

AP0100AT2L00XUGAH-GEVB

AP0100AT Evaluation Board User's Manual



ON Semiconductor®

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 2x 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 2x Controlled MCLK
- Two Wire Serial Interface
- Parallel Interface
- HiSpi (High Speed Serial Pixel) Interface
- ROHS Compliant

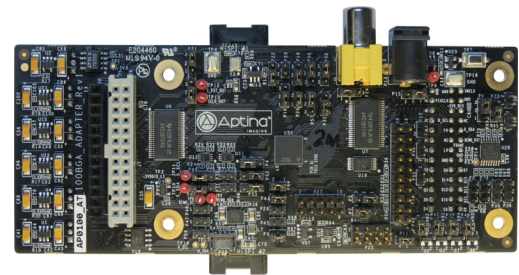


Figure 1. AP0100AT Evaluation Board

Block Diagram

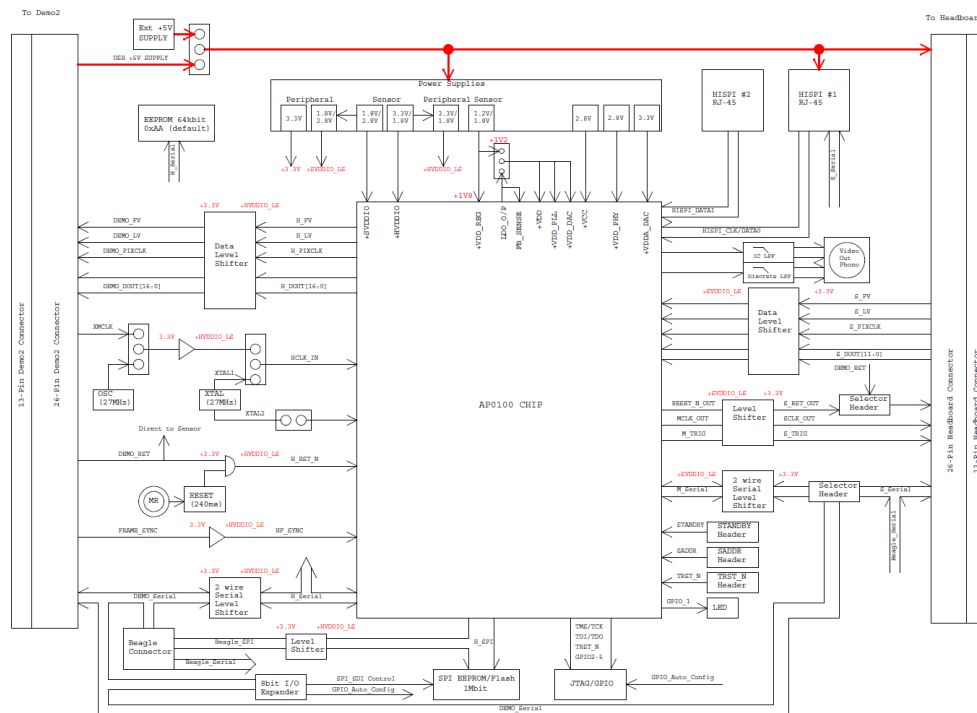


Figure 2. Block Diagram of AP0100AT2L00XUGAH-GEVB

This document, and the information contained herein, is CONFIDENTIAL AND PROPRIETARY and the property of Semiconductor Components Industries, LLC., dba ON Semiconductor. It shall not be used, published, disclosed or disseminated outside of the Company, in whole or in part, without the written permission of ON Semiconductor. Reverse engineering of any or all of the information contained herein is strictly prohibited.

© 2015, SCILLC. All Rights Reserved.

Top View

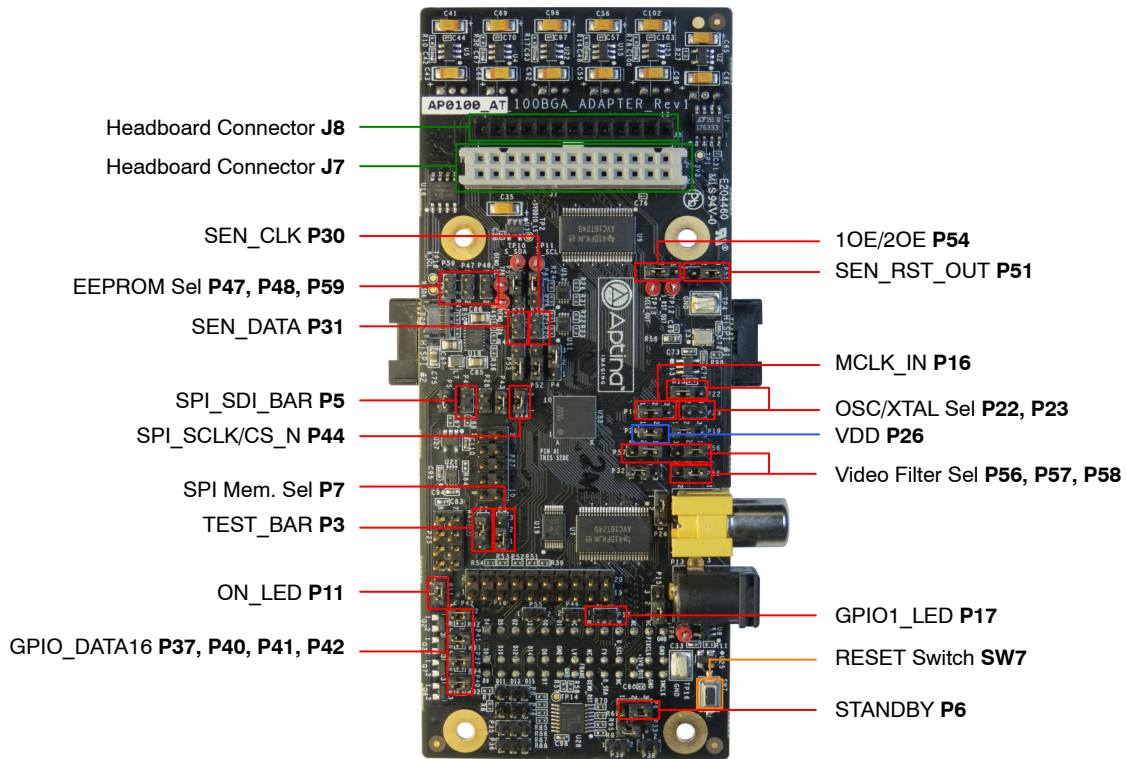


Figure 3. Top View of the Board with Default Jumpers

Bottom View

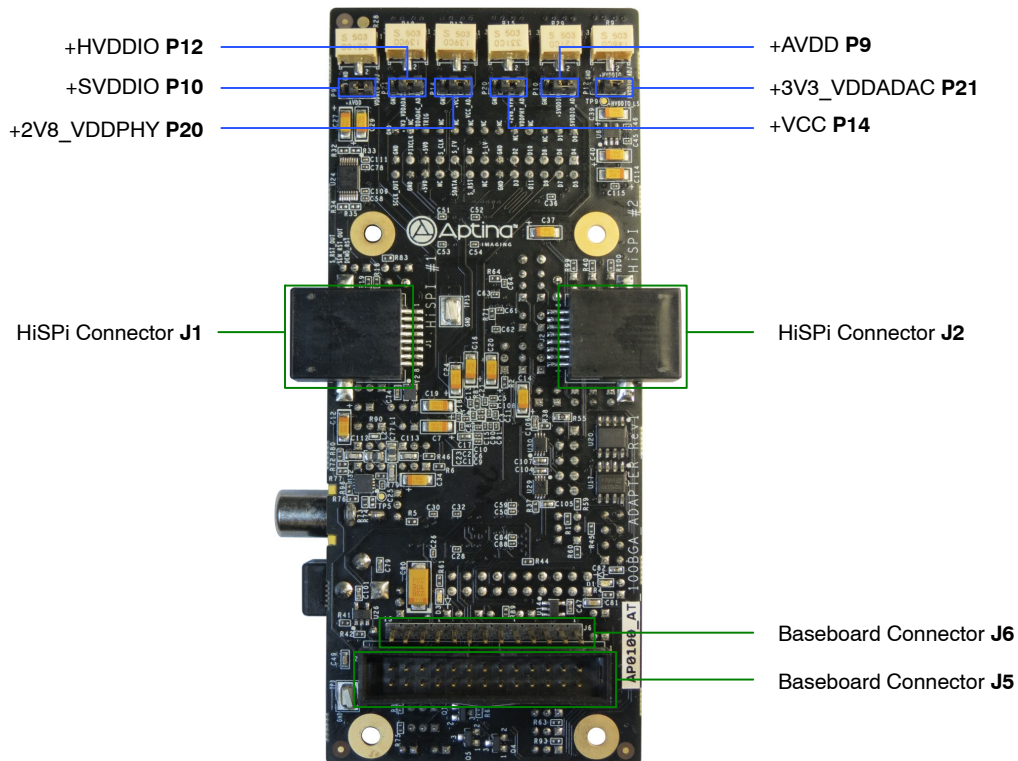


Figure 4. Bottom View of the Board

Jumper Pin Location

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.

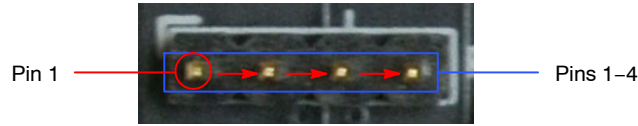


Figure 5. Pin Locations for a Single Jumper. Pin 1 is Located at the Leftmost Side and Increases as it Moves to the Right

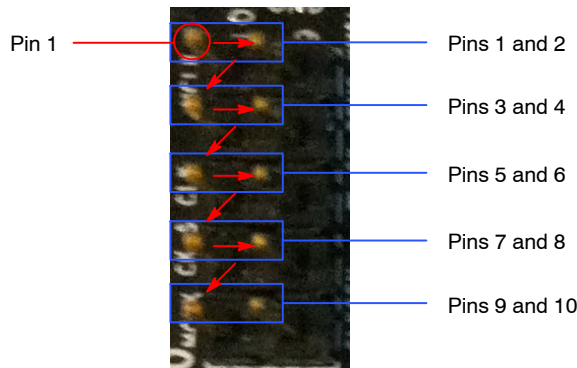


Figure 6. Pin Locations and Assignments of Grouped Jumpers. Pin 1 is Located at the Top-Left Corner and Increases in a Zigzag Fashion Shown in the Picture

Jumper/Header Functions & Default Positions

Table 1. JUMPERS AND HEADERS

Jumper/Header No.	Jumper/Header Name	Pins	Description
P3	TRST_BAR	Open	OTPM Programming Voltage Not Supplied
		2-3 (Default)	Set to Normal Mode
P4	SADDR	Open	Set to Test Mode
		Open	Analog Test 1 Header
P5	SPI_SDI_BAR	1-2 (Default)	GND; AP0100 in Host Mode
		Open	SPI_SDI_SEL; AP0100 in Flash Mode
P6	STANDBY	2-3 (Default)	Active Mode
		1-2	Standby Mode
		Open	I ² C IO Expander Control
P7	SPI Memory Selection	2-3 (Default)	EEPROM Disable/Flash Enable
		Open	Flash Disable/EEPROM Enable
P8	GPIO_5	Open (Default)	Serial IO Expander Control
		1-2	Set to Normal
		2-3	Set to Vertical Flip
P9	+AVDD	Closed (Default)	Connects to On-Board Regulator +1V8, Internal Regulator Use
		Open	Disconnects from On-Board Regulator +1V8, External Regulator Use
P10	+SVDDIO	3-5	Select Demo 3 Baseboard Clock
		2-4	Select Slave Clock (for Slave Sensor in Multi-Camera Mode)

Table 1. JUMPERS AND HEADERS (continued)

Jumper/Header No.	Jumper/Header Name	Pins	Description
P11	ON_LED	1-2 (Default)	Connects to On-Board to Indicate Power On
P12	+HVDDIO	1-2 (Default)	Connects to On-Board +HVDDIO Power Supply
		2-3	External Power Supply Connection
P14	+VCC	1-2 (Default)	Connects to On-Board +VCC Power Supply
		2-3	External Power Supply Connection
P15	+5V0	1-2 (Default)	USB +5V0_BUS Power Supply Connection
		2-3	Connects to On-Board +5V0_EXT Power Supply
P16	MCLK_IN	1-2 (Default)	Connects to On-Board Oscillator
		2-3	Connects to XMCLK (i.e. Clock Signal from Demo2 Baseboard)
P17	GPIO1_LED	Open (Default)	Off Frame LED
		Closed	On Frame LED
P19	+AVDD	Closed (Default)	Connects to On-Board Regulator +1V8, Internal Regulator Use
		Open	Disconnects from On-Board Regulator +1V8, External Regulator Use
P20	+2V8_VDDPHY	1-2 (Default)	Connects to On-Board +2V8_VDDPHY Power Supply
		2-3	External Power Supply Connection
P21	+3V3_VDDADAC	1-2 (Default)	Connects to On-Board +3V3_VDDADAC Power Supply
		2-3	External Power Supply Connection
P22, P23	Oscillator/Xtal Selection	P22 1-2, P23 Open (Default)	Selects Oscillator as AP0100 Input Clock
		P22 2-3, P23 Closed	Selects Crystal as AP0100 Input Clock
P24	EXT_REG	1-2 (Default)	Internal Regulator
		2-3	External Regulator
P26	VDD	1-2 (Default)	Internal Regulator +1V2_VDD
		2-3	External On-Board Regulator U2 Set +1V2
P28	UART Transceiver	Open (Default)	Turn Off UART Transceiver
		Closed	Turn On UART Transceiver
P30	SEN_CLK	Open (Default)	Beagle Serial No Access to Demo 2x & Sensor
		1-2	Beagle Serial Access to Demo 2x & Sensor
P31	SEN_DATA	Open (Default)	Beagle Serial No Access to Demo 2x & Sensor
		1-2	Beagle Serial Access to Demo 2x & Sensor
P32	ENLDO	1-2 (Default)	Enable Internal Regulator
		2-3	Disable Internal Regulator
P33	GPIO1_LED	1-2	Set to GPI
		2-3	Set to GPO
P34	GPIO_4	Open (Default)	Serial IO Expander Control
		1-2	Set to Normal
		2-3	Set to Horizontal Mirror
P35	GPIO_3	Open (Default)	Serial IO Expander Control
		1-2	Set to NTSC
		2-3	Set to PAL
P36	GPIO_2	Open (Default)	Serial IO Expander Control
		1-2	Set to No Pedestal
		2-3	Set to Pedestal
P37	GPIO_DATA16	1-2 (Default)	Auto-Configuration Access
		Open	JTAG/UART Access

Table 1. JUMPERS AND HEADERS (continued)

Jumper/Header No.	Jumper/Header Name	Pins	Description
P38, P39	IO Expander U38 Setting	P39 Open, P38 Closed (Default)	EEPROM Address Set to 0x48
		P39 Open, P38 Open	EEPROM Address Set to 0x4C
		P39 Closed, P38 Open	EEPROM Address Set to 0x44
		P39 Closed, P38 Closed	EEPROM Address Set to 0x40
P40	GPIO_DATA16	1-2 (Default)	Auto-Configuration Access
		Open	JTAG/UART Access
P41	GPIO_DATA16	1-2 (Default)	Auto-Configuration Access
		Open	JTAG/UART Access
P42	GPIO_DATA16	1-2 (Default)	Auto-Configuration Access
		Open	JTAG/UART Access
P43	SP1_SDO/SDI	1-2 (Default)	Beagle SPI No Access to Sensor SPI
		Open	Beagle SPI Access to Sensor SPI
P44 P44	SP1_SCLK/CS_N	1-2 (Default)	Beagle SPI No Access to Sensor SPI
		Open	Beagle SPI Access to Sensor SPI
P45	SPI_SDI	Open (Default)	Data or GND; AP0100 in Flash/Host Mode
		1-2	High Z; AP0100 in Auto-Config Mode
P47, P48, P59	Serial I ² C EEPROM Address	P47 Closed, P48 Open, P59 Open	EEPROM Address Set to 0xAA (Default)
		P47 Closed, P48 Open, P59 Open	EEPROM Address Set to 0xA2
		P47 Open, P48 Closed, P59 Open	EEPROM Address Set to 0xA6
		P47 Open, P48 Open, P59 Open	EEPROM Address Set to 0xAE
P49	SEN_SCLK	2-3 (Default)	AP0100 Serial Control
		1-2	Demo 2× Serial Control
P50	SEN_SDATA	2-3 (Default)	AP0100 Serial Control
		1-2	Demo 2× Serial Control
P51	SEN_RST_OUT	2-3 (Default)	AP0100 Reset
		1-2	Demo 2× Reset
P52	BEAGLE_SCL	1-2 (Default)	Demo 2× Accessed
		2-3	Sensor Accessed
P53	BEAGLE_SDA	1-2 (Default)	Demo 2× Accessed
		2-3	Sensor Accessed
P54	1OE/2OE	1-2 (Default)	Enable Level Transistor U9
		2-3	Disable Level Transistor U9
P56, P57, P58	Video Filter Selection	1-2 (Default)	Active Low Pass Filter
		2-3	Discrete Low Pass Filter
SW7	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 2× baseboard has a similar 26-pin connector and 13-pin connector which mate with J5 and J6

of the headboard. The four mounting holes secure the baseboard and the headboard with spacers and screws.

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** 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 not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will 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 PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.

onsemi 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 **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

onsemi products including 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. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or 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 **onsemi** 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.

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

LIMITATIONS OF LIABILITY: **onsemi** 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 **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'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.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit www.onsemi.com.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

onsemi Website: 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