

# ON Semiconductor

## Is Now



To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

onsemi and 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 product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://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. Other names and brands may be claimed as the property of others.

# AP0100AT2L00XUGAH3-GEVB

## AP0100AT Evaluation Board User's Manual



ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

### EVAL BOARD USER'S MANUAL

#### Evaluation Board Overview

The evaluation boards are designed to demonstrate the features of ON Semiconductor's image sensors products. This headboard is intended to plug directly into the Demo 3 system. Test points and jumpers on the board provide access to the clock, I/Os, and other miscellaneous signals.

#### Features

- Clock Input
  - ◆ Default – 27 MHz Crystal Oscillator
  - ◆ Optional Demo 3 Controlled MCLK
- Two Wire Serial Interface
- Parallel Interface
- HiSPi (High Speed Serial Pixel) Interface
- ROHS Compliant

#### Block Diagram

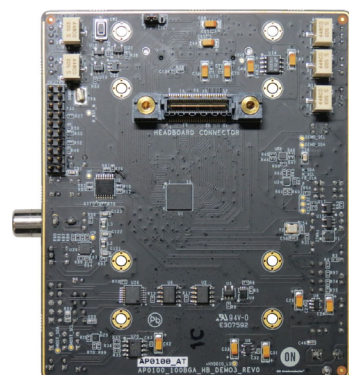


Figure 1. AP0100AT Evaluation Board

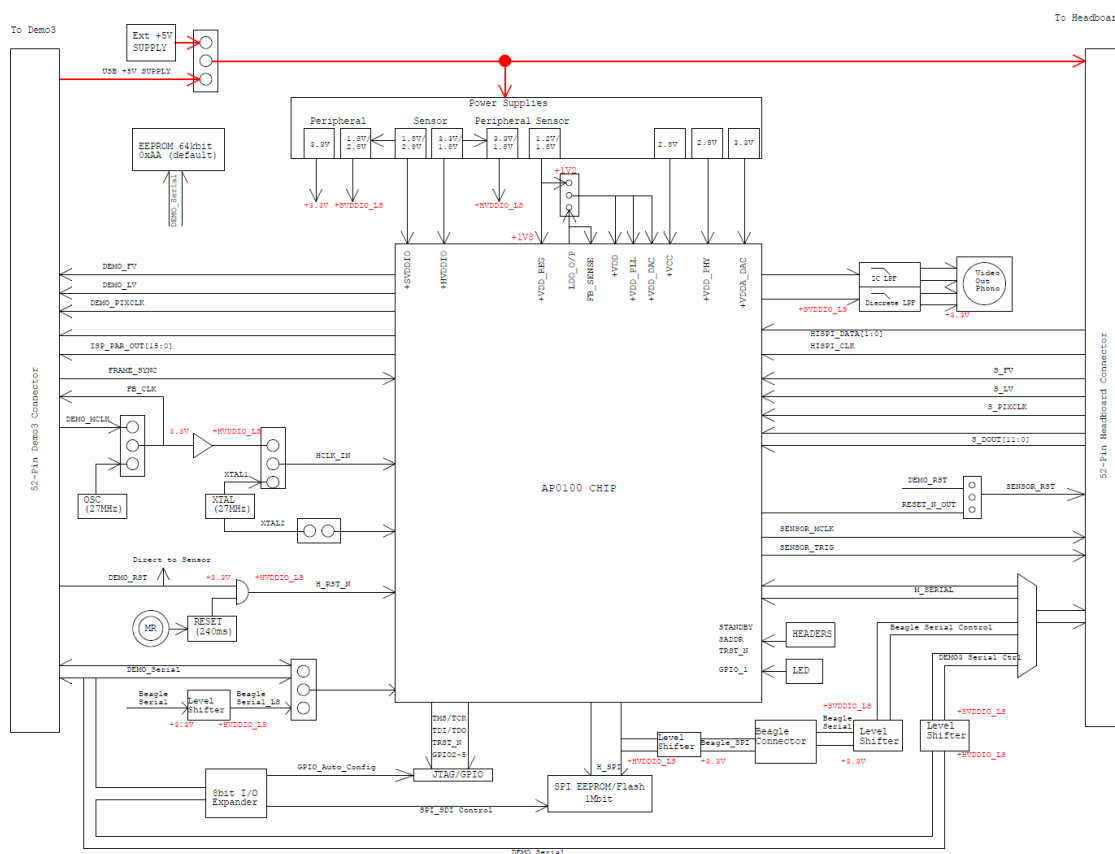


Figure 2. Block Diagram of AP0100AT2L00XUGAH3-GEVB

# AP0100AT2L00XUGAH3-GEVB

## Top View

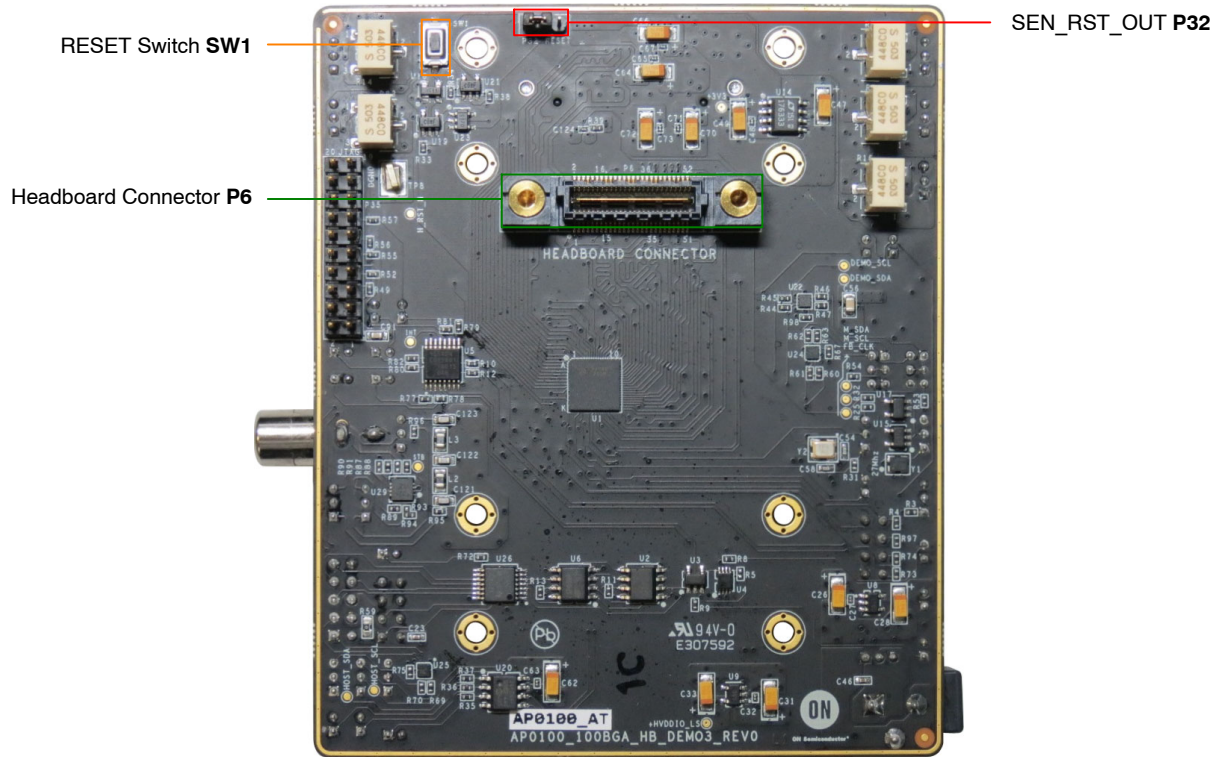


Figure 3. Top View of the Board with Default Jumpers

## Bottom View

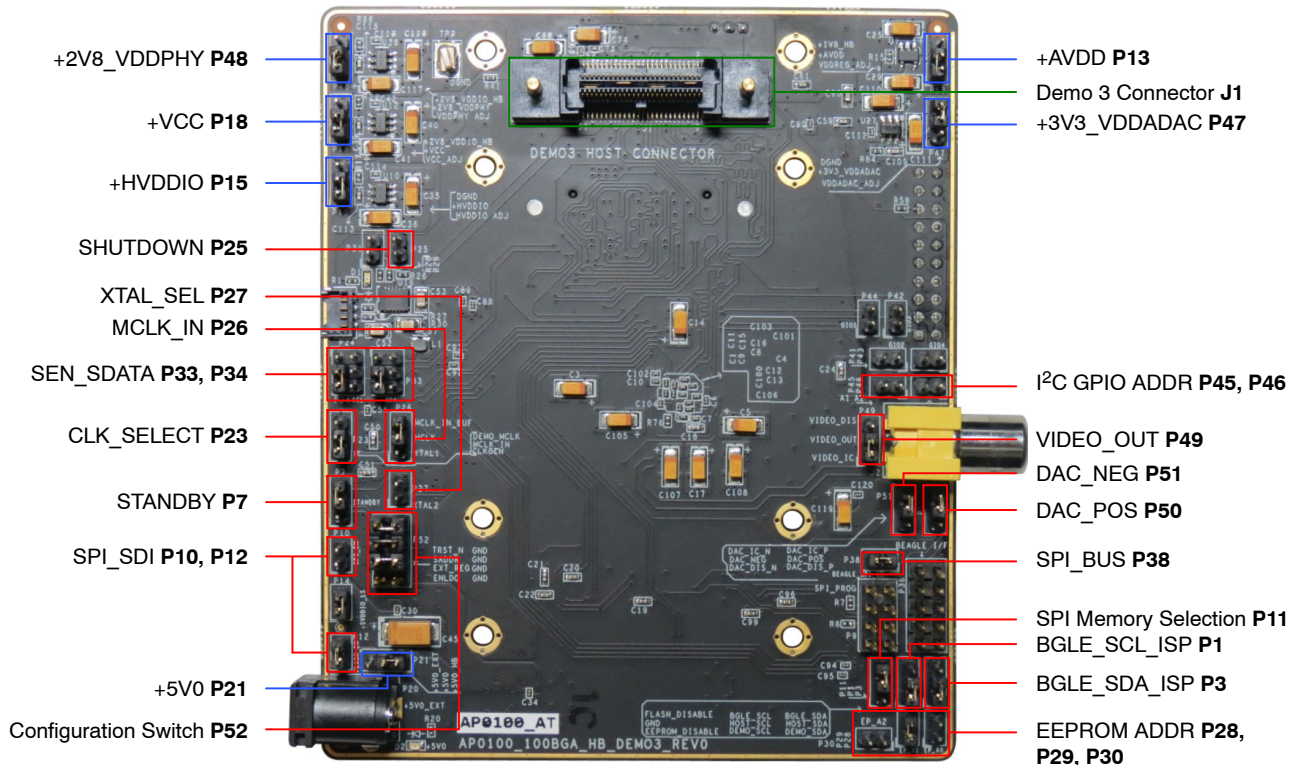
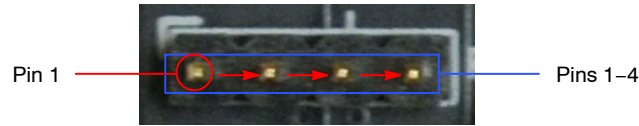


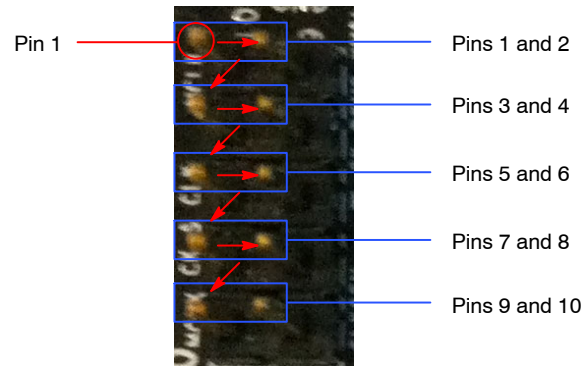
Figure 4. Bottom View of the Board

### Jumper Pin Locations

The jumpers on headboards start with Pin 1 on the leftmost side of the pin. Grouped jumpers increase in pin size with each jumper added.



**Figure 5. Pin Locations for a Single Jumper. Pin 1 is Located at the Leftmost Side and Increases as it Moves to the Right**



**Figure 6. Pin Locations and Assignments of Grouped Jumpers. Pin 1 is Located at the Top-Left Corner and Increases in a Zigzag Fashion Shown in the Picture**

### Jumper/Header Functions & Default Positions

**Table 1. JUMPERS AND HEADERS**

Jumper/Header No.	Jumper/Header Name	Pins	Description
P1	BGLE_SCL_ISP	1-2 (Default)	Demo 3 Baseboard I <sup>2</sup> C is Master
		2-3	Beagle Board is Master
P3	BGLE_SDA_ISP	1-2 (Default)	Demo 3 Baseboard I <sup>2</sup> C is Master
		2-3	Beagle Board is Master
P7	STANDBY	2-3 (Default)	Active Mode
		1-2	Standby Mode
		Open	Auto Serial Control
P11	SPI Memory Selection	2-3 (Default)	EEPROM Disable/Flash Enable
		1-2	Flash Disable/EEPROM Enable
P10, P12	SPI_SDI	P10 Open, P12 1-2 (Default)	HOST Mode
		P10 Open, P12 1-2	FLASH Mode
		P10 1-2, P12 1-2	AUTO Config Mode
P13	+AVDD	1-2(Default)	Adjusts On-Board Regulator to +1.8 V, Internal Regulator Use
		2-3	+1.8 V Supply from Demo 3
P15	+HVDDIO	1-2(Default)	Connects to On-Board +3.3 V Power Supply
		2-3	+1.8 V Supply from Demo 3

# AP0100AT2L00XUGAH3-GEVB

**Table 1. JUMPERS AND HEADERS** (continued)

Jumper/Header No.	Jumper/Header Name	Pins	Description
P18	+VCC	1-2(Default)	Connects to On-Board +VCC Power Supply
		2-3	External Power Supply Connection
P21	+5V0	1-2(Default)	Connects to On-Board +5.0 V Power Supply
		2-3	External Power Supply Connection
P23	CLK_SELECT	1-2(Default)	Selects On-Board 27 MHz Oscillator
		2-3	Selects External Demo 3 Clock
P25	SHUTDOWN	Open (Default)	Shutdown
		Closed	Normal Mode
P26	MCLK_IN	1-2 (Default)	Selects MCLK_IN Signal
		2-3	Selects Crystal Clock
P27	XTAL_SEL	Open (Default)	Selects Oscillator/Demo 3 Clock for XTAL2
		Closed	Selects Crystal Clock
P28, P29, P30	EEPROM ADDR	P28 Open, P29 Closed, P30 Open	EEPROM Address Set to 0xAA (Default)
		P28 Closed, P29 Closed, P30 Open	EEPROM Address Set to 0xA2
		P28 Closed, P29 Open, P30 Open	EEPROM Address Set to 0xA6
		P28 Open, P29 Open, P30 Open	EEPROM Address Set to 0xAE
P32	SEN_RST_OUT	2-3 (Default)	AP0100 Reset
		1-2	Demo 3 Reset
P33, P34	SEN_SDATA	3-5 (Default)	ISP Serial Control
		1-2	Beagle to ISP Serial Control
		1-3	Demo 3 Serial Control
		2-4	Beagle to Sensor Serial Control
P38	SPI_BUS	Closed (Default)	Beagle No Access to SPI Bus
		Open	Beagle Access to SPI Bus
P45, P46	I <sup>2</sup> C GPIO ADDR	P46 Open, P45 Closed (Default)	Address Set to 0x48
		P46 Open, P45 Open	Address Set to 0x4C
		P46 Closed, P45 Open	Address Set to 0x44
		P46 Closed, P45 Closed	Address set to 0x40
P47	+3V3_VDDADAC	1-2 (Default)	Connects to On-Board +VDDADAC Power Supply
		2-3	Connection to External Power Supply
P48	+2V8_VDDPHY	1-2 (Default)	Connects to On-Board +VDDPHY Power Supply
		2-3	Connection to External Power Supply
P49	VIDEO_OUT	2-3 (Default)	Active Low Pass Filter
		1-2	Discrete Low Pass Filter
P50	DAC_POS	2-3 (Default)	Active Low Pass Filter
		1-2	Discrete Low Pass Filter
P51	DAC_NEG	2-3 (Default)	Active Low Pass Filter
		1-2	Discrete Low Pass Filter

**Table 1. JUMPERS AND HEADERS** (continued)

Jumper/Header No.	Jumper/Header Name	Pins	Description
P52	Configuration Header	1–2 Open (Default)	ENLDO: Enable Internal Regulator
		1–2 Closed	ENLDO: Disable Internal Regulator
		3–4 Closed (Default)	EXT_REG: Internal Regulator Selected
		3–4 Open	EXT_REG: External Regulator Selected
		5–6 Closed (Default)	SADDR: Address Set to 0x90
		5–6 Open	SADDR: Address Set to 0xBA
		7–8 Closed (Default)	TRST_N: Normal Operation
		7–8 Open	TRST_N: Test Mode
SW1	RESET	N/A	When Pushed, 240 ms Reset Signal will be Sent to AP0100 Chip

**Interfacing to ON Semiconductor Demo 3 Baseboard**

The ON Semiconductor Demo 3 headboard has a similar 52-pin connector which mates with P6 of the adapter board. The ON Semiconductor Demo 3 baseboard has a similar

52-pin connector which mates with J1 of the adapter board. The four mounting holes secure the baseboard and the headboard with spacers and screws.



ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is as such not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and should as such only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

The board is delivered "AS IS" and without warranty of any kind including, but not limited to, that the board is production-worthy, that the functions contained in the board will meet your requirements, or that the operation of the board will be uninterrupted or error free. ON Semiconductor expressly disclaims all warranties, express, implied or otherwise, including without limitation, warranties of fitness for a particular purpose and non-infringement of intellectual property rights.

ON Semiconductor reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by ON Semiconductor shall not constitute any representation or warranty by ON Semiconductor, and no additional obligations or liabilities shall arise from ON Semiconductor having provided such information or services.

The boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. Should you purchase or use the board for any such unintended or unauthorized application, you shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

**FCC WARNING** – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by ON Semiconductor to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

ON Semiconductor does not convey any license under its patent rights nor the rights of others.

**LIMITATIONS OF LIABILITY:** ON Semiconductor shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if ON Semiconductor is advised of the possibility of such damages. In no event shall ON Semiconductor's aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

For more information and documentation, please visit [www.onsemi.com](http://www.onsemi.com).

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Email Requests to: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

### TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative