



WLT3266H dual-mode Bluetooth module

Product
Specification
V2.1



catalogue

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1 summary

WLT3266H is an audio Bluetooth module developed by Weilingtong Company, which has a built-in Bluetooth audio protocol stack and various applications

Profile can easily achieve the interconnection, data transmission, voice, music and other applications of user Bluetooth devices.

1.1 Functional characteristics

Complies with Bluetooth V5.1+BR+EDR+BLE specifications

Supports Bluetooth HFP, A2DP, SPP, AVRCP

Supports transparent/protocol data transmission mode, provides AT+instruction set configuration, supports UART

communication interface, and UART interface supports DMA mode. Built in 16 bit audio DAC and 16 bit audio ADC

Built in Capless headphone amplifier with built-in MIC bias and amplification

circuit supporting analog audio input

Supports offline speech recognition, using the latest neural network (TDNN) algorithm with advantages such as accurate recognition and low misjudgment rate. Reliable recognition at a distance of 5 meters provides+6dbm transmission power

Receiver with -90dBm sensitivity

Board mounted PCB antenna, customers can also connect an external antenna with a single power supply of 2.2-5.5V

Stamp hole pins are easy and reliable to weld.

Ultra small size:

13x27.2mm

Flexible software platform, providing customized services



1.2 application area

Bluetooth Speaker

Bluetooth

Music

Forwarder Car

Bluetooth

Handsfree

Health Care

Smart toys

Intelligent Bathroom, Intelligent Lighting, Intelligent Electromechanical,
Intelligent Home

Smart home appliances (household appliances, health appliances, kitchen appliances,
etc.)



2 Electrical characteristics

2.1 Basic characteristics

Table 1 Electrical characteristics

parameter	identification	minimum	typical	maximum	unit
Power supply voltage	VBAT	3.7	4	5.5	V
3.3V power output capacity	I3.3			one hundred and fifty	MA
Storage temperature range	TSTR	-65		one hundred and fifty	° C
Working temperature range	TOPR	-20		seventy	° C

2.2 IO performance

Table 2. IO Input/Output Electrical Logic Characteristics

IO input characteristics						
symbol	meaning	minimum	typical	maximum	unit	Test conditions
V _{IL}	Low Level Input Voltage	-0.3		0.3* VDDIO	V	VDDIO=3.3V
V _{IH}	High Level Input Voltage	0.7* VDDIO		VDDIO+0.3	V	VDDIO=3.3V
IO output characteristics						
V _{OL}	Low Level output Voltage			zero point three three	V	VDDIO=3.3V
V _{OH}	High Level output Voltage	two point seven			V	VDDIO=3.3V



Table 3. Internal Resistor Characteristics

Port	General Output	High Drive	Internal Pull Up Resistor	Internal Pull Down Resistor	Comment
PA0, PA1 PB1, PB8~PB10	8mA	24mA	10K	10K	1. PB1 default pull-up 2. USBDM&USBDP default dropdown 3. PB5 can be pulled up externally 5V 4. Internal resistance accuracy $\pm 20\%$
PB11 PC7	Output0	8mA	10K	10K	
	Output1	8mA			
PB5	8mA	8mA	10K	10K	
USBDP	4mA		1.5K	15K	
USBDM	4mA		180K	15K	

2.3 Bluetooth RF performance

Table 4. BT Characteristics

Transmitters

Basic Data Rate

parameter	minimum	typical	maximum	unit	Test conditions
RF Transmit Power		four	six	DBm	25 °C,
RF Power Control Range		twenty		DB	
20dB Bandwidth		nine hundred and fifty		KHz	
Adjacent Channel Transmit Power	+2MHz		-40	DBm	
	-2MHz		-38	DBm	
	+3MHz		-44	DBm	
	-3MHz		-35	DBm	

Enhanced Data Rate

parameter	minimum	typical	maximum	unit	Test conditions
Relative Power		-1		DB	
$\pi/4$ DQPSK	DEVm RMS	six		%	



Modulation Accuracy	DEVM 99%		ten		%	25 °C, Power Supply VBAT=5V 2441MHz
	DEVM Peak		fifteen		%	
Adjacent Channel Transmit Power	+2MHz		-40		DBm	
	-2MHz		-38		DBm	
	+3MHz		-44		DBm	
	-3MHz		-35		DBm	



Receiver

Basic Data Rate and Enhanced Data Rate

parameter	minimum	typical	maximum	unit	Test conditions
Sensitivity		-90		DBm	25 °C, Power Supply VBAT=5V 2441MHz
Co channel Interference Rejection		-13		DB	
Adjacent Channel Transmit Power	+1MHz	+5		DB	
	-1MHz	+2		DB	
	+2MHz	+37		DB	
	-2MHz	+36		DB	
	+3MHz	+40		DB	
-3MHz	+35		DB		

3 Hardware Introduction

3.1 Functional Block Diagram

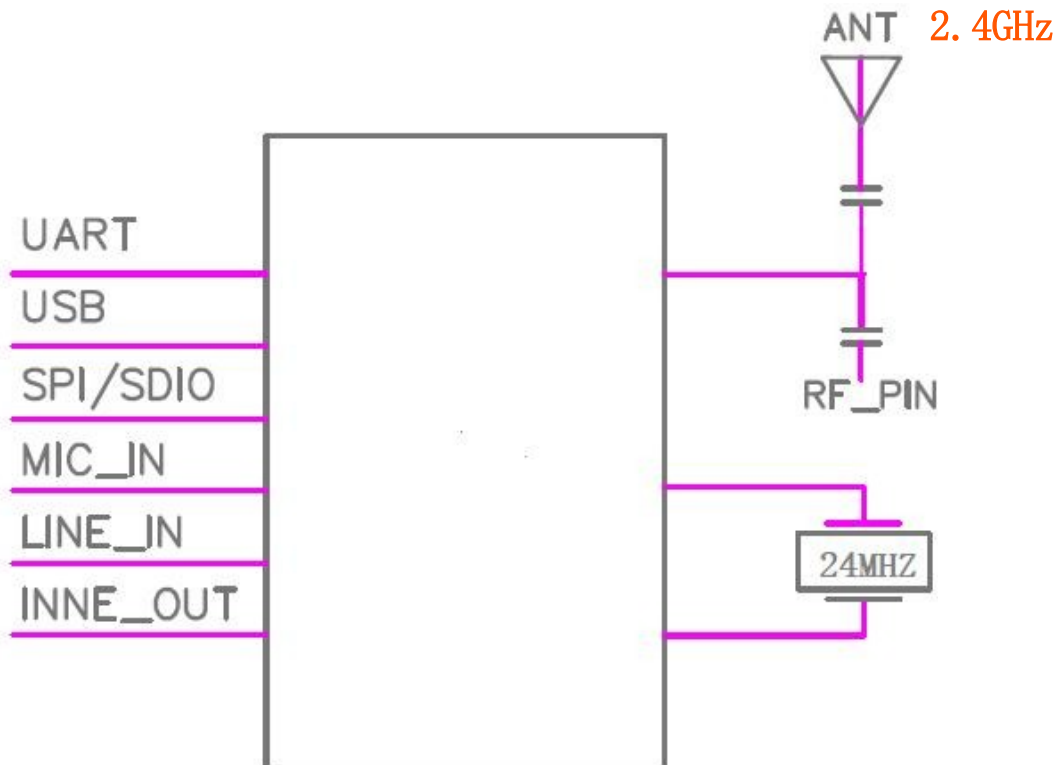


Figure 1. WLT3266H Module Principle Block Diagram



There are three main parts inside the WLT3266H module:

1. Bluetooth part: includes Bluetooth chip, 2.4GHz PCB antenna, and external interface.
2. Speech recognition part: offline speech recognition algorithm, speech denoising algorithm, audio decoding.
3. Audio part: WLT3266H integrates Audio Codec, providing analog audio input and output, digital audio input and output, headphone amplifier, etc., supporting Bluetooth HFP, A2DP (Source and Sink) and other audio applications.

3.2 Module size and pin layout

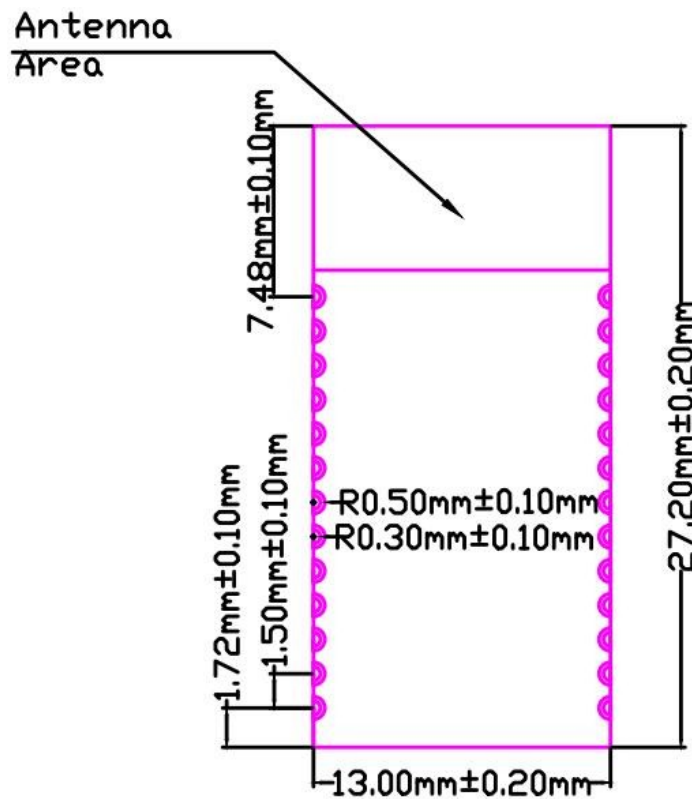


Figure 2 WLT3266H Module Dimensional Drawing (Front)

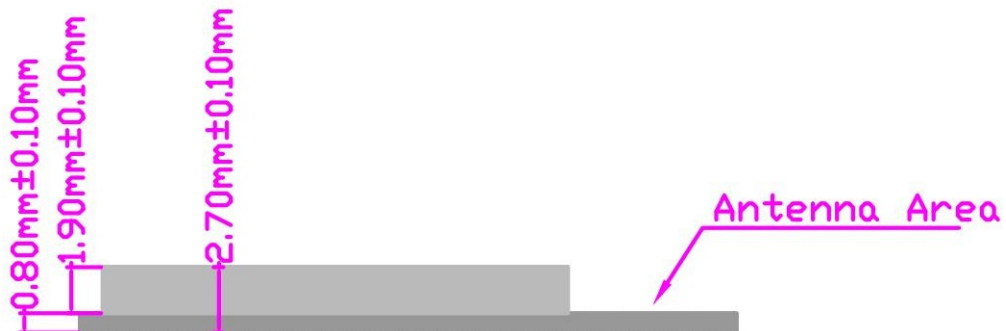


Figure 3 WLT3266H module thickness



3.3 Pin Definition

Pin#	Name	Type	Description
one	UART_TX	I/O	UART1_TXD/AMUX0L/TOUCH0/CLKOUT0/PWMCHOH
two	UART_RX	I/O	UART1_RXD/AMUX0R/ADC0/TOUCH1/PWMCHOL
three	NC	-	No Connect
four	GND	POWER	Ground
five	NC	-	No Connect
six	PB11	I/O	SDC Power Gate
seven	NC	-	No Connect
eight	NC	-	No Connect
nine	NC	-	No Connect
ten	Vcharge	I/O	PWM3/CAP1/UART0TXC/UAT0RXC/Charge Power 5V
eleven	PB1	I/O	ADC5/TMR2/UART1RXA/Long Press Reset
twelve	VCC	POWER	Power supply
thirteen	GND	POWER	Ground
fourteen	USBDM	I/O	UART1RXD/SPI2DOB/I2C_SDA_A
fifteen	USBDP	I/O	UART1TXD/SPI2CLKB/I2C_SCL_A/ADC12
sixteen	LINEIN_L	I/O	AMUX2L/SD0CLKB/SPI2CLKA/CAPO/ UART2TXC/PWMCH3H
seventeen	LINEIN_R	I/O	AMUX2R/SD0CMB/SPI2DOA/ADC9/UART2RXC/PWMCH3L
eighteen	DACL	O	DAC Left Channel
nineteen	DACR	O	DAC Right Channel
twenty	NC	-	No Connect
twenty-one	NC	-	No Connect
twenty-two	NC	-	No Connect
twenty-three	MICROP	I	MIC Input Channel
twenty-four	PB8	I/O	AMUX1R/SD0DAT0B/SPI2DIA/ADC8/CLKOUT1
twenty-five	ANT	-	ExternalANTPIN
twenty-six	GND	POWER	Ground

Table 5 Pin Definition

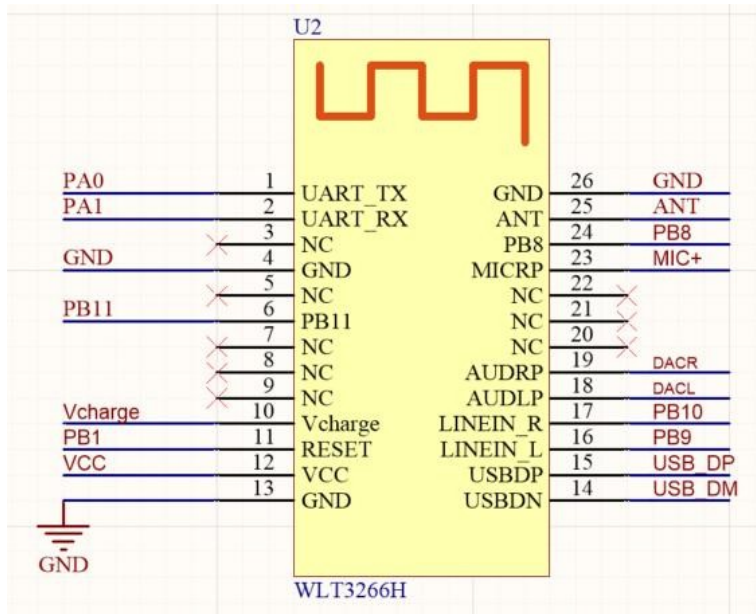


Figure 4 WLT3266H module pin diagram

3.4 Reference schematic

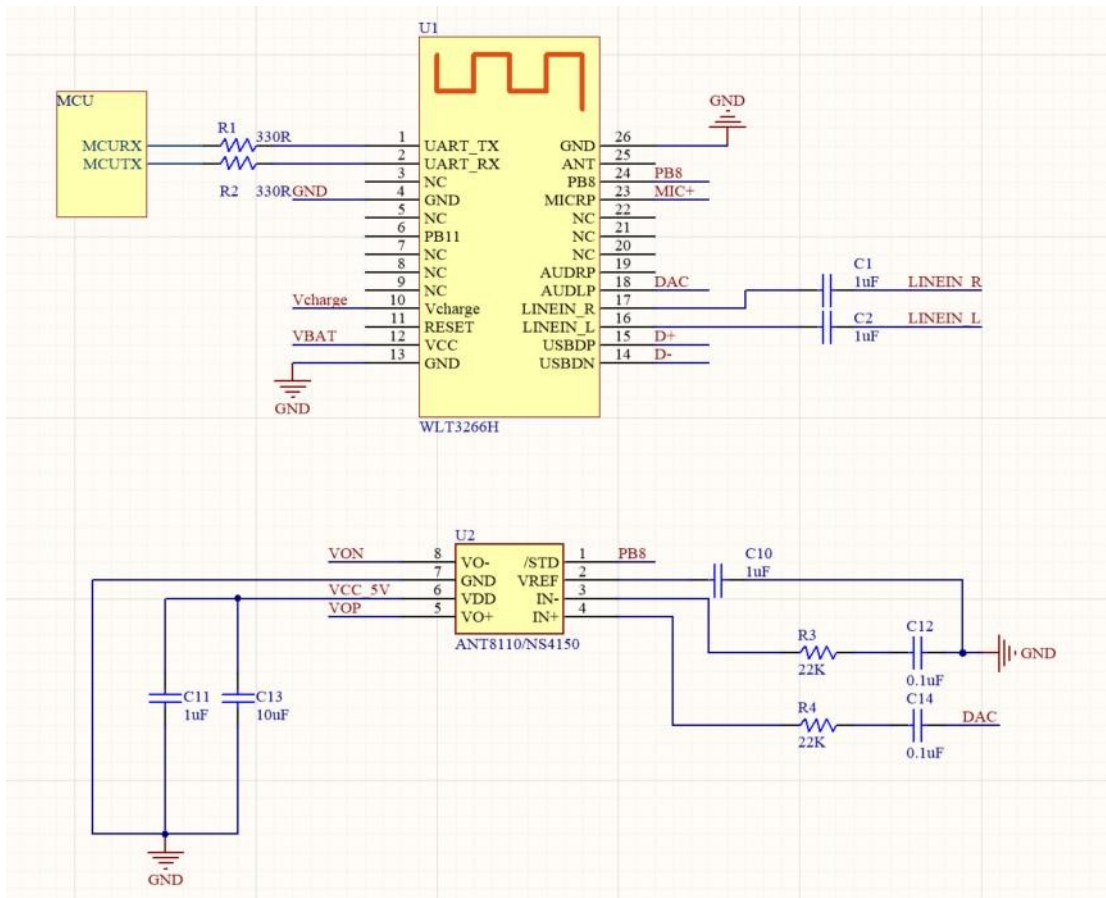


Figure 5 WLT3266H Reference Design



pad size

4.1 Recommended 4PCB design

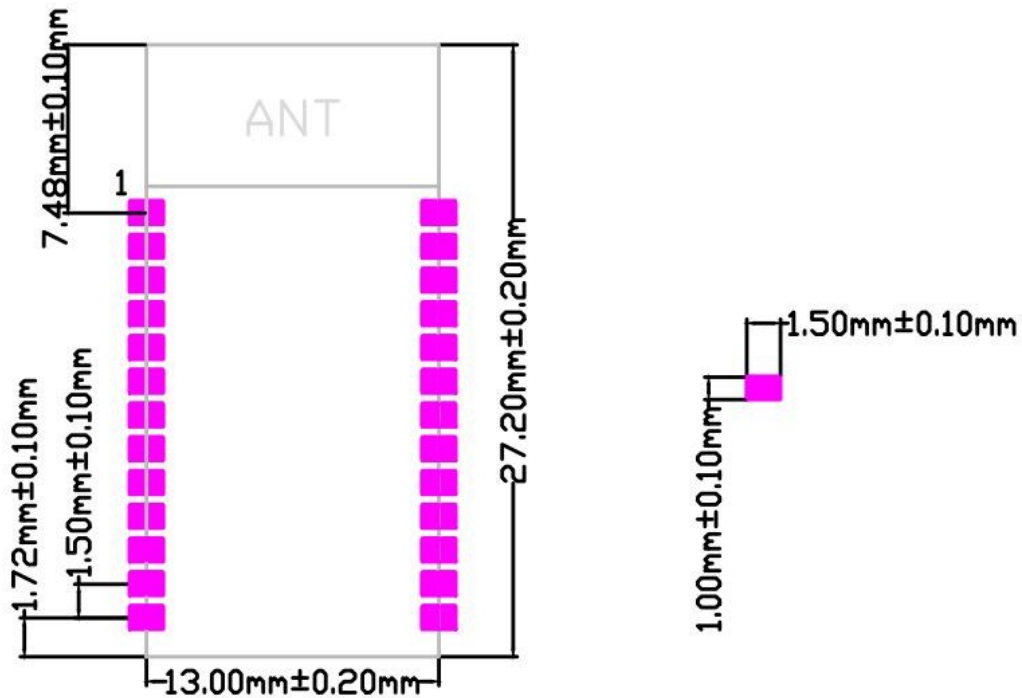


Figure 6 WLT3266H
Package Size
Reference

4.2 PCB layout precautions

Bluetooth operates at a frequency of 2.4GHz, and various factors should be avoided as much as possible to affect wireless transmission and reception. Pay attention to the following points:

1. Avoid using metal for the product casing of the enclosure module. If the casing is metal, consider using an external antenna.
2. The internal metal screws of the product should be kept away from the RF part of the module.
3. The module should be placed around the motherboard, with the antenna part at the edge or corner. Copper or wiring is not allowed in the motherboard area below the module antenna.

5 Recommended reflux parameters

The reflux parameters can refer to the following settings:

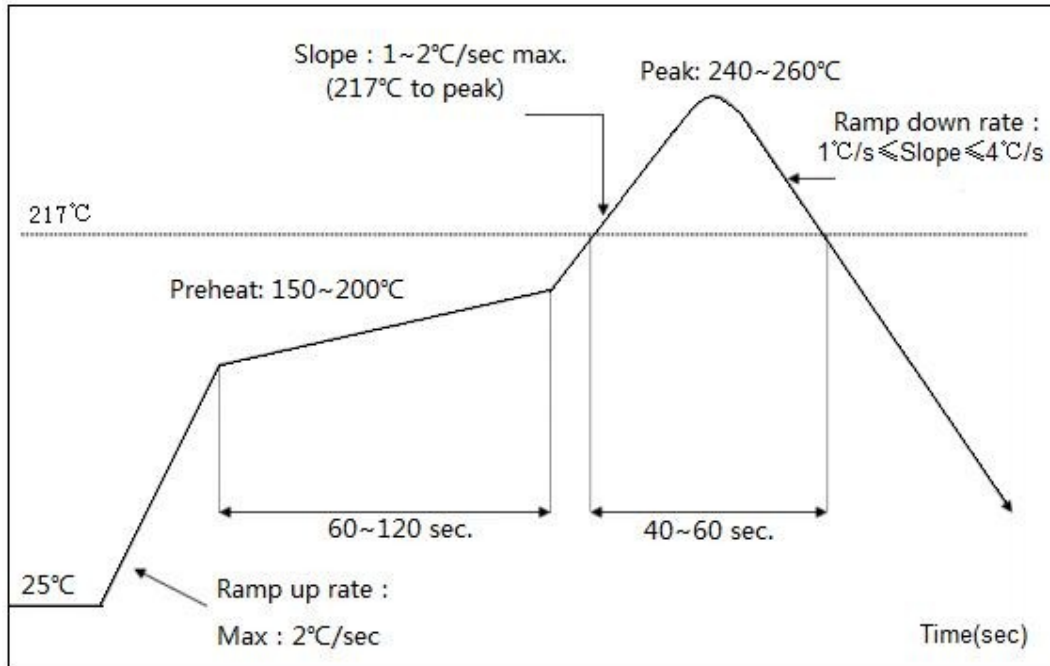


Figure 7 Reflow recommendation curve

Temperature range	Time	Key parameters
Preheat zone (<150 °C)	60-120S	Ramp up rate: ≤ 2S
Uniform temperature zone (150-200 °C)	60-120S	Ramp up rate:<1S
Circulation zone (>217 °C)	40-60S	Peak: 240-260 °C
Cooling zone		Ramp down rate: 1 °C/s ≤ Slope ≤ 4 °C/s

Table 8 Reflow recommendation parameters



6 Software applications

WLT3266H is an audio Bluetooth module that supports **Audio Codec**. The module integrates an audio Bluetooth protocol stack, supporting various traditional Bluetooth applications and low-power Bluetooth applications. For example, HFP, A2DP, AVRCP, etc.

The WLT3266H module supports the AT+command mode of UART port for configuration and operation mode selection. For specific command details, please refer to the application documentation of the relevant WLT3266H module software.

The WLT3266H module supports customer software customization. Please contact our company for details.

7 Regulatory Module Integration Instructions

List of applicable FCC rules

This device complies with part 15 of the FCC Rules.

Limited module procedures

Not applicable

Summarize the specific operational use conditions

This module can be applied in remote Bluetooth Speaker, Bluetooth music transponder Car and Bluetooth hands-free Health , Wireless POS , Portable printer as well as smart home. The input voltage to the module should be nominally 3.7-5.5 V DC , typical value 4V DC and the ambient temperature of the module should not exceed 80°C.

RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 5mm between the radiator& your body. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by 2.1093.



FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Label and compliance information

If the FCC identification number is 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. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2A006-WLT3266H Or Contains FCC ID: 2A006-WLT3266H”

When the module is installed inside another device, the user manual of the host must contain below warning statements.

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer’s instructions as described in the user documentation that comes with the product

Additional testing, Part 15 subpart B disclaimer

The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device .

The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369.



Frequency spectrum to be investigated

For host products with certified modular transmitter , the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1 through (a)(3) , or the range applicable to the digital device, as shown in Section 15.33(b)(1) , whichever is the higher frequency range of investigation.

FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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 operatio.



Update logs

Update date	personnel	version	Update content
August 24, 2022	Neve LV	V2.0	Pin Definition
September 14, 2022	Neve LV	V2.1	Modify pin definitions and characteristic tables