



User Guide

LPWA LGA Module

DLSA-WI13-WW
(LTE-M & NB-IoT)

Version 1.7

Date 2025-04-08



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1. Product Introduction

The WNC DL5A-WI13-WW is a low-pass wide area module that supports Cat-M and NB-IoT for IoT products.

Table 1-1. Band support

Band	Uplink (MHz)	Downlink (MHz)	Cat-M	Cat-NB1/NB2
LTE Band 2	1850–1910	1930–1990	v	v
LTE Band 4	1710-1755	2110-2155	v	v
LTE Band 5	824–849	869–894	v	v
LTE Band 8	880-915	925-960	v	v
LTE Band 12	699–716	729–746	v	v
LTE Band 13	777–787	746–756	v	v
LTE Band 14	788-798	758-768	v	v
LTE Band 17	704-716	734-746		v
LTE Band 25	1850–1915	1930–1995	v	v
LTE Band 26	814–849	859–894	v	v
LTE Band 66	1710–1780	2110–2200	v	v
LTE Band 85	698-716	728-746	v	v

1-1. General Features

The table below summarizes the DL5A-WI13-WW module features.

Table 1-2. General features of the DL5A-WI13-WW

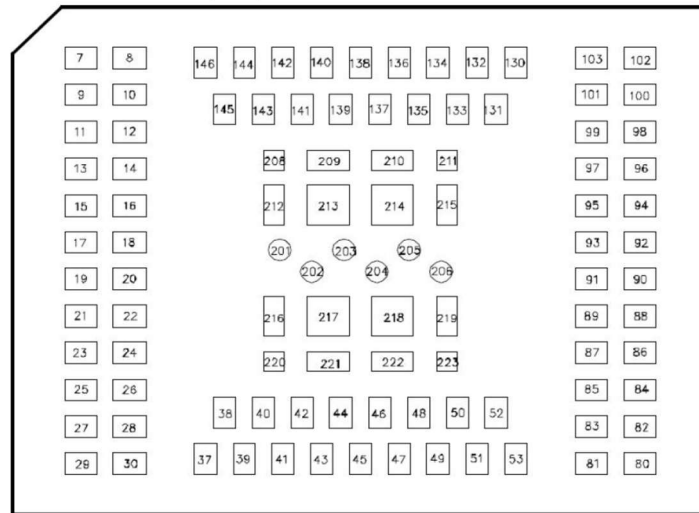
General interfaces	• JTAG
	• USIM
	• GPIO
	• UART
	• I2C
	• PCM
	• MIPI RFFE
	• ADC
Operating voltage	• VBAT (range: from 2.5 V to 4.4 V)
	• VBAT_FEM (range: from 2.5 V to 4.4 V)
Packaging	• LGA module
	• 104 pads (20.3 mm × 16 mm × 2.3 mm)
	• RoHS compliant

Table 1-3. LTE-related features of the DL5A-WI13-WW

Standards compliance	• 3GPP Rel-14
PHY	• One UL and one DL transceiver
	• Supports HD-FDD duplexing
	• Category M1 UE
	• Normal cyclic prefix
	• Supports MPDCCH
	• Modulation - DL: QPSK, 16 QAM - UL: QPSK, 16 QAM
	• All coding schemes corresponding to modulations
	• All channel coding (turbo-coding with inter-leaver, tail biting convolutional coding, block and repetition coding) and CRC lengths
	• All power control schemes and DL power allocation schemes
	• UEPCOP (from 3GPP Rel-12) Power Saving Mode

1-2. Connection Interface

The DLSA-WI13-WW module is an LGA device. All electrical and mechanical connections are made through the 104 pads on the bottom side of the PCB.



1-3. Environmental Specifications and Certifications

1.3.1 Environmental Specifications

The environmental specifications for both operating and storage conditions are defined in the table below.

Table 1-4. Temperature range

Condition	Temperature Range	Remark
Normal ambient operating temp. range	-40 °C to 85 °C	Fully functional and complies with 3GPP specifications

2. Pin Definitions

2-1. LGA Module Pin Diagram

The DLSA-WI13-WW LGA module pin layout is illustrated below.

