TWN4

MultiTech Nano

DocRev1, May 13, 2016
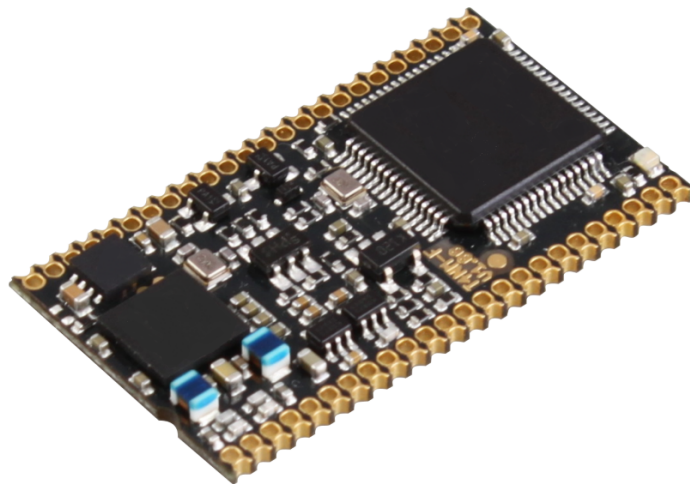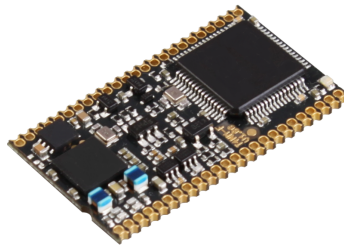
Elatec GmbH

Contents

1 Introduction

Here is a picture of the TWN4 MultiTech Nano:
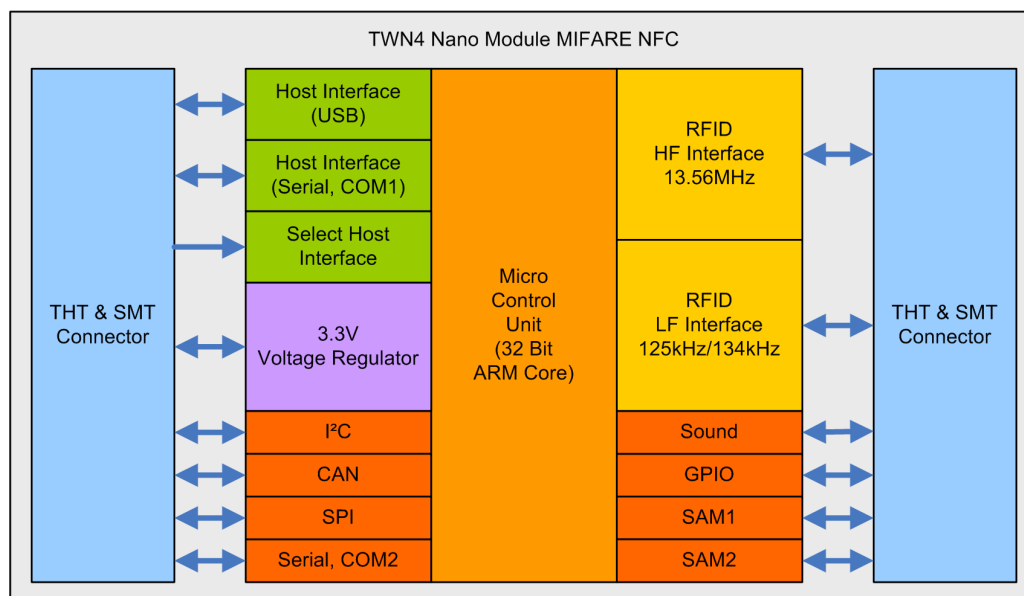
Currently, there is one model of TWN4 Nano Module available:

- TWN4 MultiTech Nano

The TWN4 Nano Module contains voltage regulator, control unit, RFID front ends and communication interfaces.

2 Connector and Pin-Out

The TWN4 Nano Module has two rows of pins (24 pins each), which can be used either for THT or SMT mounting on the carrier board. The contact pitch is 1.27mm (50mil).

| Pin	Pin Name	Function
1	HF_ANT1	TWN4 MultiTech Nano:
		Together with pin HF_ANT2, this pin is doing load modulation on antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Not connected
2	HF_RXP	TWN4 MultiTech Nano:
		Together with pin HF_RXN, this pin builds the input from the direct matched antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Not connected
3	HF_TX1	TWN4 MultiTech Nano:
		Together with pin HF_TX2, this pin builds the output to the direct matched antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Output for antenna (50 Ohm)
4	GND	Ground
5	HF_TX2	TWN4 MultiTech Nano:
		Together with pin HF_TX1, this pin builds the output to the direct matched antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Not connected
6	HF_RXN	TWN4 MultiTech Nano:
		Together with pin HF_RXP, this pin builds the input from the direct matched antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Not connected
7	HF_ANT2	TWN4 MultiTech Nano:
		Together with pin HF_ANT1, this pin is doing load modulation on antenna 13.56MHz
		TWN4 MultiTech Nano LEGIC 42:
		Not connected
8	LF_ANT1	Output 1 for connecting external 125 kHz / 134.2 kHz antennas
9	LF_ANT2	Output 2 for connecting external 125 kHz / 134.2 kHz antennas
	continued on next page...	

10	GPIO0	GPIO0, I/O pin for general purposes.
11	GPIO1	GPIO1, I/O pin for general purposes.
12	GPIO2	GPIO2, I/O pin for general purposes.
13	GPIO3	GPIO3, I/O pin for general purposes.
14	GPIO4	GPIO4, I/O pin for general purposes.
15	GPIO5	GPIO5, I/O pin for general purposes.
16	GPIO6	GPIO6, I/O pin for general purposes.
17	GPIO7	GPIO7, I/O pin for general purposes.
18	SAM1_CLK	Clock output for SAM1
19	SAM1_IO	I/O line for SAM1
20	SAM1_RST	Reset output for SAM1
21	GND	Ground
22	SAM2_CLK	Clock output for SAM2
23	SAM2_IO	I/O line for SAM2
24	SAM2_RST	Reset output for SAM2
25	BOOT	Shortcut against ground during reset will guide firmware directly into boot loader
26	SPK+	Digitally modulated output for a speaker. Second connection for the speaker is ground. The impedance of the speaker should be greater than 24 ohm.
27	COM2_TX-	Low active output (logic level, push/pull) of asynchronous TXD from COM2.
28	COM2_RX-	Low active input (logic level) with internal pull-up resistor of asynchronous RXD to COM2.
29	SPI_SS-	Pin SS- of SPI interface
30	SPI_MISO	Pin MISO of SPI interface
31	SPI_MOSI	Pin MOSI of SPI interface
32	SPI_SCK	Pin SCK of SPI interface
33	GND	Ground
34	CAN_TX	TTL TX pin of CAN interface. A external interface circuit is required.
35	CAN_RX	TTL RX pin of CAN interface. A external interface circuit is required.
continued on next page...		

36	I2C_SCL	Clock pin of I2C interface. No internal pull up.
37	I2C_SDA	Data pin of I2C interface. No internal pull up.
38	PWRDWN-	Low active TTL input with internal pull-up resistor for turning off the voltage regulator.
39	RESET-	Low active TTL input with internal pull-up resistor for hard reset.
40	VCC	3.3V power supply input.
41	VREG	3.3V output from on-board voltage regulator
42	HOSTSEL	Host channel selector: Low = COM1, high = USB. This pin is internally pulled high.
43	USB_DM	USB Data -
44	USB_DP	USB Data +
45	COM1_TX-	Low active output (logic level, push/pull) of asynchronous TXD from COM1.
46	COM1_RX-	Low active input (logic level) with internal pull-up resistor of asynchronous RXD to COM1.
47	VIN	Unregulated input to on-board voltage regulator.
48	GND	Ground

2.1 Assembly Information

2.1.1 Dimensions
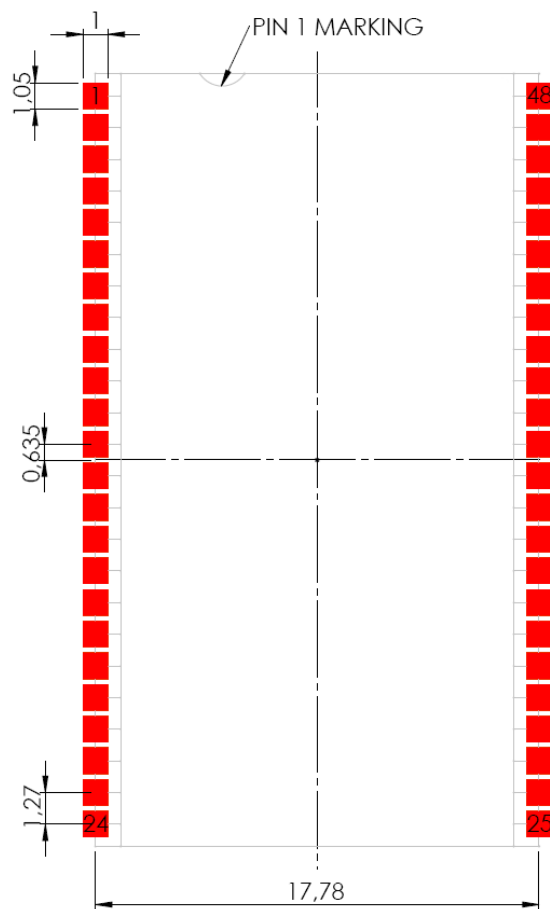
The dimensions of TWN4 Nano Module are as follows.:
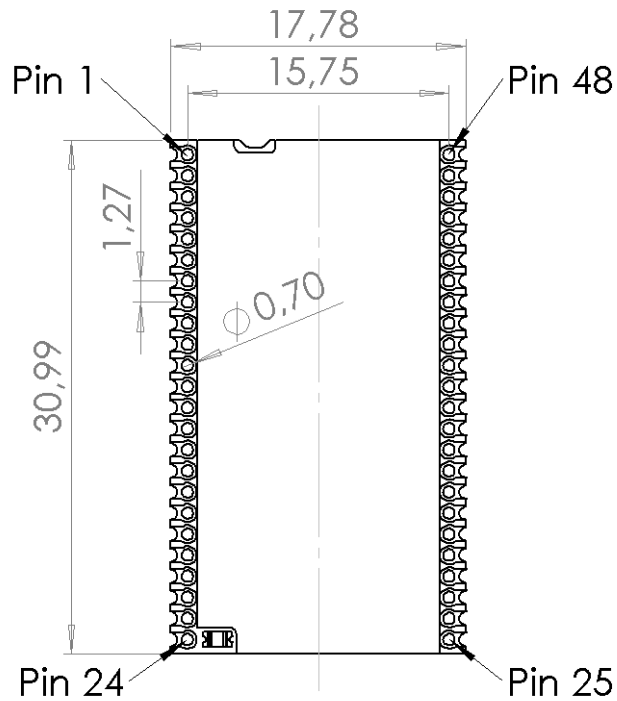
2.1.2 Through-Hole Technology (THT)

Suggested connector for THT assembly is Samtec TMS-124-02-G-S.

In case a detachable connection is required, mating part (to be mounted on carrier board) is Samtec SLM-124-01-G-S.
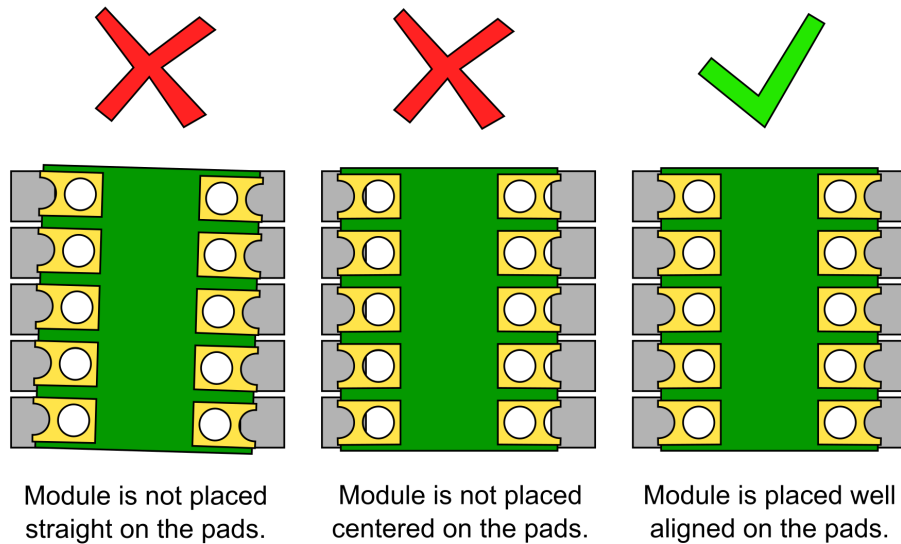
2.1.3 Surface Mount Technology (SMT)

2.1.3.1 Footprint

2.1.3.2 Placement

Please take special care about correct placement of TWN4 MultiTech Nano on the soldering pads. Wrong placement might cause holes for THT assembly to absorb tin from the SMT pads. Please follow these rules:

| Module is not placed straight on the pads. | Module is not placed centered on the pads. | Module is placed well aligned on the pads. |

2.1.3.3 Temperature Profile

For reflow soldering, following temperature profile is recommended:
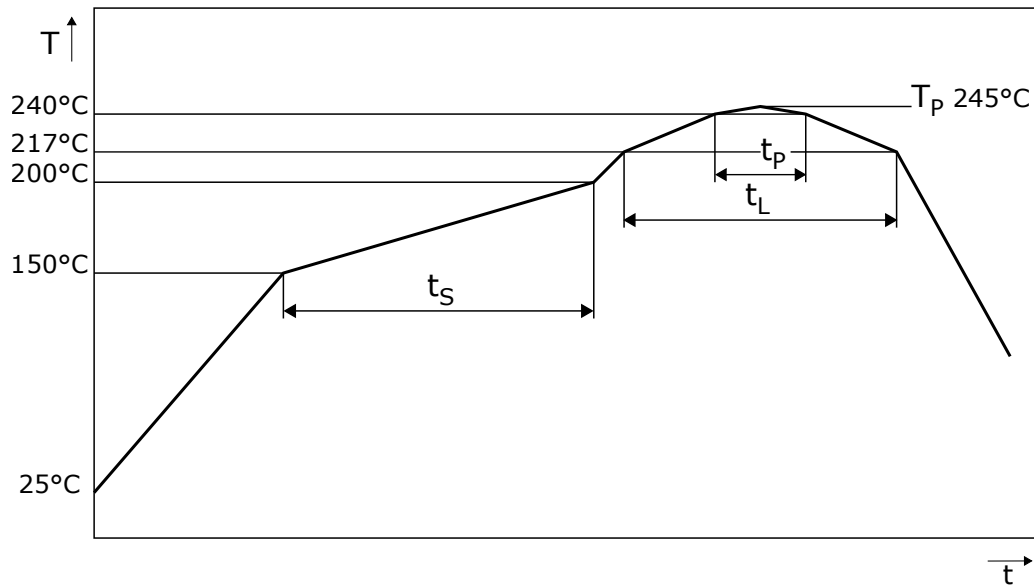
| Ramp-up rate	1-3 K/s
Preheat time (t_s)	60-180 seconds
Time within liquidus temperature (t_L)	60-150 seconds
Peak temperature (T_P)	245 +0/-5 °C
Time within peak (t_P)	10-30 seconds

3 Antenna

3.1 LF-Antenna

The nominal inductance for an external 125 kHz/134.2 kHz antenna is 490 µH. The series resistance of the antenna should be lower than 10 ohms.

3.2 HF-Antenna

Please see separate document "TWN4 MultiTech Nano Direct Matched Antenna Design Guide.xlsx" for an in-depth guide on how to design antenna for TWN4 MultiTech Nano.

4 Power Supply

The picture below is showing how power is routed through TWN4 Nano Module:
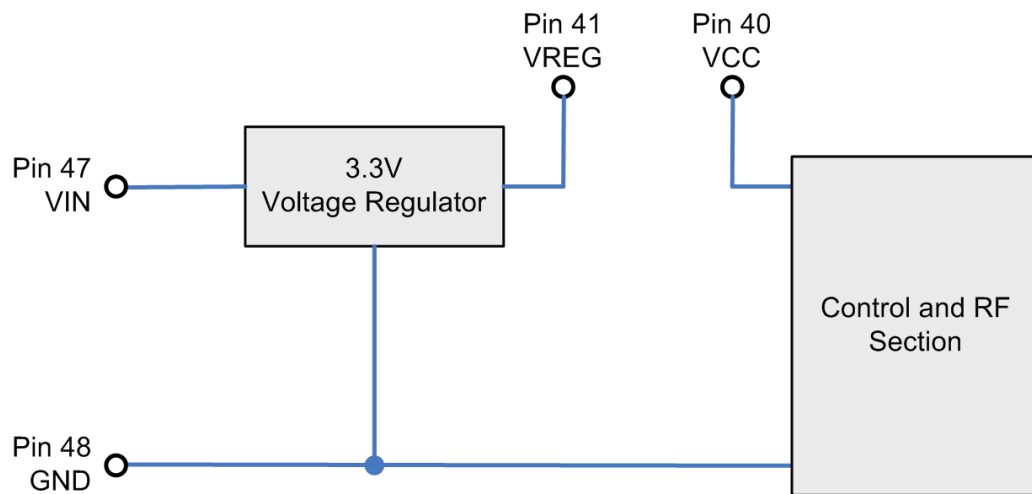
5 Disclaimer

Elatec reserves the right to change any information or data in this document without prior notice. The distribution and the update of this document is not controlled. Elatec declines all responsibility for the use of product with any other specifications but the ones mentioned above. Any additional requirement for a specific custom application has to be validated by the customer himself at his own responsibility. Where application information is given, it is only advisory and does not form part of the specification.

All referenced brands, product names, service names and trademarks mentioned in this document are the property of their respective owners.