XGS 12000, XGS 9400 and XGS 8000 Global Shutter CMOS Image Sensors XGS Family

Description

The XGS CMOS image sensor family provides high resolution, high performance global shutter image capture. The family comes in different resolutions in a single package; 8.8, 9.4 and 12.6 MP with up to 1–inch optical format. The 21 mm x 20 mm package makes the XGS family particularly suited for integration in 29 mm x 29 mm camera formats. The high speed, 12–bit output maximally leverages interfaces such as USB 3.2, Thunderbolt 12 and 10 GigE.

Image data is read out through a column ADC architecture and then transferred over a HiSPi interface. On-chip logic, programmable via the serial interface, generates internal timing for integration and readout control. Up to three register configurations can be programmed and sequentially enabled (frame by frame) using a single command over the control interface.

Parameter		Typical Value		
Optical Format	XGS 12000 1-inch (16.4 mm Diagonal)			
	XGS 9400	1/1.2-inch (13.9 mm Diagonal)		
	XGS 8000	1/1.1-inch (14.8 mm Diagonal)		
Active Pixels	XGS 12000 4096 (H) x 3072 (V)			
	XGS 9400	3072 (H) x 3072 (V)		
	XGS 8000	4096 (H) x 2160 (V)		
Pixel Size	3.2 μm			
Color Filter Array	Monochrome, Baye	er		
Shutter Type	Global Shutter			
Input Clock	32.4 MHz			
Output Interface	HiSPi (24 Lanes -	777.6 Mbps/lane)		
Frame Rate (12-bit)	24 Lanes (-X1)			
	XGS 12000	90 fps		
	XGS 9400	90 fps		
	XGS 8000	128 fps		
	12 Lanes (-X2)	•		
	XGS 9400 56 fps			
	XGS 8000	80 fps		
	6 Lanes (-X3)			
	XGS 12000	28 fps		
Read Noise	< 4 e ⁻ (1x), 1.9 e ⁻ (4x)			
SNR _{MAX}	40 dB			
Dynamic Range	68 dB			
Supply Voltages	1.2 V, 2.8 V, 3 V (0.4 V, 1.8 V Optional)			
Power Consumption	1 W (Full Speed, Full Resolution)			
Operating Temp.	-40°C to 85°C (Junction)			
Package	163-pin CLGA (Ceramic Land Grid Array)			

Tabla 1	KEV	DEBEO	BMANCE		TEDS
Table I.		PERFU	RMANCE	PARAMIC	IERO

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

Non-NDA Data Sheet

Interested in what you see? If you would like more detailed information, please request the full version of our data sheet.

Request Full Data Sheet

Features

- On-chip 12-bit Column ADCs
- 10-bit Mode with Increased Frame Rate of 100 fps (24-lane) at Full Resolution
- Companding and 10-Bit Mode at 60 fps (12-lane) and 30 fps (6-lane)
- Data Interface: 24–lane HiSPi (Scalable Low–Voltage Signaling)
- Configurable Number of HiSPi Lanes: 24, 18, 12 or 6 Lanes
- Two–Wire (I²C) and Four–Wire (SPI) Serial Interface
- Triggered Integration and Readout Control
- Programmable Control for up to 8 Regions of Interest (ROI)
- Context Switching
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Security
- Intelligent Transportation Systems (ITS)
- Broadcasting
- Medical
- Scientific

ORDERING INFORMATION

Table 2. ORDERABLE PART NUMBERS (Notes 1 and 2)

Part Number	Minimum Order Quantity	Product Description			Speed Grade	Resolution (H x V)
NOIX1SN012KB-LTI	25	12.6 MP	Mono	0° CRA	24 Lanes	4096 x 3072
NOIX1SN012KB-LTI1	4					
NOIX1SE012KB-LTI	25	12.6 MP	Color	0° CRA		
NOIX1SE012KB-LTI1	4					
NOIX1SF012KB-LTI	25	12.6 MP	Color	7.3° CRA		
NOIX1SF012KB-LTI1	4					
NOIX3SN012KB-LTI	25	12.6 MP	Mono	0° CRA	6 Lanes	
NOIX3SN012KB-LTI1	4					
NOIX3SE012KB-LTI	25	12.6 MP	Color	0° CRA		
NOIX3SE012KB-LTI1	4					

NOIX1SN9400B-LTI	25	9.4 MP	Mono	0° CRA	24 Lanes	3072 x 3072
NOIX1SN9400B-LTI1	4					
NOIX1SE9400B-LTI	25	9.4 MP	Color	0° CRA		
NOIX1SE9400B-LTI1	4					
NOIX2SN9400B-LTI	25	9.4 MP	Mono	0° CRA	12 Lanes	
NOIX2SN9400B-LTI1	4					
NOIX2SE9400B-LTI	25	9.4 MP	Color	0° CRA		
NOIX2SE9400B-LTI	4					

NOIX1SN8000B-LTI	25	8.8 MP	Mono	0° CRA	24 Lanes	4096 x 2160
NOIX1SN8000B-LTI1	4					
NOIX1SE8000B-LTI	25	8.8 MP	Color	0° CRA		
NOIX1SE8000B-LTI1	4					
NOIX2SF8000B-LTI	25	8.8 MP	Color	7.3° CRA	12 Lanes	
NOIX2SF8000B-LTI1	4					
NOIX2SN8000B-LTI	25	8.8 MP	Mono	0° CRA		
NOIX2SN8000B-LTI1	4					
NOIX2SE8000B-LTI	25	8.8 MP	Color	0° CRA		
NOIX2SE8000B-LTI1	4					

1. See the **onsemi** Device Nomenclature document (TND310/D) for a full description of the naming convention used for image sensors. For reference documentation, including information on evaluation kits, please visit our web site at www.onsemi.com.

2. All devices listed in Table 2 are equipped with microlenses.

Table 3. ORDERING INFORMATION EVALUATION KITS

Part Number	Product Description	Additional Information
NOIX1SN012KBLFB-GEVB	Sensor Headboard (12.6 MP, Mono, 24-Lane)	Demo Kit Headboard (incl. NOIX1SN012KB-LTI) (Note 3)
NOIX1SE012KBLFB-GEVB	Sensor Headboard (12.6 MP, Color, 24-Lane)	Demo Kit Headboard (incl. NOIX1SE012KB-LTI) (Note 3)
AGBAN6CS-GEVK	Frame Buffer Demo Board	AP21088 including Power Adapter
AGB1N0CS-GEVK	Demo 3 Board	FPGA Base Board including USB Cable and Tripod

3. Sensors are soldered to the headboard.



XGS Family



Figure 1. Functional Block Diagram (XGS 12000)

Thunderbolt is a trademark of Intel Corporation or its subsidiaries in the U.S. and/or other countries.





CLGA163 20.88x19.9, 1P CASE 621AB **ISSUE A**

DATE 11 SEP 2018



8X RECOMMENDED MOUNTING FOOTPRINT

DOCUMENT NUMBER:	98AON30089G	Electronic versions are uncontrolled except when accessed directly from the Document Re Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.			
DESCRIPTION:	CLGA163 20.88x19.9, 1P		PAGE 1 OF 2		

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.

Г 1.00 РІТСН

12.00 16.00

CLGA163 20.88x19.9, 1P CASE 621AB ISSUE A

DATE 11 SEP 2018

GENERIC MARKING DIAGRAM*



*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON30089G	Electronic versions are uncontrolled except when accessed directly from the Document Reposito Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.			
DESCRIPTION:	CLGA163 20.88x19.9, 1P		PAGE 2 OF 2		

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 <u>www.onsemi.com/site/pdf/Patent-Marking.pdf</u>. 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 indental 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. Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs,

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

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

ONLINE SUPPORT: <u>www.onsemi.com/support</u> For additional information, please contact your local Sales Representative at <u>www.onsemi.com/support/sales</u>