Type1MW
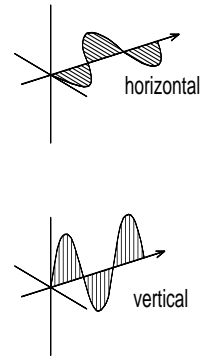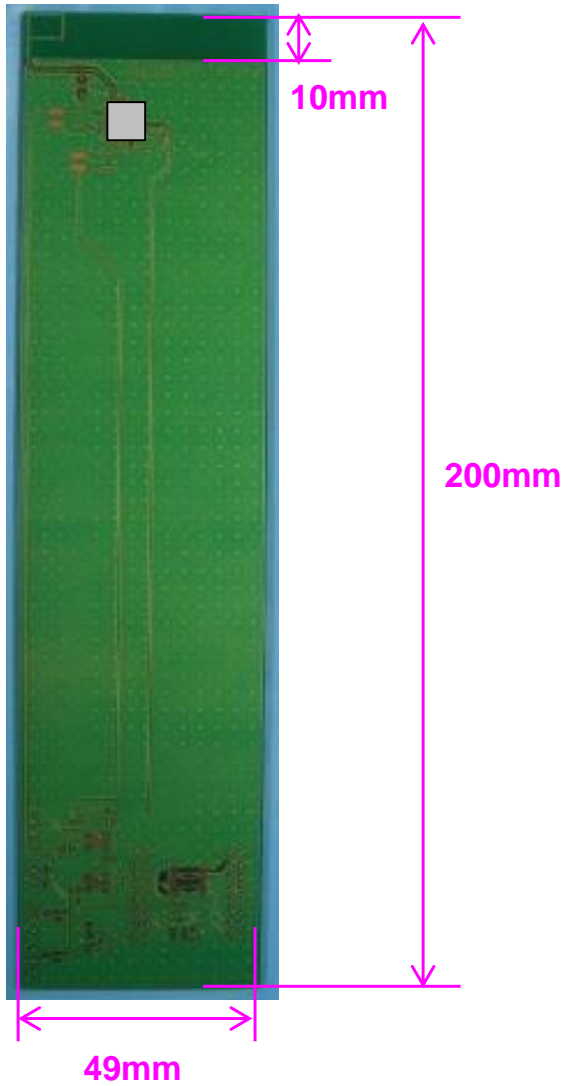# Antenna Design Guide
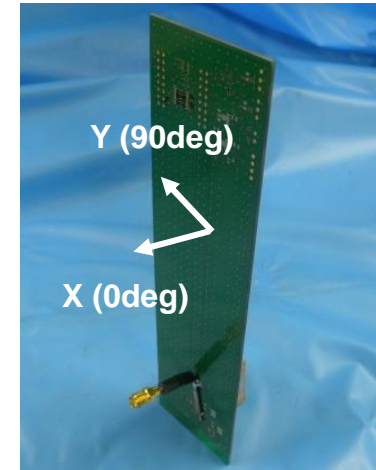
Apr, 2019
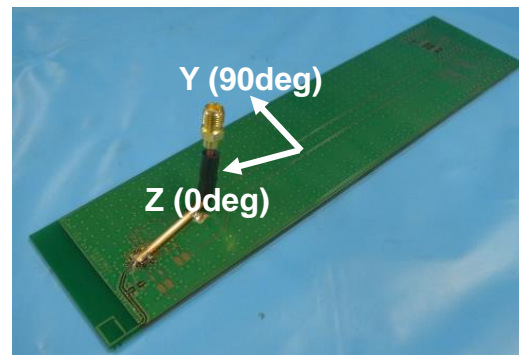
Measurement Board
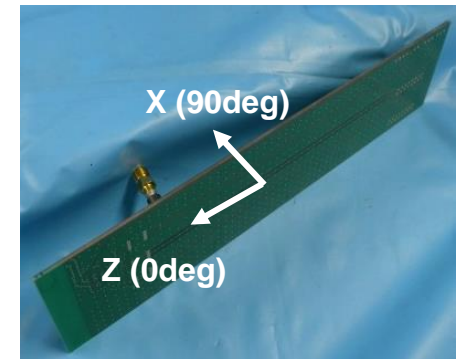

10mm

200mm

49mm

XY plane

horizontal

vertical

Y (90deg)

X (0deg)

YZ plane

ZX plane

Y (90deg)

Z (0deg)

X (90deg)

Z (0deg)

Antenna Performance for 2.4GHz

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			[dBi]					[dB]
LINEAR POLARIZATION		XY-plane		YZ-plane		ZX-plane		Total Efficiency
		hor.	ver.	hor.	ver.	hor.	ver.	
2400 MHz	MAX.	-3.8	-4.0	-0.1	-18.5	-6.0	-1.2	
	AVE.	-8.1	-7.7	-5.1	-24.0	-13.3	-3.6	-4.3
2442 MHz	**MAX.**	**-3.6**	**-3.7**	**0.1**	**-17.0**	**-5.5**	**-0.8**	
	AVE.	**-7.9**	**-7.3**	**-4.7**	**-22.9**	**-13.0**	**-3.3**	**-3.9**
2484 MHz	MAX.	-3.3	-3.6	0.0	-16.5	-5.5	-0.6	
	AVE.	-7.8	-7.1	-4.6	-22.8	-12.8	-3.1	-3.8

XY plane [dBi]

	HOR.	VER.
MAX	-3.6	-3.7
AVE	-7.9	-7.3

YZ plane [dBi]

	HOR.	VER.
MAX	0.1	-17.0
AVE	-4.7	-22.9

ZX plane [dBi]

	HOR.	VER.
MAX	-5.5	-0.8
AVE	-13.0	-3.3
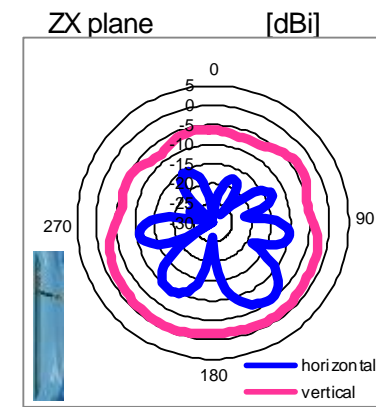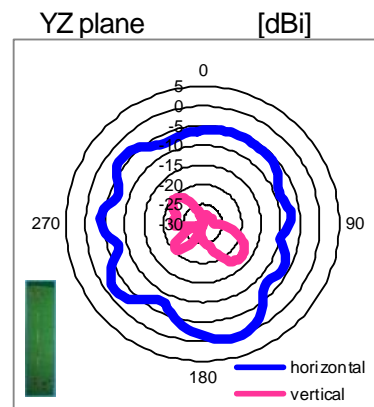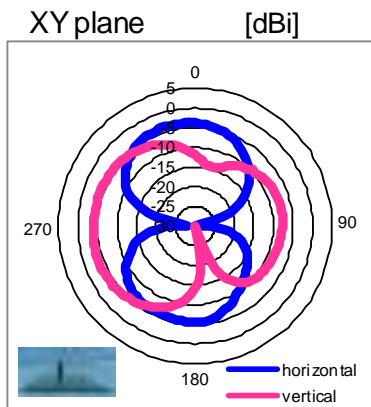
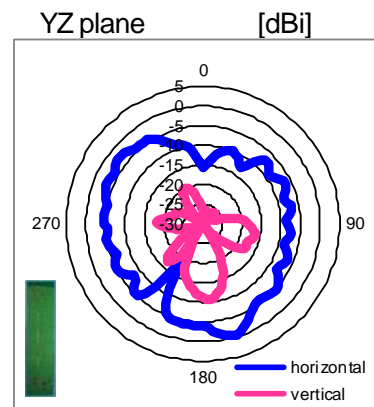Antenna Type: Monopole (pattern antenna)
Antenna Gain: 0.1dBi (peak)

Antenna Performance for 5GHz

			XY-plane		YZ-plane		ZX-plane		[dBi] [dB]
LINEAR POLARIZATION			hor.	ver.	hor.	ver.	hor.	ver.	Total Efficiency
5150 MHz	MAX.		-3.0	-6.1	-0.4	-10.3	-1.6	-1.2	
	AVE.		-8.1	-9.6	-6.1	-18.3	-8.9	-8.6	-5.6
5500 MHz	**MAX.**		**-2.4**	**-4.9**	**-0.6**	**-10.8**	**-0.7**	**-2.9**	
	AVE.		**-7.6**	**-8.6**	**-5.7**	**-19.0**	**-9.0**	**-10.0**	**-5.2**
5850 MHz	MAX.		-1.8	-4.0	-1.3	-10.7	-0.9	-5.1	
	AVE.		-7.6	-8.0	-6.2	-18.4	-8.6	-11.8	-5.4

XY plane   [dBi]
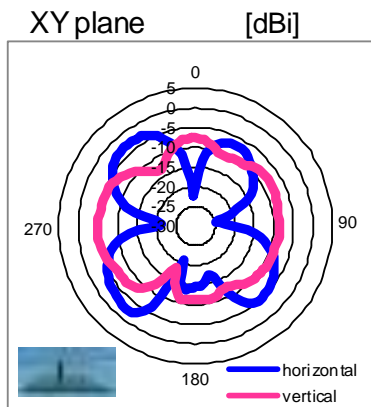
	HOR.	VER.
MAX	-2.4	-4.9
AVE	-7.6	-8.6

YZ plane   [dBi]

	HOR.	VER.
MAX	-0.6	-10.8
AVE	-5.7	-19.0

ZX plane   [dBi]
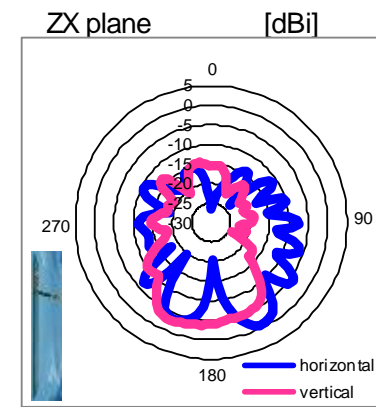
	HOR.	VER.
MAX	-0.7	-2.9
AVE	-9.0	-10.0

Antenna Type: Monopole (pattern antenna)
Antenna Gain: -0.4dBi (peak)

Layout Guide for Good Antenna Performance

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Ground Clearance

Copy from .dxf

10mm
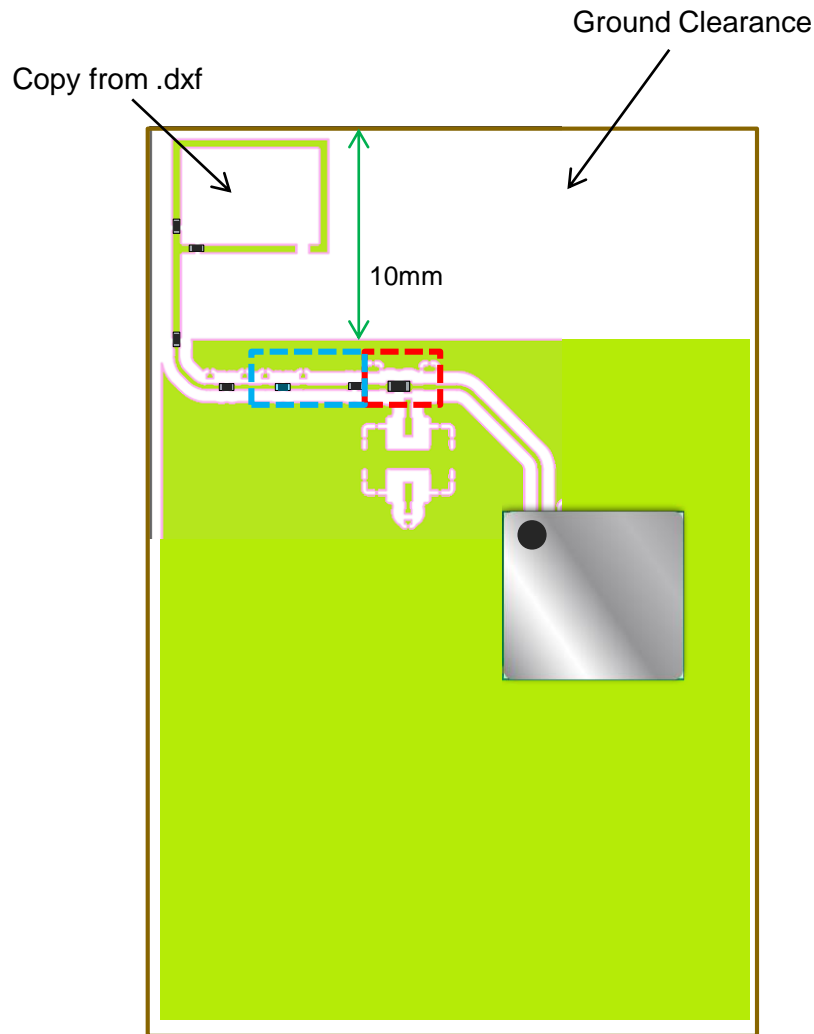
- Place the antenna on top-left(or right) corner.
- Keep GND clearance all long the top edge.
- Place metal stuff as far as possible.
- Place pi-network + one component on series for matching.
  - Put 0ohm in series and no load in parallel on the initial design.
  - Put appropriate value of C/L/R depends on actual performance.
- Place pi-network for attenuating.
  - Put 0ohm in series and no load in parallel on the initial design.
  - Put appropriate value of R depends on actual performance.

**Please follow Installation Manual.**

Antenna Design

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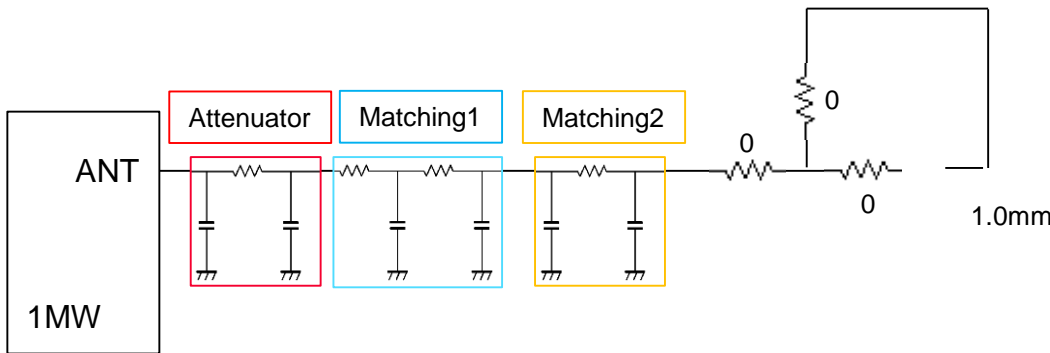
"Attenuator" part should be pi-network as above.
Appropriate value of R depends on the design of the product.
Put 0 ohm in series and no load in parallel on the initial design.

"Matching1" part should be pi-network + 1 series component as above.
Appropriate value of L/C/R depends on the design of the product.
Put 0 ohm in series and no load in parallel on the initial design.

"Matching2" part should be pi-network as above.
Only matching1 might achieve the antenna tuning, but if you have a place to have this part, please add it.
Appropriate value of L/C/R depends on the design of the product.
Put 0 ohm in series and no load in parallel on the initial design.
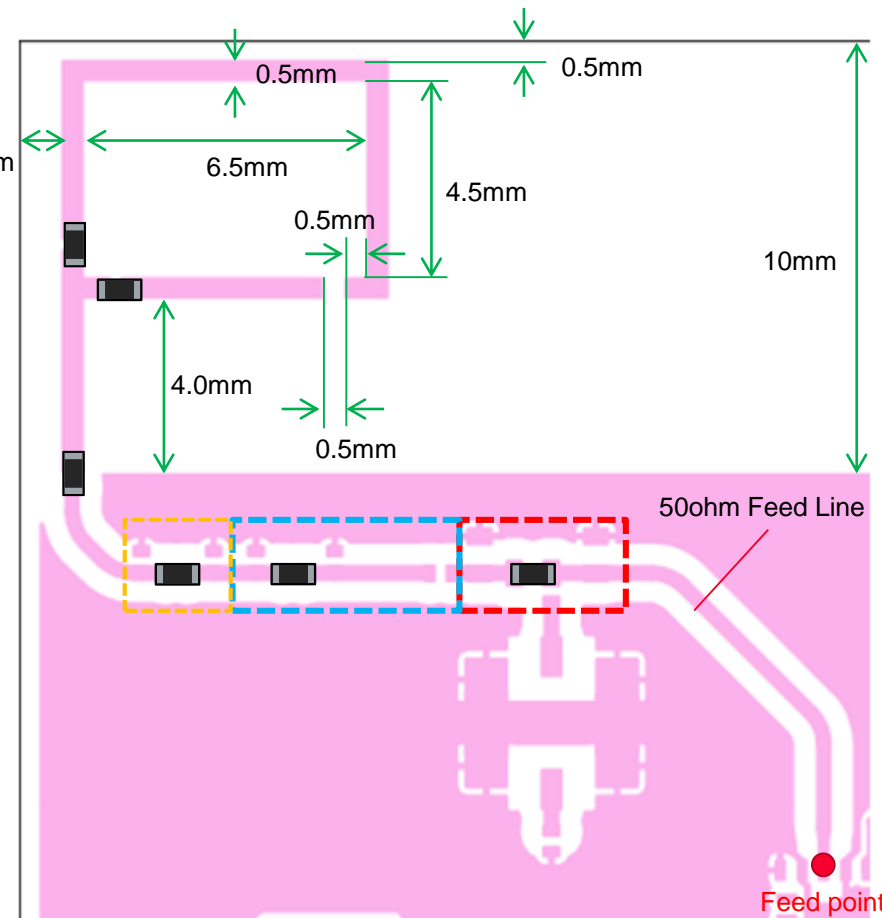
Please follow "type1mw_antenna_p2ml6161.dxf"