



FCC TEST REPORT / IC TEST REPORT

Product	Track Box Passive		
Name and address of the applicant	race result AG Joseph-von-Fraunhofer-Str. 11 D - 76327 Pfinztal (Germany)		
Name and address of the manufacturer	race result AG Joseph-von-Fraunhofer-Str. 11 D - 76327 Pfinztal (Germany)		
Model	RR10		
Rating	100 – 240 VAC		
Trademark	race result		
Serial number	20953 / 20069		
Technology	2.4 GHz (IEEE 802.15.4)		
Tested according to	FCC Part 15.207, 15.209 & 15.247 ISED Canada RSS-247 Issue 2 RSS-GEN Issue 5 For details of applied tests refer to test summary		
Report number	399615-02		
Tested in period	2020-06-22 - 2020-10-07		
Issue date	2020-10-14		
Name and address of the testing laboratory	Nemko GmbH & Co. KG Reetzstraße 58 D-76327 Pfinztal Tel.: + 49 (0) 7240 – 63 - 0 Fax: + 49 (0) 7240 – 63 - 11	 Bundesnetzagentur BNetzA-CAB-17/21-17	FCC No: 973501 ISED OATS: 10921A
 Prepared by [F. Hupbauer]  Approved by [Dipl.-Ing. P. Lukas]			

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1 INFORMATION

1.1 Test Item

Name:	Track Box Passive		
FCC ID:	SZO-RR10		
Industry Canada ID:	20465-RR10		
Model/version:	Track Box Passive US RR10		
Serial number:	20953 <i>Radiated Sample</i>		
	20069 <i>Conducted Sample with SMA Connector</i>		
Software version:	27587 (firmware)		
Frequency Range:	2405 – 2480 MHz		
Number of Channels:	16		
Transmit Channels Tested:	Channel ID	RF Channel	Channel Frequency (MHz)
	Bottom	1	2405
	Middle	5	2435
	Top	0	2480
Operating Modes:	2.4 GHz IEEE 802.15.4		
Type of Modulation:	GFSK		
Output Power (radiated):	10.51		
Type of Power Supply:	AC Adaptor: CUI SDI18-12-U (100 – 240V, 50 – 60Hz)		
Antenna Connector:	None (internal antenna)		
Number of Antennas	1		
Type of Antenna	PCB antenna CC2500 Folded Dipole EM		
Maximal gain of Antenna	6.5 dBi		

Description of Test Item

The device is an RFID reader for passive transponders. It is mainly used for sports timing. Additionally, the device contains a 2.4 GHz (IEEE 802.15.4) and GSM Bands module for data transmission. For mobile use, the device can be powered by rechargeable internal batteries.

1.2 Normal test conditions

Temperature: 19 - 23 °C
Relative humidity: 45 - 60 %
Normal test voltage: 120V / 60Hz

The values are the limit registered during the test period.

1.3 Test Engineer(s)

Frederic Hupbauer; Abdoufataou Salifou

1.4 Description of modification for Modification Filing

Not applicable.

1.5 Family List Rational

Not Applicable.

1.6 Antenna Requirement

Is the antenna detachable?

☐ Yes ☒ No

If detachable, is the antenna connector non-standard?

☐ Yes ☐ No

Type of antenna connector: N/A

Ref. FCC §15.203

1.7 Worst-Case Configuration and Mode

Radiated Emissions was performed with the EUT set to transmit at the channel with the highest output power as worst-case scenario.

1.8 Comments

The measurement were done with the EUT powered by 120V / 60Hz. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards. The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.247 and Industry Canada RSS-247 Issue 2.

Tests were performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

Radiated tests were performed in a semi-anechoic shielded room ($f < 1$ GHz) and a fully-anechoic shielded room ($f > 1$ GHz) at a measuring distance of 3m. A description of the test facility is on file with the FCC and Industry Canada.

Test setup photo document: 399615-02TRFFCC Annex – Test set-up photos

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

DSS Equipment Code

☐ Family Listing



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-247 Issue 2, RSS-GEN Issue 5 reference	Result
Supply Voltage Variations	15.31(e)		Complies
Antenna Requirement	15.203	6.8 (RSS-Gen)	Complies ¹
AC Power Line Conducted Emission limits	15.207(a)	8.8 (RSS-Gen)	Complies
Power Spectral Density	15.247(e)	5.2 (2) (RSS-247)	Complies
Occupied Bandwidth	15.247(a)(1)	6.7 (RSS-Gen)	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	6.7 (RSS-Gen)	Complies
Transmitter Duty Cycle	15.35(c)		Complies
Transmitter Output Power	15.247(b)(2)	5.4 (d) (RSS-247)	Complies
Transmitter Conducted Emissions	15.247(d)	5.5 (RSS-247)	Complies
Transmitter Radiated Emissions	15.247(d) 15.209(a)	5.5 (RSS-247) 8.9 (RSS-Gen)	Complies
Transmitter Band Edge Radiated Emissions	15.247(d) 15.209(a)	5.5 (RSS-247) 8.9 (RSS-Gen)	Complies

¹ The tested equipment has integrated antennas only

TEST RESULTS

2.3 AC Power Line Conducted Emissions limits

Para. No.: 15.207 (a)

Para. No.: 8.8

Test Performed by: Frederic Hupbauer

Date of Test: 2020-06-10 & 2020-10-07

Measurement procedure: ANSI C63.4-2014 using 50 μ H/50 ohms LISN.

Test Results: Complies.

Measurement Data: See attached graph.

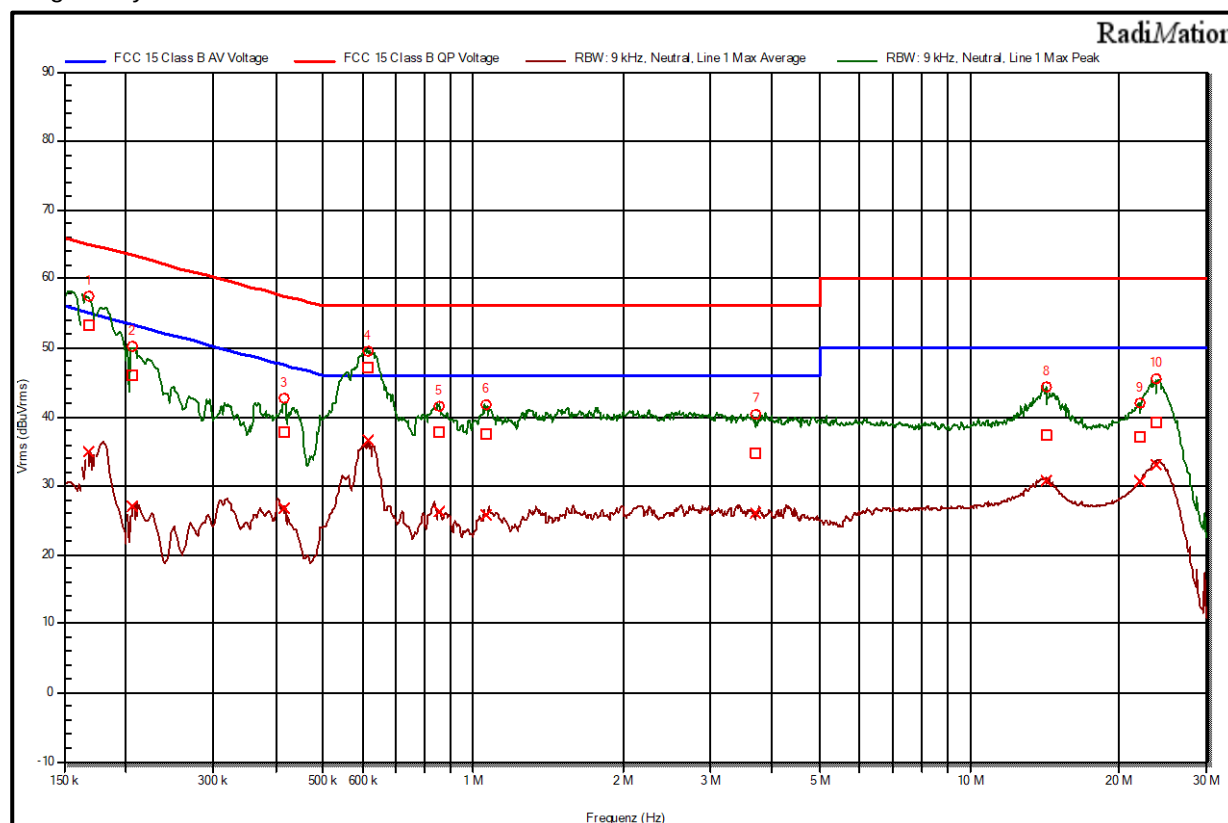
EUT supplied via AC adaptor

AC/DC adapter type: CUI SDI50-15-U

Input voltage to AC/DC adapter: 120V / 60Hz & 240V / 50Hz

Highest measured value (L1 and N):

Diagram by 120V / 60Hz



Measurement Data:

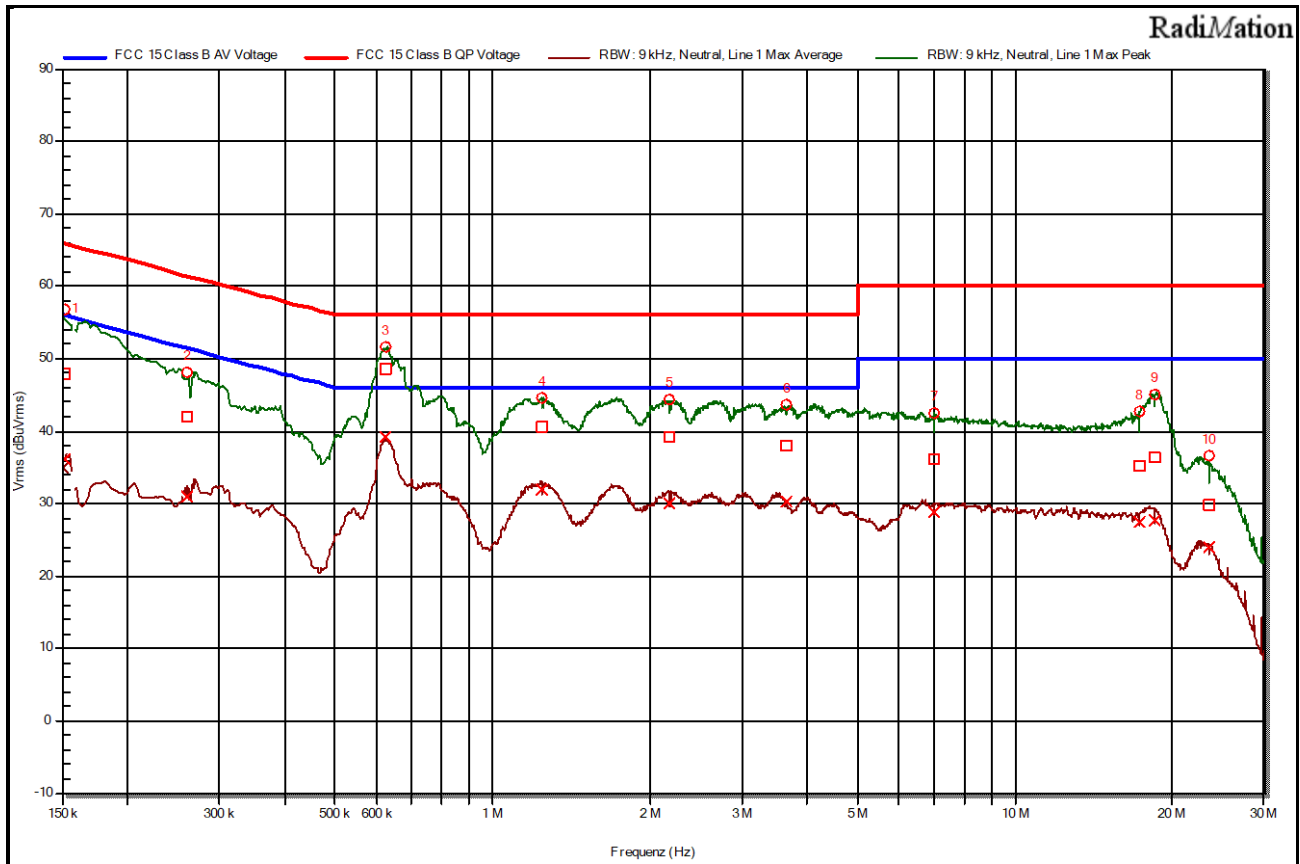
Final measurements QP with Quasi-Peak-Detector 120V / 60Hz

No.	Frequency (MHz)	Level (dBµV)	Transducer (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1	0.168	53.35	9.97	65.06	11.71	Line 1	GND
2	0.20625	46.02	9.97	63.35	17.34	Line 1	GND
3	0.41775	37.87	9.99	57.49	19.63	Line 1	GND
4	0.61575	47.08	10.01	56	8.92	Neutral	GND
5	0.852	37.82	10.02	56	18.18	Line 1	GND
6	1.06125	37.48	10.04	56	18.52	Line 1	GND
7	3.69375	34.81	10.20	56	21.19	Line 1	GND
8	14.2035	37.35	10.72	60	22.65	Line 1	GND
9	22.065	37.02	10.94	60	22.98	Neutral	GND
10	23.649	39.24	11.11	60	20.76	Neutral	GND

Final measurements AV with Average-Detector 120V / 60Hz

No.	Frequency (MHz)	Level (dBµV)	Transducer (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1	0.168	35.04	9.97	55.06	20.02	Line 1	GND
2	0.20625	26.92	9.97	53.35	26.43	Line 1	GND
3	0.41775	26.73	9.99	47.49	20.76	Line 1	GND
4	0.61575	36.6	10.01	46	9.4	Neutral	GND
5	0.852	26.3	10.02	46	19.7	Line 1	GND
6	1.06125	25.77	10.04	46	20.23	Line 1	GND
7	3.69375	26.01	10.20	46	19.99	Line 1	GND
8	14.2035	30.78	10.72	50	19.22	Line 1	GND
9	22.065	30.77	10.94	50	19.23	Neutral	GND
10	23.649	33.01	11.11	50	16.99	Neutral	GND

Diagramm by 240V / 50Hz



Measurement Data:

Final measurements QP with Quasi-Peak-Detector 240V / 50Hz

No.	Frequency (MHz)	Level (dBµV)	Transducer (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1	0,152250	47,89	9,97	65,88	17,99	Neutral	GND
2	0,260250	41,92	9,98	61,42	19,50	Neutral	GND
3	0,624750	48,53	10,01	56,00	7,47	Neutral	GND
4	1,245750	40,58	10,06	56,00	15,42	Neutral	GND
5	2,184000	39,28	10,12	56,00	16,72	Line 1	GND
6	3,642000	37,97	10,20	56,00	18,03	Neutral	GND
7	7,003500	36,05	10,38	60,00	23,95	Neutral	GND
8	17,333250	35,10	10,84	60,00	24,90	Neutral	GND
9	18,523500	36,26	10,88	60,00	23,74	Neutral	GND
10	23,478000	29,90	11,09	60,00	30,10	Line 1	GND

Final measurements AV with Average-Detector 240V / 50Hz

No.	Frequency (MHz)	Level (dBµV)	Transducer (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1	0,152250	36,21	9,97	55,88	19,67	Neutral	GND
2	0,260250	31,06	9,98	51,42	20,36	Neutral	GND
3	0,624750	39,28	10,01	46,00	6,72	Neutral	GND
4	1,245750	31,93	10,06	46,00	14,07	Neutral	GND
5	2,184000	30,04	10,12	46,00	15,96	Line 1	GND
6	3,642000	30,20	10,20	46,00	15,80	Neutral	GND
7	7,003500	28,88	10,38	50,00	21,12	Neutral	GND
8	17,333250	27,40	10,84	50,00	22,60	Neutral	GND
9	18,523500	27,66	10,88	50,00	22,34	Neutral	GND
10	23,478000	23,95	11,09	50,00	26,05	Line 1	GND

2.4 Minimum 6 dB Bandwidth

Para. No.: 15.247 (a)(2)

Para. No.: 6.7

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-06-22

Test Results: Complies

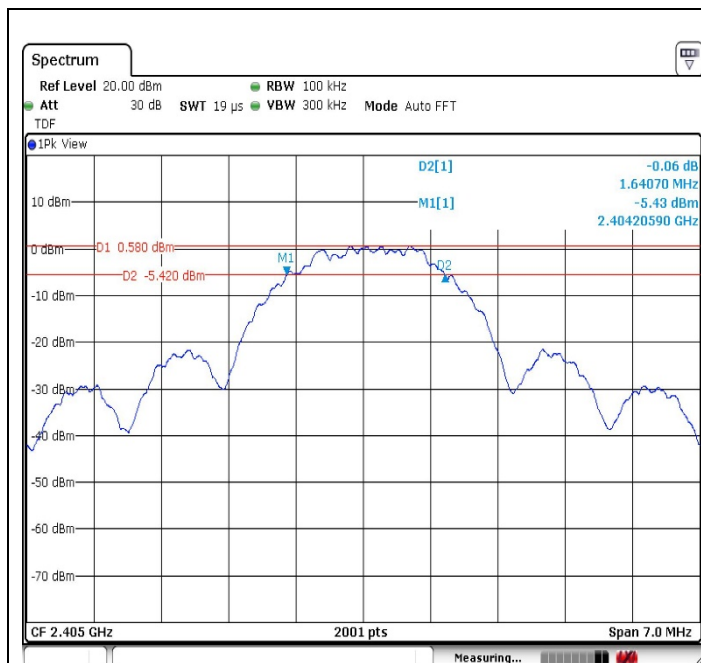
Measurement Data:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Margin (MHz)
11	2405	1.640	0.5	1.140
17	2435	1.651	0.5	1.151
26	2480	1.682	0.5	1.182

Requirements:

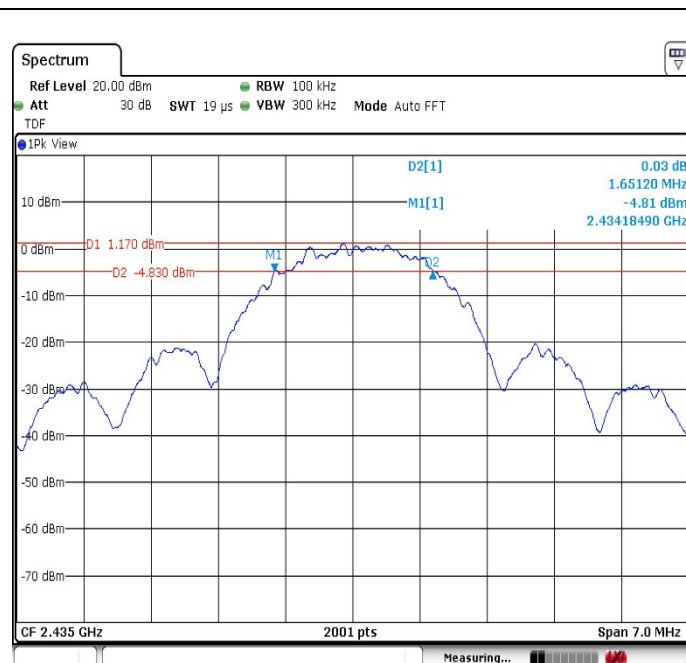
Systems using digital modulation techniques may operate in the 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6 dB Bandwidth Plots



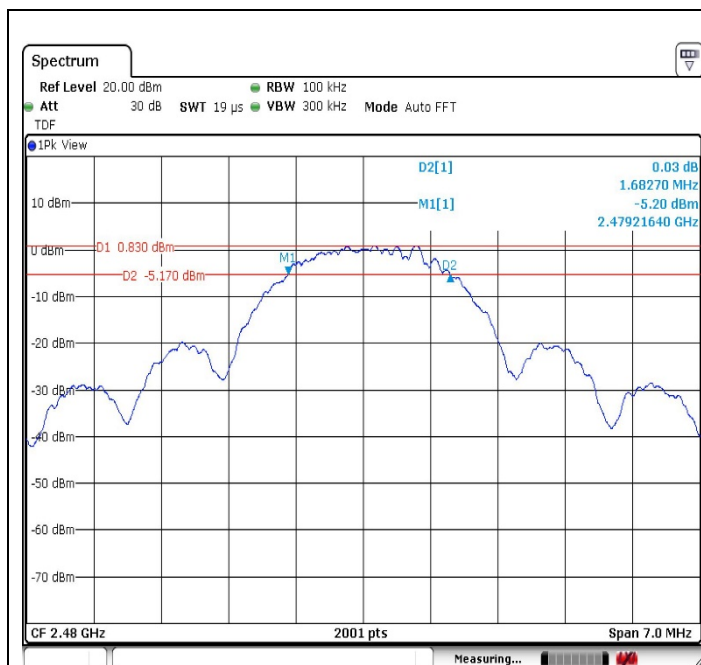
6 dB BW Bottom Channel

Plot-No.:399615-103



6 dB BW Middle Channel

Plot-No.:399615-106



6 dB BW Top Channel

Plot-No.:399615-098

2.5 Duty Cycle

Para. No.: 15.35 (c)

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-07-13

Test Results: Complies

Measurement Data:

Pulse Duration (ms)	Periode (ms)	Duty Cycle (%)
2.9167	45.6833	6.4

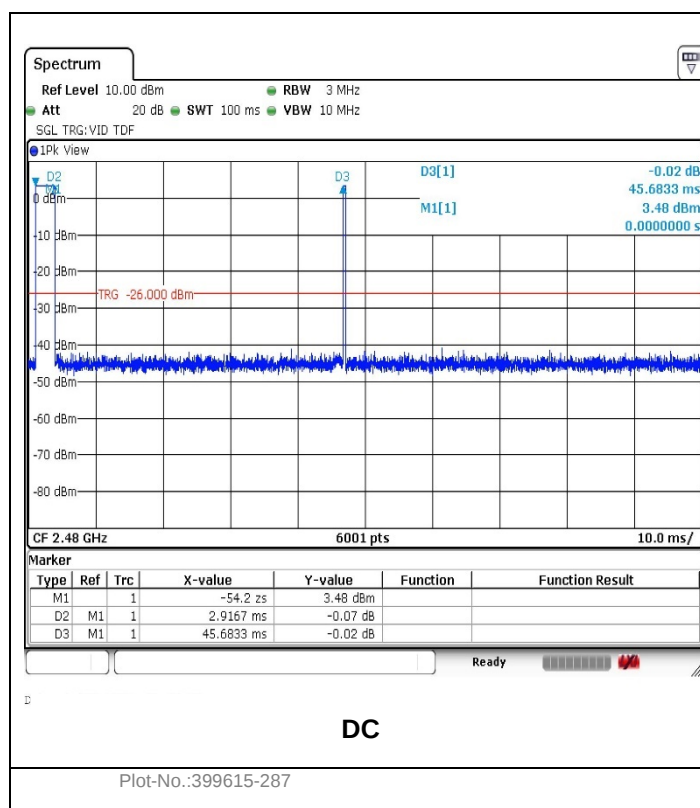
The transmitter Duty Cycle factor was calculated by using following calculation:

$20 \log (\text{Pulse Duration} / \text{Periode}) = 20 \log (2.9167 \text{ ms} / 45.6833 \text{ ms}) = -23.9 \text{ dB}$

Requirements:

No requirements for Digital Transmission Systems.

Duty Cycle Plot



2.6 Occupied Bandwidth

Para. No.: 15.247 (a)(1)

Para. No.: 5.2 (1)

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-06-22

Test Results: Complies

Measurement Data:

Channel	Frequency (MHz)	99% Bandwidth (MHz)
11	2405	2.403
17	2435	2.463
26	2480	2.557

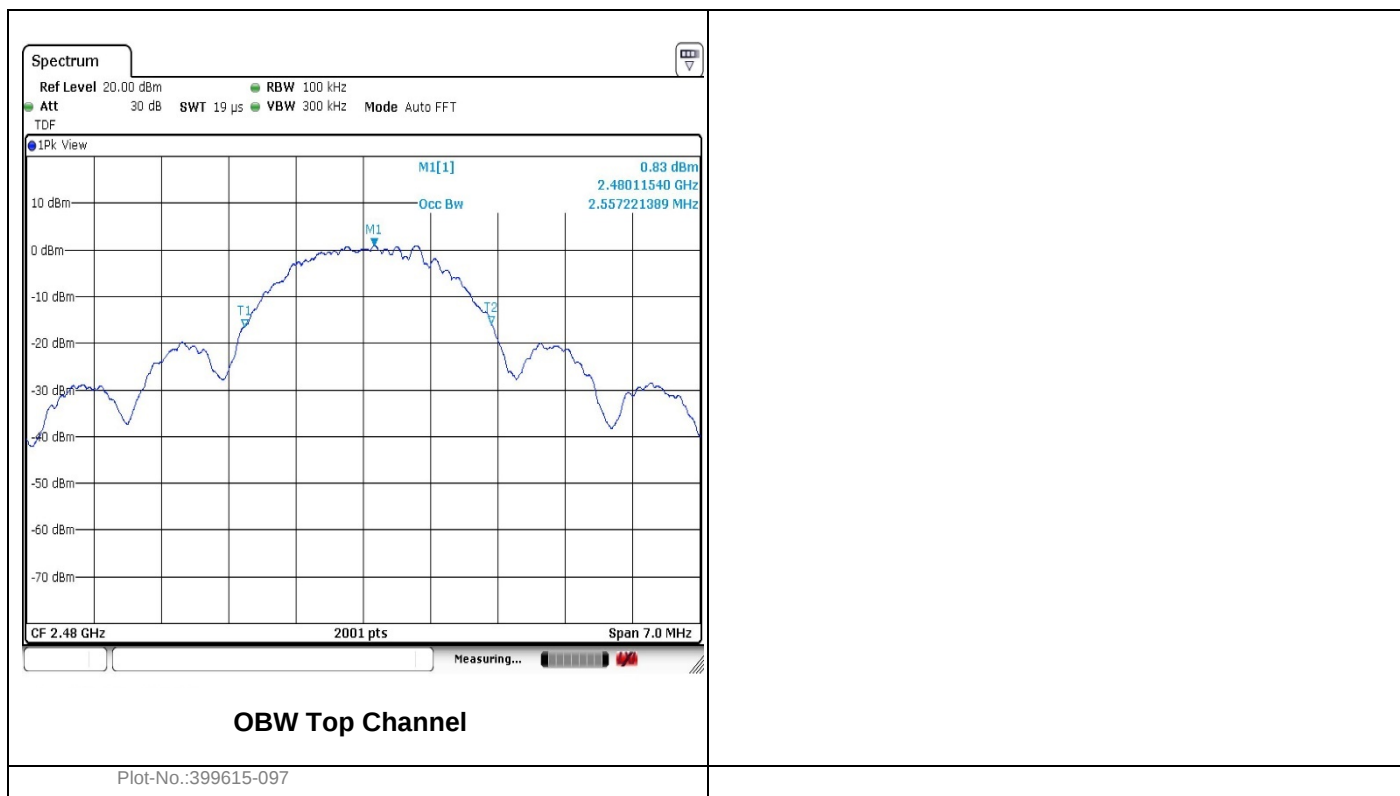
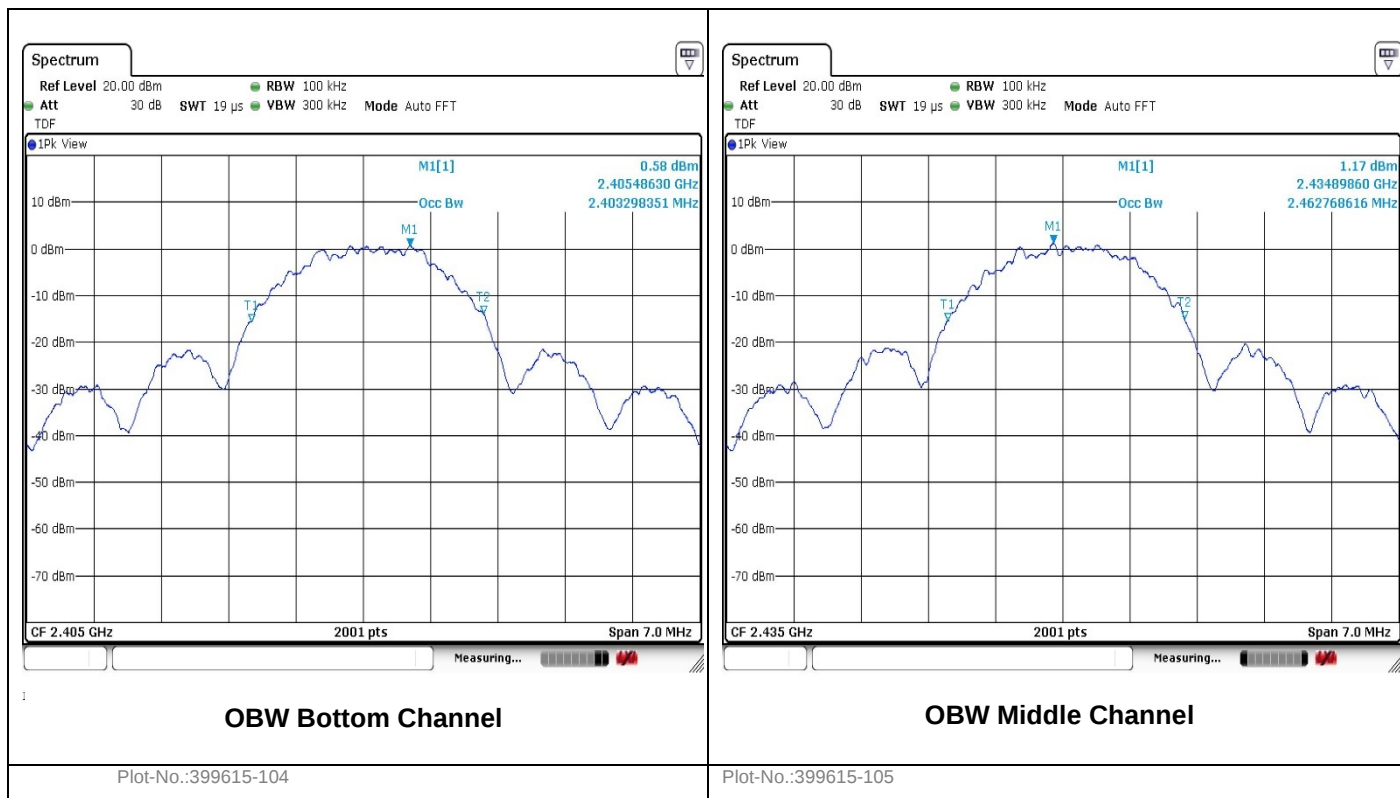
Requirements:

No requirements for bandwidth for this frequency band.

No requirements for Digital Transmission Systems.

Reported for information only

Occupied Bandwidth Plots



2.7 Transmitter Output Power

Para. No.: 15.247 (b)(3)

Para. No.: 5.4 (d)

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-06-22

Test Results: Complies

Measurement Data:

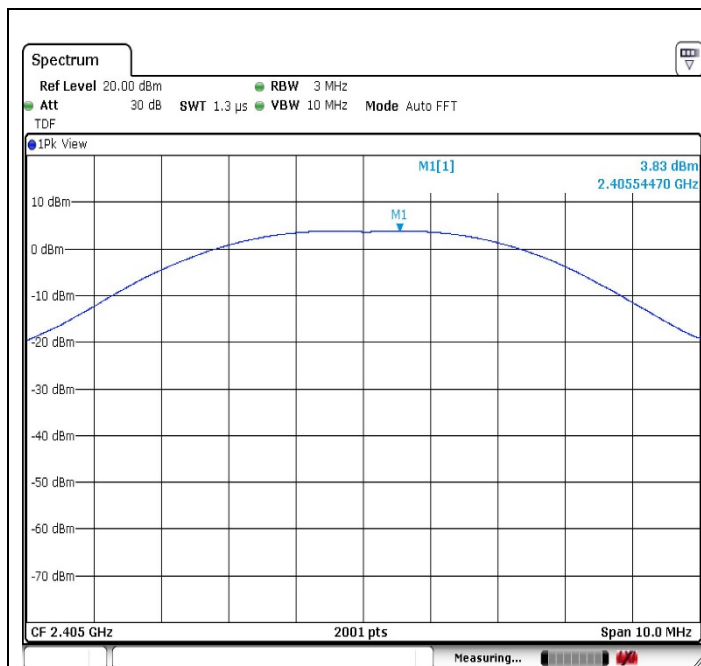
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
11	2405	3.83	29.5	25.67
17	2435	3.89	29.5	25.61
26	2480	4.01	29.5	25.49

Channel	Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
11	2405	3.83	6.5	10.33	36.0	25.67
17	2435	3.89	6.5	10.39	36.0	25.61
26	2480	4.01	6.5	10.51	36.0	25.49

Requirements:

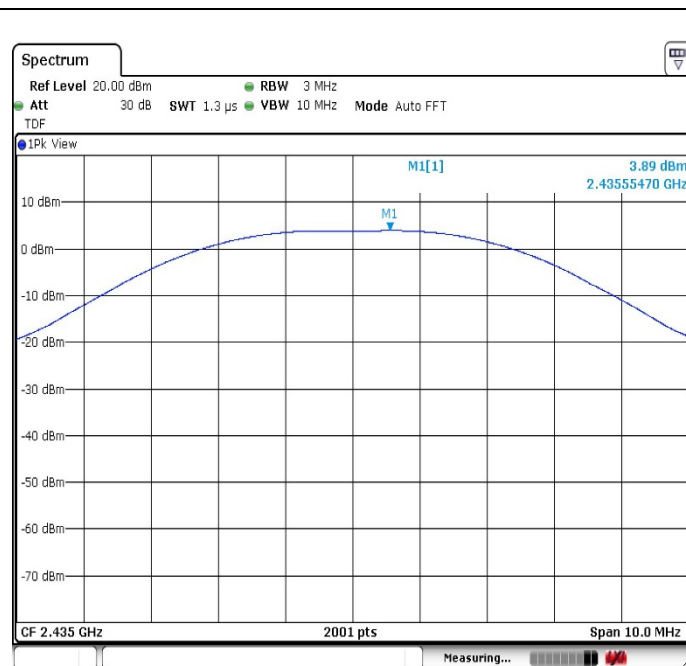
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Conducted Peak Power Output Plots



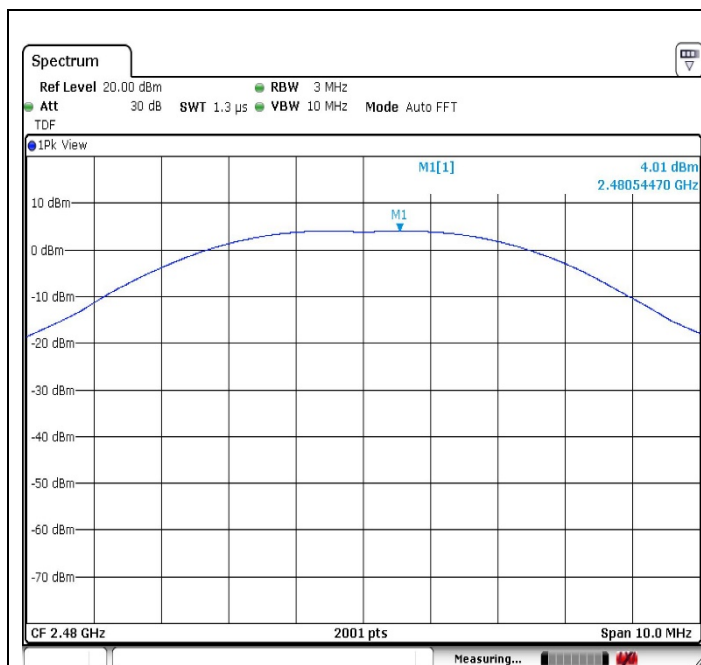
Conducted power Bottom Channel

Plot-No.:399615-101



Conducted power Middle Channel

Plot-No.:399615-108



Conducted power Top Channel

Plot-No.:399615-100

2.8 Transmitter Power Spectral Density

Para. No.: 15.247 (e)

Para. No.: 5.2 (2)

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-06-22

Test Results: Complies

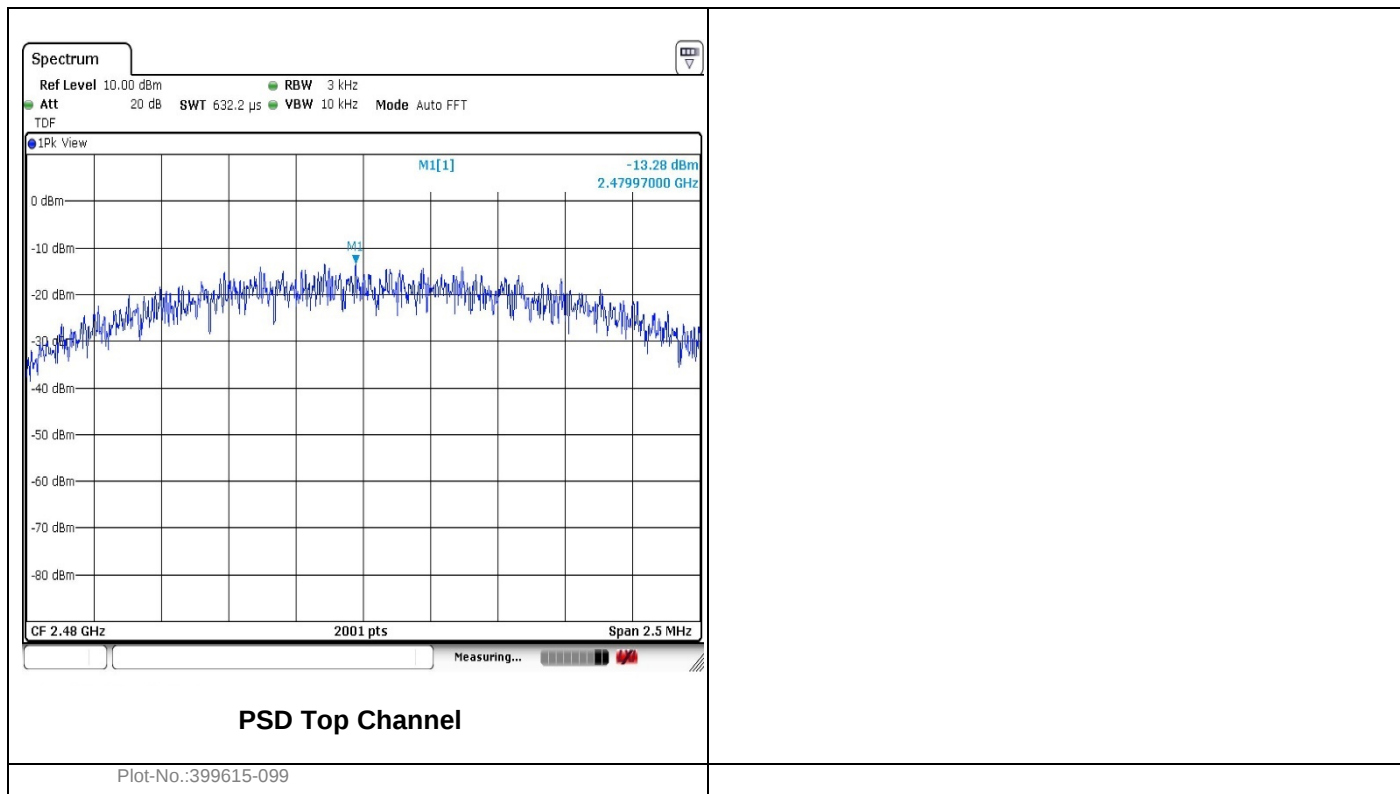
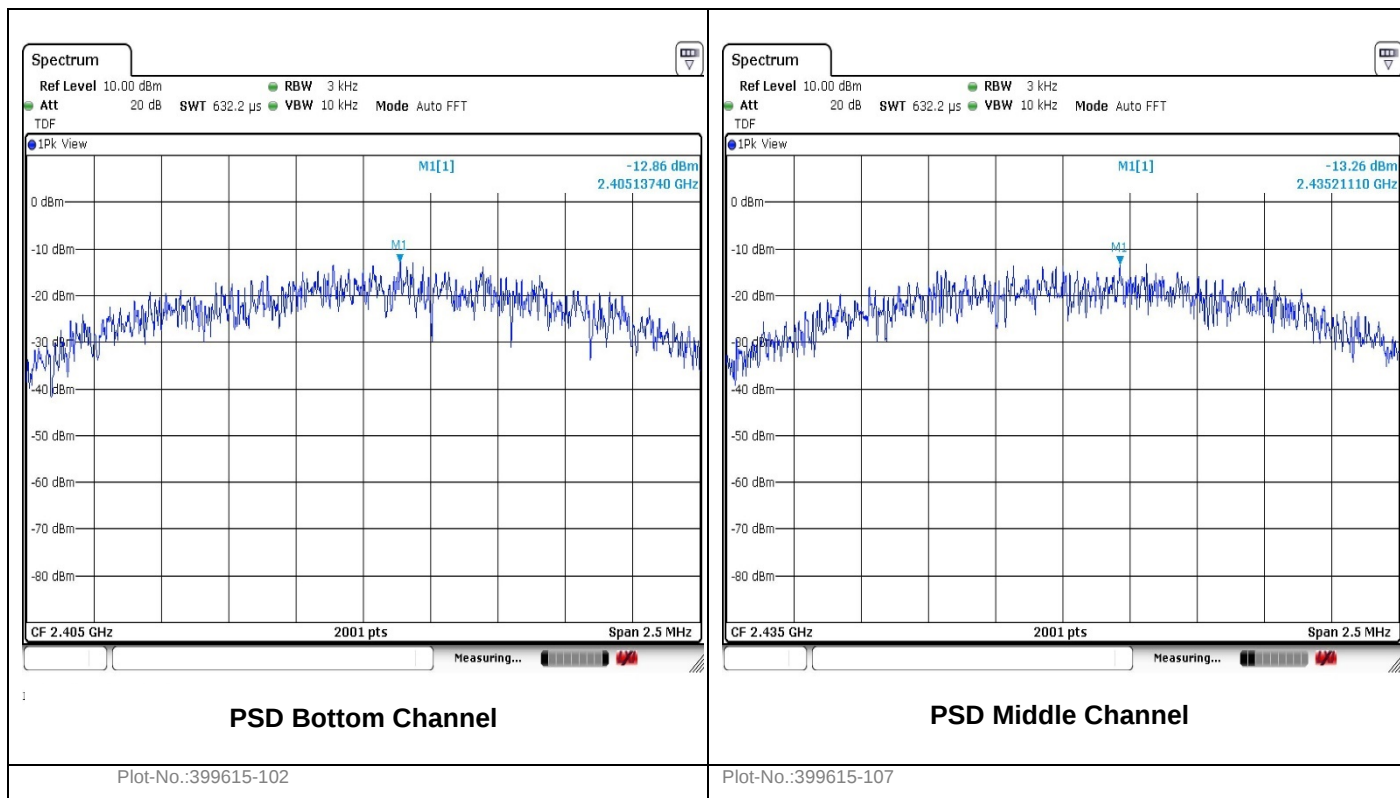
Measurement Data:

Channel	Frequency (MHz)	PSD (dBm /3kHz)	Limit (dBm /3kHz)	Margin (dB)
11	2405	-12.86	8.0	20.86
17	2435	-13.26	8.0	21.26
26	2480	-13.28	8.0	21.28

Requirements:

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Power Spectral Density Plots



2.9 Transmitter Conducted Emissions

Para. No.: 15.247 (d)

Para. No.: 5.5

Transmitter conducted emissions from 9kHz to 30 MHz

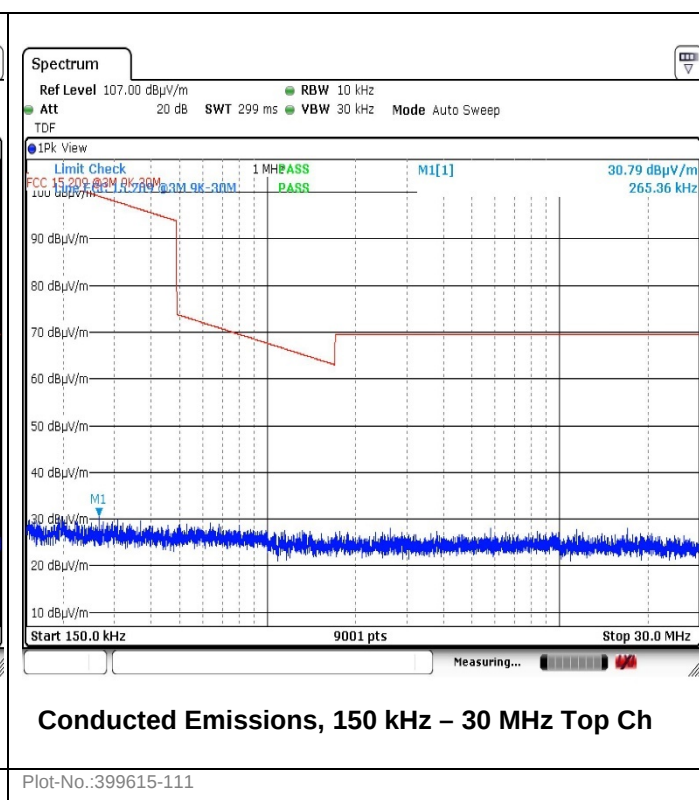
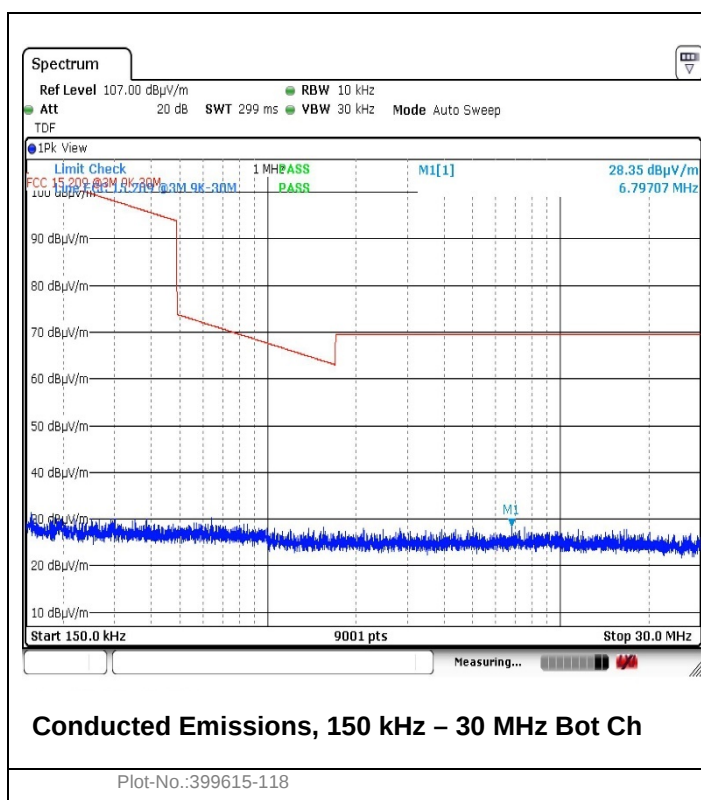
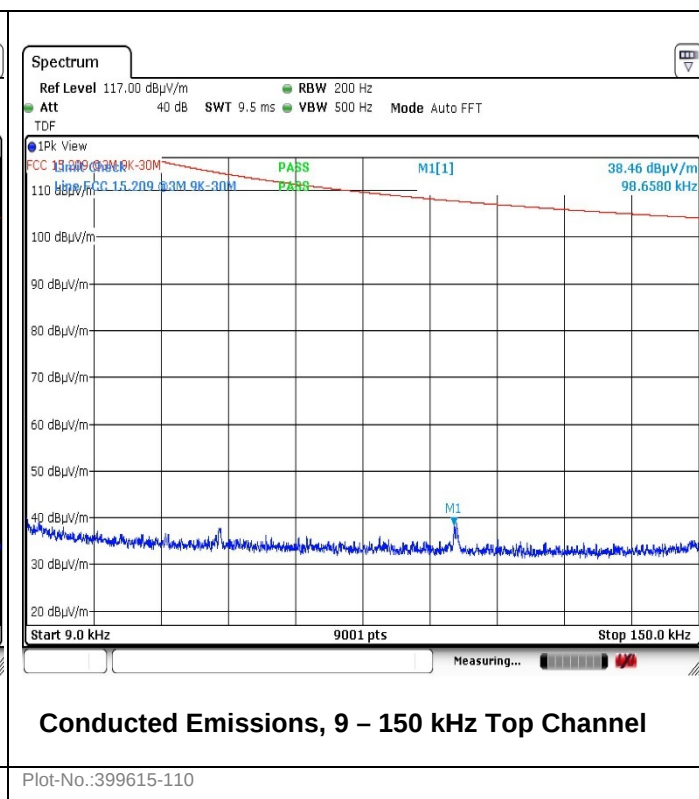
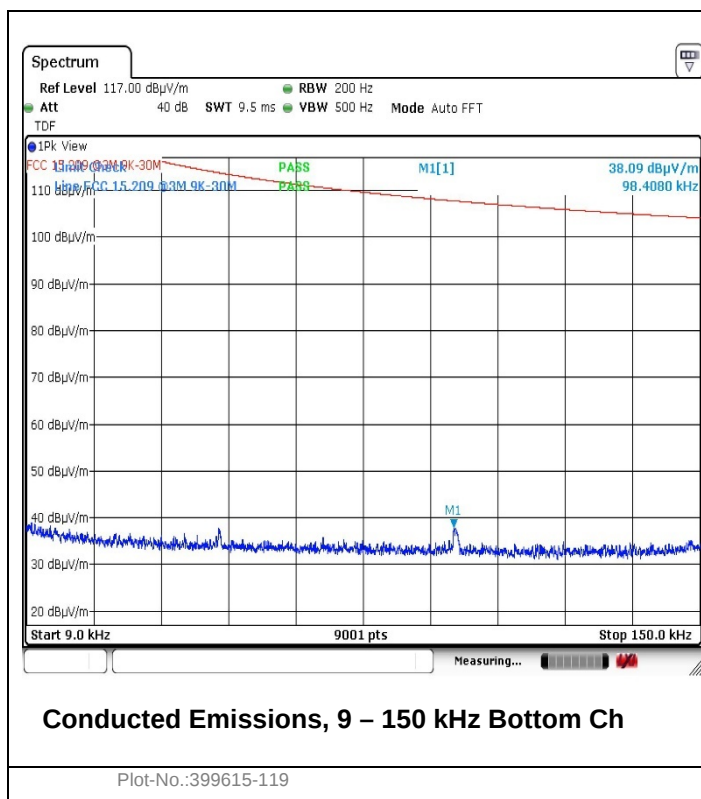
Test Performed by: Abdoufataou Salifou	Date of Test: 2020-06-22
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Test Results: Complies

Measurement Data:

Measured Frequency (MHz)	Carrier Frequency (MHz)	Antenna	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
No spurious emissions were detected					

Conducted Emissions Plots



Transmitter conducted emissions from 1 GHz to 40 GHz

Test Performed by: Abdoufataou Salifou	Date of Test: 2020-06-22
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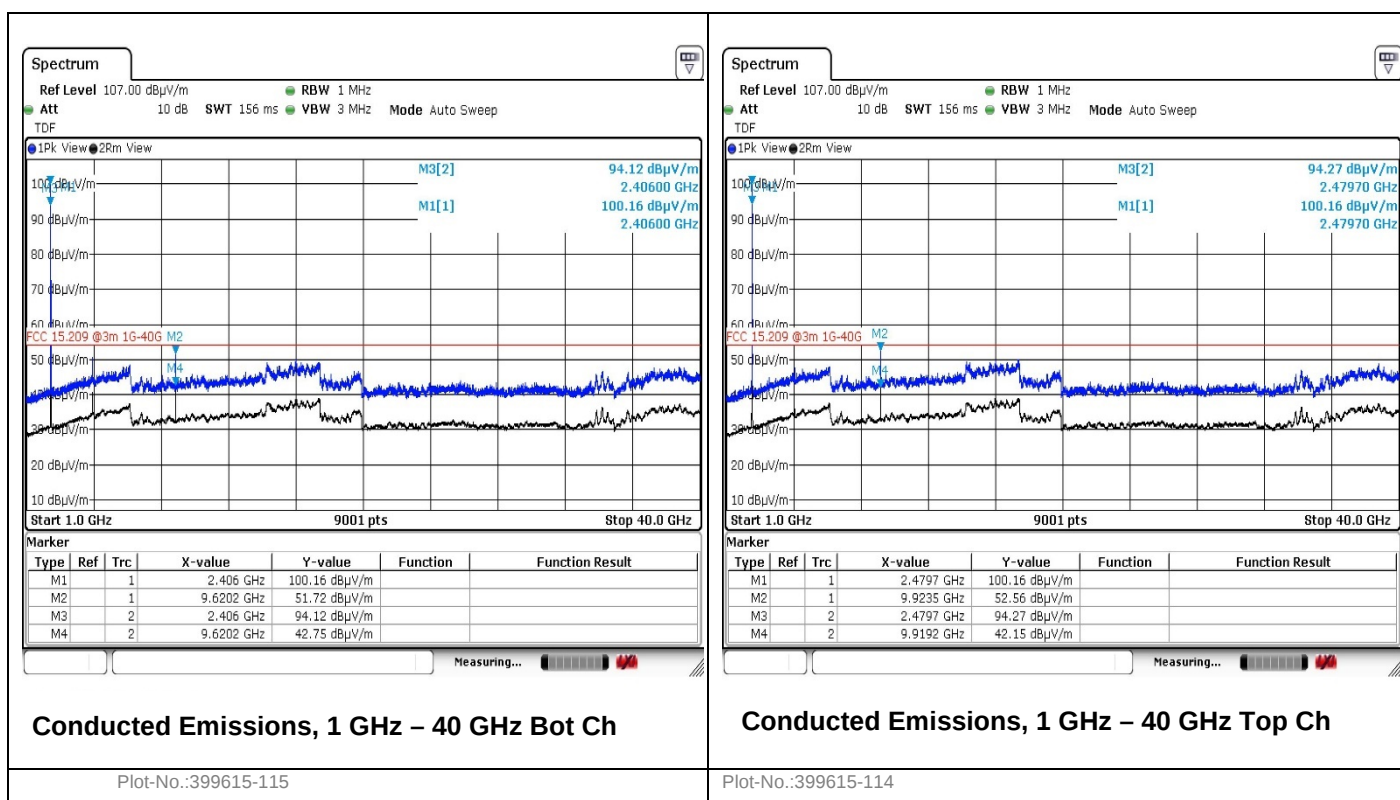
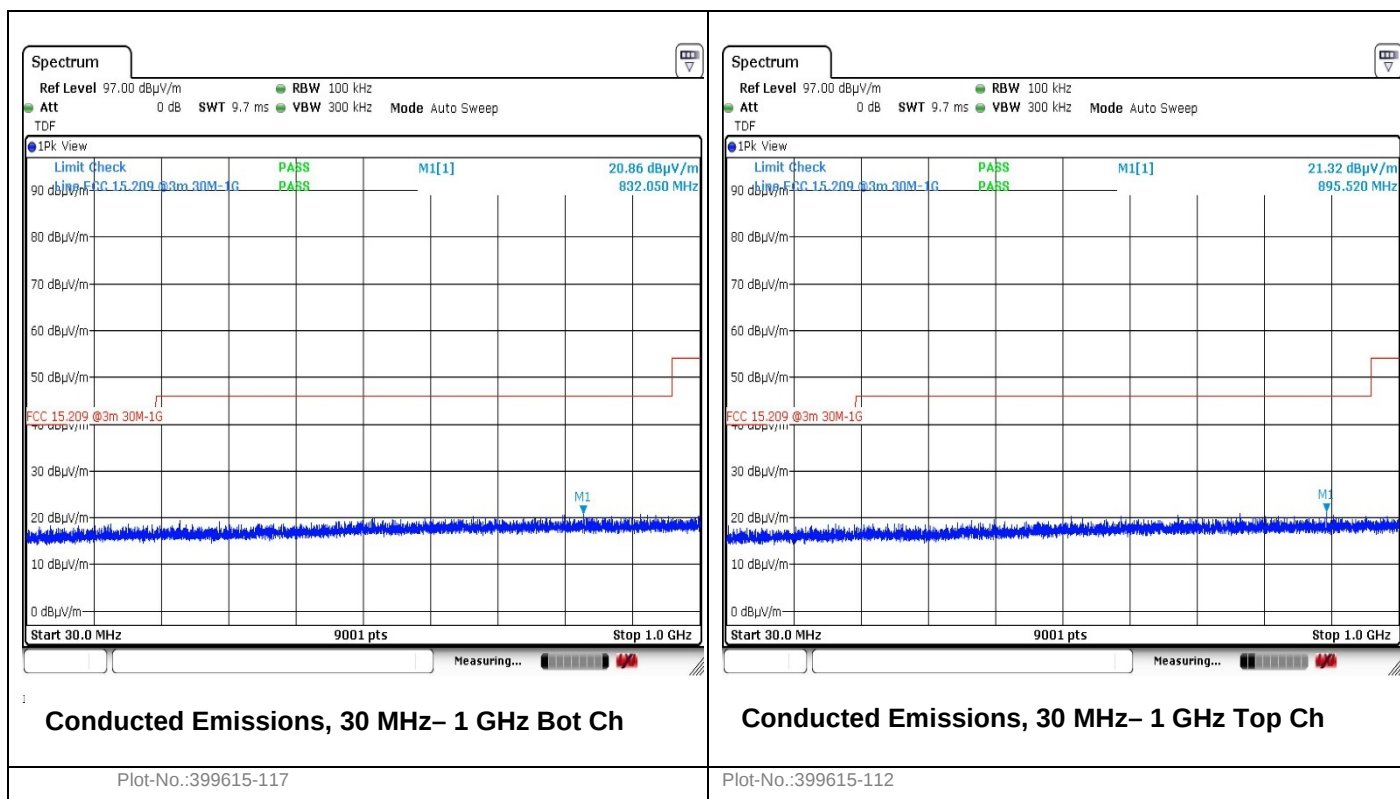
Test Results: Complies

Measurement Data:

Measured Frequency (MHz)	Carrier Frequency (MHz)	Measured Emission Peak (dBμV/m)	Antenna Gain (dB)	Corrected Emission (dBμV/m)	Peak Limit (dB)	Margin (dB)
9620.20	2406.00	51.72	6.5	58.22	74.0	15.78
9923.50	2479.70	52.56	6.5	59.06	74.0	14.94

Measured Frequency (MHz)	Carrier Frequency (MHz)	Measured Emission Average (dBμV/m)	Antenna Gain (dB)	Corrected Emission (dBμV/m)	Average Limit (dB)	Margin (dB)
9620.20	2406.00	42.75	6.5	49.25	54.0	4.75
9919.20	2479.70	42.15	6.5	48.65	54.0	5.35

Transmitter conducted Emissions Plots



Restricted Bands of operation

Restricted Bands of operation for FCC and ISSED are defined in FCC Part 15.205 and ISSED RSS-GEN, Issue 5 clause 8.10.

Generally, no fundamentals are allowed in the restricted bands and all emissions must comply with the limits in FCC 15.209 or RSS-GEN, Issue 5, clause 8.9.

FCC (MHz)	ISED (MHz)	FCC (GHz)	ISED (GHz)
0.090-0.110		0.96-1.24 1.3-1.427	0.96-1.427
0.495-0.505		1.435-1.6265	
2.1735-2.1905		1.6455-1.6465	
	3.020-3.026	1.660-1.710	
4.125-4.128		1.7188-1.7222	
4.17725-4.17775		2.2-2.3	
4.20725-4.20775		2.31-2.39	
	5.677-5.683	2.4835-2.5	
6.215-6.218		2.69-2.9	2.655-2.9
6.26775-6.26825		3.26-3.267	
6.31175-6.31225		3.332-3.339	
8.291-8.294		3.3458-3.358	
8.362-8.366		3.6-4.4	3.5-4.4
8.37625-8.38675		4.5-5.15	
8.41425-8.41475		5.35-5.46	
12.29-12.293		7.25-7.75	
12.51975-12.52025		8.025-8.5	
12.57675-12.57725		9.0-9.2	
13.36-13.41		9.3-9.5	
16.42-16.423		10.6-12.7	
16.69475-16.69525		13.25-13.4	
16.80425-16.80475		14.47-14.5	
25.5-25.67		15.35-16.2	
37.5-38.25		17.7-21.4	
73-74.6		22.01-23.12	
74.8-75.2		23.6-24.0	
108-121.94 123-138	108-138	31.2-31.8	
149.9-150.05		36.43-36.5	
156.52475-156.52525		Above 38.6	
156.7-156.9			
162.0125-167.17			
167.72-173.2			
240-285			
322-335.4			
399.9-410			
608-614			

Frequencies in **Bold** text are specific for FCC or ISSED, all other frequencies are common.

2.10 Transmitter radiated emission

Para. No.: 15.247 (d) / 15.209 (a)

Para. No.: RSS-247 5.5 / RSS-Gen 8.9

Transmitter radiated emission from 9 kHz to 30 MHz.

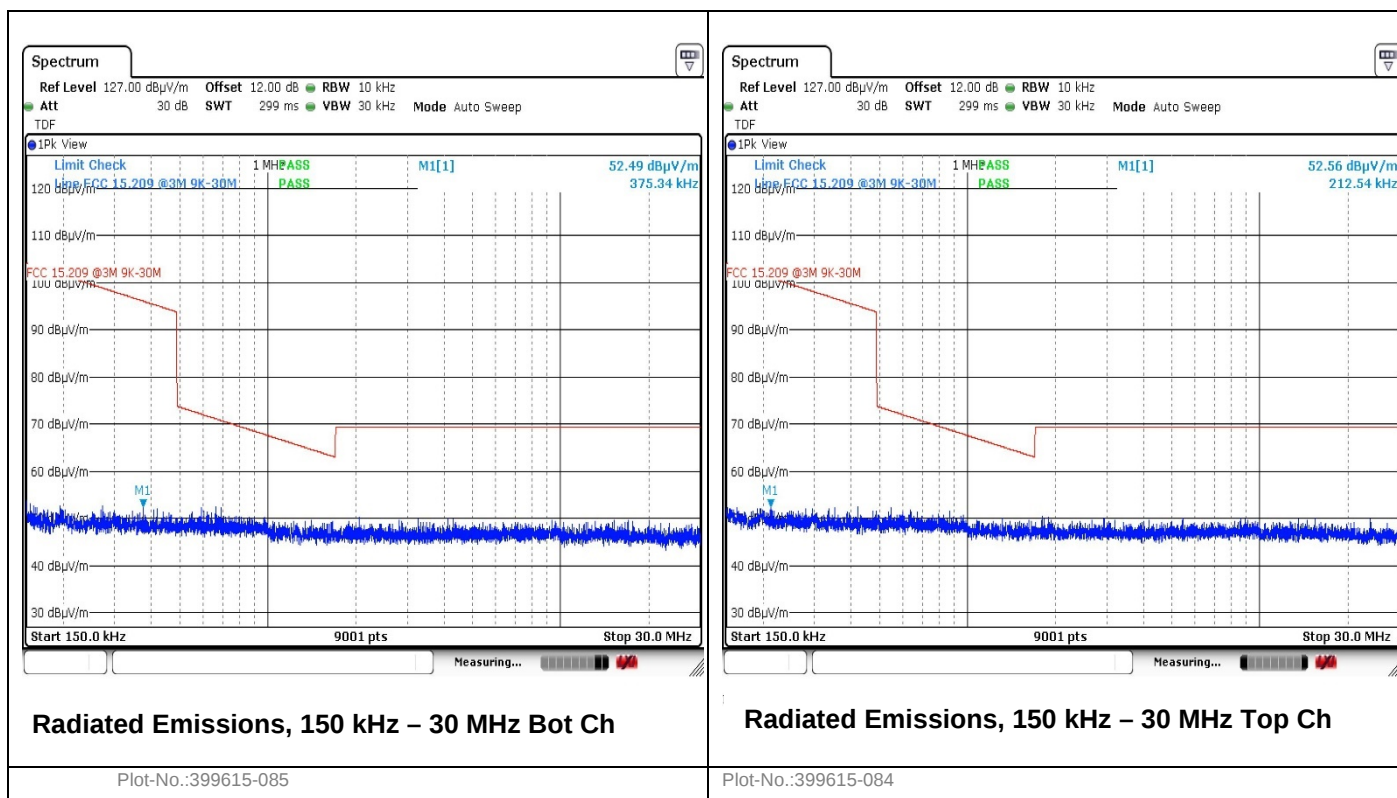
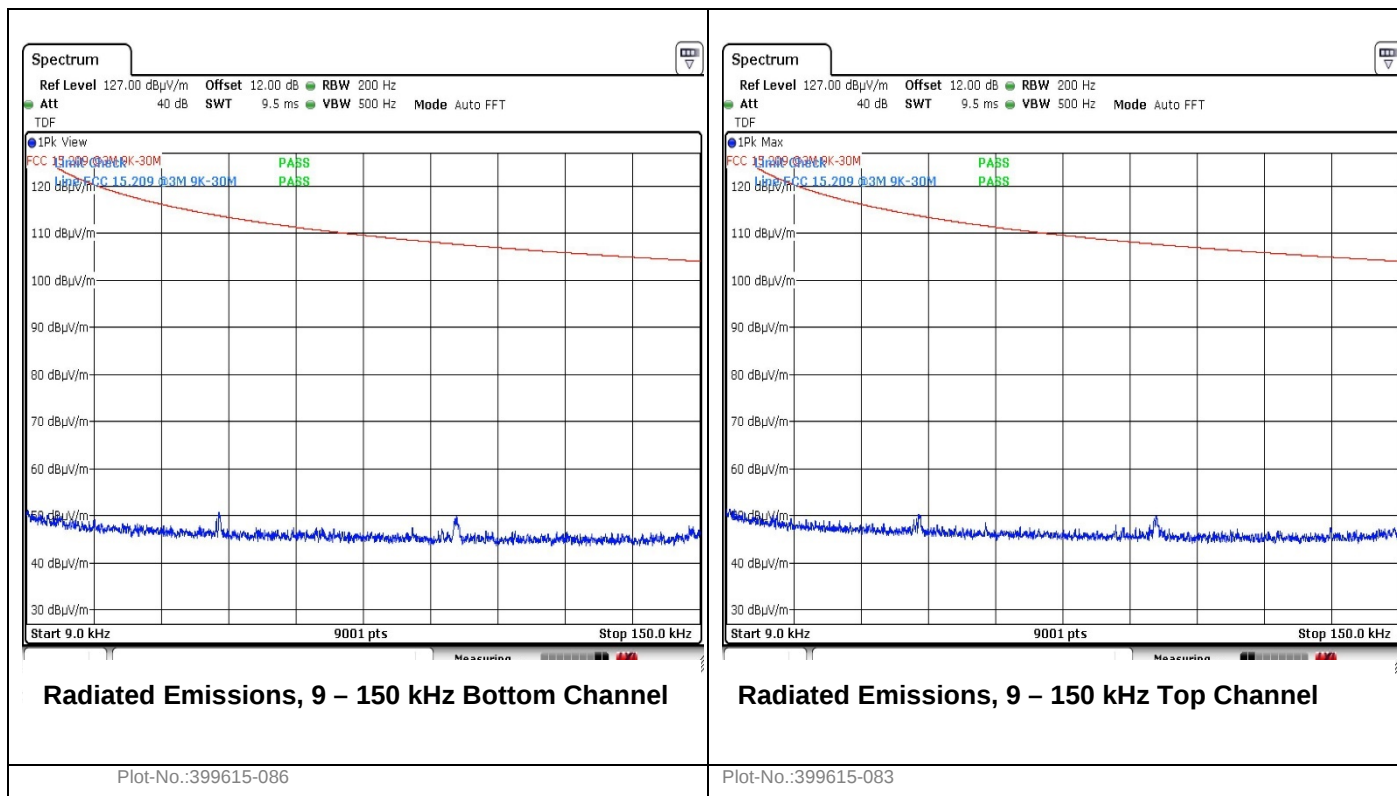
Test Performed by: Abdoufataou Salifou	Date of Test:2020-06-16
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Test Results: Complies

Measurement Data:

Measured Frequency (MHz)	Carrier Frequency (MHz)	Antenna	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
No spurious emissions were detected					

Transmitter radiated emission from 9 kHz to 30 MHz Plots:



Transmitter radiated emission from 30 to 1000 MHz

Test Performed by: Abdoufataou Salifou	Date of Test: 2020-06-16
--	--------------------------

Test Results: Complies

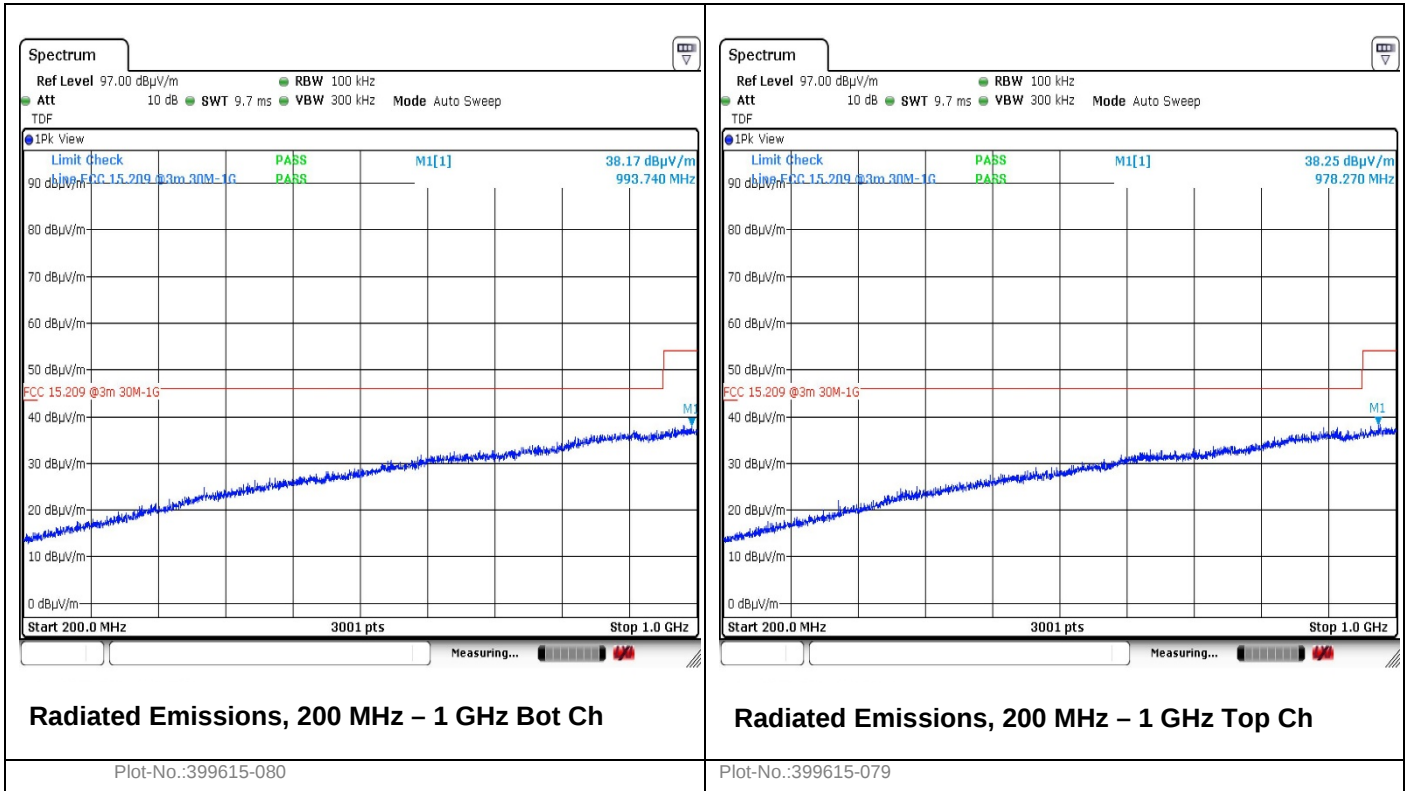
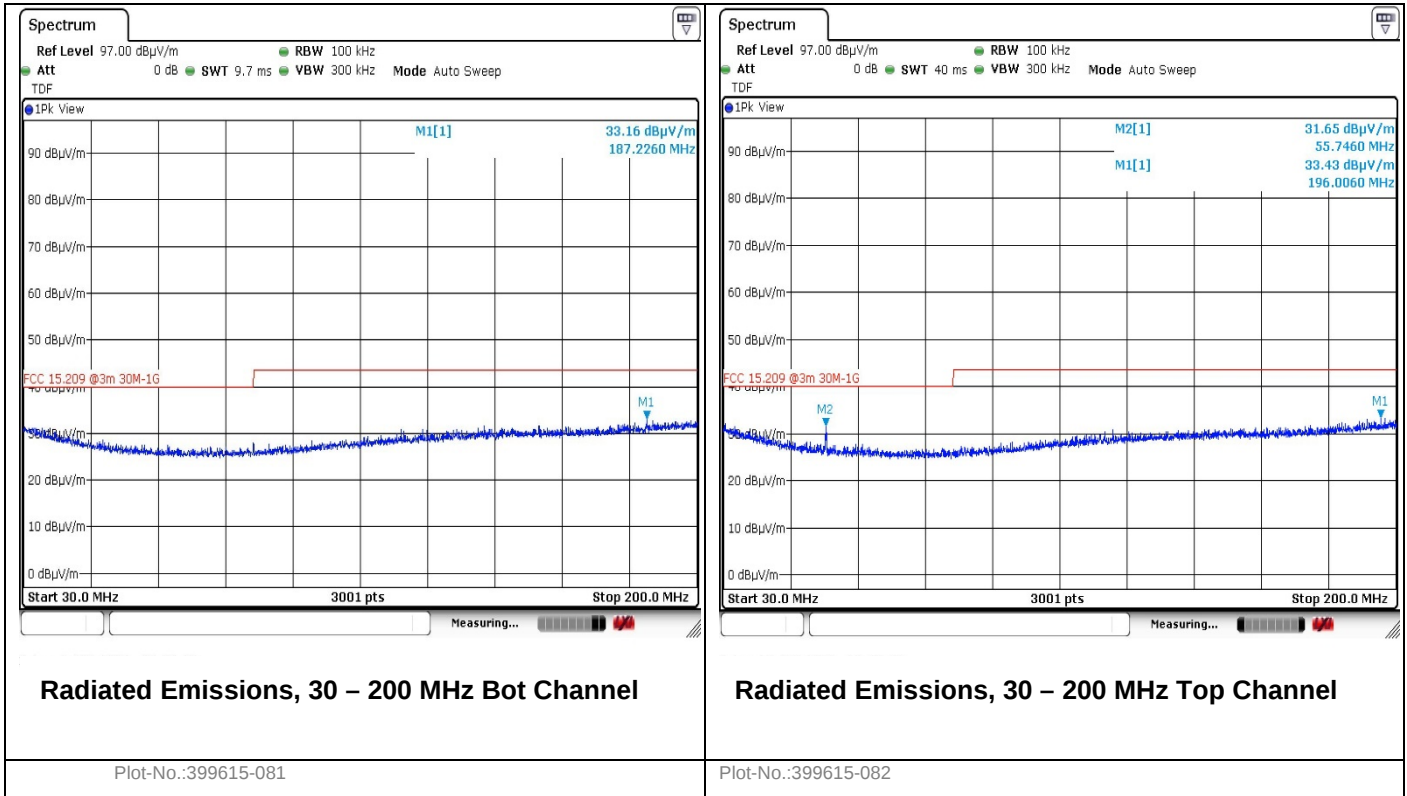
Measurement Data:

Measured Frequency (MHz)	Carrier Frequency (MHz)	Antenna	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
No spurious emissions were detected					

Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency (MHz)	Quasi Peak (µV/m)	Quasi Peak (dBµV/m)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Transmitter radiated emission from 30 to 1000 MHz Plots



Transmitter radiated Emissions from 1 GHz to 18 GHz

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-07-01

Test Results: Complies

Measurement Data:

Measured Frequency (GHz)	Carrier Frequency (MHz)	Antenna Polarisation	Peak Emission (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Calculated Average (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)
4.809	2405	Vertical	65.60	74.0	8.40	45.60	54.0	8.40
7.213	2405	Vertical	62.59	74.0	11.41	42.59	54.0	11.41
4.961	2480	Vertical	64.68	74.0	9.32	44.68	54.0	9.32
7.441	2480	Vertical	63.20	74.0	10.80	43.20	54.0	10.80

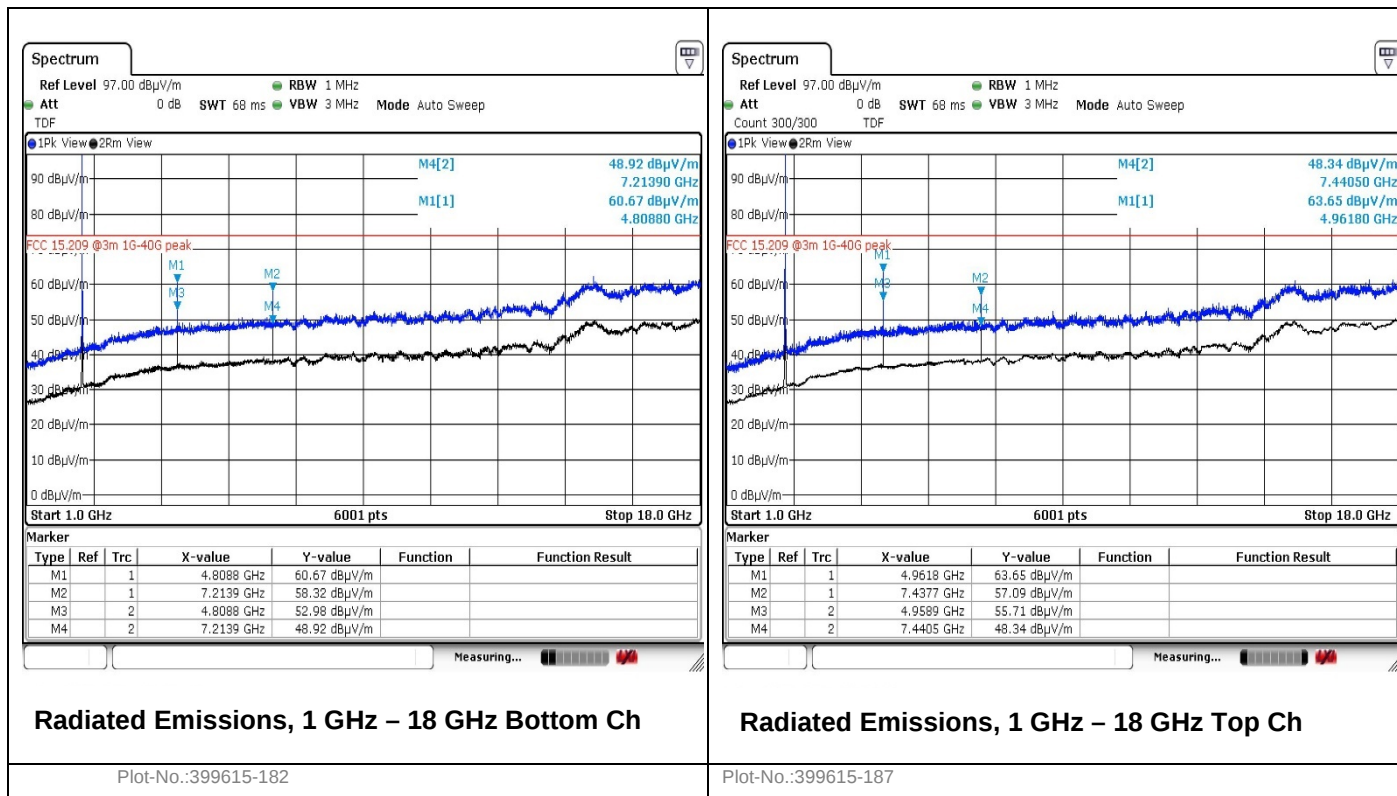
Average Values are calculated from Peak Values by Duty Cycle Correction Factor.

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor". See plots.

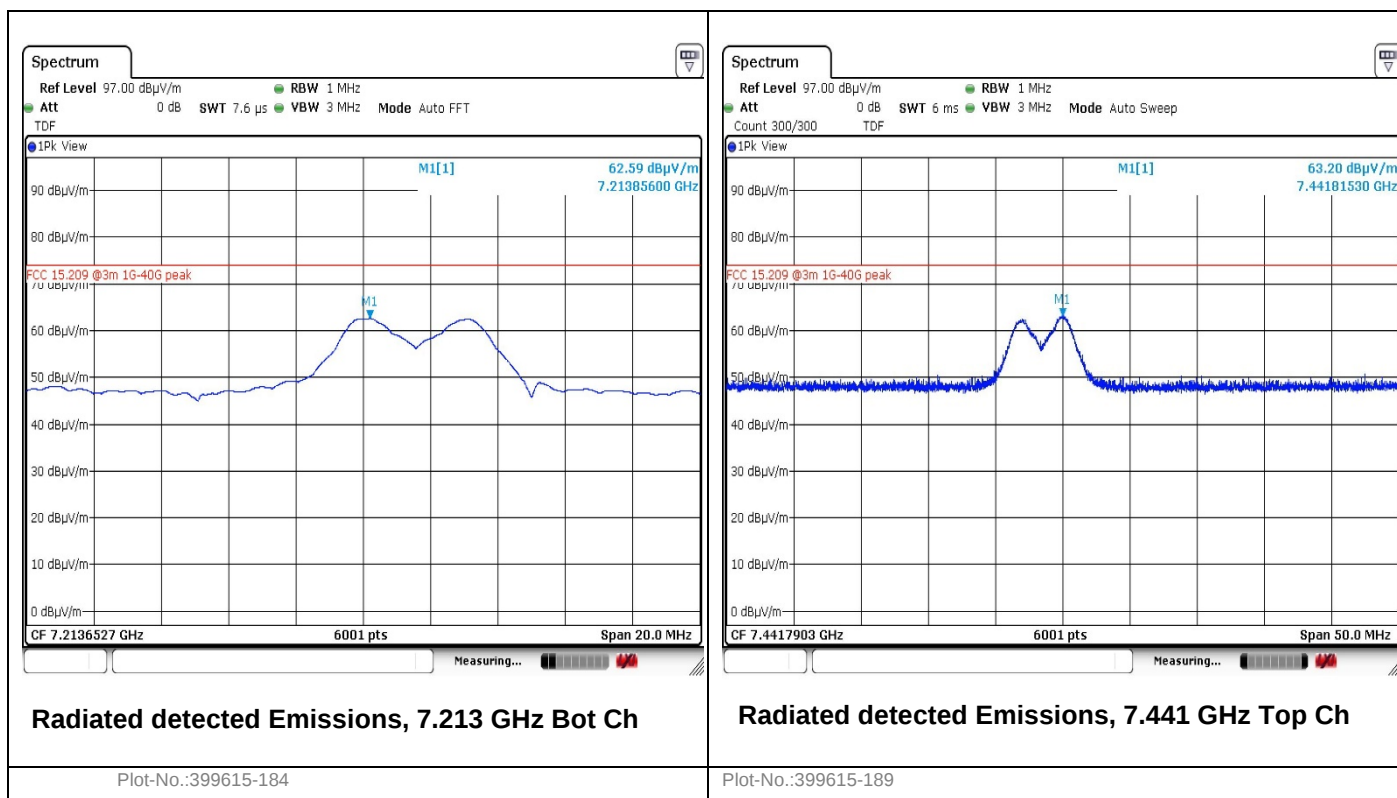
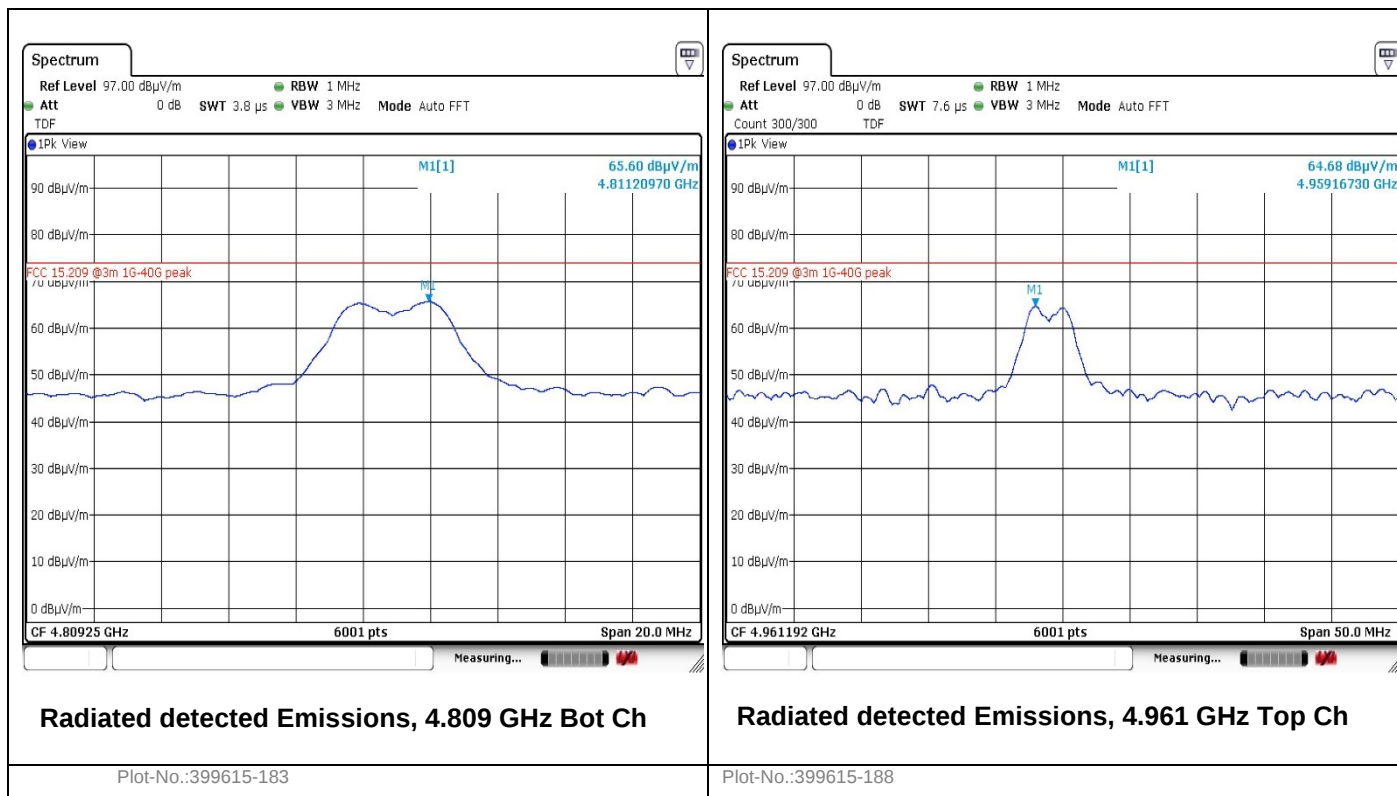
Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency	AV (dBµV/m)	PK (dBµV/m)
Above 1 GHz	54	74

Radiated Emissions from 1 GHz to 18 GHz Plots:



Radiated detected emission Plots:



Transmitter radiated Emissions from 18 GHz to 25 GHz

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-07-08

Test Results: Complies

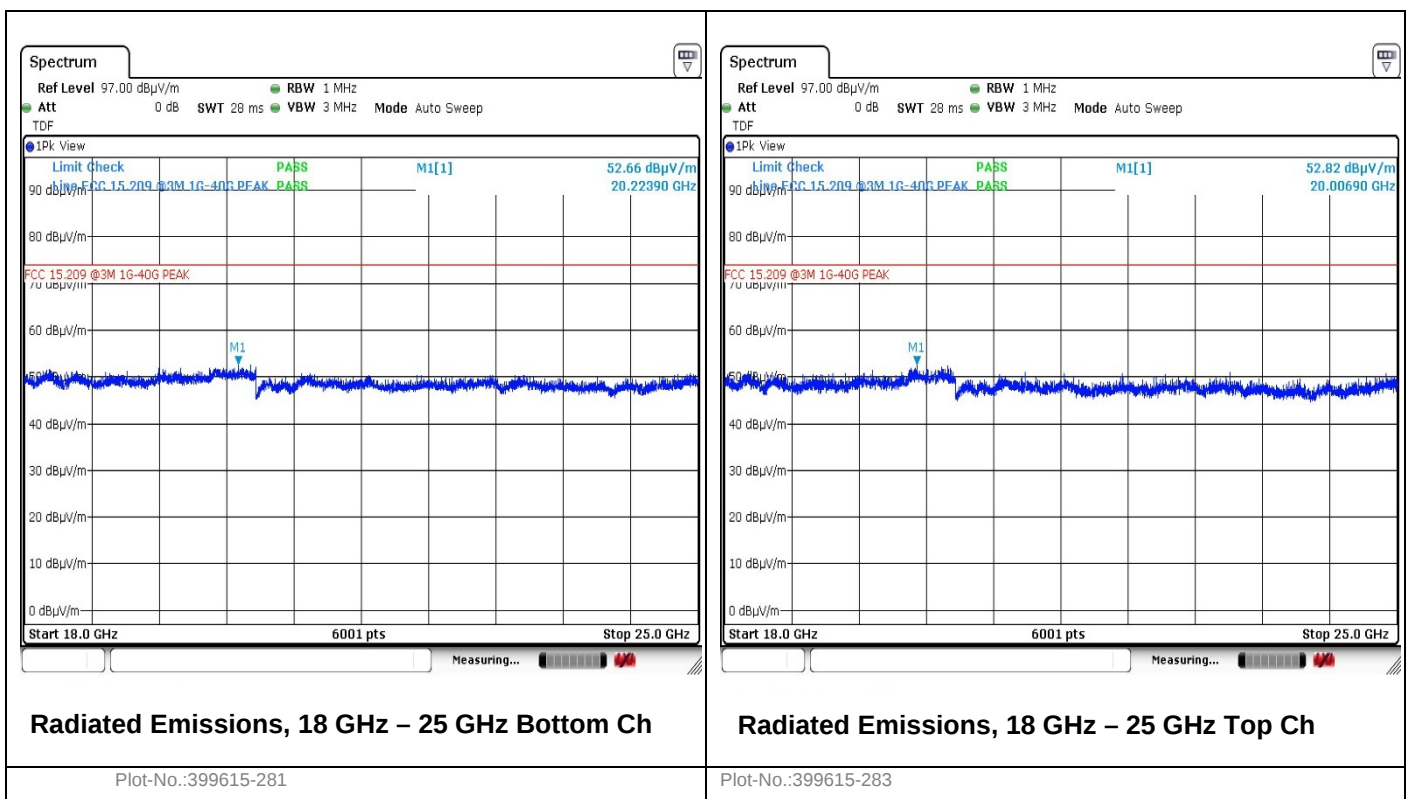
Measurement Data:

Measured Frequency (MHz)	Carrier Frequency (MHz)	Antenna	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
No spurious emissions were detected					

Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency	AV (dBμV/m)	PK (dBμV/m)
Above 1 GHz	54	74

Radiated Emissions from 18 GHz to 25 GHz Plots:



2.11 Transmitter Band Edge Radiated Emission

Para. No.: 15.247 (d) / 15.209 (a)

Para. No.: RSS-247 5.5 / RSS-Gen 8.9

Test Performed by: Abdoufataou Salifou

Date of Test: 2020-07-08

Test Results: Complies

Measurement Data: Lower Band Edge

Frequency (MHz)	Measured field strength (dB μ V/m)	Detector	20 dBc Limit (dB μ V/m)	Margin (dB)
2400.00	56.96	Peak	77.62	20.66

Measurement Data: Upper Band Edge / Restricted Band

Frequency (MHz)	Measured field strength (dB μ V/m)	Detector	Peak Limit (dB μ V/m)	Margin (dB)
2483.50	69.90	Peak	74.0	4.10

Measurement Data: Upper Band Edge / Restricted Band / Average-Integration Method

Frequency (MHz)	Measured field strength (dB μ V/m)	Detector	Average Limit (dB μ V/m)	Margin (dB)
2483.50	52.06	Average	54.0	1.94

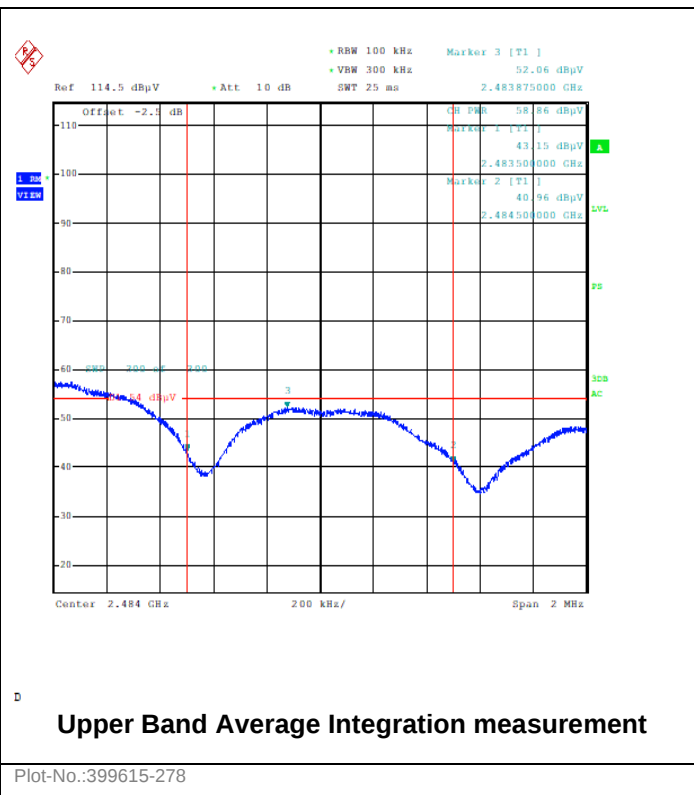
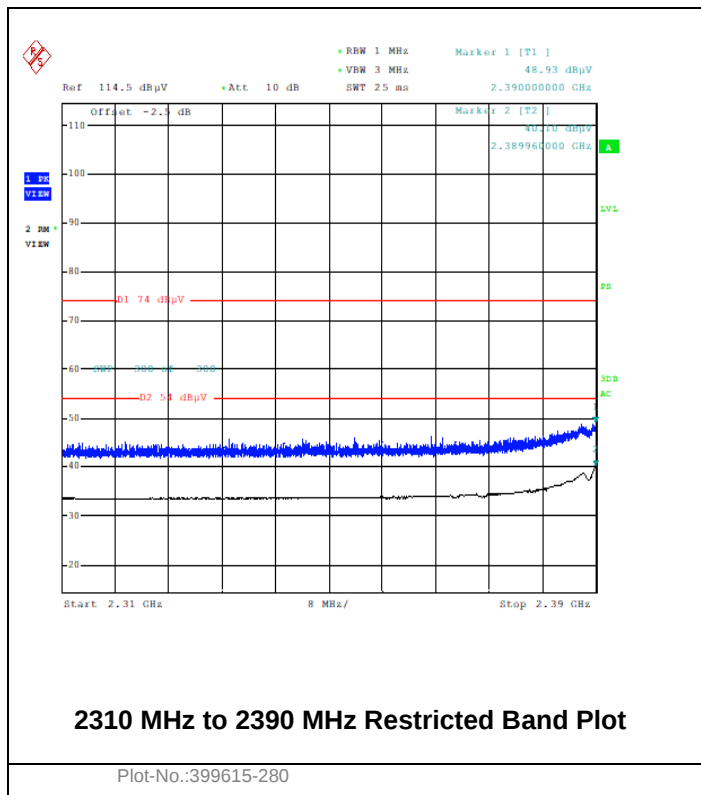
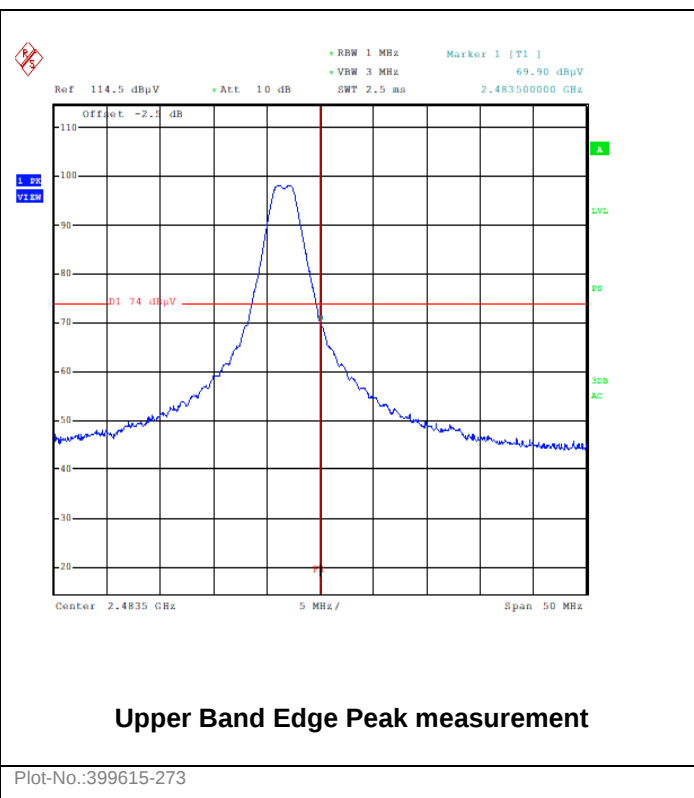
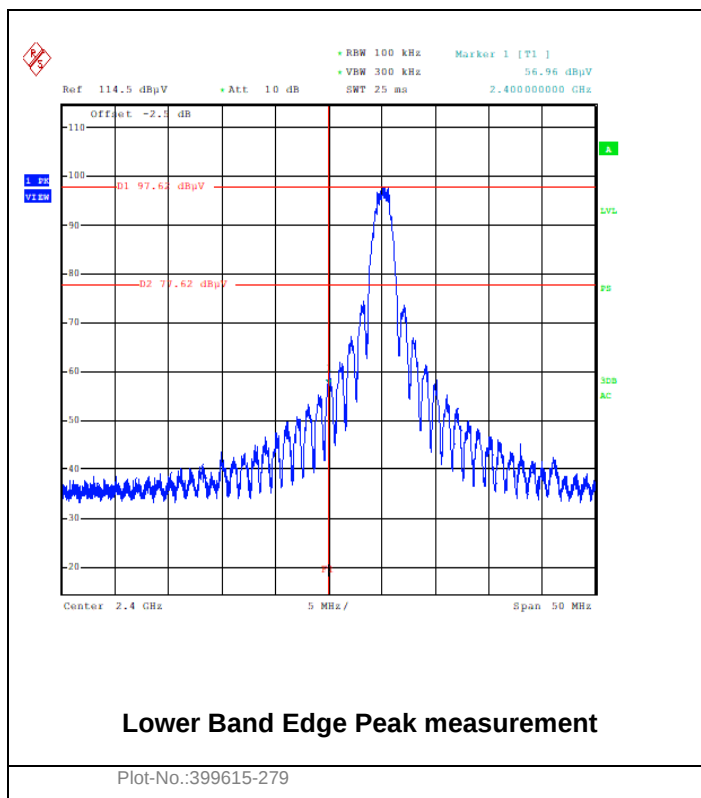
Measurement Data: 2310 to 2390 MHz Restricted Band

Frequency (MHz)	Measured field strength (dB μ V/m)	Detector	Peak Limit (dB μ V/m)	Margin (dB)
2390.000	48.93	Peak	74.0	25.07

Measurement Data: 2310 to 2390 MHz Restricted Band

Frequency (MHz)	Measured field strength (dB μ V/m)	Detector	Average Limit (dB μ V/m)	Margin (dB)
2390.000	40.10	Average	54.0	13.90

Band-edge Radiated Emissions Plots



3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty Values		
Test Item		Uncertainty
Output Power		±0.8 dB
Power Spectral Density		±0.8 dB
Out of Band Emissions, Conducted	< 3.6 GHz	±0.8 dB
	> 3.6 GHz	±1.2 dB
Spurious Emissions, Radiated	< 200 MHz	±4.77 dB
	200 MHz - 1 GHz	±5.02 dB
	1 GHz – 18 GHz	±4.94 dB
	> 18 GHz	±5.91 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		±3.58 %
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

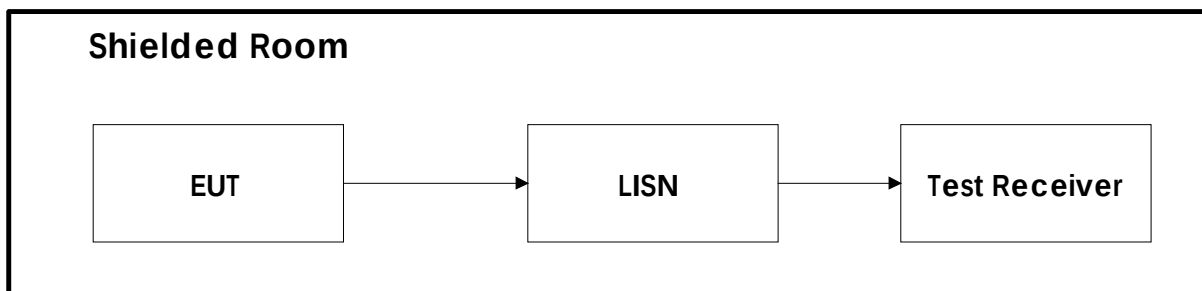
4 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

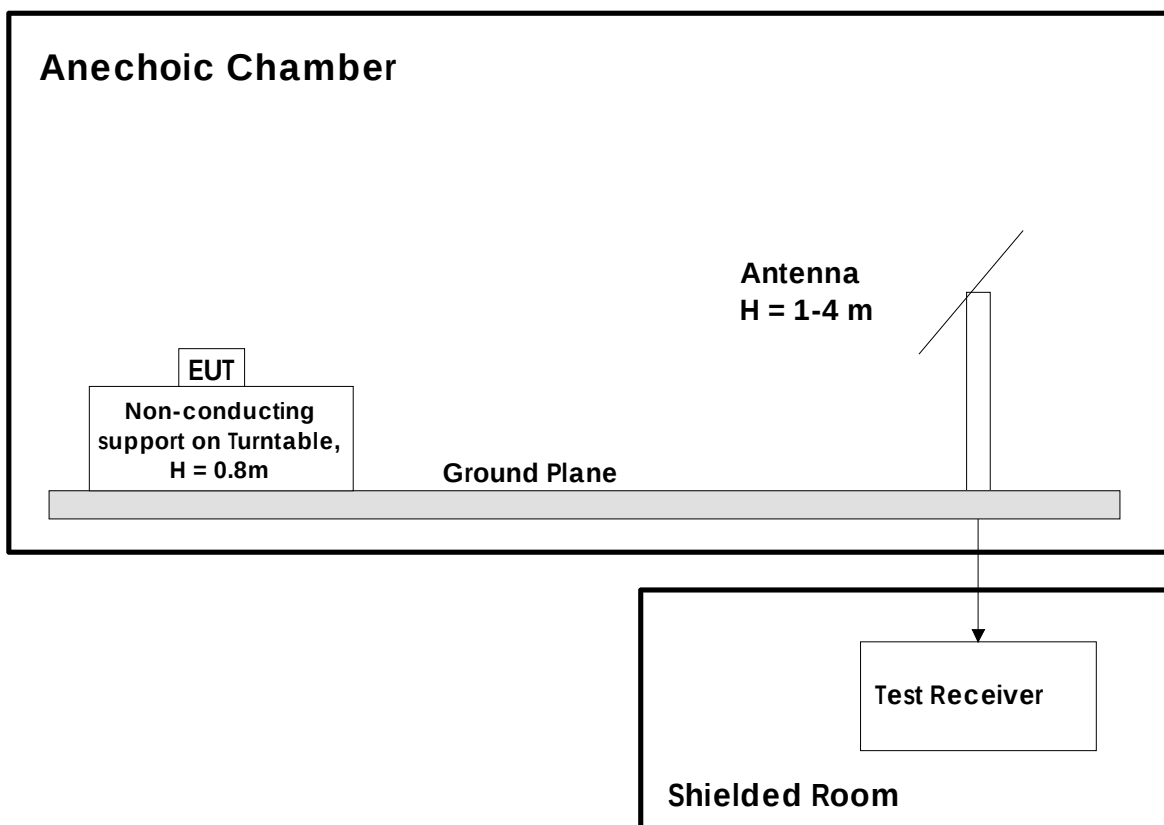
Inv.-Nr.	Instrument/ ancillary	Manufacturer	Type	Serial number	Cal. Date	Cal. Due
1-0037	Artificial mains network, 3ph	Rohde & Schwarz	ESH2-Z5	882394/019	2019-09	2020-09
1-0040	Biconical antenna	Rohde & Schwarz	HK116	888945/007	2017-07	2020-07
1-0054	Pulse limiter	Rohde & Schwarz	ESH3-Z2	3MSE/0099	2019-09	2020-09
1-0055	LogPer antenna	Rohde & Schwarz	HL223	826517/014	2017-07	2020-07
1-0072	Artificial mains network, 1ph	Rohde & Schwarz	ESH3-Z5	840062/001	2019-09	2020-09
1-0080	Turntable	H. Deisel	DS 420	1361114	N / A	N / A
1-0200	Trilog antenna	Schwarzbeck	VULB 9163	VULB 9163-107	2019-02	2022-02
1-0361	Semi anechoic chamber	Reinhold & Mahla	3m	1124	2019-12	2021-12
1-0364	Antenna cable 2	Kabelwerk Eupen	CMS / RG 214-N/7	none	2019-09	2022-09
1-0604	EMI test receiver	Rohde & Schwarz	ESU8	100203	2019-09	2020-09
1-0611	Spectrum analyzer	Rohde & Schwarz	FSV 40	100898	2019-09	2020-09
1-0614	Log.-per. antenna	Schwarzbeck	STLP 9148	STLP 9148-133	2019-08	2022-08
1-0615	Pre amplifier	Schwarzbeck	BBV-9718	BBV 9718-191	2019-09	2020-09
1-0619	Coaxial cable (to SAC)	Huber+Suhner	SF106/2x11N-651/2m	70168/6	2019-09	2022-09
1-0620	Antenna cable 3	Huber+Suhner	SF106/2x11N-651/3m	70619/6	2019-09	2022-09
1-0624	EMI-Software Radimation	DARE	Radimation	not applicable	N / A	N / A
1-0770	Horn antenna	Schwarzbeck	BBHA 9170	BBHA 9170-477	2018-06	2021-06
1-0771	Horn antenna	Schwarzbeck	BBHA 9170	BBHA 9170-476	2018-03	2021-03
1-0772	Horn antenna	Schwarzbeck	BBHA 9120D	BBHA 9120D-972	2018-03	2021-03
1-0781	Pre amplifier	Schwarzbeck	BBV 9721	BBV 9721-001	2019-09	2020-09
1-0782	Antenna cable	Huber & Suhner	FB142A1060002020	75193-01	2017-10	2020-10
1-0794	Coaxial cable	Rosenberger	FB142A0010002020	65627-01	2017-10	2020-10
1-0806	Controller	Innco	CO 3000	821/34571114/L	N / A	N / A
1-0807	Antenna mast	Innco	MA-400-XPET	4681114	N / A	N / A
1-0870	10 dB Attenuator	mini circuits	BW-N10W5+	1429	2019-09	2022-09
1-0871	10 dB Attenuator	mini circuits	BW-N10W5+	1414	2019-09	2022-09
1-0925	Coaxial cable	HARBOUR	RG316 MIL	#003	2019-09	2022-09
1-0927	Coaxial cable	HARBOUR	RG316 MIL	#005	2019-09	2022-09
1-0993	6 dB Attenuator	mini circuits	BW-N6W5+	1725	2017-10	2020-10
1-0994	3 dB Attenuator	mini circuits	BW-N3W5+	1734	2017-10	2020-10
1-0995	6 dB Attenuator	mini circuits	UNAT-6+	15542	2017-09	2021-09
1-1012	Coaxial cable	Rosenberger	LA2-018-2000	010-1964471 0001	2018-09	2021-09
1-1037	Coaxial cable	Schwarzbeck	AK 9515H	AK 9515H #91	2018-09	2021-09

5 BLOCK DIAGRAM

5.1 Power Line Conducted Emission



5.2 Test Site Radiated Emission



Measurements at 1GHz and above were performed with turntable height 1.5m and with the ground plane covered by absorbers.

Revision history

Version	Date	Comment	Sign
00	2020-10-14	First version	FH

End of Report