

N10 OpenCPU Specifications

Version 1.0



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Notice

This document provides guide for users to use *N10OpenCPU*.

This document is intended for system engineers (SEs), development engineers, and test engineers.

The information in this document is subject to change without notice due to product version update or other reasons.

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1 About N10 OpenCPU

N10 OpenCPU is a compact wireless GSM/GPRS module. It provides high-quality voice, SMS, and data services. OpenCPU, using the module as main processor, can decrease the product cost, make the product smaller, reduce the power consumption, enhance the product security, and increase product competency.

N10 OpenCPU can be widely used in industrial and consumer applications.

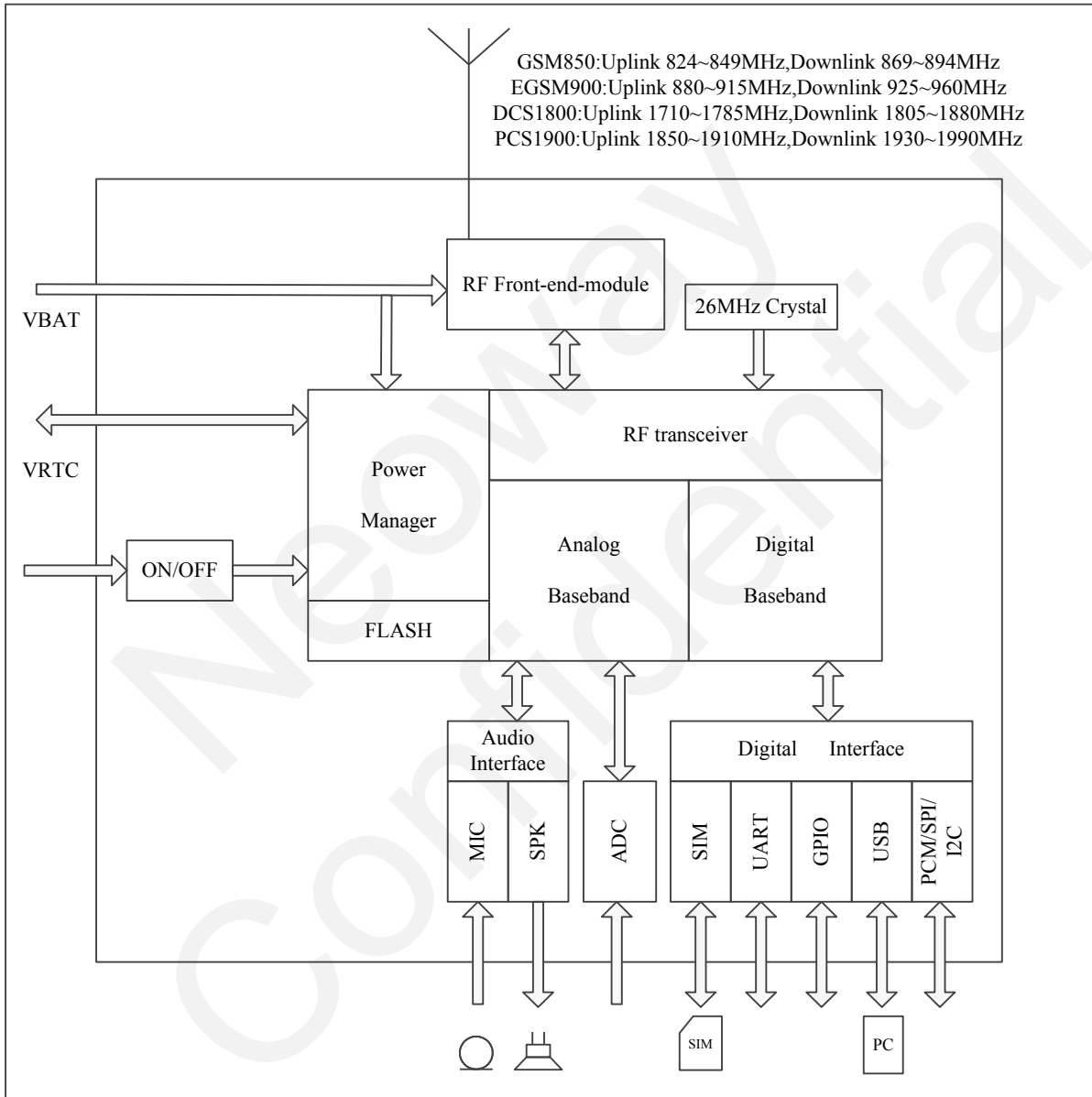
This document details the features, indicators, and testing standards of N10 OpenCPU.

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2 Block Diagram

The N10 OpenCPU module consists of baseband controller, Flash ROM, RF section, application interfaces, etc. All sections coordinate with each other to provide such communication functions as GPRS data and voice. Its design block diagram is shown in Figure 2-1.

Figure 2-1 N10 OpenCPU block diagram



3 Specifications

Table 3-1 N10OpenCPU specifications

Specifications	Description
Frequency band	GSM850/EGSM900/DCS1800/PCS1900 quad-band
Sensitivity	< -108 dBm
Transmit power	<ul style="list-style-type: none"> • GSM850/EGSM900 Class4(2W) • DCS1800/PCS1900 Class1(1W)
Protocol	Support GSM/GPRS Phase2/2+
Audio	Support voice coding: <ul style="list-style-type: none"> • HR (Half rate) • FR (Full rate) • EFR (Enhanced full rate) • AMR (Adaptive multi rate) Support Echo suppression Support recording and DTMF detection function
SMS	<ul style="list-style-type: none"> • Support PDU and TEXT mode • Support SMS message receiving and sending and alert for new SMS messages • Support SMS message management: reading/deleting/storage/list
GPRS Features	<ul style="list-style-type: none"> • Support GPRS CLASS 12 • Theoretical maximum uplink transmission rate: 85.6 Kbit/s • Theoretical maximum downlink transmission rate:85.6 Kbit/s • Embedded TCP/IP protocol, support multi-link • Support server and client mode
Supplementary Service	<ul style="list-style-type: none"> • Call forwarding • Call waiting • Call holdon and multi-way calling
UART	<ul style="list-style-type: none"> • Support hardware flow control, RTS, and CTS • Support multiplexing • Support data transmission and firmware download • Support baud rate from 1200 bit/s to 115200 bit/s
Real Time Clock (RTC)	<ul style="list-style-type: none"> • Support real-time clock and time updating • Support timing power-on/off
CPU	ARM7-EJ@270MHz
Memory	<ul style="list-style-type: none"> • ROM:32Mb • RAM: 32Mb
Software Resources	50KB RAM, 200KB Flash, 200KB File system
Antenna Feature	50Ω characteristic impedance
Operating Temperature	-40°C to +85°C

Operating Voltage	3.3V to 4.3V (3.9V is recommended)
Peak Current	Max 2.0A
Operating Current (Idle)	11 mA
Current in Sleep Mode	<ul style="list-style-type: none">• < 2mA (on live network)• < 1 mA (through instrument, DRX=9)

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4 Specifications and Pin Definition

4.1 Specifications

Table 4-1 N10 OpenCPU specifications

Specifications	N10
Dimensions	(23.5±0.1) mm x (17±0.1) mm x (2.2±0.2) mm (H x W x D)
Weight	2.6g
Package	64-pin LCC

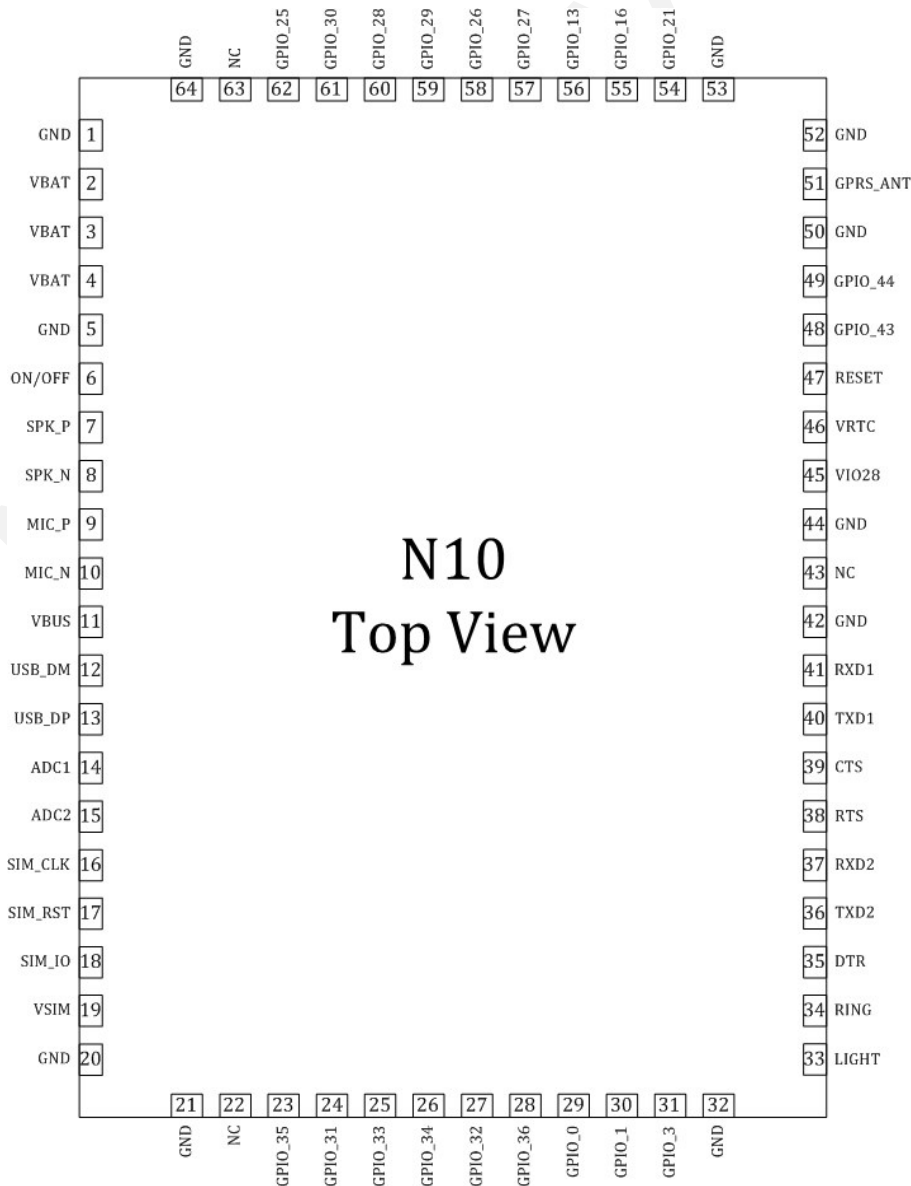
Figure 4-1 N10 OpenCPU appearance



4.2 Pin Definition

The N10 OpenCPU module uses a 2.8 V IO power system. The maximum input voltage at all IO ports (including peak signal voltage) should not exceed 3.1 V. In the application of the module, the IO output voltage from the 3.3 V power supply system of the external circuit might greatly overshoot 3.1 V due to the signal integrity design. In this situation, the IO pins of the module might be damaged if the IO signals are connected to the IO port of the 2.8 V system. To rectify this issue, take measures to match the level. For details, see *Neoway_N10_OpenCPU_Hardware_User_Guide*.

Figure 4-2 Pin Definition N10 OpenCPU module (Top View)



5 Electric Features and Reliability

5.1 Temperature

Table 5-1 Temperature feature

Module Status	Minimum Value	Typical Value	Maximum Value
Working	-40°C	25°C	85°C
Storage	-45°C		90°C



CAUTION

If the module works in temperature exceeding the thresholds, its RF performance (e.g. frequency deviation or phase deviation) might be worse but it can still work properly.

5.2 ESD Protection

Electronics need to pass sever ESD tests. The following table shows the ESD capability of key pins of our module. Add ESD protection to those pins in accordance to the application to ensure product quality when designing better products.

Humidity: 45%

Temperature: 25°C

Table 5-2 ESD feature of the module

Testing Point	Contact Discharge	Air Discharge
VBAT	±8kV	±15kV
GND	±8kV	±15kV
ANT	±8kV	±15kV
Cover	±8kV	±15kV
RXD/TXD	±4kV	±8kV
USB	±4kV	±8kV
MIC/SPK	±4kV	±8kV
Others	±4kV	±8kV

6 Mounting the Module onto the Application Board

N10 OpenCPU module is compatible with industrial standard reflow profile for lead-free SMT process.

The reflow profile is process dependent, so the following recommendation is just a starting point guideline:

- Only one flow is supported.
- Quality of the solder joint depends on the solder volume. Minimum of 0.15 mm stencil thickness is recommended.
- Use bigger aperture size of the stencil than actual pad size.
- Use a low-residue, no-clean type solder paste.

7 Package

N10 OpenCPU modules are packed in real with sealed bags for delivery to guarantee a long shelf life.

Follow same package of the modules again in case of opened for any reasons.

If exposed to air for more than 48 hours at conditions not worse than 30°C/60% RH, a baking procedure should be done before SMT. Or, if the indication card shows humidity is greater than 20%, the baking procedure is also required.

The baking should last for at least 12 hours at 90°C. Do not bake the modules with the package tray directly.

