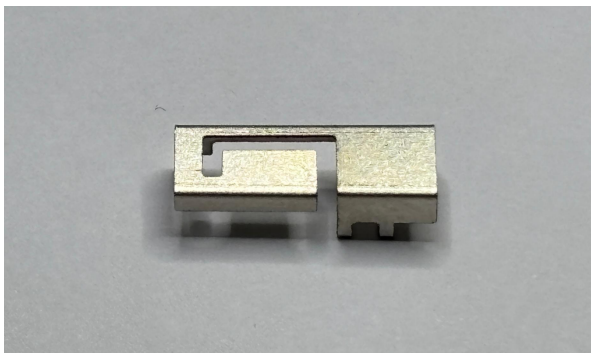
BT/BLE/WiFi Metal Stamping Antenna (T-0042-00)

1. Explanation of Part Number

S	4	J	4	0	2	0	0	4	2	0	0	0	0	0
		(1)		(2)	(3)		(4)	(5)		(6)				



Product Code:

(1) Product Categories:

J4: 2.45GHz Antenna

(2) Applications:

0: BT/BLE/WiFi

(3) Dimensions:

20: 13.75 x 5.50 x 3.53 mm

(4) Material:

0: BZn18-26

(5) Working Frequency and Polarization:

42: 2.45GHz linear polarization

(6) Antenna Series:

00: serial number

Tolerances (Unless otherwise specified) X : ± 1 X.X : ± 0.1 X.XX : ± 0.01 Angle : ± Hole Dia. : ±		Unictron Technologies Corporation Website: www.unictron.com
Scale :	Unit：mm	THIS SPECIFICATION IS THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ALL CIRCUMSTANCES WITHOUT WRITTEN PERMISSION
Drawn By : Mia	Checked By : Joy	
Designed By : Joy	Approved By :Craig	

TITLE： Metal Stamping Antenna(T-0042-00)	DOCUMENT NO.	S4J402004200000	REV. B

2. Features

*Compact
*Low loss material
*Highly efficient(η>64%)
*High Gain of 2.8 dB
*Surface Mount Device

3. Applications

* 2.4 GHz-Wi-Fi/BT/BLE/ZigBee/ISM Applications
*IoT, M2M
  ○Industrial IoT
  ○ Consumer IoT
  ○Medical IoT
*Telemetry
*Wireless Remote Control
*Personal Area Networks (PAN)
*Industrial/Commercial Equipments

4. Description

* Unictron's Metal Stamping antenna series are specially designed for 2.4G-2.5G band application. Based on Unictron's proprietary designs and processes, this Metal Stamping antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

5. Electrical Specifications

Parameter	Specification			Unit
	Min	Typ	Max	
Operating Frequency	2400		2500	MHz
Center Frequency		2445		
Return Loss	-12.15	-34.7	-11.7	dB
Polarization	Linear			
Peak Gain	2.14	2.77	2.62	dBi
Efficiency	59	64	58	%
Impedance	50			Ω

Note: All test measurements were conducted with the antenna on a 100 x 50 mm Evaluation board . Please note that the performance is dependent on the ground plane dimensions,tuning components and application environment.

6. Mechanical Specifications

Parameter	Specification
Outline Dimensions	13.75*5.50*3.53mm
Evaluation board Dimension	100 x50 mm
Mounting Type	Surface Mount

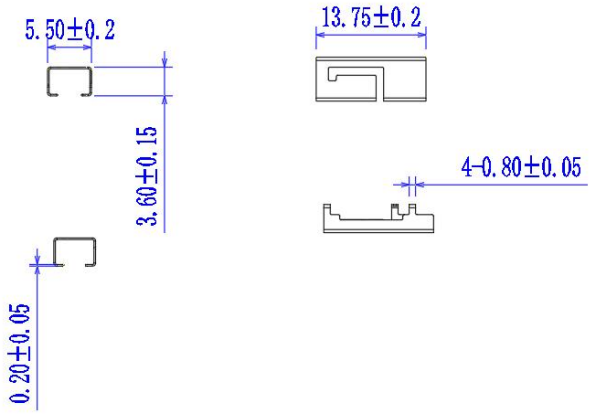
7. Environmental Specifications

Characteristics	Specifications
Operating Temperature	-40℃ ~+125 ℃
Storage Temperature	23±3℃
Storage Humidity	50±20%RH
ROHS Compliance	Yes

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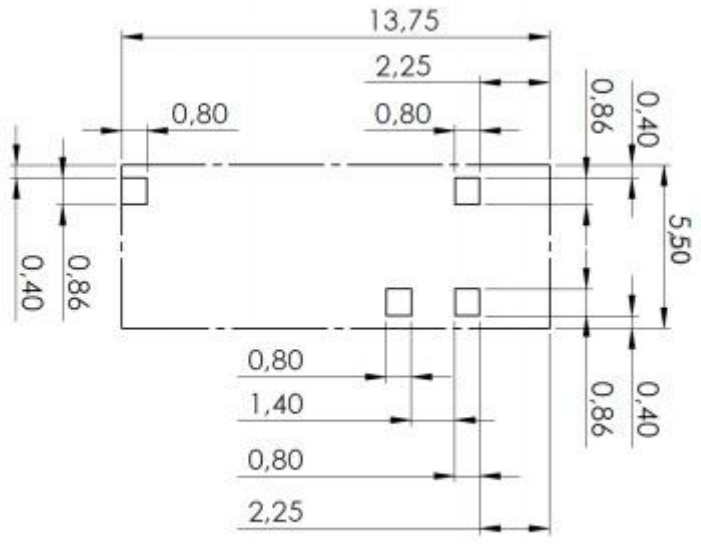
8. Antenna Dimensions (unit: mm)

(1) Product Dimension



1. 材质:洋白铜
2. 未标示公差：±0.2
3. “*”，重点尺寸

(2) Antenna pins and keep-out block

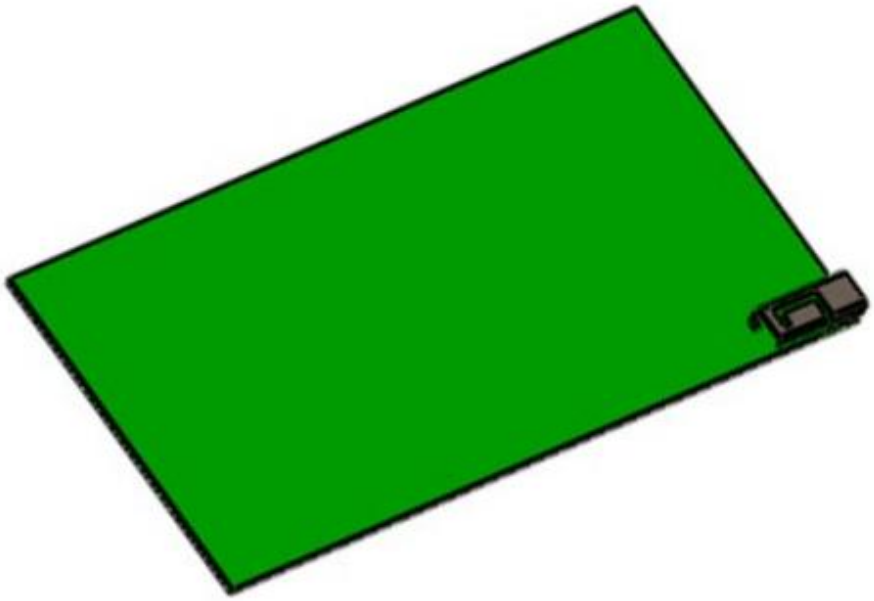


Unit : mm

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TITLE： Metal Stamping Antenna(T-0042-00)		DOCUMENT NO.	S4J402004200000
		REV.	B

9. Measurement Setup

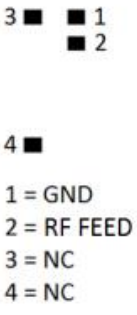
(1) The antenna measurements were done with the On Board SMD 2400 evaluation board (T-0042-00. 100 x 50 mm) in free space.



