物料承认书

客户名称	惠州市博实结科技有限公司
项目名称	
产品品名	贴片陶瓷天线
产品规格	RFECA3216060A1T/3.2*1.6*0.6MM/华新科
客户品号	1301-00559

供应商信息

供应商名称:	昆山华腾电子有限公司
供应商地址:	江苏省昆山市五联路 2588 号原创基地 B 区一栋西三楼
联系电话:	18625234197
EMAIL:	zoulin@hatn.com.cn

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供应商签署

RoHS 物料 √☐　　非 RoHS 物料 ☐

部　门	制作	工程部	设计部	品质部
签 署 者	邹林	余锦华	涂汇兵	徐雷
签署日期	2021/02/22	2021/02/22	2021/02/22	2021/02/22
注：1、RoHS 物料，非 RoHS 物料须选其一；2、工程部、设计部需要参与剧客户需求选择物料类型并签署。				

深圳市博实结科技有限公司

承认状态	☐ 承认	☐ 拒绝承认
	☐条件承认　需满足条件:	
	☐临时限量承认　限量采购　　PCS （需要签署特采流程）	

部门	负责采购	☐ ID 部	☐ 结 构		☑ 硬 件		☐ 质 量	
			结构 PL	结构总监	硬件 PL	硬件总监	QPM	SQE
检查项	交货期	外观工艺	结构尺寸、规格		电气性能、规格		外观、样品测试	
签署者								
日 期					2021.06.02			
1 、采购跟进物料交期；2、设计外观和工艺类 ID 签署；3、模具、五金外壳物料结构签署；4、电子器件、模组类、电池硬件签署；5、PE 部配合质检部负责外观、样品测试合格签署。								

注：1、供应商签署者注意客户需求和物料编号，并按需求送样承认。
2、博实结内部签署者注意审核，物料必须符合我司使用要求。
3、该文件由采购部和品质部各保存一份，有效保存时间为 2 年。

APPROVAL SHEET

RFECA Series – RoHS Compliance

CERAMIC ANTENNA

Halogens Free Product

2.4 GHz ISM Band RF Application

P/N: RFECA3216060A1T

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

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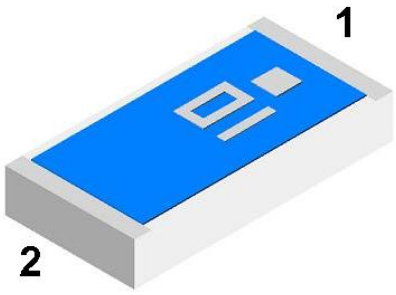
FEATURES

1. Surface Mounted Devices with a small dimension of 3.2 X 1.6 X 0.6 mm^3 meet future miniaturization trend.
2. LTCC process.
3. High stability in Temperature / Humidity Change.
4. Superb performance to place on the middle of PCB edge and excellent peak/ average gain observed by field test application.

APPLICATIONS

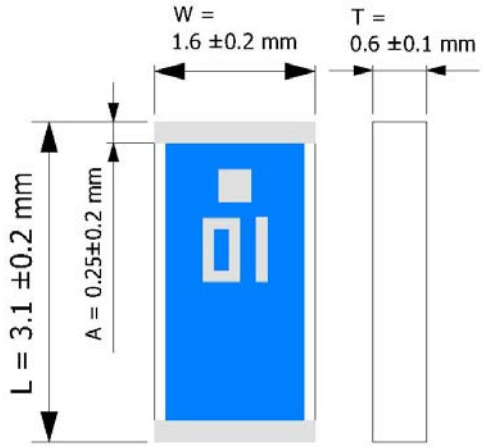
1. ISM Band 2.4GHz applications.
2. Bluetooth..

CONSTRUCTION



PIN	Connection
1	Feeding
2	Soldering terminal

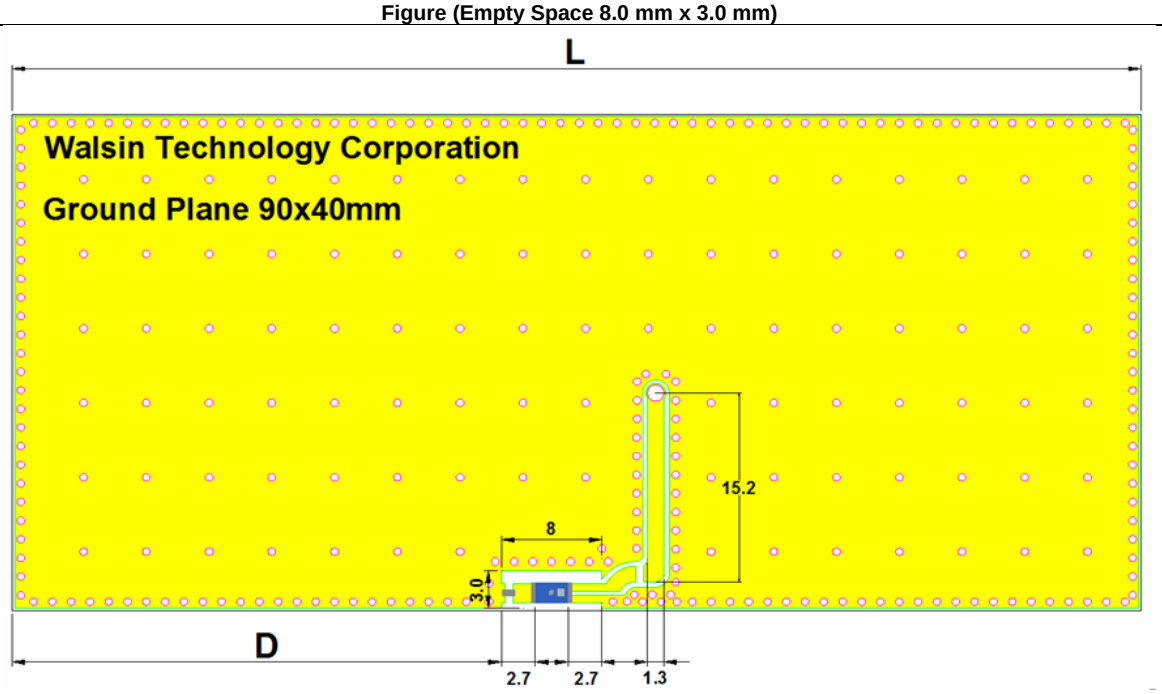
DIMENSIONS

Figure	Symbol	Dimension (mm)
	L	3.10 ± 0.20
	W	1.60 ± 0.20
	T	0.60 ± 0.10
	A	0.25 ± 0.20

SOLDER LAND PATTERN DESIGN

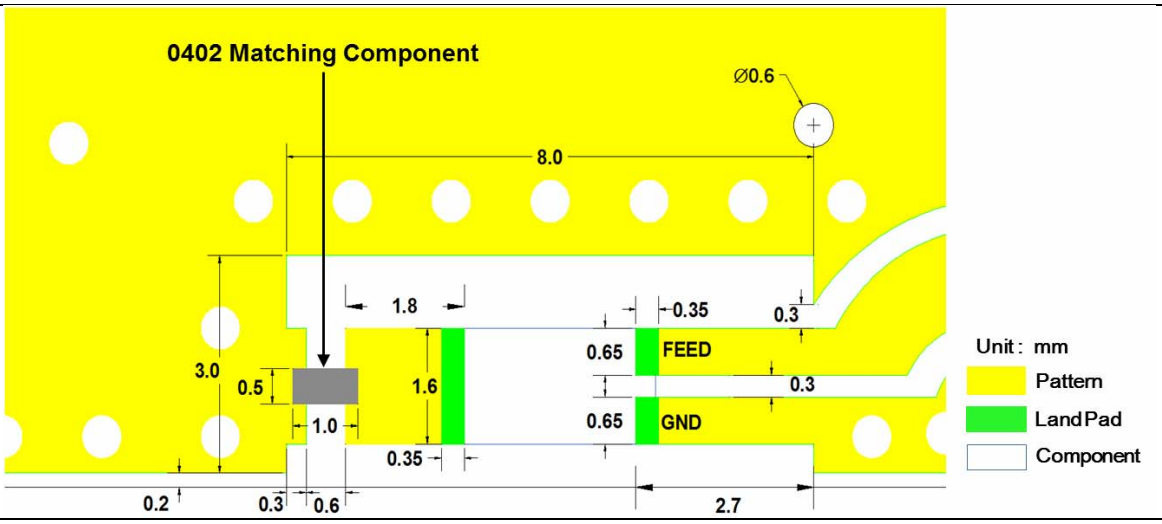
Type-1: Empty Space 8.0mm x 3.0 mm

Figure (Empty Space 8.0 mm x 3.0 mm)



The limited size for ECA3216 is L>30mm and D>6mm

Land Pattern



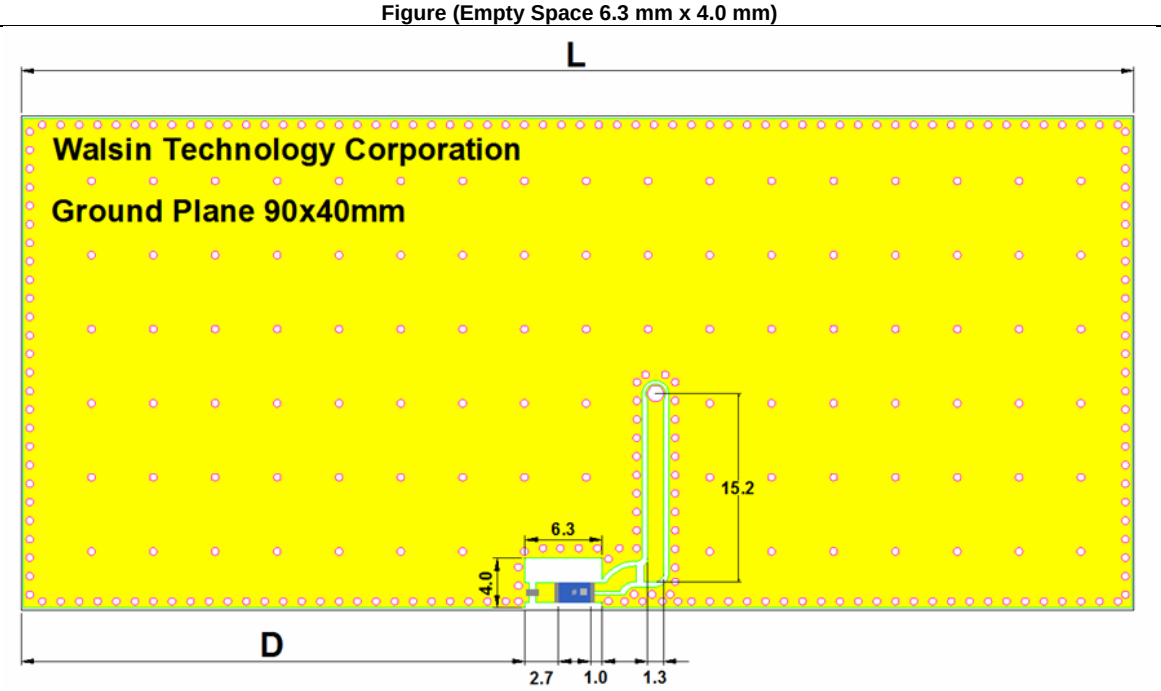
TYPE-1 TEST BOARD ELECTRONIC CHARACTERISTICS

Item	Specification
Working Frequency Range	2.4GHz~2.4835GHz (Note-1)
Gain	2 dBi (Typical)
VSWR	2.0 max.
Polarization	Linear
Azimuth Beamwidth	Omni-directional
Impedance	50Ω
Power Capacity	3 W max.
Maximum Input Power	5 Watts for 5 minutes

*Note 1. Central Frequency should be defined after customers' application approval.

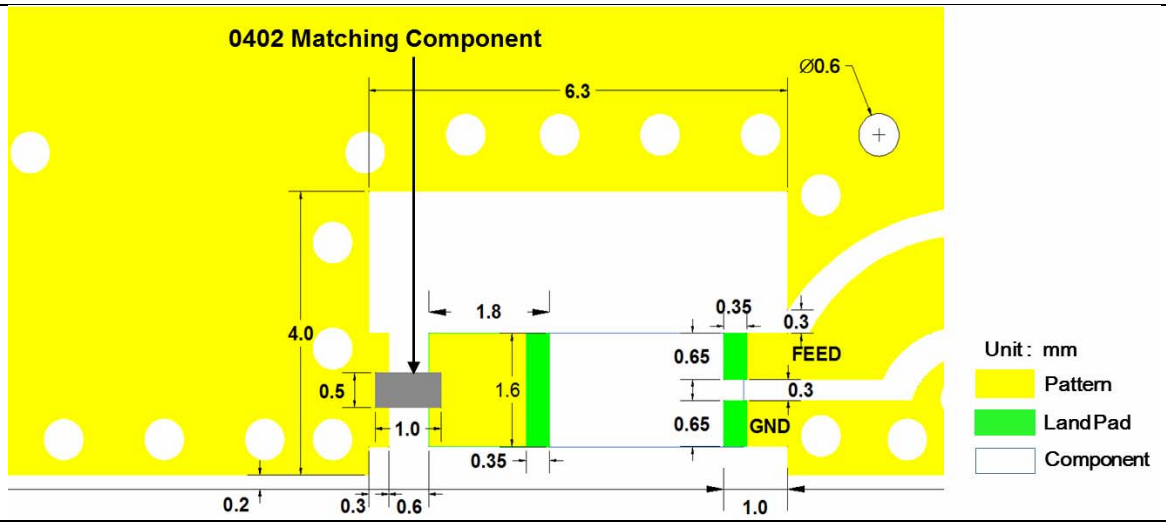
Type-2: Empty Space 6.3mm x 4.0 mm

Figure (Empty Space 6.3 mm x 4.0 mm)



The limited size for ECA3216 is L>30mm and D>6mm

Land Pattern

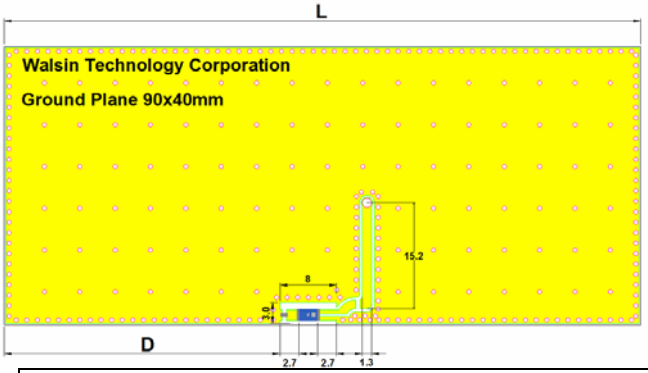


TYPE-2 TEST BOARD ELECTRONIC CHARACTERISTICS

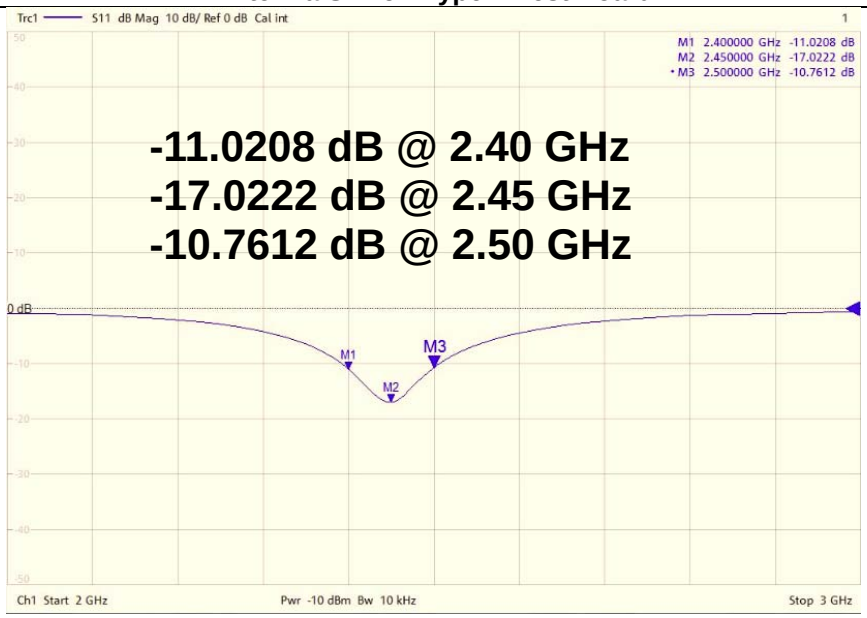
Item	Specification
Working Frequency Range	2.4GHz~2.4835GHz (Note-1)
Gain	2 dBi (Typical)
VSWR	2.0 max.
Polarization	Linear
Azimuth Beamwidth	Omni-directional
Impedance	50Ω
Power Capacity	3 W max.
Maximum Input Power	5 Watts for 5 minutes

*Note 1. Central Frequency should be defined after customers' application approval.

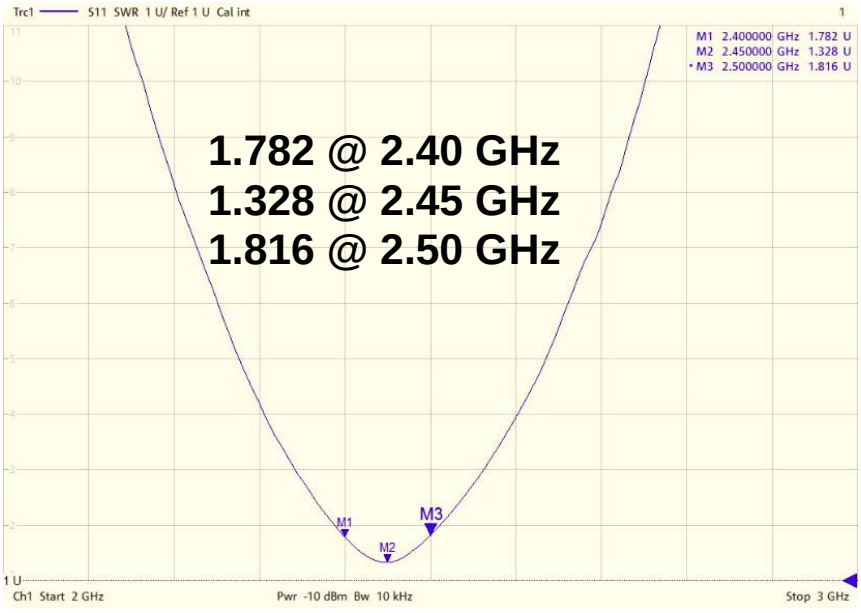
Antenna on Type-1 Test Board (Empty Space 8x3 mm &Thick ness 0.8mm)



Antenna S11 on Type-1 Test Board



Antenna VSWR on Type-1 Test Board



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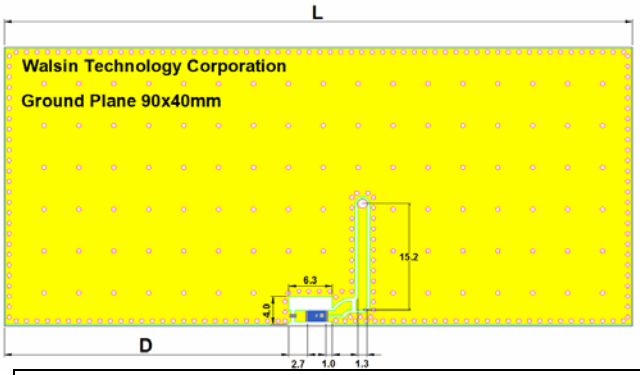
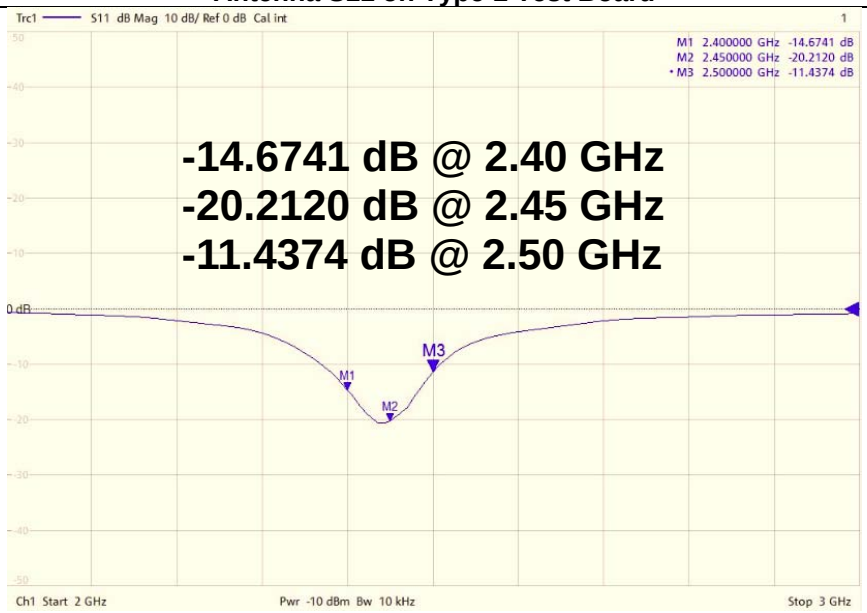
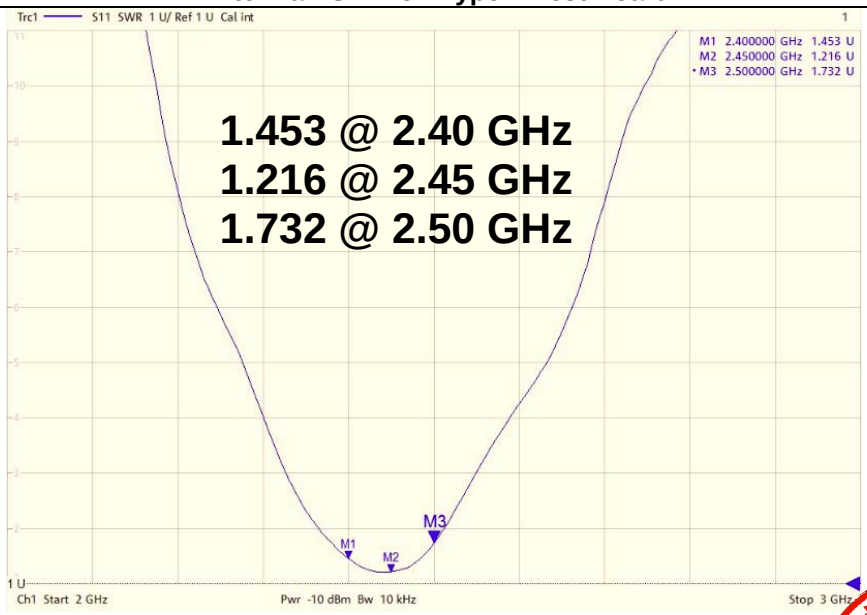
Antenna on Type-2 Test Board (Empty Space 6.3x4 mm &Thick ness 0.8mm)



Antenna S11 on Type-2 Test Board



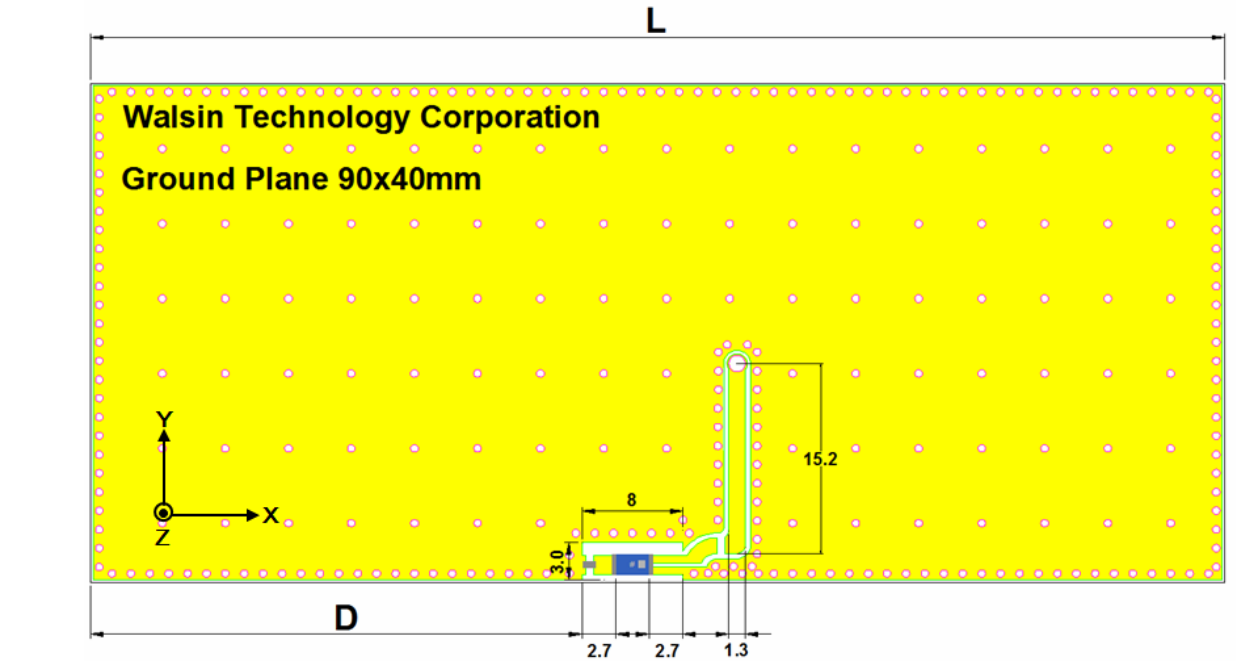
Antenna VSWR on Type-2 Test Board

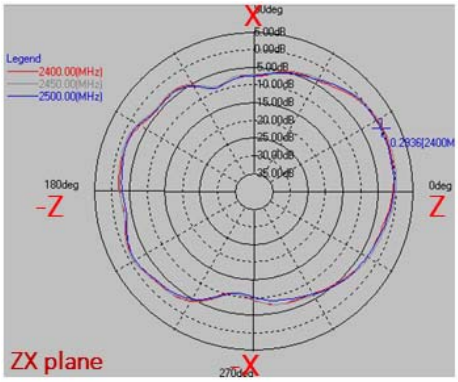


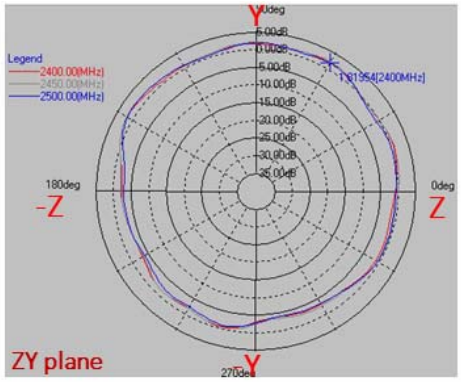
RADIATION PATTERN

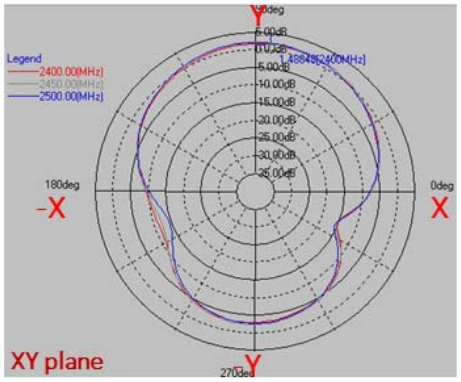
Radiation Pattern and Gain were dependent on measurement board design. The specification of RFECA3216060A1T antenna was measured based on the PCB size and installation position as shown in the below figure Test Board.

Antenna on Type-1 Test Board









	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	0.29	-3.32	1.82	-0.51	1.49	-2.87
2450	0.55	-2.88	2.09	-0.21	1.95	-2.48
2500	-0.15	-3.44	1.82	-0.62	1.82	-2.73

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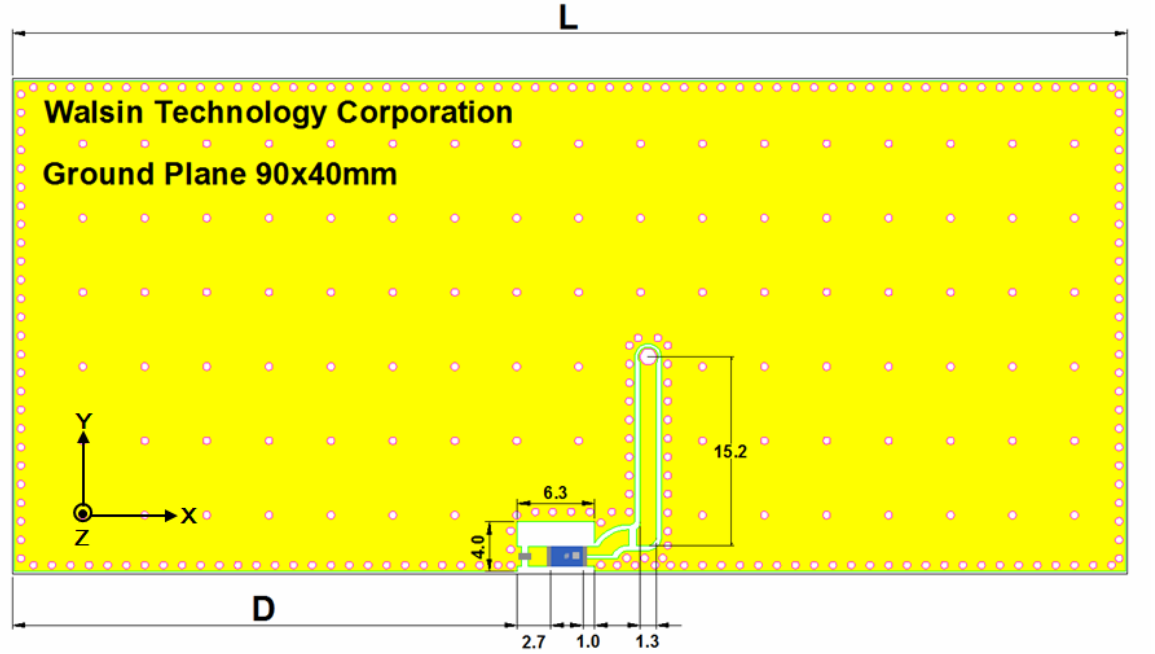
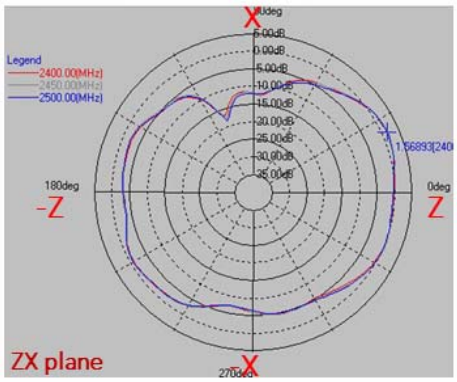
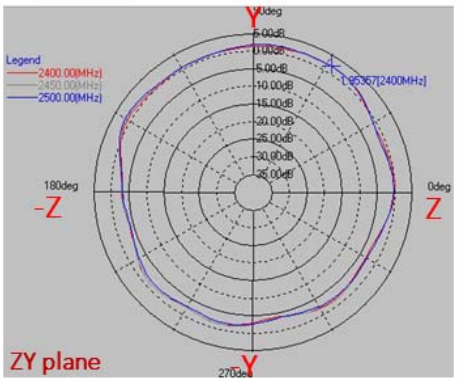
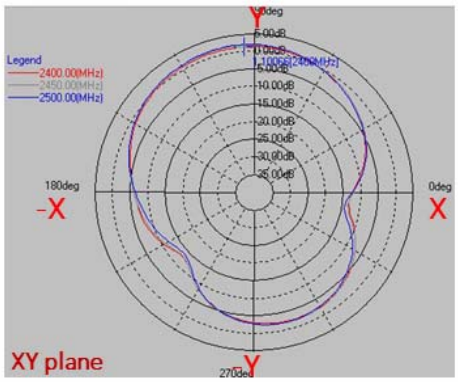
Antenna on Type-2 Test Board









	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	1.57	-2.83	1.95	-0.76	1.10	-2.93
2450	1.70	-2.62	2.02	-0.62	1.57	-2.61
2500	1.46	-2.82	1.90	-0.71	1.75	-2.68

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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C. Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test JIS C 0044 Customer's specification.	*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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.
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. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within -40 ~ 85°C.

SOLDERING CONDITION

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

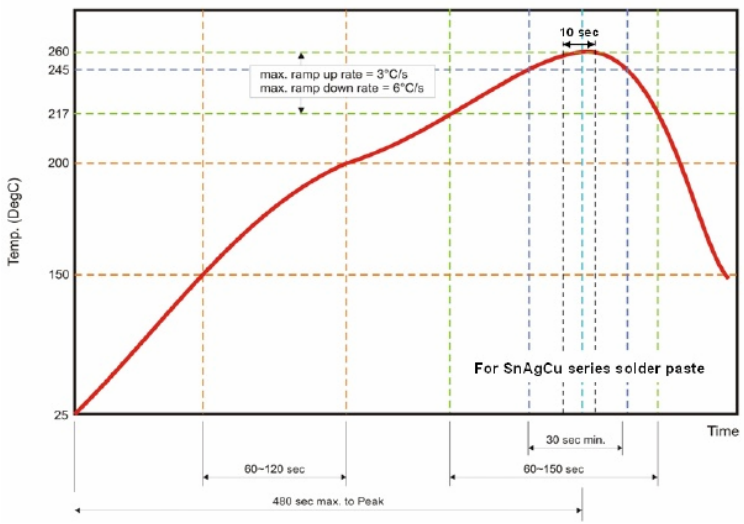


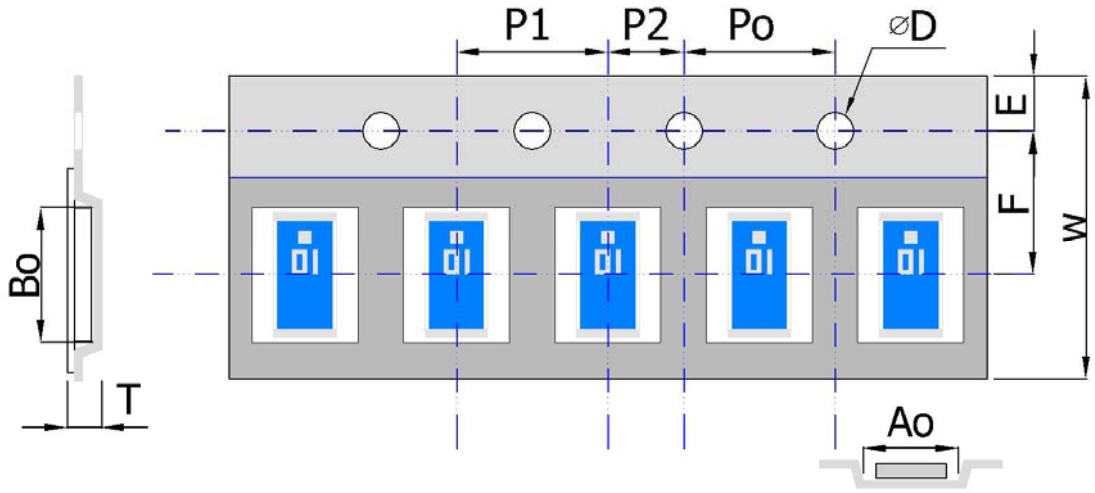
Fig 2. Infrared soldering profile

ORDERING CODE

RF	ECA	321606	0	A	1	T
Walsin RF device	**Product code** ANT : Antenna	**Dimension code** Per 2 digits of Length, Width, Thickness : e.g. : 321606 = Length 32, Width 16, Thickness 06	**Unit of dimension** 0 : 0.1 mm 1 : 1.0 mm	**Application** A : 2.4GHz ISM Band	**Specification** Design Code	**Packing** T : Reeled

Minimum Ordering Quantity: 2000 pcs per reel.

PACKAGING



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.85 ± 0.10	3.45 ± 0.10	1.55 ± 0.05	0.75 ± 0.10	8.00 ± 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

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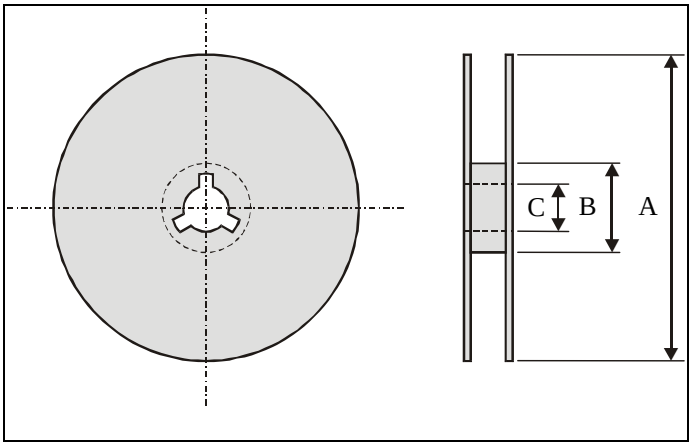
Reel dimensions



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

Taping 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.
(2) Storage environment condition.

- Products should be storage in the warehouse on the following conditions.
- Temperature : +5 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.