/M-CS	GigE PoE	Sony ICX424 CCD	1/3″	7.4µm	648 x 488	84 fps
		BFLY-PGE-03S3C/M-CS	GigE PoE	Sony ICX414 CCD	1/2″	9.9µm	648 x 488	90 fps
		BFLY-PGE-05S2C/M-CS	GigE PoE	Sony ICX693 CCD	1/3″	6.0µm	808 x 608	50 fps
		BFLY-PGE-09S2C/M-CS	GigE PoE	Sony ICX692 CCD	1/3″	4.08µm	1288 x 728	30 fps
		BFLY-PGE-12A2C/M-CS	GigE PoE	Aptina AR0134 CMOS	1/3″	3.75µm	1280 x 960	52 fps
		BFLY-PGE-13S2C/M-CS	GigE PoE	Sony ICX445 CCD	1/3″	3.75µm	1288 x 964	30 fps
		BFLY-PGE-13H2C/M-CS	GigE PoE	Sharp RJ33J4/RJ33J3 CCD	1/3″	3.75µm	1288 x 964	30 fps
		BFLY-PGE-13E4C/M-CS	GigE PoE	e2v EV76C560 CMOS	1/1.8″	5.3µm	1280 x 1024	60 fps
		BFLY-PGE-14S2C-CS	GigE PoE	Sony IMX104 CMOS	1/3″	3.75µm	1296 x 1032	60 fps
		BFLY-PGE-20E4C/M-CS	GigE PoE	e2v EV76C570 CMOS	1/1.8″	4.5µm	1600 x 1200	50 fps
		BFLY-PGE-23S2C-CS	GigE PoE	Sony IMX136 CMOS	1/2.8″	2.8µm	1920 x 1200	27 fps
		BFLY-PGE-23S6C/M-C	GigE PoE	Sony IMX249 CMOS	1/1.2″	5.86µm	1920 x 1200	41 fps
		BFLY-PGE-31S4M/C-C	GigE PoE	Sony IMX265 CMOS	1/1.8″	3.45 µm	2048 x 1536	35 fps
		BFLY-PGE-50A2C/M-CS	GigE PoE	Aptina MT9P006/031 CMOS	1/2.5″	2.2µm	2592 x 1944	13 fps
		BFLY-PGE-50H5C/M-C	GigE PoE	Sharp RJ32S4/S3AA0DT CCD	2/3″	3.45µm	2448 x 2048	7.5 fps
		BFLY-PGE-50S5M/C-C	GigE PoE	Sony IMX264 CMOS	2/3″	3.45 µm	2448 x 2048	22 fps
	FLEA3 Page 8	FL3-GE-03S1C/M-C	GigE	Sony ICX618 CCD	1/4″	5.6µm	648 x 488	120 fps
		FL3-GE-03S2C/M-C	GigE	Sony ICX424 CCD	1/3″	7.4µm	648 x 488	82 fps
		FL3-GE-08S2C/M-C	GigE	Sony ICX204 CCD	1/3″	4.65µm	1032 x 776	31 fps
		FL3-GE-13S2C/M-C/CS	GigE	Sony ICX445 CCD	1/3″	3.75µm	1288 x 964	31 fps
		FL3-GE-14S3C/M-C	GigE	Sony ICX267 CCD	1/2″	4.65µm	1384 x 1032	18 fps
		FL3-GE-20S4C/M-C	GigE	Sony ICX274 CCD	1/1.8″	4.4µm	1624 x 1224	15 fps
		FL3-GE-28S4C/M-C	GigE	Sony ICX687 CCD	1/1.8″	3.69µm	1928 x 1448	15 fps
		FL3-GE-50S5C/M-C	GigE	Sony ICX655 CCD	2/3″	3.45µm	2448 x 2048	8 fps
	GRASSHOPPER3 Page 8	GS3-PGE-23S6C/M-C	GigE-PoE	Sony IMX174 CMOS	1/1.2″	5.86µm	1920 x 1200	45 fps
		GS3-PGE-50S5C/M-C	GigE-PoE	Sony ICX625 CCD	2/3″	3.45 µm	2448 x 2048	15 fps
		GS3-PGE-60S6C/M-C	GigE-PoE	Sony ICX694 CCD	1″	4.54µm	2736 x 2192	13 fps
		GS3-PGE-91S6C/M-C	GigE-PoE	Sony ICX814 CCD	1″	3.69µm	3376 x 2704	9 fps
USB 2.0	Page 9 **CHAMELEON**	CMLN-13S2C/M-CS	USB 2.0	Sony ICX445 CCD	1/3″	3.75µm	1296x964	18 fps
	FIREFLY MV Page 9	FMVU-03MTC/M-CS	USB 2.0	Micron MT9V022 CMOS	1/3″	6.0µm	752x480	60 fps
		FMVU-13S2C-CS	USB 2.0	Sony IMX035 CMOS	1/3″	3.63µm	1328x1048	23 fps
FireWire	**FLEA3** Page 10	FL3-FW-03S1C/M-C	IEEE 1394b	Sony ICX618 CCD	1/4″	5.6µm	648x488	120 fps
		FL3-FW-03S3C/M-C	IEEE 1394b	Sony ICX414 CCD	1/2″	9.9µm	648x488	76 fps
		FL3-FW-14S3C/M-C	IEEE 1394b	Sony ICX267 CCD	1/2″	4.65µm	1384x1032	16 fps
		FL3-FW-20S4C/M-C	IEEE 1394b	Sony ICX274 CCD	1/1.8″	4.4µm	1624x1224	15 fps
	LADYBUG3	LD3-20S4C-33	IEEE 1394b	Sony ICX274 CCD	1/1.8″	4.4µm	1600x1200 (x6)	16 fps
	Page 13 **LADYBUG5**	LD5-U3-51S5C-44	USB 3	Sony ICX655 CCD	2/3″	3.45µm	2048x2448 (x6)	10 fps

SHUTTER	GPIO	LENS MOUNT	A/D CONVERTER	IMAGE DATA OUTPUT	ON-BOARD MEMORY	SIZE	OPERATING TEMP	WARRANTY
Global	6-pin Hirose	C	10-bit ADC	8, 12, 16, 24-bit	240 MB frame buffer	29 x 29 x 30 mm	0° to 50° C	3 years
Global	HR10A-7R-6PB	C	12-bit ADC		6 MB flash memory			
Global		C	10/12-bit ADC					
Global		C	10/12-bit ADC					
Global		C	10/12-bit ADC					
Rolling/Global Reset		C	10/12-bit ADC					
Global	9-pin JST	CS	12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer	44 x 35 x 19.5 mm	0° to 45° C	3 years
Global		CS	12-bit ADC		1 MB flash memory			
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global	6-pin Hirose	CS	12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer	29 x 29 x 30 mm	0° to 45° C	3 years
Global	HR10A-7R-6PB	CS	12-bit ADC		1 MB flash memory			
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		C	10/12-bit ADC					
Global		C	12-bit ADC					
Rolling	8-pin Hirose HR25	C	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer	29 x 29 x 30 mm	0° to 45° C	3 years
Global		CS	12-bit ADC		1 MB flash memory			
Global		C	10-bit ADC					
Global		C	10-bit ADC					
Rolling/Global Reset		C	10-bit ADC					
Rolling/Global Reset		C	12-bit ADC					
Global	8-pin Hirose HR25	C	14-bit ADC	8, 12, 16, 24-bit	128 MB frame buffer	44 x 29 x 58 mm	0° to 50° C	3 years
Global		C	14-bit ADC		2 MB flash memory			
Global		C	10/12-bit ADC					
Global		C	14-bit ADC					
Global		C	14-bit ADC					
Global		C	10/12-bit ADC					
Global		C	14-bit ADC					
Global		C	10-bit ADC					
Global		C	10-bit ADC					
Global		C	14-bit ADC					
Global		C	10/12-bit ADC					
Global		C	14-bit ADC					
Global		C	14-bit ADC					
Global		C	10/12-bit ADC					
Global		C	14-bit ADC					
Global		C	14-bit ADC					
Global		C	10/12-bit ADC					
Global	12-pin Hirose	C	8/10/12-bit ADC	8, 12, 16, 24-bit	256 MB frame buffer	60 x 60 x 100 mm	0° to 50° C	3 years
Global		C	8/10/12-bit ADC		32 MB flash memory			
Global		C	8/10/12-bit ADC					
Global	6-pin Hirose	C	10-bit ADC	8, 12, 16, 24-bit	240 MB frame buffer	29 x 29 x 30 mm	0° to 50° C	3 years
Global	HR10A-7R-6PB	C	12-bit ADC		6 MB flash memory			
		C						
Global	6-pin Hirose	CS	12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer	29 x 29 x 30 mm	0° to 45° C	3 years
Global	HR10A-7R-6PB	CS	12-bit ADC		512 KB flash memory			
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	12-bit ADC					
Global		CS	10-bit ADC					
Rolling		CS	12-bit ADC					
Global		CS	10-bit ADC					
Rolling		CS	12-bit ADC					
Global		C	10/12-bit ADC					
Global		CS	12-bit ADC					
Rolling/Global Reset		CS	12-bit ADC					
Global		C	12-bit ADC					
Global		C	12-bit ADC					
Global	8-pin Hirose HR25	C	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer	29 x 29 x 30 mm	0° to 45° C	3 years
Global		C			1 MB flash memory			
Global		C						
Global		C / CS						
Global		C						
Global		C						
Global		C						
Global		C						
Global	8-pin Hirose HR25	C	10/12-bit ADC	8, 12, 16, 24-bit	128 MB frame buffer	44 x 29 x 58 mm	0° to 50° C	3 years
Global		C	14-bit ADC		2 MB flash memory			
Global		C	14-bit ADC					
Global		C	14-bit ADC					
Global	7-pin JST	CS	12-bit ADC	8, 16-bit	256 KB flash memory	44 x 41 x 25.5 mm	0° to 45° C	1 year
Global	7-pin JST	CS	10-bit ADC	8, 16-bit	N/A	44 x 34 x 24.4 mm	0° to 45° C	1 year
Rolling		CS	12-bit ADC					
Global	8-pin Hirose HR25	C	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer	29 x 29 x 30 mm	0° to 45° C	3 years
Global		C			1 MB flash memory			
Global		C						
Global		C						
Global	8-pin GPIO	N/A	12-bit ADC	8-bit	N/A	122 x 141 mm	0° to 45° C	1 year
Global	12-pin GPIO	N/A		8, 12, 16-bit		139.5 x 160 mm		2 years

