



CMP961X MULTI- PROTOCOL HOSTED MODULE

Datasheet & Hardware Integration Guide

TRANSCEIVER IC.....	4
HOST DRIVER SUPPORT	4
HOST INTERFACE OPTIONS.....	4
WLAN.....	4
Bluetooth	4
802.15.4.....	4
RADIO CO-EXISTENCE OPTIONS.....	4
WCI-2.....	4
PTA.....	5
POWER SUPPLY.....	5
VCC.....	5
VIO.....	5
Power Supply	5
VCC and Bypass Capacitors.....	5
HARD RESET	5
GROUNDING CHECK LIST	6
ABSOLUTE MAXIMUM RATINGS	6
RECOMMENDED OPERATING CONDITIONS	6
POWER CONSUMPTION	6
WLAN TX Power Consumption.....	6
RF PERFORMANCE.....	7
Wi-Fi 2.4/5 GHz Band RF Receiver Specifications	7
Wi-Fi 2.4/5 GHz Band RF Transmitter Specifications	8
Bluetooth 2.4 GHz Band RF Tx/Rx Specifications.....	8
802.15.4 2.4 GHz Band RF Tx/Rx Specifications	8
I/O PIN ASSIGNMENTS	9
CMP961x-1(C) and CMP961x-2(C)	9
MODULE DIMENSIONS	10
CMP961x-1x and CMP961x-2x	10
CMP961x-9.....	10
MODULE PINOUT	11

CMP961x-1(C) and CMP961x-2(C)	11
CMP961x-9	11
MODULE LAND FOOTPRINT	11
CMP961x-9	11
CMP961x-1(C) and CMP961x-2(C)	12
HOST PCB PLACEMENT AND MECHANICAL HOUSING	12
Module Ground Plane and Keep-Out	12
Mechanical Housing and Antenna Concerns	13
Recommended Reflow Profile	13
Pb-Free Solder Paste	13
Cleaning	14
Optical Inspection	14
Repeating Reflow Soldering	14
Wave Soldering	14
Hand Soldering	14
Rework	14
Caution	14
Warning	14
Additional Grounding	15
AGENCY CERTIFICATIONS	15
FCC Compliance Statement Part 15.19, Section 7.15 of RSS-GEN	15
Warning (Part 15.21)	15
20 cm Separation Distance	15
OEM Responsibility to the FCC and IC Rules and Regulations	15
IC Certification – Industry Canada Statement	15
Certification IC - Déclaration d'Industrie Canada	16
Section 14 of RSS-210	16
L'article 14 du CNR-210	16
ANTENNA INFORMATION	16
Approved Antennas	16
SHIPMENT, HANDLING AND STORAGE	17
Tape and Reel	17



Handling 17

Warning..... 17

Warning..... 17

Moisture Sensitivity Level (MSL)..... 17

Storage 17

REFERENCES..... 18

REVISION HISTORY 19

DISCLAIMER..... 19

FOR MORE INFORMATION 19

TECHNICAL ASSISTANCE..... 19

TRANSCEIVER IC

The CMP961x, utilizing the NXP IW611 and IW612 SoC, is a multiprotocol combo device with integrated MCU core dedicated to managing host processor commands and incoming wireless communications. The IW611 features Wi-Fi 6 and Bluetooth 5.4, while the IW612 adds 802.15.4. This 1x1 Wi-Fi transceiver supports connectivity at both 2.4 and 5 GHz. WLAN host interface is SDIO, the Bluetooth host interface is UART and the 802.15.4 interface for Thread is SPI. The module supports onboard arbitrated transmit and receive operation of Wi-Fi, Bluetooth and 802.15.4.

HOST DRIVER SUPPORT

The CMP961x drivers are supported on a variety of host platforms. There are drivers available for most standard operating systems including Android, Linux and FreeRTOS. Additionally, most of the available hosts are compatible with the Matter project (formerly Project CHIP). Please contact CEL for details on available drivers, Quick Start Guides and Driver Porting Guides.

HOST INTERFACE OPTIONS

WLAN

SDIO is the supported host interface on the CMP961x for WLAN. Although other host interfaces are identified on the IW61x datasheet, the current software driver only supports SDIO.

NOTE: PCB routing of the SDIO lines is important. Do not leave any stubs on the traces and limit the length of the DATA traces so not to exceed that of the CLK trace. Match the lengths of the SDIO lines as closely as possible.

Bluetooth

UART is the Bluetooth host interface, and HCI is supported.

802.15.4

SPI is the supported host interface on the CMP9612 alone.

Consult the IW61x datasheet for detailed specifications on the SDIO, SPI, and UART interface and signal routing best practices and standards.

RADIO CO-EXISTENCE OPTIONS

CMP961x supports the latest NXP PTA architecture and should be generally available in the latest driver release. In addition, support for external radio co-existence is provided through an external interface.

