WLW7000E6

Wi-Fi 7 (802.11be) Single-Band Wireless Module

Hardware User Guide

Wi-Fi 7 / 802.11be 6GHz Single Band	**QCN6274 / QCN9274-I** Qualcomm Waikiki Series	**M.2 E Key Interface** PCIe 3.0 Compatible	**4×4 MU-MIMO** Up to 11530Mbps

Updated: 20260826

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1. Introduction

Thank you for choosing the Compex WLW7000E6. This document provides complete hardware integration guidance for engineers and system developers deploying the WLW7000E6 Wi-Fi 7 wireless module in embedded, industrial, and networking platforms.

The WLW7000E6 is a single-band Wi-Fi 7 (802.11be) wireless module based on the Qualcomm QCN6274 'Waikiki' series chipset (commercial grade) or the QCN9274-I 'Waikiki' series chipset (industrial grade). Built on the WK01.6 reference design, the module delivers 4×4 MU-MIMO operation in the 6GHz band through a standard M.2 E Key (PCIe 3.0) host interface.

Key Highlights

- Qualcomm QCN6274 'Waikiki' series chipset for commercial-grade deployments.
- Qualcomm QCN9274-I 'Waikiki' series chipset for industrial-grade deployments.
- 6GHz, 4×4 MU-MIMO, up to 11530 Mbps physical data rate.
- M.2 E Key interface with PCIe 3.0 host connectivity.
- Based on the WK01.6 reference design.
- Supports up to 4096-QAM (4K-QAM) modulation.
- Operating temperature: -20°C to 70°C (commercial grade) or -40°C to 85°C (industrial grade).
- REACH and RoHS compliant for global deployment.

2. Package Contents

Verify the following items are included in the package before proceeding with installation:

Checklist

- 1 × WLW7000E6 Wi-Fi 7 wireless module

> ⚠ **Note:** External antennas (U.FL pigtail cables), host carrier board, and power supply are not included unless specified in the order. Contact sales@compex.com.sg for accessory options.

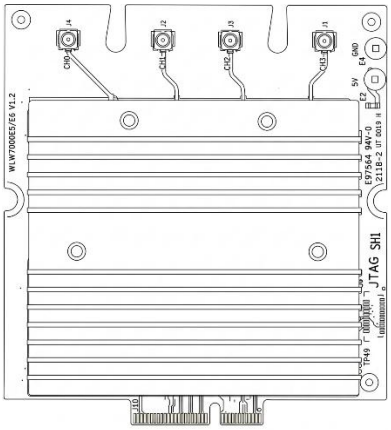
If any item is missing or damaged, contact Compex Technical Support (see Chapter 10) before proceeding.

3. Hardware Overview

The WLW7000E6 is a radio-only Wi-Fi 7 module designed to be installed into a host platform's M.2 E Key slot. To install into a different slot type, a compatible adapter may be used. All wireless baseband and RF processing is handled onboard the module; the host platform supplies power and exchanges data over the PCIe 3.0 interface.

3.1 Module Layout

The WLW7000E6 features the following major components and connectors:

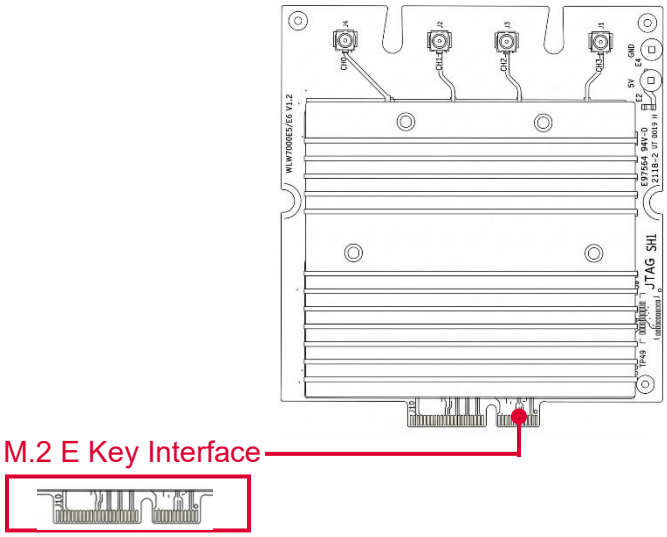


Chipset	Qualcomm QCN6274 'Waikiki' series (Commercial grade) Qualcomm QCN9274-I 'Waikiki' series (Industrial grade)
Reference Design	WK01.6
Host Interface	M.2 E Key Interface with PCIe 3.0
RF Connectors	4× U.FL Connectors (CH0, CH1, CH2, CH3)
System Memory	2Mbit serial I²C bus EEPROM
Dimensions (W × H × D)	62.7mm × 57mm × 15mm

3.2 Connector Descriptions

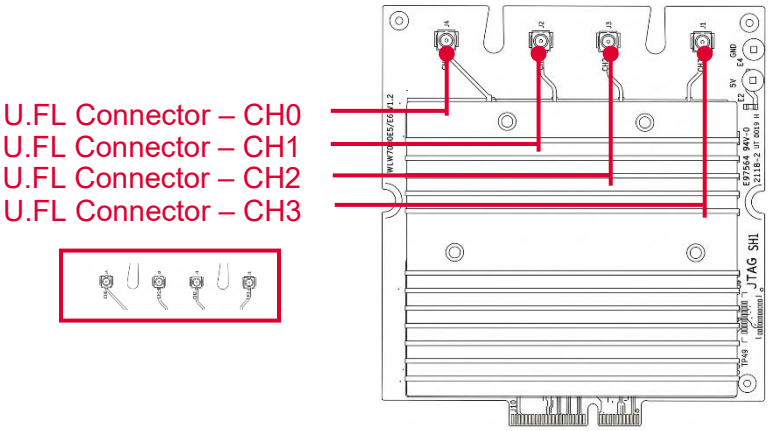
M.2 E Key Edge Connector

- Standard M.2 E Key (PCIe 3.0) edge connector along the bottom edge of the module.
- Carries PCIe data lanes, mandatory 3.3V power input, ground, and control signals to the host platform, plus a 5V input for the PA (selectable via gold-finger pins or an external connection).



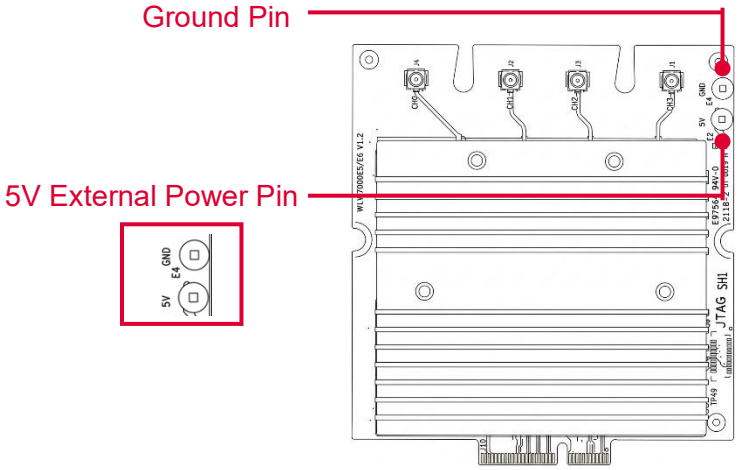
U.FL RF Connectors

- 4× U.FL Connectors (CH0, CH1, CH2, and CH3) located at the top edge of the module.
- CH0, CH1, CH2, and CH3 jointly support 4×4 MU-MIMO operation in the 6GHz band.
- Connect suitable external antennas rated for the 6GHz band.



External Power Pin

- A dedicated Ground Pin and 5V External Power Pin, separate from the M.2 E Key edge connector, provide an alternative way to supply the 5V required by the module's PA.
- Use this External Power Pin only as an alternative to, not together with, the gold-finger VDD_5V pins (15, 17, 19, 21, 23) on the M.2 edge connector; when using the External Power Pin, ensure these pins are not connected to the host board.



3.3 Hardware Pinouts

M.2 E Key Slot Pin Assignment

Top side		Bottom side	
1	GND	2	VDD_3V3
3	REFCLK_IO_P0	4	VDD_3V3
5	REFCLK_IO_N0	6	PCIE_LED0(GPIO25)
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	WSI_DAT_OUT(GPIO48)
15	VDD_5V	16	PCIE_LED1(GPIO26)
17	VDD_5V	18	GND
19	VDD_5V	20	WSI_CLK_OUT(GPIO49)
21	VDD_5V	22	NC
23	VDD_5V		
Mechanical key M.2 E Key			
33	GND	32	WSI_DAT_IN(GPIO50)
35	PCIE0_RX0_P	34	NC
37	PCIE0_RX0_N	36	WSI_CLK_IN(GPIO51)
39	GND	38	NC
41	PCIE0_TX0_P	40	NC
43	PCIE0_TX0_N	42	NC
45	GND	44	PTA1_BT_PRIO
47	PCIE0_REFCLK_P	46	PTA1_WL_ACT
49	PCIE0_REFCLK_N	48	PTA1_BT_ACT
51	GND	50	NC
53	PCIE0_CLKREQ_N	52	PCIE0_RST_N
55	PCIE0_WAKE_N	54	NC
57	GND	56	WLAN_DISABLE
59	PCIE0_RX1_P	58	NC
61	PCIE0_RX1_N	60	NC
63	GND	62	NC
65	PCIE0_TX1_P	64	NC
67	PCIE0_TX1_N	66	NC
69	GND	68	NC
71	REFCLK_IO_N1	70	NC
73	REFCLK_IO_P1	72	VDD_3V3
75	GND	74	VDD_3V3

⚠ Note: Both 3.3V and 5V are required for operation. 3.3V is supplied via the VDD_3V3 pins (2, 4, 72, 74) and must come from the M.2 E Key card slot. 5V powers the module's PA (power amplifier) and can be supplied via either of two methods — through the VDD_5V pins (15, 17, 19, 21, 23) on the M.2 gold-finger edge connector, or via an external 5V connection — choose one method.

4. Radio Module Specifications

4.1 Wi-Fi Capability

Wi-Fi Standards	802.11ax/be
Bands	6GHz Single Band
MIMO Configuration	4×4 MU-MIMO
Max Physical Data Rate	up to 11530 Mbps
Frequency Range	5.925 ~ 7.125GHz
Modulation Techniques	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM
Channel Spectrum Widths	Supports 20/40/80/160/320MHz at 6GHz
TX Power	Max 22dBm per chain @ 6GHz
RF Connectors	4× U.FL Connectors (CH0, CH1, CH2, CH3)

4.2 Notes & Recommendations

- Use external antennas rated for the 6GHz band on all four U.FL connectors to fully utilize the 4×4 MU-MIMO capability.
- The QCN6274 commercial-grade variant is rated for -20°C to 70°C operation; the QCN9274-I industrial-grade variant extends this to -40°C to 85°C, and is recommended for deployments requiring extended temperature operation.
- Refer to the Linux driver/SDK documentation supplied by Compex or Qualcomm for channel and regulatory domain configuration.
- Actual throughput will vary depending on host platform, driver configuration, channel width, and RF environment.

5. Mechanical Specifications

5.1 Module Dimensions

Dimensions (W × H × D)	62.7mm × 57mm × 15mm
Mounting Hole Diameter	Ø3.0mm
Form Factor	Standard M.2 E Key with heatsink

5.2 Environmental Ratings

Operating Temperature (Commercial Grade)	-20°C to 70°C
Operating Temperature (Industrial Grade)	-40°C to 85°C
Storage Temperature	-40°C to 90°C
Operating Humidity	5% to 95%, Non-Condensing
Storage Humidity	Max. 90%

5.3 Mounting & Installation Notes

- Secure with the mounting screw at the designated Ø3.0mm hole if the host chassis provides one.
- Ensure adequate airflow or thermal contact with the heatsink fins for sustained high-throughput operation.
- For ambient temperatures beyond -20°C to 70°C, use the industrial-grade (QCN9274-I) variant, rated to -40°C to 85°C.

6. Power Specifications

6.1 Power Requirements

Operating Voltage	3.3V DC + 5V DC (both required)
Power Consumption	14W (Max)
Power Source	3.3V supplied via the M.2 E Key card slot (mandatory; VDD_3V3 pins 2, 4, 72, 74)
PA Power Supply (5V)	5V required to power the module's PA, via either of two methods (choose one): through the M.2 gold-finger VDD_5V pins (15, 17, 19, 21, 23), or via an external 5V connection

6.2 Power Delivery Protection

- The host platform's M.2 E Key card slot must provide regulated 3.3V power with short-circuit/overcurrent protection. A 5V supply for the module's PA must also be provided, either through the M.2 gold-finger VDD_5V pins or via an external 5V connection.
- Ensure the host power rail can supply the module's peak 14W power consumption without voltage droop.

6.3 Notes & Recommendations

- Use a host platform with a stable, well-regulated 3.3V M.2 E Key power rail. Ensure the 5V supply for the PA (via gold-finger pins or external connection) is also stable.
- Avoid hot-plugging the module; always power down the host before installation or removal.
- For high-duty-cycle or industrial deployments, verify thermal dissipation is adequate at sustained 14W operation.
- Deliver the required 5V to the module's PA via only one method — either the M.2 gold-finger VDD_5V pins (15, 17, 19, 21, 23) or the External Power Pin — and not both simultaneously; if using the External Power Pin, ensure pins 15, 17, 19, 21 and 23 are not connected to the host board.
- Pins 52, 53 and 55 support either 1.8V or 3.3V logic; only one voltage option can be selected for these pins, and the default voltage is 1.8V.

7. Installation & Integration

7.1 Pre-Installation Checklist

- Power off and disconnect the host platform before installation.
- Verify the host platform provides a M.2 E Key slot compatible with PCIe 3.0.
- Prepare four external antennas rated for the 6GHz band with U.FL connectors or pigtail adapters.

7.2 Module Installation

- Align the WLW7000E6 module's gold-finger edge connector with the host M.2 E Key slot.
- Insert at a slight angle (typically 15–20°) and press down firmly until fully seated.
- Rotate the module flat and secure with the mounting screw if provided by the host chassis.

7.3 Power Connection

- 3.3V power is supplied automatically through the M.2 E Key edge connector. For the 5V PA supply, either connect it via the gold-finger pins (no extra cable needed) or via an external 5V connection, depending on the chosen method.
- Confirm the host platform's M.2 E Key slot delivers a stable 3.3V supply, and that the chosen 5V PA supply path (gold-finger pins or External Power Pin) is stable, before powering on.

7.4 Antenna Connection

- Connect external antennas to the CH0, CH1, CH2, and CH3 U.FL connectors.
- Ensure antenna cables are routed without sharp bends to avoid signal loss or connector damage.

8. Troubleshooting

Module Not Detected	•Verify the module is fully seated in the M.2 E Key slot and the retaining screw (if present) is secured. •Confirm the host platform's M.2 E Key slot supports PCIe 3.0 and provides 3.3V power, and that the 5V PA supply (gold-finger pins or External Power Pin) is present. •Check that the appropriate Linux driver/SDK package is installed on the host.
No Wireless Signal / Weak RF Performance	•Verify external antennas are securely connected to CH0, CH1, CH2, and CH3 U.FL connectors. •Confirm antennas are rated for the 6GHz bands in use. •Check for physical damage to U.FL connectors or antenna cables.
Overheating or Unexpected Shutdown	•Ensure adequate airflow or thermal contact with the heatsink fins for sustained high-throughput operation. •Confirm ambient temperature is within the rated operating range (-20°C to 70°C for commercial grade, or -40°C to 85°C for industrial grade). •For sustained high-throughput or extended-temperature use, consider the industrial-grade (QCN9274-I) variant.

