

Antenna measurement report for project R370

Pegatron BU6

2025/02/06

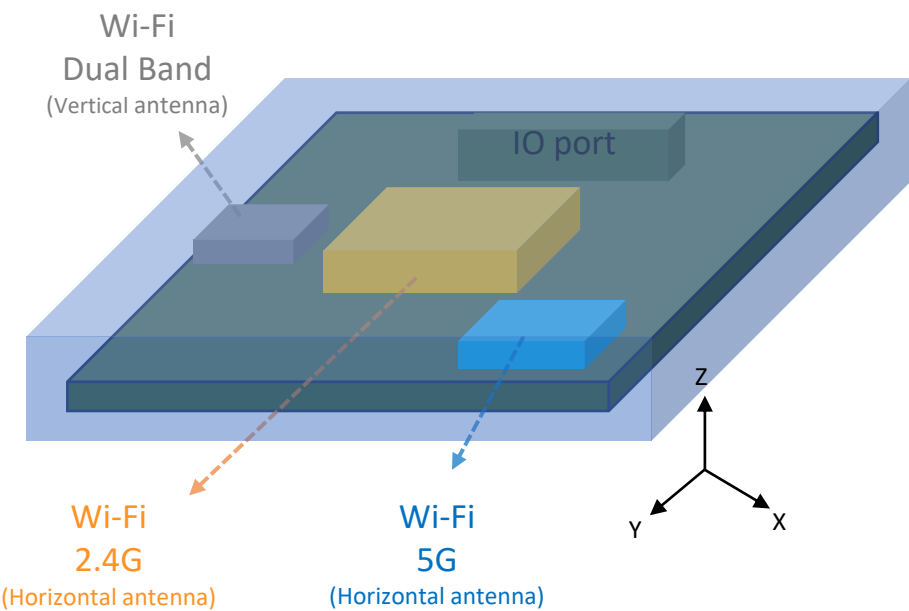
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Reversion history

Date	Rev	Description
2023-12-18		1'st release.
2024-01-03		2'nd Release Update simulation result base on latest housing and adjust dual band Horizontal antenna change to 2.4G and 5G single band
2024-01-26	V 1.0	Based on 1/5 3D drawing to evaluate antenna performance
2024-05-07	V 2.0	EVT1 antenna verification
2024-08-05	V 3.0	EVT2 antenna verification
2024-10-18	V 3.1	Optimize PCB single band 5G antenna(peak gain)
2024-12-24	V 4.0	DVT1 antenna performance verification
2025-02-06	V 5.0	DVT2 antenna performance verification

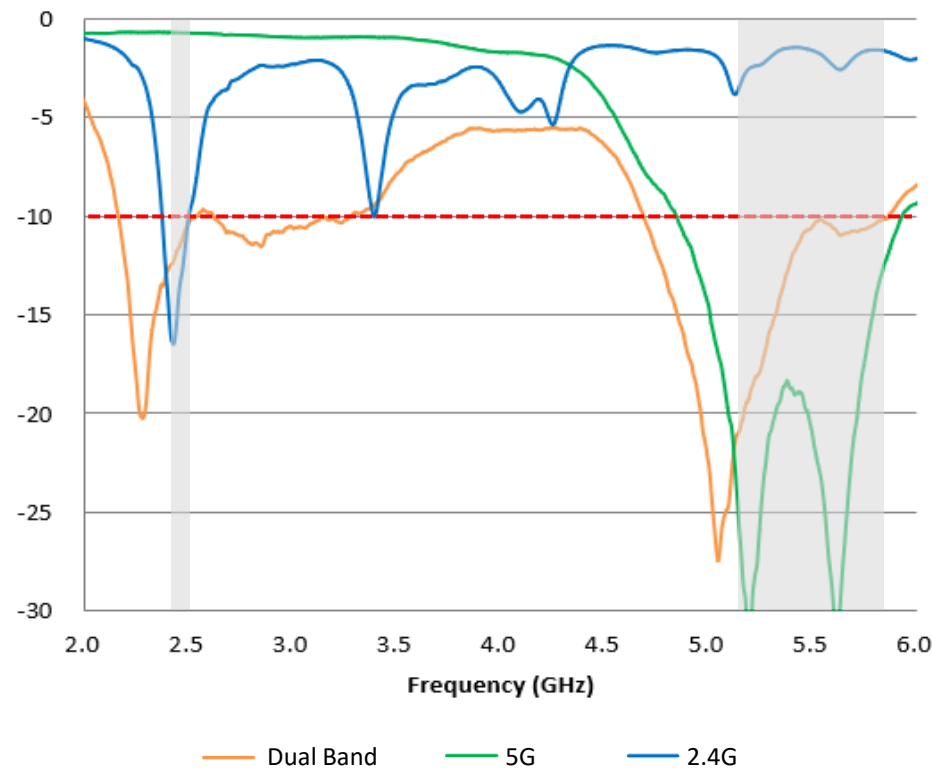
Antenna proposal and specification



Antenna Proposal		
Wireless Function	Wi-Fi : 2.4G 2X2 MIMO 、 5G 2X2 MIMO	
Antenna type	■ Wi-Fi: 2G single band antenna PCB x1(Horizontal) ■ Wi-Fi: 5G single band antenna PCB x1(Horizontal) ■ Wi-Fi: Dual Band antenna Metal x1(Vertical)	
	Customer Spec	Simulation data
Return loss	< -10dB	< -10dB
Isolation	2G to 2G : <-20 dB 5G to 5G : <-25 dB	2G to 2G : <-21 dB 5G to 5G : <-29 dB 2G to 5G : <-26dB
Peak Gain	--	2.4G: <4.71dBi 5G: <4.96dBi
Efficiency	>50%	PCB antenna 2.4GHz >51% PCB antenna 5GHz >61% Metal antenna 2/5GHz >50%

Measurement data

- S-parameter : Return loss

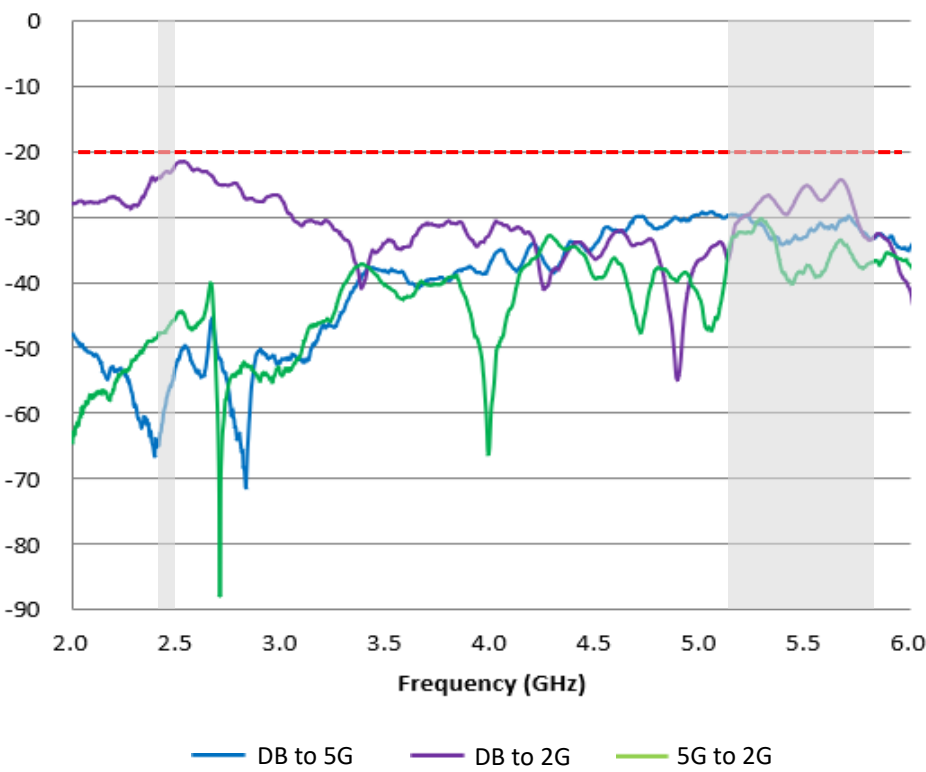


Frequency (MHz)	Wi-Fi Dual Band (Vertical)	Wi-Fi 5G (Horizontal)	Wi-Fi 2G (Horizontal)
2400	-12.66	--	-14.45
2450	-11.61	--	-14.13
2500	-10.33	--	-10.00
5150	-20.78	-26.37	--
5350	-13.71	-18.87	--
5470	-10.72	-19.89	--
5725	-10.69	-19.11	--
5850	-10.13	-12.23	--

Unit: dB

Measurement data

❖ S-parameter : Isolation



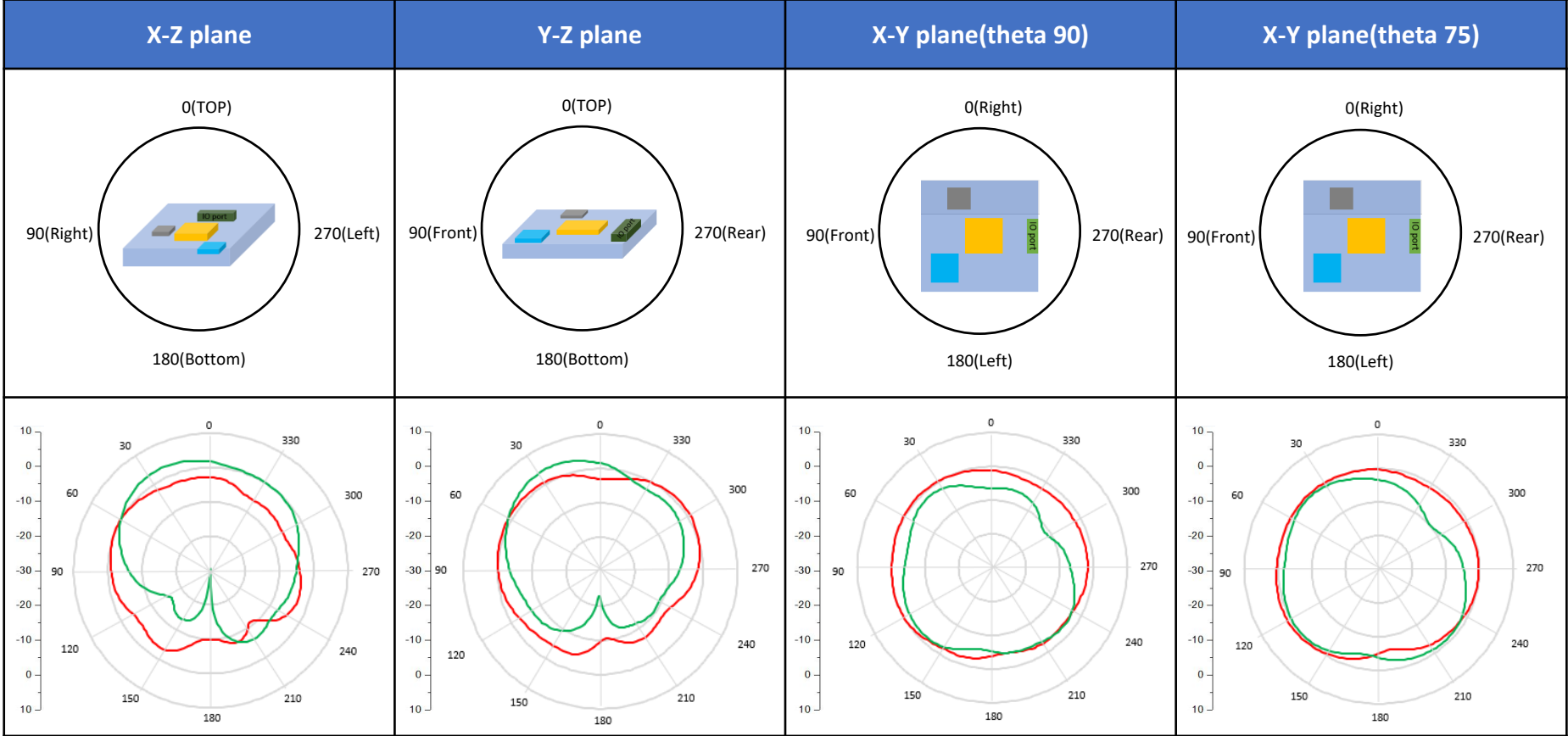
Frequency (MHz)	Dual Band to 5G	Dual Band to 2G	5G to 2G
2400	-64.45	-24.14	-48.22
2450	-57.25	-23.02	-47.00
2500	-51.73	-21.70	-44.77
5150	-29.61	-32.91	-32.94
5350	-32.92	-27.73	-33.60
5470	-33.29	-26.23	-38.25
5725	-30.66	-28.27	-36.08
5850	-32.59	-32.56	-37.15

Unit: dB

Measurement data

❖ Radiation pattern : 2.45GHz

— DB — 2G

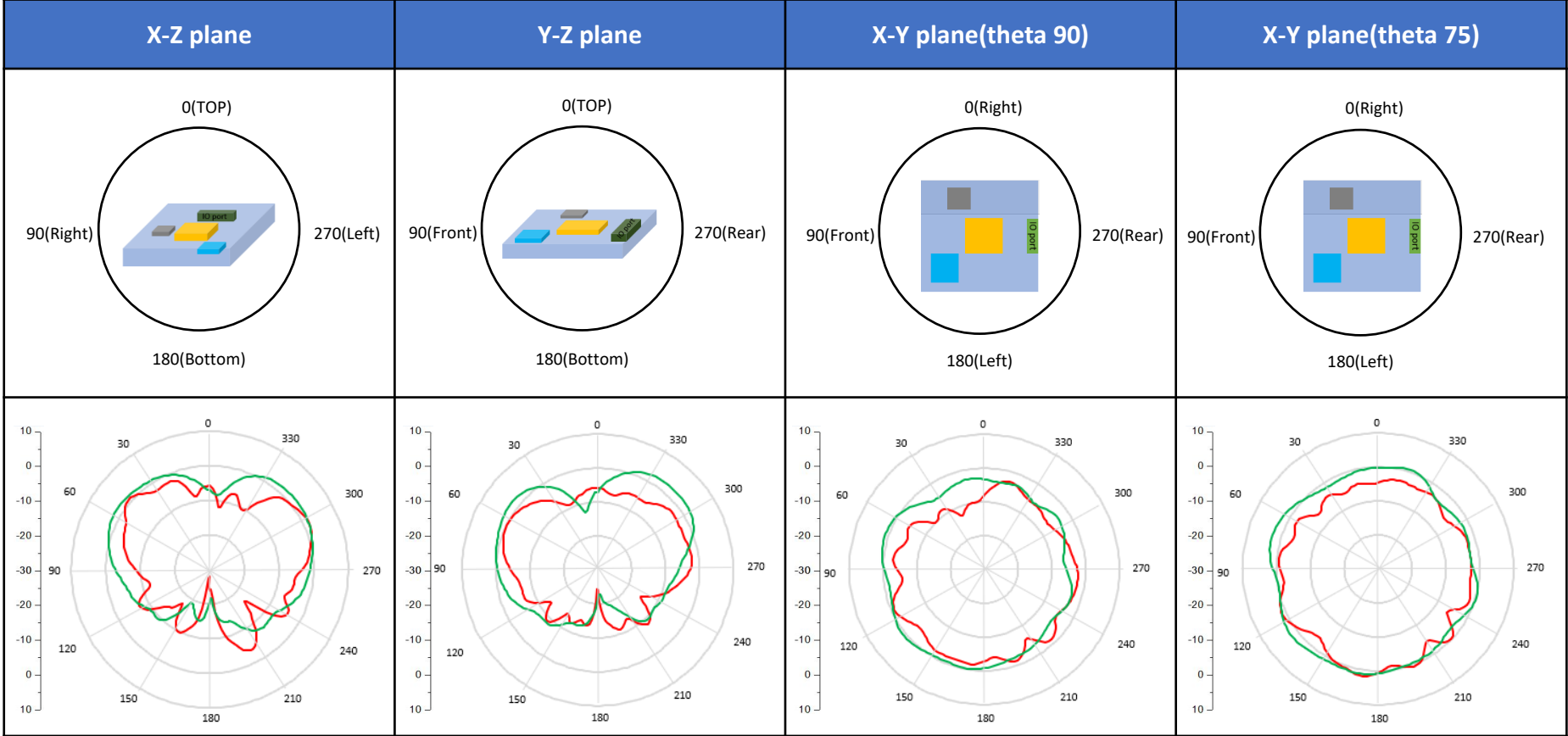


— Max:1.14 Min:-5.81
— Max:-0.03 Min:-9.81

Measurement data

❖ Radiation pattern : 5.47GHz

— DB — 5G



— Max:1.81 Min:-6.24
— Max:2.68 Min:-3.52

Measurement data

❖ Gain table:

Frequency (MHz)	2.4G Antenna			
	PCB _ Single Band		Metal _ Dual Band	
	E-total (dBi)	Efficiency (%)	E-total (dBi)	Efficiency (%)
2400	4.27	56%	2.23	61%
2412	4.46	58%	2.30	63%
2422	4.55	57%	2.27	61%
2437	4.65	57%	2.04	61%
2447	4.67	58%	2.06	63%
2450	4.71	58%	2.05	63%
2462	4.69	56%	2.14	62%
2472	4.61	55%	2.08	62%
2500	4.13	51%	1.64	60%

	5G Antenna								
	PCB _ Single Band		Metal _ Dual Band			PCB _ Single Band		Metal _ Dual Band	
Frequency (MHz)	E-total (dBi)	Efficiency (%)	E-total (dBi)	Efficiency (%)	Frequency (MHz)	E-total (dBi)	Efficiency (%)	E-total (dBi)	Efficiency (%)
5150	4.31	63%	4.66	55%	5500	3.65	65%	4.72	50%
5180	4.32	63%	4.73	54%	5580	3.98	68%	4.73	52%
5200	4.54	67%	4.77	57%	5700	3.94	68%	4.87	52%
5240	4.53	67%	4.84	56%	5720	3.55	65%	4.65	50%
5260	3.93	63%	4.74	52%	5725	3.83	68%	4.96	52%
5300	3.89	65%	4.82	53%	5745	3.64	65%	4.84	50%
5320	4.07	66%	4.90	54%	5785	3.41	65%	4.95	53%
5350	3.94	66%	4.95	54%	5825	3.34	64%	4.92	55%
5470	3.85	66%	4.62	50%	5850	3.32	61%	4.88	52%

Summary

◆ Return loss:

- All antenna return loss can meet $<-10\text{dB}$.

◆ Isolation:

- All antenna isolation can meet specification.
2G-2G under -21dB (spec is under -20dB)
5G-5G under -29dB (spec is under -25dB)

◆ Max Peak Gain Delta(Theta = 75 degrees) :

- All antenna (Max Gain-Min Gain) can be under 10dB .

◆ Efficiency :

- All antenna can achieve $>50\%$.

Antenna Information

Ant.	Brand Name	Model Name	Ant. Type	Connector	Support	Manufacturer
1	Pegatron	PCB_2.4G(Horizontal antenna)	PCB	I-Pex	2.4G	Wanshih No. 72, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan
2	Pegatron	Metal_Dual Band(Vertical antenna)	Metal	I-Pex	2.4G+5G	Wanshih No. 72, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan
3	Pegatron	PCB_5G(Horizontal antenna)	PCB	I-Pex	5G	Wanshih No. 72, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan