

Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

Series: Chip Antenna

PART NUMBER: W3008

Features:

- 2400-2483.5MHz
- Size: 3.2 x 1.6 x 1.1mm
- Efficiency: 66 %
- Gain: 1.1 dBi
- Polarization: Linear
- Power Handling: 5W
- RoHS Compliant
- Moisture Sensitivity Level MSL1

Applications:

- Bluetooth, BLE, Zigbee, WiFi
- 2.4GHz ISM band radios

All dimensions are in mm / inches

Issue: 1946

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Pulse (Suzhou) Wireless Products Co, Inc.
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Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998



Series: Chip Antenna**Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area****PART NUMBER: W3008****ELECTRICAL SPECIFICATIONS**

Frequency	2400-2483.5MHz
Nominal Impedance	50 Ω
Return Loss	-4dB
Radiation Pattern	Omni
Gain	1.1dBi
Efficiency	66%
Polarization	linear
Power Withstanding	5W

MECHANICAL SPECIFICATIONS

Weight	0.03 g
Overall Length	3.2 [0.126] MM [INCHES]
Over all width	1.6 [0.063] MM [INCHES]
Over all thickness	1.1 [0.043] MM [INCHES]
MSL (Moisture Sensitivity Level)	1

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-40~+85° C
Storage Temperature	-40~+85° C
RoHS Compliant	Yes

(*) All RF parameters measured on 80*37mm PCB with 4*4.25mm clearance in free space. No matching component used.

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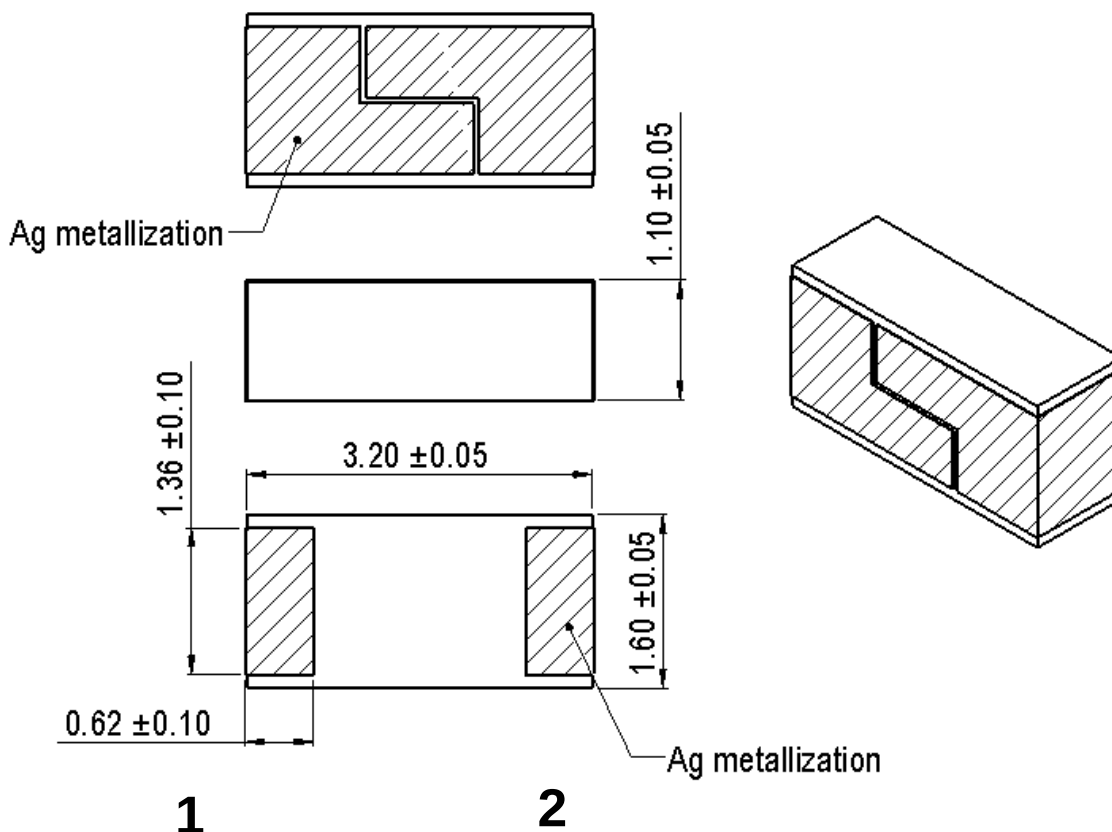
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MECHANICAL DRAWING AND TERMINAL CONFIGURATION



No.	Terminal Name	Terminal Dimensions
1	Feed /GND	0.62 x 1.36 mm
2	Feed /GND	0.62 x 1.36 mm
Antenna is symmetrical, either one of pads 1 or 2 can be used as feed terminal		

Note: This type of antenna is called loaded PIFA. One pad (on the bottom of the ceramic chip antenna) that feedline and GND are connected is a basic PIFA antenna structure. And, another pad on the other side that only GND is connected is for capacitive loading. Loaded capacitive value is optimized by the gap distance between two pads on the top surface. In PIFA, there is short mechanism usually in proximity to feed. This RF shorting affects impedance and current distribution mechanism of antenna. The actual antenna top face can seem to be mirrored, however it can be used same as the non-mirrored version. Please follow the design recommendation specified in this data sheet for either case.

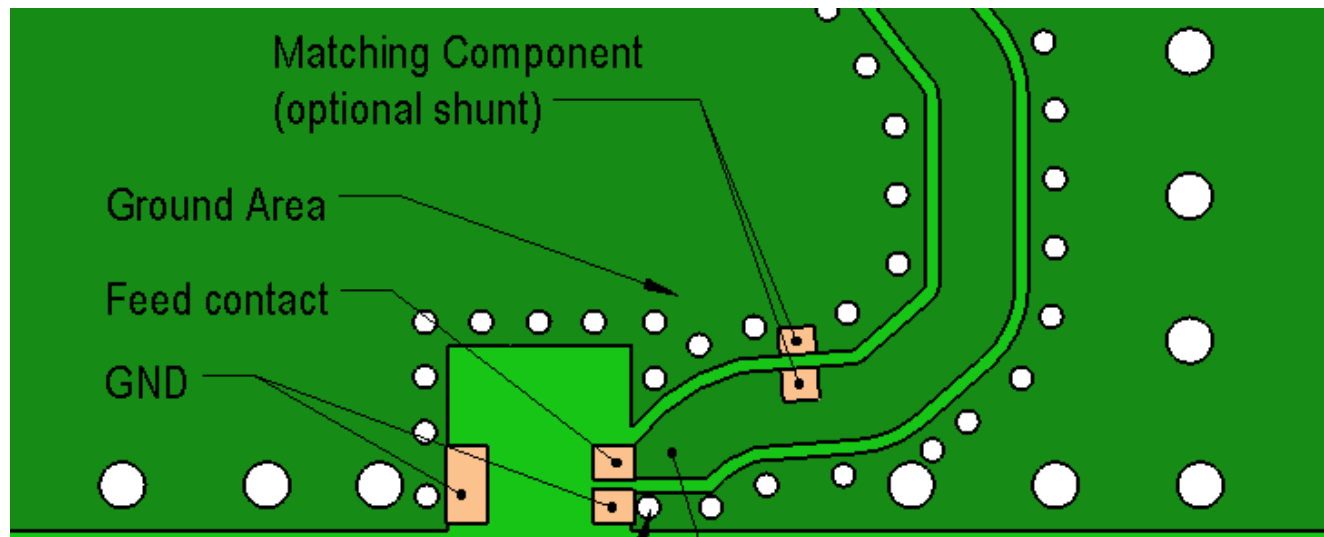
Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

Series: Chip Antenna

PART NUMBER: W3008

MECHANICAL DRAWING AND TERMINAL CONFIGURATION

Ground cleared under antenna, clearance area 4 mm x 4.25mm

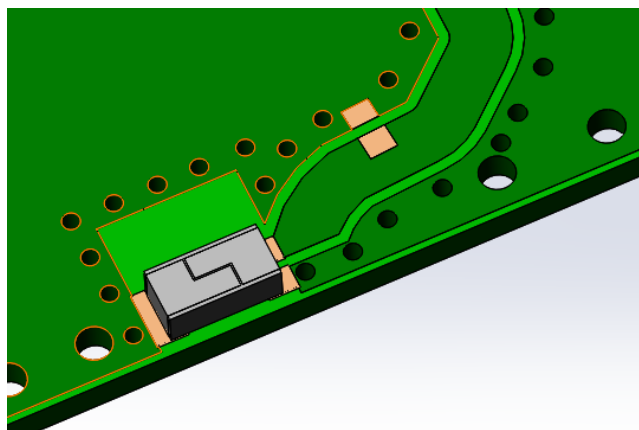


Ground Via Hole

Ground area should be surround with ground via holes

Feed line 50Ohm

Any type of 50 Ohm feed line can be used. inner layers on feed line area need to designed to give 50 Ohm characteristics to feed line.



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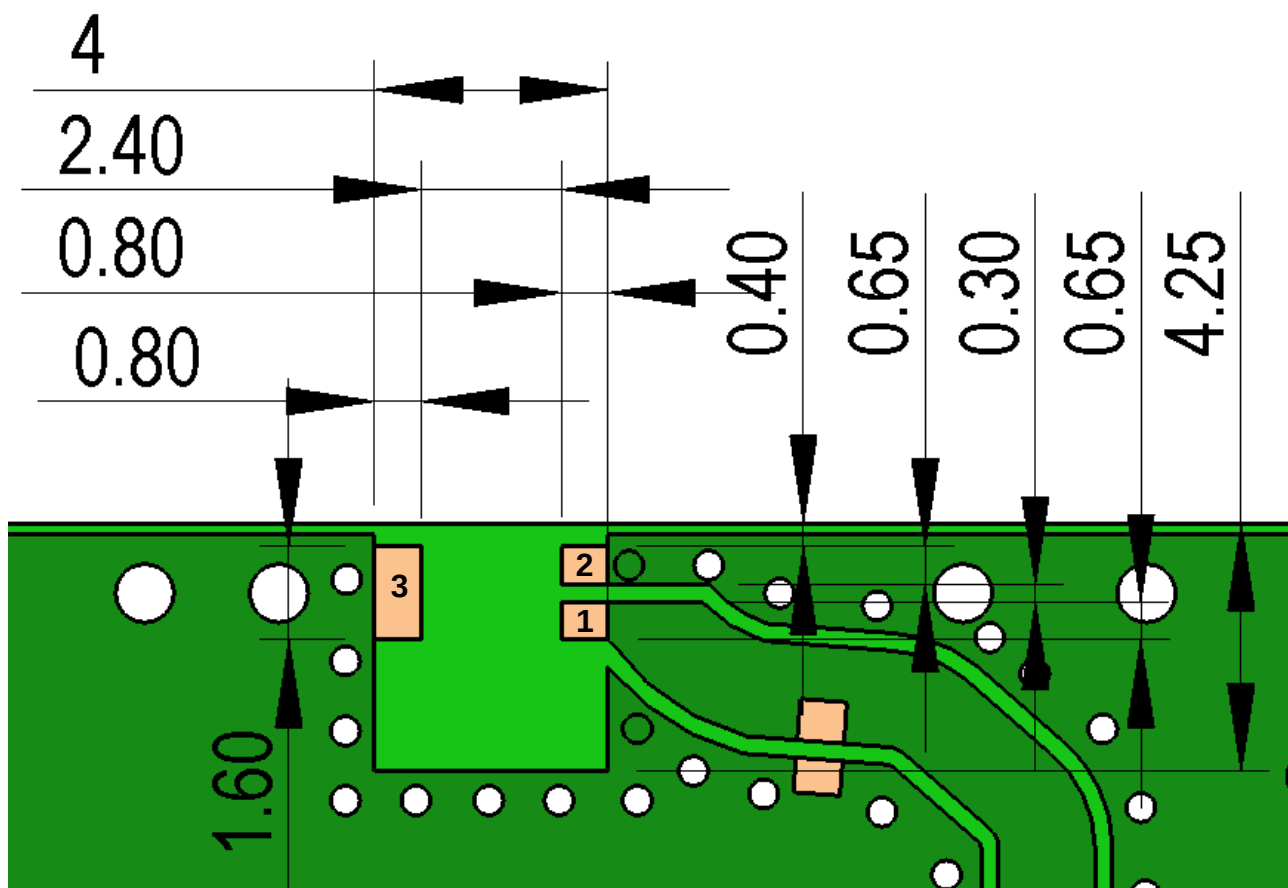
Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

