

CMOS/CCD image sensors for spectrometer

Lineup

Type	Type no.	Main features
CMOS	APS (active-pixel sensor) S11639-01, S13496 Buried type S16514-2048-11, S16596-4096-11	
	Amp array S12198 series (-01), S11637 series	
	PPS (passive-pixel sensor) S1590X series S8377/S8378 series	
CCD	Binning S7030 series, S10420 series (-01), S10140 series (-01), S13240 series, S11071 series	
	RG (resistive gate) S11155-2048-02 S11156-2048-02	

UV sensitivity
 High-sensitivity
 High-speed
 Wide dynamic range
 Good linearity
 +5 V single power supply
 Electronic shutter function
 TE-cooled type available
 Low cost

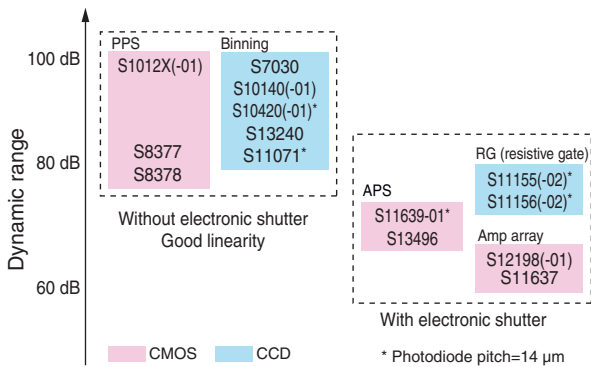
CMOS

Parameter	S11639-01	S13496	S16514-2048-11	S16596-4096-11	S12198(-01)	S11637	S8377	S8378	S15908-512	S15909-1024	Unit
Type	APS		APS		Amp array		PPS		PPS		-
Package	LCP		LCP		Ceramic		Ceramic		Ceramic		-
Package size	41.6 × 10.2		41.6 × 10.2		31.75 × 10, 40.6 × 10		15.8, 22.2, 35 × 7.87		40.6 × 10.4	40.6 × 10.4	mm
Number of pixels	2048	4096	2048	4096	512, 1024	1024, 2048	128, 256, 512	256, 512, 1024	512	1024	pixels
Pixel pitch	14	7	14	7	25	12.5	50	25	50	25	μm
Pixel height	0.2		0.2		0.5		0.5		2.5	2.5	mm
Video data rate (max.)	10		10		10		0.5		0.48	0.25	MHz
Line rate (max.)	4.6	2.3	4.6	2.3	9.4 to 18.4	4.8 to 9.4	0.97 to 3.8	0.48 to 1.9	4	8	kHz
Power consumption	150	200	150	200	160 to 230	275 to 475	15		3 to 18	1 to 8	mW
Full well capacity	100		100		26000	11000	78000	39000	1250000	625000	ke ⁻
Readout noise	20		20		4600	2300	6250	6250	3600	3600	e ⁻ rms
Dynamic range	High gain	5000	5000	5000	3000	2200	6200	1500	360000	180000	-
	Low gain				5500	4700	12500	6250			
Conversion efficiency	High gain	20	20	20	0.56	1.18	0.16	0.32	0.0025		μV/e ⁻
	Low gain				0.13	0.30	0.032	0.064			
Electronic shutter	Yes		Yes		Yes		No		No		-
Linearity	Very good		Very good		Good		Excellent		Excellent		-
Main feature	High sensitivity Easy to use		High sensitivity Easy to use		High UV sensitivity		Good linearity		High UV sensitivity Wide dynamic range		-

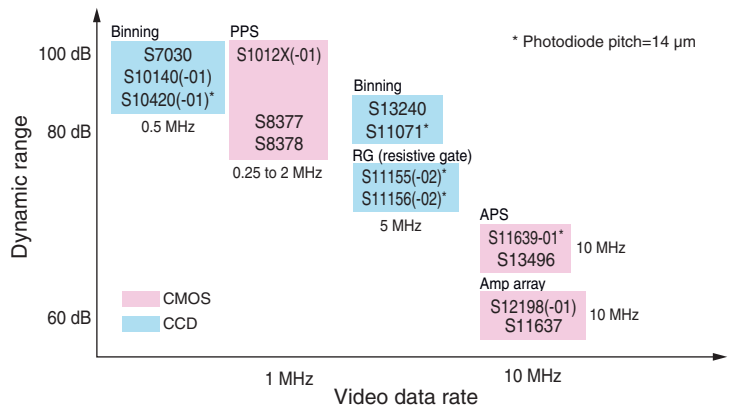
CCD

Parameter	S10140(-01)	S13240	S10420(-01)	S11071	S7030	S11155(-02) S11156(-02)	Unit
Type	Binning					RG (resistive gate)	-
Package	Ceramic					Ceramic	-
Package size	44 × 22.9	44 × 22.9	38.1 × 10.41	38.1 × 10.41	34, 44 × 22.9	38.1 × 10.41	mm
Number of pixels	2048	2048	1024, 2048	1024, 2048	512, 1024	2048	pixels
Pixel pitch	12	12	14	14	24	14	μm
Pixel height	1.464, 3, 6.072	1.464, 3, 6.072	0.224, 0.896	0.224, 0.896	1.392, 2.928	0.5, 1	mm
Video data rate (typ.)	0.25	2.5	0.25	5	0.25	5	MHz
Line rate (typ.)	0.04 to 0.1	0.2 to 0.92	0.1 to 0.22	0.65 to 1.7	0.16 to 0.41	2	kHz
Power consumption	16	100	4	75	13	75	mW
Full well capacity	500	500	300	200	1000	200	ke ⁻
Readout noise	4	30	6	23	8	30	e ⁻ rms
Dynamic range	125000	16600	50000	8700	125000	6670	-
Conversion efficiency	5	5.5	6.5	8	2.2	10	μV/e ⁻
Electronic shutter	No					Yes	-
Linearity	Excellent					Very good	-
Main feature	High sensitivity from UV to visible					UV sensitivity Electronic shutter	-
TE-cooled type	S10141(-01)	S13241	S11850	S16011	S11851	S7031	S13255/S13256(-02)
IR-enhanced type	N/A	N/A	S16010		N/A	S16000	N/A

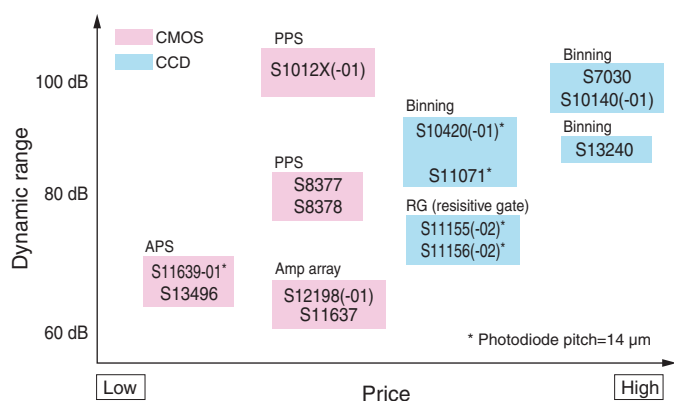
Dynamic range and electronic shutter



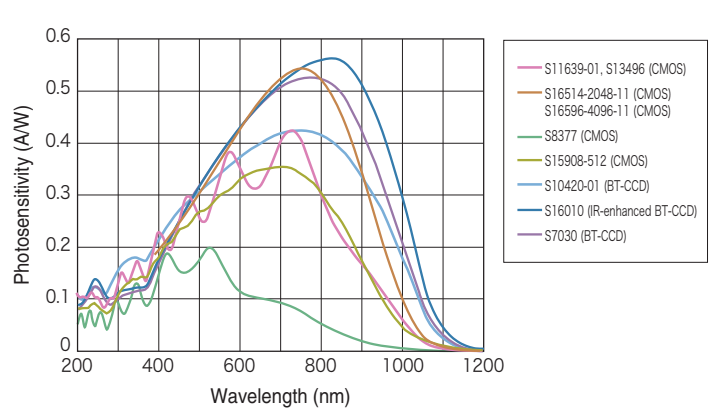
Dynamic range vs. video data rate



Dynamic range vs. Price



Spectral response



For details on the products shown in this catalog, refer to the datasheet.

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