



# PRODUCT SPECIFICATION

## 400MHz Band Wireless Communication Module

**Model** : NMT-UM434R1-C  
**Date** : Jun 30, 2020  
**Revision** : v1.5.1

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## REVISION HISTORY

Revision	Date	Description	Remark
1.0	Jun 13, 2016	Preliminary – Initial Release	
1.1	Jul 22, 2016	Product Image Change	
1.2	Oct 04, 2016	Add Application Schematic	
1.3	Apr 04, 2017	Change Address	
1.4	Jul 02, 2019	Change Electrical Properties	
1.5	Nov 27, 2019	Change Electrical Properties - Add Sleep Current - Change Operating Temperature - Fix IO Port Drive Current - Change RF Air Rate - Change UART Baud Rate - Change Mechanical Dimension	
1.5.1	Jun 30, 2020	Add Frequency Band Restriction Notice	

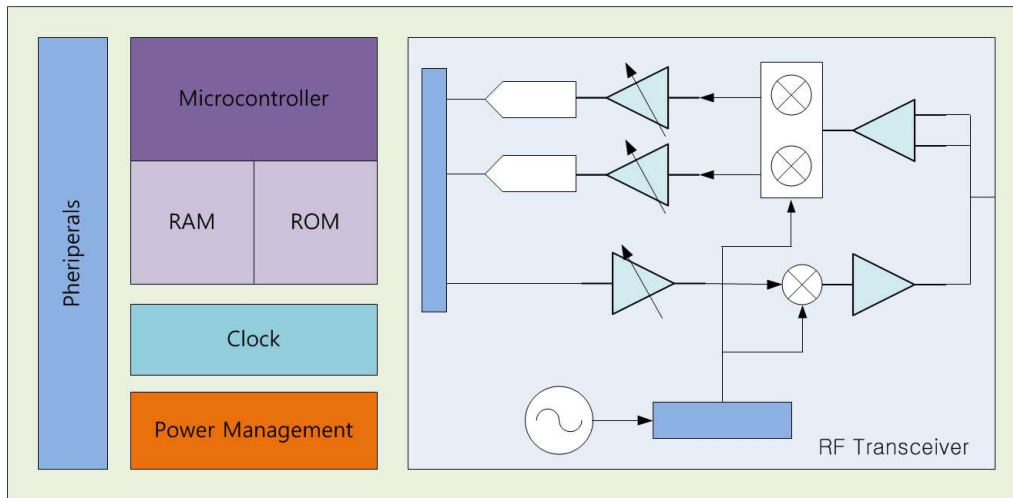


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# 1. Overview

## A. Block Diagram



## B. Features

- i. **Various Kinds of Operation Mode**
  1. **1:1 Mode : Direct(Packet, Plain Text)**
  2. **1:N Mode : Star-Network Mode**
  3. **User Settable Pre-defined Msg. Report for "Stand-Alone Wireless Sensor" Application.**
- ii. **Easy to Use & Control by UART port plus AT Command**
- iii. **Strong Data Security**
- iv. **Superior RF Performance : up to -126dBm Rx Sensitivity (Conducted, 900bps)**
- v. **Support Narrow Bandwidth Communication : 8.5kHz Bandwidth, 12.5kHz Spacing**
- vi. **Low Power Consumption**
  1. **0.1uA on Sleep Mode**
  2. **16mA on Rx Mode, 19mA on Tx Mode (Typ.)**
- vii. **Wide Range of Supply Voltage : 1.8 ~ 3.6 VDC**
- viii. **Wide Range of Operational Temperature : -30°C ~ +85°C**
- ix. **Small Size : 10.65 x 17.25 x 2.00 mm, Typ.**
- x. **KC Certified**

## C. Applications

- i. **Home Automation, Home Security**
- ii. **Remote Control, Garage Door Entry**
- iii. **Building Lighting Control, Building HVAC Control, Smart Metering**
- iv. **Fire and Security Monitoring, Security and Access Control**
- v. **Wireless Sensor Network/Monitoring, Wireless Data Logger**
- vi. **Telemetry**