The advanced coexistence framework provides packet traffic arbitration (PTA) for the following use cases:

- Coexistence between internal Wi-Fi and internal Bluetooth radios
- Coexistence between internal Wi-Fi and Bluetooth radios and an external radio such as 802.15.4. The external radio can be connected to the PTA coexistence interface or WCI-2 coexistence interface. WCI-2 message format and message type comply with Bluetooth special interest group (SIG) core specification volume 7 part C.

WCI-2

CMP961x supports WCI-2 using the following pins:

- WCI-2_DOUT
- WCI-2_DIN

PTA

CMP961x supports PTA using the following pins. Note that these pins are multiplexed with the 802.15.4 host interface pins on CMP9612. If 802.15.4 is used on the CMP9612, you cannot use PTA, only WCI-2 is available.

- GPIO[12]/EXT_STATE/SPI_CLK
- GPIO[14]/EXT_GNT/SPI_RXD
- GPIO[20]/EXT_FREQ/SPI_INT
- GPIO[13]/EXT_REQ/SPI_CS
- GPIO[15]/EXT_PRI/SPI_TXD

POWER SUPPLY

CMP961x requires two input voltage rails. Since CMP961x includes an integrated PMIC, all voltages required by the IW611 and IW612 are generated by these two voltage rails.

VCC

The CMP961x VCC voltage rail (3.3V) provides the input to the integrated PMIC. The PMIC generates the following voltage rails required by the IW611 and IW612. The following information has no implications for Hardware Integration:

- VIO_RF
- VCC
- 2.2V VPA (via integrated PMIC)
- 1.8V (via integrated PMIC)
- 1.1V VCORE (via integrated PMIC)

VIO

The CMP961x VIO voltage rail (1.8V or 3.3V) sets the IO voltage level. This sets the following voltage rails required by the IW611 and IW612. Be sure that VIO matches that of your host. SDIO 3.0 is only supported at 1.8VIO:

- VIO_DUT
- VIO_SD

Power Supply

CEL recommends a power supply design for VCC with a ripple of no more than +/- 0.3Vpp. The VCC supply should be capable of sourcing 400 mA minimum.

VCC and Bypass Capacitors

- VCC trace should be thick, at least 20 mils to 40 mils
- VCC bypass capacitor (typically 10uF CERAMIC 16V X5R 0805).
- We recommend a 10 pF RF bypass capacitor close to VCC.

HARD RESET

To perform a hard reset on the CMP961x, the WL_DS# pin should be held low for a minimum of 100 ms. It is recommended that the firmware be unloaded by the host to allow for a proper reset and reload of the firmware.

GROUNDING CHECK LIST

- All ground pins should be connected to the ground plane. If thermals are used, we recommend combining webs no smaller than 20 mils.
- The module relies on the ground plane of its host printed circuit board for proper performance of the antenna. A flooded ground plane at least 1.5" x 1.5" is recommended for the top and bottom layers of the PCB. The 1.5" includes the flooded ground plane under the module and the surrounding ground plane (the total ground plane is larger than the module). This means a ground flood of 1.5" X 1.5" is recommended on layer 1 and 4 of a four layer board.
- CEL recommends ground vias from top to bottom layers in a grid spaced every 200 mil or less.

ABSOLUTE MAXIMUM RATINGS

NOTE: For additional information on electrical characteristics please see NXP datasheets.

Description	Min	Max	Unit
Storage temperature range	-40	85	°C
Power supply voltage (VCC)	3.0	3.6	V
I/O supply voltage (VIO)	0.99	3.6	V

RECOMMENDED OPERATING CONDITIONS

Description	Min	Typ	Max	Unit
Operating temperature range (CMP961x-1 and -1C)	0	-	70	°C
Operating temperature range (CMP961x -2, -2C and -9)	-40	-	85	°C
Supply Voltage (VCC)	3.14	3.3	3.46	V
Supply Voltage (VIO – 1.8V)	1.62	1.8	1.98	V
Supply Voltage (VIO – 3.3V)	2.97	3.3	3.47	V

POWER CONSUMPTION

WLAN TX Power Consumption

Wi-Fi Band (GHz)	Mode	Bandwidth (MHz)	TX Power (dBm)	Typical Current (VCC)	Unit
2.4	11b @ 1 Mbps	20	17	298	mA
	11g @ 54 Mbps	20	16	280	
	11n @ MCS0	40	14	273	
	11n @ MCS7	40	14	251	
	11ax @ MCS0 NSS1	40	12	259	
	11ax @ MCS11 NSS1	40	12	232	
5	11a @ 6 Mbps	20	16	398	mA
	11n @ MCS0	40	16	399	

	11n @ MCS7	40	16	362	
	11ac @ MCS0 NSS1	80	14	366	
	11ac @ MCS9 NSS1	80	14	321	
	11ax @ MCS0 NSS1	80	11	314	
	11ax @ MCS11 NSS1	80	11	285	

RF PERFORMANCE

Wi-Fi 2.4/5 GHz Band RF Receiver Specifications

(@25 °C unless otherwise specified)

Parameter	Description	Min	Typ	Max	Unit
2.4 GHz Frequency Range	Center Channel Frequency	2412	-	2462	MHz
5 GHz Frequency Range	Center Channel Frequency	5180		5825	MHz
RX Sensitivity 2.4 GHz	11b (11 Mbps)		-88		dBm
	11g (54 Mbps)		-74		
	11n (HT20 MCS7)		-71		
	11n (HT40 MCS7)		-69		
	11ax (HE20 MCS11)		-62		
	11ax (HE40 MCS11)		-59		
RX Sensitivity 5 GHz	11a (54 Mbps)		-73		dBm
	11n (HT20 MCS7)		-70		
	11n (HT40 MCS7)		-68		
	11ac (VHT20 MCS8)		-68		
	11ac (VHT40 MCS9)		-64		
	11ac (VHT80 MCS9)		-60		
	11ax (HE20 MCS11)		-58		
	11ax (HE40 MCS11)		-58		
	11ax (HE80 MCS11)		-57		

Wi-Fi 2.4/5 GHz Band RF Transmitter Specifications

(@25°C unless otherwise specified)

Parameter	Description	Min	Typ	Max	Unit
2.4 GHz Frequency Range	Center Channel Frequency	2412	-	2462	MHz
5 GHz Frequency Range	Center Channel Frequency	5180		5825	
TX Power 2.4 GHz	11b (11 Mbps) @	15	17		dBm
	11g (54 Mbps)	14.5	16		
	11n (HT20 MCS7)	12.5	14		
	11n (HT40 MCS7)	12.5	14		
	11ax (HE20 MCS11)	10.5	12		
	11ax (HE40 MCS11)	10.5	12		
TX Power 5 GHz	11a (54 Mbps)	14	16		dBm
	11n (HT20 MCS7)	14	16		
	11n (HT40 MCS7)	14	16		
	11ac (VHT20 MCS8)	12	14		
	11ac (VHT40 MCS9)	12	14		
	11ac (VHT80 MCS9)	12	14		
	11ax (HE20 MCS11)	9	11		
	11ax (HE40 MCS11)	9	11		
	11ax (HE80 MCS11)	9	11		

Bluetooth 2.4 GHz Band RF Tx/Rx Specifications

(@25°C unless otherwise specified)

Parameter	Min	Typ	Max	Unit
Center Channel Frequency Range	2402	-	2480	MHz
Output Power		2		dBm
RX Sensitivity BDR(DH1)		-89		dBm
RX Sensitivity EDR(2DH5)		-87		dBm
RX Sensitivity (3DH5)		-81		dBm
RX Sensitivity Low Energy		-91		dBm

802.15.4 2.4 GHz Band RF Tx/Rx Specifications

(@25°C unless otherwise specified)

Parameter	Min	Typ	Max	Unit
Center Channel Frequency Range	2405	-	2480	MHz
TX Power		4		dBm
RX Sensitivity	-	-95	-	dBm

I/O PIN ASSIGNMENTS

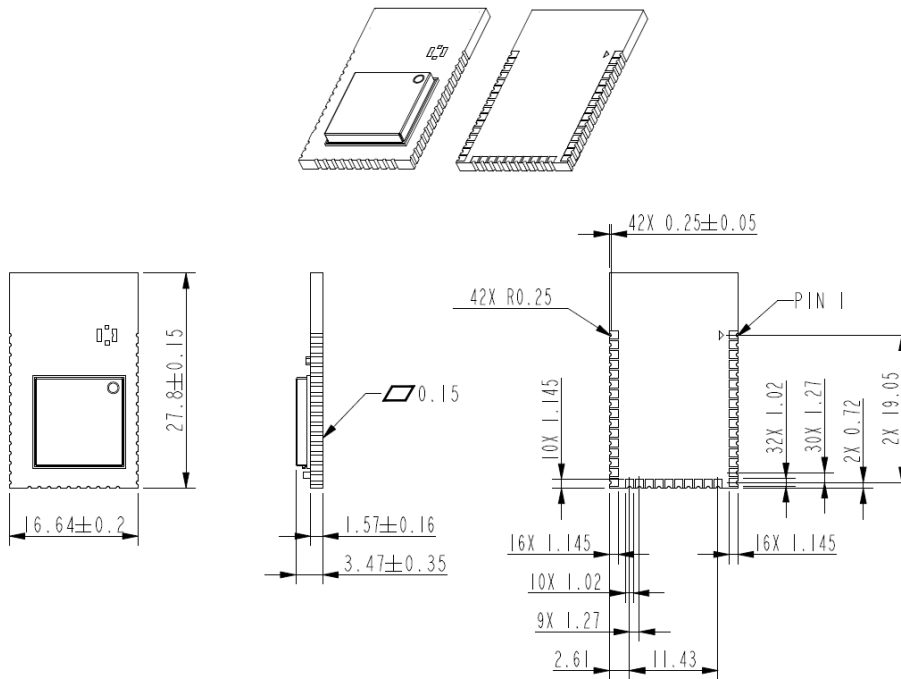
CMP961x-1(C) and CMP961x-2(C)

Pin No	Module Pin Name	Description (Note) / IW61x Pin Name
1	GPIO[29]	
2	GND	Ground
3	VCC	3.3V source input
4	PDn#	Full power-down (active low)
5	GPIO[17]	Wi-Fi-module-to-host-reset
6	SDIO_D3	Data line Bit[3]
7	SDIO_D2	Data line Bit[2]
8	SDIO_D1	Data line Bit[1]
9	SDIO_D0	Data line Bit[0]
10	SDIO_CMD	
11	SDIO_CLK	
12	GND	
13	GPIO[15]	EXT_PRI (PTA) / SPI_TXD (9612 only) ²
14	GPIO[14]	EXT_GNT (PTA) / SPI_RXD (9612 only) ²
15	GPIO[13]	EXT_REQ (PTA) / SPI_CS (9612 only) ²
16	GPIO[12]	EXT_STATE (PTA) / SPI_CLK (9612 only) ²
17	GND	
18	VIO	1.8V/3.3V Digital I/O Power Supply
19	Host_Config[0]	
20	GPIO[5]	PCM_DOUT / I2S_DIN (Digital Audio Interface)
21	GPIO[4]	PCM_CLK / I2S_BCLK (Digital Audio Interface)
22	GPIO[7]	PCM_SYNC / I2S_LRCLK (Digital Audio Interface)
23	GPIO[6]	PCM_DIN / I2S_DIN (Digital Audio Interface)
24	GPIO[31]	
25	GPIO[30]	
26	GND	
27	GPIO[28]	
28	GPIO[20]	EXT_FREQ (PTA) / SPI_INT (9612 only) ²
29	GPIO[24]	Independent soft reset for 802.15.4
30	GPIO[22]	Independent soft reset indicator to host
31	GPIO[15]	BT_DIS# / Host-to-BT soft reset
32	GPIO[1]	Independent software reset for Wi-Fi
33	WCI-2_DOUT	Used for coexistence out. GPIO[26]
34	WCI-2_DIN	Used for coexistence out. GPIO[25]
35	GPIO[16]	Host-to-WLAN wake
36	UART_CTS	
37	UART_RTS#	
38	UART_TX	GPIO[11]
39	UART_RX	GPIO[10]
40	GPIO[18]	BT host-to-device wake
41	GPIO[19]	BT device-to-host wake
42	GND	Ground

MODULE DIMENSIONS

CMP961x-1x and CMP961x-2x

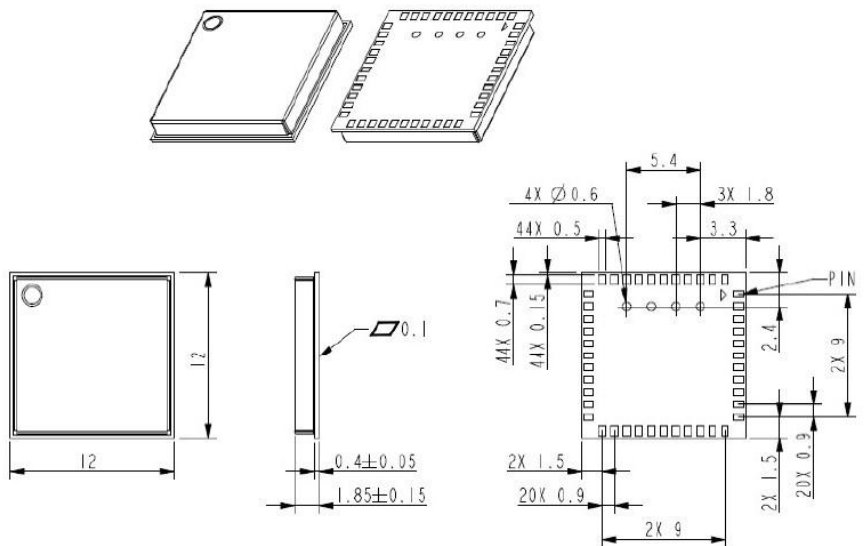
All dimensions in mm.



TOLERANCE UNLESS OTHERWISE SPECIFIED: ± 0.1 mm

CMP961x-9

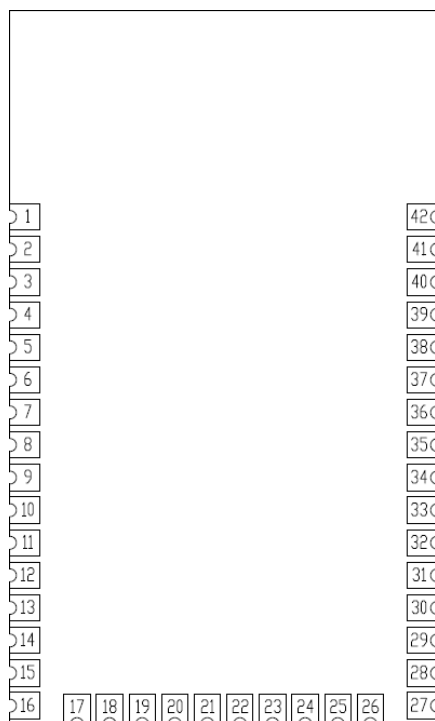
All dimensions in mm.



