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InterLab®

Final Report on

TOBY-L4006
HW:294CA0, SW:40.34 (SVN:02)
FCC ID: XPY1EHQ37NN
IC: 8595A-1EHQ37NN

Report Reference: MDE_UBLOX_1717_FCCc_rev01 acc. to:
FCC Part 22, Subpart H, Part 24, subpart E, Part 27 Subpart C

Type of Report:

Date: October 11, 2018

Test Laboratory:
7layers GmbH
Borsigstraße 11
40880 Ratingen
Germany

DAkkS Deutsche Akkreditierungsstelle D-PL-12140-01-00

1 Administrative Data

1.1 Project Data

Project Responsible:	Sören Berentzen
Date Of Test Report:	2018/10/17
Date of first test:	2018/09/06
Date of last test:	2018/09/20

1.2 Applicant Data

Company Name:	u-blox AG
Street:	Zürcherstrasse 68, CH-8800 Thalwil
Country:	Switzerland
Contact Person:	Mr. Giulio Comar
Function:	Certification Manager
Department:	Cellular Product Certification
Phone:	+41 44 722 7462
Fax:	+41 44 722 7447
E-Mail:	giulio.comar@u-blox.com

1.3 Test Laboratory Data

The following list shows all places and laboratories involved for test result generation:

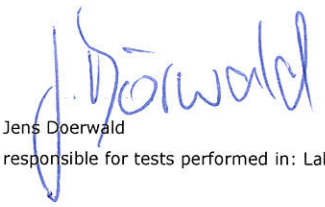
7 layers DE

Company Name :	7layers GmbH
Street :	Borsigstrasse 11
City :	40880 Ratingen
Country :	Germany
Contact Person :	Mr. Michael Albert
Phone :	+49 2102 749 201
Fax :	+49 2102 749 444
E Mail :	Michael.Albert@7Layers.com

Laboratory Details

Lab ID	*Identification*	*Responsible*	*Accreditation Info*
Lab 1	Radiated Emissions	Mr. Marco Kullik Mr. Jens Dörwald	DAkkS-Registration no. D-PL-12140-01-00 ISEDC OATS registration number 3699A-1 FCC Test firm number: 929146 FCC Designation Number: DE0015
Lab 2	Radio Lab	Mr. Dobrin Dobrinov Mr. Daniel Gall	DAkkS-Registration no. D-PL-12140-01-00 ISEDC OATS registration number 3699A-1 FCC Test firm number: 929146 FCC Designation Number: DE0015

1.4 Signature of the Testing Responsible



Jens Doerwald
responsible for tests performed in: Lab 1, Lab 2

1.5 Signature of the Accreditation Responsible

Accreditation scope responsible person
responsible for Lab 1, Lab 2

2 Test Object Data

2.1 General OUT Description

The following section lists all OUTs (Object's Under Test) involved during testing.

OUT: TOBY-L4006

Type / Model / Family:	TOBY-L4006 HW:294CA0, SW:40.34 (SVN:02) FCC ID: XPY1EHQ37NN IC: 8595A-1EHQ37NN
Product Category:	Module
Manufacturer:	
Company Name:	see applicant data
Contact Person:	see applicant data

Parameter List:

Parameter name	*Value*
Parameter for Scope FCC_v2:	
AC Power Supply	120V / 60Hz - for AC DC Adapter
Antenna gain 1700 band	not specified (dBi)
Antenna gain 1900 band	not specified (dBi)
Antenna gain 850 band	not specified (dBi)
highest channel	251 (848.8MHz) for GSM850, 810 (1909.8MHz) for GSM1900, 4233 (846.6MHz) for FDD5, 9538 (1907.6MHz) for FDD2, 1513 (1752.6MHz) for FDD4
lowest channel	128 (824.2MHz) for GSM850, 512 (1850.2MHz) for GSM1900, 4132 (826.4MHz) for FDD5, 9262 (1852.4MHz)for FDD2, 1312 (1712.4MHz) for FDD4
mid channel	190 (836.6MHz) for GSM850, 661 (1880.0MHz) for GSM1900, 4183 (836.6MHz) for FDD5, 9400 (1880MHz) for FDD2, 1412 (1732.4MHz)/1450 (1740.0MHz) for FDD4

2.2 Detailed Description of OUT Samples

Sample : ba01

OUT Identifier	TOBY-L4006		
Sample Description	Standard sample		
Serial No.	355958080034242		
HW Status	294.C.A0		
SW Status	40.34		
Low Voltage	3.3 V	*Low Temp.*	-20 °C
High Voltage	4.4 V	*High Temp.*	55 °C
Nominal Voltage	3.8 V	*Normal Temp.*	25 °C

2.3 OUT Features

Features for OUT: TOBY-L4006

Designation	*Description*	*Allowed Values*	*Supported Value(s)*
Features for scope: FCC_v2			
AC	The OUT is powered by or connected to AC Mains		
Eant	removable antenna supplied and type tested with the radio equipment, designed as an indispensable part of the equipment		
eFDD2			
eFDD4			
eFDD5			
eFDD7			
eFDD12			
eFDD13			
FDD2	EUT supports UMTS FDD2 in the band 1850 MHz - 1910 MHz		
FDD4	EUT supports UMTS FDD4 in the band 1710 MHz - 1755 MHz		
FDD5	EUT supports UMTS FDD5 in the band 824 MHz - 849 MHz		
HSDPA-FDD2	EUT supports UMTS FDD2 HSDPA in the band 1850 MHz - 1910 MHz		
HSDPA-FDD4	EUT supports UMTS FDD4 HSDPA in the band 1710 MHz - 1755 MHz		
HSDPA-FDD5	EUT supports UMTS FDD5 HSDPA in the band 824 MHz - 849 MHz		
HSUPA-FDD2	EUT supports UMTS FDD2 HSUPA in the band 1850 MHz - 1910 MHz		
HSUPA-FDD4	EUT supports UMTS FDD4 HSUPA in the band 1710 MHz - 1755 MHz		
HSUPA-FDD5	EUT supports UMTS FDD5 HSUPA in the band 824 MHz - 849 MHz		
PCS1900	EUT supports PCS1900 band 1850MHz - 1910MHz		
TantC	temporary antenna connector, which may be only built-in for testing, designed as an example part of the equipment		

2.4 Setups used for Testing

For each setup a relation is given to determine if and which samples and auxiliary equipment is used.
The left side list all OUT samples and the right side lists all auxiliary equipment for the given setup.

Setup No.	*List of OUT samples*		*List of auxiliary equipment*	
	Sample No.	*Sample Description*	*AE No.*	*AE Description*
ba01	**(ba01)**			
	Sample: ba01	Standard sample		

3 Results

3.1 General

Documentation of tested devices:	Available at the test laboratory.
Interpretation of the test results:	The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device conforms to the applied standard. In cases where 'Declaration' is printed, the required documents are available in the manufacturers product documentation. In cases where 'not applicable' is printed, the test case requirements are not relevant to the specific equipment implementation.
Note:	1. All tests are performed under environmental conditions within the requirements of the specifications. Environmental conditions are available at the laboratory. 2. This report is for regression testing pursuant to hardware change made to the product in order to show that the hardware changes made to the device do not have a negative impact on the RF characteristics previously reported in the test report referenced by: MDE_UBLOX_1717_FCCa. Please contact the manufacturer for additional information regarding the specific hardware changes. 3. This report replaces version MDE_UBLOX_1717_FCCc, dated 2018-10-11. The version of tested software was corrected.

3.2 List of the Applicable Body

(Bodies for Scope: FCC_v2)

Designation	*Description*
FCC47CFRChIPART22PUBLIC MOBILE SERVICES	Part 22, Subpart H - Cellular Radiotelephone Service
FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES	Part 24, Subpart E - Broadband PCS
FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	Part 27, Subpart C - Technical Standards

3.3 List of Test Specification

Test Specification:	**FCC part 2 and 22**
Version	10-1-17 Edition
Title:	PART 2 - GENERAL RULES AND REGULATIONS PART 22 - Subpart H, PUBLIC MOBILE SERVICES

Applicable Errata	*Activate Date*	*Comment*
ANSI C63.4-2003	04/1/30	

Test Specification:	**FCC part 2 and 24**
Version	10-1-17 Edition
Title:	PART 2 - GENERAL RULES AND REGULATIONS PART 24 - Subpart E, PERSONAL COMMUNICATIONS SERVICES

Applicable Errata	*Activate Date*	*Comment*
ANSI C63.4-2003	04/1/30	

Test Specification:	**FCC part 2 and 27**
Version	10-1-17 Edition
Title:	PART 2 - GENERAL RULES AND REGULATIONS PART 27 - Subpart C, MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

Applicable Errata	*Activate Date*	*Comment*
ANSI C63.4-2003	04/1/30	

3.4 Summary

Test Case Identifier / Name *Test (condition)*	*Result*	*Date of Test*	*Lab Ref.*	*Setup*
Test Specification: FCC part 2 and 22				
22.1 RF Power Output §2.1046, §22.913				
22.1; _RF Power Output Summary §2.1046, §22.913	Passed	2018/09/20	Lab 2	ba01
22.4 Field strength of spurious radiation §2.1053, §22.917				
22.4; Frequency Band = eFDD5, Mode = QPSK 5MHz, Channel = 20525, Frequency = 836.5MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
22.5 Emission and Occupied Bandwidth §2.1049, §22.917				
22.5; _Emission and Occupied Bandwidth Summary §2.1049, §22.917	Passed	2018/09/20	Lab 2	ba01
22.6 Band edge compliance §2.1053, §22.917				
22.6; _Band edge compliance Summary §2.1053, §22.917	Passed	2018/09/20	Lab 2	ba01
Test Specification: FCC part 2 and 24				
24.1 RF Power Output §2.1046, §24.232				
24.1; RF Power Output Summary §2.1046, §24.232	Passed	2018/09/20	Lab 2	ba01
24.4 Field strength of spurious radiation §2.1053, §24.238				
24.4; Frequency Band = eFDD2, Mode = QPSK 5MHz, Channel = 18900, Frequency = 1880MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
24.5 Emission and Occupied Bandwidth §2.1049, §24.238				
24.5; Emission and Occupied Bandwidth Summary §2.1049, §24.238	Passed	2018/09/20	Lab 2	ba01
24.6 Band edge compliance §2.1053, §24.238				
24.6; Band edge compliance summary §2.1053, §24.238	Passed	2018/09/20	Lab 2	ba01
Test Specification: FCC part 2 and 27				
27.1 RF Power Output §2.1046, §27.250				
27.1; RF Power Output Summary §2.1046, §27.250	Passed	2018/09/20	Lab 2	ba01
27.4 Field strength of spurious radiation §2.1053, §27.53				
27.4; Frequency Band = eFDD12, Mode = QPSK 5MHz, Channel = 23095, Frequency = 707.5MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
27.4; Frequency Band = eFDD13, Mode = QPSK 5MHz, Channel = 23230, Frequency = 782MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
27.4; Frequency Band = eFDD4, Mode = QPSK 5MHz, Channel = 20175, Frequency = 1732.5MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated	Passed	2018/09/07	Lab 1	ba01
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated	Passed	2018/09/06	Lab 1	ba01
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz, Method = radiated	Passed	2018/09/07	Lab 1	ba01

Test Case Identifier / Name *Test (condition)*	*Result*	*Date of Test*	*Lab* *Ref.*	*Setup*
27.5 Emission and Occupied Bandwidth §2.1049				
27.5; Emission and Occupied Bandwidth Summary §2.1049	Passed	2018/09/20	Lab 2	ba01
27.6 Band edge compliance §2.1053, §27.53				
27.6; Band edge compliance summary §2.1053, §27.53	Passed	2018/09/20	Lab 2	ba01

3.5 Detailed Results

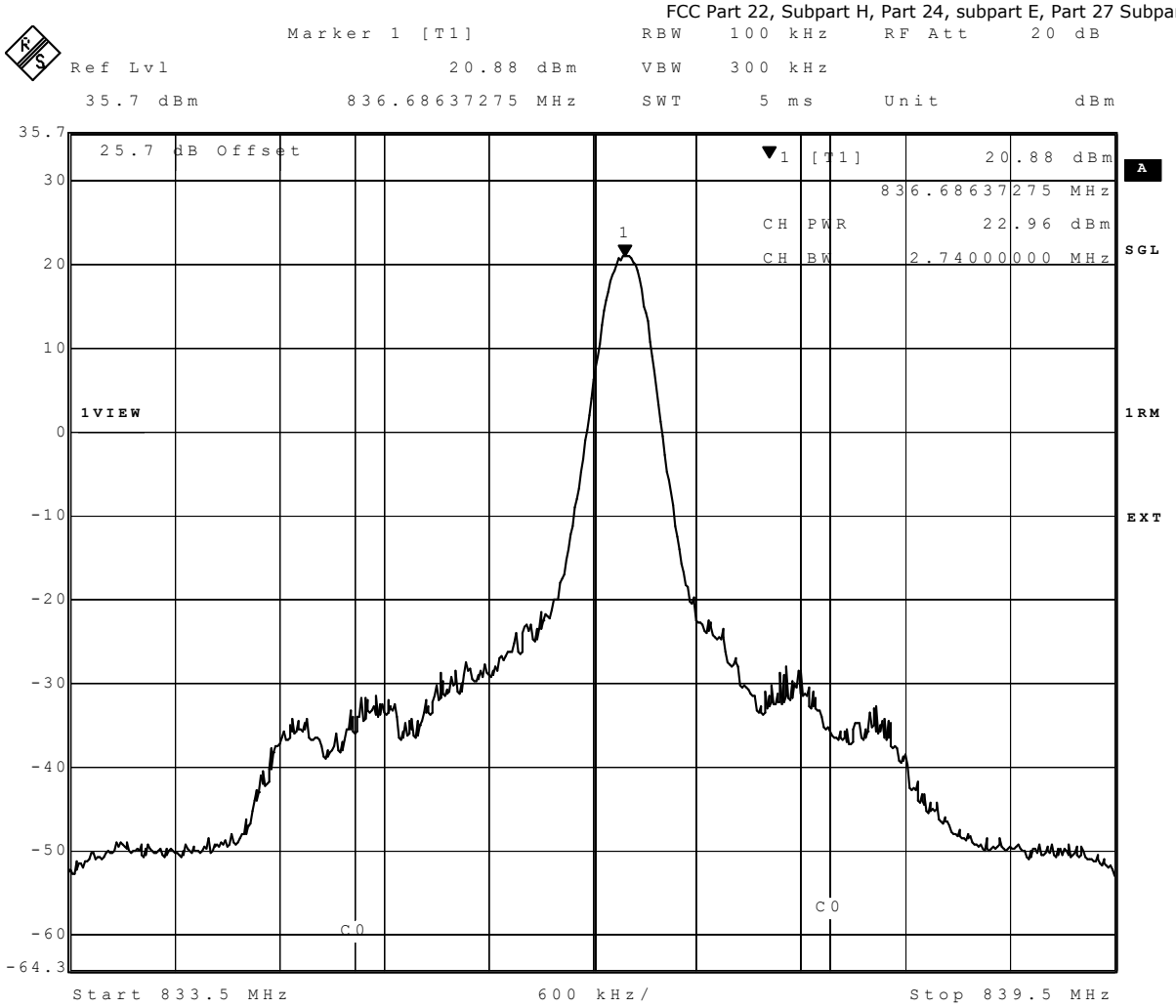
3.5.1 22.1 RF Power Output §2.1046, §22.913

Test: 22.1; _RF Power Output Summary §2.1046, §22.913

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 9:43
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Original RMS Cond. Power [dBm]	New RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]
eFDD 5 QPSK	mid	1	1.4	21.17	22.22	11.5	11.5	18.38
eFDD 5 QPSK	mid	3	1.4	21.17	22.28	11.5	11.5	18.32
eFDD 5 QPSK	mid	6	1.4	20.16	21.14	11.5	11.5	19.46
eFDD 5 16QAM	mid	1	1.4	20.3	21.26	11.5	11.5	19.34
eFDD 5 16QAM	mid	6	1.4	19.07	20.14	11.5	11.5	20.46
eFDD 5 QPSK	mid	1	3	22.31	22.96	11.5	11.5	17.64
eFDD 5 QPSK	mid	15	3	19.83	21.46	11.5	11.5	19.14
eFDD 5 16QAM	mid	1	3	21.37	21.72	11.5	11.5	18.88
eFDD 5 16QAM	mid	15	3	18.78	20.43	11.5	11.5	20.17
eFDD 5 QPSK	mid	1	5	22.01	22.81	11.5	11.5	17.79
eFDD 5 QPSK	mid	12	5	19.51	21.33	11.5	11.5	19.27
eFDD 5 QPSK	mid	25	5	19.53	21.36	11.5	11.5	19.24
eFDD 5 16QAM	mid	1	5	21.17	21.88	11.5	11.5	18.72
eFDD 5 16QAM	mid	25	5	18.61	20.33	11.5	11.5	20.27
eFDD 5 QPSK	mid	1	10	22.48	22.9	11.5	11.5	17.7
eFDD 5 QPSK	mid	50	10	20.16	21.72	11.5	11.5	18.88
eFDD 5 16QAM	mid	1	10	21.48	21.97	11.5	11.5	18.63
eFDD 5 16QAM	mid	50	10	19.11	20.66	11.5	11.5	19.94


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
20.88 dBm
VBW 300 kHz
35.7 dBm
836.68637275 MHz
SWT 5 ms
Unit dBm
25.7 dB Offset
▼1 [T1]
20.88 dBm
836.68637275 MHz
CH PWR
22.96 dBm
CH BW
2.74000000 MHz
1VIEW
A
SGL
1RM
EXT
35.7
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.3
C0
C0
Start 833.5 MHz
600 kHz/
Stop 839.5 MHz
Date: 10.SEP.2018 15:37:47

3.5.2 22.4 Field strength of spurious radiation §2.1053, §22.917

Test: 22.4; Frequency Band = eFDD5, Mode = QPSK 5MHz, Channel = 20525, Frequency = 836.5MHz, Method = radiated

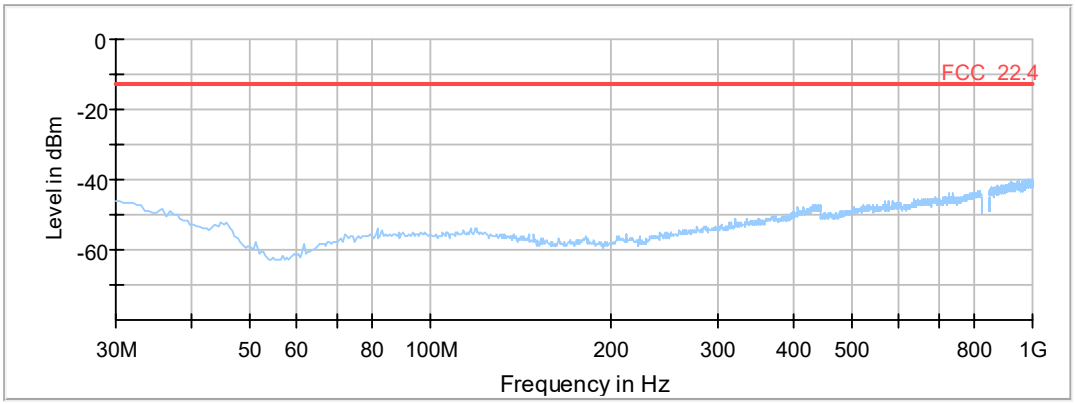
Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 17:00
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Test Report

Common Information

Test Description:
Test Standard
Operating Conditions:
Operator Name:
Comment:



Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
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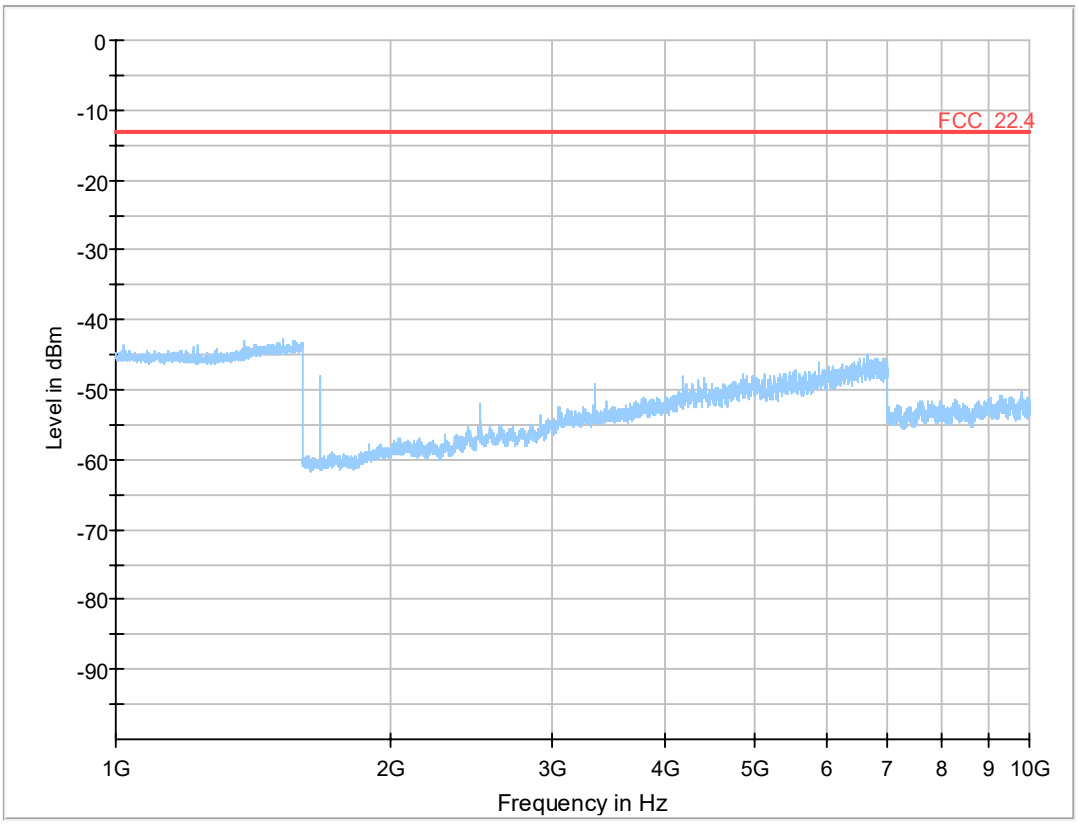
EMI Auto Test Template: FCC22_30M-1G_eFDD5_5MHz_CH20525

Hardware Setup: FCC_30M-1G_ERP
Measurement Type: Open-Area-Test-Site
Frequency Range: 30 MHz - 1 GHz
Graphics Level Range: -80 dBm - 0 dBm

Preview Measurements:
Sweep Test Template: FCC22.4_LTE_eFDD5_5MHz_20525_PRE

Adjustment:
Template for Single Meas.: FCC22_eFDD5_Adjustment

Final Measurements:
Template for Single Meas.: FCC22_eFDD5_Final



Critical_Freqs

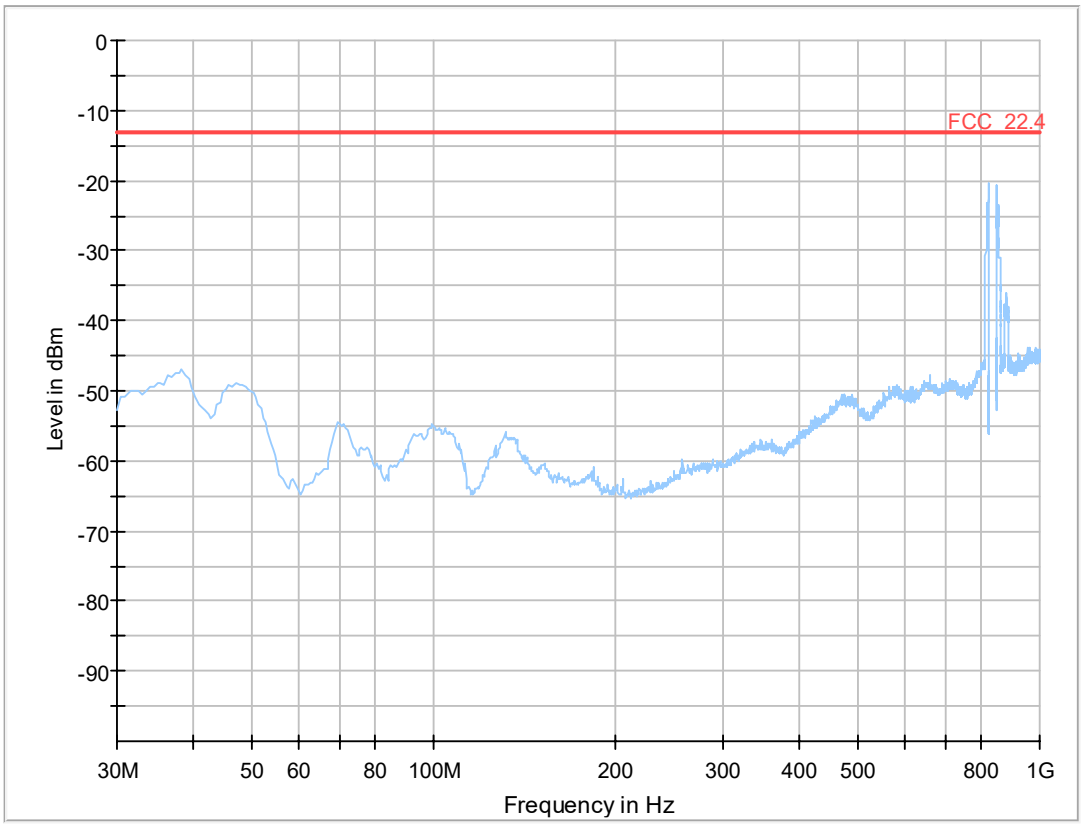
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

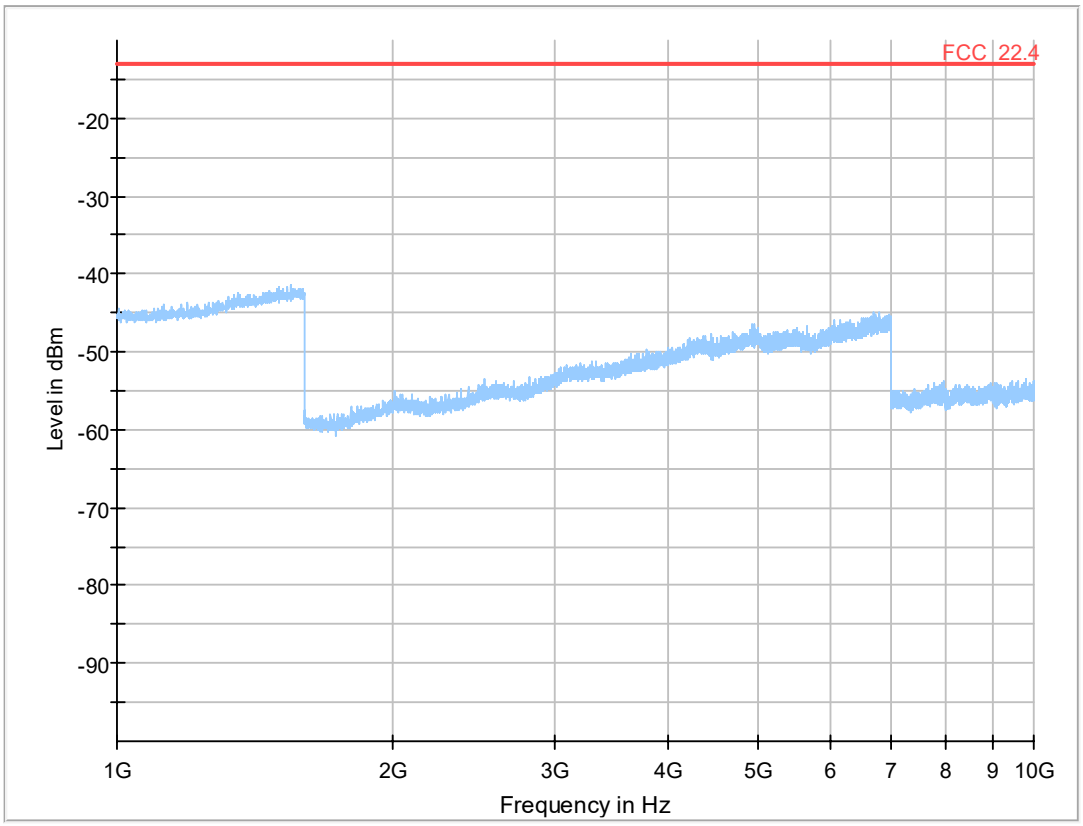
Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

22.4; Frequency Band = eFDD5, Mode = QPSK 5MHz, Channel = 20525, Frequency = 836.5MHz, Method = radiated

Updated measurement


0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Level in dBm
FCC 22.4
30M
50
60
80
100M
200
300
400
500
800
1G
Frequency in Hz



22.4; Frequency Band = eFDD5, Mode = QPSK 5MHz, Channel = 20525, Frequency = 836.5MHz, Method = radiated

Original measurement

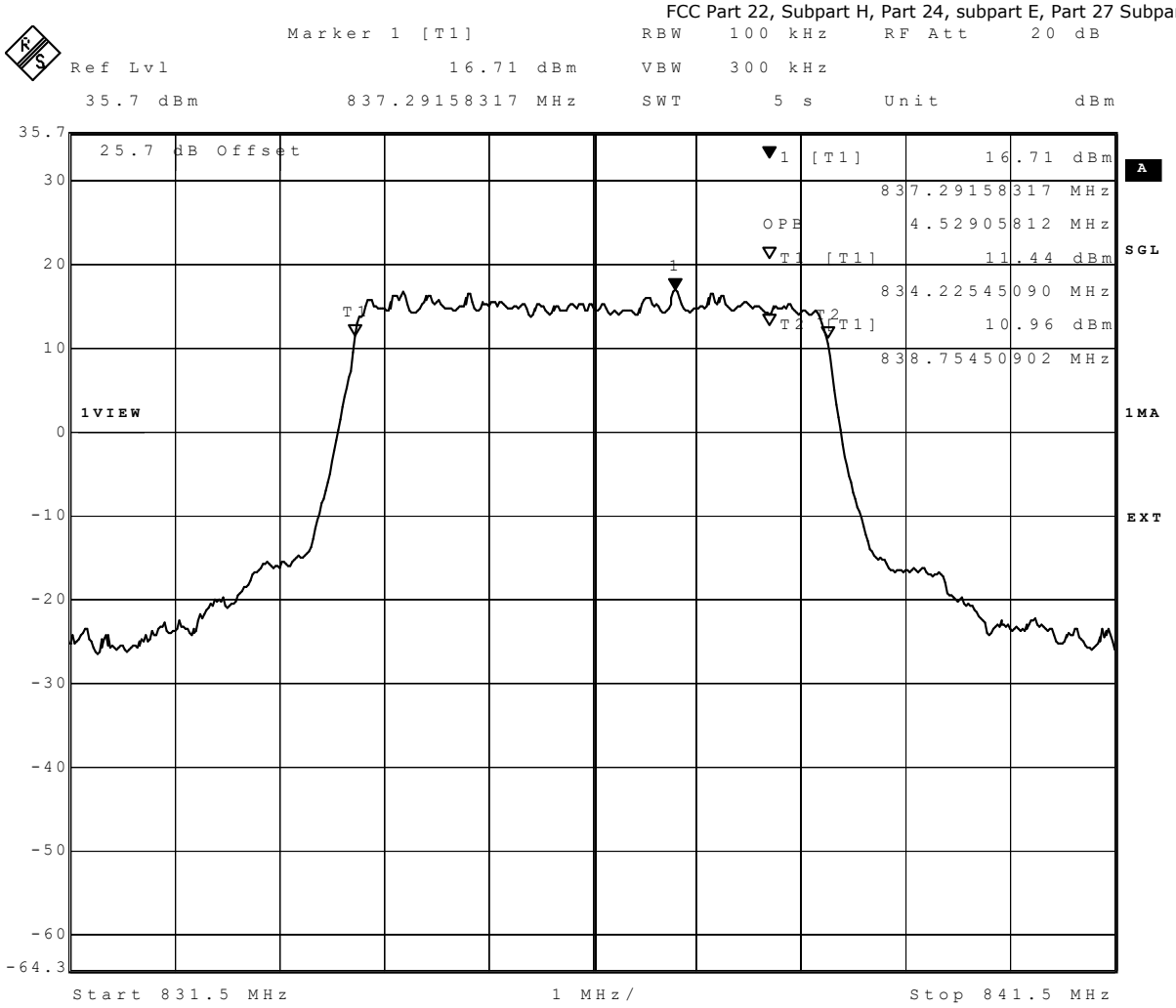
3.5.3 22.5 Emission and Occupied Bandwidth §2.1049, §22.917

Test: 22.5; _Emission and Occupied Bandwidth Summary §2.1049, §22.917

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 9:52
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Updated Values					
Radio Technology	**Channel**	**Ressource Blocks**	**Bandwidth [MHz]**	**Nominal BW [MHz]**	**99 % BW [kHz]**
eFDD 5 QPSK	mid	6	1.4	1.4	1112.22
eFDD 5 16QAM	mid	6	1.4	1.4	1118.24
eFDD 5 QPSK	mid	15	3	3	2741.48
eFDD 5 16QAM	mid	15	3	3	2753.51
eFDD 5 QPSK	mid	25	5	5	4529.06
eFDD 5 16QAM	mid	25	5	5	4529.06
eFDD 5 QPSK	mid	50	10	10	9098.2
eFDD 5 16QAM	mid	50	10	10	9058.12
Original Values					
eFDD 5 QPSK	mid	6	1.4	1.4	1106.21
eFDD 5 16QAM	mid	6	1.4	1.4	1106.21
eFDD 5 QPSK	mid	15	3	3	2741.48
eFDD 5 16QAM	mid	15	3	3	2741.48
eFDD 5 QPSK	mid	25	5	5	4529.06
eFDD 5 16QAM	mid	25	5	5	4549.1
eFDD 5 QPSK	mid	50	10	10	9058.12
eFDD 5 16QAM	mid	50	10	10	9058.12



eFDD5 QPSK 5MHz 25RB Channel = MID

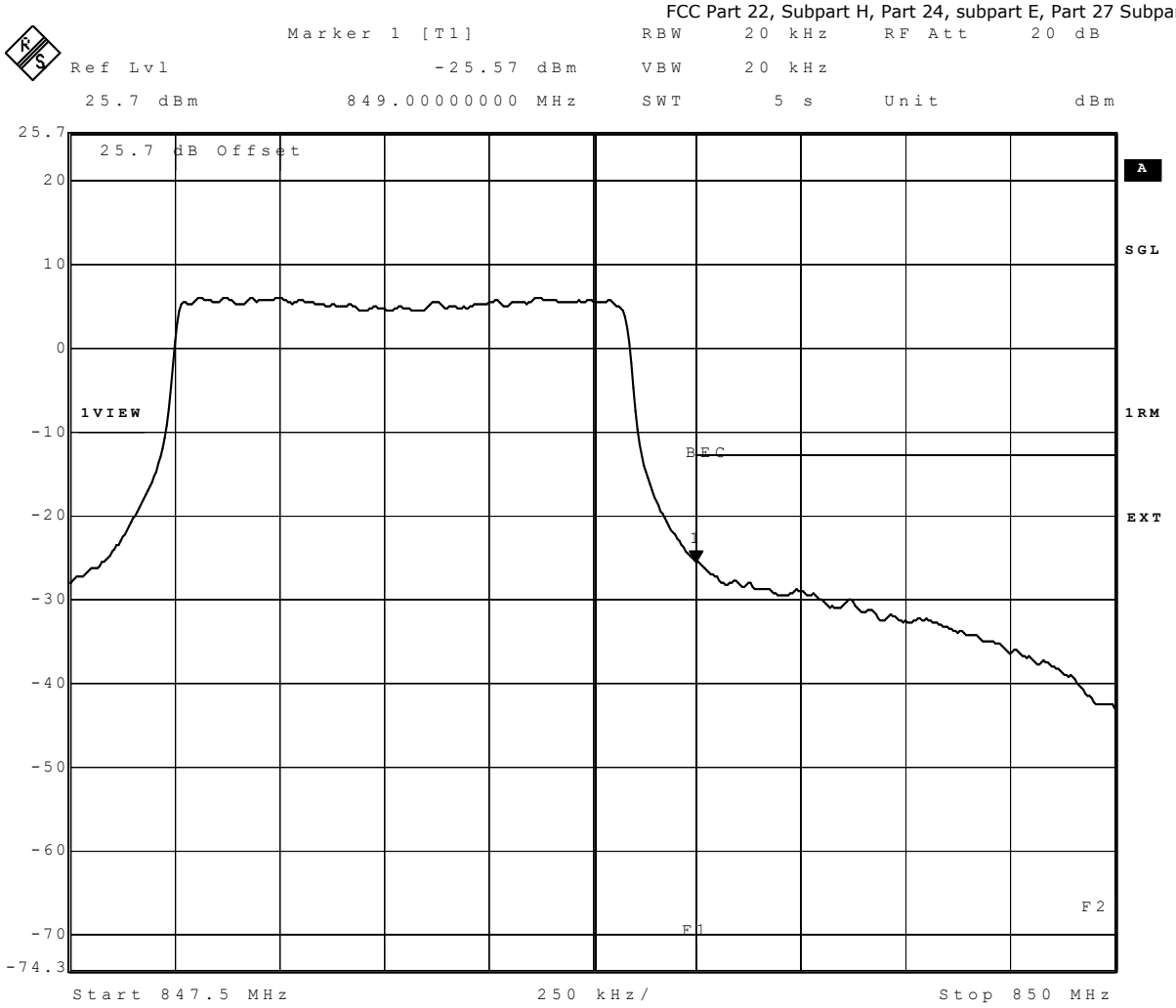
3.5.4 22.6 Band edge compliance §2.1053, §22.917

Test: 22.6; _Band edge compliance Summary §2.1053, §22.917

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 9:48
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Updated values								
Radio Technology	**Channel**	**Nominal BW**	**Ressource Blocks**	**Peak [dBm]**	**Average [dBm]**	**RMS [dBm]**	**Limit [dBm]**	**Margin to Limit [dB]**
eFDD 5 QPSK	low	1.4	6	-17.12	-27.65	-26.11	-13	13.11
eFDD 5 QPSK	high	1.4	6	-17.32	-26.64	-25.57	-13	12.57
eFDD 5 16QAM	low	1.4	6	-54.56	-29.5	-27.82	-13	14.82
eFDD 5 16QAM	high	1.4	6	-16.29	-27.82	-26.61	-13	13.61
eFDD 5 QPSK	low	3	15	-28.38	-30.04	-27.61	-13	14.61
eFDD 5 QPSK	high	3	15	-16.82	-28.74	-27	-13	14
eFDD 5 16QAM	low	3	15	-15.07	-30.92	-28.5	-13	15.5
eFDD 5 16QAM	high	3	15	-18.31	-30.32	-28.74	-13	15.74
eFDD 5 QPSK	low	5	25	-14.66	-31.24	-28.5	-13	15.5
eFDD 5 QPSK	high	5	25	-14.69	-29.24	-27	-13	14
eFDD 5 16QAM	low	5	25	-16	-33.42	-30.32	-13	17.32
eFDD 5 16QAM	high	5	25	-16.64	-31.24	-29.24	-13	16.24
eFDD 5 QPSK	low	10	50	-13.77	-33.84	-30.04	-13	17.04
eFDD 5 QPSK	high	10	50	-13.61	-29.5	-27.61	-13	14.61
eFDD 5 16QAM	low	10	50	-14.78	-35.26	-31.24	-13	18.24
eFDD 5 16QAM	high	10	50	-14.92	-30.62	-28.74	-13	15.74
Original values								
eFDD 5 QPSK	low	1.4	6	-15.27	-28.21	-26.76	-13	13.76
eFDD 5 QPSK	high	1.4	6	-17.79	-27.93	-26.94	-13	13.94
eFDD 5 16QAM	low	1.4	6	-16.47	-29.5	-27.82	-13	14.82
eFDD 5 16QAM	high	1.4	6	-17.44	-28.98	-27.82	-13	14.82
eFDD 5 QPSK	low	3	15	-28.52	-31.24	-28.98	-13	15.98
eFDD 5 QPSK	high	3	15	-18.04	-31.24	-29.5	-13	16.5
eFDD 5 16QAM	low	3	15	-18.14	-31.91	-29.76	-13	16.76
eFDD 5 16QAM	high	3	15	-19.47	-32.26	-30.62	-13	17.62
eFDD 5 QPSK	low	5	25	-15.51	-32.63	-29.24	-13	16.24
eFDD 5 QPSK	high	5	25	-18	-32.26	-30.04	-13	17.04
eFDD 5 16QAM	low	5	25	-16.37	-33.84	-30.62	-13	17.62
eFDD 5 16QAM	high	5	25	-17.25	-32.63	-30.62	-13	17.62
eFDD 5 QPSK	low	10	50	-13.27	-33.84	-30.04	-13	17.04
eFDD 5 QPSK	high	10	50	-15.26	-32.26	-30.32	-13	17.32
eFDD 5 16QAM	low	10	50	-16.89	-35.26	-31.57	-13	18.57
eFDD 5 16QAM	high	10	50	-16.94	-33.02	-31.24	-13	18.24


Marker 1 [T1]
RBW 20 kHz
RF Att 20 dB
Ref Lvl
-25.57 dBm
VBW 20 kHz
25.7 dBm
849.00000000 MHz
SWT 5 s
Unit dBm
25.7 dB Offset
1VIEW
A
SGL
1RM
EXT
BEC
F2
F1
Start 847.5 MHz
250 kHz/
Stop 850 MHz
Date: 11.SEP.2018 17:15:37

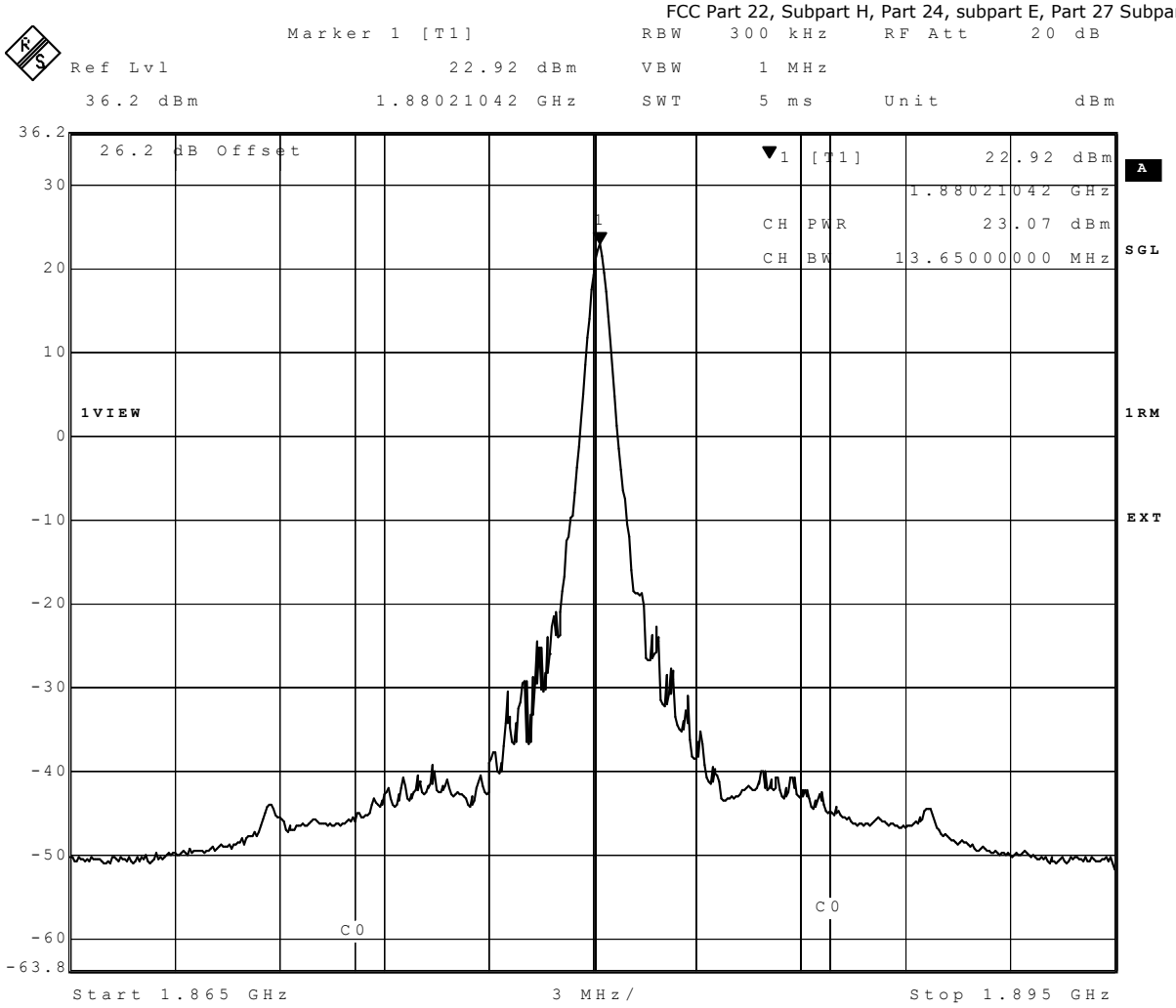
3.5.5 24.1 RF Power Output §2.1046, §24.232

Test: 24.1; RF Power Output Summary §2.1046, §24.232

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 9:55
Body:	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 24

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Original RMS Cond. Power [dBm]	Updated RMS Cond. Power [dBm]	FCC / IC EIRP Limit [W]	Maximum Antenna Gain [dBi]
eFDD 2 QPSK	mid	1	1.4	22.65	22.07	2	10.93
eFDD 2 QPSK	mid	3	1.4	22.38	22.12	2	10.88
eFDD 2 QPSK	mid	6	1.4	21.38	21.12	2	11.88
eFDD 2 16QAM	mid	1	1.4	21.45	21.19	2	11.81
eFDD 2 16QAM	mid	6	1.4	20.77	20.14	2	12.86
eFDD 2 QPSK	mid	1	3	23.5	22.93	2	10.07
eFDD 2 QPSK	mid	15	3	21.18	21.55	2	11.45
eFDD 2 16QAM	mid	1	3	22.38	21.97	2	11.03
eFDD 2 16QAM	mid	15	3	20.21	20.64	2	12.36
eFDD 2 QPSK	mid	1	5	23.17	22.8	2	10.2
eFDD 2 QPSK	mid	12	5	21.09	21.49	2	11.51
eFDD 2 QPSK	mid	25	5	21.04	21.45	2	11.55
eFDD 2 16QAM	mid	1	5	22.26	21.88	2	11.12
eFDD 2 16QAM	mid	25	5	20.1	20.36	2	12.64
eFDD 2 QPSK	mid	1	10	23.52	23.05	2	9.95
eFDD 2 QPSK	mid	50	10	21.54	21.95	2	11.05
eFDD 2 16QAM	mid	1	10	22.48	21.96	2	11.04
eFDD 2 16QAM	mid	50	10	20.57	20.91	2	12.09
eFDD 2 QPSK	mid	1	15	23.33	23.07	2	9.93
eFDD 2 QPSK	mid	36	15	21.74	22.31	2	10.69
eFDD 2 QPSK	mid	75	15	21.6	22.21	2	10.79
eFDD 2 16QAM	mid	1	15	22.36	22.09	2	10.91
eFDD 2 16QAM	mid	75	15	20.64	21.17	2	11.83
eFDD 2 QPSK	mid	1	20	23.42	22.96	2	10.04
eFDD 2 QPSK	mid	100	20	21.69	22.15	2	10.85
eFDD 2 16QAM	mid	1	20	22.3	22.02	2	10.98
eFDD 2 16QAM	mid	100	20	20.68	21.2	2	11.8

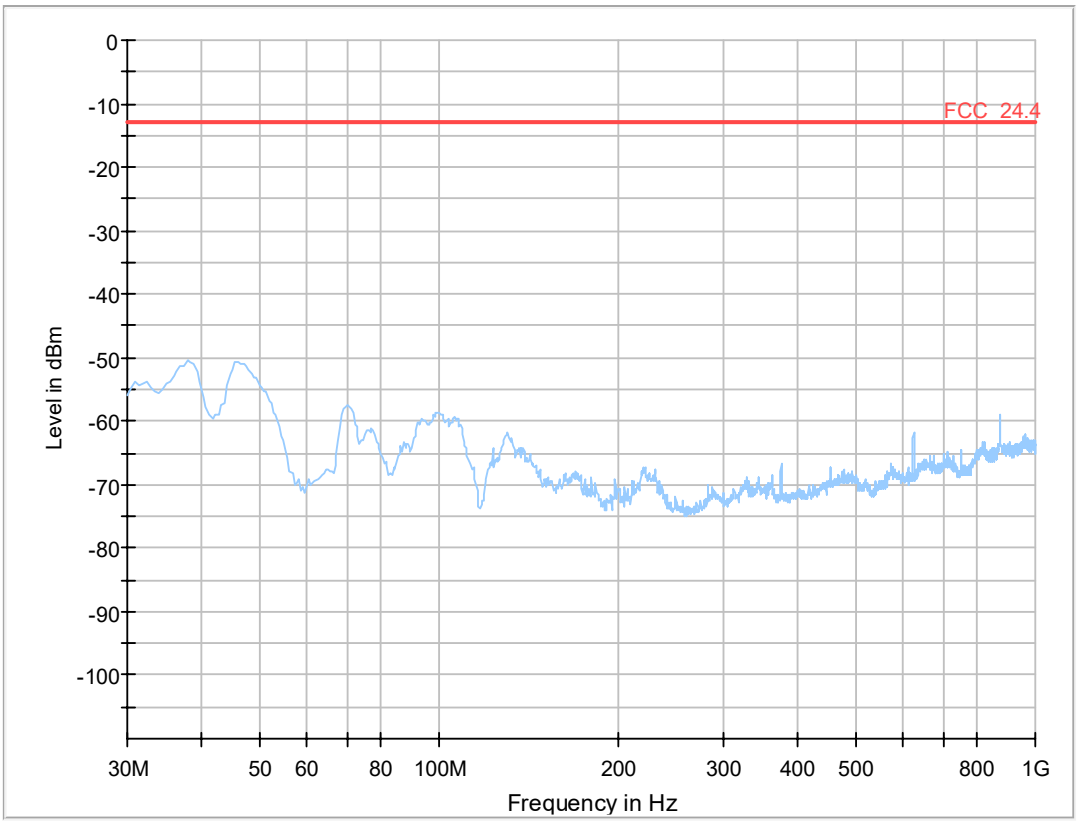

Marker 1 [T1]
RBW 300 kHz
RF Att 20 dB
Ref Lvl
22.92 dBm
VBW 1 MHz
36.2 dBm
1.88021042 GHz
SWT 5 ms
Unit dBm
26.2 dB Offset
▼1 [T1]
22.92 dBm
1.88021042 GHz
CH PWR
23.07 dBm
CH BW
13.65000000 MHz
A
SGL
1VIEW
1RM
EXT
36.2
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.8
C0
C0
Start 1.865 GHz
3 MHz/
Stop 1.895 GHz
Date: 10.SEP.2018 14:45:11

3.5.6 24.4 Field strength of spurious radiation §2.1053, §24.238

Test: 24.4; Frequency Band = eFDD2, Mode = QPSK 5MHz, Channel = 18900, Frequency = 1880MHz, Method = radiated

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 15:00
Body:	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 24

Detailed Results:



Critical_Freqs

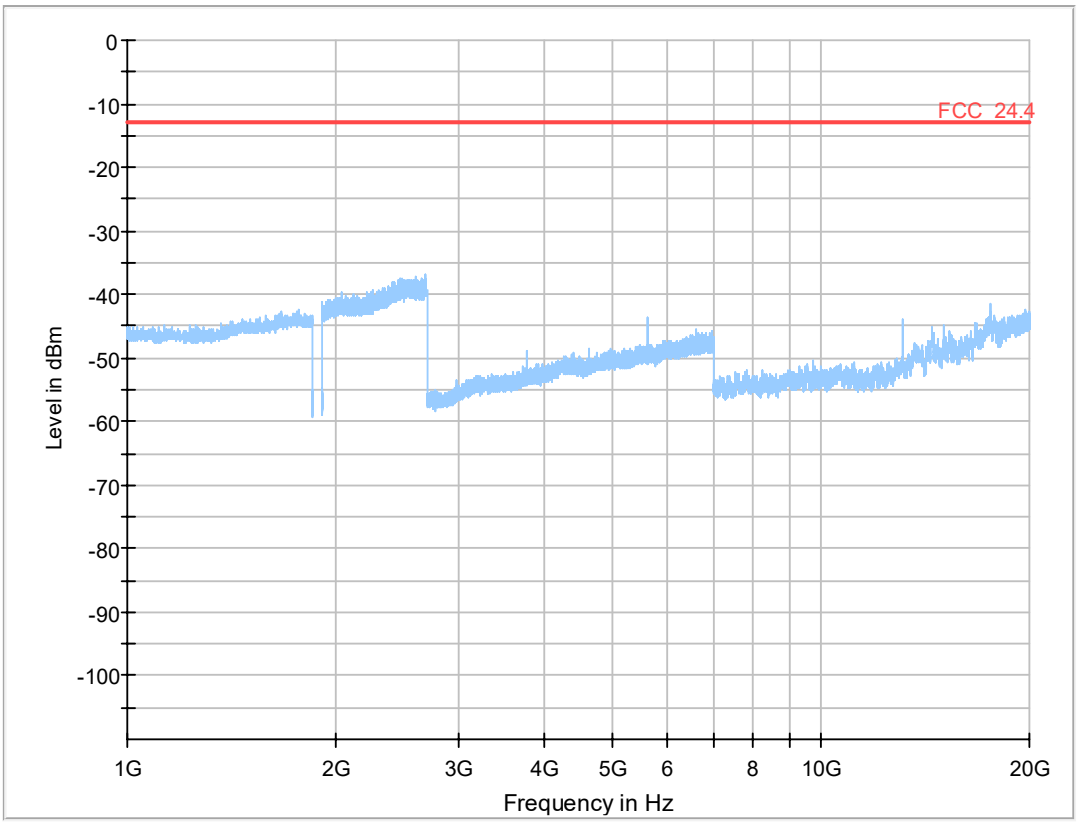
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

24.4; Frequency Band = eFDD2, Mode = QPSK 5MHz, Channel = 18900, Frequency = 1880MHz, Method = radiated

Updated measurement



Critical_Freqs

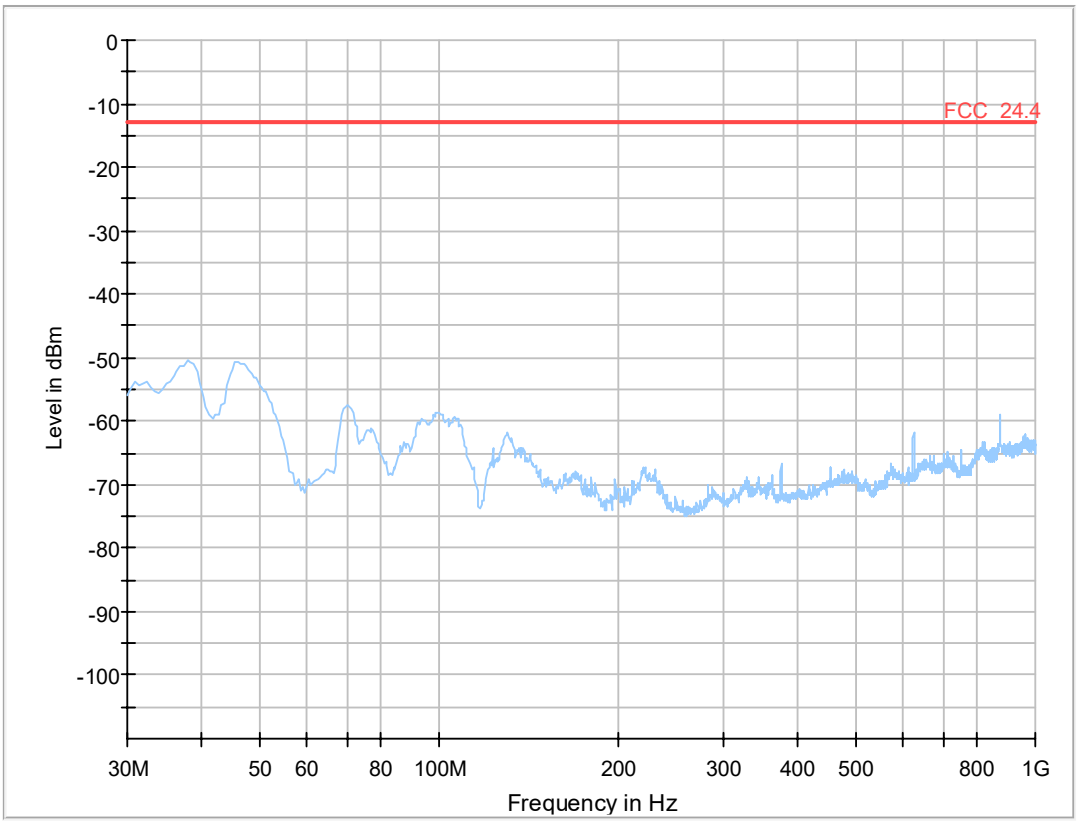
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

24.4; Frequency Band = eFDD2, Mode = QPSK 5MHz, Channel = 18900, Frequency = 1880MHz, Method = radiated

Updated measurement

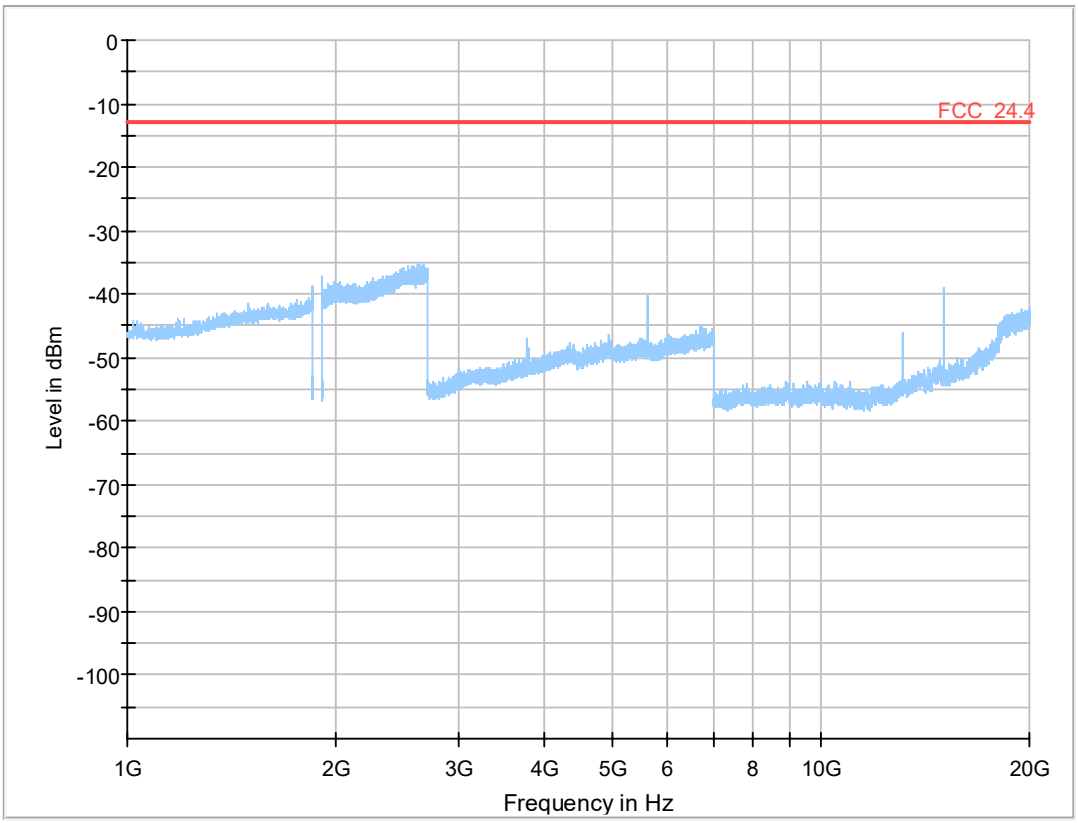


Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

24.4; Frequency Band = eFDD2, Mode = QPSK 5MHz, Channel = 18900, Frequency = 1880MHz, Method = radiated

Original Measurement

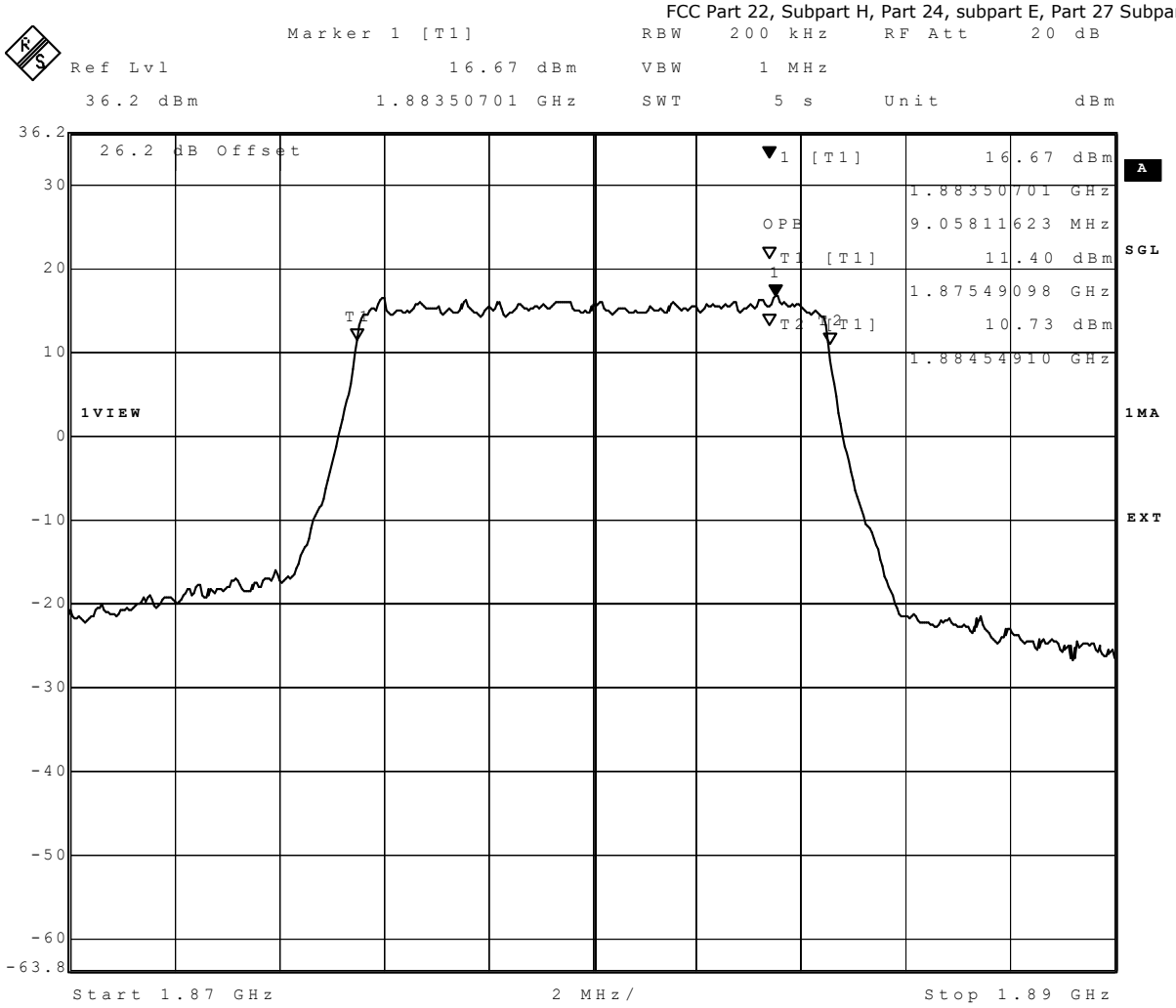
3.5.7 24.5 Emission and Occupied Bandwidth §2.1049, §24.238

Test: 24.5; Emission and Occupied Bandwidth Summary §2.1049, §24.238

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 10:15
Body:	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 24

Detailed Results:

Updated values				
Radio Technology	**Channel**	**Ressource Blocks**	**Nominal BW [MHz]**	**99 % BW [kHz]**
eFDD 2 QPSK	mid	6	1.4	1112.2
eFDD 2 16QAM	mid	6	1.4	1118.2
eFDD 2 QPSK	mid	15	3	2753.5
eFDD 2 16QAM	mid	15	3	2741.5
eFDD 2 QPSK	mid	25	5	4549.1
eFDD 2 16QAM	mid	25	5	4529.1
eFDD 2 QPSK	mid	50	10	9058.1
eFDD 2 16QAM	mid	50	10	9058.1
eFDD 2 QPSK	mid	75	15	13647
eFDD 2 16QAM	mid	75	15	13587
eFDD 2 QPSK	mid	100	20	18116
eFDD 2 16QAM	mid	100	20	18196
Original values				
eFDD 2 QPSK	mid	6	1.4	1112
eFDD 2 16QAM	mid	6	1.4	1106
eFDD 2 QPSK	mid	15	3	2741
eFDD 2 16QAM	mid	15	3	2741
eFDD 2 QPSK	mid	25	5	4529
eFDD 2 16QAM	mid	25	5	4549
eFDD 2 QPSK	mid	50	10	9058
eFDD 2 16QAM	mid	50	10	9058
eFDD 2 QPSK	mid	75	15	13587
eFDD 2 16QAM	mid	75	15	13647
eFDD 2 QPSK	mid	100	20	18277
eFDD 2 16QAM	mid	100	20	18277


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl
16.67 dBm
VBW 1 MHz
36.2 dBm
1.88350701 GHz
SWT 5 s
Unit dBm
26.2 dB Offset
1 [T1]
16.67 dBm
1.88350701 GHz
OPB
9.05811623 MHz
T1 [T1]
11.40 dBm
1.87549098 GHz
T2 [T1]
10.73 dBm
1.88454910 GHz
1VIEW
A
SGL
1MA
EXT
36.2
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.8
Start 1.87 GHz
2 MHz/
Stop 1.89 GHz
Date: 10.SEP.2018 12:00:11

3.5.8 24.6 Band edge compliance §2.1053, §24.238

Test: 24.6; Band edge compliance summary §2.1053, §24.238

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 10:07
Body:	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 24

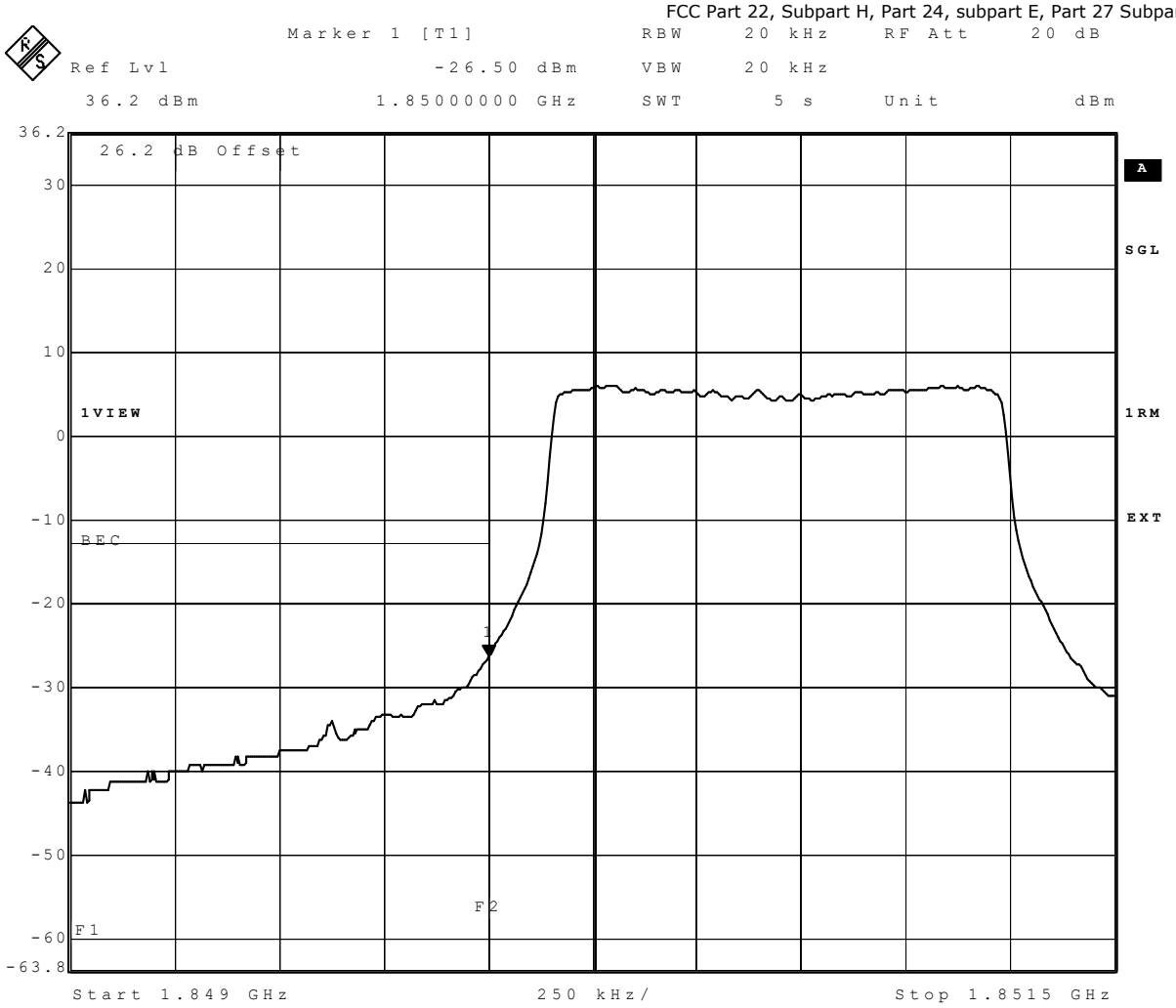
Detailed Results:

Updated Values

Radio Technology	Channel	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limit [dBm]	Margin to Limit [dB]
eFDD 2 QPSK	low	1.4	6	-16.52	-27.77	-26.5	-13	13.5
eFDD 2 QPSK	high	1.4	6	-16.93	-28.24	-26.9	-13	13.9
eFDD 2 16QAM	low	1.4	6	-17.98	-29.54	-27.77	-13	14.77
eFDD 2 16QAM	high	1.4	6	-18.89	-29.26	-27.77	-13	14.77
eFDD 2 QPSK	low	3	15	-15.61	-28.74	-26.7	-13	13.7
eFDD 2 QPSK	high	3	15	-16.72	-30.12	-28.24	-13	15.24
eFDD 2 16QAM	low	3	15	-14.83	-30.12	-28	-13	15
eFDD 2 16QAM	high	3	15	-17.32	-31.41	-29.54	-13	16.54
eFDD 2 QPSK	low	5	25	-13.15	-29.82	-27.54	-13	14.54
eFDD 2 QPSK	high	5	25	-12.39	-30.74	-28	-13	15
eFDD 2 16QAM	low	5	25	-14.67	-31.76	-29.26	-13	16.26
eFDD 2 16QAM	high	5	25	-15.95	-32.52	-29.82	-13	16.82
eFDD 2 QPSK	low	10	50	-12.89	-30.74	-28.24	-13	15.24
eFDD 2 QPSK	high	10	50	-13.66	-33.34	-29.82	-13	16.82
eFDD 2 16QAM	low	10	50	-14.62	-32.52	-29.82	-13	16.82
eFDD 2 16QAM	high	10	50	-15.94	-34.26	-30.74	-13	17.74
eFDD 2 QPSK	low	15	75	-9.46	-29.82	-27.32	-13	14.32
eFDD 2 QPSK	high	15	75	-8.83	-32.52	-28.48	-13	15.48
eFDD 2 16QAM	low	15	75	-11.27	-31.76	-29.26	-13	16.26
eFDD 2 16QAM	high	15	75	-11.07	-34.76	-30.74	-13	17.74
eFDD 2 QPSK	low	20	100	-12.66	-31.76	-29.82	-13	16.82
eFDD 2 QPSK	high	20	100	-14.22	-35.84	-32.52	-13	19.52
eFDD 2 16QAM	low	20	100	-15.14	-33.79	-31.76	-13	18.76
eFDD 2 16QAM	high	20	100	-14.1	-37.09	-33.79	-13	20.79

Original values

Radio Technology	Channel	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limit [dBm]	Margin to Limit [dB]
eFDD 2 QPSK	low	1.4	6	-15.15	-25.92	-24.88	-13	11.88
eFDD 2 QPSK	high	1.4	6	-16.67	-27.54	-26.3	-13	13.3
eFDD 2 16QAM	low	1.4	6	-15.46	-27.11	-25.92	-13	12.92
eFDD 2 16QAM	high	1.4	6	-17.43	-28	-26.5	-13	13.5
eFDD 2 QPSK	low	3	15	-15.78	-27.77	-26.11	-13	13.11
eFDD 2 QPSK	high	3	15	-16.64	-29	-27.32	-13	14.32
eFDD 2 16QAM	low	3	15	-15.42	-29	-27.32	-13	14.32
eFDD 2 16QAM	high	3	15	-18.29	-30.42	-29	-13	16
eFDD 2 QPSK	low	5	25	-12.88	-28	-26.11	-13	13.11
eFDD 2 QPSK	high	5	25	-13.76	-29.82	-28	-13	15
eFDD 2 16QAM	low	5	25	-15.15	-29.82	-28	-13	15
eFDD 2 16QAM	high	5	25	-14.81	-31.07	-29	-13	16
eFDD 2 QPSK	low	10	50	-13.48	-29	-27.11	-13	14.11
eFDD 2 QPSK	high	10	50	-14.96	-31.41	-29.26	-13	16.26
eFDD 2 16QAM	low	10	50	-14.53	-30.74	-28.74	-13	15.74
eFDD 2 16QAM	high	10	50	-14.33	-32.92	-30.74	-13	17.74
eFDD 2 QPSK	low	15	75	-10.63	-28.74	-27.11	-13	14.11
eFDD 2 QPSK	high	15	75	-10.83	-30.74	-28.24	-13	15.24
eFDD 2 16QAM	low	15	75	-10.83	-29.82	-28	-13	15
eFDD 2 16QAM	high	15	75	-11.53	-32.13	-29.54	-13	16.54
eFDD 2 QPSK	low	20	100	-15.29	-30.42	-29	-13	16
eFDD 2 QPSK	high	20	100	-14.69	-32.92	-30.74	-13	17.74
eFDD 2 16QAM	low	20	100	-16.38	-31.76	-30.42	-13	17.42
eFDD 2 16QAM	high	20	100	-15.98	-34.76	-32.52	-13	19.52


Marker 1 [T1]
RBW 20 kHz
RF Att 20 dB
Ref Lvl
-26.50 dBm
VBW 20 kHz
36.2 dBm
1.85000000 GHz
SWT 5 s
Unit dBm
26.2 dB Offset
1VIEW
BEC
A
SGL
1RM
EXT
F1
F2
Start 1.849 GHz
250 kHz/
Stop 1.8515 GHz
Date: 10.SEP.2018 17:25:38

3.5.9 27.1 RF Power Output §2.1046, §27.250

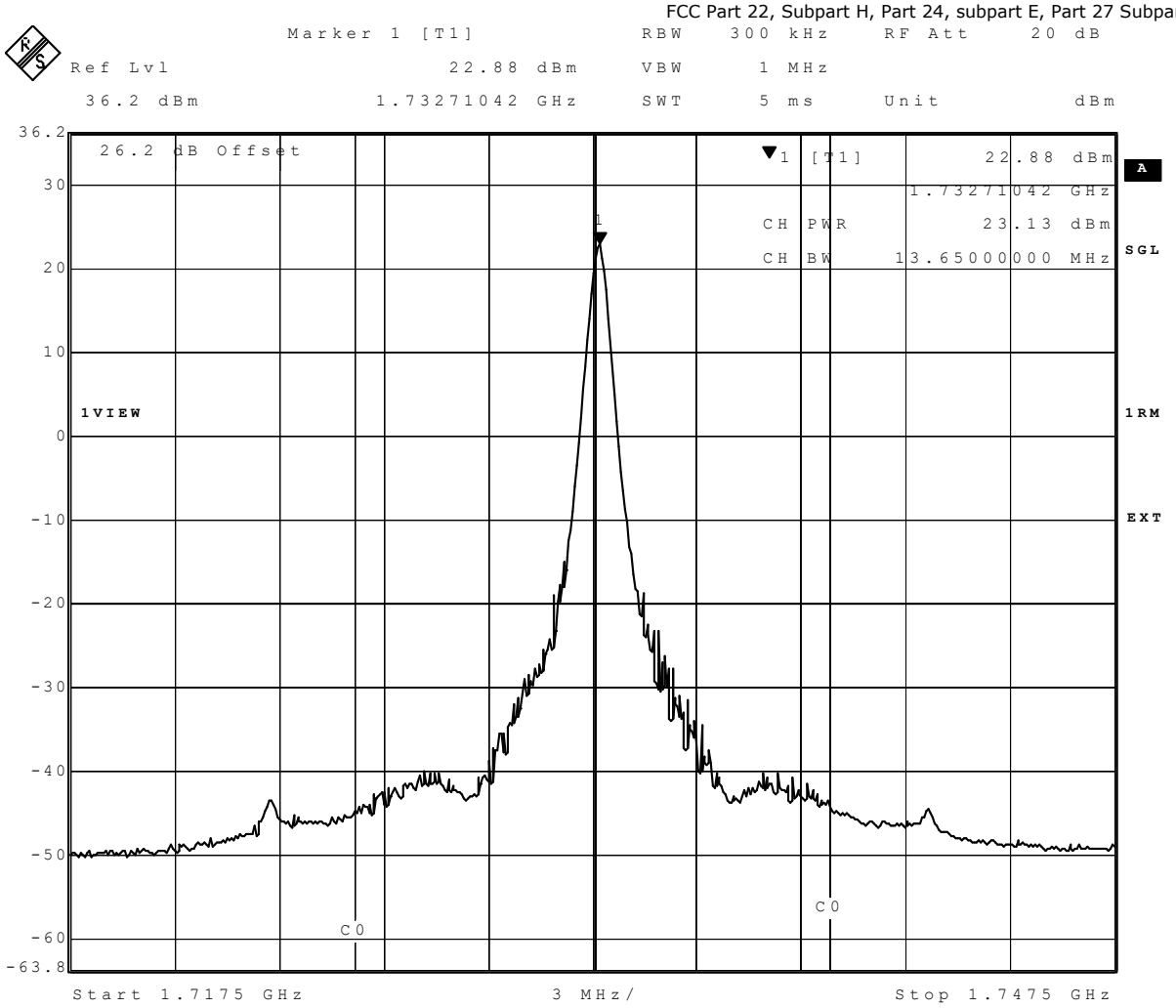
Test: 27.1; RF Power Output Summary §2.1046, §27.250

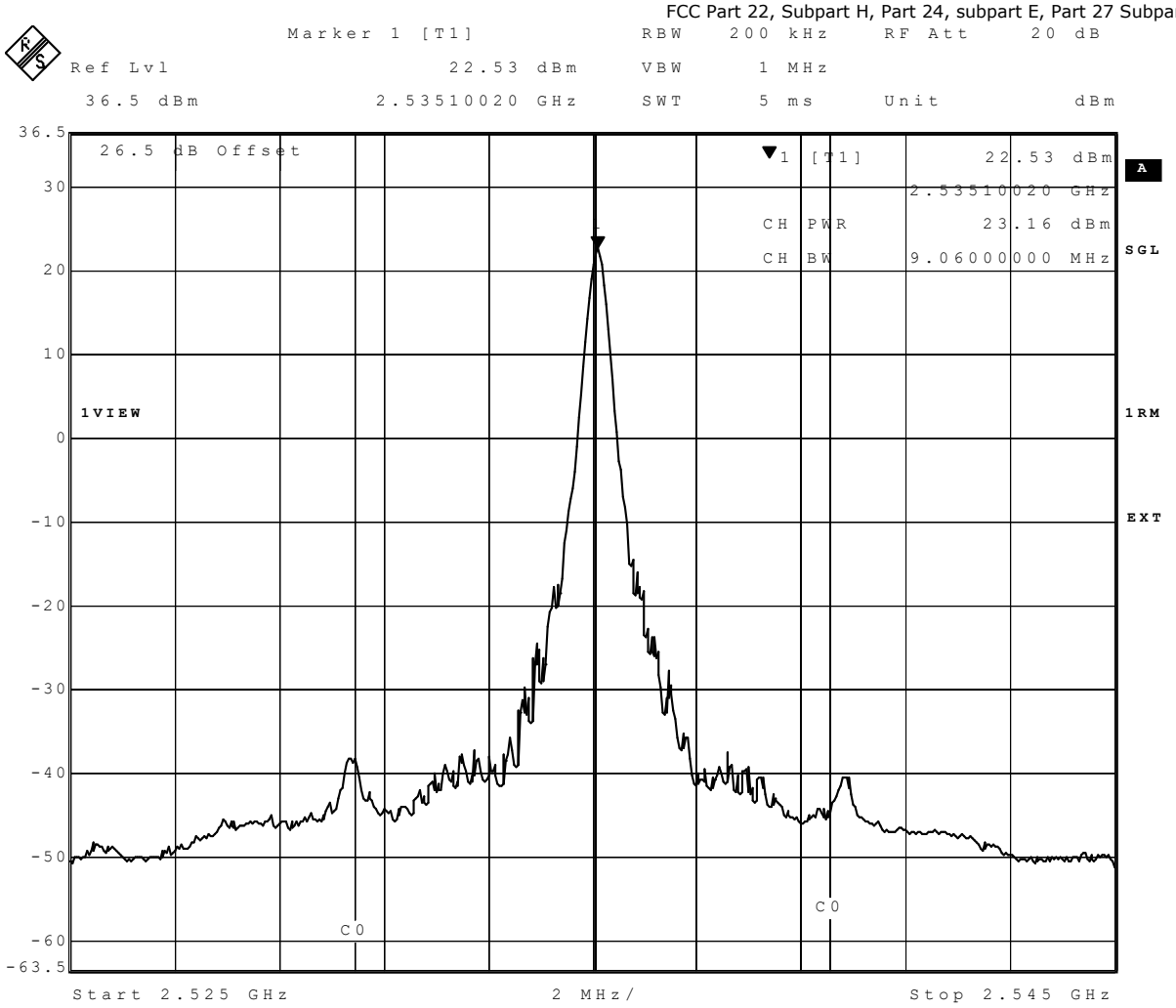
Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 10:25
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

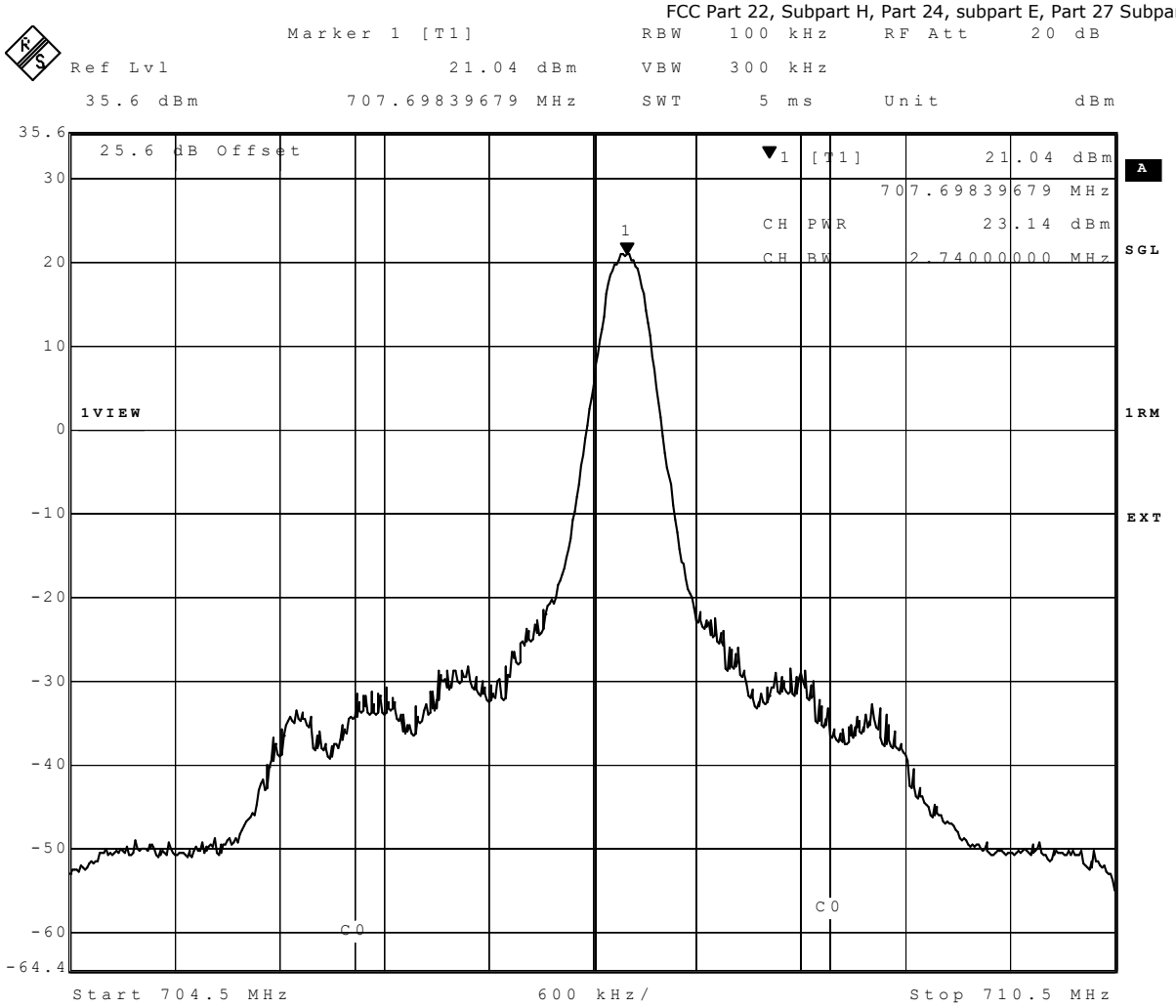
Detailed Results:

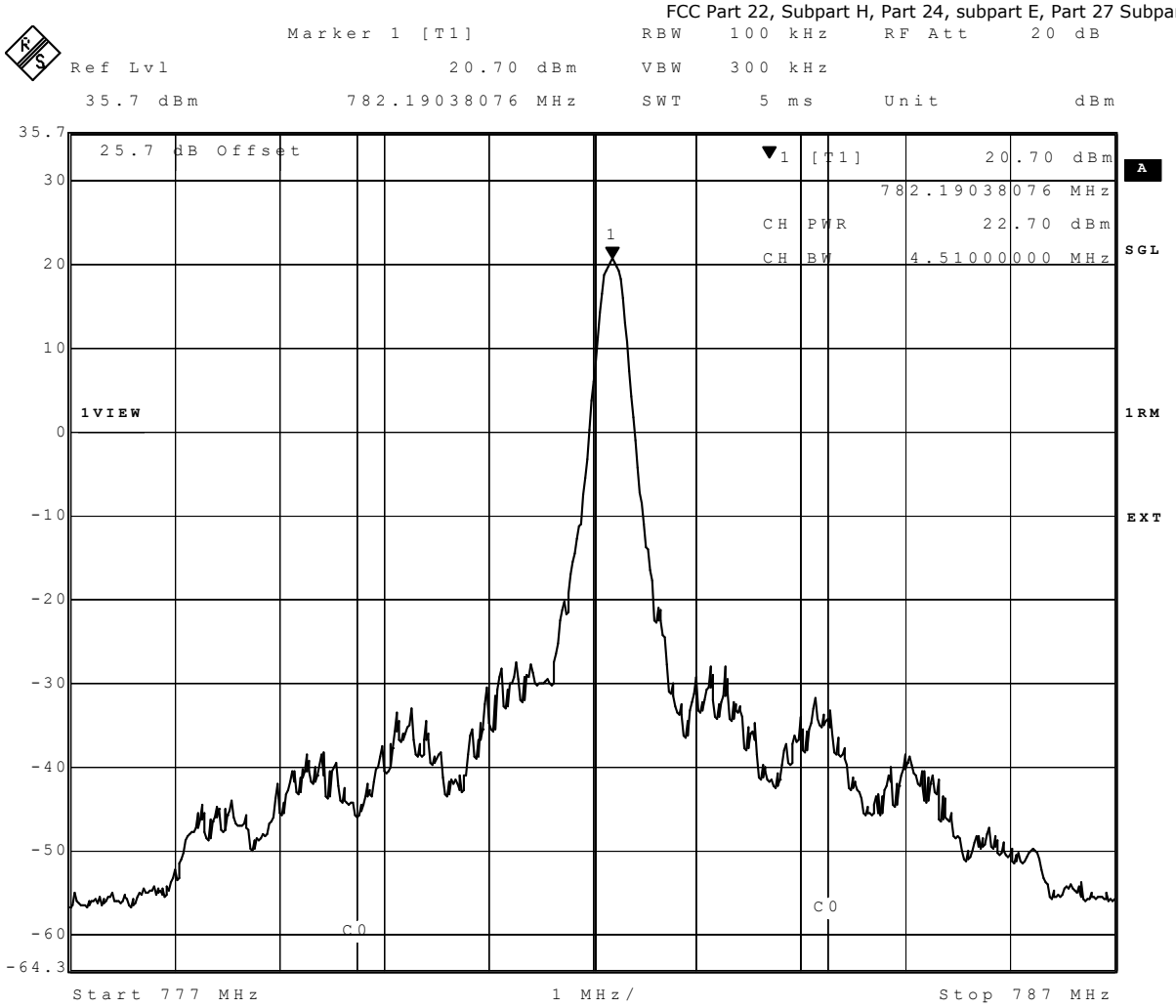
Radio Technology	Channel	Ressource Blocks	BW [MHz]	Original RMS Cond. Power [dBm]	Updated RMS Cond. Power [dBm]	FCC Limit	IC EIRP Limit [W]	Max. Antenna Gain
eFDD 4 QPSK	mid	1	1.4	21.91	22.4	1 W EIRP	1	7.6 dBi
eFDD 4 QPSK	mid	3	1.4	21.97	22.59	1 W EIRP	1	7.4 dBi
eFDD 4 QPSK	mid	6	1.4	20.77	21.31	1 W EIRP	1	8.7 dBi
eFDD 4 16QAM	mid	1	1.4	21.08	21.29	1 W EIRP	1	8.7 dBi
eFDD 4 16QAM	mid	6	1.4	19.8	20.39	1 W EIRP	1	9.6 dBi
eFDD 4 QPSK	mid	1	3	22.92	23.19	1 W EIRP	1	6.8 dBi
eFDD 4 QPSK	mid	15	3	20.54	21.73	1 W EIRP	1	8.3 dBi
eFDD 4 16QAM	mid	1	3	21.92	22.16	1 W EIRP	1	7.8 dBi
eFDD 4 16QAM	mid	15	3	19.61	20.77	1 W EIRP	1	9.2 dBi
eFDD 4 QPSK	mid	1	5	22.69	23.01	1 W EIRP	1	7.0 dBi
eFDD 4 QPSK	mid	12	5	20.43	21.57	1 W EIRP	1	8.4 dBi
eFDD 4 QPSK	mid	25	5	20.4	21.54	1 W EIRP	1	8.5 dBi
eFDD 4 16QAM	mid	1	5	22.04	21.67	1 W EIRP	1	8.3 dBi
eFDD 4 16QAM	mid	25	5	19.37	20.53	1 W EIRP	1	9.5 dBi
eFDD 4 QPSK	mid	1	10	23.03	23.07	1 W EIRP	1	6.9 dBi
eFDD 4 QPSK	mid	50	10	20.86	21.94	1 W EIRP	1	8.1 dBi
eFDD 4 16QAM	mid	1	10	21.94	22.2	1 W EIRP	1	7.8 dBi
eFDD 4 16QAM	mid	50	10	19.8	20.9	1 W EIRP	1	9.1 dBi
eFDD 4 QPSK	mid	1	15	22.86	23.13	1 W EIRP	1	6.9 dBi
eFDD 4 QPSK	mid	36	15	21.2	22.26	1 W EIRP	1	7.7 dBi
eFDD 4 QPSK	mid	75	15	21.08	22.2	1 W EIRP	1	7.8 dBi
eFDD 4 16QAM	mid	1	15	21.92	22.23	1 W EIRP	1	7.8 dBi
eFDD 4 16QAM	mid	75	15	19.98	21.23	1 W EIRP	1	8.8 dBi
eFDD 4 QPSK	mid	1	20	22.77	23.03	1 W EIRP	1	7.0 dBi
eFDD 4 QPSK	mid	100	20	21.07	22.29	1 W EIRP	1	7.7 dBi
eFDD 4 16QAM	mid	1	20	21.84	21.88	1 W EIRP	1	8.1 dBi
eFDD 4 16QAM	mid	100	20	20.07	21.23	1 W EIRP	1	8.8 dBi
eFDD 7 QPSK	mid	1	5	22.63	23.02	2 W EIRP	2	7.0 dBi
eFDD 7 QPSK	mid	12	5	20.4	21.58	2 W EIRP	2	8.4 dBi
eFDD 7 QPSK	mid	25	5	20.2	21.54	2 W EIRP	2	8.5 dBi
eFDD 7 16QAM	mid	1	5	21.96	21.96	2 W EIRP	2	8.0 dBi
eFDD 7 16QAM	mid	25	5	19.56	20.51	2 W EIRP	2	9.5 dBi
eFDD 7 QPSK	mid	1	10	23.18	23.16	2 W EIRP	2	6.8 dBi
eFDD 7 QPSK	mid	50	10	20.96	21.94	2 W EIRP	2	8.1 dBi
eFDD 7 16QAM	mid	1	10	22.22	22.15	2 W EIRP	2	7.9 dBi
eFDD 7 16QAM	mid	50	10	20.12	20.98	2 W EIRP	2	9.0 dBi
eFDD 7 QPSK	mid	1	15	22.97	23.17	2 W EIRP	2	6.8 dBi
eFDD 7 QPSK	mid	36	15	21.22	22.21	2 W EIRP	2	7.8 dBi
eFDD 7 QPSK	mid	75	15	21.08	22.17	2 W EIRP	2	7.8 dBi
eFDD 7 16QAM	mid	1	15	21.97	22.14	2 W EIRP	2	7.9 dBi
eFDD 7 16QAM	mid	75	15	20.16	21.13	2 W EIRP	2	8.9 dBi
eFDD 7 QPSK	mid	1	20	23.06	23.13	2 W EIRP	2	6.9 dBi
eFDD 7 QPSK	mid	100	20	20.71	22.1	2 W EIRP	2	7.9 dBi
eFDD 7 16QAM	mid	1	20	21.99	21.91	2 W EIRP	2	8.1 dBi
eFDD 7 16QAM	mid	100	20	20.25	21.13	2 W EIRP	2	8.9 dBi

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Original RMS Cond. Power [dBm]	Updated RMS Cond. Power [dBm]	FCC Limit	IC EIRP Limit [W]	Max. Antenna Gain
eFDD 12 QPSK	mid	1	1.4	21.61	22.32	3 W ERP	5	12.5 dBd
eFDD 12 QPSK	mid	3	1.4	21.53	22.33	3 W ERP	5	12.4 dBd
eFDD 12 QPSK	mid	6	1.4	20.37	21.22	3 W ERP	5	13.6 dBd
eFDD 12 16QAM	mid	1	1.4	20.6	21.23	3 W ERP	5	13.5 dBd
eFDD 12 16QAM	mid	6	1.4	19.44	20.22	3 W ERP	5	14.6 dBd
eFDD 12 QPSK	mid	1	3	22.63	23.14	3 W ERP	5	11.6 dBd
eFDD 12 QPSK	mid	15	3	20.06	21.61	3 W ERP	5	13.2 dBd
eFDD 12 16QAM	mid	1	3	21.74	22.25	3 W ERP	5	12.5 dBd
eFDD 12 16QAM	mid	15	3	19.11	20.65	3 W ERP	5	14.1 dBd
eFDD 12 QPSK	mid	1	5	22.52	22.89	3 W ERP	5	11.9 dBd
eFDD 12 QPSK	mid	12	5	19.95	21.48	3 W ERP	5	13.3 dBd
eFDD 12 QPSK	mid	25	5	19.94	21.51	3 W ERP	5	13.3 dBd
eFDD 12 16QAM	mid	1	5	21.57	21.99	3 W ERP	5	12.8 dBd
eFDD 12 16QAM	mid	25	5	19	20.49	3 W ERP	5	14.3 dBd
eFDD 12 QPSK	mid	1	10	22.7	22.96	3 W ERP	5	11.8 dBd
eFDD 12 QPSK	mid	50	10	20.44	21.84	3 W ERP	5	12.9 dBd
eFDD 12 16QAM	mid	1	10	21.96	22.03	3 W ERP	5	12.7 dBd
eFDD 12 16QAM	mid	50	10	19.46	20.73	3 W ERP	5	14.0 dBd
eFDD 13 QPSK	mid	1	5	21.95	22.7	3 W ERP	5	12.1 dBd
eFDD 13 QPSK	mid	12	5	19.8	21.24	3 W ERP	5	13.5 dBd
eFDD 13 QPSK	mid	25	5	19.72	21.27	3 W ERP	5	13.5 dBd
eFDD 13 16QAM	mid	1	5	21.08	21.67	3 W ERP	5	13.1 dBd
eFDD 13 16QAM	mid	25	5	18.67	20.35	3 W ERP	5	14.4 dBd
eFDD 13 QPSK	mid	1	10	22.12	22.64	3 W ERP	5	12.1 dBd
eFDD 13 QPSK	mid	50	10	20.18	21.72	3 W ERP	5	13.1 dBd
eFDD 13 16QAM	mid	1	10	21.2	21.74	3 W ERP	5	13.0 dBd
eFDD 13 16QAM	mid	50	10	19.1	20.71	3 W ERP	5	14.1 dBd


Marker 1 [T1]
RBW 300 kHz
RF Att 20 dB
Ref Lvl
22.88 dBm
VBW 1 MHz
36.2 dBm
1.73271042 GHz
SWT 5 ms
Unit dBm
26.2 dB Offset
1 [T1]
22.88 dBm
1.73271042 GHz
CH PWR 23.13 dBm
CH BW 13.65000000 MHz
A
SGL
1VIEW
1RM
EXT
36.2
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.8
C0
C0
Start 1.7175 GHz
3 MHz/
Stop 1.7475 GHz
Date: 10.SEP.2018 15:13:17


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl
22.53 dBm
VBW 1 MHz
36.5 dBm
2.535100020 GHz
SWT 5 ms
Unit dBm
26.5 dB Offset
1 [T1]
22.53 dBm
2.535100020 GHz
CH PWR
23.16 dBm
CH BW
9.060000000 MHz
A
SGL
1VIEW
1RM
EXT
36.5
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.5
C0
C0
Start 2.525 GHz
2 MHz/
Stop 2.545 GHz
Date: 10.SEP.2018 16:04:08


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
21.04 dBm
VBW 300 kHz
35.6 dBm
707.69839679 MHz
SWT 5 ms
Unit dBm
25.6 dB Offset
1 [T1]
21.04 dBm
707.69839679 MHz
CH PWR
23.14 dBm
CH BW
2.74000000 MHz
A
SGL
1VIEW
1RM
EXT
35.6
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.4
C0
C0
Start 704.5 MHz
600 kHz/
Stop 710.5 MHz
Date: 10.SEP.2018 16:26:16

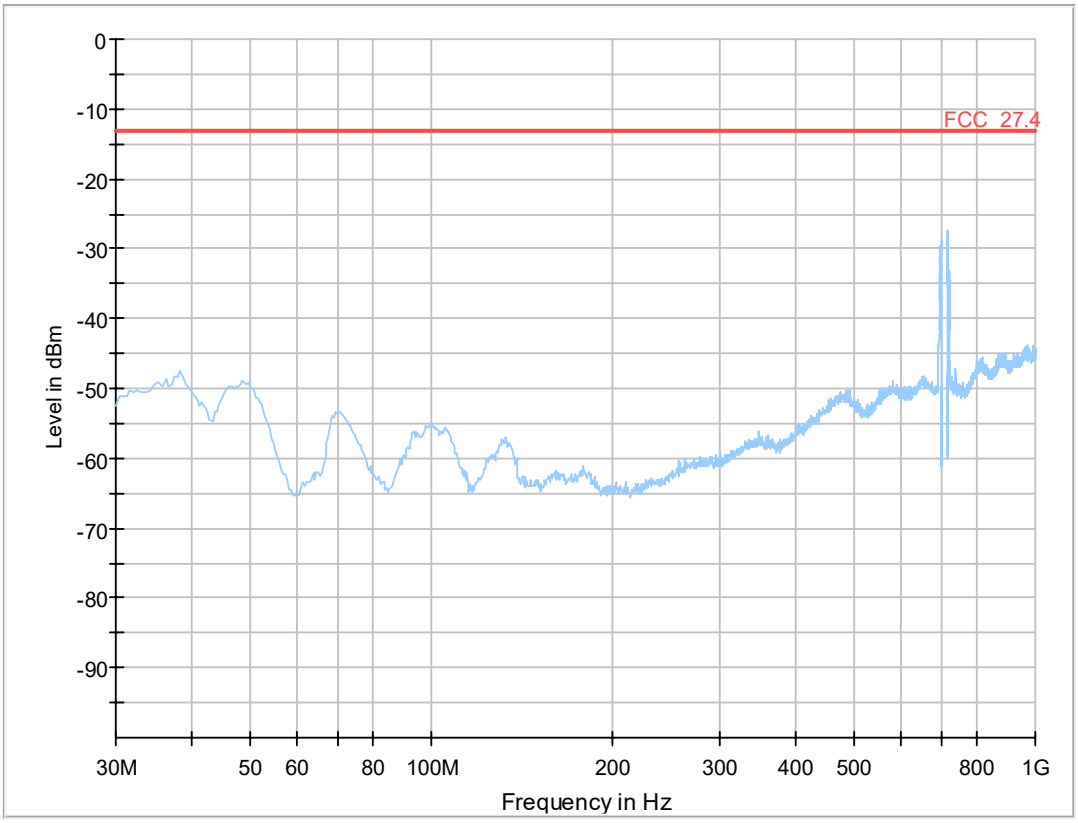

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
20.70 dBm
VBW 300 kHz
35.7 dBm
782.19038076 MHz
SWT 5 ms
Unit dBm
25.7 dB Offset
1 [T1]
20.70 dBm
782.19038076 MHz
CH PWR
22.70 dBm
CH BW
4.51000000 MHz
A
SGL
1VIEW
1RM
EXT
35.7
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.3
C0
C0
Start 777 MHz
1 MHz/
Stop 787 MHz
Date: 10.SEP.2018 17:04:55

3.5.10 27.4 Field strength of spurious radiation §2.1053, §27.53

Test: 27.4; Frequency Band = eFDD12, Mode = QPSK 5MHz, Channel = 23095, Frequency = 707.5MHz, Method = radiated

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 17:40
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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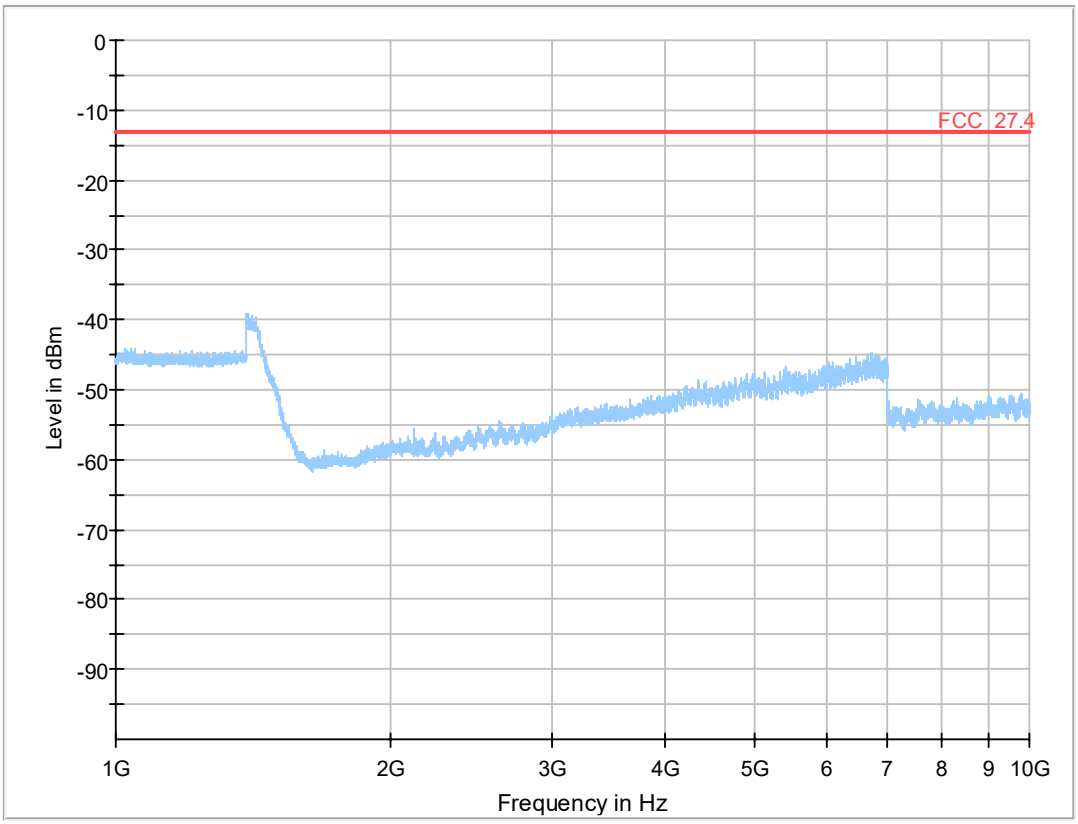

Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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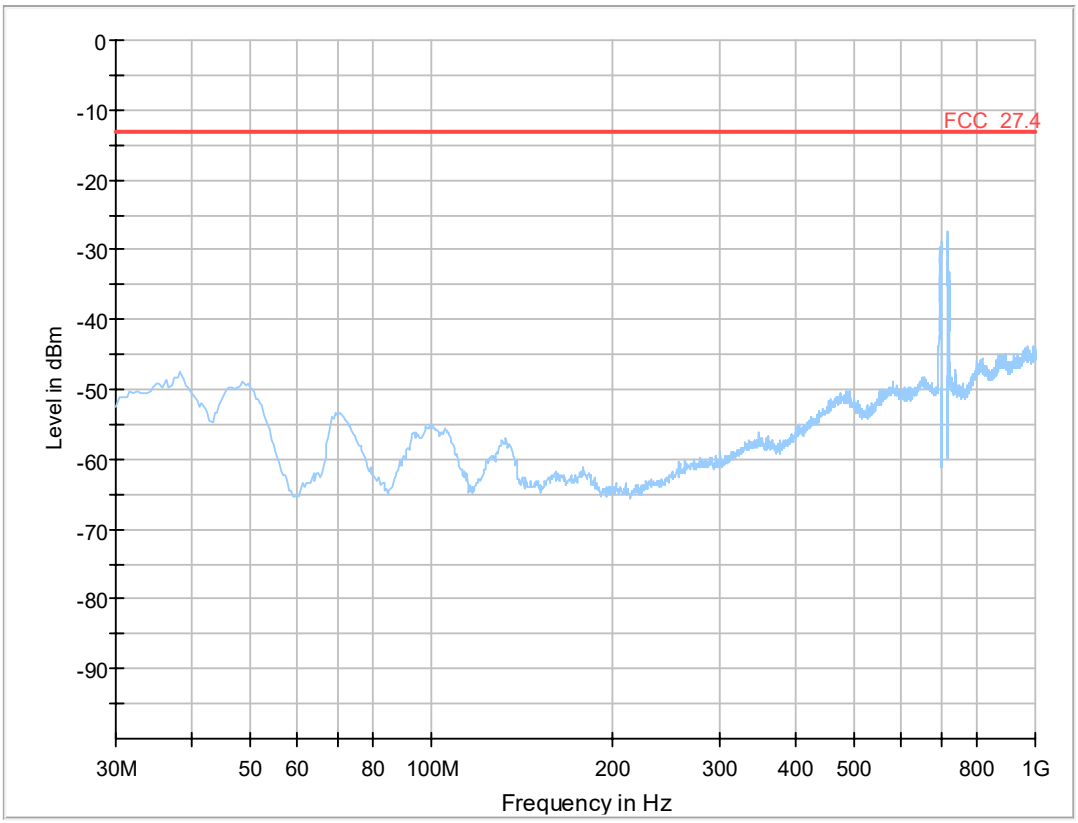
27.4; Frequency Band = eFDD12, Mode = QPSK 5MHz, Channel = 23095, Frequency = 707.5MHz, Method = radiated

Updated measurement



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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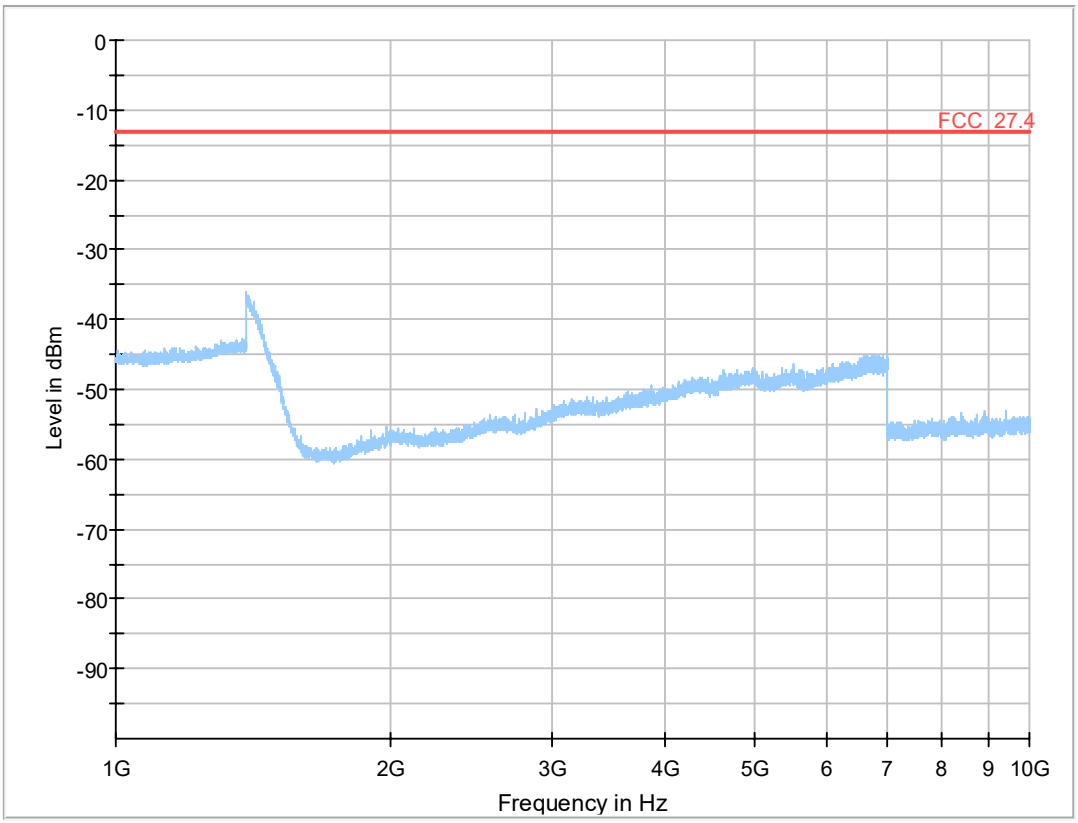

Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

27.4; Frequency Band = eFDD12, Mode = QPSK 5MHz, Channel = 23095, Frequency = 707.5MHz, Method = radiated

Original measurement

Test: 27.4; Frequency Band = eFDD13, Mode = QPSK 5MHz, Channel = 23230, Frequency = 782MHz, Method = radiated

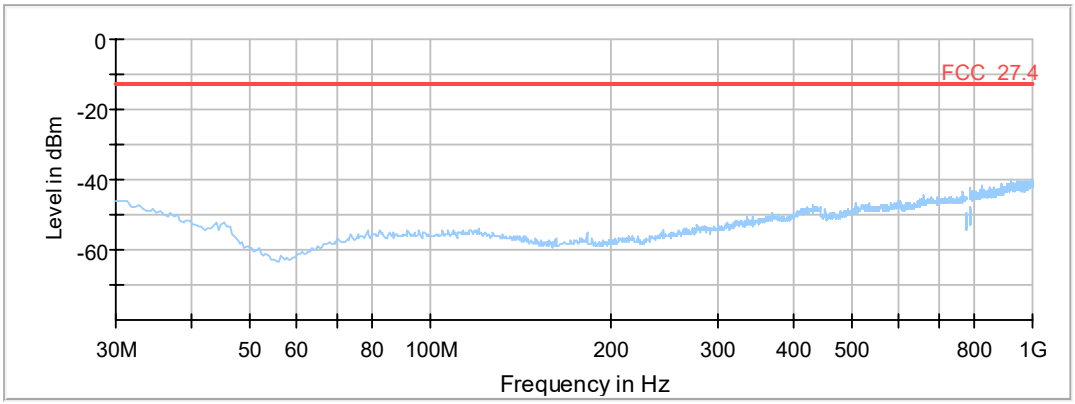
Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 20:43
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:

Test Report

Common Information

Test Description:
Test Standard
Operating Conditions:
Operator Name:
Comment:



Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
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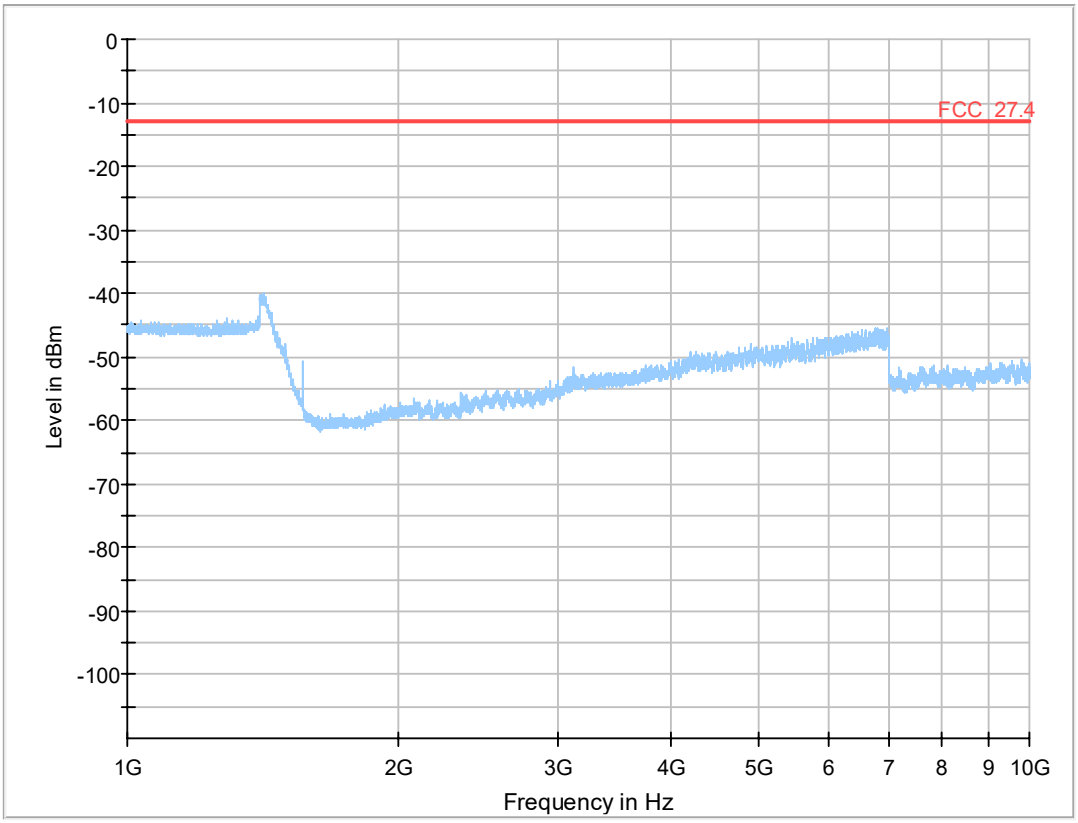
EMI Auto Test Template: FCC27_30M-1G_eFDD13_5MHz_CH23230

Hardware Setup: FCC_30M-1G_ERP
Measurement Type: Open-Area-Test-Site
Frequency Range: 30 MHz - 1 GHz
Graphics Level Range: -80 dBm - 0 dBm

Preview Measurements:
Sweep Test Template: FCC27.4_LTE_eFDD13_5MHz_23230_PRE

Adjustment:
Template for Single Meas.: FCC27_eFDD13_Adjustment

Final Measurements:
Template for Single Meas.: FCC27_eFDD13_Final



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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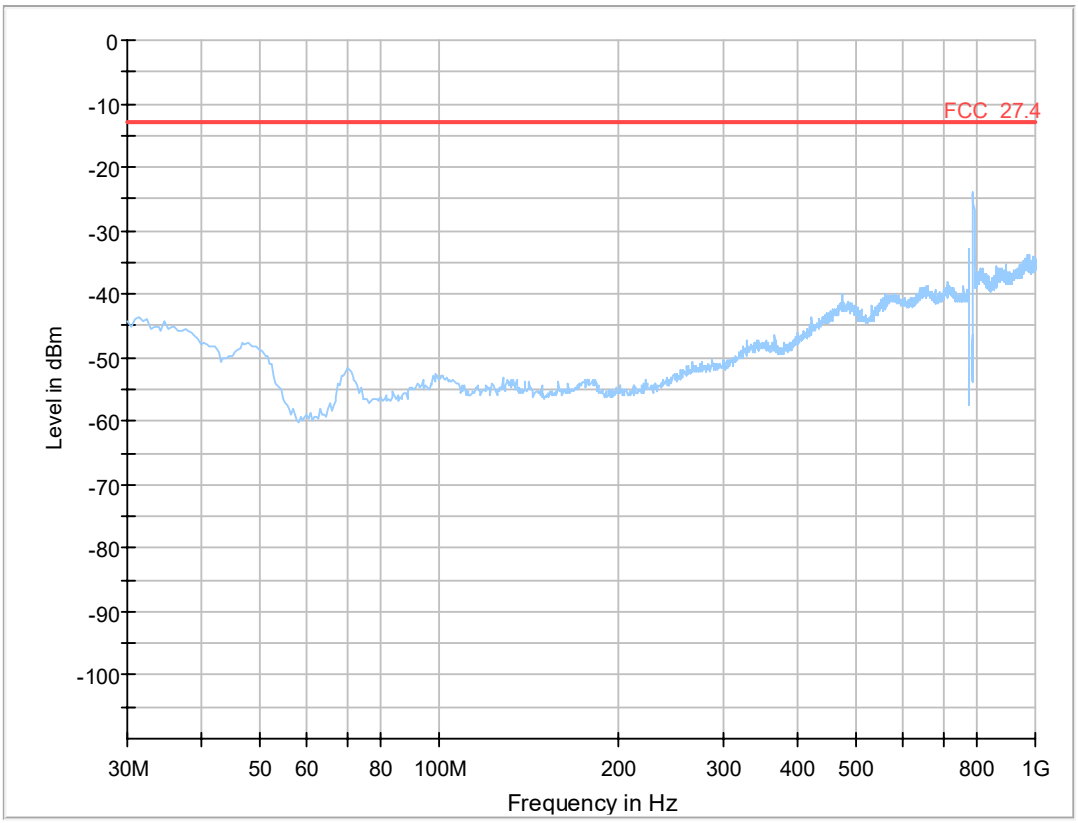
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

27.4; Frequency Band = eFDD13, Mode = QPSK 5MHz, Channel = 23230, Frequency = 782MHz, Method = radiated

Updated measurement



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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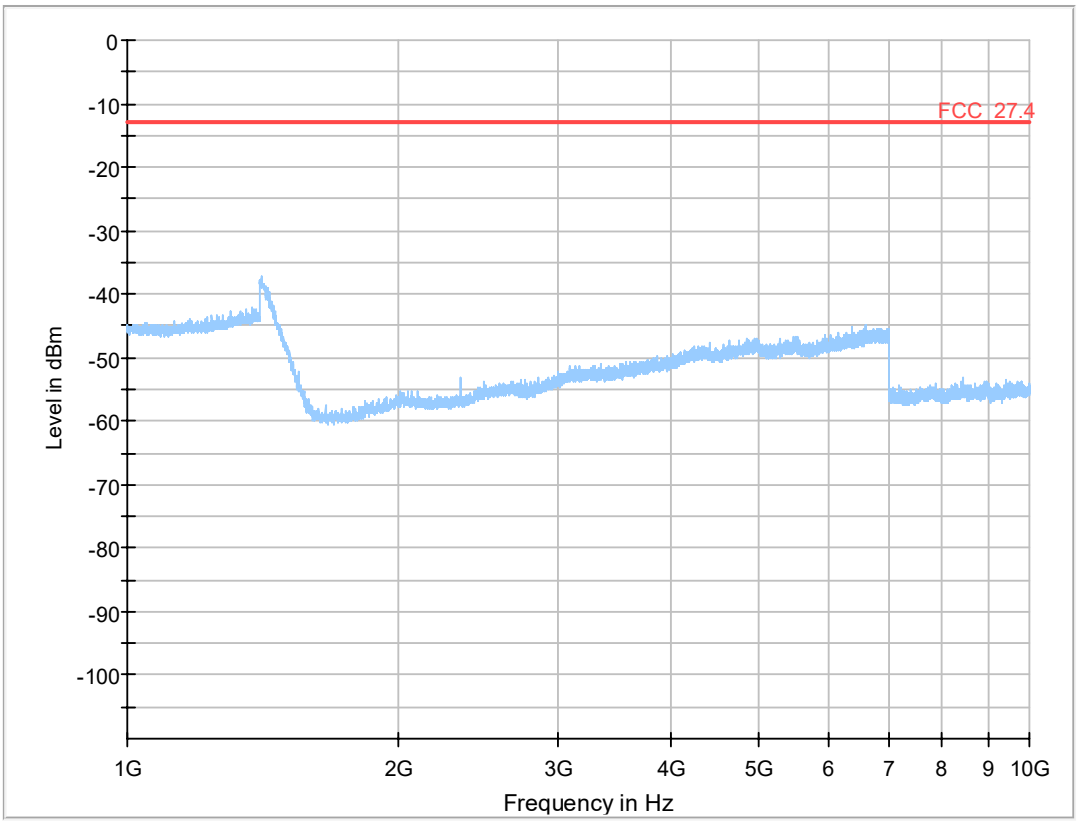
Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

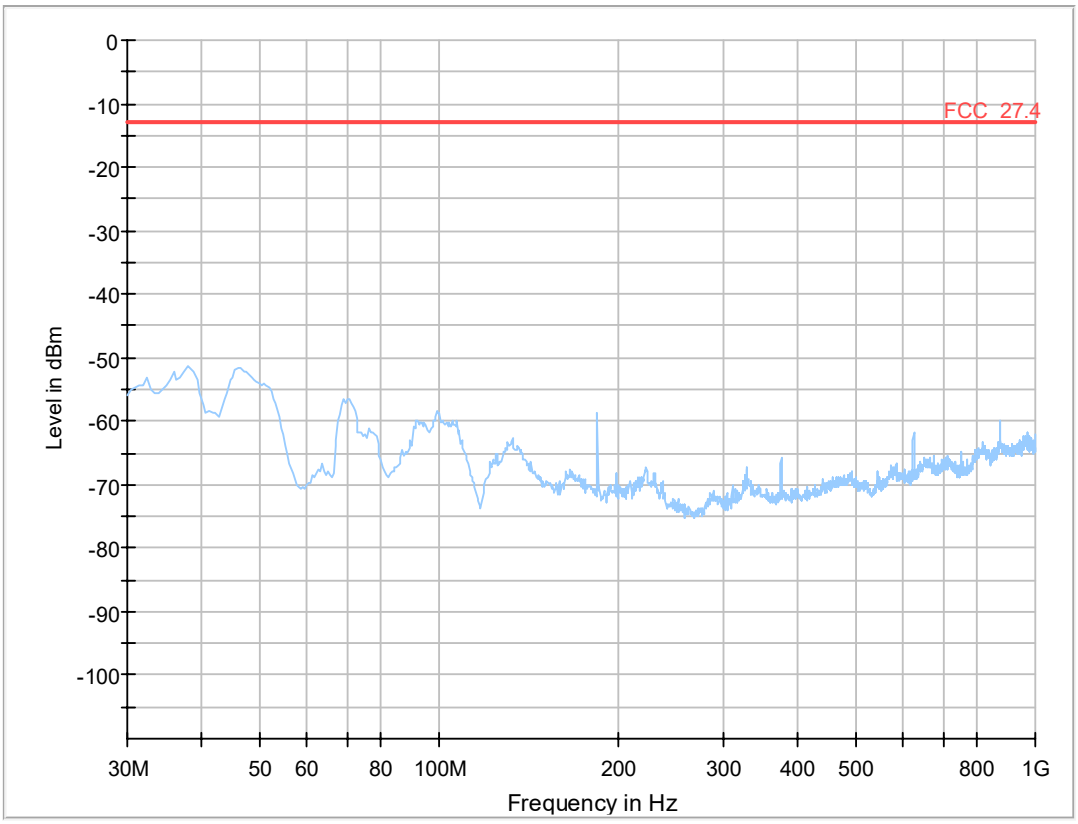
27.4; Frequency Band = eFDD13, Mode = QPSK 5MHz, Channel = 23230, Frequency = 782MHz, Method = radiated

Original measurement

Test: 27.4; Frequency Band = eFDD4, Mode = QPSK 5MHz, Channel = 20175, Frequency = 1732.5MHz, Method = radiated

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 18:40
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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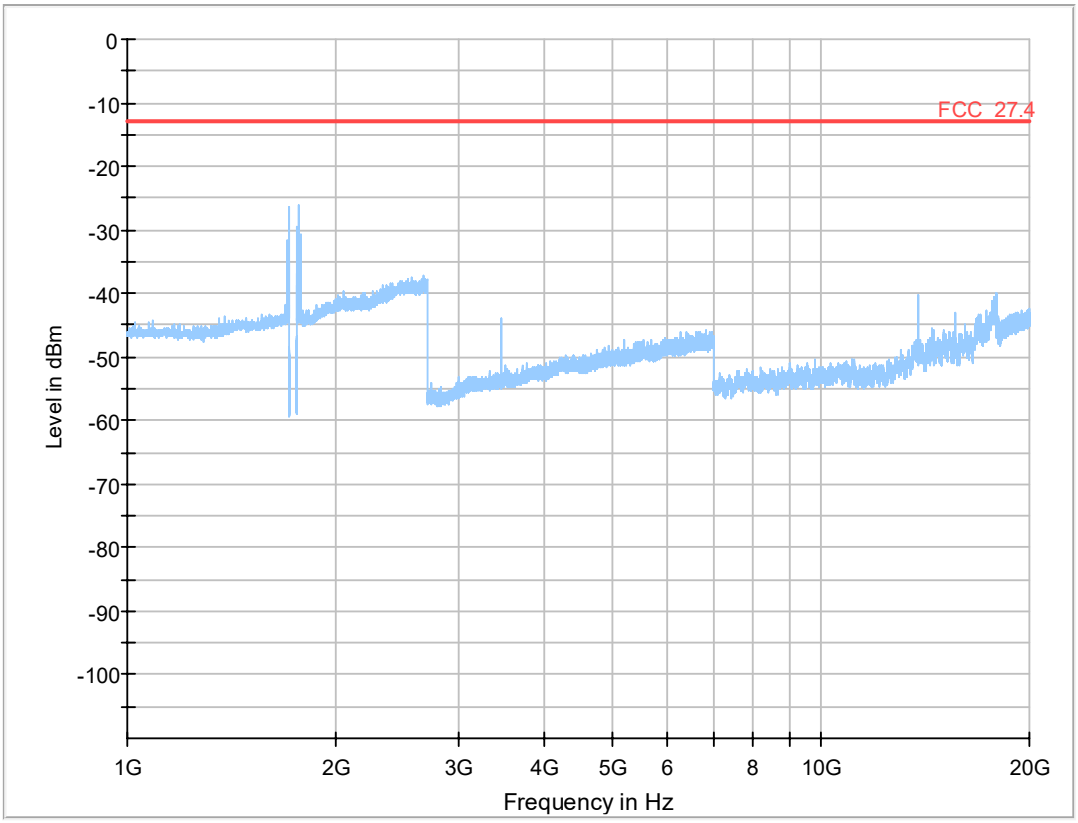
Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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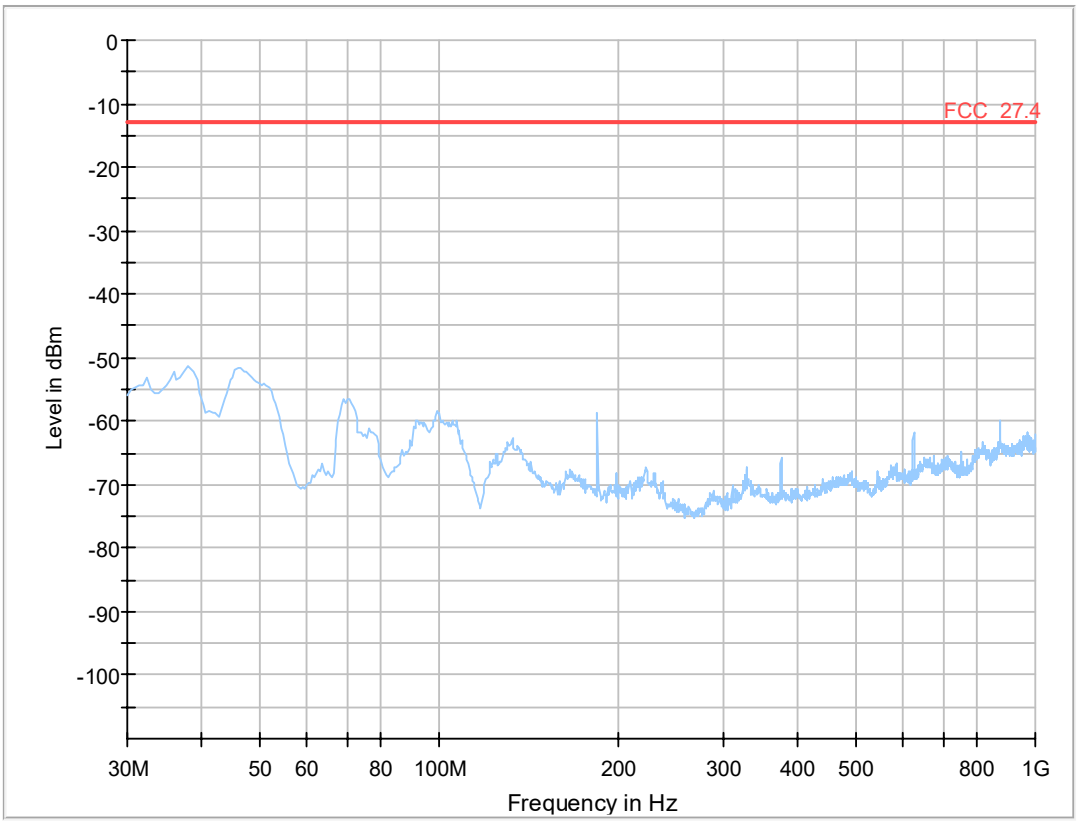
Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

27.4; Frequency Band = eFDD4, Mode = QPSK 5MHz, Channel = 20175, Frequency = 1732.5MHz, Method = radiated

Updated Measurment



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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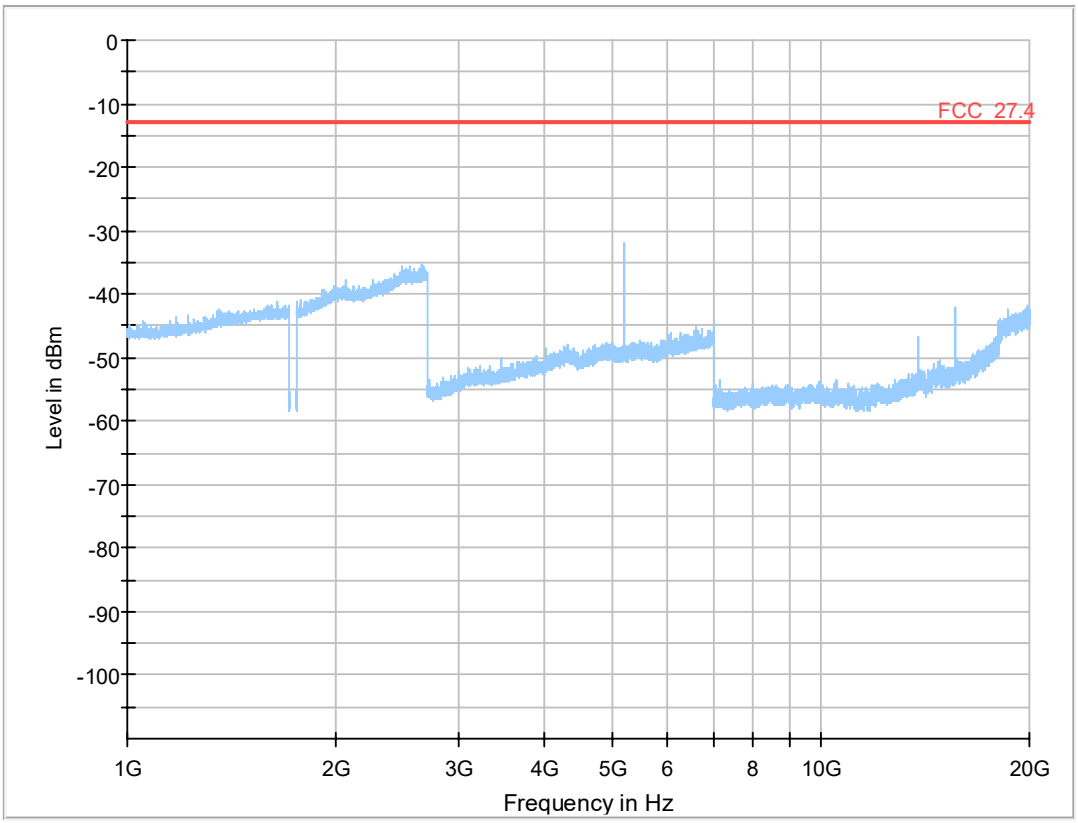
Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

27.4; Frequency Band = eFDD4, Mode = QPSK 5MHz, Channel = 20175, Frequency = 1732.5MHz, Method = radiated

Original Measurment

Test: 27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

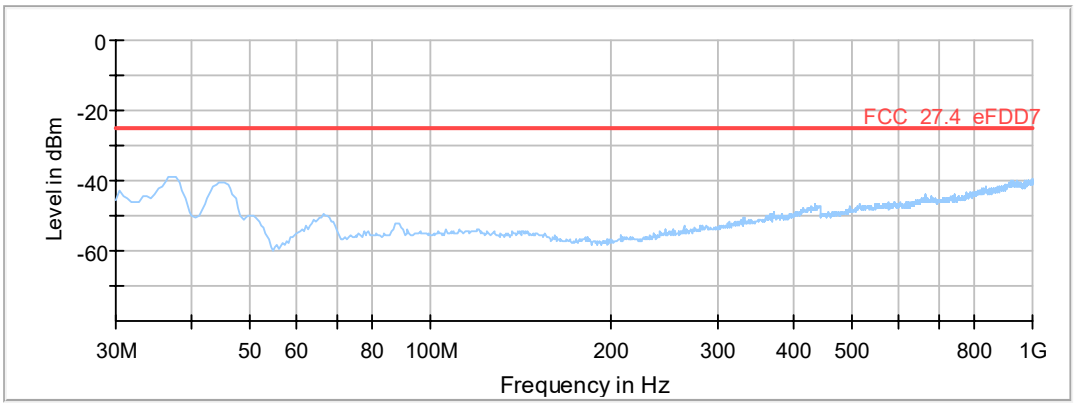
Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/07 14:09
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:

Test Report

Common Information

Test Description:
Test Standard
Operating Conditions:
Operator Name:
Comment:



Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
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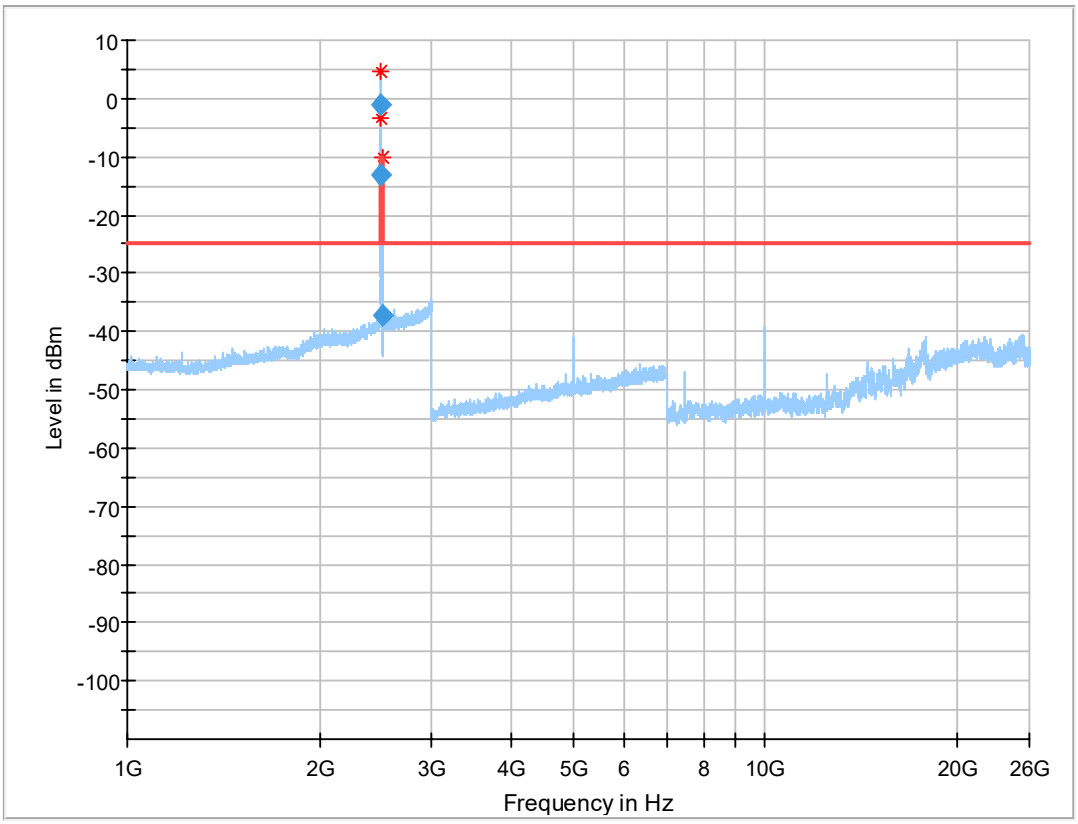
EMI Auto Test Template: FCC27_30M-1G_eFDD7_CH21100

