

ISED CABid: ES1909
 Lab. Company Number: 4621A

Test Report No:
 72676RRF.003A2

Test Report

USA FCC Part 27

CANADA RSS-130, RSS-139

(*) Identification of item tested	Continuous Positive Airway Pressure (CPAP) Device
(*) Trademark	ResMed
(*) Model and /or type reference	39485
(*) Derived model not tested	39523,39524,39525,39526,39527,39528
Other identification of the product	FCC ID: 2ACHL-AIR11M1U IC: 9103A-AIR11M1U
(*) Features	LTE Cat-M1, BLE HW version: R390-7667 SW version: SW04600
Applicant	ResMed Pty Ltd 1 Elizabeth Macarthur Drive, Bella Vista, NSW, 2153, Australia
Test method requested, standard	USA FCC Part 27 (10-1-21 Edition). CANADA RSS-130 Issue 2, Feb. 2019. CANADA RSS-139 Issue 4 September 2022, Amendment October 2022. ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2023-03-27
Report template No.	FDT08_24 (* "Data provided by the client")

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Competences and guarantees

DEKRA Testing and Certification S.A.U. 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 include testing performed in this test 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.

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DEKRA Testing and Certification S.A.U. 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 S.A.U. at the time of performance of the test.

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General conditions

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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: 30-Nov-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
39523	AirSense 11 AutoSet USA
39524	AirSense 11 CPAP USA
39525	AirSense 11 Elite USA
39526	AirSense 11 AutoSet CAN
39527	AirSense 11 CPAP CAN
39528	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
72676/003	Continuous Positive Airway Pressure (CPAP) Device	39485	22222172432	2022/10/03
72676/007	AC/DC Adapter	390000	02GNXL04	2022/10/03
72676/009	Power Cord	-	-	2022/10/03
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
72676/001	Continuous Positive Airway Pressure (CPAP) Device	39485	22222172433	2022/10/03
72676/003	Continuous Positive Airway Pressure (CPAP) Device	39485	22222172432	2022/10/03
72676/007	AC/DC Adapter	390000	02GNXL04	2022/10/03

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

- Sample S/03 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
72676/002	Continuous Positive Airway Pressure (CPAP) Device	39485	22222172424	2022/10/03
72676/008	AC/DC Adapter	390000	02GNXH04	2022/10/03
72676/010	Power Cord	-	-	2022/10/03

Sample S/03 has undergone the following test(s): The Modulation Characteristics, Frequency Stability, Occupied Bandwidth, Spurious Emissions at Antenna Terminals, Spurious Emissions at Antenna Terminals at Block Edges 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"/>		
Supplementary information to the ports.....:	-						
Rated power supply	Voltage and Frequency		Reference poles				
	<input checked="" type="checkbox"/>	AC: 100-240V~50-60 Hz 2.0A	L1	L2	L3	N	PE
			<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 checked="" type="checkbox"/>	DC: 12V (DC-DC for Vehicle Use)					
	<input checked="" 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..... :	R390-7667						
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		SARA-R5	U-blox			
	Bluetooth LE		EFR32BG22	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)	2022-10-13
Date (finish)	2023-03-09

Document history

Report number	Date	Description
72676RRF.003	2023-12-29	First release.
72676RRF.003A1	2023-01-31	Second release. The following tests are included: - FCC 27.50 / RSS-130 4.6, RSS-139 5.5: RF Output Power for all LTE Cat M1 bands. - FCC 27.53 / RSS-130 4.7, RSS-139 5.6: Radiated Emissions for the LTE Cat M1 Band 12.
72676RRF.003A2	2023-03-27	Third release. The following tests are included: - FCC 2.1047 / RSS-132 5.2: Modulation Characteristics. - FCC 22.355 / RSS-132 5.3: Frequency Stability. - FCC 2.1049: Occupied Bandwidth. - FCC 22.917 / RSS-132 5.5: Spurious Emissions at Antenna Terminals. - FCC 24.238 / RSS-133 6.5: Spurious Emissions at Antenna Terminals at Block Edges.

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: Rafael Fernández, Valentín Andarias, Francisco López, Sergio Carrasco, Fernando Chito, Alberto Agüera, Miguel Manuel López, Miriam Godoy.

Used instrumentation:

Conducted Measurements

	Last Calibration	Due Calibration
1. Shielded Room ETS LINDGREN S101	N/A	N/A
2. Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	2022-03	2023-03
3. Attenuator DC, 26.5 GHz, 10 dB, 2W TECHNIWAVE TWSMAG2	2022-05	2023-05
4. Attenuator DC, 26.5 GHz, 6 dB, 2W TECHNIWAVE TWSMAG2	2023-03	2024-03
5. Power Divider, DC-25 GHz TEKTRONIX 5333	2022-02	2023-02
6. Climatic Chamber BINDER MK 56	2022-03	2023-03
7. Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40	2022-05	2024-05
8. Attenuator 5 dB 2W DC-26.5GHz	2022-07	2023-07

Radiated Measurements

	Last Calibration	Due Calibration
1. Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N/A	N/A
2. Shielded Room ETS LINDGREN S101	N/A	N/A
3. Biconical/Log Antenna 30 MHz - 6 GHz ETS LINDGREN 3142E	2020/10	2023/10
4. Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2020/08	2023/08
5. RF Preamplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-3A	2021/12	2022/12
6. EMI Test Receiver 2Hz-44GHz, ROHDE AND SCHWARZ ESW44	2021/12	2023/12
7. Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	N/A	N/A
8. AC Power Supply CHROMA 6490	2020/12	2022/12
9. EMC/RF Testing SW ROHDE AND SCHWARZ EMC32	N/A	N/A

Testing verdicts

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

Summary

FCC PART 27 / RSS-130, RSS-139		
Requirement – Test case	Verdict	Remark
FCC 27.50 / RSS-130 4.6, RSS-139 6.5: RF Output Power	P	
FCC 2.1047 / RSS-130 4.2, RSS-139 5.3: Modulation Characteristics	P	
FCC 27.54 / RSS-130 4.5, RSS-139 5.4: Frequency Stability	P	
FCC 2.1049 / RSS-130 4.5, RSS-139 6.4: Occupied Bandwidth	P	
FCC 27.53 / RSS-130 4.7, RSS-139 5.6: Spurious Emissions at Antenna Terminals	P	
FCC 27.53 / RSS-130 4.7, RSS-139 5.6: Spurious Emissions at Antenna Terminals at Block Edges	P	
FCC 27.53 / RSS-130 4.7, RSS-139 5.6: Radiated Emissions	P	
<u>Supplementary information and remarks:</u>		
None.		

Appendix A: Test results for FCC 27 / RSS-130, RSS-139

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Radiated Emissions	120

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 (*):

Low Bands	Gain (dBi)	Type
LTE 12	+2	Ceramic
LTE 13	+2	Ceramic
LTE 71	+2	Ceramic

High Bands	Gain (dBi)	Type
LTE 66	+4.5	Ceramic
LTE 4	+4.5	Ceramic

TEST FREQUENCIES:

LTE Band 4. 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	19957 (1710.7)	19965 (1711.5)	19975 (1712.5)	20000 (1715.0)	20025 (1717.5)	20050 (1720.0)
Middle	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)
High	20393 (1754.3)	20385 (1753.5)	20375 (1752.5)	20350 (1750.0)	20325 (1747.5)	20300 (1745.0)

NOTE: Band 4 is completely included in band 66, so the channels of band 66 were tested to give conformity to the assigned block.

LTE Band 12. QPSK and 16QAM modulations:

	Channel (Frequency, MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Low	23017 (699.7)	23025 (700.5)	23035 (701.5)	23060 (704.0)
Middle	23095 (707.5)	23095 (707.5)	23095 (707.5)	23095 (707.5)
High	23173 (715.3)	23165 (714.5)	23155 (713.5)	23130 (711.0)

LTE Band 13. QPSK and 16QAM modulations:

	Channel (Frequency, MHz)	
	BW = 5 MHz	BW = 10 MHz
Low	23205 (779.5)	N/A
Middle	23230 (782.0)	23230 (782.0)
High	23255 (784.5)	N/A

LTE Band 66. 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	131979 (1710.7)	131987 (1711.5)	131997 (1712.5)	132022 (1715.0)	132047 (1717.5)	132072 (1720.0)
Middle	132322 (1745)	132322 (1745)	132322 (1745)	132322 (1745)	132322 (1745)	132322 (1745)
High	132665 (1779.3)	132657 (1778.5)	132647 (1777.5)	132622 (1775)	132597 (1772.5)	132572 (1770)

LTE Band 71. QPSK and 16QAM modulations:

	Channel (Frequency)			
	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Low	133147 (665.50 MHz)	133172 (668.00 MHz)	133197 (670.50 MHz)	133222 (673.00 MHz)
Middle	133297 (680.50 MHz)	133297 (680.50 MHz)	133297 (680.50 MHz)	133297 (680.50 MHz)
High	133447 (695.50 MHz)	133422 (693.00 MHz)	133397 (690.50 MHz)	133372 (688.00 MHz)

RF Output Power

Limits:

FCC §27.50 (b) (10):

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

FCC §27.50 (c) (10):

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

FCC §27.50 (d):

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

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

RSS-130 Clause 4.6:

4.6.1 General

The transmitter output power shall be measured in terms of average power. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the High PAPR during periods of continuous transmission.

4.6.3 Frequency bands 698-756 MHz and 777-787 MHz

The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

RSS-139 Clause 6.5:

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1710-1780 MHz shall not exceed one watt.

In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds 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:

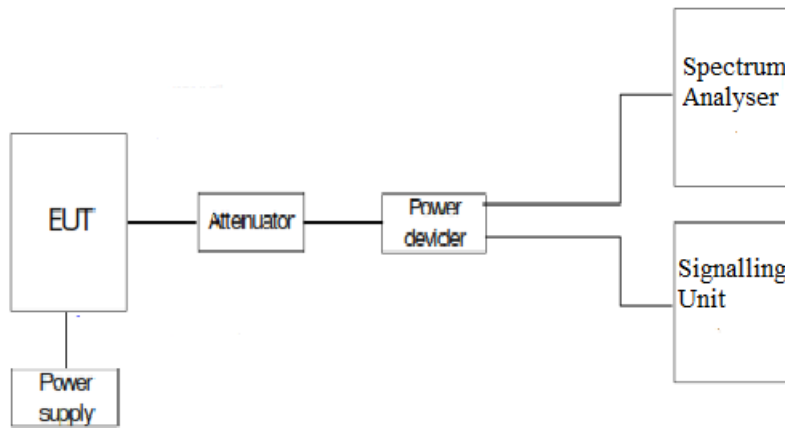
$$\text{E.R.P.} = \text{E.I.R.P.} - 2.15 \text{ dB}$$

Test setup

1. CONDUCTED AVERAGE POWER:



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



Results:

1. CONDUCTED AVERAGE POWER:

LTE Band 12:

LTE Band 12. QPSK modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.33	22.22	22.18
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.33	24.22	24.18
Maximum effective radiated power E.R.P. (dBm)	22.18	22.07	22.03
PAPR (dB)	(*)	6.41	(*)
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 12. 16QAM modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.48	22.42	22.38
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.48	24.42	24.38
Maximum effective radiated power E.R.P. (dBm)	22.33	22.27	22.23
PAPR (dB)	6.75	7.42	6.65
Measurement uncertainty (dB)	<±0.94		

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

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

LTE Band 12. QPSK modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.33	22.20	22.20
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.33	24.20	24.20
Maximum effective radiated power E.R.P. (dBm)	22.18	22.05	22.05
PAPR (dB)	(*)	6.28	(*)
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 12. 16QAM modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.54	22.41	22.34
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.54	24.41	24.34
Maximum effective radiated power E.R.P. (dBm)	22.39	22.26	22.19
PAPR (dB)	6.76	6.79	6.63
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 12. QPSK modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.40	22.17	22.31
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.40	24.17	24.31
Maximum effective radiated power E.R.P. (dBm)	22.25	22.02	22.16
PAPR (dB)	(*)	6.36	(*)
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 12. 16QAM modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.64	22.39	22.51
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.64	24.39	24.51
Maximum effective radiated power E.R.P. (dBm)	22.49	22.24	22.36
PAPR (dB)	6.49	6.97	6.39
Measurement uncertainty (dB)	<±0.94		

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

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

LTE Band 12. QPSK modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.37	22.17	22.22
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.37	24.17	24.22
Maximum effective radiated power E.R.P. (dBm)	22.22	22.02	22.07
PAPR (dB)	(*)	6.46	(*)
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 12. 16QAM modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.48	22.39	22.45
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.48	24.39	24.45
Maximum effective radiated power E.R.P. (dBm)	22.33	22.24	22.30
PAPR (dB)	6.59	6.99	6.67
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 13:

LTE Band 13. QPSK modulation. BW=5 MHz.

Measurements required on one frequency near top channel and one frequency near bottom channel, according to FCC § 15.31 (m).

Channel	Low	High
Maximum declared antenna gain (dBi)	2	
Measured maximum average power (dBm) at antenna port	22.07	22.19
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.07	24.19
Maximum effective radiated power E.R.P. (dBm)	21.92	22.04
PAPR (dB)	6.27	(*)
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 Low Channel as the worst case.

LTE Band 13. 16QAM modulation. BW=5 MHz.

Measurements required on one frequency near top channel and one frequency near bottom channel. according to FCC § 15.31 (m).

Channel	Low	High
Maximum declared antenna gain (dBi)	2	
Measured maximum average power (dBm) at antenna port	22.20	22.32
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.20	24.32
Maximum effective radiated power E.R.P. (dBm)	22.05	22.17
PAPR (dB)	6.83	6.78
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 13. QPSK modulation. BW=10 MHz.

Only one channel available in the operating range.

Channel	Middle
Maximum declared antenna gain (dBi)	2
Measured maximum average power (dBm) at antenna port	22.06
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.06
Maximum effective radiated power E.R.P. (dBm)	21.91
PAPR (dB)	6.28
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.

LTE Band 13. 16QAM modulation. BW=10 MHz.

Only one channel available in the operating range.

Channel	Middle
Maximum declared antenna gain (dBi)	2
Measured maximum average power (dBm) at antenna port	22.22
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.22
Maximum effective radiated power E.R.P. (dBm)	22.07
PAPR (dB)	6.7
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 66:

LTE Band 66. QPSK modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.77	21.87	21.77
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.27	26.37	26.27
Maximum effective radiated power E.R.P. (dBm)	24.12	24.22	24.12
PAPR (dB)	(*)	6.55	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. 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 66. 16QAM modulation. BW=1.4 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.93	22.02	21.87
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.43	26.52	26.37
Maximum effective radiated power E.R.P. (dBm)	24.28	24.37	24.22
PAPR (dB)	6.94	6.75	6.76
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 66. QPSK modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.78	21.89	21.77
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.28	26.39	26.27
Maximum effective radiated power E.R.P. (dBm)	24.13	24.24	24.12
PAPR (dB)	(*)	6.31	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. 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 66. 16QAM modulation. BW=3 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.94	22.08	21.93
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.44	26.58	26.43
Maximum effective radiated power E.R.P. (dBm)	24.29	24.43	24.28
PAPR (dB)	7	6.92	6.49
Measurement uncertainty (dB)	<±0.94		

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

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

LTE Band 66. QPSK modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.82	21.88	21.71
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.32	26.38	26.21
Maximum effective radiated power E.R.P. (dBm)	24.17	24.23	24.06
PAPR (dB)	(*)	6.35	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. 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 66. 16QAM modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.96	22.04	21.92
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.46	26.54	26.42
Maximum effective radiated power E.R.P. (dBm)	24.31	24.39	24.27
PAPR (dB)	6.92	6.68	6.7
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 66. QPSK modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.88	21.89	21.78
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.38	26.39	26.28
Maximum effective radiated power E.R.P. (dBm)	24.23	24.24	24.13
PAPR (dB)	(*)	6.31	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.

PAPR Worst Case Modulation QPSK. RB Size: 1. RB Offset: 5.

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

LTE Band 66. 16QAM modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	22.07	22.01	21.98
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.57	26.51	26.48
Maximum effective radiated power E.R.P. (dBm)	24.42	24.36	24.33
PAPR (dB)	6.76	6.96	7.16
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 1.

PAPR Worst Case Modulation 16QAM. RB Size: 1. RB Offset: 5.

LTE Band 66. QPSK modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.78	21.88	21.78
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.28	26.38	26.28
Maximum effective radiated power E.R.P. (dBm)	24.13	24.23	24.13
PAPR (dB)	(*)	6.31	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. RB Offset: 0.

PAPR Worst Case Modulation QPSK. RB Size: 1. RB Offset: 5.

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

LTE Band 66. 16QAM modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	21.97	22.09	21.99
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.47	26.59	26.49
Maximum effective radiated power E.R.P. (dBm)	24.32	24.44	24.34
PAPR (dB)	6.6	6.71	6.65
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 1.

PAPR Worst Case Modulation 16QAM. RB Size: 1. RB Offset: 5.

LTE Band 66. QPSK modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	22.07	22.17	21.79
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.57	26.67	26.29
Maximum effective radiated power E.R.P. (dBm)	24.42	24.52	24.14
PAPR (dB)	(*)	6.2	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 5.

PAPR Worst Case Modulation QPSK. RB Size: 1. RB Offset: 5.

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

LTE Band 66. 16QAM modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	4.5		
Measured maximum average power (dBm) at antenna port	22.04	22.13	21.99
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	26.54	26.63	26.49
Maximum effective radiated power E.R.P. (dBm)	24.39	24.48	24.34
PAPR (dB)	6.71	6.62	6.62
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 1.

PAPR Worst Case Modulation 16QAM. RB Size: 5. RB Offset: 1.

LTE Band 71:

LTE Band 71. QPSK modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.24	22.19	22.26
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.24	24.19	24.26
Maximum effective radiated power E.R.P. (dBm)	22.09	22.04	22.11
PAPR (dB)	(*)	6.3	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. 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 71. 16QAM modulation. BW=5 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.46	22.96	22.49
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.46	24.96	24.49
Maximum effective radiated power E.R.P. (dBm)	22.31	22.81	22.34
PAPR (dB)	6.43	6.79	7.34
Measurement uncertainty (dB)	<±0.94		

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

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

LTE Band 71. QPSK modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.34	22.23	22.40
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.34	24.23	24.40
Maximum effective radiated power E.R.P. (dBm)	22.19	22.08	22.25
PAPR (dB)	(*)	6.38	(*)
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 71. 16QAM modulation. BW=10 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.54	22.49	22.54
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.54	24.49	24.54
Maximum effective radiated power E.R.P. (dBm)	22.39	22.34	22.39
PAPR (dB)	6.43	6.6	6.59
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 71. QPSK modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.47	22.41	22.55
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.47	24.41	24.55
Maximum effective radiated power E.R.P. (dBm)	22.32	22.26	22.40
PAPR (dB)	(*)	6.35	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 1. RB Offset: 5.

PAPR Worst Case Modulation QPSK. RB Size: 1. RB Offset: 5.

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

LTE Band 71. 16QAM modulation. BW=15 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.53	22.54	22.59
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.53	24.54	24.59
Maximum effective radiated power E.R.P. (dBm)	22.38	22.39	22.44
PAPR (dB)	6.59	6.76	6.7
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 1.

PAPR Worst Case Modulation 16QAM. RB Size: 5. RB Offset: 1.

LTE Band 71. QPSK modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.24	22.50	22.30
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.24	24.50	24.30
Maximum effective radiated power E.R.P. (dBm)	22.09	22.35	22.15
PAPR (dB)	(*)	6.25	(*)
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation QPSK. RB Size: 6. 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 71. 16QAM modulation. BW=20 MHz.

Channel	Low	Middle	High
Maximum declared antenna gain (dBi)	2		
Measured maximum average power (dBm) at antenna port	22.45	22.49	22.57
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	24.45	24.49	24.57
Maximum effective radiated power E.R.P. (dBm)	22.30	22.34	22.42
PAPR (dB)	6.46	6.89	6.86
Measurement uncertainty (dB)	<±0.94		

Average Power Worst Case: Modulation 16QAM. RB Size: 5. RB Offset: 1.

PAPR Worst Case Modulation 16QAM. RB Size: 5. RB Offset: 1.

Verdict

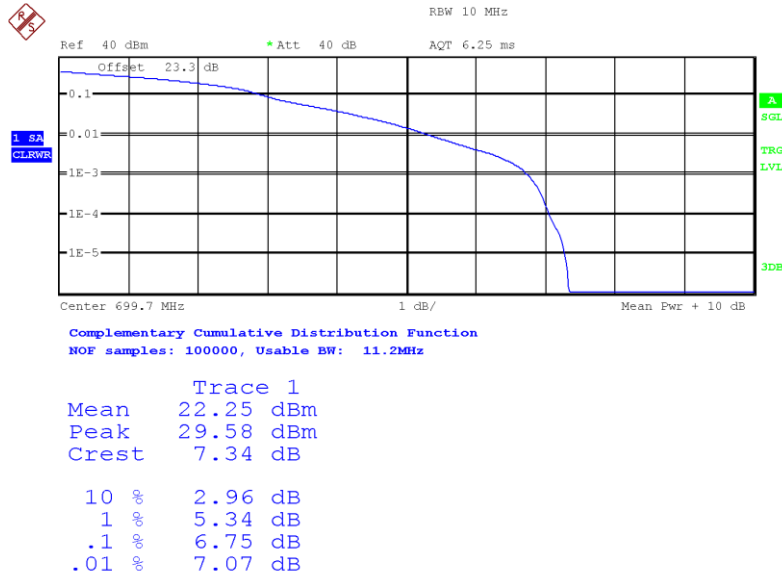
Pass

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

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

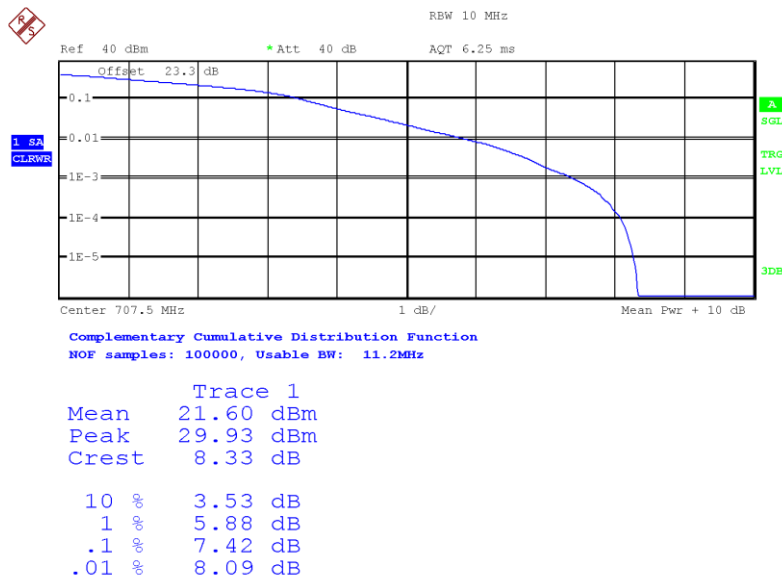
LTE Band 12. Bandwidth = 1.4 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.

Low Channel:



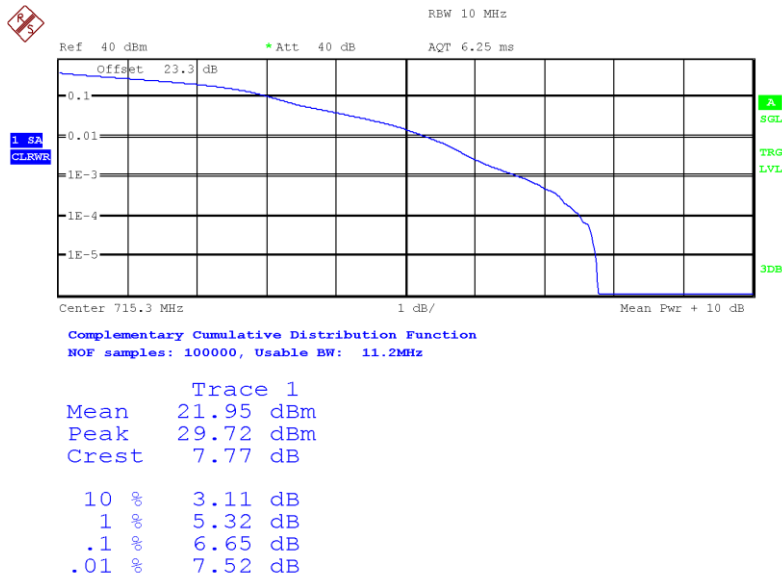
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Middle Channel:



Date: 13.JAN.2023 17:46:25

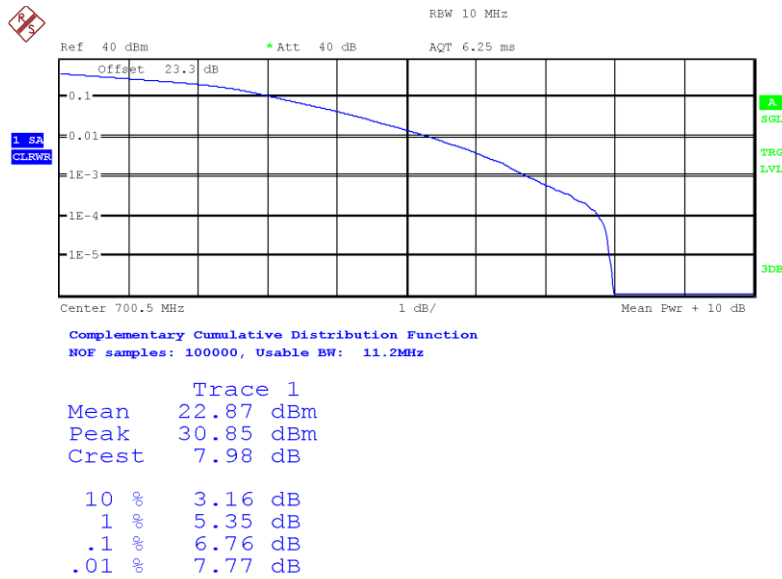
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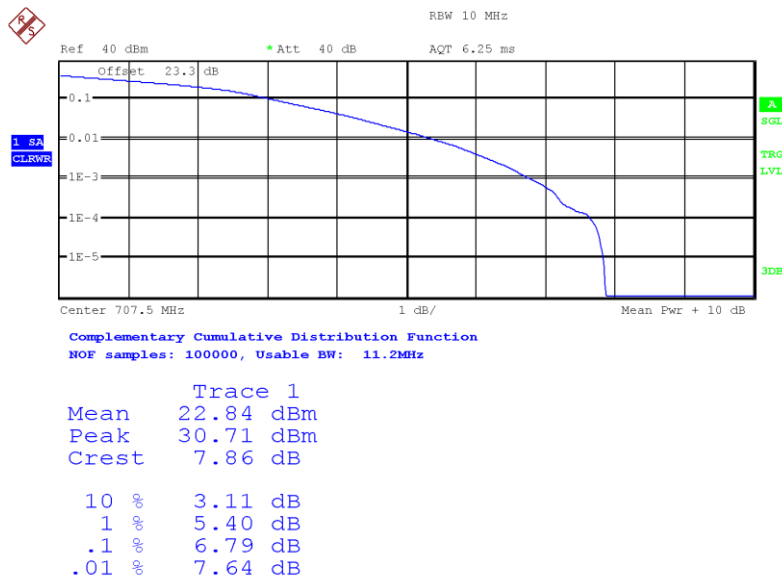
LTE Band 12. Bandwidth = 3 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

Low Channel:



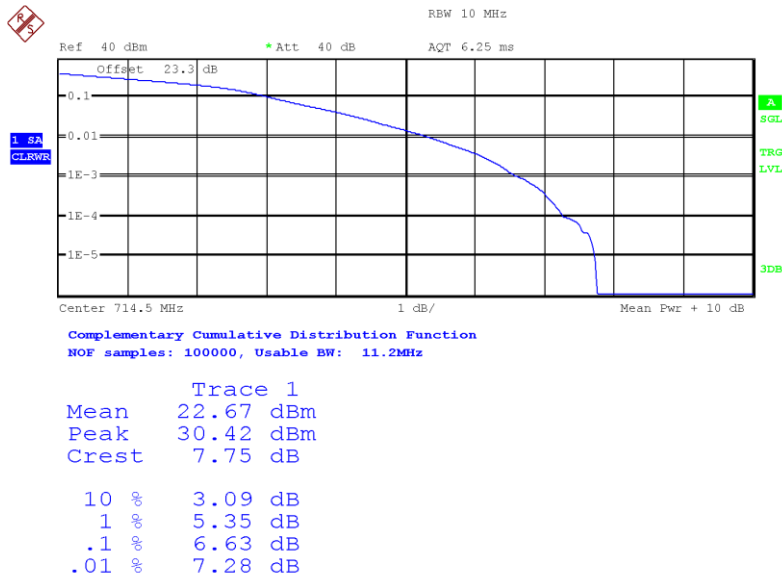
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Middle Channel:



Date: 13.JAN.2023 17:56:46

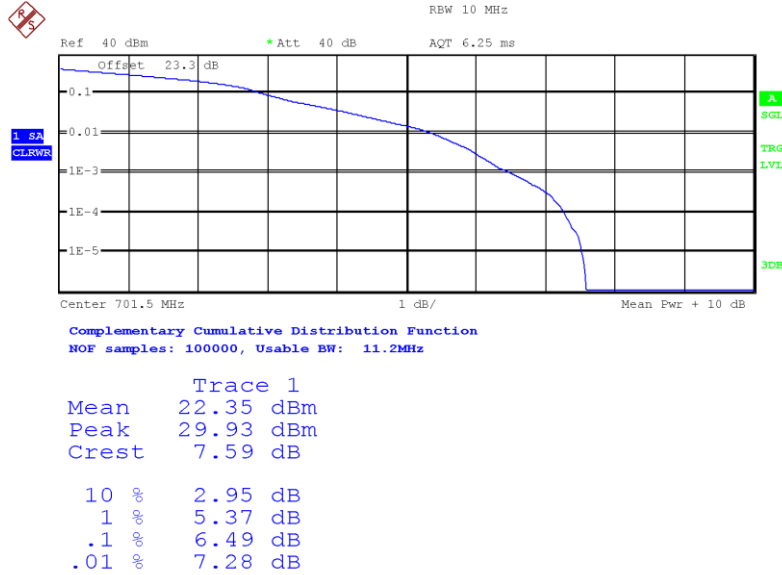
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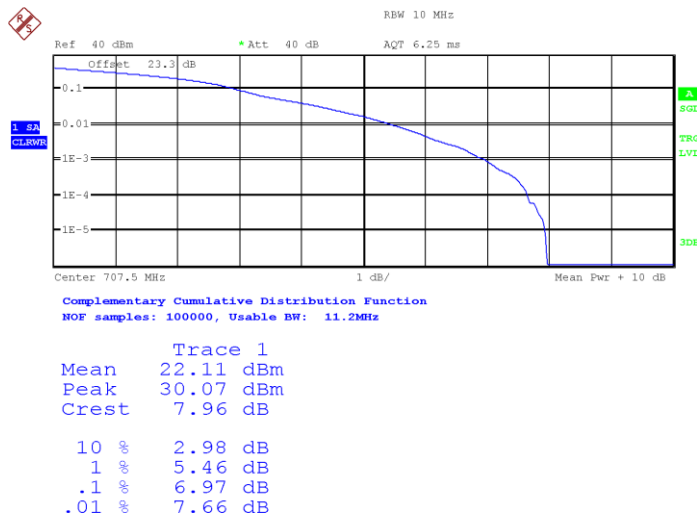
LTE Band 12. Bandwidth = 5 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.

Low Channel:



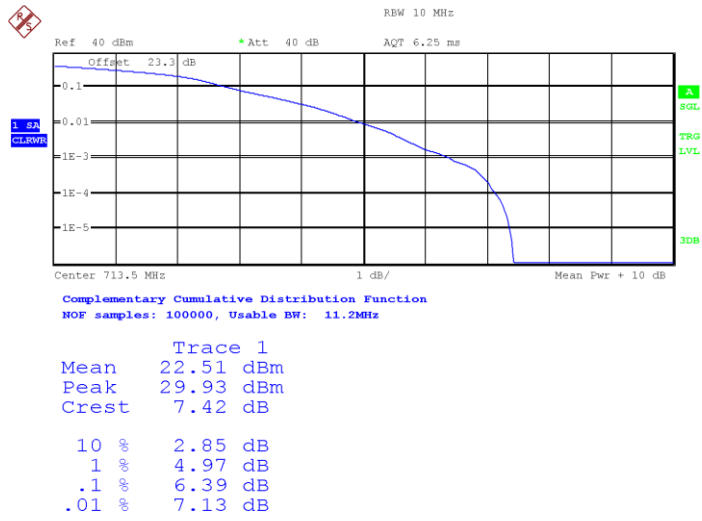
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Middle Channel:



Date: 13.JAN.2023 18:01:09

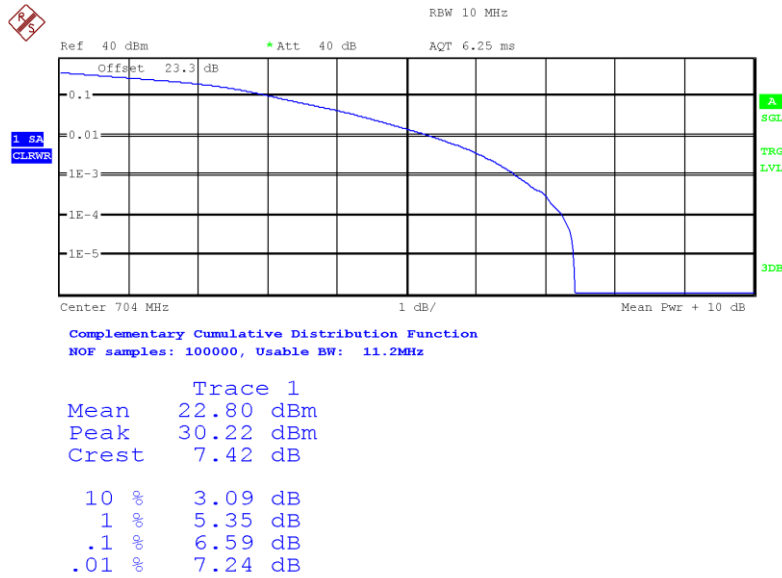
High Channel:



Date: 13.JAN.2023 18:36:10

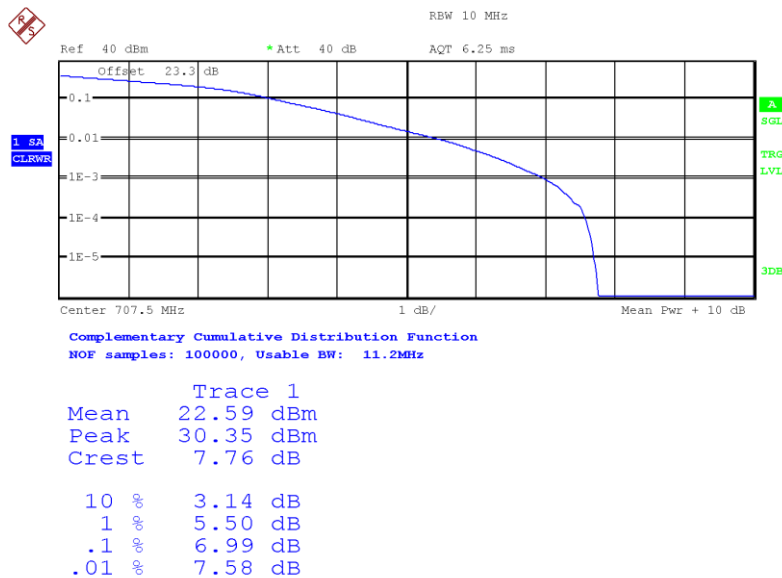
LTE Band 12. Bandwidth = 10 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

Low Channel:



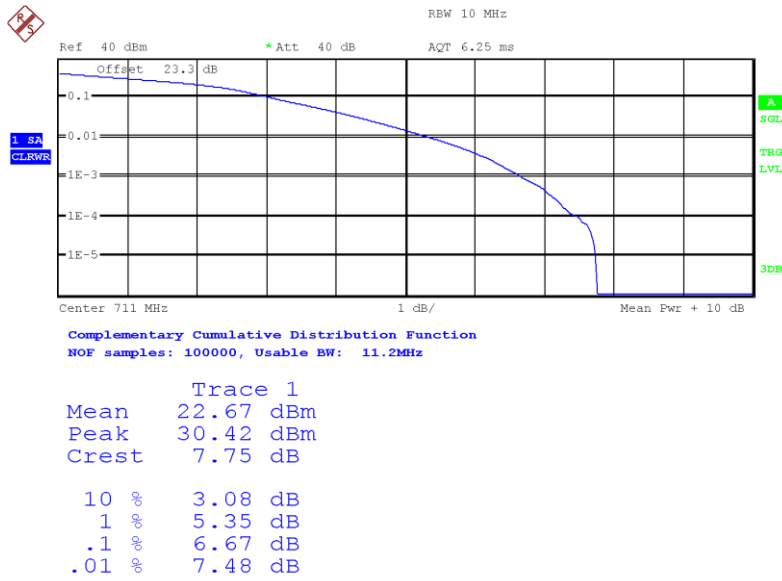
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Middle Channel:



Date: 13.JAN.2023 18:09:52

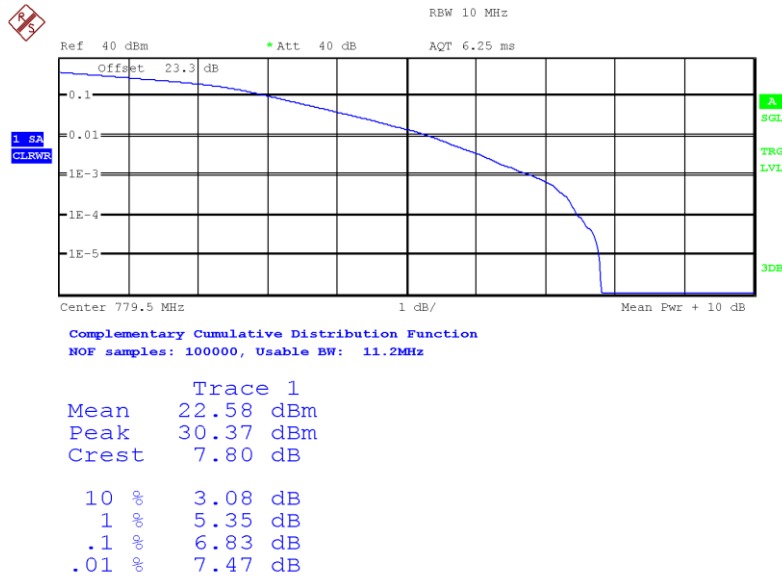
High Channel:



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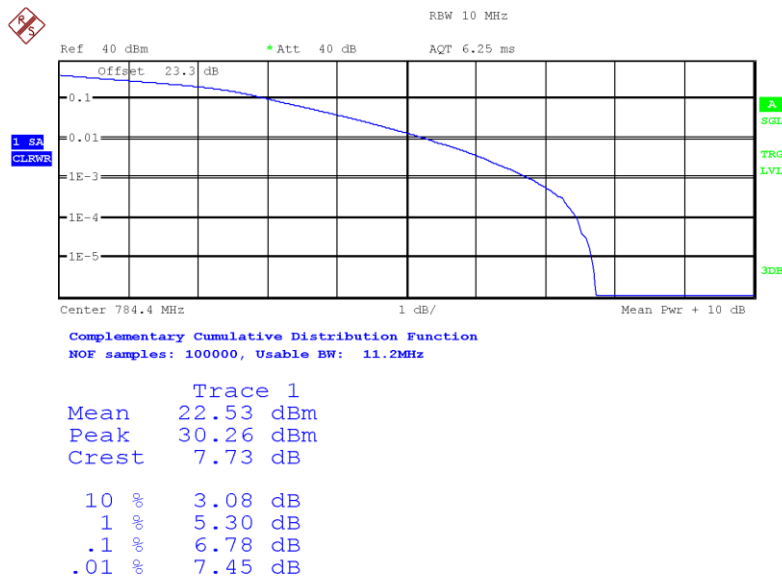
LTE Band 13. Bandwidth = 5 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

Low Channel:



Date: 13.JAN.2023 19:08:42

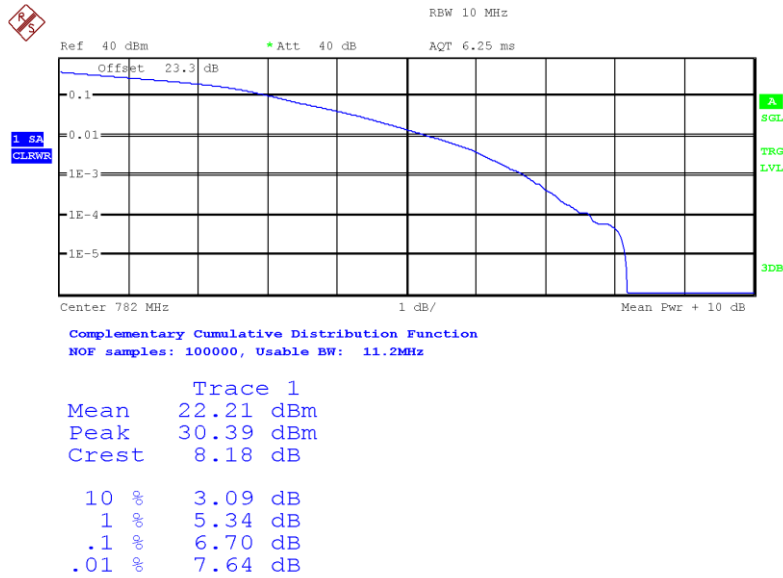
High Channel:



Date: 13.JAN.2023 19:11:24

LTE Band 13. Bandwidth = 10 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

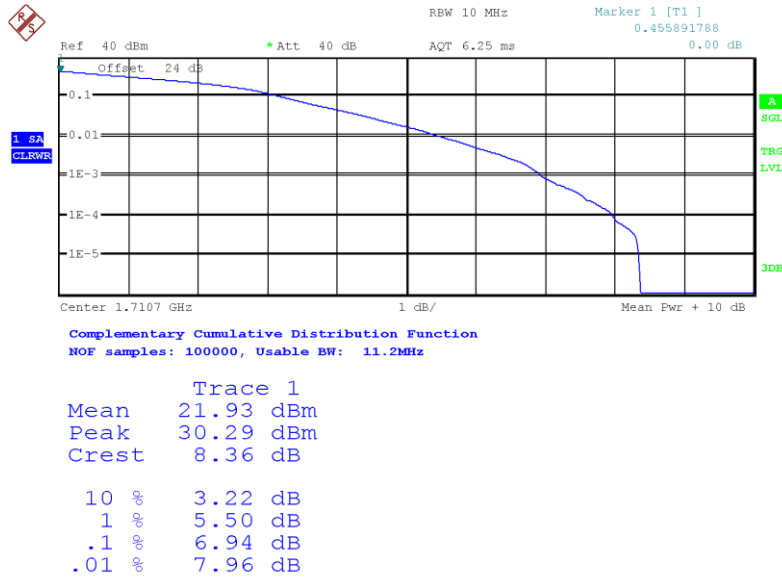
Single Channel:



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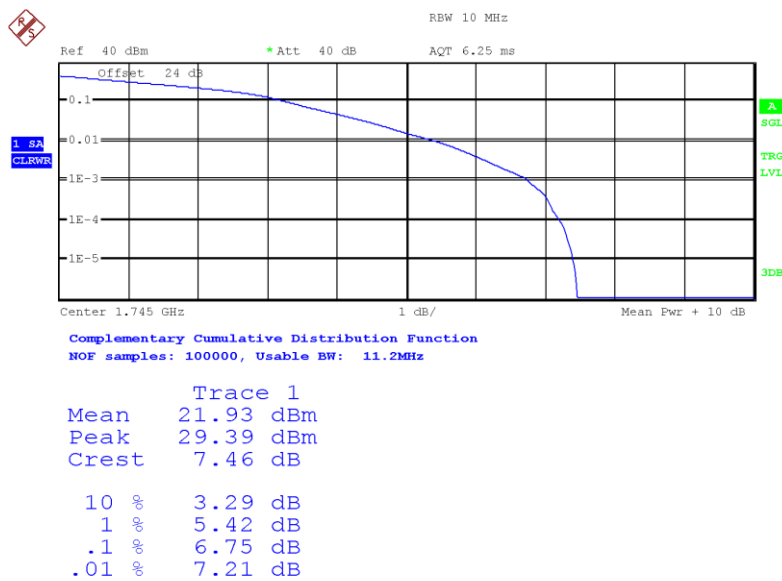
LTE Band 66. Bandwidth = 1.4 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

Low Channel:



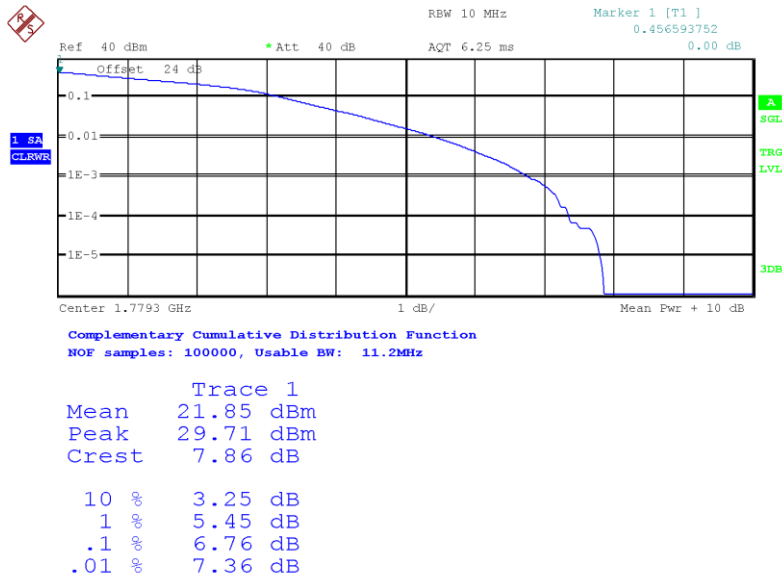
Date: 16.JAN.2023 17:00:54

Middle Channel:



Date: 16.JAN.2023 12:19:19

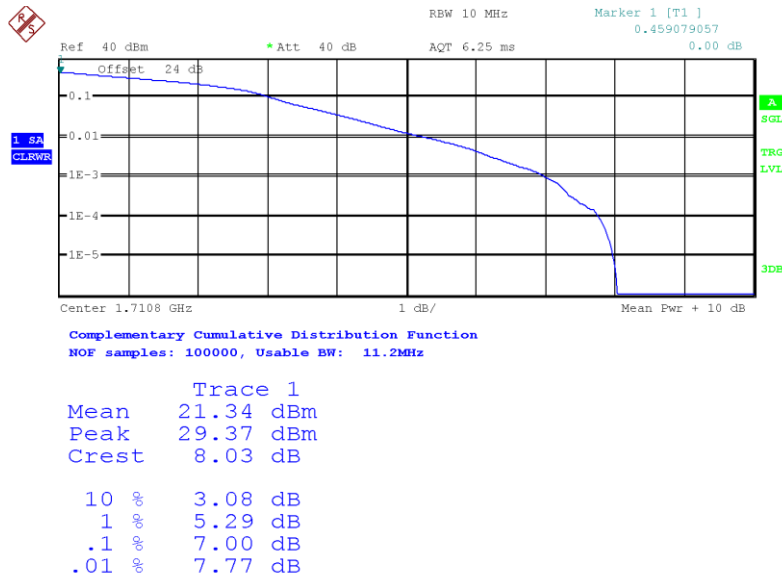
High Channel:



Date: 16.JAN.2023 17:05:39

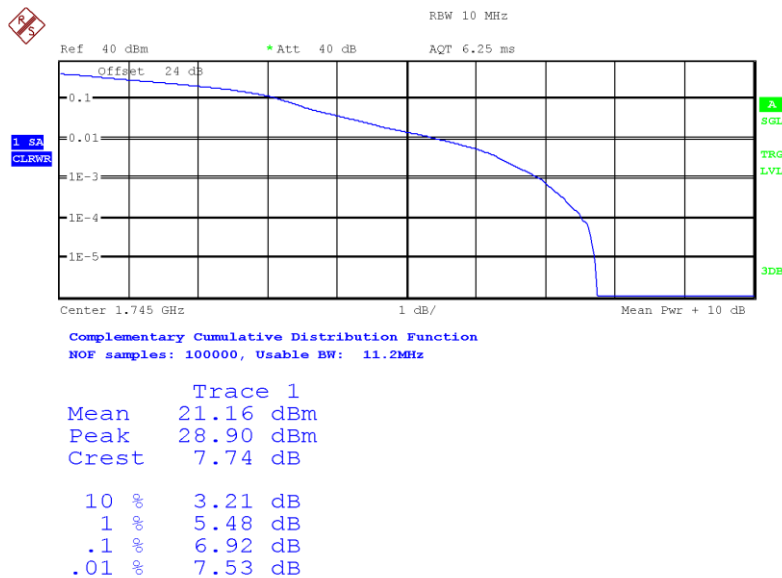
LTE Band 66. Bandwidth = 3 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.

Low Channel:



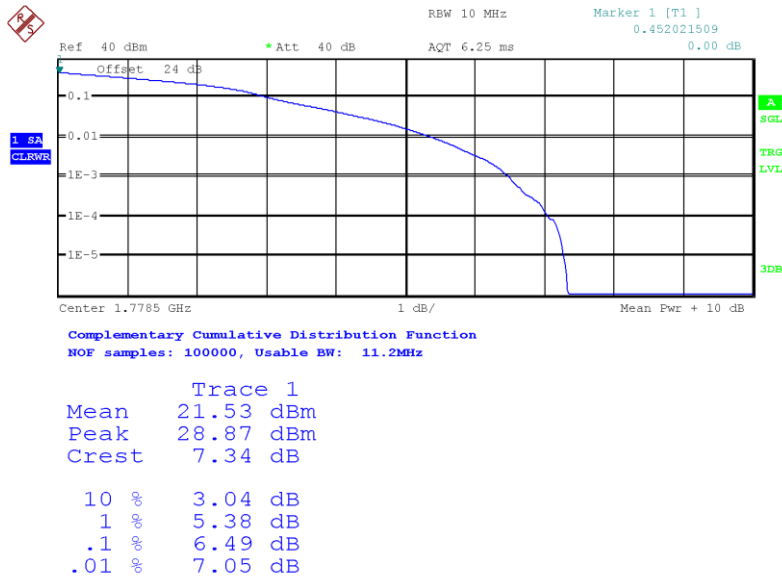
Date: 16.JAN.2023 16:33:29

Middle Channel:



Date: 16.JAN.2023 12:22:36

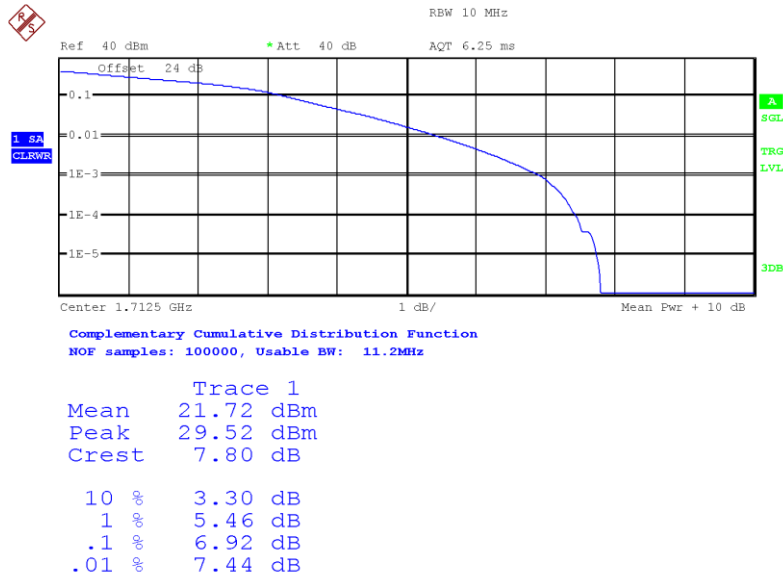
High Channel:



Date: 16.JAN.2023 16:46:10

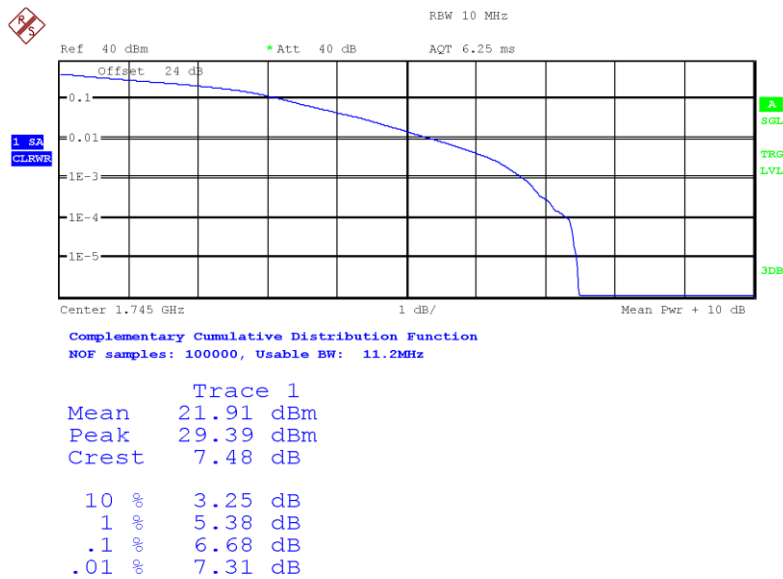
LTE Band 66. Bandwidth = 5 MHz. Modulation 16QAM. RB Size: 5. RB Offset: 0.

Low Channel:



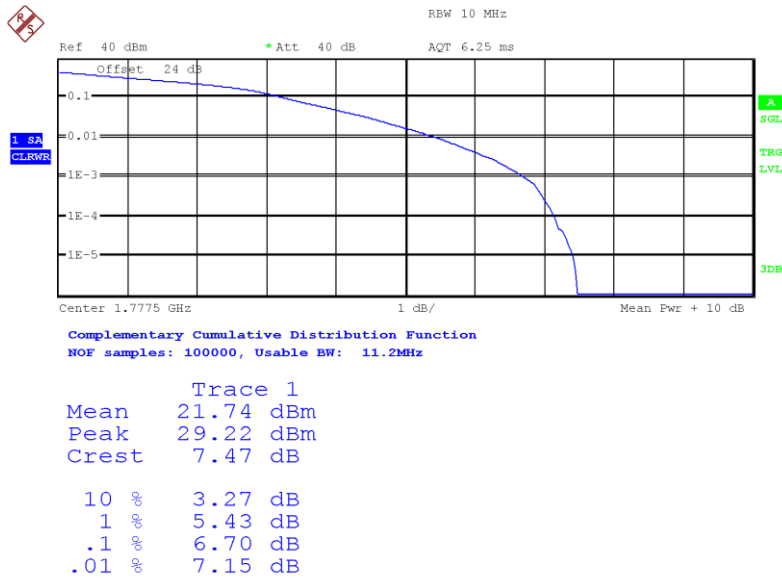
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Middle Channel:



Date: 16.JAN.2023 12:30:45

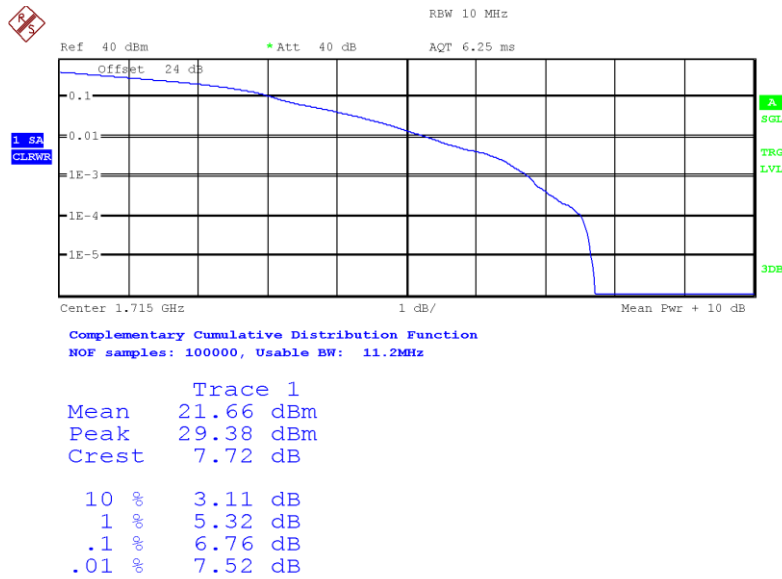
High Channel:



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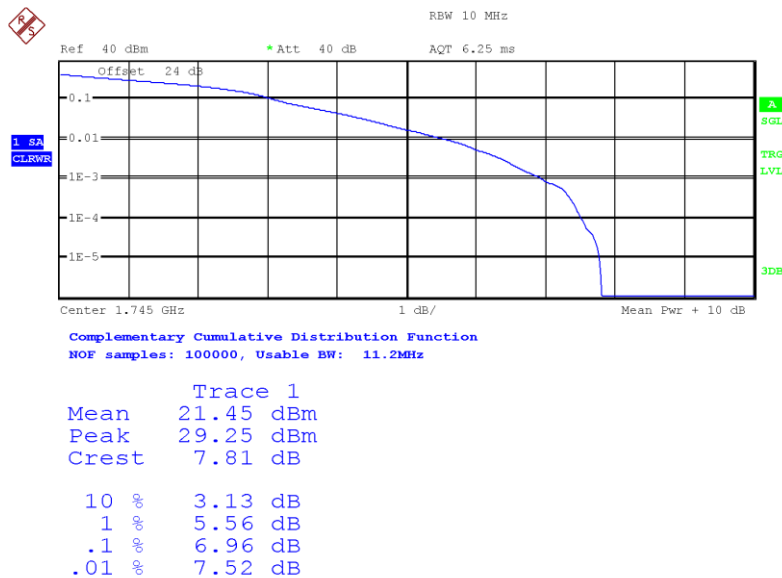
LTE Band 66. Bandwidth = 10 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 5.

Low Channel:



Date: 16.JAN.2023 13:39:46

Middle Channel:



Date: 16.JAN.2023 12:34:11