9. Safety Precautions

- Always power off and disconnect the host system before installing or removing the module.
- Handle the module by its edges; avoid touching the gold-finger connector or RF components.
- Use proper ESD (electrostatic discharge) precautions, including a grounded wrist strap, when handling the module.
- Operation in the 6GHz band is subject to regulatory approval — see Section 12 for details.
- Do not operate the module without an antenna connected, as this may damage the transmitter.
- Do not attempt to modify or repair the module; contact Compex Technical Support for service.

10. Technical Support

Compex Systems Pte Ltd provides engineering and technical support for the WLW7000E6. For technical assistance, integration support, or to report a hardware issue, please contact:

Company	Compex Systems Pte Ltd
Headquarters	Singapore
Sales Enquiries	sales@compex.com.sg
Technical Support	https://compex.com.sg/support-downloads/
Website	https://compex.com.sg
Product Page (WLW7000E6)	https://compex.com.sg/shop/wifi-module/802-11be/wlw7000e6/
Qualcomm Design Centre	Qualcomm Authorized Design Centre (ADC) since 2014

Before contacting support, please:

- Note the firmware version (visible via webUI: System > Software, or via SSH/serial console: cat /etc/openwrt_release)
- Record the MAC address of the board (visible on PCB label).
- Describe the issue with steps to reproduce, observed symptoms, and host platform details.

For sample requests, pre-production evaluations, or OEM/ODM partnership enquiries, contact the Compex sales team at sales@compex.com.sg.

11. Full Specifications

Model	WLW7000E6
Chipset	Qualcomm QCN6274 'Waikiki' series for Commercial grade Qualcomm QCN9274-I 'Waikiki' series for Industrial grade
System Memory	2Mbit serial I²C bus EEPROM
Reference Design	WK01.6
Host Interface	M.2 E Key Interface with PCIe 3.0
Operating Voltage	3.3V DC + 5V DC (both required)
Power Consumption	14W (Max)
Wireless	4×4 6GHz 802.11ax/be, max 22dBm per chain 4× U.FL Connectors
Frequency Range	5.925 ~ 7.125GHz
Modulation Techniques	OFDMA: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM
Channel Spectrum Widths	Supports 20/40/80/160/320MHz at 6GHz
Operating System	Linux
Certification	REACH & RoHS Compliance
Environmental Temperature	Operating (Commercial Grade): -20°C to 70°C Operating (Industrial Grade): -40°C to 85°C Storage: -40°C to 90°C
Environmental Humidity	Operating: 5% to 95%, Non-Condensing Storage: Max. 90%
Dimensions (W × H × D)	62.7mm × 57mm × 15mm

Notes

- For industrial-grade environmental temperature requirements, contact your sales representative for a customized heatsink solution.

12. Regulatory Information

Declaration of Conformity

The WLW7000E6 is designed to comply with applicable regional regulatory requirements, including REACH and RoHS. The WLW7000E6 is a component-level radio module intended for integration into end products. End-product manufacturers are responsible for obtaining all necessary regulatory certifications (e.g., FCC, CE, IC, or other applicable regional approvals) for their final product in each target market, including any additional certifications required for the complete host platform assembly.

6GHz Band Restrictions

Operation in the 6 GHz frequency band is subject to national regulatory authority approval. Manufacturers must ensure compliance with local regulations before enabling 6 GHz radio operation. Unauthorized use of restricted frequency bands may be illegal and could cause harmful interference to other services.

REACH & RoHS Compliance

This product is manufactured in compliance with REACH Regulation (EC) No 1907/2006 and RoHS Directive 2011/65/EU (amended by 2015/863/EU), restricting the use of hazardous substances in electrical and electronic equipment.

Disposal & Recycling

This product is subject to the Waste Electrical and Electronic Equipment (WEEE) Directive. At the end of its service life, return the product to an authorised recycling facility or contact Compex Systems for take-back options.

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