Hardware Setup:	FCC_30M-1G_ERP
Measurement Type:	Open-Area-Test-Site
Frequency Range:	30 MHz - 1 GHz
Graphics Level Range:	-80 dBm - 0 dBm
Preview Measurements:	
Sweep Test Template:	FCC27.4_LTE_eFDD7_5MHz_21100_PRE
Adjustment:	
Template for Single Meas.:	FCC24_eFDD2_Adjustment
Final Measurements:	
Template for Single Meas.:	FCC24_eFDD2_Final

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Updated measurement



Critical_Freqs

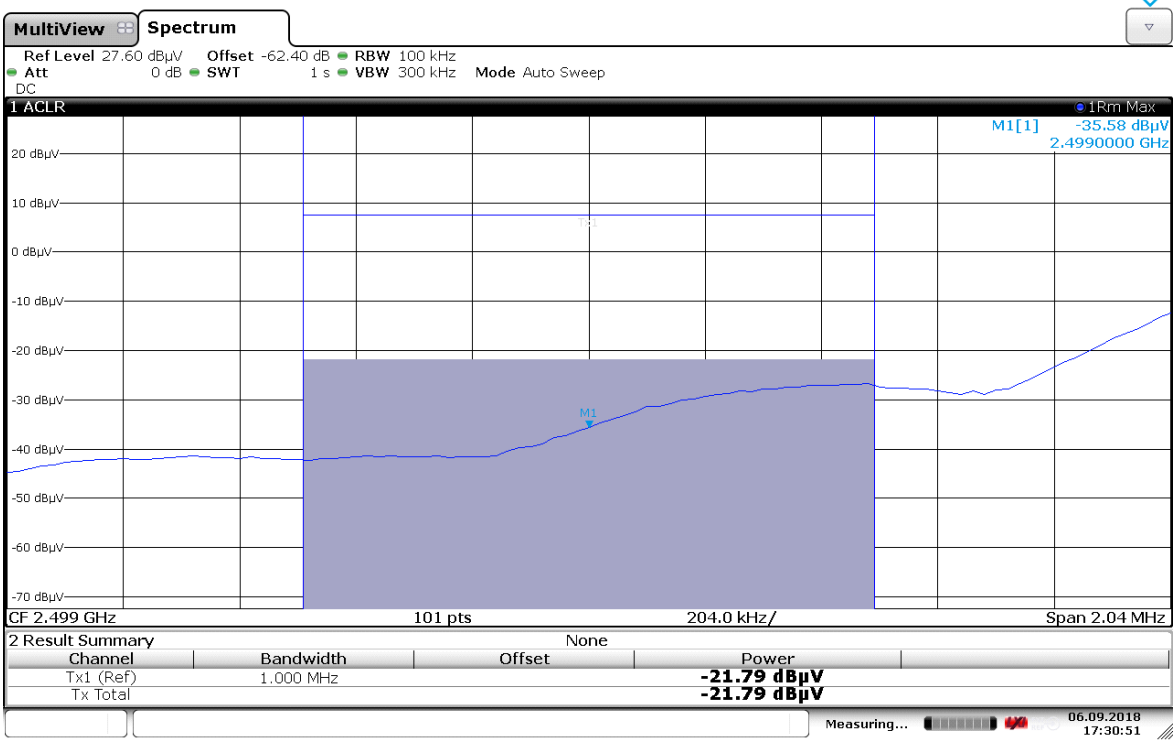
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2499.000	4.8	-10.00	-14.75	---	---	150.0	H	137.0	-3.0	-62.4
2499.993	-3.4	-10.00	-6.57	---	---	150.0	H	139.0	-3.0	-62.4
2506.000	-10.0	-10.00	0.00	---	---	150.0	H	138.0	5.0	-62.3

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2499.000	-1.2	-10.00	-8.79	1000.0	1000.000	150.0	H	137.0	-3.0	-62.4
2499.993	-13.2	-10.00	3.20	1000.0	100.000	150.0	H	139.0	-3.0	-62.4
2506.000	-37.2	-10.00	27.21	1000.0	100.000	150.0	H	138.0	5.0	-62.3

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Updated measurement



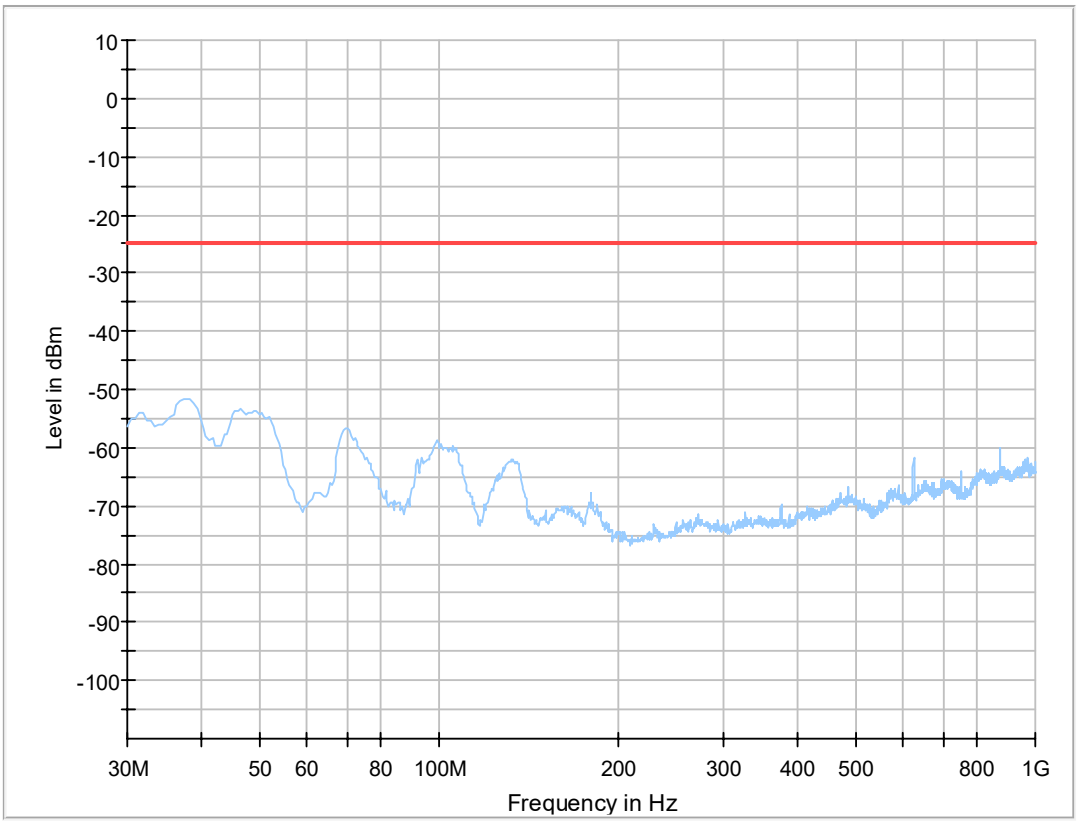
17:30:51 06.09.2018

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2499.000	-21.79	-10.00	11.79	1000.0	1000.000	150.0	H	137.0	-3.0	-62.4

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Updated measurement



Critical_Freqs

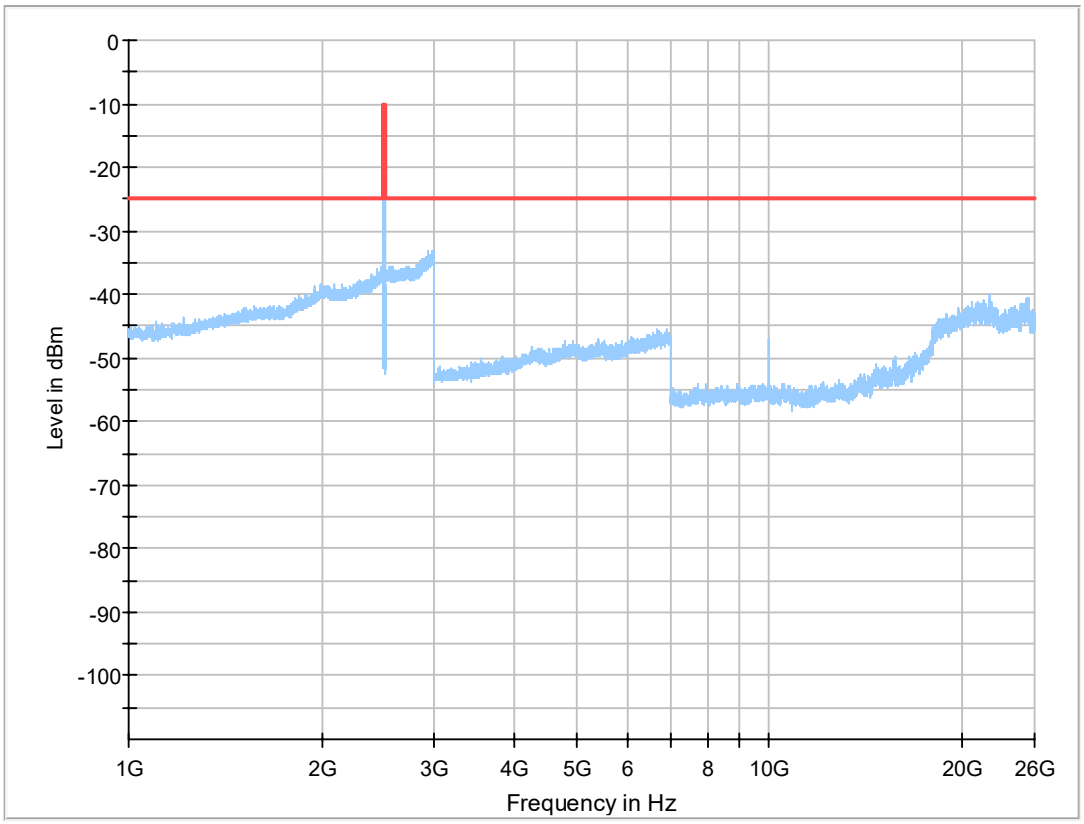
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

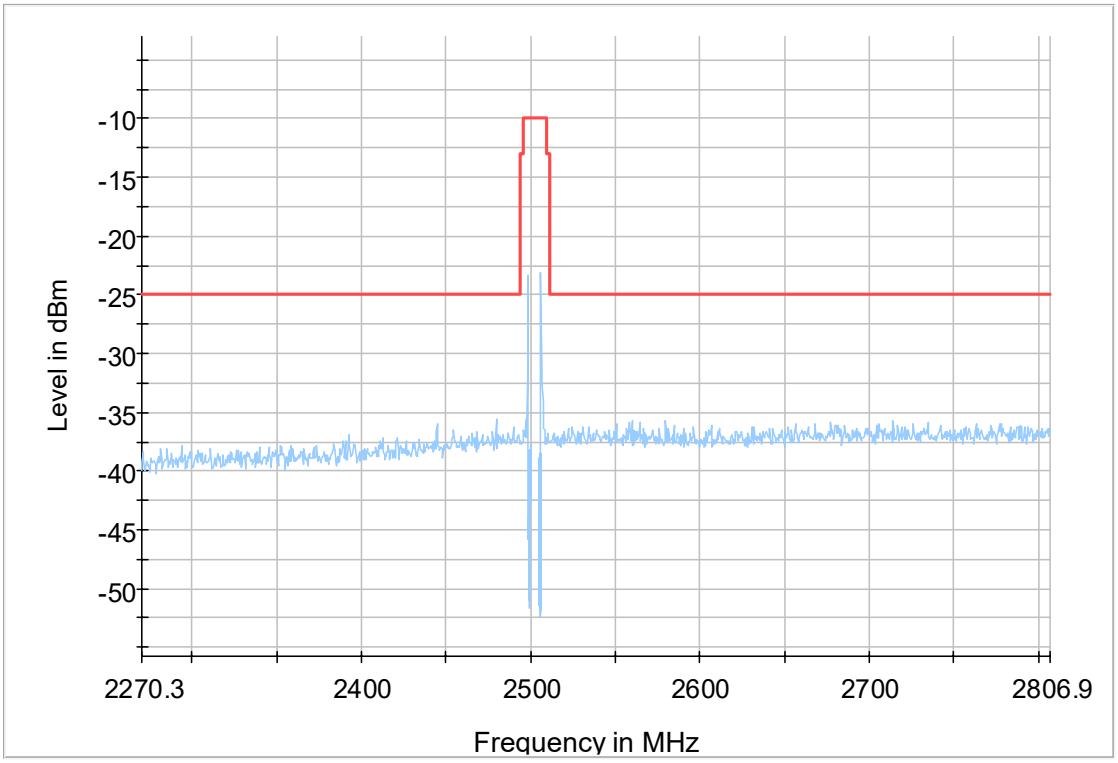
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Original measurement



27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Original measurement



Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

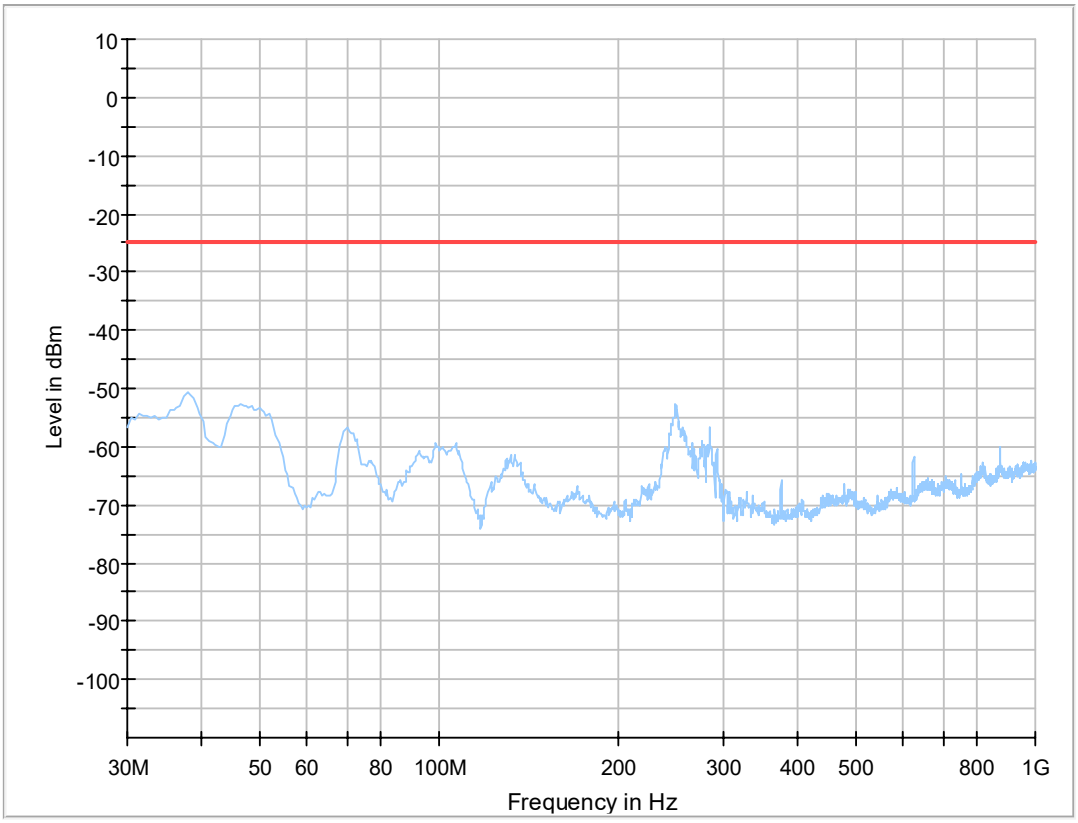
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 20775, Frequency = 2502.5MHz, Method = radiated

Original measurement

Test: 27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/06 15:08
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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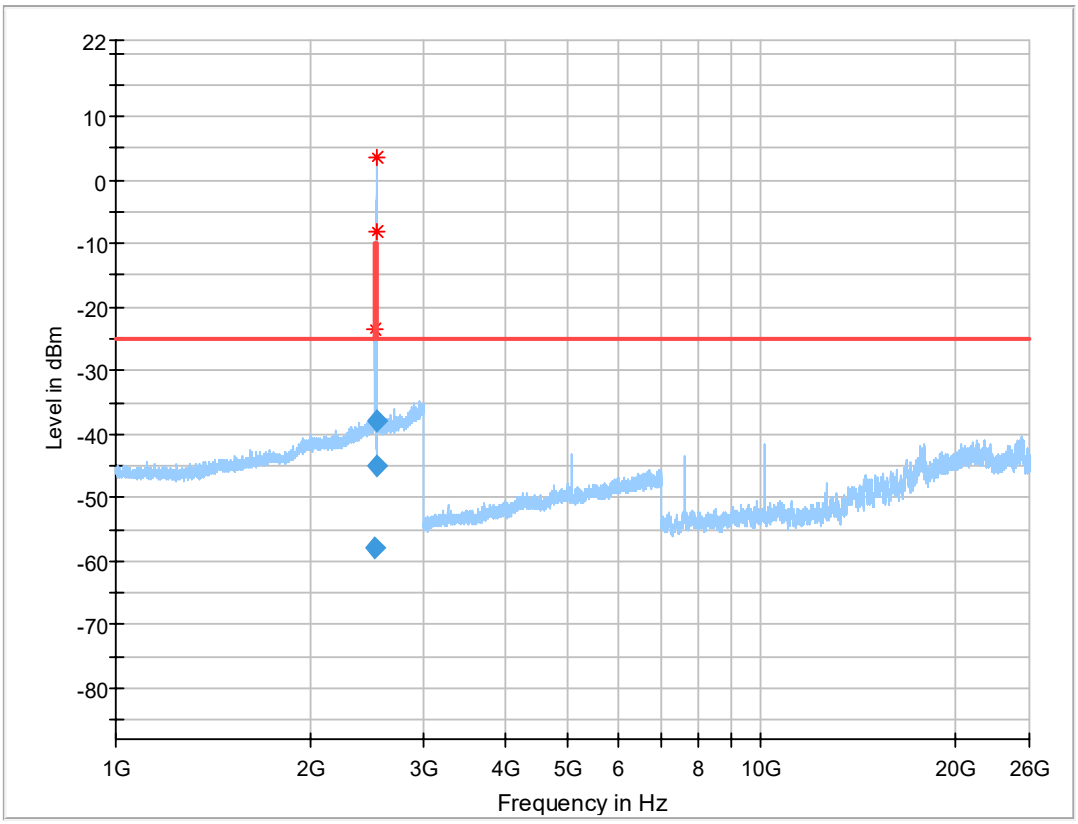
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Updated Measurement



Critical_Freqs

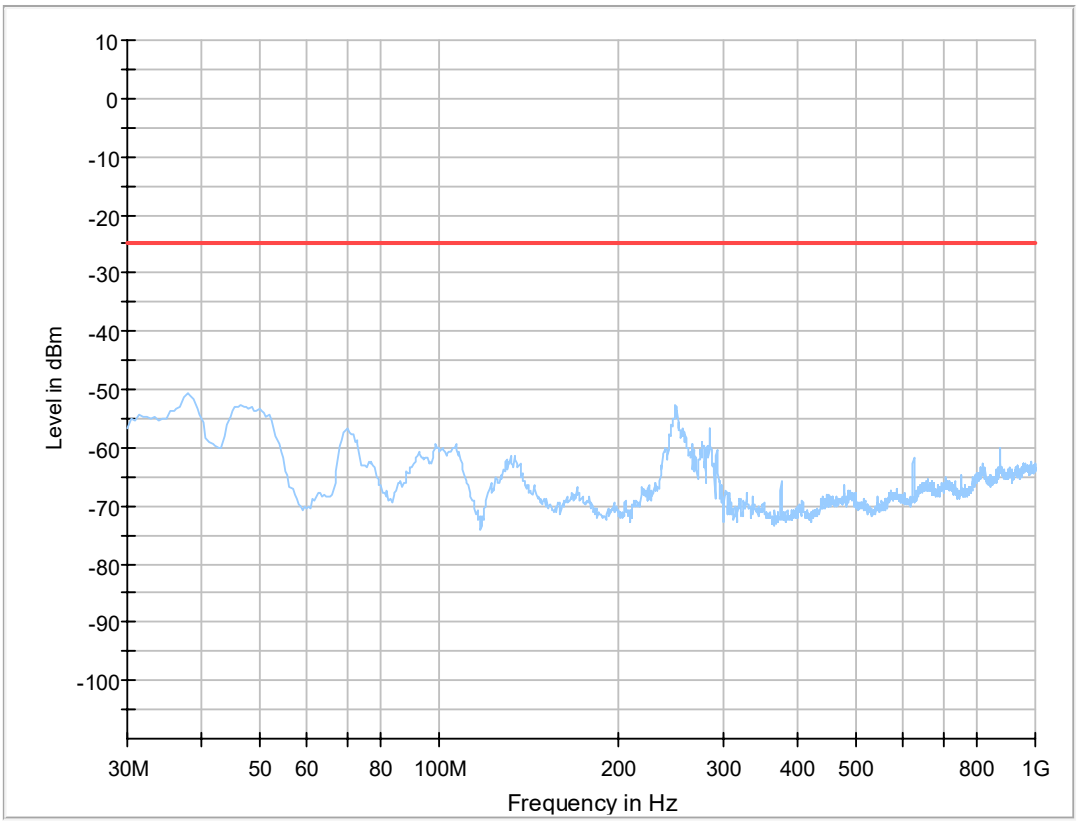
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2524.864	-23.5	-25.00	-1.51	---	---	150.0	V	-14.0	89.0	-62.3
2531.500	3.5	-10.00	-13.49	---	---	150.0	V	-16.0	91.0	-62.2
2538.500	-8.2	-10.00	-1.79	---	---	150.0	V	-15.0	88.0	-62.1

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2524.864	-57.7	-25.00	32.74	1000.0	100.000	150.0	V	-14.0	89.0	-62.3
2531.500	-37.9	-10.00	27.87	1000.0	100.000	150.0	V	-16.0	91.0	-62.2
2538.500	-45.0	-10.00	35.04	1000.0	100.000	150.0	V	-15.0	88.0	-62.1

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Updated Measurement



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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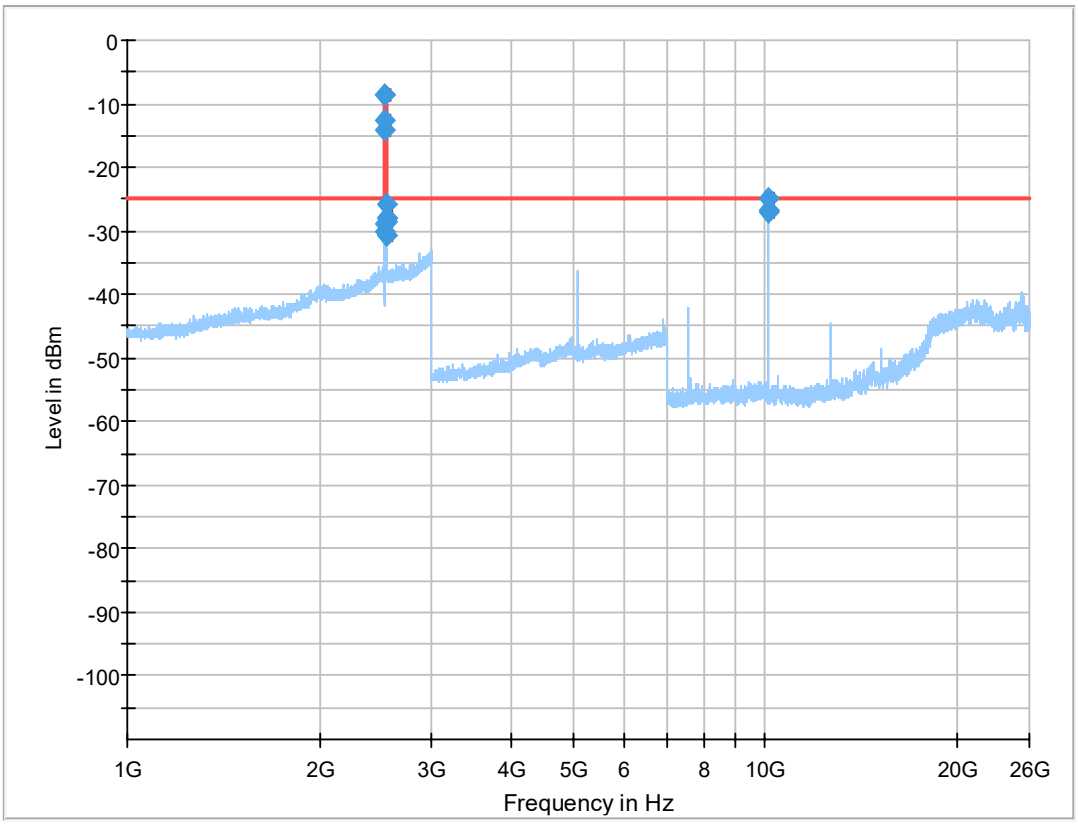
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Original Measurement

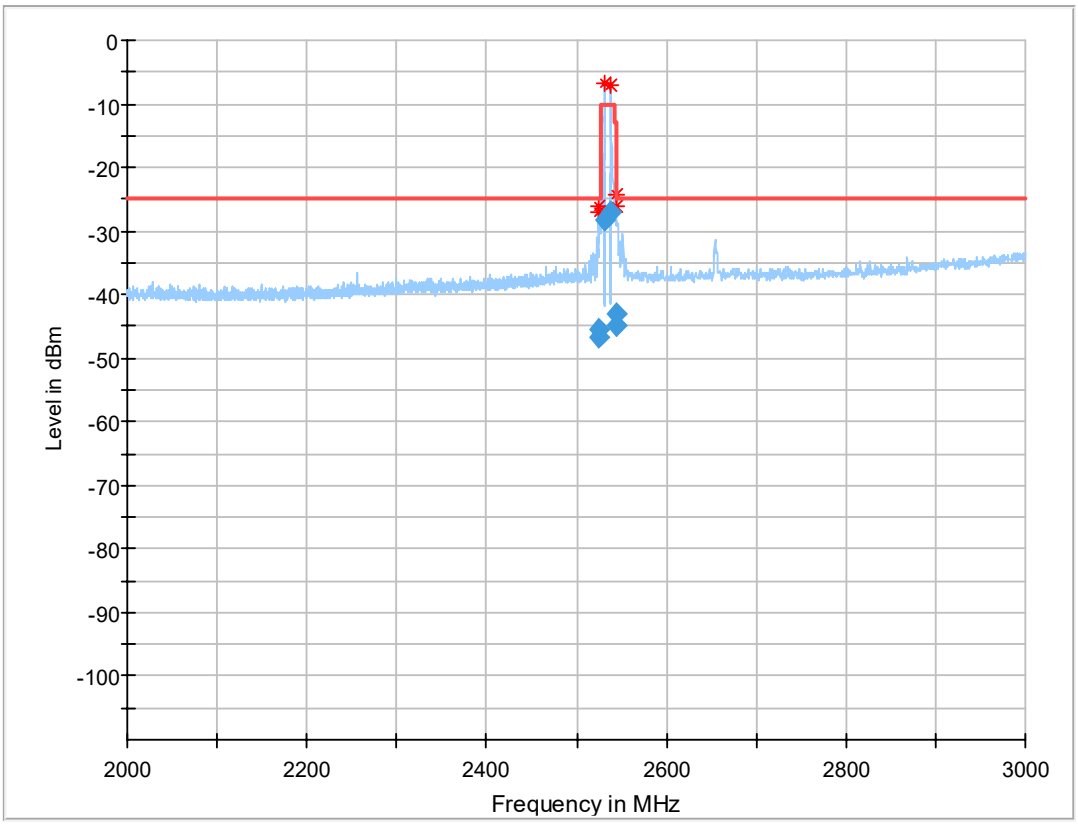


Pre-Scan_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2525.884500	-30.18	-25.00	5.18	2000.0	1000.000	150.0	H	-180.0	90.0	-60.5
2526.395000	-28.83	-25.00	3.83	2000.0	1000.000	150.0	H	-135.0	0.0	-60.5
2530.989500	-12.63	-10.00	2.63	2000.0	1000.000	150.0	H	-180.0	90.0	-60.4
2531.500000	-8.65	-10.00	-1.35	2000.0	1000.000	150.0	H	-135.0	0.0	-60.4
2538.500000	-8.63	-10.00	-1.37	1000.0	1000.000	150.0	H	-135.0	0.0	-60.4
2538.961500	-14.14	-10.00	4.14	1000.0	1000.000	150.0	V	-90.0	90.0	-60.4
2543.576500	-25.67	-25.00	0.67	1000.0	1000.000	150.0	H	-135.0	0.0	-60.4
2544.038000	-27.94	-25.00	2.94	1000.0	1000.000	150.0	V	-90.0	90.0	-60.4
2544.499500	-28.02	-25.00	3.02	1000.0	1000.000	150.0	V	-90.0	90.0	-60.4
2544.961000	-28.68	-25.00	3.68	1000.0	1000.000	150.0	V	-180.0	90.0	-60.4
2545.884000	-30.62	-25.00	5.62	1000.0	1000.000	150.0	H	-135.0	0.0	-60.4
10139.583333	-26.78	-25.00	1.78	10000.0	1000.000	150.0	V	0.0	90.0	-115.2
10140.500000	-25.02	-25.00	0.02	10000.0	1000.000	150.0	V	0.0	90.0	-115.2
10141.416667	-27.09	-25.00	2.09	10000.0	1000.000	150.0	V	0.0	90.0	-115.2

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Original Measurement



Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2524.944833	-46.70	-25.00	21.70	1000.0	1000.000	150.0	H	-10.0	95.8	-60.5
2525.476333	-45.37	-25.00	20.37	1000.0	1000.000	150.0	H	-175.0	85.8	-60.5
2531.322833	-28.28	-10.00	18.28	1000.0	1000.000	150.0	H	-178.0	88.9	-60.4
2538.500000	-26.99	-10.00	16.99	1000.0	1000.000	150.0	H	-180.0	89.0	-60.4
2543.576500	-42.95	-25.00	17.95	1000.0	1000.000	150.0	H	-181.0	86.8	-60.4
2544.499500	-44.71	-25.00	19.71	1000.0	1000.000	150.0	H	-180.0	83.9	-60.4

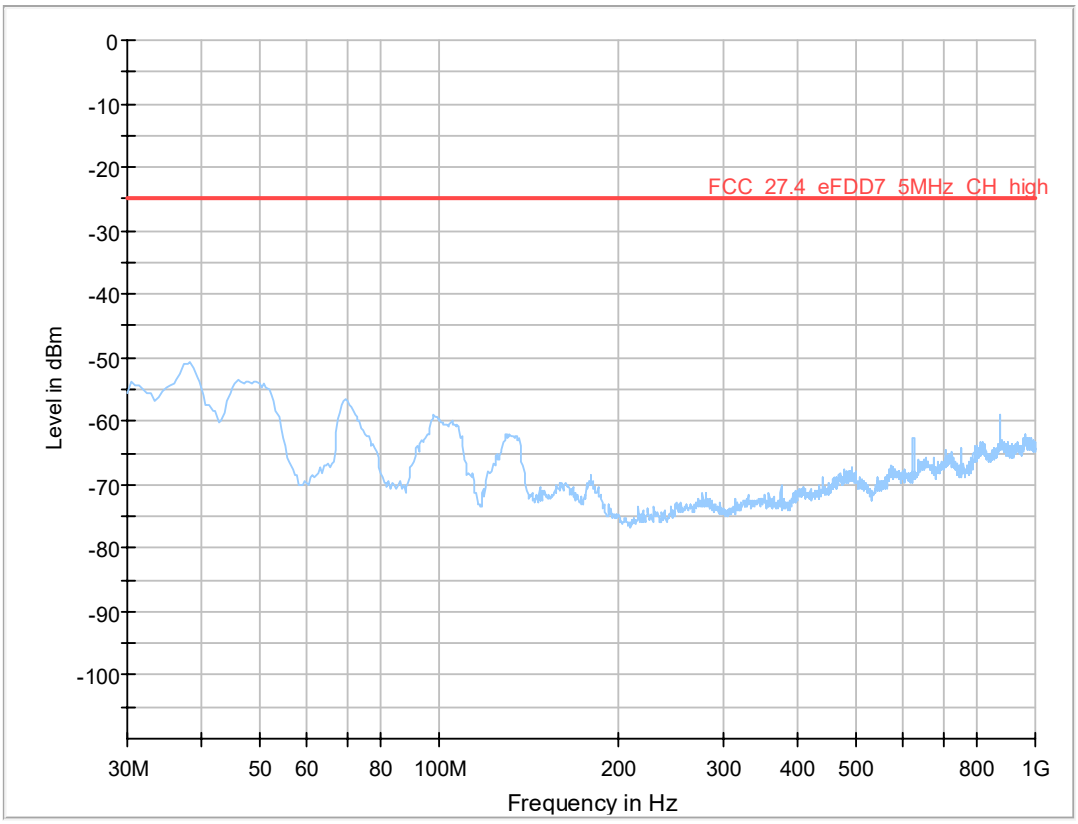
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21100, Frequency = 2535MHz, Method = radiated

Original Measurement

Test: 27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz, Method = radiated

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/07 14:09
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:



Critical_Freqs

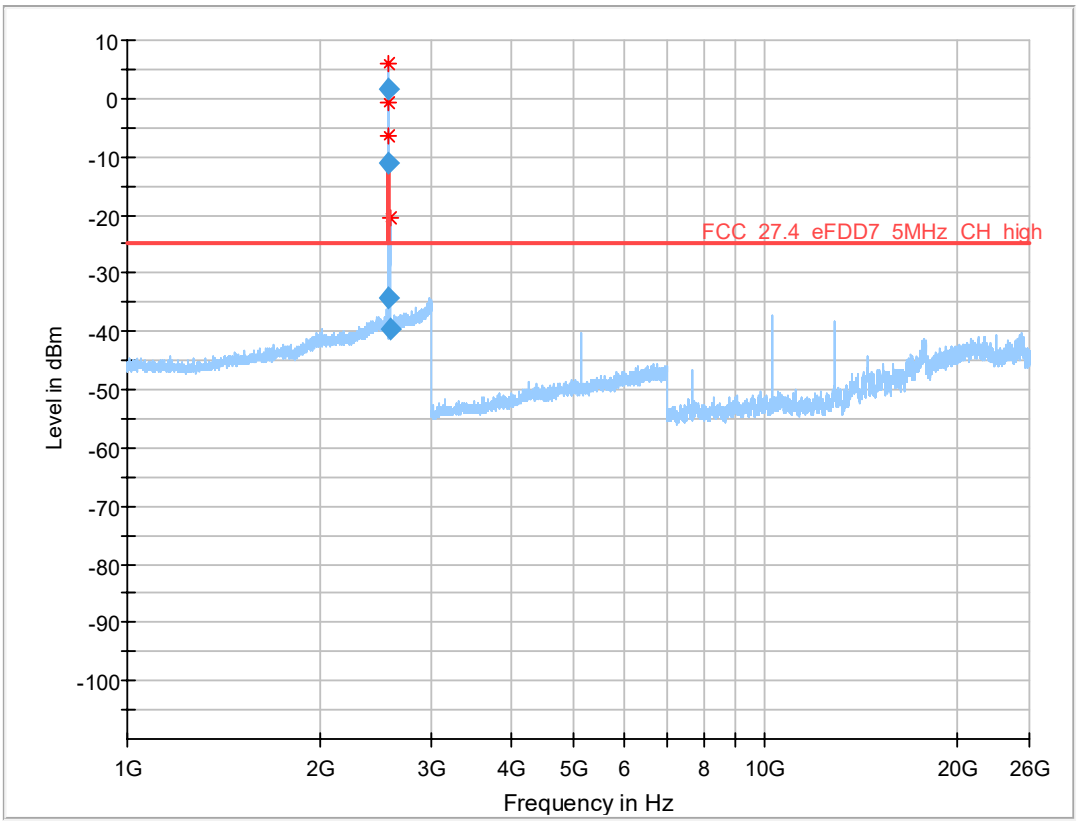
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
---	---	---	---	---	---	---		---	---	---

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz,
Method = radiated

Updated measurement



Critical_Freqs

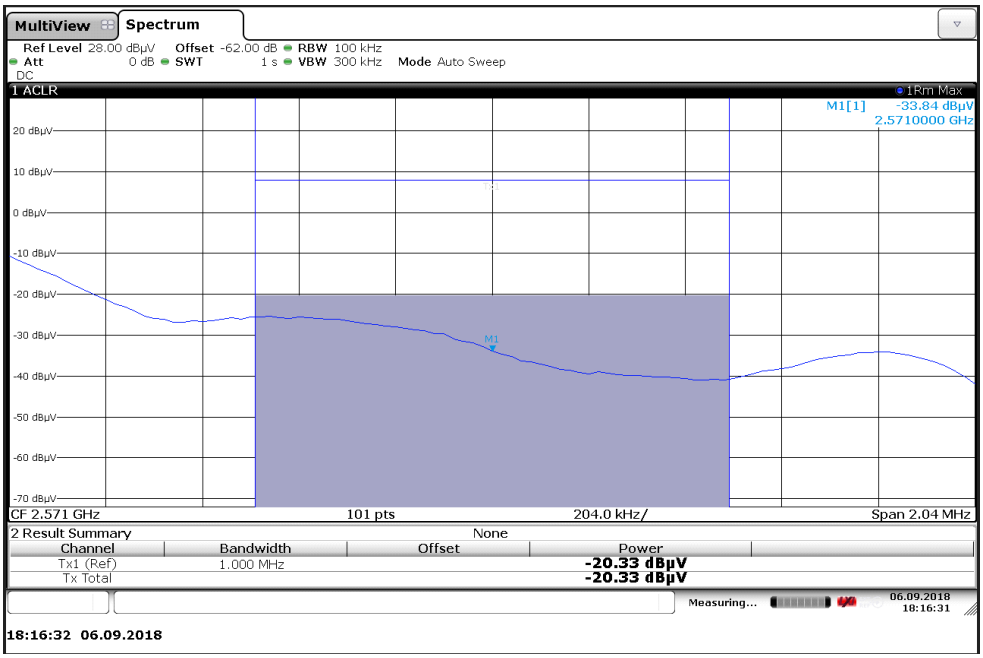
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2564.000	-6.5	-10.00	-3.49	---	---	150.0	H	134.0	8.0	-62.1
2570.001	-0.8	-10.00	-9.23	---	---	150.0	H	133.0	1.0	-62.0
2571.000	6.0	-10.00	-16.04	---	---	150.0	H	133.0	5.0	-62.0
2577.864	-20.4	-25.00	-4.63	---	---	150.0	H	133.0	0.0	-62.0

Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2564.000	-34.4	-10.00	24.38	1000.0	100.000	150.0	H	134.0	8.0	-62.1
2570.001	-11.1	-10.00	1.12	1000.0	100.000	150.0	H	133.0	1.0	-62.0
2571.000	1.6	-10.00	-11.57	1000.0	1000.000	150.0	H	133.0	5.0	-62.0
2577.864	-39.5	-25.00	14.46	1000.0	1000.000	150.0	H	133.0	0.0	-62.0

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz, Method = radiated

Updated measurement

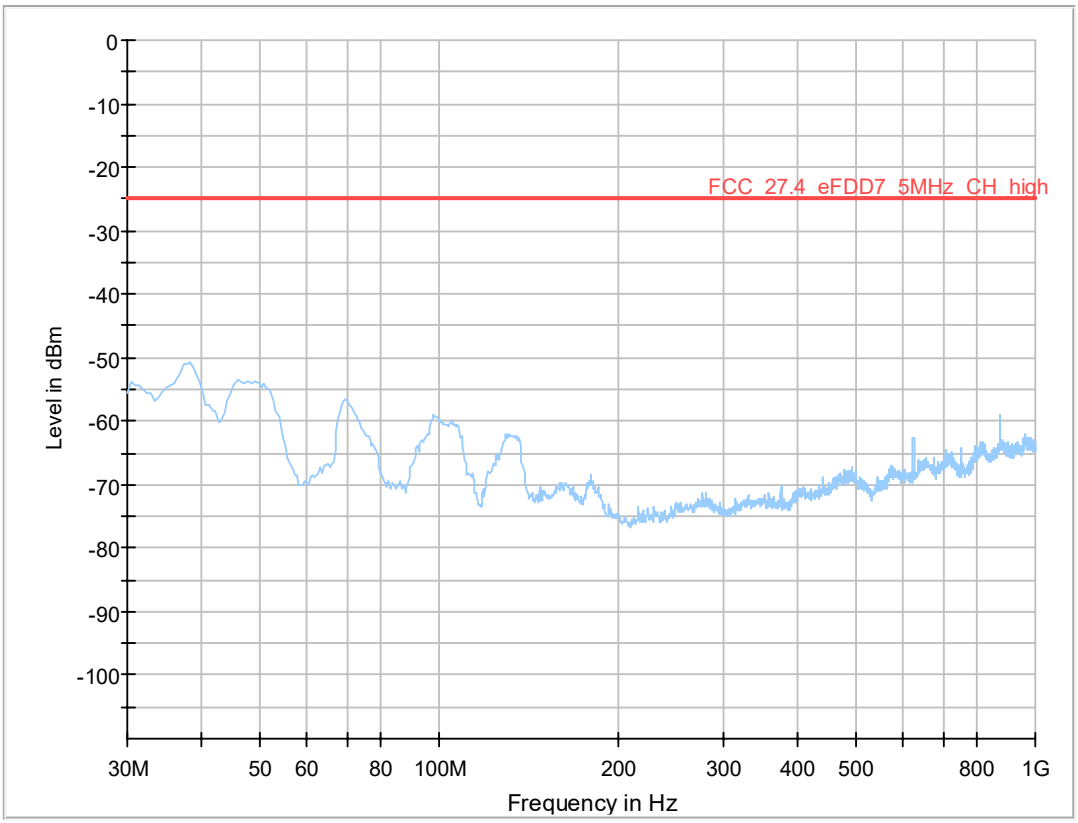


Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2571.000	1.6	-10.00	-11.57	1000.0	1000.000	150.0	H	133.0	5.0	-62.0

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz, Method = radiated

Updated measurement



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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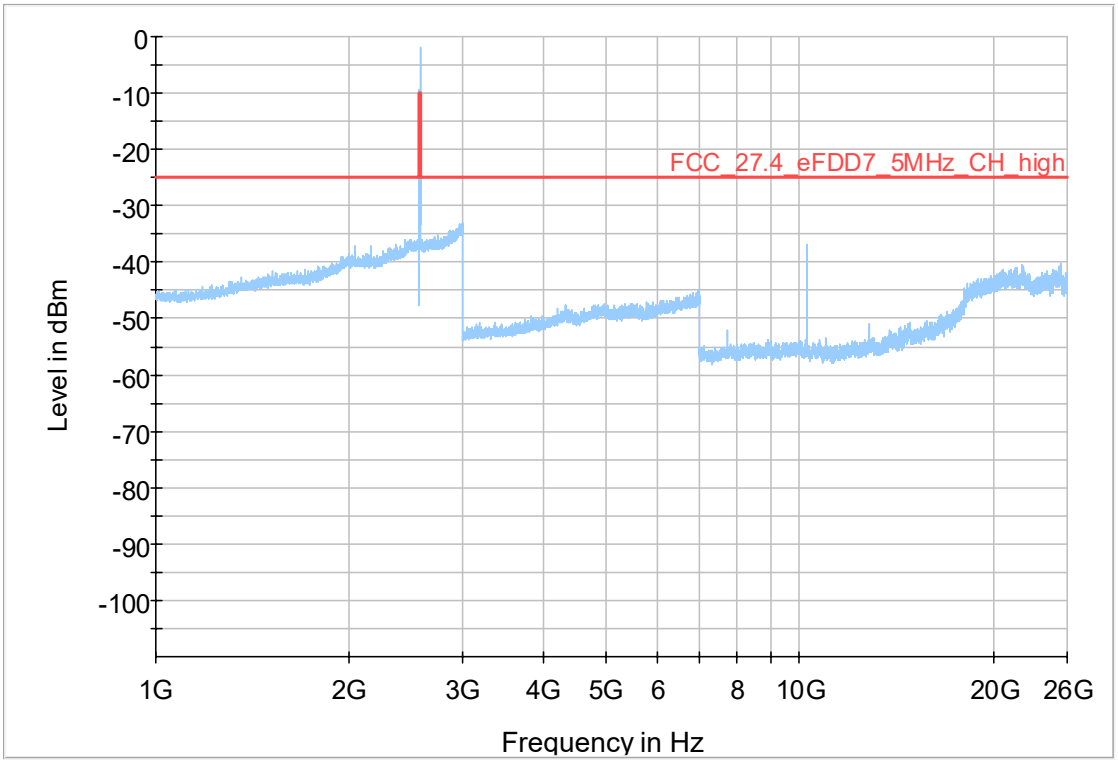
27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz, Method = radiated

Original measurement



Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Corr. (dB)	Comment
2571	-10.52---	-10	0.52	-60.4	measured with power integration method

27.4; Frequency Band = eFDD7, Mode = QPSK 5MHz, Channel = 21425, Frequency = 2567.5MHz,
Method = radiated

Original measurement

3.5.11 27.5 Emission and Occupied Bandwidth §2.1049

Test: 27.5; Emission and Occupied Bandwidth Summary §2.1049

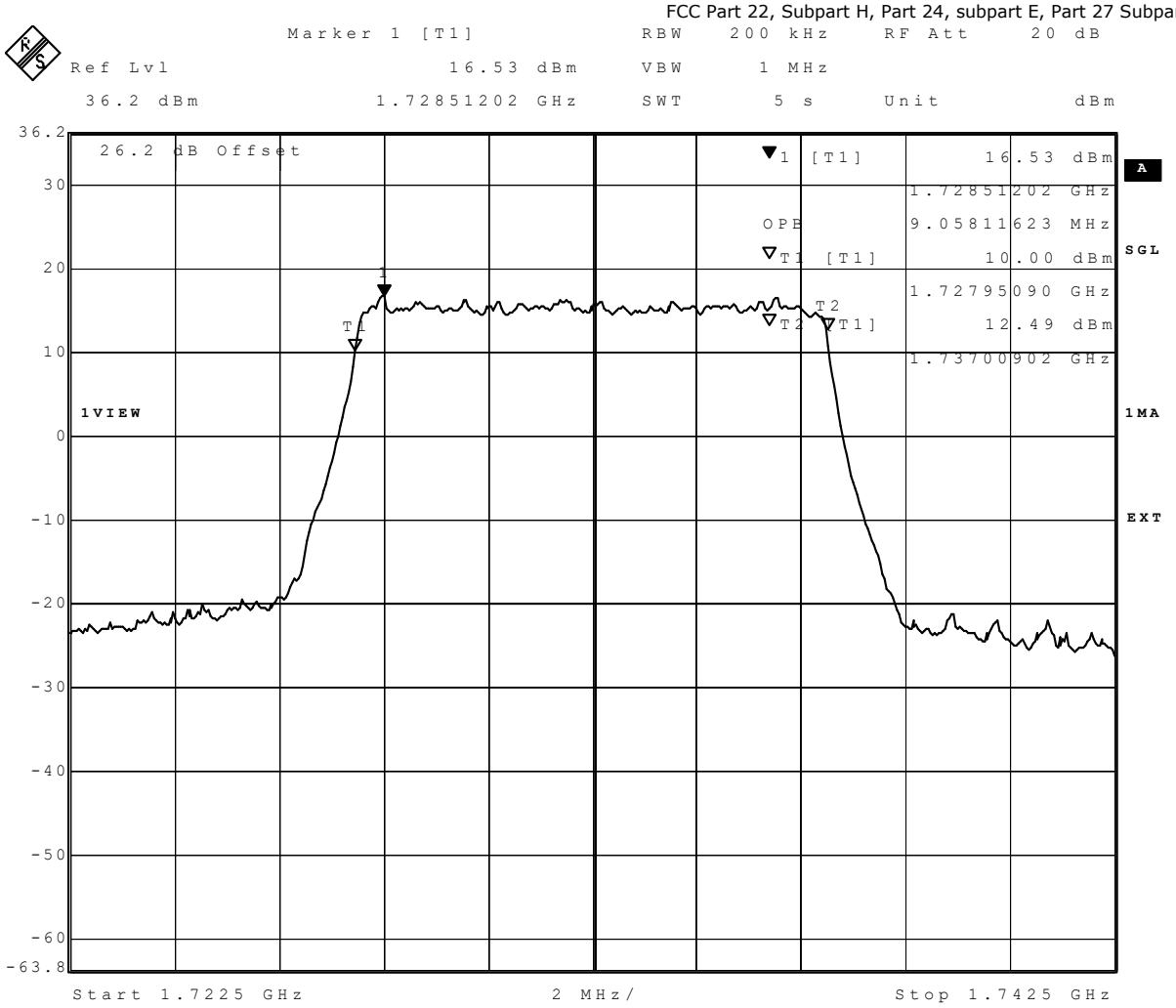
Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 10:47
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

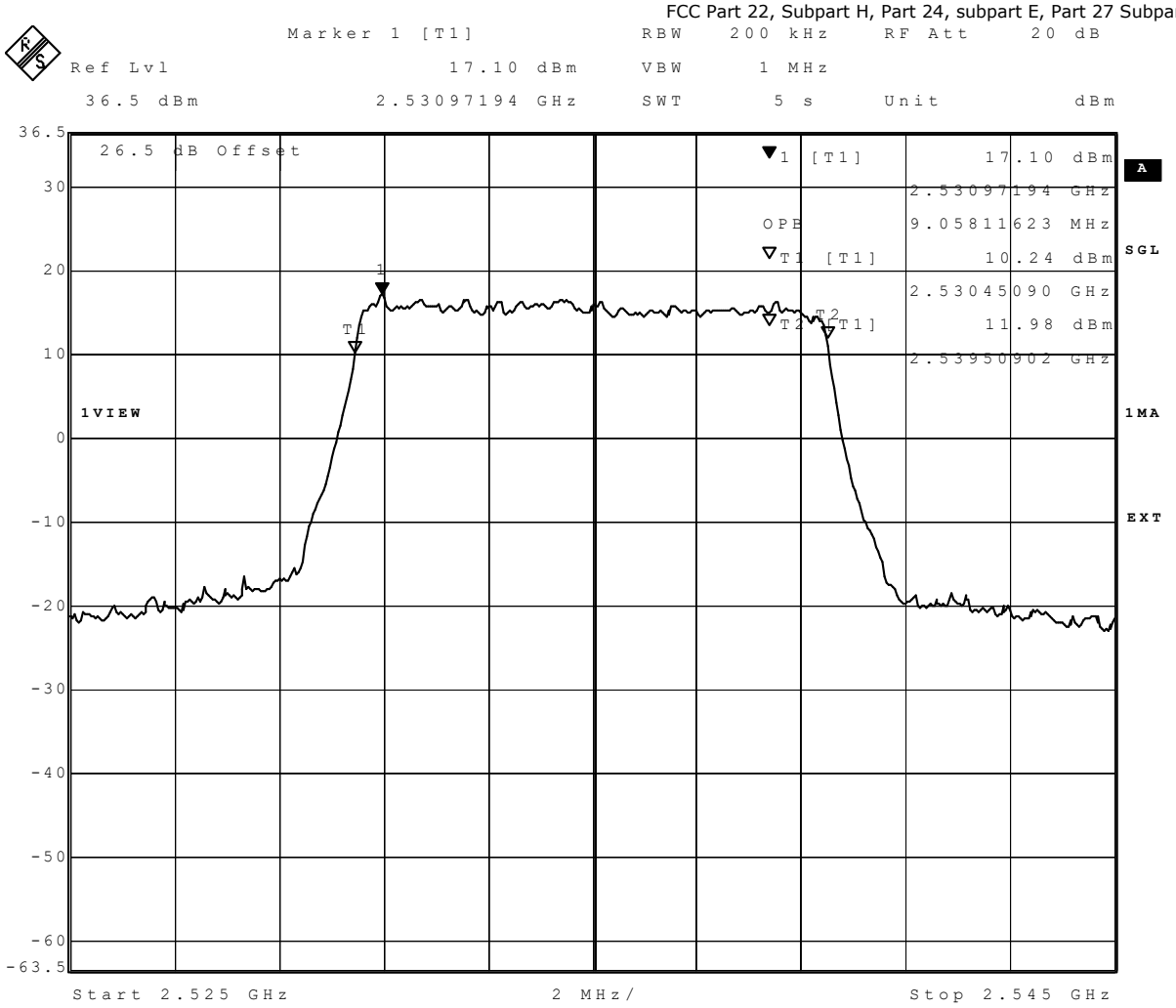
Detailed Results:

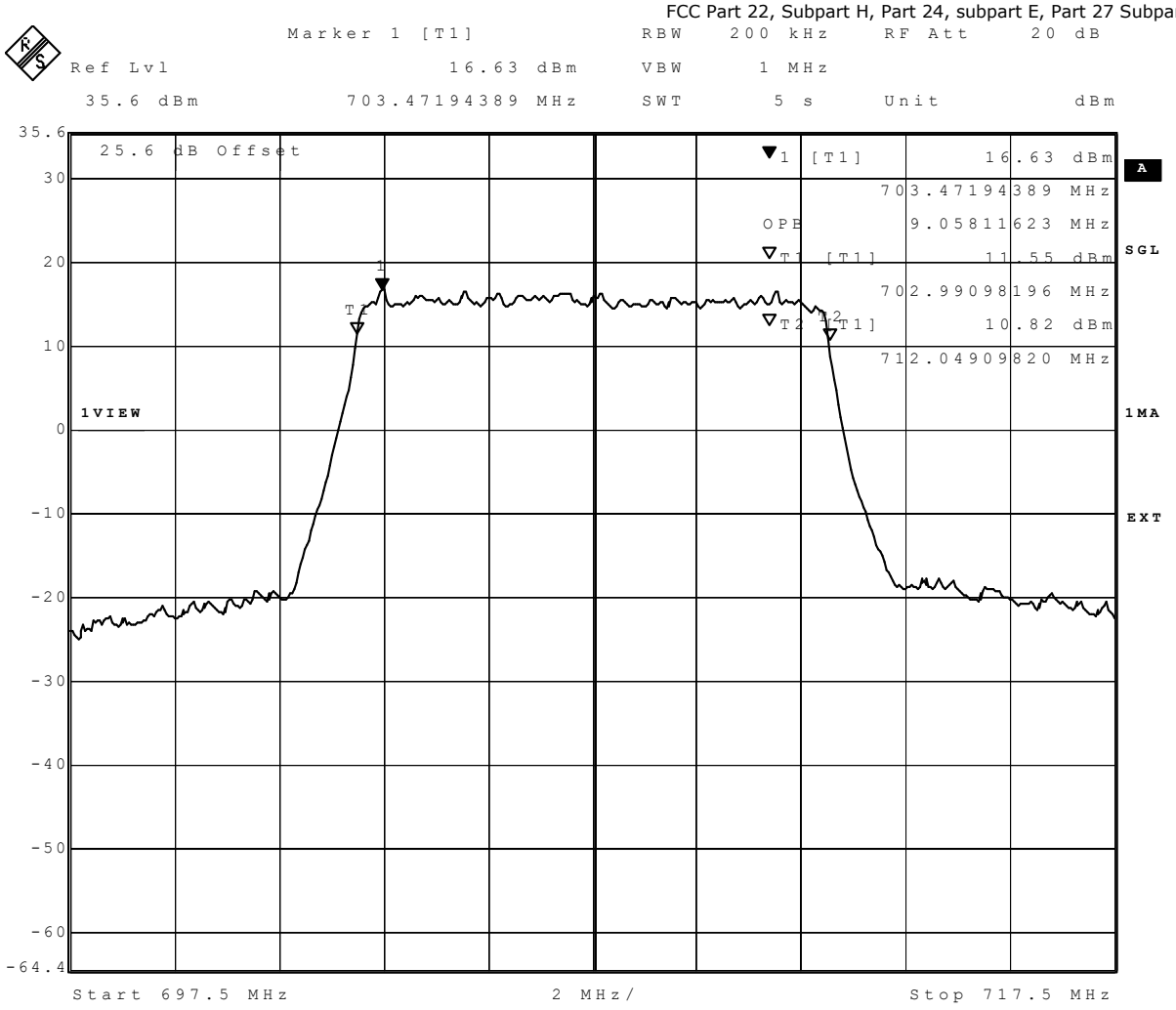
Updated Values					
Radio Technology	**Channel**	**Ressource Blocks**	**Bandwidth [MHz]**	**Nominal BW [MHz]**	**99 % BW [kHz]**
eFDD 4 QPSK	mid	6	1.4	1.4	1112.22
eFDD 4 16QAM	mid	6	1.4	1.4	1118.24
eFDD 4 QPSK	mid	15	3	3	2741.48
eFDD 4 16QAM	mid	15	3	3	2765.53
eFDD 4 QPSK	mid	25	5	5	4529.06
eFDD 4 16QAM	mid	25	5	5	4529.06
eFDD 4 QPSK	mid	50	10	10	9058.12
eFDD 4 16QAM	mid	50	10	10	9058.12
eFDD 4 QPSK	mid	75	15	15	13647.29
eFDD 4 16QAM	mid	75	15	15	13647.29
eFDD 4 QPSK	mid	100	20	20	18116.23
eFDD 4 16QAM	mid	100	20	20	18196.39
eFDD 7 QPSK	mid	25	5	5	4549.1
eFDD 7 16QAM	mid	25	5	5	4529.06
eFDD 7 QPSK	mid	50	10	10	9058.12
eFDD 7 16QAM	mid	50	10	10	9058.12
eFDD 7 QPSK	mid	75	15	15	13647.29
eFDD 7 16QAM	mid	75	15	15	13647.29
eFDD 7 QPSK	mid	100	20	20	18116.23
eFDD 7 16QAM	mid	100	20	20	18196.39
eFDD 12 QPSK	mid	6	1.4	1.4	1106.21
eFDD 12 16QAM	mid	6	1.4	1.4	1100.2
eFDD 12 QPSK	mid	15	3	3	2741.48
eFDD 12 16QAM	mid	15	3	3	2765.53
eFDD 12 QPSK	mid	25	5	5	4529.06
eFDD 12 16QAM	mid	25	5	5	4529.06
eFDD 12 QPSK	mid	50	10	10	9058.12
eFDD 12 16QAM	mid	50	10	10	9058.12
eFDD 13 QPSK	mid	25	5	5	4509.02
eFDD 13 16QAM	mid	25	5	5	4509.02
eFDD 13 QPSK	mid	50	10	10	9018.04
eFDD 13 16QAM	mid	50	10	10	9018.04

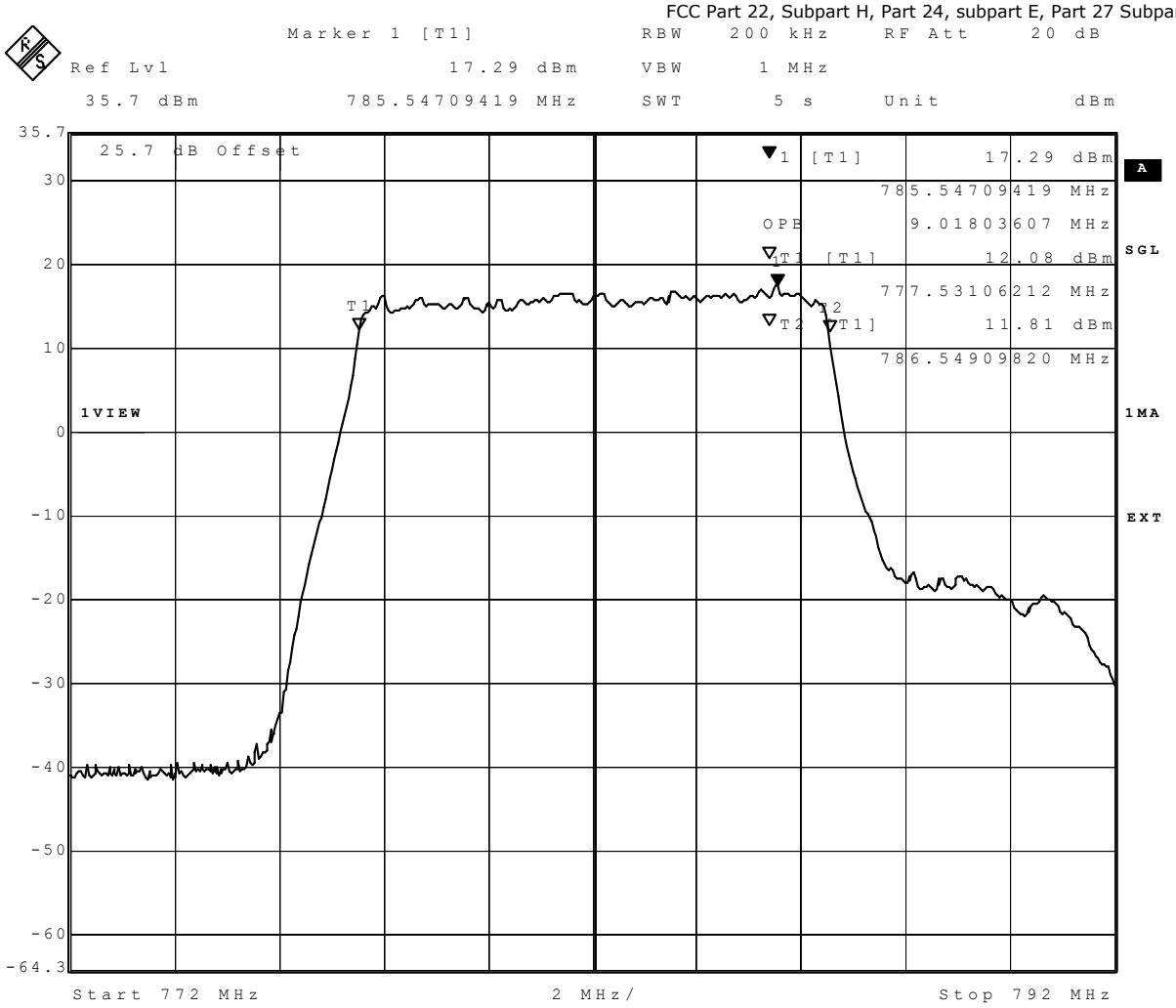
Original values

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	99 % BW [kHz]
eFDD 4 QPSK	mid	6	1.4	1.4	1118.24
eFDD 4 16QAM	mid	6	1.4	1.4	1106.21
eFDD 4 QPSK	mid	15	3	3	2741.48
eFDD 4 16QAM	mid	15	3	3	2741.48
eFDD 4 QPSK	mid	25	5	5	4509.02
eFDD 4 16QAM	mid	25	5	5	4549.1
eFDD 4 QPSK	mid	50	10	10	9058.12
eFDD 4 16QAM	mid	50	10	10	9058.12
eFDD 4 QPSK	mid	75	15	15	13587.17
eFDD 4 16QAM	mid	75	15	15	13587.17
eFDD 4 QPSK	mid	100	20	20	18276.55
eFDD 4 16QAM	mid	100	20	20	18276.55
eFDD 7 QPSK	mid	25	5	5	4549.1
eFDD 7 16QAM	mid	25	5	5	4529.06
eFDD 7 QPSK	mid	50	10	10	9018.04
eFDD 7 16QAM	mid	50	10	10	9058.12
eFDD 7 QPSK	mid	75	15	15	13587.17
eFDD 7 16QAM	mid	75	15	15	13647.29
eFDD 7 QPSK	mid	100	20	20	18196.39
eFDD 7 16QAM	mid	100	20	20	18276.55
eFDD 12 QPSK	mid	6	1.4	1.4	1112.22
eFDD 12 16QAM	mid	6	1.4	1.4	1100.2
eFDD 12 QPSK	mid	15	3	3	2741.48
eFDD 12 16QAM	mid	15	3	3	2729.46
eFDD 12 QPSK	mid	25	5	5	4529.06
eFDD 12 16QAM	mid	25	5	5	4549.1
eFDD 12 QPSK	mid	50	10	10	9018.04
eFDD 12 16QAM	mid	50	10	10	9058.12
eFDD 13 QPSK	mid	25	5	5	4529.06
eFDD 13 16QAM	mid	25	5	5	4529.06
eFDD 13 QPSK	mid	50	10	10	9018.04
eFDD 13 16QAM	mid	50	10	10	9018.04


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl
16.53 dBm
VBW 1 MHz
36.2 dBm
1.72851202 GHz
SWT 5 s
Unit dBm
26.2 dB Offset
1 [T1]
16.53 dBm
1.72851202 GHz
OPB
9.05811623 MHz
T1 [T1]
10.00 dBm
1.72795090 GHz
T2
T2 T1]
12.49 dBm
1.73700902 GHz
1VIEW
A
SGL
1MA
EXT
36.2
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.8
Start 1.7225 GHz
2 MHz/
Stop 1.7425 GHz
Date: 10.SEP.2018 12:18:01


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl 17.10 dBm
VBW 1 MHz
36.5 dBm 2.53097194 GHz
SWT 5 s
Unit dBm
26.5 dB Offset
1 [T1] 17.10 dBm
2.53097194 GHz
OPB 9.05811623 MHz
T1 [T1] 10.24 dBm
2.53045090 GHz
T2 [T1] 11.98 dBm
2.53950902 GHz
1VIEW
A
SGL
1MA
EXT
36.5
30
20
10
0
-10
-20
-30
-40
-50
-60
-63.5
Start 2.525 GHz
2 MHz/
Stop 2.545 GHz
Date: 10.SEP.2018 12:57:15


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl
16.63 dBm
VBW 1 MHz
35.6 dBm
703.47194389 MHz
SWT 5 s
Unit dBm
25.6 dB Offset
1 [T1] 16.63 dBm
703.47194389 MHz
OPB 9.05811623 MHz
T1 [T1] 11.55 dBm
702.99098196 MHz
T2 [T1] 10.82 dBm
712.04909820 MHz
1VIEW
A
SGL
1MA
EXT
35.6
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.4
Start 697.5 MHz
2 MHz/
Stop 717.5 MHz
Date: 10.SEP.2018 12:53:14


Marker 1 [T1]
RBW 200 kHz
RF Att 20 dB
Ref Lvl
17.29 dBm
VBW 1 MHz
35.7 dBm
785.54709419 MHz
SWT 5 s
Unit dBm
25.7 dB Offset
1 [T1] 17.29 dBm
785.54709419 MHz
OPB 9.01803607 MHz
T1 [T1] 12.08 dBm
777.53106212 MHz
T2 [T1] 11.81 dBm
786.54909820 MHz
1VIEW
A
SGL
1MA
EXT
35.7
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.3
Start 772 MHz
2 MHz/
Stop 792 MHz
Date: 10.SEP.2018 16:58:36

3.5.12 27.6 Band edge compliance §2.1053, §27.53

Test: 27.6; Band edge compliance summary §2.1053, §27.53

Result:	Passed
Setup No.:	ba01
Date of Test:	2018/09/20 10:40
Body:	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
Test Specification:	FCC part 2 and 27

Detailed Results:

Updated values									
Radio Technology	**Channel**	**Band Edge**	**Nominal BW**	**Ressource Blocks**	**Peak [dBm]**	**Average [dBm]**	**RMS [dBm]**	**Limit [dBm]**	**Margin to Limit [dB]**
eFDD 4 QPSK	low	lower	1.4	6	-16.86	-27.64	-26.4	-13	13.4
eFDD 4 QPSK	high	higher	1.4	6	-17.63	-28.84	-27.42	-13	14.42
eFDD 4 16QAM	low	lower	1.4	6	-18.32	-28.84	-27.42	-13	14.42
eFDD 4 16QAM	high	higher	1.4	6	-16.13	-29.64	-28.34	-13	15.34
eFDD 4 QPSK	low	lower	3	15	-15.42	-28.58	-26.6	-13	13.6
eFDD 4 QPSK	high	higher	3	15	-16.21	-30.52	-28.58	-13	15.58
eFDD 4 16QAM	low	lower	3	15	-16.44	-29.64	-27.42	-13	14.42
eFDD 4 16QAM	high	higher	3	15	-16.59	-31.86	-29.64	-13	16.64
eFDD 4 QPSK	low	lower	5	25	-13.03	-29.36	-26.8	-13	13.8
eFDD 4 QPSK	high	higher	5	25	-12.3	-30.84	-27.87	-13	14.87
eFDD 4 16QAM	low	lower	5	25	-14.32	-30.52	-28.34	-13	15.34
eFDD 4 16QAM	high	higher	5	25	-16.12	-32.62	-29.92	-13	16.92
eFDD 4 QPSK	low	lower	10	50	-13.15	-29.64	-27.64	-13	14.64
eFDD 4 QPSK	high	higher	10	50	-12.35	-33.89	-30.22	-13	17.22
eFDD 4 16QAM	low	lower	10	50	-14.2	-31.17	-29.1	-13	16.1
eFDD 4 16QAM	high	higher	10	50	-13.42	-34.86	-31.17	-13	18.17
eFDD 4 QPSK	low	lower	15	75	-9.49	-29.64	-27.64	-13	14.64
eFDD 4 QPSK	high	higher	15	75	-9.37	-33.44	-28.58	-13	15.58
eFDD 4 16QAM	low	lower	15	75	-11.27	-30.52	-28.58	-13	15.58
eFDD 4 16QAM	high	higher	15	75	-10.25	-34.86	-30.52	-13	17.52
eFDD 4 QPSK	low	lower	20	100	-14.86	-31.51	-29.92	-13	16.92
eFDD 4 QPSK	high	higher	20	100	-12.68	-35.94	-31.86	-13	18.86
eFDD 4 16QAM	low	lower	20	100	-15.12	-32.62	-31.17	-13	18.17
eFDD 4 16QAM	high	higher	20	100	-11.72	-37.19	-32.62	-13	19.62
eFDD 7 QPSK	low	lower	5	25	-5.96	-24.48	-22.19	-10	12.19
eFDD 7 QPSK	high	higher	5	25	-5.95	-32.4	-21.82	-10	11.82
eFDD 7 16QAM	low	lower	5	25	-7.75	-25.52	-23.55	-10	13.55
eFDD 7 16QAM	high	higher	5	25	-9.96	-26.3	-24.16	-10	14.16
eFDD 7 QPSK	low	lower	10	50	-6.76	-26.61	-24.6	-10	14.6
eFDD 7 QPSK	high	higher	10	50	-6.19	-27	-24.9	-10	14.9
eFDD 7 16QAM	low	lower	10	50	-8.12	-27.2	-25.22	-10	15.22
eFDD 7 16QAM	high	higher	10	50	-10.09	-28.74	-26.42	-10	16.42
eFDD 7 QPSK	low	lower	15	75	-4.37	-25.71	-24	-10	14
eFDD 7 QPSK	high	higher	15	75	-5.12	-26.1	-24	-10	14
eFDD 7 16QAM	low	lower	15	75	-7.04	-26.71	-24.99	-10	14.99
eFDD 7 16QAM	high	higher	15	75	-6.31	-27.84	-25.71	-10	15.71
eFDD 7 QPSK	low	lower	20	100	-5.86	-24.02	-22.96	-10	12.96
eFDD 7 QPSK	high	higher	20	100	-4.31	-22.84	-21.8	-10	11.8
eFDD 7 16QAM	low	lower	20	100	-6.92	-24.9	-24.02	-10	14.02
eFDD 7 16QAM	high	higher	20	100	-4.58	-24.6	-23.34	-10	13.34

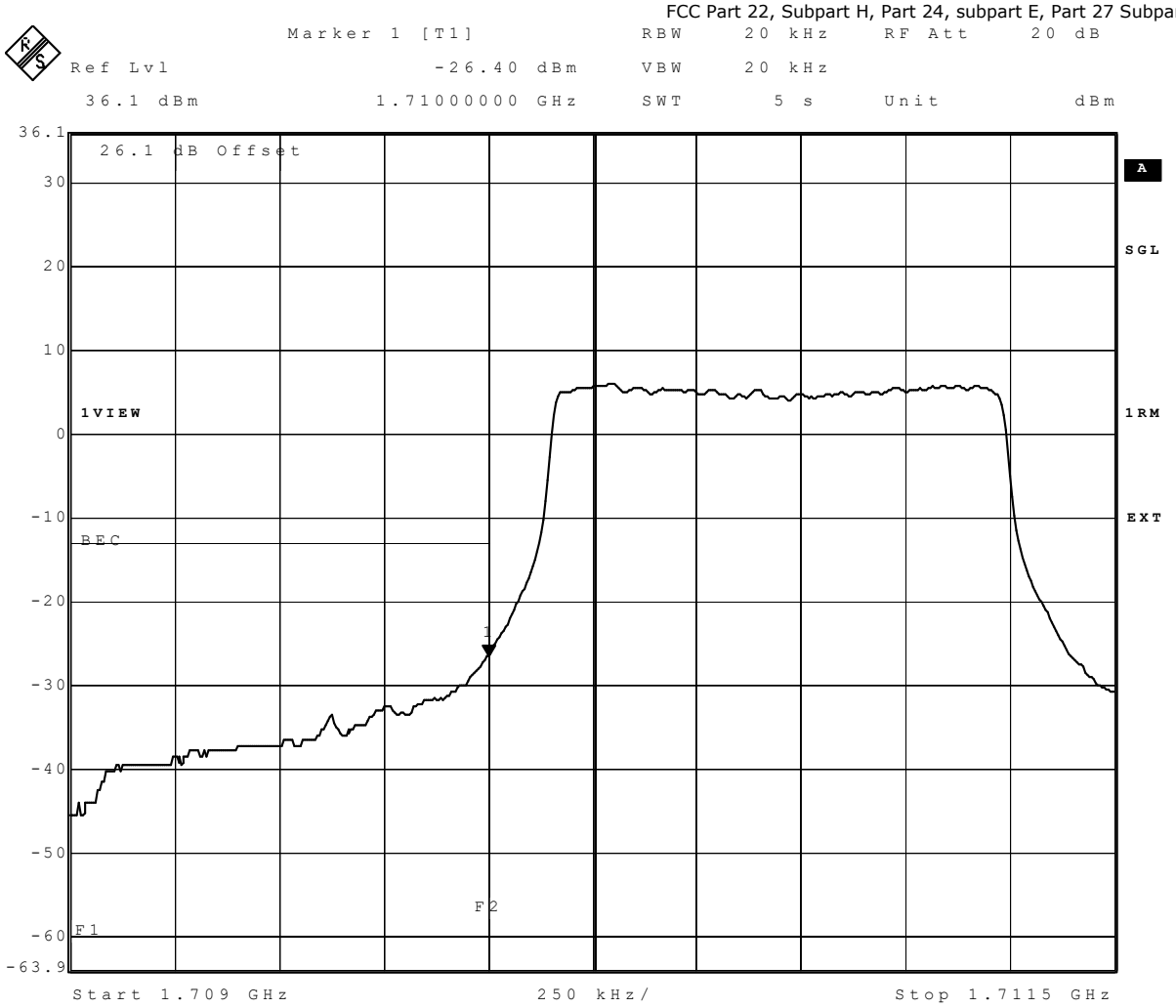
Updated Values

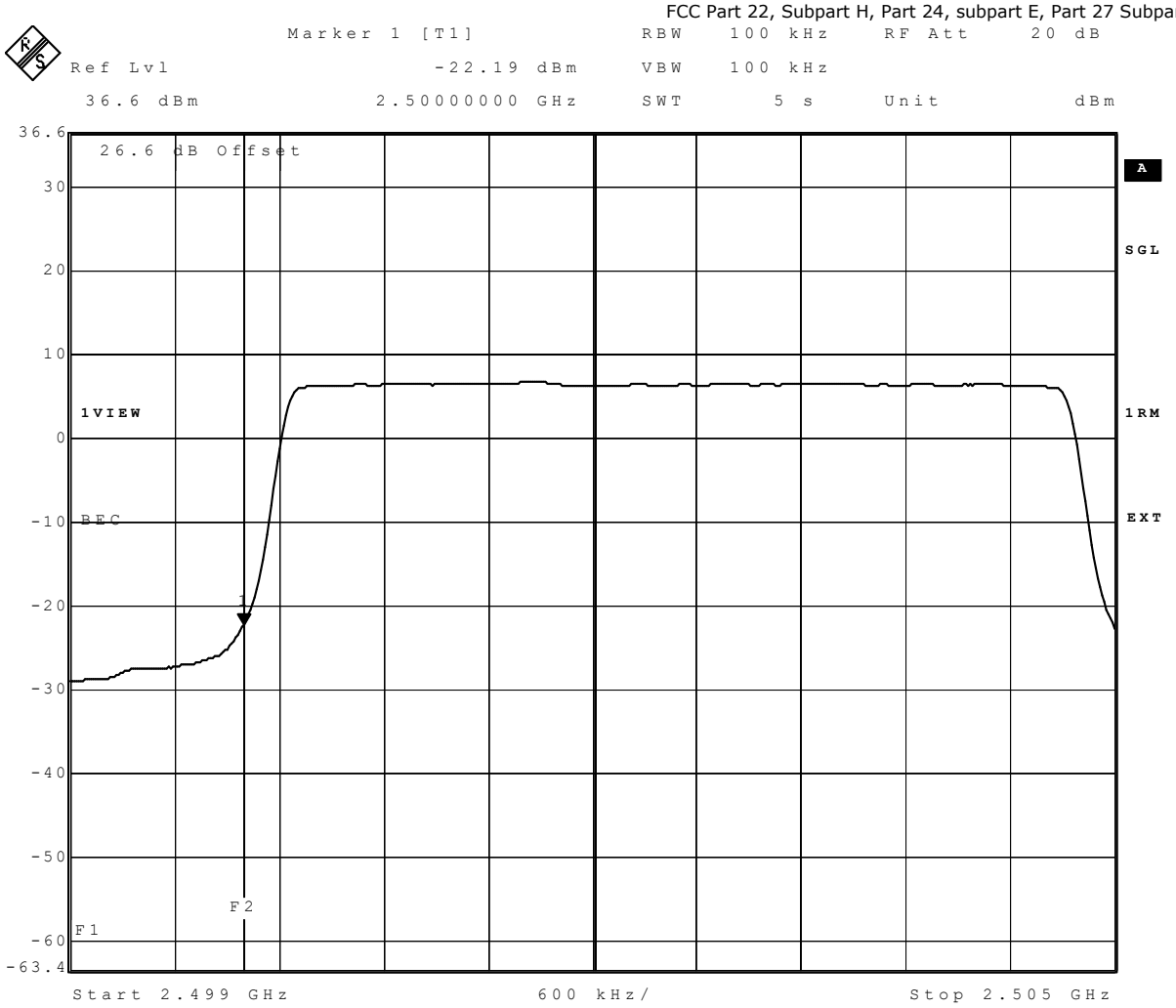
Radio Technology	Channel	Band Edge	Nominal BW	Resource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limit [dBm]	Margin to Limit [dB]
eFDD 12 QPSK	low	lower	1.4	1	-11.93	-28.37	-25.3	-13	12.32
eFDD 12 QPSK	high	higher	1.4	1	-10.11	-23.71	-22.5	-13	9.46
eFDD 12 16QAM	low	lower	1.4	1	-13.55	-30.14	-26.5	-13	13.52
eFDD 12 16QAM	high	higher	1.4	1	-13.87	-26.34	-24.7	-13	11.7
eFDD 12 QPSK	low	lower	3	1	-16.45	-31.02	-27.9	-13	14.92
eFDD 12 QPSK	high	higher	3	1	-15.59	-27.92	-26.5	-13	13.52
eFDD 12 16QAM	low	lower	3	1	-15.31	-32.36	-28.8	-13	15.84
eFDD 12 16QAM	high	higher	3	1	-18.27	-30.72	-28.8	-13	15.84
eFDD 12 QPSK	low	lower	5	1	-13.66	-32.36	-28.6	-13	15.6
eFDD 12 QPSK	high	higher	5	1	-6.07	-26.16	-24.3	-13	11.26
eFDD 12 16QAM	low	lower	5	1	-15.29	-34.39	-30.4	-13	17.42
eFDD 12 16QAM	high	higher	5	1	-9.4	-28.37	-26	-13	12.99
eFDD 12 QPSK	low	lower	10	1	-7.12	-29.08	-25.7	-13	12.65
eFDD 12 QPSK	high	higher	10	1	-6.07	-26.16	-24.3	-13	11.26
eFDD 12 16QAM	low	lower	10	1	-8.22	-30.72	-27.3	-13	14.3
eFDD 12 16QAM	high	higher	10	1	-9.4	-28.37	-26	-13	12.99
eFDD 13 QPSK	low	lower	5	1	-19	-34.29	-31.6	-13	18.57
eFDD 13 QPSK	high	higher	5	1	-16.72	-31.91	-30	-13	17.04
eFDD 13 16QAM	low	lower	5	1	-20.59	-36.34	-33.4	-13	20.42
eFDD 13 16QAM	high	higher	5	1	-19.92	-33.42	-31.6	-13	18.57
eFDD 13 QPSK	mid	lower	10	1	-24.22	-39.87	-36.9	-13	23.94
eFDD 13 QPSK	mid	higher	10	1	-23.86	-35.78	-34.3	-13	21.29
eFDD 13 16QAM	mid	lower	10	1	-25.64	-41.8	-38.3	-13	25.28
eFDD 13 16QAM	mid	higher	10	1	-23.5	-36.94	-35.3	-13	22.26

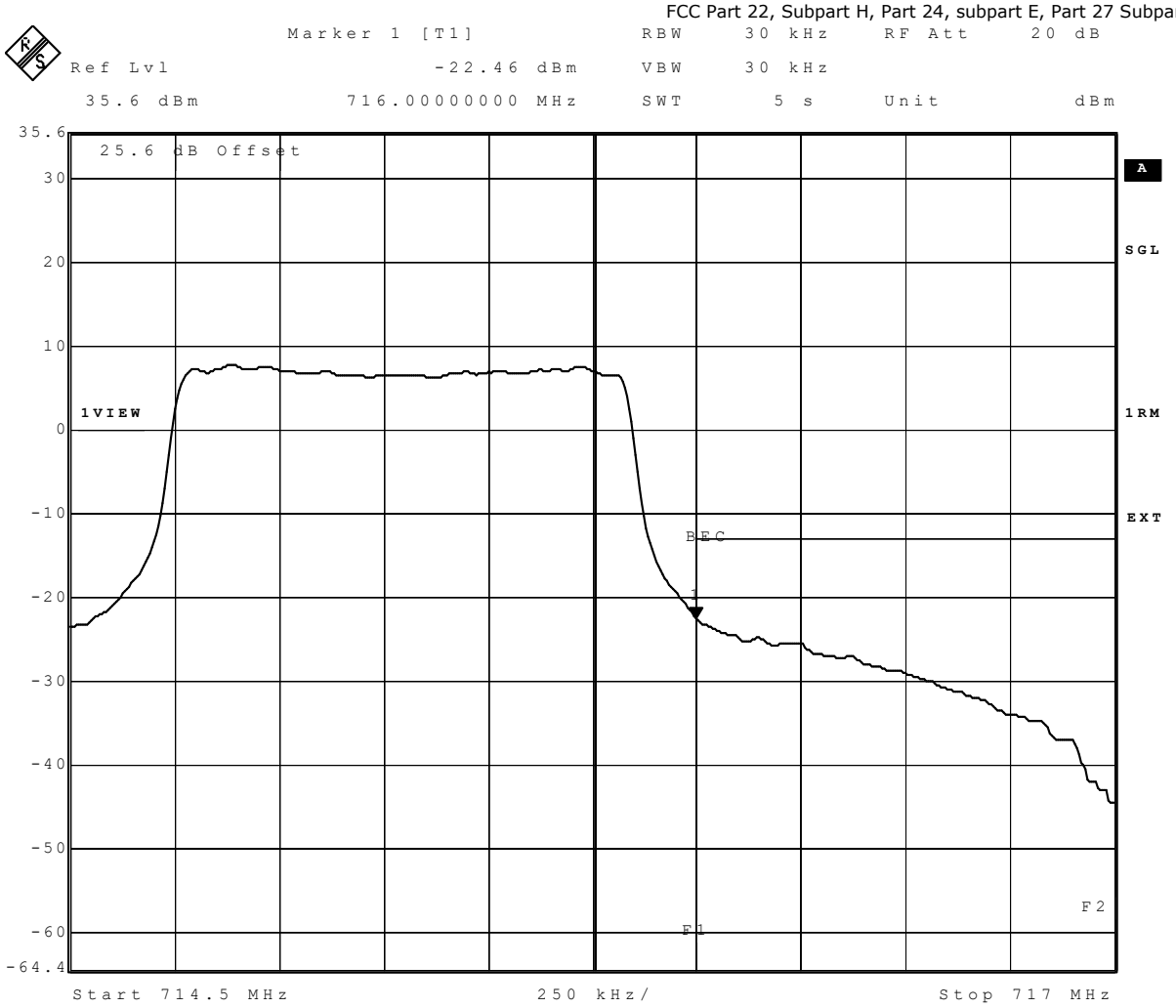
Original values

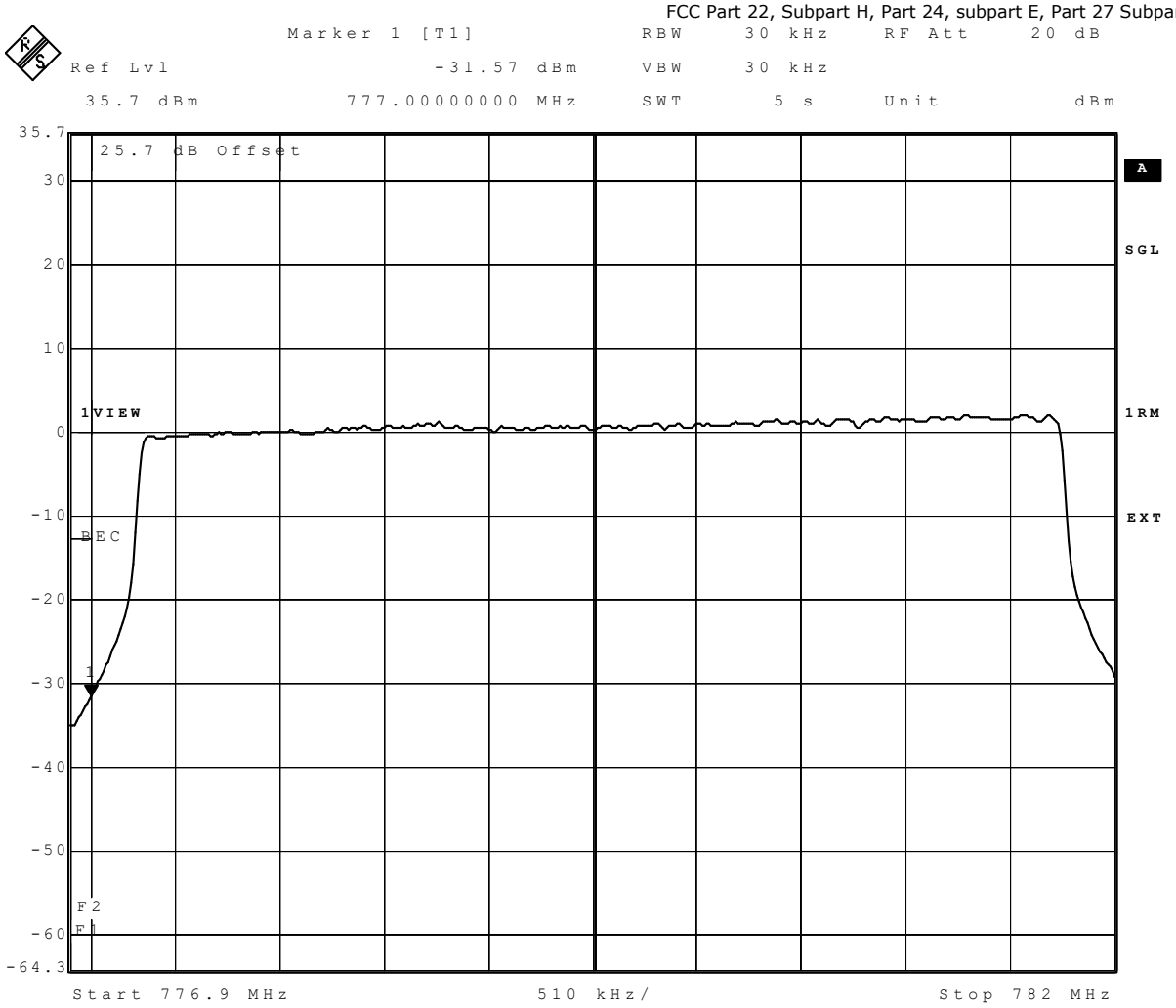
Radio Technology	Channel	Band Edge	Nominal BW	Ressource Blocks	PEAK [dBm]	RMS [dBm]	Limit [dBm]
eFDD 4 QPSK	low	lower	1.4	6	-13.86	-26.02	-13
eFDD 4 QPSK	high	higher	1.4	6	-15.82	-26.6	-13
eFDD 4 16QAM	low	lower	1.4	6	-16.13	-26.4	-13
eFDD 4 16QAM	high	higher	1.4	6	-17.24	-27.21	-13
eFDD 4 QPSK	low	lower	3	15	-15.25	-27	-13
eFDD 4 QPSK	high	higher	3	15	-16.11	-28.58	-13
eFDD 4 16QAM	low	lower	3	15	-15.87	-28.1	-13
eFDD 4 16QAM	high	higher	3	15	-17.71	-29.92	-13
eFDD 4 QPSK	low	lower	5	25	-14.86	-27.42	-13
eFDD 4 QPSK	high	higher	5	25	-15.97	-29.64	-13
eFDD 4 16QAM	low	lower	5	25	-16.15	-28.58	-13
eFDD 4 16QAM	high	higher	5	25	-14.6	-29.92	-13
eFDD 4 QPSK	low	lower	10	50	-13.41	-28.1	-13
eFDD 4 QPSK	high	higher	10	50	-14.82	-30.52	-13
eFDD 4 16QAM	low	lower	10	50	-15.29	-29.36	-13
eFDD 4 16QAM	high	higher	10	50	-14.11	-31.86	-13
eFDD 4 QPSK	low	lower	15	75	-15.95	-27.87	-13
eFDD 4 QPSK	high	higher	15	75	-15.67	-29.36	-13
eFDD 4 16QAM	low	lower	15	75	-15.74	-28.34	-13
eFDD 4 16QAM	high	higher	15	75	-15.79	-29.92	-13
eFDD 4 QPSK	low	lower	20	100	-15.31	-29.64	-13
eFDD 4 QPSK	high	higher	20	100	-17.06	-31.17	-13
eFDD 4 16QAM	low	lower	20	100	-16	-30.22	-13
eFDD 4 16QAM	high	higher	20	100	-15.25	-32.62	-13
eFDD 7 QPSK	low	lower	5	25	-	-26.5	-25
eFDD 7 QPSK	high	higher	5	25	-	-25.16	-25
eFDD 7 16QAM	low	lower	5	25	-	-26.92	-25
eFDD 7 16QAM	high	higher	5	25	-	-25.55	-25
eFDD 7 QPSK	low	lower	10	50	-	-26.06	-25
eFDD 7 QPSK	high	higher	10	50	-	-27.2	-25
eFDD 7 16QAM	low	lower	10	50	-	-27	-25
eFDD 7 16QAM	high	higher	10	50	-	-27.82	-25
eFDD 7 QPSK	low	lower	15	75	-	-27.14	-25
eFDD 7 QPSK	high	higher	15	75	-	-26.1	-25
eFDD 7 16QAM	low	lower	15	75	-	-27.14	-25
eFDD 7 16QAM	high	higher	15	75	-	-26.92	-25
eFDD 7 QPSK	low	lower	20	100	-	-25.55	-25
eFDD 7 QPSK	high	higher	20	100	-	-25.22	-25
eFDD 7 16QAM	low	lower	20	100	-	-26.24	-25

Original Values							
Radio Technology	Channel	Band Edge	Nominal BW	Ressource Blocks	PEAK [dBm]	RMS [dBm]	Limit [dBm]
eFDD 12 QPSK	low	lower	1.4	1	-	-25.16	-13
eFDD 12 QPSK	high	higher	1.4	1	-	-24.12	-13
eFDD 12 16QAM	low	lower	1.4	1	-	-25.81	-13
eFDD 12 16QAM	high	higher	1.4	1	-	-25.65	-13
eFDD 12 QPSK	low	lower	3	1	-	-28.84	-13
eFDD 12 QPSK	high	higher	3	1	-	-29.34	-13
eFDD 12 16QAM	low	lower	3	1	-	-29.6	-13
eFDD 12 16QAM	high	higher	3	1	-	-31.02	-13
eFDD 12 QPSK	low	lower	5	1	-	-29.34	-13
eFDD 12 QPSK	high	higher	5	1	-	-30.42	-13
eFDD 12 16QAM	low	lower	5	1	-	-31.02	-13
eFDD 12 16QAM	high	higher	5	1	-	-31.02	-13
eFDD 12 QPSK	low	lower	10	1	-	-26.71	-13
eFDD 12 QPSK	high	higher	10	1	-	-26.9	-13
eFDD 12 16QAM	low	lower	10	1	-	-27.92	-13
eFDD 12 16QAM	high	higher	10	1	-	-27.92	-13
eFDD 13 QPSK	low	lower	5	1	-	-34.92	-13
eFDD 13 QPSK	high	higher	5	1	-	-31.24	-13
eFDD 13 16QAM	low	lower	5	1	-	-35.78	-13
eFDD 13 16QAM	high	higher	5	1	-	-32.63	-13
eFDD 13 QPSK	mid	lower	10	1	-	-38.28	-13
eFDD 13 QPSK	mid	higher	10	1	-	-35.26	-13
eFDD 13 16QAM	mid	lower	10	1	-	-40.78	-13
eFDD 13 16QAM	mid	higher	10	1	-	-36.94	-13


Marker 1 [T1]
RBW 20 kHz
RF Att 20 dB
Ref Lvl
-26.40 dBm
VBW 20 kHz
36.1 dBm
1.71000000 GHz
SWT 5 s
Unit dBm
26.1 dB Offset
A
SGL
1VIEW
1RM
EXT
BEC
F2
F1
Start 1.709 GHz
250 kHz/
Stop 1.7115 GHz
Date: 11.SEP.2018 16:33:31


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-22.19 dBm
VBW 100 kHz
36.6 dBm
2.50000000 GHz
SWT 5 s
Unit dBm
26.6 dB Offset
A
SGL
1VIEW
1RM
EXT
BEC
F2
F1
Start 2.499 GHz
600 kHz/
Stop 2.505 GHz
Date: 11.SEP.2018 18:43:11


Marker 1 [T1]
RBW 30 kHz
RF Att 20 dB
Ref Lvl
-22.46 dBm
VBW 30 kHz
35.6 dBm
716.00000000 MHz
SWT 5 s
Unit dBm
25.6 dB Offset
A
SGL
1VIEW
1RM
EXT
BEC
1
F1
F2
35.6
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.4
Start 714.5 MHz
250 kHz/
Stop 717 MHz
Date: 11.SEP.2018 20:20:21


Marker 1 [T1]
RBW 30 kHz
RF Att 20 dB
Ref Lvl
-31.57 dBm
VBW 30 kHz
35.7 dBm
777.00000000 MHz
SWT 5 s
Unit dBm
25.7 dB Offset
1VIEW
1RM
SGL
EXT
REC
35.7
30
20
10
0
-10
-20
-30
-40
-50
-60
-64.3
Start 776.9 MHz
510 kHz/
Stop 782 MHz
Date: 11.SEP.2018 20:47:45

4 Test Equipment Details

4.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing period.

Test Equipment Anechoic Chamber

Lab ID:	**Lab 1**
Description:	Anechoic Chamber for radiated testing

Single Devices for Anechoic Chamber

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Air compressor	none	-	
Anechoic Chamber	10.58 x 6.38 x 6.00 m³	none	
Anechoic Chamber	8.8m x 4.6m x 4.05 m	B83117-S40-X191	Albatross Projects GmbH
Controller Maturo	MCU	961208	Maturo GmbH
EMC camera	CE-CAM/1	-	
EMC camera Nr.2	CCD-400E	0005033	
Filter ISDN	B84312-C110-E1		
Filter Universal 1A	BB4312-C30-H3	-	

Test Equipment Auxiliary Equipment for Radiated emissions

Lab ID:	**Lab 1**
Description:	Equipment for emission measurements
Serial Number:	see single devices

Single Devices for Auxiliary Equipment for Radiated emissions

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Antenna mast	AM 4.0	AM4.0/180/11920513	Maturo GmbH
Biconical Broadband Antenna	SBA 9119	9119-005	
Biconical dipole	VUBA 9117	9117-108	
Broadband Amplifier 1 GHz - 4 GHz	AFS4-01000400-1Q-10P-4	-	
Broadband Amplifier 18 GHz - 26 GHz	JS4-18002600-32-5P	849785	
Broadband Amplifier 30 MHz - 18 GHz	JS4-00101800-35-5P	896037	
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2+W38.01-2	
Cable "ESI to Horn Antenna"	SucoFlex	W18.02-2+W38.02-2	
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG
Double-ridged horn	HF 907	102444	Rohde & Schwarz GmbH & Co. KG
Double-ridged horn-duplicated 2015-07-15 10:47:55	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG

Single Devices for Auxiliary Equipment for Radiated emissions (continued)

Single Device Name	*Type*	*Serial Number*	*Manufacturer*	
High Pass Filter	4HC1600/12750-1.5-KK	9942011		
High Pass Filter	5HC2700/12750-1.5-KK	9942012		
High Pass Filter	5HC3500/18000-1.2-KK	200035008		
High Pass Filter	WHKX 7.0/18G-8SS	09		
Horn Antenna Schwarzbeck 15-26.5 GHz BBHA 9170	BBHA 9170	BBHA9170262		
Log.-per. Antenna	HL 562 Ultralog	100609	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*
	DKD Calibration		2018/07/05	2021/07/05
Log.-per. Antenna (upgraded)	HL 562 Ultralog new biconicals	830547/003	Rohde & Schwarz GmbH & Co. KG	
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*
	DKD calibration		2018/01/04	2021/01/04
Standard Gain / Pyramidal Horn Antenna 40 GHz	3160-10	00086675		
Tilt device Maturo (Rohacell)	Antrieb TD1.5-10kg	TD1.5-10kg/024/3790709	Maturo GmbH	

Test Equipment Auxiliary Test Equipment

Lab ID:	**Lab 1, Lab 2**
Description:	Single Devices for various Test Equipment
Type:	various
Serial Number:	none

Single Devices for Auxiliary Test Equipment

Single Device Name	*Type*	*Serial Number*	*Manufacturer*	
Broadband Power Divider N (Aux)	1506A / 93459	LM390		
Broadband Power Divider SMA	WA1515	A855		
Digital Multimeter 03 (Multimeter)	Fluke 177	86670383		
Digital Multimeter 13 (Clamp Meter)	Fluke 325	31270091WS	FLUKE	
	Calibration Details		*Last Execution*	*Next Exec.*
	DAkkS-Calibration		2016/02/04	2019/02/28
Fibre optic link Satellite (Aux)	FO RS232 Link	181-018		
Fibre optic link Transceiver (Aux)	FO RS232 Link	182-018		
Isolating Transformer	LTS 604	1888		
Notch Filter Ultra Stable (Aux)	WRCA800/960-6EEK	24		
Signal Analyzer	FSV30	103005	Rohde & Schwarz GmbH & Co. KG	
Spectrum Analyser	FSU26	200418		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2017/11/27	2018/11/26
Spectrum Analyzer	FSP3	836722/011	Rohde & Schwarz GmbH & Co. KG	
Vector Signal Generator	SMIQ 03B	832492/061		

Test Equipment Digital Signalling Devices

Lab ID:	**Lab 1, Lab 2**
Description:	Signalling equipment for various wireless technologies.

Single Devices for Digital Signalling Devices

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
CMW500	CMW500	107500	
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz GmbH & Co. KG
Universal Radio Communication Tester	CMU 200	837983/052	Rohde & Schwarz GmbH & Co. KG
Vector Signal Generator	SMU200A	100912	Rohde & Schwarz GmbH & Co. KG

Test Equipment Emission measurement devices

Lab ID:	**Lab 1**
Description:	Equipment for emission measurements
Serial Number:	see single devices

Single Devices for Emission measurement devices

Single Device Name	*Type*	*Serial Number*	*Manufacturer*	
EMI Receiver / Spectrum Analyzer	ESR 7	101424		
	Calibration Details		*Last Execution*	*Next Exec.*
	DKD Calibration		2016/11/29	2018/11/28
Personal Computer	Dell	30304832059		
Power Meter	NRVD	828110/016		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/07/18	2019/07/17
Sensor Head A	NRV-Z1	827753/005		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/07/17	2019/07/16
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG	
Spectrum Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG	
	HW/SW Status		*Date of Start*	*Date of End*
	Firmware-Update 4.34.4 from 3.45 during calibration		2009/12/03	
Spectrum Analyzer	FSW 43	103779		
	Calibration Details		*Last Execution*	*Next Exec.*
	DKD calibration		2016/12/02	2018/12/01

Test Equipment Multimeter 03

Lab ID:	**Lab 1, Lab 2**
Description:	Fluke 177
Serial Number:	86670383

Single Devices for Multimeter 03

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Digital Multimeter 03 (Multimeter)	Fluke 177	86670383	

Test Equipment Radio Lab Test Equipment

Lab ID:	**Lab 2**
Description:	Radio Lab Test Equipment

Single Devices for Radio Lab Test Equipment

Single Device Name	*Type*	*Serial Number*	*Manufacturer*	
Broadband Power Divider SMA	WA1515	A856		
Coax Attenuator 10dB SMA 2W	4T-10	F9401		
Coax Attenuator 10dB SMA 2W	56-10	W3702		
Coax Attenuator 10dB SMA 2W	56-10	W3711		
Coax Cable Huber&Suhner	Sucotest 2,0m		Huber&Suhner	
Coax Cable Rosenberger Micro Coax FA210A0010003030 SMA/SMA 1,0m	FA210A0010003030	54491-2		
Power Meter	NRVD	828110/016		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/07/18	2019/07/17
RF Step Attenuator RSP	RSP	833695/001		
Rubidium Frequency Standard	Datum, Model: MFS	5489/001		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/07/25	2019/07/24
Sensor Head A	NRV-Z1	827753/005		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/07/17	2019/07/16
Signal Generator SME	SME03	827460/016		
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2018/08/01	2021/07/31
Signal Generator SMP	SMP02	833286/0014	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard calibration		2016/05/24	2019/05/23
Spectrum Analyzer	FSIQ26	840061/005	Rohde & Schwarz GmbH & Co. KG	

Test Equipment T/A Logger 13

Lab ID:	**Lab 1, Lab 2**
Description:	Lufft Opus10 TPR
Type:	Opus10 TPR
Serial Number:	13936

Single Devices for T/A Logger 13

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
ThermoAirpressure Datalogger 13 (Environ)	Opus10 TPR (8253.00)	13936	

Calibration Details	*Last Execution*	*Next Exec.*
Customized calibration	2017/04/10	2019/04/09

Test Equipment T/H Logger 03

Lab ID:	**Lab 2**
Description:	Lufft Opus10
Serial Number:	7482

Single Devices for T/H Logger 03

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
ThermoHygro Datalogger 03 (Environ)	Opus10 THI (8152.00)	7482	

Calibration Details	*Last Execution*	*Next Exec.*
Customized calibration	2017/03/30	2019/03/29

Test Equipment T/H Logger 12

Lab ID:	**Lab 1**
Description:	Lufft Opus10
Serial Number:	12482

Single Devices for T/H Logger 12

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
ThermoHygro Datalogger 12 (Environ)	Opus10 THI (8152.00)	12482	

Calibration Details	*Last Execution*	*Next Exec.*
Customized calibration	2017/03/30	2019/03/29

Test Equipment Temperature Chamber 05

Lab ID:	**Lab 2**
Description:	Temperature Chamber VT4002
Type:	Vötsch
Serial Number:	see single devices

Single Devices for Temperature Chamber 05

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Temperature Chamber Vötsch 05	VT 4002	58566080550010	

Calibration Details	*Last Execution*	*Next Exec.*
Customized calibration	2018/04/27	2020/04/26

5 Annex

5.1 Additional Information for Report

Summary of Test Results

The EUT complied with all performed tests as listed in the summary section of this report.

Technical Report Summary

Type of Authorization :

Certification for a GSM/WCDMA/CDMA2000 cellular radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 0 to 69. The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

§ 2.1046 Measurement required: RF power output
§ 2.1049 Measurement required: Occupied bandwidth
§ 2.1053 Measurement required: Field strength of spurious radiation

Part 22, Subpart C – Operational and Technical Requirements

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22.913 Effective radiated power limits
§ 22.917 Emission limitations for cellular equipment

additional documents

ANSI C63.26-D

Description of Methods of Measurements

RF Power Output

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1046

Test Description (conducted measurement procedure)

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Channel (Frequency): please refer to the detailed results
4) The transmitted power of the EUT was recorded by using a spectrum analyser.

Test Description (radiated measurement procedure)

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A substitution procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) The output power was measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case power all orientations (X, Y, Z) of the EUT have been measured.
5) The test procedure according to ANSI C63.26-D has been considered.

Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.
§22.913 Effective radiated power limits
(a)(2) Maximum ERP. … The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Emission and Occupied Bandwidth

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1049

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth: >1% of the manufacturer’s stated occupied bandwidth
5) The maximum spectral level of the modulated signal was recorded as the reference.
6) The emission bandwidth is measured as follows:
the two furthest frequencies above and below the frequency of the maximum reference level where the spectrum is –26 dB down have to be found.
7) The occupied bandwidth (99% Bandwidth) is measured as follows:
the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 percent of the total mean power.

Test Requirements / Limits

§ 2.1049 Measurements required: Occupied bandwidth

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 by a given emission shall be measured under the following conditions (as applicable):

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be

operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Field strength of spurious radiation

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1053

Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A pre-calibration procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) All spurious radiation measurements were made with spectrum analyser and the appropriate calibrated antennas for the frequency range of 30 MHz to 10 GHz (up to the 10th harmonic of the transmit frequency). The frequency range from 9 kHz to 30 MHz has been examined during the conducted spurious emission measurements.
5) Important Analyser Settings
- [Resolution Bandwidth / Video Bandwidth]:
a) [3 kHz / 10 kHz] in the Span of 1 MHz directly below and above the Band,
b) [10 kHz / 30 kHz] in case the curve of the analyser IF-Filter leads to an exceeding of the limit, in this case a worst case correction factor of 20 dB (1 MHz -> 10 kHz) was used
c) [1 MHz / 3 MHz] otherwise
- Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
6) The spurious emissions peaks were measured in both vertical and horizontal antenna polarization during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case peaks all orientations (X, Y, Z) of the EUT have been measured.
7) After this initial test, a final test according to ANSI C63.26-D 2.2.12 Unwanted Emissions is performed on signals which are identified as being close to the limit. For any emissions found to be within 10 dB of the limit, a specific signal substitution measurement is performed at the frequency of the emission to determine the exact e.i.r.p. value.

Test Requirements / Limits

§ 2.1053 Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of Sec. 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.
(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
(2) All equipment operating on frequencies higher than 25 MHz.

§ 2.1057 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in Secs. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.
(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

§ 22.917 Emission limitations for cellular equipment

(a) 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.
This is calculated to be -13 dBm (effective radiated power) which corresponds to 84.6 dBµV/m (field strength) in a distance of 3 m.

(b) Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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.
(c) Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas [...].
(d) If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

For reporting only spurious emission levels reaching to the 20dB margin to limit were noted.

Band edge compliance

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §22.913

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth = Video Bandwidth: >1% of the manufacturer’s stated occupied bandwidth

Test Requirements / Limits

§ 22.917 Emission limitations for cellular equipment

Refer to chapter "Field strength of spurious radiation".

Summary of Test Results

The EUT complied with all performed tests as listed in the summary section of this report.

Technical Report Summary

Type of Authorization :

Certification for a GSM/WCDMA/CDMA2000 cellular radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in
47 CFR Ch.1 Parts 0 to 69. The following subparts
are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

§ 2.1046 Measurement required: RF power output
§ 2.1049 Measurement required: Occupied bandwidth
§ 2.1053 Measurement required: Field strength of spurious radiation

Part 24, Subpart E - Broadband PCS

§ 24.232 Power and antenna height limits
§ 24.236 Field strength limits
§ 24.238 Emission limitations for Broadband PCS equipment

additional documents

ANSI C63.26-D

Description of Methods of Measurements

RF Power Output

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1046

Test Description (conducted measurement procedure)

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Channel (Frequency): please refer to the detailed results
4) The transmitted power of the EUT was recorded by using a spectrum analyser.

Test Description (radiated measurement procedure)

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A substitution procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) The output power was measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case power all orientations (X, Y, Z) of the EUT have been measured.
5) The test procedure according to ANSI C63.26-D has been considered.

Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.
§24.232 Power and antenna height limits
(c) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.
(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

Emission and Occupied Bandwidth

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1049

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth: >1% of the manufacturer’s stated occupied bandwidth
5) The maximum spectral level of the modulated signal was recorded as the reference.
6) The emission bandwidth is measured as follows:
the two furthest frequencies above and below the frequency of the maximum reference level where the spectrum is –26 dB down have to be found.
7) The occupied bandwidth (99% Bandwidth) is measured as follows:
the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 percent of the total mean power.

Test Requirements / Limits

§ 2.1049 Measurements required: Occupied bandwidth

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 by a given emission shall be measured under the following conditions (as applicable):

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Field strength of spurious radiation

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1053

Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A pre-calibration procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) All spurious radiation measurements were made with spectrum analyser and the appropriate calibrated antennas for the frequency range of 30 MHz to 20 GHz (up to the 10th harmonic of the transmit frequency). The frequency range from 9 kHz to 30 MHz has been examined during the conducted spurious emission measurements.
5) Important Analyser Settings
- [Resolution Bandwidth / Video Bandwidth]:
a) [3 kHz / 10 kHz] in the Span of 1 MHz directly below and above the Band,
b) [10 kHz / 30 kHz] in case the curve of the analyser IF-Filter leads to an exceeding of the limit, in this case a worst case correction factor of 20 dB (1 MHz -> 10 kHz) was used
c) [1 MHz / 3 MHz] otherwise
- Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
6) The spurious emissions peaks were measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case peaks all orientations (X, Y, Z) of the EUT have been measured.
7) After this initial test, a final test according to ANSI C63.26-D 2.2.12 Unwanted Emissions is performed on signals which are identified as being close to the limit. For any emissions found to be within 10 dB of the limit, a specific signal substitution measurement is performed at the frequency of the emission to determine the exact e.i.r.p. value.

Test Requirements / Limits

§ 2.1053 Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of Sec. 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.
(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
(2) All equipment operating on frequencies higher than 25 MHz.

§ 2.1057 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in Secs. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:
(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.
(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

§ 24.238 Emission limitations for Broadband PCS equipment

(a) 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.
This is calculated to be -13 dBm (effective radiated power) which corresponds to 84.6 dBµV/m (field strength) in a distance of 3 m.

(b) Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.
(c) Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas [...].
(d) If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

For reporting only spurious emission levels reaching to the 20dB margin to limit were noted.

Band edge compliance

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §24.238

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth = Video Bandwidth: >1% of the manufacturer’s stated occupied bandwidth

Test Requirements / Limits

§ 24.238 Effective radiated power limits

Refer to chapter "Field strength of spurious radiation".

Summary of Test Results

The EUT complied with all performed tests as listed in the summary section of this report.

Technical Report Summary

Type of Authorization :

Certification for a GSM/WCDMA/CDMA2000 cellular radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 0 to 69. The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

§ 2.1046 Measurement required: RF power output
§ 2.1049 Measurement required: Occupied bandwidth
§ 2.1053 Measurement required: Field strength of spurious radiation

Part 22, Subpart C – Operational and Technical Requirements

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22.913 Effective radiated power limits
§ 22.917 Emission limitations for cellular equipment

additional documents

ANSI C63.26-D

Description of Methods of Measurements

RF Power Output

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1046

Test Description (conducted measurement procedure)

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Channel (Frequency): please refer to the detailed results
4) The transmitted power of the EUT was recorded by using a spectrum analyser.

Test Description (radiated measurement procedure)

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A substitution procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) The output power was measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case power all orientations (X, Y, Z) of the EUT have been measured.
5) The test procedure according to ANSI C63.26-D has been considered.

Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.
§22.913 Effective radiated power limits
(a)(2) Maximum ERP. … The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Emission and Occupied Bandwidth

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1049

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth: >1% of the manufacturer’s stated occupied bandwidth
5) The maximum spectral level of the modulated signal was recorded as the reference.
6) The emission bandwidth is measured as follows:
the two furthest frequencies above and below the frequency of the maximum reference level where the spectrum is –26 dB down have to be found.
7) The occupied bandwidth (99% Bandwidth) is measured as follows:
the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 percent of the total mean power.

Test Requirements / Limits

§ 2.1049 Measurements required: Occupied bandwidth

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 by a given emission shall be measured under the following conditions (as applicable):

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be

operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Field strength of spurious radiation

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §2.1053

Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A pre-calibration procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) All spurious radiation measurements were made with spectrum analyser and the appropriate calibrated antennas for the frequency range of 30 MHz to 10 GHz (up to the 10th harmonic of the transmit frequency). The frequency range from 9 kHz to 30 MHz has been examined during the conducted spurious emission measurements.
5) Important Analyser Settings
- [Resolution Bandwidth / Video Bandwidth]:
a) [3 kHz / 10 kHz] in the Span of 1 MHz directly below and above the Band,
b) [10 kHz / 30 kHz] in case the curve of the analyser IF-Filter leads to an exceeding of the limit, in this case a worst case correction factor of 20 dB (1 MHz -> 10 kHz) was used
c) [1 MHz / 3 MHz] otherwise
- Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
6) The spurious emissions peaks were measured in both vertical and horizontal antenna polarization during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case peaks all orientations (X, Y, Z) of the EUT have been measured.
7) After this initial test, a final test according to ANSI C63.26-D 2.2.12 Unwanted Emissions is performed on signals which are identified as being close to the limit. For any emissions found to be within 10 dB of the limit, a specific signal substitution measurement is performed at the frequency of the emission to determine the exact e.i.r.p. value.

Test Requirements / Limits

§ 2.1053 Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of Sec. 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.
(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
(2) All equipment operating on frequencies higher than 25 MHz.

§ 2.1057 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in Secs. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.
(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

§ 22.917 Emission limitations for cellular equipment

(a) 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.
This is calculated to be -13 dBm (effective radiated power) which corresponds to 84.6 dBµV/m (field strength) in a distance of 3 m.

(b) Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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.
(c) Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas [...].
(d) If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

For reporting only spurious emission levels reaching to the 20dB margin to limit were noted.

Band edge compliance

Standard FCC Part 22, Subpart H

The test was performed according to: FCC §22.913

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth = Video Bandwidth: >1% of the manufacturer’s stated occupied bandwidth

Test Requirements / Limits

§ 22.917 Emission limitations for cellular equipment

Refer to chapter "Field strength of spurious radiation".

Summary of Test Results

The EUT complied with all performed tests as listed in the summary section of this report.

Technical Report Summary

Type of Authorization :

Certification for a GSM/WCDMA/CDMA2000 cellular radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in
47 CFR Ch.1 Parts 0 to 69. The following subparts
are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

§ 2.1046 Measurement required: RF power output
§ 2.1049 Measurement required: Occupied bandwidth
§ 2.1053 Measurement required: Field strength of spurious radiation

Part 24, Subpart E - Broadband PCS

§ 24.232 Power and antenna height limits
§ 24.236 Field strength limits
§ 24.238 Emission limitations for Broadband PCS equipment

additional documents

ANSI C63.26-D

Description of Methods of Measurements

RF Power Output

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1046

Test Description (conducted measurement procedure)

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Channel (Frequency): please refer to the detailed results
4) The transmitted power of the EUT was recorded by using a spectrum analyser.

Test Description (radiated measurement procedure)

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A substitution procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) The output power was measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case power all orientations (X, Y, Z) of the EUT have been measured.
5) The test procedure according to ANSI C63.26-D has been considered.

Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.
§24.232 Power and antenna height limits
(c) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.
(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

Emission and Occupied Bandwidth

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1049

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth: >1% of the manufacturer’s stated occupied bandwidth
5) The maximum spectral level of the modulated signal was recorded as the reference.
6) The emission bandwidth is measured as follows:
the two furthest frequencies above and below the frequency of the maximum reference level where the spectrum is –26 dB down have to be found.
7) The occupied bandwidth (99% Bandwidth) is measured as follows:
the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 percent of the total mean power.

Test Requirements / Limits

§ 2.1049 Measurements required: Occupied bandwidth

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 by a given emission shall be measured under the following conditions (as applicable):

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Field strength of spurious radiation

Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §2.1053

Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A pre-calibration procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) All spurious radiation measurements were made with spectrum analyser and the appropriate calibrated antennas for the frequency range of 30 MHz to 20 GHz (up to the 10th harmonic of the transmit frequency). The frequency range from 9 kHz to 30 MHz has been examined during the conducted spurious emission measurements.
5) Important Analyser Settings
- [Resolution Bandwidth / Video Bandwidth]:
a) [3 kHz / 10 kHz] in the Span of 1 MHz directly below and above the Band,
b) [10 kHz / 30 kHz] in case the curve of the analyser IF-Filter leads to an exceeding of the limit, in this case a worst case correction factor of 20 dB (1 MHz -> 10 kHz) was used
c) [1 MHz / 3 MHz] otherwise
- Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
6) The spurious emissions peaks were measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case peaks all orientations (X, Y, Z) of the EUT have been measured.
7) After this initial test, a final test according to ANSI C63.26-D 2.2.12 Unwanted Emissions is performed on signals which are identified as being close to the limit. For any emissions found to be within 10 dB of the limit, a specific signal substitution measurement is performed at the frequency of the emission to determine the exact e.i.r.p. value.

Test Requirements / Limits

§ 2.1053 Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of Sec. 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.
(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
(2) All equipment operating on frequencies higher than 25 MHz.

§ 2.1057 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in Secs. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:
(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.
(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

§ 24.238 Emission limitations for Broadband PCS equipment

(a) 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.
This is calculated to be -13 dBm (effective radiated power) which corresponds to 84.6 dBµV/m (field strength) in a distance of 3 m.

(b) Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.
(c) Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas [...].
(d) If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

For reporting only spurious emission levels reaching to the 20dB margin to limit were noted.

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Band edge compliance

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Standard: FCC Part 24, Subpart E

The test was performed according to: FCC §24.238

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth = Video Bandwidth: >1% of the manufacturer’s stated occupied bandwidth

Test Requirements / Limits

§ 24.238 Effective radiated power limits

Refer to chapter "Field strength of spurious radiation".
Summary of Test Results

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The EUT complied with all performed tests as listed in the summary section of this report.

Technical Report Summary

Type of Authorization :

Certification for a GSM cellular radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in
47 CFR Ch.1 Parts 0 to 69. The following subparts
are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

§ 2.1046 Measurement required: RF power output
§ 2.1049 Measurement required: Occupied bandwidth
§ 2.1053 Measurement required: Field strength of spurious radiation

Part 27, Subpart C—Technical Standards

§ 27.50 Power and antenna height limits
§ 27.53 Emissions limits

additional documents

ANSI C63.26

Description of Methods of Measurements

RF Power Output

Standard FCC Part 27, Subpart C

The test was performed according to: FCC §2.1046

Test Description (conducted measurement procedure)

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Channel (Frequency): please refer to the detailed results
4) The transmitted power of the EUT was recorded by using a spectrum analyser.

Test Description (radiated measurement procedure)

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.

Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
3) A substitution procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) The output power was measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case power all orientations (X, Y, Z) of the EUT have been measured.
5) The test procedure according to TIA-603-D-2004 has been considered.

Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output
(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.
§27.50 Power and antenna height limits.
(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:
(2) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to a peak EIRP of 1 watt. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.

Emission and Occupied Bandwidth

Standard FCC Part 27, Subpart C

The test was performed according to: FCC §2.1049

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth: >1% of the manufacturer’s stated occupied bandwidth
5) The maximum spectral level of the modulated signal was recorded as the reference.
6) The emission bandwidth is measured as follows:
the two furthest frequencies above and below the frequency of the maximum reference level where the spectrum is –26 dB down have to be found.
7) The occupied bandwidth (99% Bandwidth) is measured as follows:
the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 percent of the total mean power.

Test Requirements / Limits

§ 2.1049 Measurements required: Occupied bandwidth

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 by a given emission shall be measured under the following conditions (as applicable):

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any

devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Field strength of spurious radiation

Standard FCC Part 27, Subpart C

The test was performed according to: FCC §2.1053

Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". The EUT was coupled to a Digital Communication Tester which was located outside the chamber via a small signalling antenna.
2) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel : please refer to the detailed results
3) A pre-calibration procedure is used so that the readings from the spectrum analyser are corrected and represent directly the equivalent radiated power (related to a lamda/2 dipole).
4) All spurious radiation measurements were made with spectrum analyser and the appropriate calibrated antennas for the frequency range of 30 MHz to 18 GHz (up to the 10th harmonic of the transmit frequency). The frequency range from 9 kHz to 30 MHz has been examined during the conducted spurious emission measurements.
5) Important Analyser Settings
- [Resolution Bandwidth / Video Bandwidth]:
a) [3 kHz / 10 kHz] in the Span of 1 MHz directly below and above the Band,
b) [10 kHz / 30 kHz] in case the curve of the analyser IF-Filter leads to an exceeding of the limit, in this case a worst case correction factor of 20 dB (1 MHz -> 10 kHz) was used
c) [1 MHz / 3 MHz] otherwise
- Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
6) The spurious emissions peaks were measured in both vertical and horizontal antenna polarisation during the call is established on the lowest channel, mid channel and on the highest channel. To find the worst case peaks all orientations (X, Y, Z) of the EUT have been measured.
7) After this initial test, a final test according to ANSI C63.26 Unwanted Emissions is performed on signals which are identified as being close to the limit. For any emissions found to be within 10 dB of the limit, a specific signal substitution measurement is performed at the frequency of the emission to determine the exact e.i.r.p. value.

Test Requirements / Limits

§ 2.1053 Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of Sec. 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.
(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
(2) All equipment operating on frequencies higher than 25 MHz.

§ 2.1057 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in Secs. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:
(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to

those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.
(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

§ 27.53 Emission limits

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.
Remark of the test laboratory: This is calculated to be -13 dBm (effective radiated power) which corresponds to 84.6 dBµV/m (field strength) in a distance of 3 m.
(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.
(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

For reporting only spurious emission levels reaching to the 20dB margin to limit were noted.

Band edge compliance

Standard FCC Part 27, Subpart C

The test was performed according to: FCC §27.53

Test Description

1) The EUT was coupled to a Spectrum Analyser and a Digital Communication Tester through a Power Divider. Refer to chapter "Setup Drawings".
2) The total insertion losses for signal path 1 and signal path 2 were measured. The values were used to correct the readings from the Spectrum Analyser and the Digital Communication Tester.
3) A call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
Important Settings:
- Output Power: Maximum
- Channel: please refer to the detailed results
4) Important Analyser Settings:
- Resolution Bandwidth = Video Bandwidth: >1% of the manufacturer’s stated occupied bandwidth

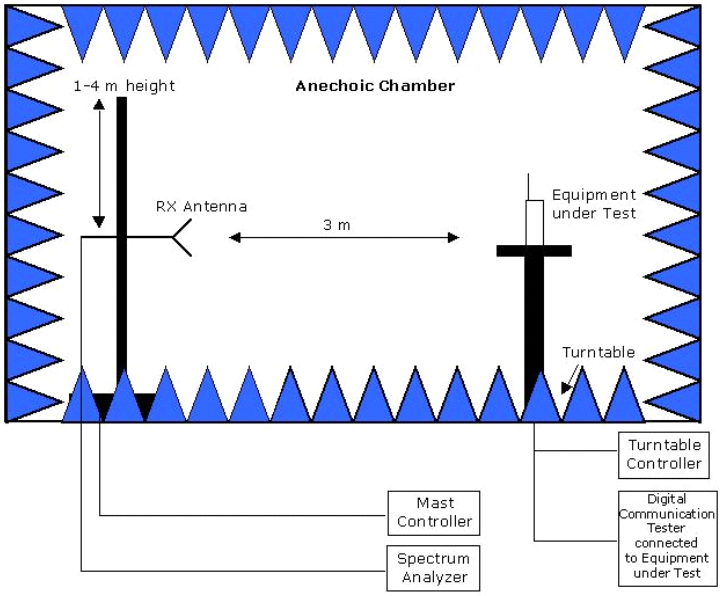
For LTE band eFDD13 in the ranges of 765-775MHz and 793-805MHz.
These frequency ranges are part of spurious conducted and measured with 10kHz RBW.

Test Requirements / Limits

§ 27.53 Effective radiated power limits

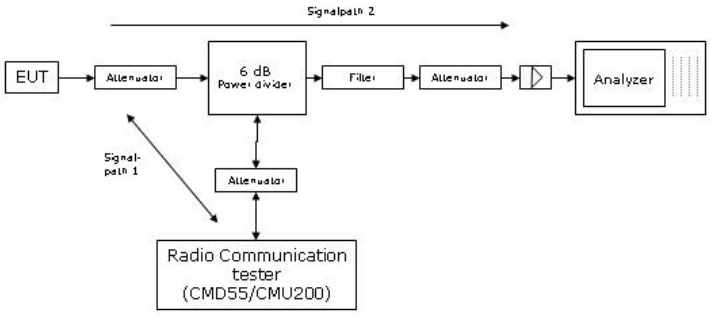
Refer to chapter "Field strength of spurious radiation".

Setup Drawings



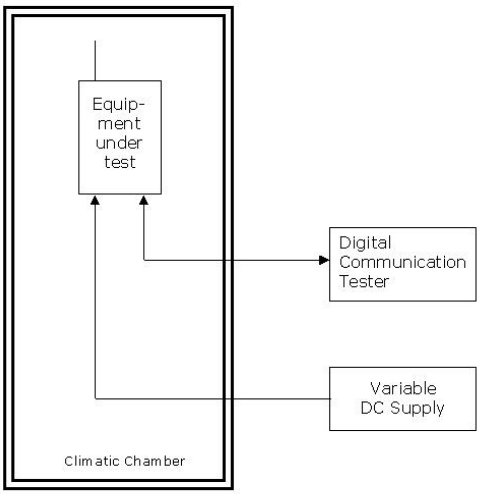
Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Principle set-up for radiated measurements



Remark: Depending on the frequency range suitable attenuators and/or filters and/or amplifiers are used.

Principle set-up for conducted measurements under nominal conditions



Principle set-up for tests under extreme test conditions

Measurement Uncertainties

FCC Part 22, 24, 27, 90
IC RSS-132, RSS-133, RSS-139

Test Case	Parameter	Uncertainty
RF Power Output	Power	± 2.2 dB
Frequency Stability	Frequency	± 25 Hz
Spurious Emissions at antenna terminal	Power	± 2.2 dB
Field strength of spurious radiation	Power	± 4.5 dB
Emission and Occupied Bandwidth	Power Frequency	± 2.9 dB GSM: ± 10.6 kHz UMTS, LTE: ± 120.0 kHz
Band Edge Compliance	Power Frequency	± 2.9 dB GSM: ± 14.6 kHz UMTS, LTE: ± 68.0 kHz

FCC Part 15b
IC ICES-003

Test Case	Parameter	Uncertainty
AC Power Line	Power	± 3.4 dB
Field Strength of spurious radiation	Field Strength	± 5.5 dB

FCC Part 15c, 15e
IC RSS-210, IC RSS-247

Test Case	Parameter	Uncertainty
AC Power Line	Power	± 3.4 dB
Field Strength of spurious radiation	Power	± 5.5 dB
6 dB / 26 dB / 99% Bandwidth	Power Frequency	± 2.9 dB ± 11.2 kHz
Conducted Output Power		± 2.2 dB
Spurious Emissions at antenna terminal	Power	± 2.2 dB
Band Edge Compliance	Power Frequency	± 2.2 dB ± 11.2 kHz
Frequency Stability	Frequency	± 25 Hz
Power Spectral Density	Power	± 2.2 dB

TEST MODE	TX / RX	RF Channel			TEST MODE	TX / RX	RF Channel		
		Low	Mid	High			Low	Mid	High
		18607	18900	19193			19957	20175	20393
	TX (1.4M)	1850.7 MHz	1880 MHz	1909.3 MHz		TX (1.4M)	1710.7MHz	1732.5MHz	1754.3MHz
		CH 18615	CH 18900	CH 19185			CH 19965	CH 20175	CH 20385
	TX (3M)	1851.5 MHz	1880 MHz	1908.5 MHz		TX (3M)	1711.50 MHz	1732.50 MHz	1753.50 MHz
		CH 18625	CH 18900	CH 19175			CH 19975	CH 20175	CH 20375
	TX (5M)	1852.5 MHz	1880 MHz	1907.5 MHz		TX (5M)	1712.50 MHz	1732.50 MHz	1752.50 MHz
		CH 18650	CH 18900	CH 19150			CH 20000	CH 20175	CH 20350
	TX (10)	1855 MHz	1880 MHz	1905 MHz		TX (10)	1715.00 MHz	1732.50 MHz	1750.00 MHz
		CH 18675	CH 18900	CH 19125			CH 20025	CH 20175	CH 20325
	TX (15M)	1857.5 MHz	1880 MHz	1902.5 MHz		TX (15M)	1717.50 MHz	1732.50 MHz	1747.50 MHz
		CH 18700	CH 18900	CH 19100			CH 20050	CH 20175	CH 20300
	TX (20M)	1860 MHz	1880 MHz	1900 MHz		TX (20M)	1720.00 MHz	1732.50 MHz	1745.00 MHz
LTE eFDD 2		CH 607	CH 900	CH 1193	LTE eFDD 4		CH 1957	CH 2175	CH 2393
	RX (1.4M)	1930.7 MHz	1960 MHz	1989.3 MHz		RX (1.4M)	2110.70 MHz	2132.50 MHz	2154.30 MHz
		CH 615	CH 900	CH 1185			CH 1965	CH 2175	CH 2385
	RX (3M)	1931.5 MHz	1960 MHz	1988.5 MHz		RX (3M)	2111.50 MHz	2132.50 MHz	2153.50 MHz
		CH 625	CH 900	CH 1175			CH 1975	CH 2175	CH 2375
	RX (5M)	1932.50 MHz	1880.00 MHz	1987.5 MHz		RX (5M)	2112.50 MHz	2132.50 MHz	2152.50 MHz
		CH 650	CH 900	CH 1150			CH 2000	CH 2175	CH 2350
	RX (10M)	1935.00 MHz	1960.00 MHz	1985.00 MHz		RX (10M)	2115.00 MHz	2132.50 MHz	2150.00 MHz
		CH 675	CH 900	CH 1125			CH 2025	CH 2175	CH 2325
	RX (15M)	1937.50 MHz	1960.00 MHz	1982.50 MHz		RX (15M)	2117.50 MHz	2132.50 MHz	2147.50 MHz
		CH 700	CH 900	CH 1100			CH 2050	CH 2175	CH 2300
	RX (20M)	1940.00 MHz	1960.00 MHz	1980.00 MHz		RX (20M)	2120.00 MHz	2132.50 MHz	2145.00 MHz

TEST MODE	TX / RX	RF Channel			TEST MODE	TX / RX	RF Channel		
		Low	Mid	High			Low	Mid	High
		20407	20525	20643			CH 23017	CH 23095	CH 23173
	TX (1.4M)	824.7	836.5	848.3		TX (1.4M)	699.70 MHz	707.50 MHz	715.30 MHz
		CH 20415	CH 20525	CH 20635			CH 23025	CH 23095	CH 23165
	TX (3M)	825.50 MHz	836.50 MHz	847.50 MHz		TX (3M)	700.50 MHz	707.50 MHz	714.50 MHz
		CH 20425	CH 20525	CH 20625			CH 23035	CH 23095	CH 23155
	TX (5M)	826.50 MHz	836.50 MHz	846.50 MHz		TX (5M)	701.50 MHz	707.50 MHz	713.50 MHz
		CH 20450	CH 20525	CH 20600			CH 23060	CH 23095	CH 23130
	TX (10)	829.00 MHz	836.50 MHz	844.00 MHz		TX (10)	704.00 MHz	707.50 MHz	711.00 MHz
LTE eFDD 5		CH 2407	CH 20525	CH 2643	LTE eFDD 12		CH 5017	CH 5095	CH 5173
	RX (1.4M)	869.70 MHz	881.50 MHz	893.70 MHz		RX (1.4M)	729.70 MHz	737.50 MHz	745.30 MHz
		CH 2415	CH 20525	CH 2635			CH 5025	CH 5095	CH 5165
	RX (3M)	870.50 MHz	881.50 MHz	892.50 MHz		RX (3M)	730.50 MHz	737.50 MHz	744.50 MHz
		CH 2425	CH 2525	CH 2625			CH 5035	CH 5095	CH 5155
	RX (5M)	871.50 MHz	881.50 MHz	891.50 MHz		RX (5M)	731.50 MHz	737.50 MHz	743.50 MHz
		CH 2450	CH 2525	CH 2600			CH 5060	CH 5095	CH 5130
	RX (10M)	874.00 MHz	881.50 MHz	889.00 MHz		RX (10M)	734.00 MHz	737.50 MHz	741.00 MHz

TEST MODE	TX / RX	RF Channel			TEST MODE	TX / RX	RF Channel		
		Low	Mid	High			Low	Mid	High
		CH 20775	CH 21100	CH 21425			CH 23205	CH 23230	CH 23255
	TX (5M)	2502.50 MHz	2535.00 MHz	2567.50 MHz		TX (5M)	779.50 MHz	782.00 MHz	784.50 MHz
		CH 20800	CH 21100	CH 21400			CH 23230	CH 23230	CH 23230
	TX (10)	2505.00 MHz	2535.00 MHz	2565.00 MHz		TX (10)	782.00 MHz	782.00 MHz	782.00 MHz
		CH 20825	CH 21100	CH 21375					
	TX (15M)	2507.50 MHz	2535.00 MHz	2562.50 MHz		TX (15M)			
		CH 20850	CH 21100	CH 21350					
	TX (20M)	2510.00 MHz	2535.00 MHz	2560.00 MHz		TX (20M)			
LTE eFDD 7		CH 2775	CH 3100	CH 3425	LTE eFDD 13		CH 5205	CH 5230	CH 5255
	RX (5M)	2622.50 MHz	2655.00 MHz	2687.50 MHz		RX (5M)	748.50 MHz	751.00 MHz	753.50 MHz
		CH 2800	CH 3100	CH 3400			CH 5230	CH 5230	CH 5230
	RX (10M)	2625.00 MHz	2655.00 MHz	2685.00 MHz		RX (10M)	751.00 MHz	751.00 MHz	751.00 MHz
		CH 2825	CH 3100	CH 3375					
	RX (15M)	2627.50 MHz	2655.00 MHz	2682.50 MHz		RX (15M)			
		CH 2850	CH 3100	CH 3350					
	RX (20M)	2630.00 MHz	2655.00 MHz	2680.00 MHz		RX (20M)			

Correlation of measurement requirements for Cellular Equipment from FCC and IC

FCC Rule / IC Standard	Part 22	RSS-132 Issue 3, 2016	Part 24	RSS-133 Issue 6, 2013	Part 27	RSS-139 Issue 3, 2015	RSS-130 Issue 1, 2013
Effective (isotropic) Radiated Power	§2.1046 §22.913	RSS-GEN, §6.12 RSS-132, §5.4	§2.1046 §24.232	RSS-GEN, §6.12 RSS-133, §6.4	§2.1046 §27.50	RSS-GEN, §6.12 RSS-139; §6.4	RSS-GEN, §6.12 RSS-130; §4.4
Emission and Occupied Bandwidth	§2.1049	RSS-GEN §6.6	§2.1049	RSS-GEN §6.6	§2.1049	RSS-GEN §6.6	RSS-GEN §6.6
"Spuri" at Antenna Terminal	§2.1051 §22.917	RSS-GEN, §6.13 RSS-132, §5.5	§2.1051 §24.238	RSS-GEN, §6.13 RSS-132, §6.5	§2.1051 §27.53	RSS-GEN, §6.13 RSS-139, §6.5	RSS-GEN, §6.13 RSS-130, §4.6
Band Edge compliance	§2.1051 §22.917	RSS-GEN, §6.13	§2.1051 §24.238	RSS-GEN, §6.13	§2.1051 §27.53	RSS-GEN, §6.13	RSS-GEN, §6.13
Frequency Stability	§2.1055 §22.355	RSS-GEN, §6.11	§2.1055 §24.235	RSS-GEN, §6.11 RSS-132, §6.3	§2.1055 §27.51	RSS-GEN, §6.11 RSS-139, §6.3	RSS-GEN, §6.11 RSS-130, §4.3
Peak to Average Ratio	N/A	RSS-132, §5.3	§2.1046 §24.232	RSS-133, §6.4	§2.1046 §27.50	RSS-139, §6.4	RSS-130; §4.4
Field Strength of Spurious Radiation	§2.1053 §22.917	RSS-GEN, §6.13 RSS-132, §5.2	§2.1053 §24.235	RSS-GEN, §6.13 RSS-133, §6.5	§2.1053 §27.51	RSS-GEN, §6.13 RSS-139, §6.5	RSS-GEN, §6.13 RSS-130, §4.6

*) Receivers which are part of Transceivers are exempted with respect to Notice 2012-DRS0126.

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