

Antenna passive test report

Product name: MX3 built-in PCB dual-band antenna

Test information

Product name	MX3 built-in dual-band PCB antenna		Product code	
Test category	Antenna passive test	Test location	S parameter (laboratory) radiation parameter (Barron test room)	
Test date	October 5, 2022	Tester	Xiao Pengcheng, Barron staff	
Test environment	Temperature: 24 °C - 28 °C	Relative humidity: 56% - 58%	atmospheric pressure : 100kPa-101kPa	
Test items	Normal temperature electrical performance: <input checked="" type="checkbox"/> return loss <input checked="" type="checkbox"/> gain <input checked="" type="checkbox"/> Directional diagram <input checked="" type="checkbox"/> Port isolation <input checked="" type="checkbox"/> Efficiency			
Test basis	Test report, see attached test drawings			
Test overview	The electrical performance of the antenna is tested at room temperature, mainly including S parameters and radiation parameters.			
Analysis of test results	The measured gain of antenna in 2.4G band is greater than 2.5dBi, and the measured gain in 5G band is greater than 2.8dBi. The antenna gain meets the requirements. The antenna pattern meets the horizontal omnidirectional coverage. 2.4G antenna return loss<- 15dB. 5G antenna return loss<- 14dB			
conclusion	The antenna radiation parameters and S parameters meet the requirements, and antenna is well matched			

Normal temperature electrical performance test results

Antenna 0 line length 90mm

Serial number	Inspection items	units	Performance index requirements	Inspection results		sentence
				Sample No. :		
1	frequency range	MHz	2400-2500/5150-5850	2400-2500/5150-5850		OK
2	Gain	dBi	3	2400	3.15	OK
				2450	3.10	OK
				2480	3.39	OK
				5150	3.01	OK
				5500	3.01	OK
3	Isolation degree	dB	≤ -15	5850	2.8	OK
				2400	-25	OK
				2450	-26	OK
				2480	-27	OK
				5150	-29	OK
4	Return loss	dB	≤ -10	5500	-30	OK
				5850	-30	OK
				2400	-22	OK
				2450	-20	OK
				2480	-15	OK
5	Antenna efficiency		$\geq 60\%$	5150	-15	OK
				5500	-16	OK
				5850	-14	OK
				2400	74%	OK
				2450	79%	OK
	2480	81%	OK			
	5150	65%	OK			
	5500	65%	OK			
	5850	66%	OK			

Normal temperature electrical performance test results
Antenna 1 line length 120mm

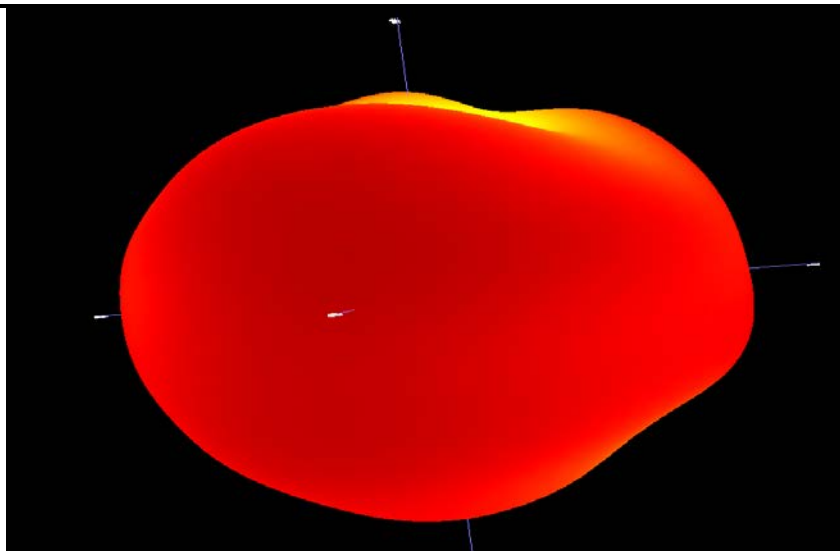
Serial number	Inspect ion items	units	Performance index requirements	Inspection results		sente nce
				Sample No. :		
1	frequency range	MHz	2400-2500/5150-5850	2400-2500/5150-5850		OK
2	Gain	dBi	3	2400	2.9	OK
				2450	2.6	OK
				2480	2.5	OK
				5150	2.9	OK
				5500	3.1	OK
				5850	3.3	OK
3	Isolation degree	dB	≤ -15	2400	-25	OK
				2450	-26	OK
				2480	-27	OK
				5150	-29	OK
				5500	-30	OK
				5850	-30	OK
4	Return loss	dB	≤ -10	2400	-23	OK
				2450	-25	OK
				2480	-20	OK
				5150	-13	OK
				5500	-15	OK
				5850	-15	OK
5			$\geq 60\%$	2400	80%	OK
				2450	80%	OK
				2480	82%	OK
				5150	65%	OK
				5500	65%	OK
				5850	67%	OK

Radiation parameter test

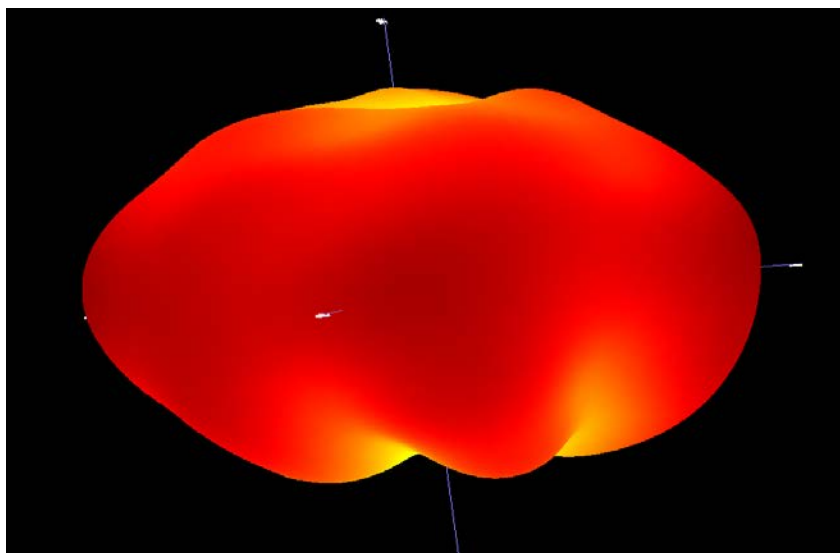
Antenna 0 line length 90mm

EUTmodel	5#(data)	ntenna 4 MW3
Frequency	E Total. dB(dBi)	Efficiency()
2400MHz	3.15	81%
2410MHz	3.21	81%
2420MHz	3.39	81%
2430MHz	3.36	83%
2440MHz	3.13	81%
2450MHz	3.10	81%
2460MHz	2.97	81%
2470MHz	3.29	83%
2480MHz	3.39	83%
2490MHz	3.33	81%
2500MHz	3.36	83%
5100MHz	3.15	68%
5150MHz	3.01	65%
5200MHz	3.01	65%
5250MHz	2.80	64%
5300MHz	2.83	65%
5350MHz	2.76	63%
5400MHz	2.58	65%
5450MHz	2.62	63%
5500MHz	3.01	65%
5550MHz	3.01	65%
5600MHz	2.97	68%
5650MHz	3.17	67%
5700MHz	2.68	65%
5750MHz	2.79	66%
5800MHz	2.66	65%
5850MHz	2.80	66%
5900MHz	2.44	63%
3D radiation field type		

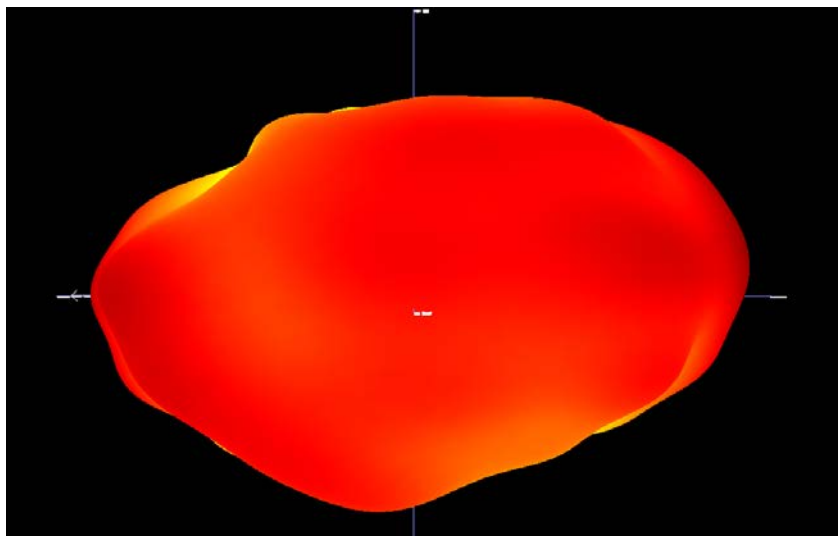
2.45GHz



5.15GHz

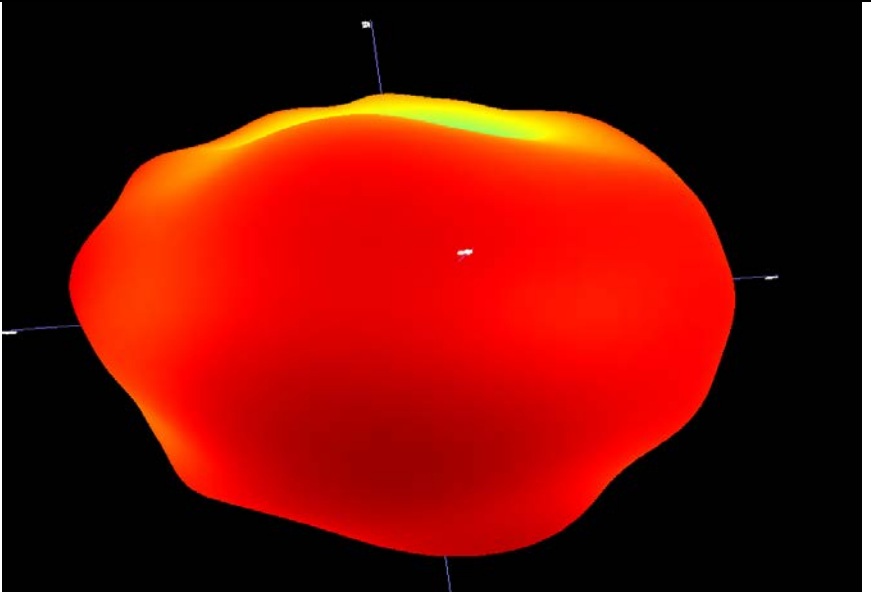
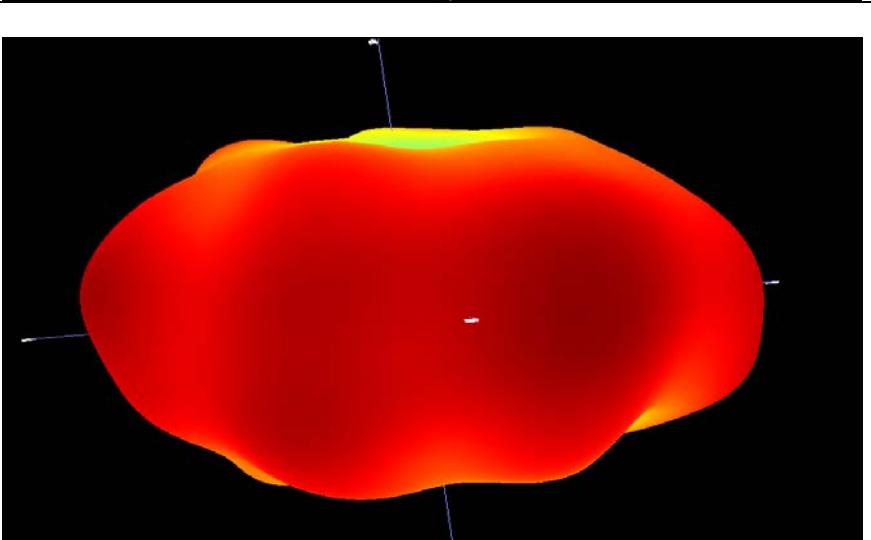
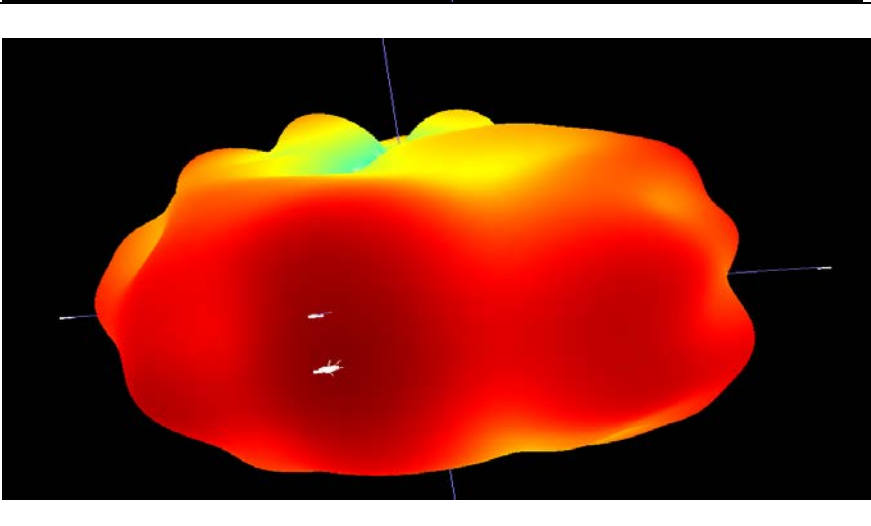


5.85GHz

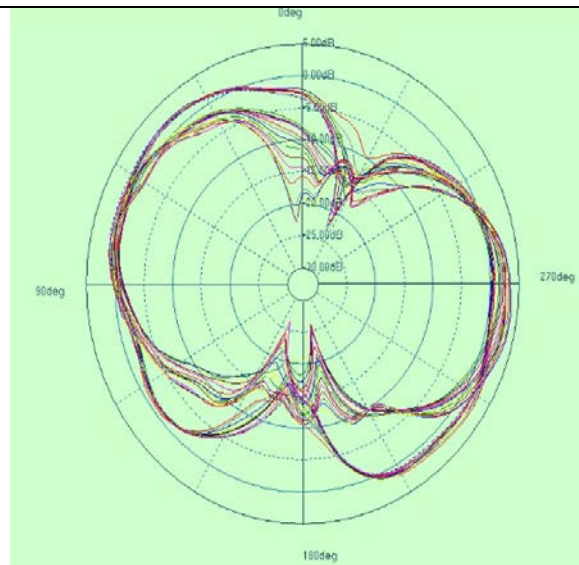


Antenna 1 line length 120mm

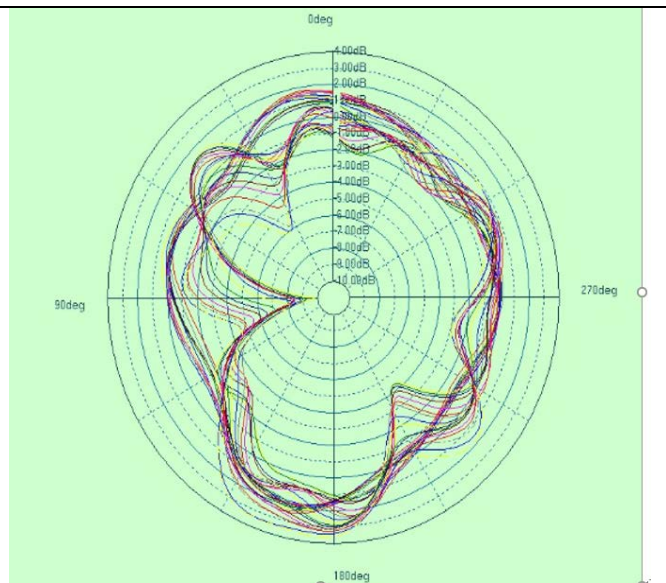
EUTmodel	5#(data)	Antenna 3 MW3
Frequency	E Total. dB(dBi)	Efficiency()
2400MHz	2.90	74%
2410MHz	2.86	75%
2420MHz	2.64	76%
2430MHz	2.56	79%
2440MHz	2.59	78%
2450MHz	2.60	78%
2460MHz	2.38	79%
2470MHz	2.39	80%
2480MHz	2.50	81%
2490MHz	2.46	81%
2500MHz	2.41	82%
5100MHz	3.08	68%
5150MHz	2.90	65%
5200MHz	3.15	65%
5250MHz	3.32	64%
5300MHz	3.50	65%
5350MHz	3.47	63%
5400MHz	3.35	62%
5450MHz	3.11	62%
5500MHz	3.10	65%
5550MHz	3.05	66%
5600MHz	3.21	65%
5650MHz	3.46	61%
5700MHz	3.22	65%
5750MHz	3.38	66%
5800MHz	3.24	67%
5850MHz	3.30	67%
5900MHz	3.00	63%
3D radiation field type		

<p>2.45GHz</p>	 A 3D radiation pattern plot for the 2.45GHz frequency. The plot shows a single, broad, and roughly spherical lobe of radiation. The color gradient transitions from red at the edges to yellow and green at the top, indicating a relatively uniform radiation pattern in all directions.
<p>5.15GHz</p>	 A 3D radiation pattern plot for the 5.15GHz frequency. The plot shows a single, broad lobe similar to the 2.45GHz pattern, but with a slightly more pronounced top edge, suggesting a slight preference for radiation in the upward direction.
<p>5.85GHz</p>	 A 3D radiation pattern plot for the 5.85GHz frequency. The plot shows a radiation pattern with a distinct, bright yellow-green lobe at the top, indicating a strong directional preference for radiation in the upward direction, while the lower portion of the lobe is primarily red.

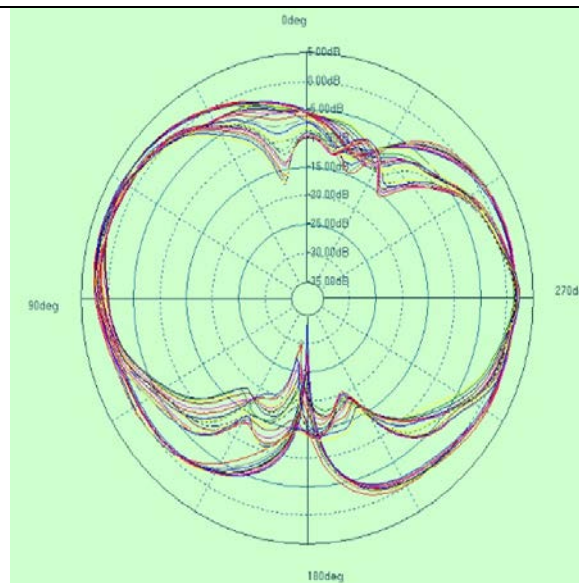
Vertical plane field pattern of antenna 0



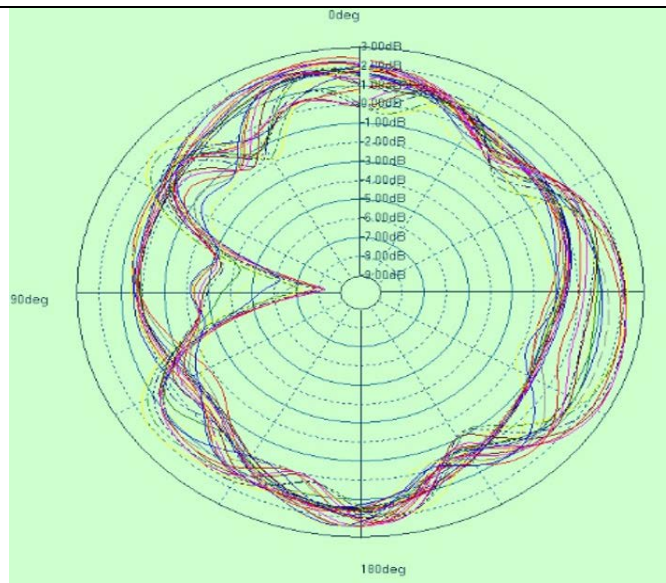
Antenna 0 horizontal plane field pattern



Field pattern of antenna vertical plane

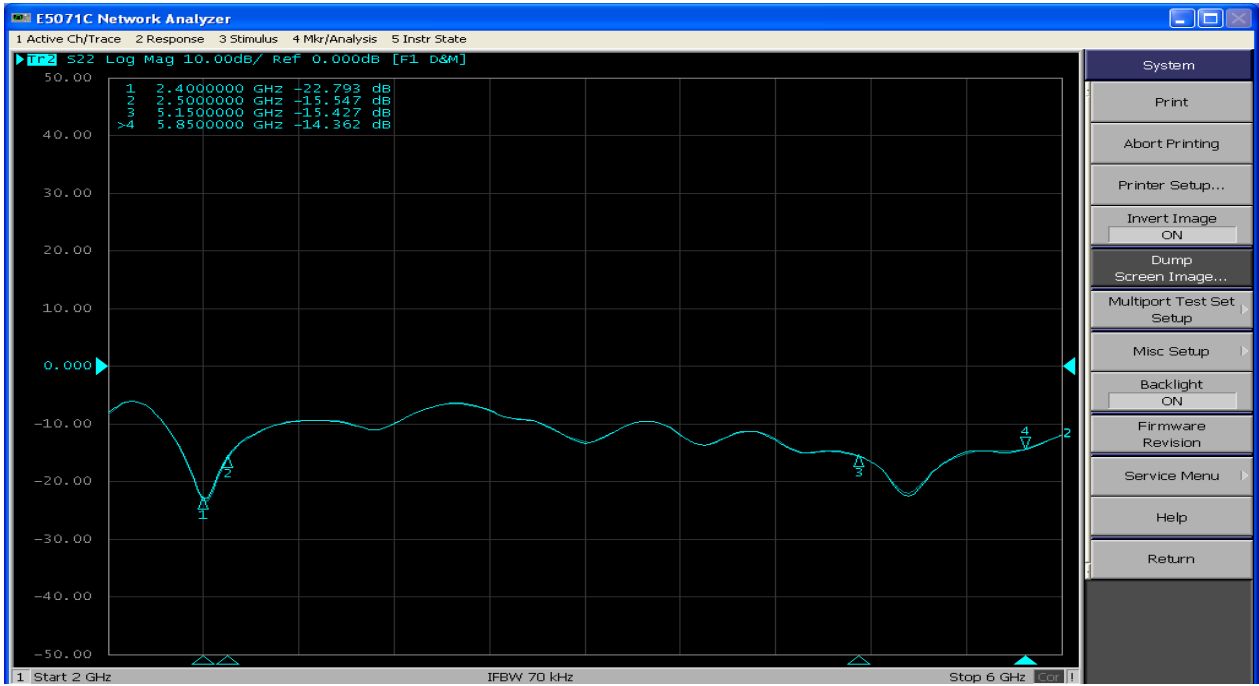


Antenna 1 horizontal plane field pattern

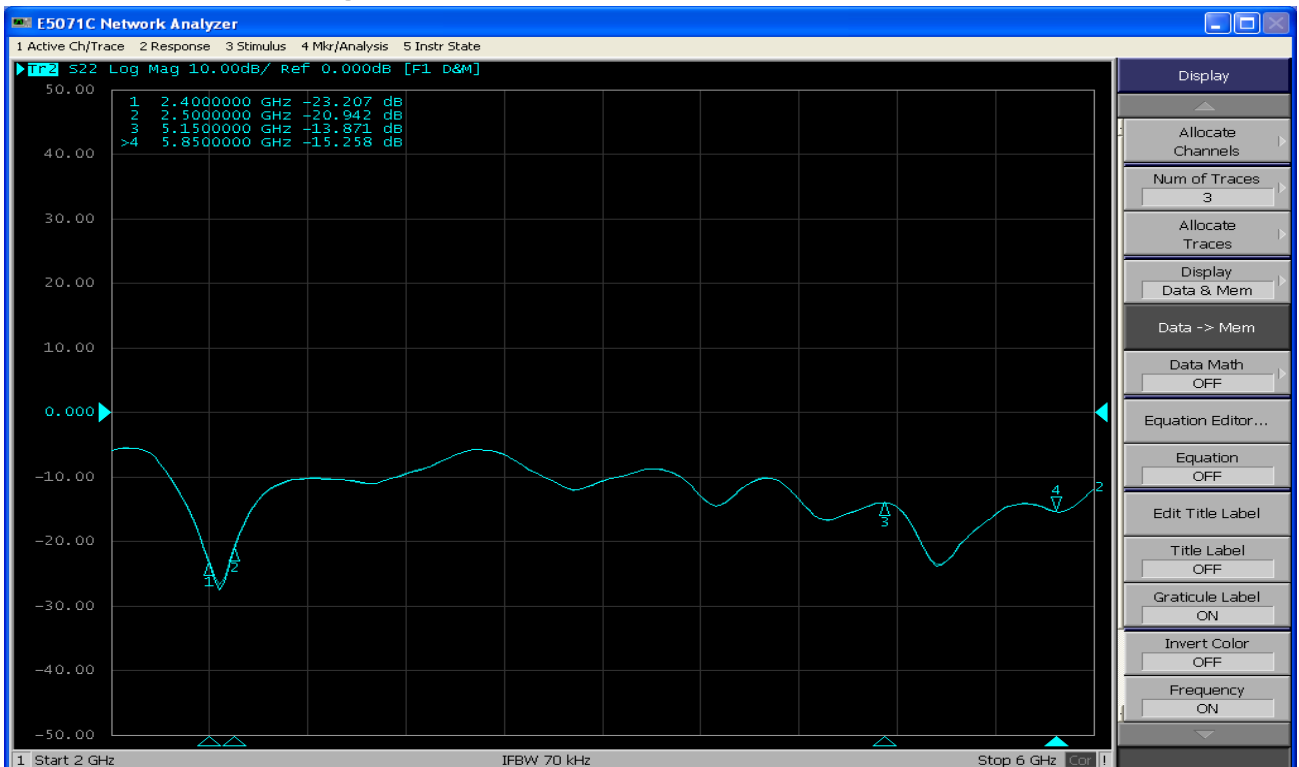


Antenna S parameter test diagram

Antenna 0 line length 90mm



Antenna 1 line length 120mm



tenna isolation

