

APPROVAL SHEET

RFANT Series – RoHS Compliance

MULTILAYER CERAMIC ANTENNA

Halogens Free Product

2.4 GHz ISM Band RF Application

P/N: RFANT3216120A5T

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

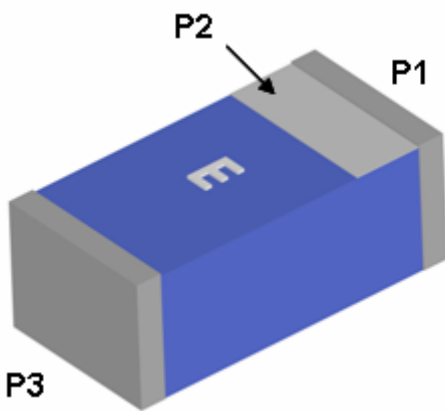
FEATURES

1. Surface Mounted Devices with a small dimension of 3.2 X 1.6 X1.2 mm³ 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



PIN	Connection
1	Feeding
2	Identification Mark
3	Soldering terminal

DIMENSIONS

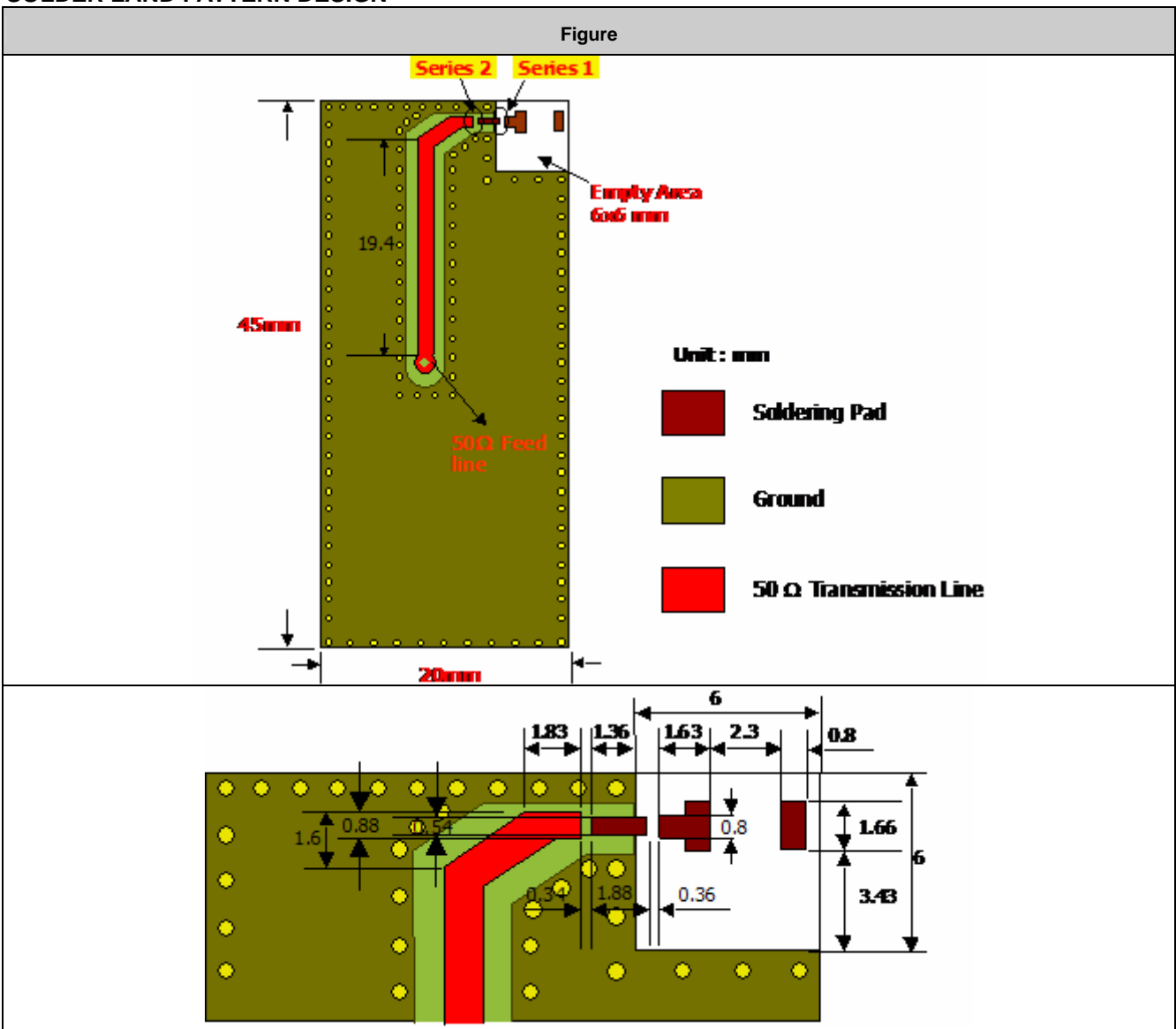
Figure	Symbol	Dimension (mm)
	L	3.20 ± 0.20
	W	1.60 ± 0.10
	T	1.20 ± 0.10
	A	0.25 ± 0.15