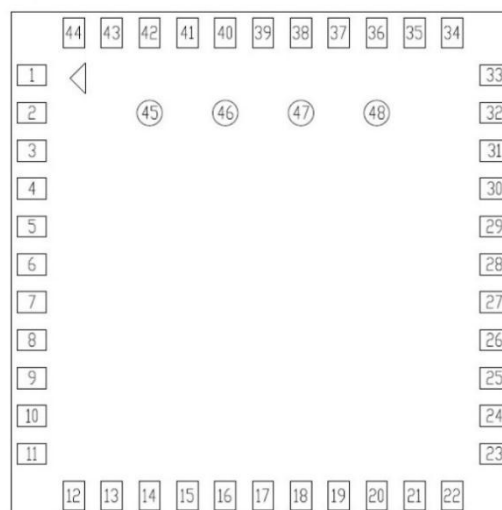
TOLERANCE UNLESS OTHERWISE SPECIFIED: ± 0.1 mm

MODULE PINOUT

CMP961x-1(C) and CMP961x-2(C)



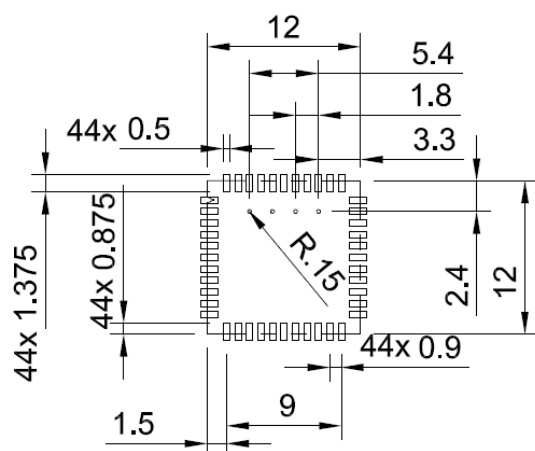
CMP961x-9



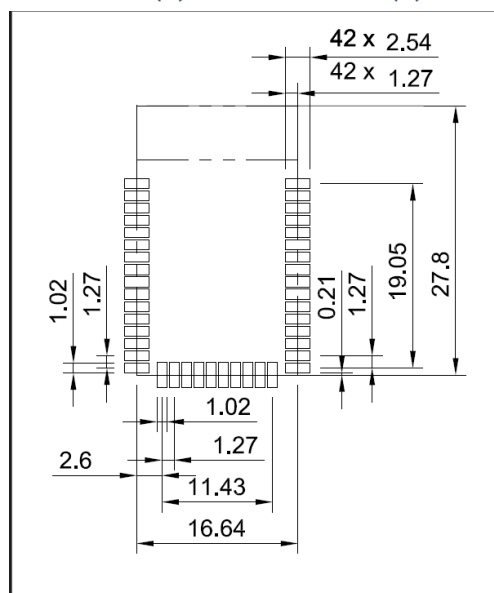
MODULE LAND FOOTPRINT

All dimensions in mm.

CMP961x-9



CMP961x-1(C) and CMP961x-2(C)



Note: Refer to the Antenna section in this document for layout recommendations which will yield optimal antenna performance.

HOST PCB PLACEMENT AND MECHANICAL HOUSING

Module Ground Plane and Keep-Out

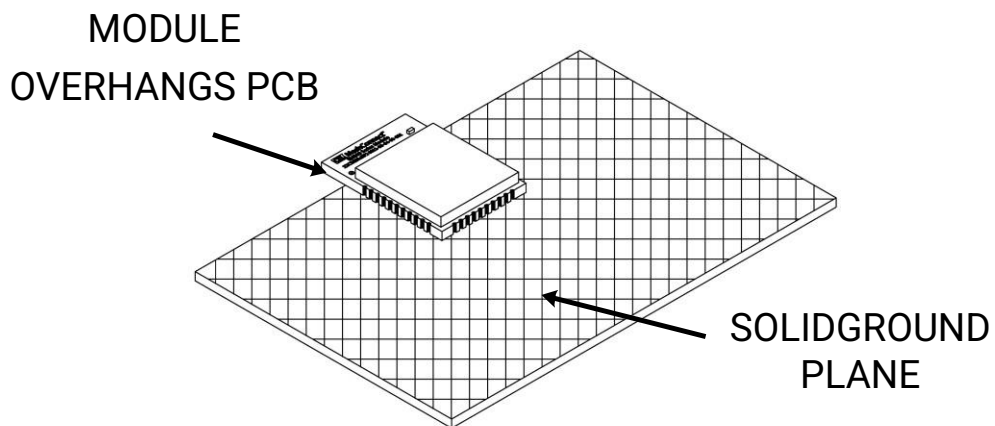


Figure 1. Example module placement with antenna overhanging PCB

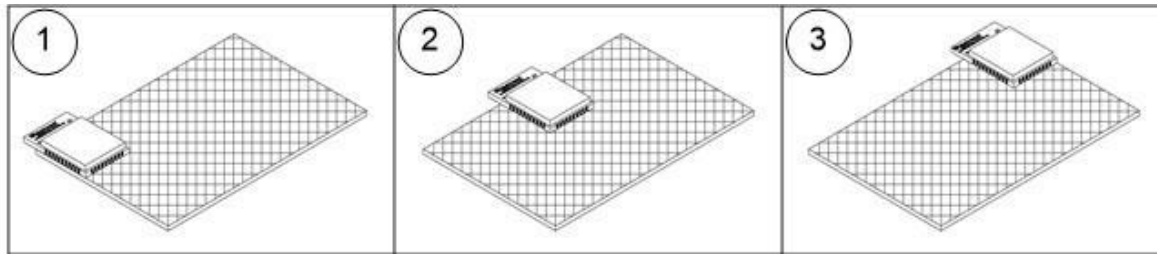


Figure 2. Preferred module location options on host PCB

Figure 2. shows various allowed module placement options. In options 1, 2 and 3, the antenna is overhanging the module and in options. **Anything other than air underneath the antenna will detune the antenna, degrading performance.**

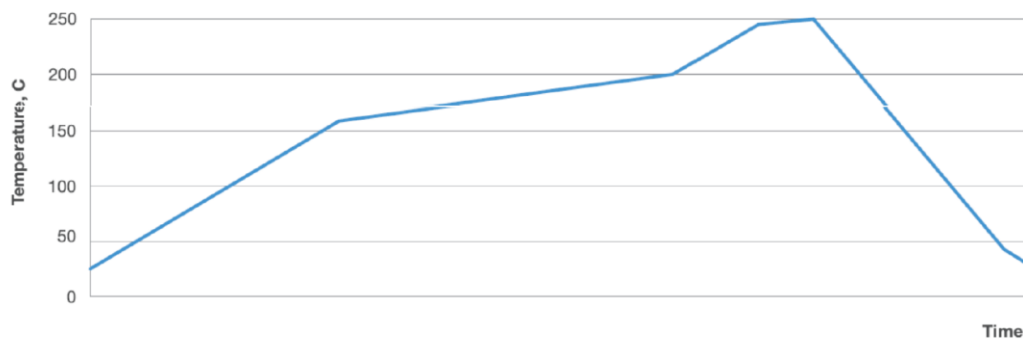
Mechanical Housing and Antenna Concerns

- If a system housing is required, an enclosure suitable for 2.4GHz and 5 GHz RF should be used. Plastic is recommended with no metallic coatings. As with all RF circuitry, mounting the module in and around metals will have significant effect on the radiation pattern of the antenna and needs to be tested on a case-by-case basis. If a metal housing is required, using the integrated trace antenna is not recommended. Instead, use an external antenna. Ferrous materials should be placed as far from the antenna as possible.
- Any objects other than air near the antenna will have an impact on it. While it may seem obvious that the antenna will be affected by any metal objects near the antenna, it is also true that any objects which do not have the dielectric constant of air, such as a plastic case or a human hand, will also detune the antenna. A separation of 0.075" (1.905mm) or greater is recommended between the antenna and the housing in all directions.

PROCESSING

Recommended Reflow Profile

Parameter Values	
Ramp Up Rate	3°C/sec max
Max Time above 217°C	120 seconds
Peak Temperature	250°C
Max Time within 5°C of Peak Temperature	20 seconds
Ramp Down Rate	6°C/sec max



Pb-Free Solder Paste

Use of "No Clean" soldering paste is strongly recommended, as it does not require cleaning after the soldering process.

Note: *The quality of solder joints on the castellations ("half vias") where they contact the host board should meet the appropriate IPC Specification. See the Castellated Terminations Section in the latest IPC-A-610 Acceptability of Electronic Assemblies document.*

Cleaning

In general, cleaning the populated module is strongly discouraged. Residuals under the module cannot be easily removed with any cleaning process.

- Cleaning with water can lead to capillary effects where water is absorbed into the gap between the host board and the module. The combination of soldering flux residuals and encapsulated water could lead to short circuits between neighboring pads. Water could also damage any stickers or labels.
- Cleaning with alcohol or a similar organic solvent will likely flood soldering flux residuals into the two housings, which is not accessible for post-washing inspection. The solvent could also damage any stickers or labels.
- Ultrasonic cleaning could damage the module permanently.

The best approach is to consider using a "No Clean" solder paste and eliminate the post-soldering cleaning step.

Optical Inspection

After soldering the module to the host board, consider optical inspection to check the following:

- Proper alignment and centering of the module over the pads
- Proper solder joints on all pads
- Excessive solder or contacts to neighboring pads or vias

Repeating Reflow Soldering

Only a single reflow soldering process is encouraged for host boards.

Wave Soldering

If a wave soldering process is required on the host boards due to the presence of leaded components, only a single wave soldering process is encouraged.

Hand Soldering

Hand soldering is possible. When using a soldering iron, follow IPC recommendations (reference document *IPC-7711*).

Rework

The CMP961x can be unsoldered from the host board. Use of a hot air rework tool should be programmable, and the solder joint and module should not exceed the maximum peak reflow temperature of 250°C.

Caution

If temperature ramps exceed the reflow temperature profile, module and component damage may occur due to thermal shock. Avoid overheating.

Warning

Never attempt a rework on the module itself (i.e., replacing individual components); such actions will terminate warranty coverage.

Additional Grounding

Attempts to improve the module or the system grounding by soldering braids, wires or cables onto the module RF shield cover is done at the customer's own risk. The ground pins at the module perimeter should be sufficient for optimum immunity to external RF interference.

AGENCY CERTIFICATIONS

The following certifications are in effect for CMP961x modules.

FCC ID: TLZ-XM549
IC ID: 6100A-XM549

Contact CEL for certification details of CMP961x.

FCC Compliance Statement Part 15.19, Section 7.15 of RSS-GEN

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS Standards. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning (Part 15.21)

Changes or modifications not expressly approved by CEL could void the user's authority to operate the equipment.

20 cm Separation Distance

To comply with FCC/IC RF exposure limits for general population/uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM Responsibility to the FCC and IC Rules and Regulations

The CMP961x modules have been certified per FCC Part 15 Rules and to Industry Canada license-exempt RSS Standards for integration into products without further testing or certification. To fulfill the FCC and IC Certification requirements, the OEM of the CMP961x must ensure that the information provided on the CMP961x label is placed on the outside of the final product. The CMP961x is labeled with its own FCC ID Number and IC ID Number. If the FCC ID and the IC ID are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. The exterior label can use wording such as the following:

"Contains Transmitter Module FCC ID: TBD" or "Contains FCC ID: TBD"
"Contains Transmitter Module IC ID: TBD" or "Contains IC ID: TBD"

IC Certification — Industry Canada Statement

The term "IC" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Certification IC - Déclaration d'Industrie Canada

Le terme "IC" devant le numéro de certification/d'enregistrement signifie seulement que les spécifications techniques Industrie Canada ont été respectées.

Section 14 of RSS-210

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population. Consult Safety Code 6, obtainable from Health Canada's website: <http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/99ehd-dhm237/index-eng.php>

L'article 14 du CNR-210

Le programme d'installation de cet équipement radio doit s'assurer que l'antenne est située ou orientée de telle sorte qu'il ne pas émettre de champ RF au-delà des limites de Santé Canada pour la population générale. Consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada: <http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/99ehd-dhm237/index-eng.php>

ANTENNA INFORMATION

CEL's CMP961x modules include options for integrated PCB trace antenna or an integrated MFH4 RF connector for use with an external antenna. The CMP961x modules have been certified with the integrated PCB trace antenna as well as select external antennas connected via the connector.

The following are some design guidelines to help ensure antenna performance for the integrated antenna:

- Either the host board must have a cutout under the antenna, or the antenna should overhang the host board.
- Never place the antenna close to metallic objects
- In the overall design, ensure that wiring and other components are not placed near the antenna
- Do not place the antenna in a metallic or metalized plastic enclosure
- Keep plastic enclosures 1cm or more away from the antenna in any direction

CEL can assist with your PCB design and layout.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Approved Antennas

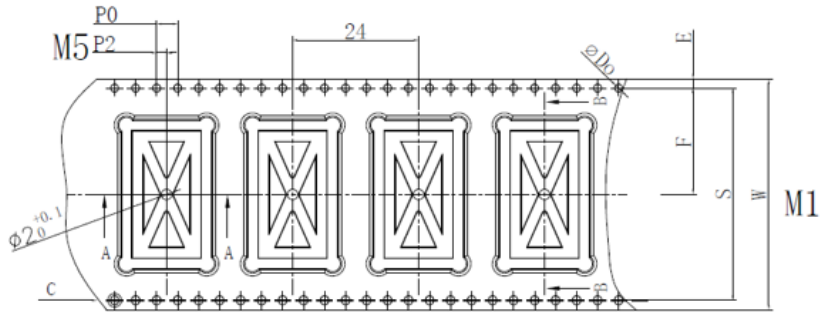
The OEM of the CMP961x may only use the approved antenna that has been certified with this module. The OEM of the CMP961x must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC Compliance per Part 15 of the FCC Rules.