## 2. Electrical Properties

### A. Absolute Maximum Ratings<sup>1</sup>

Parameter	Condition	Min	Typ.	Max	Unit
VBAT		-0.3	-	4.0	V
VDD		-0.3	-	4.0	V
IO Voltage	VDD > 2.2V	-0.3	-	5.0	V
Total Current		-	-	500	mA
Sunk Current on any IO Pin		-	-	100	mA
Total Sunk Current through all IO Pin		-	-	200	mA
Storage Temperature		-65		+150	°C

### B. General DC Characteristics

Parameter	Condition	Min	Typ.	Max	Unit
VBAT		1.8	3.3	3.6	V
VDD		1.8	3.3	3.6	V
IO Input High Voltage	VDD > 2.0 to 3.6V	VDD-0.6	-	VDD+0.3	V
	VDD < 1.8 to 2.0V	0.7 x VDD	-	VDD+0.3	
IO Input Low Voltage	VDD > 2.0 to 3.6V	-	-	0.6	V
	VDD < 1.8 to 2.0V	-	-	0.3 x VDD	
Max Current Consumption	Sleep State	-	0.1	-	uA
	RF Rx State (Normal)	-	16	19	mA
	RF Rx State (High Performance)	-	18	22	mA
	RF Tx State	-	19	25	mA
IO Port Drive Current		-	-	3	mA
UART Baud Rate		-	-	9,600	bps
Reset Low Time to Generate a System Reset		15	-	-	µs
Wakeup Time	Two-Cell Mode	-	2	-	µs
Operation Temperature		-30	-	+85	°C

<sup>1</sup> Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the devices at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

### C. AC Characteristics

Parameter	Rating	Remark
Communication	Half Duplex	
Operating Frequency Range	424 ~ 447 MHz	for Detail Supported Channel List, Check below Table
Antenna Characteristic Impedance	50 $\Omega$	
Channel Step	12.5 kHz	
Occupied Bandwidth	< 8.5 kHz	
RF Air Data Rate	9,600bps, 4,800bps 2,400bps, 1,200bps, 900bps	
RF Sensitivity	-126dBm, Typ.	900bps, GFSK
RF Tx Max. Output Power	+10dBm	
RF Tx Spurious Emission	-40 dBc, < 1 GHz -55 dBc > 1 GHz	
Channel Settling Time	50 $\mu$ s	

### 3. Supported Frequency Channel (A supported frequency band may restricted upon request)\*

#### A. Band 1

Center Freq. (MHz)	CH. No.	Remark
424.7125	1	
424.7250	2	
424.7375	3	
424.7500	4	
424.7625	5	
424.7750	6	
424.7875	7	
424.8000	8	
424.8125	9	
424.8250	10	
424.8375	11	
424.8500	12	
424.8625	13	
424.8750	14	
424.8875	15	
424.9000	16	
424.9125	17	
424.9250	18	
424.9375	19	
424.9500	20	

#### B. Band 2

Center Freq. (MHz)	CH. No.	Remark
433.9200	0	

#### C. Band 2

Center Freq. (MHz)	CH. No.	Remark
447.6000	0	
447.6125	1	
447.6250	2	
447.6375	3	
447.6500	4	
447.6625	5	
447.6750	6	
447.6875	7	
447.7000	8	
447.7125	9	
447.7250	10	
447.7375	11	
447.7500	12	
447.7625	13	
447.7750	14	
447.7875	15	
447.8000	16	

447.8125	17	
447.8250	18	
447.8375	19	
447.8500	20	

#### D. Band 1

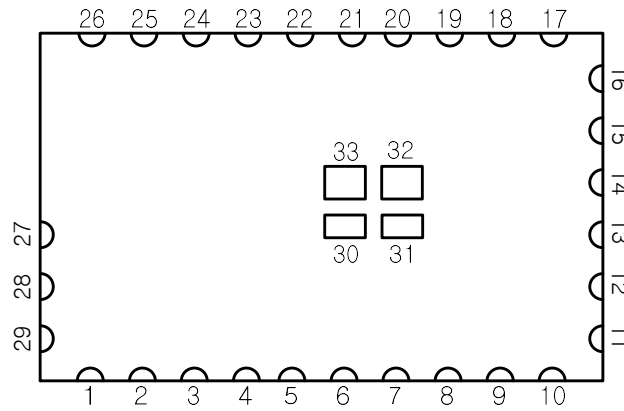
Center Freq. (MHz)	CH. No.	Remark
447.2625	0	
447.2750	1	
447.2875	2	
447.3000	3	
447.3125	4	
447.3250	5	
447.3375	6	
447.3500	7	
447.3625	8	
447.3750	9	
447.3875	10	
447.4000	11	
447.4125	12	
447.4250	13	
447.4375	14	
447.4500	15	
447.4625	16	
447.4750	17	
447.4875	18	
447.5000	19	
447.5125	20	
447.5250	21	
447.5375	22	
447.5500	23	
447.5625	24	

#### E. Band 3

Center Freq. (MHz)	CH. No.	Remark
447.8625	0	
447.8750	1	
447.8875	2	
447.9000	3	
447.9125	4	
447.9250	5	
447.9375	6	
447.9500	7	
447.9625	8	
447.9750	9	
447.9875	10	

## 4. Pinout

### A. Pinout Diagram (Top Through View)



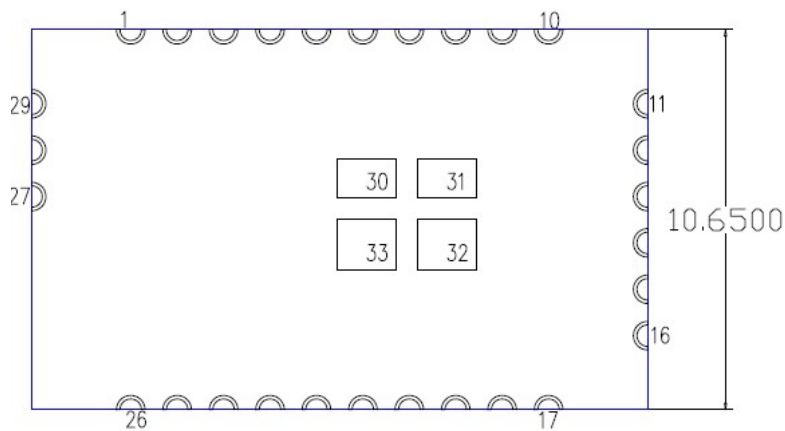
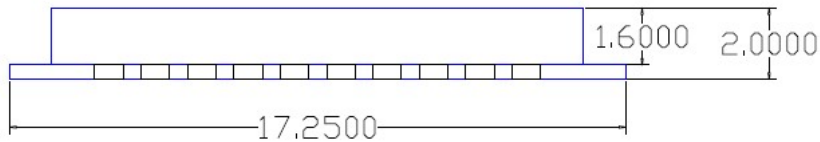
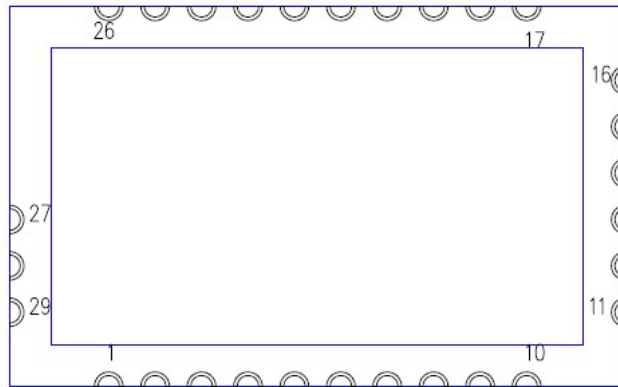
### B. Pin Description

No.	Pin Name	I/O	Description
1	RF_TX_RAMP	Output	for External PA Control. If not used, leave unconnected
2	RLED_ON	Output	Red LED ON Output. If not used, leave unconnected
3	BUSY_N	Output	BUSY_N Output. If not used, leave unconnected
4	NC	NC	Must be leave unconnected
5	UART_RXD	Input	UART Data Input
6	UART_TXD	OutPut	UART Data Output
7	GND	Ground	Ground
8	PIO0	Input/Output	PIO0. If not used, leave unconnected
9	PIO1	Input/Output	PIO1. If not used, leave unconnected
10	PIO2	Input/Output	PIO2. If not used, leave unconnected
11	PIO3	Input/Output	PIO3. If not used, leave unconnected
12	VBAT-/GND	Ground	VBAT- for One-Cell Mode or Ground for Two-Cell Mode
13	VDD_MCU	Power	Place 10nF Capacitor with the shortest length externally For Two-Cell Mode, Battery Voltage Supply Input for RF Circuit. For One Cell Mode, just add 10nF capacitor.
14	ONECELL_EN*	Power	For One-Cell mode (VBAT=1.2V), tie together with VBAT. For Two-Cell mode (VBAT=2.4V), direct connect to GND with the shortest length. *until confirmed, it doesn't support onecell mode. if required, contact technical support.
15	VBAT+	Power	Battery Voltage Supply Input Place 4.7uF Capacitor with the shortest length externally
16	GND	Ground	Ground
17	RST_N	Input	Reset Input (Low Active)
18	GND	GND	Ground
19	PIO4	Input/Output	PIO4, If not used, leave unconnected
20	NC	NC	Must be leave unconnected
21	NC	NC	Must be leave unconnected
22	PIO5	Input/Output	PIO5. If not used, leave unconnected
23	PIO6	Input/Output	PIO6. If not used, place 10nF Capacitor with the shortest length externally
24	PIO7	Input/Output	PIO7. If not used, place 10nF Capacitor with the shortest length externally
25	BLED_ON	Output	Blue LED ON Output. If not used, leave unconnected



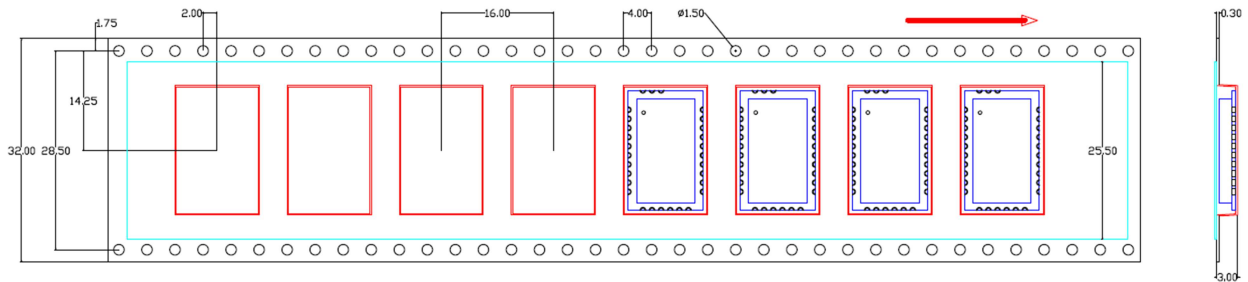
26	GLED_ON	Output	Green LED ON Output. If not used, leave unconnected
27	GND	Ground	Ground
28	ANT	RF	RF Signal Input/Output from, to Antenna
29	GND	Ground	Ground
30	BGND	Body Ground	Body Ground, Direct Connect to the Ground Plane of the Host PCB
31	BGND	Body Ground	Body Ground, Direct Connect to the Ground Plane of the Host PCB
32	BGND	Body Ground	Body Ground, Direct Connect to the Ground Plane of the Host PCB
33	BGND	Body Ground	Body Ground, Direct Connect to the Ground Plane of the Host PCB

## 5. Mechanical Dimension



[ Unit : mm ]

## 6. Packaging(Taping) Information (All dimension is mm)



## 7. MSL Rating & Reflow Profile

### A. Moisture Sensitivity Level (MSL) 2

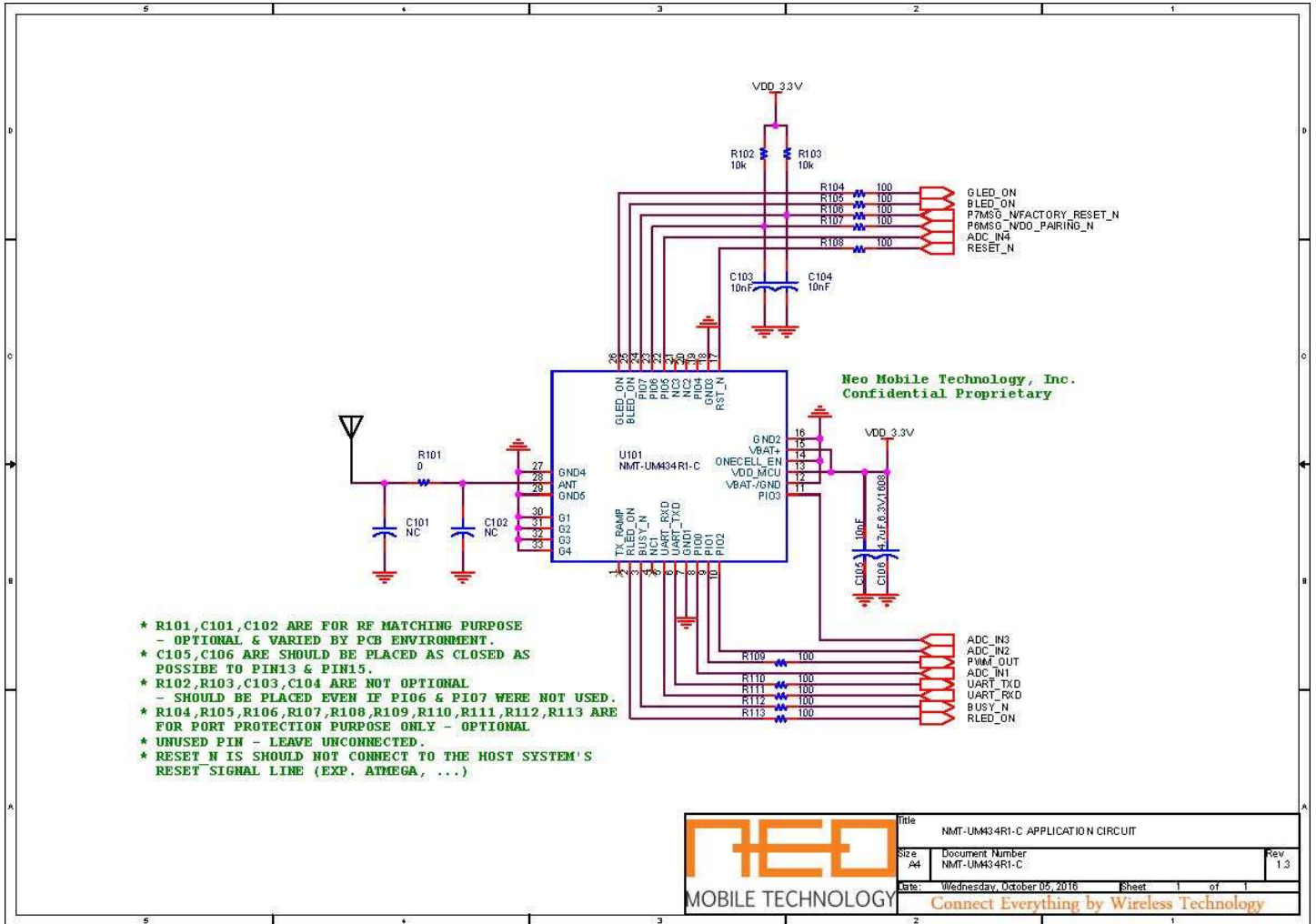
- i. Floor Life : 1 Year,  $\leq 30^{\circ}\text{C}/60\%RH$
- ii. Soak Requirement : 168  $\pm 5/0$  hrs,  $85^{\circ}\text{C}/60\%RH$

### B. Reflow

- i. A No-Clean, Type-3 solder paste is recommended.
- ii. The recommended reflow profile is per the JEDEC/IPC J-STD-020 specification for Small Body Components



# 8. Application Schematic



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