ACCESSORY LIST

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Model#	TRIPOD MOUNT / ENCLOSURES	BFLY-PGE	BFS-U3 BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-0003	Tripod Mount Adapter-3	■	■			■	■		■	■	■	■	■	■									
ACC-01-0005	Tripod Mount Adapter-5												■										
ACC-01-0011	Tripod Mount Adapter-11														■	■	■	■	■	■			
ACC-01-0010	Metal Camera Enclosure for CS-Mount FFMV only												■										
ACC-01-0012	Ladybug3 Desktop Mount																				■	■	
ACC-01-0013	Ladybug3 Tripod Mount Adapter and Plugs																				■		
ACC-01-0014	Zebra2 Tripod Mount Adapter																						■

Model#	HOST ADAPTER CARDS	BFLY-PGE	BFS-U3 BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-1000	IEEE 1394a OHCI PCI Host Adapter 3 Port			■				■					■										
ACC-01-1001	IEEE 1394b OHCI PCI Host Adapter 2 Port			■	■			■	■			■	■		■			■			■		
ACC-01-1100	Intel PRO 1000 CT Gigabit Ethernet PCIe	■								■						■	■						■
GIGE-PCIE2-2P02	Gigabit Ethernet PCIe PoE, 2 Port, Intel	■								■						■	■						■
ACC-01-1201	Generic USB 3.1 Gen 1 PCIe 2.0 x1 2 Port Card		■			■	■				■			■					■			■	
ACC-01-1202	Generic USB 3.1 Gen 1 PCIe 2.0 x1 4 Port Card		■			■	■				■			■					■			■	
U3-PCIE2-2P01X	PGR USB 3.0 PCIe 2.0 x1 Card, Fresco, 2-port		■			■	■				■			■					■			■	

Model#	CABLES	BFLY-PGE	BFS-U3 BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-2000	4.5 m, 6-pin to 6-pin, 1394a			■				■					■										
ACC-01-2004	0.3-m, 6-pin to 6-pin, Ultra Thin 1394a (10moq)			■				■					■										
ACC-01-2003	1.0 m, 6-pin to 6-pin, Ultra Thin 1394a (10moq)			■				■					■										
ACC-01-2002	2.0 m, 6-pin to 6-pin, Ultra Thin 1394a (10moq)			■				■					■										
ACC-01-2013	4.5 m, 4-pin to 9-pin, 1394a to 1394b				■				■			■			■			■			■		
ACC-01-2007	4.5 m, 6-pin to 9-pin, Locking 1394a to 1394b			■	■				■			■			■			■			■		
ACC-01-2016	0.3 m, 9-pin to 9-pin, Locking 1394b								■			■			■			■			■		
ACC-01-2015	1.0 m, 9-pin to 9-pin, Locking 1394b								■			■			■			■			■		
ACC-01-2005	4.5 m, 9-pin to 9-pin, 1394b				■																■		
ACC-01-2006	4.5 m, 9-pin to 9-pin, Locking 1394b				■				■			■			■			■			■		
ACC-01-2012	4.5 m, 9-pin to 9-pin, Locking 1394b High Flex OKI				■				■			■			■			■			■		
ACC-01-2017	FirePRO 10-m 9-pin to 9-pin, Locking 1394b				■				■			■			■			■			■		
ACC-01-2008	10 m Ladybug2 Data																						
ACC-01-2010	10 m Ladybug2 Power																						
ACC-01-2011	50 m Ladybug2 Power																						
ACC-01-2100	5 m CAT 5e Ethernet Locking Cable, High Flex	■								■						■	■						■
ACC-01-2101	4.5 meter CAT 5e Ethernet Cable	■								■						■	■						■
ACC-01-2200	3 m 85 MHz Camera Link, 1x MDR , 1x SDR mini																			■			
ACC-01-2300	3 m USB 3.0 Cable, Type-A to Micro-B (Locking)		■				■				■								■			■	
ACC-01-2301	5 m USB 3.0 Cable, Type-A to Micro-B (Locking)		■				■				■								■			■	

Model#	GPIO CONNECTORS	BFLY-PGE	BFS-U3 BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-3000	1.0 m, Circular 8-pin Prewired GPIO Hirose Conn.								■	■	■	■			■	■	■	■	■		■		
ACC-01-3005	4.5 m, Circular 8-pin Prewired GPIO Hirose Conn.								■	■	■	■			■	■	■	■	■		■		
ACC-01-3001	Circular 12PIN Prewired GPIO Hirose Connector			■																			
ACC-01-3002	7-pin Prewired GPIO JST Connector					■							■	■									
ACC-01-3013	9-pin Prewired GPIO JST Connector						■																
ACC-01-3004	8-pin Phoenix Contact GPIO Connector							■															
ACC-01-3006	8-pin Circular Hirose HR25 GPIO Connector								■	■	■	■			■	■	■	■	■		■		
ACC-01-3007	4-pin Phoenix Contact Power Connector																						■
ACC-01-3008	6-pin Phoenix Contact GPIO Connector																						■
ACC-01-3009	1.0m, Circular 6-pin Prewired GPIO Hirose Conn.	■	■																				
ACC-01-3010	4.5m, Circular 6-pin Prewired GPIO Hirose Conn.	■	■																				
ACC-01-3011	6-pin Circular Hirose HR10 GPIO Connector	■	■																				
ACC-01-3012	12-pin Circular Hirose GPIO Cable with Power Jack																					■	

Model#	GENERIC OPTICS	BFLY-PGE	BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-4000	M12 Microlens 4MM (Boowon BW38BLF)						■						■										
ACC-01-4001	M12 Microlens 6MM (Boowon BW60BLF)						■						■										
ACC-01-4002	M12 Microlens 8MM (Boowon BW80H-1000)						■						■										
ACC-01-4003	Auto Iris CS-Mount Lens 1/3" 3.5~8MM							■															

Model#	OPTIC MOUNTS	BFLY-PGE	BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-5004	C- to CS-Mount Mount 5mm Spacer Adapter	■	■			■	■	■		■	■		■	■									■
ACC-01-5005	CS- to M12 Microlens Adapter					■	■	■		■	■		■	■									■
ACC-01-5006	Cast Metal M12 Microlens Holder					■	■																
ACC-01-5007	Cast Metal M12 Microlens Holder with IR Filter					■	■																

Model#	HUBS	BFLY-PGE	BFS-U3 BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-6000	4-Port USB 3.0 Hub, Screw Locks, Ext Power Adap.		■				■				■								■				
ACC-01-6001	USB 3.1 Gen 1 Hub, VIA VL812, Micro B to Standard A, 1-port with screw locks		■				■				■								■			■	
FWB-HUB-2PORT	FirePRO 1394b 2-Port Repeater							■	■			■	■		■			■			■		
FWB-HUB-3PORT	FirePRO 1394b 3-Port Hub							■	■			■	■		■			■			■		
FWB-HUB-5PORT	FirePRO 1394b 5-Port Repeater							■	■			■	■		■			■			■		

Model#	POWER SUPPLY (PS) / MISC	BFLY-PGE	BFLY-U3	BB2	BBX3	CMLN	CM3-U3	DR2	FL3-FW	FL3-GE	FL3-U3	FL2	FFMV	FMVU	GRAS	GS2-GE	GS3-PGE	GS2-FW	GS3-U3	GZL-CL	LD3	LD5	ZBR2
ACC-01-9001	24V 2.5A 60W PS, Standard DC Barrel Connector																					■	
ACC-01-9007	20V 2A 40W PS, Standard DC Barrel Connector																						
ACC-01-9008	12V 1.5A (18W) Wall Mount PS, 4-Pin Phoenix Contact																						■
ACC-01-9009	12V 1.5A Wall-Mount PS, Plug Adapters, HR25 GPIO Harness									■						■	■		■	■			
ACC-01-9010	12V 2.0A Wall Mount PS for FWB-EC-2PORT																						
ACC-01-9011	12V 1.5A Wall-Mount PS, Plug Adapters, HR10 GPIO Harness	■																					
ACC-01-9012	19.6W Single Port PoE Injector with NA power cord	■															■						■

Model#	REGULAR LENS
LENS-V130F3C	Fujinon 3.8-13mm Varifocal C-mount lens, for 1/2" sensors (DV3.4x3.8SA-1)
LENS-V130F3C-DC	Fujinon 3.8-13mm Varifocal C-mount lens, for 1/2" sensors, DC Iris (DV3.4x3.8SA-SA1)
LENS-15F5-125C	Fujinon fixed focal length 12.5mm C-mount lens for 2/3" sensors (HF12.5HA-1B)
LENS-15F5-250C	Fujinon fixed focal length 25mm C-mount lens for 2/3" sensors (HF25HA-1B)
LENS-15F3-60C	Fujinon fixed focal length 6mm C-mount lens for 1/2" sensors (DF6HA-1B)
LENS-30F2-V80C	Fujinon vari-focal 2.8-8mm CS-mount lens, for 1/3" sensors (YV2.8×2.8SA-2)
LENS-V500F2CS	Fujinon vari-focal 15-50mm CS-mount lens, for 1/3" sensors (YV3.3x15SA-2)
LENS-V80F2CS-DC	Fujinon vari-focal 2.8-8mm CS-mount DC iris lens, for 1/3" sensors (YV2.8x2.8SA-SA2)
LENS-V500F2CS-DC	Fujinon vari-focal 15-50mm CS-mount DC iris lens, for 1/3" sensors (YV3.3x15SA-SA2)

Model#	HIGH RESOLUTION LENS
LENS-50F5-125C	Fujinon fixed focal length 12.5mm C-mount lens for 2/3" sensors (HF12.5SA-1)
LENS-160T5C	Tamron fixed focal length 16mm C-mount lens for 2/3" sensors (23FM16SP)
LENS-250T5C	Tamron fixed focal length 25mm C-mount lens for 2/3" sensors (23FM25SP)
LENS-80T4C	Tamron fixed focal length 8mm C-mount lens for 1/1.8" sensors (MF118FM08)
LENS-80T6C	Tamron fixed focal length 8mm C-mount lens for 1.1" sensors (MF111FM08)
LENS-160T4C	Tamron fixed focal length 16mm C-mount lens for 1/1.8" sensors (MF118FM16)
LENS-160E6C	Edmund Optics fixed focal lenth 16mm C-mount lens for 1" sensors (86-571)
LENS-30S6-250C	Spacecom fixed focal length 25mm C-mount lens for 1" sensors (VF25095M)
LENS-125F6C	Fujinon fixed focal length 12.5mm C-mount lens for 1" sensors (CF12.5HA-1)
LENS-250F6C	Fujinon fixed focal length 25mm C-mount lens for 1" sensors (CF25HA-1)

MONO CAMERA SENSOR REVIEW SORTED BY SENSOR TYPE (CMOS/CCD) AND RESOLUTION

	MODEL ID	Sensor	Sensor Size	Interface	Sensor Type	Shutter	Max Resolution	Max Frame Rate	Pixel Size
CMOS	FL3-U3-13E4M-C	**e2v EV76C560**	1/1.8"	USB 3.1 Gen 1	CMOS	Global	1280 x 1024	60	5.3 µm
CMOS	BFLY-PGE-13E4M-CS	**e2v EV76C560**	1/1.8"	PoE GigE	CMOS	Global	1280 x 1024	60	5.3 µm
CMOS	FL3-U3-13Y3M-C	**ON Semi VITA1300**	1/2"	USB 3.1 Gen 1	CMOS	Global	1280 x 1024	150	4.8 µm
CMOS	CM3-U3-13Y3M-CS	**ON Semi PYTHON 1300**	1/2"	USB 3.1 Gen 1	CMOS	Global	1280 x 1024	149	4.8 µm
CMOS	BFS-U3-13Y3M-C	**ON Semi PYTHON 1300**	1/2"	USB 3.1 Gen 1	CMOS	Global	1280 x 1024	170	4.8 µm
CMOS	FL3-U3-13S2M-CS	**Sony IMX035**	1/3"	USB 3.1 Gen 1	CMOS	Rolling	1328 x 1048	120	3.63 µm
CMOS	BFLY-PGE-20E4M-CS	**e2v EV76C570**	1/1.8"	PoE GigE	CMOS	Global	1600 x 1200	50	4.5 µm
CMOS	FL3-U3-20E4M-C	**e2v EV76C570**	1/1.8"	USB 3.1 Gen 1	CMOS	Global	1600 x 1200	60	4.5 µm
CMOS	GS3-U3-23S6M-C	**Sony IMX174**	1/1.2"	USB 3.1 Gen 1	CMOS	Global	1920 x 1200	162	5.86 µm
CMOS	GS3-PGE-23S6M-C	**Sony IMX174**	1/1.2"	PoE GigE	CMOS	Global	1920 x 1200	46	5.86 µm
CMOS	BFLY-PGE-23S6M-C	**Sony IMX249**	1/1.2"	PoE GigE	CMOS	Global	1920 x 1200	41	5.86 µm
CMOS	GS3-U3-32S3M-C	**Sony IMX252**	1/1.8"	USB 3.1 Gen 1	CMOS	Global	2038 x 1536	121	3.45 µm
CMOS	BFLY-PGE-31S4M-C	**Sony IMX265**	1/1.8"	PoE GigE	CMOS	Global	2048 X 1536	35	3.45 µm
CMOS	CM3-U3-31S4M-CS	**Sony IMX265**	1/1.8"	USB 3.1 Gen 1	CMOS	Global	2048 X 1536	55	3.45 µm
CMOS	GS3-U3-41C6M-C	**CMOSIS CMV4000**	1"	USB 3.1 Gen 1	CMOS	Global	2048 x 2048	90	5.5 µm
CMOS	GS3-U3-41C6NIR-C	**CMOSIS CMV4000 NIR**	1"	USB 3.1 Gen 1	CMOS	Global	2048 x 2048	90	5.5 µm
CMOS	BFLY-PGE-50S5M-C	**Sony IMX264**	2/3"	PoE GigE	CMOS	Global	2448 X 2048	22	3.45 µm
CMOS	CM3-U3-50S5M-CS	**Sony IMX264**	2/3"	USB 3.1 Gen 1	CMOS	Global	2448 X 2048	35	3.45 µm
CMOS	BFS-U3-51S5M-C	**Sony IMX250**	2/3"	USB 3.1 Gen 1	CMOS	Global	2448 x 2048	75	3.45 µm
CMOS	GS3-U3-51S5M-C	**Sony IMX250**	2/3"	USB 3.1 Gen 1	CMOS	Global	2448 x 2048	75	3.45 µm
CMOS	BFLY-PGE-50A2M-CS	**Aptina MT9P031**	1/2.5"	PoE GigE	CMOS	Rolling	2592 x 1944	13	2.2 µm
CMOS	GS3-U3-89S6M-C	**Sony IMX255**	1"	USB 3.1 Gen 1	CMOS	Global	4096 x 2160	43	3.45 µm
CMOS	GS3-U3-123S6M-C	**Sony IMX253**	1.1"	USB 3.1 Gen 1	CMOS	Global	4096 x 3000	30	3.45 µm
CCD	BFLY-PGE-03S2M-CS	**Sony ICX424**	1/3"	PoE GigE	CCD	Global	648 x 488	84	7.4 µm
CCD	BFLY-U3-03S2M-CS	**Sony ICX424**	1/3"	USB 3.1 Gen 1	CCD	Global	648 x 488	84	7.4 µm
CCD	BFLY-PGE-03S3M-CS	**Sony ICX414**	1/2"	PoE GigE	CCD	Global	648 x 488	90	9.9 µm
CCD	FL3-GE-03S1M-C	**Sony ICX618**	1/4"	GigE	CCD	Global	648 x 488	120	5.6 µm
CCD	BFLY-PGE-05S2M-CS	**Sony ICX693**	1/3"	PoE GigE	CCD	Global	808 x 608	50	6.0 µm
CCD	FL3-GE-08S2M-C	**Sony ICX204**	1/3"	GigE	CCD	Global	1032 x 776	31	4.65 µm
CCD	BFLY-PGE-09S2M-CS	**Sony ICX692**	1/3"	PoE GigE	CCD	Global	1288 x 728	30	4.08 µm
CCD	BFLY-U3-13S2M-CS	**Sony ICX445**	1/3"	USB 3.1 Gen 1	CCD	Global	1288 x 964	30	3.75 µm
CCD	BFLY-PGE-13S2M-CS	**Sony ICX445**	1/3"	PoE GigE	CCD	Global	1288 x 964	30	3.75 µm
CCD	BFLY-PGE-13H2M-CS	**Sharp RJ33J4CA3DE**	1/3"	PoE GigE	CCD	Global	1288 x 964	30	3.75 µm
CCD	CM3-U3-13S2M-CS	**Sony ICX445**	1/3"	USB 3.1 Gen 1	CCD	Global	1288 X 964	30	3.75 µm
CCD	FL3-GE-13S2M-C	**Sony ICX445**	1/3"	PoE GigE	CCD	Global	1288 x 964	31	3.75 µm
CCD	FL3-GE-14S3M-C	**Sony ICX267**	1/2"	GigE	CCD	Global	1384 x 1032	18	4.65 µm
CCD	GS3-U3-15S5M-C	**Sony ICX825**	2/3"	USB 3.1 Gen 1	CCD	Global	1384 x 1032	45	6.45 µm
CCD	GS3-U3-14S5M-C	**Sony ICX285**	2/3"	USB 3.1 Gen 1	CCD	Global	1384 x 1036	30	6.45 µm
CCD	FL3-GE-20S4M-C	**Sony ICX274**	1/1.8"	GigE	CCD	Global	1624 x 1224	15	4.4 µm
CCD	GS3-U3-28S5M-C	**Sony ICX674**	2/3"	USB 3.1 Gen 1	CCD	Global	1920 x 1440	26	4.54 µm
CCD	CM3-U3-28S4M-CS	**Sony ICX818**	1/1.8"	USB 3.1 Gen 1	CCD	Global	1928 X 1448	13	3.69 µm
CCD	FL3-GE-28S4M-C	**Sony ICX687**	1/1.8"	GigE	CCD	Global	1928 x 1448	15	3.69 µm
CCD	GS3-U3-28S4M-C	**Sony ICX687**	1/1.8"	USB 3.1 Gen 1	CCD	Global	1928 x 1448	26	3.69 µm
CCD	GS3-U3-41S4M-C	**Sony ICX808**	1/1.8"	USB 3.1 Gen 1	CCD	Global	2024 x 2024	18	3.1 µm
CCD	FL3-GE-50S5M-C	**Sony ICX655**	2/3"	GigE	CCD	Global	2448 x 2048	8	3.45 µm
CCD	GS3-U3-50S5M-C	**Sony ICX625**	2/3"	USB 3.1 Gen 1	CCD	Global	2448 x 2048	15	3.45 µm
CCD	GS3-PGE-50S5M-C	**Sony ICX625**	2/3"	PoE GigE	CCD	Global	2448 x 2048	15	3.45 µm
CCD	BFLY-PGE-50H5M-C	**Sharp RJ32S4AA0DT**	2/3"	PoE GigE	CCD	Global	2448 x 2048	7.5	3.45 µm
CCD	GS3-U3-60S6M-C	**Sony ICX694**	1"	USB 3.1 Gen 1	CCD	Global	2736 x 2192	13	4.54 µm
CCD	GS3-U3-60QS6M-C	**Sony ICX694**	1"	USB 3.1 Gen 1	CCD	Global	2736 x 2192	25	4.54 µm
CCD	GS3-PGE-60S6M-C	**Sony ICX694**	1"	PoE GigE	CCD	Global	2736 x 2192	13	4.54 µm
CCD	GS3-U3-91S6M-C	**Sony ICX814**	1"	USB 3.1 Gen 1	CCD	Global	3376 x 2704	9	3.69 µm
CCD	GS3-U3-120S6M-C	**Sony ICX834**	1"	USB 3.1 Gen 1	CCD	Global	4240 x 2824	7	3.1 µm
CCD	BFLY-PGE-12A2M-CS	**Aptina AR0134**	1/3"	PoE GigE	CMOS	Global	1280 x 960	52	3.75 µm

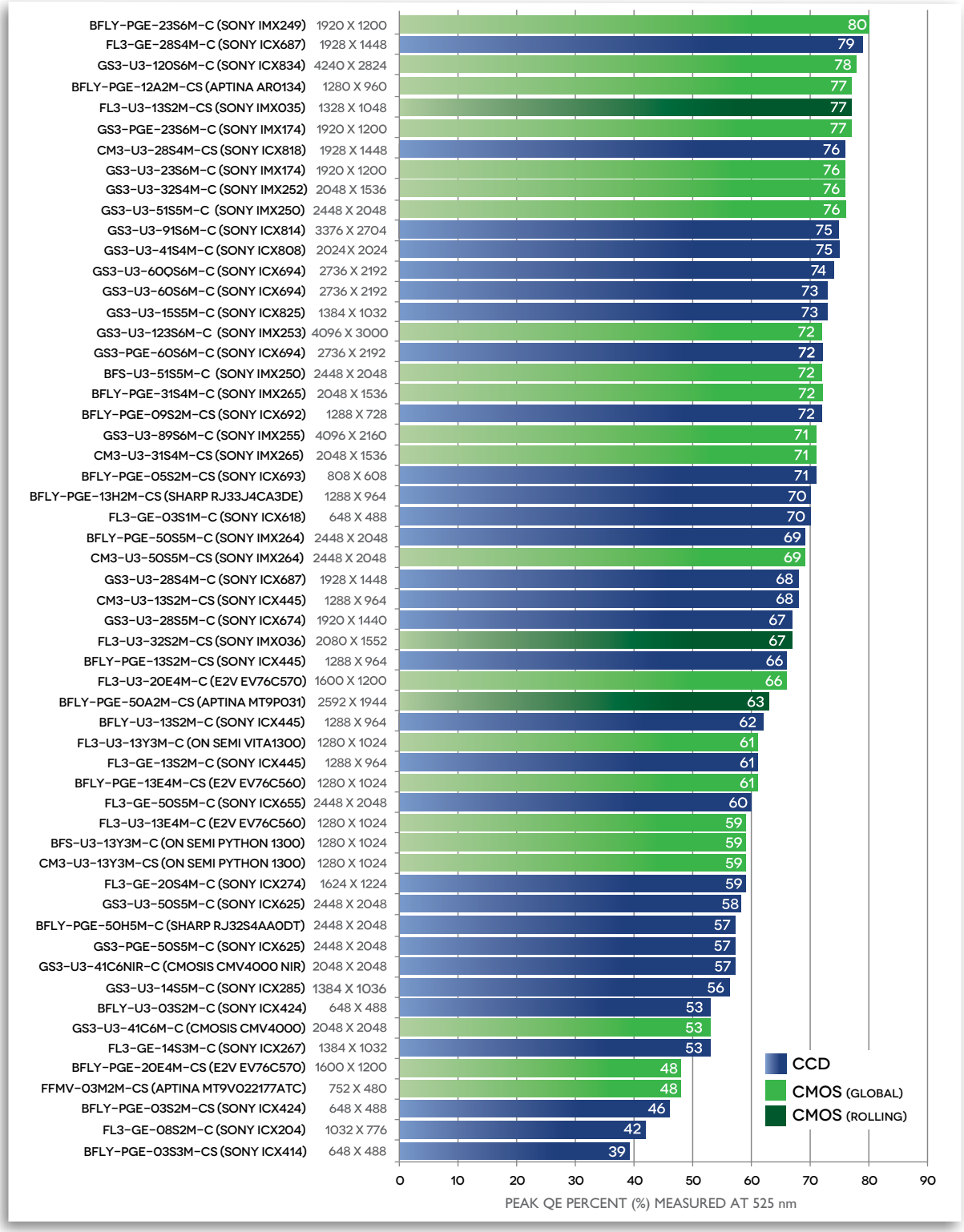
QE 525nm %	QE Near IR 850nm / 950nm %	Temporal Dark Noise	S/N Ratio Max dB	S/N Ratio Max Bits	Absolute Sensitivity Threshold	Saturation Capacity	Dynamic Range dB	Dynamic Range Bits	Gain **e-/ADU**
59	22 / 4	25.14	39.24	6.52	43.18	8384	50.29	8.35	0.16
61	22 / 8	25.32	38.76	6.44	43.00	7506	49.27	8.18	0.16
61	21 / 8	26.26	40.10	6.66	44.13	10226	51.64	8.58	0.21
59	20 / 8	9.28	37.82	6.28	16.14	6057	55.84	9.28	0.15
59	21 / 7	9.24	37.62	6.25	16.54	5779	55.47	9.21	0.14
77	12 / 4	6.00	41.90	6.96	8.72	15491	67.55	11.22	0.27
48	15 / 6	21.28	38.94	6.47	42.26	7836	51.12	8.49	0.13
66	22 / 9	24.17	38.92	6.46	37.84	7788	49.99	8.30	0.13
76	13 / 4	6.83*	45.12	7.49	9.77*	32513	72.94*	12.11	0.52
77	14 / 4	6.83*	45.14	7.50	9.75*	32691	72.99*	12.12	0.51
80	15 / 5	7.11*	45.19	7.50	9.45*	33105	72.77*	12.08	0.52
76	19 / 6	2.34*	40.20	6.68	3.98*	10482	71.34*	11.85	0.17
72	19 / 6	2.31	40.14	6.67	3.93	10326	71.31	11.84	0.17
71	19 / 7	2.89	39.90	6.63	4.80	9777	69.19	11.49	0.17
53	18 / 7	16.81	38.82	6.45	33.38	7620	52.87	8.78	0.15
57	32 / 13	17.99	39.59	6.58	31.01	9094	53.84	8.94	0.15
69	18 / 6	3.36	39.96	6.64	4.10	9909	70.78	11.76	0.17
69	18 / 6	2.29	39.94	6.63	4.03	9869	70.97	11.79	0.17
72	19 / 6	2.31	40.06	6.65	3.90	10141	71.13	11.82	0.17
76	19 / 6	2.37*	40.15	6.67	4.03*	10361	71.15*	11.82	0.17
63	14 / 5	7.64	38.26	6.35	13.00	6693	58.30	9.68	0.11
71	20 / 6	2.43*	40.19	6.67	4.13*	10435	71.03*	11.8	0.17
72	20 / 6	2.43*	40.24	6.68	4.12*	10563	71.04*	11.8	0.17
46	7/2	12.86	41.44	6.88	29.74	13932	60.37	10.03	0.22
53	8 / 3	12.03	41.37	6.87	24.76	13701	60.78	10.10	0.22
39	7/2	19.43	44.14	7.33	51.72	25949	62.29	10.35	0.41
70	21 / 8	11.73	41.62	6.91	17.57	14508	61.49	10.21	0.22
71	14 / 4	11.22	43.02	7.14	16.97	20024	64.66	10.74	0.36
42	6 / 2	12.13	40.77	6.77	30.70	11944	59.51	9.89	0.19
72	15 / 5	8.56	40.63	6.75	12.76	11551	62.11	10.32	0.24
62	16 / 5	10.30	39.86	6.62	17.78	9686	59.06	9.81	0.15
66	16 / 5	9.23	39.64	6.58	15.00	9196	59.51	9.88	0.15
70	17 / 5	5.37	38.68	6.43	8.55	7384	61.99	10.30	0.12
68	17 / 5	10.09	39.65	6.59	15.67	9231	58.81	9.77	0.15
61	15 / 4	7.61	38.66	6.42	13.63	7347	59.14	9.82	0.12
53	7 / 2	11.48	40.16	6.67	23.63	10366	58.75	9.76	0.18
73	22 / 7	8.31	43.59	7.24	12.15	22856	68.28	11.34	0.37
56	9 / 3	11.9	42.15	7.00	23.19	16408	62.43	10.37	0.28
59	7 / 2	8.35	39.01	6.48	15.77	7969	59.09	9.82	0.13
67	17 / 5	9.39	41.67	6.92	14.86	14693	63.43	10.54	0.24
76	16 / 5	10.48	40.39	6.71	14.67	10936	59.96	9.96	0.18
79	17 / 6	9.68	40.64	6.78	13.13	11586	61.12	10.15	0.19
68	15 / 5	10.17	39.56	6.57	15.78	9039	58.56	9.73	0.15
75	14/4	9.29	38.10	6.33	13.32	6459	56.39	9.37	0.10
60	9 / 4	9.43	37.68	6.26	17.23	5856	55.42	9.20	0.09
58	9 / 3	8.73	37.90	6.30	16.30	6168	56.50	9.38	0.10
57	8 / 3	8.18	37.71	6.26	15.69	5903	56.66	9.41	0.10
57	8 / 2	5.48	39.08	6.49	10.67	8086	62.61	10.4	0.13
73	16 / 5	10.54	41.60	6.91	15.22	14446	62.34	10.35	0.23
74	16 / 5	10.88	41.53	6.90	15.43	14227	61.94	10.29	0.23
72	16 / 5	10.87	41.56	6.93	13.87	14959	63.40	10.53	0.24
75	16 / 4	9.43	40.00	6.64	13.53	9996	60.06	9.98	0.16
78	13 / 4	10.87	37.87	6.29	14.82	6125	54.63	9.07	0.10
77	21 / 7	6.58	37.44	6.22	9.30	5542	57.87	9.61	0.10

*Mode 7 (Low Noise Imaging Mode)

MONO SINGLE LENS CAMERAS

QUANTUM EFFICIENCY (%) AT 525 nm (HIGHER IS BETTER)

Quantum efficiency (QE) is the ability of the sensor to turn photons into electrons, or in other words, turn incoming light into an electrical signal for imaging. A higher QE % means greater sensitivity for detecting light. A sensor with a measurement of 79% means that for every 100 photons that hit the sensor an average of 79 will be detected. Please note that the results below are taken at the wavelength of 525nm.

