Shenzhen Asian Crown antenna connector Co., LTD
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APPROVAL SHEET

MULTILAYER CERAMIC ANTENNA

RFANT Series – RoHS Compliance

2.4 GHz ISM Band Working Frequency

P/N: RFANT3216120A5T Series

深圳市亚冠天线连接器有限公司

*Contents in this sheet are subject to change without prior notice.

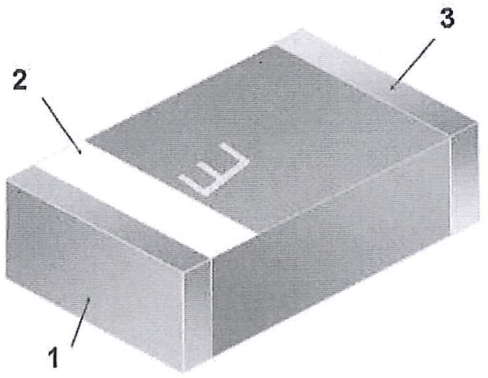
FEATURES

1. Surface Mounted Devices with a small dimension of 3.2 X 1.6 X1.2 mm^3 meet future miniaturization trend.
2. LTCC process
3. High stability in Temperature / Humidity Change

APPLICATIONS

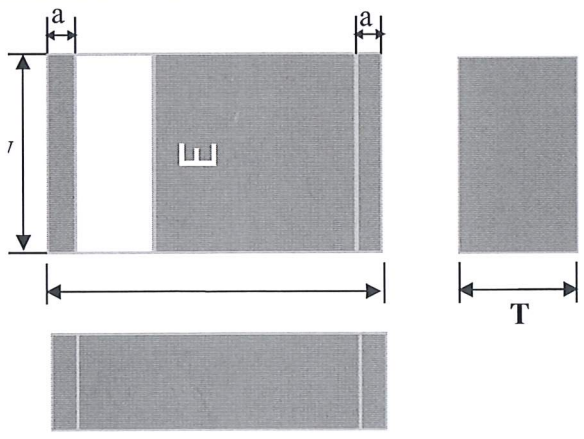
1. 2.4GHz ISM band RF applications
2. Bluetooth, Wireless, HomeRF

CONSTRUCTION



1. **Feeding**
2. **Identification Mark**
3. **Soldering terminal**

DIMENSIONS

Figure	Symbol	Dimension (mm)
	L	3.20 ± 0.20
	W	1.60 ± 0.10
	T	1.20 ± 0.10
	a	0.25 ± 0.15

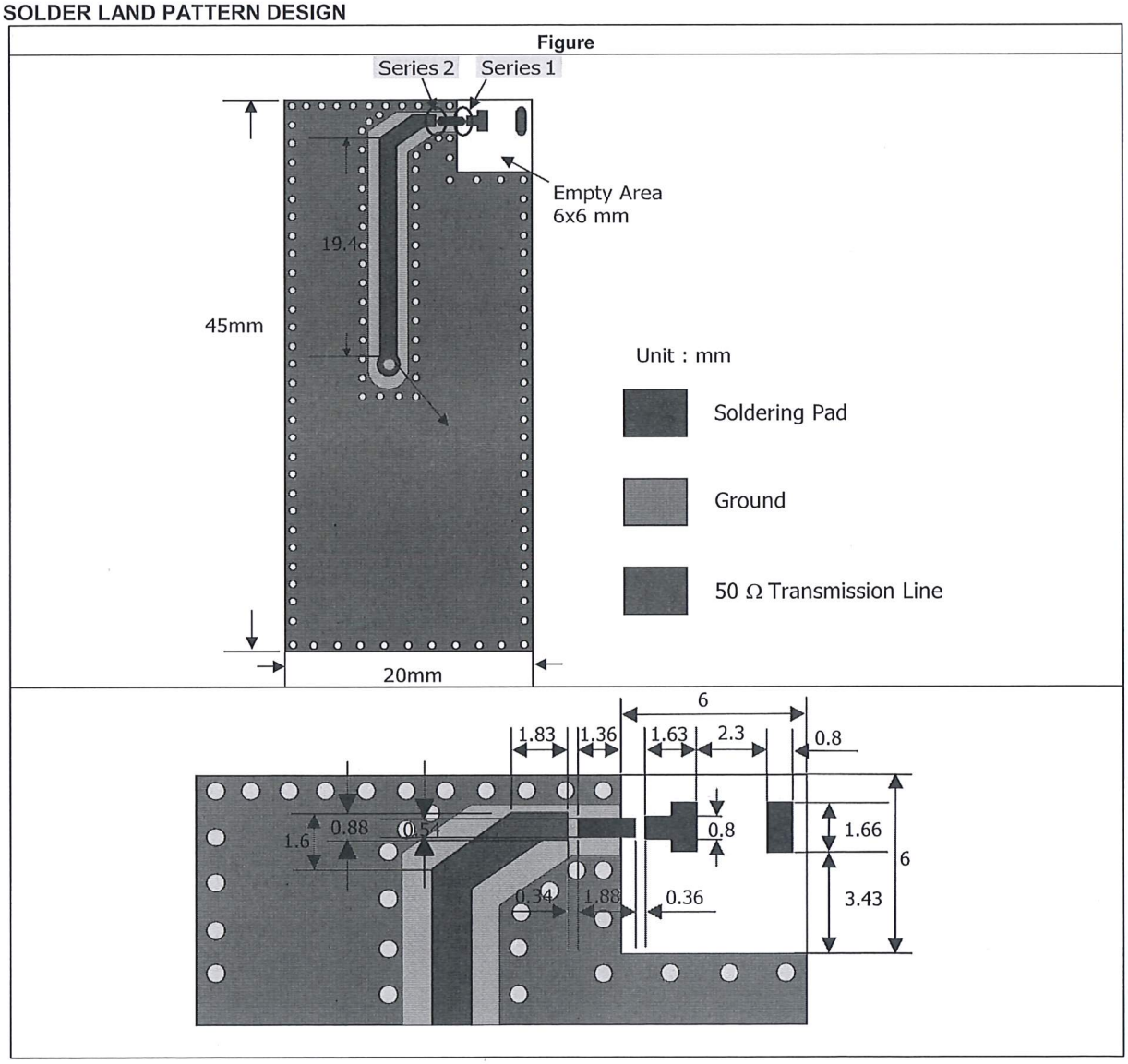
ELECTRICAL CHARACTERISTICS

RFANT3216120A5T		Specification
Working Frequency Range		2450 ± 50 MHz
Fc (GHz)		2.9
Gain (dBi)		2 (Typical)
VSWR		2 max.
Matching component value	Series 1	6.8nH
	Series 2	-
Operation Temperature		-40˚C ~ +85˚C

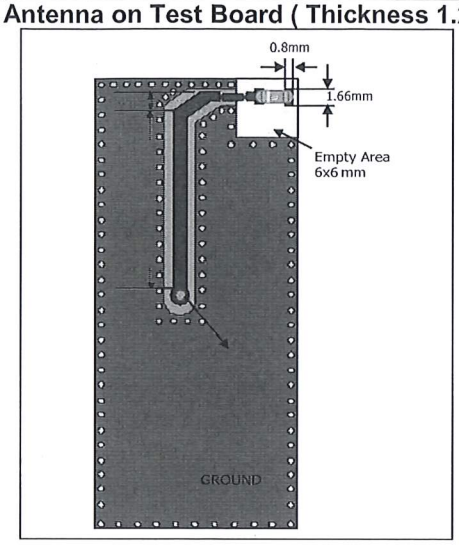
*** This frequency must be adjusted to 2.45GHz with matching circuit.**

SOLDER LAND PATTERN DESIGN

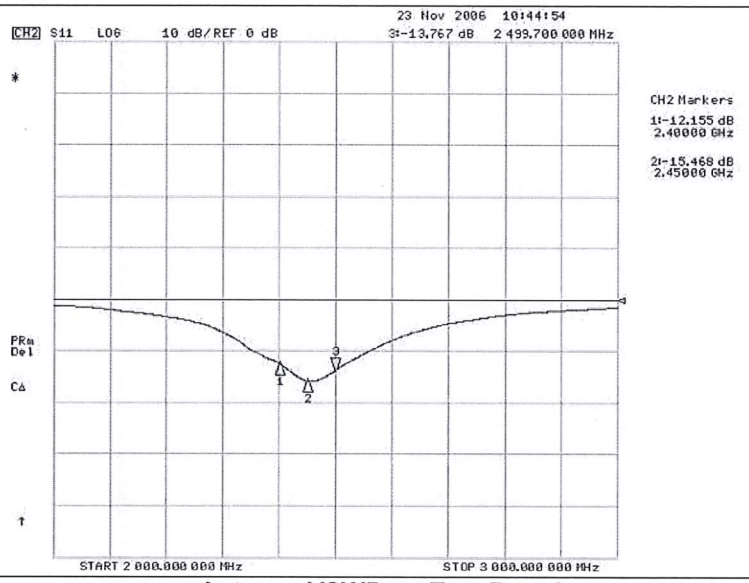
Figure



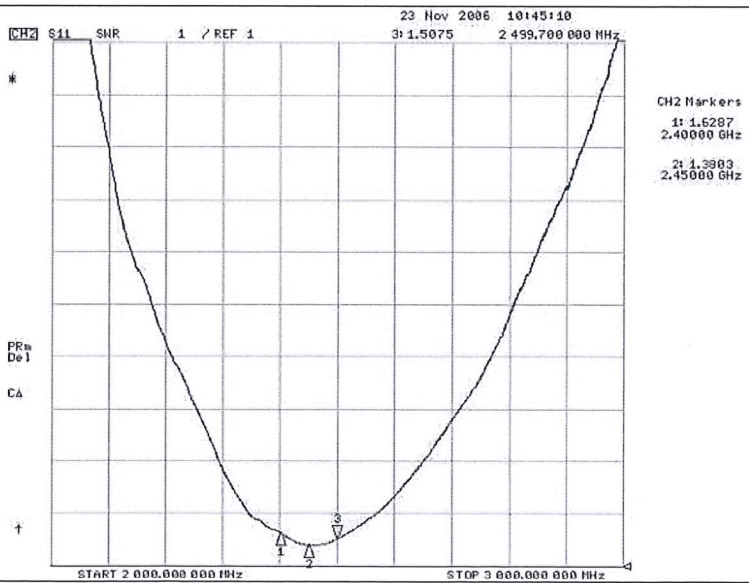
Antenna on Test Board (Thickness 1.2mm)



Antenna S11 on Test Board

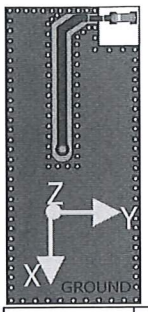


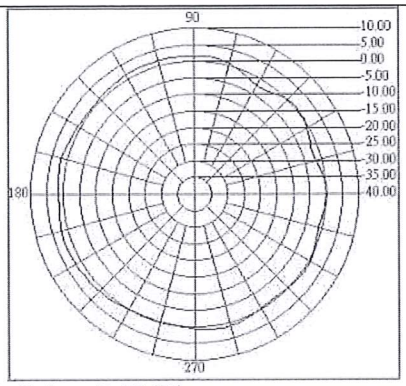
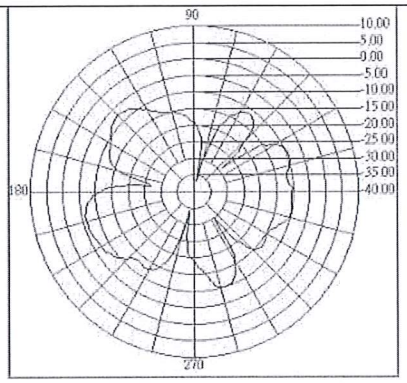
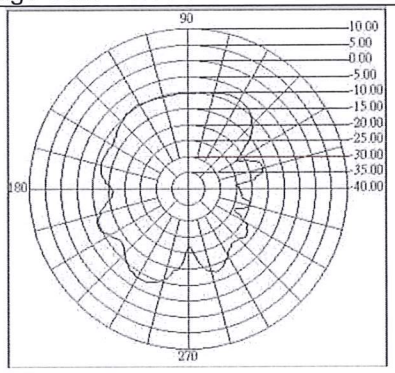
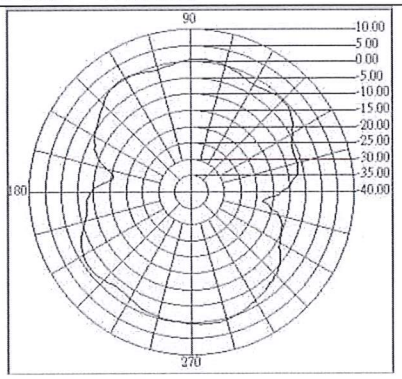
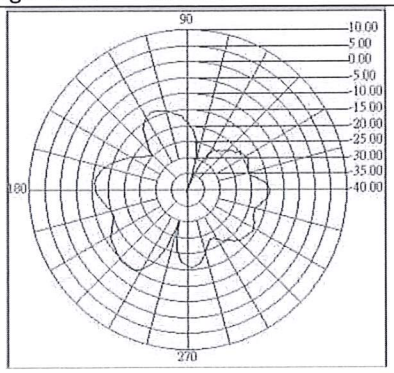
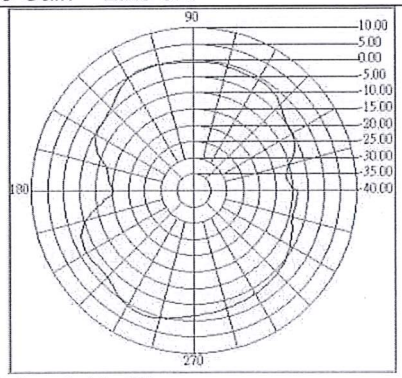
Antenna VSWR on Test Board



RADIATION PATTERN

Radiation Pattern and Gain were dependent on measurement board design. The specification of RFANT3216120A5T antenna was measured based on the PCB size and installation position as shown in the below figure Test Board



	Vertical	Horizontal
Y - Z Plane Average Gain= 0.891 dBi	 Peak Gain = 2.12dBi Average Gain = 0.64 dBi	 Peak Gain= -6.07dBi Average Gain=-11.62dBi
X - Z Plane Average Gain= -1.846 dBi	 Peak Gain= -7.78 dBi Average Gain= -11.97dBi	 Peak Gain= 0.96 dBi Average Gain= -2.29 dBi
X - Y Plane Average Gain= -2.556 dBi	 Peak Gain= -9.41 dBi Average Gain= -15.54dBi	 Peak Gain= 1.40 dBi Average Gain= -2.78 dBi

RELIABILITY TEST

Test item	Test condition / Test method	Specification
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature: 235 ± 5°C *Immersion time: 2 ± 0.5 sec *Solder: Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Leaching (Resistance to dissolution of metallization) IEC 60068-2-58	*Solder bath temperature: 260 ± 5°C *Leaching immersion time: 30 ± 0.5 sec *Solder : SN63A	Loss of metallization on the edges of each electrode shall not exceed 25%.
Resistance to soldering heat JIS C 0050-5.4	*Preheating temperature: 120~150℃, 1 minute. *Solder temperature: 270±5°C *Immersion time: 10±1 sec *Solder: Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test. Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test JIS C 0044	*Height: 75 cm *Test Surface: Rigid surface of concrete or steel. *Times: 6 surfaces for each units; 2 times for each side.	No mechanical damage. Samples shall satisfy electrical specification after test.
Adhesive Strength of Termination JIS C 0051- 7.4.3	*Pressurizing force: 5N(≦ 0603); 10N(>0603) *Test time: 10±1 sec	No remarkable damage or removal of the termination.
Bending test JIS C 0051- 7.4.1	The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 1mm/s and then pressure shall be maintained for 5±1 sec. Measurement to be made after keeping at room temperature for 24±2 hours	No mechanical damage. Samples shall satisfy electrical specification after test.

Temperature cycle JIS C 0025	1. 30±3 minutes at -40°C±3°C, 2. 10~15 minutes at room temperature, 3. 30±3 minutes at +85°C±3°C, 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Vibration JIS C 0040	*Frequency：10Hz~55Hz~10Hz(1min) *Total amplitude：1.5mm *Test times：6hrs.(Two hrs each in three mutually perpendicular directions)	No mechanical damage. Samples shall satisfy electrical specification after test.
High temperature JIS C 0021	*Temperature：85°C±2°C *Test duration：1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Humidity (steady conditions) JIS C 0022	*Humidity：90% to 95% R.H. *Temperature：40±2°C *Time：1000+24/-0 hrs. Measurement to be made after keeping at room temperature for 24±2 hrs ※500hrs measuring the first data then 1000hrs data	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature JIS C 0020	*Temperature：-40°C±2°C *Test duration：1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2

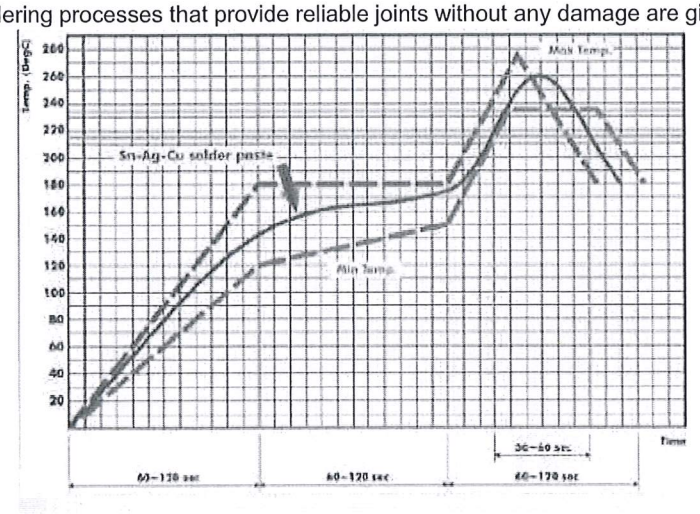


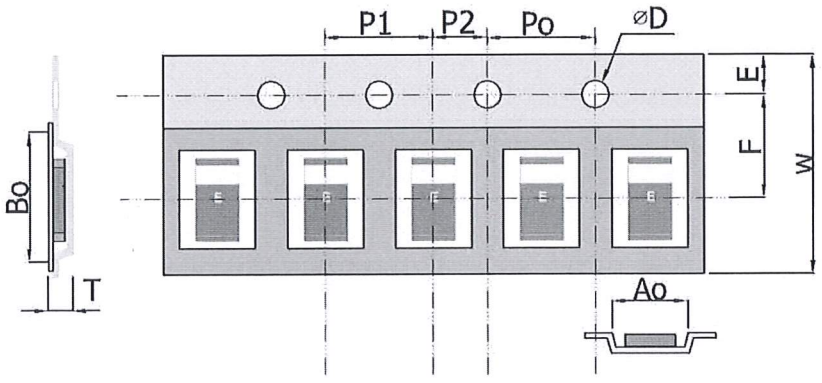
Fig 2. Infrared soldering profile

ORDERING CODE

RF	ANT	321612	0	A	5	T
Walsin RF device	**Product code** ANT : Antenna	**Dimension code** Per 2 digits of Length, Width, Thickness : e.g. : 321612 = Length 32, Width 16, Thickness 12	**Unit of dimension** 0 : 0.1 mm 1 : 1.0 mm	**Application** A : 2.4GHZ ISM Band	**Specification** Design Code	**Packing** T : 7" Reeled

Minimum Ordering Quantity: 2000 pcs per reel.

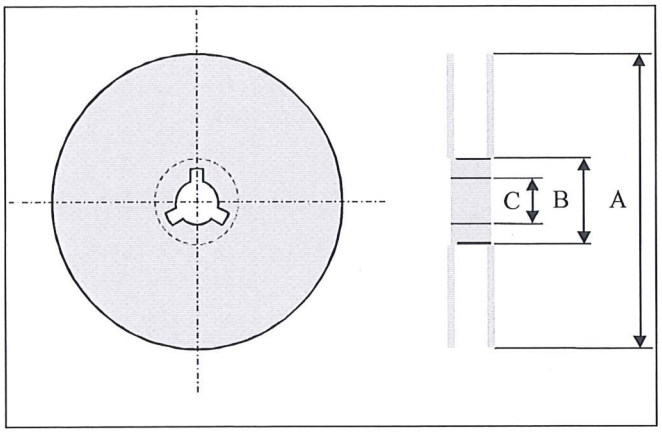
PACKAGING



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.95 ± 0.10	3.45 ± 0.10	1.55 ± 0.05	1.30 ± 0.10	8.20 +0.10 -0.30
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

Typing Quantity: 2000 pieces per 7" reel

CAUTION OF HANDLING

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

(1) Aircraft equipment
(2) Aerospace equipment
(3) Undersea equipment
(4) Medical equipment
(5) Disaster prevention / crime prevention equipment
(6) Traffic signal equipment
(7) Transportation equipment (vehicles, trains, ships, etc.)
(8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

Storage condition

(1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.

(2) Storage environment condition.

- Products should be storage in the warehouse on the following conditions.
- Temperature : -10 to +40℃
- Humidity : 30 to 70% relative humidity
- Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
- Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
- Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
- Products should be storage under the airtight packaged condition.

深圳市爱图仕影像器材有限公司
2.4G陶瓷天线测试报告

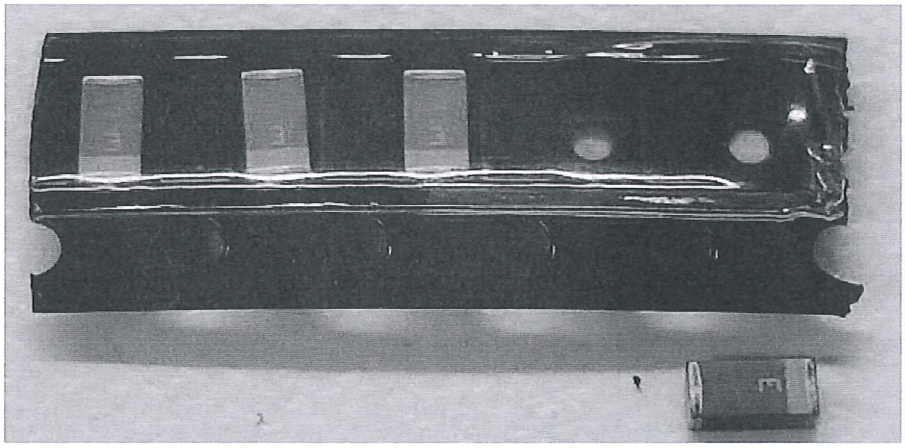
表单编号：

项目名称	TY-2897	送样次数	1	申请人	伍辉娟
物料名称	陶瓷天线-2.4G	样品数量	10PCS	测试工程师	Kevin
供方名称	YGTX001	物料编号	EEY311LAT9E2	测试日期	2024.01.15
产品阶段	☐原型机阶段 ☐工程样机阶段 ☑试产阶段 ☐量产阶段			参考标准	《陶瓷天线进料通用检验标准》
测试项目	☐综合测试 ☑其它				
测试目的	天线外观和之前的有变化，重新签样，确认物料是否符合使用标准				

序号	测试项目		测试方法	测试结果	结果判定	备注
1	包装	材质	材质：与公司样板保持一致。	NA	NA	
2		标号、规格	物料编号、品名规格标识需与采购订单一致	NA	NA	
3		标示	包装需贴有明显物品标示且应与实物或样品相符。	NA	NA	
4		外包装	外包装必须有效的保护物品，且要有防潮、警告标识；不能出现少放、漏放等现象。	NA	NA	
5		一致性	同一箱/同一批 中不可混有不同规格型号的产品在内，且外箱不可有破损、变形、受潮现象。	NA	NA	
6	尺寸	全尺寸	1.天线长宽高符合承认书； 2.天线焊盘位置，尺寸符合承认书； 3.其它尺寸，应与承认书及样品相符（尺寸无法准确测量的，以试装为准）	符合要求	OK	
7	外观	目测	表面无毛刺、开裂、破损变形、脱银；焊点有光泽，无氧化、划痕，颜色均一，无明显色差	符合要求	OK	
8	适配	实配	将天线焊接到PCB上，尺寸符合	符合要求	OK	
9		感应功率	1） 蓝牙天线发射功率在整体上大于-1dBm 2） 2.4G天线发射功率在整体上大于-6dBm	NA	NA	

10	性能	无线距离	1） 蓝牙天线无线距离65m 2） 2.4G天线距离 8m	蓝牙天线无线距离65m不隔人正常；最大距离100+	OK	
11	可靠性	可焊性	目测，烙铁调整300~320℃，3S~5S内加锡，粘锡面积须≥95%；	可焊性良好	OK	
12		高温存储	1.将天线连接线放入高温箱，温度设置80℃，储存8H后取出恢复至常温，检查外观无变色、破裂。 2.感应功率： 1） 蓝牙天线发射功率在整体上大于-1dBm 2)	高温存储无异常功能无异常	OK	
13		低温存储	1.将天线连接线放入低温箱，温度设置-40℃，储存8H后取出恢复至常温，检查外观无变色、破裂、变形，拉伸是否有弹性。 2.感应功率： 1） 蓝牙天线发射功率在整体上大于-1dBm 2)	低温存储后功能无异常	OK	
14	ROHS	有害物质检测	1.有害物质不可超标，须满足欧盟ROHS要求； 2.检查产品最小包装箱要有Rohs标识。	NA	NA	
15	一致性	/	在检验的过程中，需对产品的尺寸，结构，形态，本体信息，颜色等保持一致，如存在差异的务必上报领导处理。	NA	NA	

测试过程图片：



结论	合格	备注	

制表： **确认：** **审核：**