e2v technologies

CCD40-11 AIMO Back Illuminated High Performance Sensor for Scientific Applications

FEATURES

- 1024 by 128 Pixel Format
- 26 μm Square Pixels
- Back Illuminated
- Image Area 26.6 x 3.3 mm
- Wide Dynamic Range
- Symmetrical Anti-static Gate Protection
- Advanced Inverted Mode Operation (AIMO)
- Anti-blooming Readout Register
- Zero Light Emitting Output Amplifier

APPLICATIONS

- Spectroscopy
- Scientific Imaging
- TDI Operation

INTRODUCTION

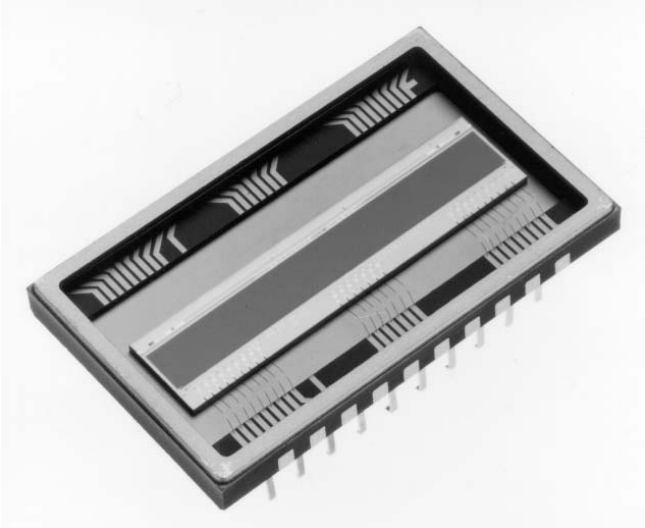
This version of the CCD40-11 is a high performance back illuminated CCD sensor designed for use in the scientific spectroscopy instrument market. With an array of 1024 x 128 26 μm square pixels, it has an imaging area to suit spectrometer outputs of 26.6 x 3.3 mm (1.05 x 0.13 inch).

The readout register is organised along the long (1024 pixel) edge of the sensor and contains an anti-blooming drain to allow high speed binning operations of low level signals which may be adjacent to much stronger signals. The novel output amplifier design has no light emission.

Standard three phase clocking and buried channel charge transfer are employed and Advanced Inverted Mode Operation (AIMO) is included as standard. The AIMO format gives the same dark current suppression as with standard IMO devices whilst minimising the reduction in full-well capacity.

The CCD40-11 comes as standard with a broadband AR coating. Other coatings are available; contact e2v technologies for details.

The CCD40-11 is packaged in a 20-pin DIL ceramic package and is pin compatible (but not completely clock compatible) with the CCD30-11.



TYPICAL PERFORMANCE

Pixel readout frequency	20 – 5000	kHz
Output amplifier responsivity	1.5	μV/e^-
Peak signal	500	ke^-/pixel
Dynamic range	75 000:1	
Readout noise (at 253 K, 20 kHz)	6	e^- rms
Peak output voltage	750	mV
Dark signal (at 293 K)	850	e^-/pixel/s
Quantum efficiency (at 253 K, standard process, broadband AR coating):		
350 nm	35	%
500 nm	90	%
650 nm	80	%
900 nm	40	%
Spectral range	200 – 1100	nm

GENERAL DATA

Format

Image area	26.6 x 6.7	mm
Active pixels (H)	1024	
(V)	128 (127 usable)	
Pixel size	26 x 26	μm
Number of output amplifiers	1	

Package

Package size	32.89 x 20.07	mm
Number of pins	20	
Inter-pin spacing	2.54	mm
Inter-row spacing	15.24	mm
Window material	quartz or removable glass	

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TYPICAL OPERATING CONDITIONS
(See note 1)

Ref.	Pin No.	Typical Voltage
SS	5, 16	9.5 V
I∅1	4	12 V
I∅2	3	12 V
I∅3	2	12 V
R∅1	9	11 V
R∅2	8	11 V
R∅3	7	11 V
∅R	6	12 V
OG	12	3.5 V
OD	14	29 V
OS	13	see note 1
RD	15	17 V
DD	18	24 V
SG	19	0 V
NC	1, 10, 11, 20	

NC = Not connected
SG = Spare gates

NOTES

1. The value of this voltage is not critical and depends on the type and value of the load used. With a typical load of 2 to 5 mA, OS ia about 3 to 5 V below V_{OD}.
2. Readout register clock pulse low levels + 1 V; other clock low levels 0 ± 0.5 V.

BLEMISH SPECIFICATION

GRADE	0	1	2
Column defects:			
black or slipped	0	2	6
white	0	0	0
Black spots	9	18	80
Traps >200 e^-	1	2	5
White spots	15	30	50

Minimum separation between adjacent column defects is 50 pixels.