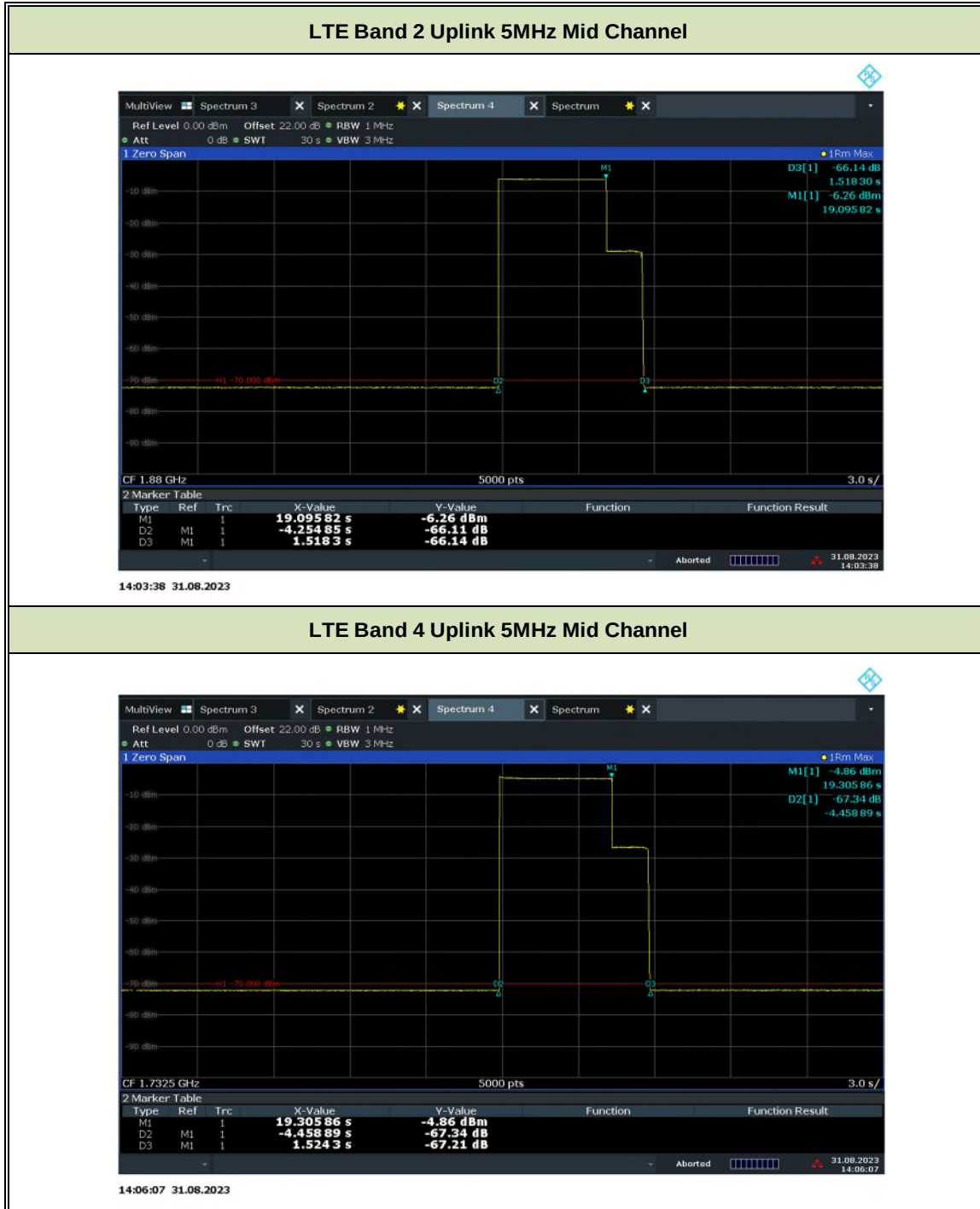


FCC ID: YETG43-CBBE

2.8.9 Sample test Plots



LTE Band 5 Uplink 5MHz Mid Channel



14:08:31 31.08.2023

LTE Band 12 Uplink 5MHz Mid Channel



14:10:05 31.08.2023

FCC ID: YETG43-CBBE

2.9 Variable Booster Gain

2.9.1 Specification Reference

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(C)(1)
FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(I)
KDB935210 D04, Clause 7.9

2.9.2 Standard Applicable

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(C)(1) Booster Gain Limits:
The gain of the frequency selective consumer booster shall meet the limits below.

1) The uplink and downlink gain in dB of a frequency selective consumer booster referenced to its input and output ports shall not exceed BSCL - 28dB - (40 dB - MSCL).

(i) Where BSCL is the coupling loss between the booster's donor port and the base station's input port, and MSCL is the minimum coupling loss in dB between the wireless device and the booster's server port. MSCL must be calculated or measured for each band of operation and provided in compliance test reports.

(ii) In order of preference, BSCL is determined as follows: determine path loss between the base station and the booster; such measurement shall be based on measuring the received forward pilot/control channel power at the booster and reading the pilot/control channel transmit power from the base station as defined in the system information messages sent by the base station; estimate BSCL by assuming that the base station is transmitting at a level of +25 dBm per channel (assume a small, lightly loaded cell) and measuring the total received signal power level within the channel in dBm (RPCH) received at the booster input port. BSCL is then calculated as 25– RPCH; or assume that the BSCL is 70dB without performing any measurement.

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(I) Transmit Power Off Mode.

When the consumer booster cannot otherwise meet the noise and gain limits defined herein it must operate in "Transmit Power OFF Mode." In this mode of operation, the uplink and downlink noise power shall not exceed -70 dBm/MHz and uplink gain shall not exceed the lesser of 23 dB or MSCL.

2.9.3 Equipment Under Test and Modification State

Serial No: 560311000026 / Test Configuration C and D

2.9.4 Date of Test/Initial of test personnel who performed the test

September 22, 2023/MARG

2.9.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.



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2.9.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature 25.8°C
Relative Humidity 53.3%
ATM Pressure 99.0kPa

2.9.7 Additional Observations

- This is conducted Test.
- Test procedure is per Section 7.9 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The EUT operated in Normal Mode
- Setup the EUT according to Figure 1 of Section 6.3.2 of KDB935210.
- Evaluations are conducted at worst according to Maximum Booster Gain test result.
- Variable Gain: Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.
- Uplink Gain Timing: Operational uplink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.
- Signal: 5MHz LTE.
- MSCL: $L_p = 20\log f + 20\log d - 27.5$

Where: L_p = Basic free space path loss,
 f = frequency in MHz,
 d = separation distance in meters (2m)
lowest MSCL value was utilized.

- BSCL: The coupling loss (in dB) between the donor port (NU) of the Consumer Booster and the input port of the Base Station

2.9.8 Test Results

LTE B2 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-42	67	-12.81	15.83	34	18.17
-52	77	3.7	42.39	44	1.61
-62	87	3.9	52.65	54	1.35
-72	97	4.18	63.14	64	0.86
-82	107	4.46	73.1	74	0.9
-92	117	4.49	83.43	84	0.57



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LTE B2 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-52	77	-35.64	2.36	45	42.64
-62	87	-24.98	13.02	55	41.98
-72	97	-14.96	23.04	65	41.96
-82	107	-4.88	33.12	75	41.88
-92	117	5.69	43.69	85	41.31
-102	127	15.52	53.52	95	41.48

LTE B4 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-41.6	66.6	-16.75	72.79	33	20.21
-51.6	76.6	0.24	40.09	43	2.91
-61.6	86.6	0.56	50.22	53	2.78
-71.6	96.6	0.78	60.4	63	2.6
-81.6	106.6	0.8	70.55	73	2.45
-91.6	116.6	1.01	80.66	83	2.36

LTE B4 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-52.1	77.1	-5.01	32.99	45	12.01
-62.1	87.1	16.42	54.42	55	0.58
-72.1	97.1	21.27	59.57	65	5.73
-82.1	107.1	21.23	59.53	75	15.77
-92.1	117.1	21.18	59.18	85	25.82
-102.1	127.1	21.19	59.19	95	35.81



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LTE B5 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-53.9	78.9	2.82	41.43	46	6.23
-63.9	88.9	3.14	51.58	56	4.57
-73.9	98.9	3.1	61.57	66	4.42
-83.9	108.9	3.47	72.14	76	4.43
-93.9	118.9	3.88	82.51	86	3.86
-103.9	128.9	3.88	92.24	96	3.49

3.76

LTE B5 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-53.9	78.9	-6.61	33.39	46	12.61
-63.9	88.9	4.44	44.44	56	11.56
-73.9	98.9	14	54	66	12
-83.9	108.9	18.8	58.8	76	17.2
-93.9	118.9	18.35	58.43	86	27.57
-103.9	128.9	18.39	58.35	96	37.65



LTE B12 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-53.2	78.2	3.18	41.45	45	5.12
-63.2	88	4.41	52.55	55	3.55
-73.2	98.2	4.42	62.78	65	2.45
-83.2	108.2	4.63	72.81	75	2.22
-93.2	118.2	4.6	83.08	85	2.19
-103.2	128.2	4.91	93.69	95	1.92

LTE B12 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-55.5	80.5	-7.04	32.96	57.5	24.54
-65.5	90.5	3.65	43.65	67.5	23.85
-75.5	100.5	14.14	54.14	77.5	23.36
-85.5	110.5	18.31	58.31	87.5	29.19
-95.5	120.5	18.25	58.25	97.5	39.25
-105.5	130.5	18.25	58.25	100	41.75

LTE B13 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-54.3	79.3	3.98	42.29	46	3.71
-64.3	89.3	4.47	53.35	56	2.65
-74.3	99.3	4.89	63.38	66	2.62
-84.3	109.3	5.13	73.48	76	2.52
-94.3	119.3	5.5	84.48	86	1.52
-104.3	129.3	5.7	94.63	96	1.37

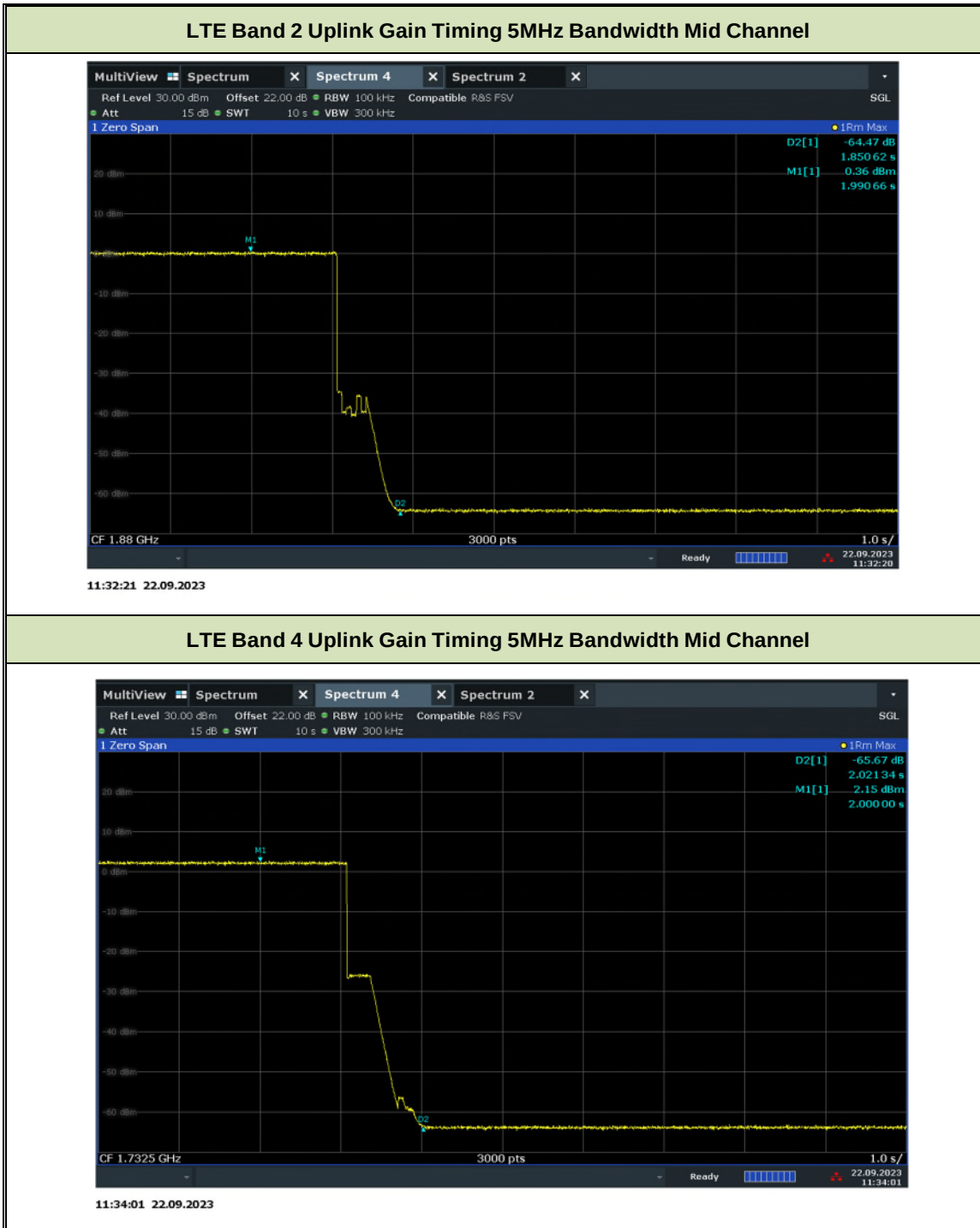
FCC ID: YETG43-CBBE

LTE B13 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-53.5	78.5	-8.22	31.78	45.5	13.72
-63.5	88.5	4.83	44.83	55.5	10.67
-73.5	98.5	15.15	55.15	65.5	10.35
-83.5	108.5	19.82	59.82	75.5	15.68
-93.5	118.5	19.24	59.24	85.5	26.26
-103.5	128.5	19.21	59.21	95.5	36.29

LTE B25 Downlink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-52.7	77.7	2.43	41.71	44	2.29
-62.7	87.7	2.73	52.16	54	1.84
-72.7	97.7	3.03	62.7	64	1.3
-82.7	107.7	3.38	73.34	74	0.66
-92.7	117.7	3.41	82.65	84	1.35
-102.7	127.7	3.72	93.07	94	0.93

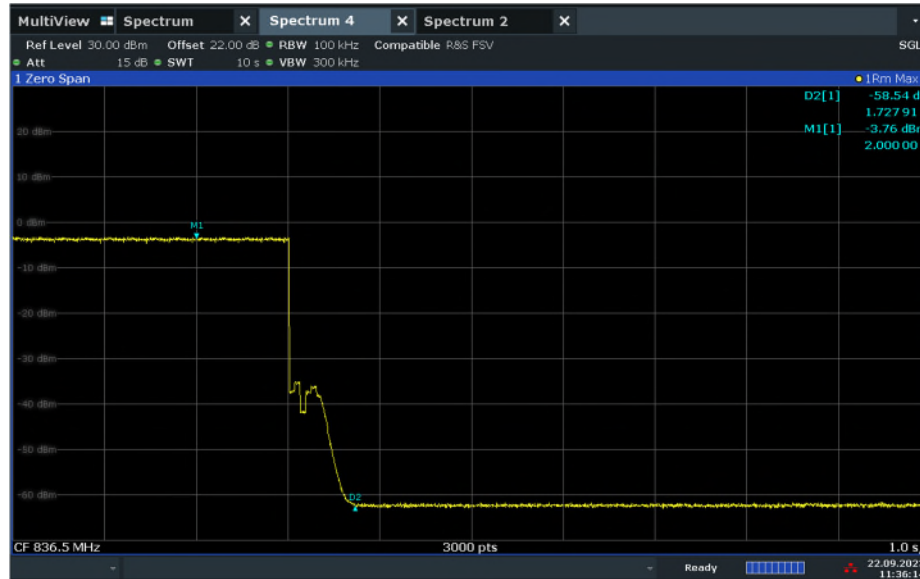
LTE B25 Uplink Gain vs RPCH and BSCL - Middle Channel					
RPCH Power (dBm)	BSCL (dB)	Measured Power (dBm)	Gain (dB)	Limit (dB)	Margin (dB)
-52.1	77.1	-6.3	31.7	45	13.3
-62.1	87.1	6.31	44.31	55	10.69
-72.1	97.1	16.8	54.8	65	10.2
-82.1	107.1	22.22	60.22	75	14.78
-92.1	117.1	22.22	60.22	85	24.78
-102.1	127.1	22.19	60.19	95	34.8

2.9.9 Test Results Plots



FCC ID: YETG43-CBBE

LTE Band 5 Uplink Gain Timing 5MHz Bandwidth Mid Channel



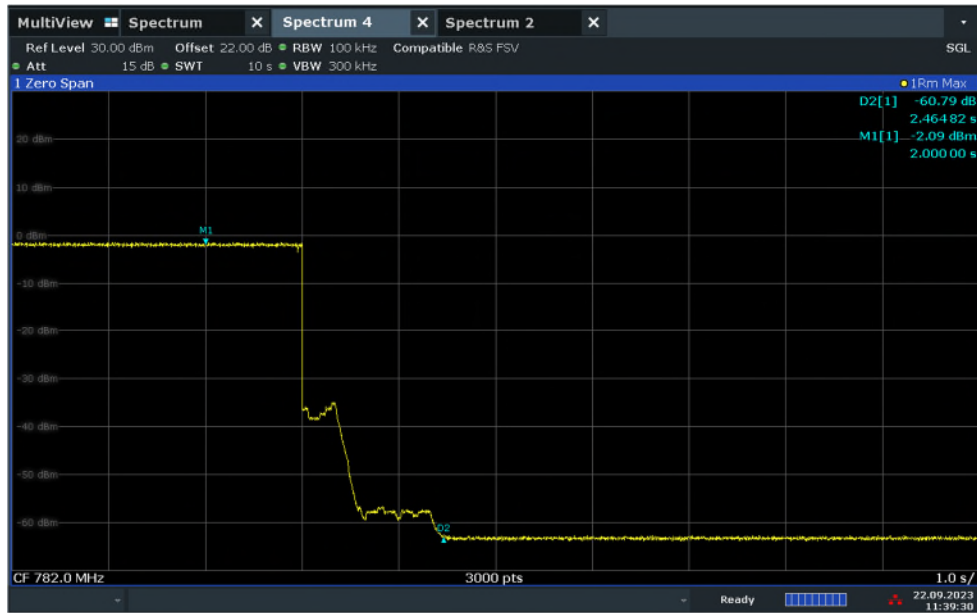
11:36:14 22.09.2023

LTE Band 12 Uplink Gain Timing 5MHz Bandwidth Mid Channel



11:38:31 22.09.2023

LTE Band 13 Uplink Gain Timing_5MHz Bandwidth Mid Channel



11:39:30 22.09.2023

LTE Band 25 Uplink Gain Timing_5MHz Bandwidth Mid Channel



11:35:01 22.09.2023

FCC ID: YETG43-CBBE

2.10 Occupied Bandwidth

2.10.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049
FCC 47 CFR Part 22, Clause 22.917(b)
FCC 47 CFR Part 24, Clause 24.238(b)
RSS-Gen, Clause 6.6

2.10.2 Standard Applicable

FCC 47 CFR Part 24, Clause 24.238(b)

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.

26dB 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 by at least 26 dB below the transmitter power.

Using the occupied bandwidth measurement function in the spectrum analyzer, the 99% occupied bandwidth was measured.

In addition, the 26dB bandwidth was measured in accordance with FCC KDB 971168 D01 V0202 Clause 4.1 using the ndB measurement function in the spectrum analyzer.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be at least 3x RBW.

2.10.3 Equipment Under Test and Modification State

Serial No: 560311000026/ Test Configuration A and B

2.10.4 Date of Test/Initial of test personnel who performed the test

July 19, and October 11 2023 / MARG

2.10.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	21.8 - 24.3 °C
Relative Humidity	40.0 – 45.3 %
ATM Pressure	99.8 – 101.1kPa

2.10.7 Additional Observations

- This is a conducted test. Both 26dB bandwidth and 99% bandwidth presented.



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- Using the occupied bandwidth measurement function in the spectrum analyzer, the 99% occupied bandwidth was measured.
- The 26dB bandwidth is measured in accordance with ANSI C63.26 clause 5.4.3 using the ndB measurement function in the spectrum analyzer.
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The RBW is set to 1% of the OBW while the VBW is $\geq 3X$ RBW.
- The detector is peak, and the trace mode is max hold.
- The transducer factor (TDF) used is from the external attenuators and cables used.
- Per Client request only High Channel was tested for Band 25
- All low, middle, and high channels were verified for Band 2, 4, 5, 12, 13.
- Only test plots for middle channel presented as the representative configuration except for Band 25.

2.10.8 Test Results

LTE Band 2 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	625	1932.5	4.44	4.77
	900	1960	4.45	4.76
	1175	1987.5	4.45	4.77
10 MHz	650	1935	8.88	9.46
	900	1960	8.91	9.49
	1150	1985	8.91	9.49
15 MHz	675	1937.5	12.95	14.37
	900	1960	13.27	14.18
	1125	1982.5	13.36	14.29
20 MHz	700	1940	17.67	18.92
	900	1960	17.70	18.95
	1100	1980	17.79	18.98

LTE Band 2 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	18625	1852.5	4.44	4.74
	18900	1880	4.44	4.77
	19175	1907.5	4.44	4.76
10 MHz	18650	1855	8.87	9.44



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	18900	1880	8.91	9.50
	19150	1905	8.89	9.45
15 MHz	18675	1857.5	13.21	14.16
	18900	1880	13.34	14.22
	19125	1902.5	13.29	14.18
20 MHz	18700	1860	17.67	18.82
	18900	1880	17.78	18.92
	19100	1900	17.71	18.85

LTE Band 4 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	1975	2112.5	4.45	4.79
	2175	2132.5	4.45	4.78
	2375	2152.5	4.45	4.78
10 MHz	2000	2115	8.90	9.51
	2175	2132.5	8.90	9.51
	2350	2150	8.92	9.53
15 MHz	2025	2117.5	13.32	14.23
	2175	2132.5	13.30	14.24
	2325	2147.5	13.35	14.33
20 MHz	2050	2120	17.76	18.99
	2175	2132.5	17.80	19.10
	2300	2145	17.77	19.07

LTE Band 4 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	19975	1712.5	4.45	4.74
	20175	1732.5	4.45	4.78
	20375	1752.5	4.45	4.77
10 MHz	20000	1715	8.90	9.46
	20175	1732.5	8.91	9.49



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	20350	1750	8.90	9.46
15 MHz	20025	1717.5	13.33	14.23
	20175	1732.5	13.34	14.24
	20325	1747.5	13.35	14.21
20 MHz	20050	1720	17.76	18.85
	20175	1732.5	17.78	18.94
	20300	1745	17.76	18.81
LTE Band 5 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	2425	871.5	4.44	4.76
	2525	881.5	4.45	4.75
	2625	891.5	4.44	4.75
10 MHz	2450	874	8.89	9.47
	2525	881.5	8.89	9.45
	2600	889	8.91	9.48

LTE Band 5 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	20425	826.5	4.43	4.73
	20525	836.5	4.43	4.74
	20625	846.5	4.43	4.75
10 MHz	20450	829	8.91	9.46
	20525	836.5	8.84	9.40
	20600	844	8.91	9.45

LTE Band 12 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	5035	731.5	4.45	4.75
	5095	737.5	4.43	4.76
	5155	743.5	4.45	9.46



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10 MHz	5060	734	8.92	9.44
	5095	737.5	8.88	9.45
	5130	741	8.91	9.47

LTE Band 12 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	23035	701.5	4.44	4.75
	23095	707.5	4.47	4.76
	23155	713.5	4.46	4.78
10 MHz	23060	704.0	8.85	9.38
	23095	707.5	8.92	9.45
	23130	711.0	8.91	9.46

LTE Band 13 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	5205	748.5	4.44	4.77
	5230	751.0	4.46	4.78
	5255	753.5	4.44	4.76
10 MHz	-	-	-	-
	5230	751.0	8.93	9.48
	-	-	-	-

LTE Band 13 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	23205	779.5	4.44	4.75
	23230	782.0	4.45	4.76
	23255	784.5	4.45	4.77
10 MHz	-	-	-	-
	23230	782.0	8.93	9.46
	-	-	-	-

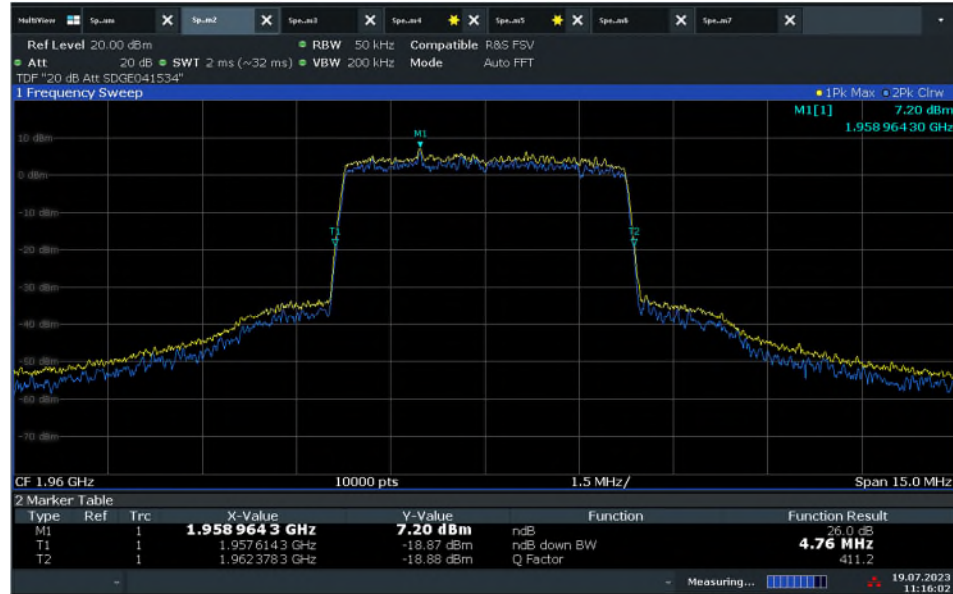
FCC ID: YETG43-CBBE

LTE Band 25 Downlink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	8665	1992.5	4.46	4.78
10 MHz	8640	1990.0	8.90	9.48
15 MHz	8615	1987.5	13.32	14.23
20 MHz	8590	1985.0	17.77	19.02

LTE Band 25 Uplink				
Bandwidth (MHz)	Channels	Frequency (MHz)	OBW (MHz)	-26dB BW (MHz)
5 MHz	26665	1912.5	4.44	4.75
10 MHz	26640	1910.0	8.88	9.44
15 MHz	26615	1907.5	13.26	14.12
20 MHz	26590	1905.0	17.64	18.76

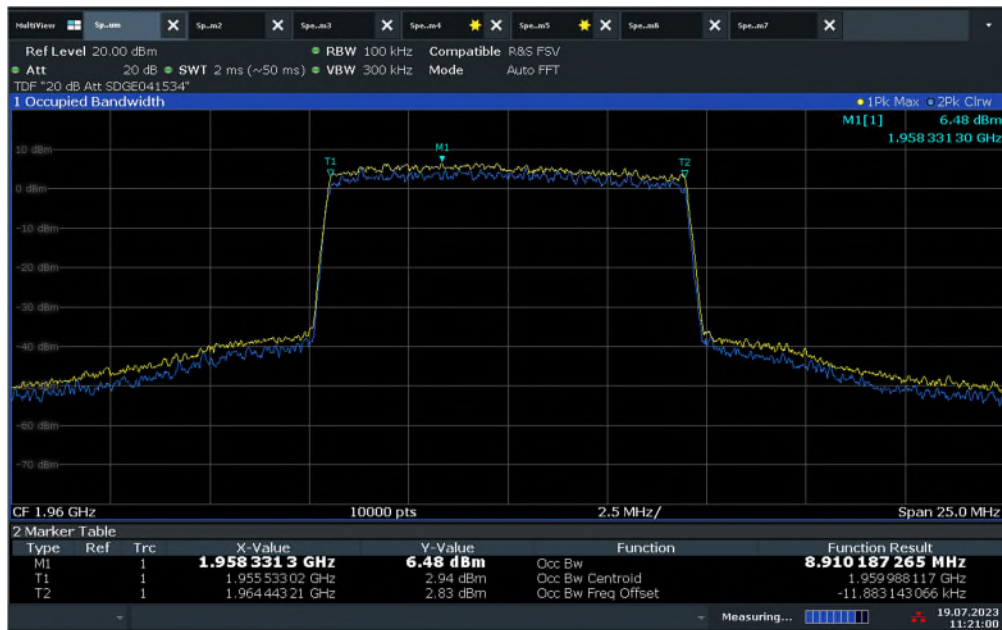


LTE Band 2 Downlink (5 MHz BW) Mid Channel 1960 MHz -26dB BW



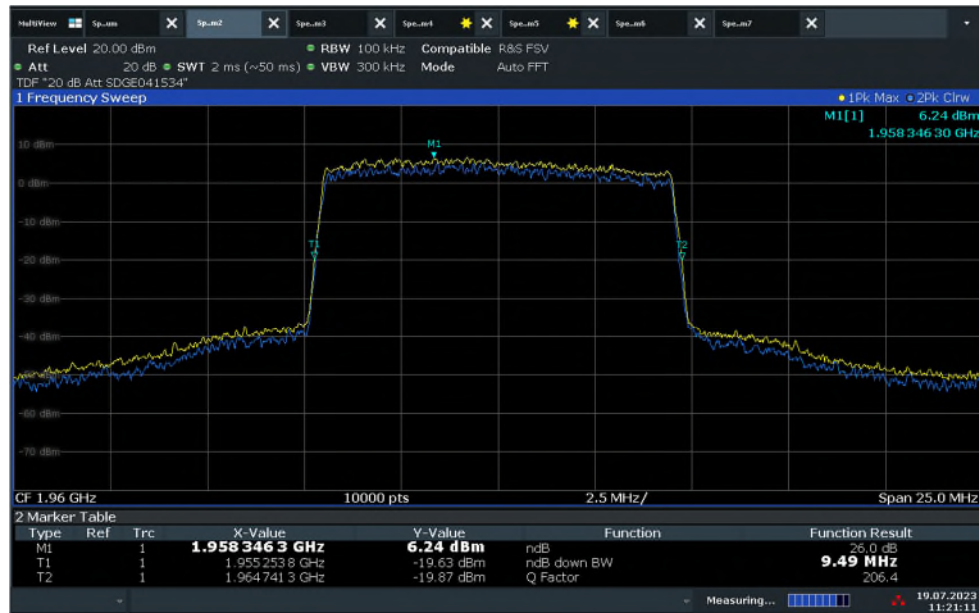
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LTE Band 2 Downlink (10 MHz BW) Mid Channel 1960 MHz 99% OBW



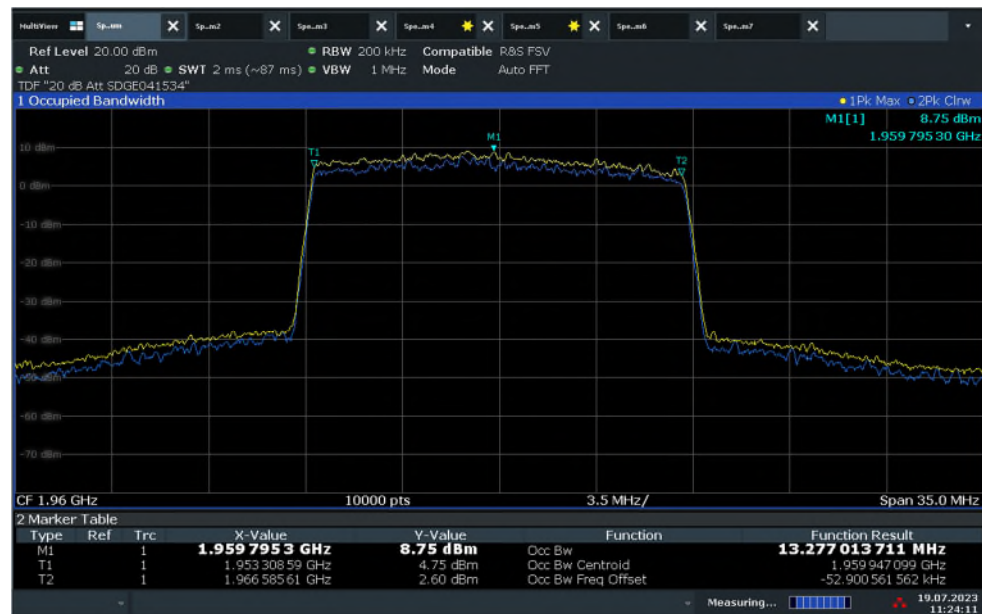
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LTE Band 2 Downlink (10 MHz BW) Mid Channel 1960 MHz -26 dB BW



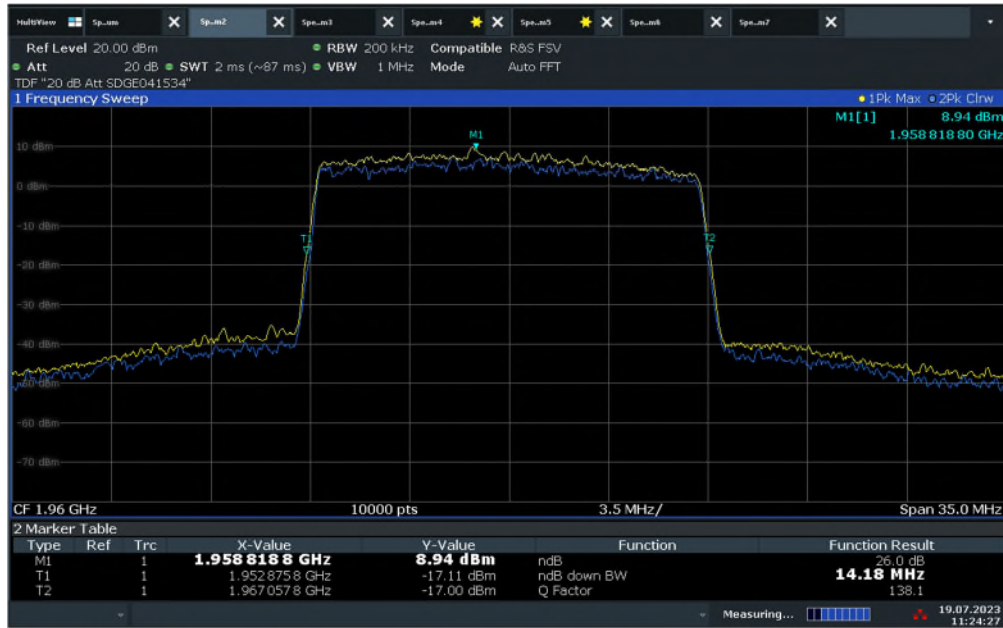
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LTE Band 2 Downlink (15 MHz BW) Mid Channel 1960 MHz 99% OBW



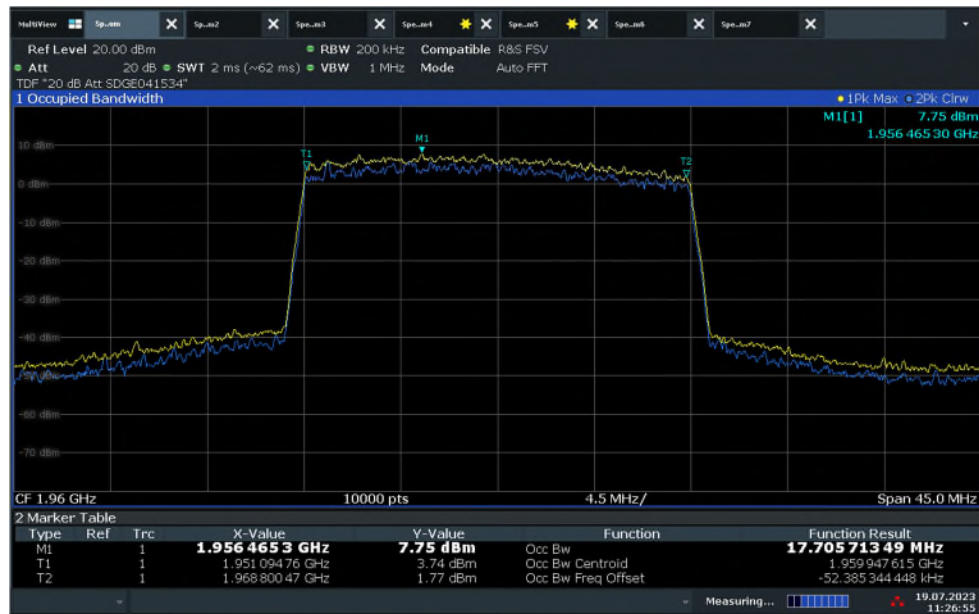
11:24:12 19.07.2023

LTE Band 2 Downlink (15 MHz BW) Mid Channel 1960 MHz -26 dB BW



11:24:28 19.07.2023

LTE Band 2 Downlink (20 MHz BW) Mid Channel 1960 MHz 99% OBW

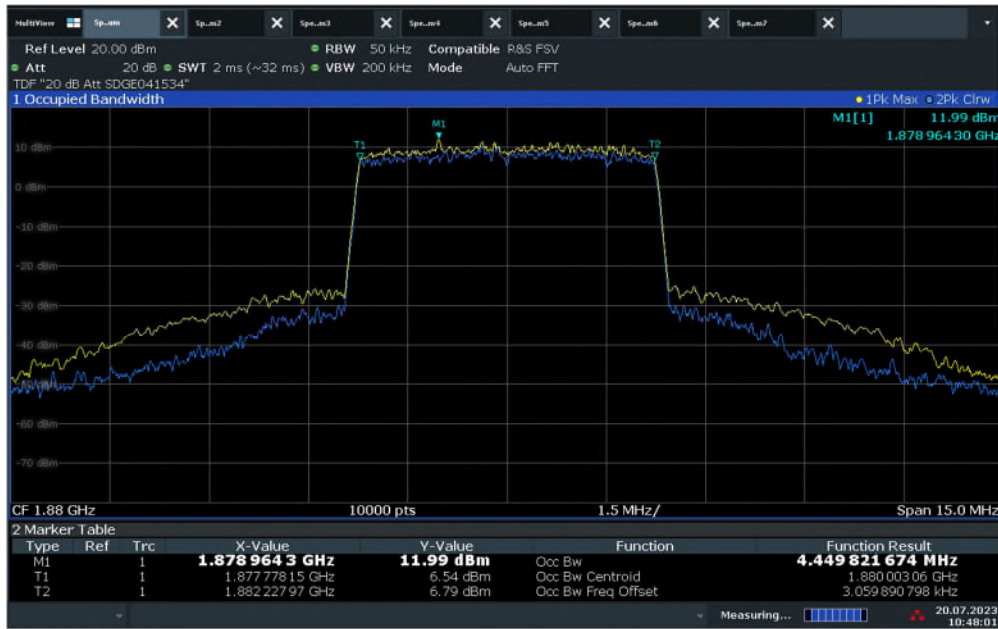


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FCC ID: YETG43-CBBE

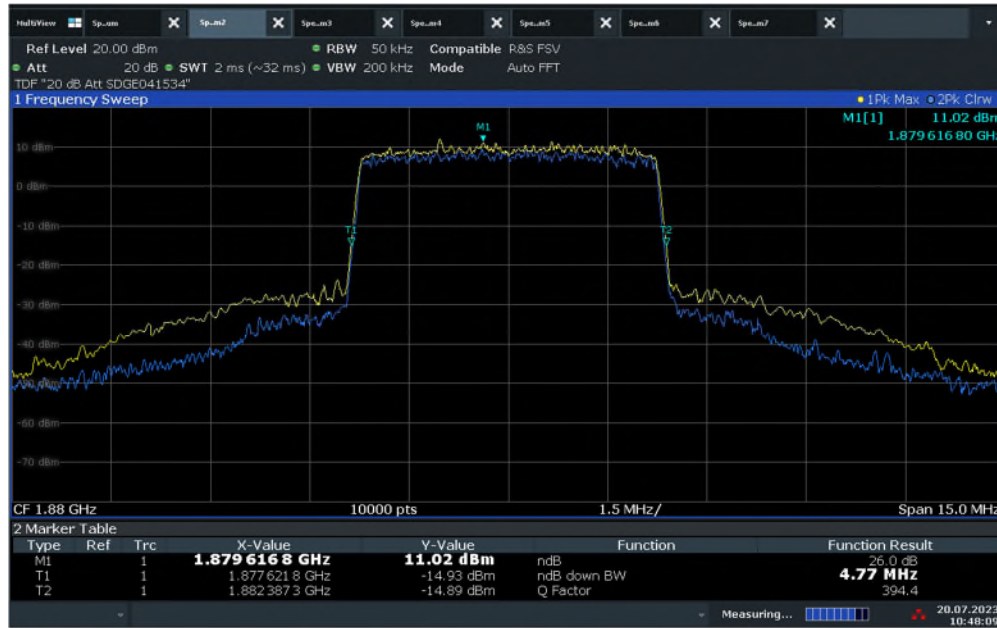
LTE Band 2 Downlink (20 MHz BW) Mid Channel 1960 MHz -26 dB BW

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LTE Band 2 Uplink (5 MHz BW) Mid Channel 1880 MHz 99% OBW

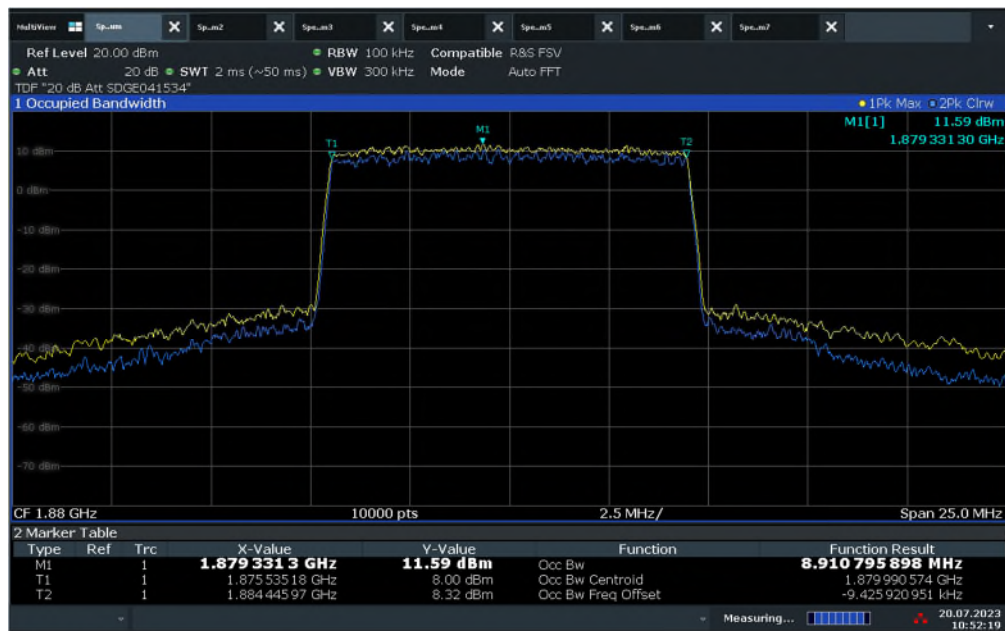
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LTE Band 2 Uplink (5 MHz BW) Mid Channel 1880 MHz -26dB BW

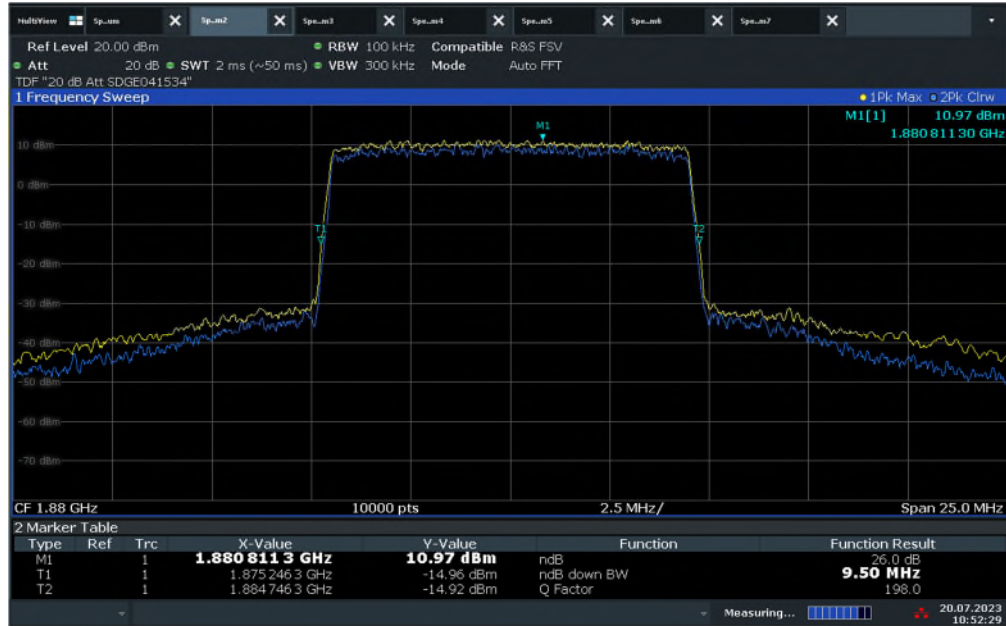


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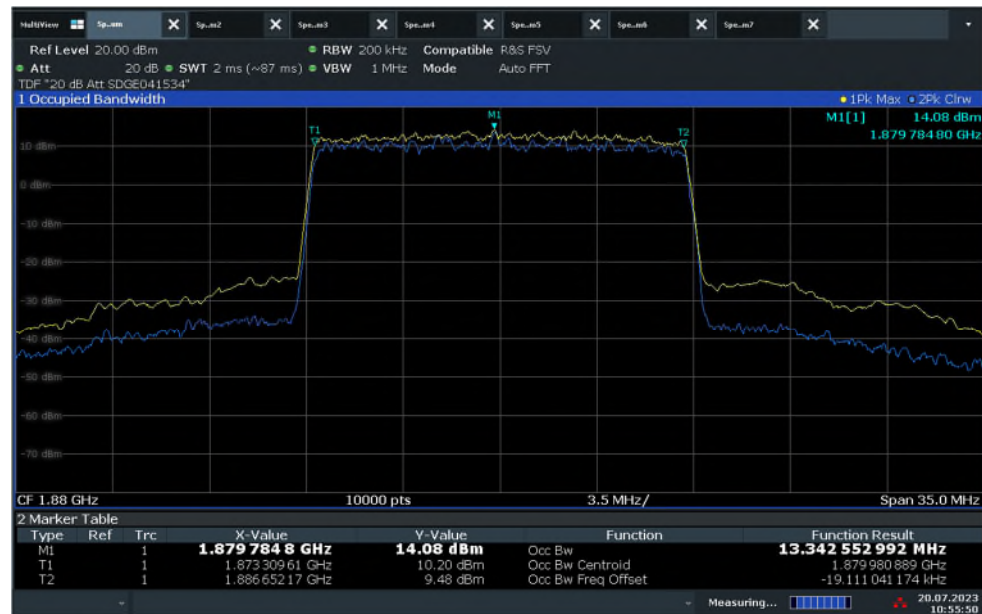
LTE Band 2 Uplink (10 MHz BW) Mid Channel 1880 MHz 99% OBW



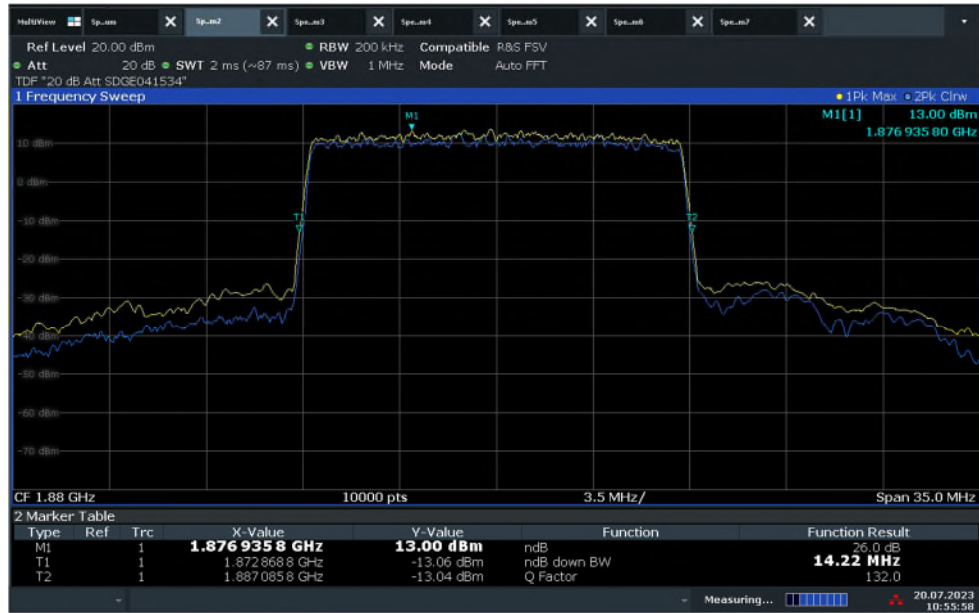
10:52:20 20.07.2023

LTE Band 2 Uplink (10 MHz BW) Mid Channel 1880 MHz -26 dB BW

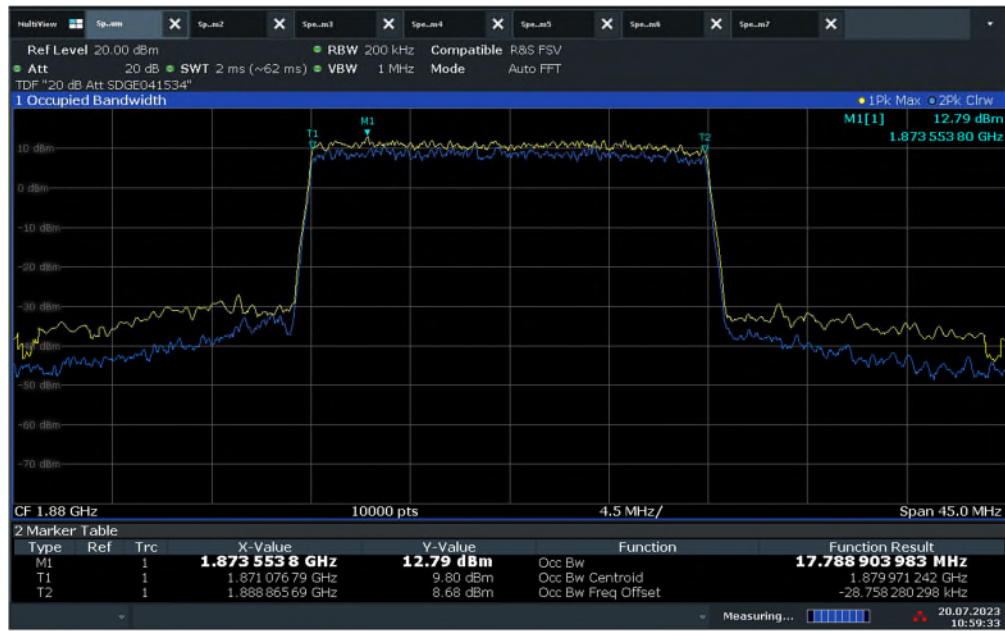
10:52:30 20.07.2023

LTE Band 2 Uplink (15 MHz BW) Mid Channel 1880 MHz 99% OBW

10:55:50 20.07.2023

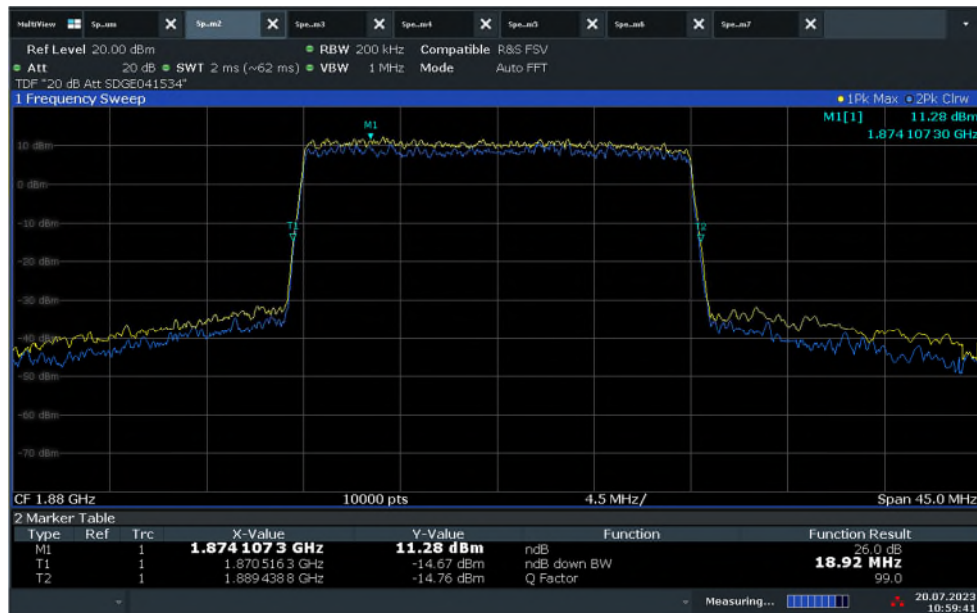
LTE Band 2 Uplink (15 MHz BW) Mid Channel 1880 MHz -26 dB BW

10:55:59 20.07.2023

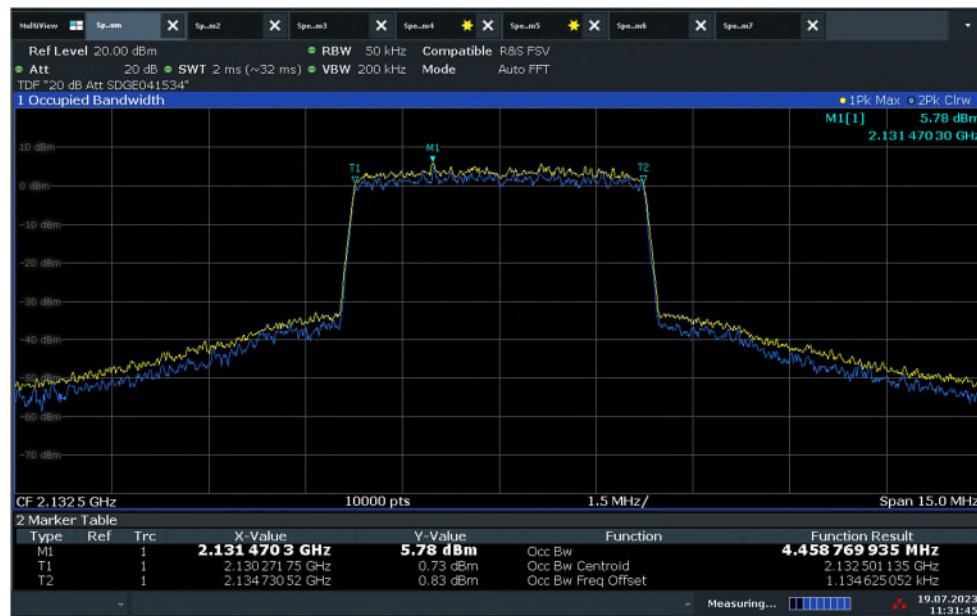
LTE Band 2 Uplink (20 MHz BW) Mid Channel 1880 MHz 99% OBW

10:59:33 20.07.2023

FCC ID: YETG43-CBBE

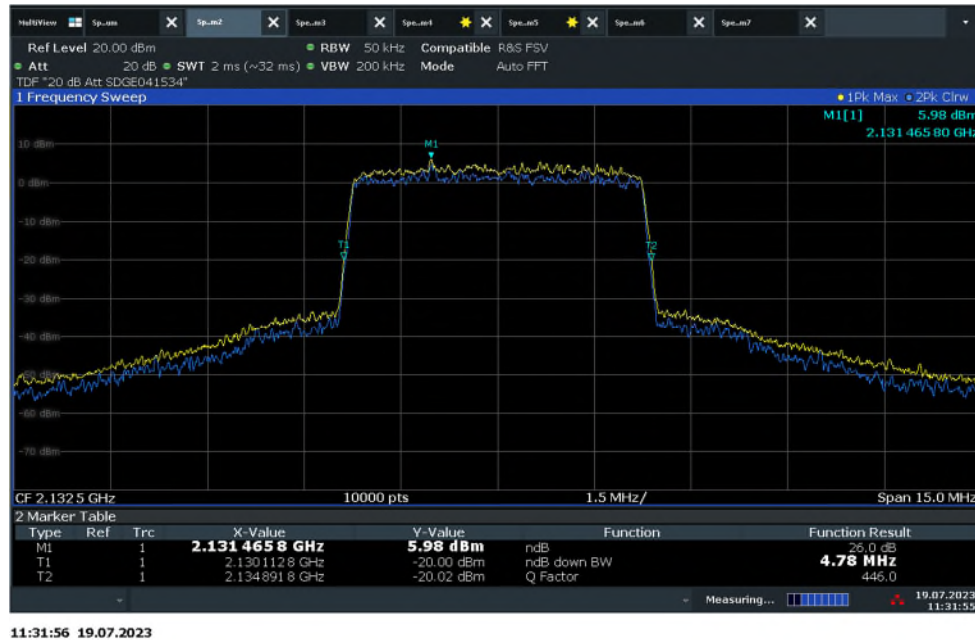
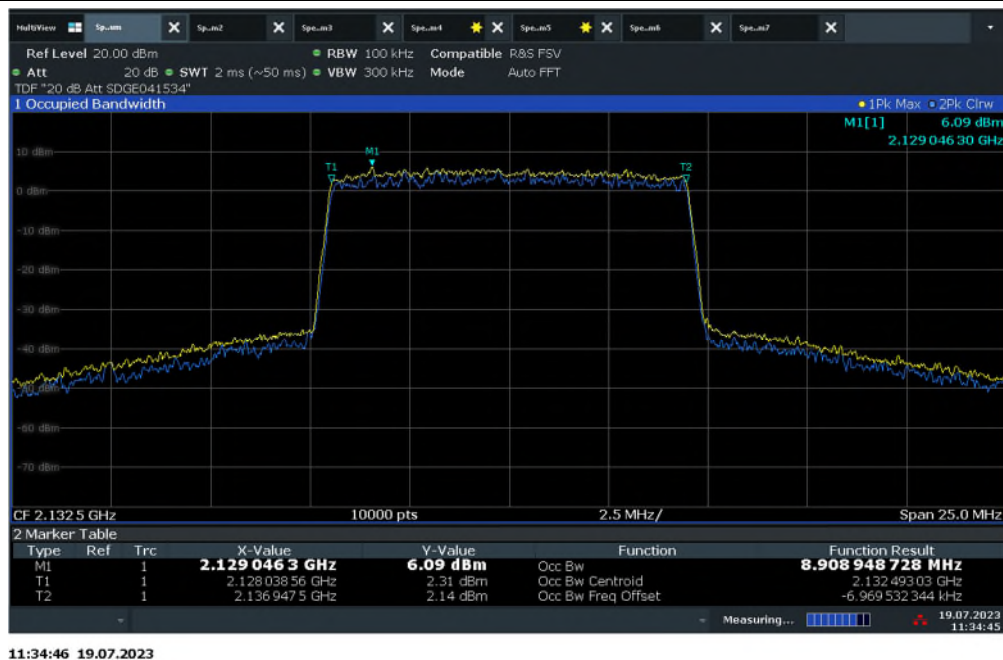
LTE Band 2 Uplink (20 MHz BW) Mid Channel 1880 MHz -26 dB BW

10:59:41 20.07.2023

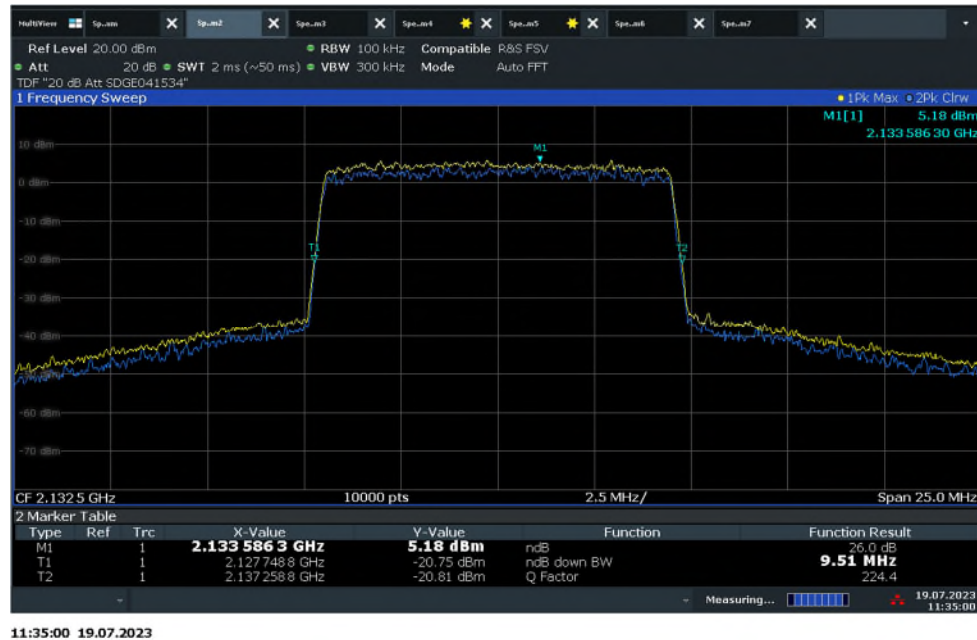
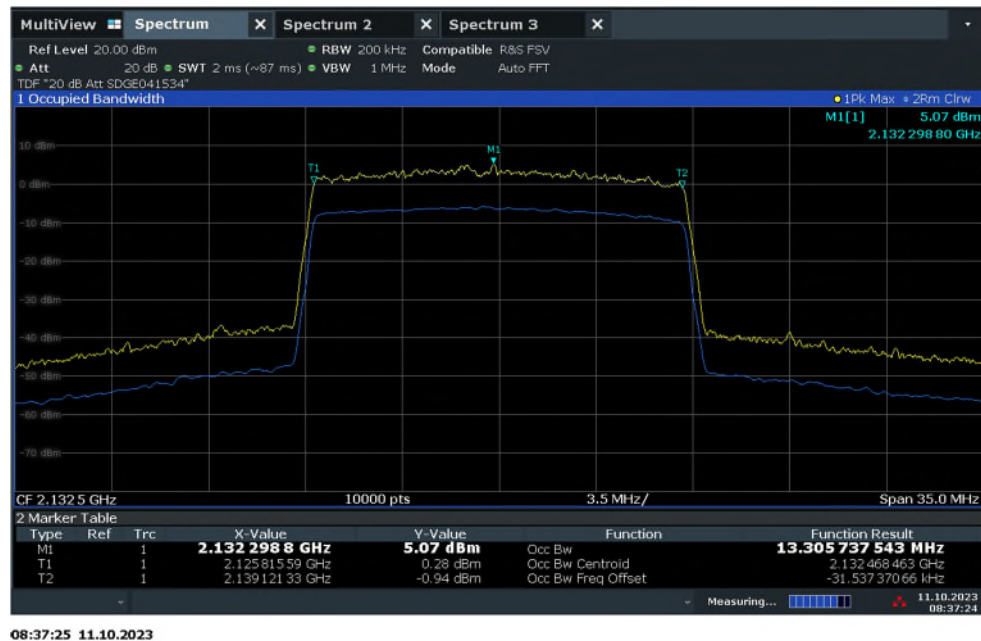
LTE Band 4 Downlink (5 MHz BW) / Mid Channel 2132.5 MHz / 99%OBW

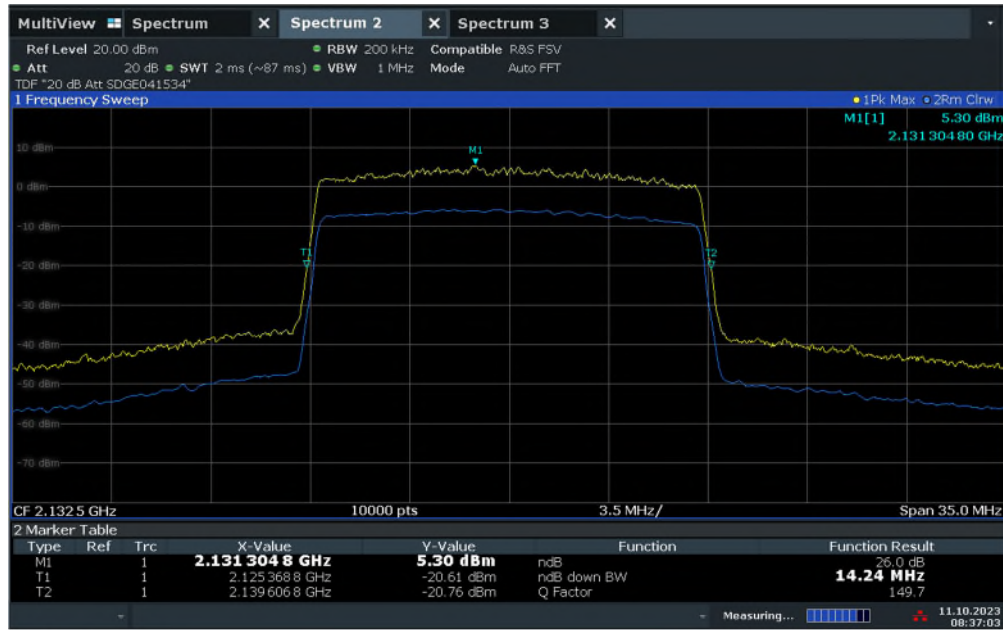
11:31:46 19.07.2023

FCC ID: YETG43-CBBE

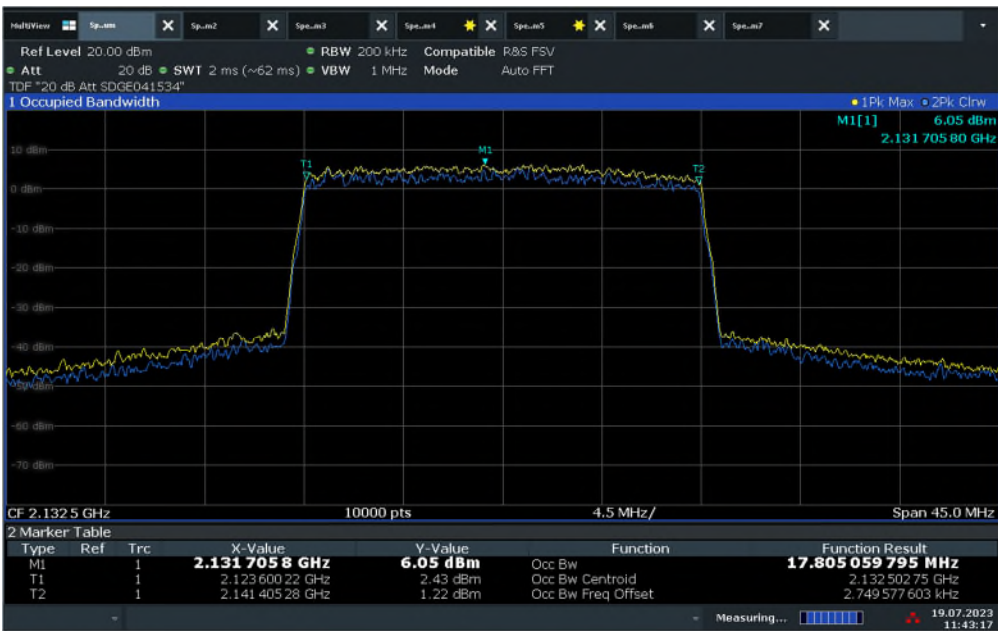
LTE Band 4 Downlink (5 MHz BW) / Mid Channel 2132.5 MHz / 26dB BW**LTE Band 4 Downlink (10 MHz BW) / Mid Channel 2132.5 MHz / 99%OBW**

FCC ID: YETG43-CBBE

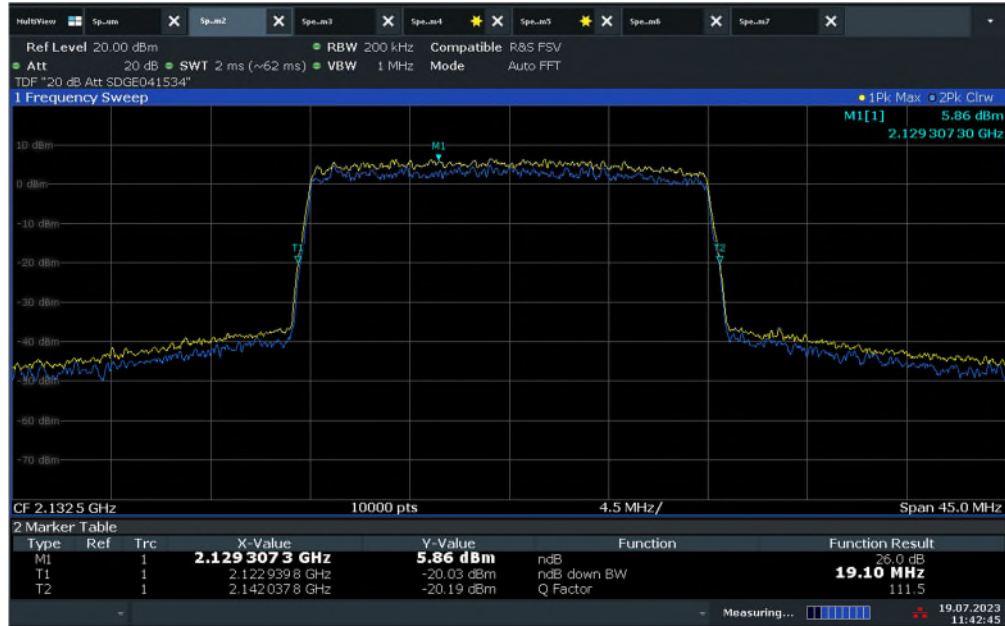
LTE Band 4 Downlink (10 MHz BW) / Mid Channel 2132.5 MHz / 26dB BW**LTE Band 4 Downlink (15 MHz BW) / Mid Channel 2132.5 MHz / 99%OBW**

LTE Band 4 Downlink (15 MHz BW) / Mid Channel 2132.5 MHz / 26dB BW

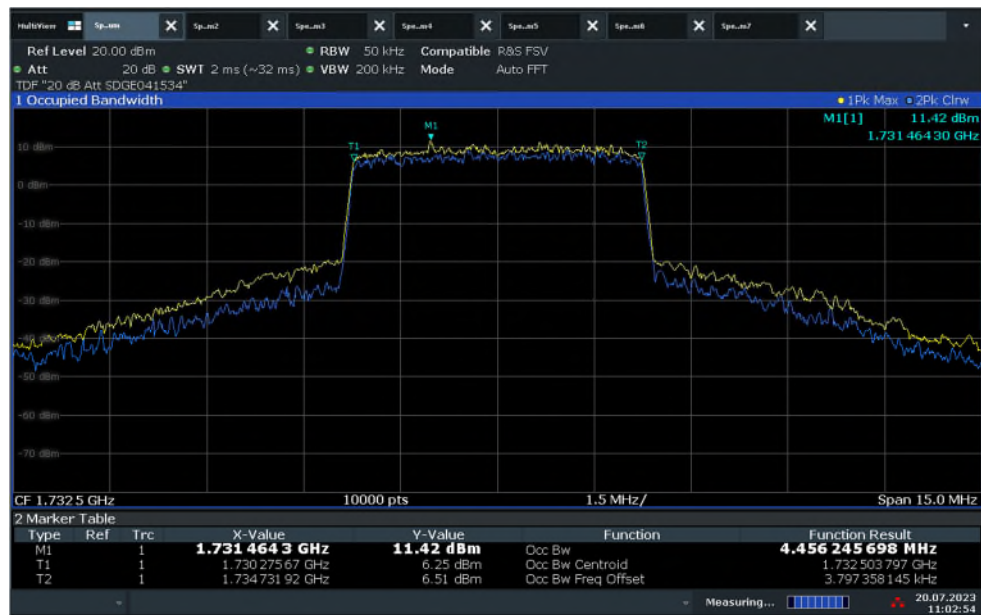
08:37:04 11.10.2023

LTE Band 4 Downlink (20 MHz BW) / Mid Channel 2132.5 MHz / 99%OBW

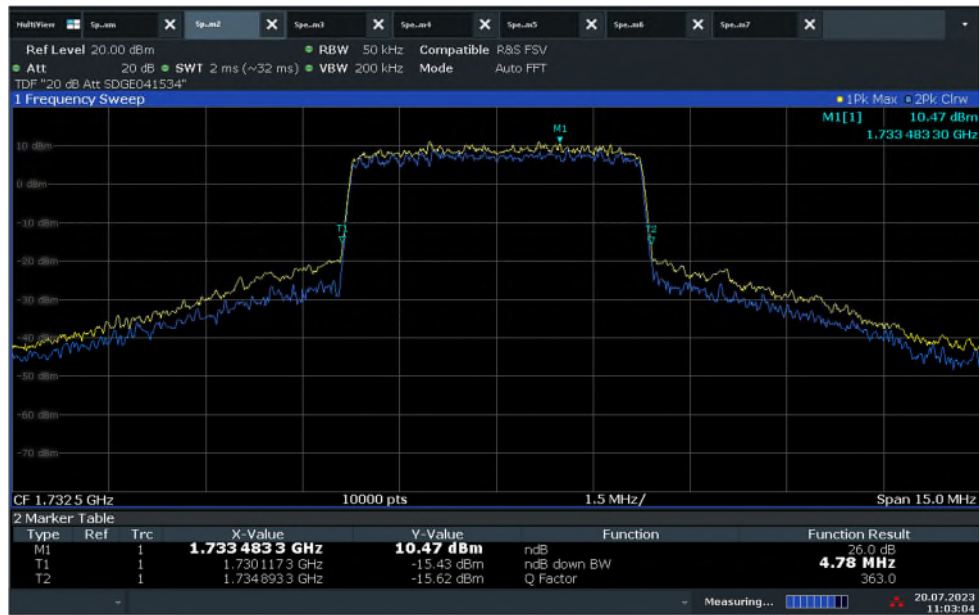
11:43:18 19.07.2023

LTE Band 4 Downlink (20 MHz BW) / Mid Channel 2132.5 MHz / 26dB BW

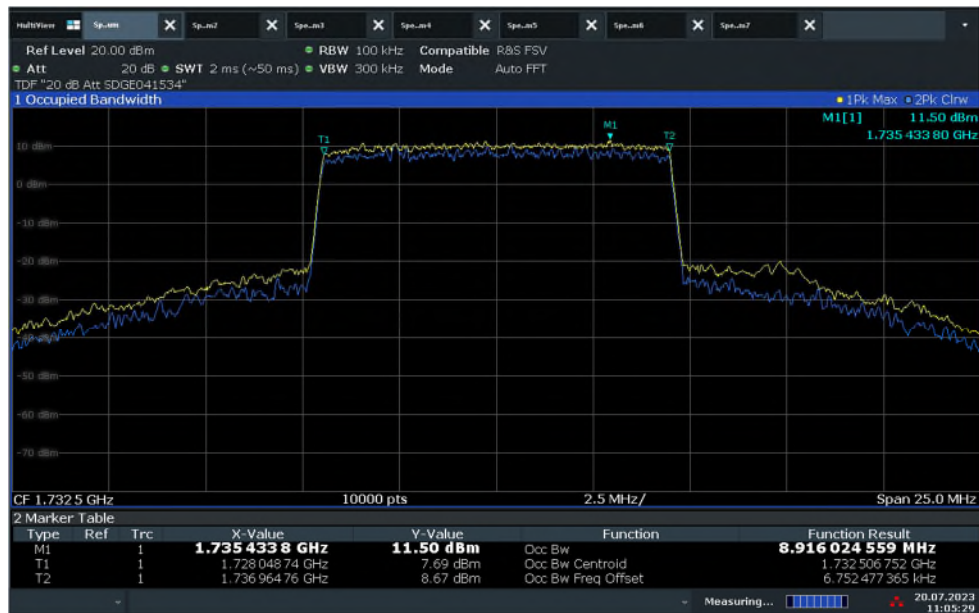
11:42:46 19.07.2023

LTE Band 4 Uplink (5 MHz BW) / Mid Channel 1732.5 MHz / 99%OBW

11:02:54 20.07.2023

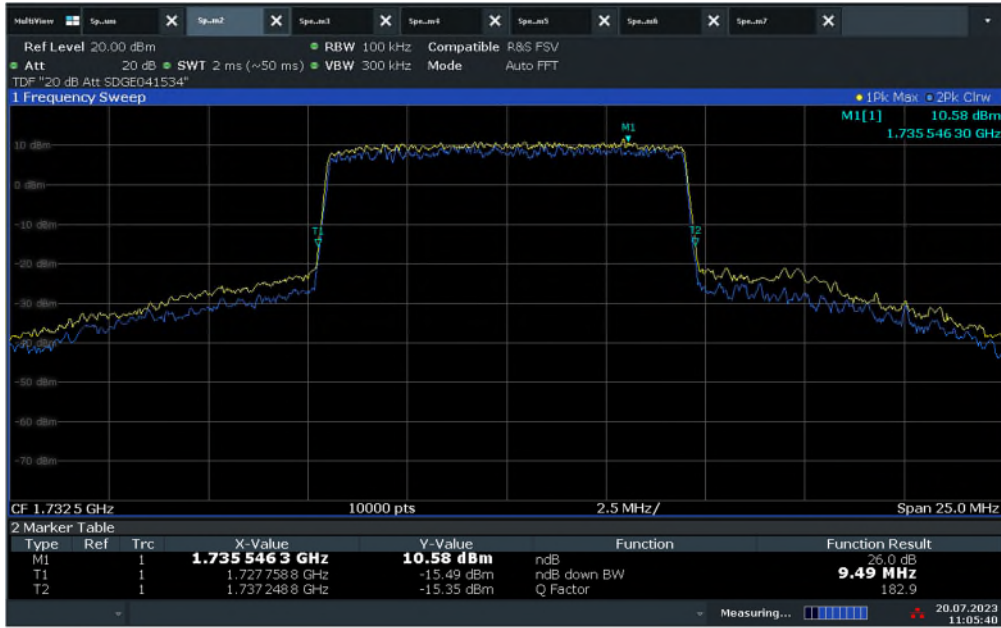
LTE Band 4 Uplink (5 MHz BW) / Middle Channel 1732.5 MHz / 26dB BW

11:03:05 20.07.2023

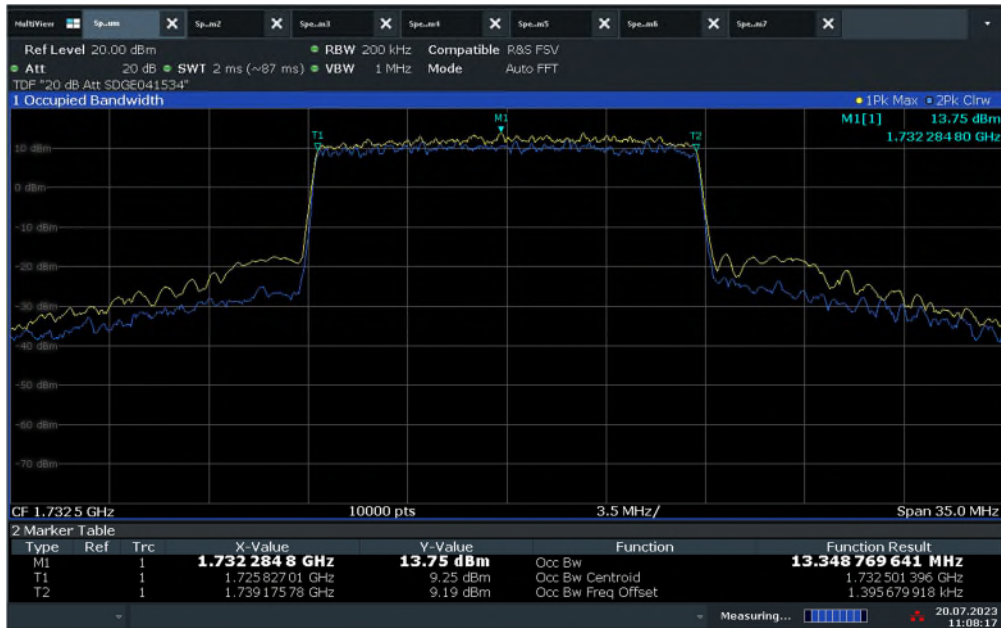
LTE Band 4 Uplink (10 MHz BW) / Mid Channel 1732.5 MHz / 99%OBW

11:05:30 20.07.2023

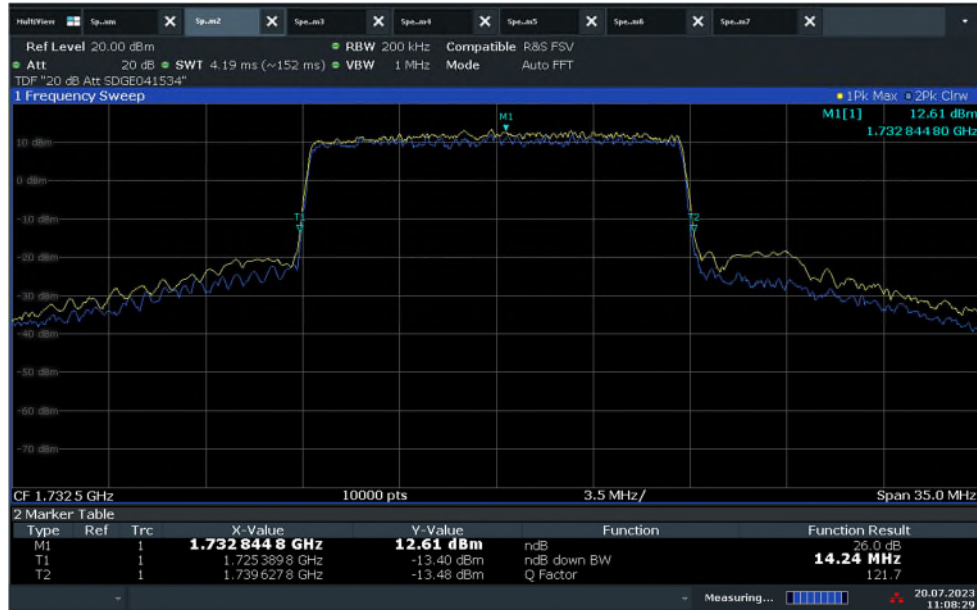
FCC ID: YETG43-CBBE

LTE Band 4 Uplink (10 MHz BW) / Mid Channel 1732.5 MHz / 26dB BW

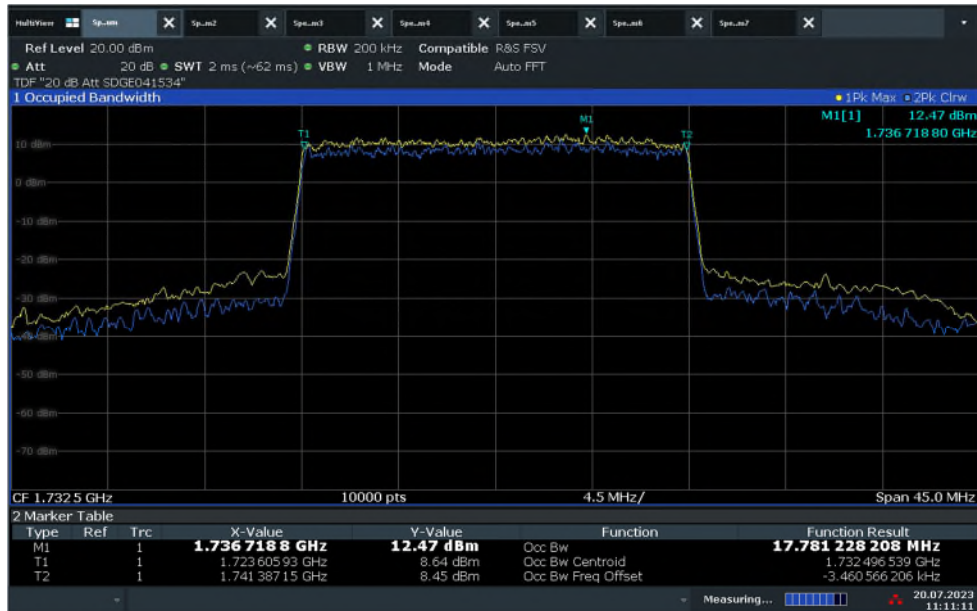
11:05:41 20.07.2023

LTE Band 4 Uplink (15 MHz BW) / Mid Channel 1732.5 MHz / 99%OBW

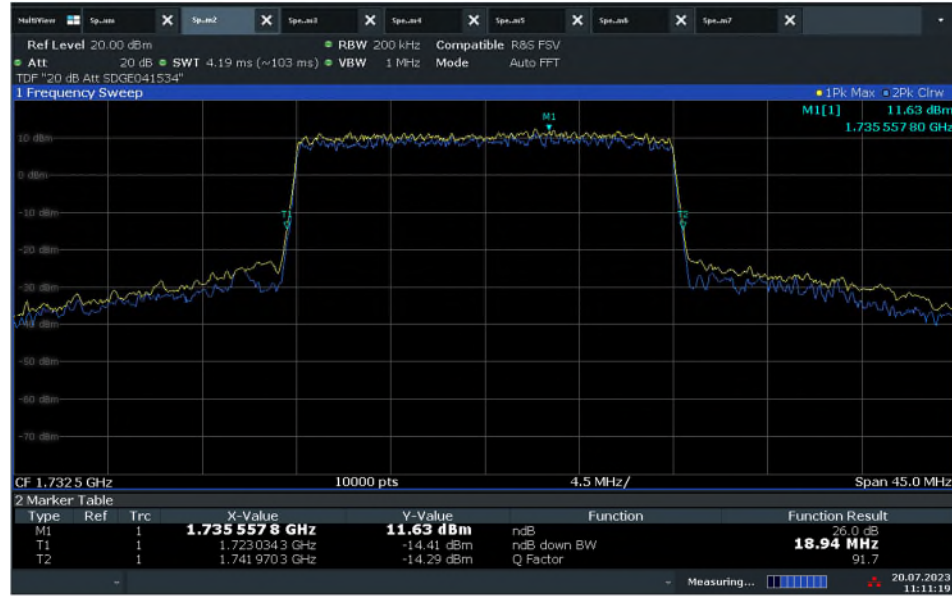
11:08:18 20.07.2023

LTE Band 4 Uplink (15 MHz BW) / Mid Channel 1732.5 MHz / 26dB BW

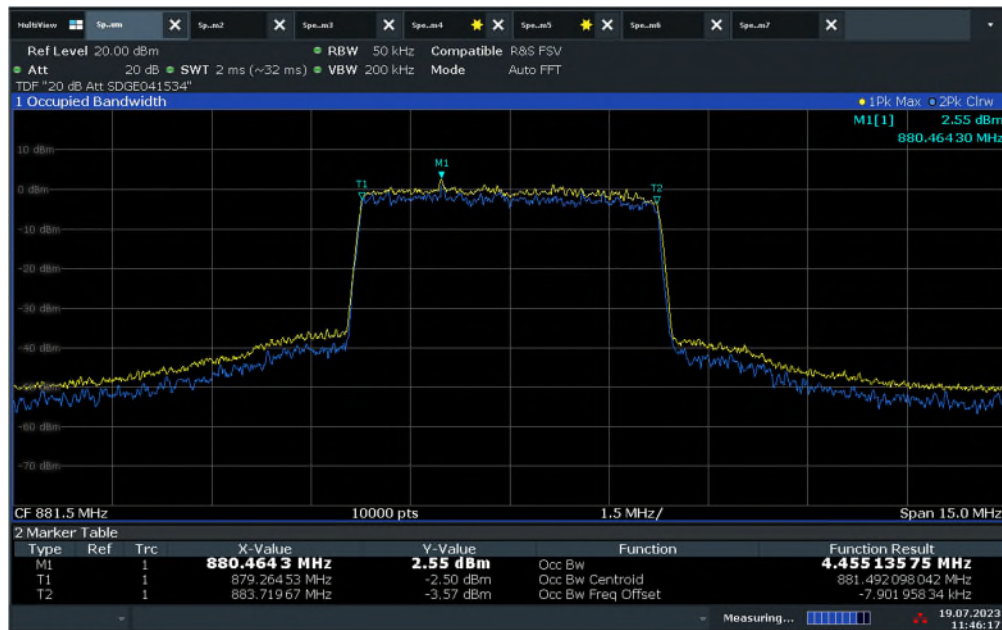
11:08:30 20.07.2023

LTE Band 4 Uplink (20 MHz BW) / Mid Channel 1732.5 MHz / 99%OBW

11:11:11 20.07.2023

LTE Band 4 Uplink (20 MHz BW) / Mid Channel 1732.5 MHz / 26dB BW

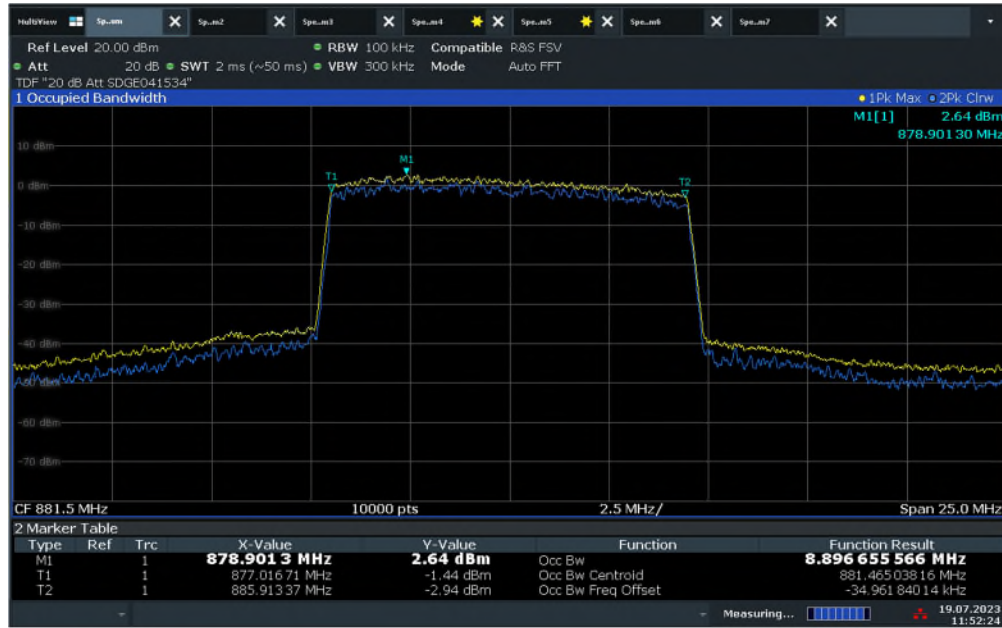
11:11:19 20.07.2023

LTE Band 5 Downlink (5 MHz BW) Mid Channel 891.5 MHz 99% OBW

11:46:18 19.07.2023

LTE Band 5 Downlink (5 MHz BW) Mid Channel 891.5 MHz 26 dB BW

11:46:31 19.07.2023

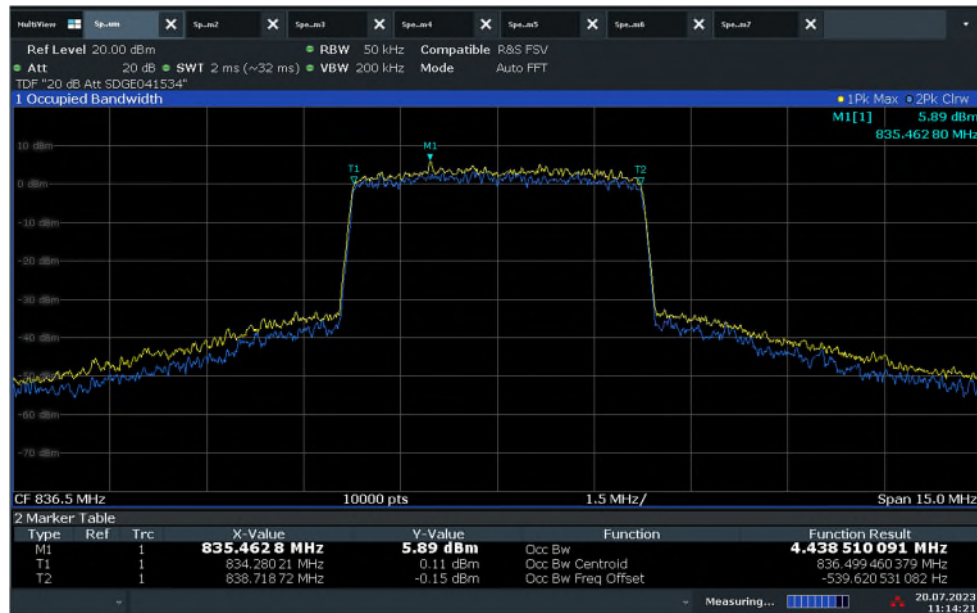
LTE Band 5 Downlink (10 MHz BW) Mid Channel 891.5 MHz 99% OBW

11:52:25 19.07.2023

FCC ID: YETG43-CBBE

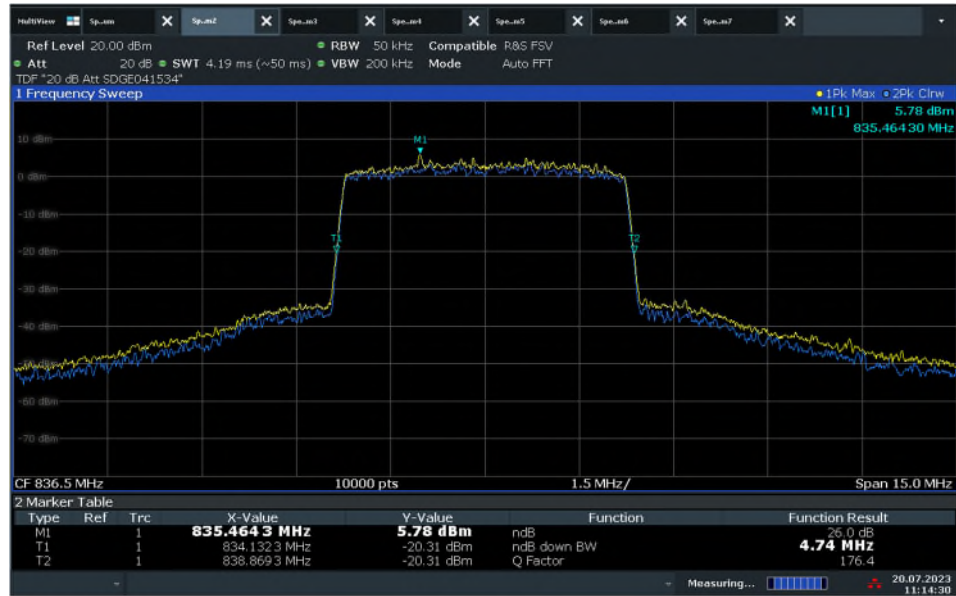
LTE Band 5 Downlink (10 MHz BW) Mid Channel 891.5 MHz 26 dB BW

11:52:33 19.07.2023

LTE Band 5 Uplink (5 MHz BW) Mid Channel 826.5 MHz 99% OBW

11:14:22 20.07.2023

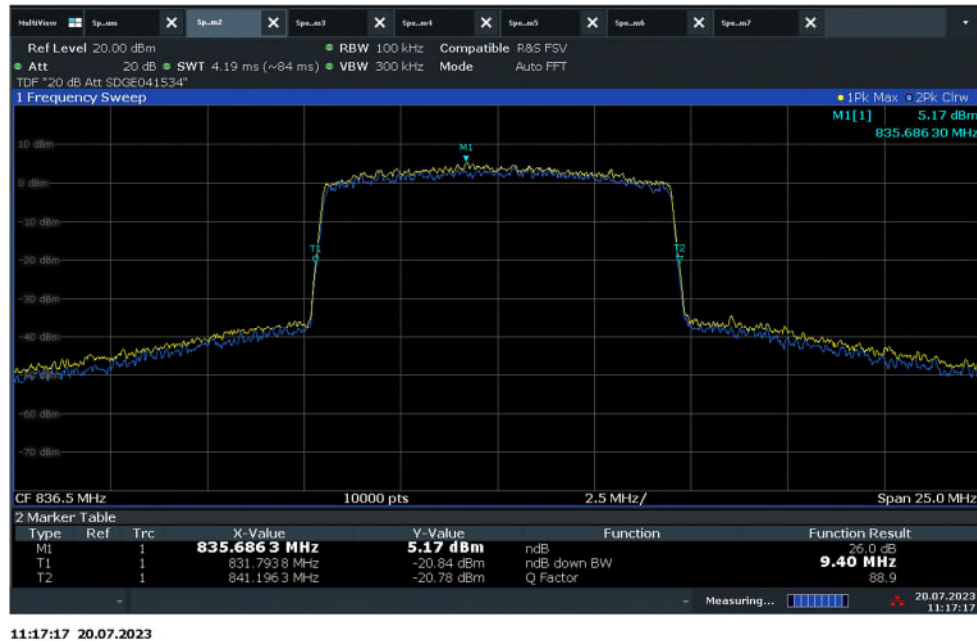
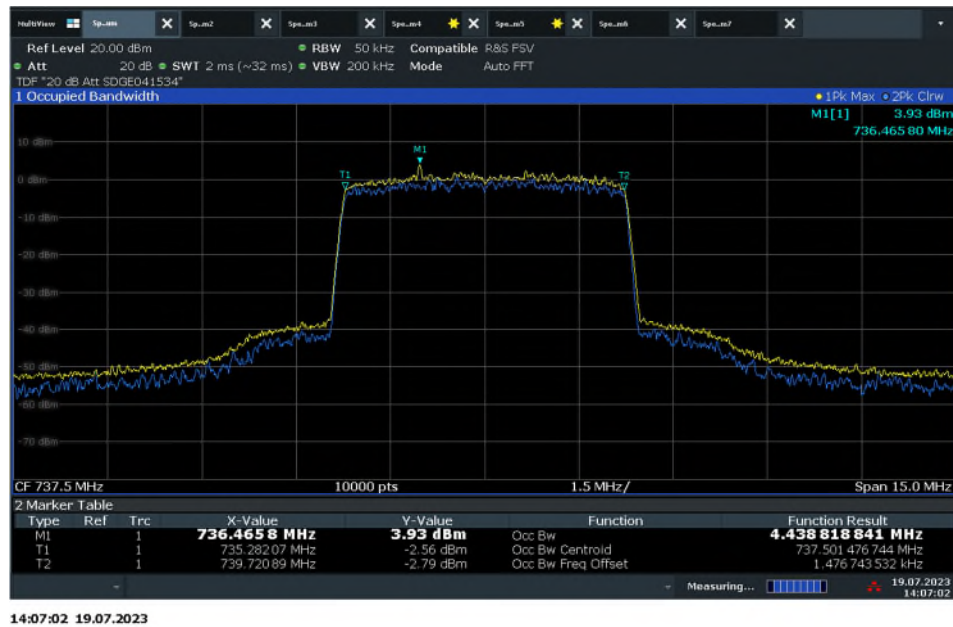
FCC ID: YETG43-CBBE

LTE Band 5 Uplink (5 MHz BW) Mid Channel 826.5 MHz 26 dB BW

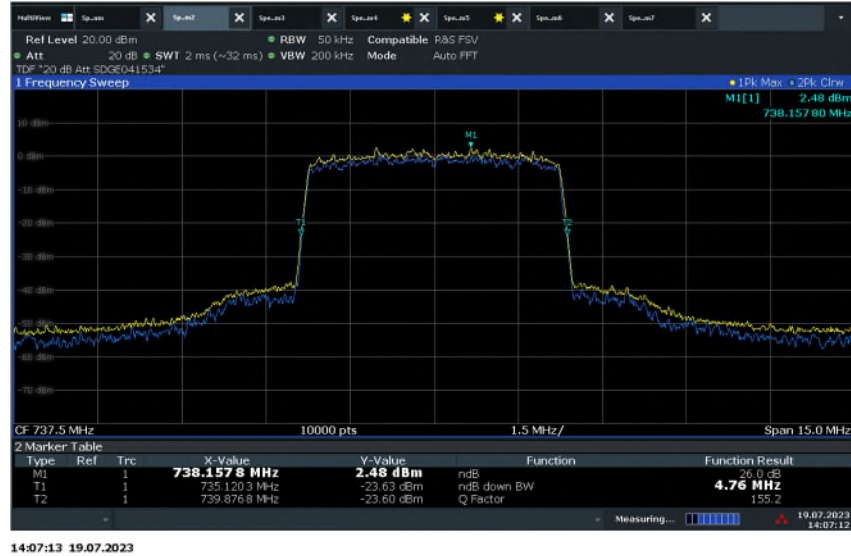
11:14:31 20.07.2023

LTE Band 5 Uplink (10 MHz BW) Mid Channel 826.5 MHz 99% OBW

11:17:11 20.07.2023

LTE Band 5 Uplink (10 MHz BW) Mid Channel 826.5 MHz 26 dB BW**LTE Band 12 Downlink (5 MHz BW) / Mid Channel 737.5 MHz / 99%OBW**

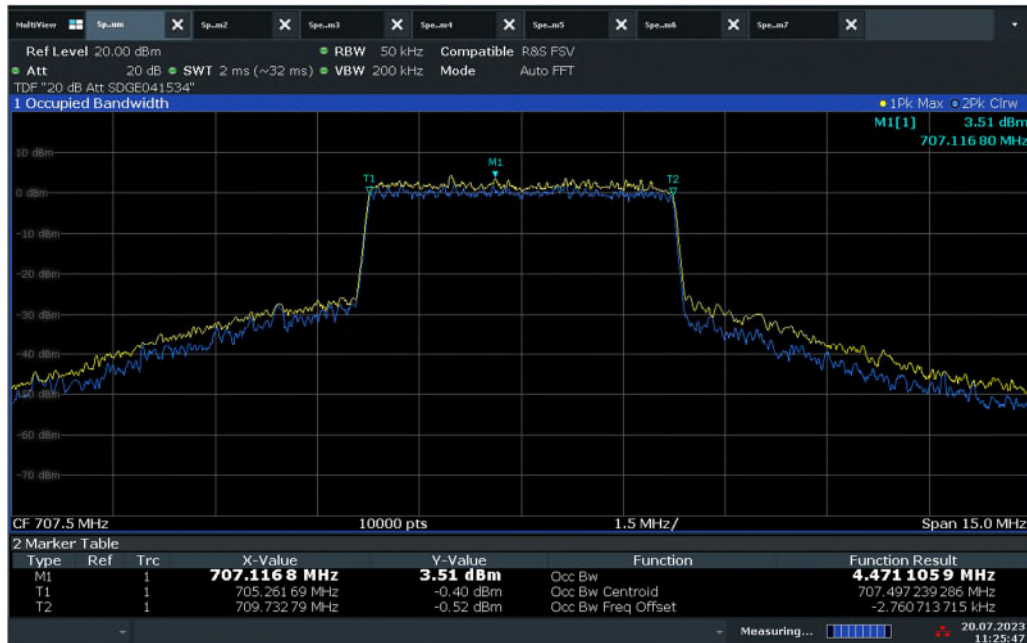
FCC ID: YETG43-CBBE

LTE Band 12 Downlink (5 MHz BW) / Mid Channel 737.5 MHz / 26dB BW**LTE Band 12 Downlink (10 MHz BW) / Mid Channel 737.5 MHz / 99%OBW**

FCC ID: YETG43-CBBE

LTE Band 12 Downlink (10 MHz BW) / Mid Channel 737.5 MHz / 26dB BW

14:14:03 19.07.2023

LTE Band 12 Uplink (5 MHz BW) / Mid Channel 707.5 MHz / 99%OBW

11:25:48 20.07.2023

FCC ID: YETG43-CBBE

LTE Band 12 Uplink (5 MHz BW) / Mid Channel 707.5 MHz / 26dB BW

11:25:57 20.07.2023

LTE Band 12 Uplink (10 MHz BW) / Mid Channel 707.5 MHz / 99%OBW

11:29:42 20.07.2023

FCC ID: YETG43-CBBE

LTE Band 12 Uplink (10 MHz BW) / Mid Channel 707.5 MHz / 26dB BW

11:29:56 20.07.2023

LTE Band 13 Downlink (5 MHz BW) / Mid Channel 751.0 MHz / 99%OBW

14:17:20 19.07.2023

LTE Band 13 Downlink (5 MHz BW) / Mid Channel 751.0 MHz / 26dB BW



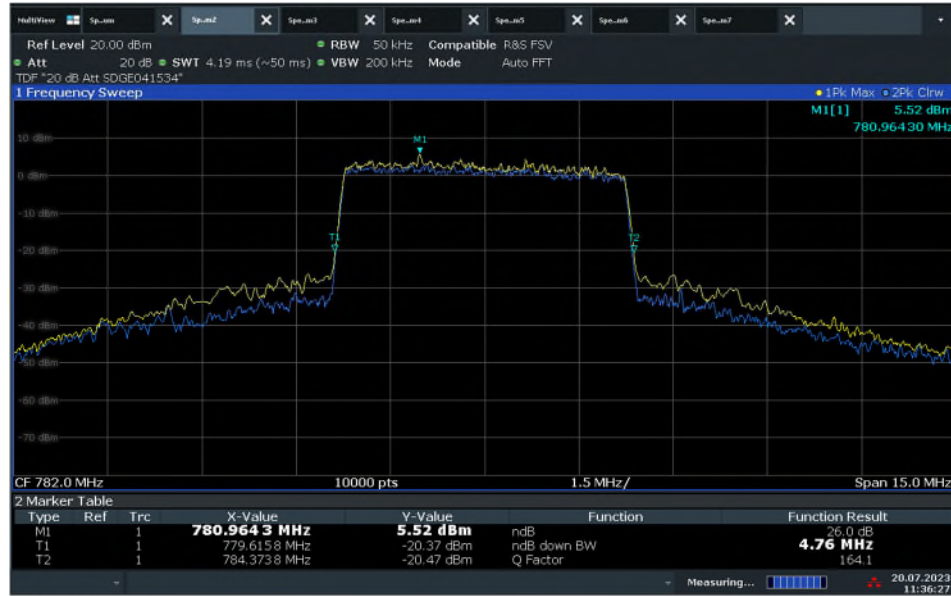
14:17:34 19.07.2023

LTE Band 13 Downlink (10 MHz BW) / Mid Channel 751.0 MHz / 99%OBW

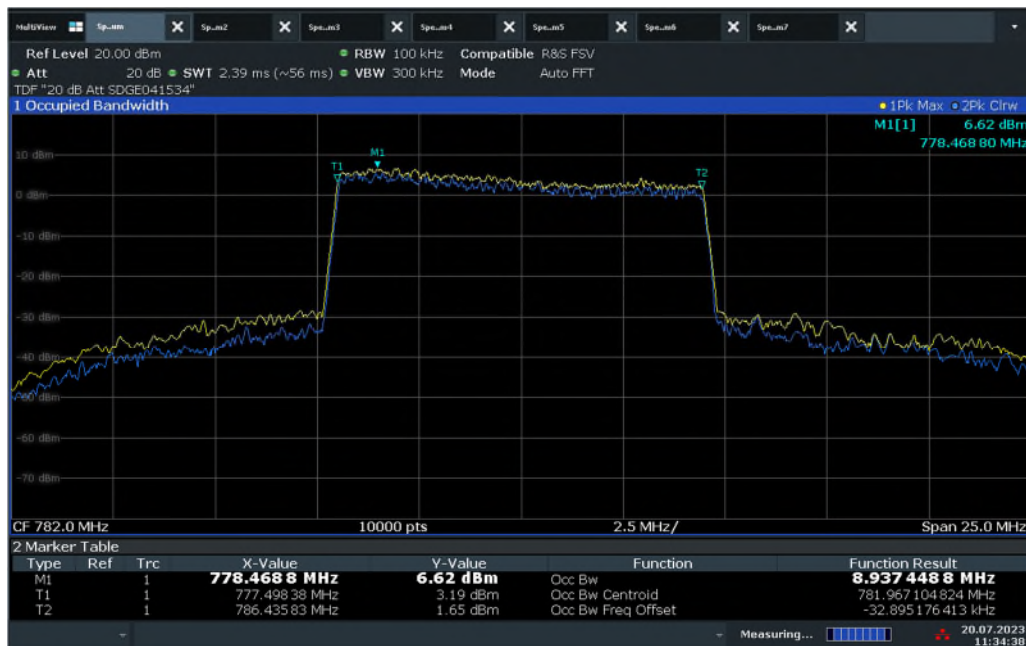


14:19:01 19.07.2023

FCC ID: YETG43-CBBE

LTE Band 13 Uplink (5 MHz BW) / Mid Channel 782.0 MHz / 26dB BW

11:36:27 20.07.2023

LTE Band 13 Uplink (10 MHz BW) / Mid Channel 782.0 MHz / 99%OBW

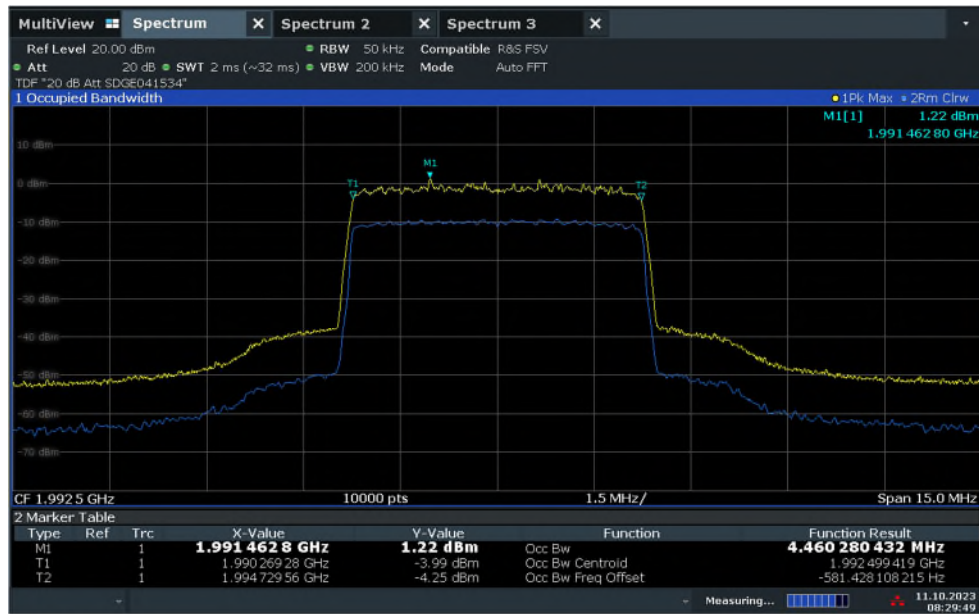
11:34:38 20.07.2023

LTE Band 13 Uplink (10 MHz BW) / Mid Channel 782.0 MHz / 26dB BW



11:34:13 20.07.2023

LTE Band 25 Downlink 5 MHz BW High Channel 99% OBW



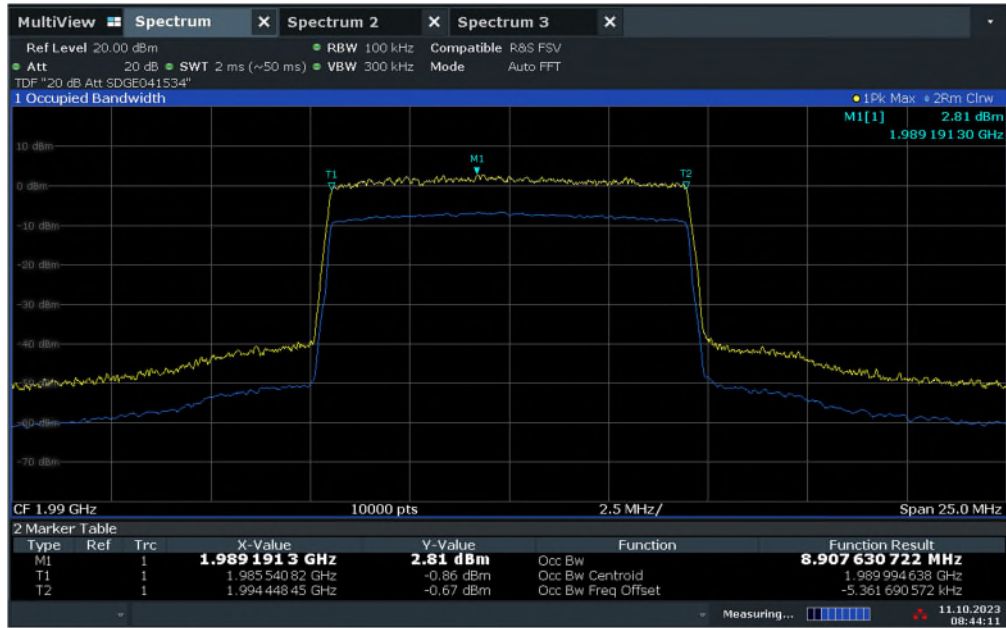
08:29:49 11.10.2023

LTE Band 25 Downlink 5 MHz BW High Channel -26dB BW



08:31:02 11.10.2023

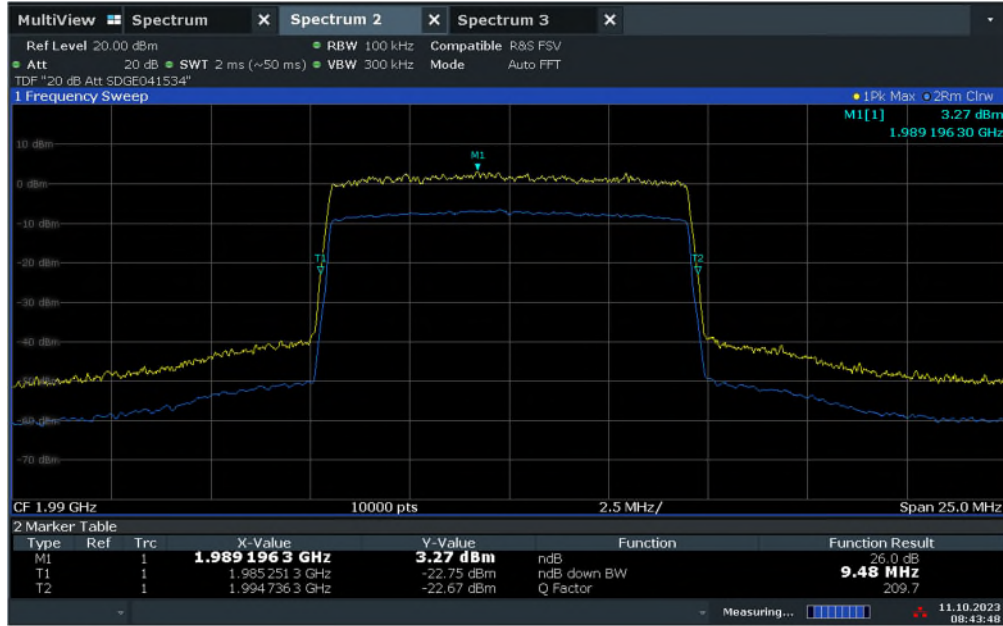
LTE Band 25 Downlink 10 MHz BW High Channel 99% OBW



08:44:12 11.10.2023

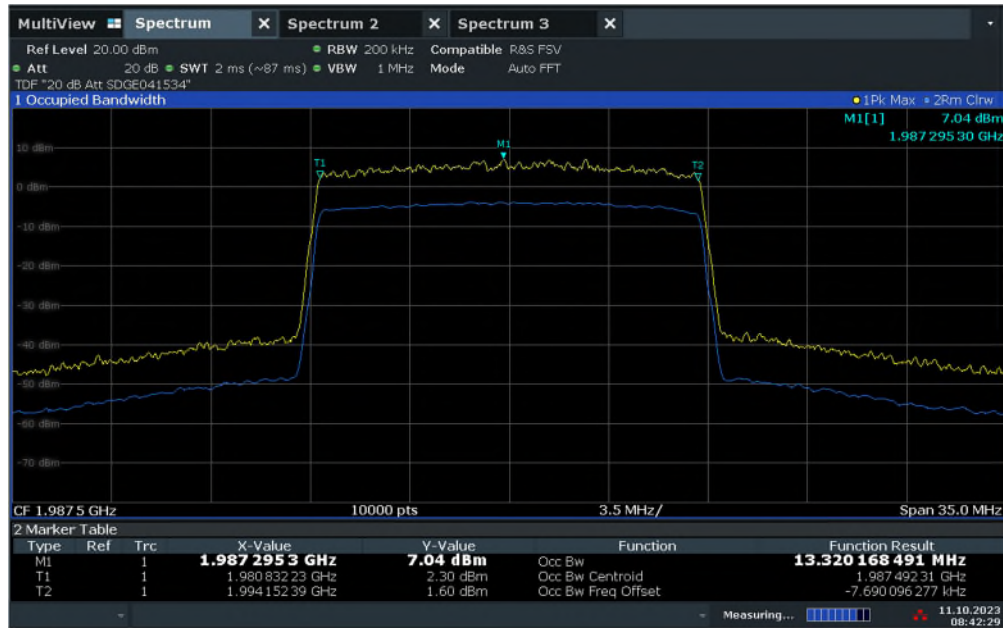
FCC ID: YETG43-CBBE

LTE Band 25 Downlink 10 MHz BW High Channel -26dB BW



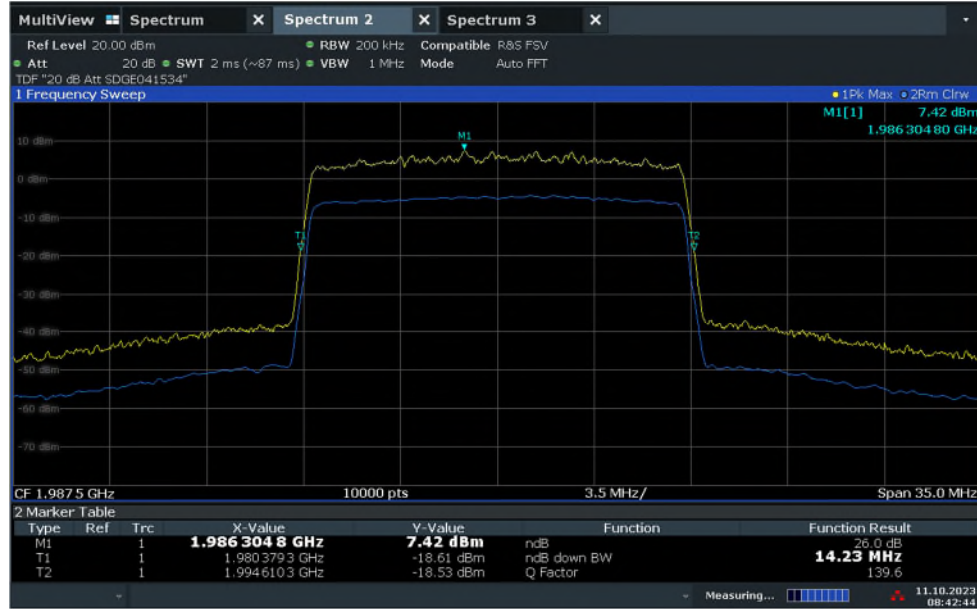
08:43:49 11.10.2023

LTE Band 25 Downlink 15 MHz BW High Channel 99% OBW



08:42:29 11.10.2023

FCC ID: YETG43-CBBE

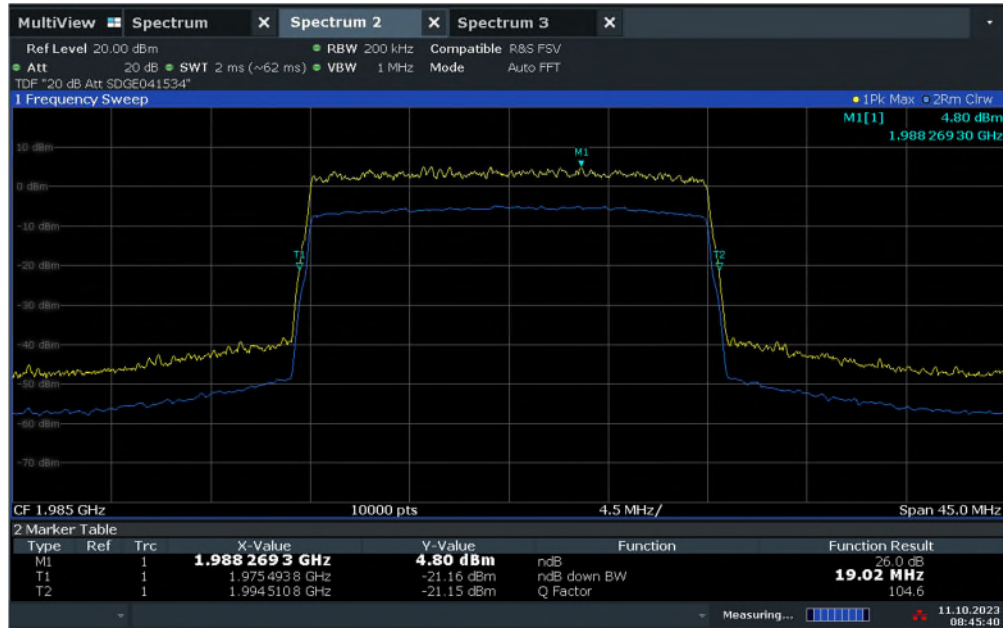
LTE Band 25 Downlink 15MHz BW High Channel -26dB BW

08:42:45 11.10.2023

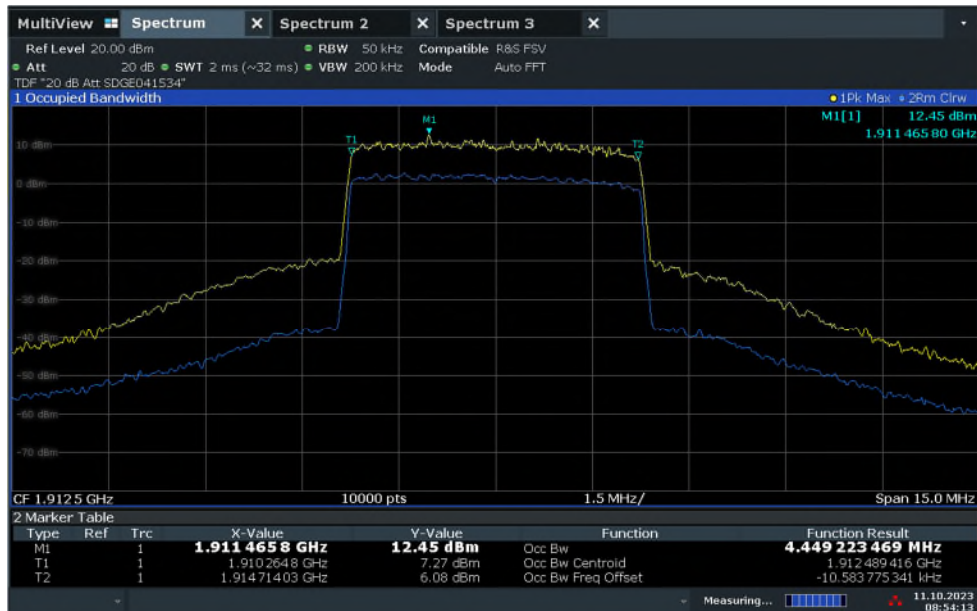
LTE Band 25 Downlink 20 MHz BW High Channel 99% OBW

08:45:28 11.10.2023

FCC ID: YETG43-CBBE

LTE Band 25 Downlink 20 MHz BW High Channel -26dB BW

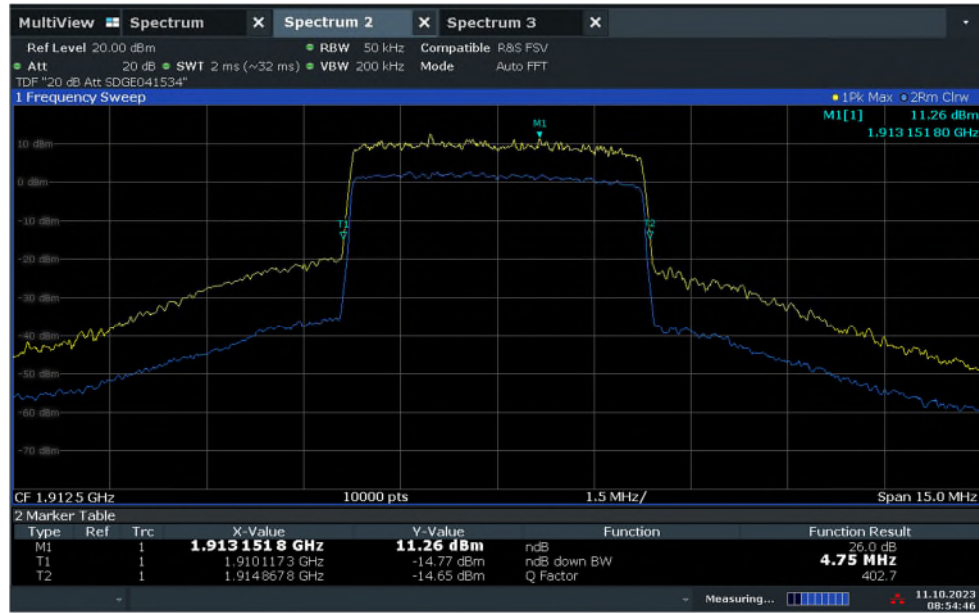
08:45:41 11.10.2023

LTE Band 25 Uplink 5 MHz BW High Channel 99% OBW

08:54:13 11.10.2023

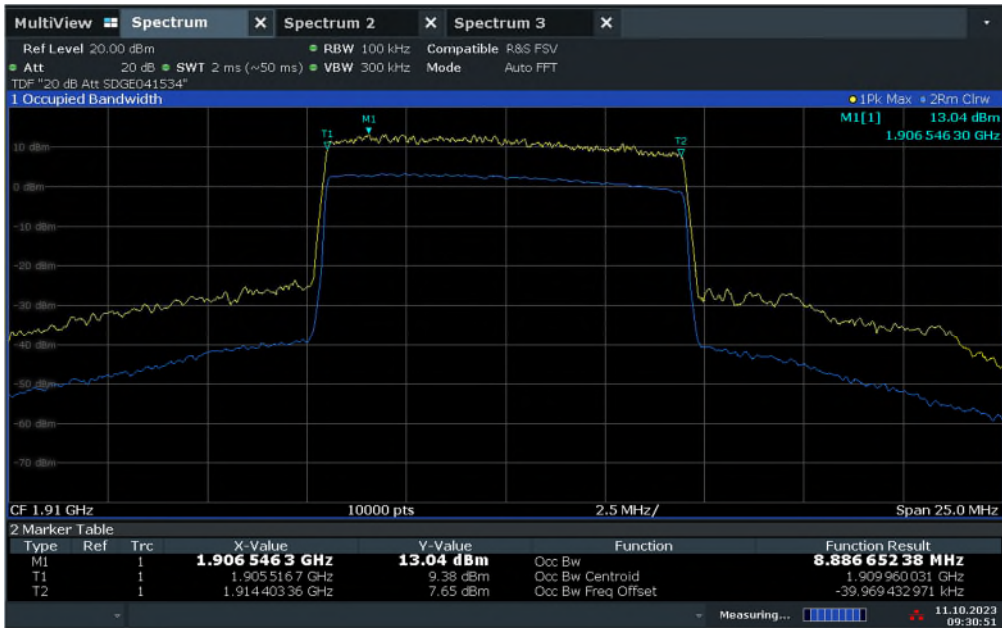
FCC ID: YETG43-CBBE

LTE Band 25 Uplink 5 MHz BW High Channel -26dB BW



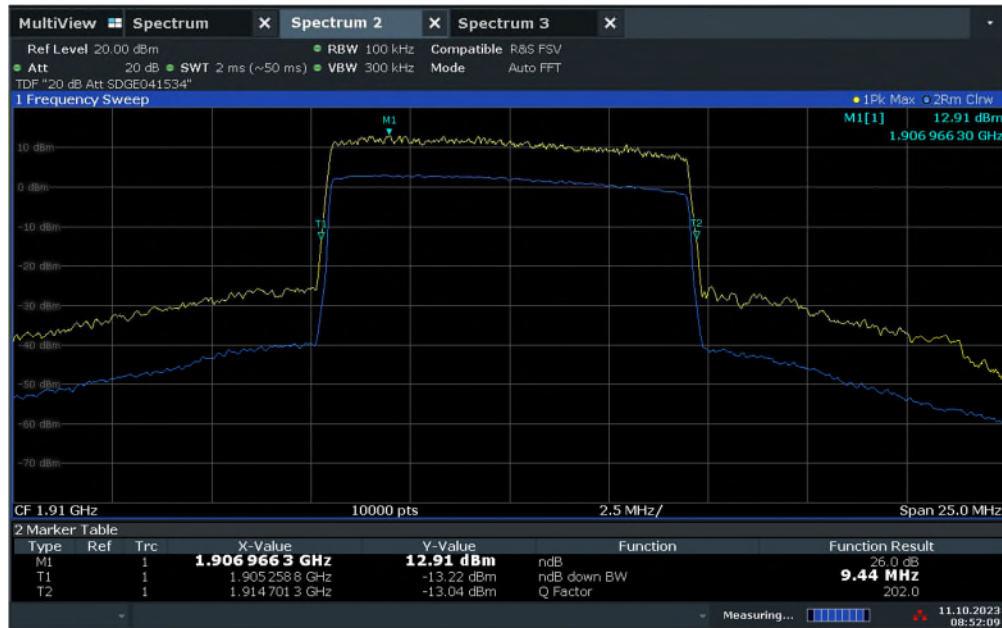
08:54:46 11.10.2023

LTE Band 25 Uplink 10 MHz BW High Channel 99% OBW



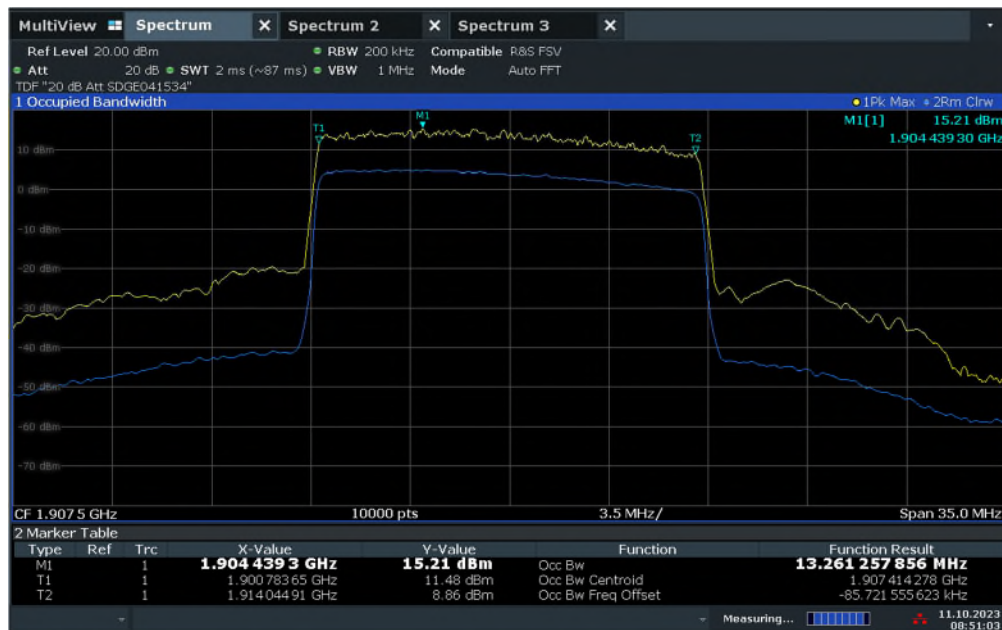
09:30:51 11.10.2023

LTE Band 25 Uplink 10 MHz BW High Channel -26dB BW



08:52:09 11.10.2023

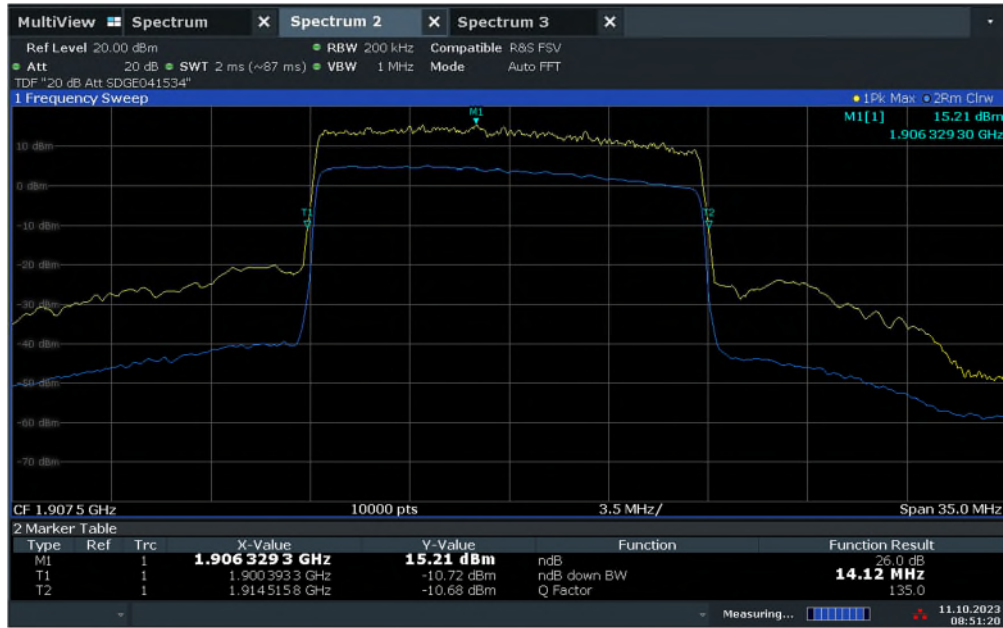
LTE Band 25 Uplink 15 MHz BW High Channel 99% OBW



08:51:04 11.10.2023

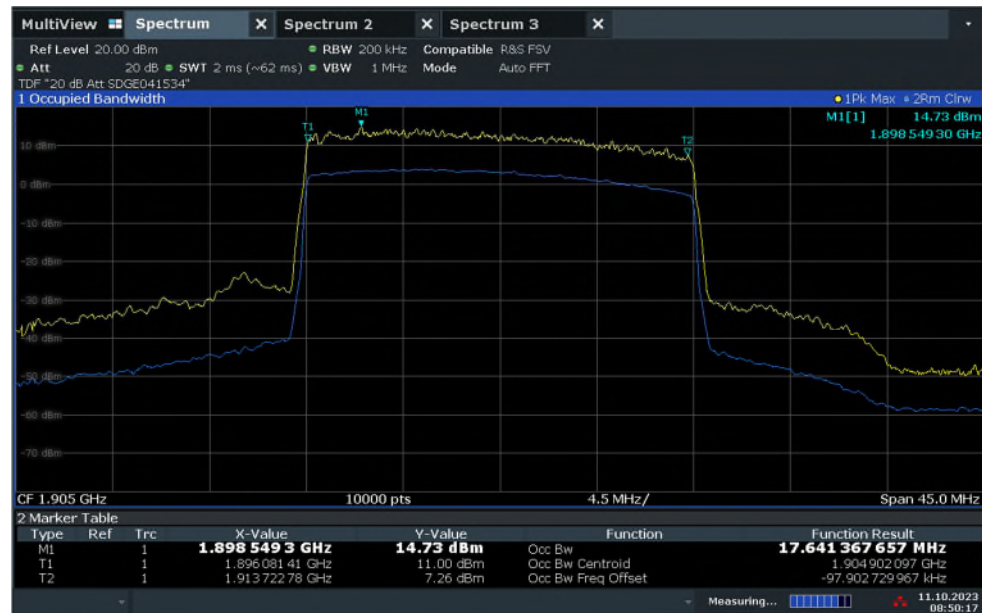
FCC ID: YETG43-CBBE

LTE Band 25 Uplink 15 MHz BW High Channel -26dB BW



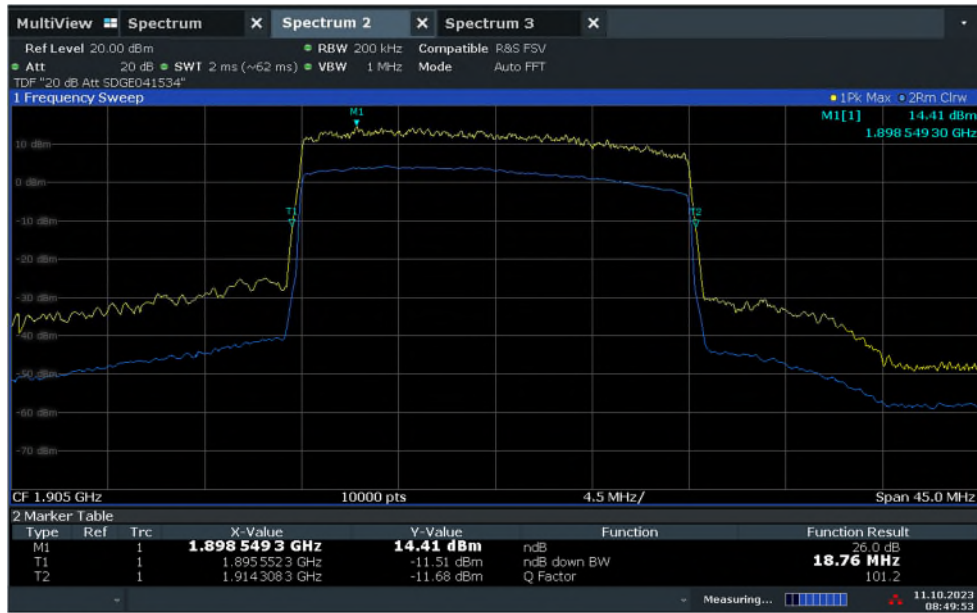
08:51:21 11.10.2023

LTE Band 25 Uplink 20 MHz BW High Channel 99% OBW



08:50:18 11.10.2023

LTE Band 25 Uplink 20 MHz BW High Channel -26dB BW



08:49:53 11.10.2023

FCC ID: YETG43-CBBE

2.11 Oscillation Detection

2.11.1 Specification Reference

FCC 47 CFR Part 20. Clause 20.21(e)(9)(ii)(A)
KDB935210 D04, Clause 7.11

2.11.2 Standard Applicable

FCC 47 CFR Part 20. Clause 20.21(e)(9)(ii)(A) Anti-Oscillation:

Consumer boosters must be able to detect and mitigate (i.e., by automatic gain reduction or shut down), any oscillations in uplink and downlink bands. Oscillation detection and mitigation must occur automatically within 0.3 seconds in the uplink band and within 1 second in the downlink band. In cases where oscillation is detected, the booster must continue mitigation for at least one minute before restarting. After five such restarts, the booster must not resume operation until manually reset.

2.11.3 Equipment Under Test and Modification State

Serial No: 560311000026 / Test Configuration A, B, C and D

2.11.4 Date of Test/Initial of test personnel who performed the test.

September 11, 2023/MARG

2.11.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.11.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	25.8°C
Relative Humidity	53.3%
ATM Pressure	99.0kPa

2.11.7 Additional Observations

- This is conducted Test.
- The test procedure is per Section 7.11 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The EUT operated in Normal Mode when testing Oscillation Mitigation Time. Setup the EUT according to Figure 10 and 11 of Section 7.11 of KDB935210 for Normal Mode.
- The EUT operated in Test Mode when testing Re-Try event. Setup the EUT according to Figure 12 of Section 7.11 of KDB935210 for Test Mode.
- Evaluations are conducted at Donnor and Server Ports.
- Signal: 5MHz LTE.



FCC ID: YETG43-CBBE

2.11.8 Test Results Summary

Band	Signal Path	Frequency (MHz)	Mitigation Time (Sec)	Limit (Sec)	Margin (Sec)
LTE Band 2 Downlink	Server Port	1960	0.725	1	0.275
LTE Band 2 Uplink	Donnor Port	1880	0.021	0.3	0.279
LTE Band 4 Downlink	Server Port	2132.5	0.710	1	0.29
LTE Band 4 Uplink	Donnor Port	1732.5	0.043	0.3	0.257
LTE Band 5 Downlink	Server Port	881.5	0.826	1	0.174
LTE Band 5 Uplink	Donnor Port	836.5	0.014	0.3	0.286
LTE Band 12 Downlink	Server Port	737.5	0.630	1	0.37
LTE Band 12 Uplink	Donnor Port	707.5	0.014	0.3	0.286
LTE Band 13 Downlink	Server Port	751.0	0.695	1	0.305
LTE Band 13 Uplink	Donnor Port	782.0	0.130	0.3	0.17
LTE Band 25 Downlink	Server Port	1962.5	0.710	1	0.29
LTE Band 25 Uplink	Donnor Port	1882.5	0.021	0.3	0.279

Band	Signal Path	Frequency (MHz)	Re-try Event	Limit Event	Margin (Sec)
LTE Band 2 Downlink	Server Port	1960	0	5	5
LTE Band 2 Uplink	Donnor Port	1880	0	5	5
LTE Band 4 Downlink	Server Port	2132.5	0	5	5
LTE Band 4 Uplink	Donnor Port	1732.5	0	5	5
LTE Band 5 Downlink	Server Port	881.5	0	5	5
LTE Band 5 Uplink	Donnor Port	836.5	0	5	5
LTE Band 12 Downlink	Server Port	737.5	0	5	5
LTE Band 12 Uplink	Donnor Port	707.5	0	5	5
LTE Band 13 Downlink	Server Port	751.0	0	5	5
LTE Band 13 Uplink	Donnor Port	782.0	0	5	5
LTE Band 25 Downlink	Server Port	1962.5	0	5	5
LTE Band 25 Uplink	Donnor Port	1882.5	0	5	5



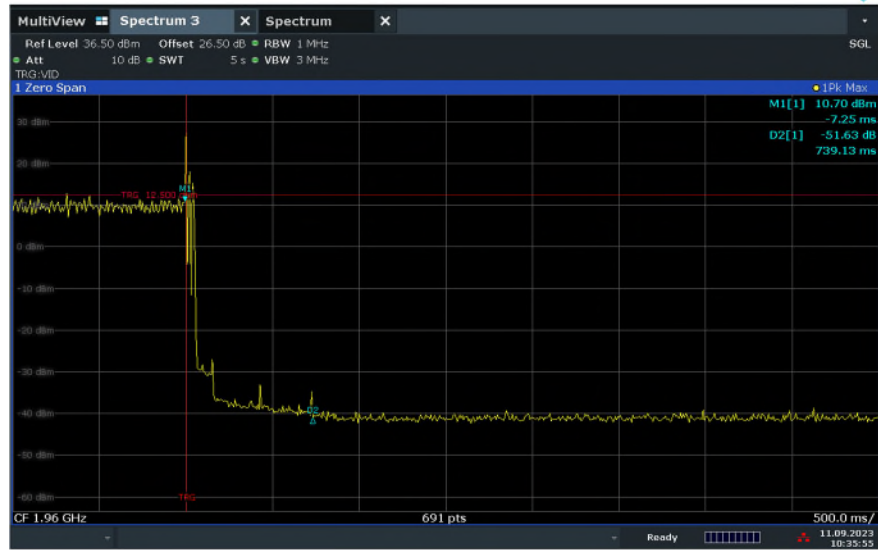
FCC ID: YETG43-CBBE

Band	Signal Path	Frequency (MHz)	Level	Peak Oscillation Level	Level
LTE Band 2 Downlink	Server Port	1960	-82.5	< 2dB	12
LTE Band 2 Uplink	Donnor Port	1880	-77.5	< 2dB	12
LTE Band 4 Downlink	Server Port	2132.5	-82.5	< 2dB	12
LTE Band 4 Uplink	Donnor Port	1732.5	-77.3	< 2dB	12
LTE Band 5 Downlink	Server Port	881.5	-82.4	< 2dB	12
LTE Band 5 Uplink	Donnor Port	836.5	-75.8	< 2dB	12
LTE Band 12 Downlink	Server Port	737.5	-82.2	< 2dB	12
LTE Band 12 Uplink	Donnor Port	707.5	-75.6	< 2dB	12
LTE Band 13 Downlink	Server Port	751.0	-82.3	< 2dB	12
LTE Band 13 Uplink	Donnor Port	782.0	-75.5	< 2dB	12
LTE Band 25 Downlink	Server Port	1962.5	-82.5	< 2dB	12
LTE Band 25 Uplink	Donnor Port	1882.5	-77.5	< 2dB	12

FCC ID: YETG43-CBBE

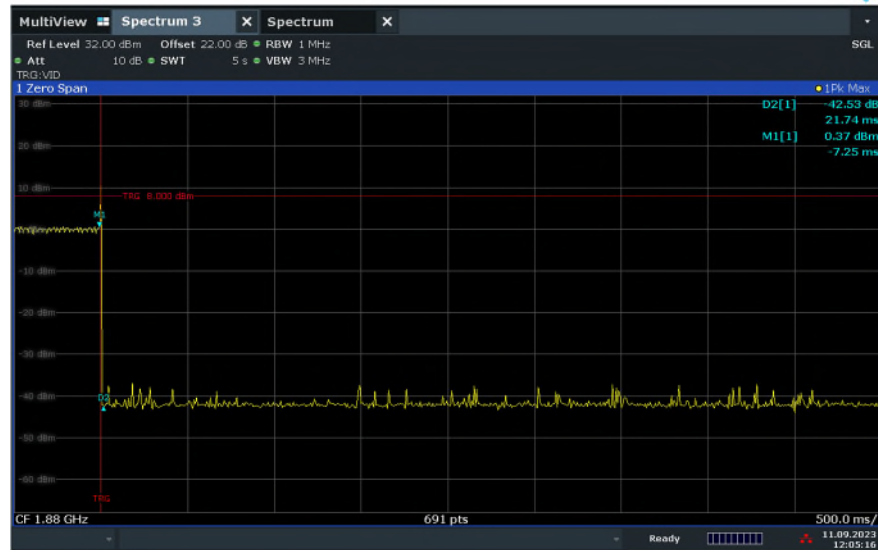
2.11.9 Test Results Plots

Mitigation Time - LTE Band 2 Downlink 5MHz Bandwidth Mid Channel - Server Port.



10:35:56 11.09.2023

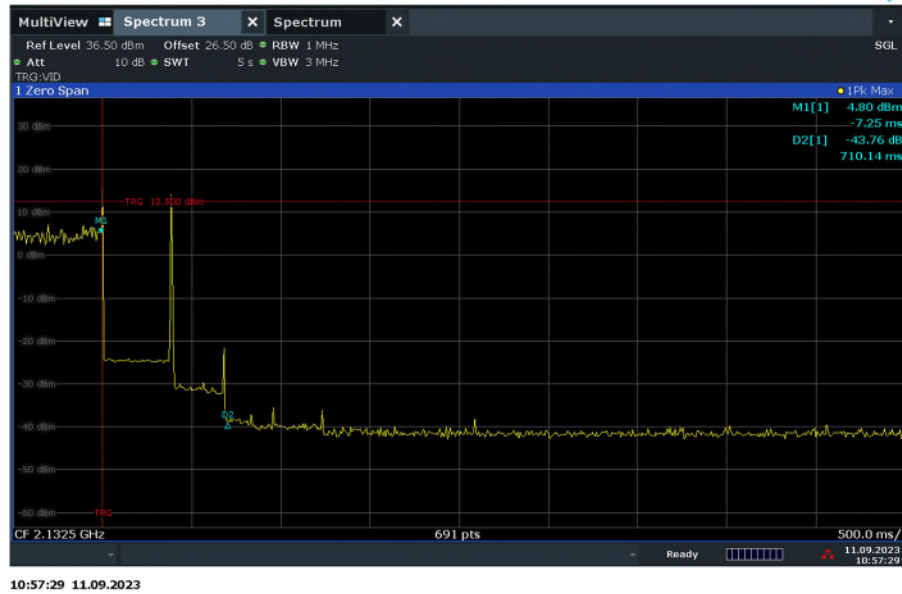
Mitigation Time - LTE Band 2 Uplink 5MHz Bandwidth Mid Channel - Donnor Port.



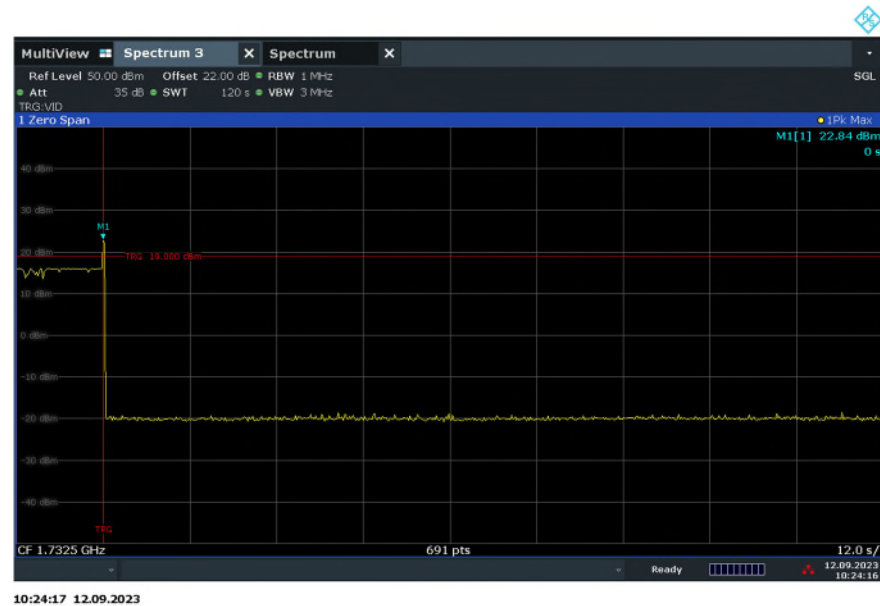
12:05:17 11.09.2023



Mitigation Time - LTE Band 4 Downlink 5MHz Bandwidth Mid Channel – Server Port.



Mitigation Time - LTE Band 4 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.



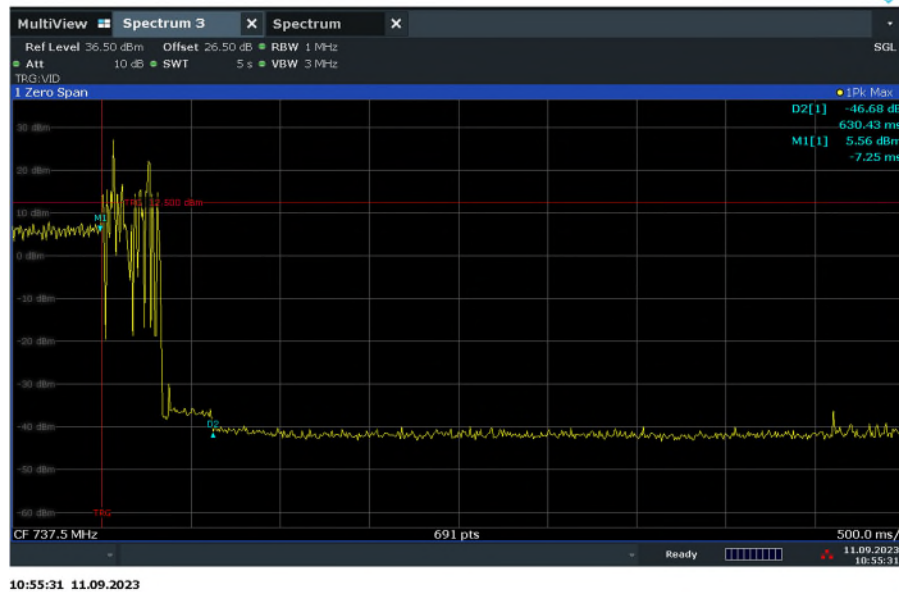
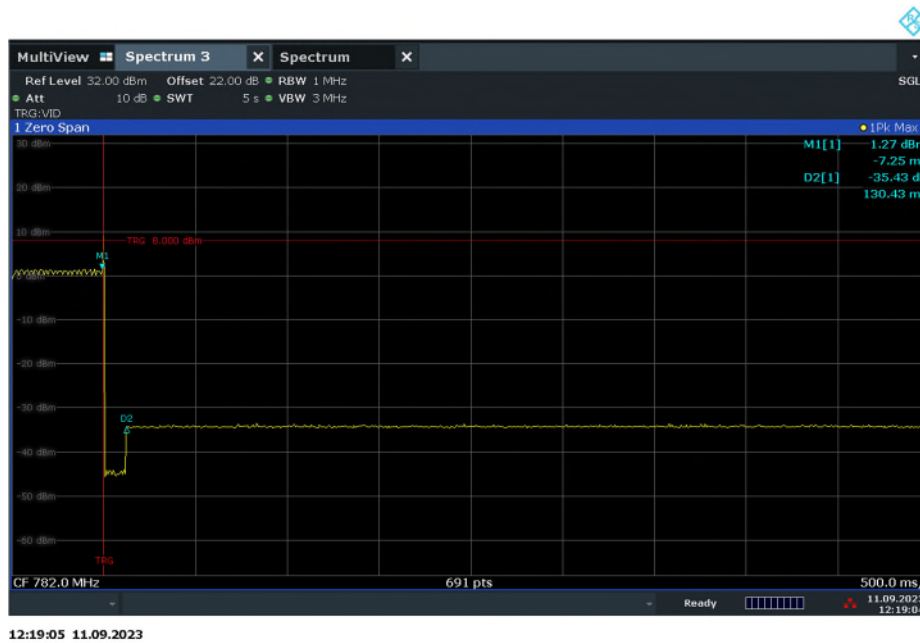
FCC ID: YETG43-CBBE

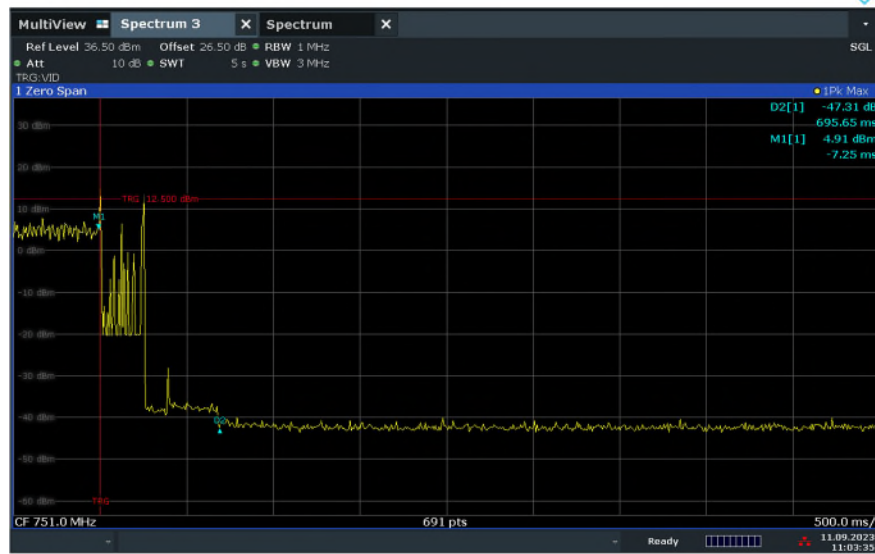
Mitigation Time - LTE Band 5 Downlink 5MHz Bandwidth Mid Channel – Server Port.



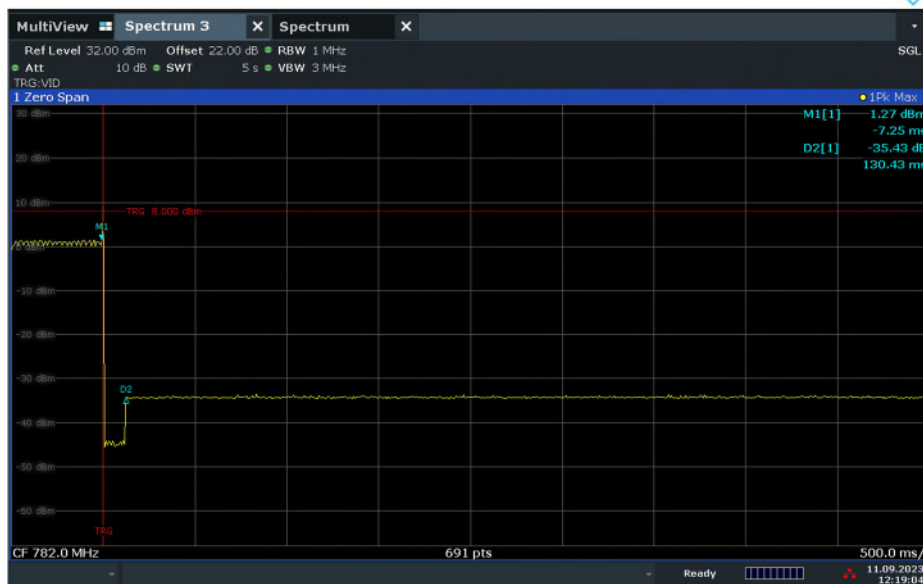
Mitigation Time - LTE Band 5 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.



Mitigation Time - LTE Band 12 Downlink 5MHz Bandwidth Mid Channel – Server Port.**Mitigation Time - LTE Band 12 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.**

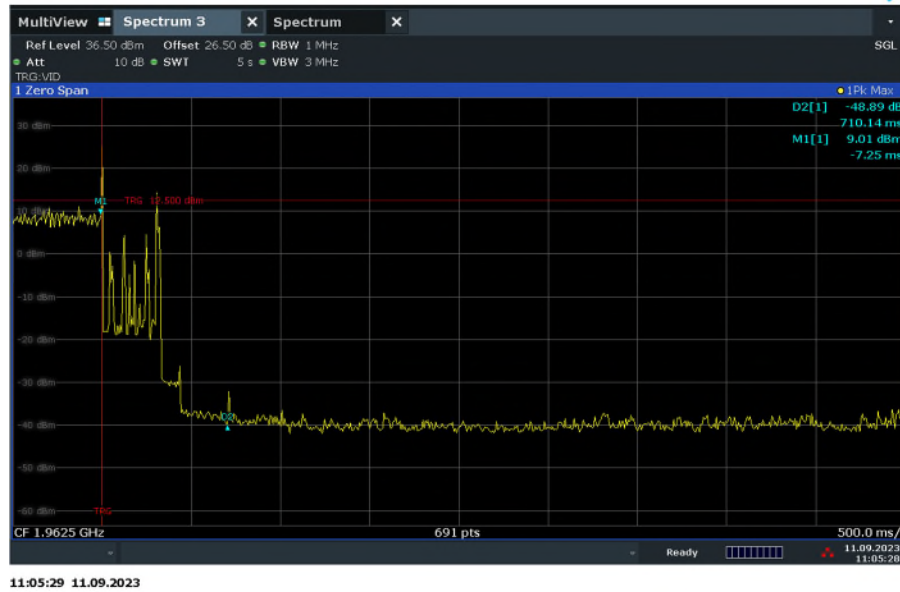
Mitigation Time - LTE Band 13 Downlink 5MHz Bandwidth Mid Channel – Server Port.

11:03:35 11.09.2023

Mitigation Time - LTE Band 13 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.

12:19:05 11.09.2023

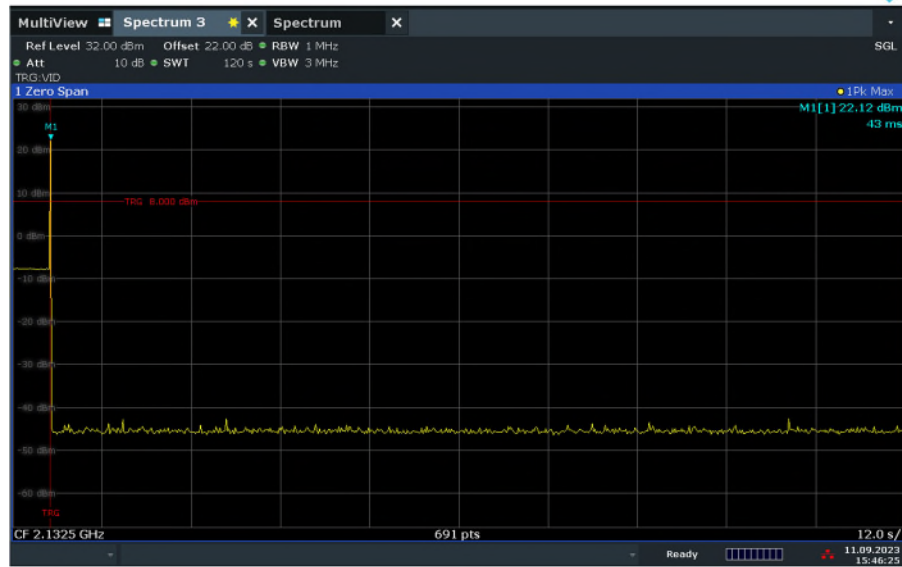
Mitigation Time - LTE Band 25 Downlink 5MHz Bandwidth Mid Channel – Server Port.



Mitigation Time - LTE Band 25 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.

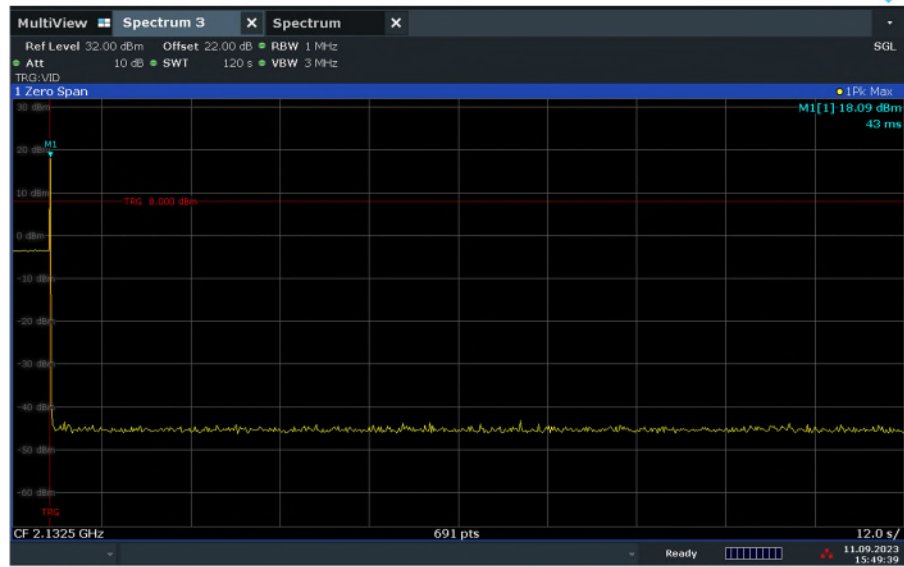


Retry Event - LTE Band 2 Downlink 5MHz Bandwidth Mid Channel – Server Port.

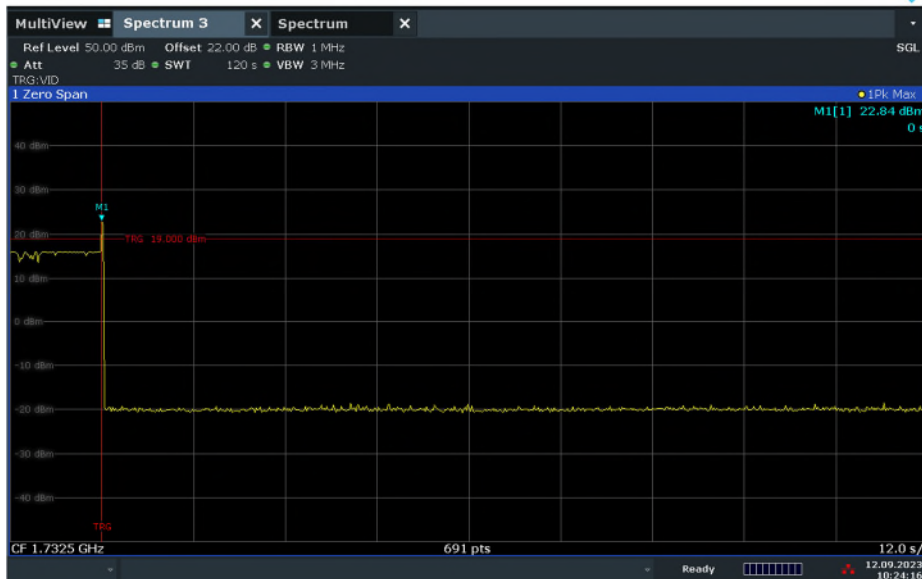


Retry Event - LTE Band 2 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.



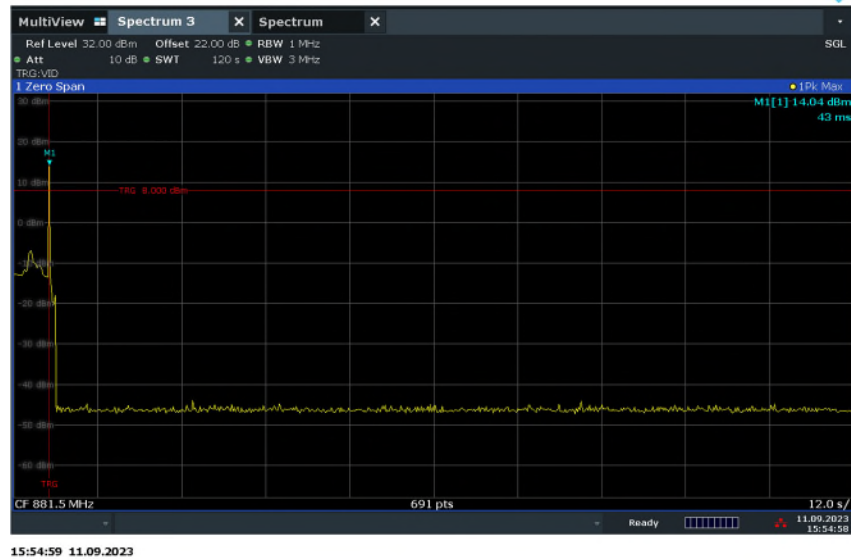
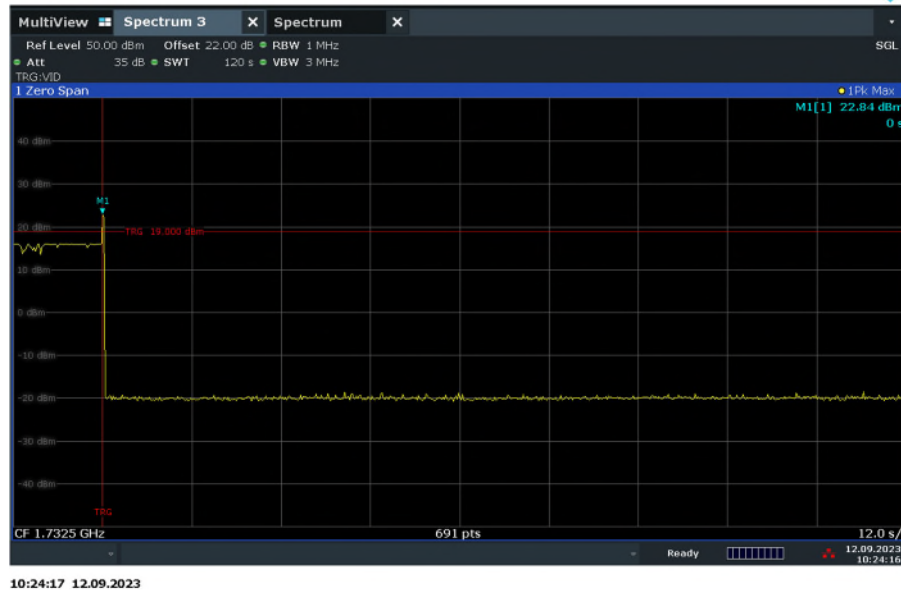
Retry Event - LTE Band 4 Downlink 5MHz Bandwidth Mid Channel – Server Port.

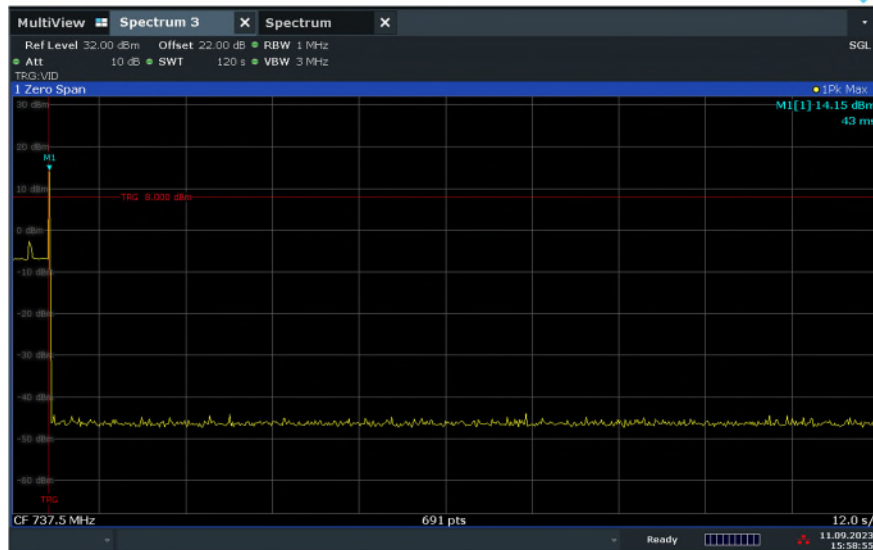
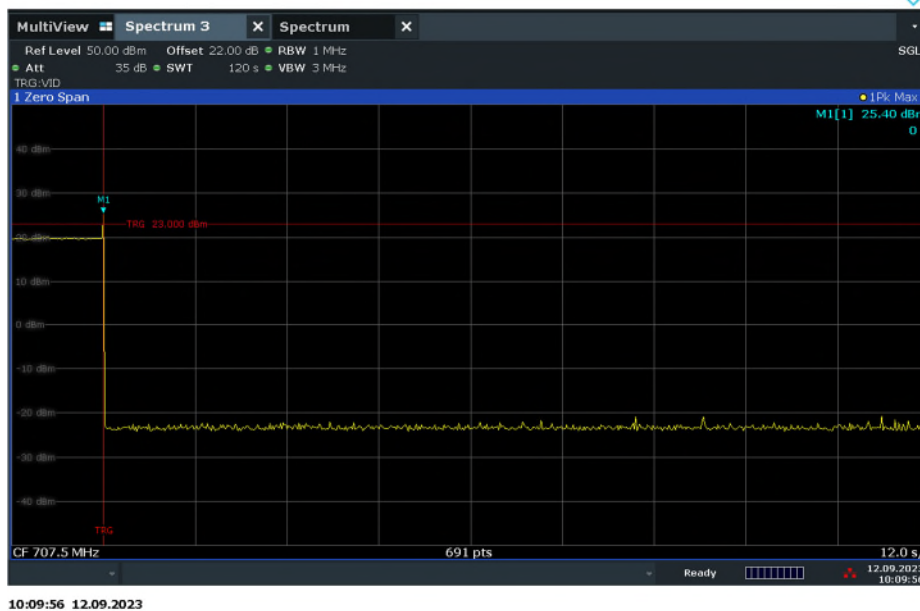
15:49:39 11.09.2023

Retry Event - LTE Band 4 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.

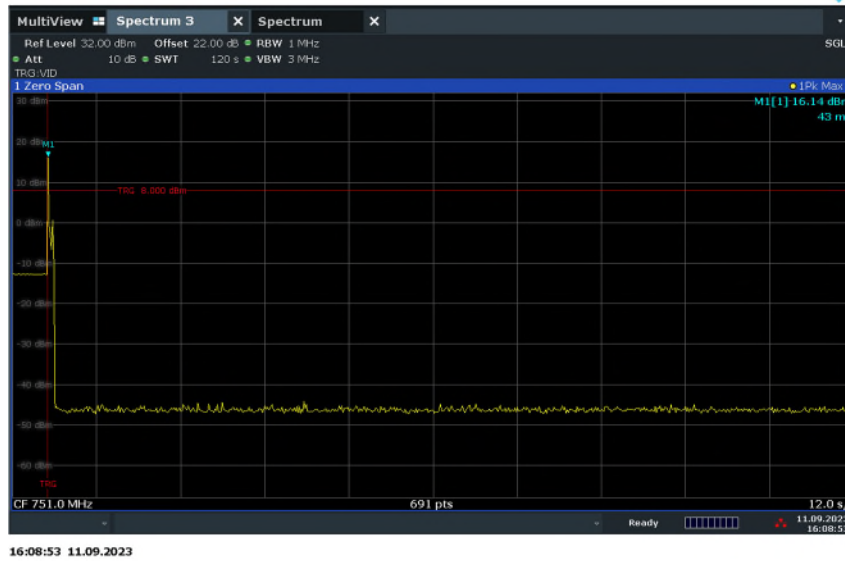
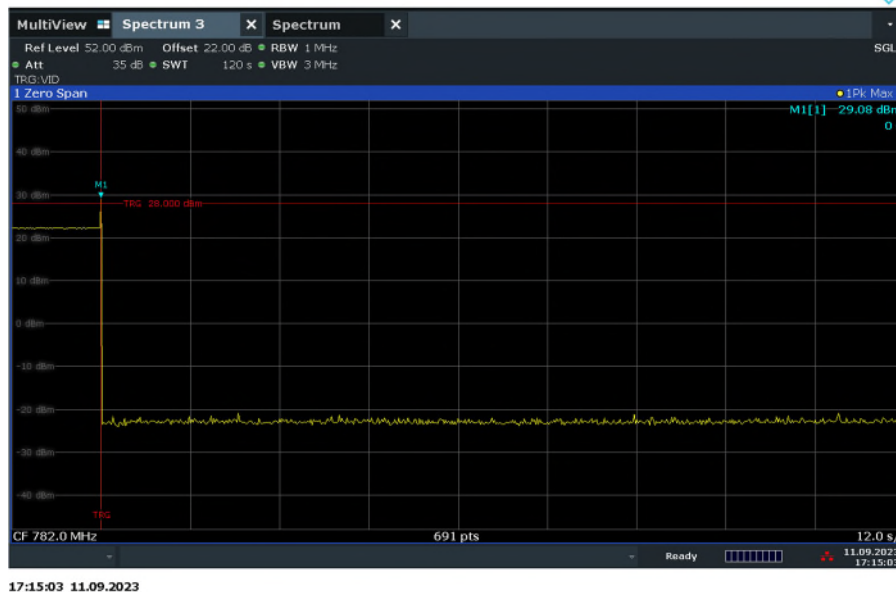
10:24:17 12.09.2023

FCC ID: YETG43-CBBE

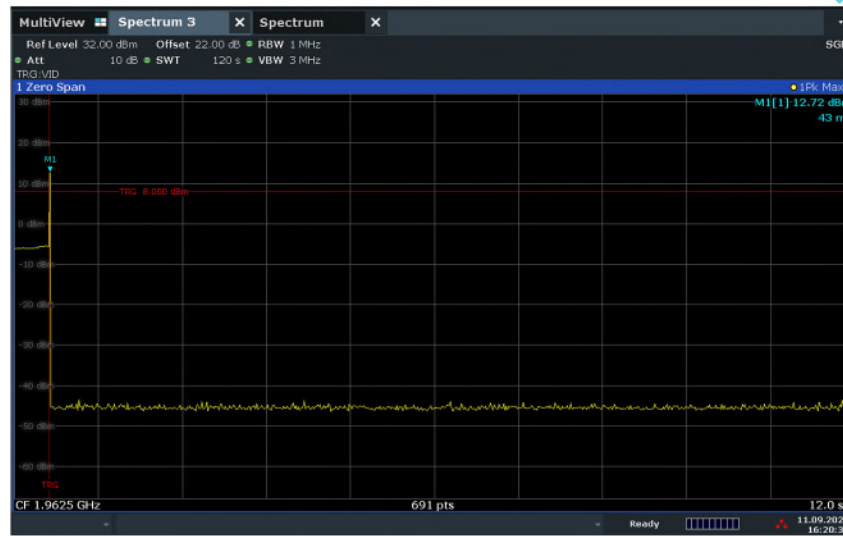
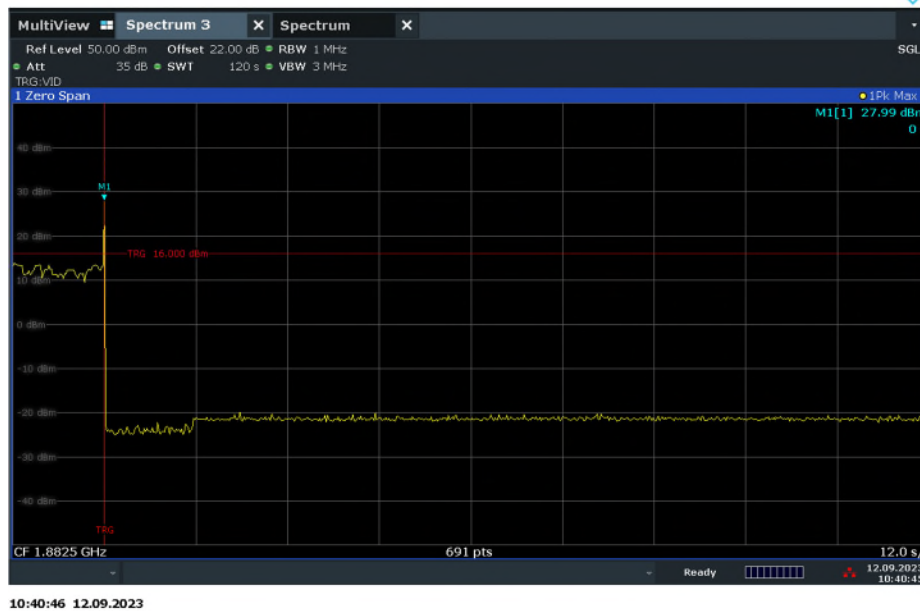
Retry Event - LTE Band 5 Downlink 5MHz Bandwidth Mid Channel – Server Port.**Retry Event - LTE Band 4 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.**

Retry Event - LTE Band 12 Downlink 5MHz Bandwidth Mid Channel – Server Port.**Retry Event - LTE Band 12 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.**

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Retry Event - LTE Band 13 Downlink 5MHz Bandwidth Mid Channel – Server Port.**Retry Event - LTE Band 13 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.**

FCC ID: YETG43-CBBE

Retry Event - LTE Band 25 Downlink 5MHz Bandwidth Mid Channel – Server Port.**Retry Event - LTE Band 25 Uplink 5MHz Bandwidth Mid Channel – Donnor Port.**

FCC ID: YETG43-CBBE

2.12 Out Of Band Gain Limit

2.12.1 Specification Reference

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(E)
KDB935210 D04, Clause 7.15

2.12.2 Standard Applicable

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(E) Out of Band Gain Limits:

(1) A frequency selective booster shall have the following minimum attenuation referenced to the gain in the center of the pass band of the booster:

- (i) -20 dB at the band edge, where band edge is the end of the licensee's allocated spectrum,
- (ii) -30 dB at 1 MHz offset from band edge,
- (iii) -40 dB at 5 MHz offset from band edge.

(2) A frequency selective booster having maximum gain greater than 80 dB (referenced to the center of the pass band) shall limit the out of band gain to 60 dB at 0.2 MHz offset from the band edge, and 45 dB at 1 MHz offset from the band edge, where band edge is the end of the licensee's allocated spectrum.

2.12.3 Equipment Under Test and Modification State

Serial No: 560311000026 / Test Configuration A and B

2.12.4 Date of Test/Initial of test personnel who performed the test.

September 11, 2023/MARG

2.12.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.12.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	26.4°C
Relative Humidity	53.7%
ATM Pressure	99.1kPa

2.12.7 Additional Observations

- This is conducted Test. Test procedure is per Section 7.15 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The test procedure is according to 7.15.1 of KDB935210. The signal generator was set to transmit a CW signal with output power level set to that as determined in clause 7.2.2 of KDB935210.

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- The EUT operated in Test Mode with the gain set to the maximum gain and a minimum bandwidth setting (5MHz).
- Setup the EUT according to Figure 2 or 3 of Section 6.3.3 of KDB935210 D04 as appropriate.
- Evaluations are conducted at Server and Donnor ports.
- Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.

2.12.8 Test Results

Out of Band Gain Limit – LTE Band 2 Downlink (1930 – 1990 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-83.71	10.29	94	-
0 (Low Band Edge)	-83.94	-41.22	42.72	74
-0.2	-83.69	-39.07	44.62	60
-1	-83.69	-46.28	37.41	45
-5	-83.45	-65.49	17.96	54
0 (High Band Edge)	-83.81	-41.84	41.97	74
+0.2	-83.41	-41.66	41.75	60
+1	-83.48	-49.16	34.32	45
+5	-83.83	-62.49	21.34	54

Out of Band Gain Limit – LTE Band 2 Uplink (1930 – 1990 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-78.47	13.10	91.57	-
0 (Low Band Edge)	-78.70	-38.79	39.91	71.57
-0.2	-78.61	-37.79	40.82	60
-1	-78.43	-45.30	33.13	45
-5	-78.63	-59.12	19.51	51.57

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0 (High Band Edge)	-78.58	-39.35	39.23	71.57
+0.2	-78.33	-37.92	40.41	60
+1	-78.80	-45.12	33.68	45
+5	-78.96	-58.90	20.06	51.57

Out of Band Gain Limit – LTE Band 4 Downlink (2110 – 2155 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-83.9	5.48	89.38	-
0 (Low Band Edge)	-83.38	-39.54	43.84	69.38
-0.2	-83.26	-39.70	43.56	60
-1	-83.29	-49.97	33.32	45
-5	-83.26	-58.35	24.91	49.38
0 (High Band Edge)	-83.42	-39.32	44.1	69.38
+0.2	-83.66	-40.45	43.21	60
+1	-83.57	-47.39	36.18	45
+5	-83.52	-56.44	27.08	49.38

Out of Band Gain Limit – LTE Band 4 Uplink (1710 – 1755 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-78.38	15.34	93.72	-
0 (Low Band Edge)	-78.37	-37.69	40.68	73.72
-0.2	-78.93	-36.95	41.98	60
-1	-78.11	-44.65	33.46	45
-5	-78.34	-58.56	19.78	53.72
0 (High Band Edge)	-78.72	-37.57	41.15	73.72

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+0.2	-78.47	-36.09	42.38	60
+1	-78.73	-43.39	35.34	45
+5	-78.37	-58.38	19.99	53.72

Out of Band Gain Limit – LTE Band 5 Downlink (869 – 894 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-83.81	12.33	96.14	-
0 (Low Band Edge)	-83.97	-50.34	33.63	76.14
-0.2	-83.63	-46.78	36.85	60
-1	-83.05	-53.27	29.78	45
-5	-83.94	-61.21	22.73	56.14
0 (High Band Edge)	-83.72	-47.46	36.26	76.14
+0.2	-83.03	-47.04	35.99	60
+1	-83.45	-53.23	30.22	45
+5	-83.10	-60.17	22.93	56.14

Out of Band Gain Limit – LTE Band 5 Uplink (824 – 849 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-75.15	11.26	86.41	-
0 (Low Band Edge)	-75.56	-42.53	33.03	66.41
-0.2	-75.32	-40.97	34.35	60
-1	-75.14	-49.09	26.05	45
-5	-75.94	-60.98	14.96	46.41
0 (High Band Edge)	-75.317	-42.96	32.357	66.41
+0.2	-75.25	-40.95	34.3	60
+1	-75.11	-78.79	-3.68	45

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+5	-75.95	-60.25	15.7	46.41
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Out of Band Gain Limit – LTE Band 12 Downlink (729 – 746MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-79.49	8.30	87.79	-
0 (Low Band Edge)	-79.75	-49.26	30.49	67.79
-0.2	-79.61	-44.41	35.2	60
-1	-80.81	-51.74	29.07	45
-5	-80.09	-60.61	19.48	47.79
0 (High Band Edge)	-80.04	-50.83	29.21	67.79
+0.2	-79.99	-58.69	21.3	60
+1	-79.17	-58.96	20.21	45
+5	-80.12	-60.16	19.96	47.79

Out of Band Gain Limit - LTE Band 12 Uplink (699 – 716MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-78.28	10.52	88.8	
0 (Low Band Edge)	-78	-43.33	34.67	68.8
-0.2	-78.70	-42.29	36.41	60
-1	-78.26	-49.39	28.87	45
-5	-78.32	-62.49	15.83	48.8
0 (High Band Edge)	-78.52	-45.56	32.96	68.8
+0.2	-78.29	-43.90	34.39	60
+1	-78.15	-52.56	25.59	45
+5	-78.38	-66.51	11.87	48.8

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Out of Band Gain Limit – LTE Band 13 Downlink (746 – 756MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-80.20	11.33	91.53	-
0 (Low Band Edge)	-80.91	-44.25	36.66	71.53
-0.2	-79.31	-43.01	36.3	60
-1	-80.85	-49.75	31.1	45
-5	-80.84	-60.97	19.87	51.53
0 (High Band Edge)	-80	-44.26	35.74	71.53
+0.2	-80.04	-42.76	37.28	60
+1	-80.84	-49.66	31.18	45
+5	-79.27	-56.64	22.63	51.53

Out of Band Gain Limit – LTE Band 13 Uplink (777 – 787 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-75.85	15.35	91.2	-
0 (Low Band Edge)	-75.28	-49.43	25.85	71.2
-0.2	-75.38	-59.63	15.75	60
-1	-75.63	-61.52	14.11	45
-5	-75.81	-60.96	14.85	51.2
0 (High Band Edge)	-75.25	-50.52	24.73	71.2
+0.2	-75.92	-60.55	15.37	60
+1	-75.44	-59.32	16.12	45
+5	-75.48	-61.43	14.05	51.2



Out of Band Gain Limit – LTE Band 25 Downlink (1930 – 1995 MHz)				
	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-82.93	9.05	91.98	
0 (Low Band Edge)	-83.05	-37.77	45.28	71.98
-0.2	-82.49	-36.95	45.54	60
-1	-82.93	-57.74	25.19	45
-5	-83.70	-58.32	25.38	51.98
0 (High Band Edge)	-83.39	-40.29	43.1	71.98
+0.2	-83.26	-39.18	44.08	60
+1	-83.70	-46.47	37.23	45
+5	-82.49	-57.61	24.88	51.98

Out of Band Gain Limit - LTE Band 25 Uplink (1850 – 1915 MHz)				
Offset (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Gain Limit (dB)
Centre Frequency	-78.77	14.32	93.09	-
0 (Low Band Edge)	-78.39	-38.11	40.28	73.09
-0.2	-77.99	-37.41	40.58	60
-1	-78.75	-45.12	33.63	45
-5	-78.50	-59.73	18.77	53.09
0 (High Band Edge)	-78.20	-39.14	39.06	73.09
+0.2	-78.98	-37.46	41.52	60
+1	-78.49	-44.87	33.62	45
+5	-78.80	-58.31	20.49	53.09



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2.13 Frequency Stability

2.13.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1055
 FCC 47 CFR Part 22, Clause 22.355
 FCC 47 CFR Part 24, Clause 24.235
 RSS-132, Clause 5.3
 RSS-133, Clause 6.3
 FCC 47 CFR Part 27, Clause 27.54
 RSS-139, Clause 6.4
 RSS-130, Clause 4.5
 RSS-195, Clause 5.4

2.13.2 Standard Applicable

FCC Part 22.355:

The carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C–1 of this section.

Table C-1 Frequency Tolerance for Transmitters in the Public Mobile Services			
Frequency Range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

FCC Part 24.235:

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

RSS-132:

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations and ± 1.5 ppm for base stations.

RSS-133

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

FCC 47 CFR Part 27, Clause 27.54:

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

RSS-139, Clause 6.4, RSS-130, Clause 4.5 and RSS-195, Clause 5.4:

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

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2.13.3 Equipment Under Test and Modification State

Serial No: 560311000026 / Test Configuration A and B

2.13.4 Date of Test/Initial of test personnel who performed the test

August 14, 15, 16, 17,18 and October 12, 2023 / MARG

2.13.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.13.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	22.4 °C	22.5 °C
Relative Humidity	42.7 %	44.2 %
ATM Pressure	100.7 kPa	100.8 kPa

2.13.7 Additional Observations

- This is a conducted test.
- The EUT was operated at 120 VAC nominal voltage and was placed in the temperature chamber for the series of temperature variation evaluations performed starting at ambient (20°C) temperature. Voltage variation is performed at 85% and 115% of the nominal voltage at 20 °C only.
- The Temperature is then set to 50°C and allowed to sit for 1 hour to allow the equipment and chamber temperature to stabilize. The measurements on both downlink and uplink were then performed. The temperature was then decreased by 10°C steps and allowed to settle before taking the next set of measurements.
- EUT was injected a CW signal from a Signal Generator and maximum frequency error was monitored using the spectrum analyser.
- 5MHz bandwidth Middle Channel was tested as the representative configuration.



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2.13.8 Test Results Summary

LTE B2 Downlink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.0
	-20	-0.01	1.0
	-10	-0.01	1.0
	0	-0.01	1.0
	+10	-0.01	1.0
	+20	-0.01	1.0
	+30	-0.01	1.0
	+40	-0.01	1.0
	+50	-0.01	1.0
102	+20	-0.01	1.0
138		-0.01	1.0

LTE Band 2 Downlink			
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)
20	102	-0.01	1.0
	138	-0.01	1.0

LTE B2 Uplink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.0
	-20	-0.01	1.0
	-10	-0.01	1.0
	0	-0.01	1.0
	+10	-0.01	1.0
	+20	-0.01	1.0
	+30	-0.01	1.0
	+40	-0.01	1.0
	+50	-0.01	1.0
102	+20	-0.01	1.0
138		-0.01	1.0



LTE Band 2 Uplink			
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)
20	102	-0.01	1.0
	138	-0.01	1.0
LTE Band 5 Downlink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.5
	-20	-0.01	1.5
	-10	-0.01	1.5
	0	-0.01	1.5
	+10	-0.01	1.5
	+20	-0.01	1.5
	+30	-0.01	1.5
	+40	-0.01	1.5
	+50	-0.01	1.5
LTE Band 5 Downlink			
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)
20	102	-0.01	1.5
	138	-0.01	1.5

LTE Band 5 Uplink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.5
	-20	-0.01	1.5
	-10	-0.01	1.5
	0	-0.01	1.5
	+10	-0.01	1.5
	+20	-0.01	1.5
	+30	-0.01	1.5
	+40	-0.01	1.5
	+50	-0.01	1.5



LTE Band 5 Uplink			
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)
20	102	-0.01	1.5
	138	-0.01	1.5

LTE Band 25 Downlink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.0
	-20	-0.01	1.0
	-10	-0.01	1.0
	0	-0.01	1.0
	+10	-0.01	1.0
	+20	-0.01	1.0
	+30	-0.01	1.0
	+40	-0.01	1.0
	+50	-0.01	1.0

LTE Band 25 Downlink			
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)
20	102	-0.01	1.0
	138	-0.01	1.0

LTE Band 25 Uplink			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	1.0
	-20	-0.01	1.0
	-10	-0.01	1.0
	0	-0.01	1.0
	+10	-0.01	1.0
	+20	-0.01	1.0
	+30	-0.01	1.0
	+40	-0.01	1.0
	+50	-0.01	1.0

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LTE Band 25 Uplink					
Temperature (°C)	Voltage (VAC)	Frequency Deviation (ppm)	Limit (ppm)		
20	102	-0.01	1.0		
	138	-0.01	1.0		
LTE B4 Downlink – 5 MHz BW Middle Channel 2132.5 MHz					
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)		
120	-30	-0.01	-		
	-20	-0.01	-		
	-10	-0.01	-		
	0	-0.01	-		
	+10	-0.01	-		
	+20	-0.01	-		
	+30	-0.01	-		
	+40	-0.01	-		
	+50	-0.01	-		
102	+20	-0.01	-		
138		-0.01	-		
LTE B4 Downlink – 5 MHz BW					
Channel	Temperature (°C)	Voltage (VAC)	F _L (MHz)	F _H (MHz)	Limit (MHz)
Low Channel	-30	120	2110.2925	-	>2110
	+20	102	2110.2852	-	
		120	2110.2861	-	
		138	2110.2882	-	
	+50	120	2110.2844	-	
High Channel	-30	120	-	2154.7243	<2155
	+20	102	-	2154.7919	
		120	-	2154.7819	
		138	-	2154.7865	
	+50	120	-	2154.7308	

The frequency stability of the EUT is sufficient to keep it within the authorized frequency ranges at any temperature interval and voltage variations across the measured range.

FCC ID: YETG43-CBBE

LTE B4 Uplink – 5 MHz BW Middle Channel 1732.5 MHz			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	-
	-20	-0.01	-
	-10	-0.01	-
	0	-0.01	-
	+10	-0.01	-
	+20	-0.01	-
	+30	-0.01	-
	+40	-0.01	-
	+50	-0.01	-
102	+20	-0.01	-
138		-0.01	-

LTE B4 Uplink – 5 MHz BW					
Channel	Temperature (°C)	Voltage (VAC)	F_L (MHz)	F_H (MHz)	Limit (MHz)
Low Channel	-30	120	1710.2942	-	>1710
	+20	102	1710.2912	-	
		120	1710.2891	-	
		138	1710.292	-	
	+50	120	1710.2857	-	
High Channel	-30	120	-	1754.7231	<1755
	+20	102	-	1754.7196	
		120	-	1754.7206	
		138	-	1754.7205	
	+50	120	-	1754.7131	

The frequency stability of the EUT is sufficient to keep it within the authorized frequency ranges at any temperature interval and voltage variations across the measured range.

FCC ID: YETG43-CBBE

LTE B12 Downlink – 5 MHz BW Middle Channel 737.5 MHz			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	-
	-20	-0.01	-
	-10	-0.01	-
	0	-0.01	-
	+10	-0.01	-
	+20	-0.01	-
	+30	-0.01	-
	+40	-0.01	-
	+50	-0.01	-
102	+20	-0.01	-
138		-0.01	-

LTE B12 Downlink Frequency Range – 5 MHz BW					
Channel	Temperature (°C)	Voltage (VAC)	F _L (MHz)	F _H (MHz)	Limit (MHz)
Low Channel	-30	120	729.2875	-	>729
	+20	102	729.2819	-	
		120	729.2810	-	
		138	729.2843	-	
	+50	120	729.2798	-	
High Channel	-30	120	-	745.7239	<746
	+20	102	-	745.7165	
		120	-	745.7196	
		138	-	745.7190	
	+50	120	-	745.7186	

The frequency stability of the EUT is sufficient to keep it within the authorized frequency ranges at any temperature interval and voltage variations across the measured range.

FCC ID: YETG43-CBBE

LTE B12 Uplink – 5 MHz BW Middle Channel 707.5 MHz			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	-
	-20	-0.01	-
	-10	-0.01	-
	0	-0.01	-
	+10	-0.01	-
	+20	-0.01	-
	+30	-0.01	-
	+40	-0.01	-
	+50	-0.01	-
102	+20	-0.01	-
138		-0.01	-

LTE B12 Uplink Frequency Range – 5 MHz BW					
Channel	Temperature (°C)	Voltage (VAC)	F _L (MHz)	F _H (MHz)	Limit (MHz)
Low Channel	-30	120	699.3006	-	>699
	+20	102	699.2648	-	
		120	699.3785	-	
		138	699.7894	-	
	+50	120	699.2953	-	
High Channel	-30	120	-	715.7030	<716
	+20	102	-	715.7247	
		120	-	715.7284	
		138	-	715.7290	
	+50	120	-	715.7221	

The frequency stability of the EUT is sufficient to keep it within the authorized frequency ranges at any temperature interval and voltage variations across the measured range.

FCC ID: YETG43-CBBE

LTE B13 Downlink – 5 MHz BW Middle Channel 751 MHz			
Voltage (VAC)	Temperature (°C)	Frequency Deviation (ppm)	Limit (ppm)
120	-30	-0.01	-
	-20	-0.01	-
	-10	-0.01	-
	0	-0.01	-
	+10	-0.01	-
	+20	-0.01	-
	+30	-0.01	-
	+40	-0.01	-
	+50	-0.01	-
102	+20	-0.01	-
138		-0.01	-

LTE B13 Downlink Frequency Range – 5 MHz BW					
Channel	Temperature (°C)	Voltage (VAC)	F _L (MHz)	F _H (MHz)	Limit (MHz)
Low Channel	-30	120	746.2884	-	>746
	+20	102	746.2805	-	
		120	746.2809	-	
		138	746.2813	-	
	+50	120	746.2738	-	
High Channel	-30	120	-	755.7297	<756
	+20	102	-	755.7274	
		120	-	755.7244	
		138	-	755.7255	
	+50	120	-	755.7107	

The frequency stability of the EUT is sufficient to keep it within the authorized frequency ranges at any temperature interval and voltage variations across the measured range.