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Radio measurements on SM 6705 B260

Product name: SM 6705 B260

Product number: KRK 101 10/1

RISE Research Institutes of Sweden AB **Vehicles and Automation - EMC-IKT**

Performed by

Examined by

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Summary

Standard Listed part of	Compliant
FCC CFR 47 part 2/ part 30 Subpart C	
2.1046/ 30.202 RF power output	Yes
2.1049 Occupied bandwidth	Yes
2.1053/ 30.204 Field strength of spurious radiation	Yes
2.1055 Frequency stability	Yes

Description of the test object

Equipment:	Radio equipment:, SM 6705 B260 Product number: KRK 101 10/1 containing KRX 101 10/1 Rev. R1A with FCC ID: TA8AKRX10110
Hardware revision state:	R1A
Tested configuration:	3GPP NR TDD
Frequency range:	TX/ RX: 37000 – 40000 MHz
No of supported beams:	Config mode 0: 4 beams in 2 orthogonal polarizations each, 8 beams in total. Config mode 1: 2 beams in 2 orthogonal polarizations each, 4 beams in total. Config mode 2: 1 beam in 2 orthogonal polarizations each, 2 beams in total.
Operating bandwidth:	Config mode 0: Four segments of 200MHz Config mode 1: Two segments of 400 MHz Config mode 2: One segment of 400 MHz
Nominal Output power (EIRP):	57 dBm/ beam and polarization config mode 2 53 dBm/ beam and polarization config mode 1 47 dBm/ beam and polarization config mode 0
RF configurations:	TX Diversity, SU and MU MIMO up to 2 layers 1x(2x2), Contiguous Spectrum (CS) and Non-Contiguous spectrum (NCS), Carrier Aggregation (CA) intra-band supported
Antenna beam steering:	Azimuth ± 60 deg, elevation ± 15 deg
Channel bandwidth(s)/ Sub Carrier Spacing:	50 MHz, 100 and 200 MHz/ 120 kHz
Modulations:	QPSK, 16QAM and 64QAM
Emission designators:	46M2W7D, 95M2W7D and 189MW7D
Emission designators Carrier Aggregation:	Maximum 792MW7D (8x 100 MHz)
RF power Tolerance:	+2.4/ -2.0 dB
CPRI Speed:	24.3 Gbps
Nominal rating:	120 VAC 60 Hz

The information above is supplied by the manufacturer.

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable parts of FCC CFR 47 part 30.

Operation modes during measurements

The measurements were performed with the test object transmitting test models as defined in 3GPP TS 38.141-2. Test model NR-FR2 TM 1.1 is used to represent QPSK, test model NR-FR2 TM 3.2 to represent 16QAM, test model NR-FR2 TM 3.1 to represent 64QAM modulation

The settings below were deemed representative for worst case settings, for all traffic scenarios when settings with different modulations and RF configurations was found to represent worst case settings.

MIMO mode, NR-FR2 TM1.1, QPSK with the beams locked in boresight. All measurements were performed with the test object configured for maximum transmit power.

The measurement shall be done during active part of transmission, or if the measurement is performed with constant duty cycle <98%, the result shall be adjusted for the duty cycle according to ANSI C63.26 5.2.4.3.4. The duty cycle was measured to 74% and to compensate for this 1.30 dB was added to the test results.

Measurements

The test object was powered with 120 VAC 60 Hz by an external power supply. Additional connections are documented in the setup drawings for radiated measurements.

RISE 10 MHz reference was connected to the signal analyser as external reference, during all measurements.

Evaluation of spurious emissions have been done in several beam directions, including extreme settings both in azimuth and elevation planes. Results have shown that Beam index 0/Boresight can represent worst case.

Far field distance for power, OBW and Band edge measurements is 3.84 m, based on the EUT antenna dimensions and the highest transmitter frequency (40 GHz).

Far field distances for OOB emissions is based on the measurement antenna dimension and highest frequency in the measure frequency range:

Frequency range [GHz]	Far field distance [m]	Measured distance [m]
18 – 26.5	0.73	4
26.5 – 40	0.49	4
40 – 60	0.34	3
60 – 90	0.18	1
90 – 110	0.16	1
110 – 150	0.13	1
150 – 170	0.13	0.5
170 – 200	0.10	0.5

Formula for far field distance calculation:

$$R = 2x D^2 / \lambda$$

References

Measurements were done according to relevant parts of the following documents:

CFR 47 part 30, Feb 2022

ANSI C63.26-2015

KDB 842590 D01 Upper Microwave Flexible Use Service v01r02

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 971168 D03 IM Emission Repeater Amp v01

3GPP TS 38.141-2 V15.5.0 (2020-03)

3GPP TR 37.842 V13.3.0 (2020-01)

RISE Measurement equipment

	Calibration Due	RISE number
Anechoic chamber, Hertz	2024-07	BX50194
R&S FSW 43	2022-07	902 073
R&S ESU 26	2022-07	901 553
R&S ZNB 40	2022-08	BX50051
RF Cable VNA-calibration	2023-01	BX50189
RF Cable VNA-calibration	2023-01	BX50190
RF Cable	2022-04	BX50236
RF Cable	2022-10	BX50192
RF Cable	2022-04	KWP04236
RF Cable	2022-05	BX81423
RF Cable	2022-09	503 681
RF Cable FSW-B21	2022-09	BX62069
RF Cable FSW-B21	2022-09	BX62073
Bilog antenna Schaffner 6143A	2024-07	504 079
Flann STD Gain Horn Antenna 20240-20	-	KWP02600
Flann STD Gain Horn Antenna 22240-20	-	KWP02601
Flann STD Gain Horn Antenna 24240-20	-	BX92414
Flann STD Gain Horn Antenna 26240-20	-	BX92416
Flann STD Gain Horn Antenna 27240-20	-	BX92417
Flann STD Gain Horn Antenna 29240-20	-	BX92419
Flann STD Gain Horn Antenna 30240-20	-	BX92420
Mixer FS-Z60	2023-08	BX90566
Mixer FS-Z90	2025-01	BX90567
Mixer FS-Z110	2024-01	BX81425
Mixer FS-Z170	2024-01	BX81426
Mixer FS-Z220	2024-01	BX81427
Miteq, Low Noise Amplifier	2023-01	503 278
EMCO Horn Antenna 3115	2024-07	502 175
EMCO Horn Antenna 3115	2024-11	902 212
EMCO Horn Antenna 3116	2024-06	503 279
µComp Nordic, Low Noise Amplifier	2023-01	901 544
Temperature and humidity meter, Testo 615	2022-06	503 498
Testo 635, temperature and humidity meter	2022-07	504 203
Multimeter Fluke 87	2022-05	502 190

EAB Measurement equipment

Calibrated at RISE before testing.

	Calibration Due	S/N
Marki Microwave FLP2650 Low pass filter	2023-02	1827
Qualwave QBF-26400-33000-60 Band pass filter	2023-02	182704

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation "SP-QD 10885". The uncertainties are calculated with a coverage factor $k=2$ (95% level of confidence).

Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

Reservation

The test results in this report apply only to the particular test object as declared in the report.

Delivery of test object

The test object was delivered: 2022-02-23

Manufacturer's representative

Patrik Hellström, Ericsson AB.

Test engineers

Tomas Lennhager and Björn Skönvall, RISE

Test participant(-s)

None

Test frequencies used for radiated measurements

Config mode 2

Symbolic name	Beam/Carrier	Frequency Hor/ Ver [MHz]	Comment
BL ₅₀	B1/C1	37025.04	50 MHz BW, TX bottom low block
ML ₅₀	B1/C1	37800.00	50 MHz BW, TX middle low block
TL ₅₀	B1/C1	38574.96	50 MHz BW, TX top low block
BH ₅₀	B1/C1	38625.00	50 MHz BW, TX bottom high block
MH ₅₀	B1/C1	39300.00	50 MHz BW, TX middle high block
TH ₅₀	B1/C1	39975.00	50 MHz BW, TX top high block
BL ₁₀₀	B1/C1	37050.00	100 MHz BW, TX bottom low block
ML ₁₀₀	B1/C1	37800.00	100 MHz BW, TX middle low block
TL ₁₀₀	B1/C1	38550.00	100 MHz BW, TX top low block
BH ₁₀₀	B1/C1	38649.96	100 MHz BW, TX bottom high block
MH ₁₀₀	B1/C1	39300.00	100 MHz BW, TX middle high block
TH ₁₀₀	B1/C1	39950.04	100 MHz BW, TX top high block
BL ₂₀₀	B1/C1	37100.04	200 MHz BW, TX bottom low block
TL ₂₀₀	B1/C1	38499.96	200 MHz BW, TX top low block
TH ₂₀₀	B1/C1	39900.00	200 MHz BW, TX top high block
BL _{2max50}	B1/C1	37025.00	50 MHz BW, TX 2 carrier bottom max IBW low block
	B1/C2	37374.96	
TL _{2max50}	B1/C1	38225.04	50 MHz BW, TX 2 carrier top max IBW low block
	B1/C2	38574.96	
BH _{2max50}	B1/C1	38625.00	50 MHz BW, TX 2 carrier bottom max IBW high block
	B1/C2	38975.04	
TH _{2max50}	B1/C1	39625.08	50 MHz BW, TX 2 carrier top max IBW high block
	B1/C2	39975.00	
BL ₂₁₀₀	B1/C1	37050.00	100 MHz BW, TX 2 carrier bottom low block
	B1/C2	37149.96	
BL ₄₁₀₀	B1/C1	37050.00	100 MHz BW, TX 4 carrier bottom low block
	B1/C2	37149.96	
	B1/C3	37249.92	
	B1/C4	37350.00	

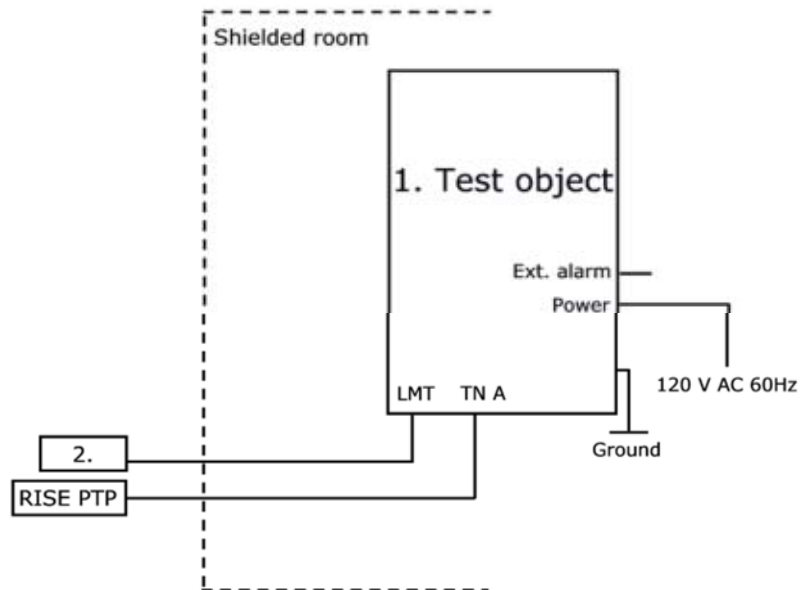
Config mode 1

Symbolic name	Beam/Carrier	Frequency Hor/ Ver [MHz]	
BL ₈₁₀₀	B1/C1	37050.00	100 MHz BW, TX 8 carrier bottom low
	B1/C2	37149.96	
	B1/C3	37249.92	
	B1/C4	37350.00	
	B2/C1	37449.96	
	B2/C2	37549.92	
	B2/C3	37650.00	
	B2/C4	37749.96	

Config mode 0

Symbolic name	Beam/Carrier	Frequency Hor/ Ver [MHz]	
BMT ₄₅₀	B1/C1	37025.04	50 MHz BW, Tx 4 carrier bottom middle and top
	B2/C1	38025.00	
	B3/C1	38975.04	
	B4/C1	39975.00	

Test setup: radiated measurements



Test object:

1.	SM 6705, KRK 101 10/1, rev. R1A, s/n: E23D698264 containing KRX 101 10/1 rev. R1A with FCC ID: TA8AKRX10110 Baseband software: CXP2010174/1, rev. R46A09 Radio Software: CXP 203 0045/1, rev. R11E23
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Functional test equipment:

2.	Computer, HP ZBook, BAMS – 1001530471 D-Link Des-3526, Network switch
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Interfaces:

Power input 120 VAC 60Hz	Power
USB, USB-C, not used in this configuration	Signal
LMT, RJ45, shielded ethernet cable	Wired network
EC, EXT Alarm, RJ45, shielded ethernet cable	Signal
TN A, Optical Interface Link	OIL
TN B, Optical Interface Link, not used in this configuration	OIL

RF power output measurements according to CFR 47 §30.202

Date	Temperature	Humidity
2022-02-23	24 °C ± 3 °C	15 % ± 5 %
2022-02-24	24 °C ± 3 °C	15 % ± 5 %
2022-03-01	24 °C ± 3 °C	13 % ± 5 %
2022-03-02	24 °C ± 3 °C	15 % ± 5 %

Test set-up and procedure

The test object was located in an anechoic chamber. The measuring antenna was aligned to the centre of the PAAM. A turn table was used to find the highest output power. A signal analyzer with the channel power function activated was used to measure the output power with the RMS detector activated. The bandwidth setting of the channel power function was set to 100 MHz.

A substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).

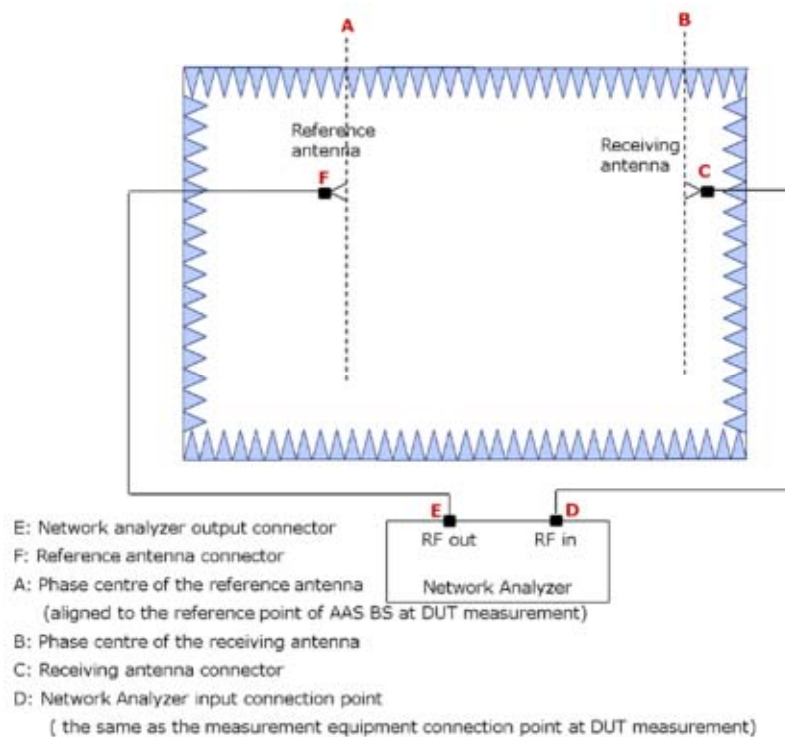


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

Stage 1 - Calibration:

- 1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
- 2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.
- 3) Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure $LF_{EIRP, E \rightarrow D}$, which is equivalent to $20 \log |S_{21}|$ (dB) obtained by the network analyzer:
 $LF_{EIRP, E \rightarrow D}$: Pathloss between E and D in figure 1.

- 4) Measure the cable loss, $LF_{EIRP, E \rightarrow F}$ between the reference antenna connector and the network analyzer connector:
 $LF_{EIRP, E \rightarrow F}$: Cable loss between E and F in figure 1.
- 5) Calculate the calibration value between A and D with the following formula:
 $L_{EIRP_cal, A \rightarrow D} = LF_{EIRP, E \rightarrow D} + G_{REF_ANT_EIRP, A \rightarrow F} - LF_{EIRP, E \rightarrow F}$.
 $L_{EIRP_cal, A \rightarrow D}$: Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer.
 $G_{REF_ANT_EIRP, A \rightarrow F}$: Antenna gain of the reference antenna.

Stage 2 - Measurement:

- 6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
- 7) Measure the mean power, $P_{R_EUT_EIRP, D}$, D in figure 1.
- 8) Calculate the EIRP with the following formula:

$$EIRP = P_{R_EUT_EIRP, D} + L_{EIRP_cal, A \rightarrow D}$$

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 22240-20	BX92413
RF Cable	KWP04236
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 3.3 dB

Results

Single carrier Config mode 2

Beam index 0 Boresight, Carrier Bandwidth 50 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 57 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal
Symbolic name	B1/C1
BL ₅₀	56.57/ 56.82

Beam index 0 Boresight, Carrier Bandwidth 100 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 57 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal
Symbolic name	B1/C1
BL ₁₀₀	56.19/ 56.25
ML ₁₀₀	55.79/ 56.19
TL ₁₀₀	56.07/ 55.47
BH ₁₀₀	56.16/ 55.55
MH ₁₀₀	55.98/ 55.57
TH ₁₀₀	55.47/ 55.29

Beam index 0 Boresight, Carrier Bandwidth 200 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 57 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal		
Symbolic name	B1/C1	B1/C1	Total (per 200 MHz)
BL ₂₀₀	52.67/ 52.89	52.98/ 53.09	55.84/ 56.00

Peak to Average Power Ratio – (PAPR)

Symbolic name	B1/C1 [dB]
BL ₅₀	9.22
BL ₁₀₀	8.5
BL ₂₀₀	7.8

2-Carrier Config mode 2

Beam index 0 Boresight, Carrier Bandwidth 100 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 57 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal		
Symbolic name	B1/C1	B1/C2	Total (per 200 MHz)
BL ₂₀₀	52.82/ 52.94	53.24/ 53.18	56.04/ 56.07

4-Carrier Config mode 2

Beam index 0 Boresight, Bandwidth 100MHz, QPSK

Nominal rated output power (EIRP) per Beam: 57 dBm/ Polarization

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal				
Symbolic name	B1/C1	B1/C2	B1/C3	B1/C4	Total (per 400 MHz)
BL ₄₀₀	48.80/ 50.02	49.51/ 49.81	50.53/ 50.68	50.44/ 51.07	55.90/ 56.45

8-Carrier Config mode 1

Beam index 0 Boresight, Carrier Bandwidth 100 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 53.0 dBm/ Polarization.

Symbolic name	Output power per 100 MHz, EIRP [RMS dBm]									
	Vertical					Horizontal				
	B1/C1	B1/C2	B1/C3	B1/C4	Total Power Beam 1 (per 400 MHz)	B2/C1	B2/C2	B2/C3	B2/C4	Total power Beam 2 (per 400 MHz)
BL8 ₁₀₀	45.12/ 46.44	45.61/ 46.05	46.77/ 46.84	46.82/ 47.36	52.16/ 52.72	45.72/ 45.96	45.80/ 45.81	47.02/ 46.64	47.22/ 47.16	52.51/ 52.45

4-Carrier Config mode 0

Beam index 0 Boresight, Carrier Bandwidth 50 MHz, QPSK

Nominal rated output power (EIRP) per Beam: 47.0 dBm/ Polarization.

Symbolic name	Output power per 100 MHz, EIRP [RMS dBm]			
	Vertical		Horizontal	
	B1/C1	B2/C1	B3/C1	B4/C1
BMT4 ₅₀	46.59/ 47.01	46.33/ 46.31	46.92/ 45.90	46.55/ 46.30

Limits

CFR47 §30.202 Power limits.

- (a) For fixed and base stations operating in connection with mobile systems, the average power of the sum of all antenna elements is limited to an equivalent isotropically radiated power (EIRP) density of +75dBm/100 MHz. For channel bandwidths less than 100 MHz the EIRP must be reduced proportionally and linearly based on the bandwidth relative to 100 MHz.

Complies?	Yes
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Occupied bandwidth measurements according to CFR47 §2.1049

Date	Temperature	Humidity
2022-02-23	24 °C ± 3 °C	15 % ± 5 %
2022-02-24	24 °C ± 3 °C	15 % ± 5 %
2022-03-02	24 °C ± 3 °C	15 % ± 5 %
2022-03-10	24 °C ± 3 °C	15 % ± 5 %

Test set-up and procedure

The test object was located in a anechoic chamber. The measuring antenna was aligned to the centre of the of the PAAM. A turn table was used to find the highest output power. A signal analyzer with Peak detector and max hold was used to measure the OBW.

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 22240-20	BX92413
RF Cable	KWP04236
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 2.5 %

Results

Single carrier, Config mode 2, Bandwidth: 50MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.1	TL ₅₀	Hor	46.193
1.2	TL ₅₀	Ver	46.211

Single carrier, Config mode 2, Bandwidth: 100MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.3	TL ₁₀₀	Hor	95.227
1.4	TL ₁₀₀	Ver	95.139

Single carrier, Config mode 2, Bandwidth: 200MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.5	TL ₂₀₀	Hor	189.439
1.6	TL ₂₀₀	Ver	189.257

Carrier Aggregation, Config mode 1, Bandwidth: 8x 100MHz, Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.7	BL8 ₁₀₀	Hor	792.159
1.8	BL8 ₁₀₀	Ver	791.584

Diagram 1.1, TL₅₀, QPSK, Horizontal:

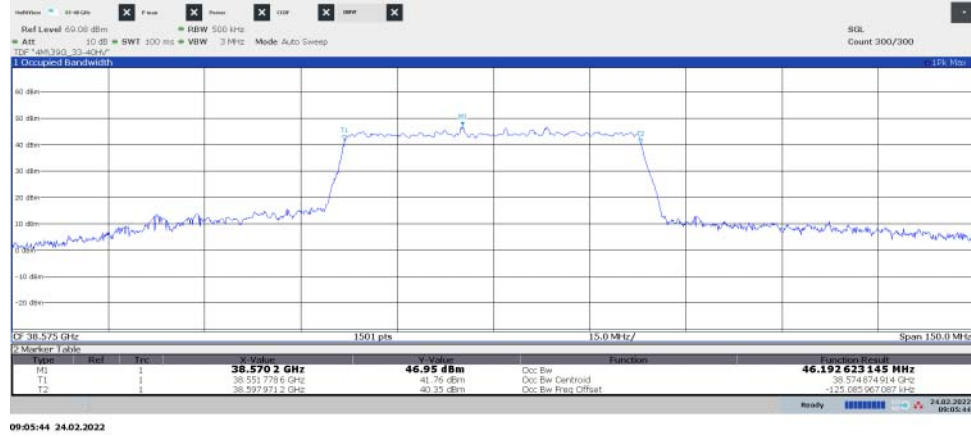


Diagram 1.2, TL₅₀, QPSK, Vertical:

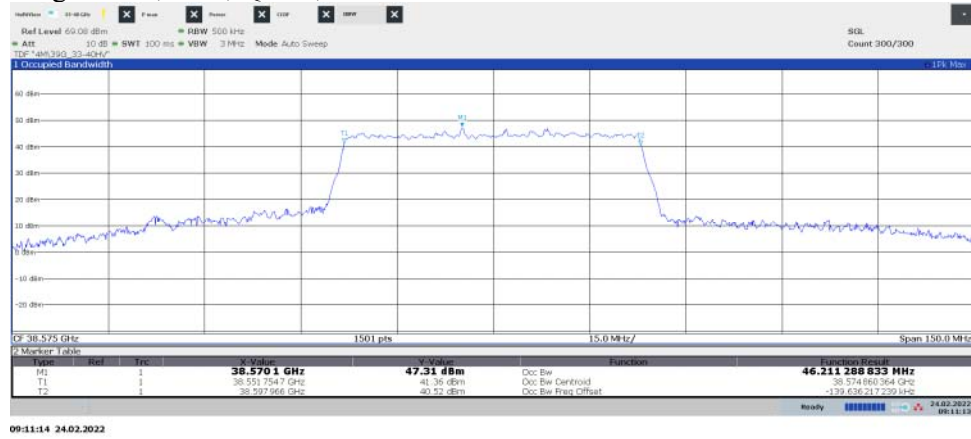


Diagram 1.3, TL₁₀₀, QPSK, Horizontal:

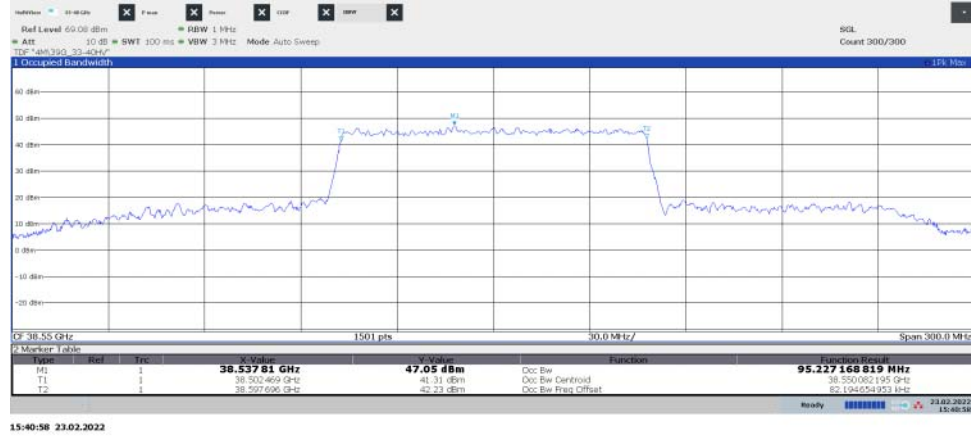


Diagram 1.4, TL₁₀₀, QPSK, Vertical::

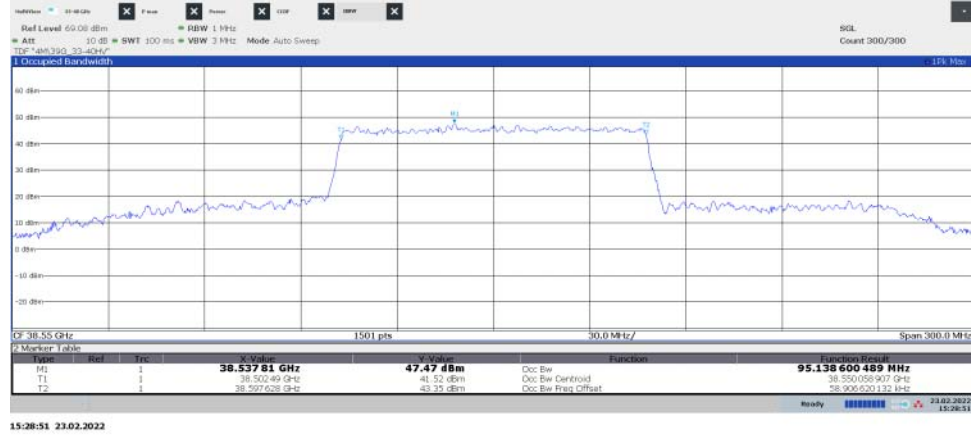


Diagram 1.5, TL₂₀₀, QPSK, Horizontal:

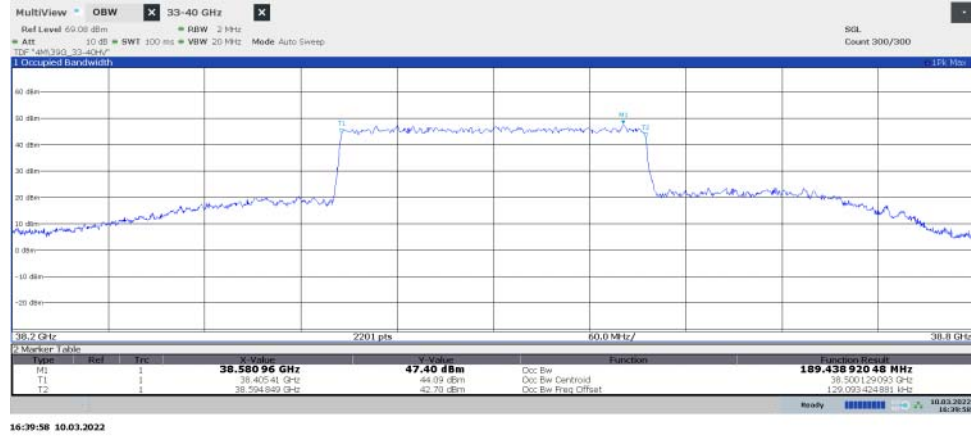


Diagram 1.6, TL₂₀₀, QPSK, Vertical::

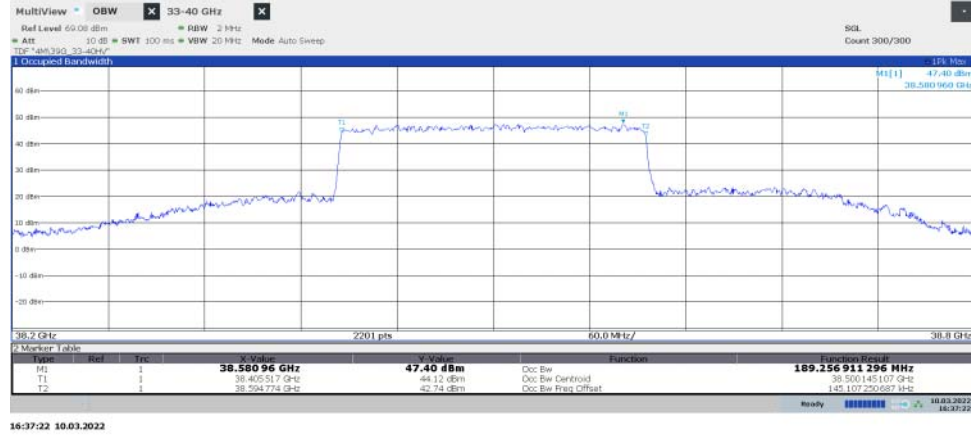


Diagram 1.7, BL8₁₀₀, QPSK, Horizontal:

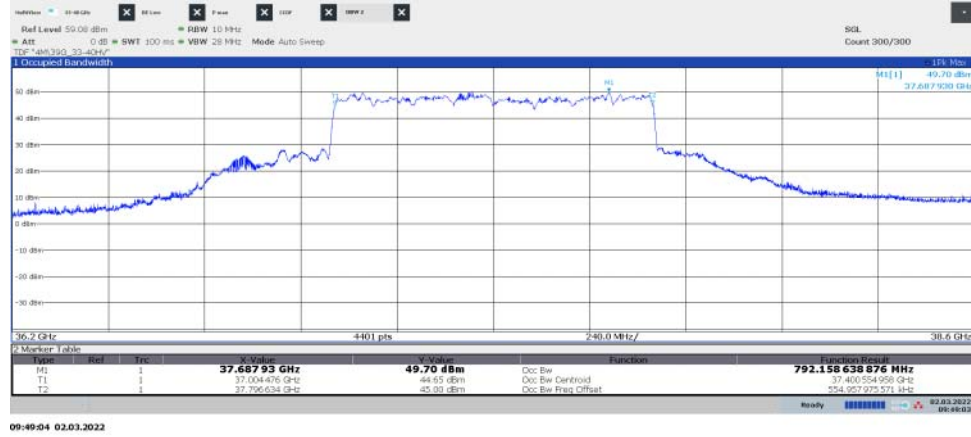
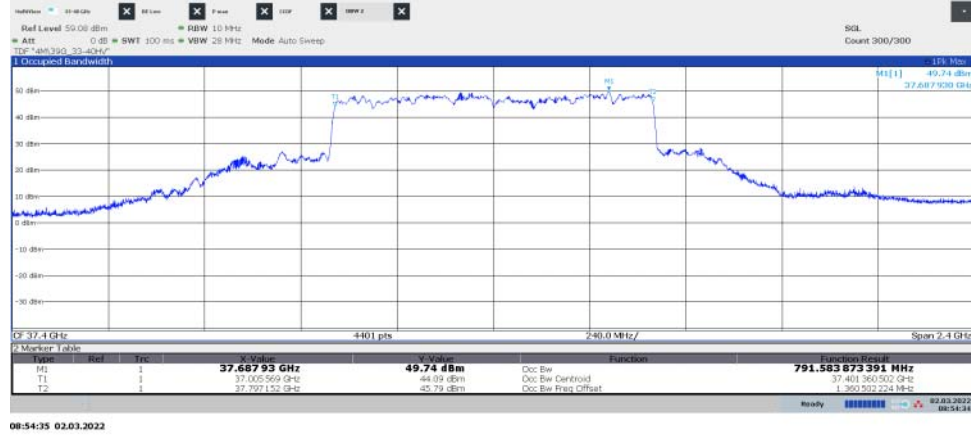


Diagram 1.8, BL8₁₀₀, QPSK, Vertical:



Field strength of spurious radiation measurements according to CFR 47 §30.203

Date	Temperature	Humidity
2022-02-24	24 °C ± 3 °C	15 % ± 5 %
2022-02-25	24 °C ± 3 °C	15 % ± 5 %
2022-03-01	24 °C ± 3 °C	13 % ± 5 %
2022-03-02	24 °C ± 3 °C	15 % ± 5 %
2022-03-03	24 °C ± 3 °C	12 % ± 5 %
2022-03-04	24 °C ± 3 °C	12 % ± 5 %
2022-03-07	24 °C ± 3 °C	12 % ± 5 %
2022-03-08	24 °C ± 3 °C	12 % ± 5 %
2022-03-09	24 °C ± 3 °C	15 % ± 5 %
2022-03-10	24 °C ± 3 °C	15 % ± 5 %
2022-03-11	24 °C ± 3 °C	12 % ± 5 %

The measurements were performed with both horizontal and vertical polarization of the antenna. The measurement was performed with a RBW of 1 MHz. The antenna distance and test object height in the different frequency ranges is described below.

In the test range from 40 – 200 GHz

A propagation loss in free space was calculated. The used formula was

$$\gamma = 20 \log \left(\frac{4\pi D}{\lambda} \right), \gamma \text{ is the propagation loss and } D \text{ is the antenna distance.}$$

For 40 – 60 GHz D was 3.0 m, for 60 – 150 GHz D was 1.0 m and for 150 – 200 GHz D was 0.5m.

In the test range from 30MHz – 40 GHz a substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).

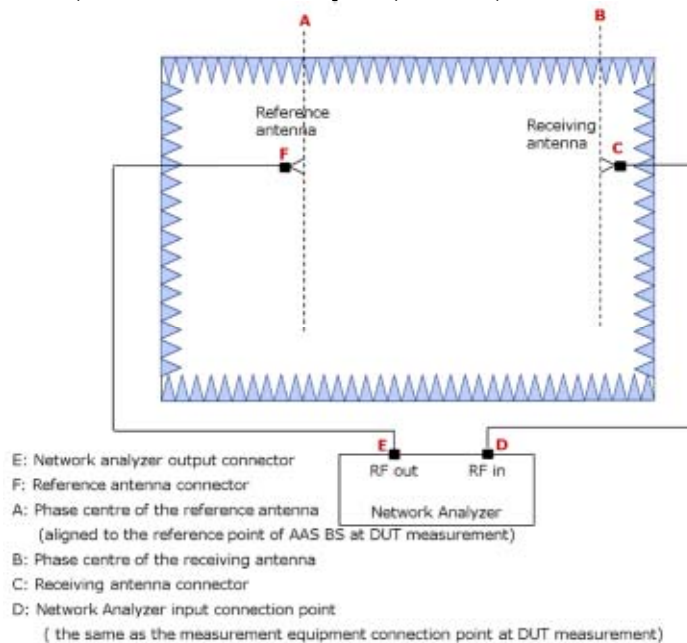


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

Stage 1 - Calibration:

- 1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
- 2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.
- 3) Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure $LF_{EIRP, E \rightarrow D}$, which is equivalent to $20\log|S_{21}|$ (dB) obtained by the network analyzer:
 $LF_{EIRP, E \rightarrow D}$: Pathloss between E and D in figure 1.
- 4) Measure the cable loss, $LF_{EIRP, E \rightarrow F}$ between the reference antenna connector and the network analyzer connector:
 $LF_{EIRP, E \rightarrow F}$: Cable loss between E and F in figure 1.
- 5) Calculate the calibration value between A and D with the following formula:
 $L_{EIRP_cal, A \rightarrow D} = LF_{EIRP, E \rightarrow D} + G_{REF_ANT_EIRP, A \rightarrow F} - LF_{EIRP, E \rightarrow F}$.
 $L_{EIRP_cal, A \rightarrow D}$: Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer.
 $G_{REF_ANT_EIRP, A \rightarrow F}$: Antenna gain of the reference antenna.

Stage 2 - Measurement:

- 6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
- 7) Measure the mean power, $P_{R_EUT_EIRP, D}$, D in figure 1.
- 8) Calculate the EIRP with the following formula:

$$EIRP = P_{R_EUT_EIRP, D} + L_{EIRP_cal, A \rightarrow D}$$

The measurement procedure was as the following:

1. An EIRP pre-scan with the measurement antenna in horizontal and vertical polarization is performed with RMS detector and Max Hold on the spectrum analyzer. The turn table was slowly rotating from 0-360 degrees.
2. EIRP spurious radiation on frequencies closer than 10 dB to the TRP limit in the pre-scan a manual search for maximum response was done.
3. If the recorded EIRP value was above the TRP limit, a TRP measurement was done according to KDB 842590 D01 chapter 4.4. Overview of the methods.
 - a. Two Cut method according to KDB 842590 D01 chapter 4.4.2.2
 - i. EUT set in vertical orientation
 - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
 - iii. EUT set in horizontal orientation
 - iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
 - v. $TRP = EIRP$ measurement samples averaged $+\Delta TRP$. ($\Delta TRP =$ Margin factor based on grid selection).
 - b. Two Cut method when pattern multiplication is applicable and used according to KDB 842590 D01 chapter 4.4.2.3
 - i. EUT set in vertical orientation
 - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
 - iii. EUT set in horizontal orientation
 - iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
 - v. TRP is calculated using the formula in Appendix E of KDB 842590 D01
 - c. EIRP to Conducted Power Conversion in Band Edge Using Antenna Gain according to KDB 842590 D01 chapter 4.4.2.5
 - i. Convert each radiated measurement to conducted power/BW using the equations:
Conducted Power level (dBm) at any frequency/BW = Measured EIRP level (dBm)/BW – EUT antenna Gain (dBi)
 - ii. Sum the radiated power Horizontal and Vertical polarisations for total conducted power level/BW.
 - iii. Evaluate the pass/fail decision by comparing total conducted power level/BW against the applicable TRP limit.

- d. Spherical Grid Method, according to KDB 842590 D01 chapter 4.4.2.4
 - i. EUT set in horizontal orientation bottom of the EUT to the right.
 - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size of the turn table was 15 degrees from 0 – 165 degrees and 195 – 360 degrees. In cone of radiation 165 – 195 degrees the step size of the turn table was 1 degree.
 - iii. EUT was changed in 15 degrees step from horizontal bottom right to horizontal bottom to the left (twelve steps). Step ii. was repeated for all twelve steps.
 - iv. TRP was calculated according to Appendix B in KDB 842590 D01.

Rise Measurement equipment

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ESU 26	901 553
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
Bilog antenna Schaffner 6143	504 079
Flann STD Gain Horn Antenna 20240-20	KWP02600
Flann STD Gain Horn Antenna 22240-20	KWP02601
Flann STD Gain Horn Antenna 24240-20	BX92414
Flann STD Gain Horn Antenna 26240-20	BX92416
Flann STD Gain Horn Antenna 27240-20	BX92417
Flann STD Gain Horn Antenna 29240-20	BX92419
Flann STD Gain Horn Antenna 30240-20	BX92420
Mixer FS-Z60	BX90566
Mixer FS-Z90	BX90567
Mixer FS-Z110	BX81425
Mizer FS-Z170	BX81426
Mixer FS-Z220	BX81427
Miteq, Low Noise Amplifier	503 278
EMCO Horn Antenna 3115	502 175
EMCO Horn Antenna 3115	902 212
µComp Nordic, Low Noise Amplifier	901 544
RF Cable	KWP04236
RF Cable	503 681
RF Cable FSW-B21	BX62069
RF Cable FSW-B21	BX62073
Temperature and humidity meter, Testo 615	503 498

EAB Measurement equipment

Calibrated at RISE before testing.

	S/N
Marki Microwave FLP2650 Low pass filter	1827
Qualwave QBF-26400-33000-60 Band pass filter	182704

Results

Evaluation of spurious emissions have been done in several beam directions, including extreme settings both in azimuth and elevation planes. Results have shown that Beam index 0/Boresight can represent worst case.

The diagrams represents worst case configurations (Beam index 0 /Boresight) for each frequency range.

Config mode 2:

Diagram	Symbolic name	Pol	Frequency range	Measurement method	“Early exit?”
2.1a	BL ₅₀	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.1b	BL ₅₀	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.2a	BL ₅₀	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.2b	BL ₅₀	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
2.3a	BL ₅₀	Hor	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.3b	BL ₅₀	Ver	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.4a	TH ₅₀	Hor	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.4b	TH ₅₀	Ver	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.5a	TH ₅₀	Hor	33-40 GHz	Pre scan Max hold EIRP	No
2.5b	TH ₅₀	Ver	33-40 GHz	Pre scan Max hold EIRP	No
2.5c	TH ₅₀	Hor/Ver	35.82-35.92 GHz	Spherical Grid Method	Compliant to TRP limit
2.6a	BL ₅₀	Hor	33-34 GHz 34-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	Yes ² No Yes ¹
2.6b	BL ₅₀	Ver	33-34 GHz 34-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	Yes ² No Yes ¹
2.6c	BL ₅₀	Hor	36-37GHz	Pre scan Max average EIRP	Yes ¹
2.6d	BL ₅₀	Ver	36-37GHz	Pre scan Max average EIRP	Yes ¹
2.7a	BL _{2max50}	Hor	33-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	No Yes ¹
2.7b	BL _{2max50}	Ver	33-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	No Yes ¹
2.7c	BL _{2max50}	Hor	36-37 GHz	Pre scan Max average EIRP	No
2.7d	BL _{2max50}	Ver	36-37 GHz	Pre scan Max average EIRP	No
2.7e	BL _{2max50}	Hor/ Ver	36.2-37 GHz	Pattern multiplication TRP	Compliant to TRP limit
2.8a	BL ₁₀₀	Hor	36-37 GHz	Pre scan Max average EIRP	Yes ¹
2.8b	BL ₁₀₀	Ver	36-37 GHz	Pre scan Max average EIRP	Yes ¹
2.9a	BL ₂₀₀	Hor	36-37 GHz	Pre scan Max average EIRP	Yes ¹
2.9b	BL ₂₀₀	Ver	36-37 GHz	Pre scan Max average EIRP	Yes ¹
2.10a	TL ₅₀	Hor	38.35-38.85 GHz	Pre scan Max average EIRP	Yes ¹
2.10b	TL ₅₀	Ver	38.35-38.85 GHz	Pre scan Max average EIRP	Yes ¹
2.11a	TL _{2max50}	Hor	37.85-39.35 GHz	Pre scan Max average EIRP	Yes ¹
2.11b	TL _{2max50}	Ver	37.85-39.35GHz	Pre scan Max average EIRP	Yes ¹
2.12a	BH ₅₀	Hor	38.35-38.85 GHz	Pre scan Max average EIRP	Yes ¹
2.12b	BH ₅₀	Ver	38.35-38.85 GHz	Pre scan Max average EIRP	Yes ¹

¹⁾ Calculated conducted power based on antenna gain below limit

²⁾ Compliant (5x LO) to TRP limit based on Lower EIRP compared to TH₅₀ (Diagram 2.5)

Config mode 2:

Diagram	Symbolic name	Pol	Frequency range	Measurement method	“Early exit?”
2.13a	BH2 _{max50}	Hor	37.85-39.35 GHz	Pre scan Max average EIRP	Yes ¹
2.13b	BH2 _{max50}	Ver	37.85-39.35 GHz	Pre scan Max average EIRP	Yes ¹
2.14a	TH ₅₀	Hor	40-41 GHz 41-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.14b	TH ₅₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.14c	TH ₅₀	Hor	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.14d	TH ₅₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.15a	TH2 _{max50}	Hor	40-40.8 GHz 40.8-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.15b	TH2 _{max50}	Ver	40-40.8 GHz 40.8-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.15c	TH2 _{max50}	Hor	40-40.8 GHz 40.8-43 GHz	Pre scan Max average EIRP	No Yes ³
2.15d	TH2 _{max50}	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	No Yes ³
2.15e	TH2 _{max50}	Hor/Ver	40-40.8 GHz	Pattern multiplication TRP	Compliant to TRP limit
2.16a	TH ₁₀₀	Hor	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.16b	TH ₁₀₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.17a	TH ₂₀₀	Hor	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.17b	TH ₂₀₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.18a	TL ₅₀	Hor	40-41.1 GHz 41.1-43 GHz	Pre scan Max hold EIRP	No Yes ⁴
2.18b	TL ₅₀	Ver	40-41.1 GHz 41.1-43 GHz	Pre scan Max hold EIRP	No Yes ⁴
2.18c	TL ₅₀	Hor/Ver	40.2-41.1	Two cut TRP	Compliant to TRP limit
2.19a	BL ₅₀	Hor	40-43 GHz	Pre scan Max hold EIRP	No
2.19b	BL ₅₀	Ver	40-43 GHz	Pre scan Max hold EIRP	No
2.19c	BL ₅₀	Hor/Ver	40.04-40.14 GHz	Two cut TRP	Compliant to TRP limit
2.20a	BL ₅₀	Hor	43-60 GHz	Pre scan Max hold EIRP	No
2.20b	BL ₅₀	Ver	43-60 GHz	Pre scan Max hold EIRP	No
2.20c	BL ₅₀	Hor/Ver	43.11-43.21	Two cut TRP	Compliant to TRP limit
2.21a	TL ₅₀	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.21b	TL ₅₀	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.22a	TL ₅₀	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.22b	TL ₅₀	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes

¹⁾ Calculated conducted power based on antenna gain below limit

³⁾ Compliant to TRP limit based on Lower EIRP compared to TL₅₀ (Diagram 2.14)

⁴⁾ Compliant (6x LO) to TRP limit based on Lower EIRP compared to BL₅₀ (Diagram 2.15)

Diagram	Symbolic name	Pol	Frequency range	Measurement method	“Early exit?”
2.23a	TL ₅₀	Hor	90-110 GHz	Pre scan Max hold EIRP	Yes
2.23b	TL ₅₀	Ver	90-110 GHz	Pre scan Max hold EIRP	Yes
2.24a	TL ₅₀	Hor	110-130 GHz	Pre scan Max hold EIRP	Yes
2.24b	TL ₅₀	Ver	110-130 GHz	Pre scan Max hold EIRP	Yes
2.25a	TL ₅₀	Hor	130-150 GHz	Pre scan Max hold EIRP	Yes
2.25b	TL ₅₀	Ver	130-150 GHz	Pre scan Max hold EIRP	Yes
2.26a	TL ₅₀	Hor	150-170 GHz	Pre scan Max hold EIRP	Yes
2.26b	TL ₅₀	Ver	150-170 GHz	Pre scan Max hold EIRP	Yes
2.27a	TL ₅₀	Hor	170-185 GHz	Pre scan Max hold EIRP	Yes
2.27b	TL ₅₀	Ver	170-185 GHz	Pre scan Max hold EIRP	Yes
2.28a	TL ₅₀	Hor	185-200 GHz	Pre scan Max hold EIRP	Yes
2.28b	TL ₅₀	Ver	185-200 GHz	Pre scan Max hold EIRP	Yes

Config mode 1:

Diagram	Symbolic name	Pol	Frequency range	Measurement method	“Early exit?”
2.29a	BL8 ₁₀₀	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.29b	BL8 ₁₀₀	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.30a	BL8 ₁₀₀	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.30b	BL8 ₁₀₀	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
2.31a	BL8 ₁₀₀	Hor	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.31b	BL8 ₁₀₀	Ver	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.32a	TH8 ₁₀₀	Hor	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.32b	TH8 ₁₀₀	Ver	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.33a	BL8 ₁₀₀	Hor	33-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	No Yes ¹
2.33b	BL8 ₁₀₀	Ver	33-38.6 GHz 38.6-40 GHz	Pre scan Max hold EIRP	No Yes ¹
2.33c	BL8 ₁₀₀	Hor	36-37GHz	Pre scan Max average EIRP	Yes ¹
2.33d	BL8 ₁₀₀	Ver	36-37GHz	Pre scan Max average EIRP	Yes ¹
2.34a	TH8 ₁₀₀	Hor	40-41 GHz	Pre scan Max hold EIRP	No
2.34b	TH8 ₁₀₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.34c	TH8 ₁₀₀	Hor	40-43 GHz	Pre scan Max average EIRP	Yes ¹
2.34d	TH8 ₁₀₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ¹ Yes ³
2.35a	BL8 ₁₀₀	Hor	43-60 GHz	Pre scan Max hold EIRP	No
2.35b	BL8 ₁₀₀	Ver	43-60 GHz	Pre scan Max hold EIRP	No
2.36a	BL8 ₁₀₀	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.36b	BL8 ₁₀₀	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.37a	BL8 ₁₀₀	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.37b	BL8 ₁₀₀	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes
2.38a	BL8 ₁₀₀	Hor	90-110 GHz	Pre scan Max hold EIRP	Yes
2.38b	BL8 ₁₀₀	Ver	90-110 GHz	Pre scan Max hold EIRP	Yes
2.39a	BL8 ₁₀₀	Hor	110-130 GHz	Pre scan Max hold EIRP	Yes
2.39b	BL8 ₁₀₀	Ver	110-130 GHz	Pre scan Max hold EIRP	Yes
2.40a	BL8 ₁₀₀	Hor	130-150 GHz	Pre scan Max hold EIRP	Yes
2.40b	BL8 ₁₀₀	Ver	130-150 GHz	Pre scan Max hold EIRP	Yes
2.41a	BL8 ₁₀₀	Hor	150-170 GHz	Pre scan Max hold EIRP	Yes
2.41b	BL8 ₁₀₀	Ver	150-170 GHz	Pre scan Max hold EIRP	Yes
2.42a	BL8 ₁₀₀	Hor	170-185 GHz	Pre scan Max hold EIRP	Yes
2.42b	BL8 ₁₀₀	Ver	170-185 GHz	Pre scan Max hold EIRP	Yes
2.43a	BL8 ₁₀₀	Hor	185-200 GHz	Pre scan Max hold EIRP	Yes
2.43b	BL8 ₁₀₀	Ver	185-200 GHz	Pre scan Max hold EIRP	Yes

¹⁾ Calculated conducted power based on antenna gain below limit

³⁾ Compliant to TRP limit based on Lower EIRP compared to TL₅₀ (Diagram 2.14)

Config mode 0:

Diagram	Symbolic name	Pol	Frequency range	Measurement method	“Early exit?”
2.44a	BMT4 ₅₀	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.44b	BMT4 ₅₀	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.45a	BMT4 ₅₀	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.45b	BMT4 ₅₀	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
2.46a	BMT4 ₅₀	Hor	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.46b	BMT4 ₅₀	Ver	18-26.5 GHz	Pre scan Max hold EIRP	Yes
2.47a	BMT4 ₅₀	Hor	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.47b	BMT4 ₅₀	Ver	26.5-33 GHz	Pre scan Max hold EIRP	Yes
2.48a	BMT4 ₅₀	Hor	33-40 GHz	Pre scan Max hold EIRP	No
2.48b	BMT4 ₅₀	Ver	33-40 GHz	Pre scan Max hold EIRP	No
2.48c	BMT4 ₅₀	Hor	36-37GHz	Pre scan Max average EIRP	Yes ^{1,5}
2.48d	BMT4 ₅₀	Ver	36-37GHz	Pre scan Max average EIRP	Yes ^{1,5}
2.49a	BMT4 ₅₀	Hor	40-41 GHz	Pre scan Max hold EIRP	No
2.49b	BMT4 ₅₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max hold EIRP	No Yes ³
2.49c	BMT4 ₅₀	Hor	40-43 GHz	Pre scan Max average EIRP	Yes ^{1,6}
2.49d	BMT4 ₅₀	Ver	40-41 GHz 41-43 GHz	Pre scan Max average EIRP	Yes ^{1,6} Yes ³
2.50a	BMT4 ₅₀	Hor	43-60 GHz	Pre scan Max hold EIRP	No
2.50b	BMT4 ₅₀	Ver	43-60 GHz	Pre scan Max hold EIRP	No
2.51a	BMT4 ₅₀	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.51b	BMT4 ₅₀	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.52a	BMT4 ₅₀	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.52b	BMT4 ₅₀	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes
2.53a	BMT4 ₅₀	Hor	90-110 GHz	Pre scan Max hold EIRP	Yes
2.53b	BMT4 ₅₀	Ver	90-110 GHz	Pre scan Max hold EIRP	Yes
2.54a	BMT4 ₅₀	Hor	110-130 GHz	Pre scan Max hold EIRP	Yes
2.54b	BMT4 ₅₀	Ver	110-130 GHz	Pre scan Max hold EIRP	Yes
2.55a	BMT4 ₅₀	Hor	130-150 GHz	Pre scan Max hold EIRP	Yes
2.55b	BMT4 ₅₀	Ver	130-150 GHz	Pre scan Max hold EIRP	Yes
2.56a	BMT4 ₅₀	Hor	150-170 GHz	Pre scan Max hold EIRP	Yes
2.56b	BMT4 ₅₀	Ver	150-170 GHz	Pre scan Max hold EIRP	Yes
2.57a	BMT4 ₅₀	Hor	170-185 GHz	Pre scan Max hold EIRP	Yes
2.57b	BMT4 ₅₀	Ver	170-185 GHz	Pre scan Max hold EIRP	Yes
2.58a	BMT4 ₅₀	Hor	185-200 GHz	Pre scan Max hold EIRP	Yes
2.58b	BMT4 ₅₀	Ver	185-200 GHz	Pre scan Max hold EIRP	Yes

¹⁾ Calculated conducted power based on antenna gain below limit

³⁾ Compliant to TRP limit based on Lower EIRP compared to TL₅₀ (Diagram 2.14)

⁵⁾ Compliant to TRP limit based on Lower EIRP compared to BL2_{max50} (Diagram 2.7)

⁶⁾ Compliant to TRP limit based on Lower EIRP compared to TH2_{max50} (Diagram 2.13)

Measurement uncertainty: 30 – 1000 MHz 3.1 dB
1 – 18 GHz, 3.0 dB
18 – 40 GHz, 3.1 dB
40 – 60 GHz, 2.27 dB
60 – 75 GHz, 2.70 dB
75 – 110 GHz, 4.24 dB
110 – 150 GHz, 3.61 dB
150 – 170 GHz, 4.67 dB
170 – 200 GHz, 5.10 dB

Limits

CFR 47 §30.203 Emission limits.

(a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be -13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.

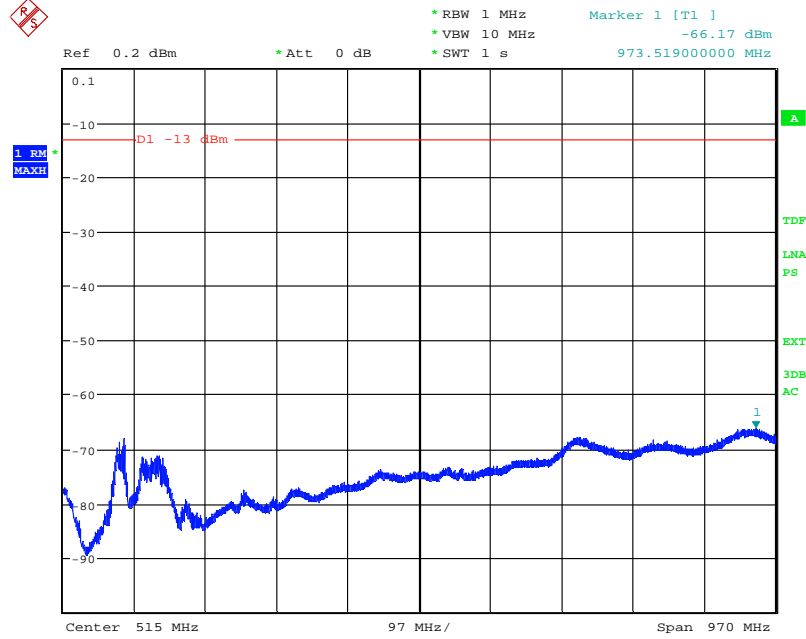
(b)(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges as the design permits.

(3) The measurements of emission power can be expressed in peak or average values.

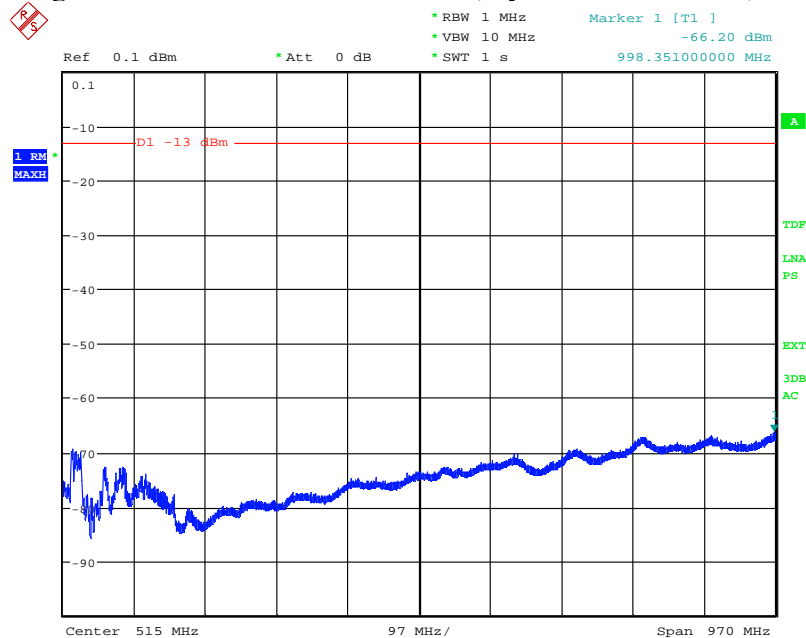
Complies?	Yes
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Diagram 2.1a: Pre scan 30 – 1000 MHz, Symbolic name: BL₅₀, EIRP Horizontal polarization



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Diagram 2.1b: Pre scan 30 – 1000 MHz, Symbolic name: BL₅₀, EIRP Vertical polarization



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Diagram 2.2a: Pre scan 1 – 18 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization

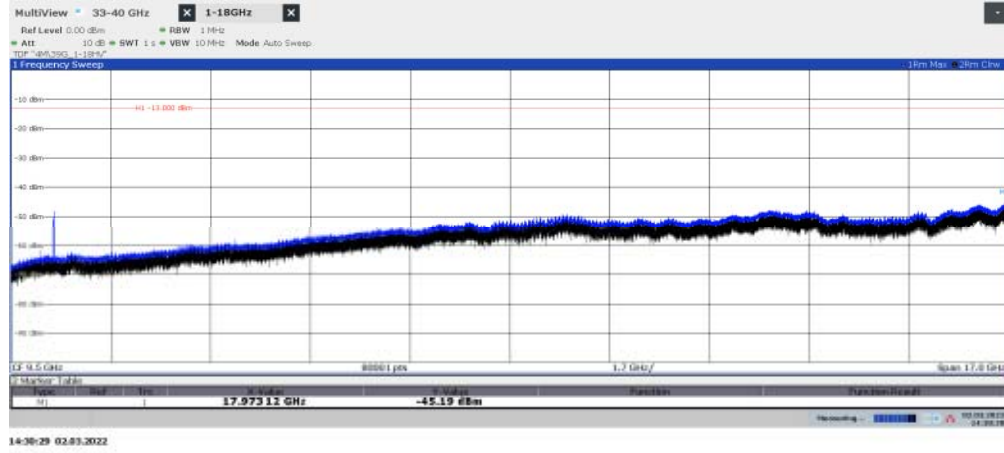


Diagram 2.2b: Pre scan 1 – 18 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization

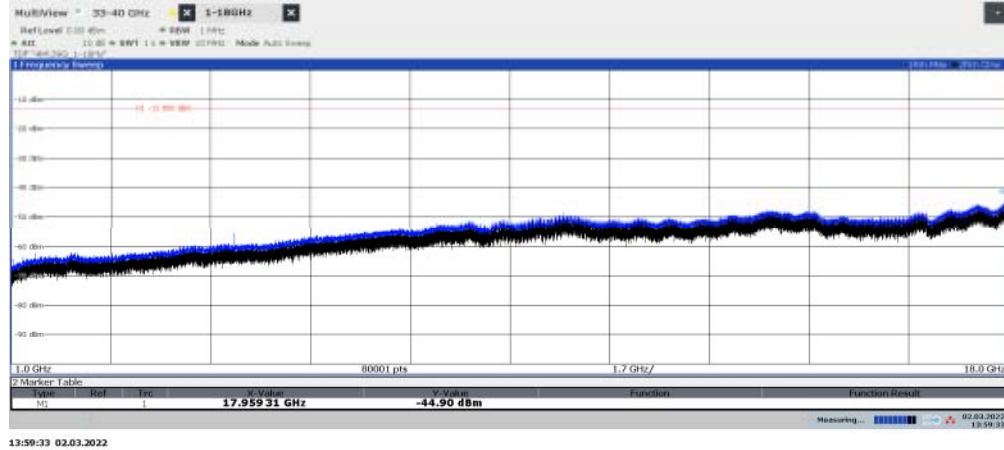


Diagram 2.3a: Pre scan 18 – 26.5 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization

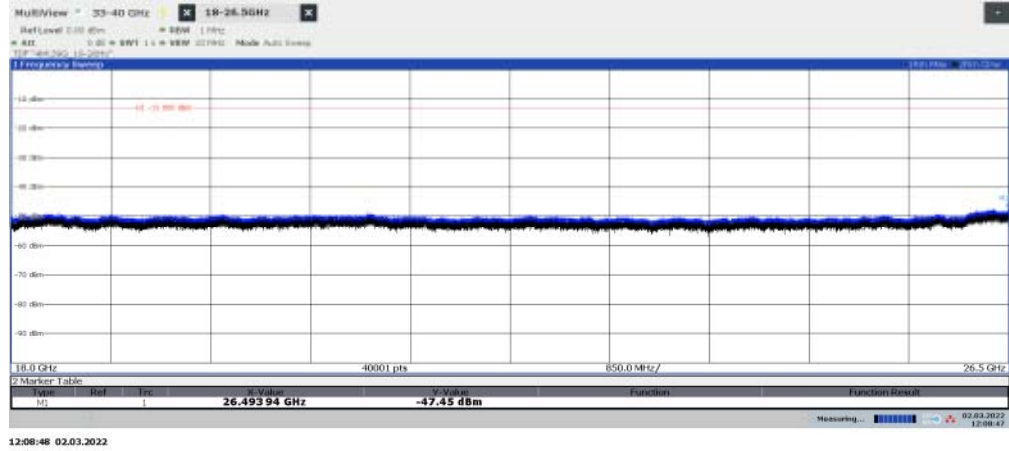


Diagram 2.3b: Pre scan 18 – 26.5 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization

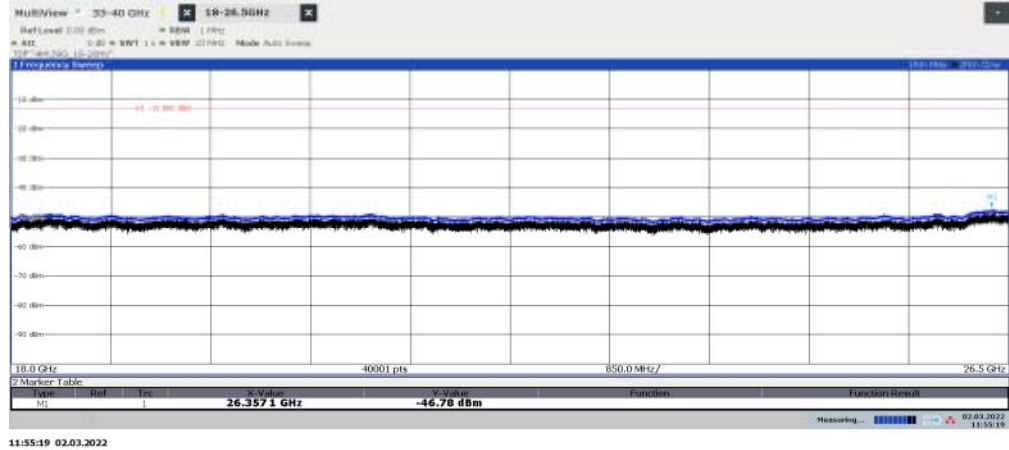


Diagram 2.4a: Pre scan 26.5 – 33 GHz, Symbolic name: TH₅₀, EIRP Horizontal polarization

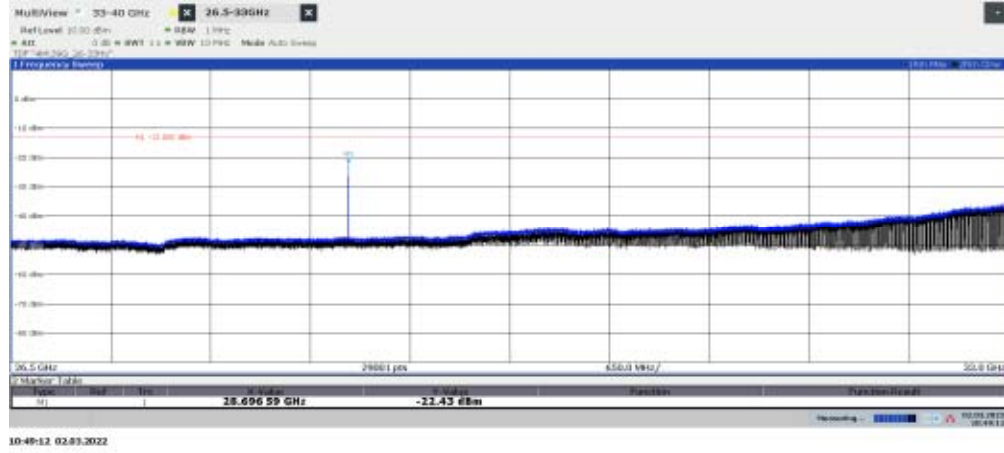


Diagram 2.4b: Pre scan 26.5 – 33 GHz, Symbolic name: TH₅₀, EIRP Vertical polarization

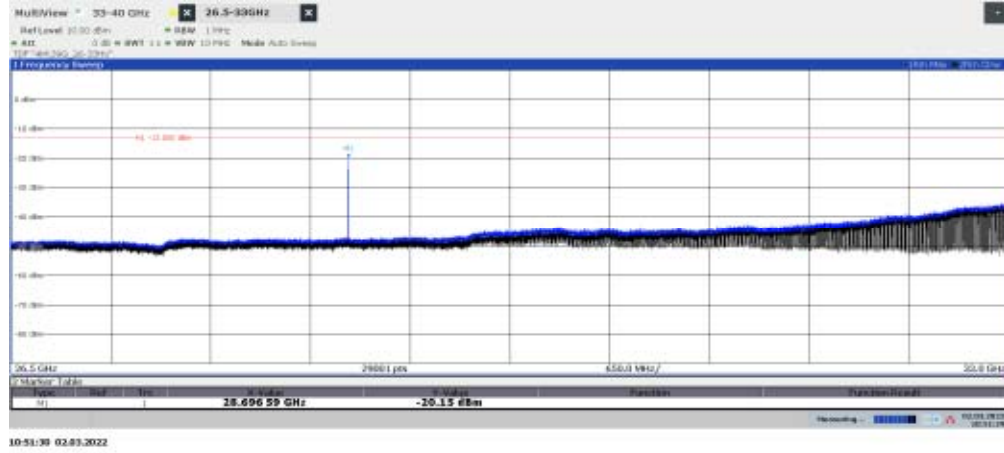


Diagram 2.5a: Pre scan 33 – 40.0 GHz, Symbolic name: TH₅₀, EIRP Horizontal polarization
See diagram 2.5c for TRP result

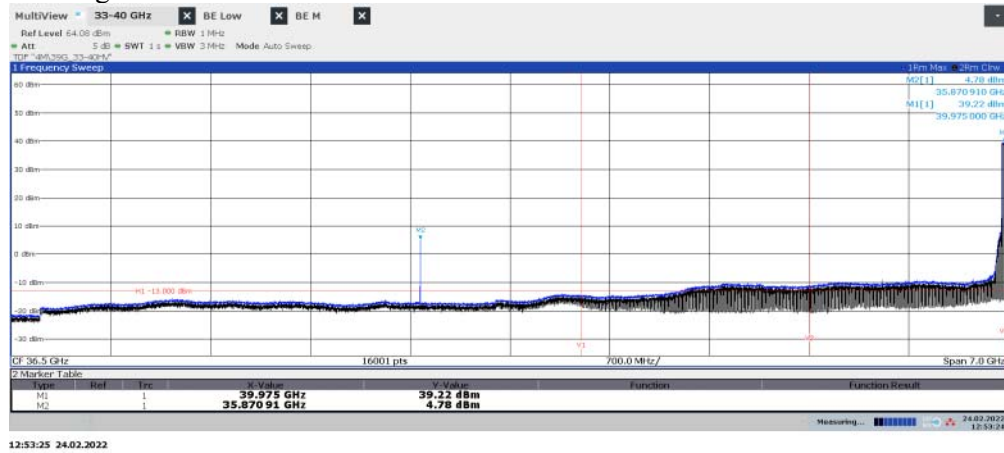


Diagram 2.5b: Pre scan 33 – 40.0 GHz, Symbolic name: TH₅₀, EIRP Vertical polarization
See diagram 2.5c for TRP result

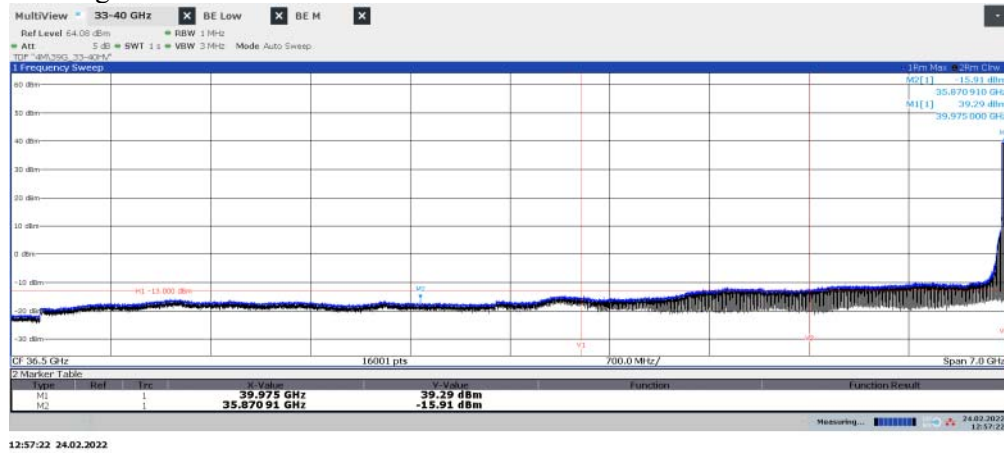


Diagram 2.5c: Spherical Grid Method 35.82 – 35.92 GHz, Symbolic name: TH₅₀

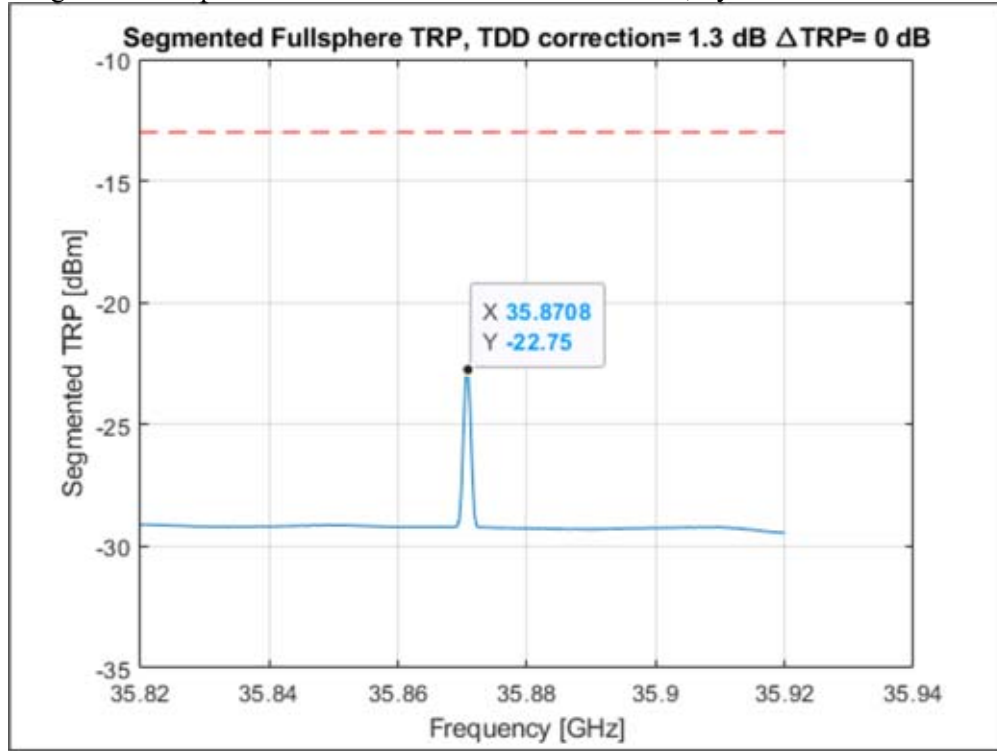


Diagram 2.6a: Pre scan 33 – 40 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization

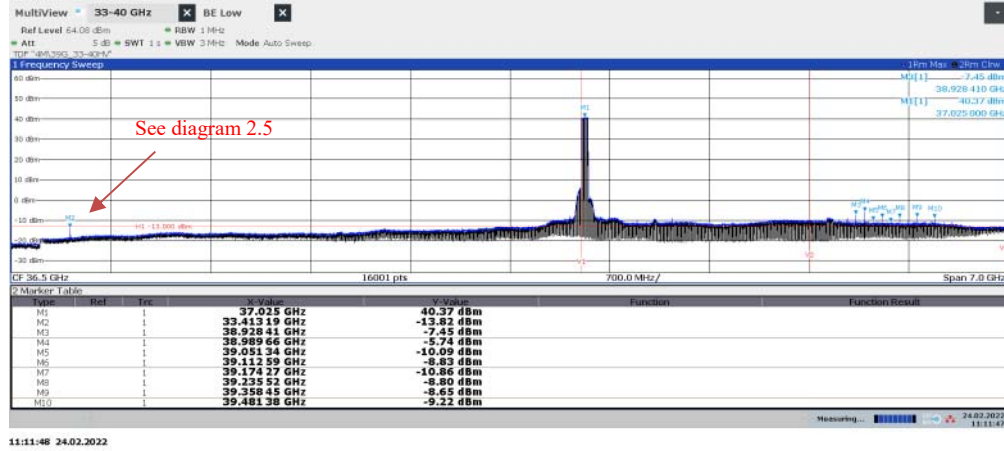
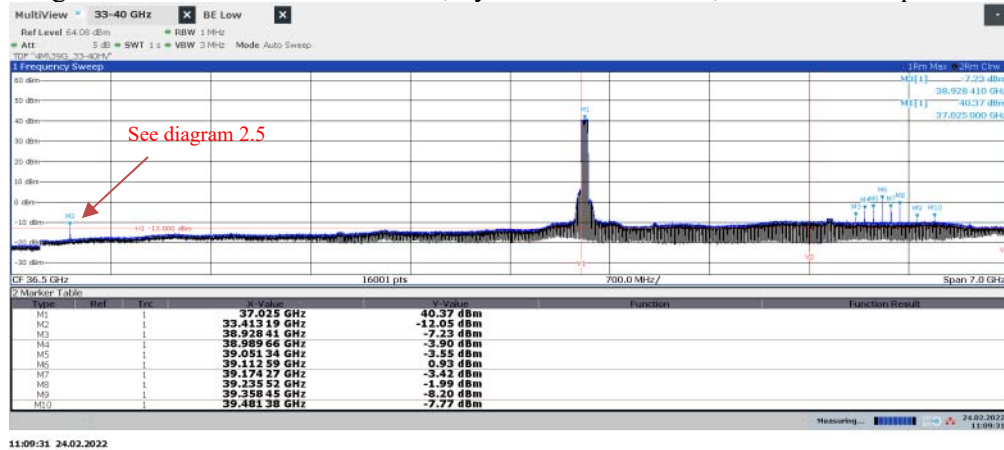


Diagram 2.6b: Pre scan 33 – 40 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization



Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
38.928	-7.45/ -7.23	31.75/ 31.75	-36.08/ Pass
38.989	-5.74/ -3.90	31.75/ 31.75	-33.46/ Pass
39.051	-10.09/ -3.55	31.75/ 31.75	-34.43/ Pass
39.112	-8.83/ 0.93	31.75/ 31.75	-30.38/ Pass
39.174	-10.86/ -3.42	31.75/ 31.75	-34.45/ Pass
39.235	-8.80/ -1.99	31.75/ 31.75	-32.92/ Pass
39.358	-8.65/ -8.20	31.75/ 31.75	-37.16/ Pass
39.481	-9.22/ -7.77	31.75/ 31.75	-37.17/ Pass

Diagram 2.6c: Pre scan 36 – 37 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization

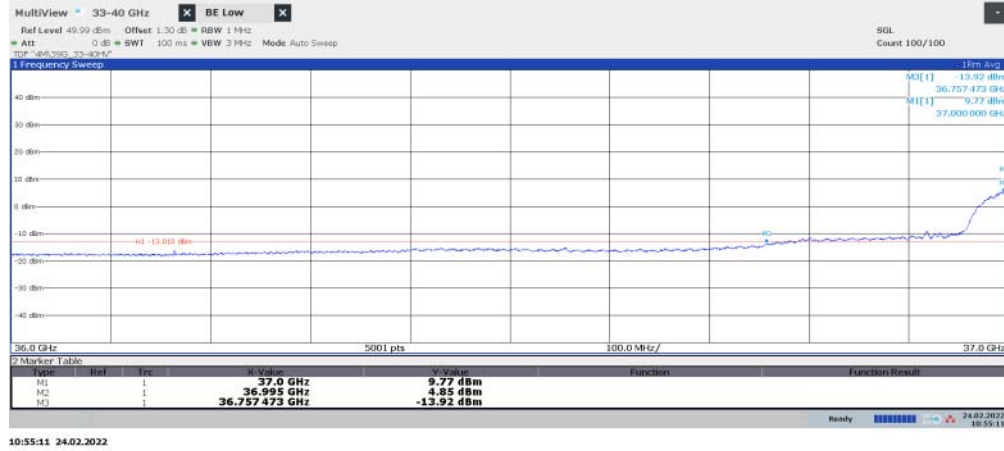
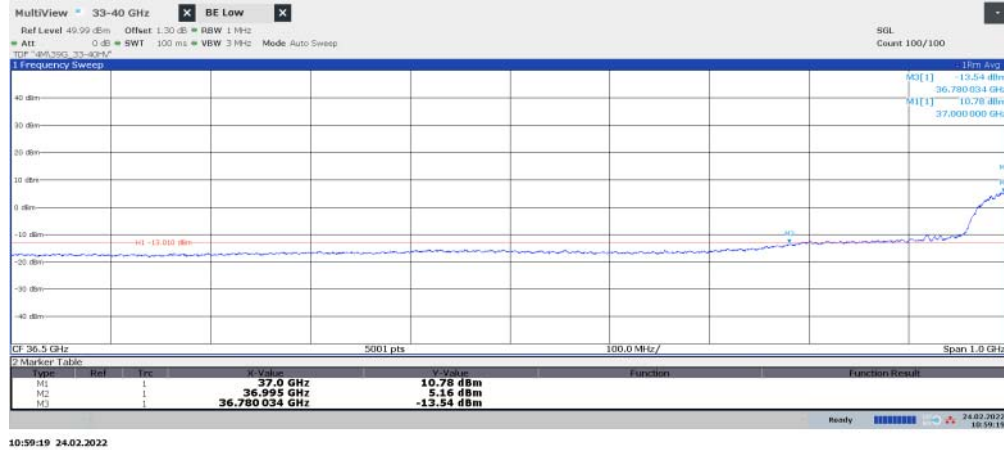
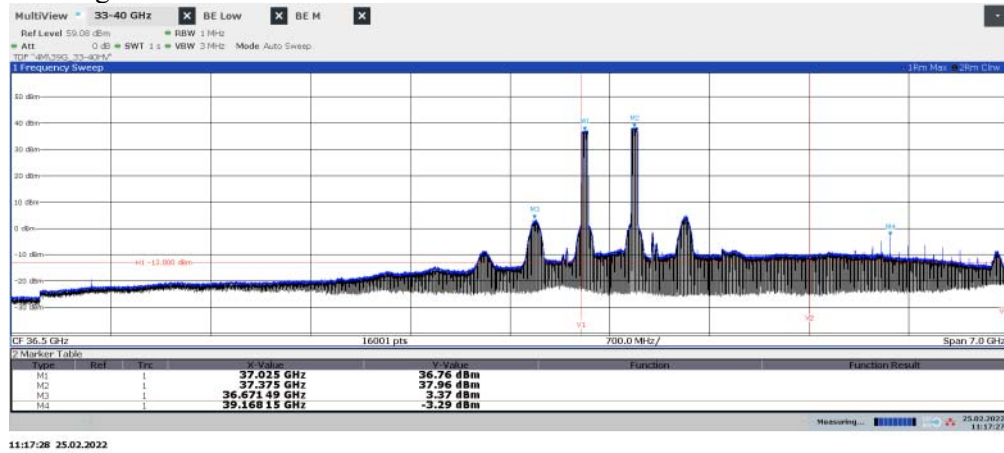


Diagram 2.6d: Pre scan 36 – 37 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization



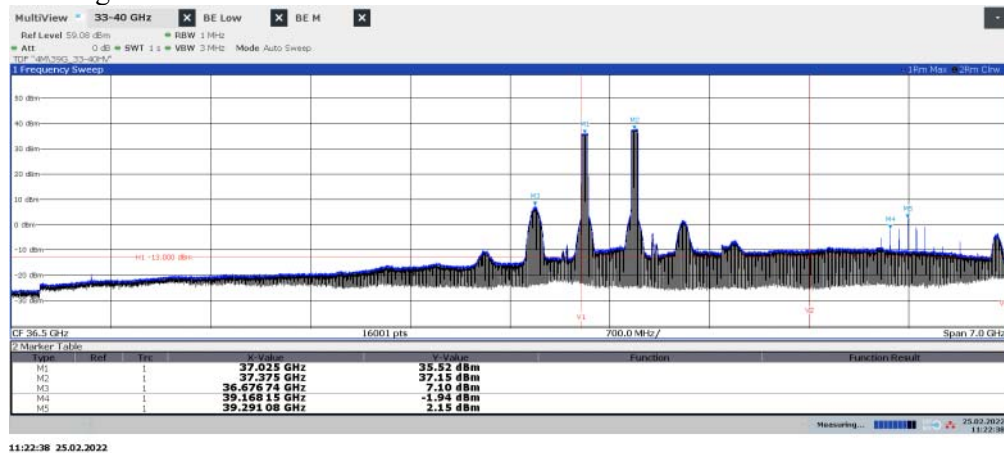
Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.995 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.995 GHz (Limit -13 dBm) [dBm]/ Verdict
9.77/ 10.78	4.85/ 5.16	31.49/ 31.32	-18.08/ Pass	-23.38/ Pass

Diagram 2.7a: Pre scan 33 – 40 GHz, Symbolic name: BL2_{max50}, EIRP Horizontal polarization
See diagram 2.7e for TRP result



11:17:28 25.02.2022

Diagram 2.7b: Pre scan 33 – 40 GHz, Symbolic name: BL2_{max50}, EIRP Vertical polarization
See diagram 2.7e for TRP result



11:22:38 25.02.2022

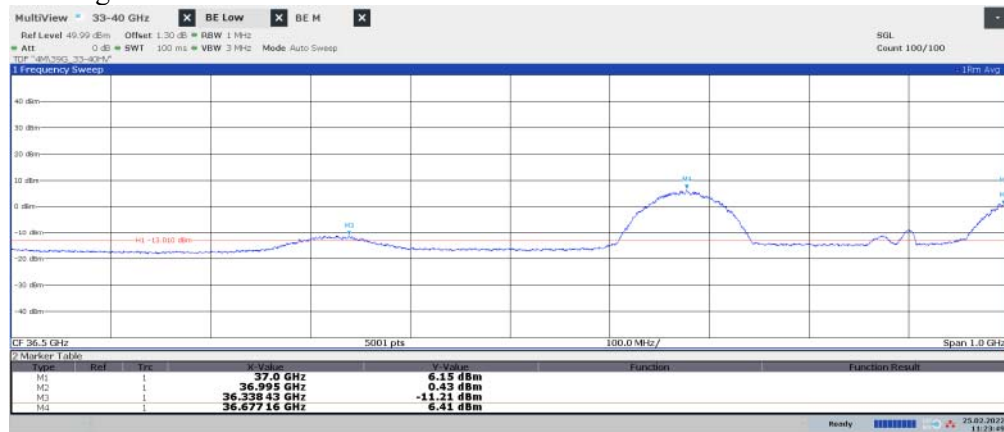
Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
39.168	-3.29/ -1.94	31.75/ 31.75	-31.30/ Pass
39.291	-4.00/ 2.15	31.75/ 31.75	-28.66/ Pass

Diagram 2.7c: Pre scan 36 – 37 GHz, Symbolic name: BL2_{max50}, EIRP Horizontal polarization
See diagram 2.7e for TRP result



11:18:35 25.02.2022

Diagram 2.7d: Pre scan 36 – 37 GHz, Symbolic name: BL2_{max50}, EIRP Vertical polarization
See diagram 2.7e for TRP result



11:23:49 25.02.2022

Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.995 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.995 GHz (Limit -13 dBm) [dBm]/ Verdict
7.01/ 6.15	0.33/ 0.43	31.49/ 31.32	-21.80/ Pass	-28.01/ Pass

Diagram 2.7e: Pattern multiplication TRP 36.2 – 37 GHz, Symbolic name: BL2_{max50}

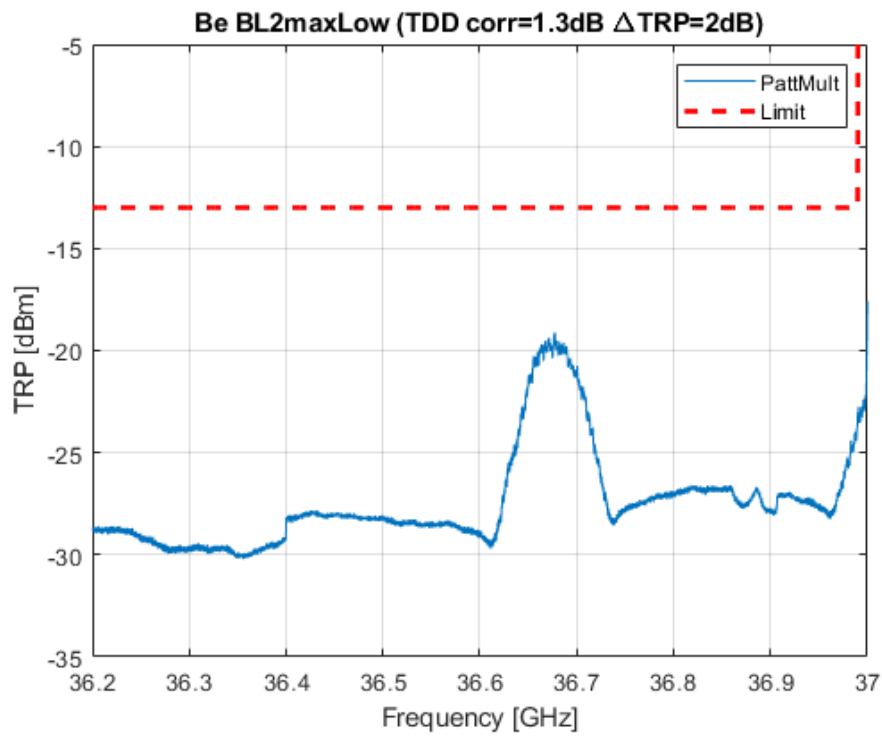
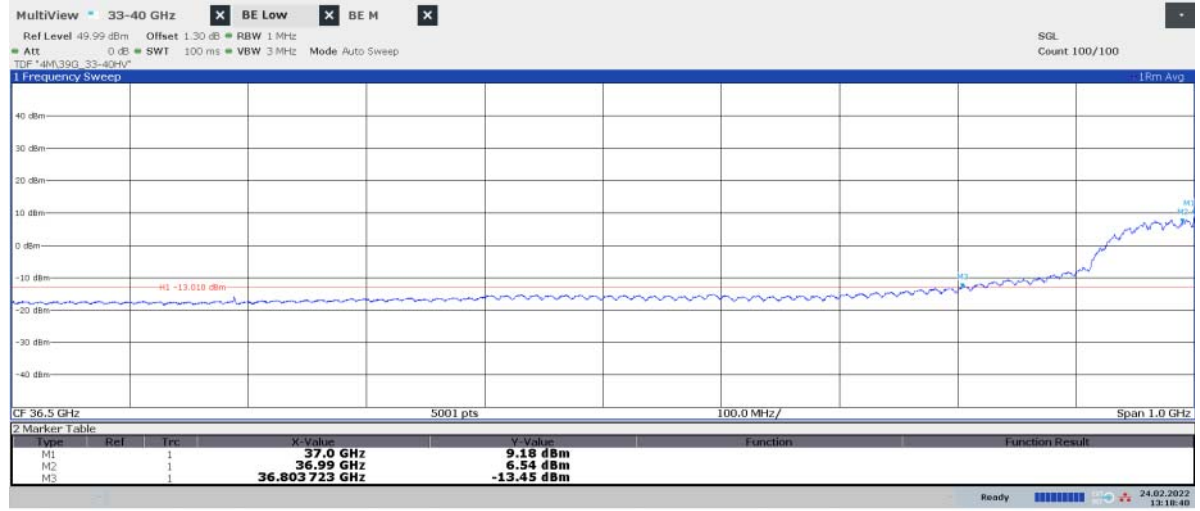
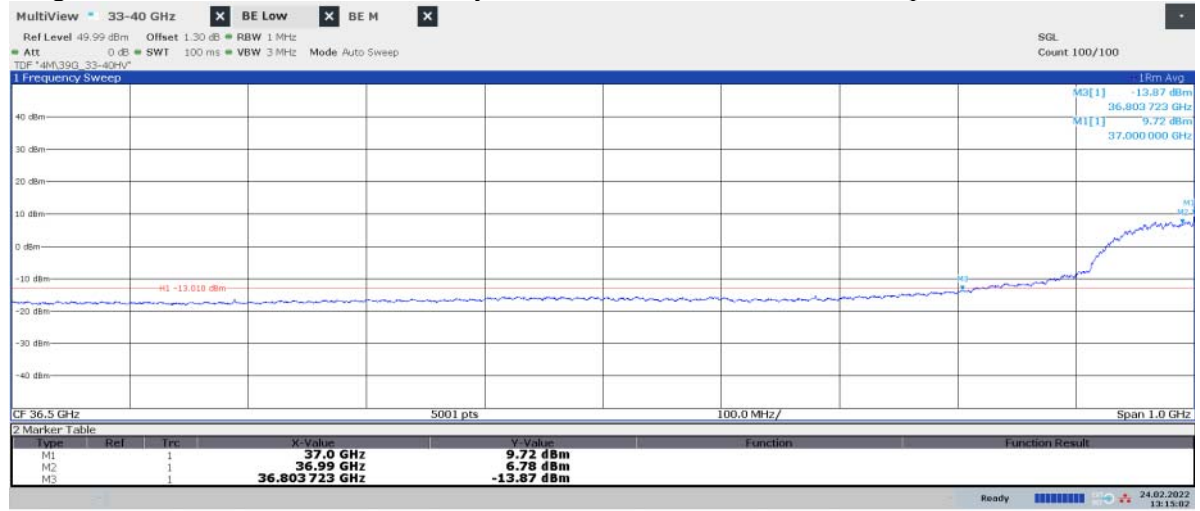


Diagram 2.8a: Pre scan 36 – 37 GHz, Symbolic name: BL₁₀₀, EIRP Horizontal polarization



13:18:40 24.02.2022

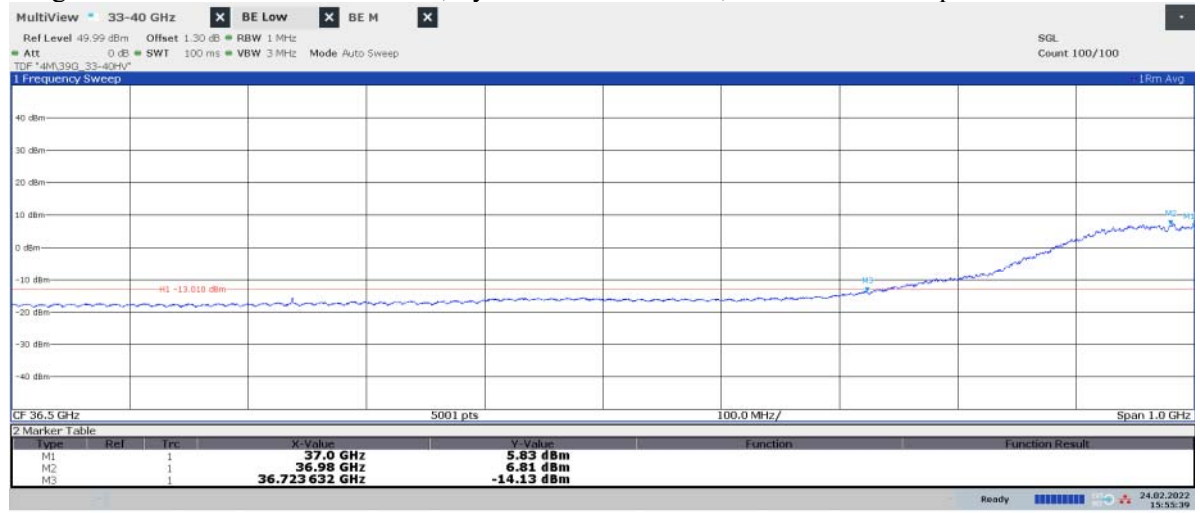
Diagram 2.8b: Pre scan 36 – 37 GHz, Symbolic name: BL₁₀₀, EIRP Vertical polarization



13:15:03 24.02.2022

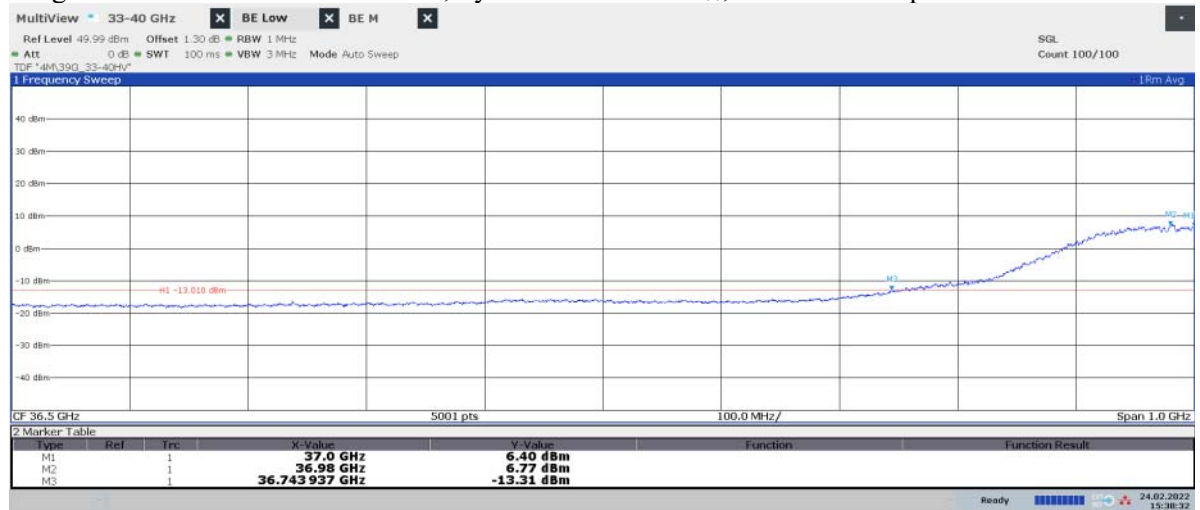
Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.99 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.99 GHz (Limit -13 dBm) [dBm]/ Verdict
9.18/ 9.72	6.54/ 6.78	31.49/ 31.32	-18.93/ Pass	-21.73/ Pass

Diagram 2.9a: Pre scan 36 – 37 GHz, Symbolic name: BL₂₀₀, EIRP Horizontal polarization



15:55:39 24.02.2022

Diagram 2.9b: Pre scan 36 – 37 GHz, Symbolic name: BL₂₀₀, EIRP Vertical polarization



15:38:32 24.02.2022

Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.98 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.98 GHz (Limit -13 dBm) [dBm]/ Verdict
5.83/ 6.40	6.81/ 6.77	31.49/ 31.32	-22.26/ Pass	-21.60/ Pass

Diagram 2.10a: Pre scan 38.35 – 38.85 GHz, Symbolic name: TL₅₀, EIRP Horizontal polarization

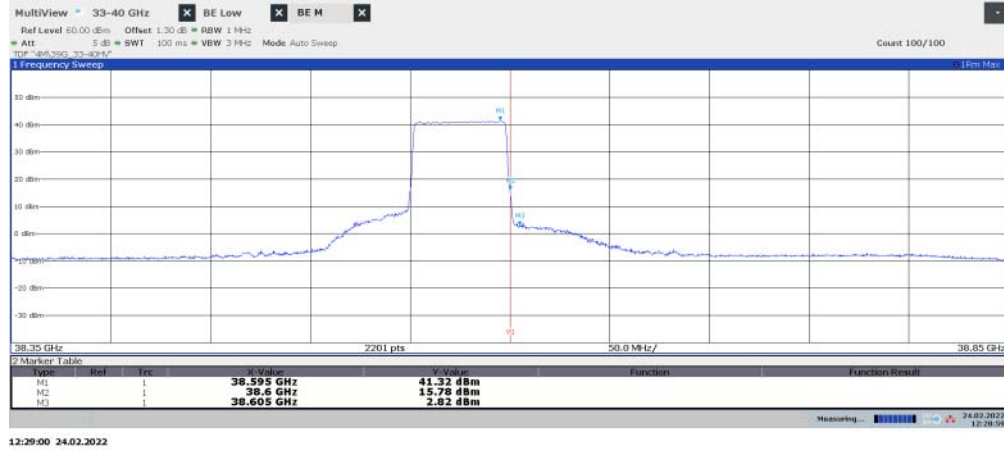
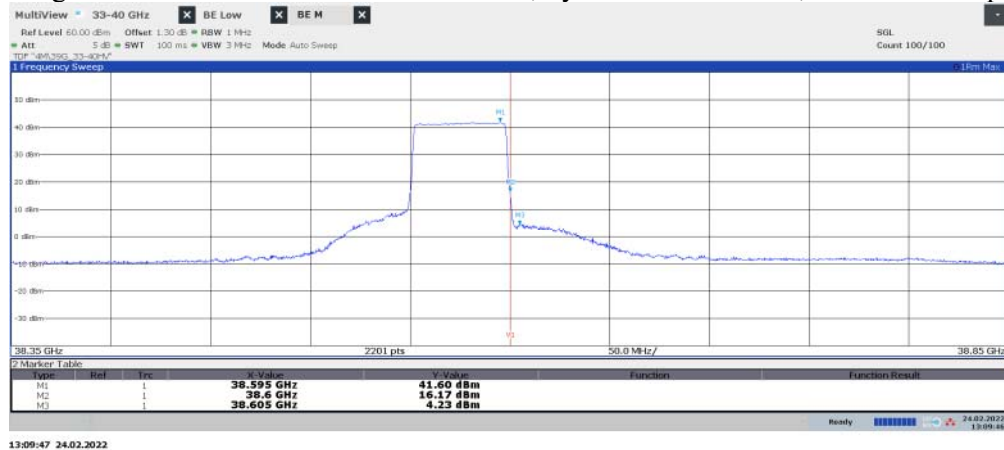
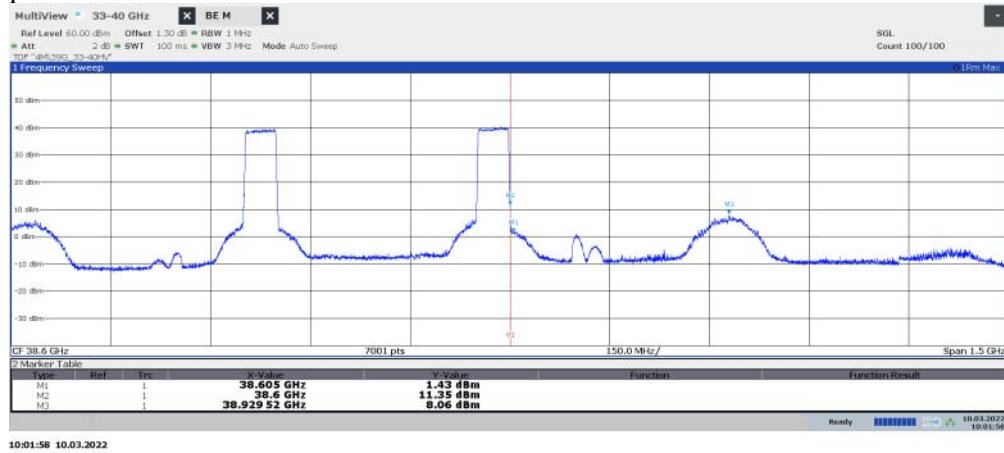


Diagram 2.10b: Pre scan 38.35 – 38.85 GHz, Symbolic name: TL₅₀, EIRP Vertical polarization



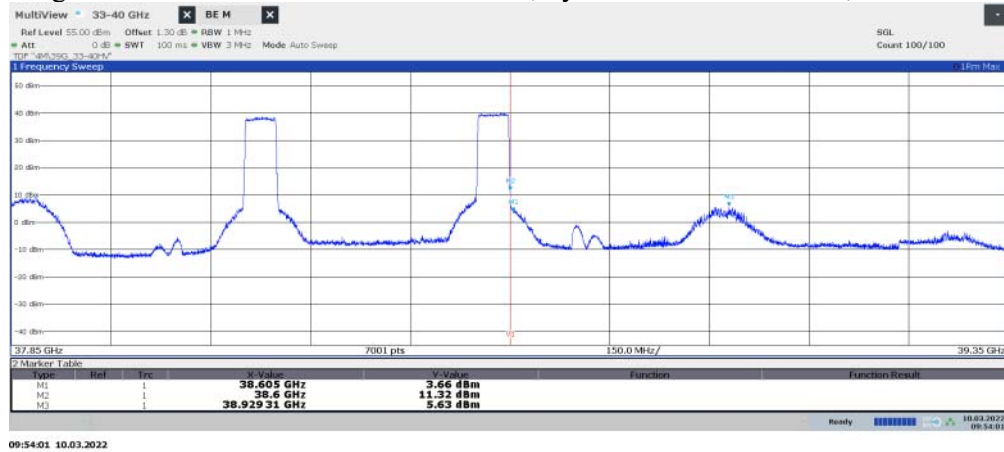
Power EIRP for 38.6 GHz Hor/ Ver [dBm]	Power EIRP for 38.605 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 38.6 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 38.605 GHz (Limit -13 dBm) [dBm]/ Verdict
15.78/ 16.17	2.82/ 4.23	31.75/ 31.75	-12.76/ Pass	-25.16/ Pass

Diagram 2.11a: Pre scan 37.85 – 39.35 GHz, Symbolic name: TL2_{max50}, EIRP Horizontal polarization



10:01:58 10.03.2022

Diagram 2.11b: Pre scan 37.85 – 39.35 GHz, Symbolic name: TL2_{max50}, EIRP Vertical polarization

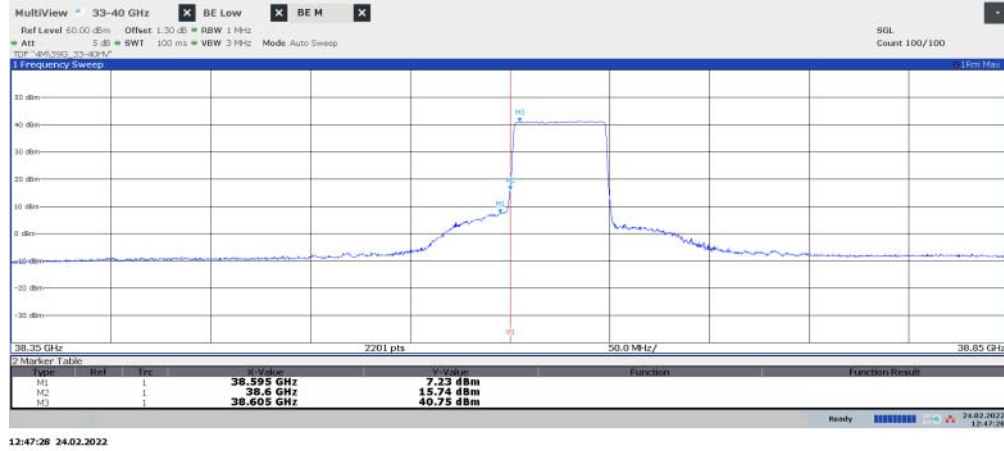


09:54:01 10.03.2022

Power EIRP for 38.6 GHz Hor/ Ver [dBm]	Power EIRP for 38.605 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 38.6 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 38.605 GHz (Limit -13 dBm) [dBm]/ Verdict
15.78/ 11.35	1.43/ 3.66	31.75/ 31.75	-14.63/ Pass	-26.05/ Pass

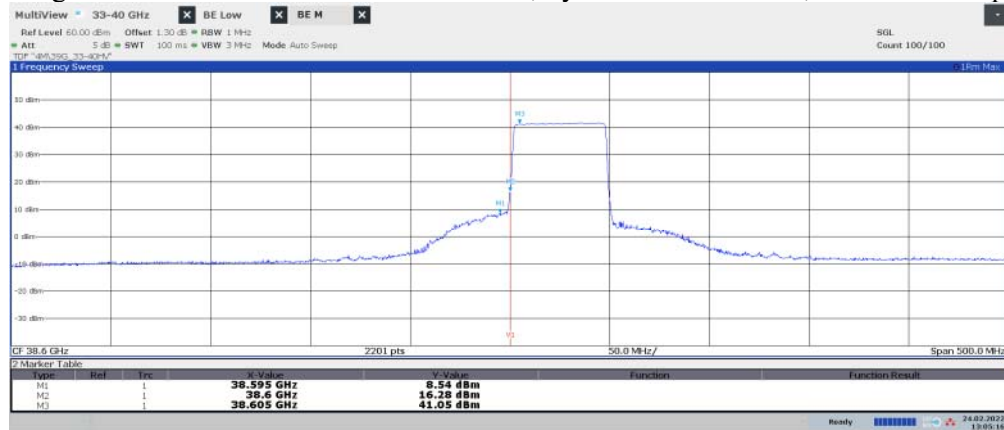
Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
38.929	8.06/ 5.63	31.75/ 31.75	-21.73/ Pass

