US159-DA16600EVZ

DA16600 Pmod™ Board

The US159-DA16600EVZ is an ultra-low power Wi-Fi + Bluetooth™ low energy combo Pmod module that provides both low power Wi-Fi and low power BLE functionality to your device. The DA16600 integrates the low power Wi-Fi DA16200 SoC and the low power Bluetooth LE DA14531 SoC on a single module. Together they deliver long battery life and low power consumption in a convenient form factor. As a single integrated system, standard functions are available such as provisioning Wi-Fi through the BLE connection and Wi-Fi/BLE coexistence.

The US159-DA16600EVZ features a Type 3A Pmod connector, incorporates the DA16600 module, and combines low power Wi-Fi with low power Bluetooth capability in a single module. With its standard connector and software support, the US159-DA16600EVZ is ideal for the Renesas Quick-Connect IoT to rapidly create an IoT system.

Kit Contents

- US159-DA16600EVZ Pmod Board

Features

- DA16600MOD-AAC4WA32 module
  - 3.3V supply voltage
  - Integrated chip antenna
  - Cortex-M4F+ at 30MHz to 160MHz and Cortex M0+ at 16MHz
  - 802.11b/g/n radio PHY, 2.4GHz
  - Bluetooth 5.1 core qualified
  - SoC runs full OS and TCP/IP stack
  - Memory: 256 kB ROM, 512kB RAM, 8kB OTP, 48B retention memory and 32Mb SPI Flash
  - RF regulatory certifications: FCC, IC, CE, KC, TELEC, and SRRC
  - Wi-Fi Alliance certifications: Wi-Fi CERTIFIED b/g/n, WPA, WPA2, and WPA3
- Standardized Type 3A Pmod connector supports an expanded UART interface
- LED (D1) to aid in user software debug
- 10-pin 1.27mm pitch Arm Cortex-Debug connector (J2) for software development and debug support

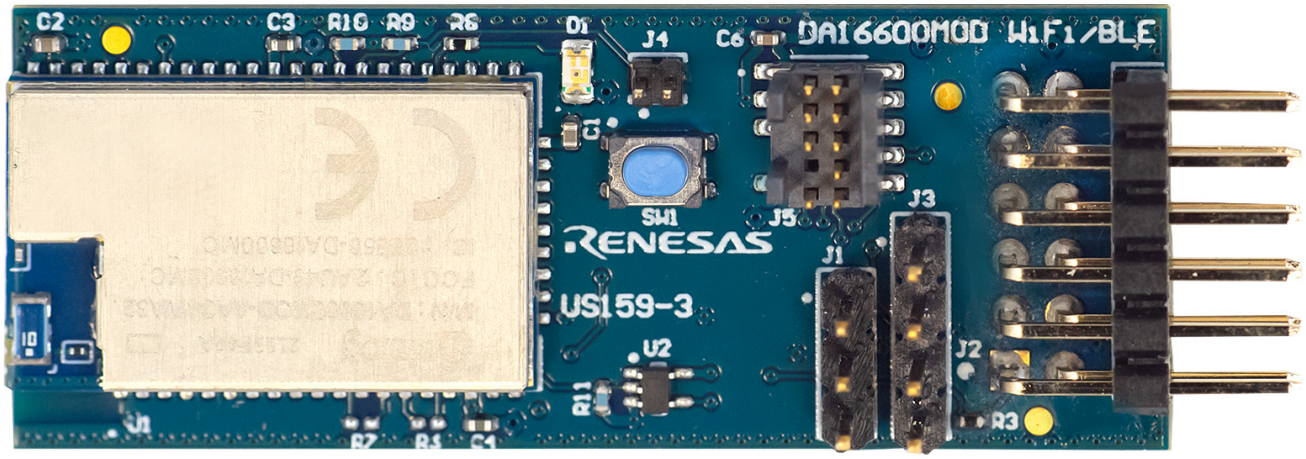


Figure 1. US159-DA16600EVZ Pmod Board (XE Evaluation Board)

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Contents

1. Functional Description . . . 3

2. Setup . . . 3

2.1 Required or Recommended User Equipment . . . 3

2.2 Software Installation and Usage . . . 3

2.3 Kit Hardware Connections . . . 3

3. Schematic Diagram . . . 5

4. Bill of Materials . . . 6

4.1 Board Layout . . . 7

5. Ordering Information . . . 9

6. Revision History . . . 9

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1. Functional Description

The US159-DA16600EVZ functions as a Wi-Fi and Bluetooth wireless building block to create a custom IoT system solution. This module adds Wi-Fi and Bluetooth connectivity capability to any IoT system that supports Pmod expansion modules. For a full list of available sensor Pmod boards, visit the Quick-Connect IoT web page on the Renesas website.

2. Setup

2.1 Required or Recommended User Equipment

The following additional lab equipment is recommended for using the board (and is sold separately):

- An MCU board that supports Type 3A Pmod.

2.2 Software Installation and Usage

For the latest version of the e2 studio, use the Renesas website, and for the latest connectivity support and details on creating customized IoT system solutions, visit the Quick-Connect IoT site.

The Renesas Flexible Software Package (FSP) is an enhanced software package designed to provide easy-to-use, scalable, high-quality software for embedded system designs using Renesas RA family of Arm Microcontrollers. With the support of a new Arm TrustZone and other advanced security features, FSP provides a quick and versatile way to build secure, connected IoT devices using production-ready drivers, Azure RTOS, FreeRTOS, and other middleware stacks.

The firmware for operating the module is pre-loaded on the US159-DA16600EVZ Pmod module.

Firmware	
DA16600 v3.2.2.0	Standard DA16600 SDK

For more details on the application, see the documentation, *Quick-Connect IoT DA16600 Provisioning Demo*.

2.3 Kit Hardware Connections

Follow these procedures to set up the kit as shown on Figure 2.

1. Ensure the MCU evaluation kit being used has a Pmod connector set to Type 3A. (For help, refer to the kit hardware manual.)
2. Plug in the US159-DA16600EVZ to the Pmod connector on the MCU evaluation kit, and be careful to align Pin 1 on the module to Pin 1 on the MCU kit.
3. The US159-DA16600EVZ is now ready to be used in the system. Follow the MCU kit instructions for connecting and powering up the evaluation kit.

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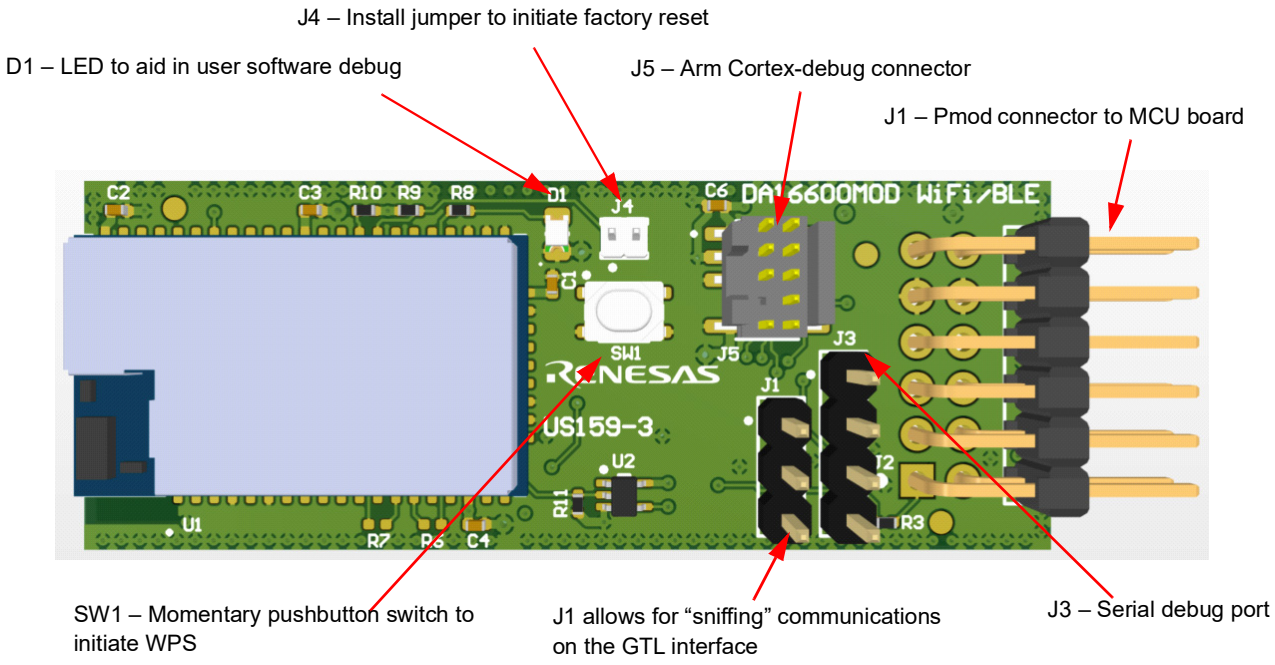


Figure 2. Evaluation Kit Details

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3. Schematic Diagram

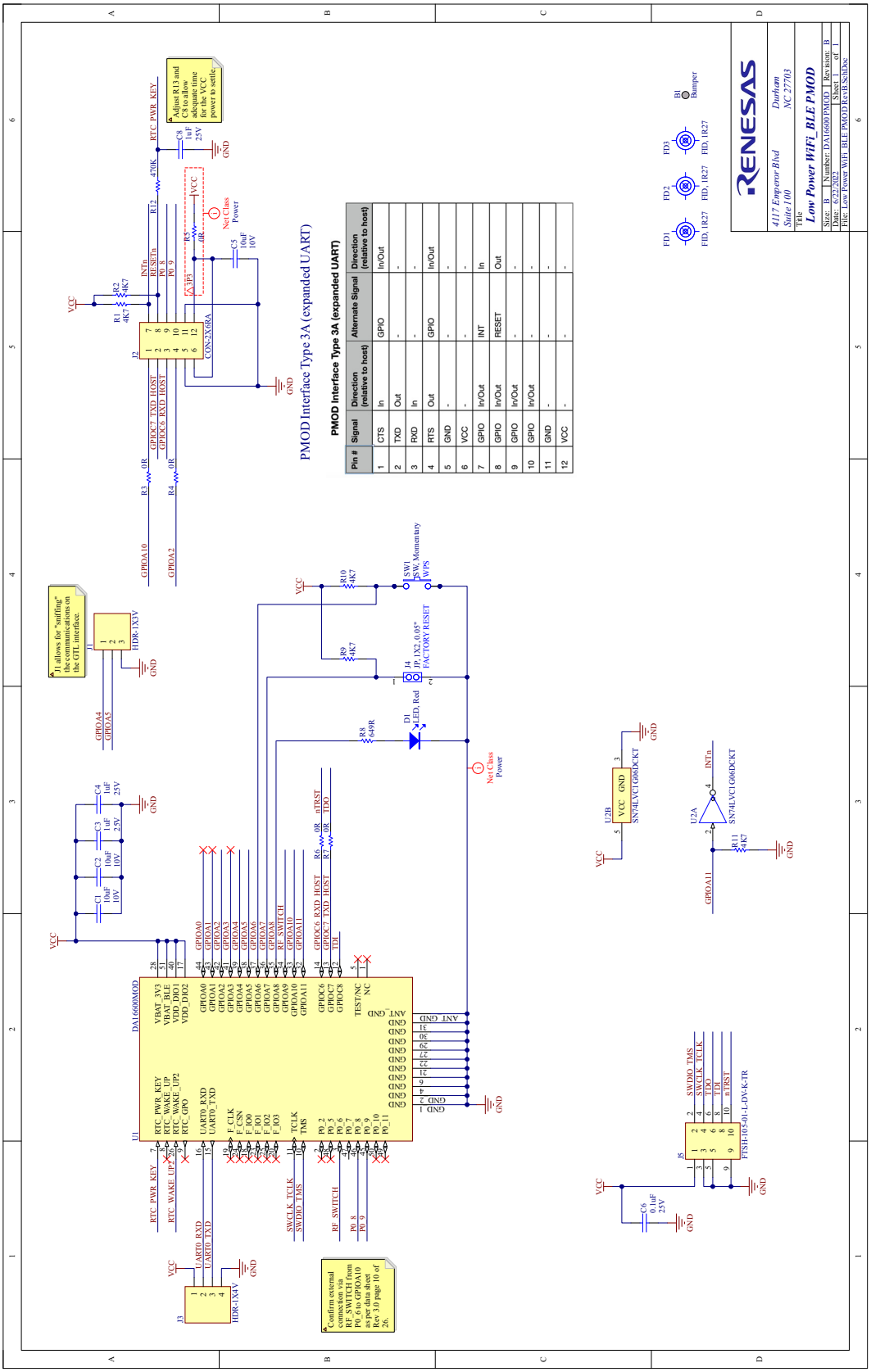


Figure 3. US159-DA16600EVZ Schematic Diagram

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4. Bill of Materials

Qty	Reference Designator	Description	Manufacturer	Manufacturer Part Number
1	B1	Bumper, Cylindrical, 0.375" D, 0.19" HSM	Bumper Specialities	BS35CL01X02RP
2	C1, C2	Capacitor, 10µF, 10V, SM 0603, Multilayer Ceramic, X5R, RoHS	Samsung Electro-Mechanics	CL05A106MP5NUNC
3	C3, C4, C8	Capacitor, 1µF, 25V, SM 0402, Multilayer Ceramic, X5R, RoHS	Taiyo Yuden	TMK105BJ105KV-F
1	C5	Capacitor, 10µF, 10V, SM 0603, Multilayer Ceramic, X5R, RoHS	Murata	GRM188R61A106KE69D
1	C6	Capacitor, 0.1µF, 25V, SM 0402, Multilayer Ceramic, X7R, RoHS	Taiyo Yuden	TMK105B7104KVHF
1	D1	LED, Red, Clear, 0805, SM, RoHS	Wurth Elektronik	150080RS75000
1	J1	3 Pin, 0.1", Single Row, Vertical, Header, RoHS	Sullins	PBC03SAAN
1	J2	Connector, 2×6, 0.1", PMOD, Right Angle, Unshrouded, RoHS	Harwin	M20-9950645
1	J3	4 Pin, 0.1", Single Row, Vertical, Header, RoHS	Sullins	PBC04SAAN
1	J4	1X2 Pin, 0.05", Single Row, Vertical, Header, RoHS	Sullins	GRPB021VWVN-RC
1	J5	Connector, 2×5 Header, Vertical, 1.27mm Pitch, Pin 7, SM, RoHS	Samtec	FTSH-105-01-L-DV-007-K
5	R1, R2, R9, R10, R11	Resistor, 4.7kΩ, 1/10W, 1%, 100ppm, SM, 50 WV, 100 OV, Thick Film, 0402, RoHS	KOA Speer	RK73H1ETTP4701F
3	R3, R4, R5	Resistor, 0Ω, 1/10W, 1%, 100ppm, SM, 50 WV, 100 OV, Thick Film, 0402, RoHS	KOA Speer	RK73Z1ETTP
1	R8	Resistor, 649Ω, 1/10W, 1%, 100ppm, SM, 50 WV, 100 OV, Thick Film, 0402, RoHS	KOA Speer	RK73H1ETTP6490F
1	R12	Resistor, 470KΩ, 1/10W, 1%, 100ppm, SM, 50 WV, 100 OV, Thick Film, 0402, RoHS	KOA Speer	RK73H1ETTP4703F
1	SW1	Switch, Pushbutton, Top Actuated, SM, RoHS	C&K Components	PTS810 SJG 250 SMTR LFS
1	U1	DA16600MOD, WiFi, 802.11b/g/n, Bluetooth LE, Transceiver, WiFi CPU - 256kB ROM, 512kB RAM, 8 kB OTP, 48 kB NV Memory, BLE CPU - 48 kB RAM, 144 kB ROM, 32 kB OTP, 51-SMD Module, SM, RoHS	Dialog Semiconductor	DA16600MOD-AAC4WA32
1	U2	IC, Digital, Buffer, Inverting, Open Drain, SM, SC-70-5, RoHS	Texas Instruments	SN74LVC1G06DCKT

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4.1 Board Layout

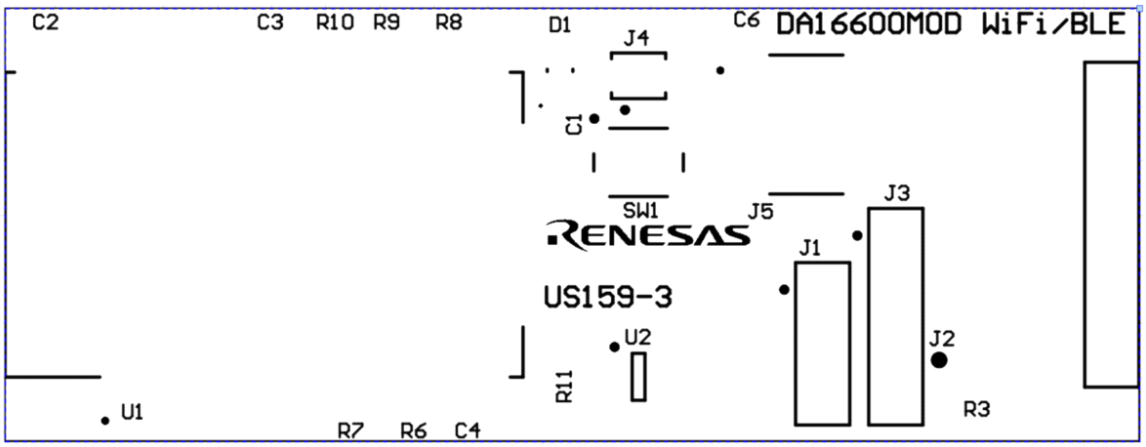


Figure 4. Silkscreen Top

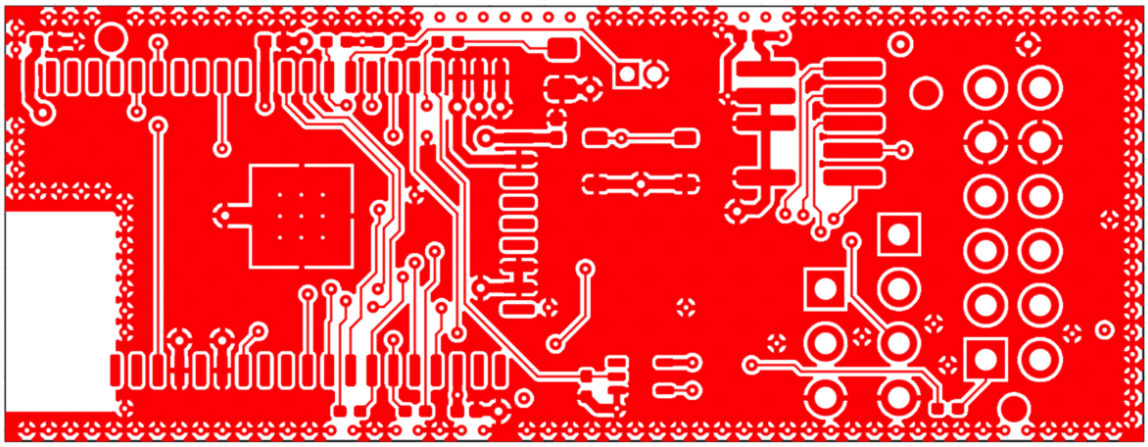


Figure 5. Copper Top

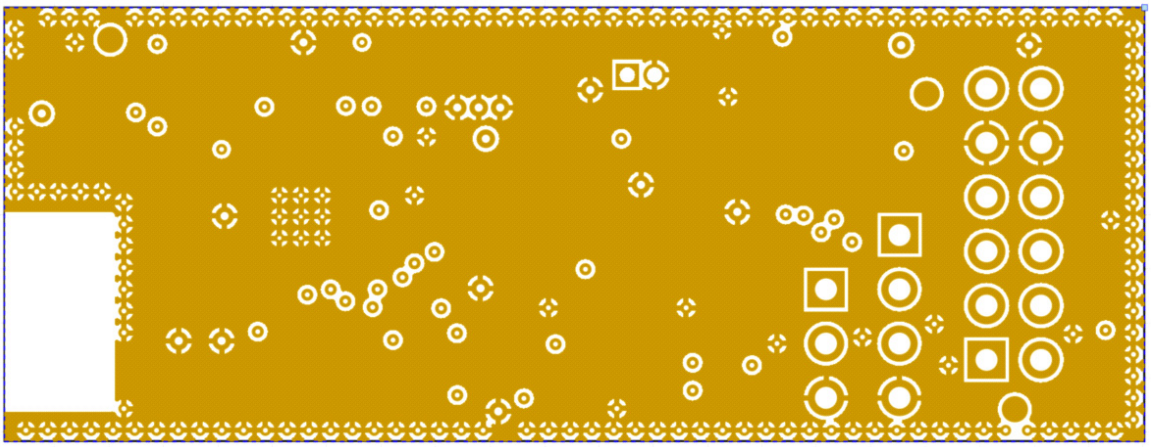


Figure 6. Copper L1 Layer

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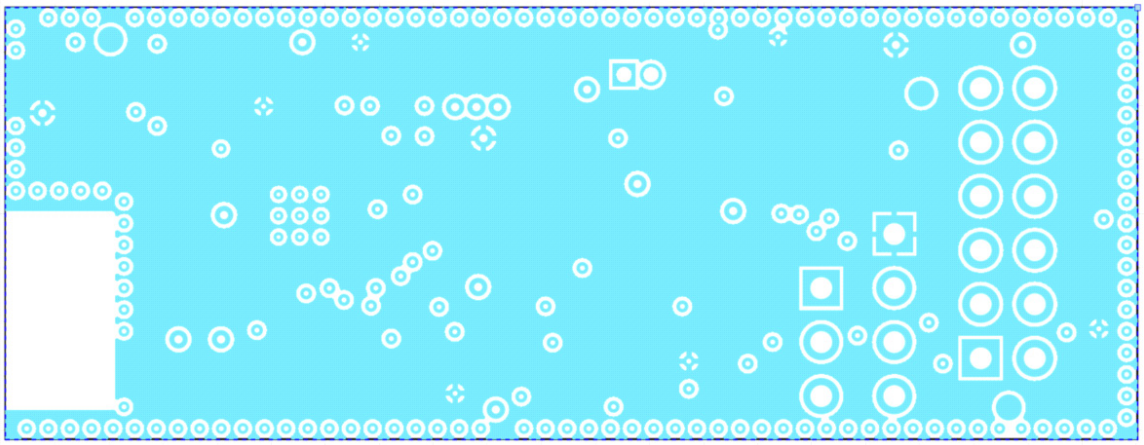


Figure 7. Copper L2 Layer

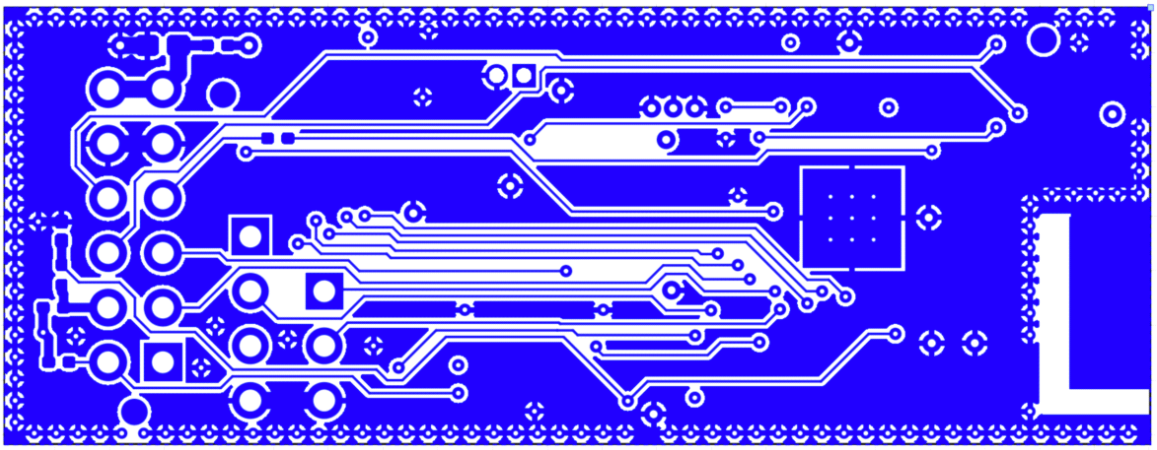


Figure 8. Copper Bottom

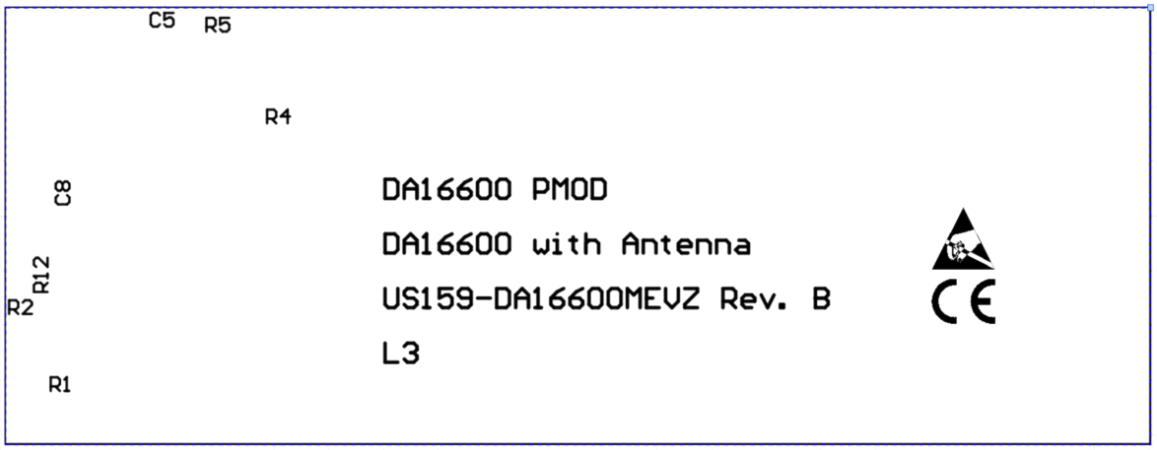


Figure 9. Silkscreen Bottom

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5. Ordering Information

Part Number	Description
US159-DA16600EVZ	DA16600 Pmod Board

6. Revision History

Revision	Date	Description
1.01	Sep 8, 2023	Replaced Figure 1 with updated image
1.00	Jun 27, 2022	Initial release

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