Series: Chip Antenna

PART NUMBER: W3008

MECHANICAL DRAWING AND TERMINAL CONFIGURATION

Recommended Antenna Pad Dimensions on PCB Layout (top surface)
Ground cleared under antenna, clearance area 4 mm x 4.25 mm



PCB contact pads		
No.	Terminal Name	Terminal Dimensions
1	Feed	0,80 x 0,65 mm
2	GND	0,80 x 0,65 mm
3	GND	0,80 x 1,60 mm

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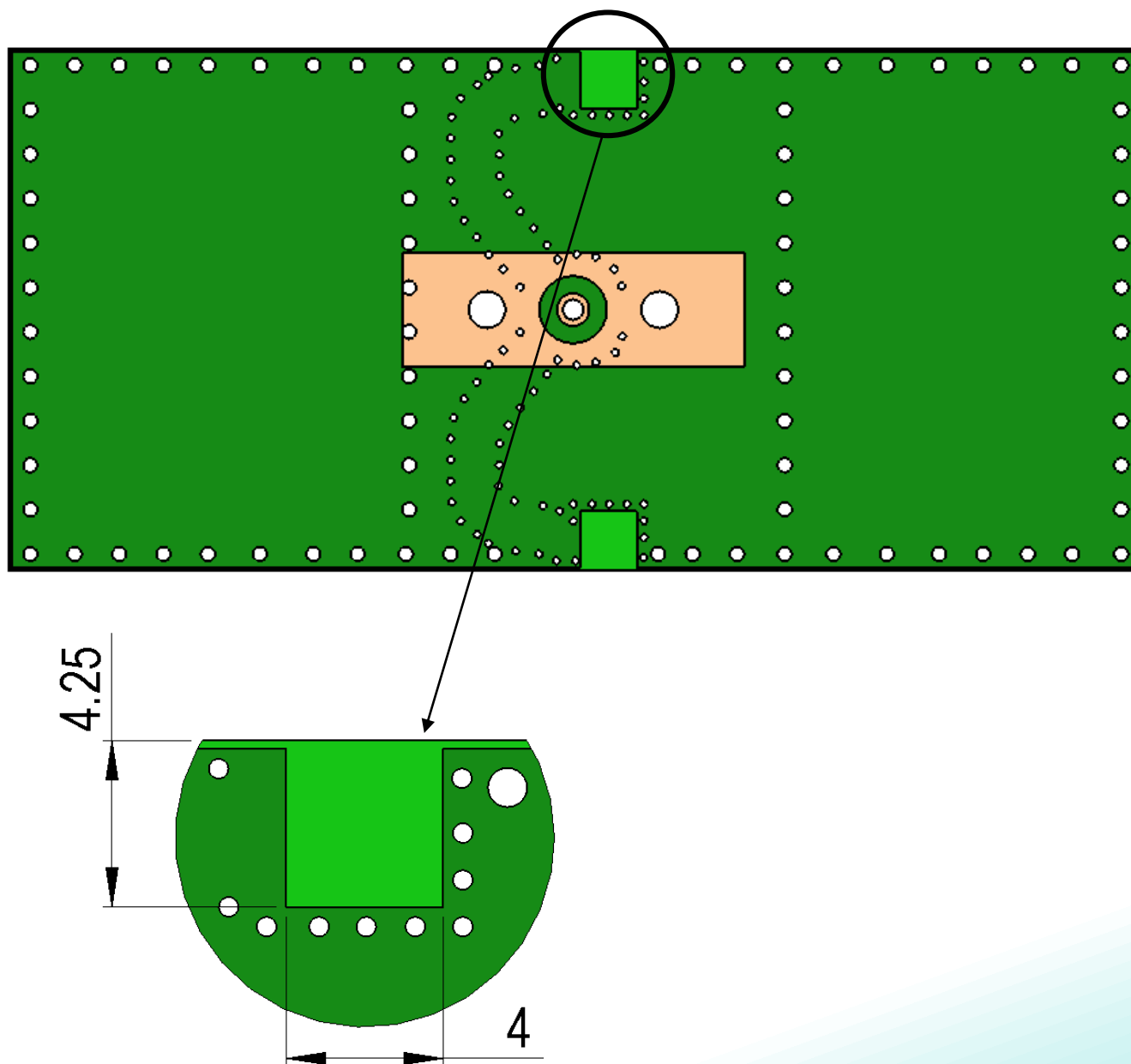
Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

Series: Chip Antenna

PART NUMBER: W3008

MECHANICAL DRAWING AND TERMINAL CONFIGURATION

Recommended Antenna Pad Dimensions on PCB Layout (bottom surface)
Ground cleared under antenna, clearance area 4 mm x 4.25 mm



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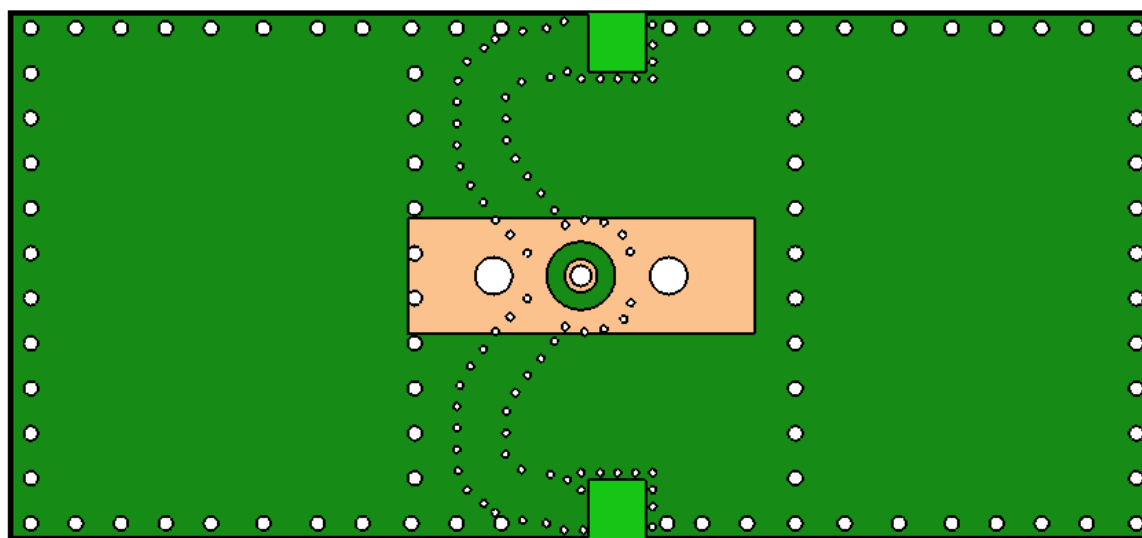
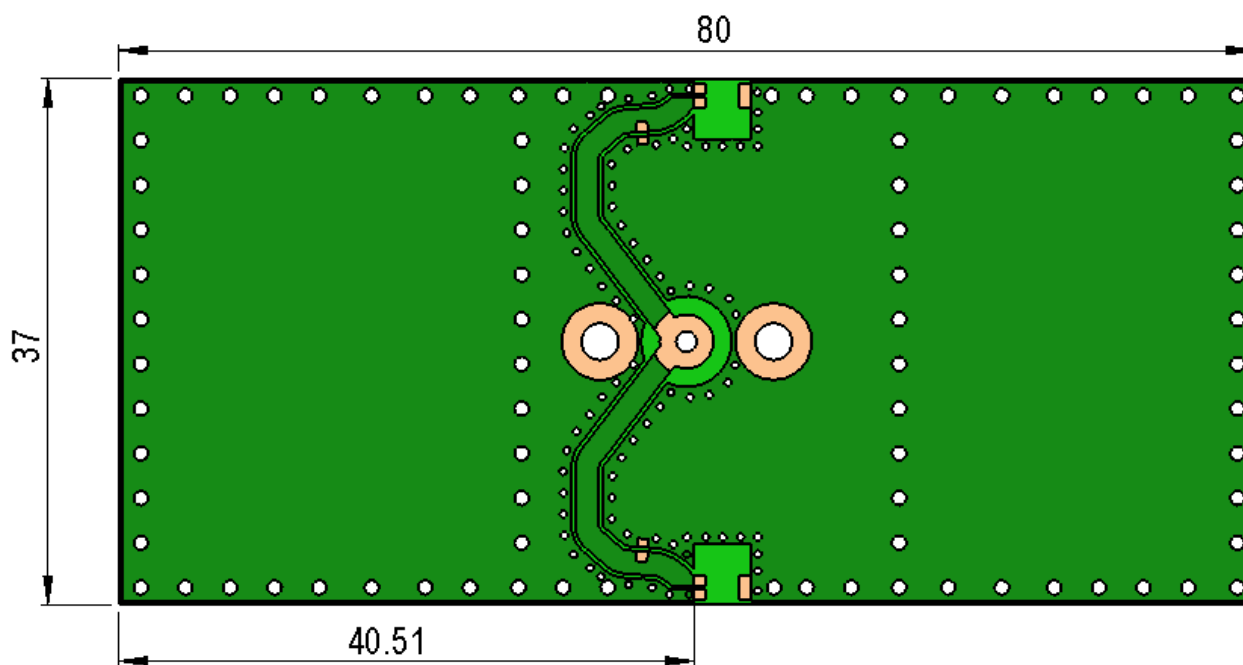
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MECHANICAL DRAWING AND TERMINAL CONFIGURATION

Recommended test board layout for electrical characteristic measurement, test board outline size 80 x 37mm



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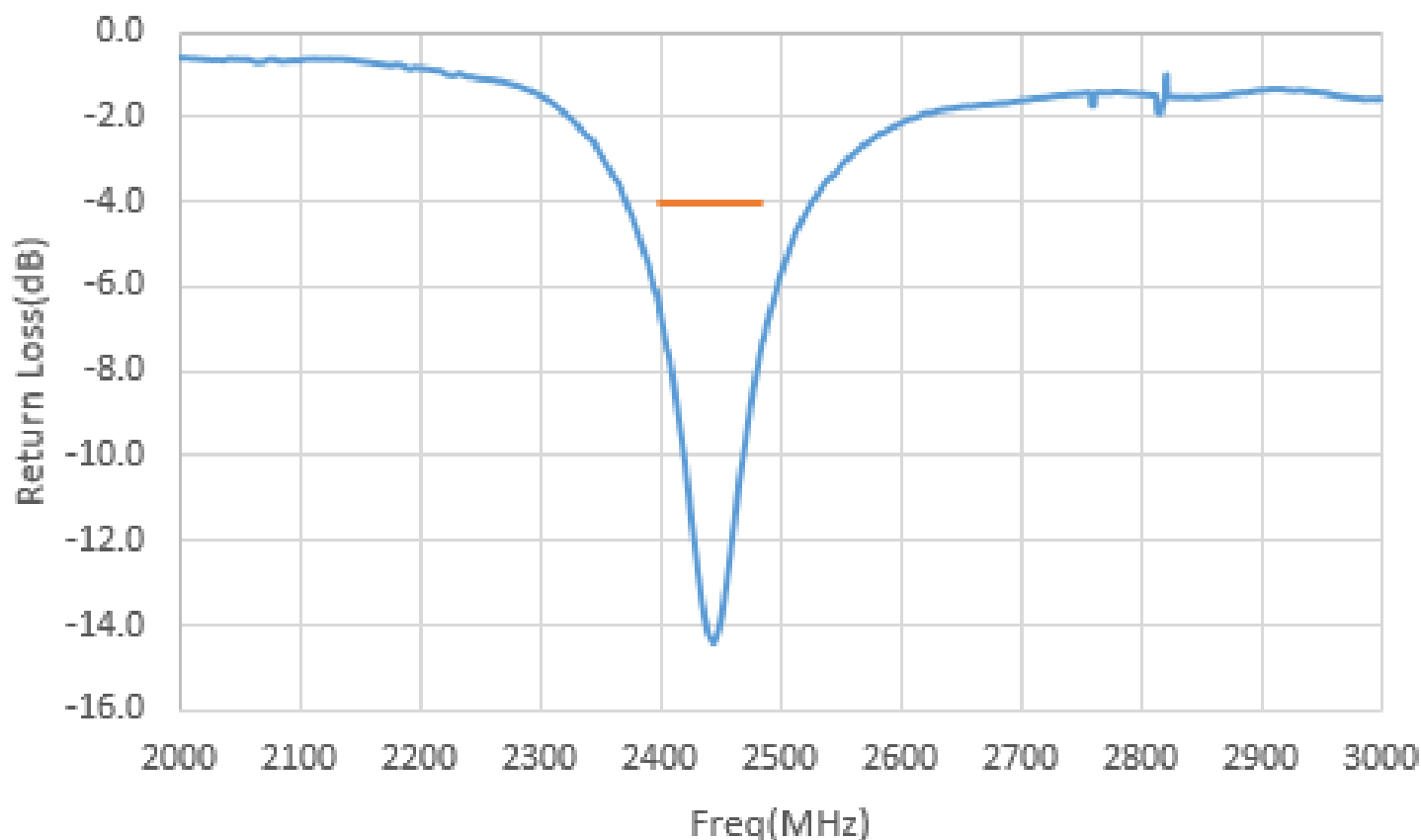
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CHARTS

Return loss



(*) All RF parameters measured on 80*37mm PCB with 4*4.25mm clearance in free space. No matching component used.

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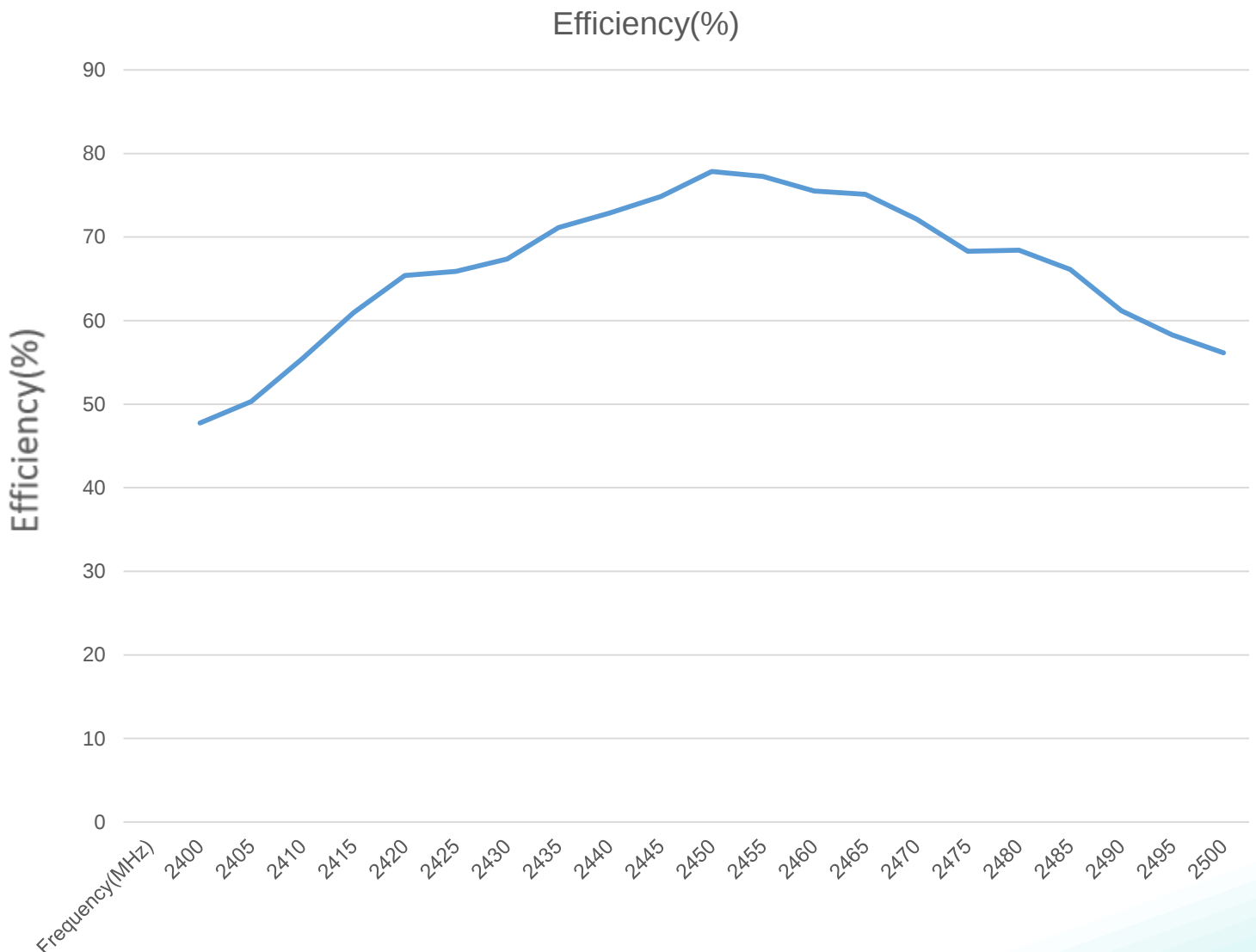
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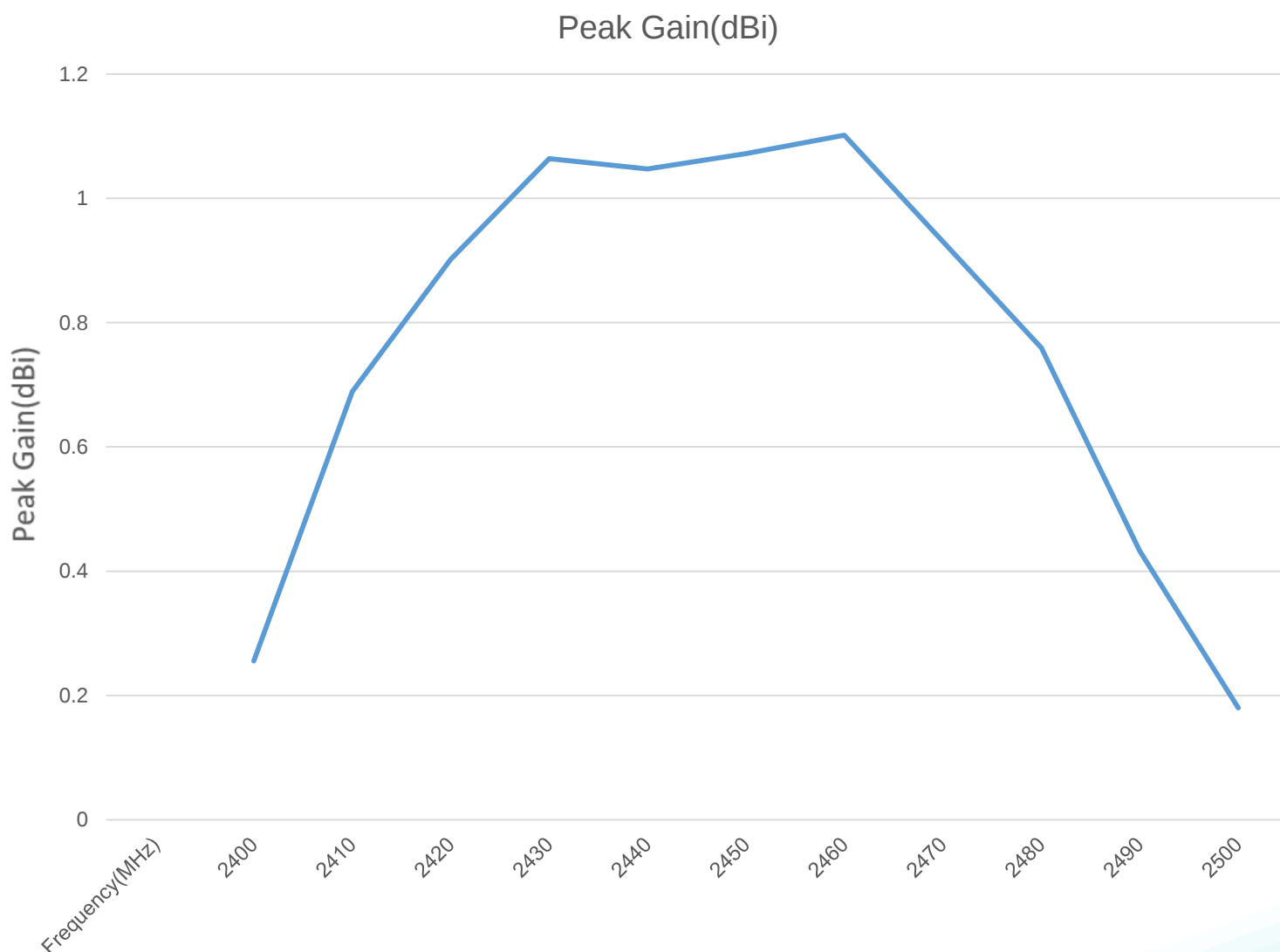
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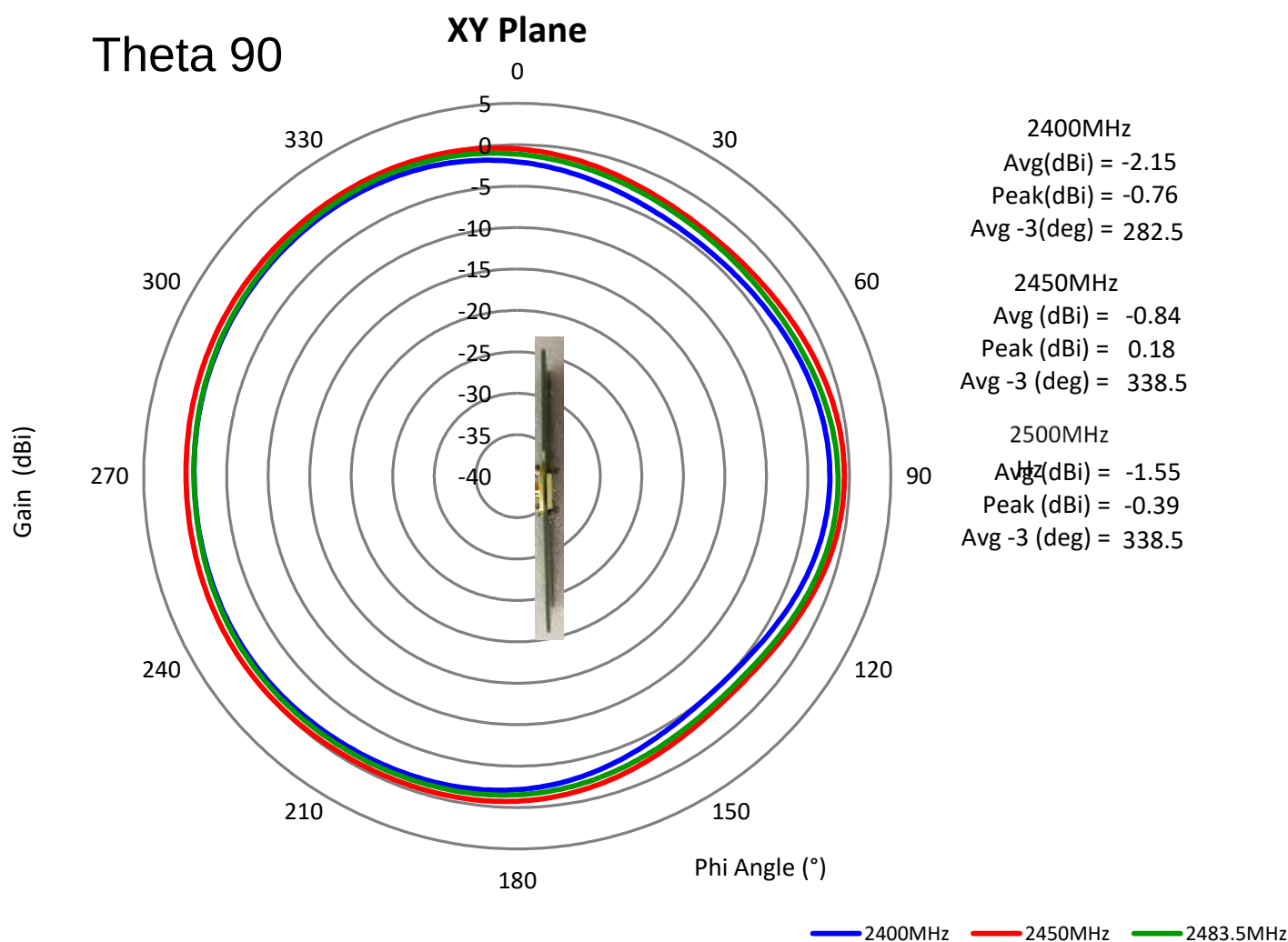
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CHARTS

Free Space Radiation Pattern



(*) All RF parameters measured on 80*37mm PCB with 4*4.25mm clearance in free space. No matching component used.

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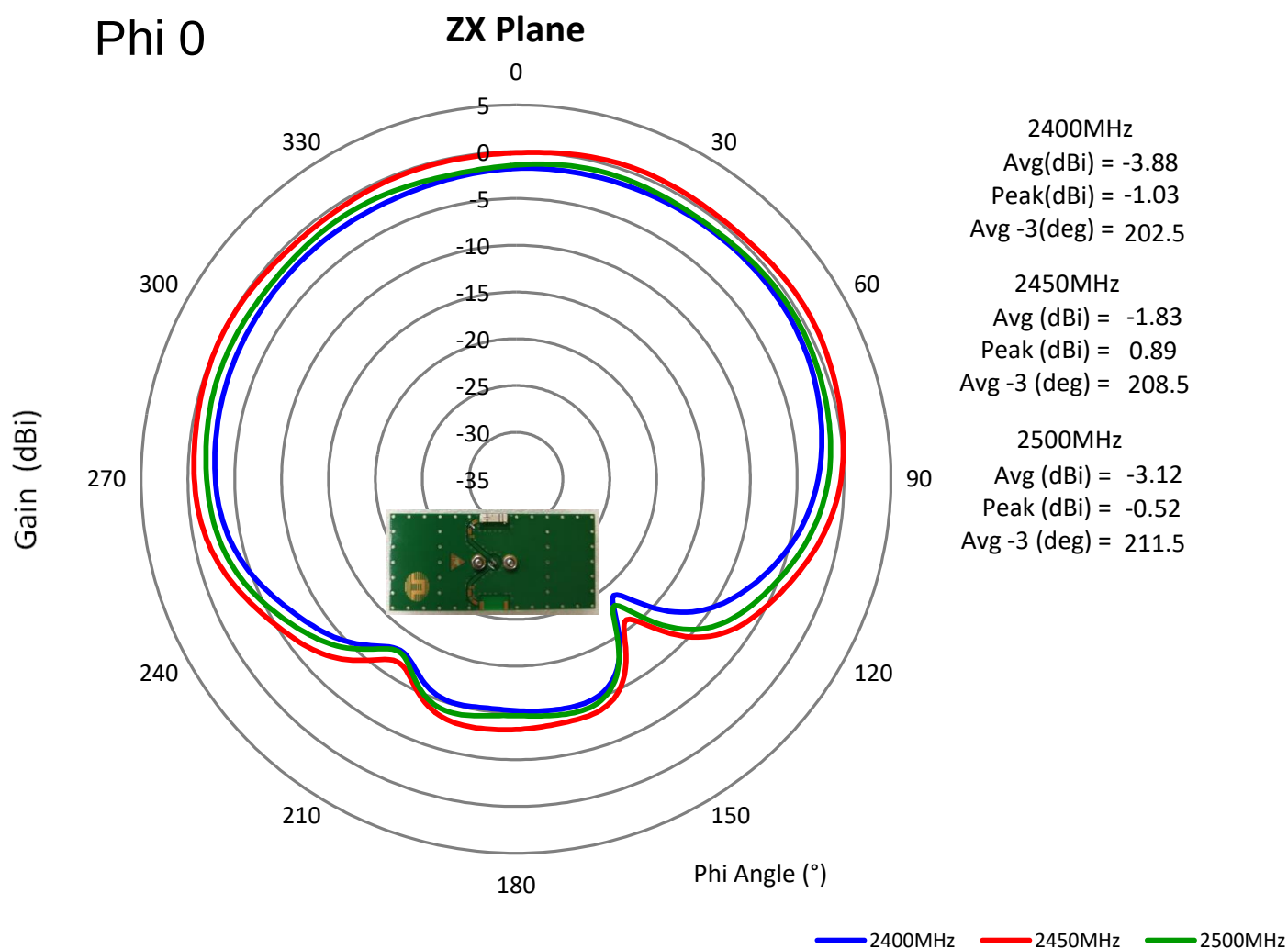
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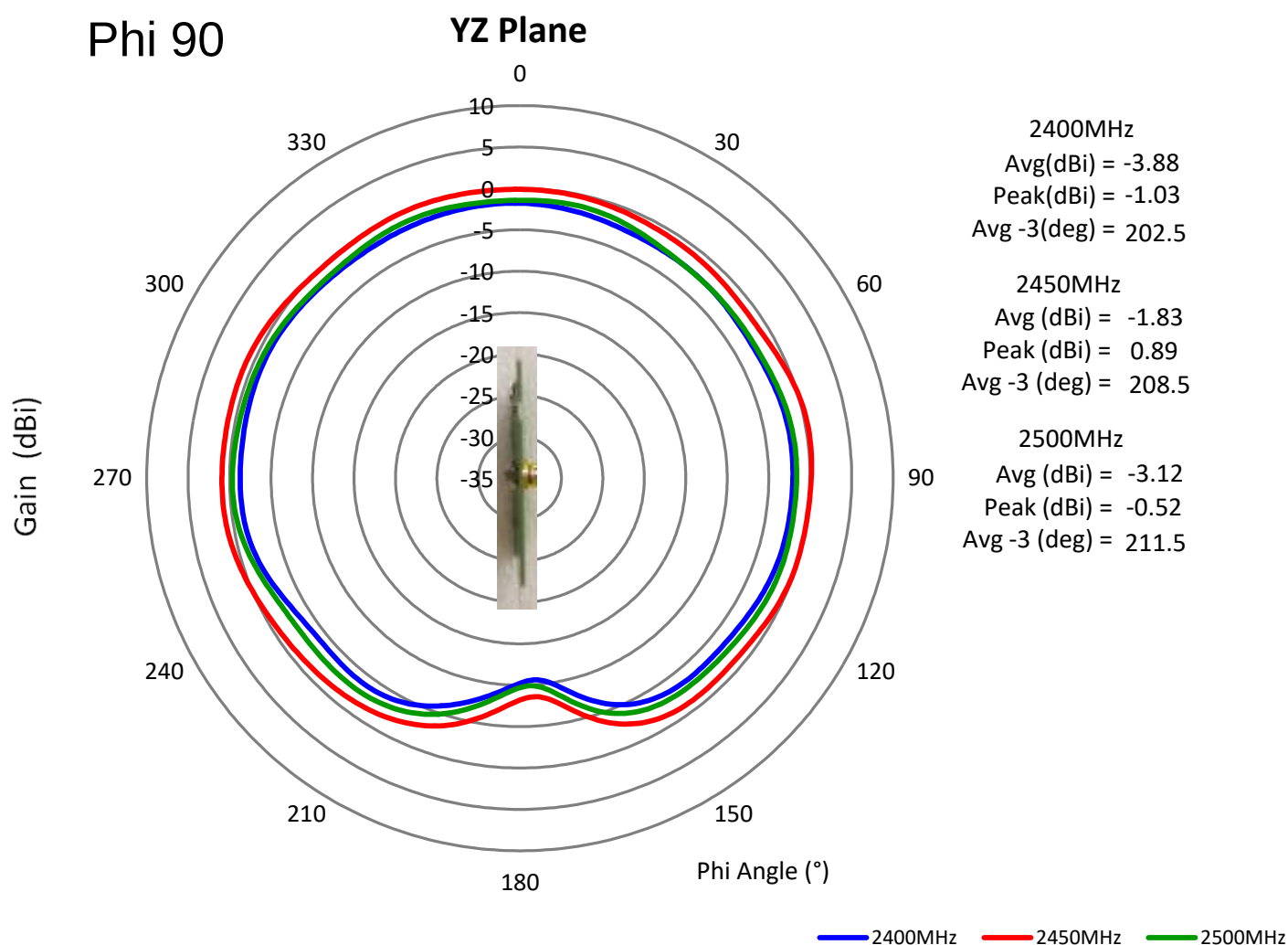
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Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

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Recommendation for reflow soldering process

Printing stencil thickness 0,15 - 0,25 mm is recommended for the solder paste. The maximum soldering temperature should not exceed 260°C. The temperature profile recommendations for reflow soldering process is presented in the Figures 1 and 2. The reflow profile

presented in figure 1 describes minimum reflow temperatures. The reflow profile presented in figure 2 describes maximum reflow temperatures. located at the center of the coverage area.

	Method of heat transfer	Controlled hot air convection
1	Average temperature gradient in preheating	2.5 °C/s
2	Soak time	2-3 minutes
3	Max temperature gradient in reflow	3 °C/s
4	Time above 217 °C	Max 30 sec
5	Peak temperature in reflow	230 °C for 10 seconds
6	Temperature gradient in cooling	Max -5 °C/s

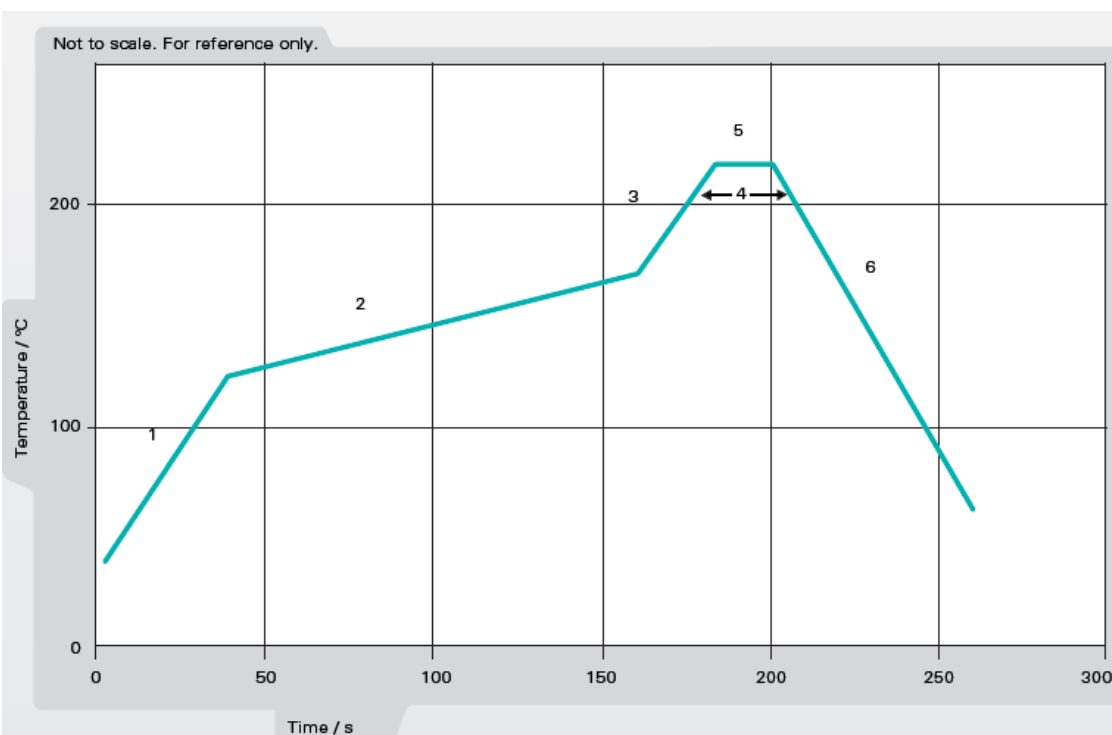


Figure 1. Minimum temperature profile recommendation for reflow soldering process

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Recommendation for reflow soldering process

	Method of heat transfer	Controlled hot air convection
1	Average temperature gradient in preheating	2.5 °C/s
2	Soak time	2-3 minutes
3	Max temperature gradient in reflow	3 °C/s
4	Time above 217 °C	Max 60 sec
5	Time above 230 °C	Max 50 sec
6	Time above 250 °C	Max 10 sec
7	Peak temperature in reflow	260 °C for 5 seconds
8	Temperature gradient in cooling	Max -5 °C/s

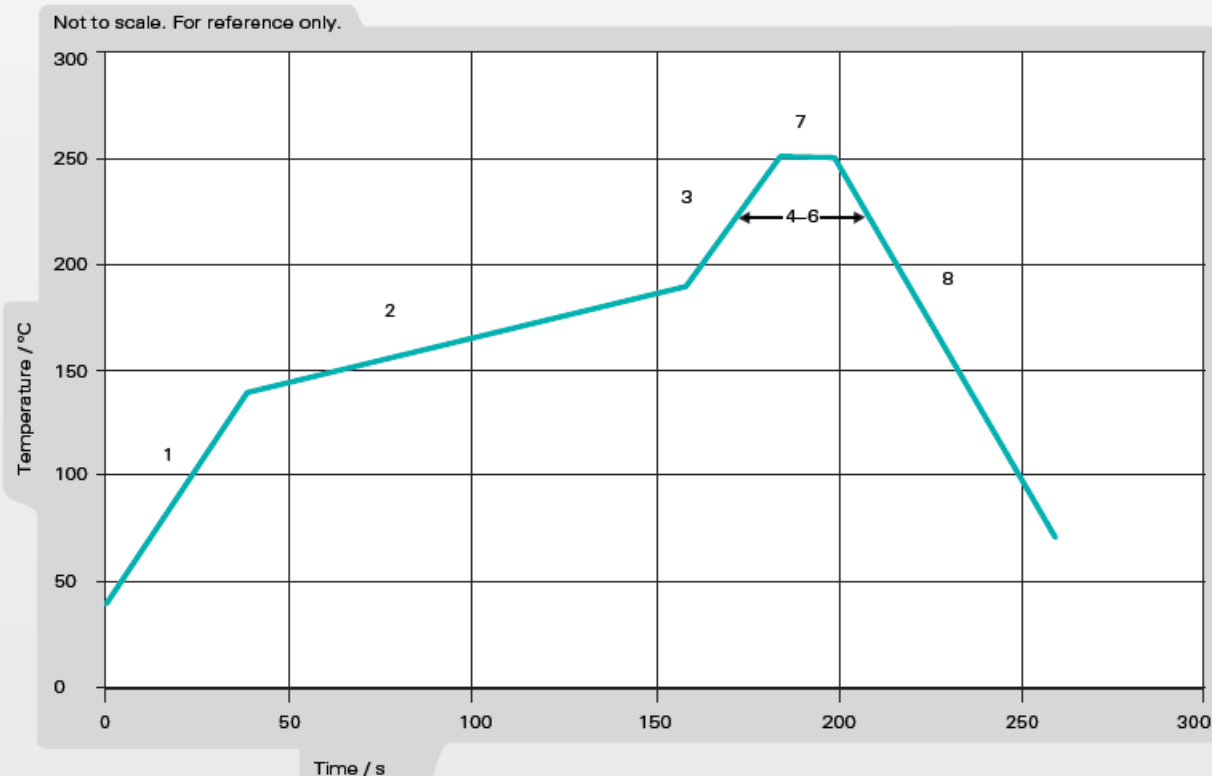


Figure 2. Maximum temperature profile recommendation for reflow soldering process

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Series: Chip Antenna

Description: 2.4-2.4835GHz Ceramic SMT antenna, 4x4.25mm keep out area

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PACKAGING-1

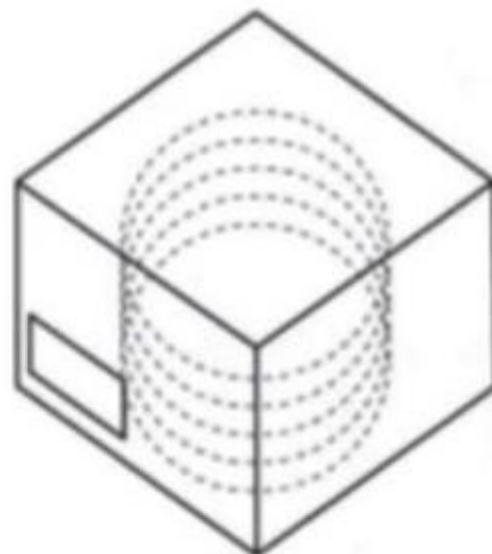
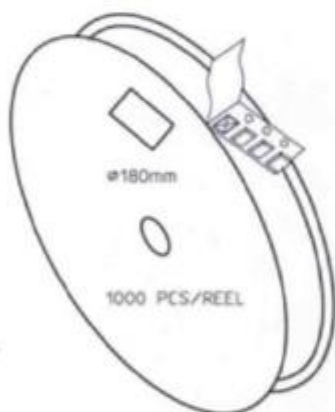
3000pcs antennas per 7" reel

5pcs 7" reel per inner package box

2pcs inner box per out box

Total 30000pcs antenna per out box

Out box size: 390mmx215mmx165mm



LEVEL

NOT MOISTURE SENSITIVE

1

These Devices do not require special storage conditions provided:

1. They are maintained at conditions equal to or less than 30°C and 85% RH.
2. They are solder reflowed at a peak body temperature which does not exceed 260°C.

Note: Level 1 and body temperature defined by IPC/JEDEC J-STD-020

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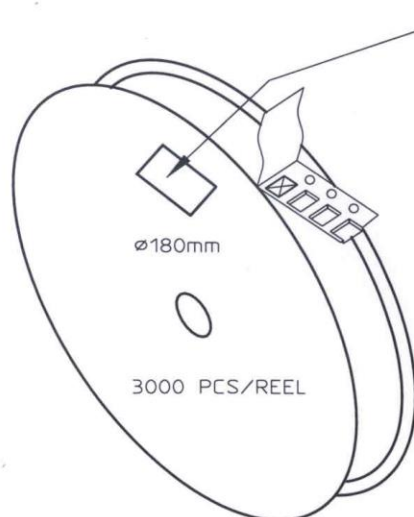
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PACKAGING-2



REEL LABEL INFORMATION:

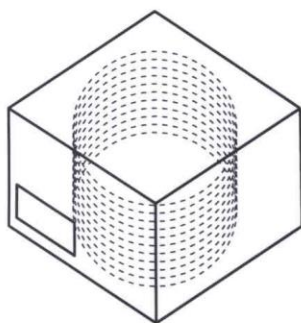
- TRACEABILITY
- QUANTITY
- PRODUCT CODE

CARRIER TAPE H85-00125
width=8,00 depth=1,22
COVER TAPE H85-00126
width=5,60

LENGTH OF TAPE:

- Leader section: min 350 mm before component section
- Trailer section: min 40 mm after component section.

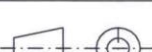
Empty part cavities at leader and trailer section of the tape must be sealed with top cover tape.



BOX H85-00128 1 pcs
(182x182x132)
- LABEL 1 pcs/BOX
REEL H85-00127 10 pcs
(D180, W12)
- REEL LABEL 1 pcs/REEL

MATERIAL

HANDLINGS

		RATIO	DRWN	090507 PeHa	H	
			DGNER		G	
			CHKD		F	
			APPRD		E	
PRODUCT	H90-OY805		APPRD BY		D	
					C	
DENOMINATION		PACKING FORM			B	
					A	
			VERSION		MOD/DATE/NAME	

Issue: 1946

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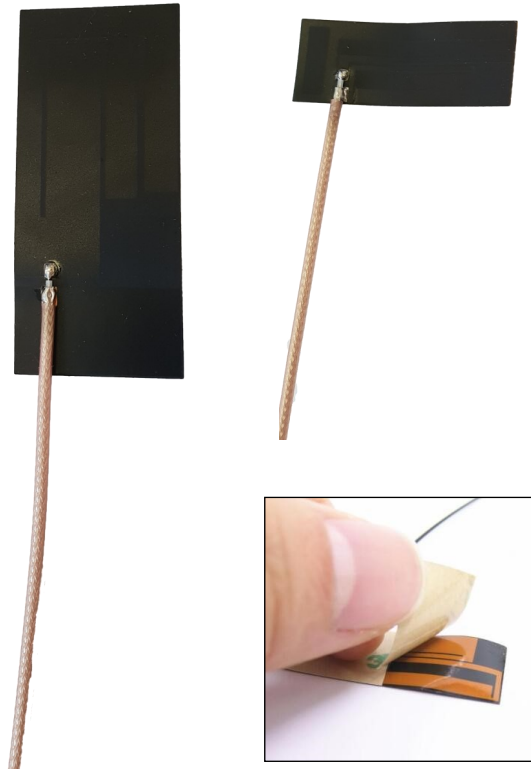
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+5dBi Gain Flexible Adhesive

Features

- Miniature Self Adhesive Patch Antenna
- Thickness 0.3mm
- 700-960 / 1800-2700MHz
- Omni Directional
- VSWR <2.0
- GFPC2452 Gain: +4dBi
- GSPC1540 Gain: +5dBi
- 50ohm Impedance
- Max Power 1w
- 15cm RG178 with ufl Connector
- 3M adhesive sticker on Rear
- Ground plane Independent
- Operating temp -10 to +70°C



Applications

- Embedded GSM
- Space Saving Applications
- Car Window

Description

A compact PCB Antenna for GSM Cellular applications where high performance is required from a small size. Using the ANT-GFPCB will give optimum range and reliability to your application.

Ordering Information

Part Number	Description	Cable Length
ANT-GFPCB1540-UFL	4G Flexi Adhesive PCB antenna 15x40mm +5dBi	15cm
ANT-GFPCB2452-UFL	4G Flexi Adhesive PCB antenna 24x52mm +4dBi	15cm



PRODUCT SPECIFICATION

TITLE

RECTANGULAR STANDARD NFC ANTENNA

TABLE OF CONTENTS

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2. PRODUCT DESCRIPTION
3. APPLICABLE DOCUMENTS
4. GENERAL SPECIFICATION
5. ANTENNA SPECIFICATION
6. ENVIRONMENTAL SPECIFICATION
7. PACKING

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
B3	EC No: 663046 DATE: 2021/05/06	Rectangular Standard NFC Antenna Product Specification	1 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-1462360001	Kang Cheng 2021/03/17	Cooper Zhou 2021/03/17	Ma Horace 2021/03/17



PRODUCT SPECIFICATION

RECTANGULAR STANDARD NFC ANTENNA

1.0 SCOPE

This Product Specification Covers the Mechanical, Electrical And Environmental Performances Specification For Rectangular Standard NFC Antenna.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: Rectangular Standard NFC Antenna
Series Number: 146236

2.2 DESCRIPTION

Series 146236 is rectangular, flexible, NFC (Near Field Communication) antennas for use in applications like payment system, boarding pass, tagging reader, access control system...

2.3 FEATURES

- NFC Five Shape Sizes
- Cable: AWG28 twisted pair
- Connector: Wire to board (Molex P/N 505565-0201), mate with header 505567 or 505568.
- The position of ferrite paste can be changed.
- Cable and connector can be customized
- RoHS Compliant

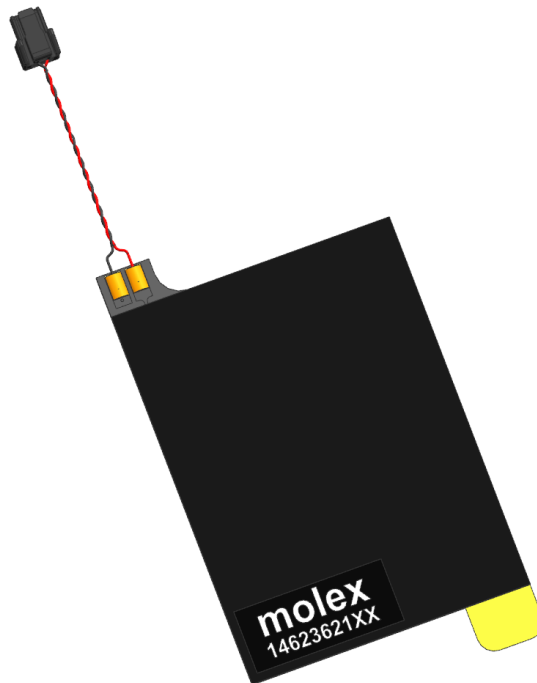


Molex 14623600XX RECTANGLE STANDARD NFC MODULE 3D VIEW

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
B3	EC No: 663046 DATE: 2021/05/06	Rectangular Standard NFC Antenna Product Specification	2 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-1462360001	Kang Cheng 2021/03/17	Cooper Zhou 2021/03/17	Ma Horace 2021/03/17



Molex 1462360XXX RECTANGLE STANDARD NFC WITH FERRITE MODULE 3D VIEW



Molex 1462362XXX RECTANGLE STANDARD NFC WITH AWG28 WIRE MODULE 3D VIEW

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
B3	EC No: 663046 DATE: 2021/05/06	Rectangular Standard NFC Antenna Product Specification	3 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-1462360001	Kang Cheng 2021/03/17	Cooper Zhou 2021/03/17	Ma Horace 2021/03/17



