

Bluetooth Module's Manual

1. Introduction

Thank you for using the Bluetooth module product provided. This product is Bluetooth 5.0 products, including embedded UART interface optimized for low-power applications

Before use, please read this user manual carefully. Please follow the technical specifications when using the module in your design and develop activity. Timex Group USA Inc. has the right to change the contents of this manual in accordance with the needs of the technical development.

2. Hardware Architecture

a. Main Chipset Information

Item	Vendor	Part Number
Bluetooth 5.0 mac/baseband/radio	NORDIC	NRF52840

3. Operational Description

It is mounted in the watch communication controller for using a wireless device user the Bluetooth devices that act.

Frequency Use the 2402MHz ~ 2480MHz band and channel interval is 2 MHz.

a. Time base of the RF frequency

ZERO IF intermediate frequency using the method and the reference frequency is external 32MHz crystal.

b. Synthesizer

Transceiver size is relatively fresh inside the internal voltage controlled oscillator (VCO) and the PLL system to respond to a wide adjustment range.

c. Transmission

Baseband processing GFSK modulation, Data transfer speed is 1Mbps.

By the DAC in the BBP IC TX IQ signal is input through the modulation process and a TX carrier frequency

The amplifier stage shelter will be sent.

d. Reception

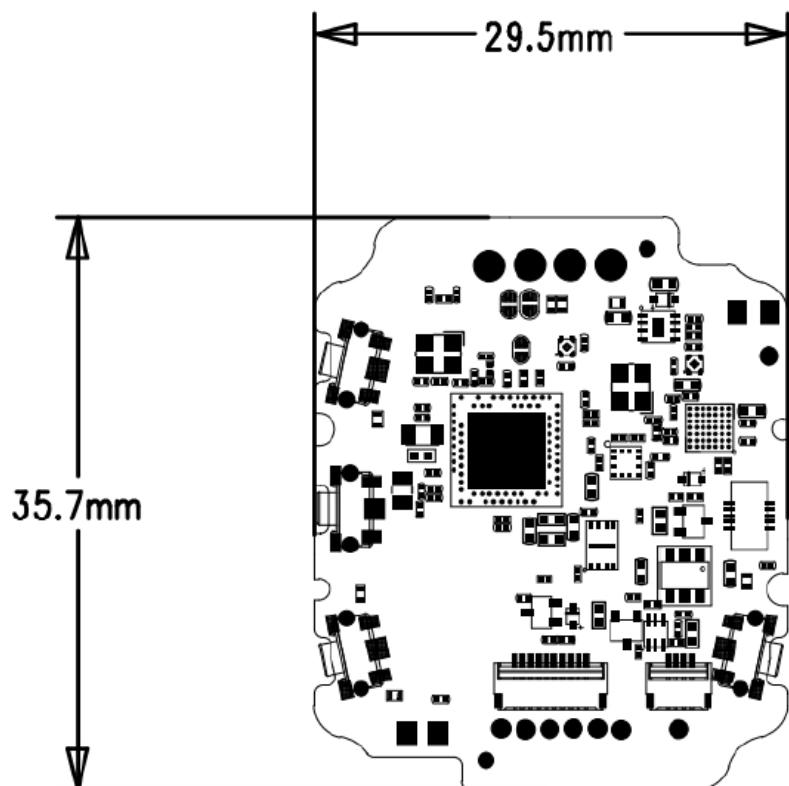
This transceiver IC is isolated to prevent unwanted noisy radiation by internal amplifier noise. The RF signal is processed through intermediate frequency conversion and demodulation, and a RXIQ signal via a low-pass filter. The input to baseband processing.

e. Product Spec.

Parameter	Min	Typ.	Max	Unit
RF Characteristics				
RF Frequency Range	2.402	-	2.480	GHz
Output power [TRM/CA/01/C] class1	-20	-2	8	dBm
TX Spurious Emission 3.0MHz to 1.0GHz 1.0GHz to 12.5GHz 1.8GHz to 1.9GHz 5.15GHz to 5.3GHz	-	-	-35	dBm
TX Frequency Tolerance	-75	-	75	KHz
Carrier Frequency Drift	-20	-	20	KHz
TX Output Spectrum_20dB bandwidth	-1	-	1	MHz
Modulation Characteristics	DELTA F1	140	-	175
	DELTA F2	115	-	-
	DELTA F2/ DELTA F1	0.8	-	3
Receiver sensitivity BER at -70dBm	-	-	0.1	%
Maximum Input Level BER at -20dBm	-	-	0.1	%
TX output Spectrum Adjacent Channel Power	IM-NI=2	-	-20	dB
	IM-NI≥3	-	-40	
Rx Adjacent Channel Rejection at 3MHz GFSK, 0.1%BER			-40	dB
Co Channel Rejection GFSK, 0.1%BER			11	dB
RX Spurious Emission 3.0MHz to 1.0GHz 1.0GHz to 12.5GHz 1.8GHz to 1.9GHz 5.15GHz to 5.3GHz			-54	dBm

4. Detailed specification

Transmission frequency: 2402 ~ 2480 MHz
Number of channels: 40 channels
Operating Voltage: DC 3.7 V
Size: 30 mm X 35 mm X 0.8 mm
Temperature, humidity range: -20 °C ~ + 70 °C
Communication system: repeated Shin way
Modulation: GFSK



5. Instruction to OEM

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

This device is verified to comply with part 15 of the FCC Rules for use with cable television service.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause interference and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 or more 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.

This application and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.

Host labeling requirement: Contains transmitter module FCC ID: EP9-TMXMO2Q

This device complies with Industry Canada's license-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'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Host labeling requirement: Contains transmitter module IC ID: 3348A-TMXMO2Q

6. Note:

- a. The module is excluded from SAR evaluation according to FCC KDB Publication 447498 D01 General RF Exposure Guidance v06 and clause 2.5.1 of RSS-102 Issue 5.
- b. The module is a limited single module without shielding case, CIIPC or new filing shall be applied for any host equipment using this module, such as provide the shielding case for this module.