Diagram 2.12a: Pre scan 38.35 – 38.85 GHz, Symbolic name: BH₅₀, EIRP Horizontal polarization



12:47:28 24.02.2022

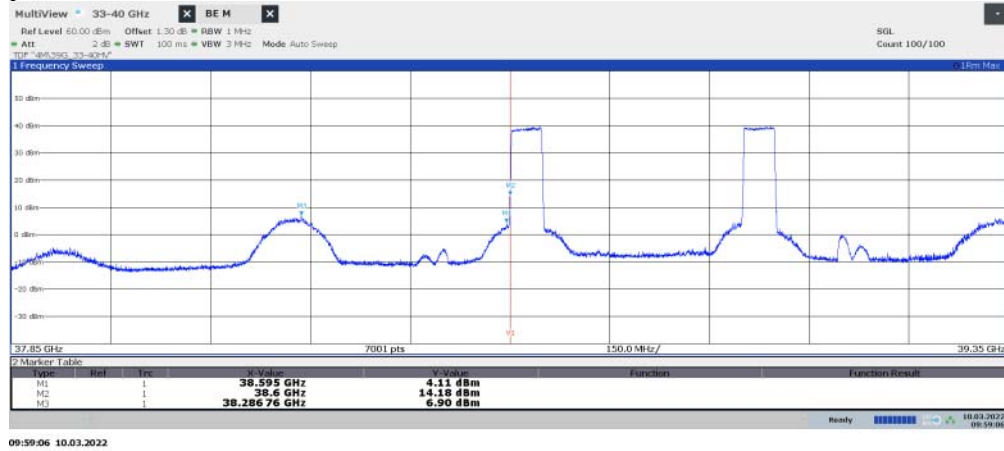
Diagram 2.12b: Pre scan 38.35 – 38.85 GHz, Symbolic name: BH₅₀, EIRP Vertical polarization



13:05:16 24.02.2022

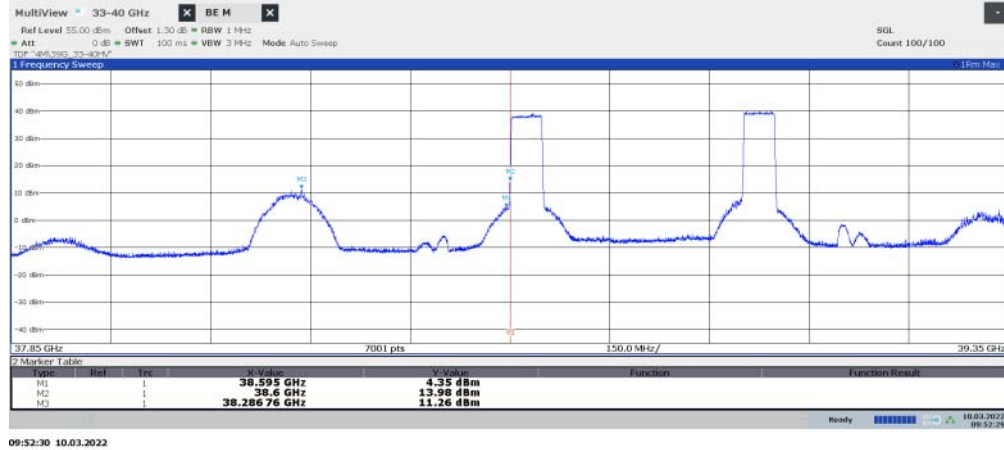
Power EIRP for 38.6 GHz Hor/ Ver [dBm]	Power EIRP for 38.595 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 38.6 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 38.595 GHz (Limit -13 dBm) [dBm]/ Verdict
15.74/ 16.28	7.23/ 8.54	31.75/ 31.75	-12.72/ Pass	-20.81/ Pass

Diagram 2.13a: Pre scan 37.85 – 39.35 GHz, Symbolic name: BH2_{max50}, EIRP Horizontal polarization



09:59:06 10.03.2022

Diagram 2.13b: Pre scan 37.85 – 39.35 GHz, Symbolic name: BH2_{max50}, EIRP Vertical polarization



09:52:30 10.03.2022

Power EIRP for 38.6 GHz Hor/ Ver [dBm]	Power EIRP for 38.595 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 38.6 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 38.595 GHz (Limit -13 dBm) [dBm]/ Verdict
14.18/ 13.98	4.11/ 4.35	31.75/ 31.75	-14.66/ Pass	-24.51/ Pass

Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
38.286	6.90/ 11.26	31.75/ 31.75	-19.13/ Pass

Diagram 2.14a: Pre scan 40 – 43 GHz, Symbolic name: TH₅₀, EIRP Horizontal polarization

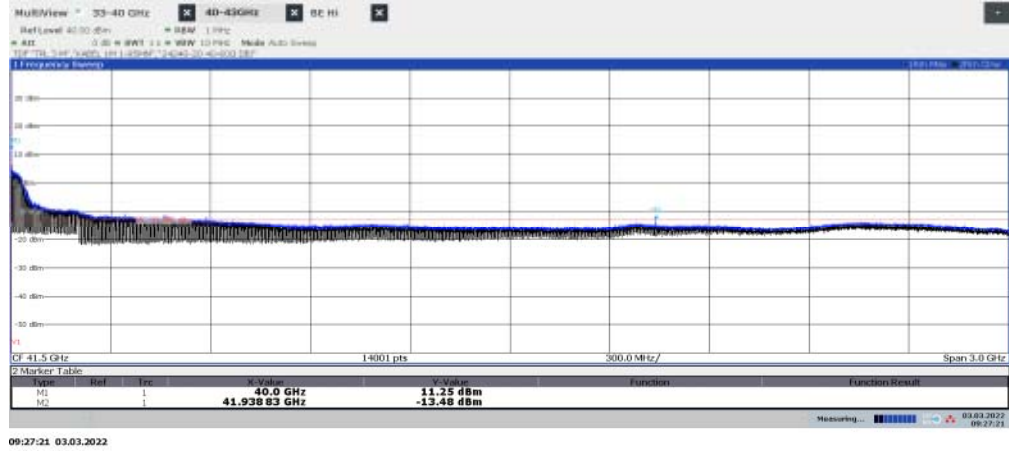


Diagram 2.14b: Pre scan 40 – 43 GHz, Symbolic name: TH₅₀, EIRP Vertical polarization

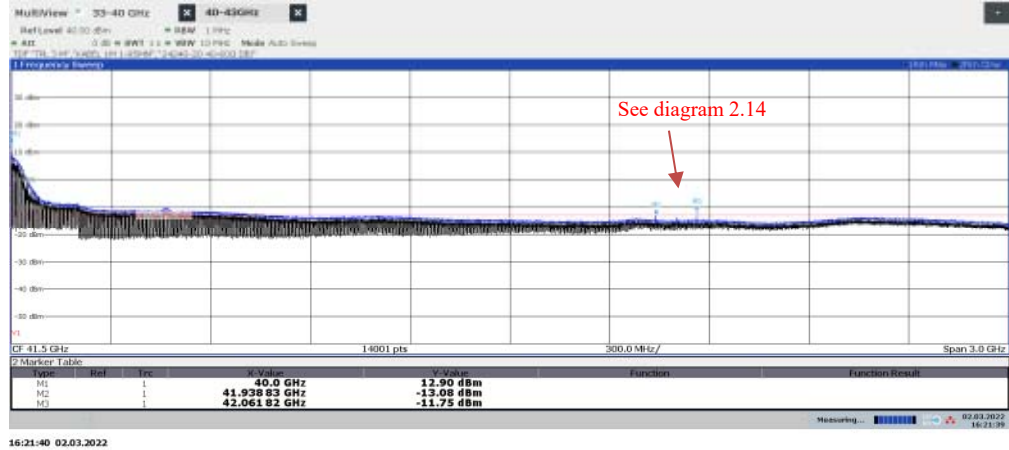
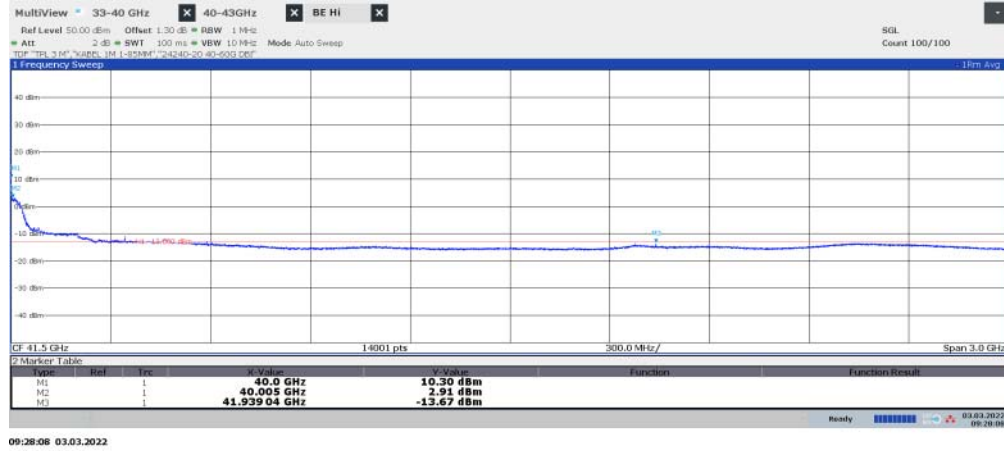
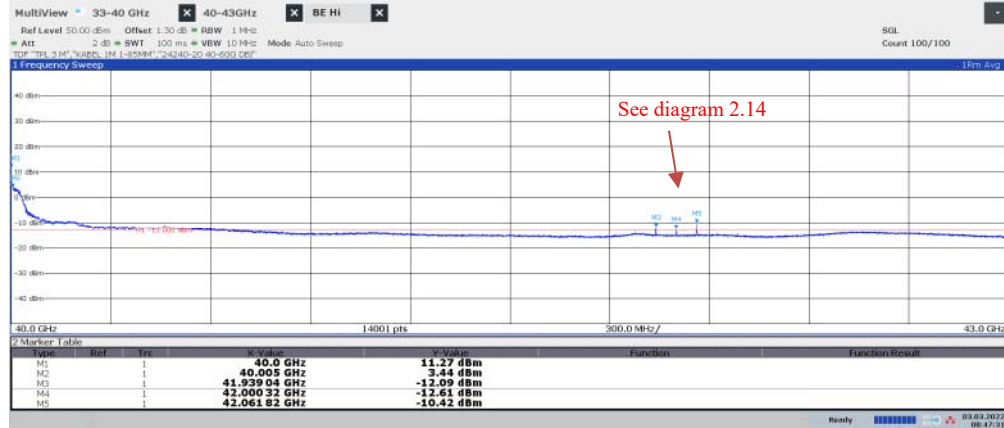


Diagram 2.14c: Pre scan 40 – 43 GHz, Symbolic name: TH₅₀, EIRP Horizontal polarization



09:28:08 03.03.2022

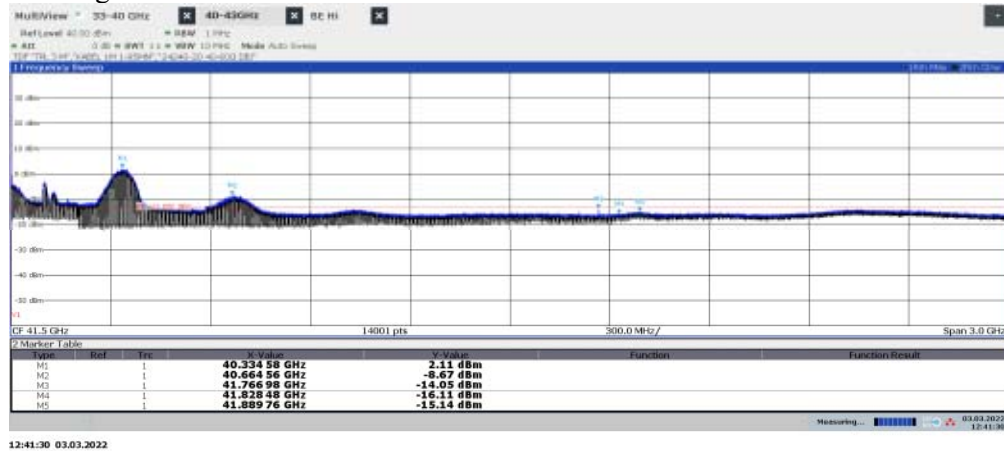
Diagram 2.14d: Pre scan 40 – 43 GHz, Symbolic name: TH₅₀, EIRP Vertical polarization



08:47:31 03.03.2022

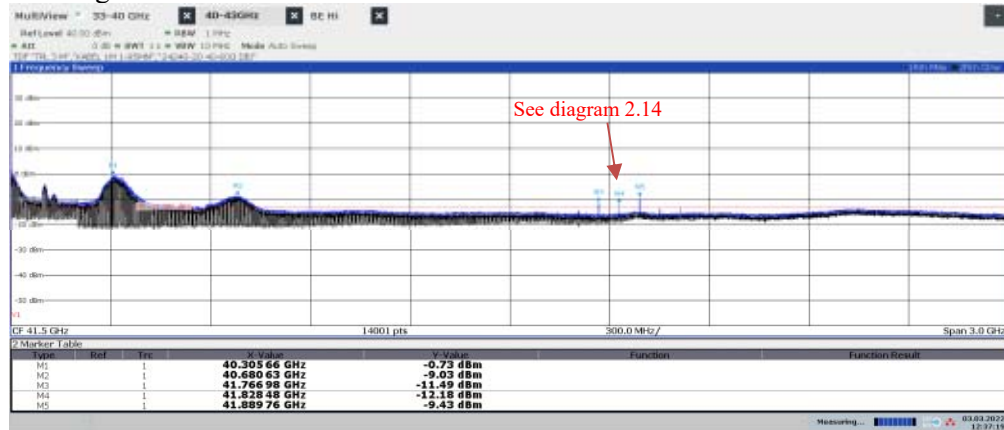
Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.005 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.005 GHz (Limit -13 dBm) [dBm]/ Verdict
10.30/ 11.27	2.91/ 3.44	31.57/ 31.61	-17.77/ Pass	-25.40/ Pass

Diagram 2.15a: Pre scan 40 – 43 GHz, Symbolic name: TH2_{max50}, EIRP Horizontal polarization
See diagram 2.15e for TRP result



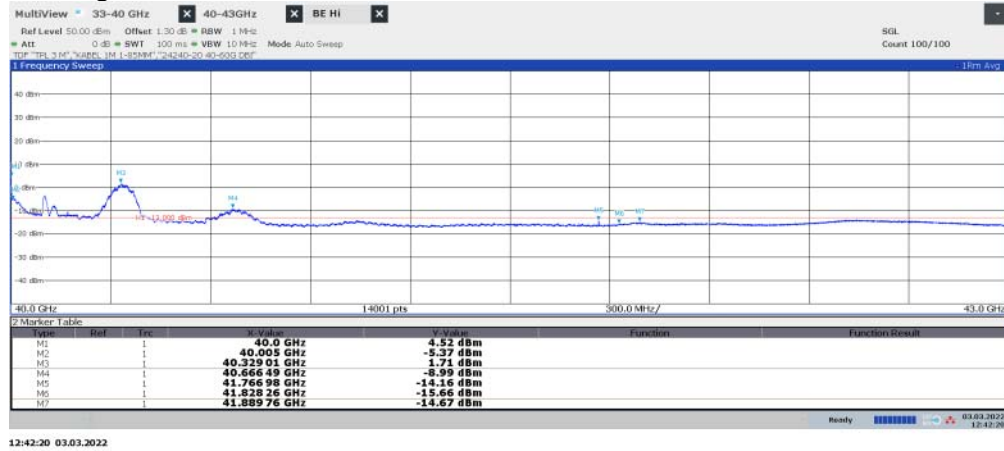
12:41:30 03.03.2022

Diagram 2.15b: Pre scan 40 – 43 GHz, Symbolic name: TH2_{max50}, EIRP Vertical polarization
See diagram 2.15e for TRP result



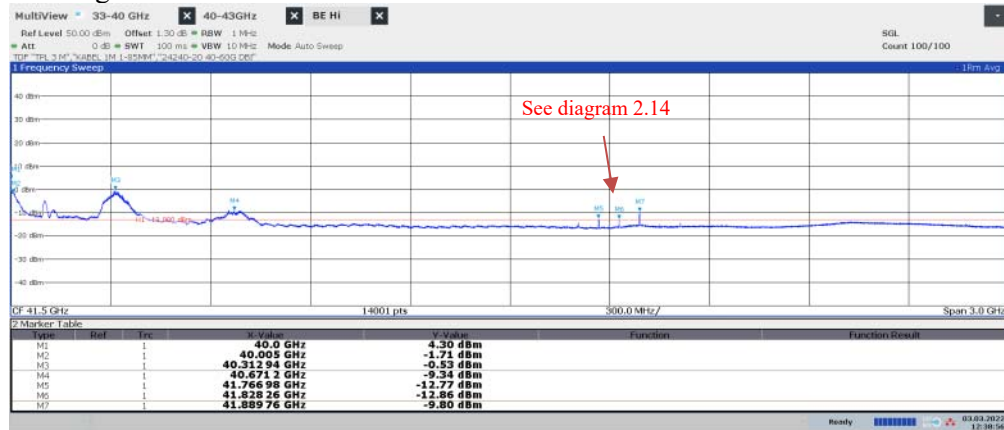
12:37:19 03.03.2022

Diagram 2.15c: Pre scan 40 – 43 GHz, Symbolic name: TH2_{max50}, EIRP Horizontal polarization
See diagram 2.15e for TRP result



12:42:20 03.03.2022

Diagram 2.15d: Pre scan 40 – 43 GHz, Symbolic name: TH2_{max50}, EIRP Vertical polarization
See diagram 2.15e for TRP result



12:38:57 03.03.2022

Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.005 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.005 GHz (Limit -13 dBm) [dBm]/ Verdict
4.52/ 4.30	-5.37/ -1.71	31.57/ 31.61	-24.17/ Pass	-31.75/ Pass

Diagram 2.15e: Pattern multiplication TRP 40 – 40.8 GHz, Symbolic name: TH2_{max50}

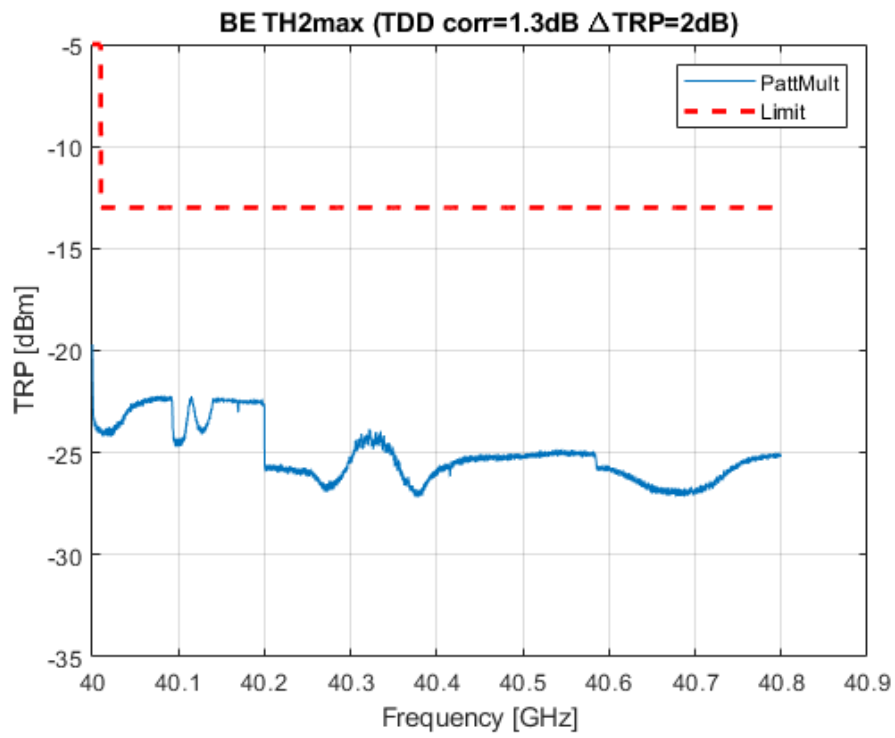
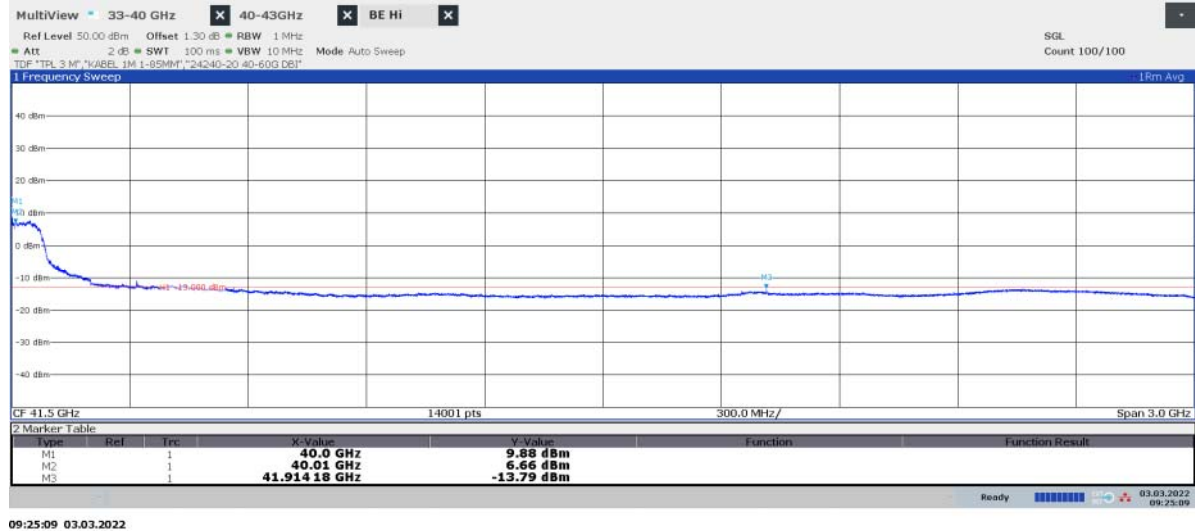
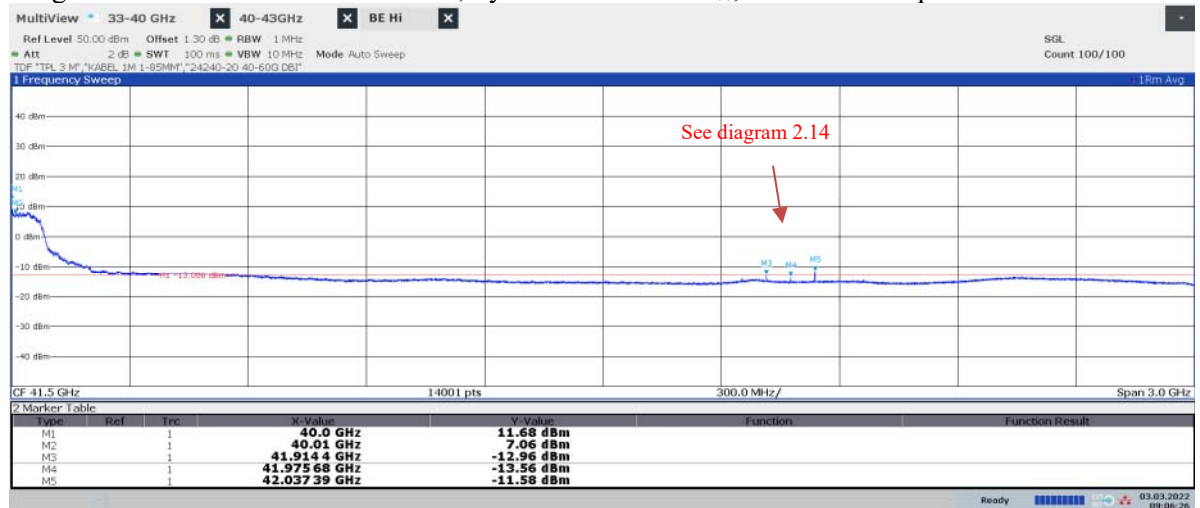


Diagram 2.16a: Pre scan 40 – 43 GHz, Symbolic name: TH₁₀₀, EIRP Horizontal polarization



09:25:09 03.03.2022

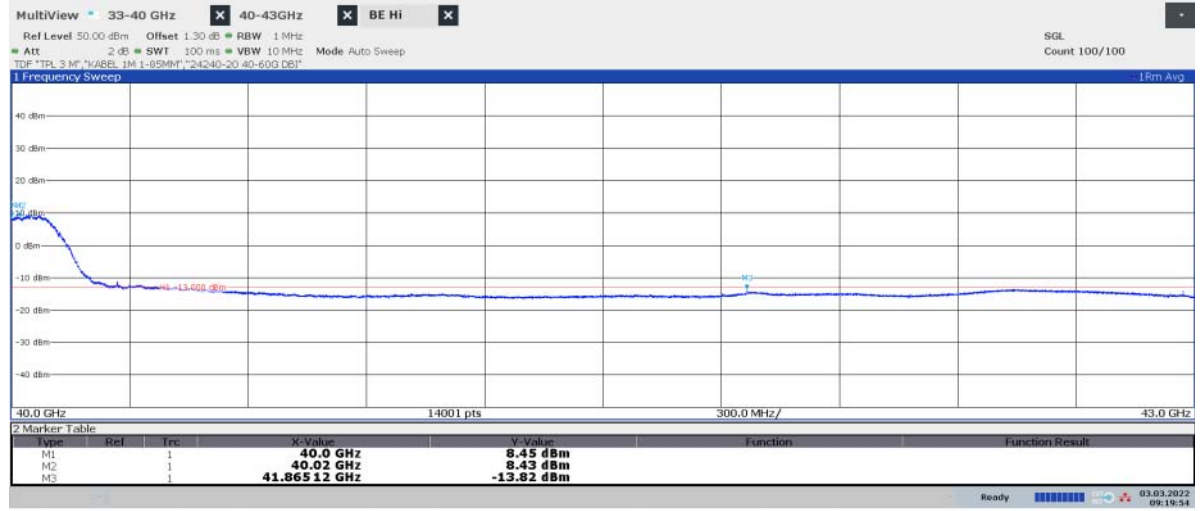
Diagram 2.16b: Pre scan 40 – 43 GHz, Symbolic name: TH₁₀₀, EIRP Vertical polarization



09:06:26 03.03.2022

Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.005 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.005 GHz (Limit -13 dBm) [dBm]/ Verdict
9.88/ 11.68	6.66/ 7.06	31.57/ 31.61	-17.71/ Pass	-21.72/ Pass

Diagram 2.17a: Pre scan 40 – 43 GHz, Symbolic name: TH₂₀₀, EIRP Horizontal polarization



09:19:54 03.03.2022

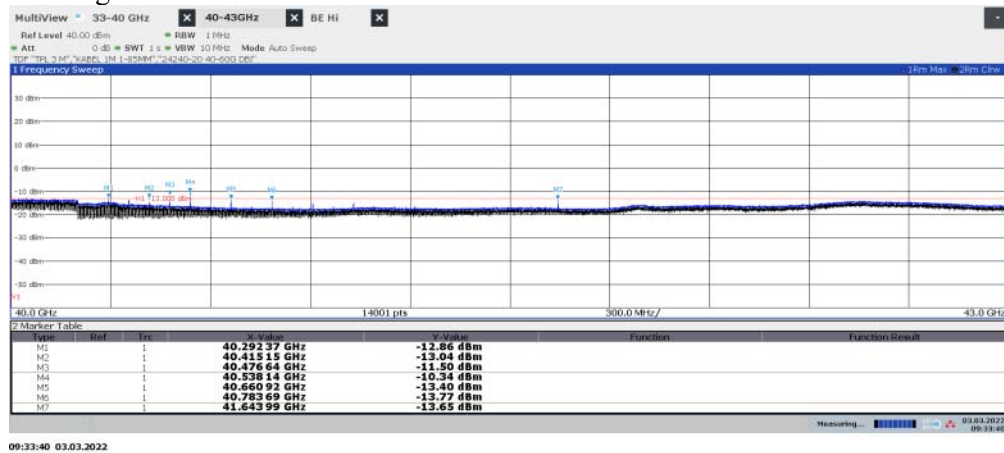
Diagram 2.17bd: Pre scan 40 – 43 GHz, Symbolic name: TH₂₀₀, EIRP Vertical polarization



09:10:25 03.03.2022

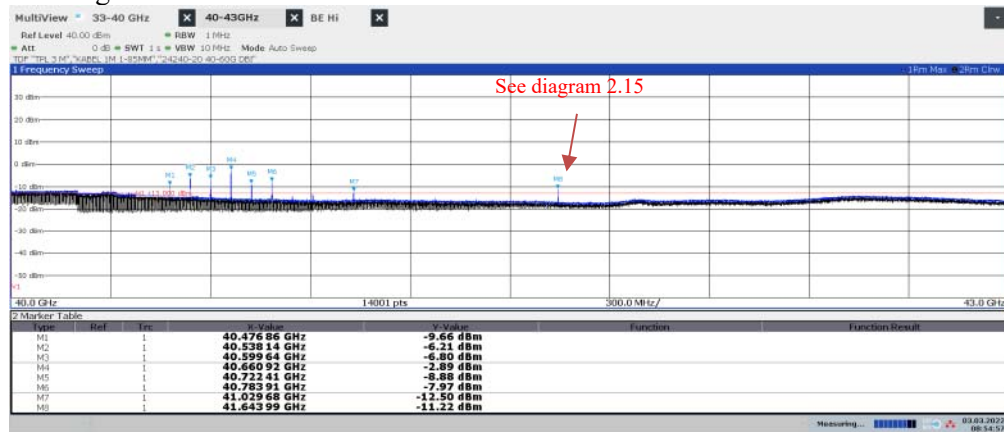
Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.02 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.02 GHz (Limit -13 dBm) [dBm]/ Verdict
8.45/ 8.69	8.43/ 8.66	31.57/ 31.61	-20.01/ Pass	-20.03/ Pass

Diagram 2.18a: Pre scan 40 – 43 GHz, Symbolic name: TL₅₀, EIRP Horizontal polarization
See diagram 2.18c for TRP result



09:33:40 03.03.2022

Diagram 2.18b: Pre scan 40 – 43 GHz, Symbolic name: TL₅₀, EIRP Vertical polarization
See diagram 2.18c for TRP result



08:54:58 03.03.2022

Diagram 2.18c: Two cut TRP 40.2 – 41.1 GHz, Symbolic name: TL₅₀

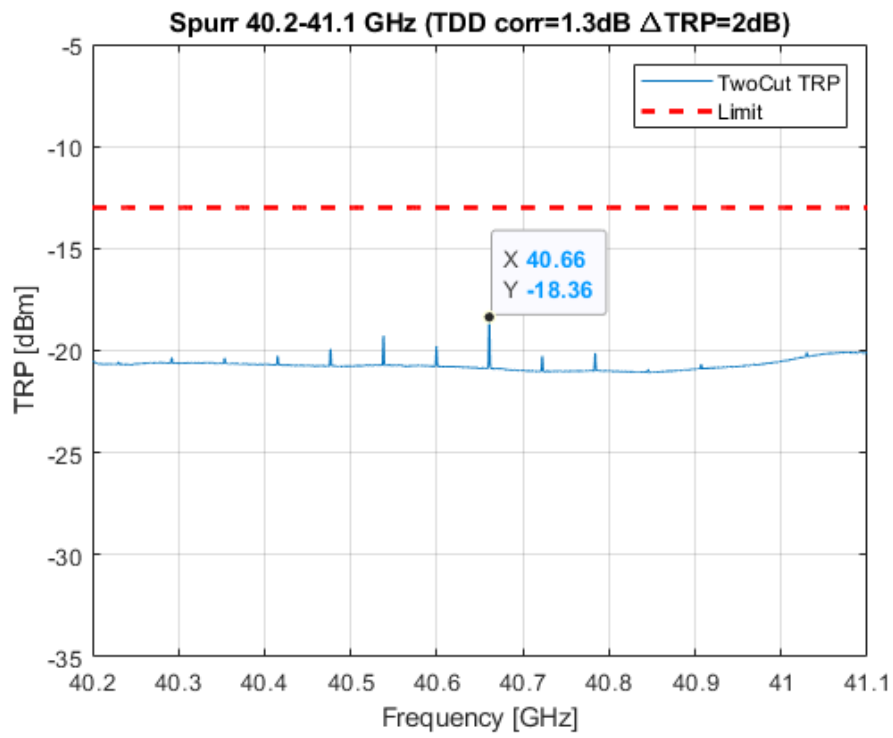


Diagram 2.19a: Pre scan 40 – 43 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization
See diagram 2.19c for TRP result

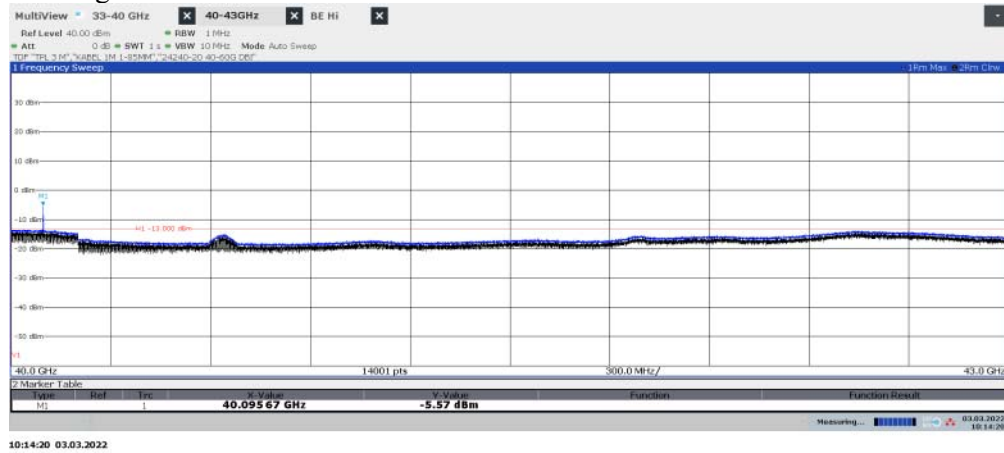


Diagram 2.19b: Pre scan 40 – 43 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization
See diagram 2.19c for TRP result

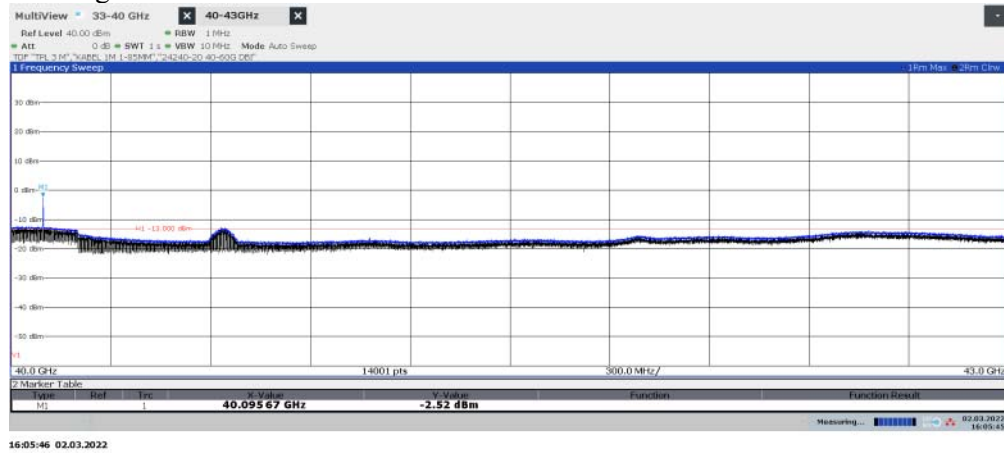


Diagram 2.19c: Two cut TRP 40.04 – 40.14 GHz, Symbolic name: BL₅₀

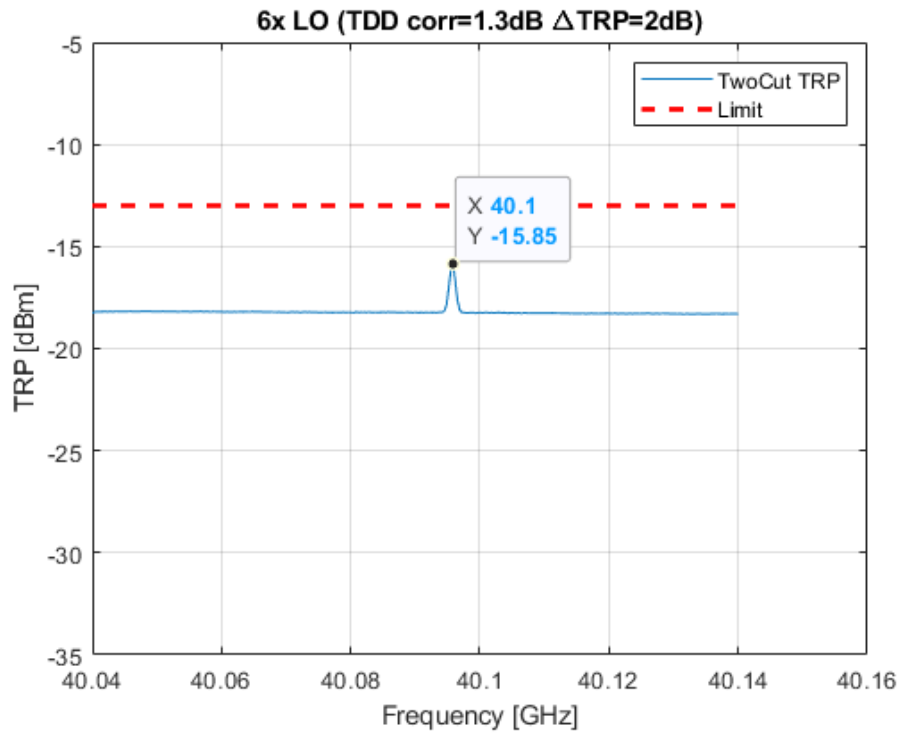


Diagram 2.20a: Pre scan 43 – 60 GHz, Symbolic name: BL₅₀, EIRP Horizontal polarization
See diagram 2.20c for TRP result

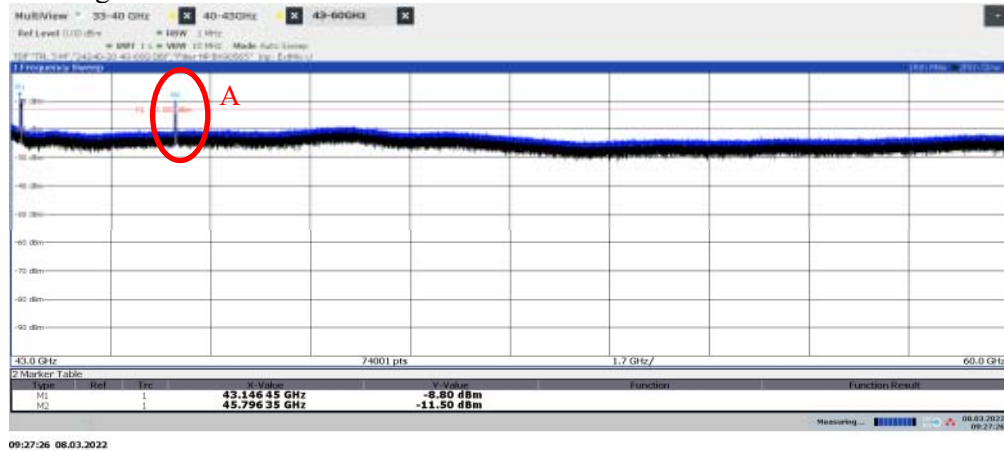
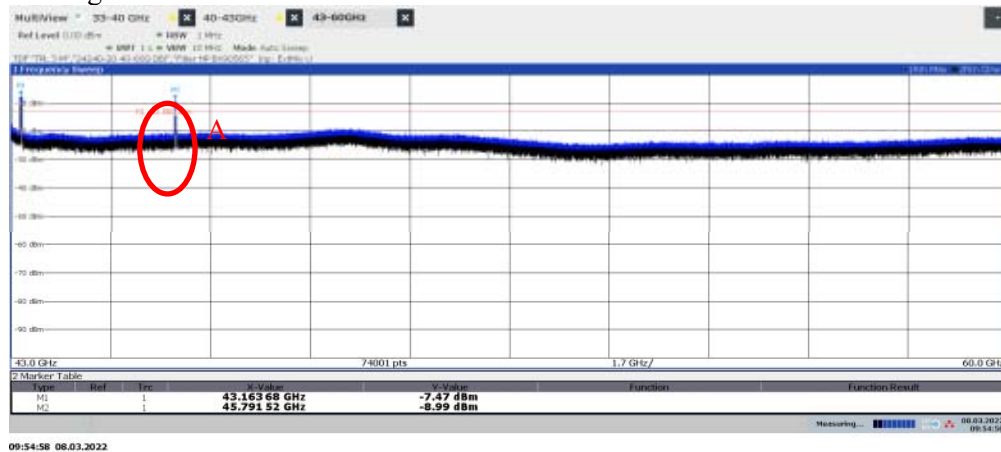


Diagram 2.20b: Pre scan 43 – 60 GHz, Symbolic name: BL₅₀, EIRP Vertical polarization
See diagram 2.20c for TRP result



“False signals” originating from unwanted mixer products between LO signal generated by the spectrum analyzer and the strong out of measurement band RF-signal (EUT carrier frequencies) are marked with red circles. The frequency of the “false signals” can be calculated and are show in the table below.

Plot label	Mixing indicies			
	F EUT [GHz]	n [-]	m [-]	"False F" [GHz]
A	37.025	4	1	45.8

Diagram 2.20c: Two cut TRP 43.11 – 43.21 GHz, Symbolic name: BL₅₀

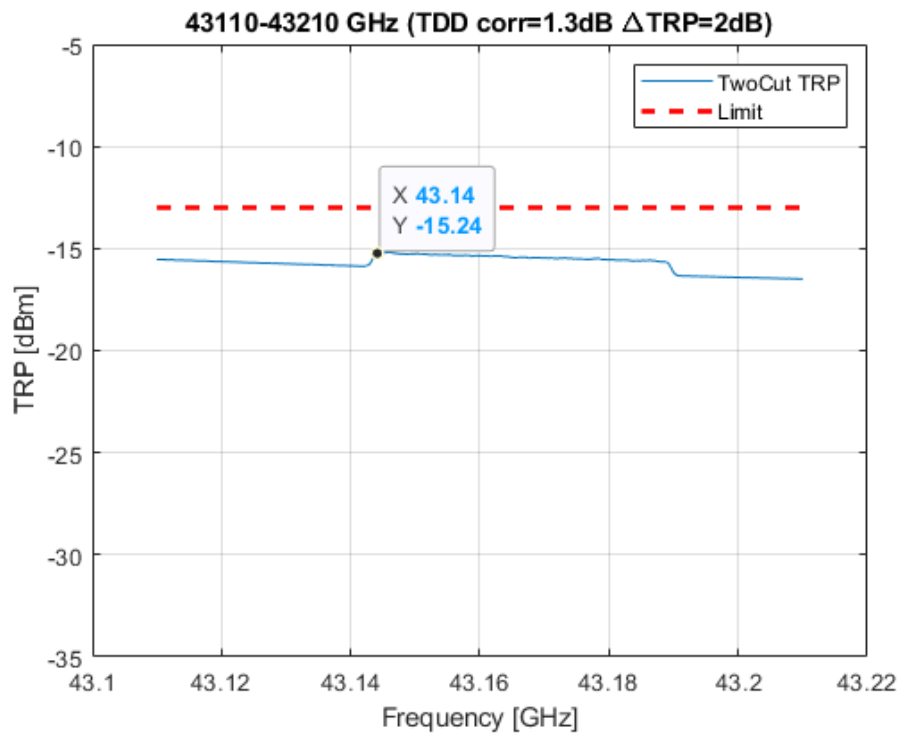


Diagram 2.21a: Pre scan 60 – 75 GHz, Symbolic name: TL₅₀, EIRP Horizontal polarization

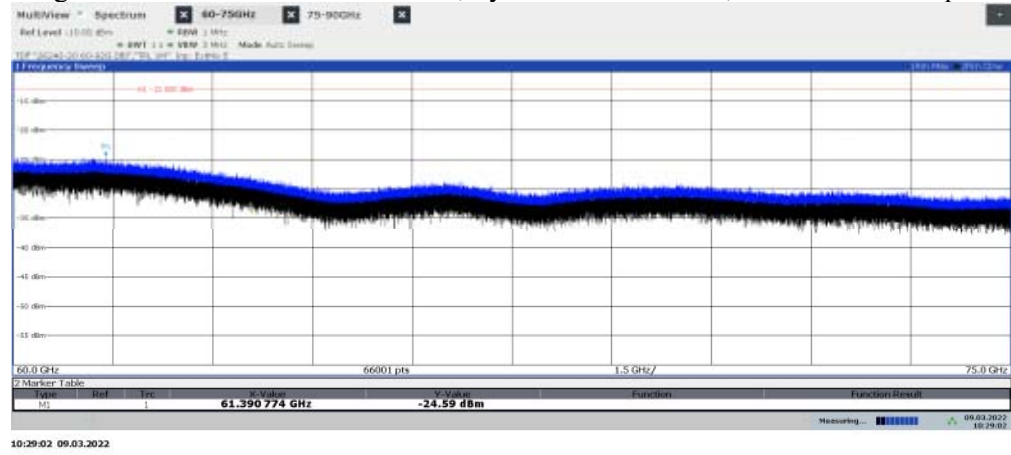


Diagram 2.21b: Pre scan 60 – 75 GHz, Symbolic name: TL₅₀, EIRP Vertical polarization

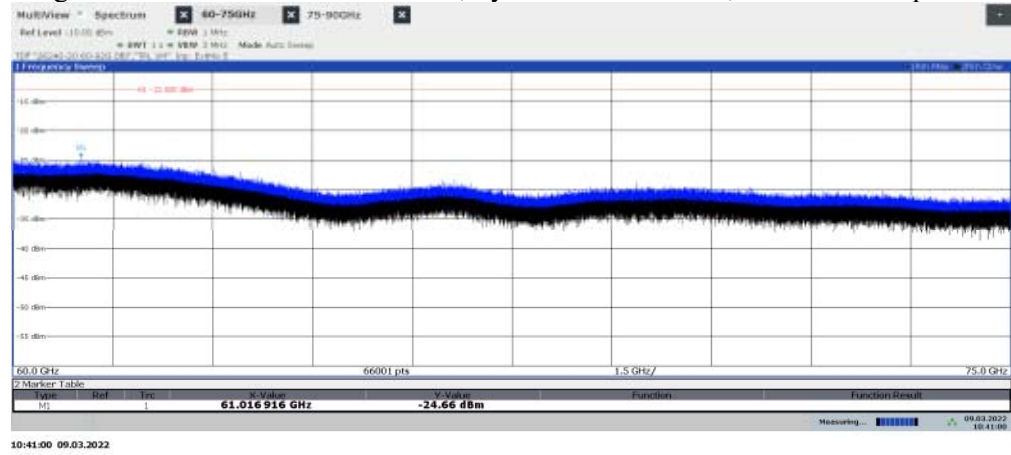


Diagram 2.22a: 75 – 90 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

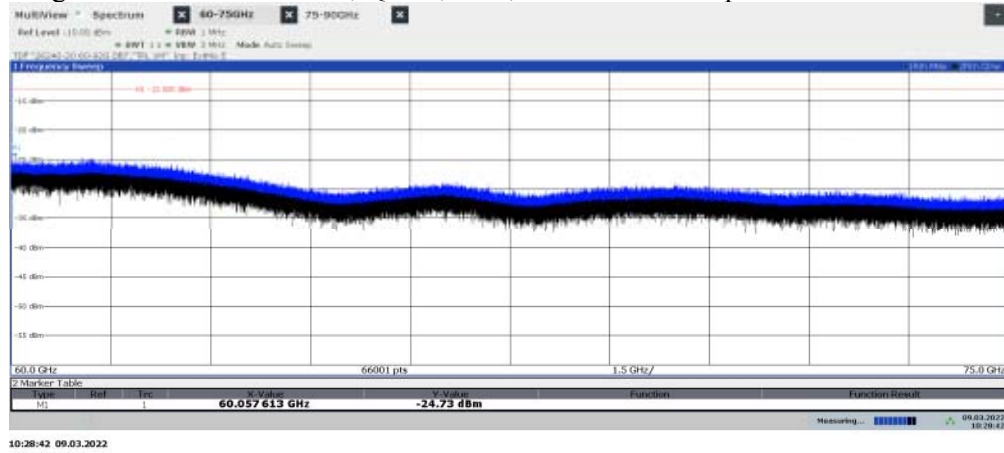


Diagram 2.22b: 75 – 90 GHz, QPSK, TL₅₀, EIRP Vertical polarization

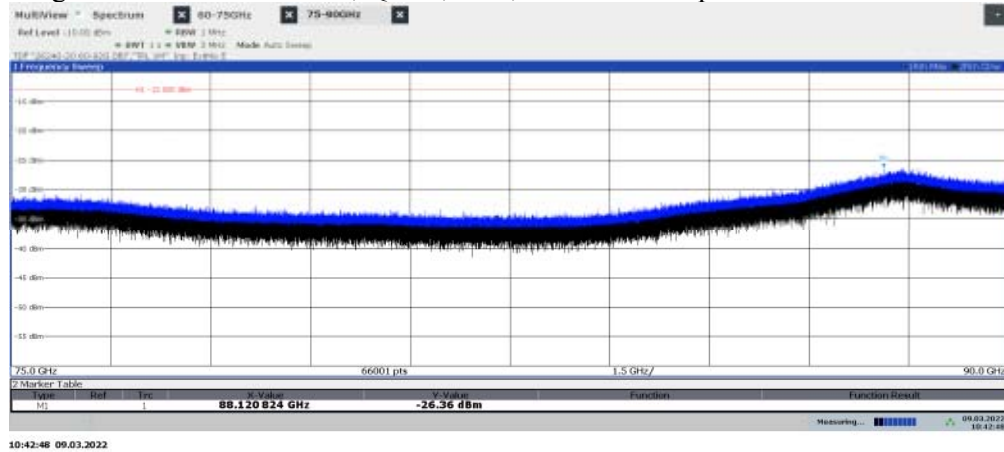


Diagram 2.23a: 90 – 110 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

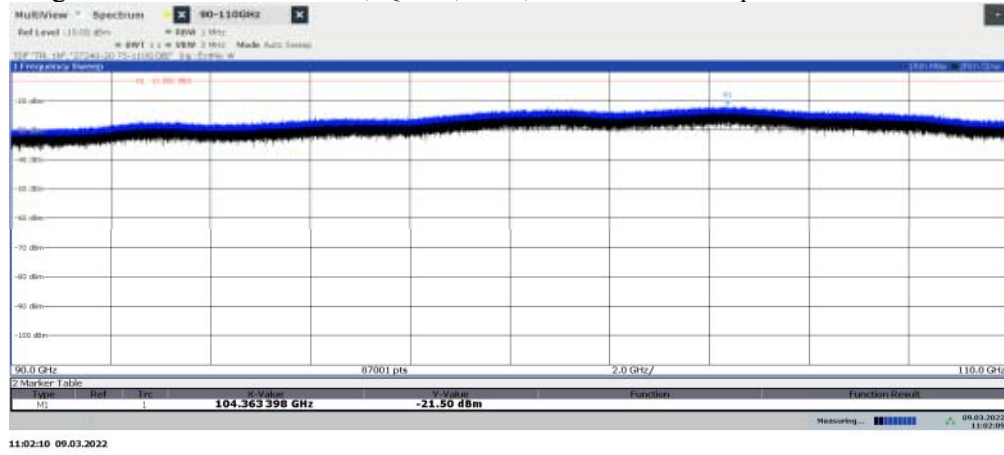


Diagram 2.23b: 90 – 110 GHz, QPSK, TL₅₀, EIRP Vertical polarization

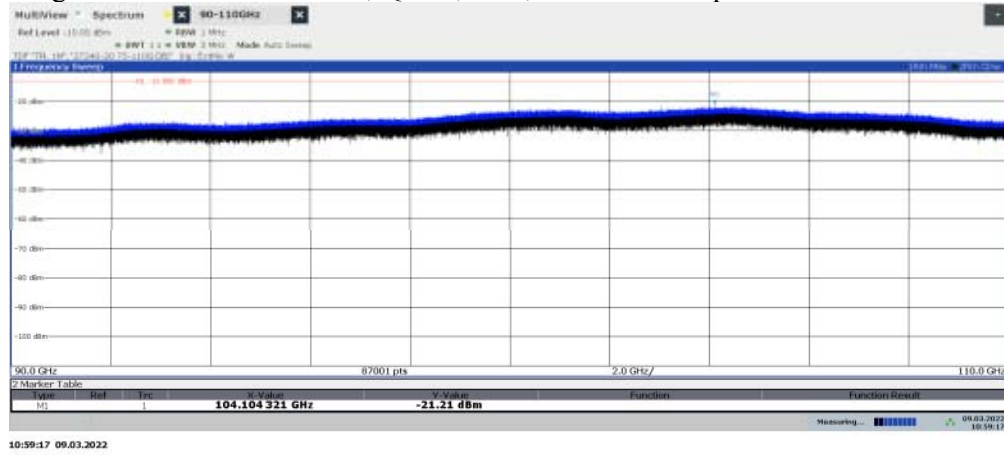


Diagram 2.24a: 110 – 130 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

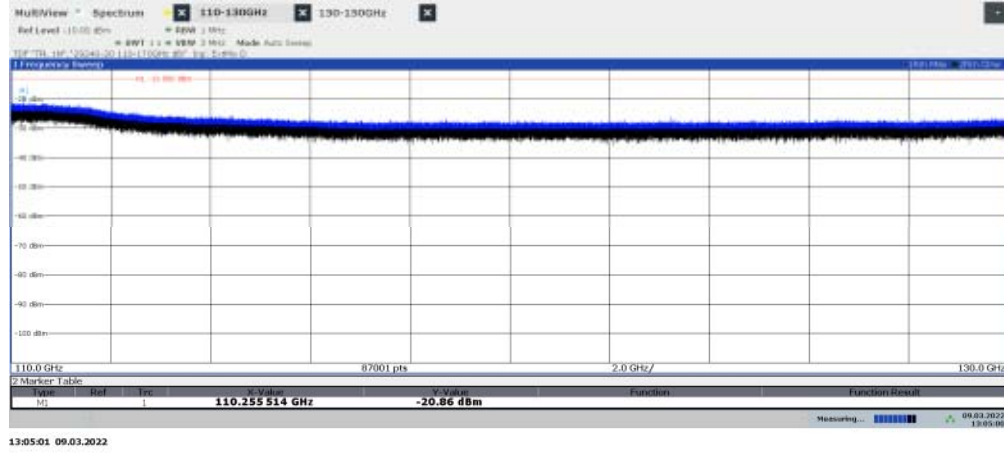


Diagram 2.24b: 110 – 130 GHz, QPSK, TL₅₀, EIRP Vertical polarization

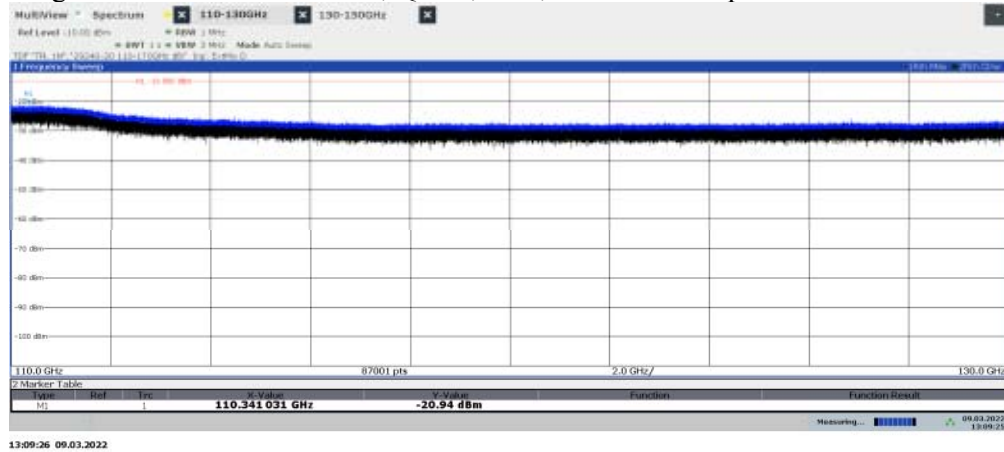


Diagram 2.25a: 130 – 150 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

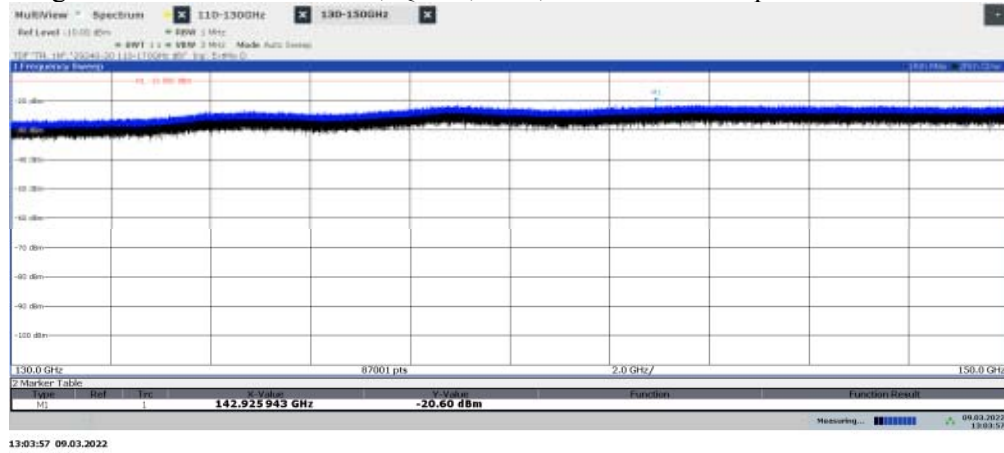


Diagram 2.25b: 130 – 150 GHz, QPSK, TL₅₀, EIRP Vertical polarization

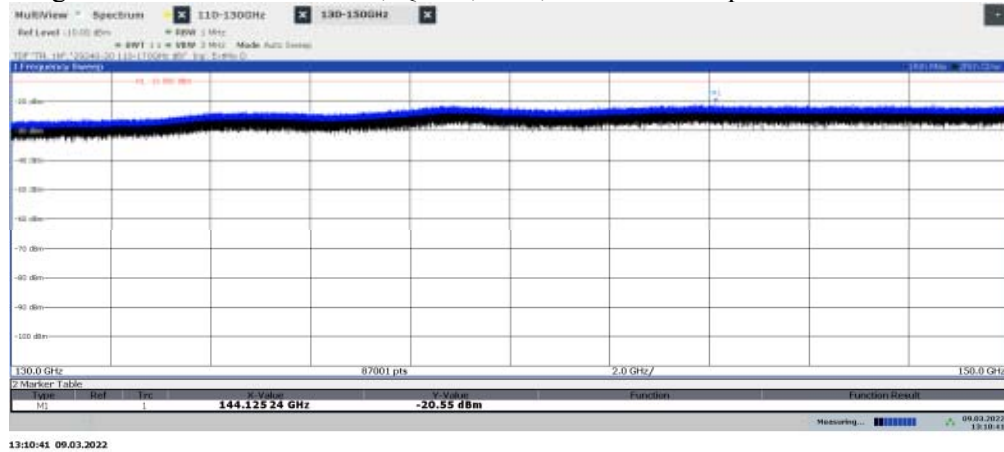


Diagram 2.26a: 150 – 170 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

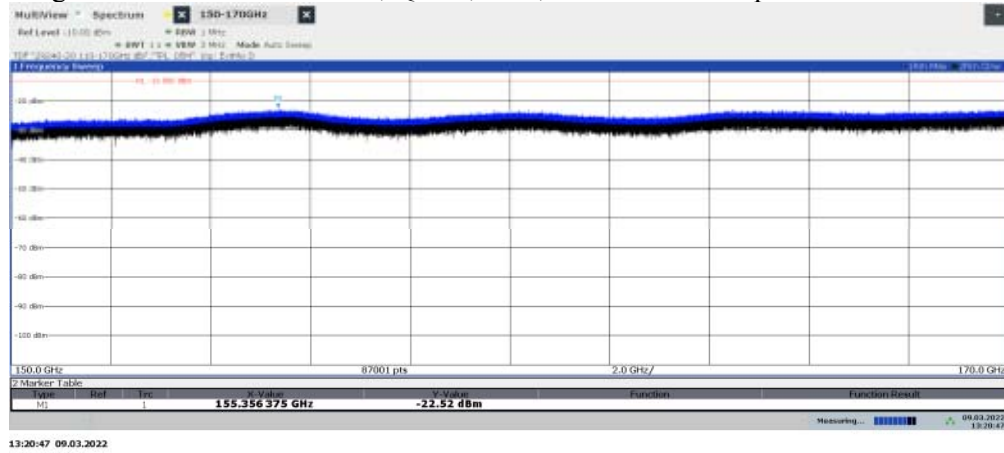


Diagram 2.26b: 150 – 170 GHz, QPSK, TL₅₀, EIRP Vertical polarization

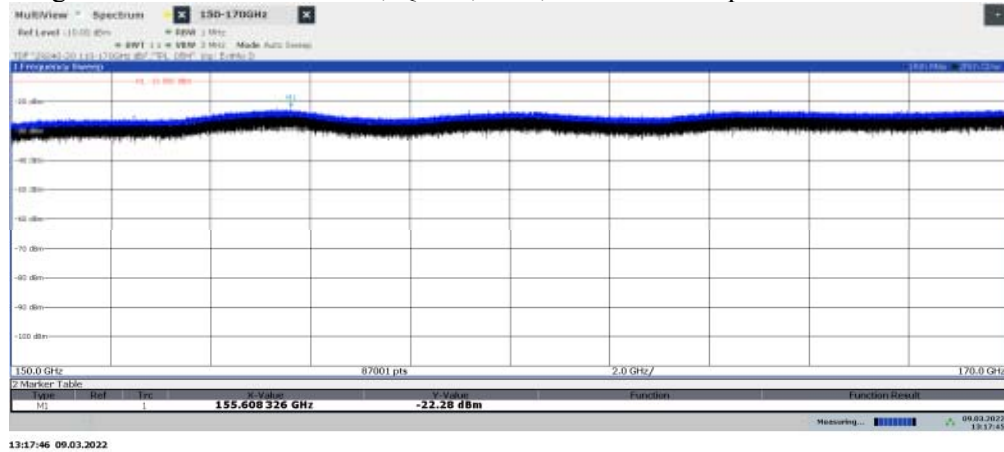


Diagram 2.27a: 170 – 185 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

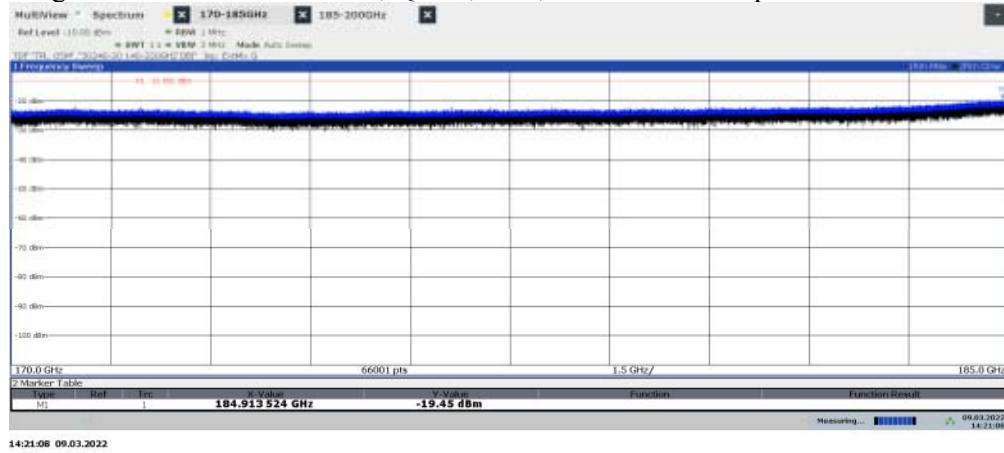


Diagram 2.27b: 170 – 185 GHz, QPSK, TL₅₀, EIRP Vertical polarization

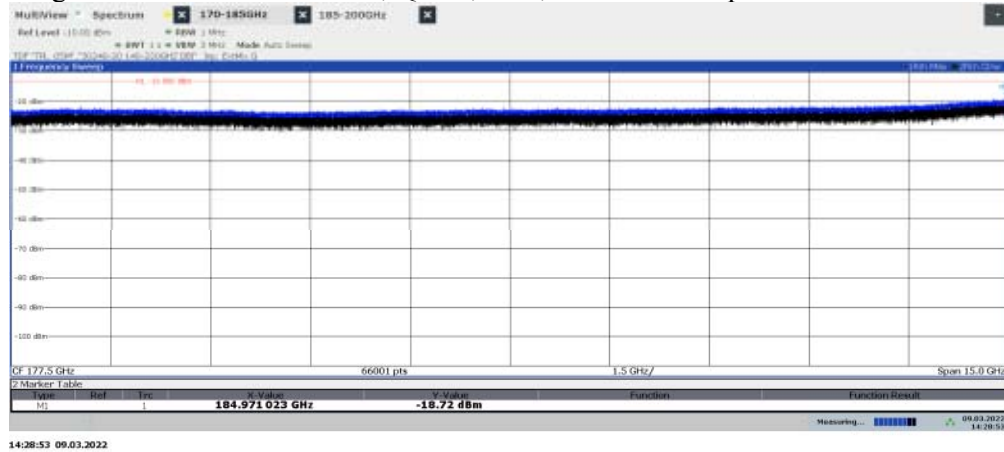


Diagram 2.28a: 185 – 200 GHz, QPSK, TL₅₀, EIRP Horizontal polarization

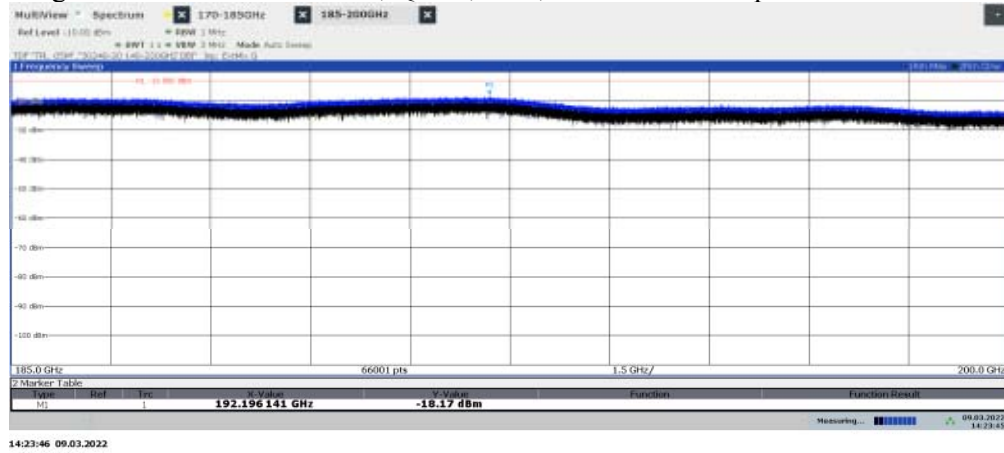


Diagram 2.28b: 185 – 200 GHz, QPSK, TL₅₀, EIRP Vertical polarization

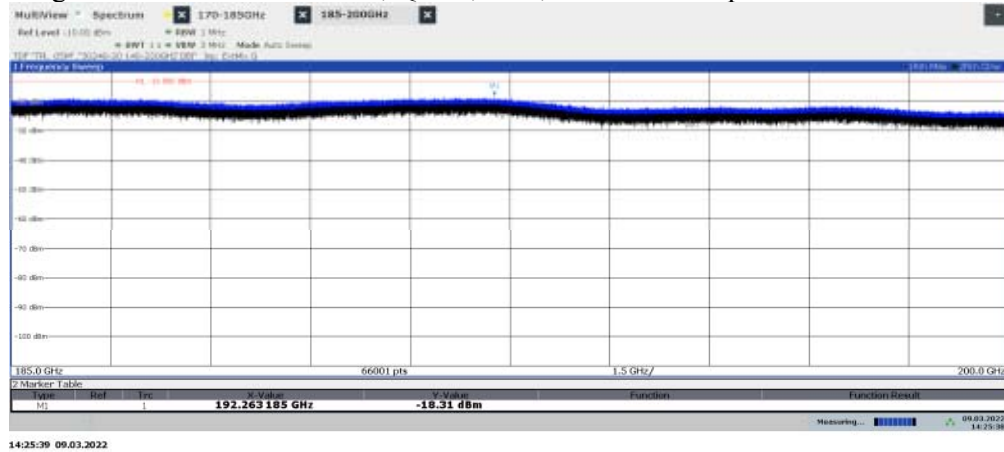
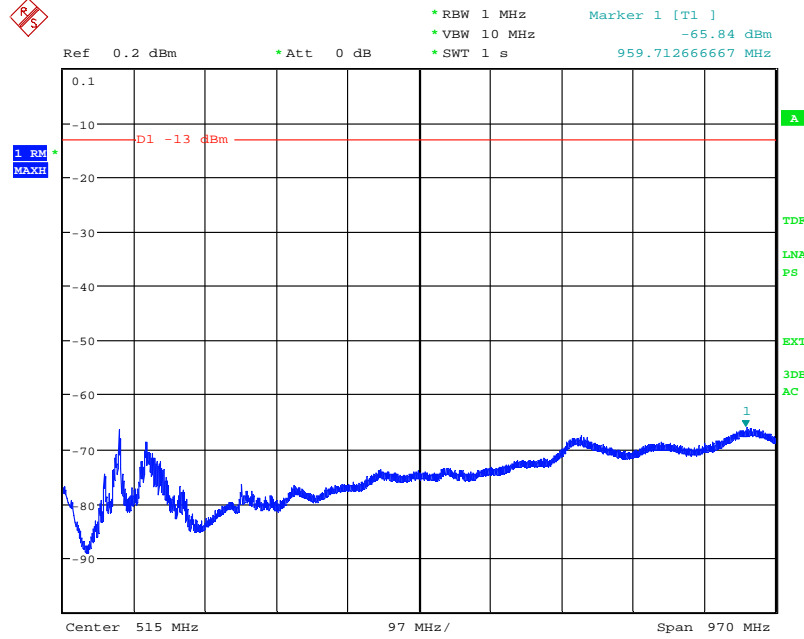
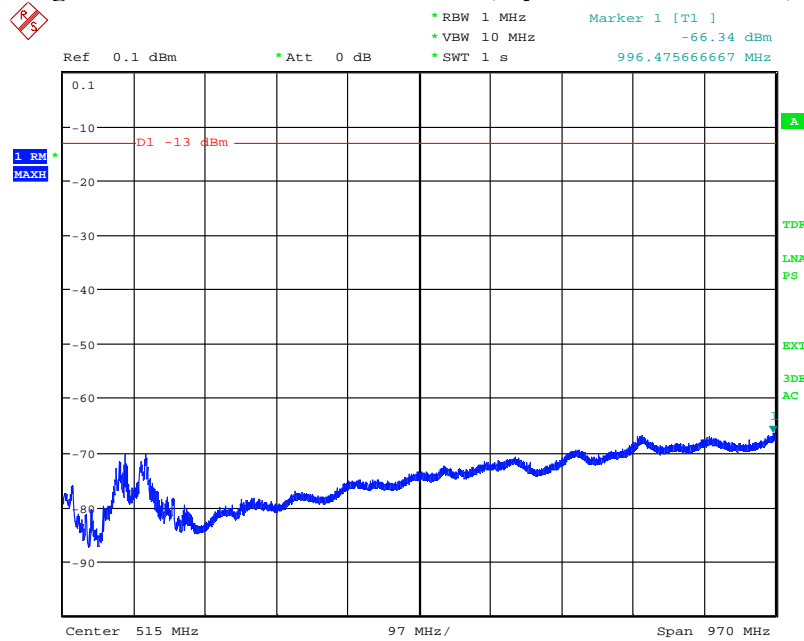


Diagram 2.29a: Pre scan 30 – 1000 MHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization



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Diagram 2.29b: Pre scan 30 – 1000 MHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization



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Diagram 2.30a: Pre scan 1 – 18 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization

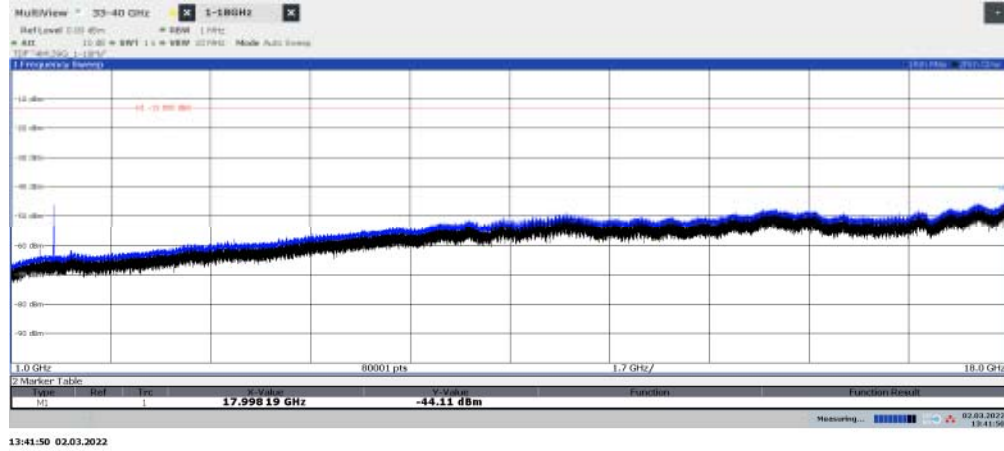


Diagram 2.30b: Pre scan 1 – 18 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization

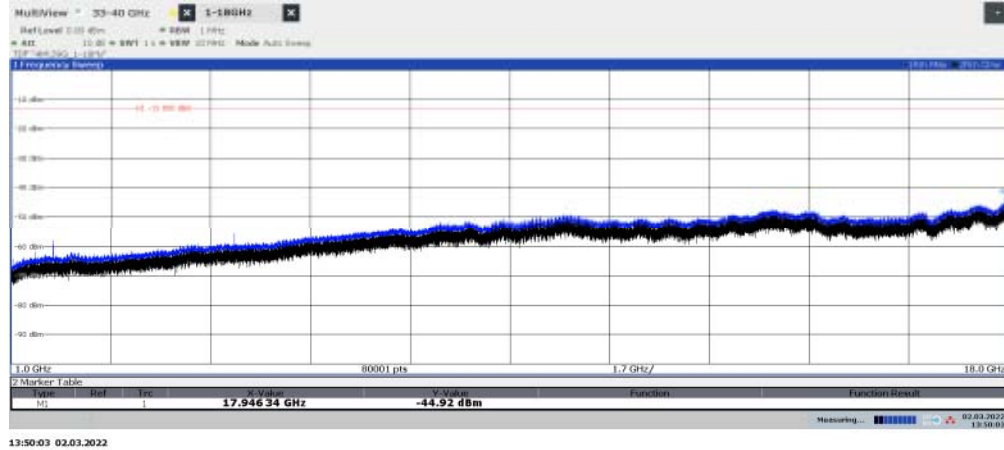


Diagram 2.31a: Pre scan 18 – 26.5 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization

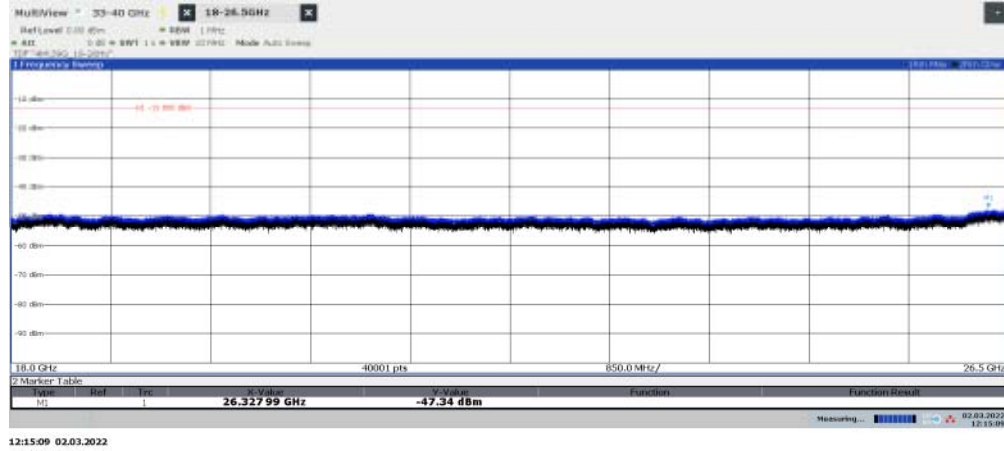


Diagram 2.31b: Pre scan 18 – 26.5 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization

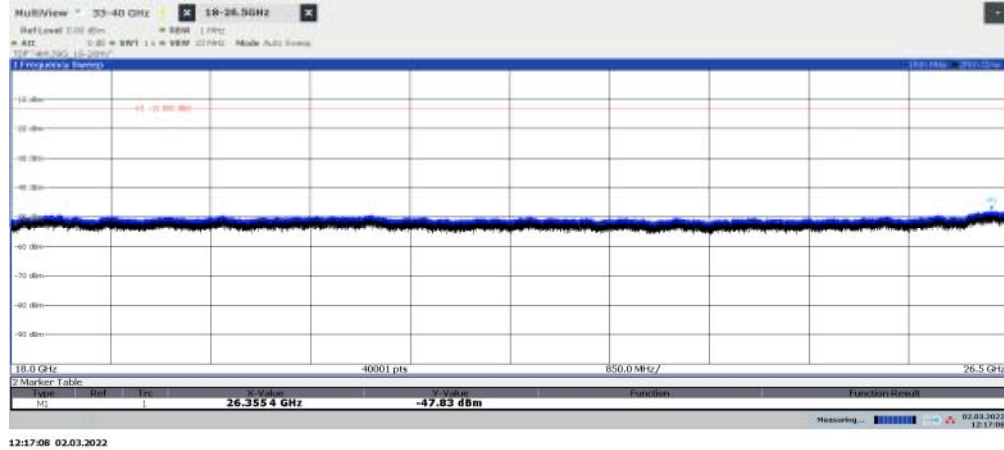


Diagram 2.32a: Pre scan 26.5 – 33 GHz, Symbolic name: TH8₁₀₀, EIRP Horizontal polarization

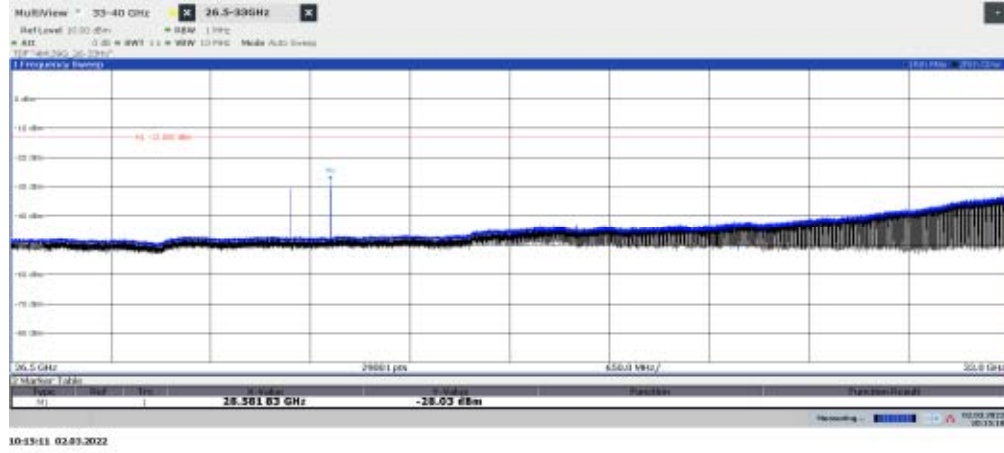


Diagram 2.32b: Pre scan 26.5 – 33 GHz, Symbolic name: TH8₁₀₀, EIRP Vertical polarization

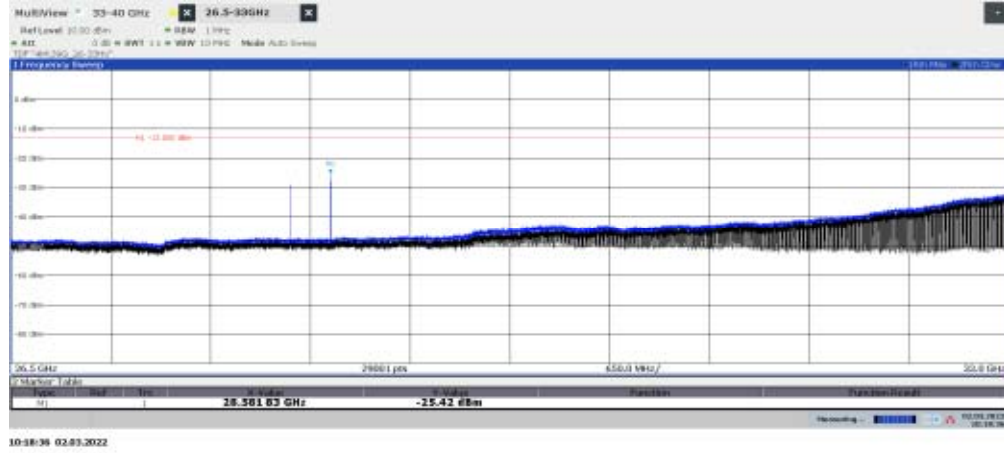
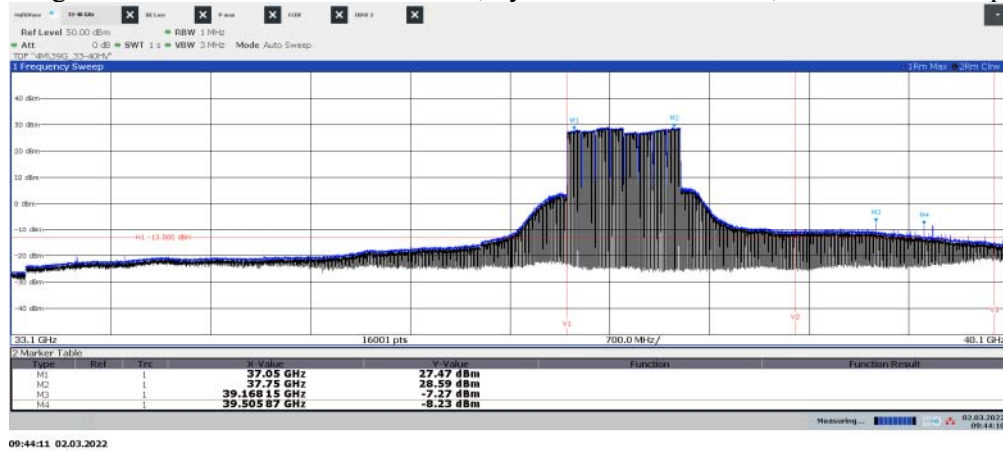
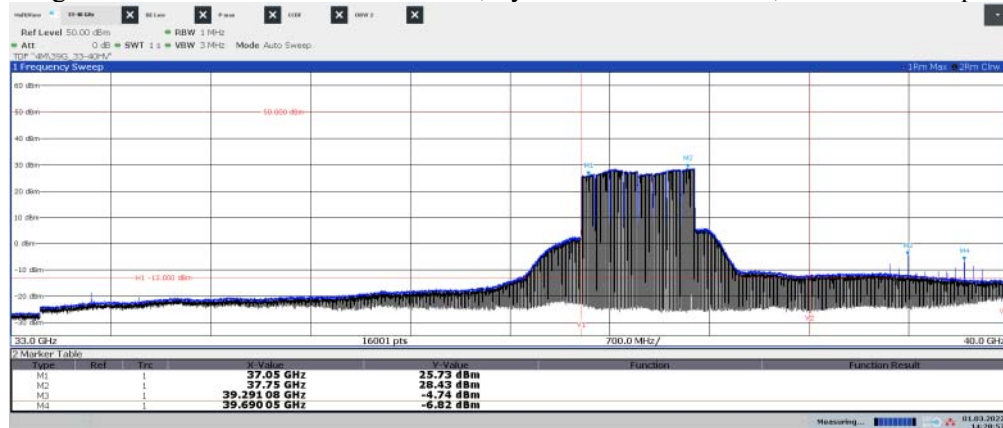


Diagram 2.33a: Pre scan 33 – 40.0 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization



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Diagram 2.33b: Pre scan 33 – 40.0 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization



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Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
39.168	-7.27/ -13.0	28.67/ 28.67	-34.91/ Pass
39.291	-13.0/ -4.74	28.67/ 28.67	-32.81/ Pass
39.505	-8.23/ -10.0	28.67/ 28.67	-34.69/ Pass
39.690	-13.0/ -6.82	28.67/ 28.67	-34.55/ Pass

Diagram 2.33c: Pre scan 36 – 37 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization

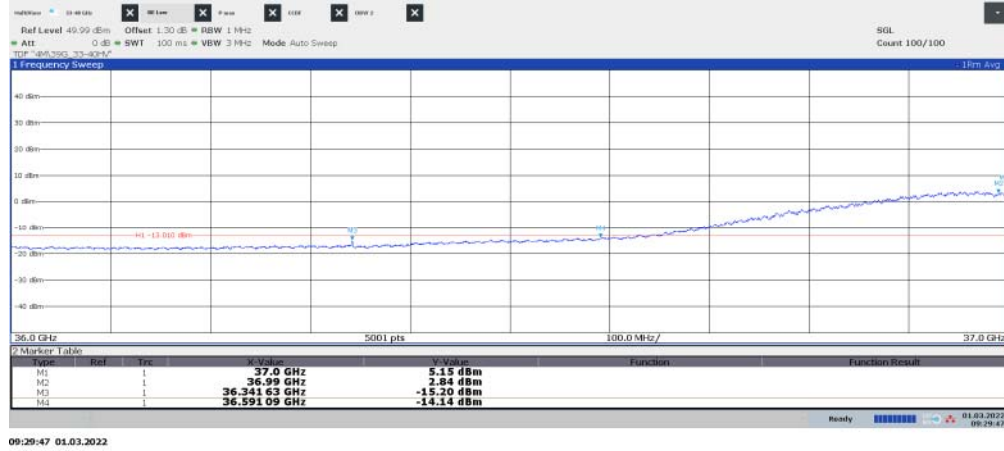


Diagram 2.33d: Pre scan 36 – 37 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization



Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.99 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.99 GHz (Limit -13 dBm) [dBm]/ Verdict
5.15/ 4.76	2.84/ 2.54	28.6/ 28.42	-20.54/ Pass	-22.81/ Pass

Diagram 2.34a: Pre scan 40 – 43 GHz, Symbolic name: TH8₁₀₀, EIRP Horizontal polarization

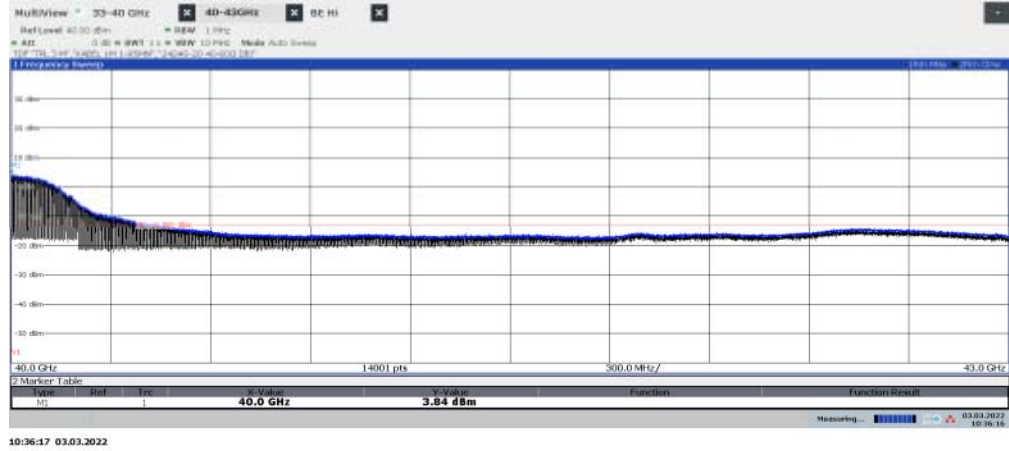


Diagram 2.34b: Pre scan 40 – 43 GHz, Symbolic name: TH8₁₀₀, EIRP Vertical polarization

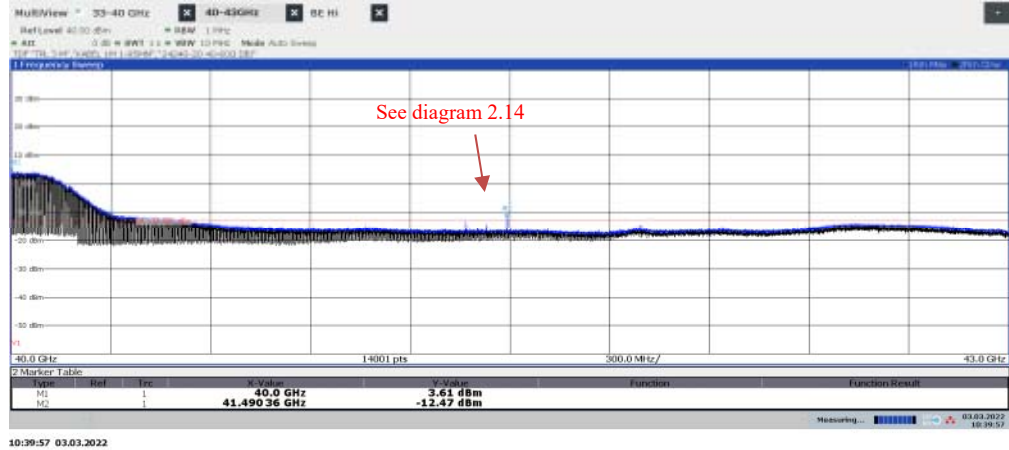
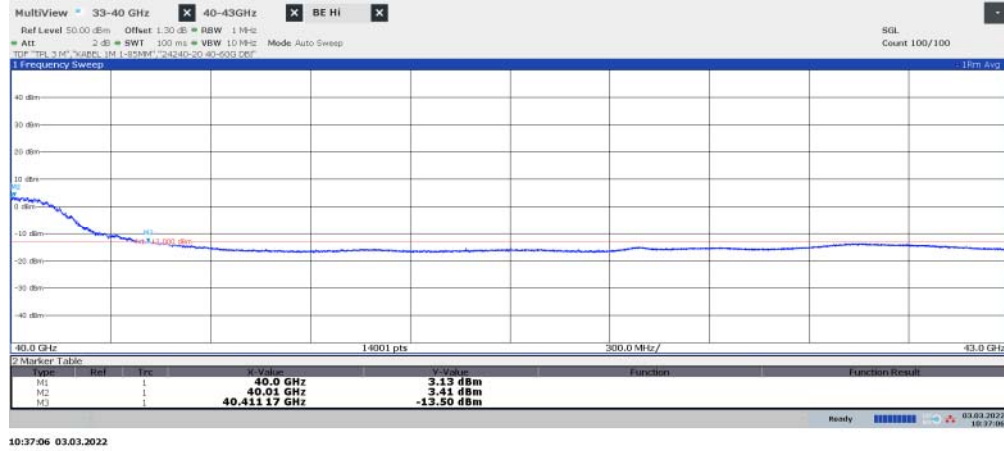
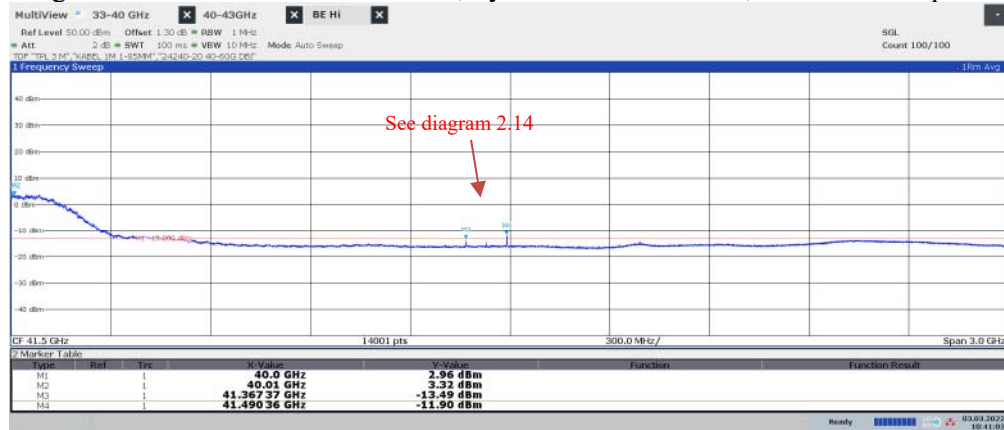


Diagram 2.34c: Pre scan 40 – 43 GHz, Symbolic name: TH8₁₀₀, EIRP Horizontal polarization



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Diagram 2.34d: Pre scan 40 – 43 GHz, Symbolic name: TH8₁₀₀, EIRP Vertical polarization



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Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.01 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.01 GHz (Limit -13 dBm) [dBm]/ Verdict
10.30/ 11.27	2.91/ 3.44	28.52/ 28.64	-14.76/ Pass	-22.39/ Pass

Diagram 2.35a: Pre scan 43 – 60 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization

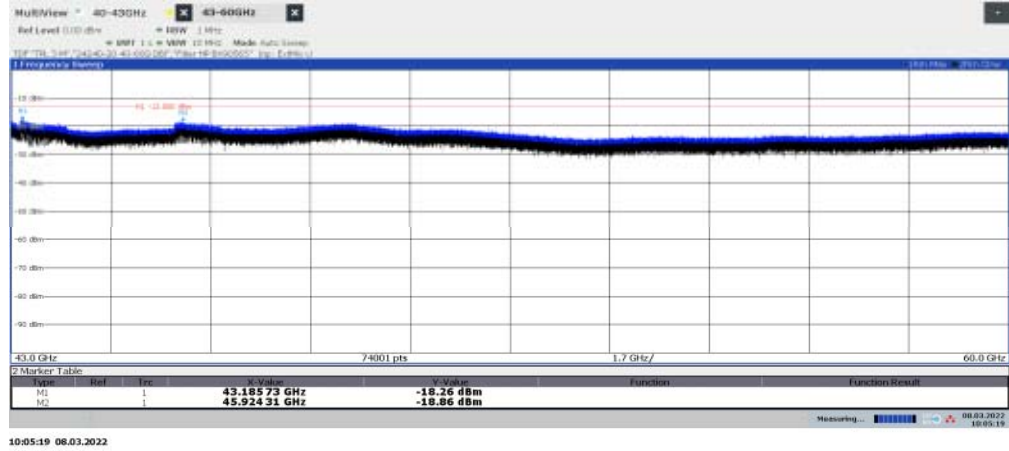


Diagram 2.35b: Pre scan 43 – 60 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization

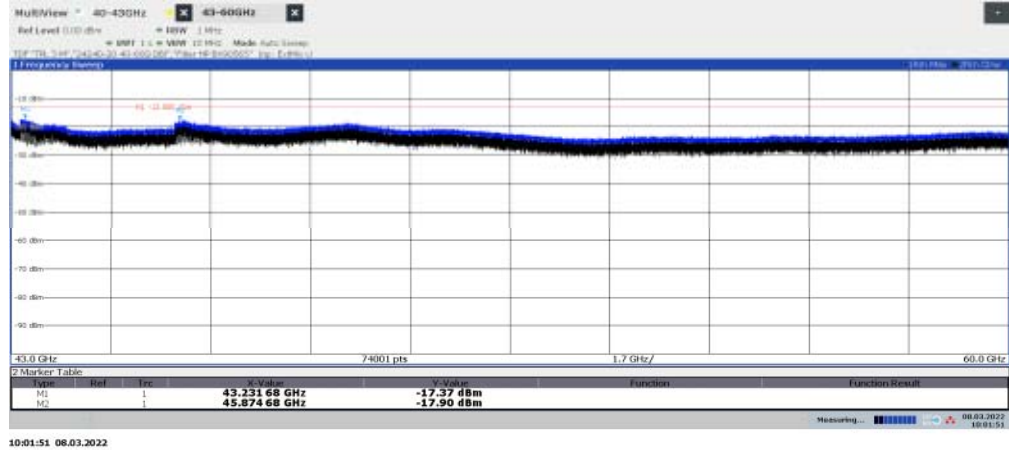


Diagram 2.36a: Pre scan 60 – 75 GHz, Symbolic name: BL8₁₀₀, EIRP Horizontal polarization

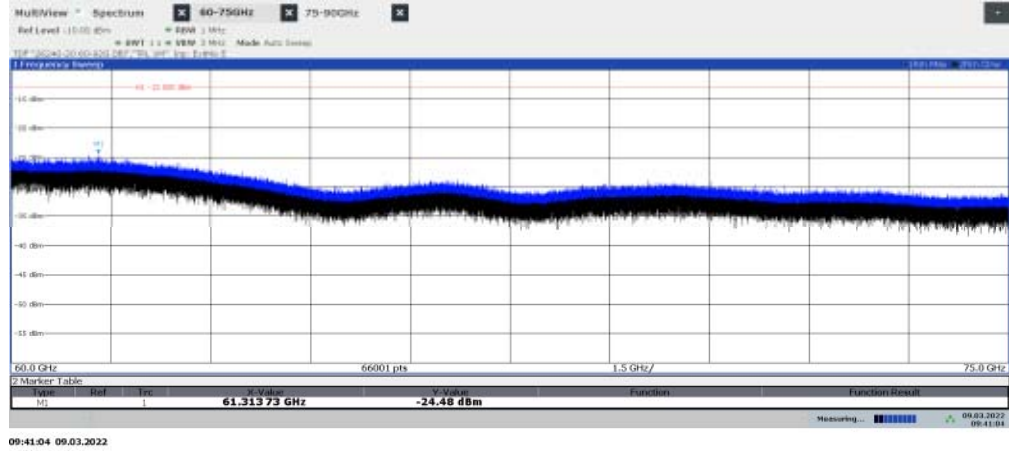


Diagram 2.36b: Pre scan 60 – 75 GHz, Symbolic name: BL8₁₀₀, EIRP Vertical polarization

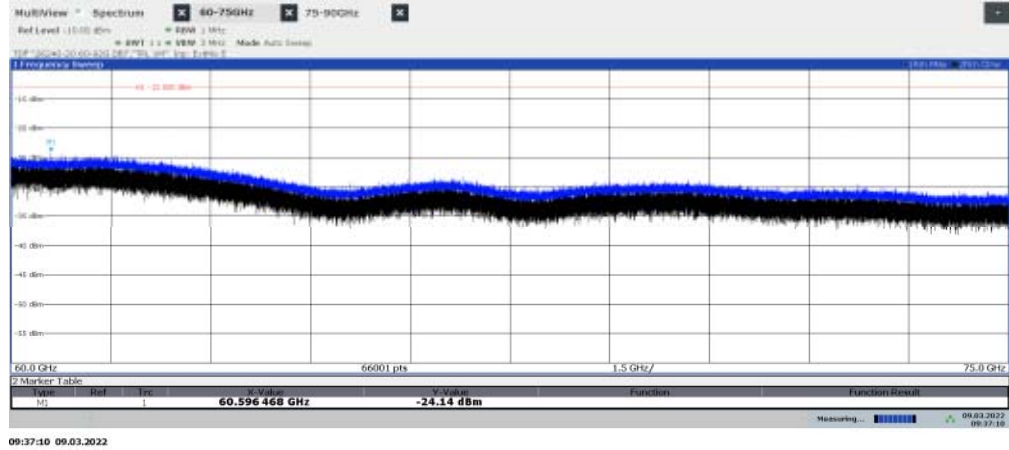


Diagram 2.37a: Pre scan 75 – 90 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

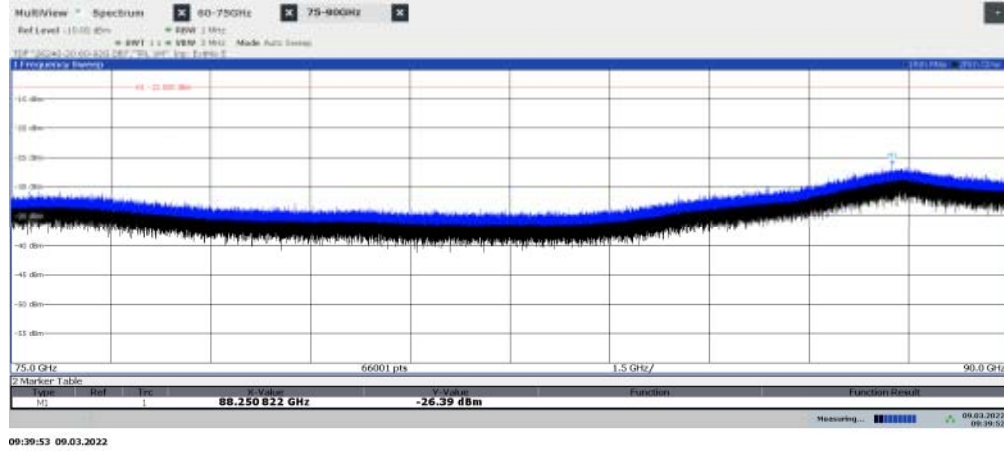


Diagram 2.37b: Pre scan 75 – 90 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

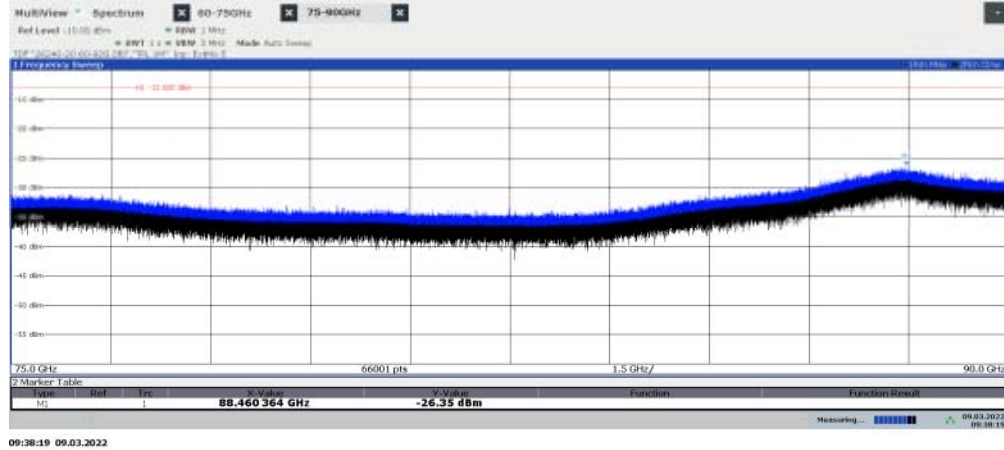


Diagram 2.38a: Pre scan 90 – 110 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

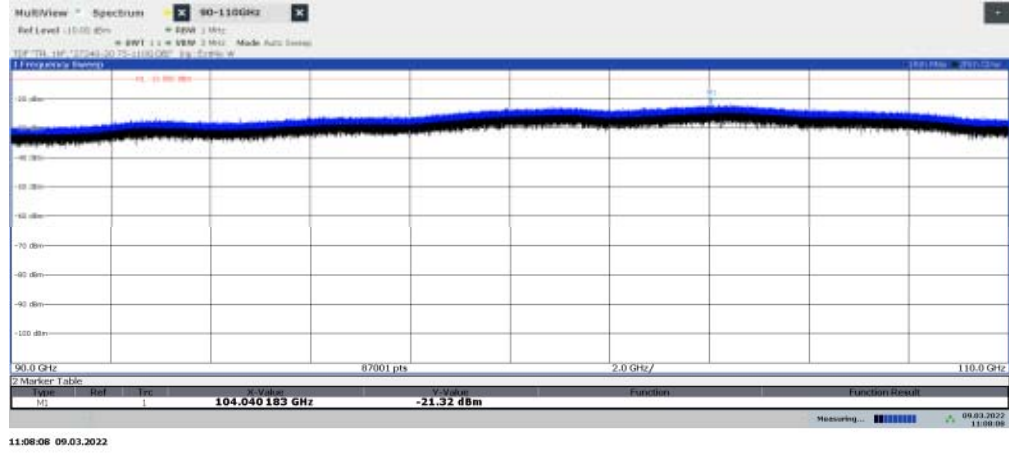


Diagram 2.38b: Pre scan 90 – 110 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

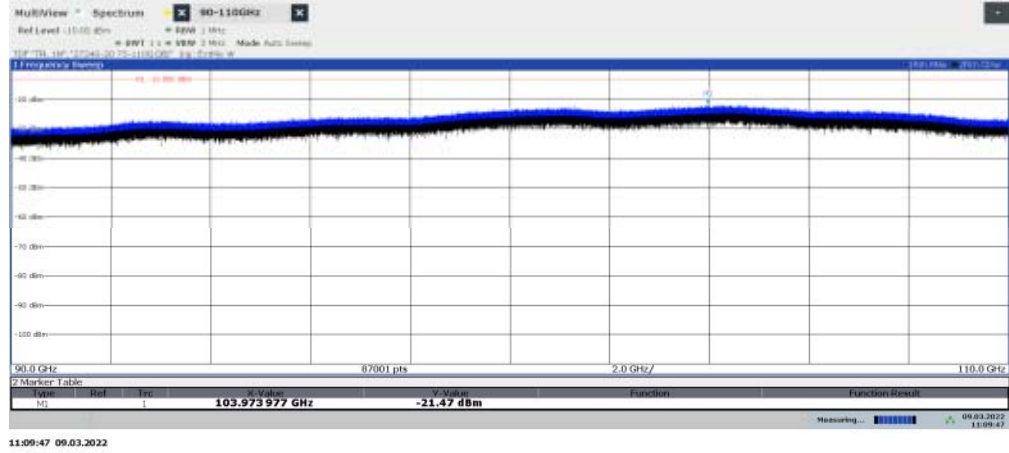


Diagram 2.39a: Pre scan 110 – 130 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

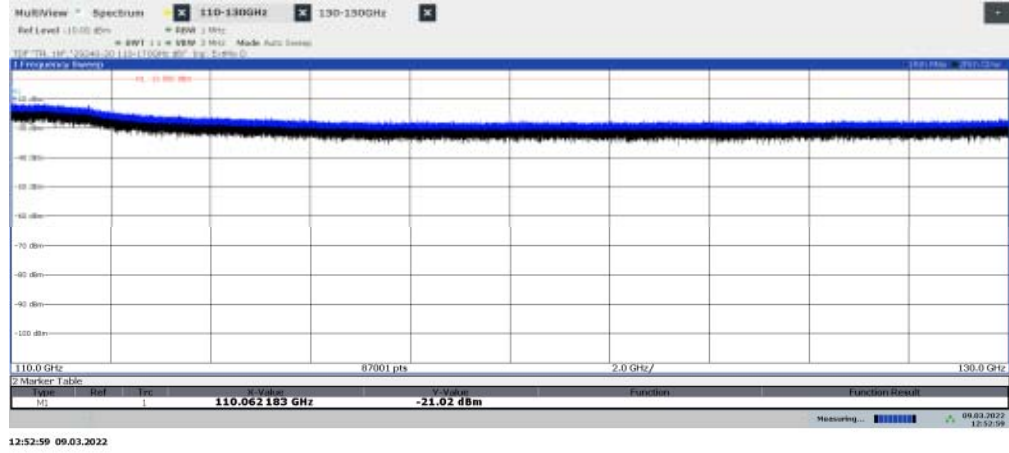


Diagram 2.39b: Pre scan 110 – 130 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

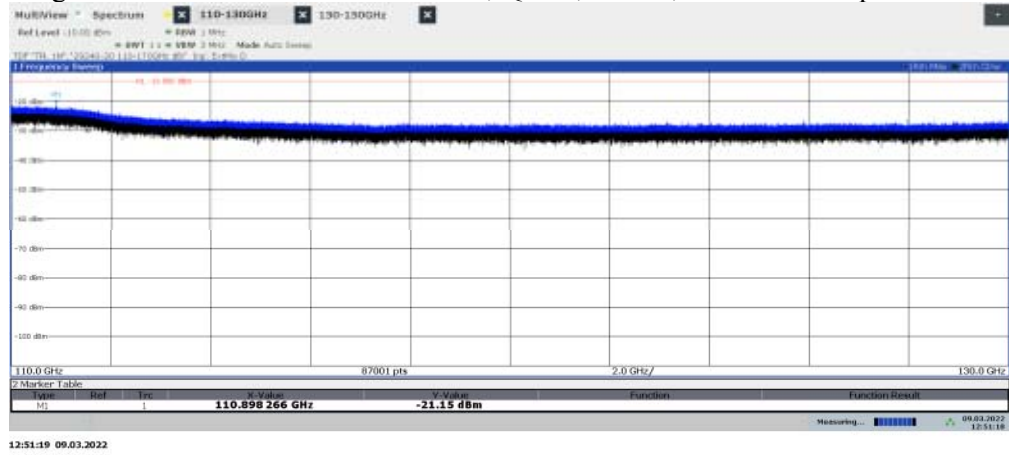


Diagram 2.40a: Pre scan 130 – 150 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

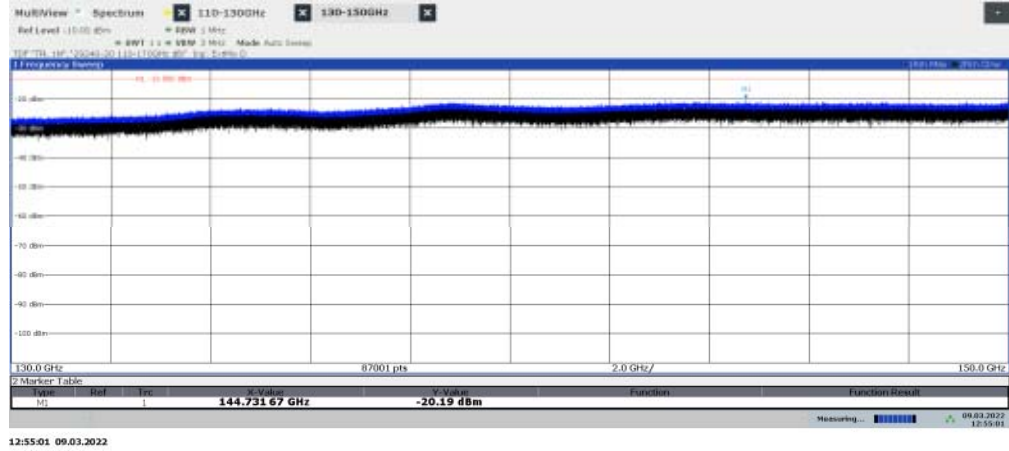


Diagram 2.40b: Pre scan 130 – 150 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

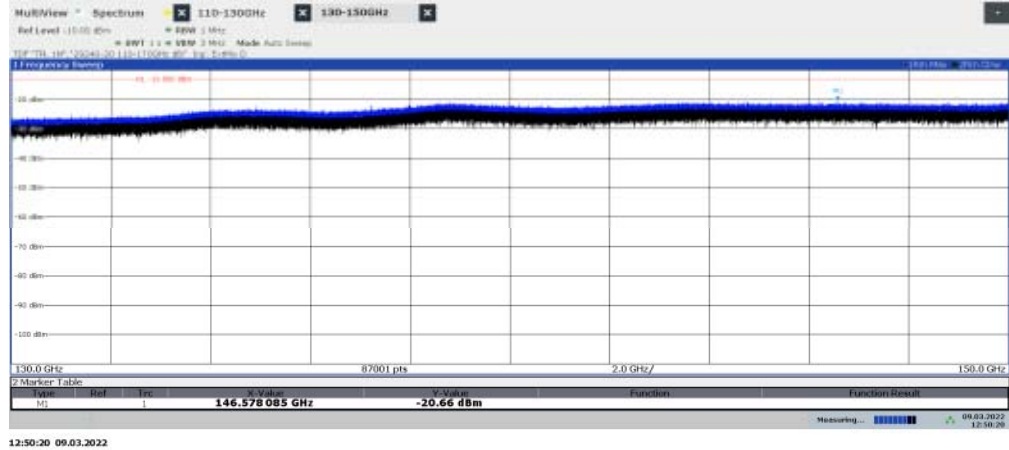


Diagram 2.41a: Pre scan 150 – 170 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

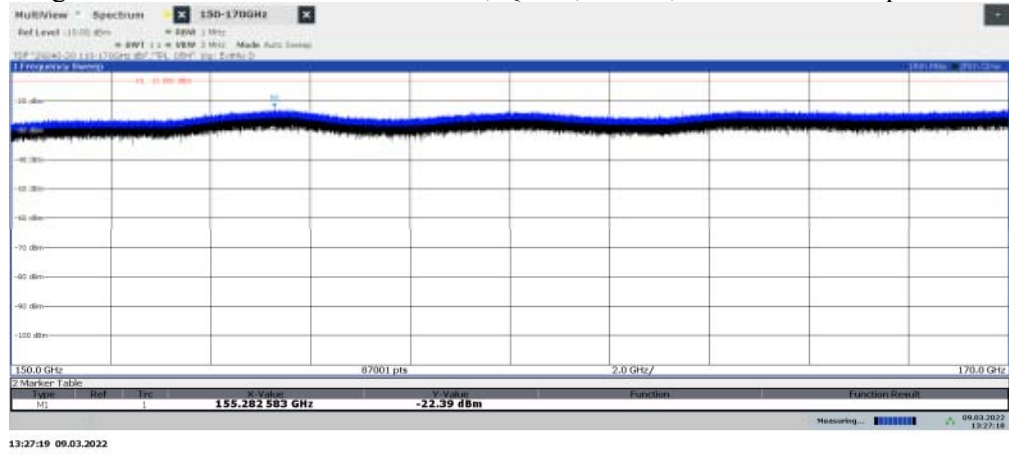


Diagram 2.41b: Pre scan 150 – 170 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

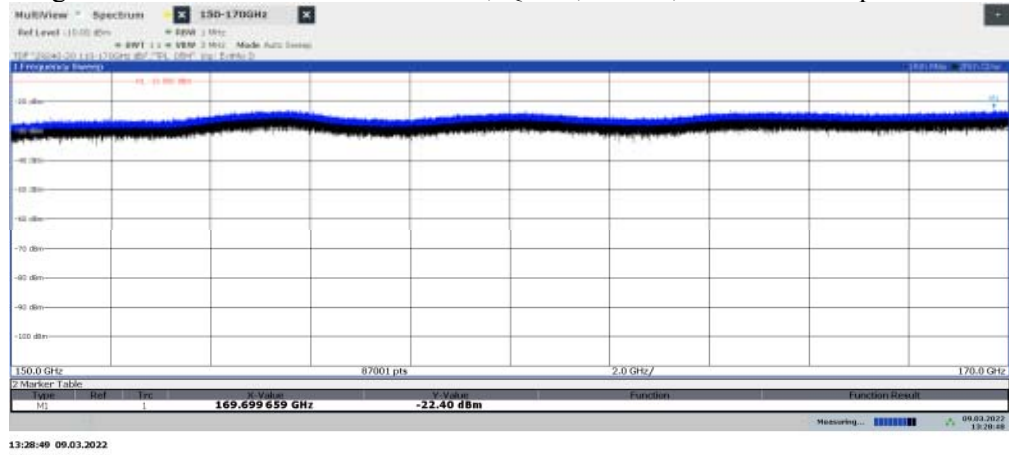


Diagram 2.42a: Pre scan 170 – 185 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

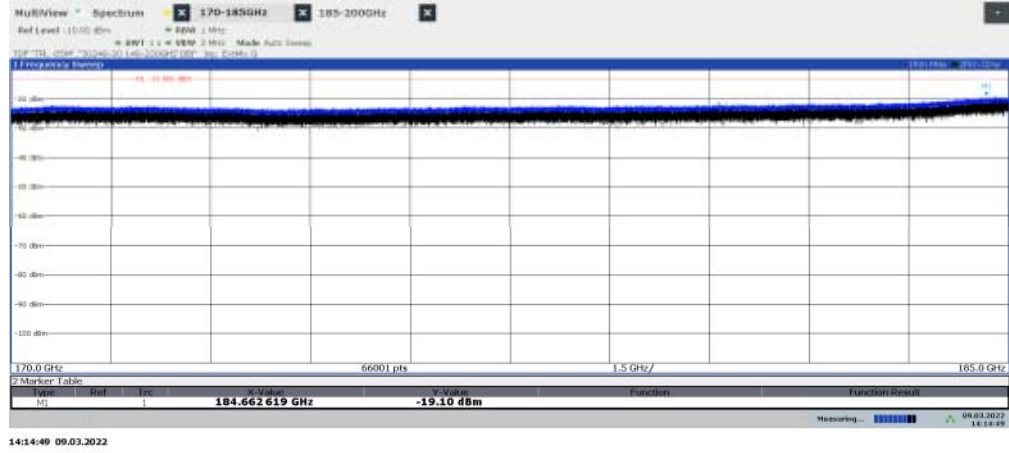


Diagram 2.42b: Pre scan 170 – 185 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

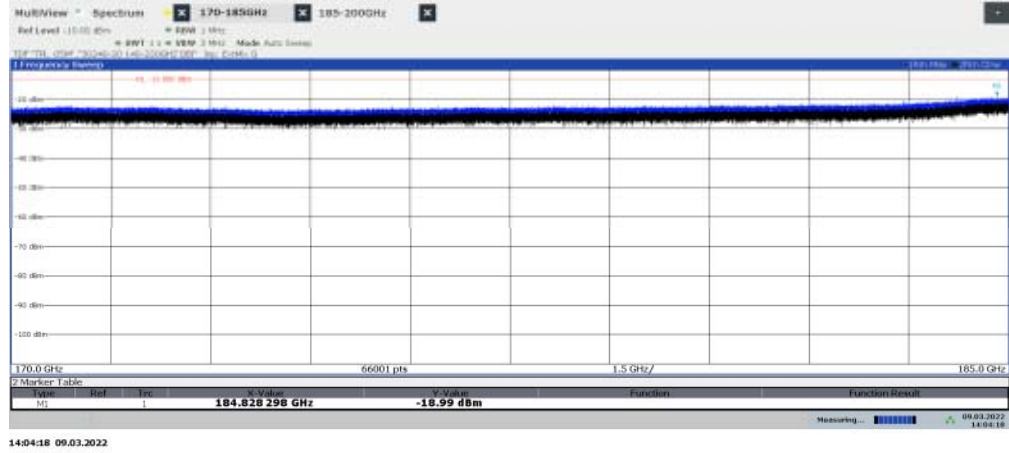


Diagram 2.43a: Pre scan 185 – 200 GHz, QPSK, BL8₁₀₀, EIRP Horizontal polarization

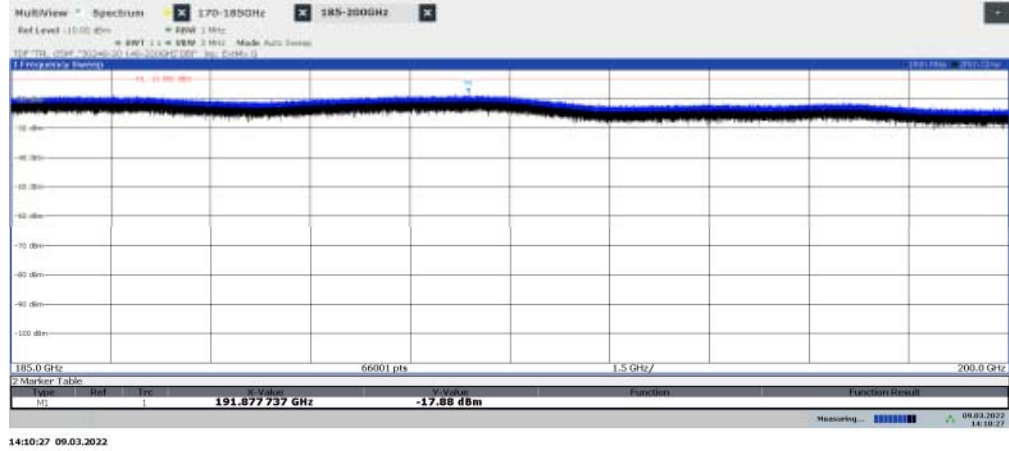


Diagram 2.43b: 185 – 200 GHz, QPSK, BL8₁₀₀, EIRP Vertical polarization

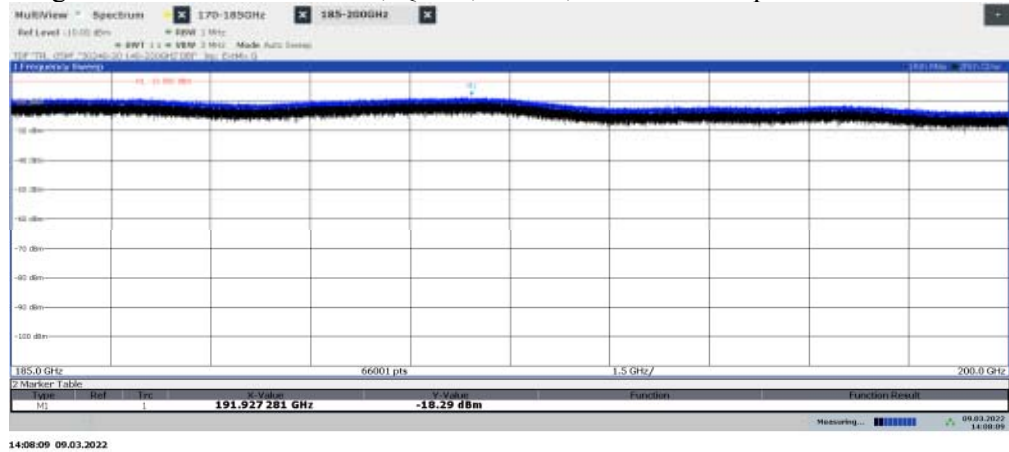
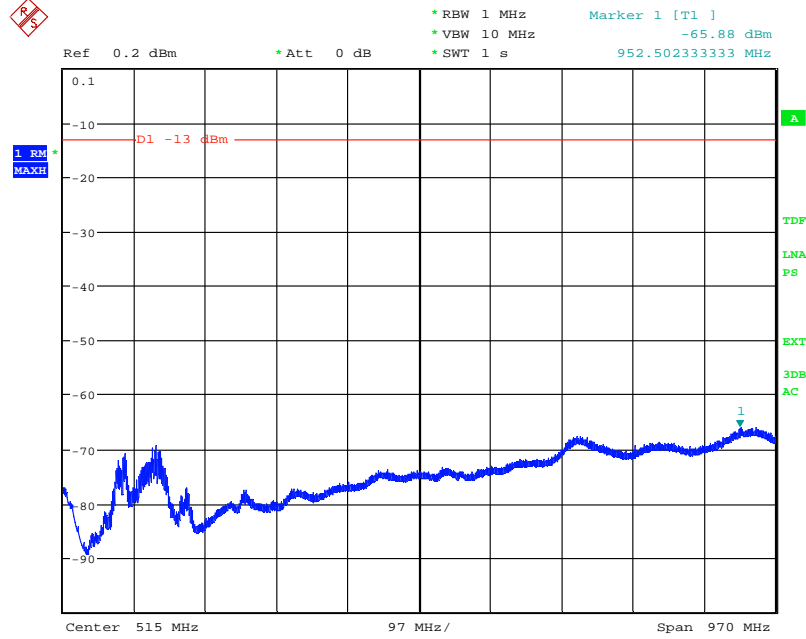
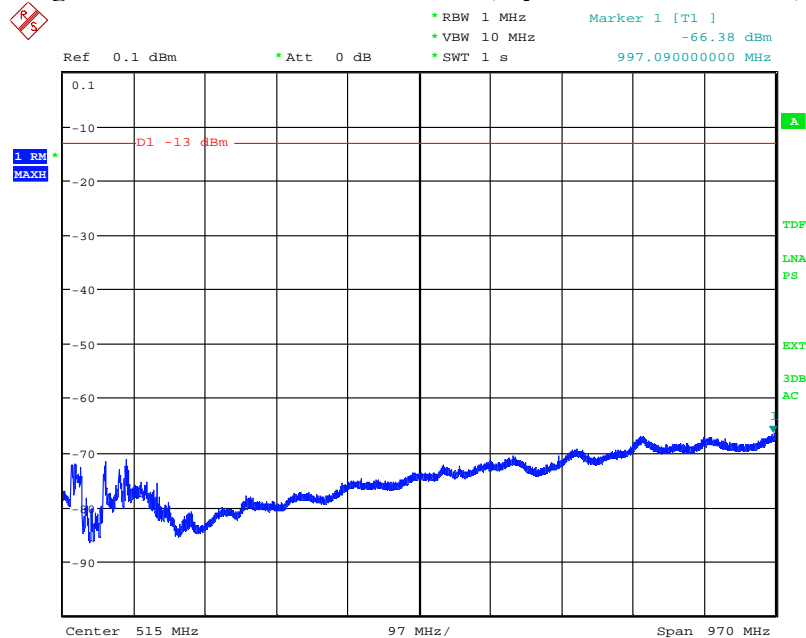


Diagram 2.44a: Pre scan 30 – 1000 MHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization



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Diagram 2.44b: Pre scan 30 – 1000 MHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization



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Diagram 2.45a: Pre scan 1 – 18 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

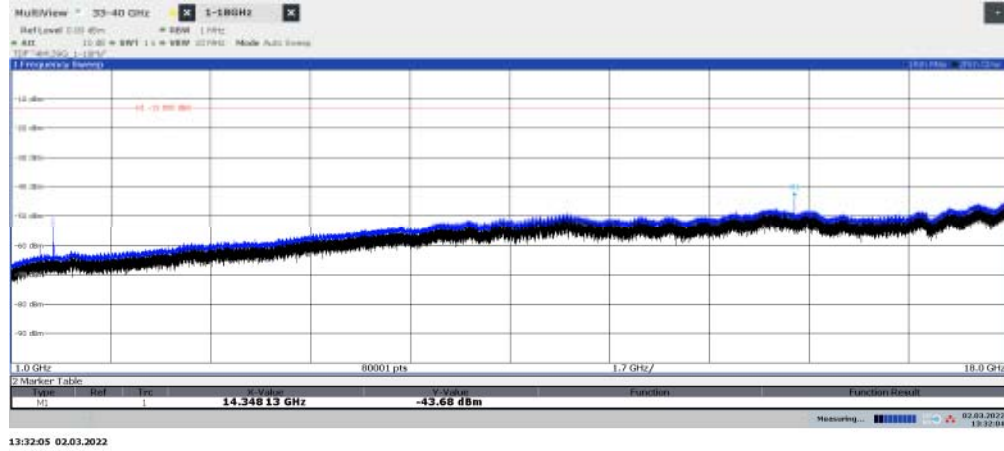


Diagram 2.45b: Pre scan 1 – 18 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

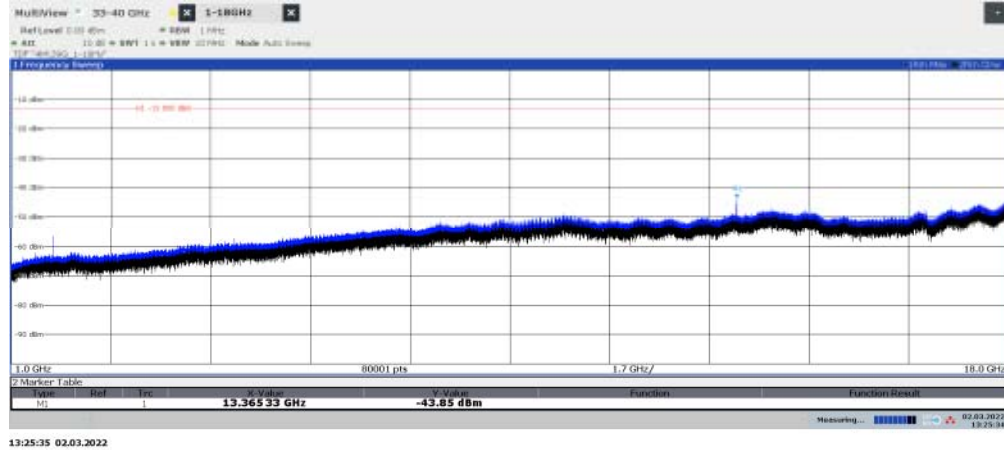


Diagram 2.46a: Pre scan 18 – 26.5 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

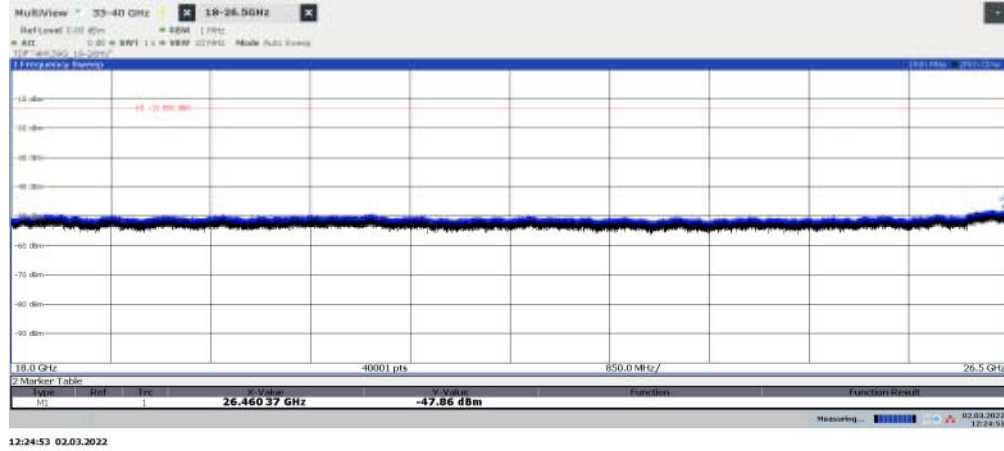


Diagram 2.46b: Pre scan 18 – 26.5 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

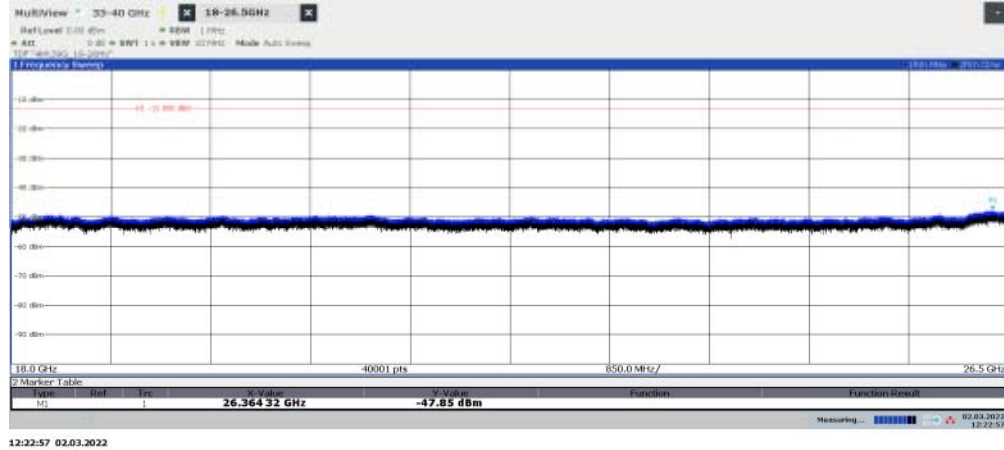


Diagram 2.47a: Pre scan 26.5 – 33 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

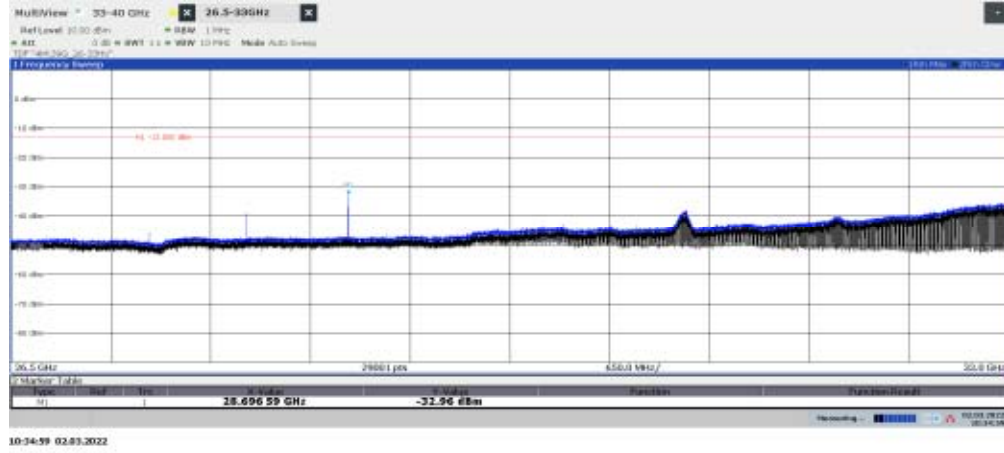


Diagram 2.47b: Pre scan 26.5 – 33 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

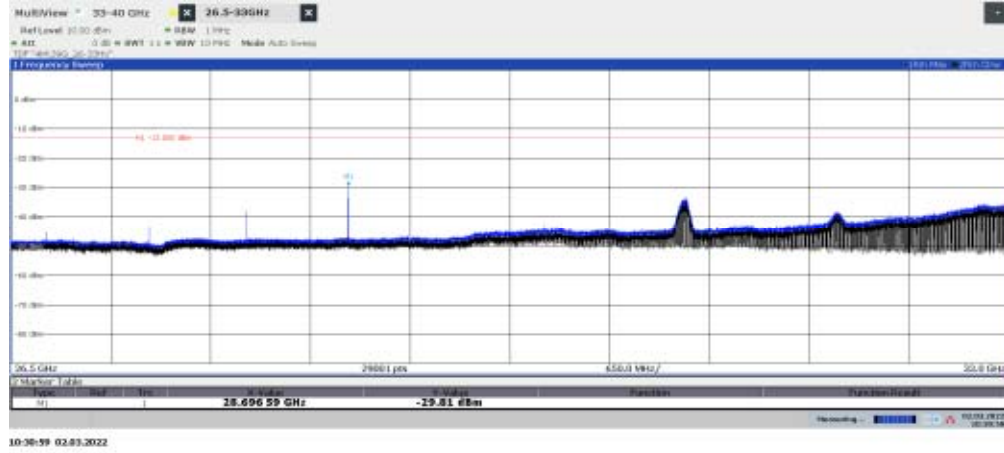
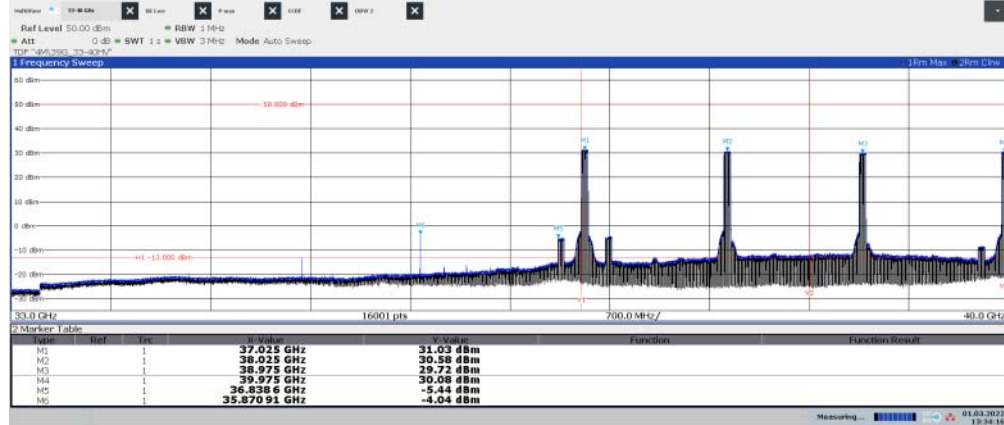
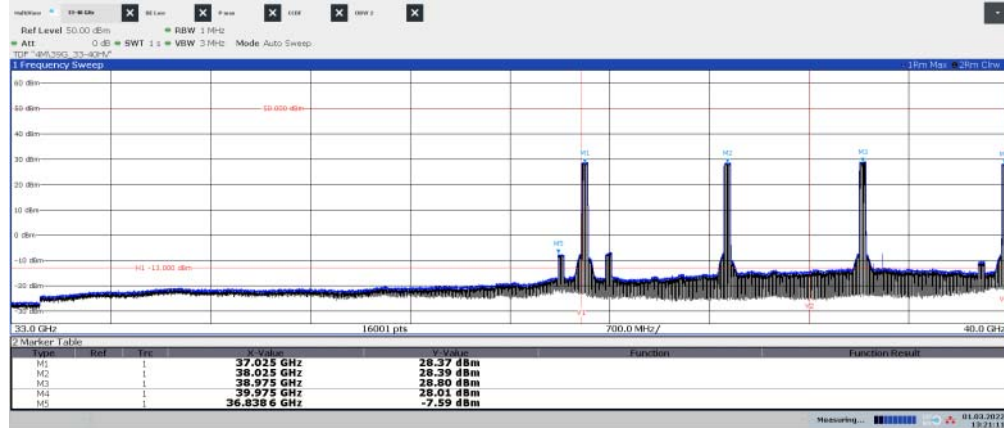


Diagram 2.48a: Pre scan 33 – 40.0 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization



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Diagram 2.48b: Pre scan 33 – 40.0 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization



13:21:12 01.03.2022

Diagram 2.48c: Pre scan 36 – 37 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

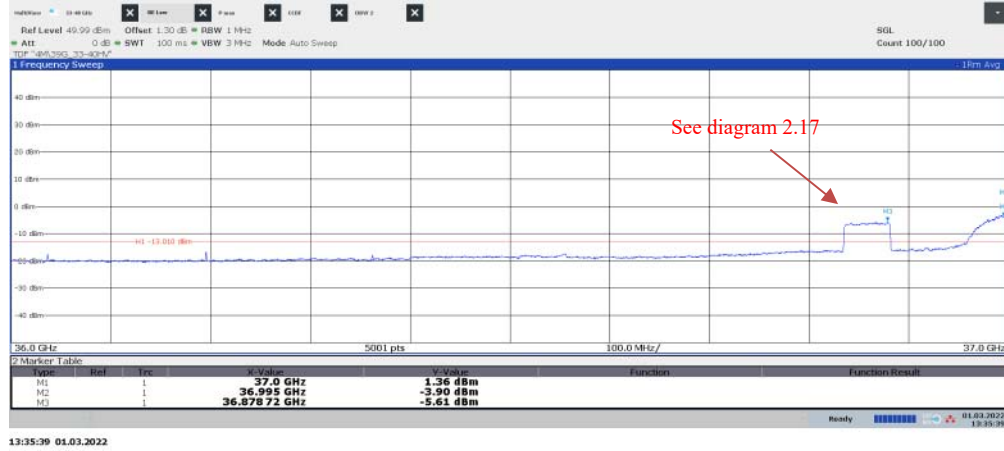
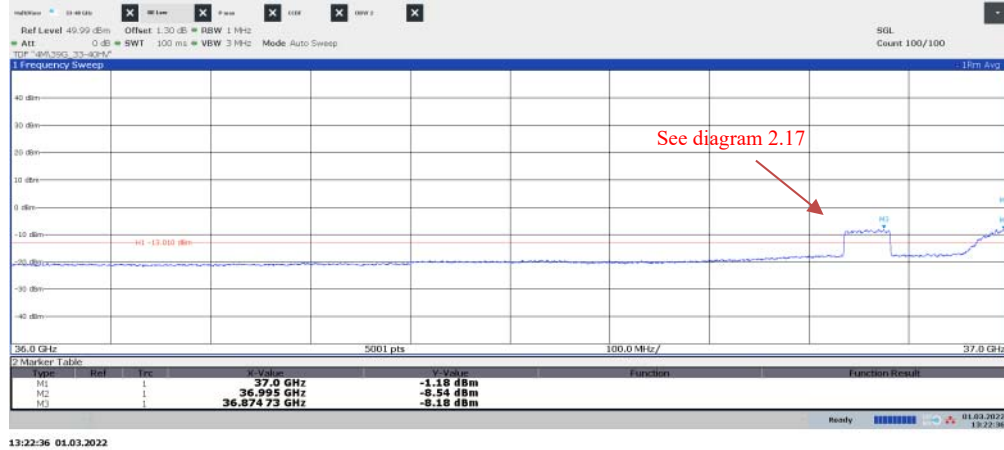


Diagram 2.48d: Pre scan 36 – 37 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization



Power EIRP for 37.0 GHz Hor/ Ver [dBm]	Power EIRP for 36.995 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 37.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 36.995 GHz (Limit -13 dBm) [dBm]/ Verdict
1.36/ -1.18	-3.90/ -8.54	25.45/ 25.65	-22.24/ Pass	-28.12/ Pass

Diagram 2.49a: Pre scan 40 – 43 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

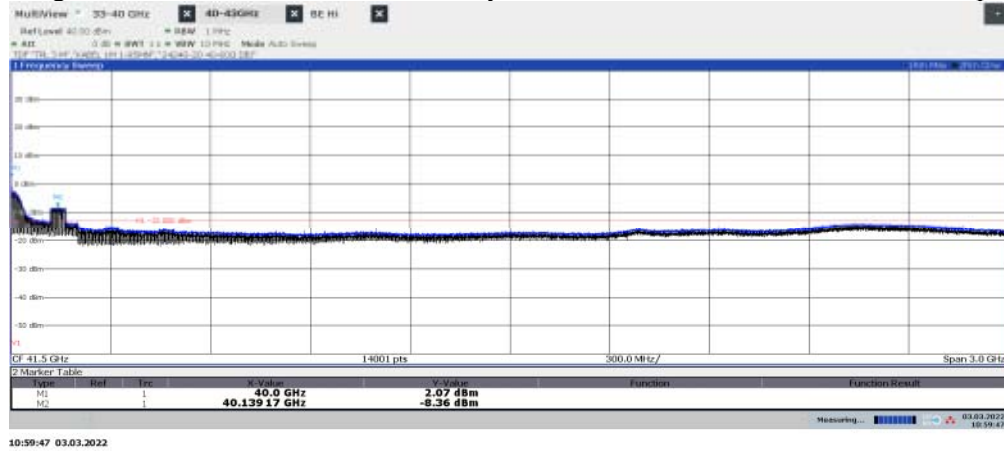


Diagram 2.49b: Pre scan 40 – 43 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

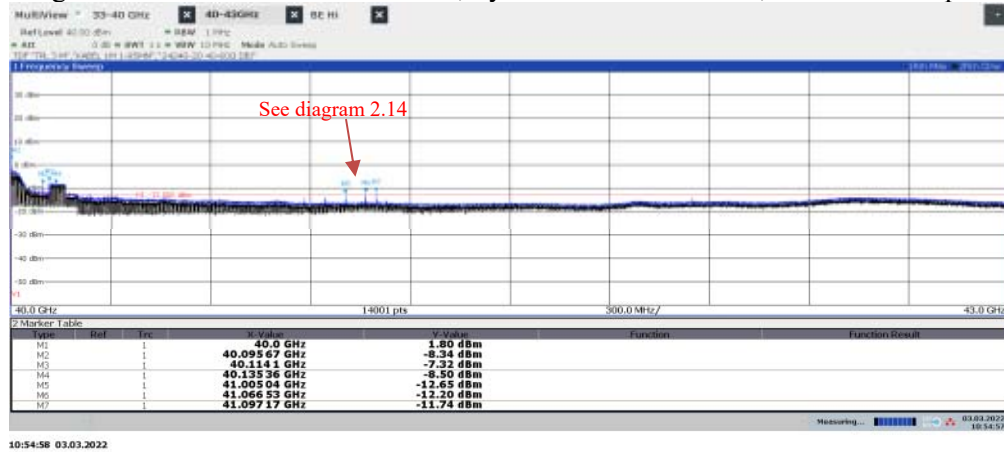


Diagram 2.49c: Pre scan 40 – 43 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

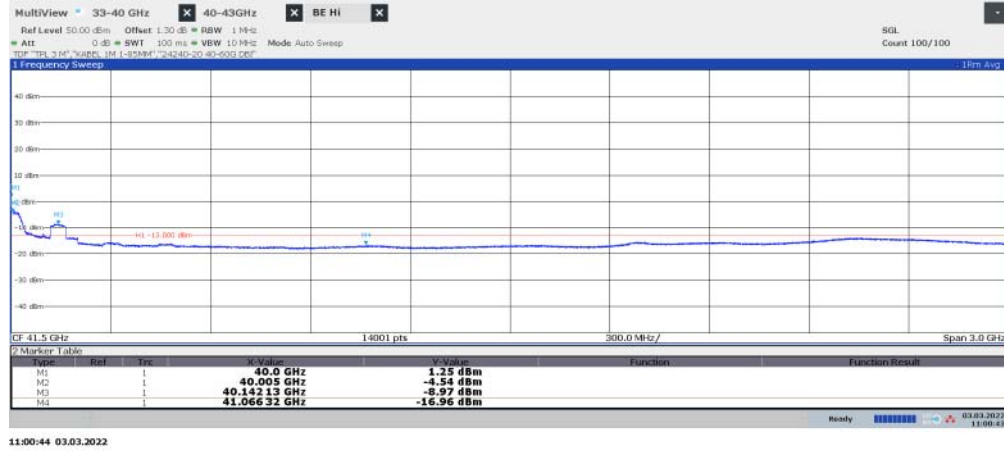
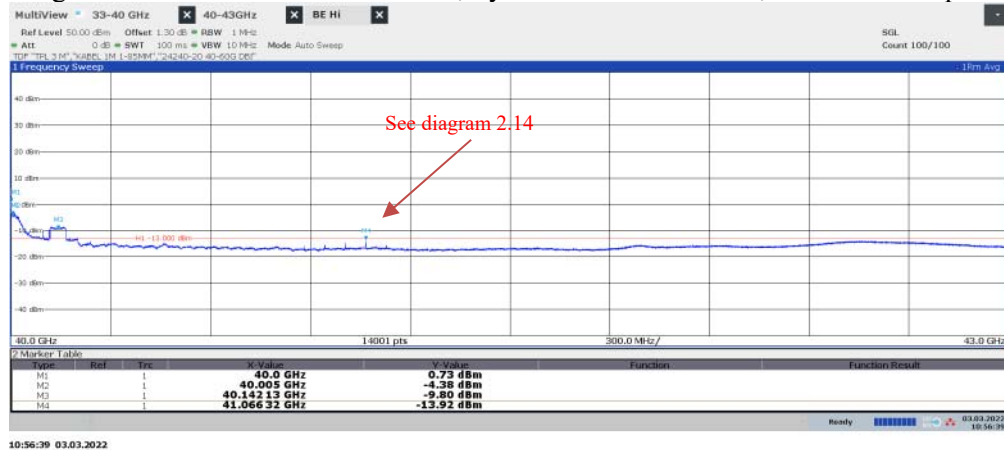


Diagram 2.45d: Pre scan 40 – 43 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization



Power EIRP for 40.0 GHz Hor/ Ver [dBm]	Power EIRP for 40.005 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 40.0 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 40.005 GHz (Limit -13 dBm) [dBm]/ Verdict
1.25/ 0.73	-4.54/ -4.38	25.37/ 25.75	-21.54/ Pass	-27.01/ Pass

Diagram 2.50a: Pre scan 43 – 60 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

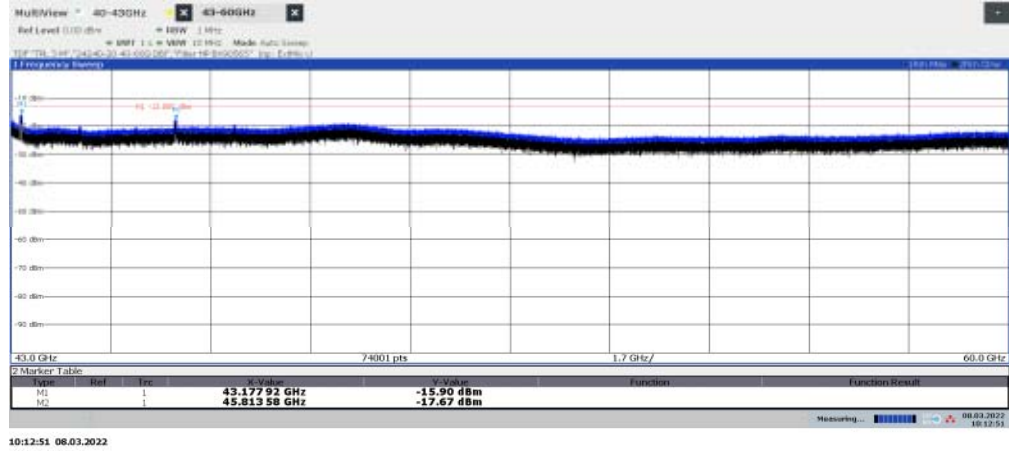


Diagram 2.50b: Pre scan 43 – 60 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

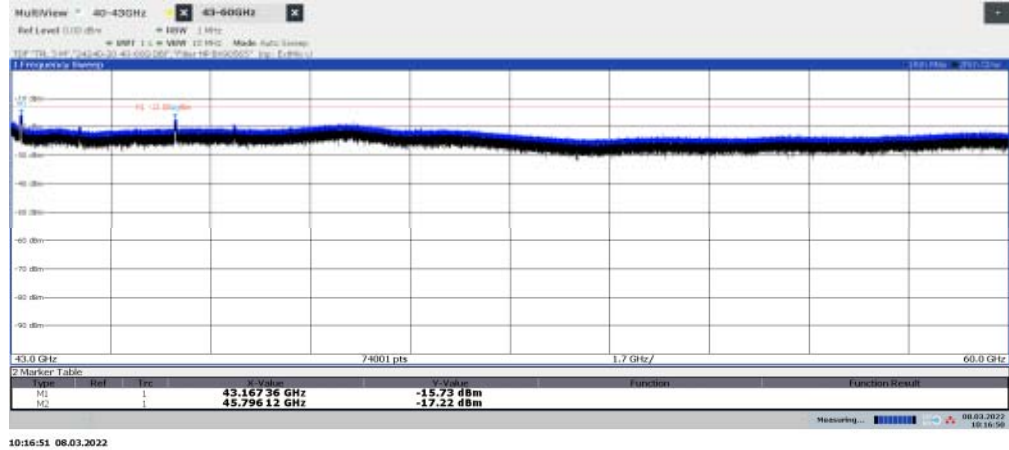


Diagram 2.51a: Pre scan 60 – 75 GHz, Symbolic name: BMT4₅₀, EIRP Horizontal polarization

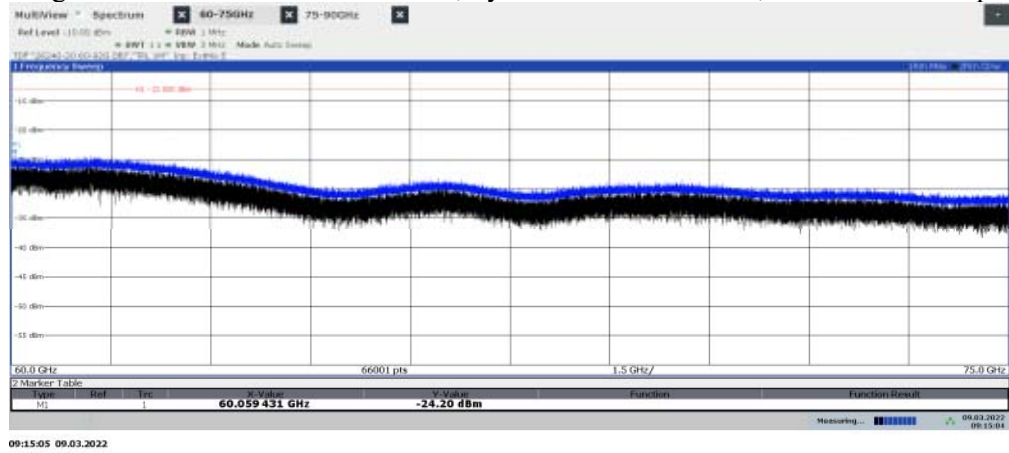


Diagram 2.51b: Pre scan 60 – 75 GHz, Symbolic name: BMT4₅₀, EIRP Vertical polarization

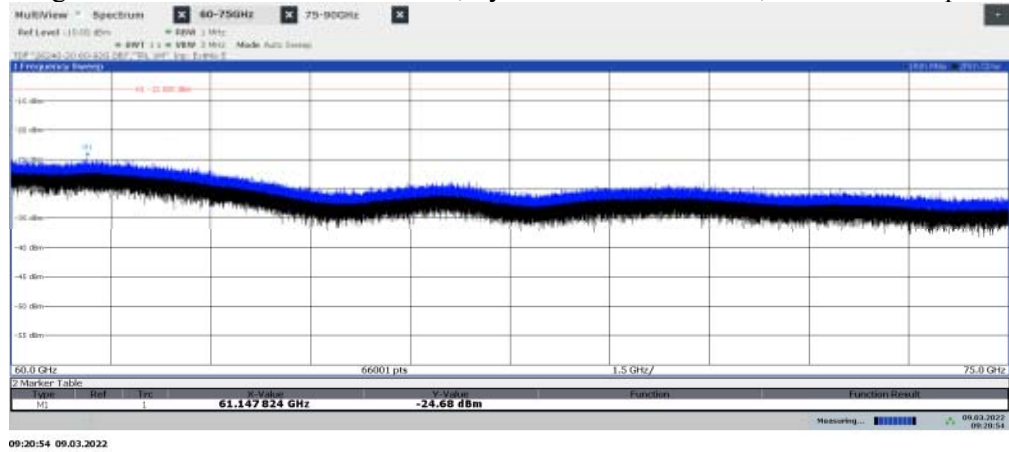


Diagram 2.52a: Pre scan 75 – 90 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

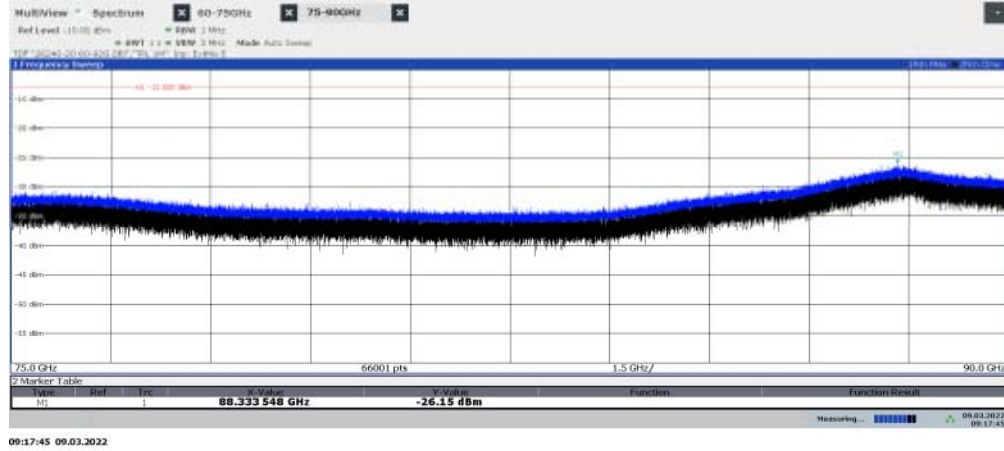


Diagram 2.52b: Pre scan 75 – 90 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

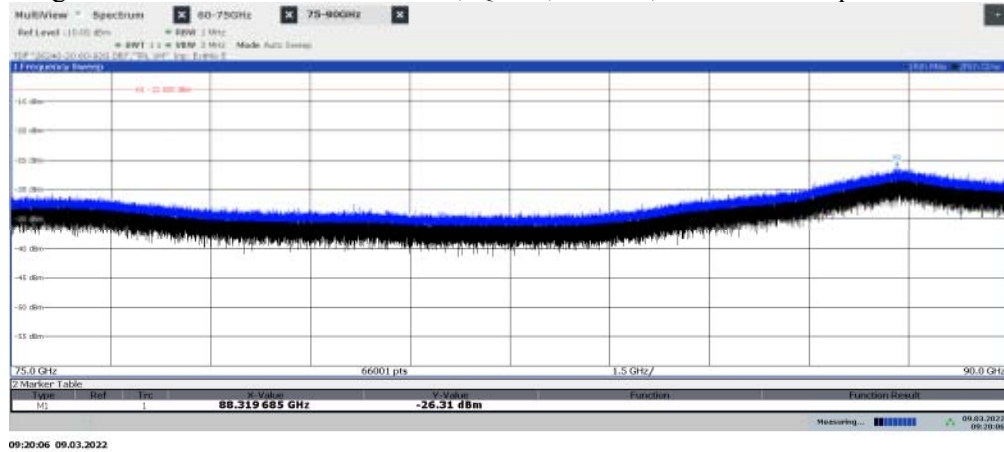


Diagram 2.53a: Pre scan 90 – 110 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

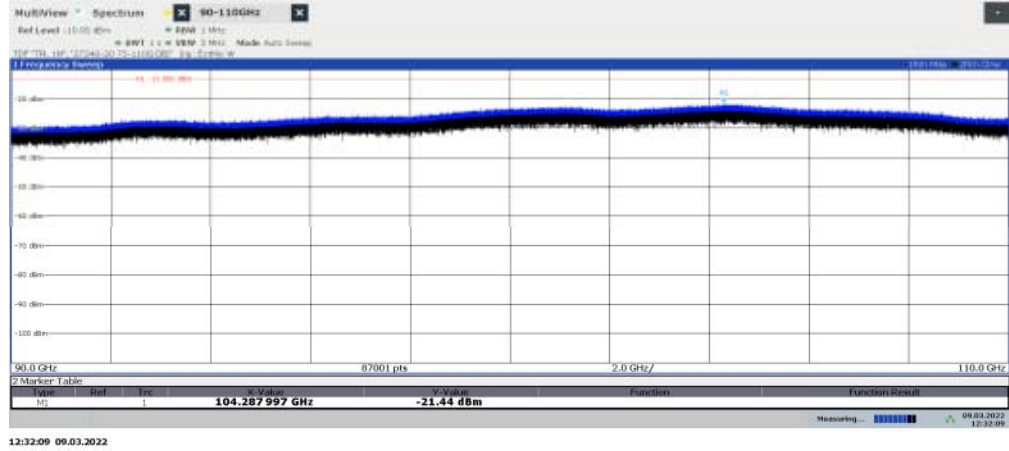


Diagram 2.53b: Pre scan 90 – 110 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

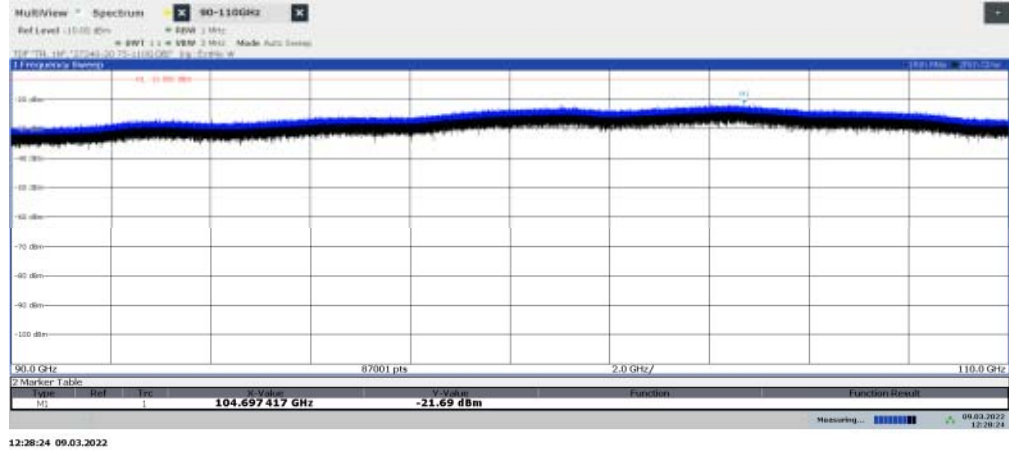


Diagram 2.54a: Pre scan 110 – 130 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

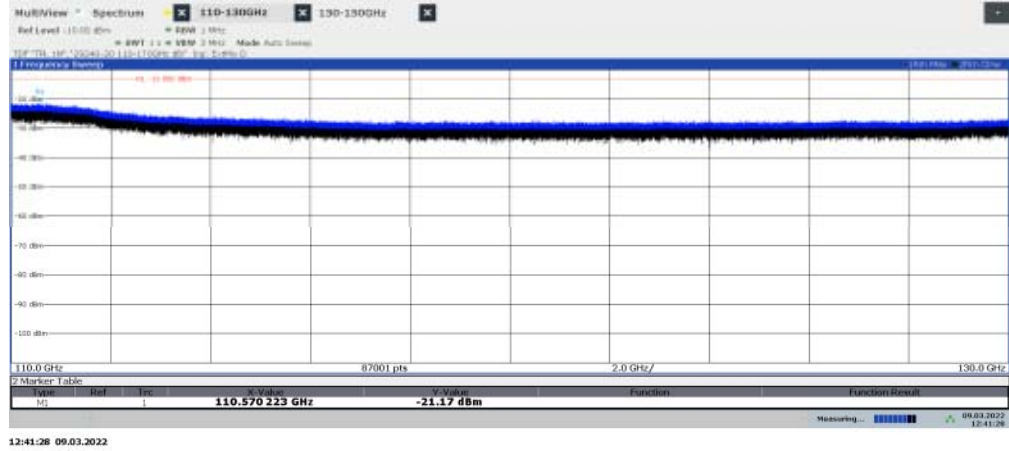


Diagram 2.54b: Pre scan 110 – 130 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

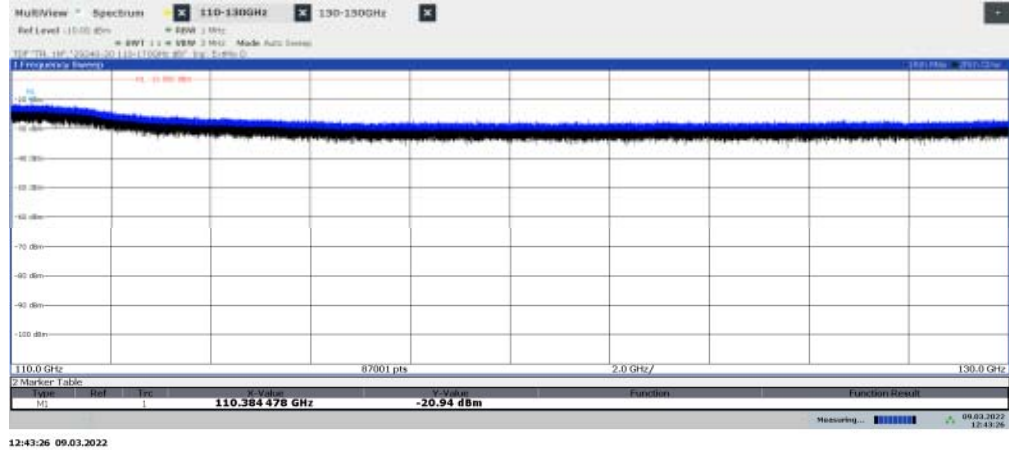


Diagram 2.55a: Pre scan 130 – 150 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

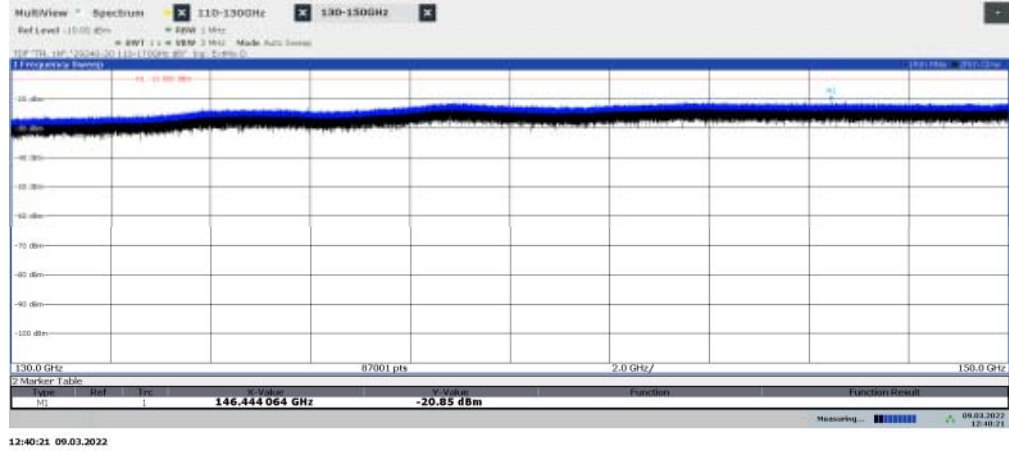


Diagram 2.55b: Pre scan 130 – 150 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

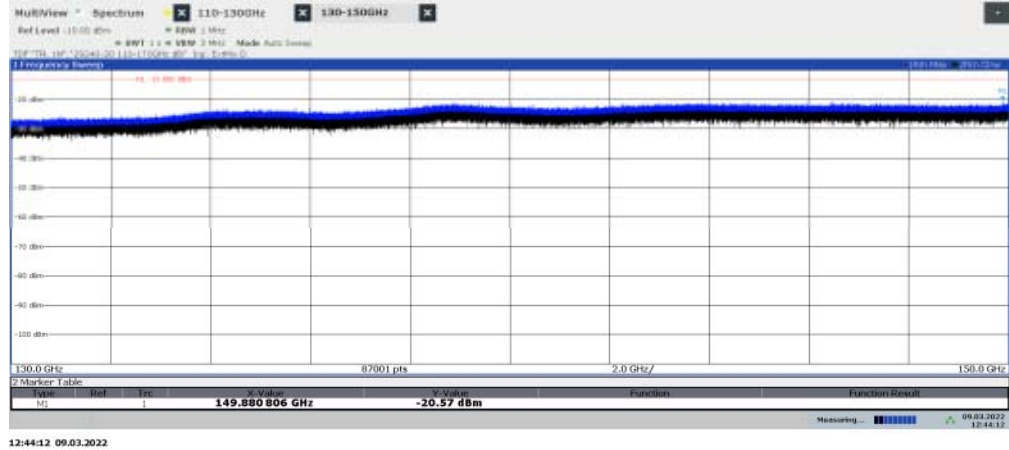


Diagram 2.56a: Pre scan 150 – 170 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

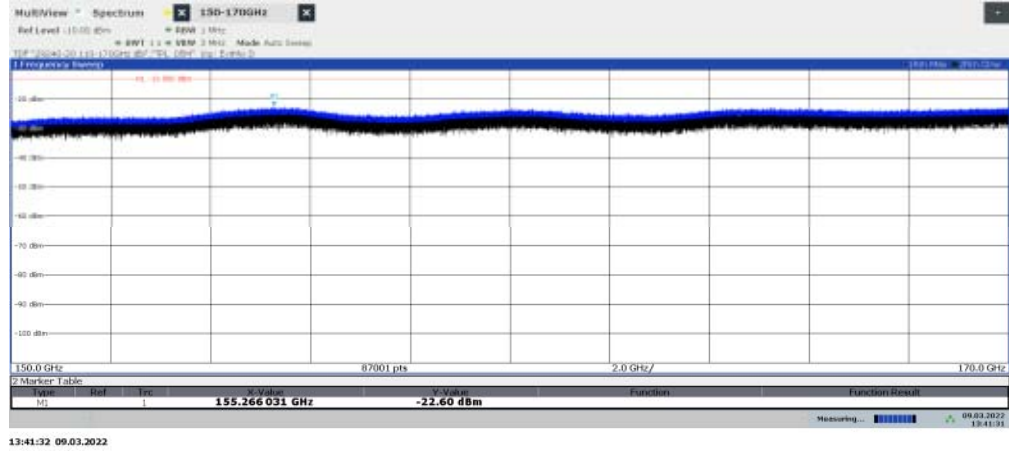


Diagram 2.56b: Pre scan 150 – 170 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

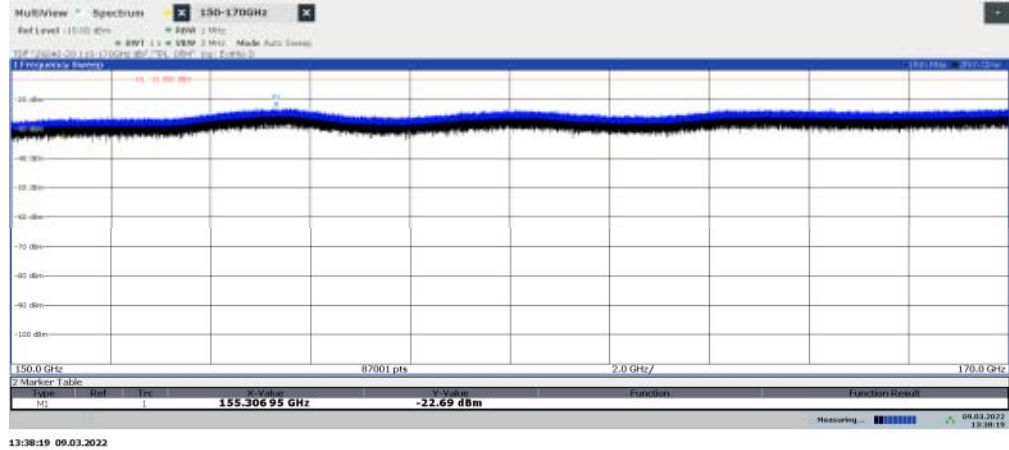


Diagram 2.57a: Pre scan 170 – 185 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

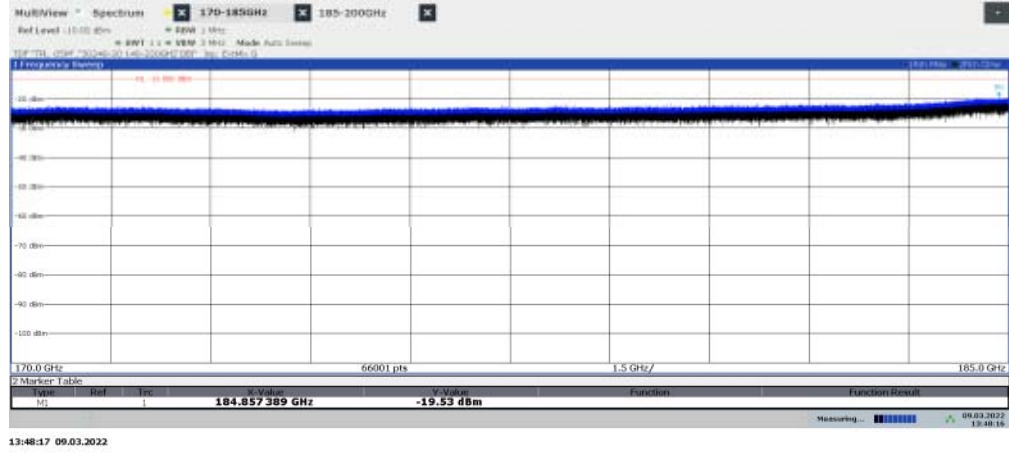


Diagram 2.57b: Pre scan 170 – 185 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization

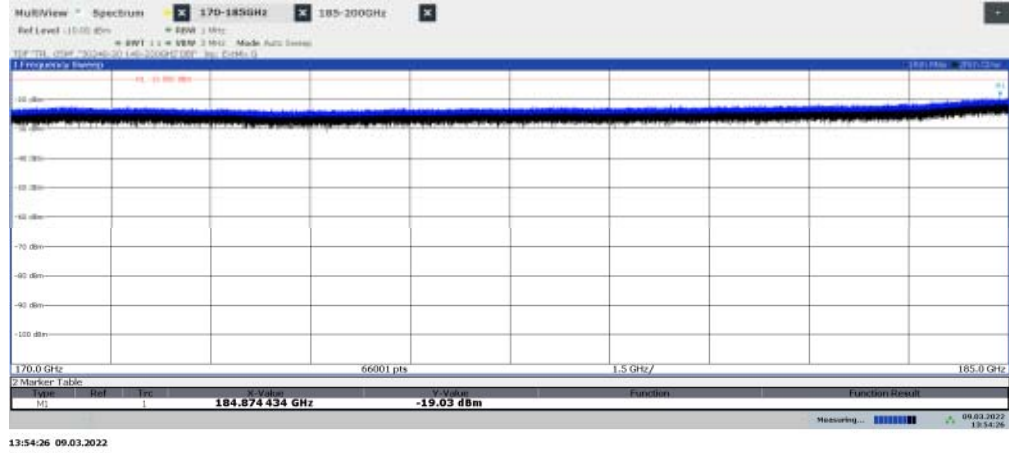


Diagram 2.58a: Pre scan 185 – 200 GHz, QPSK, BMT4₅₀, EIRP Horizontal polarization

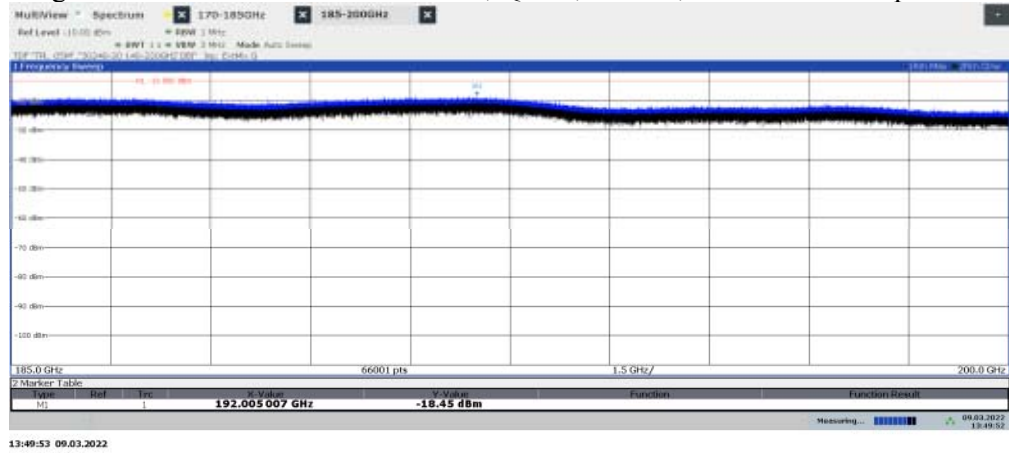
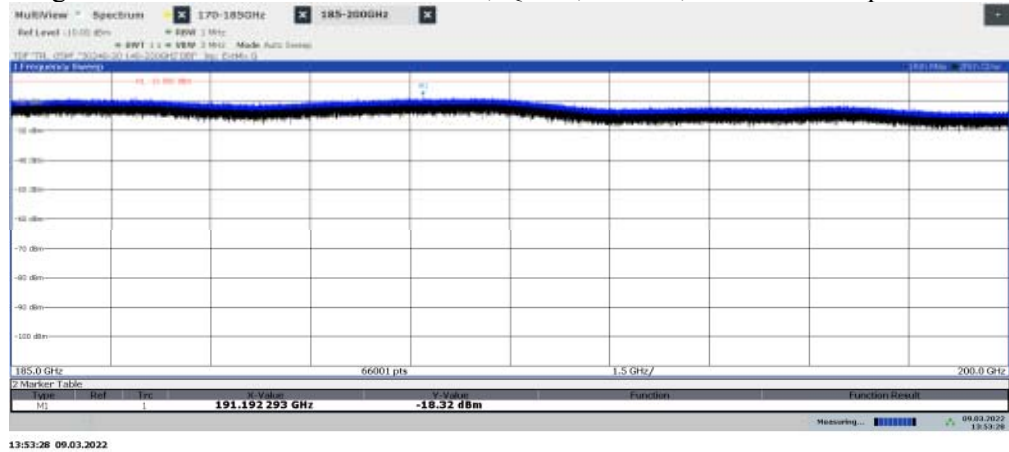


Diagram 2.58b: Pre scan 185 – 200 GHz, QPSK, BMT4₅₀, EIRP Vertical polarization



Frequency stability measurements according to 47 CFR §2.1055

Date	Temperature (test equipment)	Humidity (test equipment)
2022-03-14	23 °C ± 3 °C	15 % ± 5 %
2022-03-15	23 °C ± 3 °C	15 % ± 5 %
2022-03-16	23 °C ± 3 °C	15 % ± 5 %

Test set-up and procedure

The measurements were made per definition in ANSI C63.26, 5.6.

A temperature chamber with a RF transparent door was used and a measurement antenna was aligned outside the temperature chamber. The option NR 5G downlink measurements K144 in the spectrum analyser was used to demodulate the signal and report the frequency error.

Measurement equipment	RISE number
R&S FSW 43	902 073
RF Cable	BX50236
EMCO Horn Antenna 3116	503 279
Temperature Chamber	503 360
Testo 635, temperature and humidity meter	504 203
Multimeter Fluke 87	502 190

Results

Nominal transmitter frequency was 37050 MHz (BL₁₀₀) with a bandwidth of 100 MHz.

Test conditions		Frequency error (Hz)
Supply voltage AC (V)	Temp. (°C)	
102	+20	+63
138	+20	+62
120	+20	-62
120	+30	-65
120	+40	-59
120	+50	-86
120	+10	-51
120	0	-63
120	-10	-81
120	-20	+90
120	-30	+56
Maximum freq. error (Hz)		90
Measurement uncertainty		$< \pm 1 \times 10^{-7}$

Remark

The frequency stability performance is sufficient to ensure that the fundamental emission stays within the authorized frequency band.

End of report.