LITEON®

PRODUCT SPECIFICATION

802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module

WN4515L

Realtek RTL8812AU

Version 1.0

User Manual

LITEON®

CONTENT

FCC WARING STATEMENT

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, 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 radiate 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:

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

This device complies with Part 15 of the 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.

RF exposure warning

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated in accordance with provided instructions and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: PPQ-WN4515L ''

Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an

OEM or integrator, but should not be distributed to the end user.

1) This device is intended for OEM integrators only.

2) Please see the full Grant of Equipment document for other restrictions.

This device is operation in 5.15 – 5.25GHz frequency range, then restricted in indoor use only, Outdoor operations in the 5150~5250MHz is prohibit.

This device is slave equipment, the device is not radar detection and not ad-hoc operation in the DFS band.

IC WARING STATEMENT

Canada, avis d'Industry Canada (IC)

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:
(1)This device may not cause interference; and
(2)This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device is restricted to indoor use.

OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC No. cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: 4491A-WN4515L".

Contient le module d'émission IC: 4491A-WN4515L

This radio transmitter (4491A-WN4515L) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Ant.	Brand	Model	Type	Gain(dBi)	
				2.4G	5G
1	PSA	RFMTA401029IMLB701	PIFA	2.60	3.16
2	PSA	RFMTA401029IMLB701	PIFA	1.89	2.90
3	PSA	RFMTA401029IMLB701	PIFA	1.75	1.99
4	PSA	RFMTA401029IMLB701	PIFA	1.71	1.97
5	PSA	RFMTA401029IMLB701	PIFA	1.72	1.85
6	PSA	RFMTA401029IMLB701	PIFA	1.62	1.72
7	PSA	RFMTA100600NNLB002	PIFA	0.52	2.66

Le présent émetteur radio (4491A-WN4515L) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Ant.	Brand	Model	Type	Gain(dBi)	
				2.4G	5G
1	PSA	RFMTA401029IMLB701	PIFA	2.60	3.16
2	PSA	RFMTA401029IMLB701	PIFA	1.89	2.90
3	PSA	RFMTA401029IMLB701	PIFA	1.75	1.99
4	PSA	RFMTA401029IMLB701	PIFA	1.71	1.97
5	PSA	RFMTA401029IMLB701	PIFA	1.72	1.85
6	PSA	RFMTA401029IMLB701	PIFA	1.62	1.72
7	PSA	RFMTA100600NNLB002	PIFA	0.52	2.66

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (les antennes se situent à moins de 20 cm du corps d'une personne).

PRODUCT FEATURES

- Operate at ISM frequency Band (2.4/5GHz)
- IEEE Standards Support, 802.11a, 802.11b, 802.11g, 802.11n,and 802.11ac
- USB 2.0 support for date rates up to 12Mbps full speed and 480Mbps high speed
- Enterprise level security supporting: WEP 64/128, WPA, WPA2, WAPI
- Support 2 transmission and 2 receiving, transmission rate can up to 300Mbps (Physical Rate) in 802.11n; and 866.7Mbps in 802.11ac
- Wi-Fi Direct supports wireless peer to peer applications
- RoHS compliance
- Low Halogen compliance

PRODUCT SPECIFICATIONS

MAIN CHIPSET

MAC/ Baseband/ RF: Realtek 8812AU-VS-CG

FUNCTIONAL SPECIFICATIONS

WiFi Function	
Standard	IEEE802.11a; IEEE802.11b; IEEE 802.11g; IEEE 802.11n; IEEE802.11ac
Bus Interface	Universal Serial Bus (USB2.0)
Data Rate	*802.11a:* 54, 48, 36, 24, 18, 12, 9, 6 Mbps *802.11b:* 11, 5.5, 2, 1 Mbps *802.11g:* 54, 48, 36, 24, 18, 12, 9, 6 Mbps *802.11n:* MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz *802.11ac:* MCS 0 to 8 for HT20MHz MCS 0 to 9 for HT40MHz MCS 0 to 9 for HT80MHz
Media Access Control	CSMA/CA with ACK
Modulation Techniques	*802.11a:* 54, 48, 36, 24, 18, 12, 9, 6 Mbps *802.11b*: CCK, DQPSK, DBPSK *802.11g*: 64QAM, 16QAM, QPSK, BPSK *802.11n*: 64QAM, 16QAM, QPSK, BPSK *802.11ac*: 256QAM, 64QAM, 16QAM, QPSK, BPSK
Network Architecture	Ad-hoc mode (Peer-to-Peer) Infrastructure mode
Operation Channel	*5GHz* 12: – United States 19: – Europe 8: – Japan *2.4GHz* 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Frequency Range	*802.11a/ac* 5.15~5.85 GHz *802.11bg* 2.400 ~ 2.4835 GHz
Transmit Output Power – 2x2 (Tolerance: ±1.5dBm)	*02.11a:* 13 dBm@6-54Mbps *802.11b:*

	15 dBm@1-11Mbps
	802.11g:
	14 dBm@6-54Mbps
	802.11n(2.4GHz):
	20MHz:
	13dBm@MCS0-7
	40MHz:
	13dBm@MCS0-7
	802.11n(5GHz):
	20MHz:
	12dBm@MCS0-7
	40MHz:
	12dBm@MCS0-7
	802.11ac:
	20MHz:
	13dBm@MCS0-8
	40MHz:
	12dBm@MCS0-9
	80MHz:
	11dBm@MCS0-9
Receiver Sensitivity	*802.11a:*
	-85 dBm@6Mbps
	-70 dBm@54Mbps
	802.11b:
	-83 dBm@11Mbps
	802.11g:
	-86 dBm@6Mbps
	-70 dBm@54Mbps
	802.11n(2.4GHz):
	20MHz
	-69 dBm@MCS7
	40MHz
	-66 dBm@MCS7
	802.11n(5GHz):
	20MHz
	-69 dBm@MCS7
	40MHz
	-66 dBm@MCS7
	802.11ac:
	20MHz
	-63 dBm@MCS8
	40MHz
	-60 dBm@MCS9
	80MHz
	-57 dBm@MCS9
Security	WPA, WPA2, WPS, WEP 64/128, IEEE 802.1x, IEEE 802.11i
Operating Voltage	5V ±10% I/O supply voltage
OS Supported	Microsoft Windows Win7/Win8/Win8.1/Linux

Power Consumption
  Test Condition:
   - **Operate at HT40**
   - **File Transmission**

Mode	Average		Peak	
	2.4G **mA / W**	**5G** **mA / W**	**2.4G** **mA / W**	**5G** **mA / W**
TX	*420mA / 2.1W*	*490mA / 2.45W*	*700mA / 3.5W*	*930mA / 4.65W*
RX	*270mA /*	*332mA /*		

		1.35W	1.66W		
	Unassociated Idle	*22mA / 0.11W*			
	Standby @Wake up mode	*20mA / 0.1W*			

Antenna Type	Metal Antenna on Board

RECOMMENDED OPERATION CONDITIONS

For Module

Symbol	Rating	Min	Typ	Max	Units
VCC	5V Supply Voltage	4.5	5	5.5	V

For IC

Symbol	Rating	Min	Typ	Max	Units
VDD33	3.3V Supply Voltage	3.0	3.3	3.6	V
VDD12	1.2V Supply Voltage	1.10	1.2	1.23	V

DC CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Units
V_{IL}	Input Low Voltage	-	0	0.9	V
V_{IH}	Input High Voltage	2.0	3.3	3.6	V
V_{OL}	Output Low Voltage	0	-	0.33	
V_{OH}	Output High Voltage	2.97	-	3.3	V

PIN ASSIGNMENT

Pin.	Pin Define	Description	Status
1	+3.3V	3.3V source	YES
2	+3.3V	3.3V source	YES
3	USB_D-	USB Data-	YES
4	USB_D+	USB Data+	YES
5	GND	Ground	YES
6	WAKE#	Wake up system via wifi, low active	YES
7	RESET#	System reset RTL8812AU, low active	YES
8	GND	Ground	YES
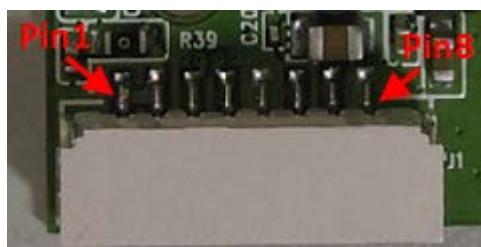
CONNECTOR SPEC

MECHANICAL

45.00

R1.50

R2.00

25.00

1.00

Tolerance: C

DEG DIM	A	B	C	D	ANGLE	
0-5	±0.02	±0.05	±0.10		0°-30°	±0.1°
5-10	±0.05	±0.10	±0.15		31°-60°	±0.3°
10-50	±0.10	±0.15	±0.20		61°-90°	±0.5°
50-100	±0.15	±0.20	±0.25			
100-	±0.15%	±0.20%	±0.25%			

Unit: mm
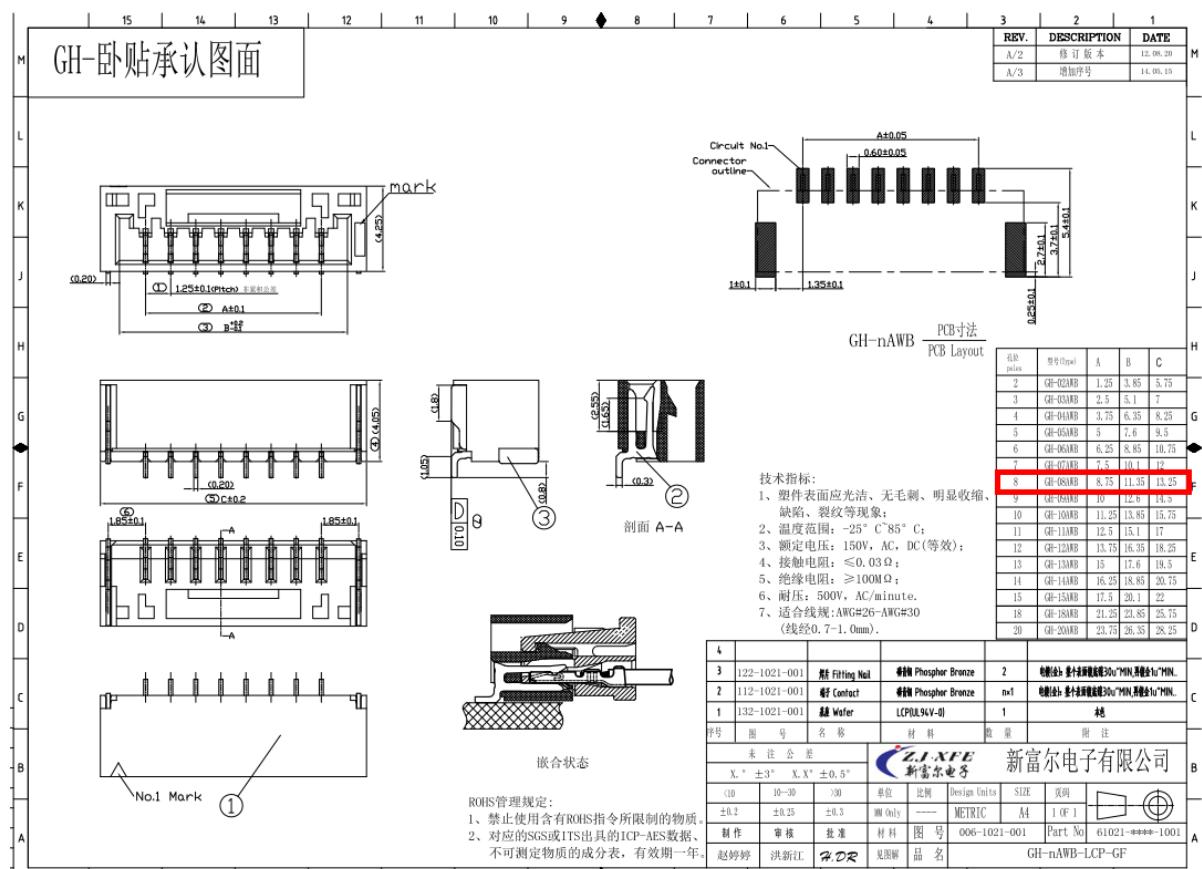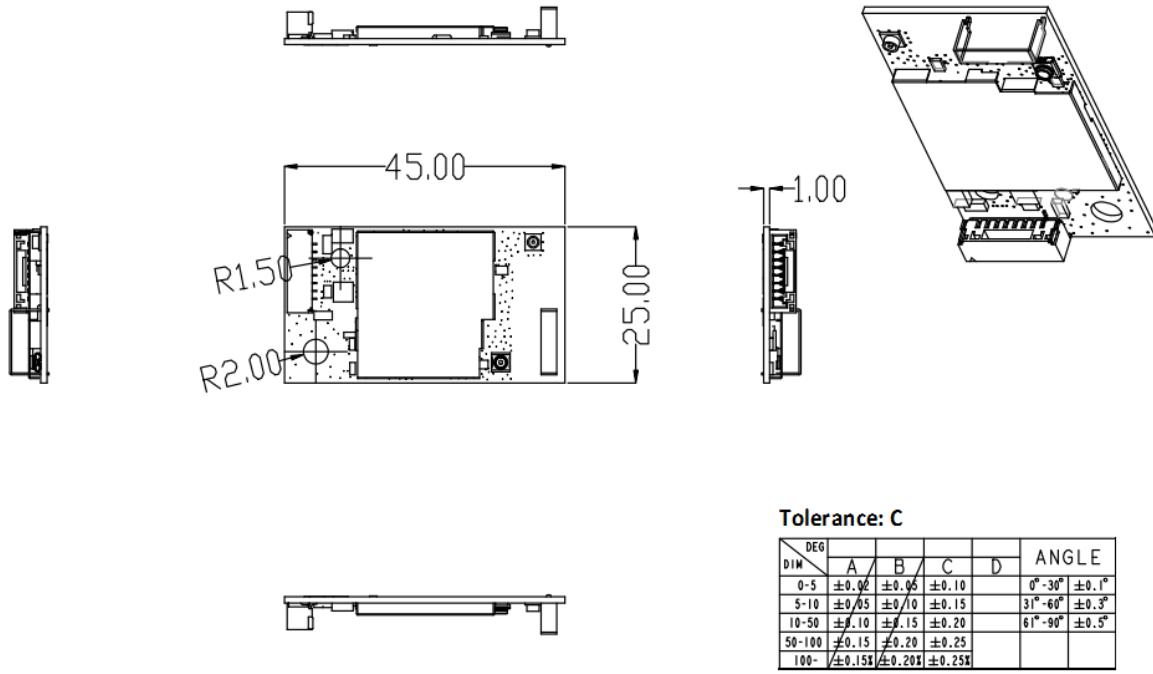
METAL ANTENNA SPEC

On Board Antenna for WiFi (Q'ty:1pcs)

No.	DESCRIPTION	MAT'L	Finish	Q'TY
A	Antenna	SUS430 T=0.3mm	先鍍後沖	1

※標記□記號者,為重點檢驗尺寸

			設計 DR.	HWCHAN	2016.07.27	品名	版本 REV.
			核准 APPL	Marco		ARTICLE	A
			容許公差 TOLERANCE				
LTR	DESCRIPTION	DATE	REQ. BY	6以下............±0.2 6以上~30...........±0.5		RFMTA100600NNLB001	
	華新科技股份有限公司 Walsin Technology Corporation			30以上~120.........±0.8 120以上~315........±1.2 315以上~1000.......±2.0 1000以上~2000......±3.0		單位 UNIT: mm	比例 SCALE: ****	張數 SHEET: 1
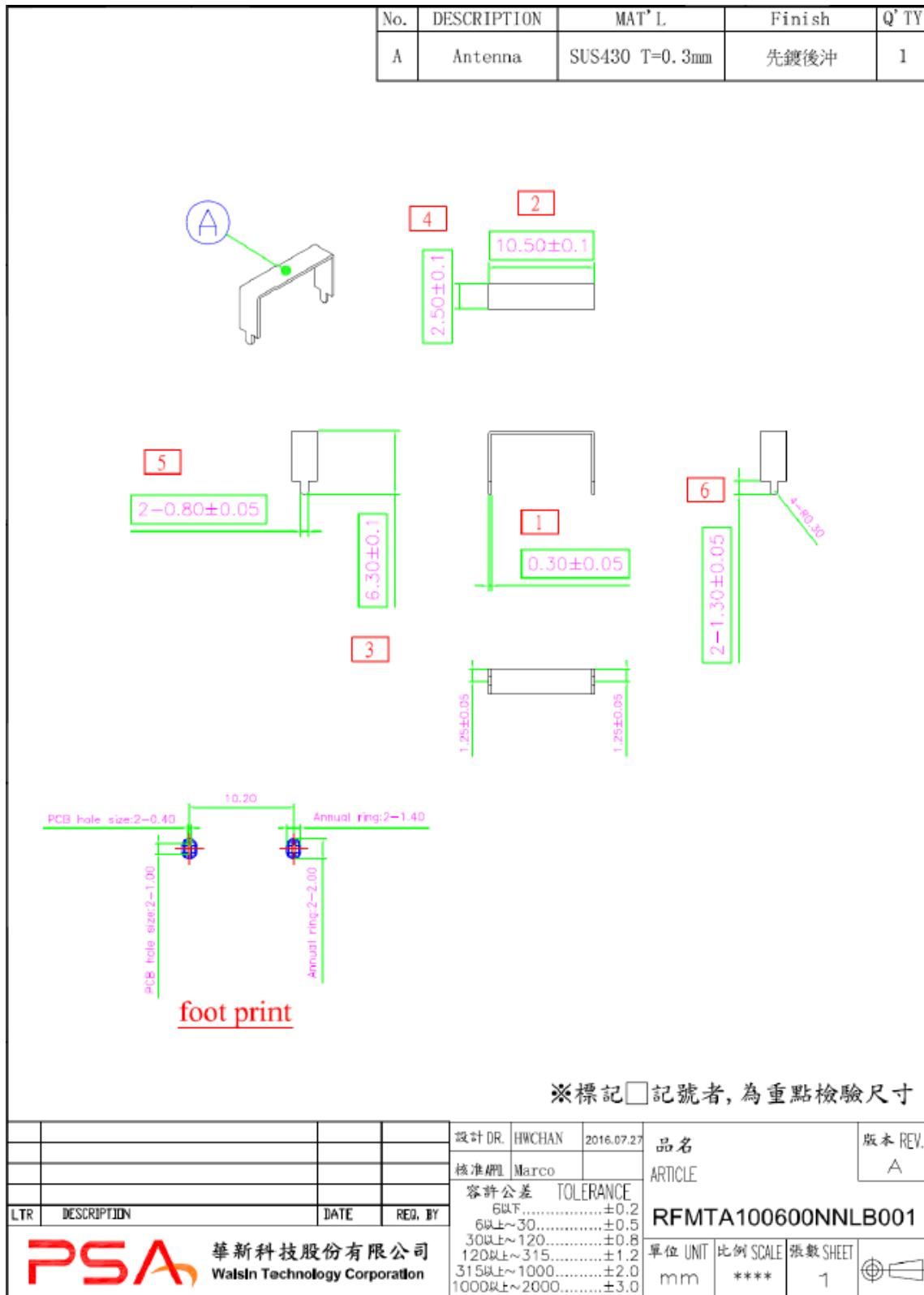
EEPROM Information

Reg Domain	US
	0x25
Vendor ID	0x0BDA
Product ID	0x881A

Environmental

Operating

Operating Temperature: 0 to 70 °C
Relevant Humidity: 5-90% (non-condensing)

Storage

Temperature: -40 to 85 °C (-40 to 185 °F)
Relevant Humidity: 5-95% (non-condensing)