

ISED CABid: ES1909
 Lab. Company Number: 4621A

Test Report No:
 NIE: 72943RRF.002A1

Partial Test Report

USA FCC Part 24

CANADA RSS-133

(*) Identification of item tested	Continuous Positive Airway Pressure (CPAP) Device
(*) Trademark	ResMed
(*) Model and /or type reference	39485
(*) Derived model not tested	39517, 39518, 39519, 39520, 39521, 39522
Other identification of the product	FCC ID: 2ACHL-AIR11M1G22 IC: 9103A-AIR11M1G22
(*) Features	LTE Cat-M1, BLE HW version: R390-7654 SW version: SW04600
Applicant	ResMed Pty Ltd 1 Elizabeth Macarthur Drive, Bella Vista, NSW, 2153 Australia
Test method requested, standard	USA FCC Part 24 (10-1-21 Edition). CANADA RSS-133 Issue 6, Jan. 2018 Amendment. ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018. <ul style="list-style-type: none"> FCC 24.232 / RSS-133 6.4: RF output power. FCC 24.238 / RSS-133 6.5: Radiated emissions.
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager
Date of issue	2022-12-29
Report template No.	FDT08_24 (*) "Data provided by the client"

Index

Competences and guarantees	3
General conditions	3
Uncertainty.....	3
Data provided by the client	3
Usage of samples	5
Test sample description	6
Identification of the client	7
Testing period and place	7
Document history.....	7
Environmental conditions	7
Remarks and comments.....	8
Testing verdicts.....	9
Summary	9
Appendix A: Test results for FCC 24 / RSS-133	10

Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document. **IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model 39485 is a CPAP device with integrated cellular and Bluetooth connectivity.
3. Derived models not tested. These models have been declared by the supplier of the sample as being the same as the model under test.



Date: 25-Oct-2022

DECLARATION OF EQUIVALENCE

This document declares that the following designated products are equivalent to the unit under test **39485**.

Model Name / Product Code	Marketing Name
39517	AirSense 11 AutoSet USA
39518	AirSense 11 CPAP USA
39519	AirSense 11 Elite USA
39520	AirSense 11 AutoSet CAN
39521	AirSense 11 CPAP CAN
39522	AirSense 11 Elite CAN

All the above stated products and the unit under test - 39485 have the same cellular hardware and firmware.

Applicant:
Company Name: ResMed Pty Ltd
Address: 1 Elizabeth Macarthur Drive,
Bella Vista NSW 2153
Australia

By,



Christopher Jenkins
Title: Manager – Systems Engineering
Company: ResMed Pty Ltd
Telephone: +61 2 8884 1517
e-mail: Christopher.jenkins@resmed.com.au

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control No.	Description	Model	Serial No.	Date of reception
72943/046	Continuous Positive Airway Pressure (CPAP) Device	39485	22221830061	2022/09/19
72943/010	Water Tank	HumidAir11	--	2022/08/02
72943/018	AC/DC Adapter	390000	0001RP02	2022/08/02
72943/025	Power Cord	-	--	2022/08/02
66427/006	Climate Line	AIR11	--	2020/12/29

Sample S/01 has undergone the following test(s): The Radiated tests indicated in Appendix A.

- Sample S/02 is composed of the following elements:

Control No.	Description	Model	Serial No.	Date of reception
72943/045	Continuous Positive Airway Pressure (CPAP) Device	39485	22221830059	2022/09/19
72943/020	AC/DC Adapter	390000	0001RG02	2022/08/02

Sample S/02 has undergone the following test(s): The Conducted tests indicated in Appendix A.

Test sample description

Ports.....:	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	
	Power		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports.....:	--						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC: 100-240V~50-60 Hz 2.0A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	AC: 115V~400Hz 1.5A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	DC: 12V (DC-DC for Vehicle Use)					
<input type="checkbox"/>	DC: 24V (DC-DC for Vehicle Use)						
Rated Power.....:	--						
Clock frequencies.....:	N/A						
Other parameters	390000 (PSU Model Number)						
Software version.....:	SW04600 (DUT)						
Hardware version	R390-7654 (DUT)						
Dimensions in cm (W x H x D) ...:	138.5 mm x 259.4 mm x 94.5 mm						
Mounting position	<input checked="" type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					
Modules/parts.....:	Module/parts of test item		Type	Manufacturer			
	Wireless Module		EXS62-W	Thales			
	Bluetooth LE		EFR32BG2 2	SiLabs			
Accessories (not part of the test item)	Description		Type	Manufacturer			
	--						
	--						
Documents as provided by the applicant	Description		File name	Issue date			
	--						
	--						

⁽³⁾ Only for Medical Equipment

Identification of the client

ResMed Pty Ltd
1 Elizabeth Macarthur Drive, Bella Vista, NSW, 2153
Australia

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-09-29
Date (finish)	2022-10-05

Document history

Report number	Date	Description
72943RRF.002	2022-11-25	First release.
72943RRF.002A1	2022-12-29	Second release. This report is modified due to minor typos. This modification test report cancels and replaces the test report 72943RRF002

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semi-anechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Miguel Manuel López, Pablo Redondo, Francisco Javier Fernández.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
6791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	2024-06-07
6792	SHIELDED ROOM	S101	ETS LINDGREN	--
7817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2024-01-24
3783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2022-12-01
7862	PRE-AMPLIFIER G>30dB 17-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2023-02-15
6143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-10-29
6496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2023-08-24
4657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2023-05-05
4609	AC POWER SUPPLY	6490	CHROMA	2022-12-11
4848	EMC/RF TEST SOFTWARE	EMC32	ROHDE AND SCHWARZ	--
6794	SHIELDED ROOM	S101	ETS LINDGREN	--
6667	WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE AND SCHWARZ	2023-05-31
3342	SIGNAL ANALIZER 20Hz-8GHz	FSQ8	ROHDE AND SCHWARZ	2022-10-06

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

FCC 24 / RSS-133		
Requirement – Test case	Verdict	Remark
FCC 24.232 / RSS-133 Clause 6.4: RF output power	P	
FCC 2.1047 / RSS-133 Clause 6.2: Modulation characteristics	N/M	(1)
FCC 24.235 / RSS-133 Clause 6.3: Frequency stability	N/M	(1)
FCC 2.1049: Occupied Bandwidth	N/M	(1)
FCC 24.238 / RSS-133 Clause 6.5: Spurious emissions at antenna terminals	N/M	(1)
FCC 24.238 / RSS-133 Clause 6.5: Spurious emissions at antenna terminals at Block Edges	N/M	(1)
FCC 24.238 / RSS-133 Clause 6.5: Radiated emissions	P	
<u>Supplementary information and remarks:</u>		
(1) Test not requested.		

Appendix A: Test results for FCC 24 / RSS-133

INDEX

TEST CONDITIONS.....	12
RF Output Power	13
Radiated Emissions.....	32

TEST CONDITIONS

(*): Declared by the Applicant.

POWER SUPPLY (*):

Vnormal: Preliminary scan determined 115Vac / 60Hz as worst case of power supply.

Type of Power Supply: Mains Supply.

ANTENNA (*):

Band	Gain (dBi)	Type of Antenna
LTE 2	+2.5	Ceramic
LTE 25	+2.5	Ceramic

TEST FREQUENCIES:

LTE Band 2. QPSK and 16QAM modulations:

	Channel per Nominal Bandwidth (Frequency, MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Low	18607 (1850.7)	18615 (1851.5)	18625 (1852.5)	18650 (1855)	18675 (1857.5)	18700 (1860)
Middle	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)
High	19193 (1909.3)	19185 (1908.5)	19175 (1907.5)	19150 (1905)	19125 (1902.5)	19100 (1900)

NOTE: Band 2 is completely included in band 25, so the channels of band 25 were tested to give conformity to the assigned block.

LTE Band 25. QPSK and 16QAM modulations:

	Channel per Nominal Bandwidth (Frequency, MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Low	26047 (1850.7)	26055 (1851.5)	26065 (1852.5)	26090 (1855)	26115 (1857.5)	26140 (1860)
Middle	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)	26365 (1882.5)
High	26683 (1914.3)	26675 (1913.5)	26665 (1912.5)	26640 (1910)	26615 (1907.5)	26590 (1905)

RF Output Power

Limits

FCC §2.1046 and §24.232:

Mobile/portable stations are limited to 2 Watts (33 dBm) Effective Isotropic Radiated Power (E.I.R.P.). The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

RSS-133. Clause 6.4:

Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the High PAPR during periods of continuous transmission.

Method

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The peak-to-average power ratio (PAPR) is measured using an attenuator, power splitter and spectrum analyser with a Complementary Cumulative Distribution Function implemented.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

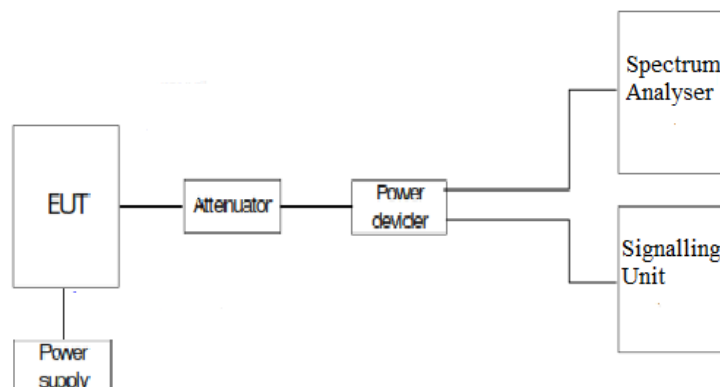
$$E.R.P. = E.I.R.P. - 2.15 \text{ dB}$$

Test setup

1. CONDUCTED AVERAGE POWER:



2. PEAK-TO-AVERAGE POWER RATIO (PAPR) and Conducted Average power:



Results

1. CONDUCTED AVERAGE POWER

LTE Band 25:

LTE Band 25. QPSK modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.42	19.28	19.33
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.92	21.78	21.83
Maximum effective radiated power E.R.P. (dBm)	19.77	19.63	19.68
PAPR (dB)	(*)	4.52	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.

(*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	18.01	17.89	17.19
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	20.51	20.39	19.69
Maximum effective radiated power E.R.P. (dBm)	18.36	18.24	17.54
PAPR (dB)	5.77	6.03	5.99
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 0.

LTE Band 25. QPSK modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.31	19.33	18.99
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.81	21.83	21.49
Maximum effective radiated power E.R.P. (dBm)	19.66	19.68	19.34
PAPR (dB)	(*)	4.41	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.

(*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	18.06	18.08	17.55
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	20.56	20.58	20.05
Maximum effective radiated power E.R.P. (dBm)	18.41	18.43	17.95
PAPR (dB)	4.78	4.52	4.90
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

LTE Band 25. QPSK modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.12	19.33	19.07
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.62	21.83	21.57
Maximum effective radiated power E.R.P. (dBm)	19.47	19.68	19.42
PAPR (dB)	(*)	4.25	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

(*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	18.84	19.08	18.69
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.34	21.58	21.19
Maximum effective radiated power E.R.P. (dBm)	19.19	19.43	19.04
PAPR (dB)	4.63	5.10	4.84
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

LTE Band 25. QPSK modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.15	19.13	18.96
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.65	21.63	21.46
Maximum effective radiated power E.R.P. (dBm)	19.50	19.48	19.31
PAPR (dB)	(*)	3.07	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

(*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	18.99	18.80	18.72
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.49	21.30	21.22
Maximum effective radiated power E.R.P. (dBm)	19.34	19.15	19.07
PAPR (dB)	3.93	3.11	4.57
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation 16QAM. RB Size: 1. RB Offset: 0.

LTE Band 25. QPSK modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.17	19.27	19.20
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.67	21.77	21.70
Maximum effective radiated power E.R.P. (dBm)	19.52	19.62	19.55
PAPR (dB)	(*)	4.71	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.
 PAPR Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.
 (*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.08	19.16	19.04
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.58	21.66	21.54
Maximum effective radiated power E.R.P. (dBm)	19.43	19.51	19.39
PAPR (dB)	4.39	5.10	5.21
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 0.
 PAPR Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 0.

LTE Band 25. QPSK modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.34	19.33	19.11
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.84	21.83	21.61
Maximum effective radiated power E.R.P. (dBm)	19.69	19.68	19.66
PAPR (dB)	(*)	4.70	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 0.

PAPR Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.

(*): Preliminary measurements determined the Middle Channel as the worst case.

LTE Band 25. 16QAM modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2.50		
Measured maximum average power (dBm) at antenna port	19.12	19.25	18.94
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	21.62	21.75	21.44
Maximum effective radiated power E.R.P. (dBm)	19.47	19.60	19.29
PAPR (dB)	3.01	5.08	4.86
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 0.

PAPR Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 0.

Verdict

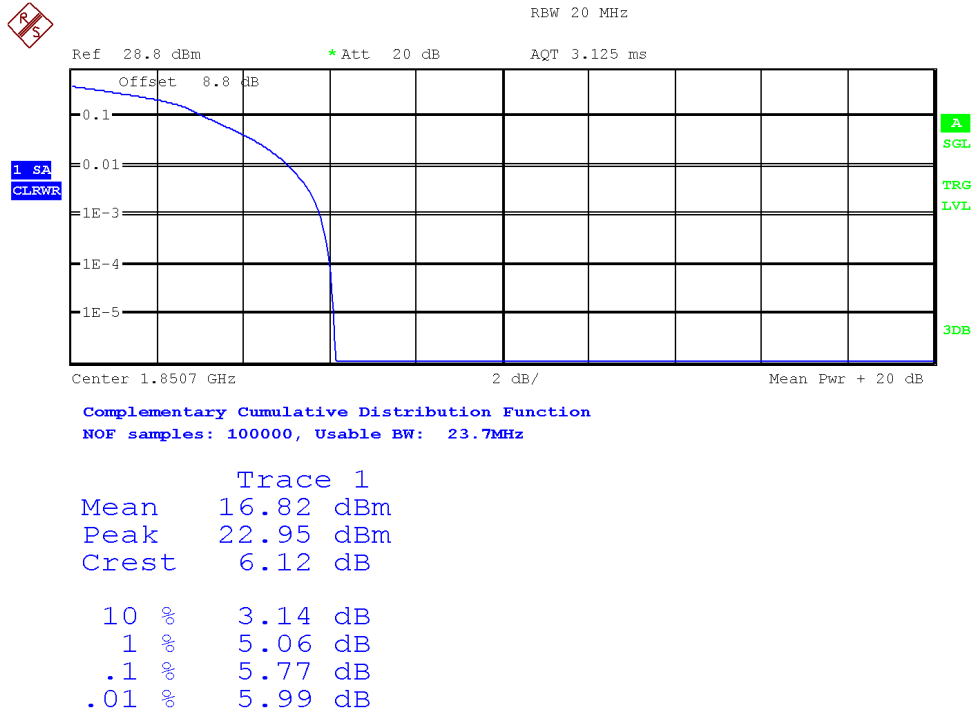
Pass

2. PEAK-TO-AVERAGE POWER RATIO (PAPR)

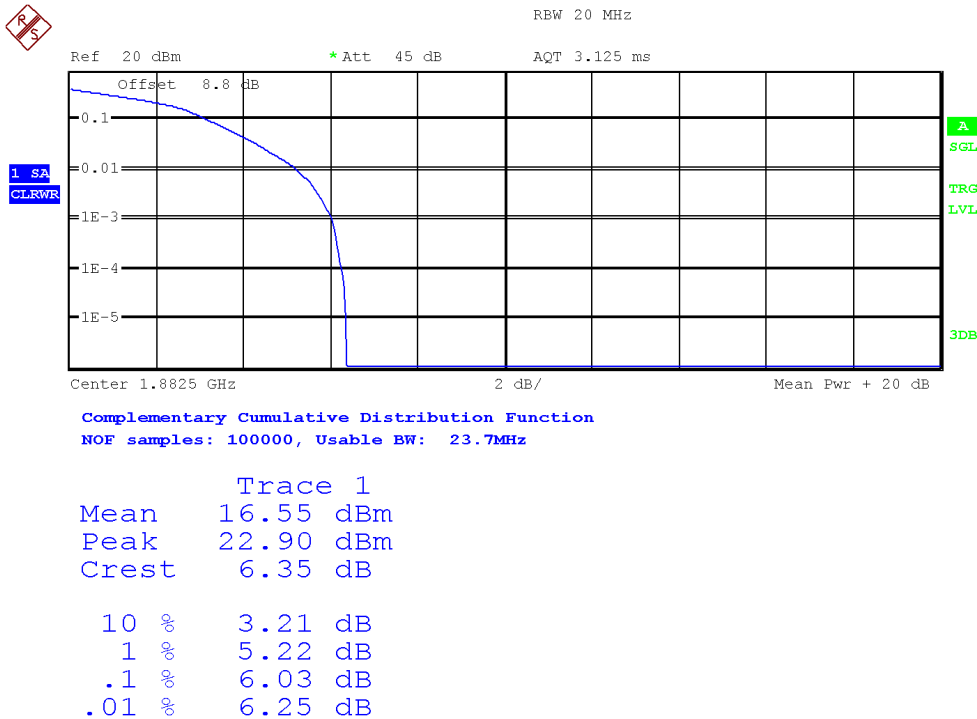
Worst-case modulation in terms of PAPR is reported below: 16QAM.

LTE Band 25. Bandwidth = 1.4 MHz. Modulation 16 QAM. RB Size: 5. RB Offset: 0.

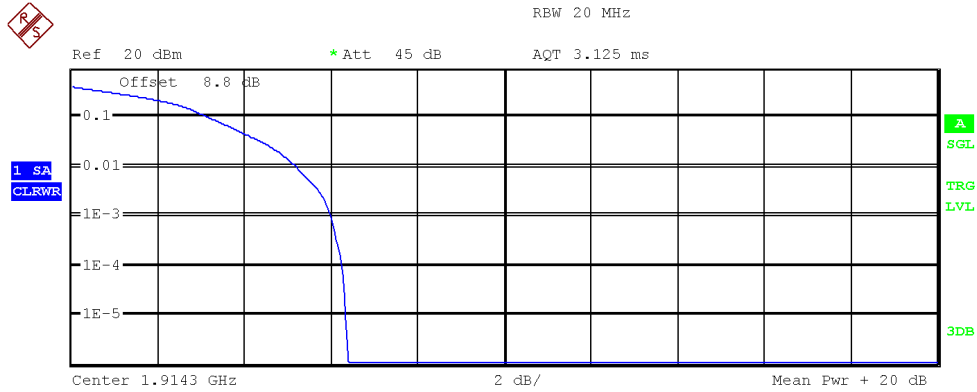
Low Channel:



Middle Channel:



High Channel:

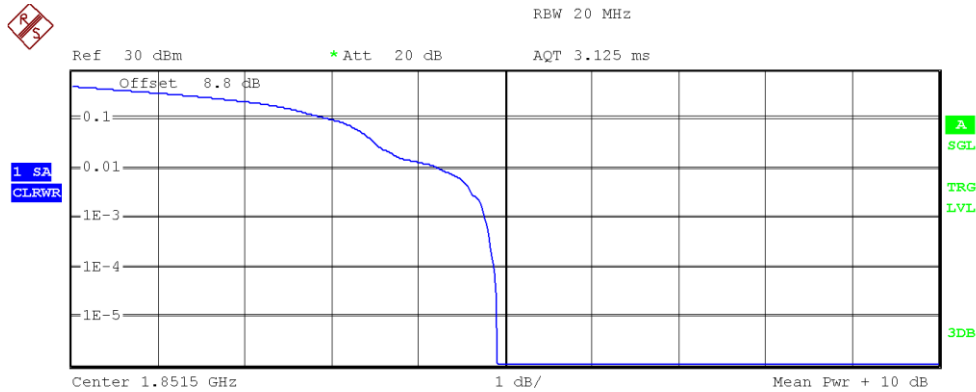


Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	16.65 dBm
Peak	23.04 dBm
Crest	6.39 dB
10 %	3.21 dB
1 %	5.19 dB
.1 %	5.99 dB
.01 %	6.25 dB

LTE Band 25. Bandwidth = 3 MHz. Modulation 16 QAM. RB Size: 1. RB Offset: 0.

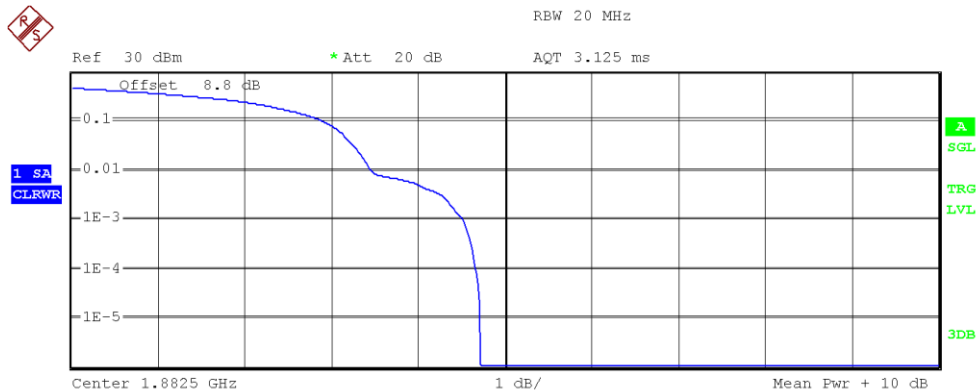
Low Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	18.55 dBm
Peak	23.46 dBm
Crest	4.91 dB
10 %	3.00 dB
1 %	4.25 dB
.1 %	4.78 dB
.01 %	4.87 dB

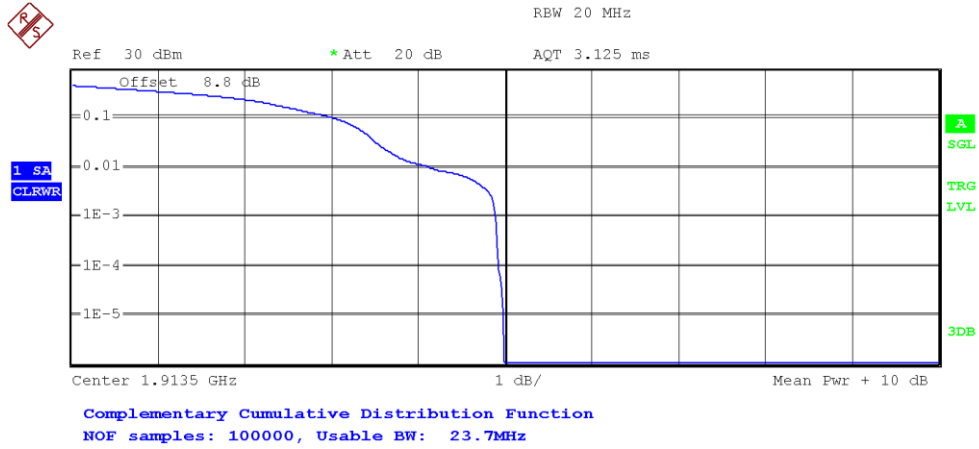
Middle Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	18.88 dBm
Peak	23.60 dBm
Crest	4.72 dB
10 %	2.90 dB
1 %	3.45 dB
.1 %	4.52 dB
.01 %	4.66 dB

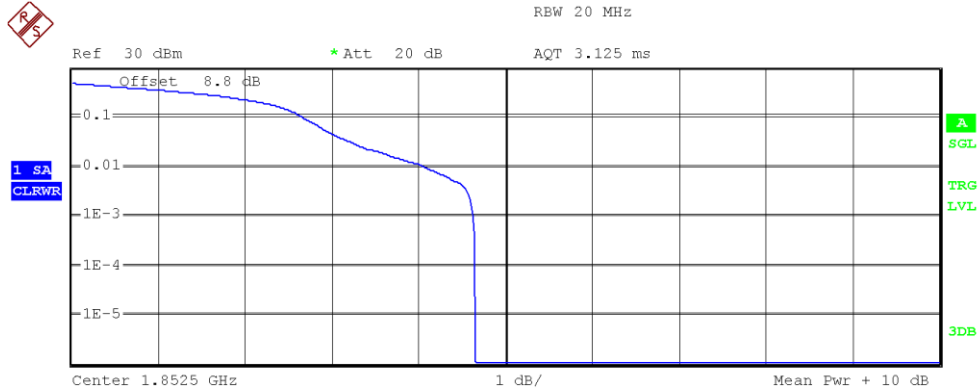
High Channel:



Trace 1	
Mean	18.58 dBm
Peak	23.57 dBm
Crest	4.99 dB
10 %	3.03 dB
1 %	4.13 dB
.1 %	4.90 dB
.01 %	4.94 dB

LTE Band 25. Bandwidth = 5 MHz. Modulation 16 QAM. RB Size: 1. RB Offset: 0.

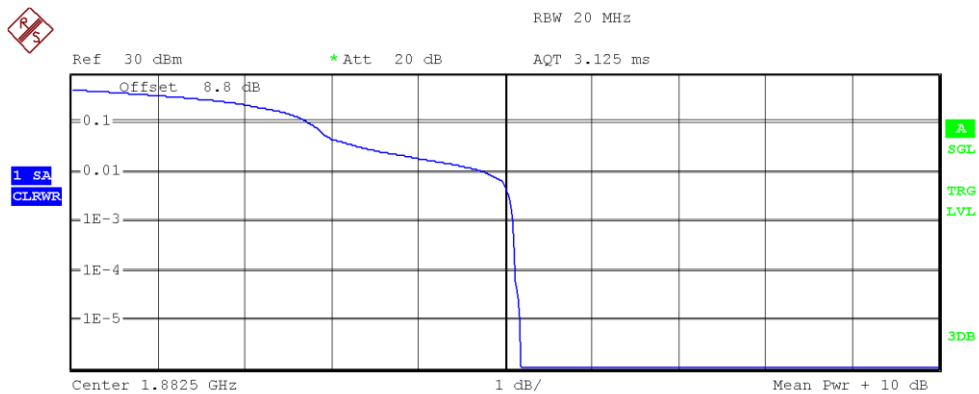
Low Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	19.23 dBm
Peak	23.89 dBm
Crest	4.65 dB
10 %	2.66 dB
1 %	4.07 dB
.1 %	4.63 dB
.01 %	4.66 dB

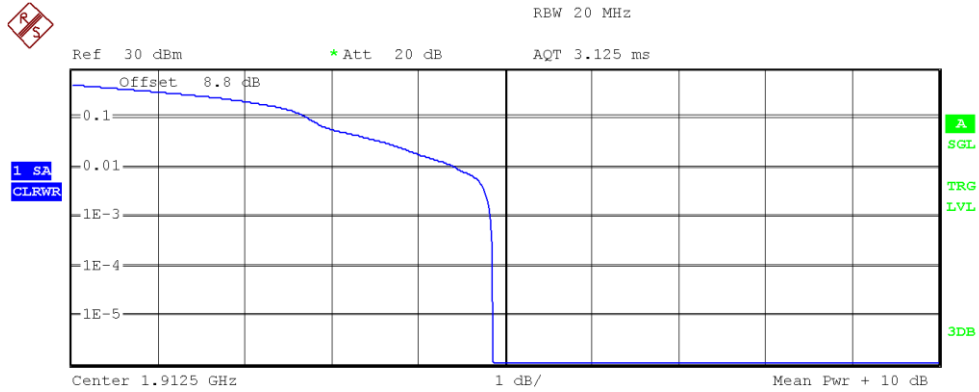
Middle Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	19.12 dBm
Peak	24.30 dBm
Crest	5.18 dB
10 %	2.74 dB
1 %	4.76 dB
.1 %	5.10 dB
.01 %	5.13 dB

High Channel:

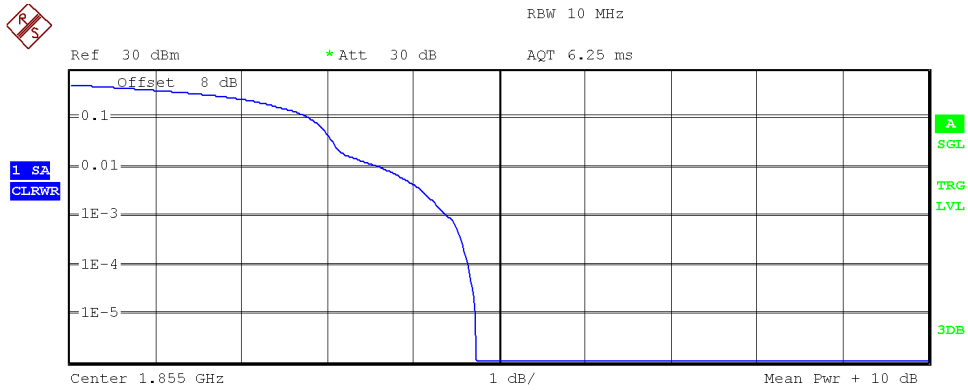


Center 1.9125 GHz 1 dB/ Mean Pwr + 10 dB
 Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	19.34 dBm
Peak	24.20 dBm
Crest	4.86 dB
10 %	2.72 dB
1 %	4.42 dB
.1 %	4.84 dB
.01 %	4.87 dB

LTE Band 25. Bandwidth = 10 MHz. Modulation 16 QAM. RB Size: 1. RB Offset: 0.

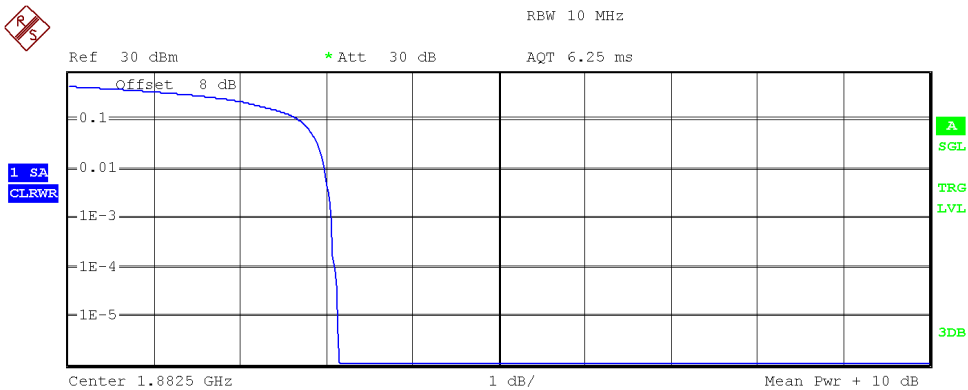
Low Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 11.2MHz

Trace 1	
Mean	18.87 dBm
Peak	22.90 dBm
Crest	4.02 dB
10 %	2.79 dB
1 %	3.21 dB
.1 %	3.93 dB
.01 %	4.01 dB

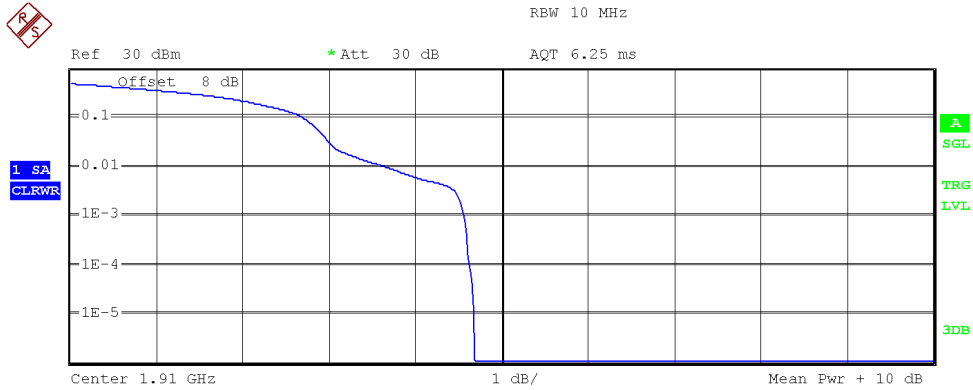
Middle Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 11.2MHz

Trace 1	
Mean	19.05 dBm
Peak	22.19 dBm
Crest	3.14 dB
10 %	2.69 dB
1 %	2.98 dB
.1 %	3.11 dB
.01 %	3.18 dB

High Channel:

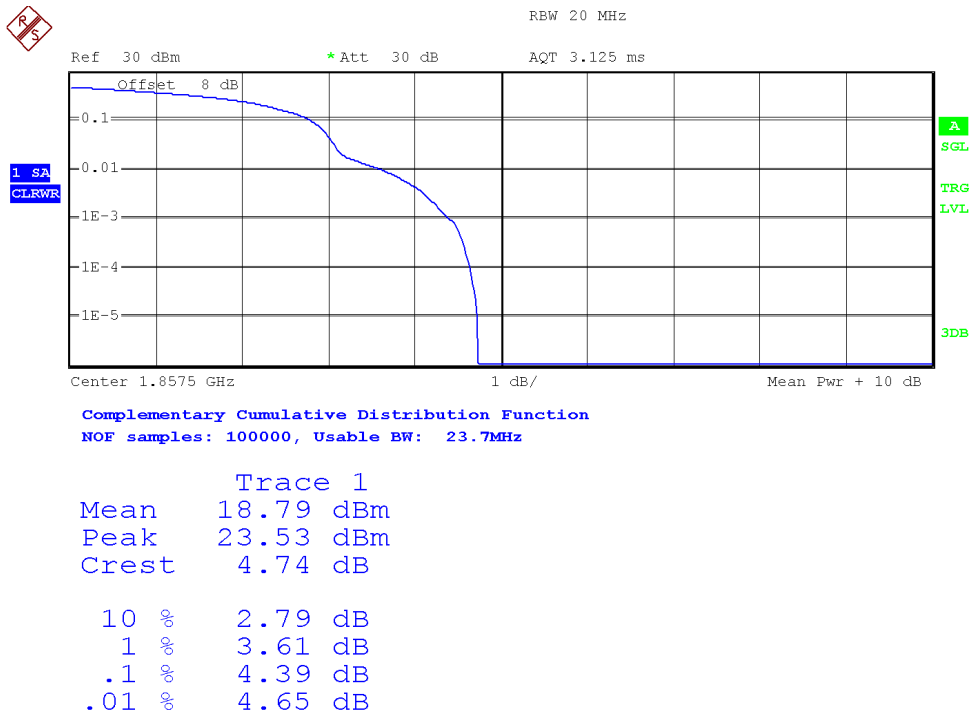


Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 11.2MHz

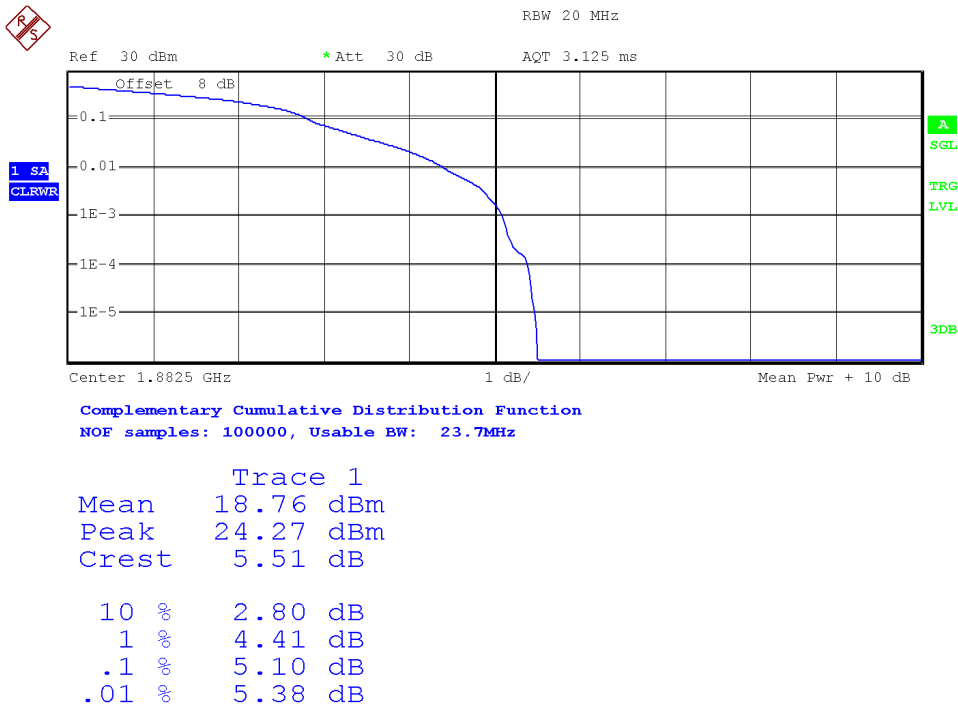
Trace 1	
Mean	18.42 dBm
Peak	23.10 dBm
Crest	4.68 dB
10 %	2.69 dB
1 %	3.64 dB
.1 %	4.57 dB
.01 %	4.63 dB

LTE Band 25. Bandwidth = 15 MHz. Modulation 16 QAM. RB Size: 5. RB Offset: 0.

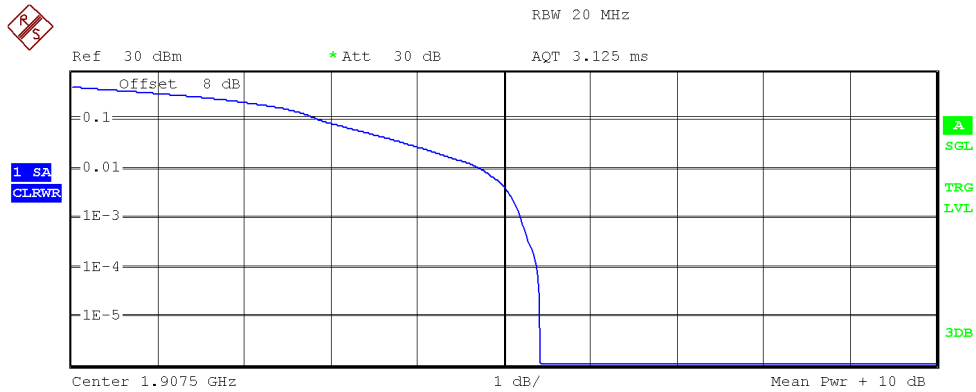
Low Channel:



Middle Channel:



High Channel:

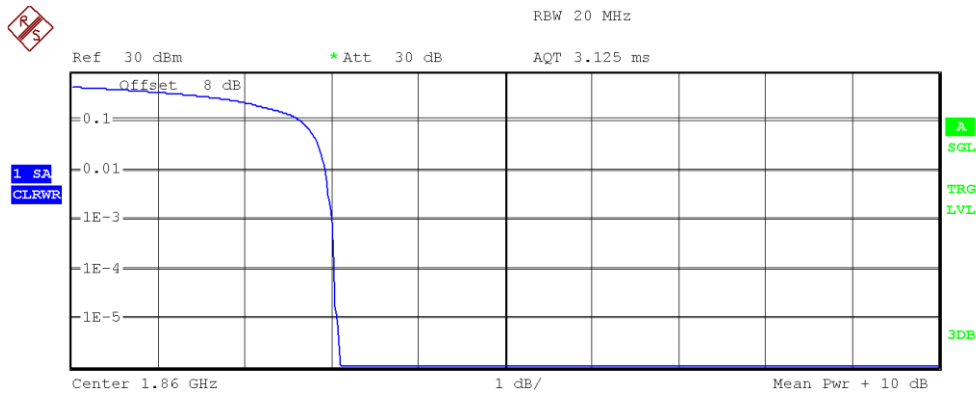


Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	18.62 dBm
Peak	24.04 dBm
Crest	5.42 dB
10 %	2.87 dB
1 %	4.74 dB
.1 %	5.21 dB
.01 %	5.38 dB

LTE Band 25. Bandwidth = 20 MHz. Modulation 16 QAM. RB Size: 5. RB Offset: 0.

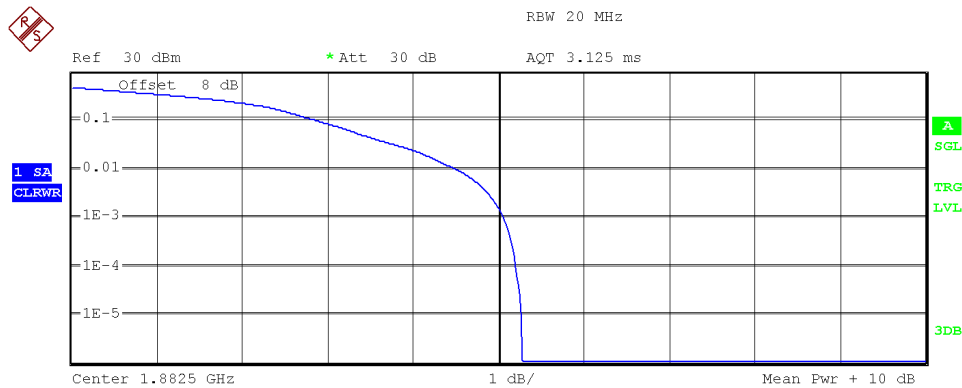
Low Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	18.96 dBm
Peak	22.06 dBm
Crest	3.10 dB
10 %	2.64 dB
1 %	2.93 dB
.1 %	3.01 dB
.01 %	3.03 dB

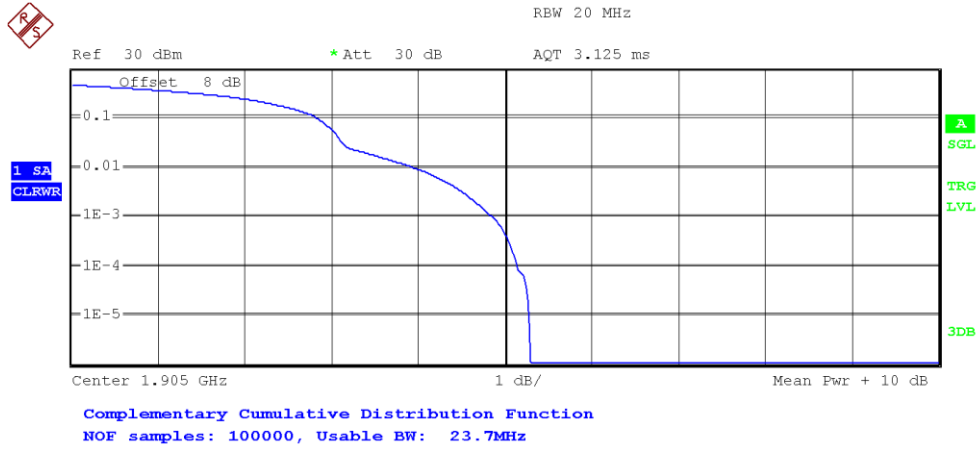
Middle Channel:



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 23.7MHz

Trace 1	
Mean	18.78 dBm
Peak	24.06 dBm
Crest	5.27 dB
10 %	2.87 dB
1 %	4.50 dB
.1 %	5.08 dB
.01 %	5.21 dB

High Channel:



Trace 1
 Mean 18.45 dBm
 Peak 23.74 dBm
 Crest 5.29 dB

10 % 2.84 dB
 1 % 3.94 dB
 .1 % 4.86 dB
 .01 % 5.14 dB

Channel	Measured maximum average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum equivalent isotropically radiated power E.I.R.P (dBm)	Maximum effective radiated power E.R.P (dBm)	PAPR (dB)
Low	19.42	2.50	21.92	19.77	5.77
Middle	19.33		21.83	19.68	6.03
High	19.33		21.83	19.68	5.99
Measurement uncertainty (dB)	<±0.94				

Radiated Emissions

Limits

FCC §24.238. RSS-133 Clause 6.5.

The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.

Method

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the High frequency generated within the equipment.

The EUT was placed on a non-conductive stand at 3-meter distance from the measuring antenna for measurements up to 18 GHz. Measurements above 18 GHz require the distance to be reduced to 1.5 meters.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the height and polarization of the measuring antenna. The maximum meter reading was recorded.

Measurement Limit:

At P_o transmitting power. the specified minimum attenuation becomes $43+10\log (P_o)$ and the level in dBm relative P_o becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

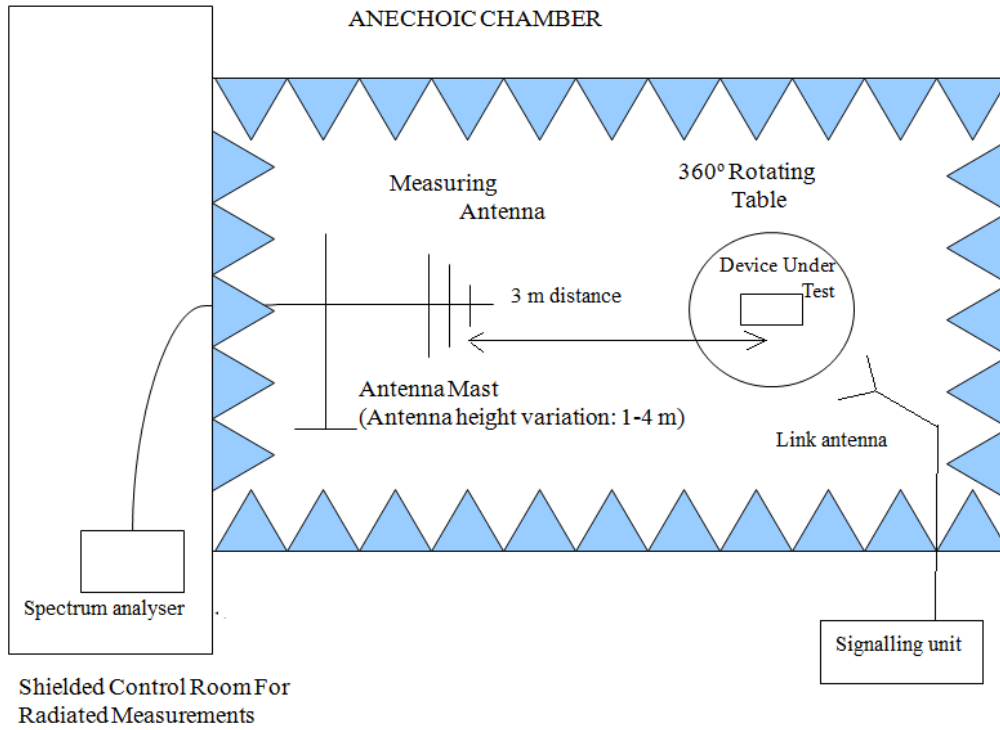
The maximum field strength (dB μ V/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log(D) - 104.8;$$

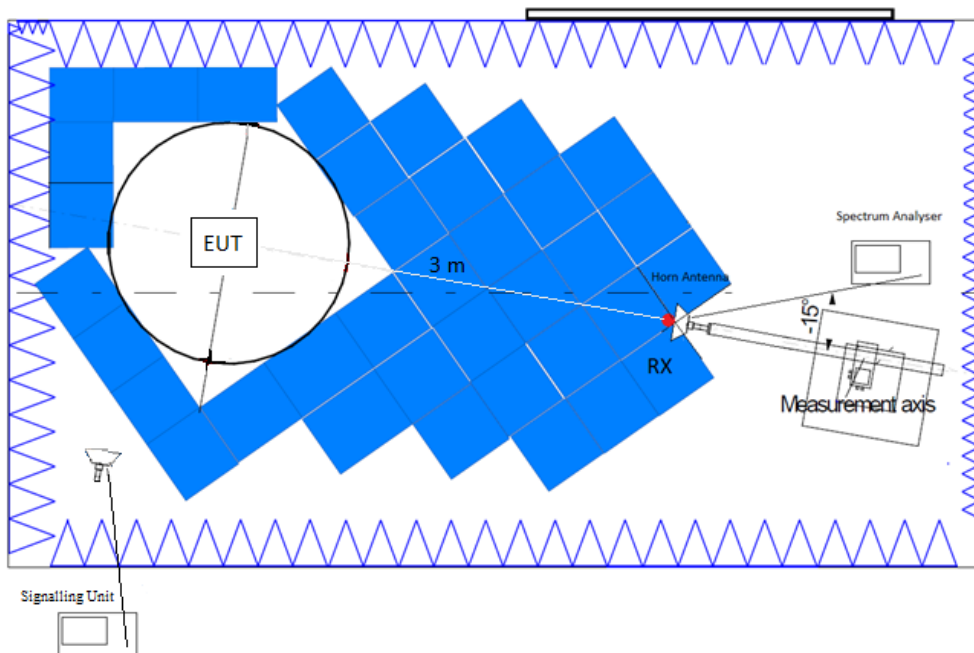
where D is the measurement distance (in the far field region) in m.

Test setup

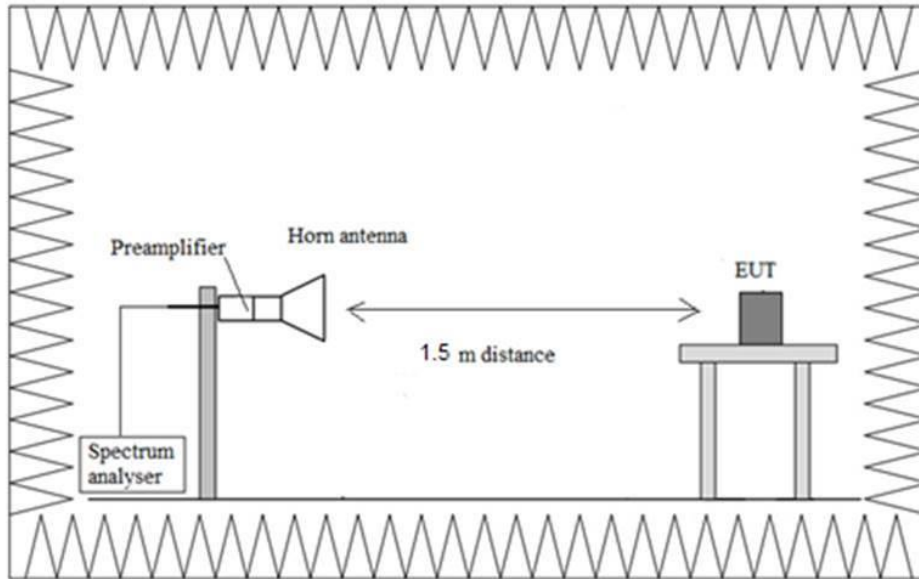
Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz up to 18 GHz:



Radiated measurements above 18 GHz:



Results

LTE Band 25:

A preliminary scan determined the QPSK modulation, BW=1.4 MHz, RB Size=1, RB Offset=0, Narrow Band=0 as the worst case. The next results are for this worst-case configuration.

- Low Channel:

Frequency range 30 MHz - 1 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz:

No spurious signals were found at less than 20 dB below the limit.

- Middle Channel:

Frequency range 30 MHz - 1 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz:

No spurious signals were found at less than 20 dB below the limit.

- High Channel:

Frequency range 30 MHz - 1 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz:

No spurious signals were found at less than 20 dB below the limit.

Measurement uncertainty (dB) $<\pm 5.35$ for $f < 1\text{GHz}$
 $<\pm 4.32$ for $f \geq 1\text{GHz}$ up to 18 GHz
 $<\pm 5.51$ for $f \geq 18\text{GHz}$ up to 20 GHz

Verdict

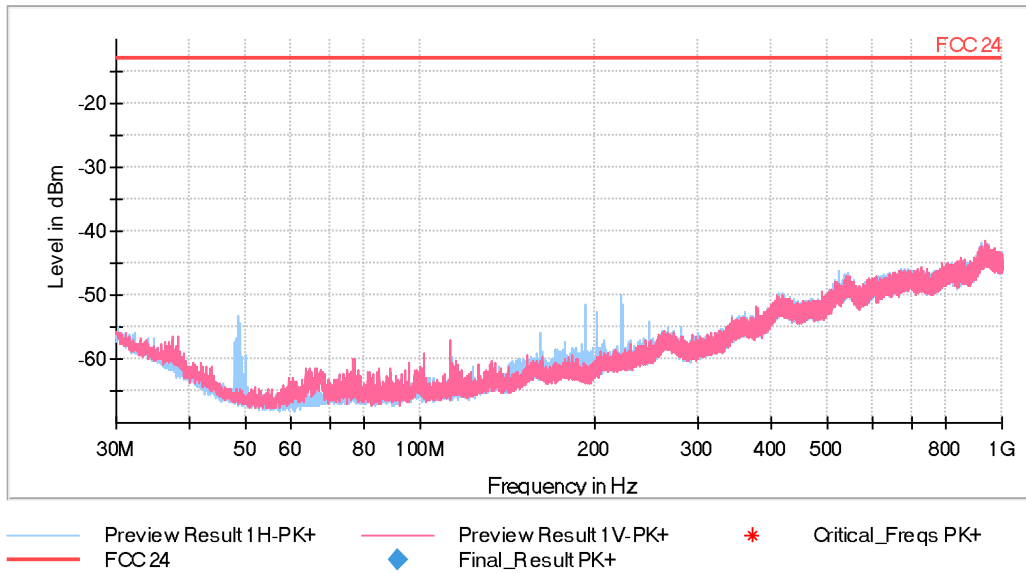
Pass

Attachments

Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
Receiver: [ESW 44] 30 MHz - 1 GHz	30,312 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [ESW 44] 1 GHz - 3 GHz	62,5 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [ESW 44] 3 GHz - 18 GHz	468,75 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [ESW 44] 18 GHz - 20 GHz	62,5 kHz	PK+	1 MHz	1 s	0 dB

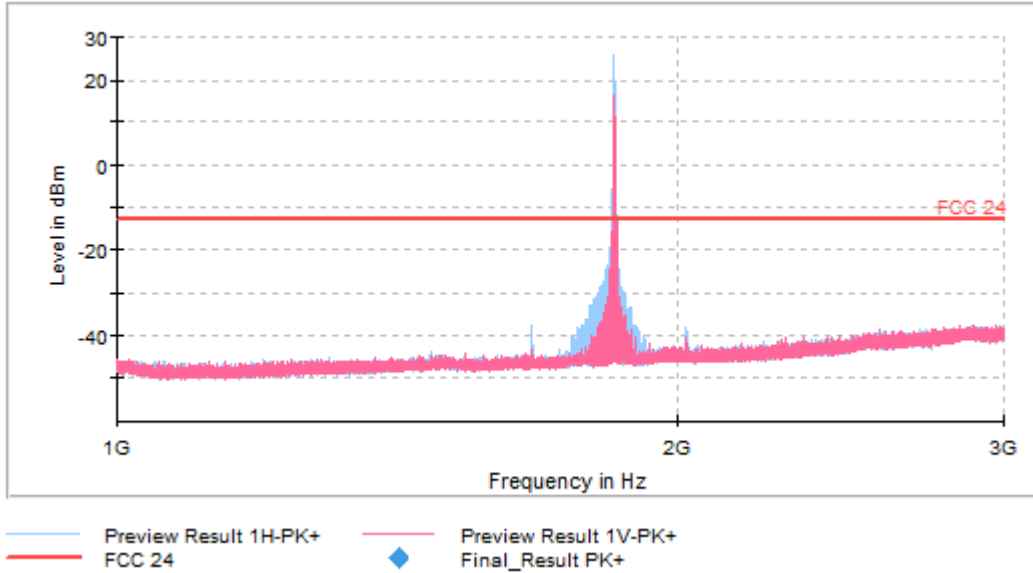
FREQUENCY RANGE 30 MHz - 1 GHz



This plot is valid for Low, Middle and High Channels

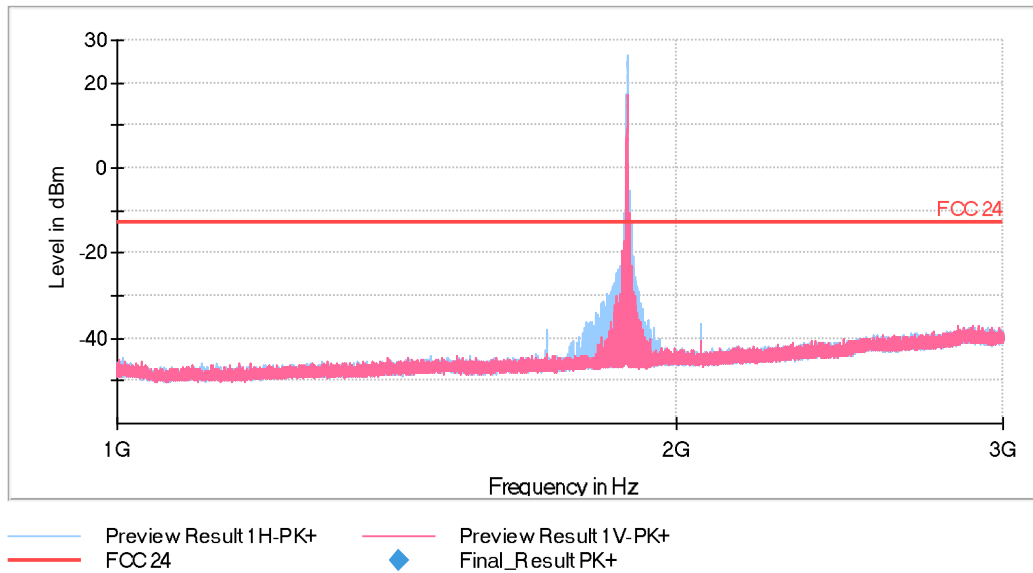
FREQUENCY RANGE 1 - 3 GHz

- Low Channel:



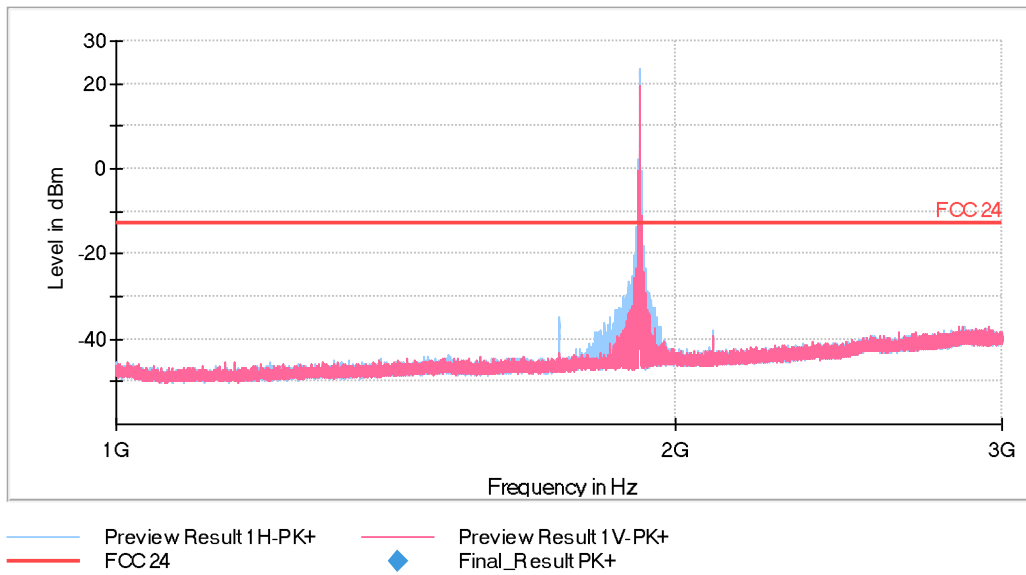
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

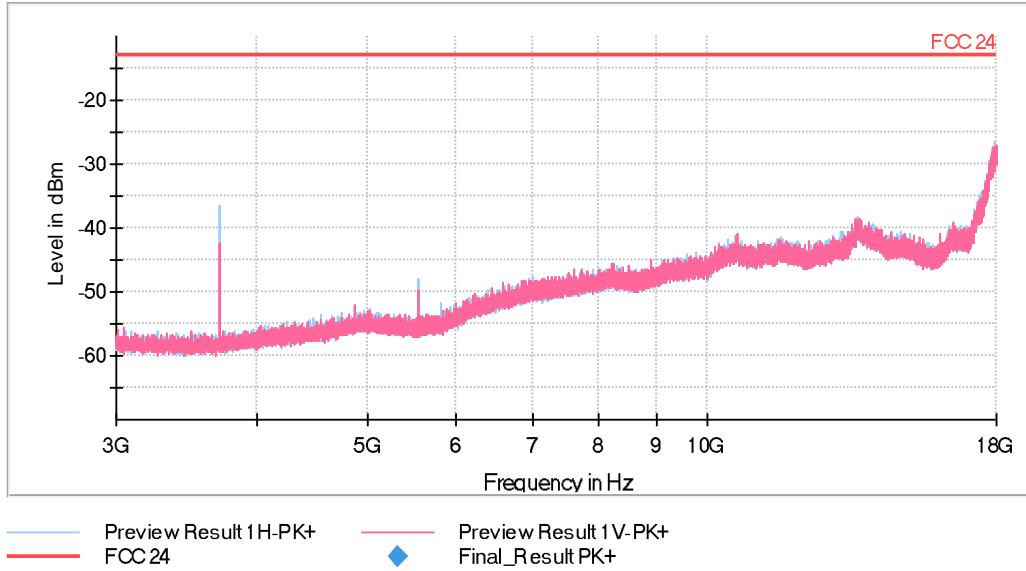
- High Channel:



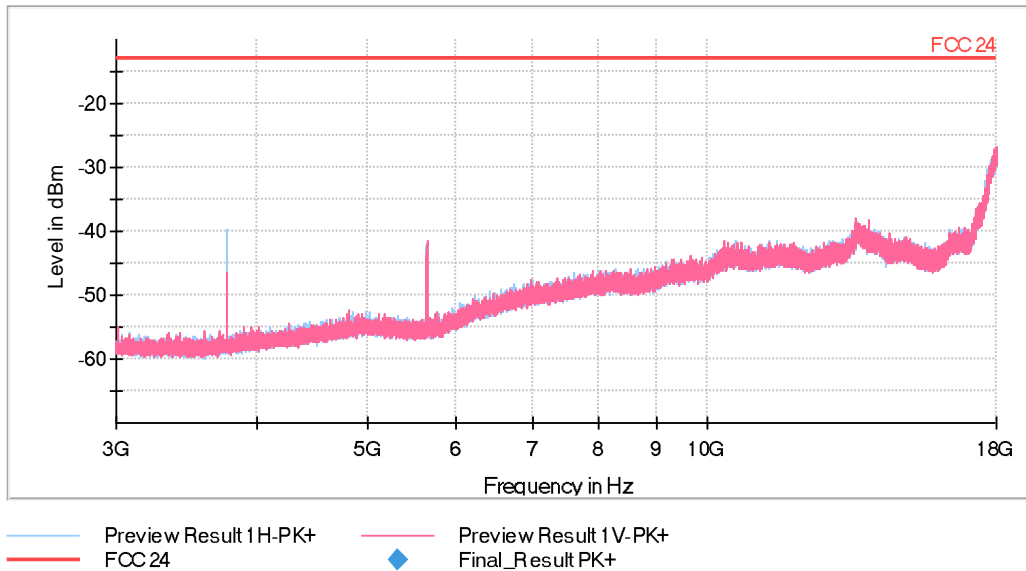
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 - 18 GHz

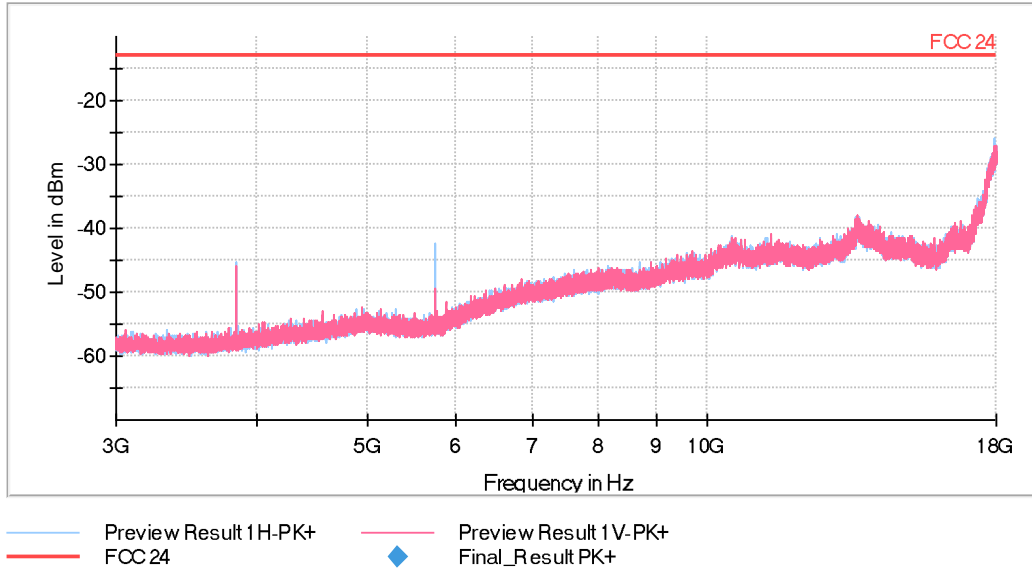
- Low Channel:



- Middle Channel:

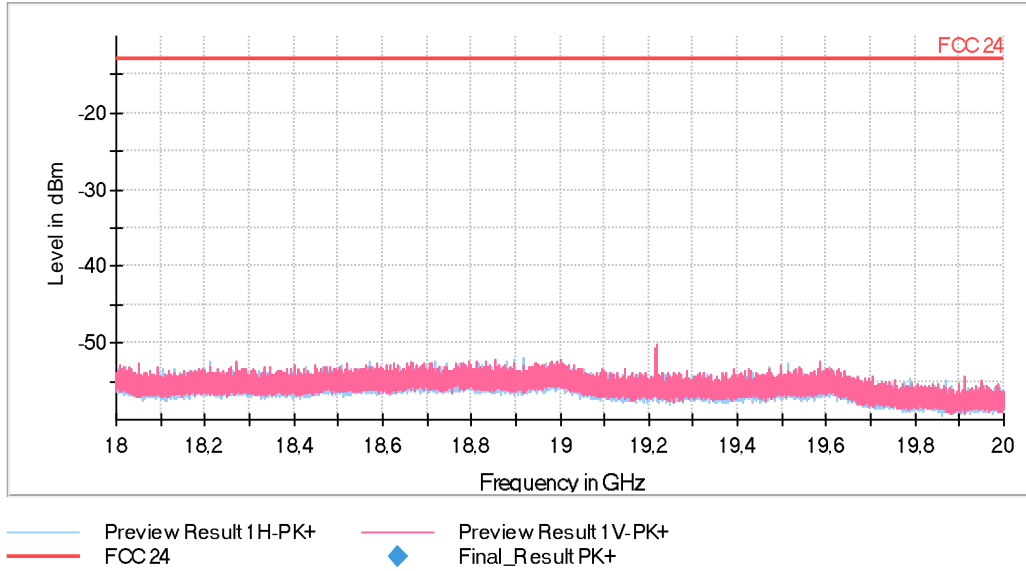


- High Channel:

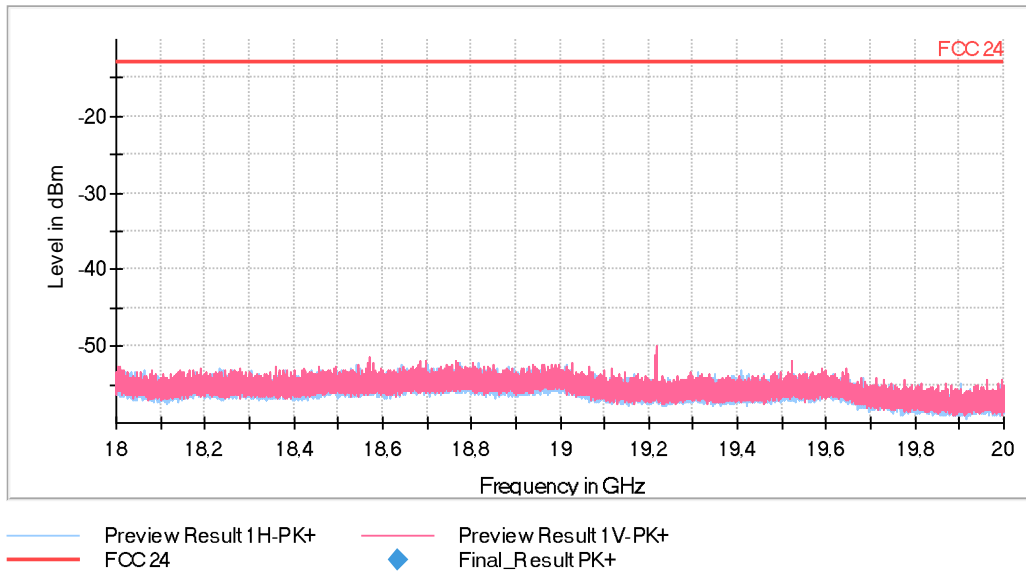


FREQUENCY RANGE 18 - 20 GHz

- Low Channel:



- Middle Channel:



- High Channel:

