

STANDARD CMOS IMAGE SENSORS GUIDE



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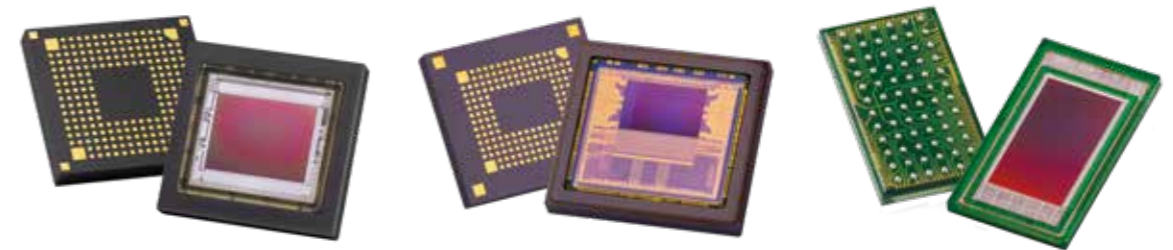
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INDUSTRY LEADING CMOS IMAGE SENSORS

The vision market is constantly looking for highly specialised, cost effective solutions where performance is not compromised. Teledyne e2v has over 40 years of heritage in imaging, with a background in the design and manufacture of CCD and CMOS image sensors.

Teledyne e2v's CMOS image sensors deliver high performance across many applications including machine vision and automation, medical and life sciences, logistics and robotics and the environment, food and recycling. Capabilities include ultra-high speed and ultra-low noise and our unique approach involves listening to the market and application challenges of customers and partnering with them to provide innovative standard, semi-custom or fully custom imaging solutions.



STANDARD CMOS IMAGE SENSORS GUIDE Custom products also available

	Resolution (pixels)	Format (H x V)	Pixel Pitch (µm)	Optical Format	Shutter Type	Output Format	Frame Rate (at 10 bits)	Dynamic Range (dB)	Package Type	Package Size (MM - H x V)	Color Filter Option	NIR Enhanced
EMERALD GEN2 FAMILY												
Emerald Gen2 8.9M - standard speed	8.9M	4,096 x 2,160	2.8	2/3'	Global	MIPI CSI-2 & LVDS	65	67.5	CLGA	21 x 20	Mono, Bayer	No
Emerald Gen2 8.9M - high speed	8.9M	4,096 x 2,160	2.8	2/3'	Global	MIPI CSI-2 & LVDS	100	67.5	CLGA	21 x 20	Mono, Bayer	No
Emerald Gen2 12M - standard speed	12M	4,096 x 3,072	2.8	1'	Global	MIPI CSI-2 & LVDS	33	67.5	CLGA	21 x 20	Mono, Bayer	No
Emerald Gen2 12M - high speed	12M	4,096 x 3,072	2.8	1'	Global	MIPI CSI-2 & LVDS	70	67.5	CLGA	21 x 20	Mono, Bayer	No
EMERALD FAMILY												
Emerald 2M - CLGA	2M	1,920 x 1,080	2.8	1/2.9'	Global	MIPI CSI-2 8b to 12b	80	68	CLGA112	13.3 x 14.1	Mono, Bayer	No
Emerald 2M - fan-out glass	2M	1,920 x 1,080	2.8	1/2.9'	Global	MIPI CSI-2 8b to 12b	80	68	Fan-out glass 112 pins	10.01 x 11.51	Mono, Bayer	No
Emerald 3.2M - CLGA	3.2M	2,048 x 1,536	2.8	1/2.5'	Global	MIPI CSI-2 8b to 12b	68	66	CLGA112	15 x 16	Mono, Bayer	No
Emerald 3.2M - fan-out glass	3.2M	2,048 x 1,536	2.8	1/2.5'	Global	MIPI CSI-2 8b to 12b	68	66	Fan-out glass 138 pins	12.01 x 14.01	Mono, Bayer	No
Emerald 5M - CLGA	5M	2,560 x 1,936	2.8	1/1.8'	Global	MIPI CSI-2 8b to 12b	54	66	CLGA112	15 x 16	Mono, Bayer	No
Emerald 5M - fan-out glass	5M	2,560 x 1,936	2.8	1/1.8'	Global	MIPI CSI-2 8b to 12b	54	66	Fan-out glass 138 pins	12.01 x 14.01	Mono, Bayer	No
Emerald 8.9 - high speed	8.9M	4,096 x 2,160	2.8	2/3'	Global	LVDS from 8b to 12b	91	67.5	CLGA224	20 x 21	Mono, Bayer	No
Emerald 8.9 - standard speed	8.9M	4,096 x 2,160	2.8	2/3'	Global	LVDS from 8b to 12b	47	67.5	CLGA224	20 x 21	Mono, Bayer	No
Emerald 10M - high speed	10M	4,096 x 2,460	2.8	1'	Global	LVDS from 8b to 12b	80	67.5	CLGA224	20 x 21	Mono, Bayer	No
Emerald 10M - standard speed	10M	4,096 x 2,460	2.8	1'	Global	LVDS from 8b to 12b	42	67.5	CLGA224	20 x 21	Mono, Bayer	No
Emerald 36M - high speed	37.7M	6,144 x 6,144	2.5	4/3'	Global	LVDS from 8b to 12b	43	67	µPGA	37 x 42	Mono, Bayer	No
Emerald 36M - ultra-high speed	37.7M	6,144 x 6,144	2.5	4/3'	Global	LVDS from 8b to 12b	87	67	µPGA	37 x 42	Mono, Bayer	No
Emerald 67M - high speed	67M	8,192 x 8,192	2.5	APS-C	Global	LVDS from 8b to 12b	32	67	µPGA	37 x 42	Mono, Bayer	No
Emerald 67M - ultra-high speed	67M	8,192 x 8,192	2.5	APS-C	Global	LVDS from 8b to 12b	65	67	µPGA	37 x 42	Mono, Bayer	No
FLASH FAMILY												
Flash 2K	2M	2,048 x 1,080	6	C-Mount	Global	LVDS 8b and 10b	1500 (at 8 bits)	>50 Up to 100 HDR	µPGA 228	27 x 27	Mono	No
Flash 4K	4M	4,096 x 1,080	6	APS-C	Global	LVDS 8b and 10b	1800 (at 8 bits)	>50 Up to 100 HDR	µPGA 380	49 x 37	Mono	No
LINCE FAMILY												
Lince 1M3	1.3M	1,280 x 1,024	10	1'	Global	LVDS from 8b to 12b	980 @ 12 bit	58	µPGA181	28 x 28	Mono	No
Lince5M - high speed	5.2M	2,560 x 2,048	5	1'	Global	LVDS from 8b to 12b	250 @ 12 bit	58	µPGA181	28 x 28	Mono, Bayer	Optional
Lince5M - standard speed	5.2M	2,560 x 2,048	5	1'	Global	LVDS from 8b to 12b	69 @ 12 bit 105 @ 8 bit	58	CLCC84	23 x 23	Mono, Bayer	No
Lince6M5	6.5M	2,560 x 2,560	5	1'	Global + Rolling	LVDS from 8b to 12b	170 @ 12 bit	58 Global 62 Rolling	µPGA179	28.7 x 28.7	Mono, Bayer	No
Lince11M	11M	4,480 x 2,496	6	31mm	Global	LVDS 10b	609	61.3	µPGA415	50 x 46	Mono	No
RUBY FAMILY												
Ruby 1.3M - rolling shutter	1.3M	1,280 x 1,024	5.3	1/1.8'	Rolling	Parallel 8 to 10 bit	60 (>100 at VGA)	>65	CLCC48	12.7 x 12.7	Mono, Bayer	Yes
Ruby 1.3M - global shutter	1.3M	1,280 x 1,024	5.3	1/1.8'	Global	Parallel 8 to 10 bit	60 (>100 at VGA)	>63	CLCC48	12.7 x 12.7	Mono, Bayer	Yes
SAPPHIRE FAMILY												
Sapphire 1.3M	1.3M	1,280 x 1,024	5.3	1/1.8'	Global + Rolling	Parallel 8 to 10 bit	60	>62	CLCC48	12.7 x 12.7	Mono, Bayer	No
Sapphire 2M	2M	1,600 x 1,200	4.5	1/1.8'	Global + Rolling	Parallel 8 to 10 bit	50 to 60	66	CLCC48	12.7 x 12.7	Mono, Bayer	No

