

Document	Datasheet
Type	Chip Antenna
Application	ISM 868/915MHz
Part No.	AMOCA3H15F4PB
Revision	1.0

DATASHEET



Application

ISM 868 / 915MHz

Features

- Monopole Structure
- Size (10.0*3.0*1.5mm³)
- Performance Optimizing
 - with external lumped matching components
- SMT Available under Pb-free Condition
- RoHS Compliant

AMOTECH

Notes

The contents of this datasheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.

Revision History

Rev. No	Date	Title	Contents	Page
0	'17. 02. 28		New Published	
1	'18. 06. 07		Added 868MHz Measurement Data	3, 7, 8, 12, 13

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1. Specifications

1.1 Electrical Specifications

No	Item	Spec.		Remark
1	Frequency Range [MHz]	863 ~ 870	902 ~ 928	
2	VSWR	Max 3.0:1		
3	Polarization	Linear		
4	Impedance [Ω]	Nominal 50		

✓ Refer to page 6~7 for matching value of each condition

1.2 Mechanical Specifications

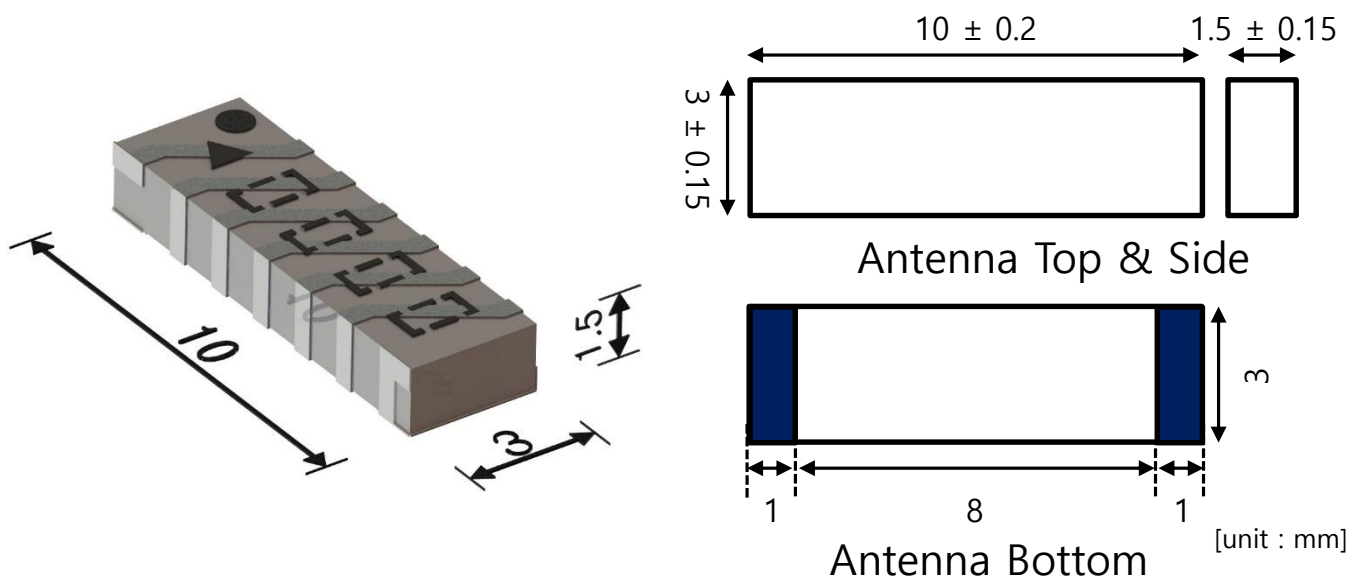
No	Item	Spec.	Remark
1	Dimensions (L*W*H)	10.0 * 3.0 * 1.5 mm ³	
2	Unit Weight	typ. 152 mg	
3	Operating Temperature	-40 ~ 85 °C	

1.3 Appearance & Material

No	Name	Function	Material
1	Electrode	Radiation Element	Ag
2	Marking	Identification Mark	Ink
3	Ceramic Body	-	Ceramic

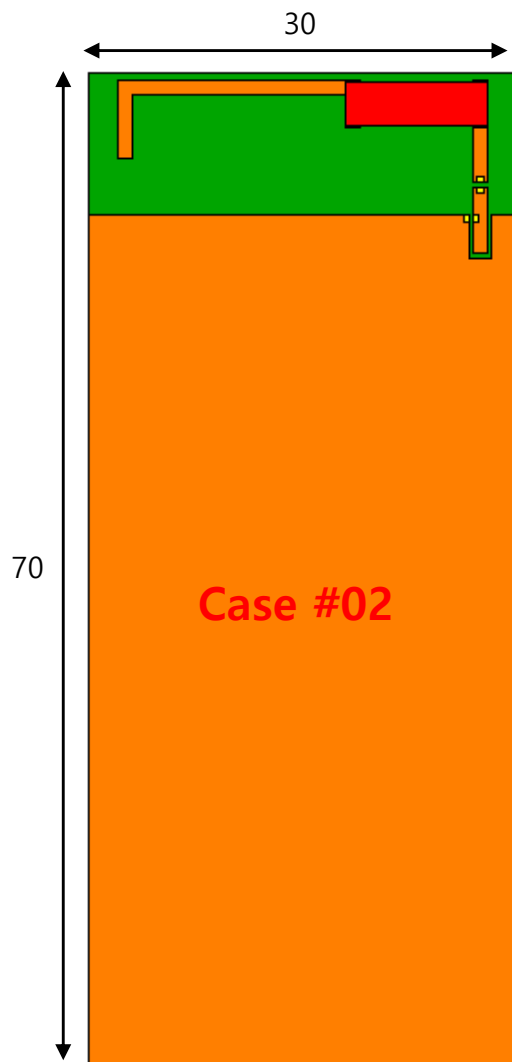
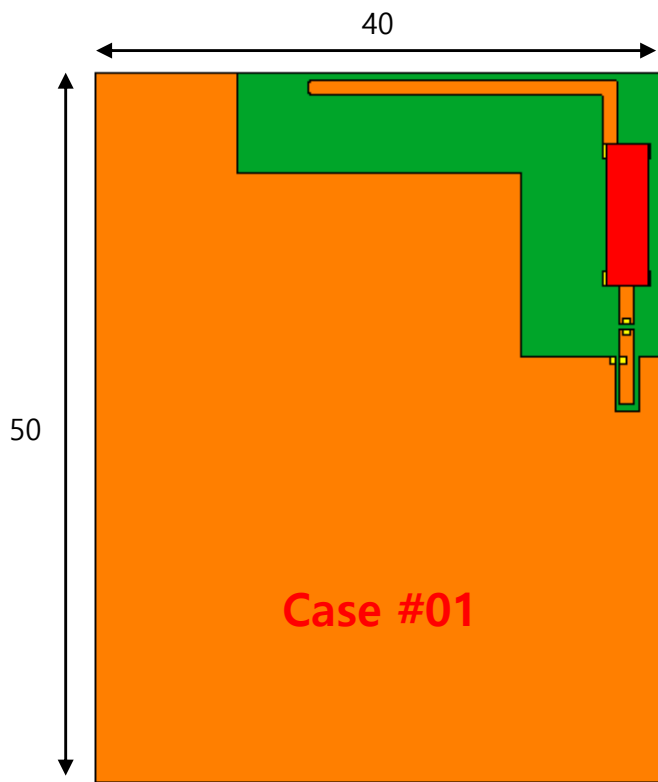
✓ Structure of AMOCA3H15F4PB is symmetric.

✓ Even if AMOCA3H15F4PA doesn't have direction for SMT, triangle marking on the top of antenna would be recommended as feeding direction.



2. PCB Design for Test

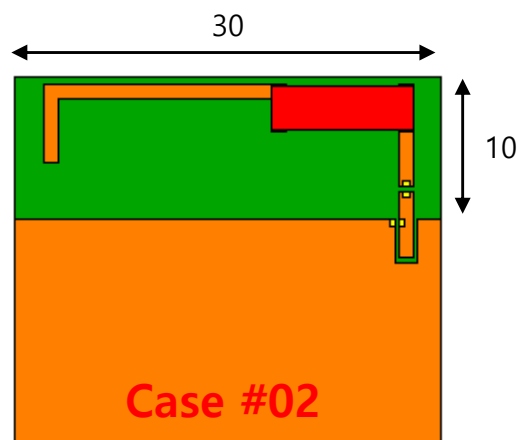
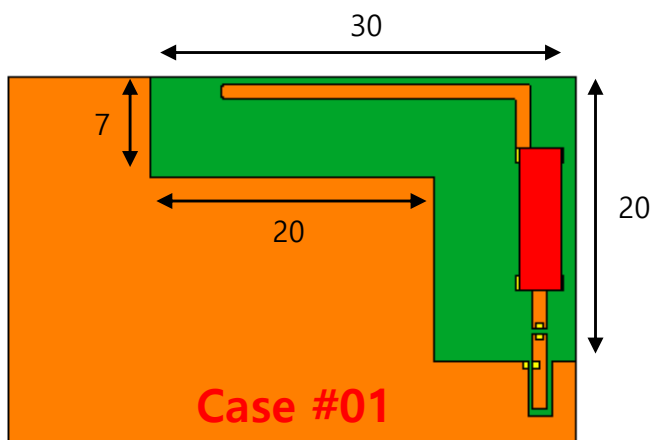
2.1 Evaluation Board Dimension



- ✓ Red box : AMOCA3H15F4PB chip antenna
- ✓ Evaluation board size : 50 x 40
 - Case #01 : 50 * 40 mm
 - Case #02 : 70 * 30 mm
- ✓ Green area : Fill Cut Area (GND Clearance)

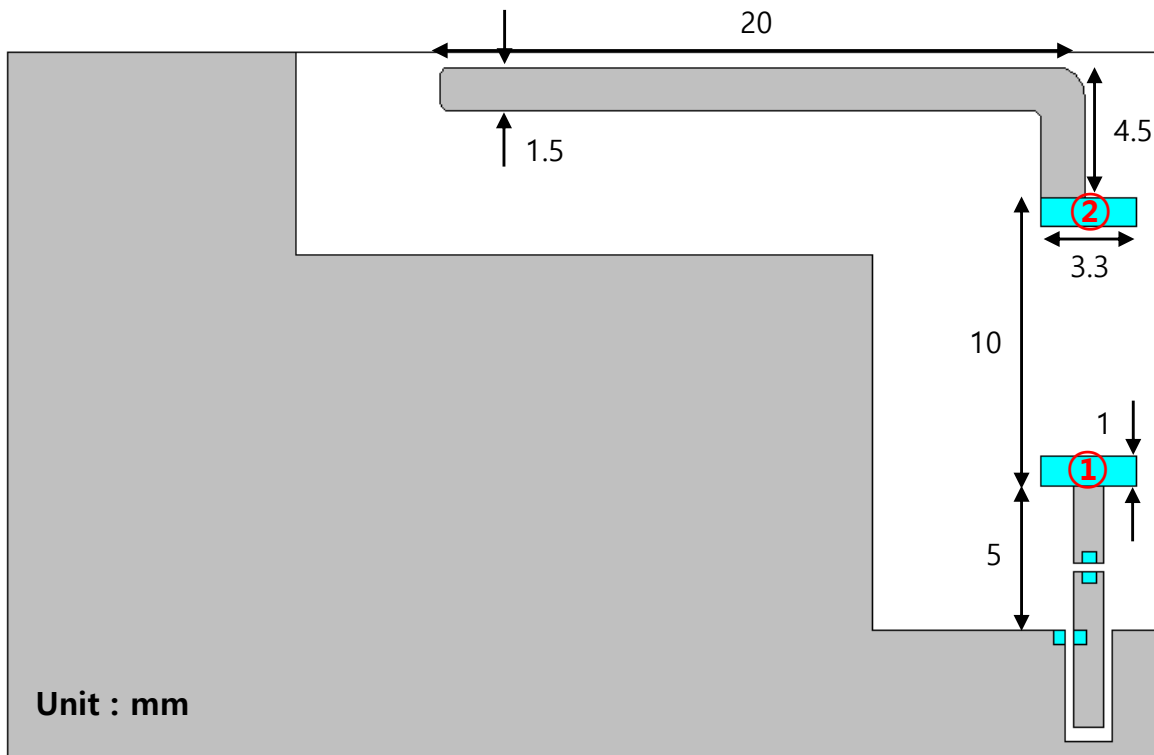
Unit : mm

2.2 GND Fill Cut Area Dimension

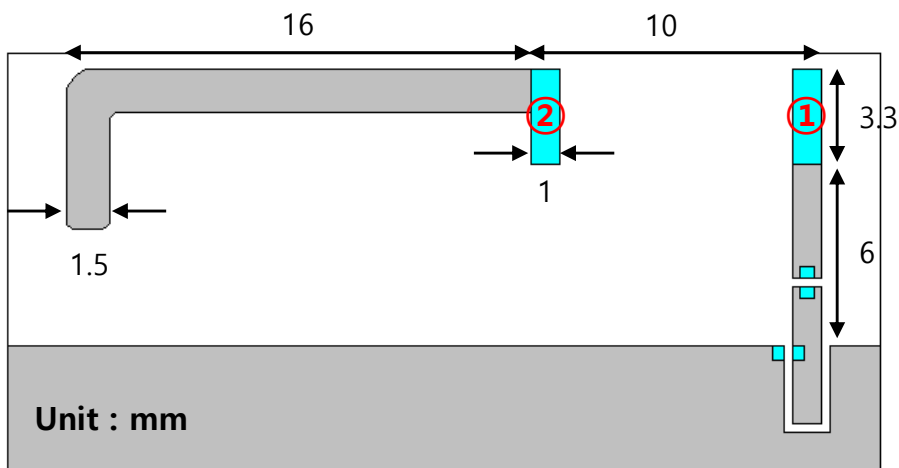


2.3 PCB Design Guide

2.3.1 Guide 1 @EVB Case#01



2.3.2 Guide 2 @EVB Case#02



✓ Stub-line could be changed by board condition.



Antenna Top



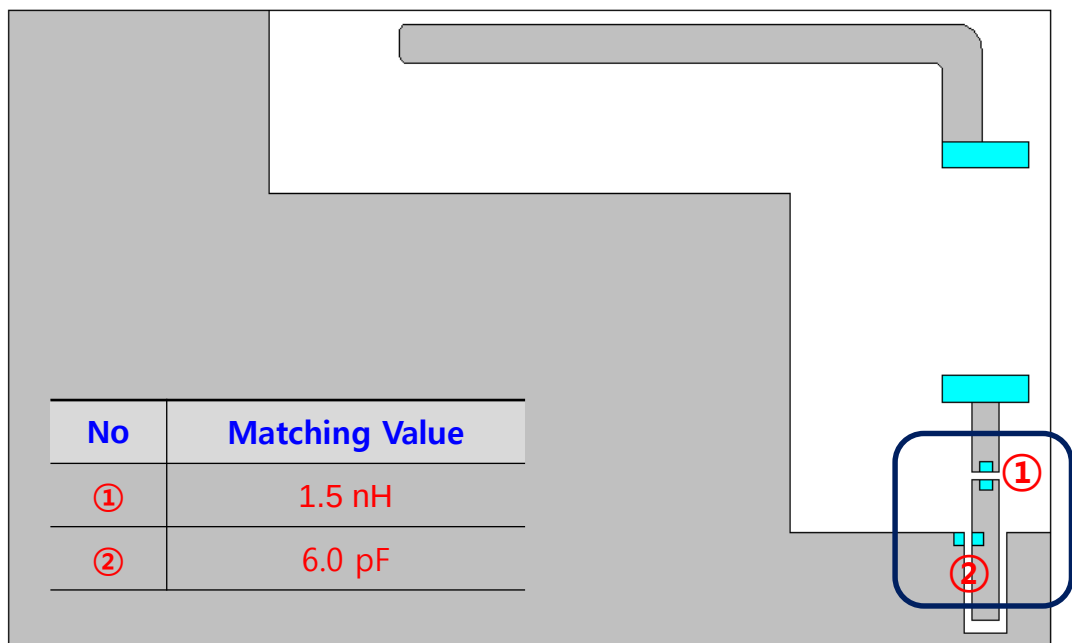
Antenna Bottom

No	Pin Assignment
①	Feeding
②	N/C (Connected Stub line)

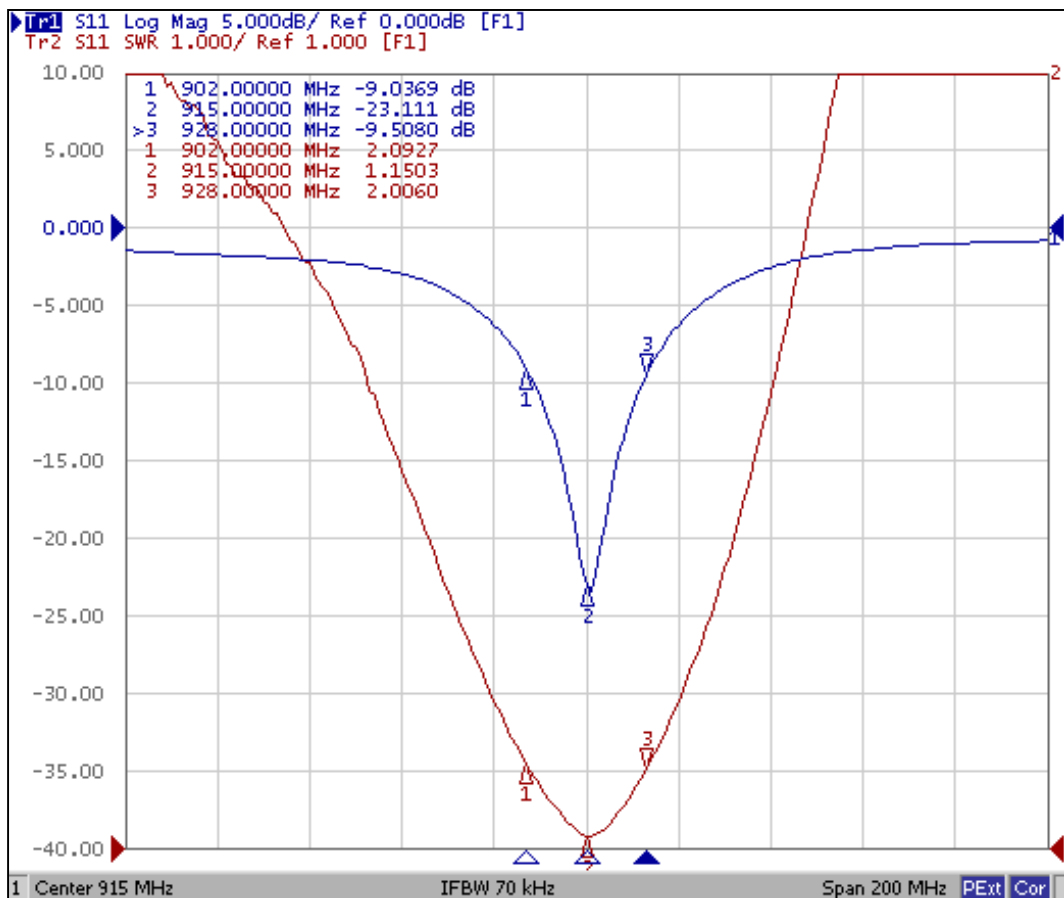
3. Measurement Result

3.1 Typical Measurement Result (VSWR & Return-loss)

3.1.1 Measured results of EVB Case#01 (915 MHz)

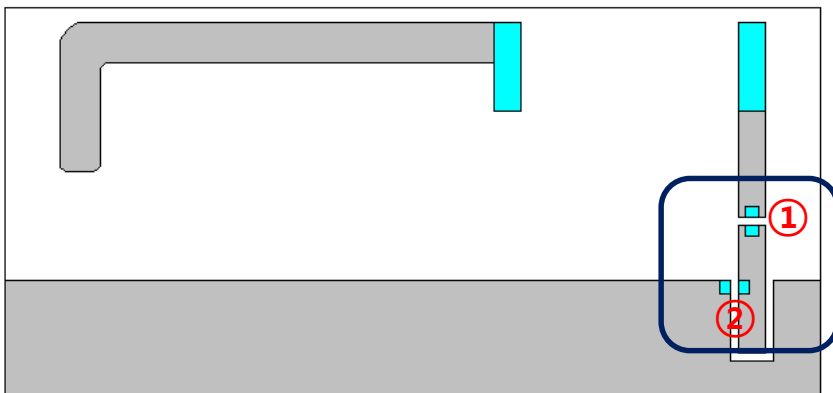


✓ Impedance matching value would be changed by board size and environment of SET.



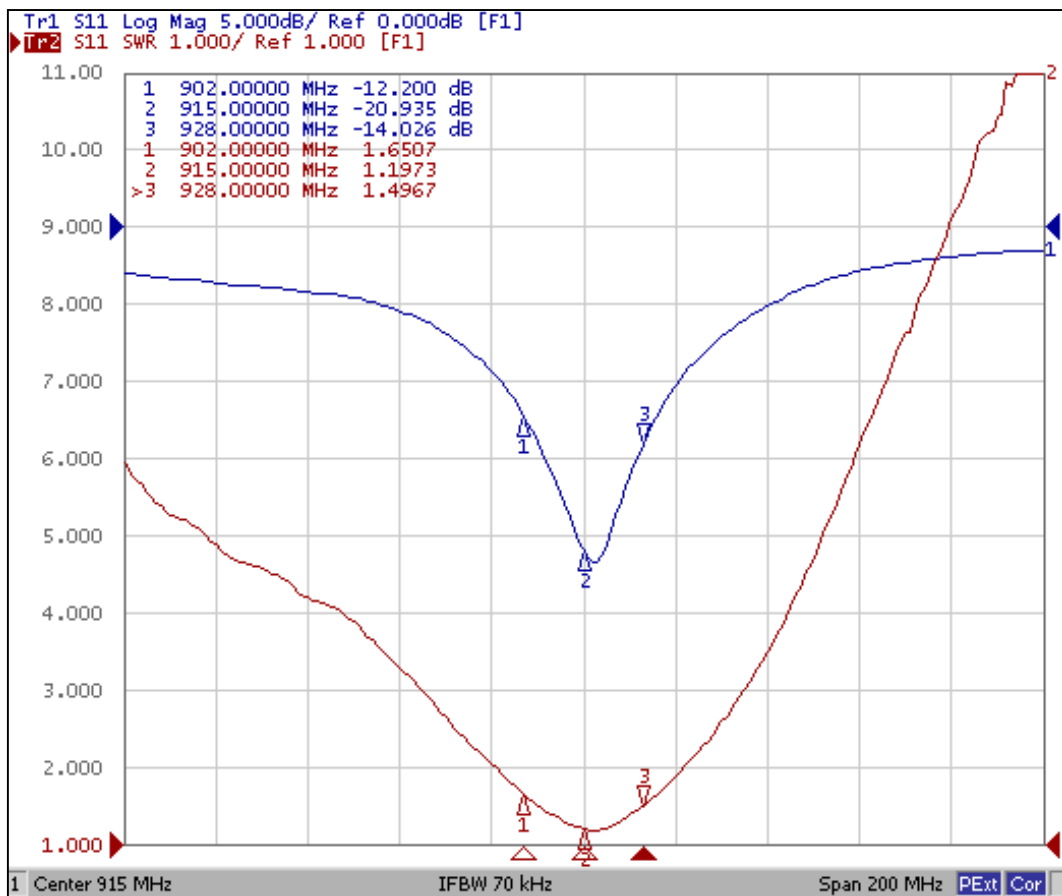
✓ Measured VSWR & Return-loss

3.1.2 Measured results of EVB Case#02 (915 MHz)



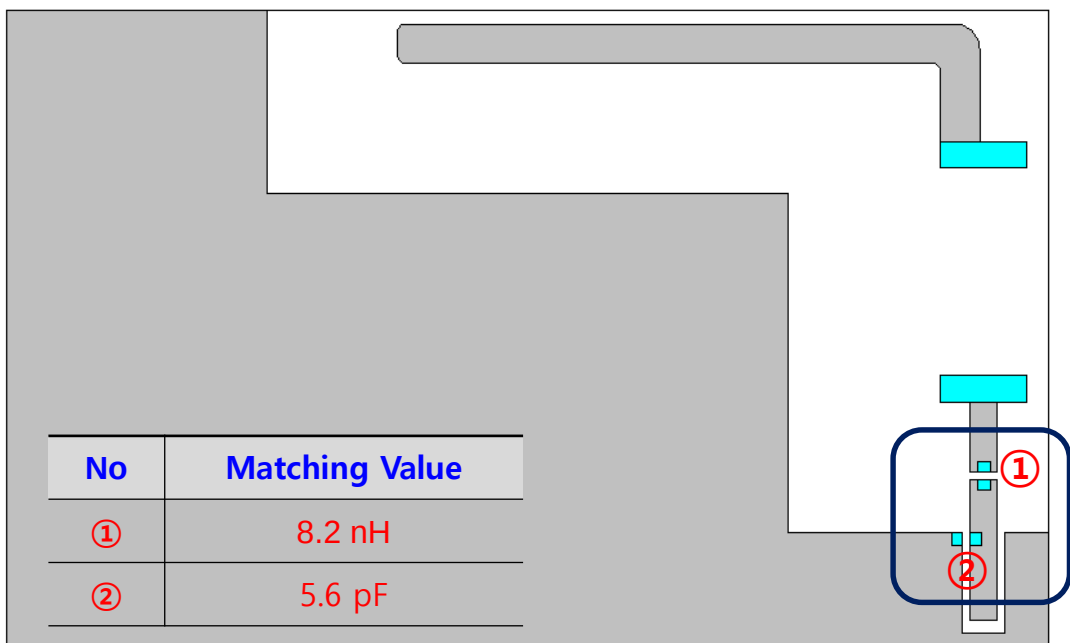
No	Matching Value
①	8.2 nH
②	3.6 pF

✓ Impedance matching value would be changed by board size and environment of SET.

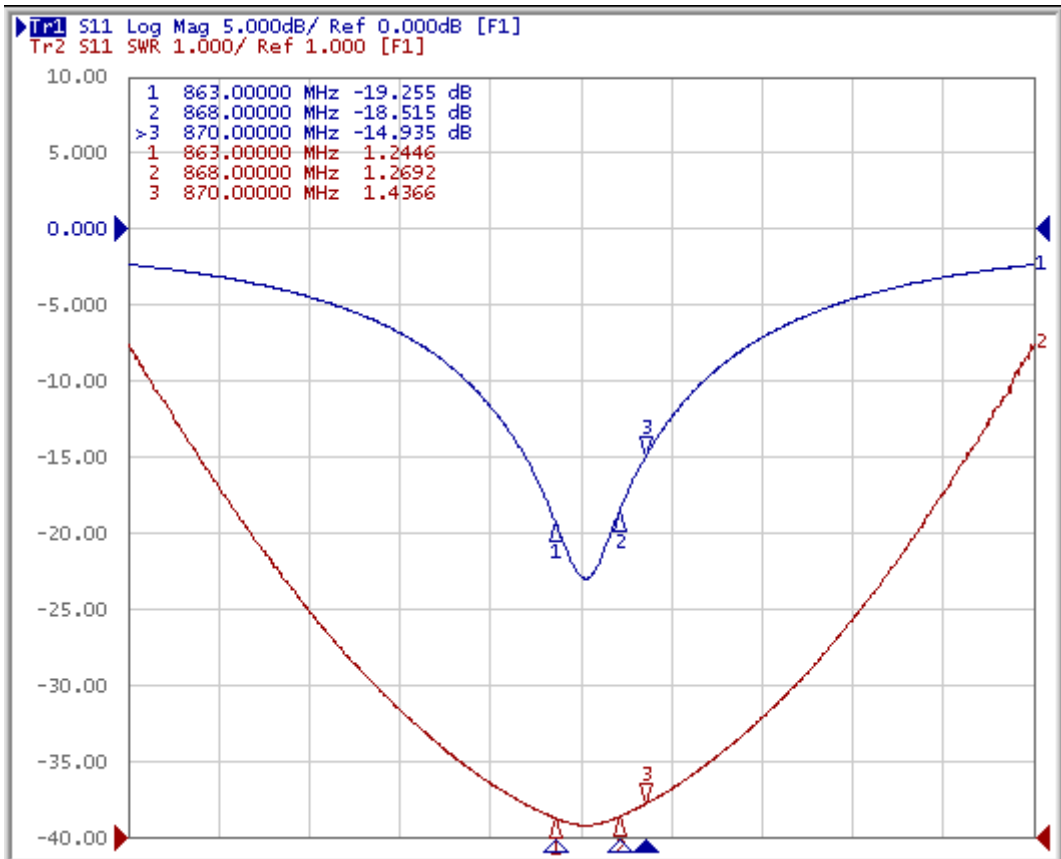


✓ Measured VSWR & Return-loss

3.1.3 Measured results of EVB Case#03 (868 MHz)

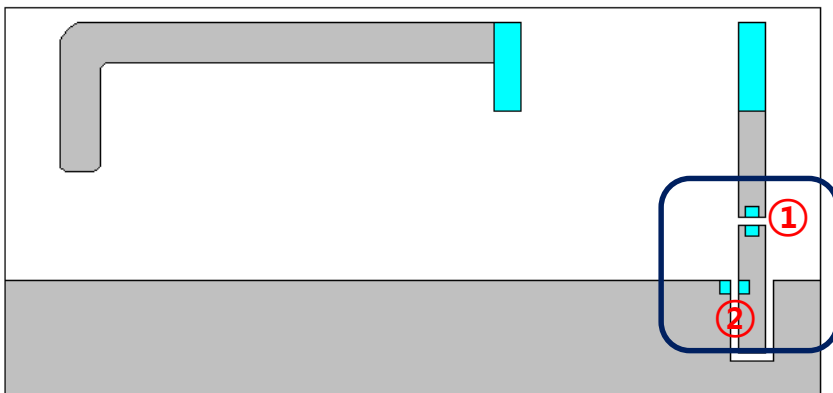


✓ Impedance matching value would be changed by board size and environment of SET.



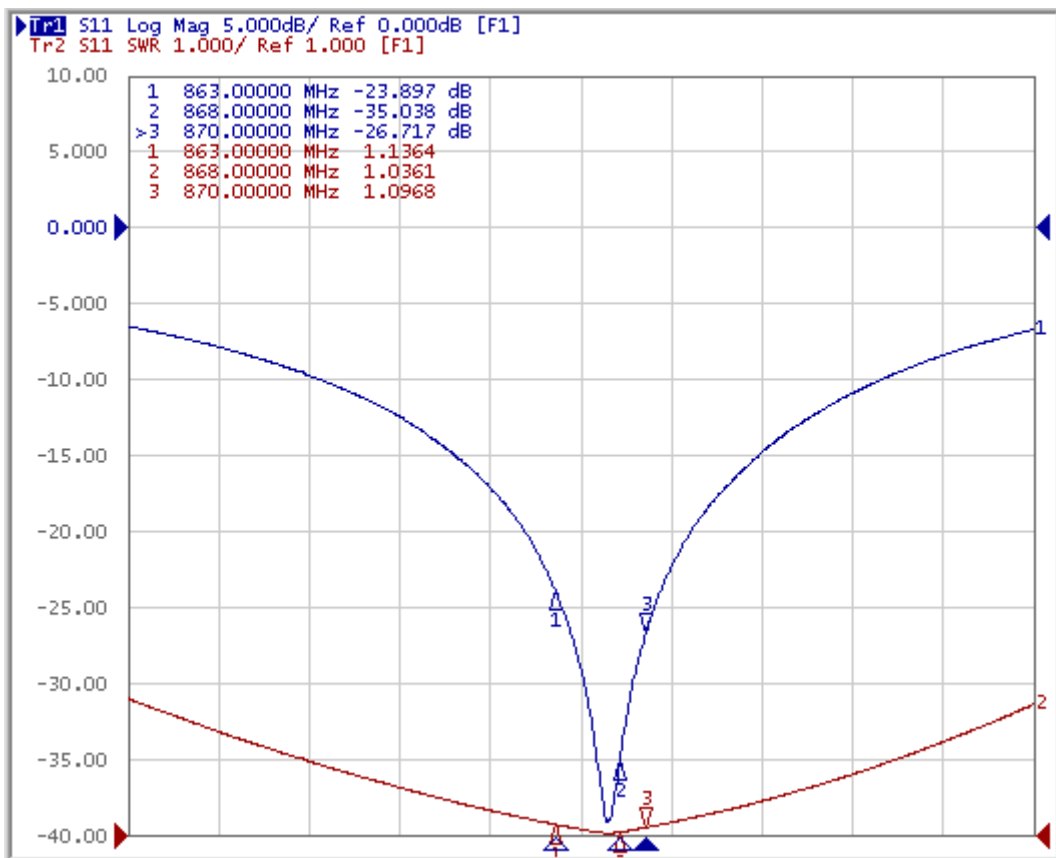
✓ Measured VSWR & Return-loss

3.1.4 Measured results of EVB Case#02 (868 MHz)



No	Matching Value
①	15 nH
②	3.9 pF

✓ Impedance matching value would be changed by board size and environment of SET.

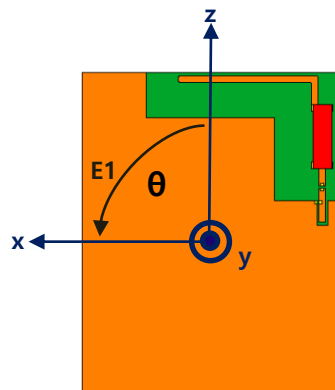


✓ Measured VSWR & Return-loss

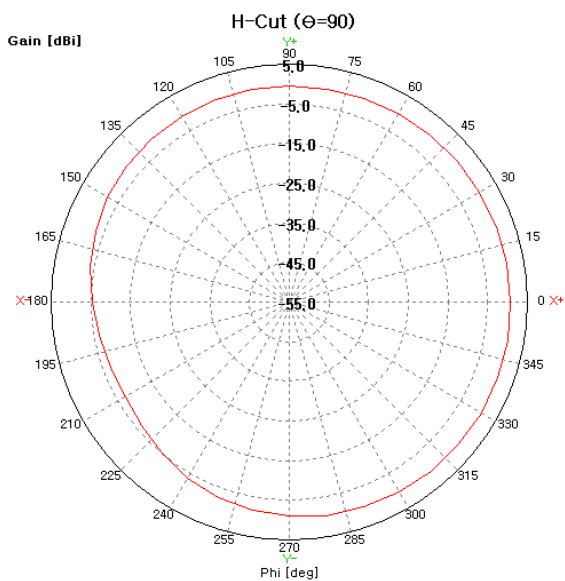
3.2 Measured Radiation Pattern

3.2.1 Measurement Results of EVB Case#01

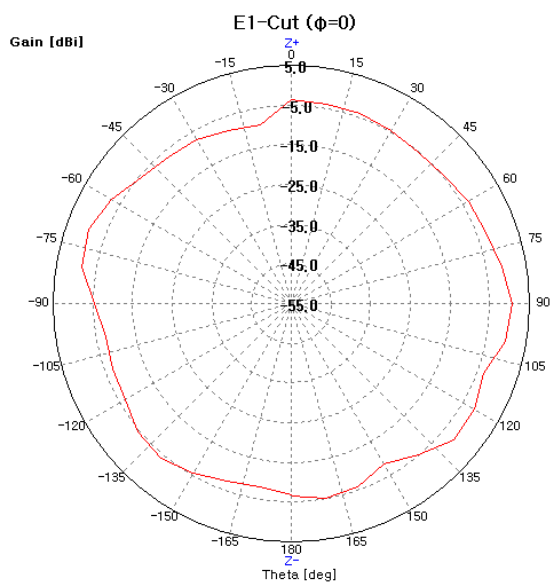
Freq. [MHz]	Peak Gain [dBi]	Avg. Gain [dBi]	Efficiency [%]
902	0.4	-3.1	49
915	0.6	-2.7	54
928	0.3	-3.6	44



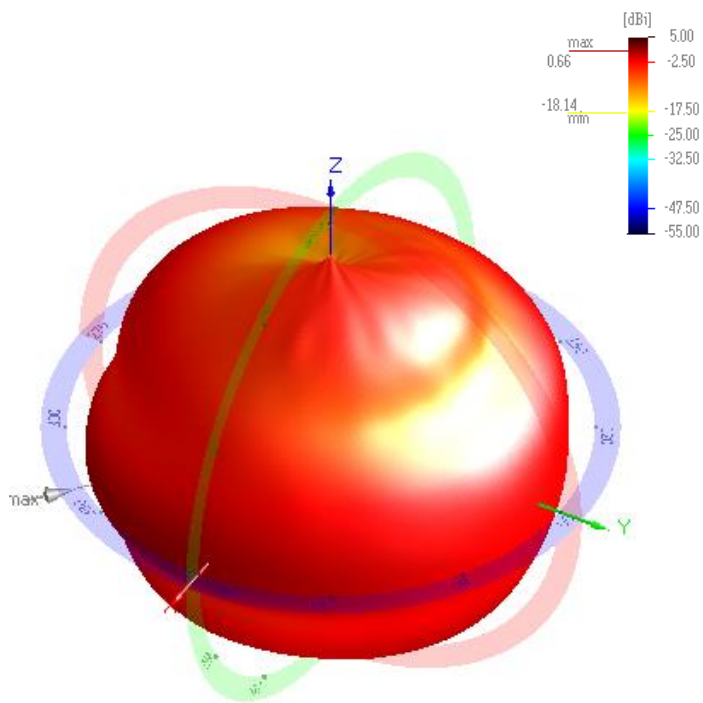
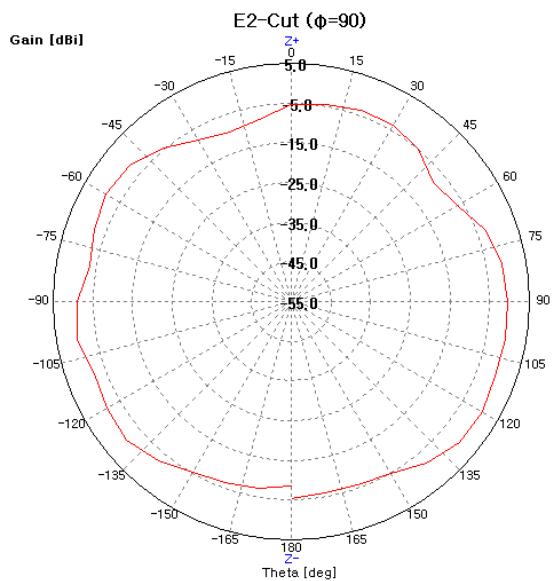
H-Cut ($\theta=90$)



E1-Cut ($\phi=0$)



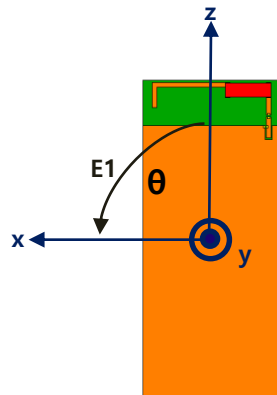
E2-Cut ($\phi=90$)



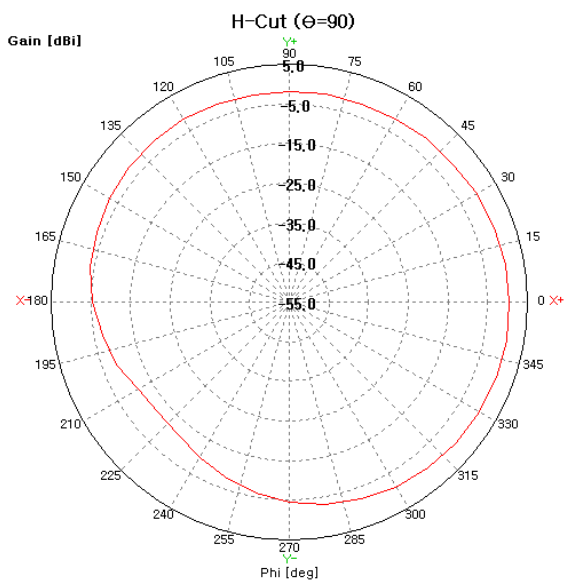
Measured Case#01 EVB 2D/3D radiation pattern @915MHz

3.2.2 Measurement Results of EVB Case#02

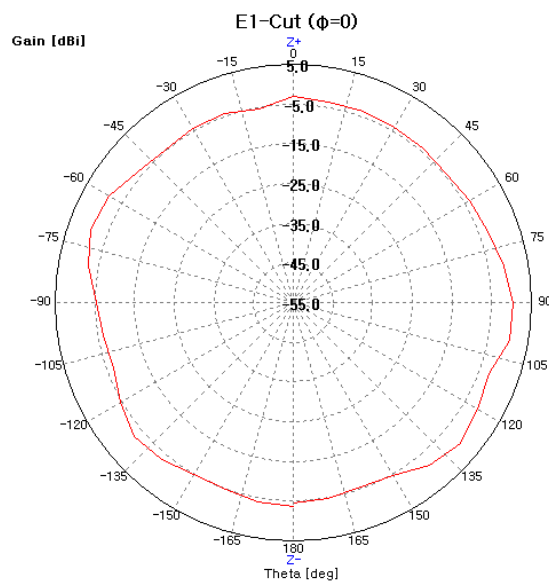
Freq. [MHz]	Peak Gain [dBi]	Avg. Gain [dBi]	Efficiency [%]
902	1.1	-2.9	51
915	1.3	-2.7	53
928	0.9	-3.4	49



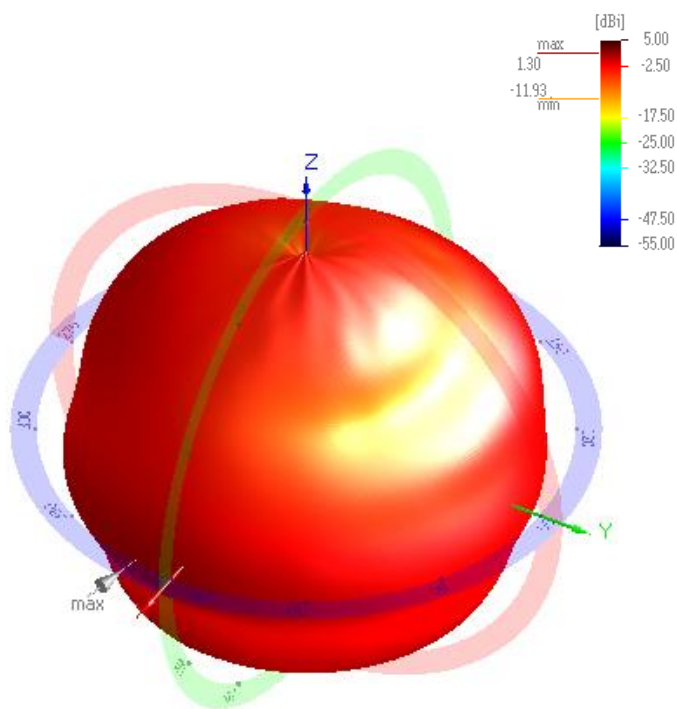
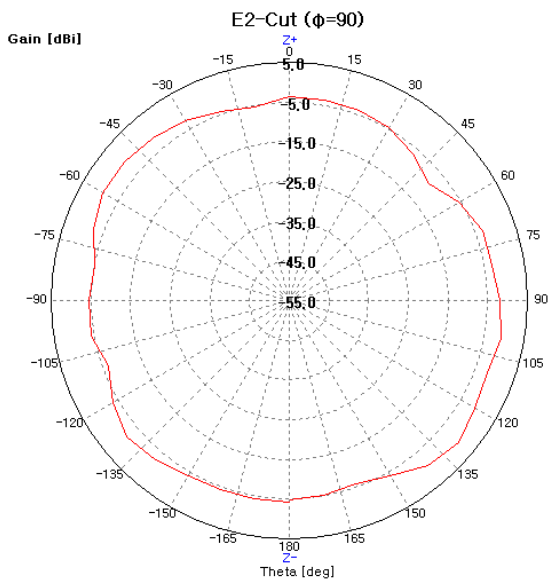
H-Cut ($\theta=90$)



E1-Cut ($\phi=0$)



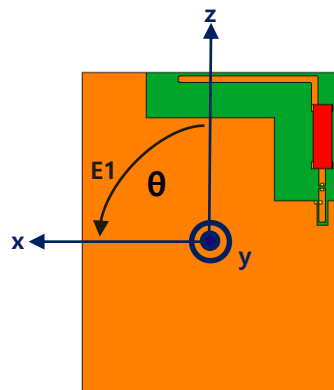
E2-Cut ($\phi=90$)



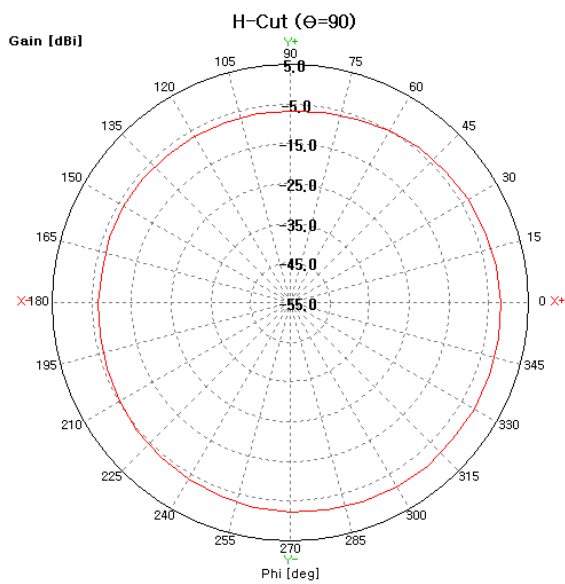
Measured Case#02 EVB 2D/3D radiation pattern @915MHz

3.2.3 Measurement Results of EVB Case#03

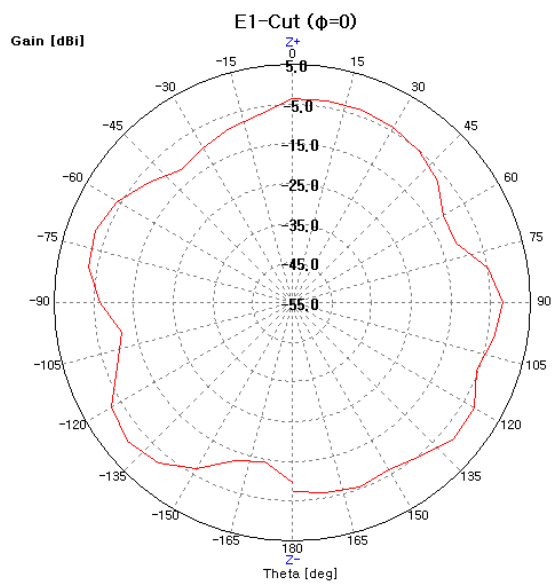
Freq. [MHz]	Peak Gain [dBi]	Avg. Gain [dBi]	Efficiency [%]
863	0.02	-4.6	35
868	0.18	-4.4	36
870	0.10	-4.5	36



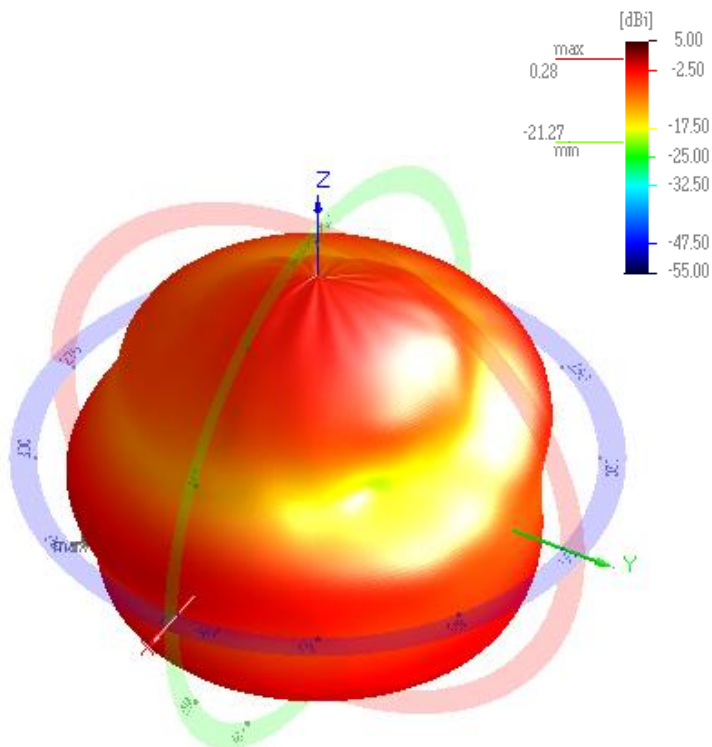
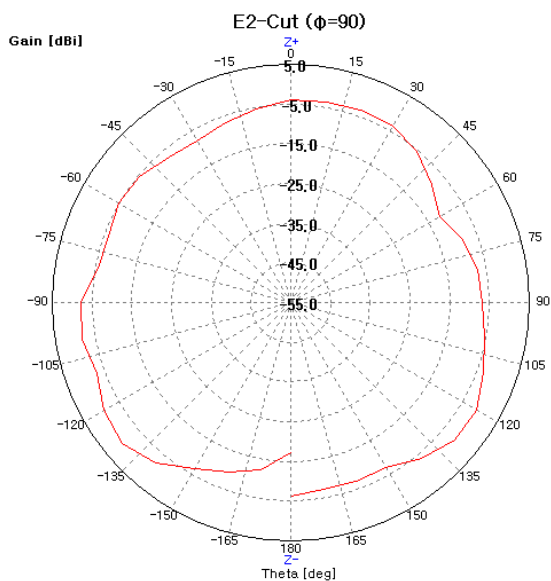
H-Cut ($\theta=90$)



E1-Cut ($\phi=0$)



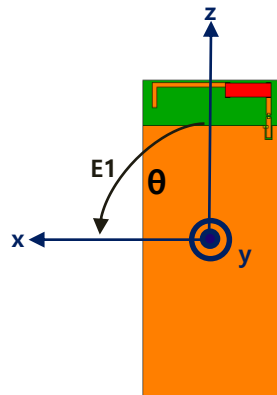
E2-Cut ($\phi=90$)



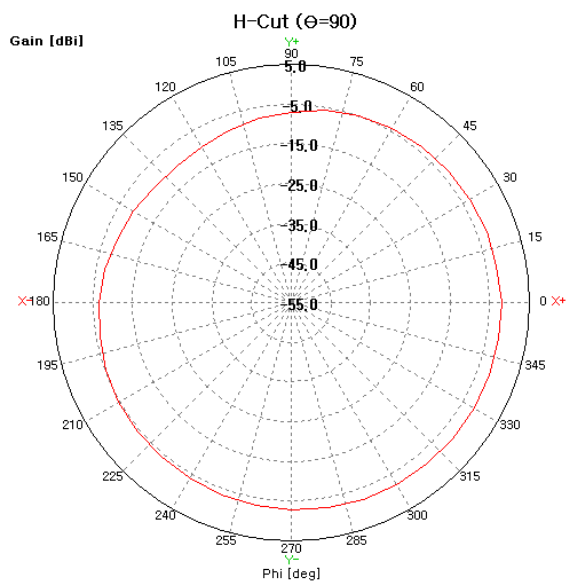
Measured Case#03 EVB 2D/3D radiation pattern @868MHz

3.2.4 Measurement Results of EVB Case#04

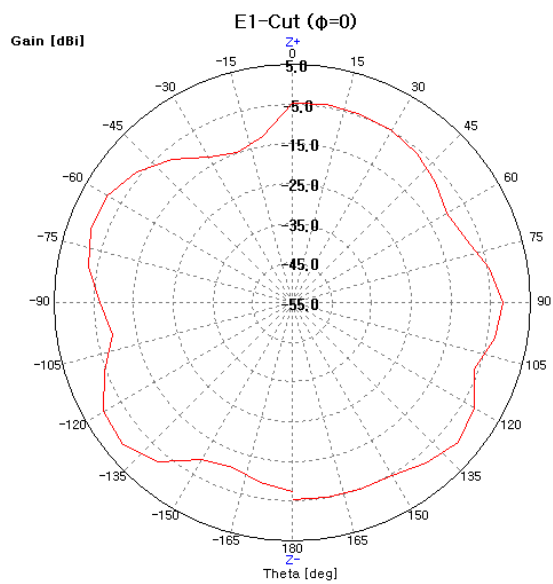
Freq. [MHz]	Peak Gain [dBi]	Avg. Gain [dBi]	Efficiency [%]
863	0.74	-3.6	43
868	0.78	-3.6	43
870	0.68	-3.7	42



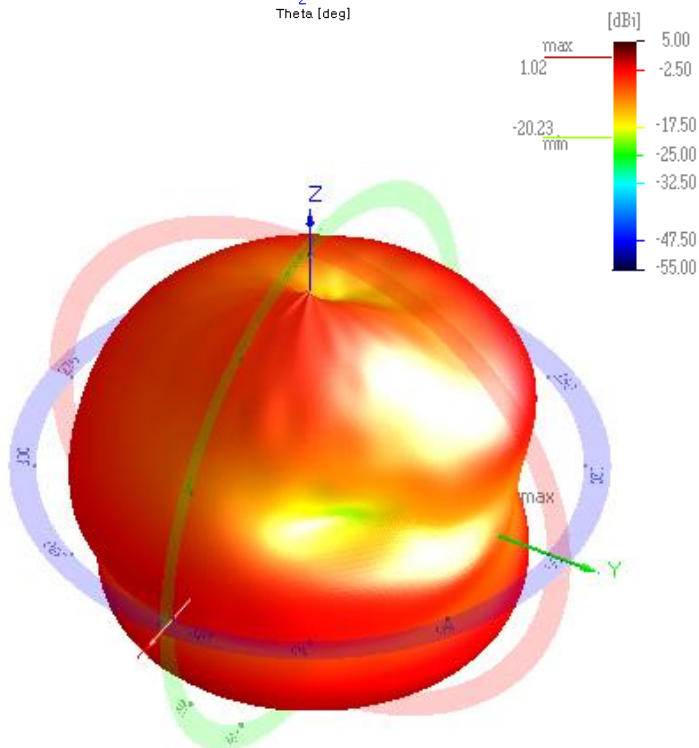
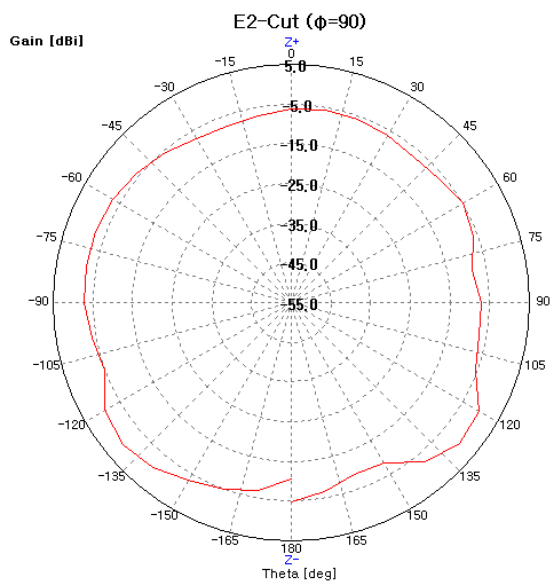
H-Cut ($\theta=90$)



E1-Cut ($\phi=0$)

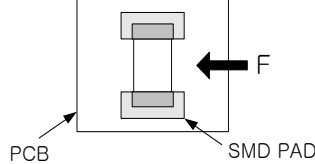


E2-Cut ($\phi=90$)



Measured Case#04 EVB 2D/3D radiation pattern @868MHz

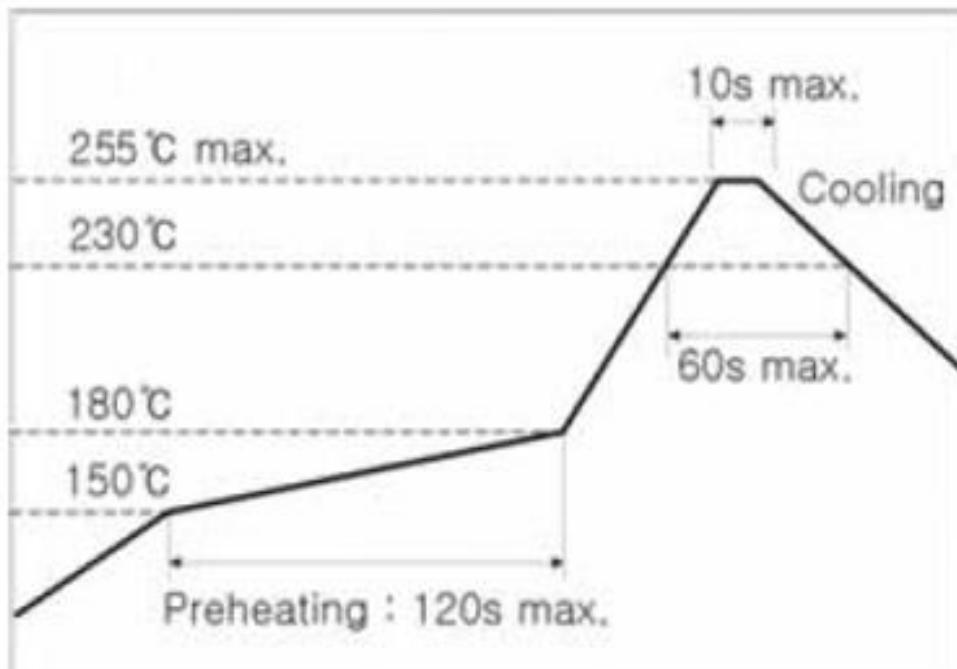
4. Reliability

No	Item	Test Condition	Test Requirements
1	Adhesive Strength of Termination	1. Apply force on SMT chip till detached from PCB. 	1. No mechanical damage on chip within applied force ($F \leq 5 \text{ kgf}$. 2. Force ($F > 5 \text{ kgf}$) should be applied till the chip is detached or damaged.
2	Thermal Shock (Cycle)	1. Step 1 : $-40 \pm 3^\circ\text{C}$, 30 min Step 2 : $+85 \pm 3^\circ\text{C}$, 30 min 2. Number of cycle : 30	1. No visual damage 2. Within electric specification (VSWR)
3	High Temperature Resistance	1. Temperature : $+85 \pm 5^\circ\text{C}$ 2. Time : 96 hrs.	1. No visual damage 2. Within electric specification (VSWR)
4	Low Temperature Resistance	1. Temperature : $-40 \pm 3^\circ\text{C}$ 2. Time : 96 hrs.	1. No visual damage 2. Within electric specification (VSWR)
5	Humidity	1. Humidity : 85 % RH Temperature : $+85 \pm 3^\circ\text{C}$ 2. Time : 120 hrs.	1. No visual damage 2. Within electric specification (VSWR)

5. Cautions (Recommendations)

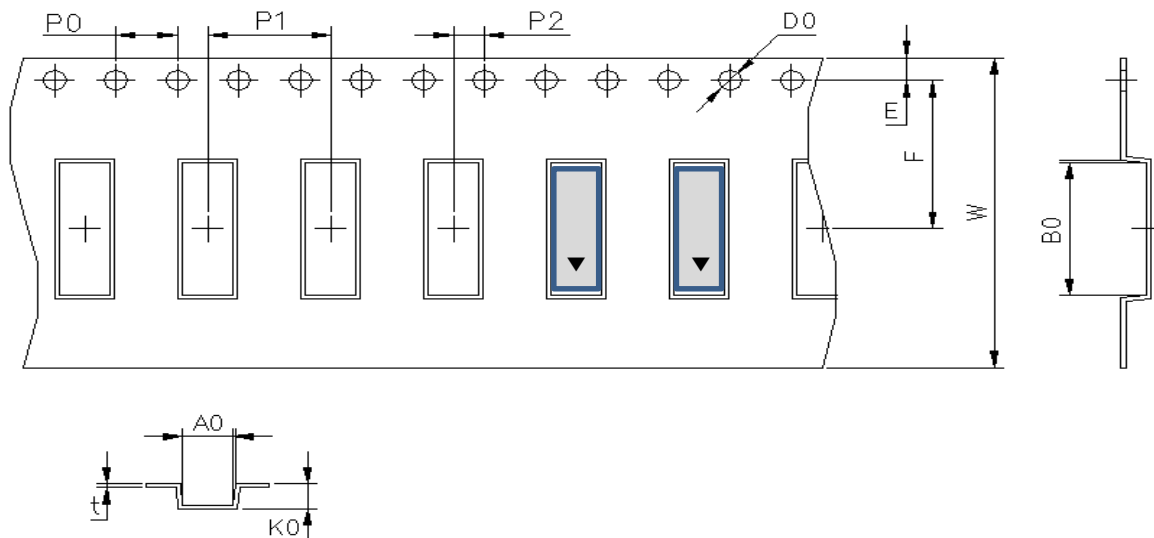
- ✓ Storage environment of parts must be at ambient temperatures of 5 to 40°C and maximum 60%RH humidity
- ✓ The parts should be used within 6 months from the time of delivery. If stored for over 6 months, check for solder ability before use.

6. Soldering Reflow Profile



7. Packaging

7.1 Carrier Tape Dimension



Item	Spec.	Item	Spec.	Item	Spec.
A0	3.30 ±0.10	P0	4.00 ±0.10	E	1.75 ±0.10
B0	10.30 ±0.10	P1	8.00 ±0.10	F	11.50 ±0.10
K0	1.65 ±0.10	P2	2.00 ±0.10	W	24.00 ±0.30
D0	1.55 ±0.05	-	-	t	0.30 ±0.05

7.2 Packaging Quantity

Item	Quantity	Dimension
Reel	4,000 ea	Φ13" * 24mm
Inner	4,000 ea (1 Reel)	350 * 350 * 55 (mm3)
Outer Box	12,000 ea (3 Inner Box)	390 * 375 * 205 (mm3)

7.3 Packaging Label

AMOTECH Co., Ltd.

5BL-1Lot, 617, Namchon-Dong, Namdong-Gu, Incheon, Korea

Dielectric Chip Antenna

P/N : AMOCA3H15F4PB

Lot No :

Quantity : 4,000 pcs Date : 2017/02/28