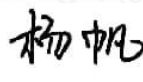


Industrial Internet Innovation Center (Shanghai) Co.,Ltd.**RF TEST REPORT**

PRODUCT	Wireless Display
BRAND	Fellowes
MODEL	LKOUT P
APPLICANT	Fellowes Inc.
FCC ID	IDH-RMTDSPY
ISSUE DATE	February 22, 2024
STANDARD(S)	FCC Part 2, FCC Part 22, FCC Part 24, FCC Part 27,FCC Part 90

Prepared by: *Rui Wu*Reviewed by: *Fan Yang*Approved by: *Min Zhang***CAUTION:**

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.

CONTENTS

1. SUMMARY OF TEST REPORT	3
1.1 TEST STANDARD (S)	3
1.2 REFERENCE DOCUMENTS.....	3
1.3 SUMMARY OF TEST RESULTS.....	3
1.4 DATA PROVIDED BY APPLICANT.....	7
2. GENERAL INFORMATION OF THE LABORATORY	8
2.1 TESTING LABORATORY	8
2.2 LABORATORY ENVIRONMENTAL REQUIREMENTS.....	8
2.3 PROJECT INFORMATION	8
3. GENERAL INFORMATION OF THE CUSTOMER.....	9
3.1 APPLICANT	9
3.2 MANUFACTURER	9
4. GENERAL INFORMATION OF THE PRODUCT.....	9
4.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	10
4.2 DESCRIPTION FOR AUXILIARY EQUIPMENT (AE)	10
4.3 ADDITIONAL INFORMATION	10
5. TEST CONFIGURATION INFORMATION	11
5.1 LABORATORY ENVIRONMENTAL CONDITIONS.....	11
5.2 TEST EQUIPMENTS UTILIZED.....	11
5.3 MEASUREMENT UNCERTAINTY	12
6. TEST RESULTS	13
6.1 OUTPUT POWER.....	13
6.2 EMISSION LIMIT	37
6.3 FREQUENCY STABILITY	48
6.4 OCCUPIED BANDWIDTH.....	53
6.5 EMISSION BANDWIDTH	67
6.6 BAND EDGE COMPLIANCE	81
6.7 CONDUCTED SPURIOUS EMISSION.....	97
6.8 PEAK-TO-AVERAGE POWER RATIO	103
ANNEX A: REVISED HISTORY	105
ANNEX B: ACCREDITATION CERTIFICATE.....	106

1. Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard	Title	Version
1	FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	2021-10-01
2	FCC Part 22	PUBLIC MOBILE SERVICES	2022-10-01
3	FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	2022-10-01
4	FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	2022-10-01
5	FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	2022-10-01

Note: FCC Part 2 have not been accredited by A2LA.

1.2 Reference Documents

No.	Test Standard	Title	Version
1	ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
2	ANSI C63.26	American National Standard of Procedures for Compliance Testing of Licensed Transmitters Used in Licensed Radio	2015
3	KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v03r01

Note: KDB 971168 D01 have not been accredited by A2LA.

1.3 Summary of Test Results

LTE Band 2

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	24.232(c)/2.1046	Pass
2	Emission Limit	24.238(a)/ 2.1051	Pass
3	Frequency Stability	24.235/2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	24.238(a)	Pass
6	Band Edge Compliance	24.238(a)	Pass
7	Conducted Spurious Emission	24.238/2.1057	Pass
8	Peak to Average Power Ratio	24.232 (d)	Pass

LTE Band 4

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50(d)(4)/2.1046	Pass
2	Emission Limit	27.53(h)/ 2.1051	Pass
3	Frequency Stability	27.54/ 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	27.53(h)	Pass
6	Band Edge Compliance	27.53(h)	Pass
7	Conducted Spurious Emission	27.53(h)/ 2.1057	Pass
8	Peak to Average Power Ratio	27.50(d)(5)	Pass

LTE Band 5

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	2.1046/22.913(a)	Pass
2	Emission Limit	22.917/2.1051	Pass
3	Frequency Stability	22.235/2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	22.917(b)	Pass
6	Band Edge Compliance	22.917(b)	Pass
7	Conducted Spurious Emission	22.917/2.1057	Pass
8	Peak to Average Power Ratio	22.913(d)	Pass

LTE Band 12

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	2.1046/27.50(c)(10)	Pass
2	Emission Limit	27.53(g), 2.1051	Pass
3	Frequency Stability	27.54, 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	27.53(g)	Pass
6	Band Edge Compliance	27.53(g)	Pass
7	Conducted Spurious Emission	27.53(g), 2.1057	Pass

LTE Band 13

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	2.1046/27.50(b)(10)	Pass
2	Emission Limit	27.53(c) (2),2.1051	Pass

3	Frequency Stability	27.54, 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	27.53(c) (2)	Pass
6	Band Edge Compliance	27.53(c) (2)	Pass
7	Conducted Spurious Emission	27.53(c) (2),2.1057	Pass

LTE Band 14

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	2.1046/90.542(a)(7)	Pass
2	Emission Limit	90.543(e),2.1051	Pass
3	Frequency Stability	90.213(a), 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	90.209(b)	Pass
6	Band Edge Compliance	90.543(e)	Pass
7	Conducted Spurious Emission	90.543(e),2.1057	Pass

LTE Band 66

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50(d)(4)	Pass
2	Emission Limit	27.53(h), 2.1051	Pass
3	Frequency Stability	27.54, 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	27.53(h)	Pass
6	Band Edge Compliance	27.53(h)	Pass
7	Conducted Spurious Emission	27.53(h), 2.1057	Pass
8	Peak to Average Power Ratio	27.50(d)(5)	Pass

LTE Band 71

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50(c)(10)	Pass
2	Emission Limit	27.53(g),2.1051	Pass
3	Frequency Stability	27.54, 2.1055	Pass
4	Occupied Bandwidth	2.1049	Pass
5	Emission Bandwidth	27.53(g)	Pass
6	Band Edge Compliance	27.53(g)	Pass
7	Conducted Spurious Emission	27.53(g),2.1057	Pass

Note1:

The LKOUT P, manufactured by Fellowes Inc. is a new product for testing.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	LTE band 2	2
2	LTE band 4	2
3	LTE band 5	2
4	LTE band 12	2
5	LTE band 13	2
6	LTE band 14	2
7	LTE band 66	2
8	LTE band 71	2

Note: The data of antenna gain is provided by Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.

2. General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364

2.2 Laboratory Environmental Requirements

Temperature	15°C~35°C
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa

2.3 Project Information

Project Manager	Xu Yuting
Test Date	December 05, 2023 to December 28, 2023

3. General Information of The Customer

3.1 Applicant

Company	Fellowes Inc.
Address	1789 Norwood Avenue Itasca, Illinois 60143-1095, USA
Telephone	+16306715102

3.2 Manufacturer

Company	Fellowes Business Machines (Suzhou) Co., Ltd.
Address	No.1 shilin Road,Suzhou NewDistrict,Jiangsu,215151,People's Republic of China
Telephone	N/A

3.3 Factory

Company	Fellowes Office Products(Suzhou) Co., Ltd.
Address	No.1 shilin Road,Suzhou NewDistrict,Jiangsu,215151,People's Republic of China
Telephone	N/A

4. General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	Wireless Display
Model	LKOUT P
Date of Receipt	S01/S02:October 25,2023
EUT ID*	S01/S02
SN/IMEI	/
Supported Radio Technology and Bands	WCDMA Band II/IV/V LTE Band 2/4/5/12/13/14/66/71 802.11b/g/n 802.11a/n/ac BLE 4.2 and Bluetooth V2.1 + EDR
Hardware Version	V2.0
Software Version	11.0.1_#7210_10.1_2168A1-V2.0
FCC ID	IDH-RMTDSPY
NOTE1: EUT ID is the internal identification code of the laboratory. NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
AE1	RF Cable	N/A	N/A
NOTE: AE ID is the internal identification code of the laboratory.			

4.3 Additional Information

Type of modulation	QPSK/16QAM
--------------------	------------

5. Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Relative Humidity	Min. = 45%, Max. = 55%		
Atmospheric Pressure	101kPa		
Temperature	Normal	Minimum	Maximum
	25°C	-30°C	50°C
Working Voltage of EUT	Normal	Minimum	Maximum
	100-240V	90V	264V

5.2 Test Equipments Utilized

Conduction test system

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Software	Eagle V3.3	N/A	V3.3	N/A	3IN	N/A	N/A
2	Frequency spectrum analyzer	FSQ	101091	V4.75	V11.00	R&S	2023-07-26	1 Year
3	Wideband Radio Communication Tester	CMW 500	148874	V3.5.136	N/A	R&S	2023-07-27	1 Year
4	Temperature Chamber	B-TF-107C	201804107	N/A	N/A	BoYi	2023-06-28	1 Year
5	Programmable power supply	Keithley 2303	4039070	N/A	N/A	Keithley	2023-06-23	1 Year
6	RF Test Automation Box	RF 2021B	2001	V3.3	N/A	RANATEC	N/A	N/A

Radiated emission test system

NO	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Universal Radio Communication Tester	CMU200	123126	V5.2.1	B12	R&S	2023-10-16	1 Year
2	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2023-10-16	1 Year

3	EMI Test Receiver	ESU40	100307	V5.1-24-3	01	R&S	2022-12-29	1 Year
							2023-12-19	
4	TRILOG Broadband Antenna	VULB9163	01345	N/A	N/A	Schwarzbeck	2023-03-23	1 Year
5	Double- ridged Waveguide Antenna	ETS-3117	00135890	N/A	N/A	ETS	2022-03-09	2 Years
6	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A

Anechoic chamber

Fully anechoic chamber by ETS.

5.3 Measurement Uncertainty

Measurement Uncertainty of Radiation test

Frequency Range	Uncertainty(dB)
$30\text{MHz} \leq f \leq 1\text{GHz}$	± 5.10
$1\text{GHz} \leq f \leq 18\text{GHz}$	± 5.66
$18\text{GHz} \leq f \leq 40\text{GHz}$	± 5.22

Measurement Uncertainty of Conduction test

No	Item	Extended uncertainty (k=2)	
1	Frequency Tolerance	23Hz	
2	RF Output Power	0.7dB	
3	conducted spurious	9kHz~3.6GHz	1.5dB
		3.6GHz~8.4GHz	2.8dB
		8.4GHz~12.75GHz	3.4dB
4	EVM	2.1%	
5	Occupied Bandwidth	Bandwidth 1.4MHz	0.03MHz
		Bandwidth 3MHz	0.03MHz
		Bandwidth 5MHz	0.03MHz
		Bandwidth 10MHz	0.05MHz
		Bandwidth 15MHz	0.06MHz
		Bandwidth 20MHz	0.08MHz
6	Emission intermodulation	Adjacent channel	1.4dB
		Alternate channel	1.4dB
7	Range of frequency	0.08MHz	

6. Test Results

6.1 Output Power

Reference

CFR part 2.1046/22.913(a) (5)/ 24.232(c)/ 27.50(b)(10)/ 27.50(c)(10)/27.50(d)(4)/ 90.542(a)(7)

6.1.1 Summary

22.913(a) (5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

24.232(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

27.50(a) For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305–2315 MHz and 2350–2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305–2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

27.50(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698–746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

27.50(b) (10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50(d) (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band is limited to 1 watt EIRP.

90.542(a) (7) Portable stations (hand-held devices) transmitting in the 758–768 MHz band and the 788–798 MHz band are limited to 3 watts ERP.

CMW500 setting:

1: CMW500 is connected to the DUT

2: Set RX Expected PEP to 30 dBm

6.1.2 Method of Measurements

Method of measurements please refer to KDB971168 D01 v03 clause 5.

The EUT was set up for the max output power with pseudo random data modulation.

The power was measured with Rhode & Schwarz Spectrum Analyzer FSQ(peak).

6.1.3 Test procedures

The transmitter output port was connected to base station.

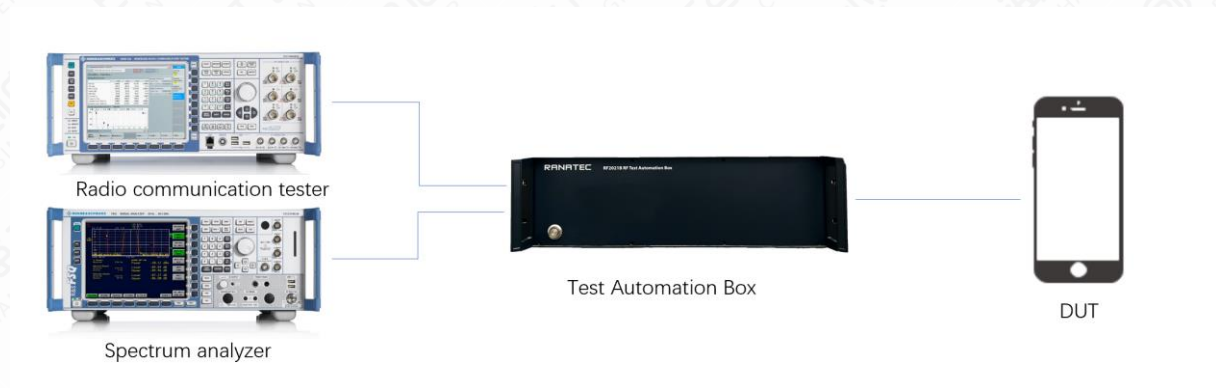
Set the EUT at maximum power through base station.

Select lowest, middle, and highest channels for each band and different modulation.

Measure maximum average power for other modulation signal.

The transmitter output power was connected to calibrated attenuator, the other end of which was connected to signal analyzer. Transmitter output power was read off the power in dBm. The power outputs at the transmitter antenna port was determined by adding the value of attenuator to the signal analyzer reading.

6.1.4 Test Setup



6.1.5 Output Power Measurement result

LTE band 2

LTE B2			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				18607/1850.7	18900/1880	19193/1909.3
QPSK	1	Low	14.00	12.30	12.84	13.09
		Middle		13.46	13.45	13.55
		High		12.87	12.74	13.05
	50%	Low	14.00	12.76	12.79	13.55
		Middle		12.71	12.74	12.81
		High		12.68	12.63	12.58
	100%	/	13.00	11.75	11.83	11.78
16QAM	1	Low	13.00	11.82	11.89	11.86
		Middle		11.80	11.75	11.68
		High		11.76	11.74	11.85
	50%	Low	13.00	11.57	11.71	11.66
		Middle		11.74	11.68	11.61
		High		11.64	11.59	11.63
	100%	/	12.00	10.63	10.63	10.52
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				18615/1851.5	18900/1880	19185/1908.5
QPSK	1	Low	14.00	12.32	12.88	13.12
		Middle		13.44	13.48	13.45
		High		12.90	12.79	13.09
	50%	Low	13.00	11.86	11.91	12.57
		Middle		11.83	11.84	11.93
		High		11.78	11.74	11.68
	100%	/	13.00	11.75	11.87	11.81
16QAM	1	Low	13.00	11.85	11.91	11.89
		Middle		11.83	11.75	11.72

	50%	High	12.00	11.78	11.78	11.88
		Low		10.68	10.84	10.78
		Middle		10.85	10.81	10.73
		High		10.74	10.71	10.76
	100%	/	12.00	10.66	10.67	10.55
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				18625/1852.5	18900/1880	19175/1907.5
QPSK	1	Low	14.00	12.29	12.86	13.08
		Middle		13.42	13.44	13.54
		High		12.87	12.74	13.05
	50%	Low	13.00	11.83	11.86	12.60
		Middle		11.81	11.80	11.88
		High		11.76	11.72	11.64
	100%	/	13.00	11.75	11.86	11.79
16QAM	1	Low	13.00	11.82	11.87	11.86
		Middle		11.80	11.73	11.69
		High		11.75	11.76	11.84
	50%	Low	12.00	10.66	10.80	10.75
		Middle		10.82	10.76	10.69
		High		10.71	10.66	10.72
	100%	/	12.00	10.64	10.63	10.50
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				18650/1855	18900/1880	19150/1905
QPSK	1	Low	14.00	12.31	12.87	13.11
		Middle		13.45	13.49	13.52
		High		12.89	12.78	13.08
	50%	Low	13.00	11.86	11.91	12.56
		Middle		11.84	11.85	11.92
		High		11.78	11.76	11.69
	100%	/	13.00	11.79	11.88	11.83
16QAM	1	Low	13.00	11.84	11.90	11.88
		Middle		11.83	11.77	11.72
		High		11.78	11.78	11.87
	50%	Low	12.00	10.69	10.85	10.79
		Middle		10.84	10.80	10.72
		High		10.74	10.71	10.76
	100%	/	12.00	10.67	10.68	10.54
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				18675/1857.5	18900/1880	19125/1902.5
QPSK	1	Low	14.00	12.30	12.83	13.09
		Middle		13.43	13.48	13.53

	50%	High	13.00	12.86	12.73	13.04
		Low		11.84	11.87	12.54
		Middle		11.81	11.80	11.88
		High		11.75	11.73	11.65
	100%	/	13.00	11.77	11.84	11.78
16QAM	1	Low	13.00	11.79	11.88	11.86
		Middle		11.81	11.74	11.70
		High		11.75	11.74	11.84
	50%	Low	12.00	10.66	10.83	10.76
		Middle		10.81	10.75	10.68
		High		10.72	10.67	10.73
	100%	/	12.00	10.64	10.63	10.50
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				18700/1860	18900/1880	19100/1900
QPSK	1	Low	14.00	12.27	12.79	13.06
		Middle		13.42	13.44	13.57
		High		12.84	12.72	13.01
	50%	Low	13.00	11.81	11.82	12.61
		Middle		11.79	11.76	11.85
		High		11.72	11.68	11.61
	100%	/	13.00	11.74	11.79	11.74
16QAM	1	Low	13.00	11.81	11.84	11.81
		Middle		11.77	11.72	11.66
		High		11.73	11.71	11.82
	50%	Low	12.00	10.63	10.79	10.73
		Middle		10.78	10.73	10.65
		High		10.69	10.62	10.69
	100%	/	12.00	10.62	10.59	10.47

LTE band 4

LTE B4			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
QPSK	1	Low	13.00	12.04	12.61	12.71
		Middle		12.30	12.77	12.77
		High		12.70	12.75	12.17
	50%	Low	13.00	12.76	12.74	12.71
		Middle		12.76	12.75	12.68
		High		12.77	12.76	12.75
	100%	/	12.50	11.76	11.86	11.78
16QAM	1	Low	12.50	11.90	11.84	11.76
		Middle		11.88	11.94	11.84

		High		11.80	11.86	11.76
	50%	Low	12.50	11.56	11.59	11.52
		Middle		11.58	11.64	11.51
		High		11.61	11.59	11.48
	100%	/	12.00	10.68	10.76	10.82
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
QPSK	1	Low	13.00	12.06	12.65	12.74
		Middle		12.28	12.73	12.71
		High		12.73	12.76	12.21
	50%	Low	12.50	11.96	11.95	11.94
		Middle		11.88	11.85	11.80
		High		11.87	11.91	11.85
	100%	/	12.50	11.76	11.90	11.81
16QAM	1	Low	12.50	11.93	11.86	11.79
		Middle		11.91	11.94	11.88
		High		11.82	11.90	11.79
	50%	Low	12.00	10.67	10.72	10.64
		Middle		10.69	10.77	10.63
		High		10.71	10.71	10.61
	100%	/	12.00	10.71	10.80	10.85
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
QPSK	1	Low	13.00	12.03	12.63	12.71
		Middle		12.26	12.76	12.76
		High		12.70	12.75	12.17
	50%	Low	12.50	11.93	11.95	11.90
		Middle		11.86	11.81	11.75
		High		11.85	11.89	11.81
	100%	/	12.50	11.76	11.89	11.79
16QAM	1	Low	12.50	11.90	11.82	11.76
		Middle		11.88	11.92	11.85
		High		11.79	11.88	11.75
	50%	Low	12.00	10.65	10.68	10.61
		Middle		10.66	10.72	10.59
		High		10.68	10.66	10.57
	100%	/	12.00	10.69	10.76	10.80
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20000/1715	20175/1732.5	20350/1750
QPSK	1	Low	13.00	12.05	12.64	12.63
		Middle		12.29	12.71	12.72

	50%	High	12.50	12.72	12.69	12.20
		Low		11.96	11.94	11.94
		Middle		11.89	11.86	11.79
		High		11.87	11.93	11.86
	100%	/	12.50	11.80	11.91	11.83
16QAM	1	Low	12.50	11.92	11.85	11.78
		Middle		11.91	11.96	11.88
		High		11.82	11.90	11.78
	50%	Low	12.00	10.68	10.73	10.65
		Middle		10.68	10.76	10.62
		High		10.71	10.71	10.61
	100%	/	12.00	10.72	10.81	10.84
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
QPSK	1	Low	13.00	12.04	12.60	12.75
		Middle		12.27	12.72	12.73
		High		12.69	12.74	12.16
	50%	Low	12.50	11.94	11.73	11.91
		Middle		11.86	11.81	11.75
		High		11.84	11.90	11.82
	100%	/	12.50	11.78	11.87	11.78
16QAM	1	Low	12.50	11.87	11.83	11.76
		Middle		11.89	11.93	11.86
		High		11.79	11.86	11.75
	50%	Low	12.00	10.65	10.71	10.62
		Middle		10.65	10.71	10.58
		High		10.69	10.67	10.58
	100%	/	12.00	10.69	10.76	10.80
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				20050/1720	20175/1732.5	20300/1745
QPSK	1	Low	13.00	12.01	12.56	12.78
		Middle		12.26	12.76	12.77
		High		12.67	12.73	12.13
	50%	Low	12.50	11.91	11.97	11.87
		Middle		11.84	11.77	11.72
		High		11.81	11.85	11.78
	100%	/	12.50	11.75	11.82	11.74
16QAM	1	Low	12.50	11.72	11.79	11.71
		Middle		11.85	11.91	11.82
		High		11.77	11.83	11.73
	50%	Low	12.00	10.62	10.67	10.59
		Middle		10.62	10.69	10.55

		High		10.66	10.62	10.54
	100%	/	12.00	10.67	10.72	10.77

LTE band 5

LTE B5			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				20407/824.7	20525/836.5	20643/848.3
QPSK	1	Low	21.00	20.47	20.56	20.59
		Middle		20.59	20.67	20.64
		High		20.44	20.33	20.62
	50%	Low	21.00	20.41	20.48	20.43
		Middle		20.34	20.43	20.38
		High		20.28	20.31	20.28
	100%	/	20.00	19.43	19.36	19.31
16QAM	1	Low	20.00	19.40	19.32	19.27
		Middle		19.38	19.27	19.27
		High		19.26	19.22	19.11
	50%	Low	20.00	19.16	19.18	19.15
		Middle		19.23	19.17	19.23
		High		19.33	19.28	19.18
	100%	/	19.00	18.43	18.42	18.36
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				20415/825.5	20525/836.5	20635/847.5
QPSK	1	Low	21.00	20.48	20.59	20.61
		Middle		20.58	20.64	20.64
		High		20.46	20.37	20.65
	50%	Low	20.00	19.48	19.47	19.43
		Middle		19.47	19.45	19.49
		High		19.38	19.44	19.39
	100%	/	20.00	19.47	19.41	19.36
16QAM	1	Low	20.00	19.42	19.33	19.29
		Middle		19.41	19.29	19.31
		High		19.28	19.26	19.13
	50%	Low	19.00	18.28	18.32	18.28
		Middle		18.33	18.29	18.34
		High		18.43	18.40	18.31
	100%	/	19.00	18.47	18.47	18.38
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				20425/826.5	20525/836.5	20625/846.5
QPSK	1	Low	21.00	20.47	20.55	20.59
		Middle		20.56	20.63	20.66

	50%	High	20.00	20.43	20.32	20.61
		Low		19.49	19.47	19.45
		Middle		19.44	19.49	19.45
		High		19.35	19.41	19.35
	100%	/	20.00	19.45	19.37	19.31
16QAM	1	Low	20.00	19.37	19.31	19.27
		Middle		19.39	19.26	19.29
		High		19.25	19.22	19.10
	50%	Low	19.00	18.25	18.30	18.25
		Middle		18.30	18.24	18.30
		High		18.41	18.36	18.28
	100%	/	19.00	18.44	18.42	18.34
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20450/829	20525/836.5	20600/844
QPSK	1	Low	21.00	20.44	20.51	20.56
		Middle		20.55	20.69	20.64
		High		20.41	20.31	20.58
	50%	Low	20.00	19.46	19.51	19.49
		Middle		19.42	19.45	19.42
		High		19.32	19.36	19.31
	100%	/	20.00	19.42	19.32	19.27
16QAM	1	Low	20.00	19.28	19.27	19.22
		Middle		19.35	19.24	19.25
		High		19.23	19.19	19.08
	50%	Low	19.00	18.22	18.26	18.22
		Middle		18.27	18.22	18.27
		High		18.38	18.31	18.24
	100%	/	19.00	18.42	18.38	18.31

LTE band 12

LTE B12				Maximum Conducted Power (dBm)		
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				23017/699.7	23095/707.5	23173/715.3
QPSK	1	Low	17.00	16.44	16.46	16.51
		Middle		16.50	16.48	16.52
		High		16.41	16.55	16.35
	50%	Low	17.00	16.42	16.51	16.45
		Middle		16.36	16.51	16.43
		High		16.35	16.29	16.24
	100%	/	16.00	15.37	15.45	15.39
16QAM	1	Low	16.00	15.34	15.40	15.29
		Middle		15.32	15.41	15.31

		High		15.39	15.44	15.27
	50%	Low	16.00	15.25	15.28	15.15
		Middle		15.23	15.27	15.32
		High		15.17	15.21	15.15
	100%	/	15.00	14.18	14.32	14.21
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				23025/700.5	23095/707.5	23165/714.5
QPSK	1	Low	17.00	16.45	16.49	16.53
		Middle		16.49	16.52	16.47
		High		16.43	16.49	16.38
	50%	Low	16.00	15.52	15.53	15.48
		Middle		15.49	15.52	15.44
		High		15.45	15.42	15.35
	100%	/	16.00	15.41	15.50	15.44
16QAM	1	Low	16.00	15.36	15.41	15.31
		Middle		15.35	15.43	15.35
		High		15.41	15.48	15.29
	50%	Low	15.00	14.37	14.42	14.28
		Middle		14.33	14.39	14.43
		High		14.27	14.33	14.28
	100%	/	15.00	14.22	14.37	14.23
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				23035/701.5	23095/707.5	23155/713.5
QPSK	1	Low	17.00	16.44	16.45	16.51
		Middle		16.56	16.54	16.54
		High		16.40	16.54	16.34
	50%	Low	16.00	15.50	15.49	15.45
		Middle		15.46	15.47	15.50
		High		15.42	15.39	15.31
	100%	/	16.00	15.39	15.46	15.39
16QAM	1	Low	16.00	15.31	15.39	15.29
		Middle		15.33	15.40	15.33
		High		15.38	15.44	15.26
	50%	Low	15.00	14.34	14.40	14.25
		Middle		14.30	14.34	14.39
		High		14.25	14.29	14.25
	100%	/	15.00	14.19	14.32	14.19
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				23060/704	23095/707.5	23130/711
QPSK	1	Low	17.00	16.41	16.41	16.48
		Middle		16.56	16.57	16.52

		High		16.38	16.53	16.31
	50%	Low	16.00	15.44	15.54	15.46
		Middle		15.47	15.53	15.51
		High		15.39	15.34	15.27
	100%	/	16.00	15.36	15.41	15.35
16QAM	1	Low	16.00	15.31	15.35	15.24
		Middle		15.29	15.38	15.29
		High		15.36	15.41	15.24
	50%	Low	15.00	14.31	14.36	14.22
		Middle		14.27	14.32	14.36
		High		14.22	14.24	14.21
	100%	/	15.00	14.17	14.28	14.16

LTE BAND 13

LTE B13			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				23205/779.5	23230/782	23255/784.5
QPSK	1	Low	18.00	17.67	17.81	17.68
		Middle		17.56	17.82	17.70
		High		17.70	17.75	17.69
	50%	Low	17.00	16.60	16.61	16.65
		Middle		16.50	16.58	16.50
		High		16.54	16.57	16.54
	100%	/	17.00	16.67	16.63	16.61
16QAM	1	Low	17.00	16.55	16.57	16.60
		Middle		16.62	16.45	16.50
		High		16.67	16.65	16.61
	50%	Low	16.00	15.61	15.63	15.67
		Middle		15.55	15.48	15.41
		High		15.47	15.54	15.45
	100%	/	16.00	15.51	15.41	15.46
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	23230/782	/
QPSK	1	Low	18.00	/	17.77	/
		Middle		/	17.88	/
		High		/	17.74	/
	50%	Low	17.00	/	16.66	/
		Middle		/	16.64	/
		High		/	16.62	/
	100%	/	17.00	/	16.58	/
16QAM	1	Low	17.00	/	16.53	/
		Middle		/	16.43	/

		High		/	16.62	/
	50%	Low	16.00	/	15.59	/
		Middle		/	15.46	/
		High		/	15.49	/
	100%	/	16.00	/	15.37	/

LTE BAND 14

LTE B14			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				23305/790.5	23330/793	23355/795.5
QPSK	1	Low	18.00	17.41	17.40	17.44
		Middle		17.52	17.50	17.51
		High		17.34	17.33	17.38
	50%	Low	17.00	16.40	16.52	16.56
		Middle		16.31	16.48	16.53
		High		16.45	16.47	16.54
	100%	/	17.00	16.40	16.42	16.46
16QAM	1	Low	17.00	15.59	15.58	15.60
		Middle		15.54	15.53	15.56
		High		15.48	15.48	15.52
	50%	Low	16.00	15.51	15.53	15.55
		Middle		15.43	15.45	15.50
		High		15.44	15.53	15.57
	100%	/	16.00	15.38	15.41	15.46
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	23330/793	/
QPSK	1	Low	18.00	/	17.36	/
		Middle		/	17.63	/
		High		/	17.32	/
	50%	Low	17.00	/	16.57	/
		Middle		/	16.54	/
		High		/	16.52	/
	100%	/	17.00	/	16.37	/
16QAM	1	Low	17.00	/	15.54	/
		Middle		/	15.51	/
		High		/	15.45	/
	50%	Low	16.00	/	15.49	/
		Middle		/	15.43	/
		High		/	15.48	/
	100%	/	16.00	/	15.37	/

LTE band 66

LTE B66			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				131979/1710.7	132322/1745	132665/1779.3
QPSK	1	Low	13.00	11.84	12.46	12.40
		Middle		12.55	12.67	12.75
		High		12.04	12.05	12.42
	50%	Low	13.00	12.76	12.84	12.84
		Middle		12.57	12.69	12.81
		High		11.97	12.04	12.40
	100%	/	12.50	11.35	11.48	11.57
16QAM	1	Low	12.50	11.36	11.41	11.62
		Middle		11.34	11.29	11.50
		High		11.19	11.28	11.65
	50%	Low	12.50	11.22	11.30	11.45
		Middle		11.20	11.27	11.62
		High		11.12	11.28	11.67
	100%	/	12.00	10.32	10.31	10.48
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				131987/1711.5	132322/1745	132657/1778.5
QPSK	1	Low	13.00	11.86	12.50	12.43
		Middle		12.53	12.70	12.79
		High		12.07	12.10	12.46
	50%	Low	12.50	11.86	12.04	12.29
		Middle		11.69	11.79	11.93
		High		11.07	11.15	11.50
	100%	/	12.50	11.35	11.52	11.60
16QAM	1	Low	12.50	11.39	11.43	11.65
		Middle		11.37	11.29	11.54
		High		11.21	11.32	11.68
	50%	Low	12.00	10.33	10.43	10.57
		Middle		10.31	10.40	10.74
		High		10.22	10.40	10.80
	100%	/	12.00	10.35	10.35	10.51
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				131997/1712.5	132322/1745	132647/1777.5
QPSK	1	Low	13.00	11.83	12.48	12.39
		Middle		12.51	12.66	12.76
		High		12.04	12.05	12.42
	50%	Low	12.50	11.83	11.99	12.25

		Middle		11.67	11.75	11.88
		High		11.05	11.13	11.46
	100%	/	12.50	11.35	11.51	11.58
16QAM	1	Low	12.50	11.36	11.39	11.62
		Middle		11.34	11.27	11.51
		High		11.18	11.30	11.64
	50%	Low	12.00	10.31	10.39	10.54
		Middle		10.28	10.35	10.70
		High		10.19	10.35	10.76
	100%	/	12.00	10.33	10.31	10.46
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				132022/1715	132322/1745	132622/1775
QPSK	1	Low	13.00	11.85	12.49	12.42
		Middle		12.54	12.71	12.84
		High		12.06	12.09	12.45
	50%	Low	12.50	11.86	12.04	12.29
		Middle		11.70	11.80	11.92
		High		11.07	11.17	11.51
	100%	/	12.50	11.39	11.53	11.62
16QAM	1	Low	12.50	11.38	11.42	11.64
		Middle		11.37	11.31	11.54
		High		11.21	11.32	11.67
	50%	Low	12.00	10.34	10.44	10.58
		Middle		10.30	10.39	10.73
		High		10.22	10.40	10.80
	100%	/	12.00	10.36	10.36	10.50
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				132047/1717.5	132322/1745	132597/1772.5
QPSK	1	Low	13.00	11.84	12.45	12.40
		Middle		12.52	12.77	12.75
		High		12.03	12.04	12.41
	50%	Low	12.50	11.84	12.00	12.26
		Middle		11.67	11.75	11.88
		High		11.04	11.14	11.47
	100%	/	12.50	11.37	11.49	11.57
16QAM	1	Low	12.50	11.33	11.40	11.62
		Middle		11.35	11.28	11.52
		High		11.18	11.28	11.64
	50%	Low	12.00	10.31	10.42	10.55
		Middle		10.27	10.34	10.69
		High		10.20	10.36	10.77
	100%	/	12.00	10.33	10.31	10.46

Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				132072/1720	132322/1745	132572/1770
QPSK	1	Low	13.00	11.81	12.41	12.37
		Middle		12.51	12.66	12.85
		High		12.01	12.03	12.38
	50%	Low	12.50	11.81	11.95	12.32
		Middle		11.65	11.71	11.85
		High		11.01	11.09	11.43
	100%	/	12.50	11.34	11.44	11.53
16QAM	1	Low	12.50	11.31	11.36	11.57
		Middle		11.31	11.26	11.48
		High		11.16	11.25	11.62
	50%	Low	12.00	10.28	10.38	10.52
		Middle		10.24	10.32	10.66
		High		10.17	10.31	10.73
	100%	/	12.00	10.31	10.27	10.43

LTE band 71

LTE B71				Maximum Conducted Power (dBm)		
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				133147/665.5	133297/680.5	133447/695.5
QPSK	1	Low	17.50	16.97	16.75	15.66
		Middle		16.94	17.14	17.13
		High		16.68	16.84	16.65
	50%	Low	16.50	15.95	16.01	15.88
		Middle		15.95	16.01	15.90
		High		15.88	15.96	15.81
	100%	/	16.50	15.84	15.95	15.89
16QAM	1	Low	16.50	15.86	15.84	15.72
		Middle		15.84	15.85	15.84
		High		15.86	15.83	15.91
	50%	Low	15.50	15.81	14.83	15.80
		Middle		15.15	15.06	15.15
		High		15.11	15.07	15.21
	100%	/	15.50	14.89	15.02	15.09
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				133172/668	133297/680.5	133422/693
QPSK	1	Low	17.50	16.99	16.76	15.69
		Middle		16.97	17.14	17.13
		High		16.70	16.88	16.68
	50%	Low	16.50	15.98	16.02	15.92

		Middle		15.98	16.02	15.94
		High		15.90	16.00	15.86
	100%	/	16.50	15.88	15.97	15.93
16QAM	1	Low	16.50	15.88	15.87	15.74
		Middle		15.87	15.89	15.87
		High		15.89	15.85	15.94
	50%	Low	15.50	15.84	14.88	15.84
		Middle		15.17	15.10	15.18
		High		15.14	15.12	15.25
	100%	/	15.50	14.92	15.07	15.13
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				133197/670.5	133297/680.5	133397/690.5
QPSK	1	Low	17.50	16.98	16.72	15.67
		Middle		16.95	17.13	17.10
		High		16.67	16.83	16.64
	50%	Low	16.50	15.96	16.01	15.89
		Middle		15.95	16.01	15.90
		High		15.87	15.97	15.82
	100%	/	16.50	15.86	15.93	15.88
16QAM	1	Low	16.50	15.83	15.85	15.72
		Middle		15.85	15.86	15.85
		High		15.86	15.81	15.91
	50%	Low	15.50	15.81	14.86	15.81
		Middle		15.14	15.05	15.14
		High		15.12	15.08	15.22
	100%	/	15.50	14.89	15.02	15.09
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				133222/673	133322/683	133372/688
QPSK	1	Low	17.50	16.95	16.68	15.64
		Middle		16.94	17.19	17.18
		High		16.65	16.82	16.61
	50%	Low	16.50	15.93	16.03	15.85
		Middle		15.92	15.97	15.84
		High		15.84	15.92	15.78
	100%	/	16.50	15.83	15.88	15.84
16QAM	1	Low	16.50	15.92	15.81	15.67
		Middle		15.81	15.84	15.81
		High		15.84	15.78	15.89
	50%	Low	15.50	15.78	14.82	15.78
		Middle		15.11	15.03	15.11
		High		15.09	15.03	15.18
	100%	/	15.50	14.87	14.98	15.06

6.1.6 EIRP/ERP

LTE Band 2- EIRP 24. 232(c)

Limits: ≤33dBm (2W)

LTE Band 2_1.4MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1850.7	15.46	33.00
1880	15.45	33.00
1909.3	15.55	33.00

LTE Band 2_3MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1851.5	15.44	33.00
1880	15.48	33.00
1908.5	15.45	33.00

LTE Band 2_5MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1852.5	15.42	33.00
1880	15.44	33.00
1907.5	15.54	33.00

LTE Band 2_10MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1855	15.45	33.00
1880	15.49	33.00
1905	15.52	33.00

LTE Band 2_15MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1857.5	15.43	33.00
1880	15.48	33.00
1902.5	15.53	33.00

LTE Band 2_20 MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1860	15.42	33.00
1880	15.44	33.00
1900	15.57	33.00

LTE Band 2_1.4MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1850.7	13.82	33.00
1880	13.89	33.00
1909.3	13.86	33.00

LTE Band 2_3MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1851.5	13.85	33.00
1880	13.91	33.00

1908.5	13.89	33.00
--------	-------	-------

LTE Band 2_5MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1852.5	13.82	33.00
1880	13.87	33.00
1907.5	13.86	33.00

LTE Band 2_10MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1855	13.84	33.00
1880	13.90	33.00
1905	13.88	33.00

LTE Band 2_15MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1857.5	13.81	33.00
1880	13.88	33.00
1902.5	13.86	33.00

LTE Band 2_20 MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1860	13.81	33.00
1880	13.84	33.00
1900	13.82	33.00

LTE Band 4- EIRP 27.50(d)
Limits: ≤30dBm (1W)

LTE Band 4_1.4MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1710.7	14.77	30.00
1732.5	14.77	30.00
1754.3	14.77	30.00

LTE Band 4_3MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1711.5	14.73	30.00
1732.5	14.76	30.00
1753.5	14.74	30.00

LTE Band 4_5MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1712.5	14.70	30.00
1732.5	14.76	30.00
1752.5	14.76	30.00

LTE Band 4_10MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1715	14.72	30.00
1732.5	14.71	30.00
1750	14.72	30.00

LTE Band 4_15MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1717.5	14.69	30.00
1732.5	14.74	30.00
1747.5	14.75	30.00

LTE Band 4_20MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1720	14.67	30.00
1732.5	14.76	30.00
1745	14.78	30.00

LTE Band 4_1.4MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1710.7	13.90	30.00
1732.5	13.94	30.00
1754.3	13.84	30.00

LTE Band 4_3MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1711.5	13.93	30.00
1732.5	13.94	30.00
1753.5	13.88	30.00

LTE Band 4_5MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1712.5	13.90	30.00
1732.5	13.92	30.00
1752.5	13.85	30.00

LTE Band 4_10MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1715	13.92	30.00
1732.5	13.96	30.00
1750.5	13.88	30.00

LTE Band 4_15MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1717.5	13.89	30.00
1732.5	13.93	30.00
1747.5	13.86	30.00

LTE Band 4_20MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1720	13.85	30.00
1732.5	13.91	30.00
1745	13.82	30.00

LTE Band 5- ERP/EIRP 22.913(a)
Limits: ≤38.45dBm (7W)

LTE Band 5_1.4MHz_QPSK

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
824.70	20.44	22.59	38.45
836.50	20.52	22.67	38.45
848.30	20.49	22.64	38.45

LTE Band 5_3MHz_QPSK

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
825.50	20.43	22.58	38.45
836.50	20.49	22.64	38.45
847.50	20.50	22.65	38.45

LTE Band 5_5MHz_QPSK

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
826.50	20.41	22.56	38.45
836.50	20.48	22.63	38.45
846.50	20.51	22.66	38.45

LTE Band 5_10MHz_QPSK

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
829.00	20.40	22.55	38.45
836.50	20.54	22.69	38.45
844.00	20.49	22.64	38.45

LTE Band 5_1.4MHz_16QAM

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
824.70	19.25	21.40	38.45
836.50	19.17	21.32	38.45
848.30	19.12	21.27	38.45

LTE Band 5_3MHz_16QAM

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
825.50	19.27	21.42	38.45
836.50	19.18	21.33	38.45
847.50	19.16	21.31	38.45

LTE Band 5_5MHz_16QAM

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
826.50	19.24	21.39	38.45
836.50	19.16	21.31	38.45
846.50	19.14	21.29	38.45

LTE Band 5_10MHz_16QAM

Frequency(MHz)	ERP(dBm)	EIRP(dBm)	Limit(dBm)
829.00	19.20	21.35	38.45
836.50	19.12	21.27	38.45
844.00	19.10	21.25	38.45

LTE Band 12- ERP 27.50(c)
Limits: ≤34.77dBm (3W)

LTE Band 12_1.4MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
----------------	----------	------------

699.7	16.35	34.77
707.5	16.40	34.77
715.3	16.37	34.77

LTE Band 12_3MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
700.5	16.34	34.77
707.5	16.37	34.77
714.5	16.38	34.77

LTE Band 12_5MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
701.5	16.41	34.77
707.5	16.39	34.77
713.5	16.39	34.77

LTE Band 12_10MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
704	16.41	34.77
707.5	16.42	34.77
711	16.37	34.77

LTE Band 12_1.4MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
699.7	15.24	34.77
707.5	15.29	34.77
715.3	15.17	34.77

LTE Band 12_3MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
700.5	15.26	34.77
707.5	15.33	34.77
714.5	15.20	34.77

LTE Band 12_5MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
701.5	15.23	34.77
707.5	15.29	34.77
713.5	15.18	34.77

LTE Band 12_10MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
704	15.21	34.77
707.5	15.26	34.77
711	15.14	34.77

LTE Band 13- ERP 27.50(c)
Limits: ≤34.77dBm (3W)

LTE Band 13_5MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
779.5	17.55	34.77

782	17.67	34.77
784.5	17.55	34.77

LTE Band 13_10MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
782	17.73	34.77
782	17.73	34.77
782	17.73	34.77

LTE Band 13_5MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
779.5	16.52	34.77
782	16.50	34.77
784.5	16.46	34.77

LTE Band 13_10MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
782	16.47	34.77
782	16.47	34.77
782	16.47	34.77

LTE Band 14- ERP 27.50(c)
Limits: ≤34.77dBm (3W)

LTE Band 14_5MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
790.5	17.37	34.77
793	17.35	34.77
795.5	17.36	34.77

LTE Band 14_10MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
793	17.48	34.77
793	17.48	34.77
793	17.48	34.77

LTE Band 14_5MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
790.5	15.44	34.77
793	15.43	34.77
795.5	15.45	34.77

LTE Band 14_10MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
793	15.39	34.77
793	15.39	34.77
793	15.39	34.77

LTE Band 66- EIRP 27.50(d)
Limits: ≤30dBm (1W)

LTE Band 66_1.4MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
----------------	-----------	------------

1710.7	14.76	30.00
1745	14.84	30.00
1779.3	14.84	30.00

LTE Band 66_3MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1711.5	14.53	30.00
1745	14.70	30.00
1778.5	14.79	30.00

LTE Band 66_5MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1712.5	14.51	30.00
1745	14.66	30.00
1777.5	14.76	30.00

LTE Band 66_10MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1715	14.54	30.00
1745	14.71	30.00
1775	14.84	30.00

LTE Band 66_15MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1717.5	14.52	30.00
1745	14.77	30.00
1772.5	14.75	30.00

LTE Band 66_20MHz_QPSK

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1720	14.51	30.00
1745	14.66	30.00
1770	14.85	30.00

LTE Band 66_1.4MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1710.7	13.36	30.00
1745	13.41	30.00
1779.3	13.67	30.00

LTE Band 66_3MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1711.5	13.39	30.00
1745	13.43	30.00
1778.5	13.68	30.00

LTE Band 66_5MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1712.5	13.36	30.00
1745	13.39	30.00
1777.5	13.64	30.00

LTE Band 66_10MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1715	13.38	30.00
1745	13.42	30.00
1775	13.67	30.00

LTE Band 66_15MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1717.5	13.35	30.00
1745	13.40	30.00
1772.5	13.64	30.00

LTE Band 66_20MHz_16QAM

Frequency(MHz)	EIRP(dBm)	Limit(dBm)
1720	13.31	30.00
1745	13.36	30.00
1770	13.62	30.00

LTE Band 71- ERP 27.50(c)
Limits: ≤34.77dBm (3W)

LTE Band 71_5MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
665.5	16.82	34.77
680.5	16.99	34.77
695.5	16.98	34.77

LTE Band 71_10MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
668.0	16.84	34.77
680.5	16.99	34.77
693.0	16.98	34.77

LTE Band 71_15MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
670.5	16.83	34.77
680.5	16.98	34.77
690.5	16.95	34.77

LTE Band 71_20MHz_QPSK

Frequency(MHz)	ERP(dBm)	Limit(dBm)
673.0	16.80	34.77
683.0	17.04	34.77
688.0	17.03	34.77

LTE Band 71_5MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
665.5	15.71	34.77
680.5	15.70	34.77
695.5	15.76	34.77

LTE Band 71_10MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
668.0	15.74	34.77
680.5	15.74	34.77
693.0	15.79	34.77

LTE Band 71_15MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
670.5	15.71	34.77
680.5	15.71	34.77
690.5	15.76	34.77

LTE Band 71_20MHz_16QAM

Frequency(MHz)	ERP(dBm)	Limit(dBm)
673.0	15.77	34.77
683.0	15.69	34.77
688.0	15.74	34.77

6.2 Emission Limit

Reference

CFR part 2.1051/22.917/24.238(a) /27.53(c)/27.53(h)/ 27.53(a)/ 27.53(g)/27.53(m)/90.543(e)

6.2.1 Summary

According to KDB 971168, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

22.917 *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

24.238(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below *the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.*

27.53(h) (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

27.53(c) (2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

27.53(g) For operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

90.543(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log (P)$ dB.

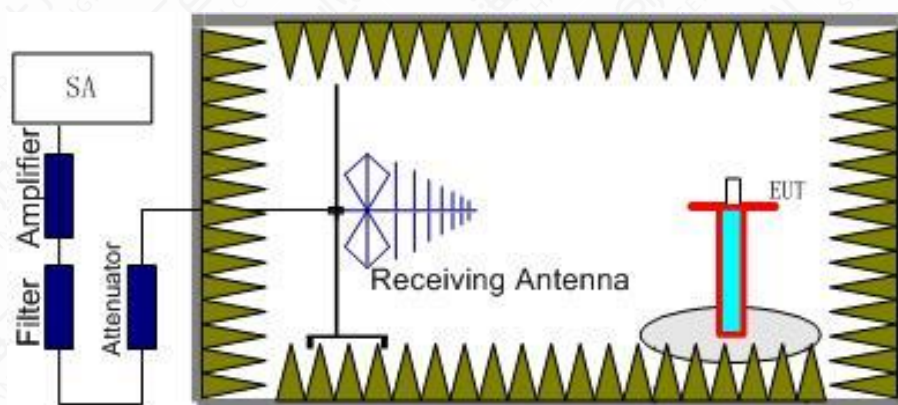
6.2.2 Method of Measurement

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

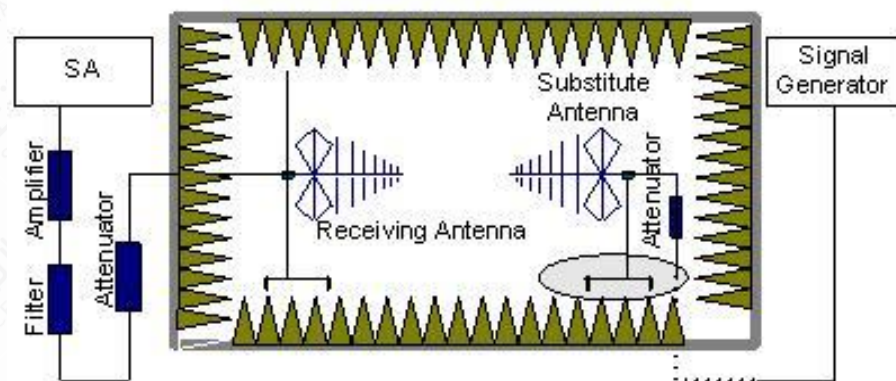
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 2.1051/22.917/24.238(a) /27.53(c)/27.53(h)/ 27.53(a)/ 27.53(g)/27.53(m)/90.543(e). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2/4/5/12/13/14/66/71.

The procedure of radiated spurious emissions is as follows:

1. Below 1 GHz, EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. Above 1 GHz, EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (P_r).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4.The Path loss (Ppl) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (Ga) should be recorded after test.

An amplifier should be connected in for the test.

The Path loss (Ppl) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

Power (EIRP) =PMea- Ppl + Ga

5.This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.

6.ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

6.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 5.It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 5. Into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The evaluated frequency range is from 30MHz to 26GHz.

BAND	Channel		Result
2	L	18607	Pass
	M	18900	Pass
	H	19193	Pass
4	L	23017	Pass
	M	23095	Pass

	H	23173	Pass
5	L	26047	Pass
	M	26365	Pass
	H	26683	Pass
12	L	23017	Pass
	M	23095	Pass
	H	23173	Pass
13	L	23205	Pass
	M	23230	Pass
	H	23255	Pass
14	L	23305	Pass
	M	23330	Pass
	H	23355	Pass
66	L	131972	Pass
	M	132322	Pass
	H	132671	Pass
71	L	133147	Pass
	M	133297	Pass
	H	133447	Pass

RSE-LTE2-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3701.6	-47.12	6.6	7.9	-45.82	-13	32.82	V
5552.4	-48.97	8.2	9.8	-47.37	-13	34.37	V
7377.2	-52.86	9.7	11.6	-50.96	-13	37.96	V
10088.4	-49.48	11.3	12.5	-48.28	-13	35.28	H
12883.0	-44.65	13.0	12.3	-45.35	-13	32.35	H
16826.8	-37.05	15.8	12.3	-40.55	-13	27.55	H

RSE-LTE2-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3759.6	-51.5	6.6	7.9	-50.2	-13	37.20	H
5640.0	-44.73	8.3	10.2	-42.83	-13	29.83	H
7745.2	-53.28	9.8	11.8	-51.28	-13	38.28	V
10650.4	-47.96	11.7	12.3	-47.36	-13	34.36	V
13144.8	-45.92	13.0	12.3	-46.62	-13	33.62	V
16348.0	-40.37	14.7	12.3	-42.77	-13	29.77	V

RSE-LTE2-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3818.4	-50.25	6.7	7.9	-49.05	-13	36.05	H
5728.0	-48.78	8.5	10.2	-47.08	-13	34.08	H
8152.4	-53.17	10.0	12.4	-50.77	-13	37.77	V
11137.2	-46.59	12.1	12.3	-46.39	-13	33.39	H
13713.2	-44.68	13.9	12.3	-46.28	-13	33.28	H
16957.0	-36.62	16.0	12.3	-40.32	-13	27.32	H

RSE-LTE4-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3420.8	-52.78	6.3	7.8	-51.28	-13	38.28	H
5132.0	-51.01	7.9	9.4	-49.51	-13	36.51	H
6842.8	-47.5	9.2	10.9	-45.8	-13	32.80	V
8739.2	-51.52	10.4	12.7	-49.22	-13	36.22	V
12754.2	-44.98	12.5	12.3	-45.18	-13	32.18	H
17974.8	-36.17	16.4	12.3	-40.27	-13	27.27	V

RSE-LTE4-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
4156.0	-54.74	7.0	8.9	-52.84	-13	39.84	V
5113.2	-52.49	7.9	9.6	-50.79	-13	37.79	H

6930.0	-47.33	9.3	11.1	-45.53	-13	32.53	V
8750.4	-52.69	10.4	12.7	-50.39	-13	37.39	V
13052.4	-45.48	13.0	12.3	-46.18	-13	33.18	V
16868.8	-36.2	16.3	12.3	-40.2	-13	27.20	V

RSE-LTE4-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3508.4	-50.74	6.4	7.8	-49.34	-13	36.34	V
4843.2	-52.67	7.6	9.0	-51.27	-13	38.27	H
7018.0	-46.84	9.3	11.1	-45.04	-13	32.04	V
9166.4	-51.52	10.5	12.6	-49.42	-13	36.42	H
13212.0	-46.05	13.0	12.3	-46.75	-13	33.75	H
18000.0	-36.13	16.4	12.3	-40.23	-13	27.23	V

RSE-LTE5-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1712.0	-41.61	4.5	4.7	-41.41	-13	28.41	H
2611.5	-42.4	5.5	5.6	-42.3	-13	29.30	H
3564.4	-50.49	6.4	7.8	-49.09	-13	36.09	H
5092.0	-52.26	7.9	9.6	-50.56	-13	37.56	V
6626.8	-52.13	9.1	10.9	-50.33	-13	37.33	V
8754.7	-52.39	10.4	12.7	-50.09	-13	37.09	H

RSE-LTE5-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1713.7	-33.66	4.5	4.7	-33.46	-13	20.46	H
2856.2	-41.47	5.8	6.1	-41.17	-13	28.17	H
4052.0	-53.76	6.9	8.6	-52.06	-13	39.06	H
5455.6	-53.17	8.1	9.8	-51.47	-13	38.47	V
7013.5	-53.32	9.3	11.1	-51.52	-13	38.52	H

9329.5	-50.64	10.7	12.7	-48.64	-13	35.64	H
--------	--------	------	------	--------	-----	-------	---

RSE-LTE5-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1641.4	-51.93	4.2	4.7	-51.43	-13	38.43	H
2787.7	-41.73	5.7	6.1	-41.33	-13	28.33	V
3621.6	-53.33	6.5	7.8	-52.03	-13	39.03	H
5141.6	-52.68	7.9	9.4	-51.18	-13	38.18	H
6750.0	-53.57	9.2	10.9	-51.87	-13	38.87	H
9182.5	-51.11	10.5	12.6	-49.01	-13	36.01	V

RSE-LTE12-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1399.8	-53.57	4.0	5.3	-52.27	-13	39.27	V
2161.5	-45.79	5.0	5.1	-45.69	-13	32.69	H
2817.7	-41.69	5.7	6.1	-41.29	-13	28.29	V
3563.6	-46.25	6.4	7.8	-44.85	-13	31.85	H
4198.0	-52.26	7.0	8.9	-50.36	-13	37.36	H
5441.6	-52.47	8.1	9.8	-50.77	-13	37.77	H

RSE-LTE12-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1401.2	-54.91	4.0	5.3	-53.61	-13	40.61	H
2164.2	-45.66	5.0	5.1	-45.56	-13	32.56	V
2898.8	-41.86	5.8	6.7	-40.96	-13	27.96	V
3564.4	-49.95	6.4	7.8	-48.55	-13	35.55	H
5325.6	-53.73	8.1	9.4	-52.43	-13	39.43	H
7148.2	-53.41	9.4	11.4	-51.41	-13	38.41	V

RSE-LTE12-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
-----------------	------------	-----------	----------	----------------	-------------	-------------	--------------

1550.3	-52.46	4.2	5.3	-51.36	-13	38.36	H
2134.6	-46.32	5.0	5.1	-46.22	-13	33.22	H
2815.4	-41.18	5.7	6.1	-40.78	-13	27.78	H
3473.2	-54.41	6.4	7.8	-53.01	-13	40.01	H
4806.4	-52.87	7.6	9.0	-51.47	-13	38.47	H
6484.0	-52.14	9.0	10.6	-50.54	-13	37.54	H

RSE-LTE13-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1491.5	-52.11	4.1	5.3	-50.91	-13	37.91	V
2204.2	-45.4	5.0	5.1	-45.3	-13	32.30	V
2875.0	-41.22	5.8	6.1	-40.92	-13	27.92	V
3578.4	-53.94	6.5	7.8	-52.64	-13	39.64	H
4380.0	-52.73	7.3	8.7	-51.33	-13	38.33	H
5493.2	-53.67	8.2	9.8	-52.07	-13	39.07	H

RSE-LTE13-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1553.8	-52.23	4.2	5.3	-51.13	-13	38.13	H
2194.2	-47.02	5.0	5.1	-46.92	-13	33.92	V
2911.5	-41.98	5.8	6.7	-41.08	-13	28.08	V
3441.6	-54.46	6.4	7.8	-53.06	-13	40.06	V
4284.4	-54.08	7.1	8.9	-52.28	-13	39.28	V
5757.6	-54.24	8.5	10.2	-52.54	-13	39.54	V

RSE-LTE13-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1653.5	-51.16	4.5	4.7	-50.96	-13	37.96	V
2171.9	-46.21	5.0	5.1	-46.11	-13	33.11	V
2718.5	-42.67	5.6	6.1	-42.17	-13	29.17	H

3956.8	-54.4	6.8	8.6	-52.6	-13	39.60	V
5208.8	-52.6	8.0	9.4	-51.2	-13	38.20	H
6319.6	-52.02	8.8	10.3	-50.52	-13	37.52	H

RSE-LTE14-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1512.6	-52.71	4.1	5.3	-51.51	-13	38.51	V
2176.5	-46.45	5.0	5.1	-46.35	-13	33.35	H
2861.5	-41.15	5.8	6.1	-40.85	-13	27.85	H
3288.0	-52.36	6.2	6.9	-51.66	-13	38.66	V
4316.4	-54.33	7.1	8.9	-52.53	-13	39.53	H
6130.0	-53.02	8.7	10.3	-51.42	-13	38.42	H

RSE-LTE14-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1612.7	-53.14	4.2	5.3	-52.04	-13	39.04	V
2232.3	-45.83	5.1	5.1	-45.83	-13	32.84	H
2883.8	-41.91	5.8	6.7	-41.01	-13	28.01	V
3741.6	-53.22	6.6	7.9	-51.92	-13	38.92	H
4896.4	-53.3	7.7	9.6	-51.4	-13	38.40	H
6094.8	-52.38	8.7	10.2	-50.88	-13	37.88	H

RSE-LTE14-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1418.1	-52.83	4.0	5.3	-51.53	-13	38.53	H
2209.2	-45.93	5.0	5.1	-45.83	-13	32.83	V
2881.9	-41.79	5.8	6.7	-40.89	-13	27.89	V
3576.0	-53.36	6.5	7.8	-52.06	-13	39.06	V
4760.8	-53.45	7.5	9.0	-51.95	-13	38.95	H
6272.0	-52.43	8.8	10.3	-50.93	-13	37.93	H

RSE-LTE66-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3420.8	-50.69	6.3	7.8	-49.19	-13	36.19	V
5132.4	-50.95	7.9	9.4	-49.45	-13	36.45	H
6842.8	-47.67	9.2	10.9	-45.97	-13	32.97	V
9301.2	-50.64	10.7	12.7	-48.64	-13	35.64	H
12927.8	-45.69	13.0	12.3	-46.39	-13	33.39	H
16840.8	-37.69	15.8	12.3	-41.19	-13	28.19	H

RSE-LTE66-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3489.6	-49.67	6.4	7.8	-48.27	-13	35.27	V
5234.8	-46.41	8.0	9.4	-45.01	-13	32.01	H
6980.0	-44.39	9.3	11.1	-42.59	-13	29.59	V
9646.8	-50.51	10.8	12.7	-48.61	-13	35.61	V
12799.0	-46.21	12.5	12.3	-46.41	-13	33.41	V
15722.2	-39.06	14.5	12.3	-41.26	-13	28.26	H

RSE-LTE66-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
3558.0	-50.19	6.4	7.8	-48.79	-13	35.79	V
5338.0	-39.89	8.1	9.4	-38.59	-13	25.59	V
7116.8	-43.4	9.4	11.1	-41.7	-13	28.70	V
9835.2	-50.26	11.0	12.5	-48.76	-13	35.76	V
13317.0	-44.5	13.6	12.3	-45.8	-13	32.80	V
16959.8	-36.74	16.0	12.3	-40.44	-13	27.44	H

RSE-LTE71-L-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1492.5	-53.17	4.1	5.3	-51.97	-13	38.97	V
2168.5	-46.11	5.0	5.1	-46.01	-13	33.01	H

2861.5	-41.48	5.8	6.1	-41.18	-13	28.18	H
3519.6	-54.52	6.4	7.8	-53.12	-13	40.12	H
4538.4	-52.43	7.4	8.7	-51.13	-13	38.13	V
6092.8	-52.87	8.7	10.2	-51.37	-13	38.37	V

RSE-LTE71-M-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1462.4	-53.56	4.1	5.3	-52.36	-13	39.36	H
2170.0	-46.81	5.0	5.1	-46.71	-13	33.71	V
2893.8	-41.06	5.8	6.7	-40.16	-13	27.16	H
3947.2	-54.42	6.8	8.6	-52.62	-13	39.62	H
5764.4	-53.72	8.5	10.2	-52.02	-13	39.02	H
7486.6	-52.85	9.7	11.6	-50.95	-13	37.95	V

RSE-LTE71-H-S02

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Margin(dBm)	Polarization
1488.0	-53.53	4.1	5.3	-52.33	-13	39.33	H
2248.8	-46.35	5.1	5.1	-46.35	-13	33.35	V
2948.1	-41.25	5.8	6.7	-40.35	-13	27.35	V
3554.4	-53.37	6.4	7.8	-51.97	-13	38.97	H
5032.4	-53.32	7.8	9.6	-51.52	-13	38.52	V
7055.5	-53.19	9.4	11.1	-51.49	-13	38.49	V

6.3 Frequency Stability

Reference

CFR Part 2.1055/22.235/24.235/27.54/90.213(a)

6.3.1 Summary

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d) (2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 6.0VDC and 8.8VDC, with a nominal voltage of 7.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. For the purposes of measuring frequency stability these voltage limits are to be used.

6.3.2 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 7. Measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1V increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C decrements from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

6.3.3 Test Setup



6.3.4 Measurement results

Temperature	Voltage	Band	BandWidth (MHz)	RbMode	QPSK (Hz)	Q16 (Hz)	QPSK (ppm)	Q16 (ppm)
Normal	Low	FDD02	1.4	fullRB	-8.211	-15.335	0.004	0.008
Normal	Normal	FDD02	1.4	fullRB	-8.855	-17.08	0.005	0.009
Normal	High	FDD02	1.4	fullRB	-4.749	-18.897	0.003	0.01
50	Normal	FDD02	1.4	fullRB	-6.795	-18.611	0.004	0.01
40	Normal	FDD02	1.4	fullRB	-8.225	-19.469	0.004	0.01
30	Normal	FDD02	1.4	fullRB	-7.811	-18.911	0.004	0.01
20	Normal	FDD02	1.4	fullRB	-7.854	-14.863	0.004	0.008
10	Normal	FDD02	1.4	fullRB	-4.292	-19.541	0.002	0.01
0	Normal	FDD02	1.4	fullRB	-10.872	-18.311	0.006	0.01
-10	Normal	FDD02	1.4	fullRB	-7.653	-19.941	0.004	0.011
-20	Normal	FDD02	1.4	fullRB	-7.625	-17.61	0.004	0.009
-30	Normal	FDD02	1.4	fullRB	-7.567	-17.982	0.004	0.01
Normal	Low	FDD04	1.4	fullRB	3.963	-15.793	0.002	0.009
Normal	Normal	FDD04	1.4	fullRB	5.236	-16.322	0.003	0.009
Normal	High	FDD04	1.4	fullRB	-4.32	-14.62	0.002	0.008
50	Normal	FDD04	1.4	fullRB	3.061	-14.749	0.002	0.009
40	Normal	FDD04	1.4	fullRB	4.063	-16.279	0.002	0.009
30	Normal	FDD04	1.4	fullRB	-6.409	-16.794	0.004	0.01
20	Normal	FDD04	1.4	fullRB	4.22	-16.379	0.002	0.009
10	Normal	FDD04	1.4	fullRB	-6.094	-13.204	0.004	0.008

Temperature	Voltage	Band	BandWidth (MHz)	RbMode	QPSK (Hz)	Q16 (Hz)	QPSK (ppm)	Q16 (ppm)
0	Normal	FDD04	1.4	fullRB	4.592	-16.265	0.003	0.009
-10	Normal	FDD04	1.4	fullRB	5.307	-13.318	0.003	0.008
-20	Normal	FDD04	1.4	fullRB	-4.778	-14.491	0.003	0.008
-30	Normal	FDD04	1.4	fullRB	-4.764	-15.178	0.003	0.009
Normal	Low	FDD05	1.4	fullRB	-1.659	-15.578	0.002	0.019
Normal	Normal	FDD05	1.4	fullRB	2.861	-14.362	0.003	0.017
Normal	High	FDD05	1.4	fullRB	-2.317	-14.606	0.003	0.017
50	Normal	FDD05	1.4	fullRB	4.206	-16.079	0.005	0.019
40	Normal	FDD05	1.4	fullRB	-1.86	-14.777	0.002	0.018
30	Normal	FDD05	1.4	fullRB	-2.904	-15.264	0.003	0.018
20	Normal	FDD05	1.4	fullRB	-2.289	-13.876	0.003	0.017
10	Normal	FDD05	1.4	fullRB	2.317	-15.249	0.003	0.018
0	Normal	FDD05	1.4	fullRB	-2.103	-14.377	0.003	0.017
-10	Normal	FDD05	1.4	fullRB	-2.203	-14.834	0.003	0.018
-20	Normal	FDD05	1.4	fullRB	-1.931	-14.291	0.002	0.017
-30	Normal	FDD05	1.4	fullRB	2.189	-15.163	0.003	0.018
Normal	Low	FDD12	1.4	fullRB	-3.676	-14.033	0.005	0.02
Normal	Normal	FDD12	1.4	fullRB	3.19	-13.247	0.005	0.019
Normal	High	FDD12	1.4	fullRB	-3.319	-13.547	0.005	0.019
50	Normal	FDD12	1.4	fullRB	-2.618	-11.845	0.004	0.017
40	Normal	FDD12	1.4	fullRB	-2.675	-13.69	0.004	0.019
30	Normal	FDD12	1.4	fullRB	2.06	-14.191	0.003	0.02
20	Normal	FDD12	1.4	fullRB	-2.146	-12.86	0.003	0.018
10	Normal	FDD12	1.4	fullRB	-1.659	-14.82	0.002	0.021
0	Normal	FDD12	1.4	fullRB	-2.689	-16.036	0.004	0.023
-10	Normal	FDD12	1.4	fullRB	-2.518	-13.161	0.004	0.019
-20	Normal	FDD12	1.4	fullRB	3.033	-13.876	0.004	0.02
-30	Normal	FDD12	1.4	fullRB	-2.503	-13.819	0.004	0.02

Temperature	Voltage	Band	BandWidth (MHz)	RbMode	QPSK (Hz)	Q16 (Hz)	QPSK (ppm)	Q16 (ppm)
Normal	Low	FDD13	5	fullRB	-2.403	9.713	0.003	0.012
Normal	Normal	FDD13	5	fullRB	-5.565	10.571	0.007	0.014
Normal	High	FDD13	5	fullRB	-1.917	8.44	0.002	0.011
50	Normal	FDD13	5	fullRB	-4.106	6.595	0.005	0.008
40	Normal	FDD13	5	fullRB	-4.048	7.396	0.005	0.009
30	Normal	FDD13	5	fullRB	-2.747	8.44	0.004	0.011
20	Normal	FDD13	5	fullRB	-1.774	7.138	0.002	0.009
10	Normal	FDD13	5	fullRB	-2.074	7.968	0.003	0.01
0	Normal	FDD13	5	fullRB	-2.117	11.029	0.003	0.014
-10	Normal	FDD13	5	fullRB	-3.519	6.766	0.005	0.009
-20	Normal	FDD13	5	fullRB	-4.764	7.71	0.006	0.01
-30	Normal	FDD13	5	fullRB	-2.375	7.453	0.003	0.01
Normal	Low	FDD14	5	fullRB	2.089	10.056	0.003	0.013
Normal	Normal	FDD14	5	fullRB	-3.347	10.6	0.004	0.013
Normal	High	FDD14	5	fullRB	-4.077	7.753	0.005	0.01
50	Normal	FDD14	5	fullRB	-3.233	9.356	0.004	0.012
40	Normal	FDD14	5	fullRB	-3.333	9.556	0.004	0.012
30	Normal	FDD14	5	fullRB	2.046	9.942	0.003	0.013
20	Normal	FDD14	5	fullRB	-1.574	8.125	0.002	0.01
10	Normal	FDD14	5	fullRB	-4.02	9.813	0.005	0.012
0	Normal	FDD14	5	fullRB	-4.935	8.998	0.006	0.011
-10	Normal	FDD14	5	fullRB	-3.49	8.883	0.004	0.011
-20	Normal	FDD14	5	fullRB	-2.389	9.184	0.003	0.012
-30	Normal	FDD14	5	fullRB	-2.275	9.899	0.003	0.012
Normal	Low	FDD66	1.4	fullRB	-4.663	8.483	0.003	0.005
Normal	Normal	FDD66	1.4	fullRB	-6.409	10.543	0.004	0.006
Normal	High	FDD66	1.4	fullRB	-9.799	8.154	0.006	0.005
50	Normal	FDD66	1.4	fullRB	-6.323	6.881	0.004	0.004

Temperature	Voltage	Band	BandWidth (MHz)	RbMode	QPSK (Hz)	Q16 (Hz)	QPSK (ppm)	Q16 (ppm)
40	Normal	FDD66	1.4	fullRB	-5.221	13.647	0.003	0.008
30	Normal	FDD66	1.4	fullRB	-6.409	7.482	0.004	0.004
20	Normal	FDD66	1.4	fullRB	-5.922	11.201	0.003	0.006
10	Normal	FDD66	1.4	fullRB	-9.484	7.052	0.005	0.004
0	Normal	FDD66	1.4	fullRB	-7.854	6.838	0.005	0.004
-10	Normal	FDD66	1.4	fullRB	-6.166	10.743	0.004	0.006
-20	Normal	FDD66	1.4	fullRB	-6.194	-10.157	0.004	0.006
-30	Normal	FDD66	1.4	fullRB	-6.194	9.484	0.004	0.005
Normal	Low	FDD71	5	fullRB	-3.047	10.514	0.004	0.015
Normal	Normal	FDD71	5	fullRB	-2.146	8.054	0.003	0.012
Normal	High	FDD71	5	fullRB	-3.505	8.755	0.005	0.013
50	Normal	FDD71	5	fullRB	-3.805	7.696	0.006	0.011
40	Normal	FDD71	5	fullRB	-3.662	8.669	0.005	0.013
30	Normal	FDD71	5	fullRB	-2.131	10.629	0.003	0.016
20	Normal	FDD71	5	fullRB	-1.659	9.913	0.002	0.015
10	Normal	FDD71	5	fullRB	-2.789	10.7	0.004	0.016
0	Normal	FDD71	5	fullRB	-3.505	8.74	0.005	0.013
-10	Normal	FDD71	5	fullRB	-3.004	10.314	0.004	0.015
-20	Normal	FDD71	5	fullRB	-3.161	6.824	0.005	0.01
-30	Normal	FDD71	5	fullRB	-3.304	8.841	0.005	0.013

6.4 Occupied Bandwidth

Reference

CFR Part 2.1049

6.4.1 Summary

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated.

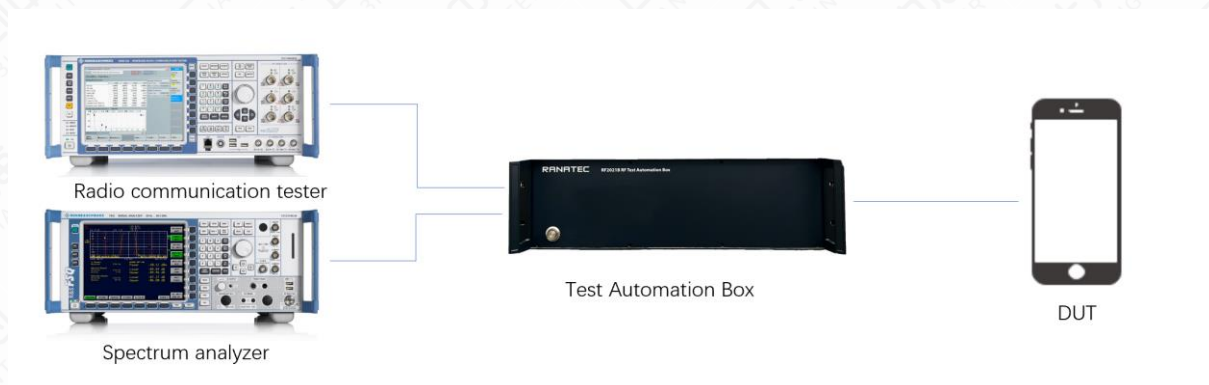
6.4.2 Method of Measurement

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168 4:

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least $10\log(\text{OBW} / \text{RBW})$ below the reference level.
- Set the detection mode to peak, and the trace mode to max hold.
- Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

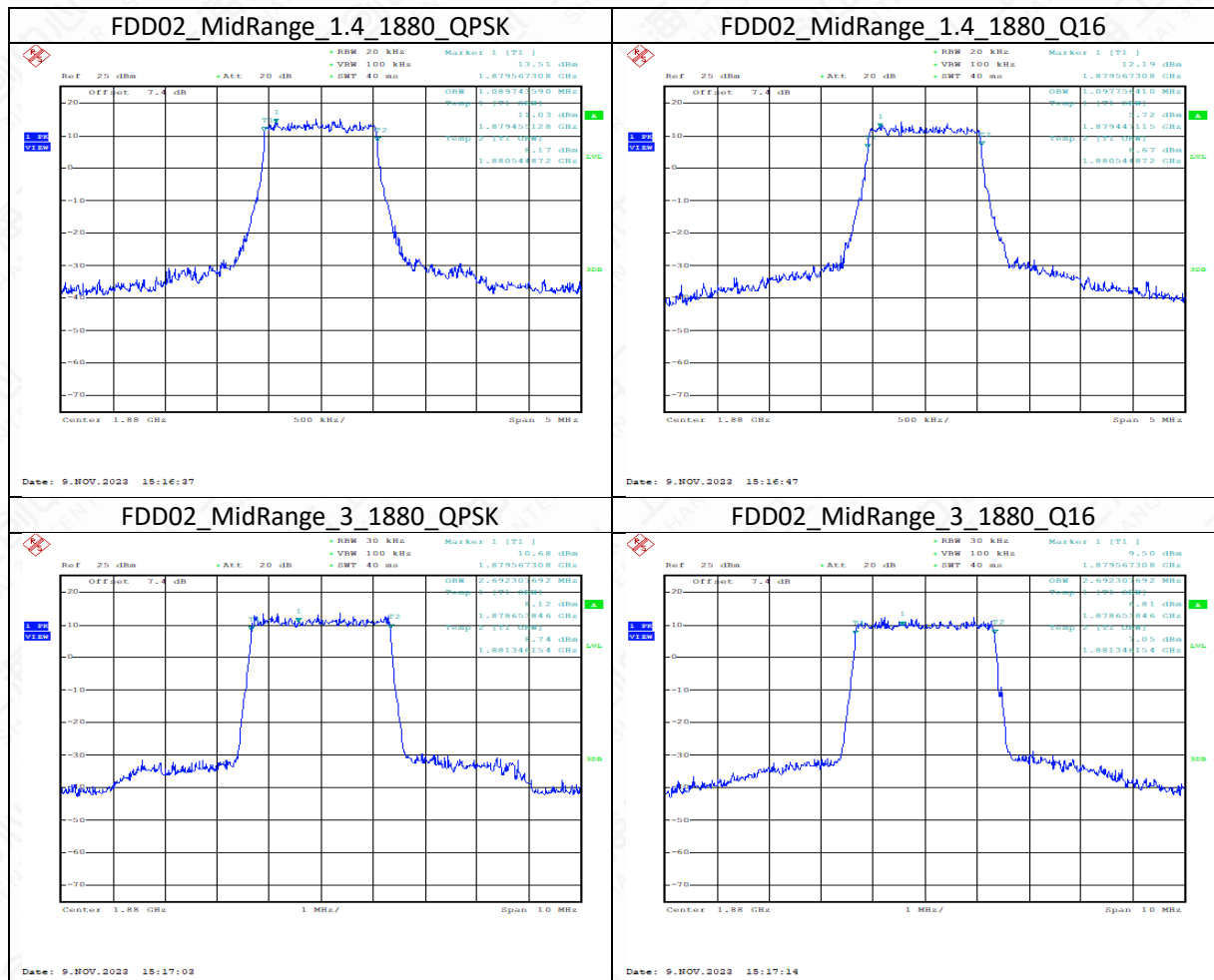
6.4.3 Test Setup

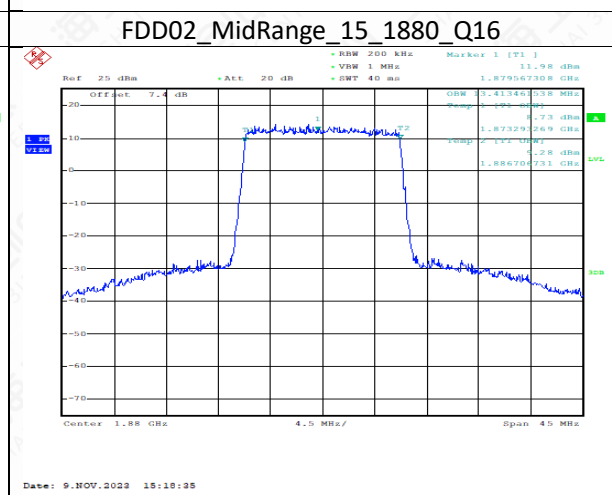
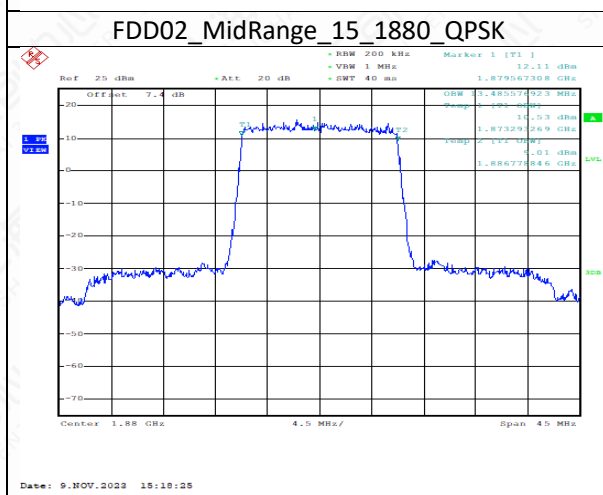
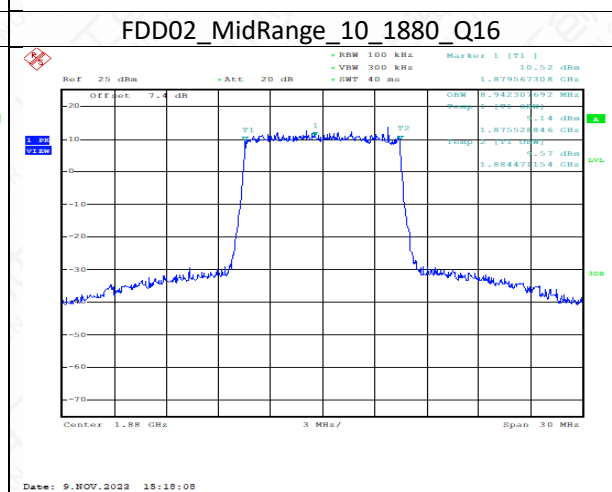
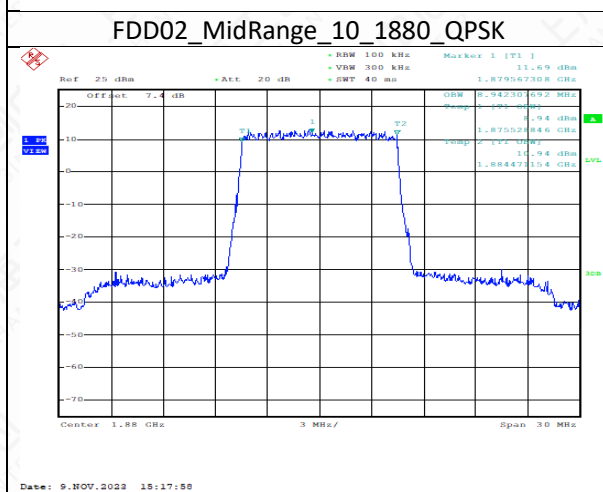
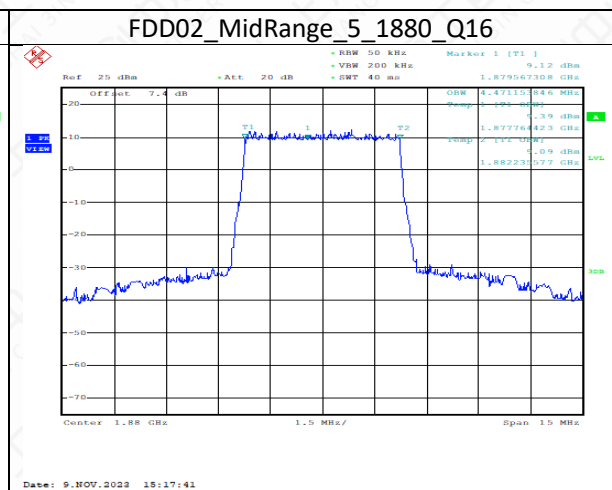
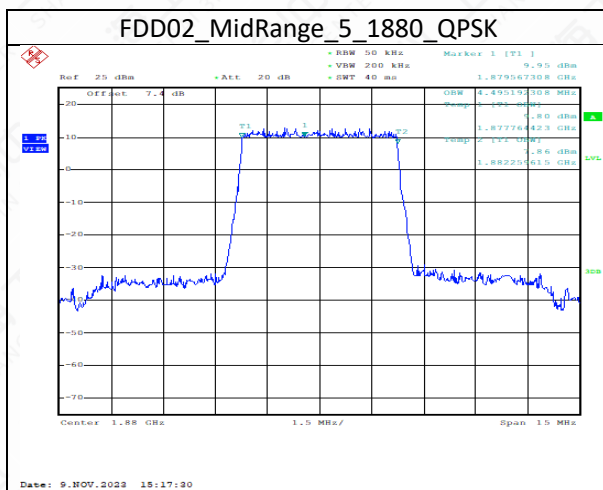


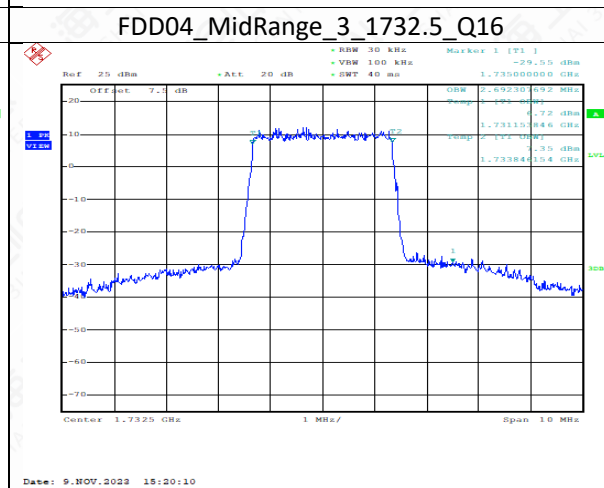
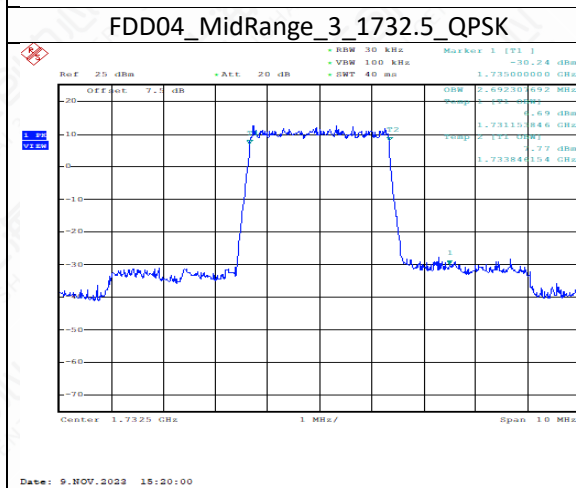
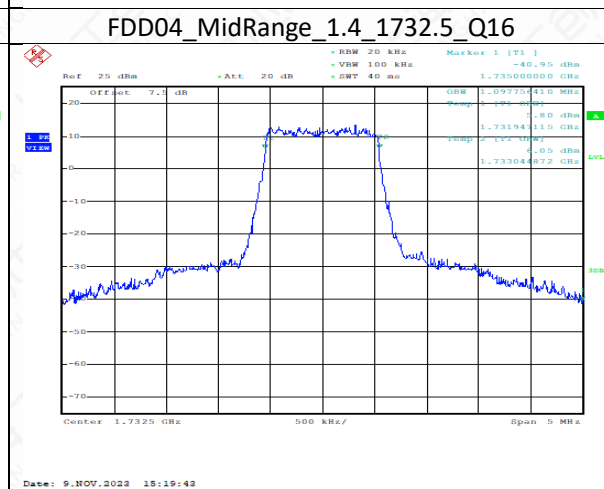
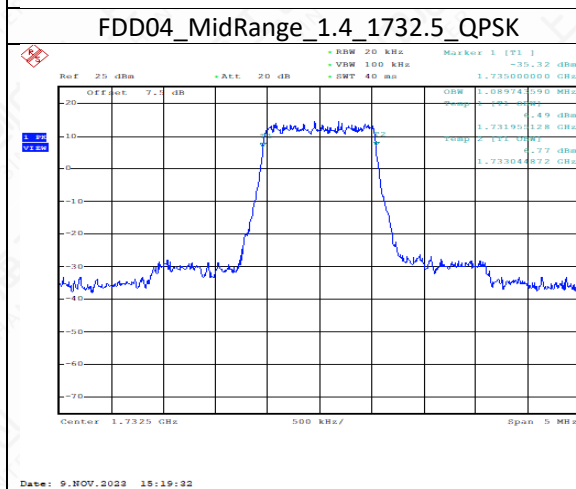
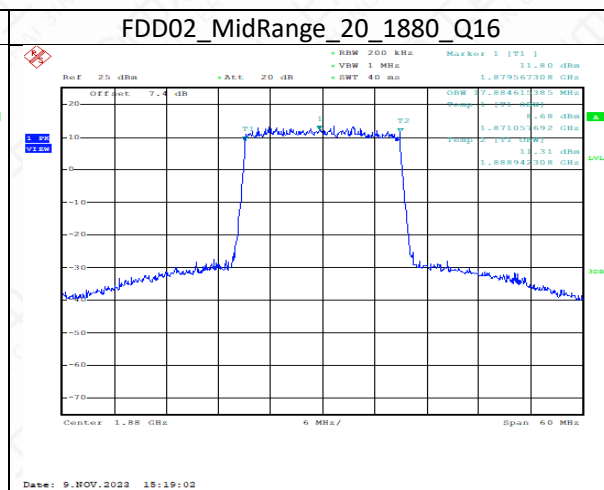
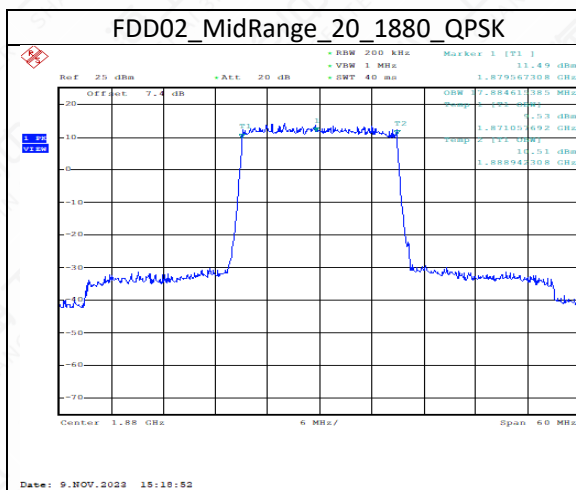
6.4.4 Measurement Results

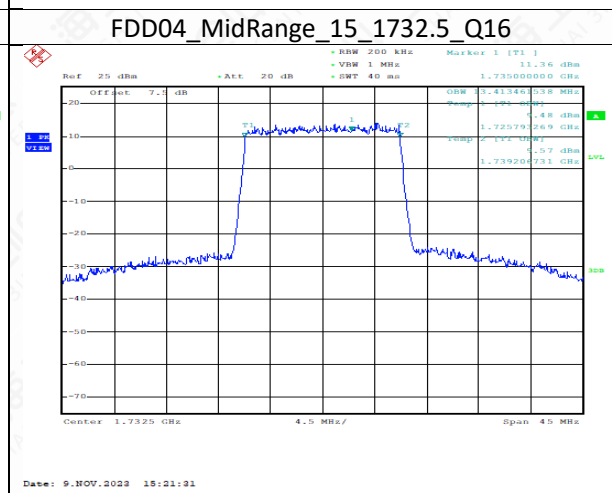
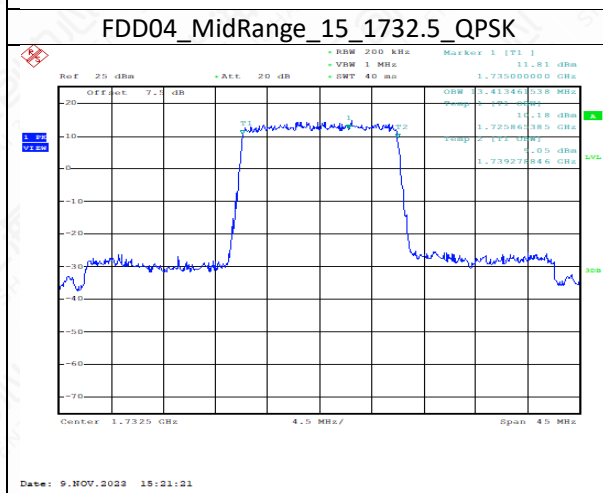
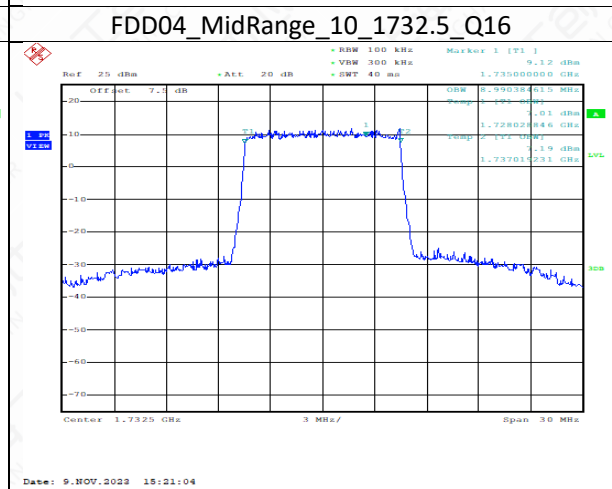
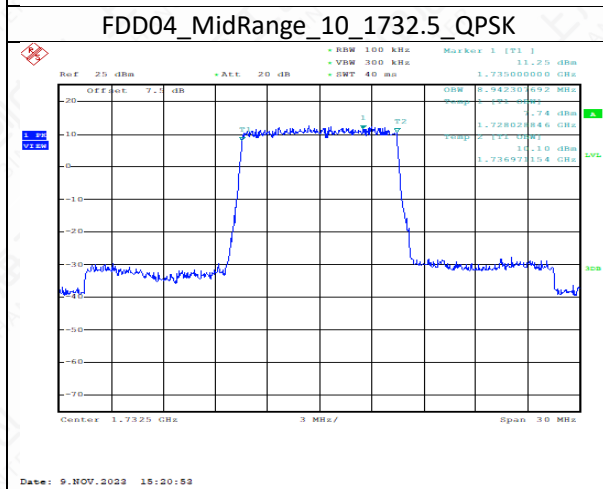
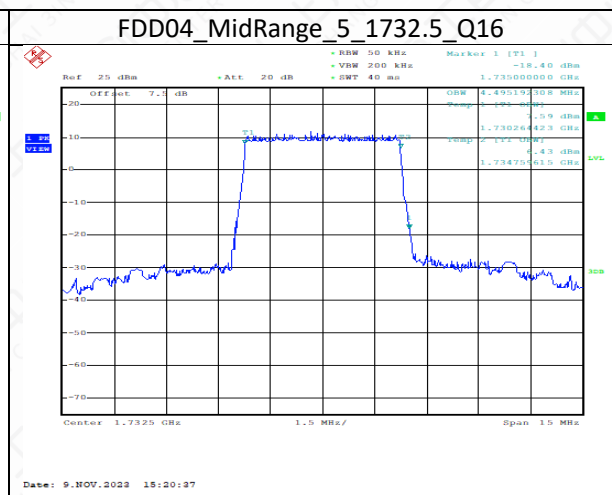
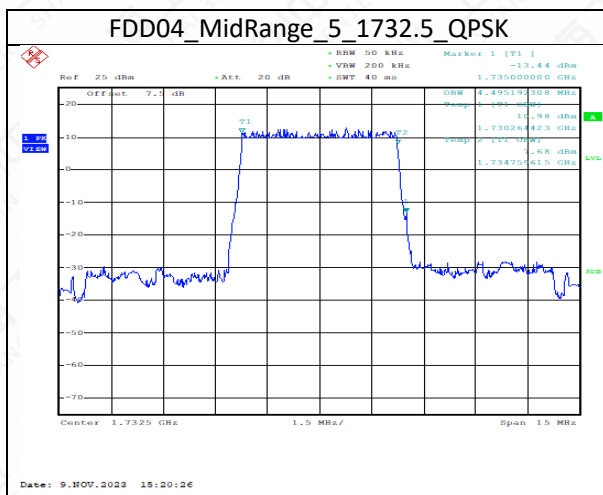
Band	Range	BandWidth	Frequency(MHz)	QPSK(MHz)	Q16(MHz)
FDD02	MidRange	1.4	1880	1.09	1.10
FDD02	MidRange	3	1880	2.69	2.69
FDD02	MidRange	5	1880	4.50	4.47
FDD02	MidRange	10	1880	8.94	8.94
FDD02	MidRange	15	1880	13.49	13.41
FDD02	MidRange	20	1880	17.89	17.89
FDD04	MidRange	1.4	1732.5	1.09	1.10
FDD04	MidRange	3	1732.5	2.69	2.69
FDD04	MidRange	5	1732.5	4.50	4.50
FDD04	MidRange	10	1732.5	8.94	8.99
FDD04	MidRange	15	1732.5	13.41	13.41
FDD04	MidRange	20	1732.5	17.98	17.98
FDD05	MidRange	1.4	836.5	1.09	1.10
FDD05	MidRange	3	836.5	2.69	2.69
FDD05	MidRange	5	836.5	4.50	4.47
FDD05	MidRange	10	836.5	8.94	8.89
FDD12	MidRange	1.4	707.5	1.09	1.09
FDD12	MidRange	3	707.5	2.69	2.69
FDD12	MidRange	5	707.5	4.50	4.47
FDD12	MidRange	10	707.5	8.94	8.94
FDD13	MidRange	5	782	4.47	4.47
FDD13	MidRange	10	782	8.94	8.94
FDD14	MidRange	5	793	4.50	4.50
FDD14	MidRange	10	793	8.94	8.94
FDD66	MidRange	1.4	1745	1.09	1.10
FDD66	MidRange	3	1745	2.69	2.69
FDD66	MidRange	5	1745	4.50	4.50

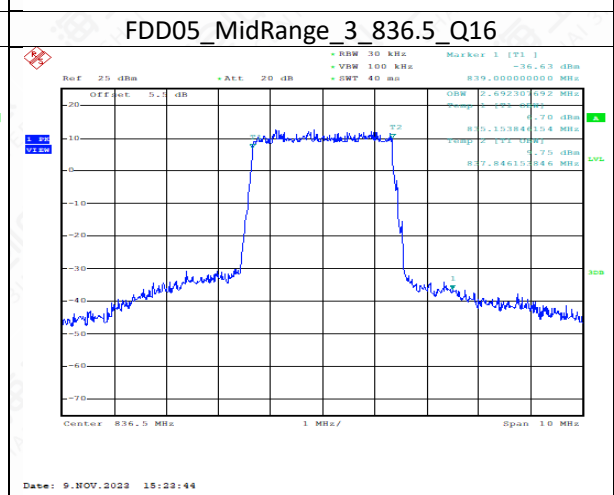
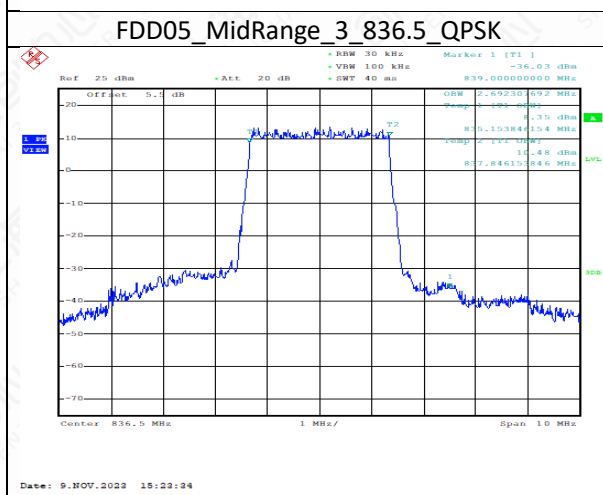
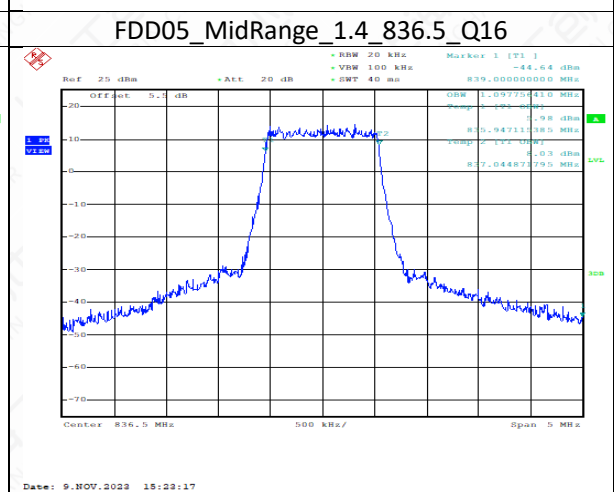
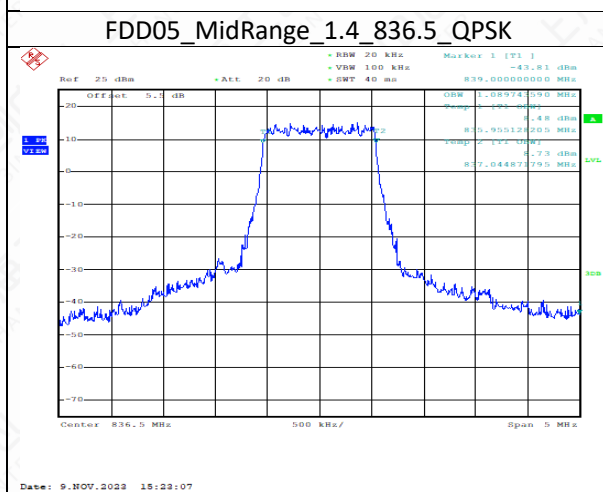
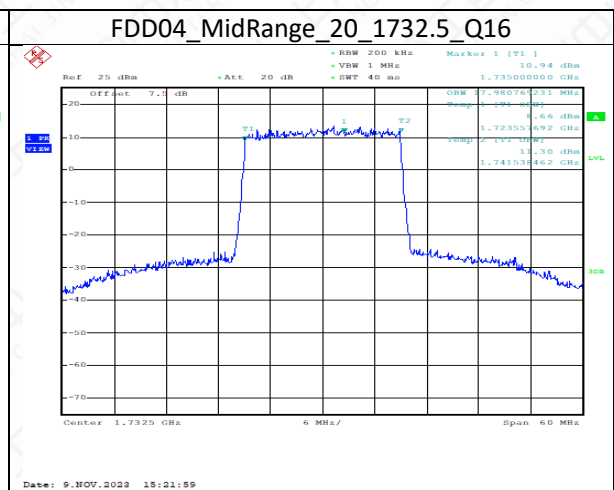
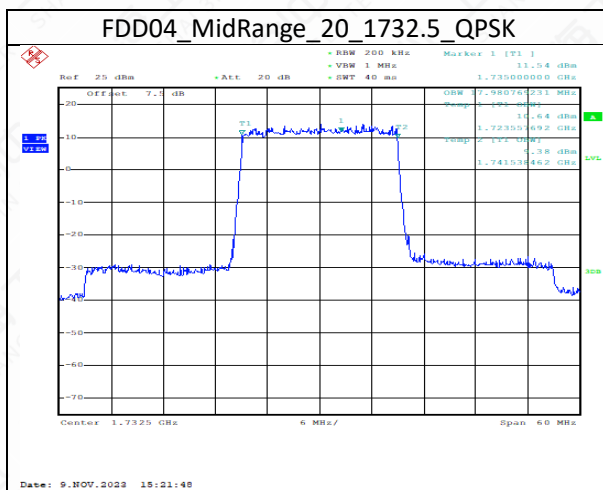
Band	Range	BandWidth	Frequency(MHz)	QPSK(MHz)	Q16(MHz)
FDD66	MidRange	10	1745	8.94	8.94
FDD66	MidRange	15	1745	13.49	13.49
FDD66	MidRange	20	1745	17.79	17.89
FDD71	MidRange	5	680.5	4.47	4.47
FDD71	MidRange	10	680.5	8.94	8.94
FDD71	MidRange	15	680.5	13.41	13.34
FDD71	MidRange	20	683	17.79	17.79

