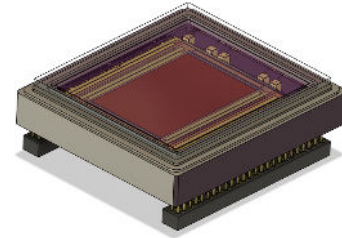


ACUROS[®] 4 CQD[®] eSWIR Sensor

Advance Information S040ECSSM00SLKA0



SWIR Sensing Meets High Resolution:

Large format sensors are essential for generating high resolution, wide field of view images. Data generated by these sensors is vital for precision-driven industries, including pharmaceutical, medical, defense, and aerospace. The ACUROS 4 high-resolution sensor empowers users and algorithms to detect and identify objects, defects, and materials, generating high-value images across a broad spectral range. With its 7 μm pixel pitch and single stage TEC, this sensor is an ideal candidate for compact systems.

SPECIFICATIONS

Table 1. SENSOR FEATURES

Parameter	Value/Description	
Type	ACUROS 4 CQD sensor	
Pixel Pitch	7 μm	
Format	2040 x 2040	
Array Size	14.34 mm x 14.34 mm	
Array Diagonal	20.2 mm	
Shutter	Global Shutter	
Max FPS (full frame)	100 Hz (8 bit), 50 Hz (12 bit)	
Min Exposure Time	10 μs	
Detector Technology	Colloidal quantum dot photodiode	
Detector Type	eSWIR	
Spectral Range	400–2100 nm	
QE	>15% @ 1900 nm typical	
Pixel Operability	>99.75% typical	
Dark Noise (at 30 °C)	TBD (e^-/s)	
Dark Noise Doubling Temperature	9 °C	
Analog Gain Modes	Low Gain	High Gain
Read Noise	125 e^-	20 e^-
Well-Depth	350 Ke^-	52 Ke^-
Dynamic Range	68 dB	63 dB
ADC Bit Depth	8-bit or 12-bit	
Region of Interest (ROIC)	Yes (8 row increments)	
ROI FPS Scaling	Yes. FPS up to 10 kHz for 2040 x 8 pixel ROI	
Frame Readout Mode	ITR (with CDS) or IWR (without CDS)	
Input Clock	350 MHz	
Data Output	8 ports, LVDS, 700 Mb/s per port	

ORDERING INFORMATION

Part Number
S040ECSSM00SLKA0

Features

- 7 μm Pixel Pitch
- Global Snapshot Shutter
- 12-bit ADC
- Vis-eSWIR
- 2 Gain Modes
- Up to 100 Hz Frame Rates (8-bit Mode)

Applications

- Silicon Inspection
- Machine Vision
- Surveillance
- Free Space Optics
- Situational Awareness
- Degraded Visual Environments

This document contains information on a new product. Specifications and information herein are subject to change without notice.

Table 2. ELECTRICAL

Parameter	Value/Description
Supply Voltages	3.3 V & 1.8 V
Power Consumption	1.5 W (TEC off, full frame, 100 FPS)

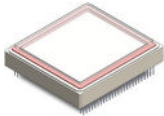
Table 3. PACKAGE

Parameter	Value/Description
Architecture	100 pin Ceramic PGA with Internal TEC
Length	36.6 mm
Width	33.3 mm
Height	7.125 mm

TABLE 4. ENVIRONMENTAL & POWER SPECIFICATIONS

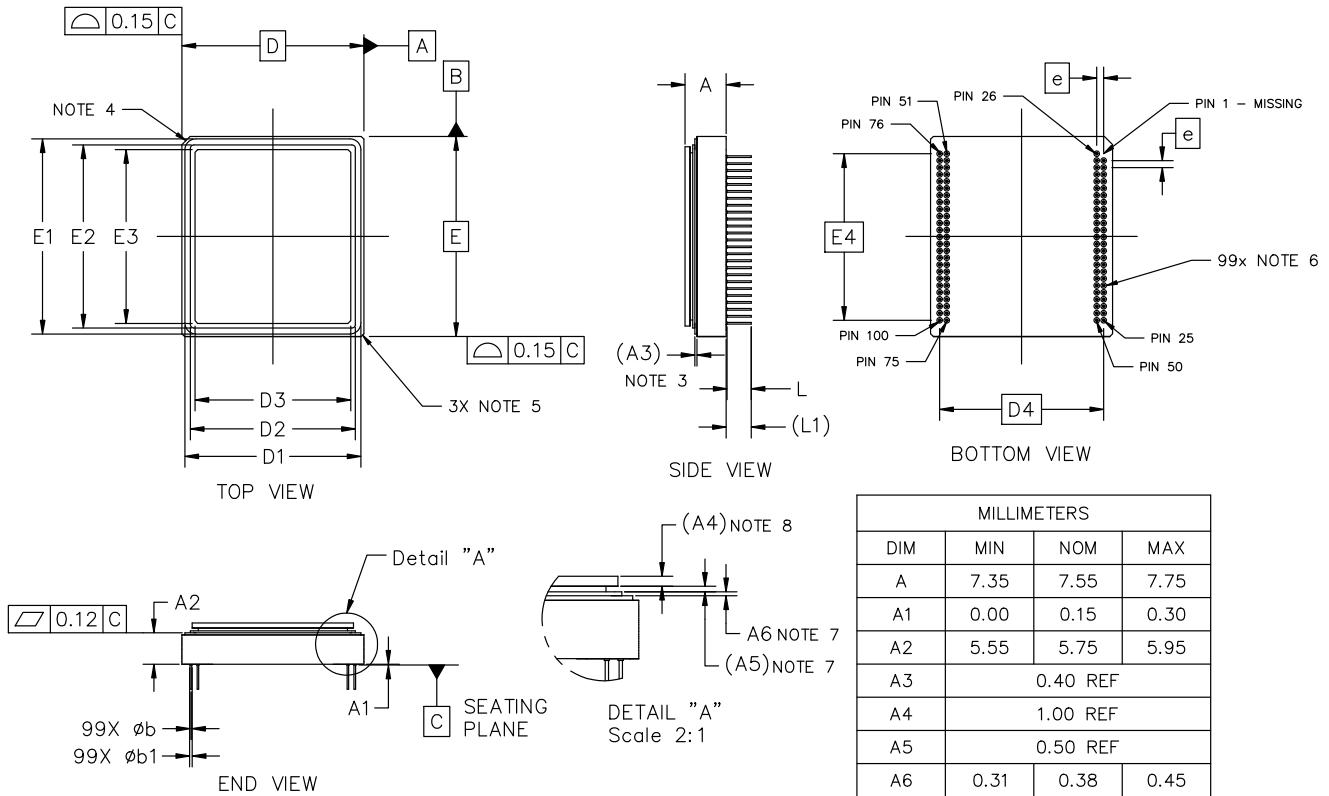
Parameter	Value/Description
Sensor Temperature Stabilization	Single-stage TEC
Operating Case Temperature	-20 °C to +55 °C
Storage Temperature	-10 °C to +55 °C

ACUROS and CQD are registered trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries.
All other brand names and product names appearing in this document are registered trademarks or trademarks of their respective holders.



CPGA99 33.30x36.60x5.75, 1.27P
CASE 107CD
ISSUE O

DATE 03 MAR 2025



- NOTES:
1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. SEAL RING.
 4. CHAMFER : 1.5 REF
 5. CHAMFER : 0.5 REF
 6. ALUMINA COAT PATTERN : ϕ 1.02
 7. KOVAR RIM
 8. SAPPHIRE GLASS

MILLIMETERS			
DIM	MIN	NOM	MAX
A	7.35	7.55	7.75
A1	0.00	0.15	0.30
A2	5.55	5.75	5.95
A3	0.40 REF		
A4	1.00 REF		
A5	0.50 REF		
A6	0.31	0.38	0.45
b	0.15	0.30	0.45
b1	0.33	0.48	0.63
D	33.30 BSC		
D1	32.05	32.20	32.35
D2	30.10	30.20	30.30
D3	28.40	28.50	28.60
D4	30.00 BSC		
E	36.60 BSC		
E1	35.55	35.70	35.85
E2	33.40	33.50	33.60
E3	31.70	31.80	31.90
E4	30.48 BSC		
e	1.27 BSC		
L	4.17	4.42	4.67
L1	4.57 REF		

DOCUMENT NUMBER:	98AON67234H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	CPGA99 33.30x36.60x5.75, 1.27P	PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales