# WLE7000E5

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

## Hardware User Guide

| | | | |
|---|---|---|---|
| **Wi-Fi 7 / 802.11be**<br>5GHz Single Band | **QCN6224 / QCN9274-I**<br>Qualcomm Waikiki Series | **MiniPCIe Interface**<br>PCIe 3.0 Compatible | **4×4 MU-MIMO**<br>Up to 8647Mbps |

Updated: 20260826

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# 1. Introduction

Thank you for choosing the Compex WLE7000E5. This document provides complete hardware integration guidance for engineers and system developers deploying the WLE7000E5 Wi-Fi 7 wireless module in embedded, industrial, and networking platforms.

The WLE7000E5 is a single-band Wi-Fi 7 (802.11be) wireless module based on the Qualcomm QCN6224 'Waikiki' series chipset (commercial grade) or the QCN9274-I 'Waikiki' series chipset (industrial grade). Built on the WK01.5 reference design, the module delivers 4×4 MU-MIMO operation in the 5GHz band through a standard MiniPCIe (PCIe 3.0) host interface.

## Key Highlights

- Qualcomm QCN6224 'Waikiki' series chipset for commercial-grade deployments.
- Qualcomm QCN9274-I 'Waikiki' series chipset for industrial-grade deployments.
- 5GHz, 4×4 MU-MIMO, up to 8647 Mbps physical data rate.
- Backward compatible with 802.11a/n/ac/ax devices in the 5GHz band.
- MiniPCIe interface with PCIe 3.0 host connectivity.
- Based on the WK01.5 reference design.
- Supports up to 4096-QAM (4K-QAM) modulation.
- Operating temperature: -20°C to 70°C with standard heatsink (customized heatsink solutions available for extended industrial-grade requirements).
- 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 × WLE7000E5 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.

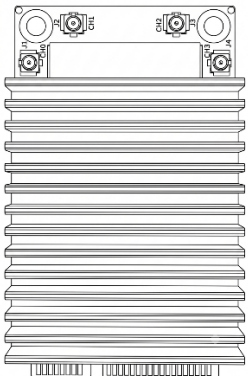
If any item is missing or damaged, contact Compex Technical Support (see Chapter 10) before proceeding.

# 3. Hardware Overview

The WLE7000E5 is a radio-only Wi-Fi 7 module designed to be installed into a host platform's MiniPCIe slot. To install on another slot such as an M.2 key slot, an M.2 key to MiniPCIe 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 WLE7000E5 features the following major components and connectors:

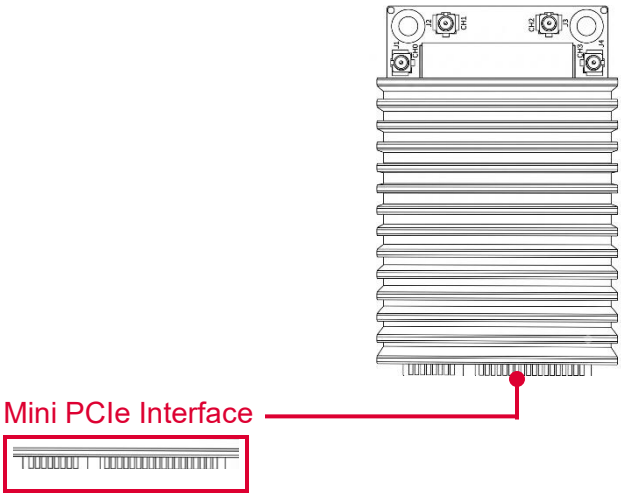


| | |
|---|---|
| **Chipset** | Qualcomm QCN6224 'Waikiki' series (Commercial grade)<br>Qualcomm QCN9274-I 'Waikiki' series (Industrial grade) |
| **Reference Design** | WK01.5 |
| **Host Interface** | MiniPCIe Interface with PCIe 3.0 |
| **RF Connectors** | 4× U.FL Connectors (CH0, CH1, CH2, CH3) |
| **System Memory** | 2Mbit serial I²C bus EEPROM |
| **Dimensions (W × H × D)** | 30mm × 50.8mm × 20.3mm |

# 3.2 Connector Descriptions

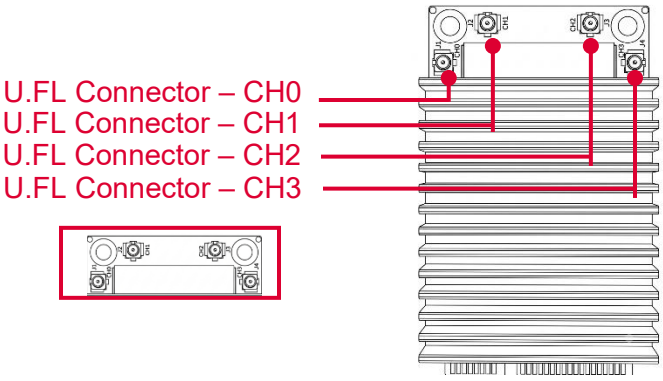
### MiniPCIe Edge Connector

- Standard MiniPCIe (PCIe 3.0) edge connector along the bottom edge of the module.
- Carries PCIe data lanes, 3.3V power input, ground, and control signals to the host platform.




### 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 5GHz band.
- Connect suitable external antennas rated for the 5GHz band.



## 3.3 Hardware Pinouts

### MiniPCIe Slot Pin Assignment

| Top side | | Bottom side | |
|---|---|---|---|
| 1 | WAKE_3v3 | 2 | VDD_3V3 |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | NC |
| 7 | CLKREQ_3v3 | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | REFCLK- | 12 | NC |
| 13 | REFCLK+ | 14 | NC |
| 15 | GND | 16 | NC |
| **Mechanical key MiniPCIe** | | | |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | W_DISABLE_1V8 |
| 21 | GND | 22 | PERST_3v3 |
| 23 | PCIE0_RX0_N | 24 | VDD_3V3 |
| 25 | PCIE0_RX0_P | 26 | GND |
| 27 | GND | 28 | NC |
| 29 | GND | 30 | NC |
| 31 | PCIE0_TX0_N | 32 | NC |
| 33 | PCIE0_TX0_P | 34 | GND |
| 35 | GND | 36 | NC |
| 37 | NC | 38 | NC |
| 39 | NC | 40 | GND |
| 41 | NC | 42 | NC |
| 43 | GND | 44 | NC |
| 45 | NC | 46 | NC |
| 47 | NC | 48 | NC |
| 49 | NC | 50 | GND |
| 51 | NC | 52 | VDD_3V3 |

# 4. Radio Module Specifications

## 4.1 Wi-Fi Capability

| | |
|---|---|
| **Wi-Fi Standards** | 802.11a/n/ac/ax/be |
| **Bands** | 5GHz Single Band |
| **MIMO Configuration** | 4×4 MU-MIMO |
| **Max Physical Data Rate** | up to 8647 Mbps |
| **Frequency Range** | 5.150 ~ 5.825GHz |
| **Modulation Techniques** | OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM |
| **Channel Spectrum Widths** | Supports 20/40/80/160/240MHz at 5GHz |
| **TX Power** | Max 18dBm per chain @ 5GHz |
| **RF Connectors** | 4× U.FL Connectors (CH0, CH1, CH2, CH3) |

## 4.2 Notes & Recommendations

- Use external antennas rated for the 5GHz band on all four U.FL connectors to fully utilize the 4×4 MU-MIMO capability.
- The QCN9274-I industrial-grade variant is recommended for deployments requiring extended temperature operation beyond the standard range. Both variants share the same standard operating range of -20°C to 70°C; operation beyond this range requires a customized heatsink solution (contact sales).
- 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)** | 30mm × 50.8mm × 20.3mm |
| **Mounting Hole Diameter** | Ø2.50mm |
| **Form Factor** | Standard MiniPCIe with heatsink |

## 5.2 Environmental Ratings

| | |
|---|---|
| **Operating Temperature** | -20°C to 70°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 Ø2.50mm hole if the host chassis provides one.
- Ensure adequate airflow or thermal contact with the heatsink fins for sustained high-throughput operation.
- For industrial-grade ambient temperatures, contact your sales representative for a customized heatsink solution.

