

InterLab[®] Final Report on

Cellular Module

Cinterion[®] ALAS66A-US Data and Voice

FCC ID: QIPALAS66A-US

IC: 7830A-ALAS66AUS

according to FCC Part 22, Subpart H, Part 24, Subpart E and
Part 27, Subpart C

Report Reference: MDE_GEMALTO_1802_FCCb_rev01

Date: February 14, 2019

Test Laboratory:

7layers GmbH
Borsigstraße 11
40880 Ratingen
Germany



Deutsche
Akkreditierungsstelle
D-PL-12140-01-00

Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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1 Administrative Data

1.1 Project Data

Project Responsible: Andreas Tübel
Date Of Test Report: 2019/02/14
Date of first test: 2018/09/30
Date of last test: 2018/11/12

1.2 Applicant Data

Company Name: Gemalto M2M GmbH
Street: Siemensdamm 50
City: 13629 Berlin
Country: Germany

Contact Person: Mr. Axel Heike
Function: Certification Manager
Department: Approval Department
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Fax: +49 30311028305
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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 ISED 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 ISED 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


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 40880 Ratingen, Germany
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2 Test Object Data

2.1 General OUT Description

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

OUT: Cinterion ALAS66A-US

Type / Model / Family:

Cinterion® ALAS66A-US

FCC ID: QIPALAS66A-US

IC: 7830A-ALAS66AUS

HVIN: ALAS66A-US

according to FCC Part 22, Subpart H, Part 24, Subpart E and
 Part 27, Subpart C

Product Category:

Module

Manufacturer:

Company Name:

see applicant data

Contact Person:

see applicant data

Parameter List:

Parameter name	Value
DC Power Supply	12 (V)
highest channel	251 for GSM850, 810 for GSM1900, 4233 for FDD5, 9538 for FDD2, 1513 for FDD4, 2064 for eFDD5, 20393 for eFDD4, 21425 for eFDD7, 23173 for eFDD12, 23255 for eFDD13, 132665 for eFDD66
lowest channel	128 for GSM850, 512 for GSM1900, 4132 for FDD5, 9262 for FDD2 1312 for FDD4, 20775 for FDD7, 23017 for eFDD12, 23205 for eFDD13, 131979 for eFDD66
mid channel	190 for GSM850, 661 for GSM1900, 4183 for FDD5, 9400 for FDD2, 1412/1450 for FDD4, 20525 for eFDD5, 21100 for eFDD7, 23095 for eFDD12, 23230 for eFDD13, 132322 eFDD66

2.2 Detailed Description of OUT Samples

Sample : am01

<i>OUT Identifier</i>	Cinterion ALAS66A-US		
<i>Sample Description</i>	RF Sample FCC/ISED #01		
<i>Serial No.</i>	004401082104247		
<i>HW Status</i>	Rev. 2.2		
<i>SW Status</i>	Rev. 00.192		
<i>Low Voltage</i>	3.3 V	<i>Low Temp.</i>	-20 °C
<i>High Voltage</i>	4.2 V	<i>High Temp.</i>	55 °C
<i>Nominal Voltage</i>	3.8 V	<i>Normal Temp.</i>	23 °C

2.3 OUT Features

Features for OUT: Cinterion ALAS66A-US

<i>Designation</i>	<i>Description</i>	<i>Allowed Values</i>	<i>Supported Value(s)</i>
Features for scope: FCC_v2			
DC	The OUT is powered by or connected to DC		
Eant	removable antenna supplied and type tested with the radio equipment, designed as an indispensable part of the equipment		
EDGE850	EUT supports EDGE in the band 824 MHz - 849 MHz		
EDGE1900	EUT supports EDGE in the band 1850 MHz - 1910 MHz		
eFDD2	EUT supports LTE eFDD2 in the band 1850 MHz - 1910 MHz		
eFDD4	EUT supports LTE eFDD4 in the band 1710 MHz - 1755 MHz		
eFDD5	EUT supports LTE eFDD5 in the band 824 MHz - 849 MHz (additional MIMO for carrier aggregation combinations)		
eFDD7	EUT supports LTE eFDD7 in the band 2500 MHz - 2570 MHz (additional MIMO for carrier aggregation combinations)		
eFDD12	EUT supports LTE eFDD12 in the band 699 MHz - 716 MHz		
eFDD13	EUT supports LTE eFDD13 in the band 777 MHz - 787 MHz		
eFDD66	EUT supports LTE eFDD66 in the band 1710 MHz - 1780 MHz		
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		
GSM850	EUT supports GSM850 band 824MHz - 849MHz		
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.

<i>Setup No.</i>	<i>List of OUT samples</i>	<i>List of auxiliary equipment</i>
<i>Sample No.</i>	<i>Sample Description</i>	<i>AE No. AE Description</i>
S01_AM01	(RF Setup FCC/ISED)	
<i>Sample:</i> am01	RF Sample FCC/ISED #01	

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 is conform 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 replace report MDE_GEMALTO_1802_FCCba
Changes done: page 71 plot added eFDD2, page 73-74 limits corrected, page 111 remark revised, remarks added to CSE and RSE FCC part 27 plots, page 5 out features added CA MIMO for bands eFDD5 and eFDD7, page 4 HW and SW formal revised, page 3 HVIN added.

3.2 List of the Applicable Body

(Bodies for Scope: FCC_v2)

<i>Designation</i>	<i>Description</i>
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

<i>Applicable Errata</i>	<i>Activate Date</i>	<i>Comment</i>
ANSI C63.26 - 2015		KDB 971168 D01 v03r01

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

<i>Applicable Errata</i>	<i>Activate Date</i>	<i>Comment</i>
ANSI C63.26 - 2015		KDB 971168 D01 v03r01

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

<i>Applicable Errata</i>	<i>Activate Date</i>	<i>Comment</i>
ANSI C63.26 - 2015		KDB 971168 D01 v03r01

3.4 Summary

<i>Test Case Identifier / Name</i>	<i>Result</i>	<i>Date of Test</i>	<i>Lab Ref.</i>	<i>Setup</i>
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	2018/10/12	Lab 2	S01_AM01
22.2 Frequency stability §2.1055				
22.2; _Frequency stability Summary §2.1055	Passed	2018/10/07	Lab 2	S01_AM01
22.3 Spurious emissions at antenna terminals §2.1051, §22.917				
22.3; Spurious emissions at antenna terminals summary §2.1051, §22.917	Passed	2018/10/12	Lab 2	S01_AM01
22.4 Field strength of spurious radiation §2.1053, §22.917				
22.4; Field strength of spurious radiation Summary §2.1053, §22.917	Passed	2018/10/08	Lab 1	S01_AM01
22.5 Emission and Occupied Bandwidth §2.1049, §22.917				
22.5; _Emission and Occupied Bandwidth Summary §2.1049, §22.917	Passed	2018/10/12	Lab 2	S01_AM01
22.6 Band edge compliance §2.1053, §22.917				
22.6; _Band edge compliance Summary §2.1053, §22.917	Passed	2018/10/12	Lab 2	S01_AM01
22.7 Peak-to-Average Ratio Summary §2.1046				
22.7; Peak-to-Average Ratio Summary §2.1046	Passed	2018/10/25	Lab 2	S01_AM01
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	2018/10/01	Lab 2	S01_AM01
24.2 Frequency stability §2.1055, §24.235				
24.2; Frequency stability Summary §2.1055, §24.235	Passed	2018/09/30	Lab 2	S01_AM01
24.3 Spurious emissions at antenna terminals §2.1051, §24.238				
24.3; Spurious emissions at antenna terminals Summary §2.1051, §24.238	Passed	2018/10/02	Lab 2	S01_AM01
24.4 Field strength of spurious radiation §2.1053, §24.238				
24.4; Field strength of spurious radiation Summary §2.1053, §24.238	Passed	2018/10/25	Lab 1	S01_AM01
24.5 Emission and Occupied Bandwidth §2.1049, §24.238				
24.5; Emission and Occupied Bandwidth Summary §2.1049, §24.238	Passed	2018/10/12	Lab 2	S01_AM01
24.6 Band edge compliance §2.1053, §24.238				
24.6; Band edge compliance summary §2.1053, §24.238	Passed	2018/10/12	Lab 2	S01_AM01
24.7 Peak-to-Average ratio §2.1046, §24.232				
24.7; Peak-to-Average Ratio Summary §2.1046, §24.232	Passed	2018/10/25	Lab 2	S01_AM01
Test Specification: FCC part 2 and 27				
27.1 RF Power Output §2.1046, §27.50				
27.1; RF Power Output Summary §2.1046, §27.50	Passed	2018/10/10	Lab 2	S01_AM01

Test Case Identifier / Name		Lab			
Test (condition)	Result	Date of Test	Ref.	Setup	
27.2 Frequency stability §2.1055, §27.54					
27.2; Frequency stability Summary §2.1055, §27.54	Passed	2018/10/12	Lab 2	S01_AM01	
27.3 Spurious emissions at antenna terminals §2.1051, §27.53					
27.3; Spurious emissions at antenna terminals Summary §2.1051, §27.53	Passed	2018/10/12	Lab 2	S01_AM01	
27.4 Field strength of spurious radiation §2.1053, §27.53					
27.4; Field strength of spurious radiation Summary §2.1053, §27.53	Passed	2018/11/12	Lab 1	S01_AM01	
27.5 Emission and Occupied Bandwidth §2.1049					
27.5; Emission and Occupied Bandwidth Summary §2.1049	Passed	2018/10/12	Lab 2	S01_AM01	
27.6 Band edge compliance §2.1053, §27.53					
27.6; Band edge compliance summary §2.1053, §27.53	Passed	2018/10/10	Lab 2	S01_AM01	
27.7 Peak-to-Average ratio §2.1046, §27.50					
27.7; Peak-to-Average Ratio Summary §2.1046, §27.50	Passed	2018/11/12	Lab 2	S01_AM01	

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

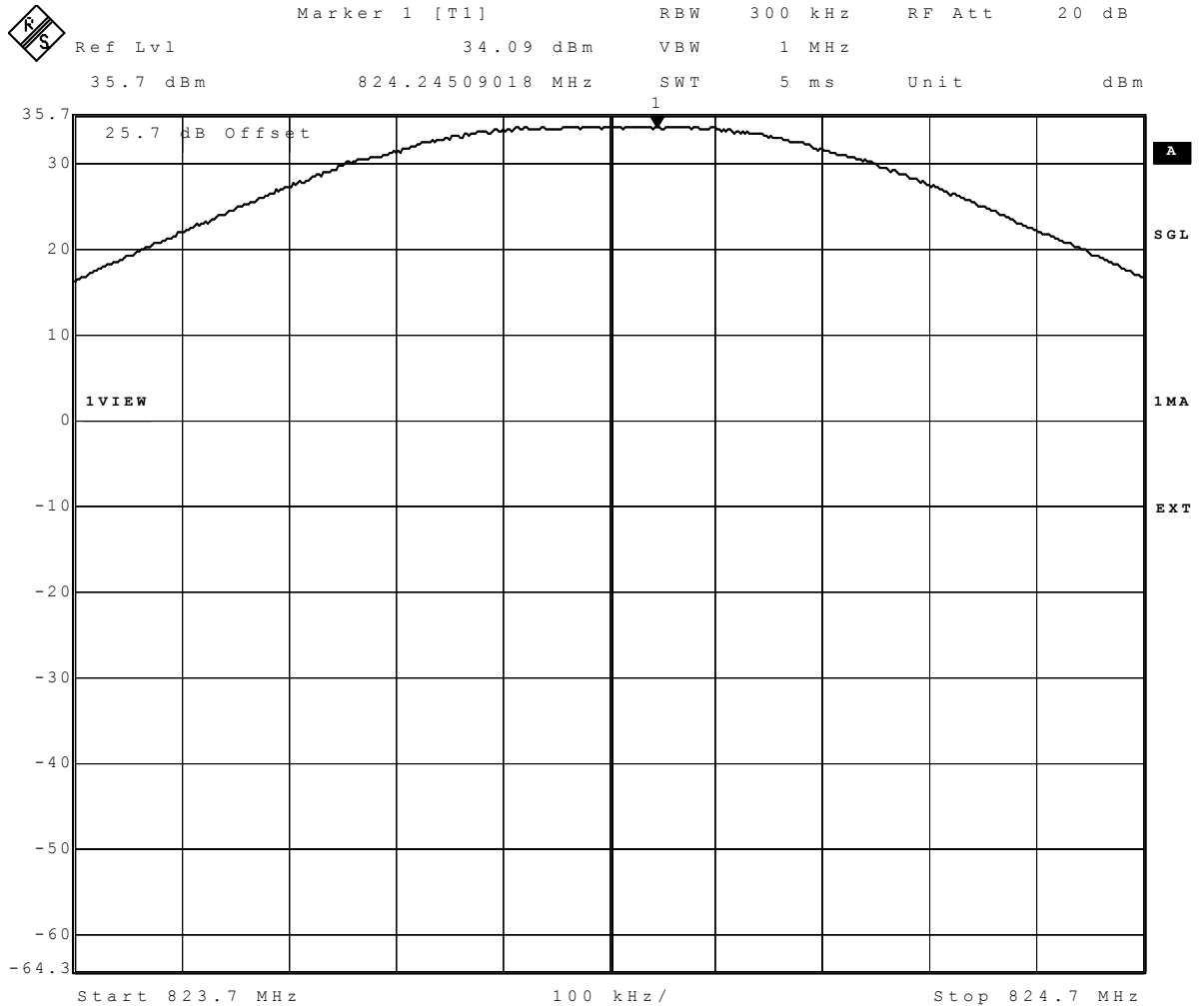
Result:	Passed
Setup No.:	S01_AM01
Date of Test:	2018/10/12 11:50
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]
GSM 850	low	-	0.2	34.09	33.96	33.97	11.5	11.5	6.51
GSM 850	mid	-	0.2	34.01	33.92	33.92	11.5	11.5	6.59
GSM 850	high	-	0.2	33.97	33.93	33.91	11.5	11.5	6.63
GSM 850 EDGE	low	-	0.2	30.66	30.59	30.55	11.5	11.5	9.94
GSM 850 EDGE	mid	-	0.2	30.58	30.49	30.41	11.5	11.5	10.02
GSM 850 EDGE	high	-	0.2	30.62	30.44	30.44	11.5	11.5	9.98
FDD V	low	-	5	30.7	25.28	25.39	11.5	11.5	15.21
FDD V	mid	-	5	30.78	25.22	25.46	11.5	11.5	15.14
FDD V	high	-	5	30.93	25.38	25.51	11.5	11.5	15.09
FDD V HSDPA Subtest 1	low	-	5	29.29	24.03	24.19	11.5	11.5	16.41
FDD V HSDPA Subtest 1	mid	-	5	30.01	24.08	24.34	11.5	11.5	16.26
FDD V HSDPA Subtest 1	high	-	5	29.86	24.19	24.19	11.5	11.5	16.41
FDD V HSDPA Subtest 2	low	-	5	30.28	23.3	23.91	11.5	11.5	16.69
FDD V HSDPA Subtest 2	mid	-	5	30.28	23.27	23.88	11.5	11.5	16.72
FDD V HSDPA Subtest 2	high	-	5	30.38	23.4	24.01	11.5	11.5	16.59
FDD V HSDPA Subtest 3	low	-	5	30.16	23.3	23.97	11.5	11.5	16.63
FDD V HSDPA Subtest 3	mid	-	5	30.16	23.27	23.99	11.5	11.5	16.61
FDD V HSDPA Subtest 3	high	-	5	30.38	23.32	24.06	11.5	11.5	16.54
FDD V HSDPA Subtest 4	low	-	5	30.56	23.15	24.07	11.5	11.5	16.53
FDD V HSDPA Subtest 4	mid	-	5	30.56	23.21	24.1	11.5	11.5	16.5
FDD V HSDPA Subtest 4	high	-	5	30.48	23.27	24.07	11.5	11.5	16.53
FDD V HSUPA Subtest 1	low	-	5	31.11	24.1	24.46	11.5	11.5	16.14
FDD V HSUPA Subtest 1	mid	-	5	31.11	24	24.32	11.5	11.5	16.28
FDD V HSUPA Subtest 1	high	-	5	31.32	24.04	24.32	11.5	11.5	16.28
FDD V HSUPA Subtest 2	low	-	5	30.48	21.61	22.48	11.5	11.5	18.12
FDD V HSUPA Subtest 2	mid	-	5	30.48	21.65	22.43	11.5	11.5	18.17
FDD V HSUPA Subtest 2	high	-	5	30.28	21.94	22.66	11.5	11.5	17.94
FDD V HSUPA Subtest 3	low	-	5	31.32	23.21	23.78	11.5	11.5	16.82
FDD V HSUPA Subtest 3	mid	-	5	31.11	23.32	23.89	11.5	11.5	16.71
FDD V HSUPA Subtest 3	high	-	5	31.22	23.4	23.99	11.5	11.5	16.61
FDD V HSUPA Subtest 4	low	-	5	30.38	21.47	22.4	11.5	11.5	18.2
FDD V HSUPA Subtest 4	mid	-	5	30.38	21.5	22.26	11.5	11.5	18.34
FDD V HSUPA Subtest 4	high	-	5	30.56	21.46	22.49	11.5	11.5	18.11
FDD V HSUPA Subtest 5	low	-	5	30.78	23.82	24.13	11.5	11.5	16.47
FDD V HSUPA Subtest 5	mid	-	5	30.78	23.78	24.09	11.5	11.5	16.51
FDD V HSUPA Subtest 5	high	-	5	30.85	23.84	24.15	11.5	11.5	16.45
eFDD 5 QPSK	low	1	1.4	-	-	23.09	11.5	11.5	17.51
eFDD 5 QPSK	low	3	1.4	-	-	22.83	11.5	11.5	17.77
eFDD 5 QPSK	low	6	1.4	-	-	21.67	11.5	11.5	18.93
eFDD 5 QPSK	mid	1	1.4	-	-	23.29	11.5	11.5	17.31
eFDD 5 QPSK	mid	3	1.4	-	-	22.87	11.5	11.5	17.73
eFDD 5 QPSK	mid	6	1.4	-	-	21.79	11.5	11.5	18.81

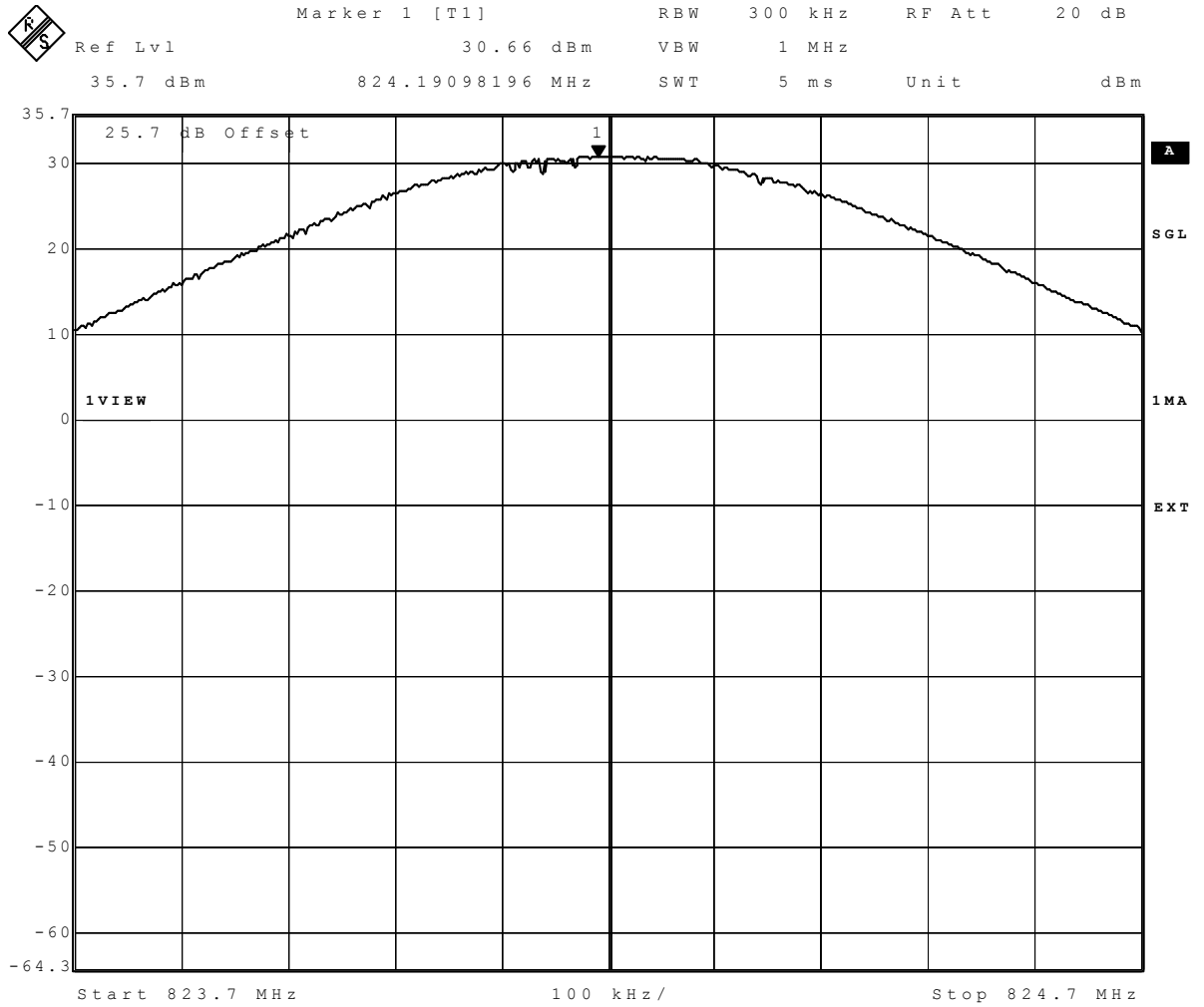
Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]
eFDD 5 QPSK	high	1	1.4	-	-	23.12	11.5	11.5	17.48
eFDD 5 QPSK	high	3	1.4	-	-	22.77	11.5	11.5	17.83
eFDD 5 QPSK	high	6	1.4	-	-	21.65	11.5	11.5	18.95
eFDD 5 16QAM	low	1	1.4	-	-	22.18	11.5	11.5	18.42
eFDD 5 16QAM	low	6	1.4	-	-	20.64	11.5	11.5	19.96
eFDD 5 16QAM	mid	1	1.4	-	-	22.37	11.5	11.5	18.23
eFDD 5 16QAM	mid	6	1.4	-	-	20.89	11.5	11.5	19.71
eFDD 5 16QAM	high	1	1.4	-	-	22.09	11.5	11.5	18.51
eFDD 5 16QAM	high	6	1.4	-	-	20.68	11.5	11.5	19.92
eFDD 5 QPSK	low	1	3	-	-	23.34	11.5	11.5	17.26
eFDD 5 QPSK	low	15	3	-	-	21.99	11.5	11.5	18.61
eFDD 5 QPSK	mid	1	3	-	-	23.6	11.5	11.5	17
eFDD 5 QPSK	mid	15	3	-	-	22.2	11.5	11.5	18.4
eFDD 5 QPSK	high	1	3	-	-	23.4	11.5	11.5	17.2
eFDD 5 QPSK	high	15	3	-	-	22.07	11.5	11.5	18.53
eFDD 5 16QAM	low	1	3	-	-	22.55	11.5	11.5	18.05
eFDD 5 16QAM	low	15	3	-	-	21.04	11.5	11.5	19.56
eFDD 5 16QAM	mid	1	3	-	-	22.62	11.5	11.5	17.98
eFDD 5 16QAM	mid	15	3	-	-	21.17	11.5	11.5	19.43
eFDD 5 16QAM	high	1	3	-	-	22.29	11.5	11.5	18.31
eFDD 5 16QAM	high	15	3	-	-	21.06	11.5	11.5	19.54
eFDD 5 QPSK	low	1	5	-	-	23.54	11.5	11.5	17.06
eFDD 5 QPSK	low	12	5	-	-	21.98	11.5	11.5	18.62
eFDD 5 QPSK	low	25	5	-	-	21.98	11.5	11.5	18.62
eFDD 5 QPSK	mid	1	5	-	-	23.7	11.5	11.5	16.9
eFDD 5 QPSK	mid	12	5	-	-	22.23	11.5	11.5	18.37
eFDD 5 QPSK	mid	25	5	-	-	22.13	11.5	11.5	18.47
eFDD 5 QPSK	high	1	5	-	-	23.66	11.5	11.5	16.94
eFDD 5 QPSK	high	12	5	-	-	22.02	11.5	11.5	18.58
eFDD 5 QPSK	high	25	5	-	-	22	11.5	11.5	18.6
eFDD 5 16QAM	low	1	5	-	-	22.68	11.5	11.5	17.92
eFDD 5 16QAM	low	25	5	-	-	21	11.5	11.5	19.6
eFDD 5 16QAM	mid	1	5	-	-	22.83	11.5	11.5	17.77
eFDD 5 16QAM	mid	25	5	-	-	21.18	11.5	11.5	19.42
eFDD 5 16QAM	high	1	5	-	-	22.74	11.5	11.5	17.86
eFDD 5 16QAM	high	25	5	-	-	21.03	11.5	11.5	19.57
eFDD 5 QPSK	low	1	10	-	-	23.53	11.5	11.5	17.07
eFDD 5 QPSK	low	50	10	-	-	22.32	11.5	11.5	18.28
eFDD 5 QPSK	mid	1	10	-	-	23.62	11.5	11.5	16.98
eFDD 5 QPSK	mid	50	10	-	-	22.39	11.5	11.5	18.21
eFDD 5 QPSK	high	1	10	-	-	23.6	11.5	11.5	17
eFDD 5 QPSK	high	50	10	-	-	22.43	11.5	11.5	18.17
eFDD 5 16QAM	low	1	10	-	-	22.62	11.5	11.5	17.98
eFDD 5 16QAM	low	50	10	-	-	21.31	11.5	11.5	19.29
eFDD 5 16QAM	mid	1	10	-	-	22.64	11.5	11.5	17.96
eFDD 5 16QAM	mid	50	10	-	-	21.42	11.5	11.5	19.18
eFDD 5 16QAM	high	1	10	-	-	22.68	11.5	11.5	17.92
eFDD 5 16QAM	high	50	10	-	-	21.41	11.5	11.5	19.19

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 11:32:43

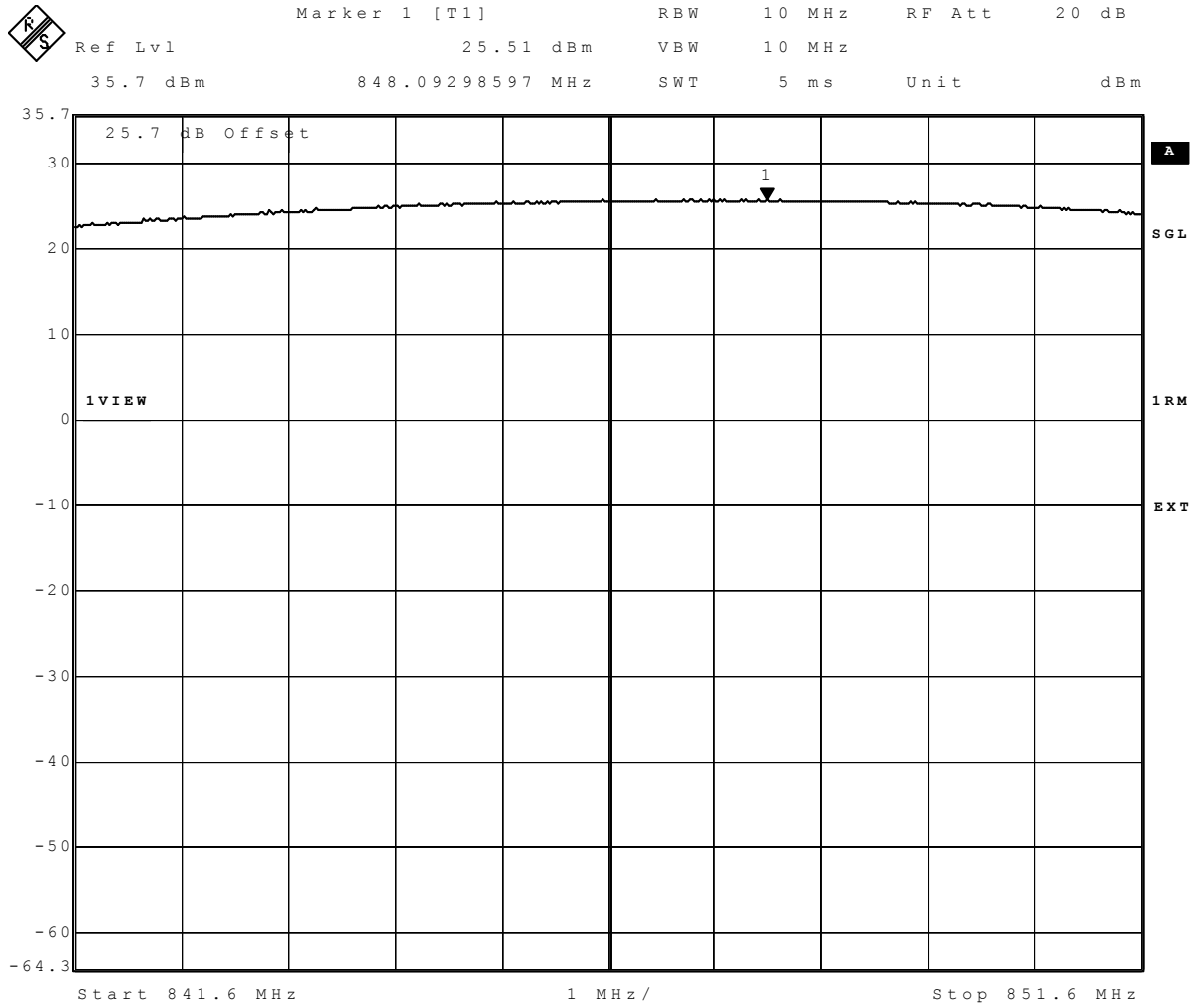
GSM 850 Channel = low



Date: 2.OCT.2018 12:24:06

EDGE 850 Channel = low

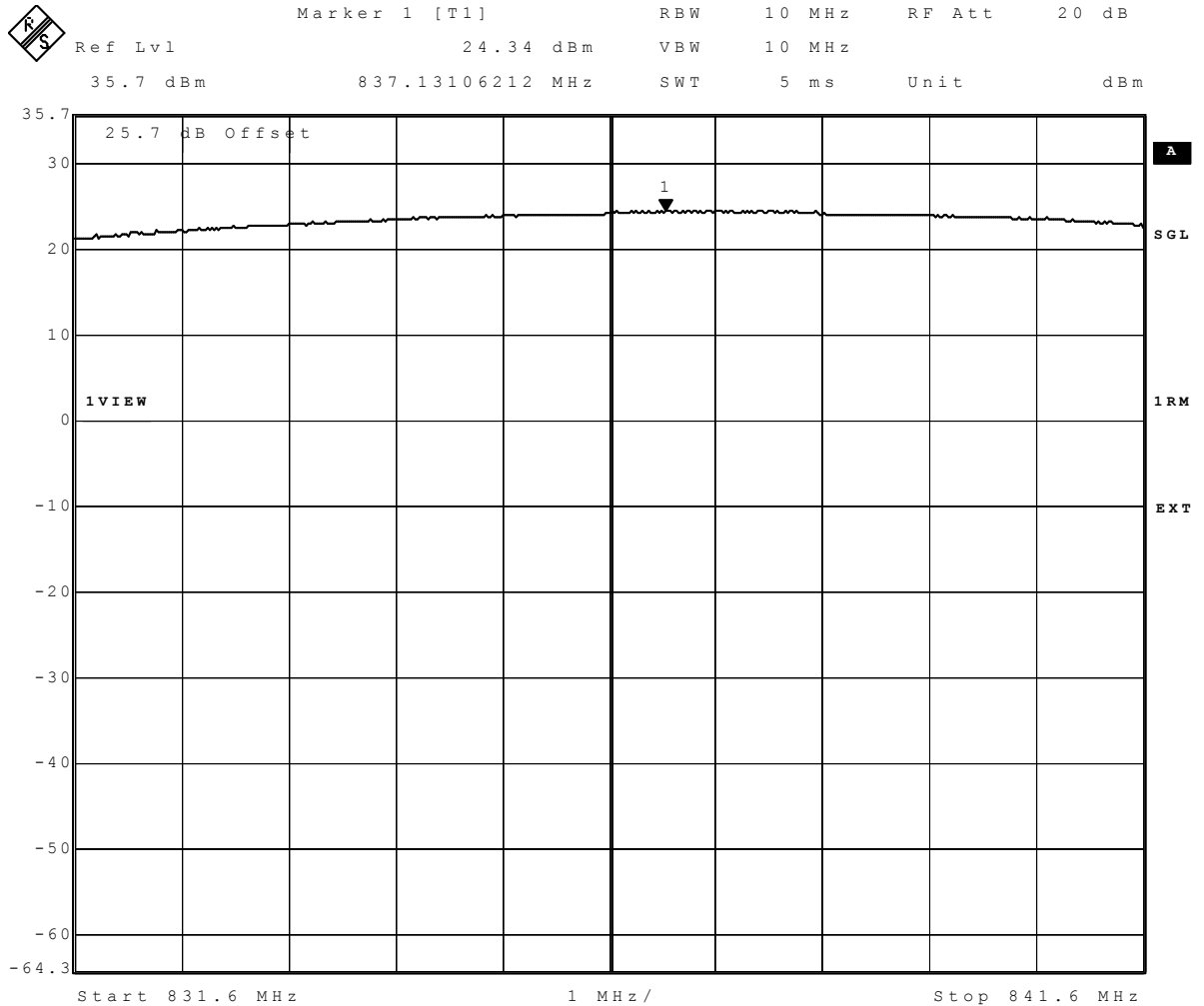
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 16:01:57

WCDMA FDD V Channel = high

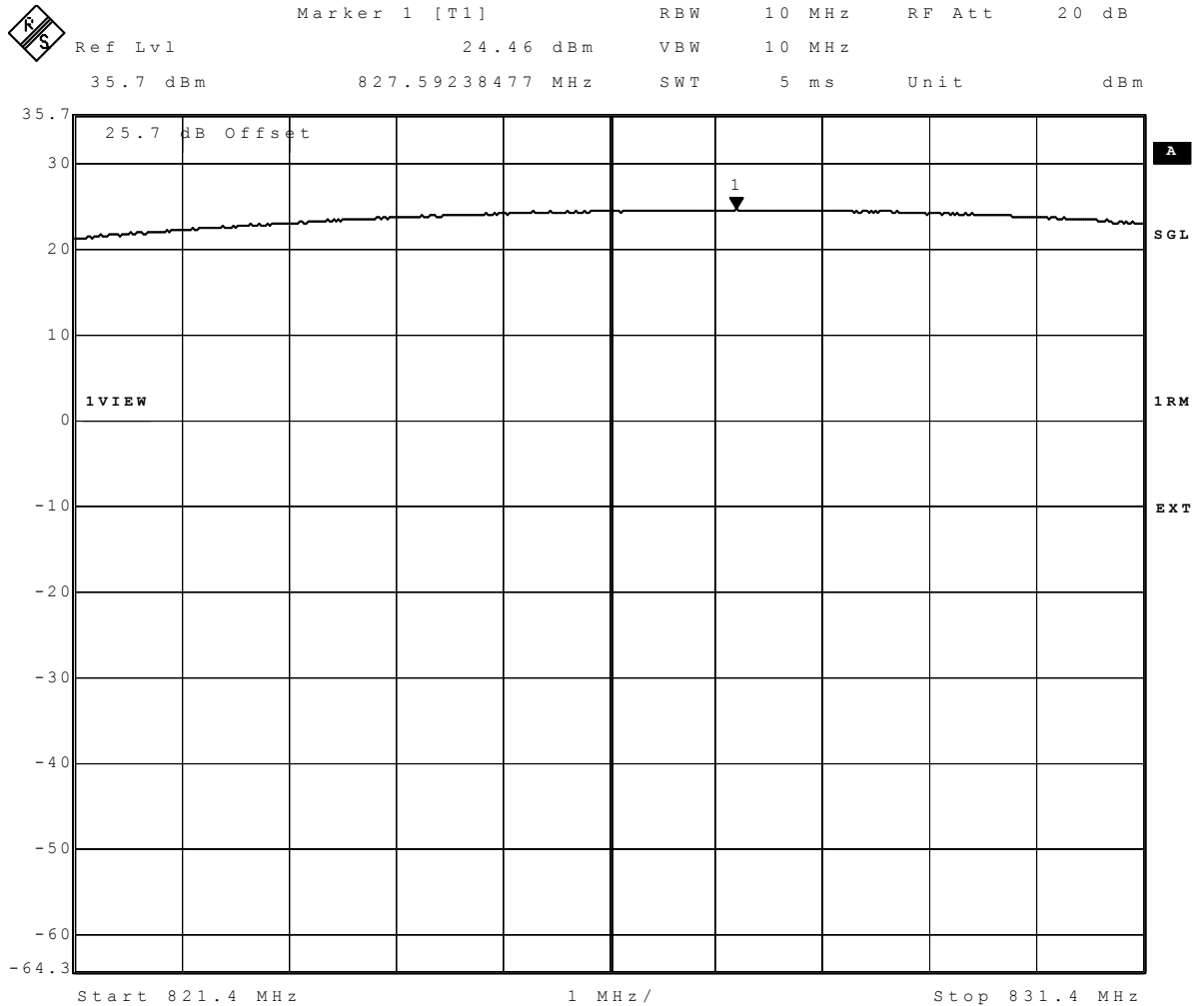
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 12.OCT.2018 15:48:27

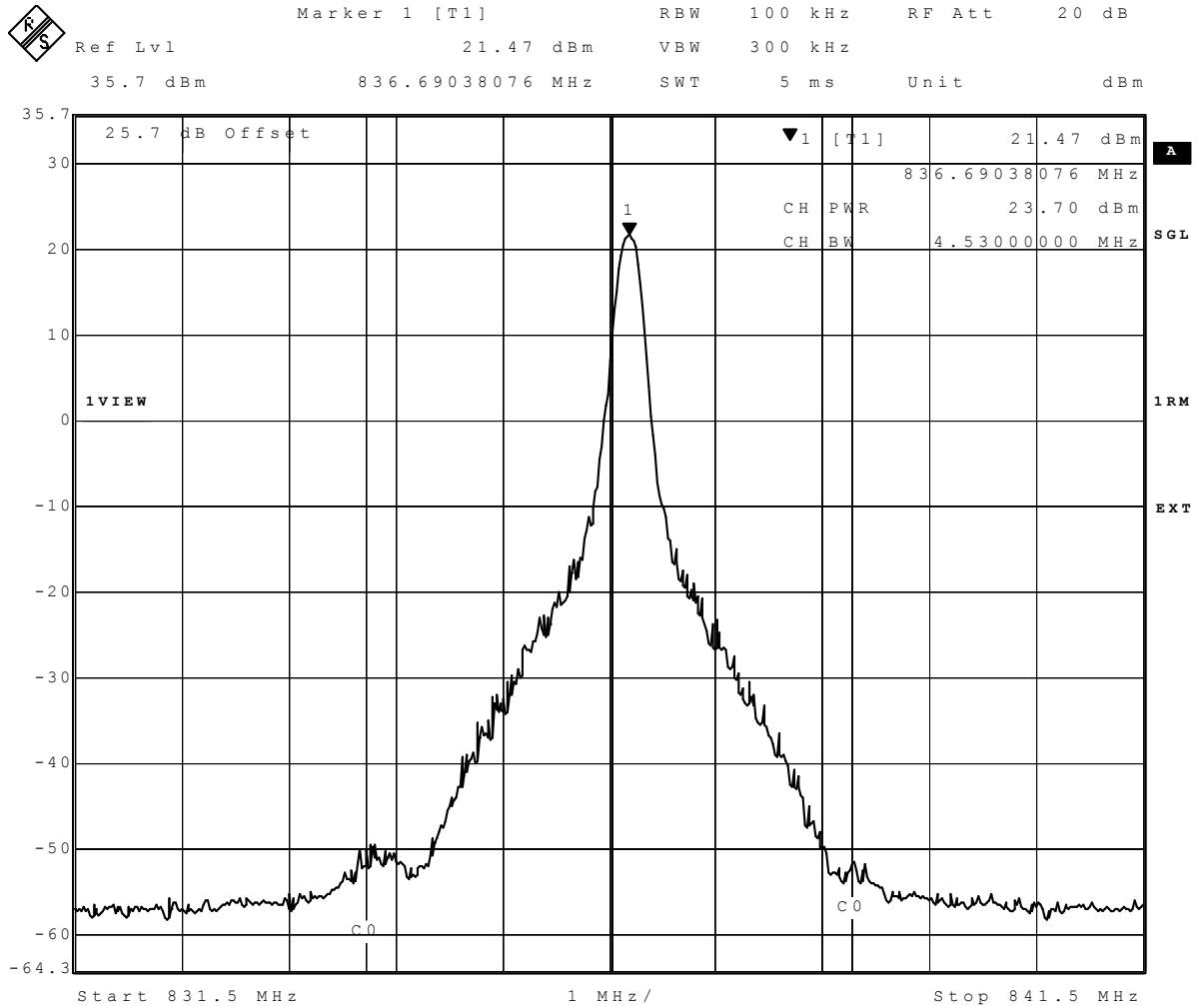
HSDPA FDD V Subtest 1 Channel = mid

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 12.OCT.2018 12:03:23

HSUPA FDD V Subtest 1 Channel = low



Date: 9.OCT.2018 20:43:29

LTE eFDD 5 QPSK 5 MHz Channel = mid

3.5.2 22.2 Frequency stability §2.1055

Test: 22.2; _Frequency stability Summary §2.1055

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/07 11:56
<i>Body:</i>	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
<i>Test Specification:</i>	FCC part 2 and 22

Detailed Results:

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2095.5	2	9	passed
-30	5			5	10	passed
-30	10			6	12	passed
-20	0	normal	2095.5	3	19	passed
-20	5			4	14	passed
-20	10			6	16	passed
-10	0	normal	2095.5	6	8	passed
-10	5			5	11	passed
-10	10			3	16	passed
0	0	normal	2095.5	4	14	passed
0	5			5	18	passed
0	10			9	13	passed
10	0	normal	2095.5	1	13	passed
10	5			2	8	passed
10	10			7	22	passed
20	0	low	2095.5	3	19	passed
20	5			6	11	passed
20	10			4	10	passed
20	0	normal	2095.5	5	16	passed
20	5			1	21	passed
20	10			2	10	passed
20	0	high	2095.5	2	20	passed
20	5			8	16	passed
20	10			4	17	passed
30	0	normal	2095.5	9	12	passed
30	5			2	14	passed
30	10			5	9	passed
40	0	normal	2095.5	3	17	passed
40	5			7	16	passed
40	10			1	14	passed
50	0	normal	2095.5	6	18	passed
50	5			10	20	passed
50	10			5	13	passed

GSM 850

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2095.5	12	26	passed
-30	5			16	27	passed
-30	10			18	21	passed
-20	0	normal	2095.5	20	29	passed
-20	5			19	33	passed
-20	10			17	37	passed
-10	0	normal	2095.5	16	21	passed
-10	5			18	26	passed
-10	10			13	29	passed
0	0	normal	2095.5	14	25	passed
0	5			10	26	passed
0	10			19	21	passed
10	0	normal	2095.5	14	20	passed
10	5			16	19	passed
10	10			18	34	passed
20	0	low	2095.5	19	26	passed
20	5			17	29	passed
20	10			16	34	passed
20	0	normal	2095.5	13	18	passed
20	5			10	19	passed
20	10			21	36	passed
20	0	high	2095.5	23	34	passed
20	5			16	19	passed
20	10			17	17	passed
30	0	normal	2095.5	19	24	passed
30	5			14	31	passed
30	10			14	30	passed
40	0	normal	2095.5	16	29	passed
40	5			13	27	passed
40	10			19	23	passed
50	0	normal	2095.5	22	34	passed
50	5			27	38	passed
50	10			26	26	passed

EDGE 850

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2095.5	-1	-4	passed
-30	5			-1	4	passed
-30	10			-1	-3	passed
-20	0	normal	2095.5	-1	-5	passed
-20	5			-1	-6	passed
-20	10			-1	-6	passed
-10	0	normal	2095.5	-1	-4	passed
-10	5			0	-4	passed
-10	10			-2	-5	passed
0	0	normal	2095.5	0	-3	passed
0	5			0	4	passed
0	10			-1	-4	passed
10	0	normal	2095.5	-1	-6	passed
10	5			-1	-5	passed
10	10			-1	-5	passed
20	0	low	2095.5	0	-3	passed
20	5			0	-4	passed
20	10			-1	-4	passed
20	0	normal	2095.5	-1	4	passed
20	5			-1	4	passed
20	10			-1	-5	passed
20	0	high	2095.5	0	-3	passed
20	5			-1	-3	passed
20	10			-1	-4	passed
30	0	normal	2095.5	-1	-5	passed
30	5			-1	-5	passed
30	10			-1	-4	passed
40	0	normal	2095.5	-1	-5	passed
40	5			-1	-4	passed
40	10			0	4	passed
50	0	normal	2095.5	-1	-5	passed
50	5			-1	-6	passed
50	10			-2	-4	passed

WCDMa FDD V

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2095.5	0	-4	passed
-30	5			1	-6	passed
-30	10			-1	-3	passed
-20	0	normal	2095.5	-1	-7	passed
-20	5			1	-4	passed
-20	10			0	-4	passed
-10	0	normal	2095.5	-2	-6	passed
-10	5			1	-7	passed
-10	10			-1	-3	passed
0	0	normal	2095.5	-1	-3	passed
0	5			0	-4	passed
0	10			-1	-8	passed
10	0	normal	2095.5	2	-6	passed
10	5			-1	-7	passed
10	10			-2	-4	passed
20	0	low	2095.5	1	-5	passed
20	5			0	-3	passed
20	10			0	-3	passed
20	0	normal	2095.5	-2	-4	passed
20	5			-1	-4	passed
20	10			-2	-6	passed
20	0	high	2095.5	2	-4	passed
20	5			1	-3	passed
20	10			0	-7	passed
30	0	normal	2095.5	3	-6	passed
30	5			-1	-4	passed
30	10			-1	-5	passed
40	0	normal	2095.5	0	-4	passed
40	5			-1	-4	passed
40	10			-1	-4	passed
50	0	normal	2095.5	-1	-3	passed
50	5			-1	-4	passed
50	10			-2	-6	passed

HSDPA FDD V

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2095.5	1	3	passed
-30	5			1	4	passed
-30	10			0	-4	passed
-20	0	normal	2095.5	0	3	passed
-20	5			0	4	passed
-20	10			0	4	passed
-10	0	normal	2095.5	0	4	passed
-10	5			0	2	passed
-10	10			1	3	passed
0	0	normal	2095.5	0	2	passed
0	5			0	-3	passed
0	10			1	4	passed
10	0	normal	2095.5	0	2	passed
10	5			0	-3	passed
10	10			0	2	passed
20	0	low	2095.5	0	-4	passed
20	5			0	2	passed
20	10			0	3	passed
20	0	normal	2095.5	0	-2	passed
20	5			-1	-2	passed
20	10			0	-3	passed
20	0	high	2095.5	1	2	passed
20	5			0	-4	passed
20	10			0	3	passed
30	0	normal	2095.5	1	2	passed
30	5			1	4	passed
30	10			0	-2	passed
40	0	normal	2095.5	0	-4	passed
40	5			-1	-4	passed
40	10			-2	-3	passed
50	0	normal	2095.5	0	1	passed
50	5			0	-2	passed
50	10			0	3	passed

HSUPA FDD V

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	2091.25	3	14	passed
-30	5			8	13	passed
-30	10			7	19	passed
-20	0	normal	2091.25	6	18	passed
-20	5			5	17	passed
-20	10			9	12	passed
-10	0	normal	2091.25	1	15	passed
-10	5			8	18	passed
-10	10			9	20	passed
0	0	normal	2091.25	4	21	passed
0	5			2	17	passed
0	10			10	22	passed
10	0	normal	2091.25	3	14	passed
10	5			5	13	passed
10	10			7	16	passed
20	0	low	2091.25	8	11	passed
20	5			4	18	passed
20	10			9	19	passed
20	0	normal	2091.25	2	15	passed
20	5			6	12	passed
20	10			5	19	passed
20	0	high	2091.25	8	21	passed
20	5			4	23	passed
20	10			9	20	passed
30	0	normal	2091.25	4	15	passed
30	5			7	18	passed
30	10			3	10	passed
40	0	normal	2091.25	8	17	passed
40	5			4	17	passed
40	10			5	16	passed
50	0	normal	2091.25	9	13	passed
50	5			7	12	passed
50	10			3	18	passed

LTE eFDD5

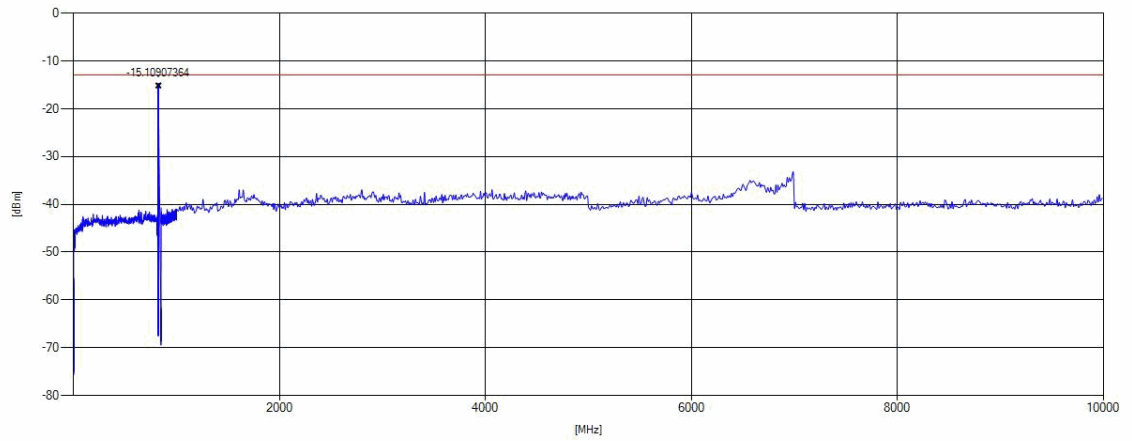
3.5.3 22.3 Spurious emissions at antenna terminals §2.1051, §22.917

Test: 22.3; Spurious emissions at antenna terminals summary §2.1051, §22.917

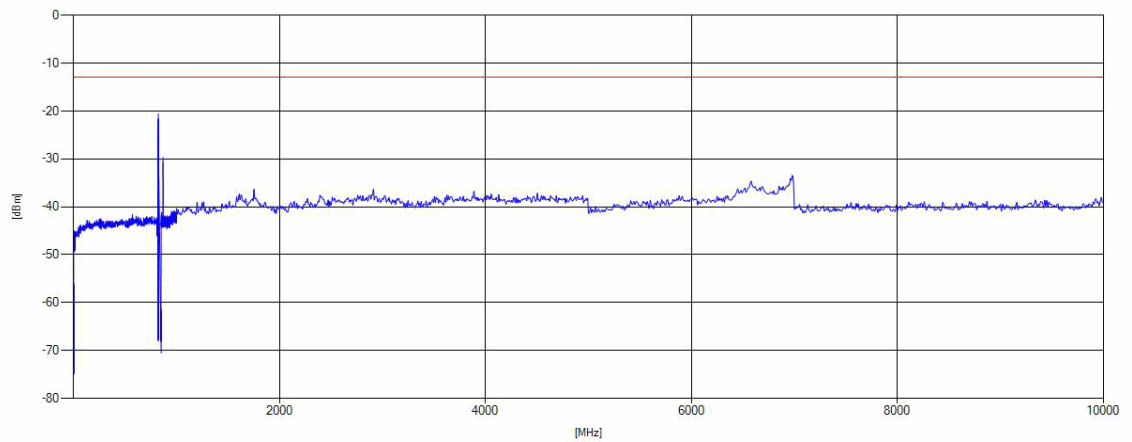
<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 12:01
<i>Body:</i>	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
<i>Test Specification:</i>	FCC part 2 and 22

Detailed Results:

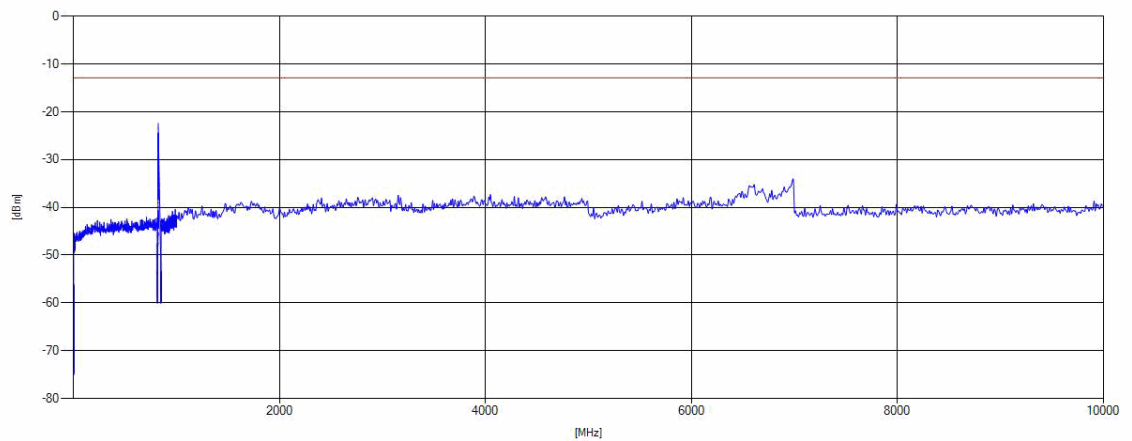
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
GSM850	low	rms	maxhold	3	823.98	-15.11	-13	2.11
GSM850	mid	rms	maxhold	-	-	-	-13	>20
GSM850	high	rms	maxhold	-	-	-	-13	>20
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
EDGE850	low	rms	maxhold	3	823.97	-21.71	-13	8.71
EDGE850	mid	rms	maxhold	-	-	-	-13	>20
EDGE850	high	rms	maxhold	3	849.04	-22.19	-13	9.19
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
WCDMA FDD5	low	rms	maxhold	50	823.84	-24.45	-13	11.45
WCDMA FDD5	mid	rms	maxhold	-	-	-	-13	>20
WCDMA FDD5	high	rms	maxhold	50	849	-25.65	-13	12.65
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD5	low	rms	maxhold	50	823.85	-26.8	-13	13.8
HSDPA FDD5	mid	rms	maxhold	-	-	-	-13	>20
HSDPA FDD5	high	rms	maxhold	50	849	-26.9	-13	13.9
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD5	low	rms	maxhold	50	824	-24.75	-13	11.75
HSUPA FDD5	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD5	high	rms	maxhold	50	849	-27.5	-13	14.5
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD5	low	rms	maxhold	-	-	-	-23	>20
eFDD5	mid	rms	maxhold	-	-	-	-13	>20
eFDD5	high	rms	maxhold	-	-	-	-13	>20



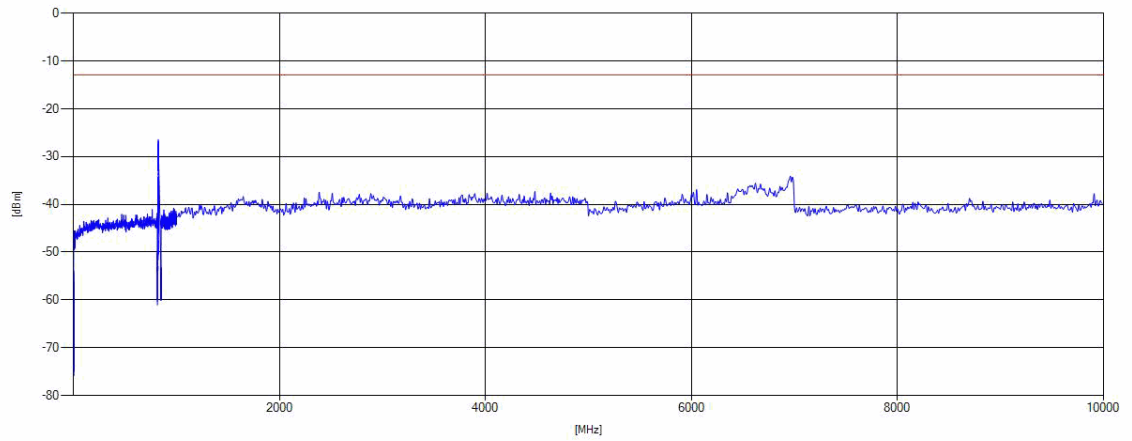
GSM 850 Channel = low



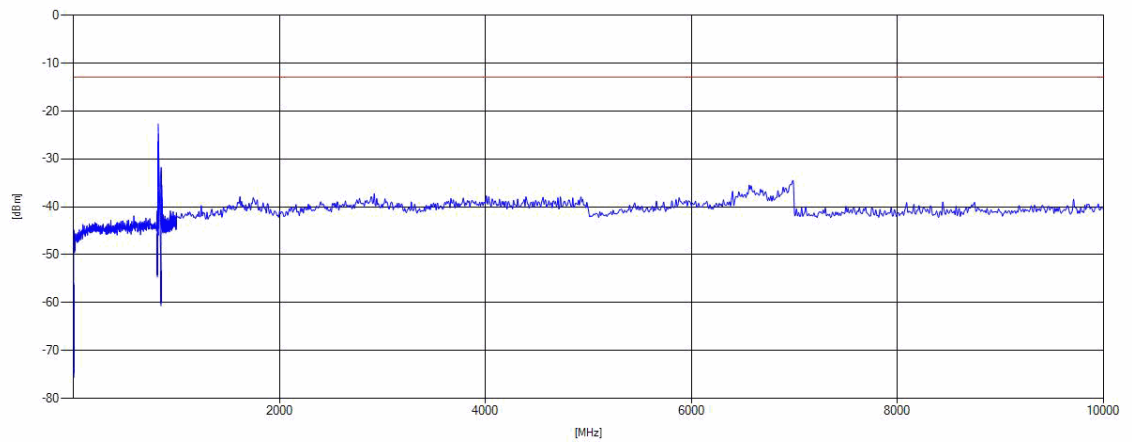
EDGE 850 Channel = low



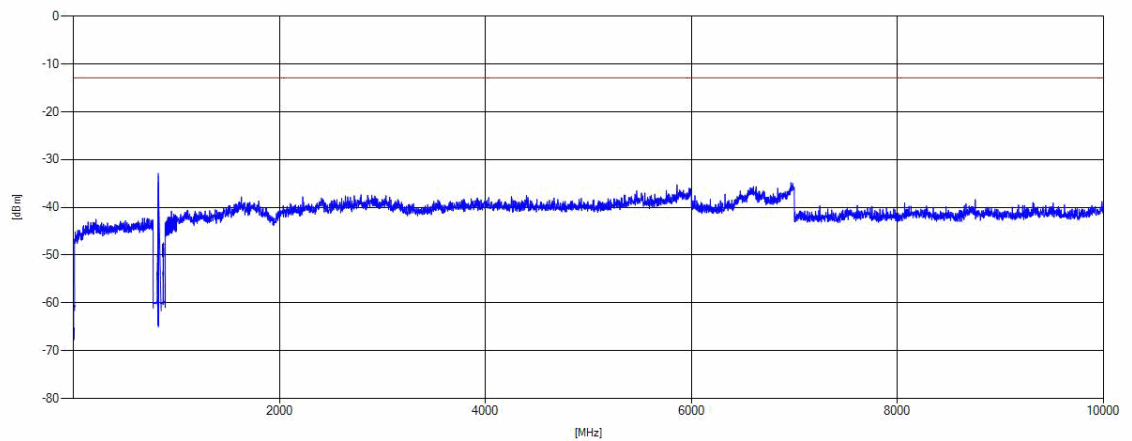
WCDMA FDD V Channel = low



HSDPA FDD V Channel = low



HSUPA FDD V Channel = low



LTE eFDD5 QPSK Channel = low

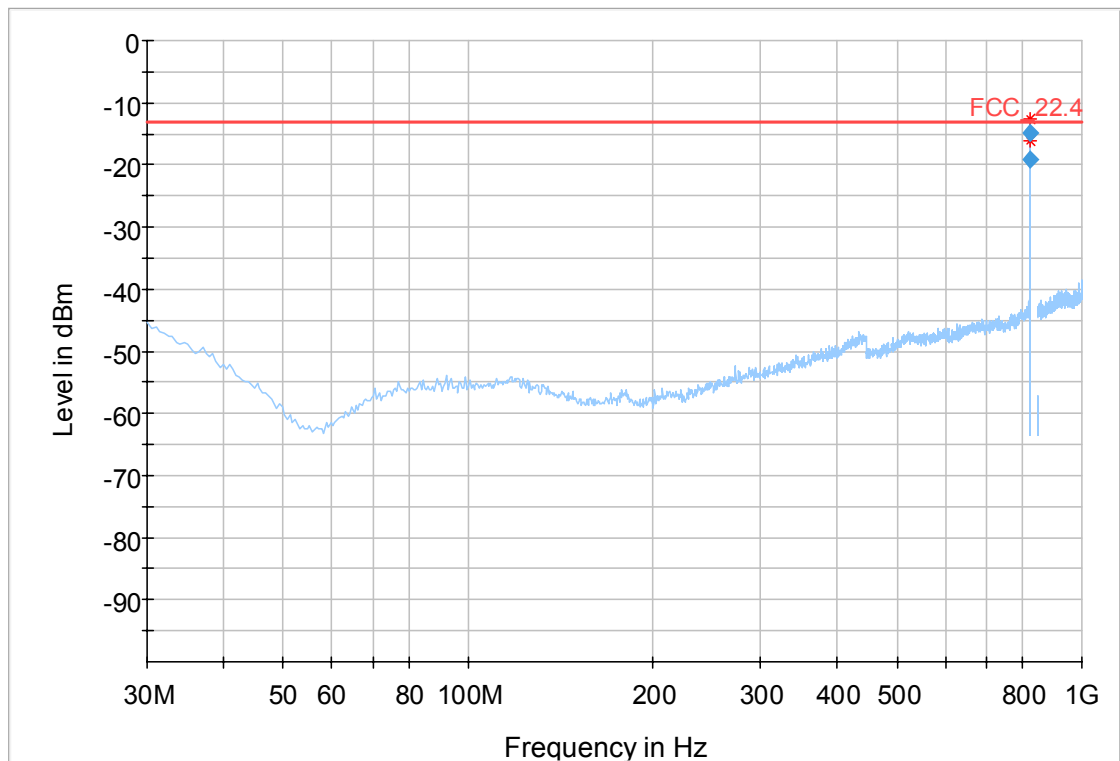
3.5.4 22.4 Field strength of spurious radiation §2.1053, §22.917

Test: 22.4; Field strength of spurious radiation Summary §2.1053, §22.917

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/08 14:13
<i>Body:</i>	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
<i>Test Specification:</i>	FCC part 2 and 22

Detailed Results:

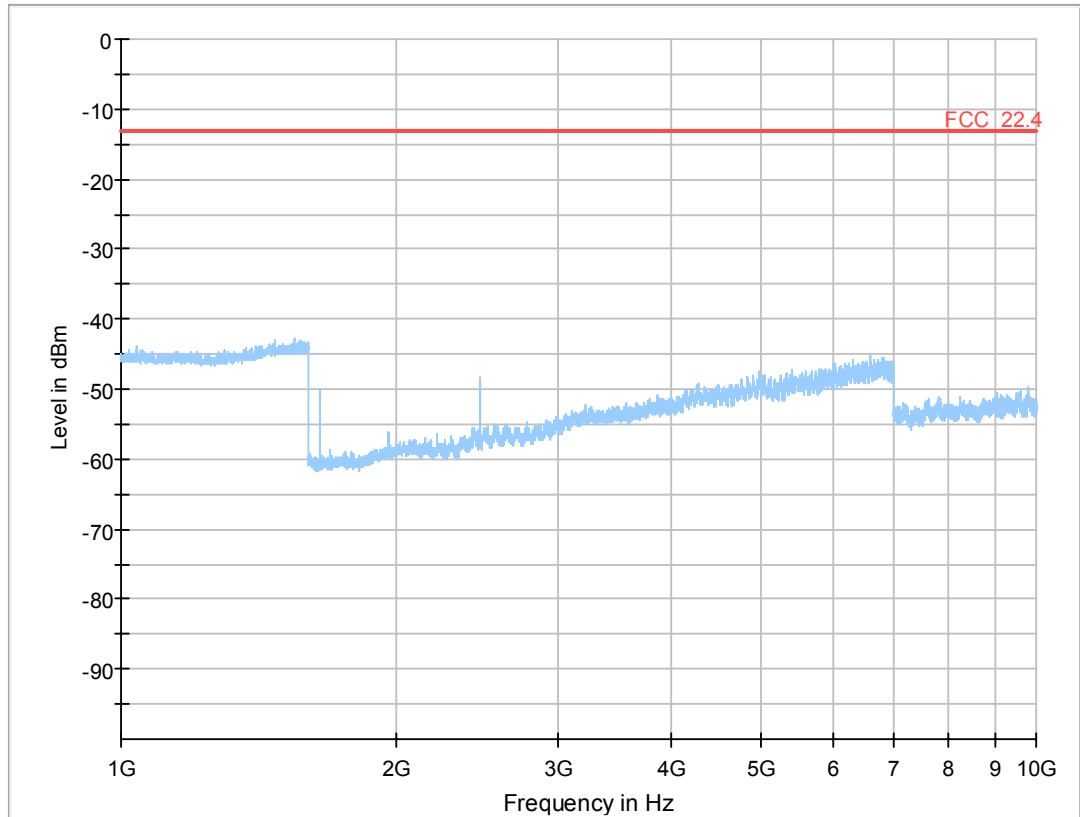
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
GSM850	low	rms	maxhold	50	823.94	-19.26	-13	6.26
GSM850	low	rms	maxhold	50	823.98	-14.75	-13	1.75
GSM850	mid	peak	maxhold	-	-	-	-13	>20
GSM850	high	peak	maxhold	50	849	-16.18	-13	3.18
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
EDGE850	low	rms	maxhold	50	823.96	-23.89	-13	10.89
EDGE850	low	rms	maxhold	50	823.97	-23.05	-12	11.05
EDGE850	mid	peak	maxhold	-	-	-	-13	>20
EDGE850	high	peak	maxhold	50	849.01	-24.1	-13	11.1
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
WCDMA FDD5	low	rms	maxhold	100	823	-30.69	-13	17.69
WCDMA FDD5	low	rms	maxhold	50	823.85	-23.51	-13	10.51
WCDMA FDD5	mid	rms	maxhold	-	-	-	-13	>20
WCDMA FDD5	high	rms	maxhold	50	849.17	-29.96	-13	16.96
WCDMA FDD5	high	rms	maxhold	50	849.79	-43.82	-13	30.82
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD5	low	rms	maxhold	50	823.8	-25.86	-13	12.86
HSDPA FDD5	mid	rms	maxhold	-	-	-	-13	>20
HSDPA FDD5	high	rms	maxhold	50	849	-24.55	-13	11.55
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD5	low	rms	maxhold	50	823	-27.1	-13	14.1
HSUPA FDD5	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD5	high	rms	maxhold	50	849.15	-26.44	-13	13.44
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD5	low	rms	maxhold	50	823.99	-24.09	-13	11.09
eFDD5	mid	rms	maxhold	-	-	-	-13	>20
eFDD5	high	rms	maxhold	50	849	-26.14	-13	13.14



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
823.944000	-19.26	-13.00	6.26	1000.0	50.000	112.0	V	-183.0	-73.4	12:31:52 - 2018-10-08
823.981000	-14.75	-13.00	1.75	1000.0	50.000	115.0	V	-182.0	-73.4	12:34:41 - 2018-10-08

30MHz - 1GHz: GSM 850 Channel = low



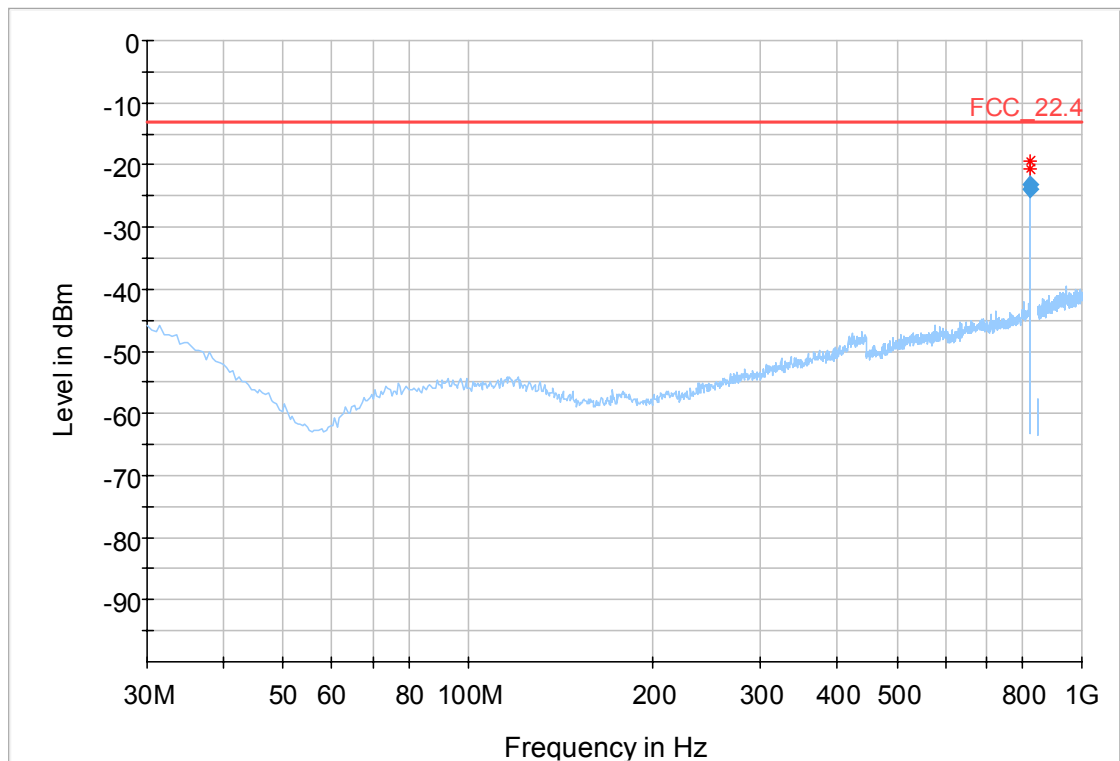
Critical_Freqs

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)
---	---	---	---	---	---	---		---	---	---

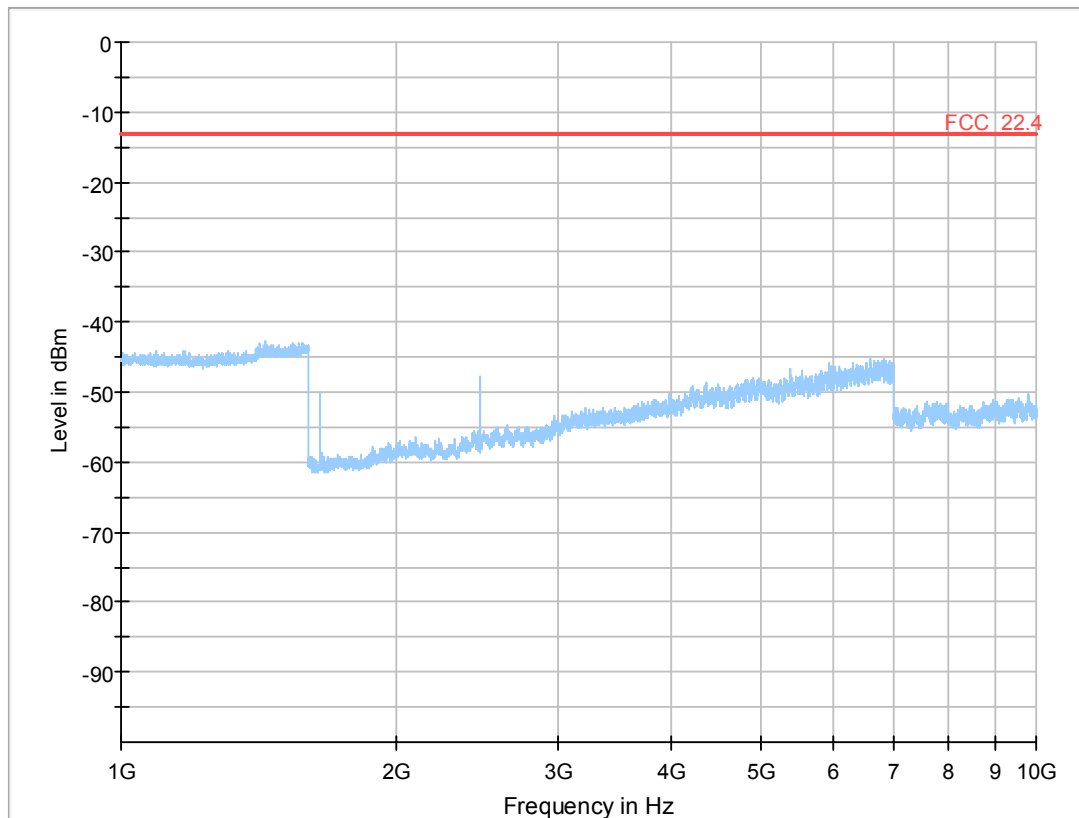
1GHz - 10GHz: GSM 850 Channel = low



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
823.964000	-23.89	-13.00	10.89	1000.0	50.000	111.0	V	-182.0	-73.4	10:48:18 - 2018-10-08
823.978000	-23.05	-13.00	10.05	1000.0	50.000	111.0	V	-185.0	-73.4	10:51:06 - 2018-10-08

30MHz - 1GHz: EDGE 850 Channel = low



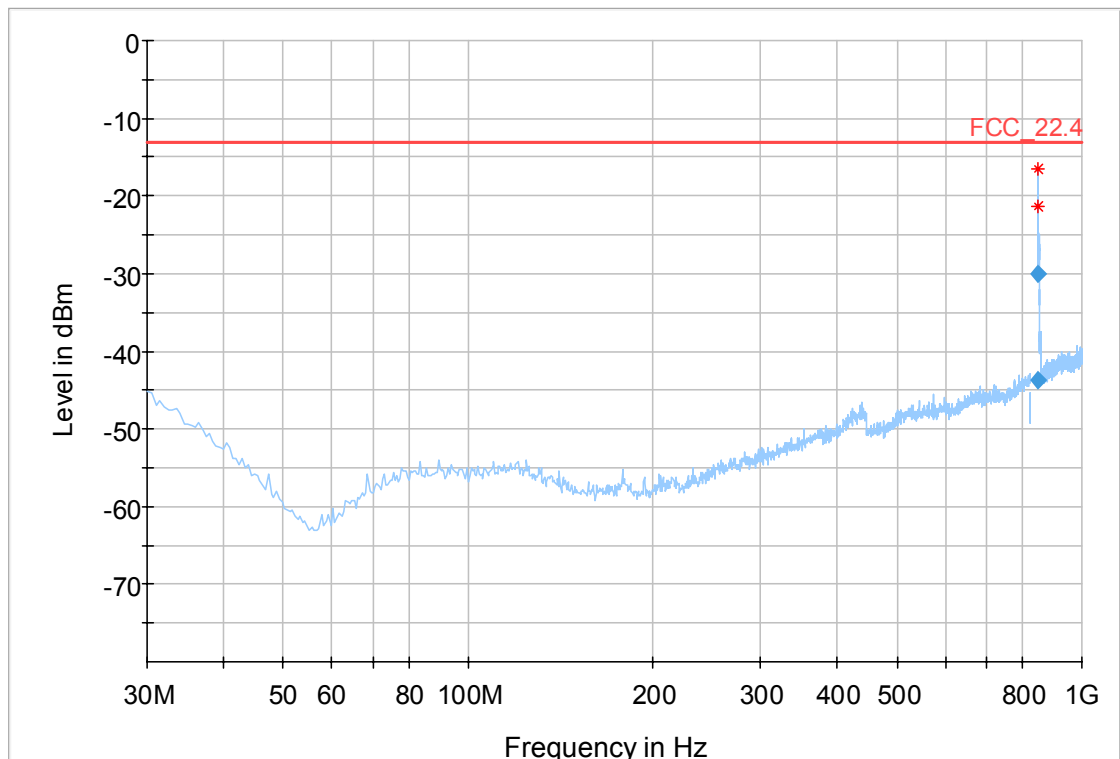
Critical_Freqs

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)
---	---	---	---	---	---	---		---	---	---

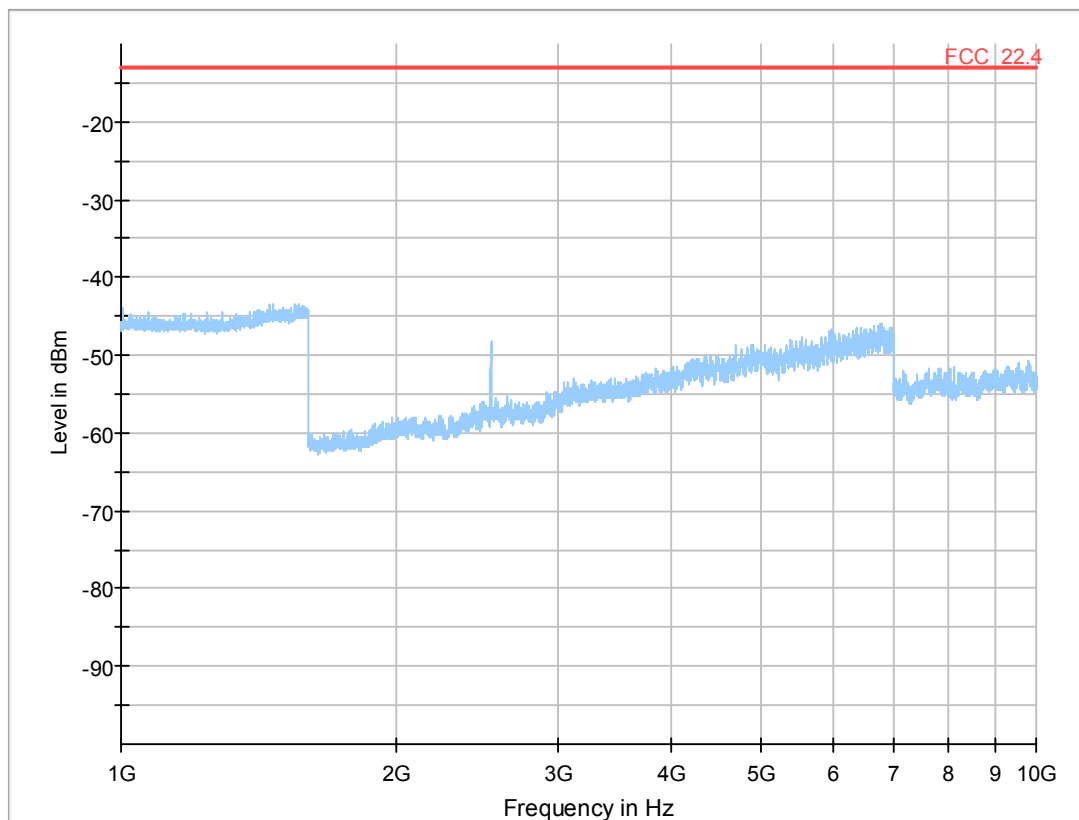
1GHz - 10GHz: EDGE 850 Channel = low



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
849.179000	-29.96	-13.00	16.96	1000.0	50.000	200.0	V	-169.0	-73.5	16:17:53 - 2018-10-08
849.792000	-43.82	-13.00	30.82	1000.0	50.000	200.0	V	99.0	-73.5	16:21:24 - 2018-10-08

30MHz - 1GHz: WCDMA FDD5 Channel = low



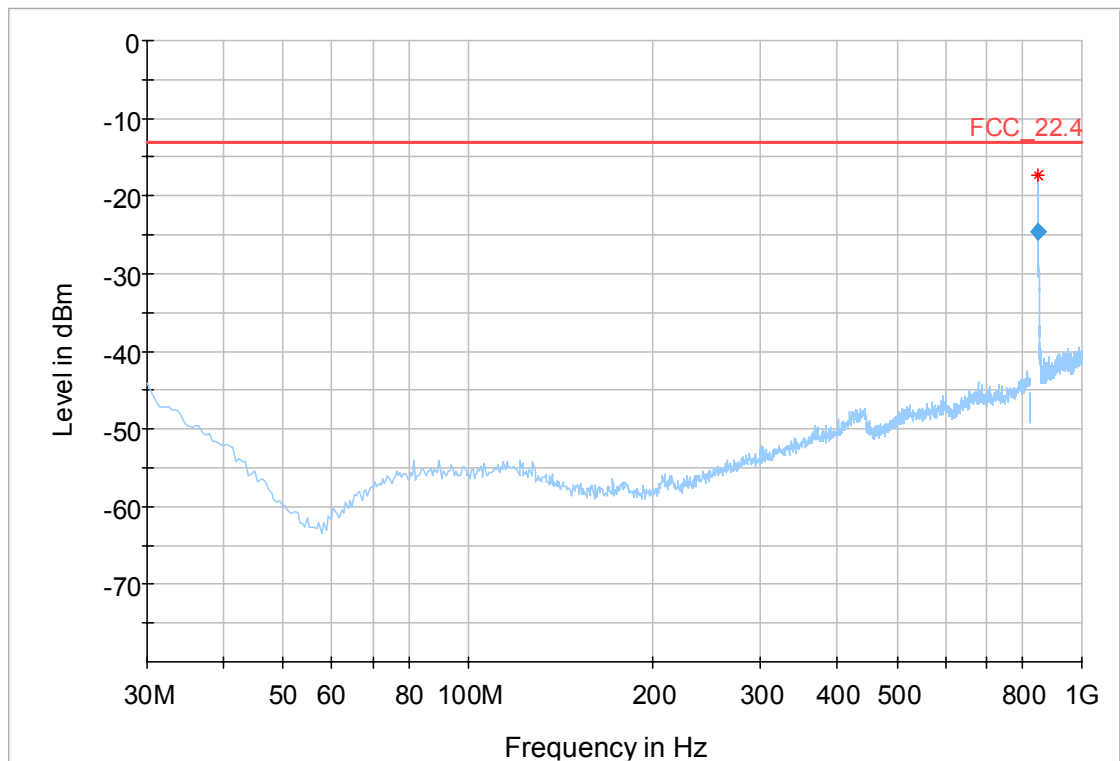
Critical_Freqs

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)
---	---	---	---	---	---	---		---	---	---

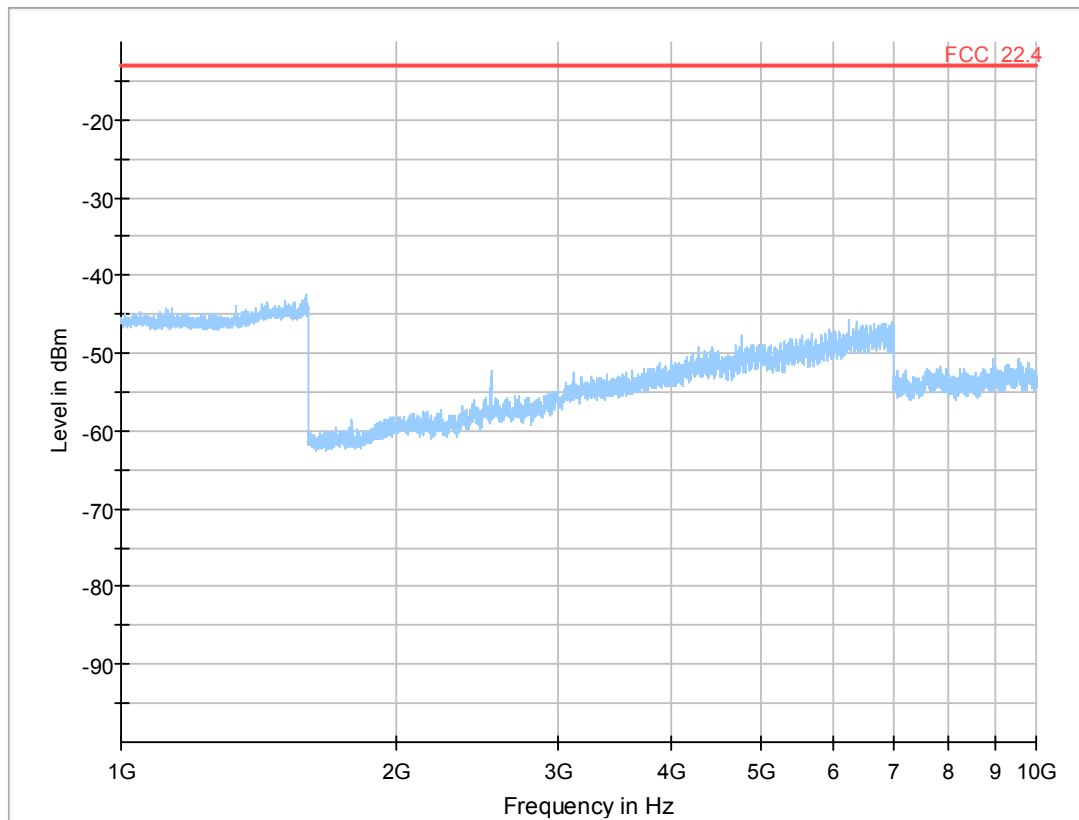
1GHz - 10GHz: WCDMA FDD5 Channel = high



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
849.000000	-24.55	-13.00	11.55	1000.0	50.000	104.0	V	-200.0	-73.5	17:16:38 - 2018-10-08

30MHz - 1GHz: HSDPA FDD5 Channel = high



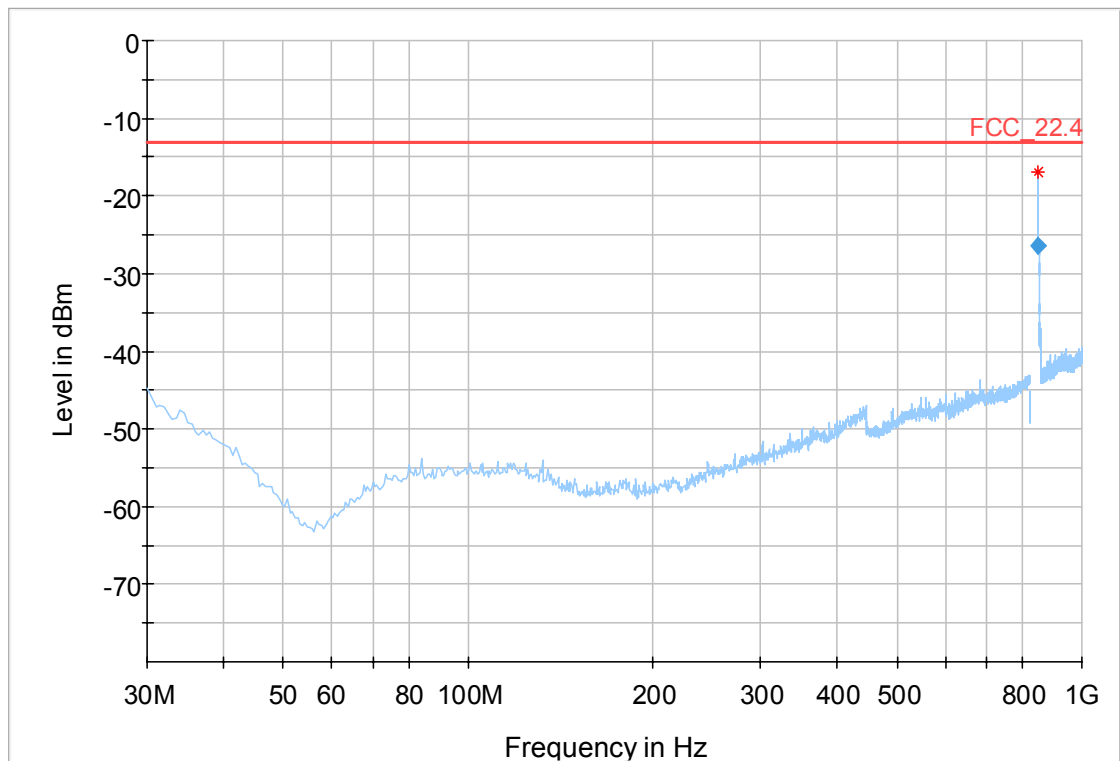
Critical_Freqs

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)
---	---	---	---	---	---	---		---	---	---

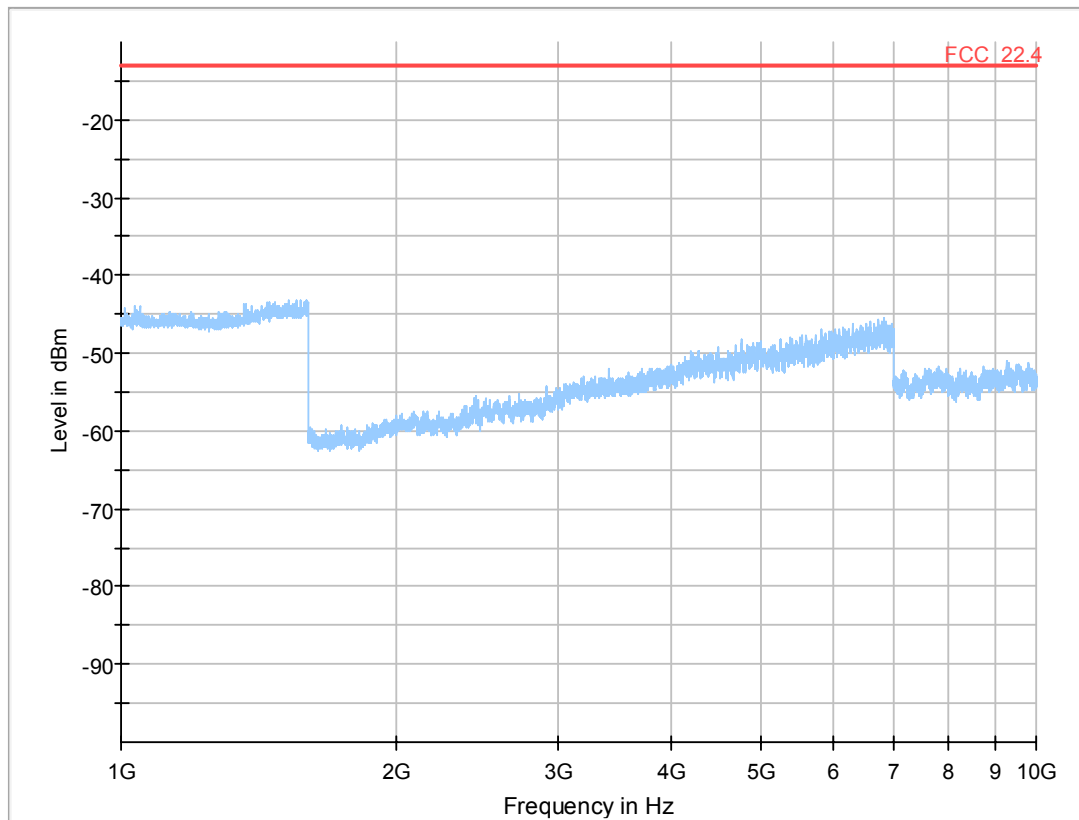
1GHz - 10GHz: HSDPA FDD5 Channel = high



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
849.145000	-26.44	-13.00	13.44	1000.0	50.000	110.0	V	-195.0	-73.5	20:31:49 - 2018-10-05

30MHz - 1GHz: HSUPA FDD5 Channel = high



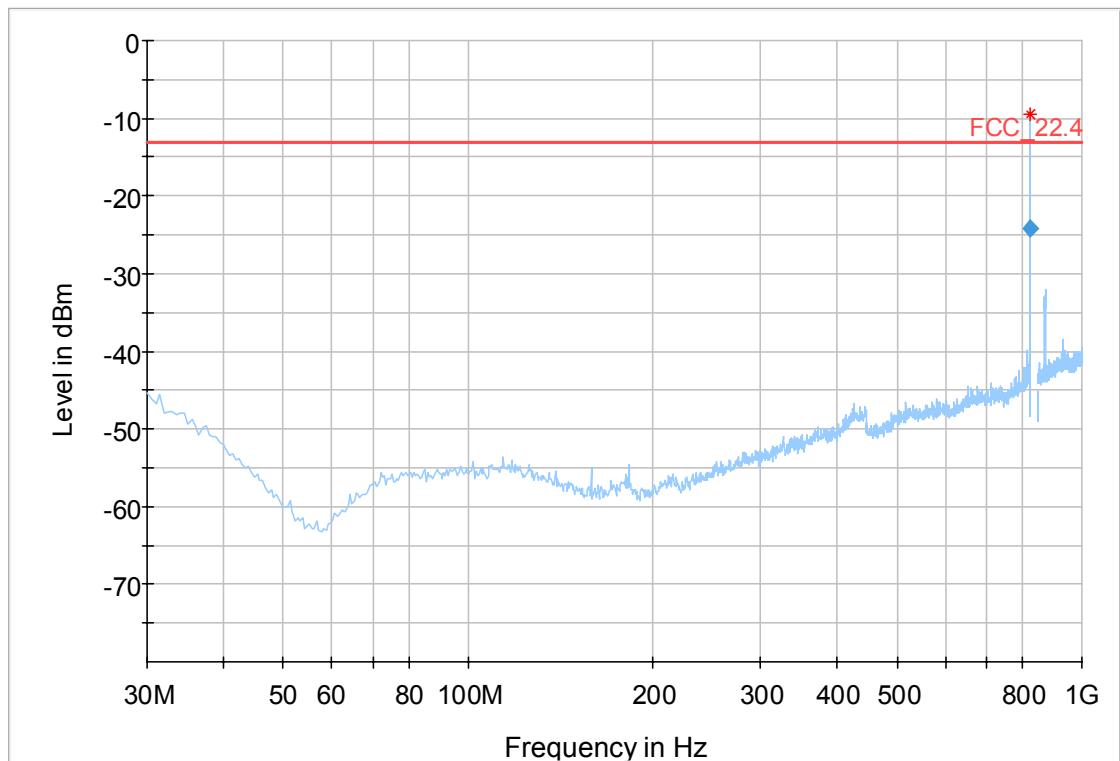
Critical_Freqs

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)
---	---	---	---	---	---	---		---	---	---

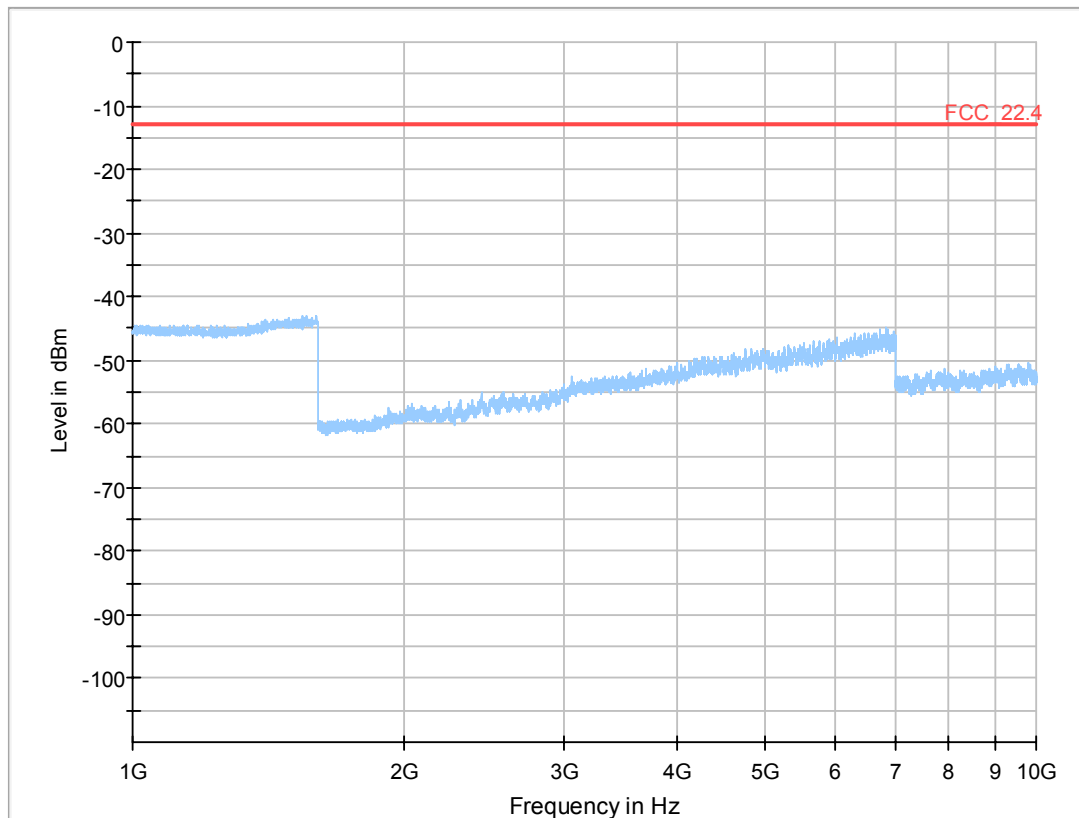
1GHz - 10GHz: HSUPA FDD5 Channel = high



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
823.996000	-24.09	-13.00	11.09	1000.0	50.000	110.0	V	-189.0	-73.4	12:27:13 - 2018-09-27

30MHz - 1GHz: LTE eFDD5 QPSK Channel = low



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)
---	---	---	---	---	---	---		---	---	---

1GHz - 10GHz: LTE eFDD5 QPSK Channel = low

3.5.5 22.5 Emission and Occupied Bandwidth §2.1049, §22.917

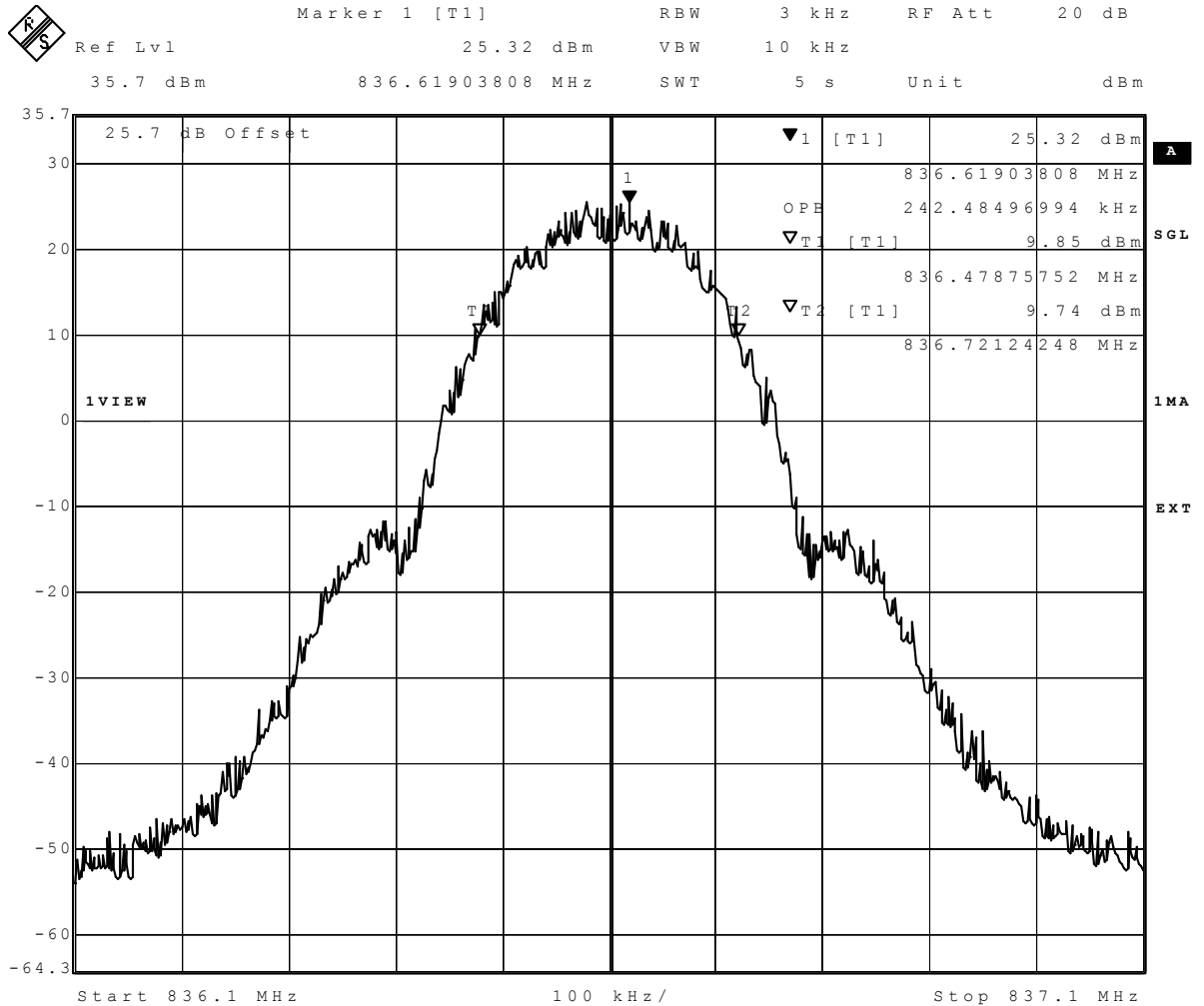
Test: 22.5; _Emission and Occupied Bandwidth Summary §2.1049, §22.917

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 12:08
<i>Body:</i>	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
<i>Test Specification:</i>	FCC part 2 and 22

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
GSM 850	low	-	0.2	0.2	316.63	244.49
GSM 850	mid	-	0.2	0.2	326.65	242.48
GSM 850	high	-	0.2	0.2	316.63	246.49
GSM 850 EDGE	low	-	0.2	0.2	280.56	236.47
GSM 850 EDGE	mid	-	0.2	0.2	286.57	232.46
GSM 850 EDGE	high	-	0.2	0.2	298.6	236.47
FDD V	low	-	5	5	4769.54	4128.26
FDD V	mid	-	5	5	4769.54	4128.26
FDD V	high	-	5	5	4769.54	4128.26
FDD V HSDPA Subtest 1	low	-	5	5	4749.5	4128.3
FDD V HSDPA Subtest 1	mid	-	5	5	4749.5	4108.22
FDD V HSDPA Subtest 1	high	-	5	5	4749.5	4128.3
FDD V HSUPA Subtest 1	low	-	5	5	4769.54	4148.3
FDD V HSUPA Subtest 1	mid	-	5	5	4749.5	4148.3
FDD V HSUPA Subtest 1	high	-	5	5	4749.5	4148.3
FDD V HSUPA Subtest 5	low	-	5	5	4749.5	4148.3
FDD V HSUPA Subtest 5	mid	-	5	5	4749.5	4148.3
FDD V HSUPA Subtest 5	high	-	5	5	4749.5	4148.3
eFDD 5 QPSK	low	6	1.4	1.4	-	1106.21
eFDD 5 QPSK	mid	6	1.4	1.4	-	1106.21
eFDD 5 QPSK	high	6	1.4	1.4	-	1100.2
eFDD 5 16QAM	low	6	1.4	1.4	-	1094.18
eFDD 5 16QAM	mid	6	1.4	1.4	-	1100.2
eFDD 5 16QAM	high	6	1.4	1.4	-	1100.2
eFDD 5 QPSK	low	15	3	3	-	2753.51
eFDD 5 QPSK	mid	15	3	3	-	2765.53
eFDD 5 QPSK	high	15	3	3	-	2765.53
eFDD 5 16QAM	low	15	3	3	-	2765.53
eFDD 5 16QAM	mid	15	3	3	-	2741.48
eFDD 5 16QAM	high	15	3	3	-	2741.48
eFDD 5 QPSK	low	25	5	5	-	4549.09
eFDD 5 QPSK	mid	25	5	5	-	4529.05
eFDD 5 QPSK	high	25	5	5	-	4509.01
eFDD 5 16QAM	low	25	5	5	-	4509.01
eFDD 5 16QAM	mid	25	5	5	-	4549.09
eFDD 5 16QAM	high	25	5	5	-	4549.09
eFDD 5 QPSK	low	50	10	10	-	9018.03
eFDD 5 QPSK	mid	50	10	10	-	9018.03
eFDD 5 QPSK	high	50	10	10	-	9018.03
eFDD 5 16QAM	low	50	10	10	-	9018.03
eFDD 5 16QAM	mid	50	10	10	-	9018.03
eFDD 5 16QAM	high	50	10	10	-	9018.03

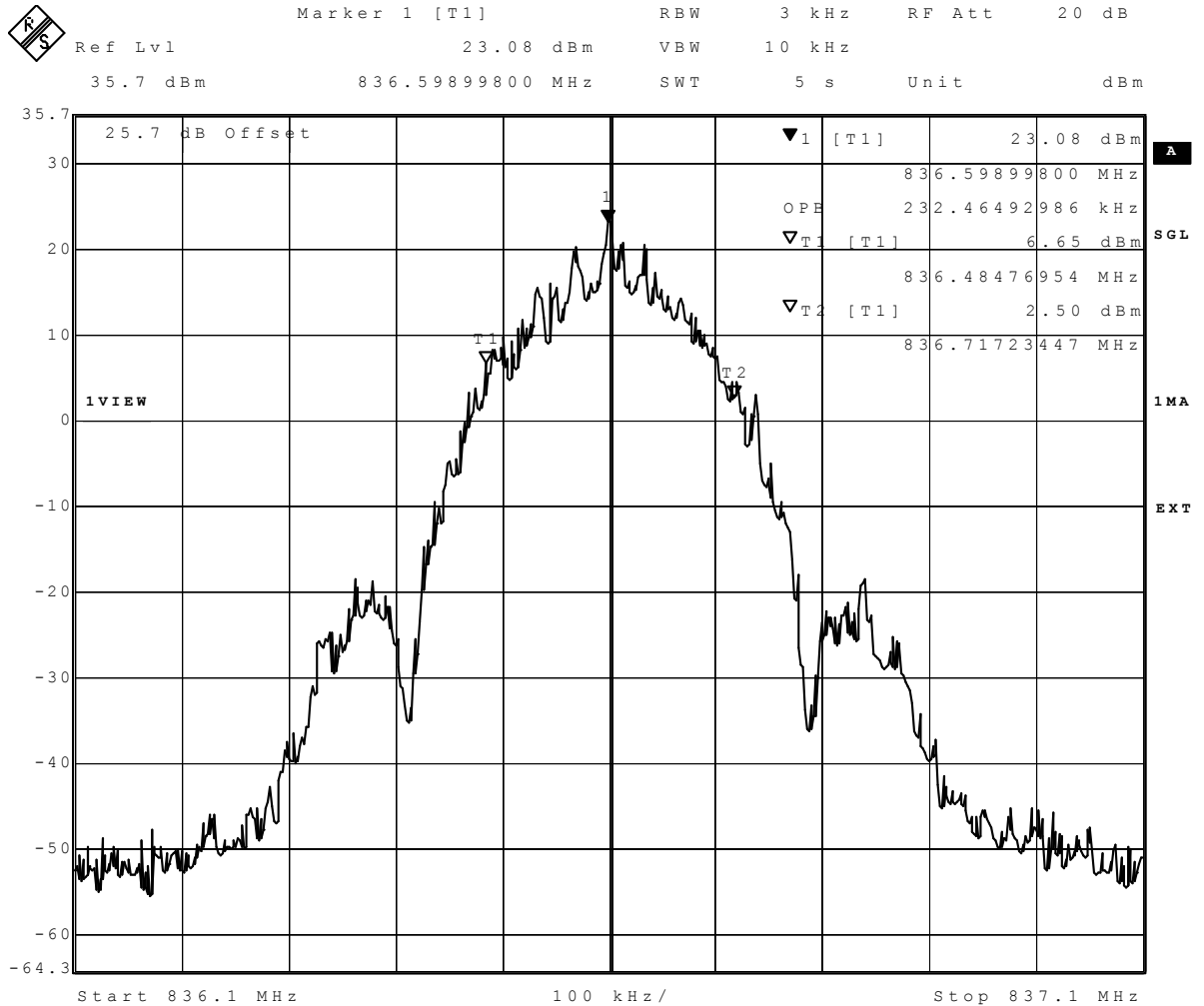
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 10:48:05

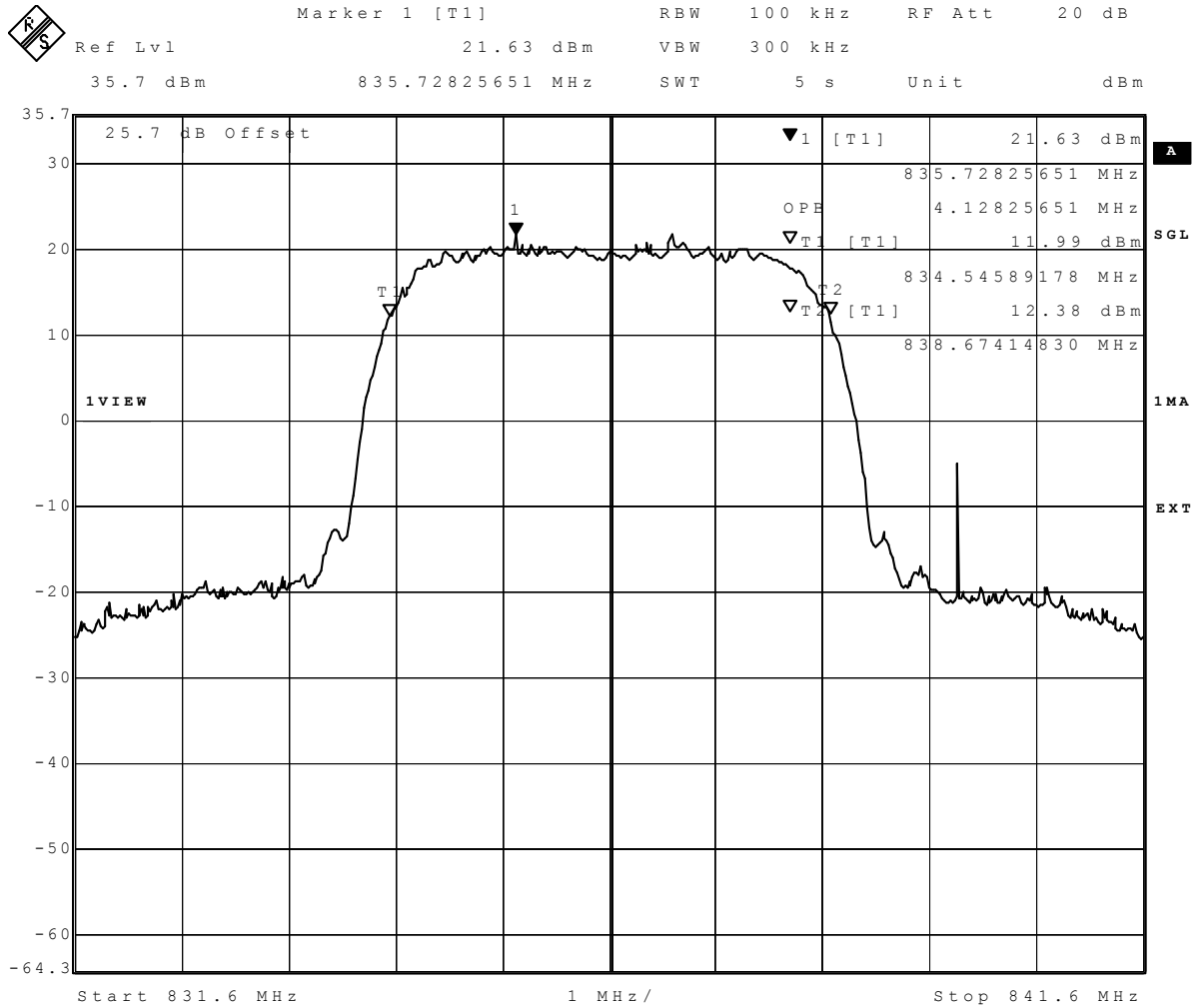
GSM 850 Channel = mid

Reference: MDE_GEMALTO_1802_FCCb_rev01



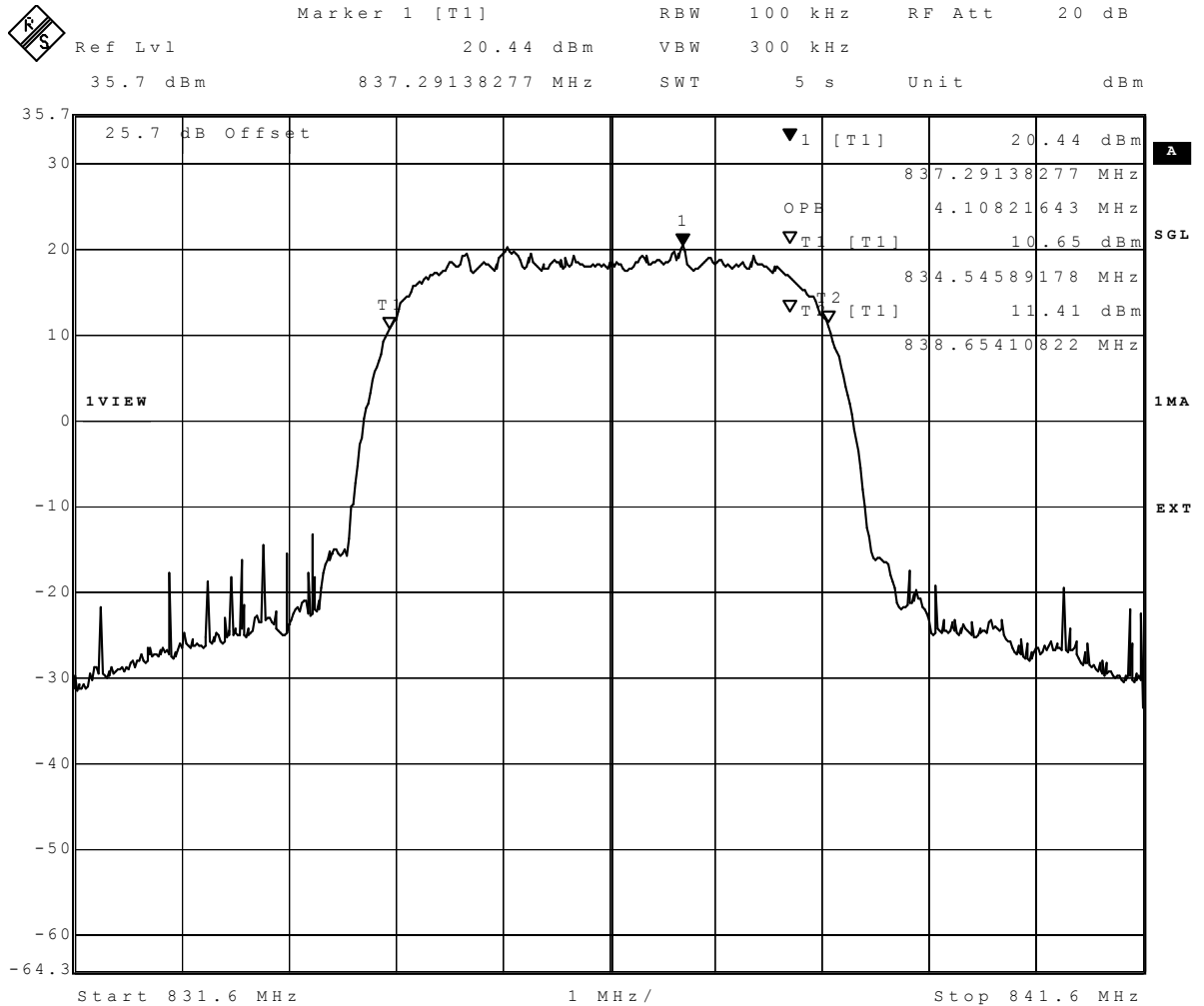
Date: 2.OCT.2018 12:15:56

EDGE 850 Channel = mid



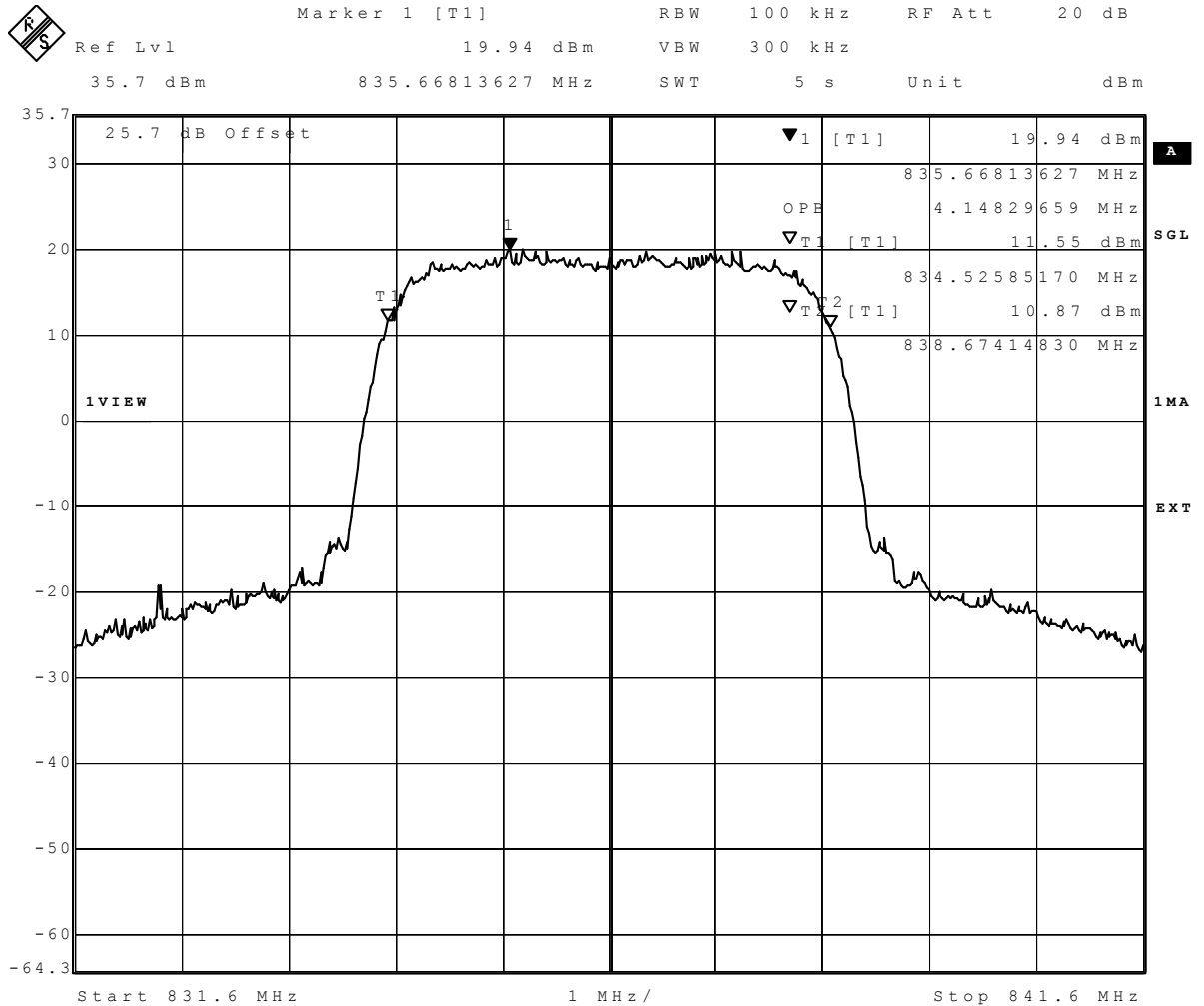
Date: 2.OCT.2018 15:23:40

WCDMa FDD V Channel = mid



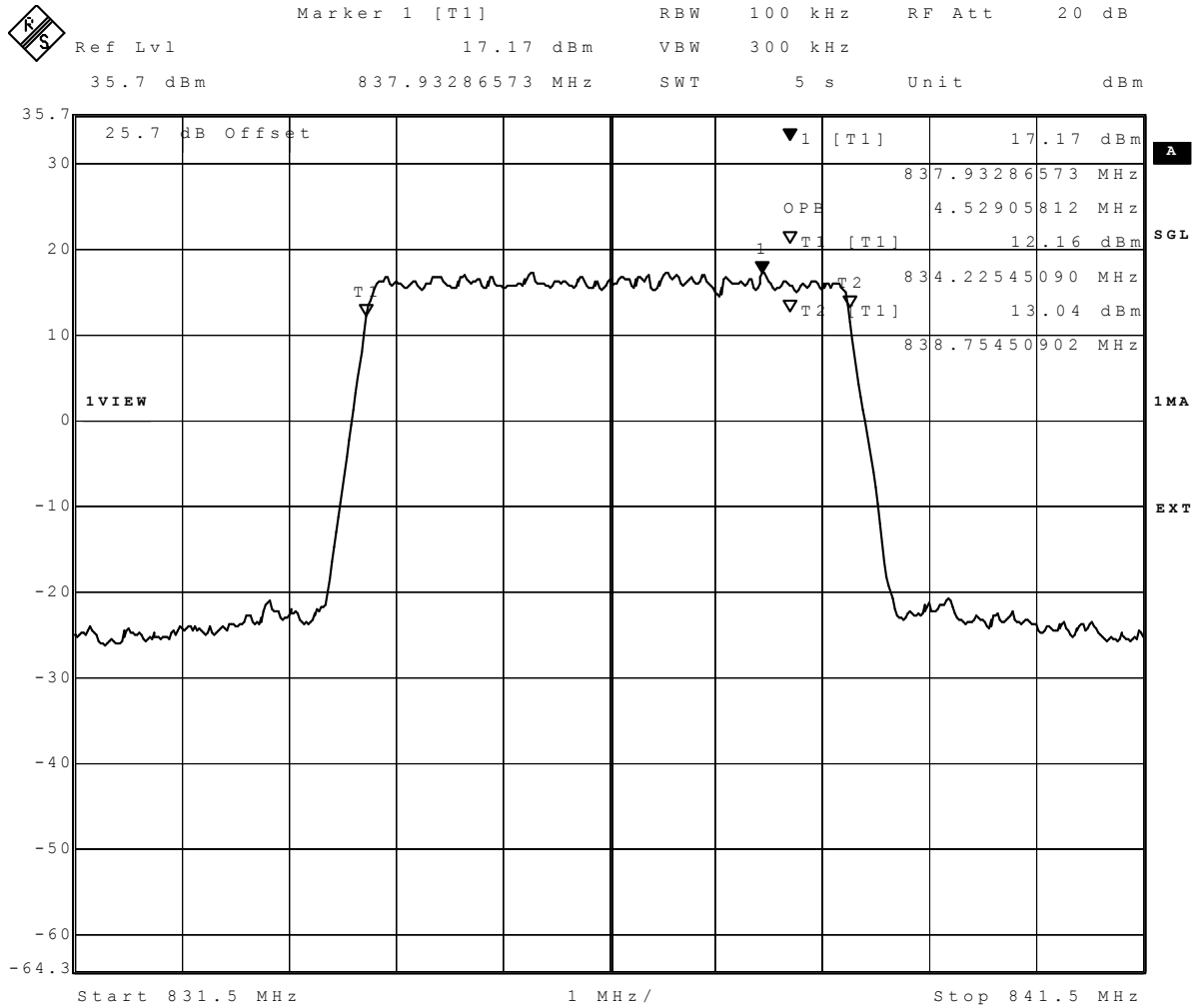
Date: 12.OCT.2018 15:33:53

HSDPA FDD V Channel = mid



Date: 12.OCT.2018 11:57:16

HSUPA FDD V Channel = mid



Date: 1.OCT.2018 12:28:22

LTE eFDD 5 QPSK Channel = mid

3.5.6 22.6 Band edge compliance §2.1053, §22.917

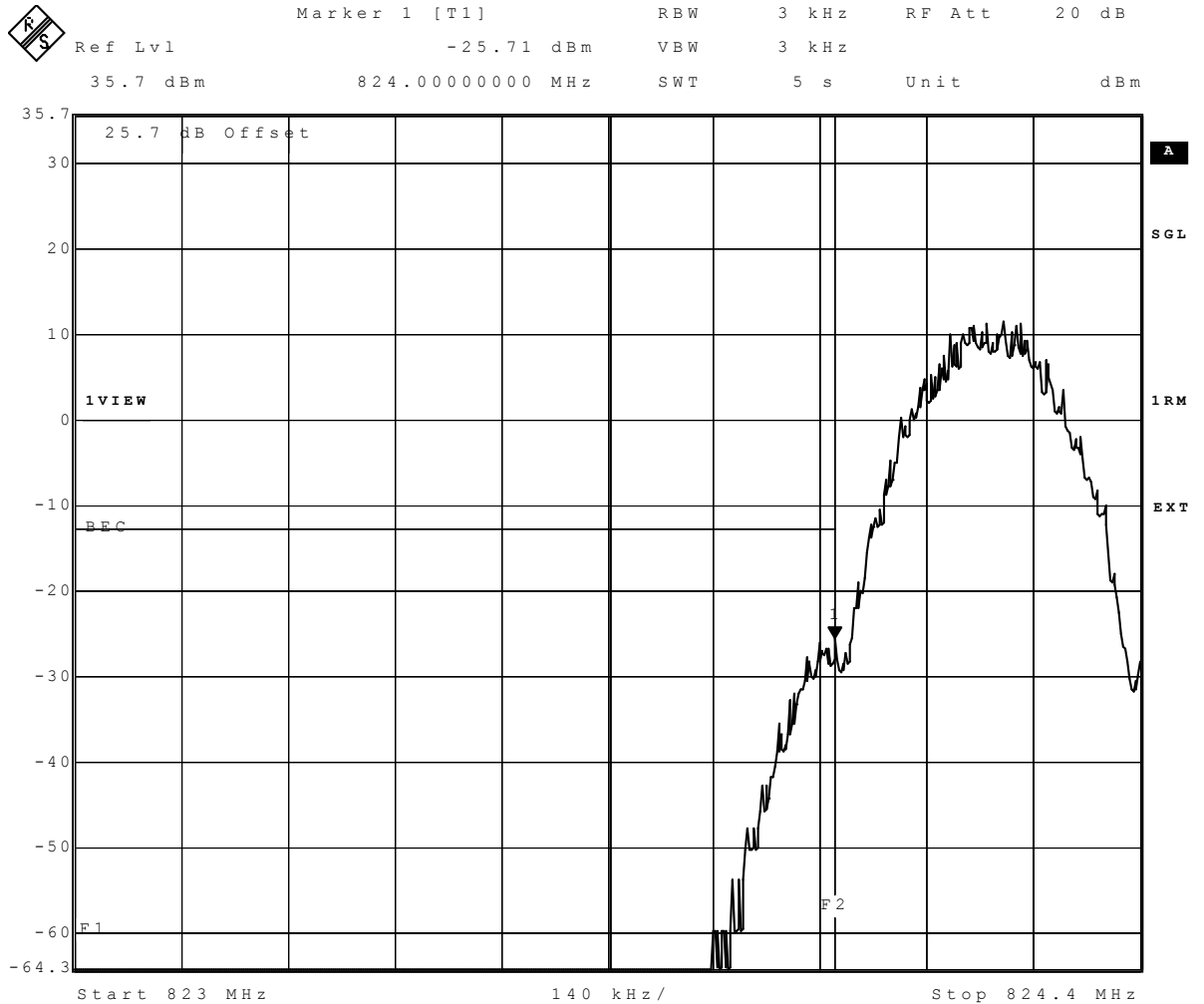
Test: 22.6; _Band edge compliance Summary §2.1053, §22.917

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 13:12
<i>Body:</i>	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
<i>Test Specification:</i>	FCC part 2 and 22

Detailed Results:

Radio Technology	Channel	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limit [dBm]	Margin to Limit [dB]
GSM 850	low	0.2	-	-20.98	-33.02	-25.71	-13	7.98
GSM 850	high	0.2	-	-23.93	-38.28	-30.32	-13	10.93
GSM 850 EDGE	low	0.2	-	-28.95	-44.3	-37.59	-13	15.95
GSM 850 EDGE	high	0.2	-	-28.71	-50.32	-38.28	-13	15.71
FDD V	low	5	-	-16.1	-24.6	-23.61	-13	10.61
FDD V	high	5	-	-15.84	-25.38	-24.3	-13	11.3
FDD V HSDPA Subtest 1	low	5	-	-19.63	-28.04	-27.2	-13	14.2
FDD V HSDPA Subtest 1	high	5	-	-16.63	-27.2	-26.24	-13	13.24
FDD V HSUPA Subtest 1	low	5	-	-17.4	-25.55	-24.75	-13	11.75
FDD V HSUPA Subtest 1	high	5	-	-17.75	-27	-26.42	-13	13.42
FDD V HSUPA Subtest 5	low	5	-	-16.4	-25.38	-24.6	-13	11.6
FDD V HSUPA Subtest 5	high	5	-	-18.36	-28.27	-27.4	-13	14.4
eFDD 5 QPSK	low	1.4	6	-28	-37.82	-37.2	-13	24.2
eFDD 5 QPSK	high	1.4	6	-26.5	-34.9	-34.3	-13	21.3
eFDD 5 16QAM	low	1.4	6	-29.67	-40.78	-39.87	-13	26.87
eFDD 5 16QAM	high	1.4	6	-27.2	-37.59	-36.34	-13	23.34
eFDD 5 QPSK	low	3	15	-15.48	-29.24	-26.8	-13	13.8
eFDD 5 QPSK	high	3	15	-16.1	-30.32	-28.27	-13	15.27
eFDD 5 16QAM	low	3	15	-17.02	-31.57	-28.5	-13	15.5
eFDD 5 16QAM	high	3	15	-16.05	-30.92	-28.5	-13	15.5
eFDD 5 QPSK	low	5	25	-17.47	-33.02	-30.32	-13	17.32
eFDD 5 QPSK	high	5	25	-17.38	-32.63	-30.62	-13	17.62
eFDD 5 16QAM	low	5	25	-17.97	-34.76	-31.91	-13	18.91
eFDD 5 16QAM	high	5	25	-17.64	-33.42	-31.24	-13	18.24
eFDD 5 QPSK	low	10	50	-19.23	-34.76	-33.02	-13	20.02
eFDD 5 QPSK	high	10	50	-20.13	-34.29	-33.02	-13	20.02
eFDD 5 16QAM	low	10	50	-21.4	-36.34	-34.76	-13	21.76
eFDD 5 16QAM	high	10	50	-21.29	-36.34	-34.29	-13	21.29

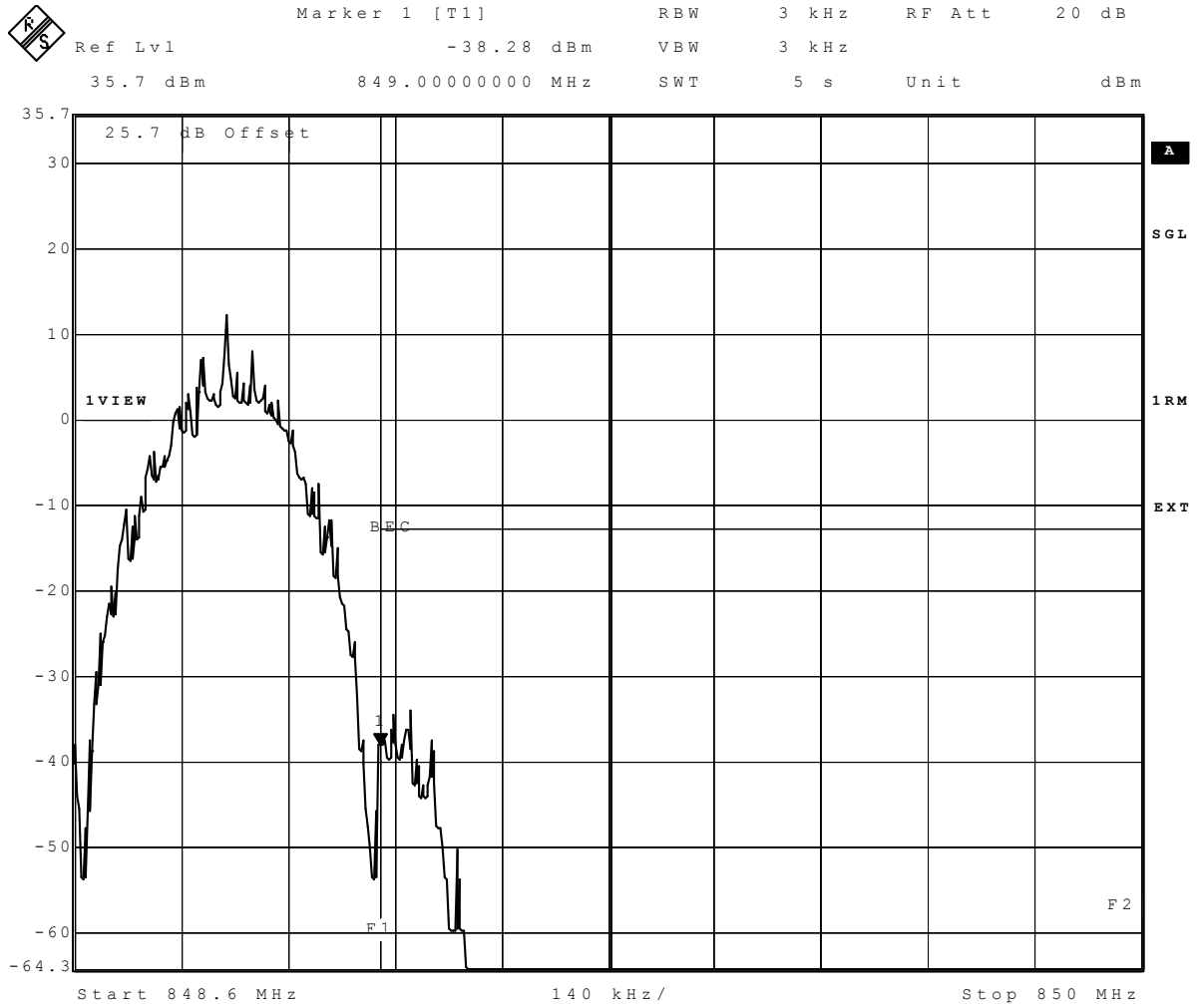
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 31.OCT.2018 16:29:28

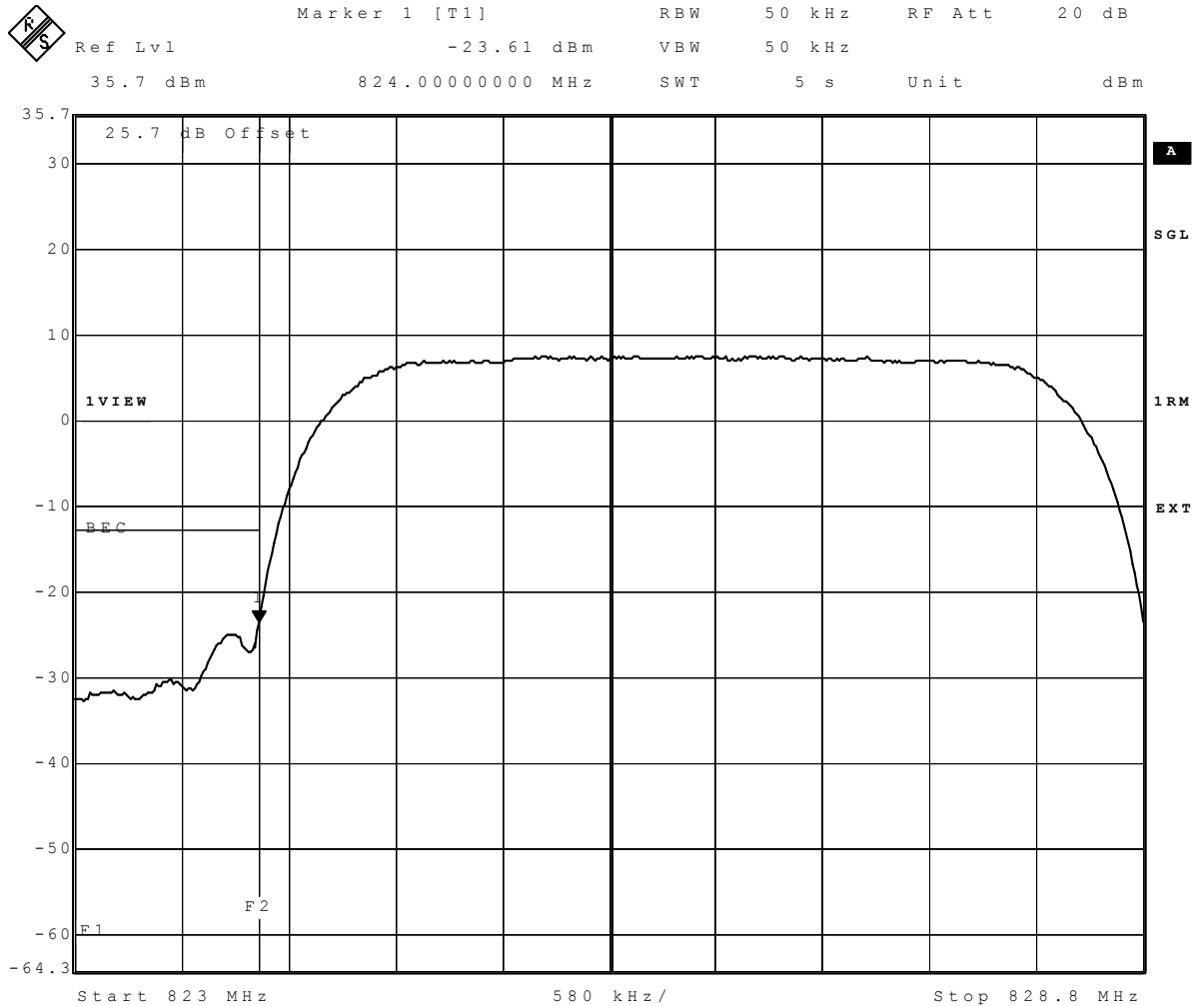
GSM 850 Channel = low

Reference: MDE_GEMALTO_1802_FCCb_rev01



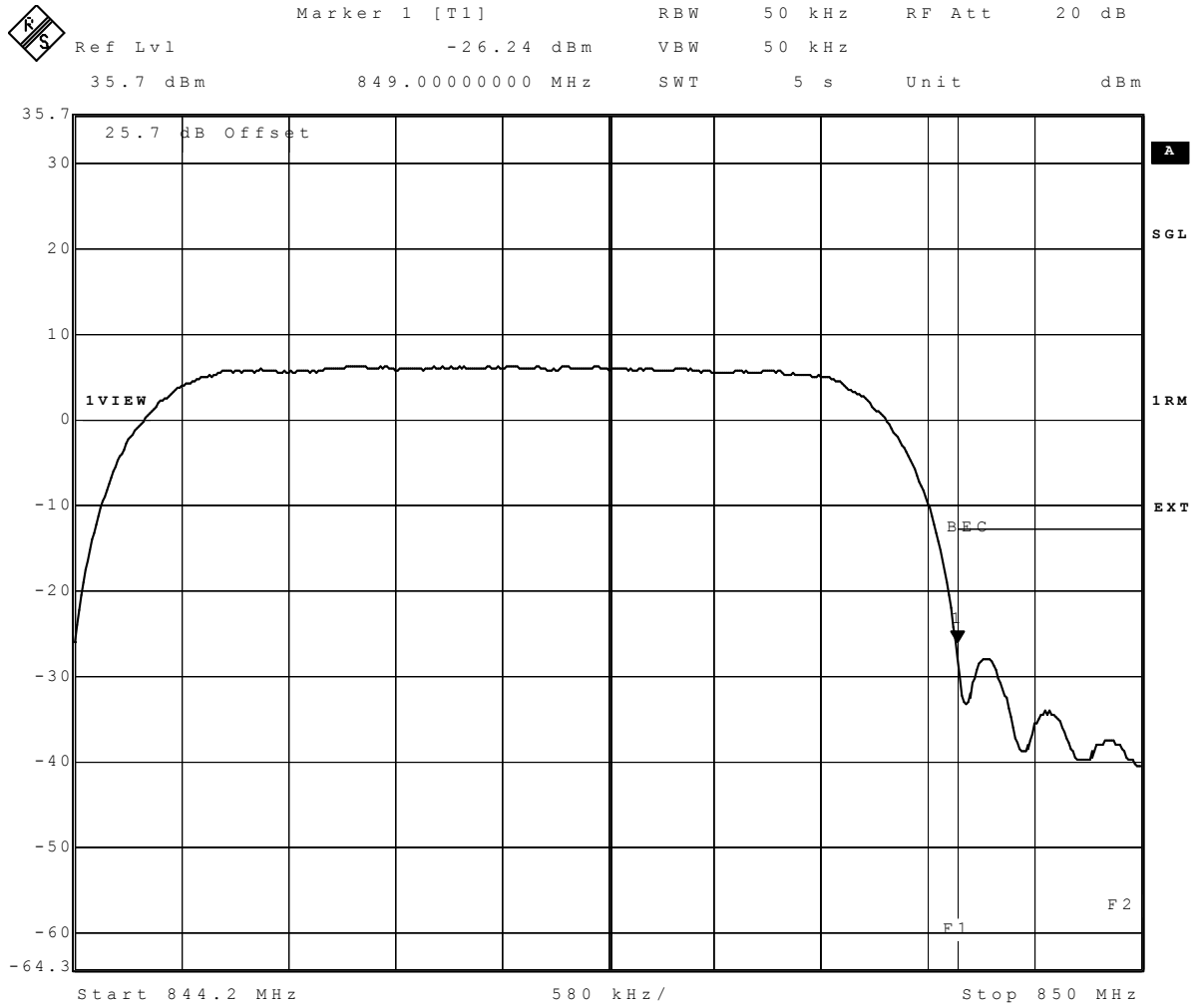
Date: 2.OCT.2018 12:22:04

EDGE 850 Channel = high



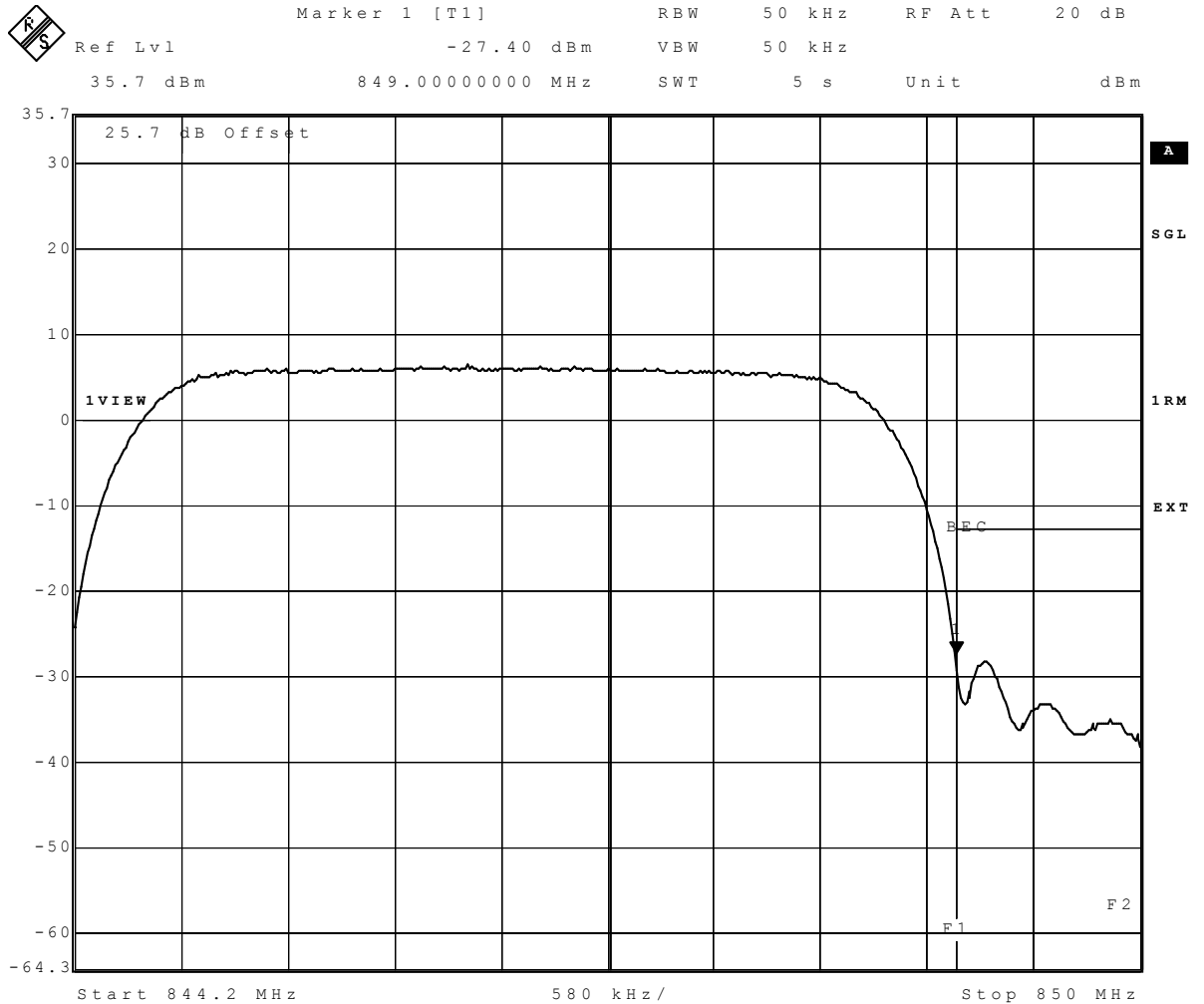
Date: 2.OCT.2018 15:38:18

WCDMA FDD V Channel = low



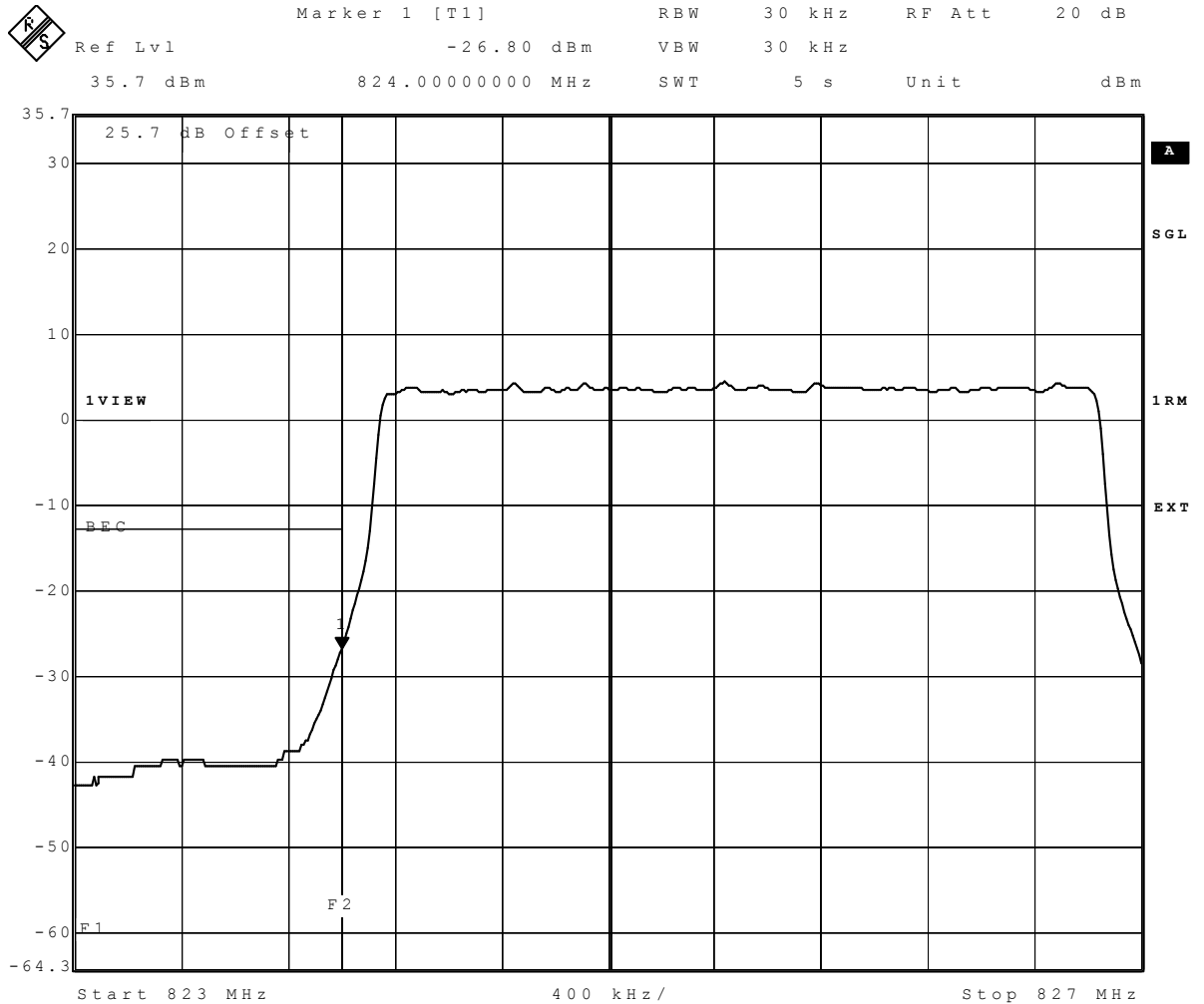
Date: 12.OCT.2018 15:21:15

HSDPA FDD V Channel = high



Date: 12.OCT.2018 12:35:22

HSUPA FDD V Channel = low



Date: 9.OCT.2018 20:10:11

LTE eFDD 5 QPSK Channel = low

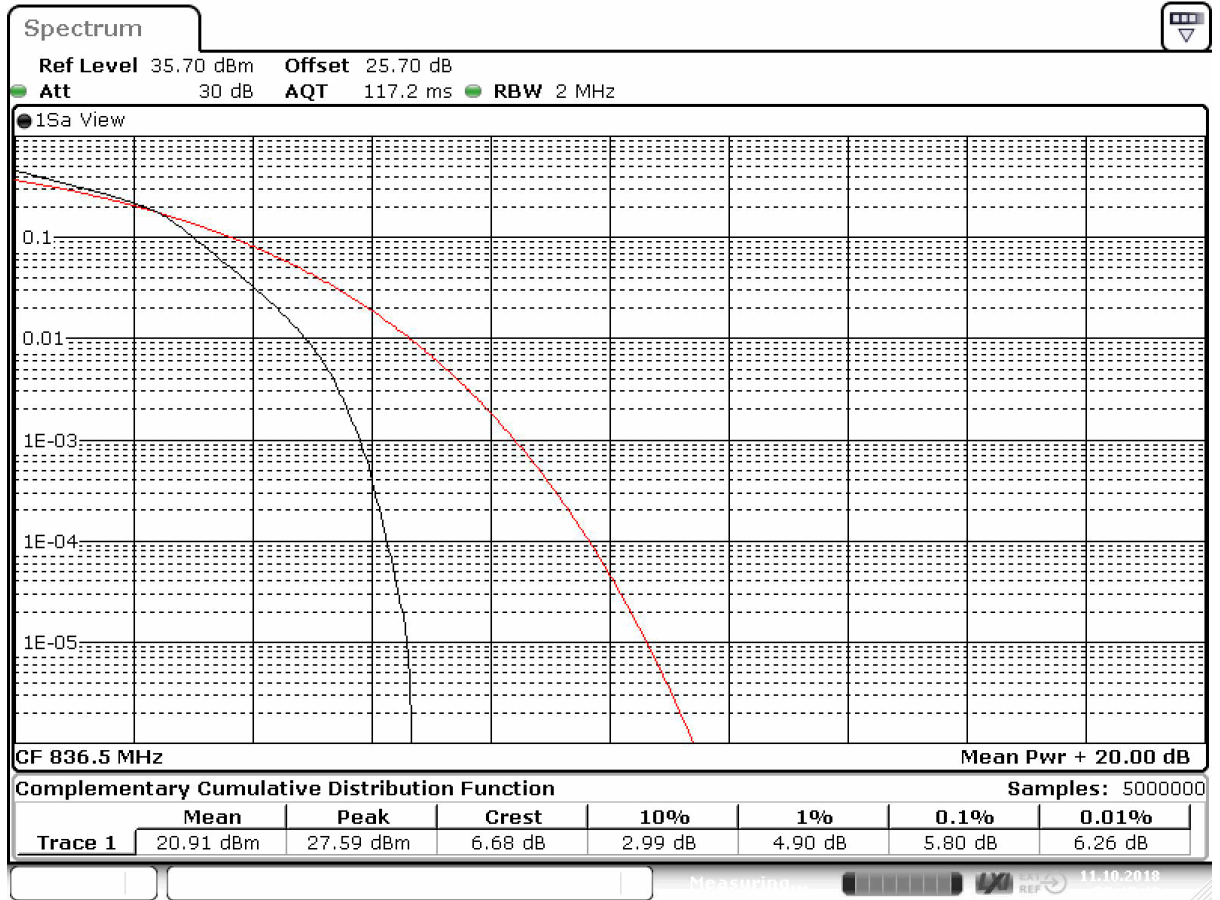
3.5.7 22.7 Peak-to-Average Ratio Summary §2.1046

Test: 22.7; Peak-to-Average Ratio Summary §2.1046

Result:	Passed
Setup No.:	S01_AM01
Date of Test:	2018/10/25 13:18
Body:	FCC47CFRChIPART22PUBLIC MOBILE SERVICES
Test Specification:	FCC part 2 and 22

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak to Average Ratio [dB]	Limiti (IC) [dB]
GSM 850	low	-	0.2	0.13	13
GSM 850	mid	-	0.2	0.09	13
GSM 850	high	-	0.2	0.04	13
GSM 850 EDGE	low	-	0.2	0.07	13
GSM 850 EDGE	mid	-	0.2	0.09	13
GSM 850 EDGE	high	-	0.2	0.18	13
FDD V	low	-	5	5.42	13
FDD V	mid	-	5	5.56	13
FDD V	high	-	5	5.55	13
FDD V HSDPA Subtiesti 1	low	-	5	5.26	13
FDD V HSDPA Subtiesti 1	mid	-	5	5.93	13
FDD V HSDPA Subtiesti 1	high	-	5	5.67	13
FDD V HSUPA Subtiesti 1	low	-	5	7.01	13
FDD V HSUPA Subtiesti 1	mid	-	5	7.11	13
FDD V HSUPA Subtiesti 1	high	-	5	7.28	13
FDD V HSUPA Subtiesti 5	low	-	5	6.96	13
FDD V HSUPA Subtiesti 5	mid	-	5	7	13
FDD V HSUPA Subtiesti 5	high	-	5	7.01	13
eFDD 5 QPSK	low	6	1.4	4.99	13
eFDD 5 QPSK	mid	6	1.4	4.9	13
eFDD 5 QPSK	high	6	1.4	4.9	13
eFDD 5 16QAM	low	6	1.4	5.8	13
eFDD 5 16QAM	mid	6	1.4	5.8	13
eFDD 5 16QAM	high	6	1.4	5.71	13



Date: 11.OCT.2018 08:49:49

LTE eFDD5 16QAM Channel = mid

3.5.8 24.1 RF Power Output §2.1046, §24.232

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

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/01 10:55
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

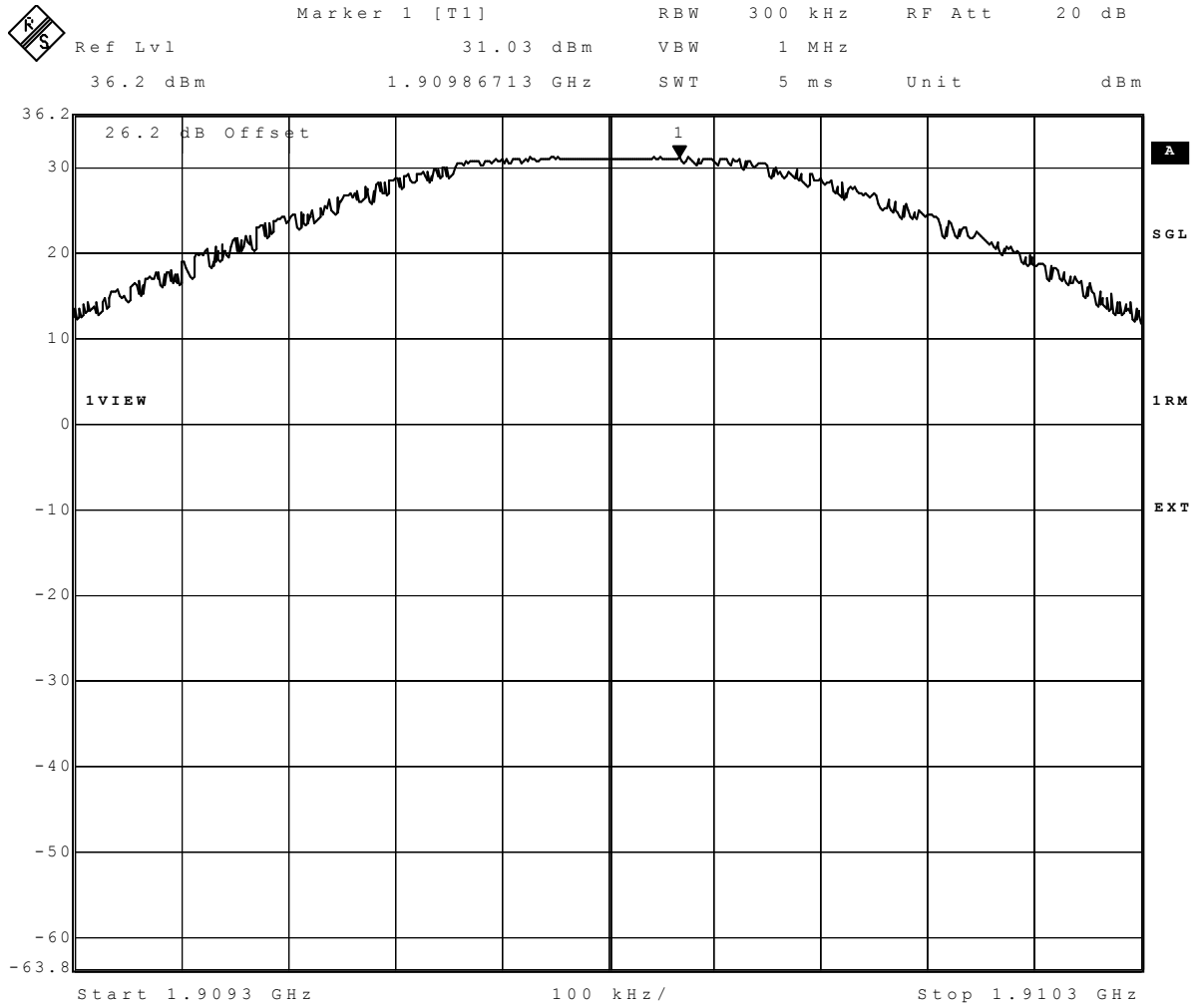
Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC / IC EIRP Limit [W]	Maximum Antenna Gain [dBi]
GSM 1900	low	-	0.2	30.94	30.91	30.9	2	2.06
GSM 1900	mid	-	0.2	31.03	31	31.02	2	1.97
GSM 1900	high	-	0.2	31.05	31.03	31.03	2	1.95
GSM 1900 EDGE	low	-	0.2	29.68	29.59	29.22	2	3.32
GSM 1900 EDGE	mid	-	0.2	29.79	29.33	29.63	2	3.21
GSM 1900 EDGE	high	-	0.2	29.71	29.56	29.46	2	3.29
FDD II	low	-	5	30.88	25.3	25.41	2	7.59
FDD II	mid	-	5	30.78	25.35	25.46	2	7.54
FDD II	high	-	5	31.13	25.31	25.47	2	7.53
FDD II HSDPA Subtiesti 1	low	-	5	29.43	24.09	24.2	2	8.8
FDD II HSDPA Subtiesti 1	mid	-	5	29.43	24.14	24.25	2	8.75
FDD II HSDPA Subtiesti 1	high	-	5	29.43	24.04	24.34	2	8.66
FDD II HSDPA Subtiesti 2	low	-	5	29.65	23.35	23.87	2	9.13
FDD II HSDPA Subtiesti 2	mid	-	5	30.51	23.32	23.8	2	9.2
FDD II HSDPA Subtiesti 2	high	-	5	30.98	23.45	24.1	2	8.9
FDD II HSDPA Subtiesti 3	low	-	5	29.79	23.08	23.9	2	9.1
FDD II HSDPA Subtiesti 3	mid	-	5	29.98	23.34	23.94	2	9.06
FDD II HSDPA Subtiesti 3	high	-	5	30.36	23.3	24.05	2	8.95
FDD II HSDPA Subtiesti 4	low	-	5	30.66	23.15	23.96	2	9.04
FDD II HSDPA Subtiesti 4	mid	-	5	30.36	23.24	24.05	2	8.95
FDD II HSDPA Subtiesti 4	high	-	5	30.66	23.34	24.09	2	8.91
FDD II HSUPA Subtiesti 1	low	-	5	30.98	23.9	24.28	2	8.72
FDD II HSUPA Subtiesti 1	mid	-	5	31.2	23.94	24.35	2	8.65
FDD II HSUPA Subtiesti 1	high	-	5	31.06	23.99	24.51	2	8.49
FDD II HSUPA Subtiesti 2	low	-	5	30.36	21.86	22.52	2	10.48
FDD II HSUPA Subtiesti 2	mid	-	5	30.98	22.02	22.51	2	10.49
FDD II HSUPA Subtiesti 2	high	-	5	30.21	22.14	22.57	2	10.43
FDD II HSUPA Subtiesti 3	low	-	5	31.43	23.51	24.01	2	8.99
FDD II HSUPA Subtiesti 3	mid	-	5	31.51	23.49	24	2	9
FDD II HSUPA Subtiesti 3	high	-	5	31.43	23.58	23.98	2	9.02
FDD II HSUPA Subtiesti 4	low	-	5	30.21	21.65	22.36	2	10.64
FDD II HSUPA Subtiesti 4	mid	-	5	30.51	21.75	22.5	2	10.5
FDD II HSUPA Subtiesti 4	high	-	5	30.21	21.66	22.54	2	10.46
FDD II HSUPA Subtiesti 5	low	-	5	31.06	24.03	24.28	2	8.72
FDD II HSUPA Subtiesti 5	mid	-	5	31.06	23.97	24.35	2	8.65
FDD II HSUPA Subtiesti 5	high	-	5	30.98	24.01	24.3	2	8.7
eFDD 2 QPSK	low	1	1.4	-	-	22.62	2	10.38
eFDD 2 QPSK	low	3	1.4	-	-	22.36	2	10.64
eFDD 2 QPSK	low	6	1.4	-	-	21.41	2	11.59
eFDD 2 QPSK	mid	1	1.4	-	-	23.07	2	9.93
eFDD 2 QPSK	mid	3	1.4	-	-	22.65	2	10.35
eFDD 2 QPSK	mid	6	1.4	-	-	21.46	2	11.54

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC / IC EIRP Limit [W]	Maximum Antenna Gain [dBi]
eFDD 2 QPSK	high	1	1.4	-	-	23.24	2	9.76
eFDD 2 QPSK	high	3	1.4	-	-	22.76	2	10.24
eFDD 2 QPSK	high	6	1.4	-	-	21.59	2	11.41
eFDD 2 16QAM	low	1	1.4	-	-	21.68	2	11.32
eFDD 2 16QAM	low	6	1.4	-	-	20.29	2	12.71
eFDD 2 16QAM	mid	1	1.4	-	-	22.25	2	10.75
eFDD 2 16QAM	mid	6	1.4	-	-	20.44	2	12.56
eFDD 2 16QAM	high	1	1.4	-	-	22.35	2	10.65
eFDD 2 16QAM	high	6	1.4	-	-	20.58	2	12.42
eFDD 2 QPSK	low	1	3	-	-	23.04	2	9.96
eFDD 2 QPSK	low	15	3	-	-	21.69	2	11.31
eFDD 2 QPSK	mid	1	3	-	-	23.57	2	9.43
eFDD 2 QPSK	mid	15	3	-	-	21.77	2	11.23
eFDD 2 QPSK	high	1	3	-	-	23.76	2	9.24
eFDD 2 QPSK	high	15	3	-	-	21.95	2	11.05
eFDD 2 16QAM	low	1	3	-	-	22.22	2	10.78
eFDD 2 16QAM	low	15	3	-	-	20.67	2	12.33
eFDD 2 16QAM	mid	1	3	-	-	22.66	2	10.34
eFDD 2 16QAM	mid	15	3	-	-	20.78	2	12.22
eFDD 2 16QAM	high	1	3	-	-	22.84	2	10.16
eFDD 2 16QAM	high	15	3	-	-	20.97	2	12.03
eFDD 2 QPSK	low	1	5	-	-	23.09	2	9.91
eFDD 2 QPSK	low	12	5	-	-	21.53	2	11.47
eFDD 2 QPSK	low	25	5	-	-	21.51	2	11.49
eFDD 2 QPSK	mid	1	5	-	-	23.59	2	9.41
eFDD 2 QPSK	mid	12	5	-	-	21.73	2	11.27
eFDD 2 QPSK	mid	25	5	-	-	21.59	2	11.41
eFDD 2 QPSK	high	1	5	-	-	23.93	2	9.07
eFDD 2 QPSK	high	12	5	-	-	21.78	2	11.22
eFDD 2 QPSK	high	25	5	-	-	21.79	2	11.21
eFDD 2 16QAM	low	1	5	-	-	22.04	2	10.96
eFDD 2 16QAM	low	25	5	-	-	20.55	2	12.45
eFDD 2 16QAM	mid	1	5	-	-	22.7	2	10.3
eFDD 2 16QAM	mid	25	5	-	-	20.63	2	12.37
eFDD 2 16QAM	high	1	5	-	-	22.85	2	10.15
eFDD 2 16QAM	high	25	5	-	-	20.78	2	12.22
eFDD 2 QPSK	low	1	10	-	-	23.01	2	9.99
eFDD 2 QPSK	low	50	10	-	-	21.91	2	11.09
eFDD 2 QPSK	mid	1	10	-	-	23.65	2	9.35
eFDD 2 QPSK	mid	50	10	-	-	22	2	11
eFDD 2 QPSK	high	1	10	-	-	23.8	2	9.2
eFDD 2 QPSK	high	50	10	-	-	22.13	2	10.87

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC / IC EIRP Limit [W]	Maximum Antenna Gain [dBi]
eFDD 2 16QAM	low	1	10	-	-	21.29	2	11.71
eFDD 2 16QAM	low	50	10	-	-	20.94	2	12.06
eFDD 2 16QAM	mid	1	10	-	-	22.73	2	10.27
eFDD 2 16QAM	mid	50	10	-	-	20.98	2	12.02
eFDD 2 16QAM	high	1	10	-	-	22.79	2	10.21
eFDD 2 16QAM	high	50	10	-	-	21.09	2	11.91
eFDD 2 QPSK	low	1	15	-	-	23.22	2	9.78
eFDD 2 QPSK	low	36	15	-	-	22.18	2	10.82
eFDD 2 QPSK	low	75	15	-	-	22.12	2	10.88
eFDD 2 QPSK	mid	1	15	-	-	23.82	2	9.18
eFDD 2 QPSK	mid	36	15	-	-	22.27	2	10.73
eFDD 2 QPSK	mid	75	15	-	-	22.22	2	10.78
eFDD 2 QPSK	high	1	15	-	-	23.93	2	9.07
eFDD 2 QPSK	high	36	15	-	-	22.44	2	10.56
eFDD 2 QPSK	high	75	15	-	-	22.39	2	10.61
eFDD 2 16QAM	low	1	15	-	-	22.29	2	10.71
eFDD 2 16QAM	low	75	15	-	-	21.19	2	11.81
eFDD 2 16QAM	mid	1	15	-	-	22.93	2	10.07
eFDD 2 16QAM	mid	75	15	-	-	21.25	2	11.75
eFDD 2 16QAM	high	1	15	-	-	23.15	2	9.85
eFDD 2 16QAM	high	75	15	-	-	21.4	2	11.6
eFDD 2 QPSK	low	1	20	-	-	23.14	2	9.86
eFDD 2 QPSK	low	100	20	-	-	22.14	2	10.86
eFDD 2 QPSK	mid	1	20	-	-	23.69	2	9.31
eFDD 2 QPSK	mid	100	20	-	-	22.17	2	10.83
eFDD 2 QPSK	high	1	20	-	-	23.81	2	9.19
eFDD 2 QPSK	high	100	20	-	-	22.3	2	10.7
eFDD 2 16QAM	low	1	20	-	-	22.27	2	10.73
eFDD 2 16QAM	low	100	20	-	-	21.14	2	11.86
eFDD 2 16QAM	mid	1	20	-	-	22.57	2	10.43
eFDD 2 16QAM	mid	100	20	-	-	21.15	2	11.85
eFDD 2 16QAM	high	1	20	-	-	22.9	2	10.1
eFDD 2 16QAM	high	100	20	-	-	21.29	2	11.71

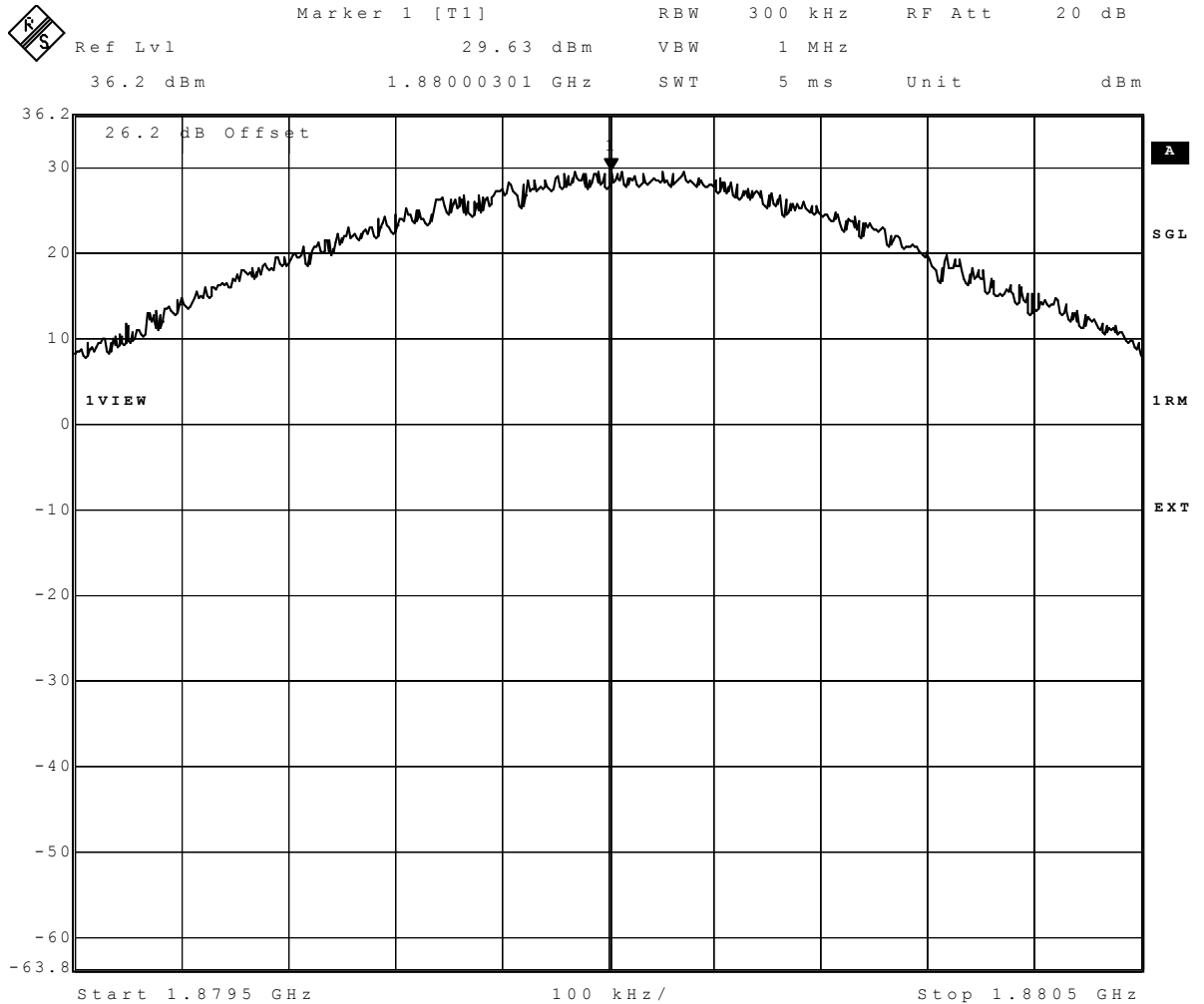
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 11:16:22

GSM 1900 Channel = high

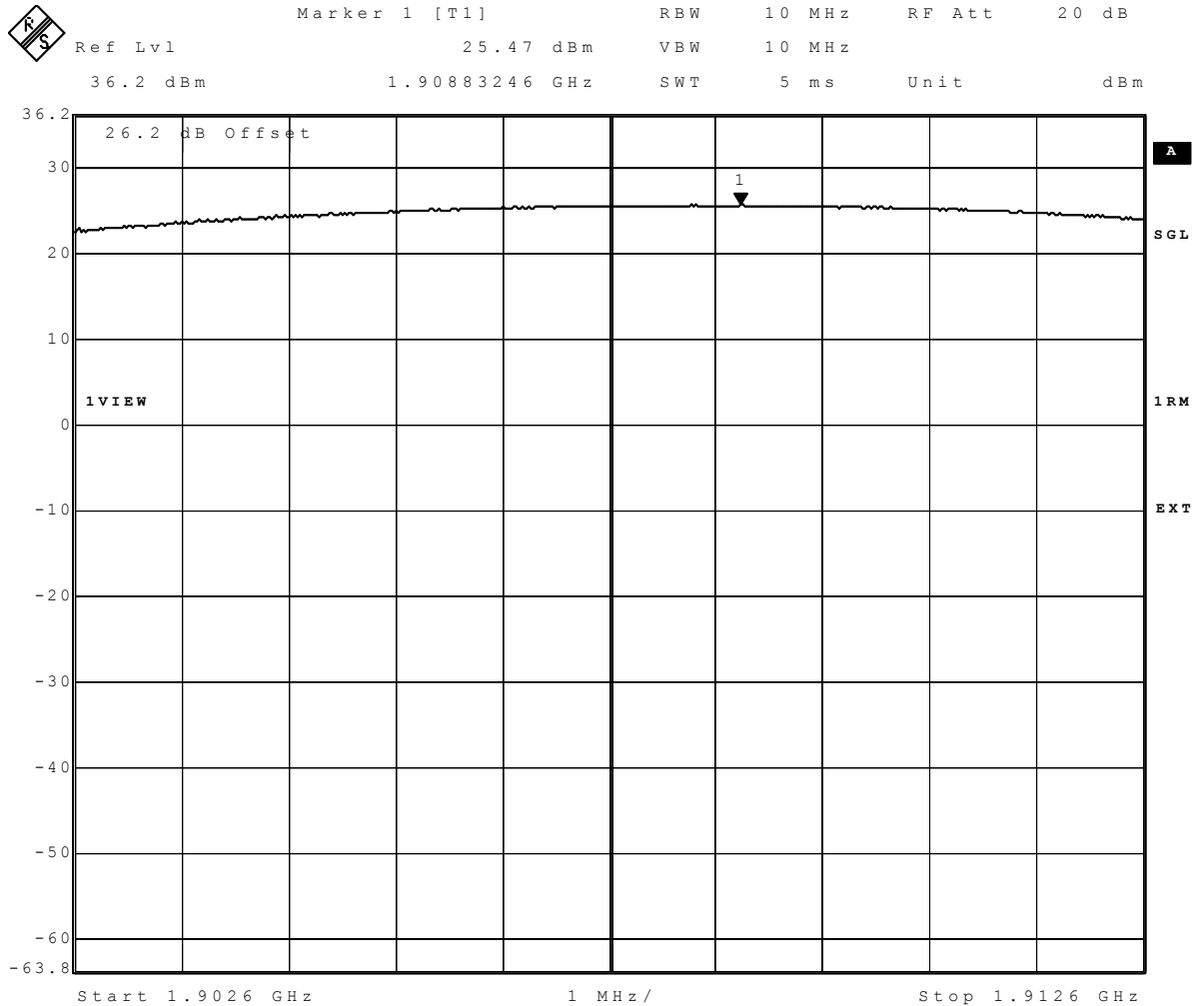
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 14:59:57

EDGE 1900 Channel = mid

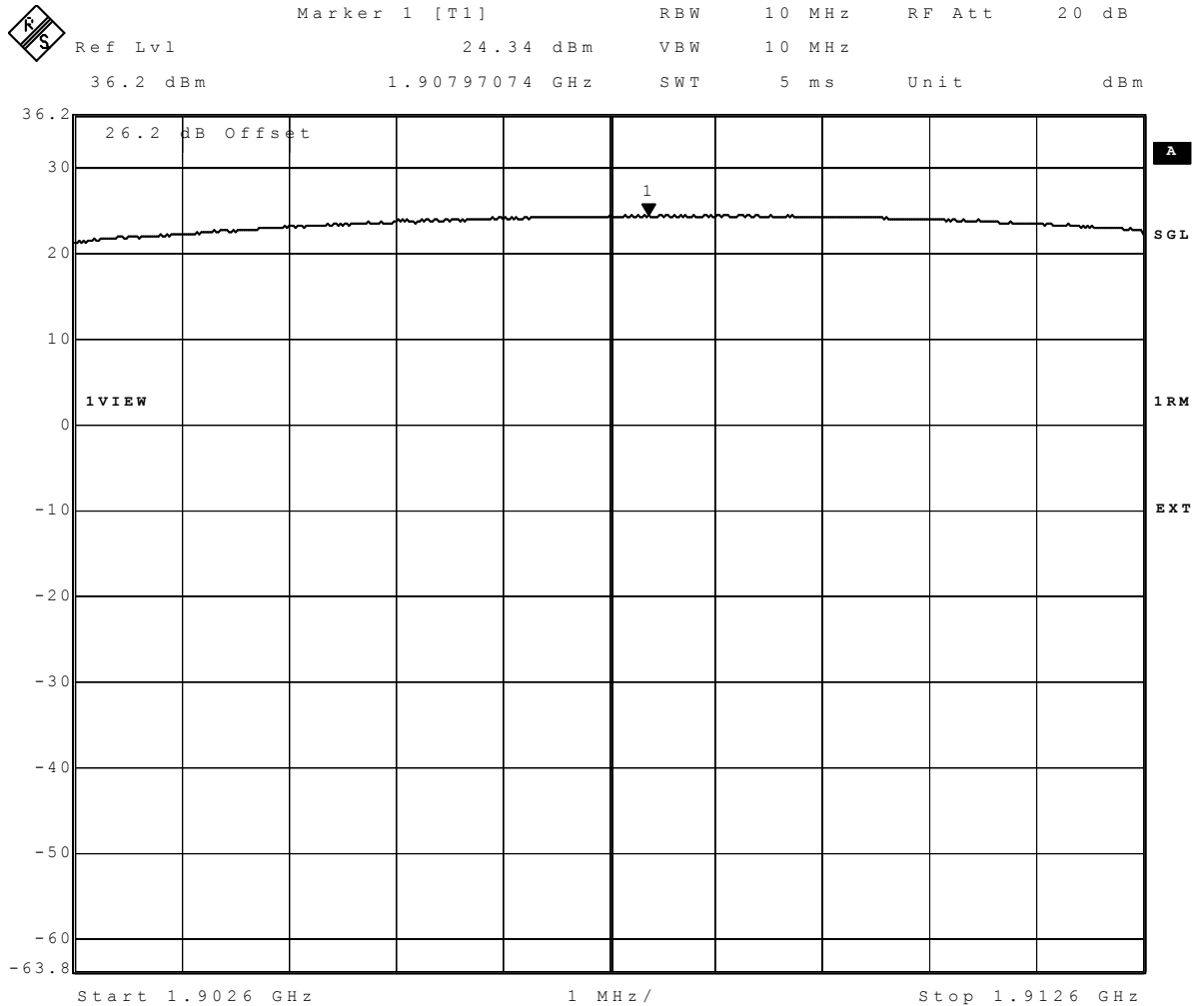
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 16:06:35

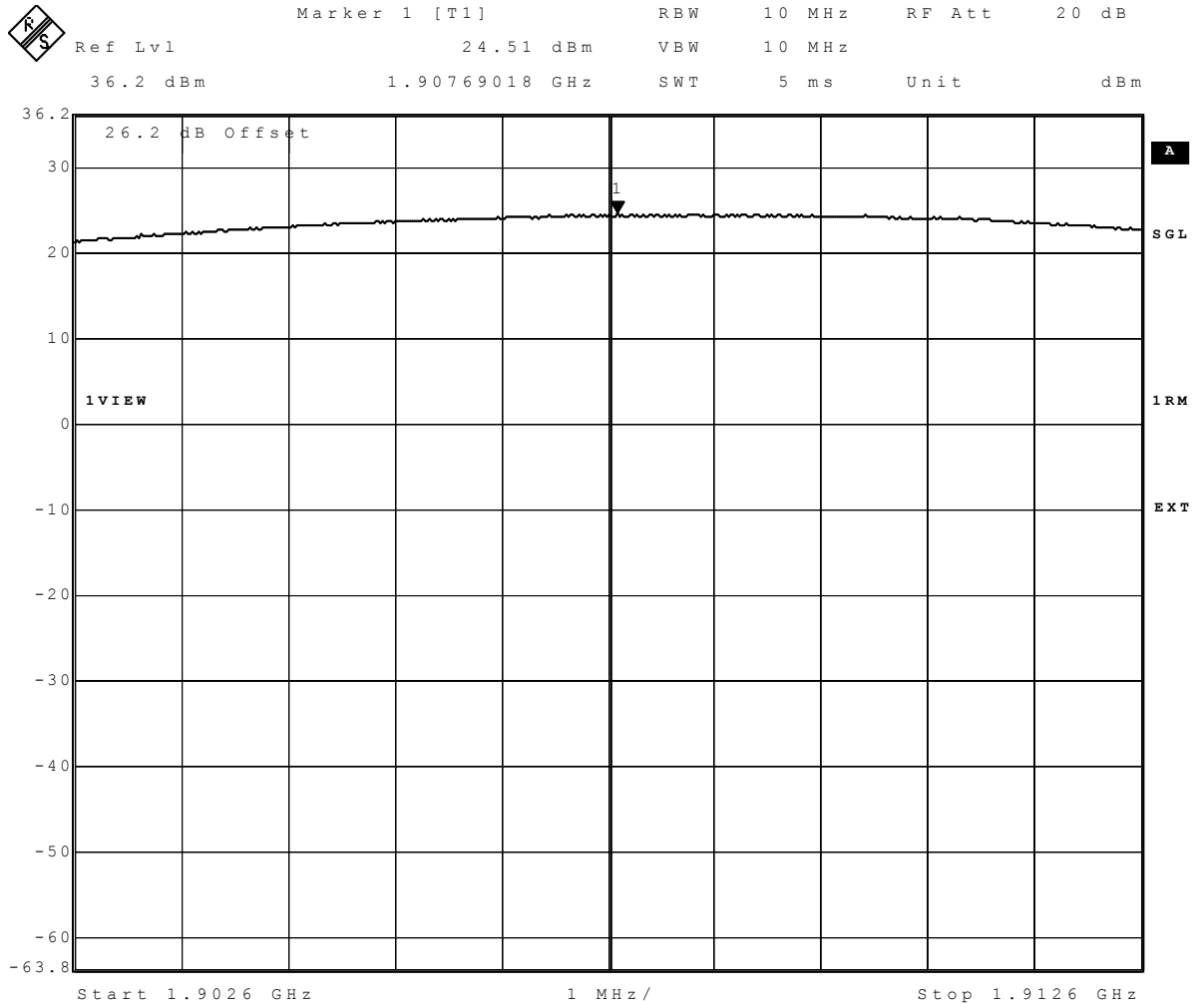
WCDMa FDD II Channel = high

Reference: MDE_GEMALTO_1802_FCCb_rev01



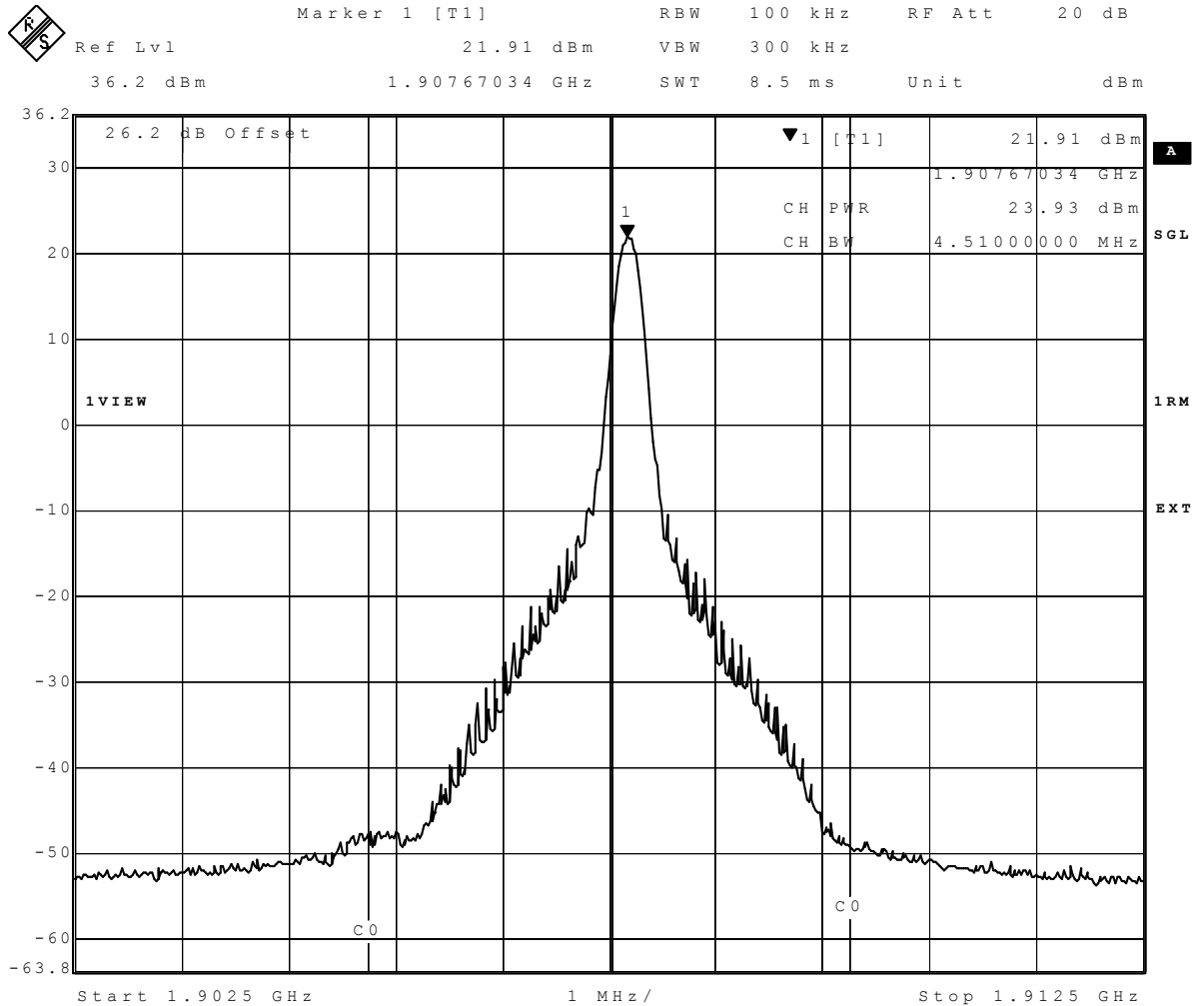
Date: 12.OCT.2018 15:57:01

HSDPA FDD II Subtest 1 Channel = high



Date: 12.OCT.2018 10:10:07

HSUPA FDD II Subtest 1 Channel = high



Date: 11.OCT.2018 11:00:52

eFDD2 QPSK 5MHz RB1 Channel = high

3.5.9 24.2 Frequency stability §2.1055, §24.235

Test: 24.2; Frequency stability Summary §2.1055, 24.235

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/09/30 11:02
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	14	22	passed
-30	5			16	21	passed
-30	10			16	22	passed
-20	0	normal	4700	13	24	passed
-20	5			9	19	passed
-20	10			17	32	passed
-10	0	normal	4700	18	26	passed
-10	5			9	27	passed
-10	10			4	33	passed
0	0	normal	4700	18	24	passed
0	5			16	25	passed
0	10			12	29	passed
10	0	normal	4700	15	26	passed
10	5			15	24	passed
10	10			13	28	passed
20	0	low	4700	14	31	passed
20	5			16	30	passed
20	10			19	34	passed
20	0	normal	4700	9	21	passed
20	5			7	26	passed
20	10			8	29	passed
20	0	high	4700	8	24	passed
20	5			14	22	passed
20	10			3	20	passed
30	0	normal	4700	16	35	passed
30	5			18	26	passed
30	10			12	31	passed
40	0	normal	4700	15	22	passed
40	5			17	36	passed
40	10			13	34	passed
50	0	normal	4700	11	30	passed
50	5			16	25	passed
50	10			18	29	passed

GSM 1900

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	7	18	passed
-30	5			11	19	passed
-30	10			13	17	passed
-20	0	normal	4700	8	18	passed
-20	5			14	16	passed
-20	10			11	15	passed
-10	0	normal	4700	13	22	passed
-10	5			8	16	passed
-10	10			12	19	passed
0	0	normal	4700	10	11	passed
0	5			11	23	passed
0	10			11	15	passed
10	0	normal	4700	13	14	passed
10	5			8	16	passed
10	10			9	18	passed
20	0	low	4700	10	18	passed
20	5			13	19	passed
20	10			15	18	passed
20	0	normal	4700	13	20	passed
20	5			14	22	passed
20	10			9	26	passed
20	0	high	4700	7	34	passed
20	5			6	34	passed
20	10			6	29	passed
30	0	normal	4700	14	18	passed
30	5			11	20	passed
30	10			13	15	passed
40	0	normal	4700	13	17	passed
40	5			10	19	passed
40	10			9	18	passed
50	0	normal	4700	14	25	passed
50	5			12	26	passed
50	10			12	23	passed

EDGE 1900

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	10	17	passed
-30	5			11	13	passed
-30	10			10	13	passed
-20	0	normal	4700	11	14	passed
-20	5			10	15	passed
-20	10			10	12	passed
-10	0	normal	4700	11	18	passed
-10	5			11	18	passed
-10	10			10	13	passed
0	0	normal	4700	10	15	passed
0	5			11	16	passed
0	10			11	16	passed
10	0	normal	4700	11	14	passed
10	5			10	16	passed
10	10			11	16	passed
20	0	low	4700	10	15	passed
20	5			10	14	passed
20	10			11	15	passed
20	0	normal	4700	11	17	passed
20	5			11	15	passed
20	10			10	16	passed
20	0	high	4700	11	16	passed
20	5			10	12	passed
20	10			11	14	passed
30	0	normal	4700	10	15	passed
30	5			11	13	passed
30	10			11	13	passed
40	0	normal	4700	11	15	passed
40	5			11	15	passed
40	10			10	12	passed
50	0	normal	4700	10	17	passed
50	5			12	14	passed
50	10			11	14	passed

WCDMa FDD II

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	9	19	passed
-30	5			13	16	passed
-30	10			14	18	passed
-20	0	normal	4700	12	15	passed
-20	5			10	14	passed
-20	10			9	16	passed
-10	0	normal	4700	13	18	passed
-10	5			14	18	passed
-10	10			12	17	passed
0	0	normal	4700	10	16	passed
0	5			13	17	passed
0	10			13	16	passed
10	0	normal	4700	11	13	passed
10	5			12	14	passed
10	10			8	11	passed
20	0	low	4700	15	19	passed
20	5			16	17	passed
20	10			15	17	passed
20	0	normal	4700	10	18	passed
20	5			11	16	passed
20	10			14	17	passed
20	0	high	4700	13	17	passed
20	5			12	19	passed
20	10			9	13	passed
30	0	normal	4700	10	16	passed
30	5			14	15	passed
30	10			11	13	passed
40	0	normal	4700	12	16	passed
40	5			12	15	passed
40	10			12	16	passed
50	0	normal	4700	10	13	passed
50	5			10	13	passed
50	10			11	16	passed

HSDPA FDD II

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	12	15	passed
-30	5			12	15	passed
-30	10			11	13	passed
-20	0	normal	4700	12	15	passed
-20	5			12	15	passed
-20	10			12	16	passed
-10	0	normal	4700	12	15	passed
-10	5			13	16	passed
-10	10			11	14	passed
0	0	normal	4700	12	15	passed
0	5			14	17	passed
0	10			13	16	passed
10	0	normal	4700	12	16	passed
10	5			12	14	passed
10	10			12	14	passed
20	0	low	4700	10	16	passed
20	5			11	16	passed
20	10			10	12	passed
20	0	normal	4700	10	14	passed
20	5			10	13	passed
20	10			10	13	passed
20	0	high	4700	11	13	passed
20	5			10	14	passed
20	10			10	13	passed
30	0	normal	4700	12	14	passed
30	5			11	13	passed
30	10			11	13	passed
40	0	normal	4700	11	15	passed
40	5			10	15	passed
40	10			11	13	passed
50	0	normal	4700	12	15	passed
50	5			11	13	passed
50	10			11	14	passed

HSUPA FDD II

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4700	9	21	passed
-30	5			11	23	passed
-30	10			10	19	passed
-20	0	normal	4700	8	18	passed
-20	5			12	33	passed
-20	10			11	17	passed
-10	0	normal	4700	7	26	passed
-10	5			9	31	passed
-10	10			10	28	passed
0	0	normal	4700	4	24	passed
0	5			6	20	passed
0	10			12	29	passed
10	0	normal	4700	8	19	passed
10	5			11	21	passed
10	10			13	37	passed
20	0	low	4700	10	28	passed
20	5			5	25	passed
20	10			7	26	passed
20	0	normal	4700	6	29	passed
20	5			10	31	passed
20	10			14	22	passed
20	0	high	4700	12	17	passed
20	5			16	16	passed
20	10			13	20	passed
30	0	normal	4700	8	34	passed
30	5			9	35	passed
30	10			9	31	passed
40	0	normal	4700	12	23	passed
40	5			13	29	passed
40	10			9	27	passed
50	0	normal	4700	13	21	passed
50	5			10	19	passed
50	10			8	23	passed

LTE eFDD 2

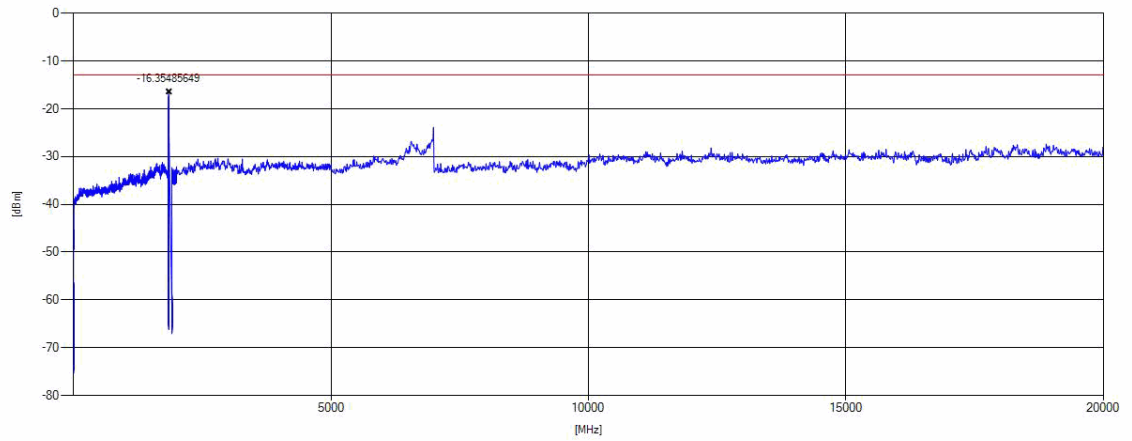
3.5.10 24.3 Spurious emissions at antenna terminals §2.1051, §24.238

Test: 24.3; Spurious emissions at antenna terminals Summary §2.1051, §24.238

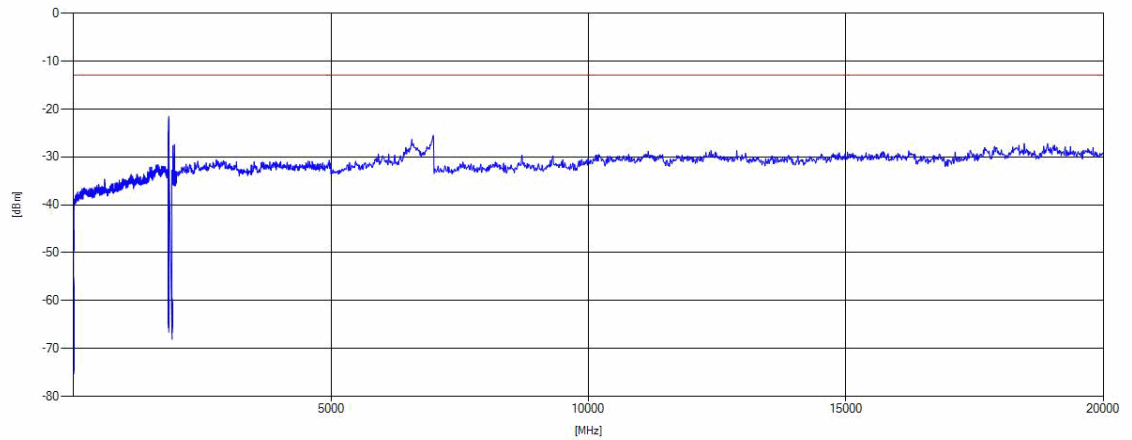
<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/02 11:10
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

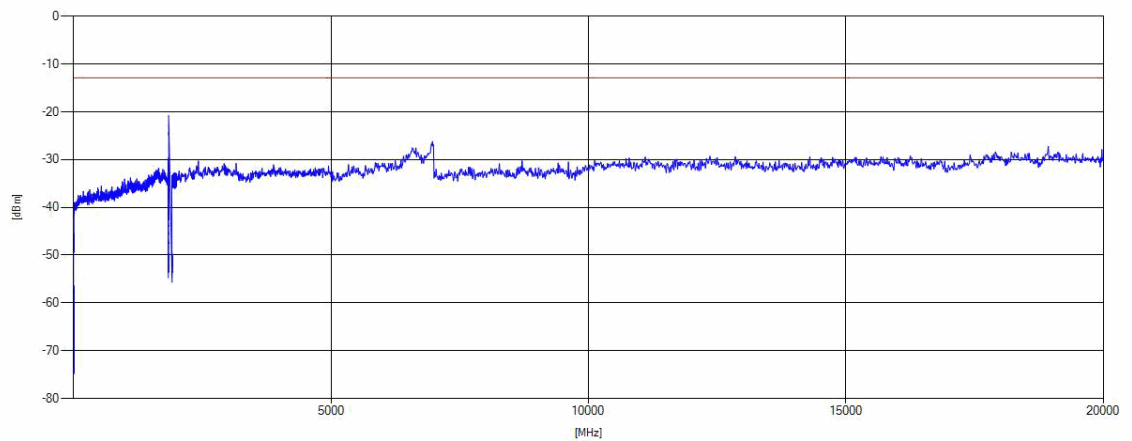
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
GSM1900	low	rms	maxhold	3	1849.98	-16.35	-13	3.35
GSM1900	mid	rms	maxhold	-	-	-	-13	>20
GSM1900	high	rms	maxhold	3	1910.02	-17.47	-13	4.47
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
EDGE1900	low	rms	maxhold	3	1849.95	-21.83	-13	8.83
EDGE1900	mid	rms	maxhold	-	-	-	-13	>20
EDGE1900	high	rms	maxhold	3	1910.02	-23.42	-13	10.42
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
WCDMA FDD2	low	rms	maxhold	50	1850	-22.72	-13	9.72
WCDMA FDD2	mid	rms	maxhold	-	-	-	-13	>20
WCDMA FDD2	high	rms	maxhold	50	1910	-24.35	-13	11.35
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD2	low	rms	maxhold	50	1850	-25.39	-13	12.39
HSDPA FDD2	mid	rms	maxhold	-	-	-	-13	>20
HSDPA FDD2	high	rms	maxhold	50	1910	-24.82	-13	11.82
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD2	low	rms	maxhold	50	1850	-24.72	-13	11.72
HSUPA FDD2	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD2	high	rms	maxhold	50	1910	-26.02	-13	13.02
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD2	low	rms	maxhold	5	1850	-32.92	-23	9.92
eFDD2	mid	rms	maxhold	-	-	-	-13	>20
eFDD2	high	rms	maxhold	5	1910	-33.44	-23	10.44



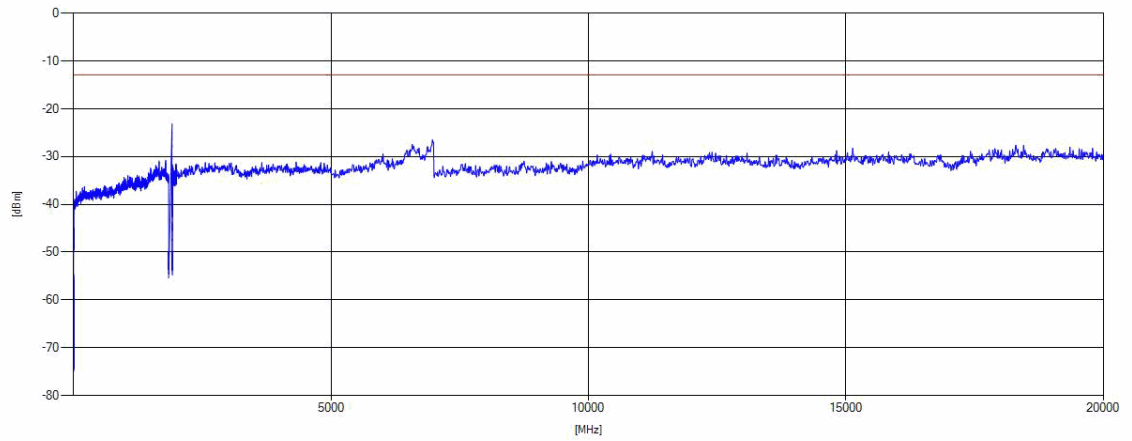
GSM 1900 Channel = low



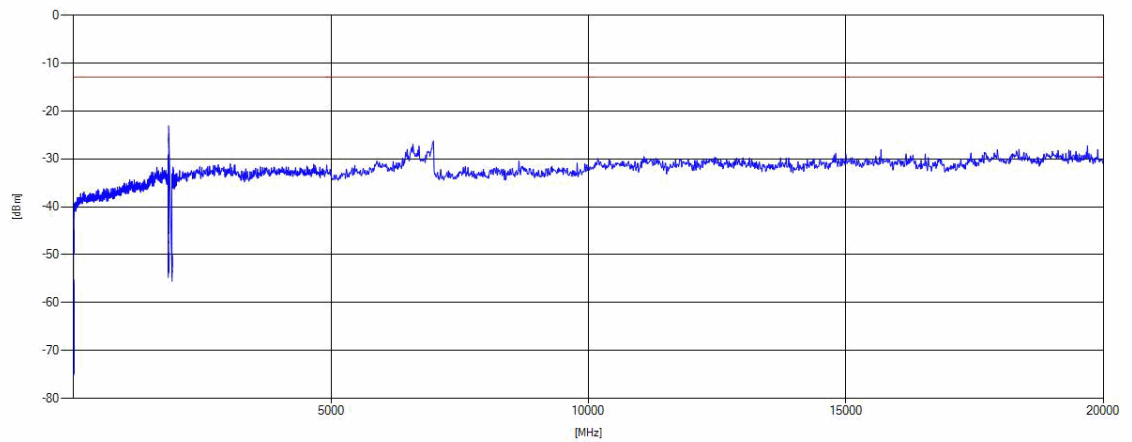
EDGE 1900 Channel = low



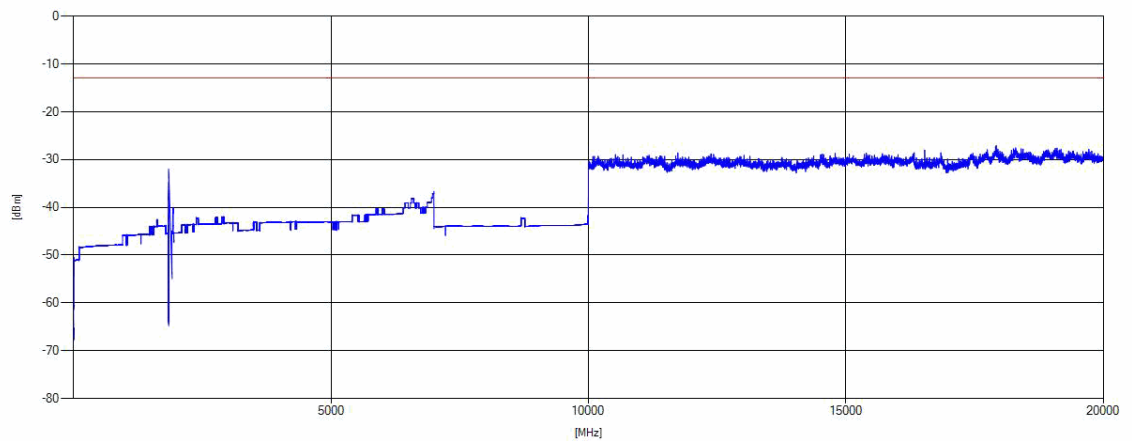
WCDMa FDD II Channel = low



HSDPA FDD II Subtest 1 Channel = high



HSUPA FDD II Subtest 1 Channel = low



LTE eFDD 2 QPSK Channel = low

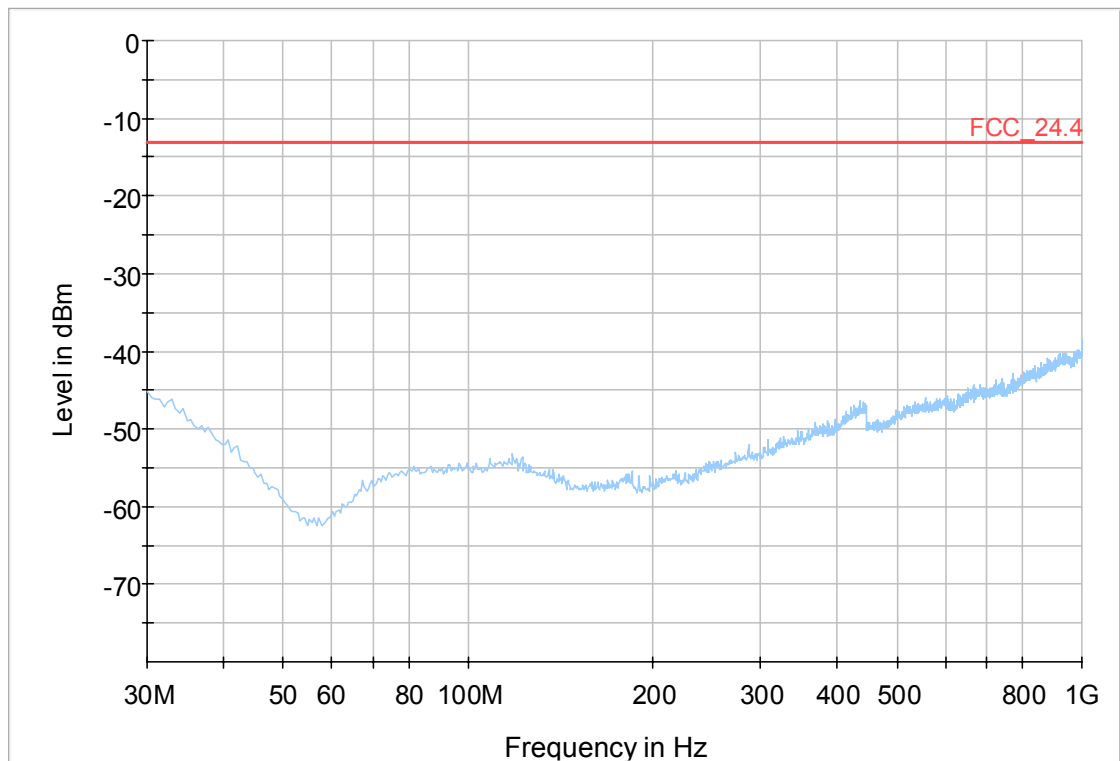
3.5.11 24.4 Field strength of spurious radiation §2.1053, §24.238

Test: 24.4; Field strength of spurious radiation Summary §2.1053, §24.238

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/25 15:48
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

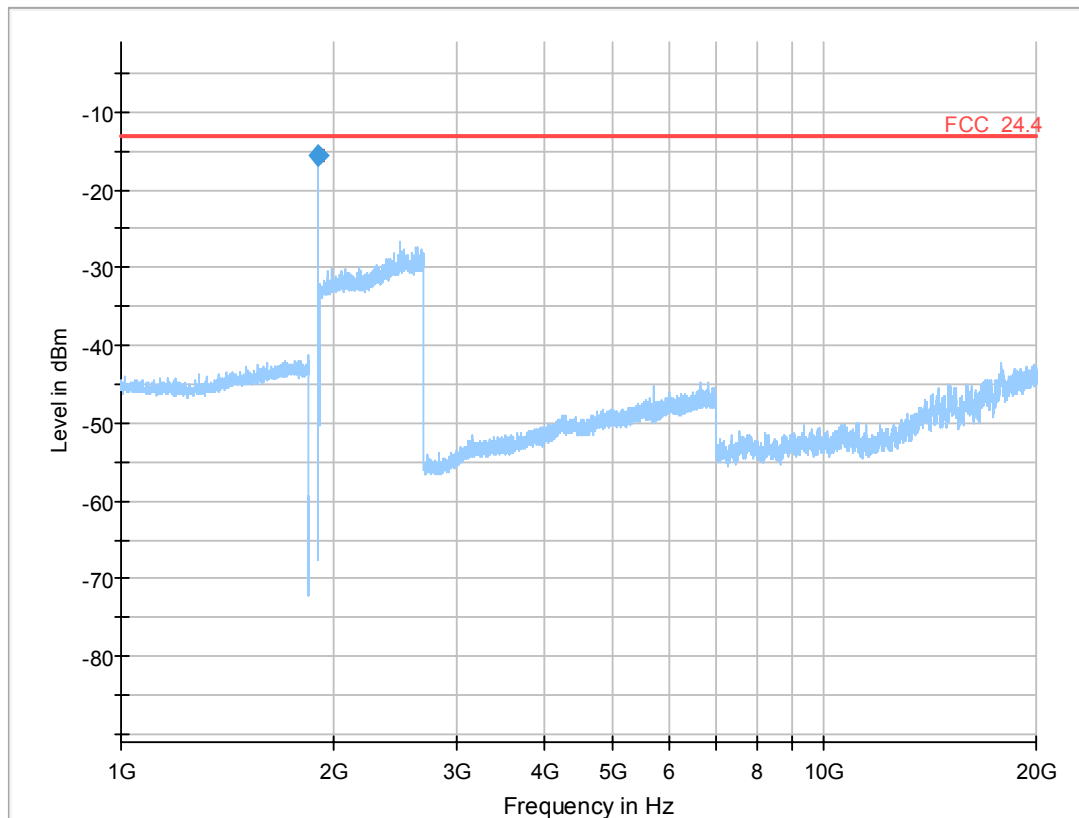
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
GSM1900	low	rms	maxhold	3	1849.99	-16	-13	3
GSM1900	mid	rms	maxhold	-	-	-	-13	>20
GSM1900	high	rms	maxhold	3	1910.02	-15.6	-13	2.6
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
EDGE1900	low	peak	maxhold	3	1849.9	-23.1	-13	10.1
EDGE1900	mid	peak	maxhold	-	-	-	-13	>20
EDGE1900	high	peak	maxhold	3	1910	-23.89	-13	10.89
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
WCDMA FDD2	low	rms	maxhold	50	1848.96	-19.91	-13	6.91
WCDMA FDD2	mid	rms	maxhold	-	-	-	-13	>20
WCDMA FDD2	high	rms	maxhold	50	1910	-23.86	-13	10.86
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD2	low	rms	maxhold	50	1848.99	-17.962	-13	4.962
HSDPA FDD2	mid	rms	maxhold	-	-	-	-13	>20
HSDPA FDD2	high	rms	maxhold	50	1910	-25.14	-13	12.14
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD2	low	rms	maxhold	50	1848.99	-15.95	-13	2.95
HSUPA FDD2	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD2	high	rms	maxhold	50	1910	-27.89	-13	14.89
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD2	low	rms	maxhold	5	1849.98	-36.17	-23	13.17
eFDD2	mid	rms	maxhold	-	-	-	-13	>20
eFDD2	high	rms	maxhold	5	1910	-34.97	-23	11.97



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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30MHz - 1GHz: GSM1900 Channel = high



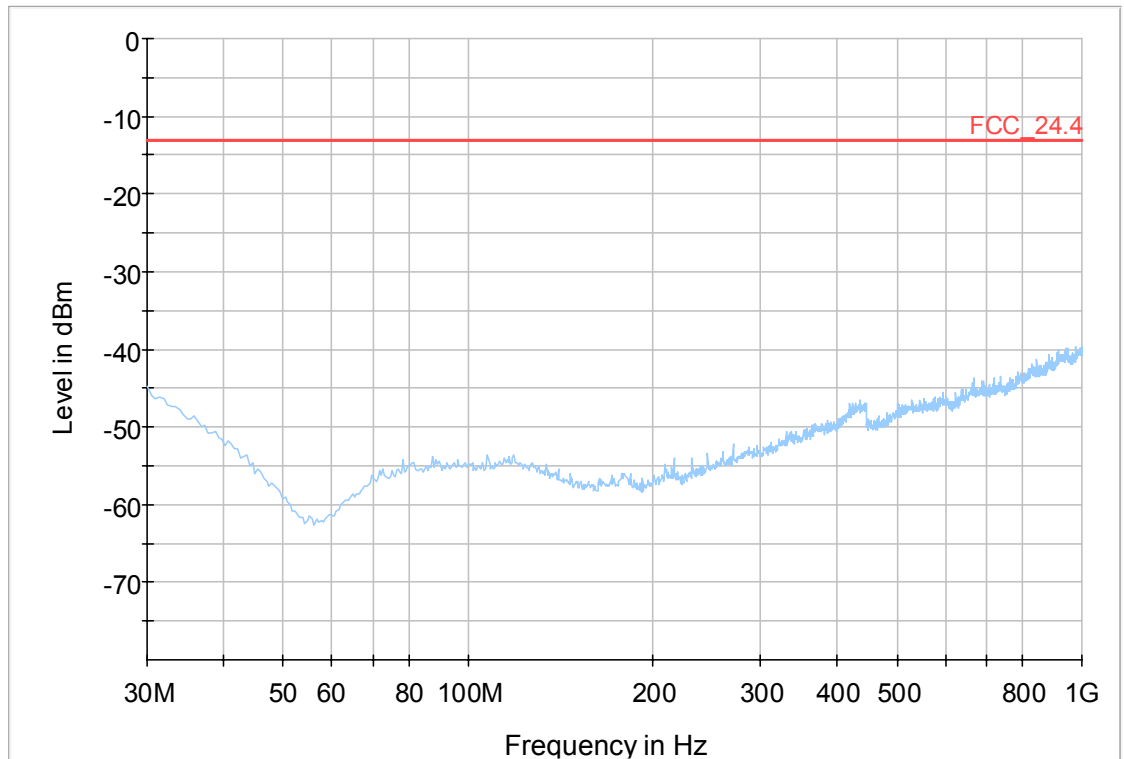
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1910.021	-15.6	-13.00	2.62	2000.0	3.000	150.0	H	-45.0	90.0	-64.7

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1910.021	-15.6	-13.00	2.62	2000.0	3.000	150.0	H	-45.0	90.0	-64.7

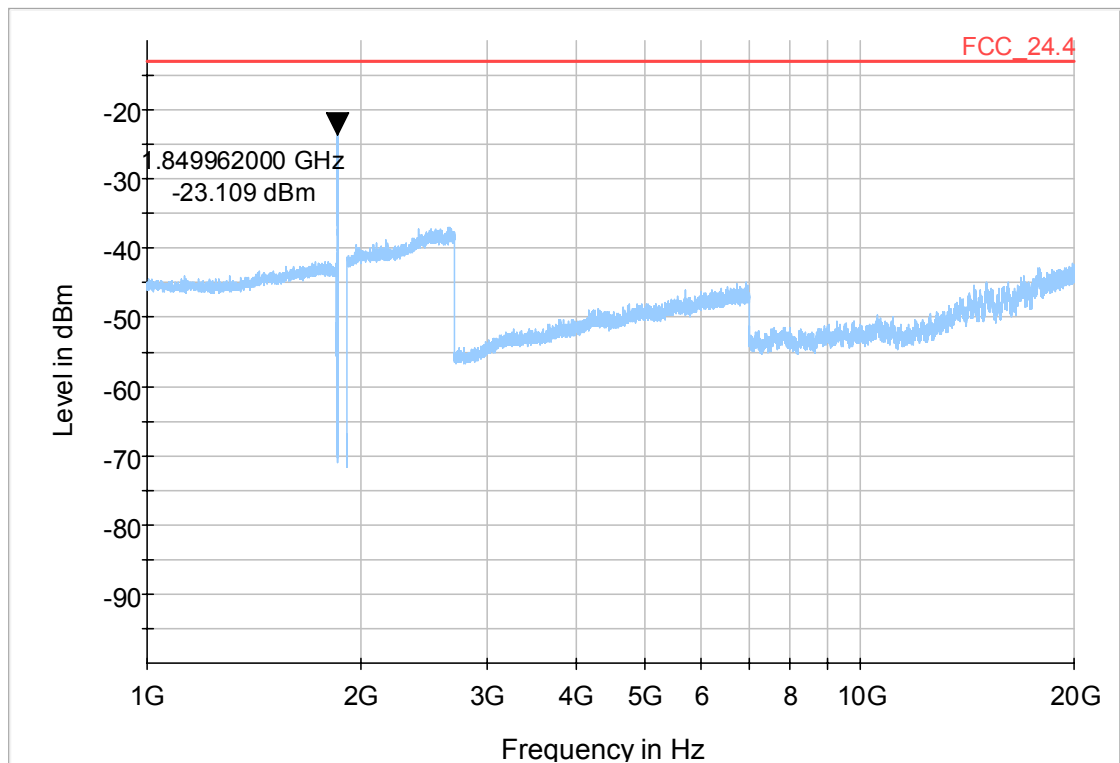
1GHz - 20GHz: GSM1900 Channel = high



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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30MHz - 1GHz: EDGE1900 Channel = low



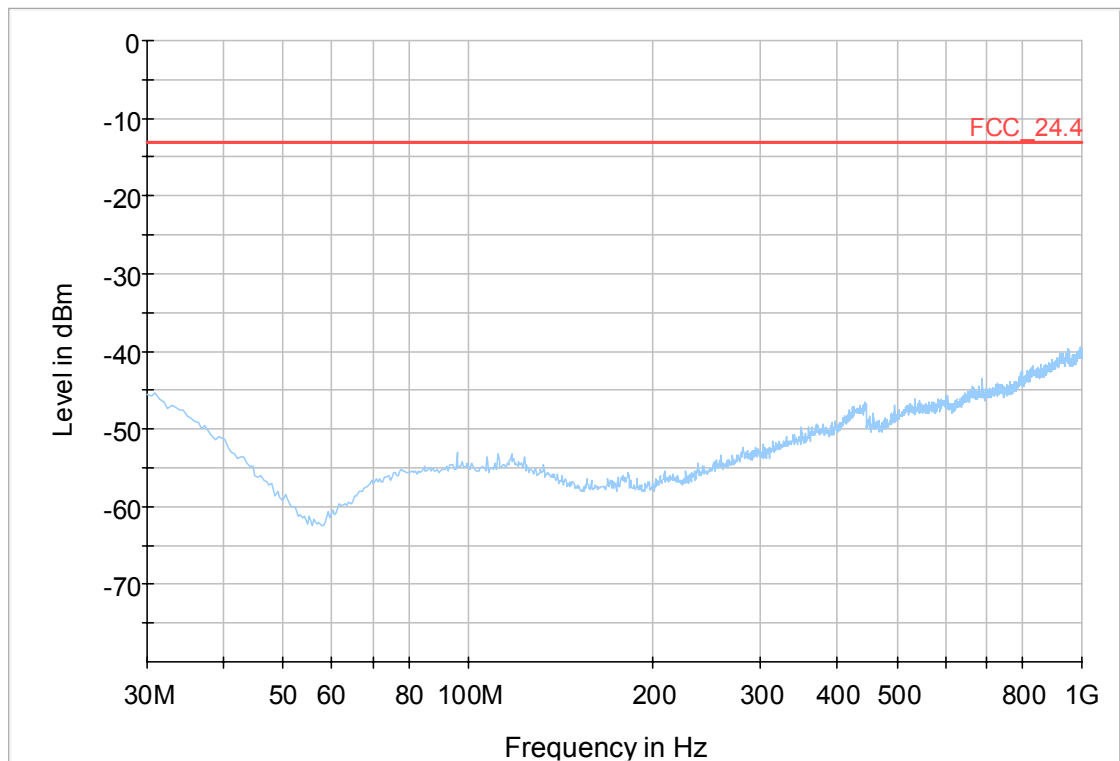
Critical_Freqs

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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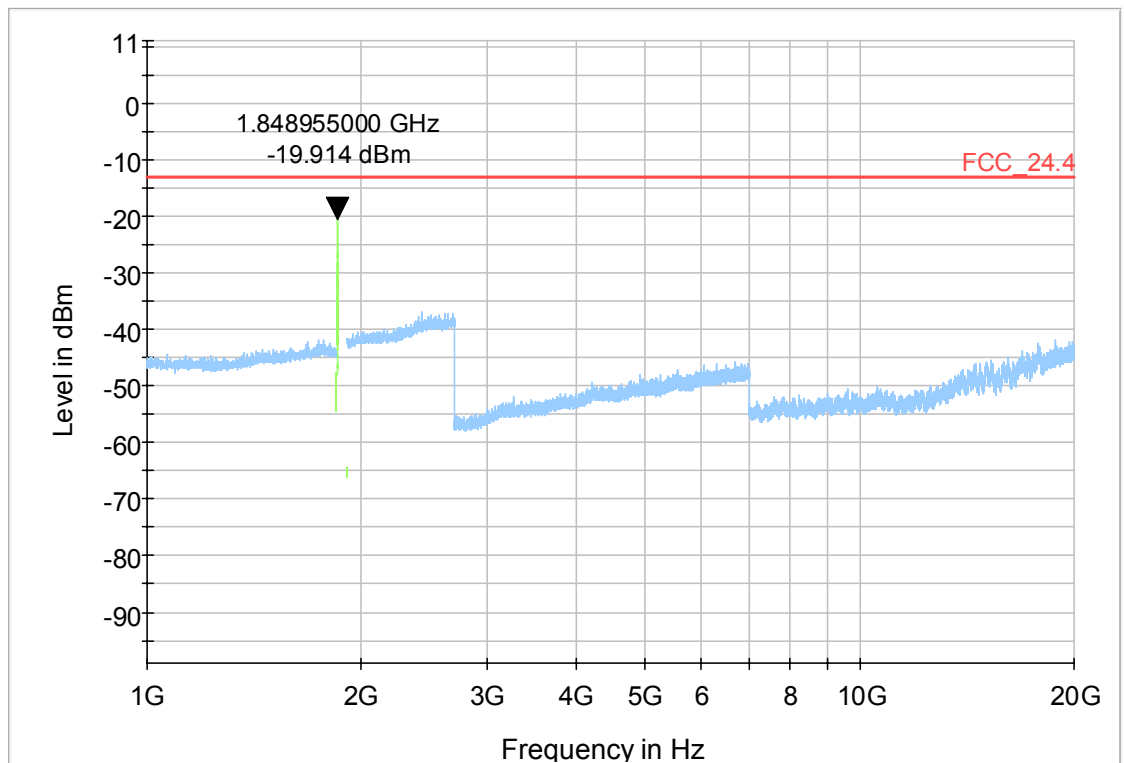
1GHz - 20GHz: EDGE1900 Channel = low



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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30MHz - 1GHz: WCDMA FDD2 Channel = low



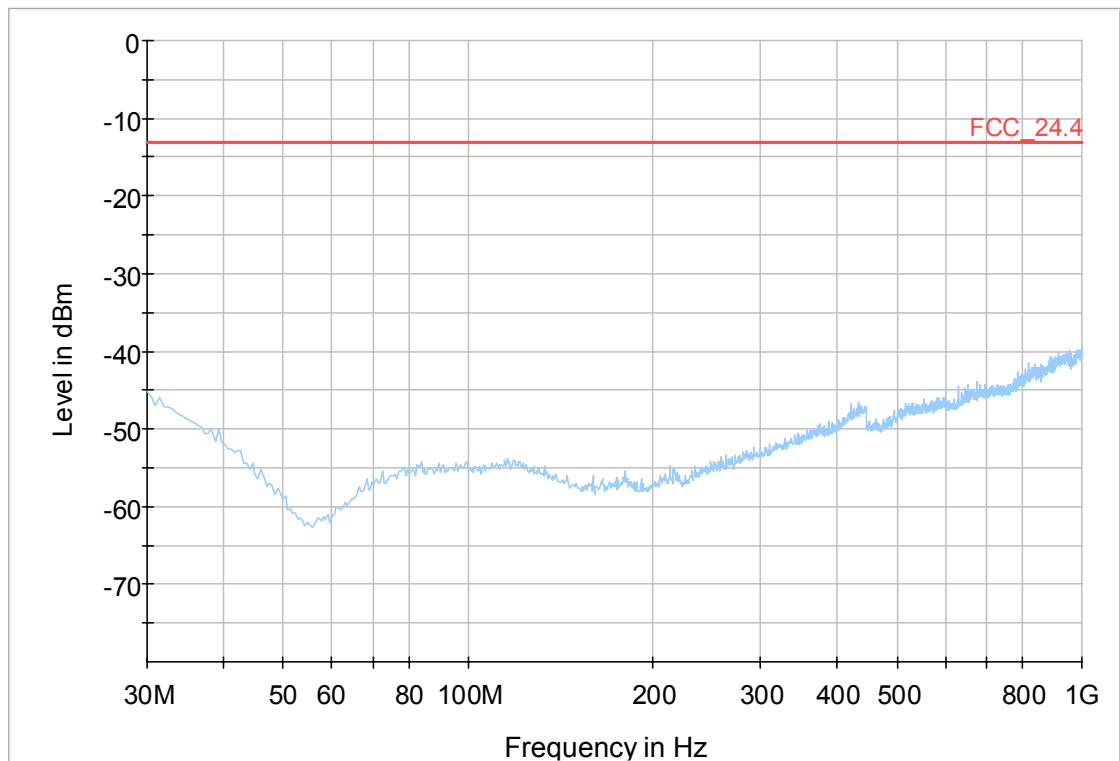
Critical_Freqs

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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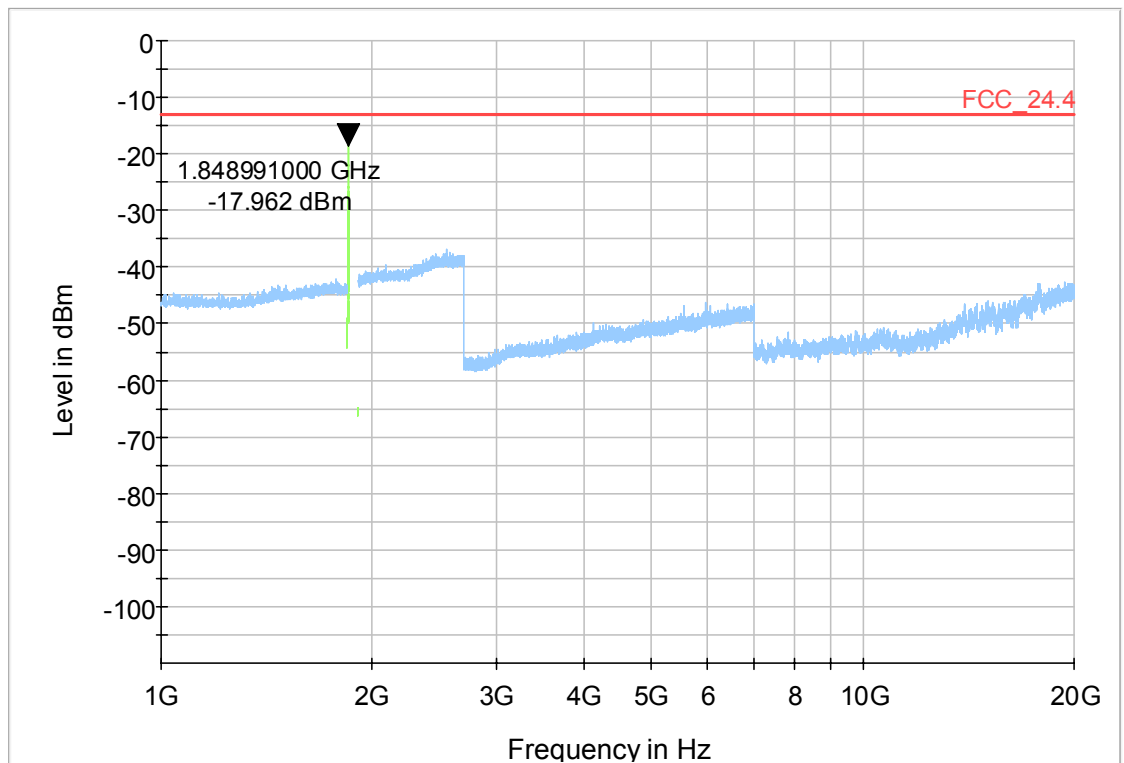
1GHz - 20GHz: WCDMA FDD2 Channel = low



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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30MHz - 1GHz: HSDPA FDD2 Channel = low



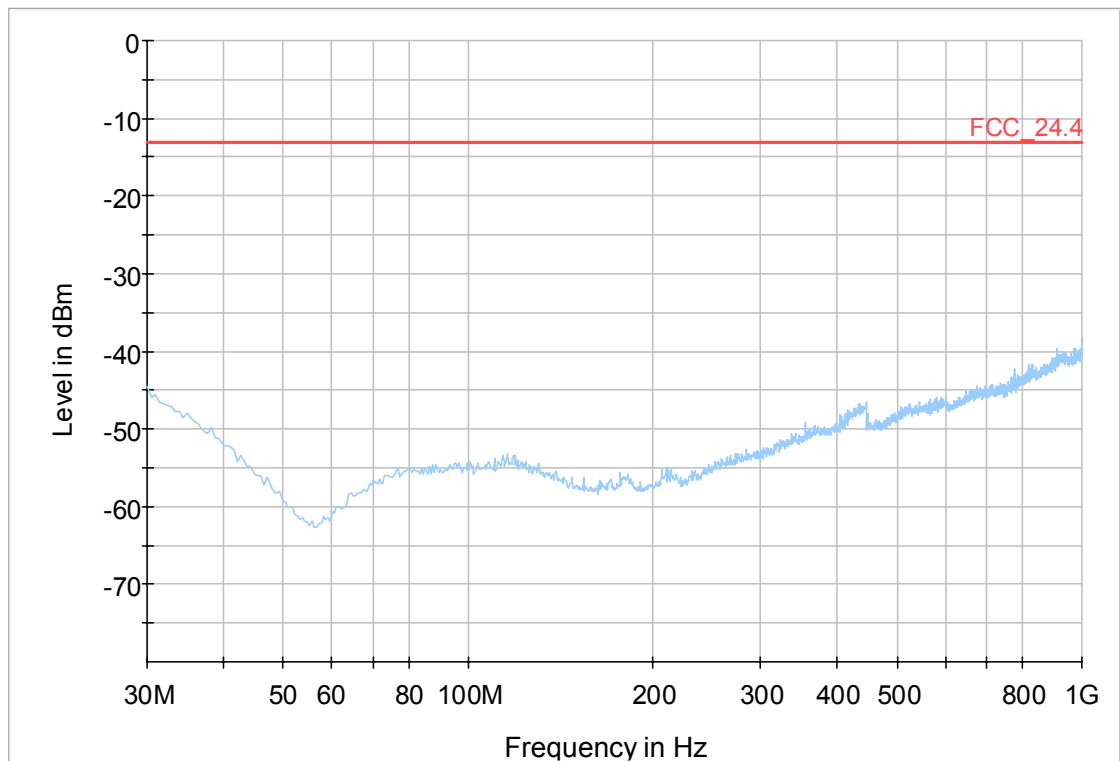
Critical_Freqs

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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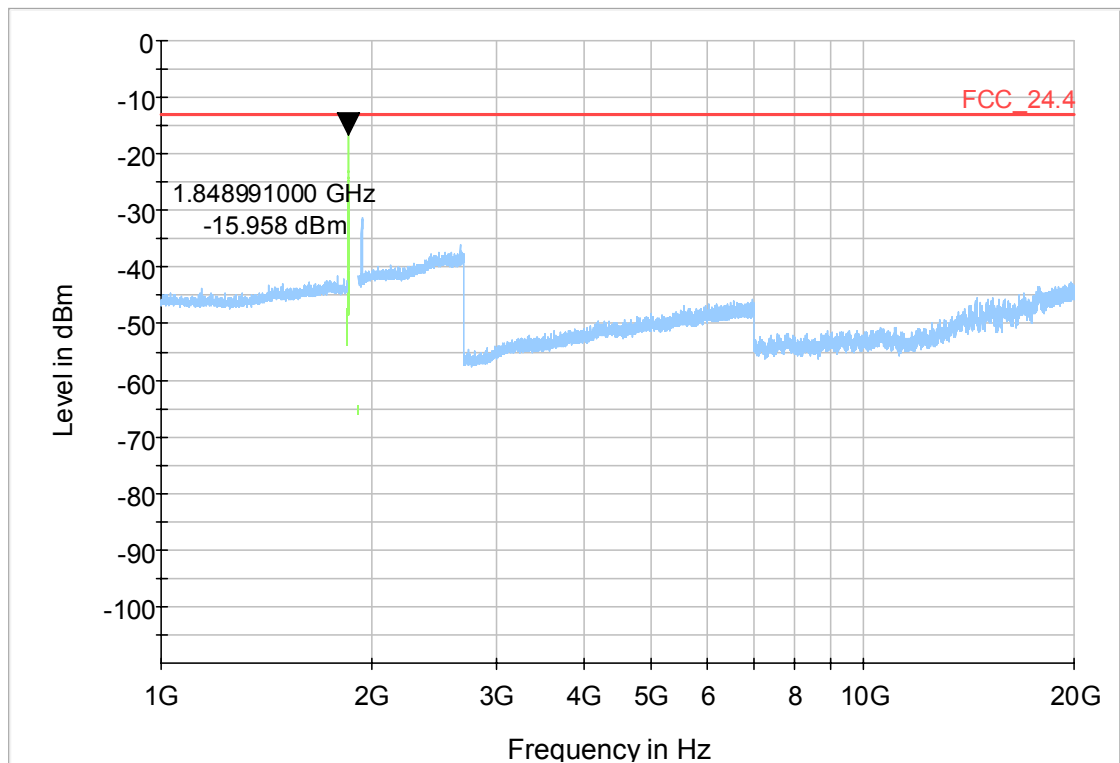
1GHz - 20GHz: HSDPA FDD2 Channel = low



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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30MHz - 1GHz: HSUPA FDD2 Channel = low



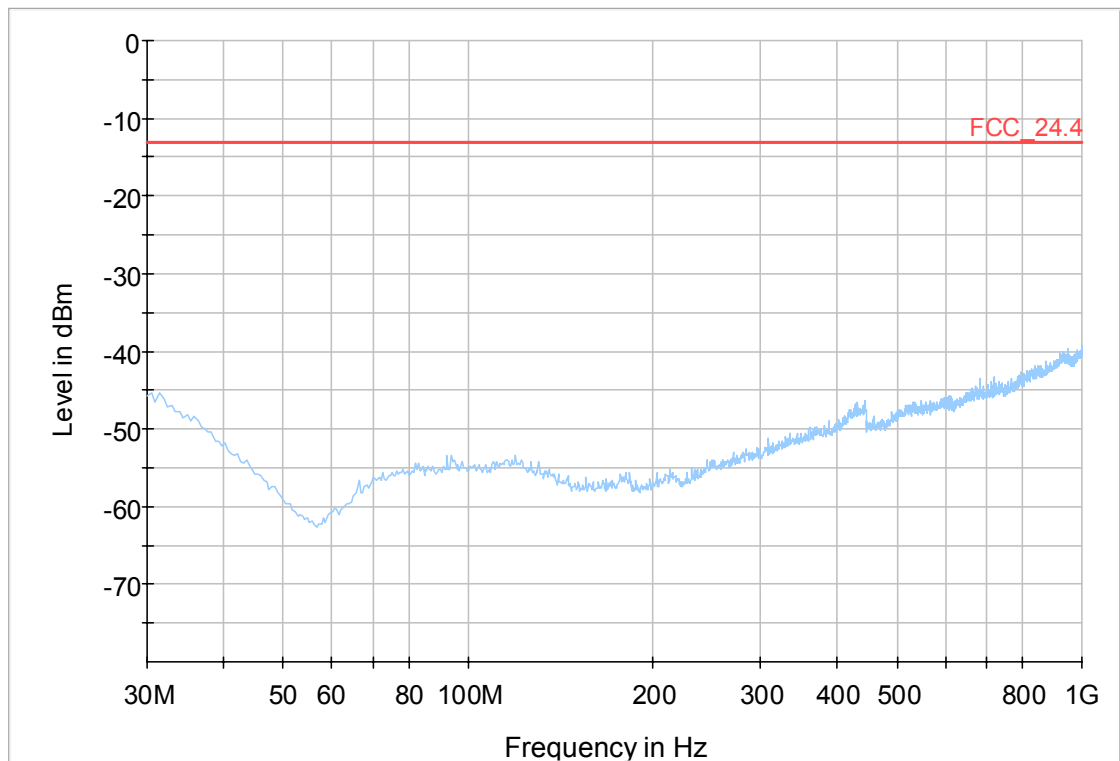
Critical_Freqs

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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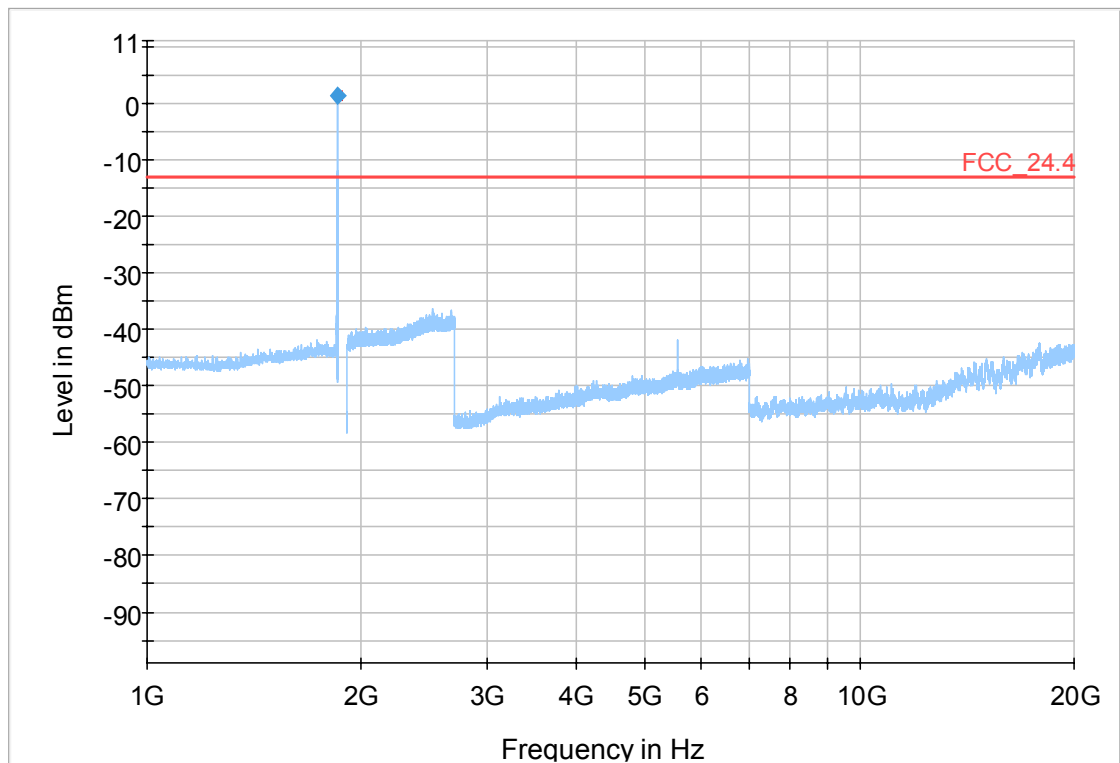
1GHz - 20GHz: HSUPA FDD2 Channel = low



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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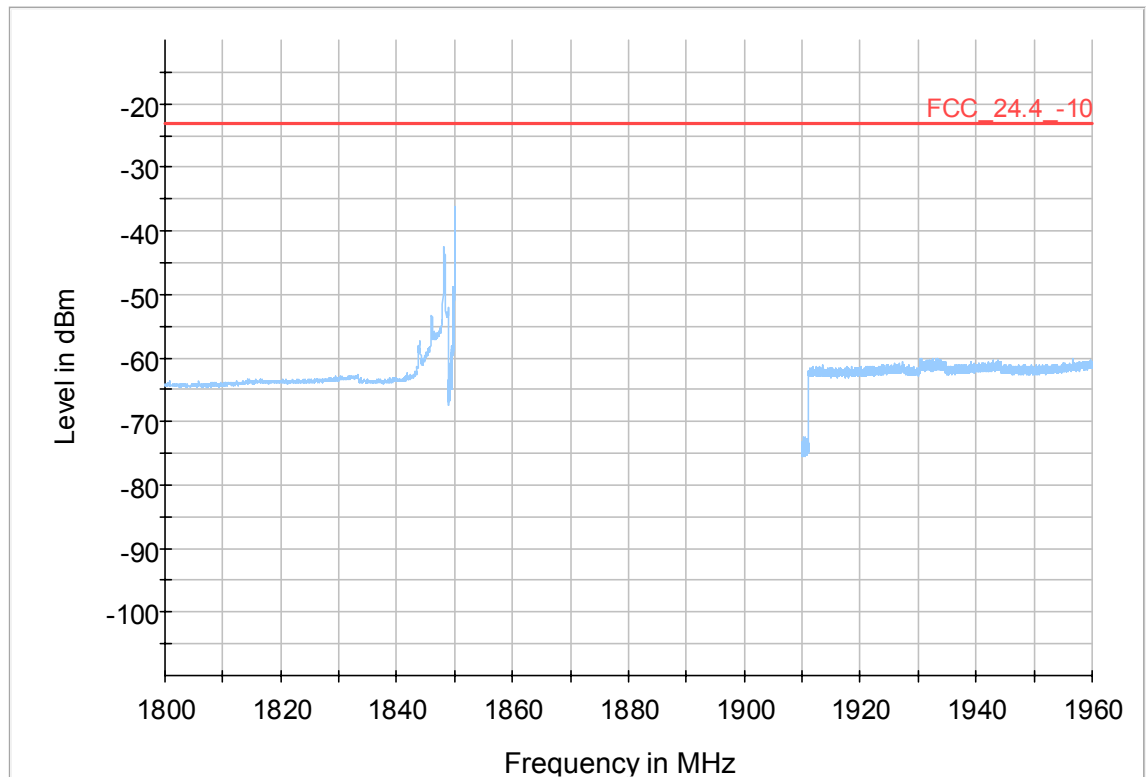
30MHz - 1GHz: LTE eFDD2 Channel = low



Final Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1849.000	1.4	-13.00	-14.38	1000.	1000.000	150.0	V	90.0	0.0	-65.6

1GHz - 20GHz: LTE eFDD2 Channel = low



final measurement at band edge: LTE eFDD2 Channel = low

3.5.12 24.5 Emission and Occupied Bandwidth §2.1049, §24.238

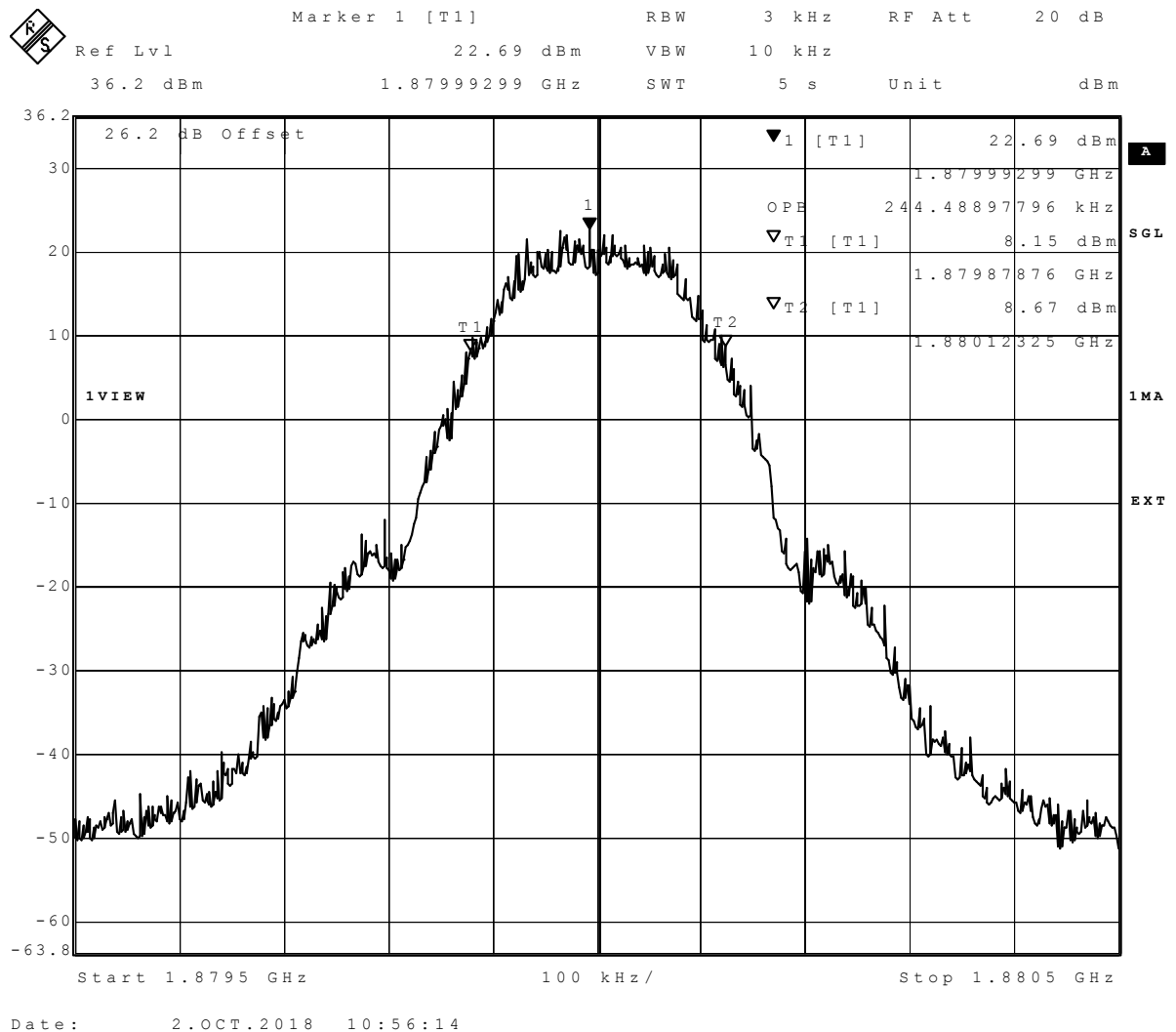
Test: 24.5; Emission and Occupied Bandwidth Summary §2.1049, §24.238

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 11:14
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

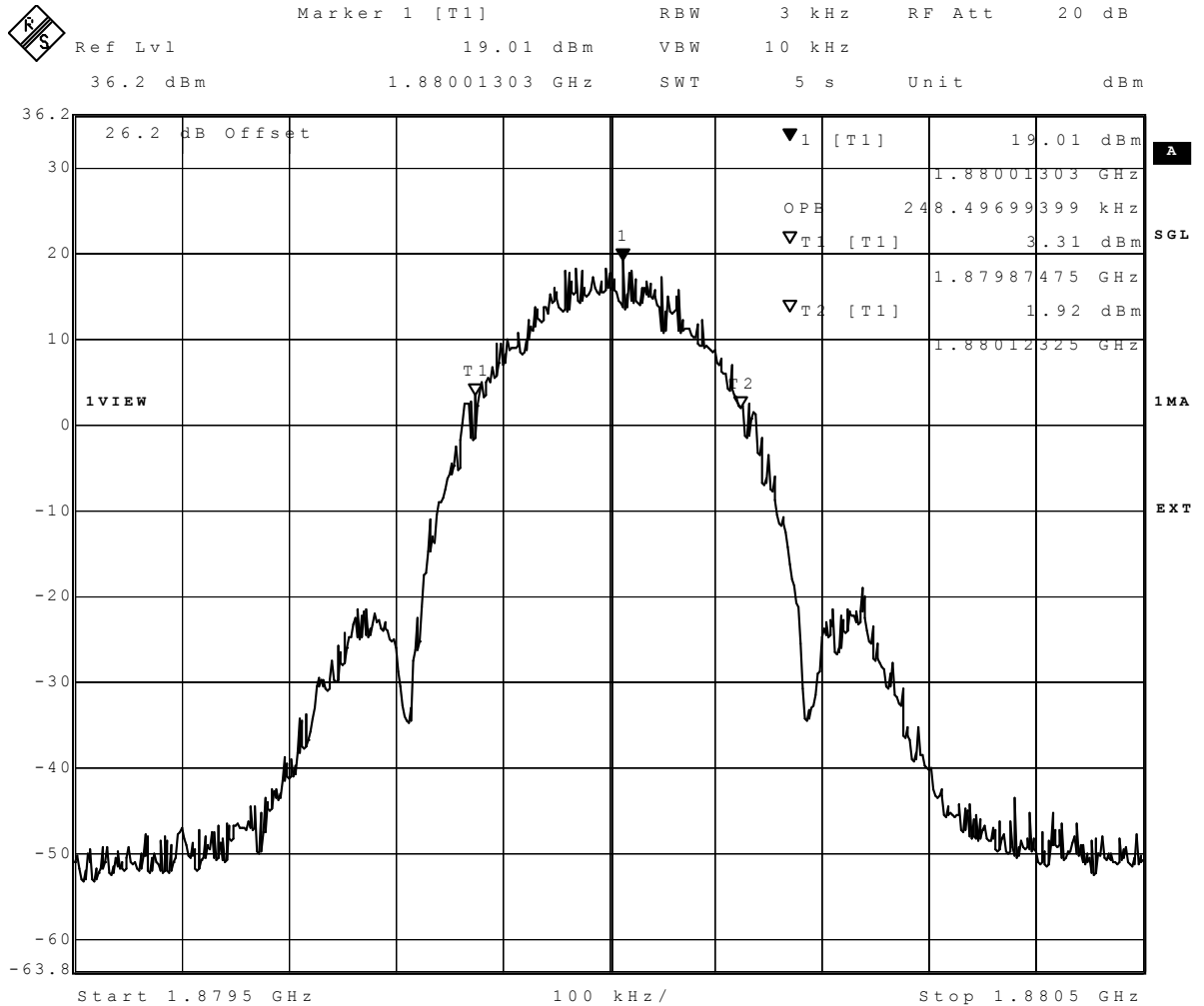
Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
GSM 1900	low	-	0.2	0.2	308.62	248.5
GSM 1900	mid	-	0.2	0.2	318.64	244.49
GSM 1900	high	-	0.2	0.2	314.63	242.48
GSM 1900 EDGE	low	-	0.2	0.2	314.63	248.5
GSM 1900 EDGE	mid	-	0.2	0.2	312.63	248.5
GSM 1900 EDGE	high	-	0.2	0.2	312.63	248.5
FDD II	low	-	5	5	4749.5	4128.26
FDD II	mid	-	5	5	4749.5	4128.26
FDD II	high	-	5	5	4769.54	4128.26
FDD II HSDPA Subtiesti 1	low	-	5	5	4729.46	4108.22
FDD II HSDPA Subtiesti 1	mid	-	5	5	4769.54	4128.26
FDD II HSDPA Subtiesti 1	high	-	5	5	4749.5	4128.26
FDD II HSUPA Subtiesti 1	low	-	5	5	4769.54	4148.3
FDD II HSUPA Subtiesti 1	mid	-	5	5	4749.5	4148.3
FDD II HSUPA Subtiesti 1	high	-	5	5	4749.5	4148.3
FDD II HSUPA Subtiesti 5	low	-	5	5	4749.5	4128.3
FDD II HSUPA Subtiesti 5	mid	-	5	5	4749.5	4148.3
FDD II HSUPA Subtiesti 5	high	-	5	5	4749.5	4128.3
eFDD 2 QPSK	low	6	1.4	1.4	-	1106.2
eFDD 2 QPSK	mid	6	1.4	1.4	-	1106.2
eFDD 2 QPSK	high	6	1.4	1.4	-	1100.2
eFDD 2 16QAM	low	6	1.4	1.4	-	1100.2
eFDD 2 16QAM	mid	6	1.4	1.4	-	1106.2
eFDD 2 16QAM	high	6	1.4	1.4	-	1100.2
eFDD 2 QPSK	low	15	3	3	-	2753.5
eFDD 2 QPSK	mid	15	3	3	-	2753.5
eFDD 2 QPSK	high	15	3	3	-	2765.5
eFDD 2 16QAM	low	15	3	3	-	2789.6
eFDD 2 16QAM	mid	15	3	3	-	2753.5
eFDD 2 16QAM	high	15	3	3	-	2753.5
eFDD 2 QPSK	low	25	5	5	-	4509.01
eFDD 2 QPSK	mid	25	5	5	-	4509.01
eFDD 2 QPSK	high	25	5	5	-	4509.01
eFDD 2 16QAM	low	25	5	5	-	4509.01
eFDD 2 16QAM	mid	25	5	5	-	4529.05
eFDD 2 16QAM	high	25	5	5	-	4529.05
eFDD 2 QPSK	low	50	10	10	-	9018.03
eFDD 2 QPSK	mid	50	10	10	-	9018.03
eFDD 2 QPSK	high	50	10	10	-	9018.03
eFDD 2 16QAM	low	50	10	10	-	9058.11
eFDD 2 16QAM	mid	50	10	10	-	9018.03
eFDD 2 16QAM	high	50	10	10	-	9018.03

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
eFDD 2 QPSK	low	75	15	15	-	13587.17
eFDD 2 QPSK	mid	75	15	15	-	13527.05
eFDD 2 QPSK	high	75	15	15	-	13466.93
eFDD 2 16QAM	low	75	15	15	-	13587.17
eFDD 2 16QAM	mid	75	15	15	-	13527.05
eFDD 2 16QAM	high	75	15	15	-	13466.93
eFDD 2 QPSK	low	100	20	20	-	18116.23
eFDD 2 QPSK	mid	100	20	20	-	18116.23
eFDD 2 QPSK	high	100	20	20	-	18036.07
eFDD 2 16QAM	low	100	20	20	-	18116.23
eFDD 2 16QAM	mid	100	20	20	-	18036.07
eFDD 2 16QAM	high	100	20	20	-	18036.07



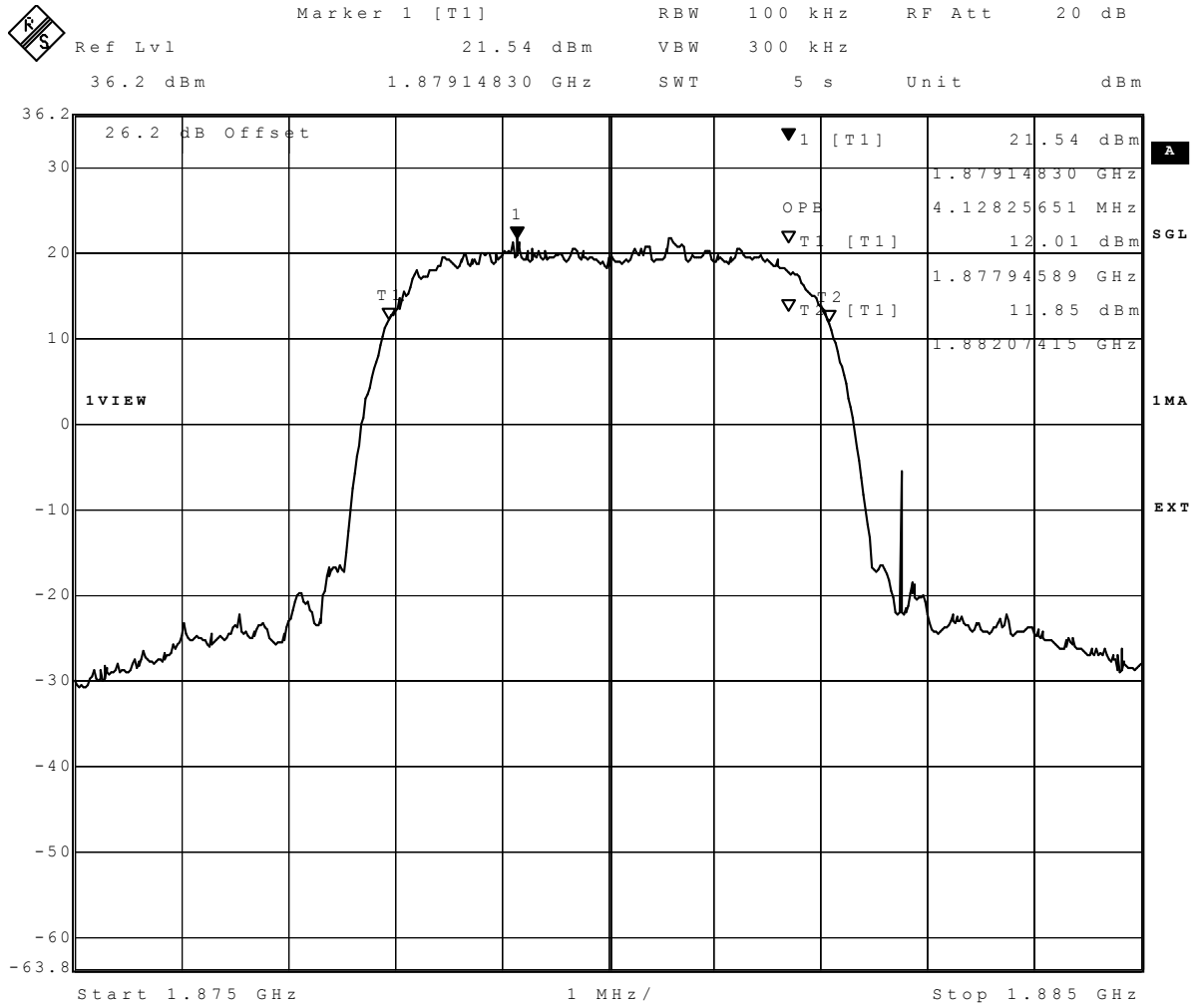
GSM 1900 Channel = mid

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 13:51:59

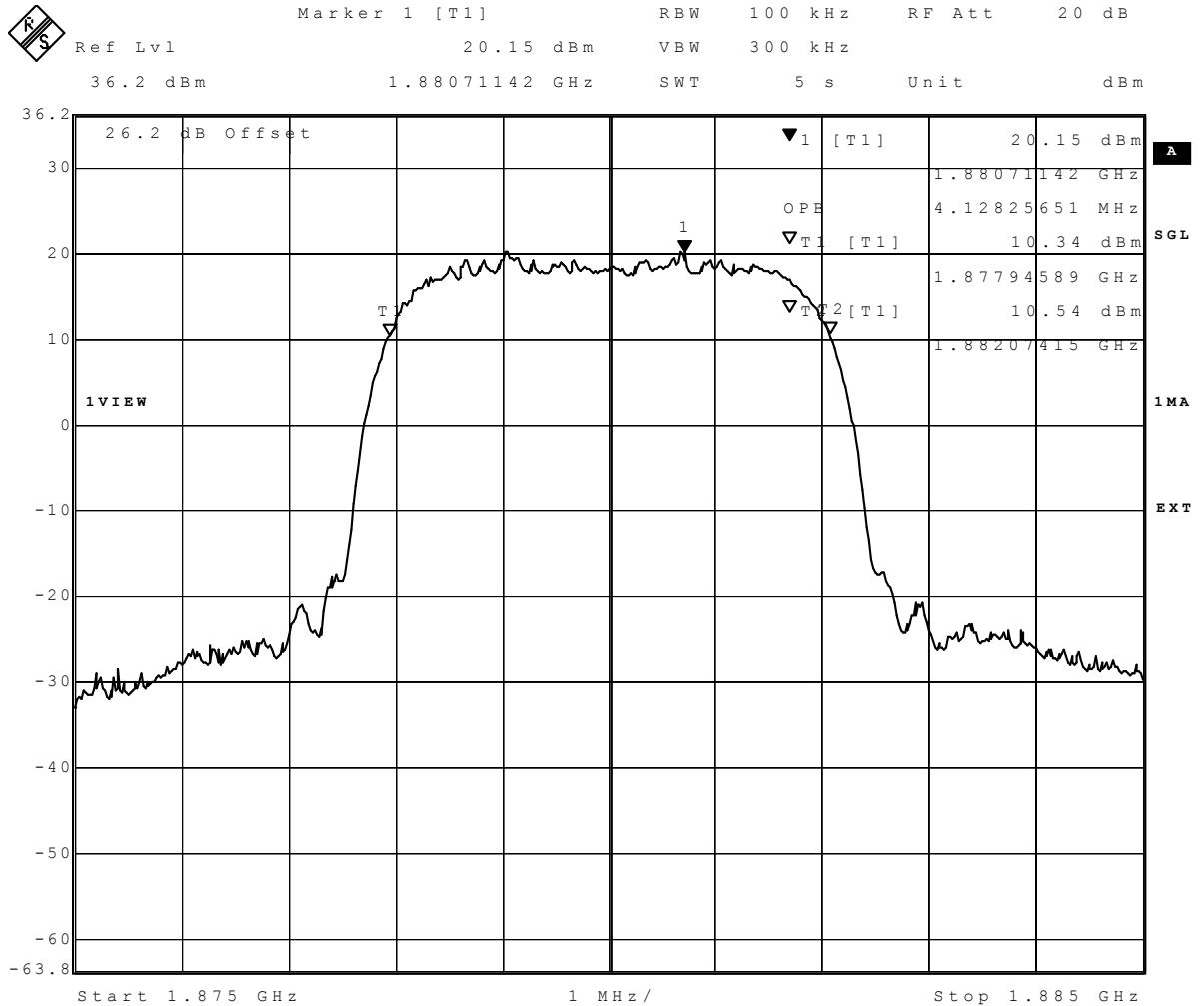
EDGE 1900 Channel = mid



Date: 2.OCT.2018 15:33:10

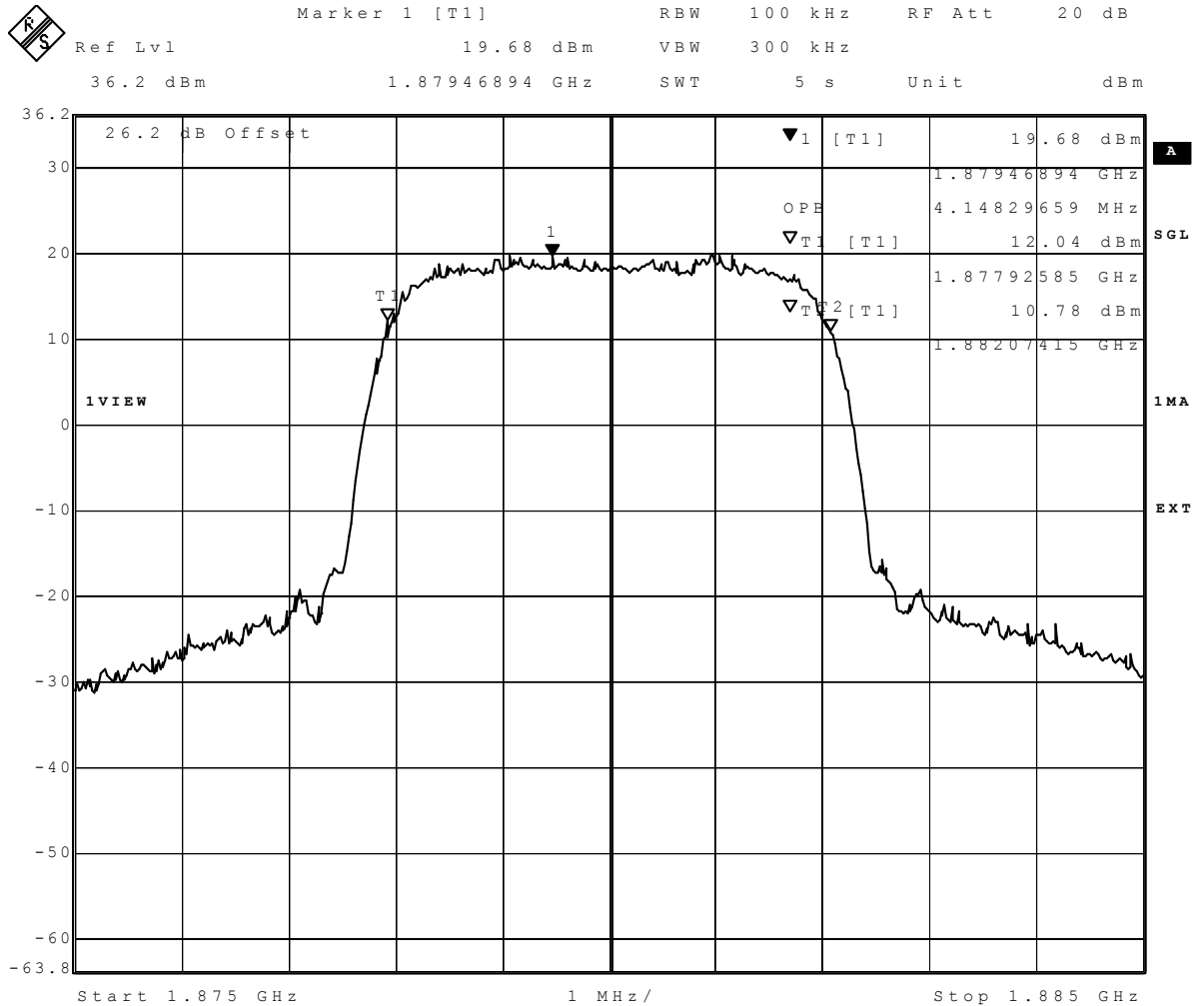
WCDMA FDD II Channel = mid

Reference: MDE_GEMALTO_1802_FCCb_rev01



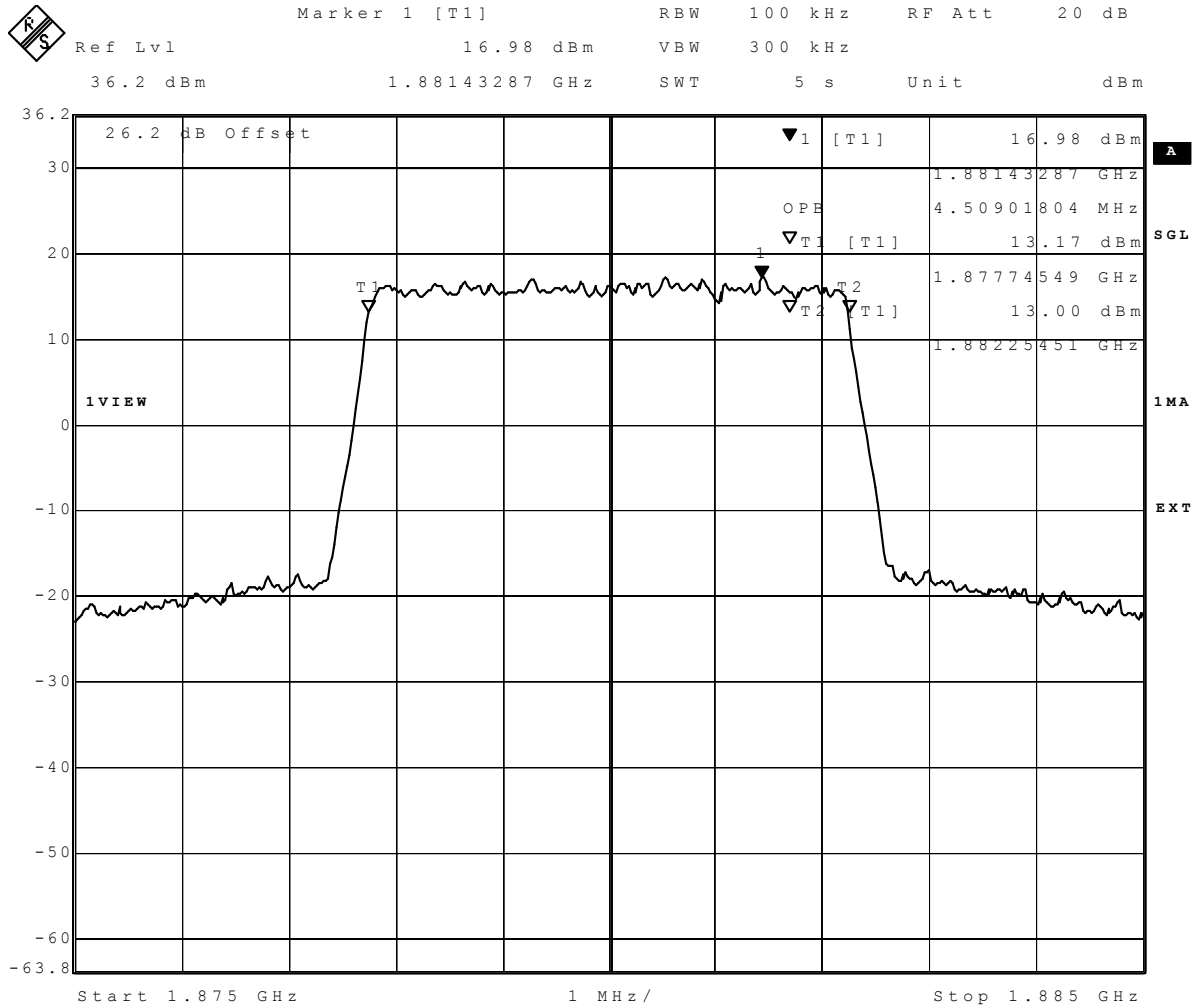
Date: 12.OCT.2018 15:43:23

HSDPA FDD II Channel = mid



Date: 12.OCT.2018 11:18:22

HSUPA FDD II Channel = high



Date: 1.OCT.2018 12:46:04

LTE eFDD 2 QPSK 5MHz Channel = mid

3.5.13 24.6 Band edge compliance §2.1053, §24.238

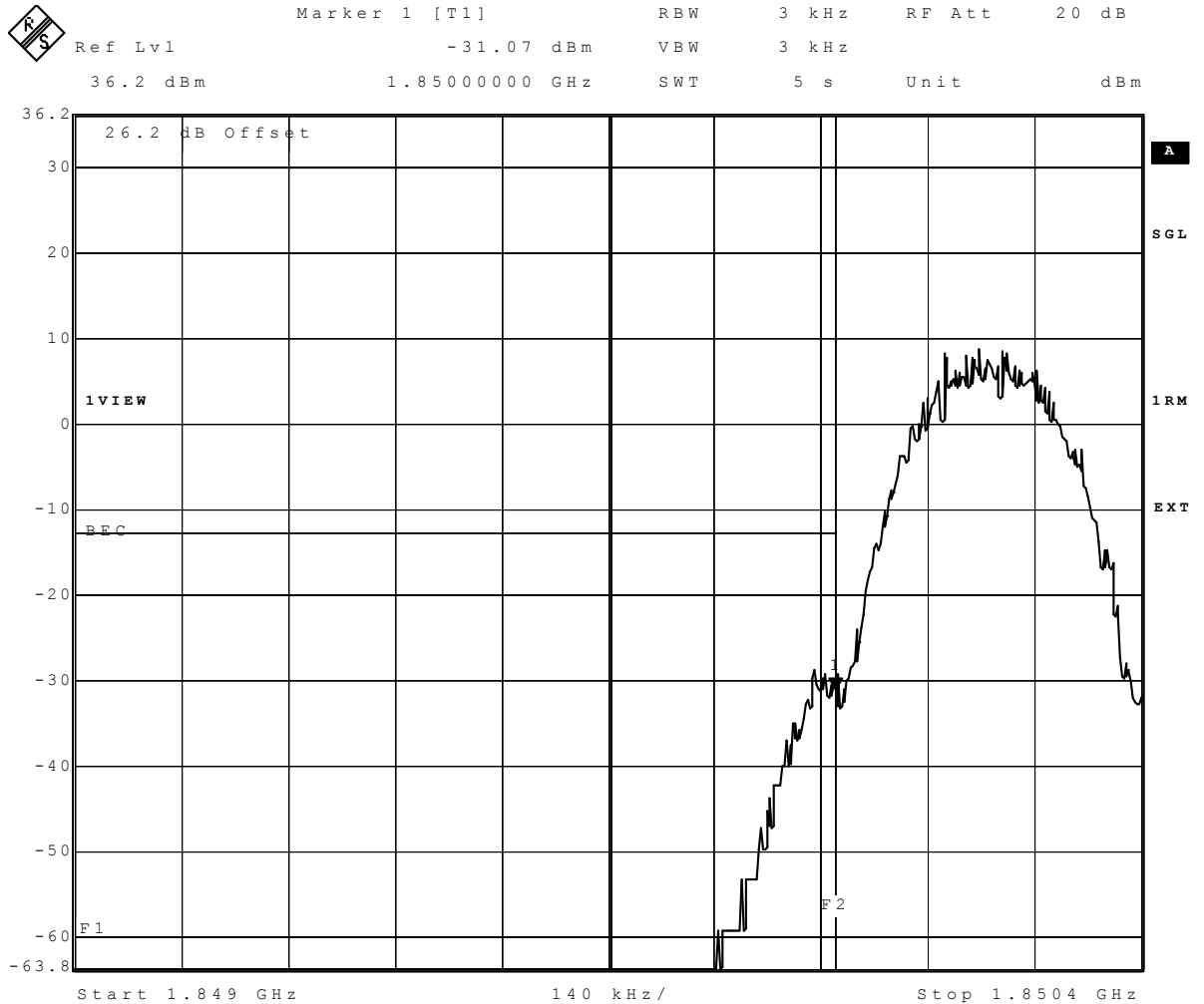
Test: 24.6; Band edge compliance summary §2.1053, §24.238

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 11:19
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

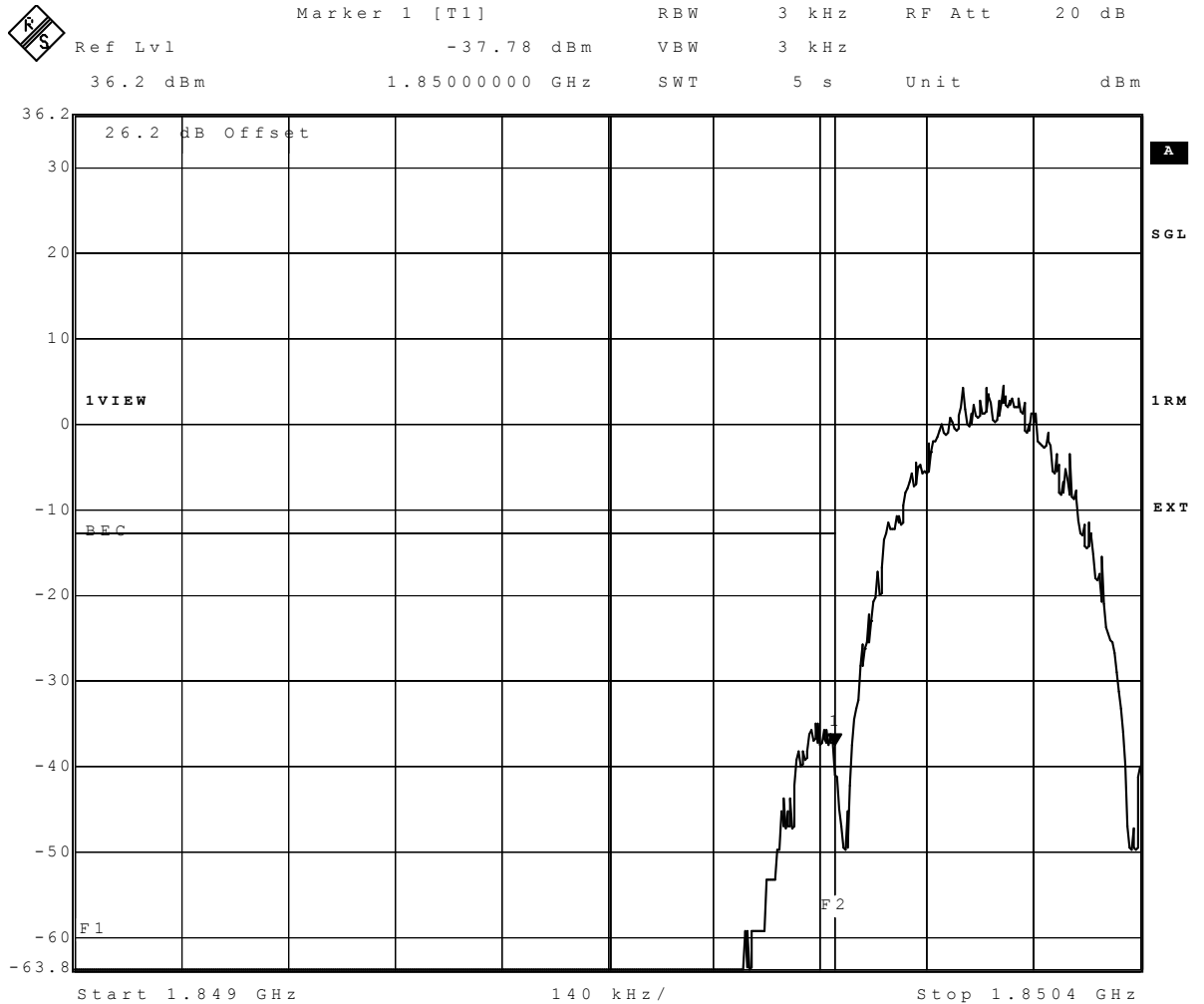
Radio Technology	Channel	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limiti [dBm]	Margin tio Limiti [dB]
GSM 1900	low	0.2	-	-15.95	-38.54	-31.07	-13	2.95
GSM 1900	high	0.2	-	-20.71	-40.28	-33.34	-13	7.71
GSM 1900 EDGE	low	0.2	-	-25.29	-45.39	-37.78	-13	12.29
GSM 1900 EDGE	high	0.2	-	-25.6	-47.32	-38.54	-13	12.6
FDD II	low	5	-	-15.68	-23.66	-22.84	-13	9.84
FDD II	high	5	-	-16.85	-26.3	-25.74	-13	12.74
FDD II HSDPA Subtiesti 1	low	5	-	-17.39	-25.92	-25.05	-13	12.05
FDD II HSDPA Subtiesti 1	high	5	-	-16.18	-25.74	-24.88	-13	11.88
FDD II HSUPA Subtiesti 1	low	5	-	-15.9	-25.56	-24.88	-13	11.88
FDD II HSUPA Subtiesti 1	high	5	-	-16.06	-25.92	-24.88	-13	11.88
FDD II HSUPA Subtiesti 5	low	5	-	-16.96	-25.21	-24.1	-13	11.1
FDD II HSUPA Subtiesti 5	high	5	-	-16.11	-26.3	-25.21	-13	12.21
eFDD 2 QPSK	low	1.4	6	-22.05	-30.74	-29.82	-13	16.82
eFDD 2 QPSK	high	1.4	6	-22.22	-30.42	-29.54	-13	16.54
eFDD 2 16QAM	low	1.4	6	-23.39	-31.76	-31.07	-13	18.07
eFDD 2 16QAM	high	1.4	6	-22.33	-31.76	-31.07	-13	18.07
eFDD 2 QPSK	low	3	15	-15.31	-26.9	-25.21	-13	12.21
eFDD 2 QPSK	high	3	15	-16.03	-28.24	-26.7	-13	13.7
eFDD 2 16QAM	low	3	15	-17.03	-29	-27.32	-13	14.32
eFDD 2 16QAM	high	3	15	-16.4	-28.74	-27.32	-13	14.32
eFDD 2 QPSK	low	5	25	-15.89	-29.26	-28	-13	15
eFDD 2 QPSK	high	5	25	-16.71	-30.12	-28.74	-13	15.74
eFDD 2 16QAM	low	5	25	-17.12	-31.41	-29.54	-13	16.54
eFDD 2 16QAM	high	5	25	-17.18	-31.41	-29.82	-13	16.82
eFDD 2 QPSK	low	10	50	-16.88	-30.12	-28.74	-13	15.74
eFDD 2 QPSK	high	10	50	-20.01	-31.76	-30.74	-13	17.74
eFDD 2 16QAM	low	10	50	-20.88	-32.52	-31.07	-13	18.07
eFDD 2 16QAM	high	10	50	-21.19	-33.34	-32.13	-13	19.13
eFDD 2 QPSK	low	15	75	-16.57	-29	-27.77	-13	14.77
eFDD 2 QPSK	high	15	75	-17.79	-30.12	-29	-13	16
eFDD 2 16QAM	low	15	75	-19.38	-31.41	-30.12	-13	17.12
eFDD 2 16QAM	high	15	75	-19.2	-32.13	-31.07	-13	18.07
eFDD 2 QPSK	low	20	100	-19.44	-31.41	-30.42	-13	17.42
eFDD 2 QPSK	high	20	100	-19.71	-32.13	-31.07	-13	18.07
eFDD 2 16QAM	low	20	100	-21.85	-33.34	-32.52	-13	19.52
eFDD 2 16QAM	high	20	100	-20.72	-33.79	-32.52	-13	19.52

Reference: MDE_GEMALTO_1802_FCCb_rev01



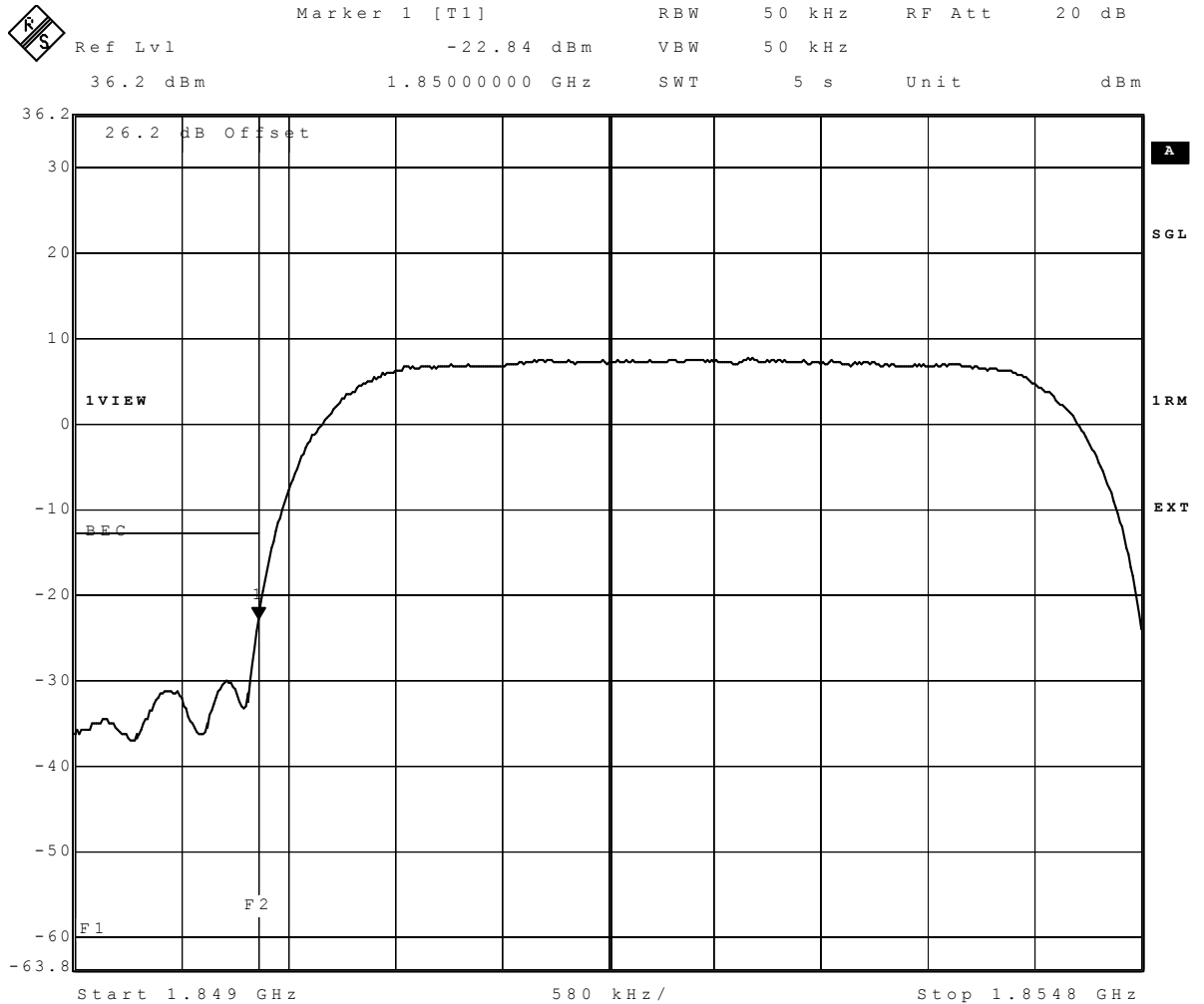
Date: 2.OCT.2018 11:10:21

GSM 1900 Channel = low



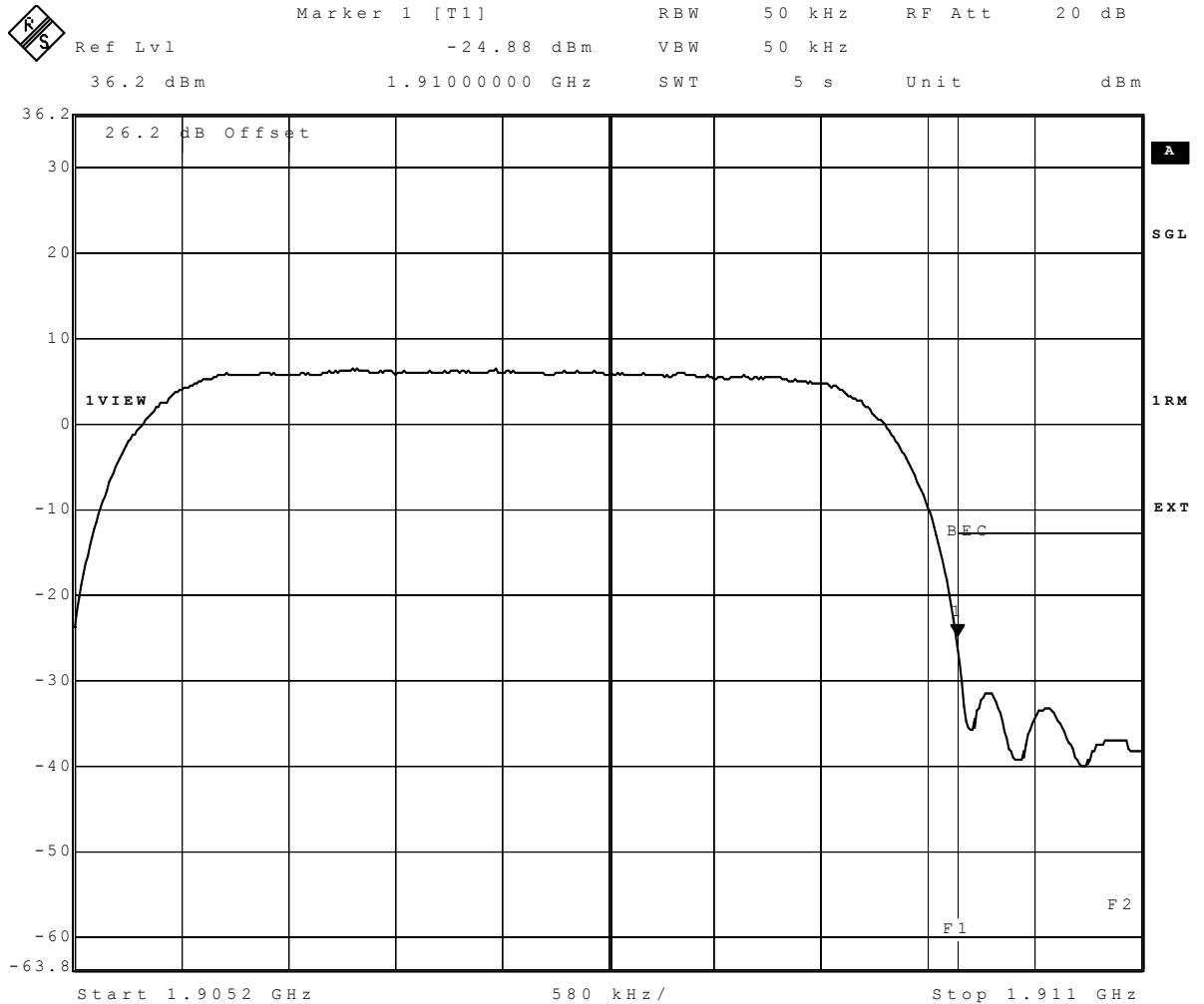
Date: 2.OCT.2018 14:54:48

EDGE 1900 Channel = low



Date: 2.OCT.2018 15:41:50

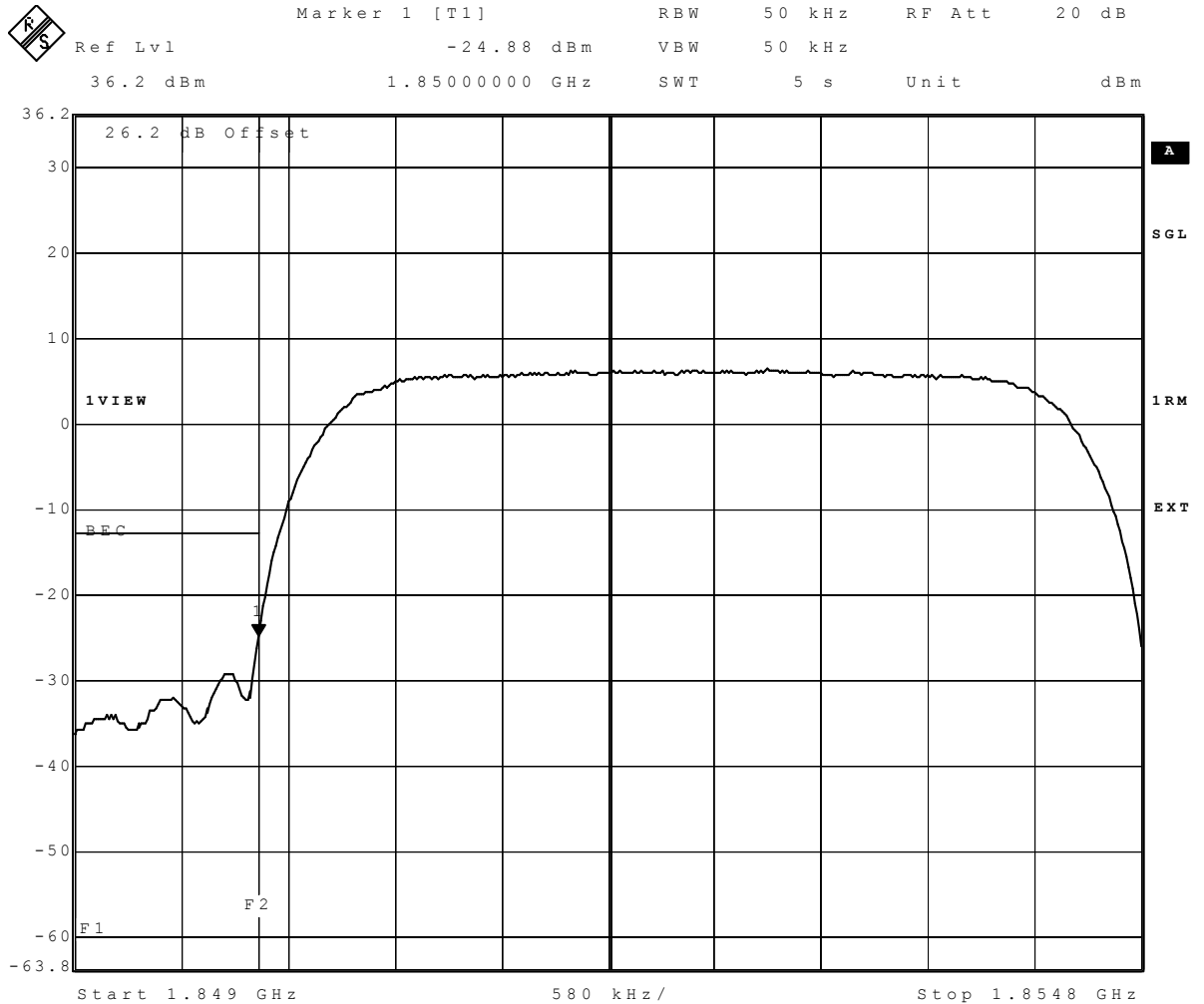
WCDMA FDD II Channel = low



Date: 12.OCT.2018 15:24:48

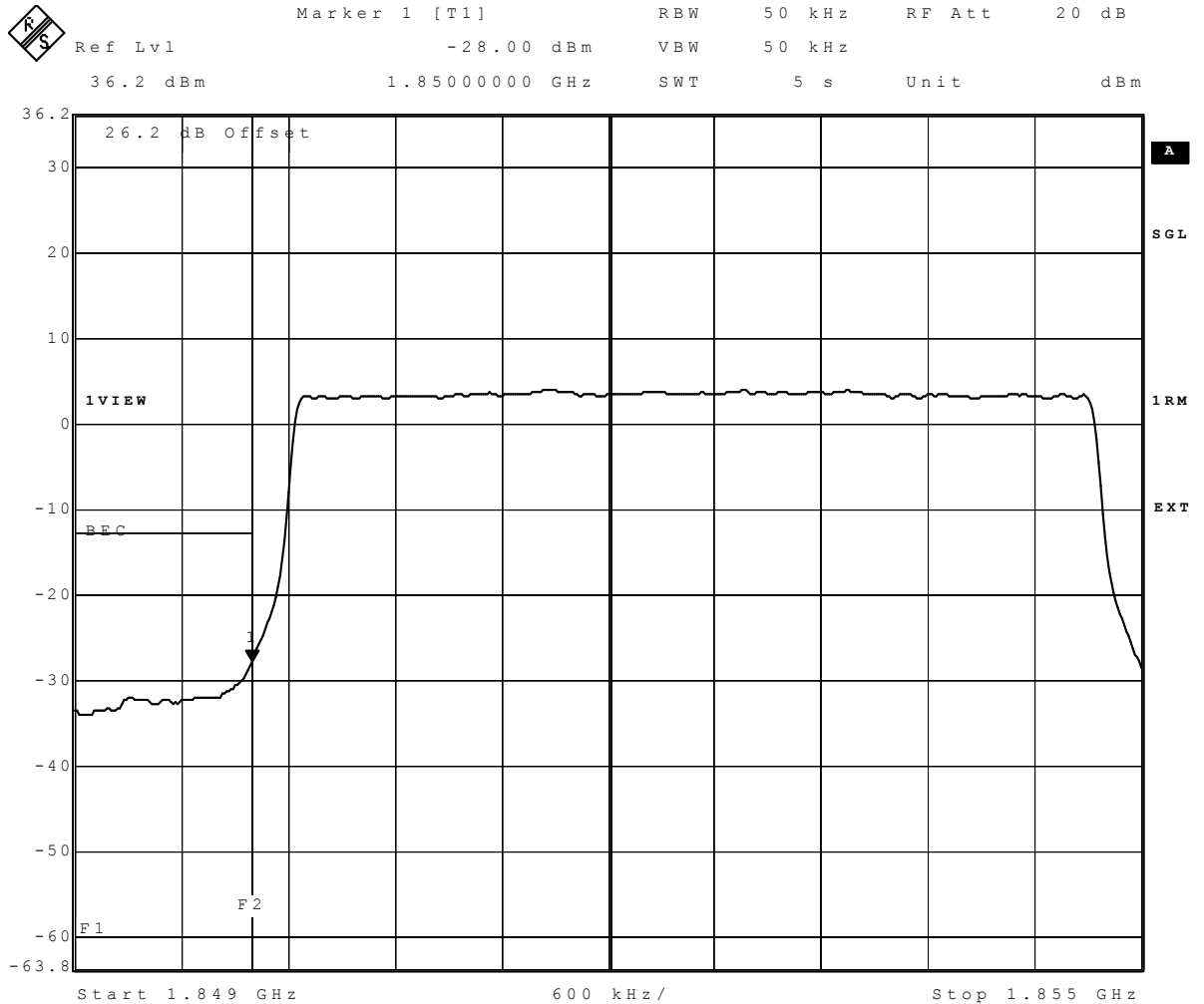
HSDPA FDD II Channel = high

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 12.OCT.2018 10:15:07

HSUPA FDD II Channel = low



Date: 9.OCT.2018 18:35:34

LTE eFDD2 QPSK Channel = low

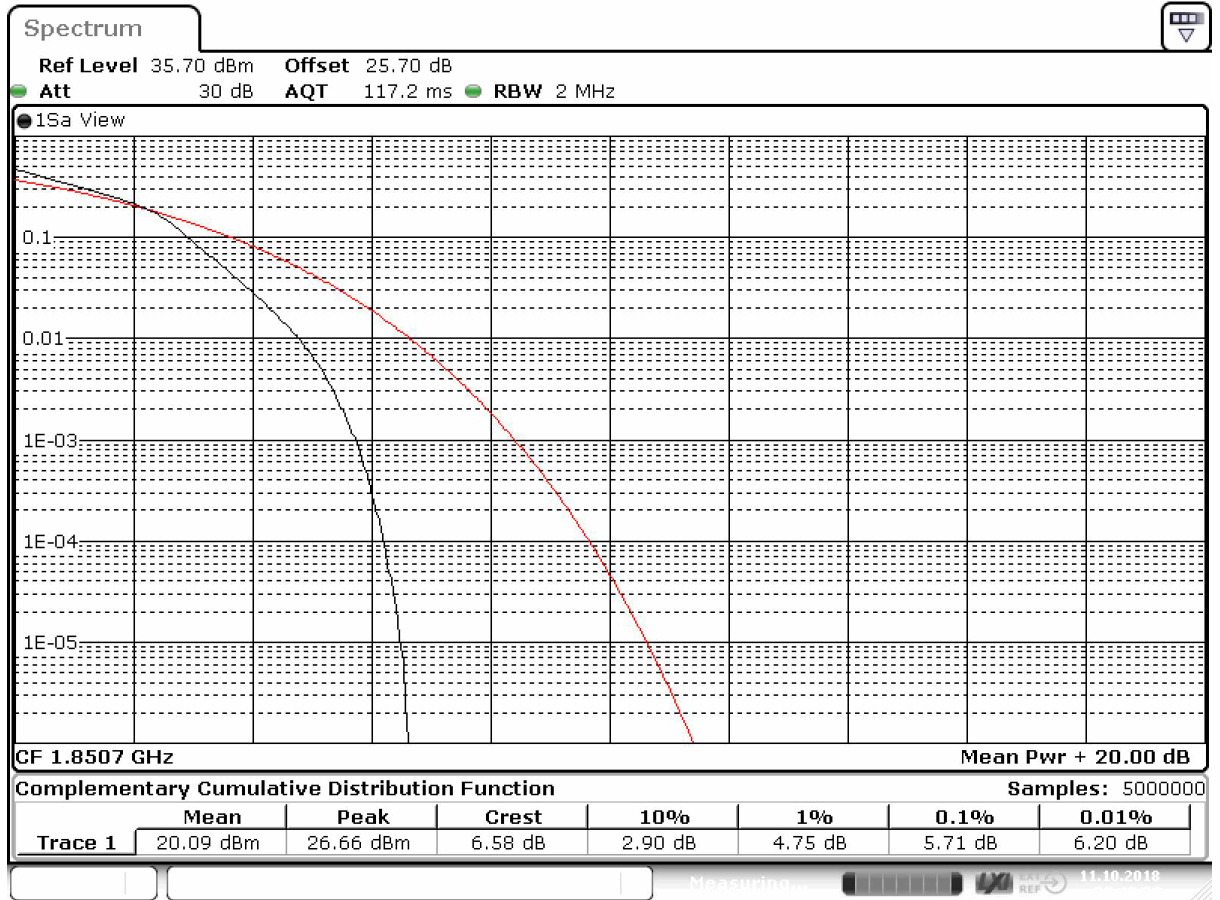
3.5.14 24.7 Peak-to-Average ratio §2.1046, §24.232

Test: 24.7; Peak-to-Average Ratio Summary §2.1046, §24.232

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/25 11:25
<i>Body:</i>	FCC47CFRChIPART24PERSONAL COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 24

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak to Average Ratio [dB]	Limiti (IC) [dB]
GSM 1900	low	-	0.2	0.03	13
GSM 1900	mid	-	0.2	0.03	13
GSM 1900	high	-	0.2	0.02	13
GSM 1900 EDGE	low	-	0.2	0.09	13
GSM 1900 EDGE	mid	-	0.2	0.46	13
GSM 1900 EDGE	high	-	0.2	0.15	13
FDD II	low	-	5	5.58	13
FDD II	mid	-	5	5.43	13
FDD II	high	-	5	5.82	13
FDD II HSDPA Subtiesti 1	low	-	5	5.34	13
FDD II HSDPA Subtiesti 1	mid	-	5	5.29	13
FDD II HSDPA Subtiesti 1	high	-	5	5.39	13
FDD II HSUPA Subtiesti 1	low	-	5	6.3	13
FDD II HSUPA Subtiesti 1	mid	-	5	7.19	13
FDD II HSUPA Subtiesti 1	high	-	5	7.53	13
FDD II HSUPA Subtiesti 5	low	-	5	6.71	13
FDD II HSUPA Subtiesti 5	mid	-	5	6.64	13
FDD II HSUPA Subtiesti 5	high	-	5	7.06	13
eFDD II QPSK	low	6	1.4	4.81	13
eFDD II QPSK	mid	6	1.4	4.7	13
eFDD II QPSK	high	6	1.4	4.78	13
eFDD II 16QAM	low	6	1.4	5.71	13
eFDD II 16QAM	mid	6	1.4	5.51	13
eFDD II 16QAM	high	6	1.4	5.57	13



Date: 11.OCT.2018 08:43:03

LTE eFDD2 16QAM Channel = low

3.5.15 27.1 RF Power Output §2.1046, §27.50

Test: 27.1; RF Power Output Summary §2.1046, §27.50

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/10 15:31
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
FDD IV	low	-	5	30.78	25.16	25.32	1	1	4.68	4.68
FDD IV	mid 1	-	5	30.78	25.27	25.38	1	1	4.62	4.62
FDD IV	mid 2	-	5	31.03	25.25	25.37	1	1	4.63	4.63
FDD IV	high	-	5	30.68	25.16	25.3	1	1	4.7	4.7
FDD IV HSDPA Subtest 1	low	-	5	29.33	23.95	24.14	1	1	5.86	5.86
FDD IV HSDPA Subtest 1	mid 1	-	5	29.33	23.94	24.27	1	1	5.73	5.73
FDD IV HSDPA Subtest 1	mid 2	-	5	29.43	23.97	24.05	1	1	5.95	5.95
FDD IV HSDPA Subtest 1	high	-	5	29.33	23.93	24.05	1	1	5.95	5.95
FDD IV HSDPA Subtest 2	low	-	5	29.69	23.13	23.68	1	1	6.32	6.32
FDD IV HSDPA Subtest 2	mid 1	-	5	30.11	23.31	23.79	1	1	6.21	6.21
FDD IV HSDPA Subtest 2	mid 2	-	5	29.69	23.23	23.78	1	1	6.22	6.22
FDD IV HSDPA Subtest 2	high	-	5	30.56	23.19	23.75	1	1	6.25	6.25
FDD IV HSDPA Subtest 3	low	-	5	29.88	23.08	23.77	1	1	6.23	6.23
FDD IV HSDPA Subtest 3	mid 1	-	5	29.88	23.1	23.8	1	1	6.2	6.2
FDD IV HSDPA Subtest 3	mid 2	-	5	30.41	23.17	23.8	1	1	6.2	6.2
FDD IV HSDPA Subtest 3	high	-	5	29.88	23.17	23.86	1	1	6.14	6.14
FDD IV HSDPA Subtest 4	low	-	5	30.78	23.08	23.78	1	1	6.22	6.22
FDD IV HSDPA Subtest 4	mid 1	-	5	30.11	23.16	23.87	1	1	6.13	6.13
FDD IV HSDPA Subtest 4	mid 2	-	5	30.68	23.21	23.84	1	1	6.16	6.16
FDD IV HSDPA Subtest 4	high	-	5	30.26	23.01	23.86	1	1	6.14	6.14
FDD IV HSUPA Subtest 1	low	-	5	30.78	23.87	24.19	1	1	5.81	5.81
FDD IV HSUPA Subtest 1	mid 1	-	5	31.25	23.97	24.26	1	1	5.74	5.74
FDD IV HSUPA Subtest 1	mid 2	-	5	31.1	23.99	24.55	1	1	5.45	5.45
FDD IV HSUPA Subtest 1	high	-	5	30.88	23.72	24.09	1	1	5.91	5.91
FDD IV HSUPA Subtest 2	low	-	5	30.56	21.73	22.34	1	1	7.66	7.66
FDD IV HSUPA Subtest 2	mid 1	-	5	30.78	21.9	22.4	1	1	7.6	7.6
FDD IV HSUPA Subtest 2	mid 2	-	5	30.68	21.72	22.52	1	1	7.48	7.48
FDD IV HSUPA Subtest 2	high	-	5	30.68	21.61	22.35	1	1	7.65	7.65
FDD IV HSUPA Subtest 3	low	-	5	31.18	23.46	23.94	1	1	6.06	6.06
FDD IV HSUPA Subtest 3	mid 1	-	5	31.1	23.48	24.15	1	1	5.85	5.85
FDD IV HSUPA Subtest 3	mid 2	-	5	32.09	23.4	24.05	1	1	5.95	5.95
FDD IV HSUPA Subtest 3	high	-	5	31.41	23.26	24.04	1	1	5.96	5.96
FDD IV HSUPA Subtest 4	low	-	5	29.33	22.08	22.34	1	1	7.66	7.66
FDD IV HSUPA Subtest 4	mid 1	-	5	30.26	21.61	22.53	1	1	7.47	7.47
FDD IV HSUPA Subtest 4	mid 2	-	5	30.41	21.68	22.42	1	1	7.58	7.58
FDD IV HSUPA Subtest 4	high	-	5	30.41	21.47	22.3	1	1	7.7	7.7
FDD IV HSUPA Subtest 5	low	-	5	30.96	23.94	24.24	1	1	5.76	5.76
FDD IV HSUPA Subtest 5	mid 1	-	5	30.96	23.98	24.27	1	1	5.73	5.73
FDD IV HSUPA Subtest 5	mid 2	-	5	31.03	23.95	24.25	1	1	5.75	5.75
FDD IV HSUPA Subtest 5	high	-	5	30.88	23.85	24.2	1	1	5.8	5.8

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 4 QPSK	low	1	1.4	-	-	22.63	1	1	7.37	7.37
eFDD 4 QPSK	low	3	1.4	-	-	22.53	1	1	7.47	7.47
eFDD 4 QPSK	low	6	1.4	-	-	21.27	1	1	8.73	8.73
eFDD 4 QPSK	mid	1	1.4	-	-	22.92	1	1	7.08	7.08
eFDD 4 QPSK	mid	3	1.4	-	-	22.48	1	1	7.52	7.52
eFDD 4 QPSK	mid	6	1.4	-	-	21.37	1	1	8.63	8.63
eFDD 4 QPSK	high	1	1.4	-	-	22.87	1	1	7.13	7.13
eFDD 4 QPSK	high	3	1.4	-	-	22.33	1	1	7.67	7.67
eFDD 4 QPSK	high	6	1.4	-	-	21.23	1	1	8.77	8.77
eFDD 4 16QAM	low	1	1.4	-	-	21.67	1	1	8.33	8.33
eFDD 4 16QAM	low	6	1.4	-	-	20.33	1	1	9.67	9.67
eFDD 4 16QAM	mid	1	1.4	-	-	21.72	1	1	8.28	8.28
eFDD 4 16QAM	mid	6	1.4	-	-	20.37	1	1	9.63	9.63
eFDD 4 16QAM	high	1	1.4	-	-	21.83	1	1	8.17	8.17
eFDD 4 16QAM	high	6	1.4	-	-	20.33	1	1	9.67	9.67
eFDD 4 QPSK	low	1	3	-	-	23.22	1	1	6.78	6.78
eFDD 4 QPSK	low	15	3	-	-	21.81	1	1	8.19	8.19
eFDD 4 QPSK	mid	1	3	-	-	23.25	1	1	6.75	6.75
eFDD 4 QPSK	mid	15	3	-	-	21.87	1	1	8.13	8.13
eFDD 4 QPSK	high	1	3	-	-	23.18	1	1	6.82	6.82
eFDD 4 QPSK	high	15	3	-	-	20.82	1	1	9.18	9.18
eFDD 4 16QAM	low	1	3	-	-	22.19	1	1	7.81	7.81
eFDD 4 16QAM	low	15	3	-	-	20.76	1	1	9.24	9.24
eFDD 4 16QAM	mid	1	3	-	-	22.28	1	1	7.72	7.72
eFDD 4 16QAM	mid	15	3	-	-	20.89	1	1	9.11	9.11
eFDD 4 16QAM	high	1	3	-	-	22.25	1	1	7.75	7.75
eFDD 4 16QAM	high	15	3	-	-	20.82	1	1	9.18	9.18
eFDD 4 QPSK	low	1	5	-	-	22.25	1	1	7.75	7.75
eFDD 4 QPSK	low	12	5	-	-	21.76	1	1	8.24	8.24
eFDD 4 QPSK	low	25	5	-	-	21.75	1	1	8.25	8.25
eFDD 4 QPSK	mid	1	5	-	-	23.23	1	1	6.77	6.77
eFDD 4 QPSK	mid	12	5	-	-	21.75	1	1	8.25	8.25
eFDD 4 QPSK	mid	25	5	-	-	21.83	1	1	8.17	8.17
eFDD 4 QPSK	high	1	5	-	-	23.26	1	1	6.74	6.74
eFDD 4 QPSK	high	12	5	-	-	21.78	1	1	8.22	8.22
eFDD 4 QPSK	high	25	5	-	-	21.71	1	1	8.29	8.29
eFDD 4 16QAM	low	1	5	-	-	22.46	1	1	7.54	7.54
eFDD 4 16QAM	low	25	5	-	-	20.8	1	1	9.2	9.2
eFDD 4 16QAM	mid	1	5	-	-	22.24	1	1	7.76	7.76
eFDD 4 16QAM	mid	25	5	-	-	20.82	1	1	9.18	9.18
eFDD 4 16QAM	high	1	5	-	-	22.4	1	1	7.6	7.6
eFDD 4 16QAM	high	25	5	-	-	20.73	1	1	9.27	9.27

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 4 QPSK	low	1	10	-	-	23.44	1	1	6.56	6.56
eFDD 4 QPSK	low	50	10	-	-	22.13	1	1	7.87	7.87
eFDD 4 QPSK	mid	1	10	-	-	23.47	1	1	6.53	6.53
eFDD 4 QPSK	mid	50	10	-	-	22.19	1	1	7.81	7.81
eFDD 4 QPSK	high	1	10	-	-	23.33	1	1	6.67	6.67
eFDD 4 QPSK	high	50	10	-	-	22.11	1	1	7.89	7.89
eFDD 4 16QAM	low	1	10	-	-	22.29	1	1	7.71	7.71
eFDD 4 16QAM	low	50	10	-	-	21.16	1	1	8.84	8.84
eFDD 4 16QAM	mid	1	10	-	-	22.24	1	1	7.76	7.76
eFDD 4 16QAM	mid	50	10	-	-	20.82	1	1	9.18	9.18
eFDD 4 16QAM	high	1	10	-	-	22.53	1	1	7.47	7.47
eFDD 4 16QAM	high	50	10	-	-	21.18	1	1	8.82	8.82
eFDD 4 QPSK	low	1	15	-	-	23.43	1	1	6.57	6.57
eFDD 4 QPSK	low	36	15	-	-	22.28	1	1	7.72	7.72
eFDD 4 QPSK	low	75	15	-	-	22.23	1	1	7.77	7.77
eFDD 4 QPSK	mid	1	15	-	-	23.47	1	1	6.53	6.53
eFDD 4 QPSK	mid	36	15	-	-	22.29	1	1	7.71	7.71
eFDD 4 QPSK	mid	75	15	-	-	22.22	1	1	7.78	7.78
eFDD 4 QPSK	high	1	15	-	-	23.35	1	1	6.65	6.65
eFDD 4 QPSK	high	36	15	-	-	22.24	1	1	7.76	7.76
eFDD 4 QPSK	high	75	15	-	-	22.13	1	1	7.87	7.87
eFDD 4 16QAM	low	1	15	-	-	22.36	1	1	7.64	7.64
eFDD 4 16QAM	low	75	15	-	-	21.22	1	1	8.78	8.78
eFDD 4 16QAM	mid	1	15	-	-	22.44	1	1	7.56	7.56
eFDD 4 16QAM	mid	75	15	-	-	21.26	1	1	8.74	8.74
eFDD 4 16QAM	high	1	15	-	-	22.41	1	1	7.59	7.59
eFDD 4 16QAM	high	75	15	-	-	21.19	1	1	8.81	8.81
eFDD 4 QPSK	low	1	20	-	-	23.35	1	1	6.65	6.65
eFDD 4 QPSK	low	100	20	-	-	22.34	1	1	7.66	7.66
eFDD 4 QPSK	mid	1	20	-	-	23.49	1	1	6.51	6.51
eFDD 4 QPSK	mid	100	20	-	-	22.37	1	1	7.63	7.63
eFDD 4 QPSK	high	1	20	-	-	23.36	1	1	6.64	6.64
eFDD 4 QPSK	high	100	20	-	-	22.27	1	1	7.73	7.73
eFDD 4 16QAM	low	1	20	-	-	22.32	1	1	7.68	7.68
eFDD 4 16QAM	low	100	20	-	-	21.37	1	1	8.63	8.63
eFDD 4 16QAM	mid	1	20	-	-	22.63	1	1	7.37	7.37
eFDD 4 16QAM	mid	100	20	-	-	21.35	1	1	8.65	8.65
eFDD 4 16QAM	high	1	20	-	-	22.3	1	1	7.7	7.7
eFDD 4 16QAM	high	100	20	-	-	21.28	1	1	8.72	8.72
eFDD 7 QPSK	low	1	5		-	23.35	2	2	6.65	6.65
eFDD 7 QPSK	low	12	5		-	21.87	2	2	8.13	8.13
eFDD 7 QPSK	low	25	5		-	21.85	2	2	8.15	8.15

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 7 QPSK	mid	1	5		-	23.27	2	2	6.73	6.73
eFDD 7 QPSK	mid	12	5		-	21.8	2	2	8.2	8.2
eFDD 7 QPSK	mid	25	5		-	21.73	2	2	8.27	8.27
eFDD 7 QPSK	high	1	5		-	23.24	2	2	6.76	6.76
eFDD 7 QPSK	high	12	5		-	21.82	2	2	8.18	8.18
eFDD 7 QPSK	high	25	5		-	21.78	2	2	8.22	8.22
eFDD 7 16QAM	low	1	5		-	22.44	2	2	7.56	7.56
eFDD 7 16QAM	low	25	5		-	20.84	2	2	9.16	9.16
eFDD 7 16QAM	mid	1	5		-	22.51	2	2	7.49	7.49
eFDD 7 16QAM	mid	25	5		-	20.74	2	2	9.26	9.26
eFDD 7 16QAM	high	1	5		-	22.23	2	2	7.77	7.77
eFDD 7 16QAM	high	25	5		-	20.77	2	2	9.23	9.23
eFDD 7 QPSK	low	1	10		-	23.43	2	2	6.57	6.57
eFDD 7 QPSK	low	50	10		-	22.16	2	2	7.84	7.84
eFDD 7 QPSK	mid	1	10		-	23.27	2	2	6.73	6.73
eFDD 7 QPSK	mid	50	10		-	22.08	2	2	7.92	7.92
eFDD 7 QPSK	high	1	10		-	23.32	2	2	6.68	6.68
eFDD 7 QPSK	high	50	10		-	22.14	2	2	7.86	7.86
eFDD 7 16QAM	low	1	10		-	22.53	2	2	7.47	7.47
eFDD 7 16QAM	low	50	10		-	21.17	2	2	8.83	8.83
eFDD 7 16QAM	mid	1	10		-	22.2	2	2	7.8	7.8
eFDD 7 16QAM	mid	50	10		-	21.05	2	2	8.95	8.95
eFDD 7 16QAM	high	1	10		-	22.38	2	2	7.62	7.62
eFDD 7 16QAM	high	50	10		-	21.13	2	2	8.87	8.87
eFDD 7 QPSK	low	1	15		-	23.34	2	2	6.66	6.66
eFDD 7 QPSK	low	36	15		-	22.32	2	2	7.68	7.68
eFDD 7 QPSK	low	75	15		-	22.31	2	2	7.69	7.69
eFDD 7 QPSK	mid	1	15		-	23.34	2	2	6.66	6.66
eFDD 7 QPSK	mid	36	15		-	22.27	2	2	7.73	7.73
eFDD 7 QPSK	mid	75	15		-	22.19	2	2	7.81	7.81
eFDD 7 QPSK	high	1	15		-	23.37	2	2	6.63	6.63
eFDD 7 QPSK	high	36	15		-	22.25	2	2	7.75	7.75
eFDD 7 QPSK	high	75	15		-	22.24	2	2	7.76	7.76
eFDD 7 16QAM	low	1	15		-	22.5	2	2	7.5	7.5
eFDD 7 16QAM	low	75	15		-	21.29	2	2	8.71	8.71
eFDD 7 16QAM	mid	1	15		-	22.33	2	2	7.67	7.67
eFDD 7 16QAM	mid	75	15		-	21.21	2	2	8.79	8.79
eFDD 7 16QAM	high	1	15		-	22.5	2	2	7.5	7.5
eFDD 7 16QAM	high	75	15		-	21.25	2	2	8.75	8.75
eFDD 7 QPSK	low	1	20		-	23.46	2	2	6.54	6.54
eFDD 7 QPSK	low	100	20		-	22.46	2	2	7.54	7.54
eFDD 7 QPSK	mid	1	20		-	23.41	2	2	6.59	6.59

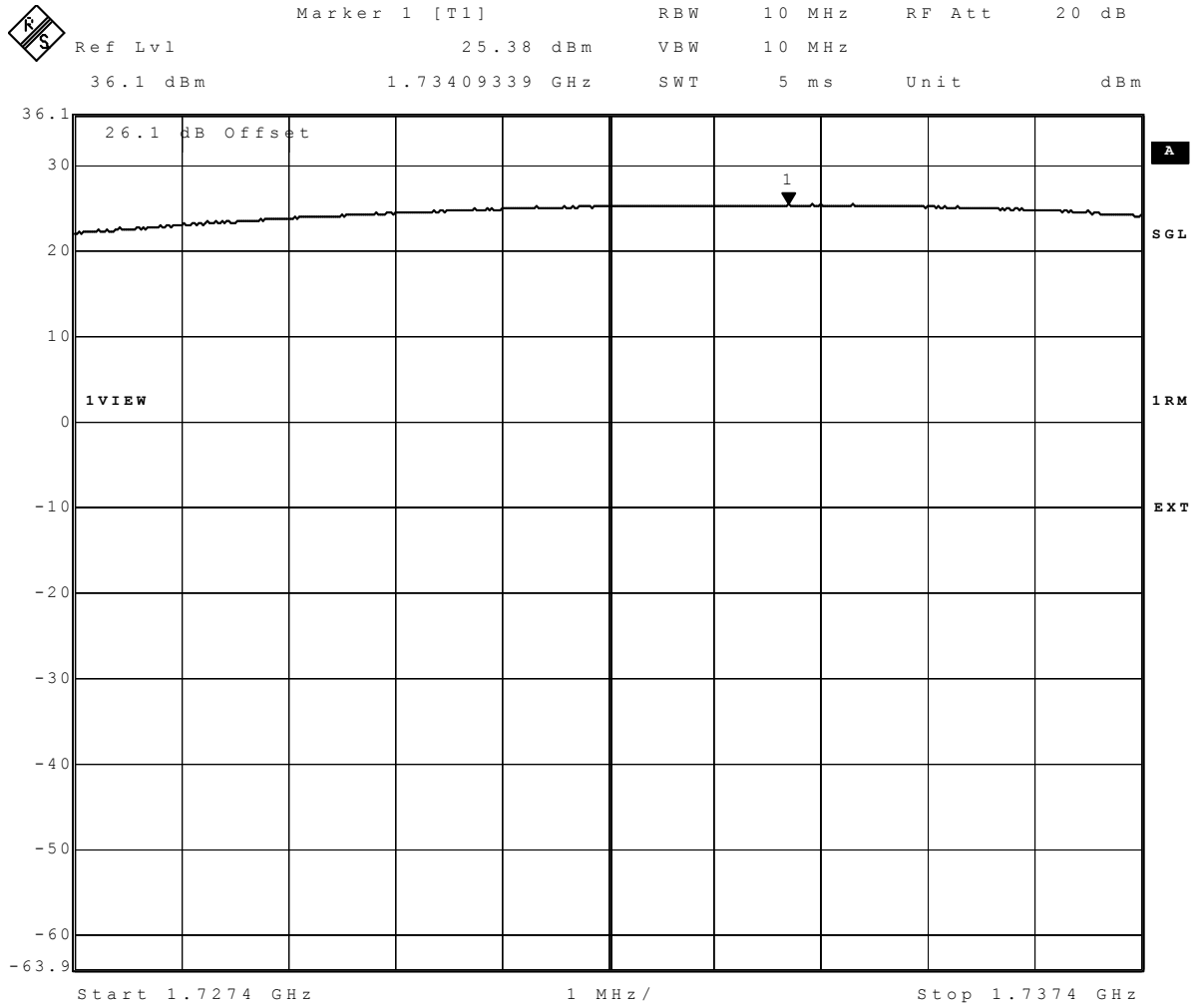
Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 7 QPSK	mid	100	20		-	22.27	2	2	7.73	7.73
eFDD 7 QPSK	high	1	20		-	23.25	2	2	6.75	6.75
eFDD 7 QPSK	high	100	20		-	22.25	2	2	7.75	7.75
eFDD 7 16QAM	low	1	20		-	22.48	2	2	7.52	7.52
eFDD 7 16QAM	low	100	20		-	21.43	2	2	8.57	8.57
eFDD 7 16QAM	mid	1	20		-	22.39	2	2	7.61	7.61
eFDD 7 16QAM	mid	100	20		-	21.29	2	2	8.71	8.71
eFDD 7 16QAM	high	1	20		-	22.44	2	2	7.56	7.56
eFDD 7 16QAM	high	100	20		-	21.16	2	2	8.84	8.84
eFDD 12 QPSK	low	1	1.4	-	-	23.1	3	5	11.67	13.89
eFDD 12 QPSK	low	3	1.4	-	-	22.87	3	5	11.9	14.12
eFDD 12 QPSK	low	6	1.4	-	-	21.75	3	5	13.02	15.24
eFDD 12 QPSK	mid	1	1.4	-	-	23.49	3	5	11.28	13.5
eFDD 12 QPSK	mid	3	1.4	-	-	22.99	3	5	11.78	14
eFDD 12 QPSK	mid	6	1.4	-	-	21.85	3	5	12.92	15.14
eFDD 12 QPSK	high	1	1.4	-	-	23.43	3	5	11.34	13.56
eFDD 12 QPSK	high	3	1.4	-	-	23	3	5	11.77	13.99
eFDD 12 QPSK	high	6	1.4	-	-	21.99	3	5	12.78	15
eFDD 12 16QAM	low	1	1.4	-	-	22.15	3	5	12.62	14.84
eFDD 12 16QAM	low	6	1.4	-	-	20.77	3	5	14	16.22
eFDD 12 16QAM	mid	1	1.4	-	-	22.16	3	5	12.61	14.83
eFDD 12 16QAM	mid	6	1.4	-	-	20.94	3	5	13.83	16.05
eFDD 12 16QAM	high	1	1.4	-	-	22.42	3	5	12.35	14.57
eFDD 12 16QAM	high	6	1.4	-	-	21.07	3	5	13.7	15.92
eFDD 12 QPSK	low	1	3	-	-	23.62	3	5	11.15	13.37
eFDD 12 QPSK	low	15	3	-	-	22.25	3	5	12.52	14.74
eFDD 12 QPSK	mid	1	3	-	-	23.82	3	5	10.95	13.17
eFDD 12 QPSK	mid	15	3	-	-	22.45	3	5	12.32	14.54
eFDD 12 QPSK	high	1	3	-	-	23.88	3	5	10.89	13.11
eFDD 12 QPSK	high	15	3	-	-	22.53	3	5	12.24	14.46
eFDD 12 16QAM	low	1	3	-	-	22.69	3	5	12.08	14.3
eFDD 12 16QAM	low	15	3	-	-	21.3	3	5	13.47	15.69
eFDD 12 16QAM	mid	1	3	-	-	22.79	3	5	11.98	14.2
eFDD 12 16QAM	mid	15	3	-	-	21.47	3	5	13.3	15.52
eFDD 12 16QAM	high	1	3	-	-	23	3	5	11.77	13.99
eFDD 12 16QAM	high	15	3	-	-	21.62	3	5	13.15	15.37
eFDD 12 QPSK	low	1	5	-	-	23.84	3	5	10.93	13.15
eFDD 12 QPSK	low	12	5	-	-	22.31	3	5	12.46	14.68
eFDD 12 QPSK	low	25	5	-	-	22.36	3	5	12.41	14.63
eFDD 12 QPSK	mid	1	5	-	-	23.9	3	5	10.87	13.09
eFDD 12 QPSK	mid	12	5	-	-	22.45	3	5	12.32	14.54
eFDD 12 QPSK	mid	25	5	-	-	22.44	3	5	12.33	14.55

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 12 QPSK	high	1	5	-	-	23.85	3	5	10.92	13.14
eFDD 12 QPSK	high	12	5	-	-	22.48	3	5	12.29	14.51
eFDD 12 QPSK	high	25	5	-	-	22.42	3	5	12.35	14.57
eFDD 12 16QAM	low	1	5	-	-	22.9	3	5	11.87	14.09
eFDD 12 16QAM	low	25	5	-	-	21.35	3	5	13.42	15.64
eFDD 12 16QAM	mid	1	5	-	-	23.07	3	5	11.7	13.92
eFDD 12 16QAM	mid	25	5	-	-	21.42	3	5	13.35	15.57
eFDD 12 16QAM	high	1	5	-	-	23.08	3	5	11.69	13.91
eFDD 12 16QAM	high	25	5	-	-	21.47	3	5	13.3	15.52
eFDD 12 QPSK	low	1	10	-	-	23.75	3	5	11.02	13.24
eFDD 12 QPSK	low	50	10	-	-	22.61	3	5	12.16	14.38
eFDD 12 QPSK	mid	1	10	-	-	23.89	3	5	10.88	13.1
eFDD 12 QPSK	mid	50	10	-	-	22.62	3	5	12.15	14.37
eFDD 12 QPSK	high	1	10	-	-	23.83	3	5	10.94	13.16
eFDD 12 QPSK	high	50	10	-	-	22.57	3	5	12.2	14.42
eFDD 12 16QAM	low	1	10	-	-	22.74	3	5	12.03	14.25
eFDD 12 16QAM	low	50	10	-	-	21.64	3	5	13.13	15.35
eFDD 12 16QAM	mid	1	10	-	-	22.77	3	5	12	14.22
eFDD 12 16QAM	mid	50	10	-	-	21.58	3	5	13.19	15.41
eFDD 12 16QAM	high	1	10	-	-	22.93	3	5	11.84	14.06
eFDD 12 16QAM	high	50	10	-	-	21.57	3	5	13.2	15.42
eFDD 13 QPSK	low	1	5	-	-	23.89	3	5	10.88	13.1
eFDD 13 QPSK	low	12	5	-	-	22.19	3	5	12.58	14.8
eFDD 13 QPSK	low	25	5	-	-	22.23	3	5	12.54	14.76
eFDD 13 QPSK	mid	1	5	-	-	23.69	3	5	11.08	13.3
eFDD 13 QPSK	mid	12	5	-	-	22.2	3	5	12.57	14.79
eFDD 13 QPSK	mid	25	5	-	-	22.19	3	5	12.58	14.8
eFDD 13 QPSK	high	1	5	-	-	23.48	3	5	11.29	13.51
eFDD 13 QPSK	high	12	5	-	-	22.2	3	5	12.57	14.79
eFDD 13 QPSK	high	25	5	-	-	22.09	3	5	12.68	14.9
eFDD 13 16QAM	low	1	5	-	-	22.71	3	5	12.06	14.28
eFDD 13 16QAM	low	25	5	-	-	21.18	3	5	13.59	15.81
eFDD 13 16QAM	mid	1	5	-	-	22.81	3	5	11.96	14.18
eFDD 13 16QAM	mid	25	5	-	-	21.11	3	5	13.66	15.88
eFDD 13 16QAM	high	1	5	-	-	22.69	3	5	12.08	14.3
eFDD 13 16QAM	high	25	5	-	-	21.12	3	5	13.65	15.87
eFDD 13 QPSK	mid	1	10	-	-	23.65	3	5	11.12	13.34
eFDD 13 QPSK	mid	50	10	-	-	22.41	3	5	12.36	14.58
eFDD 13 16QAM	mid	1	10	-	-	22.55	3	5	12.22	14.44
eFDD 13 16QAM	mid	50	10	-	-	21.39	3	5	13.38	15.6
eFDD 66 QPSK	low	1	1.4	-	-	22.48	1	1	7.52	7.52
eFDD 66 QPSK	low	3	1.4	-	-	22.15	1	1	7.85	7.85

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 66 QPSK	low	6	1.4	-	-	21.13	1	1	8.87	8.87
eFDD 66 QPSK	mid	1	1.4	-	-	22.79	1	1	7.21	7.21
eFDD 66 QPSK	mid	3	1.4	-	-	22.33	1	1	7.67	7.67
eFDD 66 QPSK	mid	6	1.4	-	-	21.3	1	1	8.7	8.7
eFDD 66 QPSK	high	1	1.4	-	-	22.98	1	1	7.02	7.02
eFDD 66 QPSK	high	3	1.4	-	-	22.16	1	1	7.84	7.84
eFDD 66 QPSK	high	6	1.4	-	-	21.41	1	1	8.59	8.59
eFDD 66 16QAM	low	1	1.4	-	-	21.69	1	1	8.31	8.31
eFDD 66 16QAM	low	6	1.4	-	-	20.17	1	1	9.83	9.83
eFDD 66 16QAM	mid	1	1.4	-	-	21.61	1	1	8.39	8.39
eFDD 66 16QAM	mid	6	1.4	-	-	20.27	1	1	9.73	9.73
eFDD 66 16QAM	high	1	1.4	-	-	22.05	1	1	7.95	7.95
eFDD 66 16QAM	high	6	1.4	-	-	20.52	1	1	9.48	9.48
eFDD 66 QPSK	low	1	3	-	-	22.96	1	1	7.04	7.04
eFDD 66 QPSK	low	15	3	-	-	21.69	1	1	8.31	8.31
eFDD 66 QPSK	mid	1	3	-	-	23.22	1	1	6.78	6.78
eFDD 66 QPSK	mid	15	3	-	-	21.82	1	1	8.18	8.18
eFDD 66 QPSK	high	1	3	-	-	23.1	1	1	6.9	6.9
eFDD 66 QPSK	high	15	3	-	-	21.73	1	1	8.27	8.27
eFDD 66 16QAM	low	1	3	-	-	22.04	1	1	7.96	7.96
eFDD 66 16QAM	low	15	3	-	-	20.72	1	1	9.28	9.28
eFDD 66 16QAM	mid	1	3	-	-	22.56	1	1	7.44	7.44
eFDD 66 16QAM	mid	15	3	-	-	20.84	1	1	9.16	9.16
eFDD 66 16QAM	high	1	3	-	-	21.99	1	1	8.01	8.01
eFDD 66 16QAM	high	15	3	-	-	20.72	1	1	9.28	9.28
eFDD 66 QPSK	low	1	5	-	-	23.05	1	1	6.95	6.95
eFDD 66 QPSK	low	12	5	-	-	21.63	1	1	8.37	8.37
eFDD 66 QPSK	low	25	5	-	-	21.65	1	1	8.35	8.35
eFDD 66 QPSK	mid	1	5	-	-	23.21	1	1	6.79	6.79
eFDD 66 QPSK	mid	12	5	-	-	21.75	1	1	8.25	8.25
eFDD 66 QPSK	mid	25	5	-	-	21.76	1	1	8.24	8.24
eFDD 66 QPSK	high	1	5	-	-	23.2	1	1	6.8	6.8
eFDD 66 QPSK	high	12	5	-	-	21.7	1	1	8.3	8.3
eFDD 66 QPSK	high	25	5	-	-	21.66	1	1	8.34	8.34
eFDD 66 16QAM	low	1	5	-	-	22.23	1	1	7.77	7.77
eFDD 66 16QAM	low	25	5	-	-	20.64	1	1	9.36	9.36
eFDD 66 16QAM	mid	1	5	-	-	22.24	1	1	7.76	7.76
eFDD 66 16QAM	mid	25	5	-	-	20.78	1	1	9.22	9.22
eFDD 66 16QAM	high	1	5	-	-	22.27	1	1	7.73	7.73
eFDD 66 16QAM	high	25	5	-	-	20.71	1	1	9.29	9.29
eFDD 66 QPSK	low	1	10	-	-	23.27	1	1	6.73	6.73
eFDD 66 QPSK	low	50	10	-	-	22.06	1	1	7.94	7.94

Radio Technology	Channel	Ressource Blocks	BW [MHz]	Peak Cond. Power [dBm]	Average Cond. Power [dBm]	RMS Cond. Power [dBm]	FCC EIRP Limit [W]	IC EIRP Limit [W]	Max. Antenna Gain [dBi]	Max. Antenna Gain IC [dBi]
eFDD 66 QPSK	mid	1	10	-	-	23.58	1	1	6.42	6.42
eFDD 66 QPSK	mid	50	10	-	-	22.14	1	1	7.86	7.86
eFDD 66 QPSK	high	1	10	-	-	23.23	1	1	6.77	6.77
eFDD 66 QPSK	high	50	10	-	-	22.1	1	1	7.9	7.9
eFDD 66 16QAM	low	1	10	-	-	22.17	1	1	7.83	7.83
eFDD 66 16QAM	low	50	10	-	-	21.13	1	1	8.87	8.87
eFDD 66 16QAM	mid	1	10	-	-	22.72	1	1	7.28	7.28
eFDD 66 16QAM	mid	50	10	-	-	21.21	1	1	8.79	8.79
eFDD 66 16QAM	high	1	10	-	-	22.48	1	1	7.52	7.52
eFDD 66 16QAM	high	50	10	-	-	21.14	1	1	8.86	8.86
eFDD 66 QPSK	low	1	15	-	-	23.32	1	1	6.68	6.68
eFDD 66 QPSK	low	36	15	-	-	22.25	1	1	7.75	7.75
eFDD 66 QPSK	low	75	15	-	-	22.14	1	1	7.86	7.86
eFDD 66 QPSK	mid	1	15	-	-	23.46	1	1	6.54	6.54
eFDD 66 QPSK	mid	36	15	-	-	22.26	1	1	7.74	7.74
eFDD 66 QPSK	mid	75	15	-	-	22.24	1	1	7.76	7.76
eFDD 66 QPSK	high	1	15	-	-	23.29	1	1	6.71	6.71
eFDD 66 QPSK	high	36	15	-	-	22.25	1	1	7.75	7.75
eFDD 66 QPSK	high	75	15	-	-	22.18	1	1	7.82	7.82
eFDD 66 16QAM	low	1	15	-	-	22.58	1	1	7.42	7.42
eFDD 66 16QAM	low	75	15	-	-	21.16	1	1	8.84	8.84
eFDD 66 16QAM	mid	1	15	-	-	22.51	1	1	7.49	7.49
eFDD 66 16QAM	mid	75	15	-	-	21.27	1	1	8.73	8.73
eFDD 66 16QAM	high	1	15	-	-	22.46	1	1	7.54	7.54
eFDD 66 16QAM	high	75	15	-	-	21.19	1	1	8.81	8.81
eFDD 66 QPSK	low	1	20	-	-	23.3	1	1	6.7	6.7
eFDD 66 QPSK	low	100	20	-	-	22.33	1	1	7.67	7.67
eFDD 66 QPSK	mid	1	20	-	-	23.6	1	1	6.4	6.4
eFDD 66 QPSK	mid	100	20	-	-	22.38	1	1	7.62	7.62
eFDD 66 QPSK	high	1	20	-	-	23.38	1	1	6.62	6.62
eFDD 66 QPSK	high	100	20	-	-	22.3	1	1	7.7	7.7
eFDD 66 16QAM	low	1	20	-	-	22.18	1	1	7.82	7.82
eFDD 66 16QAM	low	100	20	-	-	21.36	1	1	8.64	8.64
eFDD 66 16QAM	mid	1	20	-	-	22.74	1	1	7.26	7.26
eFDD 66 16QAM	mid	100	20	-	-	21.42	1	1	8.58	8.58
eFDD 66 16QAM	high	1	20	-	-	22.44	1	1	7.56	7.56
eFDD 66 16QAM	high	100	20	-	-	21.35	1	1	8.65	8.65

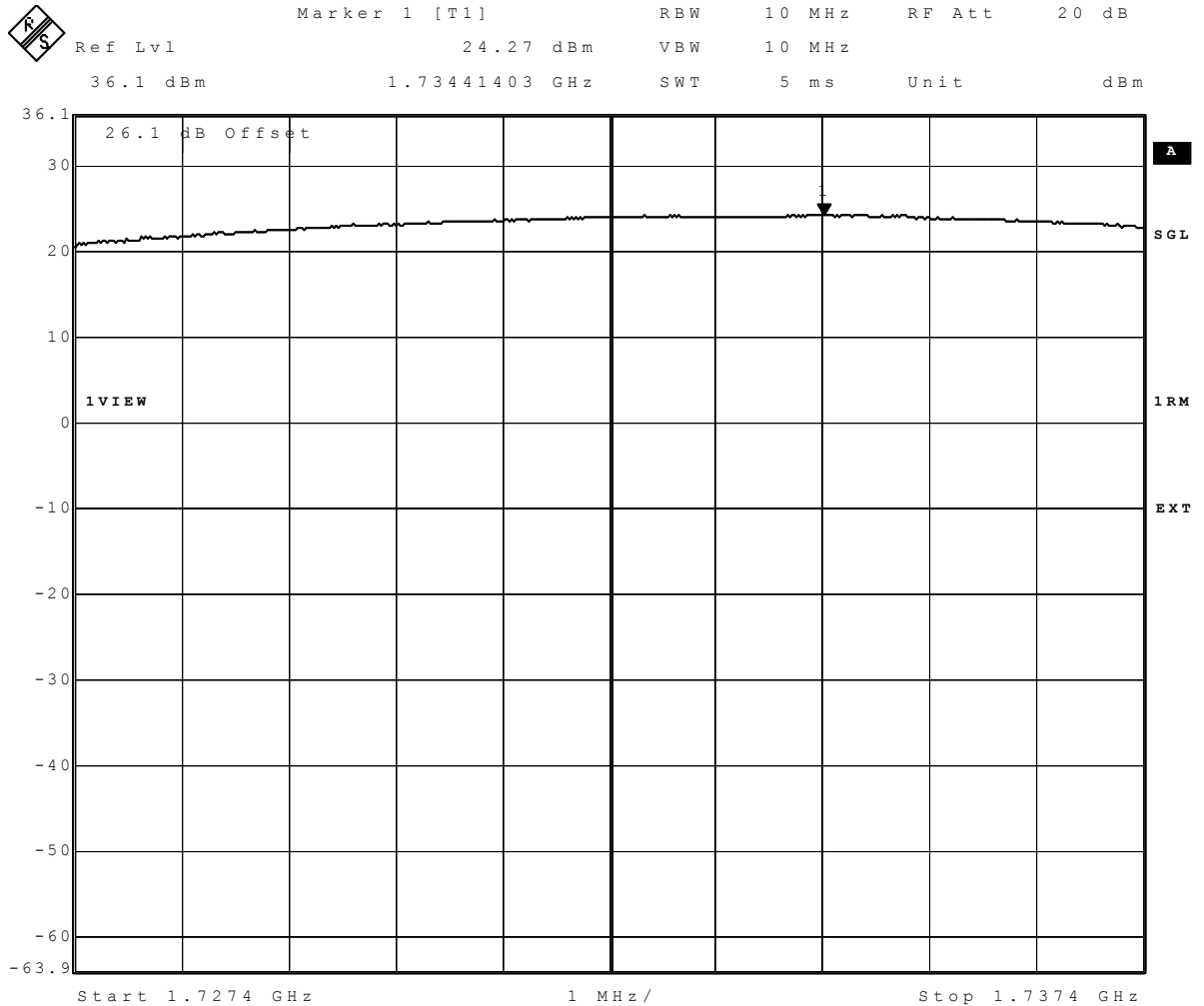
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 2.OCT.2018 16:09:53

WCDMa FDD4 Channel = mid1

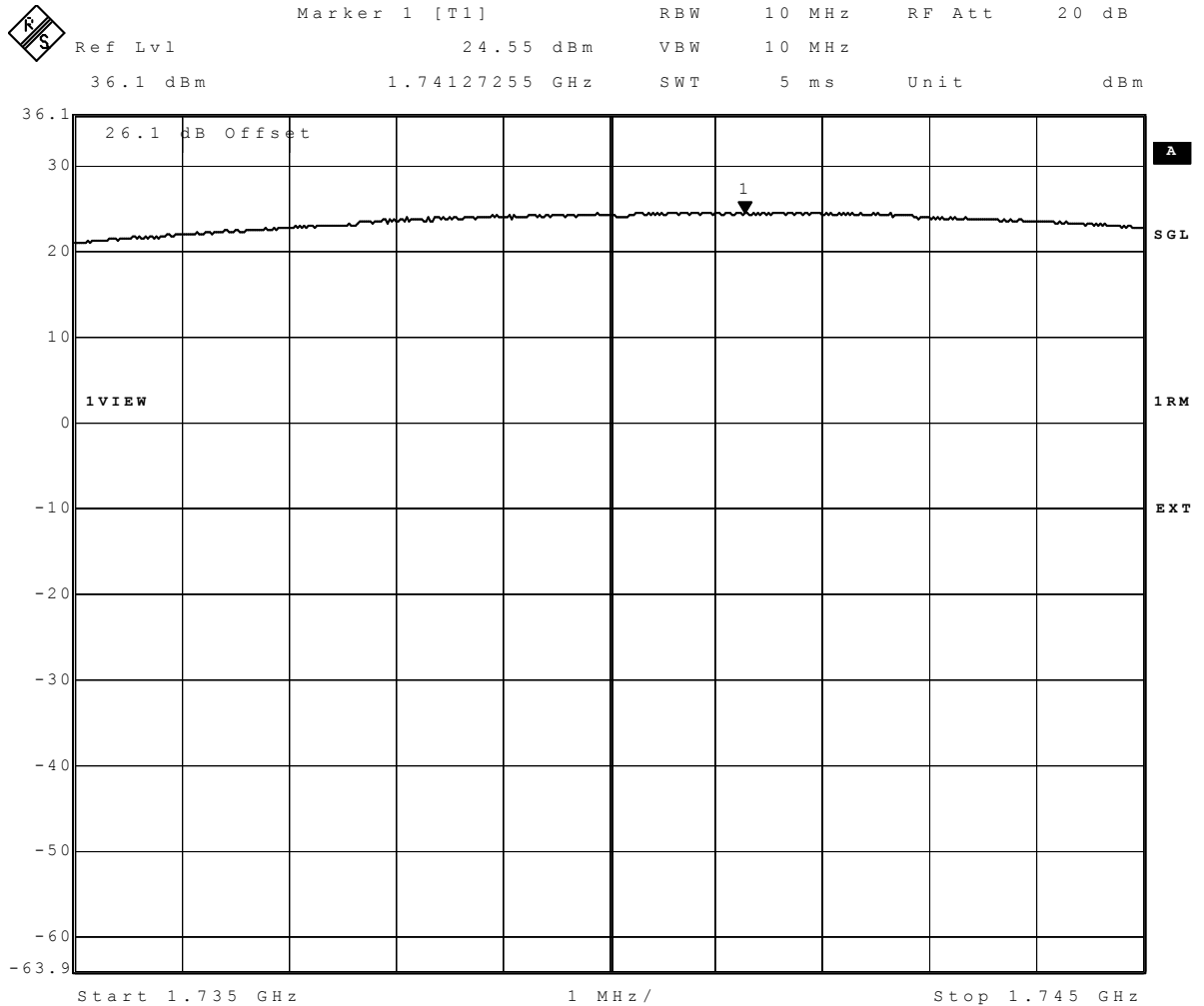
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Date: 12.OCT.2018 15:51:41

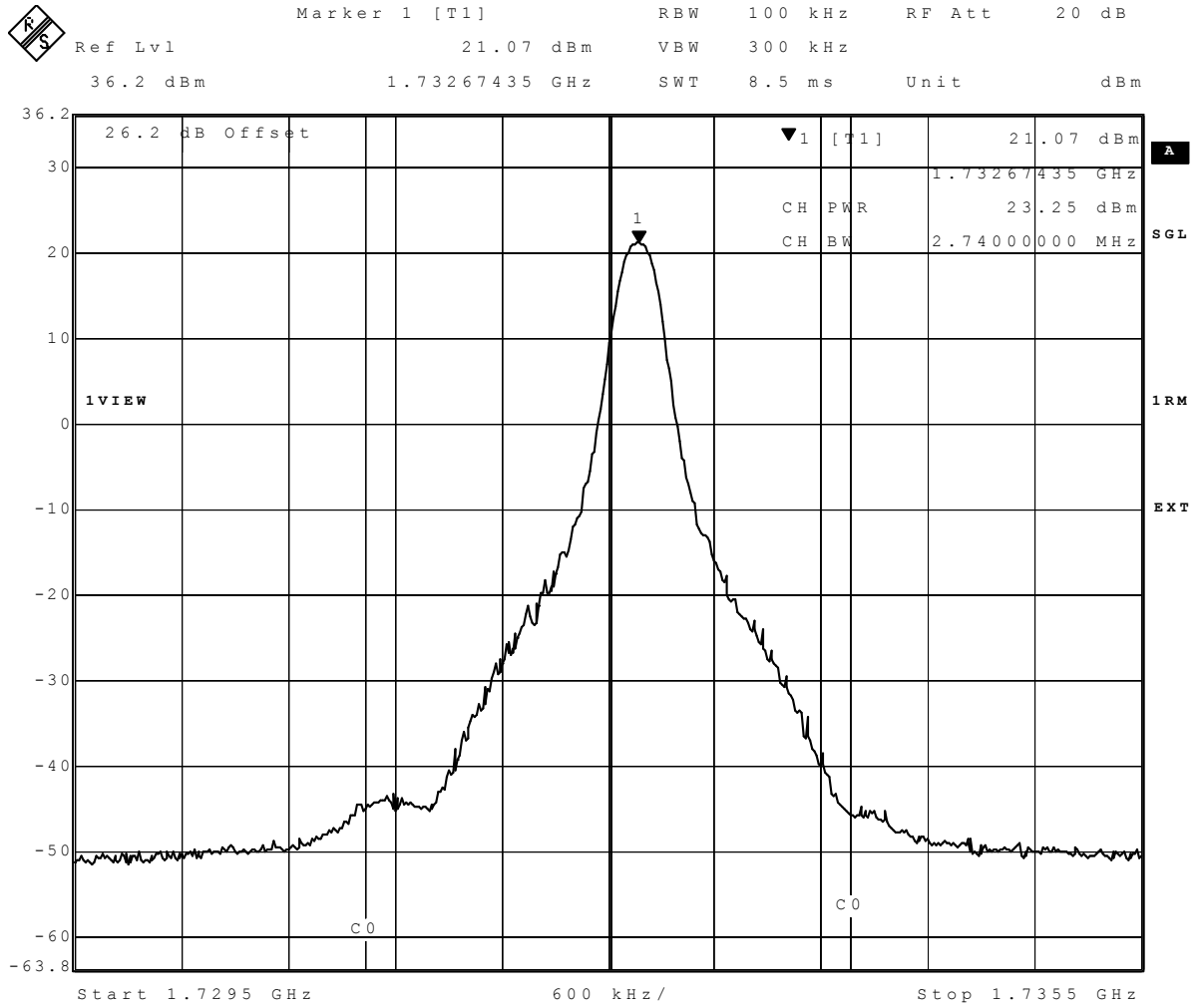
HSDPA FDD4 Subtest1 Channel = mid1

Reference: MDE_GEMALTO_1802_FCCb_rev01



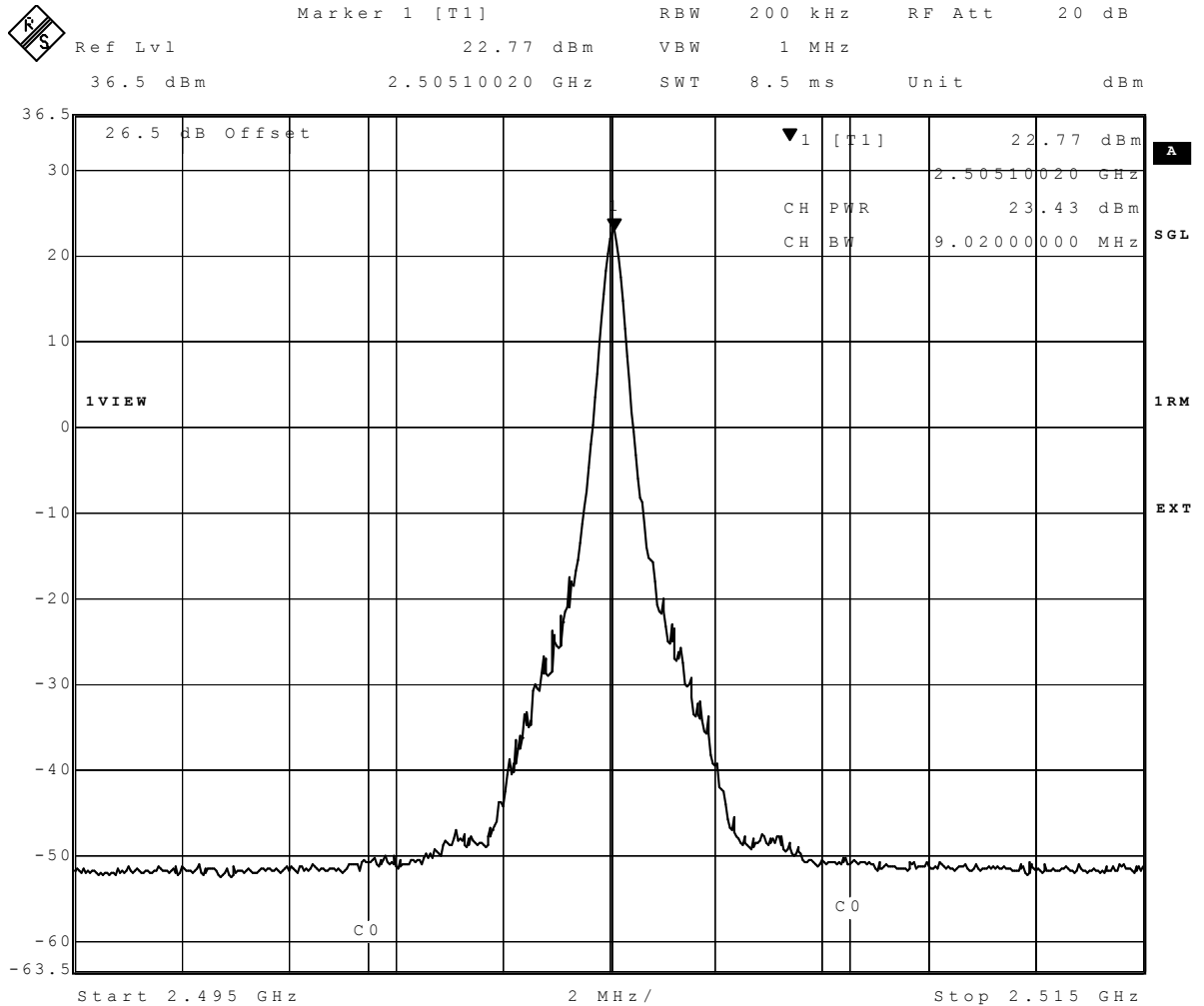
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HSUPA FDD4 Subtest1 Channel = mid2



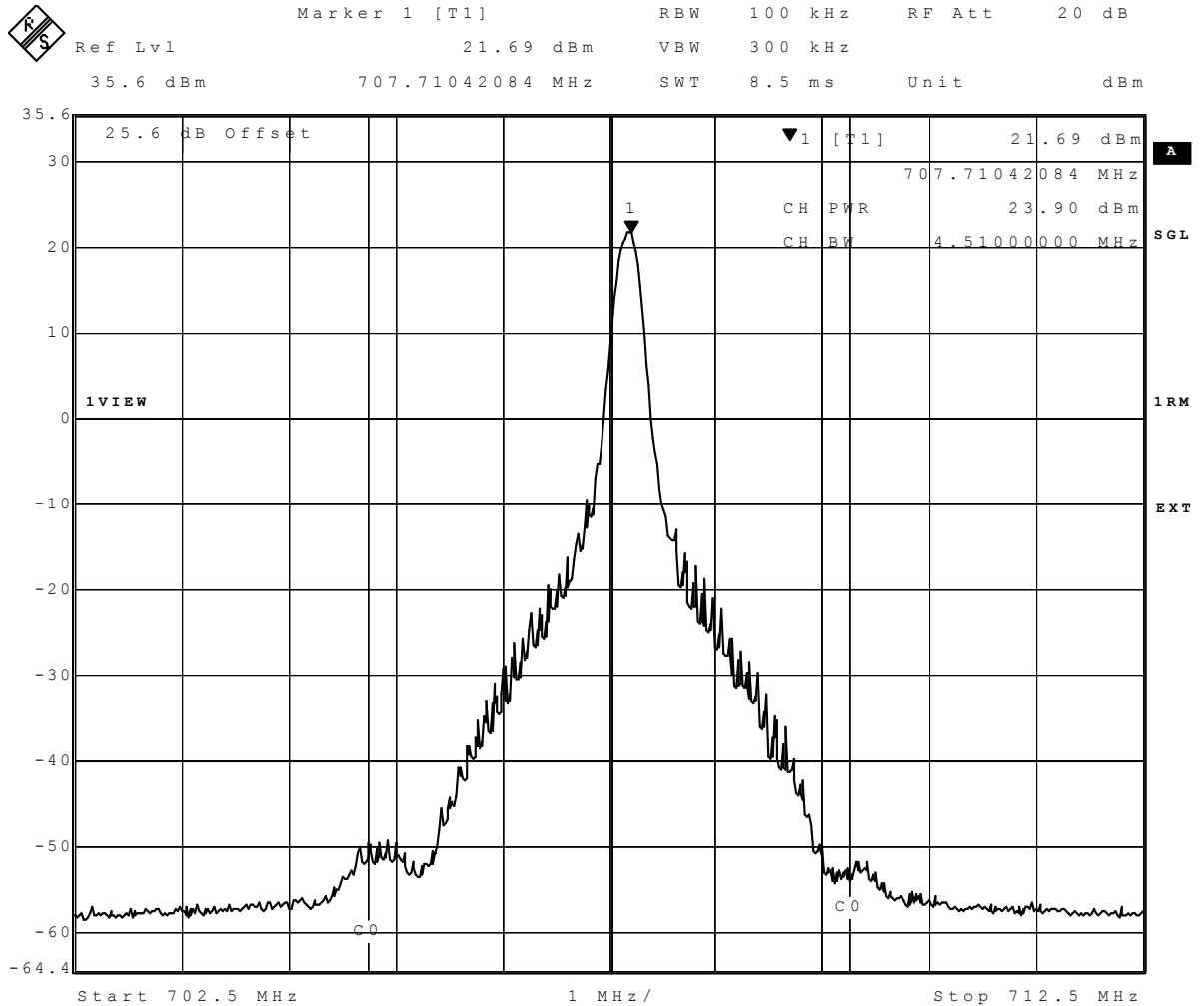
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LTE eFDD4 QPSK 3MHz RB1 Channel = mid



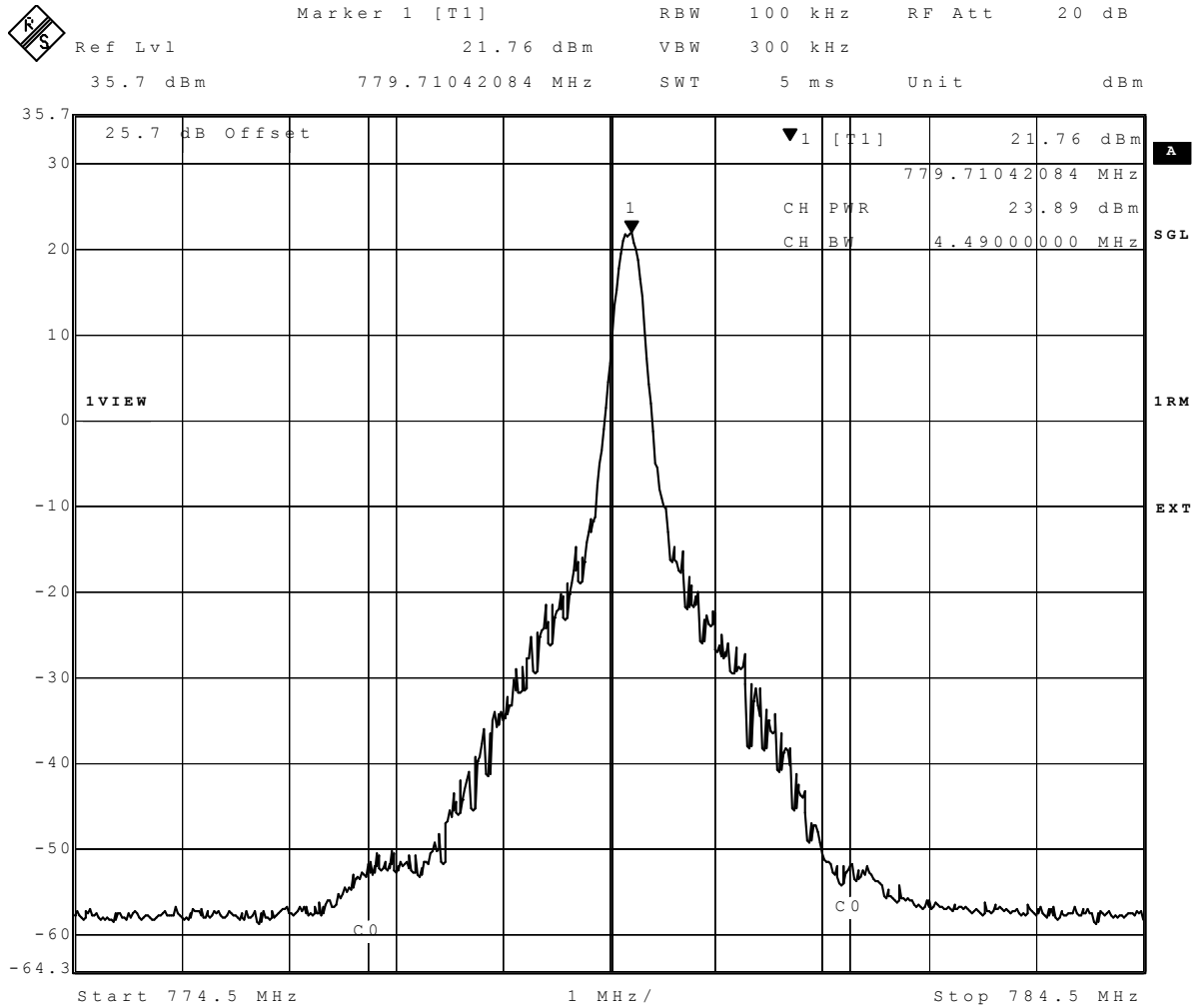
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eFDD7 QPSK 10MHz RB1 Channel = LOW



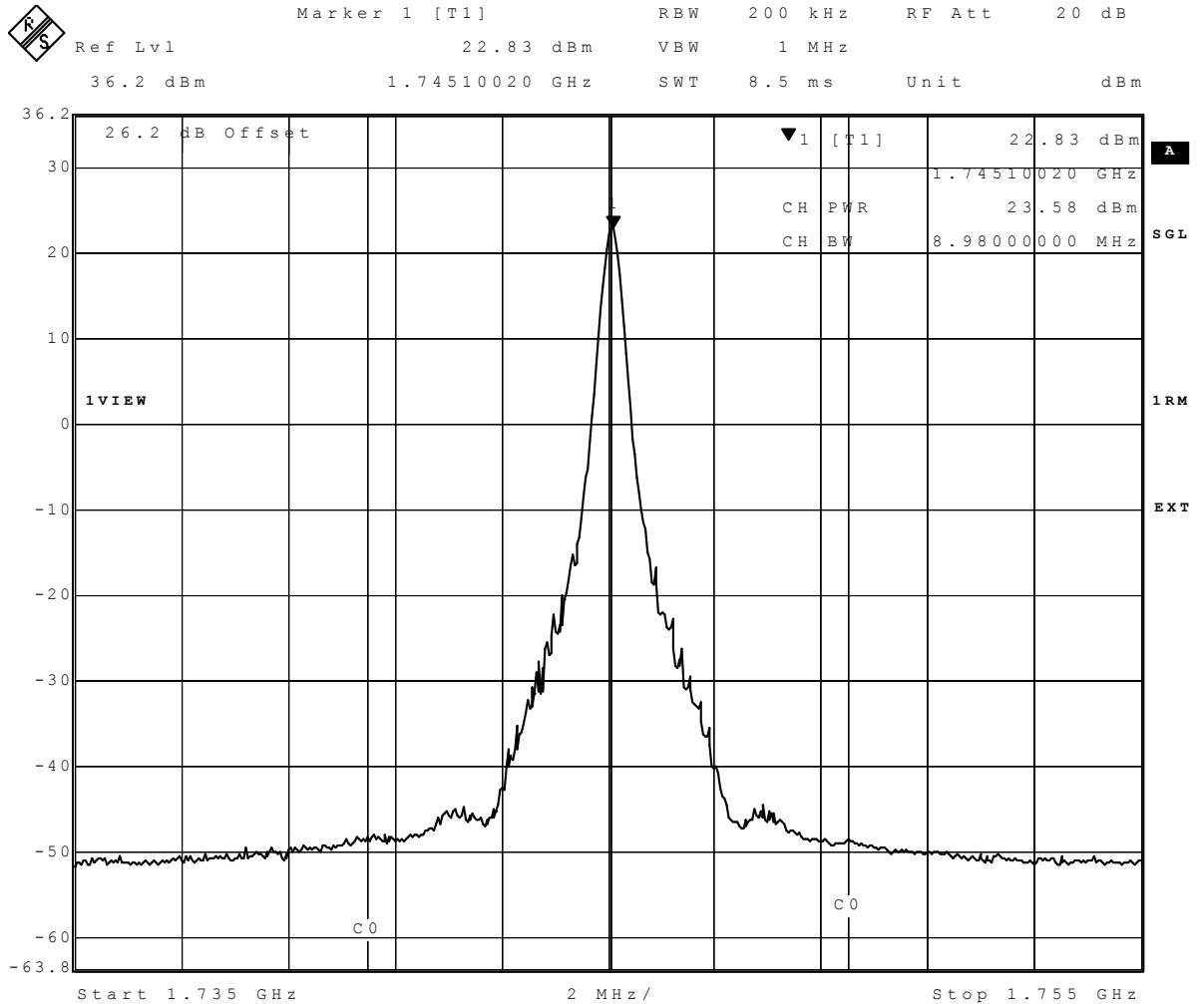
Date: 10.OCT.2018 19:13:01

LTE eFDD12 QPSK 5MHz RB1 Channel = mid



Date: 10.OCT.2018 17:52:49

LTE eFDD13 QPSK 5MHz RB1 Channel = low



Date: 11.DEC.2018 18:59:22

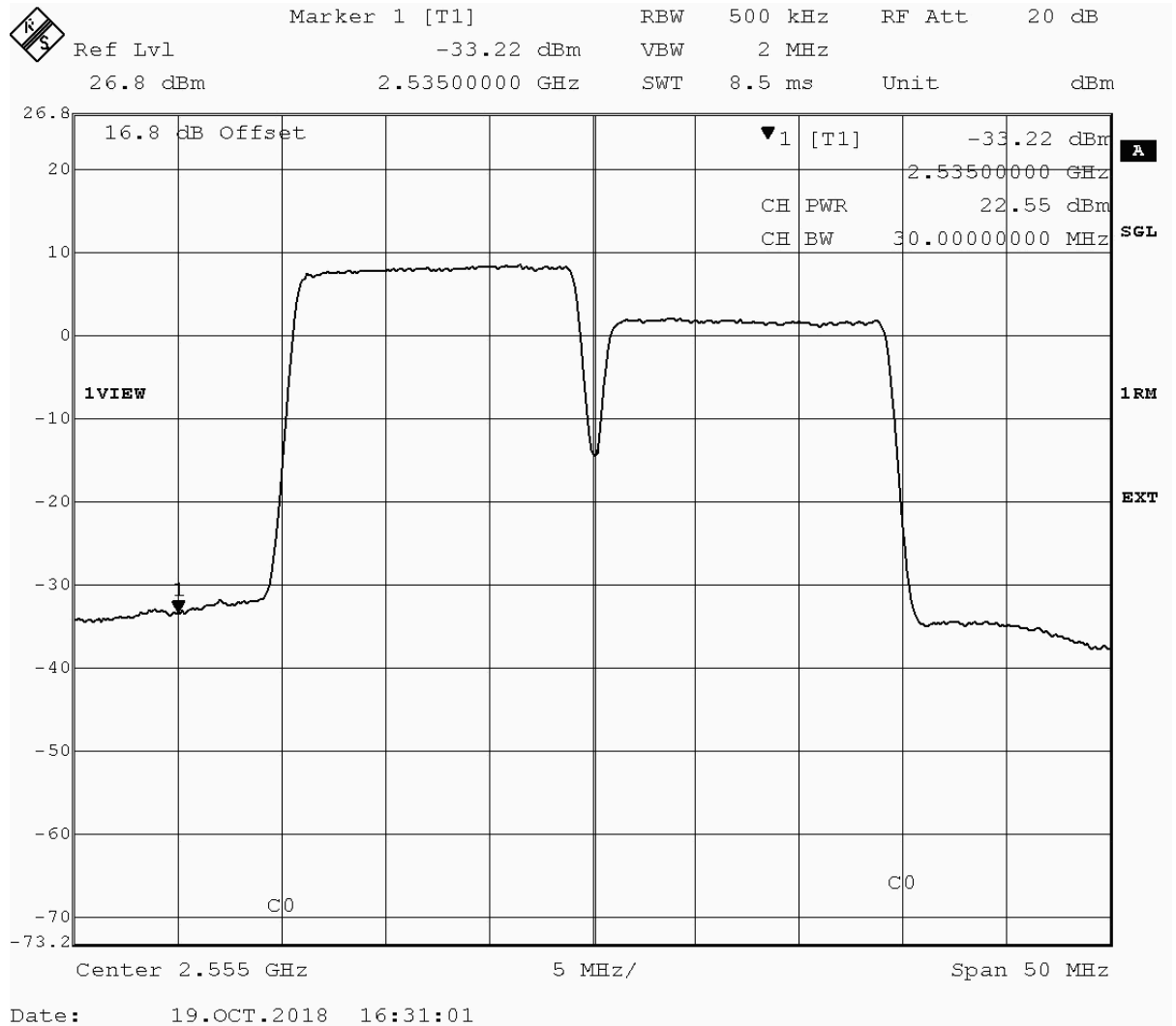
eFDD66 QPSK 10MHz RB1 Channel = MID

Carrier Aggregation (intier-band)								
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	RMS Cond. Power PCC [dB]	RMS Cond. Power SCC1 [dB]
eFDD 5 QPSK	eFDD 7 QPSK	low + low	1	1	1.4	10	19.69	19.85
eFDD 5 QPSK	eFDD 7 QPSK	low + low	6	50	1.4	10	19.39	19.8
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	1	1	1.4	10	21.37	18.55
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	6	50	1.4	10	21.01	18.43
eFDD 5 QPSK	eFDD 7 QPSK	high + high	1	1	1.4	10	20.81	18.46
eFDD 5 QPSK	eFDD 7 QPSK	high + high	6	50	1.4	10	20.49	18.4
eFDD 5 16QAM	eFDD 7 16QAM	low + low	1	1	1.4	10	19.68	19.73
eFDD 5 16QAM	eFDD 7 16QAM	low + low	6	50	1.4	10	19.51	19.74
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	1	1	1.4	10	20.43	18.49
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	6	50	1.4	10	20.03	18.43
eFDD 5 16QAM	eFDD 7 16QAM	high + high	1	1	1.4	10	20.96	18.54
eFDD 5 16QAM	eFDD 7 16QAM	high + high	6	50	1.4	10	20.43	18.44
eFDD 5 QPSK	eFDD 7 QPSK	low + low	1	1	5	10	20.5	19.99
eFDD 5 QPSK	eFDD 7 QPSK	low + low	25	50	5	10	19.81	19.79
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	1	1	5	10	20.8	18.89
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	25	50	5	10	21.35	18.59
eFDD 5 QPSK	eFDD 7 QPSK	high + high	1	1	5	10	20.39	18.86
eFDD 5 QPSK	eFDD 7 QPSK	high + high	25	50	5	10	21.05	18.53
eFDD 5 16QAM	eFDD 7 16QAM	low + low	1	1	5	10	19.28	20.03
eFDD 5 16QAM	eFDD 7 16QAM	low + low	25	50	5	10	19.97	18.45
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	1	1	5	10	20.88	18.66
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	25	50	5	10	21.32	18.45
eFDD 5 16QAM	eFDD 7 16QAM	high + high	1	1	5	10	20.52	18.85
eFDD 5 16QAM	eFDD 7 16QAM	high + high	25	50	5	10	21.07	18.54
eFDD 5 QPSK	eFDD 7 QPSK	low + low	1	1	10	20	21.18	19.6
eFDD 5 QPSK	eFDD 7 QPSK	low + low	50	100	10	20	20.54	19.76
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	1	1	10	20	21.53	19.06
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	50	100	10	20	21.27	18.63
eFDD 5 QPSK	eFDD 7 QPSK	high + high	1	1	10	20	21.15	18.38
eFDD 5 QPSK	eFDD 7 QPSK	high + high	50	100	10	20	21.22	18.57
eFDD 5 16QAM	eFDD 7 16QAM	low + low	1	1	10	20	20.61	19.59
eFDD 5 16QAM	eFDD 7 16QAM	low + low	50	100	10	20	20.39	19.97
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	1	1	10	20	20.58	18.77
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	50	100	10	20	21.25	19.83
eFDD 5 16QAM	eFDD 7 16QAM	high + high	1	1	10	20	21.17	18.25
eFDD 5 16QAM	eFDD 7 16QAM	high + high	50	100	10	20	21.21	18.51

Carrier Aggregation (intira-band)							
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	RMS Cond. Power [dBm]
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	15	15	19.7
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	75	15	15	22.57
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	15	15	19.37
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	75	75	15	15	22.33
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	15	15	19.54
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	75	15	15	22.55
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	15	15	19.53
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	75	15	15	21.72
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	15	15	19.29
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	75	75	15	15	21.43
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	15	15	19.39
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	75	15	15	21.56
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	10	20	19.79
eFDD 7 QPSK	eFDD 7 QPSK	low + low	50	100	10	20	22.62
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	10	20	19.19
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	50	100	10	20	22.53
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	10	20	19.28
eFDD 7 QPSK	eFDD 7 QPSK	high + high	50	100	10	20	22.69
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	10	20	19.35
eFDD 7 16QAM	eFDD 7 16QAM	low + low	50	100	10	20	21.74
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	10	20	19
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	50	100	10	20	21.62
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	10	20	19.17
eFDD 7 16QAM	eFDD 7 16QAM	high + high	50	100	10	20	21.66
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	20	15	19.33
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	75	20	15	22.67
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	20	15	19.15
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	75	20	15	22.45
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	20	15	19.36
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	75	20	15	22.59
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	20	15	19.21
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	75	20	15	21.67
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	20	15	19.03
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	100	75	20	15	21.48
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	20	15	19.44
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	75	20	15	21.53
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	15	20	19.45
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	100	15	20	22.43
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	15	20	19.19
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	75	100	15	20	22.22
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	15	20	19.35

Carrier Aggregation (intira-band)							
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	RMS Cond. Power [dBm]
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	100	15	20	22.39
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	15	20	19.36
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	100	15	20	21.45
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	15	20	19.02
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	75	100	15	20	21.22
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	15	20	19.21
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	100	15	20	21.38
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	20	10	19.28
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	50	20	10	22.38
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	20	10	19.24
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	50	20	10	22.24
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	20	10	19.43
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	50	20	10	22.37
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	20	10	19.36
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	50	20	10	21.33
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	20	10	19.13
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	100	50	20	10	21.23
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	20	10	19.32
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	50	20	10	21.3
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	20	20	19.27
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	100	20	20	22.36
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	20	20	19.18
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	100	20	20	22.22
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	20	20	19.28
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	100	20	20	22.29
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	20	20	19.15
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	100	20	20	21.34
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	20	20	19
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	100	100	20	20	21.24
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	20	20	19.15
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	100	20	20	21.28

Reference: MDE_GEMALTO_1802_FCCb_rev01



PCC: LTE eFDD7 QPSK 15MHz RB75 Channel = high
SCC1: LTE eFDD7 QPSK 15MHz RB75 Channel = high

3.5.16 27.2 Frequency stability §2.1055, §27.54

Test: 27.2; Frequency stability Summary §2.1055, §27.54

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 16:12
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4350	-4	-7	passed
-30	5			-4	-8	passed
-30	10			-4	-8	passed
-20	0	normal	4350	-5	-9	passed
-20	5			-4	-9	passed
-20	10			-4	-10	passed
-10	0	normal	4350	-4	-8	passed
-10	5			-4	-6	passed
-10	10			-4	-8	passed
0	0	normal	4350	-5	-7	passed
0	5			-5	-7	passed
0	10			-4	-8	passed
10	0	normal	4350	-4	-8	passed
10	5			-4	-8	passed
10	10			-4	-10	passed
20	0	low	4350	-3	-7	passed
20	5			-3	-8	passed
20	10			-4	-10	passed
20	0	normal	4350	-5	-9	passed
20	5			-4	-9	passed
20	10			-5	-9	passed
20	0	high	4350	-4	-13	passed
20	5			-5	-10	passed
20	10			-4	-10	passed
30	0	normal	4350	-4	-11	passed
30	5			-4	-7	passed
30	10			-4	-8	passed
40	0	normal	4350	-5	-9	passed
40	5			-4	-9	passed
40	10			-4	-7	passed
50	0	normal	4350	-5	-8	passed
50	5			-4	-8	passed
50	10			-4	-9	passed

WCDMA FDD4

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4350	-5	-6	passed
-30	5			-1	-7	passed
-30	10			-3	5	passed
-20	0	normal	4350	-4	-6	passed
-20	5			0	-4	passed
-20	10			-2	3	passed
-10	0	normal	4350	-3	-8	passed
-10	5			-3	-6	passed
-10	10			-1	5	passed
0	0	normal	4350	0	4	passed
0	5			-1	-5	passed
0	10			-3	-4	passed
10	0	normal	4350	-4	-9	passed
10	5			1	6	passed
10	10			-6	7	passed
20	0	low	4350	-1	-5	passed
20	5			-3	-2	passed
20	10			-1	-3	passed
20	0	normal	4350	-1	-6	passed
20	5			-2	-10	passed
20	10			-2	-7	passed
20	0	high	4350	-3	-3	passed
20	5			-3	4	passed
20	10			-1	6	passed
30	0	normal	4350	-3	-4	passed
30	5			-4	-8	passed
30	10			-2	-3	passed
40	0	normal	4350	-1	6	passed
40	5			-2	-5	passed
40	10			-2	-5	passed
50	0	normal	4350	-4	-7	passed
50	5			-5	-7	passed
50	10			-4	-8	passed

HSDPA FDD4

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4350	-1	-4	passed
-30	5			-1	-6	passed
-30	10			-1	-5	passed
-20	0	normal	4350	0	-4	passed
-20	5			-1	-3	passed
-20	10			-1	-5	passed
-10	0	normal	4350	-1	-4	passed
-10	5			-1	-4	passed
-10	10			-1	-5	passed
0	0	normal	4350	-1	-3	passed
0	5			-1	-5	passed
0	10			-1	-3	passed
10	0	normal	4350	-1	-3	passed
10	5			-2	-4	passed
10	10			-1	-5	passed
20	0	low	4350	-1	-4	passed
20	5			-1	5	passed
20	10			-1	-3	passed
20	0	normal	4350	-1	-5	passed
20	5			-2	-4	passed
20	10			-1	-5	passed
20	0	high	4350	-2	-5	passed
20	5			0	-2	passed
20	10			0	-5	passed
30	0	normal	4350	-2	-5	passed
30	5			0	4	passed
30	10			-1	-3	passed
40	0	normal	4350	-1	-4	passed
40	5			-1	-3	passed
40	10			-1	-4	passed
50	0	normal	4350	-1	-6	passed
50	5			0	4	passed
50	10			-2	-6	passed

HSUPA FDD4

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4331.25	12	25	passed
-30	5			16	26	passed
-30	10			14	29	passed
-20	0	normal	4331.25	15	24	passed
-20	5			19	21	passed
-20	10			13	21	passed
-10	0	normal	4331.25	10	31	passed
-10	5			12	30	passed
-10	10			18	27	passed
0	0	normal	4331.25	16	36	passed
0	5			9	34	passed
0	10			8	29	passed
10	0	normal	4331.25	11	25	passed
10	5			13	28	passed
10	10			17	23	passed
20	0	low	4331.25	16	24	passed
20	5			20	26	passed
20	10			21	28	passed
20	0	normal	4331.25	13	31	passed
20	5			16	32	passed
20	10			18	34	passed
20	0	high	4331.25	19	29	passed
20	5			14	24	passed
20	10			16	28	passed
30	0	normal	4331.25	18	23	passed
30	5			19	21	passed
30	10			14	33	passed
40	0	normal	4331.25	13	24	passed
40	5			10	29	passed
40	10			18	27	passed
50	0	normal	4331.25	9	22	passed
50	5			14	27	passed
50	10			15	24	passed

LTE eFDD4

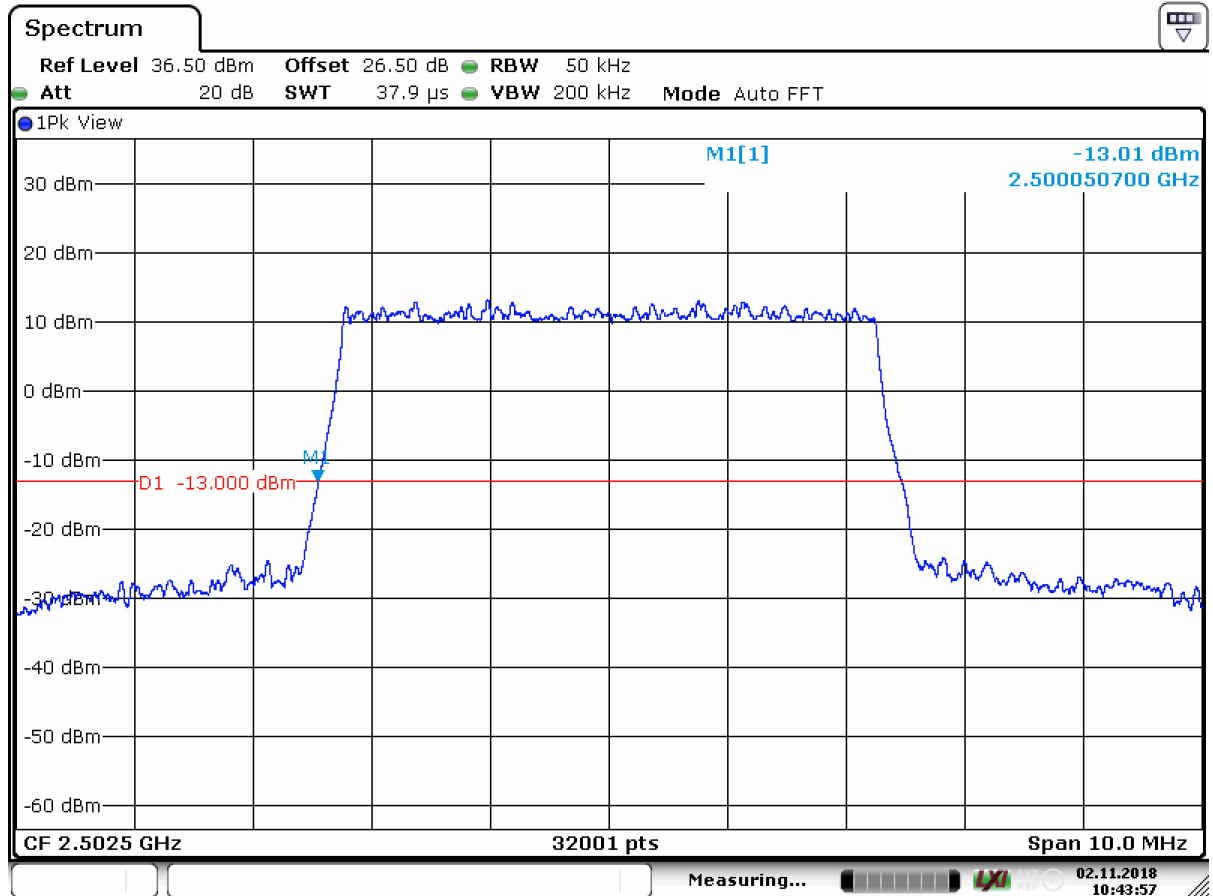
Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	6337.5	-1	-9	passed
-30	5			-1	-7	passed
-30	10			-1	-5	passed
-20	0	normal	6337.5	-2	-7	passed
-20	5			-2	17	passed
-20	10			-3	16	passed
-10	0	normal	6337.5	3	15	passed
-10	5			2	7	passed
-10	10			7	17	passed
0	0	normal	6337.5	0	15	passed
0	5			2	14	passed
0	10			3	15	passed
10	0	normal	6337.5	0	14	passed
10	5			1	13	passed
10	10			-1	-13	passed
20	0	low	6337.5	4	-13	passed
20	5			0	7	passed
20	10			-1	15	passed
20	0	normal	6337.5	-2	-16	passed
20	5			1	12	passed
20	10			-1	-13	passed
20	0	high	6337.5	0	6	passed
20	5			-3	15	passed
20	10			1	14	passed
30	0	normal	6337.5	-2	-14	passed
30	5			0	-15	passed
30	10			-2	-16	passed
40	0	normal	6337.5	0	12	passed
40	5			-2	-13	passed
40	10			-1	-13	passed
50	0	normal	6337.5	-1	-17	passed
50	5			0	-16	passed
50	10			-2	-16	passed

LTE eFDD7

additional measurementi according RSS-199 4.3

LTE eFDD7						
(MHz) / Resource	f _L (MHz)	f _H (MHz)	Frequency Error (Hz)	Resulting Freq. (MHz)	Limiti (MHz)	Resulti
5 / 25	2500.0507	-	17	2500.05	2500	Passed
	-	2569.95367	17	2569.95	2570	Passed

LTE eFDD7



Date: 2.NOV.2018 10:43:58

LTE eFDD7 QPSK 5MHz Channel = low

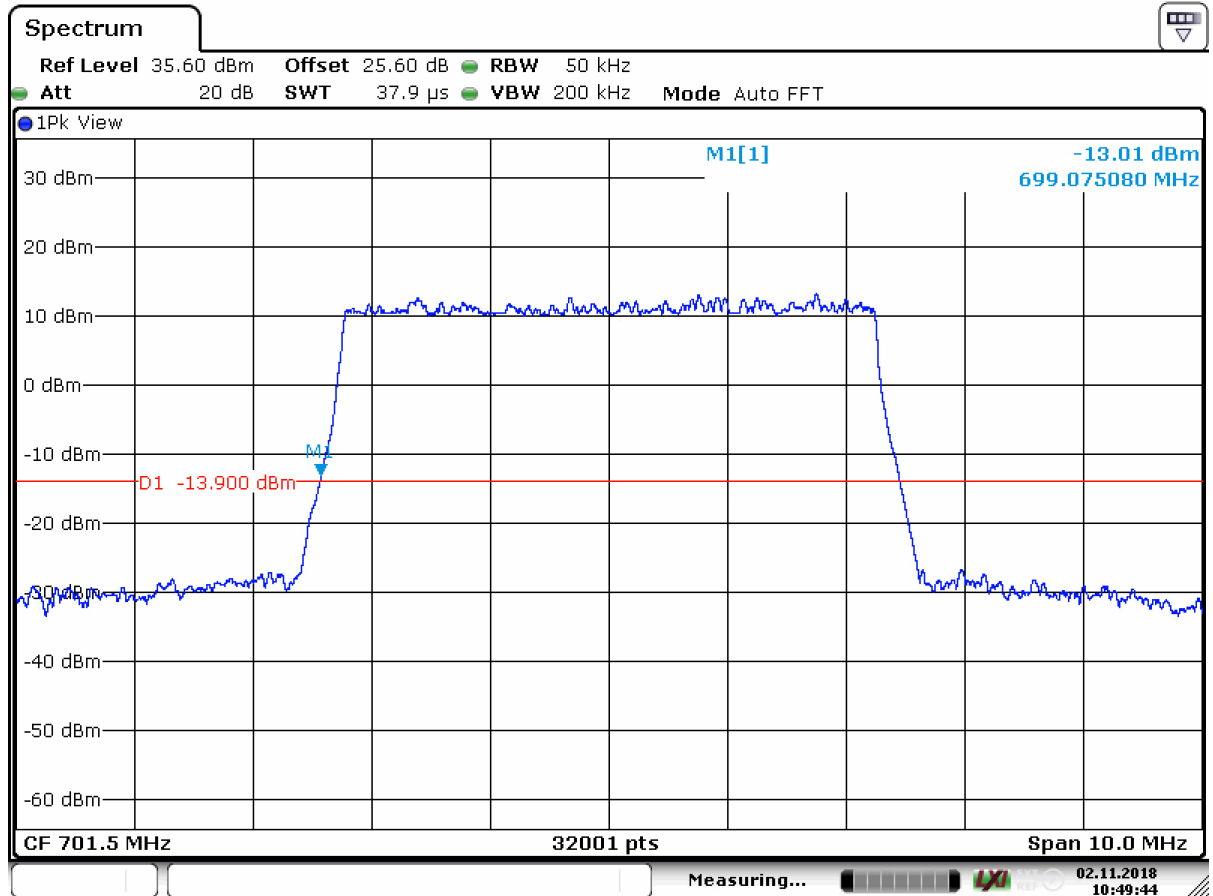
Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1768.75	-3	-7	passed
-30	5			-4	-7	passed
-30	10			2	-9	passed
-20	0	normal	1768.75	-2	8	passed
-20	5			3	6	passed
-20	10			-1	-5	passed
-10	0	normal	1768.75	-1	-7	passed
-10	5			1	-8	passed
-10	10			2	4	passed
0	0	normal	1768.75	0	3	passed
0	5			2	9	passed
0	10			0	-5	passed
10	0	normal	1768.75	1	-8	passed
10	5			1	5	passed
10	10			0	4	passed
20	0	low	1768.75	-2	-7	passed
20	5			-2	-8	passed
20	10			-1	-8	passed
20	0	normal	1768.75	-2	-8	passed
20	5			-2	-8	passed
20	10			-1	-8	passed
20	0	high	1768.75	-2	-7	passed
20	5			-3	-7	passed
20	10			0	-5	passed
30	0	normal	1768.75	-3	-9	passed
30	5			-3	-8	passed
30	10			-5	-8	passed
40	0	normal	1768.75	-2	-11	passed
40	5			-1	-4	passed
40	10			-2	-5	passed
50	0	normal	1768.75	-3	-6	passed
50	5			-6	-8	passed
50	10			-6	-8	passed

LTE eFDD12

RSS-130 4.3

LTE eFDD12						
(MHz) / Resource	f _L (MHz)	f _H (MHz)	Frequency Error (Hz)	Resulting Freq. (MHz)	Limiti (MHz)	Resulti
5 / 25	699.07508	-	-11	699.08	699.08	Passed
	-	715.9443	-11	715.94	715.94	Passed

LTE eFDD12



Date: 2.NOV.2018 10:49:45

LTE eFDD12 QPSK 5MHz Channel = low

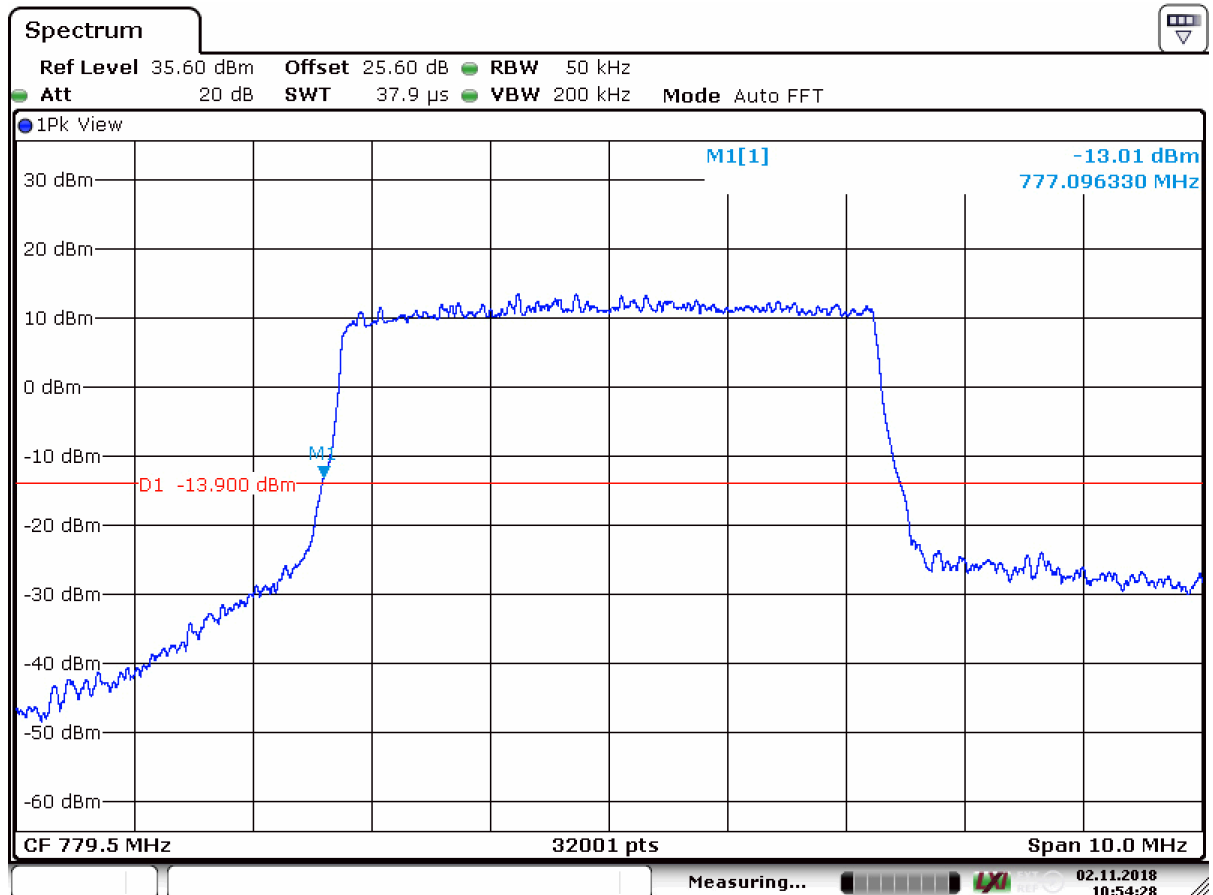
Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1955	2	13	passed
-30	5			3	10	passed
-30	10			3	11	passed
-20	0	normal	1955	2	7	passed
-20	5			1	14	passed
-20	10			4	9	passed
-10	0	normal	1955	3	7	passed
-10	5			1	4	passed
-10	10			1	4	passed
0	0	normal	1955	1	10	passed
0	5			5	8	passed
0	10			4	10	passed
10	0	normal	1955	0	-11	passed
10	5			1	9	passed
10	10			0	-10	passed
20	0	low	1955	0	9	passed
20	5			-1	8	passed
20	10			-1	-9	passed
20	0	normal	1955	-1	-12	passed
20	5			2	4	passed
20	10			2	-8	passed
20	0	high	1955	0	9	passed
20	5			0	9	passed
20	10			-1	8	passed
30	0	normal	1955	0	4	passed
30	5			-2	9	passed
30	10			0	10	passed
40	0	normal	1955	-1	9	passed
40	5			0	10	passed
40	10			-1	10	passed
50	0	normal	1955	0	3	passed
50	5			2	-8	passed
50	10			1	4	passed

LTE eFDD13

RSS-130 4.3

LTE eFDD13						
(MHz) / Resource	f _L (MHz)	f _H (MHz)	Frequency Error (Hz)	Resulting Freq. (MHz)	Limiti (MHz)	Resulti
5 / 25	777.09633	-	14	777.10	777	Passed
	-	786.9193	14	786.92	787	Passed

LTE eFDD13



Date: 2.NOV.2018 10:54:28

LTE eFDD13 QPSK 5MHz Channel = low

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4362.5	0	11	passed
-30	5			0	8	passed
-30	10			1	10	passed
-20	0	normal	4362.5	0	12	passed
-20	5			1	10	passed
-20	10			1	9	passed
-10	0	normal	4362.5	2	12	passed
-10	5			1	15	passed
-10	10			0	11	passed
0	0	normal	4362.5	1	12	passed
0	5			1	12	passed
0	10			0	10	passed
10	0	normal	4362.5	1	12	passed
10	5			2	11	passed
10	10			1	9	passed
20	0	low	4362.5	0	8	passed
20	5			2	13	passed
20	10			2	11	passed
20	0	normal	4362.5	1	11	passed
20	5			0	12	passed
20	10			0	10	passed
20	0	high	4362.5	1	13	passed
20	5			1	12	passed
20	10			1	10	passed
30	0	normal	4362.5	0	9	passed
30	5			2	8	passed
30	10			1	11	passed
40	0	normal	4362.5	1	12	passed
40	5			0	10	passed
40	10			1	13	passed
50	0	normal	4362.5	2	11	passed
50	5			1	14	passed
50	10			1	11	passed

LTE eFDD66

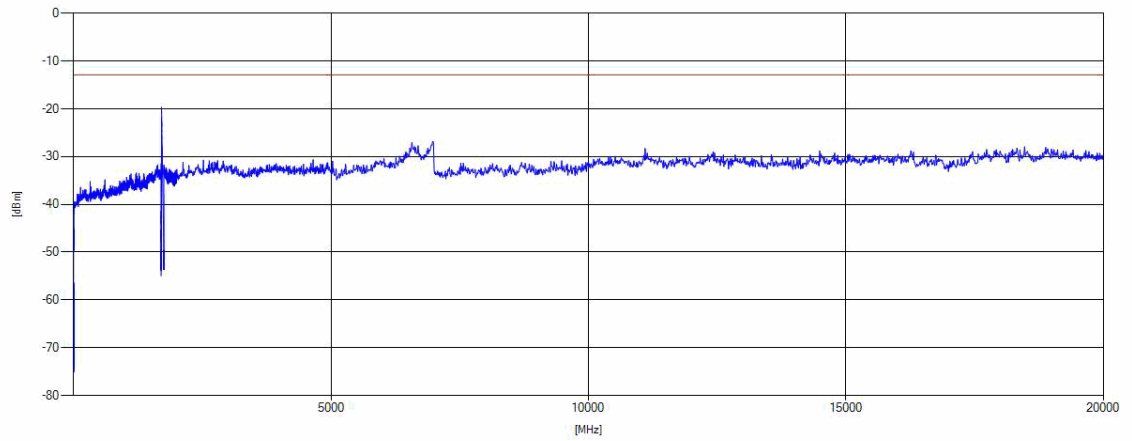
3.5.17 27.3 Spurious emissions at antenna terminals §2.1051, §27.53

Test: 27.3; Spurious emissions at antenna terminals Summary §2.1051, §27.53

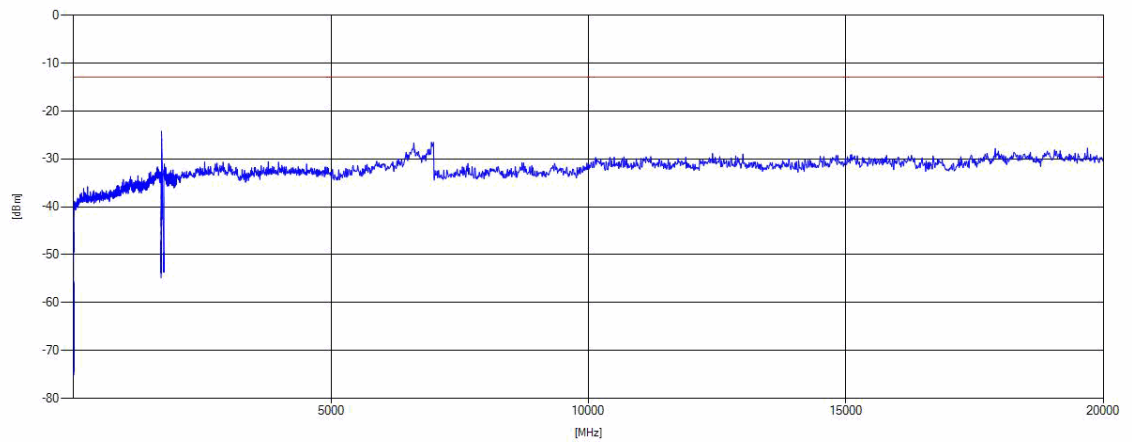
<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 17:06
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

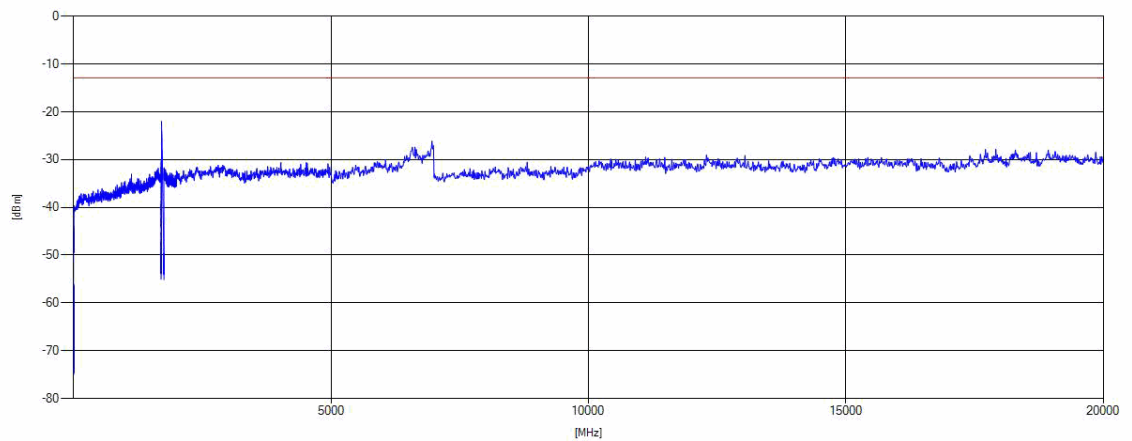
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
FDD4	low	rms	maxhold	50	1709.99	-21.74	-13	8.74
FDD4	mid	rms	maxhold	-	-	-	-13	>20
FDD4	high	rms	maxhold	50	1755	-25.25	-13	12.25
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD4	low	rms	maxhold	50	1709.99	-25.84	-13	12.84
HSDPA FDD4	mid	rms	maxhold	-	-	-	-13	>20
HSDPA FDD4	high	rms	maxhold	50	1755	-26.9	-13	13.9
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD4	low	rms	maxhold	50	1709.99	-23.9	-13	10.9
HSUPA FDD4	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD4	high	rms	maxhold	50	1755	-27.31	-13	14.31
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD4	low	rms	maxhold	5	1710	-33.4	-23	10.4
eFDD4	mid	rms	maxhold	-	-	-	-13	>20
eFDD4	high	rms	maxhold	5	1755	-35.48	-23	12.48
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD7	low	peak	maxhold	5	2500	-27.2	-20	7.2
eFDD7	mid	peak	maxhold	-	-	-	-13	>20
eFDD7	high	peak	maxhold	5	2570	-34.1	-20	14.1
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD12	low	rms	maxhold	-	-	-	-13	>20
eFDD12	mid	rms	maxhold	-	-	-	-13	>20
eFDD12	high	rms	maxhold	-	-	-	-13	>20
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD13	low	rms	maxhold	-	-	-	-13	>20
eFDD13	mid	rms	maxhold	-	-	-	-13	>20
eFDD13	high	rms	maxhold	30	787	-27.92	-23	4.92
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD66	low	rms	maxhold	50	1710	-22.82	-13	9.82
eFDD66	mid	rms	maxhold	-	-	-	-13	>20
eFDD66	high	rms	maxhold	50	1780	-25.15	-13	12.15



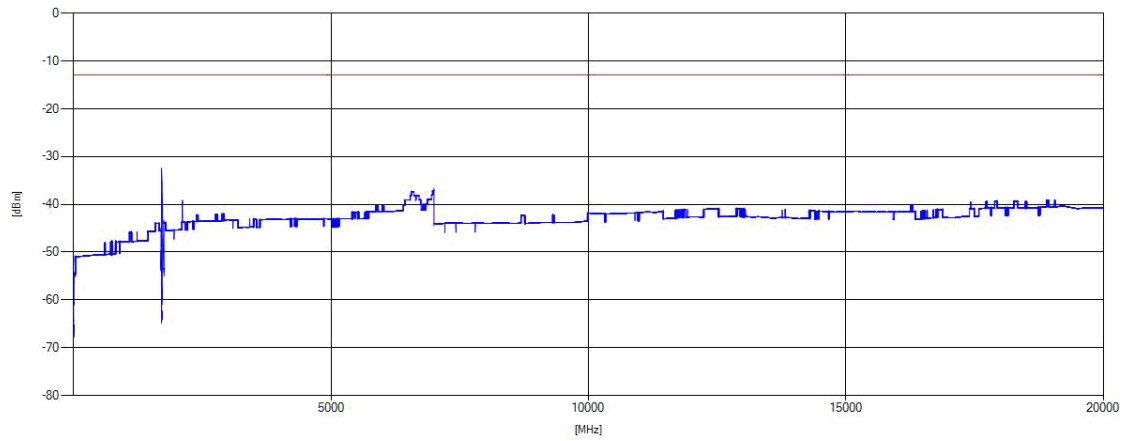
WCDMA FDD4 Channel = low



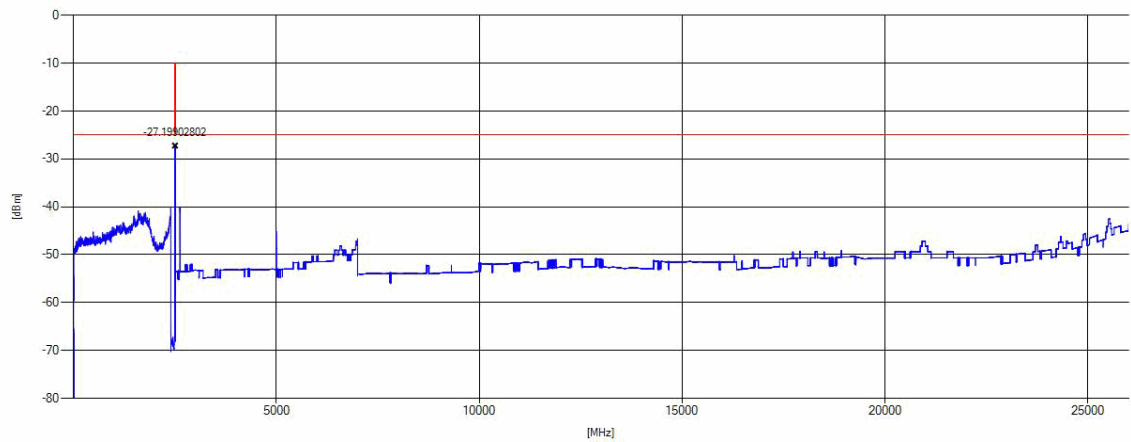
HSDPA FDD4 Channel = low



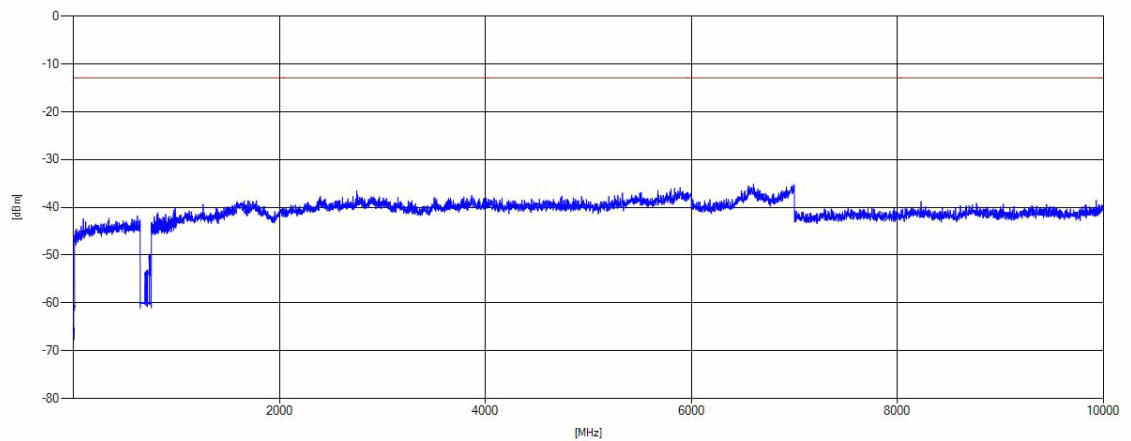
HSUPA FDD4 Channel = low



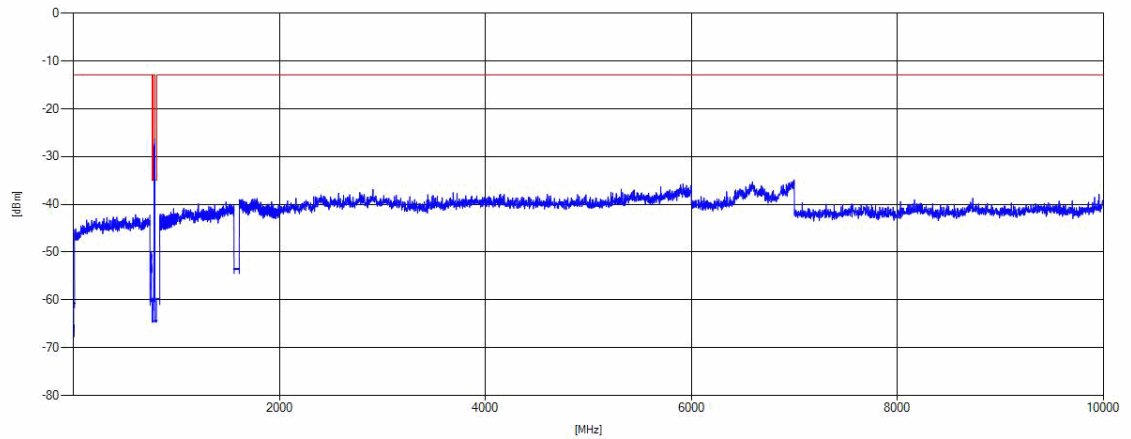
LTE eFDD4 QPSK Channel = low



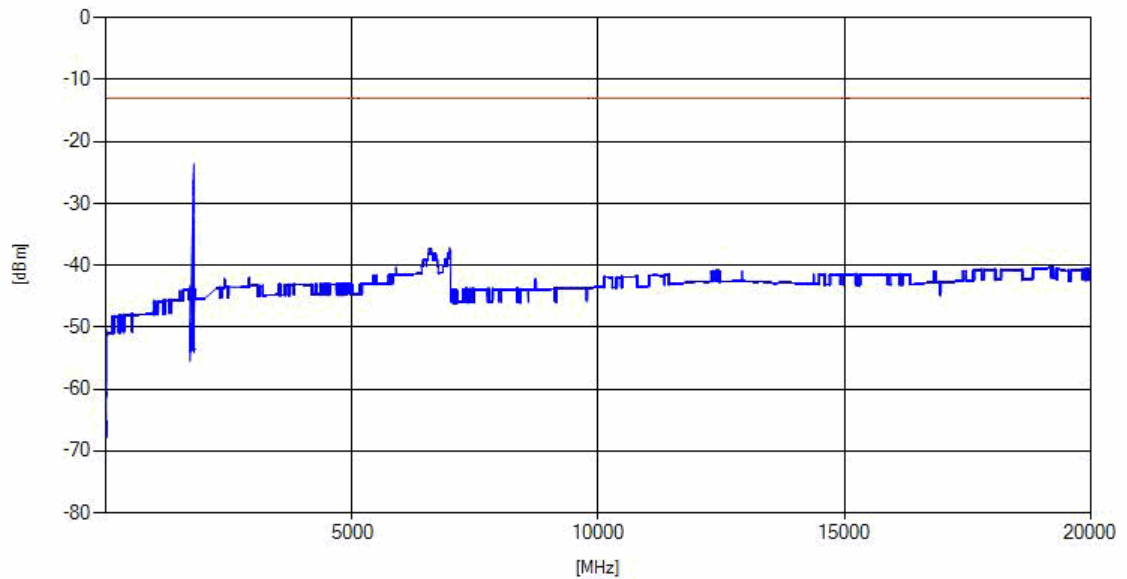
LTE eFDD7 QPSK Channel = low
REMARK: compliant to FCC27.53m)4) and RSS-199 4.5



LTE eFDD12 QPSK Channel = mid

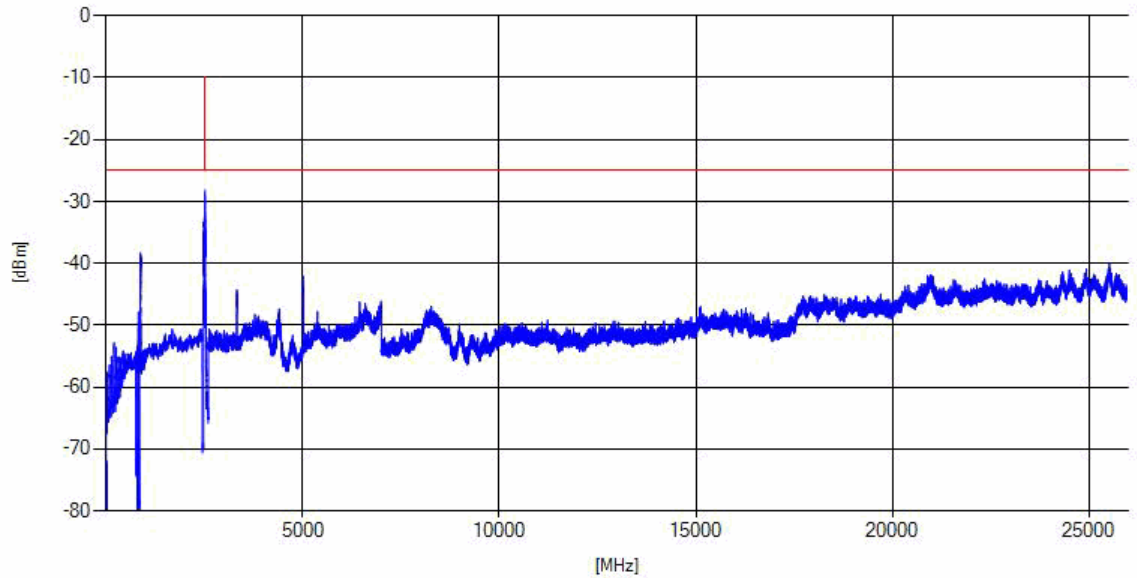


LTE eFDD13 QPSK Channel = high
REMARK: compliant to FCC27.53c)4) and RSS-130 4.7.1



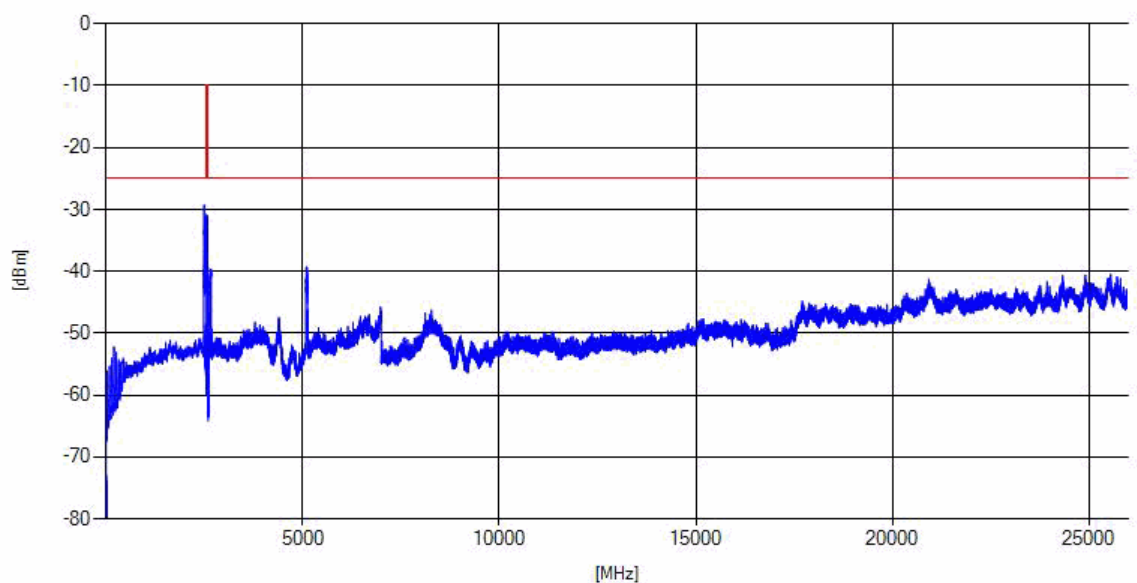
LTE eFDD66 QPSK Channel = high

Carrier Aggregation (intier-band)									
Radio Technology PCC	Radio Technology SCC1	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD5	eFDD7	low	rms	maxhold	5	823.99	-49.7	-25	24.7
eFDD5	eFDD7	low	rms	maxhold	100	2498.96	-33.26	-10	23.26
eFDD5	eFDD7	mid	rms	maxhold	-	-	-	-25	>20
eFDD5	eFDD7	high	rms	maxhold	-	-	-	-25	>20



PCC: eFDD5 QPSK 5MHz RB1 Channel = low
 SCC1: eFDD7 QPSK 10MHz RB1 Channel = low
 REMARK: compliant to FCC27.53m)4) and RSS-199 4.5

Carrier Aggregation (intira-band)									
Radio Technology PCC	Radio Technology SCC1	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD7	eFDD7	low	rms	maxhold	1000	5030.06	-45.38	-25	20.38
eFDD7	eFDD7	mid	rms	maxhold	1000	5072.14	-40.15	-25	15.15
eFDD7	eFDD7	high	rms	maxhold	1000	5112.22	-39.38	-25	14.38



PCC: eFDD7 QPSK 15MHz Channel = high
 SCC1: eFDD7 QPSK 15MHz Channel = high
 REMARK: compliant to FCC27.53m)4) and RSS-199 4.5

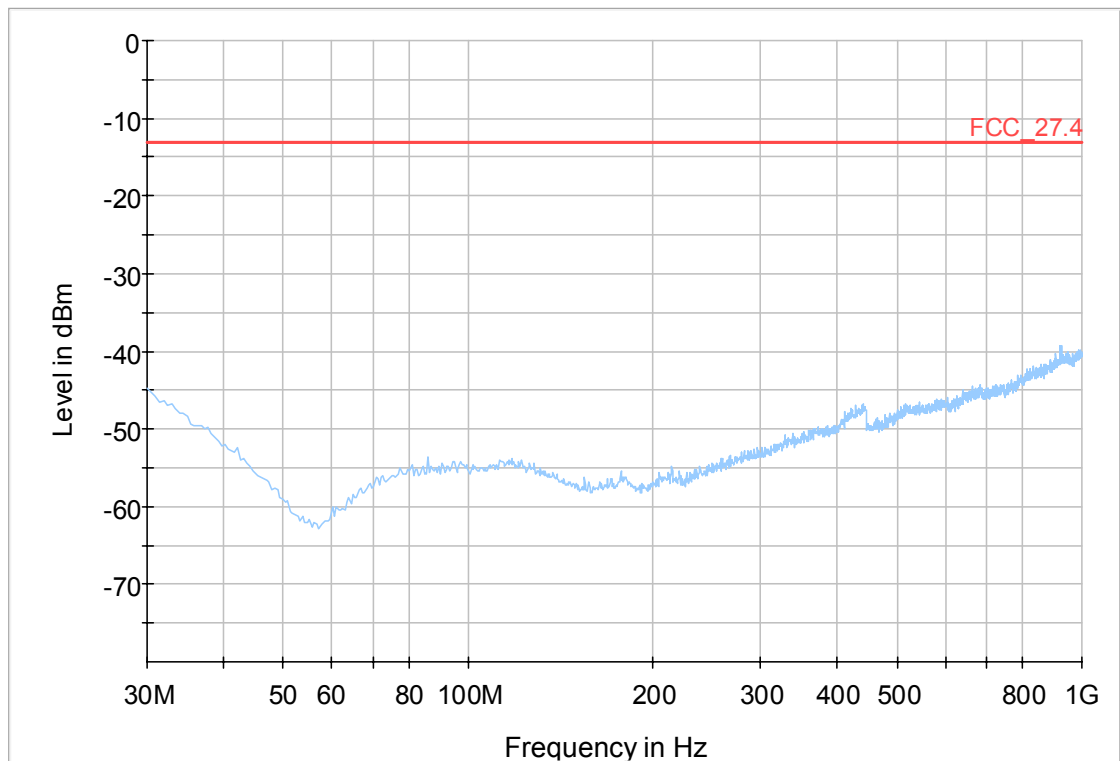
3.5.18 27.4 Field strength of spurious radiation §2.1053, §27.53

Test: 27.4; Field strength of spurious radiation Summary §2.1053, §27.53

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/11/12 14:37
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

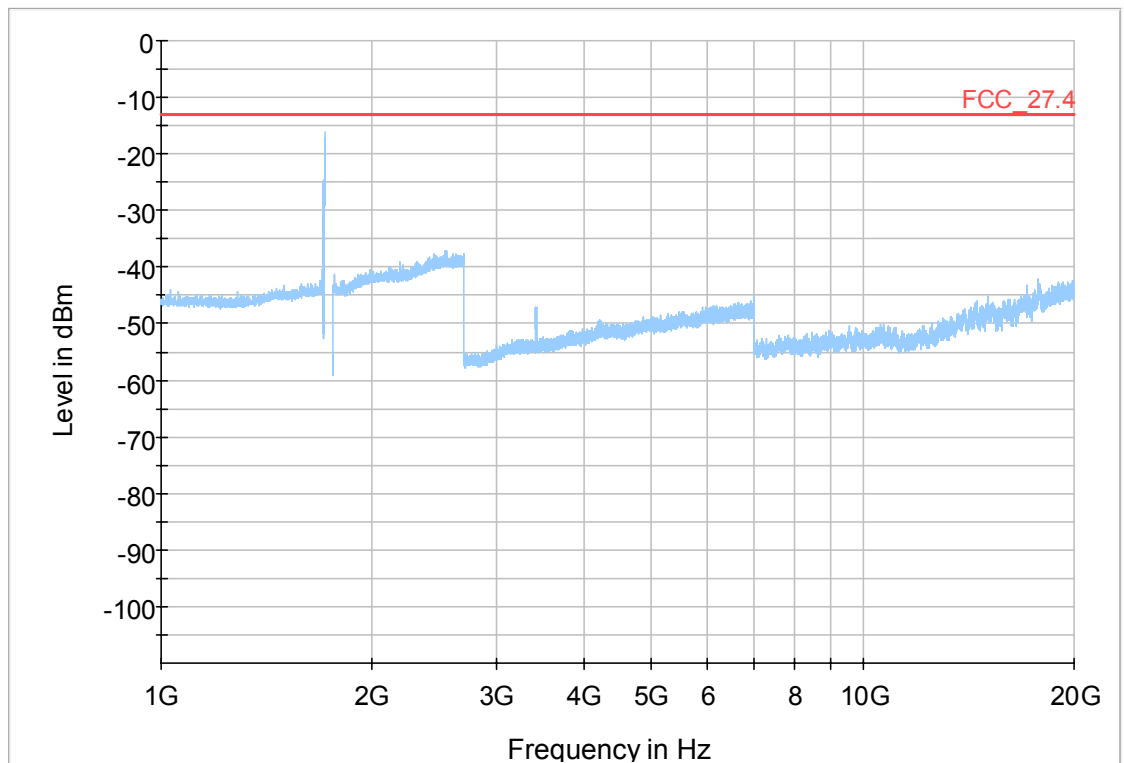
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
FDD4	low	peak	maxhold	50	1710	-16.19	-13	3.19
FDD4	mid	rms	maxhold	-	-	-	-13	>20
FDD4	high	rms	maxhold	50	1755	-18.9	-13	5.9
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSDPA FDD4	low	peak	maxhold	50	1710	-20.71	-13	7.71
HSDPA FDD4	mid	peak	maxhold	-	-	-	-13	>20
HSDPA FDD4	high	peak	maxhold	50	1755	-20.39	-13	7.39
HSDPA FDD4	high	peak	maxhold	1000	2153.96	-30.07	-13	17.07
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
HSUPA FDD4	low	peak	maxhold	50	1709.99	-18.8	-13	5.8
HSUPA FDD4	mid	rms	maxhold	-	-	-	-13	>20
HSUPA FDD4	high	peak	maxhold	1000	1765.94	-17.6	-13	4.6
HSUPA FDD4	high	peak	maxhold	1000	1768.27	-18.4	-13	5.4
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD4	low	rms	maxhold	3	1709.98	-36.01	-25.2	10.81
eFDD4	mid	rms	maxhold	-	-	-	-13	>20
eFDD4	high	rms	maxhold	50	1756	-31.73	-13	18.73
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD7	low	rms	maxhold	50	2499.99	-24.82	-10	14.82
eFDD7	low	peak	maxhold	1000	5001	-34.14	-25	9.14
eFDD7	mid	rms	maxhold	-	-	-	-13	>20
eFDD7	high	rms	maxhold	50	2570	-24.07	-10	14.07
eFDD7	high	peak	maxhold	1000	5140	-32.05	-25	7.05
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD12	low	rms	maxhold	-	-	-	-13	>20
eFDD12	mid	rms	maxhold	-	-	-	-13	>20
eFDD12	high	rms	maxhold	-	-	-	-13	>20
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD13	low	rms	maxhold	-	-	-	-13	>20
eFDD13	mid	rms	maxhold	-	-	-	-13	>20
eFDD13	high	rms	maxhold	787	30	-27.37	-23	4.37
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
eFDD66	low	rms	maxhold	5	1709.99	-39.17	-23	16.17
eFDD66	mid	rms	maxhold	-	-	-	-13	>20
eFDD66	high	rms	maxhold	5	1780	-37.57	-23	14.57



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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30MHz - 1GHz: WCDMA FDD4 Channel = low



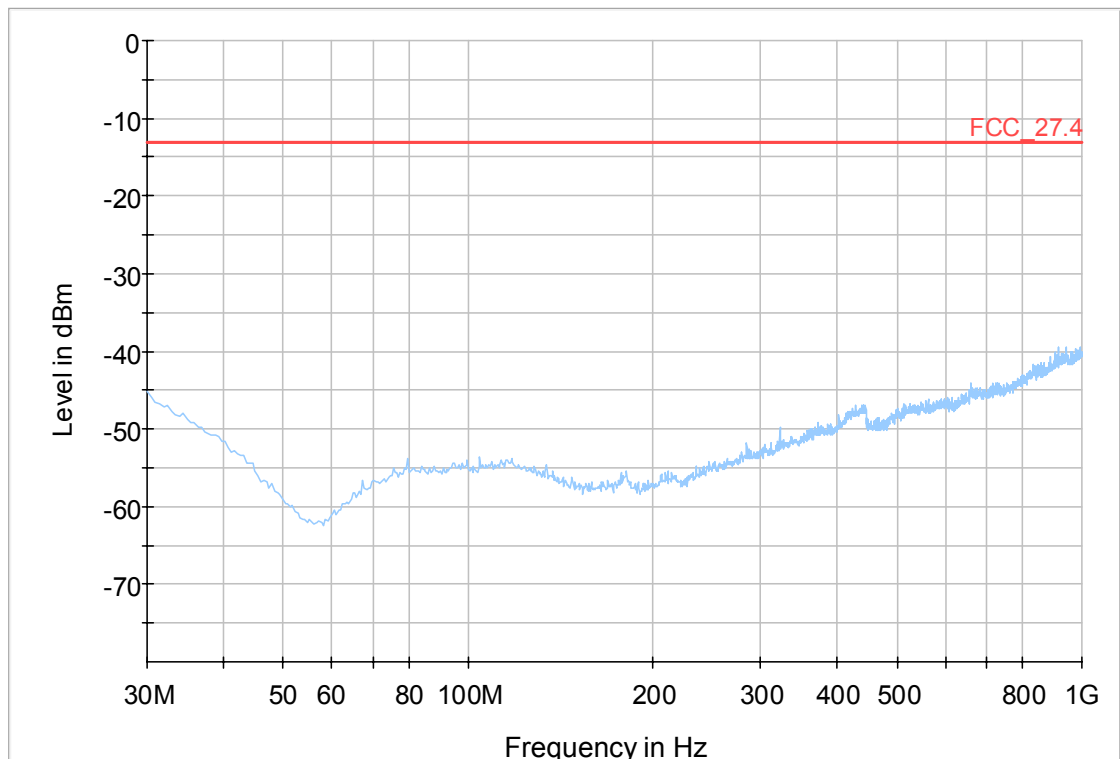
Critical_Freqs

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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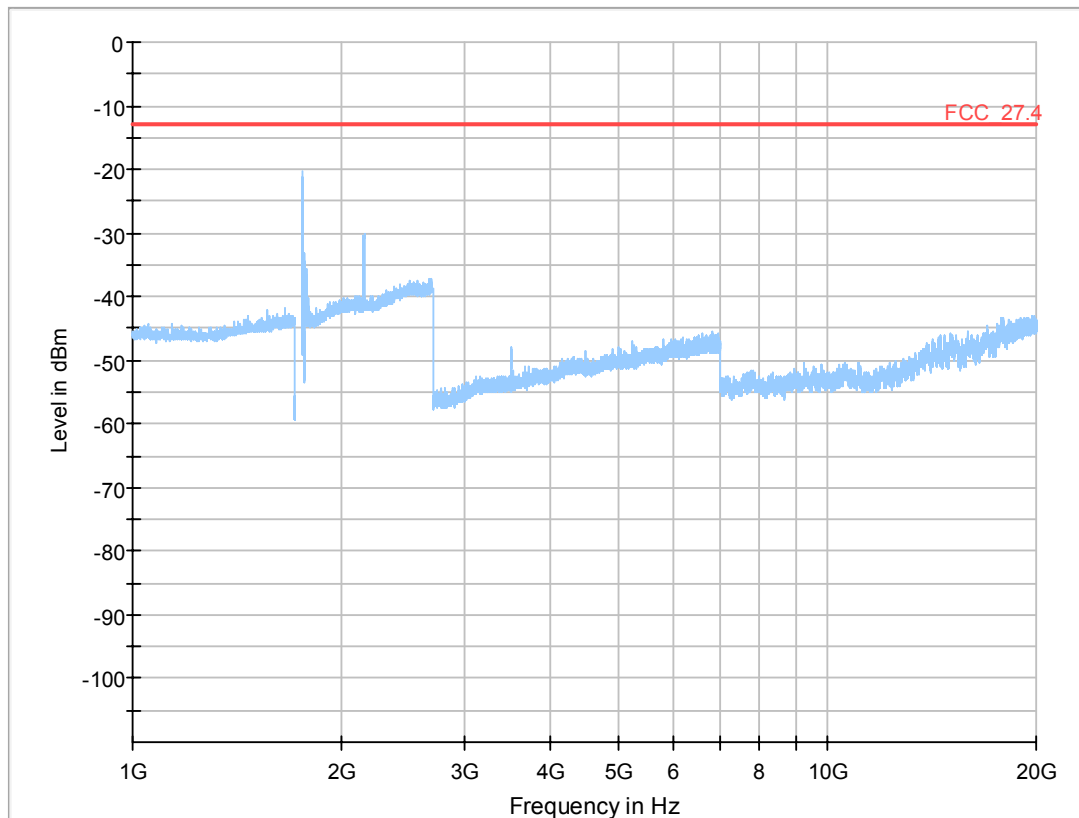
1GHz - 20GHz: WCDMa FDD4 Channel = low



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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30MHz - 1GHz: HSDPA FDD4 Channel = low



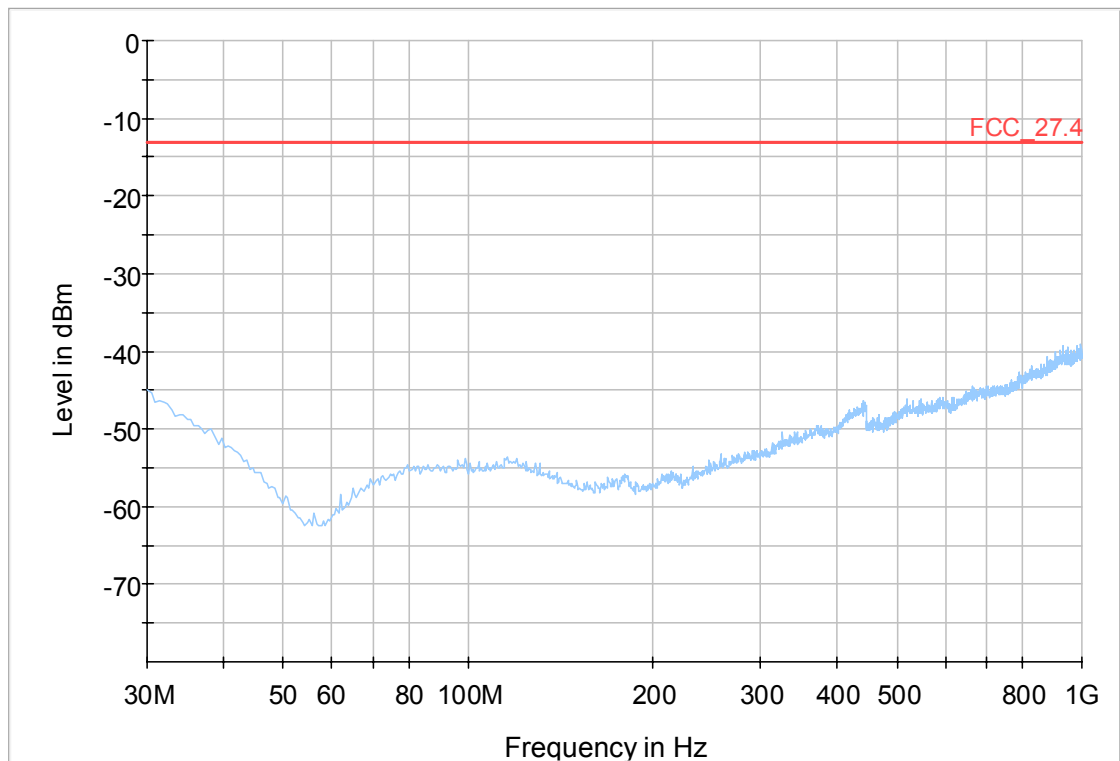
Critical_Freqs

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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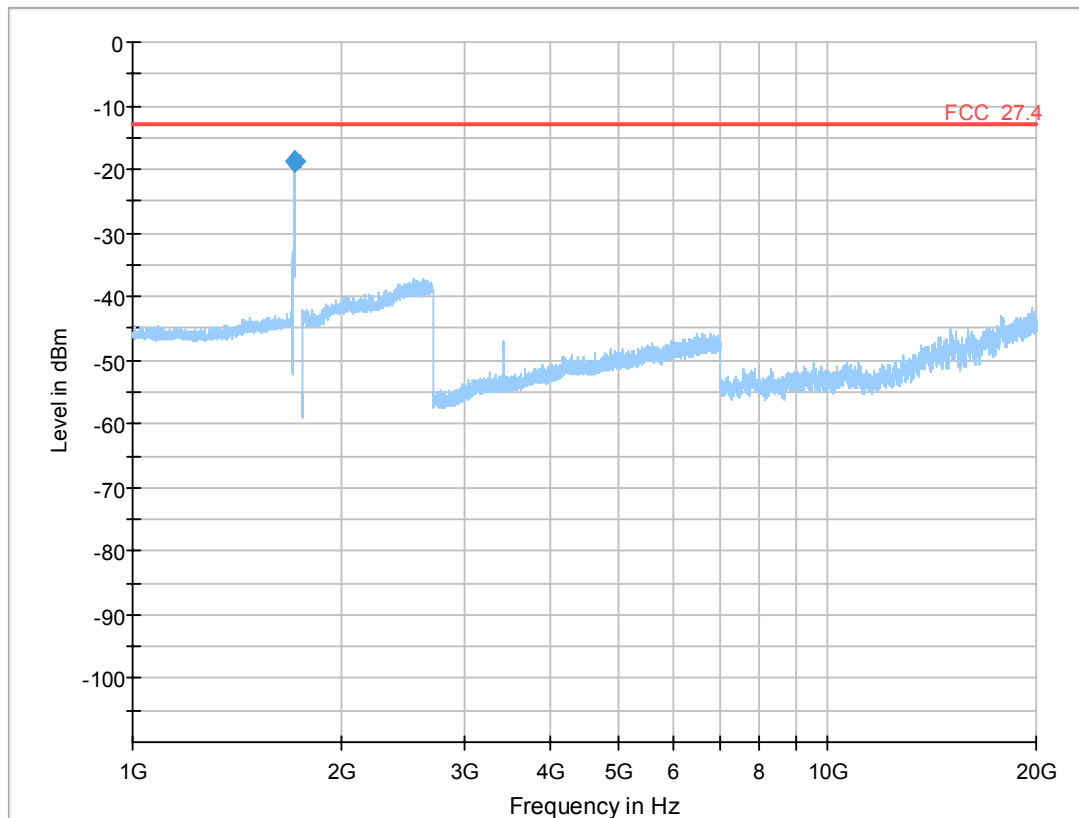
1GHz - 20GHz: HSDPA FDD4 Channel = low



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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30MHz - 1GHz: HSUPA FDD4 Channel = low



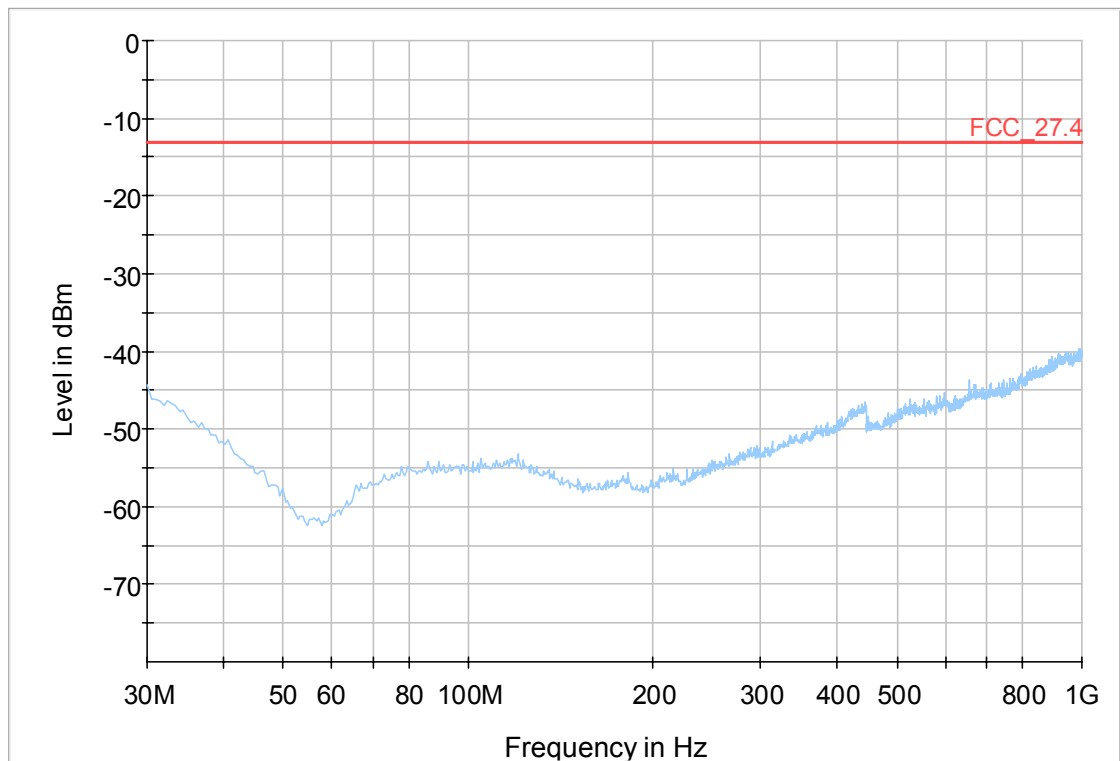
Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1709.991	-18.8	-13.00	5.76	1000.0	50.000	150.0	V	-180.0	0.0	-66.1

Final_Result

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1709.991	-18.8	-13.00	5.76	1000.0	50.000	150.0	V	-180.0	0.0	-66.1

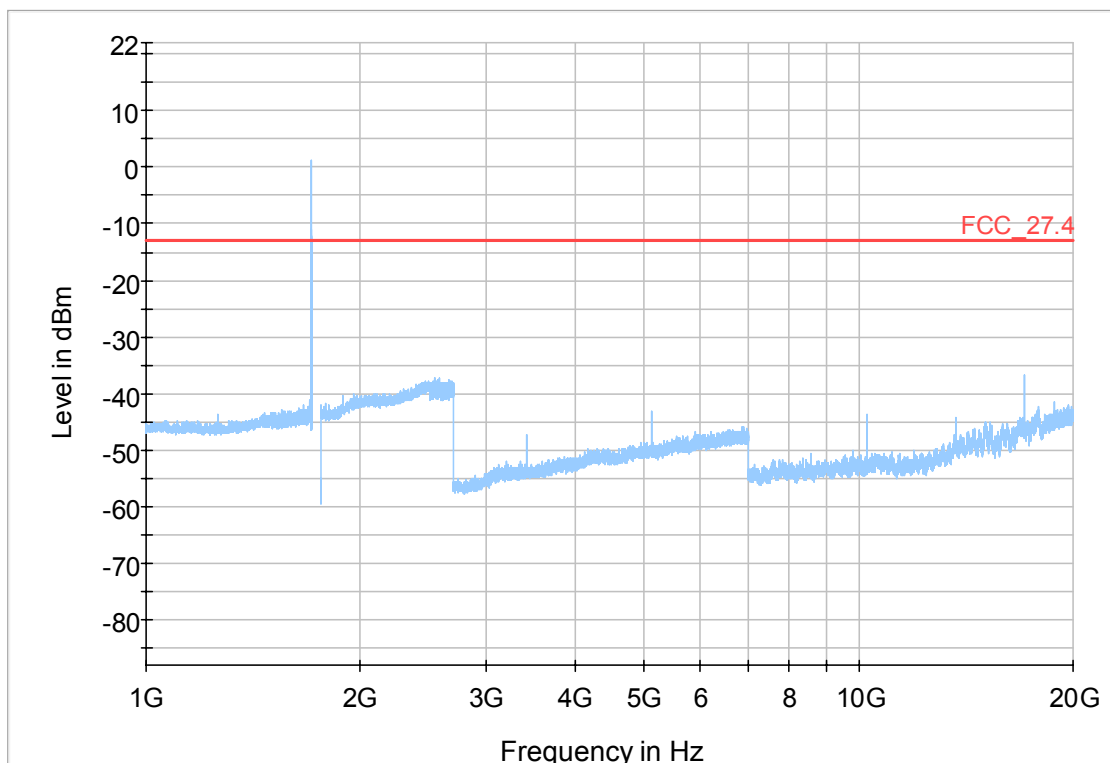
1GHz - 20GHz: HSUPA FDD4 Channel = low



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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30MHz - 1GHz: LTE eFDD4 Channel = low



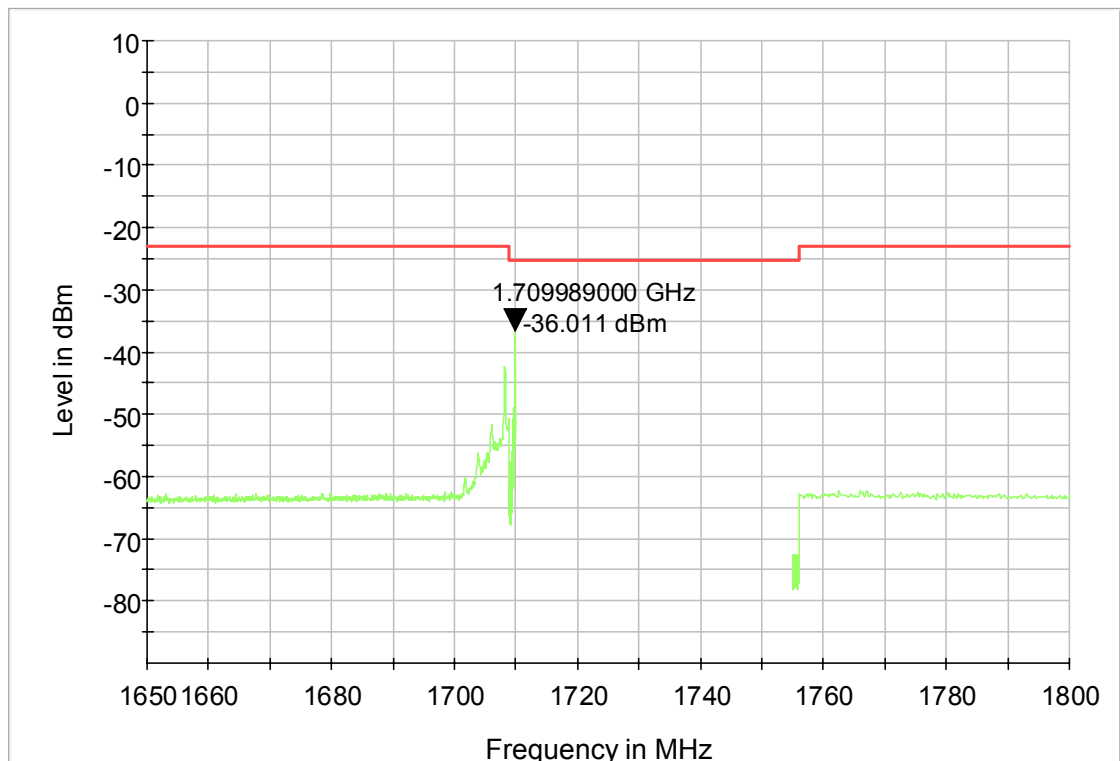
Critical_Freqs

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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1GHz - 20GHz: LTE eFDD4 Channel = low



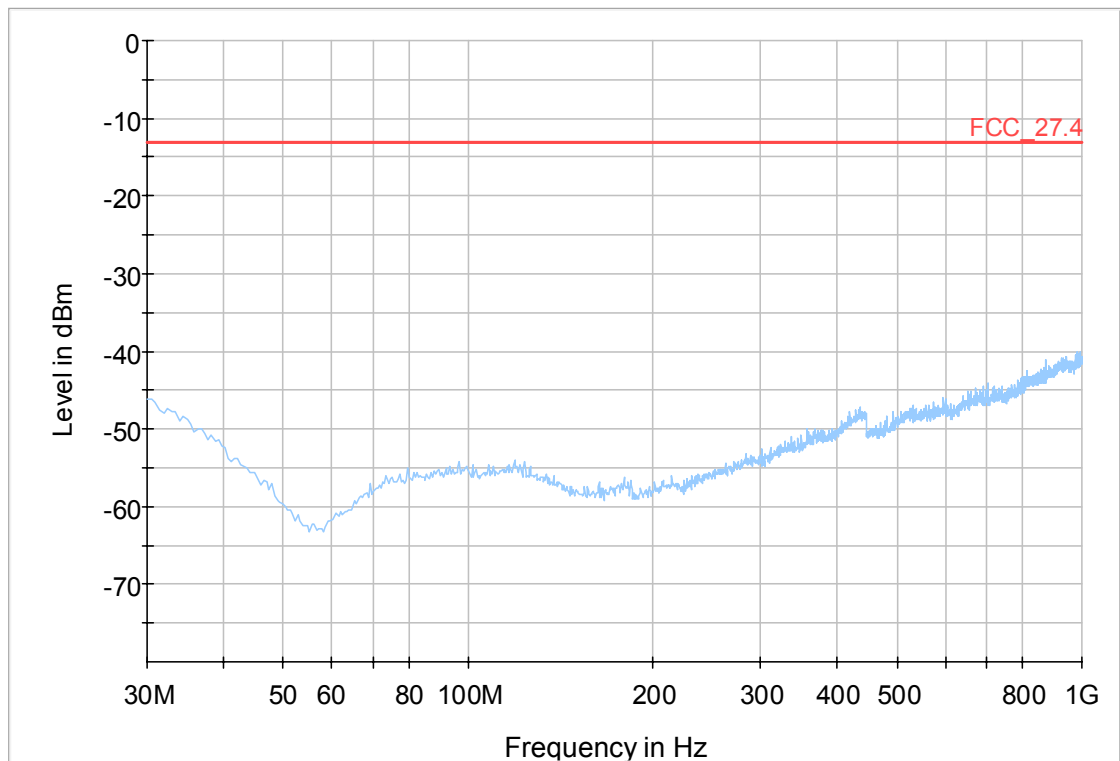
Critical_Freqs

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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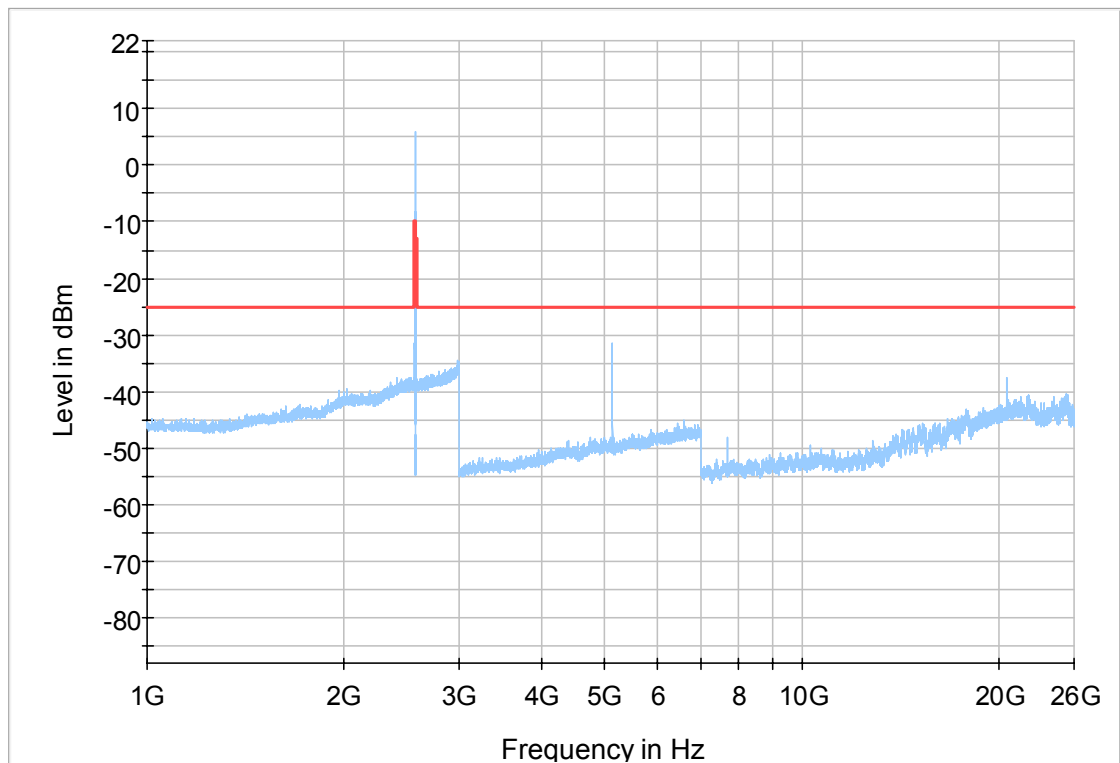
final measurement at band edge: LTE eFDD4 Channel = low



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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30MHz - 1GHz: LTE eFDD7 Channel = high



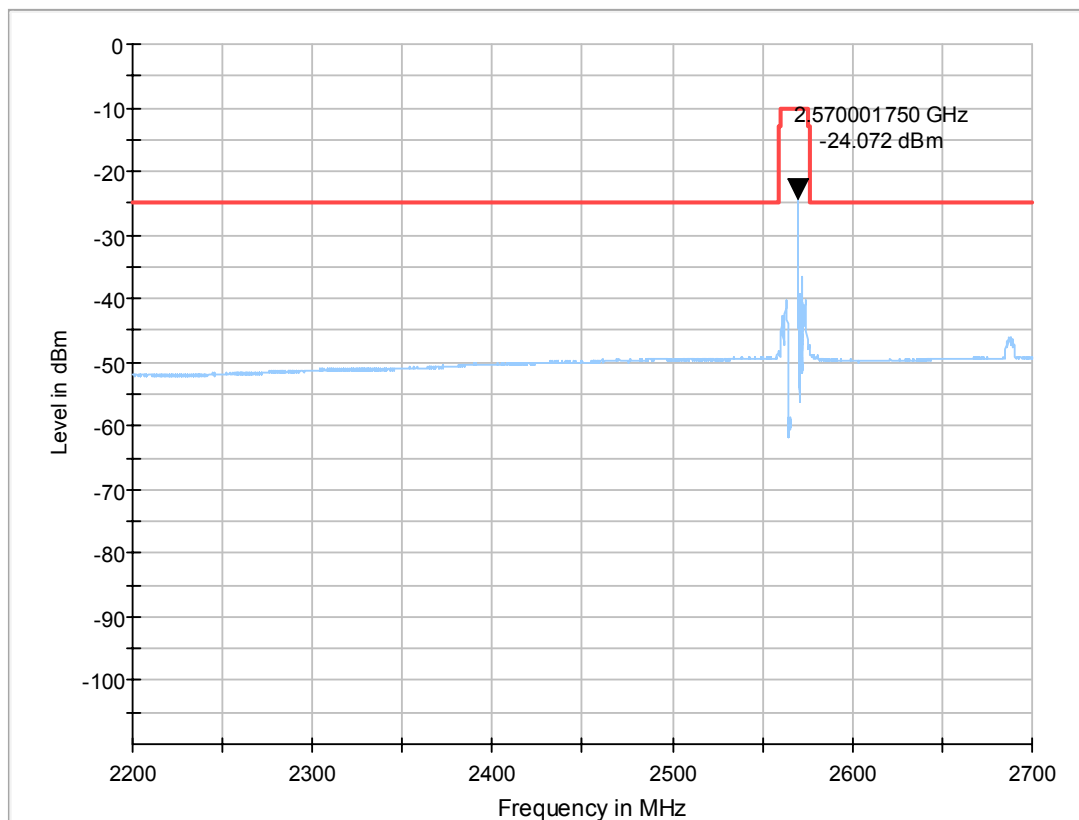
Critical_Freqs

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)
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1GHz - 26GHz: LTE eFDD7 Channel = high
REMARK: compliant to FCC27.53m)4) and RSS-199 4.5



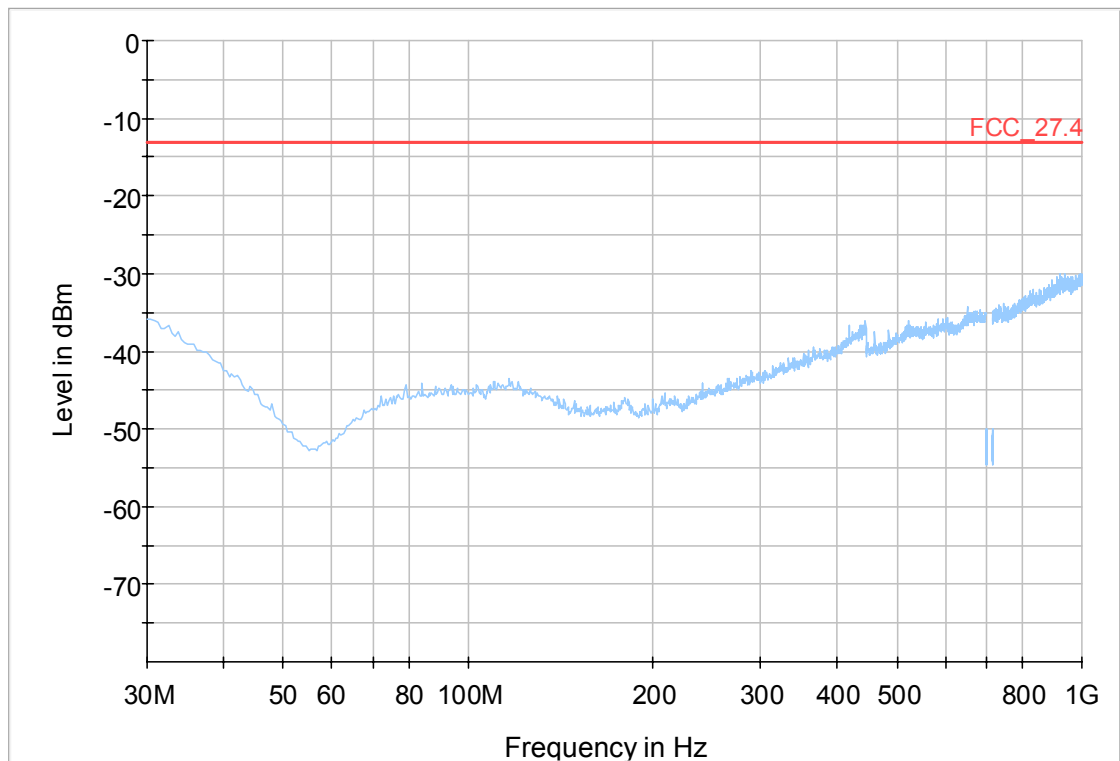
Critical Freqs

Frequency (MHz)	RMS (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)
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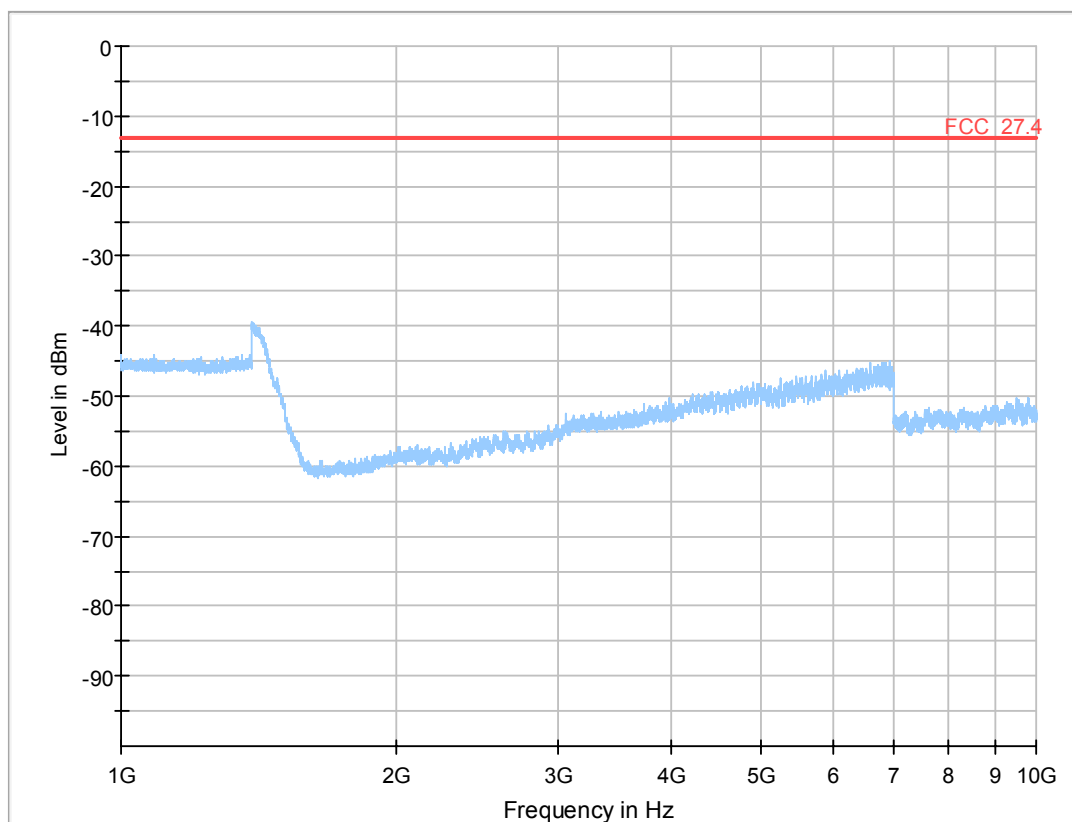
final measurement at band edge: LTE eFDD7 Channel = high
REMARK: compliant to FCC27.53m)4) and RSS-199 4.5



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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30MHz - 1GHz: LTE eFDD12 Channel = mid



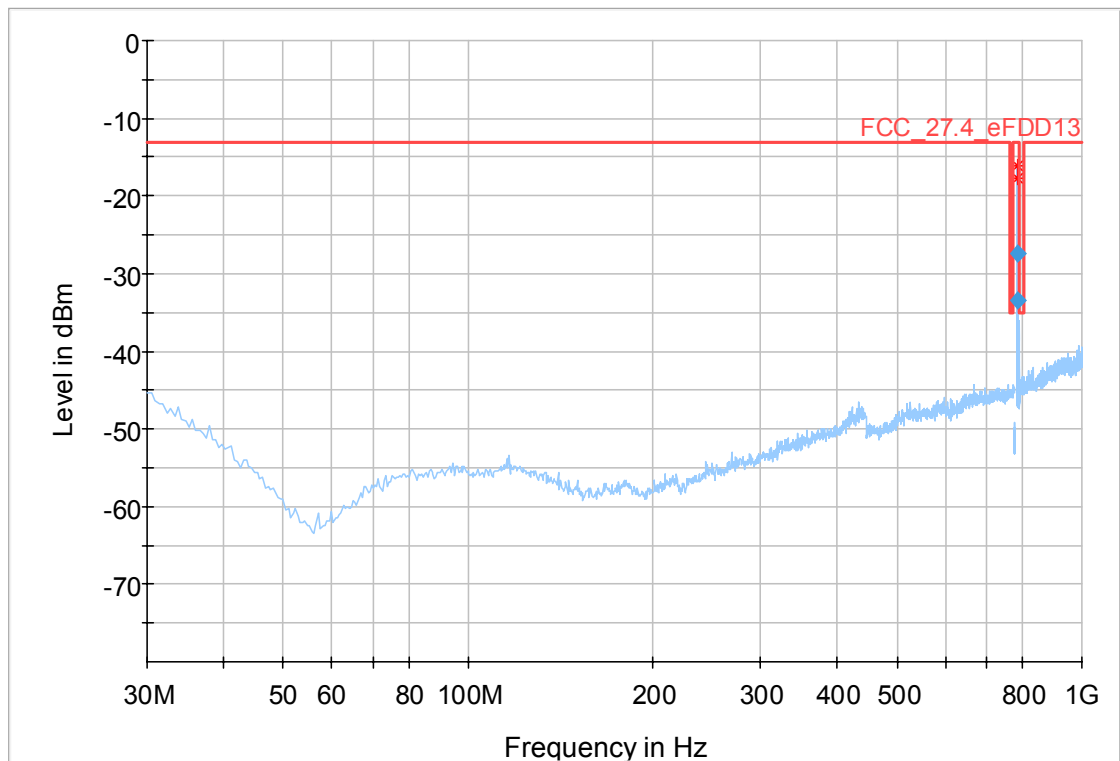
Critical_Freqs

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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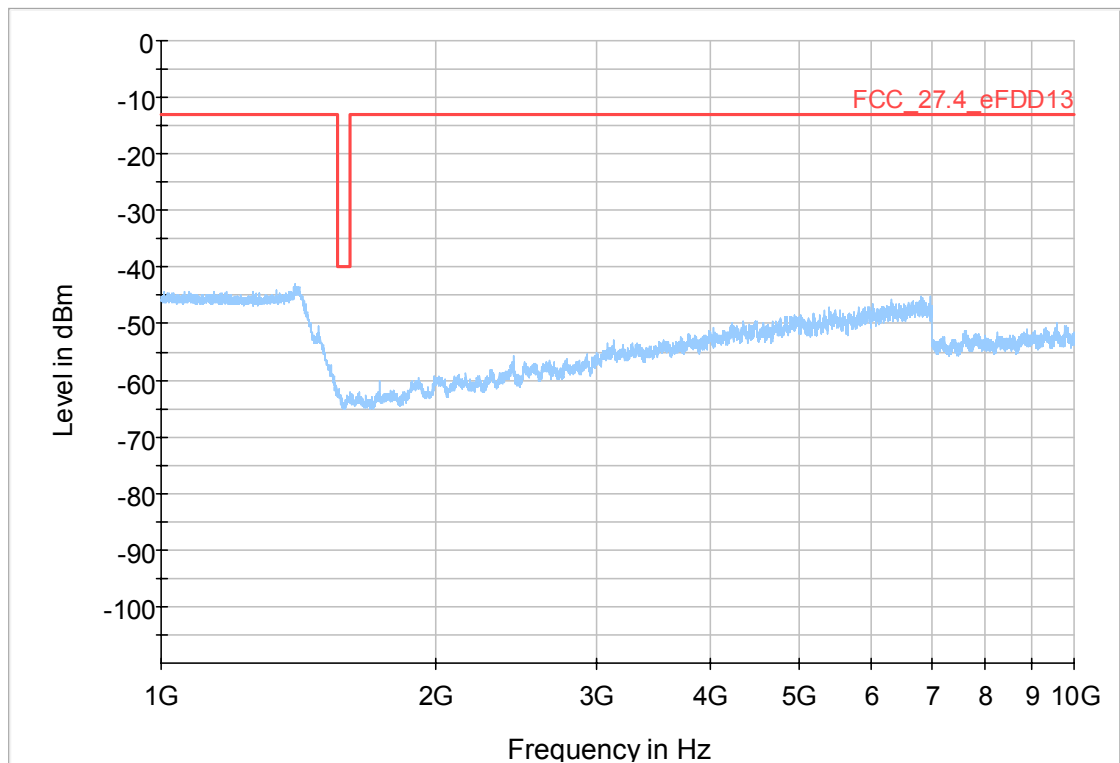
1GHz - 10GHz: LTE eFDD12 Channel = mid



Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
787.002300	-27.37	-13.00	14.37	1000.0	30.000	116.0	V	-174.0	-74.3	08:54:45 - 2018-10-08
787.108700	-33.48	-13.00	20.48	1000.0	100.000	114.0	V	-168.0	-74.3	08:57:33 - 2018-10-08

30MHz - 1GHz: LTE eFDD13 Channel = high
REMARK: compliant to FCC27.53c)4) and RSS-130 4.7.1



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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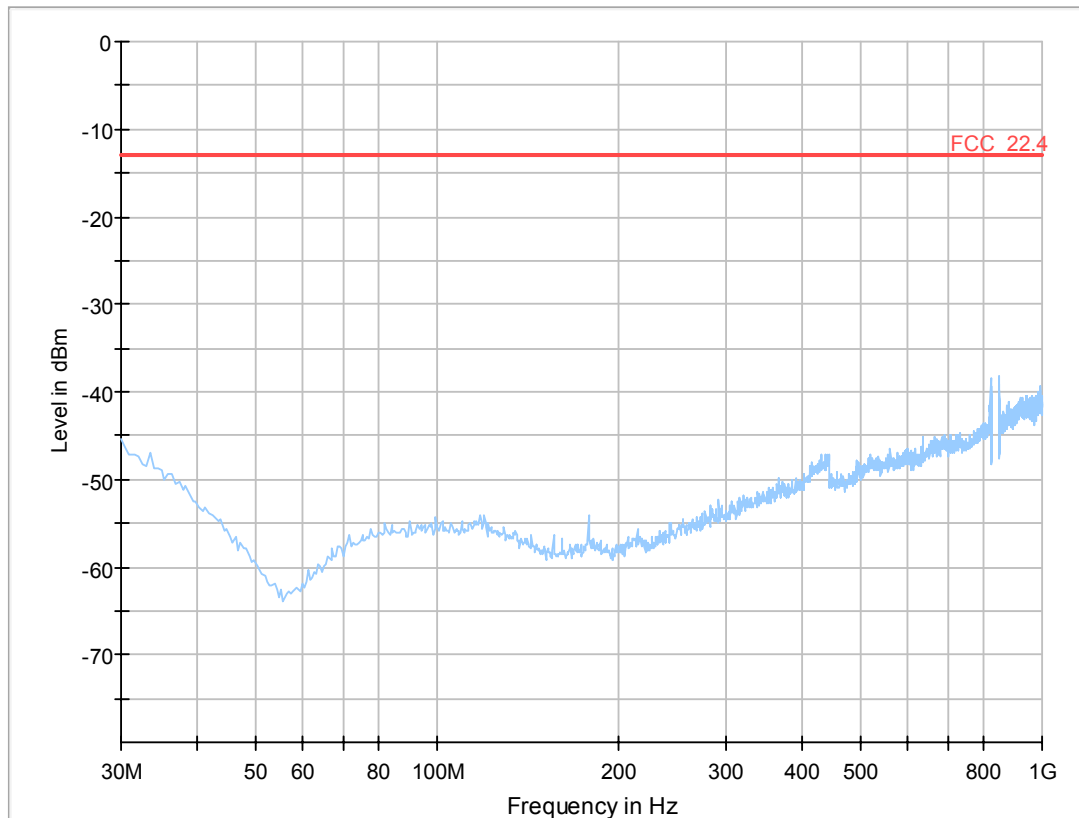
Final_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
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LTE eFDD13 Channel = high

REMARK: compliant to FCC27.53f) and RSS-130 4.7.2

Carrier Aggregation (inter-band)										
Radio Technology PCC	Radio Technology SCC1	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB	
eFDD5	eFDD7	low	peak	maxhold	1000	2626.16	-43.21	-25	18.21	
eFDD5	eFDD7	low	peak	maxhold	1000	2652.31	-42.84	-25	17.84	
eFDD5	eFDD7	mid	peak	maxhold	1000	2681.47	-44.22	-25	19.22	



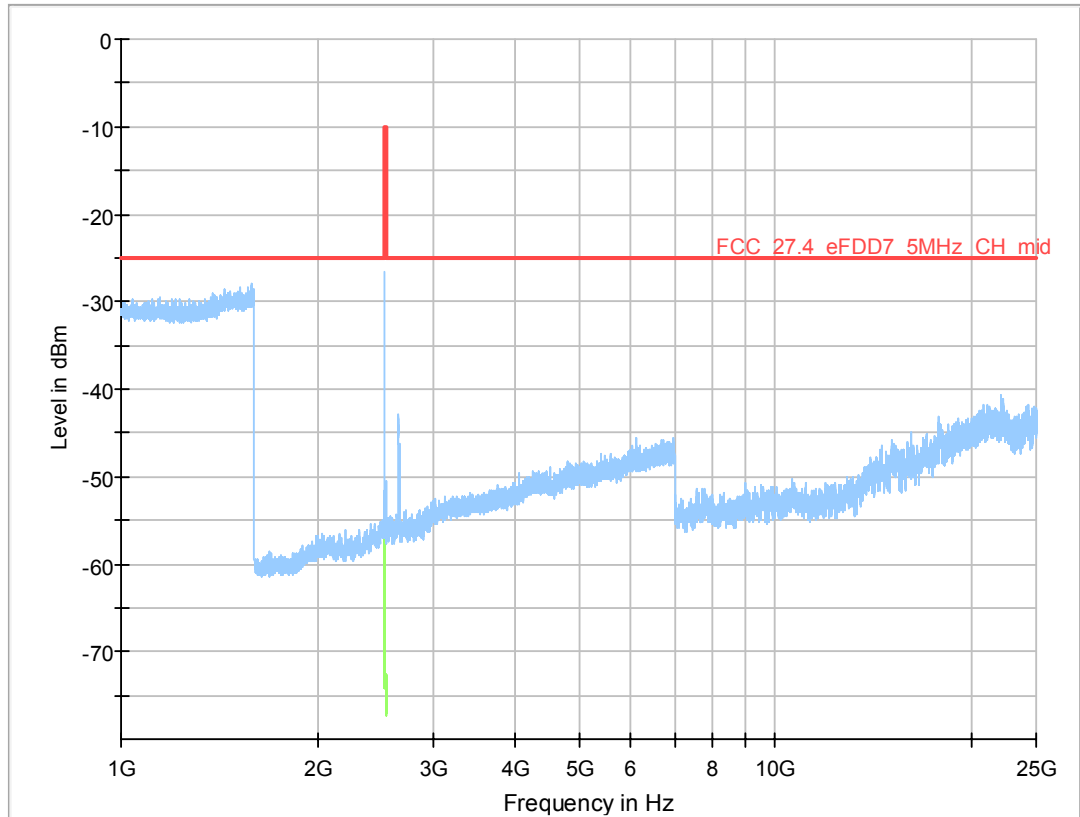
Final_Result

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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30 MHz - 1GHz:

PCC: eFDD5 QPSK 5MHz Channel = mid

SCC1: eFDD7 QPSK 10MHz Channel = mid



Critical_Freqs

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

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

1 GHz - 25GHz:
PCC: eFDD5 QPSK 5MHz Channel = mid
SCC1: eFDD7 QPSK 10MHz Channel = mid
REMARK: compliant to FCC27.53m)4) and RSS-199 4.5

3.5.19 27.5 Emission and Occupied Bandwidth §2.1049

Test: 27.5; Emission and Occupied Bandwidth Summary §2.1049

<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/12 16:04
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

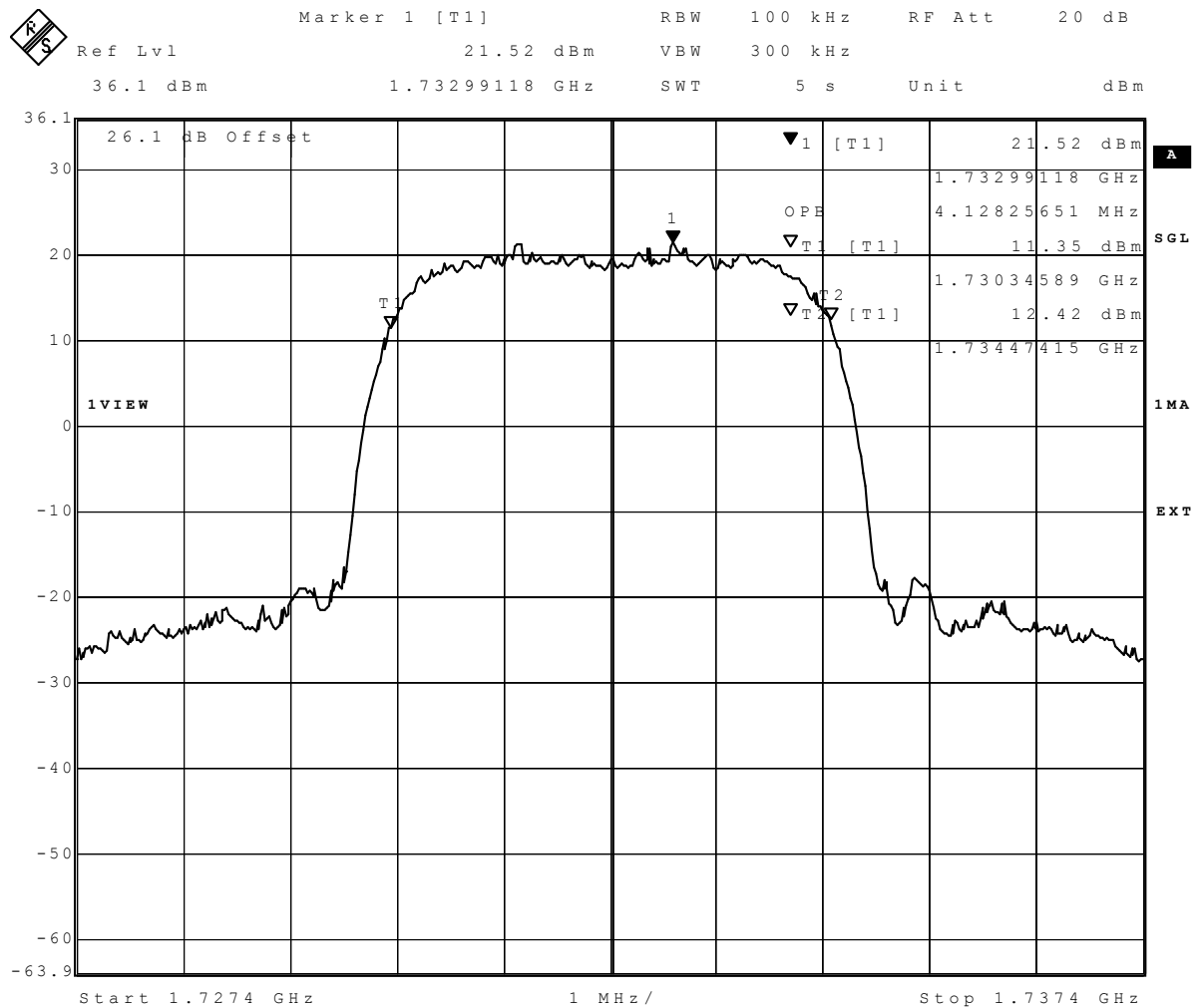
Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
FDD IV	low	-	5	5	4769.54	4128.26
FDD IV	mid	-	5	5	4769.54	4128.26
FDD IV	high	-	5	5	4749.5	4128.26
FDD IV HSDPA Subtest 1	low	-	5	5	4769.54	4128.26
FDD IV HSDPA Subtest 1	mid	-	5	5	4729.46	4128.26
FDD IV HSDPA Subtest 1	high	-	5	5	4749.5	4128.26
FDD IV HSUPA Subtest 1	low	-	5	5	4749.5	4128.26
FDD IV HSUPA Subtest 1	mid	-	5	5	4749.5	4148.3
FDD IV HSUPA Subtest 1	high	-	5	5	4769.54	4128.3
FDD IV HSUPA Subtest 5	low	-	5	5	4789.6	4148.3
FDD IV HSUPA Subtest 5	mid	-	5	5	4749.5	4148.3
FDD IV HSUPA Subtest 5	high	-	5	5	4148.3	4789.6
eFDD 4 QPSK	low	6	1.4	1.4	-	1106.2
eFDD 4 QPSK	mid	6	1.4	1.4	-	1106.2
eFDD 4 QPSK	high	6	1.4	1.4	-	1100.2
eFDD 4 16QAM	low	6	1.4	1.4	-	1100.2
eFDD 4 16QAM	mid	6	1.4	1.4	-	1106.2
eFDD 4 16QAM	high	6	1.4	1.4	-	1100.2
eFDD 4 QPSK	low	15	3	3	-	2753.51
eFDD 4 QPSK	mid	15	3	3	-	2741.48
eFDD 4 QPSK	high	15	3	3	-	2753.51
eFDD 4 16QAM	low	15	3	3	-	2777.56
eFDD 4 16QAM	mid	15	3	3	-	2741.48
eFDD 4 16QAM	high	15	3	3	-	2753.51
eFDD 4 QPSK	low	25	5	5	-	4529.06
eFDD 4 QPSK	mid	25	5	5	-	4529.06
eFDD 4 QPSK	high	25	5	5	-	4509.02
eFDD 4 16QAM	low	25	5	5	-	4529.06
eFDD 4 16QAM	mid	25	5	5	-	4549.1
eFDD 4 16QAM	high	25	5	5	-	4529.06
eFDD 4 QPSK	low	50	10	10	-	9018.04
eFDD 4 QPSK	mid	50	10	10	-	9018.04
eFDD 4 QPSK	high	50	10	10	-	9058.12
eFDD 4 16QAM	low	50	10	10	-	9018.04
eFDD 4 16QAM	mid	50	10	10	-	9018.04
eFDD 4 16QAM	high	50	10	10	-	9018.04
eFDD 4 QPSK	low	75	15	15	-	13587.17
eFDD 4 QPSK	mid	75	15	15	-	13466.9
eFDD 4 QPSK	high	75	15	15	-	13527.05
eFDD 4 16QAM	low	75	15	15	-	13527.05
eFDD 4 16QAM	mid	75	15	15	-	13527.05
eFDD 4 16QAM	high	75	15	15	-	13466.9

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
eFDD 4 QPSK	low	100	20	20	-	18116.2
eFDD 4 QPSK	mid	100	20	20	-	18036.1
eFDD 4 QPSK	high	100	20	20	-	18036.1
eFDD 4 16QAM	low	100	20	20	-	18196.4
eFDD 4 16QAM	mid	100	20	20	-	17955.9
eFDD 4 16QAM	high	100	20	20	-	18036.1
eFDD 7 QPSK	low	25	5	5	-	4509.02
eFDD 7 QPSK	mid	25	5	5	-	4529.06
eFDD 7 QPSK	high	25	5	5	-	4529.06
eFDD 7 16QAM	low	25	5	5	-	4509.02
eFDD 7 16QAM	mid	25	5	5	-	4549.1
eFDD 7 16QAM	high	25	5	5	-	4529.06
eFDD 7 QPSK	low	50	10	10	-	9018.04
eFDD 7 QPSK	mid	50	10	10	-	9018.04
eFDD 7 QPSK	high	50	10	10	-	9018.04
eFDD 7 16QAM	low	50	10	10	-	9018.04
eFDD 7 16QAM	mid	50	10	10	-	9018.04
eFDD 7 16QAM	high	50	10	10	-	9018.04
eFDD 7 QPSK	low	75	15	15	-	13587.17
eFDD 7 QPSK	mid	75	15	15	-	13466.93
eFDD 7 QPSK	high	75	15	15	-	13527.05
eFDD 7 16QAM	low	75	15	15	-	13527.05
eFDD 7 16QAM	mid	75	15	15	-	13527.05
eFDD 7 16QAM	high	75	15	15	-	13527.05
eFDD 7 QPSK	low	100	20	20	-	18036.07
eFDD 7 QPSK	mid	100	20	20	-	18116.23
eFDD 7 QPSK	high	100	20	20	-	18116.23
eFDD 7 16QAM	low	100	20	20	-	18116.23
eFDD 7 16QAM	mid	100	20	20	-	18116.23
eFDD 7 16QAM	high	100	20	20	-	18116.23
eFDD 12 QPSK	low	6	1.4	1.4	-	1106.2
eFDD 12 QPSK	mid	6	1.4	1.4	-	1100.2
eFDD 12 QPSK	high	6	1.4	1.4	-	1100.2
eFDD 12 16QAM	low	6	1.4	1.4	-	1100.2
eFDD 12 16QAM	mid	6	1.4	1.4	-	1100.2
eFDD 12 16QAM	high	6	1.4	1.4	-	1100.2
eFDD 12 QPSK	low	15	3	3	-	2753.51
eFDD 12 QPSK	mid	15	3	3	-	2753.5
eFDD 12 QPSK	high	15	3	3	-	2753.51
eFDD 12 16QAM	low	15	3	3	-	2777.56
eFDD 12 16QAM	mid	15	3	3	-	2741.5
eFDD 12 16QAM	high	15	3	3	-	2741.5

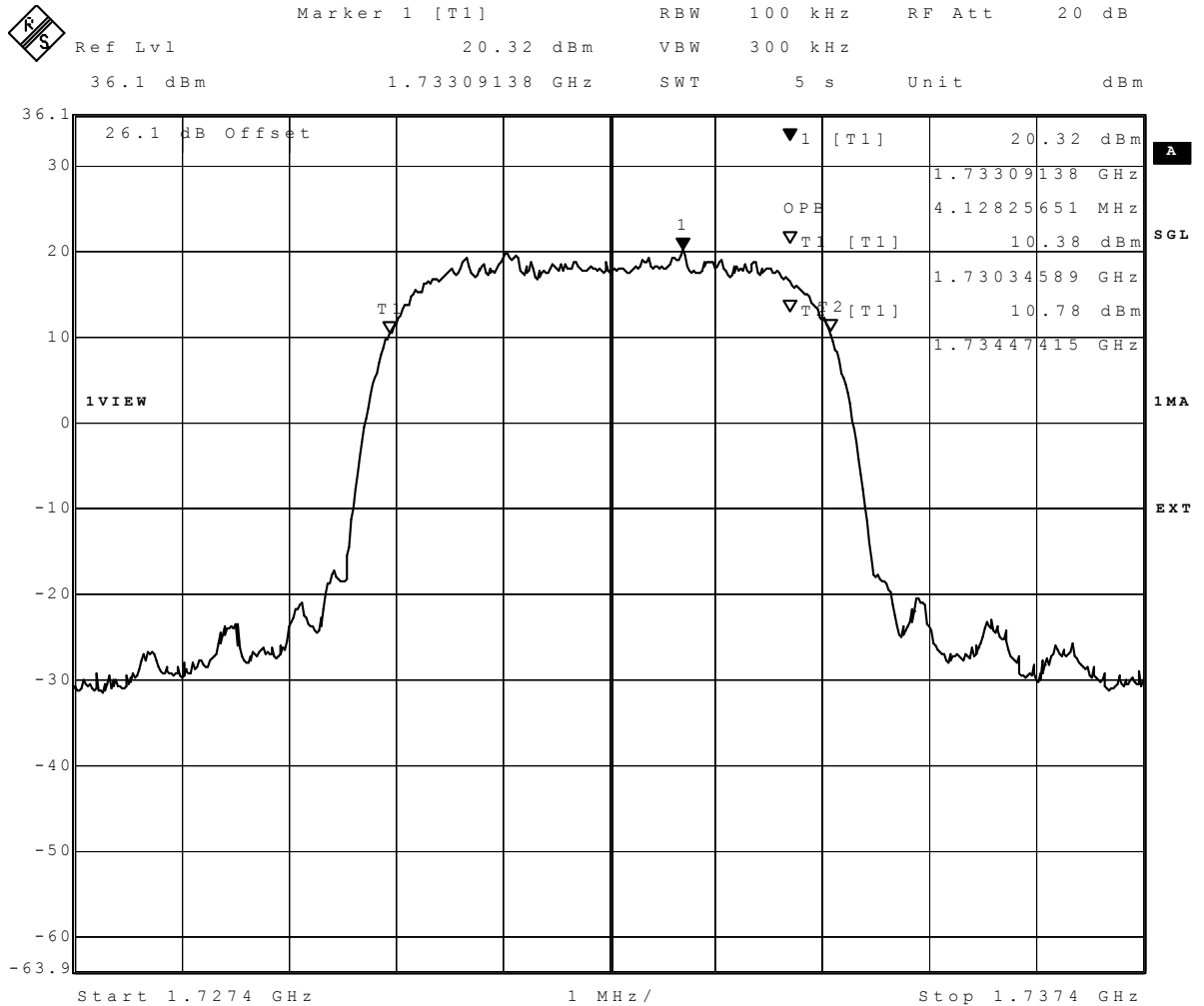
Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
eFDD 12 QPSK	low	25	5	5	-	4549.1
eFDD 12 QPSK	mid	25	5	5	-	4509.02
eFDD 12 QPSK	high	25	5	5	-	4529.06
eFDD 12 16QAM	low	25	5	5	-	4509.02
eFDD 12 16QAM	mid	25	5	5	-	4529.06
eFDD 12 16QAM	high	25	5	5	-	4549.1
eFDD 12 QPSK	low	50	10	10	-	9018.04
eFDD 12 QPSK	mid	50	10	10	-	8937.9
eFDD 12 QPSK	high	50	10	10	-	9058.12
eFDD 12 16QAM	low	50	10	10	-	9018.04
eFDD 12 16QAM	mid	50	10	10	-	8977.96
eFDD 12 16QAM	high	50	10	10	-	9058.12
eFDD 13 QPSK	low	25	5	5	-	4488.9
eFDD 13 QPSK	mid	25	5	5	-	4549.1
eFDD 13 QPSK	high	25	5	5	-	4488.9
eFDD 13 16QAM	low	25	5	5	-	4509.02
eFDD 13 16QAM	mid	25	5	5	-	4529.1
eFDD 13 16QAM	high	25	5	5	-	4509.02
eFDD 13 QPSK	mid	50	10	10	-	8937.9
eFDD 13 16QAM	mid	50	10	10	-	8937.9
eFDD 66 QPSK	low	6	1.4	1.4	-	1100.2
eFDD 66 QPSK	mid	6	1.4	1.4	-	1106.2
eFDD 66 QPSK	high	6	1.4	1.4	-	1094.2
eFDD 66 16QAM	low	6	1.4	1.4	-	1100.2
eFDD 66 16QAM	mid	6	1.4	1.4	-	1094.2
eFDD 66 16QAM	high	6	1.4	1.4	-	1100.2
eFDD 66 QPSK	low	15	3	3	-	2753.5
eFDD 66 QPSK	mid	15	3	3	-	2753.5
eFDD 66 QPSK	high	15	3	3	-	2741.5
eFDD 66 16QAM	low	15	3	3	-	2777.6
eFDD 66 16QAM	mid	15	3	3	-	2741.4
eFDD 66 16QAM	high	15	3	3	-	2753.5
eFDD 66 QPSK	low	25	5	5	-	4509
eFDD 66 QPSK	mid	25	5	5	-	4529.1
eFDD 66 QPSK	high	25	5	5	-	4509
eFDD 66 16QAM	low	25	5	5	-	4509
eFDD 66 16QAM	mid	25	5	5	-	4529.1
eFDD 66 16QAM	high	25	5	5	-	4529.1
eFDD 66 QPSK	low	50	10	10	-	9018
eFDD 66 QPSK	mid	50	10	10	-	8977.9
eFDD 66 QPSK	high	50	10	10	-	9018
eFDD 66 16QAM	low	50	10	10	-	9018

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Nominal BW [MHz]	26 dB BW [kHz]	99 % BW [kHz]
eFDD 66 16QAM	mid	50	10	10	-	9018
eFDD 66 16QAM	high	50	10	10	-	9018
eFDD 66 QPSK	low	75	15	15	-	13587.2
eFDD 66 QPSK	mid	75	15	15	-	13466.9
eFDD 66 QPSK	high	75	15	15	-	13466.9
eFDD 66 16QAM	low	75	15	15	-	13527.1
eFDD 66 16QAM	mid	75	15	15	-	13527.1
eFDD 66 16QAM	high	75	15	15	-	13527.1
eFDD 66 QPSK	low	100	20	20	-	18116.2
eFDD 66 QPSK	mid	100	20	20	-	18036.1
eFDD 66 QPSK	high	100	20	20	-	18036.1
eFDD 66 16QAM	low	100	20	20	-	18116.2
eFDD 66 16QAM	mid	100	20	20	-	18036.1
eFDD 66 16QAM	high	100	20	20	-	18116.2



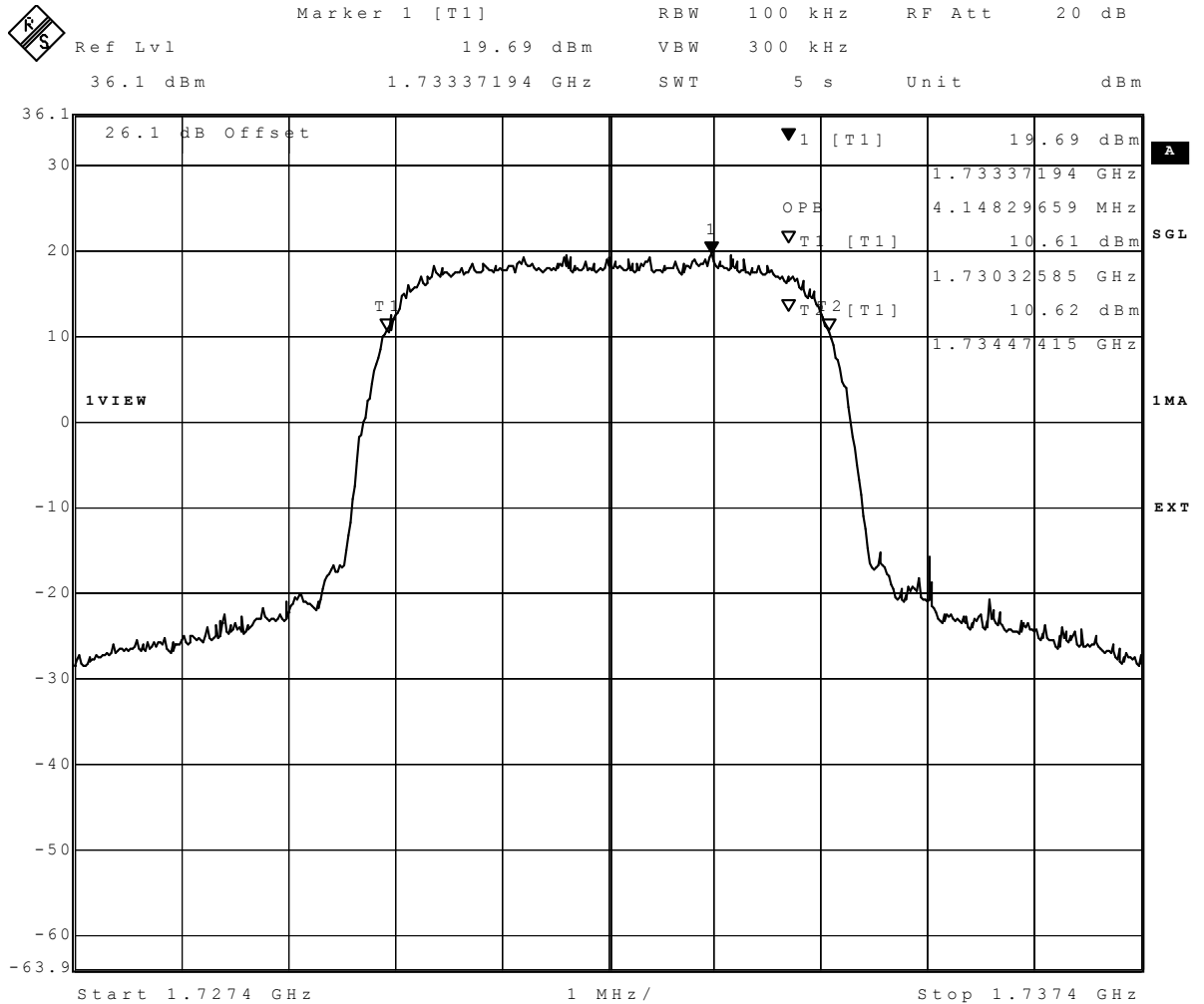
Date: 2.OCT.2018 15:28:03

WCDMA FDD4 Channel = mid



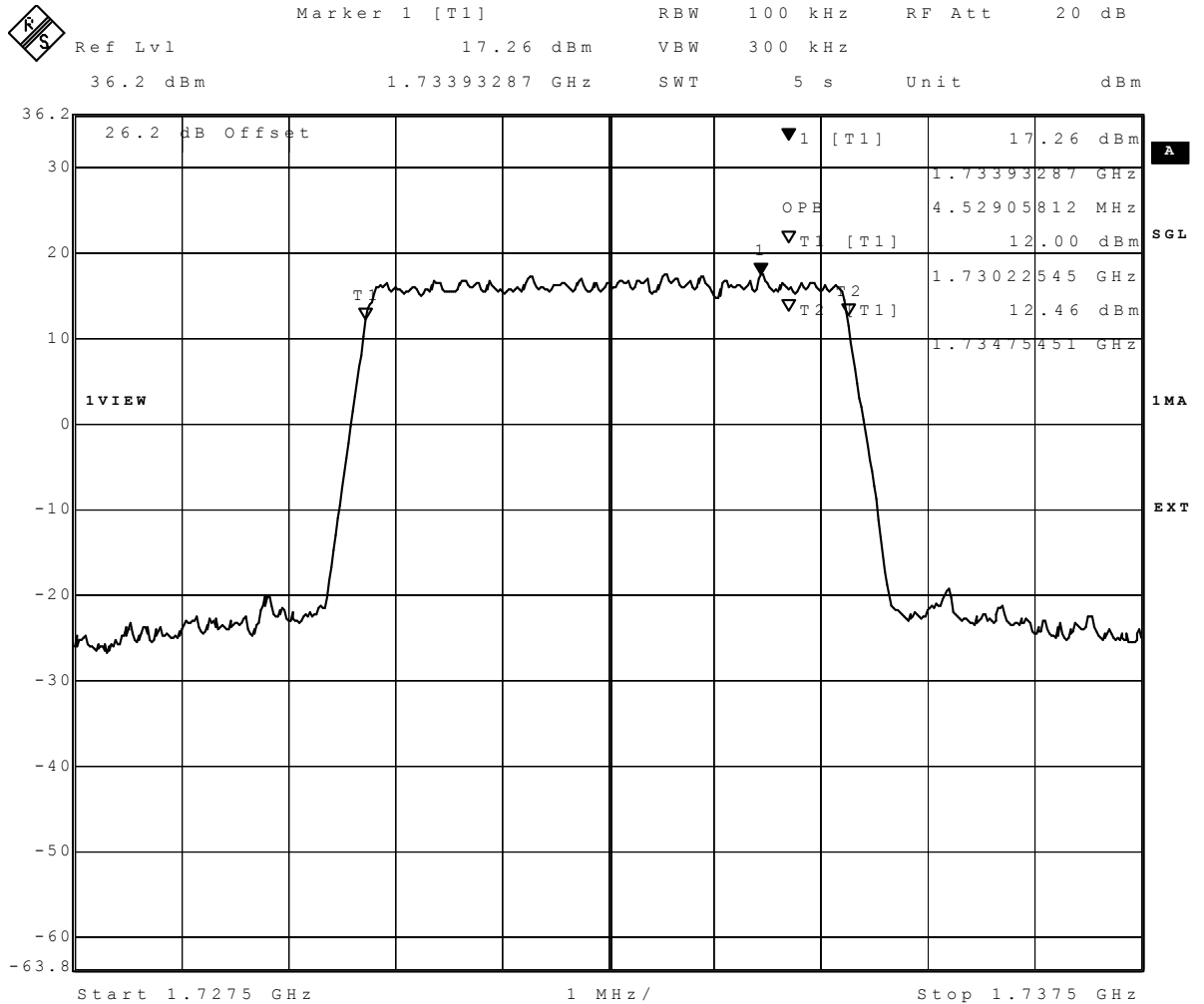
Date: 12.OCT.2018 15:38:43

HSDPA FDD4 Channel = mid



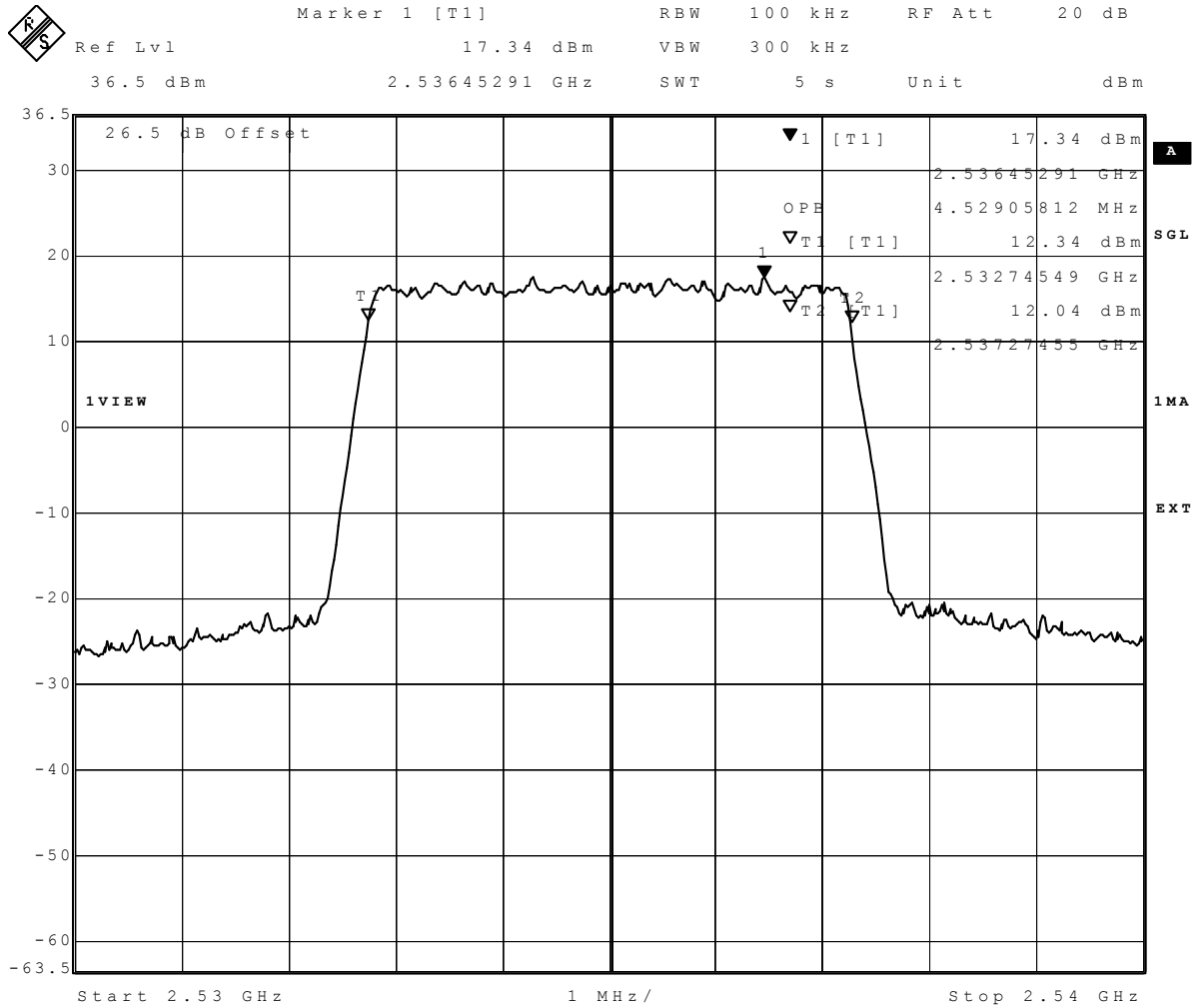
Date: 12.OCT.2018 13:04:19

HSUPA FDD4 Subtest1 Channel = mid



Date: 1.OCT.2018 13:04:32

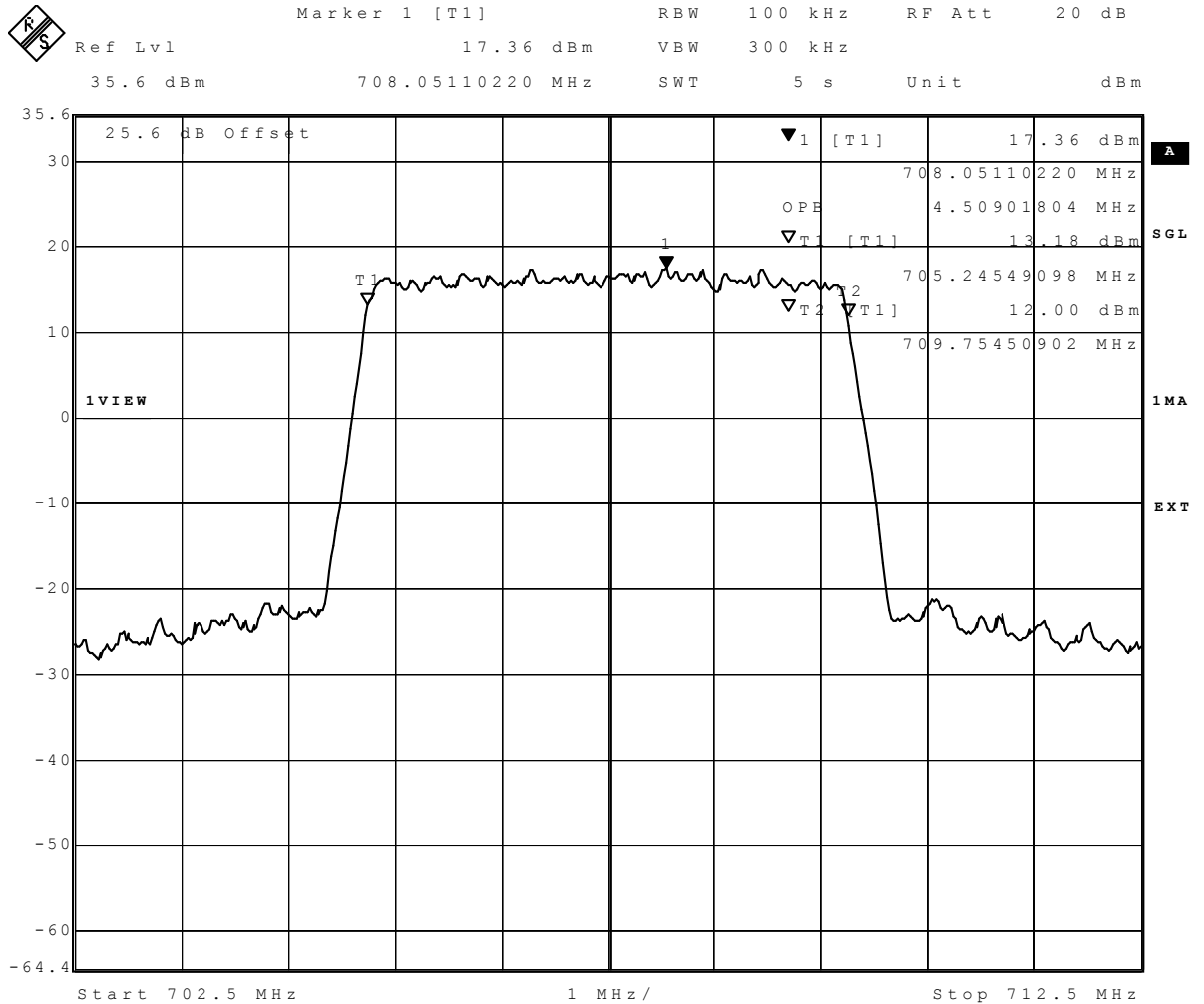
LTE eFDD4 QPSK 5MHz Channel = mid



Date: 9.OCT.2018 15:26:12

LTE eFDD7 QPSK 5MHz Channel = mid

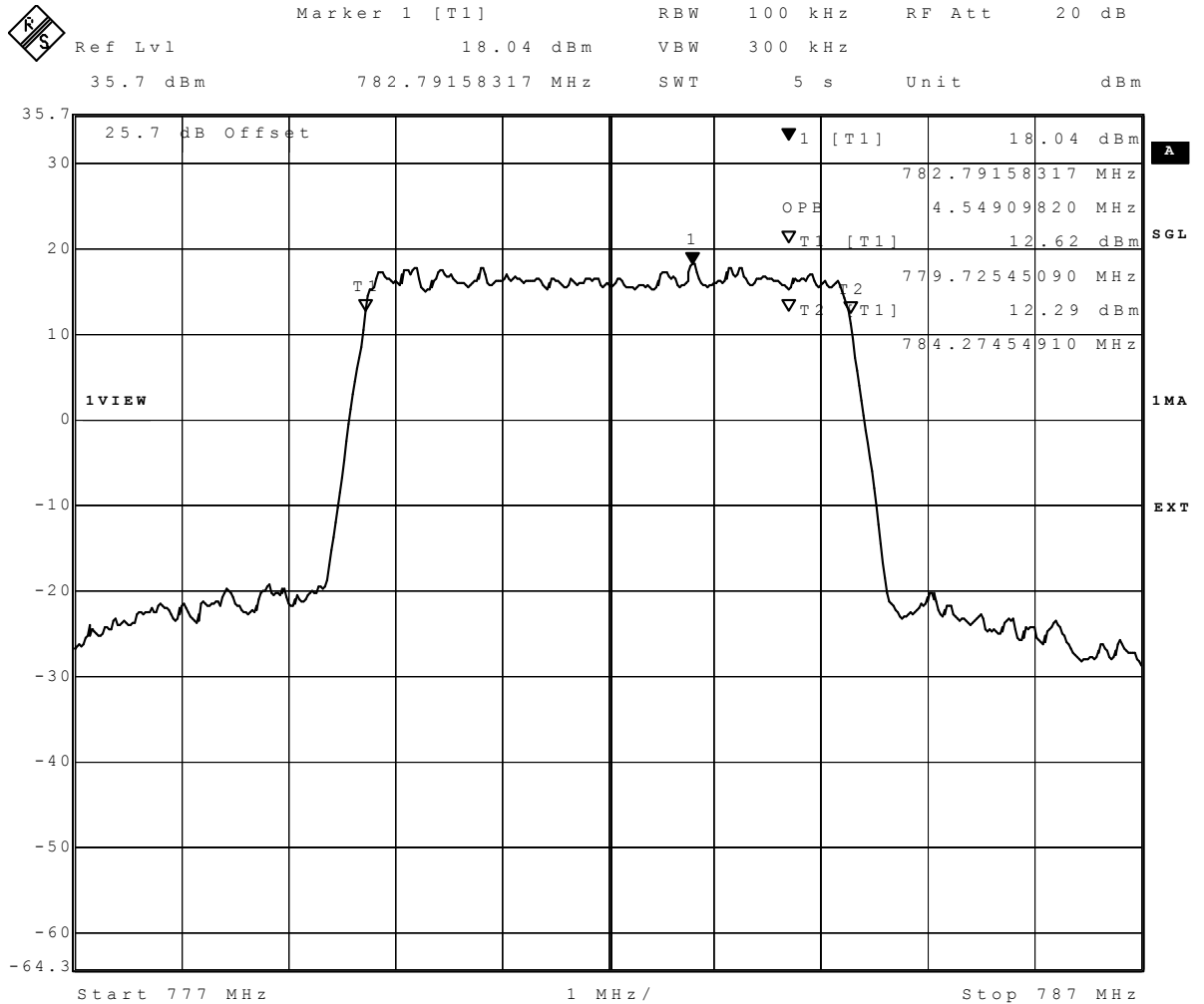
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 1.OCT.2018 13:23:09

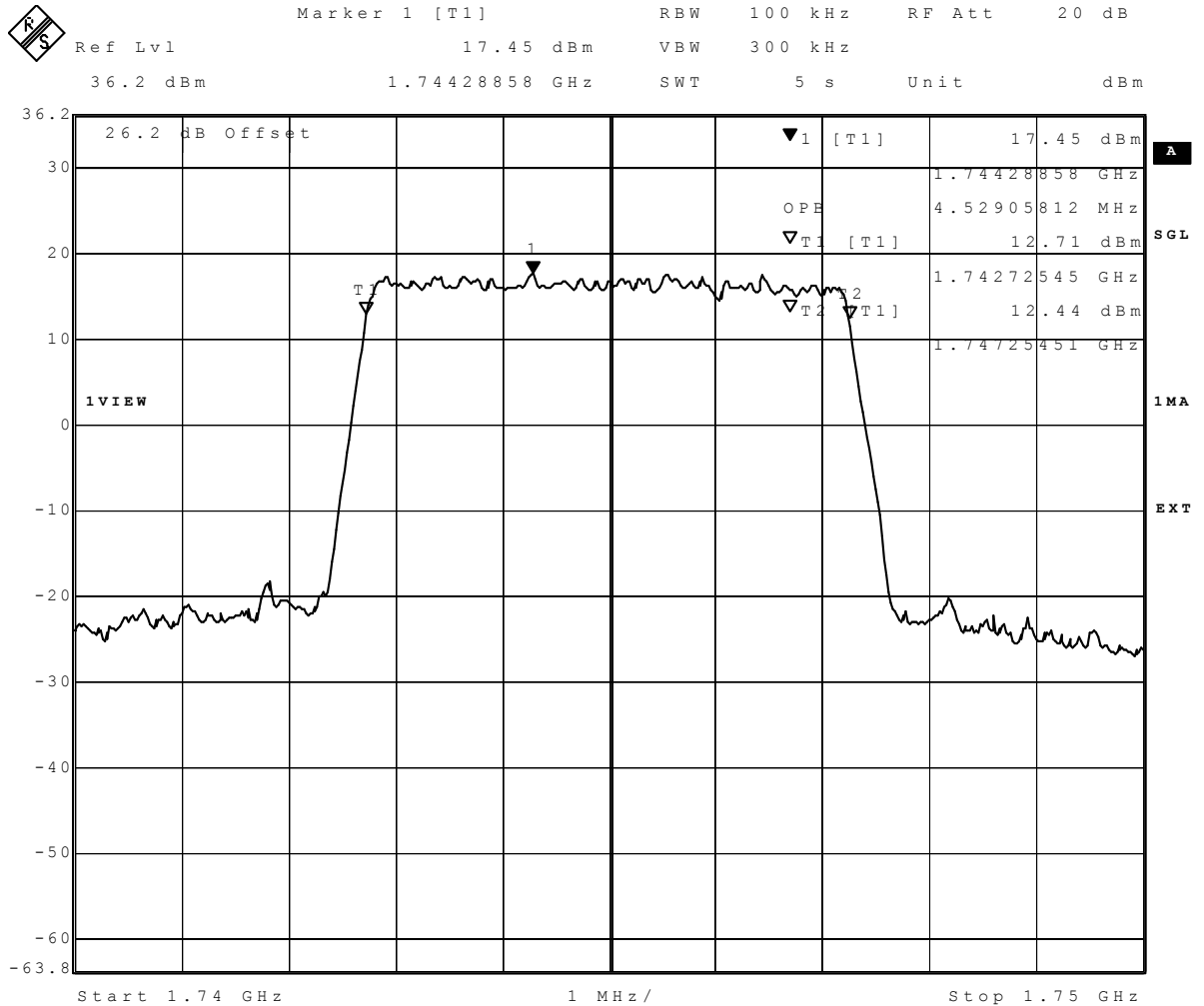
LTE eFDD12 QPSK 5MHz Channel = mid

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 1.OCT.2018 13:30:04

LTE eFDD13 QPSK 5MHz Channel = mid

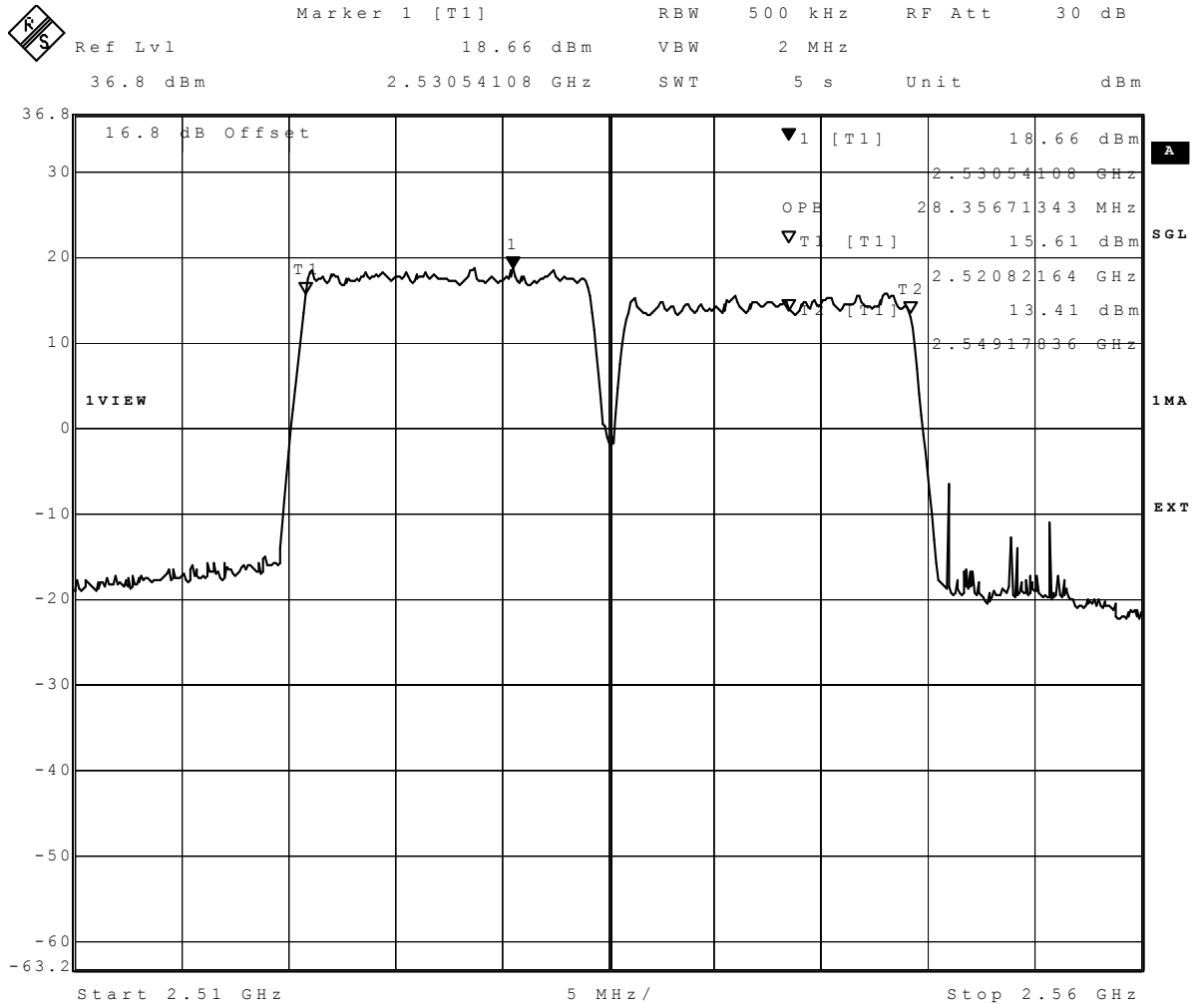


Date: 10.OCT.2018 18:24:40

LTE eFDD66 QPSK 5MHz Channel = mid

Carrier Aggregation (intira-band)							
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	99 % BW [kHz]
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	75	15	15	28.46
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	75	75	15	15	28.36
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	75	15	15	28.26
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	75	15	15	28.36
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	75	75	15	15	28.46
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	75	15	15	28.36
eFDD 7 QPSK	eFDD 7 QPSK	low + low	50	100	10	20	27.76
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	50	100	10	20	27.76
eFDD 7 QPSK	eFDD 7 QPSK	high + high	50	100	10	20	27.86
eFDD 7 16QAM	eFDD 7 16QAM	low + low	50	100	10	20	27.66
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	50	100	10	20	27.86
eFDD 7 16QAM	eFDD 7 16QAM	high + high	50	100	10	20	27.76
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	75	20	15	32.77
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	75	20	15	32.57
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	75	20	15	32.57
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	75	20	15	32.77
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	100	75	20	15	32.67
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	75	20	15	32.57
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	100	15	20	32.67
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	75	100	15	20	32.67
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	100	15	20	32.67
eFDD 7 16QAM	eFDD 7 QPSK	low + low	75	100	15	20	32.67
eFDD 7 16QAM	eFDD 7 QPSK	mid + mid	75	100	15	20	32.77
eFDD 7 16QAM	eFDD 7 QPSK	high + high	75	100	15	20	32.67
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	50	20	10	27.86
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	50	20	10	27.86
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	50	20	10	27.86
eFDD 7 16QAM	eFDD 7 QPSK	low + low	100	50	20	10	27.76
eFDD 7 16QAM	eFDD 7 QPSK	mid + mid	100	50	20	10	27.86
eFDD 7 16QAM	eFDD 7 QPSK	high + high	100	50	20	10	27.86
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	100	20	20	37.64
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	100	100	20	20	37.52
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	100	20	20	37.52
eFDD 7 16QAM	eFDD 7 QPSK	low + low	100	100	20	20	37.64
eFDD 7 16QAM	eFDD 7 QPSK	mid + mid	100	100	20	20	37.52
eFDD 7 16QAM	eFDD 7 QPSK	high + high	100	100	20	20	37.52

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 18.OCT.2018 15:10:37

PCC: eFDD7 QPSK 15MHz RB75 Channel = mid
SCC1: eFDD7 QPSK 15MHz RB75 Channel = mid

3.5.20 27.6 Band edge compliance §2.1053, §27.53

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

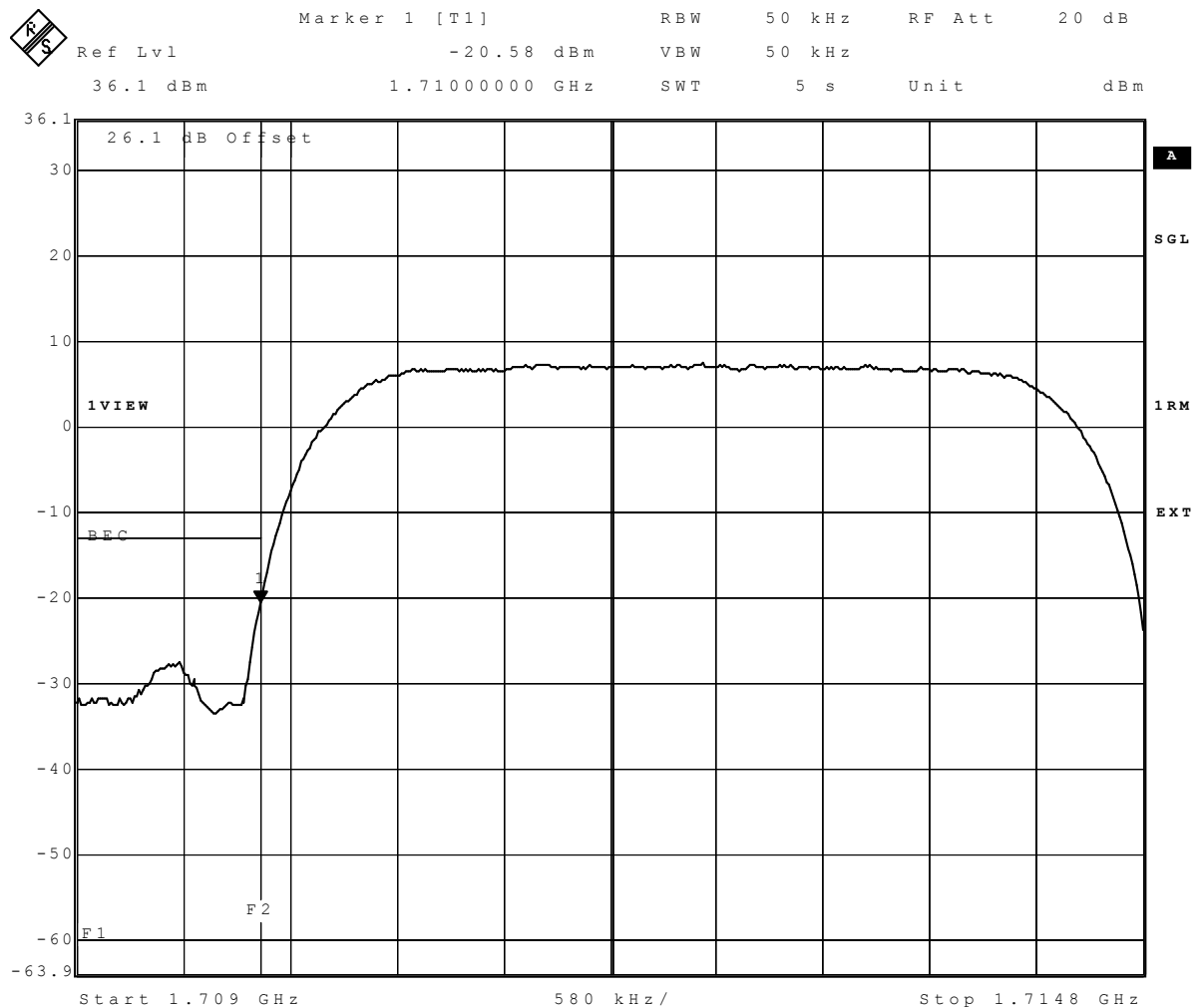
<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/10/10 8:31
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

Radio Technology	Channel	Band Edge	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limiti [dBm]	Margin tio Limiti [dB]
FDD IV	low	lower	5	-	-12.48	-21.62	-20.6	-13	7.58
FDD IV	high	higher	5	-	-14.53	-24.98	-24.4	-13	11.35
FDD IV HSDPA Subtest 1	low	lower	5	-	-17.59	-25.15	-24.8	-13	11.82
FDD IV HSDPA Subtest 1	high	higher	5	-	-16.72	-27.42	-26.4	-13	13.4
FDD IV HSUPA Subtest 1	low	lower	5	-	-15.05	-24.05	-23.2	-13	10.21
FDD IV HSUPA Subtest 1	high	higher	5	-	-18.52	-28.1	-27	-13	14
FDD IV HSUPA Subtest 5	low	lower	5	-	-14.67	-23.9	-23.2	-13	10.21
FDD IV HSUPA Subtest 5	high	higher	5	-	-19.62	-28.1	-27.2	-13	14.21
eFDD 4 QPSK	low	lower	1.4	6	-21.46	-31.86	-30.5	-13	17.52
eFDD 4 QPSK	high	higher	1.4	6	-31.53	-40.38	-39.5	-13	26.47
eFDD 4 16QAM	low	lower	1.4	6	-24.25	-34.36	-33	-13	20.02
eFDD 4 16QAM	high	higher	1.4	6	-31.21	-40.38	-39.5	-13	26.47
eFDD 4 QPSK	low	lower	3	15	-14.46	-27	-25.2	-13	12.15
eFDD 4 QPSK	high	higher	3	15	-16.42	-31.86	-29.1	-13	16.1
eFDD 4 16QAM	low	lower	3	15	-16.67	-29.36	-27.4	-13	14.42
eFDD 4 16QAM	high	higher	3	15	-17.2	-32.23	-29.6	-13	16.64
eFDD 4 QPSK	low	lower	5	25	-17.48	-29.92	-28.3	-13	15.34
eFDD 4 QPSK	high	higher	5	25	-16.53	-33.89	-31.5	-13	18.51
eFDD 4 16QAM	low	lower	5	25	-18.4	-32.62	-30.5	-13	17.52
eFDD 4 16QAM	high	higher	5	25	-18.3	-35.38	-32.2	-13	19.23
eFDD 4 QPSK	low	lower	10	50	-17.75	-31.17	-29.4	-13	16.36
eFDD 4 QPSK	high	higher	10	50	-20	-37.19	-35.4	-13	22.38
eFDD 4 16QAM	low	lower	10	50	-20.87	-34.86	-33	-13	20.02
eFDD 4 16QAM	high	higher	10	50	-21.13	-37.19	-35.4	-13	22.38
eFDD 4 QPSK	low	lower	15	75	-16.1	-28.84	-27.6	-13	14.64
eFDD 4 QPSK	high	higher	15	75	-17.14	-31.86	-30.5	-13	17.52
eFDD 4 16QAM	low	lower	15	75	-19.69	-32.62	-31.2	-13	18.17
eFDD 4 16QAM	high	higher	15	75	-18.07	-35.94	-33.9	-13	20.89
eFDD 4 QPSK	low	lower	20	100	-18.82	-31.86	-30.8	-13	17.84
eFDD 4 QPSK	high	higher	20	100	-20.58	-35.38	-33.9	-13	20.89
eFDD 4 16QAM	low	lower	20	100	-21.52	-35.94	-34.4	-13	21.36
eFDD 4 16QAM	high	higher	20	100	-22.1	-38.64	-37.2	-13	24.19
eFDD 7 QPSK	low	lower	5	25	-10.44	-26.1	-24	-10	14
eFDD 7 QPSK	high	higher	5	25	-9.6	-26.71	-24.8	-10	14.81
eFDD 7 16QAM	low	lower	5	25	-11.93	-28.6	-26.1	-10	16.1
eFDD 7 16QAM	high	higher	5	25	-9.79	-28.08	-25.3	-10	15.34
eFDD 7 QPSK	low	lower	10	50	-11.12	-28.5	-27	-10	17
eFDD 7 QPSK	high	higher	10	50	-12.89	-28.5	-27.4	-10	17.4
eFDD 7 16QAM	low	lower	10	50	-16.04	-31.24	-29.8	-10	19.76
eFDD 7 16QAM	high	higher	10	50	-13.58	-30.32	-29.2	-10	19.24
eFDD 7 QPSK	low	lower	15	75	-11.24	-27.14	-26.1	-10	16.1
eFDD 7 QPSK	high	higher	15	75	-12.35	-26.5	-25.5	-10	15.52

Radio Technology	Channel	Band Edge	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limiti [dBm]	Margin tio Limiti [dB]
eFDD 7 16QAM	low	lower	15	75	-13.89	-29.72	-28.6	-10	18.6
eFDD 7 16QAM	high	higher	15	75	-11.98	-28.6	-27.6	-10	17.6
eFDD 7 QPSK	low	lower	20	100	-9.52	-24.6	-23.9	-10	13.88
eFDD 7 QPSK	high	higher	20	100	-8.5	-24.16	-23.3	-10	13.34
eFDD 7 16QAM	low	lower	20	100	-10.87	-26.06	-25.2	-10	15.22
eFDD 7 16QAM	high	higher	20	100	-9.75	-25.38	-24.6	-10	14.6
eFDD 12 QPSK	low	lower	1.4	1	-25.87	-35.88	-34.9	-13	21.86
eFDD 12 QPSK	high	higher	1.4	1	-23.17	-32.73	-31.7	-13	18.67
eFDD 12 16QAM	low	lower	1.4	1	-27.18	-37.69	-36.4	-13	23.44
eFDD 12 16QAM	high	higher	1.4	1	-23.91	-35.36	-33.9	-13	20.94
eFDD 12 QPSK	low	lower	3	1	-14.47	-28.84	-26.3	-13	13.34
eFDD 12 QPSK	high	higher	3	1	-15.26	-29.08	-27.3	-13	14.3
eFDD 12 16QAM	low	lower	3	1	-16.78	-31.02	-28.4	-13	15.37
eFDD 12 16QAM	high	higher	3	1	-15.13	-30.42	-28.1	-13	15.14
eFDD 12 QPSK	low	lower	5	1	-16.84	-32.01	-29.6	-13	16.6
eFDD 12 QPSK	high	higher	5	1	-16.53	-31.34	-29.6	-13	16.6
eFDD 12 16QAM	low	lower	5	1	-17.59	-33.94	-31	-13	18.02
eFDD 12 16QAM	high	higher	5	1	-17.17	-33.52	-31.3	-13	18.34
eFDD 12 QPSK	low	lower	10	1	-11.07	-29.86	-28.1	-13	15.14
eFDD 12 QPSK	high	higher	10	1	-11.96	-29.86	-28.6	-13	15.6
eFDD 12 16QAM	low	lower	10	1	-15.19	-31.67	-29.9	-13	16.86
eFDD 12 16QAM	high	higher	10	1	-14.57	-31.67	-30.4	-13	17.42
eFDD 13 QPSK	low	lower	5	1	-24.93	-33.84	-32.6	-13	19.63
eFDD 13 QPSK	high	higher	5	1	-25.15	-39.04	-36.9	-13	23.94
eFDD 13 16QAM	low	lower	5	1	-23.85	-35.78	-34.3	-13	21.29
eFDD 13 16QAM	high	higher	5	1	-25.33	-39.87	-37.6	-13	24.59
eFDD 13 QPSK	mid	lower	10	1	-29.05	-40.78	-39.9	-13	26.87
eFDD 13 QPSK	mid	higher	10	1	-32.94	-42.96	-41.8	-13	28.8
eFDD 13 16QAM	mid	lower	10	1	-31.13	-42.96	-41.8	-13	28.8
eFDD 13 16QAM	mid	higher	10	1	-32.95	-45.89	-44.3	-13	31.3
eFDD 66 QPSK	low	lower	1.4	6	-22.85	-32.23	-31.5	-13	18.51
eFDD 66 QPSK	high	higher	1.4	6	-31.53	-39.47	-38.6	-13	25.64
eFDD 66 16QAM	low	lower	1.4	6	-23.76	-34.86	-33	-13	20.02
eFDD 66 16QAM	high	higher	1.4	6	-30.51	-41.4	-40.4	-13	27.38
eFDD 66 QPSK	low	lower	3	15	-14.07	-27	-25.2	-13	12.15
eFDD 66 QPSK	high	higher	3	15	-16.59	-31.51	-29.1	-13	16.1
eFDD 66 16QAM	low	lower	3	15	-16.56	-30.22	-27.9	-13	14.87
eFDD 66 16QAM	high	higher	3	15	-17.18	-32.23	-29.6	-13	16.64
eFDD 66 QPSK	low	lower	5	25	-16.83	-30.22	-28.3	-13	15.34
eFDD 66 QPSK	high	higher	5	25	-17.36	-33.89	-31.5	-13	18.51
eFDD 66 16QAM	low	lower	5	25	-17.09	-32.62	-30.2	-13	17.22
eFDD 66 16QAM	high	higher	5	25	-19.1	-35.94	-33	-13	20.02

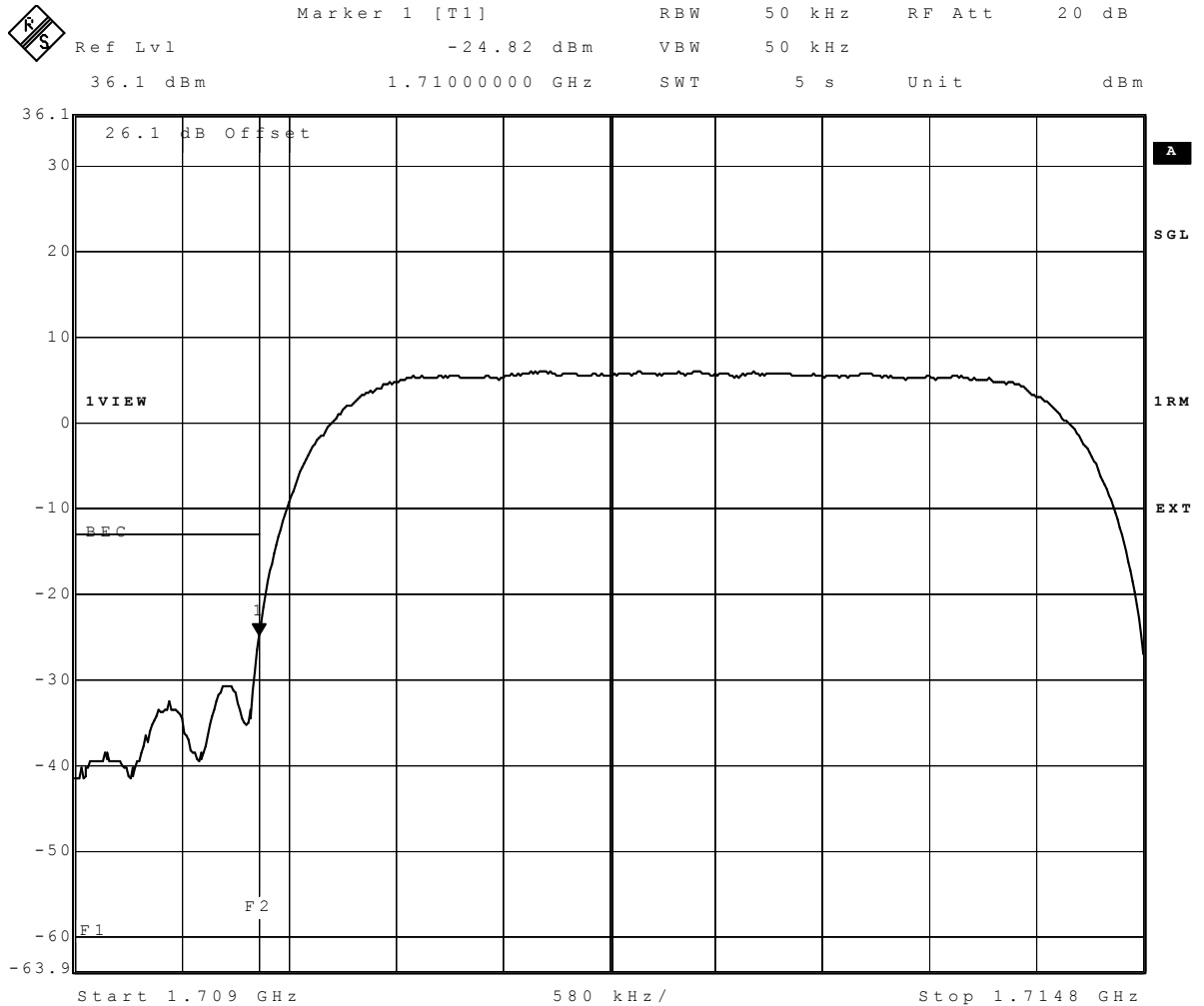
Radio Technology	Channel	Band Edge	Nominal BW	Ressource Blocks	Peak [dBm]	Average [dBm]	RMS [dBm]	Limiti [dBm]	Margin to Limiti [dB]
eFDD 66 QPSK	low	lower	10	50	-17.69	-31.17	-29.9	-13	16.92
eFDD 66 QPSK	high	higher	10	50	-19.94	-37.19	-35.4	-13	22.38
eFDD 66 16QAM	low	lower	10	50	-20.7	-34.86	-33	-13	20.02
eFDD 66 16QAM	high	higher	10	50	-22.17	-39.47	-37.2	-13	24.19
eFDD 66 QPSK	low	lower	15	75	-17.07	-28.84	-27.6	-13	14.64
eFDD 66 QPSK	high	higher	15	75	-18.26	-35.38	-33.4	-13	20.44
eFDD 66 16QAM	low	lower	15	75	-19.32	-32.62	-31.2	-13	18.17
eFDD 66 16QAM	high	higher	15	75	-19.58	-37.88	-35.9	-13	22.94
eFDD 66 QPSK	low	lower	20	100	-19.05	-32.23	-31.2	-13	18.17
eFDD 66 QPSK	high	higher	20	100	-21.87	-37.88	-36.5	-13	23.54
eFDD 66 16QAM	low	lower	20	100	-21.09	-35.38	-33.9	-13	20.89
eFDD 66 16QAM	high	higher	20	100	-23.37	-39.47	-37.9	-13	24.88



Date: 2.OCT.2018 15:47:20

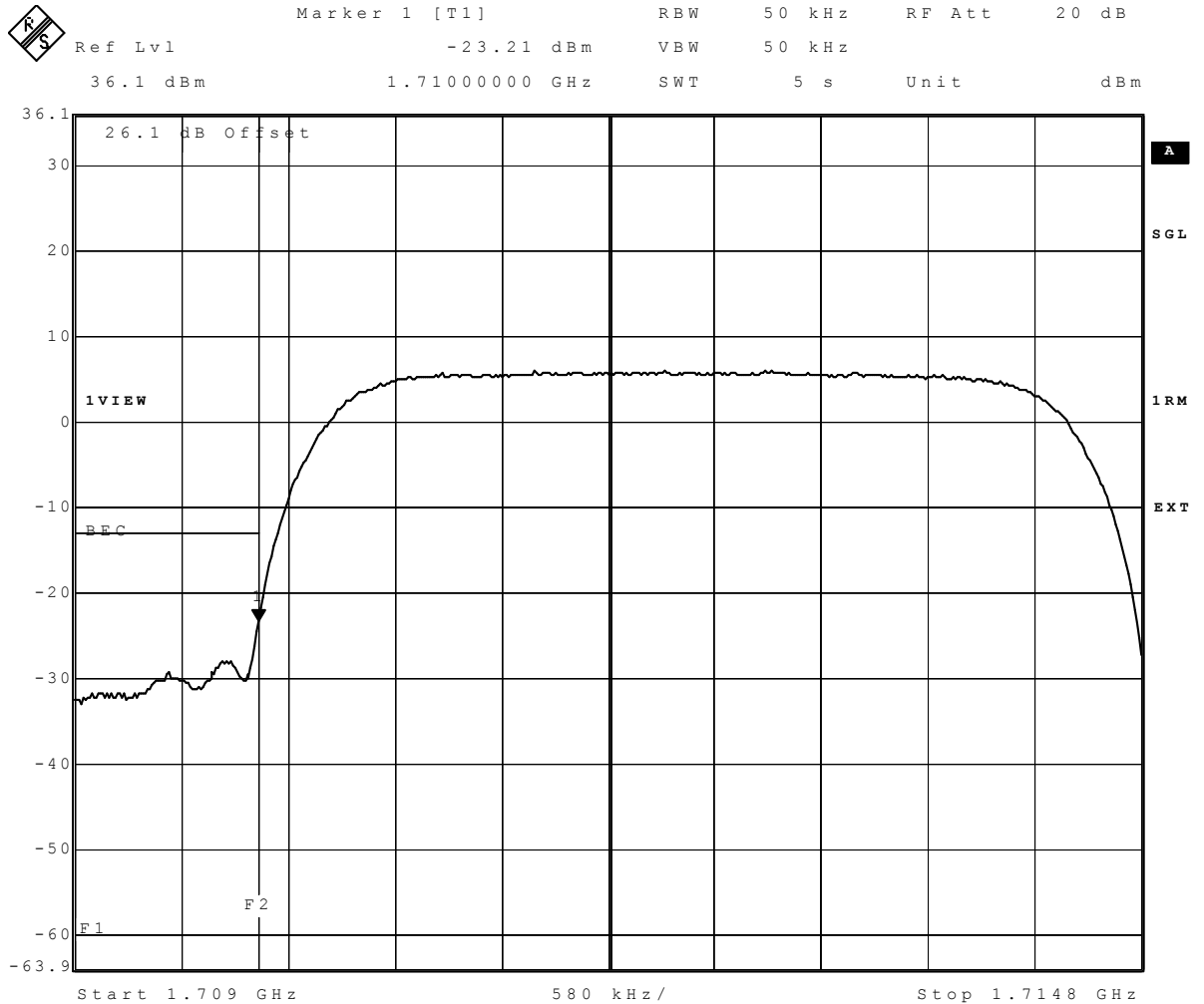
WCDMA FDD4 Channel = low

Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 12.OCT.2018 15:26:48

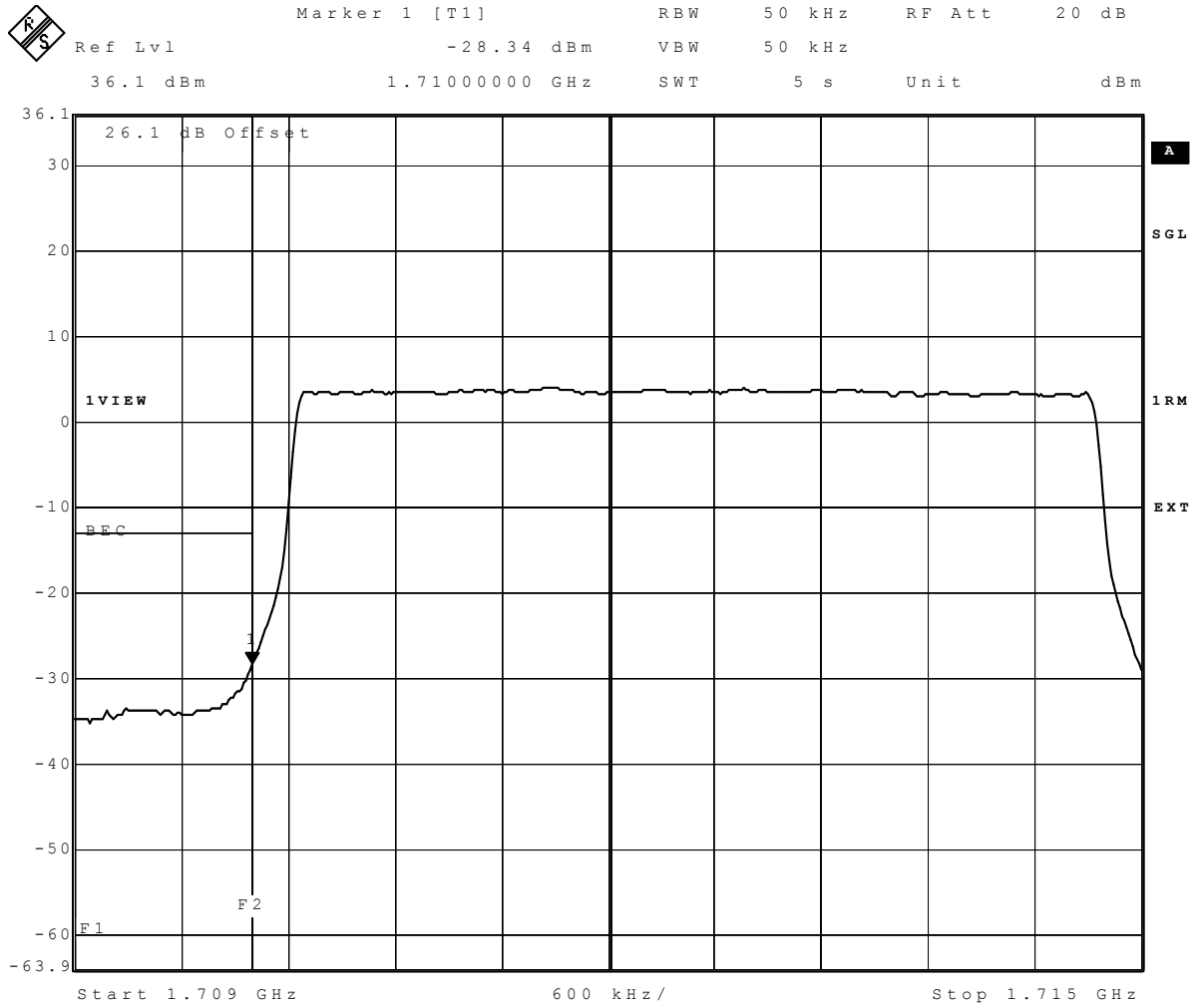
HSDPA FDD4 Channel = low



Date: 12.OCT.2018 12:51:24

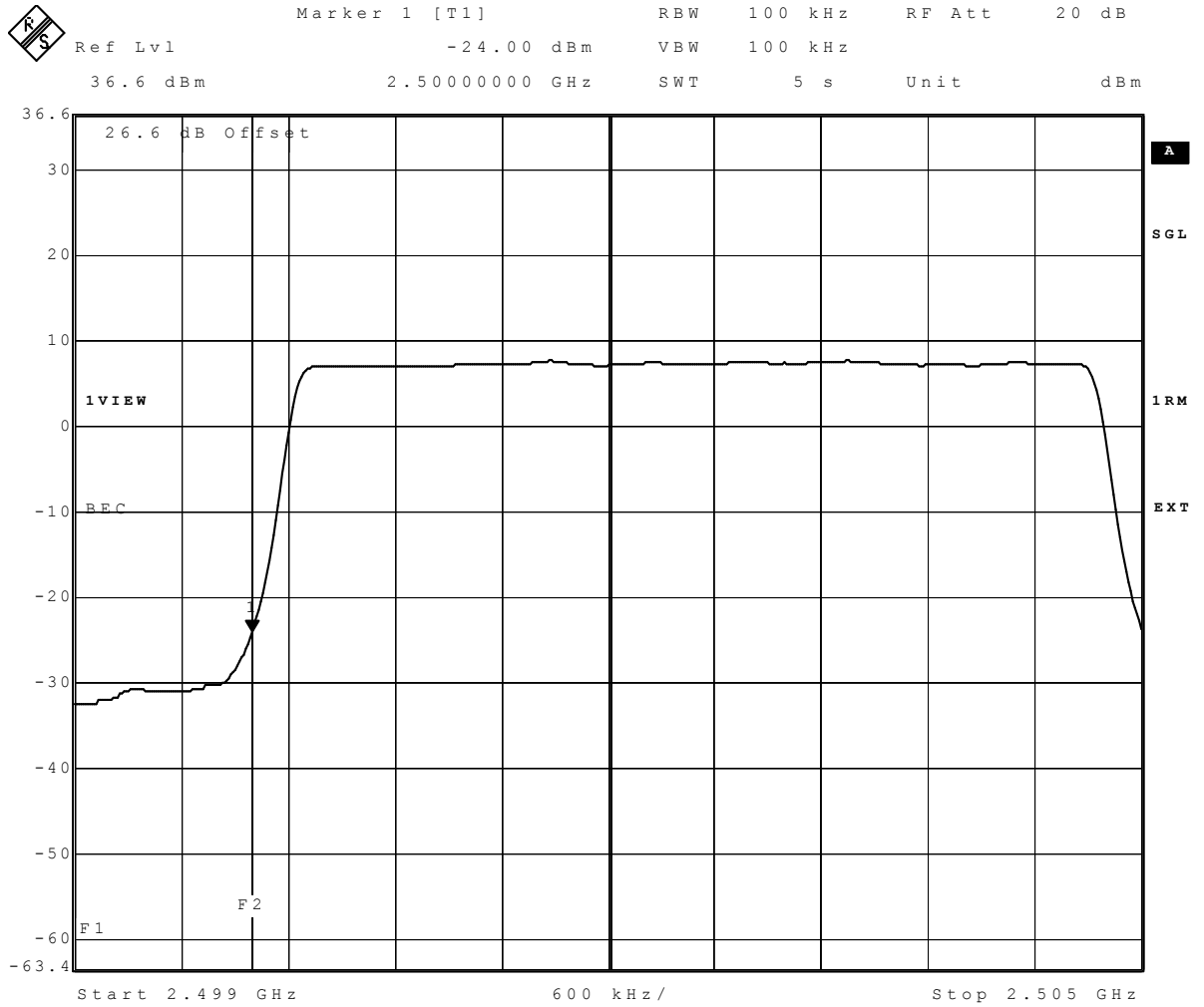
HSUPA FDD4 Subtest1 Channel = low

Reference: MDE_GEMALTO_1802_FCCb_rev01



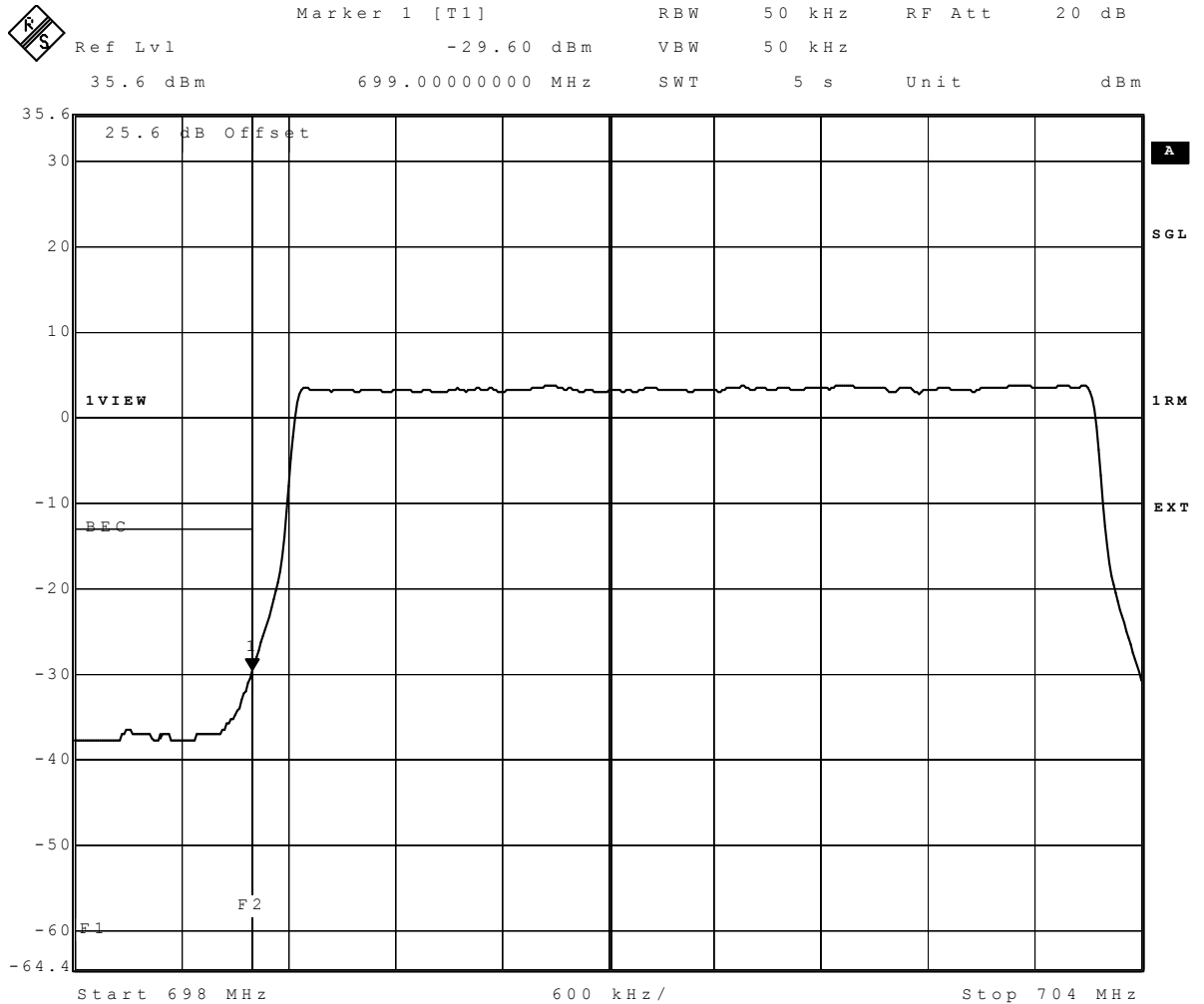
Date: 10.OCT.2018 14:56:29

LTE eFDD4 QPSK 5MHz Channel = low



Date: 9.OCT.2018 17:35:30

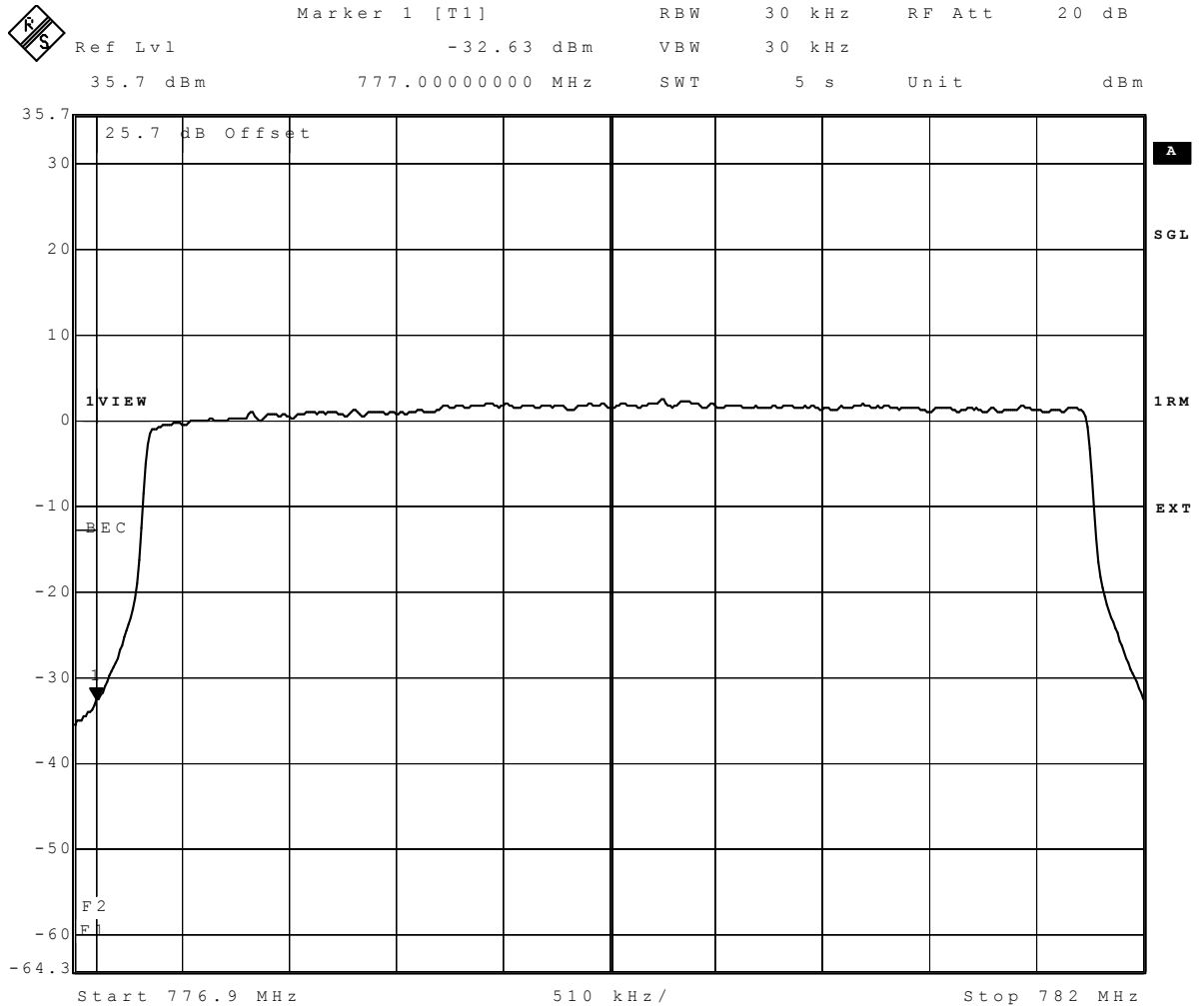
LTE eFDD7 QPSK 5MHz Channel = low



Date: 10.OCT.2018 13:52:05

LTE eFDD12 QPSK 5MHz Channel = low

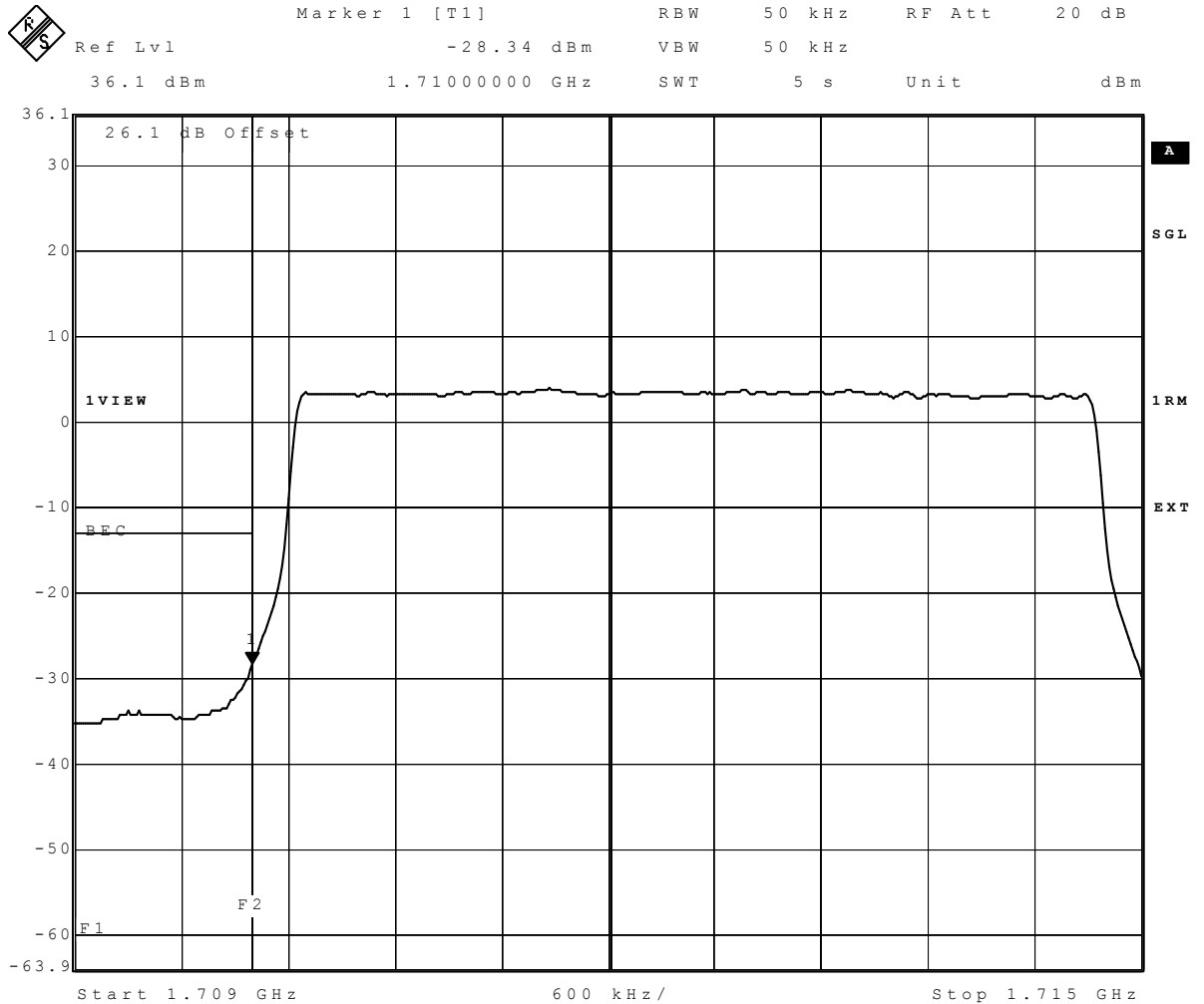
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 10.OCT.2018 13:59:16

LTE eFDD13 QPSK 5MHz Channel = low

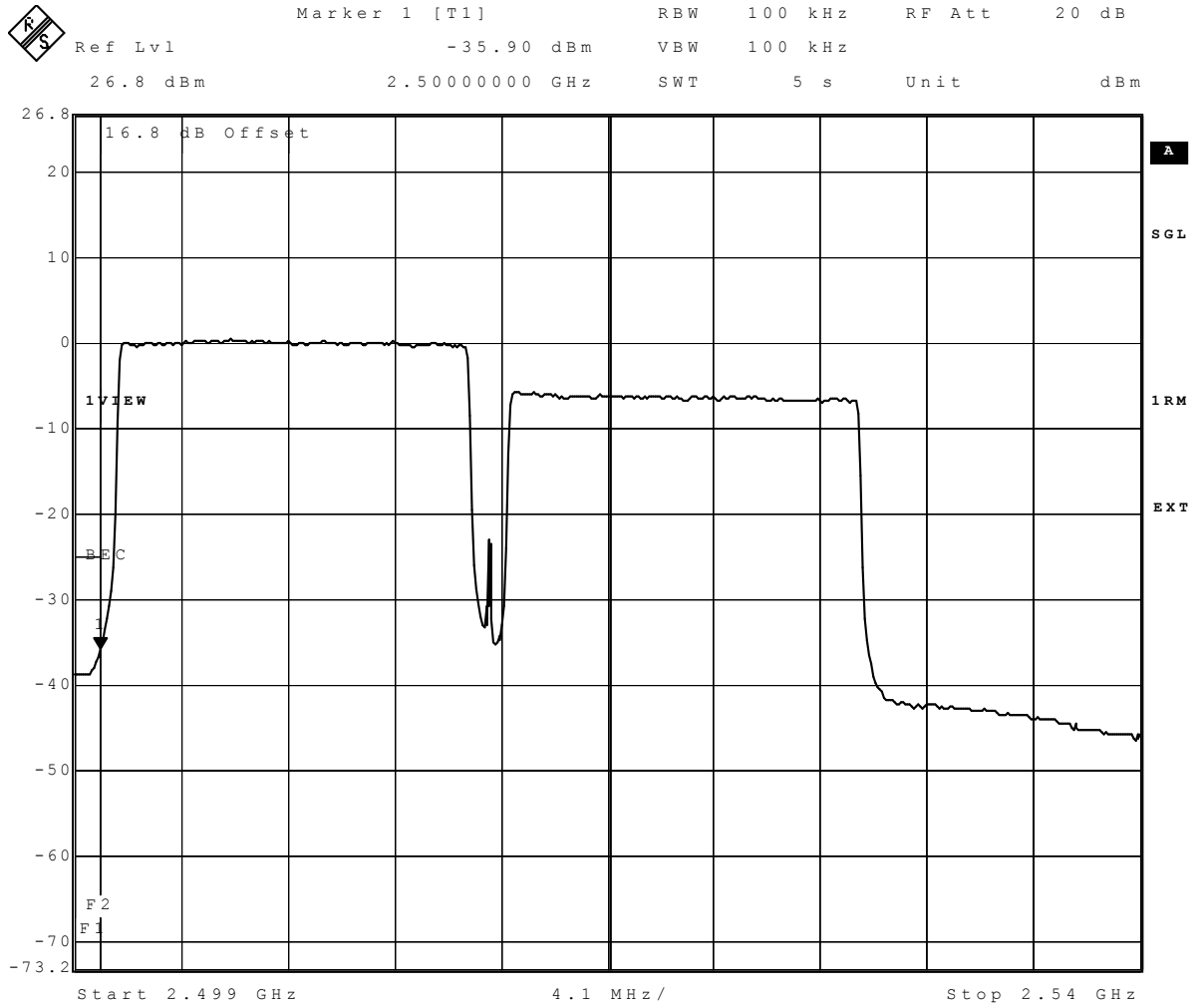
Reference: MDE_GEMALTO_1802_FCCb_rev01



Date: 11.OCT.2018 08:51:16

LTE eFDD66 QPSK 5MHz Channel = low

Carrier Aggregation (intira-band)							
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	RMS [dBm]
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	75	15	15	-35.9
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	75	15	15	-39.52
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	75	15	15	-36.1
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	75	15	15	-41.53
eFDD 7 QPSK	eFDD 7 QPSK	low + low	50	100	10	20	-33.2
eFDD 7 QPSK	eFDD 7 QPSK	high + high	50	100	10	20	-41.92
eFDD 7 16QAM	eFDD 7 16QAM	low + low	50	100	10	20	-35.51
eFDD 7 16QAM	eFDD 7 16QAM	high + high	50	100	10	20	-44.16
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	75	20	15	-35.51
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	75	20	15	-39.82
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	75	20	15	-38.14
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	75	20	15	-41.92
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	100	15	20	-33.35
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	100	15	20	-41.92
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	100	15	20	-36.1
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	100	15	20	-43.19
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	50	20	10	-35.9
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	50	20	10	-38.14
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	50	20	10	-37.64
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	50	20	10	-39.82
eFDD 7 QPSK	eFDD 7 QPSK	low + low	100	100	20	20	-35.14
eFDD 7 QPSK	eFDD 7 QPSK	high + high	100	100	20	20	-40.47
eFDD 7 16QAM	eFDD 7 16QAM	low + low	100	100	20	20	-37.88
eFDD 7 16QAM	eFDD 7 16QAM	high + high	100	100	20	20	-42.32



Date: 22.OCT.2018 16:38:49

PCC: eFDD7 QPSK 15MHz Channel = low
SCC1: eFDD7 QPSK 15MHz Channel = low

3.5.21 27.7 Peak-to-Average ratio §2.1046, §27.50

Test: 27.7; Peak-to-Average Ratio Summary §2.1046, §27.50

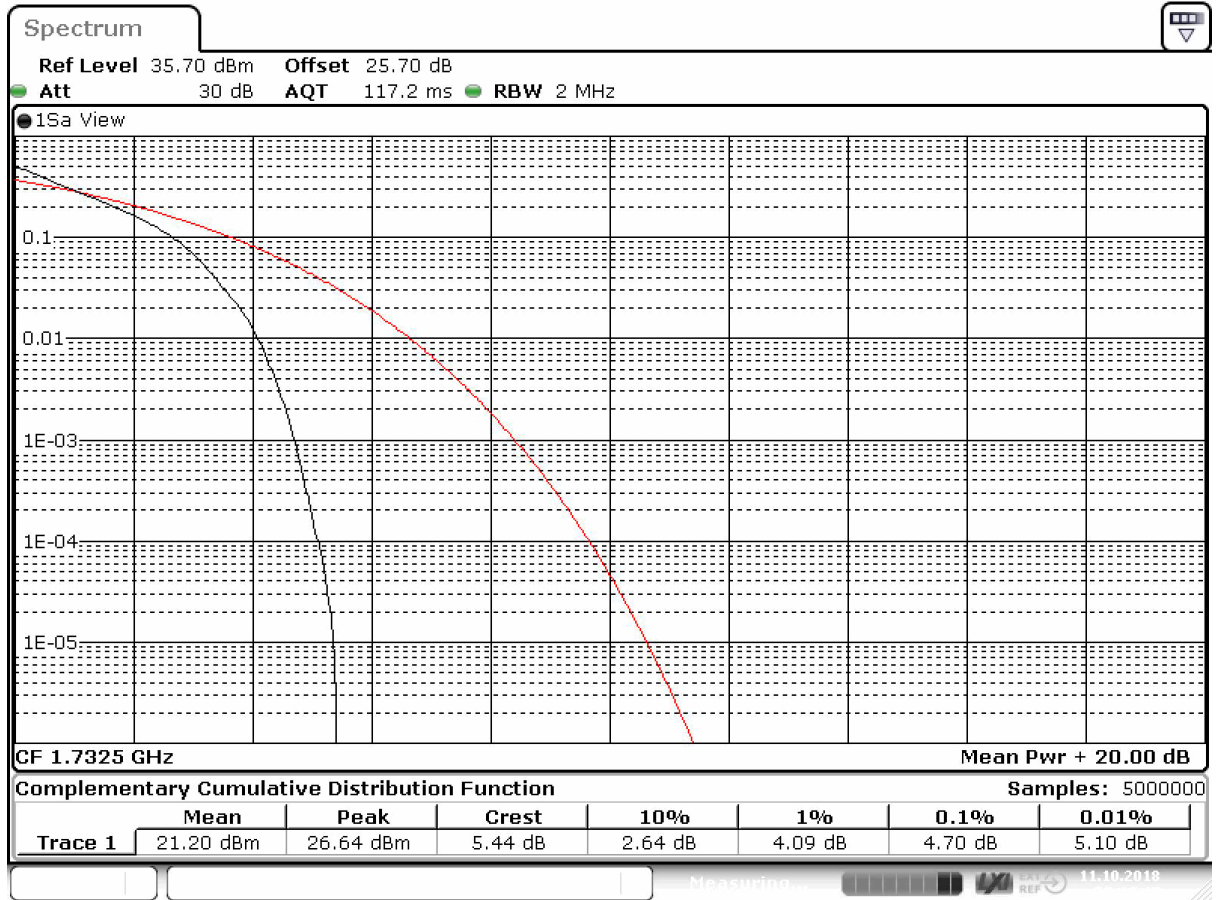
<i>Result:</i>	Passed
<i>Setup No.:</i>	S01_AM01
<i>Date of Test:</i>	2018/11/12 9:27
<i>Body:</i>	FCC47CFRChIPART27MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
<i>Test Specification:</i>	FCC part 2 and 27

Detailed Results:

Radio Technology	Channel	Ressource Blocks	Bandwidth [MHz]	Peak to Average Ratio [dB]	Limiti (IC) [dB]
FDD IV	low	-	5	5.62	13
FDD IV	mid	-	5	5.51	13
FDD IV	high	-	5	5.78	13
FDD IV HSDPA Subtest 1	low	-	5	5.52	13
FDD IV HSDPA Subtest 1	mid	-	5	5.38	13
FDD IV HSDPA Subtest 1	high	-	5	5.39	13
FDD IV HSUPA Subtest 1	low	-	5	5.46	13
FDD IV HSUPA Subtest 1	mid	-	5	5.4	13
FDD IV HSUPA Subtest 1	high	-	5	6.56	13
FDD IV HSUPA Subtest 5	low	-	5	6.8	13
FDD IV HSUPA Subtest 5	mid	-	5	6.46	13
FDD IV HSUPA Subtest 5	high	-	5	7.37	13
eFDD 4 QPSK	low	6	1.4	4.43	13
eFDD 4 QPSK	mid	6	1.4	4.7	13
eFDD 4 QPSK	high	6	1.4	4.78	13
eFDD 4 16QAM	low	6	1.4	5.3	13
eFDD 4 16QAM	mid	6	1.4	5.54	13
eFDD 4 16QAM	high	6	1.4	5.71	13
eFDD 7 QPSK	low	6	1.4	5.01	13
eFDD 7 QPSK	mid	6	1.4	5.01	13
eFDD 7 QPSK	high	6	1.4	5.07	13
eFDD 7 16QAM	low	6	1.4	5.83	13
eFDD 7 16QAM	mid	6	1.4	5.86	13
eFDD 7 16QAM	high	6	1.4	5.86	13
eFDD 12 QPSK	low	6	1.4	4.93	13
eFDD 12 QPSK	mid	6	1.4	4.93	13
eFDD 12 QPSK	high	6	1.4	4.87	13
eFDD 12 16QAM	low	6	1.4	5.86	13
eFDD 12 16QAM	mid	6	1.4	5.97	13
eFDD 12 16QAM	high	6	1.4	5.74	13
eFDD 13 QPSK	low	25	5	4.81	13
eFDD 13 QPSK	mid	25	5	4.96	13
eFDD 13 QPSK	high	25	5	4.75	13
eFDD 13 16QAM	low	25	5	5.65	13
eFDD 13 16QAM	mid	25	5	5.77	13
eFDD 13 16QAM	high	25	5	5.68	13
eFDD 66 QPSK	low	6	1.4	4.43	13
eFDD 66 QPSK	mid	6	1.4	4.75	13
eFDD 66 QPSK	high	6	1.4	4.93	13
eFDD 66 16QAM	low	6	1.4	5.3	13
eFDD 66 16QAM	mid	6	1.4	5.62	13
eFDD 66 16QAM	high	6	1.4	5.83	13

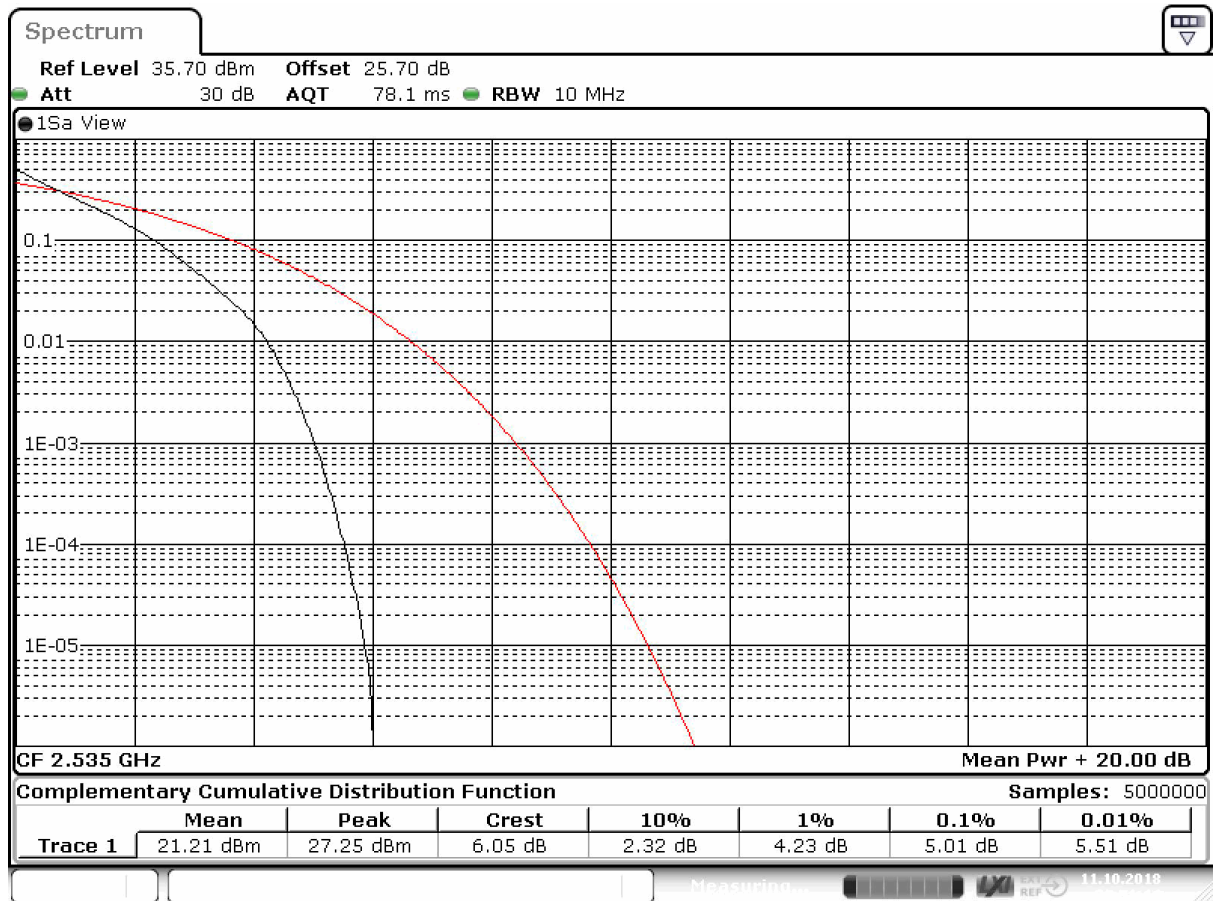
Carrier Aggregation (intier-band)									
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	Peak tio Average Ratio PCC [dB]	Peak tio Average Ratio SCC1 [dB]	Limiti (IC) [dB]
eFDD 5 QPSK	eFDD 7 QPSK	low + low	6	50	1.4	10	5.07	5.1	13
eFDD 5 QPSK	eFDD 7 QPSK	mid + mid	6	50	1.4	10	5.74	5.68	13
eFDD 5 QPSK	eFDD 7 QPSK	high + high	6	50	1.4	10	4.96	5.16	13
eFDD 5 16QAM	eFDD 7 16QAM	low + low	6	50	1.4	10	5.59	5.77	13
eFDD 5 16QAM	eFDD 7 16QAM	mid + mid	6	50	1.4	10	4.7	5.74	13
eFDD 5 16QAM	eFDD 7 16QAM	high + high	6	50	1.4	10	6.58	5.88	13

Carrier Aggregation (intira-band)								
Radio Technology PCC	Radio Technology SCC1	Channel	Ressource Blocks PCC	Ressource Blocks SCC1	BW PCC [MHz]	BW SCC1 [MHz]	Peak tio Average Ratio [dB]	Limiti (IC) [dB]
eFDD 7 QPSK	eFDD 7 QPSK	low + low	1	1	15	15	5.59	13
eFDD 7 QPSK	eFDD 7 QPSK	low + low	75	75	15	15	5.48	13
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	1	1	15	15	6.08	13
eFDD 7 QPSK	eFDD 7 QPSK	mid + mid	75	75	15	15	5.32	13
eFDD 7 QPSK	eFDD 7 QPSK	high + high	1	1	15	15	6.3	13
eFDD 7 QPSK	eFDD 7 QPSK	high + high	75	75	15	15	5.37	13
eFDD 7 16QAM	eFDD 7 16QAM	low + low	1	1	15	15	7	13
eFDD 7 16QAM	eFDD 7 16QAM	low + low	75	75	15	15	6.25	13
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	1	1	15	15	6.99	13
eFDD 7 16QAM	eFDD 7 16QAM	mid + mid	75	75	15	15	6.35	13
eFDD 7 16QAM	eFDD 7 16QAM	high + high	1	1	15	15	7.27	13
eFDD 7 16QAM	eFDD 7 16QAM	high + high	75	75	15	15	6.34	13



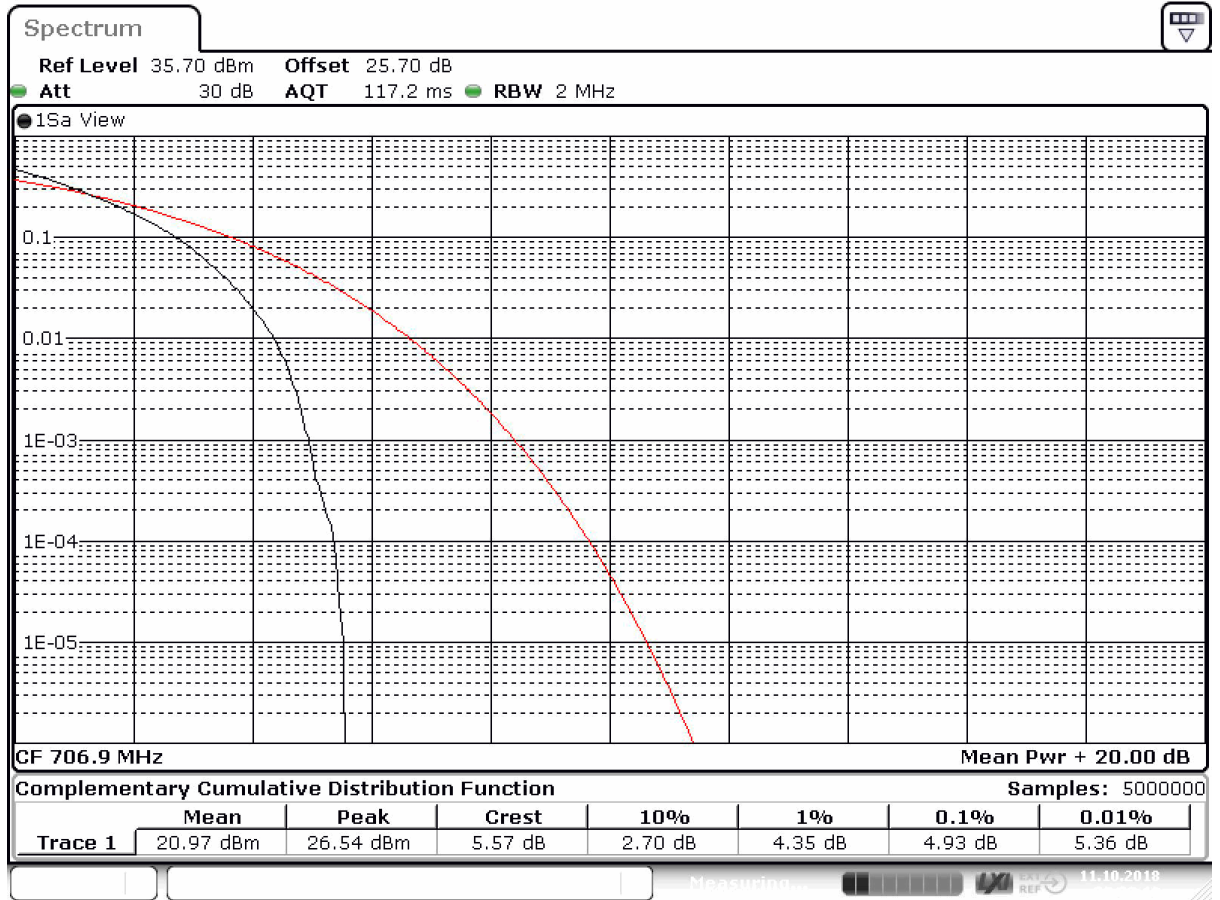
Date: 11.OCT.2018 08:44:45

LTE eFDD4 QPSK Channel = mid



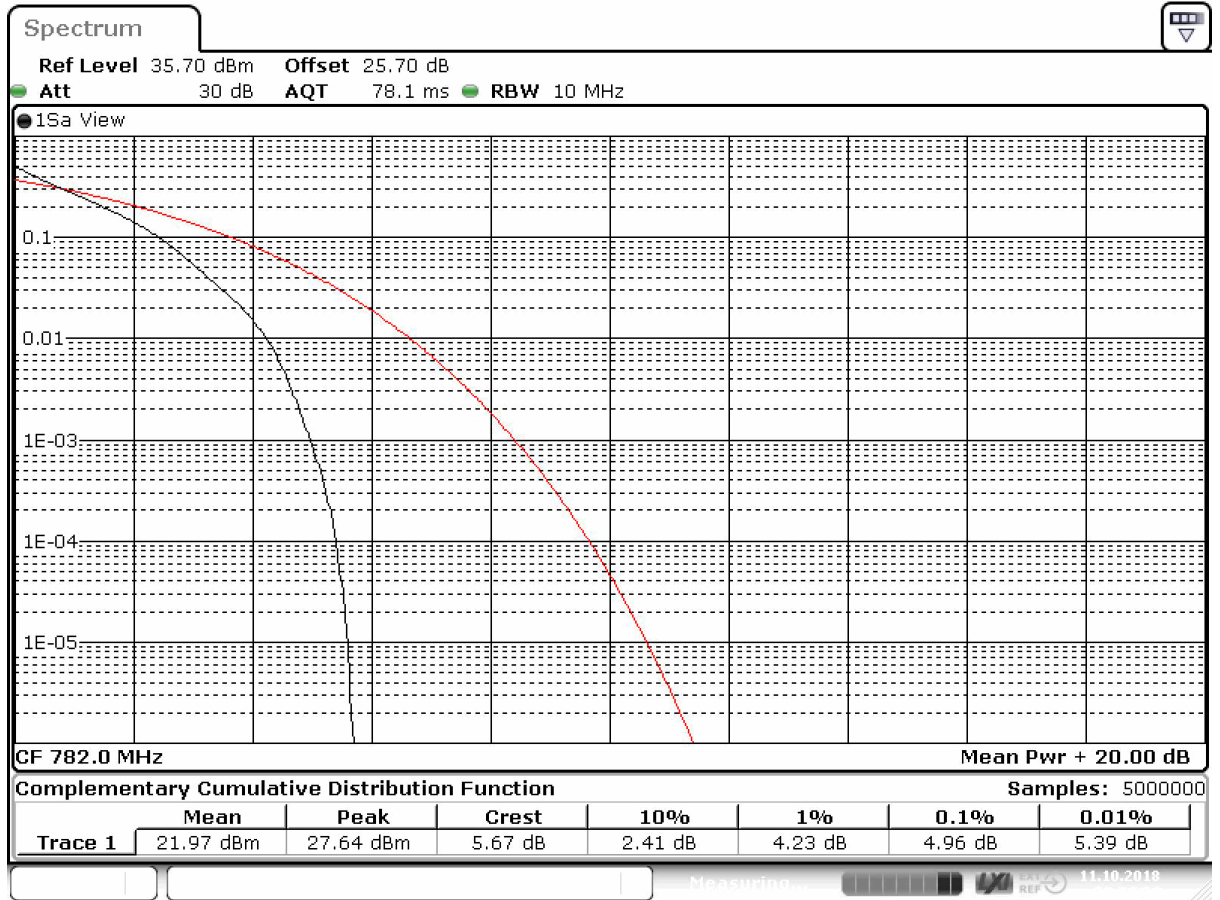
Date: 11.OCT.2018 08:51:15

LTE eFDD7 QPSK Channel = mid



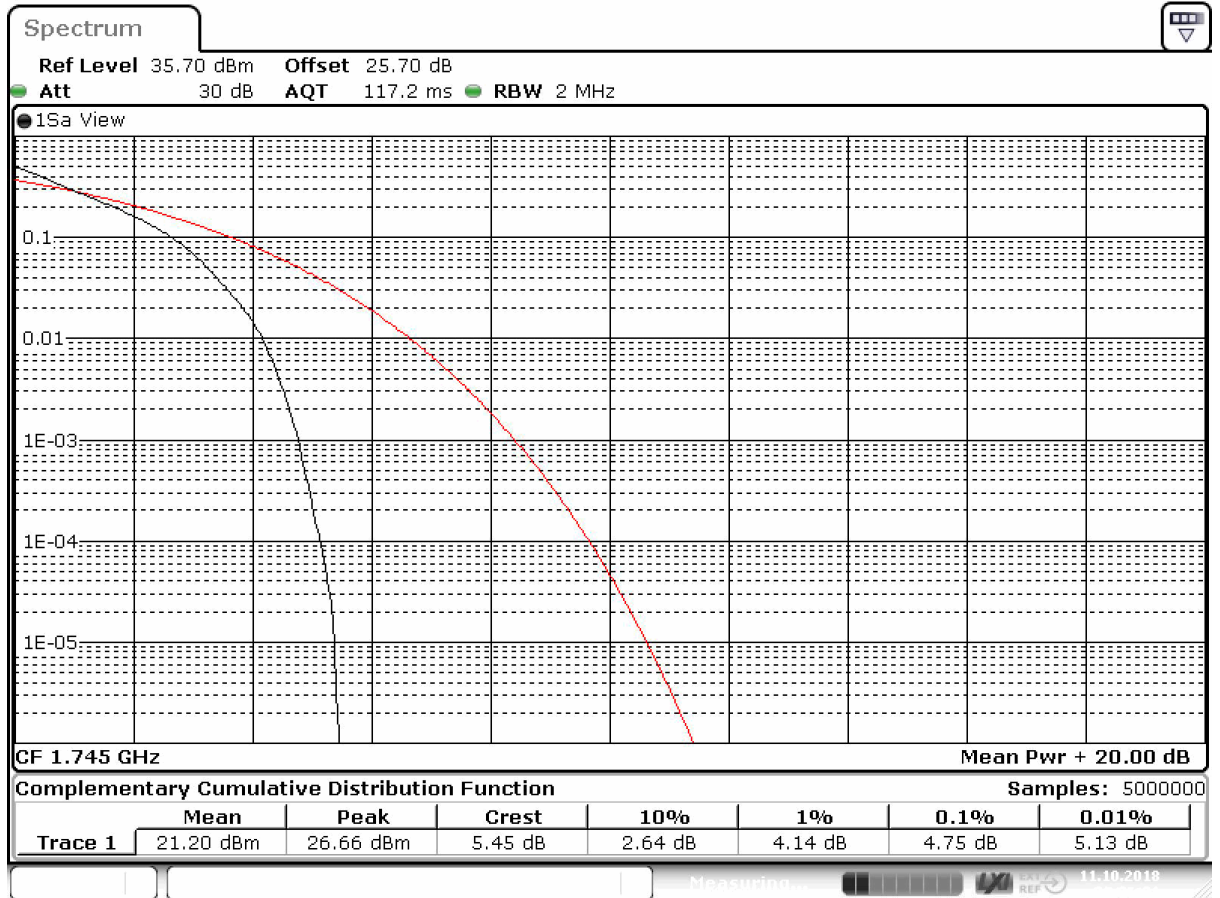
Date: 11.OCT.2018 09:03:11

LTE eFDD12 QPSK Channel = mid



Date: 11.OCT.2018 08:54:05

LTE eFDD13 QPSK Channel = mid



Date: 11.OCT.2018 09:06:31

LTE eFDD66 QPSK Channel = mid

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 m ³	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	AM4.0/180/11920 513	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
Calibration Details			Last Execution Next Execution
Standard Calibration			2018/07/20 2021/07/19

Single Devices for Auxiliary Equipment for Radiated emissions (continued)

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>		
Double-ridged horn-duplicated 2015-07-15 10:47:55	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG		
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	DKD-Calibration			2018/03/09	2021/03/08
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		
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	DKD Calibration			2018/07/05	2021/07/05
Log.-per. Antenna (upgraded)	HL 562 Ultralog new biconicals	830547/003	Rohde & Schwarz GmbH & Co. KG		
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	DKD-Calibration			2018/07/05	2021/07/04
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG		
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	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		
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	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			
	<i>Calibration Details</i>			<i>Last Execution</i>	<i>Next Execution</i>
	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 Execution
	DKD Calibration			2016/11/29	2018/11/28
Personal Computer	Dell	30304832059			
Power Meter	NRVD	828110/016			
	Calibration Details			Last Execution	Next Execution
	Standard calibration			2018/07/18	2019/07/17
Sensor Head A	NRV-Z1	827753/005			
	Calibration Details			Last Execution	Next Execution
	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 Execution
	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 Execution
	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 Execution
	Standard calibration		2018/07/25	2019/07/24
Sensor Head A	NRV-Z1	827753/005		
	Calibration Details		Last Execution	Next Execution
	Standard calibration		2018/07/17	2019/07/16
Signal Generator SME	SME03	827460/016		
	Calibration Details		Last Execution	Next Execution
	Standard calibration		2018/08/01	2021/07/31
Signal Generator SMP	SMP02	833286/0014	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		Last Execution	Next Execution
	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 Execution
	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 Execution
	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 Execution
	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 Execution
	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
- § 2.1051 Measurement required: Spurious emissions at antenna terminals
- § 2.1053 Measurement required: Field strength of spurious radiation
- § 2.1055 Measurement required: Frequency stability
- § 2.1057 Frequency spectrum to be investigated

Part 22, Subpart C – Operational and Technical Requirements

§ 22.355 Frequency tolerance

Part 22, Subpart H – Cellular Radiotelephone Service

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

additional documents

ANSI C63.26-2015

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 $\lambda/2$ 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 C63.26-2015 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.

Spurious emissions at antenna terminals

Standard FCC Part 22, Subpart H

The test was performed according to FCC §2.1051

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]:
 - a) [$\geq 1\%$ of wanted signal bandwidth] in the Span of 1 MHz directly below and above the PCS-Band,
 - b) otherwise [100 kHz] (or [1 MHz] for accelerated sweep times)
 - c) [reduced resolution bandwidth] in case the curve of the analyser IF-Filter or the wanted EUT signal leads to an exceeding of the limit, in this case a correction factor was used
 - Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
- 5) The spurious emissions peaks were measured in the frequency range from 9 kHz to 10 GHz (up to the 10th harmonic) during the call was established

Test Requirements / Limits

§ 2.1051 Spurious emissions at antenna terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in Sec. 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 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.

Remark of the test laboratory: This is calculated to be -13 dBm.

(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.

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 $\lambda/2$ 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 C63.26-2015 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.

Frequency stability

Standard FCC Part 22, Subpart H

The test was performed according to FCC §2.1055

Test Description

- 1) The EUT was placed inside a temperature chamber.
- 2) The EUT was coupled to a Digital Communication Tester. Refer to chapter "Setup Drawings".

- 3) The climatic chamber was cycled down/up to a certain temperature, starting with the EUT minimum temperature.
- 4) After the temperature was stabilized the EUT was switched on and a call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
- Important Settings:
- Output Power: Maximum
 - Mid Channel
- 5) The frequency error of the EUT was recorded by using an internal measurement function of the Digital Communication Tester immediately after the call was established, five minutes after the call was established and ten minutes after the call was established.
- 6) This measurement procedure was performed for temperature variation from -30°C to +50°C in increments of 10°C, if not otherwise stated in the detailed results.
- When the EUT did not operate at certain temperature levels, these measurements were left out.

Test Requirements / Limits

§2.1055 Measurements required: Frequency stability

- (a) The frequency stability shall be measured with variation of ambient temperature as follows:
- (1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
- (b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.
- (d) The frequency stability shall be measured with variation of primary supply voltage as follows:
- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
- (3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

§22.355 Frequency tolerance

...the carrier frequency of each transmitter in the Public Mobile Service must be maintained within the tolerances given in table C-1 of this section.

Table C-1.- Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile up to 3 watts (ppm)	Mobile above 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

channel (836.6 MHz) the frequency tolerance is 2.5 ppm (2091.5 Hz).

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

§ 2.1051 Measurement required: Spurious emissions at antenna terminals

§ 2.1053 Measurement required: Field strength of spurious radiation

§ 2.1055 Measurement required: Frequency stability

§ 2.1057 Frequency spectrum to be investigated

Part 24, Subpart E - Broadband PCS

§ 24.232 Power and antenna height limits

§ 24.235 Frequency stability

§ 24.236 Field strength limits

§ 24.238 Emission limitations for Broadband PCS equipment

additional documents

ANSI C63.26-2015

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 $\lambda/2$ 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 C63.26-2015 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.

Spurious emissions at antenna terminals

Standard: FCC Part 24, Subpart E

The test was performed according to FCC §2.1051

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]:
 - a) [$\geq 1\%$ of wanted signal bandwidth] in the Span of 1 MHz directly below and above the Band,
 - b) otherwise [1 MHz]
 - c) [reduced resolution bandwidth] in case the curve of the analyser IF-Filter or the wanted EUT signal leads to an exceeding of the limit, in this case a correction factor was used
 - Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
 - 5) The spurious emissions peaks were measured in the frequency range from 9 kHz to 20 GHz (up to the 10th harmonic) during the call was established

Test Requirements / Limits

§ 2.1051 Spurious emissions at antenna terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in Sec. 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 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.

Remark of the test laboratory: This is calculated to be -13 dBm.

(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.

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 $\lambda/2$ 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 C63.26-2015 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.

Frequency stability

Standard: FCC Part 24, Subpart E

The test was performed according to FCC §2.1055

Test Description

- 1) The EUT was placed inside a temperature chamber.
 - 2) The EUT was coupled to a Digital Communication Tester. Refer to chapter "Setup Drawings".
 - 3) The climatic chamber was cycled down/up to a certain temperature, starting with the EUT minimum temperature.
 - 4) After the temperature was stabilized the EUT was switched on and a call was established on a Traffic Channel between the EUT and the Digital Communication Tester.
- Important Settings:
- Output Power: Maximum
 - Mid Channel
- 5) The frequency error of the EUT was recorded by using an internal measurement function of the Digital Communication Tester immediately after the call was established, five minutes after the call was established and ten minutes after the call was established.
 - 6) This measurement procedure was performed for temperature variation from -30°C to +50°C in increments of 10°C, if not otherwise stated in the detailed results.
- When the EUT did not operate at certain temperature levels, these measurements were left out.

Test Requirements / Limits

§2.1055 Measurements required: Frequency stability

- (a) The frequency stability shall be measured with variation of ambient temperature as follows:
- (1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
 - (b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.
 - (d) The frequency stability shall be measured with variation of primary supply voltage as follows:
 - (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
 - (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
 - (3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

§24.235 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

7Layers interpretation of limit:

To ensure that the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block following limit was used:

$\pm 2.5 \text{ ppm} = 4700 \text{ Hz}$ for a frequency of 1880.0 MHz

in accordance with FCC Part 22, Subpart H, §22.355, table C-1: Frequency tolerance for the carrier frequency of mobile transmitters in the Public Mobile Service in the frequency range 821 to 896 MHz.

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".

Part 2, Subpart J - Equipment Authorization Procedures, Certification

- § 2.1046 Measurement required: RF power output
- § 2.1049 Measurement required: Occupied bandwidth
- § 2.1051 Measurement required: Spurious emissions at antenna terminals
- § 2.1053 Measurement required: Field strength of spurious radiation
- § 2.1055 Measurement required: Frequency stability
- § 2.1057 Frequency spectrum to be investigated

Part 27, Subpart C—Technical Standards

- § 27.50 Power and antenna height limits
- § 27.53 Emissions limits
- § 27.54 Frequency stability

additional documents

ANSI C63.26-2015

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 $\lambda/2$ 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 C63.26-2015 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.

Spurious emissions at antenna terminals

Standard FCC Part 27, Subpart C

The test was performed according to FCC §2.1051

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]:
 - a) [$\geq 1\%$ of wanted signal bandwidth] in the Span of 1 MHz directly below and above the Band,
 - b) otherwise [1 MHz]
 - c) [reduced resolution bandwidth] in case the curve of the analyser IF-Filter or the wanted EUT signal leads to an exceeding of the limit, in this case a correction factor was used
 - Sweep Time: depending on the transmitting signal, the span and the resolution bandwidth
- 5) The spurious emissions peaks were measured in the frequency range from 9 kHz to 18 GHz (up to the 10th harmonic) during the call is established

Test Requirements / Limits

§ 2.1051 Spurious emissions at antenna terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in Sec. 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 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 $43 + 10 \log_{10}(P)$ dB.

Remark of the test laboratory: This is calculated to be -13 dBm.

- (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.

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 $\lambda/2$ 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 $\rightarrow$ 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 C63.26-2015 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 $43 + 10 \log_{10}(P)$ 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.

Frequency stability

Standard FCC Part 27, Subpart C

The test was performed according to FCC §2.1055

Test Description

- 1) The EUT was placed inside a temperature chamber.
- 2) The EUT was coupled to a Digital Communication Tester. Refer to chapter "Setup Drawings".
- 3) The climatic chamber was cycled down/up to a certain temperature, starting with the EUT minimum temperature.
- 4) After the temperature was stabilized the EUT was switched on and a call was established on a Traffic Channel between the EUT and the Digital Communication Tester.

Important Settings:

- Output Power: Maximum
- Mid Channel

5) The frequency error of the EUT was recorded by using an internal measurement function of the Digital Communication Tester immediately after the call was established, five minutes after the call was established and ten minutes after the call was established.

6) This measurement procedure was performed for temperature variation from -30°C to +50°C in increments of 10°C, if not otherwise stated in the detailed results.

When the EUT did not operate at certain temperature levels, these measurements were left out.

Test Requirements / Limits

§2.1055 Measurements required: Frequency stability

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

§27.54 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7Layers interpretation of limit:

To ensure that the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block following limit was used:

+/- 2.5 ppm = 4350 Hz for channel 1450, frequency 1740.0 MHz

+/- 2.5 ppm = 4331 Hz for channel 1412, frequency 1732.4 MHz

Subtests HSDPA

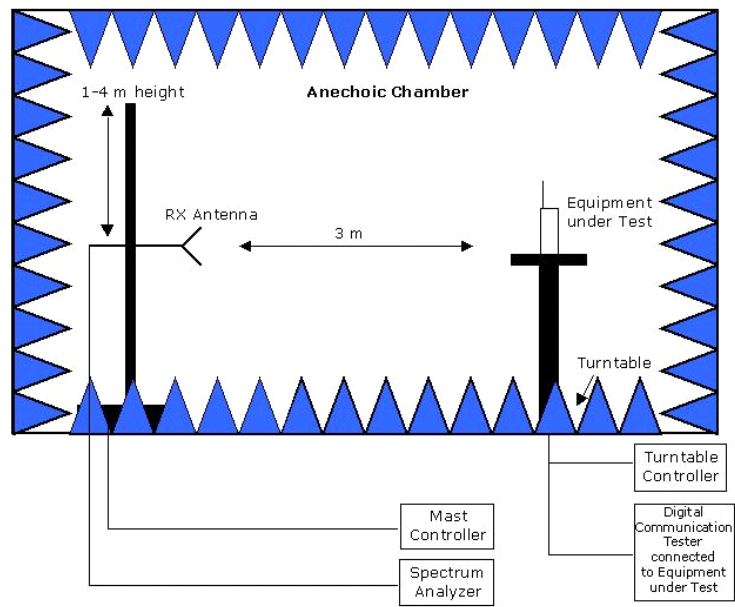
Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5
Note 1: γ_{ACK}, γ_{NACK} and $\gamma_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, γ_{ACK} and $\gamma_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\gamma_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$. Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF0) to $\beta_c = 11/15$ and $\beta_d = 15/15$.							

Subtests HSUPA

Subtest	Mode	Loopback Mode	Rel99 RMC	HSDPA FRC	HSUPA Test	Number of E-DPDCH Channels
1	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set1	HSUPA Loopback	1
2	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set1	HSUPA Loopback	1
3	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set1	HSUPA Loopback	2
4	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set1	HSUPA Loopback	1
5	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set1	HSUPA Loopback	1

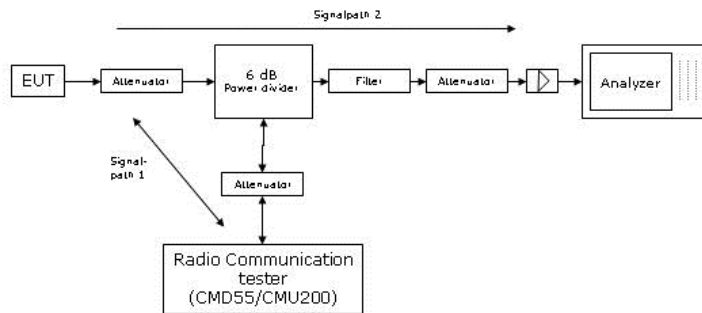
Subtest	Max UL Data Rate (kb/s)	β_c/β_d	β_{hs}	β_{ed}	CM
1	242.1	11/15	22/15	1309/225	1
2	161.3	6/15	12/15	94/75	3
3	524.7	15/9	30/15	47/15	2
4	197.6	2/15	4/15	56/75	3
5	299.6	15/15	30/15	134/15	1

Setup Drawings



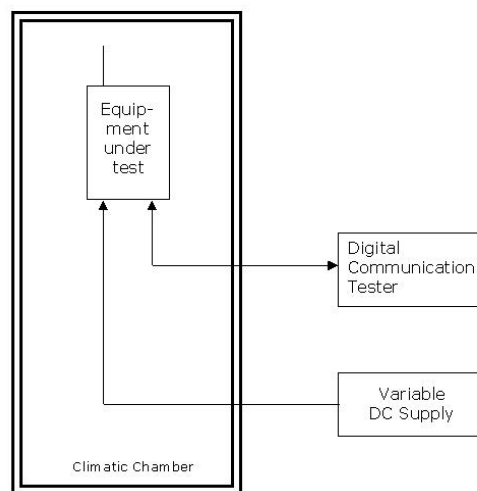
Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

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

Correlation of measurement requirements for Cellular Equipment from FCC and IC

Test name – FCC	FCC reference CFR47				Test name – IC	IC reference					
	Part 2	Part 22	Part 24	Part 27		RSS-Gen	RSS-130 SRSP-518	RSS-132 SRSP-503	RSS-133 SRSP-510	RSS-139 SRSP-513	RSS-199 SRSP-517
					Issue:	5, 2014	1, 2013	3, 2013	6, 2018	3, 2016	3, 2016
RF power output	§ 2.1046	§ 22.913	§ 24.232	§ 27.50	Transmitter output power	6.12	4.4	5.4	6.4	6.5	4.4
Frequency stability	§ 2.1055	§ 22.355	§ 24.235	§ 27.54	Frequency stability	6.11	4.3	5.3	6.3	6.4	4.3
Spurious emissions at antenna terminals	§ 2.1051	§ 22.917	§ 24.238	§ 27.53	Transmitter unwanted emissions conducted	6.13	4.6	5.5	6.5	6.6	4.5
-	-	-	-	-	Receiver unwanted emissions conducted	5/7 *), 7.1.3	-	5.6	6.6	-	-
Field strength of spurious radiation	§ 2.1053	§ 22.917	§ 24.238	§ 27.53	Transmitter unwanted emissions radiated	6.13	4.6	5.5	6.5	6.6	4.5
-	-	-	-	-	Receiver unwanted emissions radiated	5/7 *), 7.1.2	-	5.6	6.6	-	-
Emission and Occupied Bandwidth	§ 2.1049	-	-	-	Emission and Occupied Bandwidth	6.6	-	5.5	2.3; 6.5	-	-
Band edge compliance	§ 2.1053	§ 22.917	§ 24.238	§ 27.53	Band edge compliance	6.13	4.6	5.5	6.5	6.6	4.5

*) Receivers are exempted from certification besides if operating in stand-alone mode in the frequency range 30-960 MHz or if these are scanner receivers.

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