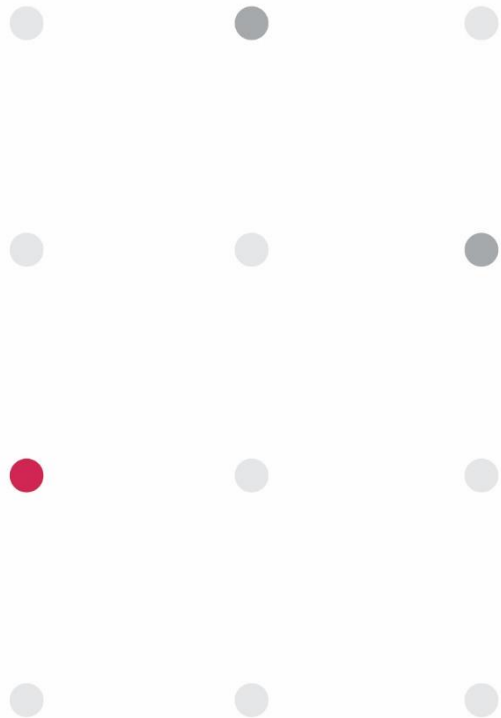


PSA

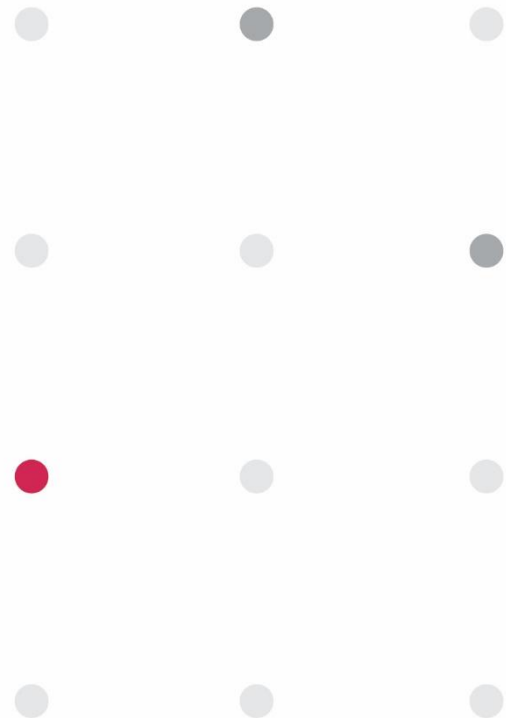
佳邦科技股份有限公司

INPAQ TECHNOLOGY CO., LTD.



PSA

PASSIVE SYSTEM ALLIANCE
INPAQ TECHNOLOGY CO., LTD.



好帮手 V10 Antenna Test Report

Presented by

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INPAQ Technology Co., Ltd.

Version : V1.1

Released Date : Mar.12th, 2021

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- Requirement of Antenna Design and Measurement
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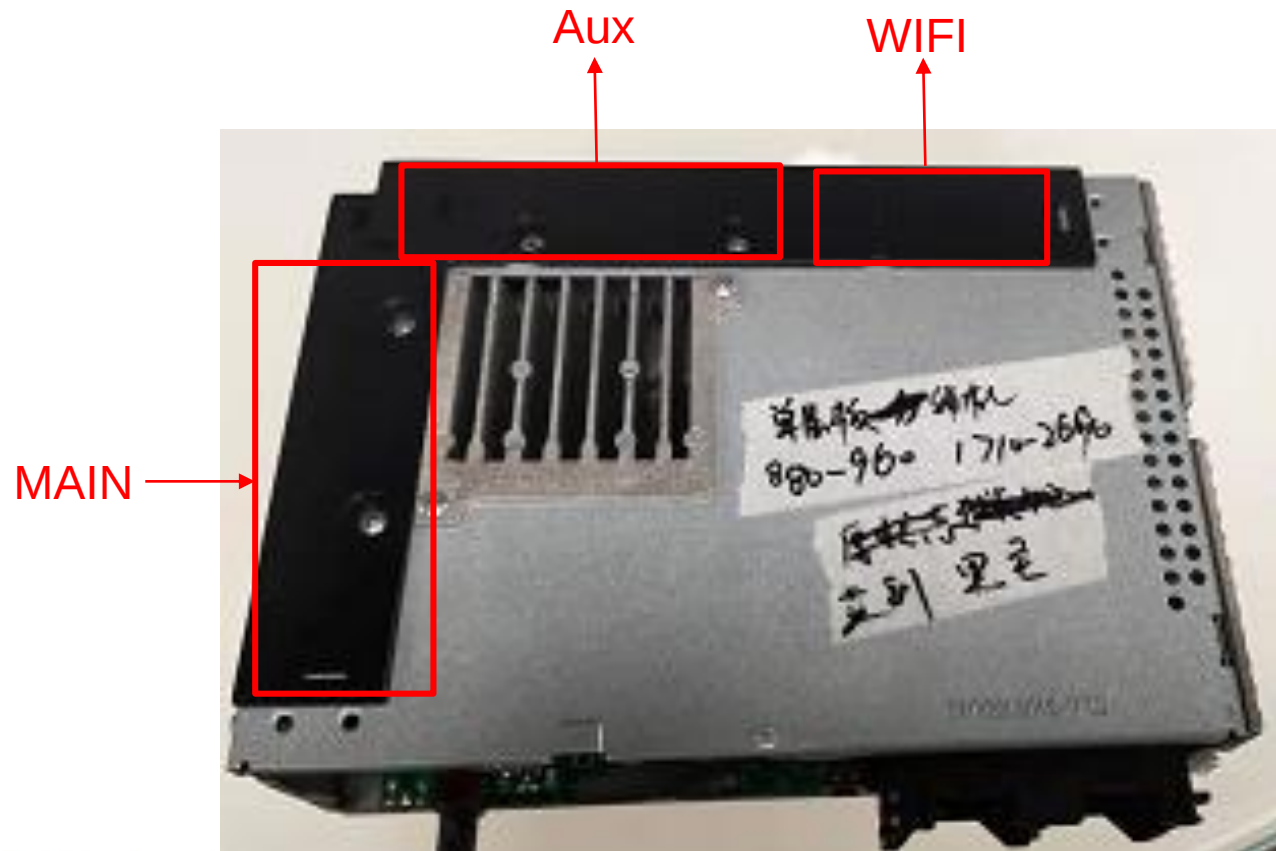
Revision History

Released Date	Version	Record
Jan. 11th, 2021	1.0	有源机台调试验证
Mar. 12th, 2021	1.1	单层板分体机有源调试优化

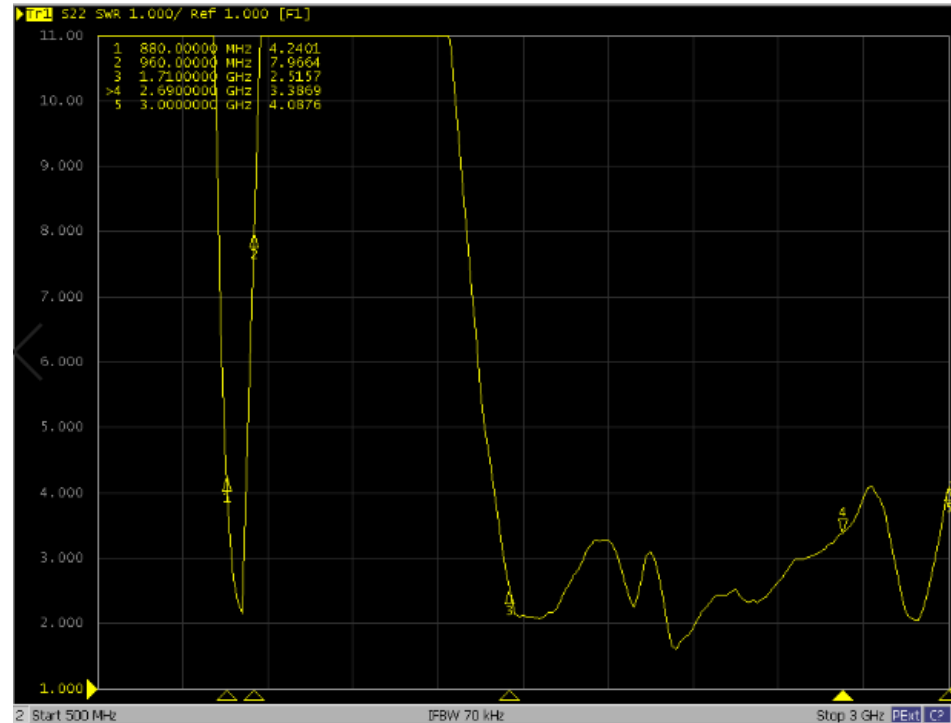
Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
Main	1	880~960MHz, 1710~2690MHz	
AUX	1	880~960MHz, 1805~2690MHz	
WIFI	1	2400~2500MHz, 5100~5900MHz	

Antenna Placement & Solution

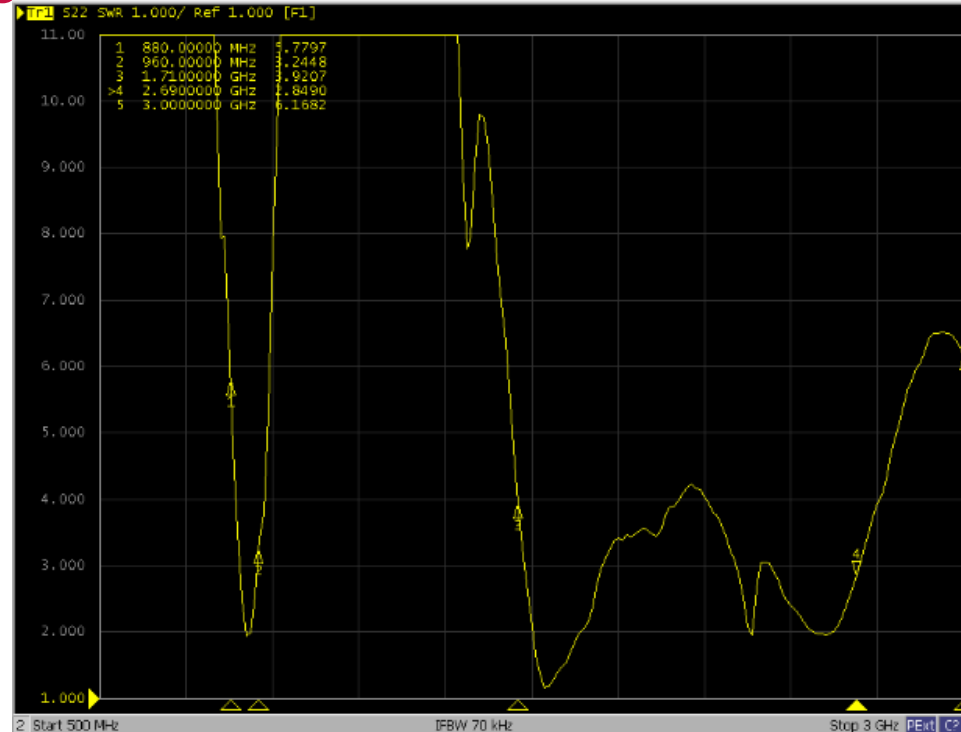


VSWR Results -Main



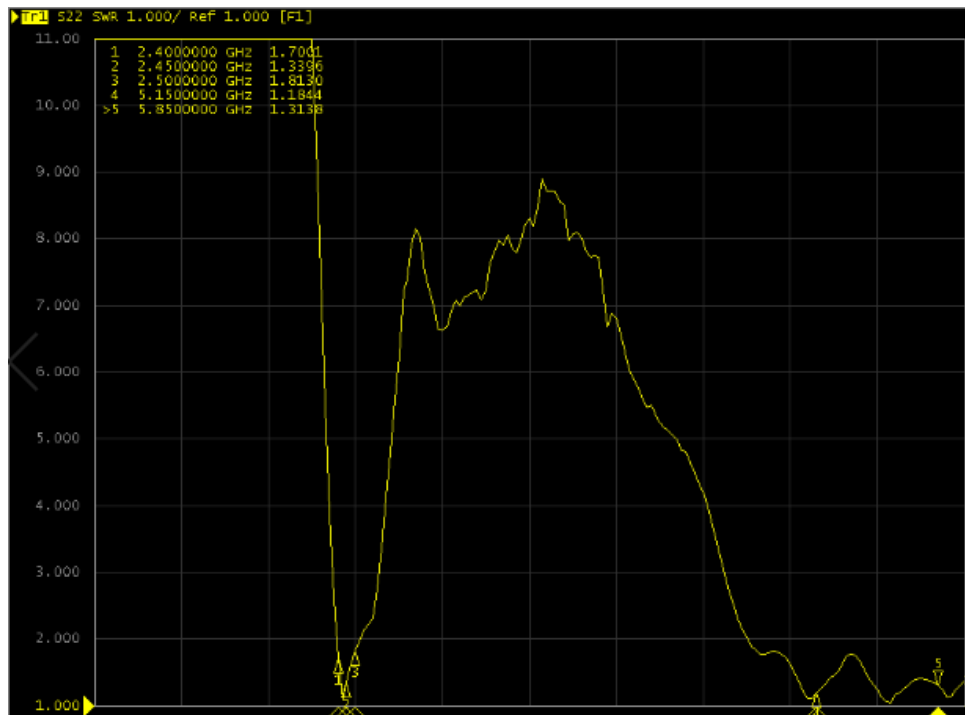
Frequency (MHz)	880	960	1710	2690
VSWR	4.24	7.96	2.51	3.38

VSWR Results -AUX



Frequency (MHz)	880	960	1805	2690
VSWR	5.77	3.24	3.92	2.84

VSWR Results (WIFI)



WiFi-Main	Frequency (MHz)	2400	2450	2500	5100	5900
	VSWR	1.70	1.33	1.81	1.18	1.31

Test Setup for Radiation Pattern Measurement

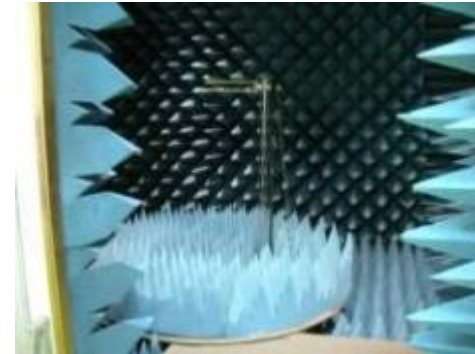
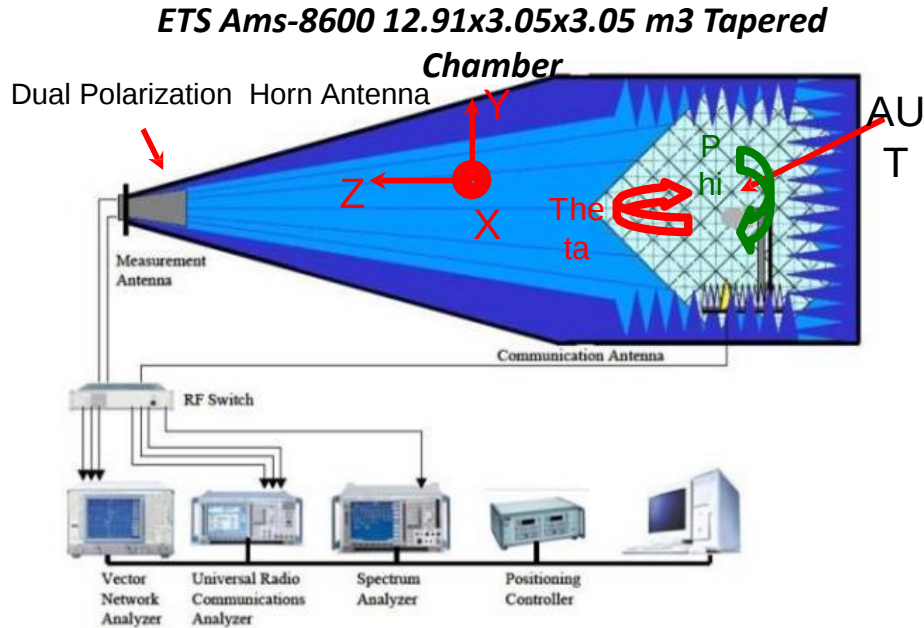


Figure 1: System diagram for test system including compact-size tapered anechoic chamber and optional test instrumentation

QUIPMENT	BRAND	MODULE TYPE
Spectrum	Agilent	E4402B
Signal Generator	Agilent	8960
Switch	Agilent	3499A
Switch	ETS	2090
Network Analyzer	Agilent	N5230A

Efficiency And Peak Gain-LTE Main

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
880	39.54	2.97
890	45.5	3.26
900	46.99	2.86
910	49.55	2.95
920	52.48	3.09
930	55.85	2.67
940	53.7	2.46
950	48.98	2.4
960	46.34	2.75

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
1710	37.84	0.68
1750	51.29	2.5
1790	57.41	3.47
1830	51.09	3.22
1870	42.95	1.77
1910	44.46	1.14
1950	39.54	0.21
1990	32.8	-0.67
2030	28.43	-1.54
2070	27.5	-0.83
2110	26.06	0
2150	25.94	0.19
2190	34.99	1.37

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
2230	48.53	2.85
2270	45.39	2.42
2310	37.07	2.19
2350	36.48	1.91
2390	35.89	1.72
2430	30.13	-0.31
2470	25.53	-1.02
2510	20.61	-1.22
2550	20.61	-0.95
2590	25.7	0.23
2630	39.54	2.09
2670	45.08	2.85
2690	43.15	2.51

Efficiency And Peak Gain-LTE AUX

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
880	30.2	0.26
890	43.55	0.75
900	53.95	1.62
910	52.36	1.76
920	50.93	0.47
930	45.81	-0.17
940	39.9	-0.33
950	34.83	-0.41
960	33.19	-0.05

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
1805	52.24	4.52
1845	50.35	5.26
1885	41.3	5
1925	43.15	4.3
1965	42.85	3.51
2005	46.88	2.68
2045	53.1	2.98
2085	53.83	2.27
2125	51.76	2.93
2165	36.73	3.27
2205	30.2	1.4
2245	27.16	3.4
2285	24.15	2.97

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
2325	26.67	2.88
2365	22.54	1.83
2405	21.11	1.3
2445	29.11	2.52
2485	27.35	1.38
2525	33.57	3.78
2565	41.11	2.01
2605	44.26	2.69
2645	40.74	2.12
2685	39.81	2.09

Efficiency And Peak Gain (WIFI)

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
2400	38.11	2.9
2410	39.99	3.16
2420	41.69	3.65
2430	42.95	3.98
2440	41.11	3.89
2450	39.39	3.41
2460	38.59	3.35
2470	38.43	3.06
2480	37.02	2.75
2490	36.67	3.39
2500	36.07	3.25

Frequency (MHz)	Main Antenna	
	Efficiency (%)	Gain (dBi)
5150	41.56	2.47
5250	42.99	1.6
5350	43.77	1.48
5450	43.5	2.9
5550	45.56	4.03
5650	44.24	3.95
5750	43.58	4.2
5850	41.12	3.99

Results Summary-OTA Test-LTE

Measurement	Band	Channel	Total
TRP	FDD_B1(10M)	18050	17.4
TRP	FDD_B1(10M)	18300	17.13
TRP	FDD_B1(10M)	18550	17.02
TIS(RSSI)	FDD_B1(10M)	550	-93.82
TRP	FDD_B3(10M)	19250	17.81
TRP	FDD_B3(10M)	19575	19.3
TRP	FDD_B3(10M)	19900	18.17
TIS(RSSI)	FDD_B3(10M)	1900	-93.34

Measurement	Band	Channel	Total
TRP	FDD_B8(10M)	21500	17.66
TRP	FDD_B8(10M)	21625	17.83
TRP	FDD_B8(10M)	21750	17.23
TIS(RSSI)	FDD_B8(10M)	3750	-89.07

Results Summary-OTA Test-LTE

Measurement	Band	Channel	Total
TRP	TDD_B38(20M)	37850	18.82
TRP	TDD_B38(20M)	38000	18.45
TRP	TDD_B38(20M)	38150	18.16
TIS(RSSI)	TDD_B38(20M)	38150	-90.21
TRP	TDD_B39(20M)	38350	18.21
TRP	TDD_B39(20M)	38450	17.92
TRP	TDD_B39(20M)	38550	17.62
TIS(RSSI)	TDD_B39(20M)	38550	-90.45

Measurement	Band	Channel	Total
TRP	TDD_B40(20M)	38750	17.94
TRP	TDD_B40(20M)	39150	17.21
TRP	TDD_B40(20M)	39550	17.03
TIS(RSSI)	TDD_B40(20M)	39550	-85.1
TRP	TDD_B41(20M)	40340	18.02
TRP	TDD_B41(20M)	40620	18.92
TRP	TDD_B41(20M)	41140	17.06
TIS(RSSI)	TDD_B41(20M)	41140	-88.86

Results Summary-OTA Test-WIFI

Measurement	Band	Channel	Total
TRP	WIFI_B (11M)	1	12.26
TRP	WIFI_B (11M)	7	12.48
TRP	WIFI_B (11M)	13	12.13
TIS(EIRP)	WIFI_B (11M)	13	-76.57
TRP	WIFI_A (54M)	36	10.38
TRP	WIFI_A (54M)	149	10.42
TRP	WIFI_A (54M)	165	10.22
TIS(EIRP)	WIFI_A (54M)	165	-70.42

Conclusion & Comments

- 分体机天线OTA有源测试数据如上，TRP均可满足贵司要求，LTE B40 TIS因天线太靠近屏幕，受整机干扰影响，导致灵敏度略低；
- 因整机金属件较多，且相互拼装，天线Cable线在金属机台内摆放位置及长短对天线稳定性会有较大影响，故建议要保证装配一致性，确保cable线在机台内摆放位置一致且固定好，在保证可装配的情况下，建议cable线尽量短，具体理线方式会再与贵司RD电话沟通说明；

Thank you

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