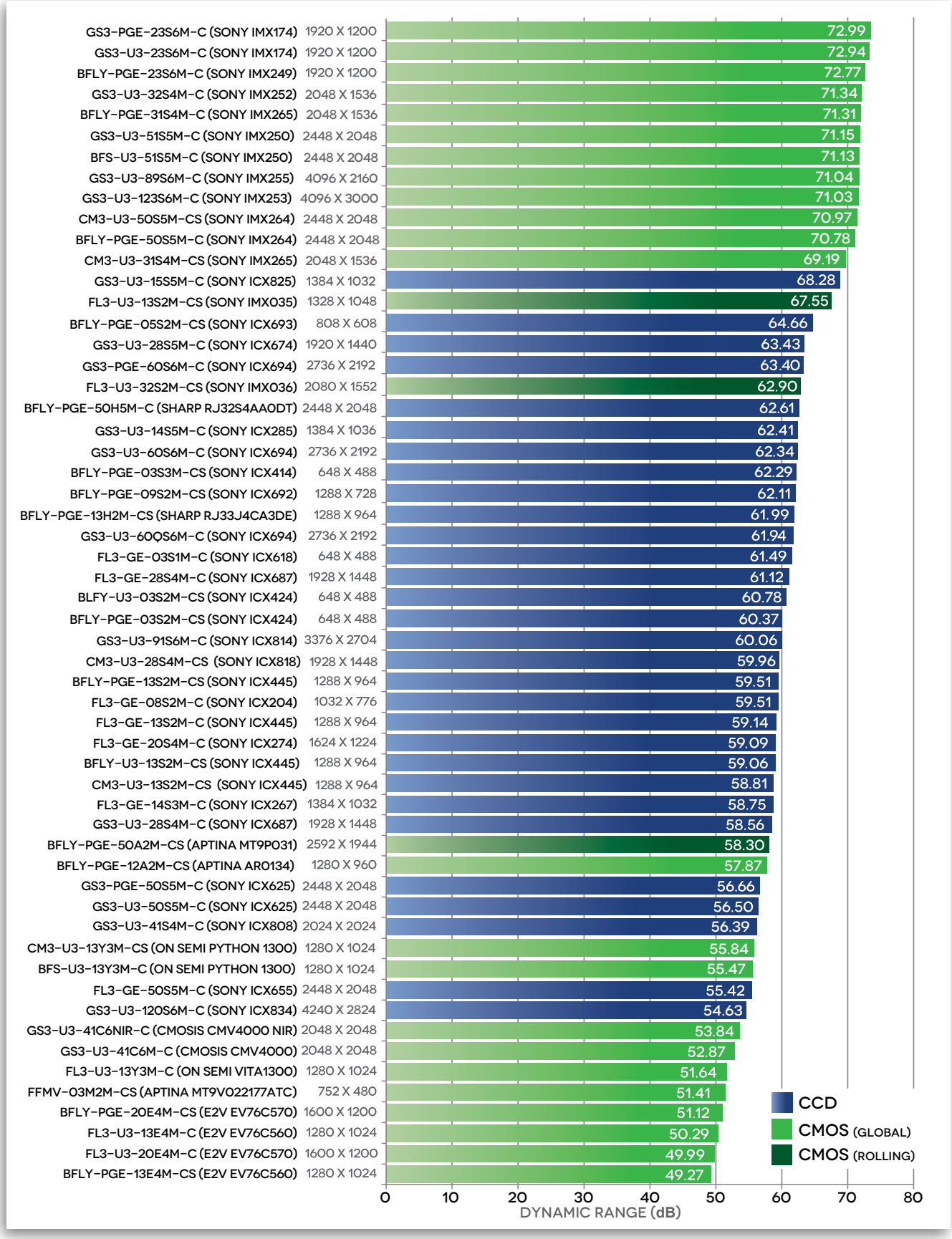


Please note that all measurements are taken based on guidelines in the EMVA 1288 standard. Camera settings are at maximum exposure time and bit depth unless otherwise noted. The pixel format is Mono 16 for mono cameras except for the last two Bandwidth and Throughput graphs which are done at Mono 8. Results are captured at room temperature (20°C). For more information on the EMVA 1288 standard please visit EMVA.org. Thanks for considering FLIR and please enjoy our mono camera sensor review.

MONO SINGLE LENS CAMERAS

DYNAMIC RANGE dB (HIGHER IS BETTER)

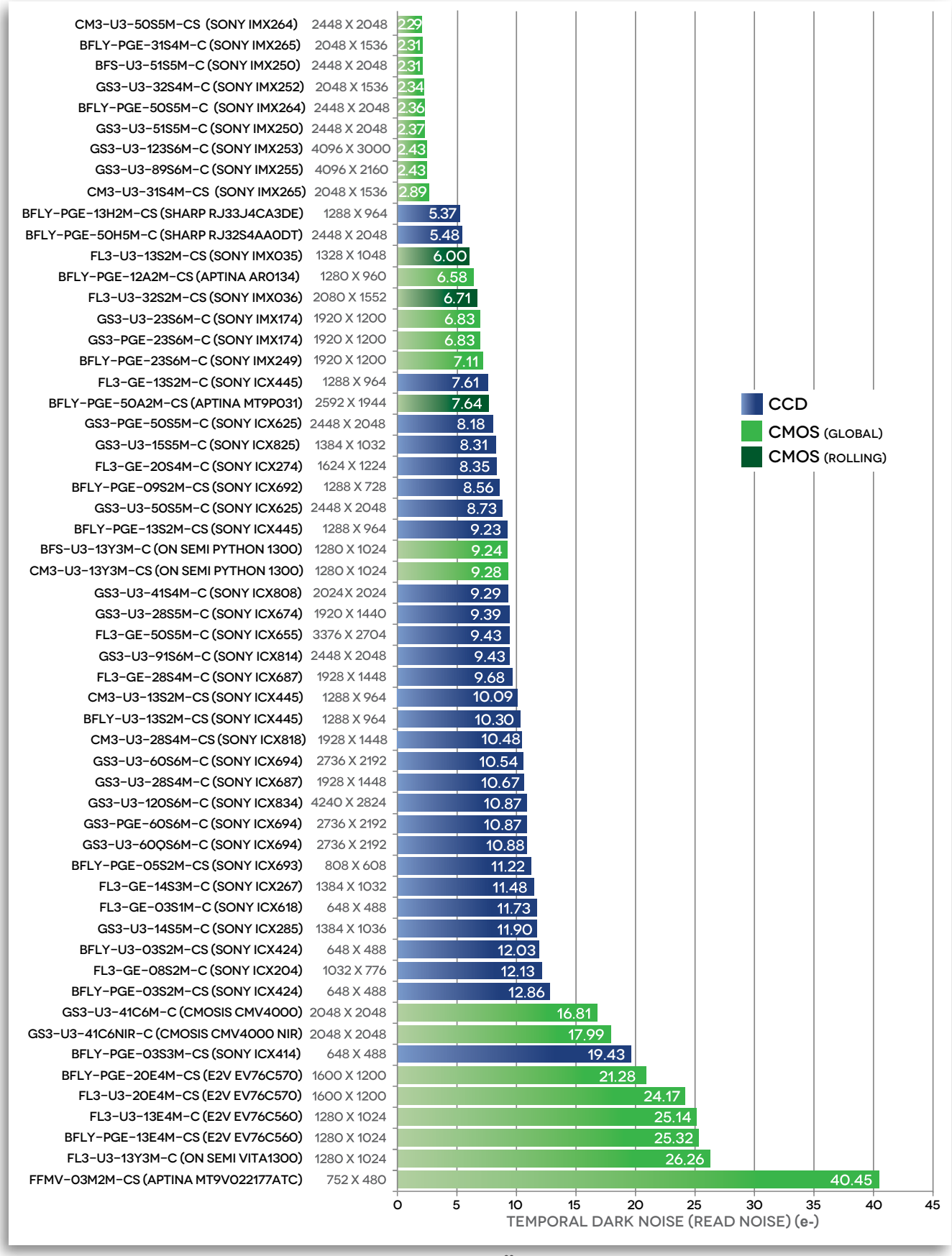
Dynamic range describes the camera model's ability to detect the maximum and minimum of light intensities (shadows and highlights). Models with higher dynamic range can detect more detail in the darks and lights.



MONO SINGLE LENS CAMERAS

TEMPORAL DARK NOISE / READ NOISE e- (LOWER IS BETTER)

