

Operation Guide for CUW Module

1. Product Overview

CUW wireless module is a proprietary modem designed and manufactured by Continental Automotive Systems, Inc. The modem will be integrated into Data Connectivity Modules (DCMs) designed and produced by Continental for use by automotive OEMs. DCMs will be installed into vehicles during the OEM's factory assembly process and will not be accessible without use of special tools. Primary use-cases are data-centric with data and voice connections to Telematics Service Providers (TSP). CUW also supports WiFi and will be used provide WiFi Hotspot functionality within the vehicle.



Fig. 1. Top view of CUW module.

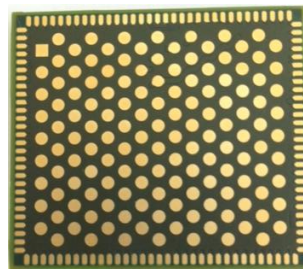


Fig. 2. Bottom view of CUW module.

CUW Feature Table:

Feature	Description
Cellular Operating Bands	LTE FDD: 2,1,3,8,41 WCDMA: 3,8,1,2
WiFi Operating Bands and Protocols	2.4 GHz: - 802.11b - 802.11g - 802.11n 5 GHz: - 802.11a - 802.11n
Application Interface	USB 4 wire UART 2 wire UART Audio: PCM ACC_POWER_ON pin



FCC ID: LHJ-CUW

	Hardware Reset Pin BOOT_OK status pin MSG indicator pin JTAG Antenna interface (Primary, MIMO)
Data Services	LTE data rates: up to 100Mbps DL / 50Mbps UL WiFi data rates: <ul style="list-style-type: none">- 802.11a up to 54 Mbit/s- 802.11b up to 11 Mbit/s- 802.11g up to 54 Mbit/s- 802.11n up to 150 Mbit/s

2. Regulatory Compliance Notes

FCC:

This device complies with Part 24(E) of the FCC Rules. The FCC ID for this device is LHJ-CUW. 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.

3. Device Installation and User Manual

The CUW module is a proprietary product designed and manufactured by Continental Automotive Systems, Inc. for integration into telematics control units manufactured by Continental Automotive Systems, Inc. for automotive OEMs.

- i.** The module is limited to installation **ONLY** in an integrated device manufactured by Continental Automotive Systems, Inc.
- ii.** During manufacturing process of the integrated device, the module is soldered onto the pcb of the integrated device.
- iii.** The integrated device must provide RF connectors to external antennas or RF traces to connect the CUW modules to antennas inside the integrated device.

The typical reference design for the trace layout, including pcb stack-up and trace length is as described and shown in a Figure 3 below:

Typical RF trace layout between the CUW module and RF Connector:

- Recommended RF Connector Type: Fakra



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- Main LTE/WCDMA antenna connector (MIMO1) is X203.
 - o Recommended RF trace length is less than 40 mm.
- Diversity LTE/WCDMA antenna connector (MIMO2) is X202.
 - o Recommended RF trace length is less than 45 mm.
- WiFi antenna connector is X201.
 - o Recommended RF trace length is less than 50 mm.

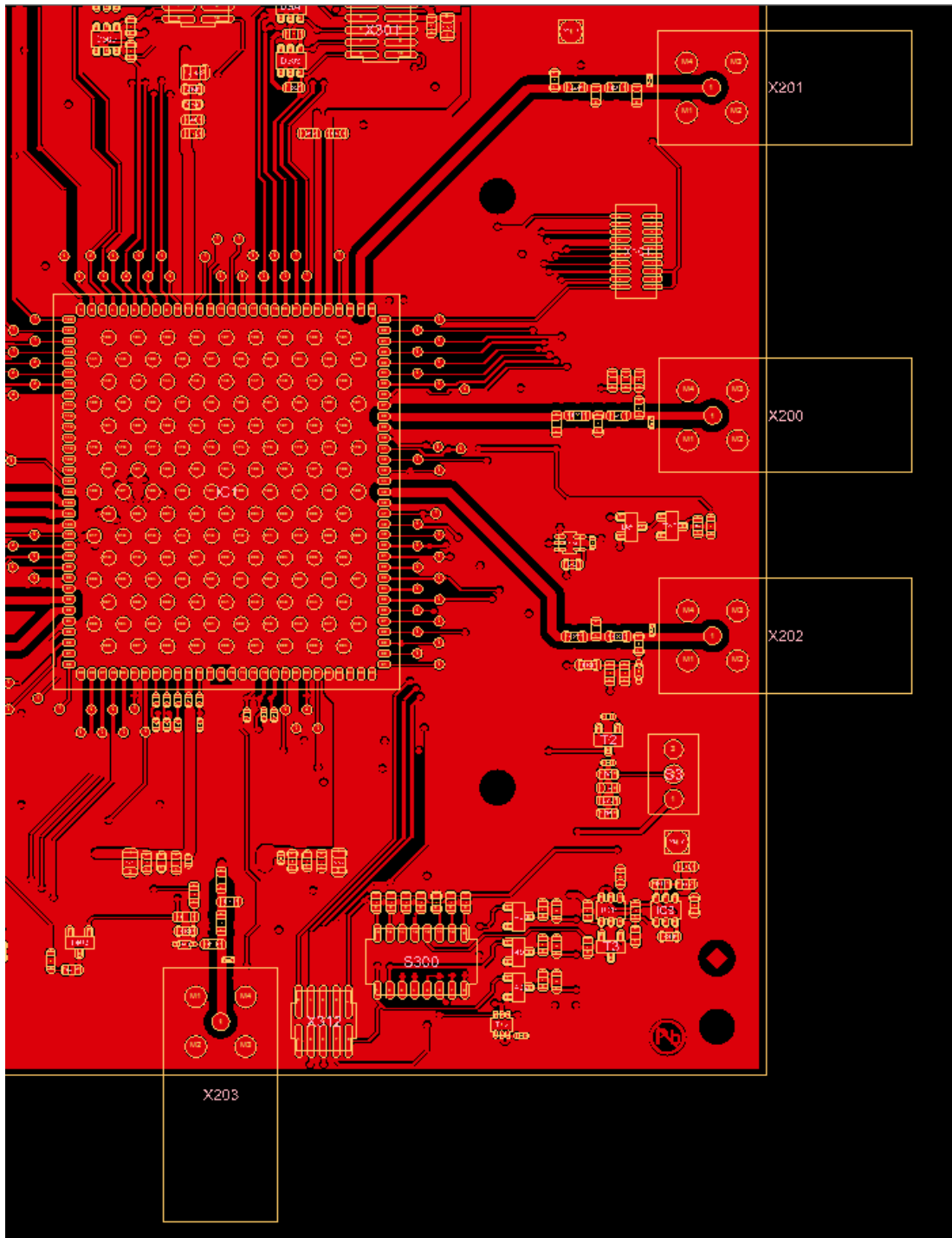


Fig. 3. Typical trace routing recommended for use with the CUW module.

- PCB Material: FR 4
- PCB design information:
 - Microstrip on layer 1 with ground on layer 2 / 50 ohm Single Ended Line/ 840 mm W 840 mm
 - Stripline on layer 2 with ground on layers 1&3 / 50 Ohm Single Ended Line/ 405 mm W

LAYER STACK-UP

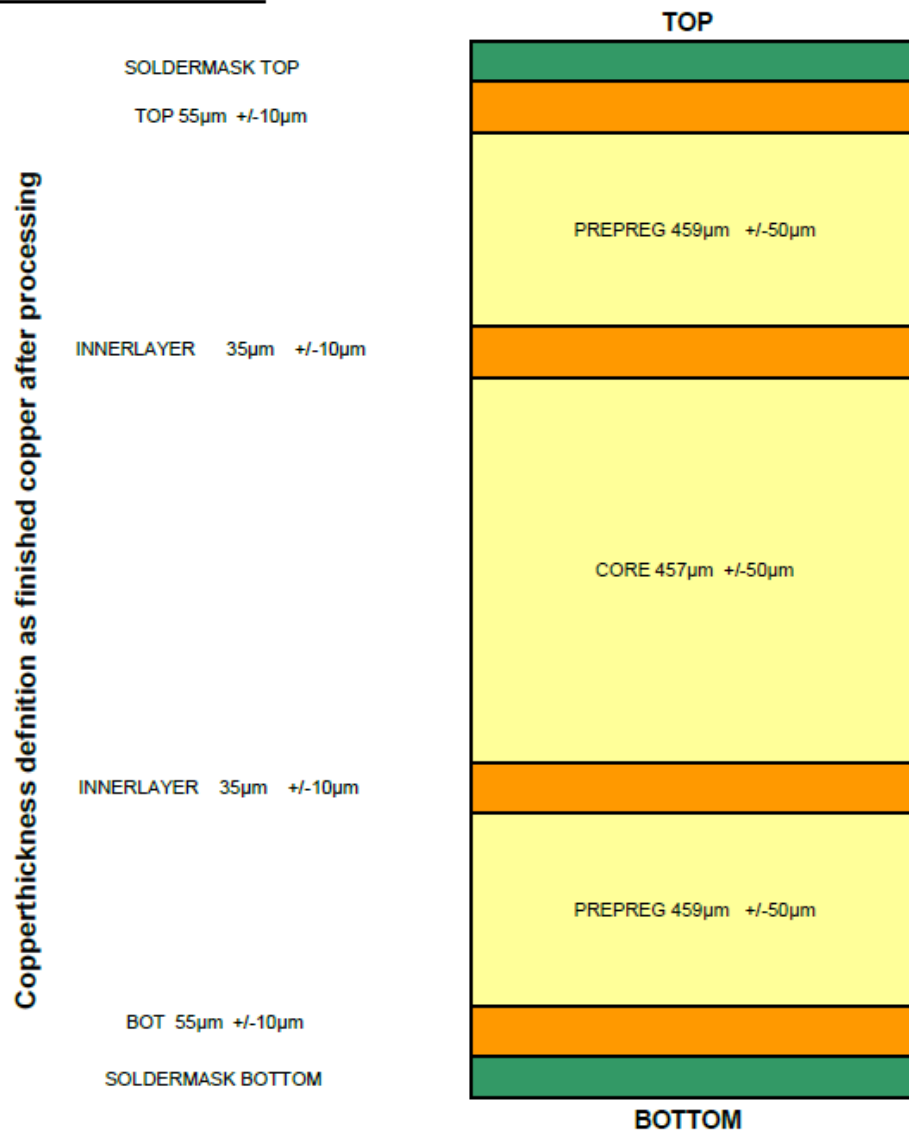


Fig. 4. Recommended PCB stack-up information for use while integrating CUW module.



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- iv. Automotive OEM is responsible for ensuring that the end-user has no manual instructions to remove or install module.
- v. The module is limited to installation in mobile applications, according to Part 2.1091(b).
- vi. No other operation configurations are allowed.
- vii. Changes or modifications to this system by other than a facility authorized by Continental could void authorization to use this equipment.
- viii. The module must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operate in conjunction with any other antenna or transmitter.
- ix. The integrator is responsible for fulfilling FCC requirements for the integrated device.

If Continental chooses to re-use modular approval, then the TCU shall be clearly labeled with an external label containing the integrated modem's FCC ID. For example, the label can include text "Contains device with FCC ID: LHJ-CUW."

4. Antenna requirements for use with CUW module:

- The module must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.
- The CUW module is for use with external antennas ONLY.
- For all LTE operating bands the maximum antenna gain is 6 dBi including cable loss.
- The maximum gain of the antenna path (cable loss + antenna gain) shall not exceed the above mentioned values.

This radio transmitter (FCC ID: LHJ-CUW) has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

5. Instructions to OEMs:

Continental must instruct the automotive OEM and provide them to include the following information into the car user's manual (i.e. for the DCM):

1. End-users must be provided with transmitter/antenna installation requirements and operating conditions for satisfying RF exposure compliance:
2. A separate section should clearly state "FCC RF Exposure requirements:"
3. Required operating conditions for end users.



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4. The antenna used with this device must be installed to provide a separation distance of at least 20cm from all persons, and must not transmit simultaneously with any other transmitter, except in accordance with FCC multi-transmitter product procedures.
 5. The Maximum ERP/EIRP and maximum antenna gain required for compliance with Part 24(E).
 6. Clear instructions describing the other party's responsibility to obtain station licensing.