ELECTRICAL CHARACTERISTICS

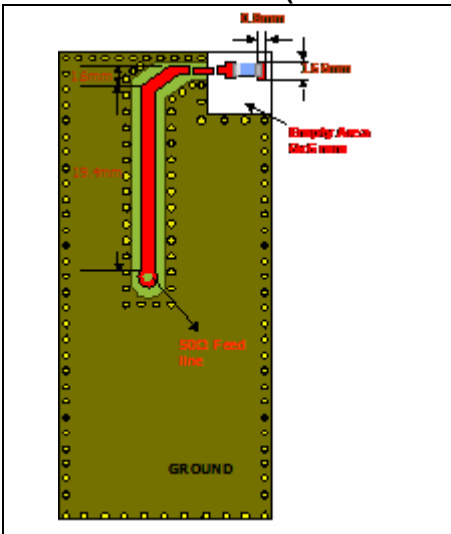
RFANT3216120A5T		Specification
Working Frequency Range		2450 ± 50 MHz
Fc (GHz)		2.9
Gain (dBi)		2 (Typical)
VSWR		2 max.
Matching component value	Series 1	6.8nH
	Series 2	-
Power Capacity		3 W max.
Maximum Input Power		5 Watts for 5 minutes
Operation Temperature		-40°C ~ +85°C
Polarization		Linear
Azimuth Beamwidth		Omni-directional

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

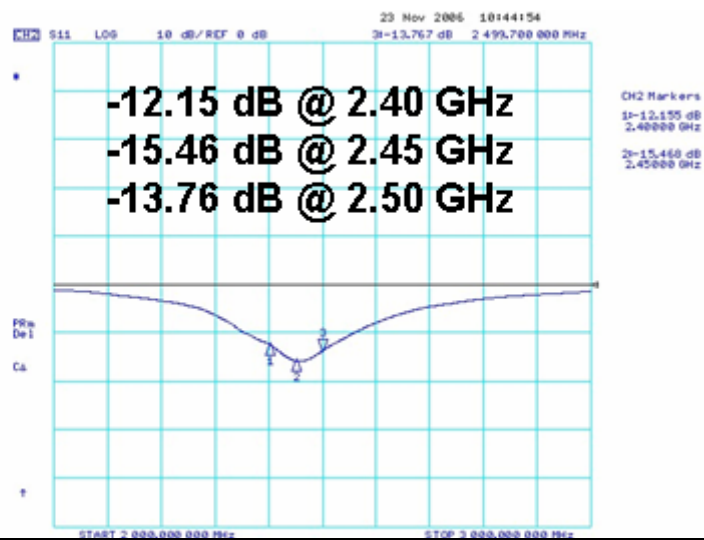
SOLDER LAND PATTERN DESIGN



Antenna on Test Board (Thickness 1.2mm)



Antenna S11 on Test Board

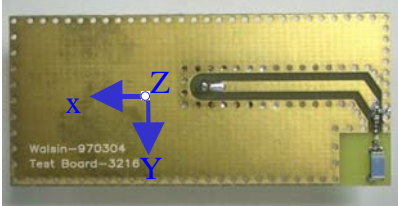


Antenna VSWR on Test Board



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= 0.948 dBi	<p>Peak Gain = 2.93dBi Average Gain = 0.60dBi</p>	<p>Peak Gain= -5.60dBi Average Gain=-10.19dBi</p>
X - Z Plane Average Gain= -2.147 dBi	<p>Peak Gain= -4.98 dBi Average Gain= -9.68dBi</p>	<p>Peak Gain= 1.61 dBi Average Gain= -2.99 dBi</p>
X - Y Plane Average Gain= -2.810 dBi	<p>Peak Gain= -3.79 dBi Average Gain= -8.89dBi</p>	<p>Peak Gain= 0.77 dBi Average Gain= -4.04 dBi</p>

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°C , 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	<ol style="list-style-type: none"> 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

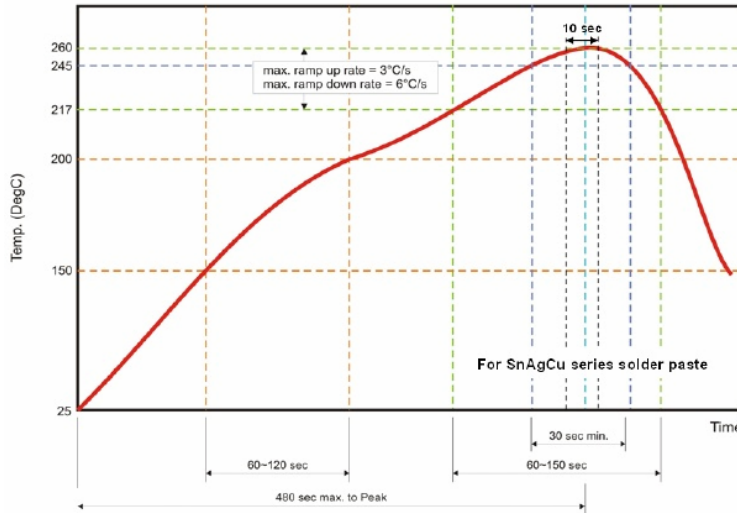


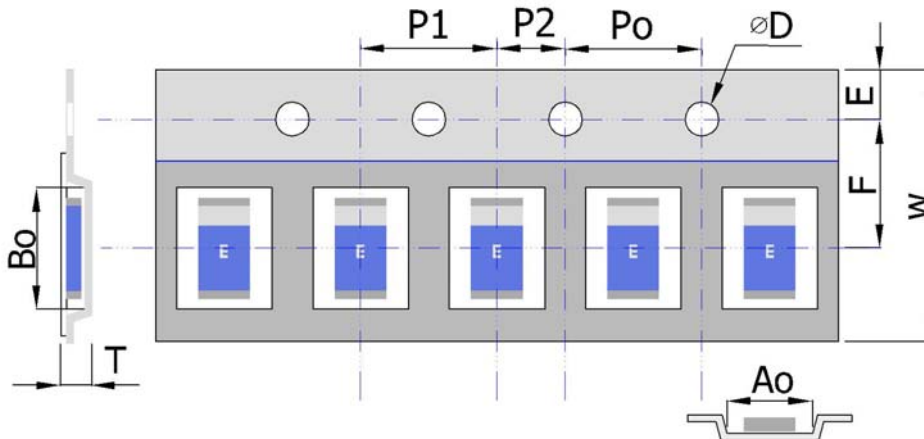
Fig 2. Infrared soldering profile

ORDERING CODE

RF Walsin RF device	ANT Product code ANT : Antenna	321612 Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 321612 = Length 32, Width 16, Thickness 12	0 Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	A Application A : 2.4GHz ISM Band	5 Specification Design Code	T Packing T : 7" Reeled
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Minimum Ordering Quantity: 2000 pcs per reel.

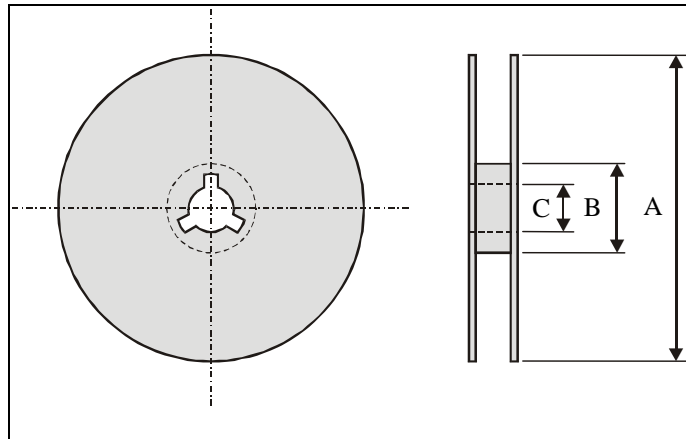
PACKAGING



Plastic Tape specifications (unit :mm)

Index	Ao	B0	ΦD	T	W
Dimension (mm)	1.81± 0.10	3.42 ± 0.10	1.55 ± 0.05	1.26 ± 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

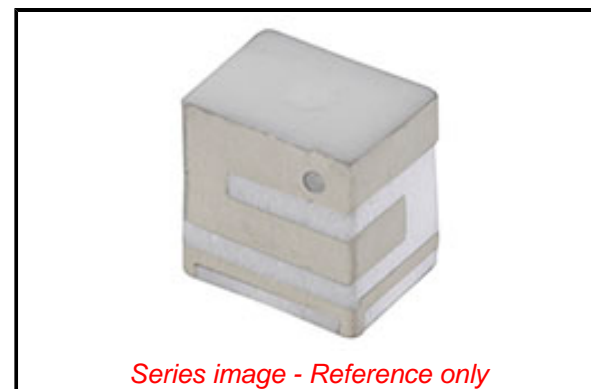
- (1) Products should be used in 6 months from the day of WAL SIN outgoing inspection.
- (2) Storage environment condition.
 - Products should be storage in the warehouse on the following conditions.
 - Temperature : +5 to +40℃
 - Humidity : 30 to 70% relative humidity
 - Don't keep products in corrosive 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.

PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION

Part Number: [2065140001](#)
Status: **Active**
Overview: Internet of Things (IoT) Antennas: Wi-Fi, Bluetooth, Zigbee
Description: 2.4GHz / 5GHz SMT Ceramic Antenna, 4.00mm by 3.00mm

Documents:

Drawing (PDF)	Application Specification 2065140001-001 (PDF)
3D Model	Packaging Specification 2065140001-001 (PDF)
3D Model (PDF)	Datasheet (PDF)
HFSS Model	RoHS Certificate of Compliance (PDF)
Product Specification 2065140001-000 (PDF)	



General

Product Family	Antennas
Series	206514
Component Type	Surface Mount Device Antenna
Function	Signal
Overview	Internet of Things (IoT) Antennas: Wi-Fi, Bluetooth, Zigbee
Product Name	2.4/5GHz Ceramic SMT Antenna
Protocol	BLE, BT, Thread, Wi-Fi, Wireless Hart, Zigbee
Type	Wi-Fi Antenna
UPC	191130127795

Physical

Cable Length	N/A
Length	4.00mm
Mounting Style	Surface Mount
Net Weight	0.139/g
Packaging Type	Embossed Tape on Reel
Polarization	Linear
Radiation Pattern	Omnidirectional
Thickness	4.00mm
Width	3.00mm

Electrical

Band#1 F_End (MHz)	2483.5
Band#1 F_Start (MHz)	2400
Band#2 F_End (MHz)	5850
Band#2 F_Start (MHz)	5150
Electrical Connectivity	SMD
Peak Gain (dBi)	3.5 @ 2.4 GHz, 6.2 @ 5 GHz
Return Loss - S11 (dB)	< -5, < -8
Total Efficiency	>75%

Material Info

Reference - Drawing Numbers

Application Specification	2065140001-001
Packaging Specification	2065140001-001
Product Specification	2065140001-000
Sales Drawing	2065140001-000

EU ELV

Not Relevant

EU RoHS

Compliant

REACH SVHC

Not Contained Per -
D(2021)4569-DC (8
July 2021)

Halogen-Free

Status

Low-Halogen

For more information, please visit [Contact US](#)

China ROHS

ELV

RoHS Phthalates

China RoHS

Green Image

Not Relevant

Not Contained

Search Parts in this Series

[206514 Series](#)

Mouser Electronics

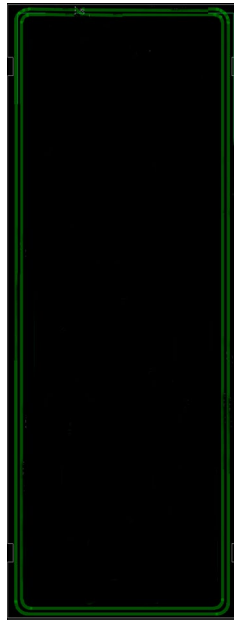
Authorized Distributor

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[206514-0001](#)

HF Antenna Specifications



Frequency	13.56MHz
Turns	3
Dimensions	39 mm x 74.50 mm
Inductance	800 uH

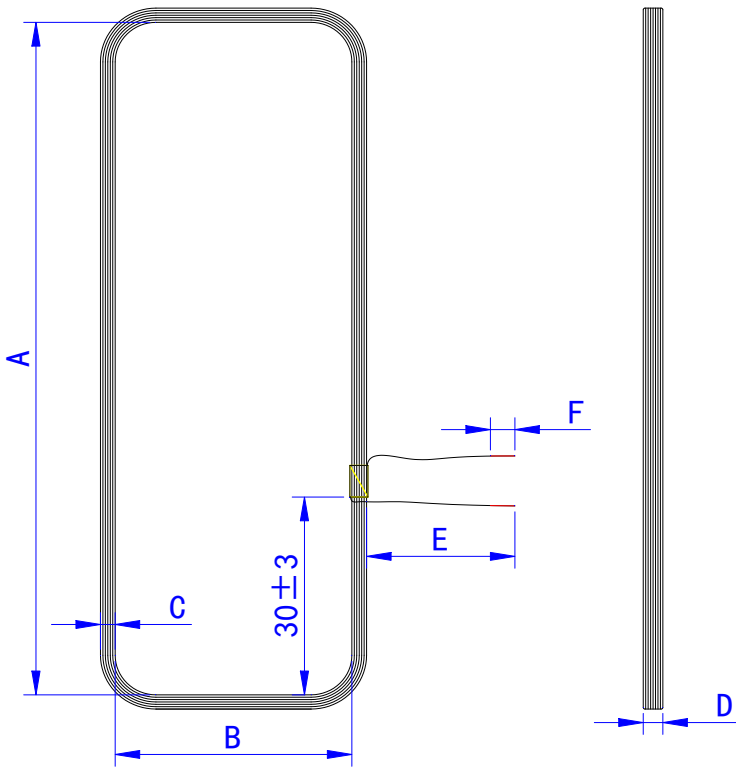
Specification

product	SL600	material	0.2	winding direction, CCW
COIL		spec.	85X29X0.2X720UH	

1. Specification, unit, mm

item	turns	L 125KHZ/1V	A	B	C	D	E	F	
standard	68TS	720UH	85	29	1.8	2.5	30	4	
tolerance	REF	±5%	±0.8	±0.8	±0.5	MAX	±2	±1	
sample date	68TS	720UH	60.05	34.00	2.5	2.5	20	4	

2. Drawing shows: unit, mm



注意：产品不可严重变形

Approval

			Customer approval	