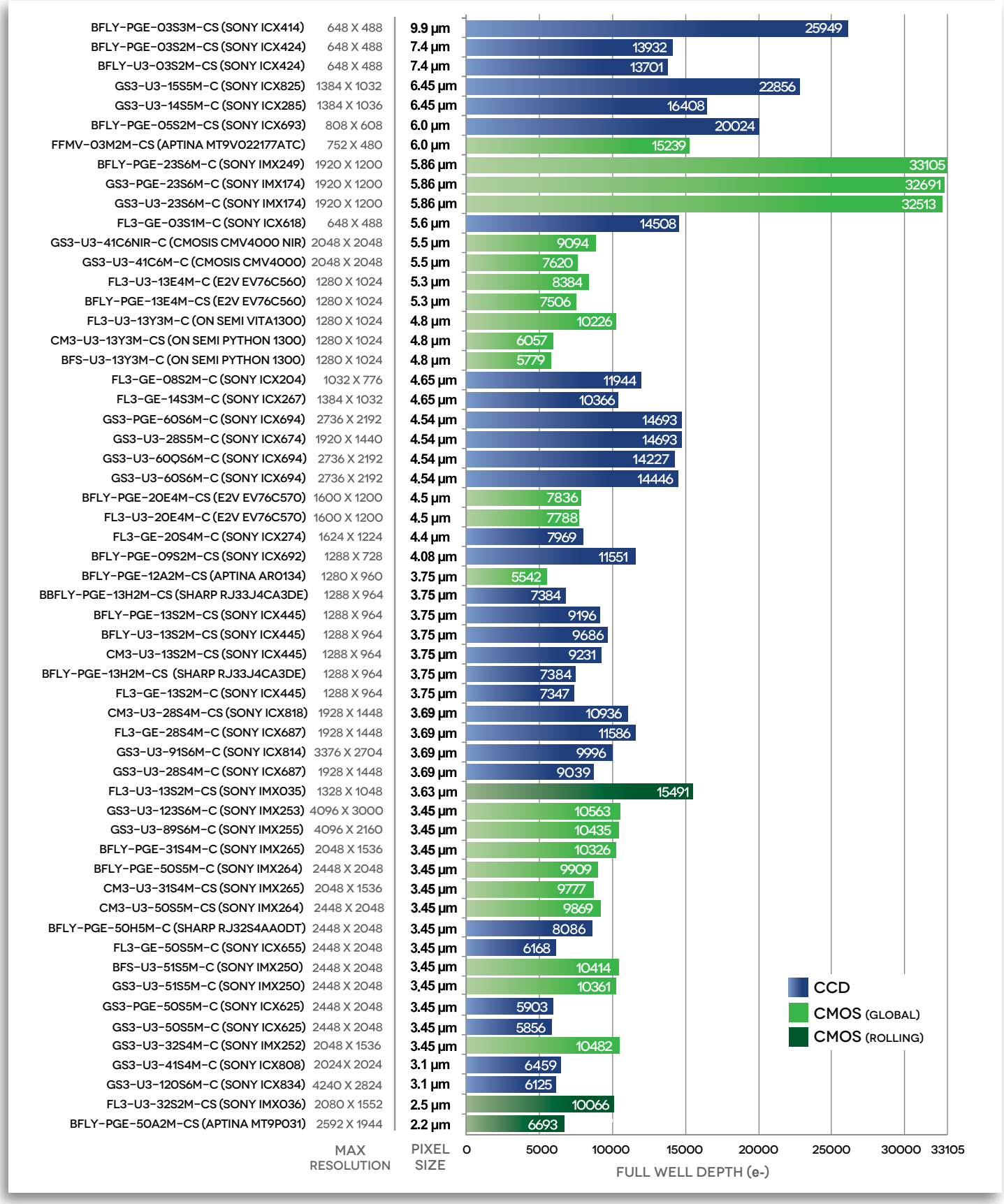
Temporal dark noise (also known as read noise) comes from energy within the sensor and the surrounding sensor electronics. Over time, random electrons are created that fall into the sensor wells and are detected and turned into signal. Models with lower read noise measurements produce cleaner images.



MONO SINGLE LENS CAMERAS

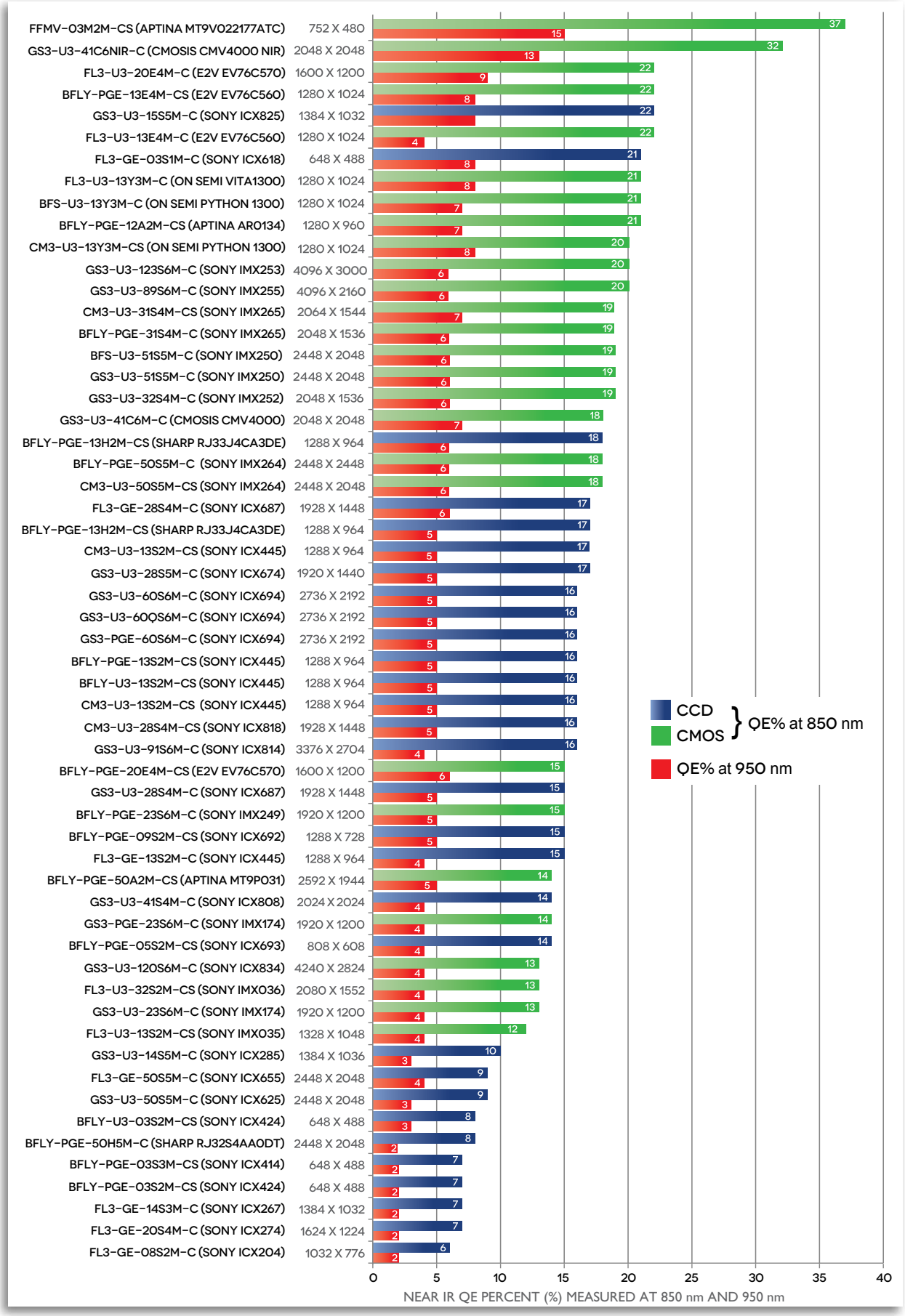
SATURATION CAPACITY (WELL DEPTH) e- (HIGHER IS BETTER, SORTED BY PIXEL SIZE)

The saturation capacity (well depth) is the largest charge a pixel can hold before over-saturation occurs and signal degradation begins. Saturation must be avoided because it diminishes the quantitative ability of the sensor and in the case of CCDs produces image smearing due to a phenomenon known as blooming.



MONO SINGLE LENS CAMERAS

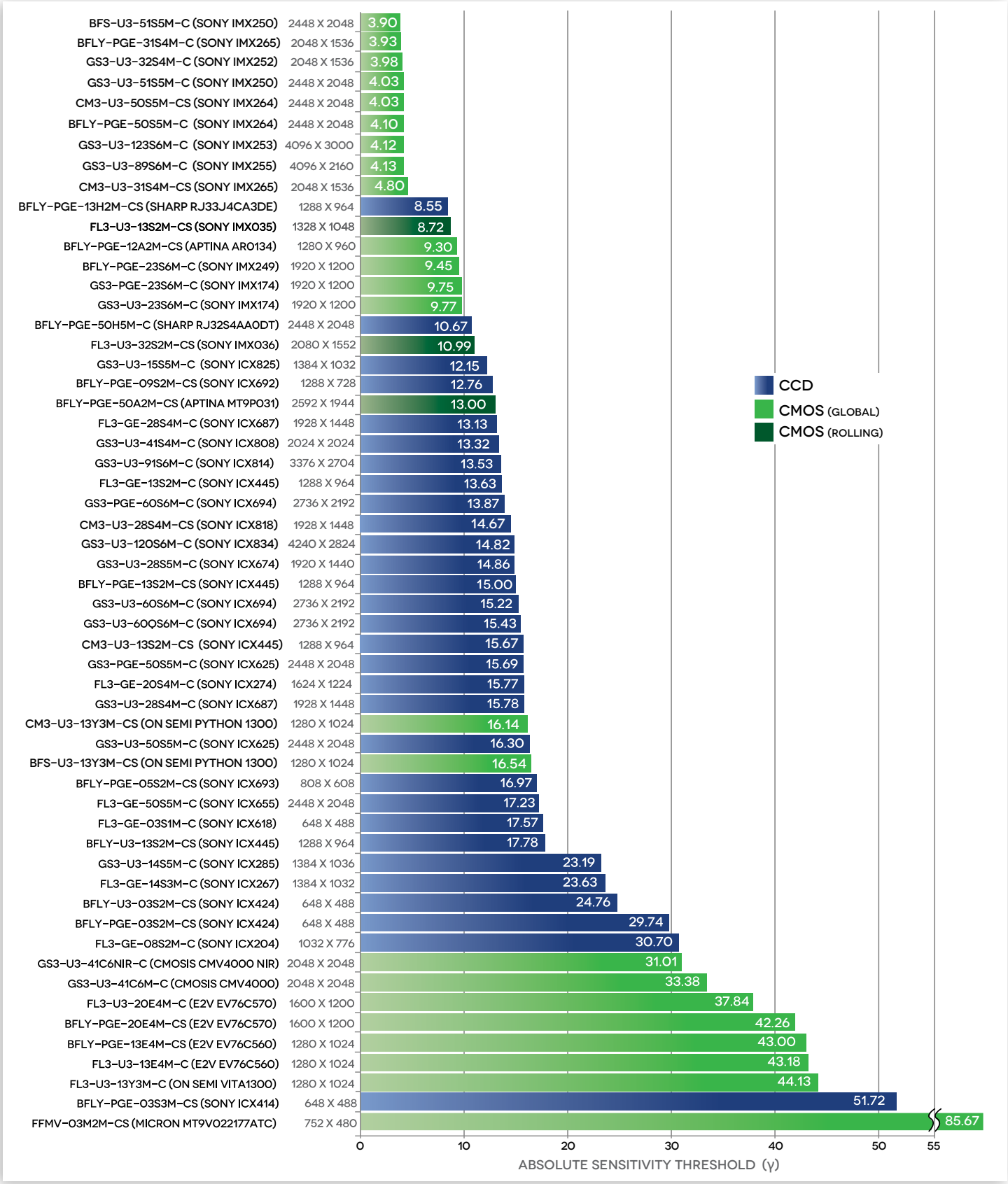
NEAR IR QE (%) (HIGHER IS BETTER)



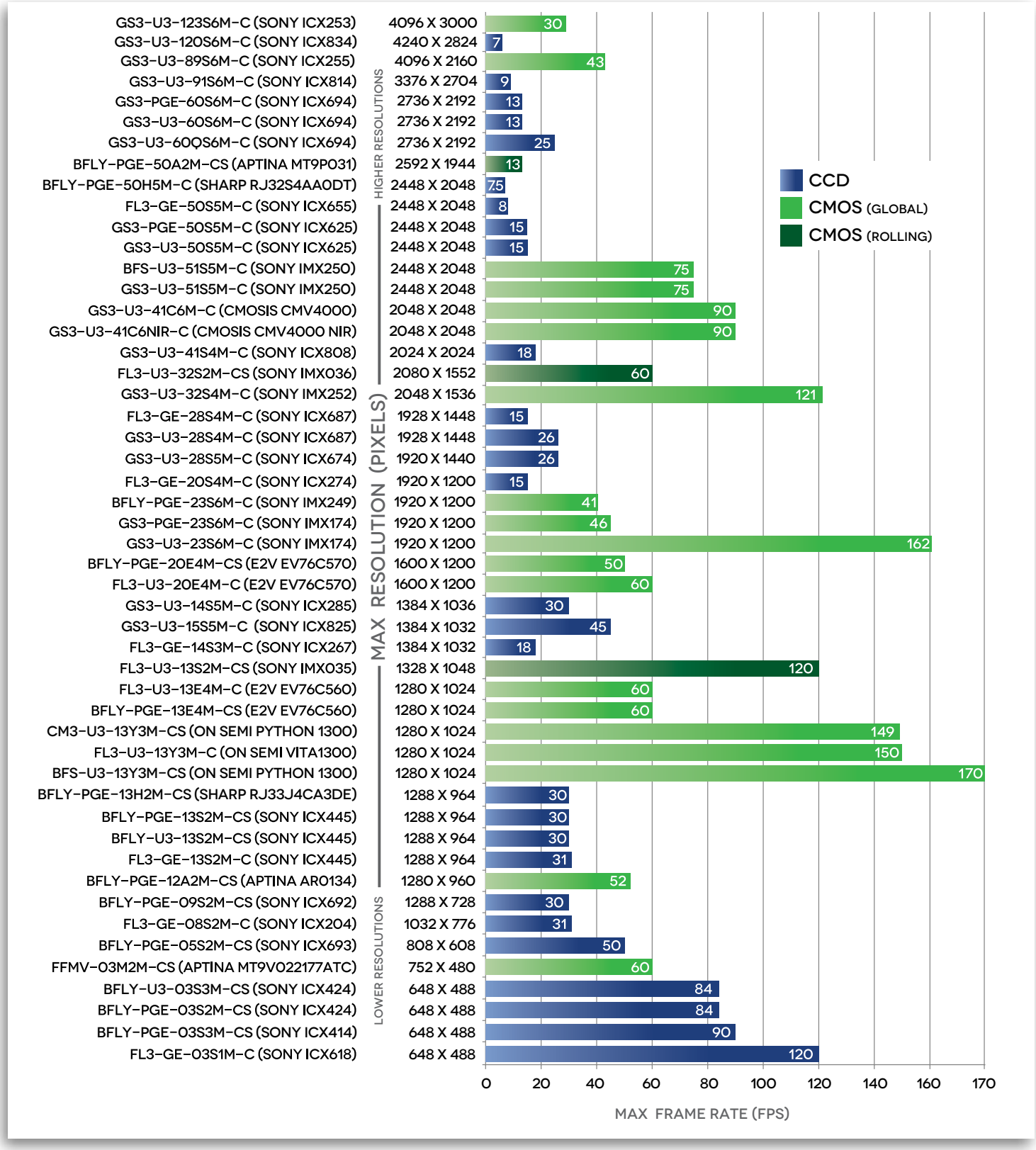
MONO SINGLE LENS CAMERAS

ABSOLUTE SENSITIVITY THRESHOLD (y) (LESS IS BETTER)

Absolute sensitivity threshold is the minimum number of photons needed to equal the noise level. The lower the number the less light is needed to detect useful imaging data.

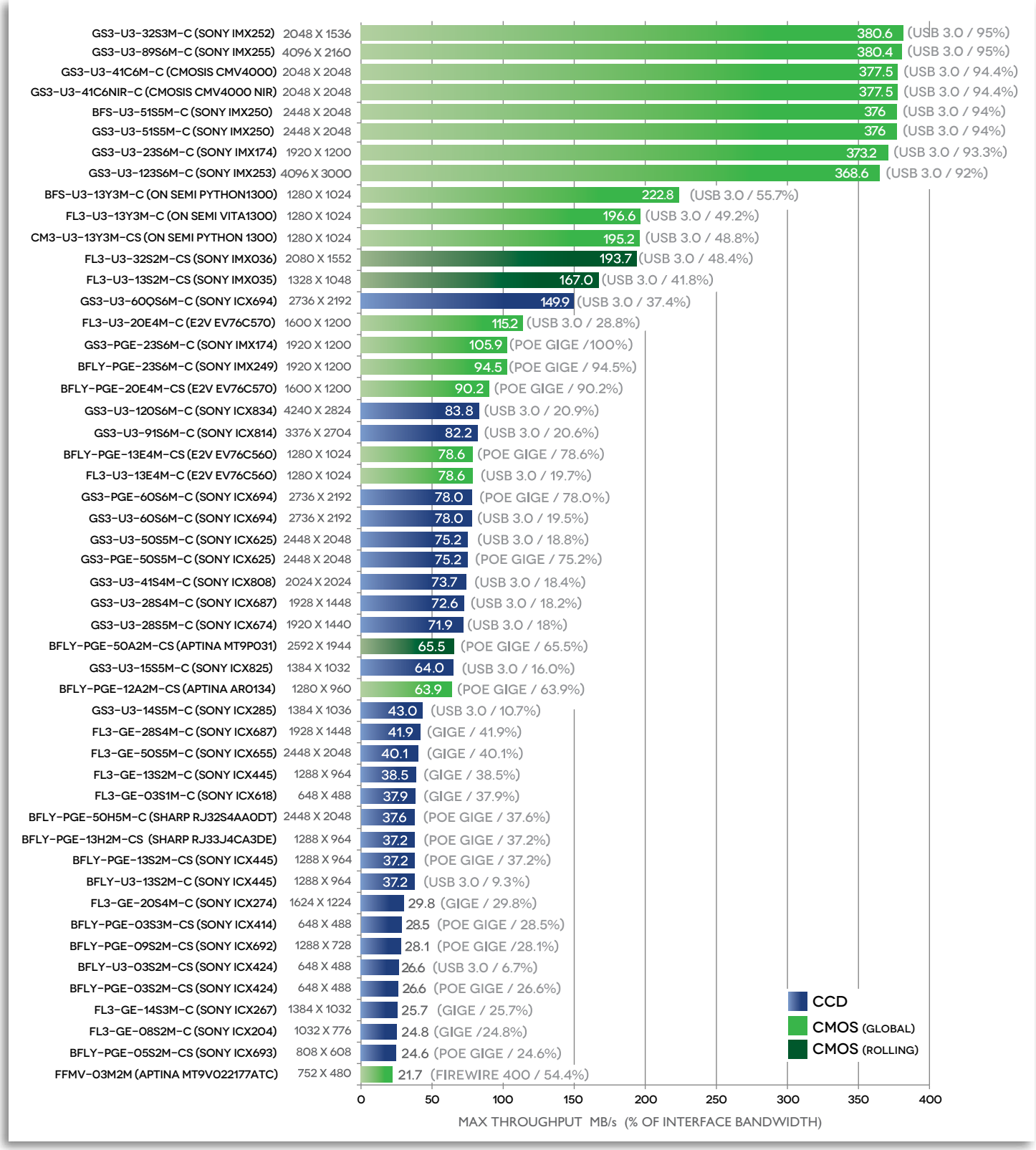


MAX RESOLUTION TO MAX FRAME RATE

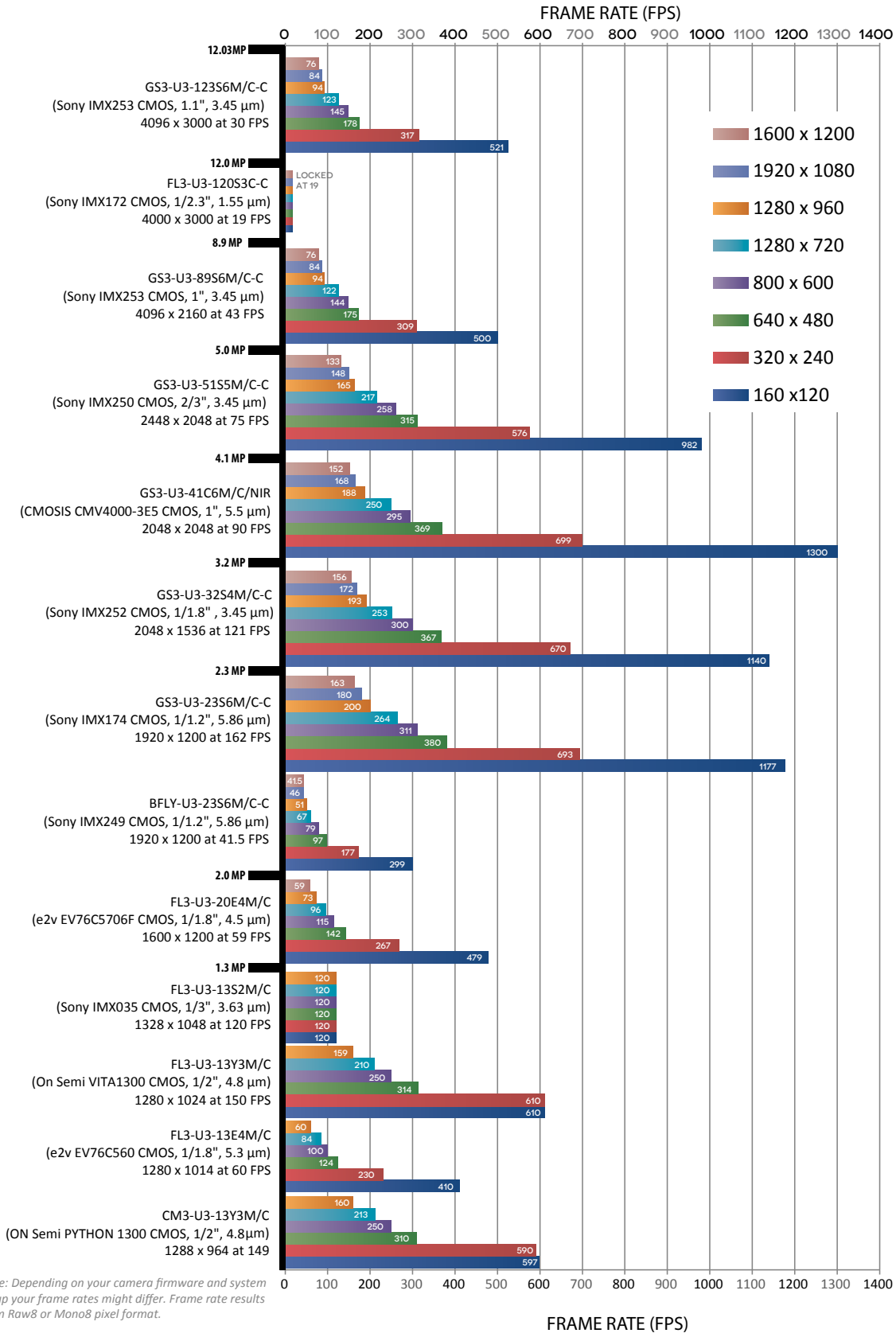


CAMERA THROUGHPUT (MB/s) AND % OF INTERFACE BANDWIDTH

When considering multi-camera setups bandwidth considerations are a must. We calculated the maximum throughput (MB/s) by multiplying the maximum resolution by the maximum frame rate (note: to simplify these calculations an image data format of Mono8 was used). In addition we added the percentage of interface bandwidth which the camera model pumped out. For those calculations we used 400 MB/s for USB 3.1 Gen 1, 100 MB/s for GigE, 80 MB/s for FireWire 800, and 40 MB/s for both FireWire 400 and USB 2.0.

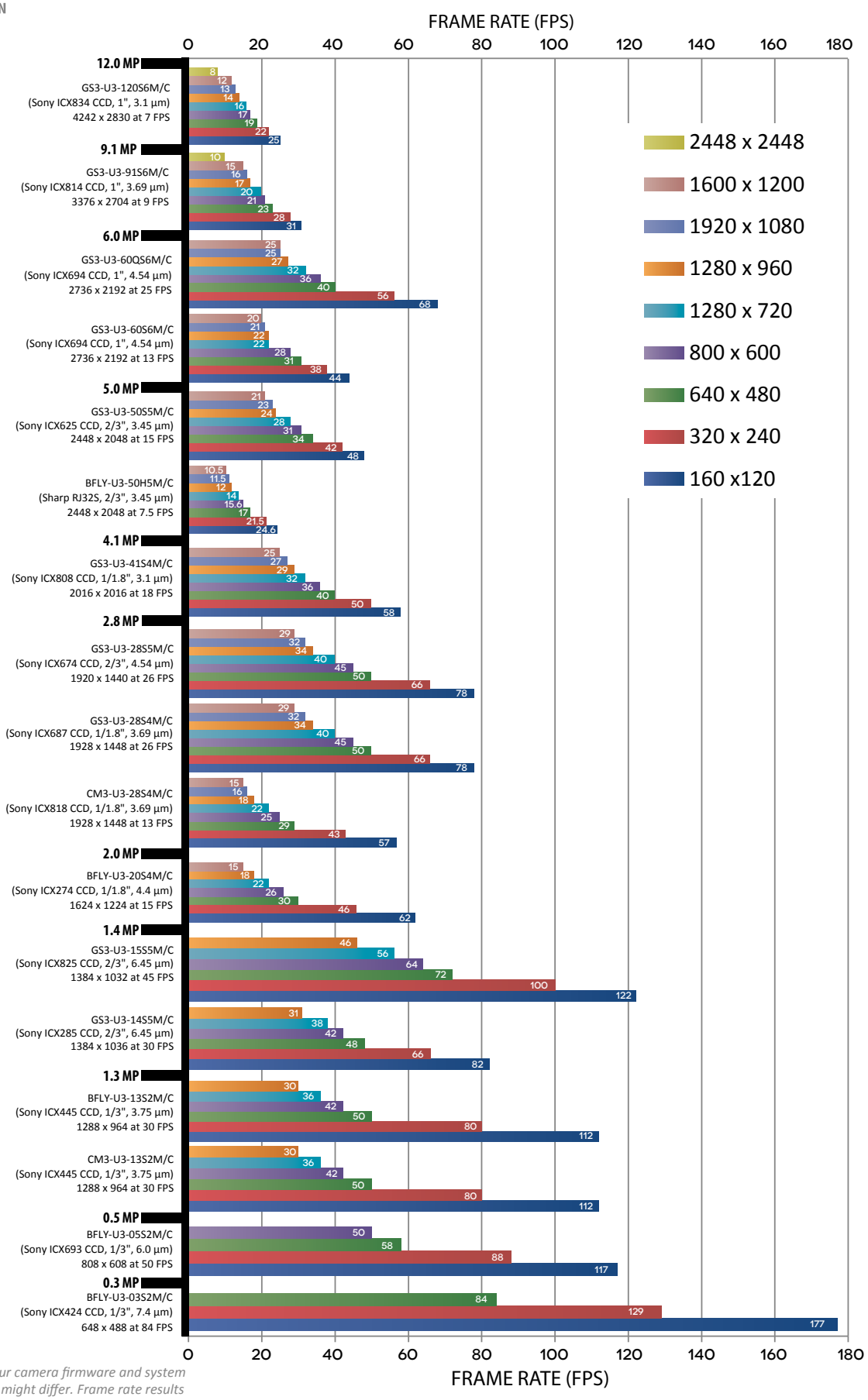


USB 3.1 Gen 1 CMOS Resolution vs Frame Rate Chart

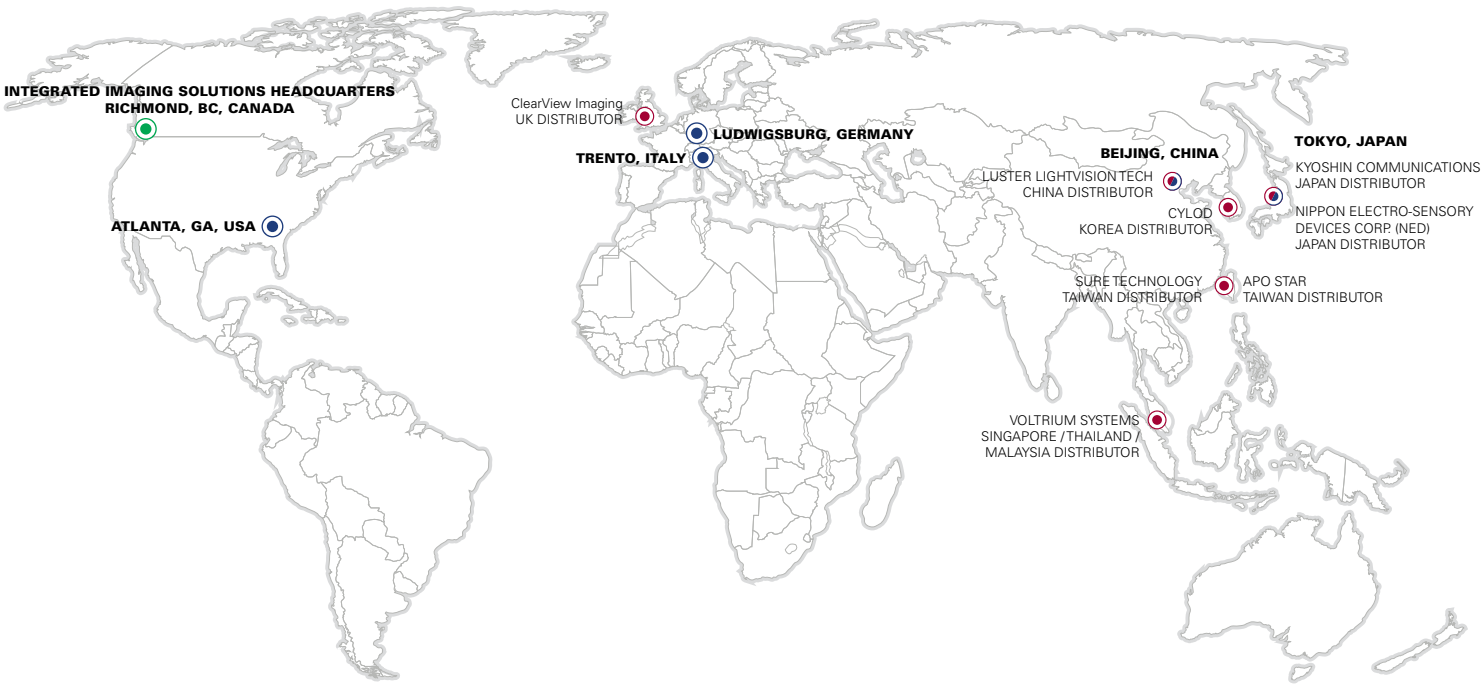


Note: Depending on your camera firmware and system setup your frame rates might differ. Frame rate results from Raw8 or Mono8 pixel format.

USB 3.1 Gen 1 CCD Resolution vs Frame Rate Chart



Note: Depending on your camera firmware and system setup your frame rates might differ. Frame rate results from Raw8 or Mono8 pixel format.



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