PRODUCT SPECIFICATION

2.4 DESCRIPTION OF MOLEX MATERIAL P/N

146236 **XXXX**

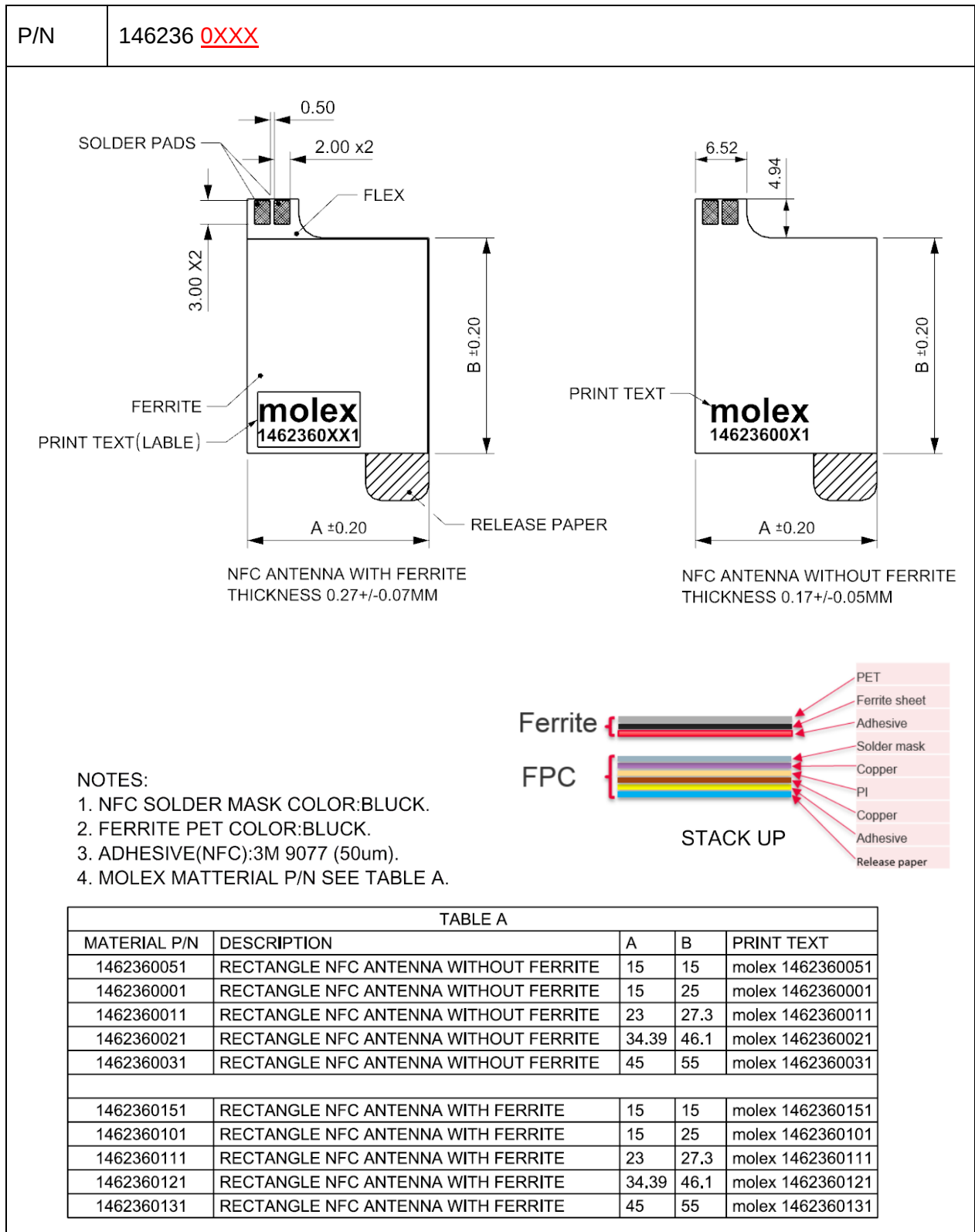
→ Different product sizes correspond to different tail numbers.

***Refer to the next page for details**

MATERIAL P/N	DESCRIPTION	A	B
1462360051	Rectangular NFC antenna without ferrite	15	15
1462360001	Rectangular NFC antenna without ferrite	15	25
1462360011	Rectangular NFC antenna without ferrite	23	27.3
1462360021	Rectangular NFC antenna without ferrite	34.39	46.1
1462360031	Rectangular NFC antenna without ferrite	45	55
1462360151	Rectangular NFC antenna with ferrite	15	15
1462360101	Rectangular NFC antenna with ferrite	15	25
1462360111	Rectangular NFC antenna with ferrite	23	27.3
1462360121	Rectangular NFC antenna with ferrite	34.39	46.1
1462360131	Rectangular NFC antenna with ferrite	45	55
1462362151	NFC coil with AWG28 wire 102mm and connector	15	15
1462362102	NFC coil with AWG28 wire 102mm and connector	15	25
1462362111	NFC coil with AWG28 wire 102mm and connector	23	27.3
1462362122	NFC coil with AWG28 wire 102mm and connector	34.39	46.1
1462362131	NFC coil with AWG28 wire 102mm and connector	45	55

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PS-1462360001	Kang Cheng 2021/03/17	Cooper Zhou 2021/03/17	Ma Horace 2021/03/17

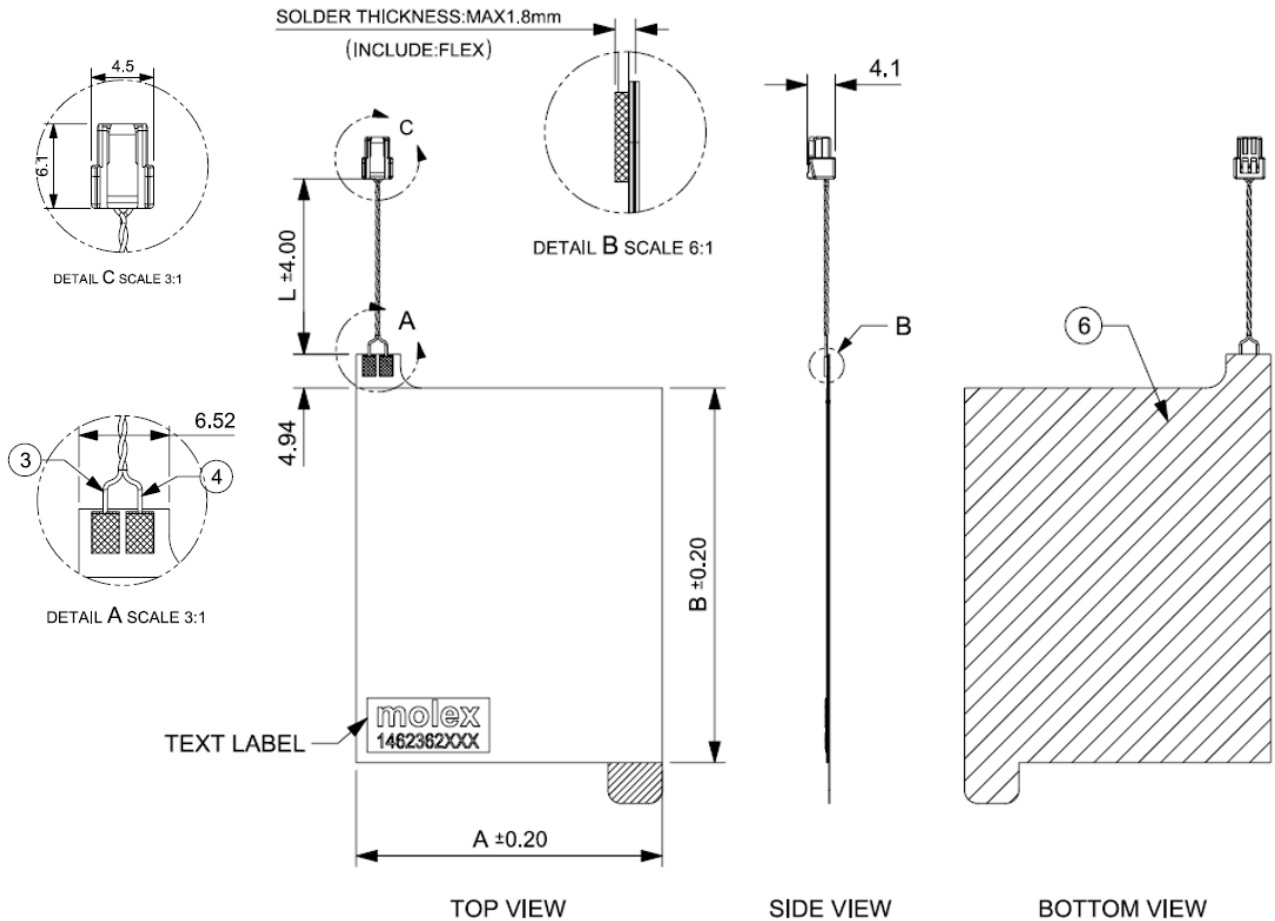
2.5 PRODUCT STRUCTURE INFORMATION



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		APPROVED BY: Ma Horace 2021/03/17	

P/N

146236 [2XXX](#)



NOTES:

1. NFC ANTENNA THICKNESS 0.17 ± 0.05 mm.
NFC ANTENNA WITH FERRITE THICKNESS 0.27 ± 0.07 mm
2. CABLE INFORMATION: WIRE RANGE: 28 AWG;
(MODEL: UL3302#28-7/0.13TA OD=0.7)
3. CONNECTOR MATERIAL:
HOUSINGS (MOLEX P/N: 505565-0201)
TERMINALS (MOLEX P/N: 505431-1000)
4. NFC ADHESIVE: 3M 9077, THICKNESS: 50um.

TABLE A

MATERIAL P/N	A	B	"L" LENGTH	PRINT TEXT LABEL
1462362151	15	15	102mm	molex 1462362151
1462362102	15	25	102mm	molex 1462362102
1462362111	23	27.3	102mm	molex 1462362111
1462362122	34.39	46.10	102 mm	molex 1462362122
1462362131	45	55	102 mm	molex 1462362131

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Kang Cheng 2021/03/17

CHECKED BY:

Cooper Zhou 2021/03/17

APPROVED BY:

Ma Horace 2021/03/17



PRODUCT SPECIFICATION

3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sale Drawing (SD)	SD-1462360001	Rectangle standard NFC
	SD-1462362131	NFC coil with AWG28 wire and connector
Application Specification (AS)	AS-1462360001	Antenna Application and surrounding
Packing Drawing (PK)	PK-1462360001	Product packaging specifications
	PK-1462362131	

4.0 GENERAL SPECIFICATION

Product name		Rectangular Standard NFC Antenna	
Part number		146236	
NFC with ferrite thickness		0.27mm	
NFC without ferrite thickness		0.17mm	
Operation temperature		-40°C to 85°C	
Storage temperature		-40°C to 85°C	
Antenna type		Flex	
Cable type		Twisted pair	
User Implementation type		Adhesive 3M9077	
Single weight			
1462360001	0.121g	1462360101	0.315g
1462360011	0.189g	1462360111	0.499g
1462360021	0.44g	1462360121	1.27g
1462360031	0.671g	1462360131	0.962g
1462360051	0.083g	1462360151	0.198g
1462362102	1.82g	1462362111	2.011g
1462362122	2.161g	1462362131	2.431g
1462362151	1.088g		

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PRODUCT SPECIFICATION

5.0 ANTENNA SPECIFICATION

Part No.	1462360001	1462360011	1462360021	1462360031	1462360051
Antenna Type	Near-field coupling				
Operating Frequency	13.56MHz				
La	2.0uH	2.0uH	2.6uH	2.4uH	1.4uH
Ra	3.4Ω	3.4Ω	3.2Ω	3.1Ω	2.3Ω
Ca	1.1pF	1.4 pF	2.3 pF	2.7 pF	0.9 pF
Fra	108.0MHz	96.9MHz	66.6MHz	62.7MHz	143.2MHz
Rp	41.5kΩ	28.0kΩ	18.9kΩ	14.8kΩ	50.0kΩ
Q	50.4	50.9	68.4	66.8	51.1

Part No.	1462360101	1462360111	1462360121	1462360131	1462360151
Material	With Ferrite				
Antenna Type	Near-field coupling				
Operating Frequency	13.56MHz				
La	3.1uH	3.0uH	3.8uH	3.5uH	2.1uH
Ra	5.1Ω	5.2Ω	6.2Ω	5.7Ω	3.6Ω
Ca	1.3 pF	1.8 pF	3.0 pF	3.7 pF	1.0 pF
Fra.	80.1MHz	70.7MHz	48.7MHz	45.8MHz	109.0MHz
Rp	12.7kΩ	12.4kΩ	10.3kΩ	10.8kΩ	10.0kΩ
Q	51.8	48.5	52.4	52.5	50.4

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Part No.	1462362102	1462362111	1462362122	1462362131	1462362151
Material	With Ferrite and twisted pair				
Antenna Type	Near-field coupling				
Operating Frequency	13.56MHz				
La	3.3uH	3.3uH	4.2uH	4.1uH	2.4uH
Ra	6.0Ω	5.3Ω	7.8Ω	7.8Ω	5.1Ω
Ca	4.9 pF	5.3 pF	6.0 pF	7.9 pF	5.2 pF
Fra	41.8MHz	40.2MHz	34.3MHz	31.0MHz	46.8MHz
Rp	11.8kΩ	10.9kΩ	11.8kΩ	10.4kΩ	8.8kΩ
Q	46.8	53.5	46.0	44.2	40.6

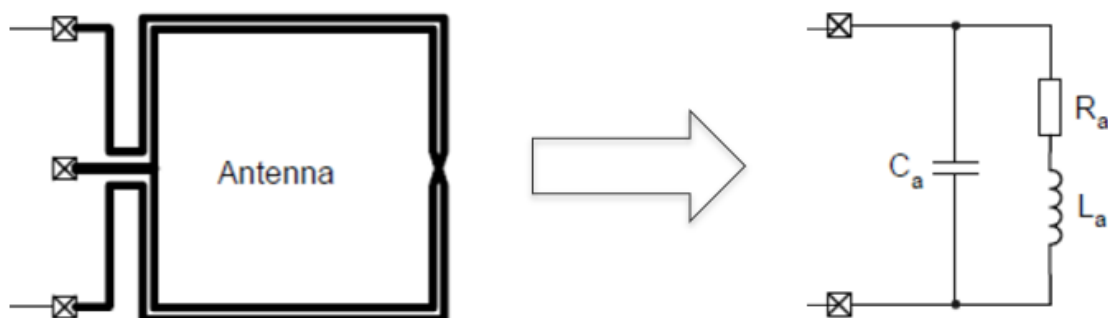


FIGURE4.2 ANTENNA EQUIVALENT CIRCUIT

Fra: Self-resonance frequency of the antenna
 Rp: Parallel resistance @ self-resonance frequency
 Q: Quality factor

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PRODUCT SPECIFICATION

6.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
High Temperature	1. Temperature:85°C ($\pm 2^{\circ}\text{C}$), Time:240H 2. No cosmetic problem (No soldering problem; No adhesion problem of glue.
Low Temperature	1. Temperature:-40°C ($\pm 3^{\circ}\text{C}$), Time:240H 2. No cosmetic problem (No soldering problem; No adhesion problem of glue) .
High Humidity & High Temperature	1. Temperature:85°C ($\pm 2^{\circ}\text{C}$), Humidity:85%, Time:96H 2. No cosmetic problem (No soldering problem; No adhesion problem of glue) .
Temperature Cycling	1. Mate antenna and subject to the following conditions for 48 cycles. 1 cycle of: a. $-40\pm 3^{\circ}\text{C}$ 30 minutes b. $+85\pm 2^{\circ}\text{C}$ 30 minutes Shift time: Within 5 minutes 2. No cosmetic problem (No soldering problem; No adhesion problem of glue) .
Salt Mist Test	1. NaCl solution Concentration: $5\pm 1\%$ Spray time: 48 ± 4 hours Ambient temperature: $35\pm 2^{\circ}\text{C}$ 2. No visible corrosion. 3. Discoloration accepted.
Pull Test	1. Stick the NFC on a metal board, Cable keeps parallel to flex plane. pull cable in horizontal direction. 2. Test speed: 10-15 mm/min. 3. Pull force >8N

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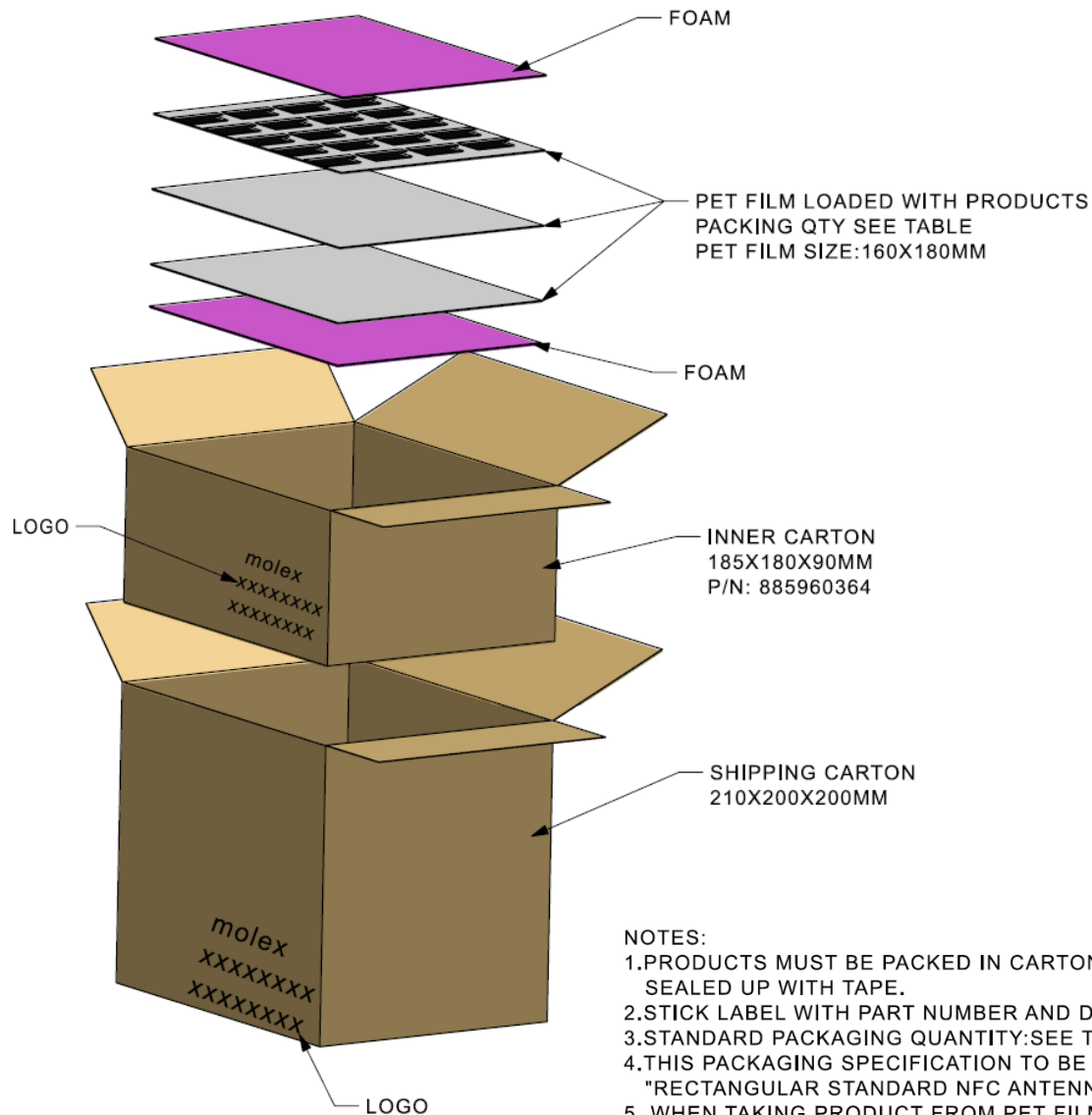
CHECKED BY:

Cooper Zhou 2021/03/17

APPROVED BY:

Ma Horace 2021/03/17

7.0 PACKING



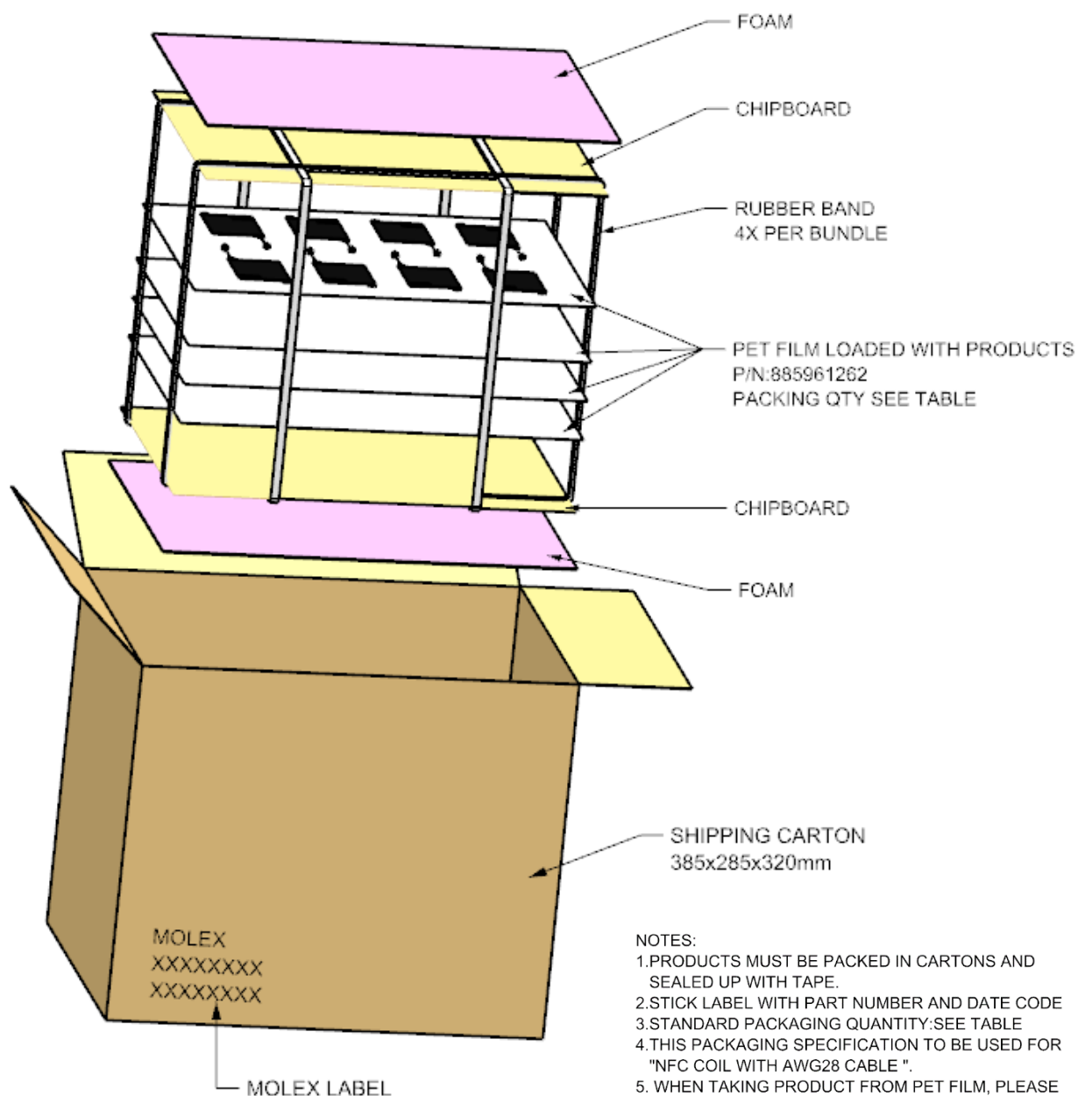
- NOTES:
1. PRODUCTS MUST BE PACKED IN CARTONS AND SEALED UP WITH TAPE.
 2. STICK LABEL WITH PART NUMBER AND DATE CODE
 3. STANDARD PACKAGING QUANTITY: SEE TABLE
 4. THIS PACKAGING SPECIFICATION TO BE USED FOR "RECTANGULAR STANDARD NFC ANTENNA".
 5. WHEN TAKING PRODUCT FROM PET FILM, PLEASE REMOVE THE COVER TAPE FIRST, THEN PICK UP.

Part Number	PCS/FILM	FILM/INNER CARTON	INNER CARTON/SHIPPING CARTON	QTY/CARTON(SPQ)
1462360001	20	100	2	4000 PCS
1462360011	20	100	2	4000 PCS
1462360021	9	100	2	1800 PCS
1462360031	6	100	2	1200 PCS
1462360051	20	100	2	4000 PCS
1462360101	20	100	2	4000 PCS
1462360111	20	100	2	4000 PCS
1462360121	9	100	2	1800 PCS
1462360131	6	100	2	1200 PCS
1462360151	20	100	2	4000 PCS

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PRODUCT SPECIFICATION

PART NUMBER	PCS/FILM	FILMS/BUNDLE	BUNDLES/CARTON	QTY/CARTON
1462362102	14	40	3	1680PCS
1462362111	12	40	3	1440PCS
1462362122	10	40	3	1200PCS
1462362131	8	36	5	1440PCS
1462362151	14	40	3	1680PCS



- NOTES:
- 1.PRODUCTS MUST BE PACKED IN CARTONS AND SEALED UP WITH TAPE.
 - 2.STICK LABEL WITH PART NUMBER AND DATE CODE
 - 3.STANDARD PACKAGING QUANTITY:SEE TABLE
 - 4.THIS PACKAGING SPECIFICATION TO BE USED FOR "NFC COIL WITH AWG28 CABLE".
 5. WHEN TAKING PRODUCT FROM PET FILM, PLEASE REMOVE THE COVER TAPE FIRST, THEN PICK UP THE PART FROM FLEX NOT THE CABLE, TO AVOID SOLDER JOINT DAMAGE.

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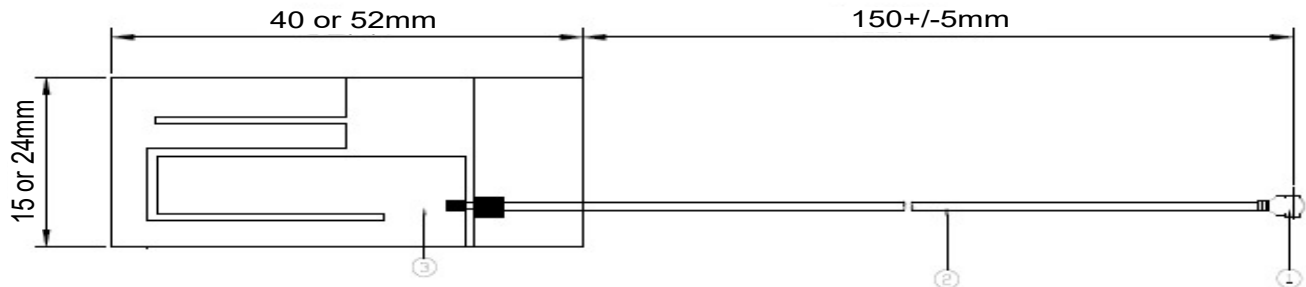


PRODUCT SPECIFICATION

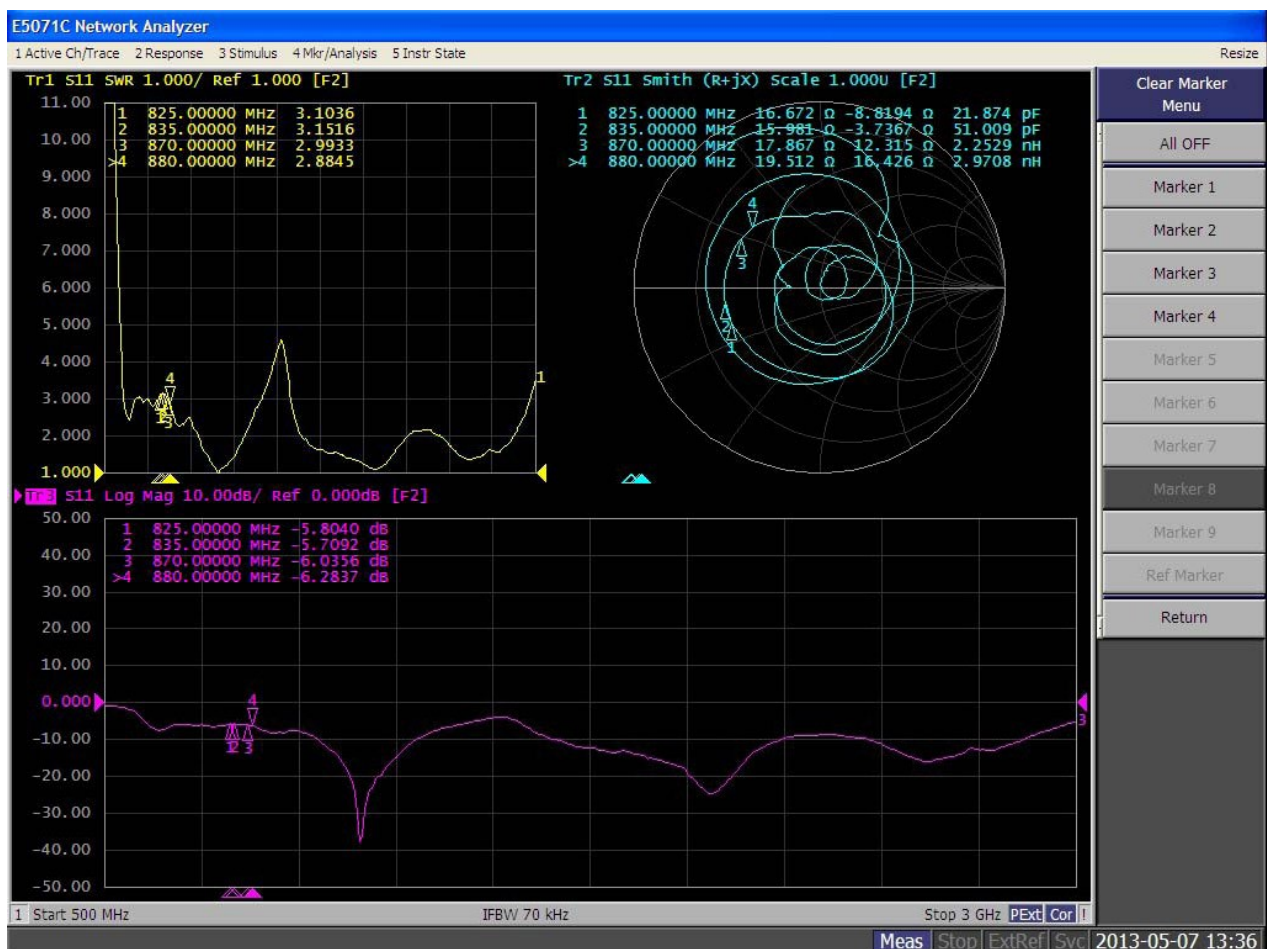
REV	DATE	DESCRIPTION
B3	2021/05/06	Updated 4.0 General Specification

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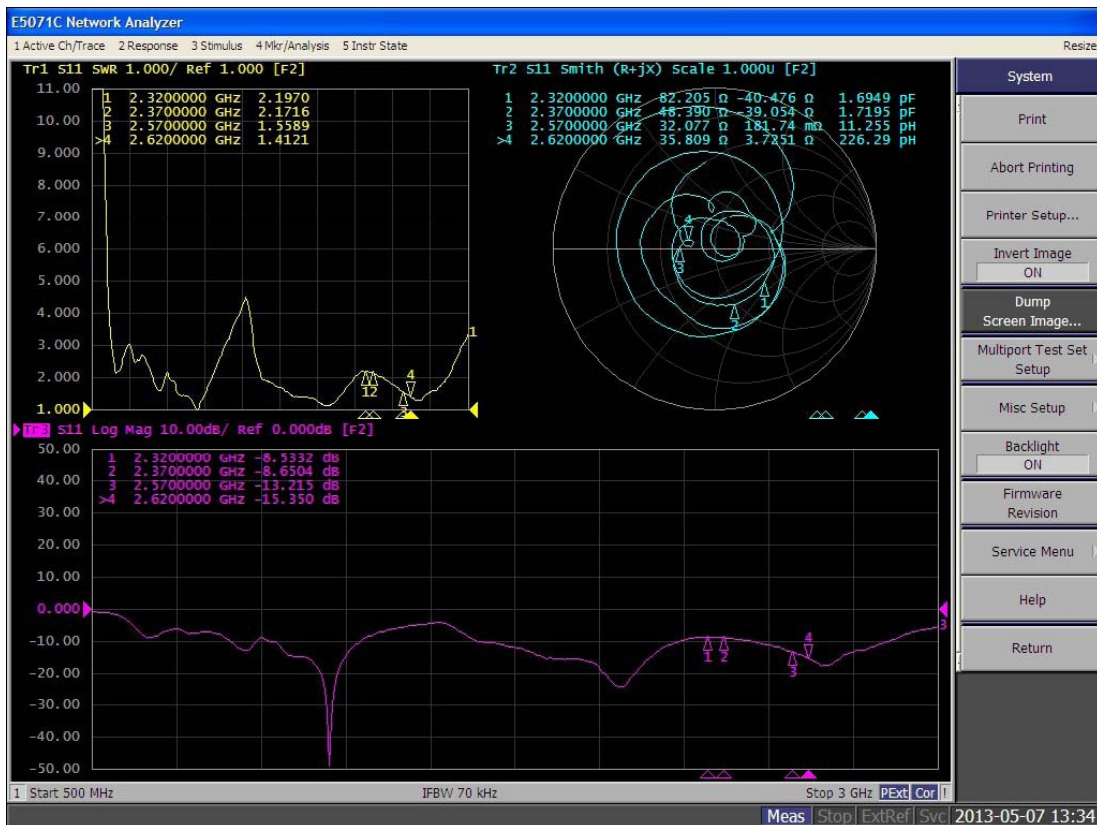
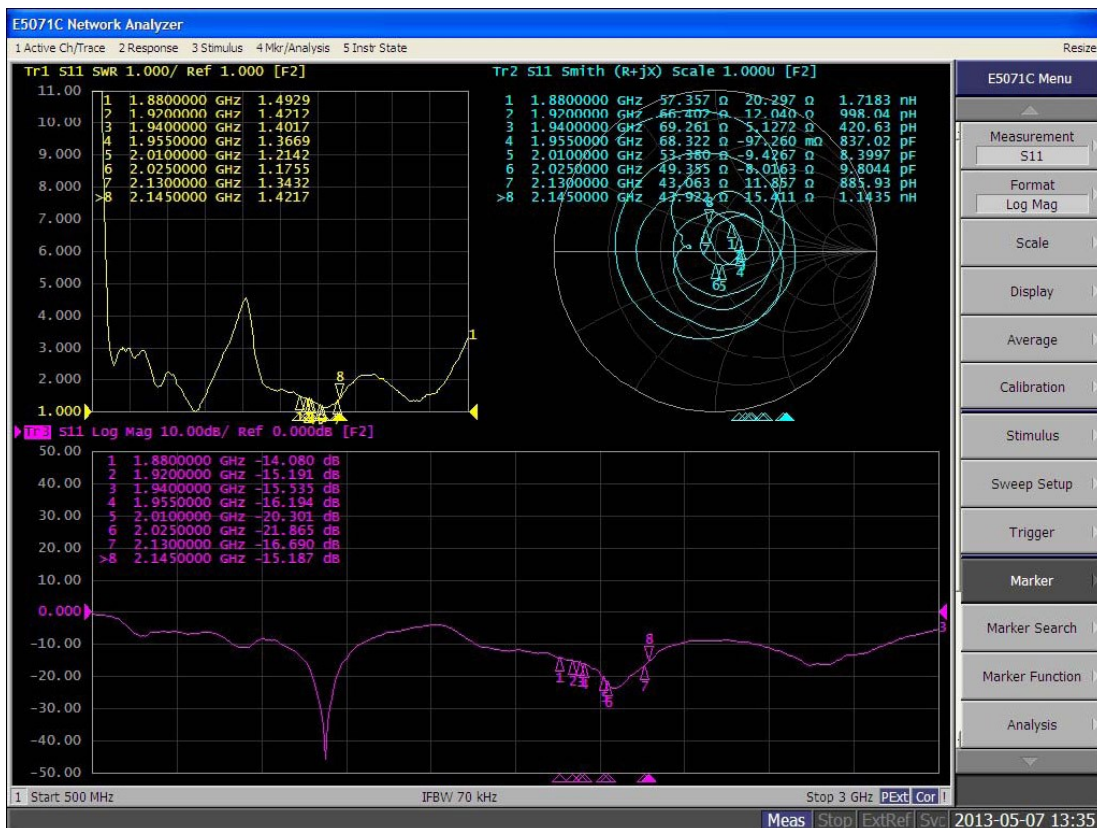
Mechanical Detail



Performance Data



Performance Data (cont)



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DO NOT

Discard with normal waste, please recycle.

ROHS Directive 2011/65/EU and amendment 2015/863/EU
Specifies certain limits for hazardous substances.

WEEE Directive 2012/19/EU

Waste electrical & electronic equipment. This product must be disposed of through a licensed WEEE collection point. RF Solutions Ltd., fulfills its WEEE obligations by membership of an approved compliance scheme. Environment Agency Registration number: **WEE/JB0104WV**.

Waste Batteries and Accumulators Directive 2006/66/EC

Where batteries are fitted, before recycling the product, the batteries must be removed and disposed of at a licensed collection point.

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