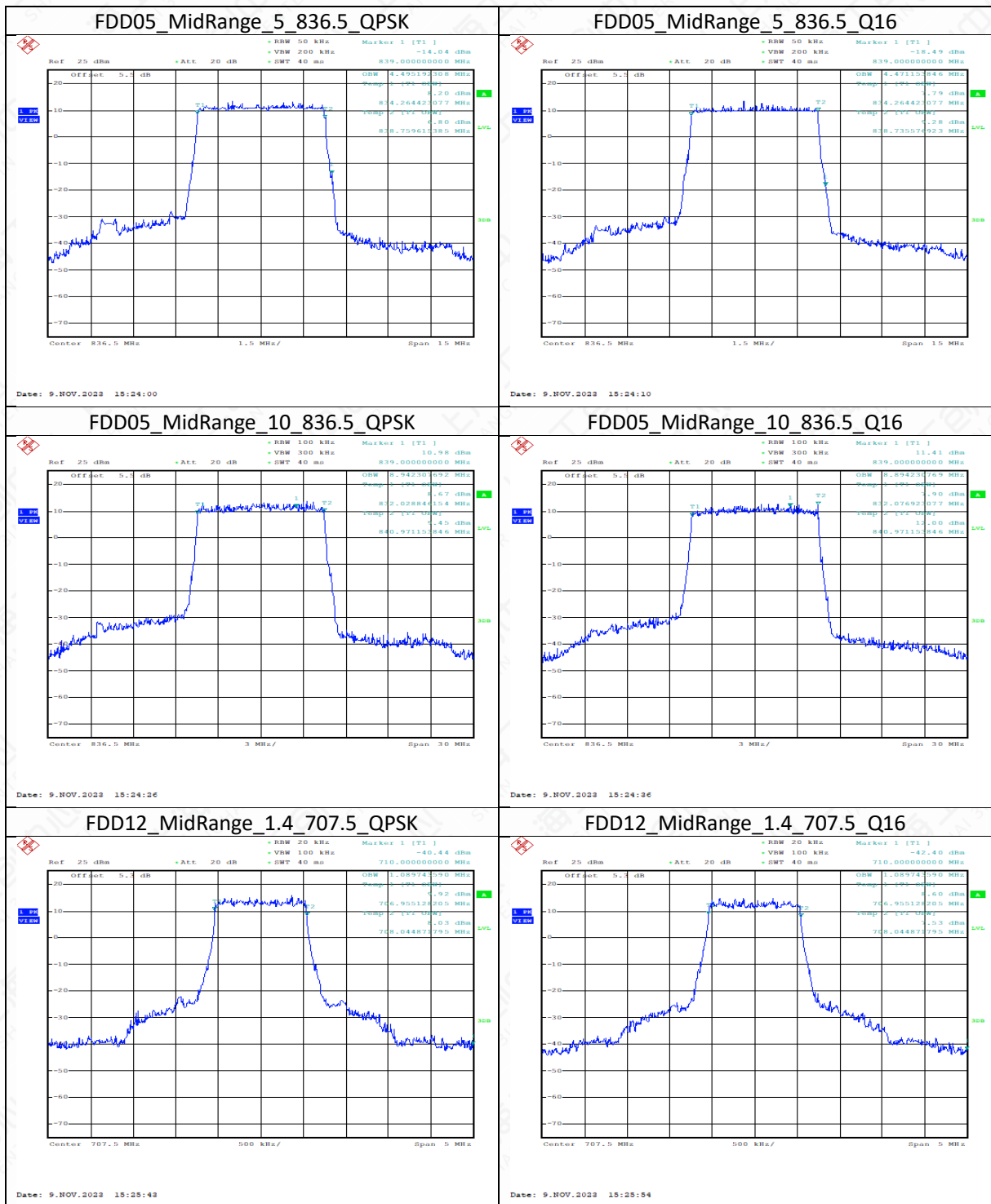


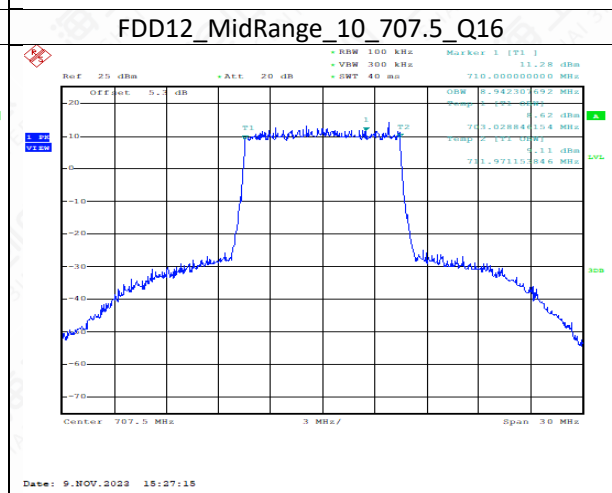
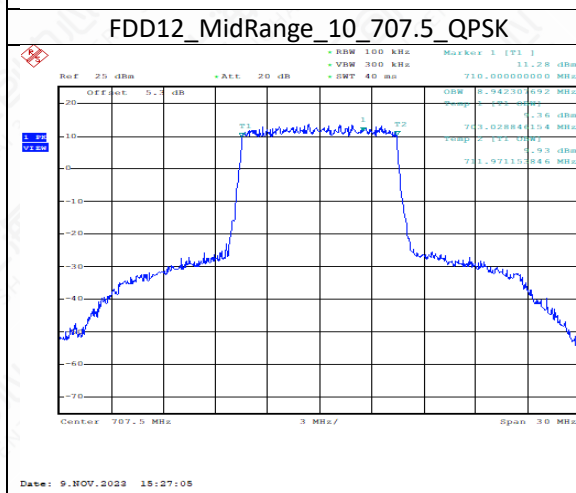
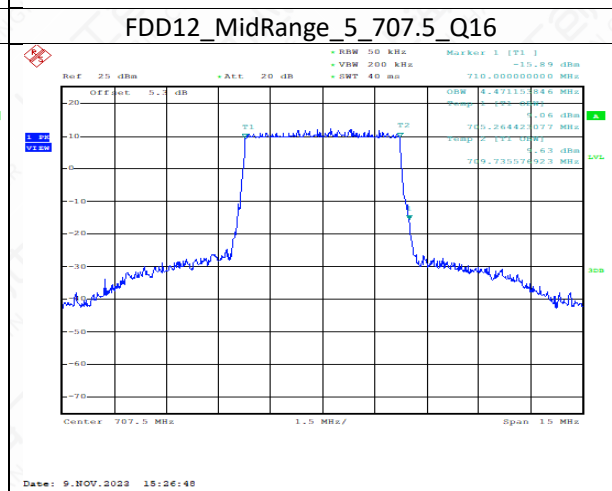
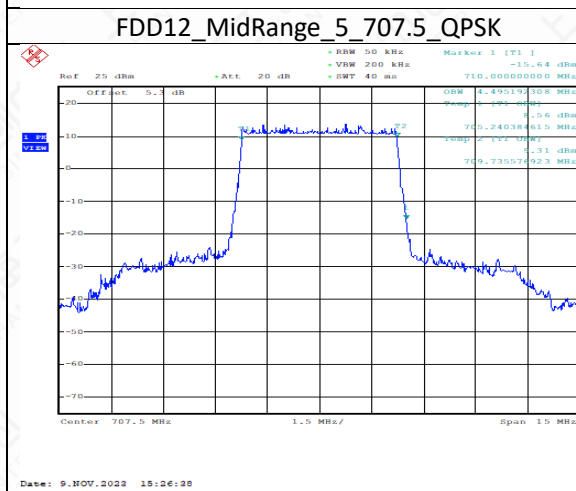
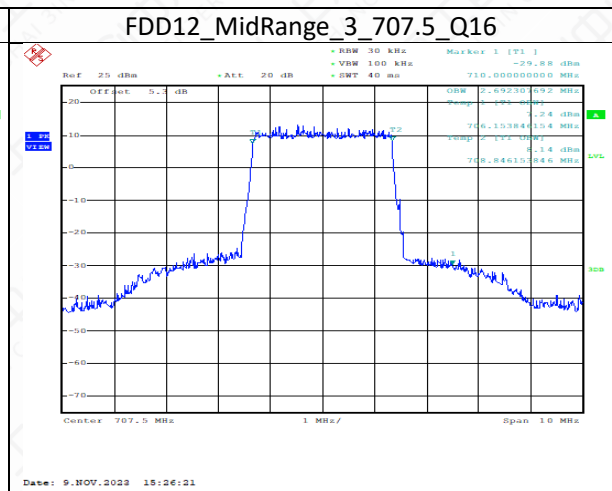
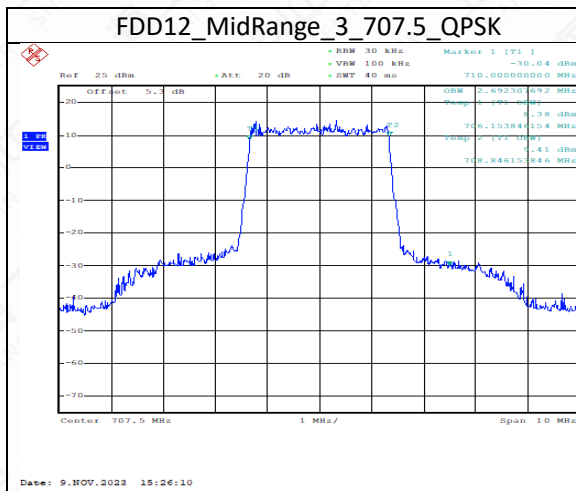


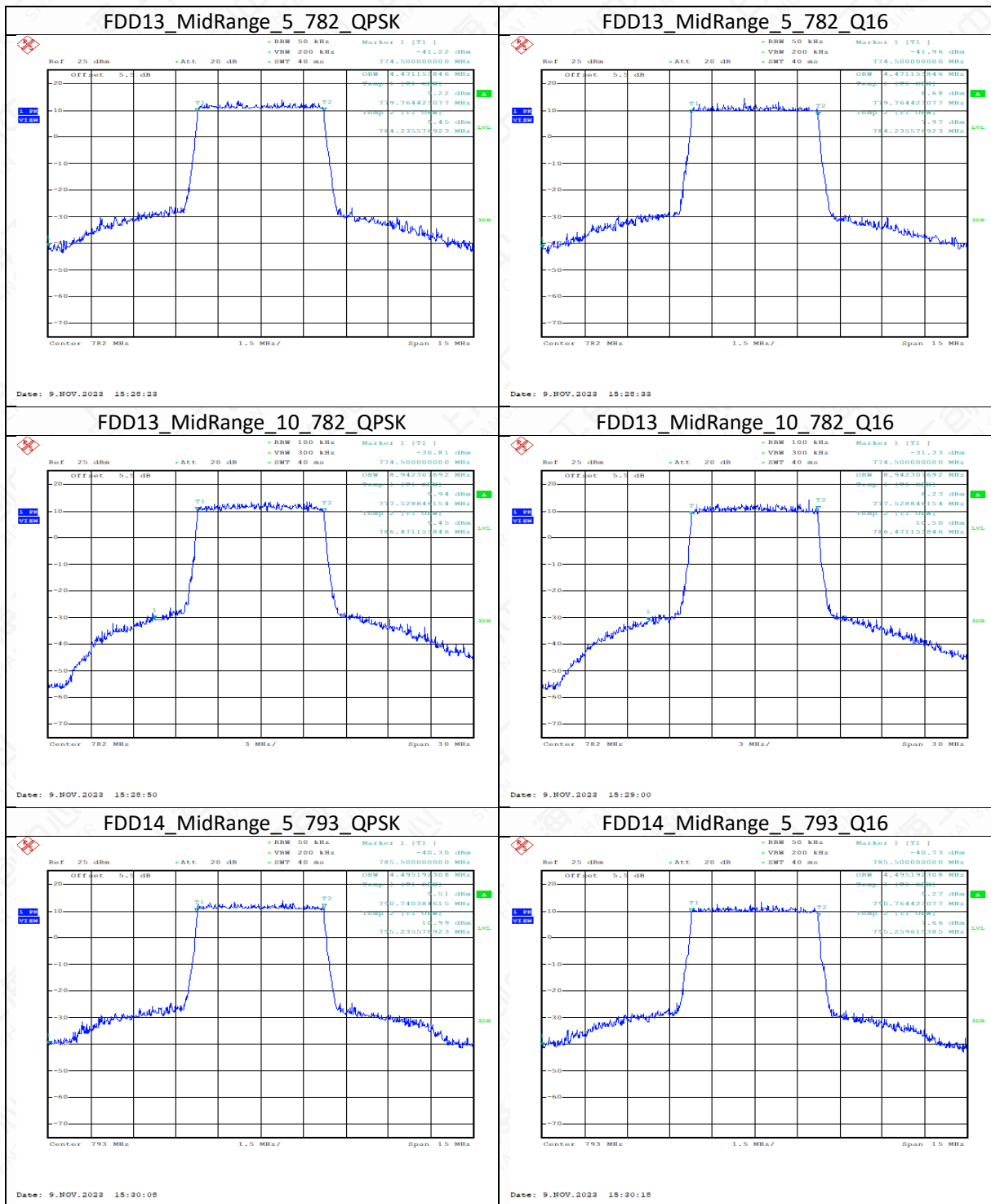


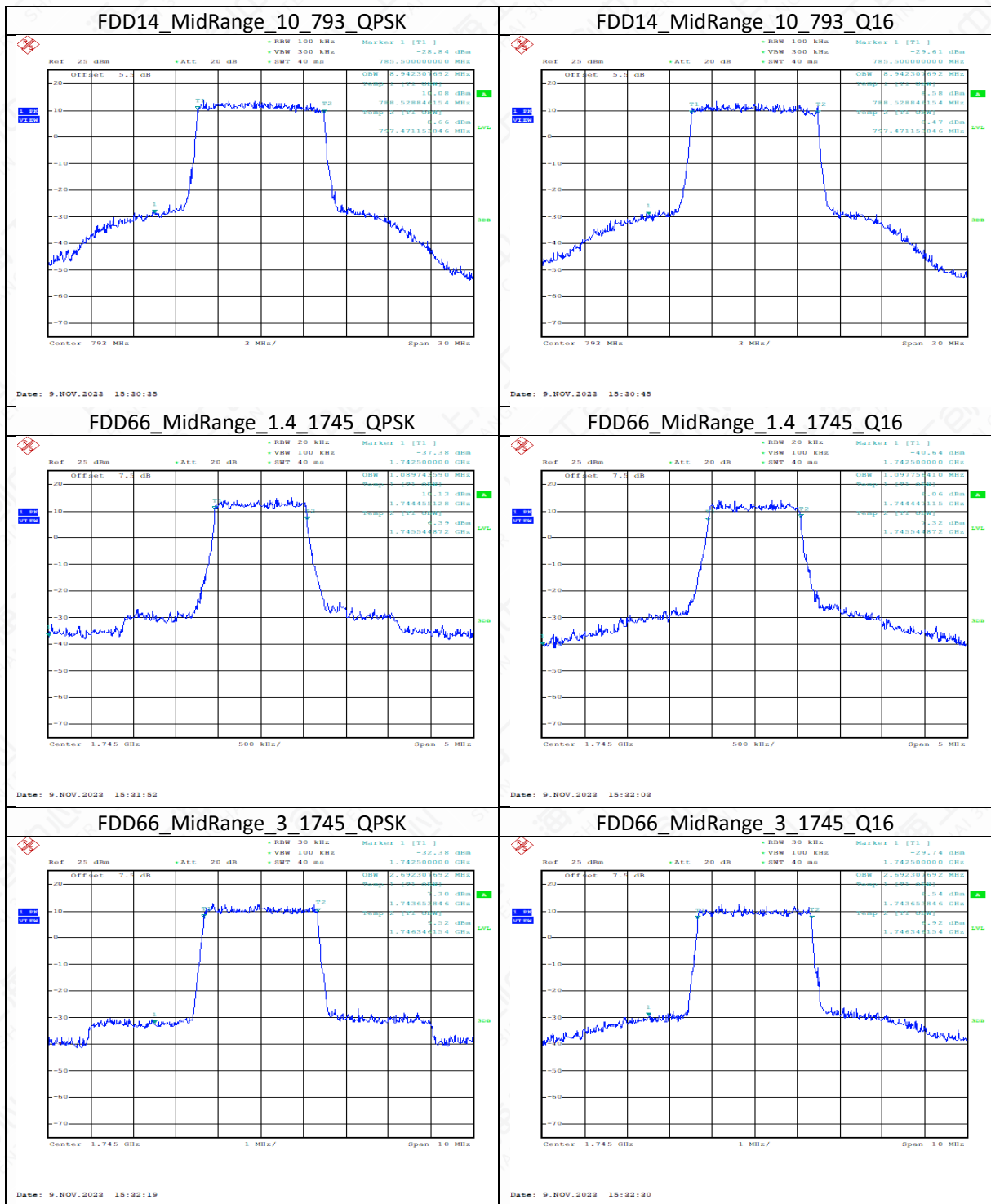


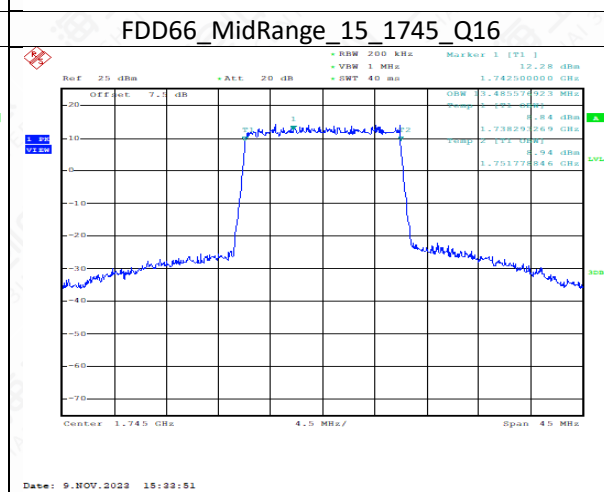
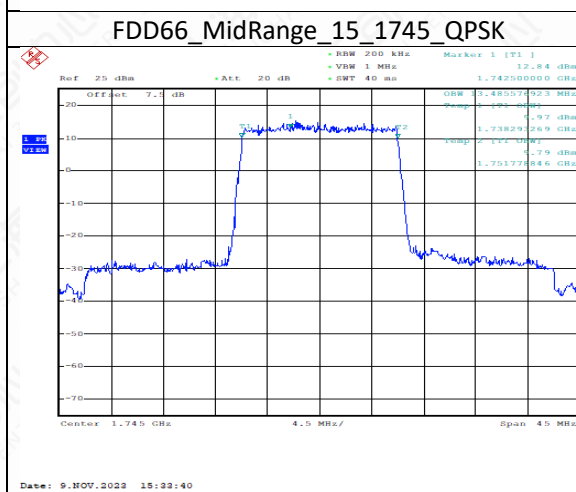
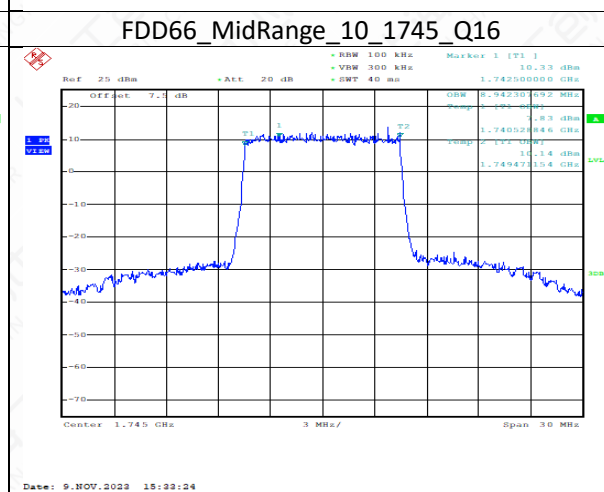
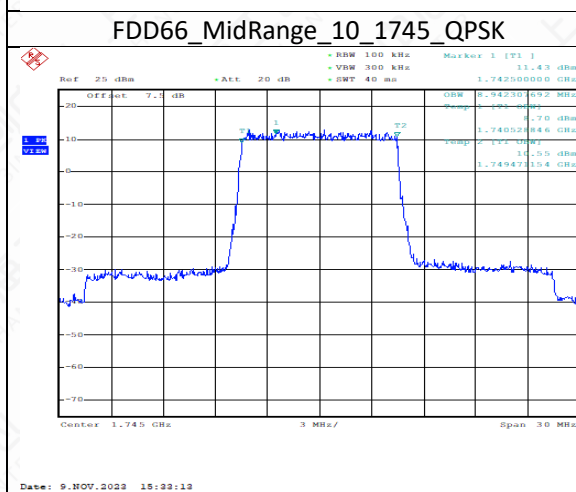
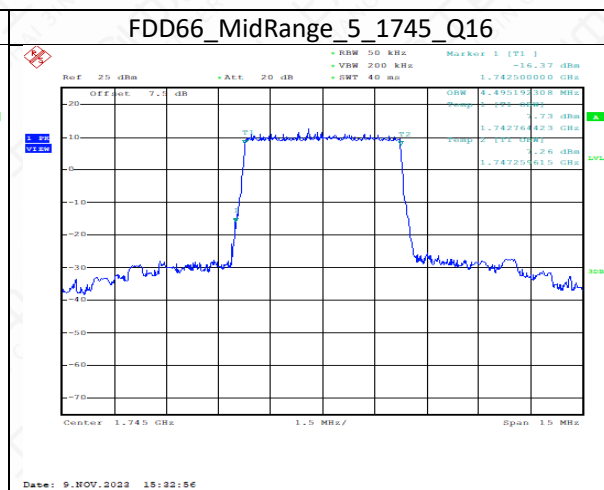
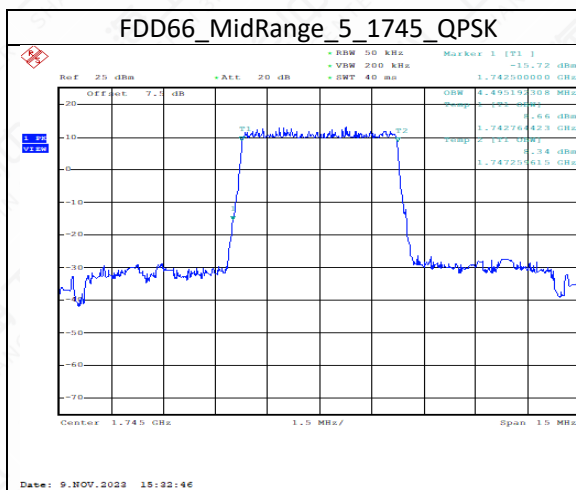


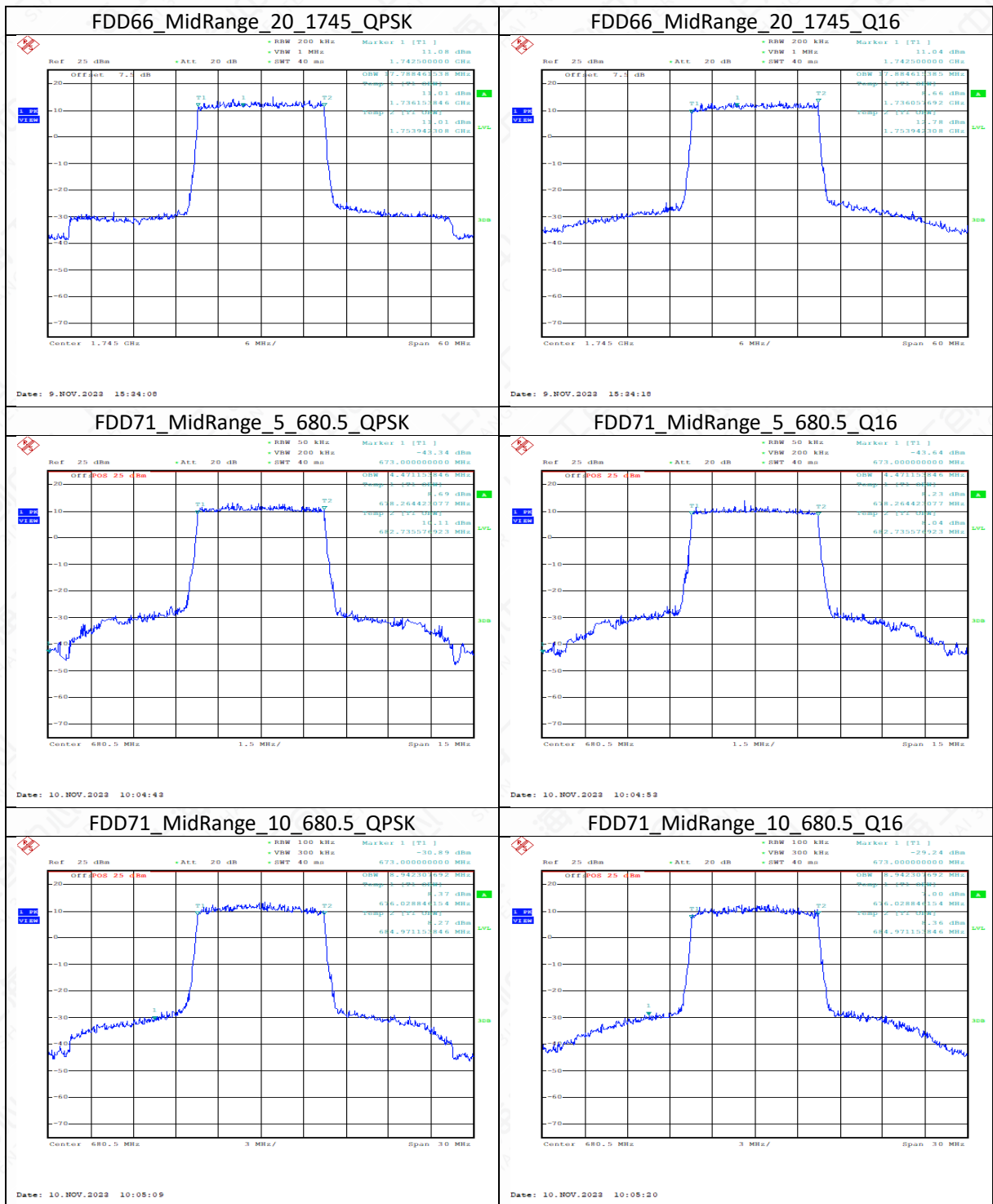


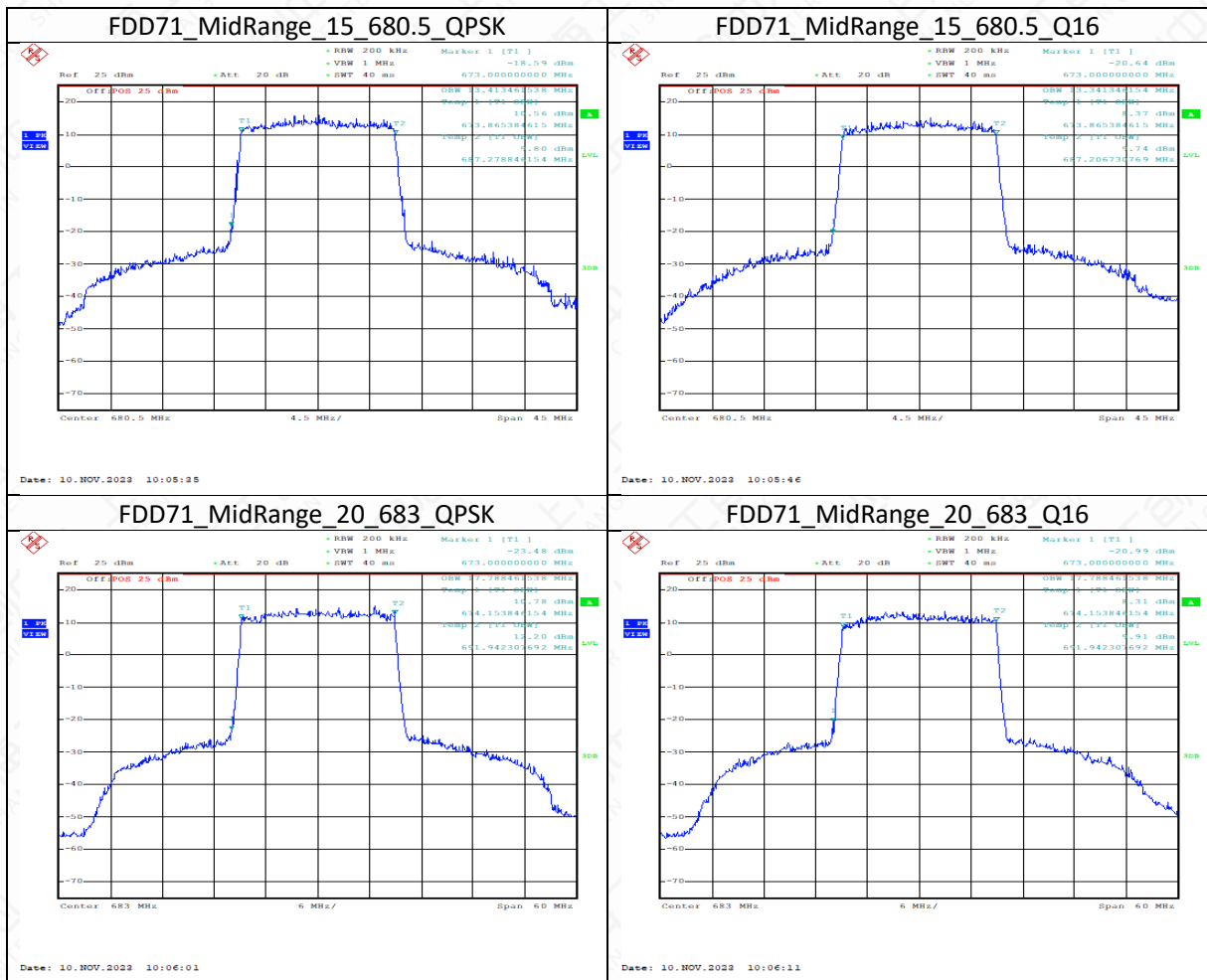












6.5 Emission Bandwidth

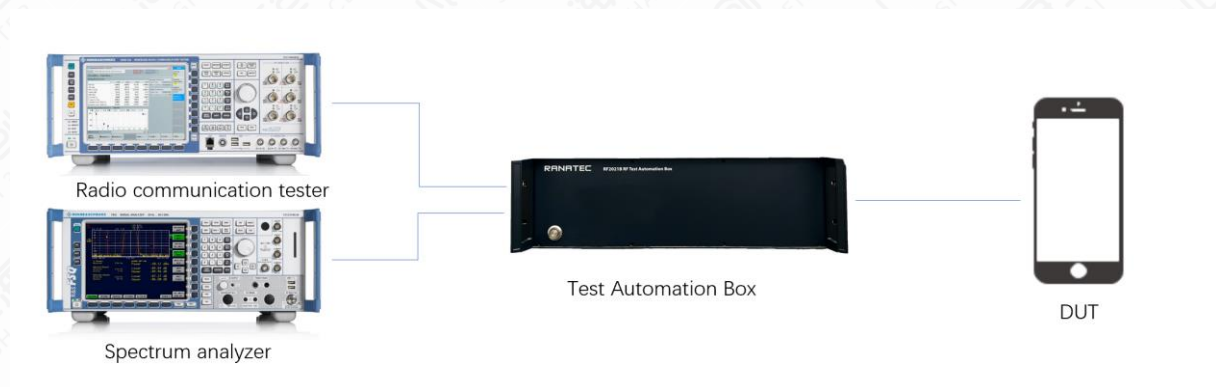
Reference

CFR Part 2.1051/22.917/24.238(a) /27.53(c)/27.53(h)/ 27.53(a)/ 27.53(g)/27.53(m)/90.543(e)

6.5.1 Method of Measurement

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

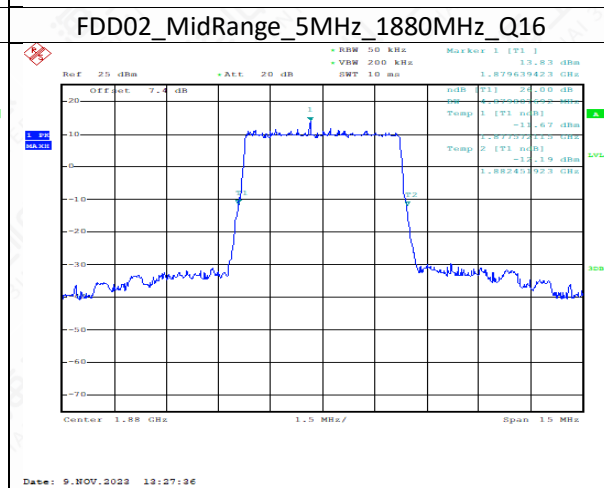
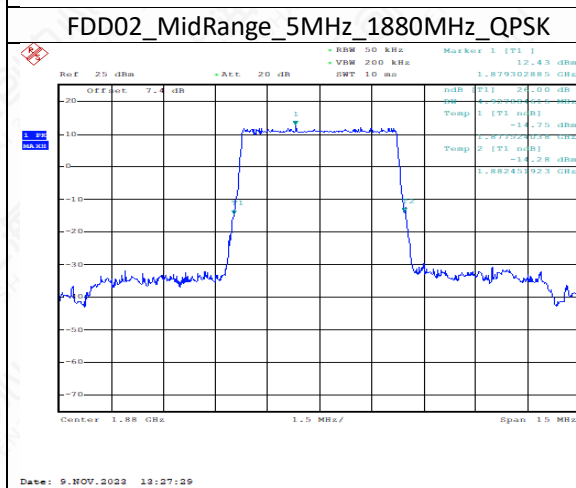
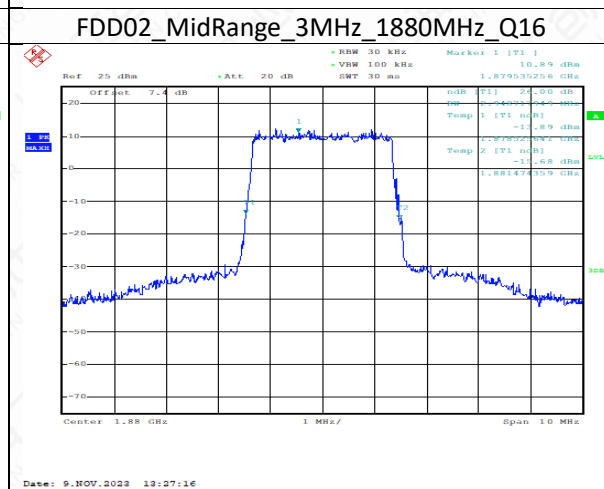
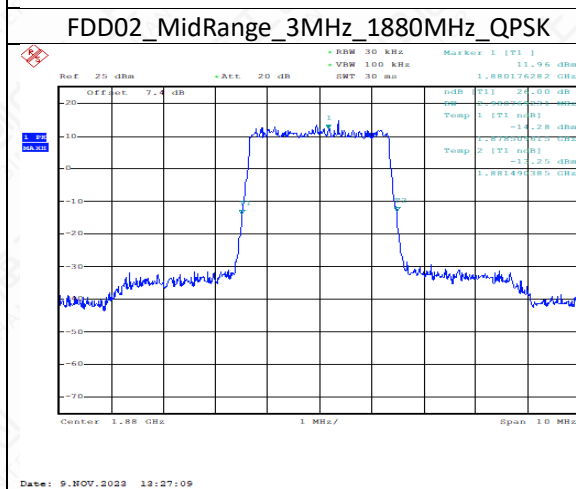
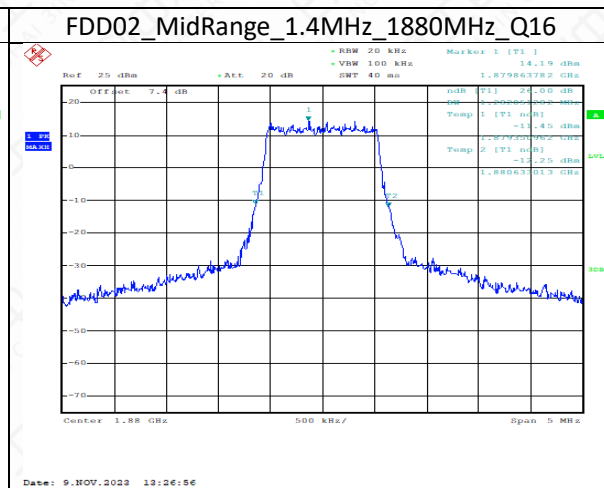
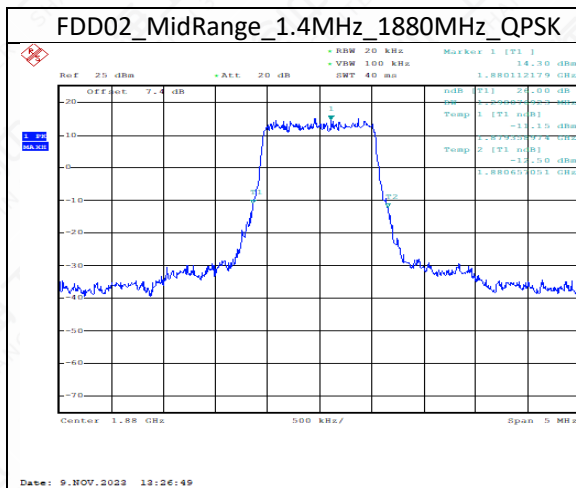
6.5.2 Test Setup

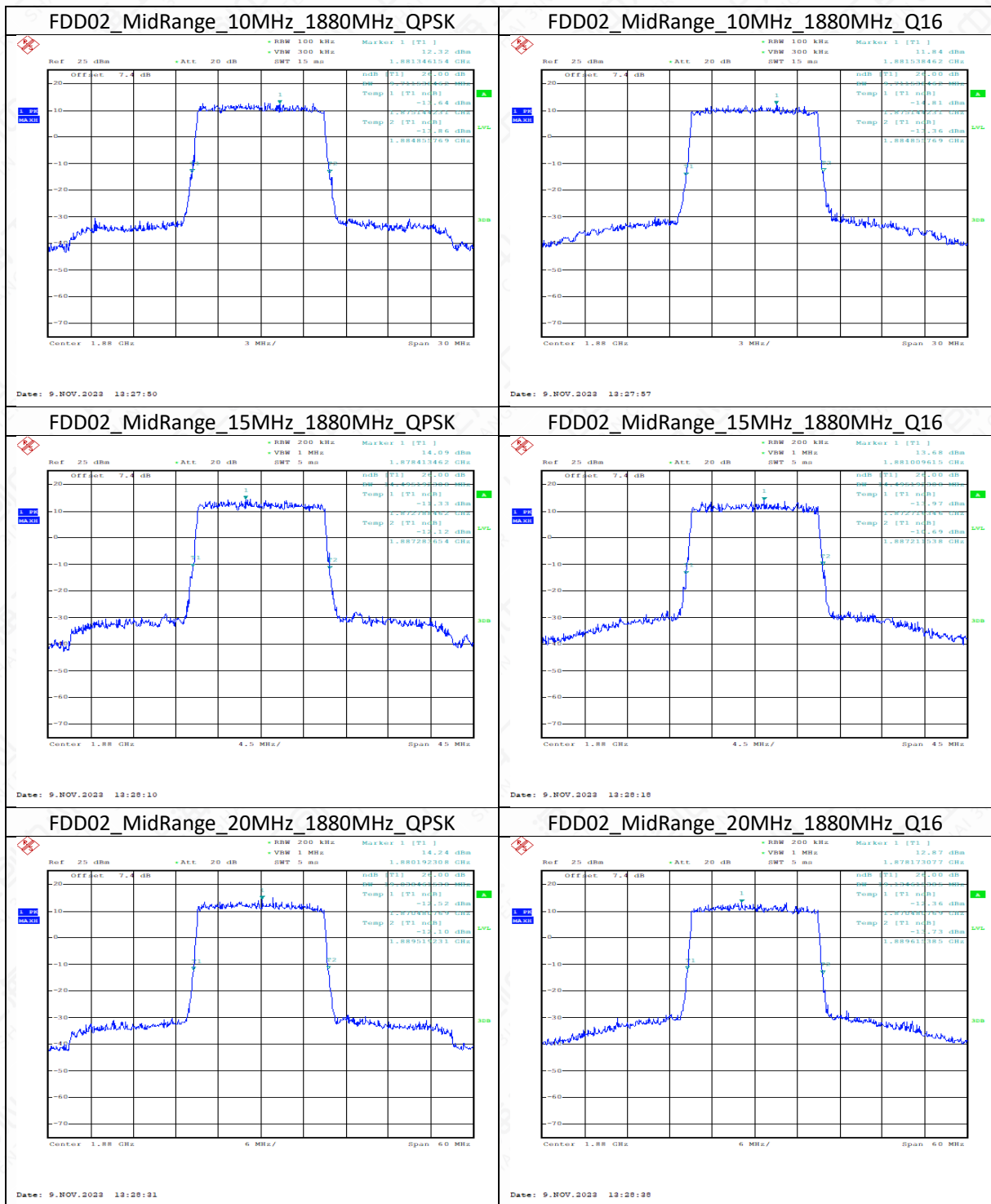


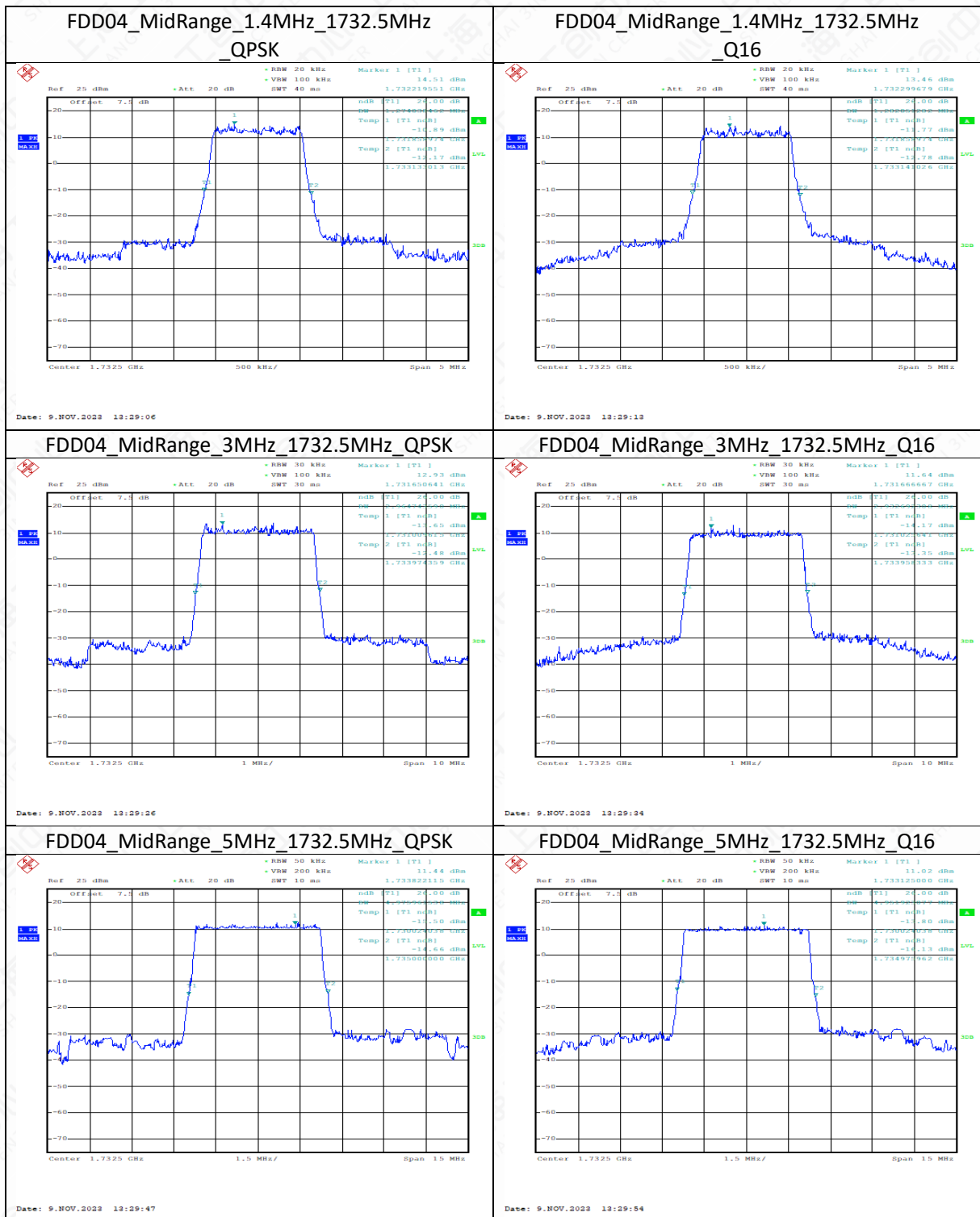
6.5.3 Measurement results

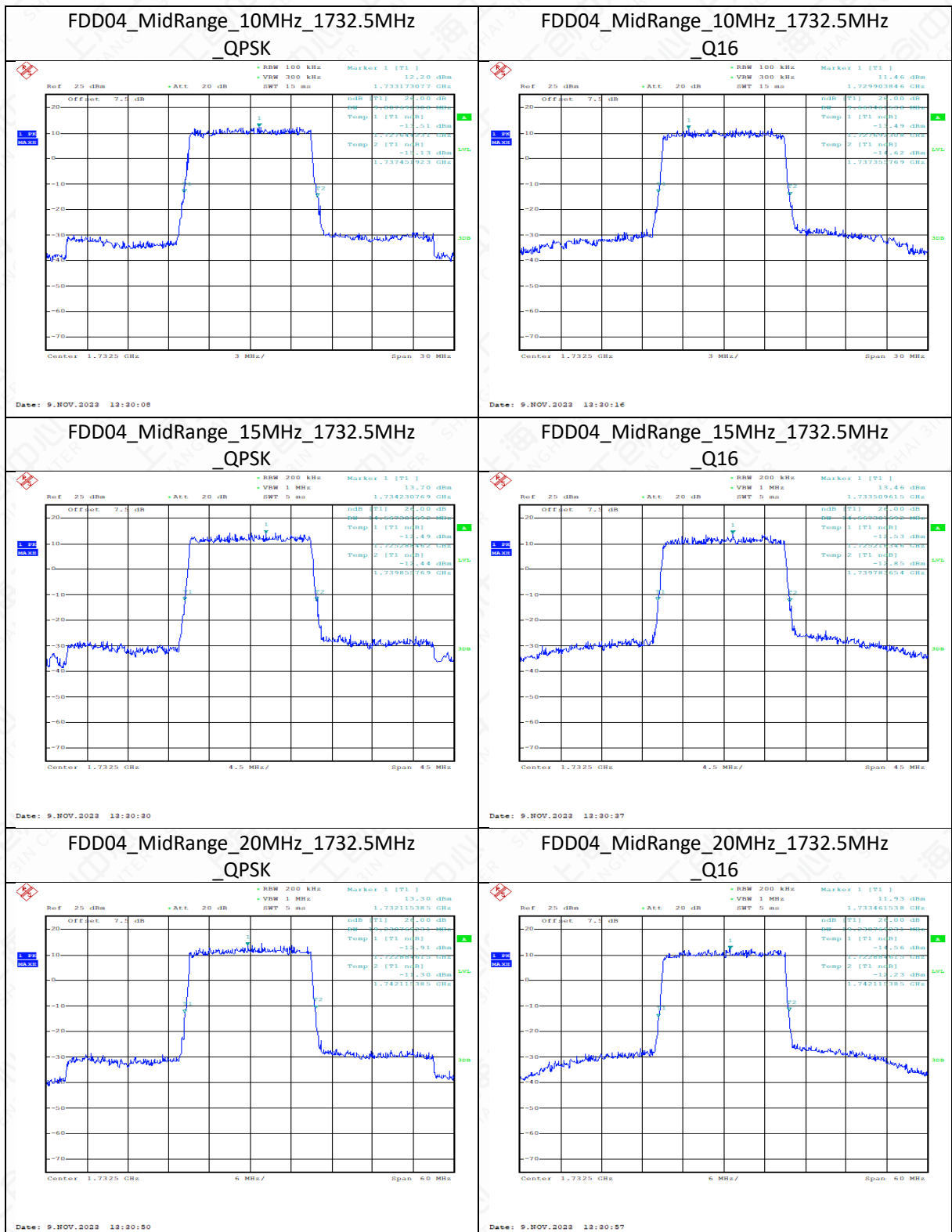
Band	Range	BandWidth	Frequency(MHz)	QPSK(MHz)	Q16(MHz)
FDD02	MidRange	1.4	1880	1.30	1.27
FDD02	MidRange	3	1880	2.98	2.95
FDD02	MidRange	5	1880	4.93	4.88
FDD02	MidRange	10	1880	9.71	9.71
FDD02	MidRange	15	1880	14.50	14.50
FDD02	MidRange	20	1880	19.04	19.13
FDD04	MidRange	1.4	1732.5	1.27	1.28
FDD04	MidRange	3	1732.5	2.96	2.93
FDD04	MidRange	5	1732.5	4.98	4.95
FDD04	MidRange	10	1732.5	9.81	9.66
FDD04	MidRange	15	1732.5	14.57	14.57
FDD04	MidRange	20	1732.5	19.23	19.23
FDD05	MidRange	1.4	836.5	1.27	1.31

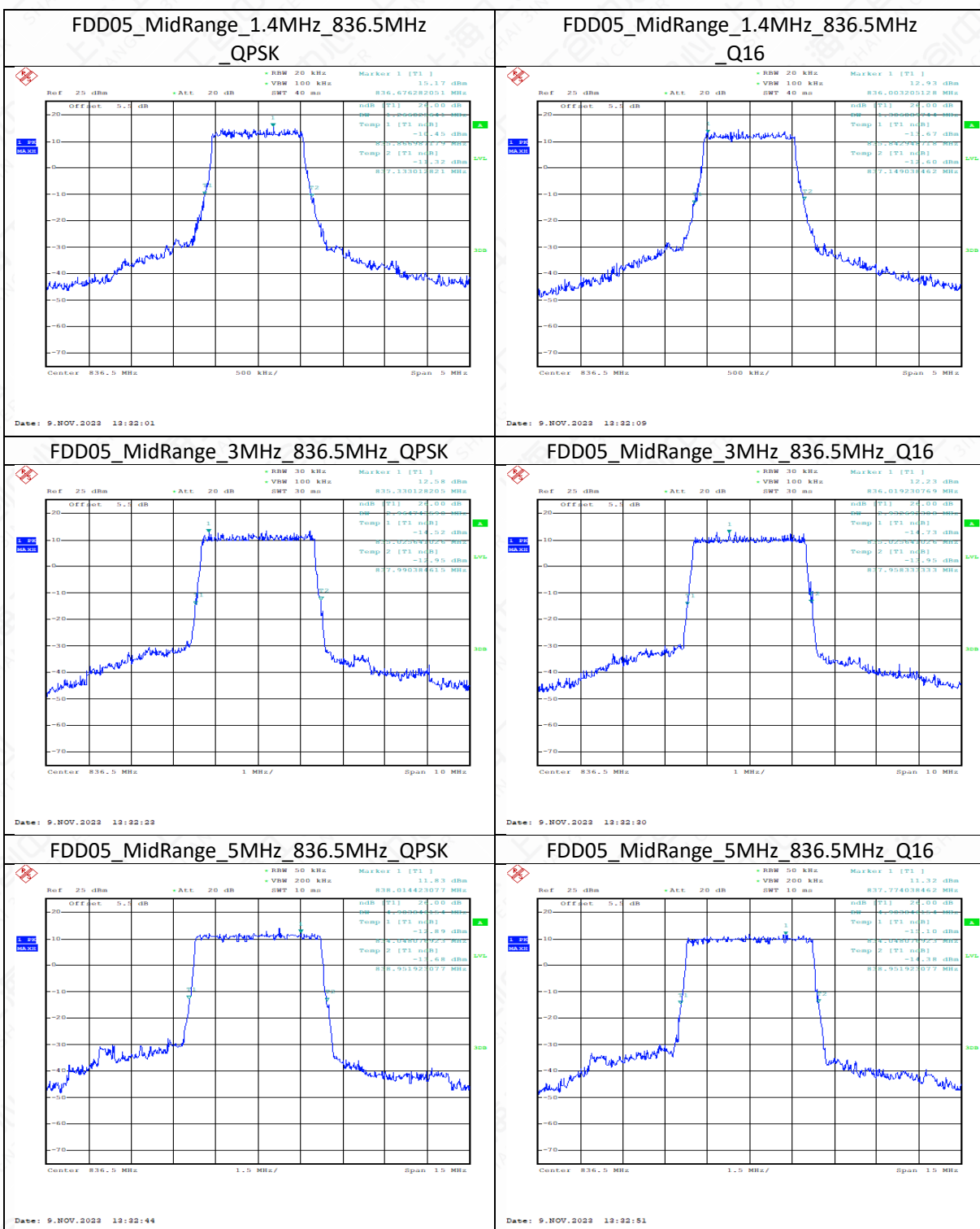
Band	Range	BandWidth	Frequency(MHz)	QPSK(MHz)	Q16(MHz)
FDD05	MidRange	3	836.5	2.96	2.93
FDD05	MidRange	5	836.5	4.90	4.90
FDD05	MidRange	10	836.5	9.62	9.57
FDD12	MidRange	1.4	707.5	1.27	1.27
FDD12	MidRange	3	707.5	2.95	2.92
FDD12	MidRange	5	707.5	4.93	4.88
FDD12	MidRange	10	707.5	9.62	9.71
FDD13	MidRange	5	782	4.95	4.93
FDD13	MidRange	10	782	9.71	9.71
FDD14	MidRange	5	793	4.88	4.90
FDD14	MidRange	10	793	9.66	9.62
FDD66	MidRange	1.4	1745	1.29	1.31
FDD66	MidRange	3	1745	2.96	2.98
FDD66	MidRange	5	1745	4.95	4.93
FDD66	MidRange	10	1745	9.71	9.66
FDD66	MidRange	15	1745	14.57	14.57
FDD66	MidRange	20	1745	19.13	19.04
FDD71	MidRange	5	680.5	4.88	4.93
FDD71	MidRange	10	680.5	9.81	9.62
FDD71	MidRange	15	680.5	14.57	14.35
FDD71	MidRange	20	683	19.23	18.94

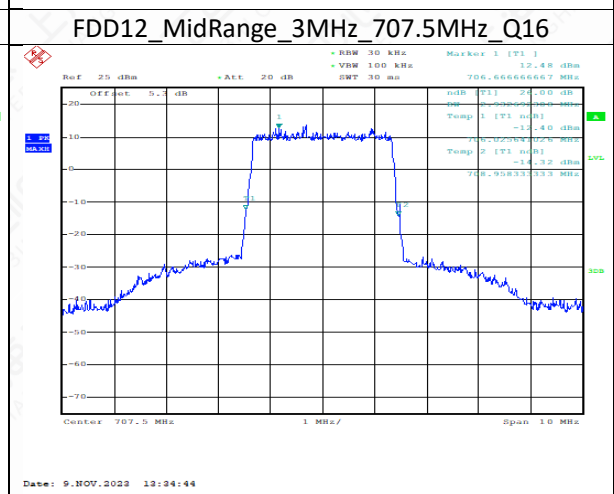
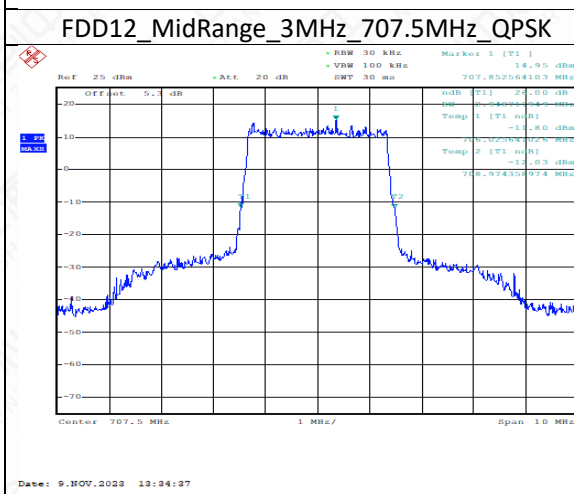
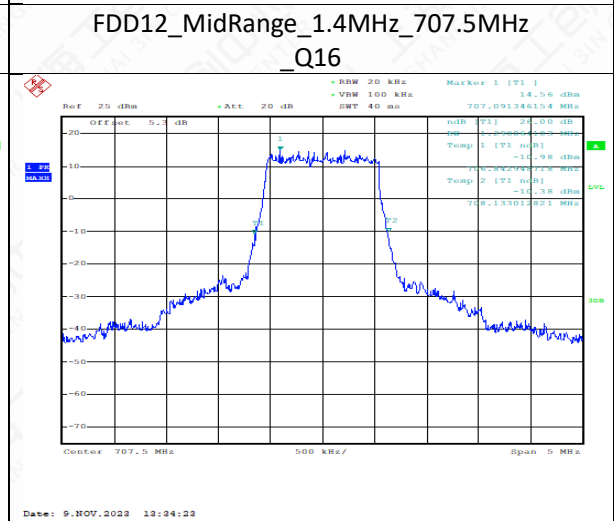
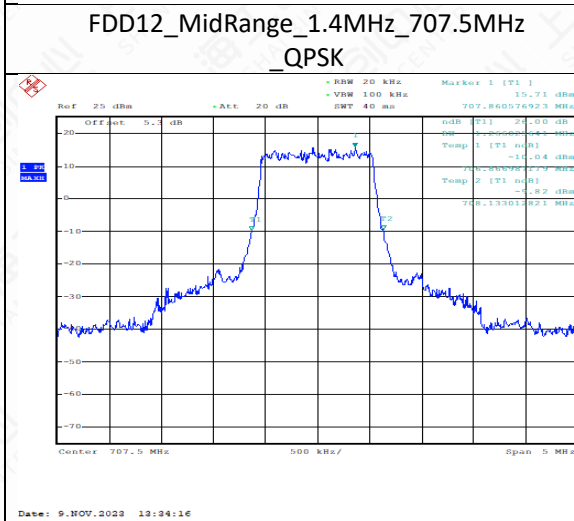
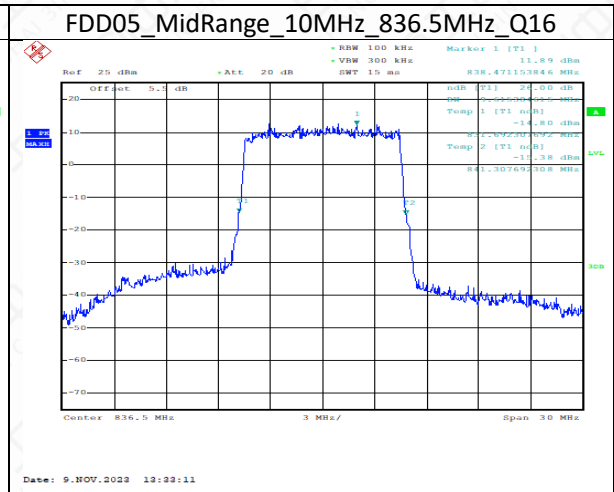
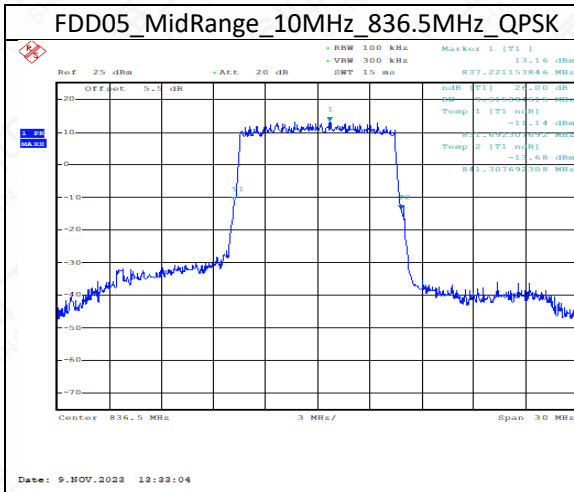


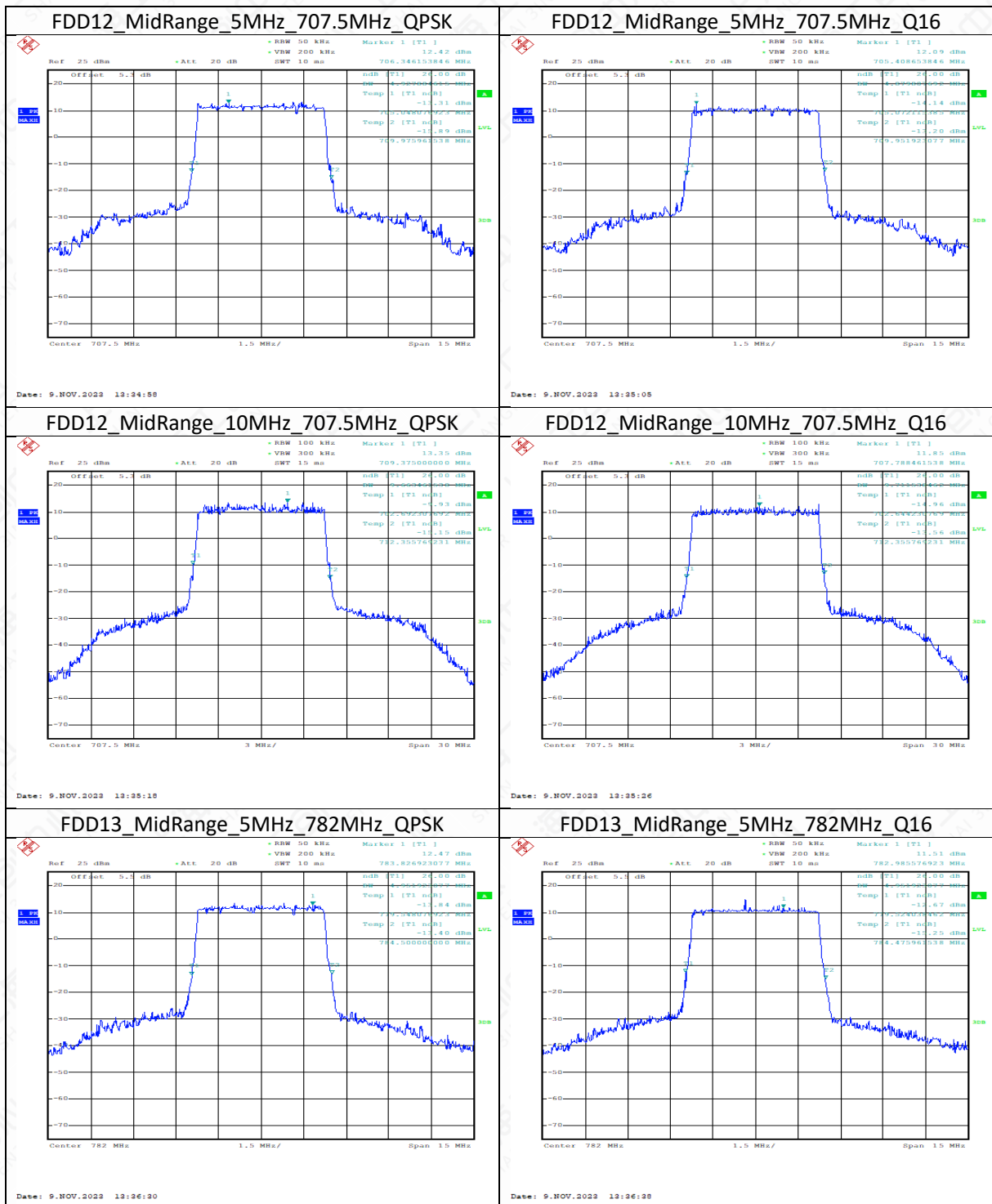


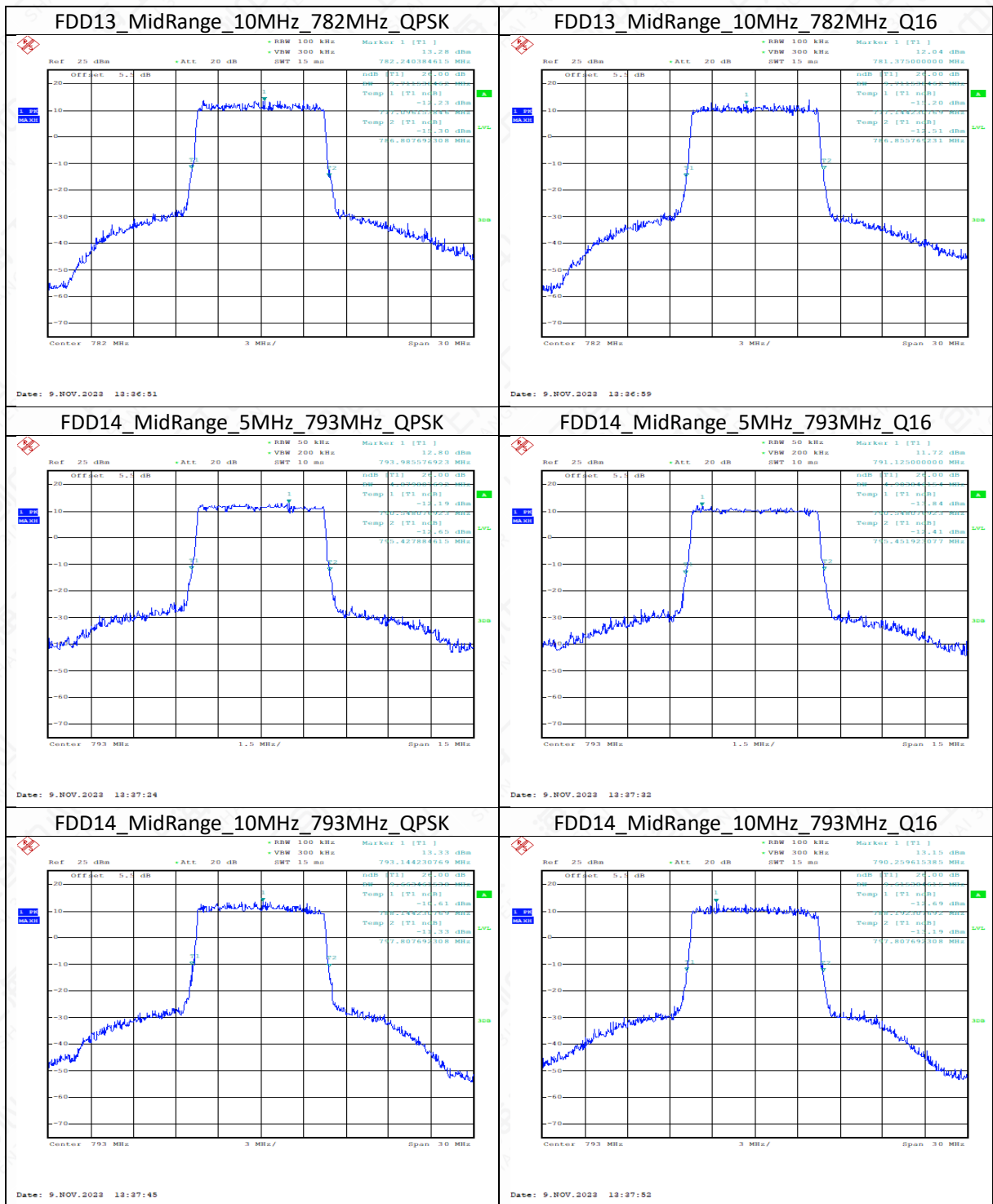


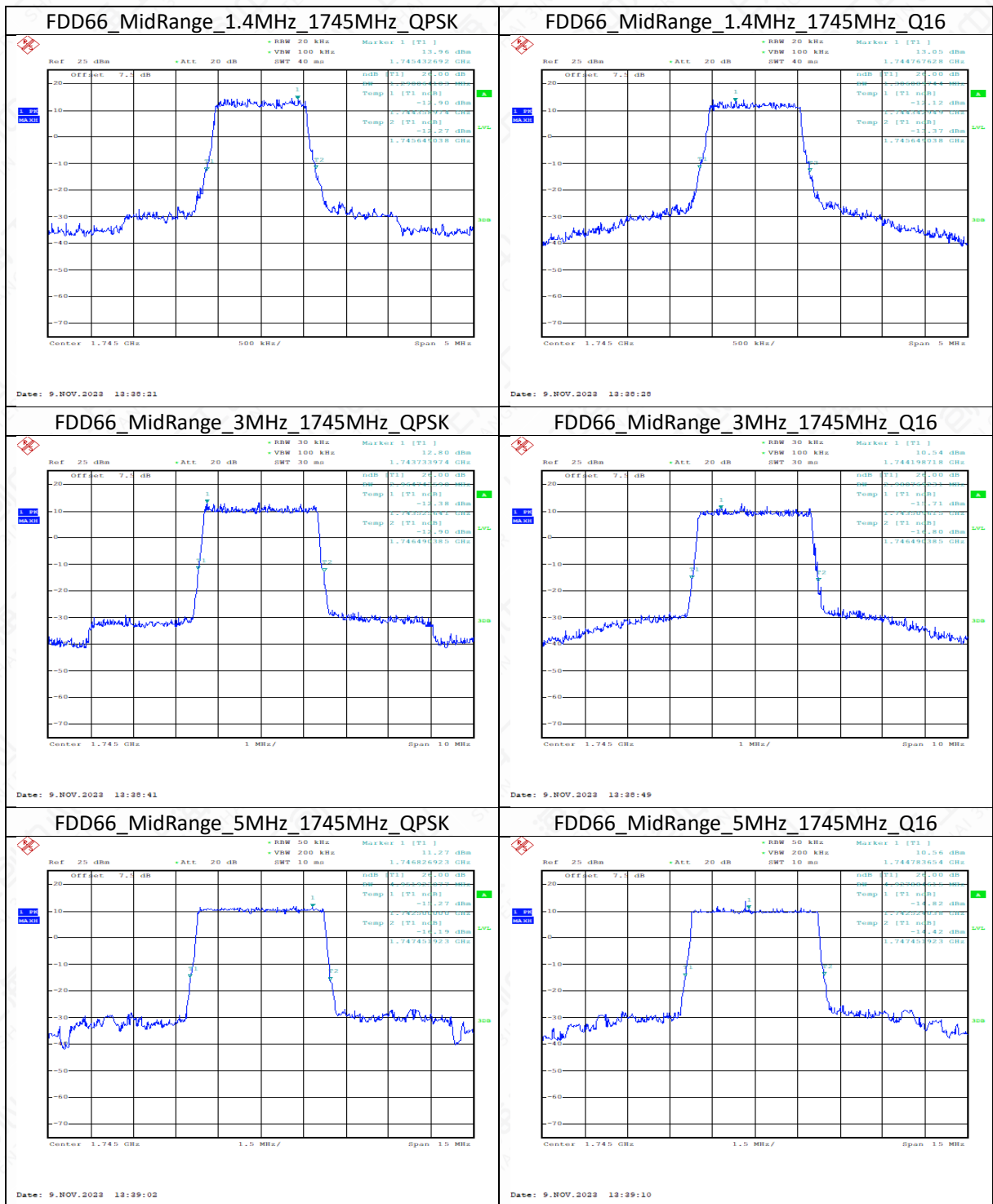


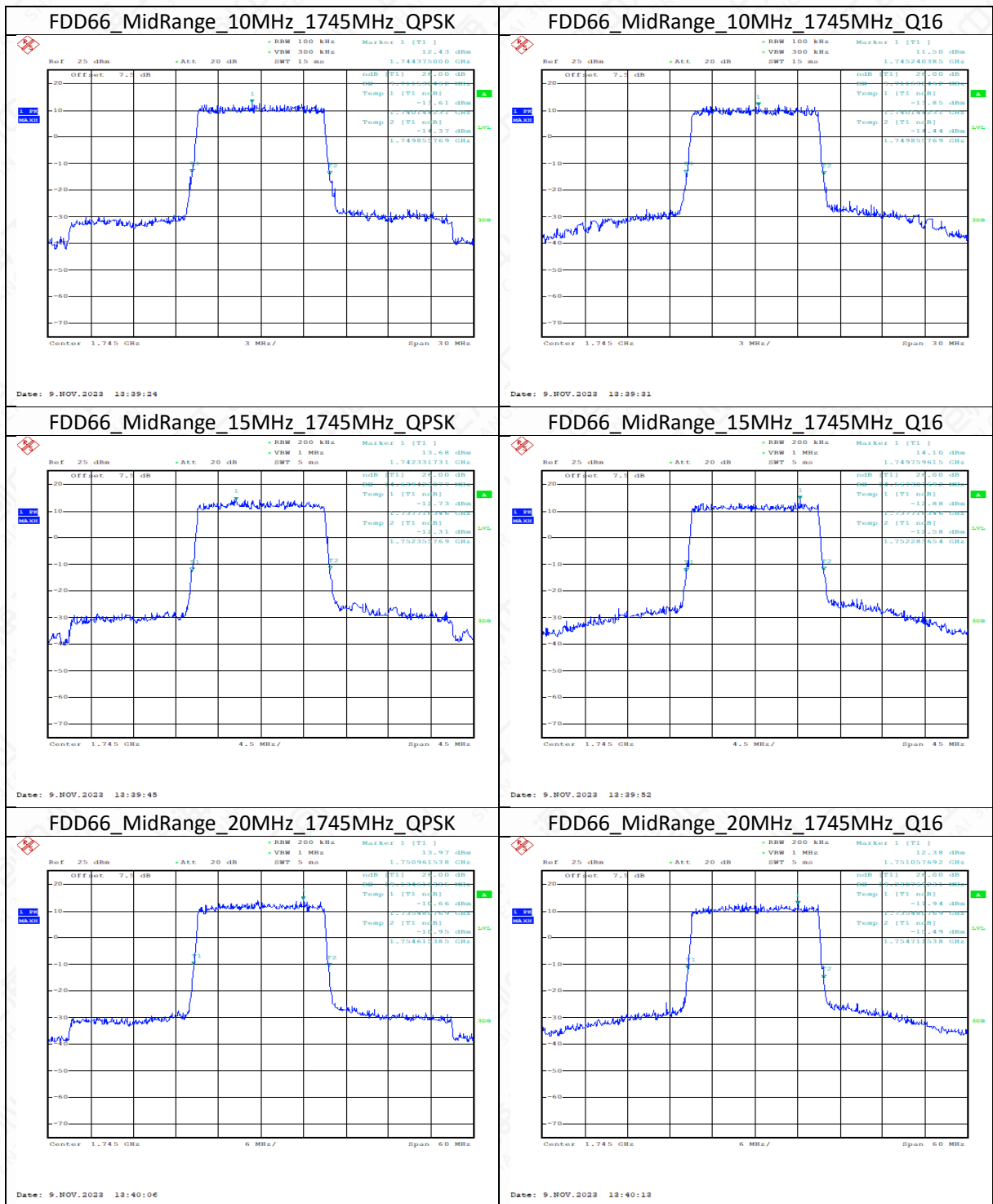


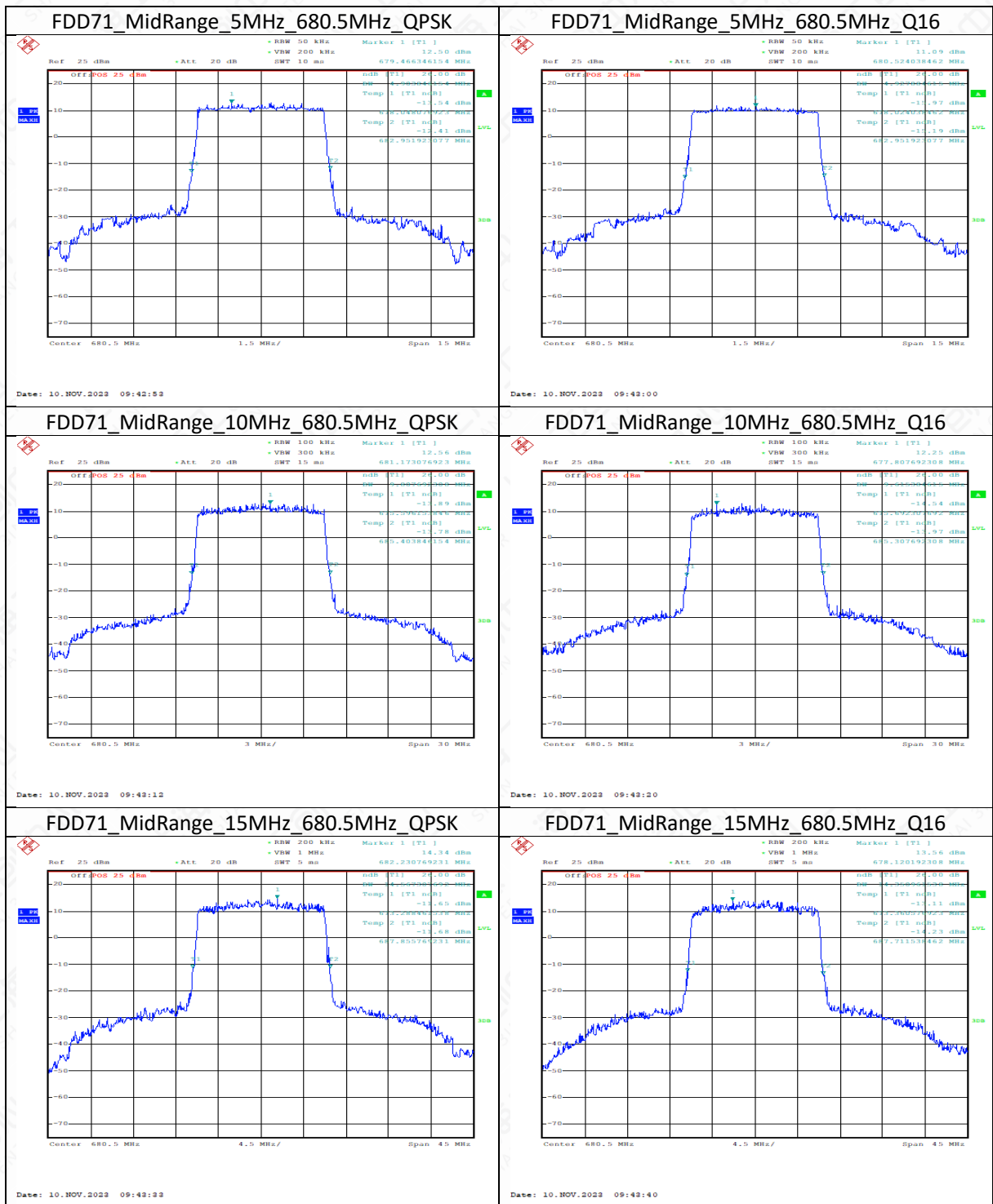


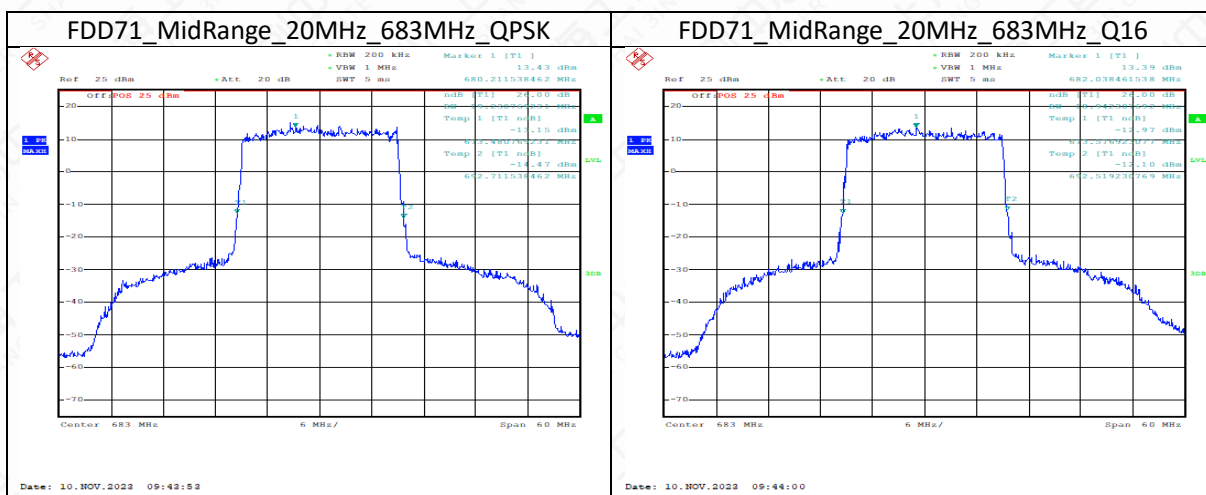












6.6 Band Edge Compliance

Reference

CFR part 2.1051/22.917/24.238(a) /27.53(c)/27.53(h)/ 27.53(a)/ 27.53(g)/27.53(m)/90.543(e)

6.6.1 Summary

22.917 *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

24.238(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below *the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.*

27.53(h) (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

27.53(c) (2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

27.53(g) For operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

90.543(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log(P)$ dB.

6.6.2 Method of Measurement

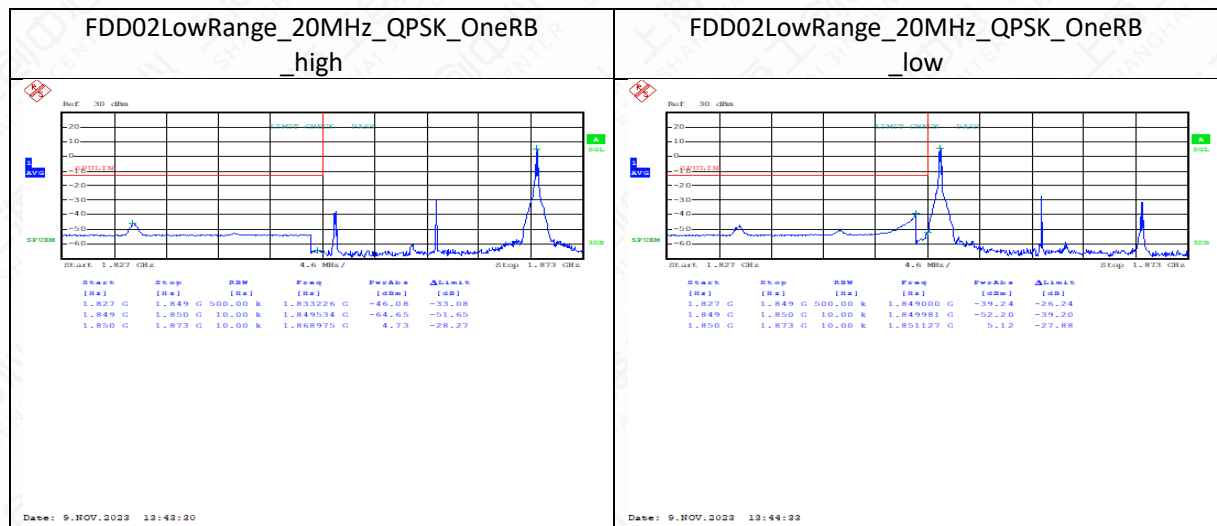
Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

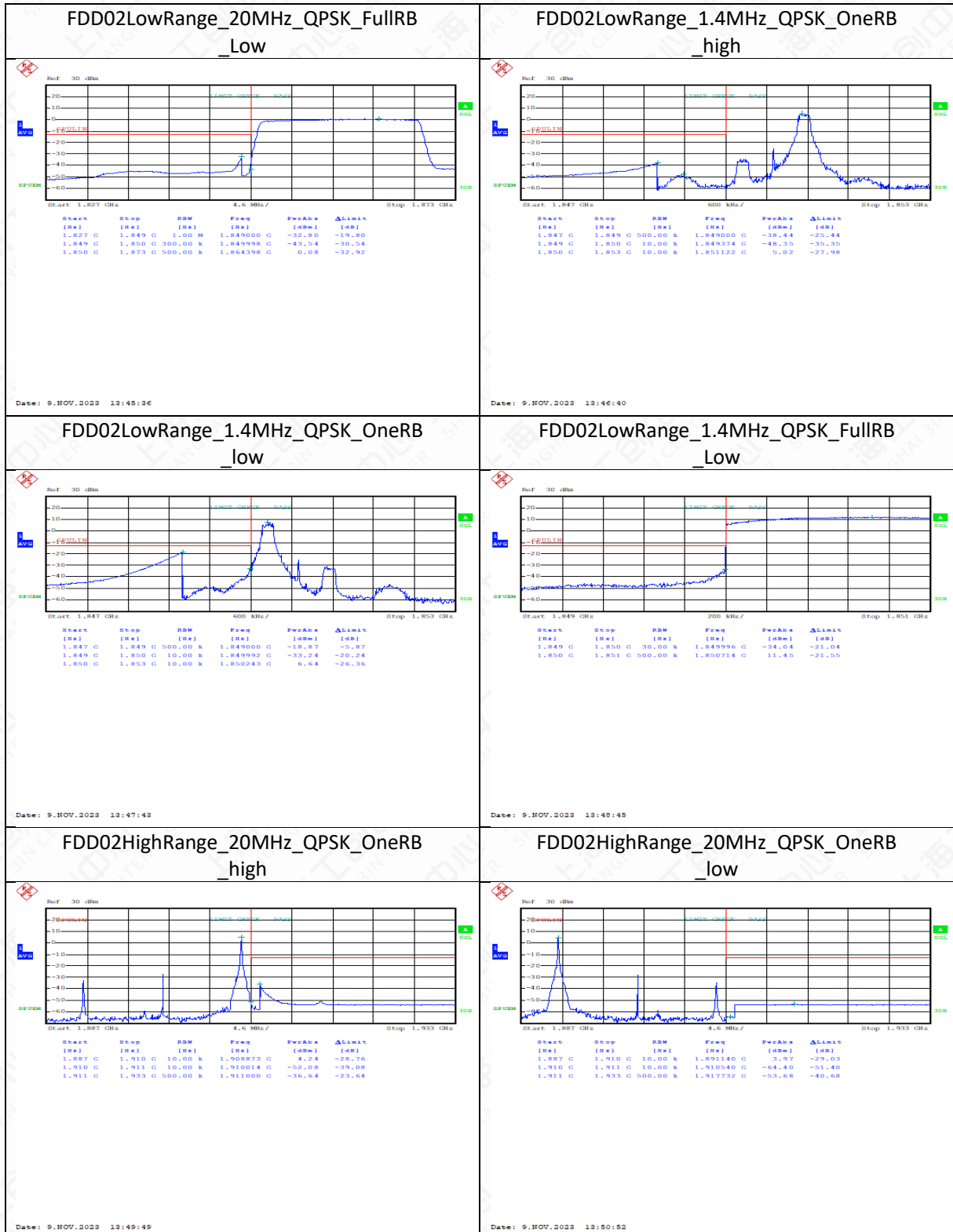
The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser. the other end of which was connected to a Base Station Simulator, The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at two frequencies (low channel and high channel). in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to rms.

6.6.3 Test Setup

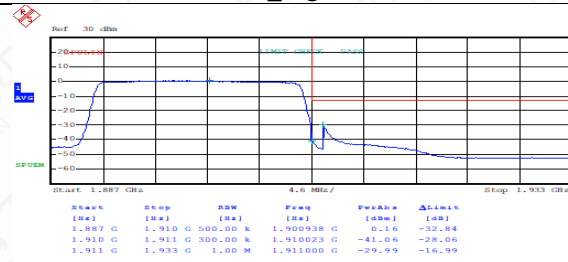


6.6.4 Measurement result



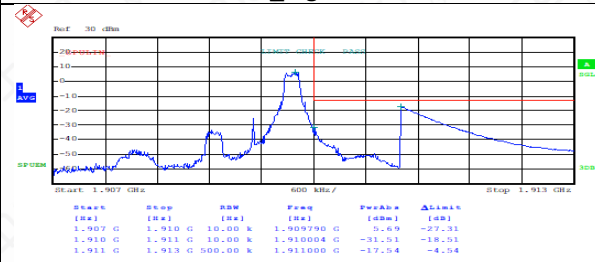


FDD02HighRange_20MHz_QPSK_FullRB
_High



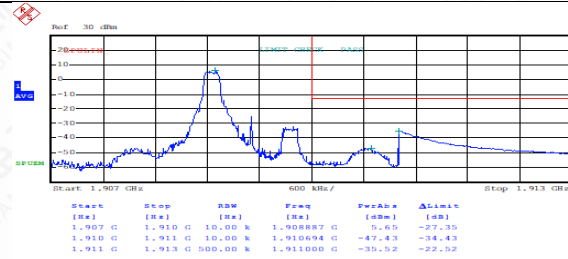
Date: 9.NOV.2023 13:51:54

FDD02HighRange_1.4MHz_QPSK_OneRB
_high



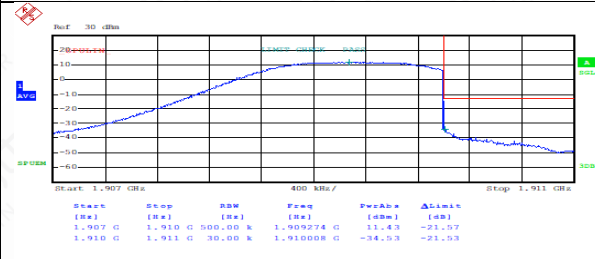
Date: 9.NOV.2023 13:52:58

FDD02HighRange_1.4MHz_QPSK_OneRB
_low



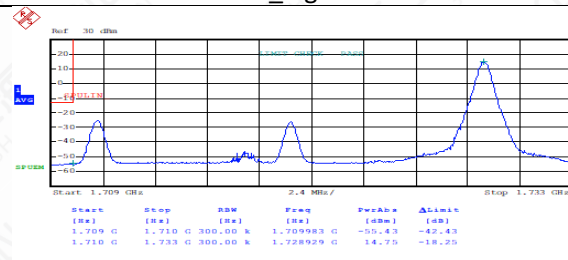
Date: 9.NOV.2023 13:54:01

FDD02HighRange_1.4MHz_QPSK_FullRB
_High



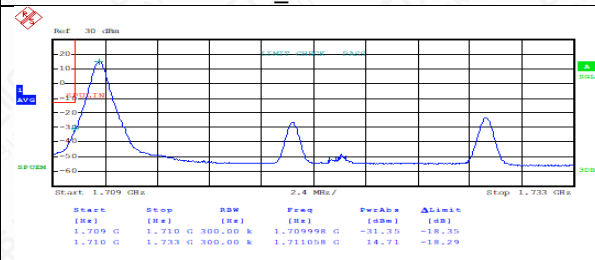
Date: 9.NOV.2023 13:55:03

FDD04LowRange_20MHz_QPSK_OneRB
_high

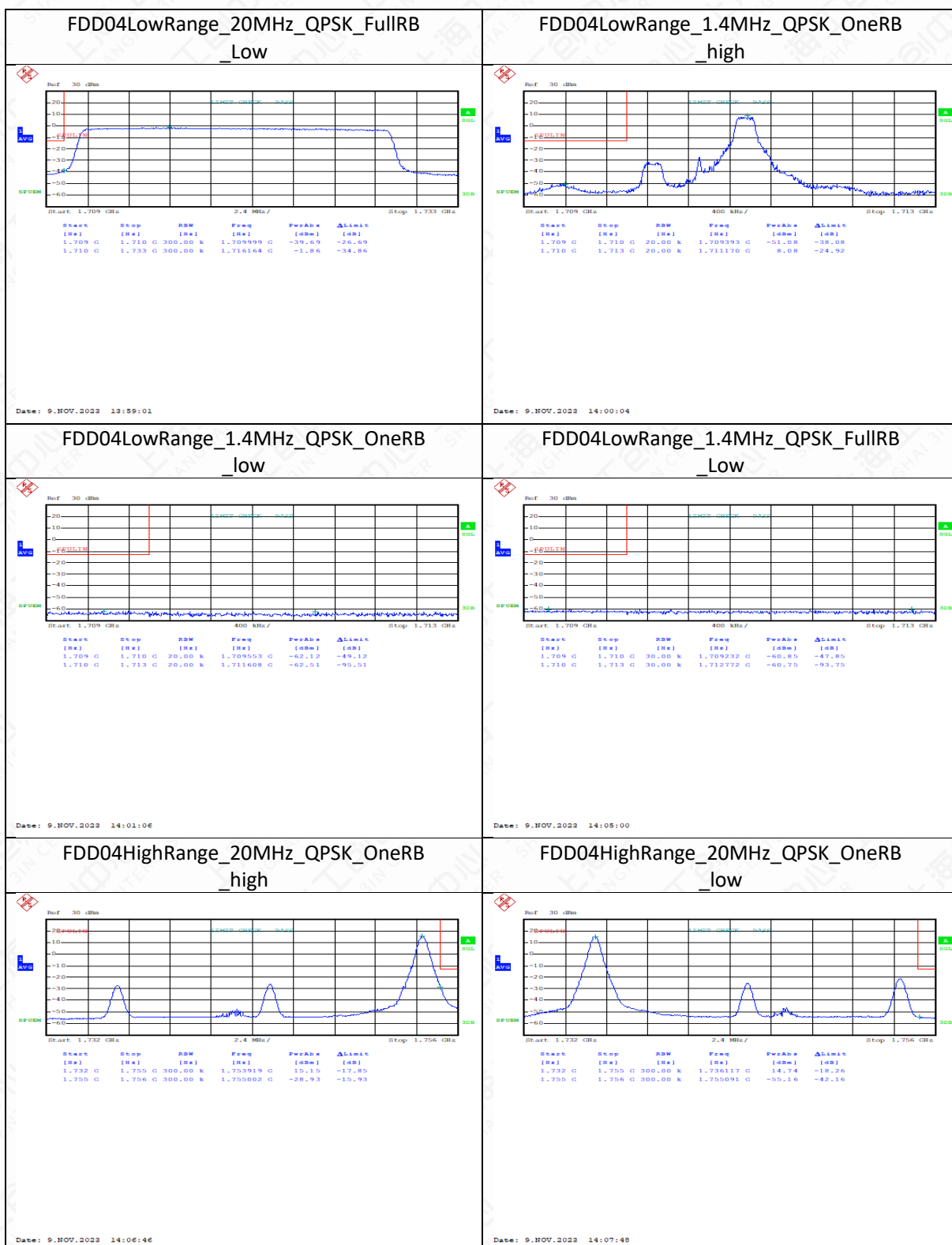


Date: 9.NOV.2023 13:56:57

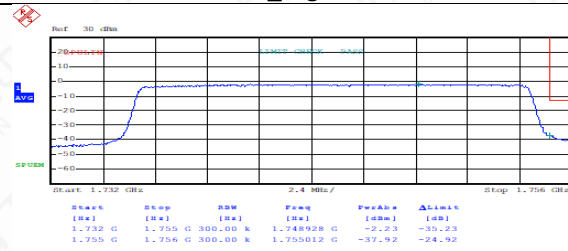
FDD04LowRange_20MHz_QPSK_OneRB
_low



Date: 9.NOV.2023 13:57:59

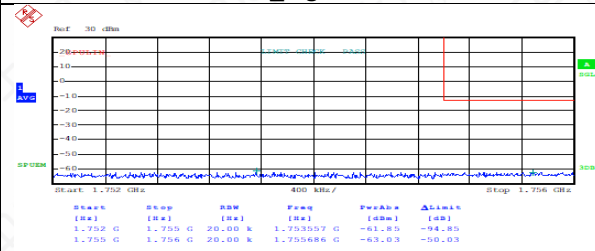


FDD04HighRange_20MHz_QPSK_FullRB
_High



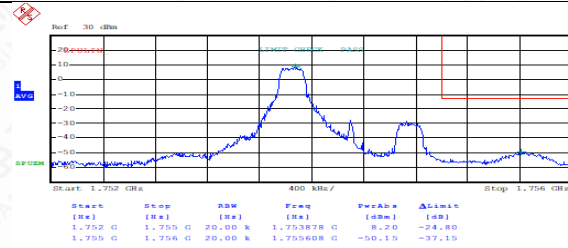
Date: 9.NOV.2023 14:08:51

FDD04HighRange_1.4MHz_QPSK_OneRB
_high



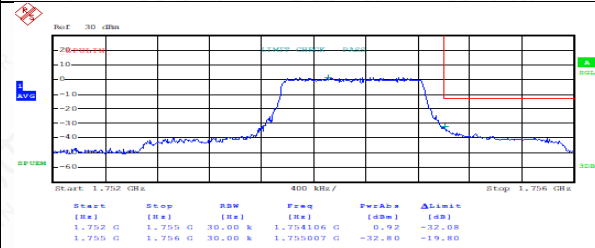
Date: 9.NOV.2023 14:12:47

FDD04HighRange_1.4MHz_QPSK_OneRB
_low



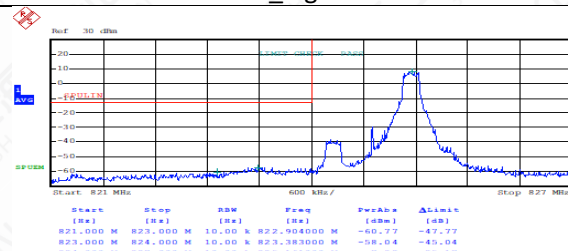
Date: 9.NOV.2023 14:14:33

FDD04HighRange_1.4MHz_QPSK_FullRB
_High



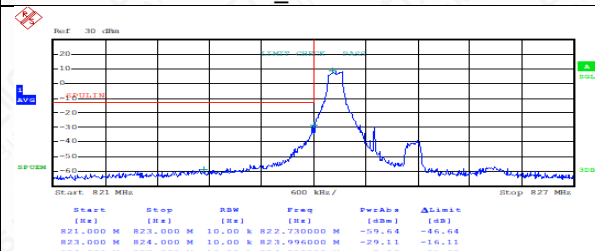
Date: 9.NOV.2023 14:15:35

FDD05LowRange_1.4MHz_QPSK_OneRB
_high

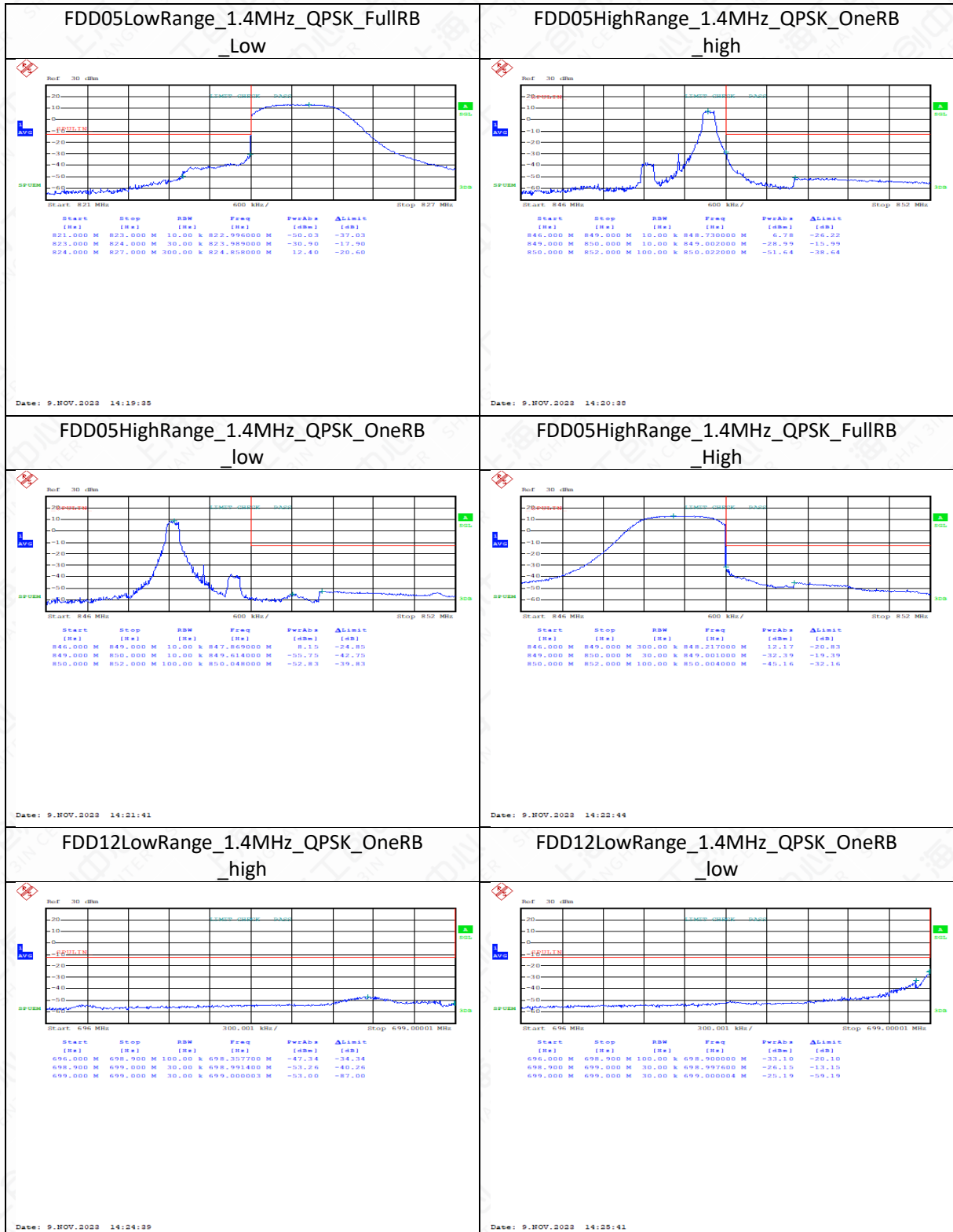


Date: 9.NOV.2023 14:17:30

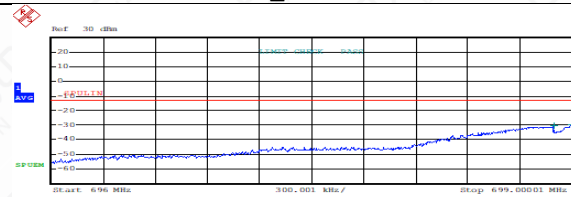
FDD05LowRange_1.4MHz_QPSK_OneRB
_low



Date: 9.NOV.2023 14:18:33

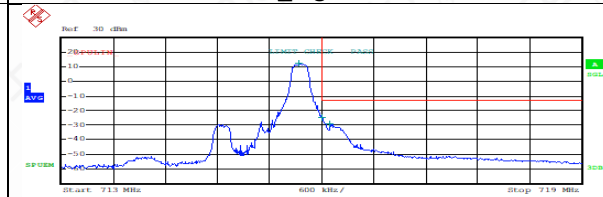


FDD12LowRange_1.4MHz_QPSK_FullRB
_Low



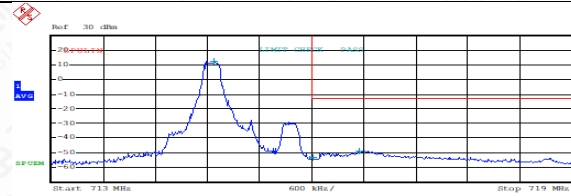
Date: 9.NOV.2023 14:26:44

FDD12HighRange_1.4MHz_QPSK_OneRB
_high



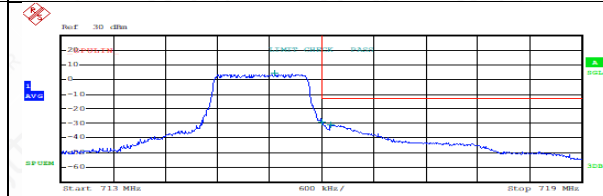
Date: 9.NOV.2023 14:27:47

FDD12HighRange_1.4MHz_QPSK_OneRB
_low



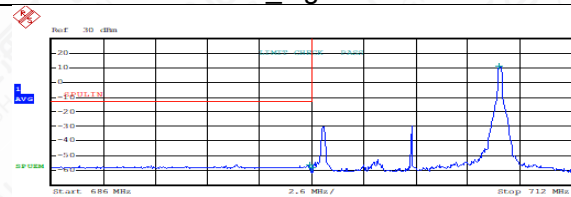
Date: 9.NOV.2023 14:28:50

FDD12HighRange_1.4MHz_QPSK_FullRB
_high



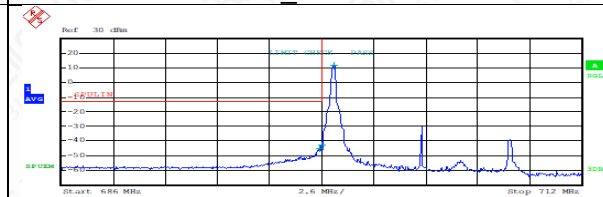
Date: 9.NOV.2023 14:29:53

FDD12LowRange_10MHz_QPSK_OneRB
_high



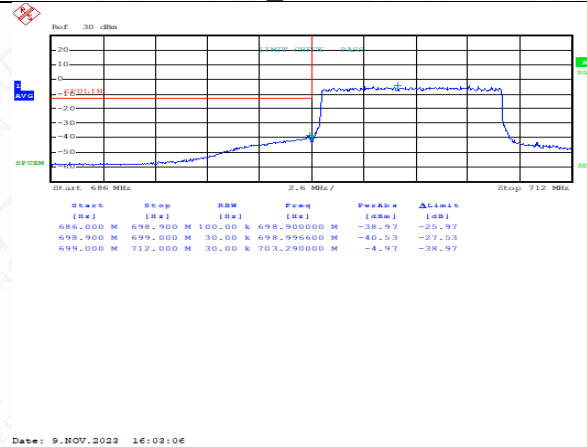
Date: 9.NOV.2023 16:01:00

FDD12LowRange_10MHz_QPSK_OneRB
_low

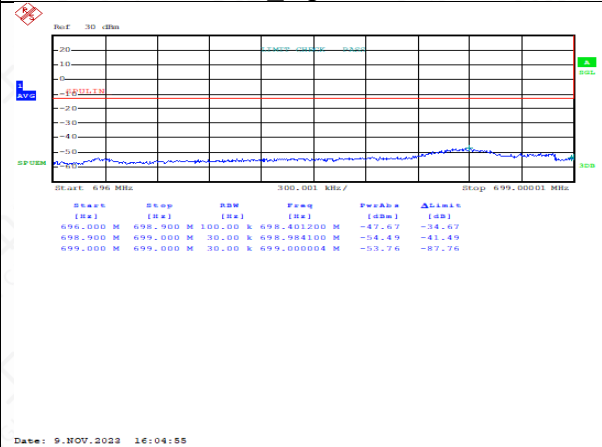


Date: 9.NOV.2023 16:02:03

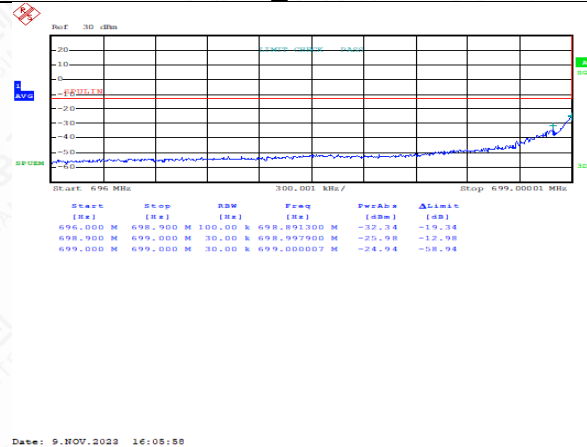
FDD12LowRange_10MHz_QPSK_FullRB
Low



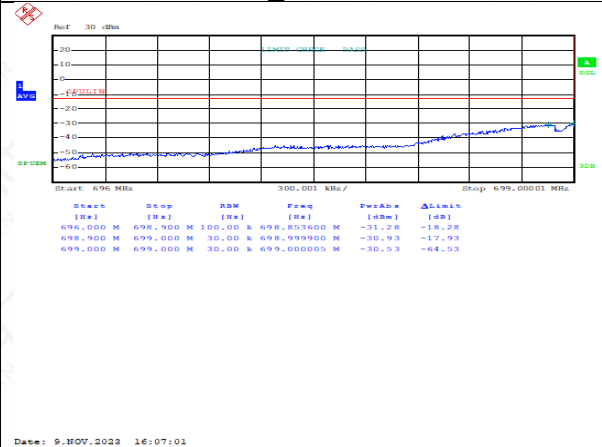
FDD12LowRange_1.4MHz_QPSK_OneRB
high



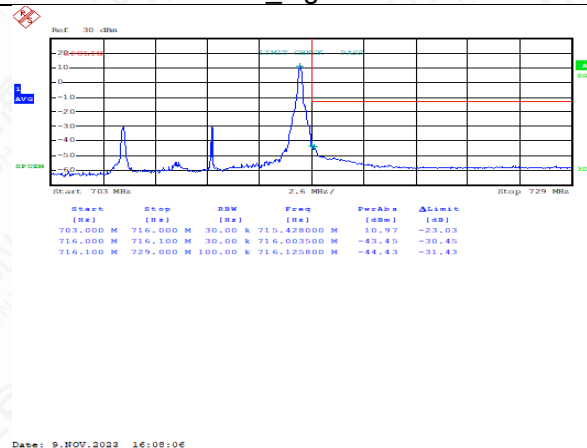
FDD12LowRange_1.4MHz_QPSK_OneRB
low



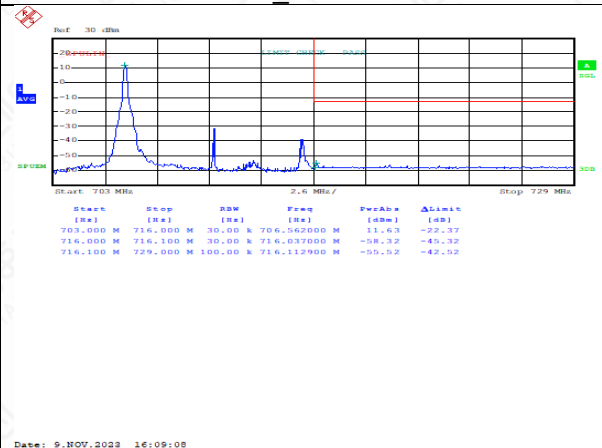
FDD12LowRange_1.4MHz_QPSK_FullRB
Low



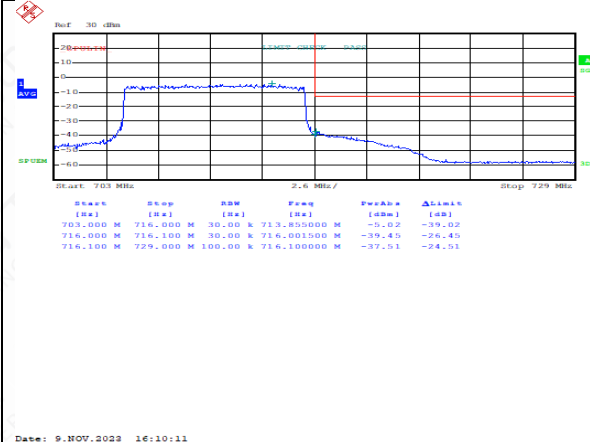
FDD12HighRange_10MHz_QPSK_OneRB
high



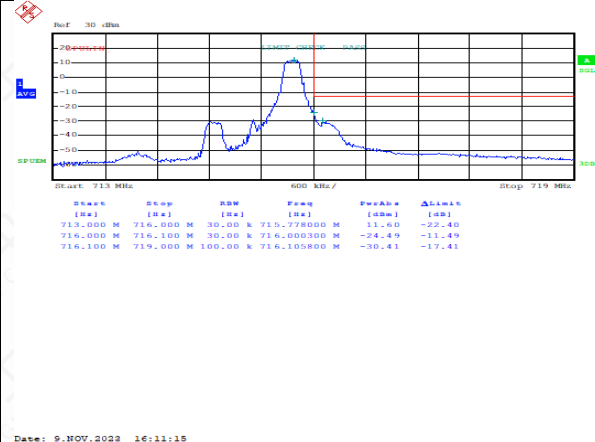
FDD12HighRange_10MHz_QPSK_OneRB
low



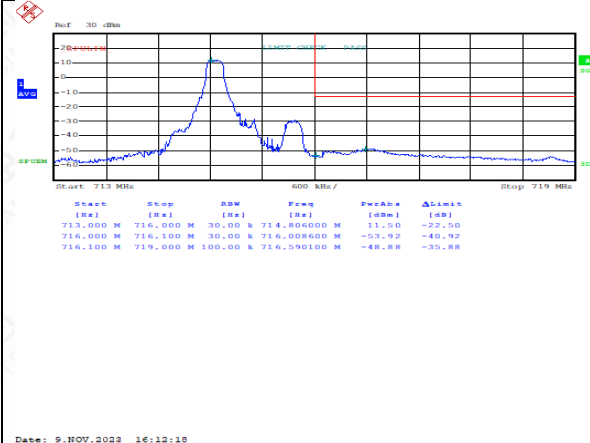
FDD12HighRange_10MHz_QPSK_FullRB_high



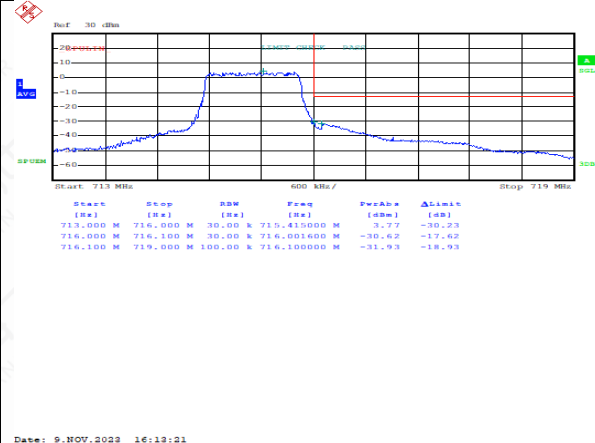
FDD12HighRange_1.4MHz_QPSK_OneRB_high



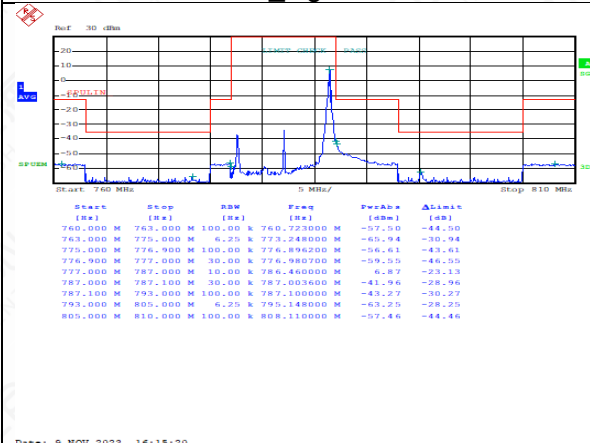
FDD12HighRange_1.4MHz_QPSK_OneRB_low



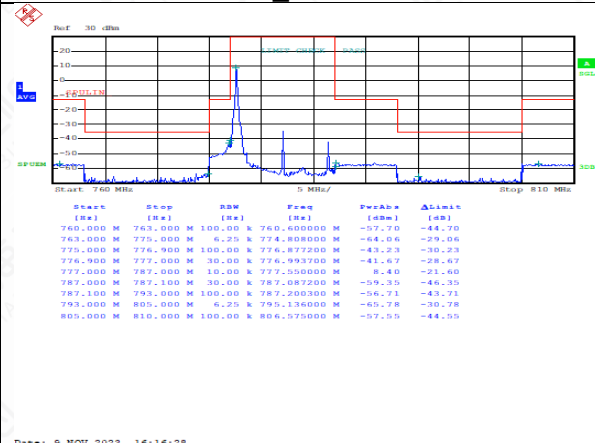
FDD12HighRange_1.4MHz_QPSK_FullRB_high

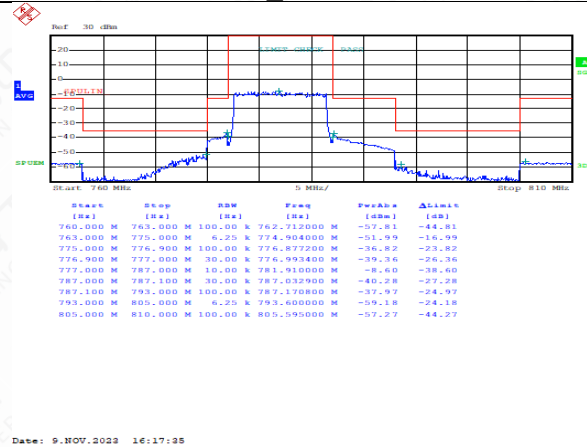


FDD13LowRange_10MHz_QPSK_OneRB_high

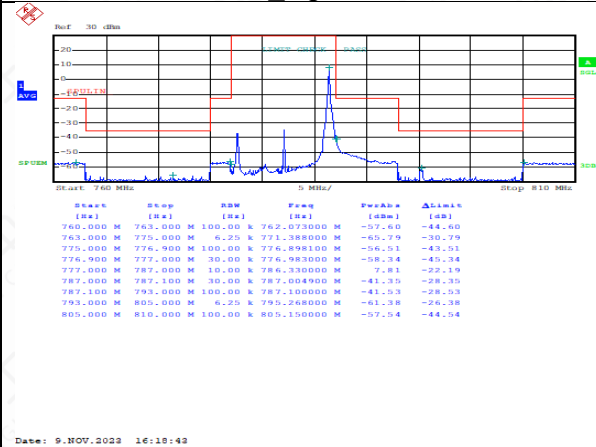


FDD13LowRange_10MHz_QPSK_OneRB_low

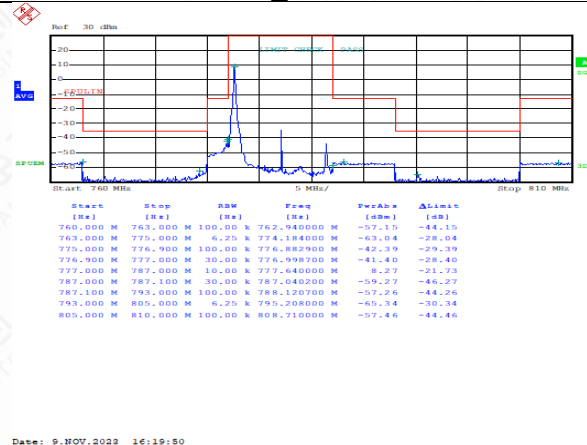


FDD13LowRange_10MHz_QPSK_FullRB
Low


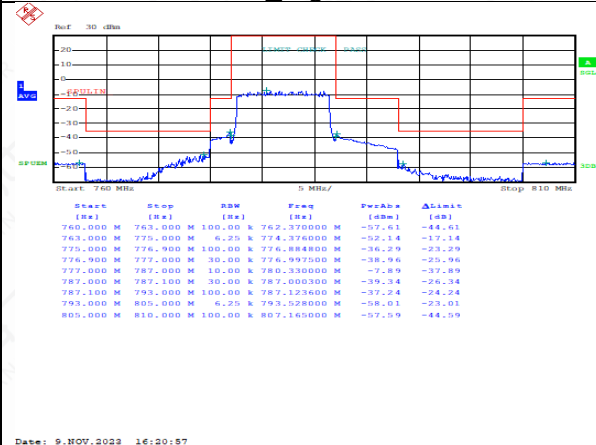
Date: 9.NOV.2023 16:17:35

FDD13HighRange_10MHz_QPSK_OneRB
high


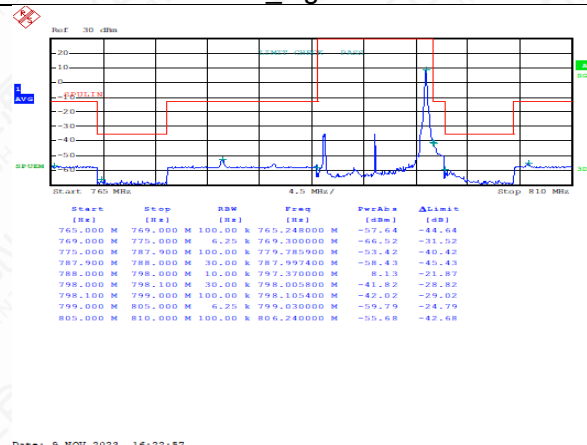
Date: 9.NOV.2023 16:18:40

FDD13HighRange_10MHz_QPSK_OneRB
low


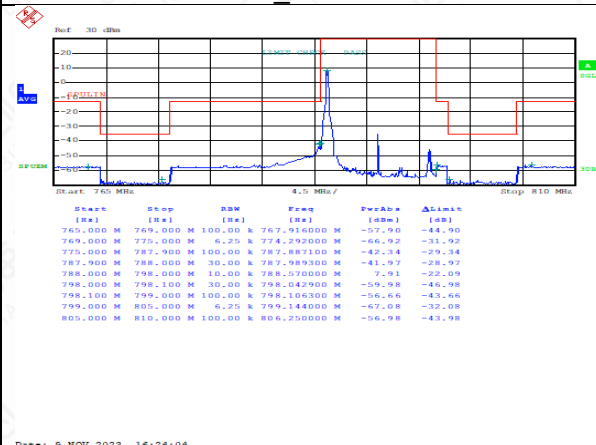
Date: 9.NOV.2023 16:19:50

FDD13HighRange_10MHz_QPSK_FullRB
High


Date: 9.NOV.2023 16:20:57

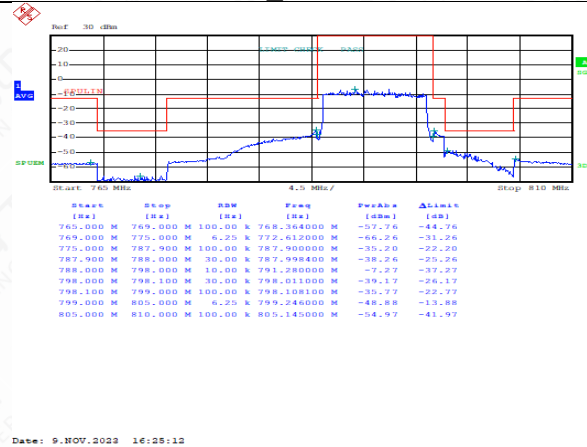
FDD14LowRange_10MHz_QPSK_OneRB
high


Date: 9.NOV.2023 16:22:57

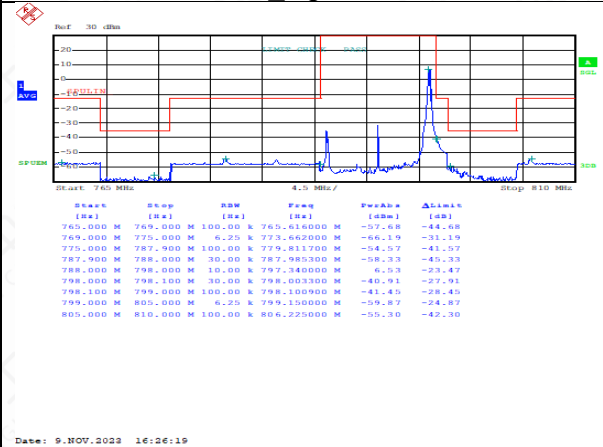
FDD14LowRange_10MHz_QPSK_OneRB
low


Date: 9.NOV.2023 16:24:04

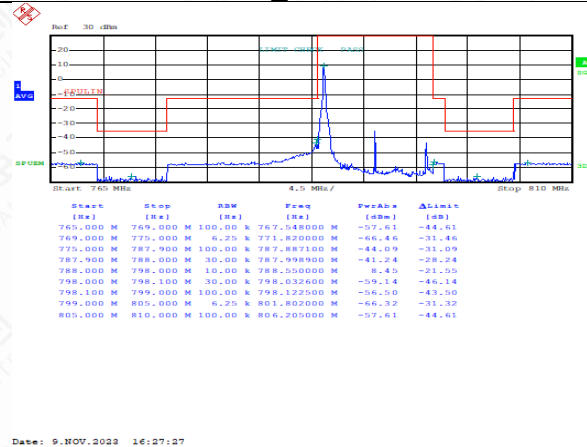
FDD14LowRange_10MHz_QPSK_FullRB Low



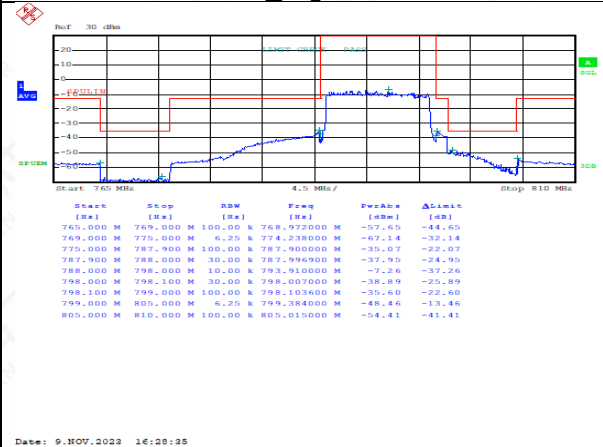
FDD14HighRange_10MHz_QPSK_OneRB high



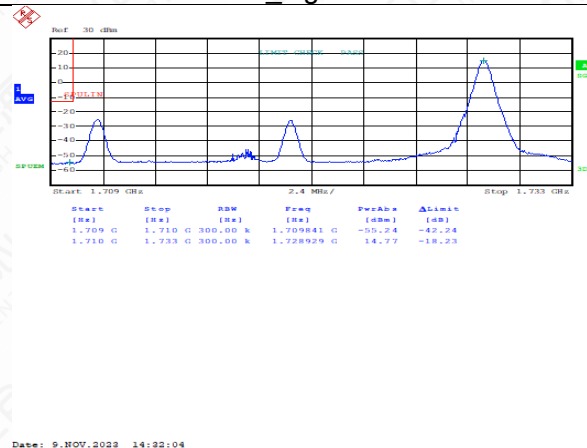
FDD14HighRange_10MHz_QPSK_OneRB low



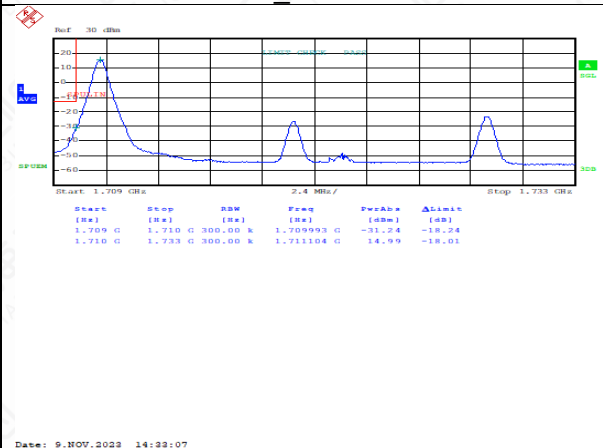
FDD14HighRange_10MHz_QPSK_FullRB High



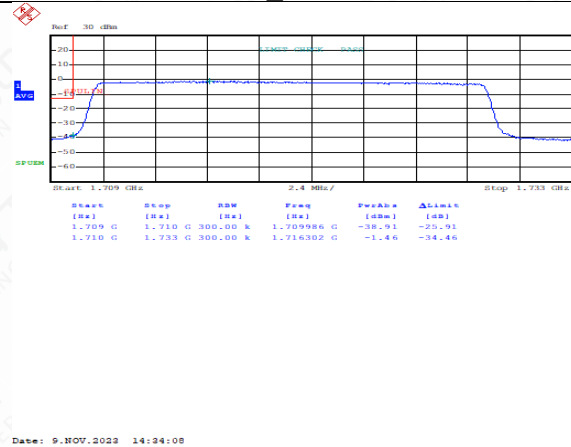
FDD66LowRange_20MHz_QPSK_OneRB high



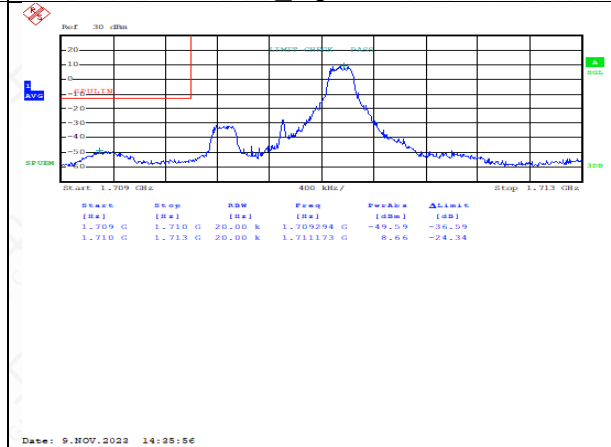
FDD66LowRange_20MHz_QPSK_OneRB low



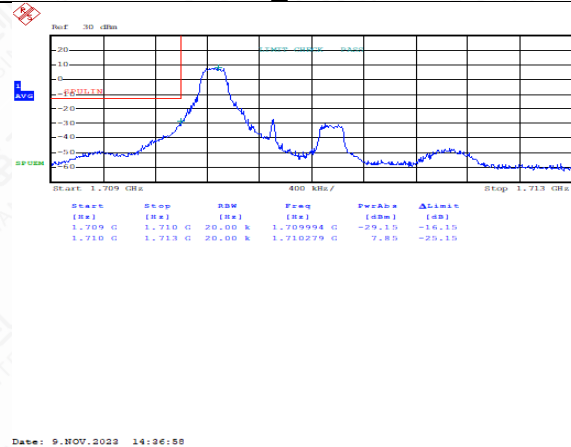
FDD66LowRange_20MHz_QPSK_FullRB
Low



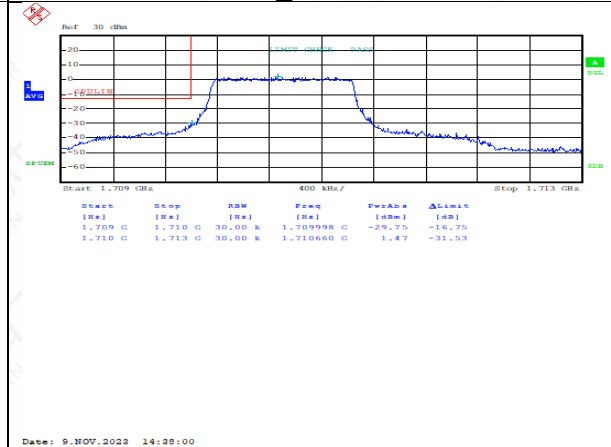
FDD66LowRange_1.4MHz_QPSK_OneRB
high



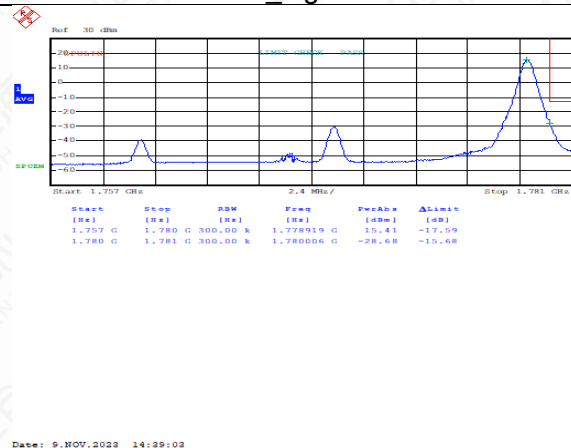
FDD66LowRange_1.4MHz_QPSK_OneRB
low



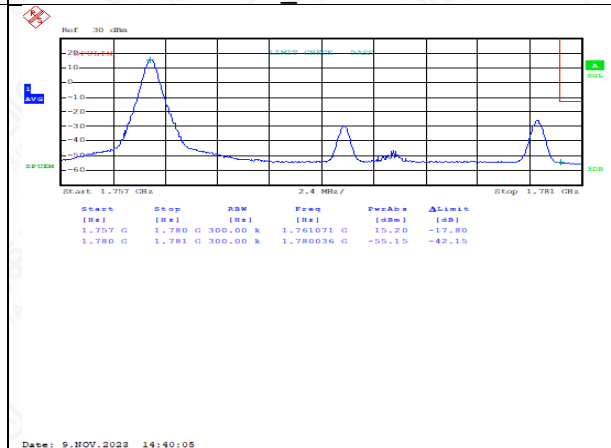
FDD66LowRange_1.4MHz_QPSK_FullRB
Low



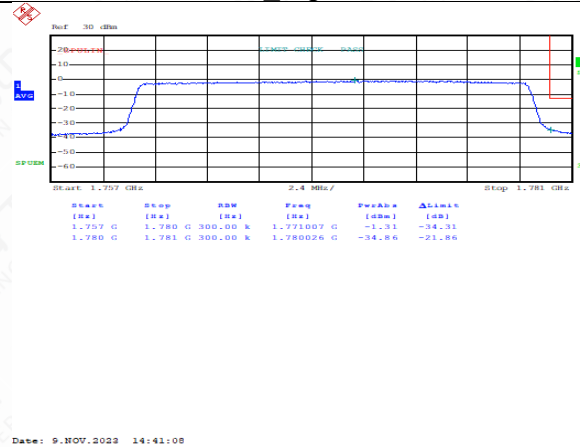
FDD66HighRange_20MHz_QPSK_OneRB
high



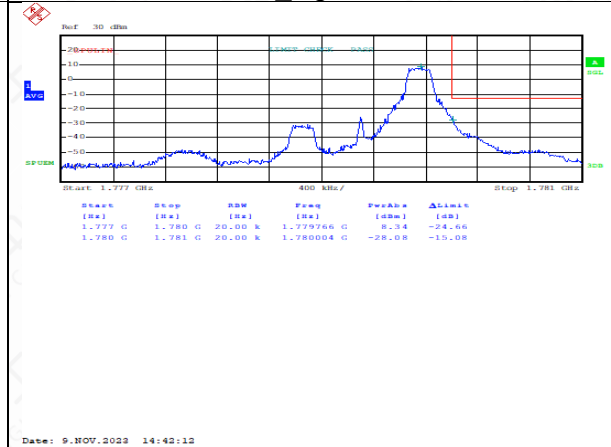
FDD66HighRange_20MHz_QPSK_OneRB
low



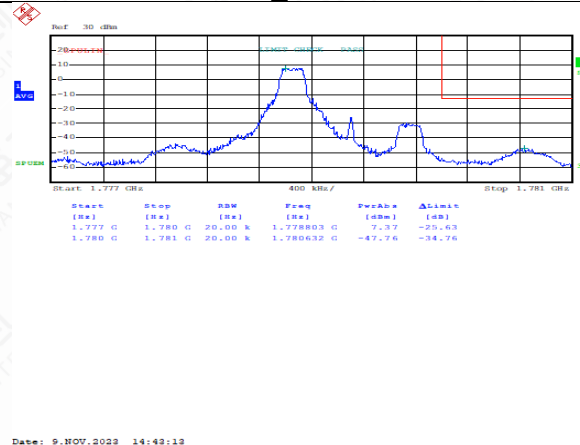
FDD66HighRange_20MHz_QPSK_FullRB_High



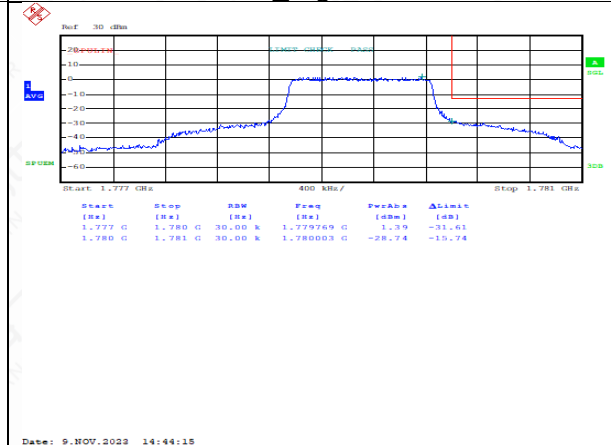
FDD66HighRange_1.4MHz_QPSK_OneRB_high



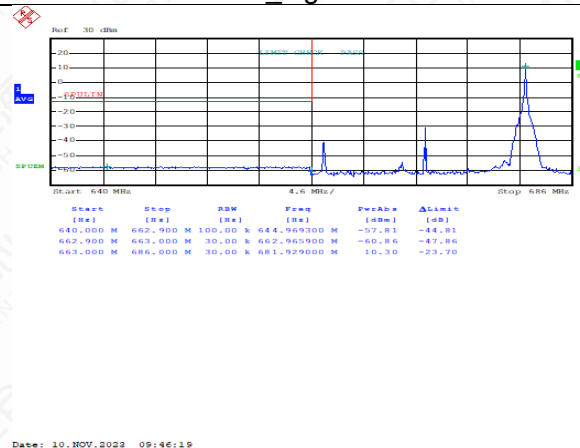
FDD66HighRange_1.4MHz_QPSK_OneRB_low



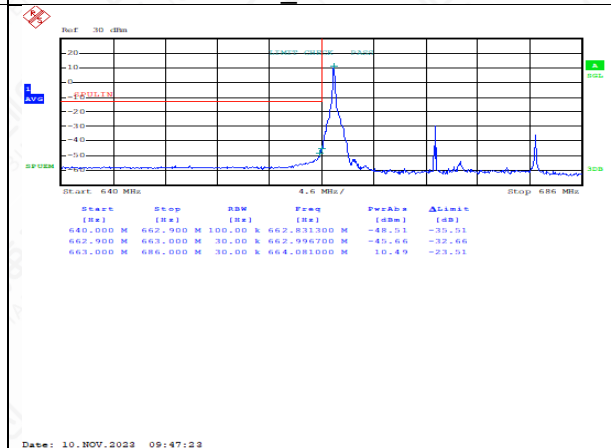
FDD66HighRange_1.4MHz_QPSK_FullRB_High



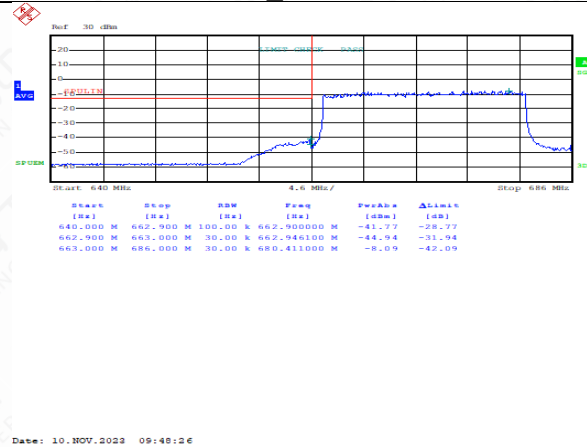
FDD71LowRange_20MHz_QPSK_OneRB_high



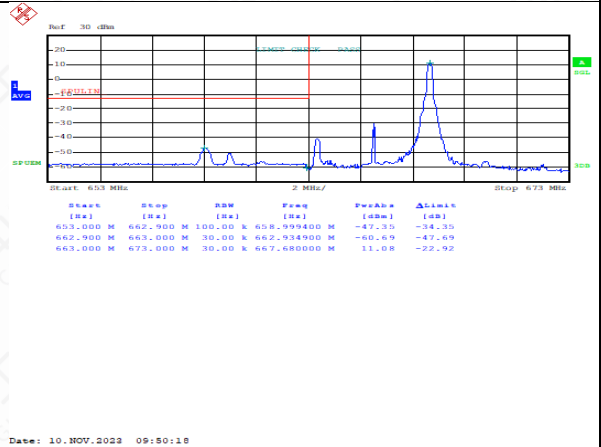
FDD71LowRange_20MHz_QPSK_OneRB_low



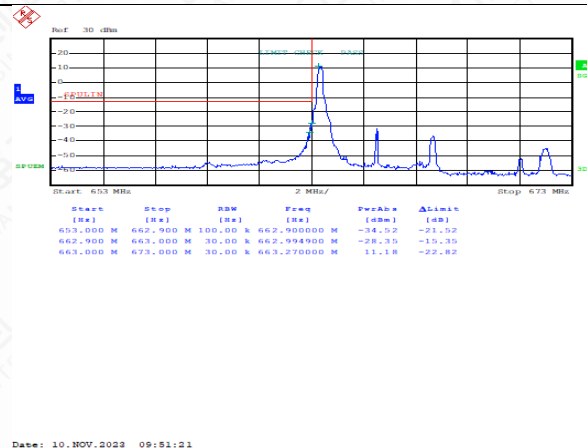
FDD71LowRange_20MHz_QPSK_FullIRB
Low



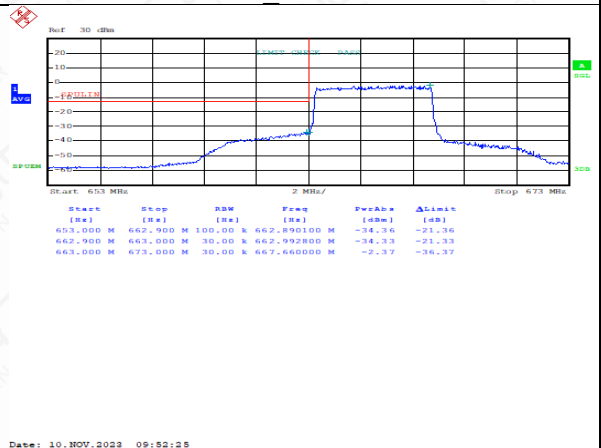
FDD71LowRange_5MHz_QPSK_OneRB_high



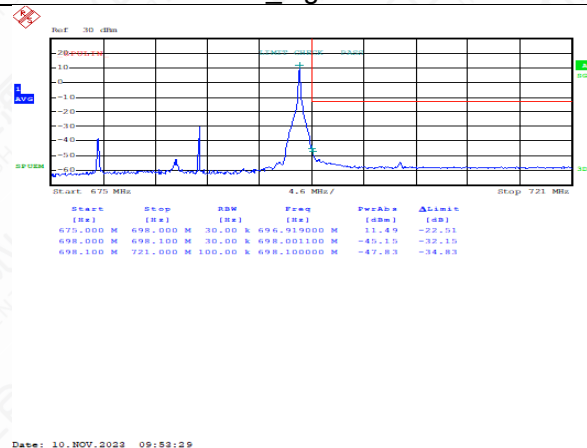
FDD71LowRange_5MHz_QPSK_OneRB_low



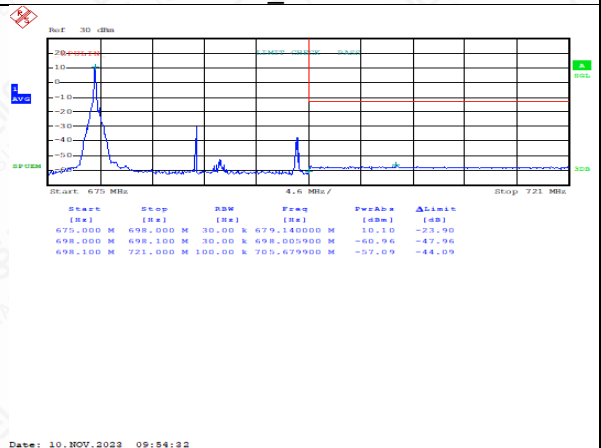
FDD71LowRange_5MHz_QPSK_FullIRB
Low



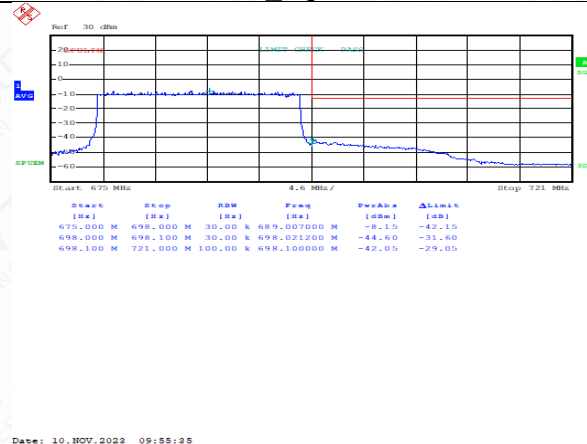
FDD71HighRange_20MHz_QPSK_OneRB
high



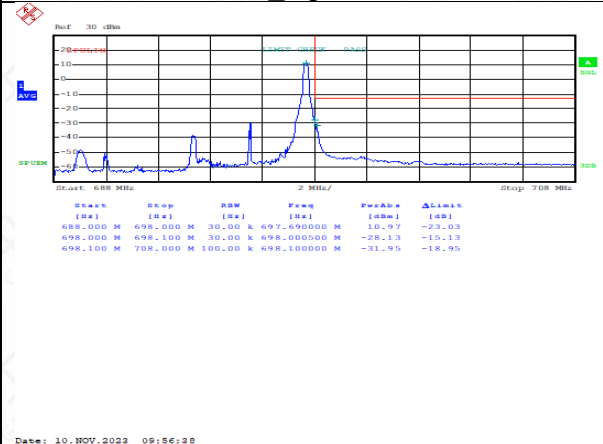
FDD71HighRange_20MHz_QPSK_OneRB
low



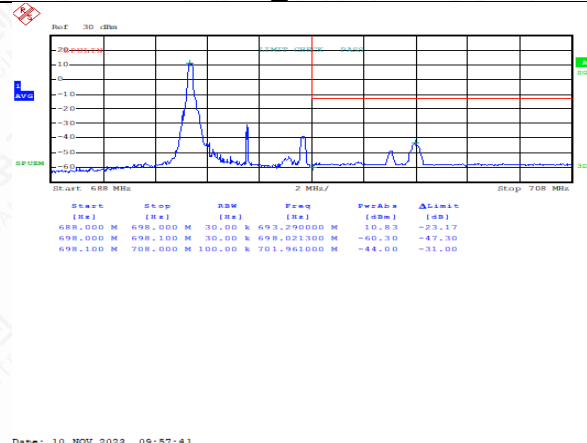
FDD71HighRange_20MHz_QPSK_FullRB_high



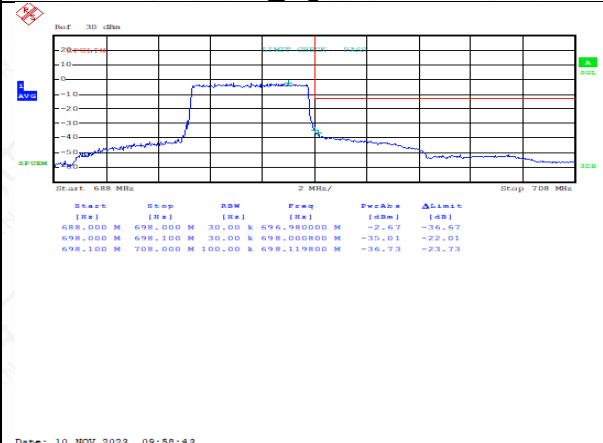
FDD71HighRange_5MHz_QPSK_OneRB_high



FDD71HighRange_5MHz_QPSK_OneRB_low



FDD71HighRange_5MHz_QPSK_FullRB_high



6.7 Conducted Spurious Emission

Reference

FR Part 2.1051/22.917/24.238(a) /27.53(c)/27.53(h)/ 27.53(a)/ 27.53(g)/27.53(m)/90.543(e)

6.7.1 Summary

22.917 *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

24.238(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below *the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.*

27.53(h) (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

27.53(c) (2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

27.53(g) For operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

90.543(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

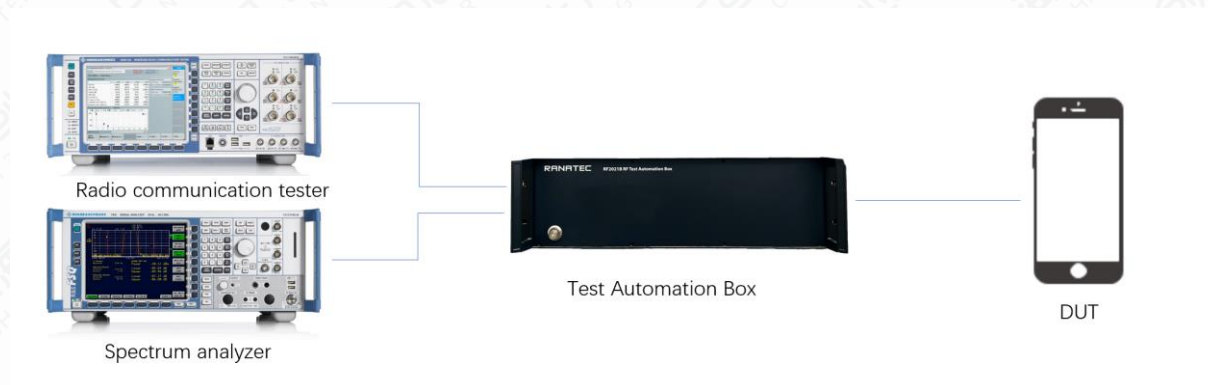
(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log(P)$ dB.

6.7.2 Method of Measurement

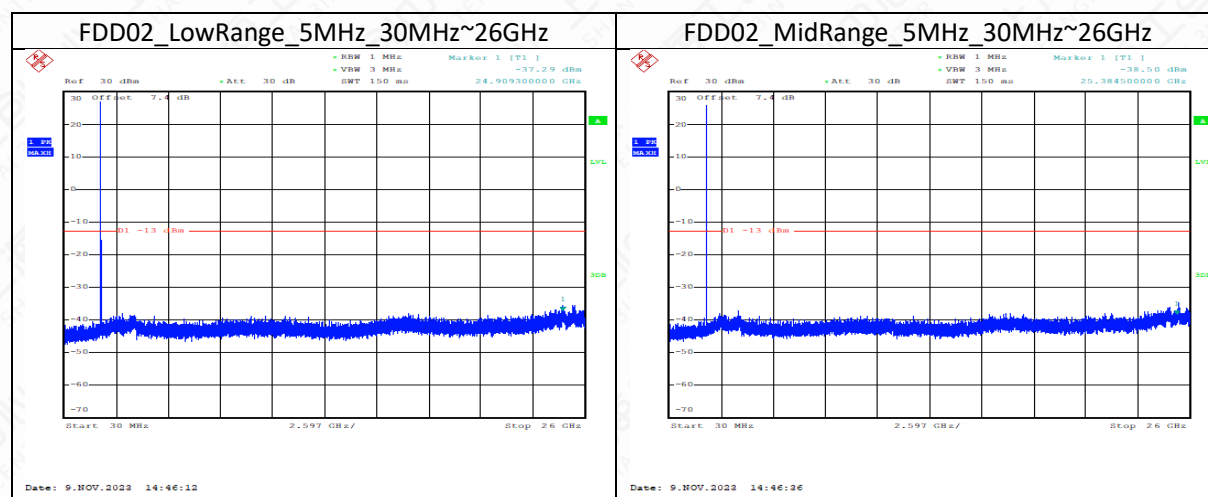
The following steps outline the procedure used to measure the conducted emissions from the EUT.

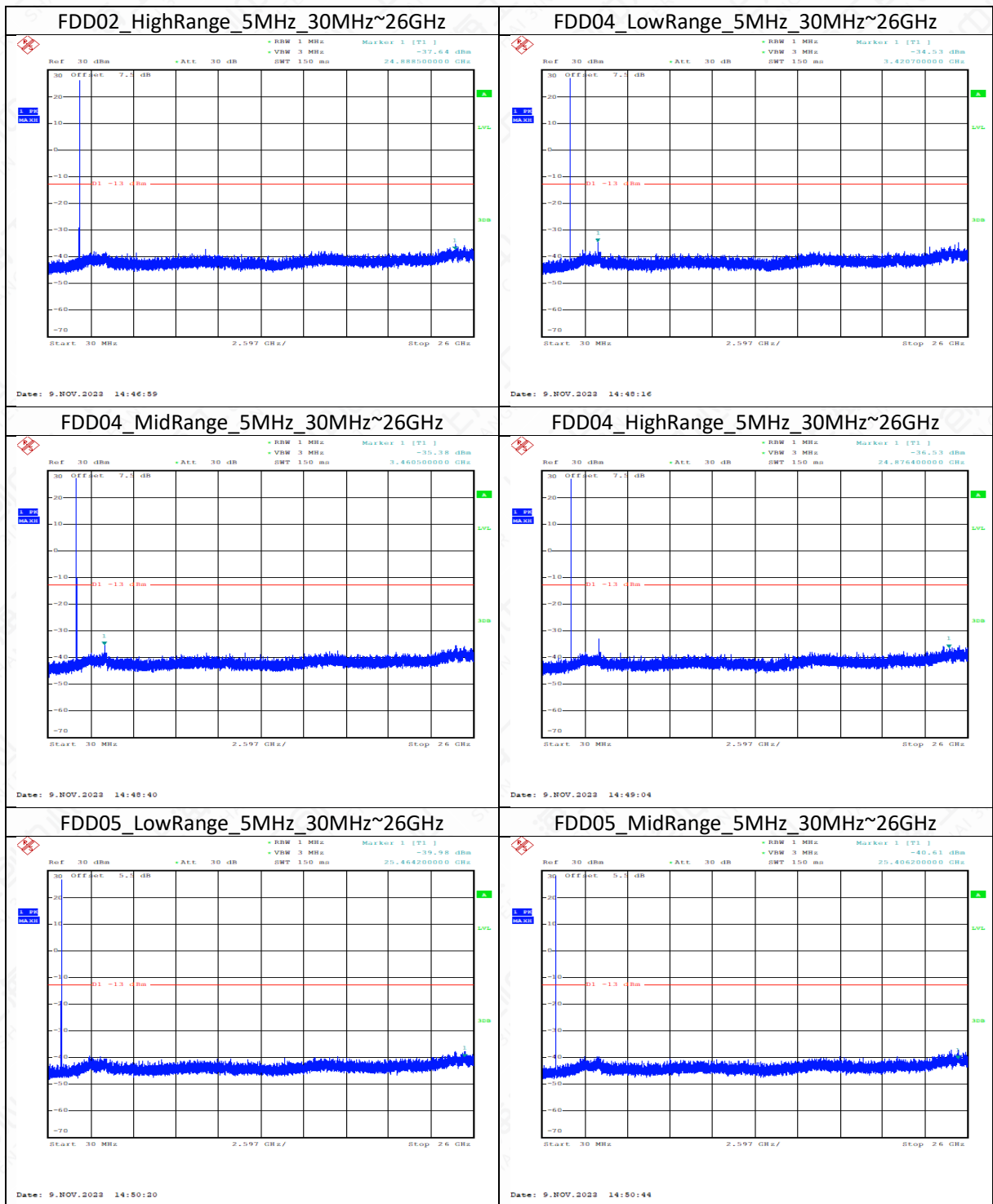
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

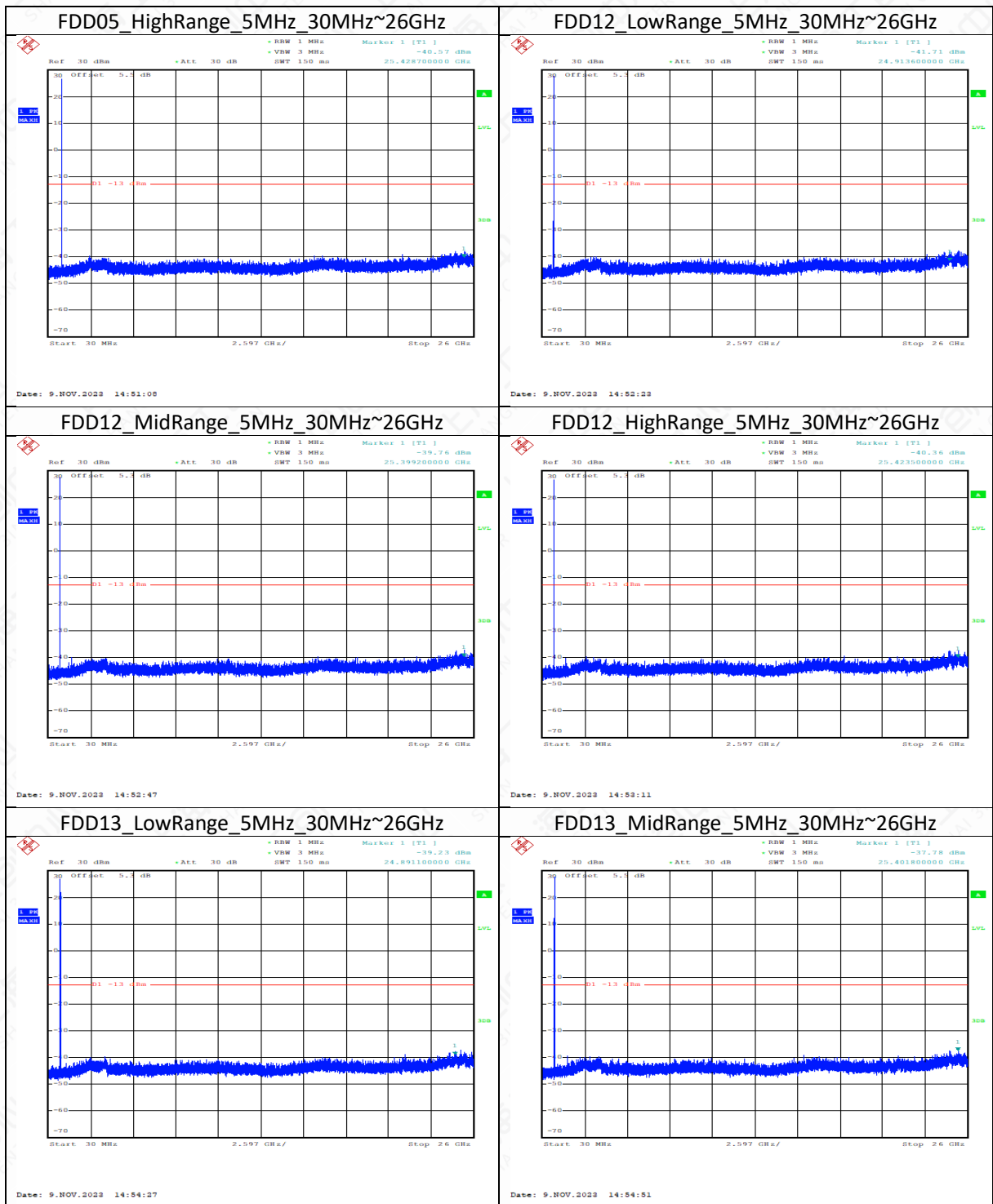
6.7.3 Test Setup

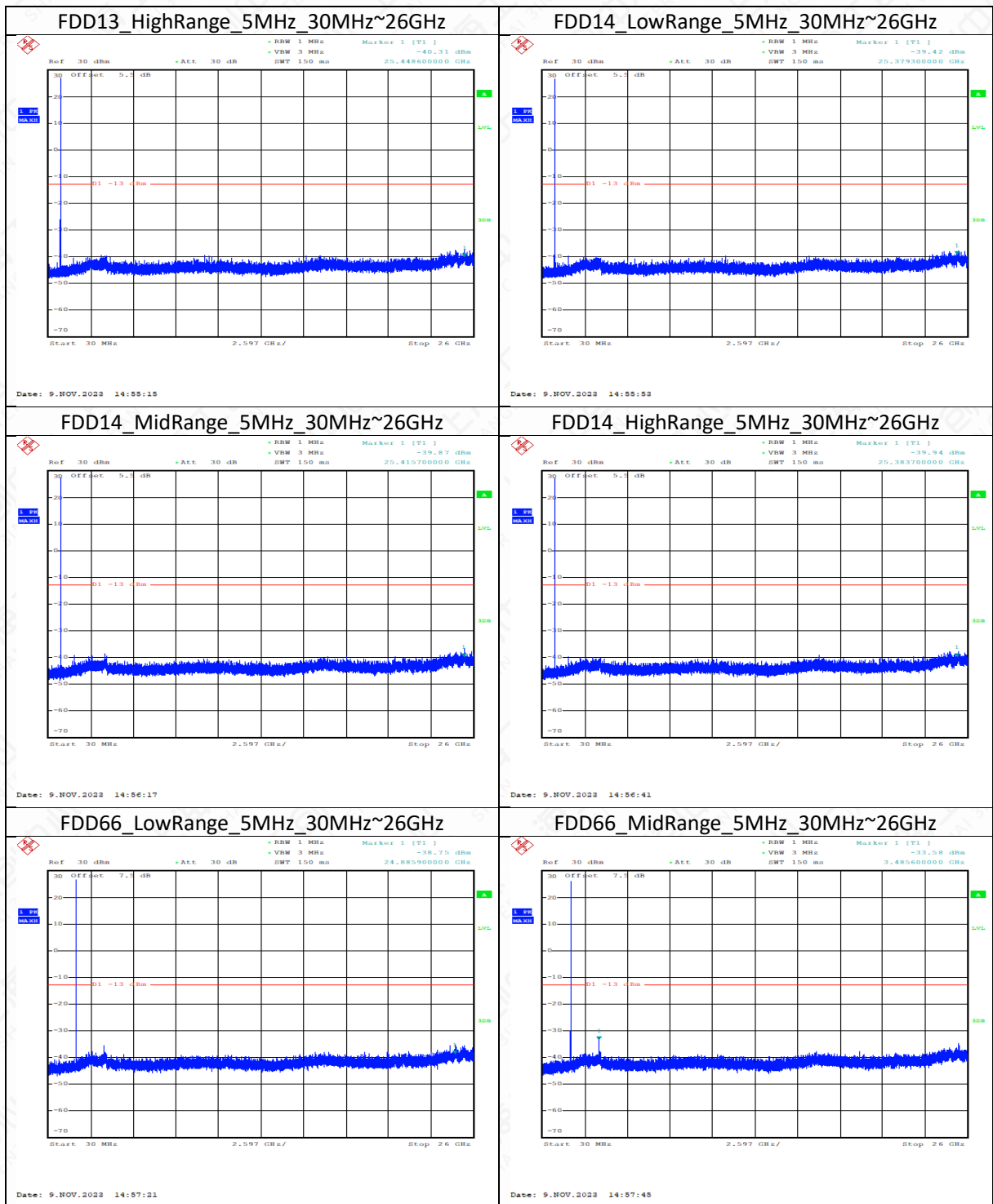


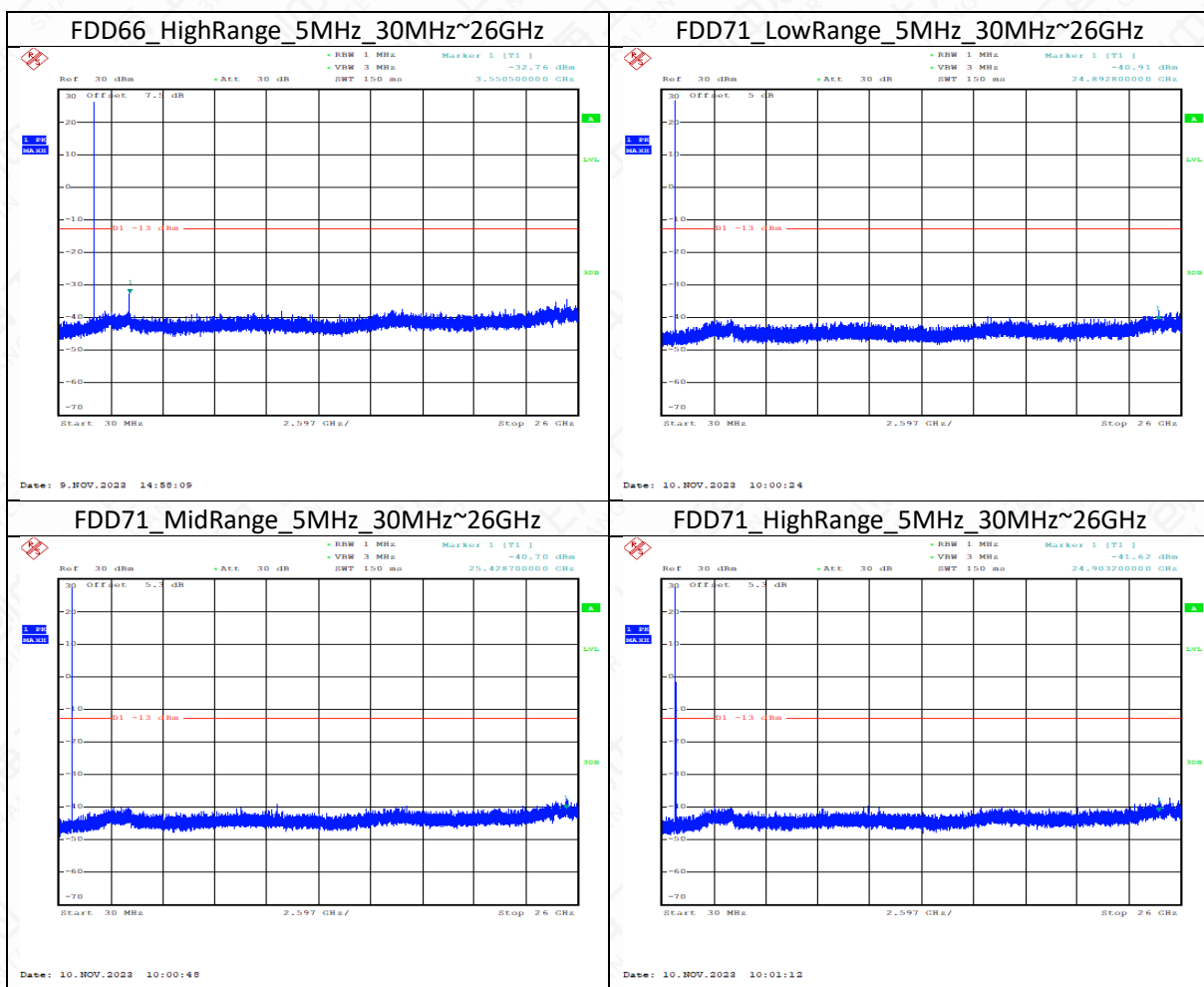
6.7.4 Measurement result











6.8 Peak-To-Average power Ratio

Reference

CFR Part 22.913(d)/24.232(d)/27.50

6.8.1 Summary

CFR Part 22.913(d)/24.232(d)/27.50 :The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB

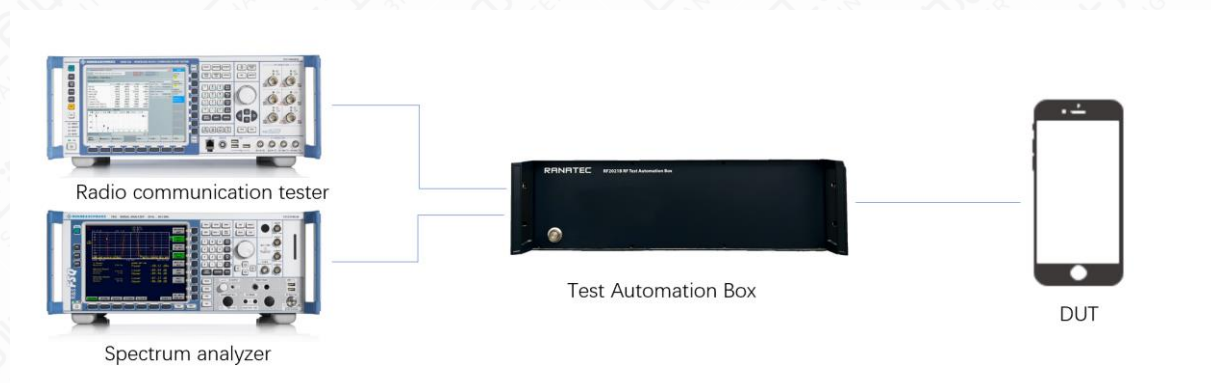
6.8.2 Method of Measurement

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7:

- Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Set the measurement interval to 1 ms
- Record the maximum PAPR level associated with a probability of 0.1%

6.8.3 Test Setup



6.8.4 Measurement results

Band	Range	BandWidth	RbMode	QPSK(dBm)	Q16(dBm)
FDD02	LowRange	20	fullRB	4.94	6.31
FDD02	MidRange	20	fullRB	4.97	6.22
FDD02	HighRange	20	fullRB	4.97	6.22

Band	Range	BandWidth	RbMode	QPSK(dBm)	Q16(dBm)
FDD04	LowRange	20	fullRB	4.90	6.19
FDD04	MidRange	20	fullRB	4.97	6.25
FDD04	HighRange	20	fullRB	5.00	6.22
FDD05	LowRange	10	fullRB	5.13	5.90
FDD05	MidRange	10	fullRB	5.06	5.96
FDD05	HighRange	10	fullRB	4.94	5.74
FDD12	LowRange	10	fullRB	5.16	5.99
FDD12	MidRange	10	fullRB	5.22	6.06
FDD12	HighRange	10	fullRB	5.19	5.99
FDD13	LowRange	10	fullRB	5.00	5.83
FDD13	MidRange	10	fullRB	4.97	5.80
FDD13	HighRange	10	fullRB	5.00	5.83
FDD14	LowRange	10	fullRB	4.90	5.71
FDD14	MidRange	10	fullRB	4.90	5.74
FDD14	HighRange	10	fullRB	4.87	5.74
FDD66	LowRange	20	fullRB	4.87	6.22
FDD66	MidRange	20	fullRB	5.00	6.19
FDD66	HighRange	20	fullRB	5.00	6.19
FDD71	LowRange	20	fullRB	5.00	6.28
FDD71	MidRange	20	fullRB	4.97	6.19
FDD71	HighRange	20	fullRB	4.97	6.19

Annex A: Revised History

Version	Revised Content
V00	Initial

Annex B: Accreditation Certificate



END OF REPORT