

DRJC-15J03

# Application Note (3<sup>rd</sup> Edition)

Chip antenna  
— The antenna properties —

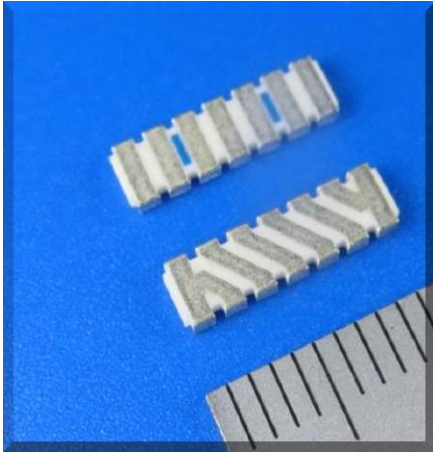
MITSUBISHI MATERIALS CORPORATION  
ELECTRONIC COMPONENTS DIVISION

**Application note (3<sup>rd</sup> Edition)**

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1. AM11DP-ST01 Summary

<Visual>



<Features>

- Small (10.5 × 3.0 × 0.8mm<sup>3</sup>)
- High gain
- Omni-directional

<Applications>

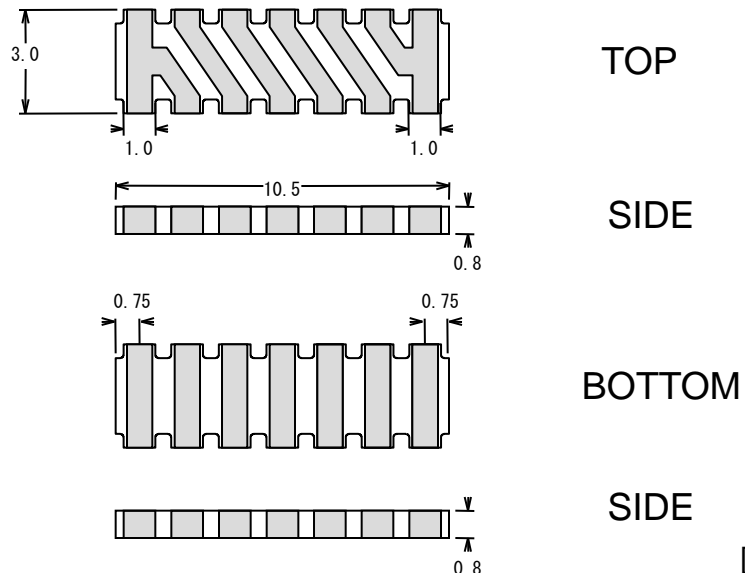
Telemeter(Industrial & medical use)  
 Tele-controller, Data communication,  
 Keyless entry system, Immobilizer  
 system, Voice communication terminal,  
 ZigBee  
 Smart meter, Security system, HEMS

<Specifications>

Parts number	AM11DP-ST01
Frequency range *	315~1600MHz
Impedance	50Ω

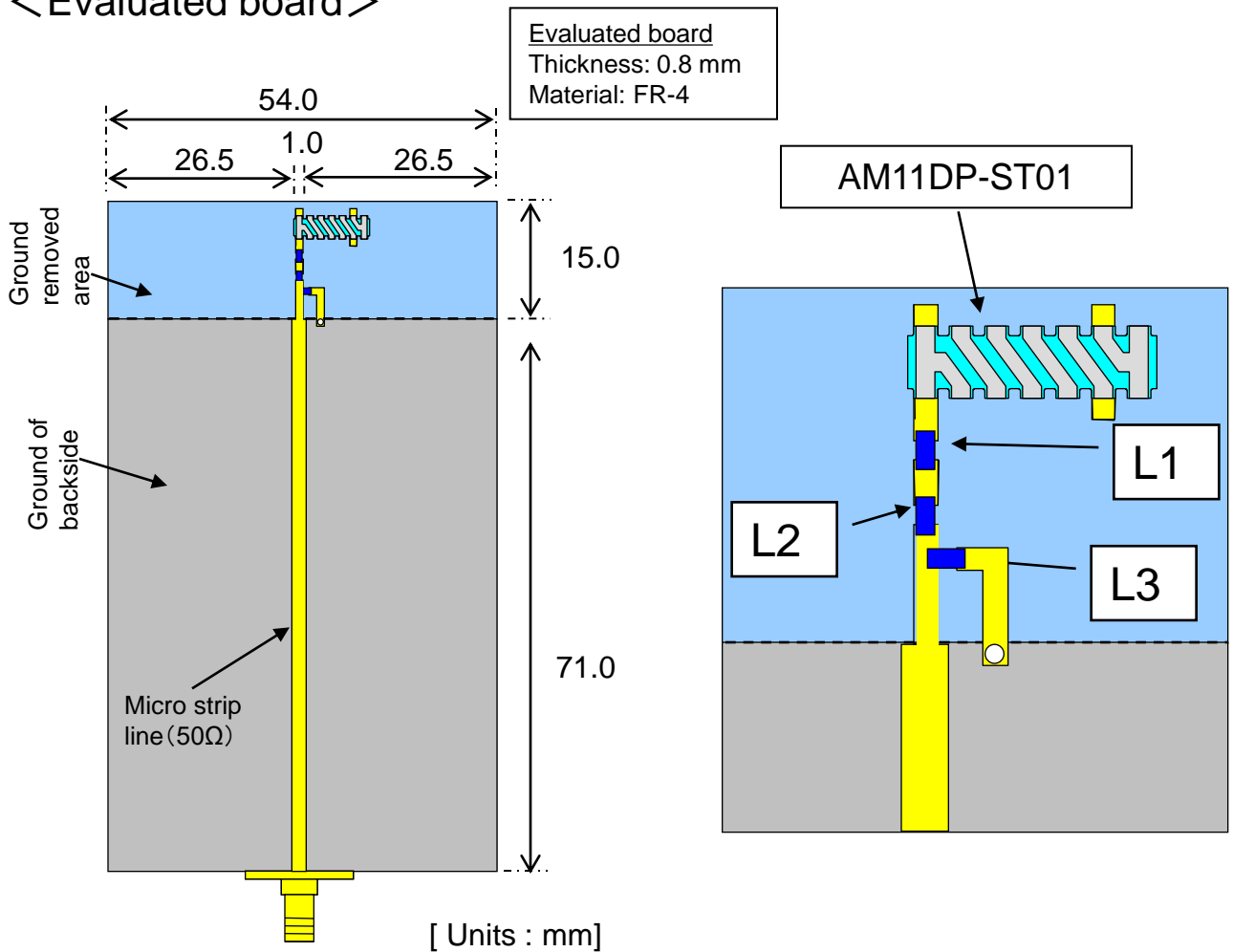
\* With an external tuning circuit , frequency range is applicable from 315MHz to 1600MHz.

<Size >



[Units : mm]

<Evaluated board>

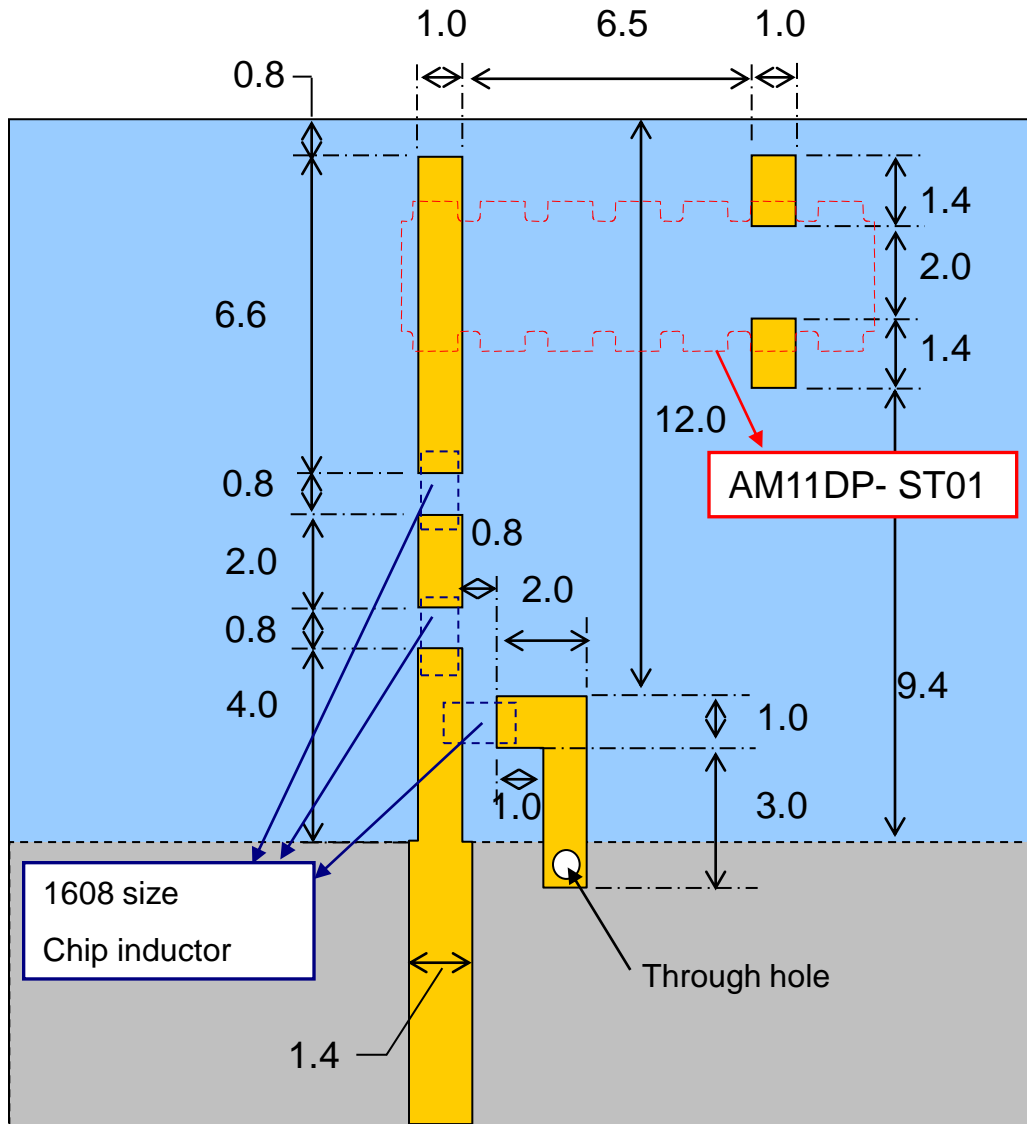


The frequency range is adjustable by changing the value of the inductor.

※ The type of inductor to recommend : Wire wound type

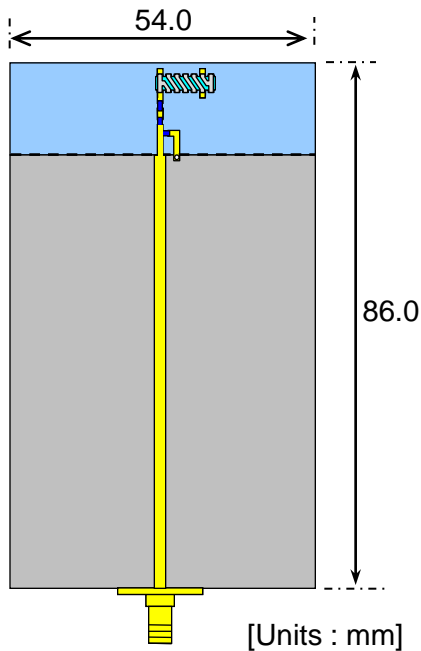
fc [MHz]	Inductance [nH]		
	L1	L2	L3
315	88	390	33
430	30	220	16
868	4.3	47	8.2
915	8.7	39	7.5

< The land pattern for AM11DP-ST01 >



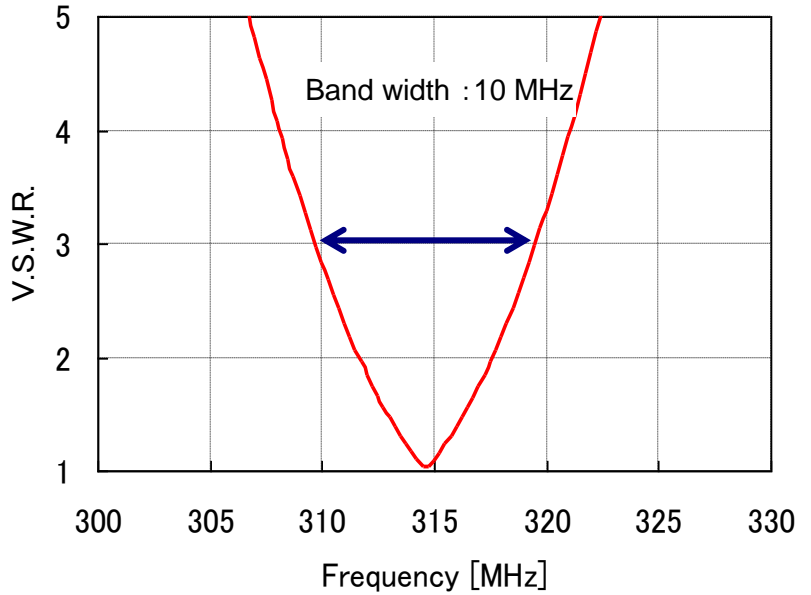
[ Units : mm]

1. AM11DP-ST01  
 1) 315MHz

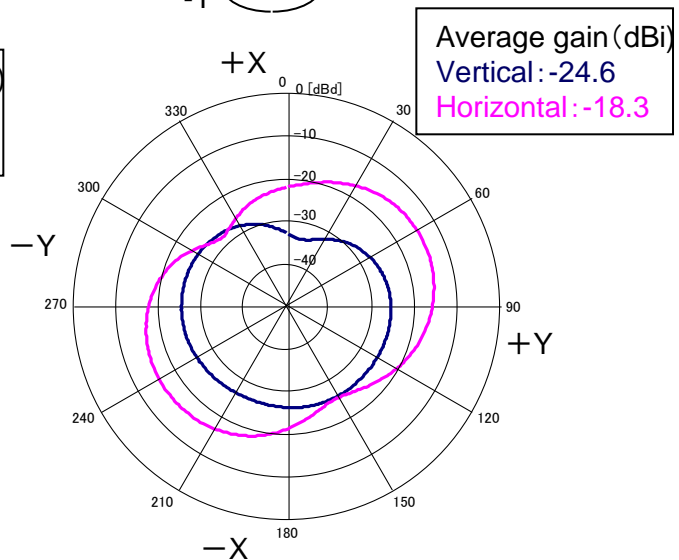
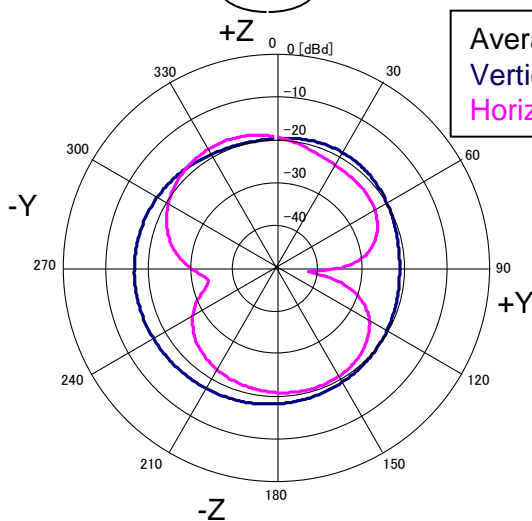
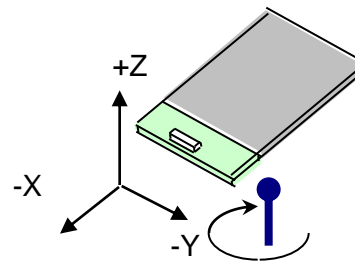
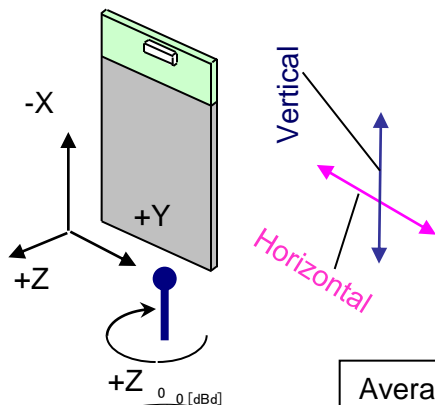


[Units : mm]

**Evaluated board**



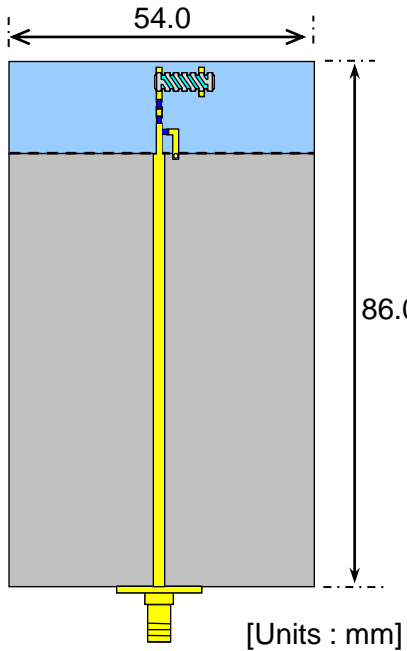
**V.S.W.R.**



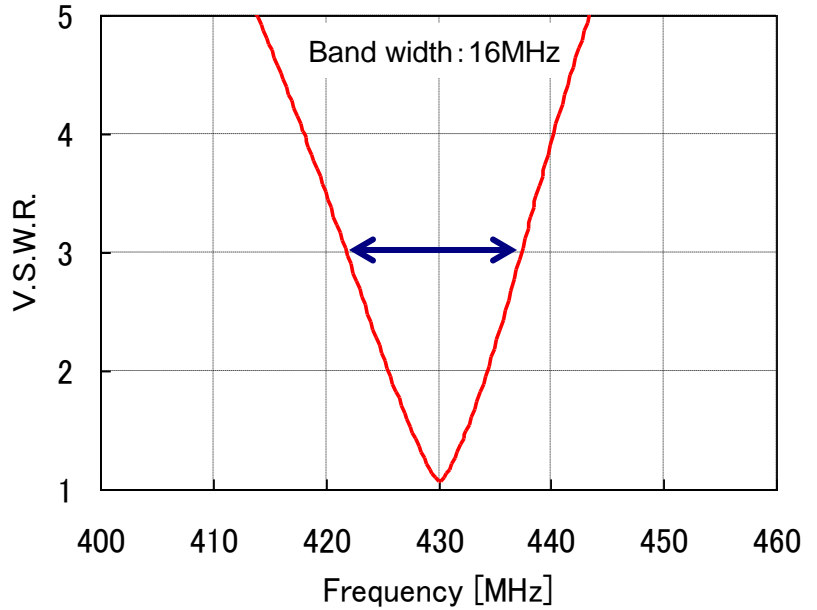
**Radiation pattern:fc=315MHz**

※These characteristics are not guaranteed ones ,but typical ones.

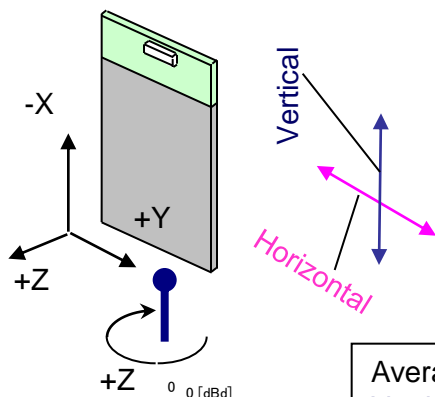
1. AM11DP-ST01  
 2) 430MHz



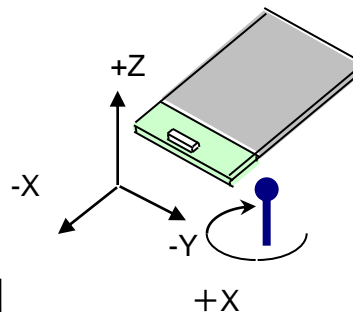
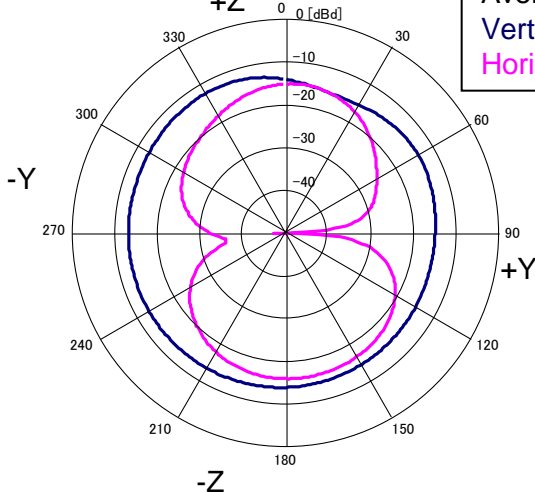
**Evaluated board**



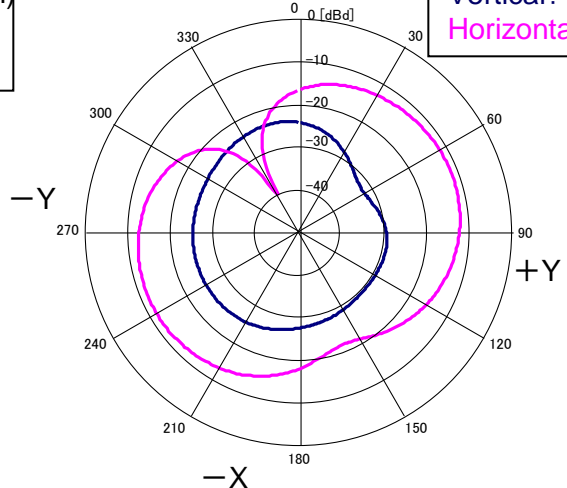
**V.S.W.R.**



Average gain (dBi)  
 Vertical: -11.7  
 Horizontal: -16.9



Average gain (dBi)  
 Vertical: -24.3  
 Horizontal: -12.3

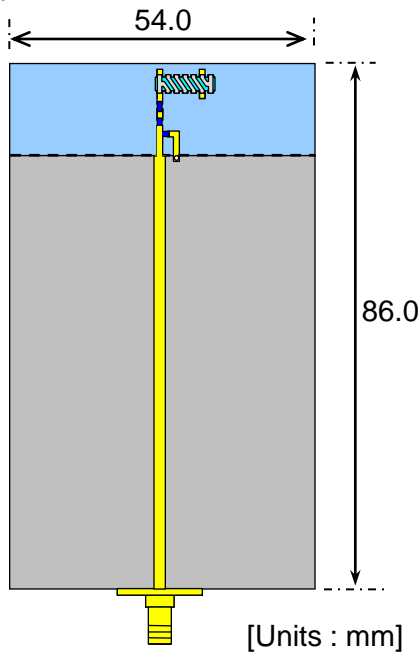


**Radiation Pattern:fc=430MHz**

※These characteristics are not guaranteed ones ,but typical ones.

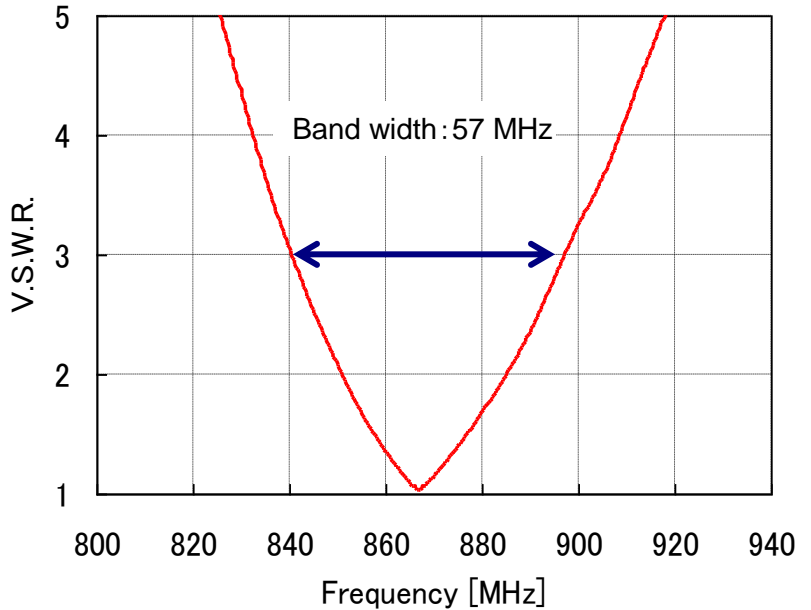
1. AM11DP-ST01

3) 868MHz

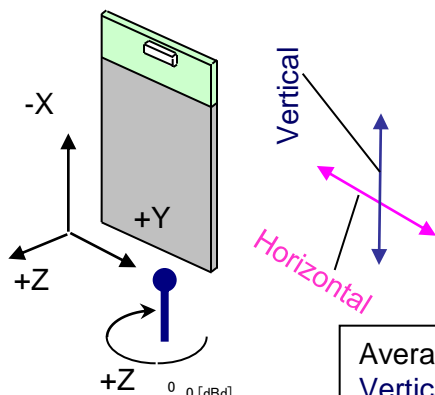


**Evaluated board**

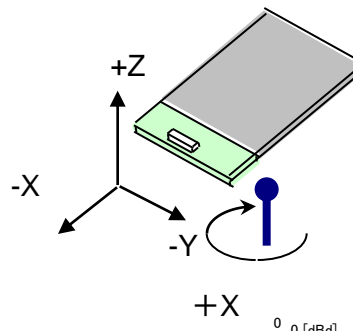
[Units : mm]



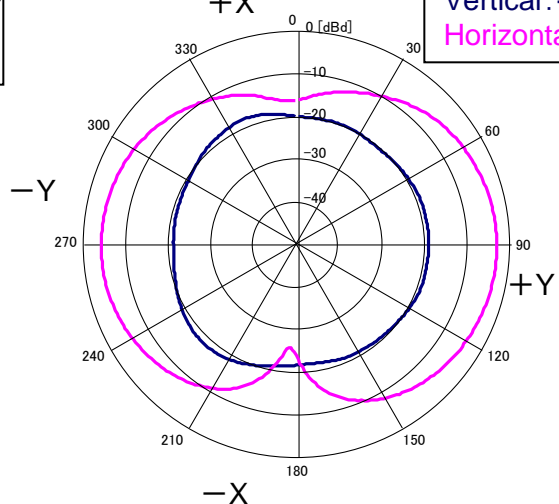
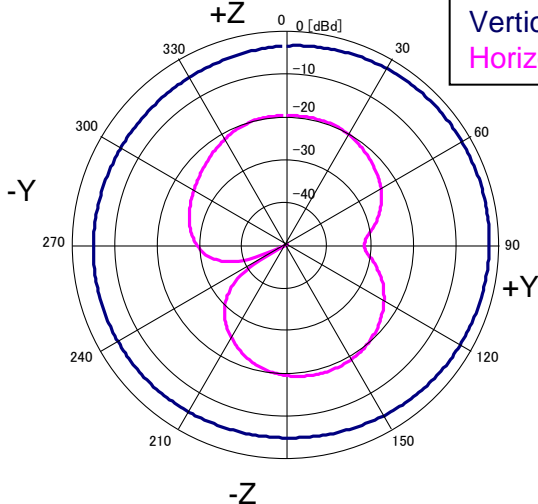
**V.S.W.R.**



Average gain (dBi)  
 Vertical: -1.6  
 Horizontal: -20.4



Average gain (dBi)  
 Vertical: -17.7  
 Horizontal: -4.7

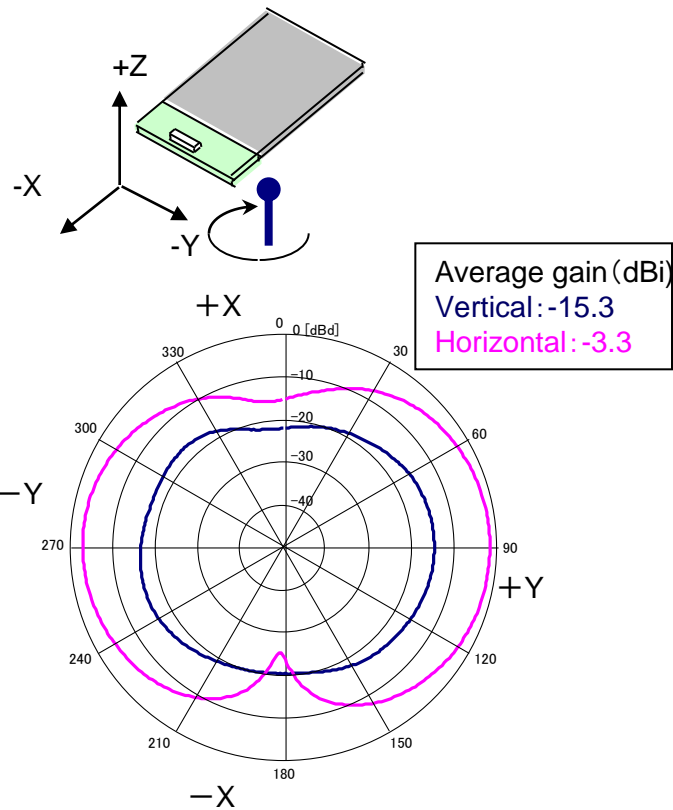
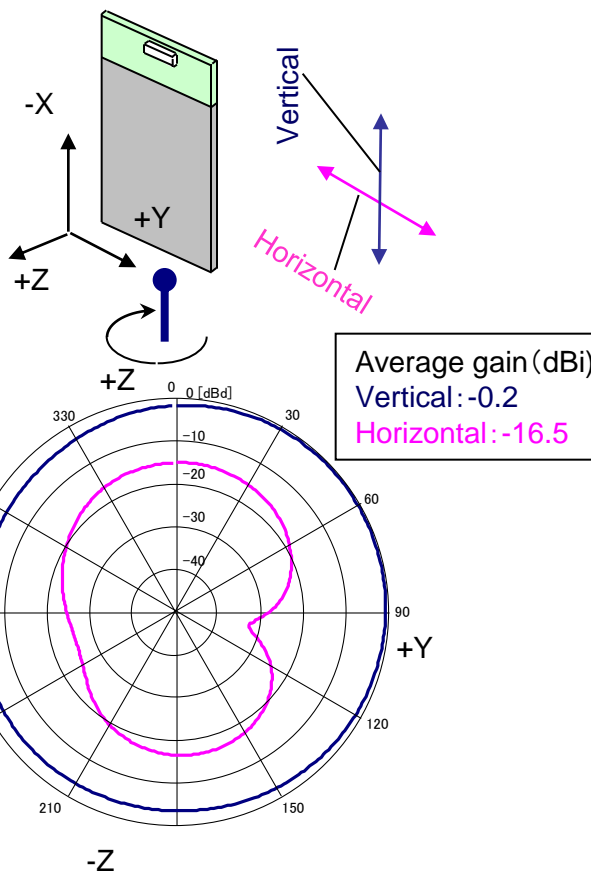
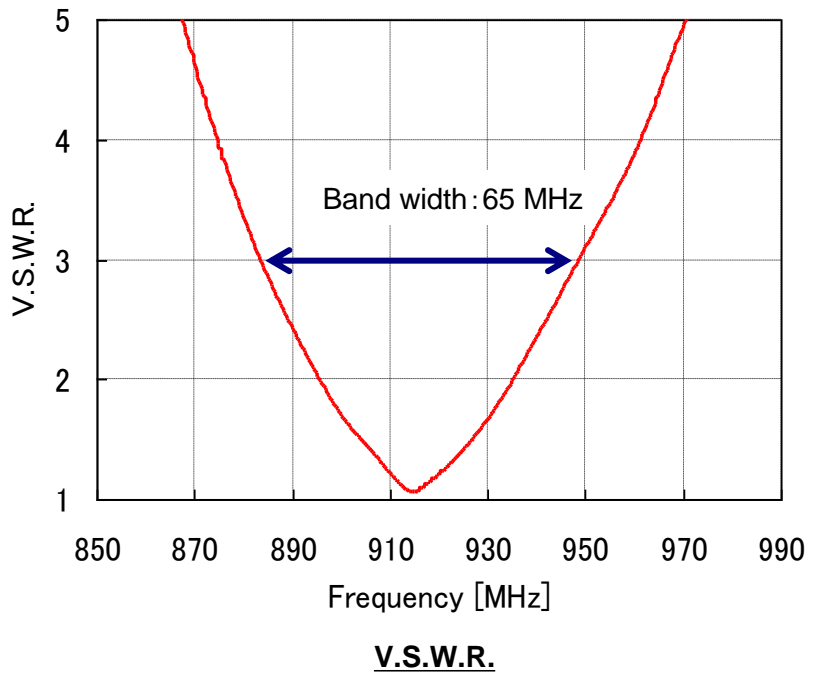
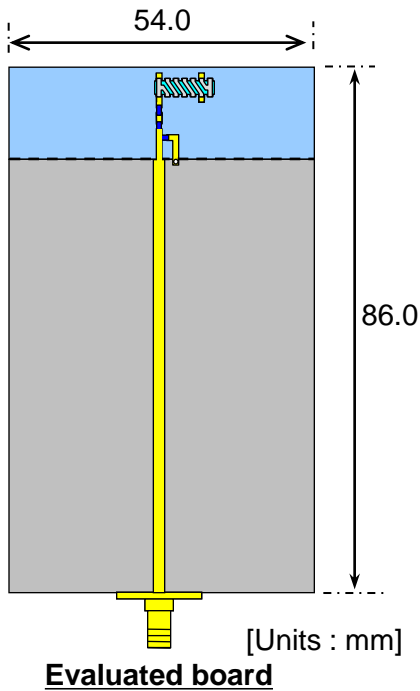


**Radiation pattern: fc=868MHz**

※These characteristics are not guaranteed ones ,but typical ones.



1. AM11DP-ST01  
 4) 915MHz

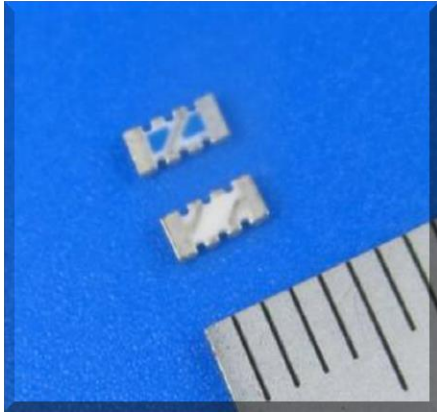


**Radiation pattern: fc=915MHz**

※These characteristics are not guaranteed ones ,but typical ones.

2. AM03DP-ST01 Summary

<Visual>



<Feature>

- Very small (  $3.2 \times 1.5 \times 0.4\text{mm}^3$  )
- High gain
- Omni-directional

<Applications>

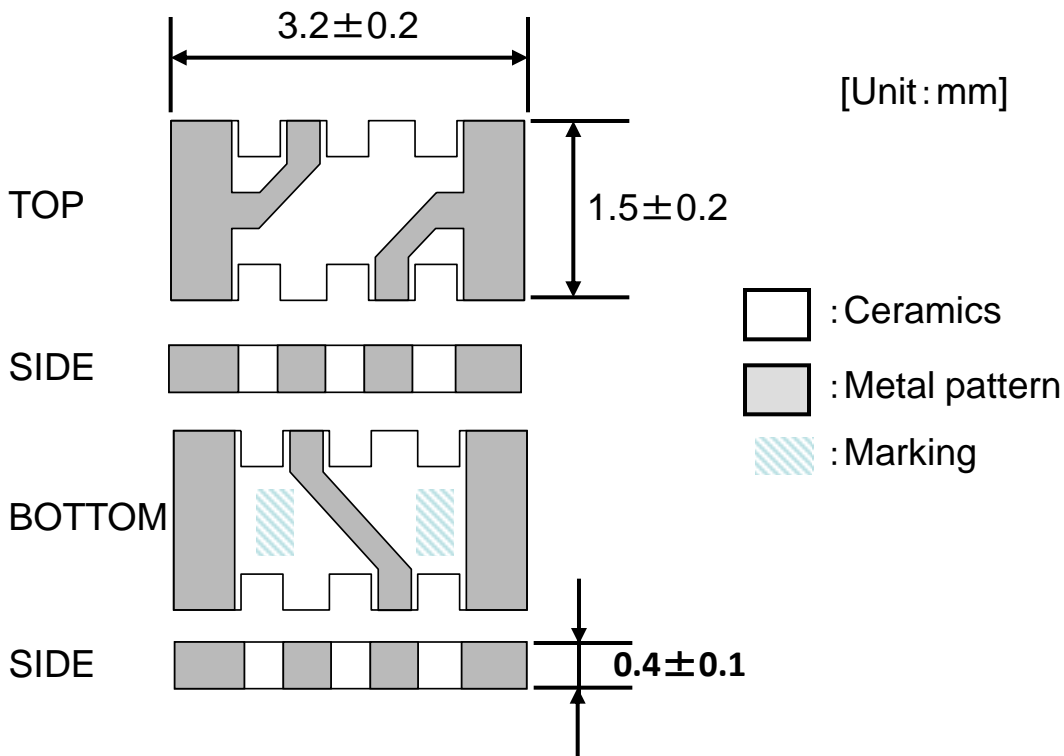
Bluetooth/BLE device, IEEE802.11b/g device, ZigBee device, DECT

<Specifications>

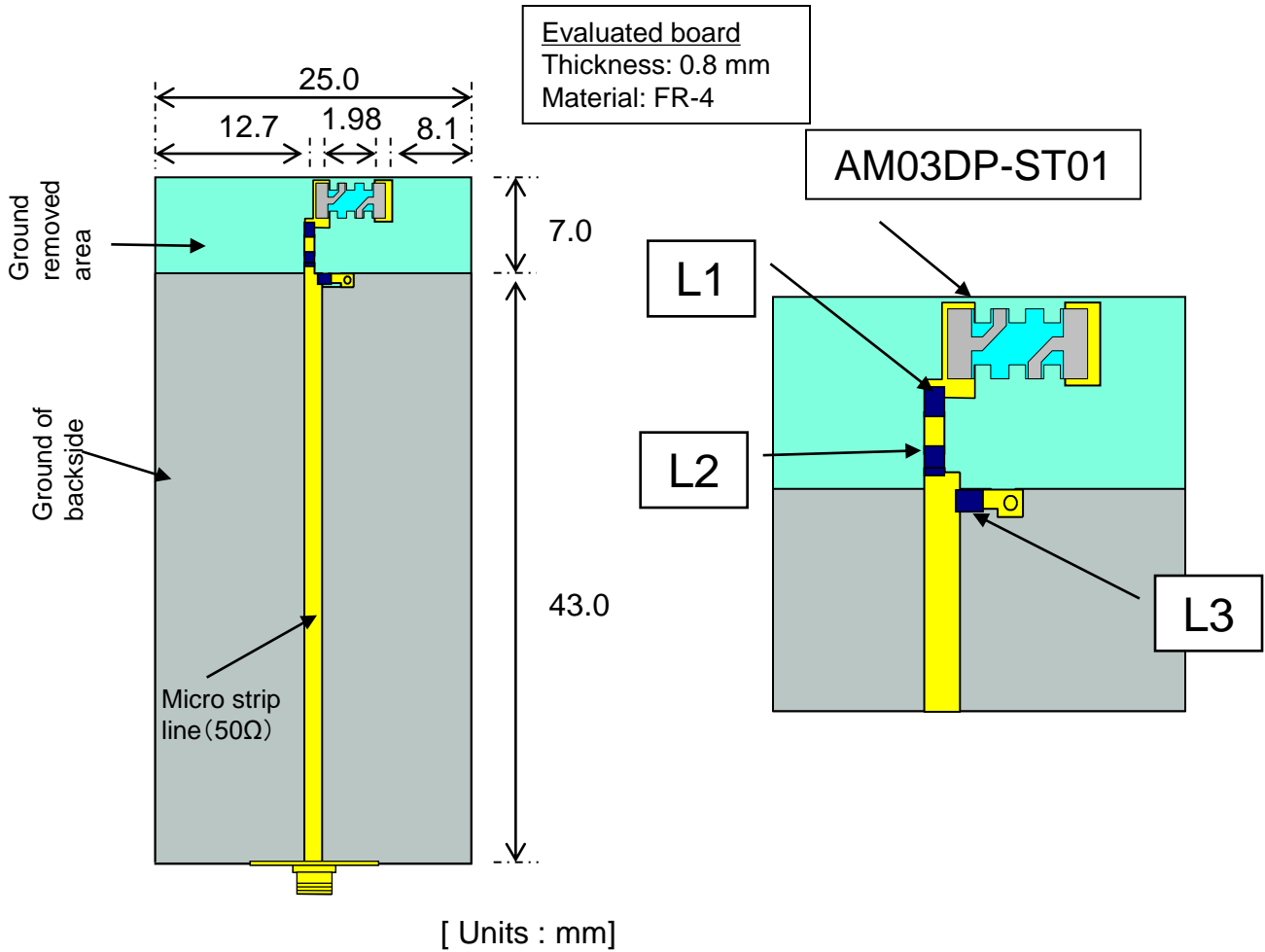
Parts number	AM03DP-ST01
Frequency range *	1500~6000MHz
Impedance	50Ω

\* Impedance and center frequency shifting can be adjusted with an external tuning circuit.

<Size>



<Evaluated board>

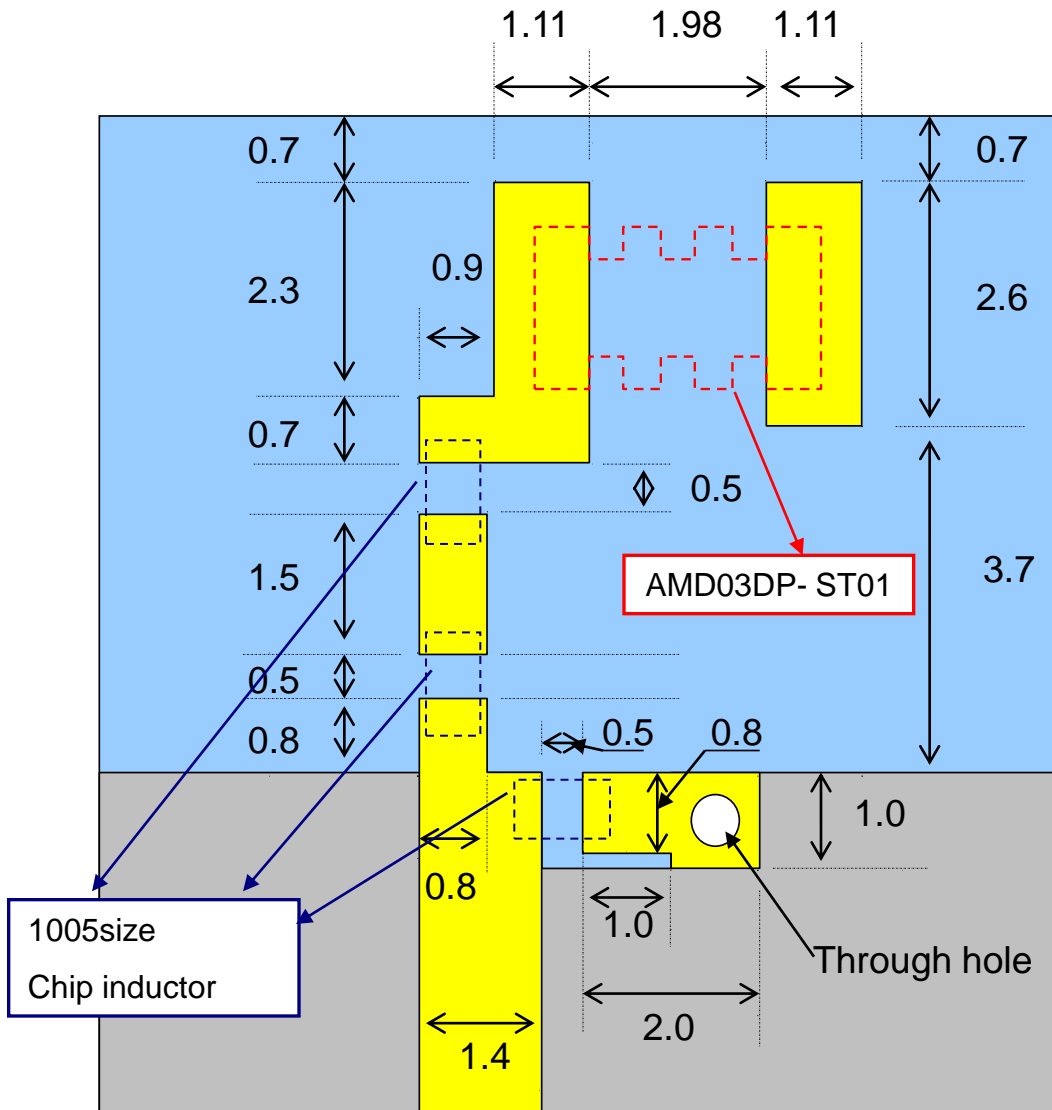


**Optimal value of chip inductors for 25mm × 50mm size evaluated board**

**Chip inductor : Wire wound type**

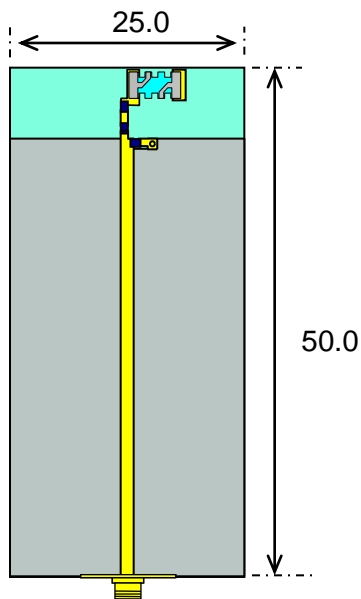
fc [MHz]	Inductance [nH]		
2442	L1	L2	L3
	2.9	8.7	2.4

< The land pattern for AM03DP-ST01 >



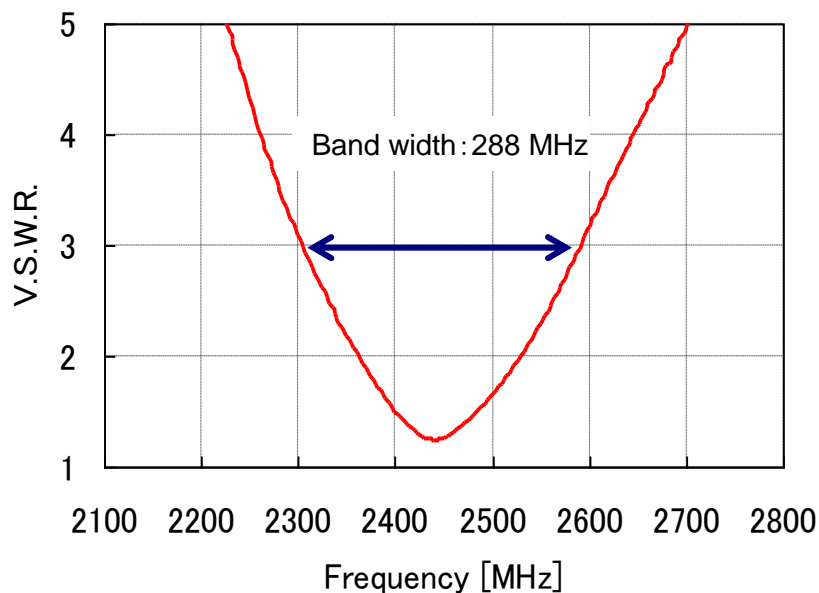
[ Units : mm]

2. AM03DP-ST01

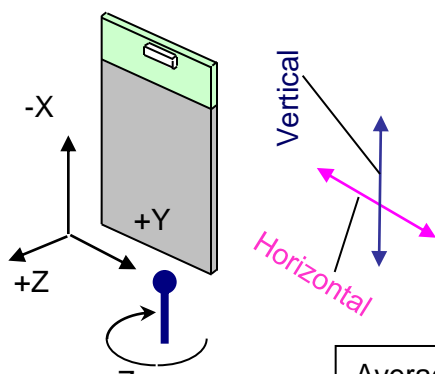


[Units : mm]

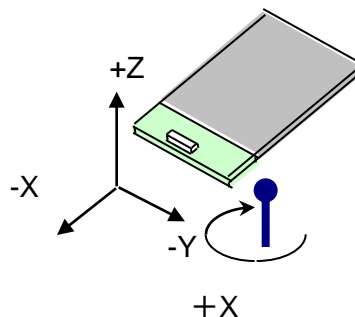
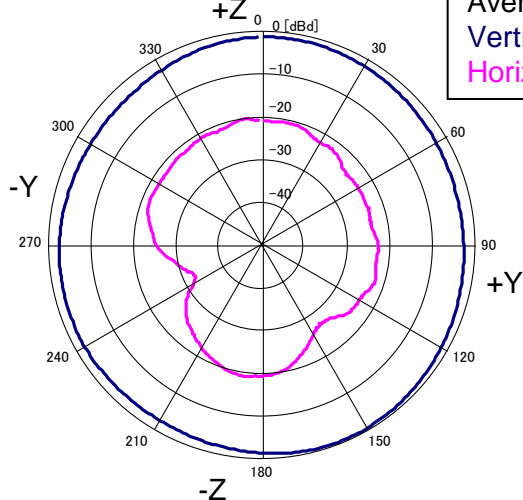
**Evaluated board**



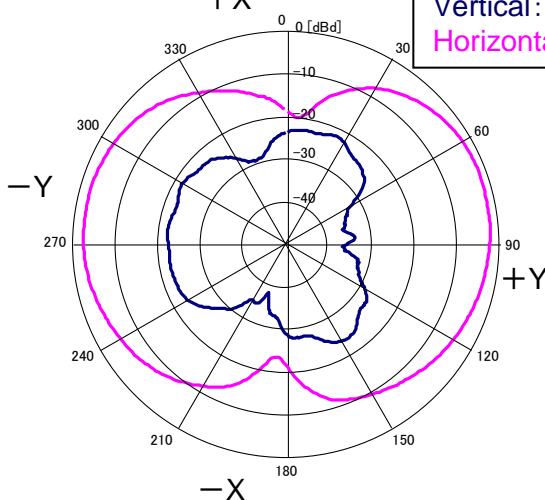
**V.S.W.R.**



Average gain (dBi)  
Vertical: 0.1  
Horizontal: -20.4



Average gain (dBi)  
Vertical: -23.3  
Horizontal: -3.4



**Radiation pattern fc=2442MHz**

※These characteristics are not guaranteed ones ,but typical ones.