



Antenna test report

Customers: DK
Project: DK066
Structure: Xiao Xiang-13316888409
RF: Liu Houxiong-17328763286
Date: 2023-10-24



Report type:

Version number: V1.0

Machine status: FCC IC

Debug the frequency band:

GSM:B2/B3/B5/B8

WCDMA:B2/B4/B5

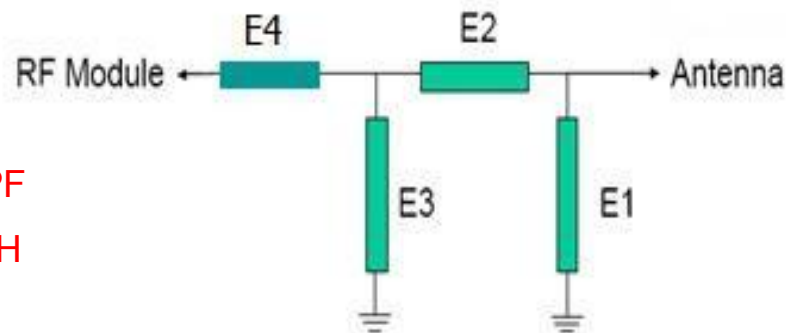
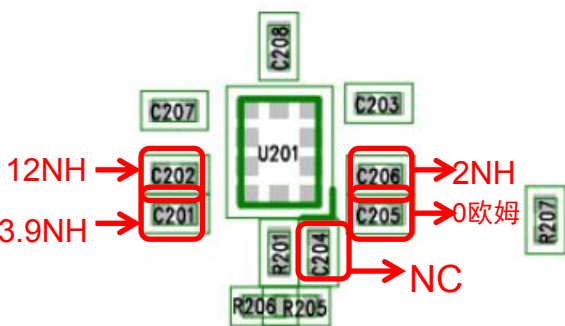
FDD-LTE: B2/B3/B4/B5/B7/12/13/17/26/66

GPS and other satellite positioning antenna

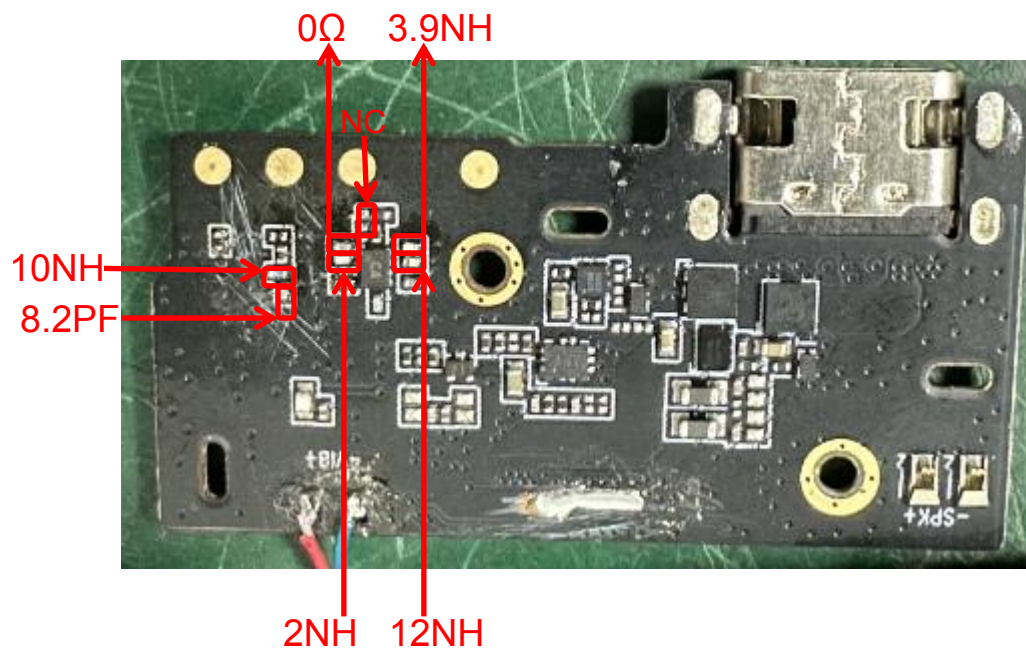
2.4G/5.8G WIFI

Bluetooth

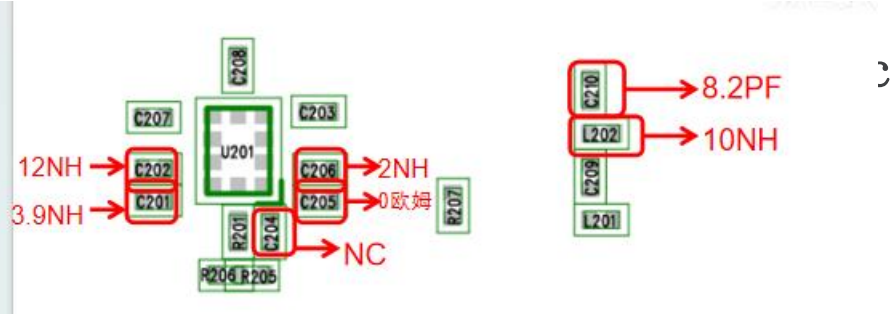
PCB panel (main antenna)



0201Specifications		
Element	Value	PCB位号
E1	NC	L201
E2	0Ω	C209
E3	10NH	L202
E4	8.2PF	C210
E5	NC	C204



PCB panel (lower antenna):



DK066 Small panel main antenna switch logic		
RF1	0Ω (C205)	GSM:900
RF2	2nH (C206)	GSM:850 LTE-FDD:B5/7/26 WCDMA:B5
RF3	3.9nH (C201)	GSM:1800/1900 LTE-FDD:B2/3/4/13/66 WCDMA:B2/4
RF4	12nH (C202)	LTE-FDD:B12/17

Band	ch	TRP	TIS
GSM 850	128	24.5	
	190	24.4	
	251	24.2	-101.5
EGSM	1	22.8	
	62	22.6	
	124	22.4	-94.5
DCS	512	23.3	
	698	23.7	
	885	24.4	-102.2
PCS	512	25.2	
	661	25.4	
	810	25.1	-101.5

Band	ch	TRP	TIS
WCDMA Band2	10562	17.1	
	10700	17.3	
	10838	17.4	-103.5
WCDMA Band4	1538	15.2	
	1675	16.3	
	1738	16.5	-102.4
WCDMA Band5	4357	15.8	
	4410	16.2	
	4458	16.6	-102.6



Antenna test data

	Band	ch	TRP	TIS
FDD-LTE (10M)	B2	650	18.8	
		900	18.6	
		1150	18.6	-92.2
	B3	1250	16.6	
		1575	17.4	
		1900	18.3	-93.1
	B4	2000	17.1	
		2175	17.6	
		2350	18.5	-92.6
	B5	2450	16.2	
		2525	16.3	
		2600	17	-91.2
	B7	2800	15.4	
		3100	16.2	
		3400	16.9	-92.3

	Band	ch	TRP	TIS
FDD-LTE (10M)	B12	5060	16.3	
		5095	16.8	
		5130	16.5	-89.1
	B13			
		5230	15.8	-88.8
	B17	5780	16.5	
		5790	16.8	
		5800	17.3	-87.9
	B26	8740	15.4	
		8865	16.2	
		8990	16.5	-89.3
	B66	66536	16.3	
		66786	16.5	
		67036	17.8	-91.8

Antenna test data

WIFI OTA				
2.4G	Band	Channel	TRP	TIS
	b (11M)	1	13.16	
		6	13.37	
		13	13.17	-81.61
	g (54M)	1	11.22	
		6	11.35	
		13	11.28	-70.32
	n (MCS7)	1	10.77	
		6	10.43	
		13	10.88	-65.26
5G	a (54M)	36	10.52	
		56	10.87	
		165	11.36	-72.52
	n (MCS7)	36	10.3	
		56	10.25	
		165	10.71	-67.15

Main antenna gain, passive data

Freq (MHz)	Effi (%)	Gain (dBi)
700	16.61	-5.73
710	18.08	-5.19
720	21.25	-4.53
730	22.94	-4.59
740	24.9	-4.22
750	17.05	-5.23
810	20.04	-3.5
820	23.64	-2.58
830	24.81	-2.62
840	22.4	-3.16
850	19.12	-4.01
910	19.59	-2.5
920	20.64	-2.86
930	21.46	-2.81
940	22.01	-3.35
950	18.44	-3.74
960	17.4	-4.28

Freq (MHz)	Effi (%)	Gain (dBi)
1710	25.29	-2.39
1730.2	29.23	-1.75
1750.41	29.6	-1.85
1770.61	32.4	-1.39
1790.82	32.7	-1.53
1811.02	32.5	-1.55
1831.22	32.5	-1.55
1851.43	28.82	-1.88
1871.63	26.21	-2.24
1891.84	27.44	-1.91
1912.04	23.73	-2.4
1932.24	22.48	-2.28
1952.45	25.56	-1.61
1972.65	22.2	-2.65
1992.86	22.35	-2.8
2013.06	23.99	-2.5
2033.26	21.99	-3.27
2053.47	22.18	-3.46
2073.67	24.28	-3.06
2093.88	24.8	-2.95
2114.08	25.79	-2.55

Freq (MHz)	Effi (%)	Gain (dBi)
2497.96	30.4	-1.3
2518.16	31.1	-0.88
2538.36	30.49	-0.88
2558.57	27.1	-1.75
2578.77	27.64	-1.56
2598.98	21.83	-2.9
2619.18	20.55	-3.43
2639.38	20.92	-2.93
2659.59	16.54	-3.82
2679.79	19.56	-2.77
2700	18.21	-3.34

Three-in-one antenna gain, passive data

Freq (MHz)	Effi (%)	Gain (dBi)
1550	32.27	-1.51
1555	32.21	-1.14
1560	32.99	-1.2
1565	33.93	-1.18
1570	32.19	-1.15
1575	31.01	-1.36
1580	32.63	-1.34
2400	36.85	1.78
2410	38.42	2.07
2420	37.04	1.59
2430	39.93	2.1
2440	42.34	2.31
2450	43.96	2.41
2460	45.69	2.83
2470	44.98	2.64
2480	45.14	2.83
2490	45.18	2.8
2500	43.53	2.74

Freq (MHz)	Effi (%)	Gain (dBi)
5100	19.82	-2.62
5200	26.48	-0.5
5300	30.3	-0.45
5400	36.36	0.53
5500	34.45	0.39
5600	31.88	0.28
5700	33.29	0.45
5800	33.66	0.68
5900	32.05	0.05

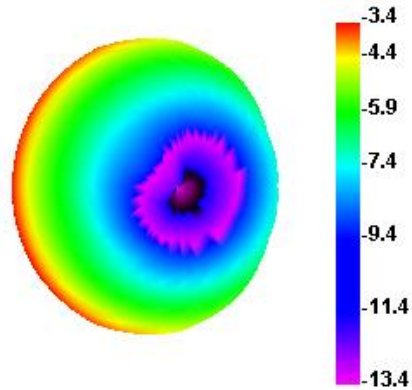
Diversity antenna gain, passive data

Freq (MHz)	Effi (%)	Gain (dBi)
700	5.65	-9.15
710	7.71	-7.65
720	8.91	-6.59
730	9.48	-6.35
740	9.43	-6.29
750	9.86	-6.11
810	10.88	-5.65
820	10.78	-6.11
830	10.48	-5.79
840	10.76	-5.6
850	10.08	-5.8
910	9.04	-6.17
920	8.82	-6.6
930	9.15	-6.46
940	9.34	-6.53
950	9.46	-6.45
960	7.81	-7.51

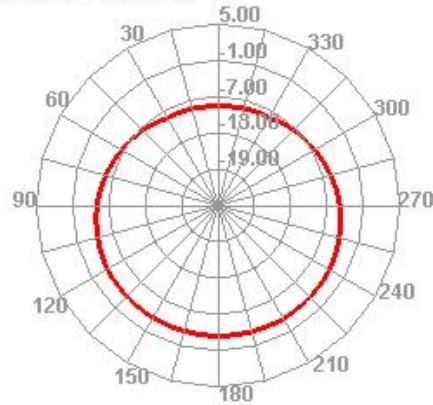
Freq (MHz)	Effi (%)	Gain (dBi)
1710	17.43	-2.15
1730.2	19.27	-1.69
1750.41	18.33	-1.93
1770.61	18.1	-2.33
1790.82	18.2	-2.82
1811.02	23.73	-2.4
1831.22	22.48	-2.28
1851.43	25.56	-1.61
1871.63	22.2	-2.65
1891.84	22.35	-2.8
1912.04	23.99	-2.5
1932.24	21.99	-3.27
1952.45	22.18	-3.46
1972.65	24.28	-3.06
1992.86	24.8	-2.95
2013.06	25.79	-2.55
2033.26	22.78	-3.09
2053.47	21.37	-3.17
2073.67	22.06	-3.05
2093.88	23.02	-2.95
2114.08	24.84	-2.65

Freq (MHz)	Effi (%)	Gain (dBi)
2497.96	25.64	-1.56
2518.16	21.83	-2.9
2538.36	20.55	-3.43
2558.57	20.92	-2.93
2578.77	16.54	-3.82
2598.98	19.56	-2.77
2619.18	18.21	-3.34
2639.38	15.39	-3.9
2659.59	18.35	-3.1
2679.79	17.34	-3.16
2700	14.75	-3.86

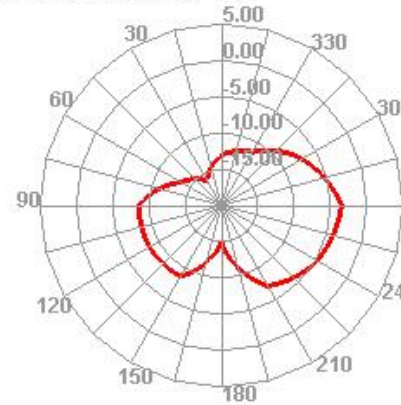
810.000MHz



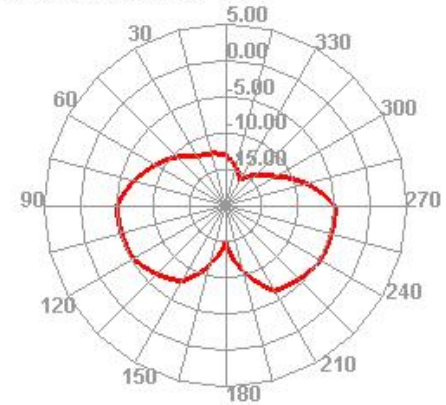
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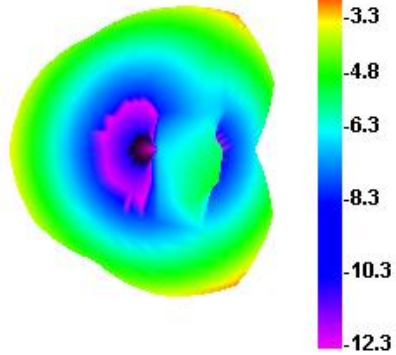
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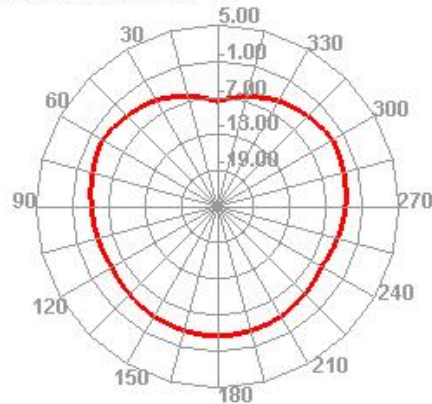
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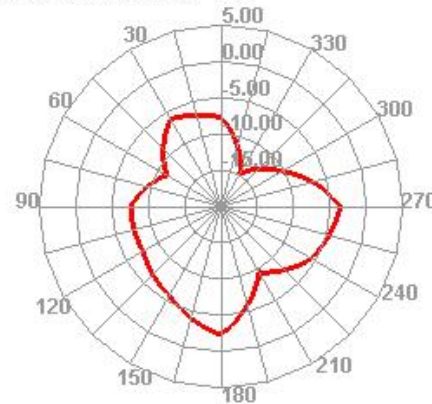
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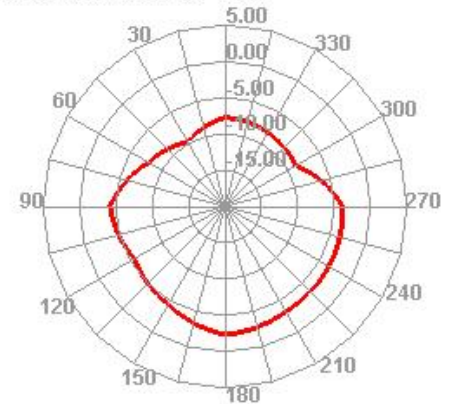
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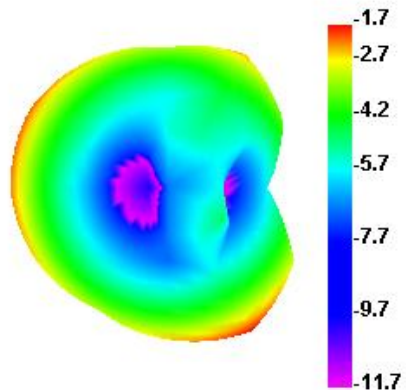
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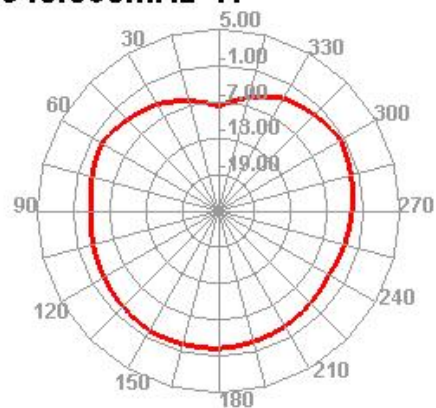
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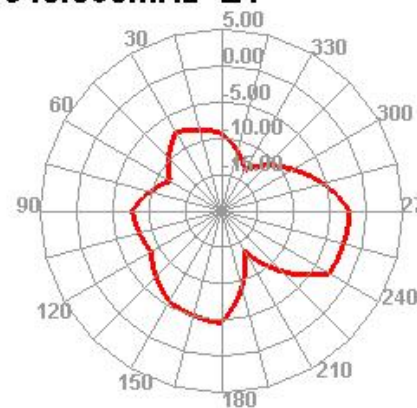
948.568MHz



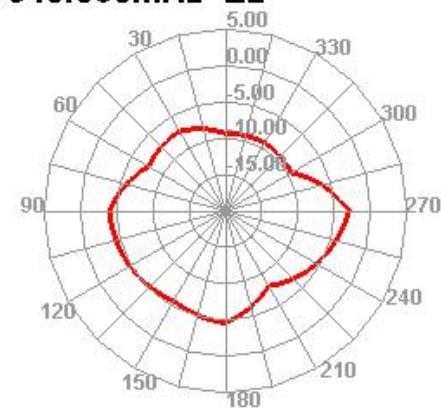
948.568MHz H



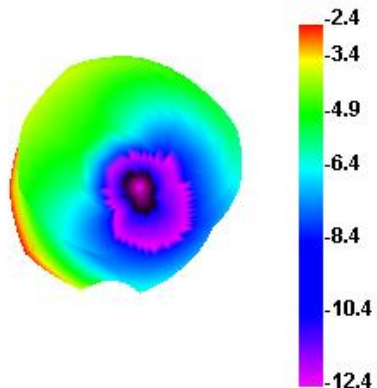
948.568MHz E1



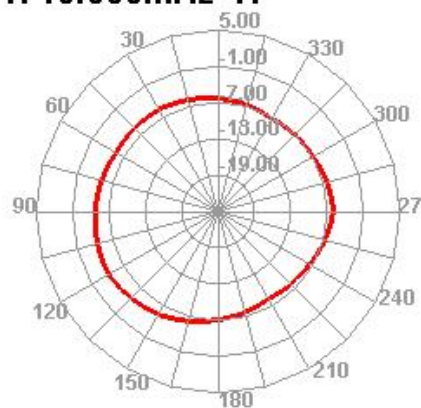
948.568MHz E2



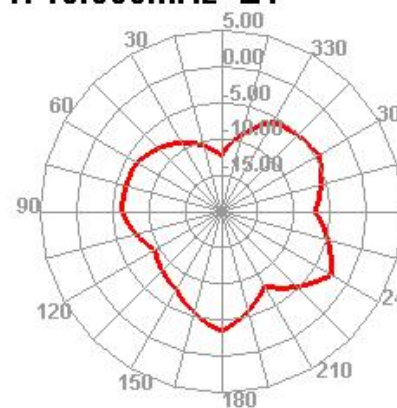
1710.000MHz



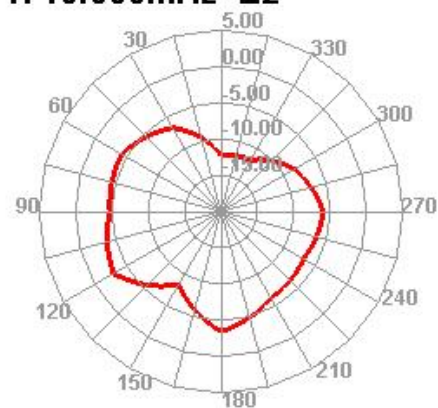
1710.000MHz H



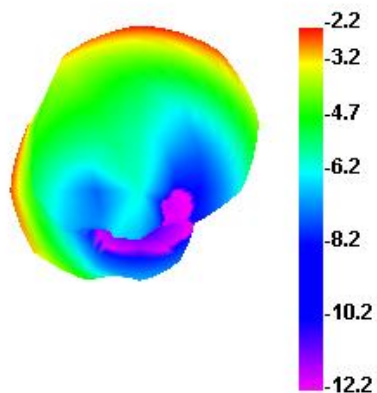
1710.000MHz E1



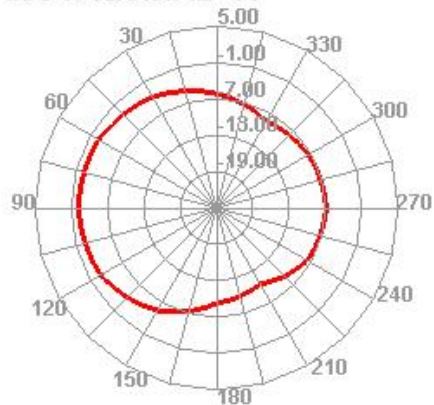
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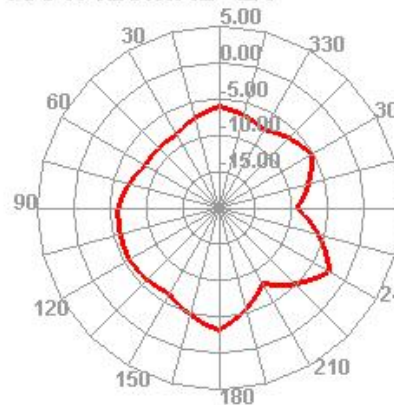
1851.428MHz



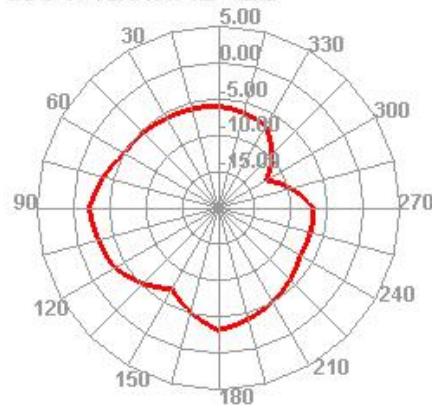
1851.428MHz H



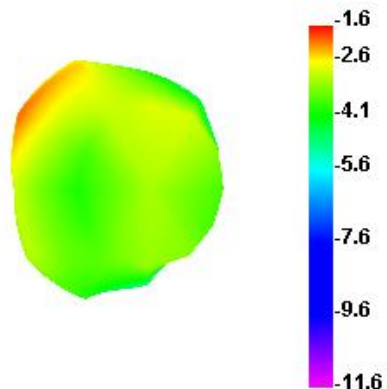
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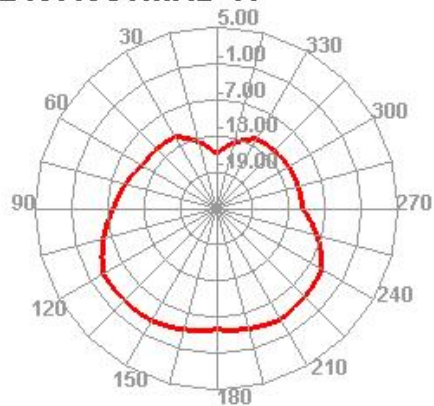
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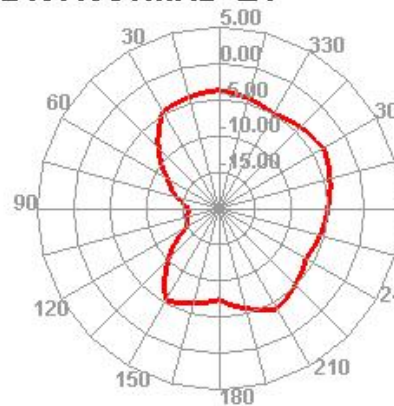
2497.956MHz



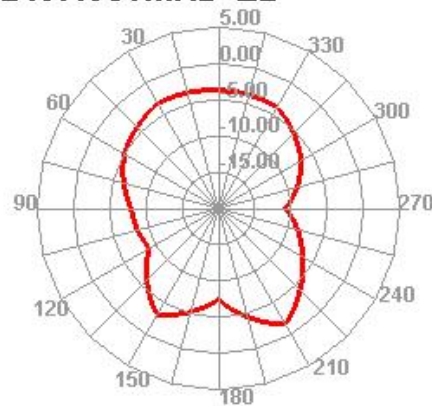
2497.956MHz H



2497.956MHz E1

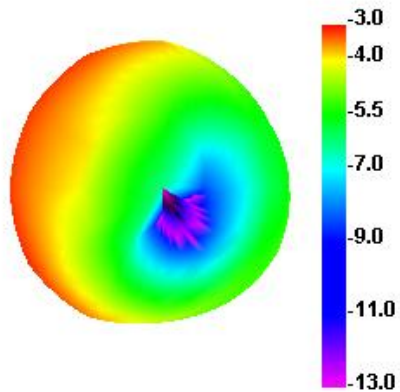


2497.956MHz E2

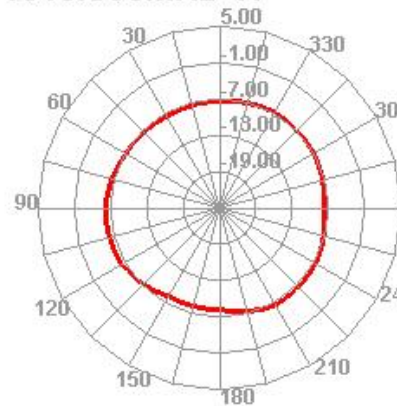


3D image (three-in-one antenna)

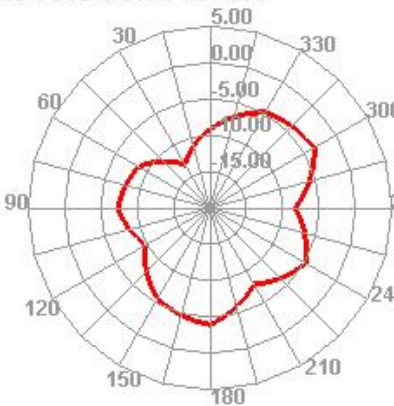
1510.000MHz



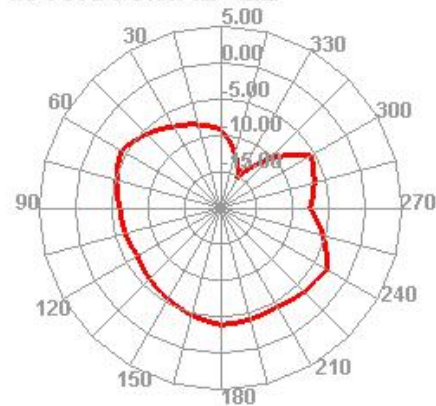
1510.000MHz H



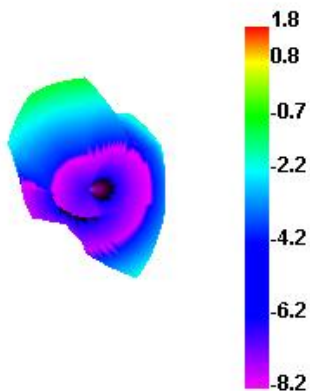
1510.000MHz E1



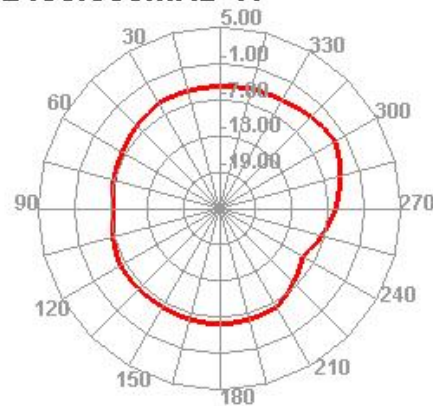
1510.000MHz E2



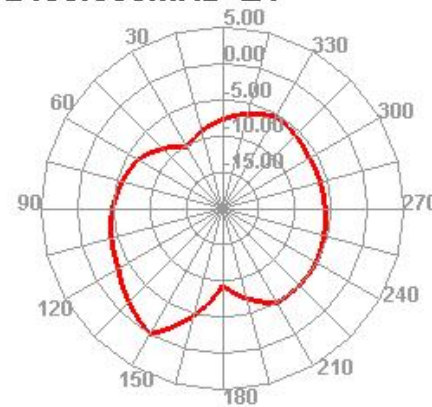
2400.000MHz



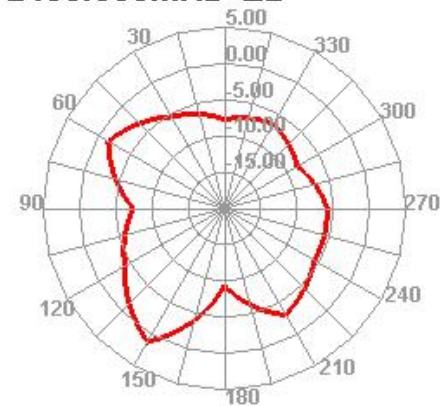
2400.000MHz H



2400.000MHz E1

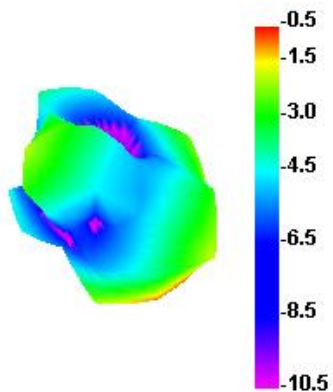


2400.000MHz E2

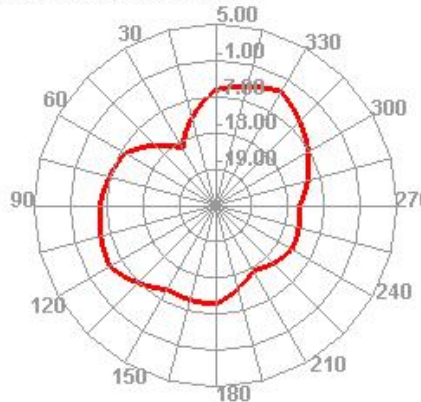


3D image (three-in-one antenna)

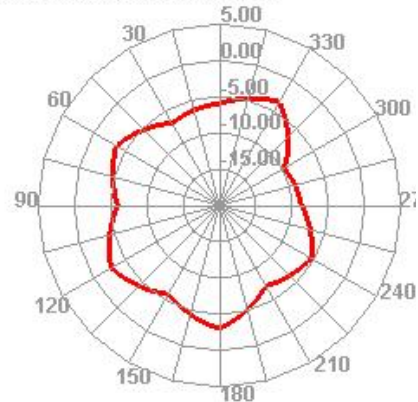
5200.000MHz



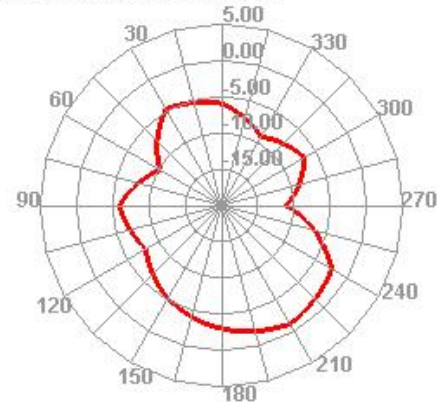
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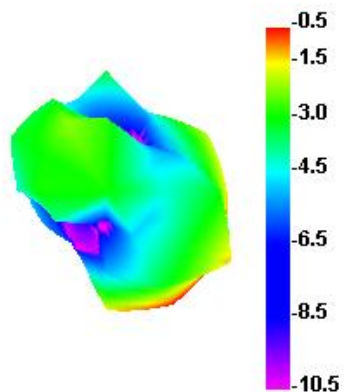
5200.000MHz E1



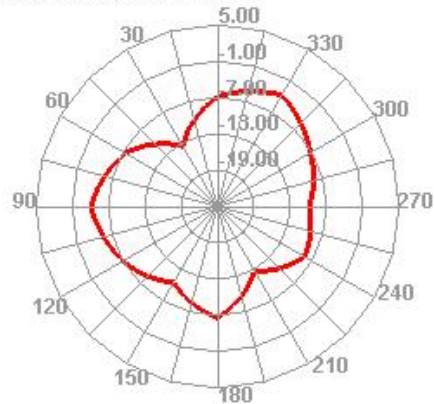
5200.000MHz E2



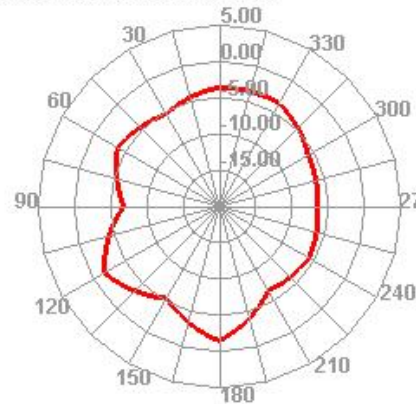
5300.000MHz



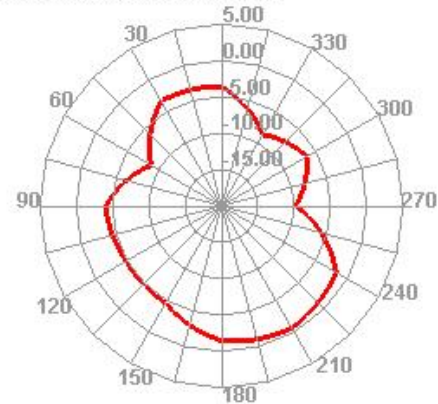
5300.000MHz H



5300.000MHz E1



5300.000MHz E2



GPS measurements:

Location: The Pinot noir roof

The weather: Cloudy-overcast

The test results are as follows:

Average CNR

G:30.4/-/-/-/- R:23.5/-/-/-/- B:26.6/-/-/-/- E:-/-/-/-/-
Q:25.0/-/-/-/- L:-/-/-/-/- I:-/-/-/-/- S:-/-/-/-/-

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ID	CNR	ID	CNR	ID	CNR
G5	22.3/-/-/-/-	G10	29.9/-/-/-/-	G13	11.5/-/-/-/-
G15	36.2/-/-/-/-	G18	30.6/-/-/-/-	G23	41.0/-/-/-/-
G24	44.1/-/-/-/-	G32	27.4/-/-/-/-	R71	31.5/-/-/-/-
R75	18.6/-/-/-/-	R87	20.3/-/-/-/-	B4	0.0/-/-/-/-
B5	25.3/-/-/-/-	B6	26.6/-/-/-/-	B7	17.8/-/-/-/-
B8	15.8/-/-/-/-	B9	15.5/-/-/-/-	B13	32.2/-/-/-/-
B16	31.6/-/-/-/-	B24	30.4/-/-/-/-	B25	32.9/-/-/-/-
B28	30.6/-/-/-/-	B33	33.8/-/-/-/-	Q2	20.0/-/-/-/-
Q3	21.0/-/-/-/-	Q4	34.0/-/-/-/-	S50	0.0/-/-/-/-

Average CNR

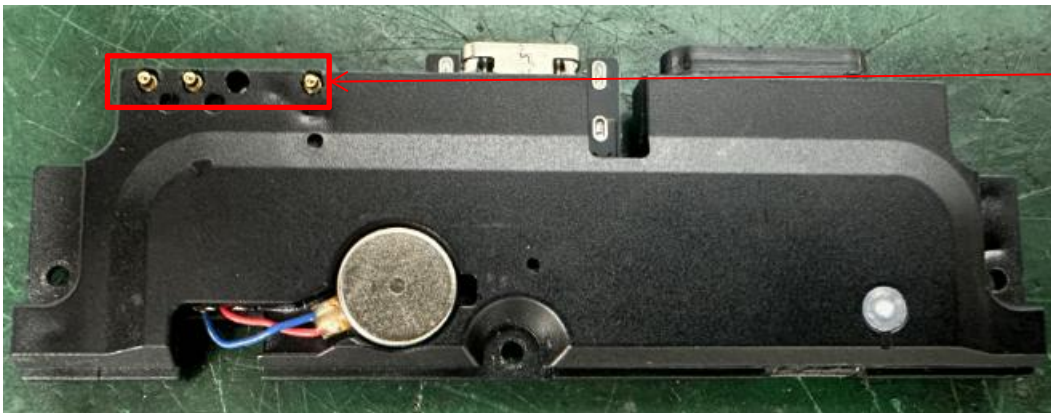
G:31.1/-/-/-/- R:26.1/-/-/-/- B:25.2/-/-/-/- E:-/-/-/-/-
Q:22.0/-/-/-/- L:-/-/-/-/- I:-/-/-/-/- S:32.0/-/-/-/-

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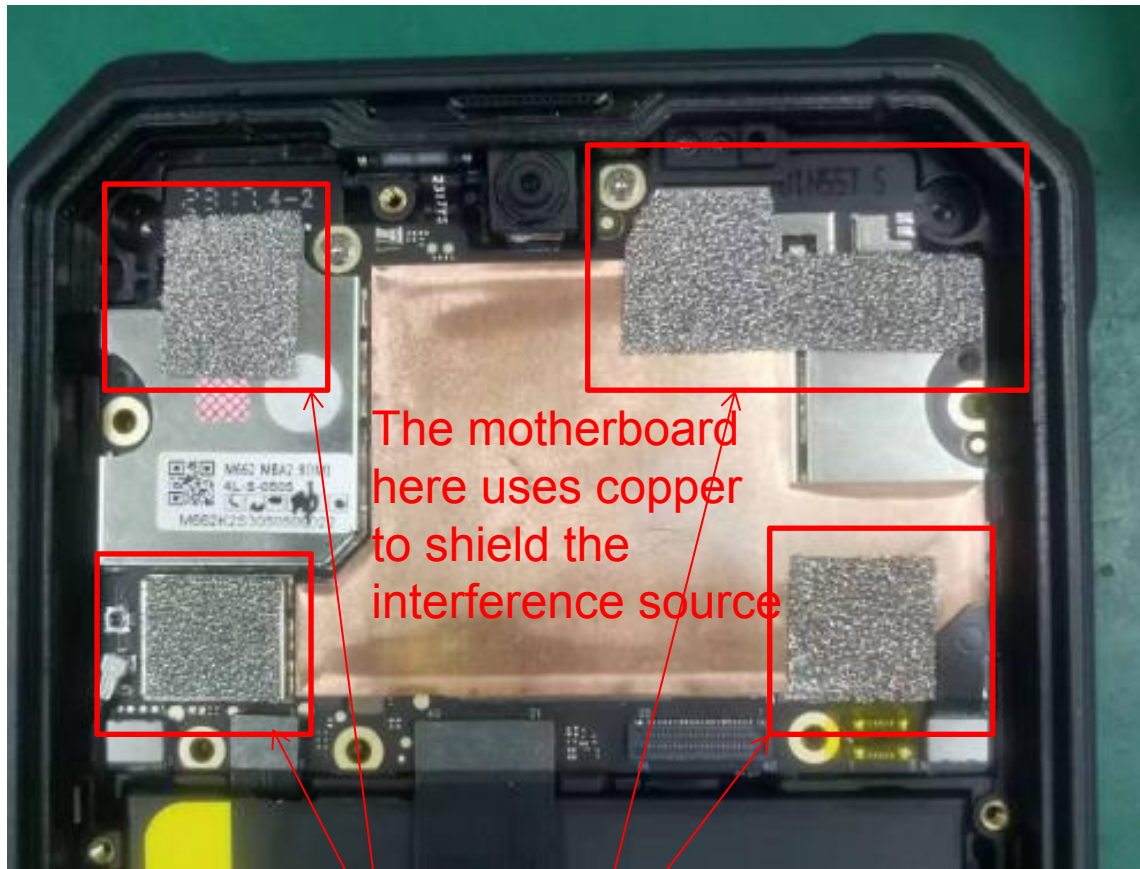
ID	CNR	ID	CNR	ID	CNR
G5	0.0/-/-/-/-	G13	25.0/-/-/-/-	G15	39.9/-/-/-/-
G18	17.3/-/-/-/-	G23	41.0/-/-/-/-	G24	41.6/-/-/-/-
G32	21.8/-/-/-/-	R71	22.8/-/-/-/-	R72	34.3/-/-/-/-
R75	18.6/-/-/-/-	R87	28.6/-/-/-/-	B4	0.0/-/-/-/-
B5	0.0/-/-/-/-	B6	27.6/-/-/-/-	B7	17.2/-/-/-/-
B8	33.1/-/-/-/-	B10	13.0/-/-/-/-	B13	27.6/-/-/-/-
B16	34.9/-/-/-/-	B24	33.2/-/-/-/-	B25	9.8/-/-/-/-
B28	29.0/-/-/-/-	B33	26.2/-/-/-/-	Q2	19.0/-/-/-/-
Q3	25.0/-/-/-/-	S45	32.0/-/-/-/-		

Three in one

Diversity

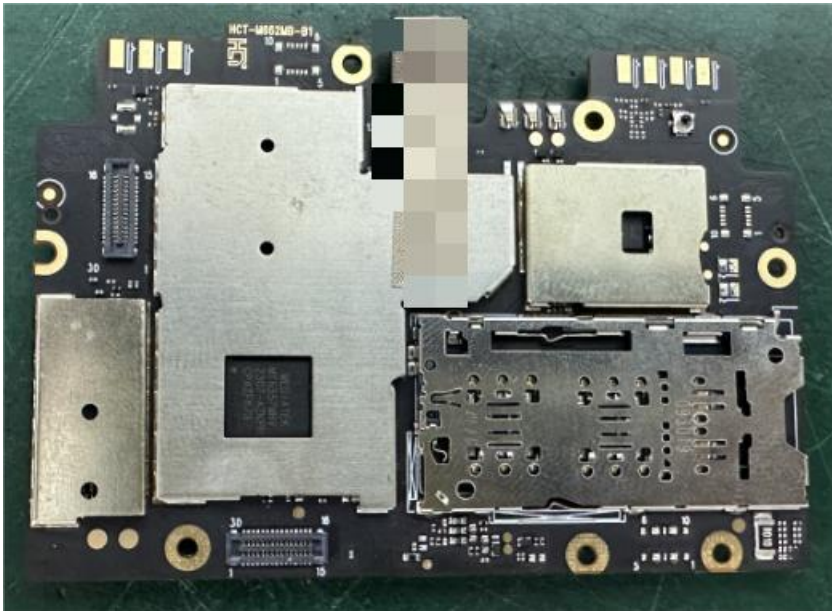


main



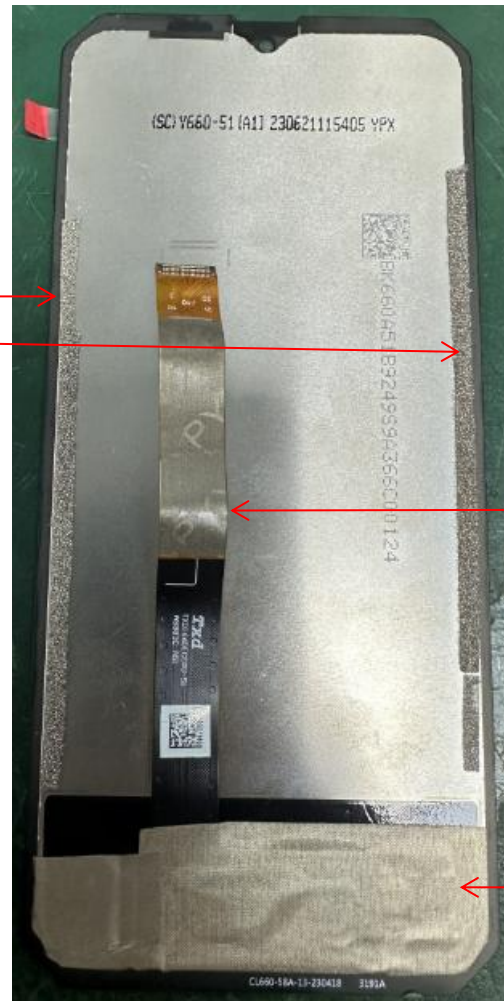
Note in particular, the motherboard grounding strictly according to the picture, conductive sponge and motherboard grounding area to be large, the sponge height of 1.5 mm

The camera environment is handled in accordance with the EVT machine



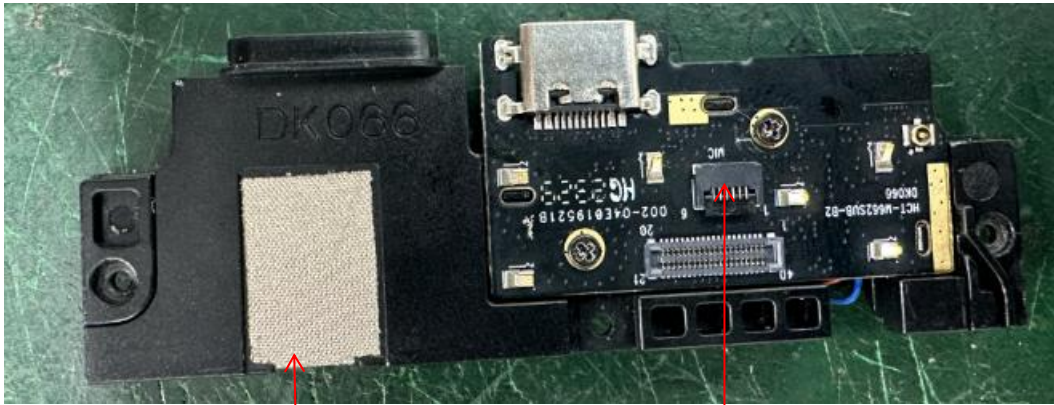
Red Box EVB foam replaced with conductive cloth foam with screen grounding

The metal layers on both sides of the screen are grounded with conductive sponges and the cover plate



Screen wiring to do a good grounding

The Screen IC is shielded with a conductive cloth



Horn earthing, motor and panel earthing, MIC wiring earthing

