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HT MICRON semicondutores

iMCP HTSXMO32L-22 PCB

ANTENNA TEST-BOARD

Sigfox® Monarch RF System-in-Package

Classification: PUBLIC

Doc. Type: DATASHEET

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Date: 03/08/2021

Code: PCBANT-HTSXMO32L-22

SUMMARY

DOCUMENT INFO

This document provides the technical information about the iMCP HTSXMO32L-22 PCB antenna test-board.

1. GENERAL DESCRIPTION

The PCB antenna test-board provides a reference layout design with integrated antenna for an easy connection to the Sigfox backend using the HT Micron iMCP HTSXMO32L-22 solution. The firmware example can be found here [link]. The datasheet of the iMCP HTSXMO32L-22 can be downloaded from [link].

2. FEATURES AND BENEFITS

2.1. KEY FEATURES

- iMCP HTSXMO32L-22
- PCB antenna layout
- Matching network
- Push-button
- SWD pin connections
- USART pins connections
- Jumper to enable/disable voltage supply
- Power-on LED
- Bypass capacitors

2.2. RF - FREQUENCY BANDS

- RC2: North America and Brazil 902.104 ~ 902.296 MHz

3. BOARD SCHEMATICS

The board schematics is provided below, and it is publicly available together with the Gerber files on: [link].

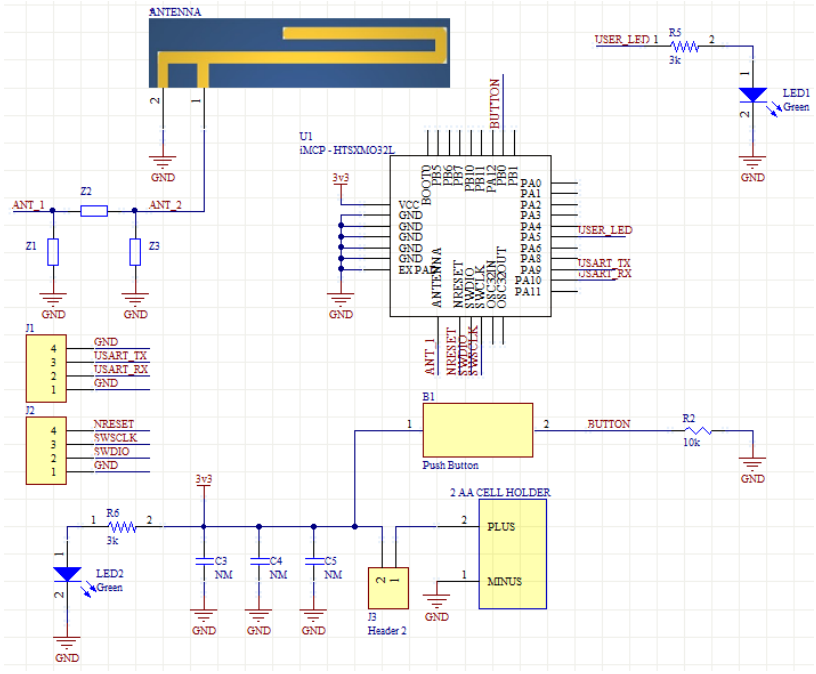

Figure 1: Board schematics

4. PINOUT INFORMATION

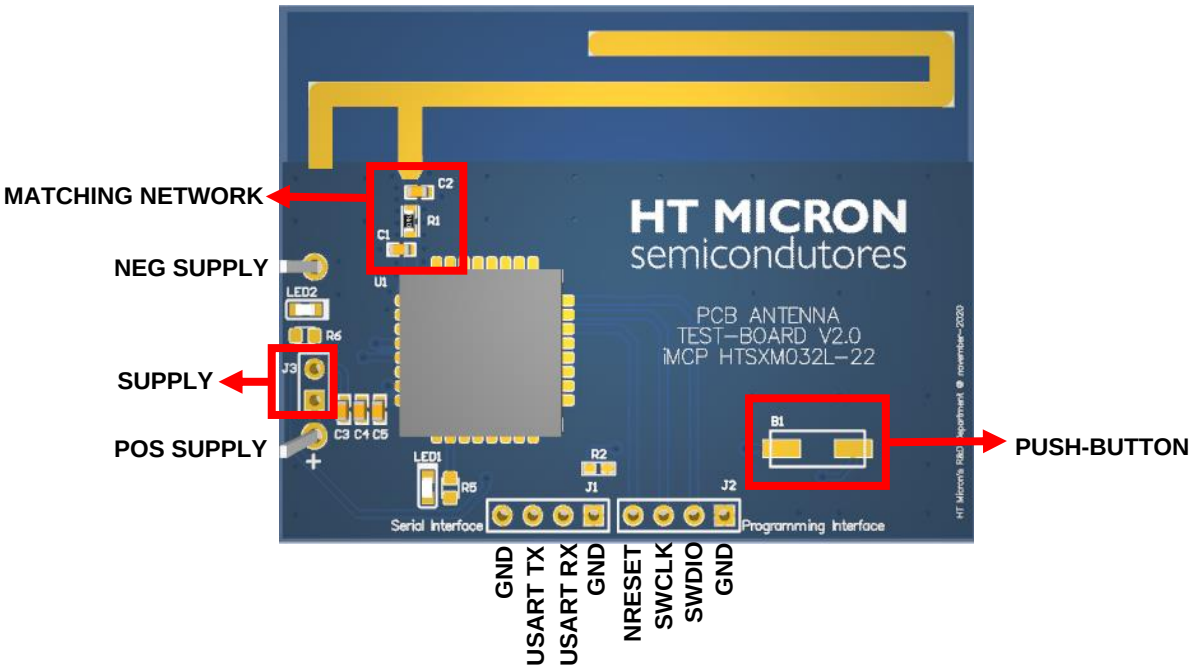

Figure 2: Pin Diagram

4.1. CONNECTIONS DESCRIPTION

Table 1: Detailed pin functions.

Connector	Number	Name	Type	Description
J1	1	GND	Ground	Ground
	2	USART RX	Digital I/O	USART interface
	3	USART TX	Digital I/O	USART interface
	4	GND	Ground	Ground
J2	1	GND	Ground	Ground
	2	SWDIO	Digital I/O	Serial wire
	3	SWCLK	Digital I/O	Serial wire clock output
	4	NRESET	Digital I/O	Bi-directional reset pin
J3	1	POWER SUPPLY	-	Jumper to activate power supply
B1	1	PUSH-BUTTON	Digital I/O	User push-button

4.2. Power Pins

Table 2: Power pins description.

Pins	Description
Header +	Positive voltage next to supply jumper
Header -	Negative voltage next to LED 2

5. STATIC CHARACTERISTICS

5.1. General operating range

Table 3: General operating conditions.

Parameter	Conditions	Min	Typ.	Max	Unit
Supply Voltage	-	2.7	3.3	3.6	V
Supply Current	-	-	-	500	mA
Operating Temperature	-	-40	-	85	°C

5.2. Power consumption

Refer to HTSXMO32L-22 official datasheet and consider the current consumption of all LEDs on the board.

6. RF CHARACTERISTICS

The PCB antenna impedance right at its terminal referred to ground is $Z_A = 4.8 + j36.8\ \Omega$. Matching to the iMCP HTSXMO32L-22 antenna pin was achieved with an SMD capacitor of 12 pF (0603) in series (Z2 only) for the central frequency of RC2 (902.2MHz). Pads are available on the board for π- matching network if the user wants to tune the antenna to another frequency.

The PCB antenna tuning was performed over the air (the board was fixed in a support) and it is very sensitive to where the board is placed. If the test-board is placed flat on a desk, the performance may differ.

The reference PCB material specification is a two-layer FR4 1.6mm 1 Oz copper. It is important to notice that the FR4 material quality can impact greatly on the performance of the antenna and the matching network might need to be adjusted.

Table 4: PCB antenna RF characteristics.

Parameter	Sigfox RC2
Antenna gain	0 dBi

7. BOARD DIMMENSIONS

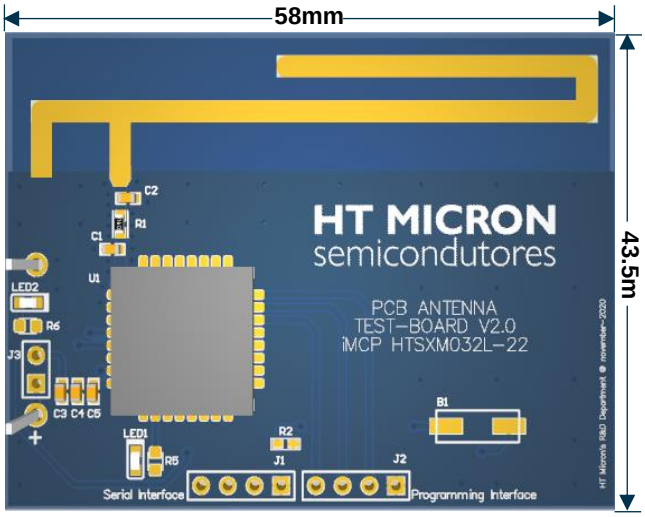

Figure 3: Board dimensions

LIST OF FIGURES

LIST OF TABLES

REVISION HISTORY

Version	Date	Changes	Authors
01	05/03/2021	- Initial draft	AC
02	08/03/2021	- Added schematics and minor revisions	AC and FK

CONTACT

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