# 6. Power Specifications

## 6.1 Power Requirements

| | |
|---|---|
| **Operating Voltage** | 3.3V DC |
| **Power Consumption** | 8.5W (Max) |
| **Power Source** | Supplied via MiniPCIe edge connector from host platform |

## 6.2 Power Delivery Protection

- The host platform's MiniPCIe slot is responsible for providing regulated 3.3V power and short-circuit/overcurrent protection.
- Ensure the host power rail can supply the module's peak 8.5W power consumption without voltage droop.

## 6.3 Notes & Recommendations

- Use a host platform with a stable, well-regulated 3.3V MiniPCIe power rail.
- 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 8.5W operation.

# 7. Installation & Integration

## 7.1 Pre-Installation Checklist

- Power off and disconnect the host platform before installation.
- Verify the host platform provides a MiniPCIe slot compatible with PCIe 3.0.
- Prepare four external antennas rated for the 5GHz band with U.FL connectors or pigtail adapters.

## 7.2 Module Installation

- Align the WLE7000E5 module's gold-finger edge connector with the host MiniPCIe 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

- Power is supplied automatically through the MiniPCIe edge connector; no separate power cable is required.
- Confirm the host platform's MiniPCIe slot delivers a stable 3.3V supply before powering on.

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## 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 MiniPCIe slot and the retaining screw (if present) is secured.<br>•Confirm the host platform's MiniPCIe slot supports PCIe 3.0 and provides 3.3V power.<br>•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.<br>•Confirm antennas are rated for the 5GHz bands in use.<br>•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.<br>•Confirm ambient temperature is within the rated -20°C to 70°C operating range.<br>•For sustained high-throughput or industrial use, consider a customized heatsink solution. |

# 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.
- 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 WLE7000E5. 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 (WLE7000E5)** | https://compex.com.sg/shop/wifi-module/802-11be/wle7000e5-wifi7-11be-qcn6224-qcn6274-qcn9274/ |
| **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** | WLE7000E5 |
| **Chipset** | Qualcomm QCN6224 'Waikiki' series for Commercial grade<br>Qualcomm QCN9274-I 'Waikiki' series for Industrial grade |
| **System Memory** | 2Mbit serial I²C bus EEPROM |
| **Reference Design** | WK01.5 |
| **Host Interface** | MiniPCIe Interface with PCIe 3.0 |
| **Operating Voltage** | 3.3V |
| **Power Consumption** | 8.5W (Max) |
| **Wireless** | 4×4 5GHz 802.11a/n/ac/ax/be, max 18dBm per chain<br>4× U.FL Connectors |
| **Frequency Range** | 5.150 ~ 5.825GHz |
| **Modulation Techniques** | OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM |
| **Channel Spectrum Widths** | Supports 20/40/80/160/240MHz at 5GHz |
| **Operating System** | Linux |
| **Certification** | REACH & RoHS Compliance |
| **Environmental Temperature** | Operating: -20°C to 70°C<br>Storage: -40°C to 90°C |
| **Environmental Humidity** | Operating: 5% to 95%, Non-Condensing<br>Storage: Max. 90% |
| **Dimensions (W × H × D)** | 30mm × 50.8mm × 20.3mm |

## Notes

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

# 12. Regulatory Information

## Declaration of Conformity

The WLE7000E5 is designed to comply with applicable regional regulatory requirements, including REACH and RoHS. The WLE7000E5 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.

## 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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