

# UMC-9628FHN LGA-type LTE Module

## User Manual

**WistronNeWeb Corp.**

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### Revision History

Version	Change history	Date
0.1	Preliminary release	2018/10/15

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## A. PRODUCT DESCRIPTION

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### FCC Regulations:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device maynot cause harmful interference, and (2) This device must accept any interference received, including interference that maycause undesired operation.

This device has been tested and found to comply with the limits for a Class B digitaldevice, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### **End Product Labeling**

The final end product must be labeled in a visible area with the following: "Contains FCC ID: NKRUMC-9628FHN". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

### **RF Exposure Information**

**This device is intended only for ODM/OEM integrators under the following conditions:**

- (1) The antenna must be installed such more than 26cm is maintained between the antenna and users,
- (2) The transmitter module may not be co-located with any other transmitter or antenna.
- (3) To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile exposure condition must not exceed:

**Standalone Condition:**

1.5dBi in 700 MHz Band

3.6dBi in 1700 MHz Band

### **IMPORTANT NOTE:**

This module is intended for ODM/OEM integrator. The integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. 26cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an unpopulated/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

### **USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least 26cm separation with the antenna while this end product is installed and operated. The end user

has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the user's manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

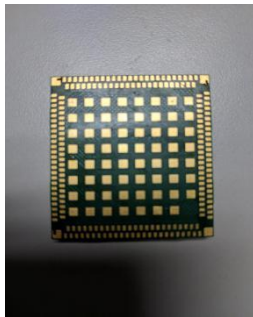


Figure 1: UMC-9628FHN LGA-type LTE Module

### A.1 General Descriptions

This document describes the specifications of UMC-9628FHN LGA LTE Module. This module is based on Qualcomm MDM9628 platform and capable to allow users enjoying high speed internet access anywhere and anytime over 4G LTE broadband network.

With integrating UMC-9628FHN module, the end products are enhanced in both functionality and usability based on leading edge mobile wireless technology.

This document will introduce hardware, software, mechanical and environmental specifications in following sections.

Product information:

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Part Number	Category	WWAN	GNSS	Footprint	Dimension
UMC-9628FHN	CAT4	LTE 2/4/5/7/12/17 WCDMA 2/5 GSM 850/1900	GPS	LGA 263 pads	35x38x4.35(H) mm

## A.2 Applicable Device

The UMC-9628FHN is automotive grade LTE module with LGA pins and targeted for automotive application that is the Machine to Machine (M2M) market including TCU (Telematics Control unit), AMM (Automatic Metering Management), tracking system, etc.

## B. MAIN FEATURES

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- Support 1.8/3.0VUSIM
- Operation System (OS) Support - Linux (device driver)
- Certification
- FCC (in plan)
- Operating Ambient Temperature
- Operating : -30°C ~ +85°C
- Normal range: -30°C to +70°C (fully compliant with 3GPP)  
Extended range: -40°C to +85°C (fully functional)
- Storage : -40°C ~ +85°C

### B.1 APPLICATION INTERFACE FEATURES

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- WNC MAL (Modem Abstraction Layer) Manager SDK for Linux

## B.2 PACKET MODE FEATURES

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- LTE data rates with category 4 (UMC-9628FHN)
  - ✧ 150 Mbps DL with 20 MHz bandwidth
  - ✧ 50 Mbps UL with 20 MHz bandwidth

## B.3 LTE FEATURES

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- 3GPP LTE Release 10
- Bandwidth support 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz and 20 MHz per 3GPP standard
- VoLTE
- IPv4 and IPv6 supported
- LTE Rel-10 MDT with location information

## B.4 SHORT MESSAGE SERVICE (SMS) FEATURES

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- SMS over SGs
- SMS over IMS

## B.5 RF SPECIFICATION

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- Cellular Frequency Band

<b>E-UTRA Operating Band</b>	<b>Uplink Frequency UE Transmit</b>	<b>Downlink Frequency UE Receive</b>
Band 2	1850 MHz - 1910 MHz	1930 MHz - 1990 MHz

Band 4	1710 MHz - 1755 MHz	2110 MHz - 2155 MHz
Band 5	824 MHz - 849 MHz	869 MHz - 894 MHz
Band 7	2500 MHz - 2570 MHz	2620 MHz - 2690 MHz
Band 12	699 MHz - 716 MHz	729 MHz - 746 MHz
Band 17	704 MHz - 716 MHz	734 MHz - 746 MHz
WCDMA B2	1850 MHz - 1910 MHz	1930 MHz - 1990 MHz
WCDMA B5	824 MHz - 849 MHz	869 MHz - 894 MHz
GSM850	824 MHz - 849 MHz	869 MHz - 894 MHz
GSM1900	1850 MHz - 1910 MHz	1930 MHz - 1990 MHz

➤ LTE Channel Bandwidth

E-UTRA Operating Band	Channel Bandwidth (CHBW)					
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Band 2	Yes	Yes	Yes	Yes	Yes	Yes
Band 4	Yes	Yes	Yes	Yes	Yes	Yes
Band 5	Yes	Yes	Yes	Yes		
Band 7			Yes	Yes	Yes	Yes
Band 12	Yes	Yes	Yes	Yes		



Band17			Yes	Yes		
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➤ RF Performance

Specification	Min	Typ	Max	Units
<b>LTE Sensitivity</b>				
B2 (1930-1990MHz Rx) - 10MHz		-101	-94.3	dBm
B4 (2110-2155MHz Rx) - 10MHz		-101	-96.3	dBm
B5 (869-894MHz Rx) - 10MHz		-101	-94.3	dBm
B7 (2620-2690MHz Rx) - 10MHz		-100	-94.3	dBm
B12 (729-746MHz Rx) - 10MHz		-103	-93.3	dBm
B17 (734-746MHz Rx) - 10MHz		-103	-93.3	dBm
<b>UMTS Sensitivity</b>				
B2 (1930-1990MHz Rx)		-109	-104.7	dBm
B5(869-894MHz Rx)		-109	-104.7	dBm
<b>GSM Sensitivity</b>				
GSM850		-109	-102	dBm
GSM1900		-109	-102	dBm
<b>LTE Max Output Power</b>				
B2 (1850-1910MHz Tx)	20.3	23	25.7	dBm
B4 (1710-1755MHz Tx)	20.3	23	25.7	dBm
B5 (824-849MHz Tx)	20.3	23	25.7	dBm
B7 (2500-2570MHz Tx)	20.3	23	25.7	dBm

B12 (699-716MHz Tx)	20.3	23	25.7	dBm
B17 (704-716MHz Tx)	20.3	23	25.7	dBm
UMTS Max Output Power				
B2 (1850-1910MHz Tx)	20.3	23	25.7	dBm
B5 (824-849MHz Tx)	20.3	23	25.7	dBm
GSM Output Power				
GSM850	31	33	35	dBm
GSM1900	28	30	32	dBm
EDGE Max Output power - multislot 1D4U MCS5 (Profile1)				
GSM850	19	23	27	dBm
GSM1900	18	22	26	dBm

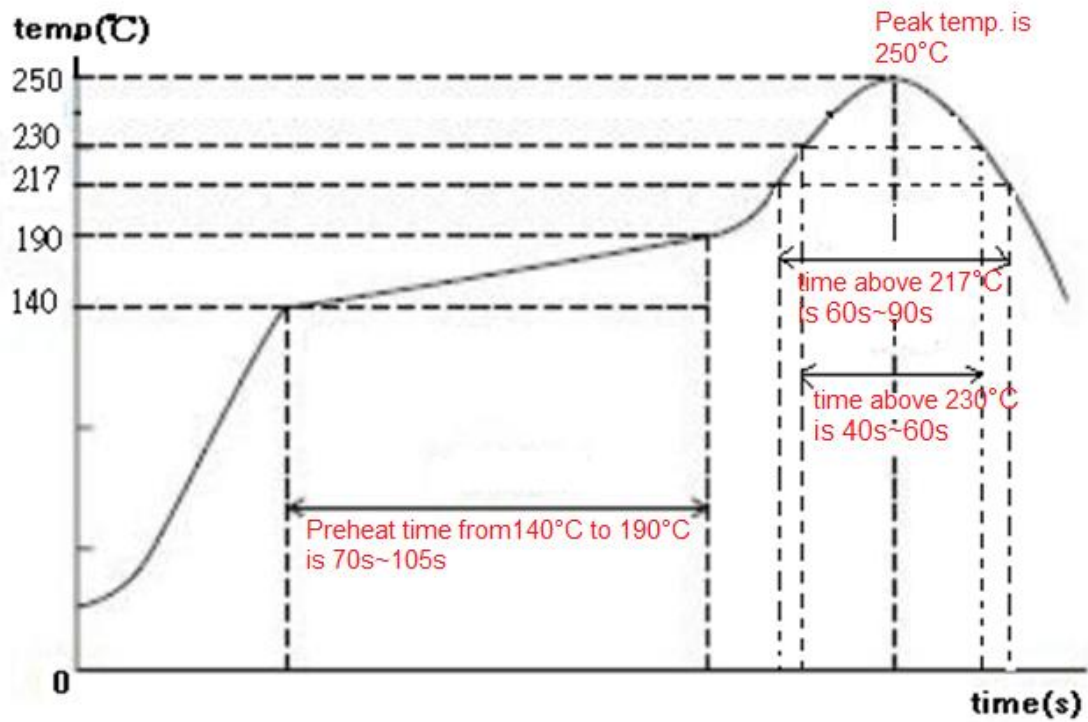
Note: The RF Transmit Specification is defined at the LGA pad.

➤ GPS Receive Specifications

Sensitivity	-154dBm
Acquire First with Signal Level	-140dBm
Time To First Fix (TTFF) with -130 dBm input signal	< 10s(Assisted)
	< 60s (Non-Assisted)
2D RMS Accuracy with -130 dBm input	< 5 Meters

## E. MOUNTING CONSIDERATIONS

- Reflow soldering profile:



Profile	Min.	Max.	Unit
Preheat time from 140°C to 190°C	70	105	S
Time maintained above 230°C	40	60	S
Peak package body temperature	230	250	°C
Time maintained above 217°C	60	90	S

## F. MECHANIC SPECIFICATIONS

Figure 6 shows the top and bottom view of UMC-9628FHN and provides an overview of the board's mechanical dimensions and further details information is shown as Figure 7.

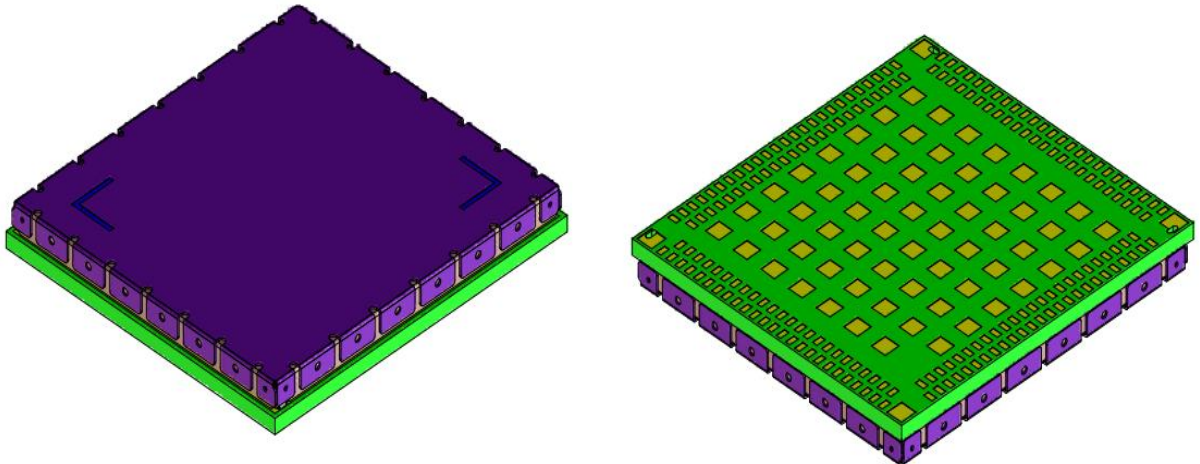


FIGURE 1: TOP AND BOTTOM VIEW OF UMC-9628

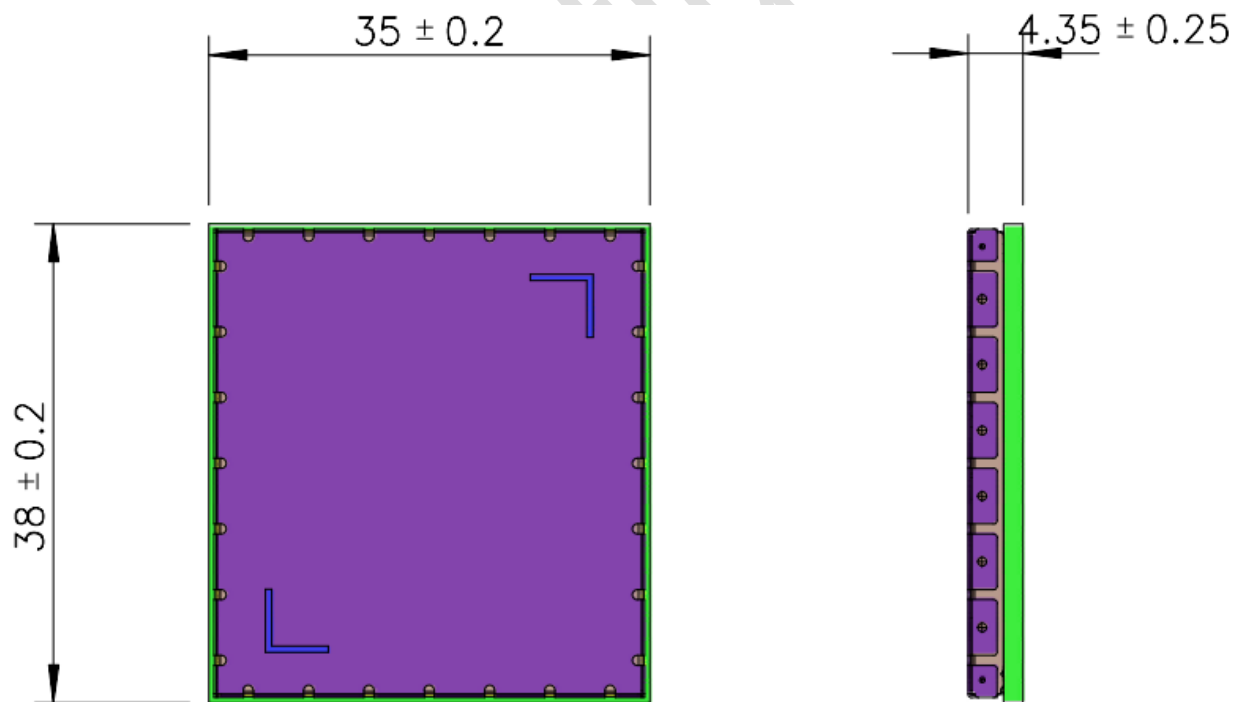


FIGURE 2: DIMENSIONS OF UMC-9628 (UNIT: MM)

## 1.1.1 SMT PCB Assembly

The land pattern and stencil design as shown below is for lead-free solder paste and a 120 micron thick stencil.

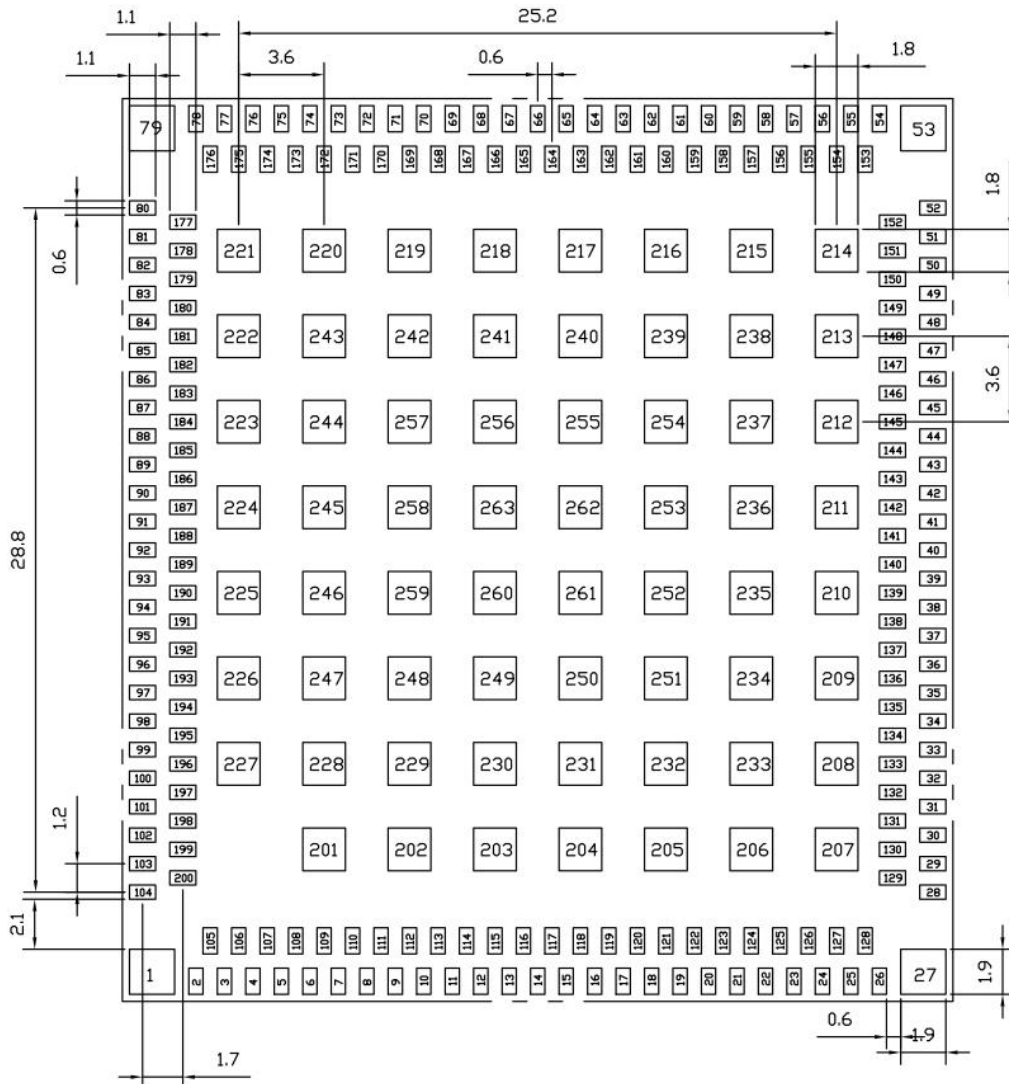


FIGURE 3: LAND PATTERN OF UMC-9628 (TOP VIEW)

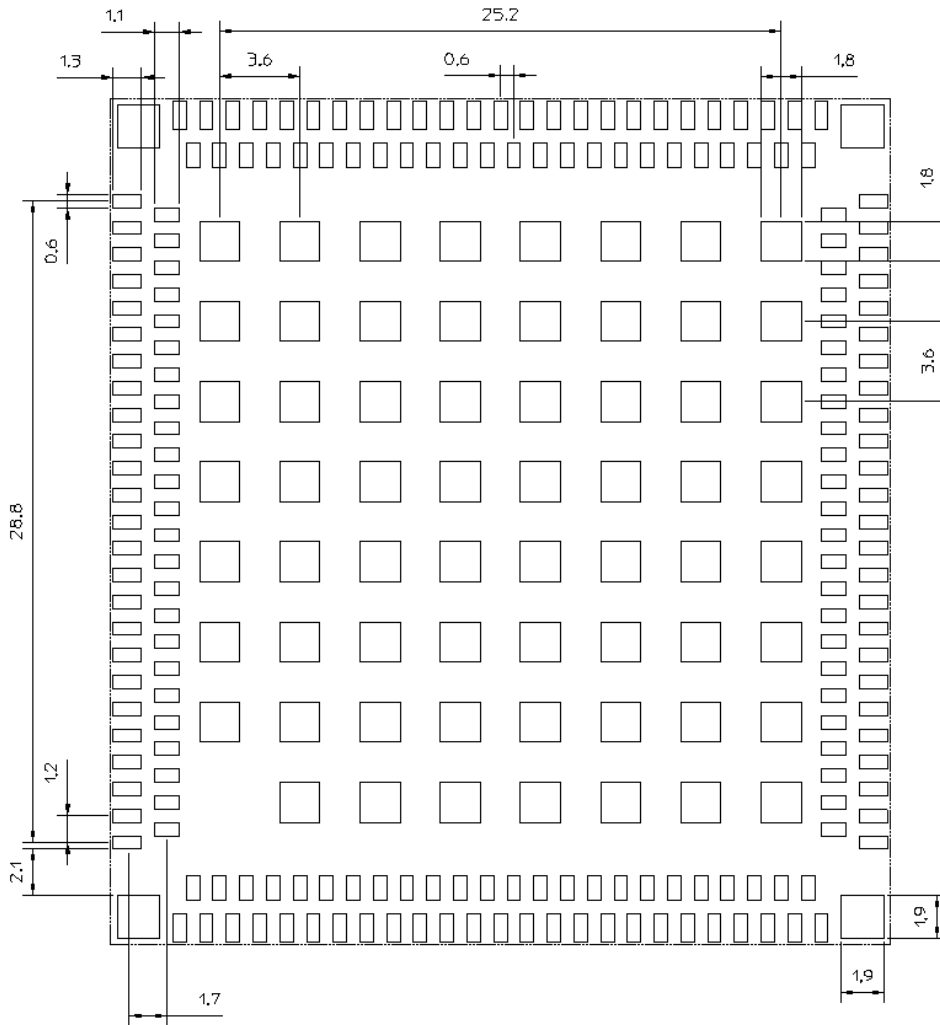
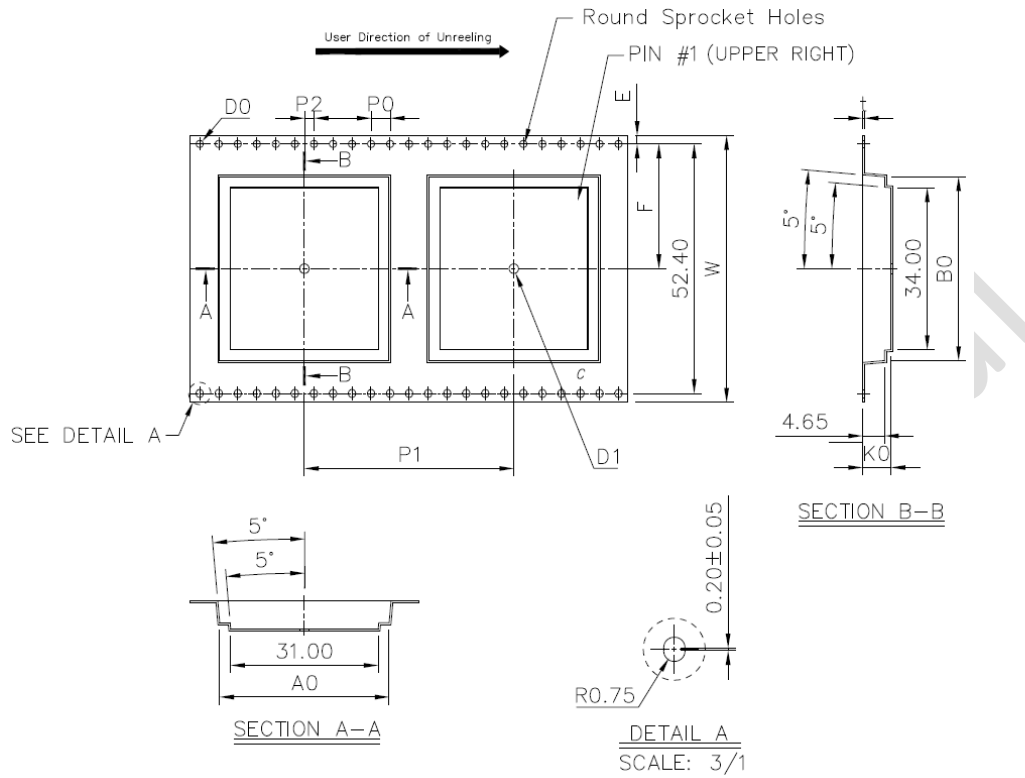


FIGURE 4: RECOMMENDED STENCIL OF UMC-9628 (TOP VIEW)

## G. PACKAGE SPECIFICATIONS

The single-feed tape carrier for UMC-9628FHN is illustrated in Figure 11. The figure also shows the proper part orientation. The tape width is 56 mm and the module is placed on the tape with a 44 mm pitch. The Direction into SMD machine is shown as

Figure 12. The packing length per reel is 10.6 meters and each reel contains 150 pcs modules.



ITEM	DIMENSIONS	ITEM	DIMENSIONS
W	*56.00±0.30	P1	*44.00±0.10
S	52.40±0.10	P2	2.00±0.10
E	1.75±0.10	A0	*35.6±0.10
F	26.20±0.10	B0	*38.6±0.10
D0	1.50 <sup>+0.10</sup> <sub>-0.00</sub>	K0	*6.0±0.10
D1	2.0 <sup>+0.10</sup> <sub>-0.00</sub>	T	*0.4±0.05
P0	4±0.10		

FIGURE 5: CARRIER TAPE

MODULE DIRECTION

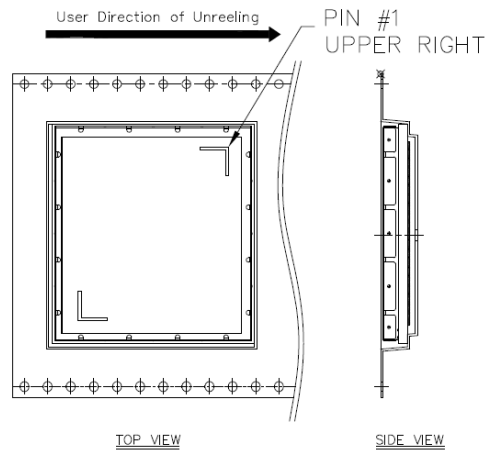


FIGURE 6: REEL DIRECTION

## H. LABEL FORM

- Dimension : 19mm \* 19mm (example as shown below)



## I. ELECTROSTATIC DISCHARGE (ESD)

UMC-9628FHN module is not protected against Electrostatic Discharge (ESD) in general. Consequently, it is subject to ESD handling precautions that typically apply to ESD sensitive components. The remaining interfaces of UMC-9628FHN with the exception of the antenna interface are only protected according to the ANSI/ESDA/JEDEC JS-001-2011 requirements.

<b>Specification/Requirements</b>	<b>Contact discharge</b>
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Human Body Model	2KV
Charge Device Model (CDM)	500V

TABLE 6-3-1 ESD SPECIFICATION

WNC Confidential



20 Park Avenue II,  
Hsinchu Science Park,  
Hsinchu 308, Taiwan, R.O.C.

TEL: 886-3-666-7799

FAX: 886-3-666-7321

Website: <http://www.wnc.com.tw>