Diagram 2.13 NR: FR1-TM1.1, T_{5NR}, Port A:

Diagram 2.14 NR: FR1-TM1.1, T_{10NR}, Port A:

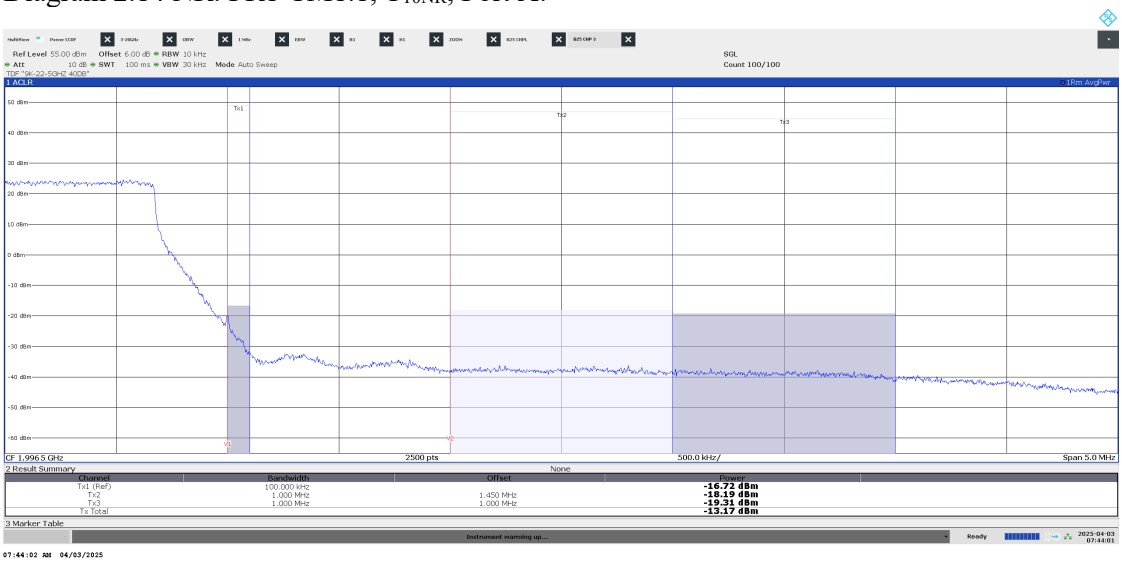


Diagram 2.15 NR: FR1-TM1.1, T_{15NR}, Port A:

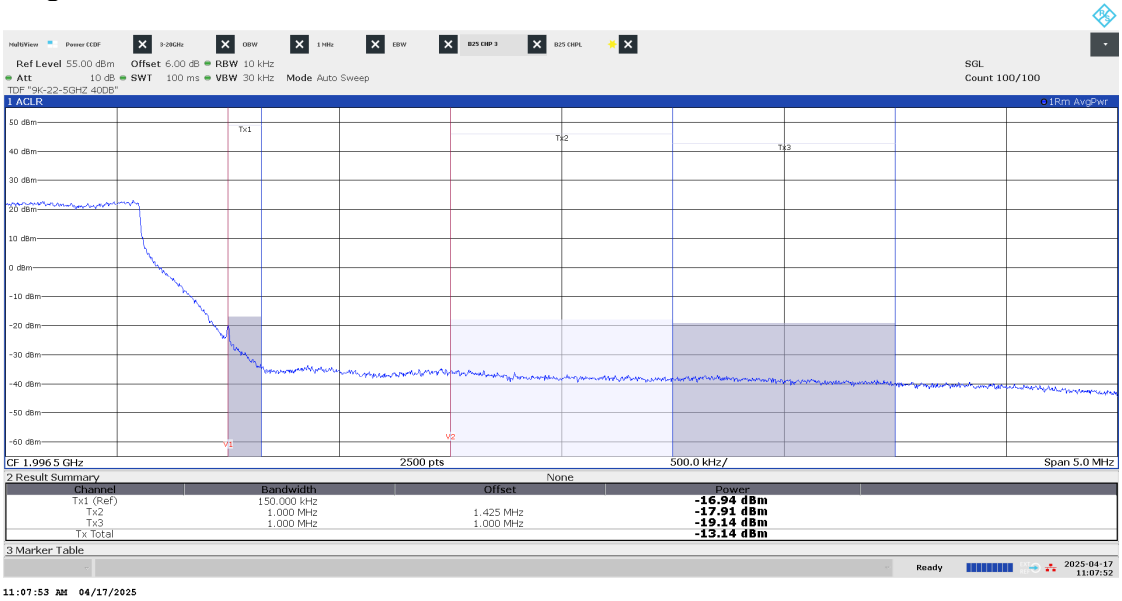


Diagram 2.16 NR: FR1-TM1.1, T_{20NR}, Port A:

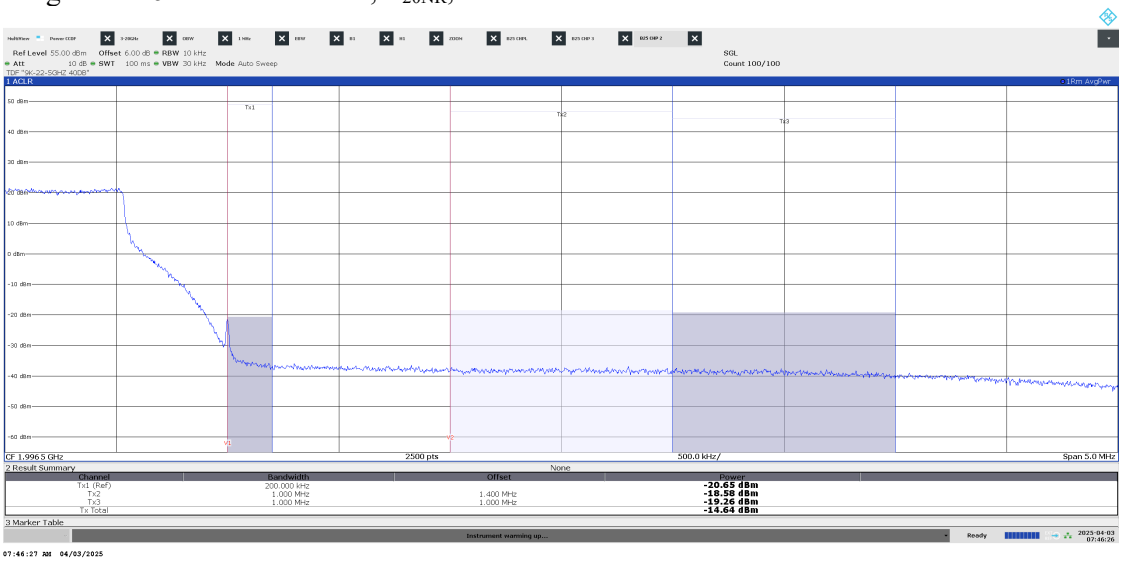


Diagram 2.17 NR: FR1-TM1.1, B_{25NR}, Port A:

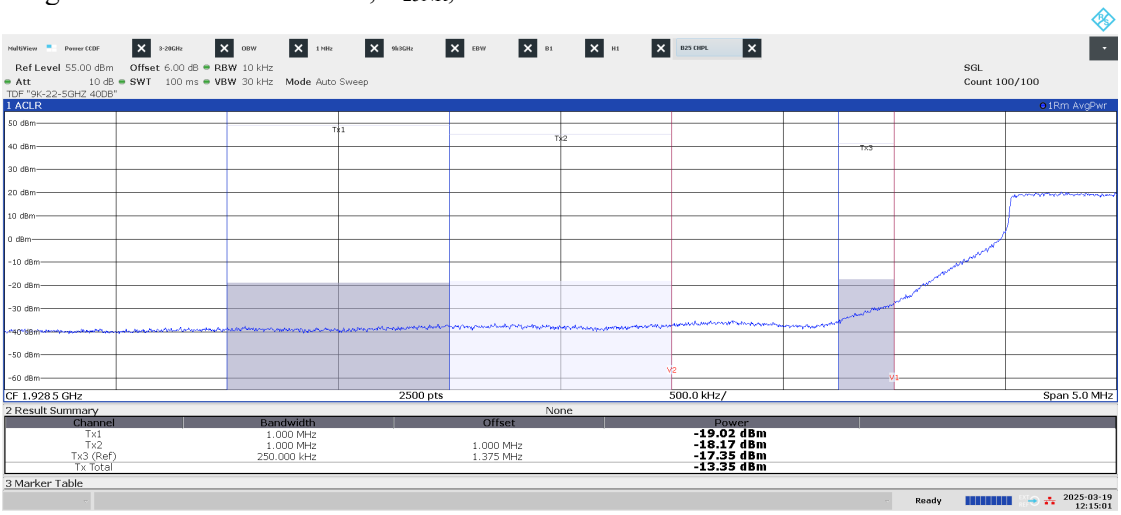


Diagram 2.18 NR: FR1-TM1.1, T_{25NR}, Port A:

Diagram 2.19 NR: FR1-TM1.1, B_{30NR}, Port A:

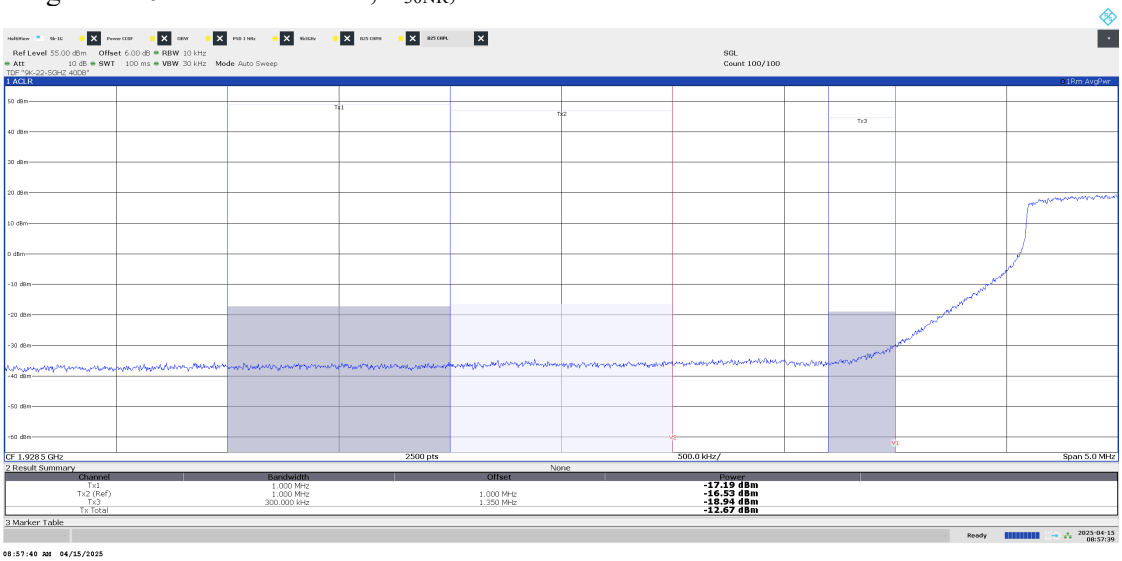


Diagram 2.20 NR: FR1-TM1.1, T_{30NR}, Port A:

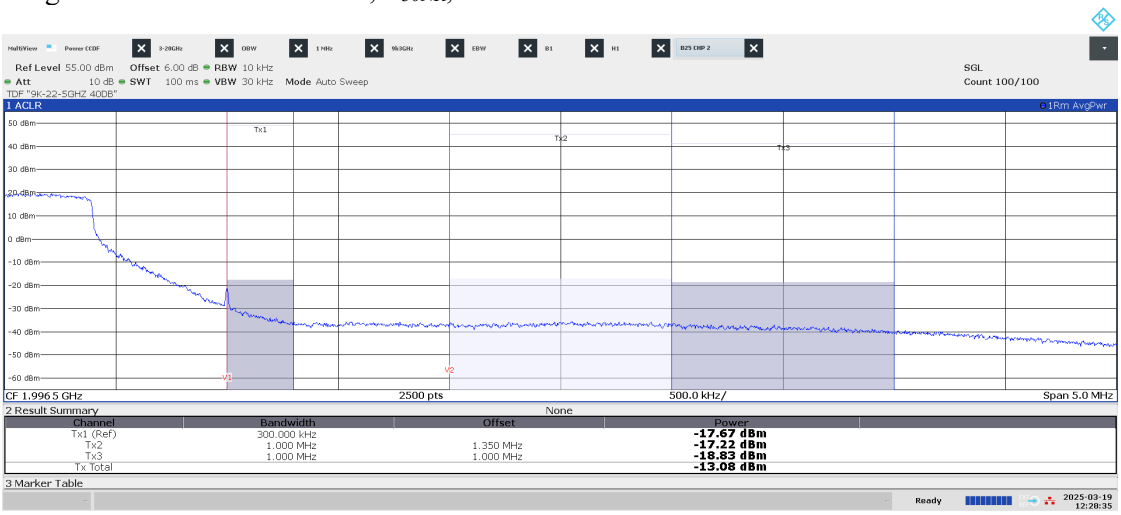


Diagram 2.21 NR: FR1-TM1.1, B_{40NR}, Port A:

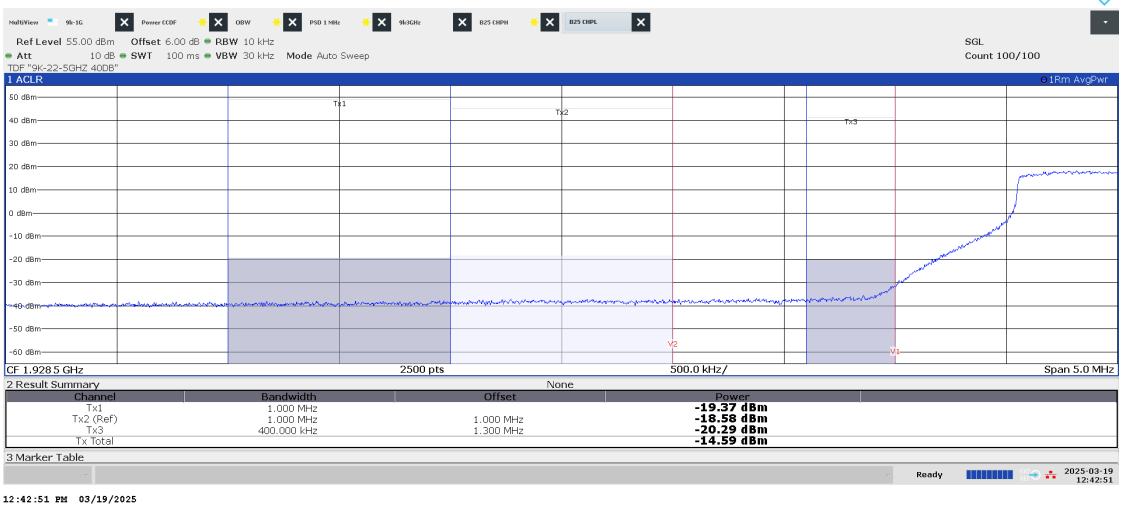


Diagram 2.22 NR: FR1-TM1.1, T_{40NR}, Port A:

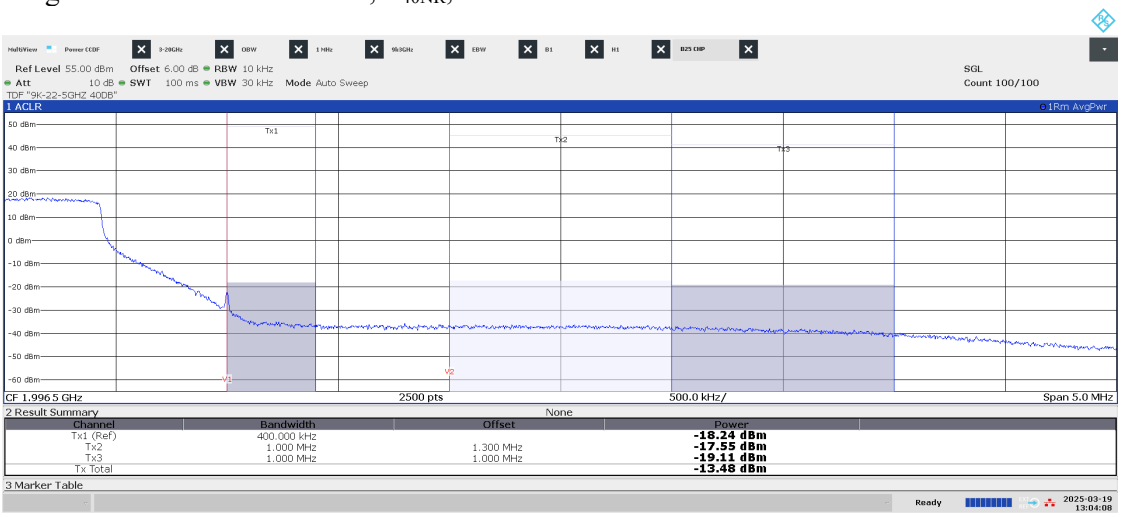


Diagram 2.23 NB IoT: N-TM, LTE: E-TM1.1, $B_{GB+10LTE}$, Port A:

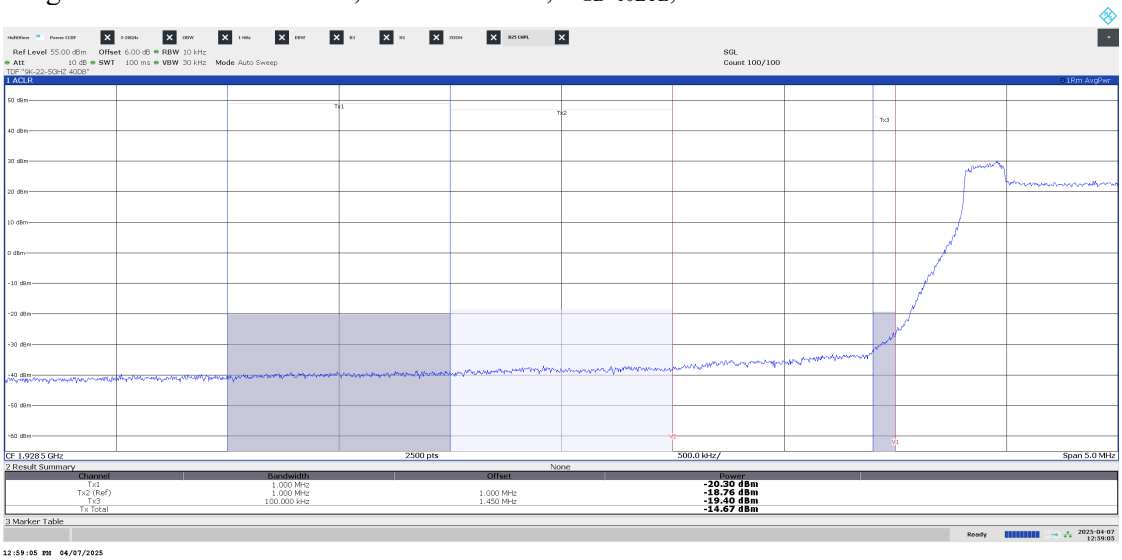


Diagram 2.24 NB IoT: N-TM, LTE: E-TM1.1, $T_{GB+10LTE}$, Port A:

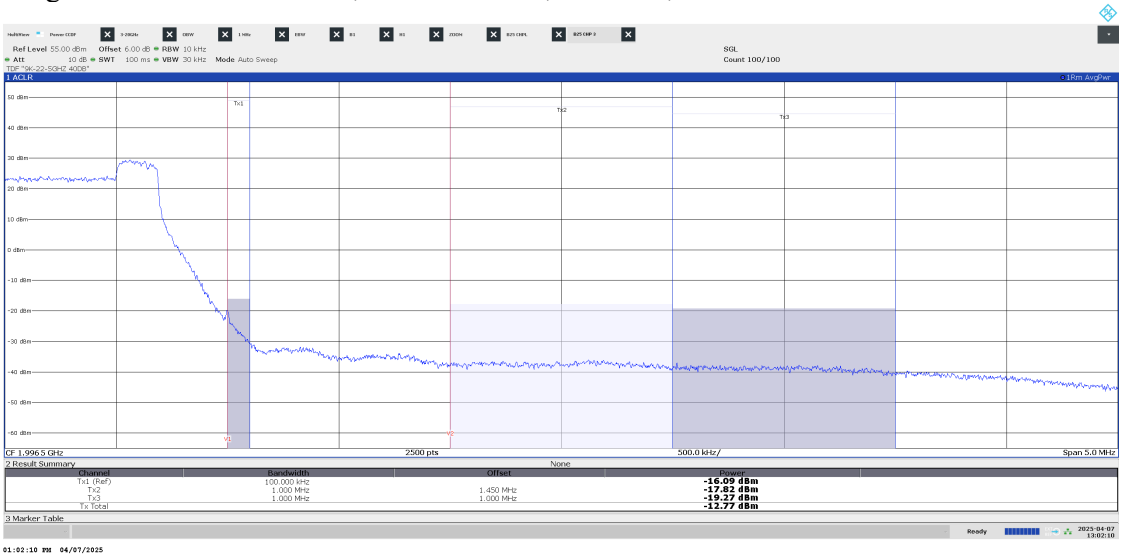


Diagram 2.25 NB IoT: N-TM, LTE: E-TM1.1, $B_{GB+15LTE}$, Port A:

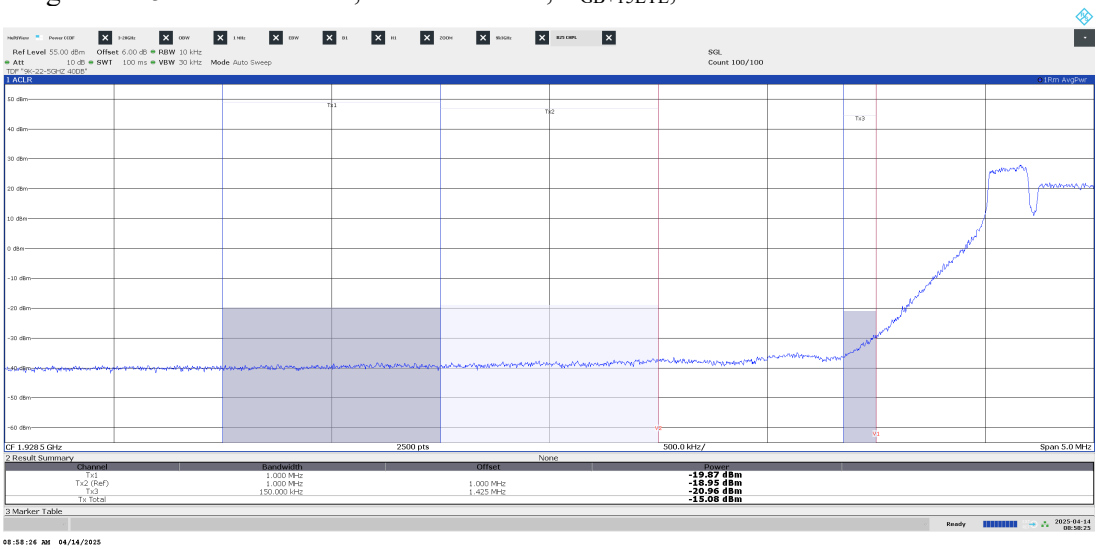


Diagram 2.26 NB IoT: N-TM, LTE: E-TM1.1, $T_{GB+15LTE}$, Port A:

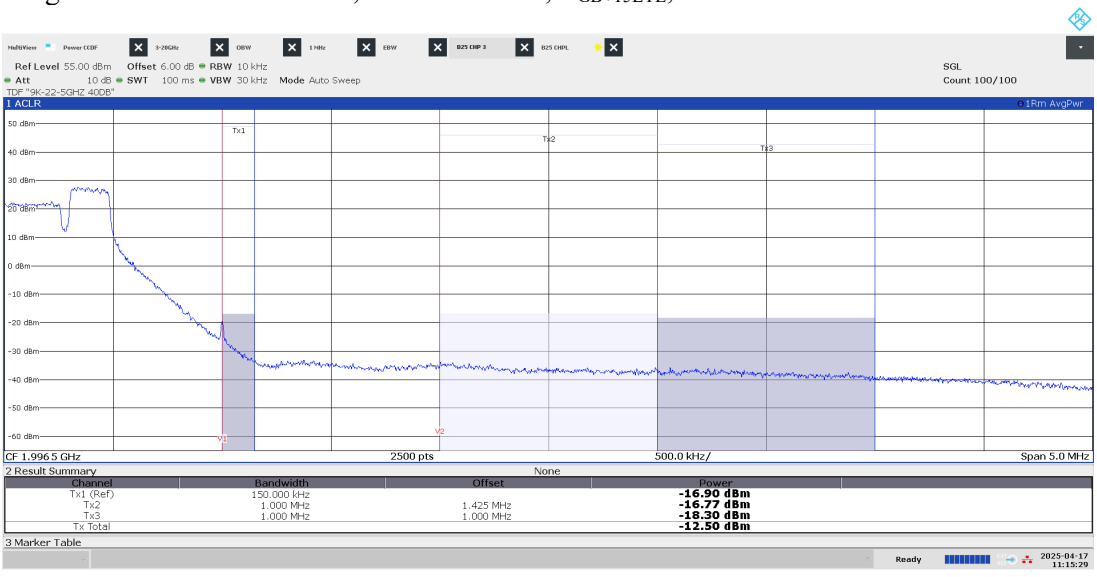


Diagram 2.27 NB IoT: N-TM, LTE: E-TM1.1, $B_{GB+20LTE}$, Port A:

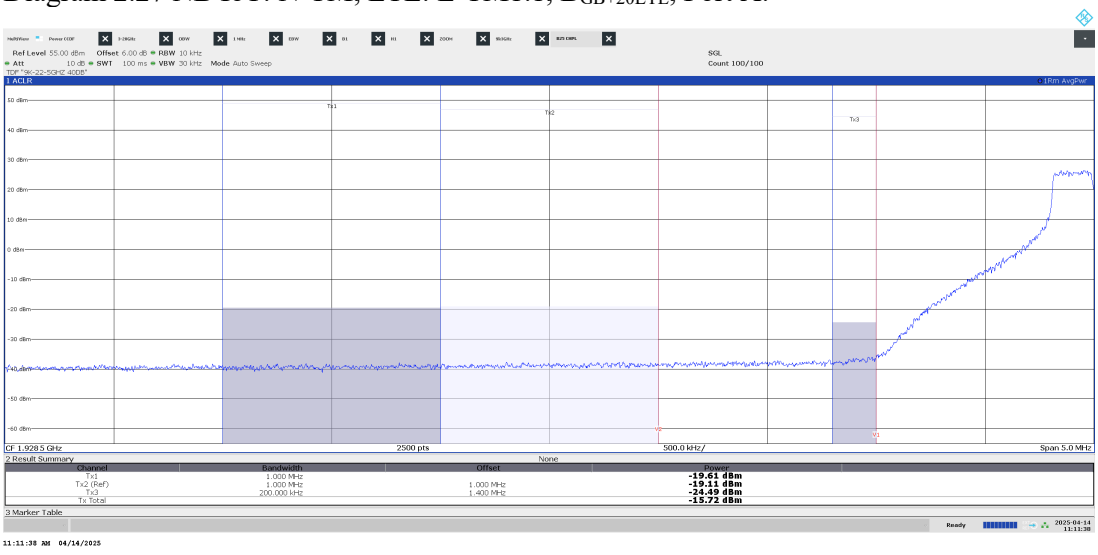


Diagram 2.28 NB IoT: N-TM, LTE: E-TM1.1, $T_{GB+20LTE}$, Port A:

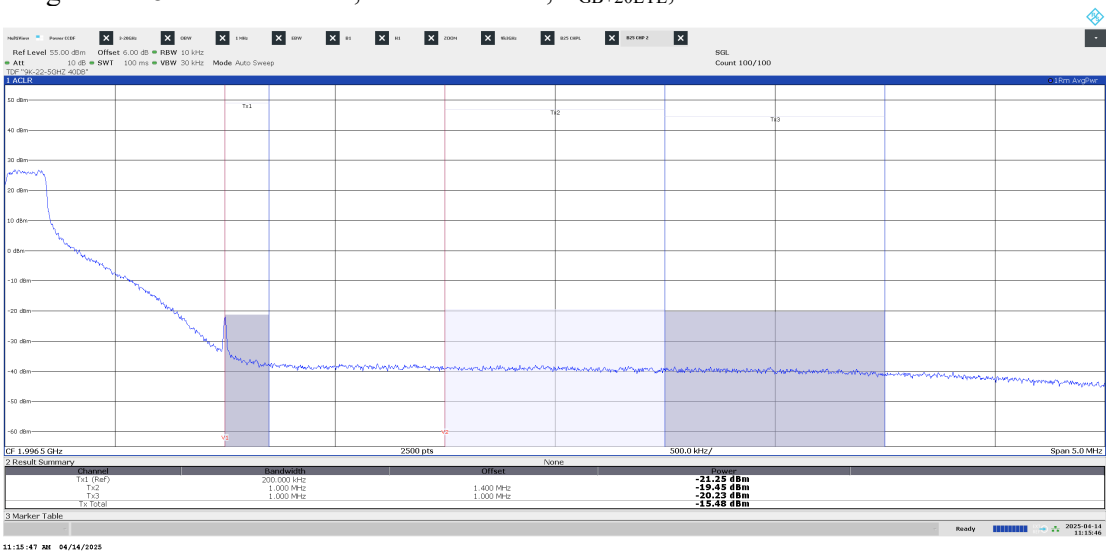


Diagram 2.29 NB IoT: N-TM, LTE: E-TM1.1, $B_{IB+5LTE}$, Port A:

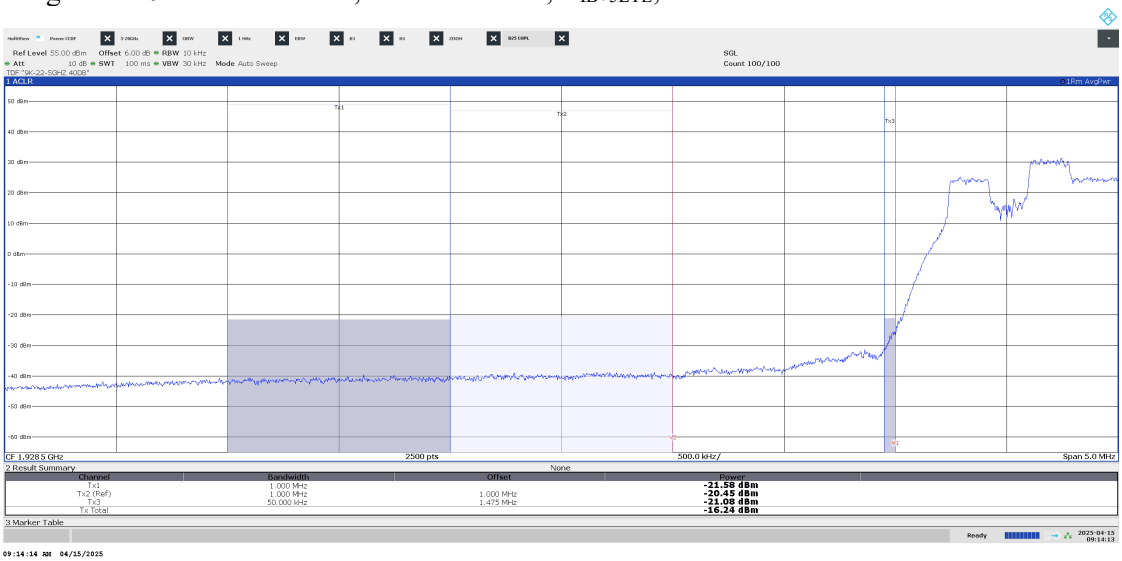


Diagram 2.30 NB IoT: N-TM, LTE: E-TM1.1, $T_{IB+5LTE}$, Port A:

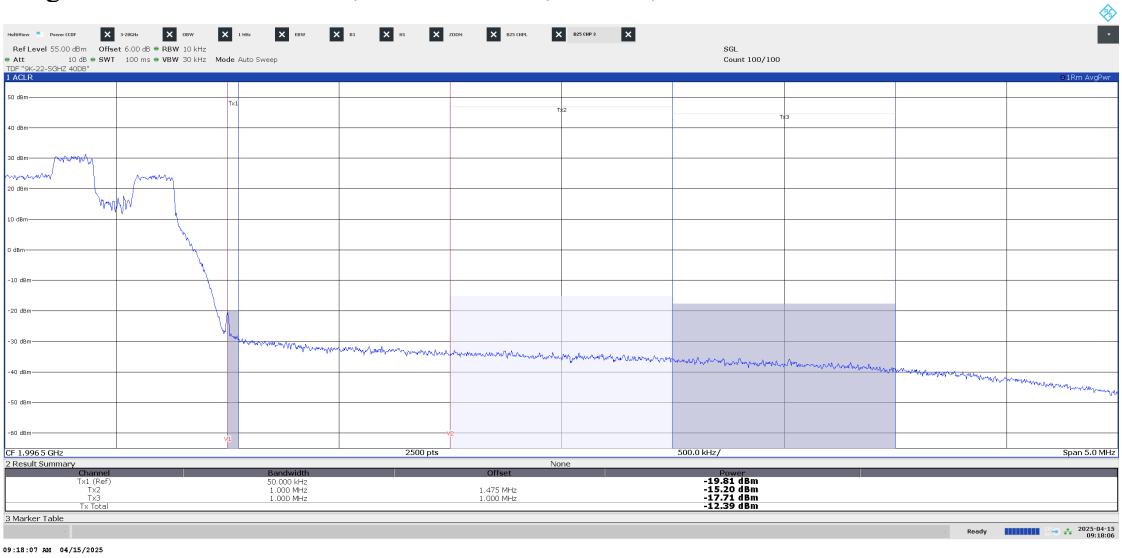


Diagram 2.31 NB IoT: N-TM, LTE: E-TM1.1, $B_{IB+10LTE}$, Port A:

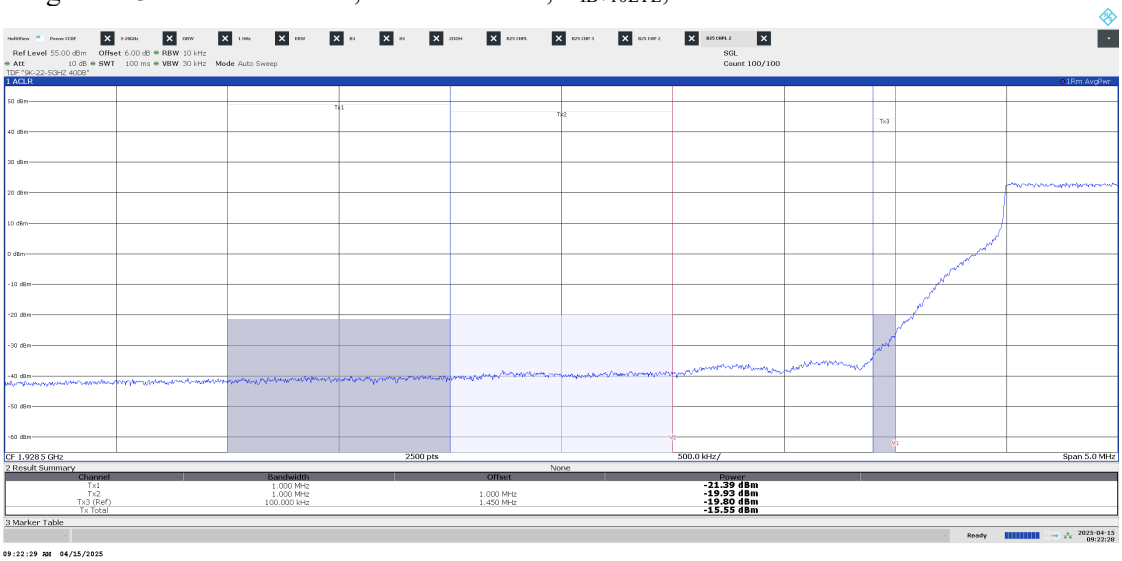


Diagram 2.32 NB IoT: N-TM, LTE: E-TM1.1, $T_{IB+10LTE}$, Port A:

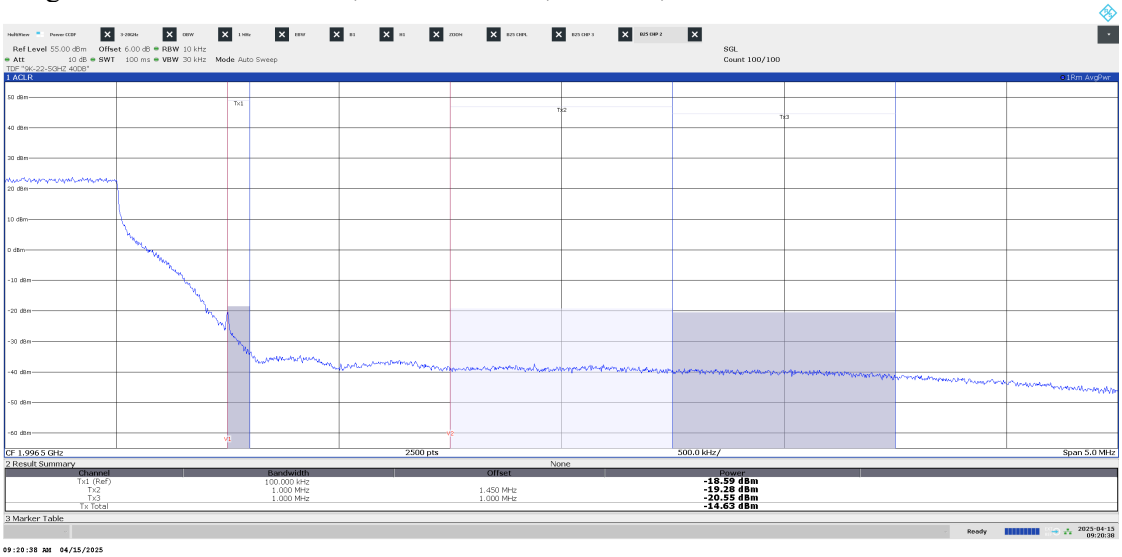


Diagram 2.33 NB IoT: N-TM, LTE: E-TM1.1, $B_{IB+15LTE}$, Port A:

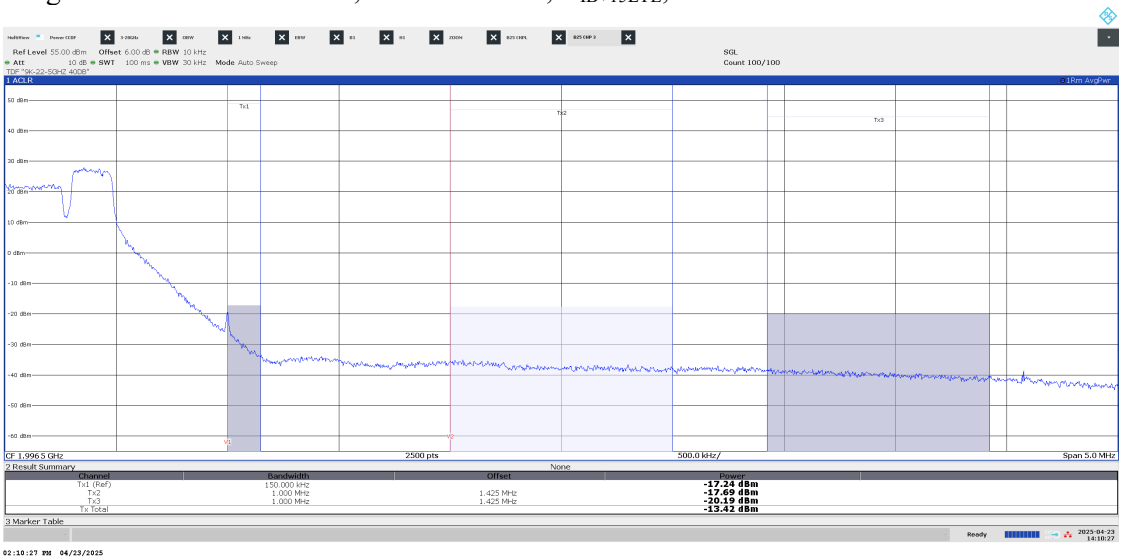


Diagram 2.34 NB IoT: N-TM, LTE: E-TM1.1, $T_{IB+15LTE}$, Port A:

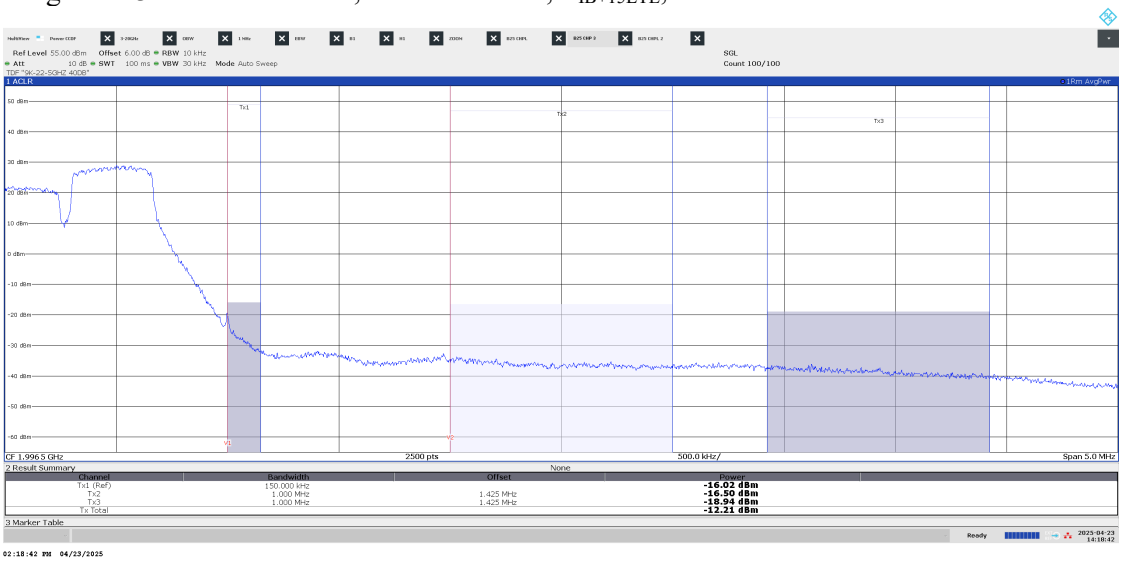


Diagram 2.35 NB IoT: N-TM, LTE: E-TM1.1, $B_{IB+20LTE}$, Port A:

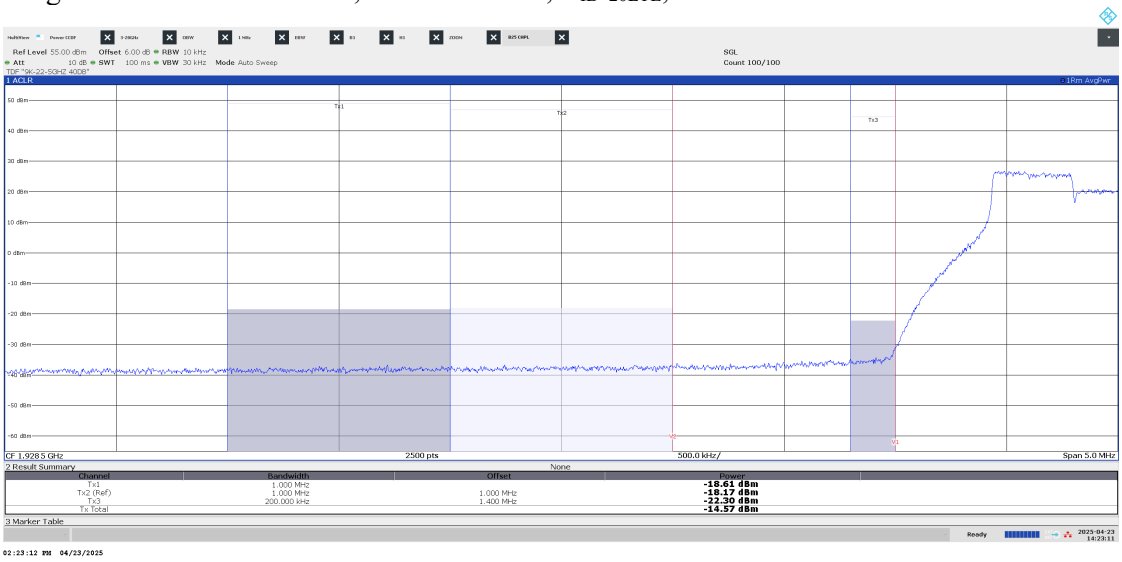


Diagram 2.36 NB IoT: N-TM, LTE: E-TM1.1, $T_{IB+20LTE}$, Port A:

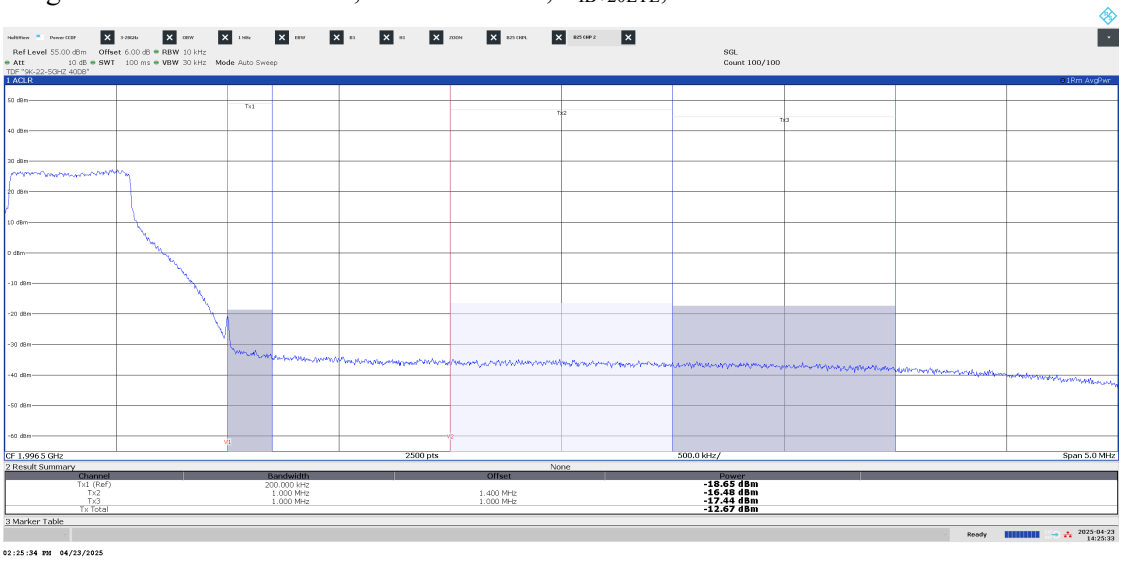


Diagram 2.37 NB IoT: N-TM, NR: FR1-TM1.1, B_{IB+5NR}, Port A:

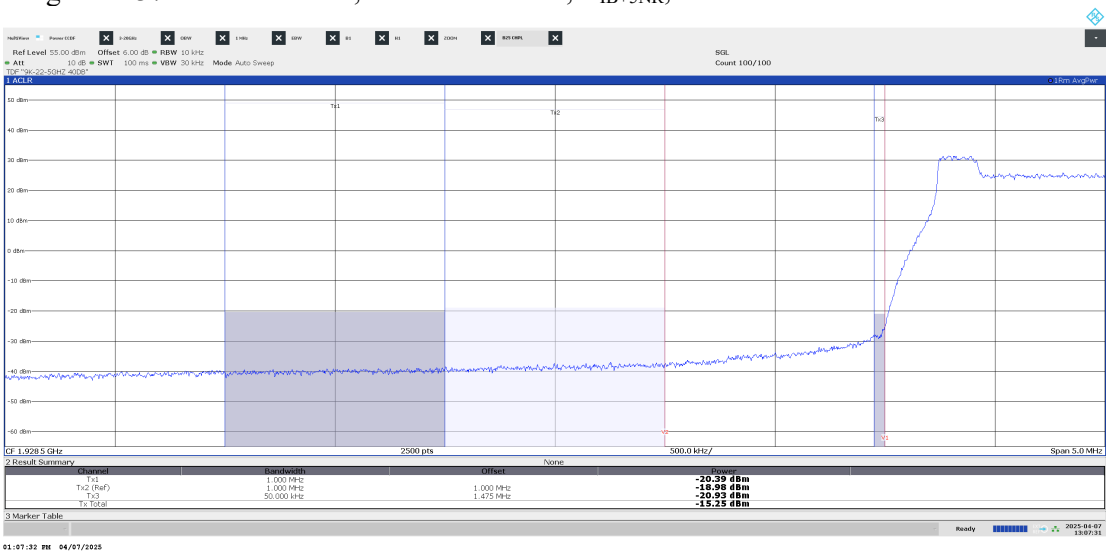


Diagram 2.38 NB IoT: N-TM, NR: FR1-TM1.1, T_{IB+5NR}, Port A:

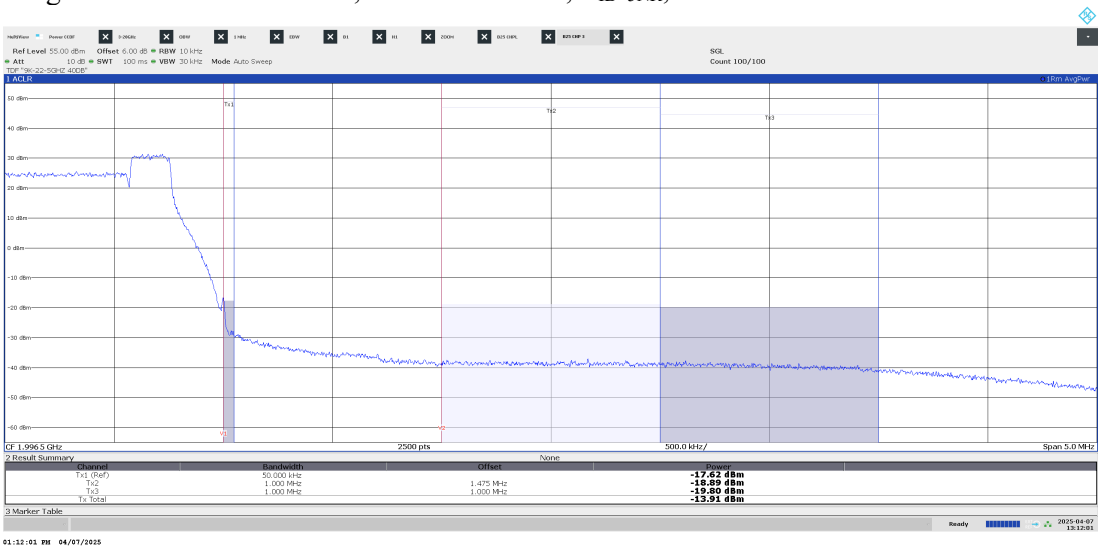


Diagram 2.39 NB IoT: N-TM, NR: FR1-TM1.1, $B_{IB+10NR}$, Port A:

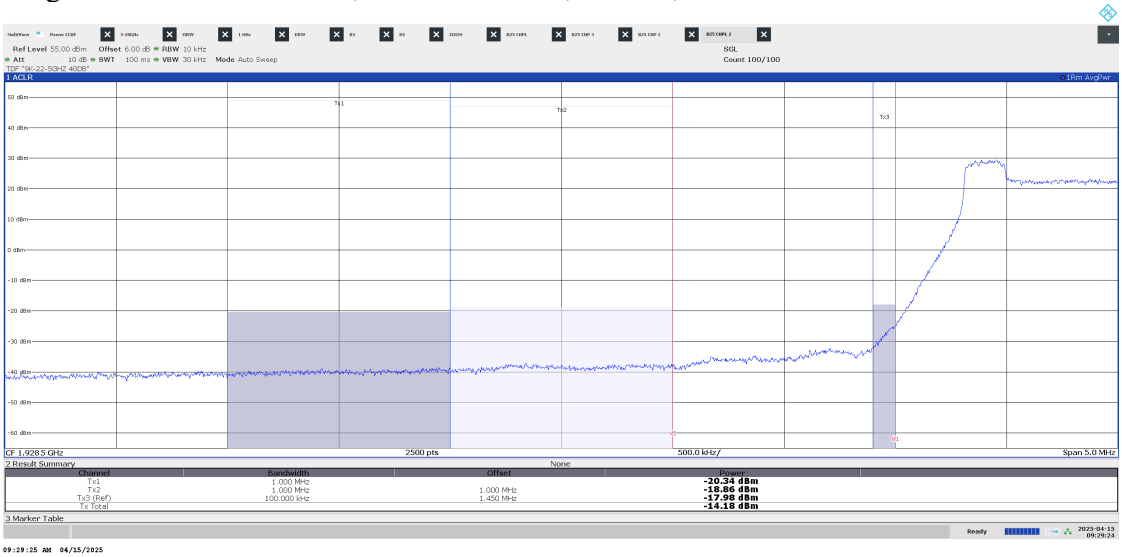


Diagram 2.40 NB IoT: N-TM, NR: FR1-TM1.1, $T_{IB+10NR}$, Port A:

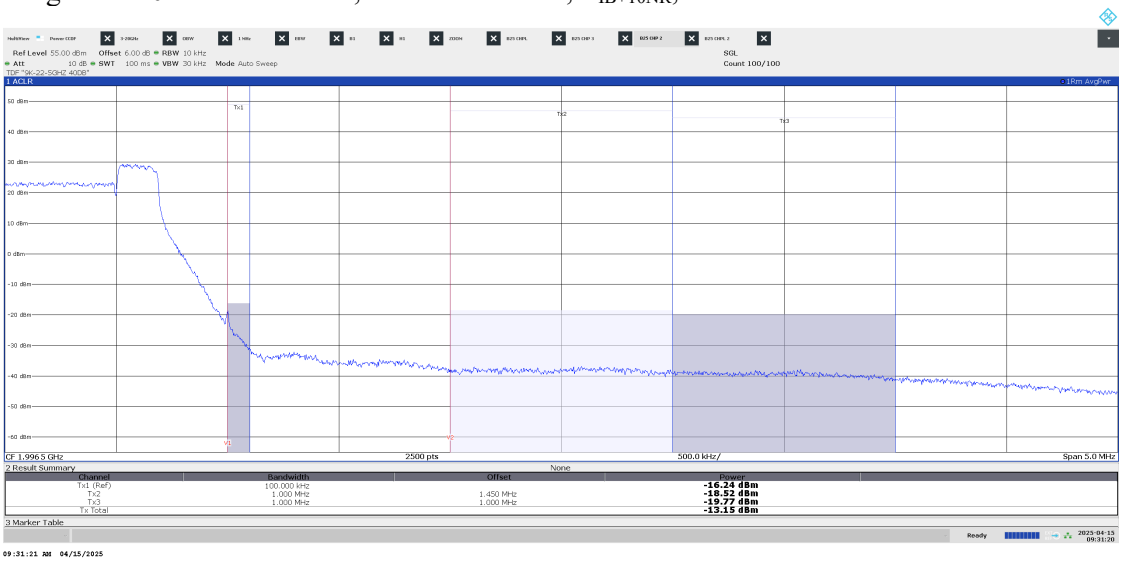


Diagram 2.41 NB IoT: N-TM, NR: FR1-TM1.1, $B_{IB+15NR}$, Port A:

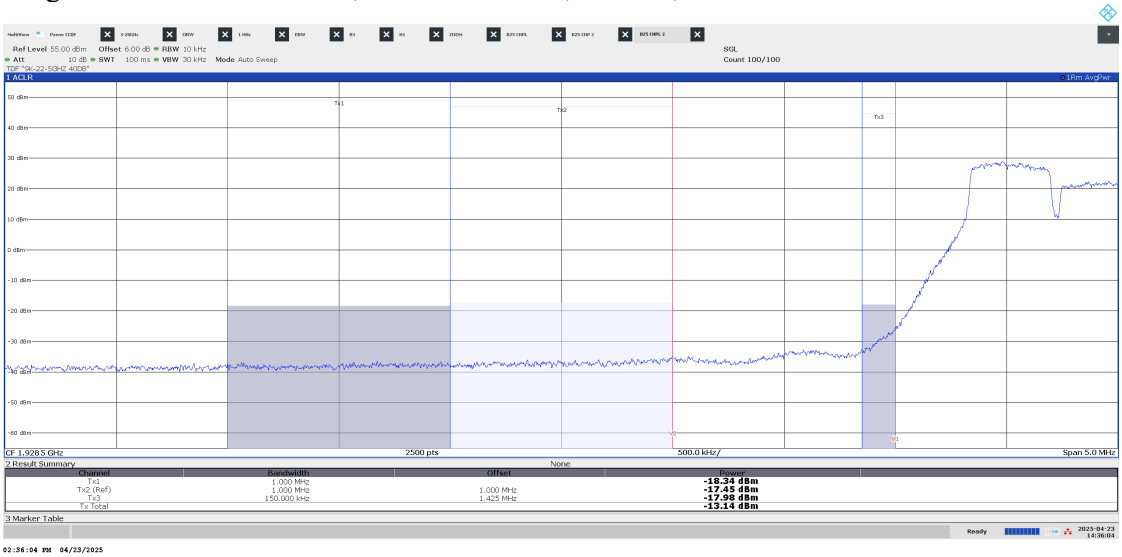


Diagram 2.42 NB IoT: N-TM, NR: FR1-TM1.1, $T_{IB+15NR}$, Port A:

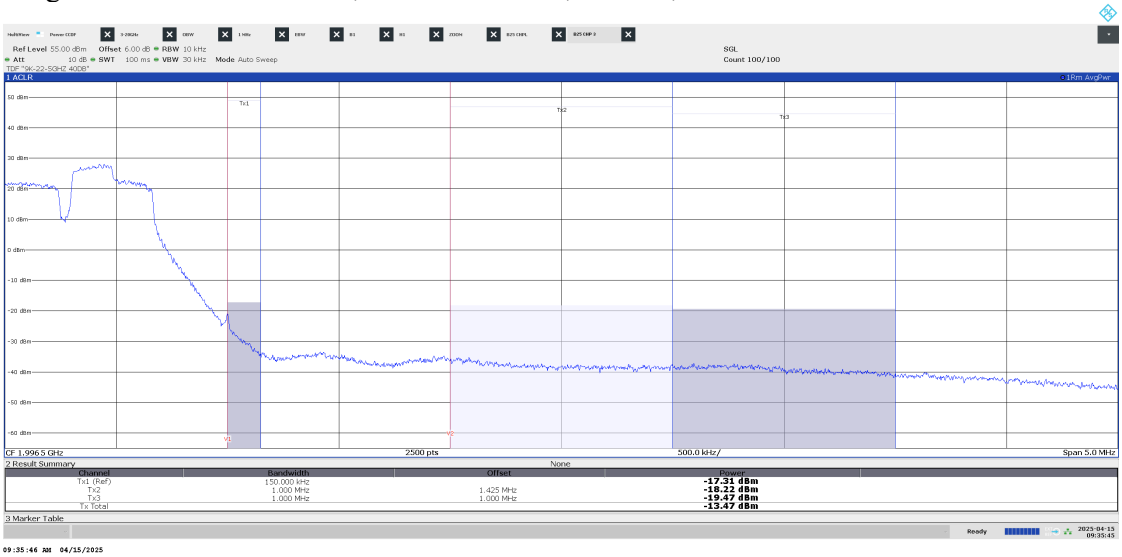


Diagram 2.43 NB IoT: N-TM, NR: FR1-TM1.1, $B_{IB+20NR}$, Port A:

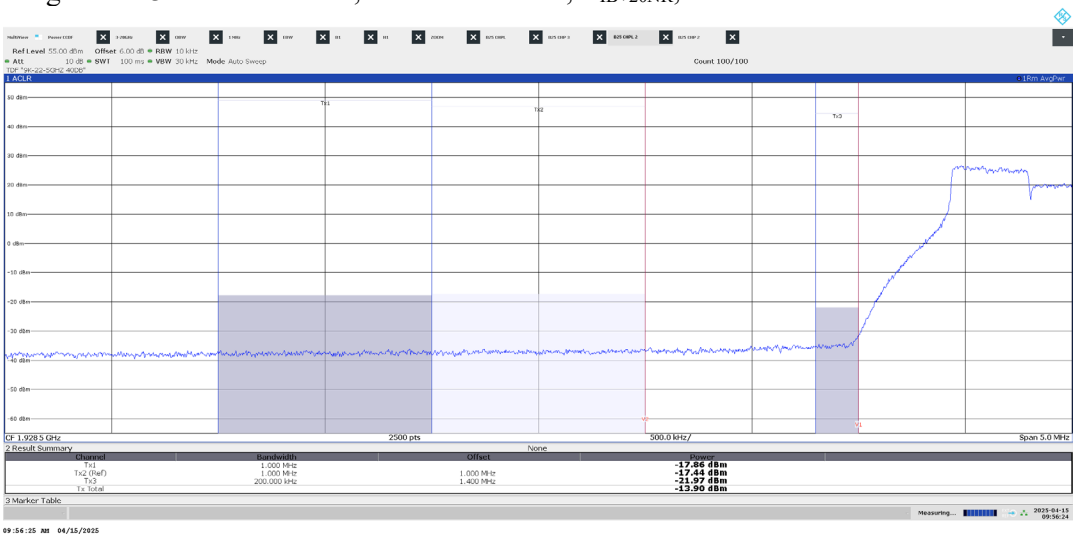


Diagram 2.44 NB IoT: N-TM, NR: FR1-TM1.1, $T_{IB+20NR}$, Port A:

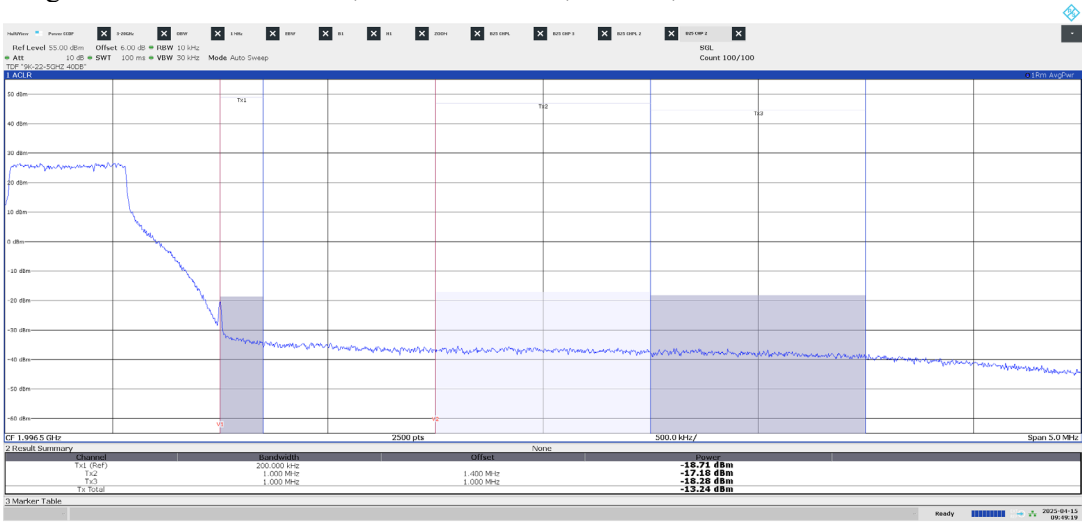


Diagram 2.45 NB IoT: N-TM, NR: FR1-TM1.1, $B_{IB+25NR}$, Port A:

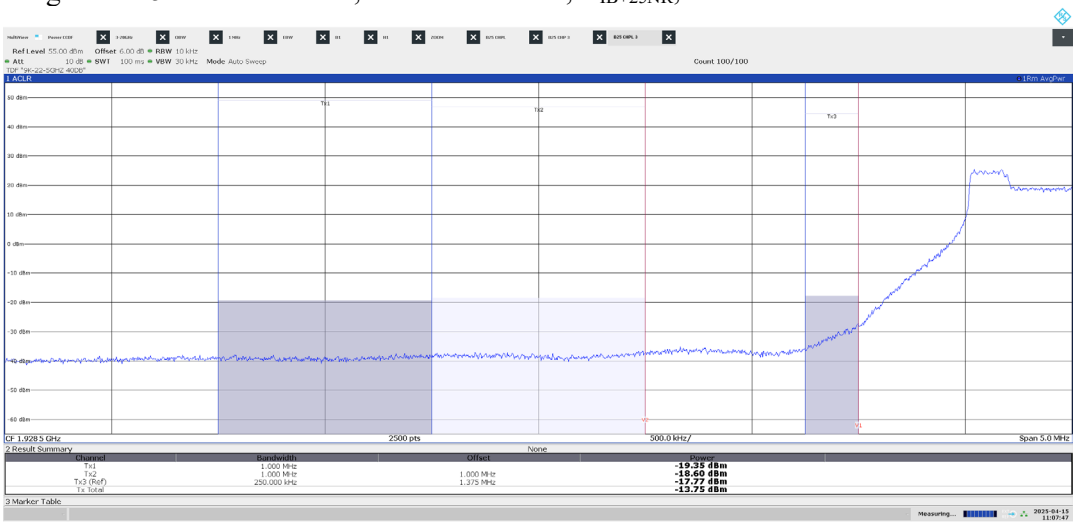


Diagram 2.46 NB IoT: N-TM, NR: FR1-TM1.1, $T_{IB+25NR}$, Port A:

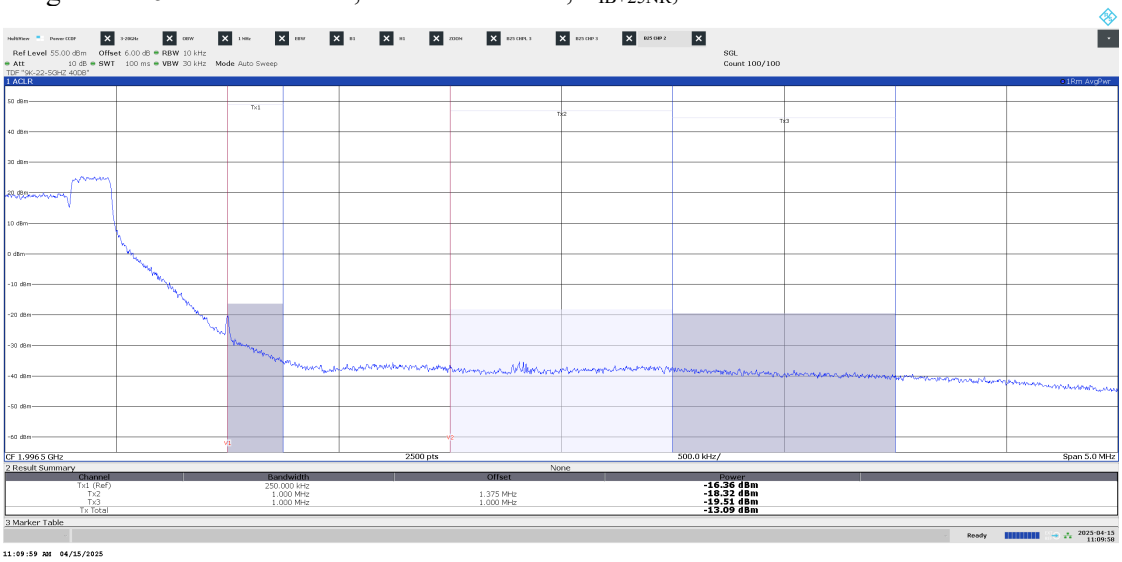


Diagram 2.47 NB IoT: N-TM, $B_{IOT\ SA}$, Port A:

Diagram 2.48 NB IoT: N-TM, $T_{IOT\ SA}$, Port A:

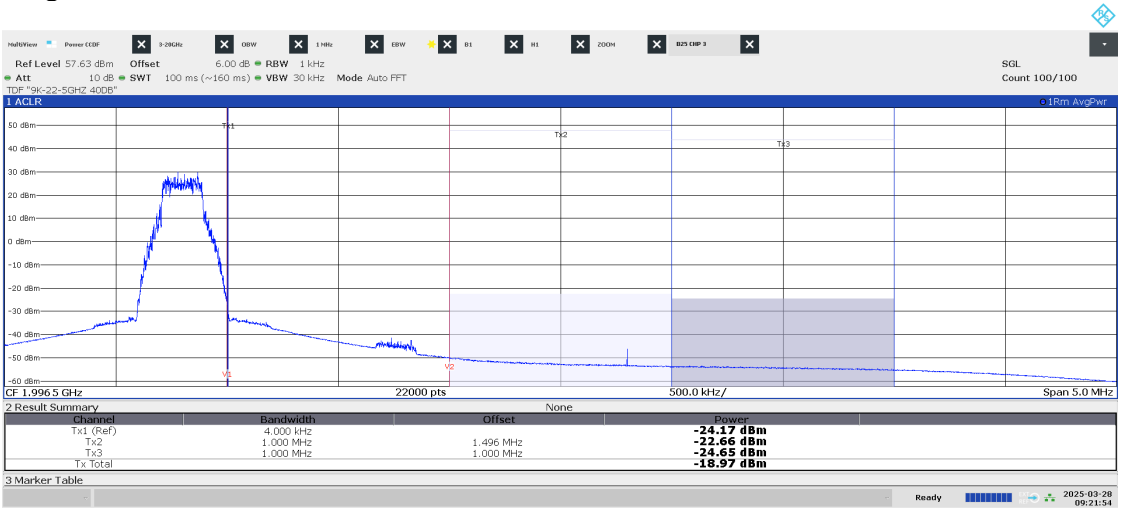


Diagram 2.49 ESS NR 90% and LTE 10% FR1/E-TM1.1, $BESS_{10NR+LTE}$, Port A:

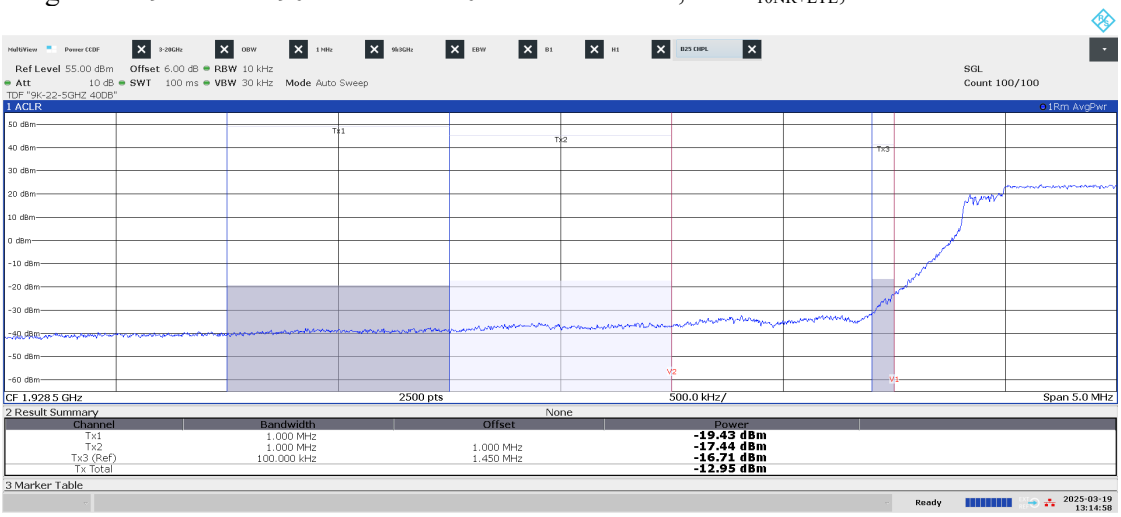


Diagram 2.50 ESS NR 90% and LTE 10% FR1/E-TM1.1, $TESS_{10NR+LTE}$, Port A:

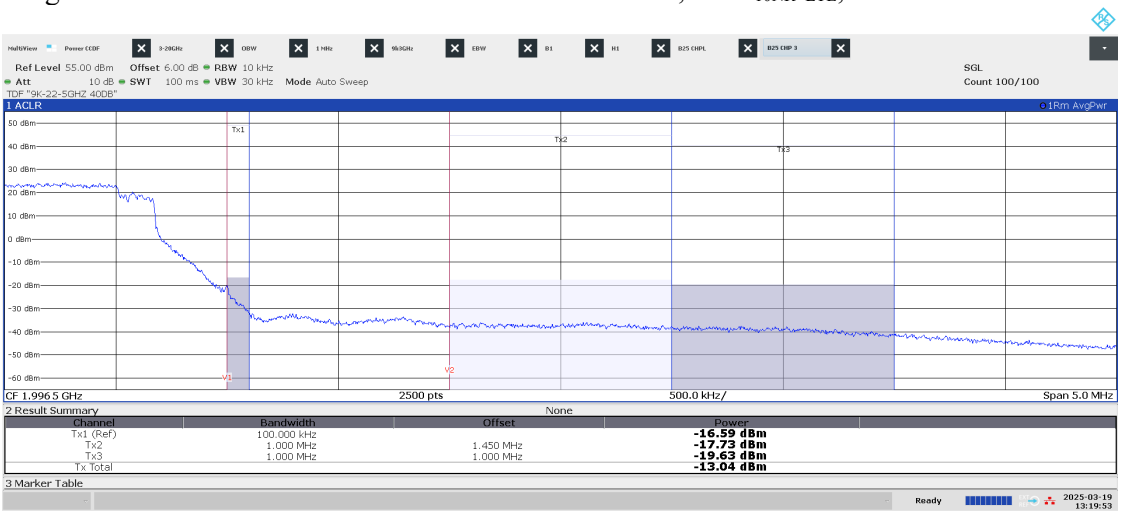


Diagram 2.51 ESS NR 90% and LTE 10% FR1/E-TM1.1, $BESS_{10NR+LTE}$, Port A:

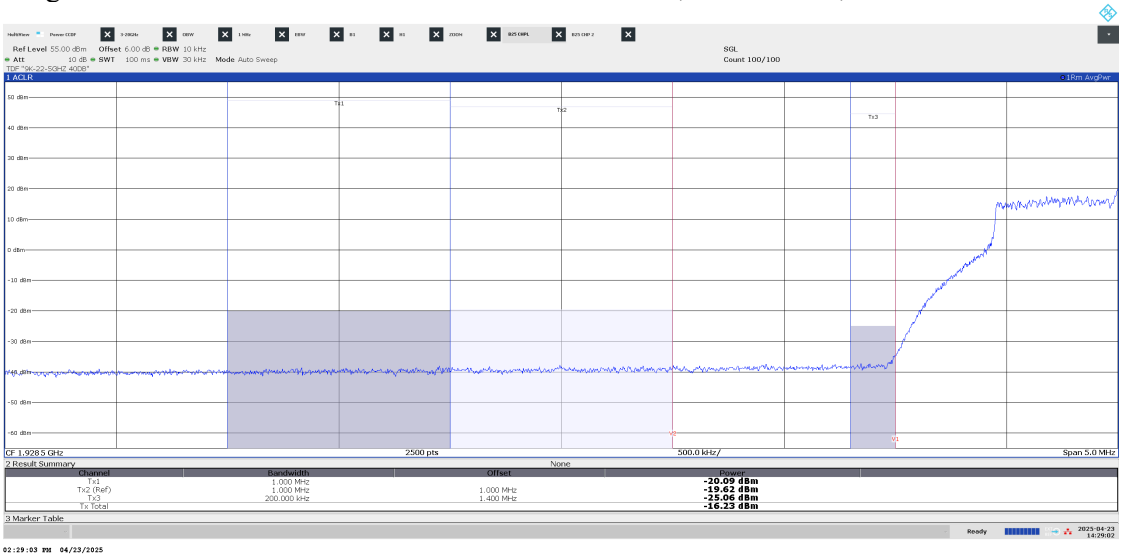
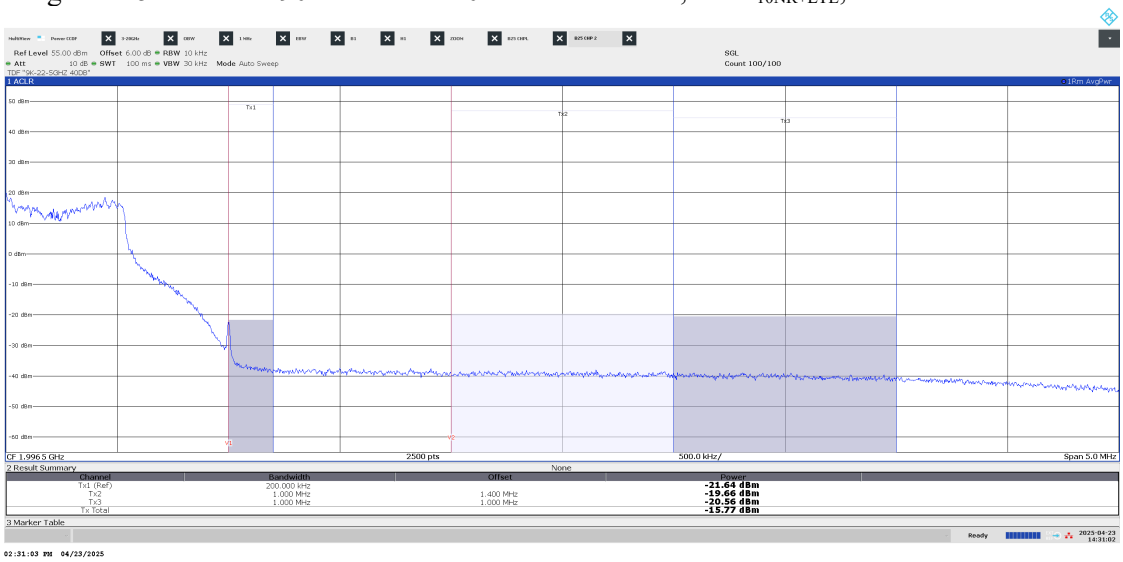


Diagram 2.52 ESS NR 90% and LTE 10% FR1/E-TM1.1, $TESS_{10NR+LTE}$, Port A:



Conducted spurious emission measurements according to CFR 47 §24.238 / RSS-133 5.6

Date	Temperature	Humidity
2025-03-14	22 °C ± 3 °C	31 % ± 5 %
2025-03-16	22 °C ± 3 °C	34 % ± 5 %
2025-03-17	22 °C ± 3 °C	22 % ± 5 %
2025-03-18	23 °C ± 3 °C	29 % ± 5 %
2025-03-19	22 °C ± 3 °C	29 % ± 5 %
2025-03-25	22 °C ± 3 °C	36 % ± 5 %
2025-04-07	23 °C ± 3 °C	32 % ± 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.

An offset of 6 dB has been used to cover 4x4 MIMO according to ANSI C63.26 6.4.4.1 c "measure and add 10 $\log_{10}$ (N_{ANT})" in the frequency range 9k – 3GHz, for 3–20GHz an offset of 6.6 dB was used to compensate for the high pass filter

The vertical lines V1 and V2 in the plots 9k to 3 GHz represent the band edges of the operating band

Measurement equipment	RISE number
R&S FSW 43	902 073
RF attenuator	902 282
High pass filter 1-20 GHz	504 199
Coaxial cable Sucoflex 102EA	BX50236
Coaxial cable Sucoflex 102EA	BX50237
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 2.6 dB

Results LTE

Single carrier LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.1 a-b	B_{5LTE}	RF B
3.2 a-b	M_{5LTE}	RF A
3.3 a-b	M_{5LTE}	RF B
3.4 a-b	M_{5LTE}	RF C
3.5 a-b	M_{5LTE}	RF D
3.6 a-b	M_{10LTE}	RF B
3.7 a-b	M_{15LTE}	RF B
3.8 a-b	M_{20LTE}	RF B
3.9 a-b	T_{5LTE}	RF B

Multi carrier LTE: E-TM1.1

Diagram	Symbolic name	Tested Port
3.10 a-b	CA_{LTE}	RF A

Results NR

Single carrier NR: FR1-TM1.1

Diagram	Symbolic name	Tested Port
3.11 a-b	B_{5NR}	RF A
3.12 a-b	M_{5NR}	RF A
3.13 a-b	M_{10NR}	RF A
3.14 a-b	M_{15NR}	RF A
3.15 a-b	M_{20NR}	RF A
3.16 a-b	M_{25NR}	RF A
3.17 a-b	M_{30NR}	RF A
3.18 a-b	M_{40NR}	RF A
3.19 a-b	T_{5NR}	RF A

Multi carrier NR: FR1-TM1.1

Diagram	Symbolic name	Tested Port
3.20 a-c	CA_{NR}	RF A

Results LTE with NB IoT GB

Single carrier: LTE: E-TM1.1,NB IoT : N-TM

Diagram	Symbolic name	Tested Port
3.21 a-b	$B_{GB+10LTE}$	RF A
3.22 a-b	$T_{GB+10LTE}$	RF A
3.23 a-b	$B_{GB+20LTE}$	RF A
3.24 a-b	$T_{GB+20LTE}$	RF A

Results LTE with NB IoT IB

Single carrier LTE: E-TM1.1, NB IoT: N-TM

Diagram	Symbolic name	Tested Port
3.25 a-b	$B_{IB+5LTE}$	RF A
3.26 a-b	$T_{IB+5LTE}$	RF A
3.27 a-b	$B_{IB+10LTE}$	RF A
3.28 a-b	$T_{IB+10LTE}$	RF A
3.29 a-b	$B_{IB+20LTE}$	RF A
3.30 a-b	$T_{IB+20LTE}$	RF A

Results NR with NB IoT IB

Single carrier: NR: FR1-TM1.1,NB IoT: N-TM

Diagram	Symbolic name	Tested Port
3.31 a-b	B_{IB+5NR}	RF A
3.32 a-b	T_{IB+5NR}	RF A
3.33 a-b	$B_{IB+10NR}$	RF A
3.34 a-b	$T_{IB+10NR}$	RF A
3.35 a-b	$B_{IB+15NR}$	RF A
3.36 a-b	$T_{IB+15NR}$	RF A
3.37 a-b	$B_{IB+20NR}$	RF A
3.38 a-b	$T_{IB+20NR}$	RF A
3.39 a-b	$B_{IB+25NR}$	RF A
3.40 a-b	$T_{IB+25NR}$	RF A

Results Multi RAT ESS NR and LTE

ESS NR 90% and LTE 10% TM1.1

Diagram	Symbolic name	Tested Port
3.41 a-b	$BESS_{10NR+LTE}$	RF A
3.42 a-b	$TESS_{10NR+LTE}$	RF A

Results Multi RAT NR and IOT SA

Multi carrier: NR: FR1-TM1.1,NB IoT: N-TM

Diagram	Symbolic name	Tested Port
3.43 a-c	$B_{NR+IOT\ SA}$	RF A
3.44 a-c	$T_{NR+IOT\ SA}$	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 1995 MHz, The measurements were made up to 20 GHz (10x1995 MHz = 19.95 GHz).

Limits

§24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB,
-13 dBm.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified).

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RSS-133 5.6 Unwanted emission limits

Unwanted emissions shall be measured in terms of average values while the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, –13 dBm, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment’s operating frequency range.

For the unwanted emission limits, in the 1 MHz bands immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth (OBW). Beyond these 1 MHz bands, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth may be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% of the OBW, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed –13 dBm.

Complies?	Yes

Diagram 3.1a LTE: E-TM1.1, B_{5LTE}, 9 kHz – 3 GHz, Port B:

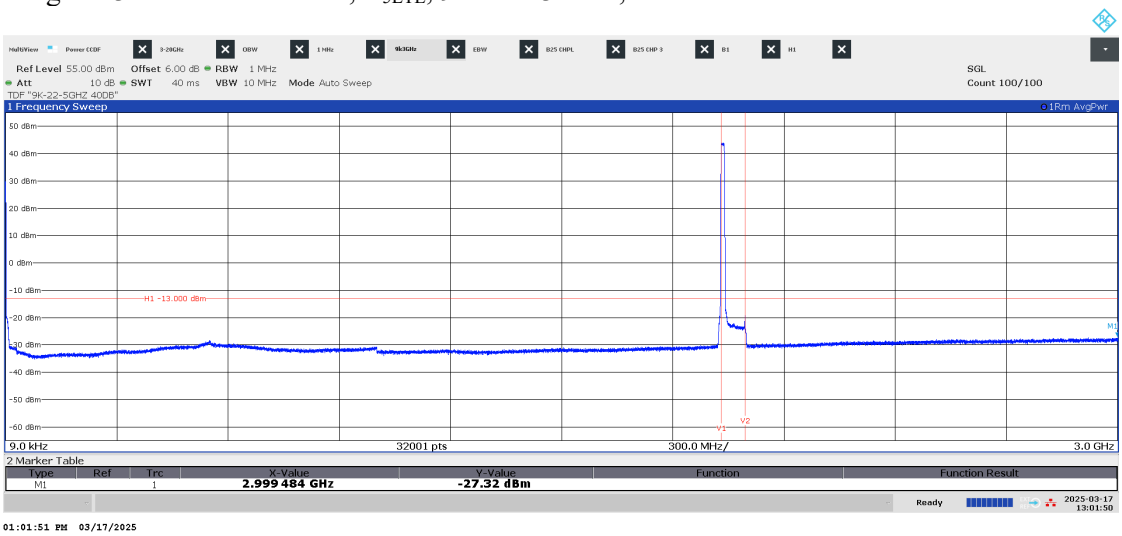
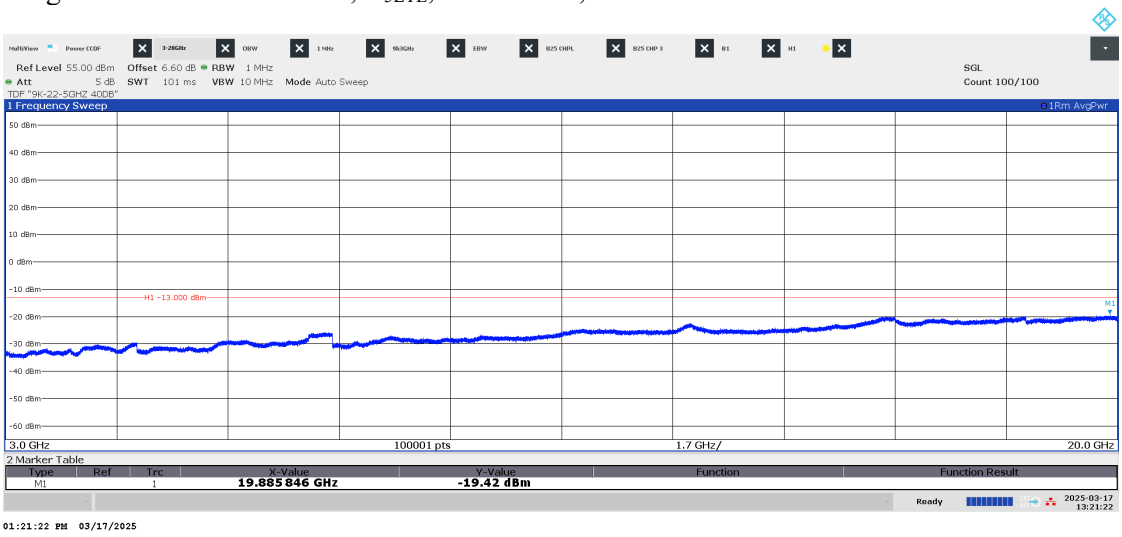


Diagram 3.1b LTE: E-TM1.1, B_{5LTE}, 3 – 20 GHz, Port B:



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