✓ This version (12 Aug 2017 07:50) was *approved* by Jadhav.Pranit, Harsha.
The Previously approved version (11 Aug 2017 12:42) is available.   🔖

EV-COG-BLEINTP1Z Connectivity Cog

Introduction

EV-COG-BLEINTP1Z board is a connectivity Cog board for MCU Cogs (EV-COG-AD3029LZ and EV-COG-AD4050LZ). This board enables wireless RF transceiver connectivity, Bluetooth Low Energy connectivity and WIFI connectivity for various IoT applications.

- The following ADI wireless RF daughter boards are supported via SPI interface
    - 🌐 ADF7023
    - 🌐 ADF7024
    - 🌐 ADF7030-1
    - 🌐 ADF7242

- BTLE - available on board and can be communicated via SPI interface
- WIFI - provision to support 🌐 ESP8266 via UART (not available in the kit)

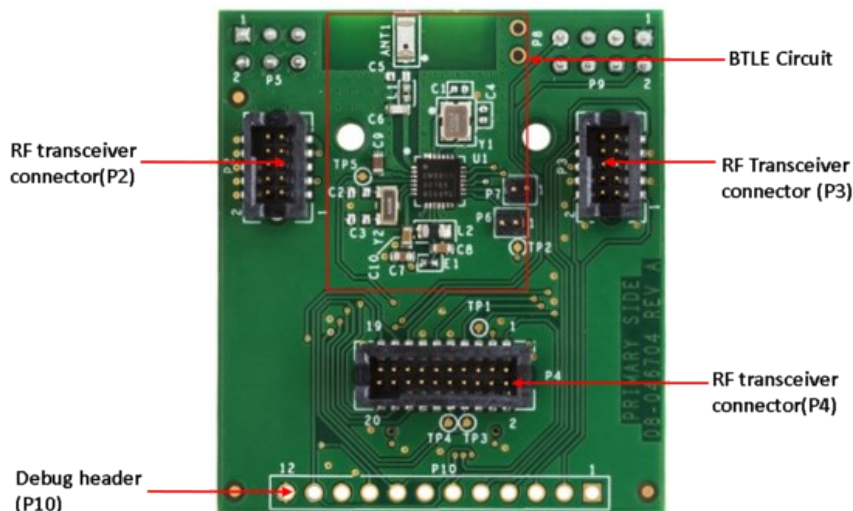This user guide describes the connector pin out, power options and jumper settings available on board.

Hardware details

Board image

Primary-side

Secondary-side
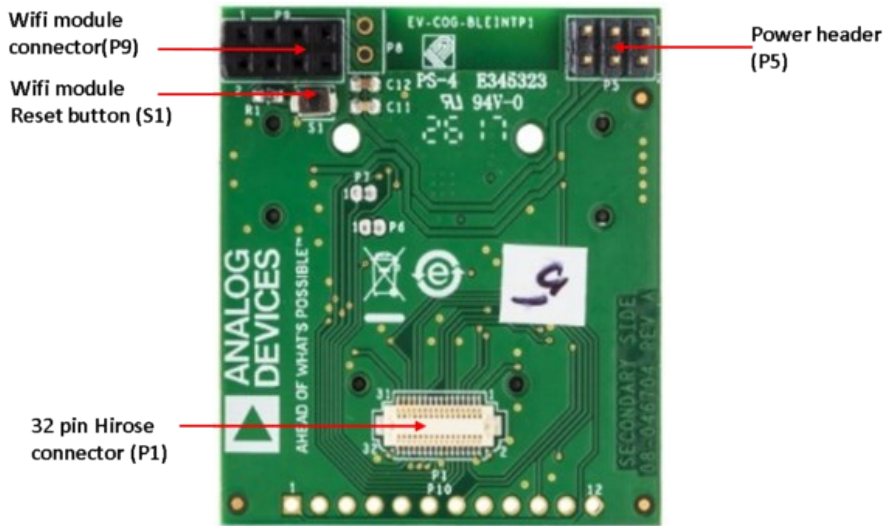
The board consists of

- 32 pin Hirose connector (P1)
- Power header (P5)
- Wireless RF transceiver connector (P2, P3, P4)
- Bluetooth Low Energy Chipset
- WIFI module connector (P9)
- Debug header/test points

Power options

The EV-COG-BLEINTP1Z board is powered up by means of the VDD supply from the MCU cog through the 32 pin connector (P1). The VDD supply is shared between RF transceiver, BLE and WIFI via jumper P5. Shunts must be placed in appropriate positions as shown in the following figure to power up different blocks.

> 💡 P5 can also be used for measuring current flowing through different rails by connecting an ammeter between VDD and VDD_RF/VDD_BLE/VDD_WIFI.

32 pin Hirose connector

The Hirose connector P1 interfaces the EV-COG-BLEINTP1Z board with the MCU Cog. The connector carries VDD, UART, SPI2 and GPIO signals from MCU cog board. The pinout details are given in the following table

Hirose connector (P1) pin number	pin name	MCU Cog signal name
1	VDD	VDD_RF
2	VDD	VDD_RF
3	GND	GND
4	GND	GND
5	WIFI_TX	MCU/UART0_RX
6	RF_INT	RF_INT
	_RX	MCU/UART0_TX

Hirose connector (P1) pin number	pin name	MCU Cog signal name
8	SPI2_CS3_RF	MCU/SPI2_CS3
9	GND	GND
10	SPI2_MISO	MCU/SPI2_MISO
11	ADF7030_EEPROM_CSN	RF_SYS_WAKE
12	SPI2_MOSI	MCU/SPI2_MOSI
13	ADF7030_EEPROM_VDD	MCU/GPIO08
14	SPI2_CLK	MCU/SPI2_CLK
15	GND	P.D [GND, 100K]
16	GND	GND
17	N.C.	P.U [VDD_RF, 100K]
18	SPI2_RDY	SPI2_RDY
19	N.C.	N.C
20	RF_SS	SS_TO_RF
21	BLE_CHIP_ENABLE	GPIO27
22	RF_RESET	GPIO_RF_RESET
23	RF_GPIO0	C2/54
24	RF_GPIO1	C2/55
25	RF_GPIO5	C2/58
26	N.C.	RF_SYS_WAKE
27	RF_GPIO4	C2/59
28	SPI2_CS0_BLE	SPI2_CS0
29	GND	GND
30	GND	GND
31	VDD	VDD_RF
32	VDD	VDD_RF

Wireless RF transceiver connectors

The wireless RF transceiver connectors consist of three connectors P1, P2 and P3, which support ADF7023, ADF7024, ADF7030, ADF7030-1 and ADF7242 RF transceiver daughter boards. Pinout details are given in the following table.

Connector	Pin number	Signal name	ADF7023 signal name	ADF7024 signal name	ADF7242 signal name	ADF7030-1 signal name
P2	1	N.C	GND	NC	DGUARD (VDD_DIG)	NC
	2	GND	GND	GND	GND	GND
	3	XOSC26N	Xosc26N	Xosc26N	Xosc26N	Xosc26N
	4	GND	GND	GND	GND	GND
	5	N.C	NC	NC	NC	NC
	6	GND	GND	GND	GND	GND
	7	VDD_RF	VDD	VDD	NC	NC
	8	GND	GND	GND	GND	GND

Connector	Pin number	Signal name	ADF7023 signal name	ADF7024 signal name	ADF7242 signal name	ADF7030-1 signal name
	9	VDD_RF	VDD	VDD	NC	NC
	10	GND	GND	GND	GND	GND
P3	1	ATB1/GPIO6	ATB1/OSC32P/GP5	ATB1/GP5	GP7/XOSC32K	GPIO6
	2	ATB2/GPIO7	ATB2/OSC32N	ATB2	ATB2/XOSC32K	GPIO7
	3	GND	GND	GND	GND	GND
	4	GND	GND	GND	GND	GND
	5	VDD_RF	VDD	NC	VDD	VDD
	6	VDD_RF	VDD	NC	VDD	VDD
	7	GND	GND	GND	GND	GND
	8	ATB3	ATB3	ATB3	ATB3	NC
	9	VREF	ADCVREF	NC	NC	NC
	10	ATB4	ATB4	ATB4	ATB4	NC
P4	1	RF_RESET	NC	NC	RXEN_GP6	RSTN
	2	GND	GND	GND	GND	GND
	3	RF_GPIO4	GP4	GP4	TXEN_GP5	GPIO3
	4	GND	GND	GND	GND	GND
	5	SPI2_CS3_RF	CSN	CSN	CSN	CSN
	6	GND	GND	GND	GND	GND
	7	SPI2_MOSI	MOSI	MOSI	MOSI	MOSI
	8	ADF7030-1_EEPROM_CSN	NC	GND	NC	EEPROM_CSN
	9	GND	GND	GND	GND	GND
	10	ADF7030-1_EEPROM_VDD	NC	NC	NC	EEPROM_VDD
	11	SPI2_CLK	SCLK	SCLK	SCLK	SCLK
	12	GND	GND	GND	GND	GND
	13	GND	GND	GND	GND	GND
	14	GND	GND	GND	GND	GND
	15	SPI2_MISO	MISO	MISO	MISO	MISO
	16	RF_GPIO0	GP0	GP0	DR_GP0	GPIO1
	17	RF_INT	IRQ_GP3	IRQ_GP3	IRQ_GP4	GPIO4
	18	RF_GPIO1	GP1	GP1	DT_GP1	GPIO0
	19	RF_SS	GP2	GP2	TRCLK_CKO_GP3	GPIO2
	20	RF_GPIO5	NC	NC	TRFS_GP2	GPIO5

The following figure shows EV-COG-BLEINTP1Z connected to ADF7023DBExZ daughter board.

> 📝 Install the jumper between VDD_BLE and VDD in addition to VDD_RF

Bluetooth Low Energy Chipset

The EV-COG-BLEINTP1Z has a Bluetooth low energy chipset EM9304 from EM Microlectronic. The chipset contains BLE protocol stack along with some profiles. The MCU cog communicates to EM9304 by means of SPI2. The user will need to send BLE configuration commands and data over SPI. The following table captures the signals connected to EM9304

Component	EM9304 pin number	EM9304 pin name	MCU cog signal
U1	4	ENABLE	GPIO27
	15	GPIO0	SPI2_CS0
	16	GPIO1	SPI2_CLK
	17	GPIO2	SPI2_MISO
	18	GPIO3	SPI2_MOSI
	20	GPIO4	SPI2_RDY

> ⚠️ The Jumpers P6 and P7 are provided to isolate SPI_CS and SPI_CLK lines connected to BLE while working with RF transceiver daughter cards. But shunts must be placed on these jumpers for BLE to work.

WIFI module connector

The connector P9 supports the WIFI module ESP8266. The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack. The module communicates to MCU cog via UART TX and UART RX lines. Each ESP8266 module comes pre-programmed with an AT command set firmware which allows easy programing over UART. For more information & support concerning the WiFi module please follow the links below:

- 🌐 Product Page/Details
- 🌐 AT Command List
- 🌐 Hardware/Software Details
- 🌐 Github Details

The following figure shows the orientation of the module.

Pinout details of the module connector are given below.

Component	module pin number	Module pin function	cog signal
P9	1	DGND	GND
	2	WIFI TX	MCU/UART0_RX
	3	GPIO0	WIFI_GPIO0
	4	Chip enable	VDD_WIFI
	5	GPIO2	WIFI_GPIO2
	6	WIFI Reset	WIFI_RESET
	7	WIFI RX	MCU/UART0_TX
	8	DVDD	VDD_WIFI

> 📝 This WiFi module is NOT developed by Analog Devices and it will not be shipped along with this board.

Debug header

Test points are provided to probe some specify signals w.r.t RF transceiver daughter cards, BLE and WIFI module. The pinout details are given in the following table.

Test point/Debug header	pin number	Cog signal
TP1	1	SPI2_CS3_RF
TP2	1	SPI2_CS0_BLE
TP3	1	ADF7030-1_EEPROM_CSN
TP4	1	ADF7030-1_EEPROM_VDD
TP5	1	BLE_CHIP_ENABLE
P8	1	WIFI_GPIO0
	2	WIFI_GPIO2
P10	1	XOSC26N
	2	ATB1/GPIO6
	3	ATB2/GPIO7

Test point/Debug header	pin number	Cog signal
	4	ATB3
	5	ATB4
	6	VREF
	7	RF_GPIO0
	8	RF_GPIO1
	9	RF_GPIO4
	10	RF_GPIO5
	11	RF_SS
	12	GND

Schematics, PCB layout, Bill of materials

EV-COG-BLEINTP1Z Rev A Design and Integration Files

- Schematics (PDF)
- Bill of materials (zip)
- Fabrication Files (Zip)
- Assembly Files (Zip)

End Document

Back

Ahead of What's Possible

15,000	4,700+	125,000	50+
Problem Solvers	Patents	Customers	Years

ADI enables our customers to interpret the world around us by intelligently bridging the physical and digital with unmatched technologies that sense, measure and connect. We collaborate with our customers to accelerate the pace of innovation and create breakthrough solutions that are ahead of what's possible.

See the Innovations

Analog Devices. Dedicated to solving the toughest engineering challenges.

SOCIAL

QUICK LINKS

About ADI	Analog Dialogue
Careers	Contact us
Investor Relations	News Room
Quality & Reliability	Sales & Distribution

LANGUAGES

English
简体中文
日本語
Русский

NEWSLETTER

Interested in the latest news and articles about ADI products, design tools, training and events? Choose from one of our 12 newsletters that match your product area of interest, delivered monthly or quarterly to your inbox.

Sign Up

Sitemap | Privacy & Security | Terms of use