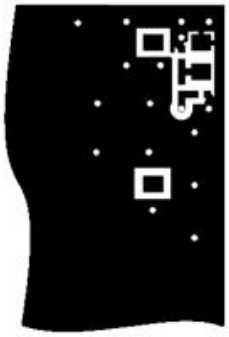
Tolerances (Unless otherwise specified) X : ± 1 X.X : ± 0.1 X.XX : ± 0.01 Angle : ± Hole Dia. : ±		Unictron Technologies Corporation Website: www.unictron.com	
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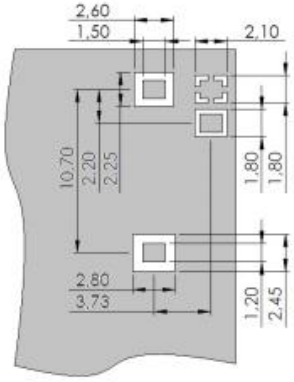
(2) PCB Layout

*The antenna is developed for optimum performance when mounted on a ground plane and is therefore very suitably mounted on a printed circuit board, where all empty space in the layout shall be filed solid copper. This also means that no ground cutout area is required under the antenna. If there are several layers in the PCB, there is an advantage to add via holes for interconnection of the ground areas. It is also very important that there is a ground clearance around the NC pads and the RF feed pad, through all layers of the PCB. Otherwise, there will be capacitive coupling which may detune the antenna.



Pin configuration

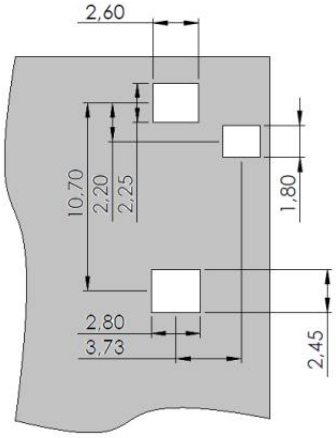




PCB Layout (from evaluation board)

The antenna is preferably positioned along one side of the PCB ground plane, where pin I shall be as close as possible to the layout corner.

It is also recommended to implement a pi-matching network as seen in the PCB Layout to compensate for eventual mismatch due to the practical implementation.The components can be positioned below the antenna next to the feed pad. See "Evaluation Board Outline & Matching Circuit" section for more details.



Clearance through all layers

Unit : mm

Tolerances (Unless otherwise specified) X : ± 1 X.X : ± 0.1 X.XX : ± 0.01 Angle : ± Hole Dia. : ±		Unictron Technologies Corporation Website: www.unictron.com	
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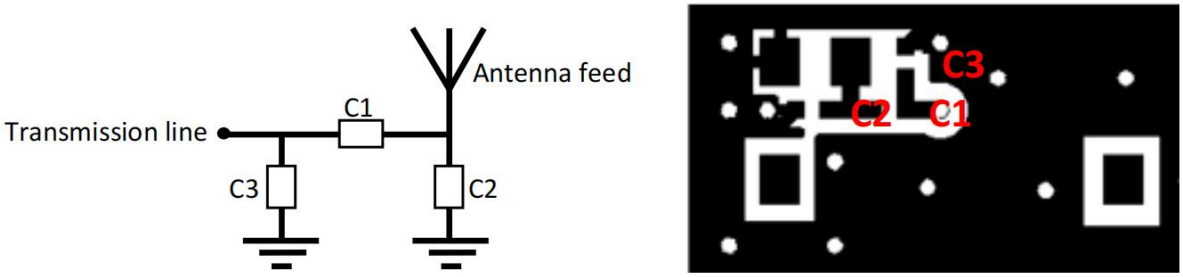
(3) Evaluation Board Outline & Matching Circuit

*The evaluation board is developed to simplify antenna testing and evaluation. It has an arbitrary size of 100 x 50 mm,and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device.



Evaluation board outline

*The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user. The component positions are sized for 0402 (1005 metric) SMD components.

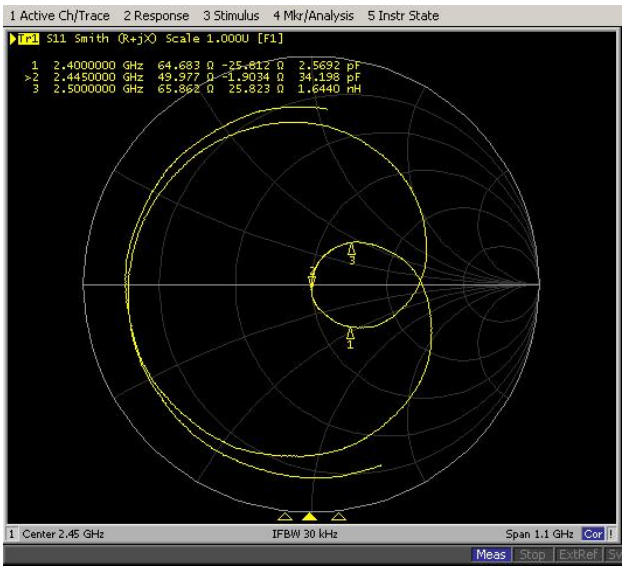


Matching circuit

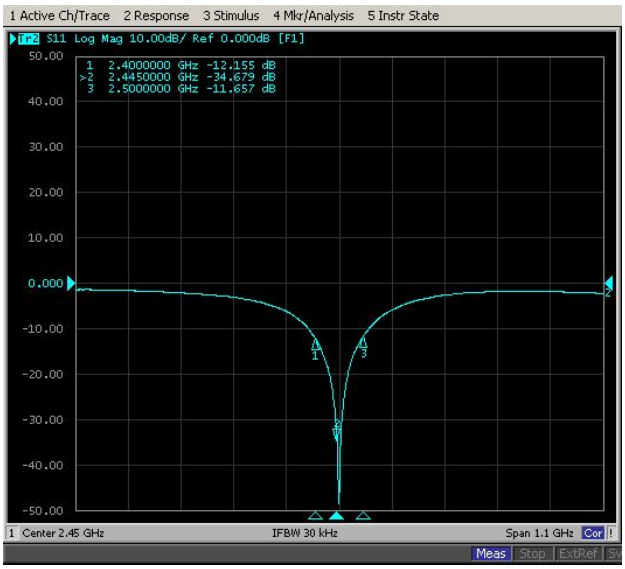
*The antenna needs a matching circuit to adjust the resonant frequency balance. hen delivered, the evaluation board is tuned for optimum balance at the 2.4 GHz band. The component values for this setup is C1 = 1.5nH, C2 = 1.0pF. C3= 0.5pF, However, it is common that the resonant frequency will shift during implementation in an arbitrary device.Therefore, this matching may be changed for compensation of such effects.

10. Return Loss&Smith Chart

Smith Chart



Return Loss



*Efficiency&Gain

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400	2.14	-2.26	59.46
2405	2.21	-2.2	60.29
2410	2.29	-2.15	60.92
2415	2.35	-2.11	61.49
2420	2.43	-2.07	62.11
2425	2.52	-2.03	62.6
2430	2.62	-1.98	63.36
2435	2.69	-1.94	64.03
2440	2.74	-1.92	64.25
2445	2.77	-1.92	64.23
2450	2.8	-1.94	64.04
2455	2.83	-1.95	63.77
2460	2.83	-1.99	63.28
2465	2.82	-2.02	62.87
2470	2.8	-2.05	62.33
2475	2.78	-2.1	61.72
2480	2.75	-2.15	60.95
2485	2.69	-2.22	59.99
2490	2.66	-2.27	59.29
2495	2.66	-2.29	58.96
2500	2.62	-2.34	58.28

Tolerances (Unless otherwise specified)

X : ± 1 X.X : ± 0.1 X.XX : ± 0.01

Angle : ± Hole Dia. : ±

Unictron Technologies Corp.

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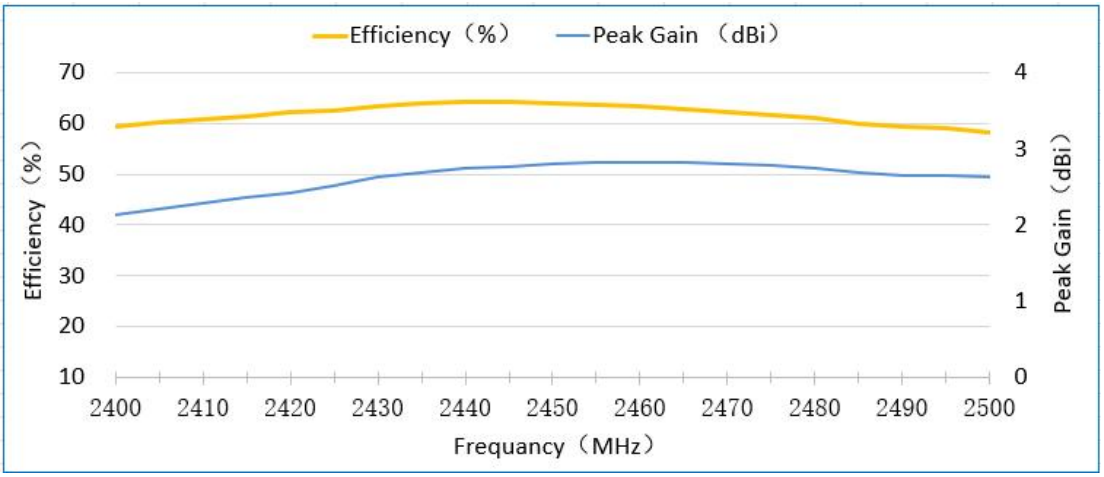
Website: www.unictron.com

Scale :	Unit：mm
Drawn By : Mia	Checked By : Joy
Designed By : Joy	Approved By :Craig

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TITLE： Metal Stamping Antenna(T-0042-00)	DOCUMENT NO.	S4J402004200000	REV. B

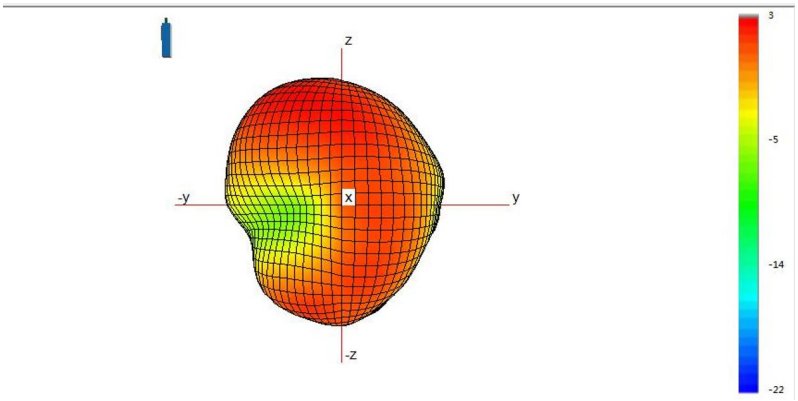
*Total Radiation Efficiency

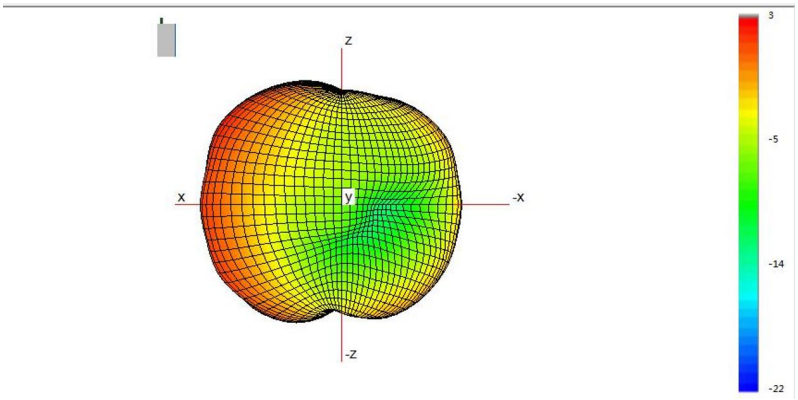


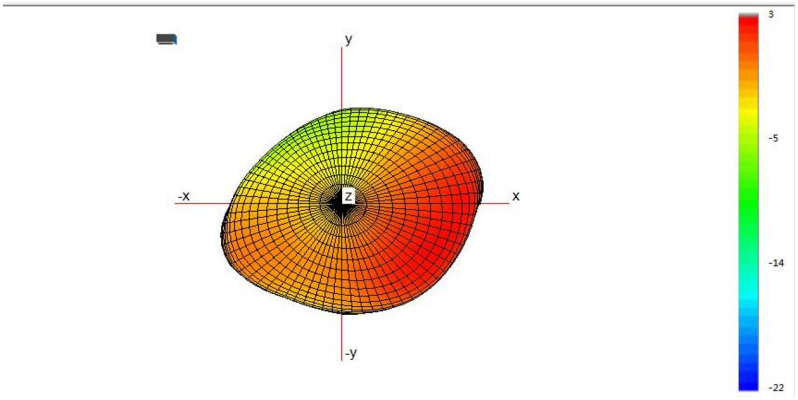
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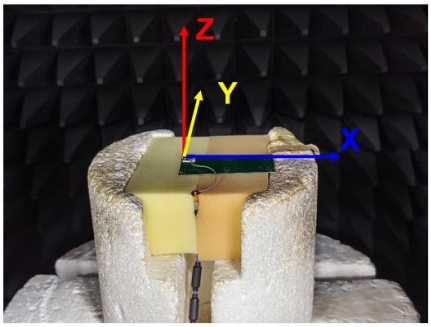
11. Radiation Characteristics

(1) 3D Radiation Pattern @2445 MHz(unit:dBi)



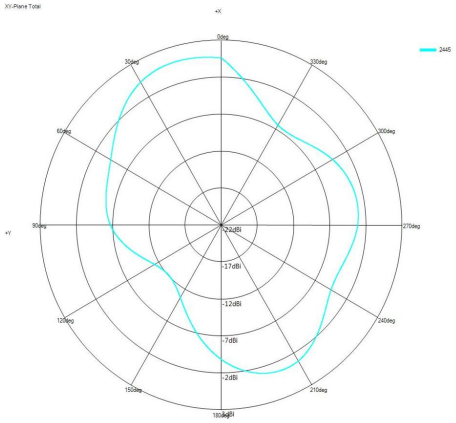


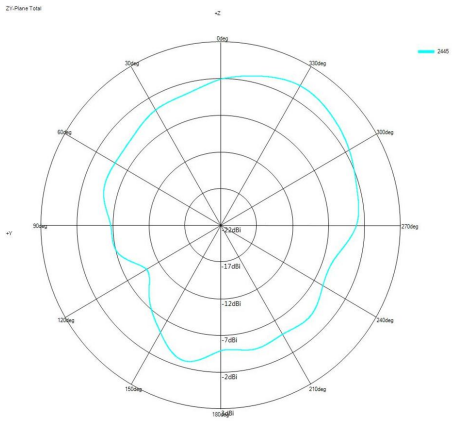


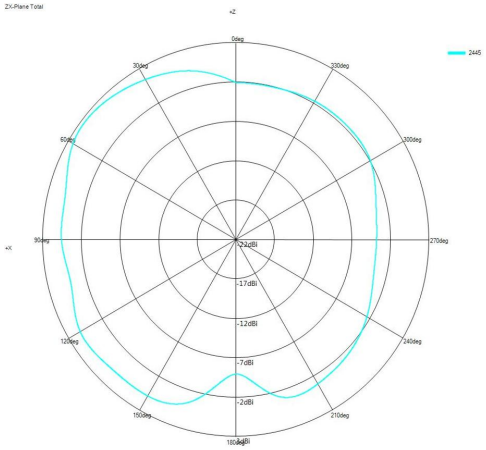


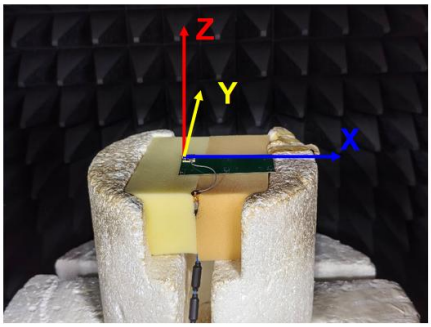
Tolerances (Unless otherwise specified) X : ± 1 X.X : ± 0.1 X.XX : ± 0.01 Angle : ± Hole Dia. : ±		Unictron Technologies Corporation Website: www.unictron.com	
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(2) 2D Radiation Pattern @2445MHz(unit:dBi)









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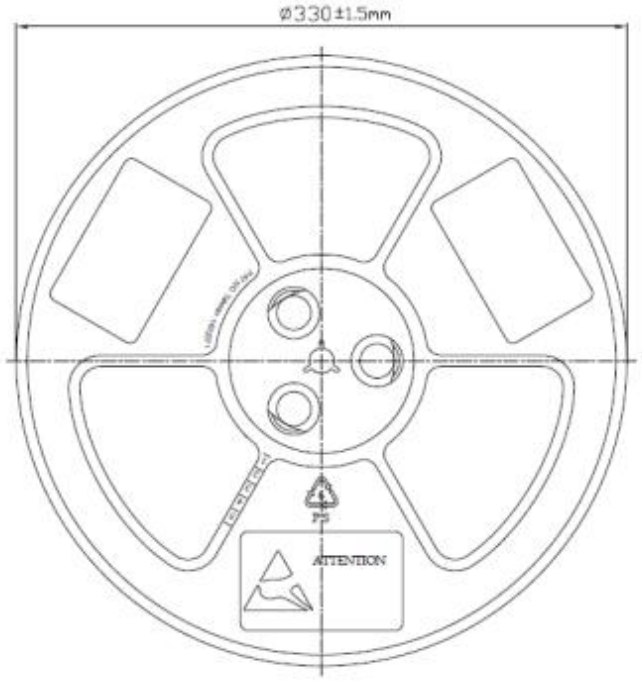
12. Packing Introduction(mm)

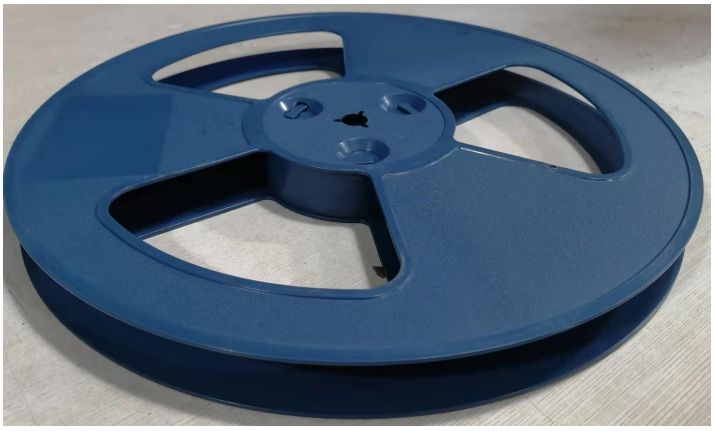
(1)Quantity/Reel: 1500 pcs/Reel; 7 Reel 10500pcs in one carton

(2)Carton Dimensions-400*400*400mm

(3)Plastic tape: black anti-static polystyrene

a. Reel Dimensions





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13. Revision Control:

Revision	Date	Content	Remark
A	Jun.4.2026	New Issued.	N/A
B	Jul.28.2026	Update 1&6&8&10&11&12	