Non-exhaustive list, limited to standard version of Teledyne e2v sensors. Other sensors are potentially available under restricted conditions. Note: Whilst Teledyne e2v has taken care to ensure the accuracy of the information contained herein, it accepts no responsibility for the consequences of any use thereof and also reserves the right to change specification of goods without notice.

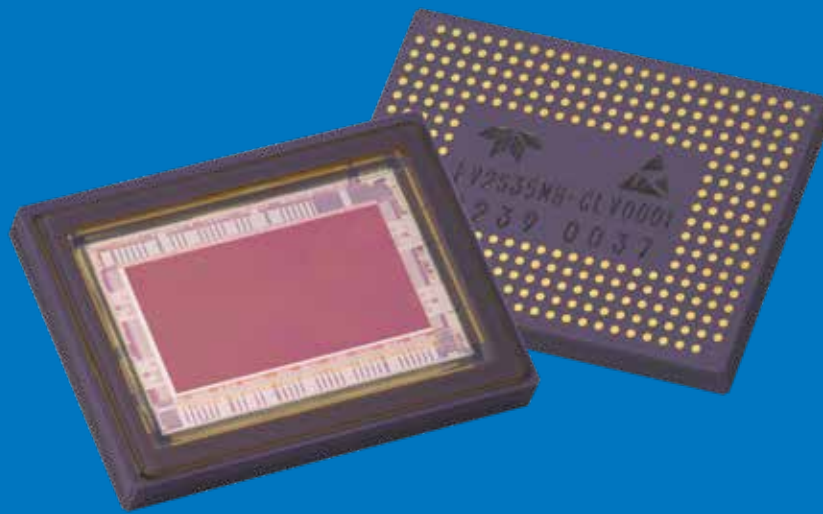
Teledyne e2v accepts no liability beyond that set out in its standard conditions of sale in respect of infringement of third party patents arising from the use of devices in accordance with the information contained herein. Not all combinations of variants are available for a single device. Users are advised to contact Teledyne e2v to confirm if their particular requirements are available with a standard device before designing their system.

