



TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-4904-0113 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR25-SRF0174 Page(1) of (118)	
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1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2025-08-06

2. Use of Report : Certification

3. Name of Product / Model : Tablet PC / SM-X236B

4. Manufacturer / Country of Origin : Samsung Electronics Co., Ltd. / Vietnam

5. FCC ID : A3LSMX236B

6. Date of Test : 2025-08-08 to 2025-09-10

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing
 (Address: 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

8. Test method used : FCC Part 2
 FCC Part 22 Subpart H

9. Test Result : Refer to the test result in the test report

Affirmation	Tested by Name : Narae Kang (Signature)	Technical Manager Name : Kwonse Kim (Signature)
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2025-09-12

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REPORT REVISION HISTORY

Date	Revision	Page No
2025-09-12	Originally issued	-

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General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ Statement not required by the standard or client used for type testing

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2.1. Frequency/channel operations

This device contains the following capabilities:

GSM 850, WCDMA 850, LTE B5/26, 5G NR n5/26

GSM 850

Ch.	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Table 2.1-1.
Voice/GPRS/EDGE

WCDMA 850

Ch.	Frequency (MHz)
4132	826.4
4183	836.6
4233	846.6

Table 2.1-2.
RMC/HSDPA/HSUPA/
DC-HSDPA

LTE B5

Ch.	Frequency (MHz)
20407	824.7
20525	836.5
20643	848.3

Table 2.1-3. 1.4M BW

Ch.	Frequency (MHz)
20415	825.5
20525	836.5
20635	847.5

Table 2.1-4. 3M BW

Ch.	Frequency (MHz)
20425	826.5
20525	836.5
20625	846.5

Table 2.1-5. 5M BW

Ch.	Frequency (MHz)
20450	829.0
20525	836.5
20600	844.0

Table 2.1-6. 10M BW

LTE B26

Ch.	Frequency (MHz)
26797	824.7
26915	836.5
27033	848.3

Table 2.1-7. 1.4M BW

Ch.	Frequency (MHz)
26805	825.5
26915	836.5
27025	847.5

Table 2.1-8. 3M BW

Ch.	Frequency (MHz)
26815	826.5
26915	836.5
27015	846.5

Table 2.1-9. 5M BW

Ch.	Frequency (MHz)
26840	829.0
26915	836.5
26990	844.0

Table 2.1-10. 10M BW

Ch.	Frequency (MHz)
26865	831.5
26915	836.5
26965	841.5

Table 2.1-11. 15M BW

5G NR n5

Ch.	Frequency (MHz)
165300	826.5
167300	836.5
169300	846.5

Table 2.1-12. 5M BW

Ch.	Frequency (MHz)
165800	829.0
167300	836.5
168800	844.0

Table 2.1-13. 10M BW

Ch.	Frequency (MHz)
166300	831.5
167300	836.5
168300	841.5

Table 2.1-14. 15M BW

Ch.	Frequency (MHz)
166800	834.0
167300	836.5
167800	839.0

Table 2.1-15. 20M BW

5G NR n26

Ch.	Frequency (MHz)
165300	826.5
167300	836.5
169300	846.5

Table 2.1-16. 5M BW

Ch.	Frequency (MHz)
165800	829.0
167300	836.5
168800	844.0

Table 2.1-17. 10M BW

Ch.	Frequency (MHz)
166300	831.5
167300	836.5
168300	841.5

Table 2.1-18. 15M BW

Ch.	Frequency (MHz)
166800	834.0
167300	836.5
167800	839.0

Table 2.1-19. 20M BW

3. Maximum ERP power

GSM 850

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
GSM 850 (Voice)	824.2 ~ 848.8	244KF9W	32.17	1.648
GSM 850 (EDGE)	824.2 ~ 848.8	248KF9W	26.31	0.428

WCDMA 850

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
WCDMA 850	826.4 ~ 846.6	4M17F9W	23.40	0.219

LTE B5

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE B5	824.7 ~ 848.3	1M10G7D	22.84	0.192
		1M10W7D	21.96	0.157
	825.5 ~ 847.5	2M71G7D	22.95	0.197
		2M69W7D	22.07	0.161
	826.5 ~ 846.5	4M51G7D	22.37	0.172
		4M51W7D	21.60	0.144
	829.0 ~ 844.0	8M99G7D	22.48	0.177
		8M99W7D	21.43	0.139

LTE B26

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE B26	824.7 ~ 848.3	1M10G7D	22.75	0.188
		1M10W7D	21.71	0.148
	825.5 ~ 847.5	2M70G7D	22.65	0.184
		2M69W7D	21.82	0.152
	826.5 ~ 846.5	4M51G7D	22.37	0.173
		4M52W7D	21.51	0.141
	829.0 ~ 844.0	8M99G7D	22.44	0.175
		8M99W7D	21.50	0.141
	831.5 ~ 841.5	13M5G7D	22.52	0.179
		13M5W7D	21.61	0.145

5G NR n5

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
5G NR n5	826.5 ~ 846.5	4M52G7D	22.38	0.173
		4M51W7D	21.52	0.142
	829.0 ~ 844.0	8M99G7D	22.27	0.169
		8M97W7D	21.56	0.143
	831.5 ~ 841.5	13M5G7D	22.55	0.180
		13M4W7D	21.65	0.146
	834.0 ~ 839.0	18M0G7D	22.65	0.184
		18M0W7D	21.80	0.151

5G NR n26

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
5G NR n26	826.5 ~ 846.5	4M52G7D	22.39	0.173
		4M50W7D	21.42	0.139
	829.0 ~ 844.0	8M99G7D	22.44	0.175
		8M97W7D	21.51	0.142
	831.5 ~ 841.5	13M5G7D	22.15	0.164
		13M4W7D	21.41	0.138
	834.0 ~ 839.0	18M0G7D	22.22	0.167
		18M0W7D	21.35	0.137

4. Summary of tests

FCC Part section(s)	Parameter	Test Limit	Test Condition	Test results
2.1046	Conducted Output Power	N/A	Conducted	Pass
2.1049	Occupied Bandwidth & 26 dB Bandwidth	N/A		Pass
2.1051 22.917(a)	B Edge Emissions at Antenna Terminal	<43 + 10Log ₁₀ (P) dB at B Edge and for all out of B emissions		Pass
	Spurious Emissions at Antenna Terminal			Pass
-	Peak to Average Power Ratio	<13 dB		Pass
2.1055 22.355	Frequency stability	< 2.5 ppm		Pass
22.913(a)(5)	Effective Radiated Power	< 7 Watts max. ERP	Radiated	Pass
2.1053 22.917(a)	Radiated Spurious Emissions	<43 + 10Log ₁₀ (P) dB for all out of B emissions		Pass

Notes:

- The test procedure(s) in this report were performed in accordance as following.
 - ◆ ANSI C63.26-2015
 - ◆ ANSI/TIA-603-E-2016
 - ◆ KDB 971168 D01 v03r01
 - ◆ KDB 971168 D02 v02r02

4.1. Worst case orientation

- All modes of operation were investigated and the worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel Bandwidth configurations in the test data.
- In the case of radiated spurious emissions, only the worst case bandwidth results were reported.
- Output power measurements were measured on all of modulation. All tests except output power was performed with below modulation with highest power.
 - GSM: Voice, Edge
 - WCDMA: RMC
 - LTE: QPSK, 16QAM
 - NR: QPSK, 16QAM
 - Waveform: DFT-s OFDM
 - Mode: SA(n26), NSA(n5)
- However, the PAPR was evaluated for all wave forms and modulations during pre-test, then all Bandwidth was performed for the modulations with the highest result.
 - LTE: QPSK, 16QAM
 - NR: QPSK, 256 QAM
 - Waveform: DFT-s OFDM/CP OFDM [Worst case: CP OFDM]
- All configurations have been performed (Stand-alone, Stand-alone with TA, With accessories).
 - Accessory type: DLC
- The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z and all of the radiated tests have been performed with the accessories as below. It was determined that below orientation was worst case orientation for each band.

Band	Stand-alone			Stand-alone with TA			With accessories		
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis
GSM 850	O	-	-	-	-	-	-	-	-
WCDMA 850	O	-	-	-	-	-	-	-	-
LTE B5	O	-	-	-	-	-	-	-	-
LTE B26	O	-	-	-	-	-	-	-	-
NR n5	O	-	-	-	-	-	-	-	-
NR n26	O	-	-	-	-	-	-	-	-

7. Test Condition

- The measurement was performed with various configurations then worst results are reported.

1) Radiated measurement

Test Description		Mode	Condition		Test Channel
Radiated Power		GSM	Voice, EDGE (1 Tx)		Low, Middle, High
		WCDMA	RMC (12.2 kbps)		
		LTE	QPSK, 16QAM	RB Size: 1	
		NR	DFT-s OFDM: QPSK, 16QAM	RB Size: 1	
Radiated Emissions	Spurious	GSM	Voice		Low, Middle, High
		WCDMA	RMC (12.2 kbps)		
		LTE	QPSK	RB Size: 1	
		NR	DFT-s OFDM: QPSK	RB Size: 1	

Band	Bandwidth (MHz)	RB size	RB offset
LTE B5	1.4, 3, 5, 10	1	Low, Middle, High
LTE B26	1.4, 3, 5, 10, 15	1	Low, Middle, High
NR n5	5, 10, 15, 20	1	Low, Middle, High
NR n26	5, 10, 15, 20	1	Low, Middle, High

2) Conducted measurement

Test Description	Mode	Condition		Test Channel
OBW & 26 dB BW	GSM	Voice, EDGE (1 Tx)		Low, Middle, High
	WCDMA	RMC (12.2 kbps)		
	LTE	QPSK, 16QAM	RB Size: Full	
	NR	DFT-s OFDM: QPSK, 16QAM	RB Size: Full	
PAPR	GSM	Voice, EDGE (1 Tx)		Middle
	WCDMA	RMC (12.2 kbps)		
	LTE	QPSK, 16QAM	RB Size: Full	
	NR	CP OFDM: QPSK, 256QAM	RB Size: Full	
Stability	GSM	Voice (1 Tx)		Middle
	WCDMA	RMC (12.2 kbps)		
	LTE	QPSK	RB Size: Full	
	NR	DFT-s OFDM: QPSK	RB Size: Full	
Band Edge	GSM	Voice, EDGE (1 Tx)		Low, High
	WCDMA	RMC (12.2 kbps)		
	LTE	QPSK	RB Size: 1, Full	
	NR	DFT-s OFDM: QPSK	RB Size: 1, Full	
Spurious Emissions	GSM	Voice, EDGE (1 Tx)		Low, Middle, High
	WCDMA	RMC (12.2 kbps)		
	LTE	QPSK	RB Size: 1	
	NR	DFT-s OFDM: QPSK	RB Size: 1	

Band	Bandwidth (MHz)	RB size	RB offset
LTE B5	1.4, 3, 5, 10	1	0, 5, 14, 24, 49
		Full	0
LTE B26	1.4, 3, 5, 10, 15	1	0, 5, 14, 24, 49, 74
		Full	0
NR n5	5, 10, 15, 20	1	0, 23, 50, 77, 104
		Full	0
NR n26	5, 10, 15, 20	1	0, 23, 50, 77, 104
		Full	0

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicated a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$)	
Conducted RF power	0.9 dB	
Conducted spurious emissions	2.0 dB	
Radiated spurious emissions	Below 1 000 MHz	2.5 dB
	1 000 MHz to 18 000 MHz	2.5 dB
	Above 18 000 MHz	2.6 dB

6. Measurement results explanation example

[GSM, WCDMA, LTE]

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	5.86	11 000	9.30
50	6.08	12 000	8.90
100	6.16	13 000	9.44
200	6.14	14 000	9.73
300	6.34	15 000	10.53
400	6.44	16 000	11.18
500	6.53	17 000	10.79
600	6.58	18 000	9.96
700	6.64	19 000	9.41
800	6.70	20 000	9.08
900	6.76	21 000	9.52
1 000	6.82	22 000	12.11
2 000	7.23	23 000	11.95
3 000	7.46	24 000	10.40
4 000	7.75	25 000	10.77
5 000	8.12	26 000	10.46
6 000	8.44	26 500	11.81
7 000	7.59	27 000	12.81
8 000	7.82	28 000	13.54
9 000	8.17	29 000	12.16
10 000	7.78	30 000	11.53

Note.

1. Offset(dB) = RF cable loss(dB) + Divider (dB)

[NR]

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	6.20	16 000	9.62
50	6.24	17 000	10.14
100	6.33	18 000	10.45
200	6.44	19 000	10.37
300	6.54	20 000	10.00
400	6.60	21 000	10.21
500	6.70	22 000	10.91
600	6.72	23 000	9.26
700	6.81	24 000	11.94
800	6.87	25 000	10.75
900	6.90	26 000	10.86
1 000	6.98	26 500	10.97
2 000	7.36	27 000	11.23
3 000	7.50	28 000	11.91
4 000	7.67	29 000	12.01
5 000	7.92	30 000	11.72
6 000	8.26	31 000	11.31
7 000	8.45	32 000	10.96
8 000	8.90	33 000	11.67
9 000	8.93	34 000	12.64
10 000	8.49	35 000	13.30
11 000	9.27	36 000	12.59
12 000	9.41	37 000	12.73
13 000	9.50	38 000	12.80
14 000	9.37	39 000	12.81
15 000	9.63	40 000	13.29

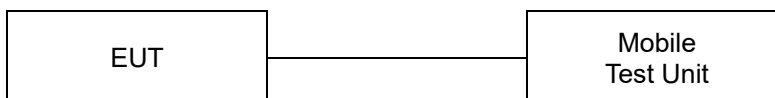
Note.

- Offset(dB) = RF cable loss(dB) + Divider (dB)

7. Test results

7.1. Conducted output power

Test setup



Test procedure

971168 D01 v03r01 – Section 5.2

ANSI C63.26-2015 – Section 5.2.4.2

CFR 47 - Section §2.1046

Test settings

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurement be performed only over durations of active transmissions at maximum output power level applies. Thus, an average power meter can always be used to perform the measurement when the EUT can be configured to transmit continuously.

If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98%), then the following options can be implemented to facilitate measurement of the average power with an average power meter:

- A gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only during active transmission bursts at maximum output power levels.
- A conventional average power meter with no signal gating capability can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than or equal to $\pm 2\%$) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to $[10\log (1/\text{duty cycle})]$. See 5.2.4.3.4 for guidance with respect to measuring the transmitter duty cycle.

See item r) of 4.1 for more information regarding power meter functional requirements and limitations, and consult the instrumentation-specific application literature for proper set-up and use.

Note:

- Offset(dB) = RF cable loss(dB)

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Test results

Main Antenna

Maximum Average Power (dBm)										
Test Band	Channel	GSM	GPRS				EDGE			
		Voice	1Tx	2Tx	3Tx	4Tx	1Tx	2Tx	3Tx	4Tx
GSM850	Low	32.74	32.72	31.46	29.08	28.02	25.88	24.73	22.46	20.55
	Middle	33.23	33.23	32.29	29.79	28.40	26.20	25.03	22.75	20.82
	High	33.25	33.24	32.47	29.98	28.61	25.73	24.29	23.17	21.21

Test Band	Test mode	Maximum Average Power (dBm)		
		Channel		
		Low	Middle	High
WCDMA850	RMC	23.86	24.27	24.31
	HSDPA-Subtest 1	23.13	23.55	23.53
	HSDPA-Subtest 2	23.14	23.44	23.51
	HSDPA-Subtest 3	22.71	23.05	22.98
	HSDPA-Subtest 4	22.63	22.99	22.97
	HSUPA-Subtest 1	22.36	22.75	22.84
	HSUPA-Subtest 2	20.41	20.72	20.81
	HSUPA-Subtest 3	20.92	21.27	21.32
	HSUPA-Subtest 4	20.35	20.76	20.77
	HSUPA-Subtest 5	21.86	22.26	22.36
	DC-HSDPA-Subtest 1	22.89	23.29	23.30
	DC-HSDPA-Subtest 2	22.92	23.31	23.33
	DC-HSDPA-Subtest 3	22.45	22.85	22.87
	DC-HSDPA-Subtest 4	22.42	22.82	22.86

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	Maximum Average Power (dBm)		
					Channel		
					Low	Middle	High
LTE B5	1.4	QPSK	1	0	23.90	23.76	23.77
			1	3	23.89	23.67	23.86
			1	5	23.90	23.70	23.99
			3	0	23.94	23.69	23.73
			3	1	23.93	23.68	23.75
			3	3	23.93	23.65	23.80
			6	0	22.98	22.73	22.71
		16QAM	1	0	23.10	22.72	22.72
			1	3	23.09	22.65	22.80
			1	5	23.06	22.69	22.76
			3	0	22.90	22.66	22.85
			3	1	22.96	22.66	22.84
			3	3	22.91	22.63	22.88
			6	0	21.89	21.66	21.72
		64QAM	1	0	22.20	21.97	21.99
			1	3	22.18	22.02	22.00
			1	5	22.14	21.97	21.96
			3	0	22.06	21.87	21.84
			3	1	22.14	21.86	21.85
			3	3	22.08	21.83	21.86
			6	0	21.06	20.79	20.74
		256QAM	1	0	19.16	18.84	18.81
			1	3	19.10	18.92	18.90
			1	5	19.04	18.91	18.81
			3	0	19.08	18.88	18.84
			3	1	19.13	18.87	18.88
			3	3	19.11	18.78	18.78
			6	0	19.01	18.74	18.76
	3	QPSK	1	0	23.93	23.81	23.60
			1	8	23.89	23.76	23.67
			1	14	23.94	23.72	23.86
			8	0	22.96	22.77	22.75
			8	4	22.94	22.73	22.74
			8	7	22.93	22.69	22.72
			15	0	23.00	22.76	22.71
			1	0	23.14	22.69	22.90
		16QAM	1	8	23.06	22.66	22.99
			1	14	23.02	22.66	22.99
			8	0	22.04	21.83	21.79
			8	4	21.97	21.77	21.78
			8	7	21.98	21.74	21.76
			15	0	21.95	21.80	21.79
			1	0	22.22	22.03	21.88
		64QAM	1	8	22.20	22.01	21.93
			1	14	22.17	21.99	22.02
			8	0	21.14	20.91	20.85
			8	4	21.02	20.79	20.78
			8	7	21.13	20.82	20.84
			15	0	21.06	20.84	20.78
			1	0	19.18	18.87	18.78
		256QAM	1	8	19.06	18.87	18.81
			1	14	19.03	18.86	18.82
			8	0	19.13	18.90	18.85
			8	4	19.03	18.85	18.78
			8	7	19.05	18.83	18.77
			15	0	19.05	18.84	18.75

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	Maximum Average Power (dBm)		
					Channel		
					Low	Middle	High
LTE B5	5	QPSK	1	0	24.01	23.91	23.61
			1	12	23.96	23.79	23.70
			1	24	23.96	23.69	23.97
			12	0	22.97	22.79	22.67
			12	7	22.95	22.73	22.69
			12	13	22.92	22.68	22.70
		16QAM	25	0	22.99	22.81	22.73
			1	0	23.20	23.09	22.94
			1	12	23.13	23.07	23.02
			1	24	23.06	23.02	23.04
			12	0	21.99	21.87	21.69
			12	7	21.97	21.81	21.69
			12	13	21.91	21.76	21.70
			25	0	22.00	21.78	21.77
		64QAM	1	0	22.19	22.08	21.89
			1	12	22.22	22.10	21.91
			1	24	22.17	21.98	22.00
			12	0	21.10	20.91	20.80
			12	7	21.09	20.86	20.78
			12	13	21.02	20.83	20.82
			25	0	21.04	20.81	20.81
		256QAM	1	0	19.15	18.91	18.76
			1	12	19.11	18.91	18.85
			1	24	19.03	18.88	18.87
			12	0	19.05	18.90	18.73
			12	7	19.03	18.81	18.76
			12	13	19.01	18.78	18.70
			25	0	19.05	18.87	18.79
	10	QPSK	1	0	24.04	24.05	23.69
			1	25	23.90	23.76	23.49
			1	49	23.91	23.66	23.84
			25	0	22.95	22.98	22.62
			25	12	22.86	22.75	22.60
			25	25	22.85	22.69	22.67
		16QAM	50	0	22.90	22.91	22.65
			1	0	22.95	23.10	22.91
			1	25	22.81	22.99	22.77
			1	49	22.74	22.93	22.90
			25	0	22.02	21.87	21.57
			25	12	21.90	21.75	21.59
		64QAM	25	25	21.87	21.72	21.59
			50	0	21.88	21.78	21.59
			1	0	22.22	22.12	21.98
			1	25	22.09	21.99	21.83
			1	49	22.07	21.94	22.06
			25	0	21.02	20.88	20.70
		256QAM	25	12	20.95	20.83	20.72
			25	25	20.89	20.76	20.68
			50	0	20.96	20.82	20.72
			1	0	19.16	18.97	18.91
			1	25	18.96	18.85	18.81
			1	49	19.01	18.85	18.94
			25	0	19.02	18.89	18.73
			25	12	18.94	18.79	18.70
			25	25	18.88	18.75	18.69
			50	0	18.91	18.82	18.68

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	Maximum Average Power (dBm)		
					Channel		
					Low	Middle	High
LTE B26	1.4	QPSK	1	0	23.48	23.49	23.64
			1	3	23.42	23.55	23.44
			1	5	23.42	23.46	23.40
			3	0	23.54	23.47	23.56
			3	1	23.54	23.50	23.61
			3	3	23.51	23.53	23.61
			6	0	22.47	22.59	22.47
		16QAM	1	0	22.44	22.67	22.60
			1	3	22.56	22.42	22.46
			1	5	22.47	22.42	22.40
			3	0	22.44	22.45	22.59
			3	1	22.56	22.40	22.64
			3	3	22.46	22.59	22.42
			6	0	21.41	21.66	21.46
		64QAM	1	0	21.40	21.53	21.46
			1	3	21.56	21.62	21.55
			1	5	21.52	21.48	21.59
			3	0	21.55	21.52	21.58
			3	1	21.40	21.51	21.53
			3	3	21.54	21.61	21.53
			6	0	20.57	20.54	20.46
		256QAM	1	0	18.54	18.61	18.41
			1	3	18.51	18.52	18.53
			1	5	18.42	18.64	18.59
			3	0	18.48	18.51	18.43
			3	1	18.42	18.56	18.52
			3	3	18.57	18.52	18.59
			6	0	18.44	18.40	18.57
	3	QPSK	1	0	23.41	23.53	23.49
			1	8	23.49	23.54	23.52
			1	14	23.44	23.61	23.53
			8	0	22.52	22.61	22.67
			8	4	22.55	22.65	22.46
			8	7	22.46	22.49	22.54
			15	0	22.51	22.43	22.41
			1	0	22.56	22.52	22.57
		16QAM	1	8	22.52	22.42	22.58
			1	14	22.42	22.40	22.50
			8	0	21.41	21.51	21.56
			8	4	21.54	21.51	21.60
			8	7	21.54	21.63	21.55
			15	0	21.51	21.47	21.48
		64QAM	1	0	21.52	21.55	21.41
			1	8	21.57	21.40	21.66
			1	14	21.52	21.50	21.43
			8	0	20.41	20.45	20.52
			8	4	20.49	20.47	20.43
			8	7	20.54	20.58	20.55
			15	0	20.49	20.63	20.52
		256QAM	1	0	18.50	18.61	18.53
			1	8	18.44	18.67	18.58
			1	14	18.50	18.48	18.47
			8	0	18.42	18.60	18.40
			8	4	18.48	18.40	18.67
			8	7	18.41	18.49	18.64
			15	0	18.49	18.42	18.67

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	Maximum Average Power (dBm)		
					Channel		
					Low	Middle	High
LTE B26	5	QPSK	1	0	23.45	23.40	23.66
			1	12	23.56	23.41	23.45
			1	24	23.45	23.48	23.58
			12	0	22.45	22.43	22.44
			12	7	22.41	22.54	22.64
			12	13	22.43	22.42	22.60
		16QAM	25	0	22.55	22.44	22.57
			1	0	22.55	22.65	22.48
			1	12	22.40	22.53	22.46
			1	24	22.51	22.57	22.53
			12	0	21.52	21.46	21.54
			12	7	21.56	21.67	21.40
			12	13	21.50	21.60	21.61
			25	0	21.51	21.50	21.66
		64QAM	1	0	21.53	21.54	21.54
			1	12	21.54	21.41	21.52
			1	24	21.46	21.58	21.59
			12	0	20.56	20.58	20.47
			12	7	20.55	20.62	20.58
			12	13	20.49	20.41	20.43
			25	0	20.51	20.66	20.63
		256QAM	1	0	18.50	18.41	18.59
			1	12	18.44	18.45	18.45
			1	24	18.46	18.47	18.56
			12	0	18.41	18.45	18.60
			12	7	18.53	18.54	18.45
			12	13	18.42	18.63	18.53
			25	0	18.48	18.55	18.58
	10	QPSK	1	0	23.42	23.56	23.51
			1	25	23.40	23.42	23.52
			1	49	23.56	23.48	23.65
			25	0	22.59	22.46	22.52
			25	12	22.54	22.56	22.49
			25	25	22.60	22.56	22.57
			50	0	22.65	22.52	22.47
			1	0	22.60	22.47	22.56
		16QAM	1	25	22.53	22.51	22.44
			1	49	22.42	22.49	22.47
			25	0	21.64	21.45	21.65
			25	12	21.52	21.51	21.59
			25	25	21.57	21.53	21.44
			50	0	21.57	21.48	21.61
			1	0	21.48	21.50	21.53
			1	25	21.56	21.52	21.44
		64QAM	1	49	21.62	21.40	21.50
			25	0	20.63	20.53	20.61
			25	12	20.67	20.53	20.65
			25	25	20.67	20.51	20.55
			50	0	20.61	20.51	20.62
			1	0	18.53	18.42	18.52
		256QAM	1	25	18.65	18.46	18.51
			1	49	18.55	18.56	18.59
			25	0	18.60	18.50	18.45
			25	12	18.47	18.54	18.67
			25	25	18.53	18.48	18.49
			1	0	18.64	18.54	18.47

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	Maximum Average Power (dBm)		
					Channel		
					Low	Middle	High
LTE B26	15	QPSK	1	0	23.43	23.55	23.51
			1	36	23.42	23.57	23.55
			1	74	23.43	23.45	23.40
			36	0	22.66	22.56	22.57
			36	18	22.42	22.40	22.47
			36	37	22.53	22.51	22.51
			75	0	22.45	22.49	22.60
		16QAM	1	0	22.63	22.44	22.66
			1	36	22.55	22.45	22.54
			1	74	22.60	22.47	22.50
			36	0	21.62	21.53	21.62
			36	18	21.67	21.47	21.58
			36	37	21.40	21.57	21.65
			75	0	21.55	21.56	21.54
		64QAM	1	0	21.63	21.50	21.46
			1	36	21.58	21.43	21.53
			1	74	21.59	21.57	21.52
			36	0	20.54	20.41	20.61
			36	18	20.61	20.57	20.44
			36	37	20.56	20.46	20.42
			75	0	20.55	20.51	20.47
		256QAM	1	0	18.41	18.54	18.50
			1	36	18.61	18.41	18.57
			1	74	18.57	18.52	18.41
			36	0	18.53	18.44	18.64
			36	18	18.52	18.46	18.48
			36	37	18.42	18.55	18.60
			75	0	18.65	18.46	18.60

Test Band	Bandwidth (MHz)	Waveform	SCS (kHz)	Modulation	RB size	RB offset	Maximum Average Power (dBm)		
							Channel		
							Low	Middle	High
5G NR n5	5	DFT-s OFDM	15	PI/2 BPSK	1	1	24.51	24.46	24.00
					1	13	24.34	24.27	23.83
					1	23	23.95	24.02	23.71
					12	0	23.91	23.97	23.45
					12	7	24.44	24.31	23.91
					12	13	23.79	23.58	23.21
					25	0	23.90	23.79	23.46
				QPSK	1	1	24.31	24.22	23.95
					1	13	24.36	24.34	23.87
					1	23	23.95	23.89	23.54
					12	0	23.33	23.50	22.94
					12	7	24.46	24.43	23.90
					12	13	23.16	23.24	22.86
					25	0	23.34	23.27	22.98
				16QAM	1	1	23.45	23.56	23.11
				64QAM	1	1	22.08	22.06	21.61
				256QAM	1	1	19.84	19.97	19.42
		CP OFDM		QPSK	1	1	22.69	22.77	22.22
	10	DFT-s OFDM	15	PI/2 BPSK	1	1	24.47	24.45	24.26
					1	26	24.47	24.44	24.19
					1	50	24.16	24.10	23.94
					25	0	23.94	24.07	23.75
					25	14	24.36	24.43	24.08
					25	27	23.55	23.57	23.56
					50	0	23.83	23.93	23.70
				QPSK	1	1	24.33	24.35	24.02
					1	26	24.33	24.16	24.06
					1	50	23.88	23.91	23.83
					25	0	23.29	23.34	23.09
					25	14	24.31	24.35	24.17
					25	27	23.23	23.30	23.04
					50	0	23.29	23.24	23.19
				16QAM	1	1	23.59	23.39	23.21
				64QAM	1	1	22.07	21.93	21.82
				256QAM	1	1	19.89	19.96	19.62
		CP OFDM		QPSK	1	1	22.65	22.75	22.55

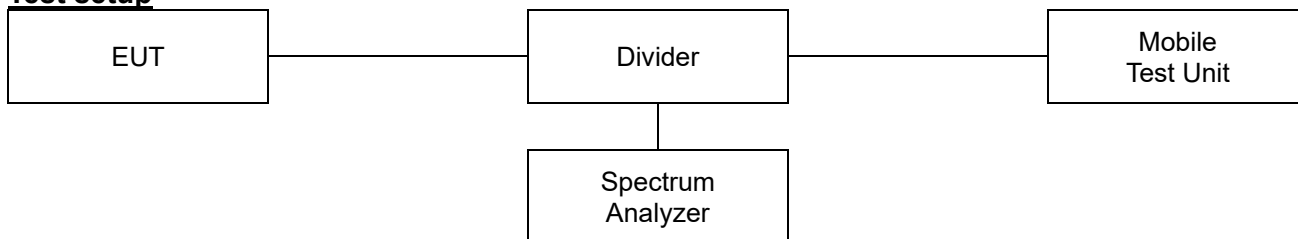
Test Band	Bandwidth (MHz)	Waveform	SCS (kHz)	Modulation	RB size	RB offset	Maximum Average Power (dBm)		
							Channel		
							Low	Middle	High
5G NR n5	15	DFT-s OFDM	15	PI/2 BPSK	1	1	24.52	24.34	24.24
					1	40	24.33	24.33	24.00
					1	77	24.06	24.00	23.78
					36	0	23.86	24.06	23.69
					36	22	24.33	24.26	24.10
					36	43	23.74	23.59	23.43
					75	0	23.79	23.78	23.45
				QPSK	1	1	24.27	24.37	24.19
					1	40	24.27	24.27	24.04
					1	77	23.93	24.00	23.57
					36	0	23.38	23.48	23.17
					36	22	24.33	24.30	24.22
					36	43	23.23	23.17	22.88
					75	0	23.31	23.35	23.06
				16QAM	1	1	23.41	23.51	23.03
				64QAM	1	1	21.91	22.12	21.59
				256QAM	1	1	19.96	19.81	19.48
		CP OFDM		QPSK	1	1	22.71	22.77	22.53
	20	DFT-s OFDM	15	PI/2 BPSK	1	1	24.46	24.44	24.55
					1	53	24.32	24.34	24.38
					1	104	24.05	24.04	24.11
					50	0	23.93	23.97	24.04
					50	28	24.32	24.35	24.43
					50	56	23.65	23.66	23.74
					100	0	23.80	23.83	23.79
				QPSK	1	1	24.30	24.33	24.44
					1	53	24.26	24.24	24.37
					1	104	23.94	23.98	24.08
					50	0	23.37	23.41	23.52
					50	28	24.41	24.37	24.50
					50	56	23.26	23.22	23.28
					100	0	23.30	23.32	23.33
				16QAM	1	1	23.48	23.47	23.59
				64QAM	1	1	22.04	22.02	22.07
				256QAM	1	1	19.83	19.87	19.87
		CP OFDM		QPSK	1	1	22.74	22.74	22.75

Test Band	Bandwidth (MHz)	Waveform	SCS (kHz)	Modulation	RB size	RB offset	Maximum Average Power (dBm)		
							Channel		
							Low	Middle	High
5G NR n26	5	DFT-s OFDM	15	PI/2 BPSK	1	1	24.14	24.09	23.76
					1	13	24.41	24.43	24.15
					1	23	24.56	24.31	23.87
					12	0	23.36	23.35	23.50
					12	7	24.66	24.44	24.17
					12	13	23.50	23.33	23.39
					25	0	23.32	23.27	23.43
				QPSK	1	1	24.24	24.13	24.11
					1	13	24.56	24.42	24.18
					1	23	24.56	24.39	23.72
					12	0	23.51	23.36	23.06
					12	7	24.73	24.57	24.03
					12	13	23.59	23.45	22.82
					25	0	23.44	23.22	22.88
				16QAM	1	1	23.46	23.37	22.93
		64QAM		1	1	21.99	21.91	21.44	
		256QAM		1	1	19.84	19.82	19.45	
		CP OFDM		QPSK	1	1	22.92	22.74	22.34
	10	DFT-s OFDM		PI/2 BPSK	1	1	24.12	24.11	23.84
					1	26	24.41	24.59	24.21
					1	50	24.43	24.43	23.77
					25	0	23.32	23.43	23.56
					25	14	24.63	24.53	24.12
					25	27	23.48	23.52	23.39
					50	0	23.19	23.29	23.48
				QPSK	1	1	24.19	24.22	24.03
					1	26	24.54	24.54	24.03
					1	50	24.51	24.52	23.70
					25	0	23.39	23.48	22.94
					25	14	24.66	24.66	24.17
					25	27	23.51	23.54	22.78
					50	0	23.27	23.33	22.86
				16QAM	1	1	23.47	23.42	23.08
				64QAM	1	1	21.98	21.95	21.49
				256QAM	1	1	19.84	19.89	19.43
		CP OFDM		QPSK	1	1	22.87	22.88	22.32

Test Band	Bandwidth (MHz)	Waveform	SCS (kHz)	Modulation	RB size	RB offset	Maximum Average Power (dBm)		
							Channel		
							Low	Middle	High
5G NR n26	15	DFT-s OFDM	15	PI/2 BPSK	1	1	24.03	23.95	23.99
					1	40	24.25	24.11	24.18
					1	77	23.96	23.82	23.80
					36	0	23.68	23.58	23.59
					36	22	24.22	24.08	24.08
					36	43	23.58	23.41	23.41
					75	0	23.59	23.46	23.54
				QPSK	1	1	24.06	23.91	24.02
					1	40	24.13	24.19	24.15
					1	77	23.94	24.22	23.82
					36	0	23.17	23.16	23.04
					36	22	24.22	24.35	24.02
					36	43	22.94	23.31	22.78
					75	0	23.16	23.17	22.93
				16QAM	1	1	23.06	23.10	22.92
				64QAM	1	1	21.69	21.67	21.59
				256QAM	1	1	19.48	19.51	19.32
		CP OFDM		QPSK	1	1	22.45	22.59	22.37
	20	DFT-s OFDM	15	PI/2 BPSK	1	1	23.89	24.09	24.05
					1	53	24.10	24.24	24.12
					1	104	23.83	24.02	23.91
					50	0	23.52	23.74	23.59
					50	28	24.06	24.26	24.09
					50	56	23.40	23.58	23.54
					100	0	23.47	23.68	23.58
				QPSK	1	1	24.09	24.22	24.10
					1	53	24.38	24.48	24.15
					1	104	24.35	24.42	23.86
					50	0	23.32	23.36	22.99
					50	28	24.58	24.60	24.11
					50	56	23.37	23.51	22.90
					100	0	23.26	23.51	22.96
				16QAM	1	1	23.22	23.38	23.01
				64QAM	1	1	21.89	21.97	21.58
				256QAM	1	1	19.68	19.80	19.50
		CP OFDM		QPSK	1	1	22.62	22.78	22.43

7.2. 99% Occupied Bandwidth & 26dB Bandwidth

Test setup



Limit

According to §2.1049,

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

Test procedure

971168 D01 v03r01 – Section 4.2 and 4.3

ANSI C63.26-2015 – Section 5.4.3 and 5.4.4

Test settings

◆ 26dB Bandwidth

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- Determine the reference value by either of the following:
 - Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
 - Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
- Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).

- i) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- j) The spectral envelope can cross the “-X dB amplitude” at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the “-X dB amplitude.”
- k) The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

◆ 99% Occupied Bandwidth

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of $1.5 \times \text{OBW}$ is sufficient).
- b) The nominal IF filter 3 dB Bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d) Set the detection mode to peak, and the trace mode to max-hold.
- e) If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the upper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.
- f) The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

Notes:

1. The EUT was setup to maximum output power with all Bandwidth and modulation.

Test results

Test mode		Channel	26 dB Bandwidth (MHz)	99 % Bandwidth (MHz)
GSM 850	Voice (GPRS)	Low	0.304	0.244
		Middle	0.304	0.244
		High	0.304	0.242
	EDGE	Low	0.312	0.246
		Middle	0.316	0.248
		High	0.308	0.248
WCDMA 850	RMC	Low	4.720	4.166
		Middle	4.705	4.166
		High	4.720	4.151

Test Band	Bandwidth (MHz)	Channel	Test mode	26dB Bandwidth (MHz)	99 % Bandwidth (MHz)
LTE B5	1.4	Low	QPSK	1.304	1.098
			16QAM	1.276	1.087
		Middle	QPSK	1.287	1.098
			16QAM	1.290	1.091
		High	QPSK	1.294	1.094
			16QAM	1.318	1.098
	3	Low	QPSK	2.937	2.705
			16QAM	2.960	2.690
		Middle	QPSK	2.930	2.697
			16QAM	2.945	2.690
		High	QPSK	2.945	2.690
			16QAM	2.945	2.690
	5	Low	QPSK	4.945	4.508
			16QAM	4.958	4.483
		Middle	QPSK	4.945	4.508
			16QAM	4.958	4.508
		High	QPSK	4.945	4.483
			16QAM	4.970	4.508
	10	Low	QPSK	9.790	8.991
			16QAM	9.765	8.941
		Middle	QPSK	9.740	8.966
			16QAM	9.715	8.991
		High	QPSK	9.565	8.966
			16QAM	9.690	8.941

Test Band	Bandwidth (MHz)	Channel	Test mode	26dB Bandwidth (MHz)	99 % Bandwidth (MHz)
LTE B26	1.4	Low	QPSK	1.294	1.091
			16QAM	1.318	1.098
		Middle	QPSK	1.311	1.087
			16QAM	1.280	1.087
		High	QPSK	1.273	1.098
			16QAM	1.280	1.094
	3	Low	QPSK	2.922	2.690
			16QAM	2.960	2.690
		Middle	QPSK	2.922	2.682
			16QAM	2.952	2.690
		High	QPSK	2.945	2.697
			16QAM	2.945	2.690
	5	Low	QPSK	4.983	4.496
			16QAM	4.945	4.496
		Middle	QPSK	4.970	4.508
			16QAM	4.933	4.520
		High	QPSK	4.920	4.496
			16QAM	4.983	4.496
	10	Low	QPSK	9.790	8.991
			16QAM	9.740	8.991
		Middle	QPSK	9.765	8.966
			16QAM	9.715	8.991
		High	QPSK	9.740	8.966
			16QAM	9.740	8.966
	15	Low	QPSK	14.498	13.449
			16QAM	14.798	13.487
		Middle	QPSK	14.498	13.374
			16QAM	14.610	13.449
		High	QPSK	14.423	13.487
			16QAM	14.535	13.412

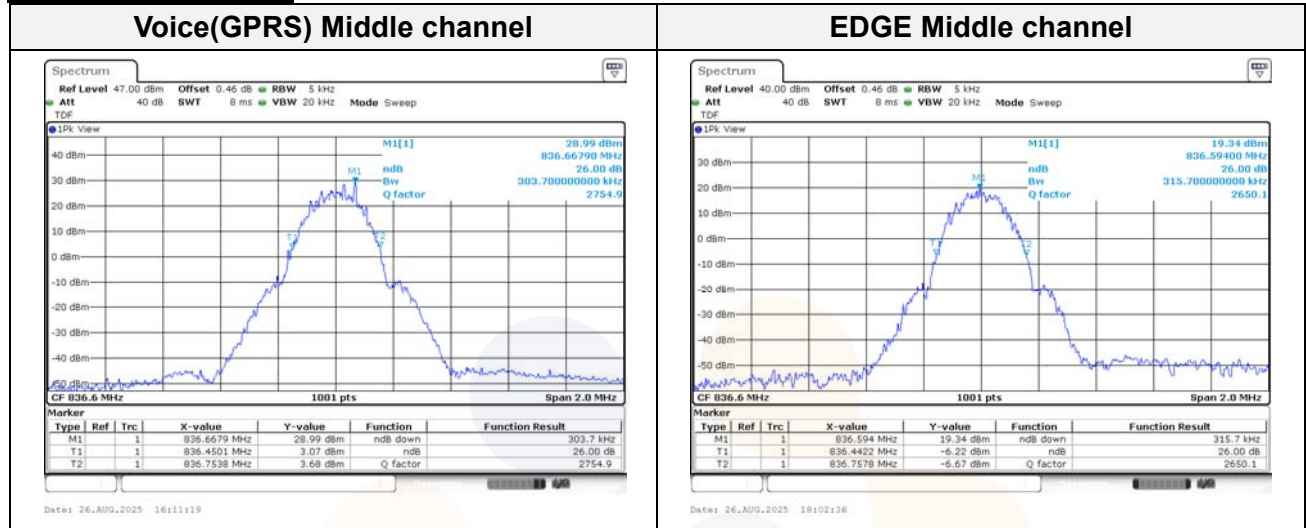
Test Band	Bandwidth (MHz)	Channel	Waveform	SCS (kHz)	Modulation	26dB Bandwidth (MHz)	99 % Bandwidth (MHz)
5G NR n5	5	Low	DFT-s OFDM	15	QPSK	4.883	4.508
					16QAM	4.920	4.496
		Middle			QPSK	4.920	4.508
					16QAM	4.895	4.508
		High			QPSK	4.908	4.520
					16QAM	4.933	4.496
	10	Low	DFT-s OFDM		QPSK	9.515	8.966
					16QAM	9.515	8.941
		Middle			QPSK	9.540	8.991
					16QAM	9.515	8.966
		High			QPSK	9.515	8.966
					16QAM	9.515	8.966
	15	Low	DFT-s OFDM		QPSK	14.236	13.449
					16QAM	14.311	13.449
		Middle			QPSK	14.311	13.487
					16QAM	14.311	13.449
		High			QPSK	14.348	13.449
					16QAM	14.311	13.412
	20	Low	DFT-s OFDM		QPSK	19.181	17.982
					16QAM	19.231	17.982
		Middle			QPSK	19.131	17.982
					16QAM	19.181	17.982
		High			QPSK	19.181	17.982
					16QAM	19.181	17.932

Test Band	Bandwidth (MHz)	Channel	Waveform	SCS (kHz)	Modulation	26dB Bandwidth (MHz)	99 % Bandwidth (MHz)
5G NR n26	5	Low	DFT-s OFDM	15	QPSK	4.920	4.508
					16QAM	4.908	4.496
		Middle			QPSK	4.933	4.508
					16QAM	4.895	4.496
		High			QPSK	5.007	4.520
					16QAM	4.933	4.496
	10	Low	DFT-s OFDM		QPSK	9.466	8.966
					16QAM	9.515	8.966
		Middle			QPSK	9.540	8.991
					16QAM	9.515	8.966
		High			QPSK	9.565	8.966
					16QAM	9.540	8.941
	15	Low	DFT-s OFDM		QPSK	14.273	13.449
					16QAM	14.311	13.449
		Middle			QPSK	14.311	13.487
					16QAM	14.423	13.449
		High			QPSK	14.348	13.449
					16QAM	14.273	13.412
	20	Low	DFT-s OFDM		QPSK	19.131	17.982
					16QAM	19.231	17.982
		Middle			QPSK	19.181	17.982
					16QAM	19.131	17.932
		High			QPSK	19.181	17.932
					16QAM	19.181	17.932

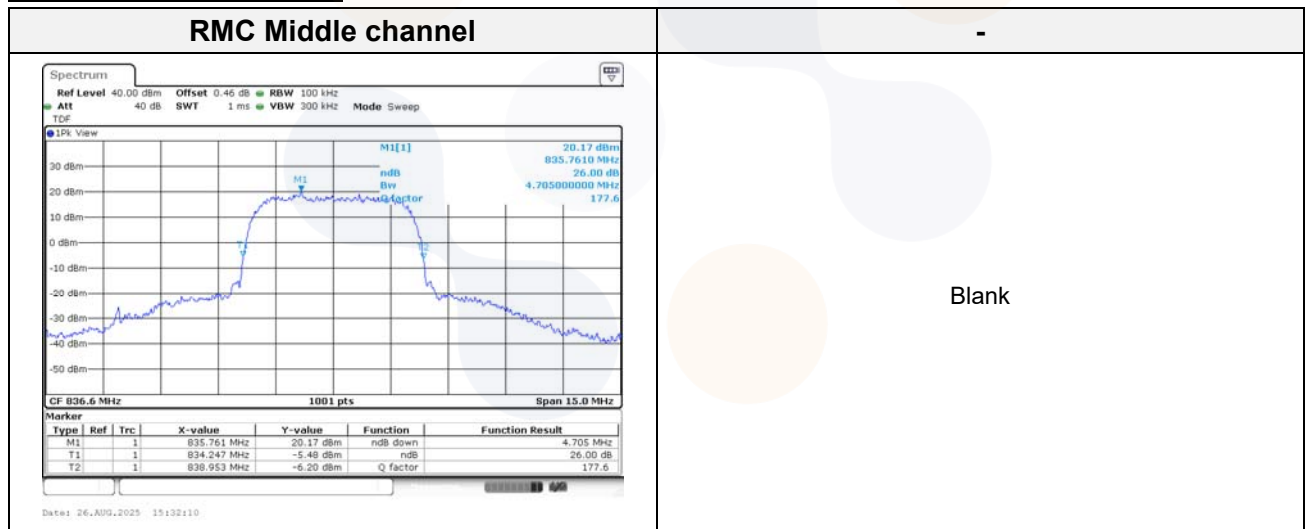
In order to simplify the report, only Middle channel test plots are attached

26dB Bandwidth

Test mode: GSM 850

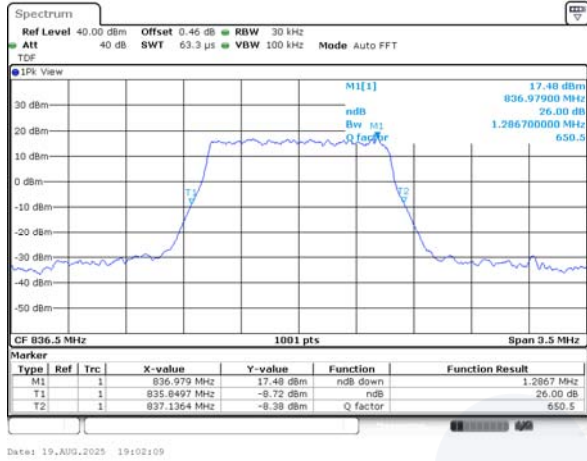


Test mode: WCDMA 850

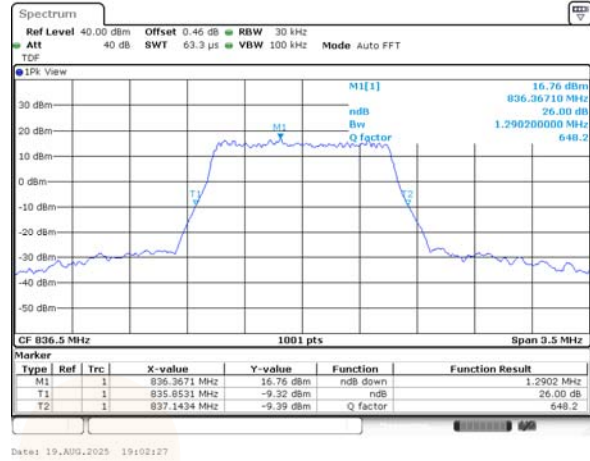


Test mode: LTE B5

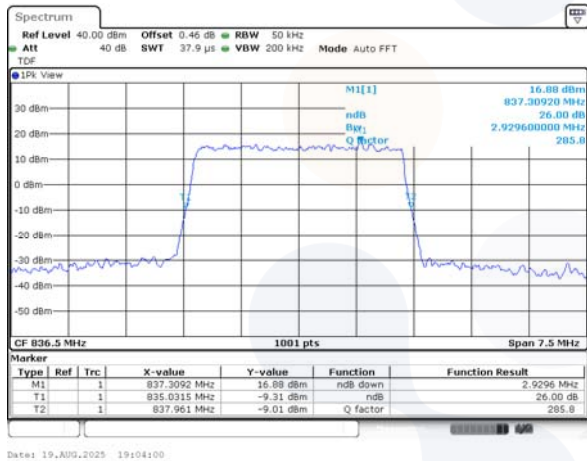
1.4M BW QPSK Middle channel



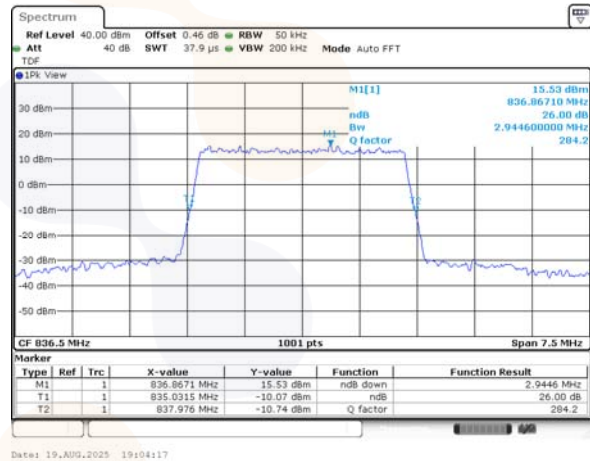
1.4M BW 16QAM Middle channel



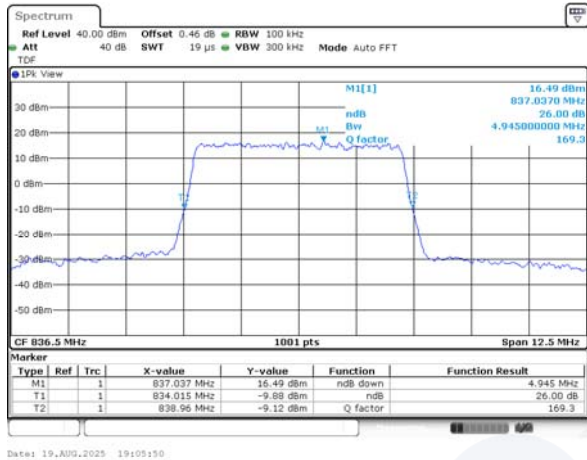
3M BW QPSK Middle channel



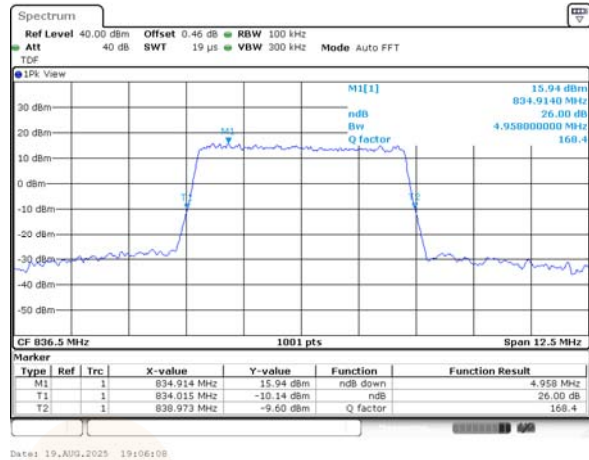
3M BW 16QAM Middle channel



5M BW QPSK Middle channel



5M BW 16QAM Middle channel



10M BW QPSK Middle channel

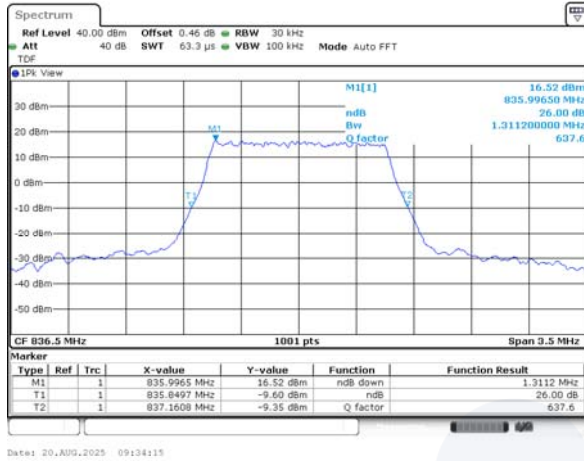


10M BW 16QAM Middle channel



Test mode: LTE B26

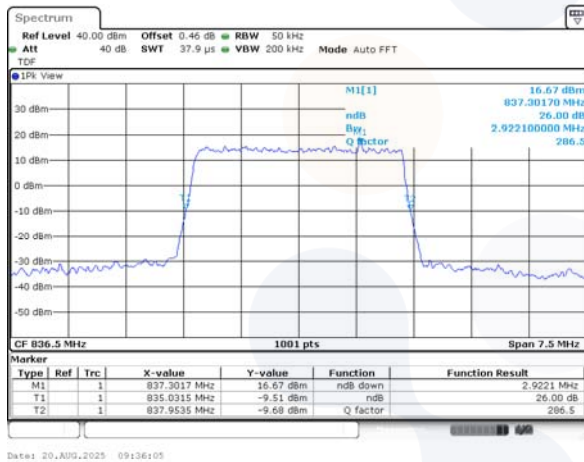
1.4M BW QPSK Middle channel



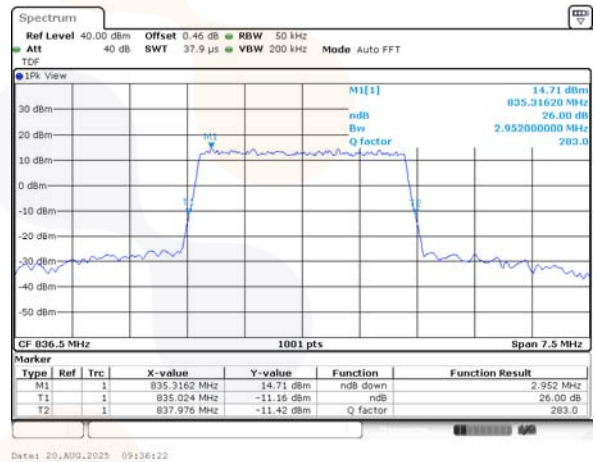
1.4M BW 16QAM Middle channel



3M BW QPSK Middle channel



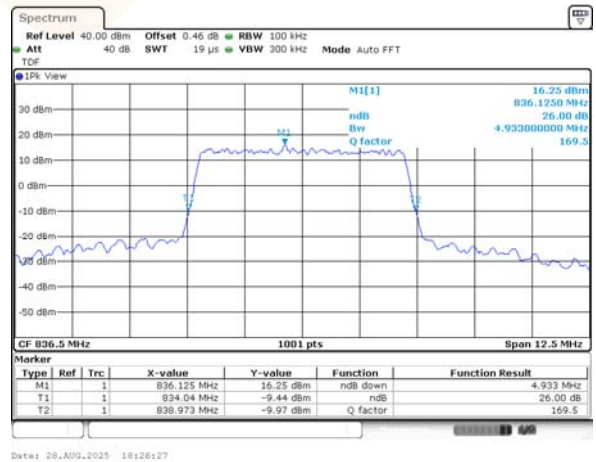
3M BW 16QAM Middle channel



5M BW QPSK Middle channel



5M BW 16QAM Middle channel



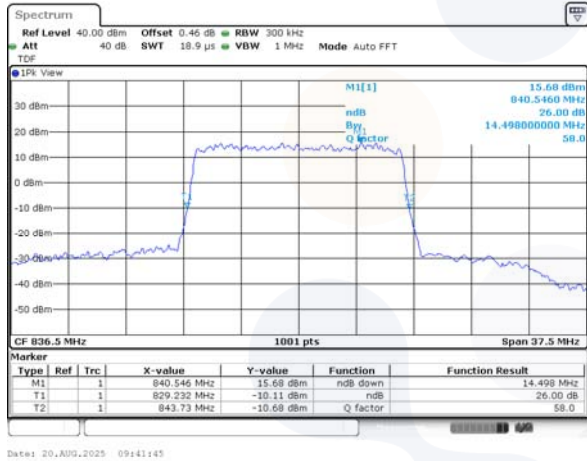
10M BW QPSK Middle channel



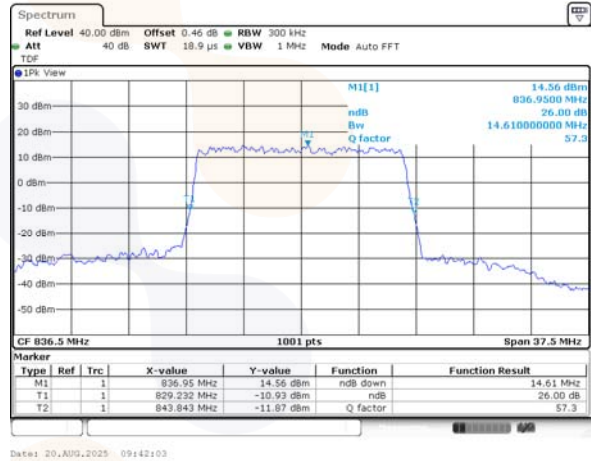
10M BW 16QAM Middle channel



15M BW QPSK Middle channel

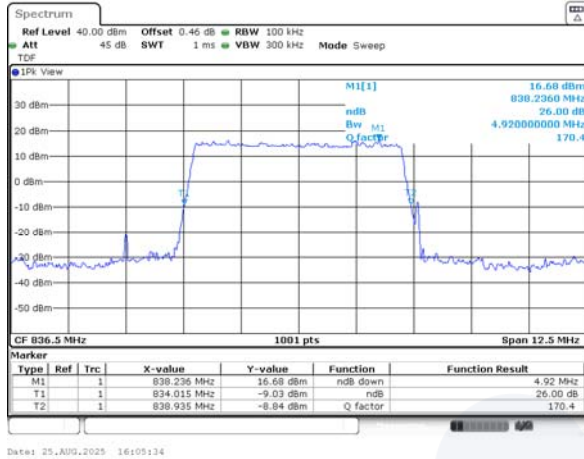


15M BW 16QAM Middle channel

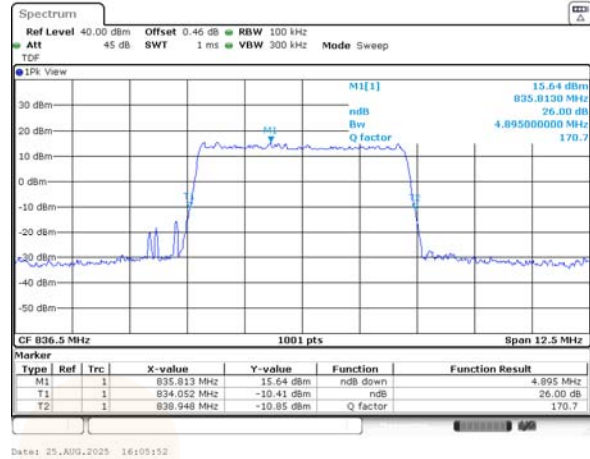


Test mode: 5G NR n5 DFT-s OFDM

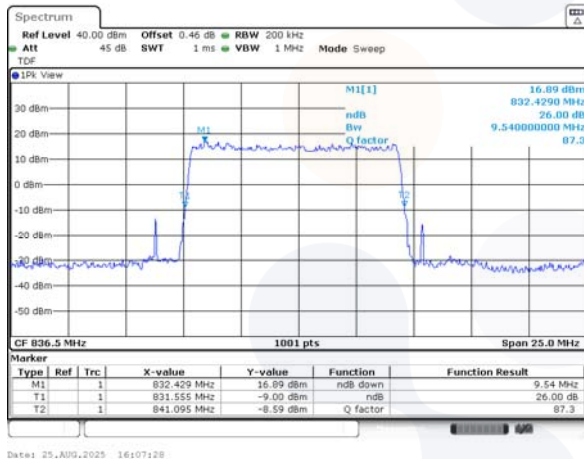
5M BW QPSK Middle channel



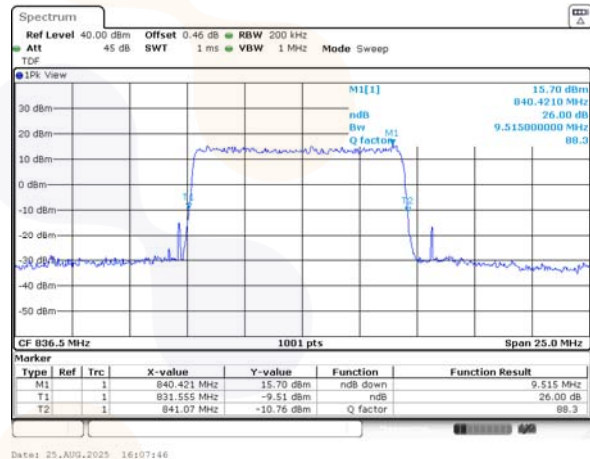
5M BW 16QAM Middle channel



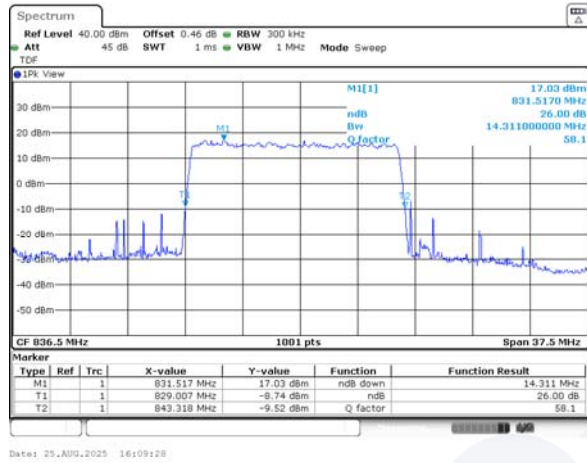
10M BW QPSK Middle channel



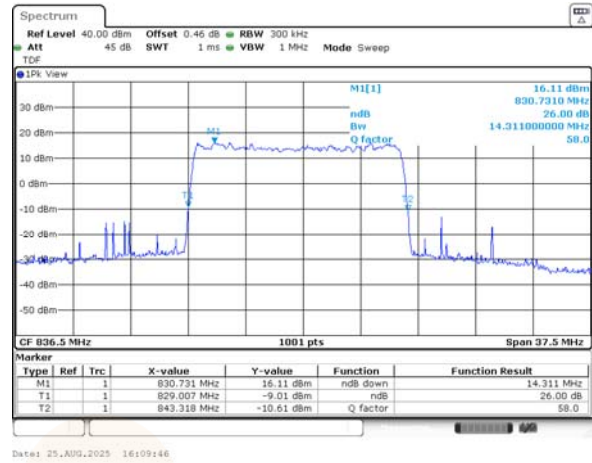
10M BW 16QAM Middle channel



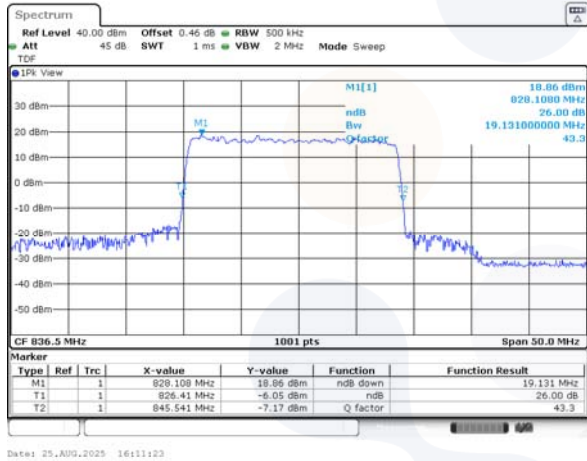
15M BW QPSK Middle channel



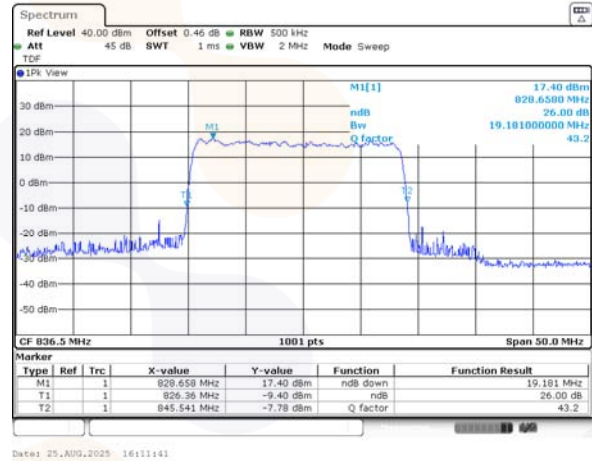
15M BW 16QAM Middle channel



20M BW QPSK Middle channel

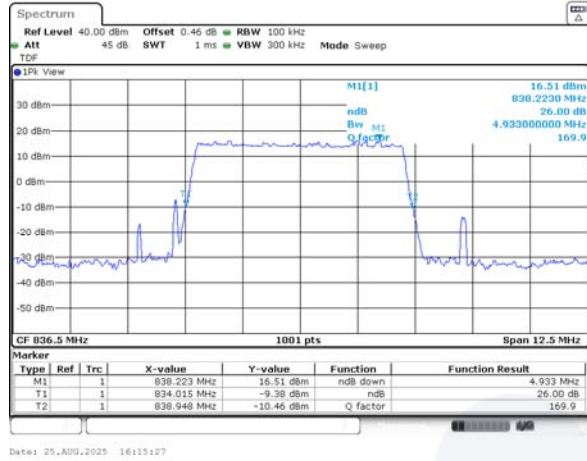


20M BW 16QAM Middle channel

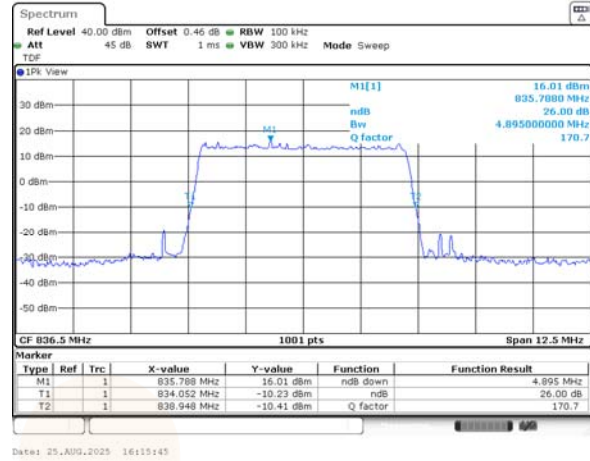


Test mode: 5G NR n26 DFT-s OFDM

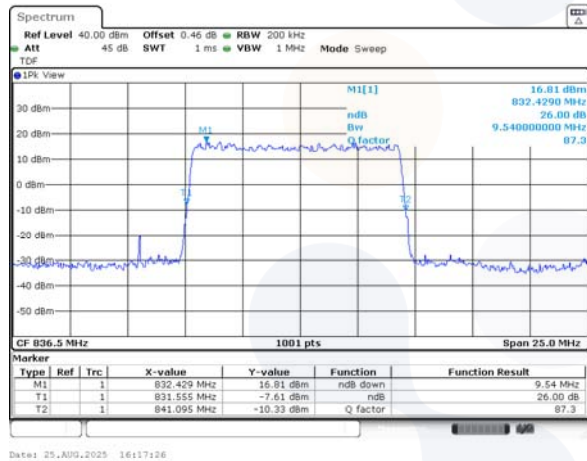
5M BW QPSK Middle channel



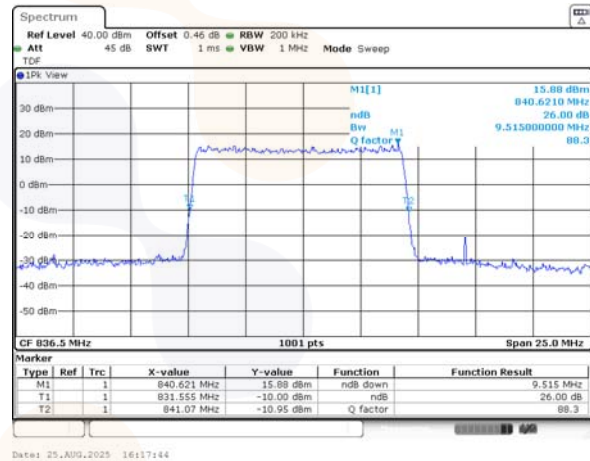
5M BW 16QAM Middle channel



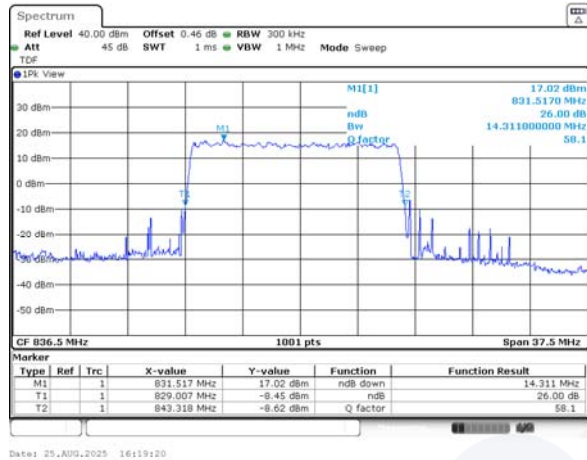
10M BW QPSK Middle channel



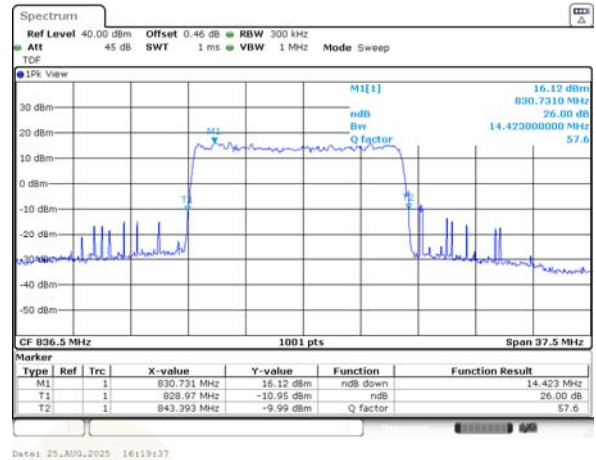
10M BW 16QAM Middle channel



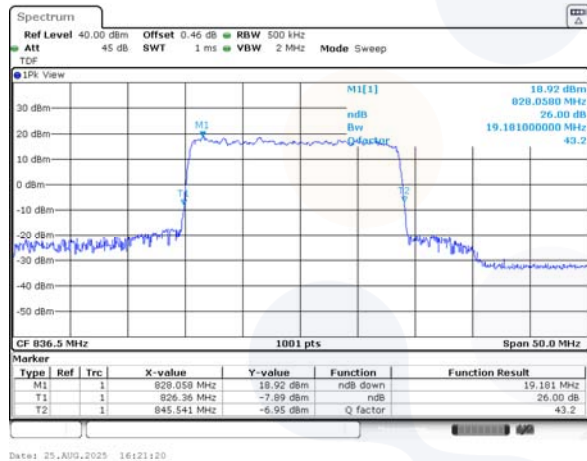
15M BW QPSK Middle channel



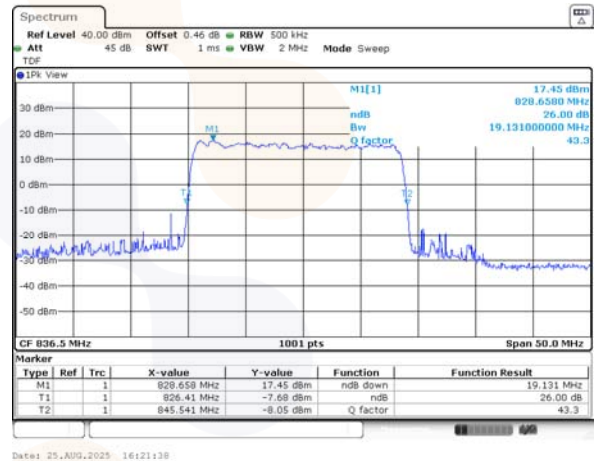
15M BW 16QAM Middle channel



20M BW QPSK Middle channel



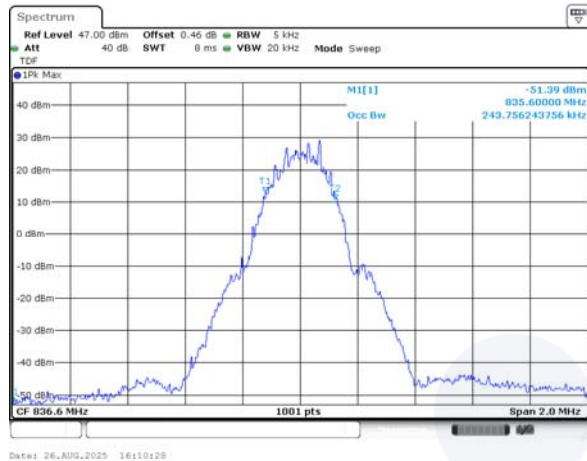
20M BW 16QAM Middle channel



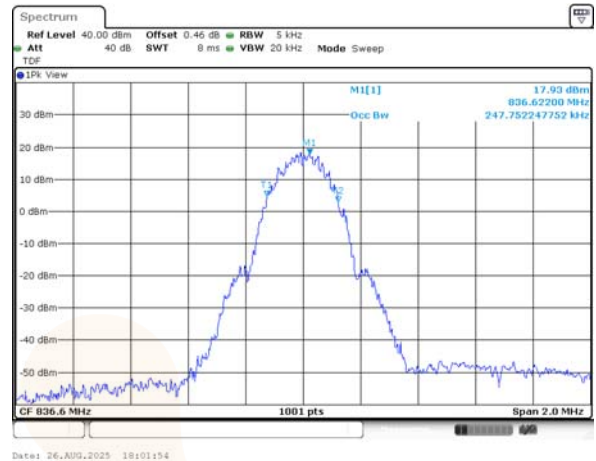
99% Occupied Bandwidth

Test mode: GSM 850

Voice(GPRS) Middle channel

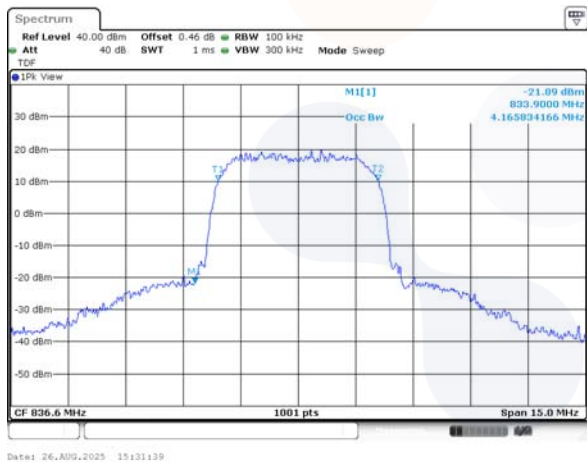


EDGE Middle channel



Test mode: WCDMA 850

RMC Middle channel



-

Blank

Test mode: LTE B5

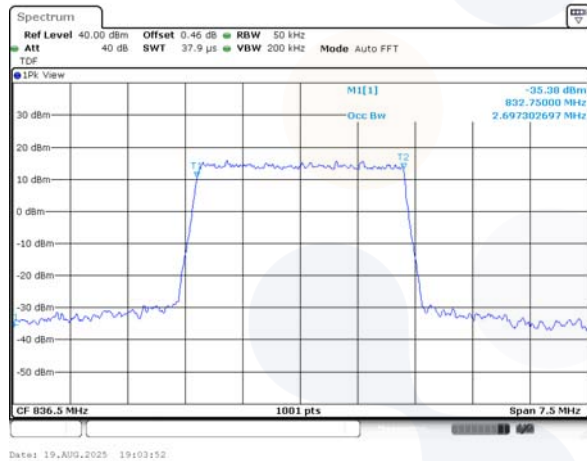
1.4M BW QPSK Middle channel



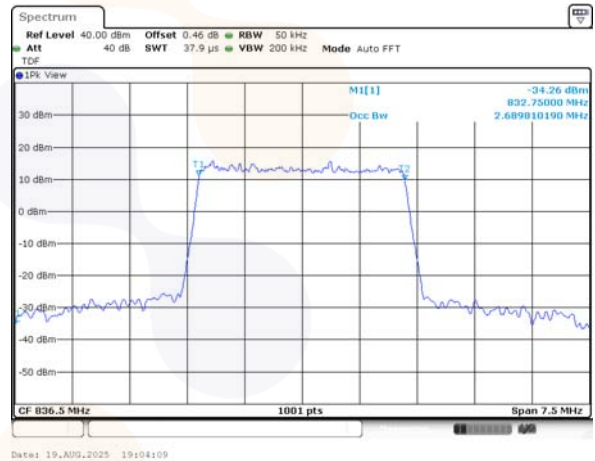
1.4M BW 16QAM Middle channel



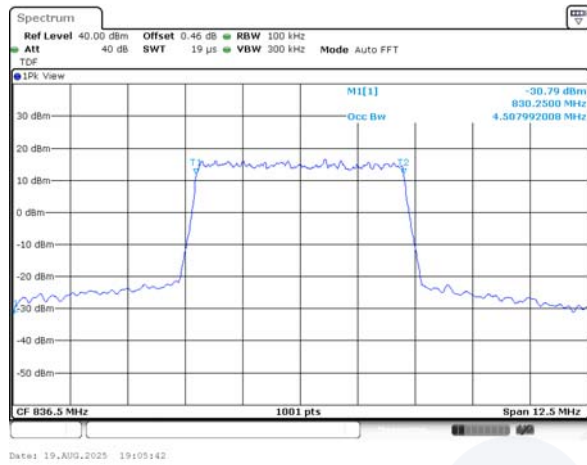
3M BW QPSK Middle channel



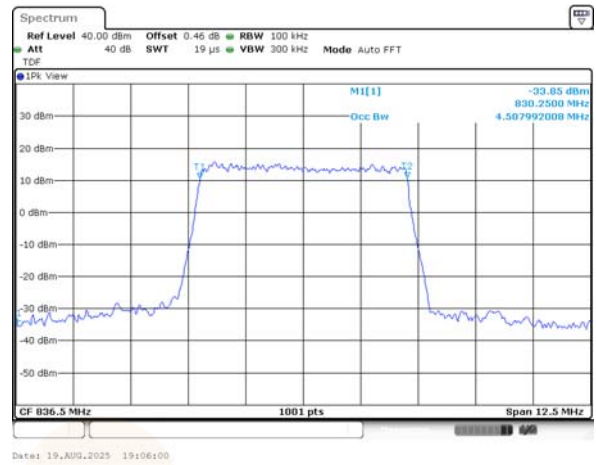
3M BW 16QAM Middle channel



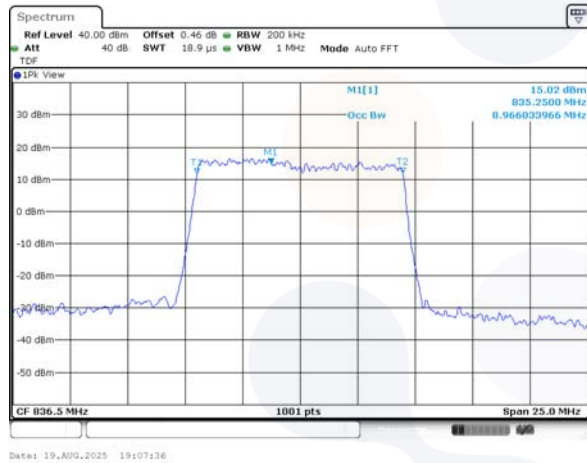
5M BW QPSK Middle channel



5M BW 16QAM Middle channel



10M BW QPSK Middle channel

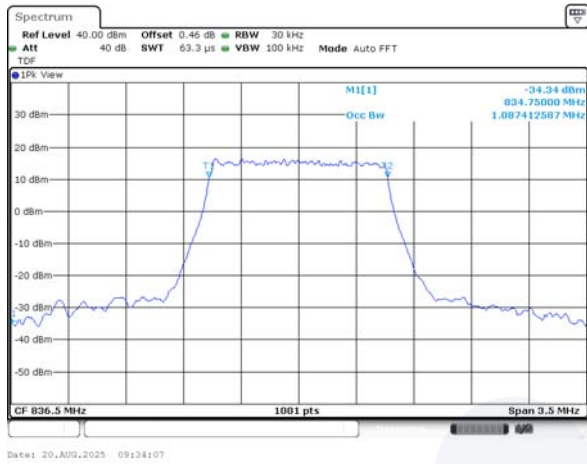


10M BW 16QAM Middle channel

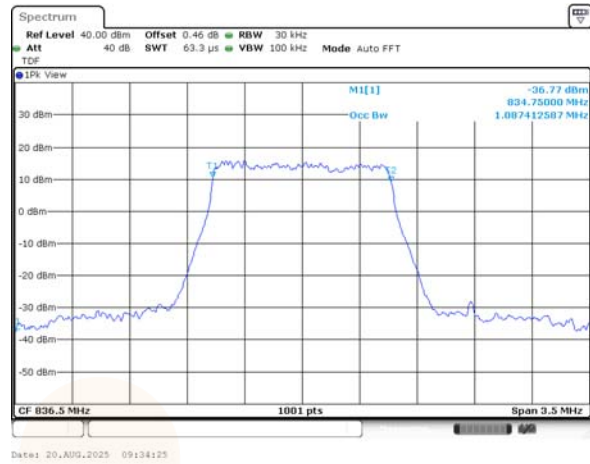


Test mode: LTE B26

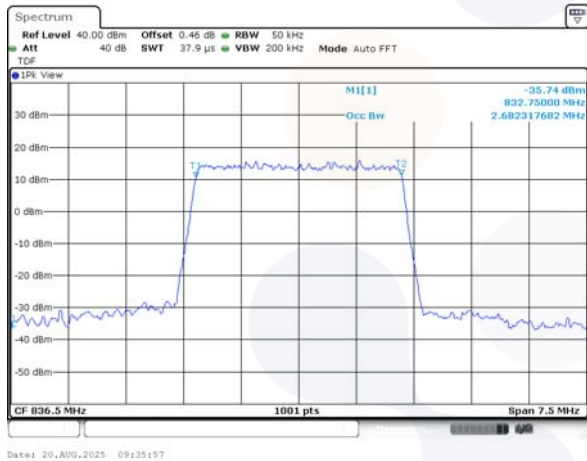
1.4M BW QPSK Middle channel



1.4M BW 16QAM Middle channel



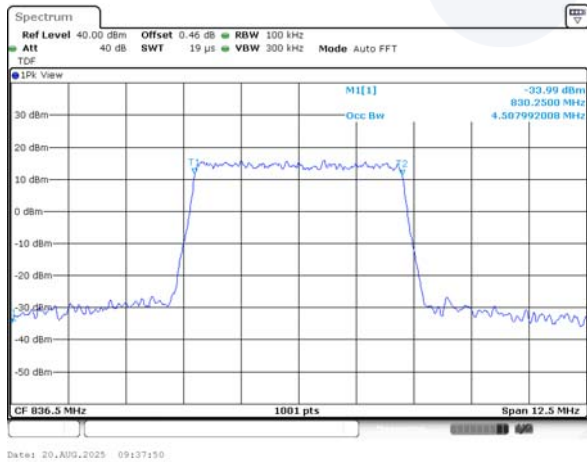
3M BW QPSK Middle channel



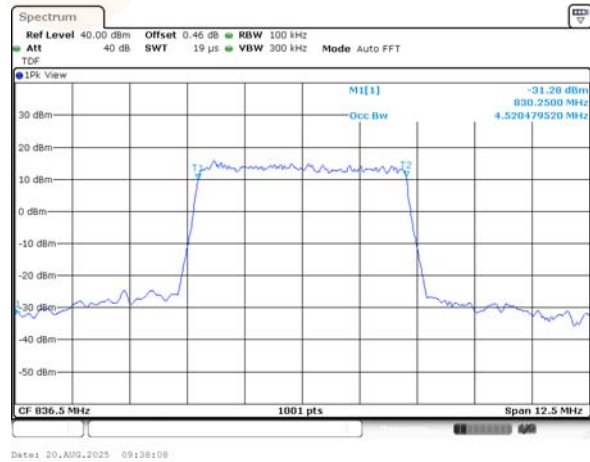
3M BW 16QAM Middle channel



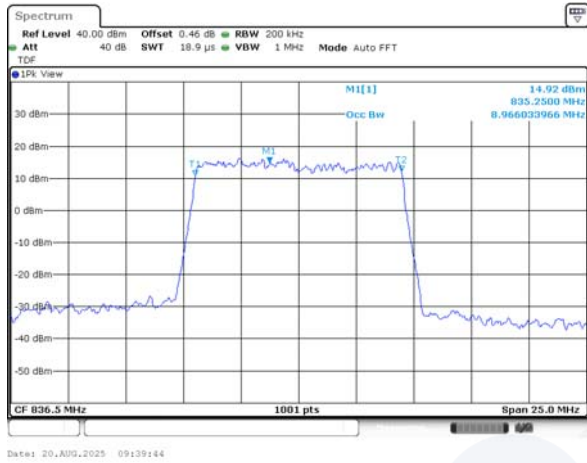
5M BW QPSK Middle channel



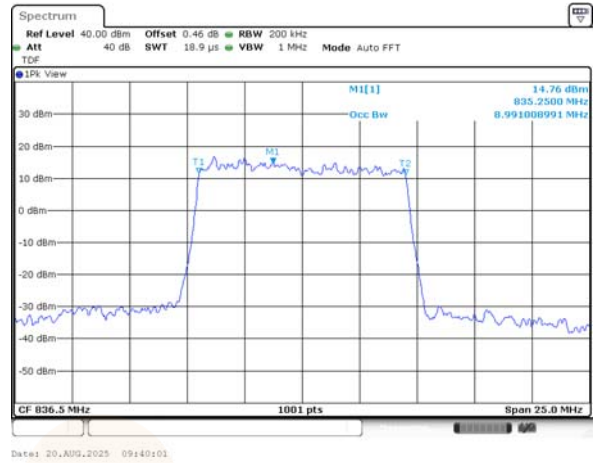
5M BW 16QAM Middle channel



10M BW QPSK Middle channel



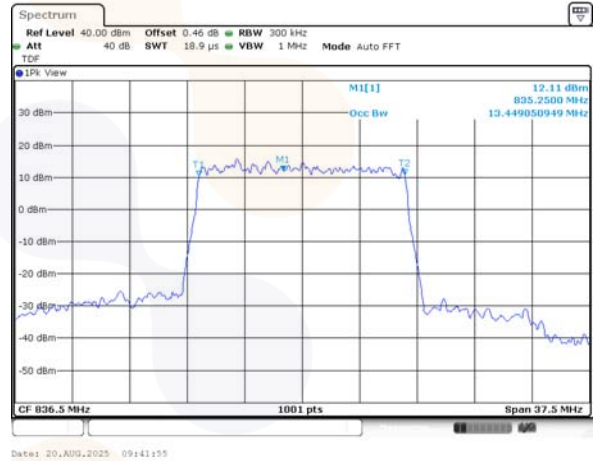
10M BW 16QAM Middle channel



15M BW QPSK Middle channel

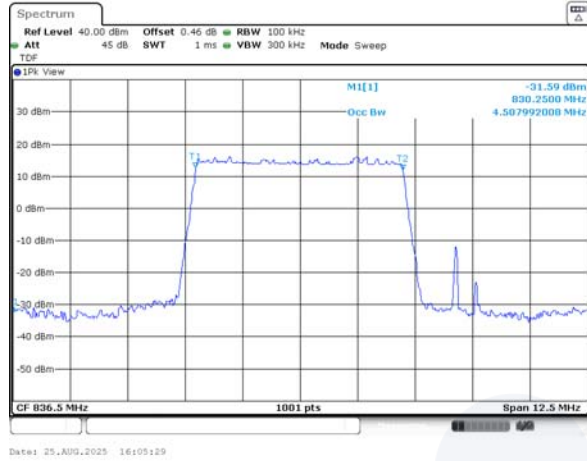


15M BW 16QAM Middle channel

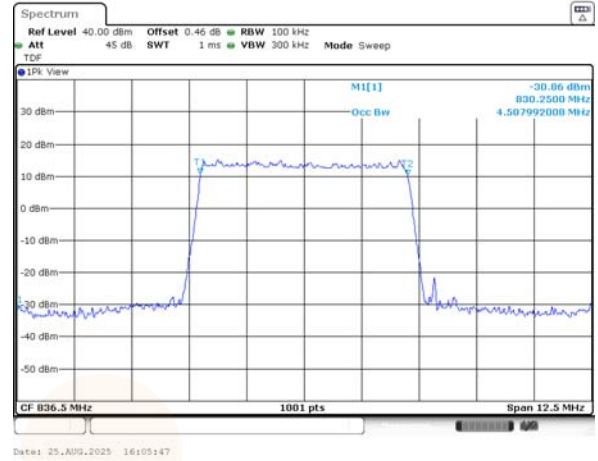


Test mode: 5G NR n5 DFT-s OFDM

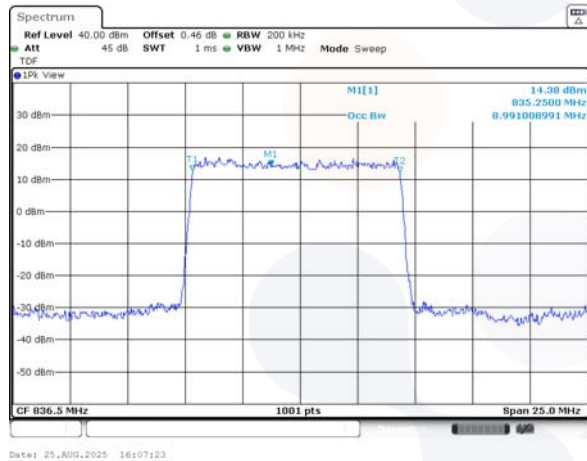
5M BW QPSK Middle channel



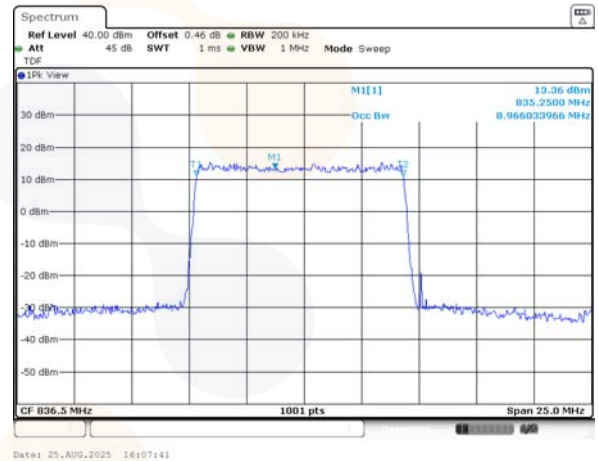
5M BW 16QAM Middle channel



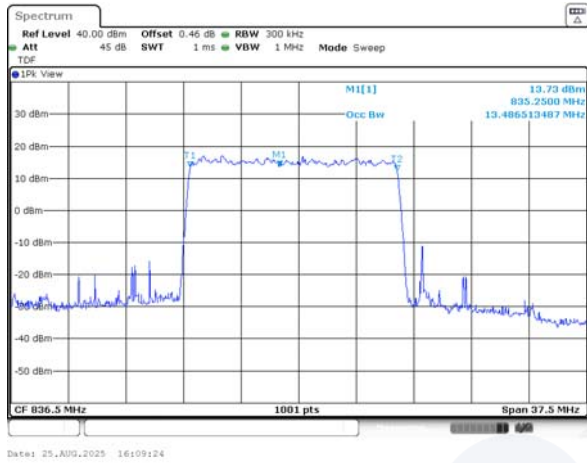
10M BW QPSK Middle channel



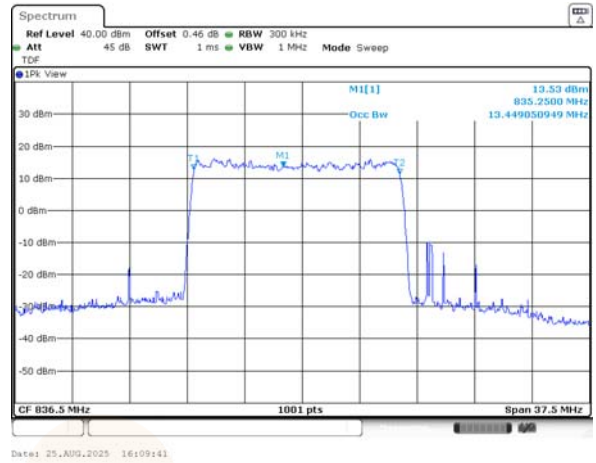
10M BW 16QAM Middle channel



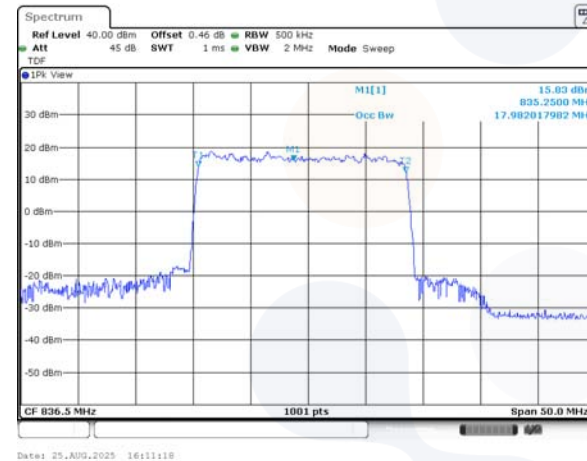
15M BW QPSK Middle channel



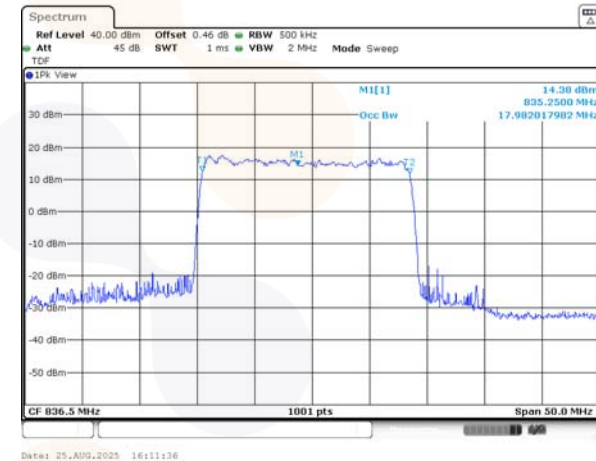
15M BW 16QAM Middle channel



20M BW QPSK Middle channel

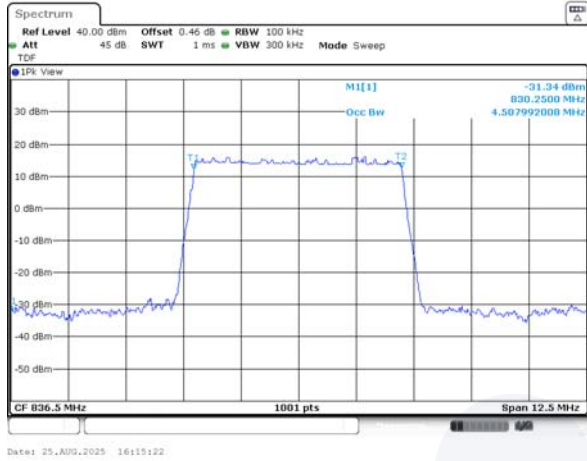


20M BW 16QAM Middle channel

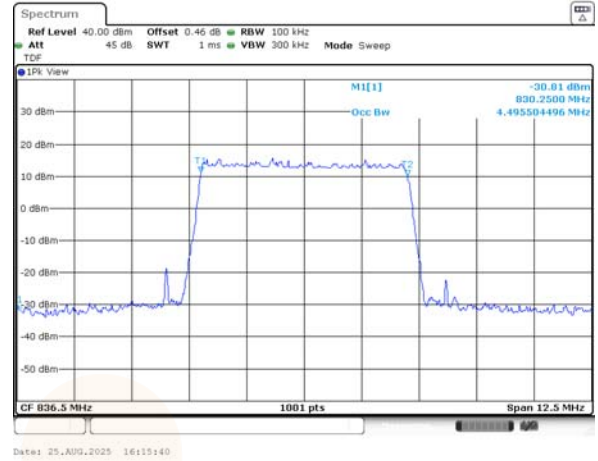


Test mode: 5G NR n26 DFT-s OFDM

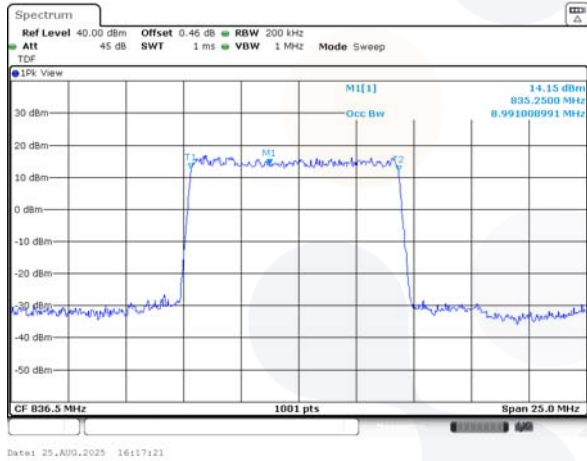
5M BW QPSK Middle channel



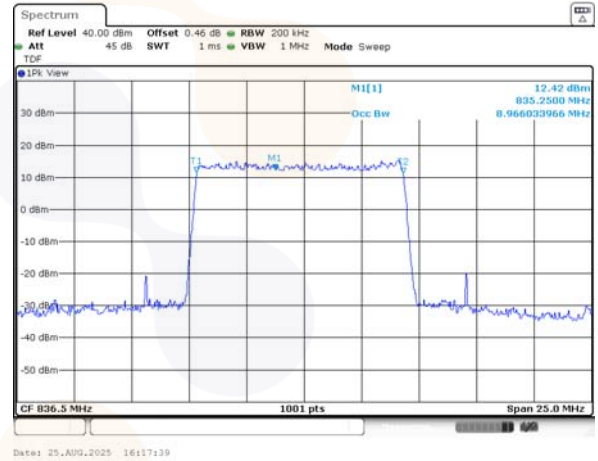
5M BW 16QAM Middle channel



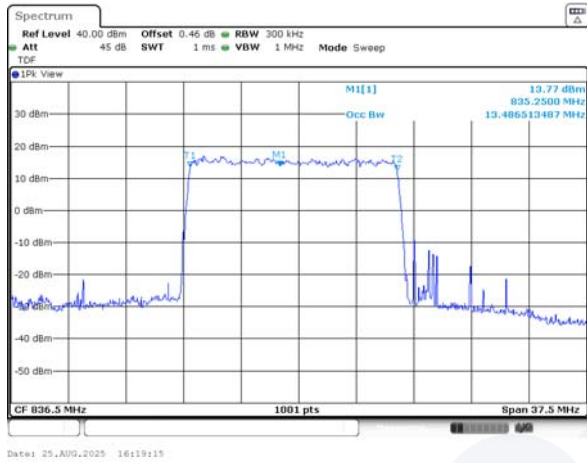
10M BW QPSK Middle channel



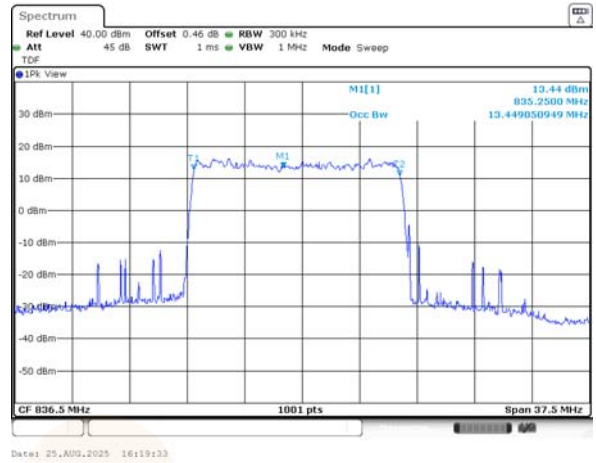
10M BW 16QAM Middle channel



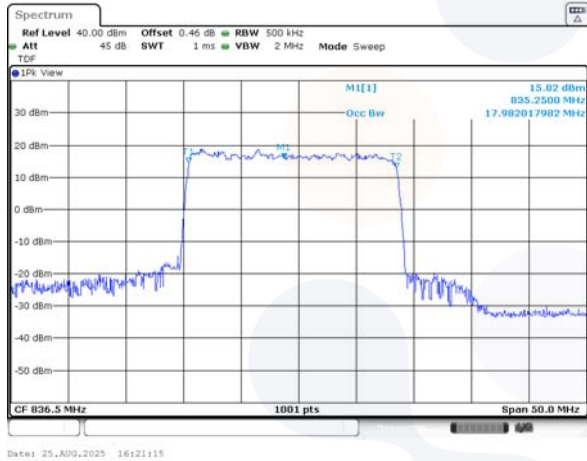
15M BW QPSK Middle channel



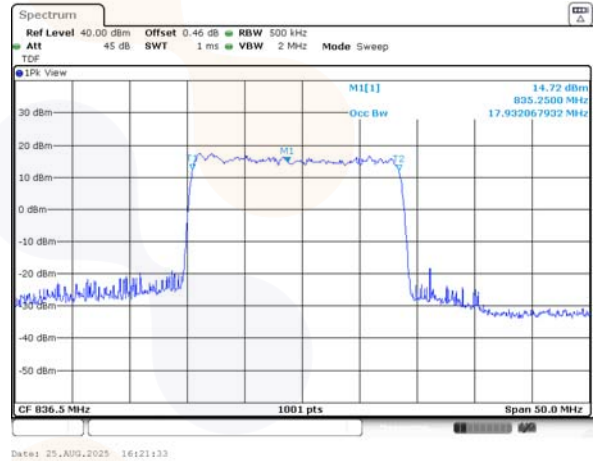
15M BW 16QAM Middle channel



20M BW QPSK Middle channel

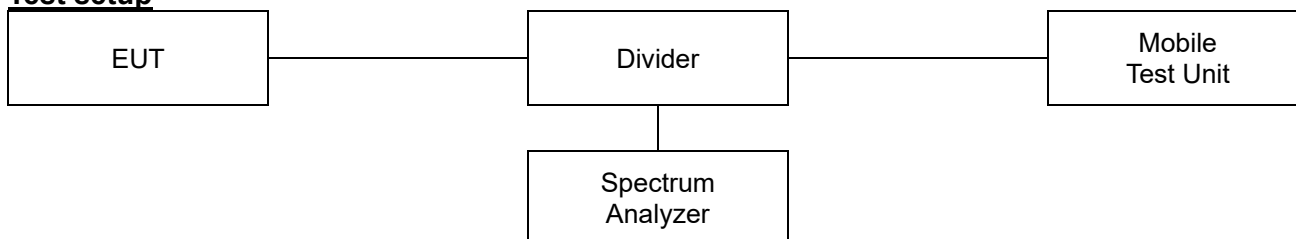


20M BW 16QAM Middle channel



7.3. Band Edge Emissions at Antenna Terminal

Test setup



Limit

According to §22.917(a),

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.

Test procedure

971168 D01 v03r01 - Section 6

ANSI C63.26-2015 – Section 5.7

Test settings

- 1) Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2) Span was set large enough so as to capture all out of band emissions near the band edge.
- 3) Set the RBW > 1% of the emission Bandwidth.
- 4) Set the VBW $\geq 3 \times$ RBW.
- 5) Set the number of sweep points $\geq 2 \times$ Span/RBW
- 6) Detector = RMS
- 7) Trace mode = trace average
- 8) Sweep time should be auto for peak detection. For RMS detection the sweep time should be set as follows:
 - a) If the device can be configured to transmit continuously (duty cycle $\geq 98\%$), set the (sweep time) > (number of points in sweep) $\times$ (symbol period) (e.g., by a factor of $10 \times$ symbol period $\times$ number of points) Increasing the sweep time (i.e., slowing the sweep speed) will allow for averaging over multiple symbols.
 - b) If the device cannot transmit continuously (duty cycle < 98%), a gated sweep shall be used when possible (i.e., gate triggered such that the analyzer only sweeps when the device is transmitting at full power), set the sweep time > (number of points in sweep) $\times$ (symbol period) but the sweep time shall always be maintained at a value that is less than or equal to the minimum transmission time
 - c) If the device cannot be configured to transmit continuously (duty cycle > 98%), and a free-running sweep must be used, set the sweep time so that the averaging is performed over multiple on/off cycles by setting the sweep time > (number of points in sweep) $\times$ (transmitter period) (i.e., the transmit on-time + the off-time). The spectrum analyzer readings shall subsequently be corrected by $[10 \log (1/\text{duty cycle})]$. This assumes that the transmission period and duty cycle is relatively constant (duty cycle variation $\leq \pm 2\%$).
 - d) If the device cannot be configured to transmit continuously and a free-running

sweep must be used, and if the transmissions exhibit a non-constant duty cycle (duty cycle variations $> \pm 2\%$), set the sweep time so that the averaging is performed over the on-period by setting the sweep time $> (\text{symbol period}) \times (\text{number of points})$, while also maintaining the sweep time $< (\text{transmitter on-time})$. The trace mode shall be set to max hold, since not every display point will be averaged only over just the on-time. Thus, multiple sweeps (e.g., 100) in maximum hold art necessary to ensure that the maximum power is measured.

- 9) Allow trace to fully stabilize.

Notes:

- Per 22.917(b), 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. 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.
- For Band-Edge extended:

Channel BW (MHz)	RBW Used (kHz)	CF for emissions more than 100 kHz	CF for emissions more than 1 MHz
1.4	20	+6.99 dB	+16.99 dB
3	30	+5.23 dB	+15.23 dB
5	50	+3.01 dB	+13.01 dB
10	100	N/A	+10.00 dB
15	200	N/A	+6.99 dB
20	200	N/A	+6.99 dB

For emission levels measured with a resolution bandwidth of [RBW Used] at frequency offsets greater than 1 MHz from the band edge, even after applying a correction factor to represent the equivalent level in a 100 kHz or 1 MHz resolution bandwidth, the levels remain below -13 dB m.

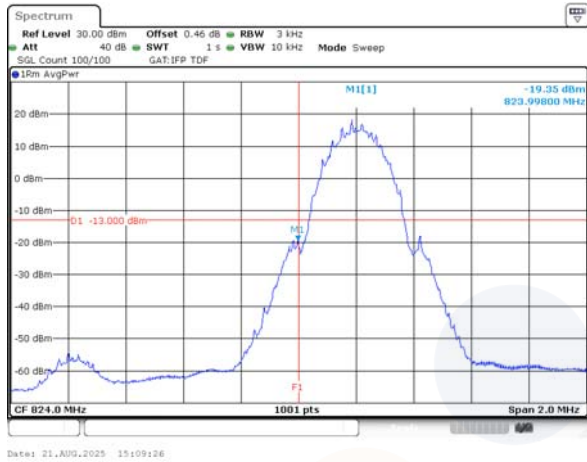
- The EUT was setup to maximum output power as its lowest and highest channel with all bandwidth, modulation and RB configurations.

Test results

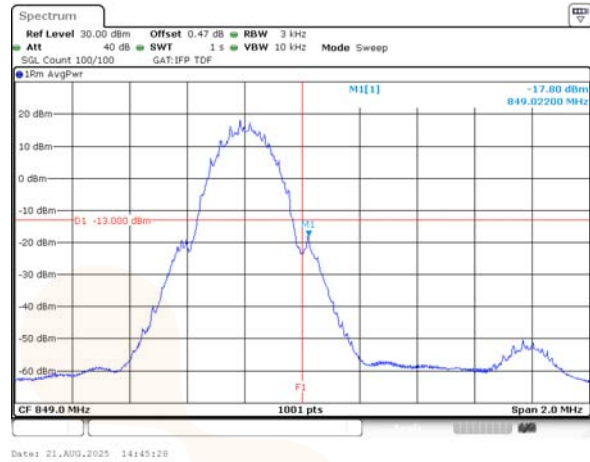
Test mode: GSM 850

Voice(GPRS)

Low channel

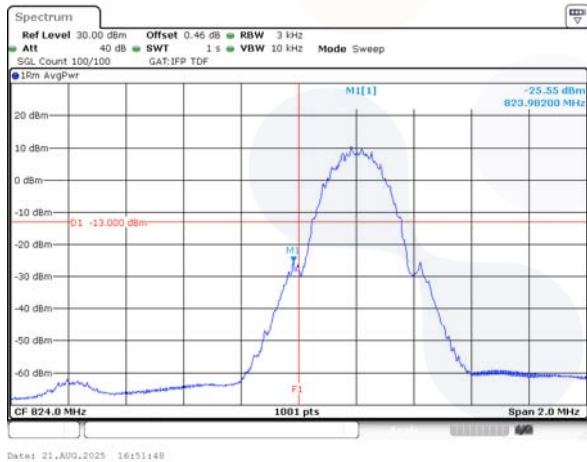


High channel

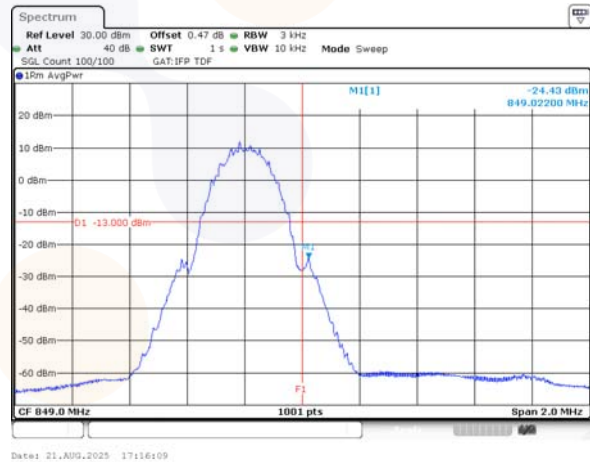


EDGE

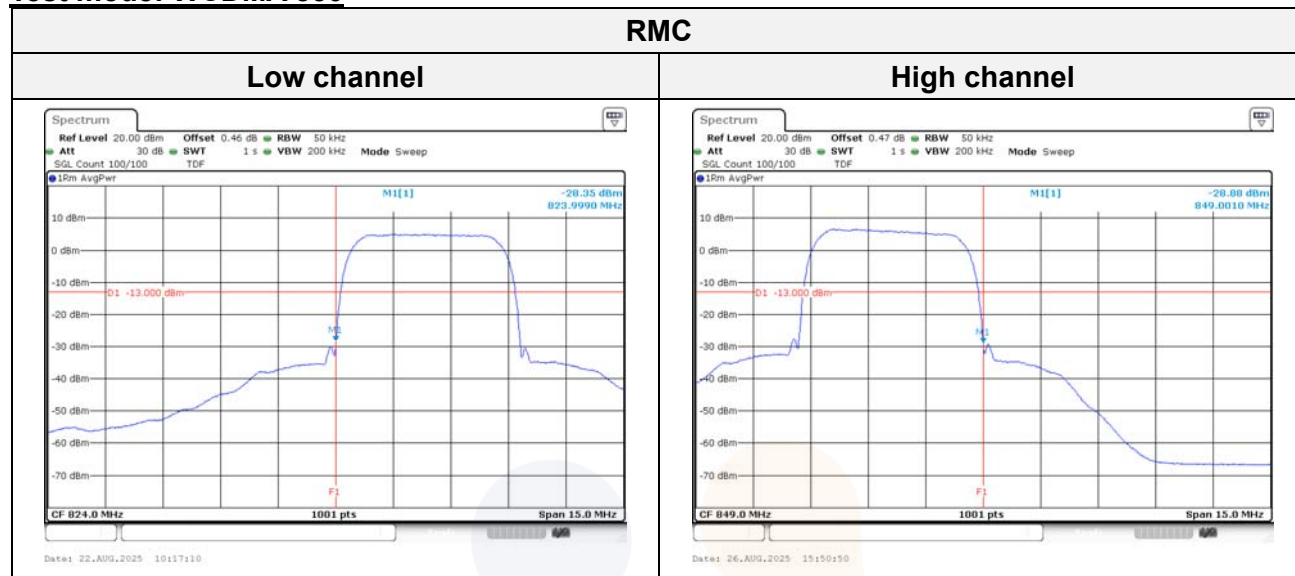
Low channel



High channel



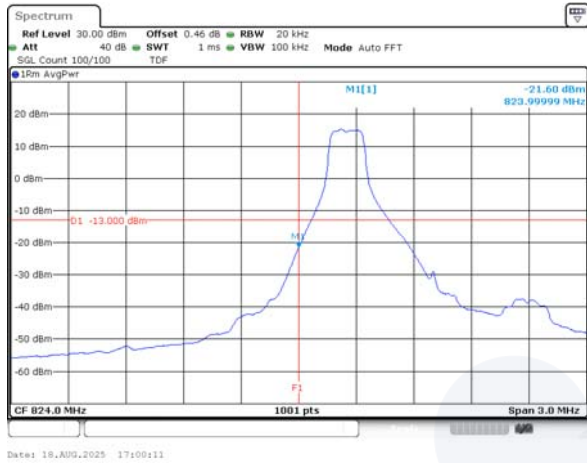
Test mode: WCDMA 850



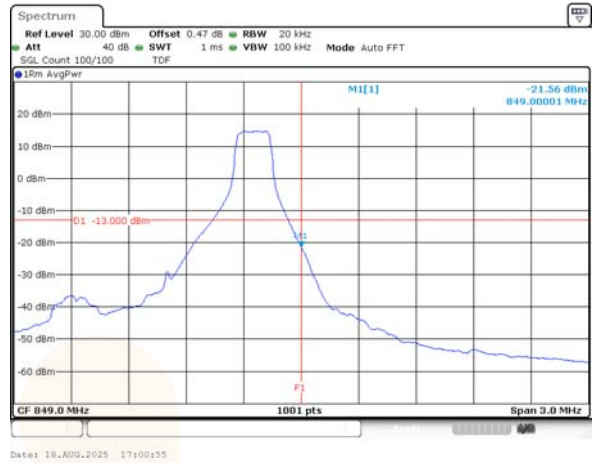
Test mode: LTE B5

1.4M BW QPSK

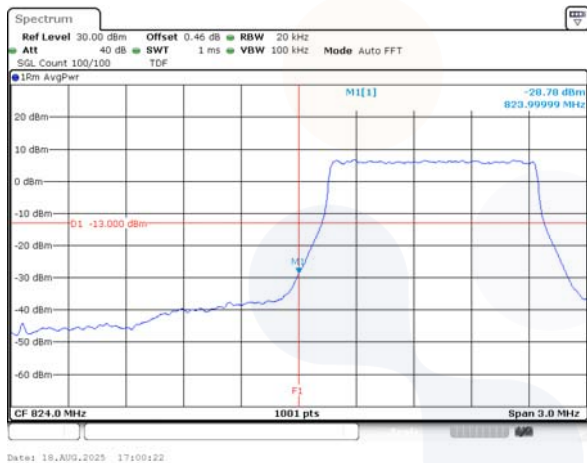
Low channel 1RB



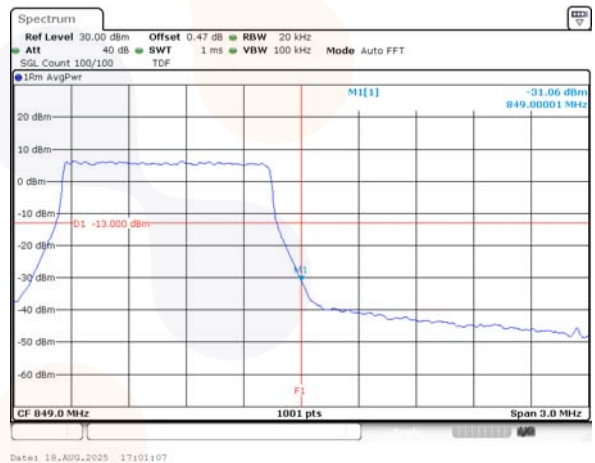
High channel 1RB



Low channel FRB

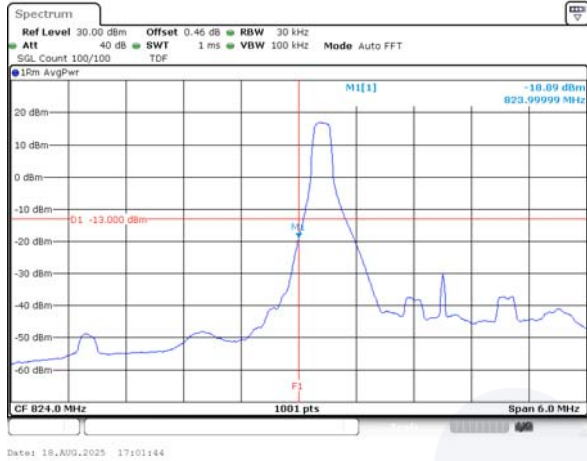


High channel FRB

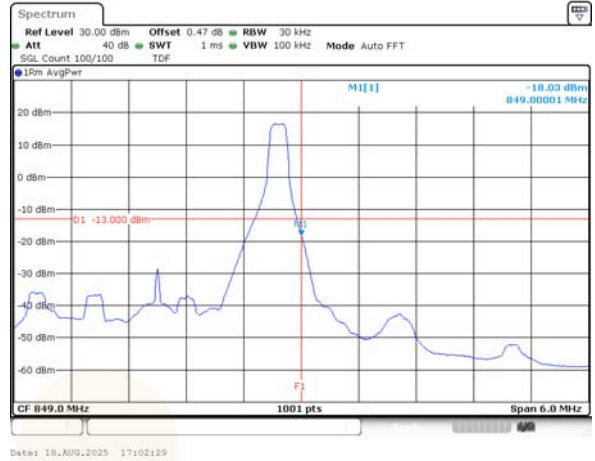


3M BW QPSK

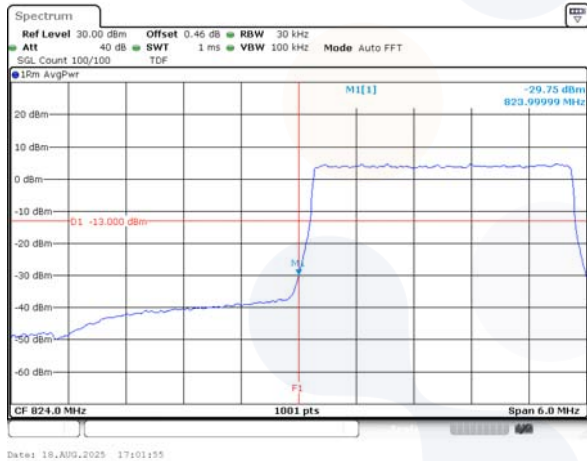
Low channel 1RB



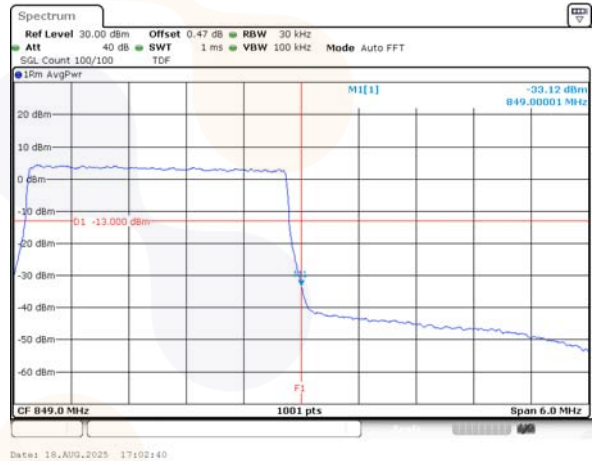
High channel 1RB



Low channel FRB

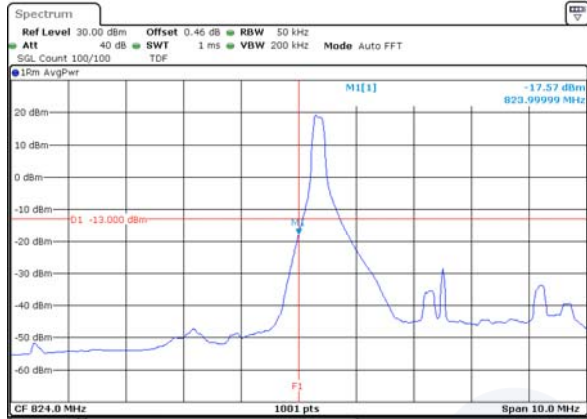


High channel FRB



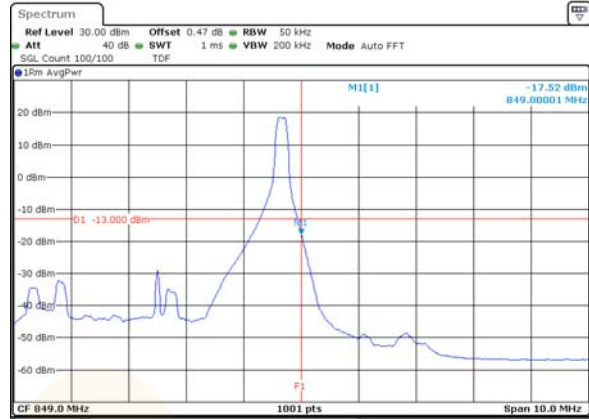
5M BW QPSK

Low channel 1RB



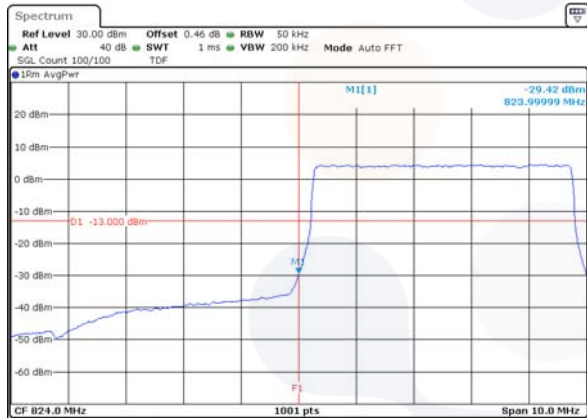
Date: 19.AUG.2025 17:03:24

High channel 1RB



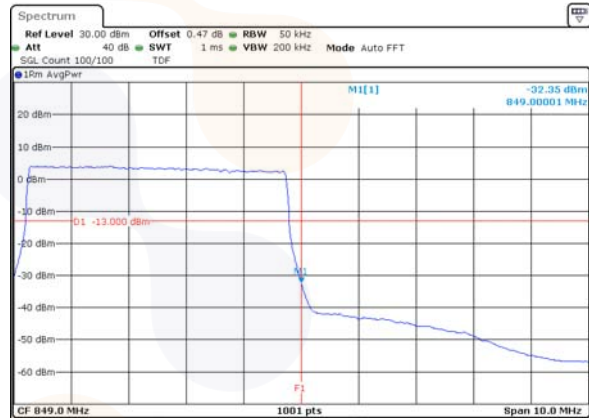
Date: 19.AUG.2025 17:04:11

Low channel FRB



Date: 19.AUG.2025 17:03:35

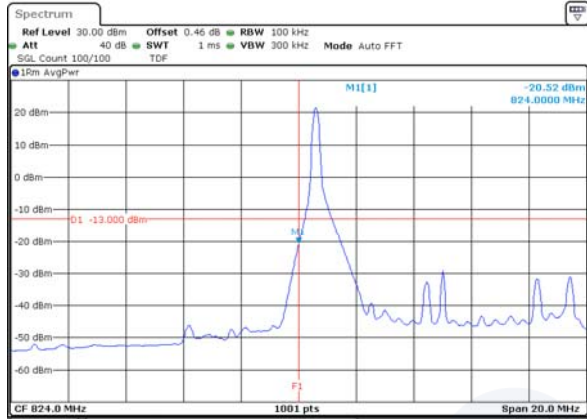
High channel FRB



Date: 19.AUG.2025 17:04:24

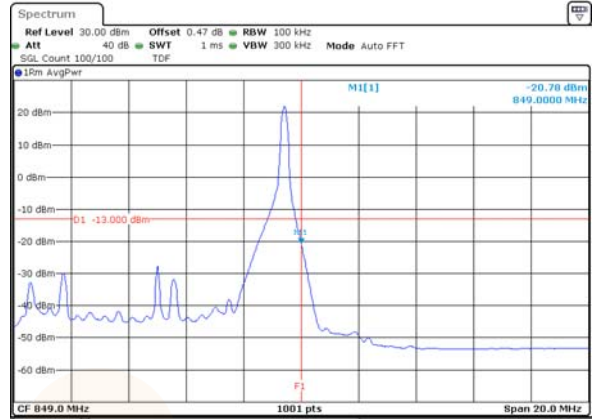
10M BW QPSK

Low channel 1RB



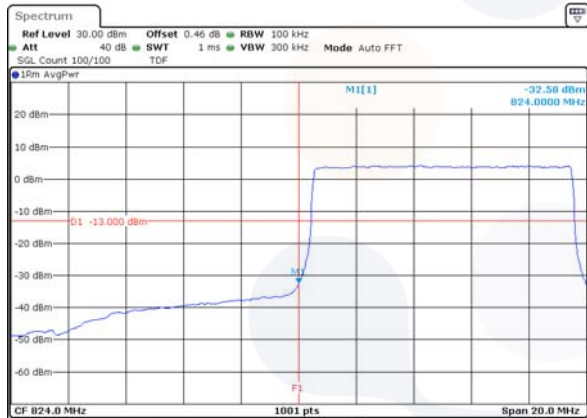
Date: 18.AUG.2025 17:05:03

High channel 1RB



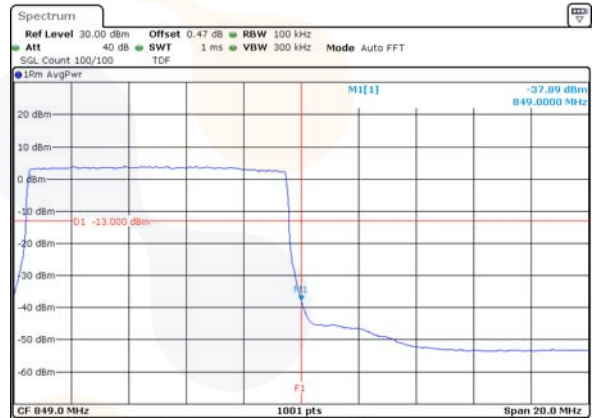
Date: 18.AUG.2025 17:05:53

Low channel FRB



Date: 18.AUG.2025 17:05:15

High channel FRB

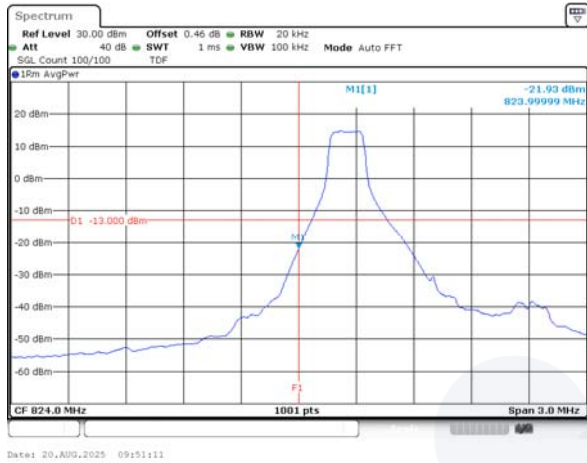


Date: 18.AUG.2025 17:06:05

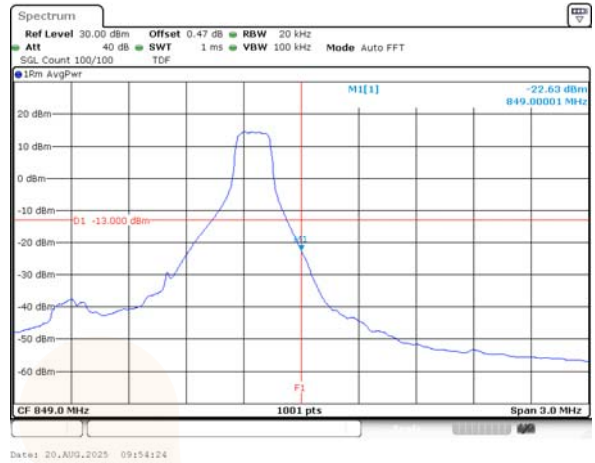
Test mode: LTE B26

1.4M BW QPSK

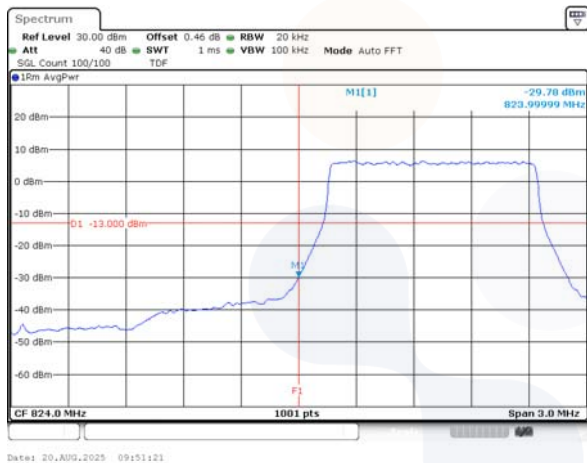
Low channel 1RB



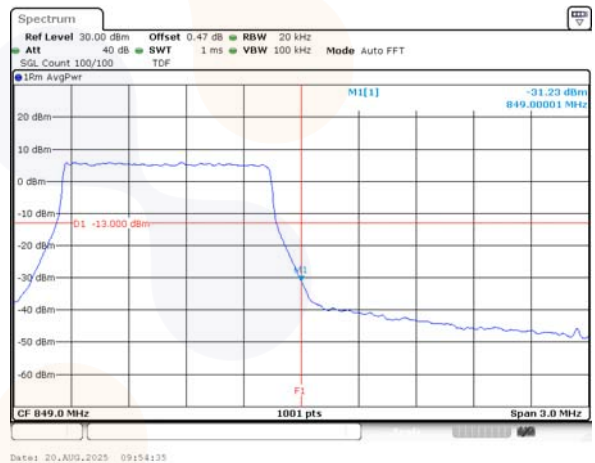
High channel 1RB



Low channel FRB

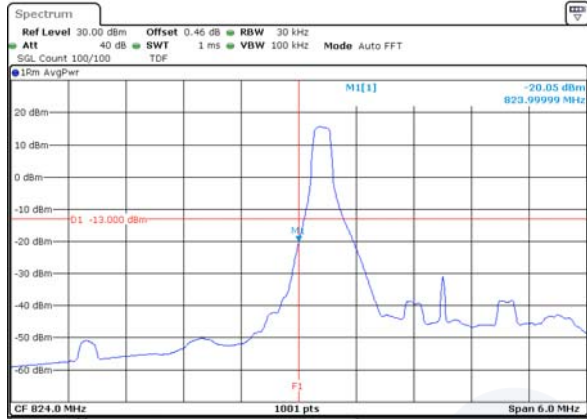


High channel FRB



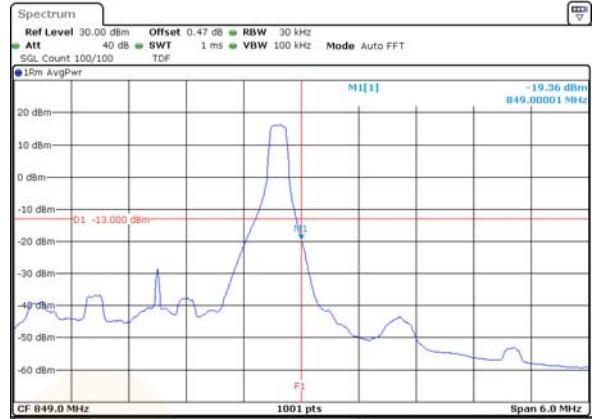
3M BW QPSK

Low channel 1RB



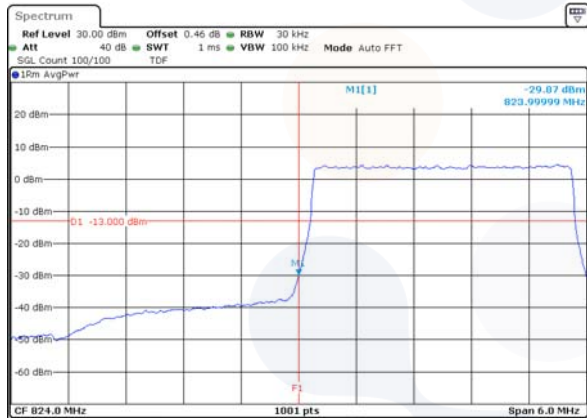
Date: 20, AUG, 2025 09:34:25

High channel 1RB



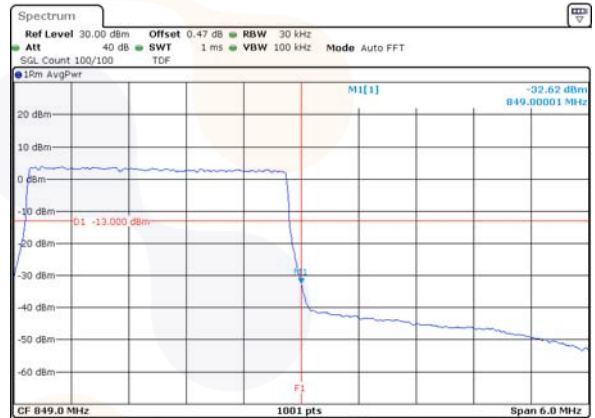
Date: 20, AUG, 2025 09:59:45

Low channel FRB



Date: 20, AUG, 2025 09:56:40

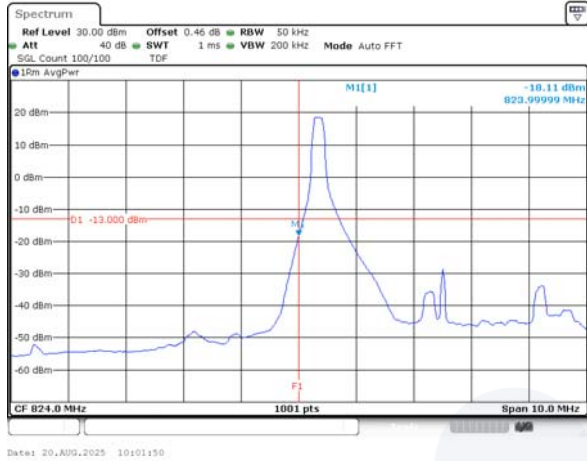
High channel FRB



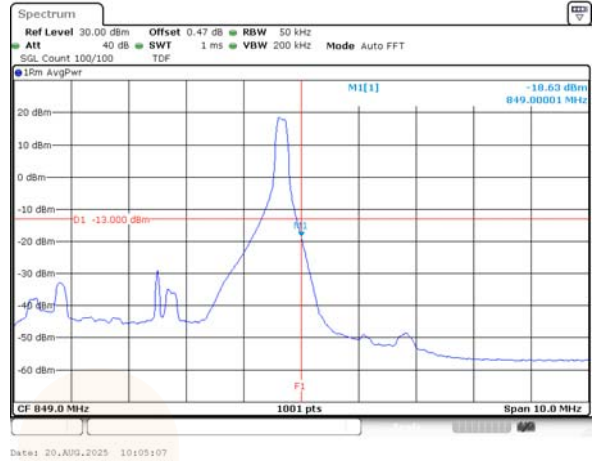
Date: 20, AUG, 2025 09:59:56

5M BW QPSK

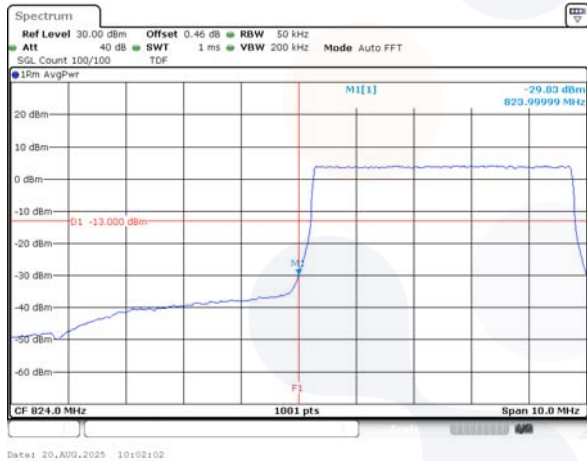
Low channel 1RB



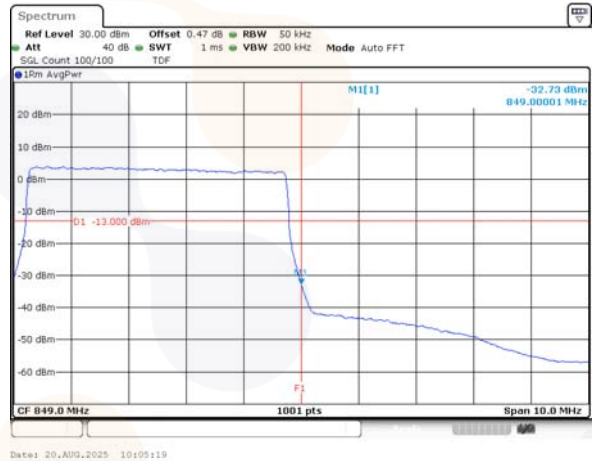
High channel 1RB



Low channel FRB

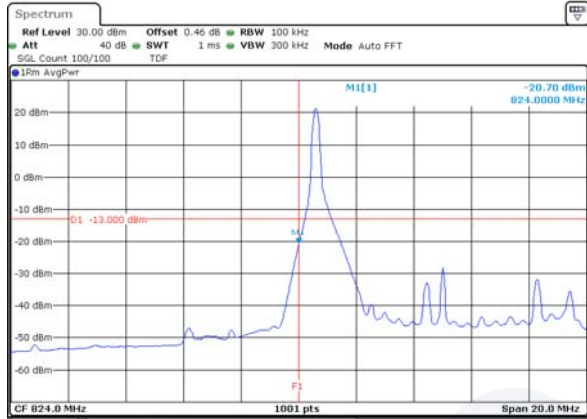


High channel FRB



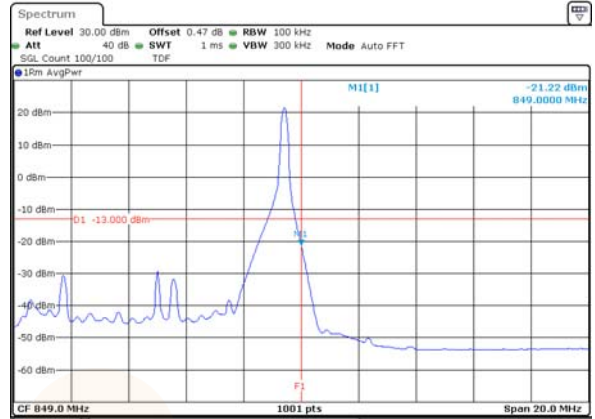
10M BW QPSK

Low channel 1RB



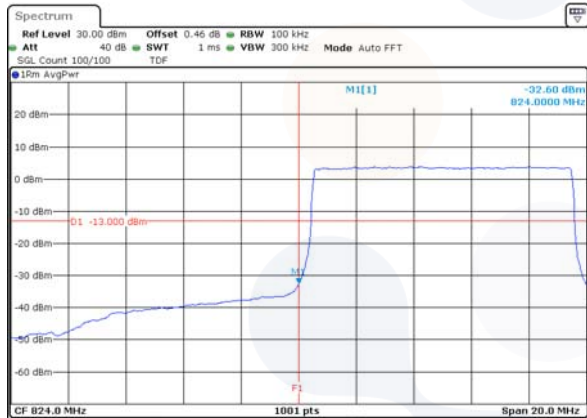
Date: 20, AUG, 2025 10:07:15

High channel 1RB



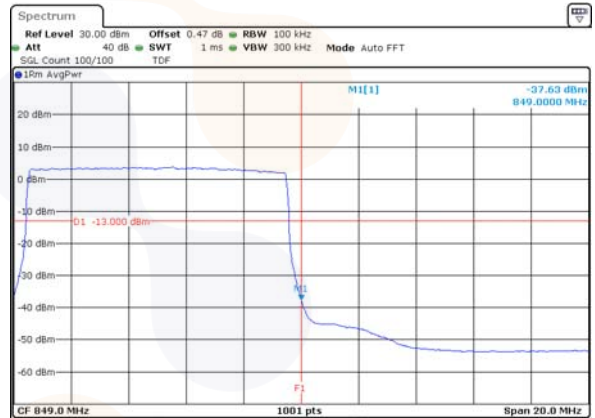
Date: 20, AUG, 2025 10:10:34

Low channel FRB



Date: 20, AUG, 2025 10:07:27

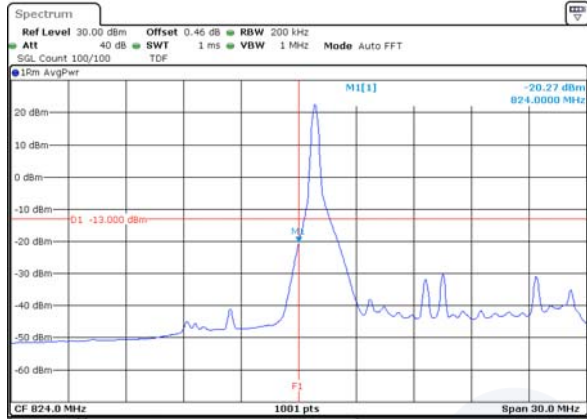
High channel FRB



Date: 20, AUG, 2025 10:10:46

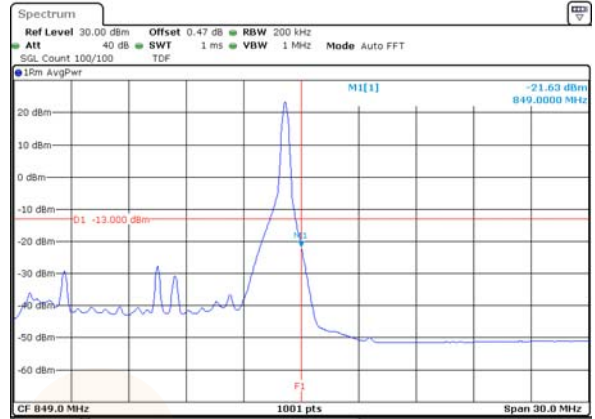
15M BW QPSK

Low channel 1RB



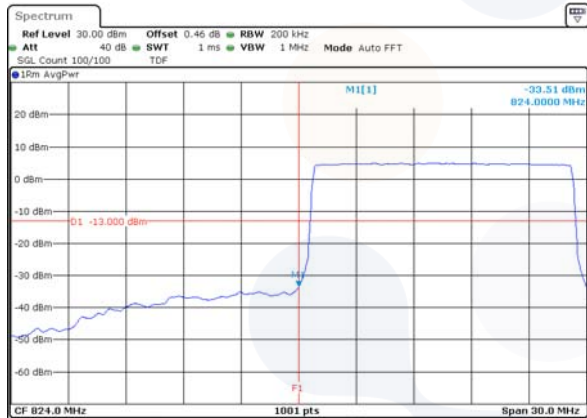
Date: 20,AUG,2025 10:12:49

High channel 1RB



Date: 20,AUG,2025 10:16:13

Low channel FRB



Date: 20,AUG,2025 10:13:02

High channel FRB

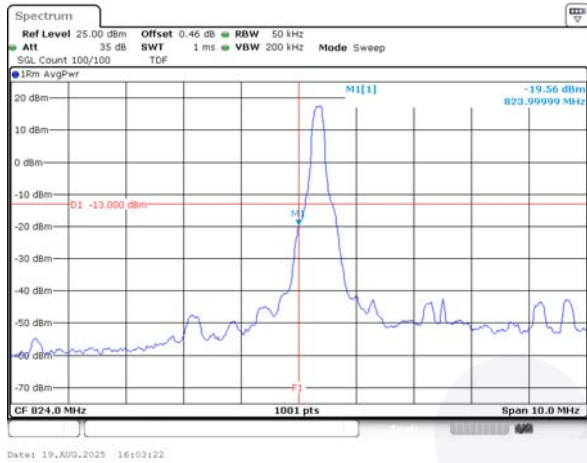


Date: 20,AUG,2025 10:16:26

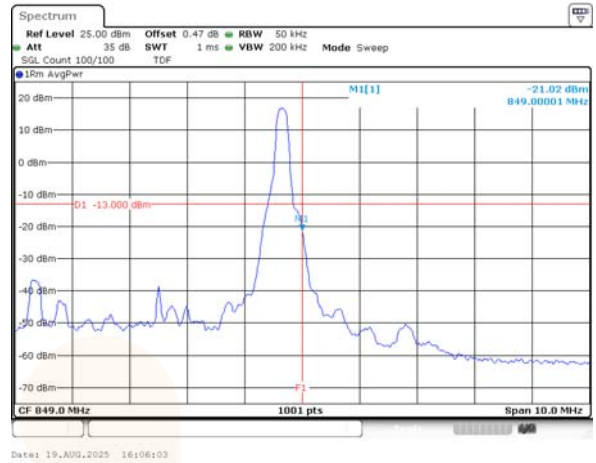
Test mode: 5G NR n5 DFT-s OFDM

5M BW QPSK

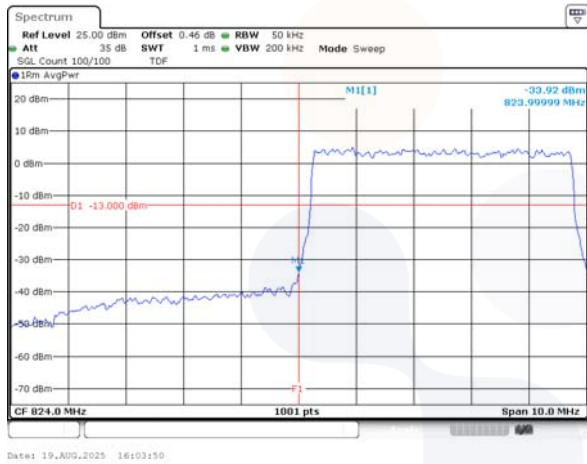
Low channel 1RB



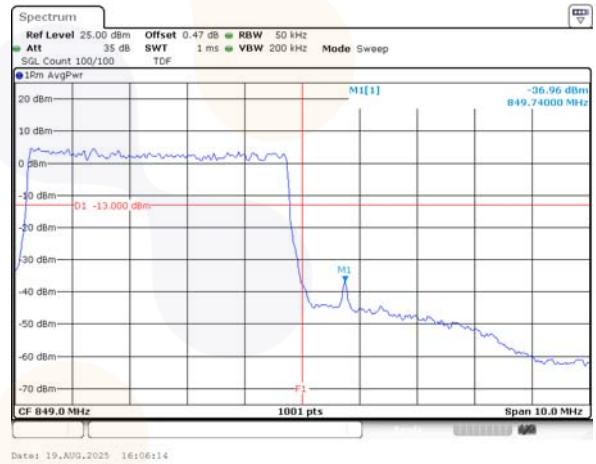
High channel 1RB



Low channel FRB

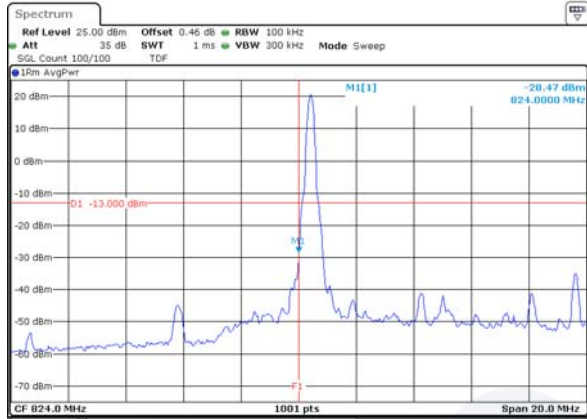


High channel FRB

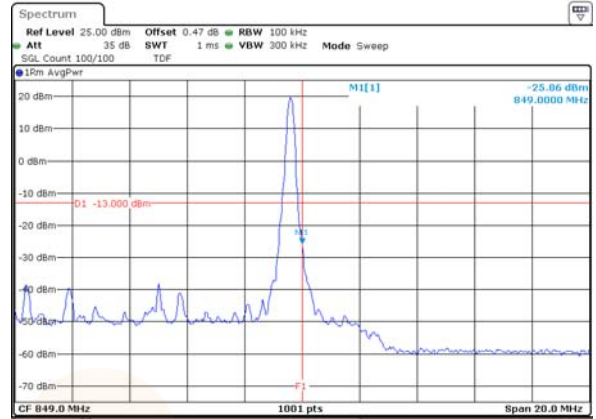


10M BW QPSK

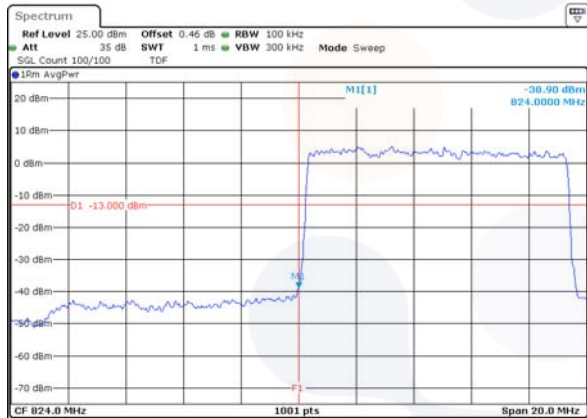
Low channel 1RB



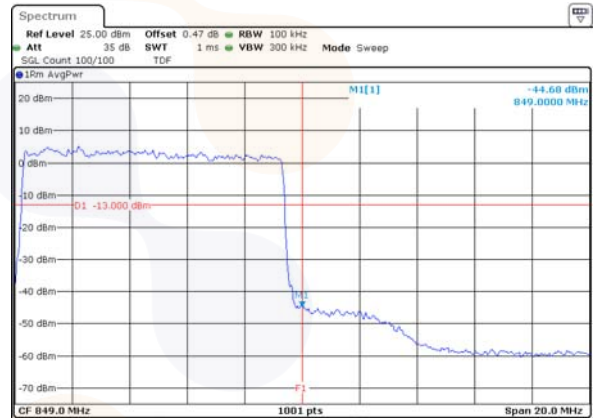
High channel 1RB



Low channel FRB

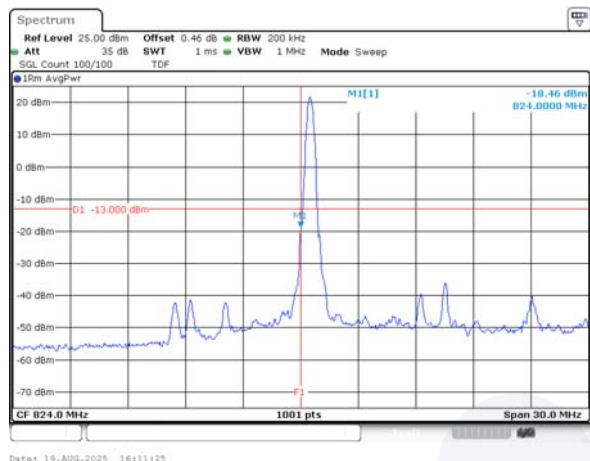


High channel FRB

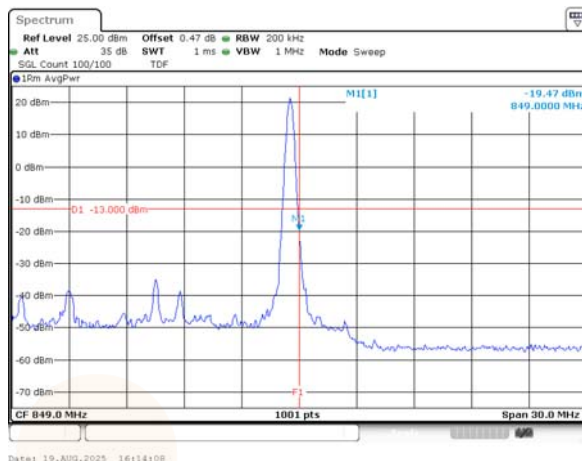


15M BW QPSK

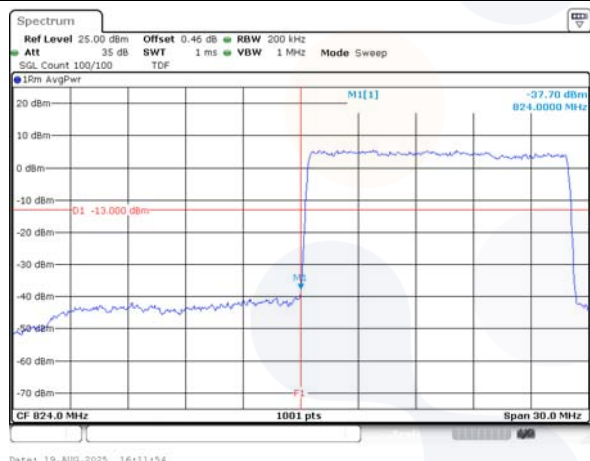
Low channel 1RB



High channel 1RB



Low channel FRB



High channel FRB

