

N720 Specifications

Version 1.4



有物联 方智能

GET CONNECTED GET SMART

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Notice

This document provides guide for users to use the N720.

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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Shenzhen Neoway provides customers complete technical support. If you have any question, please contact your account manager or email to the following email addresses:

Sales@neoway.com

Support@neoway.com

Website: <http://www.neoway.com>

Revision Record		
Version	Changes	Date
V1.0	Initial draft	2016-04
V1.1	<ul style="list-style-type: none">• Added bands• Modified the pin description	2016-10
V1.2	<ul style="list-style-type: none">• Modified the UIM card part and delete the UIM2 part• Improved band information• Modified part of the pin definition (the original pin78 RING, pin80 LIGHT are modified to pin13 RING, pin83 LIGHT. Pin13 and pin83 are NC)	2016-12
V1.3	Modified some non-standard syntax	2017-05
V1.4	<ul style="list-style-type: none">• Added module pictures• Added LTE B12 for the US version• Added memory, antenna, and dimension tolerances• Modified some description	2017-07

Contents

1 Overview	1
2 Compliant Standards	3
3 Features	4
4 Specifications and Pin Definition	6
5 PCB Foot Print	9
6 Electrical Feature and Reliability	10
6.1 Temperature	10
6.2 Working Band.....	10
6.3 TX Power and RX Sensitivity	11
6.4 ESD Protection	12
7 Mounting the Module onto the Application Board	14
8 Packaging and Storage	15
8.1 Packaging	15
8.2 Storage Conditions	16

1 Overview

N720 is an industrial-grade 4G module developed on Qualcomm platform. Its dimensions are 30 mm x 28 mm x 2.8 mm and it is with industrial-grade high-performance: ultra-wide operating temperature of -40 °C to +85 °C, electrostatic capacity of 8 kV. It is well applicable to electrical terminals, in-vehicle computers, POS, industrial routers, and other IoT terminals with the following features:

- ARM Cortex-A7 processors, 1.3 GHz main frequency, 256 kB L2 cache, 28 nm process technology
- GSM/GPRS/EDGE & CDMA2000@1x/1xAdvanced/1xEV-DOrA & WCDMA R99 to DC-HSPA+ & TD-SCDMA & LTE Cat4
- USB2.0/ SIM/ADC/UART/GNSS

N720 series include the following versions:

Module	Versions	Region	Category	Bands
N720	CA	China	Cat4	LTE FDD: B1, B3, B5, B8 LTE TDD: B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B8 EV-DO: BC0 CDMA 1x: BC0 GSM/GPRS/EDGE: 900/1800 MHz
	CB	China	Cat4	LTE FDD: B1, B3, B5, B8 LTE TDD: B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B8 GSM/GPRS/EDGE: 900/1800 MHz
	CC	China	Cat4	LTE FDD: B1, B3, B8, B28 LTE TDD: B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B8 GSM/GPRS/EDGE: 900/1800 MHz
	EA	Europe	Cat4	LTE FDD: B1, B3, B5, B7, B8, B20 LTE TDD: B40 UMTS: B1, B8 GSM/GPRS/EDGE: 850/900/1800/1900 MHz
	UA	the United States	Cat4	LTE FDD: B2, B4, B5, B7, B12, B17 UMTS: B2, B4, B5 GSM/GPRS/EDGE: 850/900/1800/1900 MHz
	JA	Japan	Cat4	LTE FDD: B1, B3, B8, B9, B19 UMTS: B1, B8, B9, B19

	IA	India	Cat4	LTE FDD: B3, B5 LTE TDD: B40 UMTS: B1, B8 GSM/GPRS/EDGE: 850/900/1800/1900 MHz
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2 Compliant Standards

1. 3GPP TS 07.07AT *command set for GSM Mobile Equipment (ME)*
2. YD 1214-2006 *Technical requirement of 900/1800MHz TDMA Digital Cellular Mobile Telecommunication Network General Packet Radio Service (GPRS)Equipment: Mobile Stations*
3. YD 1215-2006*Testing Methods of 900/1800MHz TDMA Digital Cellular Mobile Telecommunication Network General Packet Radio Service (GPRS)Equipment: Mobile Stations*
4. YD 1032-2000*Limits and Measurement Methods of Electromagnetic Compatibility for 900/1800MHz Digital Cellular Telecommunications System Part1:Mobile Station and Ancillary Equipment*
5. YD/T 2220-2011 *Technical Requirement and test method of WCDMA/GSM(GPRS) dual mode digit mobile user equipment (phase 4)*
6. Ministry of Industry and Information Technology PRC, *Measures for the Network Access Management of Telecommunication Equipment (2014 Amendment)*
7. GB4943.1-2011 *Information technology equipment - Safety - Part 1: General requirements*
8. GB/T22450.1-2008 *Limits and measurement methods of electromagnetic compatibility for 900/1800MHz TDMA digital cellular telecommunications system - Part 1: Mobile station and ancillary equipment*
9. CNCA-O7C-031:2007*Rules for Compulsory Certification of Telecommunication Equipment Telecommunication Terminal Equipment*
10. 3GPP TS GSM *Specification Set*
11. 3GPP TS WCDMA *Specification Set*
12. CDMA2000@1x,1xAdvanced,1xEV-DOorA *Specification Set*
13. 3GPP TS LTE Cat4 4G *Specification Set*

3 Features

Table 3-1 N720 baseband and wireless features

Specifications	Description
Power supply	VBAT: 3.3V to 4.3V, typical: 3.8 V
Current in sleep mode	4 mA
Operating temperature	-40 °C to +85 °C
Processor	ARM Cortex-A7 processor Main frequency: 1.3 GHz 256kB L2 cache
Memory	RAM=128MB or 256MB ROM=256MB
Band	See Table 1-1
Rate	GPRS: Max 85.6Kbps(DL) / Max 85.6Kbps(UL) CDMA:Max3.1Mbps (DL) / Max 1.8Mbps (UL) WCDMA: DC-HSPA+, Max 42Mbps(DL)/Max 5.76Mbps(UL) TD-SCDMA: Max 4.2Mbps(DL)/Max 2.2Mbps(UL) LTE FDD: non-CA cat4, Max 150Mbps(DL)/Max 50Mbps(UL) LTE TDD: non-CA cat4, Max 130Mbps(DL)/Max 35Mbps(UL)
Transmit power	GSM850: +33 dBm (Power Class 4) EGSM900: +33 dBm (Power Class 4) DCS1800: +30 dBm (Power Class 1) PCS1900: +30 dBm (Power Class 1) EDGE 850MHz: +27 dBm (Power Class E2) EDGE 900MHz: +27 dBm (Power Class E2) EDGE1800MHz: +26 dBm (Power Class E2) EDGE1900MHz: +26 dBm (Power Class E2) TD-SCDMA:+23 dBm (Power Class 3) CDMA 1X/EVDO:+23 dBm(Power Class 3) UMTS: 23 dBm (Power Class 3) LTE: +23 dBm (Power Class 3)
Antenna feature	2G/3G/4G antenna, 4G diversity antenna, GNSS antenna, 50 Ω impedance

UART	1 group , At most 4 Mbps data rate
UIM	1 group, 1.8V/3V dual-voltage adaptive
USB	1 group of USB2.0 high-speed interface
ADC	2 groups of 16-bit ADC, input voltage ranging from 0.1 to 1.7V

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4 Specifications and Pin Definition

Table 4-1 N720 dimensions

Specifications	N720
Dimensions	30±0.1 mm x 28±0.1 mm x 2.8±0.1 mm(H*W*D)
Weight	5.1g
Package	100-Pin LGA

Figure 4-1 Top view and bottom view



Figure 4-2 N720 pin definition (top view)

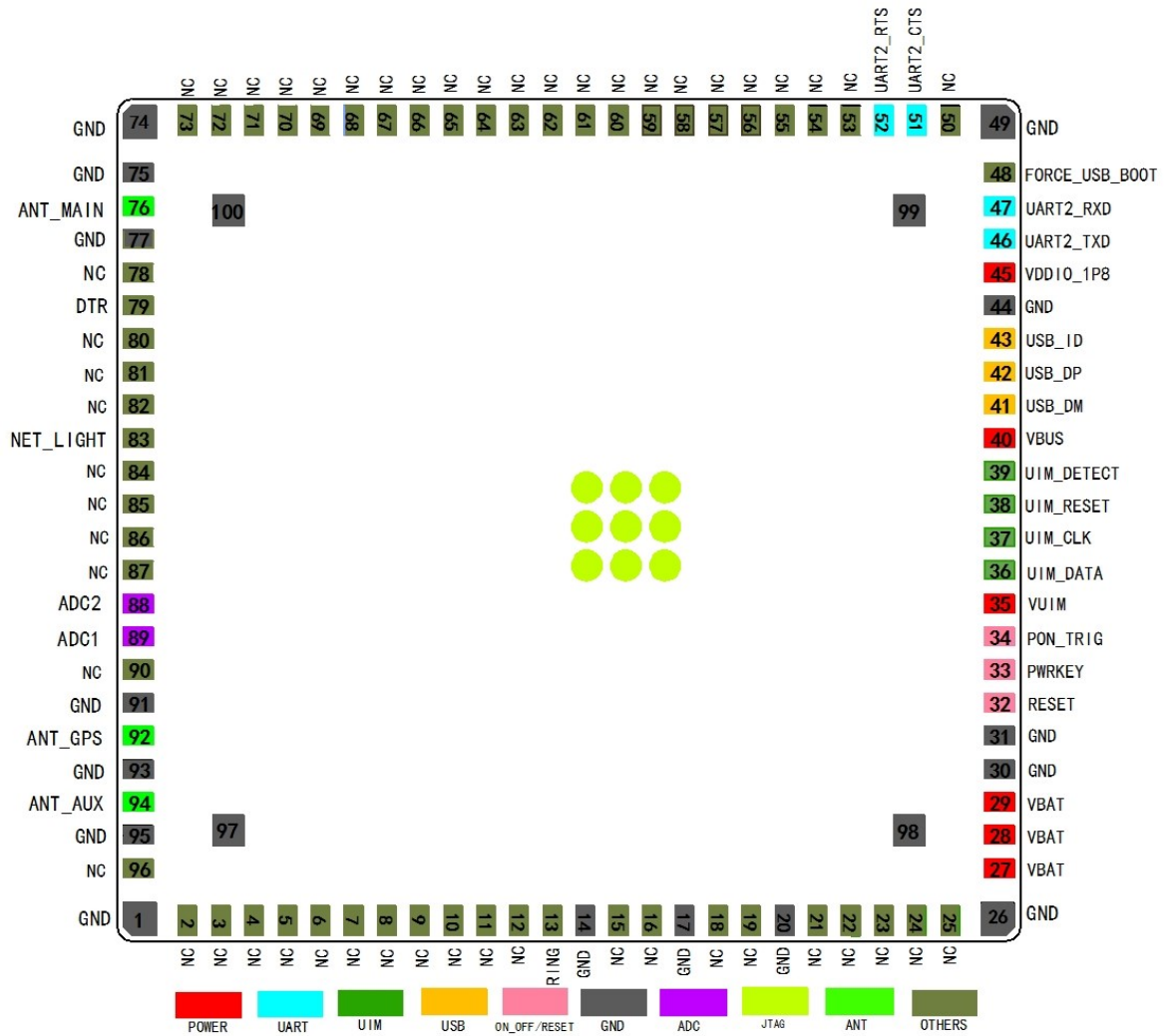
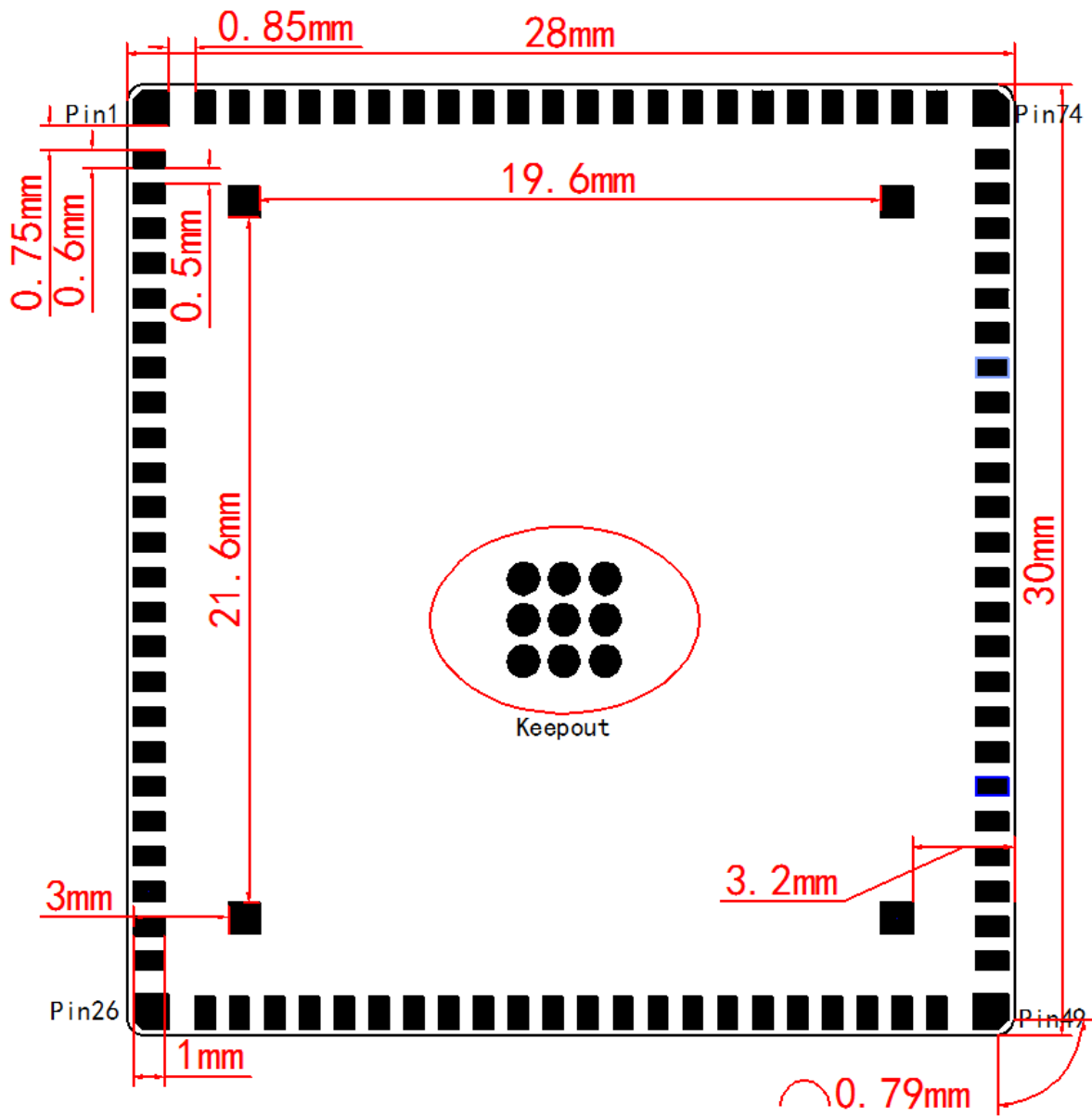


Figure 4-3 N720 foot print (bottom view)

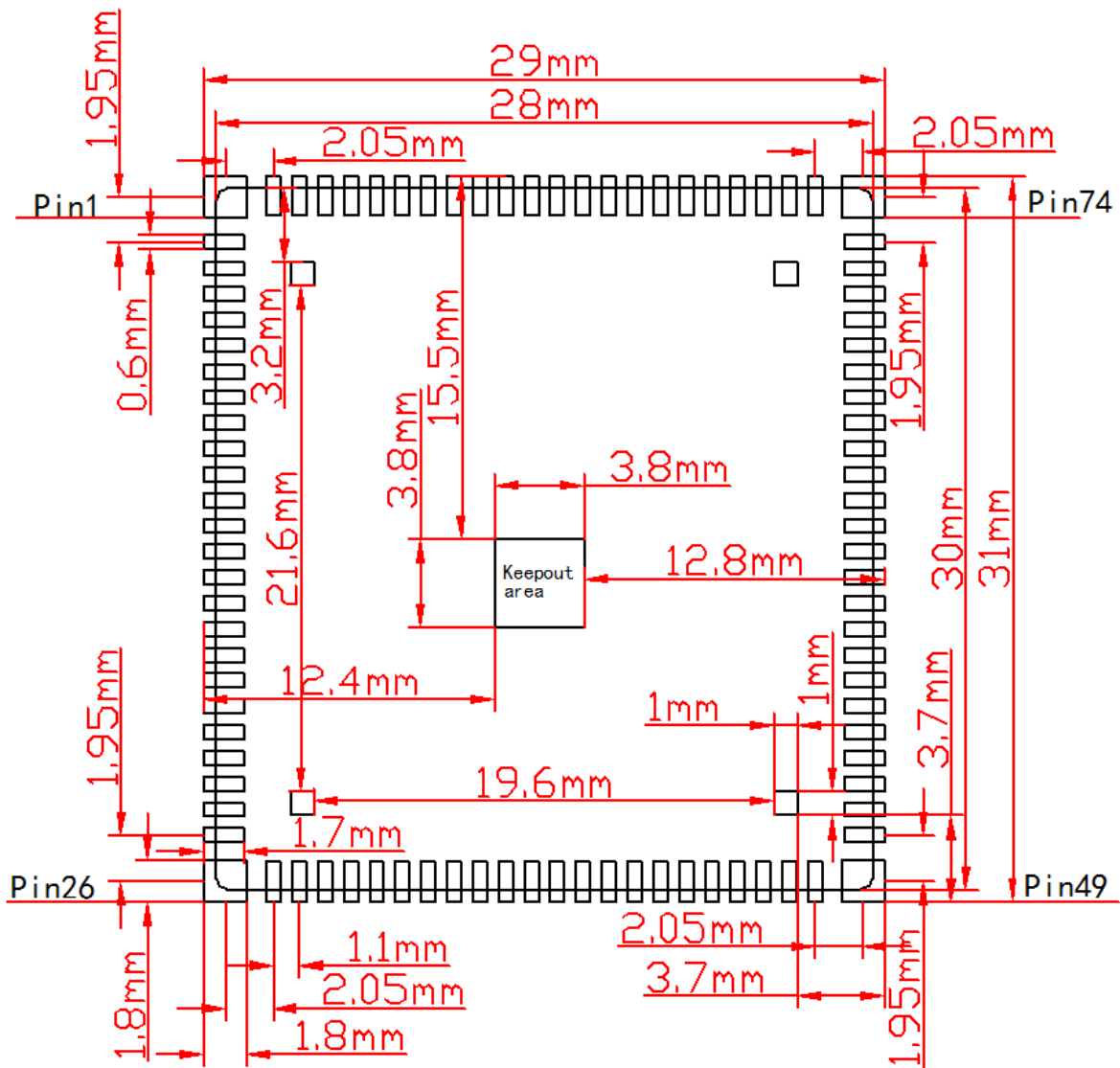


5 PCB Foot Print

LGA packaging is adopted to the N720 module.

Figure 5-1 shows the recommended PCB foot print. (Unit: mm)

Figure 5-1 N720 PCB foot print (top view)



6 Electrical Feature and Reliability

6.1 Temperature

Table 6-1 Temperature Feature

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



CAUTION

If the module works in temperature exceeding the thresholds, some of its RF performance indicator might be worse but it can still work properly.

6.2 Working Band

Table 6-2 N720 working band

Work band	Uplink	Downlink
GSM850	824~849 MHz	869~894 MHz
EGSM900	880~915 MHz	925~960 MHz
DCS1800	1710~1785 MHz	1805~1880 MHz
PCS1900	1850~1910 MHz	1930~1990 MHz
CDMA BC0	824~849 MHz	869~894 MHz
UMTS B1	1920~1980 MHz	2110~2170 MHz
UMTS B2	1850~1910 MHz	1930~1990 MHz
UMTS B4	1710~1755 MHz	2110~2155 MHz
UMTS B5	824~849 MHz	869~894 MHz
UMTS B8	880~915 MHz	925~960 MHz
UMTS B9	1749.9~1784.9 MHz	1844.9~1879.9 MHz
UMTS B19	869~894 MHz	869~894 MHz
TD-SCDMA B34	2010~2025 MHz	2010~2025 MHz

TD-SCDMA B39	1880~1920 MHz	1880~1920 MHz
LTE-FDD B1	1920~1980 MHz	2110~2170 MHz
LTE-FDD B2	1850~1910 MHz	1930~1990 MHz
LTE-FDD B3	1710~1785 MHz	1805~1880 MHz
LTE-FDD B4	1710~1755 MHz	2110~2155 MHz
LTE-FDD B5	824~849 MHz	869~894 MHz
LTE-FDD B7	2500~2570 MHz	2620~2690 MHz
LTE-FDD B8	880~915 MHz	925~960 MHz
LTE-FDD B9	1749.9~1784.9 MHz	1844.9~1879.9 MHz
LTE-FDD B12	699~716 MHz	728~746 MHz
LTE-FDD B19	830~845 MHz	875~890 MHz
LTE-FDD B20	832~862 MHz	791~821 MHz
LTE-FDD B28	703~748 MHz	758~803 MHz
LTE-TDD B38	2570~2620 MHz	2570~2620 MHz
LTE-TDD B39	1880~1920 MHz	1880~1920 MHz
LTE-TDD B40	2300~2400 MHz	2300~2400 MHz
LTE-TDD B41	2555~2655 MHz	2555~2655 MHz

6.3 TX Power and RX Sensitivity

Table 6-3 N720 RF power and RX sensitivity

Band	Transmitting Power	Receiving Sensitivity
GSM850	33 dBm+2/-2 dBm	<-108 dBm
EGSM900	33 dBm+2/-2 dBm	<-108 dBm
DCS1800	30 dBm+2/-2 dBm	<-108 dBm
PCS1900	30 dBm+2/-2 dBm	<-108 dBm
CDMA BC0	24 dBm +1/-1 dBm	<-107 dBm
UMTS B1	24 dBm +1/-3 dBm	<-108 dBm
UMTS B2	24 dBm +1/-3 dBm	<-108 dBm

UMTS B4	24 dBm +1/-3 dBm	<-108 dBm
UMTS B5	24 dBm +1/-3 dBm	<-108 dBm
UMTS B8	24 dBm +1/-3 dBm	<-108 dBm
UMTS B9	24 dBm +1/-3 dBm	<-108 dBm
UMTS B19	24 dBm +1/-3 dBm	<-108 dBm
TD-SCDMA B34/B39	24 dBm +1/-3 dBm	<-109 dBm
LTE-FDD B1 (10MHz)	23 dBm+2/-2 dBm	<-97 dBm
LTE-FDD B2 (10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B3 (10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B4(10MHz)	23 dBm+2/-2 dBm	<-97 dBm
LTE-FDD B5(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B7(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B8(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B9(10MHz)	23 dBm+2/-2 dBm	<-96 dBm
LTE-FDD B12(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B20(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
LTE-FDD B28(10MHz)	23 dBm+2/-2 dBm	<-95 dBm
TDD-LTE B38(10MHz)	23 dBm+2/-2 dBm	<-97 dBm
TDD-LTE B39(10MHz)	23 dBm+2/-2 dBm	<-97 dBm
TDD-LTE B40(10MHz)	23 dBm+2/-2 dBm	<-97 dBm
TDD-LTE B41(10MHz)	23 dBm+2/-2 dBm	<-95 dBm

6.4 ESD Protection

Humidity: 45% Temperature: 25 °C

Table 6-4 N720 ESD feature

Testing Point	Contact Discharge	Air Discharge
VBAT	±8 kV	±15 kV
GND	±8 kV	±15 kV

ANT	±8 kV	±15 kV
Cover	±8 kV	±15 kV
Others	±2 kV	±4 kV

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7 Mounting the Module onto the Application Board

N720 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 start point guideline:

- Only one flow is supported.
- Quality of the solder joint depends on the solder volume. Minimum of 0.12 mm to 0.15 stencil thickness is recommended.
- Use bigger aperture size of the stencil than actual pad size.
- Use a low-residue, no-clean type solder paste.

For information about cautions in N720 storage and mounting, refer to *Neoway Module Reflow Manufacturing Recommendations*.

To maintain and manually desolder it, use heat guns with great opening, adjust the temperature to 250 degrees (depending on the type of the solder paste), and heat the module till the solder paste is melt. Use tweezers to remove the module. Do not shake the module in high temperature while removing it.

Otherwise, the components inside the module might be misplaced.

8 Packaging and Storage

8.1 Packaging

N720 modules are packed in sealed bags on delivery to guarantee a long shelf life. Follow the 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 greater than 20%, the baking procedure is also required. Do not bake modules with the package tray directly.

Figure 8-1 N720 tray



Figure 8-2 N720 package



8.2 Storage Conditions

- Temperature: 20°C~ 26°C
- Humidity: 40%-60%
- Period: 120 days

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