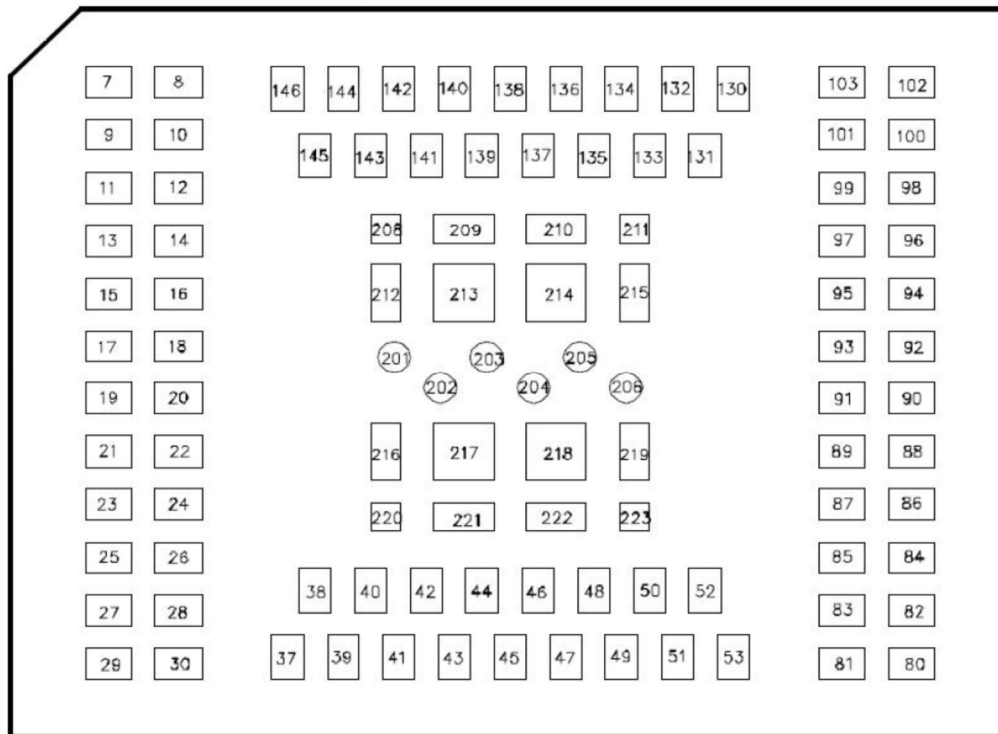


Figure 2-1. DLSA-WI13-WW LGA module pin layout (top view)

3. Electrical Specifications

3-1. Power Supply

The DLSA-WI13-WW module is supplied through the power signal with the following characteristics.

Table 3-1. Power supply

	Direction	V _{min}	V _{Typ.}	V _{max}	Unit
VBAT	In	2.5	3.8	4.4	V
VBAT_FEM	In	2.5	3.8	4.4	V
VDD_PSRAM	Out	1.0	1.8	2.0	V
VDD_GPIO	Out	1.0	1.8	2.0	V
VDD_RF	Out	1.0	1.8	2.0	V
VDD_SIM	Out	1.0	1.8	2.0	V
VDD_FLASH	Out	1.0	1.8	2.0	V

3-2. Control Interfaces

This section describes the power-on/off, wake-up, and reset interface for controlling the module.

3.2.1 Power-on Signal

The function is not available in the present firmware; the module will be turned on automatically when the power supply exists. Set this pin as “floating” or use 0 Ω as a reserve.

3.2.2 Wake-up Interface

There are two wake up pin of the module:

1. WAKEUP0-this is for MCU wake-up
2. WAKEUP1-this is for SHUB wake-up

3.2.3 Reset Signal

The module will reset automatically when the power supply voltage is applied on the power inputs. If requiring an external hardware reset, the user can connect the module to a key or host control signal. A low pulse will reset the module. The duration of the low pulse must be at least 100 μ s. The module has a pull-up resistor; therefore the reset signal does not require an external pull-up resistor.

3-3. Control Interfaces

There are three UART interfaces; these interfaces are 4 bit for high-speed data transfer, and the UART definitions of DLSA-WI13-WW are illustrated in the following figure. The UART interface support 1.8V.

1. UART0 for LTE data and AT command; the default baud rate is 921,600 bps.
2. UART1 for software firmware upgrade
3. UART2 for debug console; the default baud rate is 115.200 bps.

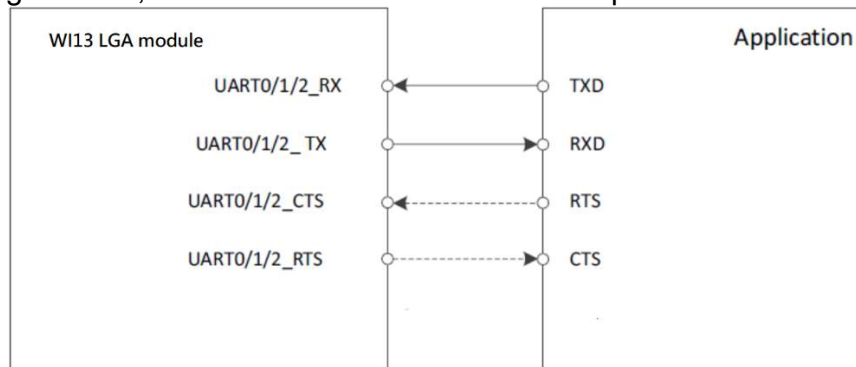


Figure 3-1. UART interface (example)

3-4. UIM Interface

DLSA-WI13-WW modules provide a UIM_DETECT input pin for UIM connectors to detect a UIM card. When a UIM card is present, UIM_DETECT should be high (1.8 V). If the UIM card is absent, UIM_DETECT should be low. This is required to pull UIM_DETECT to VREF with a 470 k Ω resistor. We recommend placing a 0.1 μ F and a 33 pF capacitor between UIM_VCC and Ground in-parallel and a 33 pF capacitor between UIM_RESET, UIM_CLK, and UIM_DATA and Ground in parallel. An electrostatic discharge (ESD) protection circuit is also recommended near the UIM socket as close as possible, and the Ground pin of the ESD protection component must be well connected to the Ground plane.

The following figure illustrates an example UIM card circuit. The default configuration is active high.

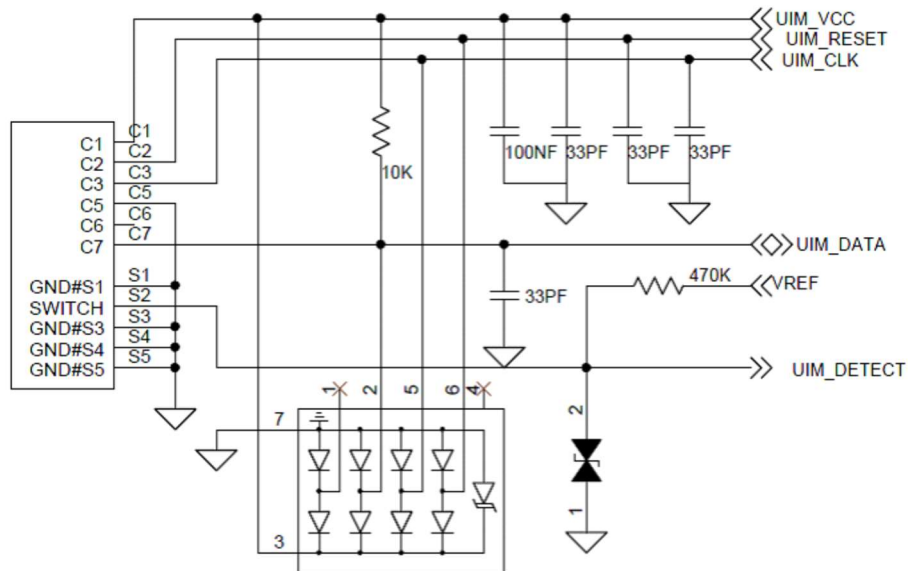


Figure 3-2. Example UIM card circuit

3-5. I/O Characteristics

The voltage and current characteristics of the various IO pads of the DLSA-WI13-WW versus IO bank supply voltage are illustrated in [Table 3-3](#) below.

Symbol	Parameter	Min.	Max.	Units
V_{IL}	Input LOW Level, input and I/O pins		0.54	V
V_{IH}	Input HIGH Level, input and I/O pins	1.26	1.8	V
V_{OL}	Output LOW Level		0.36	V
V_{OH}	Output HIGH Level	1.44	1.8	V
V_H	Input Hysteresis (when enabled)	1.44	1.8	V
I_{RPU}	IO Drive Strength		15	μA
R_{PU}	Input pull-up resistor resistance		32.4	$K\Omega$
I_{RPU}	Input pull-up resistor current	15		μA
R_{PD}	Input pull-down resistor resistance		32.4	$K\Omega$
I_{RPD}	Input pull-down resistor current		1	μA

3-6. JTAG Interface

The DLSA-WI13-WW contains one JTAG interface; leave JTAG pins floating if they are not used.

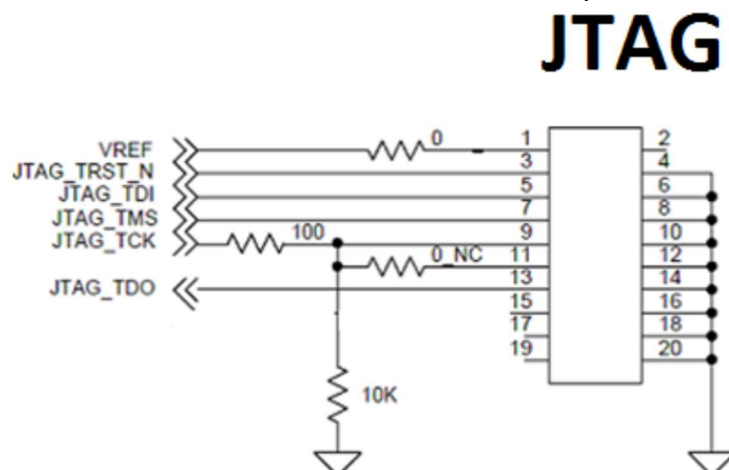


Figure 3-3. JTAG schematic

3-7. ADC Interface

The DLSA-WI13-WW contains five ADC ports; the specifications are listed below.

Symbol	Parameter	Min.	Typ.	Max.	Units
N	Resolution	6		12	Bits
F _{CLK}	Clock rate	TBD		TBD	MHz
F _S	Conversion rate per channel		F _o /(N+3)		MSPS
V _{IN}	Input voltage range		1.8		V
INL	Integral Nonlinearity			+2.2	LSB
DNL	Differential Nonlinearity	-0.97		1.9	LSB
SINAD	Signal to Noise and Distortion ratio		62.5		dB
OE	Offset error		+1		%F _s
GE	Gain error		+1		%F _s
R _{IN}	Input resistance			0.5	KΩ
C _{IN}	Input capacitance during sampling		2.56		pF

Table 3-4. ADC characteristics

3-8. RF performance

DLSA-WI13-WW module has three RF pads; developers must connect it via 50 Ω traces to the main board. Main antenna pad (Pin15) – Primary RX/TX path.

To verify that the antenna trace layout and characteristics of the DUT meet the reference design requirements and integration manual specifications, ensuring consistent RF performance.

1. Required Equipment

Equipment	Specification / Model	Purpose
Caliper / Micrometer	Accuracy ±0.01 mm	Measure trace width & dielectric thickness
Copper thickness gauge or PCB cross-section tool	Accuracy ±1 μm	Measure copper thickness
Vector Network Analyzer (VNA)	Frequency range covering DUT operational bands	Impedance & return loss measurement
Optical microscope / magnifier	≥10× magnification	Visual inspection of trace routing
Reference integration manual & design files	—	Layout & tolerance comparison

Table 3-5. Required Equipment

2. Test Environment

- Ambient temperature: 20–25 °C
- Relative humidity: 30–60%
- Stable ESD-protected workbench
- No strong RF interference in the testing area

3. Procedure

3.1 Visual Inspection

1. Place the DUT on an ESD-safe inspection table.
2. Compare the **antenna trace routing** with the reference layout provided in the integration manual.
3. Verify that the **trace path**, **bend angles**, and **total length** match the design reference.
4. Check for manufacturing defects (e.g., broken traces, scratches, solder residue).

3.2 Dimensional Measurement

1. Measure **trace width** is **1534 mils $\pm$ 20 mils**.
2. Measure **copper thickness** is **1.4 mils $\pm$ 0.2 mils**.
3. Measure **dielectric thickness** between trace and reference ground is **8.5 $\pm$ 0.5 mils**.
4. Verify **PCB material type** and **dielectric constant** (FR4, $\epsilon_r = 4.3$).

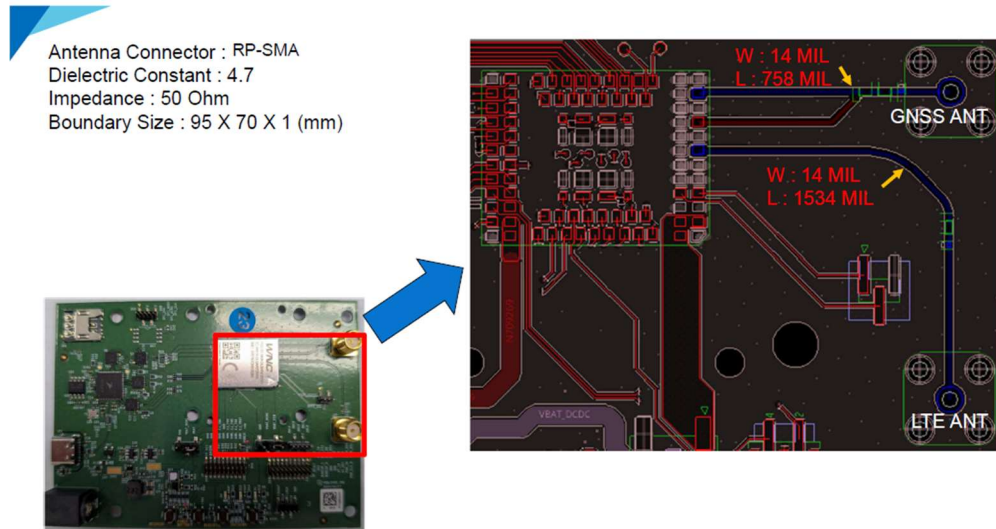


Figure 3-4. JTAG schematic

3.3 Impedance Verification

1. Connect DUT antenna port to the **VNA** using a calibrated RF cable.
2. Measure **S11 / return loss** across operational frequency band(s).
3. Target: **Impedance 50 Ω $\pm$ 10 Ω , VSWR $\leq$ 1.5**.
4. Save the VNA measurement data for record keeping.

4. Documentation

1. Record all measurements in the test log.
2. Compare each result against the **tolerance table** in the integration manual.
3. Mark each parameter as **PASS** or **FAIL**.
4. Attach measurement data and photos to the inspection report.

5. Acceptance Criteria

All parameters must be within the specified tolerances. Any failure requires rework or rejection of the PCB before integration into the host system.

3.8.1 RF Transmission Specifications

Table 3-7. Conductive Tx output power

Band	Item	Parameter	Min.	Typ.	Max.	Unit
Band 1	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 2	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 3	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 4	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 5	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 8	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 12	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 13	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 14	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 18	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 19	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 20	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm

Band 25	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 26	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 27	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 28	Max. TX Power	20 MHz 1 RBs/QPSK	19.8	23	25.7	dBm
Band 66	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm
Band 85	Max. TX Power	20 MHz 1 RBs/QPSK	20.3	23	25.7	dBm

Notes: 1. The RF transmission specification is defined at the LGA pad.
2. Complies with 3GPP test standards.

3.8.2 RF Receiver Specifications

Table 3-8. Conductive Rx sensitivity-3GPP

Band	Item	Parameter	Min.	Typ.	Max.	Unit
Band 1	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.5	dBm
Band 2	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.7	dBm
Band 3	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.7	dBm
Band 4	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.6	dBm
Band 5	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.4	dBm
Band 8	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.4	dBm
Band 12	RX Sensitivity	5 MHz with 4 RBs	-	-107	-108.1	dBm
Band 13	RX Sensitivity	5 MHz with 4 RBs	-	-107	-108.3	dBm
Band 14	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.3	dBm
Band 18	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.4	dBm
Band 19	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.4	dBm
Band 20	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.5	dBm
Band 25	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.7	dBm
Band 26	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.4	dBm
Band 27	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.5	dBm
Band 28	RX Sensitivity	5 MHz with 4 RBs	-	-108	-109.3	dBm
Band 66	RX Sensitivity	5 MHz with 4 RBs	-	-108	-108.6	dBm
Band 85	RX Sensitivity	5 MHz with 4 RBs	-	-107	-107.9	dBm

Notes: 1. The RF transmission specification is defined at the LGA pad.
2. Complies with 3GPP test standards.

4. Reliability Specification

TBA

5. Design Guide

5-1. Power Trace Design

Power trace layout suggestion: At least 22 μF , 0.1 μF , and 100 pF capacitors are required; place the capacitors as close to the power pins as possible. Power trace should possess sufficient line width to withstand its respective current listed in the table below:

Table 6-1. Reference current for power trace

Net Name	Peak Current Value for PCB Power Trace Design
VBAT (101, 103)	1A
VBAT_FEM (8-10)	1A

5-2. RF Pad Design

We recommend that a ground not be present under the surface of the RF pads in the layout. Details are included below. Layer 2 has the same exclusion area as Layer 1.

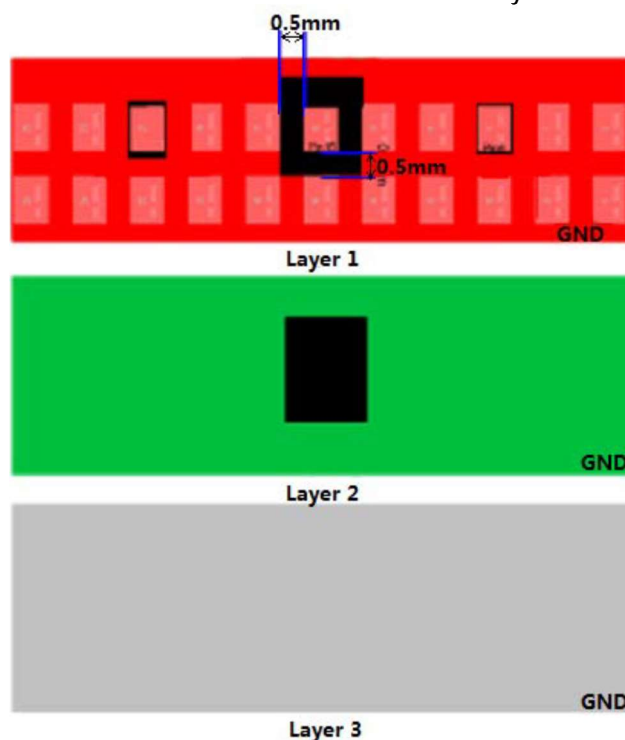


Figure 5-1. Sample RF pad layout

5-3. RF Matching Guide

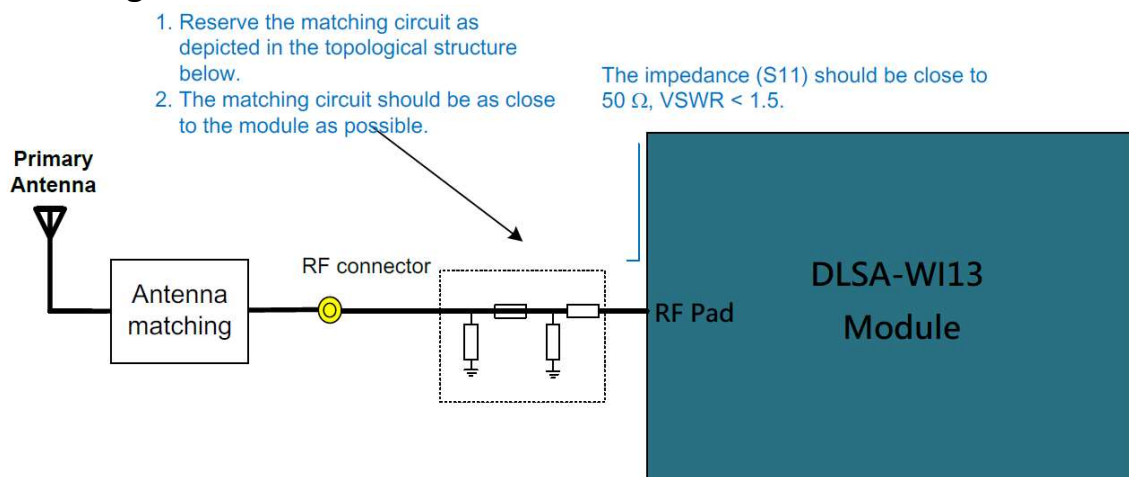


Figure 5-2. RF Matching guide

5-4. Interference and Sensitivity

This section includes tips to help developers identify interferences that may affect the DLSA-WI13-WW module when used in systems.

- Interference from other wireless devices
 - We highly recommend checking the RX performance of entire systems within the shielding environment.
 - Good isolation (ex.: Wi-Fi antenna, GPS antenna) is required between the other wireless system antenna and the DLSA-WI13-WW module LTE antenna.
- Interference from the host interface
 - High-speed signal-switching elements in systems can easily couple noise into the module (ex.: DDR memory, LCD modules, DC-TO-DC converters, PCM signals).
- Methods to avoid sources of interference
 - Antenna location is important; we recommend directing the antenna away from high-speed switching signals. Furthermore, the trace from the module to the antenna should be as short as possible and must be shielded by complete grounding.
 - The DLSA-WI13-WW module is well shielded; high-speed elements (Ex.: DDR memory, LCD modules, DC-to-DC converters, PCM signals) on a system should have shielding reserved during the early stages of development.

5-5. Example of PCB Design

Signals are transferred from the module pads to the internal layer as closely as possible using blind and buried vias. Many ground vias are used below and around the module to ensure a proper return path to the main ground plane on L2 and to aid in thermal dissipation.

Good ground connection is required between the DLSA-WI13-WW's center pad and the outer pads at each corner.

- One ground via should be placed as close as possible to each DLSA-WI13-WW ground pad.
- Ground vias are needed near the pads under the middle of the DLSA-WI13-WW.
- Ground should surround each signal via.
- Signal traces around the module should be routed on inner layers as much as possible.
- JTAG test points should be placed close to the DLSA-WI13-WW.
- Minimize the number of signal vias under the module between the center and outer pads. It is recommended to route signal traces between the pads and move vias outside the DLSA-WI13-WW area (Pad → 100 μ m → Trace; Trace → 100 μ m → Pad).
- The clearance between ground and vias/pads/tracks should be as narrow as possible, around 100 μ m. Maximizing the ground surface under the DLSA-WI13-WW is very important.
- The recommended distance between components and the DLSA-WI13-WW is 40 mils.

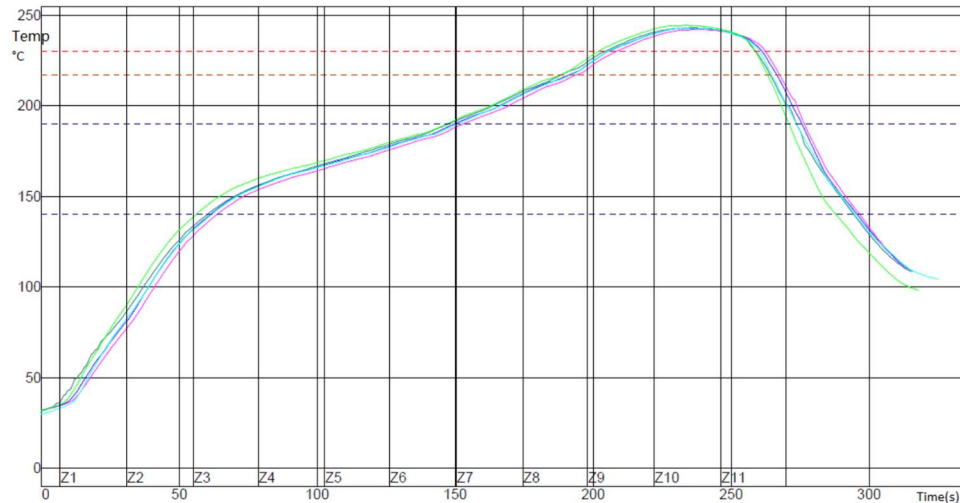
Impact of narrow clearance:

- Increased ground area under the module.
- Vias can be inserted between the module's center pad and outer pads (very close to the pads).
- Allows routing traces between the pads.
- Ensures ground connection at each corner.
- Prevents cuts in the ground plane, even for tightly spaced vias.

5-6. Mounting Considerations

This section details the recommended reflow profile when the module is mounted onto other boards.

Temp. Region	1	2	3	4	5	6	7	8	9	10	11
Upper temp. region	160	175	175	175	180	180	215	230	250	255	240
Lower temp. region	160	175	175	175	180	180	215	230	250	255	240
Conveyer band speed	90 cm/minute										



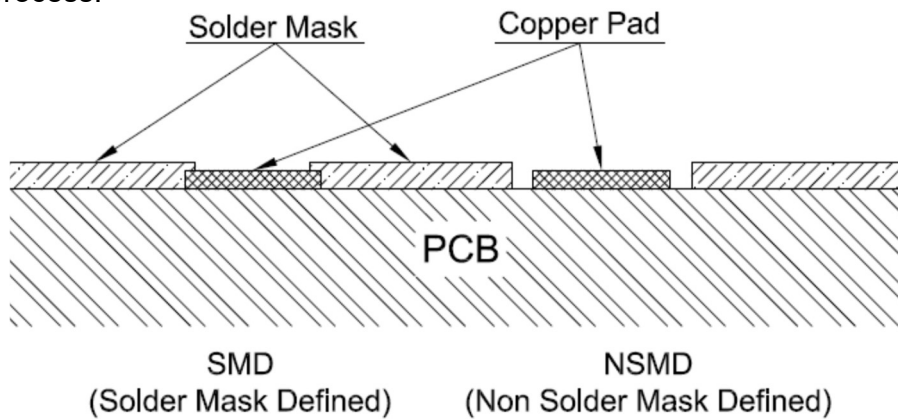
PWI = 91%	U13-1	U13-4	J45-2	U29-2	J44-3	Temp. Difference
Preheat from 140–190°C						
	89.22	88.45	87.27	89.00	90.95	3.68
	10%	5%	-1%	9%	20%	
Melt-out Time/230°C						
	54.12	55.80	54.72	55.01	56.98	2.86
	41%	58%	47%	50%	70%	
Max Temp						
	242.12	242.73	243.00	242.88	244.45	2.33
	21%	27%	30%	29%	45%	
Total Time/217°C						
	73.89	75.48	75.89	72.9	75.31	2.99
	-44%	-38%	-36%	-48%	-39%	
Gradient1 (100–150°C)						
	1.85	1.88	1.84	1.9	1.93	0.09
	23%	25%	23%	27%	29%	

Process limit:

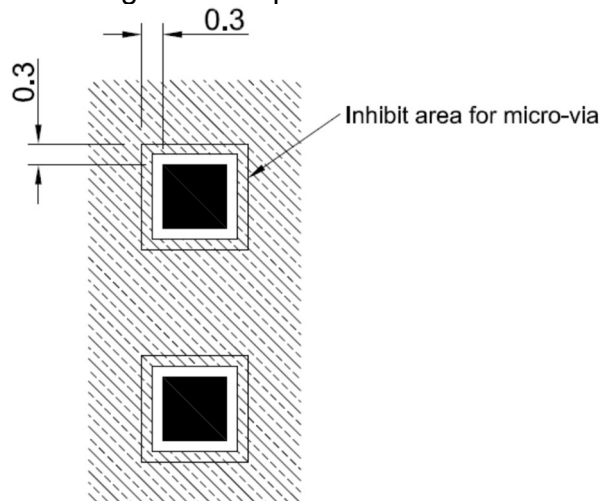
Solder Paste	Lead-free		
Profile feature	Min.	Max.	Unit
Gradient1 (Target = 1.5) (100 °C–150 °C) (Time period = 20 s)	0	3	°C/S
Preheat time from 140 °C to 190 °C	70	105	S
Time maintained above 230 °C	40	60	S
Peak package body temperature	230	250	°C
Time maintained above 217 °C	60	110	S

5-7. PCB Pad Design

We recommend a non-solder mask defined (NSMD) type for the solder pads of the PCB on which DLSA-WI13-WW modules will be mounted. This type of design enables high soldering reliability during the SMT process.



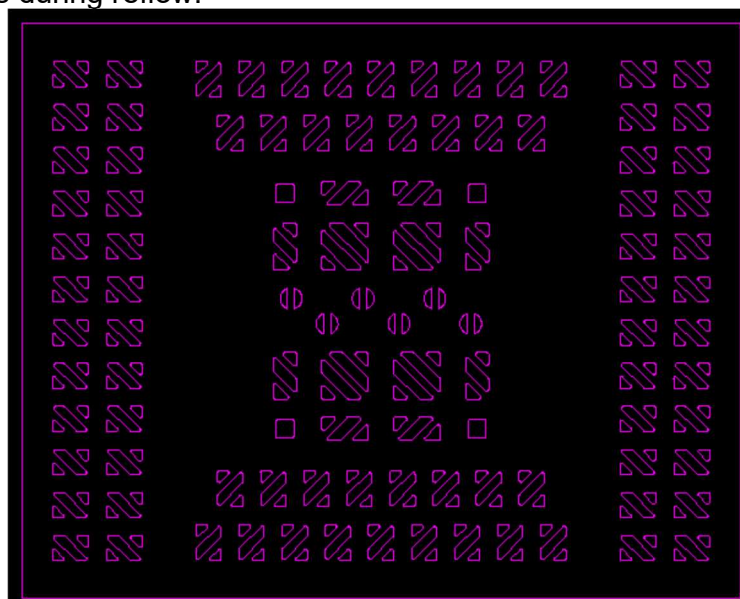
We recommend not placing via or micro-via not covered by solder resistance within 0.3 mm around the pads unless it carries the same signal of the pad itself. Refer to the following figure.



Holes in pad are allowed only for blind holes and not for through holes.

5-8. Stencils

WNC suggests a stencil-foil thickness of ≥ 0.12 mm for module SMTs and the use of a diagonal pattern to prevent voids during reflow.



Stencil-foil drawing

6. Warning Statements

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15, 27, 22, 24, 90

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Please contact the module supplier

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type	Dipole
Antenna connector	RP-SMA

The specifications of the dipole antenna are as follows:

Main technical specifications	
Frequency Range(MHz)	699-960, 1710-2690
Impedance(Ω)	50 $\pm$ 10
Gain(dBi)	2 $\pm$ 0.6
Return Loss(dB)	$\leq$ -6
VSWR	$\leq$ 6.0 $\leq$ 3.5
Admitted Power	1W
Polarization	Linear, Vertical
Radiation	Omni-directional
Connector Type	RP-SMA
Physical Properties	
Antenna Base	ABS
Operating Temp	-40°C ~+70°C
Storage Temp	-40°C ~+70°C

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: NKR-DLSAWI13WW. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

2.11 Note EMI Considerations

Please follow the guidance provided for host manufacturers in KDB publications 996369 D02 and D04.

2.12 How to make changes

Only Grantees are permitted to make permissive changes. Please contact us should the host integrator expect the module to be used differently than as granted:

Name: Benson.Cheng

Email: Benson.Cheng@wnc.com.tw

Phone: +886-3-666-7799 ext:6288

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

ISED

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following conditions

- 1) The antenna must be installed and operated with greater than 20 cm between the antenna and users
- 2) The transmitter module may not be co-located with any other transmitter or antenna.
- 3) Module approval valid only when the module is installed in the tested host or compatible series of host which have similar RF exposure characteristic with equal or larger antenna separation distance.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

- 1) L'antenne doit être installé et exploité avec plus de 20 cm entre l'antenne et les utilisateurs
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.
- 3) Approbation du Module valable que lorsque le module est installé dans l'hôte testé ou de la série de l'hôte compatible qui ont même caractéristique de l'exposition aux RF avec la distance égale ou supérieure séparation antenne.

Tant que les 3 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed and operated with greater than 20 cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 4441A-DLSAWI13WW".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 4441A-DLSAWI13WW".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel

DETACHABLE ANTENNA USAGE

This radio transmitter [IC: 4441A-DLSAWI13WW] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio [IC: 4441A-DLSAWI13WW] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Manufacturer	Connector	Antenna Type	Frequency (MHz)	MaxGain (dBi)	Impedance (Ω)
WNC	RP-SMA	Dipole	700	1.63	50 $\pm$ 2 Ω
			960	2.63	
			1710	2.03	

			2690	2.26	
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ETSI

This device meets the EU requirements (2014/53/EU) on the limitation of exposure of the general public to electromagnetic fields by way of health protection.

This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Declaration of Conformity

Hereby, Wistron NeWeb Corporation declares that the radio equipment type cellular module is in compliance with Directive 2014/53/EU.

The frequency and maximum transmitted power in EU are listed as follows,

703~748 MHz: 24.78dBm

880~915 MHz: 33.83 dBm

832~862 MHz: 25.09 dBm

1710.2~1784.8 MHz: 31.17 dBm

1920~1980 MHz: 24.81 dBm

2500~2570 MHz: 24.98 dBm

CE Mark Warning



EU Declaration of Conformity (DoC)

Hereby we,

Name of manufacturer: **WNC Corporation**
 Address: **20 Park Ave. II, Hsinchu Science Park**
 Zip code & City: **Hsinchu 308**
 Country: **Taiwan**
 Telephone number: **+886 3-666-7799**

declare that this DoC is issued under our sole responsibility and that this product:

Product description: **WNC LPWA Module**
 Type designation(s): **DLSA-WI13-WW**

WNC Corporation

Trademark: **WNC**

Batch / Serial number: _____

Object of the declaration (further identification of the radio equipment allowing traceability; it may include a color image for the identification of the radio equipment):

DLSA-WI13-WW

is in conformity with the relevant Union harmonization legislation:

Radio Equipment directive: 2014 / 53 / EU

and other Union harmonization legislation where applicable:

with reference to the following standards applied:

EN IEC 62311:2020

EN 62368-1:2014+A11:2017

EN301489-1 V2.2.3 , EN301489-52 V1.2.1 (2021-11)

EN 55032: 2015 + A11: 2020, Class B

EN 55035: 2017+A11:2020

EN301908-1 V15.1.1, EN 301908-13 V13.1.1, EN301511 V12.5.1

Where applicable:

The issued EU-type examination certificate: 222140357/AA/00

Description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the DoC