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	CEL	0032-02-07-00-001	PIFA Antenna	I-PEX	

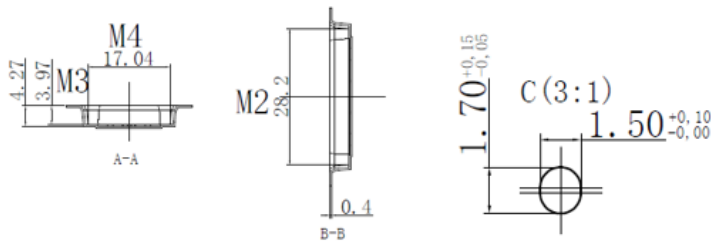
SHIPMENT, HANDLING AND STORAGE

Tape and Reel

The CMP961x modules are delivered in tape and reel. The CMP961x-1x and CMP961x-2x reels contain 600 modules.



E	1.75 ± 0.10
F	20.20 ± 0.15
S	40.40 ± 0.10
P2	2.00 ± 0.15
ϕ Do	$1.50 \pm \begin{smallmatrix} 0.10 \\ 0.00 \end{smallmatrix}$
ϕ D1	$2.00 \pm \begin{smallmatrix} 0.10 \\ 0.00 \end{smallmatrix}$
Po	4.00 ± 0.10
10Po	40.00 ± 0.20
W	44.00 ± 0.30
P	24.00 ± 0.10
AO	17.04 ± 0.10
B0	28.20 ± 0.10
K0	4.27 ± 0.10
T	0.40 ± 0.05



The CMP961x-9 reels contain 1500 modules.

Handling

The CMP961x modules are designed and packaged to be processed in an automated assembly line.

Warning

The CMP961x modules contain highly sensitive electronic circuitry. Handling without proper ESD protection may destroy or damage the module permanently.

Warning

The CMP961x modules are moisture-sensitive devices. Appropriate handling instructions and precautions are summarized in J-STD-033. Read carefully to prevent permanent damage due to moisture intake.

Moisture Sensitivity Level (MSL)

MSL 3, per J-STD-033

Storage

Storage/shelf life in sealed bags is 12 months at <40°C and <90% relative humidity.

ORDERABLE PART NUMBERS

Orderable Part Number	Description	Min/Mult
CMP9611-1-R	IW611, Wi-Fi + BT combo, PCB antenna, Commercial Temp	600
CMP9611-1C-R	IW611, Wi-Fi + BT combo, MFH4 connector, Commercial Temp	600
CMP9611-2-R	IW611, Wi-Fi + BT combo, PCB antenna, Industrial Temp	600
CMP9611-2C-R	IW611, Wi-Fi + BT combo, MFH4 connector, Industrial Temp	600
CMP9611-2-EVB	Evaluation Board, CMP9611-2	1
CMP9611-2C-EVB	Evaluation Board, CMP9611-2C	1
CMP9612-1-R	IW612, Wi-Fi + BT + 15.4 combo, PCB antenna, Commercial Temp	600
CMP9612-1C-R	IW612, Wi-Fi + BT + 15.4 combo, MFH4 connector, Commercial	600
CMP9612-2-R	IW612, Wi-Fi + BT + 15.4 combo, PCB antenna, Industrial Temp	600
CMP9612-2C-R	IW612, Wi-Fi + BT + 15.4 combo, MFH4 connector, Industrial Temp	600
CMP9612-2-EVB	Evaluation Board, CMP9612-2	1
CMP9612-2C-EVB	Evaluation Board, CMP9612-2C	1
CMP9611-9-R	IW611, Wi-Fi + BT combo, LGA, Industrial Temp	1500
CMP9612-9-R	IW612, Wi-Fi + BT + 15.4 combo, LGA, Industrial Temp	1500

REFERENCES

Reference Documents	Download
California Eastern Laboratories	Link
CMP961x Product Page	Link
NXP	Link
IW611 Product Page	Link
IW612 Product Page	Link
Health Canada Safety Code 6	Link

REVISION HISTORY

Previous Versions	Changes to Current Version	Page(s)
0032-00-07-01-000 (Issue 1) Aug 2022	Initial Preliminary Data Sheet	N/A
0032-00-07-01-000 (Issue 2) Nov 2022	Add radio Tx/Rx specifications; update power consumption; update mechanical dimensions and pinout list	
0032-00-07-01-000 (Issue 3) June 2023	Clarify operating conditions for module variants; add WiFi power consumption data.	
0032-00-07-01-000 (Issue 4) Nov 2023	Added approved antenna table	16
0032-00-07-01-000 (Issue 5) Sep 2024	Combined Data Sheet and User Guide into a single document; updated layout and consolidated information.	
0032-00-07-01-000 (Issue 6) Sep 2024	Reformatting	
0032-00-07-01-000 (Issue 7) Mar 2025	Corrected pin lists, details on PTA coexistence, updated to new data sheet standards, added drawings, updating language	

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