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	Resolution (pixels)	Format (H x V)	Pixel Pitch (µm)	Optical Format	Shutter Type	Output Format	Frame Rate (at 10 bits)	Dynamic Range (dB)	Package Type	Package Size (MM - H x V)	Color Filter Option	NIR Enhanced
SNAPPY WIDE FAMILY												
Snappy Wide 16M	16M	8,192 x 2,000	2.5	21.1mm	Global	LVDS	>130	66	CLGA 326 pins	33 x 24.5	Mono, Bayer	No
Snappy Wide 28M	28M	8,192 x 3,500	2.5	22.3mm	Global	LVDS	>75	66	CLGA 326 pins	33 x 24.5	Mono, Bayer	No
Snappy Wide 35M	35M	8,192 x 4,320	2.5	23.2mm	Global	LVDS	>65	66	CLGA 326 pins	33 x 24.5	Mono, Bayer	No
SNAPPY FAMILY												
Snappy 2M - fan-out glass	2M	1,920 x 1,080	2.8	1/2.9'	Global	MIPI CSI-2 8b to 12b	80	67.9	Fan-out glass 112 pins	10.01 x 11.51	Mono, Bayer	No
Snappy 2M - CLGA	2M	1,920 x 1,080	2.8	1/2.9'	Global	MIPI CSI-2 8b to 12b	80	67.9	CLGA112	13.3 x 14.1	Mono, Bayer	No
Snappy 5M - fan-out glass	5M	2,560 x 1,936	2.8	1/1.8'	Global	MIPI CSI-2 8b to 12b	54	67.9	Fan-out glass 138 pins	12.01 x 14.01	Mono, Bayer	No
Snappy 5M - CLGA	5M	2,560 x 1,936	2.8	1/1.8'	Global	MIPI CSI-2 8b to 12b	54	67.9	CLGA112	15 x 16	Mono, Bayer	No
TETRA FAMILY												
Tetra 2k multispectral	2k	2,048 x 4	14	28.672mm	Synchronized	LVDS 12 bit	25kHz x 4	71	LCC	37.6 x 8.3 x 3.3	RGB & NIR	No
Tetra 2k color & mono	2k	2,048x4	14	28.672mm	Synchronized	LVDS 12 bit	25kHz x 4	71	LCC	37.6 x 8.3 x 3.3	RGB & Mono	No
Tetra 2k mono	2k	2,048 x 4	14	28.672mm	Synchronized	LVDS 12 bit	100kHz	71	LCC	37.6 x 8.3 x 3.3	Mono	No
Tetra 4k multispectral	4k	4,096 x 4	7	28.672mm	Synchronized	LVDS 12 bit	128kHz	71	Ceramic LCC	37.4 x 9.1 x 3.2	RGB & NIR	No
Tetra 4k color & mono	4k	4,096 x 4	7	28.672mm	Synchronized	LVDS 12 bit	128kHz	71	Ceramic LCC	37.4 x 9.1 x 3.2	RGB & Mono	No
Tetra 4k mono	4k	4,096 x 4	7	28.672mm	Synchronized	LVDS 12 bit	128kHz	71	Ceramic LCC	37.4 x 9.1 x 3.2	Mono	No
TIME-OF-FLIGHT SENSORS												
Hydra3D	0.5M	832 x 600	10	2/3'	Gated global	LVDS 12b	416 (12bits)	62	CLGA	24 x 22	Mono	Yes
Hydra3D+	0.5M	832 x 600	10	2/3'	Gated global	LVDS 12b	416 (12bits)	64	CLGA	24 x 22	Mono	Yes
TOPAZ FAMILY												
Topaz 1.5M	1.5M	1,920 x 800	2.5	1/3.2"	Global	MIPI CSI-2	130 @ 8 bits, 85 @ 10 bits	64	CSP	7.65 x 4.45 mm	Mono, Bayer	No
Topaz 2M	2M	1,920 x 1,080	2.5	1/3.2"	Global	MIPI CSI-2	100 @ 8 bits, 65 @ 10 bits	64	CSP	7.65 x 4.45 mm	Mono, Bayer	No
OTHER SENSORS												
ELITE4k2k	4k/2k	2,048 x 8	7.5	15.36mm	Global + Rolling	LVDS 12b	200klps	54 Global 68 Rolling	Chip on Board 60	39 x 33	Mono, True RGB & Bayer	No
		4,096 x 8	5.78 x 3.75				100klps					
Jade 0.5M	0.5M	860 x 640	5.8	1/2.9'	Global	Parallel 8 bit	>52 linear >100 line/log	>40	CLCC48	10 x 10	Mono, Bayer, Sparse	No
LS4K	4k/2k	2,048 x 1	14	28.672 mm	Rolling	LVDS 12b	18klps to 80klps	65	Dual in-line 40	44 x 15.5	Mono	No
		4,096 x 1	7									
OnyxMax	1.3M	1,280 x 1,024	10	1'	Global + Rolling + Range Gating	LVDS from 8b to 14b	120	75	PGA 67	25 x 25	Mono	Yes
Onyx 1.3M	1.3M	1,280 x 1,024	10	1'	Global + Digital Double Sampling + Rolling	LVDS from 8b to 14b	58/67/74	42	PGA 67	25 x 25	Mono, Sparse	Yes

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