

## 昆山睿翔讯通通信技术有限公司

## 样品承认书

## Antenna Specification

<b>Customer</b>	Honeywell	<b>Phone Model</b>	WiFi
<b>Project</b>	CW45	<b>Frequency band</b>	WIFI-LDS-BRACKET-L-ASM
<b>Color</b>	Black	<b>Revision</b>	T05
<b>Design</b>	Xiangyang Ye	<b>Date</b>	2022-09-20
<b>Check</b>	Zijun Chen	<b>Date</b>	2022-09-20
<b>Approve</b>	Jiapeng Yan	<b>Date</b>	2022-09-20
<b>Customer Approve</b>		<b>Date</b>	

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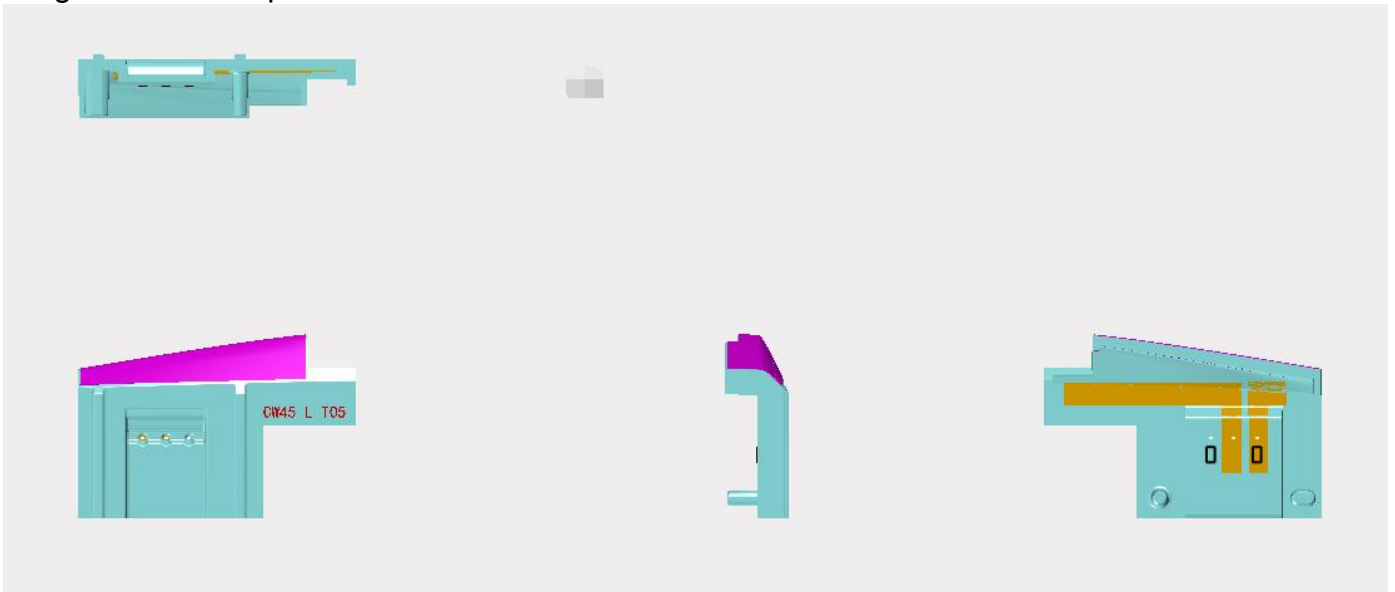
## 1. General

This document presents the antenna specification on electric, mechanic and reliability properties. The testing conditions, fixturing methods and related pictures are also included.

### 1.1 Product Description

The antenna products contain one fixed internal antenna which consists of a plastic carrier and two separated antenna patterns. They are used in a portable unit for wireless communication (referred to as a cellphone). The barcode scanner model number is Honeywell CW45 WiFi 6 antenna. The Honeywell CW45 WiFi 6 antenna works in frequency bands WiFi 2.4GHz & 5GHz.

Figure 1-1 is the pictures of the antenna



### 1.2 Product Part Number

Honeywell Product Number: 3010-8529-001

Innowave Product Number: F10686602910001

### 1.3 Print Acceptance

Samples and Antenna Specifications are sent to customer. When they are approved, the approval form should be completed, signed, and sent back to Innowave before further mass production batches can be delivered

## 2. Electrical Properties

### 2.1 Frequency Band

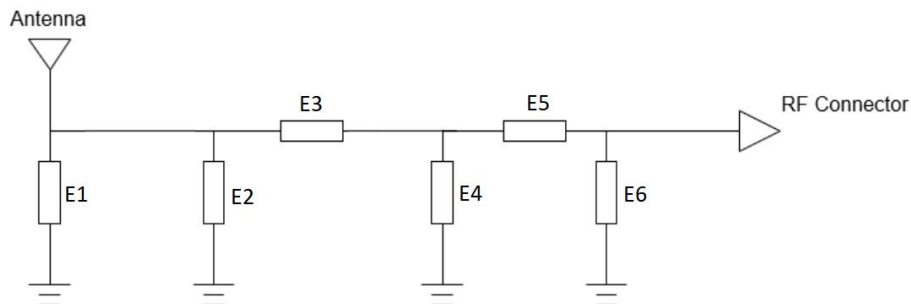
WiFi 2.4GHz & 5GHz.

### 2.2 Impedance

2.2.1 Nominal:50Ω

2.2.2 Method

E1=Null E2=Null E3=100pF E4=Null E5=0Ω E6=Null



Innowave will supply engineering assistance to ensure that the impedance over the frequency bands is as close to 50Ω as possible after matching.

### 2.3 Passive Specification

#### 2.3.1 Methods of passive measurements

A 50Ω coaxial cable is connected to the 50Ω feeding point on the RF JIG to measure S11 of the typical sample (Free Space).

Figure 2-1 is the Methods of passive measurements

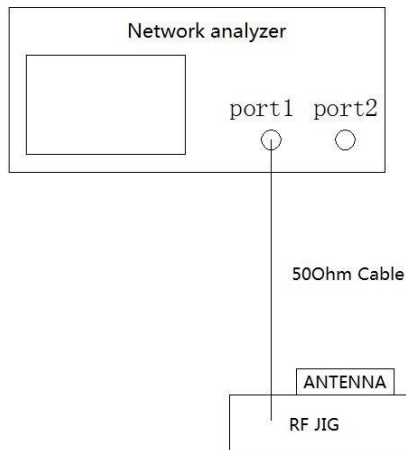


Figure 2-2 is the Return Loss and VSWR parameters

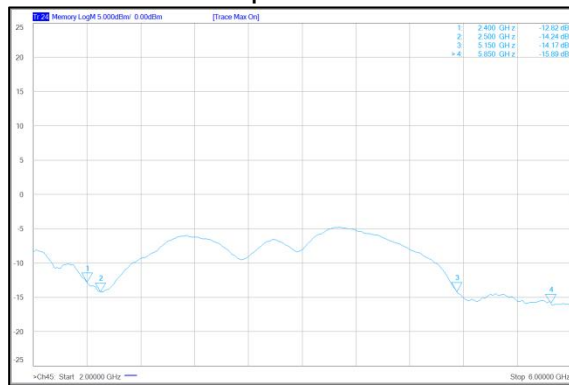


Figure 2-2: S11 plots of the antenna

Chambers which comply with CTIA criteria are used in Innowave to measure antenna transmission parameters such as antenna efficiency, radiation pattern, etc. Table 2-4 is the efficiency of the typical sample.

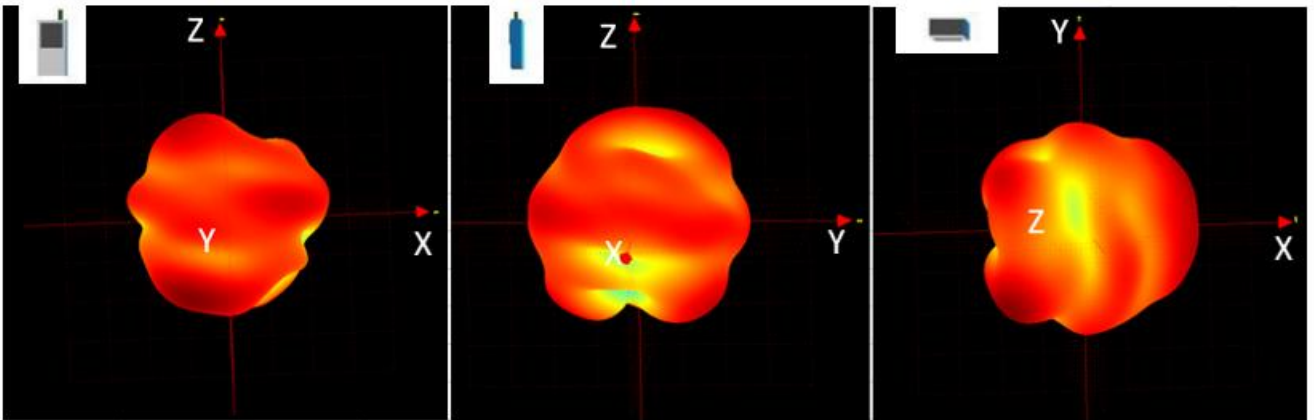
## Antenna Specification

Table 2-4 Efficiency of the typical sample

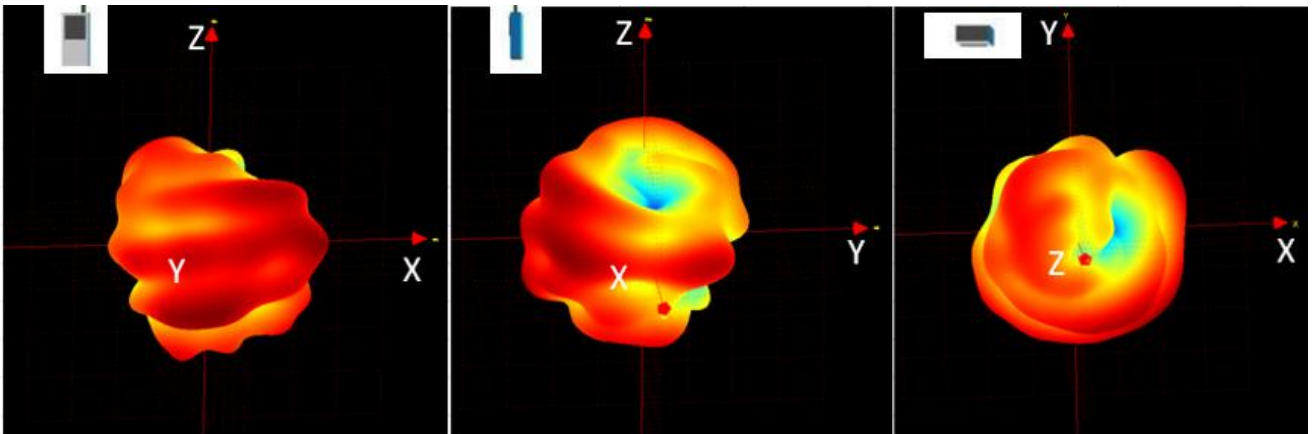
Fre. (MHz)	Eff.(dB)	Gain (dBi)	Fre. (MHz)	Eff.(dB)	Gain (dBi)
2400	-4.3	0.1	5150	-4.3	1.5
2420	-4.0	0.3	5250	-3.6	1.2
2440	-3.9	0.9	5350	-3.9	1.1
2460	-4.2	0.5	5450	-3.0	1.3
2480	-4.4	0.6	5550	-3.8	1.0
2500	-4.6	-0.3	5650	-3.3	0.7
<b>AVG</b>	<b>-4.2</b>	<b>0.4</b>	5750	-4.1	0.7
			5850	-4.1	1.4
			<b>AVG</b>	<b>-3.8</b>	<b>1.1</b>

Figure 2-5 is the radiation pattern

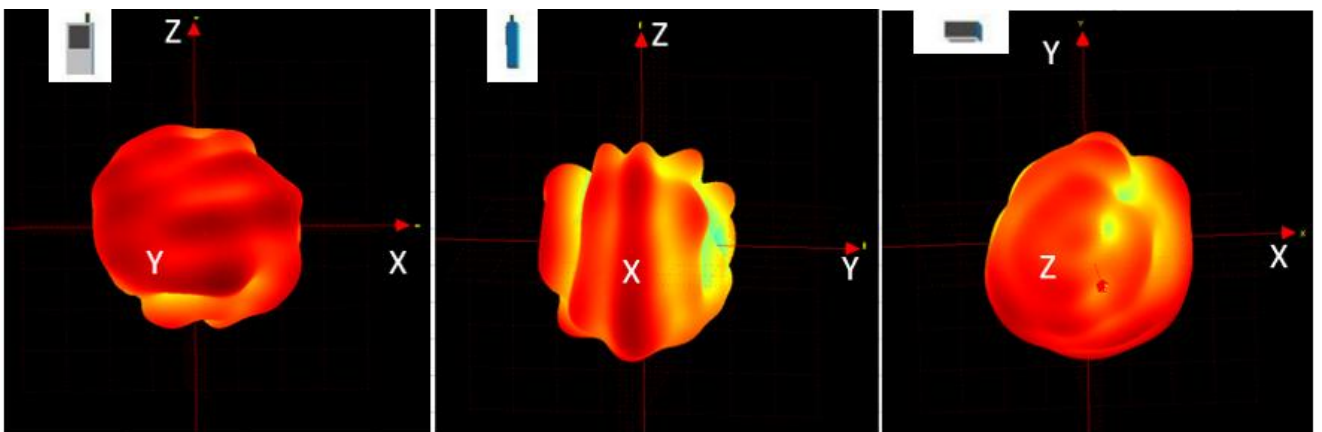
Frequency point: 2400 MHz



Frequency point: 5150MHz



Frequency point: 5850MHz











### 4. Full Size Report




NO	Material code	Product name				Specifications				WIFI-LDS-BRACKET-L-ASM		Material	Chemical nickel plating
	Supplier	Upper	+ TOL.	- TOL.	Lower	Measured 1	Measured 2	Measured 3	Measured 4	Measured 5	Measured 6	UPPER $\leq 100\%$	LOWER $\leq 100\%$
	F10686602910001	CW45				Quadratic element				MM		Measurement date	2022/9/20
	Innowave												
1	10.33	10.48	0.15	0.15	10.18	10.36	10.36	10.32	10.30	10.30	10.36	20%	20%
2	17.08	17.18	0.1	0.1	16.98	17.12	17.06	17.08	17.10	17.12	17.06	40%	20%
3	2.15	2.25	0.1	0.1	2.05	2.12	2.12	2.16	2.10	2.18	2.12	30%	50%
4	0.70	0.80	0.1	0.1	0.60	0.70	0.72	0.72	0.73	0.66	0.72	30%	40%
5	2.15	2.25	0.1	0.1	2.05	2.14	2.18	2.16	2.14	2.16	2.18	30%	10%
6	24.00	24.10	0.1	0.1	23.90	24.04	23.98	23.99	23.98	24.01	23.98	40%	20%
7	2.51	2.61	0.1	0.1	2.41	2.56	2.56	2.48	2.50	2.54	2.56	50%	30%
8	19.15	19.25	0.1	0.1	19.05	19.12	19.18	19.18	19.20	19.20	19.18	50%	30%
9	0.70	0.80	0.1	0.1	0.60	0.68	0.72	0.68	0.68	0.70	0.72	20%	20%
10	4.15	4.25	0.1	0.1	4.05	4.18	4.10	4.12	4.14	4.12	4.10	30%	50%
11	7.31	7.41	0.1	0.1	7.21	7.30	7.34	7.28	7.34	7.30	7.34	30%	30%
12	2.69	2.84	0.15	0.15	2.54	2.68	2.68	2.66	2.68	2.72	2.68	20%	20%
13	30.00	30.10	0.1	0.1	29.90	30.04	30.00	30.00	29.96	30.02	30.00	40%	40%
14	19.85	19.95	0.1	0.1	19.75	19.90	19.83	19.84	19.88	19.86	19.83	50%	20%
15	6.90	7.00	0.1	0.1	6.80	6.86	6.88	6.93	6.88	6.88	6.88	30%	40%

### 5. CPK Report

<b>Material code</b>	F10686602910001				<b>Product name</b>	CW45		
<b>Specifications</b>	WIFI-LDS-BRACKET-L-ASM				<b>Material</b>	Chemical nickel plating		
<b>Supplier</b>	Innowave				<b>Measuring tool</b>	Quadratic element		
<b>Unit of measure</b>	mm				<b>Measurement date</b>	2022/9/20		
<b>Dim. Designator</b>	7	8	10	12				
<b>Nominal</b>	2.51	19.15	4.15	2.69				
<b>+ Tolerance</b>	0.10	0.10	0.10	0.15				
<b>- Tolerance</b>	-0.10	-0.10	-0.10	-0.15				
<b>Upper Limit</b>	2.61	19.25	4.25	2.84				
<b>Lower Limit</b>	2.41	19.05	4.05	2.54				
<b>1</b>	2.53	19.17	4.18	2.65				
<b>2</b>	2.52	19.14	4.18	2.73				
<b>3</b>	2.53	19.18	4.18	2.65				
<b>4</b>	2.49	19.12	4.17	2.66				
<b>5</b>	2.53	19.17	4.18	2.73				
<b>6</b>	2.52	19.12	4.16	2.73				
<b>7</b>	2.48	19.14	4.13	2.65				
<b>8</b>	2.53	19.17	4.17	2.72				
<b>9</b>	2.53	19.14	4.12	2.67				
<b>10</b>	2.49	19.17	4.18	2.67				
<b>11</b>	2.49	19.13	4.14	2.68				
<b>12</b>	2.49	19.14	4.14	2.66				
<b>13</b>	2.54	19.18	4.17	2.64				
<b>14</b>	2.48	19.13	4.16	2.72				
<b>15</b>	2.50	19.19	4.18	2.65				
<b>16</b>	2.49	19.12	4.18	2.73				
<b>17</b>	2.49	19.12	4.13	2.71				
<b>18</b>	2.53	19.13	4.14	2.71				
<b>19</b>	2.50	19.18	4.13	2.67				
<b>20</b>	2.48	19.16	4.13	2.65				
<b>21</b>	2.54	19.18	4.12	2.64				
<b>22</b>	2.53	19.18	4.18	2.70				
<b>23</b>	2.48	19.18	4.14	2.68				
<b>24</b>	2.49	19.12	4.16	2.67				
<b>25</b>	2.50	19.12	4.14	2.66				
<b>26</b>	2.50	19.13	4.17	2.67				
<b>27</b>	2.53	19.14	4.18	2.74				
<b>28</b>	2.48	19.12	4.13	2.72				
<b>29</b>	2.50	19.18	4.16	2.68				
<b>30</b>	2.50	19.14	4.18	2.72				
<b>31</b>	2.50	19.14	4.16	2.65				
<b>32</b>	2.55	19.17	4.19	2.73				
<b>MAX.</b>	2.55	19.19	4.19	2.74				
<b>MIN.</b>	2.48	19.12	4.12	2.64				
<b>AVERAGE</b>	2.51	19.15	4.16	2.69				
<b>STDEV</b>	0.02	0.02	0.02	0.03				
<b>CP</b>	1.54	1.36	1.52	1.51				
<b>Cpk</b>	1.50	1.36	1.40	1.47				

## 6. Reliability Test Report

Customer	Honeywell	Product name	CW45-WIFI-LDS-BRACKET-L-ASM	P/N	F10686602 910001	Test date	2022/9/1 6	Finish date	2022/9/18
Serial number	Test project	Test conditions		Decision criteria		The test image		Result	
1	Constant temperature and humidity	1) Temperature $65\pm 1^{\circ}\text{C}$ Humidity $93\pm 2\%\text{RH}$ , mass production 96H, trial production 168H; 2) Check the appearance after the normal temperature is restored for 2H; 3) Draw $10*10\text{ mm}^2$ small boxes; 4) The normal temperature should be restored for at least 0.5h. Check the appearance, paste the surface with 3M610 tape, hold for 5 seconds, and pull up vertically at a $90^{\circ}$ Angle for 3 times.		1) The coating has no bubbles, peeling and other anomalies (LDS coating has no effect on the electrical property); 2) Hundred lattice reaches 4B, shedding area is less than 5%.				OK	
2	Temperature shock	1) The low temperature is $-40\pm 2^{\circ}\text{C}/1\text{H}$ , and the high temperature is $75\pm 2^{\circ}\text{C}/1\text{H}$ within 1min, 20 cycles; 2) Check the appearance after the normal temperature is restored for 2H;		No bubbles, peeling and other anomalies in the coating (LDS coating has no effect on the electrical property)				OK	
3	Film thickness test	1) X-Ray coating thickness tester selected Cr-Ni-Cu-Al program, randomly tested 5 points, and recorded the average value; 2) Look for the thinnest position of the metal coating at the corner of the die closing line, measure the film thickness and record the value; 3) Measure the height difference between the highest point and the lowest point of the substrate at the above corner, and record the value.		1) Flat copper: 8-14um, nickel 2-4um 2) The copper layer at the corner should be no less than 5um 3) The height difference between the highest point and the lowest point of the substrate is recorded for reference only, without judgment				OK	
4	Salt spray test	1) NaCl: 5%, pH 6.5~7.2; 2) Experimental chamber temperature: $35\pm 1^{\circ}\text{C}$ .		The surface of the product shall not appear oxidation, rust, discoloration, corrosion spots, etc				OK	

5	High temperature storage	<p>1) Temperature: <math>75\pm 2^{\circ}\text{C}</math>;          2) Time: 48H for mass production, 96H for trial production, and at room temperature (<math>25\pm 5^{\circ}\text{C}</math>) after recovery for at least 2H for observation.</p>	No bubbles, peeling and other anomalies in the coating (LDS coating has no effect on the electrical property)		OK
6	The low temperature	<p>1) Temperature: <math>-40\pm 2^{\circ}\text{C}</math>;          2) Time: 48H for mass production, 96H for trial production, and at room temperature (<math>25\pm 5^{\circ}\text{C}</math>) after recovery for at least 2H for observation.</p>	No bubbles, peeling and other anomalies in the coating (LDS coating has no effect on the electrical property)		OK
7	Adhesion	<p>1) Draw <math>10*10\text{mm}*1\text{mm}</math> small boxes;          2) Clean the surface with a dust-free cloth, glue the small mesh with 3M610 adhesive paper and flatten it to ensure that all bubbles are extruded. Static press for more than 5S, quickly pull the adhesive paper vertically and stick it in the same position for 3 times.</p>	4B Qualified (shedding area < 5%)		OK

## 7. Bill Of Materials

<b>Material name</b>		CW45		<b>Supplier</b>				Innowave									
<b>Material code</b>		F10686602910001		<b>Material model</b>				WIFI-LDS-BRACKET-L-ASM									
<b>Product composition information</b>																	
NO.	Material Name	Material Specifications	Material supplier	ROHS controls substance content(ppm)										Test Lab	Report Code	Report Date	
				Hg	Cd	Pb	DEHP	BBP	DBP	DIBP	Cr6+	PBBS	PBDEs				
1	Plating	Copper nickel	lvtu	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	CTI	A2220004798101001E	2022.1.21
2	double faced adhesive tape	3M55261	3M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	CANE C2214195801	2022.7.6
3	Bracket	DX 11355	sabic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

## 8. Packing

<b>Material code</b>	3010-8529-001	<b>Product name</b>	CW45
<b>Material model</b>	WIFI6 antenna	<b>Packing material</b>	Carton Box+Tray wool+PE bag
<b>QTY</b>	1 box	<b>Tray size</b>	33.5*22.5*1.2CM
<b>QTY</b>	1368 PCS	<b>Carton size</b>	35.0 *24.0*25.0CM
<b>Packing</b>	Tray	<b>Pearl wool</b>	/
		<b>PE bag size</b>	800*800MM

1.Single packing



2.Packaging



3.View (front, side, top)



4.Label



**Notes:**

1.Grid holds 1 pcs product ,72 pcs/Tray, 19 trays/box, and 1368 pcs/box.

Lister: Zhangpeng

Approved: Chenqingliang