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Radio measurements on AIR 1281 B260

Product name: AIR 1281 B260

Product number: KRD 901 166/4

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

Performed by

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Summary

| Standard Listed part of | Compliant |
|---|-----------|
| FCC CFR 47 part 30 | |
| | |
| 2.1046 RF power output | Yes |
| 2.1049 Occupied bandwidth | Yes |
| 2.1053 Field strength of spurious radiation | Yes |

Description of the test object

| | |
|--|--|
| Equipment: | Radio equipment AIR 1281 B260 Product number: KRD 901 166/4 including KRX 101 02/1, Rev. R1A with FCC ID: TA8AKRX10102 |
| Tested configuration: | 3GPP NR TDD |
| Frequency range: | TX/ RX: 37000 – 40000 MHz |
| No of supported beams: | 1 beam in 2 orthogonal polarizations, 2 beams in total |
| Operating bandwidth: | 1 segment of 400 MHz |
| Nominal Output power (EIRP): | 50 dBm/ beam and polarization |
| 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: | 100 MHz/ 120 kHz |
| Modulations: | QPSK, 16QAM and 64QAM |
| Emission designators: | 95M6W7D, |
| Emission designators Carrier Aggregation: | 400MW7D (4x 100 MHz) |
| RF power Tolerance: | +1.5/ -2.0 dB |
| CPRI Speed | Up to 10.1 Gbit/s |

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 items 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 1.31 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.

Far field distance for power, OBW and Band edge measurements is 2.68 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 measurement range :

| Frequency range [GHz] | Far field distance R [m] | Measurement distance [m] |
|-----------------------|--------------------------|--------------------------|
| 18 – 26.5 | 0.73 | 3 |
| 26.5 – 40 | 0.48 | 3 |
| 40 – 60 | 0.34 | 3 |
| 60 – 90 | 0.22 | 1 |
| 90 – 110 | 0.17 | 1 |
| 110 – 150 | 0.13 | 1 |
| 150 – 170 | 0.13 | 0.5 |
| 170 – 200 | 0.10 | 0.5 |

Formula for far field distance calculation, with R being far field distance and D meaning antenna aperture size:

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

References

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

CFR 47 part 30, May 2020

ANSI C63.26-2015

KDB 842590 D01 Upper Microwave Flexible Use Service v01r01

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

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

Measurement equipment

| | Calibration Due | RISE number |
|---|-----------------|-------------|
| Anechoic chamber, Hertz | 2020-11 | BX50194 |
| R&S FSW 43 | 2020-09 | 902 073 |
| R&S ESU | 2020-07 | 901 553 |
| R&S ZNB 40 | 2020-07 | BX50051 |
| RF Cable VNA-calibration | 2021-01 | BX50189 |
| RF Cable VNA-calibration | 2021-01 | BX50190 |
| RF Cable | 2021-05 | BX50236 |
| RF Cable | 2020-09 | BX50192 |
| RF Cable | 2021-01 | BX81431 |
| RF Cable | 2021-05 | BX81423 |
| RF Cable | 2020-09 | 503 681 |
| RF Cable FSW-B21 | 2020-10 | BX62069 |
| RF Cable FSW-B21 | 2020-10 | BX62073 |
| Bilog antenna Schaffner 6143A | 2021-08 | 504079 |
| EMCO Horn Antenna 3115 | 2021-07 | 502 175 |
| EMCO Horn Antenna 3115 | 2021-12 | 902 212 |
| EMCO Horn Antenna 3116 | 2021-07 | 503 279 |
| Flann STD Gain Horn Antenna 20240-20 | - | BX92412 |
| Flann STD Gain Horn Antenna 22240-20 | - | BX92413 |
| 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 | 2021-12 | BX90566 |
| Mixer FS-Z90 | 2022-01 | BX90567 |
| Mixer FS-Z110 | 2021-07 | BX81425 |
| Mixer FS-Z170 | 2021-02 | BX81426 |
| Mixer FS-Z220 | 2021-07 | BX81427 |
| µComp Nordic, Low Noise Amplifier | 2021-01 | 901 544 |
| Miteq, Low Noise Amplifier | 2021-01 | 503 278 |
| Temperature and humidity meter, Testo 615 | 2020-06 | 503 498 |

EAB Measurement equipment

Calibrated at RISE before testing.

| | Calibration Due | S/N |
|--|-----------------|--------|
| Marki Microwave FLP2650 Low pass filter | 2021-04 | 1827 |
| Qualwave QBF-26400-33000-60 Band pass filter | 2021-04 | 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: 2020-04-15.

Manufacturer's representative

Mikael Jansson, Ericsson AB.

Test engineers

Tomas Lennhager and Karl Flysjö, RISE

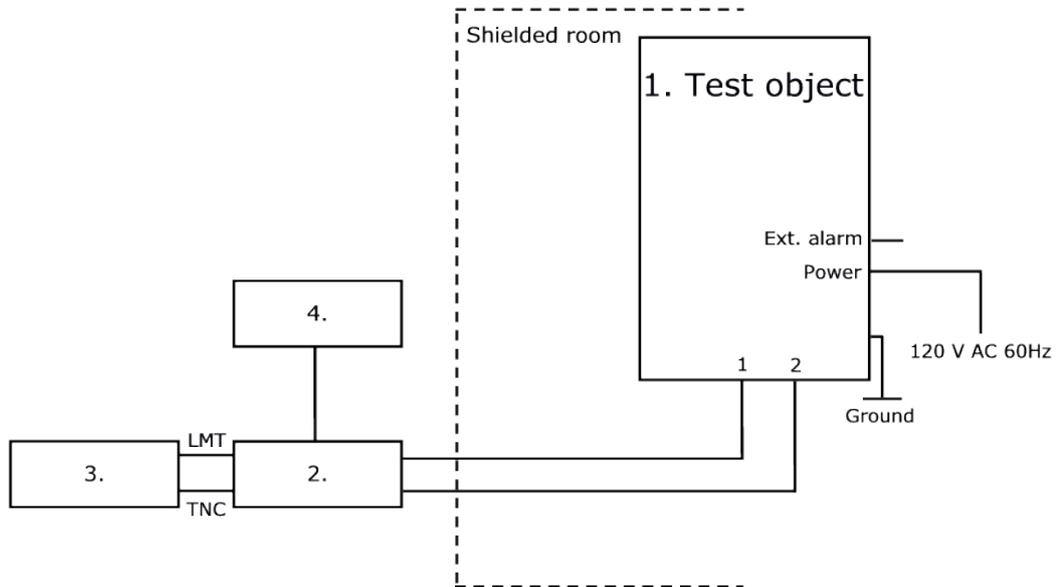
Test participant(-s)

None

Test frequencies used for radiated measurements

| Frequency Hor/ Ver [MHz] | Symbolic name | Comment |
|--|------------------|---|
| 37050.00 | BL1 | 100 MHz BW, TX bottom frequency configuration lower band |
| 37800.00 | ML1 | 100 MHz BW, TX middle frequency configuration lower band |
| 38550.00 | TL1 | 100 MHz BW, TX top frequency configuration lower band |
| 38649.96 | BH1 | 100 MHz BW, TX bottom frequency configuration higher band |
| 39399.96 | MH1 | 100 MHz BW, TX middle frequency configuration higher band |
| 39949.92 | TH1 | 100 MHz BW, TX top frequency configuration higher band |
| 37050.00 37149.96 | BL2 | 100 MHz BW, 2 carrier, TX bottom frequencies configuration lower band |
| 39849.96 39949.92 | TH2 | 100 MHz BW, 2 carrier, TX top frequencies configuration higher band |
| 37050.00 37149.96 37350.00 | BH3 | 100 MHz BW, 3 carrier, TX bottom frequencies configuration lower band |
| 39649.92 39849.96 39949.92 | TH3 | 100 MHz BW, 3 carrier, TX top frequencies configuration higher band |
| 37050.00 37149.96 37249.92 37350.00 | BL4 | 100 MHz BW, 4 carrier, TX bottom frequencies configuration lower band |
| 38250.00 38349.96 38449.92 38550.00 | TL4 | 100 MHz BW, 4 carrier, TX top frequencies configuration lower band |
| 39649.92 39750.00 39849.96 39949.92 | TH4 | 100 MHz BW, 4 carrier, TX top frequencies configuration higher band |

Test setup: radiated measurements



Test object:

| | |
|----|--|
| 1. | AIR 1281 B260, KR D 901 166/4, rev. R1A, s/n: C82A592312 including KRX 101 02/1 rev R1A with FCC ID: TA8AKRX10102 Radio Software: CXP 903 0045/1, rev. R4A445 |
|----|--|

Associated equipment:

| | |
|----|---|
| 2. | Testing Equipment: Baseband 6630, KDU 137 848/1, rev. R3B, s/n: E23B220396 with software : CXP904418/15, rev. R5A24 |
|----|---|

Functional test equipment:

| | |
|----|--|
| 3. | Computer, HP ZBook, BAMS - 1001530471 |
| 4. | GPS Active Antenna, KRE 101 2082/1 GPS 02 01, NCD 901 41/1, rev. R1D, s/n: A401804384 |

Interfaces:

| | |
|---|--------|
| 1, Optical Interface Link, single mode opto fibre | Signal |
| 2, Optical Interface Link, single mode opto fibre | Signal |
| Ethernet link, LMT | Signal |
| Ethernet link, TNC | Signal |
| Power input configuration AC: 120 VAC 60Hz | Power |
| EXT Alarm, shielded multi-wire | Signal |
| Ground wire | Ground |

RF power output measurements according to CFR 47 §30.202

| Date | Temperature | Humidity |
|------------|--------------|------------|
| 2020-04-23 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2020-04-28 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2020-05-13 | 23 °C ± 3 °C | 17 % ± 5 % |
| 2020-05-14 | 23 °C ± 3 °C | 17 % ± 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 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).

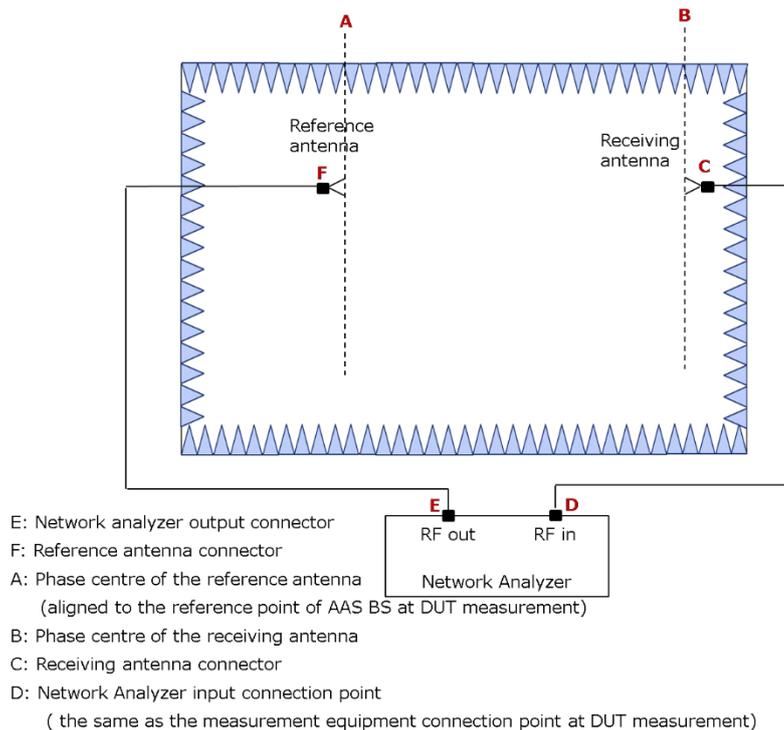


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

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:

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

Test Setup, measuring distance 3m:

| 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 | BX81423 |
| Testo 615, temperature and humidity meter | 503 498 |

Measurement uncertainty: 3.3 dB

Results

Single carrier

Beam index 0 Bore site, Bandwidth 100MHz, QPSK

Nominal rated output power (EIRP) per Beam: 50 dBm/ Polarization.

| | Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal |
|---------------|--|
| Symbolic name | Carrier 1 |
| BL1 | 50.87/ 50.31 |
| ML1 | 50.57/ 50.02 |
| TL1 | 50.11/ 50.09 |
| BH1 | 50.40/ 50.53 |
| MH1 | 50.52/ 50.54 |
| TH1 | 50.97/ 51.20 |

Multi carrier

Beam index 0 Bore site, Bandwidth 100MHz, QPSK

Nominal rated output power (EIRP) per Beam: 50 dBm/ Polarization.

| | Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal | | |
|---------------|--|--------------|---------------------|
| Symbolic name | Carrier 1 | Carrier 2 | Total (per 200 MHz) |
| BL2 | 47.25/ 46.96 | 47.79/ 47.51 | 50.54/ 50.26 |
| TH2 | 47.65/ 48.21 | 48.27/ 48.43 | 50.99/ 51.34 |

Beam index 0 Bore site, Bandwidth 100MHz, QPSK

Nominal rated output power (EIRP) per Beam: 50 dBm/ Polarization.

| | Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal | | | | |
|---------------|--|--------------|--------------|--------------|---------------------|
| Symbolic name | Carrier 1 | Carrier 2 | Carrier 3 | Carrier 4 | Total (per 400 MHz) |
| BL4 | 43.76/ 42.95 | 44.42/ 43.30 | 45.09/ 43.98 | 45.37/ 45.71 | 50.54/ 50.14 |
| TH4 | 44.34/ 45.28 | 44.16/ 44.61 | 44.19/ 44.52 | 45.19/ 46.61 | 50.51/ 51.36 |

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 |
|-----------|-----|

Occupied bandwidth measurements according to CFR47 2.1049

| Date | Temperature | Humidity |
|------------|--------------|------------|
| 2020-04-23 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2020-04-28 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2020-05-13 | 23 °C ± 3 °C | 17 % ± 5 % |
| 2020-05-19 | 23 °C ± 3 °C | 22 % ± 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.

Test Setup, measuring distance 3m:

| 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 | BX81423 |
| Testo 615, temperature and humidity meter | 503 498 |

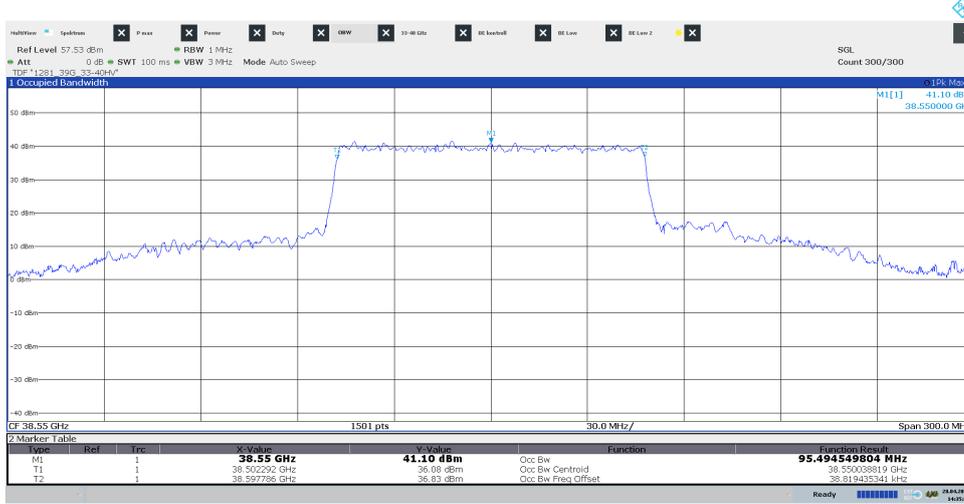
Measurement uncertainty: 3.3 dB

Results

Modulation: QPSK

| Diagram | Symbolic name | Polarization | Occupied BW (99%) [MHz] |
|---------|---------------|--------------|-------------------------|
| 1.1 | TL1 | Hor | 95.495 |
| 1.2 | TL1 | Ver | 95.601 |
| 1.3 | TL4 | Hor | 399.576 |
| 1.4 | TL4 | Ver | 400.274 |

Diagram 1.1, TL1, QPSK, Horizontal:



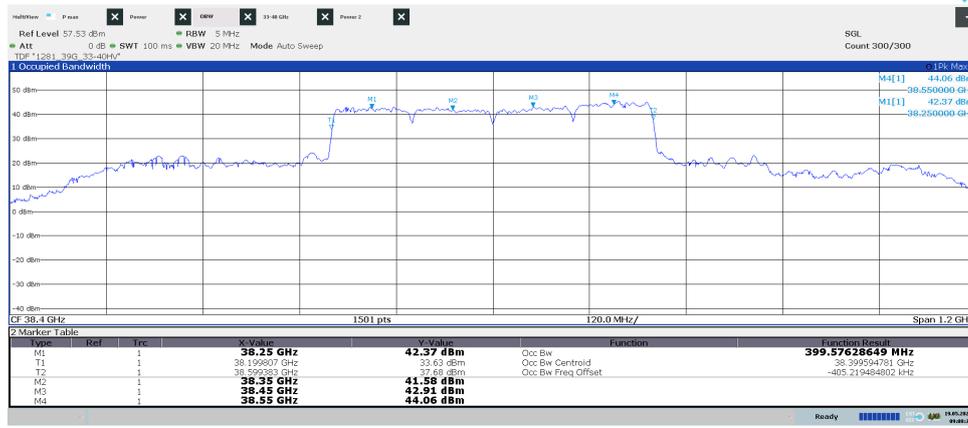
14:35:58 28.04.2020

Diagram 1.2, TL1, QPSK, Vertical:



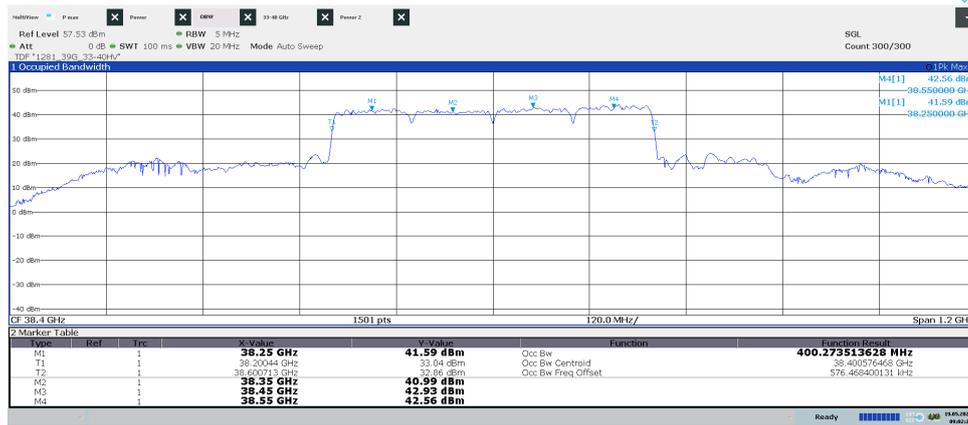
15:02:33 28.04.2020

Diagram 1.3, TL4, QPSK, Horizontal:



09:08:35 19.05.2020

Diagram 1.4, TL4, QPSK, Vertical:



09:02:39 19.05.2020

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

| Date | Temperature | Humidity |
|------------|--------------|------------|
| 2020-04-23 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2020-04-24 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2019-04-27 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2020-04-28 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2020-04-29 | 23 °C ± 3 °C | 12 % ± 5 % |
| 2020-05-01 | 23 °C ± 3 °C | 22 % ± 5 % |
| 2020-05-03 | 23 °C ± 3 °C | 21 % ± 5 % |
| 2020-05-12 | 23 °C ± 3 °C | 20 % ± 5 % |
| 2020-05-13 | 23 °C ± 3 °C | 17 % ± 5 % |
| 2020-05-14 | 23 °C ± 3 °C | 17 % ± 5 % |
| 2020-05-15 | 23 °C ± 3 °C | 17 % ± 5 % |
| 2020-05-16 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2020-05-18 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2020-05-19 | 23 °C ± 3 °C | 22 % ± 5 % |
| 2020-05-27 | 23 °C ± 3 °C | 35 % ± 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 3.0m, for 60 – 150 GHz D was 1.0m 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).

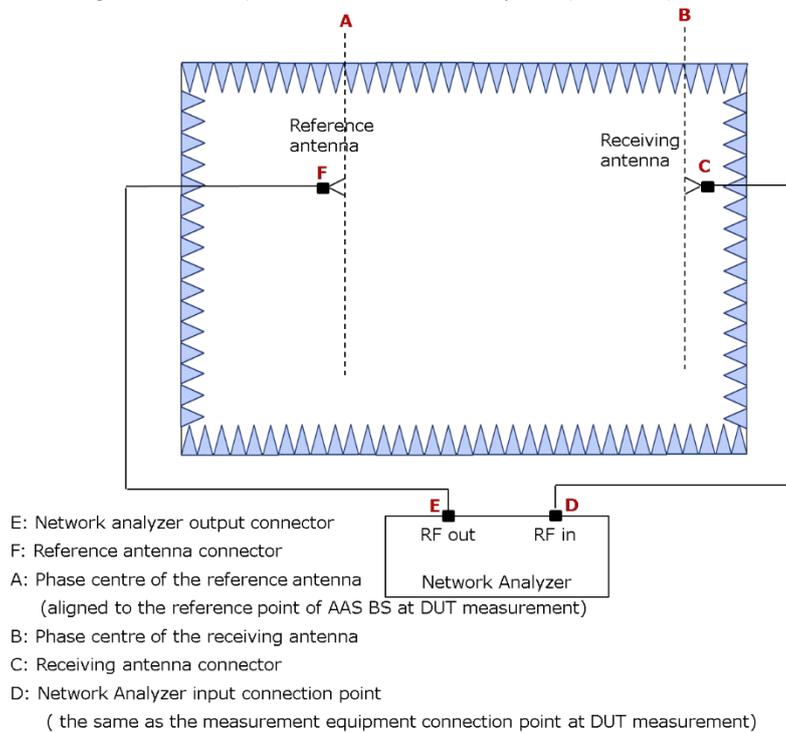


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

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 $20\log|S21|$ (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.

Measurement equipment

| | RISE number |
|---|-------------|
| Anechoic chamber, Hertz | BX50194 |
| R&S FSW 43 | 902 073 |
| R&S ESU | 901 553 |
| R&S ZNB 40 | BX50051 |
| RF Cable VNA-calibration | BX50189 |
| RF Cable VNA-calibration | BX50190 |
| RF Cable | BX50236 |
| RF Cable | BX50192 |
| RF Cable | BX81431 |
| RF Cable | BX81423 |
| RF Cable | 503 681 |
| RF Cable FSW-B21 | BX62069 |
| RF Cable FSW-B21 | BX62073 |
| Bilog antenna Schaffner 6143A | 504079 |
| EMCO Horn Antenna 3115 | 502 175 |
| EMCO Horn Antenna 3115 | 902 212 |
| EMCO Horn Antenna 3116 | 503 279 |
| Flann STD Gain Horn Antenna 20240-20 | BX92412 |
| Flann STD Gain Horn Antenna 22240-20 | BX92413 |
| 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 | BX81427 |
| Mixer FS-Z170 | BX81428 |
| Mixer FS-Z220 | BX81429 |
| µComp Nordic, Low Noise Amplifier | 901 544 |
| Miteq, Low Noise Amplifier | 503 278 |
| 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

The diagrams represents worst case configurations for each frequency range.

| Diagram | Symbolic name | Pol | Frequency range | Measurement method | “Early exit?” |
|---------|---------------|---------|-----------------|----------------------------|------------------------|
| 2.1a | TH1 | Hor | 30-1000 MHz | Pre scan Max hold EIRP | Yes |
| 2.1b | TH1 | Ver | 30-1000 MHz | Pre scan Max hold EIRP | Yes |
| 2.2a | TH1 | Hor | 1-18 GHz | Pre scan Max hold EIRP | Yes |
| 2.2b | TH1 | Ver | 1-18 GHz | Pre scan Max hold EIRP | Yes |
| 2.3a | TH1 | Hor | 18-26.5 GHz | Pre scan Max hold EIRP | Yes |
| 2.3b | TH1 | Ver | 18-26.5 GHz | Pre scan Max hold EIRP | Yes |
| 2.4a | TH1 | Hor | 26.5-33 GHz | Pre scan Max hold EIRP | Yes |
| 2.4b | TH1 | Ver | 26.5-33 GHz | Pre scan Max hold EIRP | Yes |
| 2.5a | BL1 | Hor | 33-40 GHz | Pre scan Max hold EIRP | No |
| 2.5b | BL1 | Ver | 33-40 GHz | Pre scan Max hold EIRP | No |
| 2.5c | BL1 | Hor/Ver | 36.13-36.23 GHz | Two cut TRP | Compliant to TRP limit |
| 2.6a | BL1 | Hor | 36-37 GHz | Pre scan Max average EIRP | No |
| 2.6b | BL1 | Ver | 36-37 GHz | Pre scan Max average EIRP | No |
| 2.6c | BL1 | Hor/Ver | 36.8-37 GHz | Pattern multiplication TRP | Compliant to TRP limit |
| 2.7a | BL3 | Hor | 36-37 GHz | Pre scan Max average EIRP | No |
| 2.7b | BL3 | Ver | 36-37 GHz | Pre scan Max average EIRP | No |
| 2.7c | BL3 | Hor/Ver | 36.3-37 GHz | Pattern multiplication TRP | Compliant to TRP limit |
| 2.8a | MH1 | Hor | 33-40 GHz | Pre scan Max hold EIRP | No |
| 2.8b | MH1 | Ver | 33-40 GHz | Pre scan Max hold EIRP | No |
| 2.8c | MH1 | Hor/Ver | 35.34-35.44 GHz | Spherical grid TRP | Compliant to TRP limit |

| Diagram | Symbolic name | Pol | Frequency range | Measurement method | “Early exit?” |
|---------|---------------|---------|-----------------|----------------------------|------------------------|
| 2.9a | TL1 | Hor | 38.35-38.85 GHz | Pre scan Max average EIRP | Compliant to TRP limit |
| 2.9b | TL1 | Ver | 38.35-38.85 GHz | Pre scan Max average EIRP | Compliant to TRP limit |
| 2.10a | BH1 | Hor | 38.35-38.85 GHz | Pre scan Max average EIRP | Compliant to TRP limit |
| 2.10b | BH1 | Ver | 38.35-38.85 GHz | Pre scan Max average EIRP | Compliant to TRP limit |
| 2.11a | TH1 | Hor | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.11b | TH1 | Ver | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.11c | TH1 | Hor | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.11d | TH1 | Ver | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.11e | TH1 | Hor/Ver | 40-40.3 GHz | Pattern multiplication TRP | Compliant to TRP limit |
| 2.12a | TH2 | Hor | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.12b | TH2 | Ver | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.12c | TH2 | Hor | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.12d | TH2 | Ver | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.12e | TH2 | Hor/Ver | 40-40.4 GHz | Pattern multiplication TRP | Compliant to TRP limit |
| 2.13a | TH3 | Hor | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.13b | TH3 | Ver | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.13c | TH3 | Hor | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.13d | TH3 | Ver | 40-43 GHz | Pre scan Max average EIRP | No |
| 2.13e | TH3 | Hor/Ver | 40-40.7 GHz | Pattern multiplication TRP | Compliant to TRP limit |
| 2.14a | BL1 | Hor | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.14b | BL1 | Ver | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.14c | BL1 | Hor/Ver | 40.1-40.6 Ghz | Two cut TRP | Compliant to TRP limit |
| 2.15a | ML1 | Hor | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.15b | ML1 | Ver | 40-43 GHz | Pre scan Max hold EIRP | No |
| 2.15c | ML1 | Hor/Ver | 40-41.3 Ghz | Two cut TRP | Compliant to TRP limit |

| Diagram | Symbolic name | Pol | Frequency range | Measurement method | “Early exit?” |
|---------|---------------|---------|-----------------|------------------------|------------------------|
| 2.16a | BL1 | Hor | 43-60 GHz | Pre scan Max hold EIRP | No |
| 2.16b | BL1 | Ver | 43-60 GHz | Pre scan Max hold EIRP | No |
| 2.16c | BL1 | Hor/Ver | 43.1-43.25 GHz | Spherical grid TRP | Compliant to TRP limit |
| 2.17a | TH1 | Hor | 60-75 GHz | Pre scan Max hold EIRP | Yes |
| 2.17b | TH1 | Ver | 60-75 GHz | Pre scan Max hold EIRP | Yes |
| 2.18a | TH1 | Hor | 75-90 GHz | Pre scan Max hold EIRP | Yes |
| 2.18b | TH1 | Ver | 75-90 GHz | Pre scan Max hold EIRP | Yes |
| 2.19a | TH1 | Hor | 90-110 GHz | Pre scan Max hold EIRP | Yes |
| 2.19b | TH1 | Ver | 90-110 GHz | Pre scan Max hold EIRP | Yes |
| 2.20a | TH1 | Hor | 110-130 GHz | Pre scan Max hold EIRP | Yes |
| 2.20b | TH1 | Ver | 110-130 GHz | Pre scan Max hold EIRP | Yes |
| 2.21a | TH1 | Hor | 130-150 GHz | Pre scan Max hold EIRP | Yes |
| 2.21b | TH1 | Ver | 130-150 GHz | Pre scan Max hold EIRP | Yes |
| 2.22a | TH1 | Hor | 150-170 GHz | Pre scan Max hold EIRP | Yes |
| 2.22b | TH1 | Ver | 150-170 GHz | Pre scan Max hold EIRP | Yes |
| 2.23a | TH1 | Hor | 170-185 GHz | Pre scan Max hold EIRP | Yes |
| 2.23b | TH1 | Ver | 170-185 GHz | Pre scan Max hold EIRP | Yes |
| 2.24a | TH1 | Hor | 185-200 GHz | Pre scan Max hold EIRP | Yes |
| 2.24b | TH1 | Ver | 185-200 GHz | Pre scan Max hold EIRP | Yes |

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 |
|-----------|-----|

Diagram 2.2a: 1 – 18 GHz, QPSK, TH1, EIRP Horizontal polarization

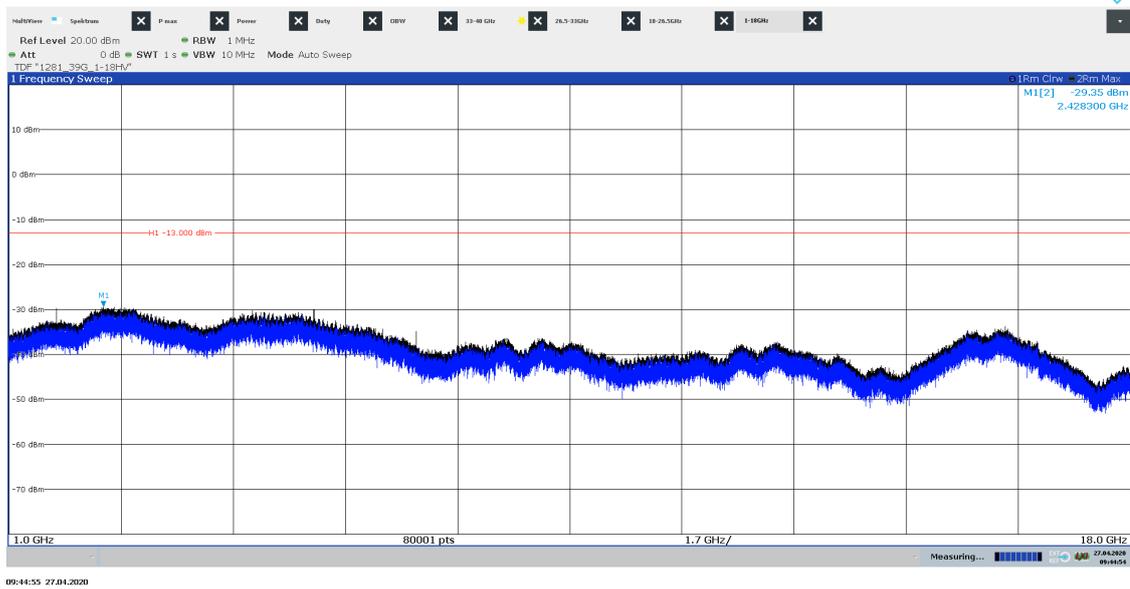


Diagram 2.2b: 1 – 18 GHz, QPSK, TH1, EIRP Vertical polarization

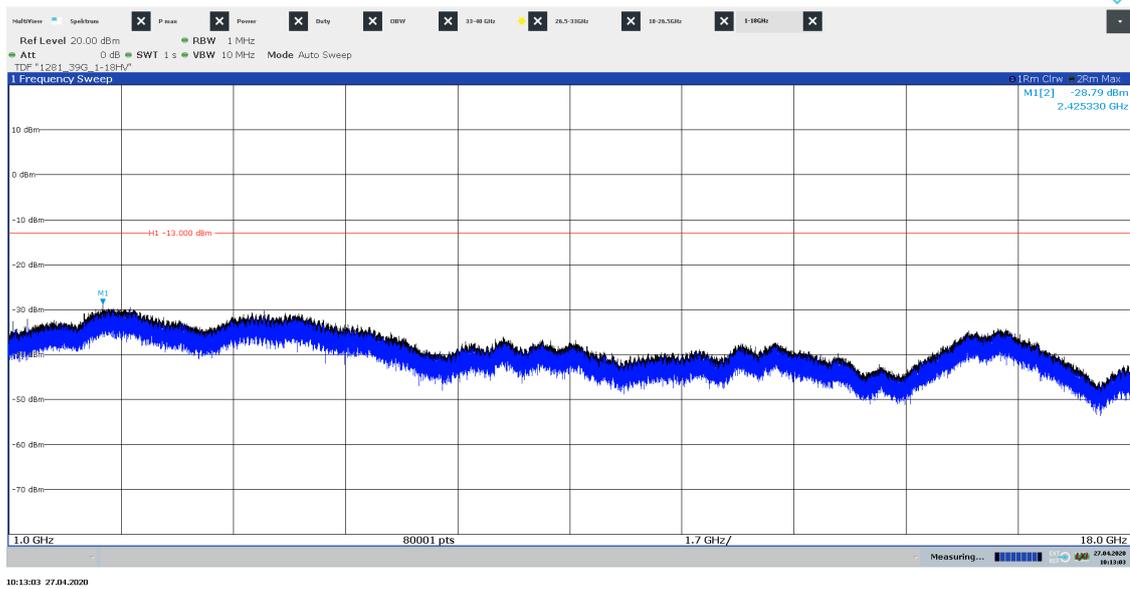


Diagram 2.3a: 18 – 26.5 GHz, QPSK, TH1, EIRP Horizontal polarization

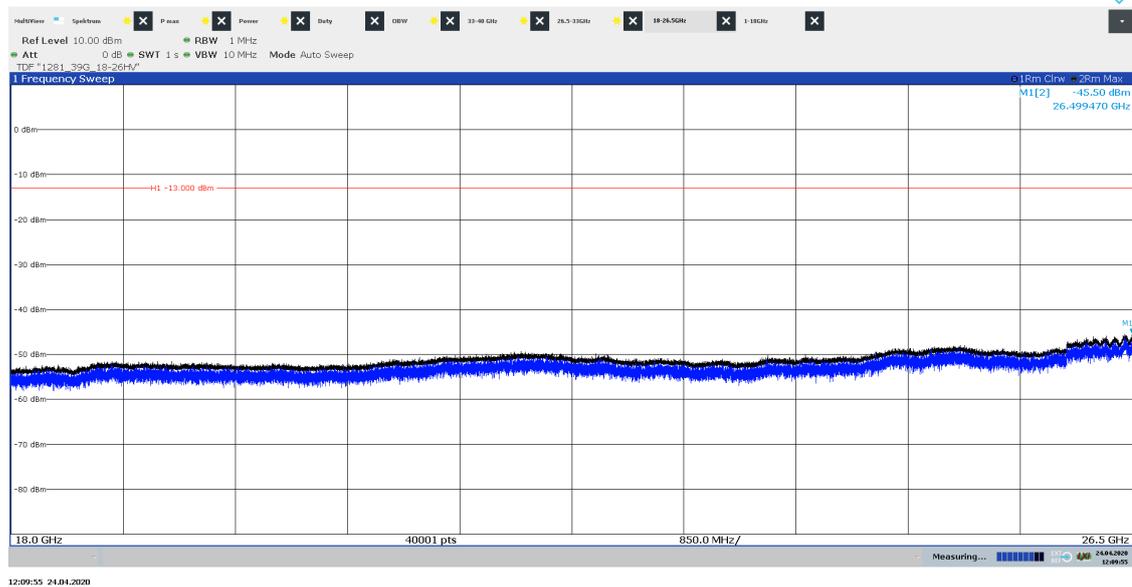


Diagram 2.3b: 18 – 26.5 GHz, QPSK, TH1, EIRP Vertical polarization

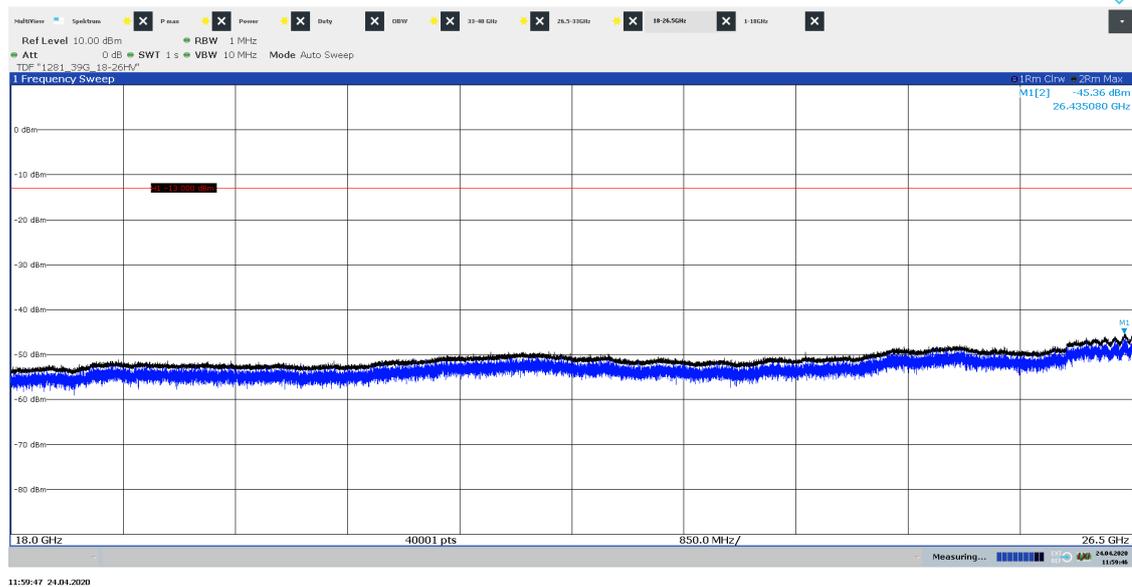
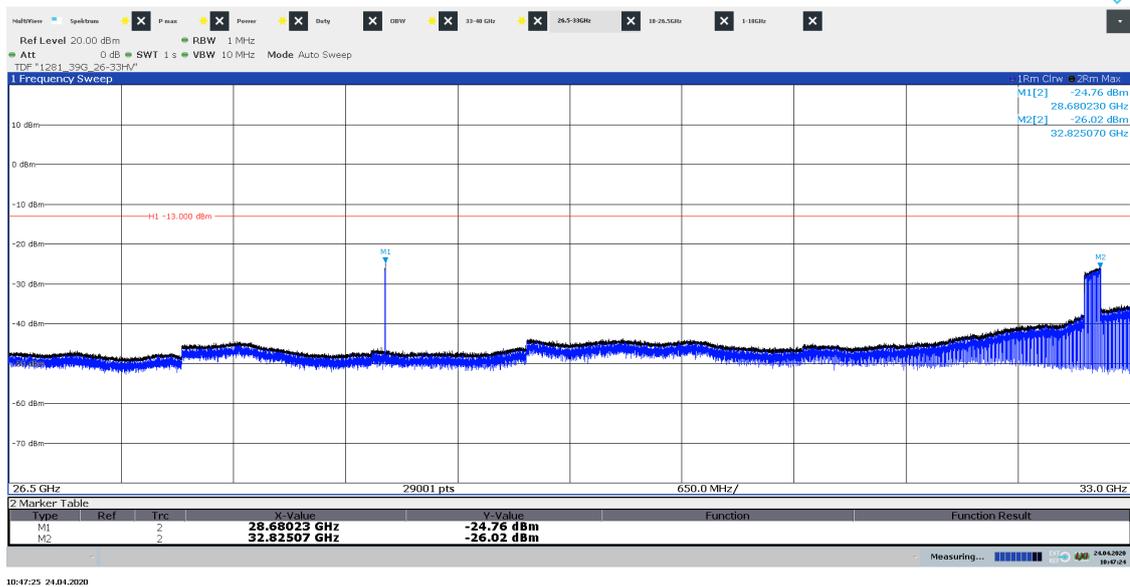
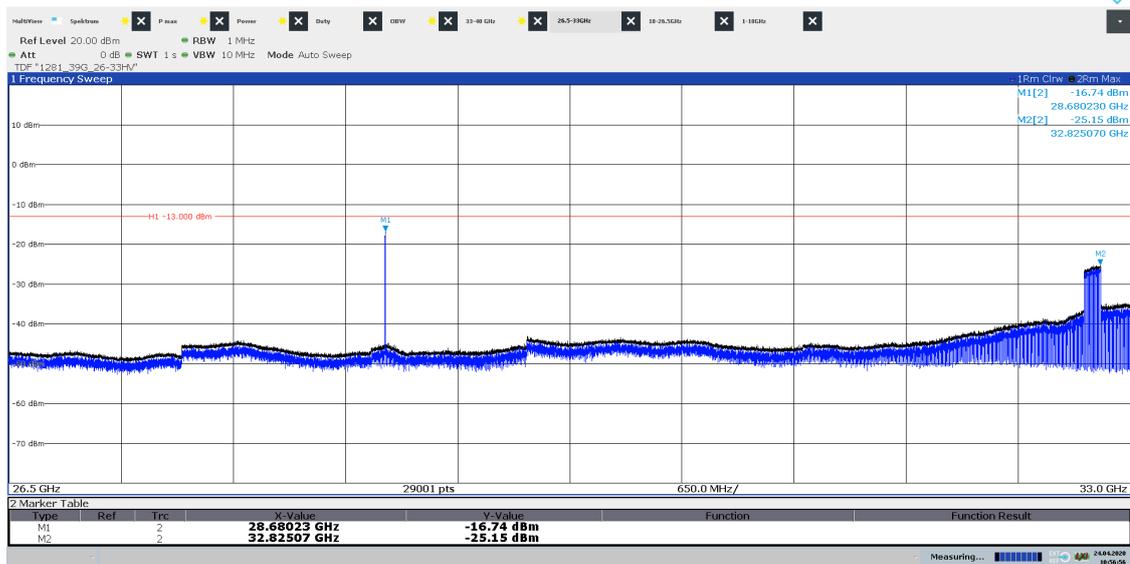


Diagram 2.4a: 26.5 – 33 GHz, QPSK, TH1, EIRP Horizontal polarization



10:47:25 24.04.2020

Diagram 2.4b: 26.5 – 33 GHz, QPSK, TH1, EIRP Vertical polarization



10:56:56 24.04.2020

Diagram 2.5a: 33 – 40 GHz, QPSK, BL1, EIRP Horizontal polarization
See diagram 2.5c for TRP result

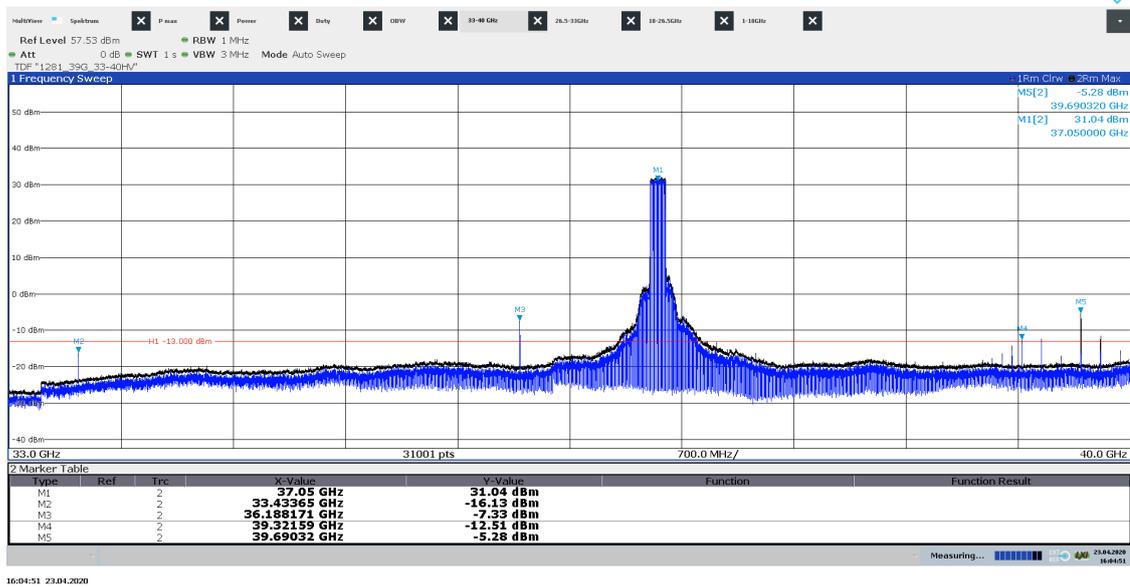
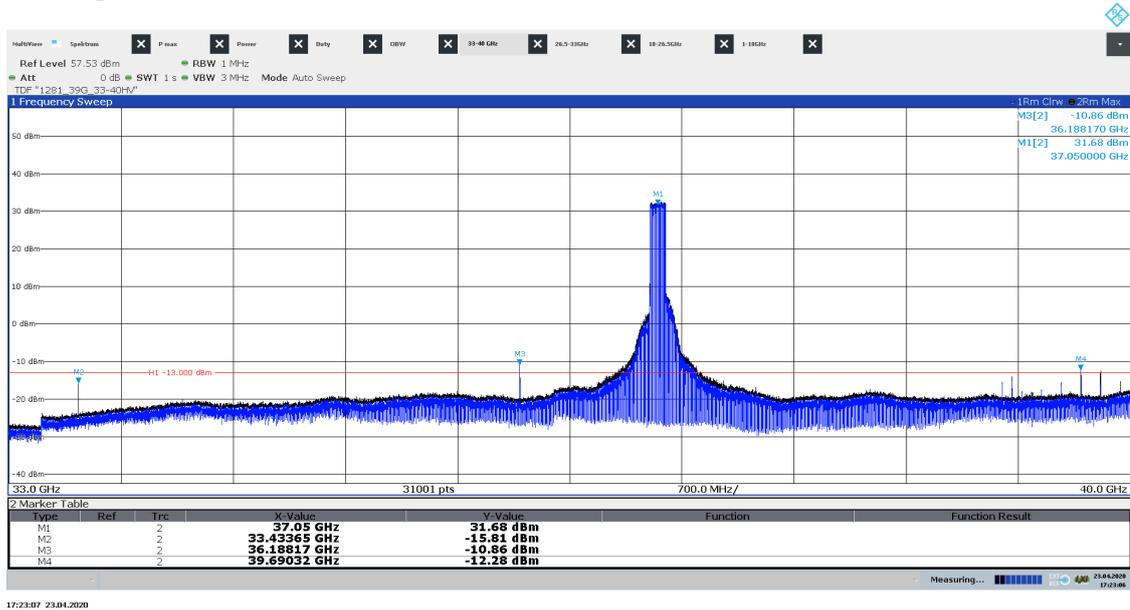


Diagram 2.5b: 33 – 40 GHz, QPSK, BL1, EIRP Vertical polarization
See diagram 2.5c for TRP result



| | | |
|---|-----------------------------------|---|
| Power EIRP for 39.69GHz Hor/ Ver [dBm] | Antenna Gain Hor/ Ver [dBi] | Total conducted power/BW for 39.69 GHz (Limit -13 dBm) [dBm]/ Verdict |
| -5.28/ -12.28 | 29.26/ 29.28 | -33.75/ Pass |

Diagram 2.5c: Two cut TRP 36.13 – 36.23 GHz, Symbolic name: BL1

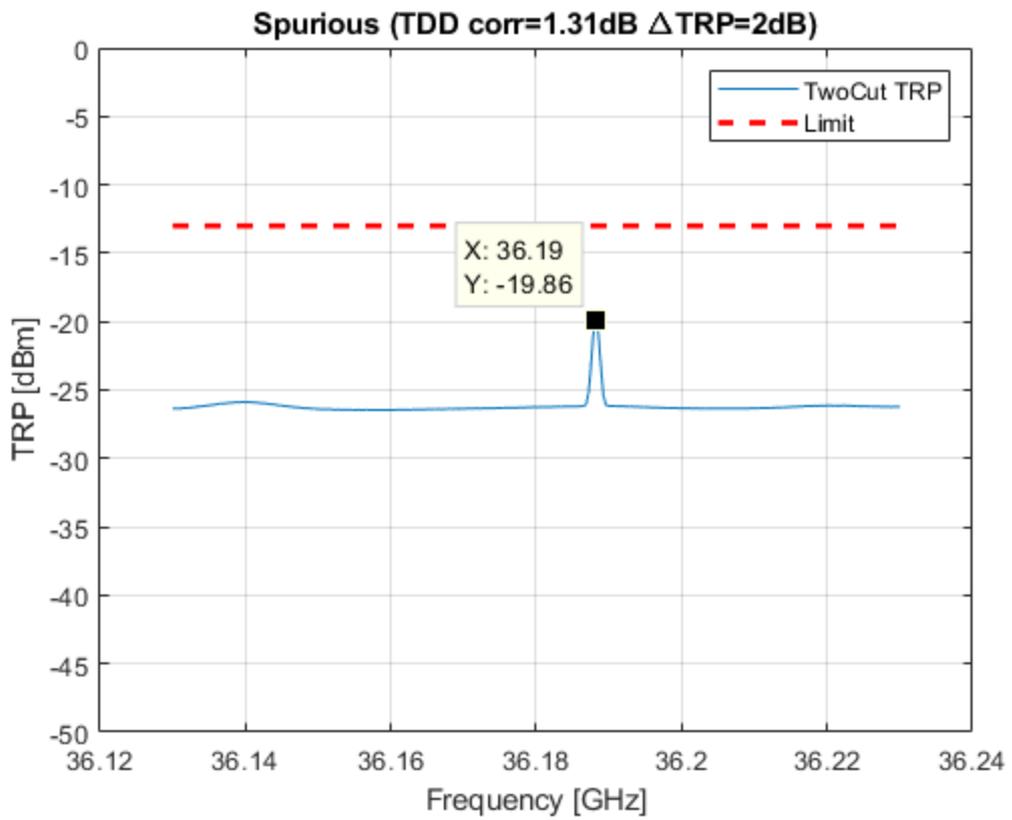
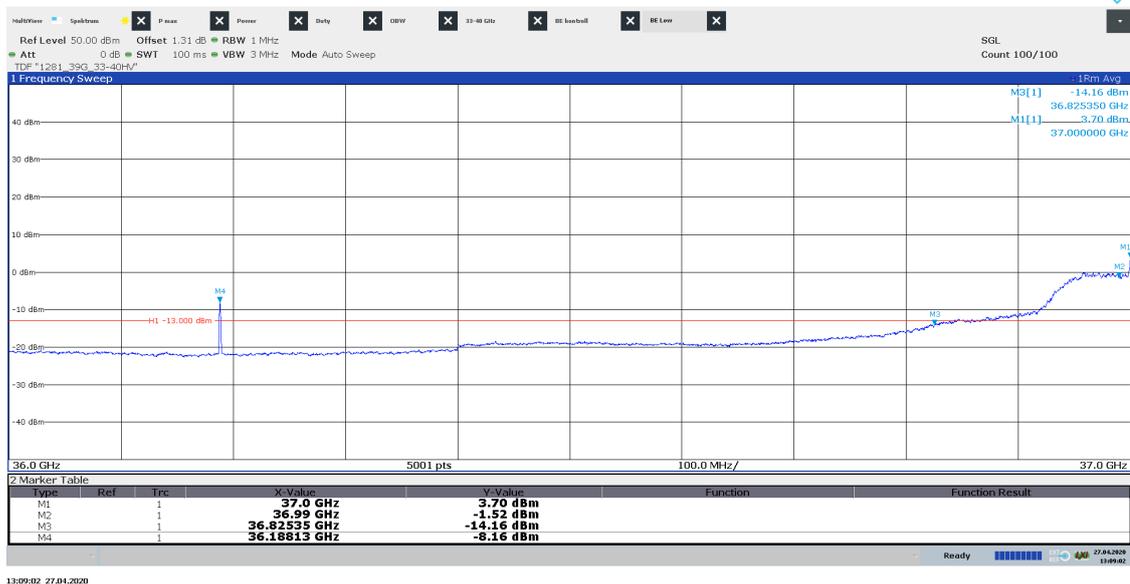
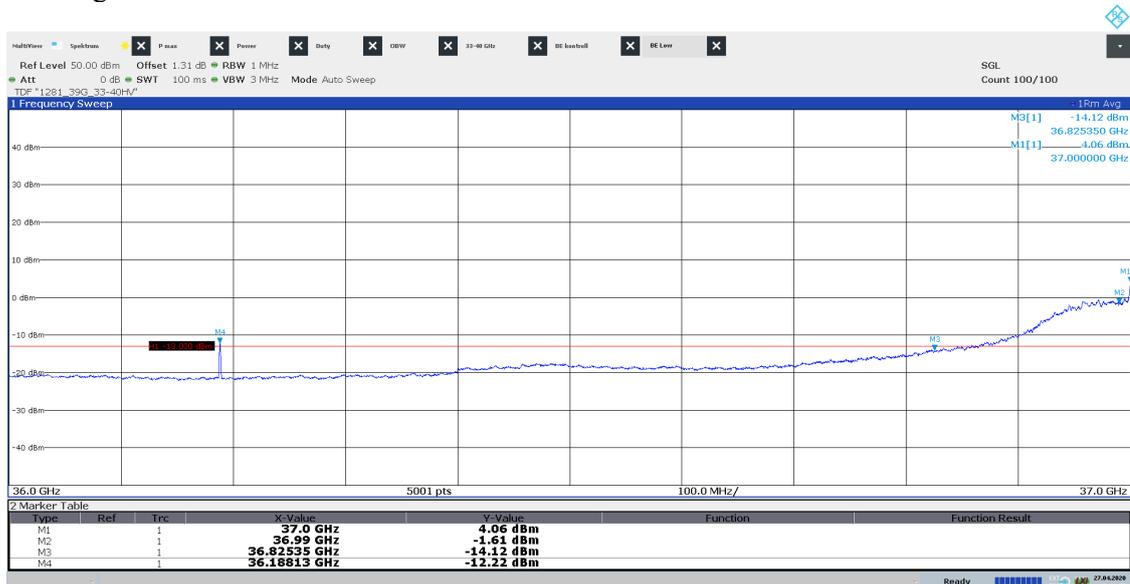


Diagram 2.6a: 36 – 37 GHz, QPSK, BL1, EIRP Horizontal polarization
See diagram 2.6c for TRP result



13:09:02 27.04.2020

Diagram 2.6b: 36 – 37 GHz, QPSK, BL1, EIRP Vertical polarization
See diagram 2.6c for TRP result



13:13:57 27.04.2020

| | | | | |
|---|---|-----------------------------------|---|---|
| Power EIRP for 37.0GHz 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 |
| 3.70/ 4.06 | -1.52/ -1.61 | 28.28/ 28.42 | -21.46/ Pass | -26.90/ Pass |

Diagram 2.6c: Pattern multiplication TRP 36.8 – 37.0 GHz, Symbolic name: BL1

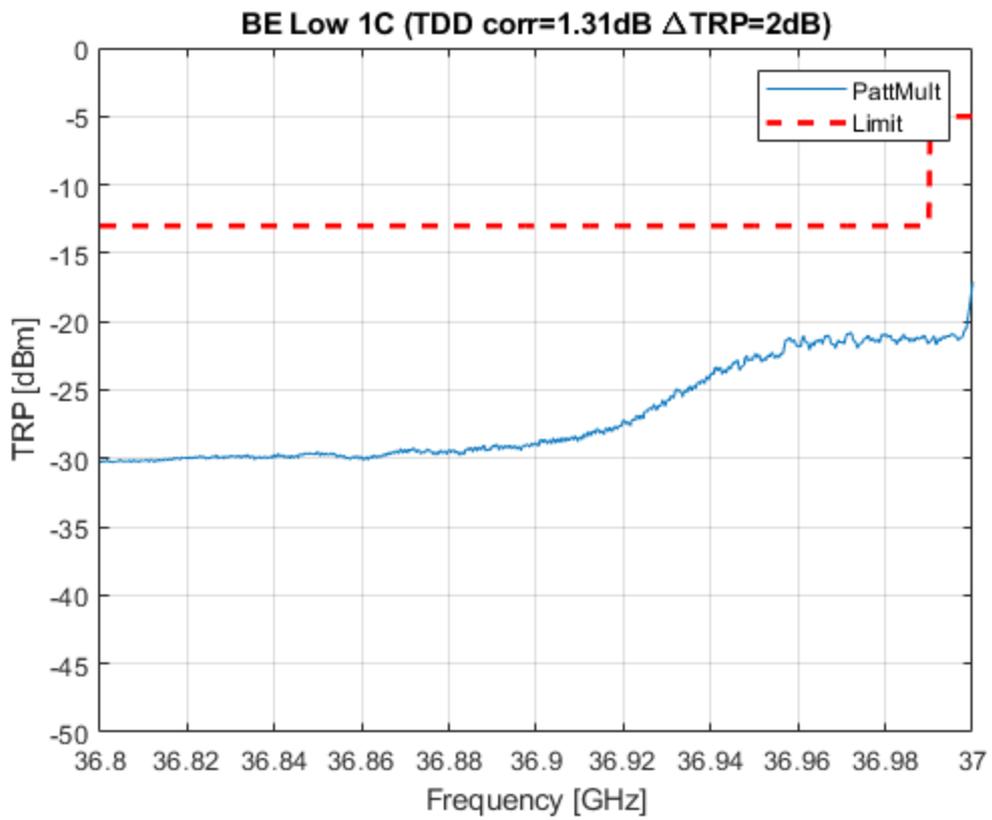


Diagram 2.7a: 36 – 37 GHz, QPSK, BL3, EIRP Horizontal polarization
See diagram 2.7c for TRP result



Diagram 2.7b: 36 – 37 GHz, QPSK, BL3, EIRP Vertical polarization
See diagram 2.7c for TRP result



| Power EIRP for 37.0GHz 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 |
|---|---|-----------------------------------|---|---|
| 1.65/ 2.70 | -1.35/ 0.35 | 28.28/ 28.42 | -23.14/ Pass | -25.77/ Pass |

Diagram 2.7c: Pattern multiplication TRP 36.3 – 37.0 GHz, Symbolic name: BL3

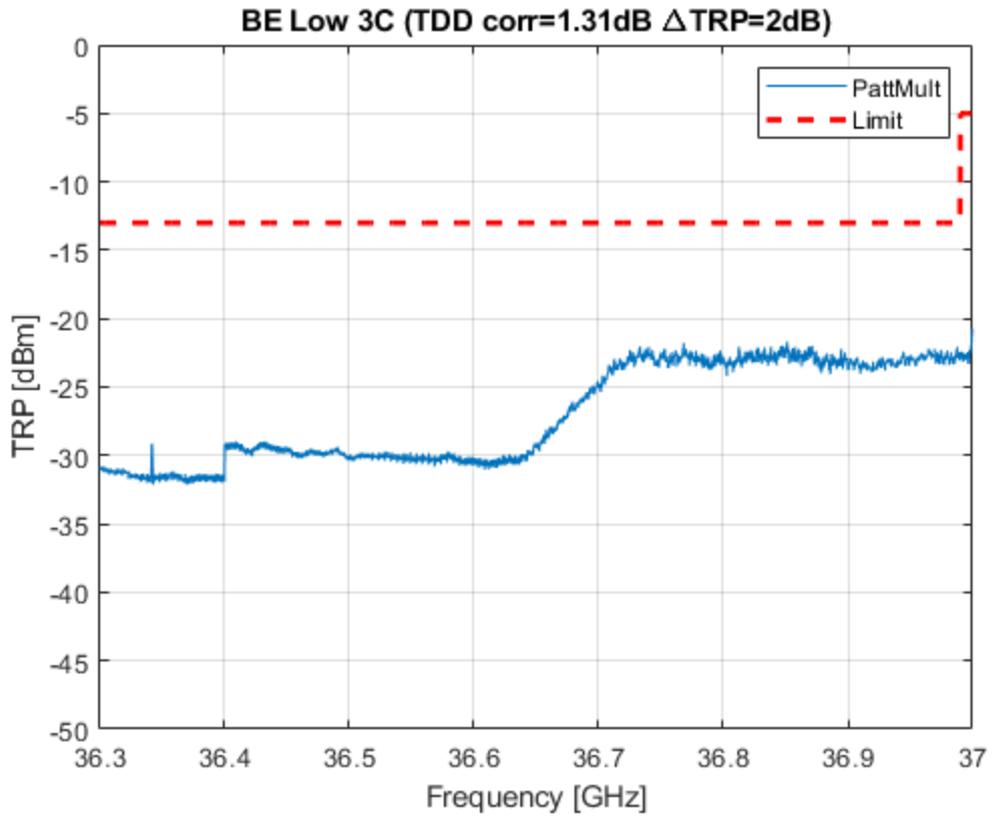


Diagram 2.8a: 33 – 40 GHz, QPSK, MH1, EIRP Horizontal polarization
See diagram 2.8c for TRP result

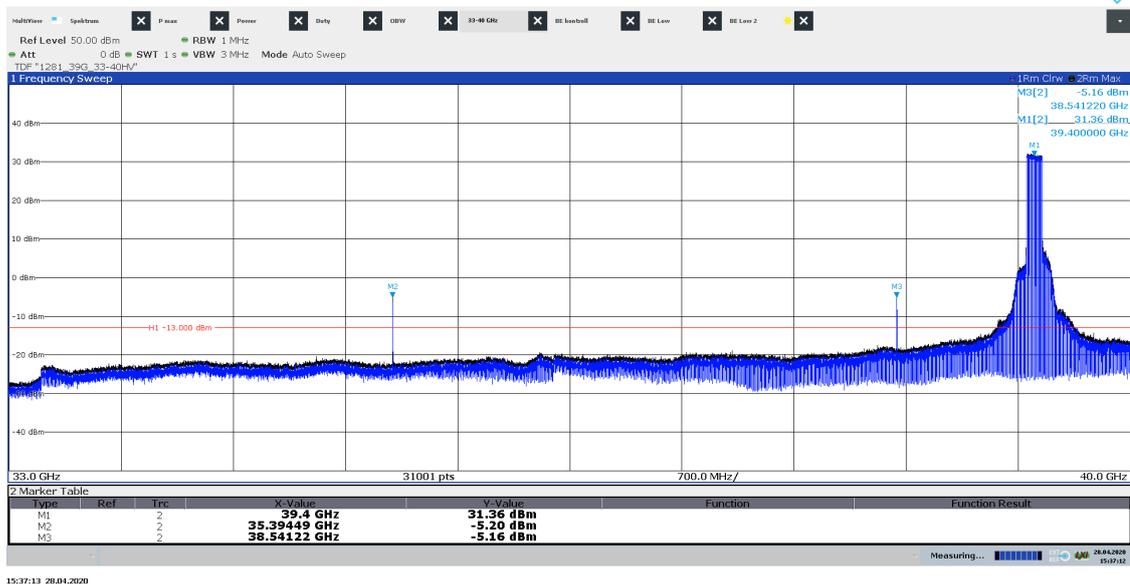
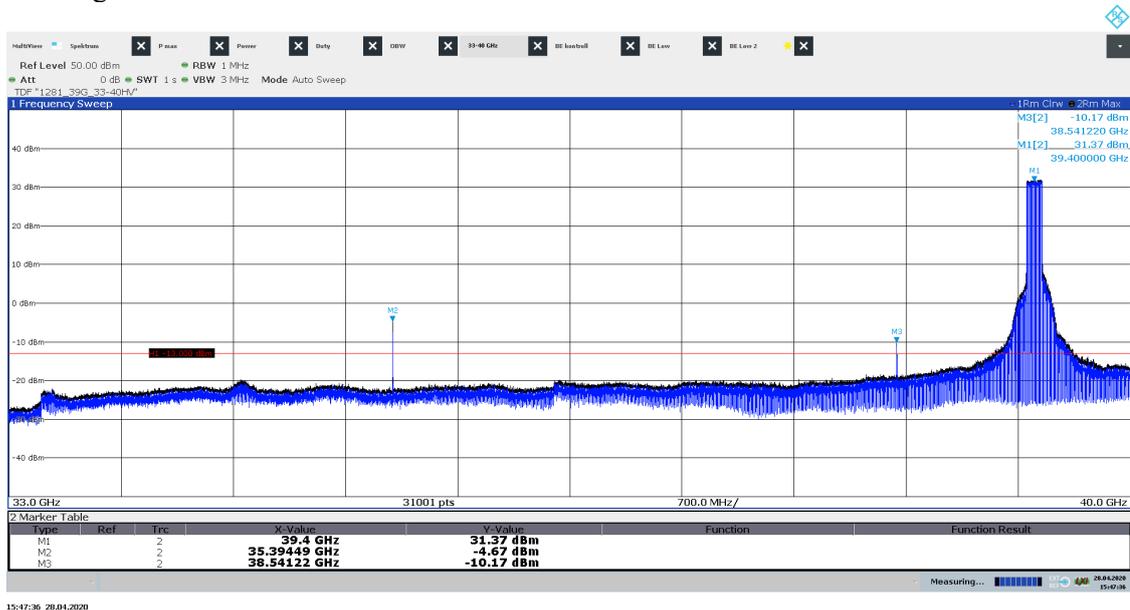


Diagram 2.8b: 33 – 40 GHz, QPSK, MH1, EIRP Vertical polarization
See diagram 2.8c for TRP result



| | | |
|---|-----------------------------------|---|
| Power EIRP for 38.54GHz Hor/ Ver [dBm] | Antenna Gain Hor/ Ver [dBi] | Total conducted power/BW for 38.54 GHz (Limit -13 dBm) [dBm]/ Verdict |
| -5.16/ -10.17 | 28.78/ 28.93 | -32.78/ Pass |

Diagram 2.8c: Spherical grid Method TRP 35.34 – 35.44 GHz, Symbolic name: MH1

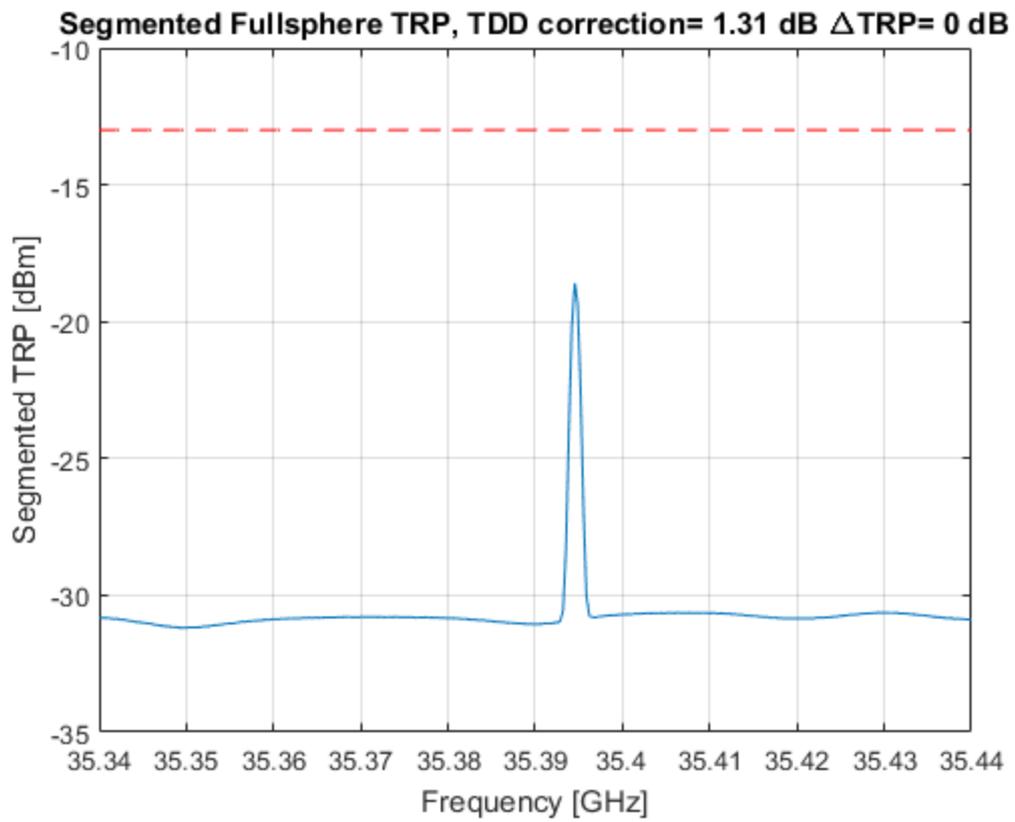


Diagram 2.9a: 38.35 – 38.85 GHz, QPSK, TL1, EIRP Horizontal polarization

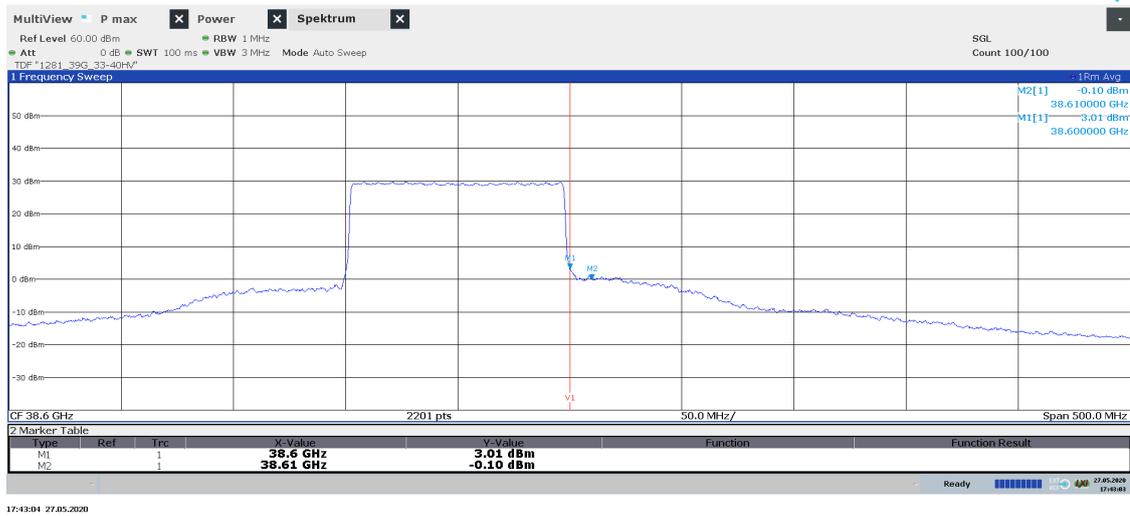
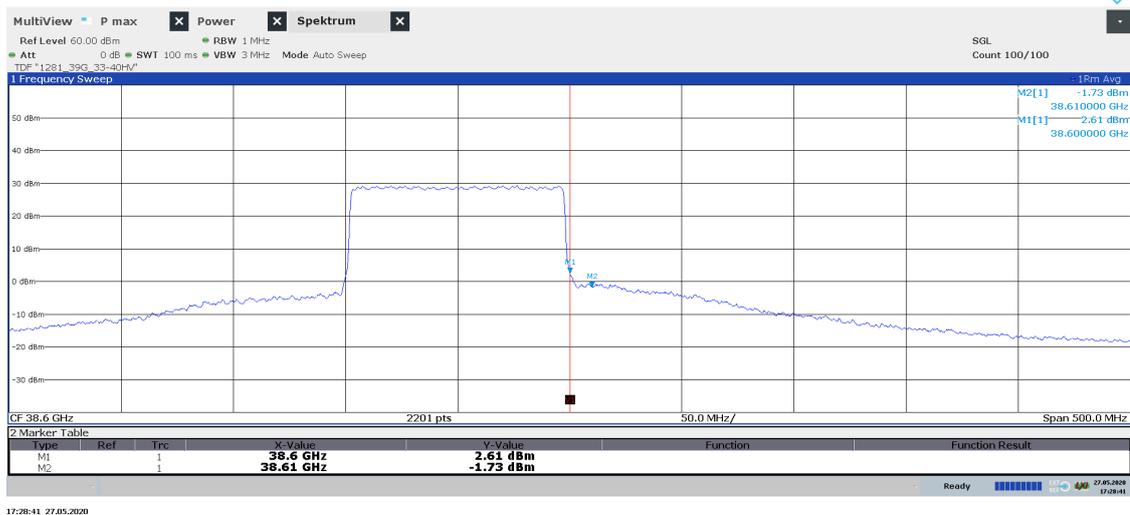


Diagram 2.9b: 38.35 – 38.85 GHz, QPSK, TL1, EIRP Vertical polarization

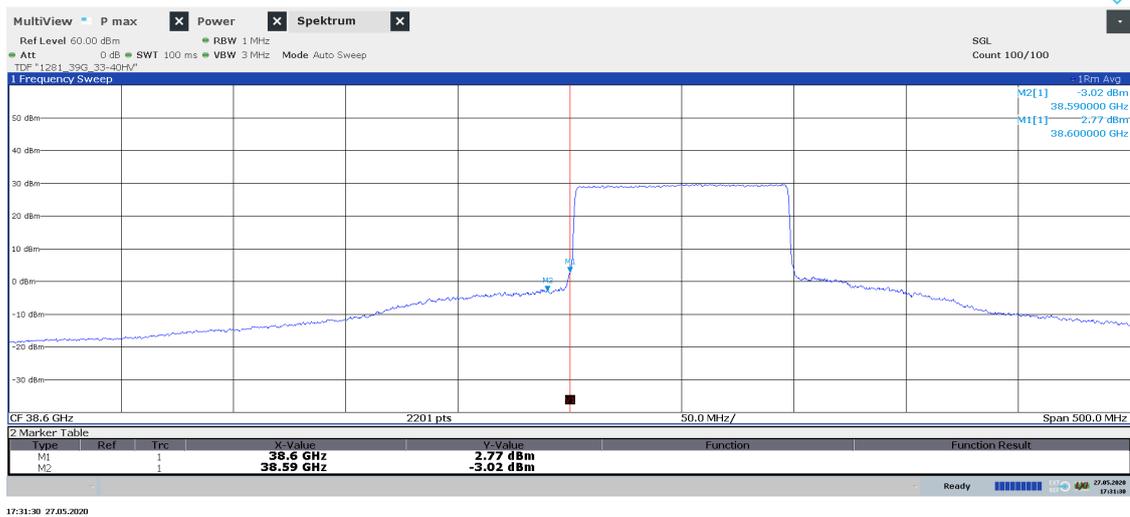


| Power EIRP for 38.6 GHz Hor/ Ver [dBm] | Power EIRP for 38.61 GHz Hor/ Ver [dBm] | Antenna Gain Hor/ Ver [dBi] | Total conducted power/BW for 38.6 GHz (Limit -5 dBm) [dBm]/ Verdict | Total conducted power/BW for 38.61 GHz (Limit -13 dBm) [dBm]/ Verdict |
|---|--|-----------------------------------|---|---|
| 3.01/ 2.61 | -0.10/ -1.73 | 28.78/ 28.93 | -23.03/ Pass | -26.67/ Pass |

Diagram 2.10a: 38.35 – 38.85 GHz, QPSK, BH1, EIRP Horizontal polarization



Diagram 2.10b: 38.35 – 38.85 GHz, QPSK, BH1, EIRP Vertical polarization



| Power EIRP for 38.6 GHz Hor/ Ver [dBm] | Power EIRP for 38.59 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 38.59 GHz (Limit -13 dBm) [dBm]/ Verdict |
|---|--|-----------------------------------|---|---|
| 3.74/ 2.77 | -2.85/ -3.02 | 28.78/ 28.93 | -22.55/ Pass | -28.78/ Pass |

Diagram 2.11a: 40 – 43 GHz, QPSK, TH1, EIRP Horizontal polarization
See diagram 2.11e for TRP result

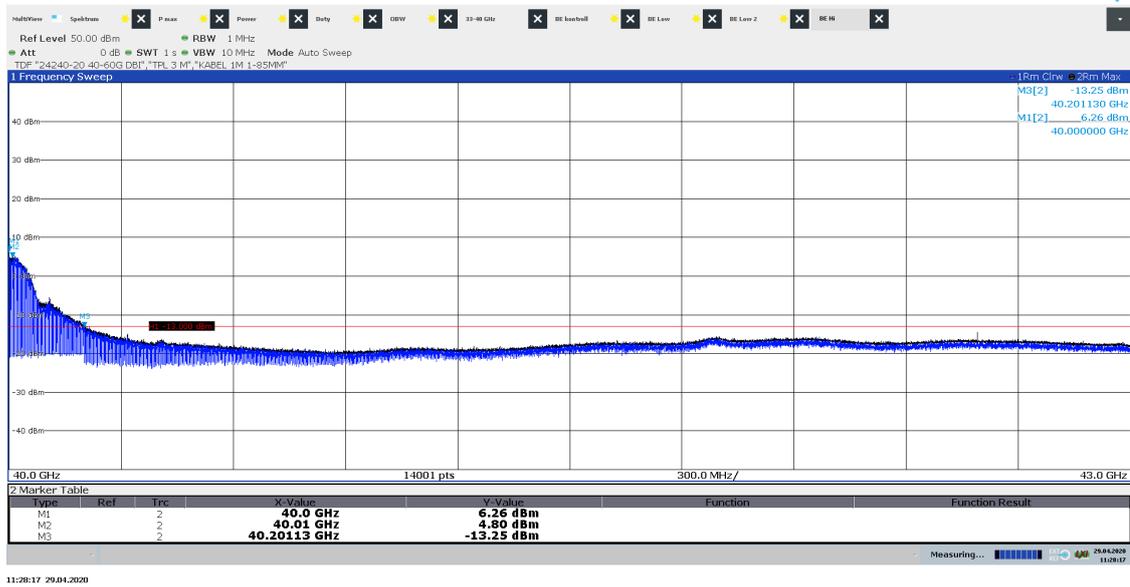


Diagram 2.11b: 40 – 43 GHz, QPSK, TH1, EIRP Vertical polarization
See diagram 2.11e for TRP result

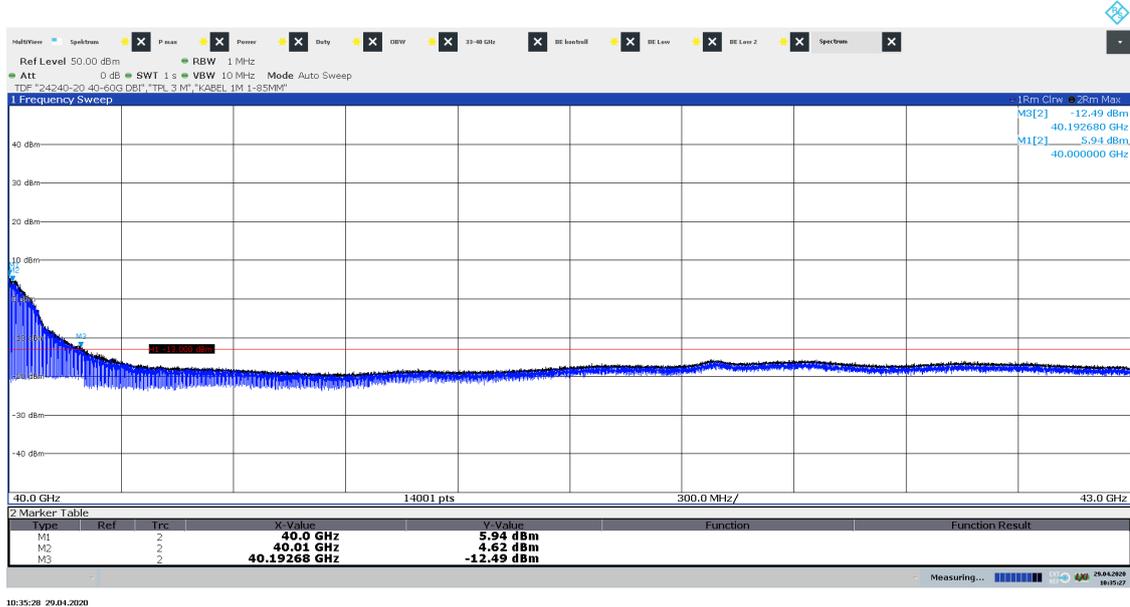
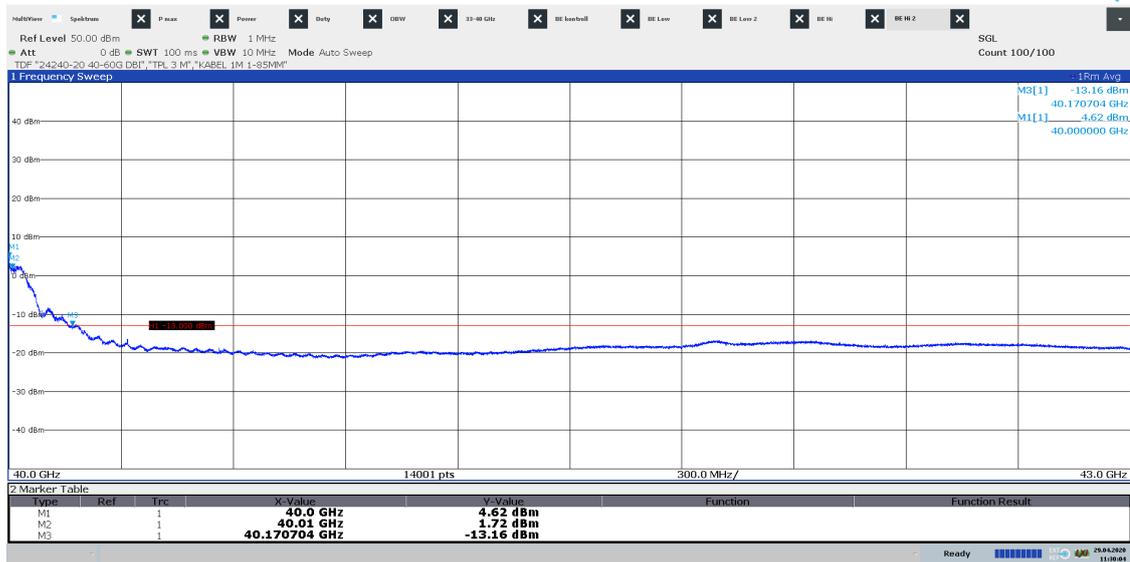
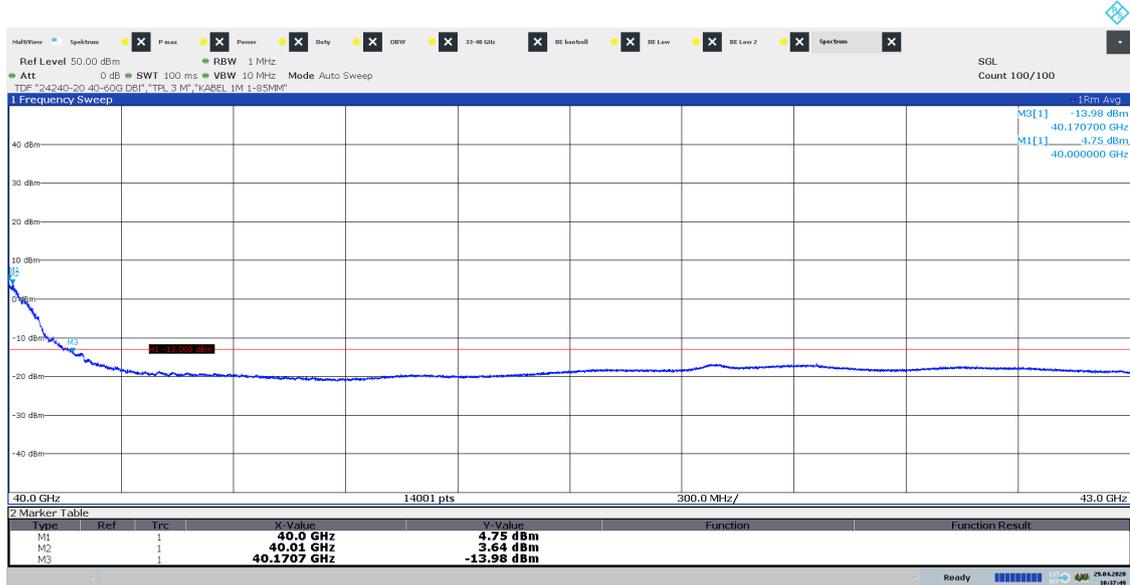


Diagram 2.11c: 40 – 43 GHz, QPSK, TH1, EIRP Horizontal polarization
See diagram 2.11e for TRP result



11:30:04 29.04.2020

Diagram 2.11d: 40 – 43 GHz, QPSK, TH1, EIRP Vertical polarization
See diagram 2.11e for TRP result



10:37:49 29.04.2020

| 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 |
|--|---|-----------------------------|---|---|
| 4.62/ 4.75 | 1.72/ 3.64 | 29.26/ 29.28 | -21.57/ Pass | -23.48/ Pass |

Diagram 2.11e: Pattern multiplication TRP 40 – 40.3 GHz, Symbolic name: TH1

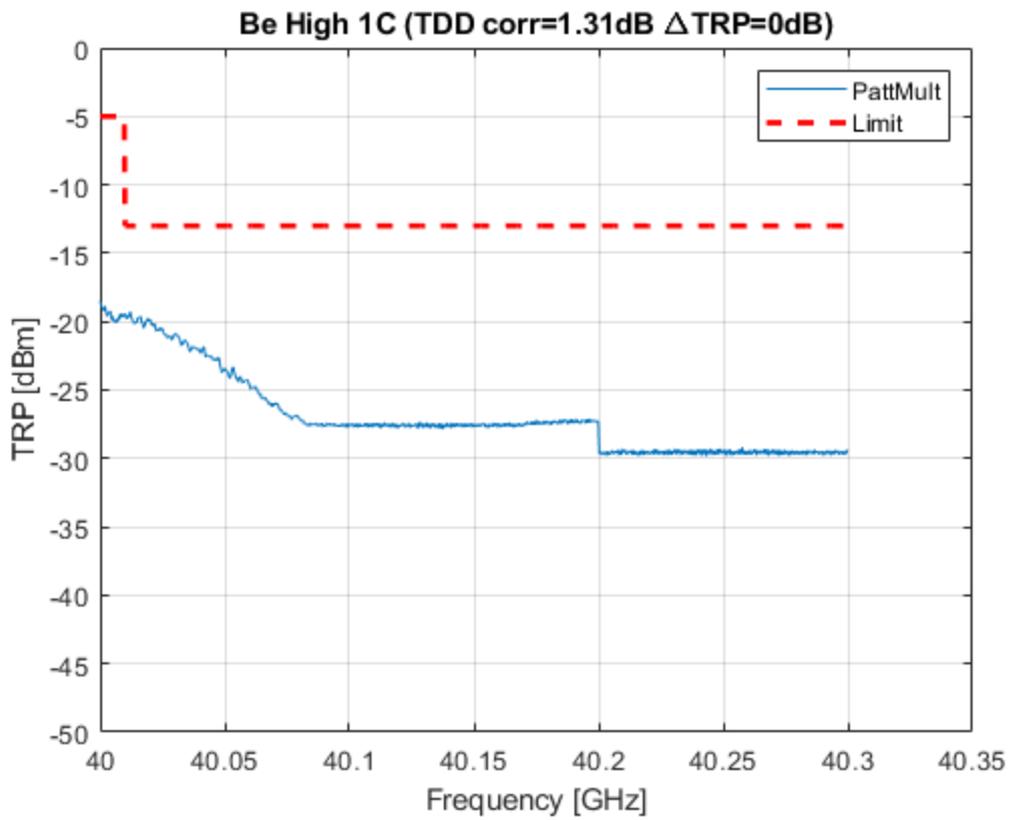
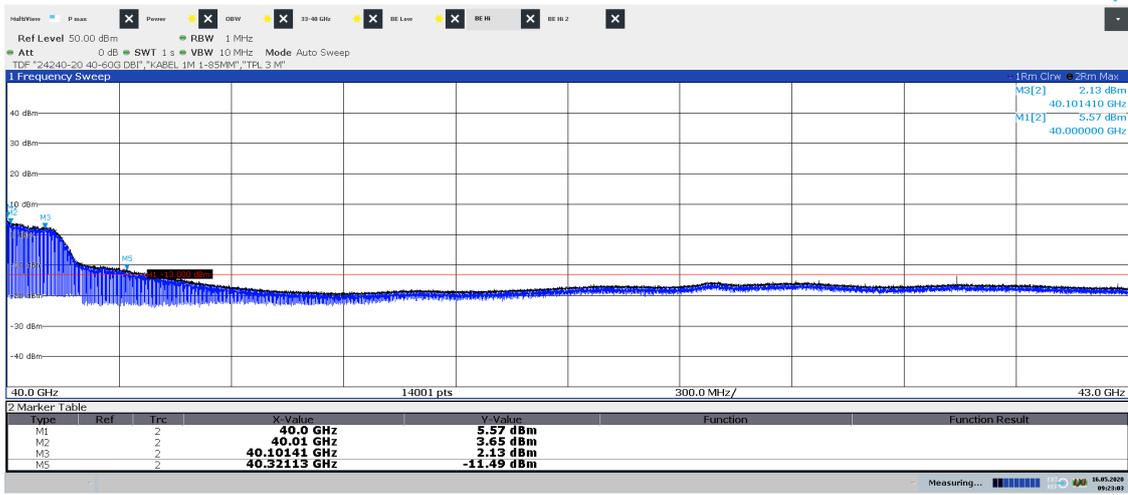
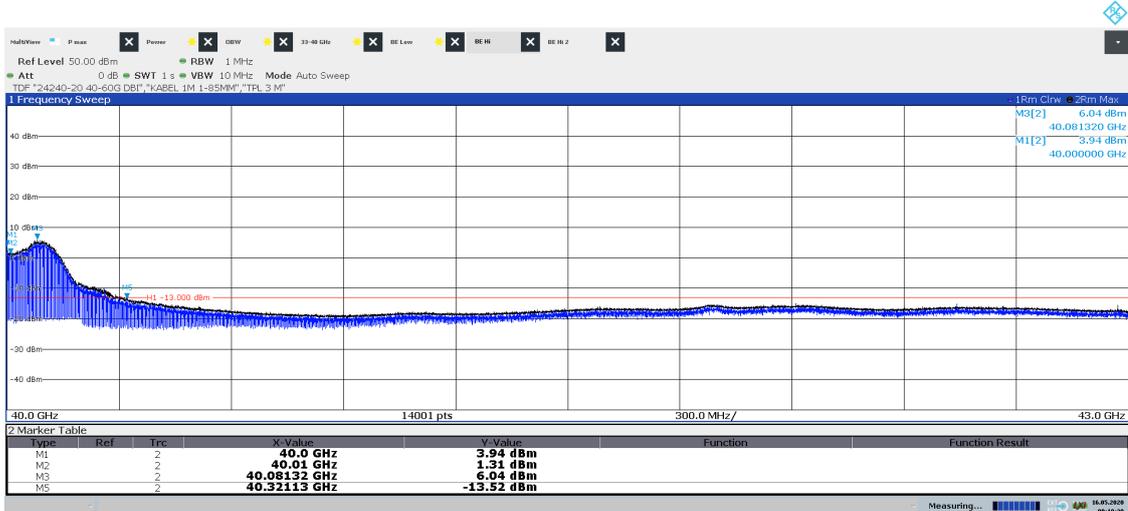


Diagram 2.12a: 40 – 43 GHz, QPSK, TH2, EIRP Horizontal polarization
See diagram 2.12e for TRP result



09:23:04 16.05.2020

Diagram 2.12b: 40 – 43 GHz, QPSK, TH2, EIRP Vertical polarization
See diagram 2.12e for TRP result



09:18:30 16.05.2020

Diagram 2.12c: 40 – 43 GHz, QPSK, TH2, EIRP Horizontal polarization
See diagram 2.12e for TRP result

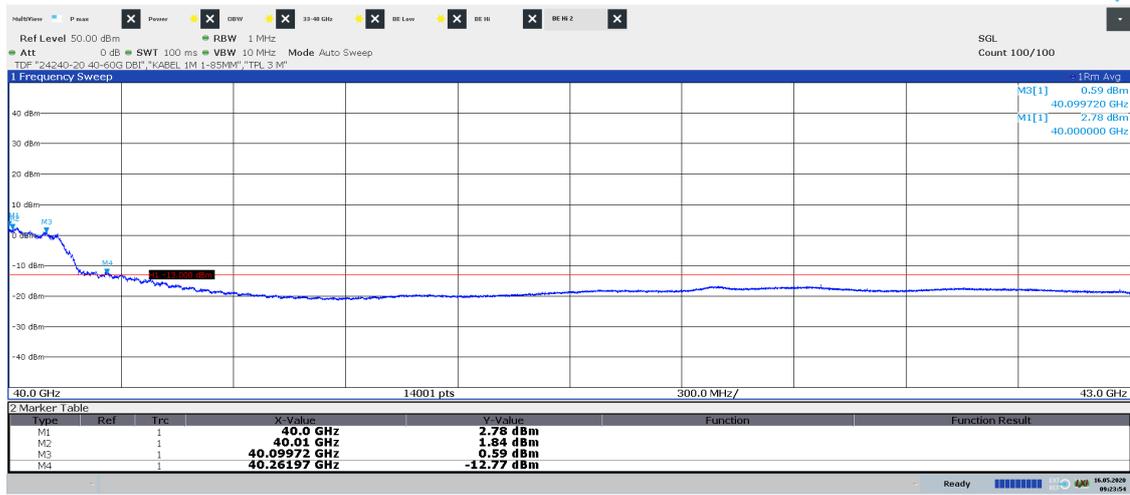
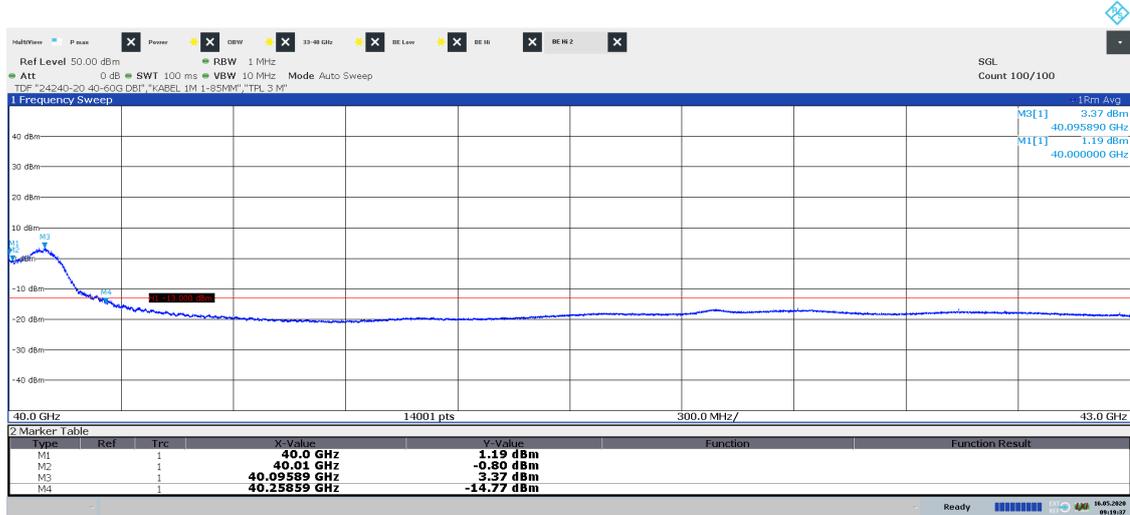


Diagram 2.12d: 40 – 43 GHz, QPSK, TH2, EIRP Vertical polarization
See diagram 2.12e for TRP result



| 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 |
|--|---|-----------------------------------|---|---|
| 2.78/ 1.19 | 1.84/ -0.80 | 29.26/ 29.28 | -24.20/ Pass | -25.54/ Pass |

Diagram 2.12e: Pattern multiplication TRP 40 – 40.4 GHz, Symbolic name: TH2

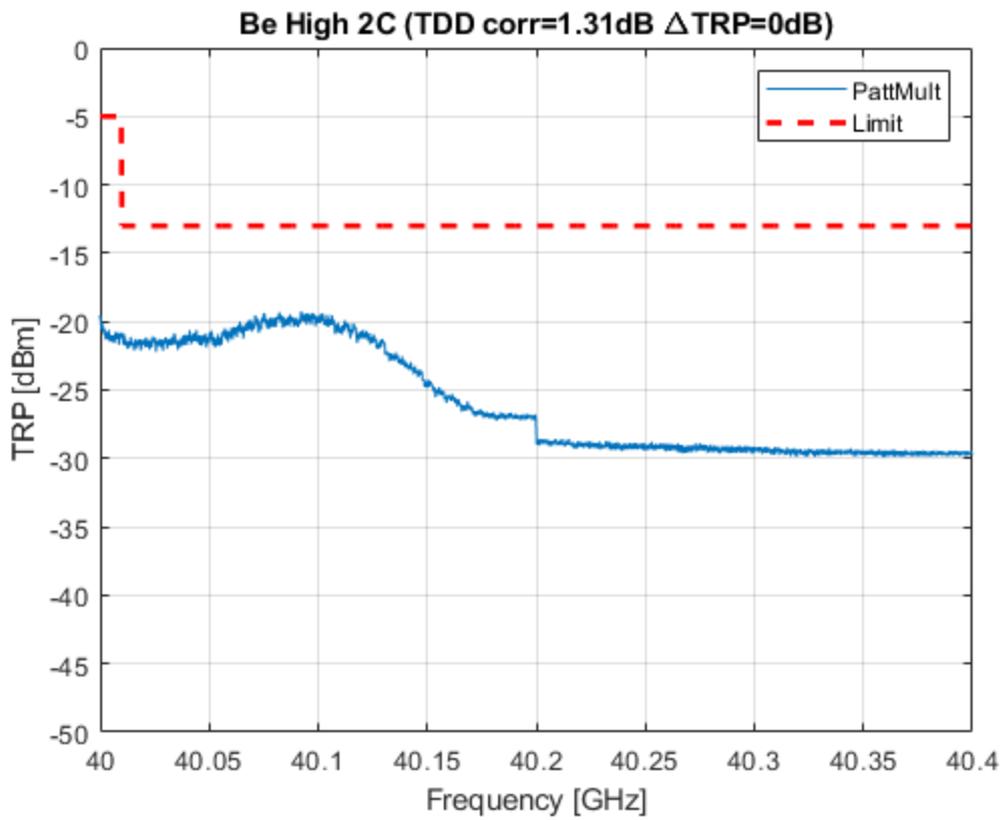


Diagram 2.13a: 40 – 43 GHz, QPSK, TH3, EIRP Horizontal polarization
See diagram 2.13e for TRP result

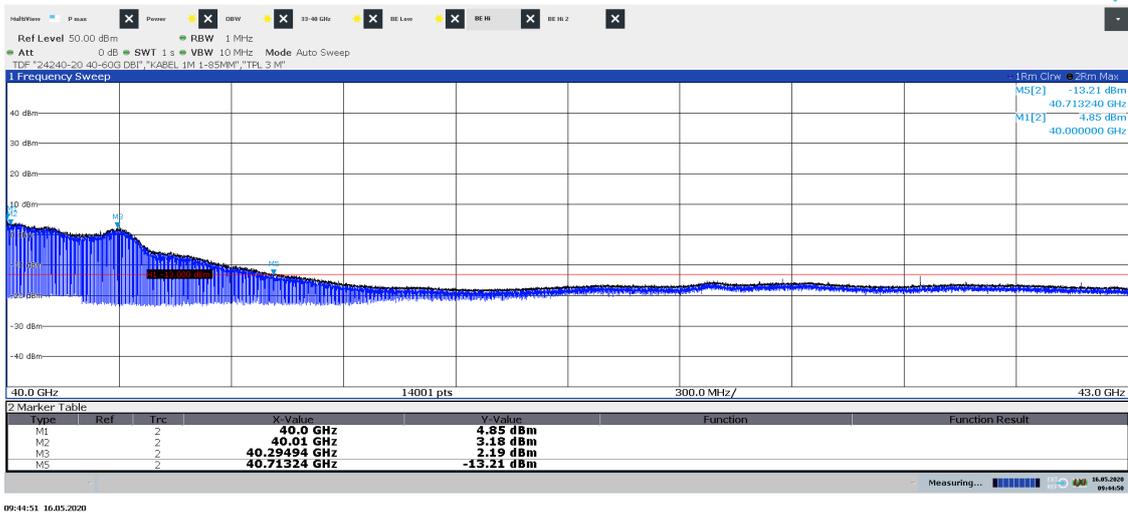


Diagram 2.13b: 40 – 43 GHz, QPSK, TH3, EIRP Vertical polarization
See diagram 2.13e for TRP result

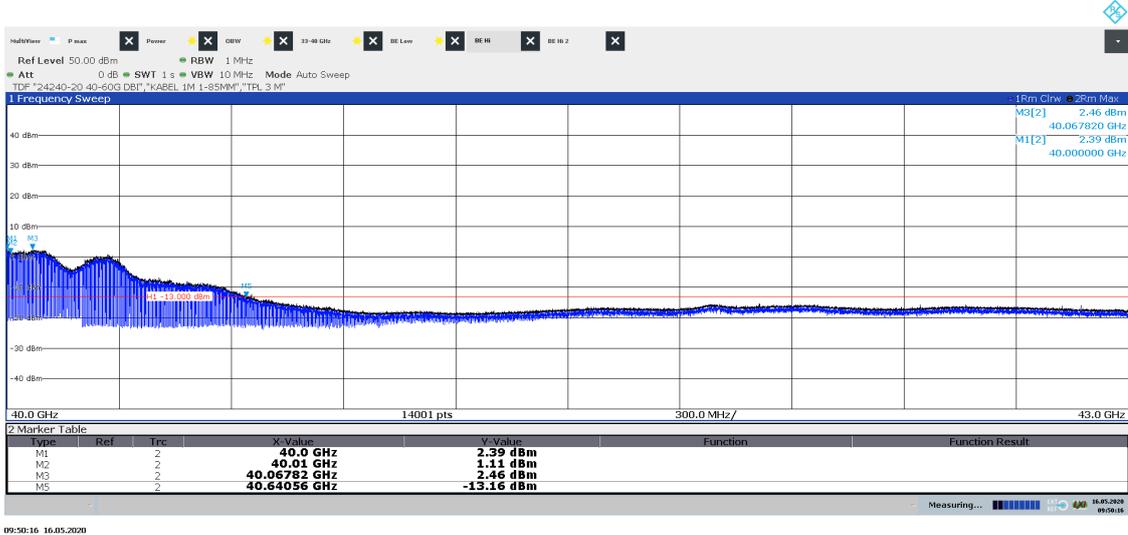


Diagram 2.13c: 40 – 43 GHz, QPSK, TH3, EIRP Horizontal polarization
See diagram 2.13e for TRP result

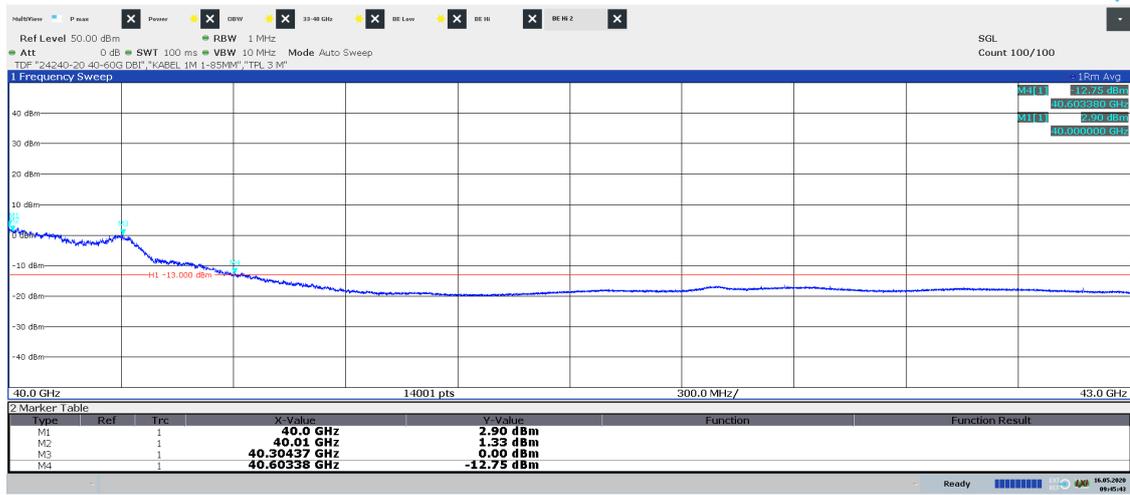
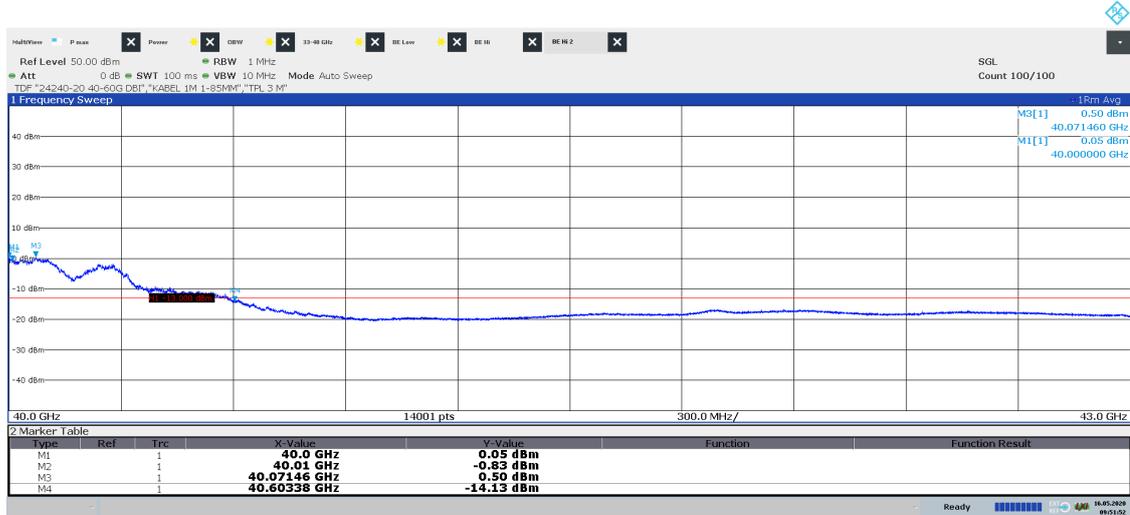


Diagram 2.13d: 40 – 43 GHz, QPSK, TH3, EIRP Vertical polarization
See diagram 2.13e for TRP result



| 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 |
|---|--|-----------------------------------|---|---|
| 2.90/ 0.05 | 1.33/ -0.83 | 29.26/ 29.28 | -24.07/ Pass | -26.63/ Pass |

Diagram 2.13e: Pattern multiplication TRP 40 – 40.3 GHz, Symbolic name: TH3

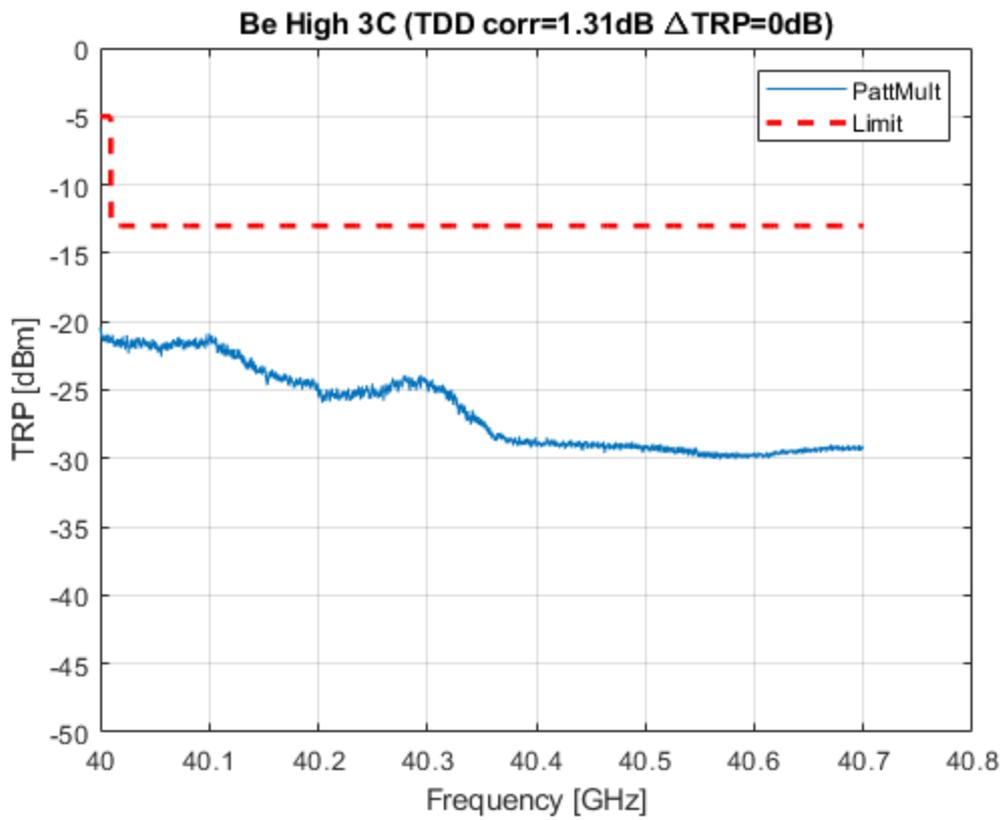
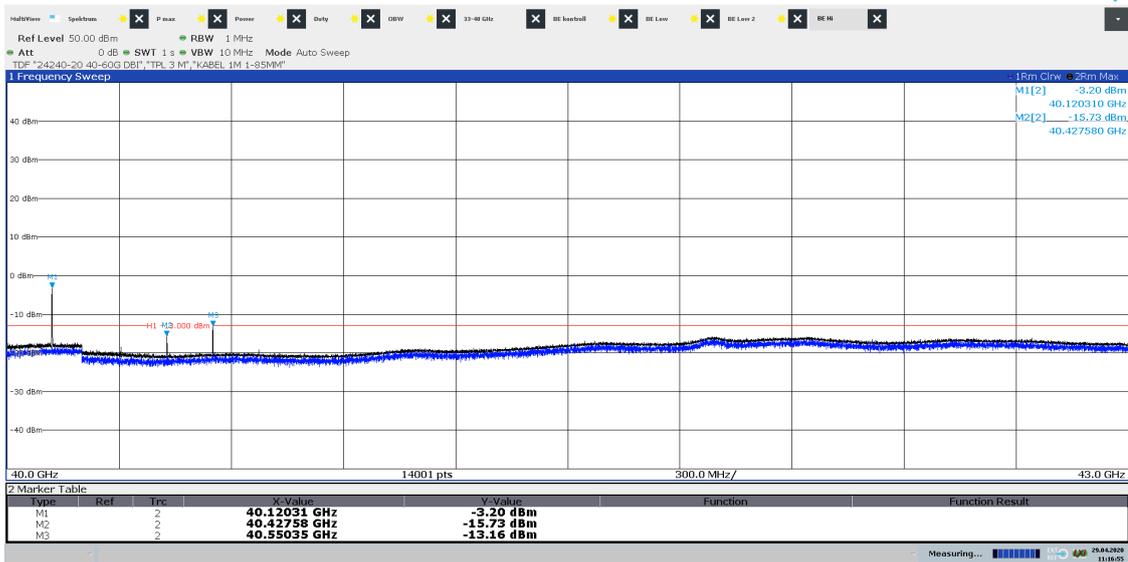
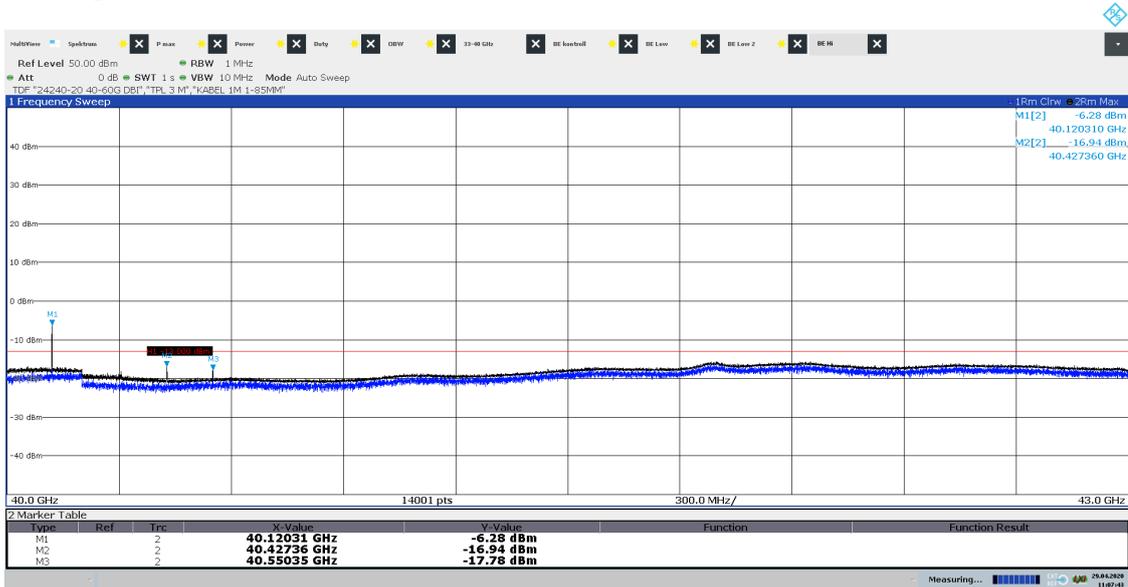


Diagram 2.14a: 40 – 43 GHz, QPSK, BL1, EIRP Horizontal polarization
See diagram 2.14c for TRP result



11:16:56 29.04.2020

Diagram 2.14b: 40 – 43 GHz, QPSK, BL1, EIRP Vertical polarization
See diagram 2.14c for TRP result



11:07:43 29.04.2020

Diagram 2.14c: Two cut TRP 40.1 – 40.6 GHz, Symbolic name: BL1

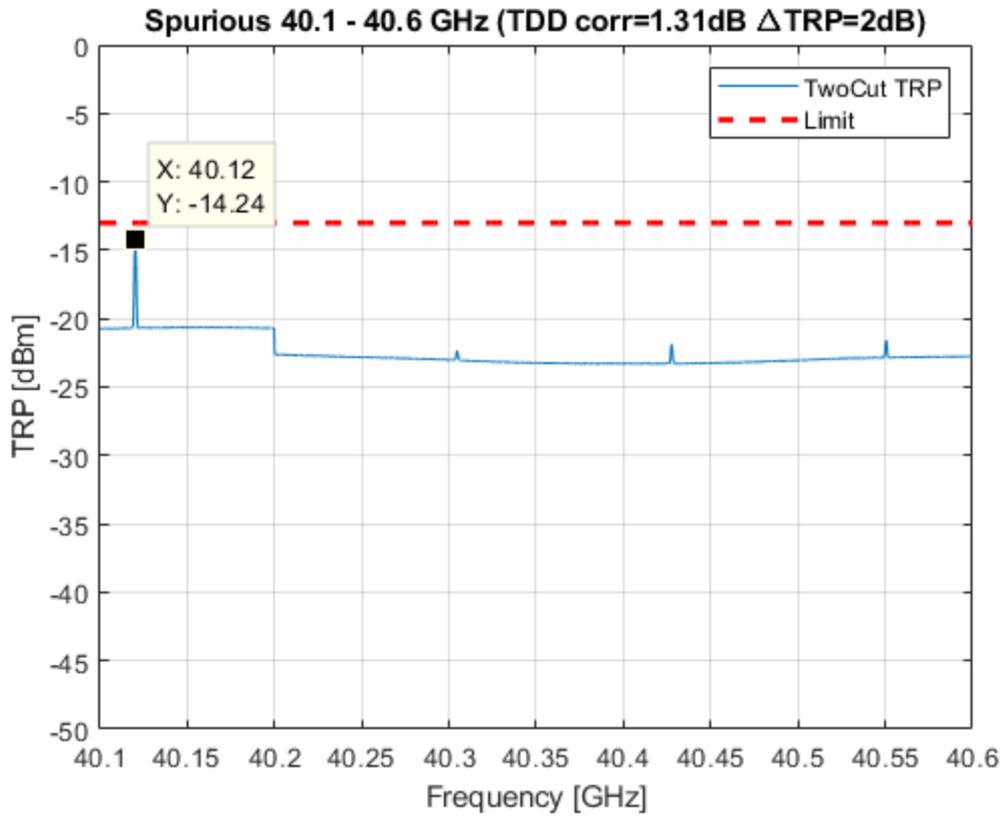
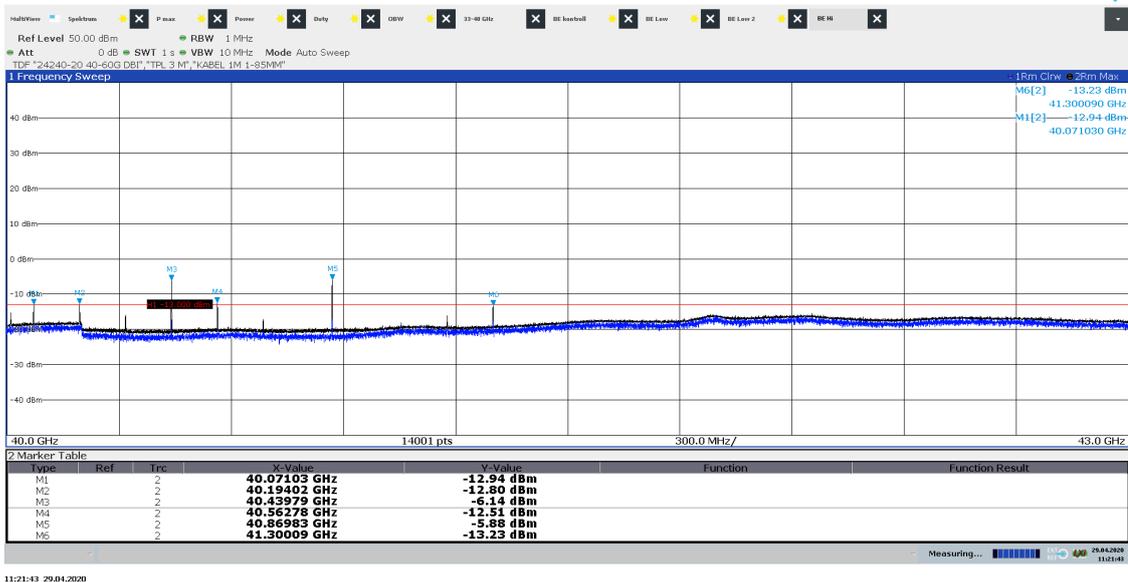
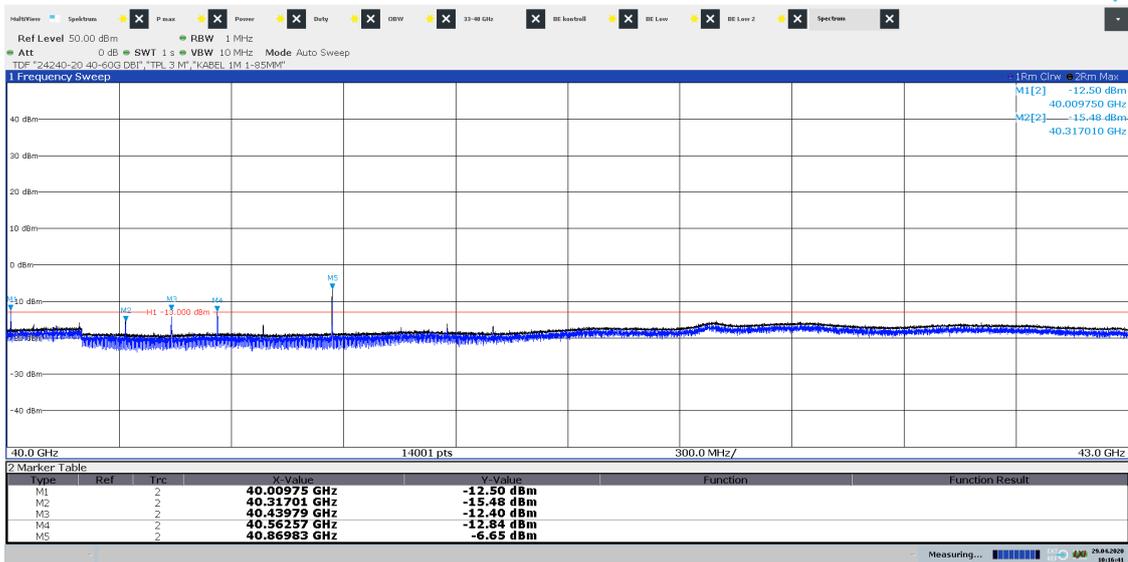


Diagram 2.15a: 40 – 43 GHz, QPSK, ML1, EIRP Horizontal polarization
See diagram 2.15c for TRP result



11:21:43 29.04.2020

Diagram 2.15b: 40 – 43 GHz, QPSK, ML1, EIRP Vertical polarization
See diagram 2.15c for TRP result



10:16:42 29.04.2020

Diagram 2.15c: Two cut TRP 40.1 – 40.6 GHz, Symbolic name: ML1

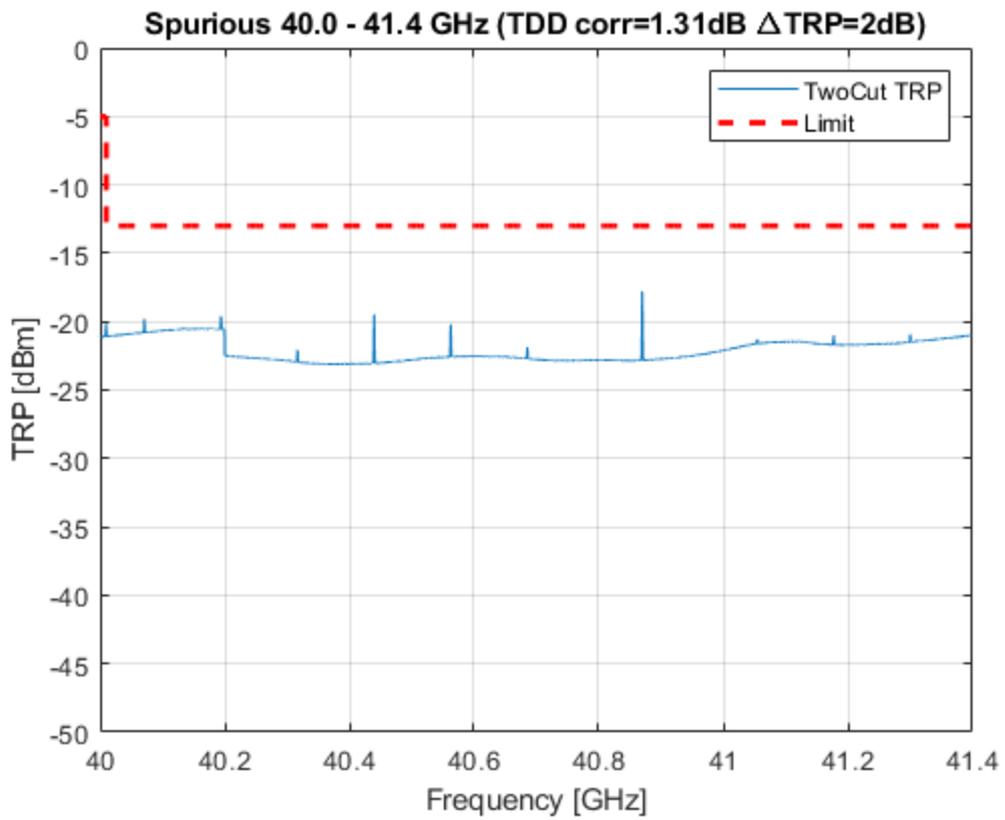


Diagram 2.16a: 43 – 60 GHz, QPSK, BL1, EIRP Horizontal polarization
See diagram 2.16c for TRP result

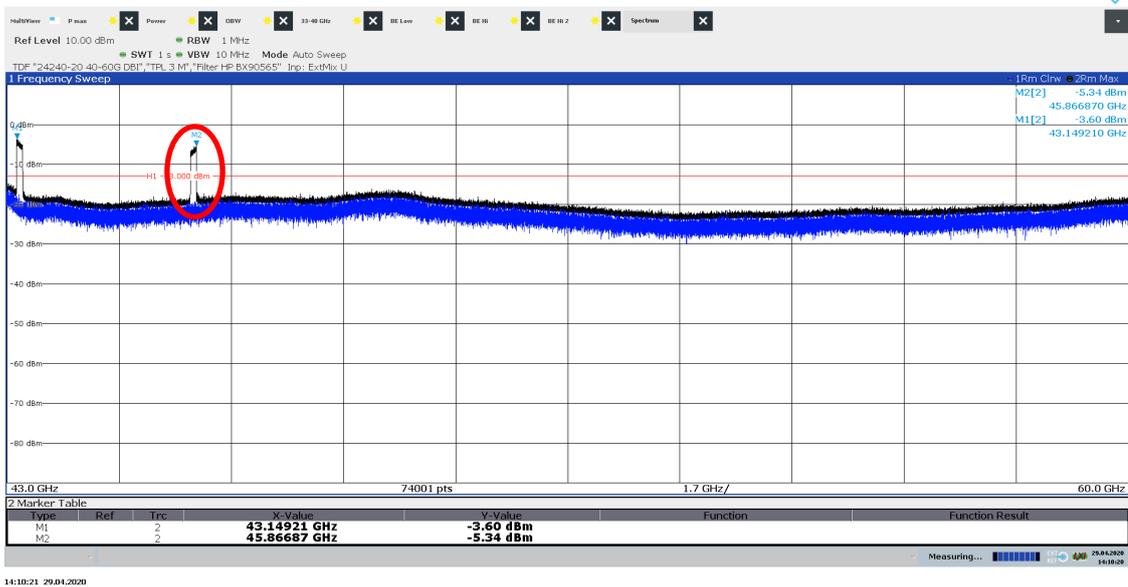
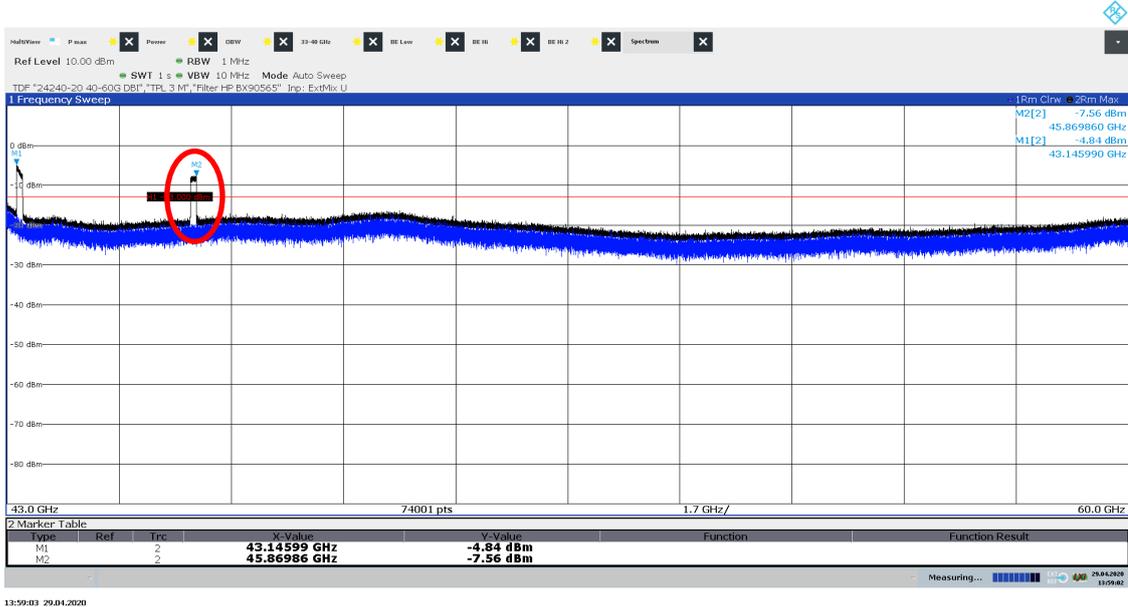


Diagram 2.16b: 43 – 60 GHz, QPSK, BL1, EIRP Vertical polarization
See diagram 2.16c for TRP result



“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 indices | | | |
|------------|----------------|----------|----------|--------------------|
| | F EUT [GHz] | n [-] | m [-] | "False F" [GHz] |
| A | 37.05 | 4 | 1 | 45.85 |

Diagram 2.16c: Spherical grid Method TRP 43.1 – 43.25 GHz, Symbolic name: BL1

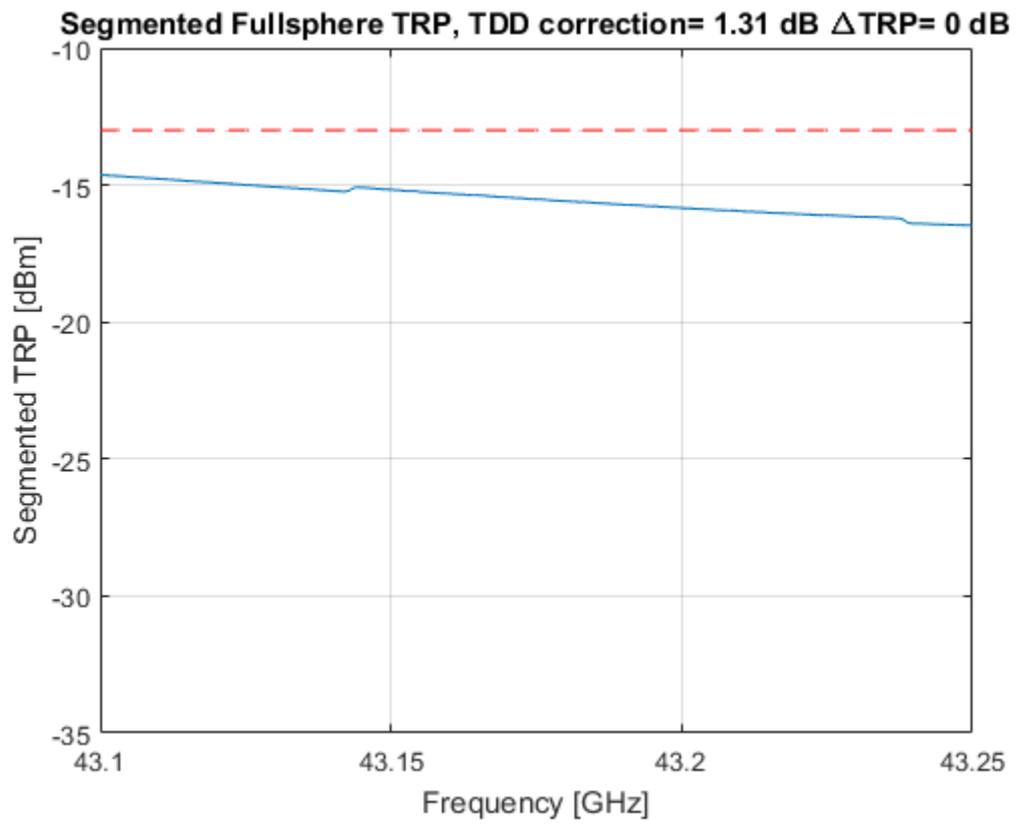


Diagram 2.17a: 60 – 75 GHz, QPSK, TH1, EIRP Horizontal polarization

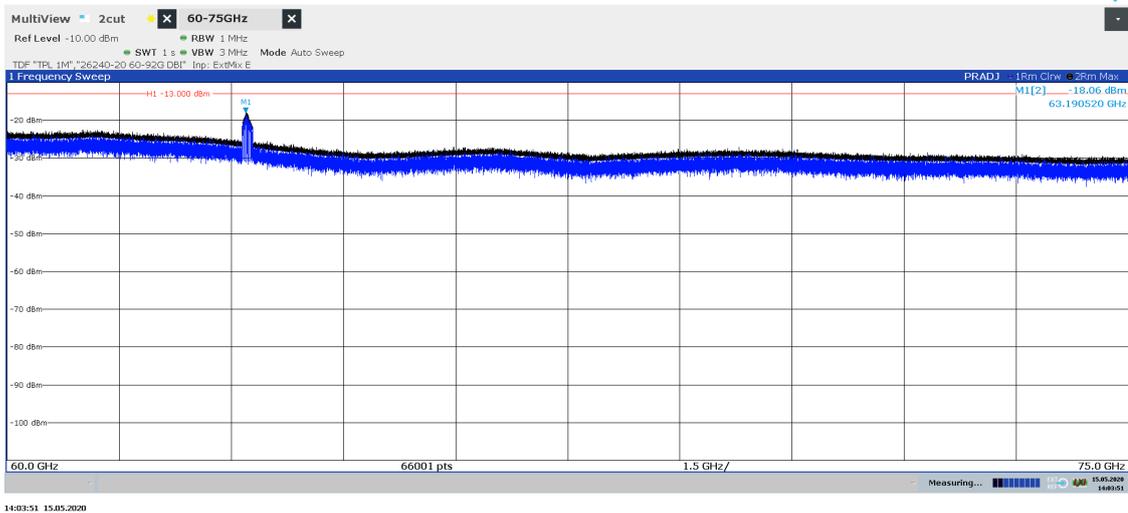


Diagram 2.17b: 60 – 75 GHz, QPSK, TH1, EIRP Vertical polarization

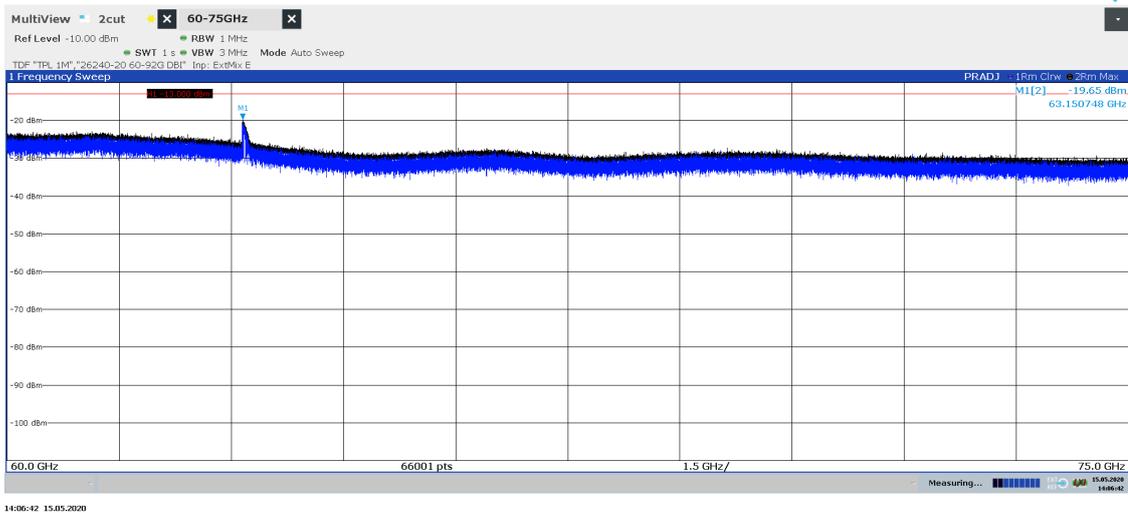


Diagram 2.18a: 75 – 90 GHz, QPSK, TH1, EIRP Horizontal polarization

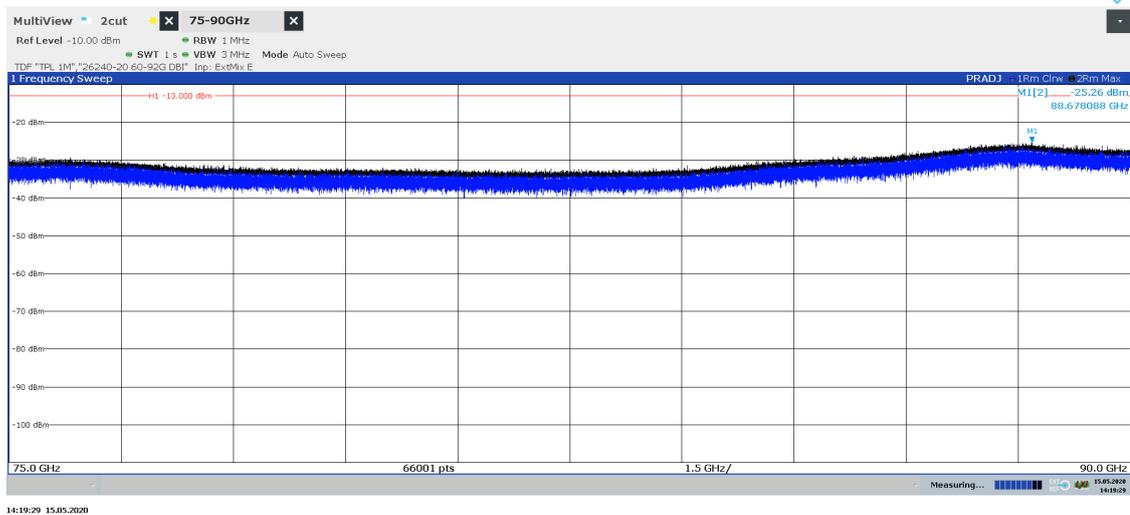


Diagram 2.18b: 75 – 90 GHz, QPSK, TH1, EIRP Vertical polarization

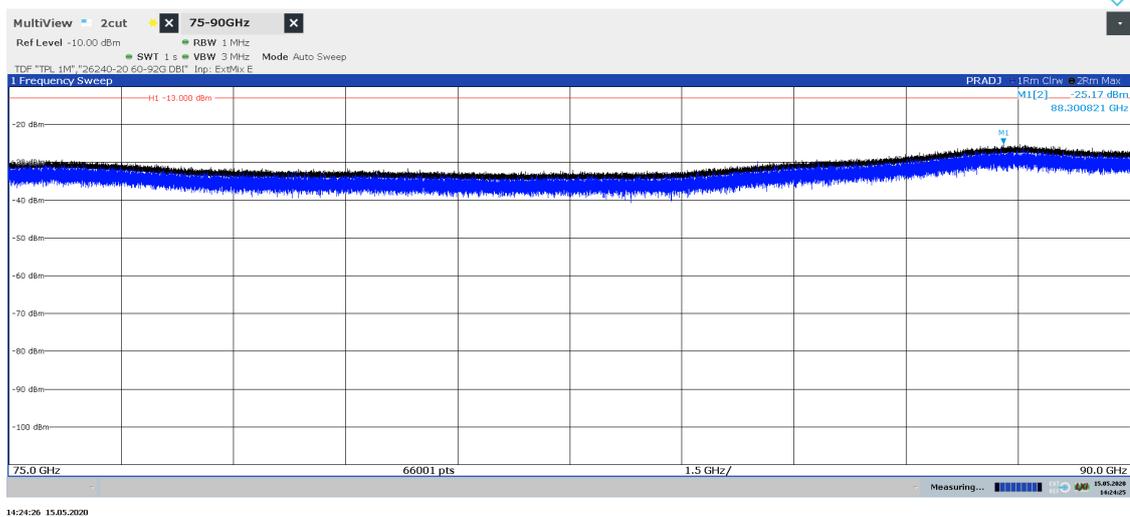


Diagram 2.19a: 90 – 110 GHz, QPSK, TH1, EIRP Horizontal polarization

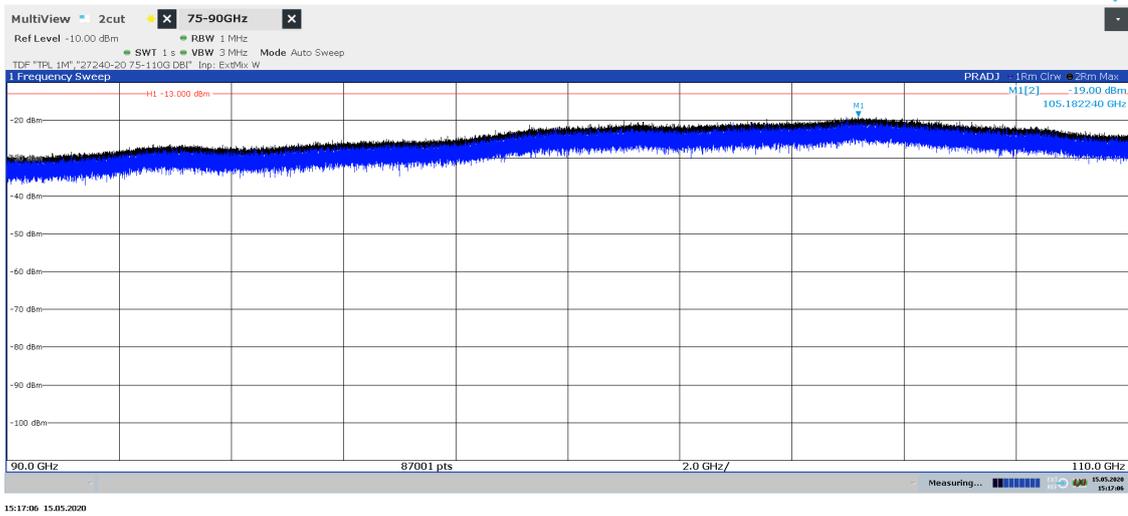


Diagram 2.19b: 43 – 110 GHz, QPSK, TH1, EIRP Vertical polarization

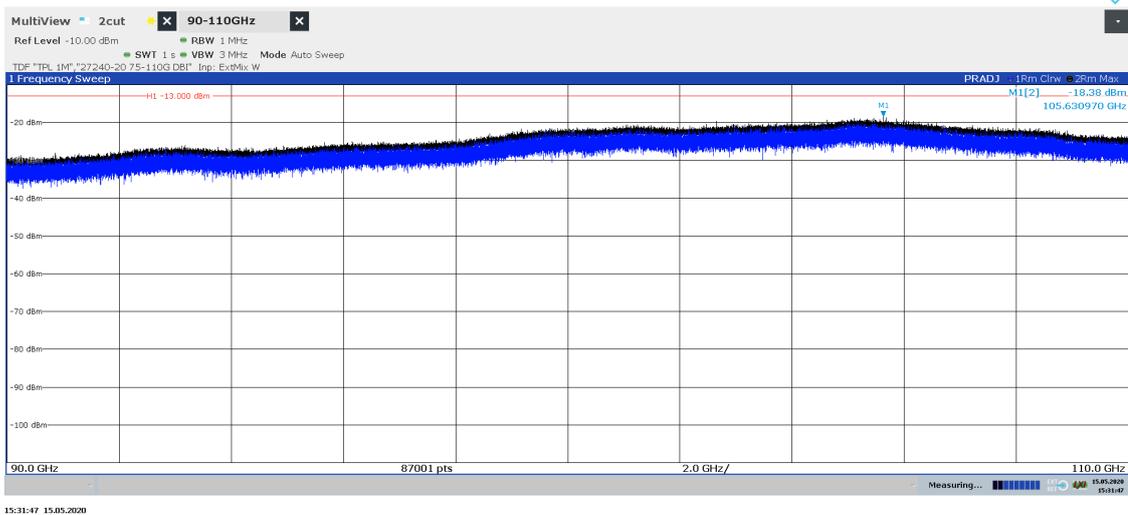


Diagram 2.20a: 110 – 130 GHz, QPSK, TH1, EIRP Horizontal polarization

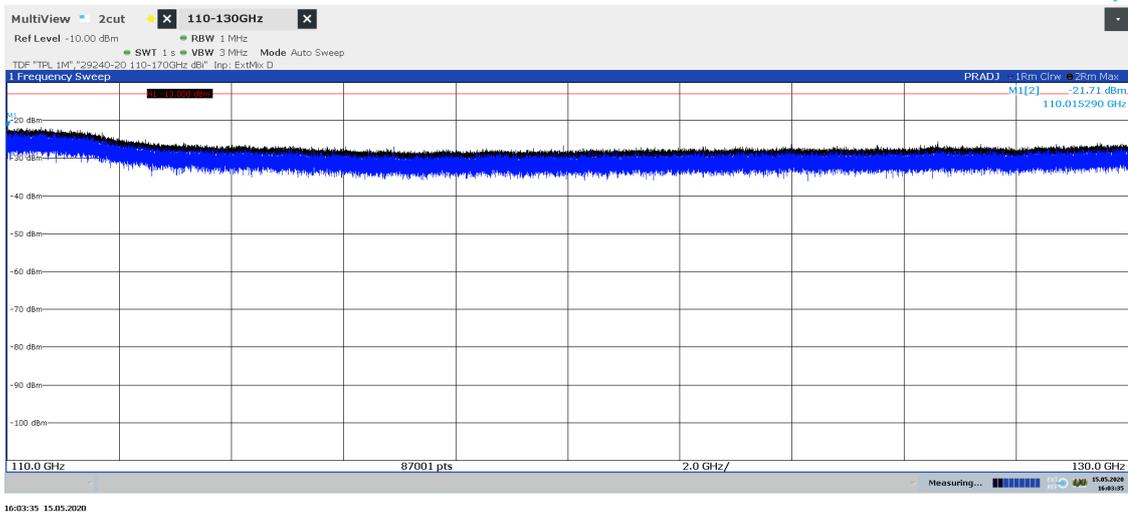


Diagram 2.20b: 110 – 130 GHz, QPSK, TH1, EIRP Vertical polarization

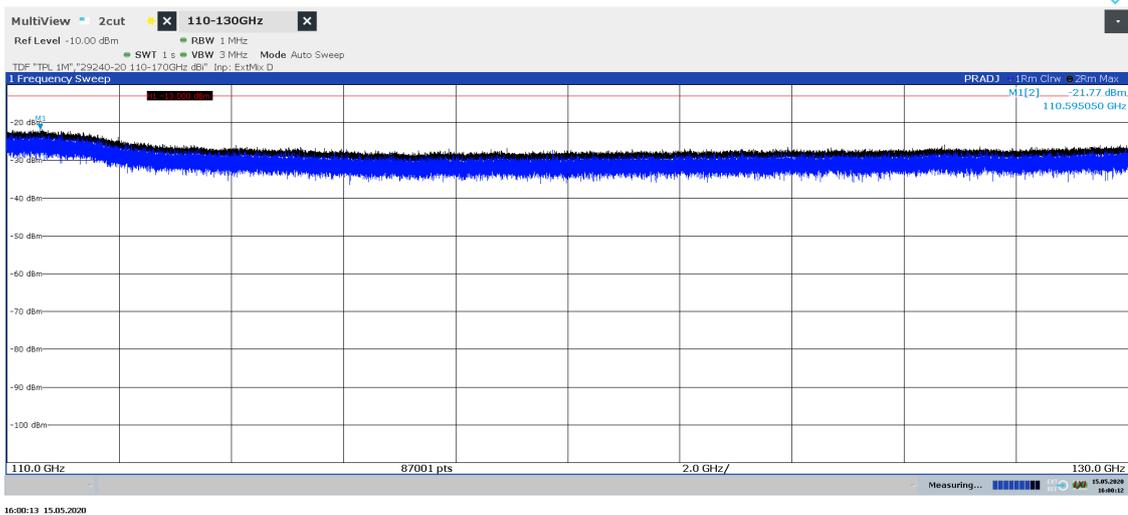


Diagram 2.21a: 130 – 150 GHz, QPSK, TH1, EIRP Horizontal polarization

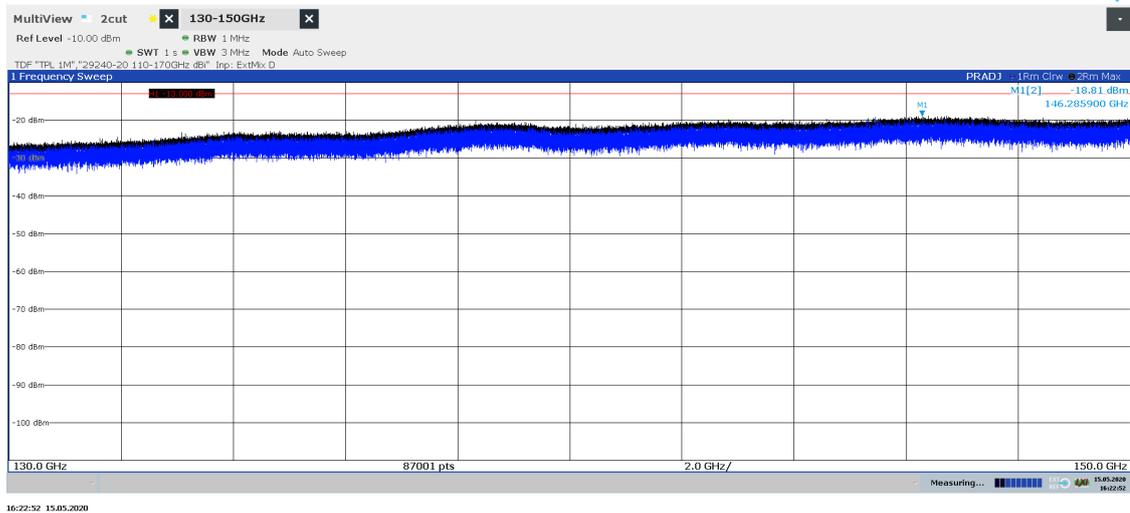


Diagram 2.21b: 130 – 150 GHz, QPSK, TH1, EIRP Vertical polarization

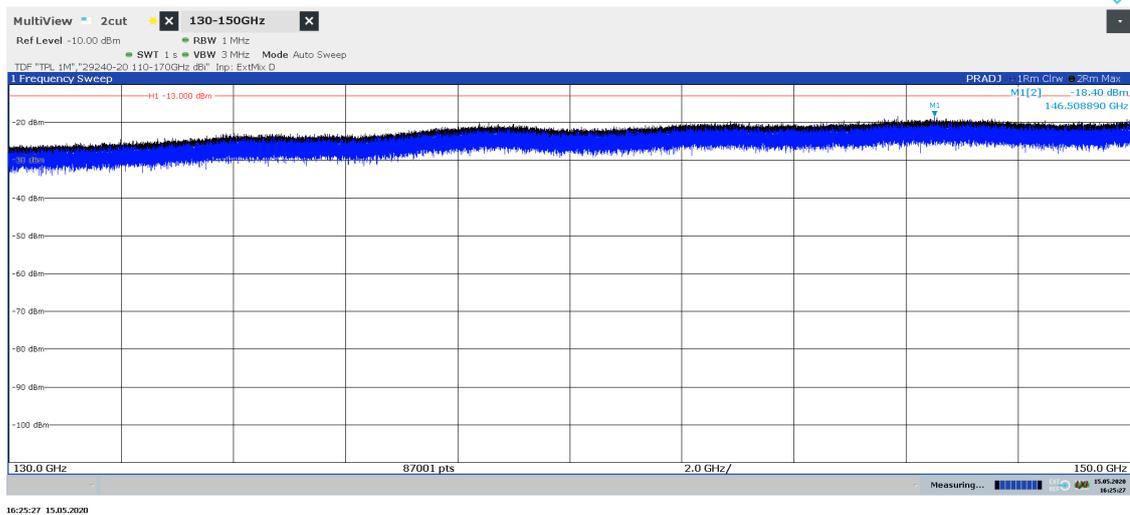


Diagram 2.22a: 150 – 170 GHz, QPSK, TH1, EIRP Horizontal polarization

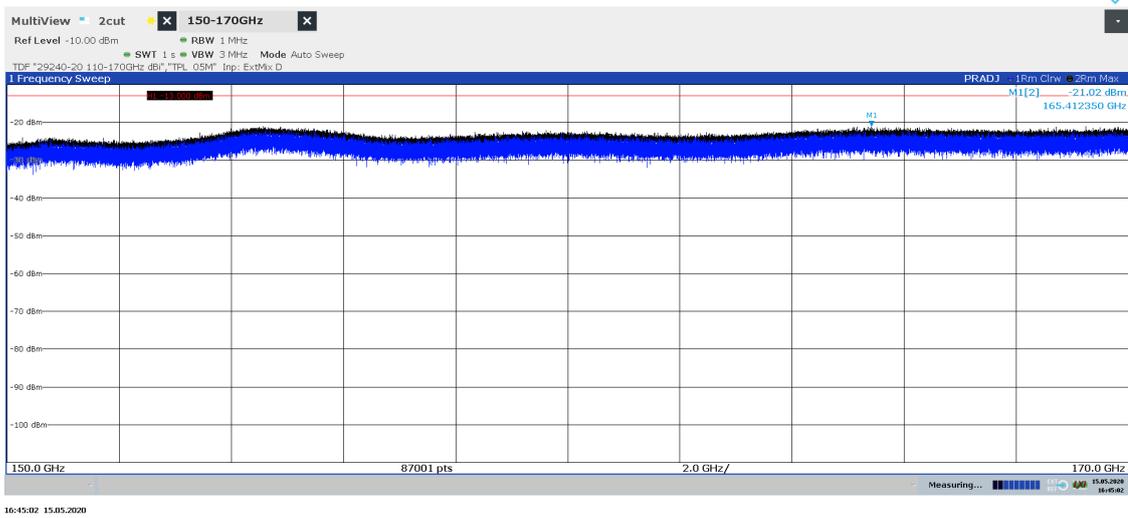


Diagram 2.22b: 150 – 170 GHz, QPSK, TH1, EIRP Vertical polarization

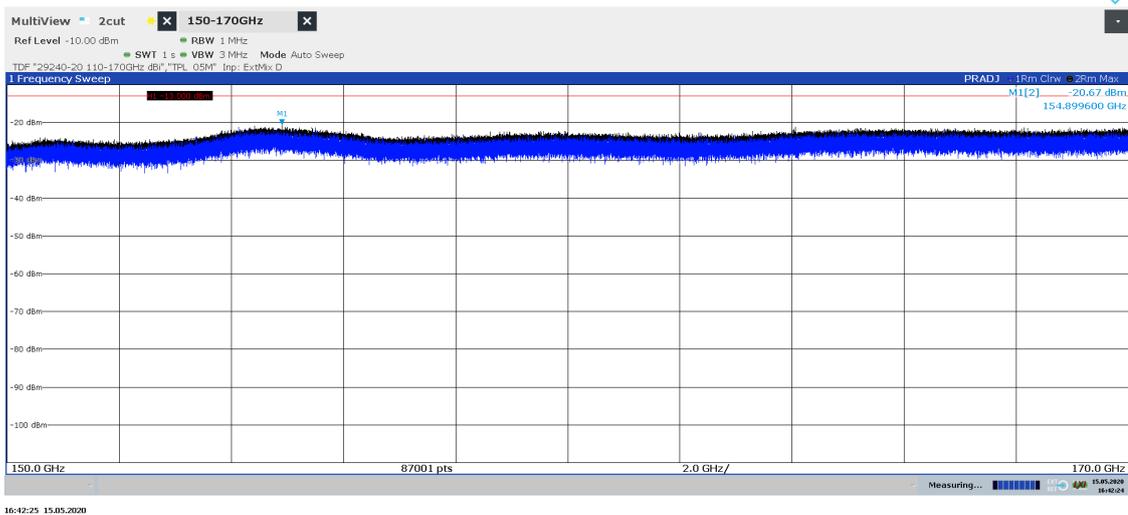


Diagram 2.23a: 170 – 185 GHz, QPSK, TH1, EIRP Horizontal polarization

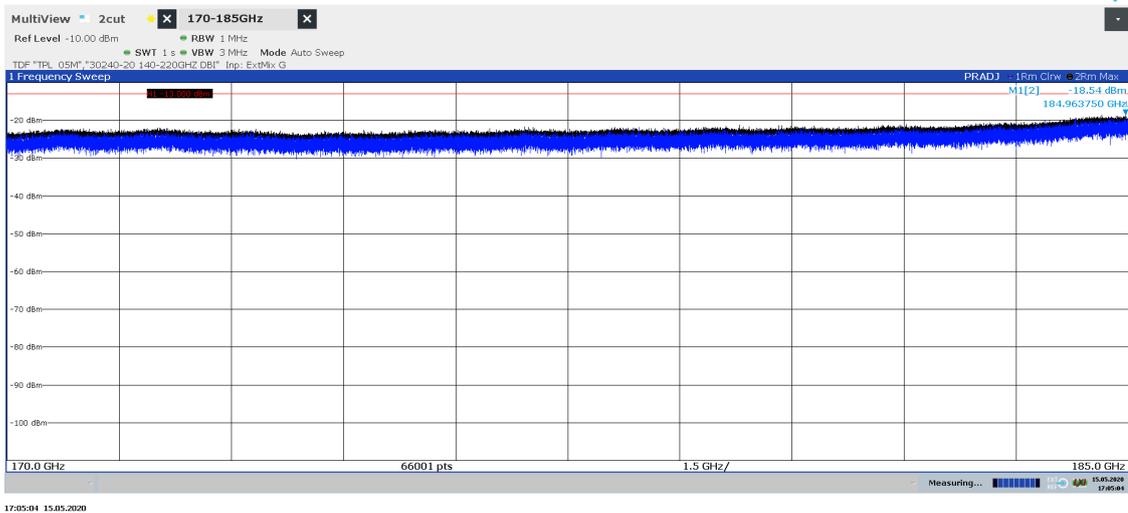


Diagram 2.23b: 170 – 185 GHz, QPSK, TH1, EIRP Vertical polarization

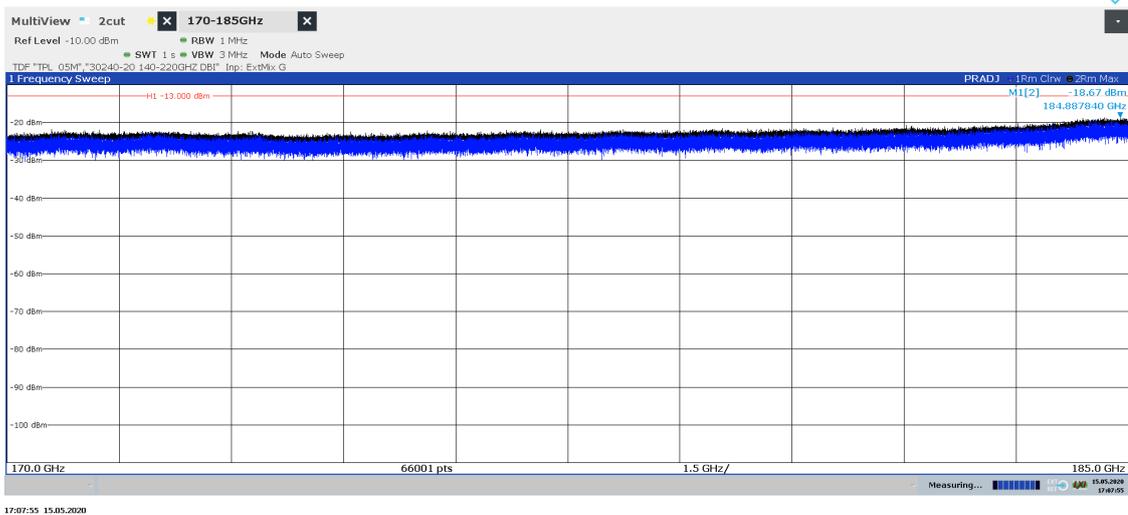


Diagram 2.24a: 185 – 200 GHz, QPSK, TH1, EIRP Horizontal polarization

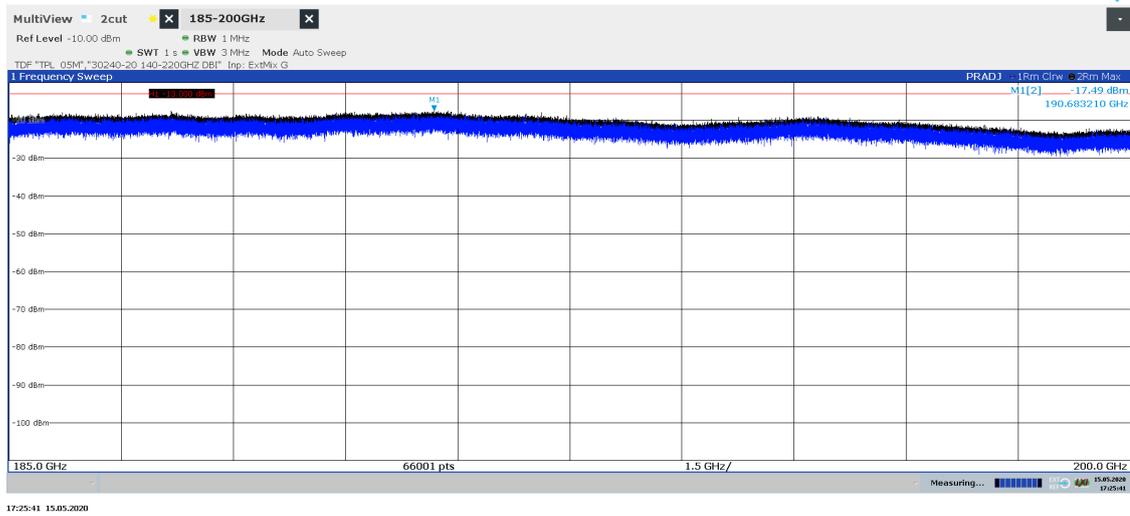
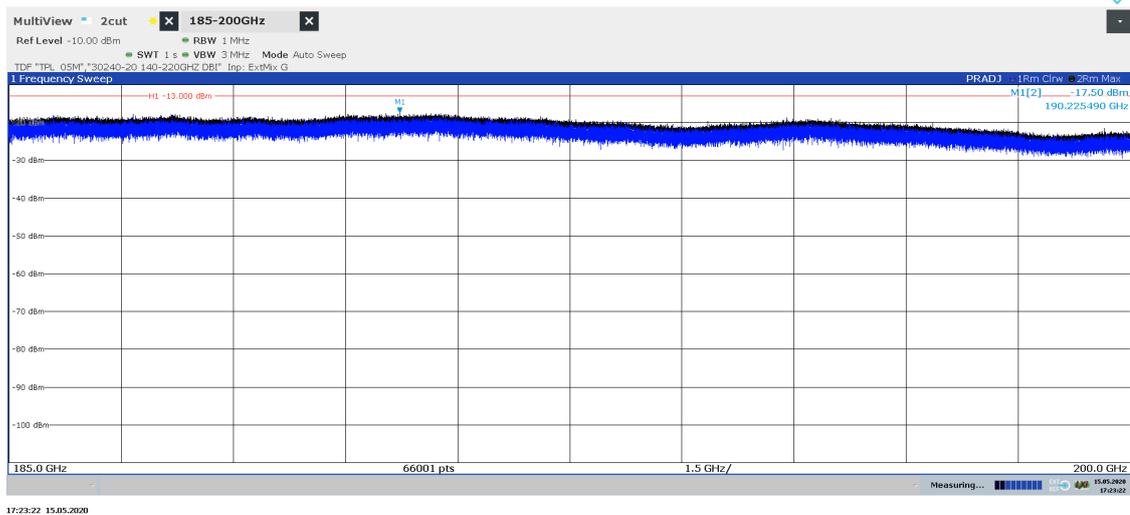


Diagram 2.24b: 185 – 200 GHz, QPSK, TH1, EIRP Vertical polarization



End of report.