Diagram 2.33a, E-TM1.1, B_5, Port D:

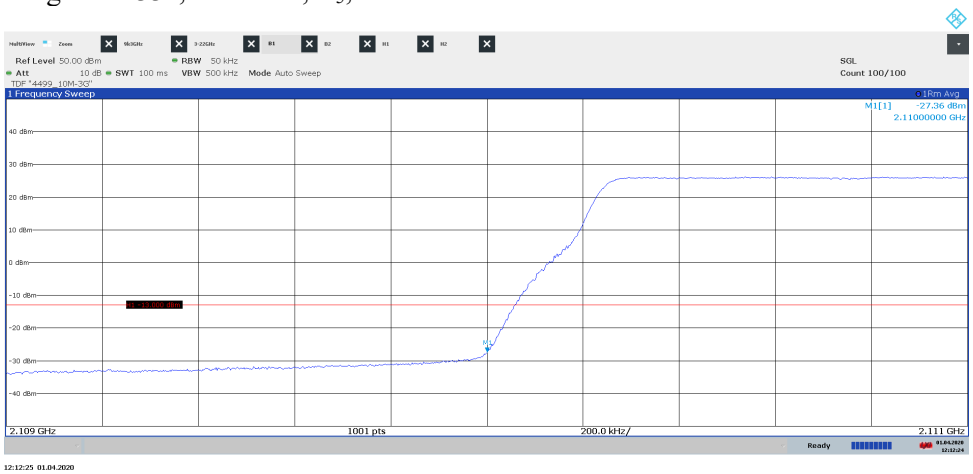


Diagram 2.33b, E-TM1.1, B_5, Port D:

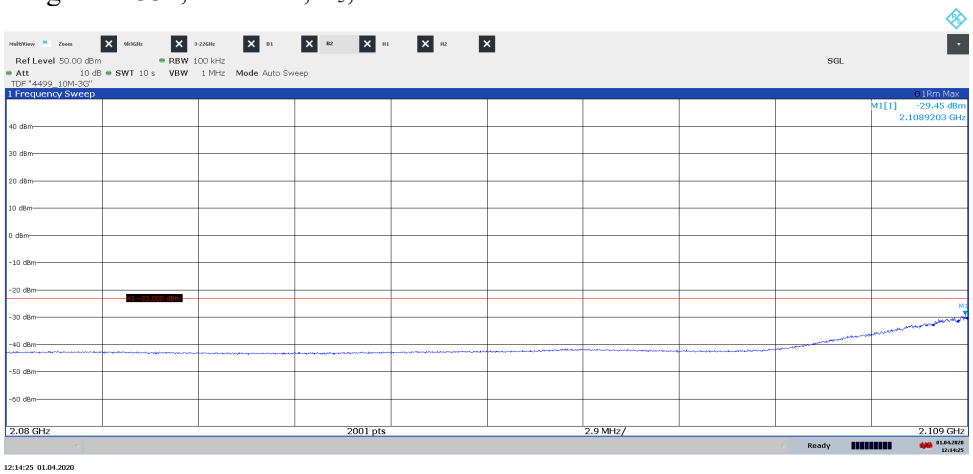


Diagram 2.34a, E-TM1.1, B_{10}, Port B:

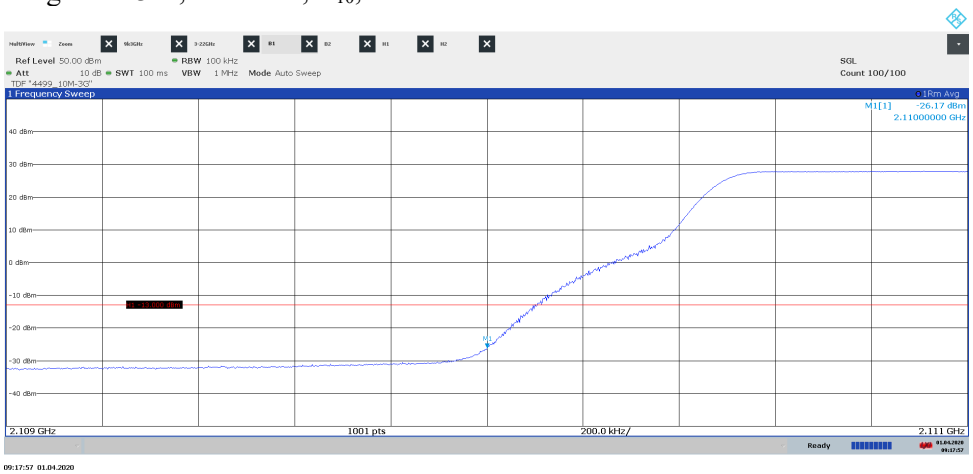


Diagram 2.34b, E-TM1.1, B_{10}, Port B:

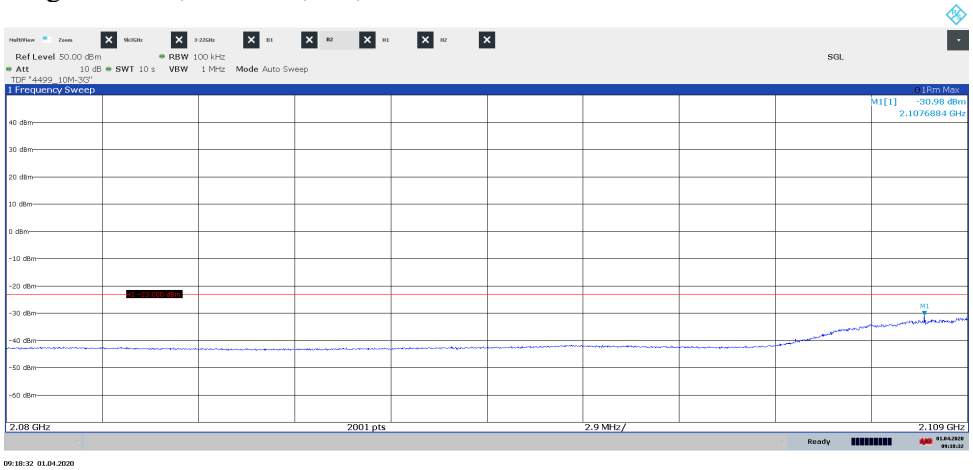


Diagram 2.35a, E-TM1.1, B_{15}, Port B:

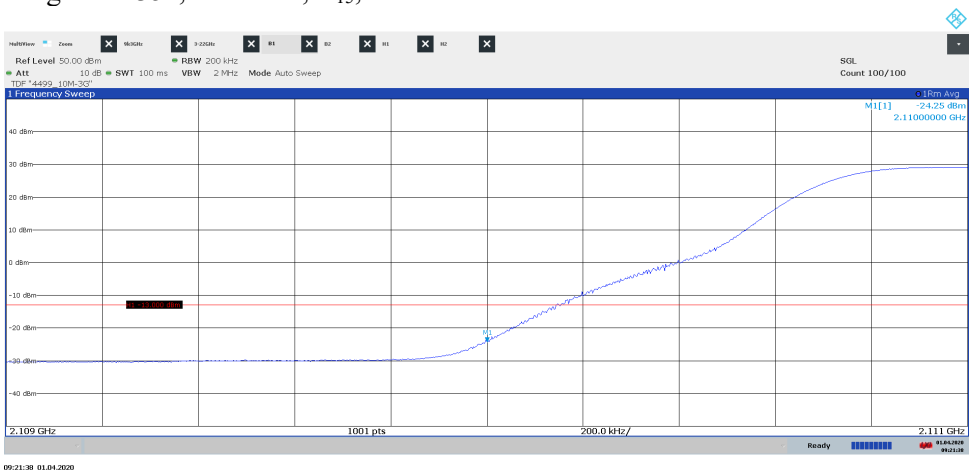


Diagram 2.35b, E-TM1.1, B_{15}, Port B:

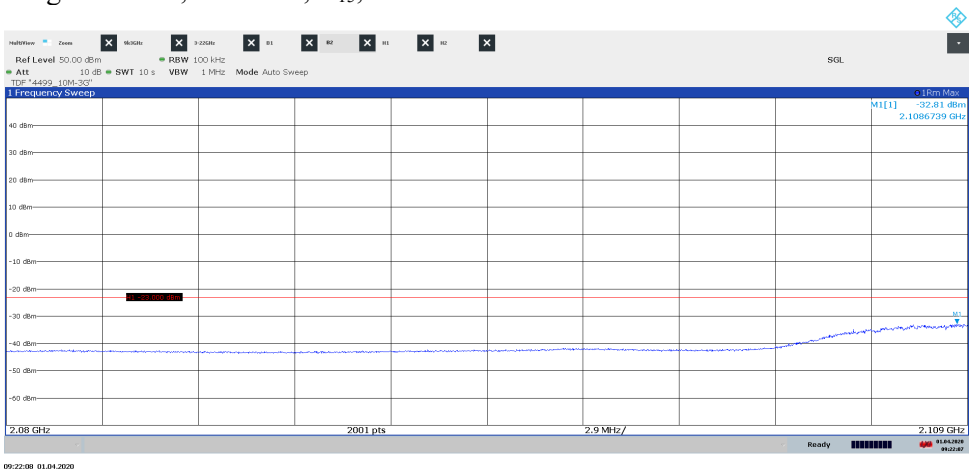


Diagram 2.36a, E-TM1.1, B_{20}, Port B:

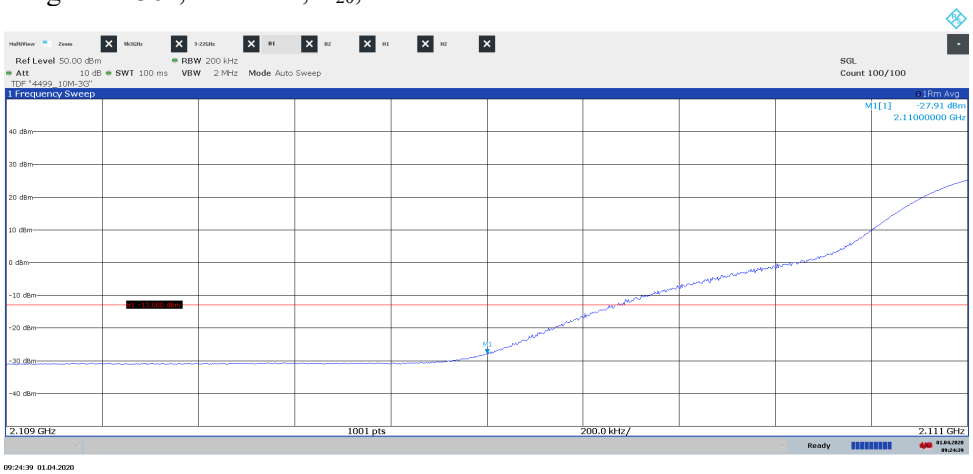


Diagram 2.36b, E-TM1.1, B_{20}, Port B:

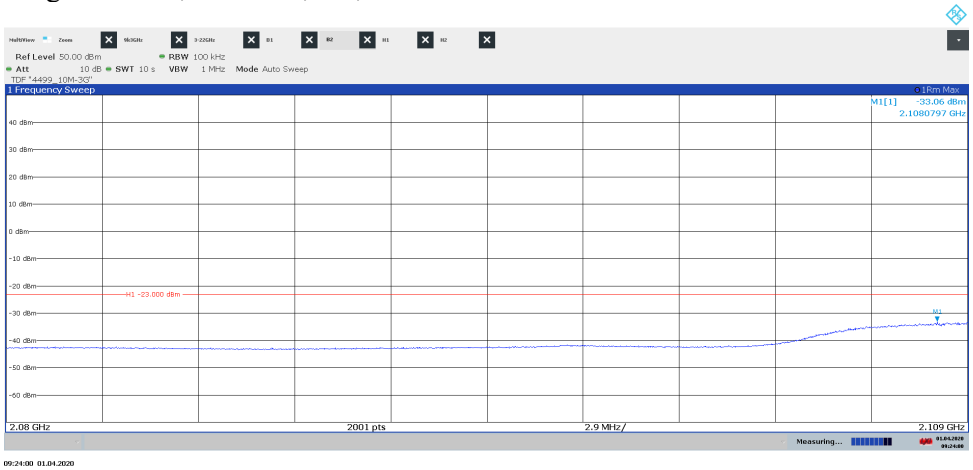


Diagram 2.37a, E-TM1.1, T_5, Port A:

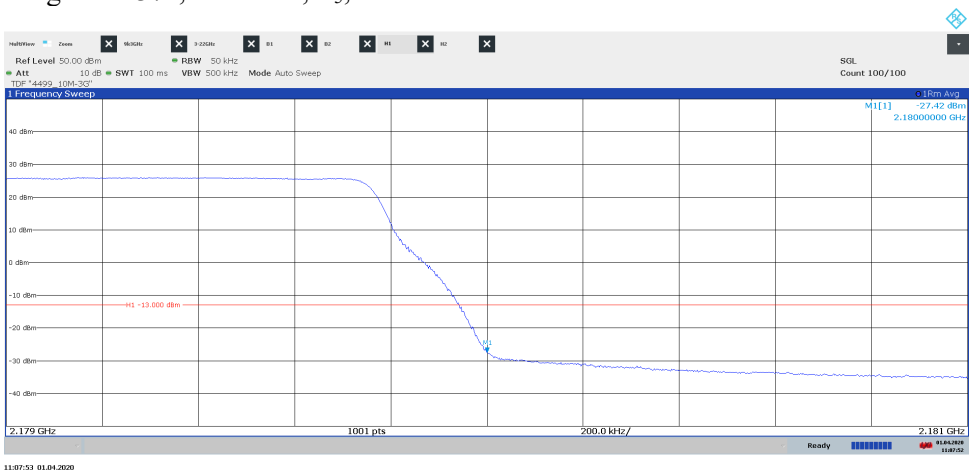


Diagram 2.37b, E-TM1.1, T_5, Port A:

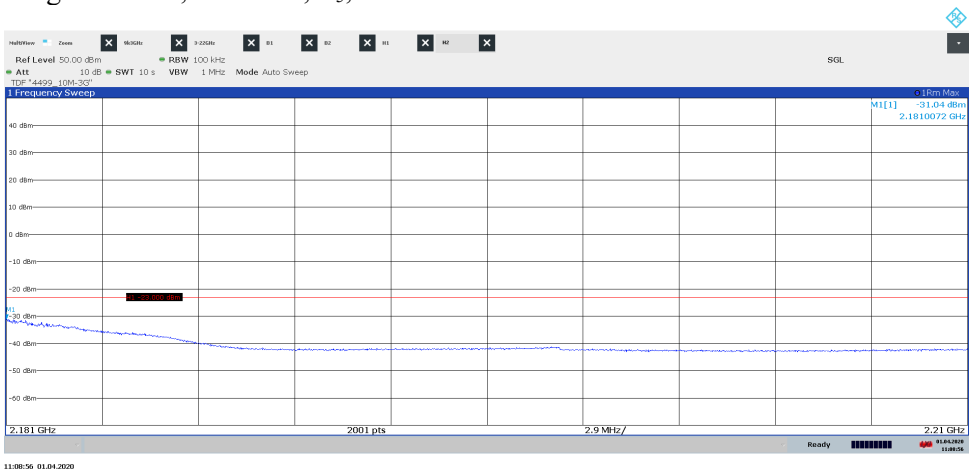


Diagram 2.38a, E-TM1.1, T_5, Port B:

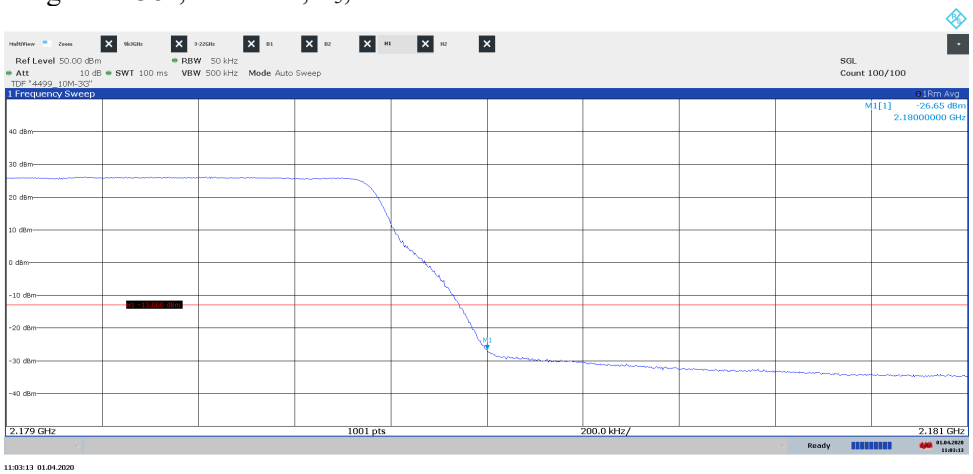


Diagram 2.38b, E-TM1.1, T_5, Port B:

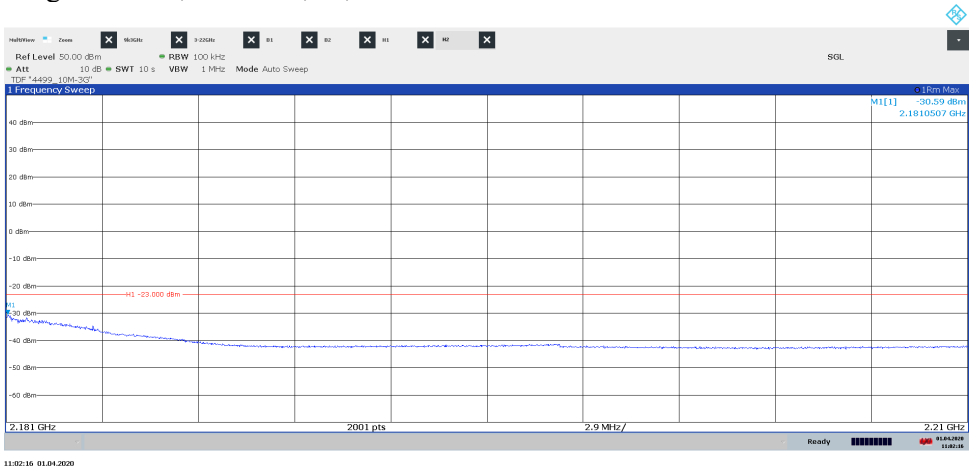


Diagram 2.39a, E-TM1.1, T_5, Port C:

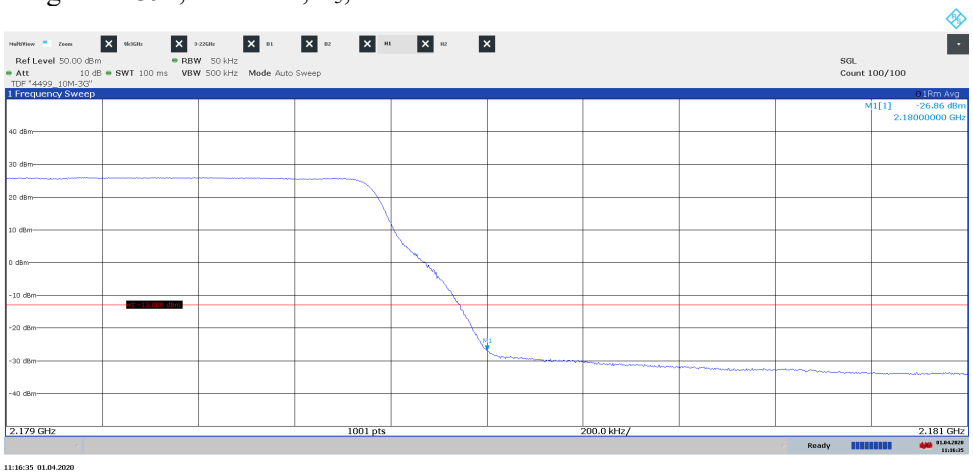


Diagram 2.39b, E-TM1.1, T_5, Port C:

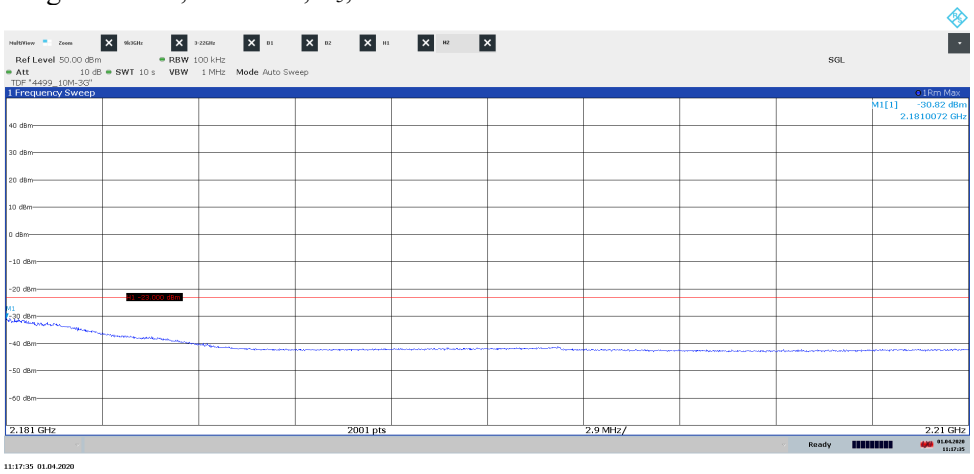


Diagram 2.40a, E-TM1.1, T_5, Port D:

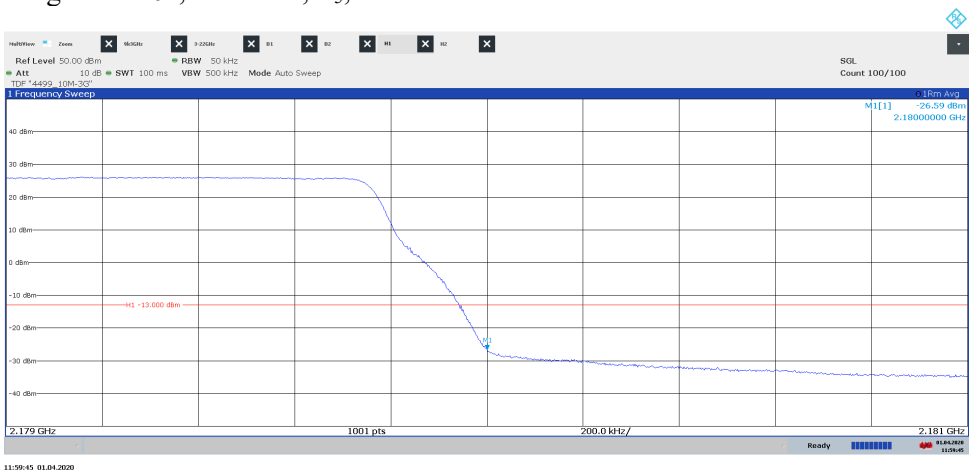


Diagram 2.40b, E-TM1.1, T_5, Port D:

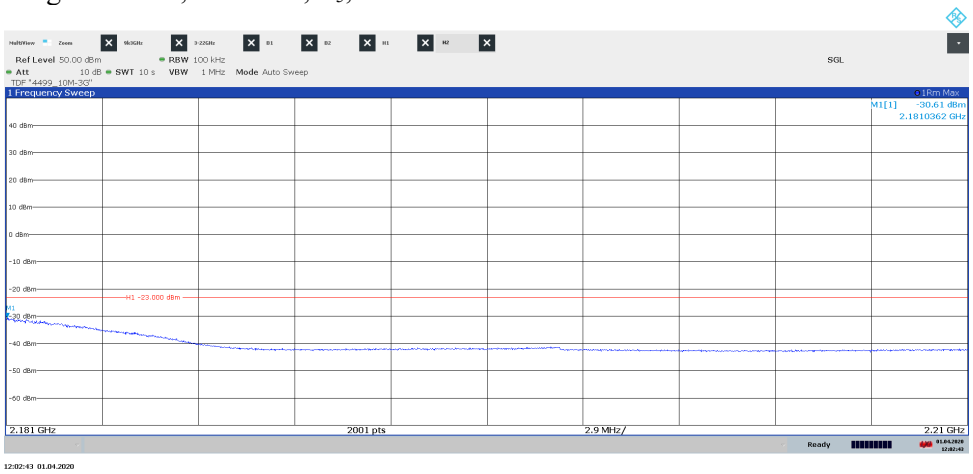


Diagram 2.41a, E-TM1.1, T_{10}, Port B:

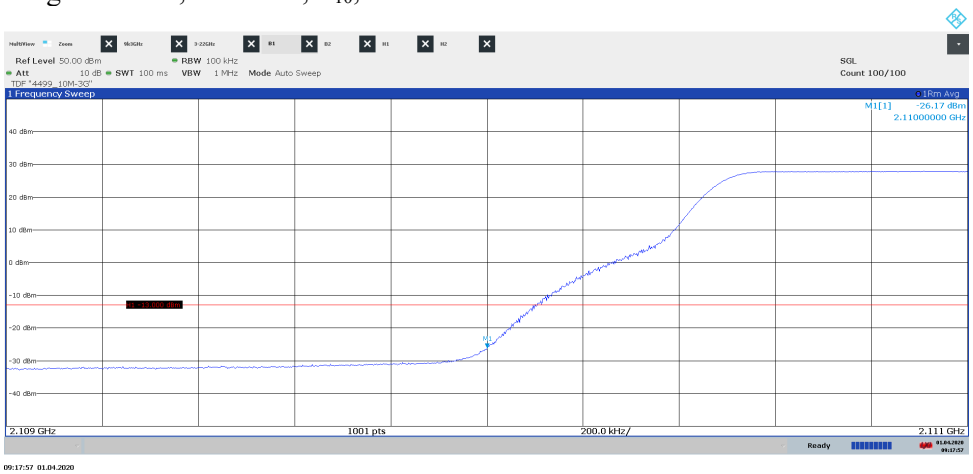


Diagram 2.41b, E-TM1.1, T_{10}, Port B:

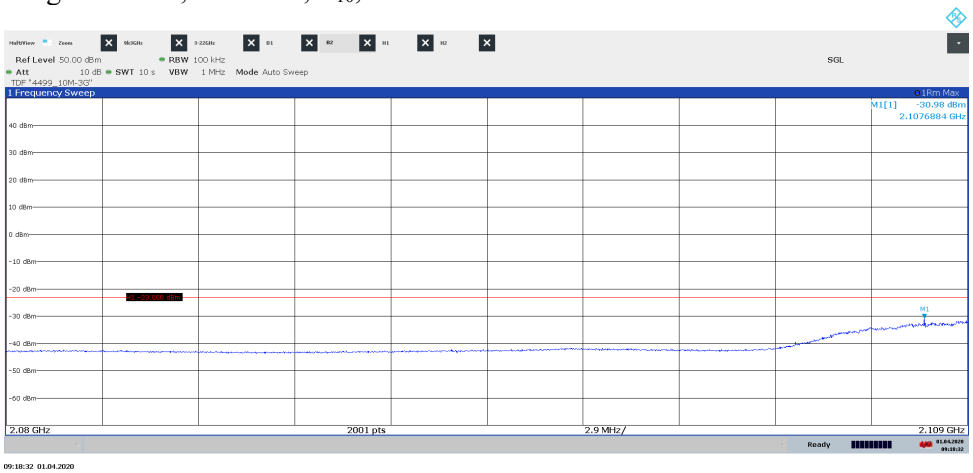


Diagram 2.42a, E-TM1.1, T_{15}, Port B:

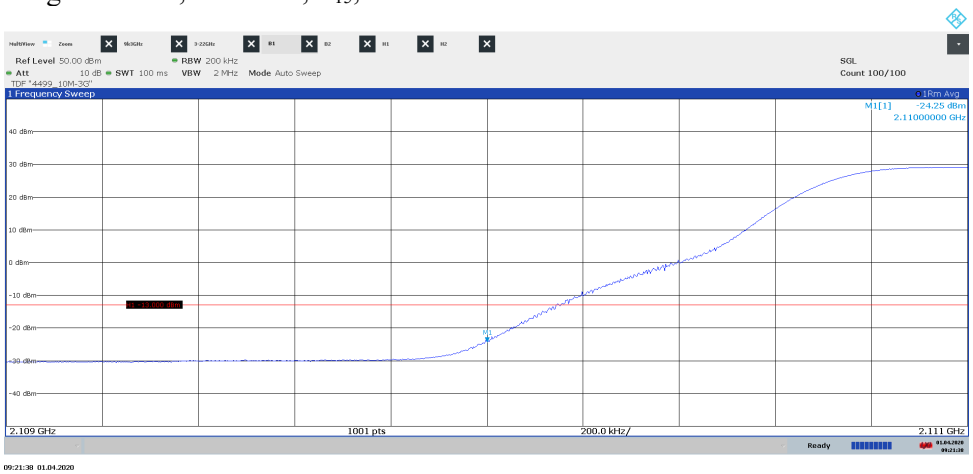


Diagram 2.42b, E-TM1.1, T_{15}, Port B:

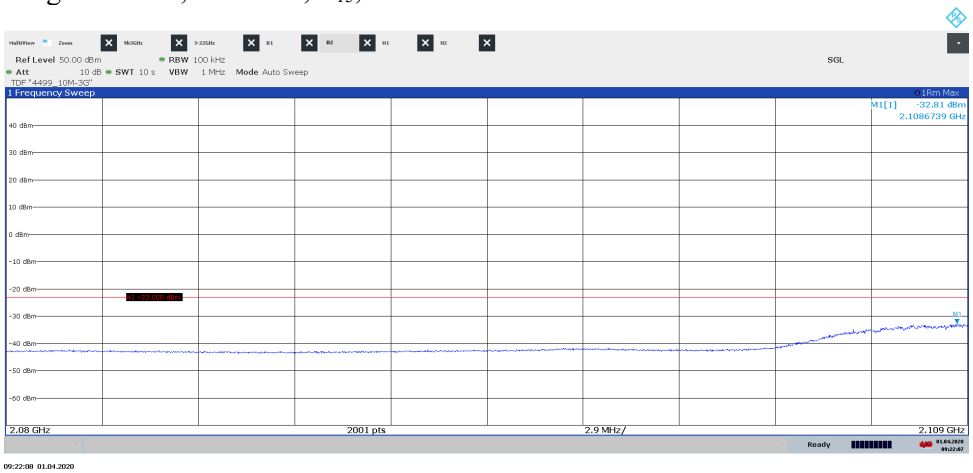


Diagram 2.43a, E-TM1.1, T_{20}, Port B:

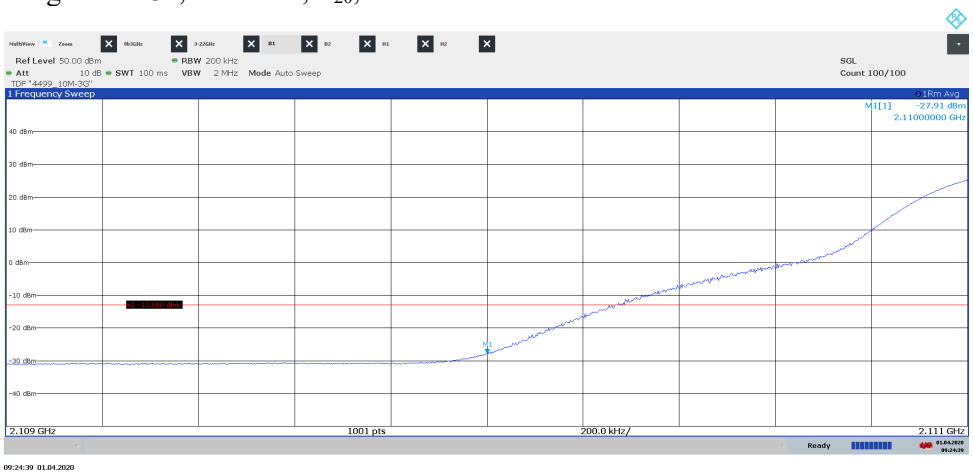


Diagram 2.43b, E-TM1.1, T_{20}, Port B:

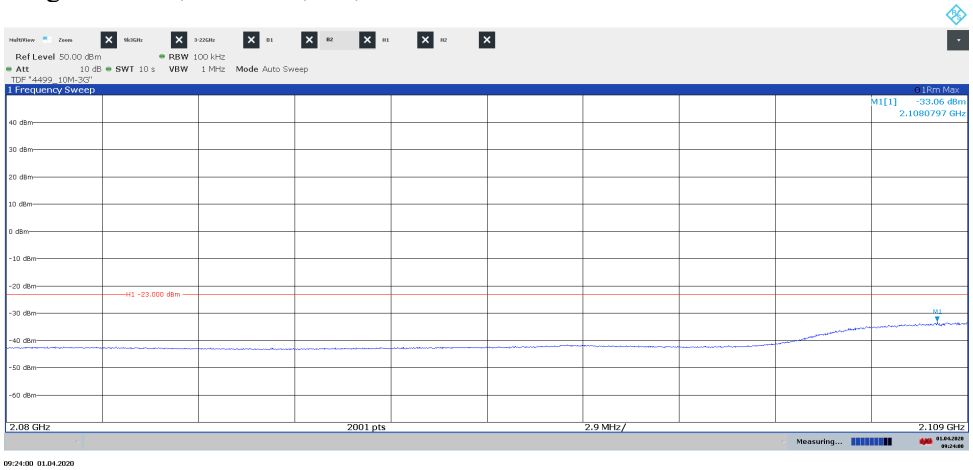


Diagram 2.44a, E-TM1.1, Bim_5, Port B:

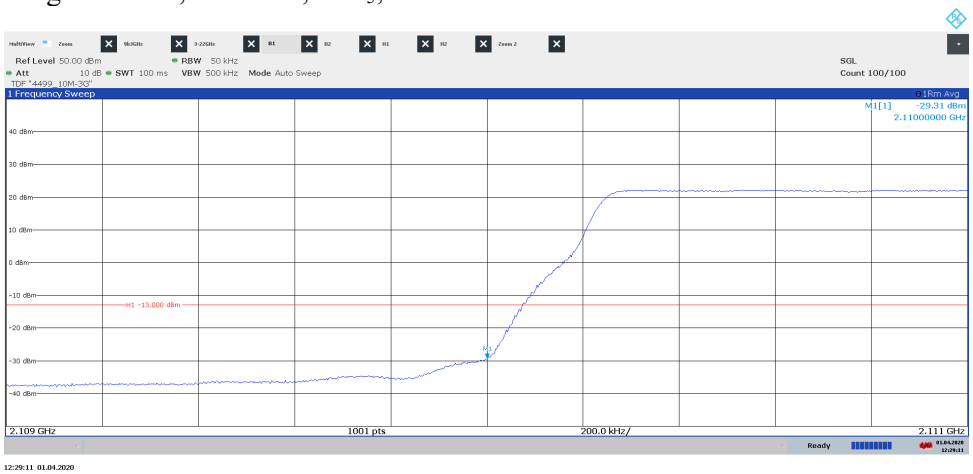


Diagram 2.44b, E-TM1.1, Bim_5, Port B:

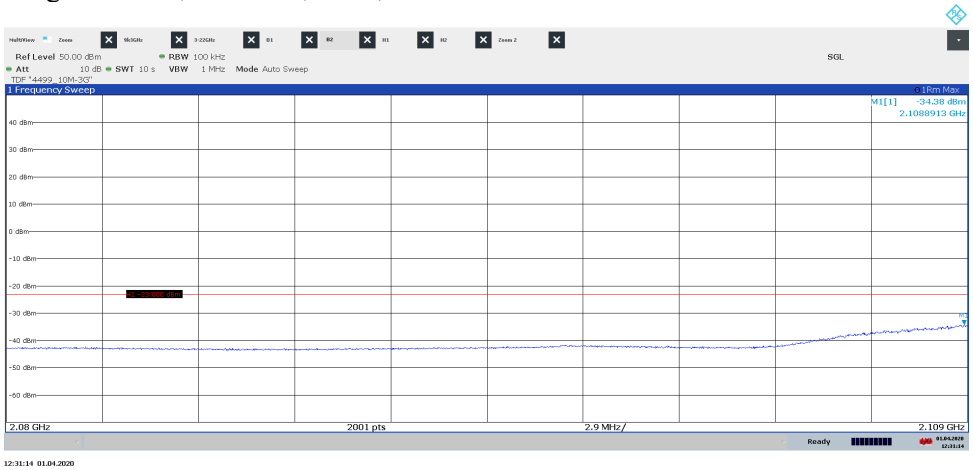


Diagram 2.45a, E-TM1.1, Tim_5, Port B:

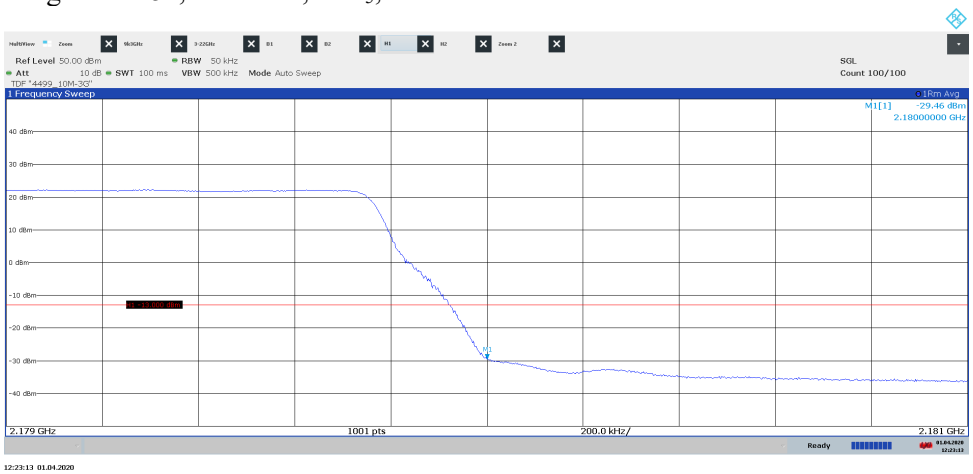


Diagram 2.45b, E-TM1.1, Tim_5, Port B:

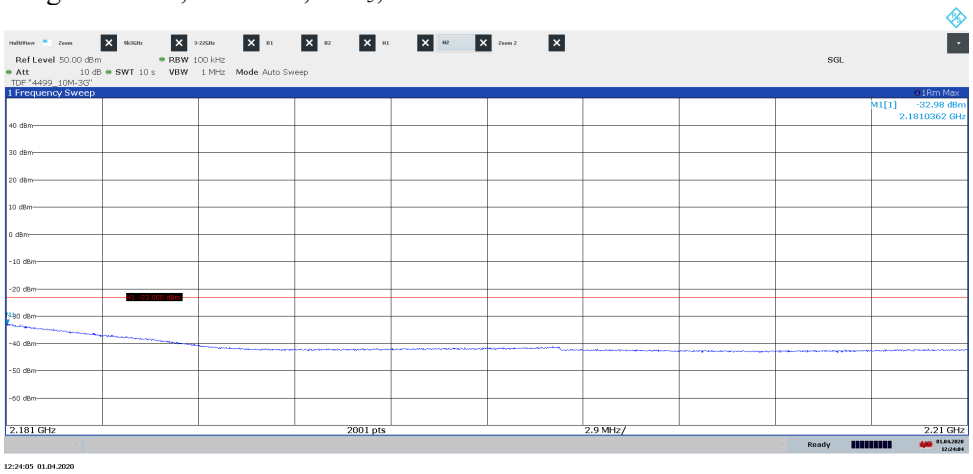


Diagram 2.46a, GSM: GMSK, LTE: E-TM1.1, B_{G+L}, Port A:

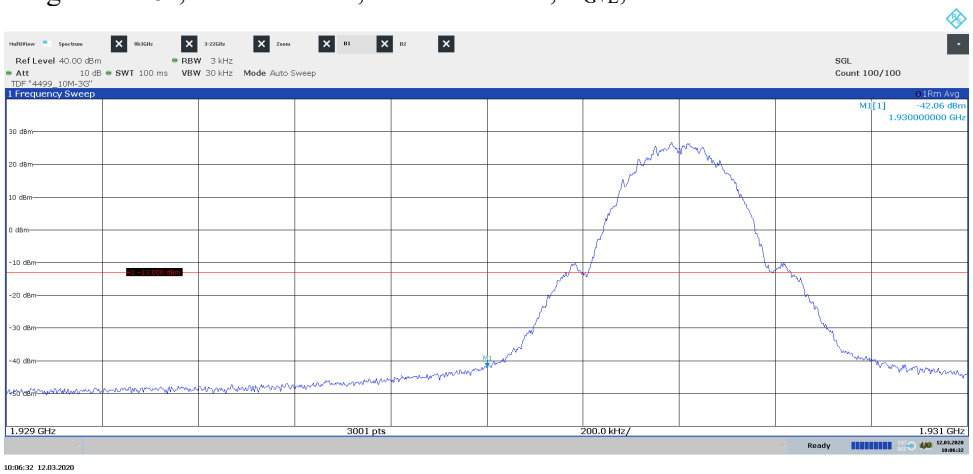


Diagram 2.46b, GSM: GMSK, LTE: E-TM1.1, B_{G+L}, Port A:

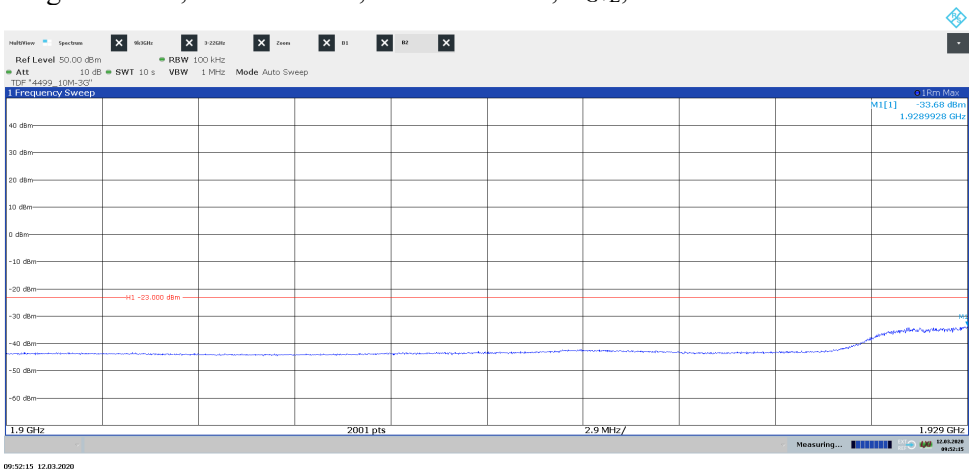


Diagram 2.47a, GSM: GMSK, LTE: E-TM1.1, T_{G+L}, Port A:

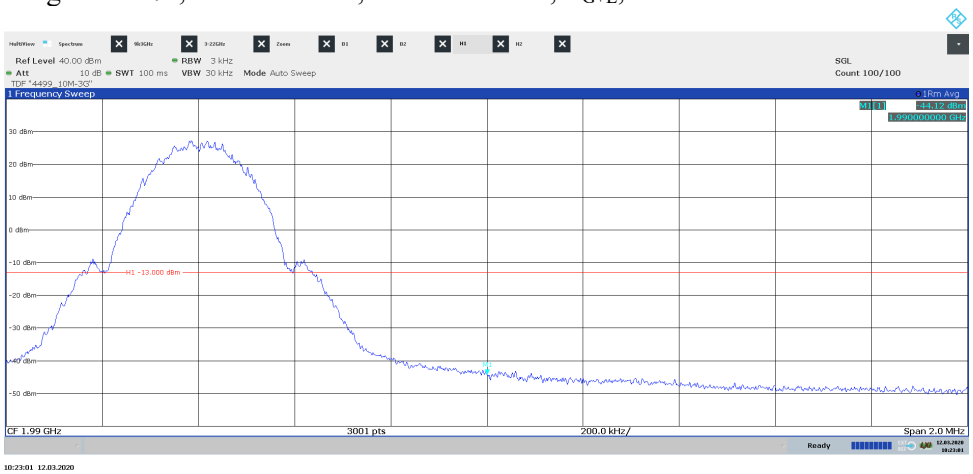


Diagram 2.47b, GSM: GMSK, LTE: E-TM1.1, T_{G+L}, Port A:

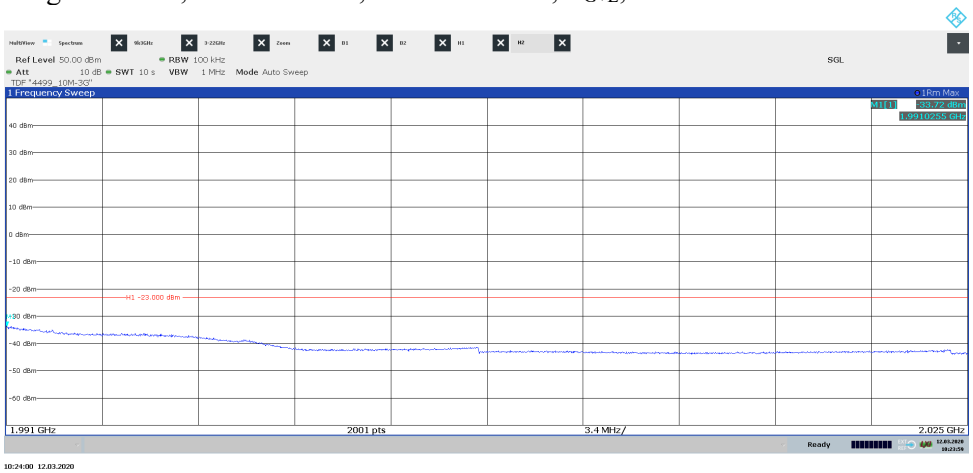


Diagram 2.48a, GSM: AQPSK, LTE: E-TM1.1, B_{G+L}, Port A:

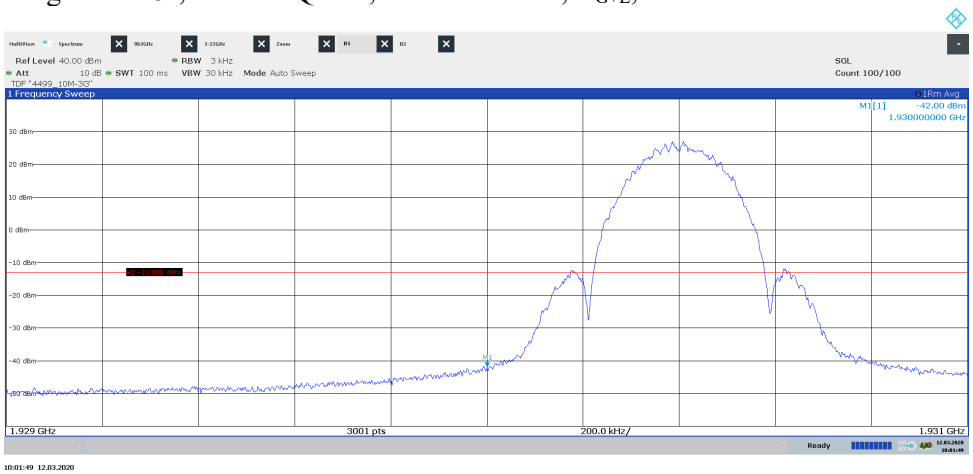


Diagram 2.48b, GSM: AQPSK, LTE: E-TM1.1, B_{G+L}, Port A:

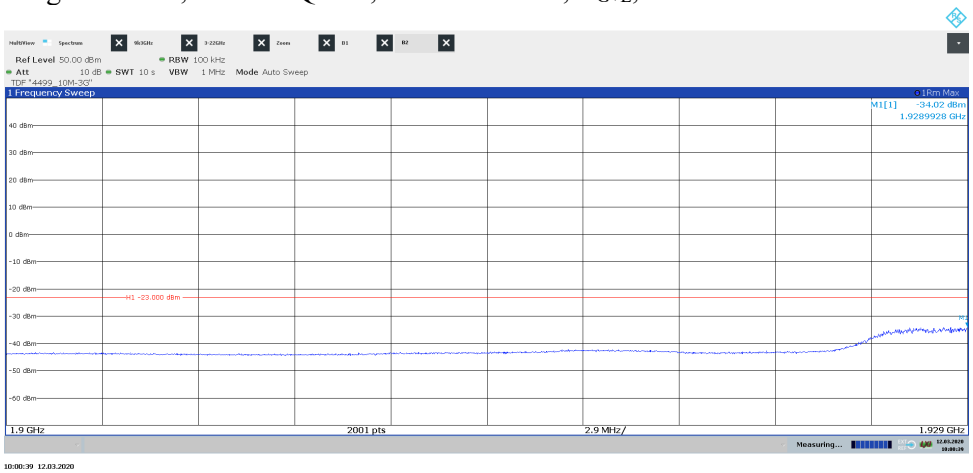


Diagram 2.49a, GSM: AQPSK, LTE: E-TM1.1, T_{G+L}, Port A:

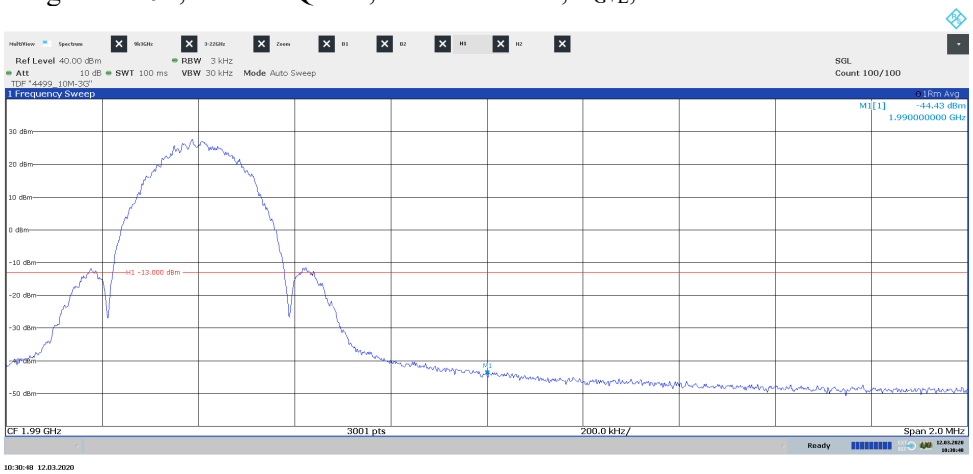


Diagram 2.49b, GSM: AQPSK, LTE: E-TM1.1, T_{G+L}, Port A:

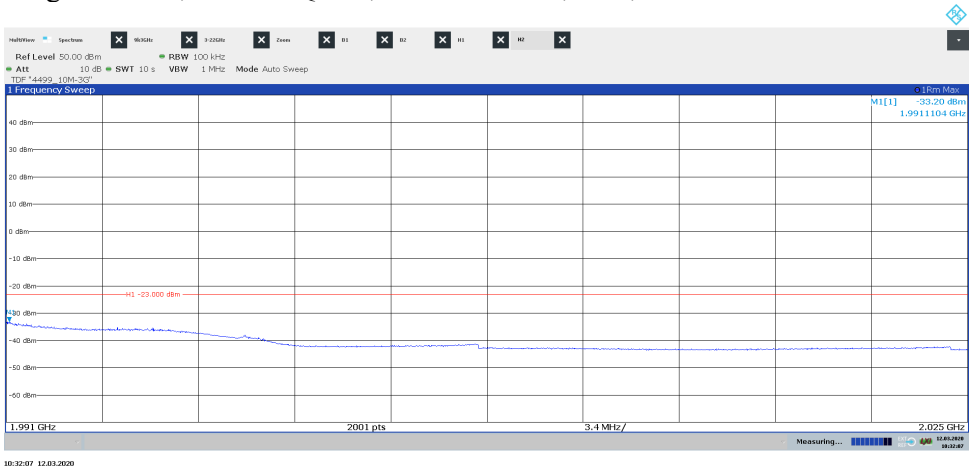


Diagram 2.50a, GSM: 8PSK, LTE: E-TM1.1, B_{G+L}, Port A:

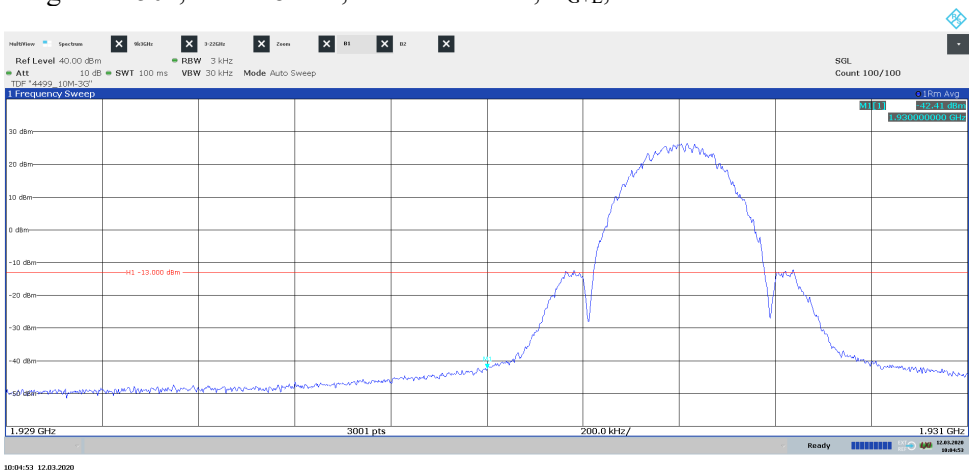


Diagram 2.50b, GSM: 8PSK, LTE: E-TM1.1, B_{G+L}, Port A:

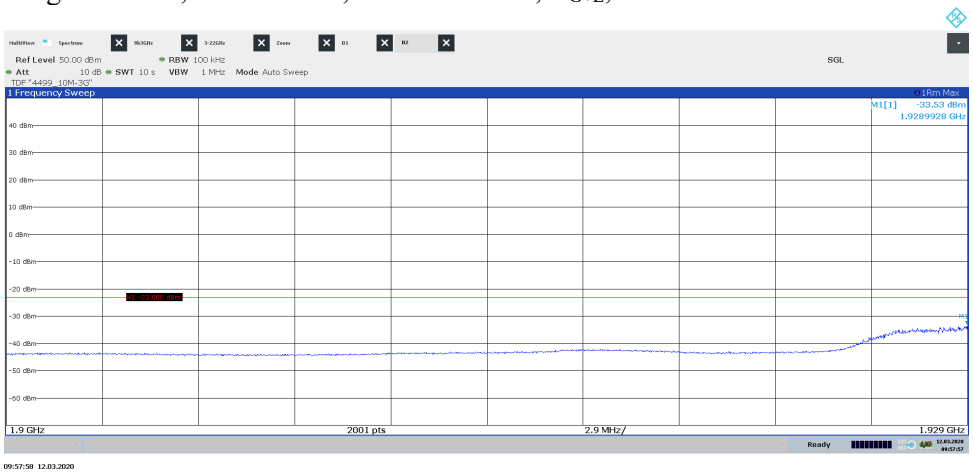


Diagram 2.51a, GSM: 8PSK, LTE: E-TM1.1, T_{G+L}, Port A:

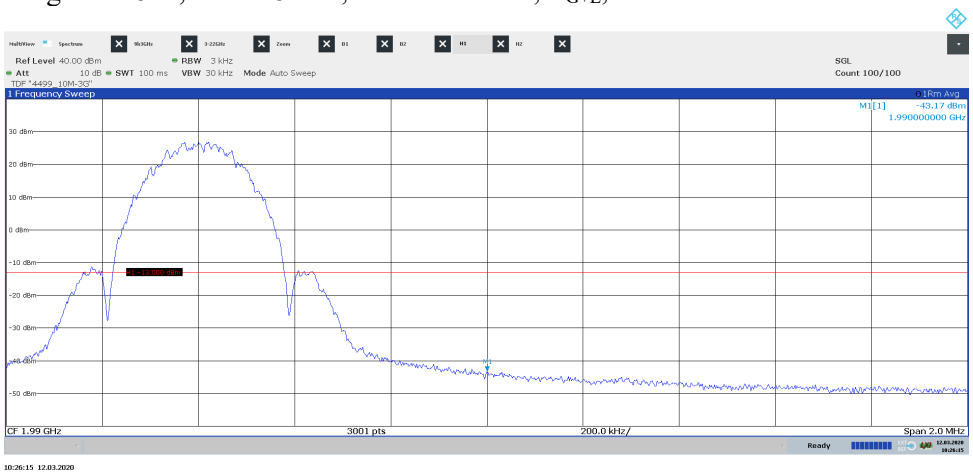


Diagram 2.51b, GSM: 8PSK, LTE: E-TM1.1, T_{G+L}, Port A:

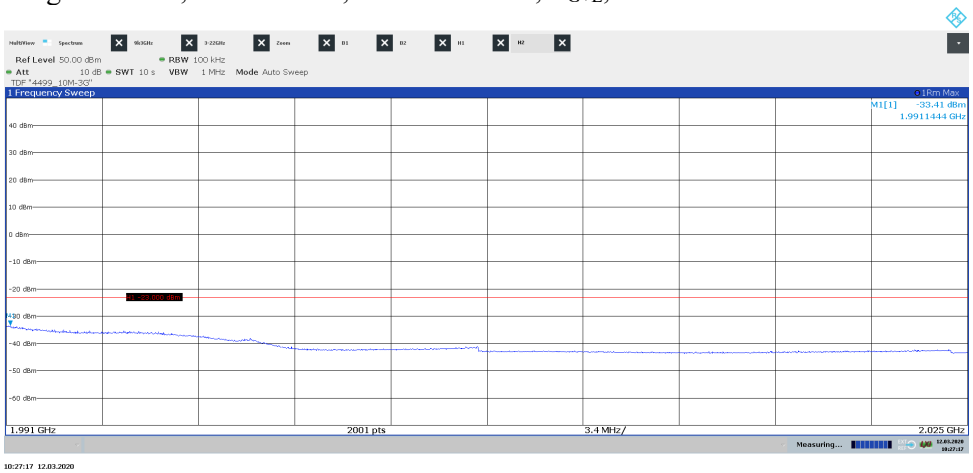


Diagram 2.52a, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port A:

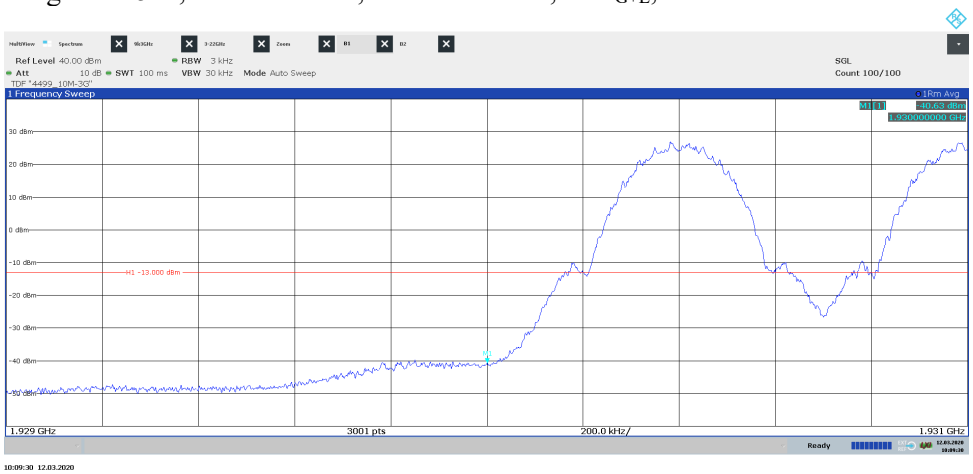


Diagram 2.52b, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port A:

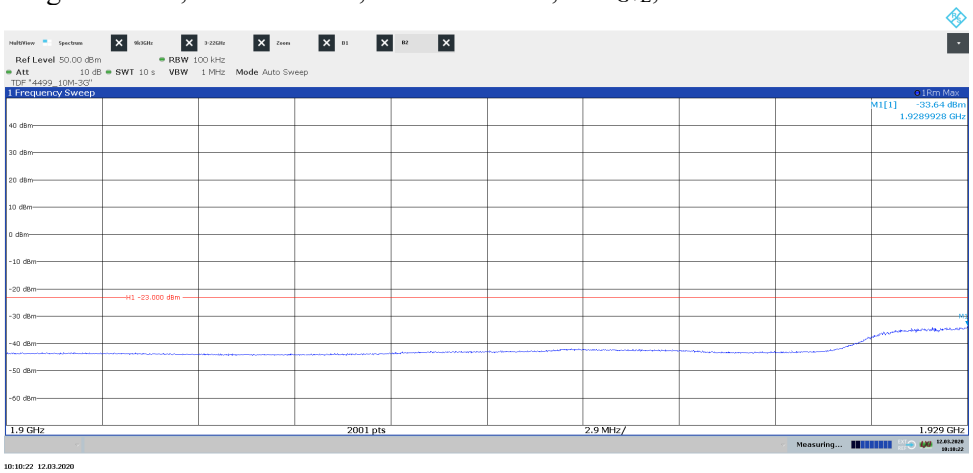


Diagram 2.53a, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port B:

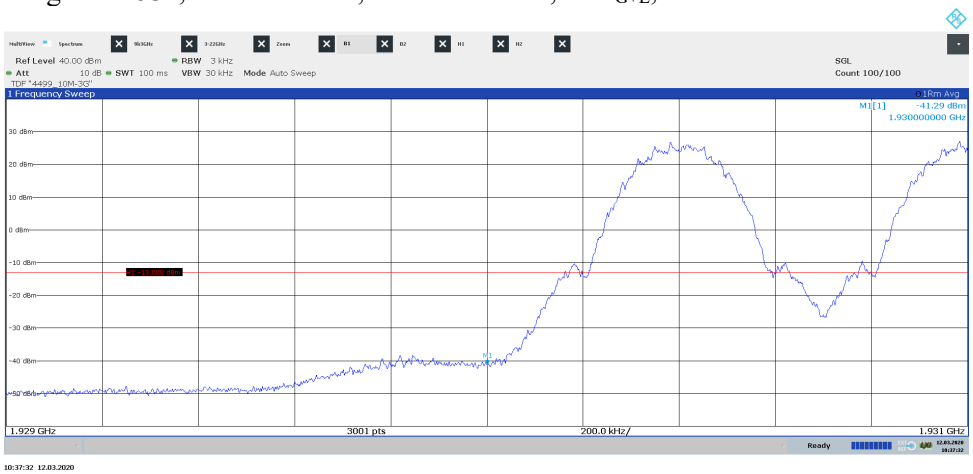


Diagram 2.53b, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port B:

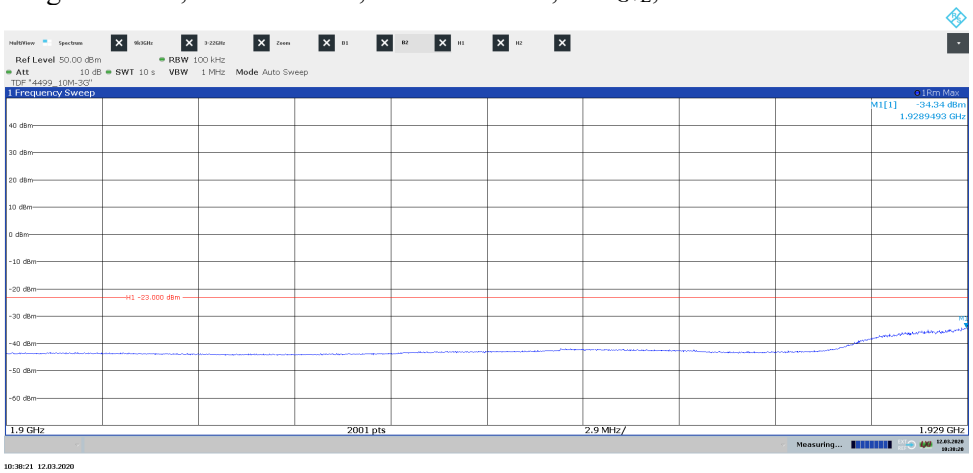


Diagram 2.54a, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port C:

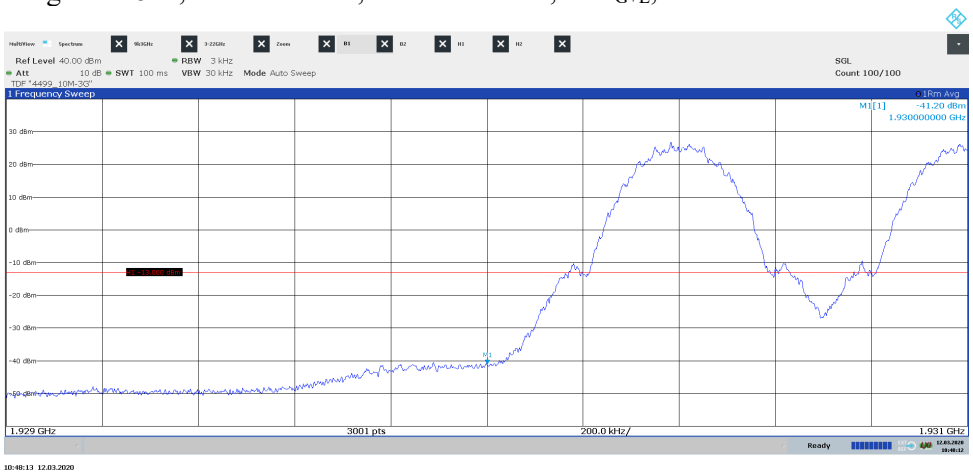


Diagram 2.54b, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port C:

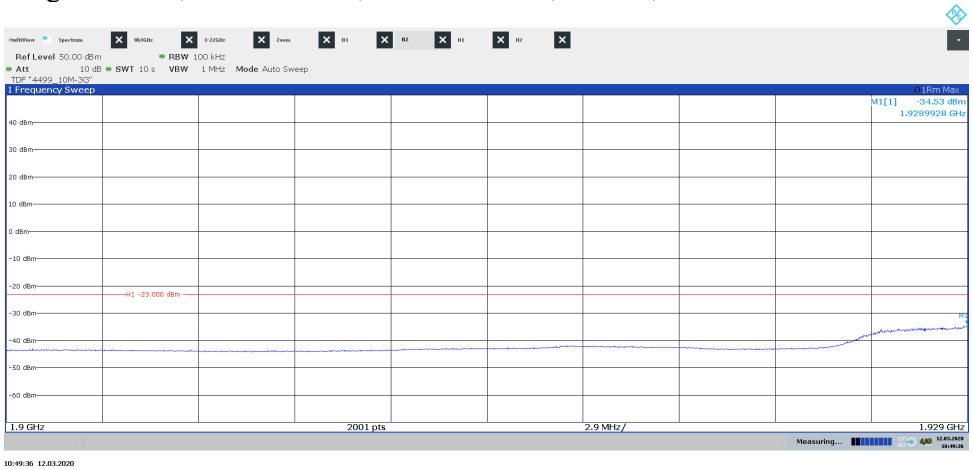


Diagram 2.55a, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port D:

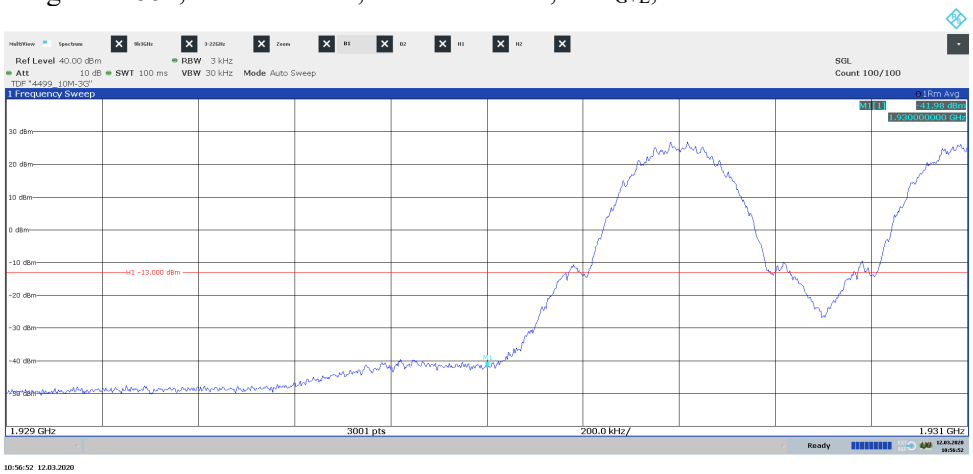


Diagram 2.55b, GSM: GMSK, LTE: E-TM1.1, Bim_{G+L}, Port D:

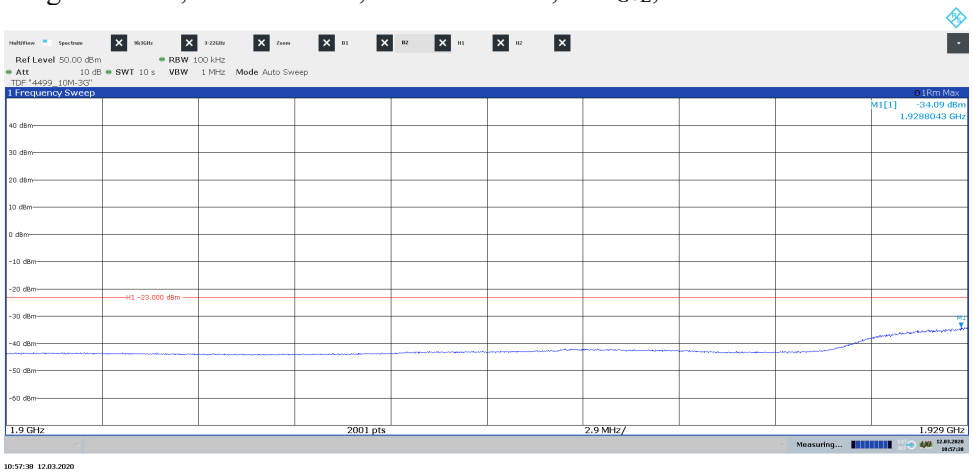


Diagram 2.56a, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port A:

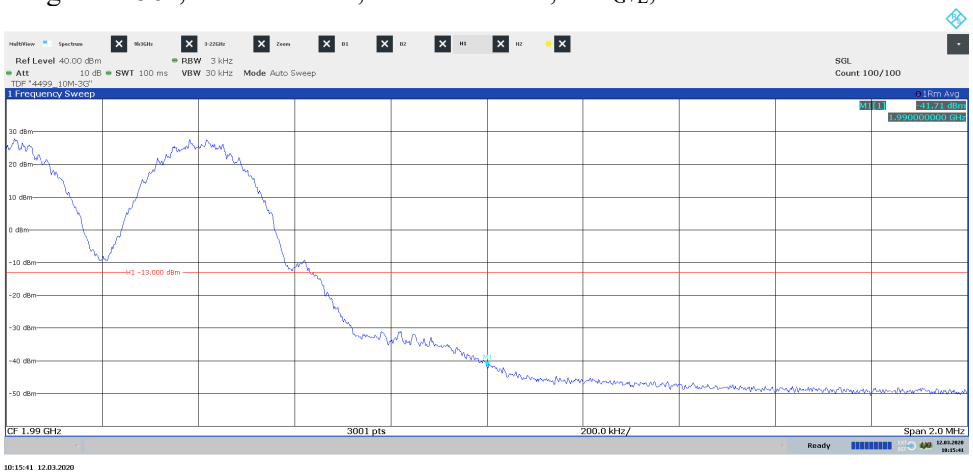


Diagram 2.56b, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port A:

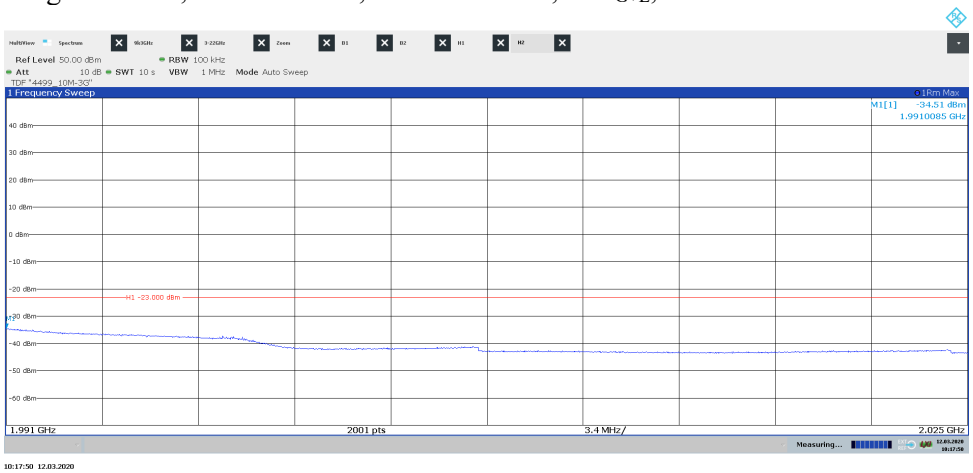


Diagram 2.57a, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port B:

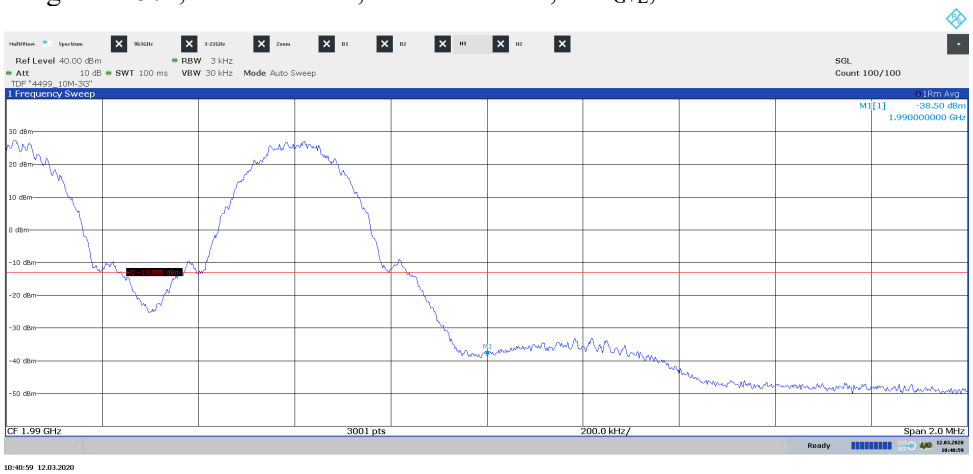


Diagram 2.57b, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port B:

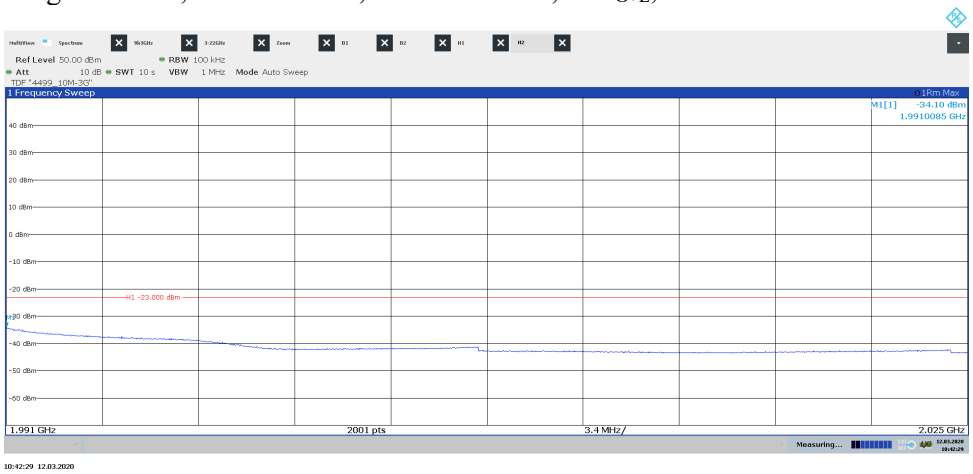


Diagram 2.58a, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port C:

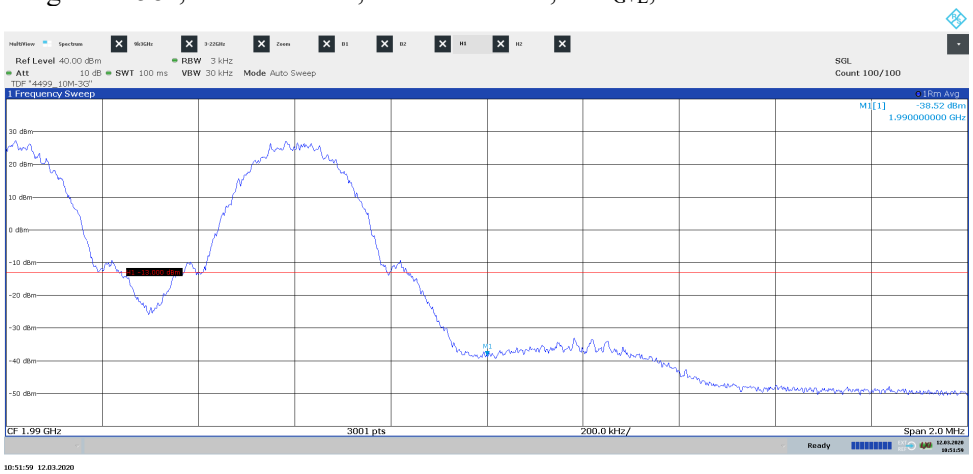


Diagram 2.58b, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port C:

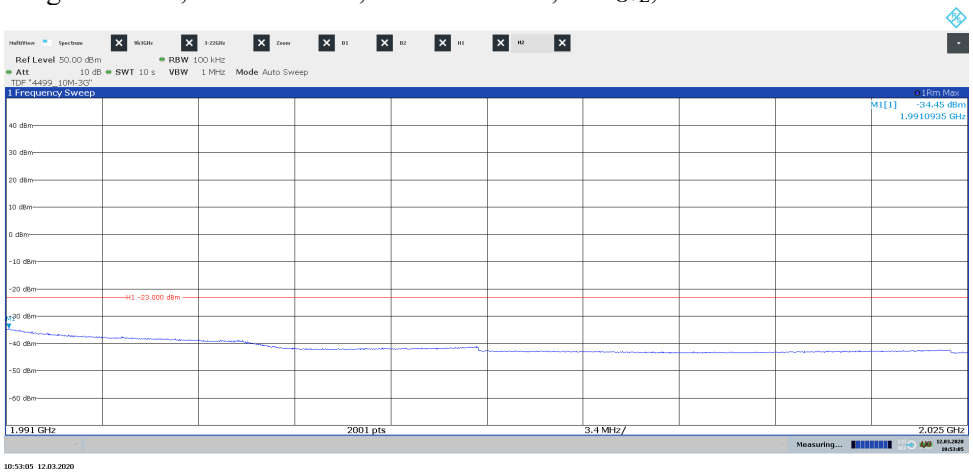


Diagram 2.59a, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port D:

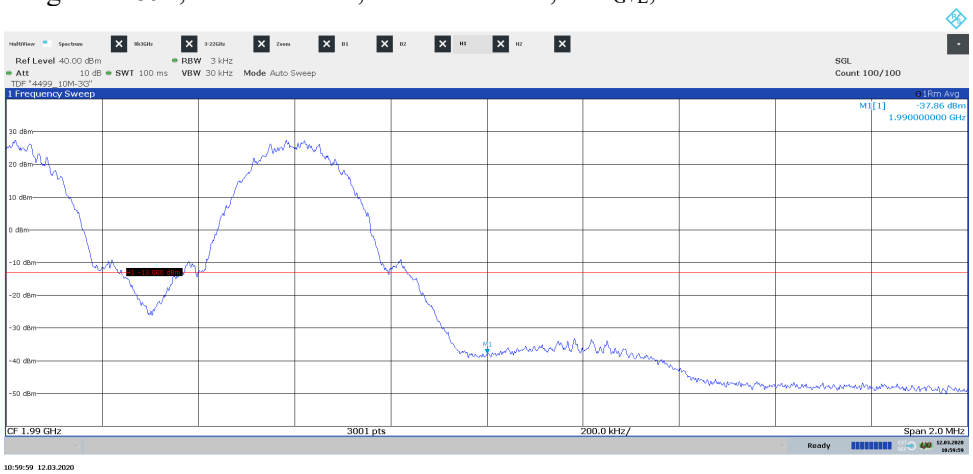


Diagram 2.59b, GSM: GMSK, LTE: E-TM1.1, Tim_{G+L}, Port D:

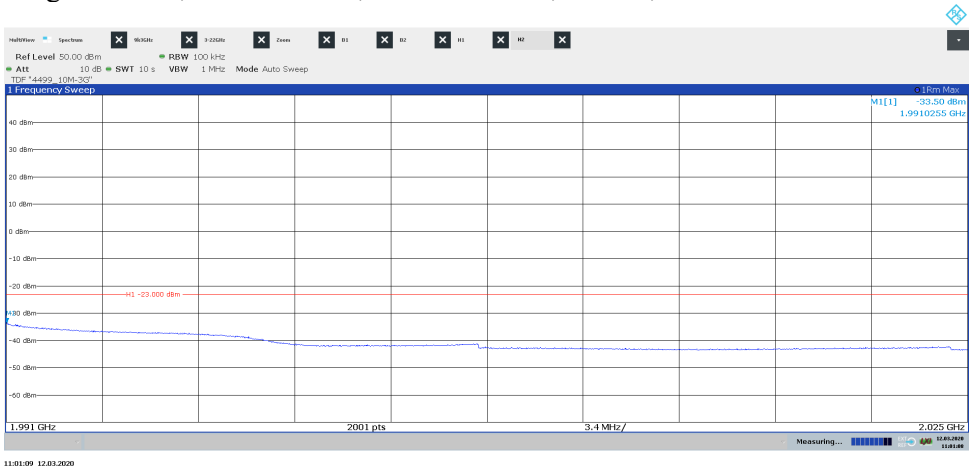


Diagram 2.60a, NB IoT SA: N-TM, LTE: E-TM1.1, B_{IoT+L}, Port A:

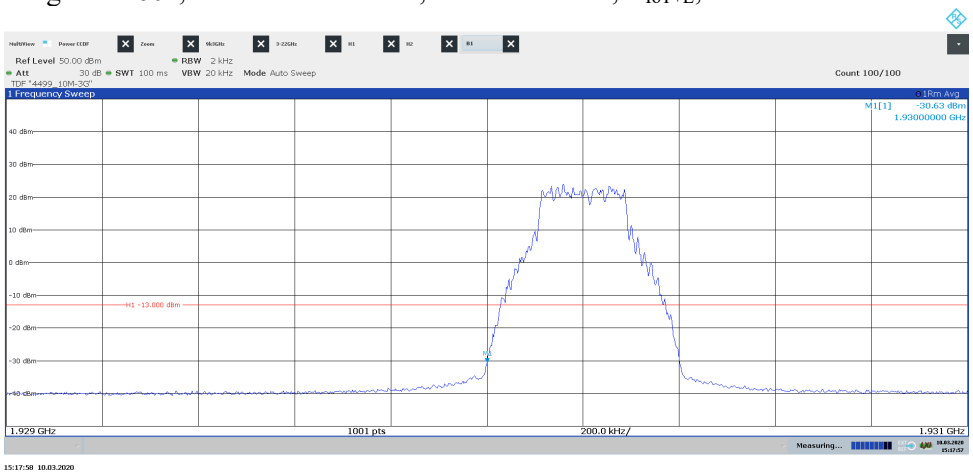


Diagram 2.60b, NB IoT SA: N-TM, LTE: E-TM1.1, B_{IoT+L}, Port A:

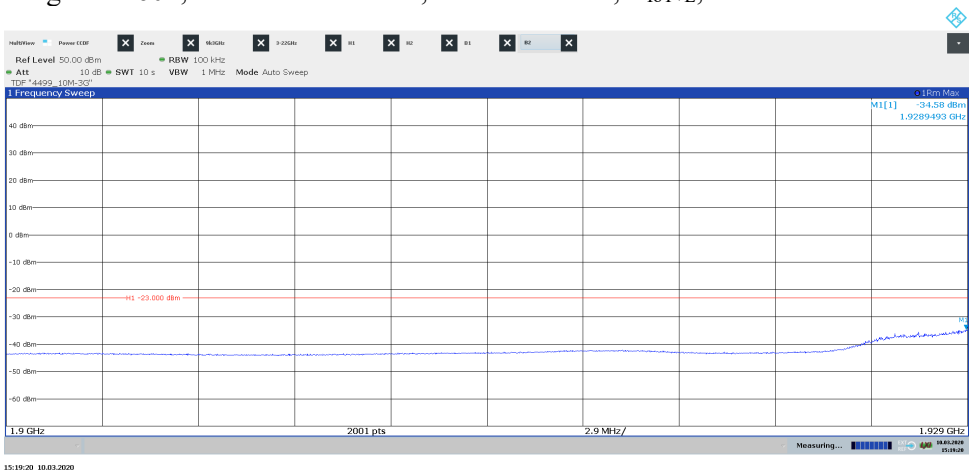


Diagram 2.61a, NB IoT SA: N-TM, LTE: E-TM1.1, T_{IoT+L}, Port A:

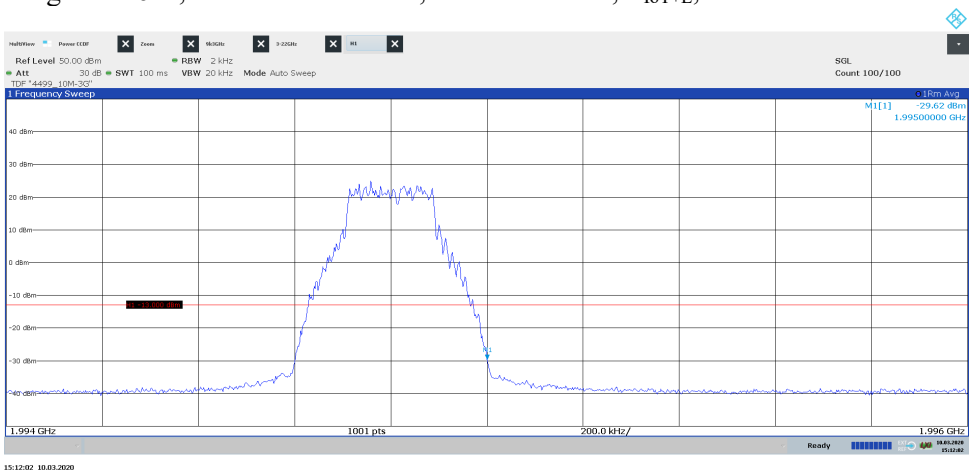


Diagram 2.61b, NB IoT SA: N-TM, LTE: E-TM1.1, T_{IoT+L}, Port A:

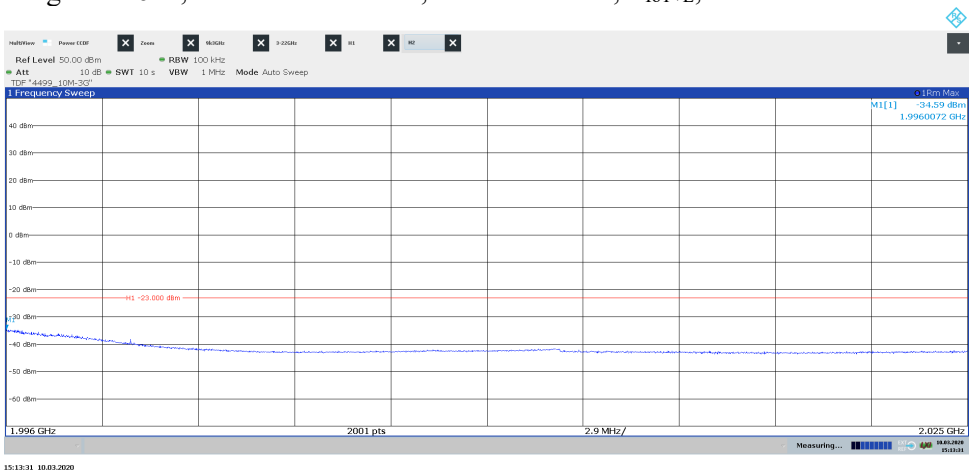


Diagram 2.62a, LTE: E-TM3.1, NB IoT GB: N-TM, B10$_{Guard}$, Port A:

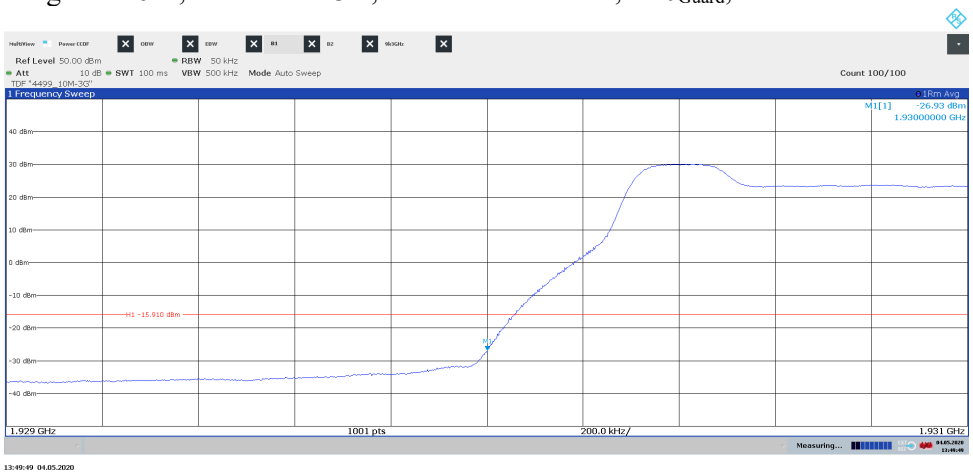


Diagram 2.62b, LTE: E-TM3.1, NB IoT GB: N-TM, B10$_{Guard}$, Port A:

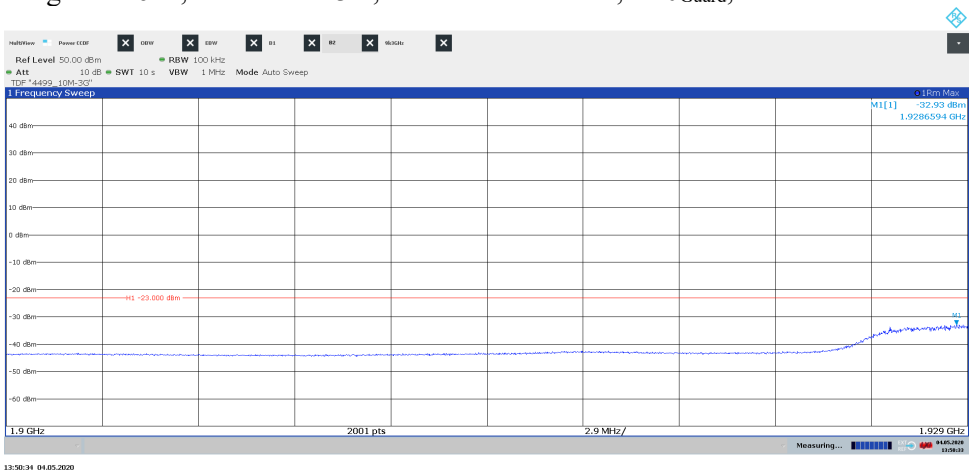


Diagram 2.63a, LTE: E-TM3.1, NB IoT GB: N-TM, B15$_{Guard}$, Port A:

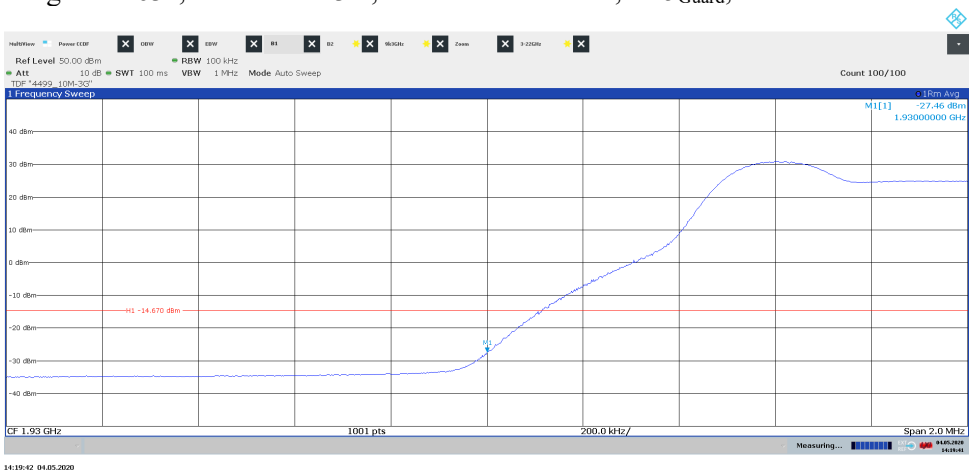


Diagram 2.63b, LTE: E-TM3.1, NB IoT GB: N-TM, B15$_{Guard}$, Port A:

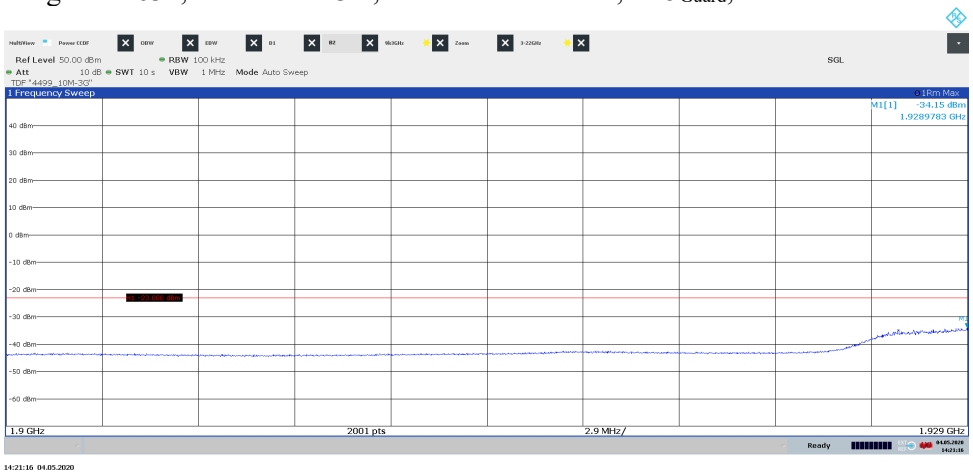


Diagram 2.64a, LTE: E-TM3.1, NB IoT GB: N-TM, $B20_{Guard}$, Port A:

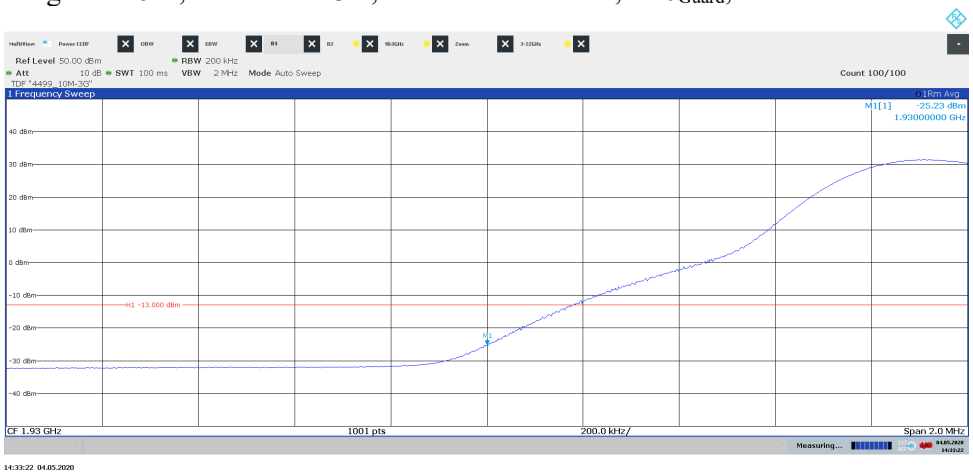


Diagram 2.64b, LTE: E-TM3.1, NB IoT GB: N-TM, $B20_{Guard}$, Port A:

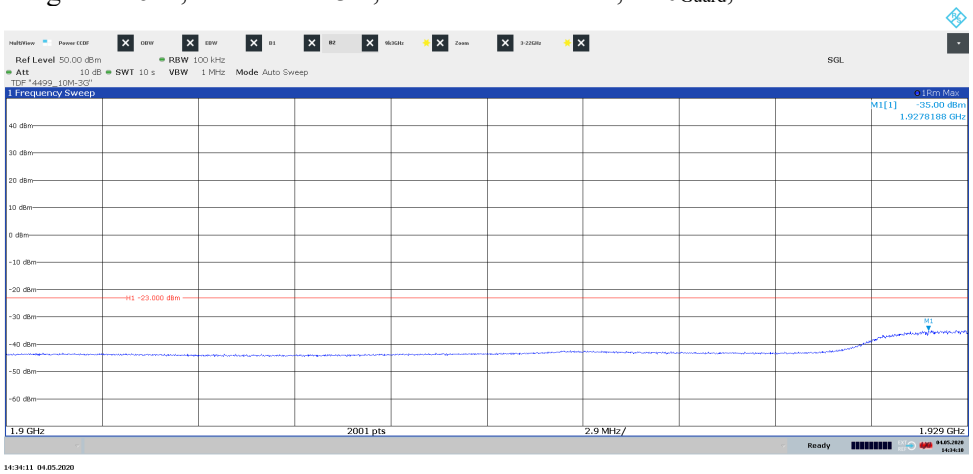


Diagram 2.65a, LTE: E-TM3.1, NB IoT GB: N-TM, $T10_{Guard}$, Port A:

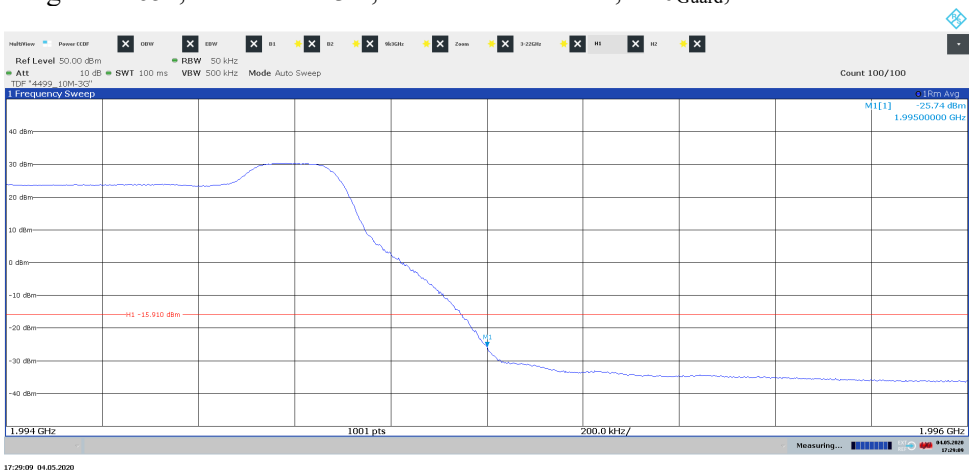


Diagram 2.65b, LTE: E-TM3.1, NB IoT GB: N-TM, $T10_{Guard}$, Port A:

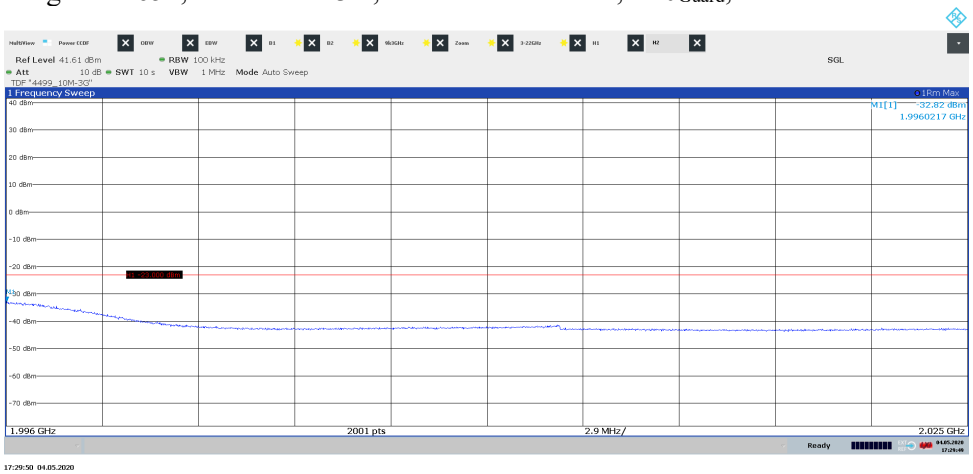


Diagram 2.66a, LTE: E-TM3.1, NB IoT GB: N-TM, $T15_{Guard}$, Port A:

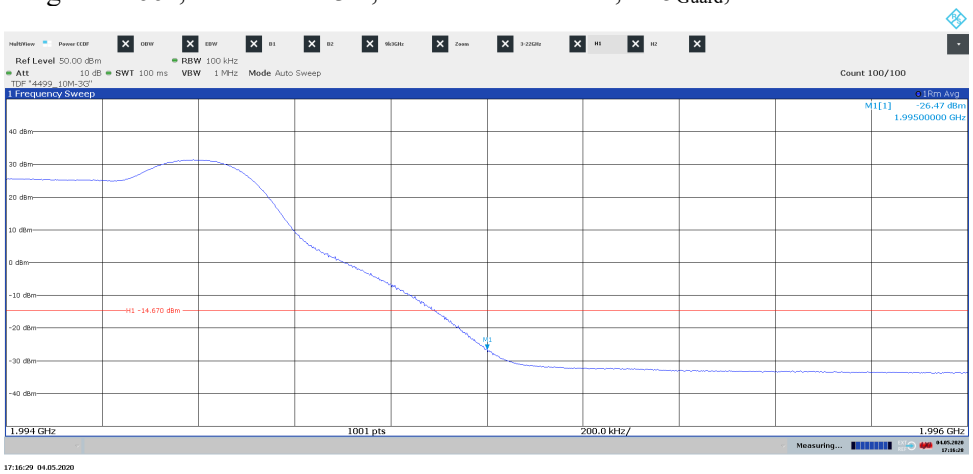


Diagram 2.66b, LTE: E-TM3.1, NB IoT GB: N-TM, $T15_{Guard}$, Port A:

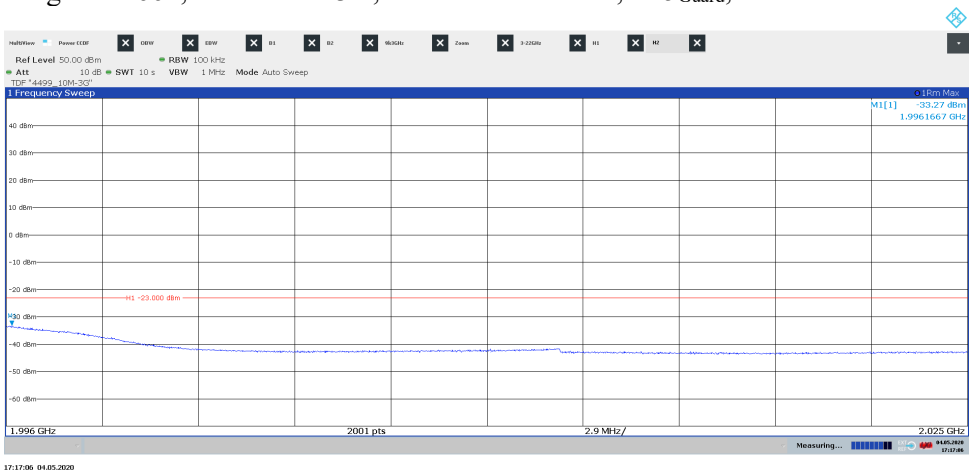


Diagram 2.67a, LTE: E-TM3.1, NB IoT GB: N-TM, $T20_{Guard}$, Port A:

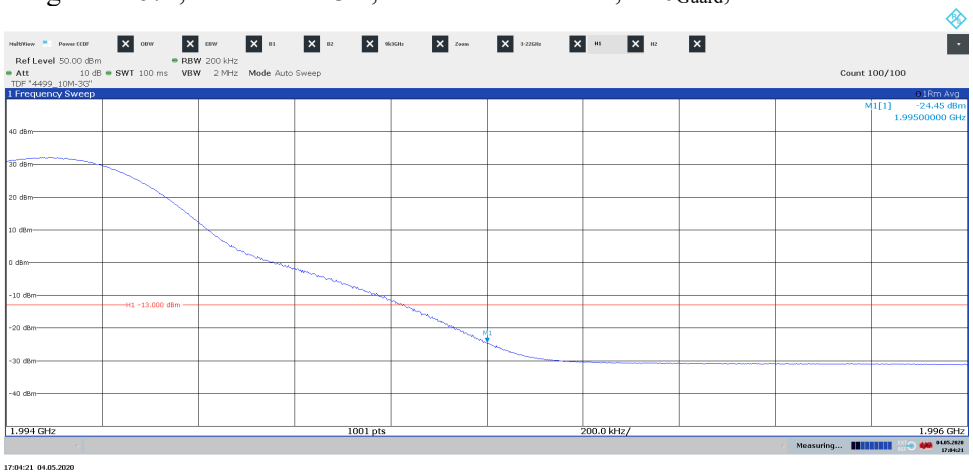


Diagram 2.67b, LTE: E-TM3.1, NB IoT GB: N-TM, $T20_{Guard}$, Port A:

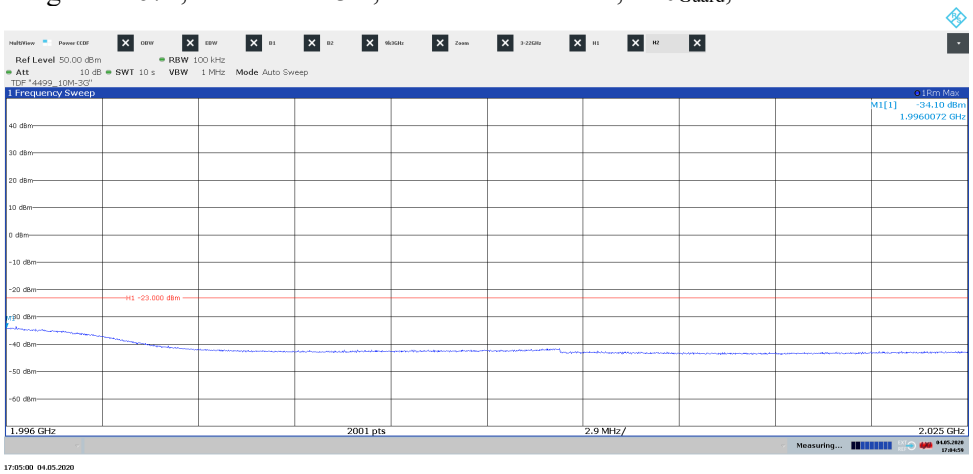


Diagram 2.68a, NB IoT SA: N-TM, LTE: E-TM1.1, B_{IoT+L}, Port B:

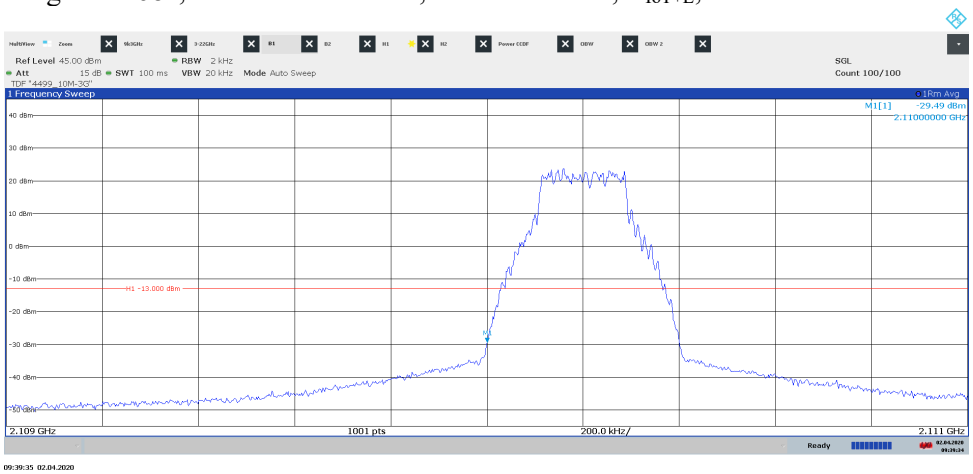


Diagram 2.68b, NB IoT SA: N-TM, LTE: E-TM1.1, B_{IoT+L}, Port B:

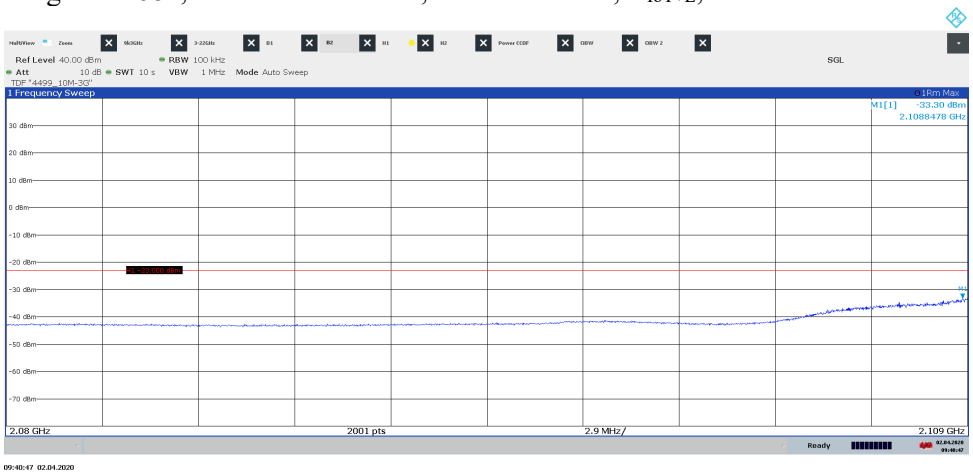


Diagram 2.69a, NB IoT SA: N-TM, LTE: E-TM1.1, T_{IoT+L}, Port B:

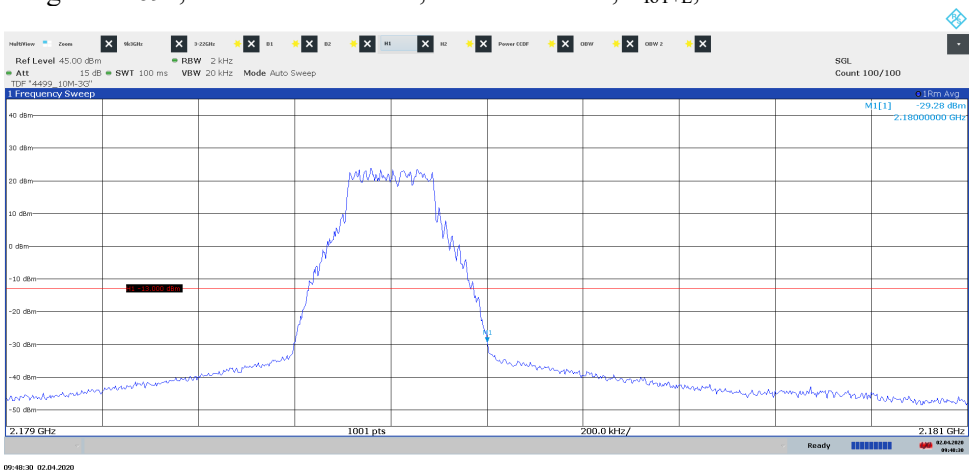


Diagram 2.69b, NB IoT SA: N-TM, LTE: E-TM1.1, T_{IoT+L}, Port B:

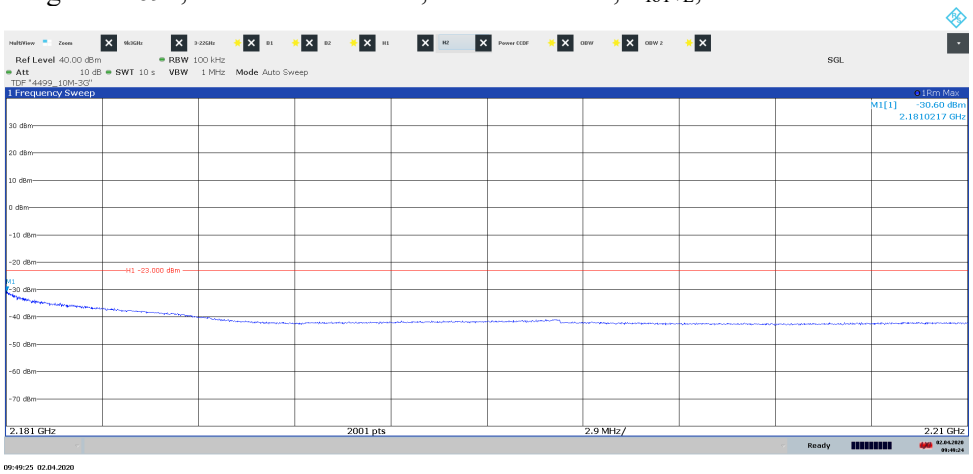


Diagram 2.70a, LTE: E-TM3.1, NB IoT GB: N-TM, B10$_{Guard}$, Port B:

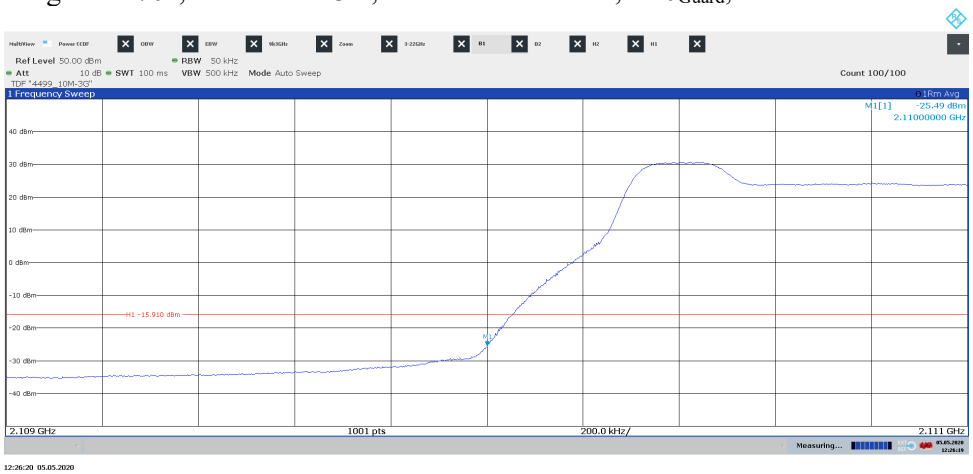


Diagram 2.70b, LTE: E-TM3.1, NB IoT GB: N-TM, B10$_{Guard}$, Port B:

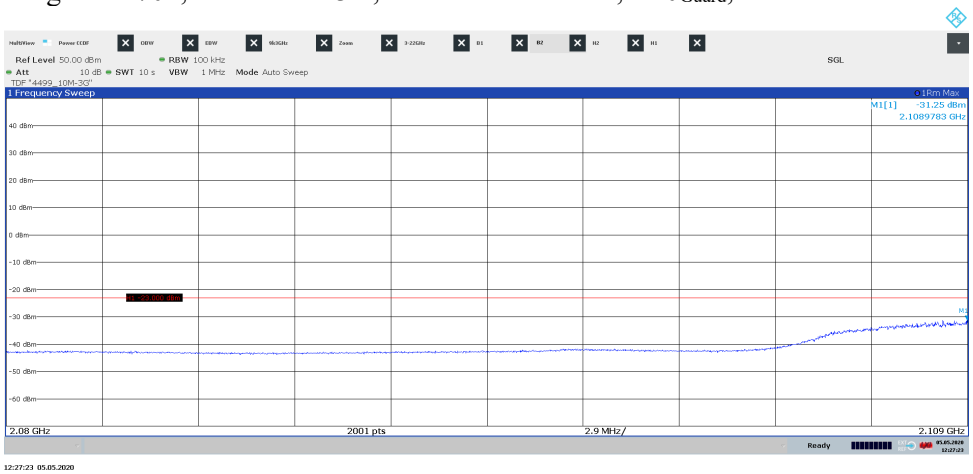


Diagram 2.71a, LTE: E-TM3.1, NB IoT GB: N-TM, B15$_{Guard}$, Port B:

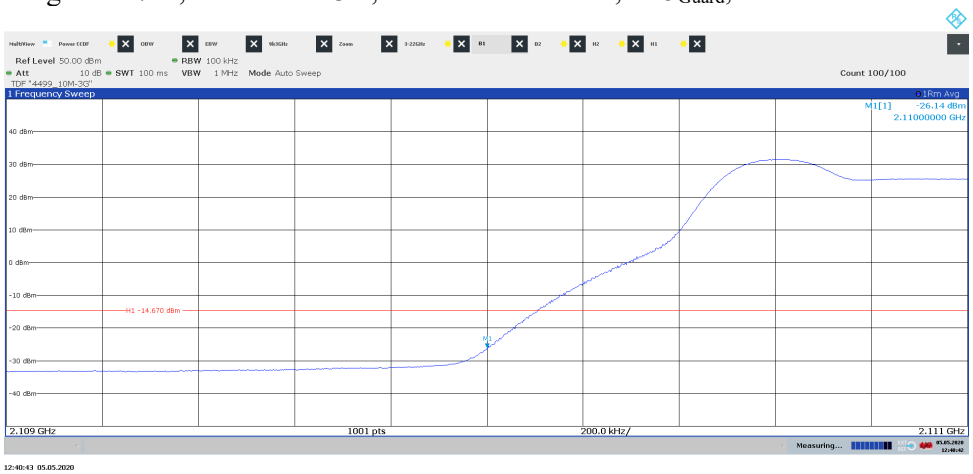


Diagram 2.71b, LTE: E-TM3.1, NB IoT GB: N-TM, B15$_{Guard}$, Port B:

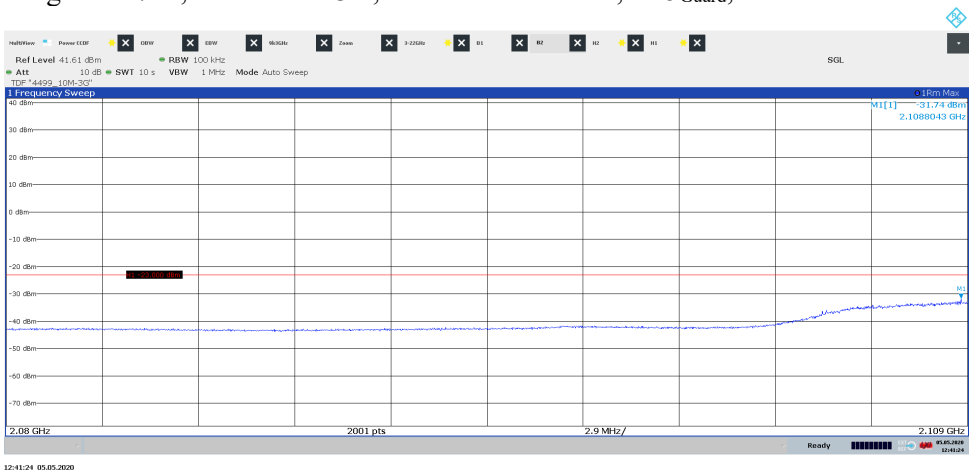


Diagram 2.72a, LTE: E-TM3.1, NB IoT GB: N-TM, B20$_{Guard}$, Port B:

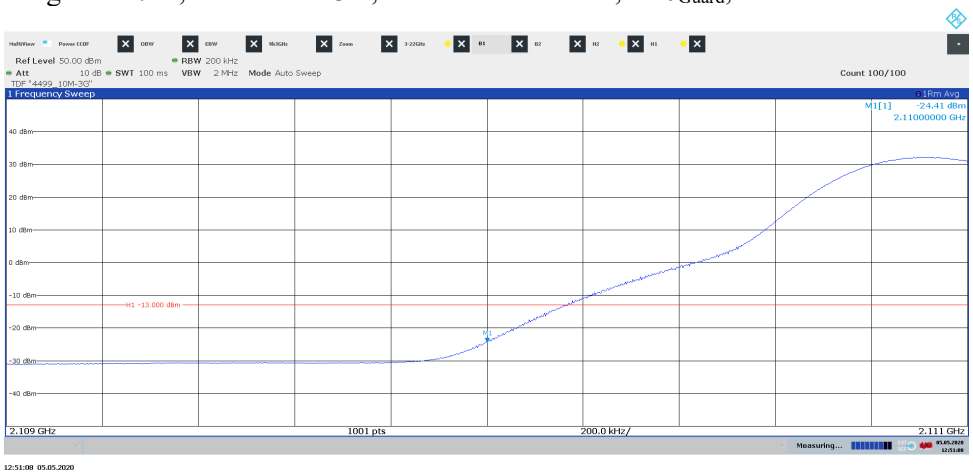


Diagram 2.72b, LTE: E-TM3.1, NB IoT GB: N-TM, B20$_{Guard}$, Port B:

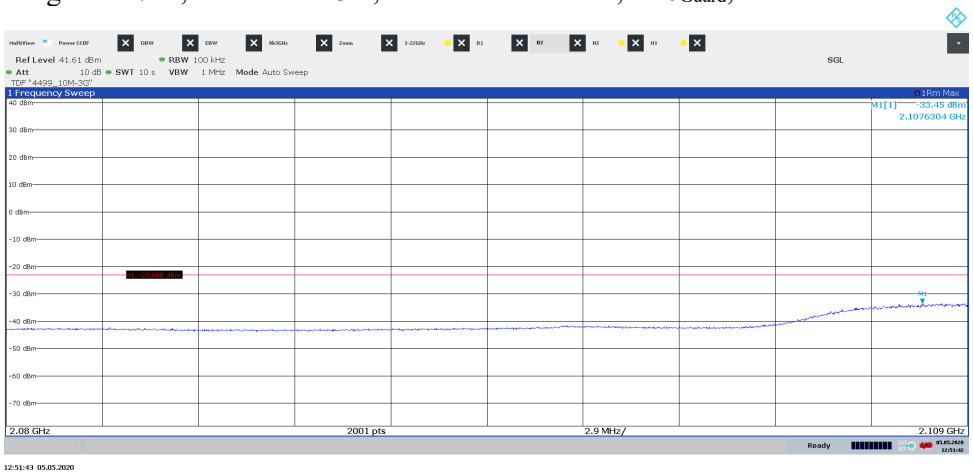


Diagram 2.73a, LTE: E-TM3.1, NB IoT GB: N-TM, $T10_{Guard}$, Port B:

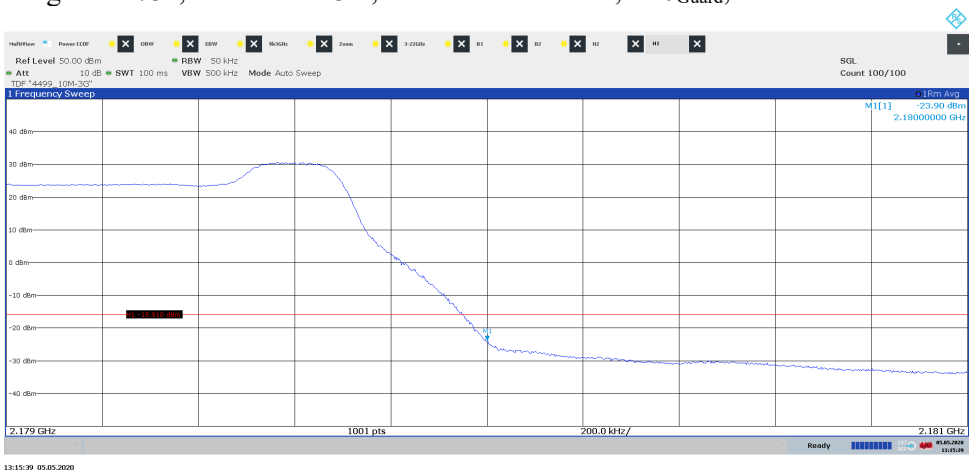


Diagram 2.73b, LTE: E-TM3.1, NB IoT GB: N-TM, $T10_{Guard}$, Port B:

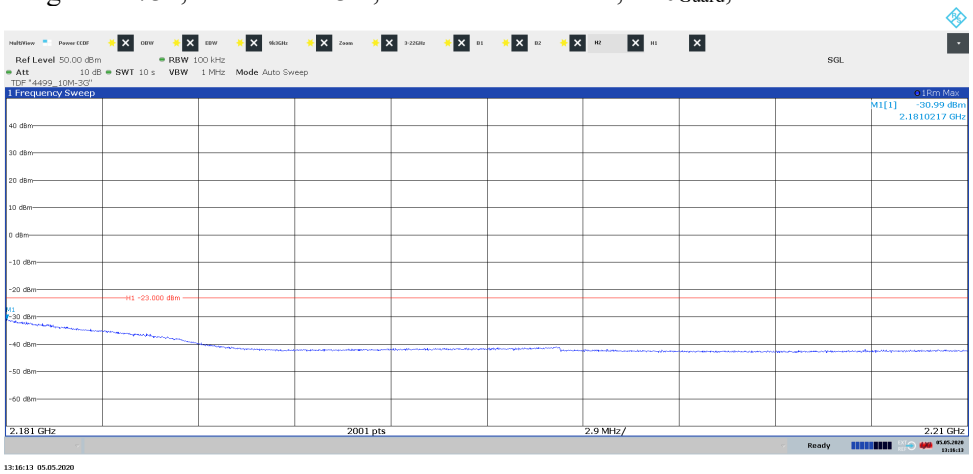


Diagram 2.74a, LTE: E-TM3.1, NB IoT GB: N-TM, $T15_{Guard}$, Port B:

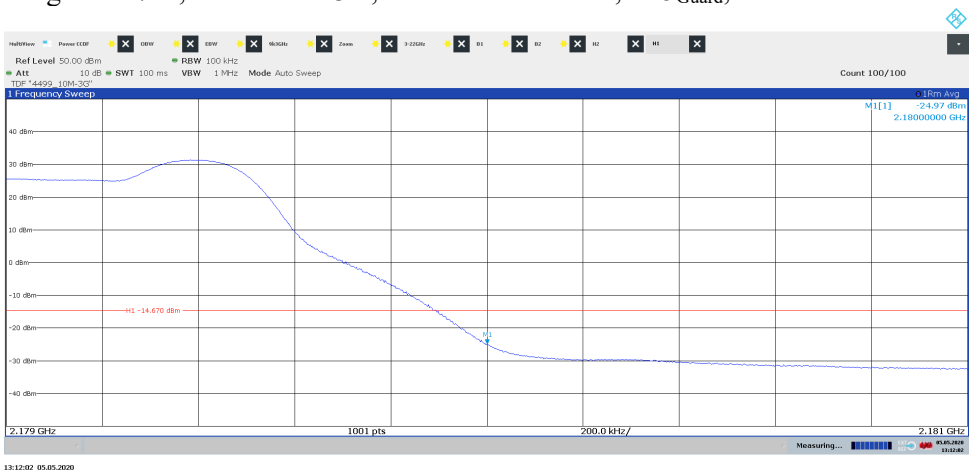


Diagram 2.74b, LTE: E-TM3.1, NB IoT GB: N-TM, $T15_{Guard}$, Port B:

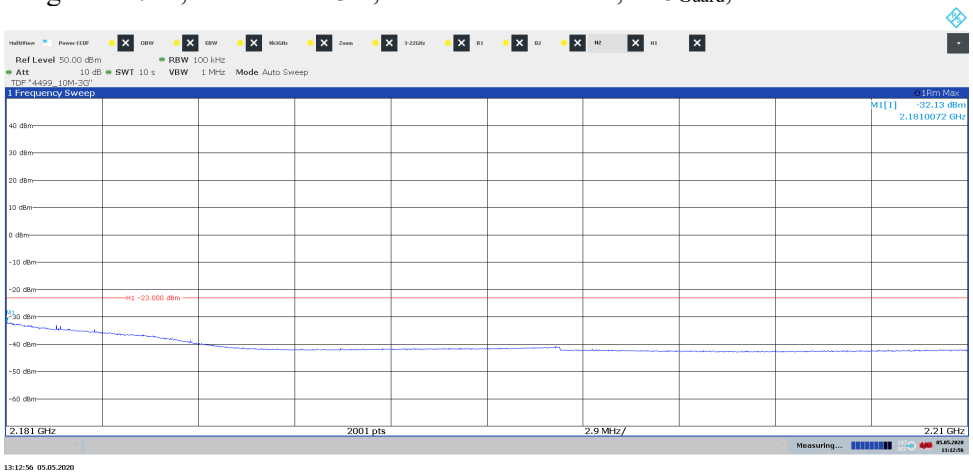


Diagram 2.75a, LTE: E-TM3.1, NB IoT GB: N-TM, $T20_{Guard}$, Port B:

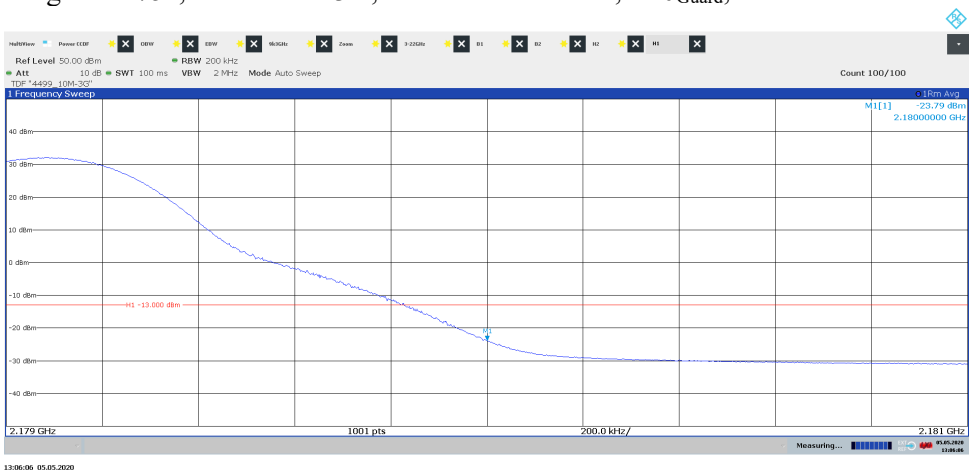


Diagram 2.75b, LTE: E-TM3.1, NB IoT GB: N-TM, $T20_{Guard}$, Port B:

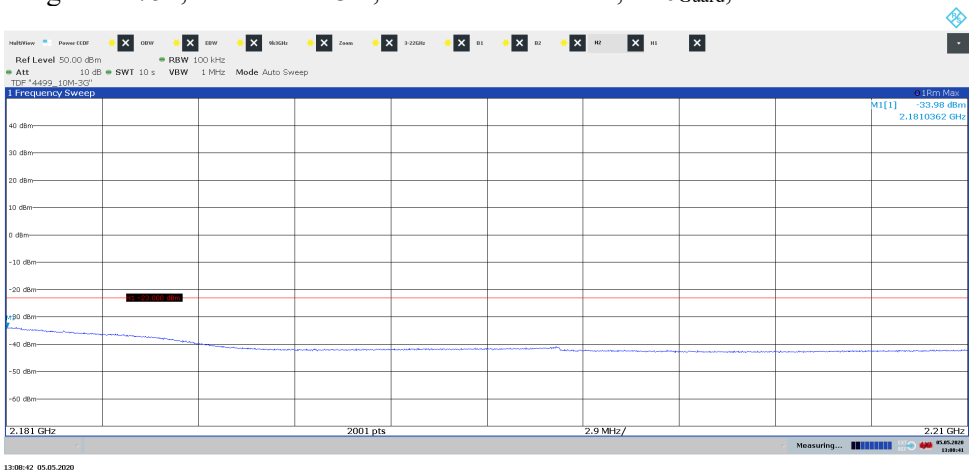


Diagram 2.76a, G: GMSK, NB IoT SA: N-TM, LTE: E-TM1.1, $Bim_{G+IoT+L}$, Port A:

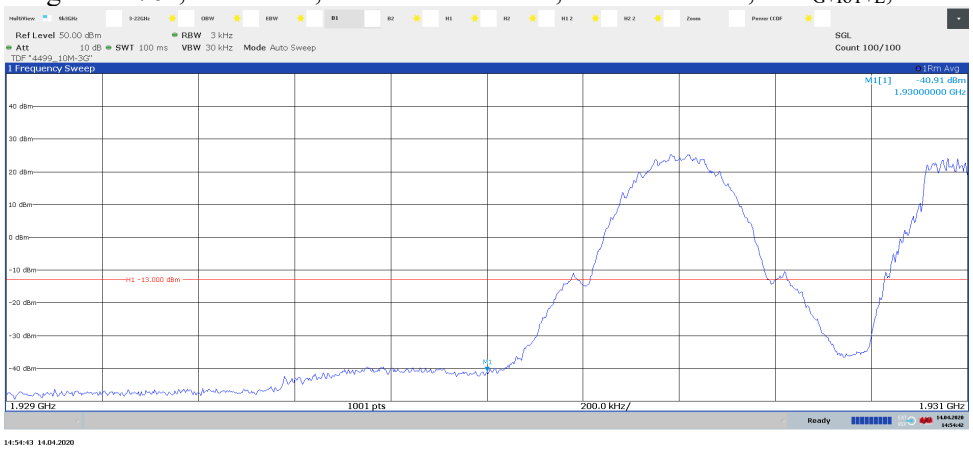


Diagram 2.76b, G: GMSK, NB IoT SA: N-TM, LTE: E-TM1.1, $Bim_{G+IoT+L}$, Port A:

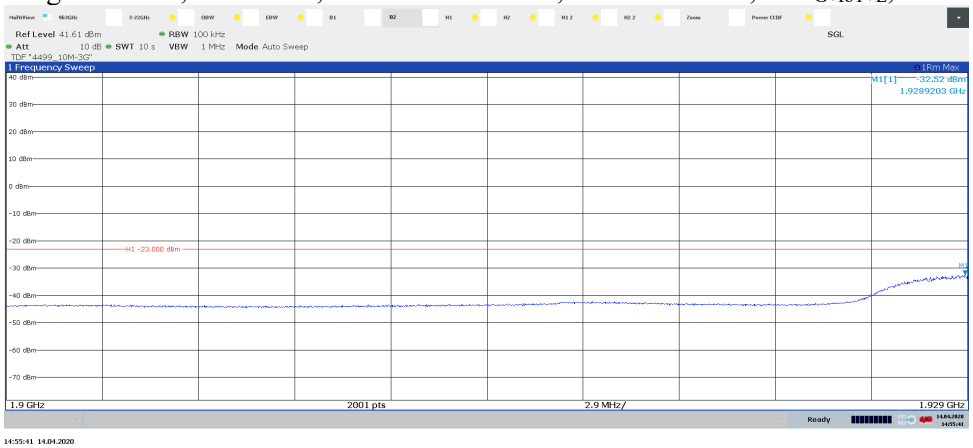


Diagram 2.77a, G: GMSK, NB IoT SA: N-TM, LTE: E-TM1.1, $Tim_{G+IoT+L}$, Port A

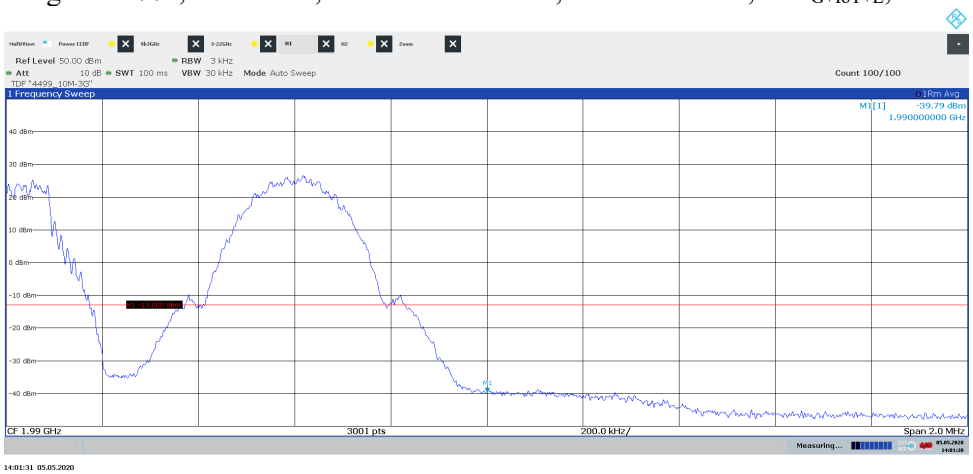
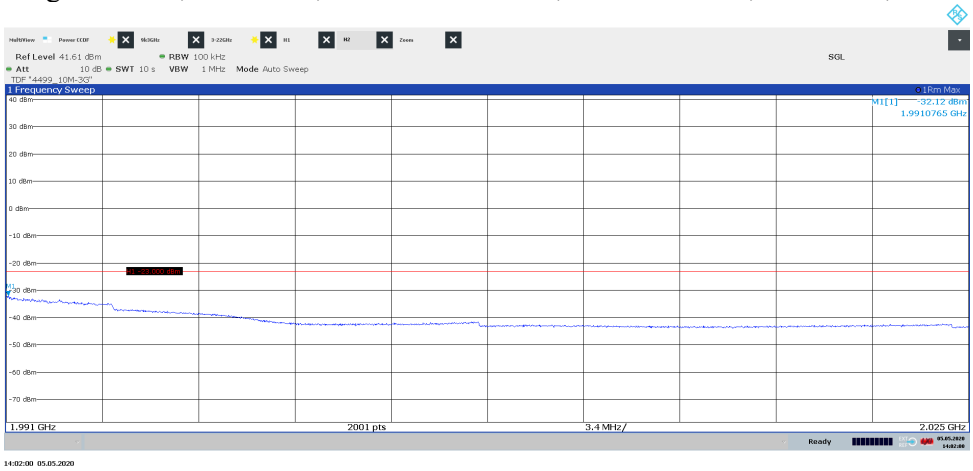


Diagram 2.77b, G: GMSK, NB IoT SA: N-TM, LTE: E-TM1.1, $Tim_{G+IoT+L}$, Port A



Conducted spurious emission measurements according to CFR 47 §24.238 and §27.53(h) / RSS-133 6.5, RSS-139 6.6

Date	Temperature	Humidity
2020-02-28	24 °C ± 3 °C	11 % ± 5 %
2020-03-02	23 °C ± 3 °C	18 % ± 5 %
2020-03-03	24 °C ± 3 °C	16 % ± 5 %
2020-03-05	24 °C ± 3 °C	17 % ± 5 %
2020-03-10	23 °C ± 3 °C	18 % ± 5 %
2020-03-12	23 °C ± 3 °C	19 % ± 5 %
2020-03-27	23 °C ± 3 °C	14 % ± 5 %
2020-03-31	23 °C ± 3 °C	12 % ± 5 %
2020-04-01	24 °C ± 3 °C	16 % ± 5 %
2020-04-02	23 °C ± 3 °C	17 % ± 5 %
2020-04-15	22 °C ± 3 °C	25 % ± 5 %
2020-05-04	23 °C ± 3 °C	16 % ± 5 %
2020-05-05	22 °C ± 3 °C	14 % ± 5 %

Test set-up and procedure

The measurements were made per definition in ANSI C63.26, 5.7.4. The output was connected to a spectrum analyzer with the RMS detector activated.

Before comparing the results to the limit, 6 dB [10 $\log_{10}$ (4)] to cover 4x4 MIMO, should be added according to ANSI C63.26 6.4.4.1 c “measure and add 10 $\log_{10}$ (N_{ANT})”.

Measurement equipment	RISE number
R&S FSW 43	902 073
Directional coupler	901 496
RF attenuator	902 282
High pass filter 3-27 GHz	901 502
Coaxial cable Megaphase	BX50191
Coaxial cable Sucoflex 102EA	BX50236
Coaxial cable Sucoflex 102EA	BX50237
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results LTE

B25 max power configuration:

Single carrier E-TM1.1

Diagram	Symbolic name	Tested Port
3.1 a-b	B_3	RF A
3.2 a-b	B_{20}	RF A
3.3 a-b	$M_{1.4}$	RF A
3.4 a-b	M_3	RF A
3.5 a-b	M_5	RF A
3.6 a-b	M_{10}	RF A
3.7 a-b	M_{10}	RF B
3.8 a-b	M_{10}	RF C
3.9 a-b	M_{10}	RF D
3.10 a-b	M_{15}	RF A
3.11 a-b	M_{20}	RF A
3.12 a-b	T_3	RF A
3.13 a-b	T_{20}	RF A

Multi carrier E-TM1.1

Diagram	Symbolic name	Tested Port
3.14 a-c	Bim_3	RF A
3.15 a-c	Tim_3	RF A
3.16 a-c	$M6_{10}$	RF A

Note: Measurements were mainly limited to port RF A due to the measurement result in single carrier mode that shows that the ports are electrical identical as declared by the client.

B66 max power configuration:

Single carrier E-TM1.1

Diagram	Symbolic name	Tested Port
3.17 a-b	B_{10}	RF B
3.18 a-b	M_5	RF B
3.19 a-b	M_{10}	RF A
3.20 a-b	M_{10}	RF B
3.21 a-b	M_{10}	RF C
3.22 a-b	M_{10}	RF D
3.23 a-b	M_{15}	RF B
3.24 a-b	M_{20}	RF B
3.25 a-b	T_{10}	RF B

Multi carrier E-TM1.1

Diagram	Symbolic name	Tested Port
3.26 a-c	Bim_5	RF B
3.27 a-c	Tim_5	RF B
3.28 a-c	$M6_{10}$	RF B

Results GSM

B2 max power configuration:

Multi RAT: GSM: GMSK, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.29 a-b	B_{G+L}	RF A
3.30 a-b	M_{G+L}	RF A
3.31 a-b	M_{G+L}	RF B
3.32 a-b	M_{G+L}	RF C
3.33 a-b	M_{G+L}	RF D
3.34 a-b	T_{G+L}	RF A

Multi RAT: GSM: GMSK, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.35 a-c	$M4_{G+L}$	RF A

Multi RAT: GSM: 8PSK, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.36 a-c	Bim_{G+L}	RF A
3.37 a-c	Tim_{G+L}	RF A

Results NB IoT SA/ GB/ IB

B25 max power configuration:

Multi RAT: NB IoT SA/GB/IB: N-TM, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.38 a-c	B_{IoT+L}	RF A
3.39 a-c	$B_{IBIoT+L}$	RF A
3.40 a-c	M_{IoT+L}	RF A
3.41 a-c	M_{IoT+L}	RF B
3.42 a-c	M_{IoT+L}	RF C
3.43 a-c	M_{IoT+L}	RF D
3.44 a-c	$M_{IBIoT+L}$	RF A
3.45 a-c	T_{IoT+L}	RF A
3.46 a-c	$T_{IBIoT+L}$	RF A
3.47 a-c	$T10_{Guard}$	RF A
3.48 a-c	$T15_{Guard}$	RF A
3.49 a-c	$T20_{Guard}$	RF A

B66 max power configuration:

Multi RAT: NB IoT SA/GB/IB: N-TM, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.50 a-c	B_{IoT+L}	RF B
3.51 a-c	$B_{IBIoT+L}$	RF B
3.52 a-c	$B10_{Guard}$	RF B
3.53 a-c	$B15_{Guard}$	RF B
3.54 a-c	$B20_{Guard}$	RF B
3.55 a-c	M_{IoT+L}	RF A
3.56 a-c	M_{IoT+L}	RF B
3.57 a-c	M_{IoT+L}	RF C
3.58 a-c	M_{IoT+L}	RF D
3.59 a-c	$M_{IBIoT+L}$	RF B
3.60 a-c	T_{IoT+L}	RF B
3.61 a-c	$T_{IBIoT+L}$	RF B

Results GSM+NB IoT SA+LTE

B2 max power configuration:

Multi RAT GSM: GMSK, NB IoT SA: N-TM, LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.62 a-c	$Bim_{G+IoT+L}$	RF A
3.63 a-c	$Tim_{G+IoT+L}$	RF A
3.64 a-c	$Max_{G+IoT+L}$	RF A

Note: Measurements were mainly limited to port RF A due to the measurement result in single carrier mode that shows that the ports are electrical identical as declared by the client.

Remark

The emission at 9 kHz on the plots was not generated by the test object. A complementary measurement with a smaller RBW showed that it was related to the LO feed-through.

The highest fundamental frequency is 2180 MHz. The measurements were made up to 22 GHz (10x2180 MHz = 21.80 GHz).

Limits

CFR 47 §24.238, §27.53(h) and RSS-133 6.5, RSS-139 6.6

i. In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} P(\text{watts})$.

ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} P(\text{watts})$. If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

Complies?	Yes

Diagram 3.1a, E-TM1.1, B_3, 9 kHz – 3 GHz, Port A:

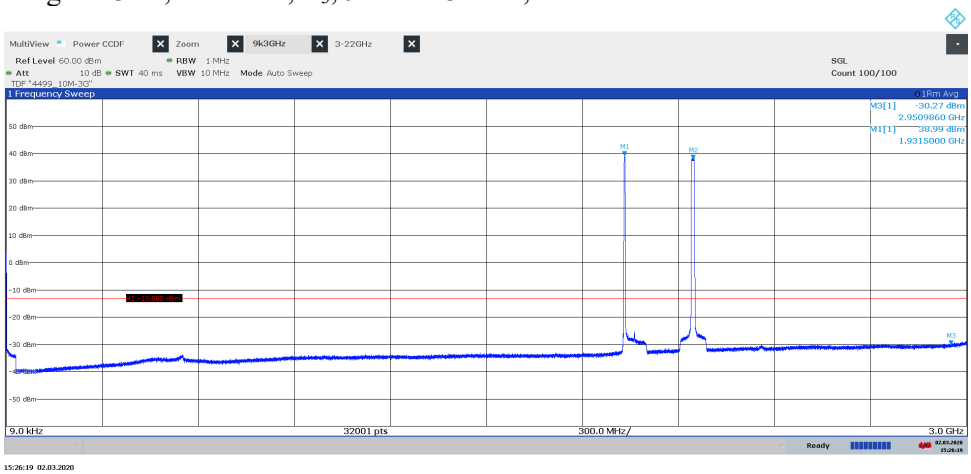


Diagram 3.1b, E-TM1.1, B_3, 3 GHz – 22 GHz, Port A:

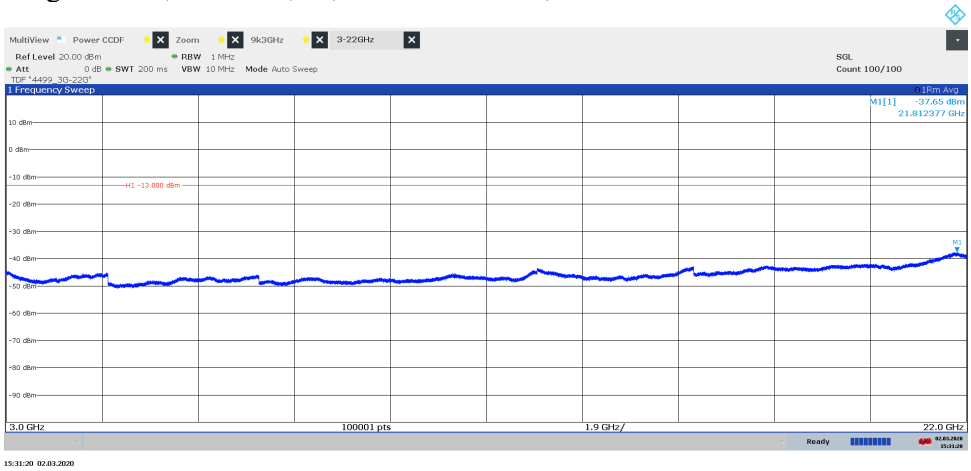


Diagram 3.2a, E-TM1.1, B_{20}, 9 kHz – 3 GHz, Port A:

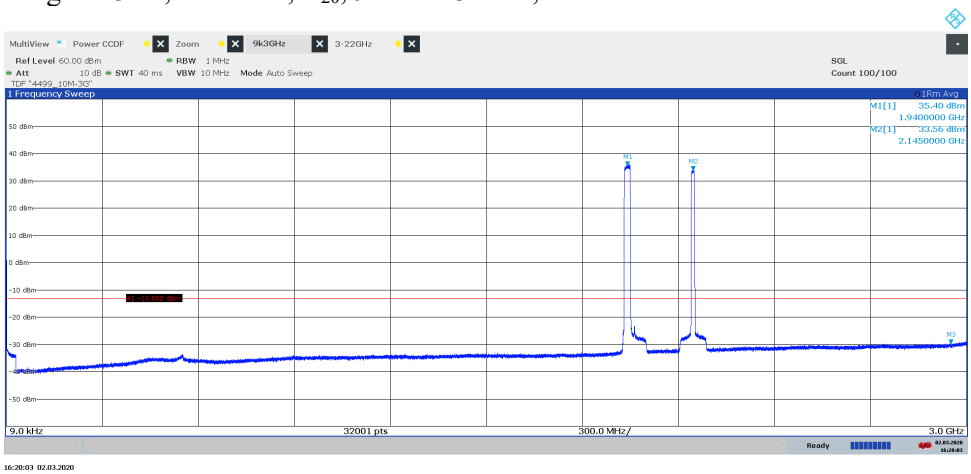


Diagram 3.2b, E-TM1.1, B_{20}, 3 GHz – 22 GHz, Port A:

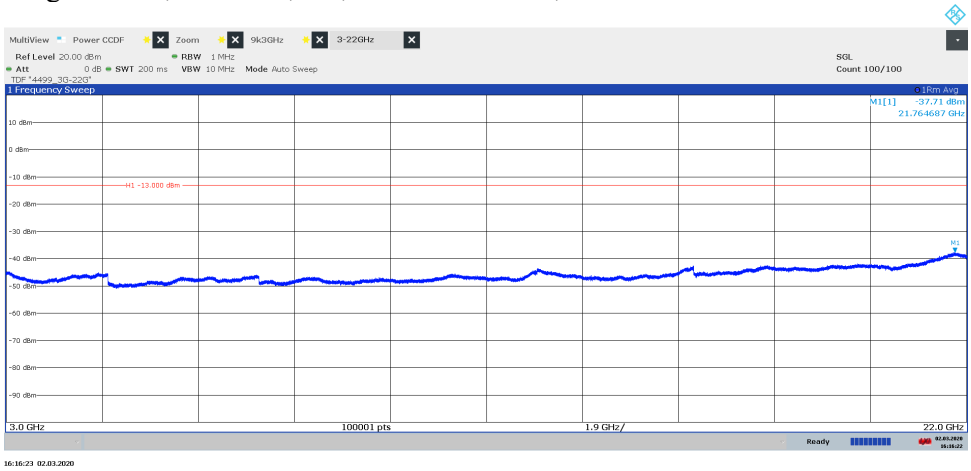


Diagram 3.3a, E-TM1.1, $M_{1.4}$, 9 kHz – 3 GHz, Port A:

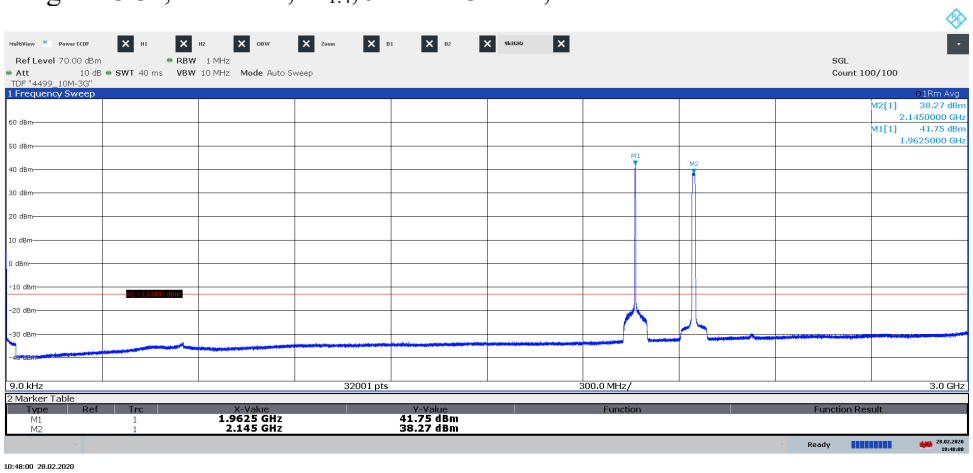


Diagram 3.3b, E-TM1.1, $M_{1.4}$, 3 GHz – 22 GHz, Port A:

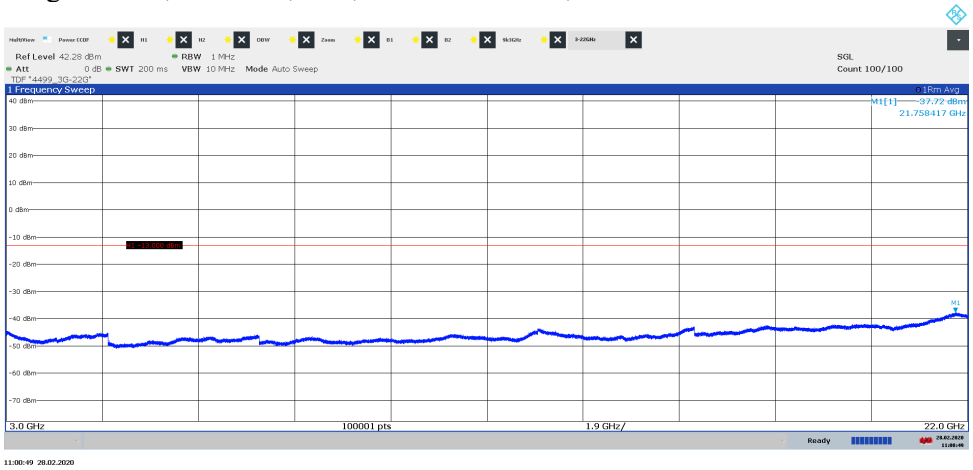


Diagram 3.4a, E-TM1.1, M_3, 9 kHz – 3 GHz, Port A:

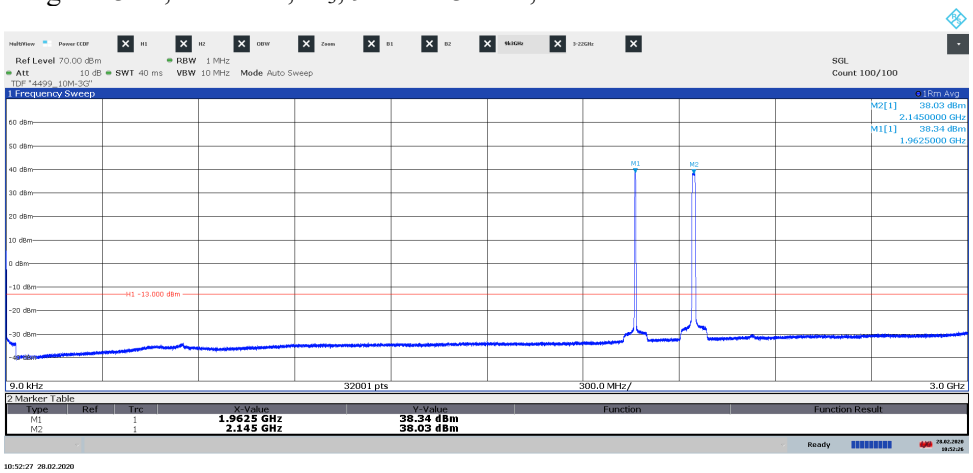


Diagram 3.4b, E-TM1.1, M_3, 3 GHz – 22 GHz, Port A:

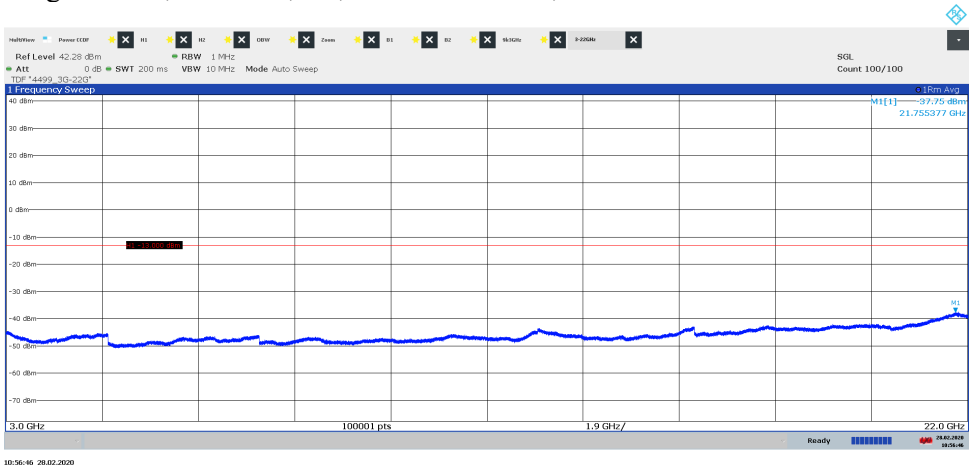


Diagram 3.5a, E-TM1.1, M_5, 9 kHz – 3 GHz, Port A:

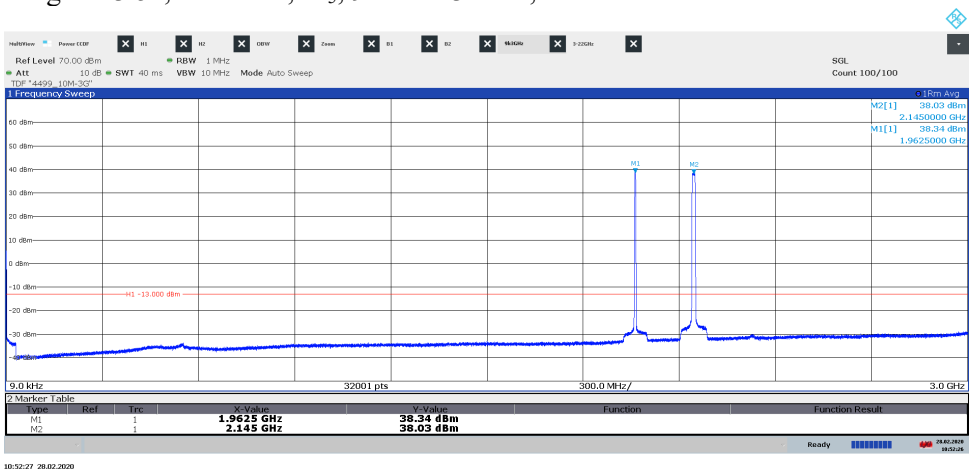


Diagram 3.5b, E-TM1.1, M_5, 3 GHz – 22 GHz, Port A:

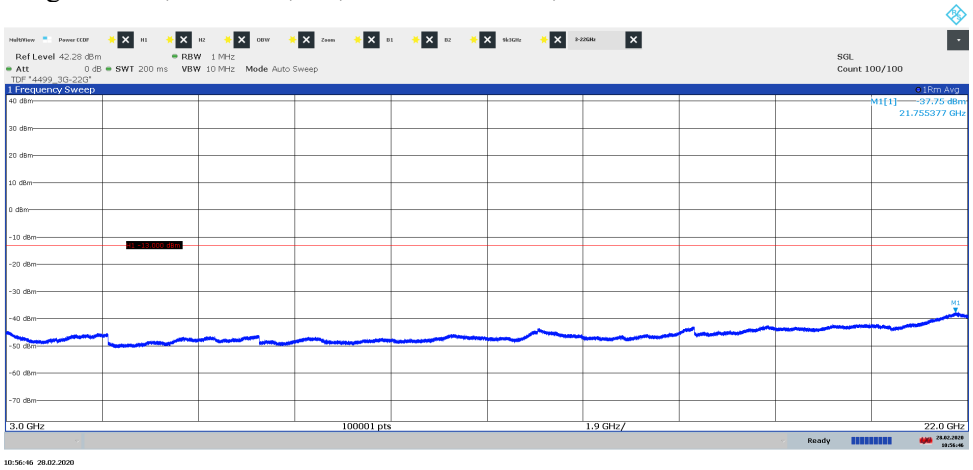


Diagram 3.6a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port A:

Diagram 3.6b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port A:

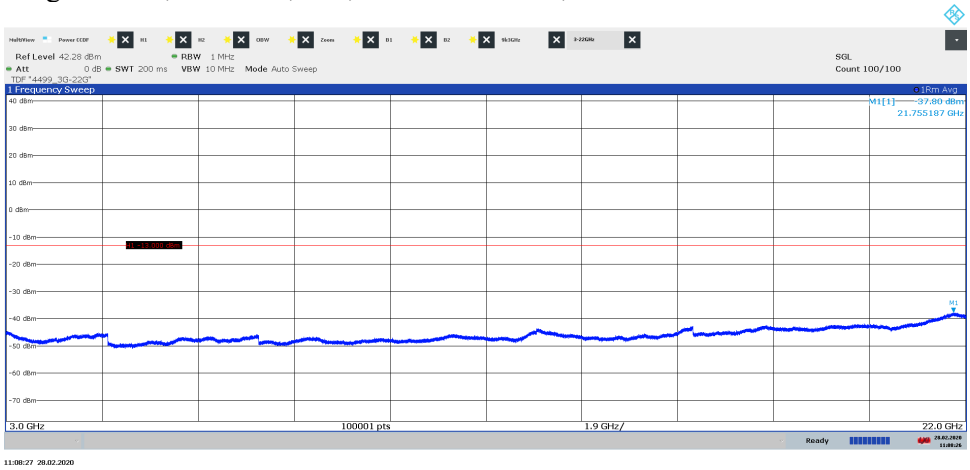


Diagram 3.7a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port B:

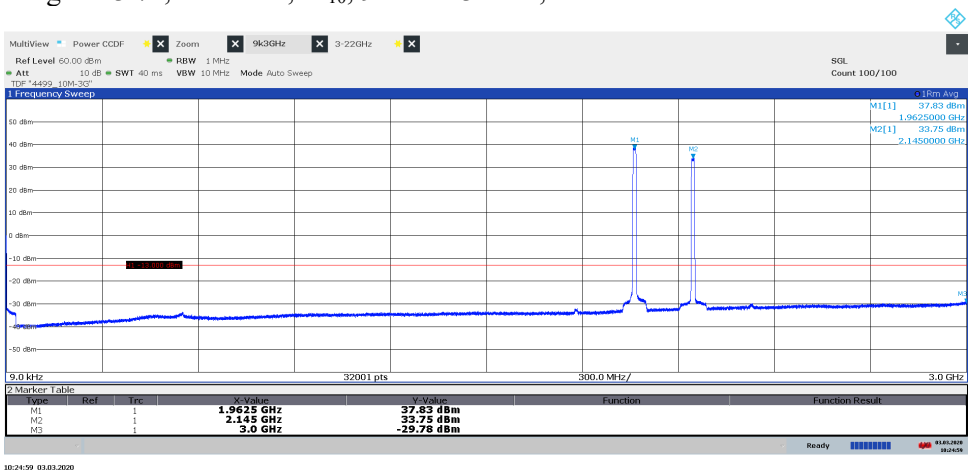


Diagram 3.7b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port B:

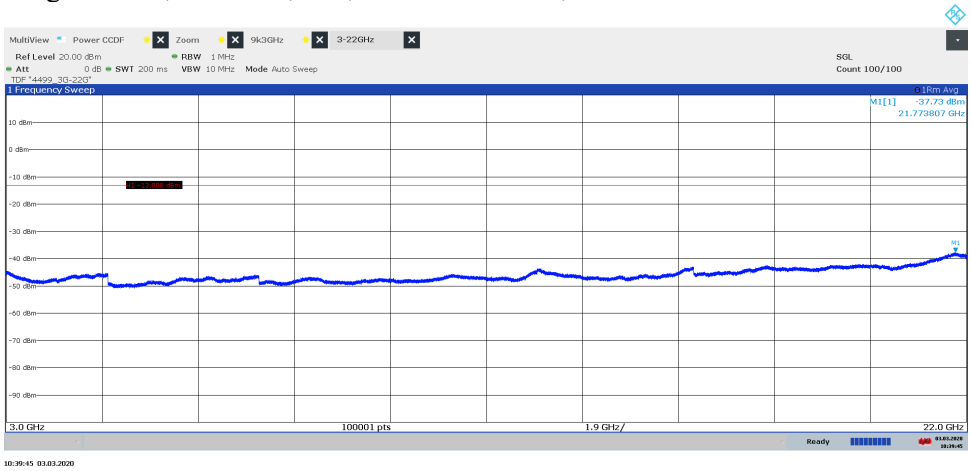


Diagram 3.8a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port C:

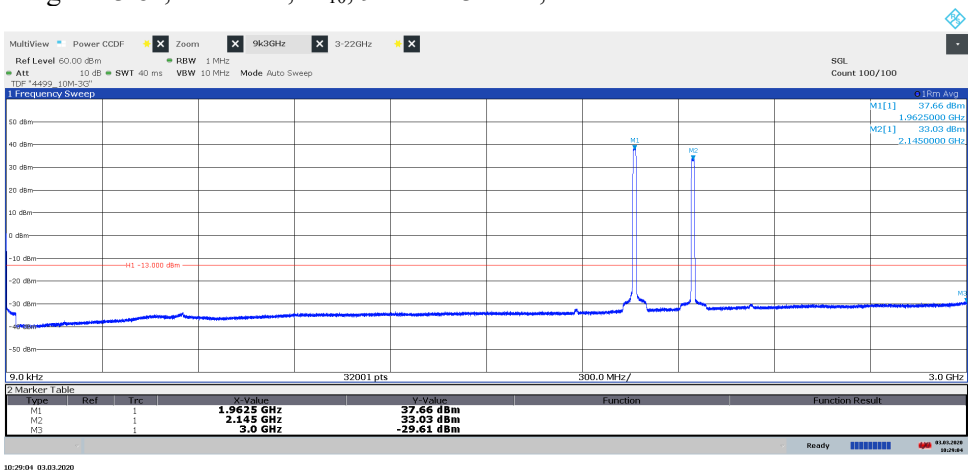


Diagram 3.8b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port C:

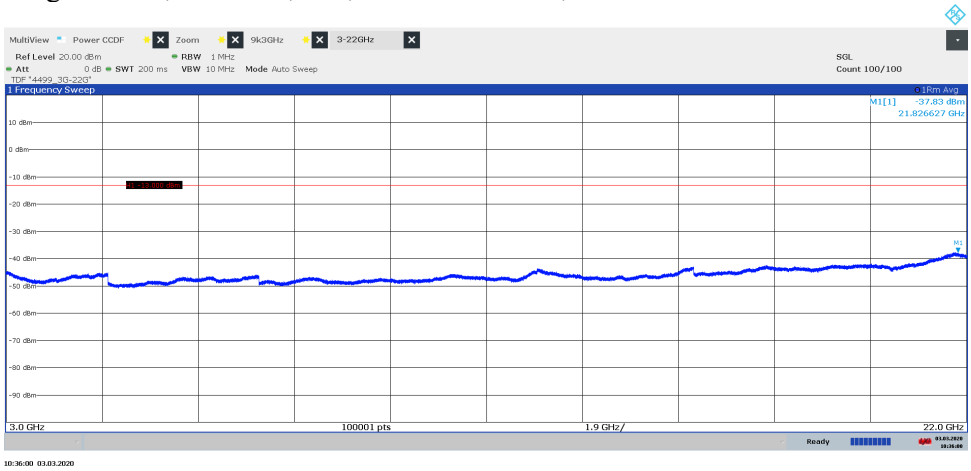


Diagram 3.9a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port D:

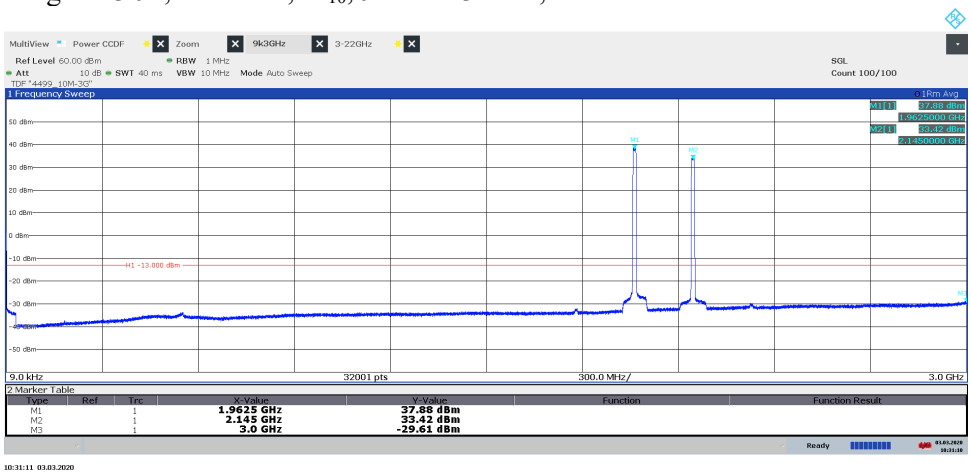


Diagram 3.9b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port D:

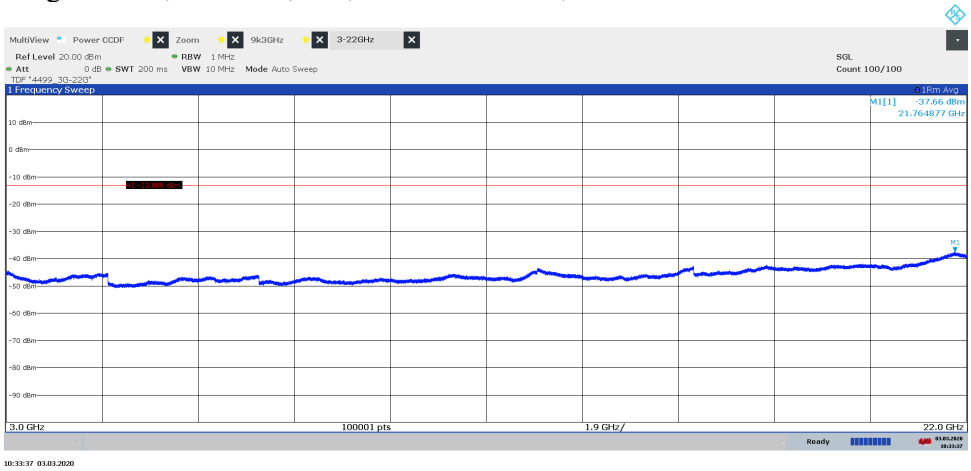


Diagram 3.10a, E-TM1.1, M_{15}, 9 kHz – 3 GHz, Port A:

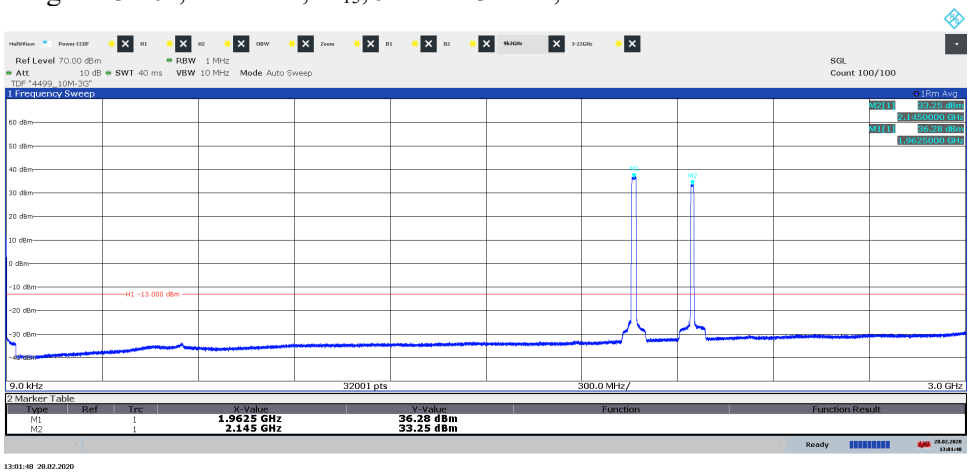


Diagram 3.10b, E-TM1.1, M_{15}, 3 GHz – 22 GHz, Port A:

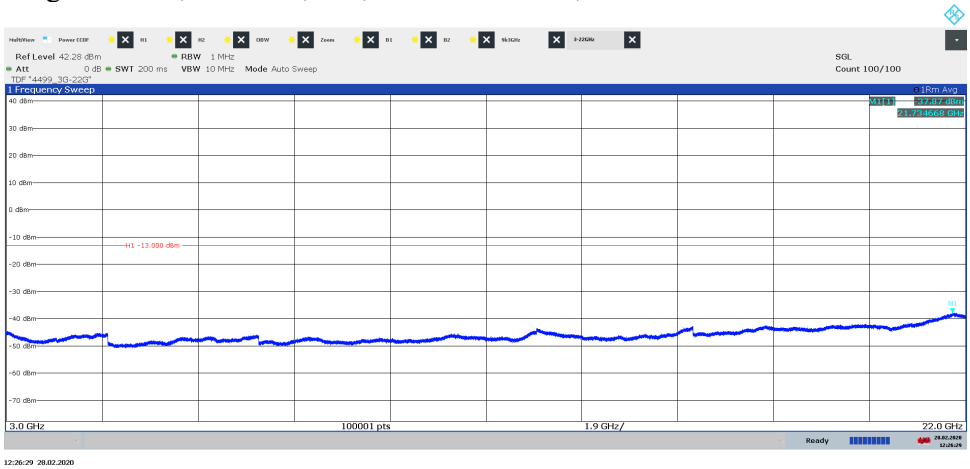


Diagram 3.11a, E-TM1.1, M_{20}, 9 kHz – 3 GHz, Port A:

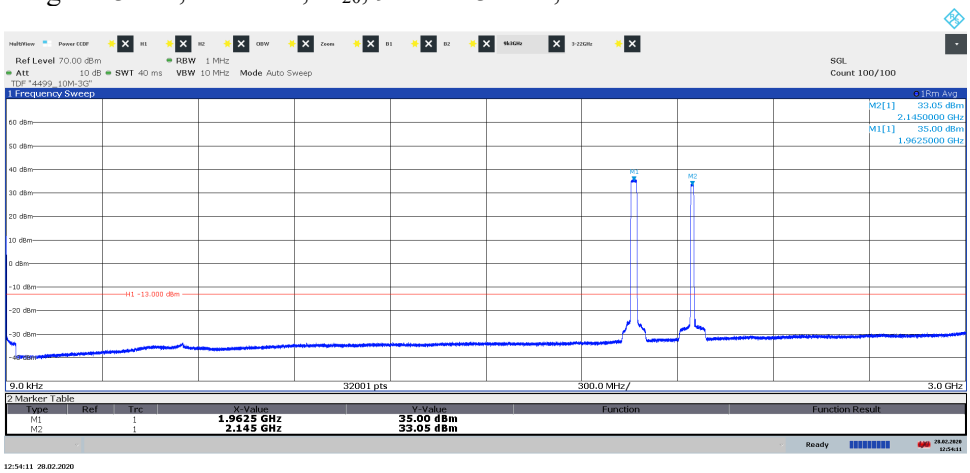


Diagram 3.11b, E-TM1.1, M_{20}, 3 GHz – 22 GHz, Port A:

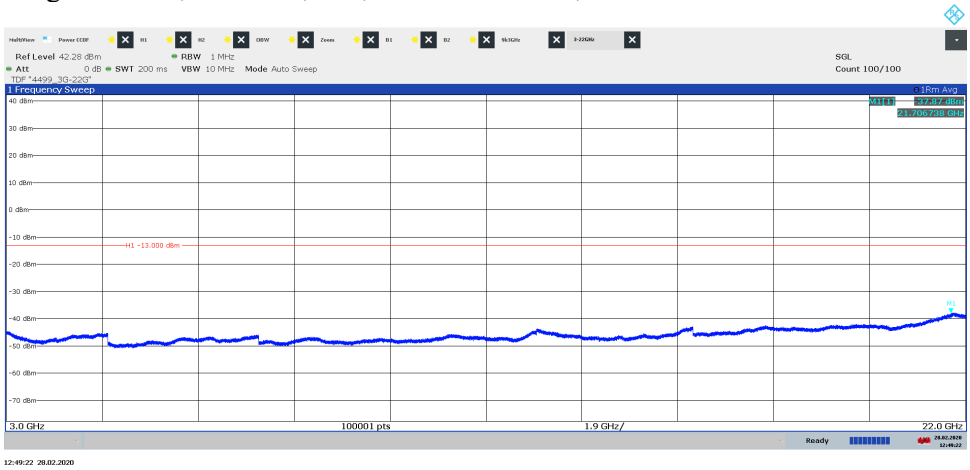


Diagram 3.12a, E-TM1.1, T_3, 9 kHz – 3 GHz, Port A:

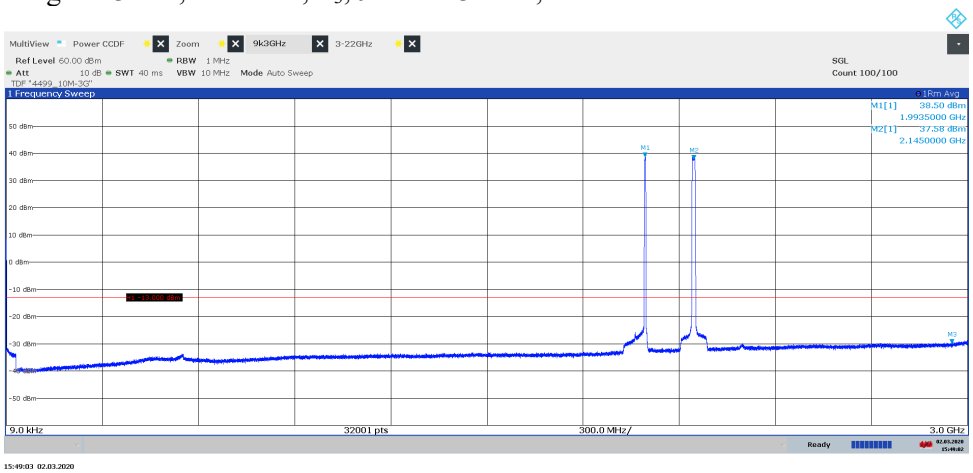


Diagram 3.12b, E-TM1.1, T_3, 3 GHz – 22 GHz, Port A:

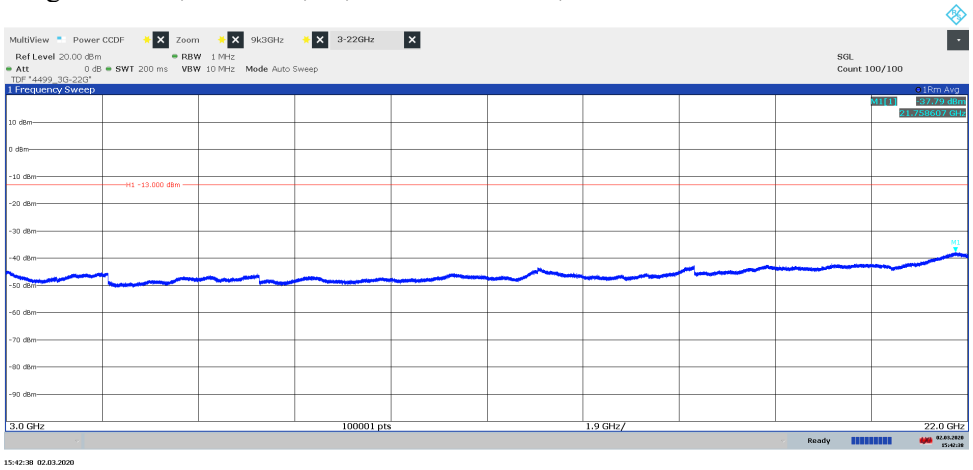


Diagram 3.13a, E-TM1.1, T_{20}, 9 kHz – 3 GHz, Port A:

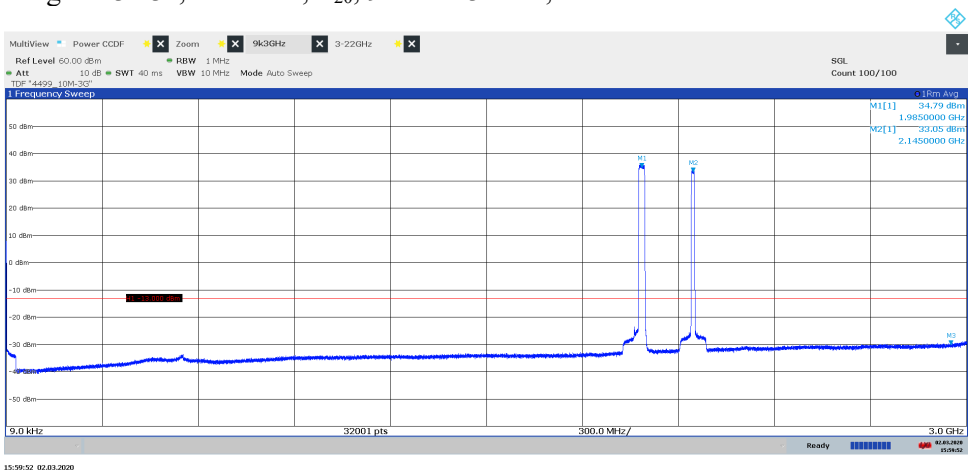


Diagram 3.13b, E-TM1.1, T_{20}, 3 GHz – 22 GHz, Port A:

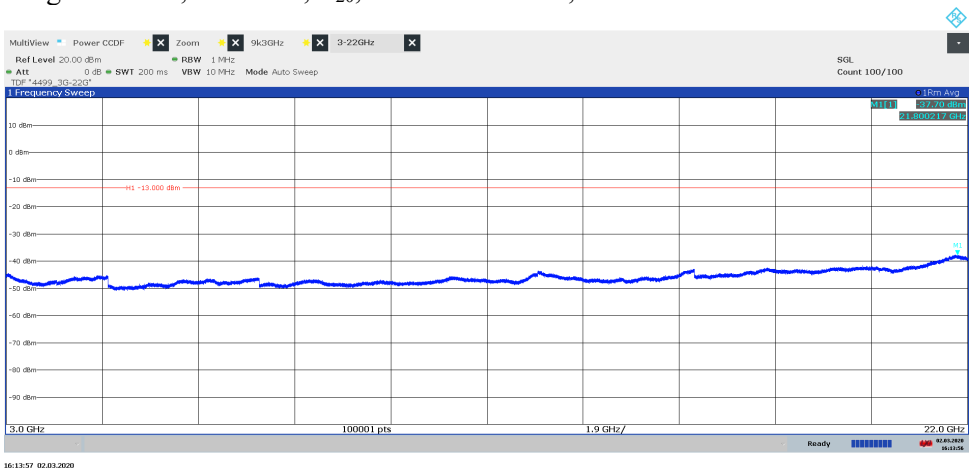


Diagram 3.14a, E-TM1.1, Bim_3, 9 kHz – 3 GHz, Port A:

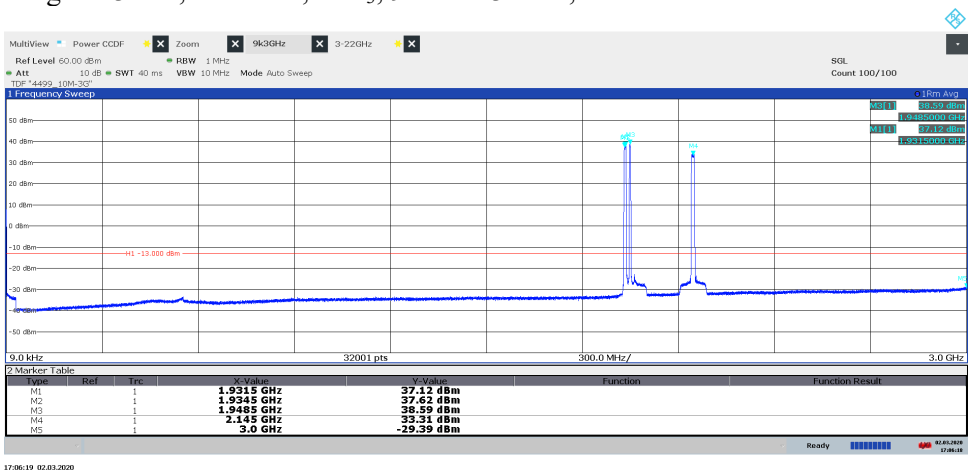
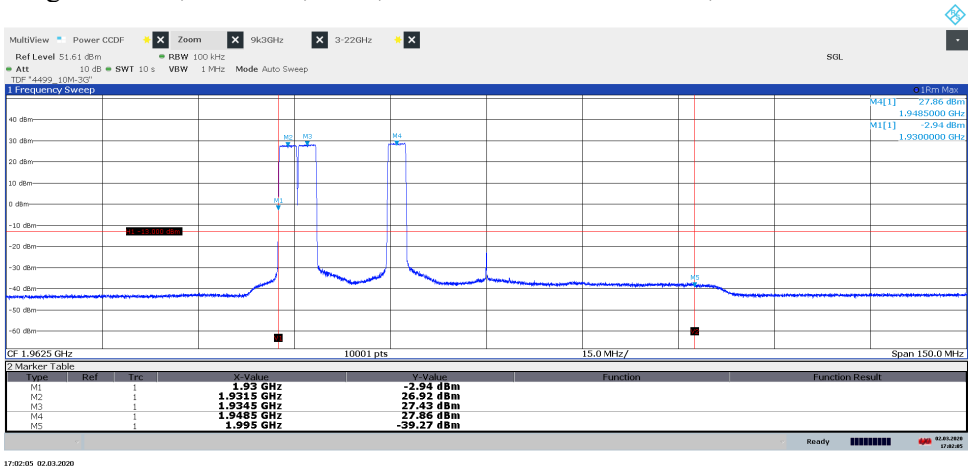


Diagram 3.14b, E-TM1.1, Bim_3, 1.8875 GHz – 2.0375 GHz, Port A:



Note: The purpose of this measurement is to find IM products, not to verify compliance at the edges.

Diagram 3.14c, E-TM1.1, Bim_3, 3 GHz – 22 GHz, Port A:

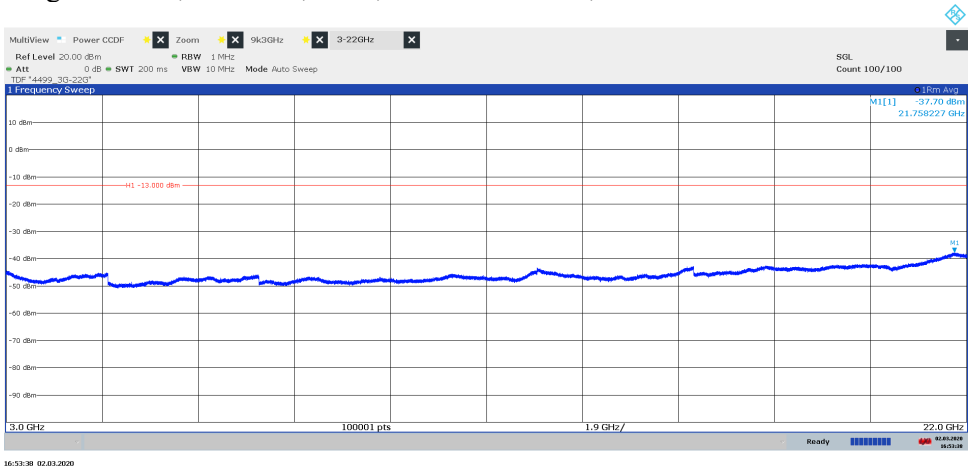


Diagram 3.15a, E-TM1.1, Tim_3, 9 kHz – 3 GHz, Port A:

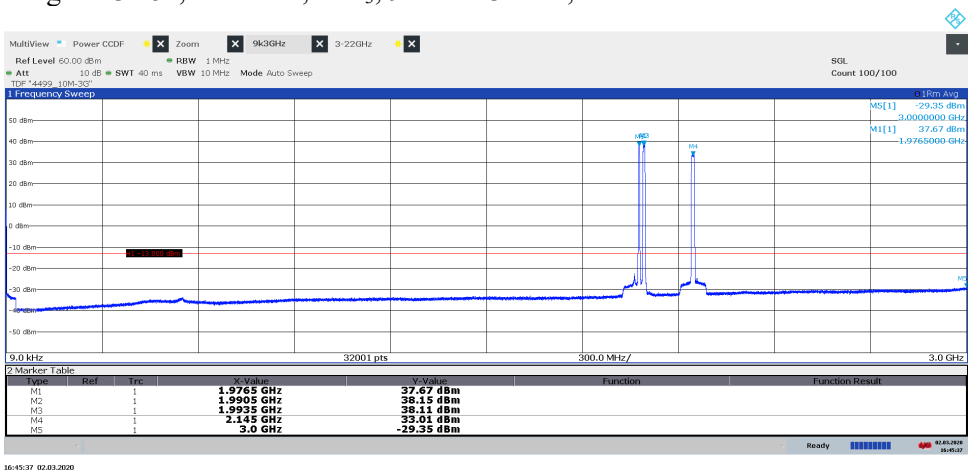
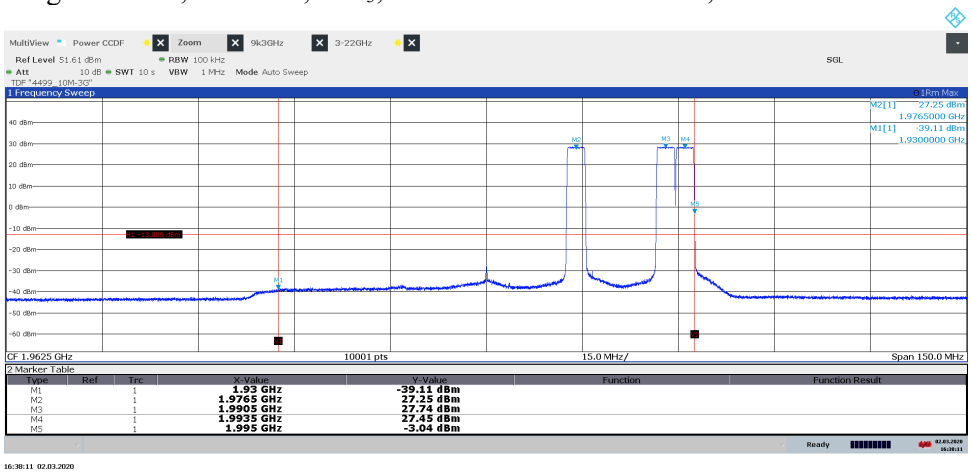


Diagram 3.15b, E-TM1.1, Tim_3, 1.8875 GHz – 2.0375 GHz, Port A:



Note: The purpose of this measurement is to find IM products, not to verify compliance at the Band edges.

Diagram 3.15c, E-TM1.1, Tim_3, 3 GHz – 22 GHz, Port A:

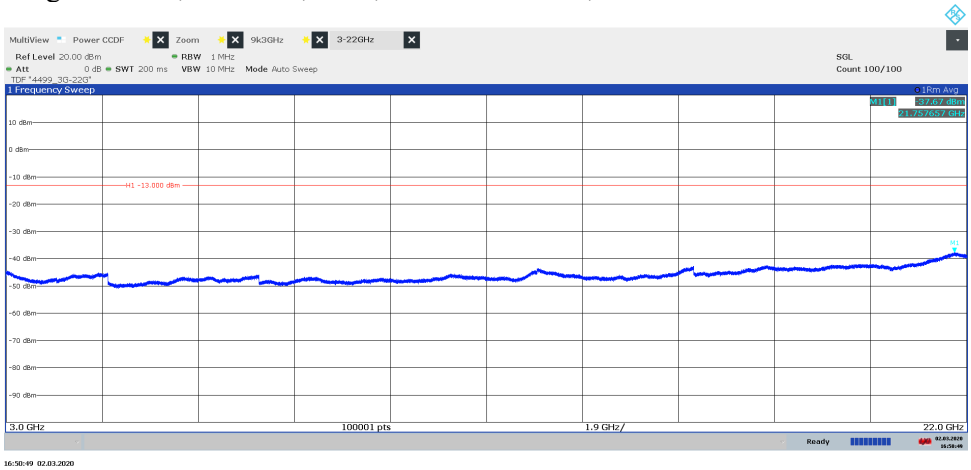


Diagram 3.16a, E-TM1.1, $M6_{10}$, 9 kHz – 3 GHz, Port A:

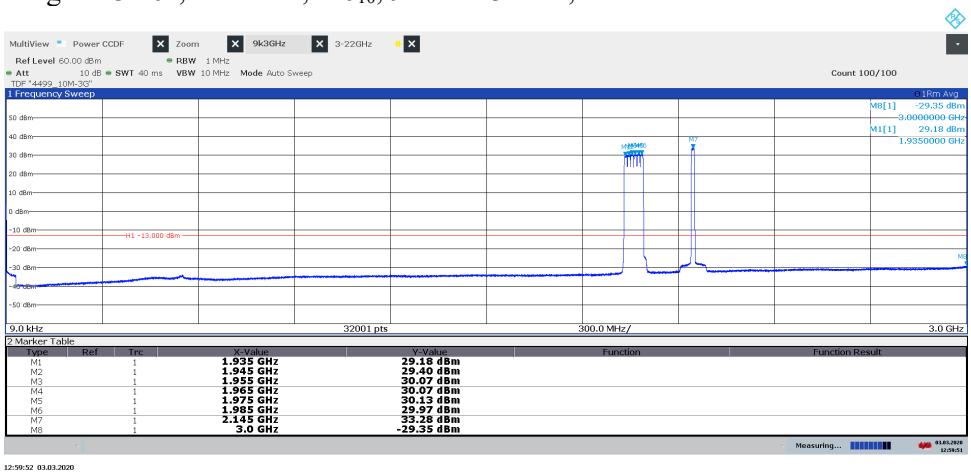


Diagram 3.16b, E-TM1.1, $M6_{10}$, 1.8875 GHz – 2.0375 GHz, Port A:

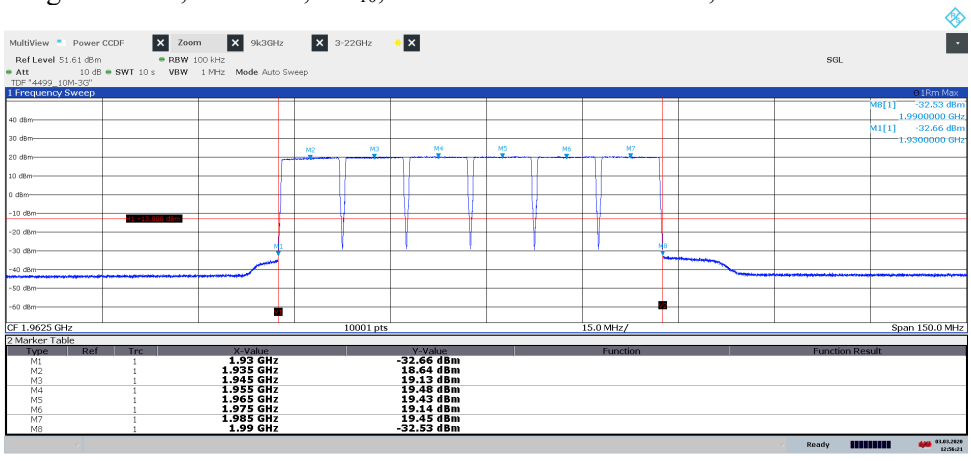


Diagram 3.16c, E-TM1.1, $M6_{10}$, 3 GHz – 22 GHz, Port A:

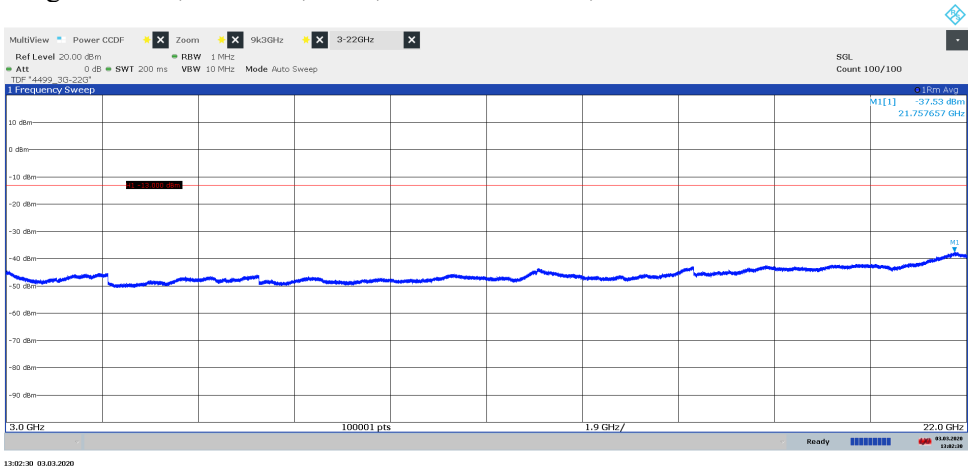


Diagram 3.17a, E-TM1.1, B_{10}, 9 kHz – 3 GHz, Port B:

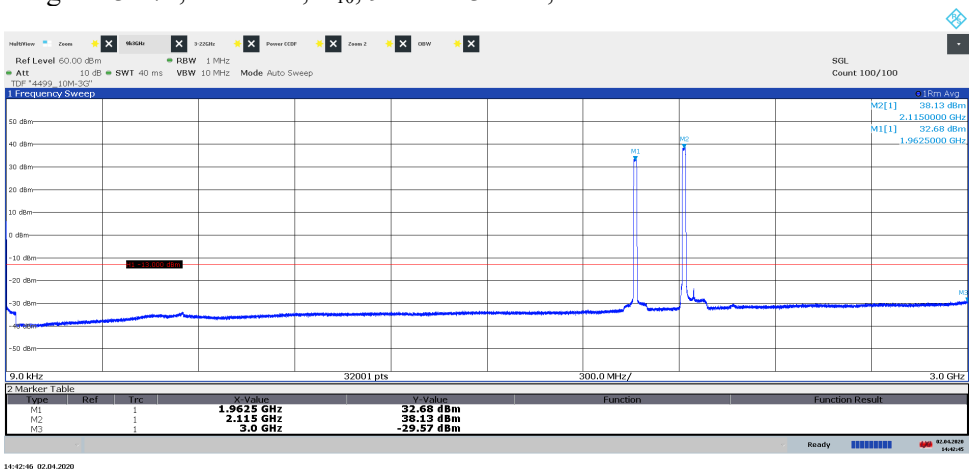


Diagram 3.17b, E-TM1.1, B_{10}, 3 GHz – 22 GHz, Port B:

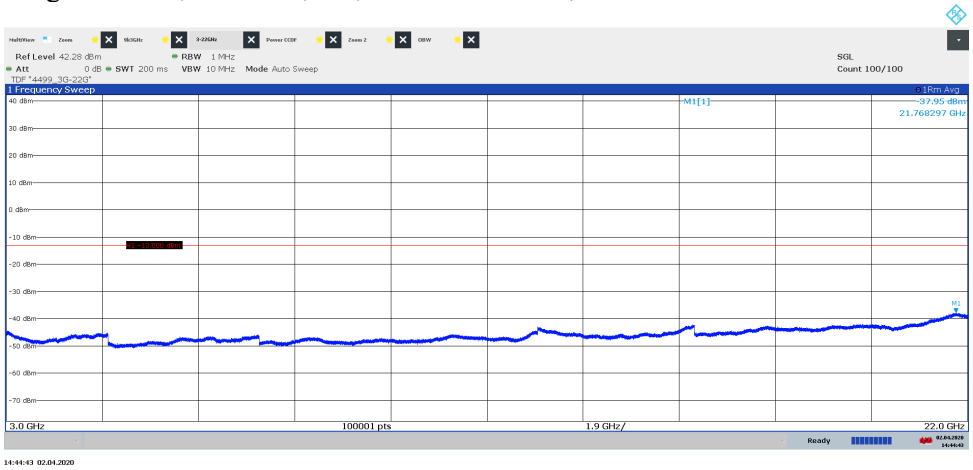


Diagram 3.18a, E-TM1.1, M_5, 9 kHz – 3 GHz, Port B:

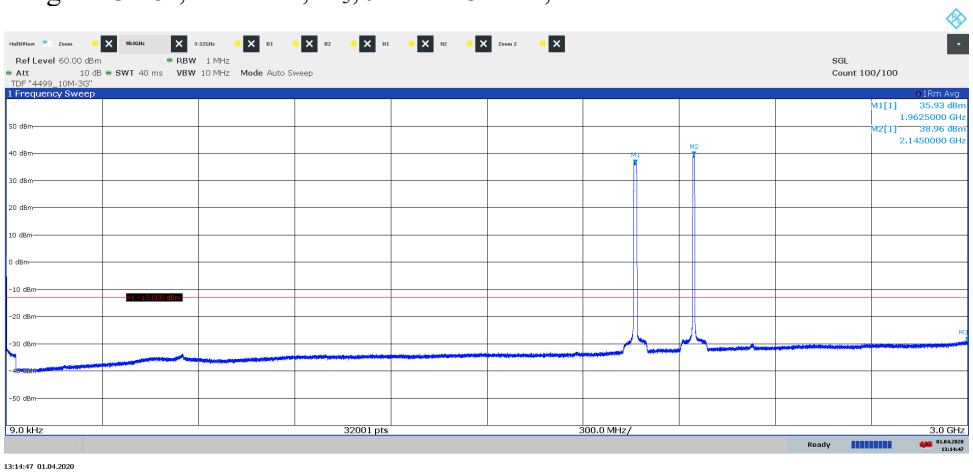


Diagram 3.18b, E-TM1.1, M_5, 3 GHz – 22 GHz, Port B:

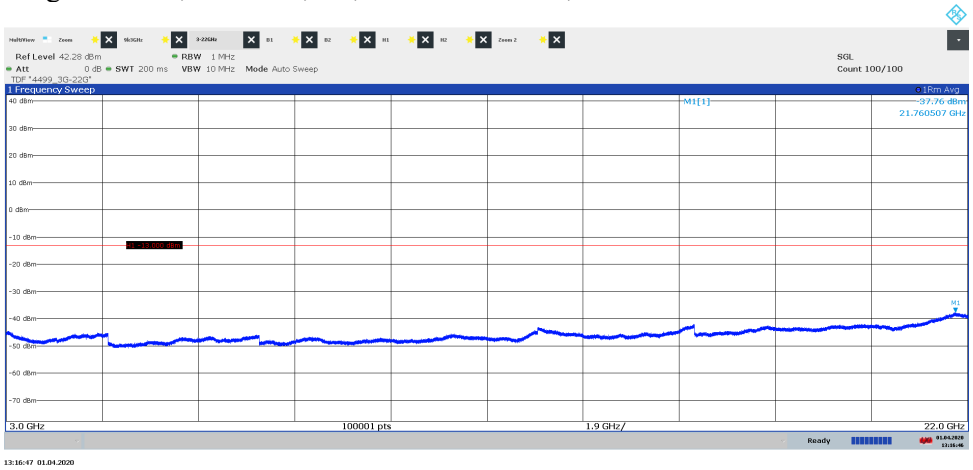


Diagram 3.19a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port A:

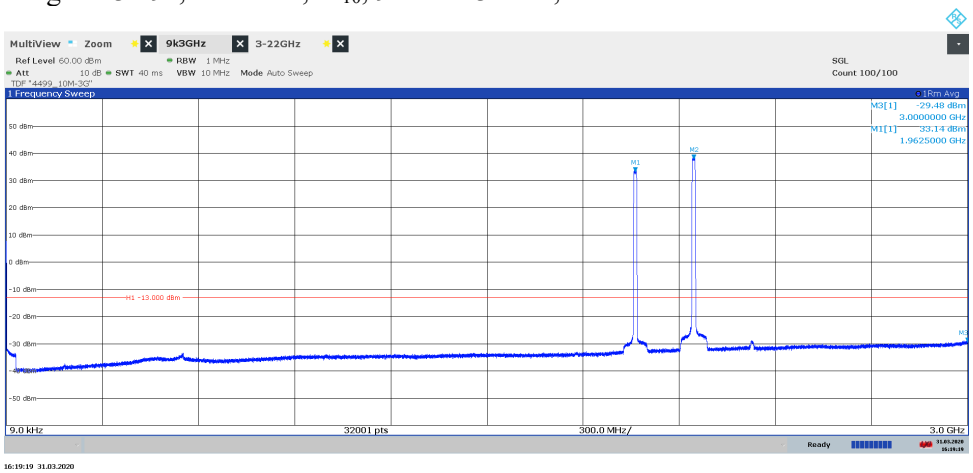


Diagram 3.19b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port A:

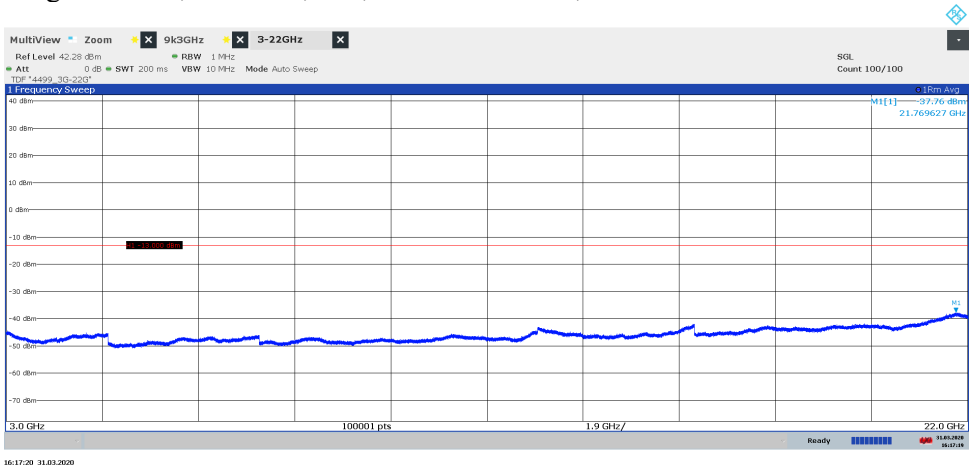


Diagram 3.20a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port B:

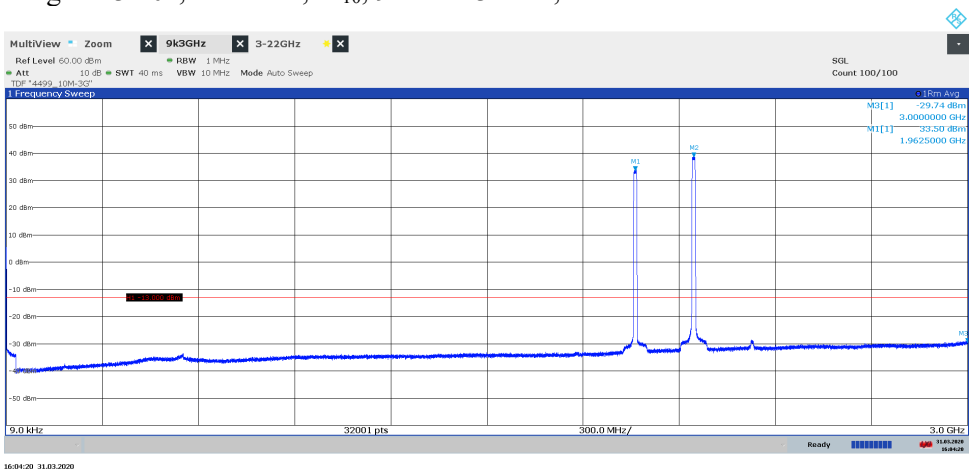


Diagram 3.20b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port B:

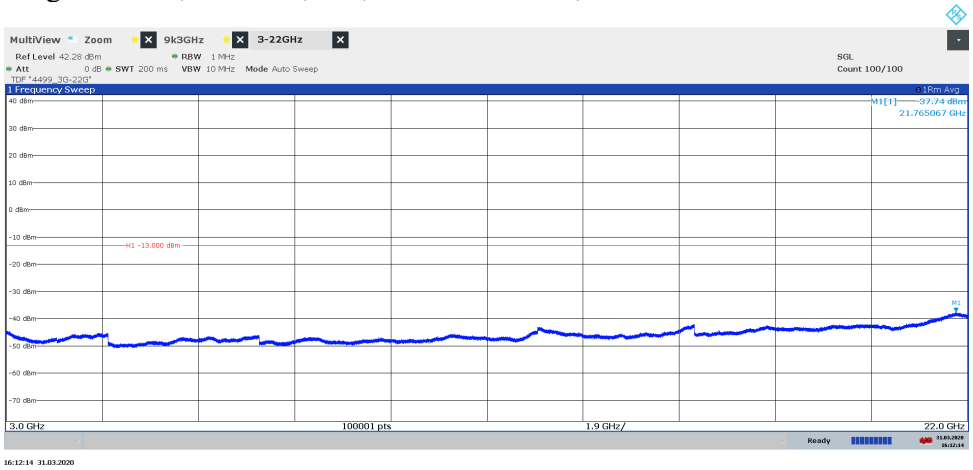


Diagram 3.21a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port C:

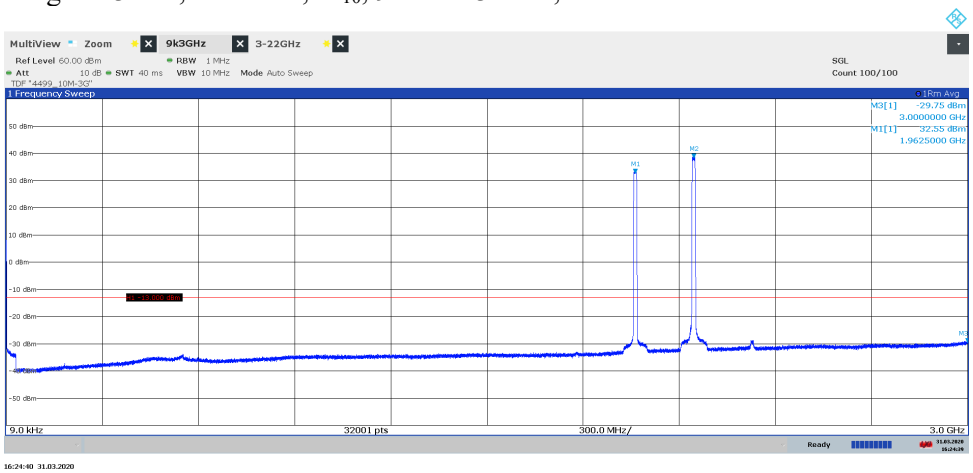


Diagram 3.21b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port C:

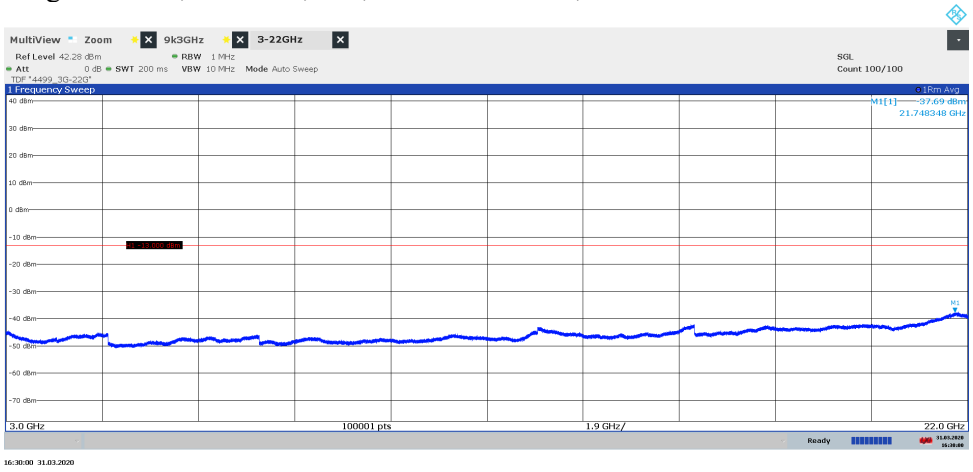


Diagram 3.22a, E-TM1.1, M_{10}, 9 kHz – 3 GHz, Port D:

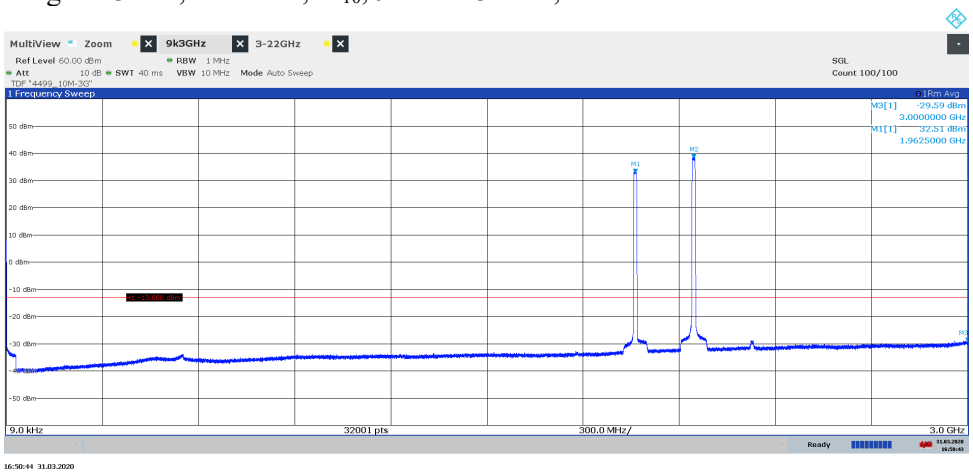


Diagram 3.22b, E-TM1.1, M_{10}, 3 GHz – 22 GHz, Port D:

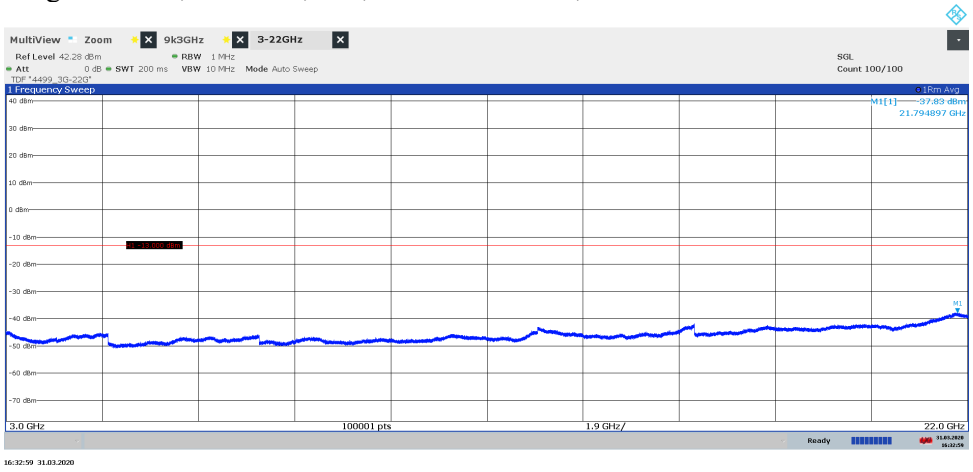


Diagram 3.23a, E-TM1.1, M_{15}, 9 kHz – 3 GHz, Port B:

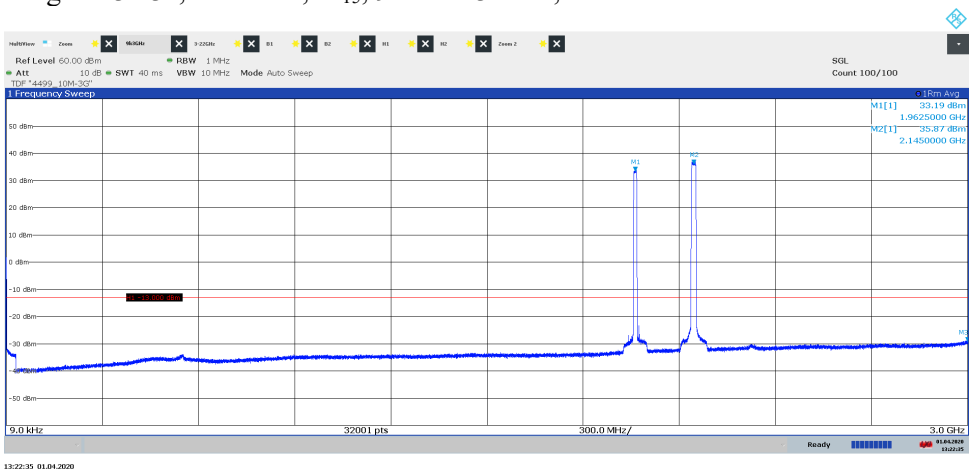


Diagram 3.23b, E-TM1.1, M_{15}, 3 GHz – 22 GHz, Port B:

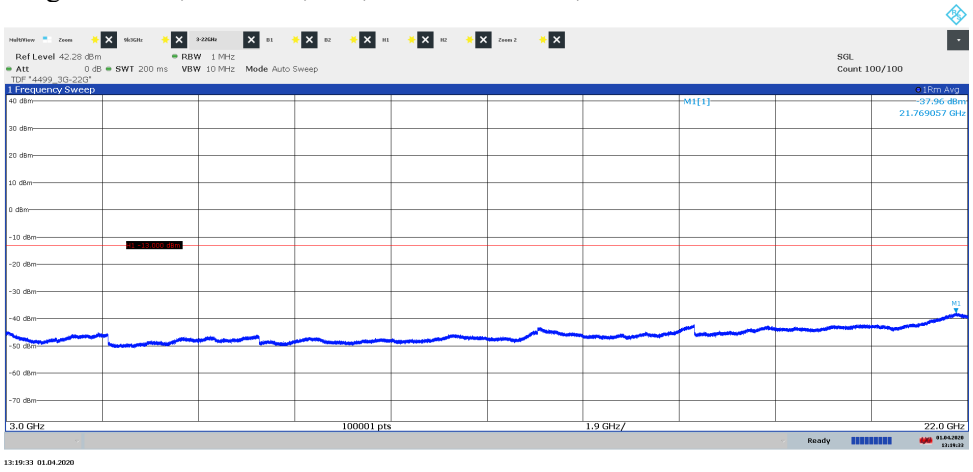


Diagram 3.24a, E-TM1.1, M_{20}, 9 kHz – 3 GHz, Port B:

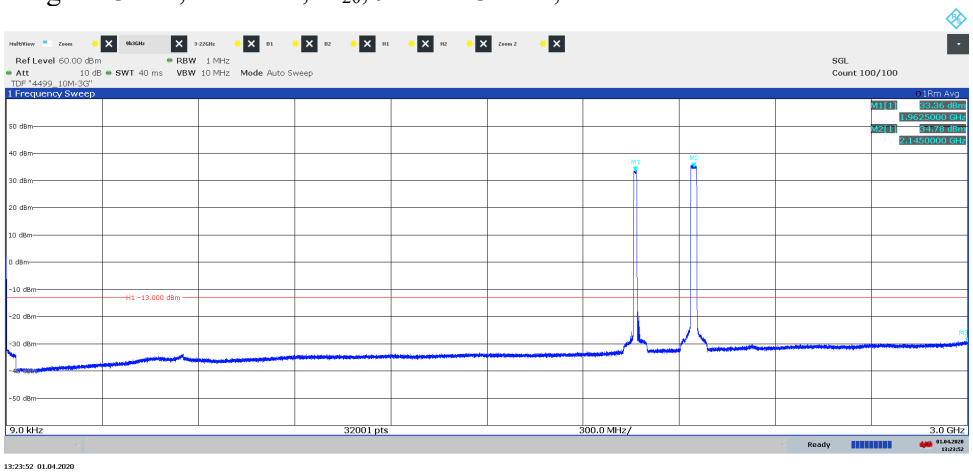


Diagram 3.24b, E-TM1.1, M_{20}, 3 GHz – 22 GHz, Port B: