



FCC Test Report (4G)

FCC ID : 2AIV5CWELL001

Applicant : CWELL INTERNATIONAL CO.,LTD.

Room 2810-2814, Building A, Qunxing Plaza, Huaqiang North Rd,
Futian District, Shenzhen, 518031, China .

Sample Description

Product Name : Rugged Smartphone

Model No. : HG06

Serial No. : N/A

Trademark : AngelLira

Receipt Date : 2016-06-26

Test Date : 2016-06-27 to 2016-07-05

Issue Date : 2016-07-06

Test Standard(s) : FCC PART 2; FCC PART 27

Conclusions : PASSED*

*In the configuration tested, the EUT complied with the standards specified above.

Test/Witness Engineer :

Jason Deng

Approved & Authorized :

Frank Zhang

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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1. General Information

1.1 Client Information

Applicant	:	CWELL INTERNATIONAL CO.,LTD.
Address	:	Room 2810-2814, Building A, Qunxing Plaza, Huaqiang North Rd, Futian District, Shenzhen, 518031,China .
Manufacturer	:	CWELL INTERNATIONAL CO.,LTD.
Address	:	Room 2810-2814, Building A, Qunxing Plaza, Huaqiang North Rd, Futian District, Shenzhen, 518031,China .

1.2 General Description of EUT (Equipment Under Test)

Product Name	:	Rugged Smartphone	
Models No.	:	HG06	
Difference	:	N/A	
Trademark	:	AngellLira	
Product Description	:	Operation Band:	LTE B4
		Operation frequency	LTE B4 1710-1755MHz
		Modulation Technology:	16QAM, QPSK
		Antenna Type:	Integral Antenna
		Antenna Gain:	1dBi
Power Supply	:	USB DC 5V from PC, DC 3.7V from Li-ion battery	

Note:

- (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



1.3 Description of Test Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follows was evaluated respectively.

Test Mode	Description
Transmitting mode(QPSK)	Keep the EUT in continuous transmitting with modulation
Transmitting mode(16QAM)	Keep the EUT in continuous transmitting with modulation

Remark: The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows: During all testing, EUT is in link mode with base station emulator at maximum power level in each test mode and channel as below:

Mode	Channel	Frequency(MHz)
LTE B2(1.4MHz)	19957	1710.7
	20175	1732.5
	20393	1754.3
LTE B2(3MHz)	19965	1711.5
	20175	1732.5
	20385	1753.5
LTE B2((5MHz)	19975	1712.5
	20175	1732.5
	20375	1752.5
LTE B2 (10MHz)	20000	1715
	20175	1732.5
	20350	1750
LTE B2 (15MHz)	20025	1717.5
	20175	1732.5
	20325	1747.5
LTE B2 (20MHz)	20050	1720
	20175	1732.5
	20300	1745



1.4 Test Instruments List

	Test Equipment	Manufacturer	Model No.	Cal. Date	Cal. Due date
1	Bilog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	May 22, 2016	May 21, 2017
2	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	May 27, 2016	May 26, 2017
3	Coaxial Cable	N/A	N/A	Mar. 28, 2016	Mar. 27, 2017
4	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
5	Coaxial cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
6	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
7	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
8	Amplifier (10kHz-1.3GHz)	HP	8447D	Mar. 29, 2016	Mar. 29, 2017
9	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	Jun. 06, 2016	Mar. 29, 2017
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	Mar. 29, 2016	Mar. 29, 2017
11	Horn Antenna	ETS-LINDGREN	3160	Mar. 27, 2016	Mar. 27, 2017
12	Positioning Controller	UC	UC3000	N/A	N/A
13	Spectrum analyzer 9kHz-30GHz	Rohde & Schwarz	FSP	May 26, 2016	May 27, 2017
14	EMI Test Receiver	Rohde & Schwarz	ESPI	Mar. 29, 2016	Mar. 30, 2017
15	Loop antenna	Laplace instrument	RF300	May 22,, 2016	May 23, 2017
16	Universal radio communication tester	Rhode & Schwarz	CMU200	May 26, 2016	May 27, 2017
17	Signal Analyzer	Rohde & Schwarz	FSIQ3	May 26, 2016	May 27, 2017
18	L.I.S.N.#1	Rohde & Schwarz	NSLK8126	May 26, 2016	May 27, 2017
19	L.I.S.N.#2	Rohde & Schwarz	ENV216	May 26, 2016	May 27, 2017
20	Power Meter	Anritsu	ML2495A	May 26, 2016	May 27, 2017
21	Power sensor	Anritsu	ML2491A	May 26, 2016	May 27, 2017
22	Base station	Agilent	E5515C	May 26, 2016	May 27, 2017



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1.5 Laboratory Location

Shenzhen TOBY technology Co., Ltd

Address: 1 A/F., Bldg.6, Yusheng Industrial Zone The National Road No.107 Xixiang Section 467,

Xixiang, Bao'an, Shenzhen, Guangdong, 518057, China

At the time of testing, the Laboratory is accredited. It is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562 7.

Tel:0086-755-26509301 Fax: 0086-755-26509195



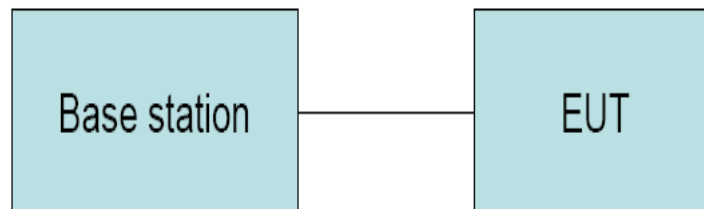
2. Test Summary

Description of Test Item	Standard	Results
Conducted Output power	FCC PART 2: 2.1046 FCC PART 27.50(d)	PASS
Radiated Output power(erp/eirp)	FCC PART 2: 2.1046 FCC PART 27.50(d)	PASS
Occupied bandwidth	FCC PART 2: 2.1049	PASS
Frequency stability	FCC PART 2: 2.1055 FCC PART 27.54	PASS
Conducted spurious emission (Antenna terminal)	FCC PART 2: 2.1051 FCC PART 27.53(h)	PASS
Radiated spurious emissions	FCC PART 2: 2.1051 FCC PART 27.53(h)	PASS
Band edge compliance	FCC PART 2: 2.1051 FCC PART 27.53(h)	PASS
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.4: 2014	PASS



3. Conducted Output Power

3.1. Test Setup



3.2. Limit

LTE Band2
30Bm(ERP)

3.3. Test Procedure

- (1) The EUT's RF output port was connected to base station.
- (2) A call is set up by the SS according to the generic call set up procedure
- (3) Set EUT at maximum power level through base station by power level command
- (4) Measure the maximum output power of EUT at each frequency band and mode by base station.



3.4. Test Result

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	LCH	RB1#0	22.37	30	Pass
				RB1#3	22.44	30	Pass
				RB1#5	22.6	30	Pass
				RB3#0	22.3	30	Pass
				RB3#2	22.4	30	Pass
				RB3#3	22.58	30	Pass
				RB6#0	20.9	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	MCH	RB1#0	22.27	30	Pass
				RB1#3	22.61	30	Pass
				RB1#5	22.69	30	Pass
				RB3#0	22.51	30	Pass
				RB3#2	22.57	30	Pass
				RB3#3	22.34	30	Pass
				RB6#0	21.02	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	HCH	RB1#0	22.52	30	Pass
				RB1#3	22.7	30	Pass
				RB1#5	22.63	30	Pass
				RB3#0	22.37	30	Pass
				RB3#2	22.24	30	Pass
				RB3#3	22.51	30	Pass
				RB6#0	20.44	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	LCH	RB1#0	22.23	30	Pass
				RB1#7	22.34	30	Pass
				RB1#14	22.52	30	Pass
				RB8#0	22.67	30	Pass
				RB8#4	21.54	30	Pass
				RB8#7	21.46	30	Pass
				RB15#0	21.67	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	MCH	RB1#0	22.38	30	Pass
				RB1#7	22.51	30	Pass
				RB1#14	22.65	30	Pass
				RB8#0	22.41	30	Pass
				RB8#4	21.3	30	Pass
				RB8#7	21.6	30	Pass
				RB15#0	22.00	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	HCH	RB1#0	22.44	30	Pass
				RB1#7	22.65	30	Pass
				RB1#14	22.47	30	Pass
				RB8#0	22.2	30	Pass
				RB8#4	21.17	30	Pass
				RB8#7	21.95	30	Pass
				RB15#0	21.87	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	LCH	RB1#0	21.82	30	Pass
				RB1#13	22.07	30	Pass
				RB1#24	21.4	30	Pass
				RB12#0	21.03	30	Pass
				RB12#6	21.13	30	Pass
				RB12#13	20.86	30	Pass
				RB25#0	20.99	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	MCH	RB1#0	21.94	30	Pass
				RB1#13	22.07	30	Pass
				RB1#24	21.57	30	Pass
				RB12#0	21.03	30	Pass
				RB12#6	21.06	30	Pass
				RB12#13	20.82	30	Pass
				RB25#0	20.96	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	HCH	RB1#0	21.63	30	Pass
				RB1#13	21.82	30	Pass
				RB1#24	21.54	30	Pass
				RB12#0	20.89	30	Pass
				RB12#6	20.5	30	Pass
				RB12#13	20.49	30	Pass
				RB25#0	20.74	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	LCH	RB1#0	21.4	30	Pass
				RB1#25	21.64	30	Pass
				RB1#49	21.44	30	Pass
				RB25#0	20.79	30	Pass
				RB25#13	20.4	30	Pass
				RB25#25	20.39	30	Pass
				RB50#0	20.64	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	MCH	RB1#0	21.49	30	Pass
				RB1#25	21.68	30	Pass
				RB1#49	20.71	30	Pass
				RB25#0	20.64	30	Pass
				RB25#13	20.73	30	Pass
				RB25#25	20.53	30	Pass
				RB50#0	20.57	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	HCH	RB1#0	21.64	30	Pass
				RB1#25	21.87	30	Pass
				RB1#49	21.06	30	Pass
				RB25#0	20.52	30	Pass
				RB25#13	20.71	30	Pass
				RB25#25	20.86	30	Pass
				RB50#0	21.02	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	LCH	RB1#0	21.76	30	Pass
				RB1#38	21.99	30	Pass
				RB1#74	21.18	30	Pass
				RB38#0	20.64	30	Pass
				RB38#19	20.83	30	Pass
				RB25#39	20.98	30	Pass
				RB75#0	21.14	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	MCH	RB1#0	21.44	30	Pass
				RB1#38	21.66	30	Pass
				RB1#74	21.51	30	Pass
				RB38#0	20.78	30	Pass
				RB38#19	21.01	30	Pass
				RB25#39	20.78	30	Pass
				RB75#0	20.93	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	HCH	RB1#0	21.79	30	Pass
				RB1#38	22.06	30	Pass
				RB1#74	21.84	30	Pass
				RB38#0	21.11	30	Pass
				RB38#19	21.19	30	Pass
				RB25#39	20.98	30	Pass
				RB75#0	21.22	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	LCH	RB1#0	21.48	30	Pass
				RB1#50	21.78	30	Pass
				RB1#99	21.5	30	Pass
				RB50#0	21.07	30	Pass
				RB50#25	21.12	30	Pass
				RB50#50	20.87	30	Pass
				RB100#0	21.06	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	MCH	RB1#0	21.59	30	Pass
				RB1#50	21.9	30	Pass
				RB1#99	21.64	30	Pass
				RB50#0	21.12	30	Pass
				RB50#25	21.17	30	Pass
				RB50#50	20.79	30	Pass
				RB100#0	21.16	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	HCH	RB1#0	21.65	30	Pass
				RB1#50	21.96	30	Pass
				RB1#99	21.75	30	Pass
				RB50#0	21.18	30	Pass
				RB50#25	21.24	30	Pass
				RB50#50	20.88	30	Pass
				RB100#0	21.2	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	LCH	RB1#0	22.35	30	Pass
				RB1#3	22.44	30	Pass
				RB1#5	22.54	30	Pass
				RB3#0	22.37	30	Pass
				RB3#2	22.48	30	Pass
				RB3#3	22.64	30	Pass
				RB6#0	20.92	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	MCH	RB1#0	22.29	30	Pass
				RB1#3	22.56	30	Pass
				RB1#5	22.27	30	Pass
				RB3#0	22.48	30	Pass
				RB3#2	22.41	30	Pass
				RB3#3	22.44	30	Pass
				RB6#0	21.08	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	HCH	RB1#0	22.37	30	Pass
				RB1#3	22.58	30	Pass
				RB1#5	22.41	30	Pass
				RB3#0	22.36	30	Pass
				RB3#2	22.45	30	Pass
				RB3#3	22.29	30	Pass
				RB6#0	20.91	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	LCH	RB1#0	22.47	30	Pass
				RB1#7	22.65	30	Pass
				RB1#14	22.8	30	Pass
				RB8#0	22.64	30	Pass
				RB8#4	21.38	30	Pass
				RB8#7	21.74	30	Pass
				RB15#0	21.49	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	MCH	RB1#0	22.43	30	Pass
				RB1#7	22.28	30	Pass
				RB1#14	22.58	30	Pass
				RB8#0	22.68	30	Pass
				RB8#4	21.37	30	Pass
				RB8#7	21.4	30	Pass
				RB15#0	22.12	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	HCH	RB1#0	22.46	30	Pass
				RB1#7	22.32	30	Pass
				RB1#14	22.24	30	Pass
				RB8#0	22.31	30	Pass
				RB8#4	21.36	30	Pass
				RB8#7	21.48	30	Pass
				RB15#0	21.6	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	LCH	RB1#0	21.54	30	Pass
				RB1#13	21.72	30	Pass
				RB1#24	21.2	30	Pass
				RB12#0	20.66	30	Pass
				RB12#6	20.88	30	Pass
				RB12#13	20.62	30	Pass
				RB25#0	20.77	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	MCH	RB1#0	21.63	30	Pass
				RB1#13	21.76	30	Pass
				RB1#24	21.3	30	Pass
				RB12#0	20.6	30	Pass
				RB12#6	20.72	30	Pass
				RB12#13	20.45	30	Pass
				RB25#0	20.53	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	HCH	RB1#0	21.37	30	Pass
				RB1#13	21.47	30	Pass
				RB1#24	21.21	30	Pass
				RB12#0	20.55	30	Pass
				RB12#6	20.14	30	Pass
				RB12#13	20.24	30	Pass
				RB25#0	20.43	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	LCH	RB1#0	21.62	30	Pass
				RB1#25	21.44	30	Pass
				RB1#49	20.6	30	Pass
				RB25#0	20.11	30	Pass
				RB25#13	20.2	30	Pass
				RB25#25	20.32	30	Pass
				RB50#0	21.62	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	MCH	RB1#0	21.37	30	Pass
				RB1#25	21.47	30	Pass
				RB1#49	20.55	30	Pass
				RB25#0	20.48	30	Pass
				RB25#13	20.55	30	Pass
				RB25#25	20.34	30	Pass
				RB50#0	20.47	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	HCH	RB1#0	21.55	30	Pass
				RB1#25	21.8	30	Pass
				RB1#49	21.02	30	Pass
				RB25#0	20.3	30	Pass
				RB25#13	20.55	30	Pass
				RB25#25	20.67	30	Pass
				RB50#0	20.88	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	LCH	RB1#0	21.33	30	Pass
				RB1#38	21.46	30	Pass
				RB1#74	21.52	30	Pass
				RB38#0	20.64	30	Pass
				RB38#19	20.77	30	Pass
				RB25#39	20.63	30	Pass
				RB75#0	20.74	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	MCH	RB1#0	21.55	30	Pass
				RB1#38	21.77	30	Pass
				RB1#74	21.39	30	Pass
				RB38#0	20.64	30	Pass
				RB38#19	20.58	30	Pass
				RB25#39	20.72	30	Pass
				RB75#0	20.99	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	HCH	RB1#0	21.75	30	Pass
				RB1#38	21.67	30	Pass
				RB1#74	21.77	30	Pass
				RB38#0	21.12	30	Pass
				RB38#19	20.97	30	Pass
				RB25#39	20.78	30	Pass
				RB75#0	21.04	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	LCH	RB1#0	21.6	30	Pass
				RB1#50	21.91	30	Pass
				RB1#99	21.59	30	Pass
				RB50#0	21.13	30	Pass
				RB50#25	21.23	30	Pass
				RB50#50	20.98	30	Pass
				RB100#0	21.2	30	Pass

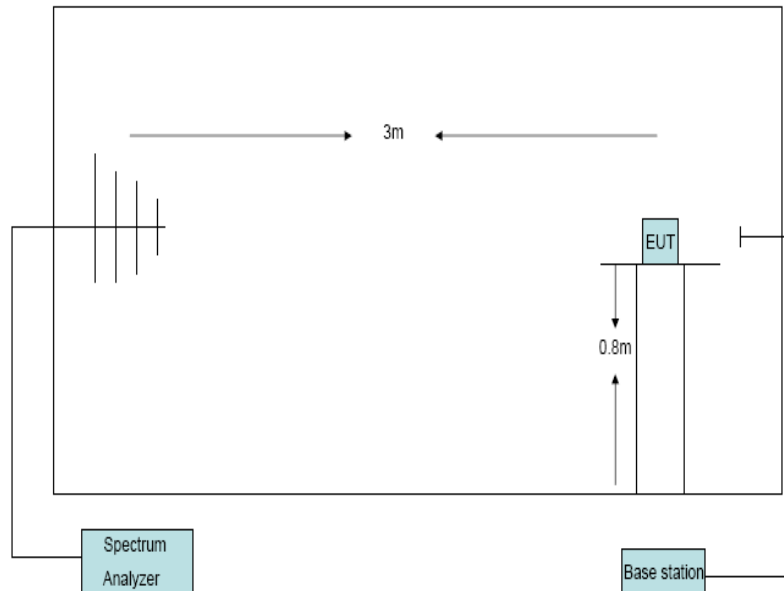
Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	MCH	RB1#0	21.89	30	Pass
				RB1#50	21.78	30	Pass
				RB1#99	21.65	30	Pass
				RB50#0	20.92	30	Pass
				RB50#25	20.85	30	Pass
				RB50#50	20.71	30	Pass
				RB100#0	20.9	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	HCH	RB1#0	21.6	30	Pass
				RB1#50	21.9	30	Pass
				RB1#99	21.59	30	Pass
				RB50#0	20.93	30	Pass
				RB50#25	20.98	30	Pass
				RB50#50	20.79	30	Pass
				RB100#0	21.12	30	Pass



4. Effective (Isotropic) Radiated Power

4.1 Test Setup



4.2 Limit

LTE Band 4
33dBm(EIRP)

4.3 Test Procedure

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna(for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.



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The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss(only for Dipole antenna) - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$



4.4 Test Data

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	LCH	RB1#0	23.37	30	Pass
				RB1#3	23.44	30	Pass
				RB1#5	23.6	30	Pass
				RB3#0	23.3	30	Pass
				RB3#2	23.4	30	Pass
				RB3#3	23.58	30	Pass
				RB6#0	21.9	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	MCH	RB1#0	23.27	30	Pass
				RB1#3	23.61	30	Pass
				RB1#5	23.69	30	Pass
				RB3#0	23.51	30	Pass
				RB3#2	23.57	30	Pass
				RB3#3	23.34	30	Pass
				RB6#0	22.02	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	HCH	RB1#0	23.52	30	Pass
				RB1#3	23.7	30	Pass
				RB1#5	23.63	30	Pass
				RB3#0	23.37	30	Pass
				RB3#2	23.24	30	Pass
				RB3#3	23.51	30	Pass
				RB6#0	21.44	33	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	LCH	RB1#0	23.23	30	Pass
				RB1#7	23.34	30	Pass
				RB1#14	23.52	30	Pass
				RB8#0	23.67	30	Pass
				RB8#4	22.54	30	Pass
				RB8#7	22.46	30	Pass
				RB15#0	22.67	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	MCH	RB1#0	23.38	30	Pass
				RB1#7	23.51	30	Pass
				RB1#14	23.65	30	Pass
				RB8#0	23.41	30	Pass
				RB8#4	22.3	30	Pass
				RB8#7	22.6	30	Pass
				RB15#0	23.00	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	HCH	RB1#0	23.44	30	Pass
				RB1#7	23.65	30	Pass
				RB1#14	23.47	30	Pass
				RB8#0	23.2	30	Pass
				RB8#4	22.17	30	Pass
				RB8#7	22.95	30	Pass
				RB15#0	22.87	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	LCH	RB1#0	22.82	30	Pass
				RB1#13	23.07	30	Pass
				RB1#24	22.4	30	Pass
				RB12#0	22.03	30	Pass
				RB12#6	22.13	30	Pass
				RB12#13	21.86	30	Pass
				RB25#0	21.99	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	MCH	RB1#0	22.94	30	Pass
				RB1#13	23.07	30	Pass
				RB1#24	22.57	30	Pass
				RB12#0	22.03	30	Pass
				RB12#6	22.06	30	Pass
				RB12#13	21.82	30	Pass
				RB25#0	21.96	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	5MHz	HCH	RB1#0	22.63	30	Pass
				RB1#13	22.82	30	Pass
				RB1#24	22.54	30	Pass
				RB12#0	21.89	30	Pass
				RB12#6	21.5	30	Pass
				RB12#13	21.49	30	Pass
				RB25#0	21.74	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	LCH	RB1#0	22.4	30	Pass
				RB1#25	22.64	30	Pass
				RB1#49	22.44	30	Pass
				RB25#0	21.79	30	Pass
				RB25#13	21.4	30	Pass
				RB25#25	21.39	30	Pass
				RB50#0	21.64	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	MCH	RB1#0	22.49	30	Pass
				RB1#25	22.68	30	Pass
				RB1#49	21.71	30	Pass
				RB25#0	21.64	30	Pass
				RB25#13	21.73	30	Pass
				RB25#25	21.53	30	Pass
				RB50#0	21.57	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	10MHz	HCH	RB1#0	22.64	30	Pass
				RB1#25	22.87	30	Pass
				RB1#49	22.06	30	Pass
				RB25#0	21.52	30	Pass
				RB25#13	21.71	30	Pass
				RB25#25	21.86	30	Pass
				RB50#0	22.02	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	LCH	RB1#0	22.76	30	Pass
				RB1#38	22.99	30	Pass
				RB1#74	22.18	30	Pass
				RB38#0	21.64	30	Pass
				RB38#19	21.83	30	Pass
				RB25#39	21.98	30	Pass
				RB75#0	22.14	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	MCH	RB1#0	22.44	30	Pass
				RB1#38	22.66	30	Pass
				RB1#74	22.51	30	Pass
				RB38#0	21.78	30	Pass
				RB38#19	22.01	30	Pass
				RB25#39	21.78	30	Pass
				RB75#0	21.93	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	15MHz	HCH	RB1#0	22.79	30	Pass
				RB1#38	23.06	30	Pass
				RB1#74	22.84	30	Pass
				RB38#0	22.11	30	Pass
				RB38#19	22.19	30	Pass
				RB25#39	21.98	30	Pass
				RB75#0	22.22	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	LCH	RB1#0	22.48	30	Pass
				RB1#50	22.78	30	Pass
				RB1#99	22.5	30	Pass
				RB50#0	22.07	30	Pass
				RB50#25	22.12	30	Pass
				RB50#50	21.87	30	Pass
				RB100#0	22.06	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	MCH	RB1#0	22.59	30	Pass
				RB1#50	22.9	30	Pass
				RB1#99	22.64	30	Pass
				RB50#0	22.12	30	Pass
				RB50#25	22.17	30	Pass
				RB50#50	21.79	30	Pass
				RB100#0	22.16	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	20MHz	HCH	RB1#0	22.65	30	Pass
				RB1#50	22.96	30	Pass
				RB1#99	22.75	30	Pass
				RB50#0	22.18	30	Pass
				RB50#25	22.24	30	Pass
				RB50#50	21.88	30	Pass
				RB100#0	22.2	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	LCH	RB1#0	23.35	30	Pass
				RB1#3	23.44	30	Pass
				RB1#5	23.54	30	Pass
				RB3#0	23.37	30	Pass
				RB3#2	23.48	30	Pass
				RB3#3	23.64	30	Pass
				RB6#0	21.92	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	MCH	RB1#0	23.29	30	Pass
				RB1#3	23.56	30	Pass
				RB1#5	23.27	30	Pass
				RB3#0	23.48	30	Pass
				RB3#2	23.41	30	Pass
				RB3#3	23.44	30	Pass
				RB6#0	22.08	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	1.4MHz	HCH	RB1#0	23.37	30	Pass
				RB1#3	23.58	30	Pass
				RB1#5	23.41	30	Pass
				RB3#0	23.36	30	Pass
				RB3#2	23.45	30	Pass
				RB3#3	23.29	30	Pass
				RB6#0	21.91	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	LCH	RB1#0	23.47	30	Pass
				RB1#7	23.65	30	Pass
				RB1#14	23.8	30	Pass
				RB8#0	23.64	30	Pass
				RB8#4	22.38	30	Pass
				RB8#7	22.74	30	Pass
				RB15#0	22.49	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	MCH	RB1#0	23.43	30	Pass
				RB1#7	23.28	30	Pass
				RB1#14	23.58	30	Pass
				RB8#0	23.68	30	Pass
				RB8#4	22.37	30	Pass
				RB8#7	22.4	30	Pass
				RB15#0	23.12	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	QPSK	3MHz	HCH	RB1#0	23.46	30	Pass
				RB1#7	23.32	30	Pass
				RB1#14	23.24	30	Pass
				RB8#0	23.31	30	Pass
				RB8#4	22.36	30	Pass
				RB8#7	22.48	30	Pass
				RB15#0	22.6	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	LCH	RB1#0	22.54	30	Pass
				RB1#13	22.72	30	Pass
				RB1#24	22.2	30	Pass
				RB12#0	21.66	30	Pass
				RB12#6	21.88	30	Pass
				RB12#13	21.62	30	Pass
				RB25#0	21.77	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	MCH	RB1#0	22.63	30	Pass
				RB1#13	22.76	30	Pass
				RB1#24	22.3	30	Pass
				RB12#0	21.6	30	Pass
				RB12#6	21.72	30	Pass
				RB12#13	21.45	30	Pass
				RB25#0	21.53	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	5MHz	HCH	RB1#0	22.37	30	Pass
				RB1#13	22.47	30	Pass
				RB1#24	22.21	30	Pass
				RB12#0	21.55	30	Pass
				RB12#6	21.14	30	Pass
				RB12#13	21.24	30	Pass
				RB25#0	21.43	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	LCH	RB1#0	22.62	30	Pass
				RB1#25	22.44	30	Pass
				RB1#49	21.6	30	Pass
				RB25#0	21.11	30	Pass
				RB25#13	21.2	30	Pass
				RB25#25	21.32	30	Pass
				RB50#0	22.62	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	MCH	RB1#0	22.37	30	Pass
				RB1#25	22.47	30	Pass
				RB1#49	21.55	30	Pass
				RB25#0	21.48	30	Pass
				RB25#13	21.55	30	Pass
				RB25#25	21.34	30	Pass
				RB50#0	21.47	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	10MHz	HCH	RB1#0	22.55	30	Pass
				RB1#25	22.8	30	Pass
				RB1#49	22.02	30	Pass
				RB25#0	21.3	30	Pass
				RB25#13	21.55	30	Pass
				RB25#25	21.67	30	Pass
				RB50#0	21.88	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	LCH	RB1#0	22.33	30	Pass
				RB1#38	22.46	30	Pass
				RB1#74	22.52	30	Pass
				RB38#0	21.64	30	Pass
				RB38#19	21.77	30	Pass
				RB25#39	21.63	30	Pass
				RB75#0	21.74	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	MCH	RB1#0	22.55	30	Pass
				RB1#38	22.77	30	Pass
				RB1#74	22.39	30	Pass
				RB38#0	21.64	30	Pass
				RB38#19	21.58	30	Pass
				RB25#39	21.72	30	Pass
				RB75#0	21.99	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	15MHz	HCH	RB1#0	22.75	30	Pass
				RB1#38	22.67	30	Pass
				RB1#74	22.77	30	Pass
				RB38#0	22.12	30	Pass
				RB38#19	21.97	30	Pass
				RB25#39	21.78	30	Pass
				RB75#0	22.04	30	Pass



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Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	LCH	RB1#0	22.6	30	Pass
				RB1#50	22.91	30	Pass
				RB1#99	22.59	30	Pass
				RB50#0	22.13	30	Pass
				RB50#25	22.23	30	Pass
				RB50#50	21.98	30	Pass
				RB100#0	22.2	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	MCH	RB1#0	22.89	30	Pass
				RB1#50	22.78	30	Pass
				RB1#99	22.65	30	Pass
				RB50#0	21.92	30	Pass
				RB50#25	21.85	30	Pass
				RB50#50	21.71	30	Pass
				RB100#0	21.9	30	Pass

Band	Test Mode	Test bandwidth	Channel	RB	Output Power	Limit	Result
Band 4	16QAM	20MHz	HCH	RB1#0	22.6	30	Pass
				RB1#50	22.9	30	Pass
				RB1#99	22.59	30	Pass
				RB50#0	21.93	30	Pass
				RB50#25	21.98	30	Pass
				RB50#50	21.79	30	Pass
				RB100#0	22.12	30	Pass

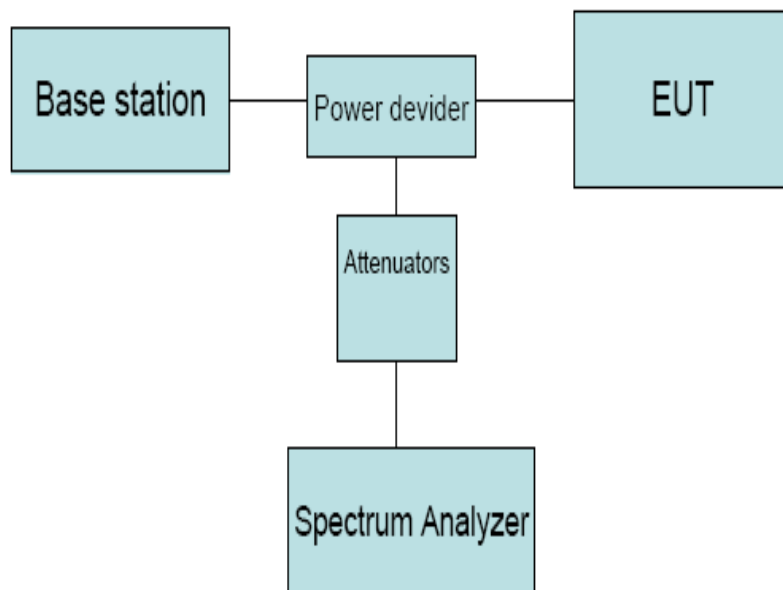


5. Occupied Bandwidth

5.1. Limit

N/A

5.2. Test Setup



5.3. Test Procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.
2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth



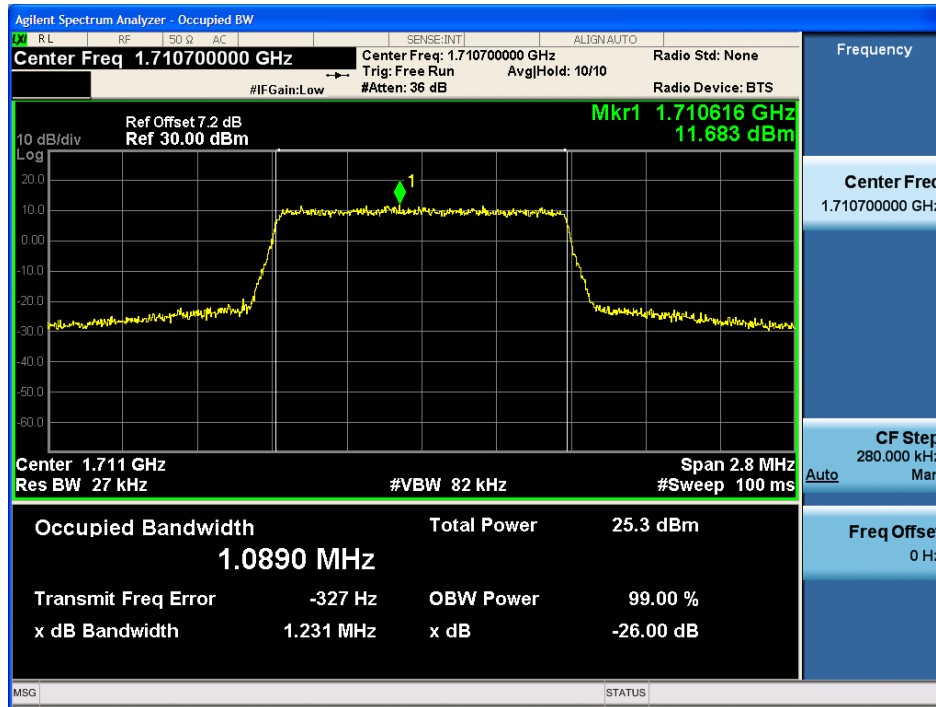
5.4. Test Data

BW [MHz]	Mod	Bandwidth [MHz]					
		Lowest		Middle		Highest	
		26dB BW	99% BW	26dB BW	99% BW	26dB BW	99% BW
1.4	QPSK	1.231	1.0890	1.224	1.0901	1.225	1.0890
1.4	16QAM	1.242	1.0900	1.223	1.0900	1.226	1.0882
3.0	QPSK	2.953	2.7052	2.934	2.6986	2.932	2.6994
3.0	16QAM	2.949	2.7078	2.950	2.7067	2.953	2.7087
5	QPSK	4.869	4.5057	4.851	4.4973	4.867	4.4992
5	16QAM	4.881	4.4970	4.883	4.5039	4.861	4.5084
10	QPSK	9.610	8.9884	9.586	8.9926	9.560	8.9698
10	16QAM	9.628	8.9955	9.614	8.9943	9.594	8.9893
15	QPSK	14.40	13.484	14.40	13.480	14.41	13.463
15	16QAM	14.48	13.479	14.43	13.481	14.41	13.456
20	QPSK	19.08	17.955	19.13	17.962	19.12	17.943
20	16QAM	19.13	17.963	19.15	17.978	19.08	17.935

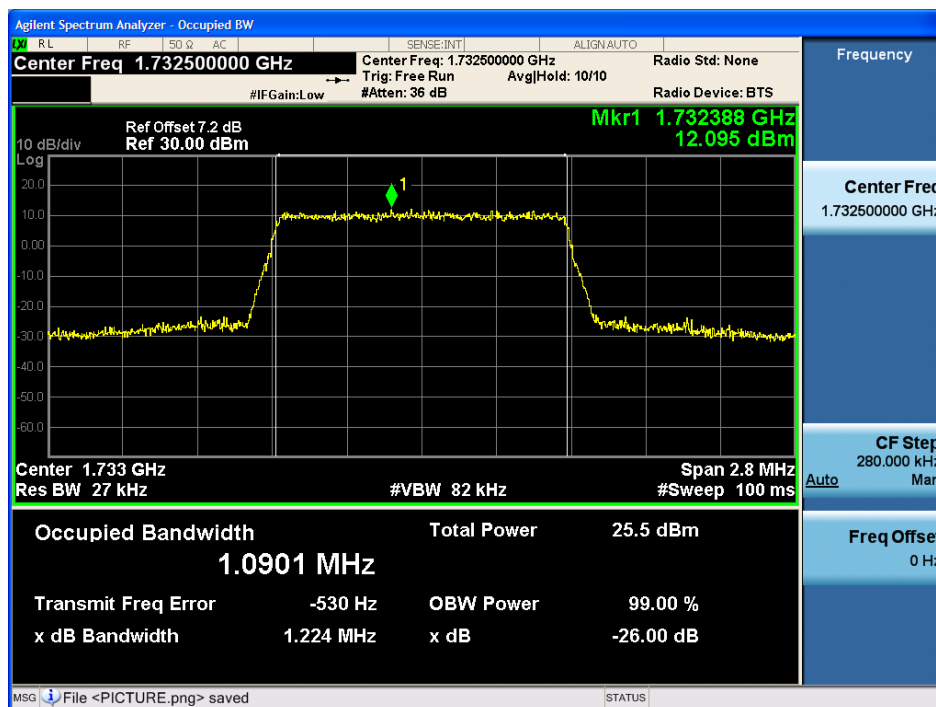


5.5. Test Plot

1.4MHz Lowest QPSK

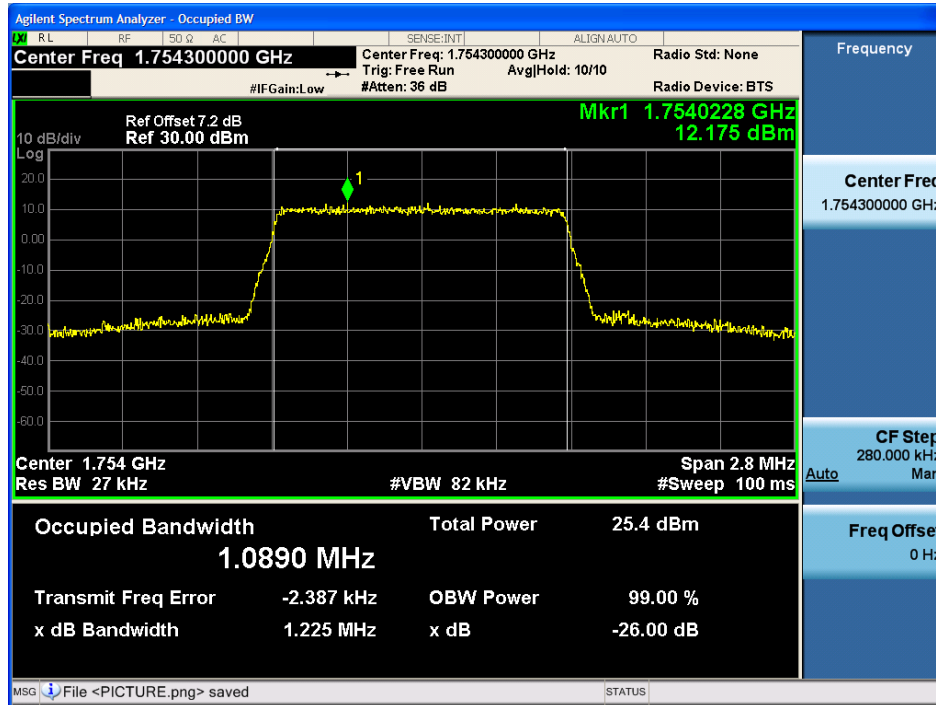


1.4MHz Middle QPSK

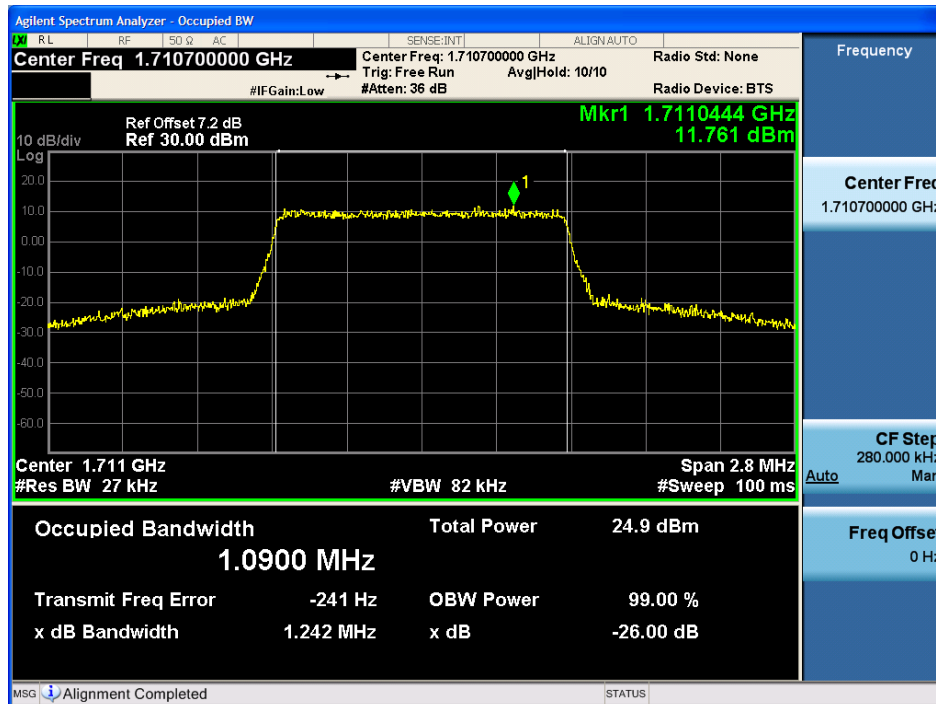




1.4MHz Highest QPSK



1.4MHz Lowest 16QAM



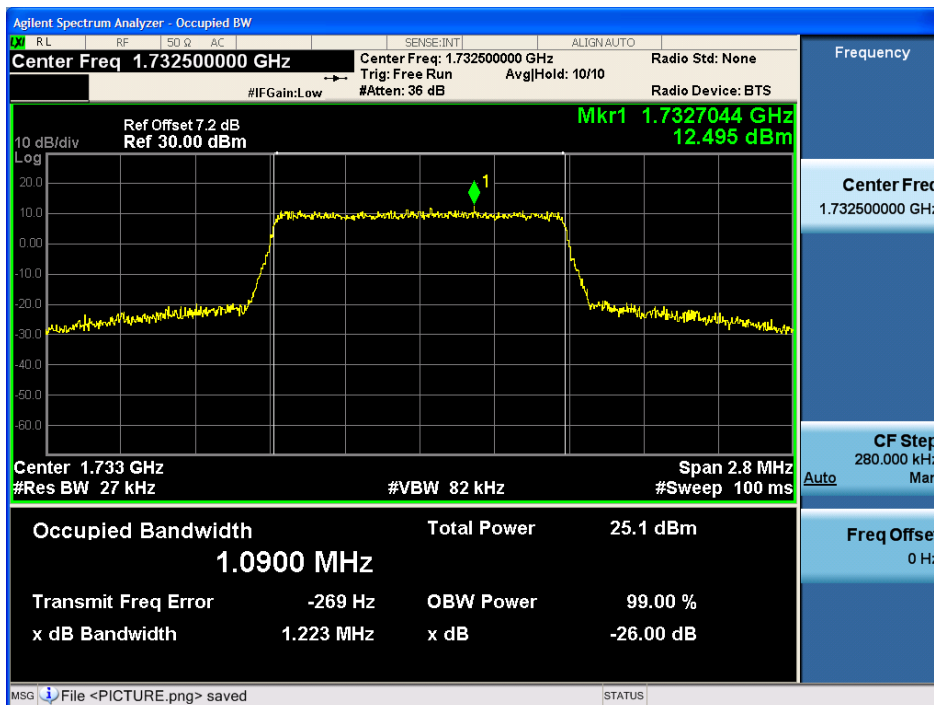


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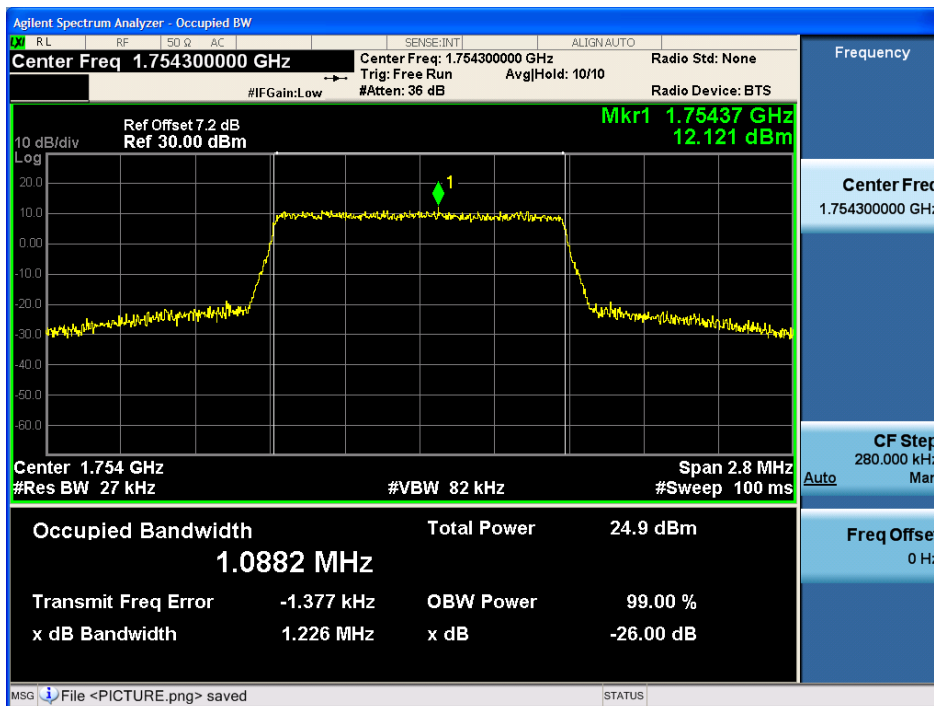
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1.4MHz Middle 16QAM



1.4MHz Highest 16QAM



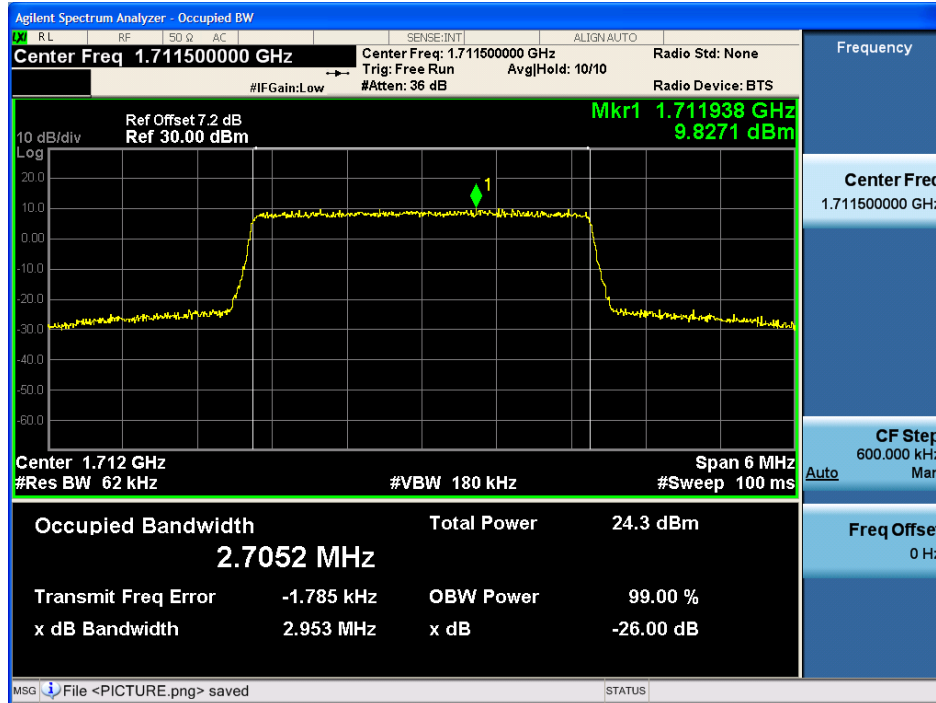


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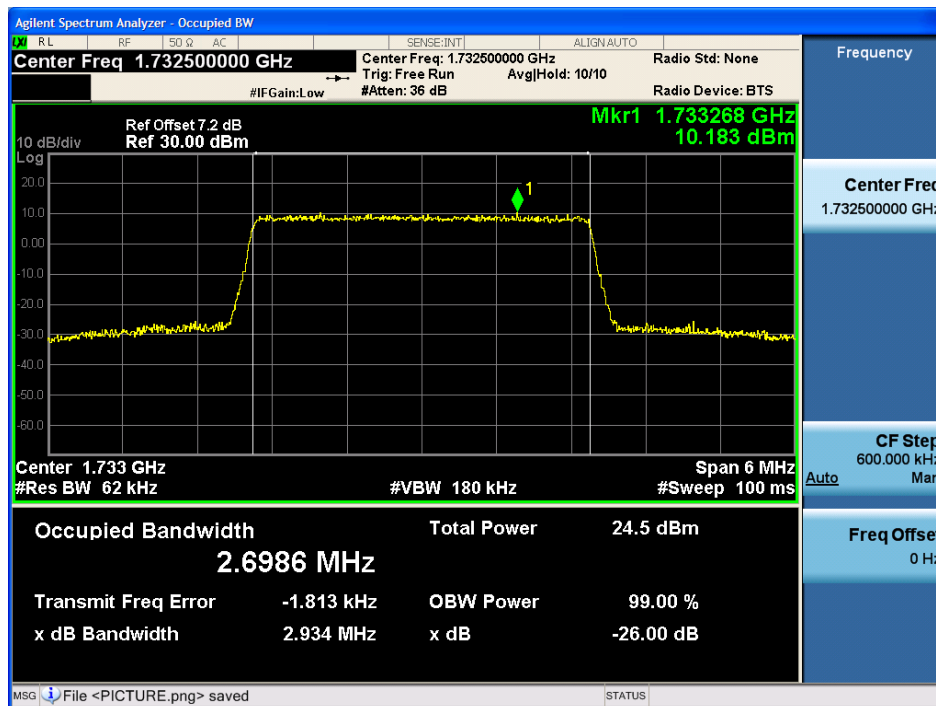
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3MHz Lowest QPSK



3MHz Middle QPSK



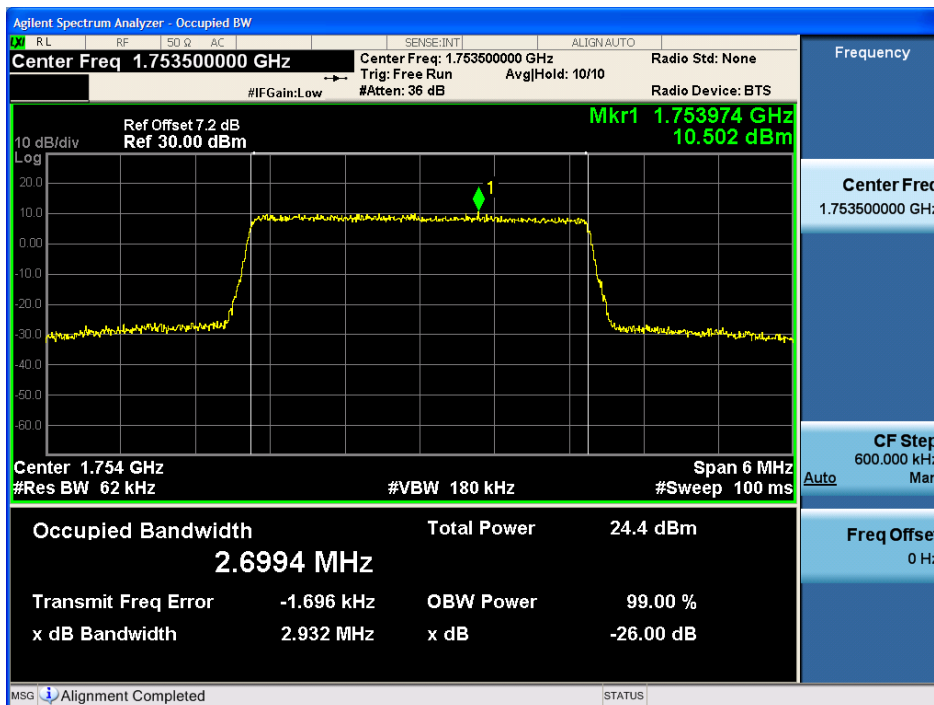


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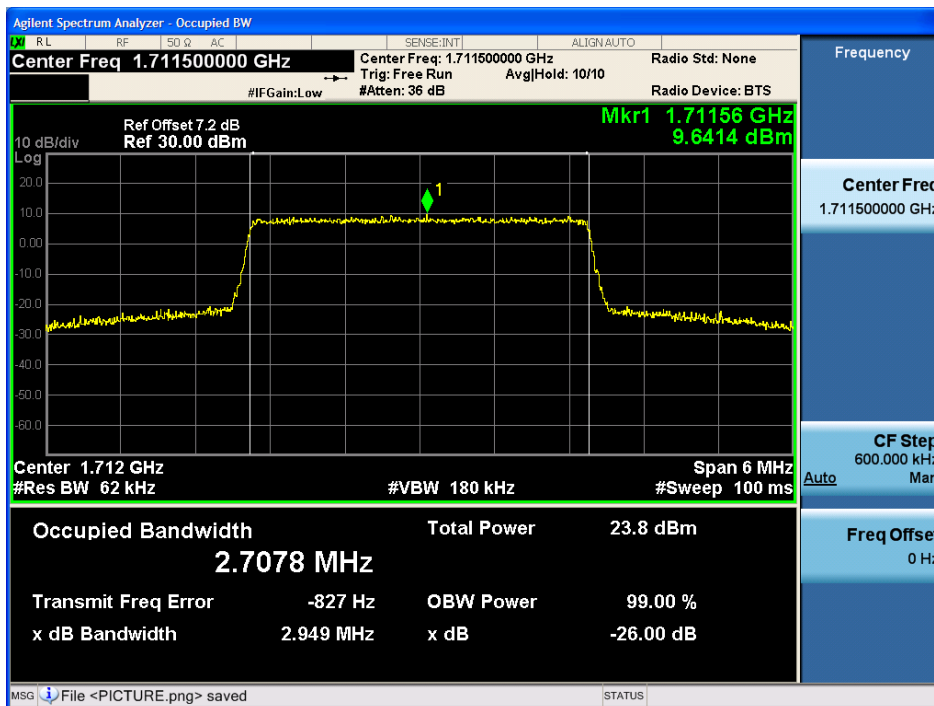
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3MHz Highest QPSK



3MHz Lowest 16QAM



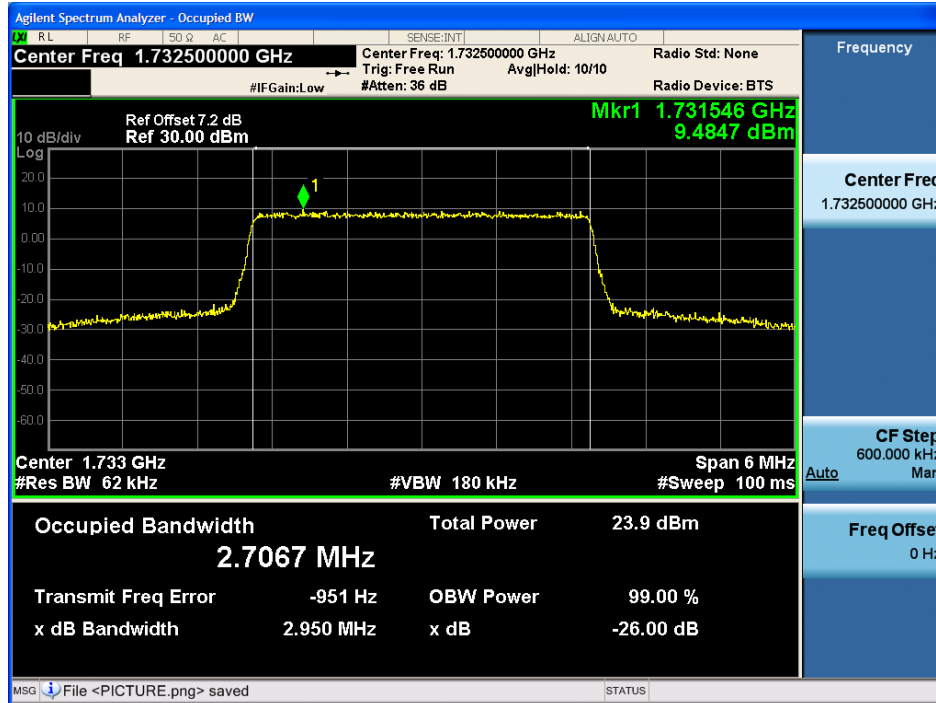


ATA Testing Technology Service Co., Ltd.

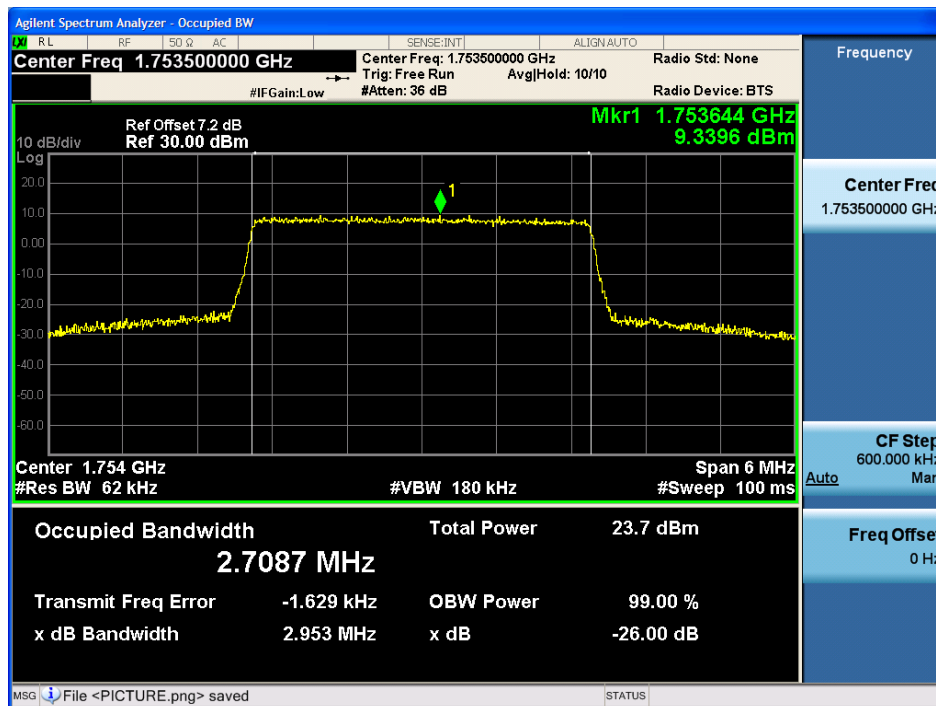
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3MHz Middle 16QAM



3MHz Highest 16QAM



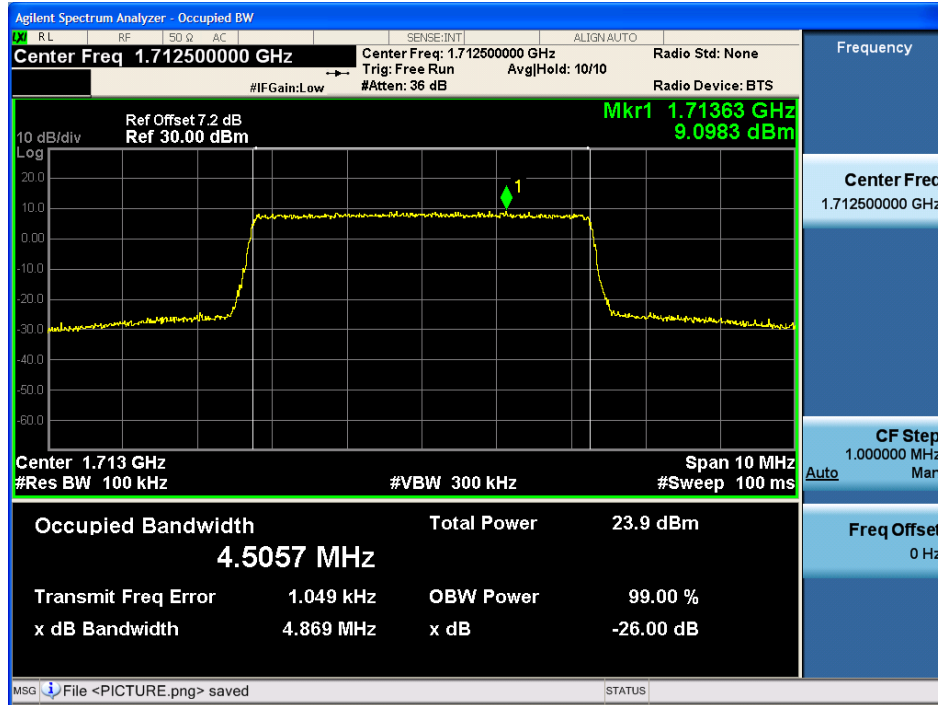


ATA Testing Technology Service Co., Ltd.

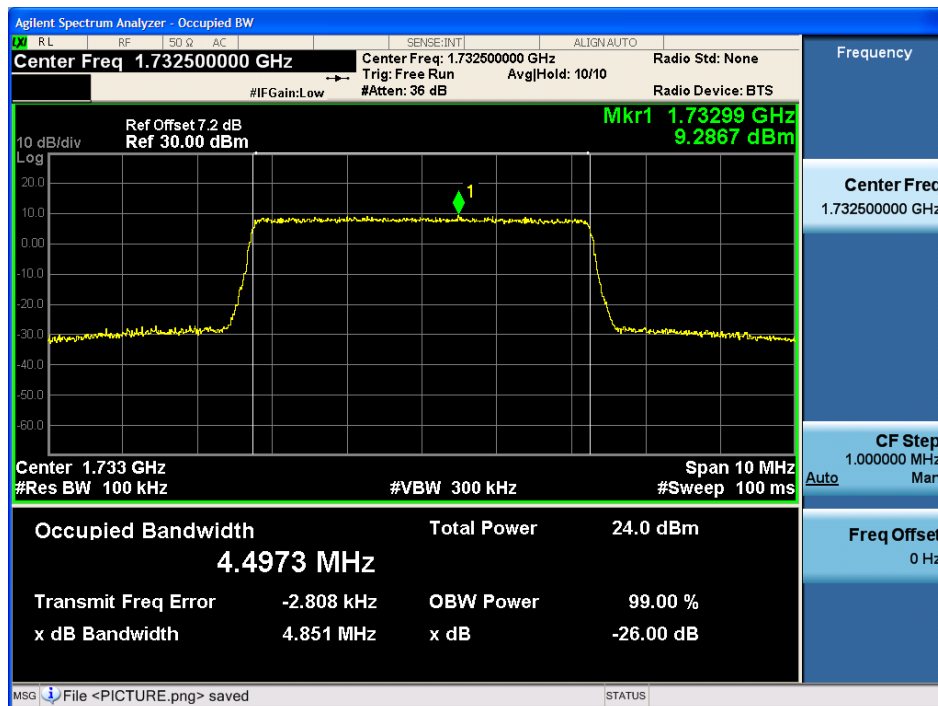
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5MHz Lowest QPSK



5MHz Middle QPSK



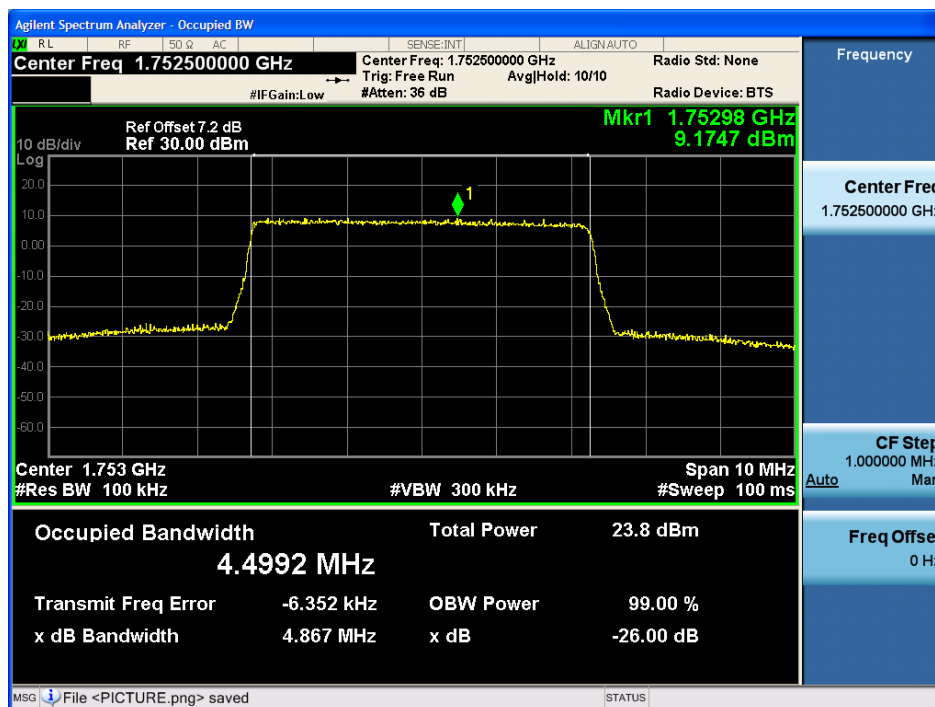


ATA Testing Technology Service Co., Ltd.

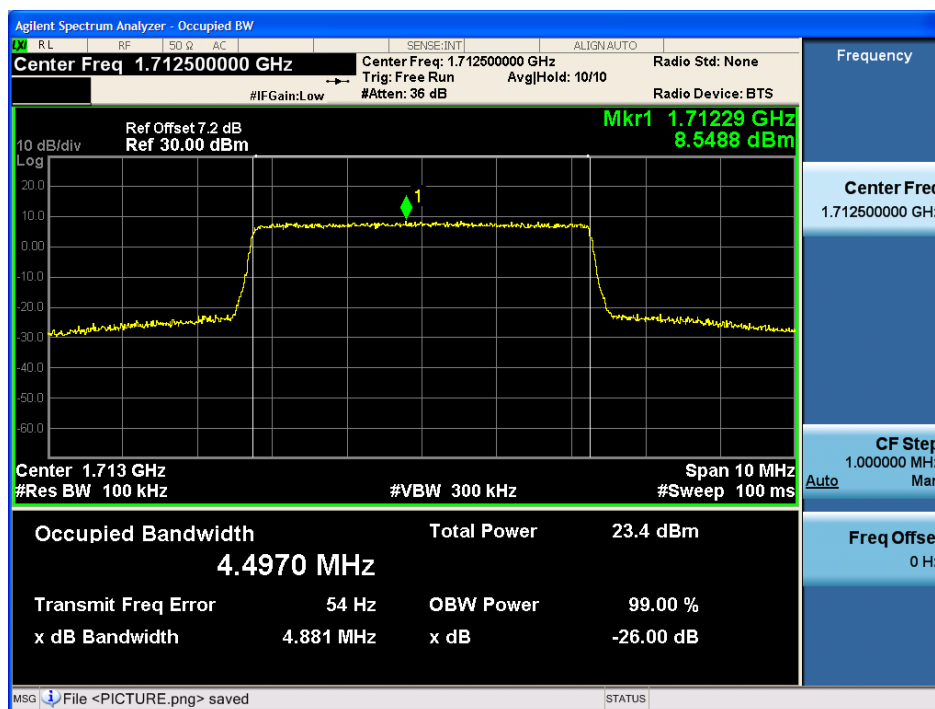
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5MHz Highest QPSK

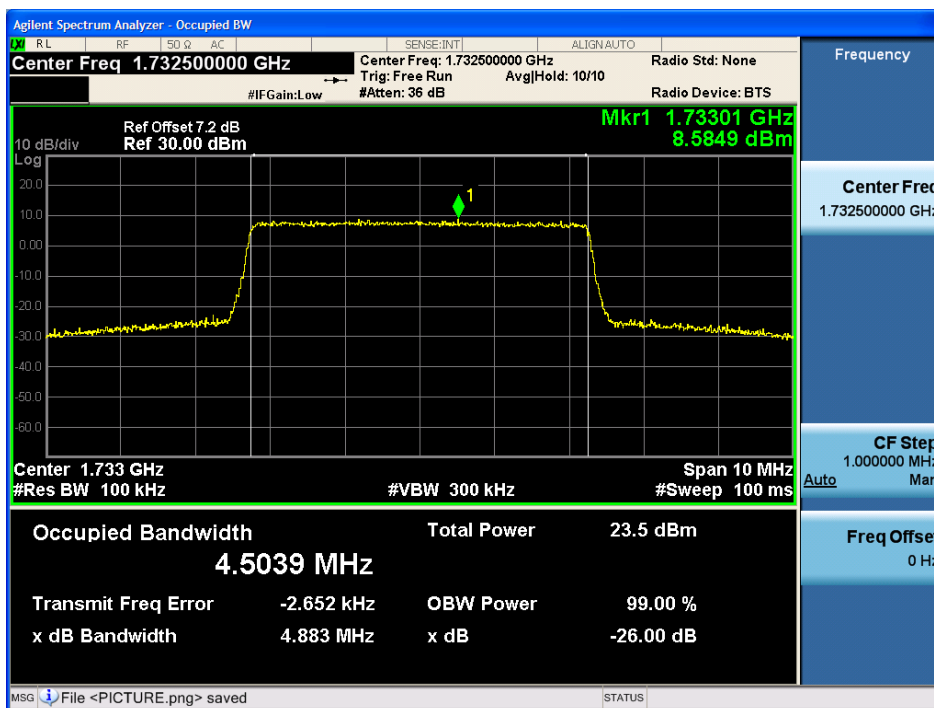


5MHz Lowest 16QAM

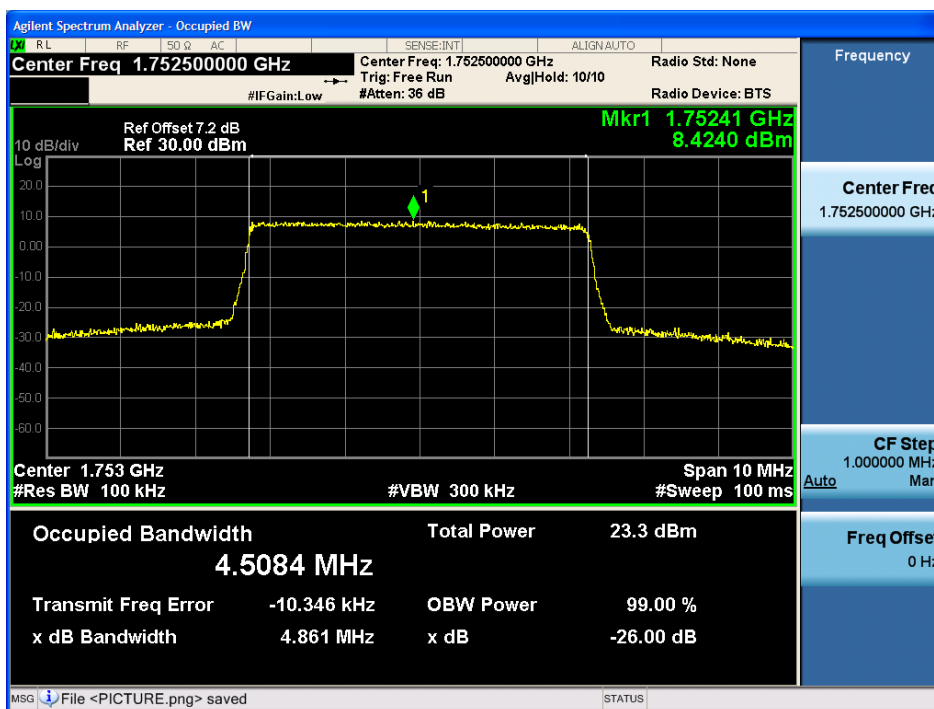




5MHz Middle 16QAM



5MHz Highest 16QAM



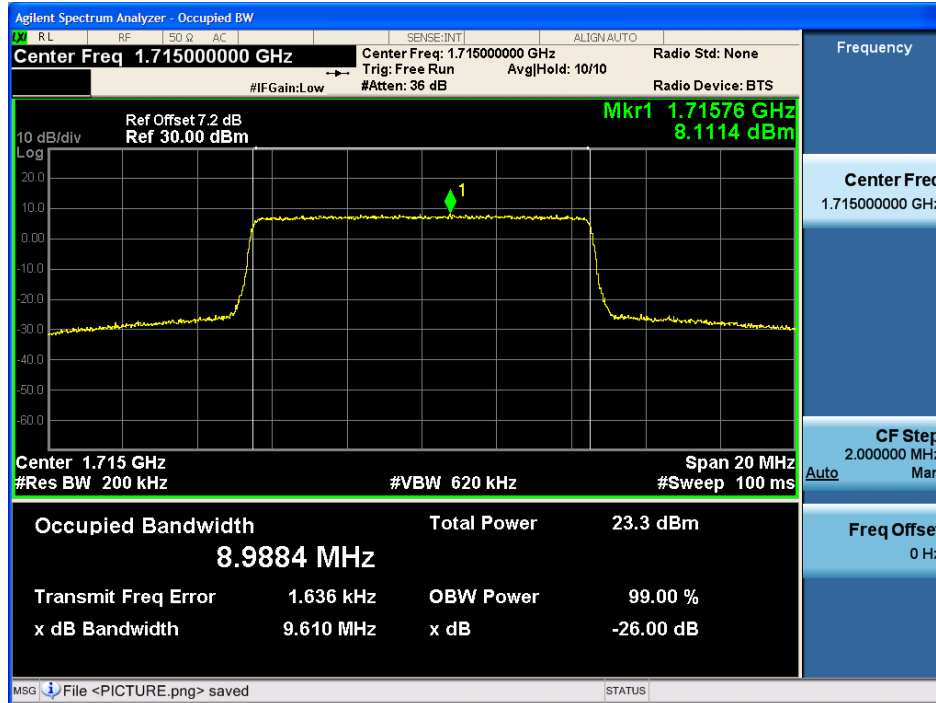


ATA Testing Technology Service Co., Ltd.

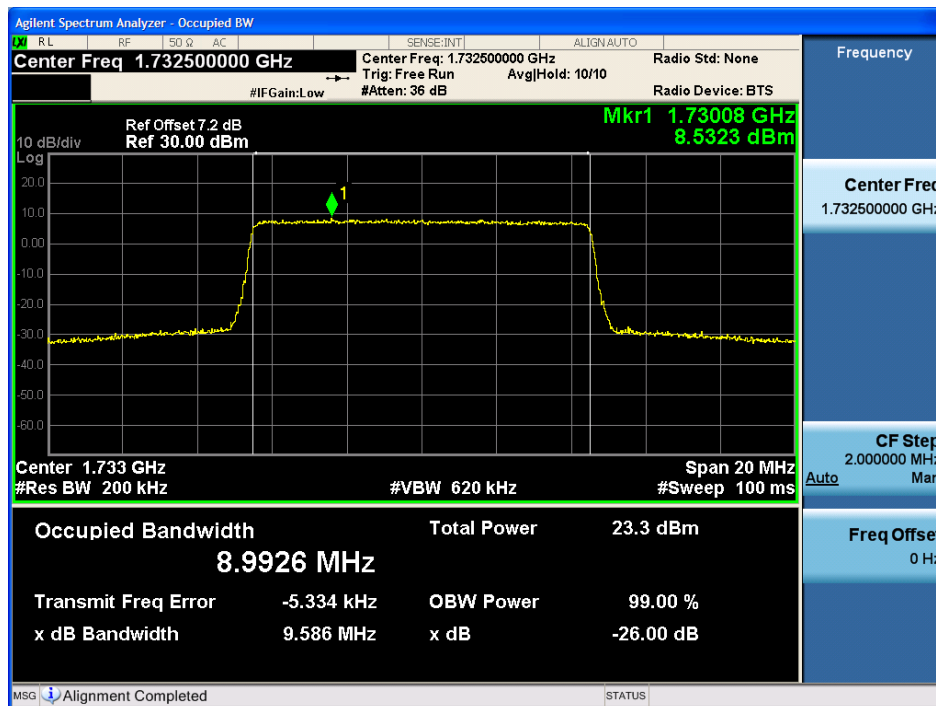
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10MHz Lowest QPSK



0MHz Middle QPSK



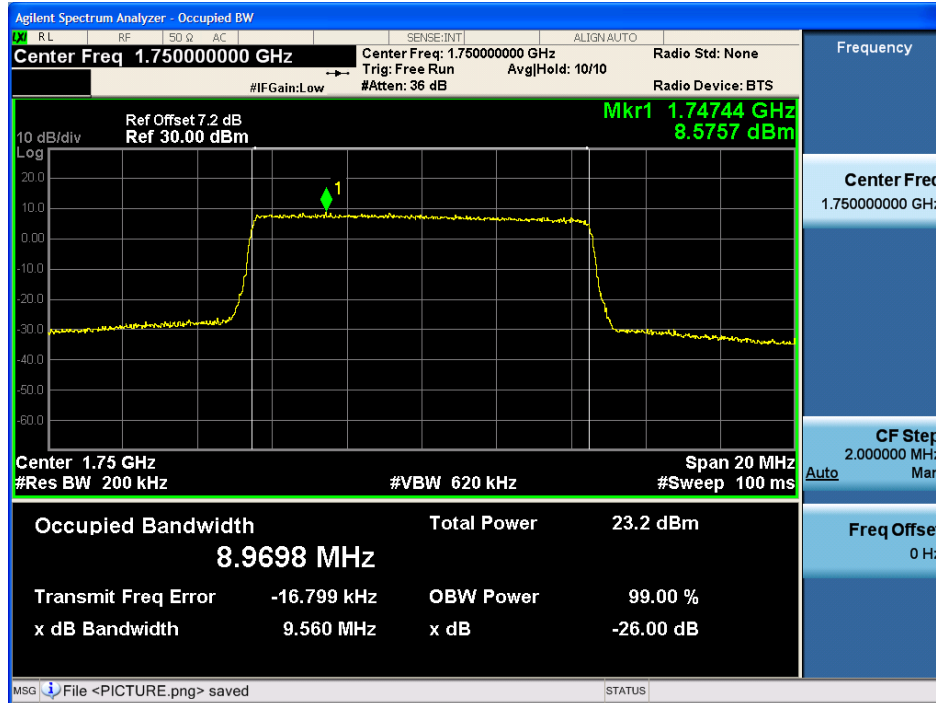


ATA Testing Technology Service Co., Ltd.

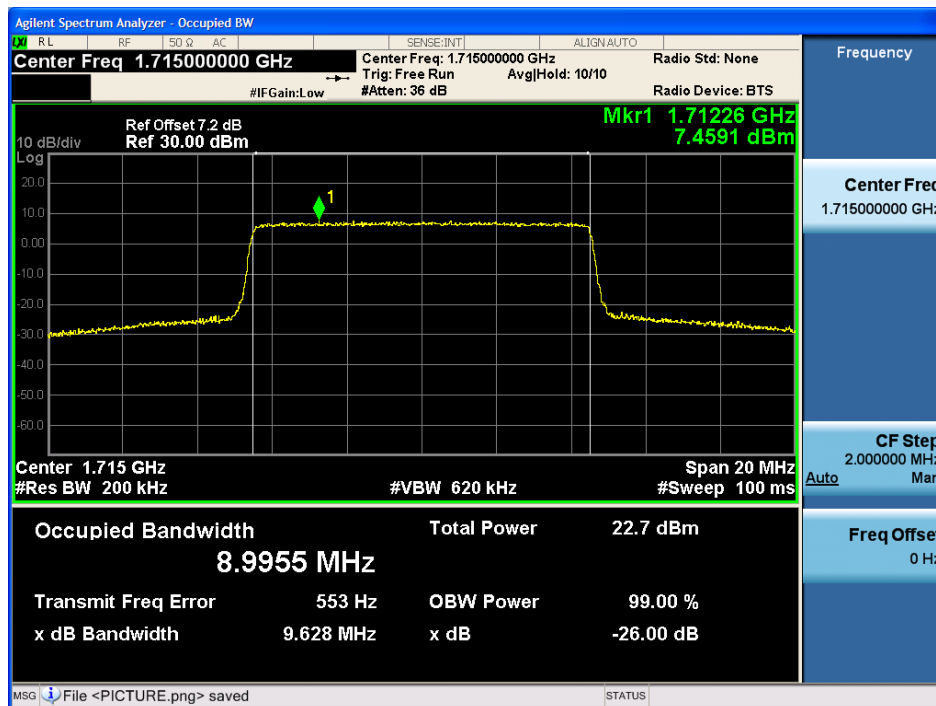
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10MHz Highest QPSK



10MHz Lowest 16QAM



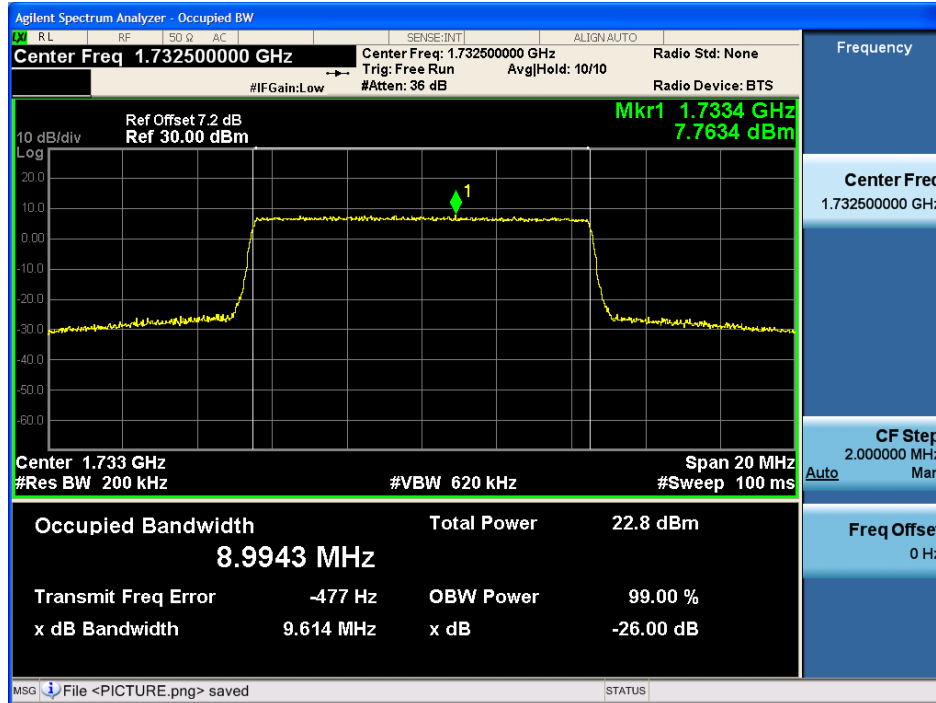


ATA Testing Technology Service Co., Ltd.

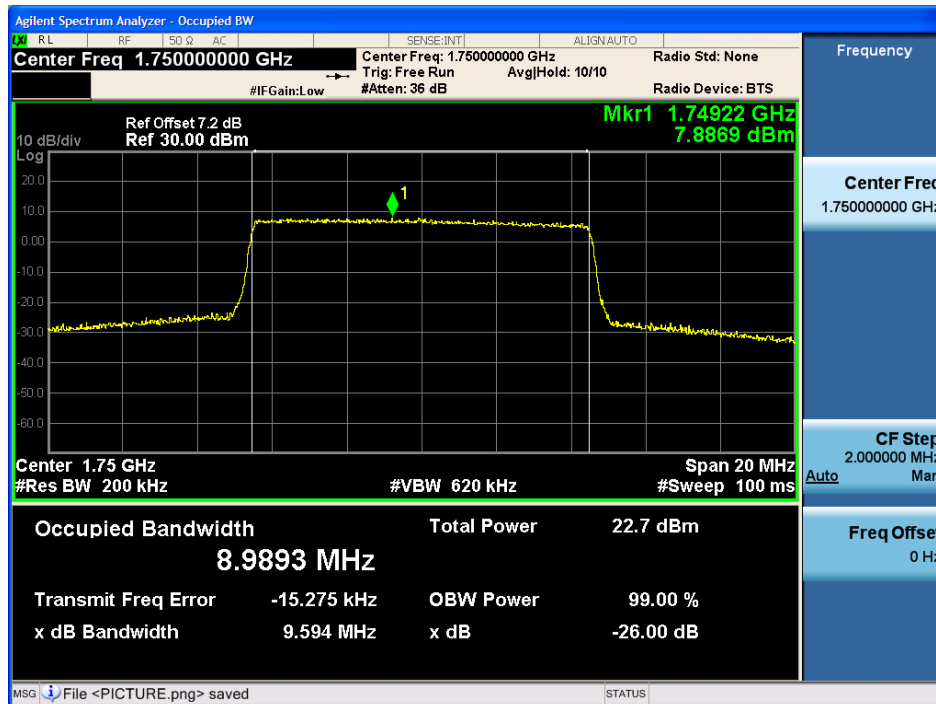
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10MHz Middle 16QAM

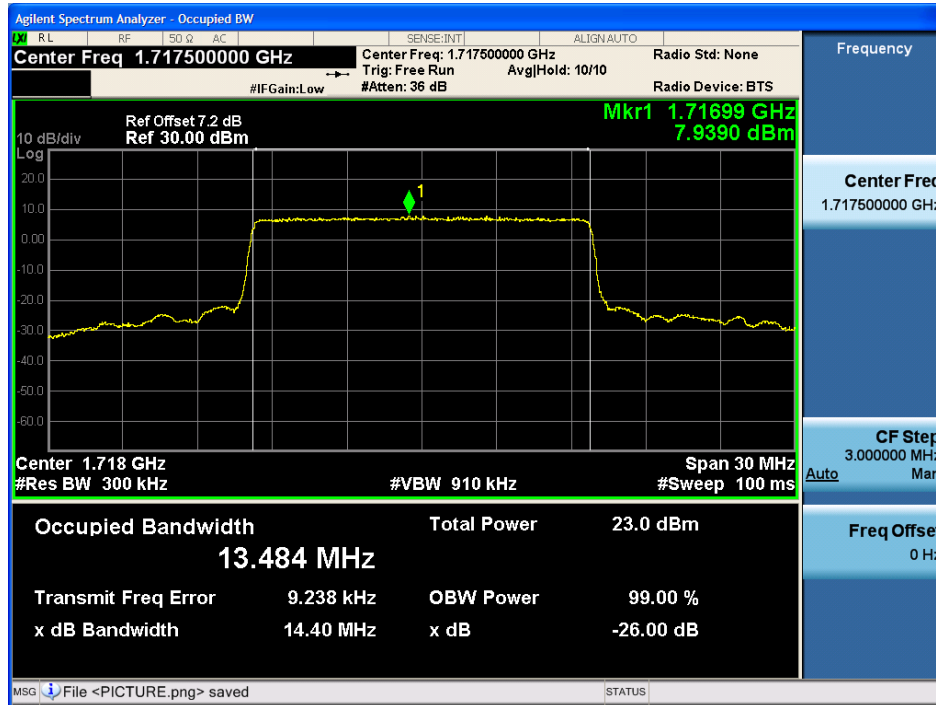


10MHz Highest 16QAM

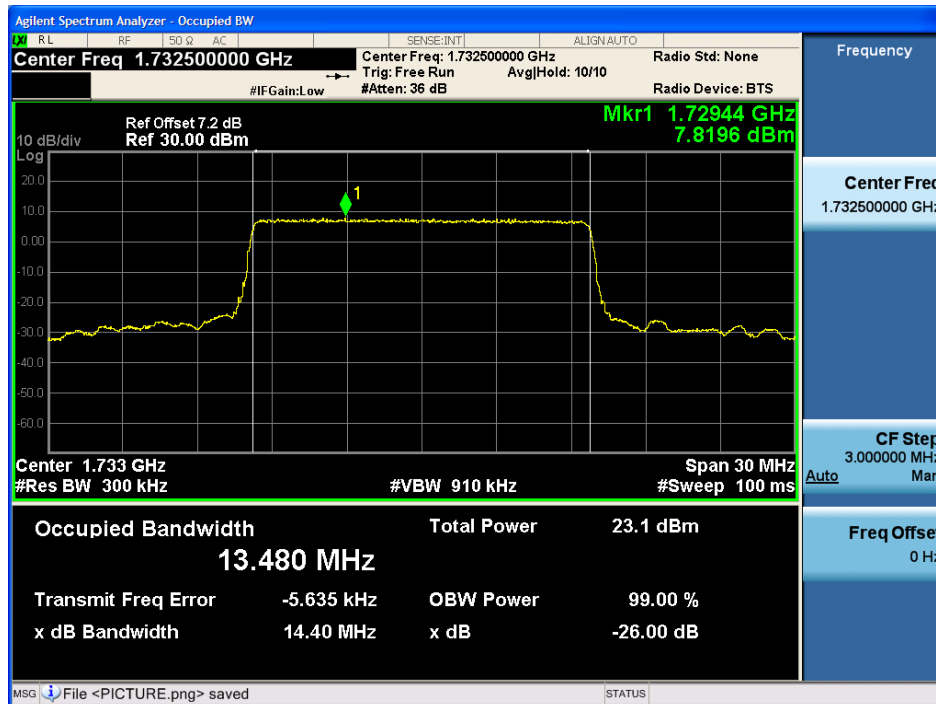




15MHz Lowest QPSK



15MHz Middle QPSK



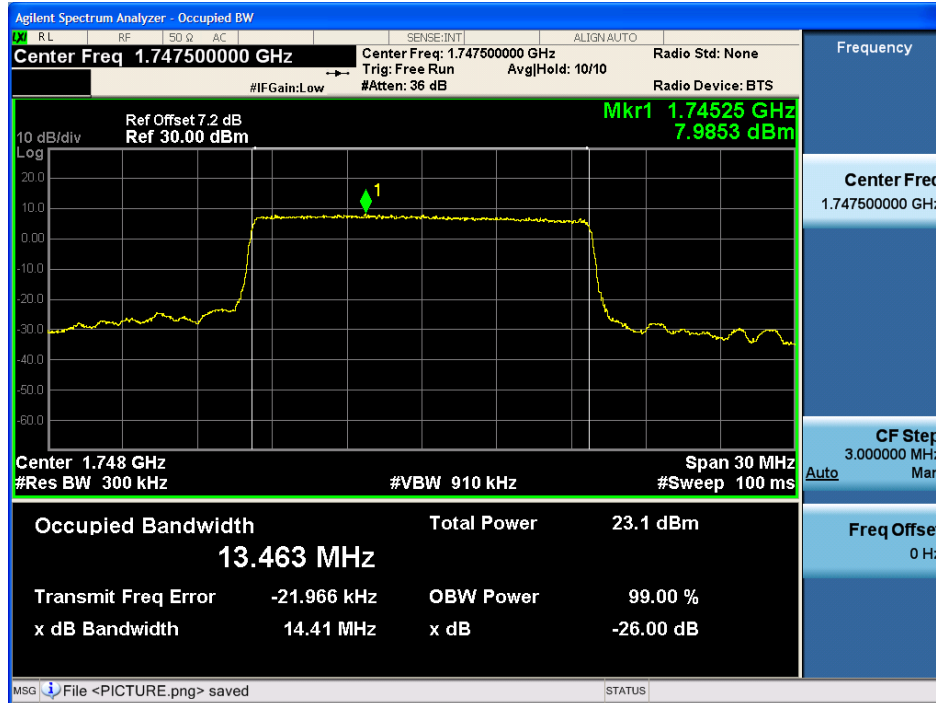


ATA Testing Technology Service Co., Ltd.

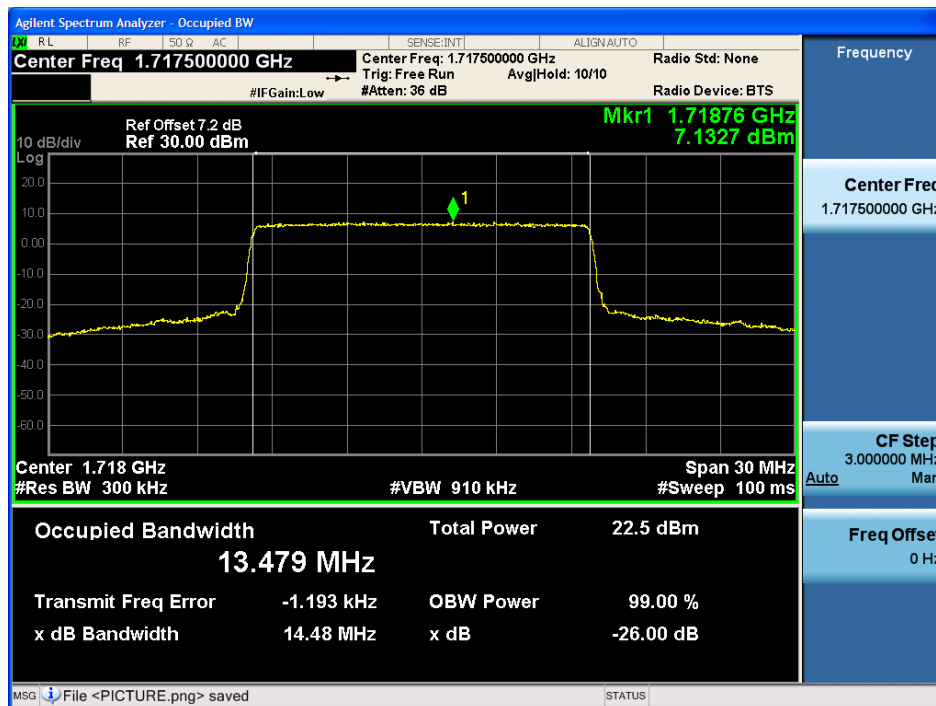
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15MHz Highest QPSK



15MHz Lowest 16QAM



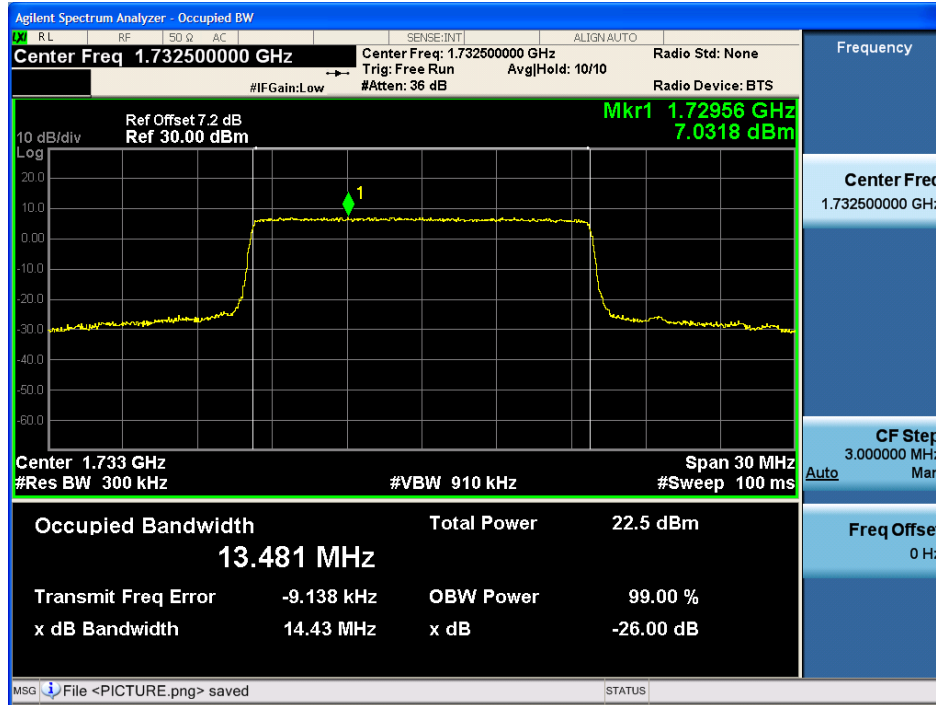


ATA Testing Technology Service Co., Ltd.

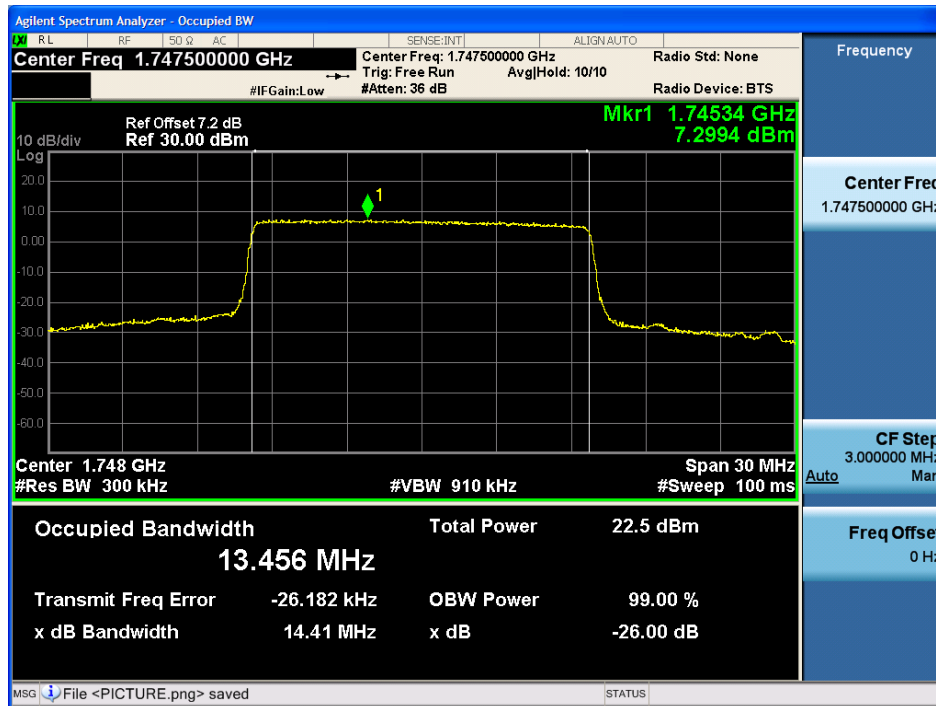
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15MHz Middle 16QAM



15MHz Highest 16QAM



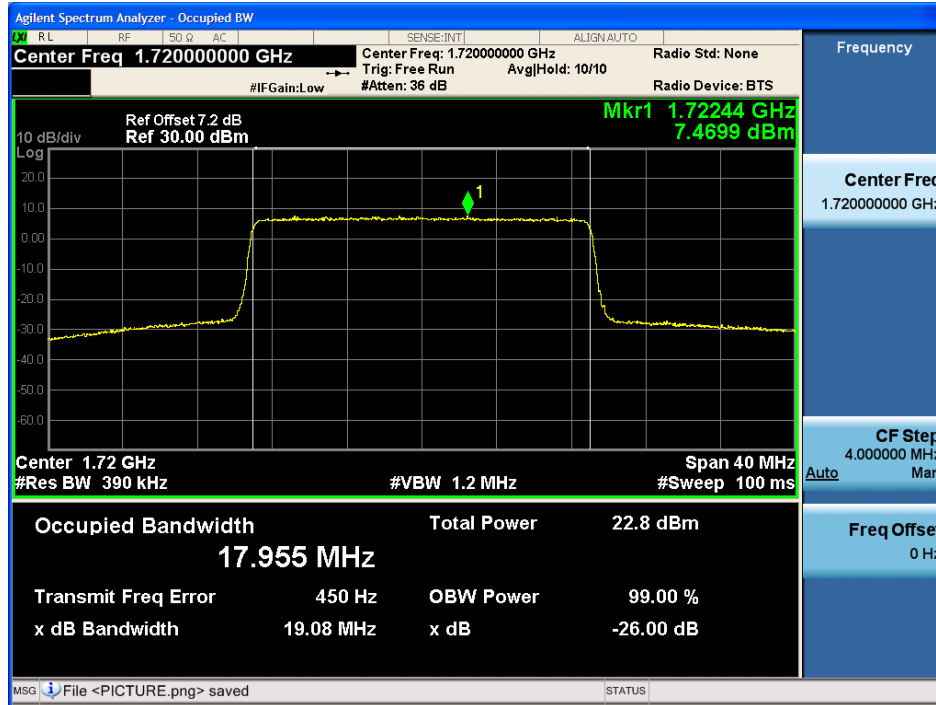


ATA Testing Technology Service Co., Ltd.

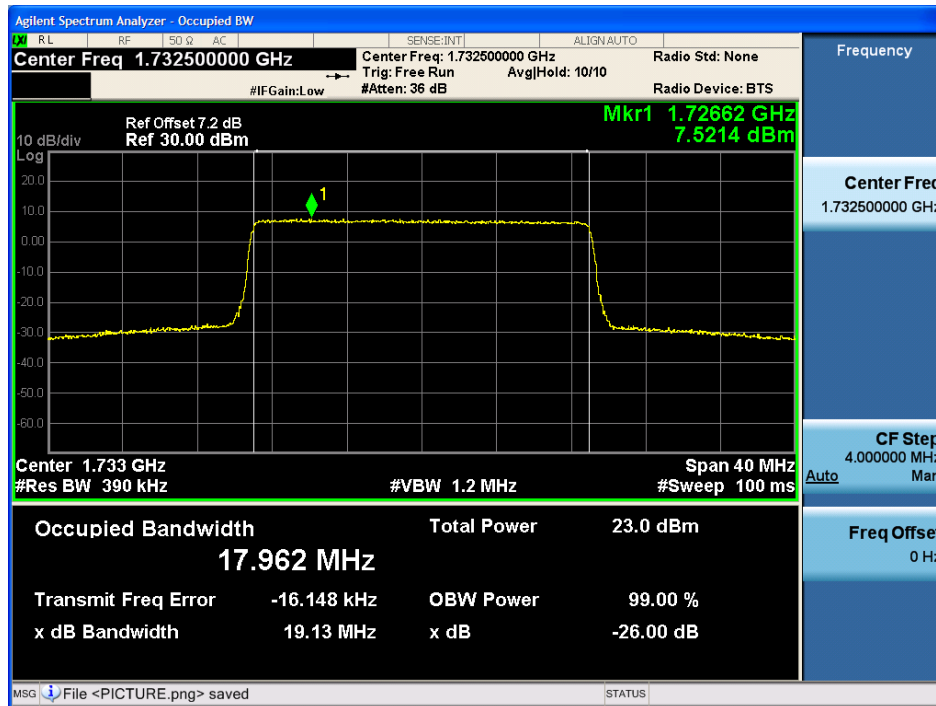
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20MHz Lowest QPSK



20MHz Middle QPSK



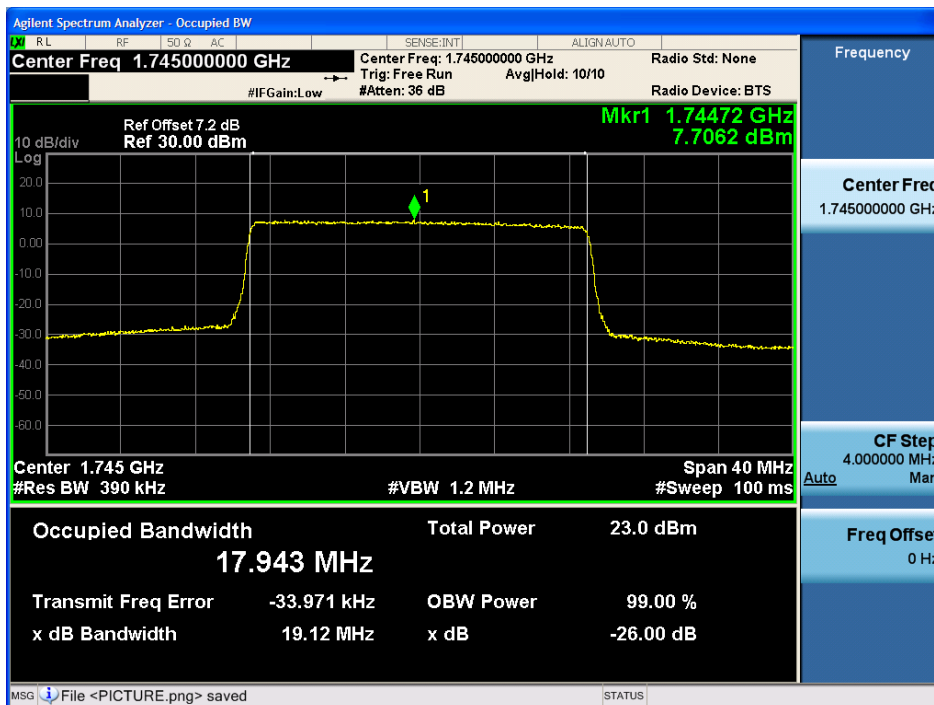


ATA Testing Technology Service Co., Ltd.

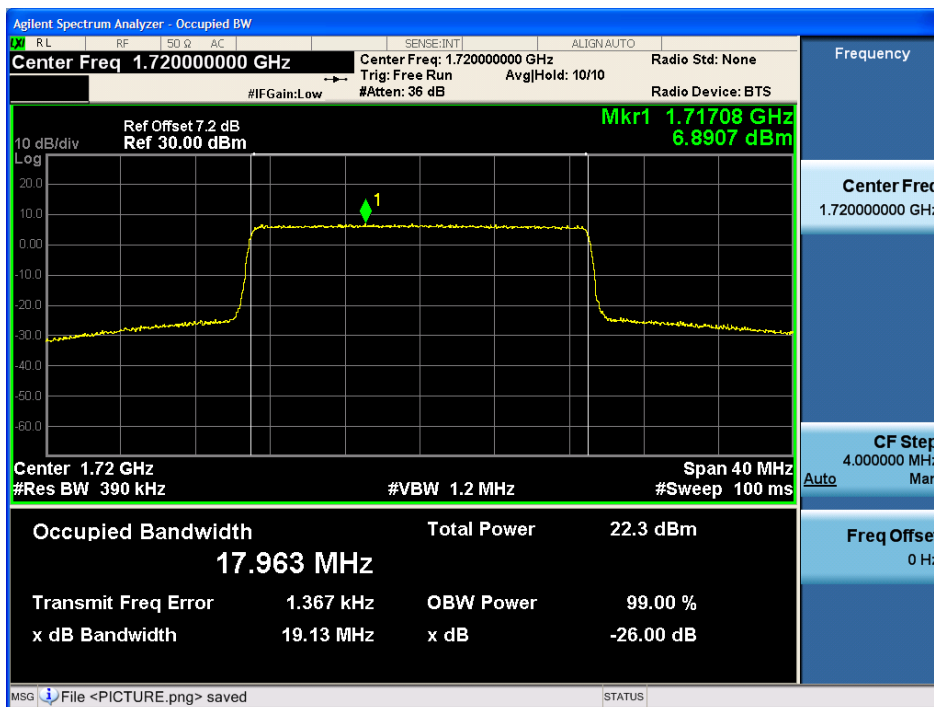
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20MHz Highest QPSK

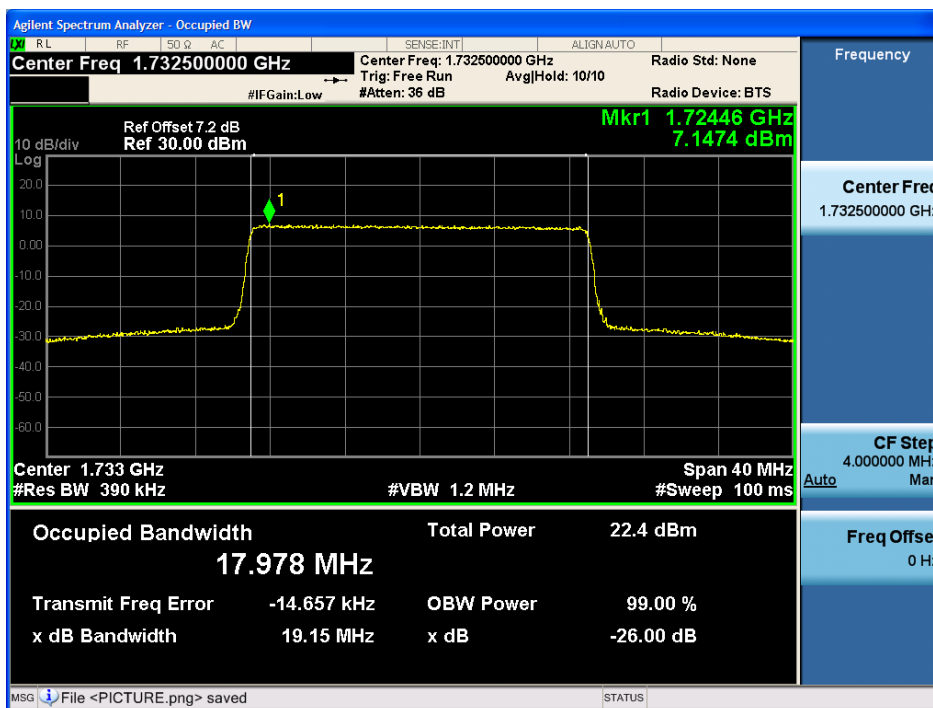


20MHz Lowest 16QAM

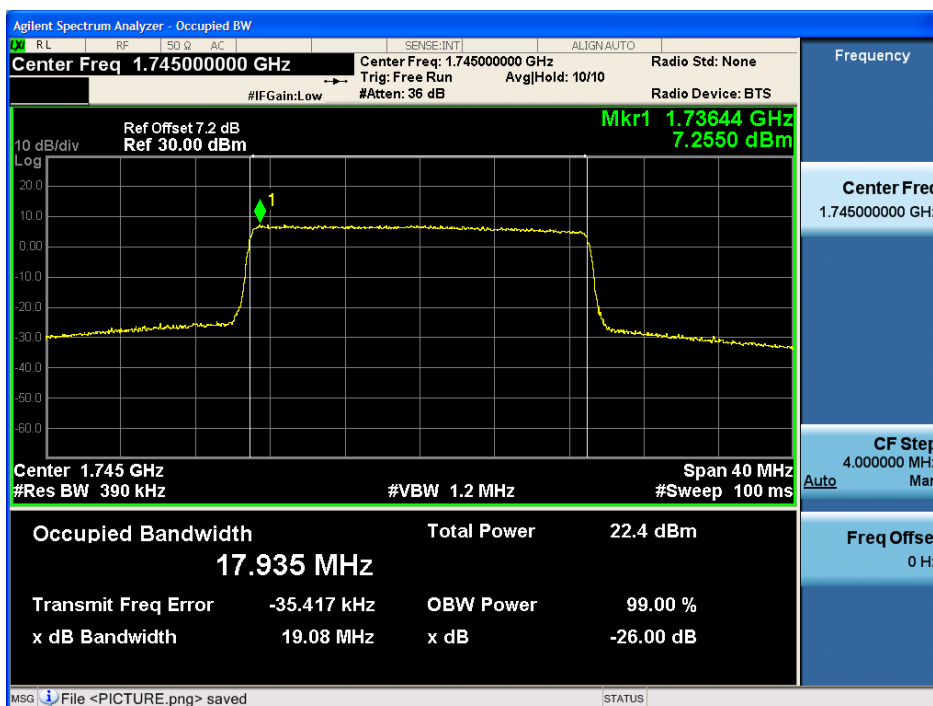




20MHz Middle 16QAM



20MHz Highest 16QAM



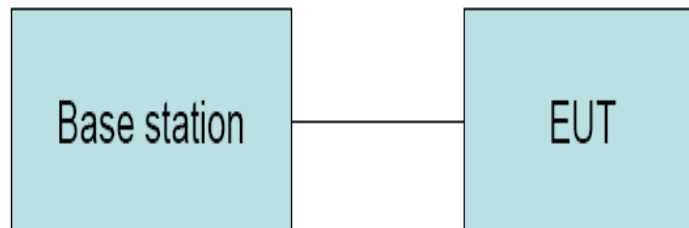


6. Frequency Stability

6.1. Limit

LTE Band4
Must stay within the authorized frequency block

6.2. Test Setup



6.3. Test Procedure

Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -10°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 45°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -10°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from DC 5V to 3.5V
3. The variation in frequency was measured for the worst case.



6.4. Test Data

Test Conditions		(QPSK) / Middle Channel		Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz		Note
		Deviation (Hz)	Deviation (ppm)	Result
50°C	Normal Voltage	27	0.016	PASS
30°C	Normal Voltage	45	0.026	
20°C	Normal Voltage	36	0.021	
10°C	Normal Voltage	-19	-0.011	
0°C	Normal Voltage	-24	-0.014	
-10°C	Normal Voltage	31	0.018	
-20°C	Normal Voltage	23	0.013	
-30°C	Normal Voltage	22	0.013	
25°C	Maximum Voltage	-26	-0.015	
25°C	Normal Voltage	-21	-0.012	
25°C	Minimum Voltage	-35	-0.020	

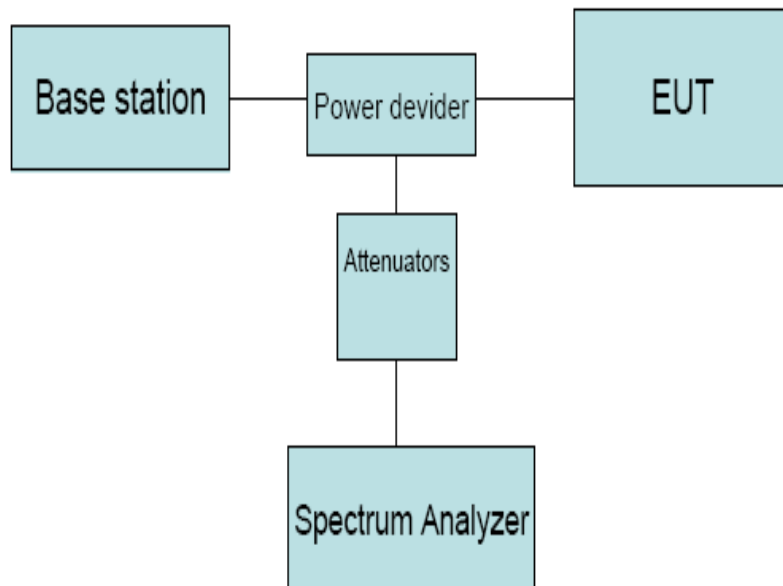


7. Conducted Spurious Emission

7.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least $(43 + 10 \log P)$ dB, in this case, -13dBm.

7.2. Test Setup



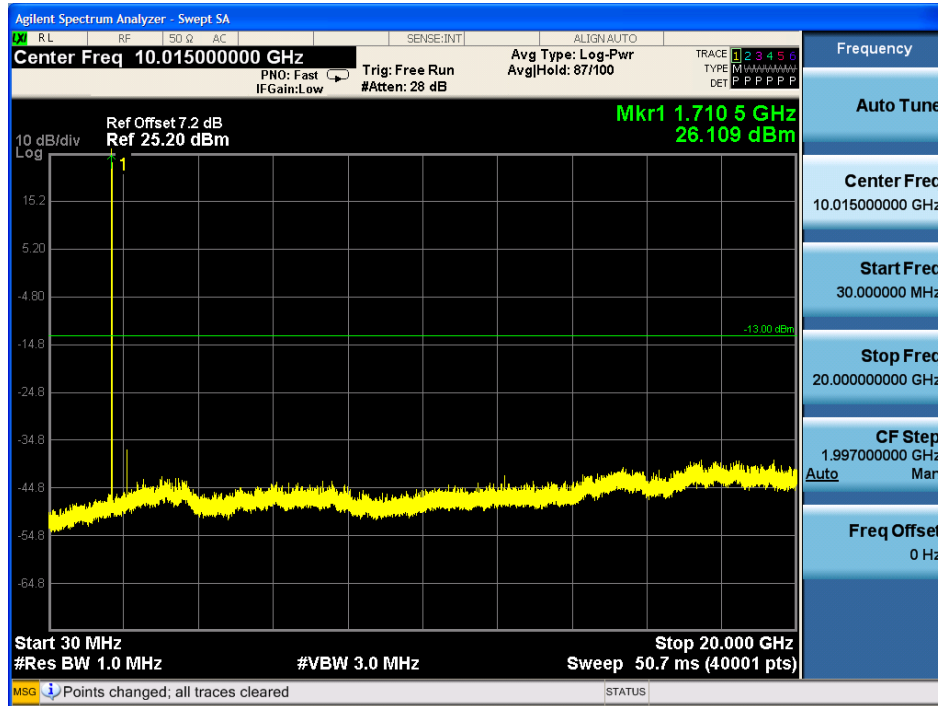
7.3. Test Procedure

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The low, middle and high channels of each band and mode's spurious emissions for 30MHz to 10th Harmonic were measured by Spectrum analyzer.

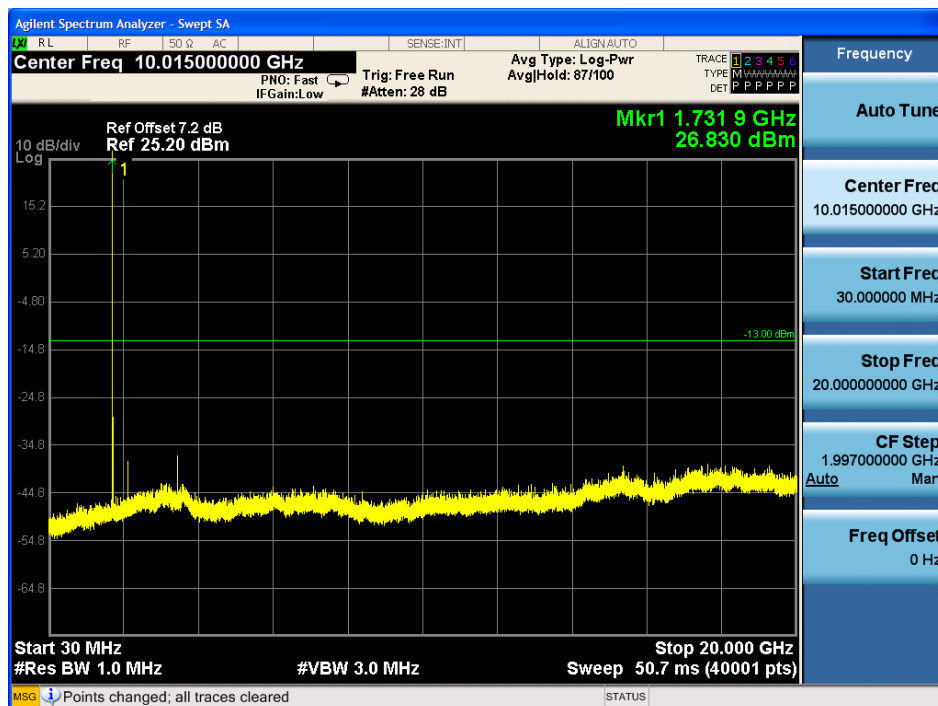


7.4. Test Plot

1.4MHz Lowest QPSK

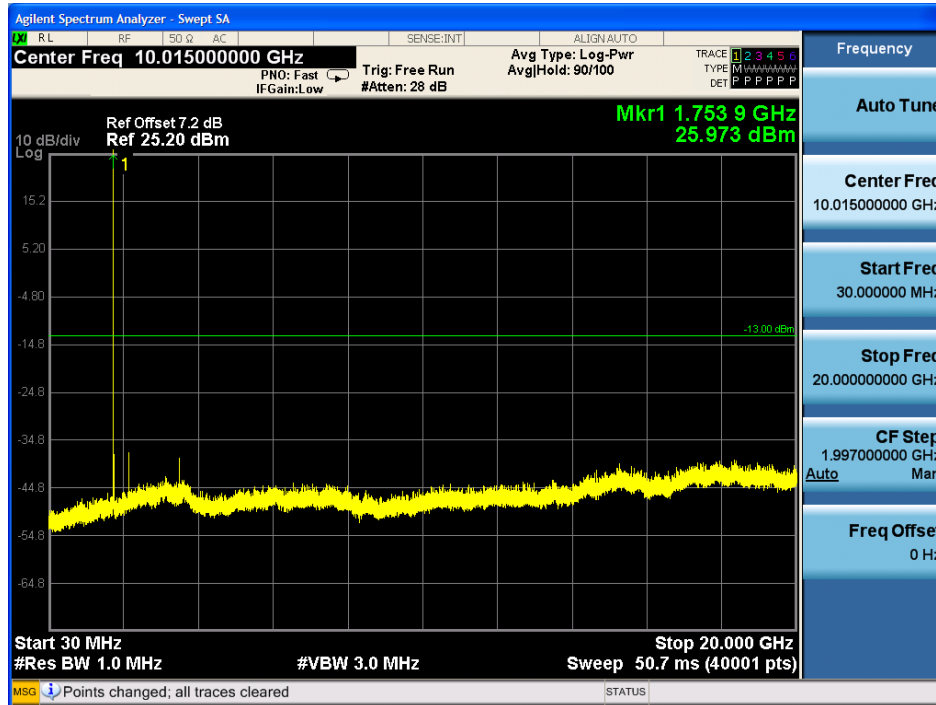


1.4MHz Middle QPSK

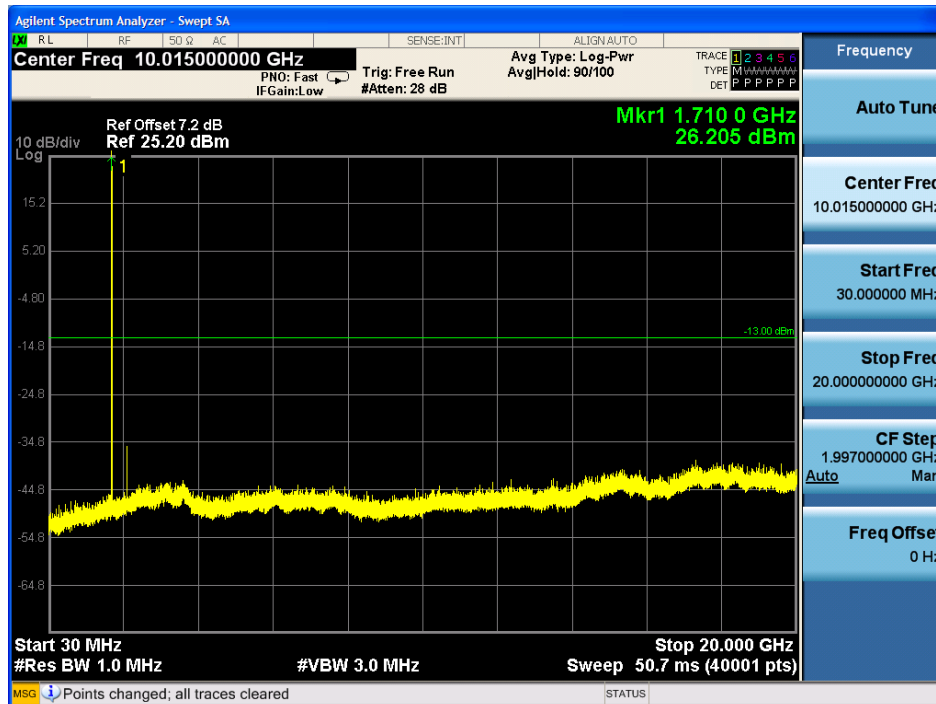




1.4MHz Highest QPSK

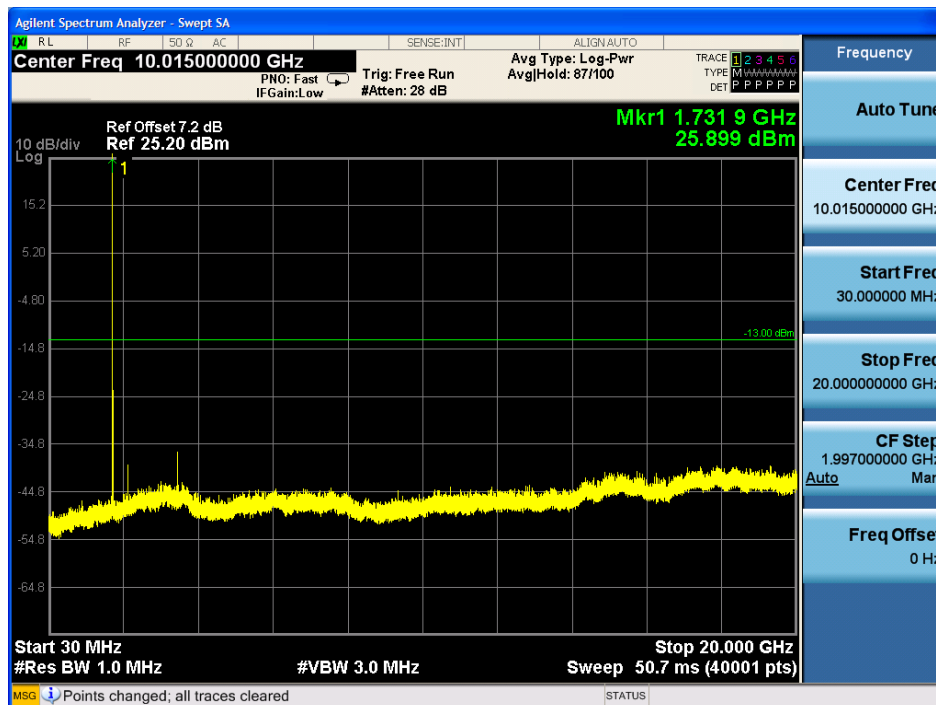


1.4MHz Lowest 16QAM

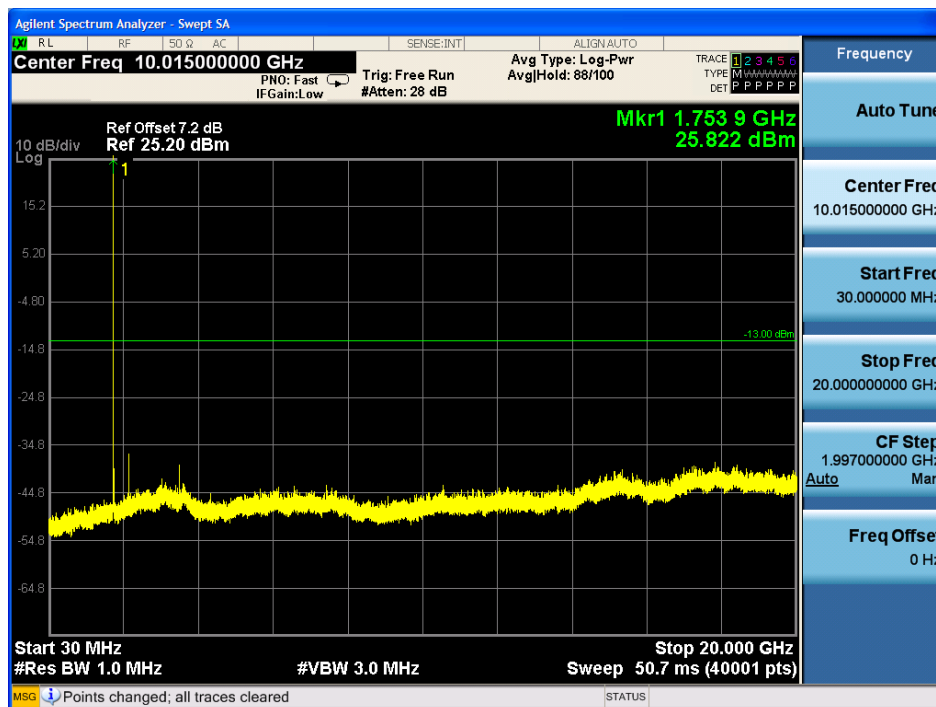




1.4MHz Middle 16QAM

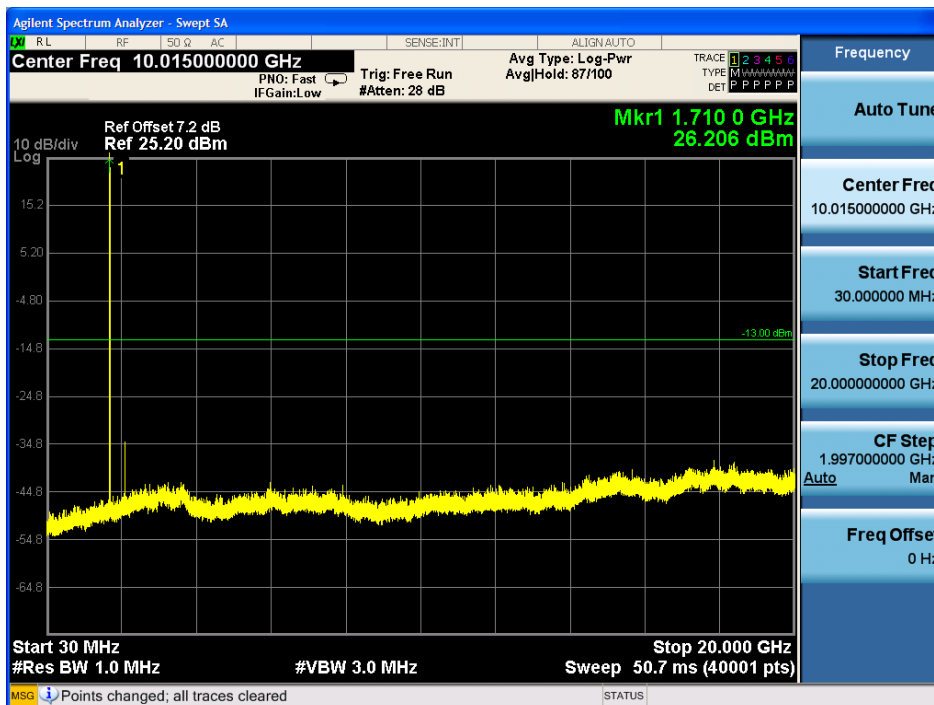


1.4MHz Highest 16QAM

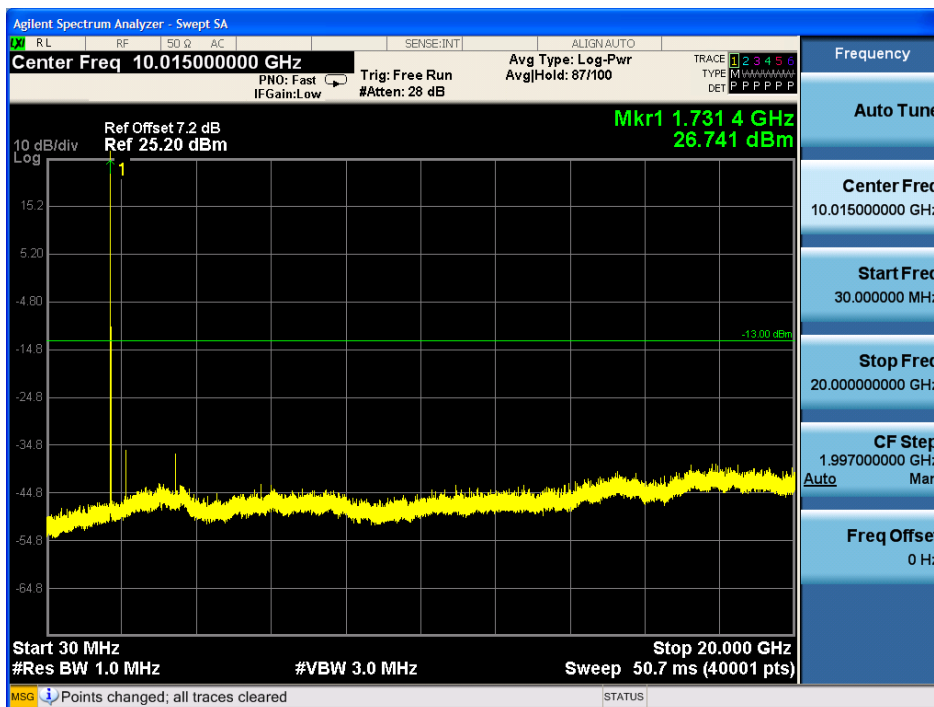




3MHz Lowest QPSK

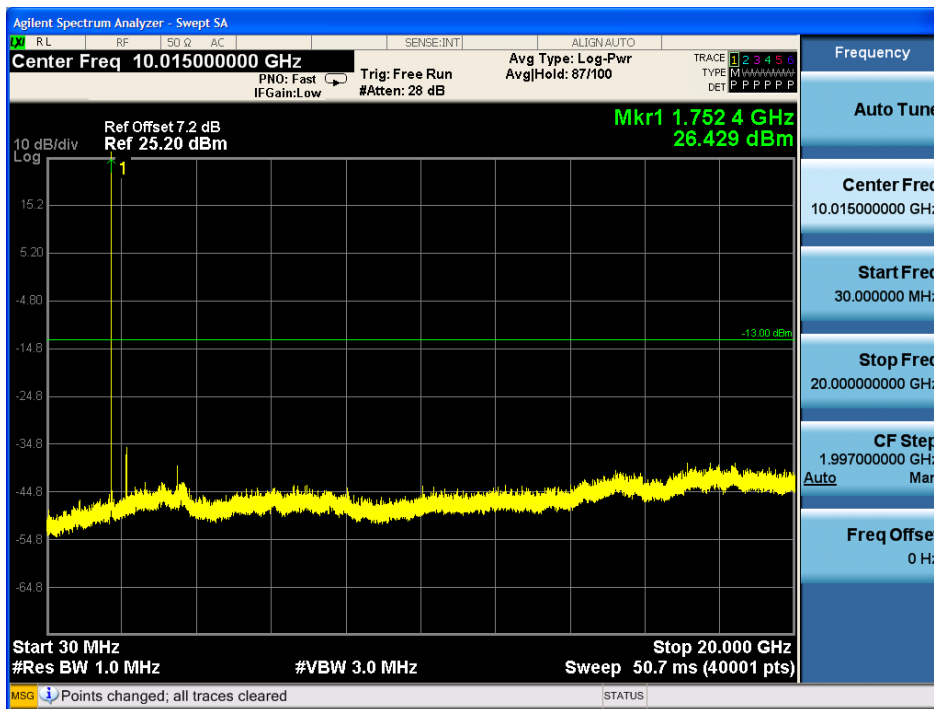


3MHz Middle QPSK

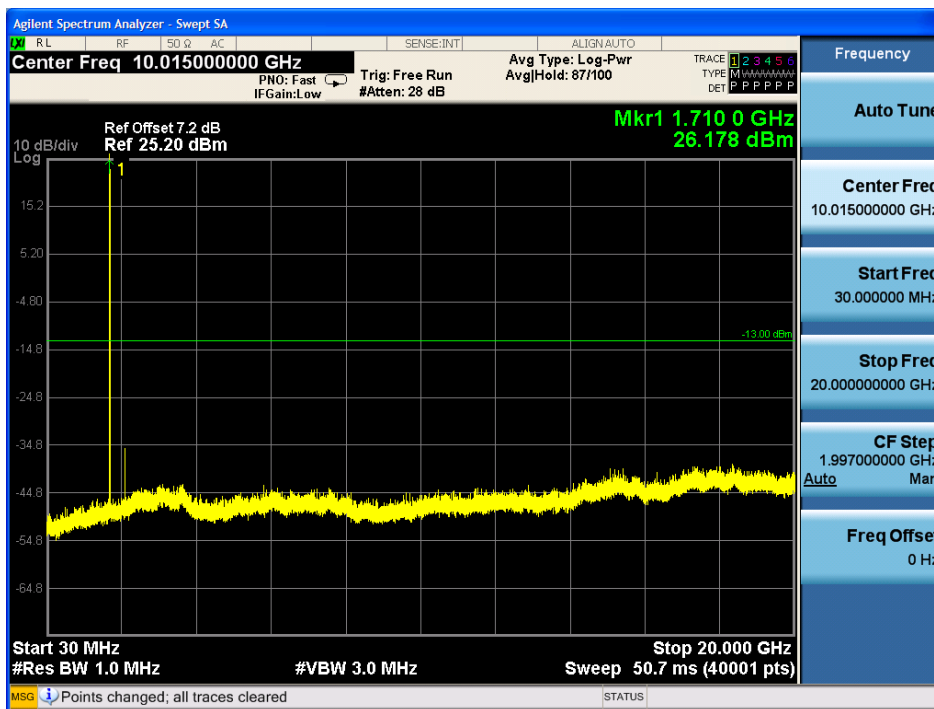




3MHz Highest QPSK

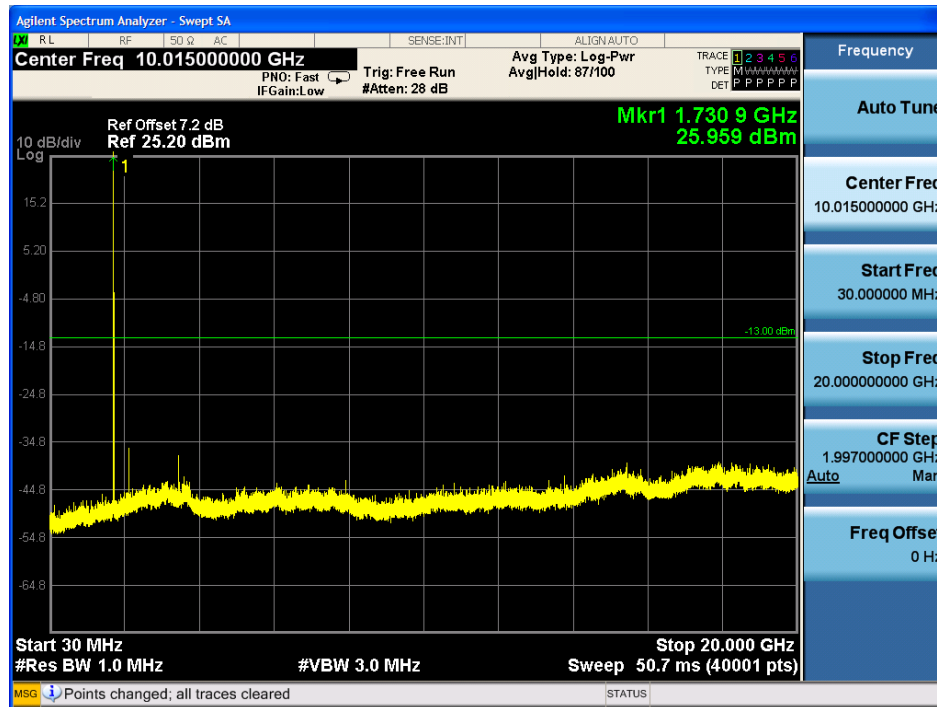


3MHz Lowest 16QAM

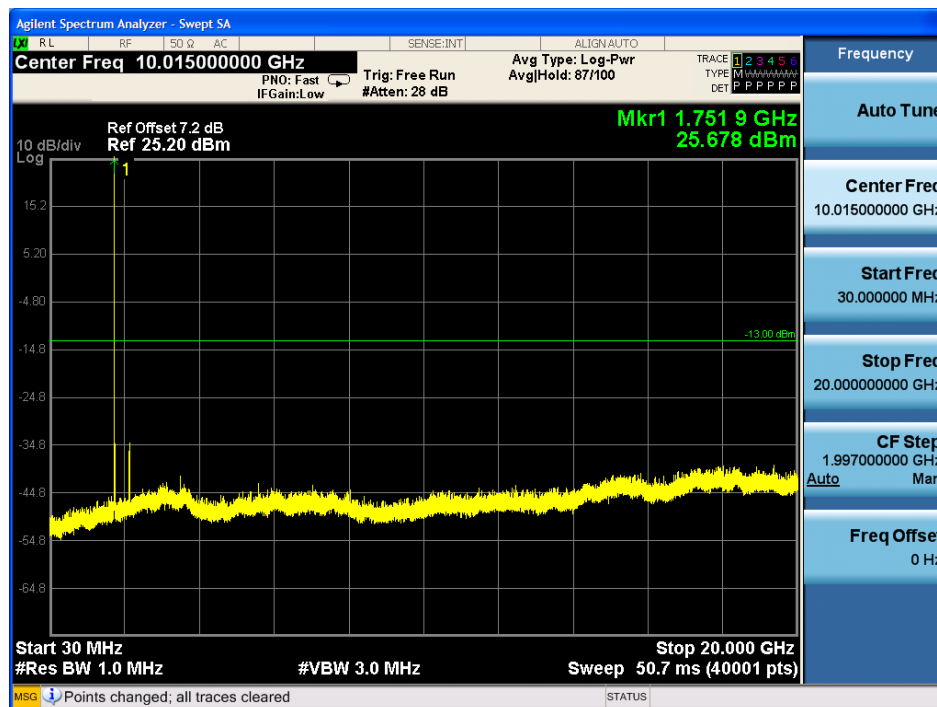




3MHz Middle 16QAM



3MHz Highest 16QAM



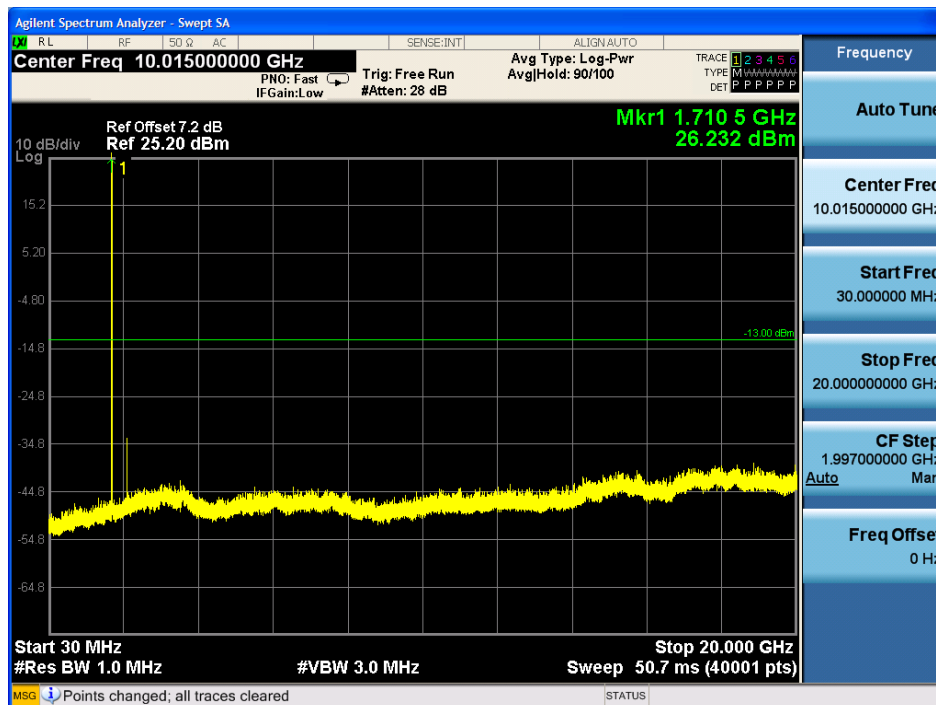


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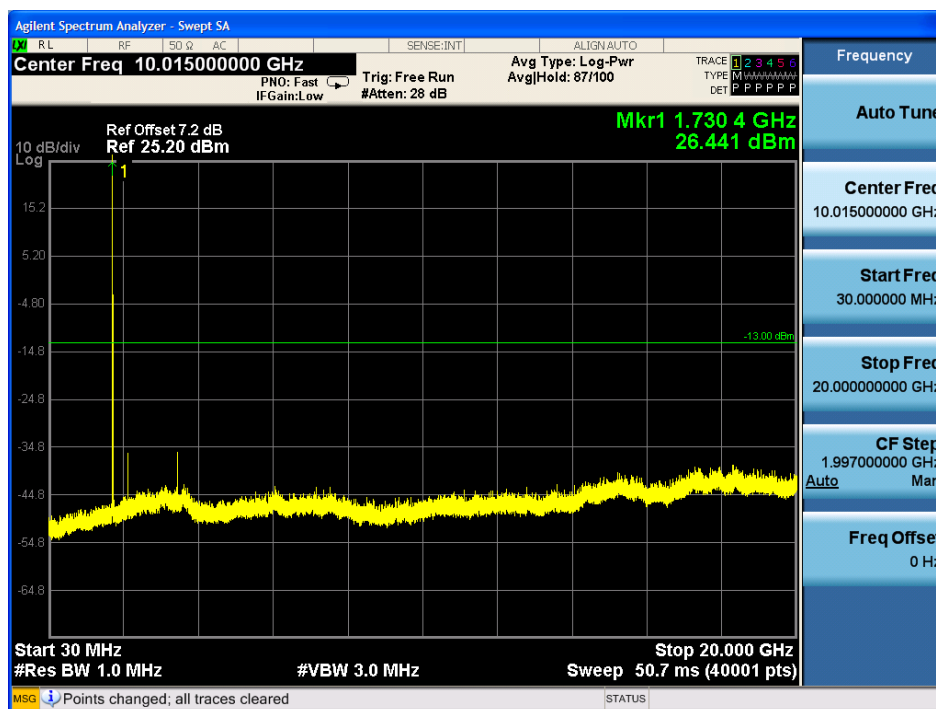
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5MHz Lowest QPSK

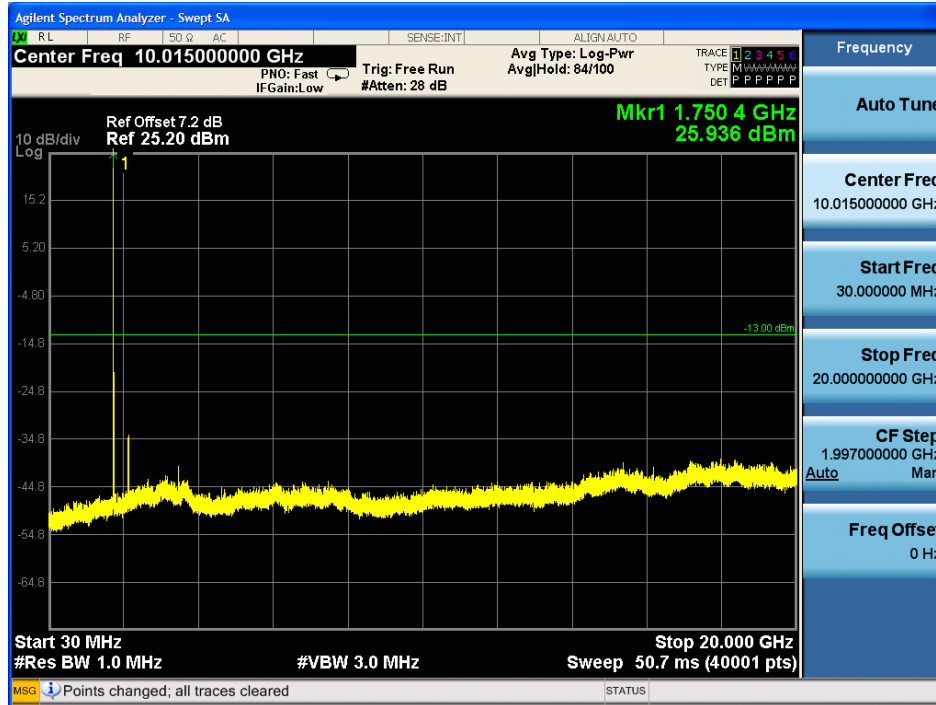


5MHz Middle QPSK

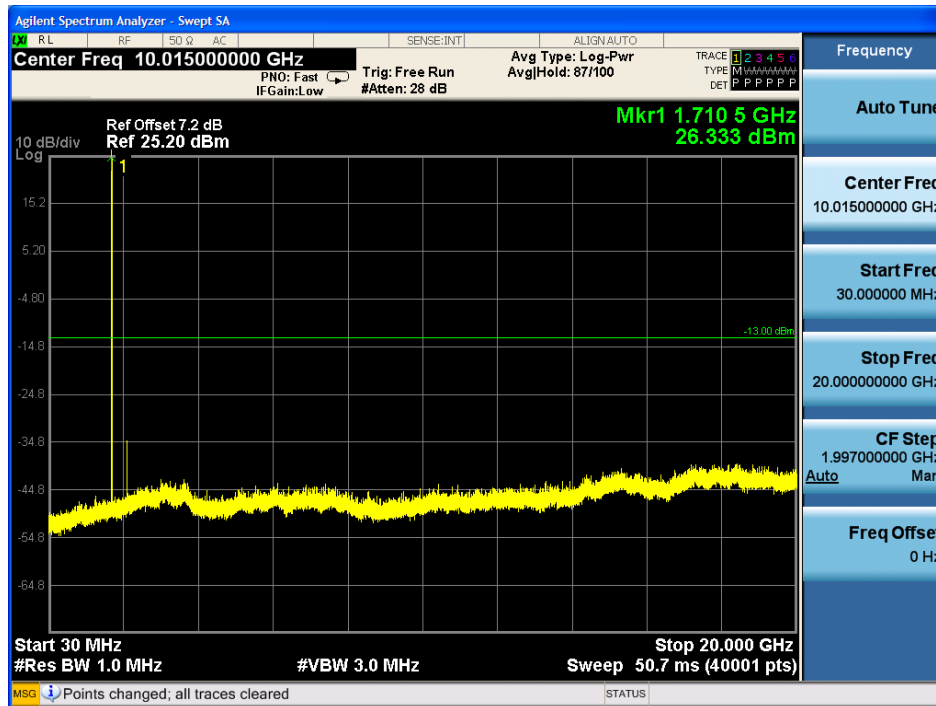




5MHz Highest QPSK



5MHz Lowest 16QAM



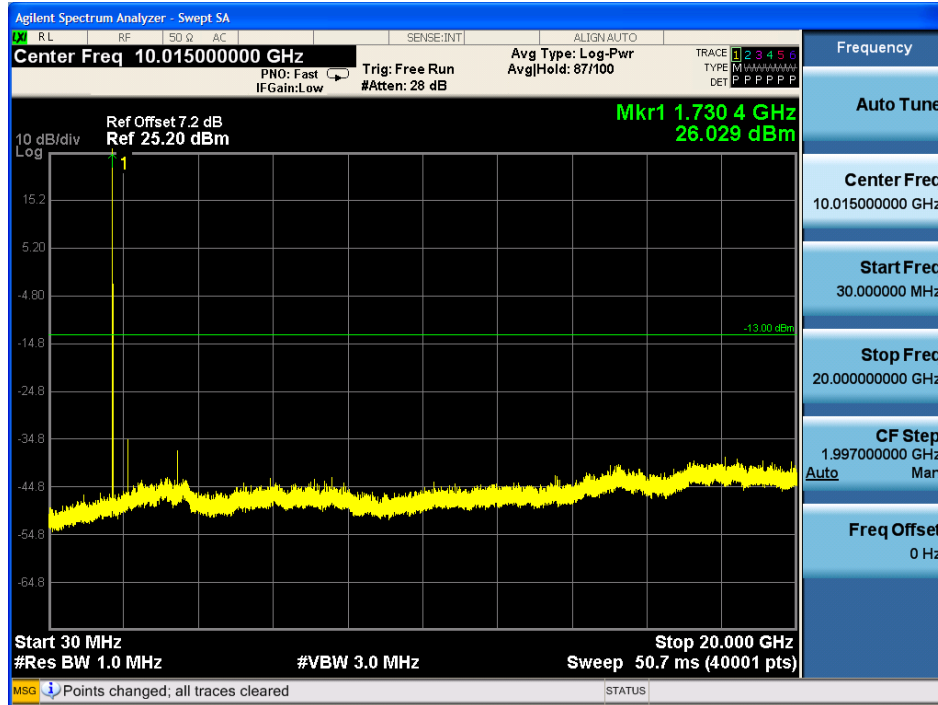


ATA Testing Technology Service Co., Ltd.

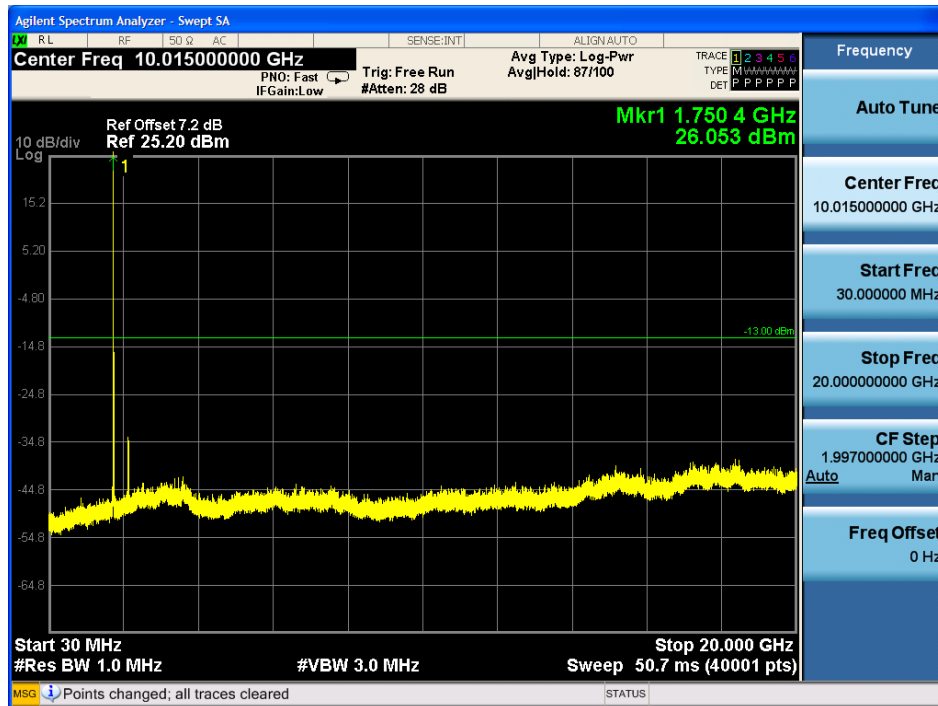
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5MHz Middle 16QAM



5MHz Highest 16QAM



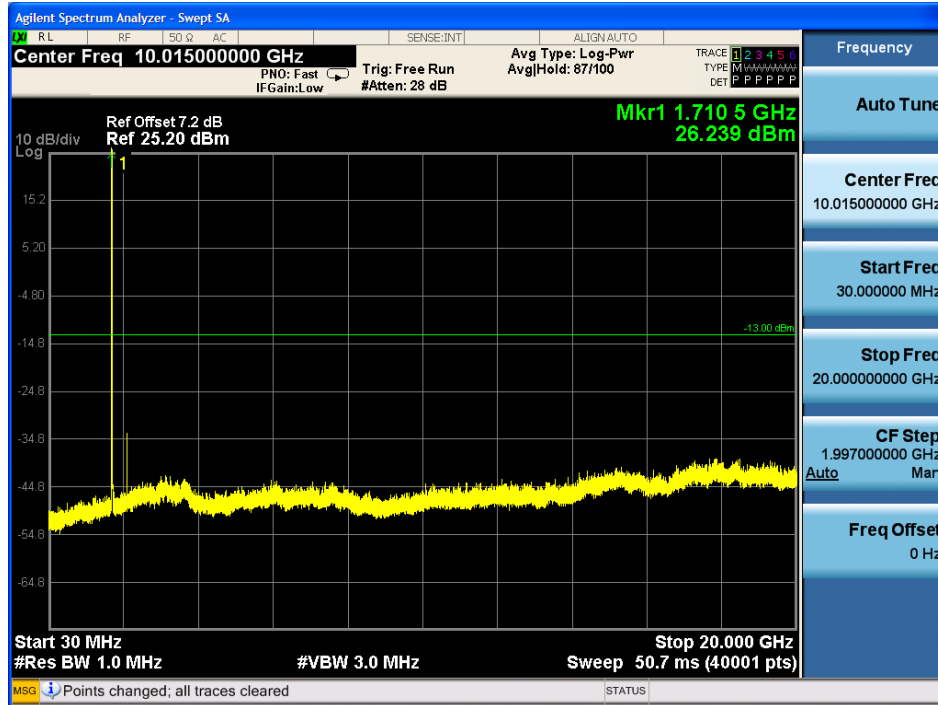


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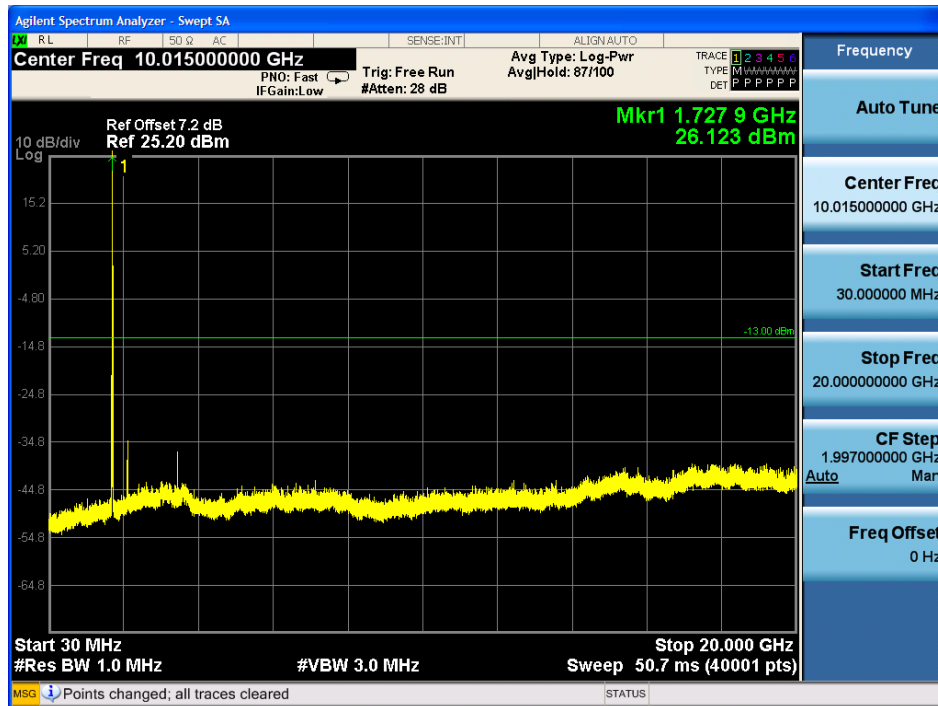
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10MHz Lowest QPSK



10MHz Middle QPSK



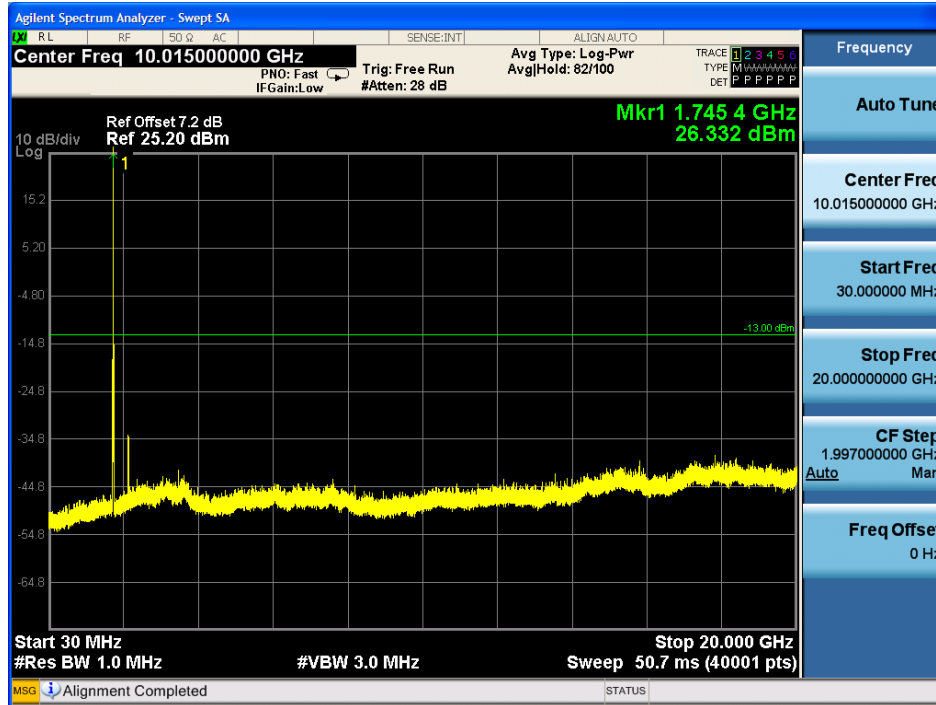


ATA Testing Technology Service Co., Ltd.

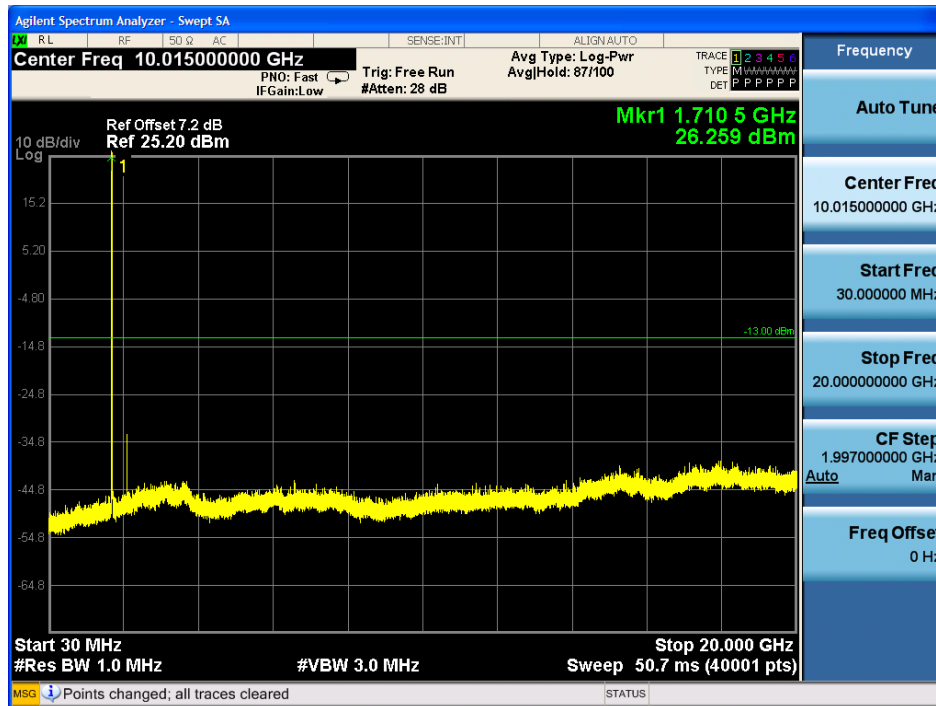
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10MHz Highest QPSK

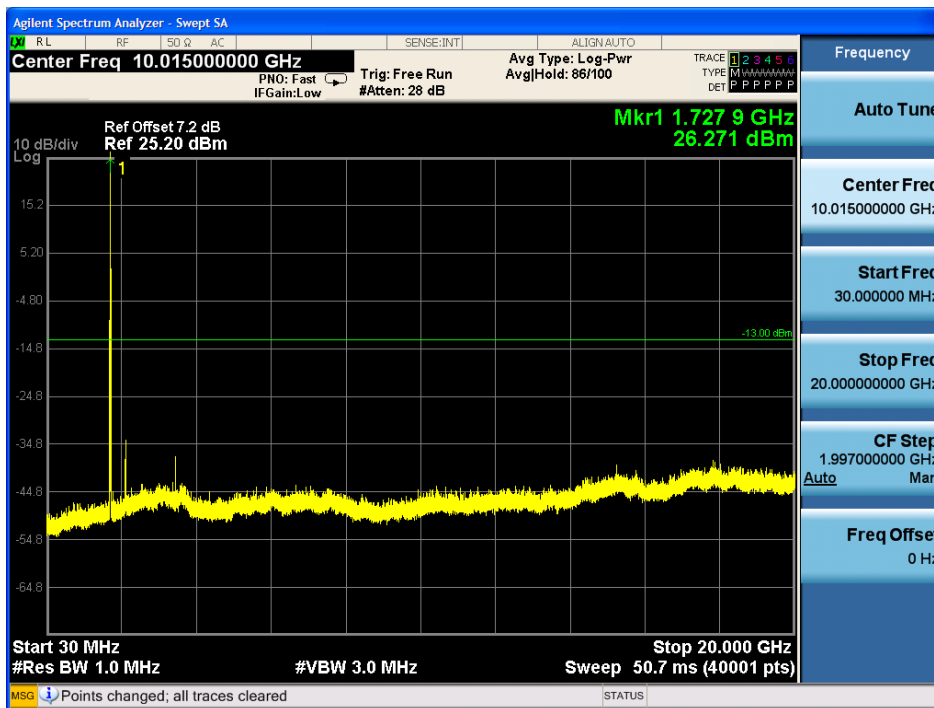


10MHz Lowest 16QAM

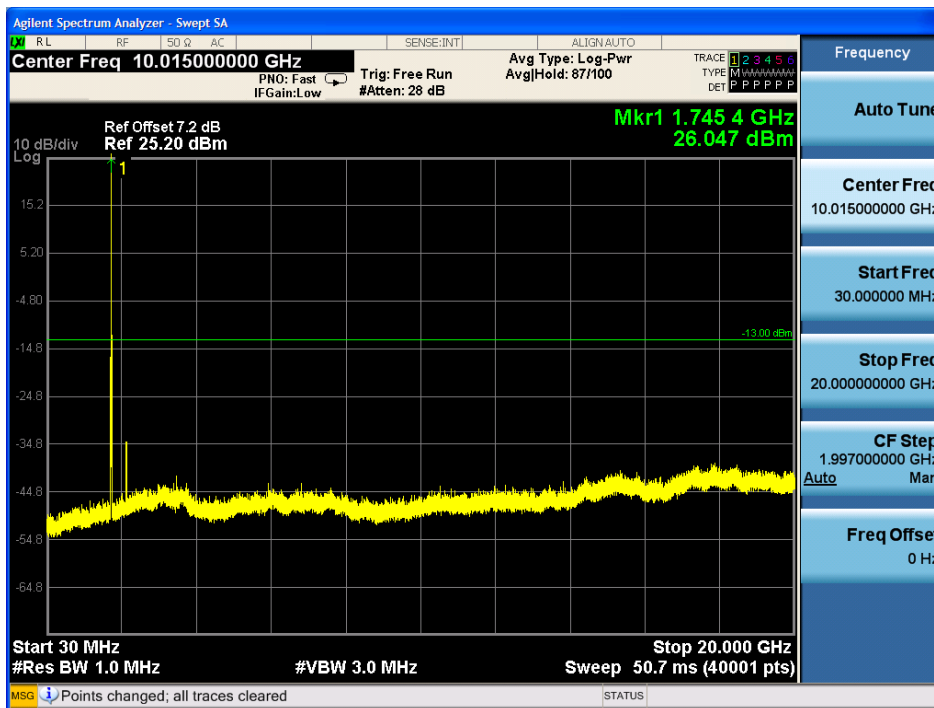




10MHz Middle 16QAM



10MHz Highest 16QAM



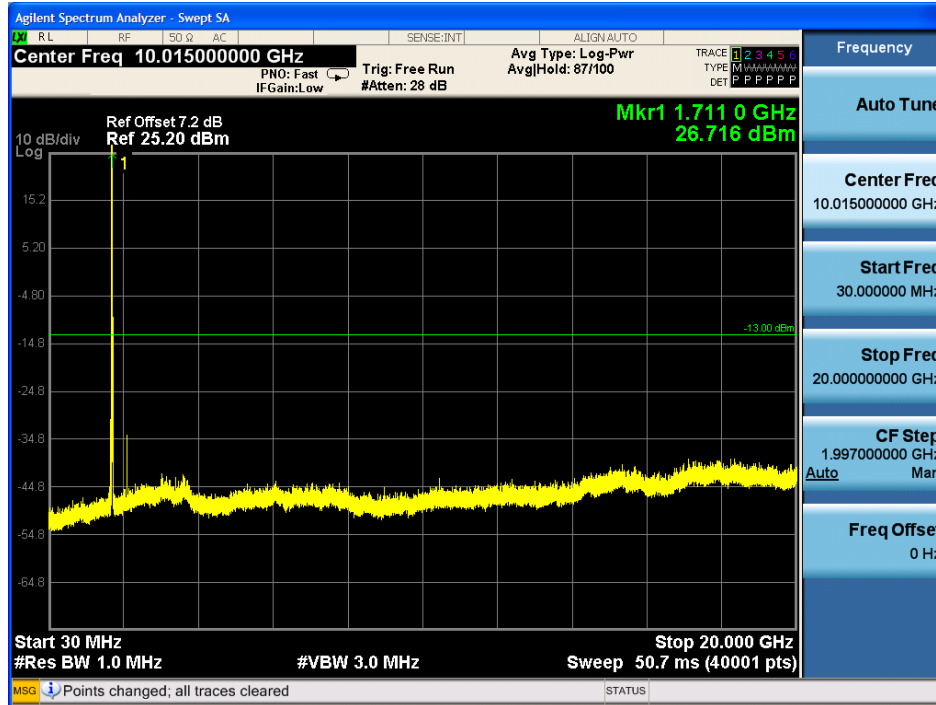


ATA Testing Technology Service Co., Ltd.

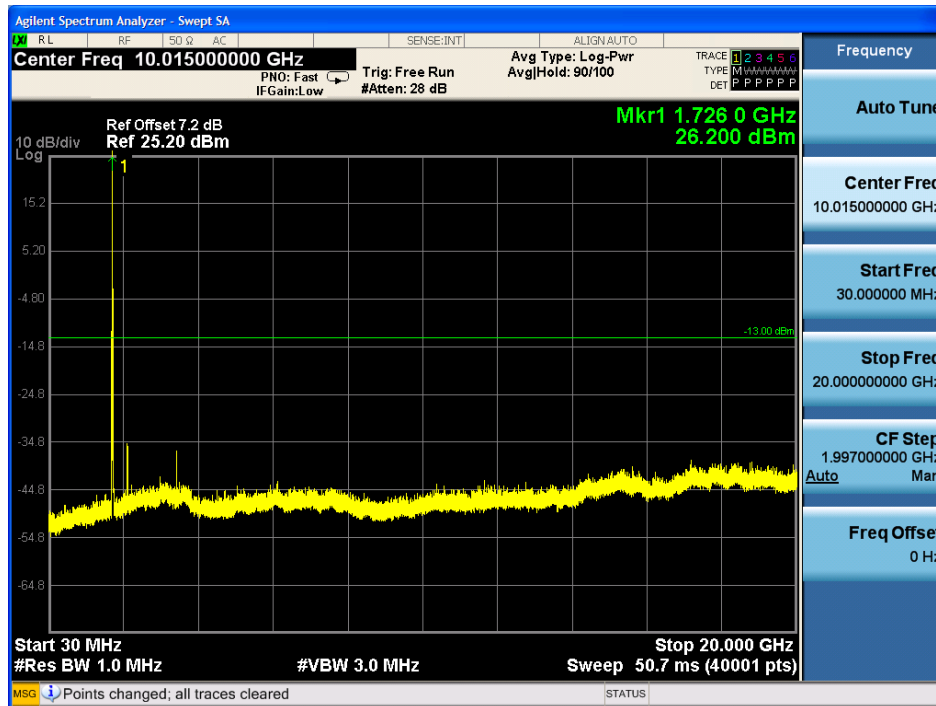
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15MHz Lowest QPSK

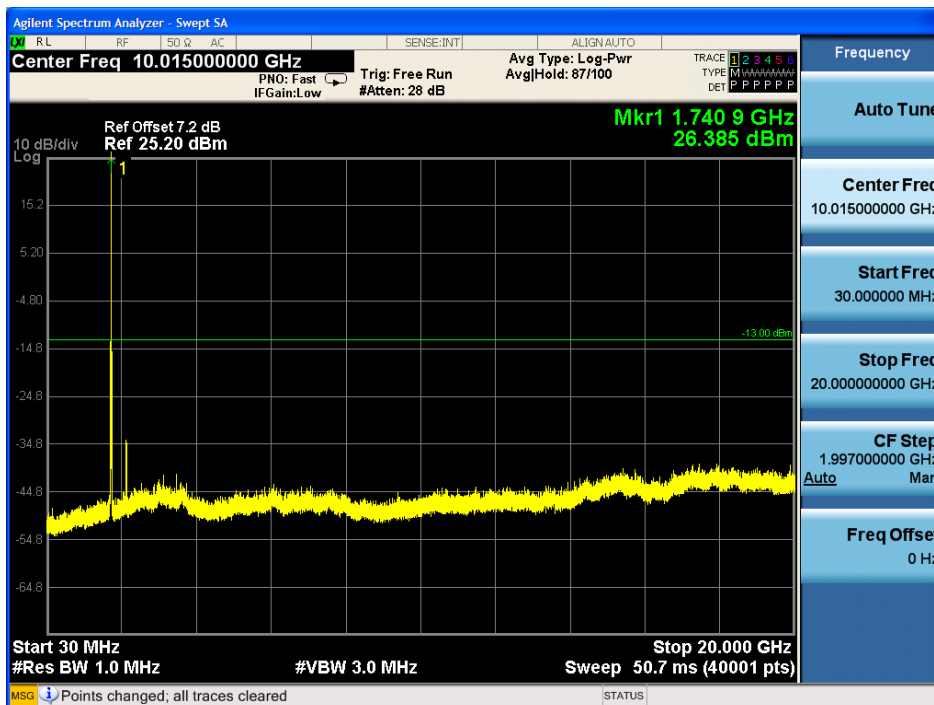


15MHz Middle QPSK

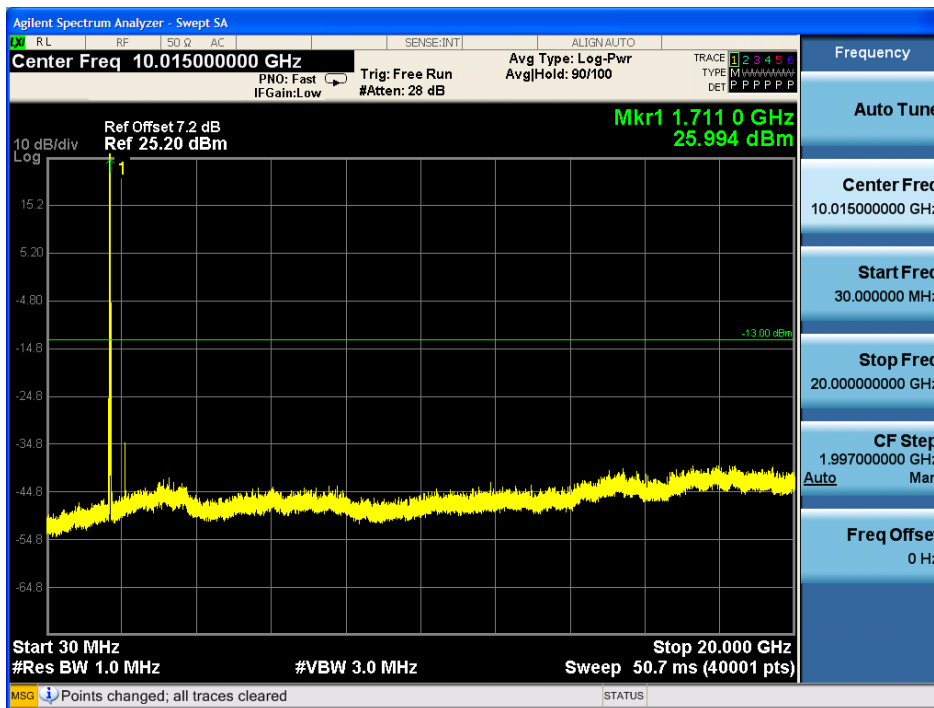




15MHz Highest QPSK



15MHz Lowest 16QAM



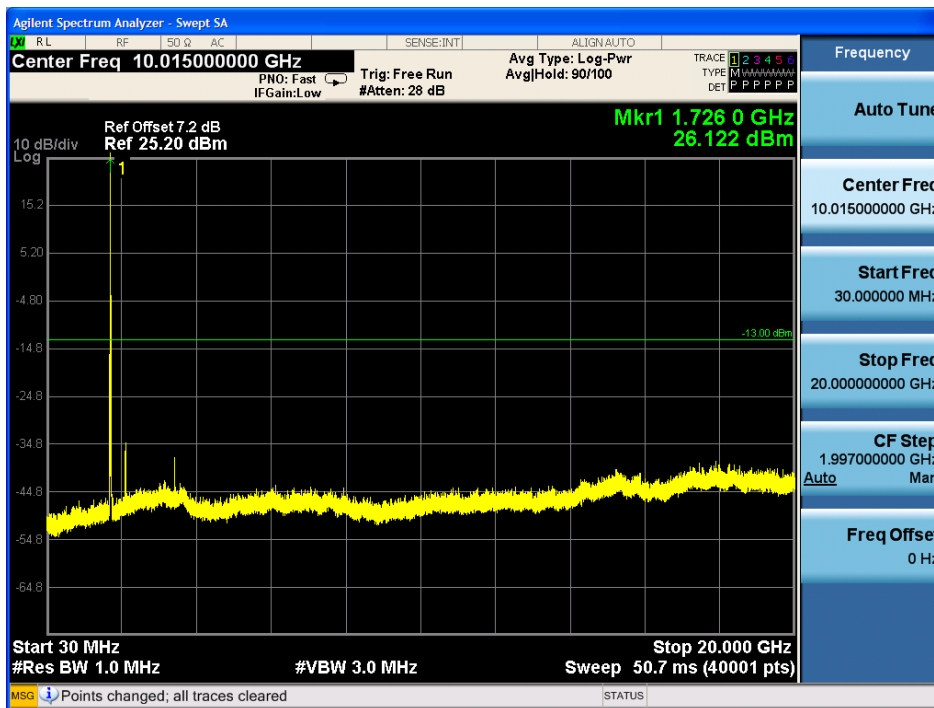


ATA Testing Technology Service Co., Ltd.

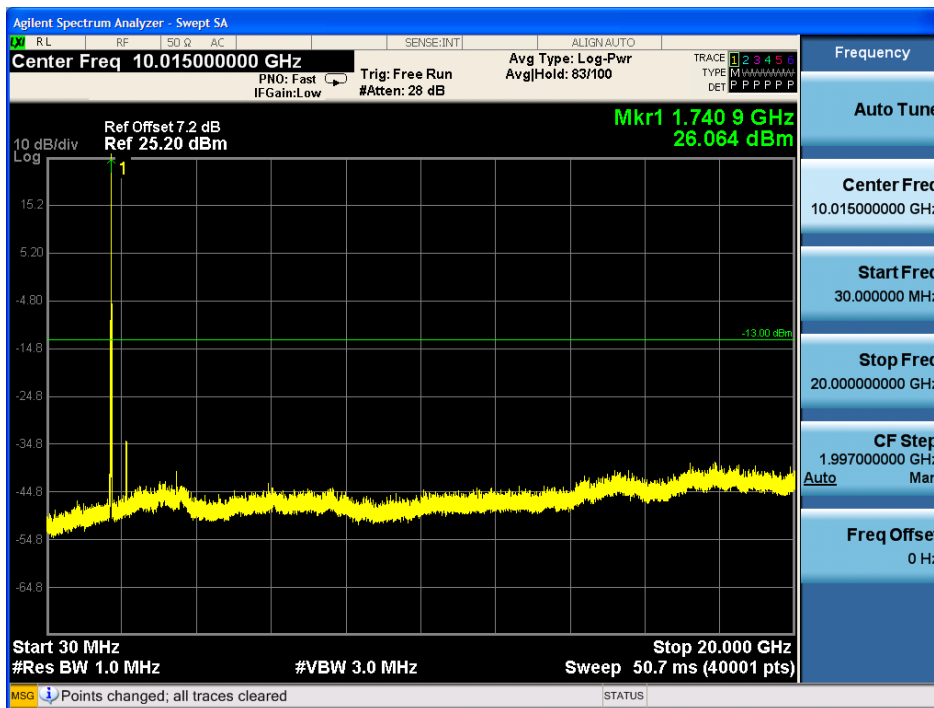
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15MHz Middle 16QAM

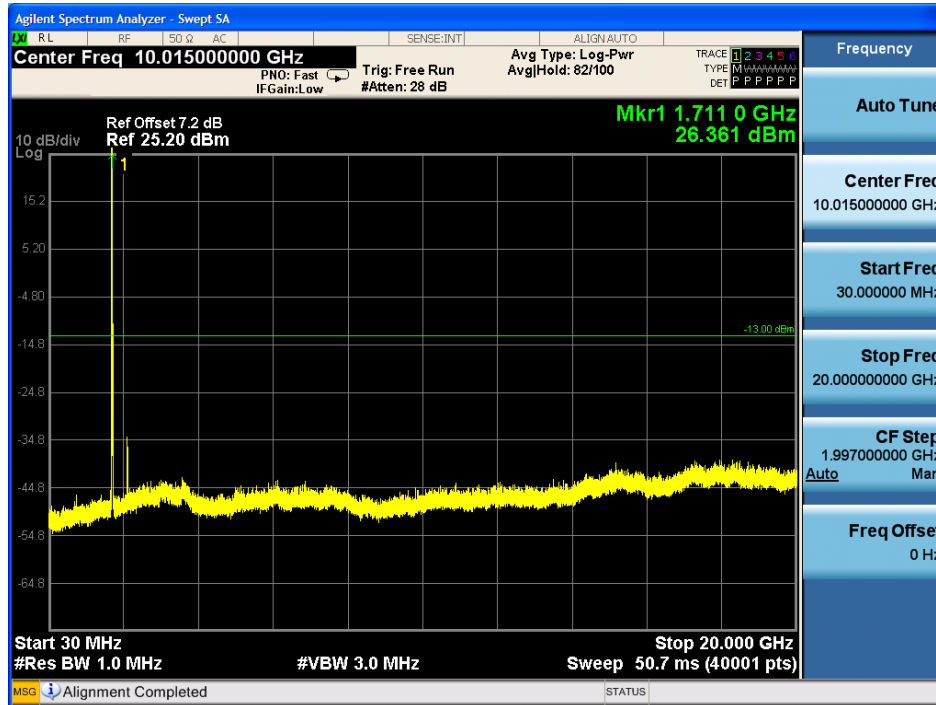


15MHz Highest 16QAM

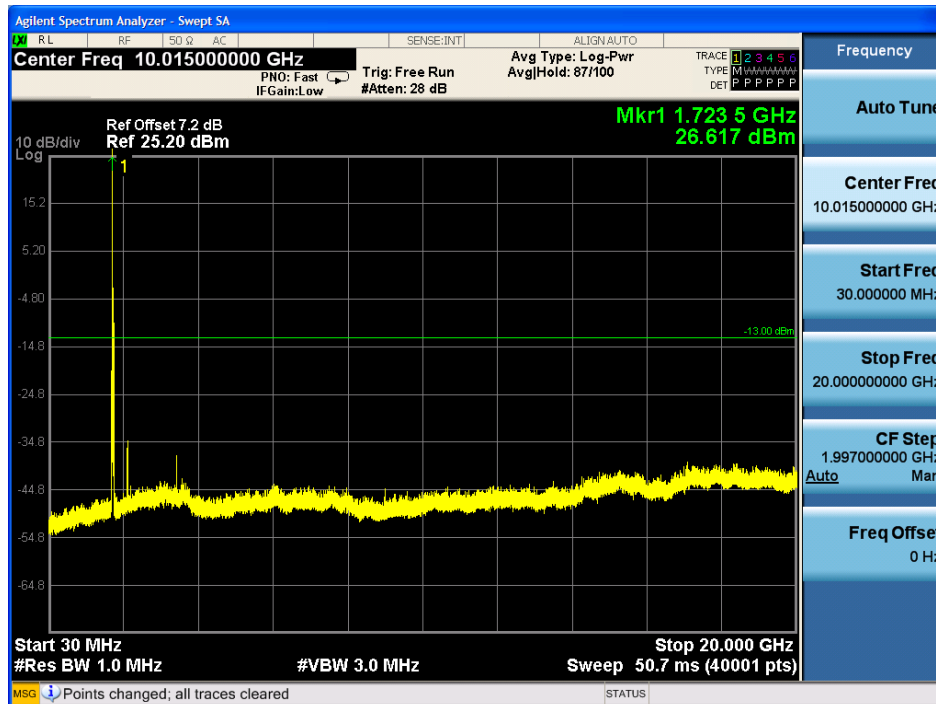




20MHz Lowest QPSK

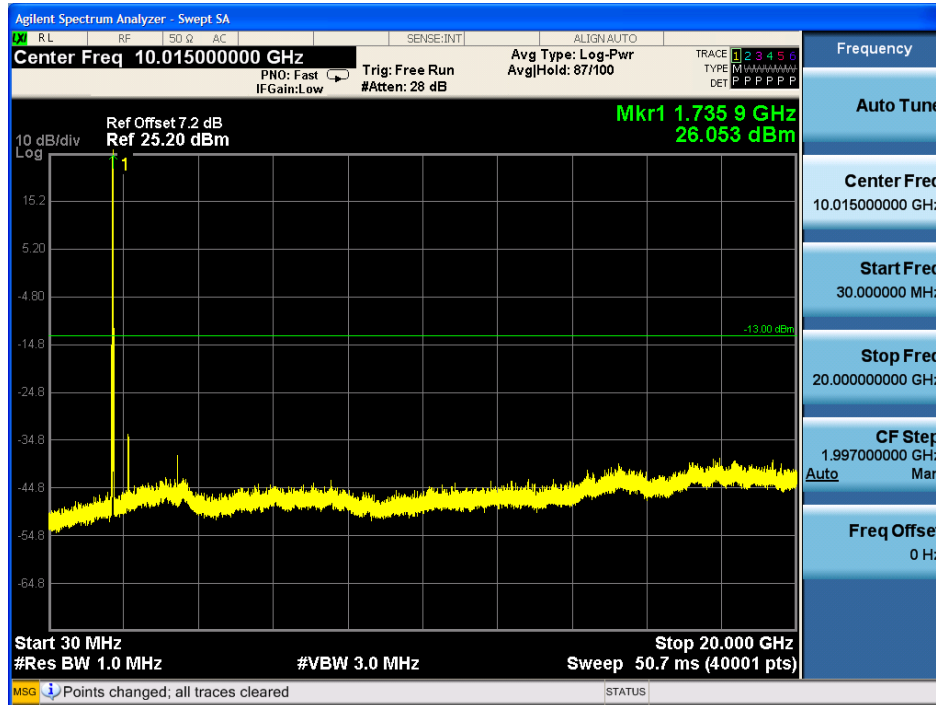


20MHz Middle QPSK

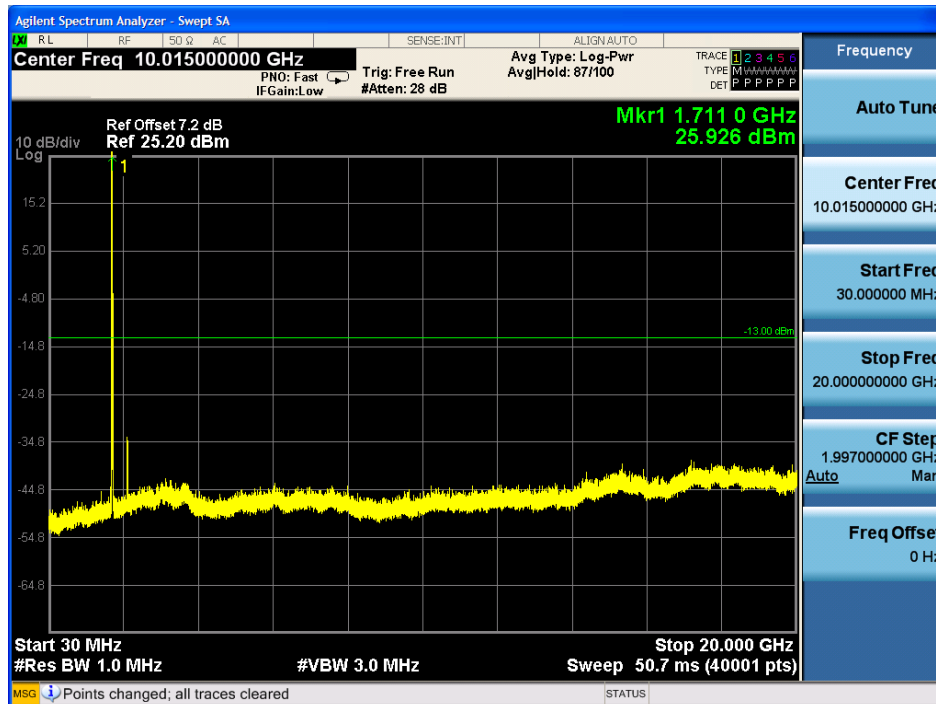




20MHz Highest QPSK



20MHz Lowest 16QAM



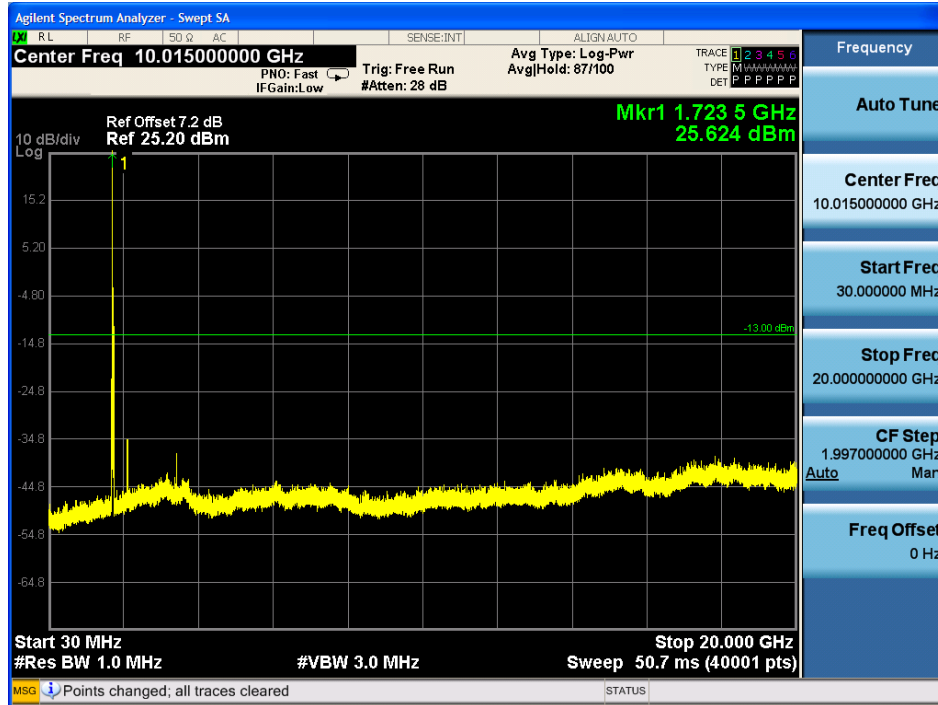


ATA Testing Technology Service Co., Ltd.

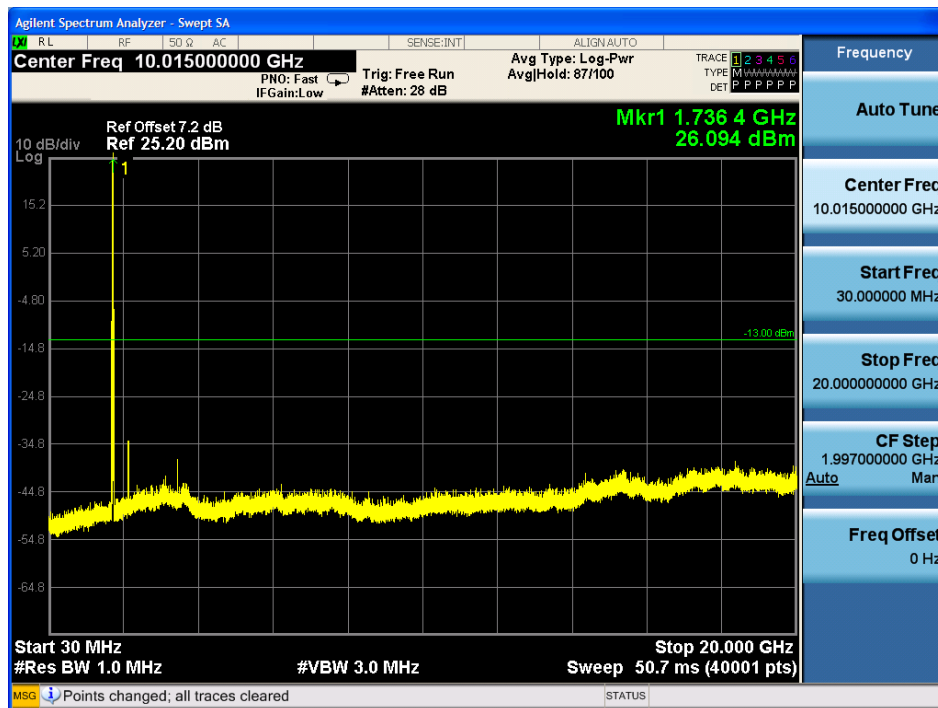
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20MHz Middle 16QAM



20MHz Highest 16QAM

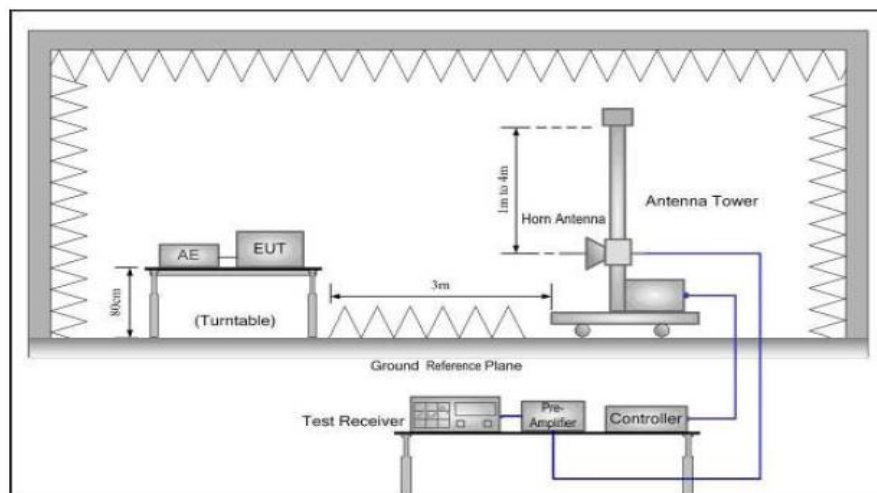


8. Radiated Spurious Emission

8.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least $(43 + 10 \log P)$ dB, in this case, -13dBm.

8.2. Test Setup



8.3. Test Procedure

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonic of fundamental frequency were measured at 3m with a test antenna and a spectrum analyzer with RBW= 1MHz, VBW= 1MHz, peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions (record as LVL) at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Final spurious emissions levels were measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Substitution antenna Loss (only for Dipole antenna) - Analyzer reading. Then final

spurious emissions were calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and



8.4. Test Result

Test result for Lowest Channel QPSK(1.4MHz)						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1232.9	H	-55.89	4.25	-51.64	-13.00	38.64
3421.4	H	-57.43	5.67	-51.76	-13.00	38.76
1232.9	V	-53.35	4.25	-49.1	-13.00	36.10
3421.4	V	-58.65	5.67	-52.98	-13.00	39.98
/	/	/	/	/	/	/

Test result for Lowest Channel 16QAM(1.4MHz)						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1232.9	H	-55.26	4.25	-51.01	-13.00	38.01
3421.4	H	-57.15	5.67	-51.48	-13.00	38.48
1232.9	V	-53.38	4.25	-49.13	-13.00	36.13
3421.4	V	-58.54	5.67	-52.87	-13.00	39.87
/	/	/	/	/	/	/



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Test result for Middle Channel QPSK(1.4MHz)						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1232.9	H	-55.45	4.25	-51.2	-13.00	38.20
3465	H	-57.36	6.32	-51.04	-13.00	38.04
1232.9	V	-53.12	4.25	-48.87	-13.00	35.87
3465	V	-58.76	6.32	-52.44	-13.00	39.44
/	/	/	/	/	/	/

Test result for Middle Channel 16QAM(1.4MHz)						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1232.9	H	-55.26	4.25	-51.01	-13.00	38.01
3465	H	-57.15	6.32	-50.83	-13.00	37.83
1232.9	V	-53.77	4.25	-49.52	-13.00	36.52
3465	V	-58.56	6.32	-52.24	-13.00	39.24
/	/	/	/	/	/	/



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Test result for Highest Channel QPSK(1.4MHz)						
Frequenc y (MHz)	Antenna polarizatio n	LVL (dBm)	Correction factor(dB)	Result (ERP)(dB m)	Limit (dBm)	Margin (dB)
1232.9	H	-55.68	4.25	-51.43	-13.00	38.43
3508	H	-57.43	6.93	-50.5	-13.00	37.50
1232.9	V	-53.41	4.25	-49.16	-13.00	36.16
3508	V	-58.54	6.93	-51.61	-13.00	38.61
/	/	/	/	/	/	/

Test result for Highest Channel 16QAM(1.4MHz)						
Frequenc y (MHz)	Antenna polarizatio n	LVL (dBm)	Correction factor(dB)	Result (ERP)(dB m)	Limit (dBm)	Margin (dB)
1232.9	H	-55.46	4.25	-51.21	-13.00	38.21
3508	H	-57.76	6.93	-50.83	-13.00	37.83
1232.9	V	-53.87	4.25	-49.62	-13.00	36.62
3508	V	-58.26	6.93	-51.33	-13.00	38.33
/	/	/	/	/	/	/

Note1: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Note2: Only worst data of 5MHz mode was listed in report..

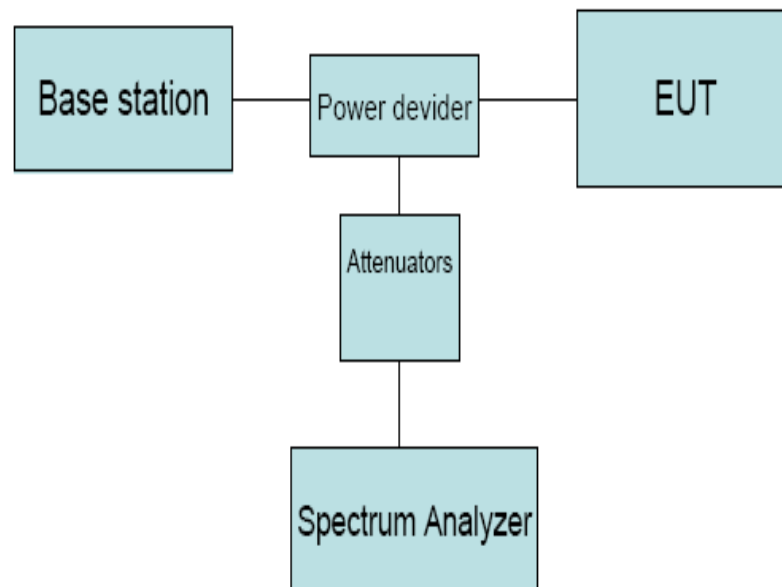


9. Band Edge Requirement

9.1. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least $(43 + 10 \log P)$ dB, in this case, -13dBm.

9.2. Test Setup



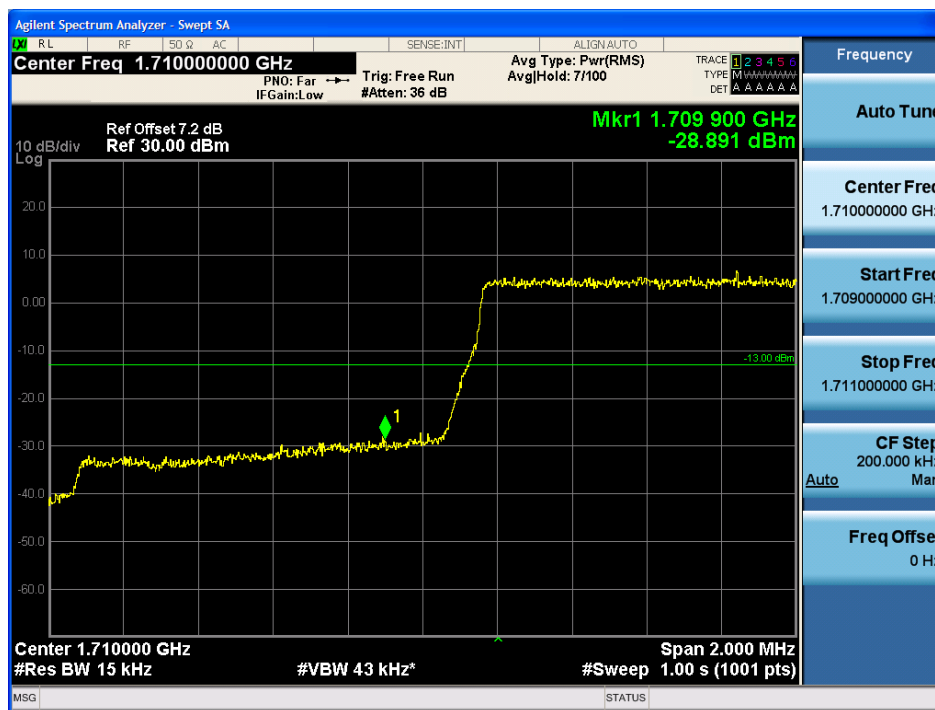
9.3. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured.

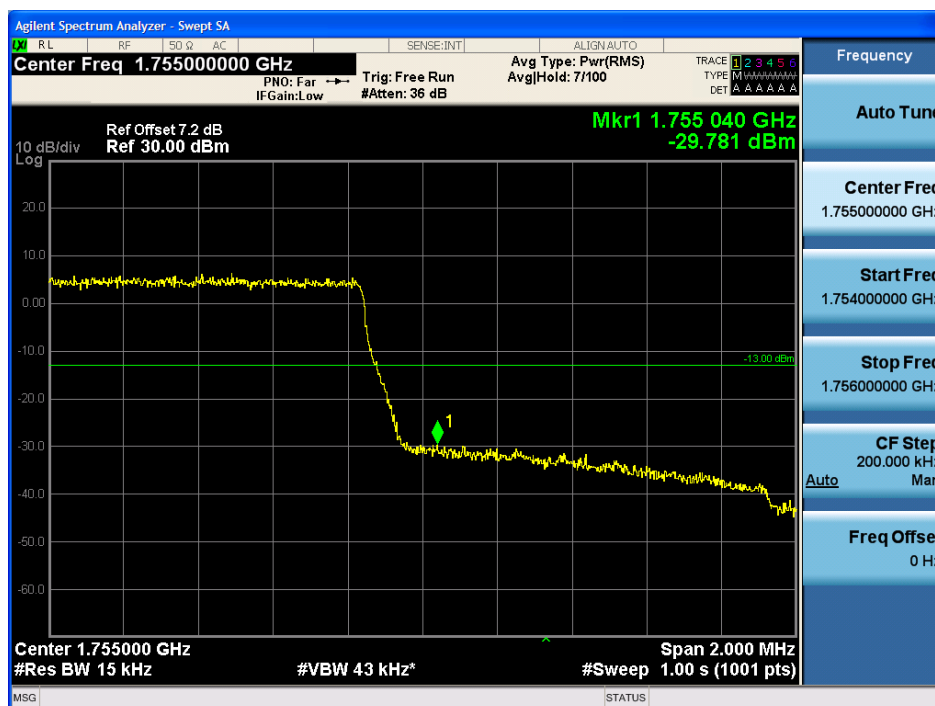


9.4. Test Plot

1.4MHz Lowest QPSK

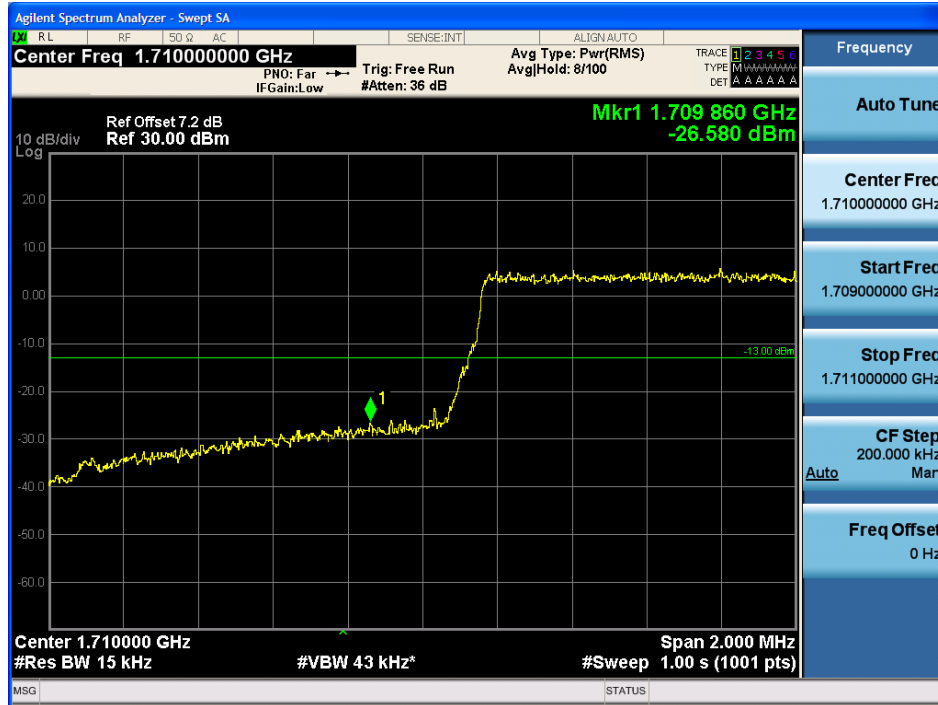


1.4MHz Highest QPSK





1.4MHz Lowest 16QAM



1.4MHz Highest 16QAM



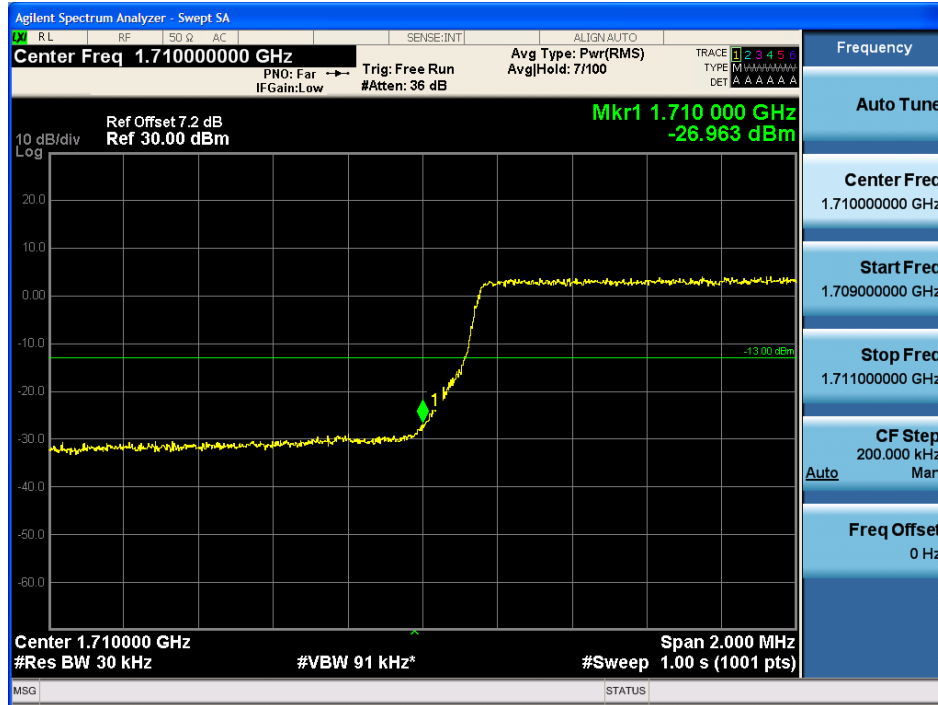


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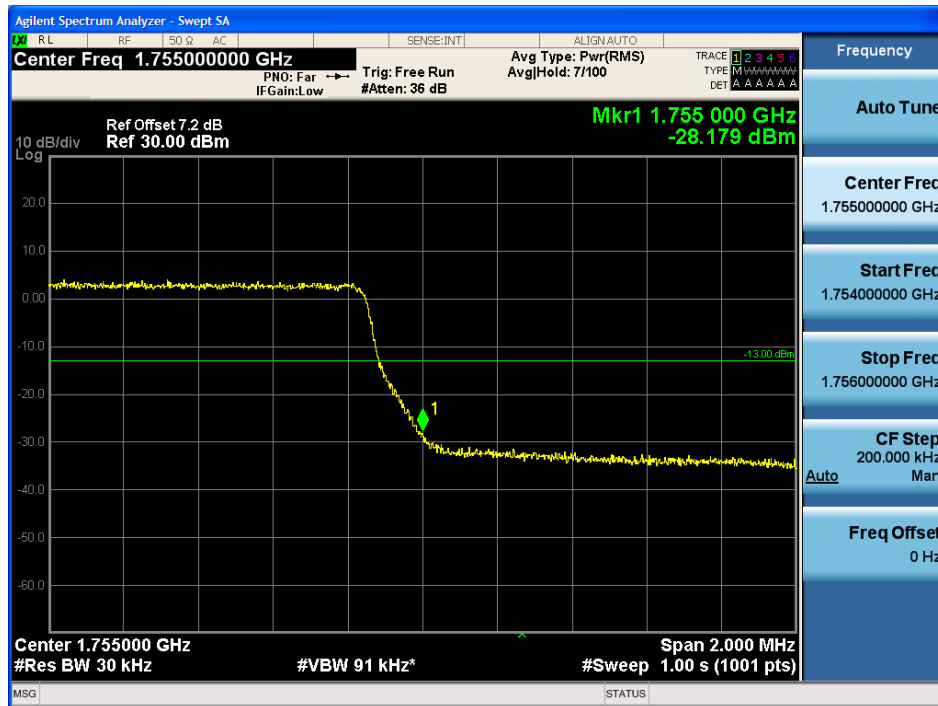
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3MHz Lowest QPSK



3MHz Highest QPSK



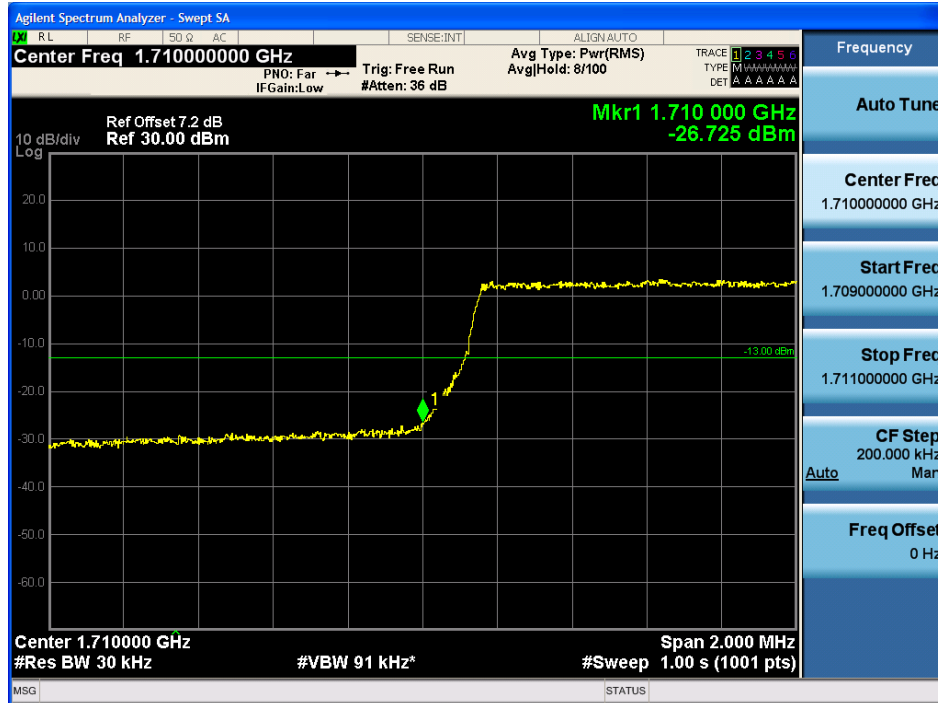


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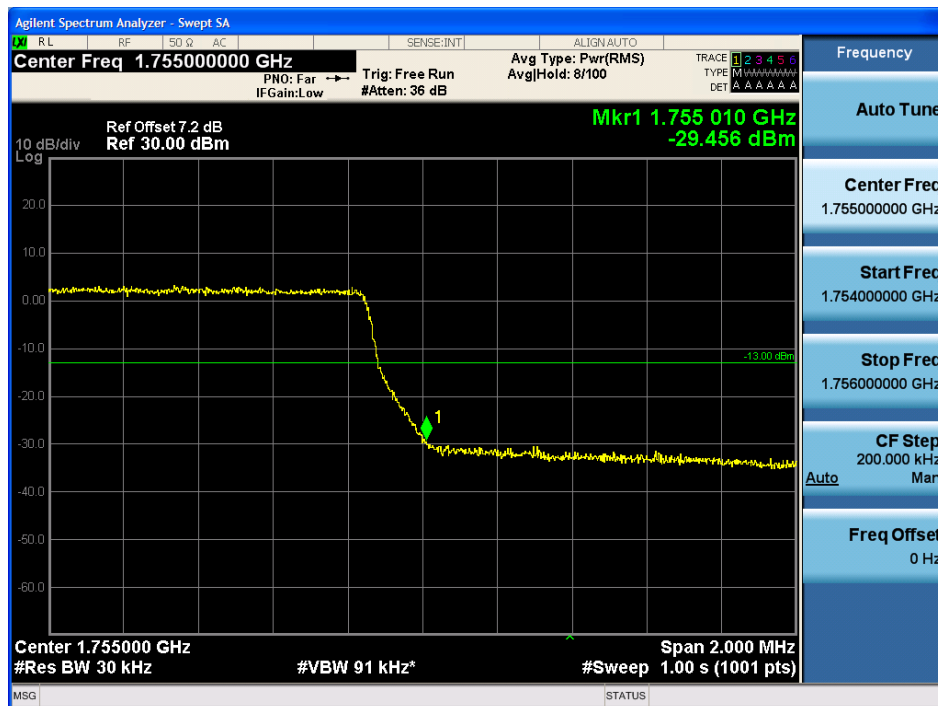
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3MHz Lowest 16QAM



3MHz Highest 16QAM



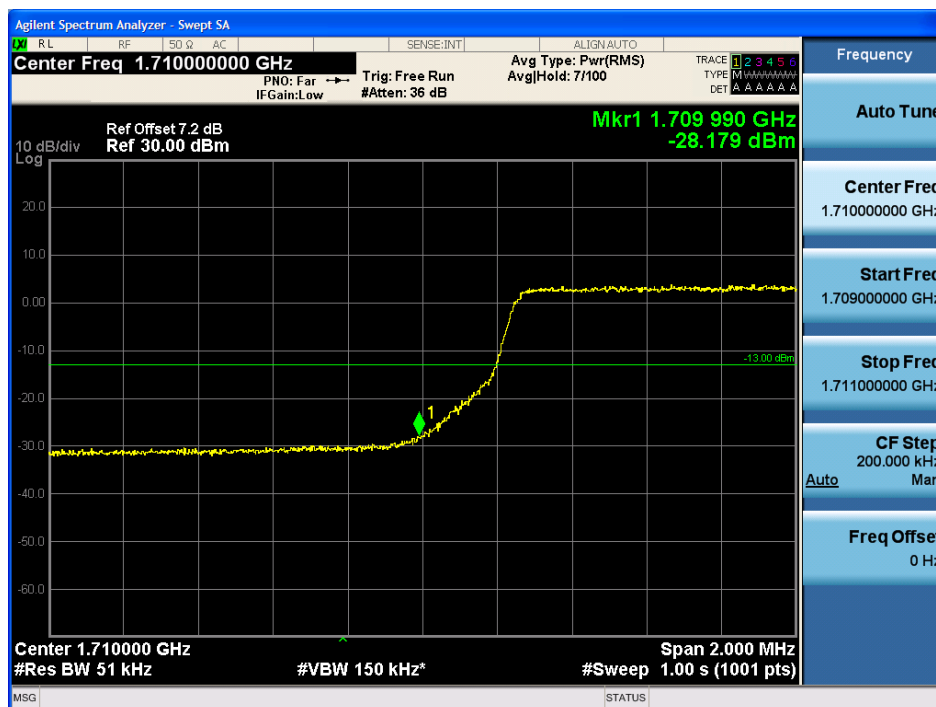


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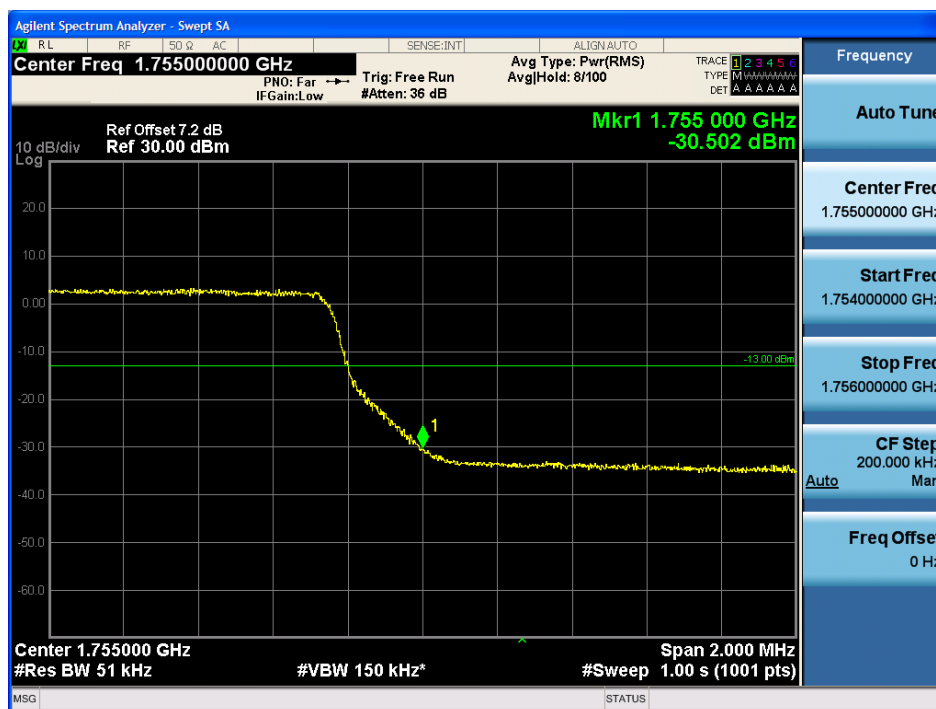
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5MHz Lowest QPSK

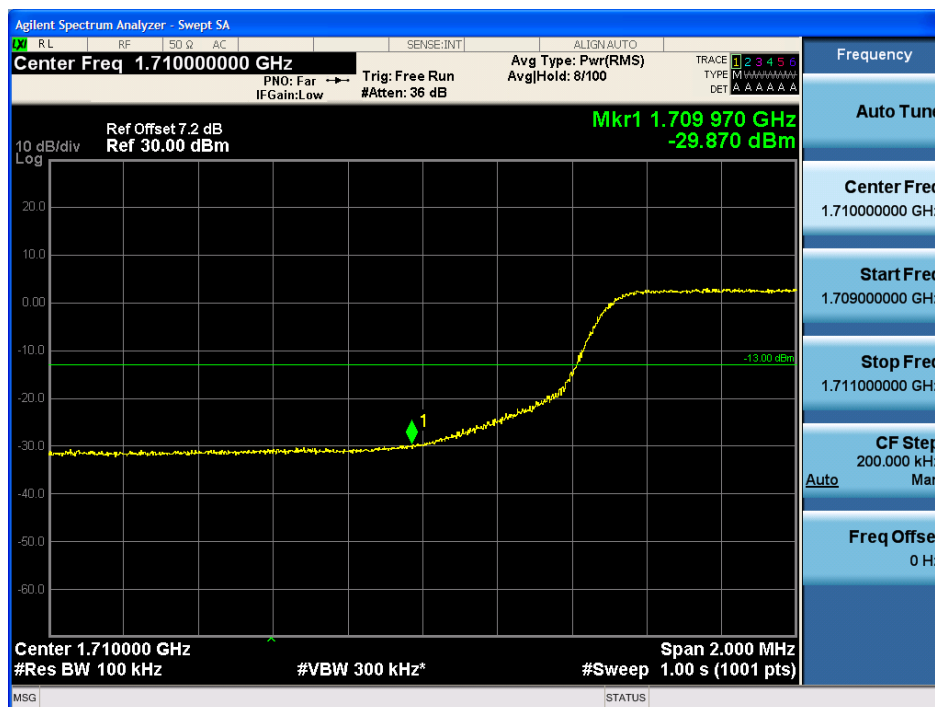


5MHz Highest QPSK

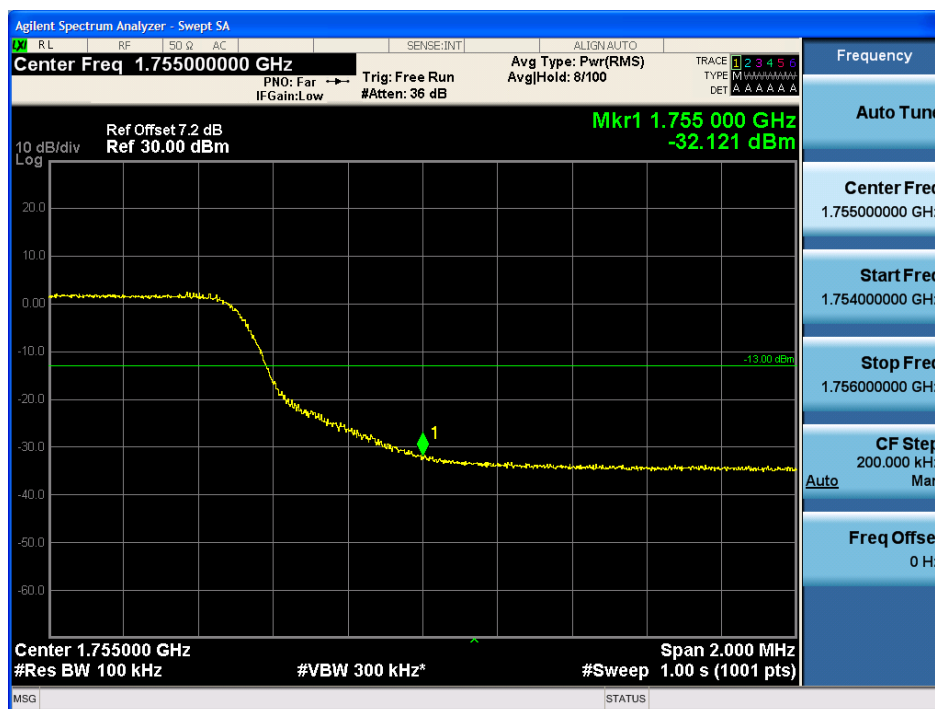




5MHz Lowest 16QAM



5MHz Highest 16QAM



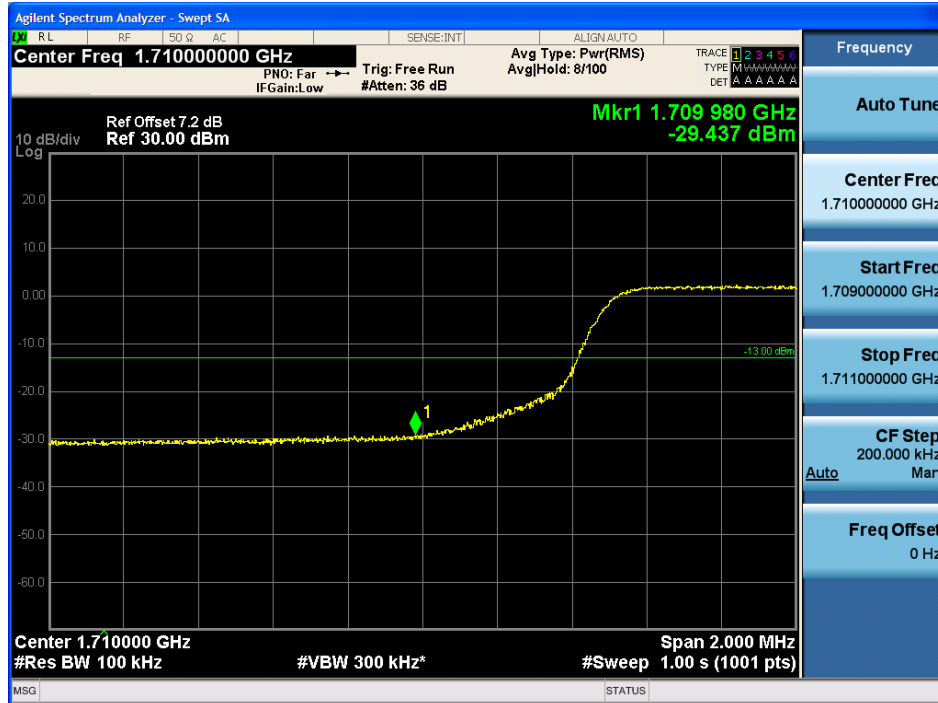


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10MHz Lowest QPSK

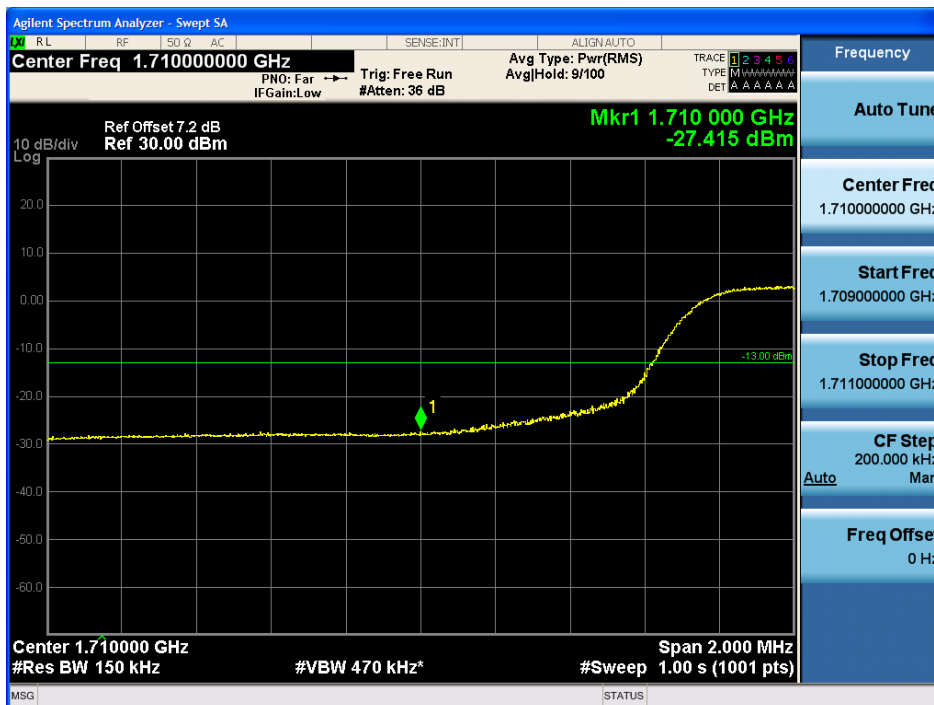


10MHz Highest QPSK

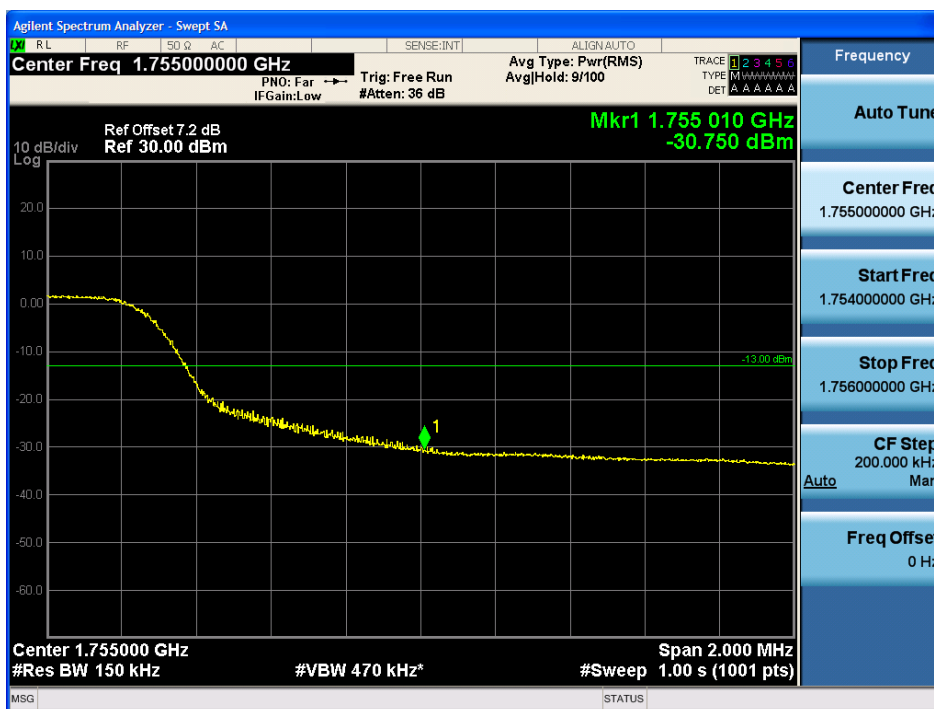




10MHz Lowest 16QAM



10MHz Highest 16QAM



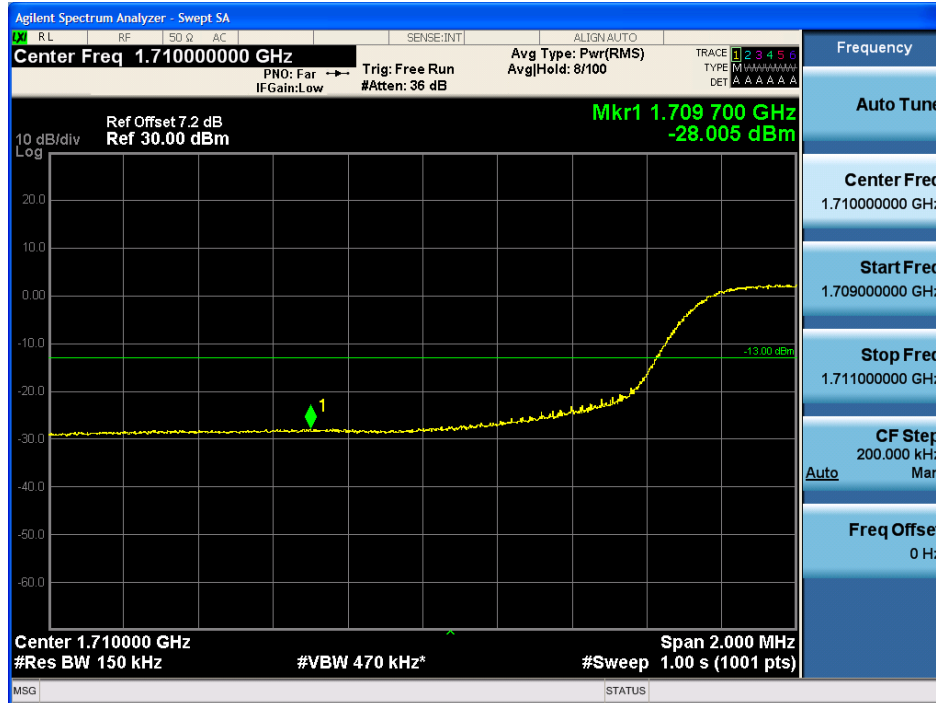


ATA Testing Technology Service Co., Ltd.

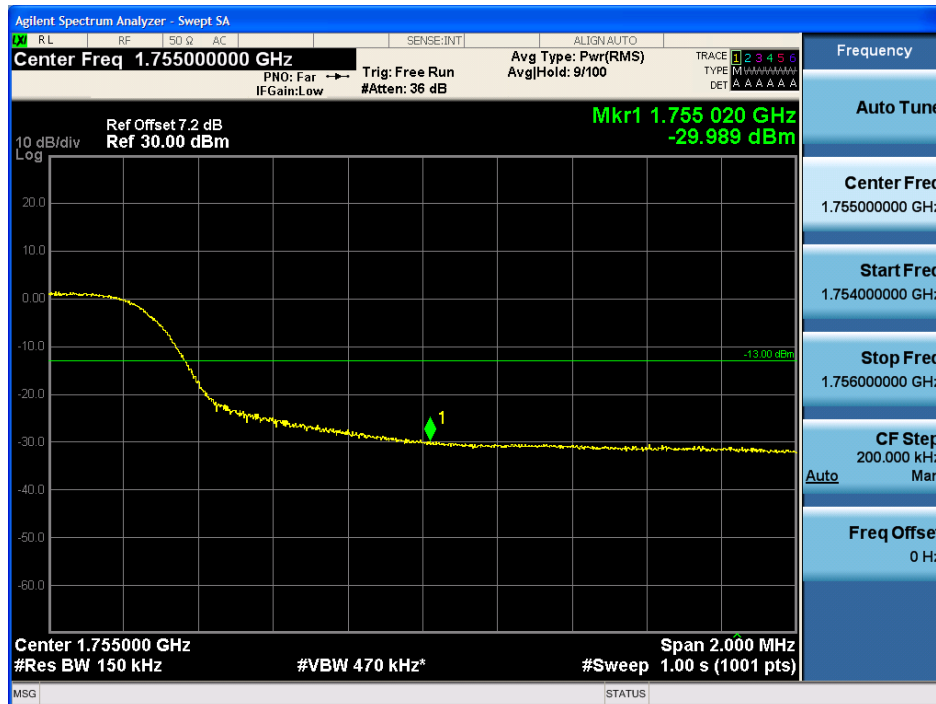
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15MHz Lowest QPSK



15MHz Highest QPSK

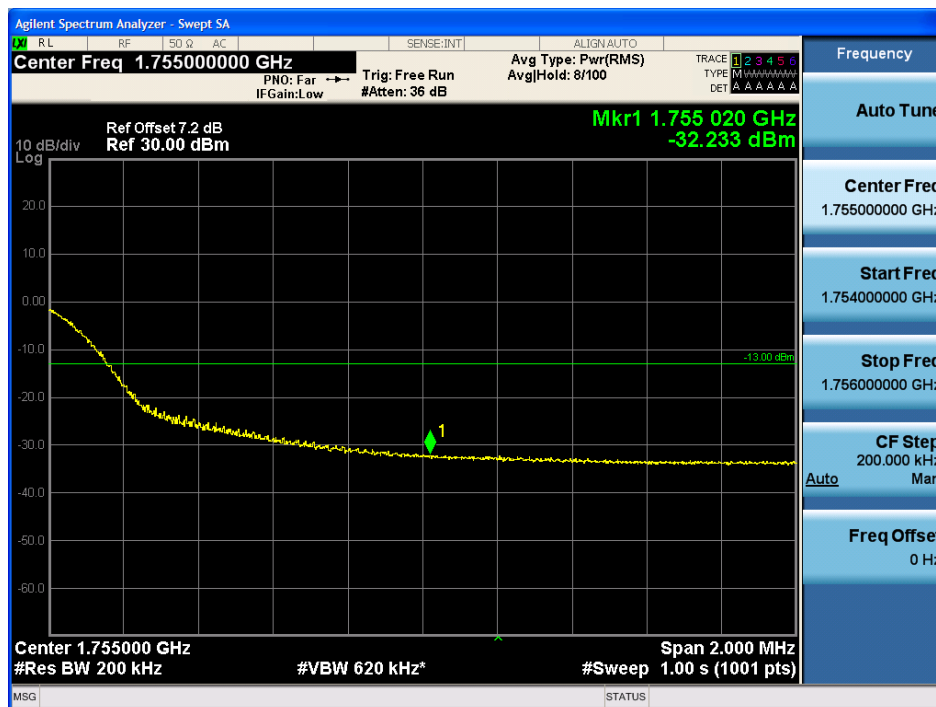




15MHz Lowest 16QAM

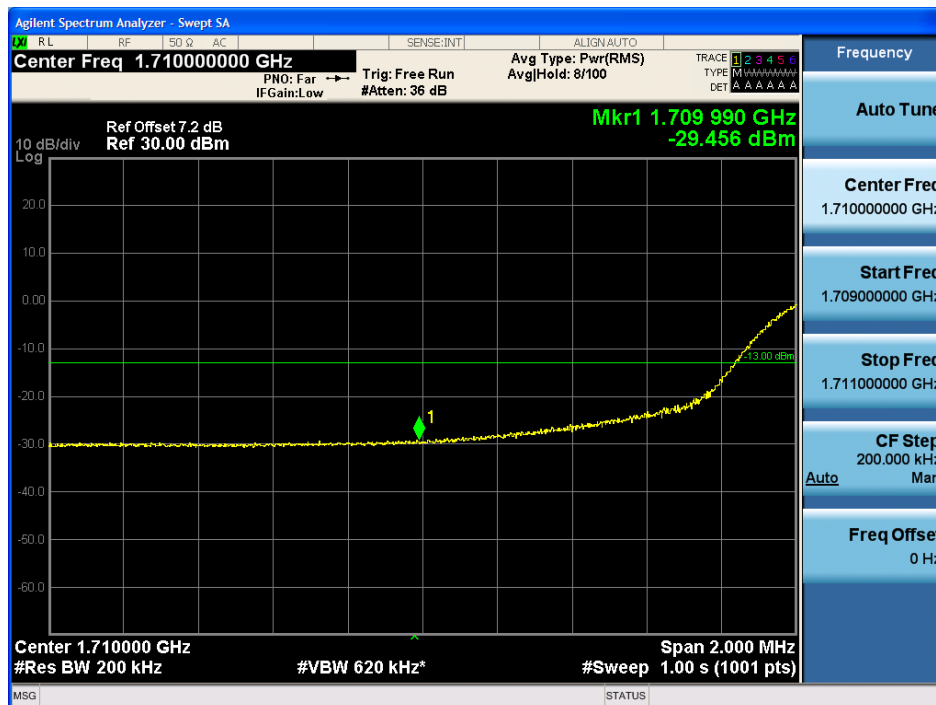


15MHz Highest 16QAM

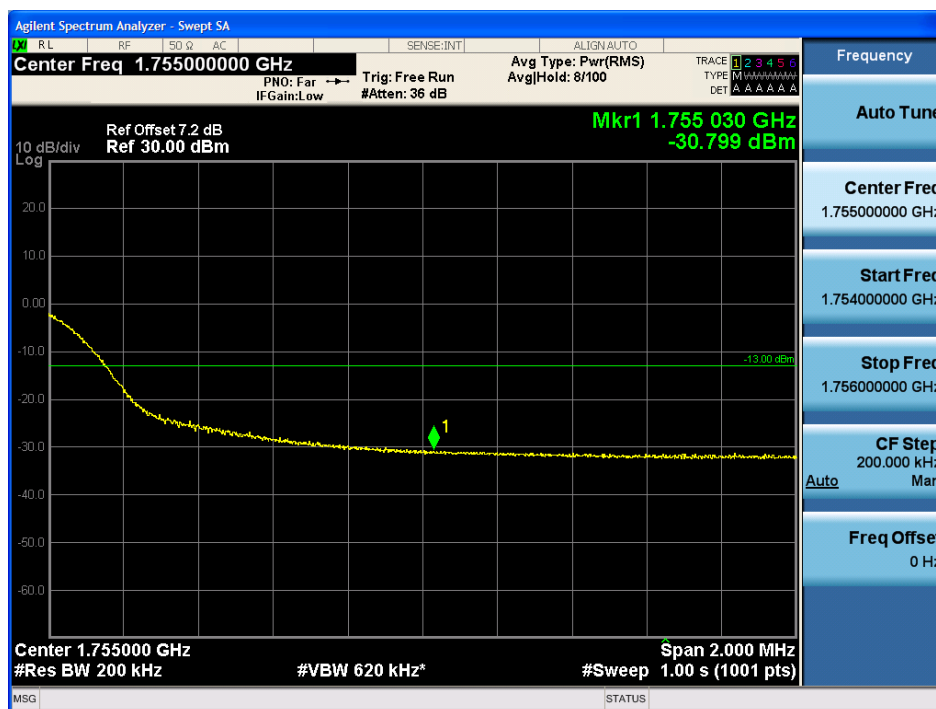




20MHz Lowest QPSK



20MHz Highest QPSK



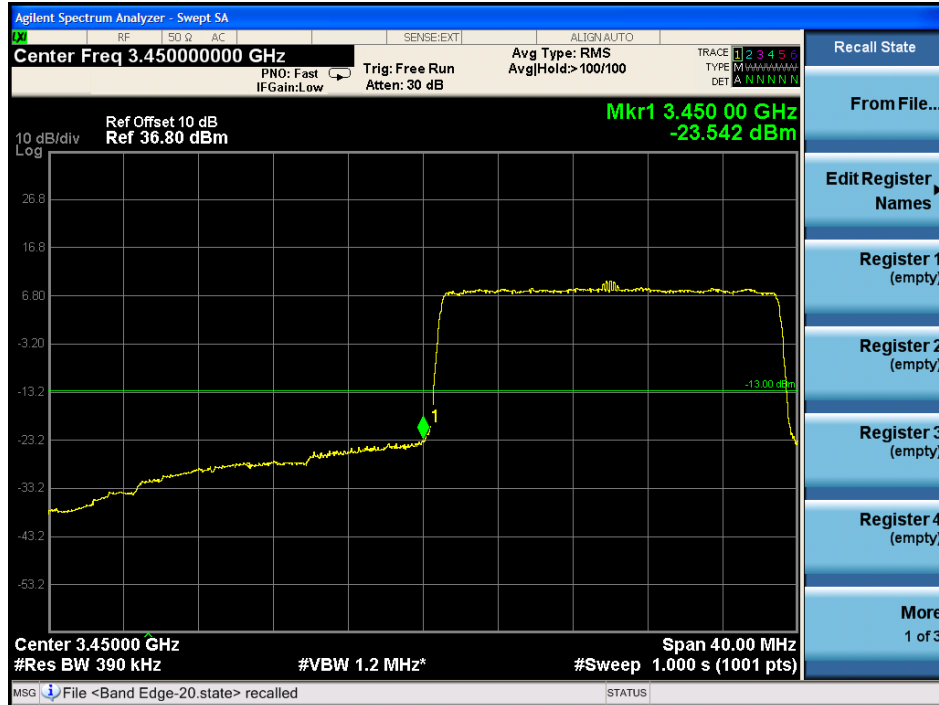


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20MHz Lowest 16QAM



20MHz Highest 16QAM



10. Power Line Conducted Emission

11.1. Test Standard and Limit

11.1.1 Test Standard

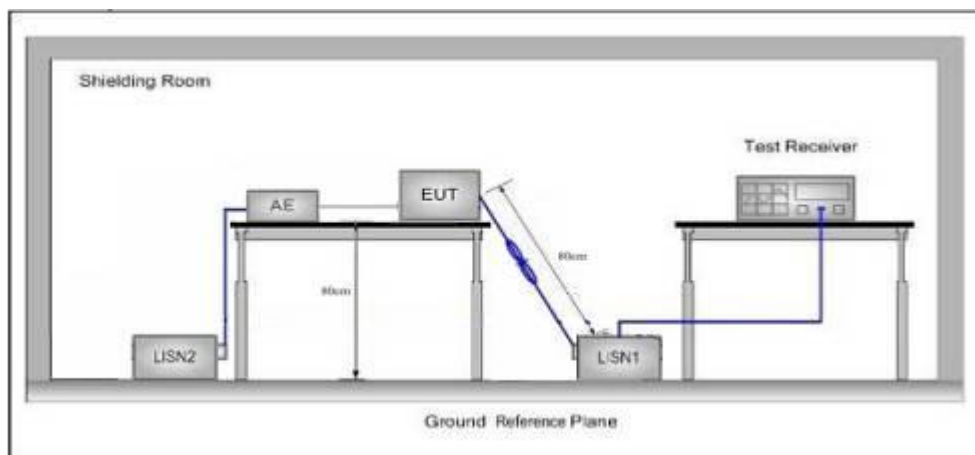
FCC Part15 C Section 15.207

11.1.2 Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Remark: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequencies.

11.2. Test Setup



11.3. Test Procedure

1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50 Ω /50 μ H + 5 Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal



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ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

The Test Receiver setup: RBW=9kHz, VBW=30kHz, Sweep time= auto

11.4. Test Data

Please to see the following pages

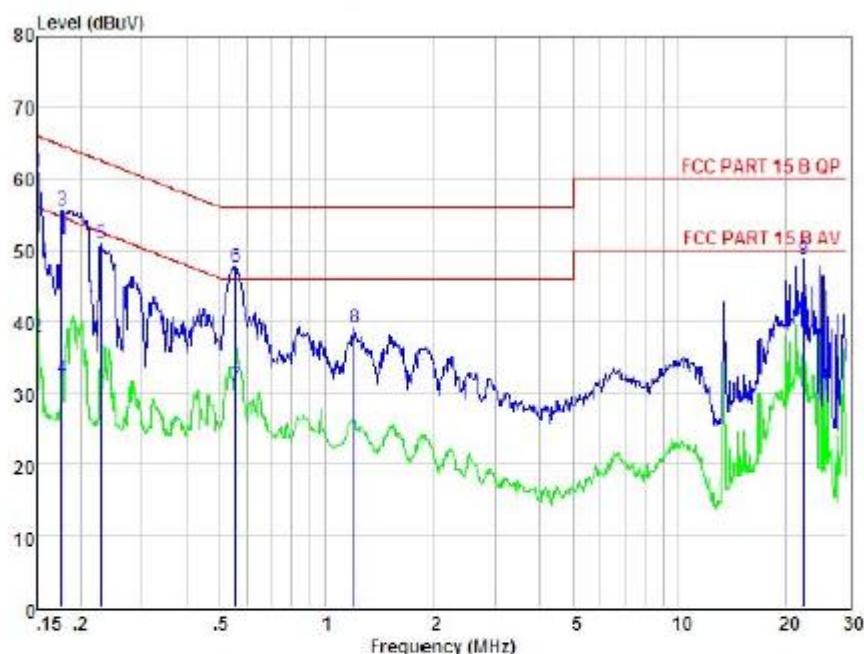


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Conducted Emission Test Data

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EUT: Rugged Smartphone M/N: HG06
Operating Condition: Charging & Working mode
Test Site: Shielded room
Operator: Jason
Test Specification: AC120V/60Hz
Polarization: Line
Note: Tem:25°C Hum:50%



Condition : FCC PART 15 B QP					POL: LINE		Temp:24 °C		Hum:56 %	
Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark	
	MHz	dBuV	Factor	Factor	Loss	dBuV	dBuV	dBuV		
1	0.150	51.10	0.03	-9.72	0.10	60.95	66.00	-5.05	Peak	
2	0.150	28.00	0.03	-9.72	0.10	37.85	56.00	-18.15	Average	
3	0.177	45.73	0.03	-9.72	0.10	55.88	64.64	-9.06	Peak	
4	0.177	22.13	0.03	-9.72	0.10	31.98	54.64	-22.66	Average	
5	0.229	41.03	0.03	-9.72	0.10	50.88	62.48	-11.60	Peak	
6	0.552	37.83	0.03	-9.72	0.10	47.68	56.00	-8.32	Peak	
7	0.862	21.00	0.03	-9.72	0.10	30.88	46.00	-15.12	Average	
8	1.210	29.16	0.04	-9.71	0.10	39.01	56.00	-16.99	Peak	
9	22.775	38.39	0.41	-9.55	0.42	48.77	60.00	-11.23	Peak	

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

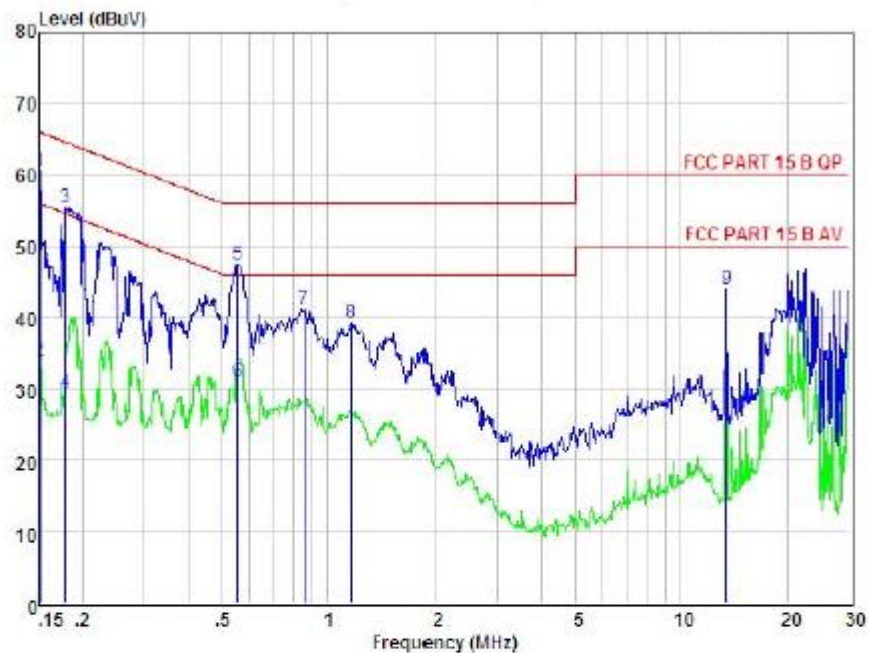


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Conducted Emission Test Data

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EUT: Rugged Smartphone M/N: HG06
Operating Condition: Charging & Working mode
Test Site: Shielded room
Operator: Jason
Test Specification: AC 120V/60Hz
Polarization: Neutral
Note Tem:25℃ Hum:50%



Condition : FCC PART 15 B QP					POL: NEUTRAL Temp:24 °C Hum:56 %				
Item	Freq	Read	LISN Factor	Preamplifier Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.151	50.64	0.03	-9.72	0.10	60.49	65.96	-5.47	Peak
2	0.151	24.00	0.03	-9.72	0.10	33.85	55.96	-22.11	Average
3	0.179	45.58	0.03	-9.72	0.10	55.43	64.55	-9.12	Peak
4	0.179	19.48	0.03	-9.72	0.10	29.33	54.55	-25.22	Average
5	0.552	37.60	0.03	-9.72	0.10	47.45	56.00	-8.55	Peak
6	0.852	21.00	0.03	-9.72	0.10	30.85	46.00	-15.15	Average
7	0.853	31.38	0.04	-9.71	0.10	41.23	56.00	-14.77	Peak
8	1.166	29.34	0.04	-9.71	0.10	39.19	56.00	-16.81	Peak
9	13.479	34.15	0.23	-9.42	0.22	44.02	60.00	-15.98	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable Loss

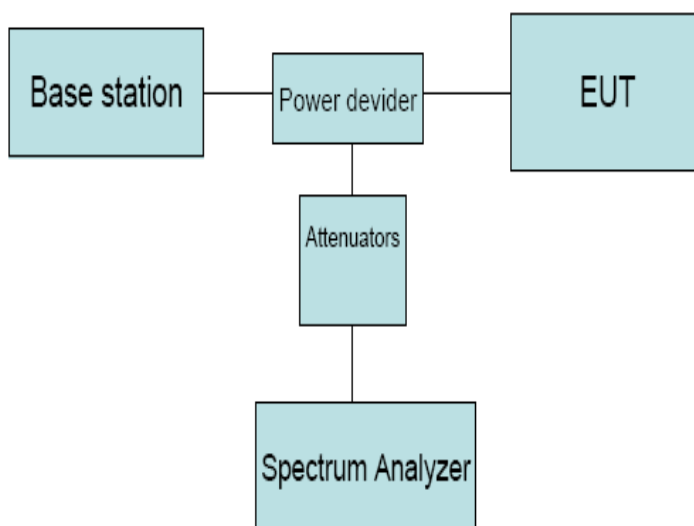


11 Peak-to-Average Ratio

11.1 Limit

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

11.2 Test Setup



11.3 Test Procedure

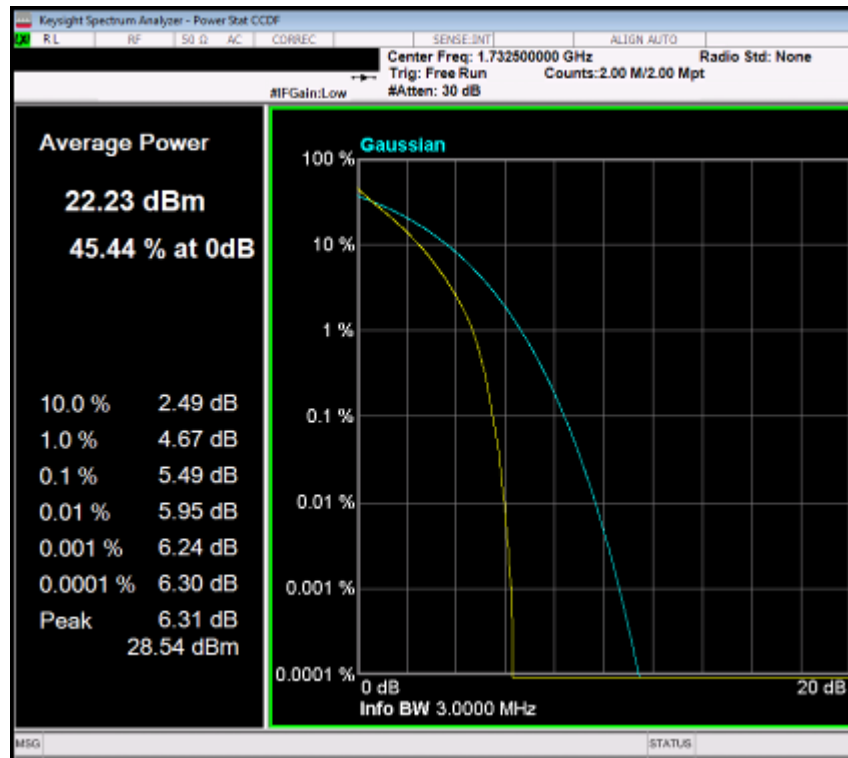
The EUT' RF output port was connected to Measurement Instrument(s) and Base Station via power divider, and then measure the test data.

11.4 Test Result

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
LTE BAND4	QPSK	LCH	6.14	13	PASS
		MCH	6.31	13	PASS
		HCH	6.17	13	PASS
	16QAM	LCH	7.15	13	PASS
		MCH	7.27	13	PASS
		HCH	7.18	13	PASS



Test plots of worst case
QPSK



16QAM

