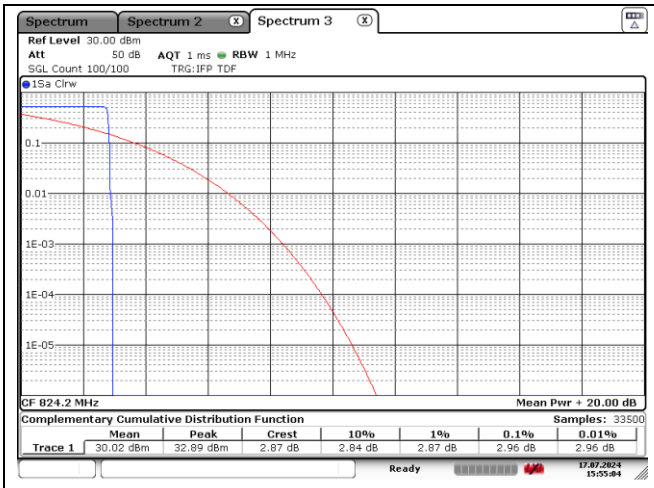
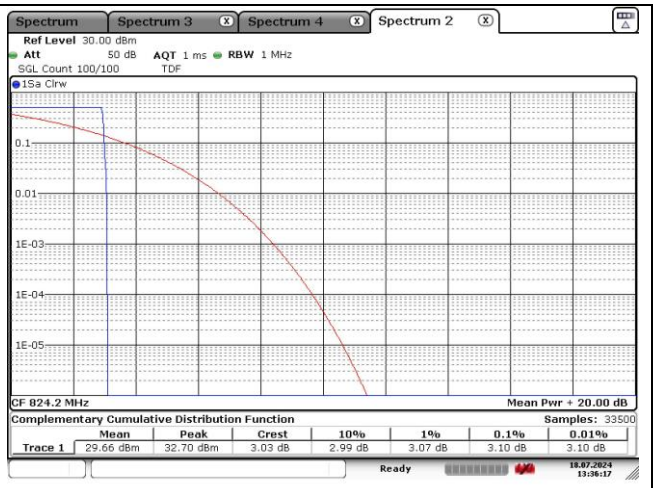
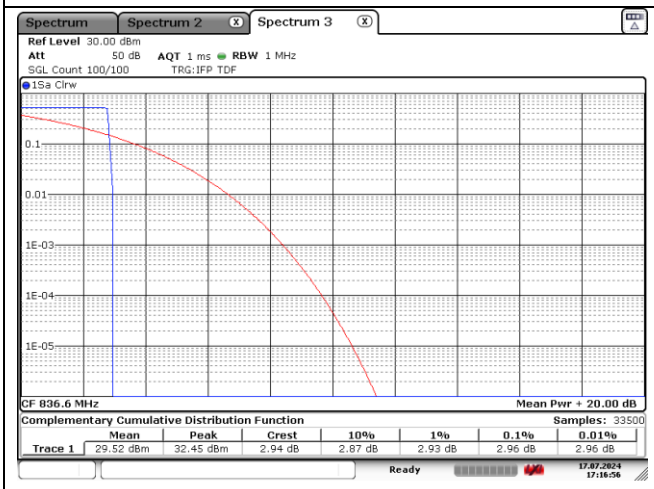
GSM 850



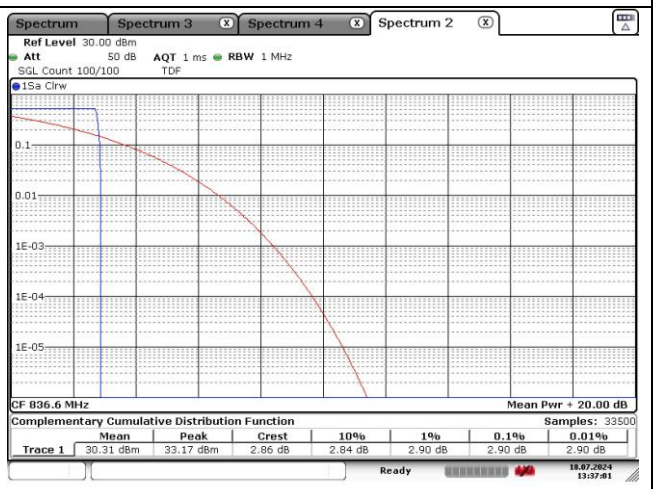
GSM 850 VOICE Low Channel



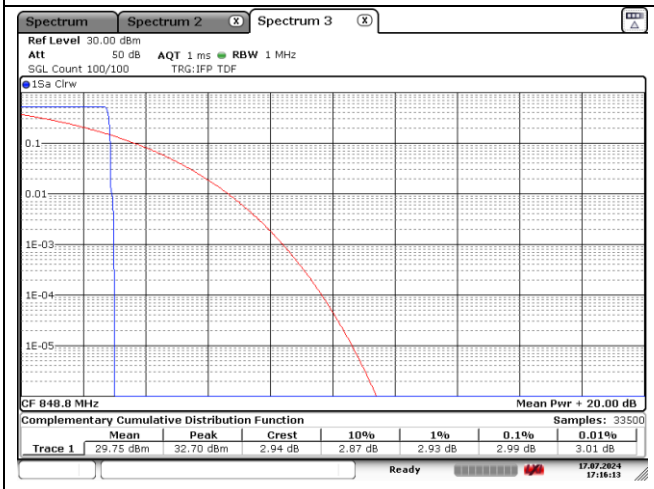
GSM 850 EDGE Low Channel



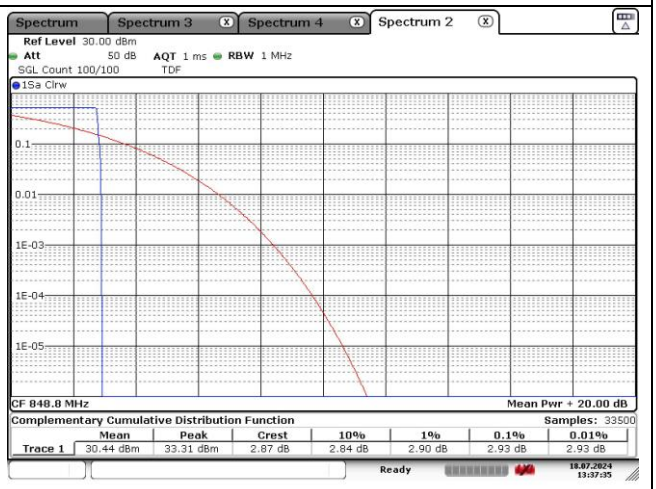
GSM 850 VOICE Middle Channel



GSM 850 EDGE Middle Channel

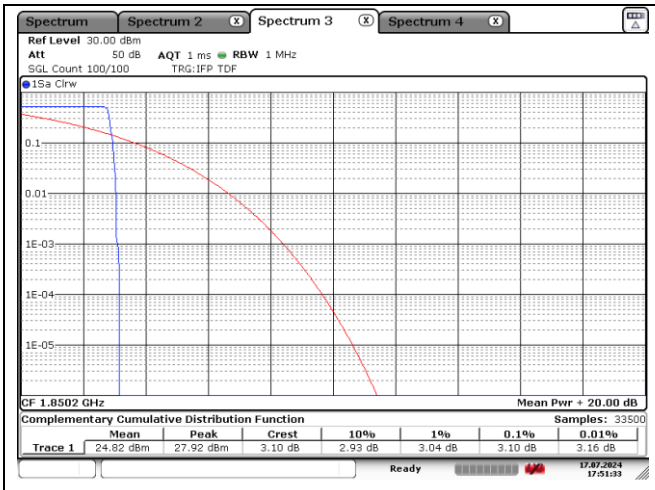


GSM 850 VOICE High Channel

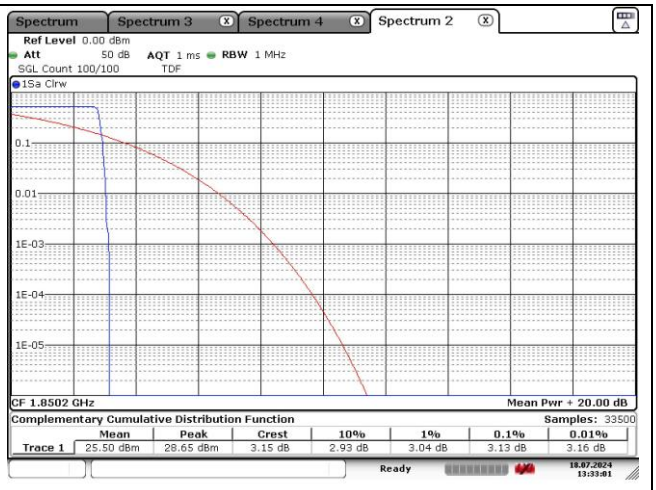


GSM 850 EDGE High Channel

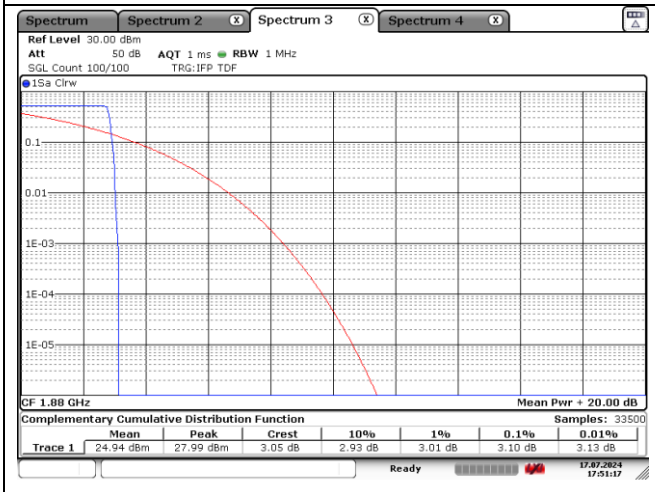
GSM 1900



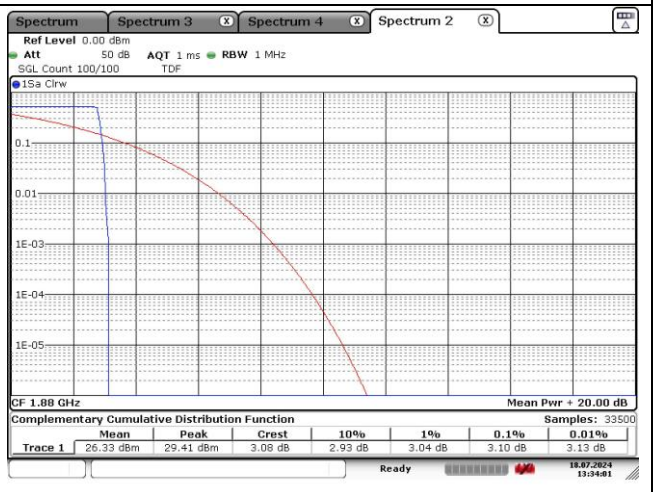
GSM 1900 VOICE Low Channel



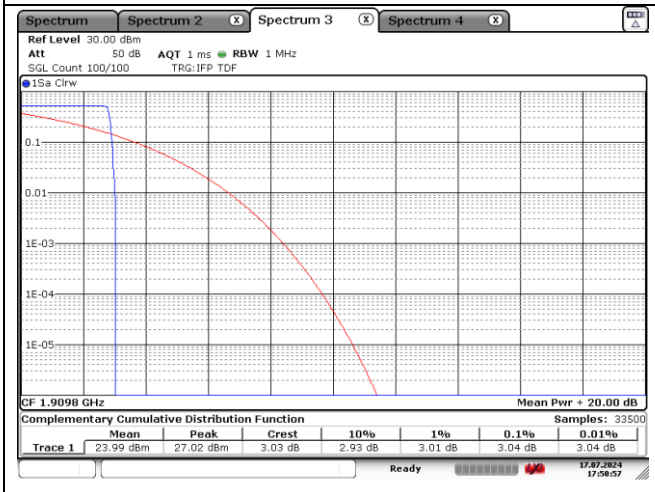
GSM 1900 EDGE Low Channel



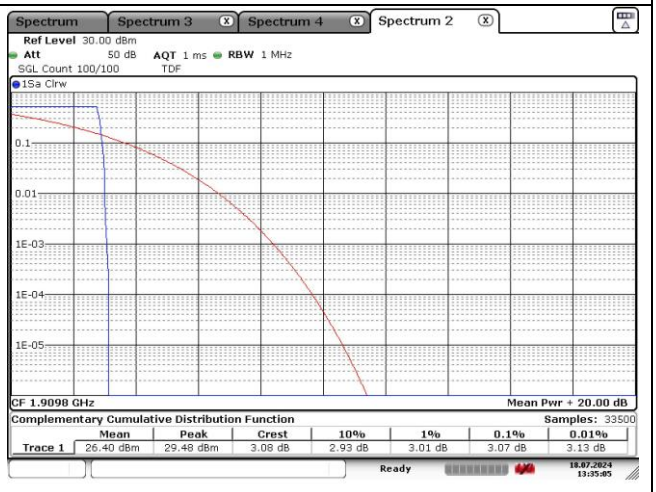
GSM 1900 VOICE Middle Channel



GSM 1900 EDGE Middle Channel



GSM 1900 VOICE High Channel



GSM 1900 EDGE High Channel

6. Spurious Emissions at Antenna Terminal

6.1. Limit

- §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 + 10log(P) ㏈.

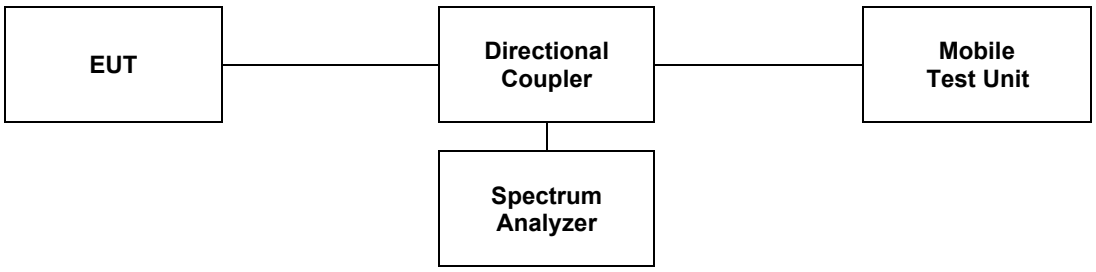
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §27.53(h)(1), for operations in the 1 695-1 710 ㎒, 1 710-1 755 ㎒, 1 755-1 780 ㎒, 1 915-1 920 ㎒, 1 995-2 000 ㎒, 2 000-2 020 ㎒, 2 110-2 155 ㎒, 2 155-2 180 ㎒, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) ㏈.

6.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

1. Start frequency was set to 9 ㎑ and stop frequency was set to at least 10* the fundamental frequency.
2. Detector = RMS.
3. Trace mode = Max hold.
4. Sweep time = Auto couple.
5. The trace was allowed to stabilize.
6. Please see notes below for RBW and VBW settings.
7. For plots showing conducted spurious emissions from 9 ㎑ to 20 ㎓, all path loss of wide frequency range was investigated and compensated to spectrum analyzer as TDF function.



Note;

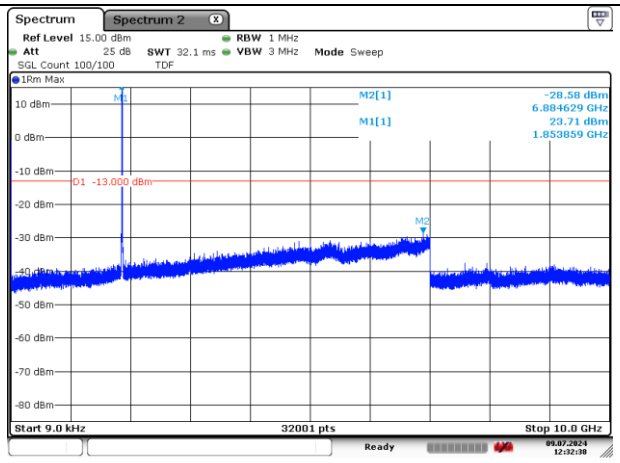
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 ㎑ or greater for frequencies less than 1 ㎓ and frequencies greater than 1 ㎓. However, in the 1 ㎒ bands immediately outside and adjacent to the frequency block a resolution 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 point, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 ㏈ below the transmitter power.

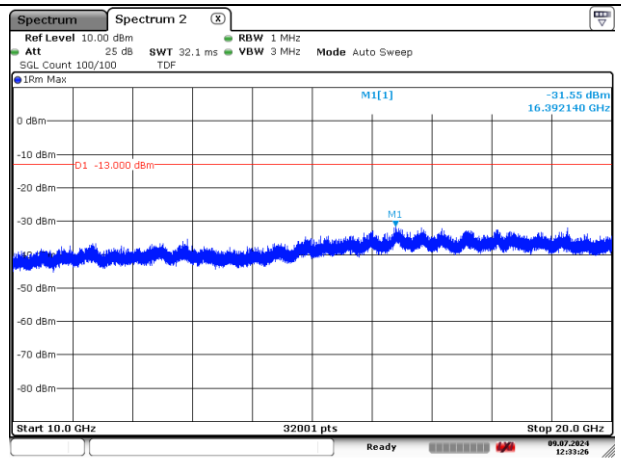
6.3. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

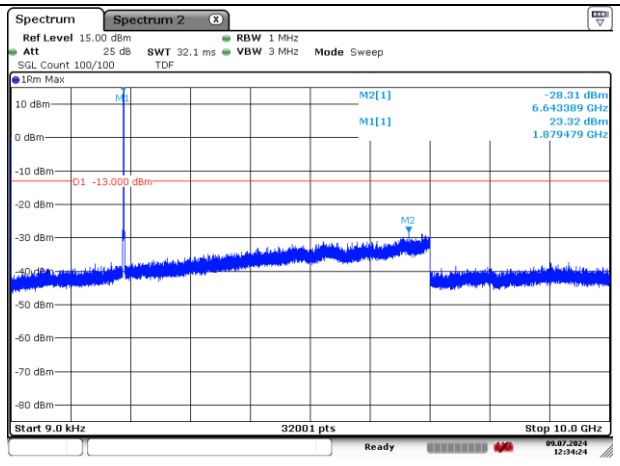
- Test plots

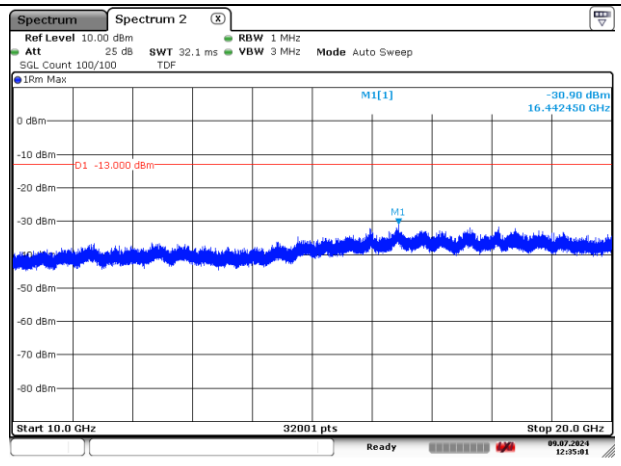
WCDMA Ⅱ



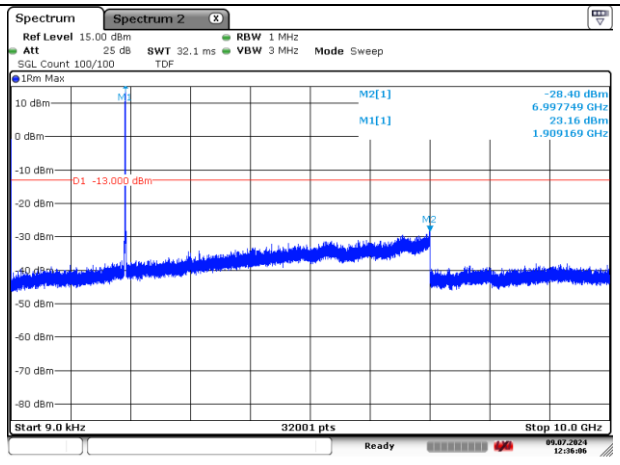


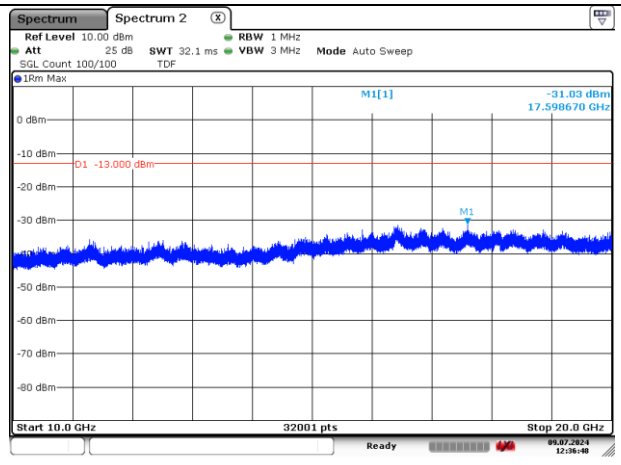
WCDMA Ⅱ RMC Low Channel





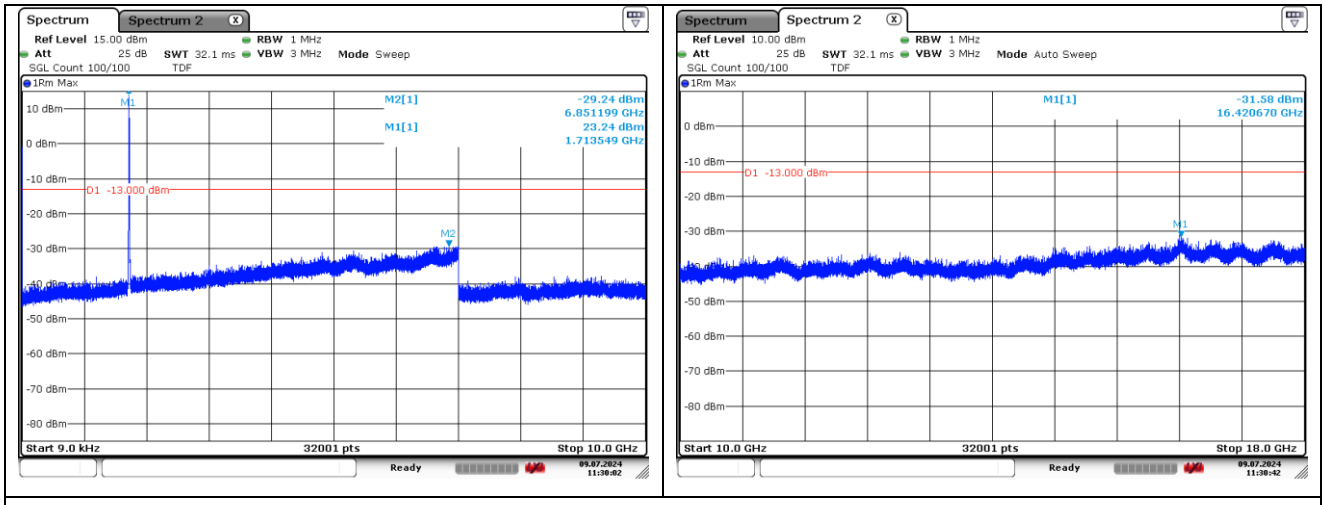
WCDMA Ⅱ RMC Middle Channel



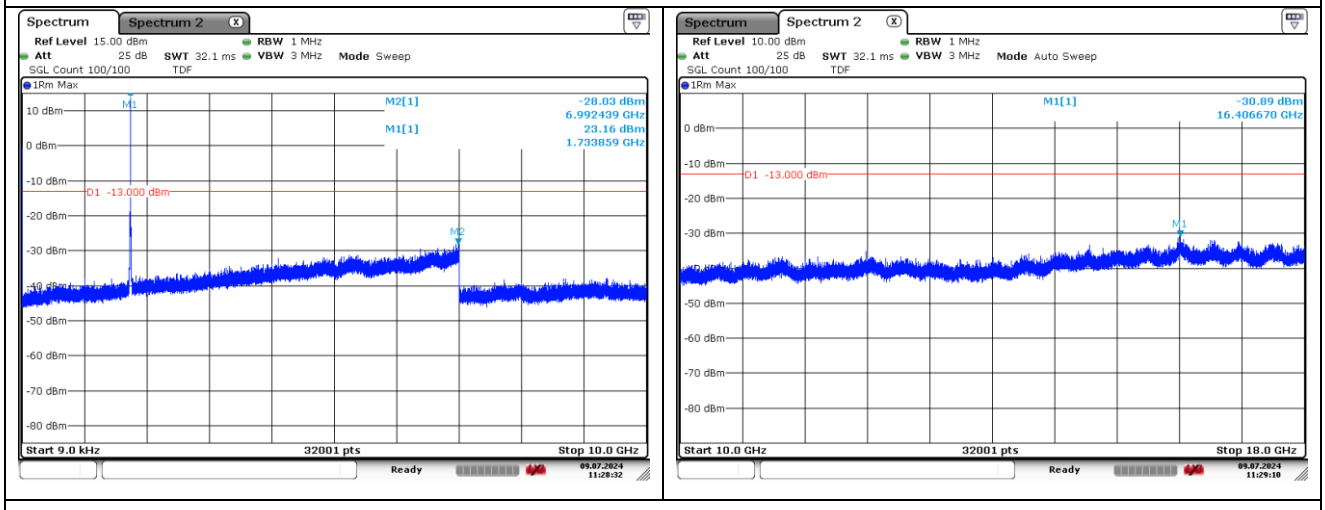


WCDMA Ⅱ RMC High Channel

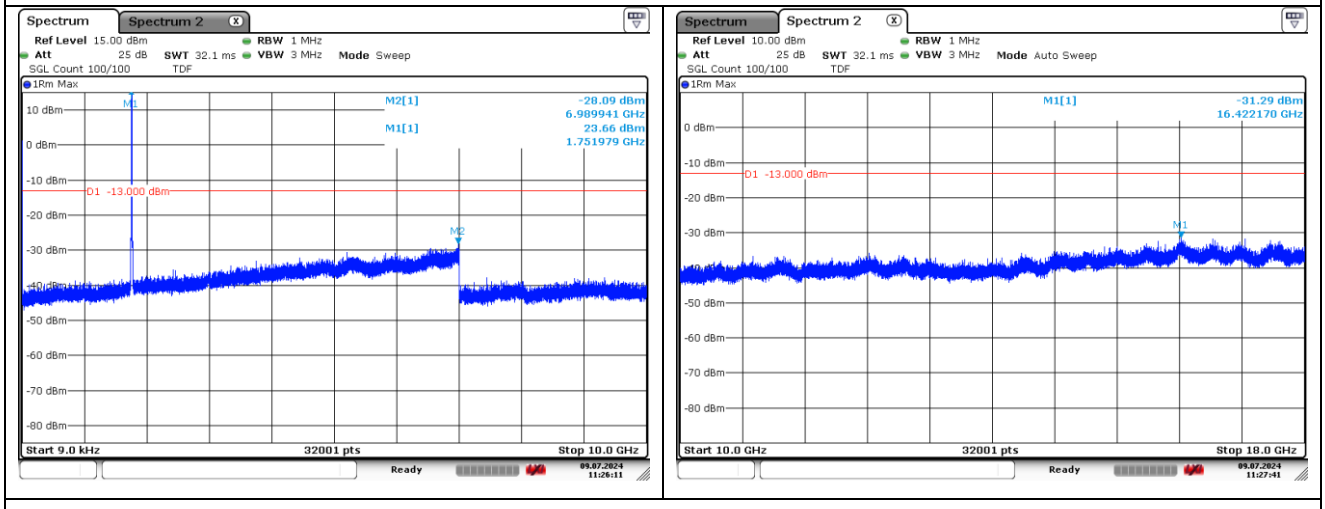
WCDMA Ⅳ



WCDMA Ⅳ RMC Low Channel

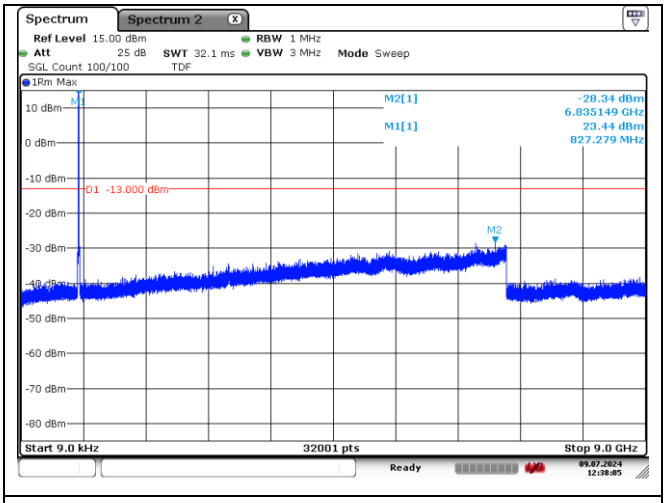


WCDMA Ⅳ RMC Middle Channel

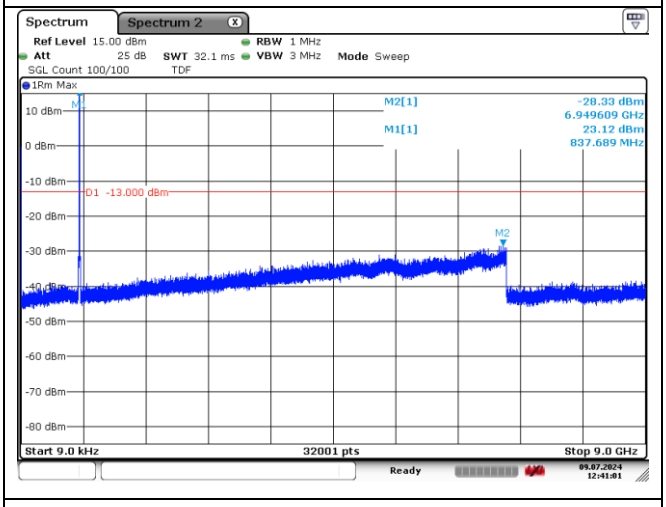


WCDMA Ⅳ RMC High Channel

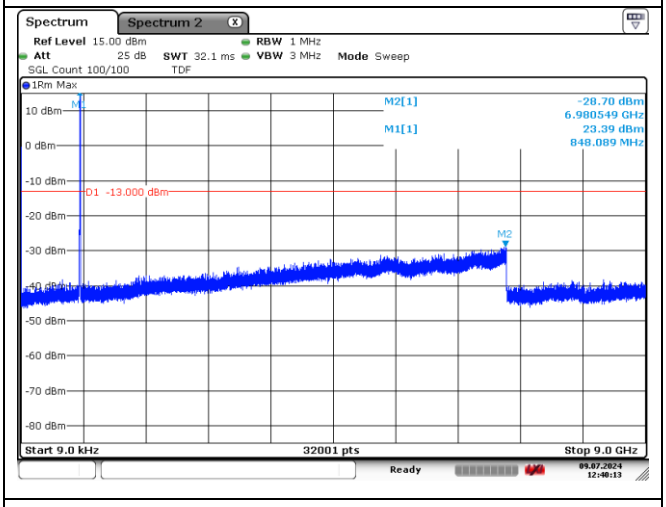
WCDMA Ⅴ



WCDMA Ⅴ RMC Low channel

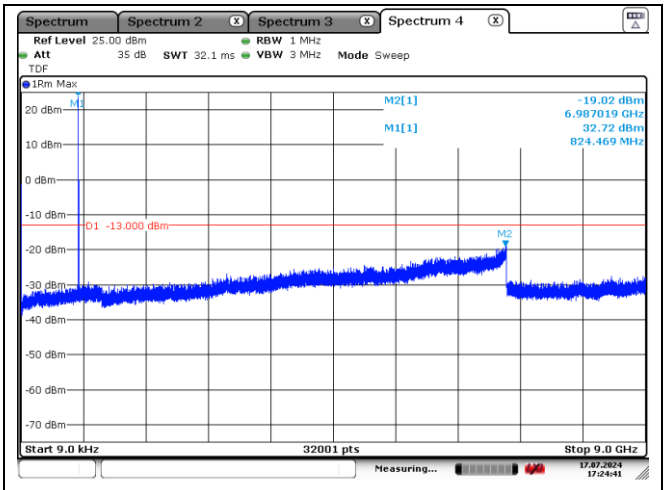


WCDMA Ⅴ RMC Middle channel

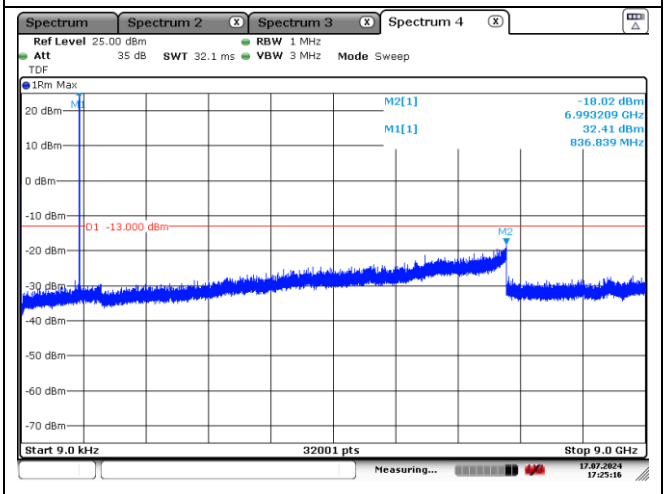


WCDMA Ⅴ RMC High channel

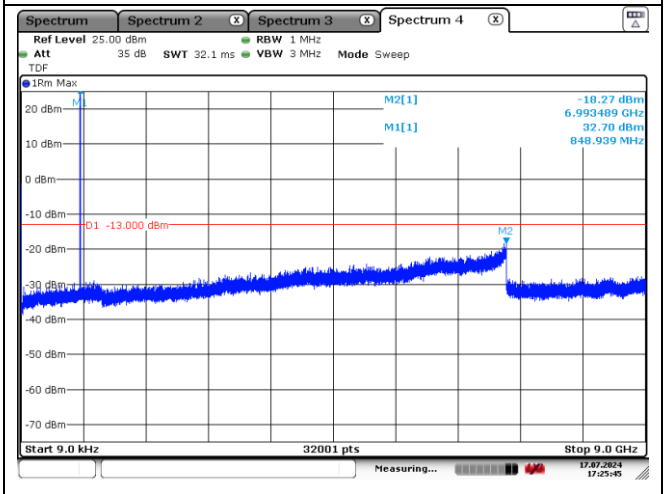
GSM 850



GSM 850 VOICE Low Channel

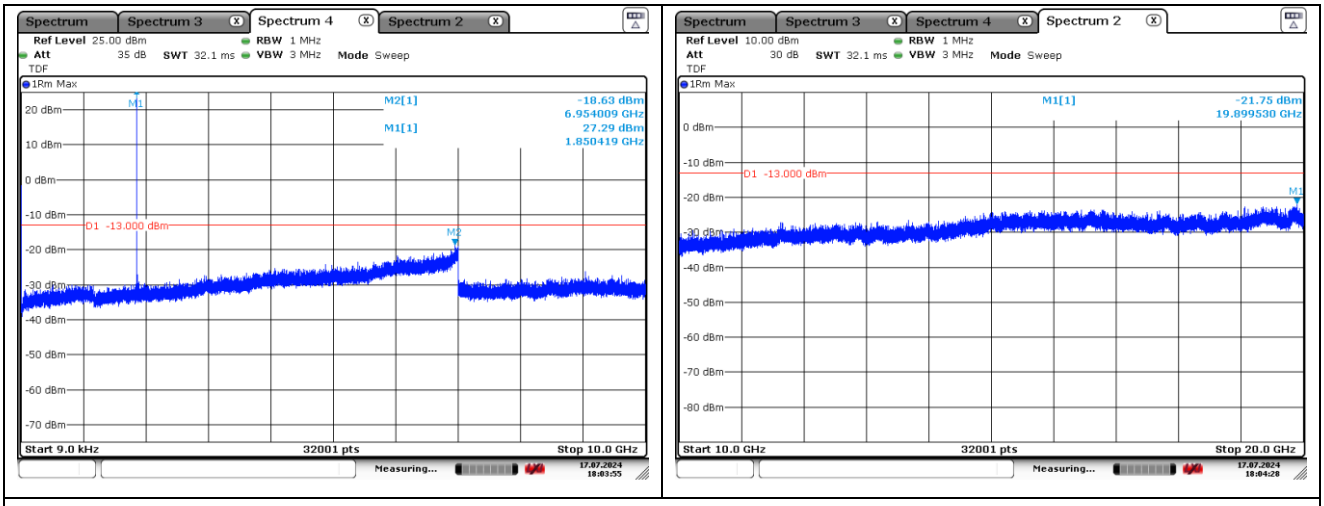


GSM 850 VOICE Middle Channel

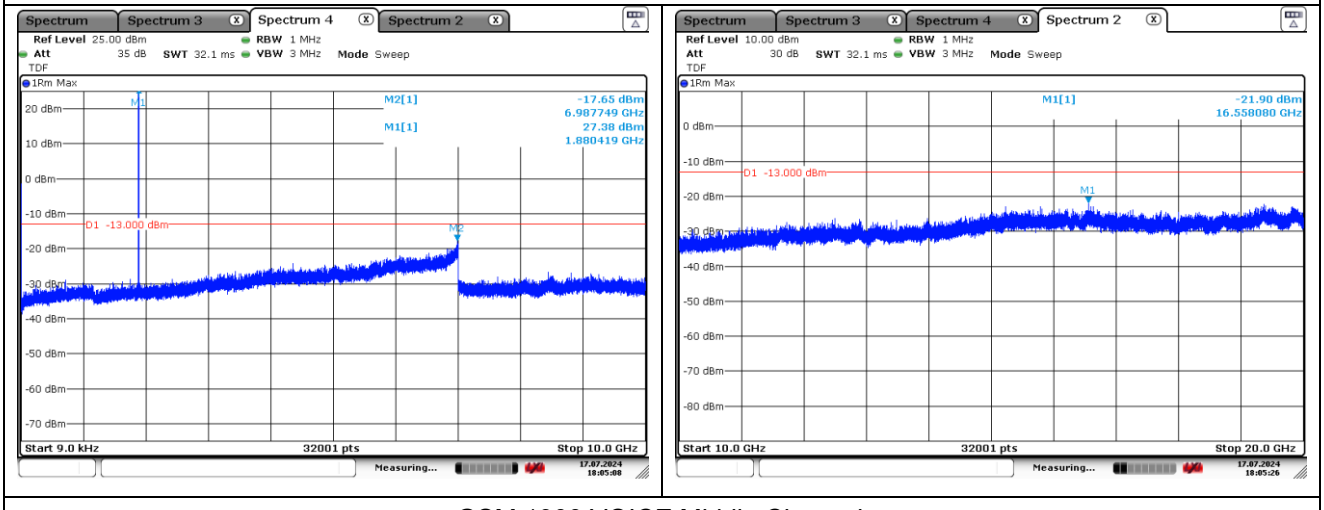


GSM 850 VOICE High Channel

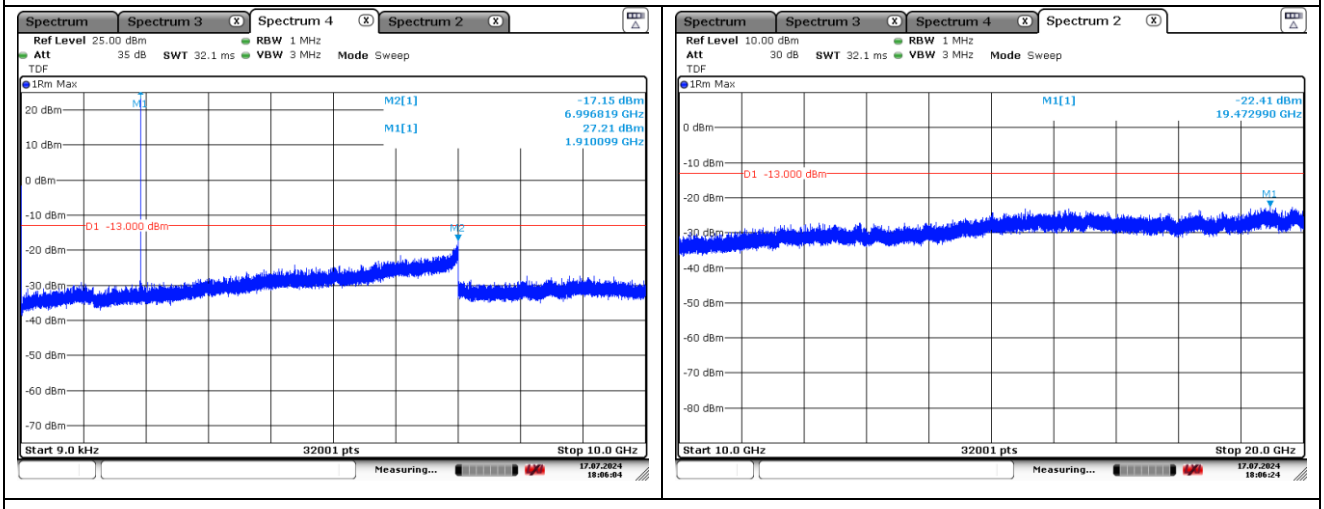
GSM 1900



GSM 1900 VOICE Low Channel



GSM 1900 VOICE Middle Channel



GSM 1900 VOICE High Channel

7. Band Edge

7.1. Limit

- §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 + 10log(P) ㏈.

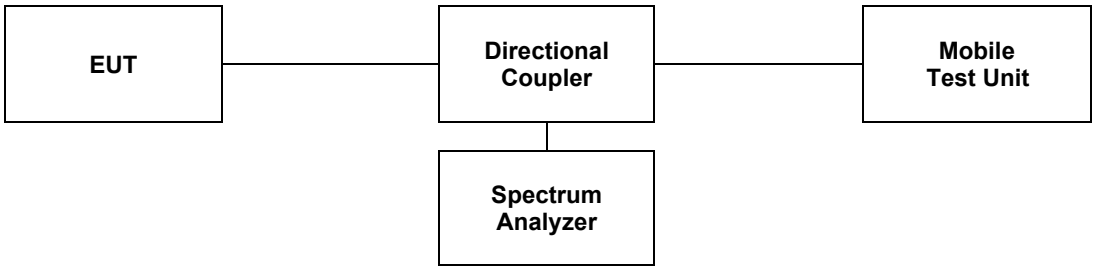
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §27.53(h)(1), for operations in the 1 695-1 710 ㎒, 1 710-1 755 ㎒, 1 755-1 780 ㎒, 1 915-1 920 ㎒, 1 995-2 000 ㎒, 2 000-2 020 ㎒, 2 110-2 155 ㎒, 2 155-2 180 ㎒, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) ㏈.

7.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

a. Span was set large enough so as to capture all out of band emissions near the band edge.
b. RBW ≥ 1 % of OBW
c. VBW ≥ 3 x RBW.
d. Detector = RMS.
e. Trace mode = Average.
f. Sweep time = Auto.
g. The trace was allowed to stabilize.
h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.

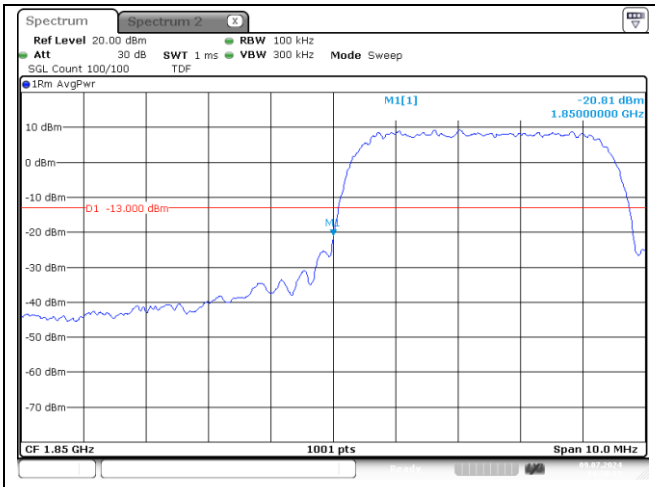


7.3. Test Results

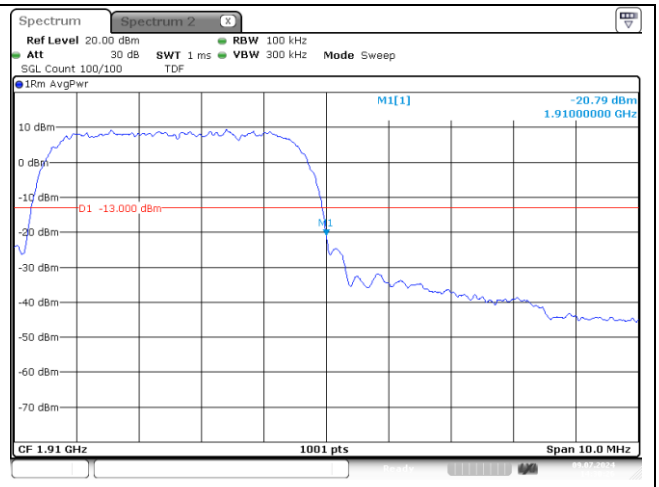
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

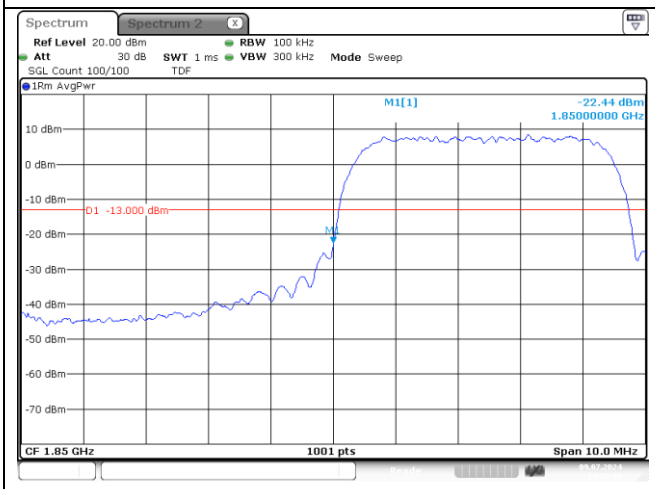
WCDMA Ⅱ



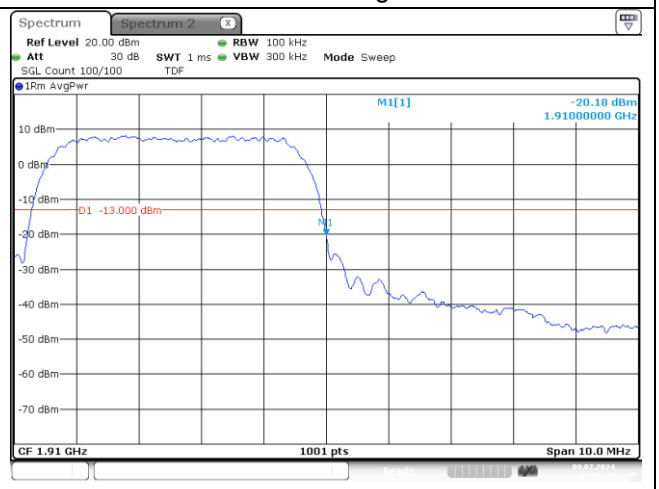
WCDMA Ⅱ RMC Low Channel



WCDMA Ⅱ RMC High Channel

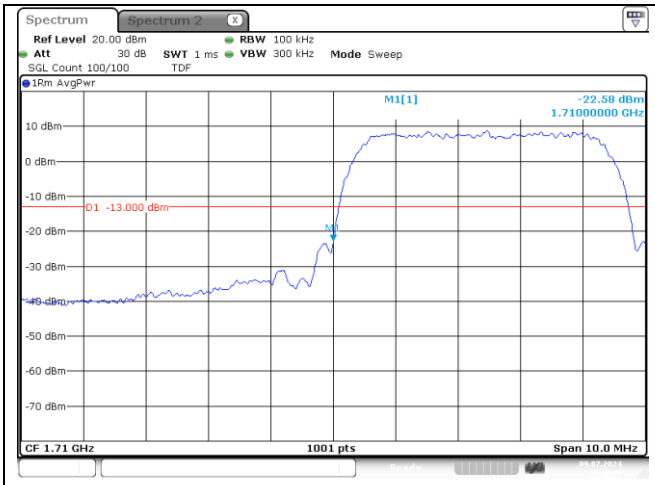


WCDMA Ⅱ HSDPA Low Channel

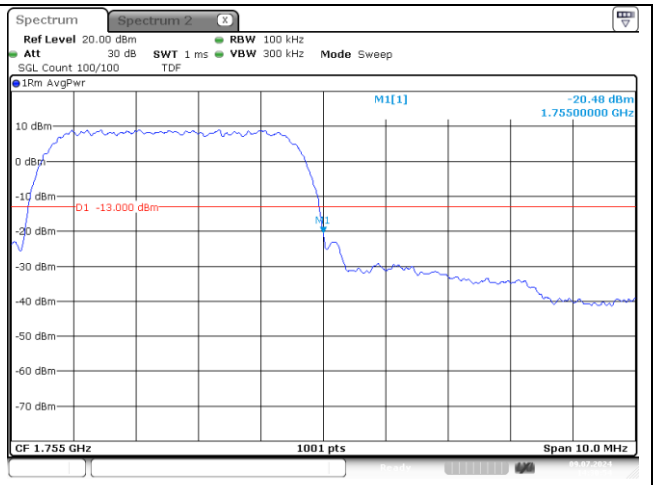


WCDMA Ⅱ HSDPA High Channel

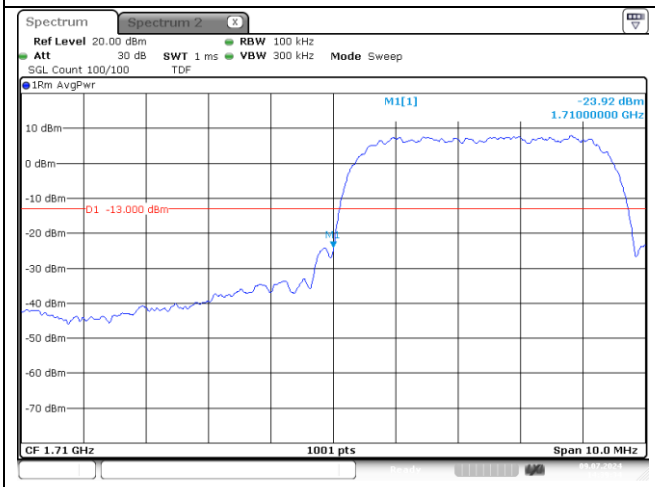
WCDMA Ⅳ



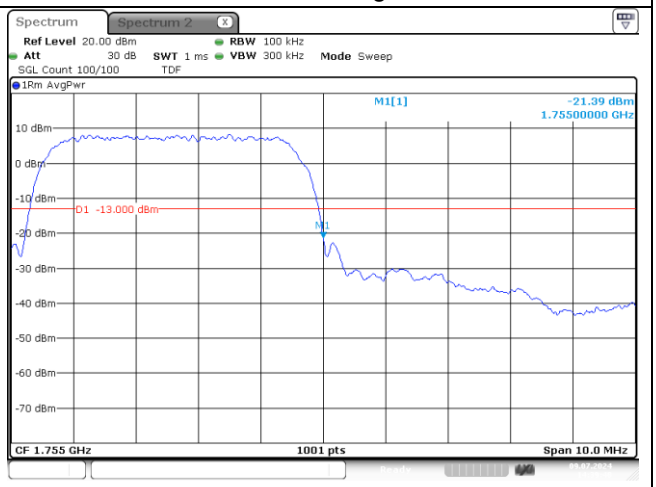
WCDMA Ⅳ RMC Low Channel



WCDMA Ⅳ RMC High Channel

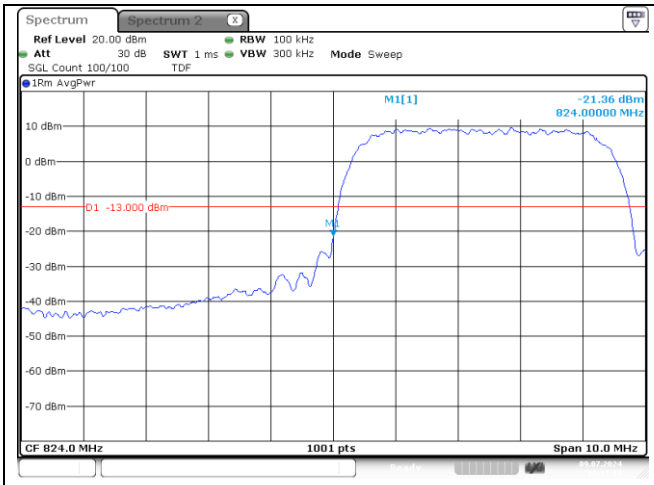


WCDMA Ⅳ HSDPA Low Channel

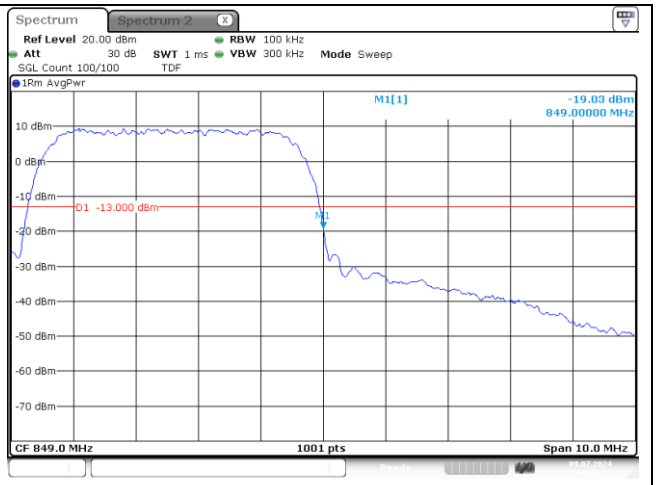


WCDMA Ⅳ HSDPA High Channel

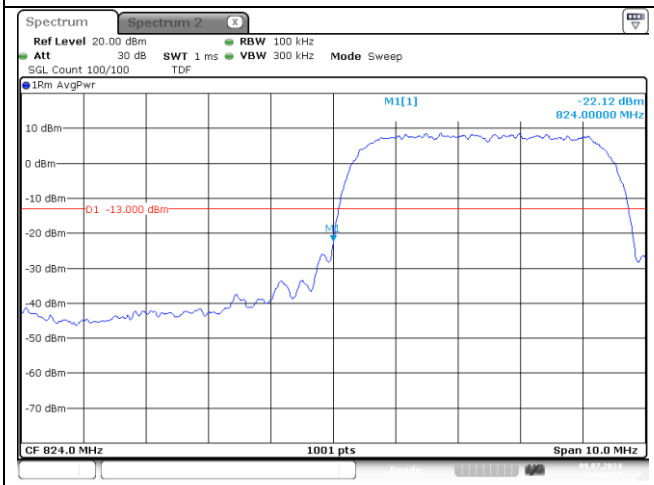
WCDMA Ⅴ



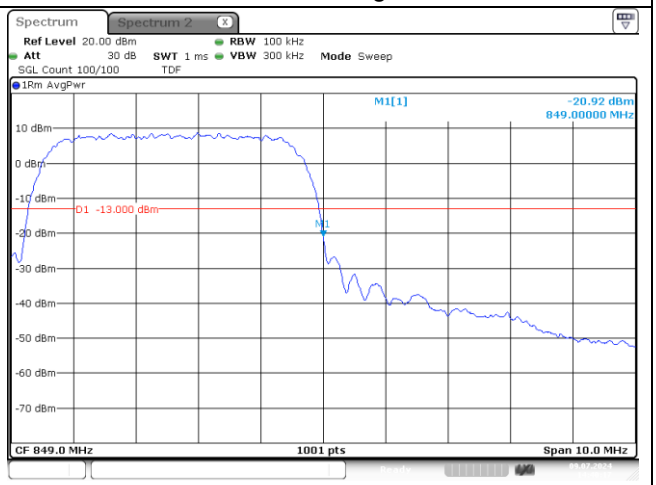
WCDMA Ⅴ RMC Low Channel



WCDMA Ⅴ RMC High Channel

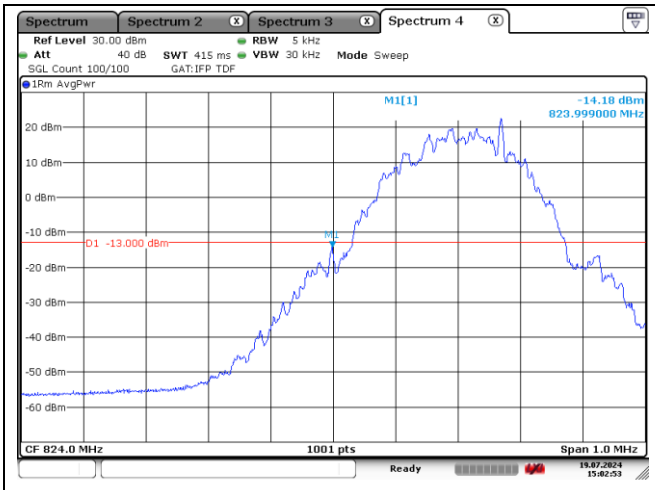


WCDMA Ⅴ HSDPA Low Channel

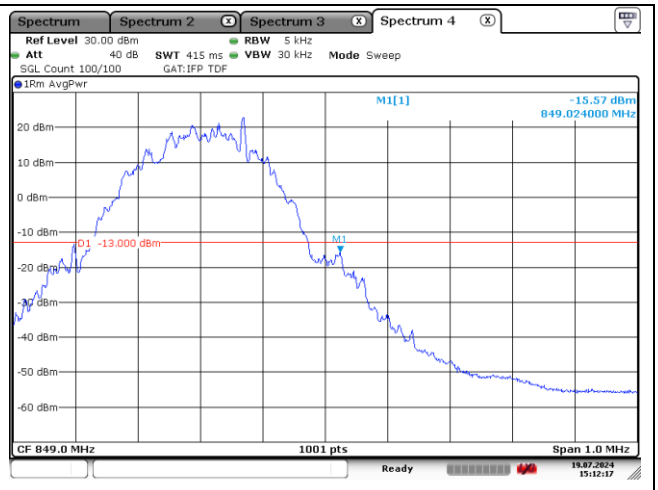


WCDMA Ⅴ HSDPA High Channel

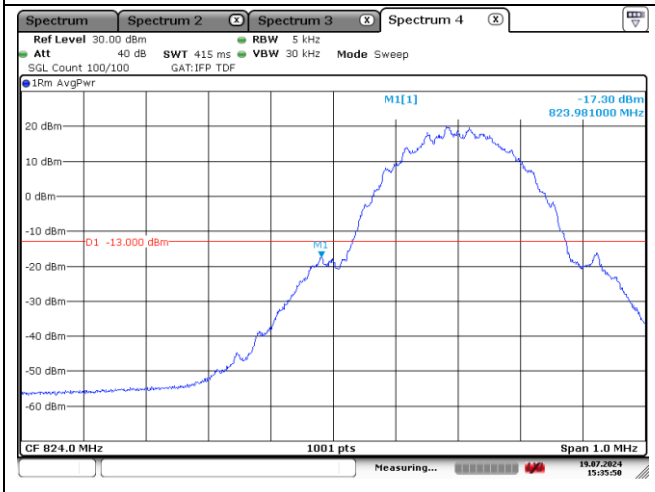
GSM 850



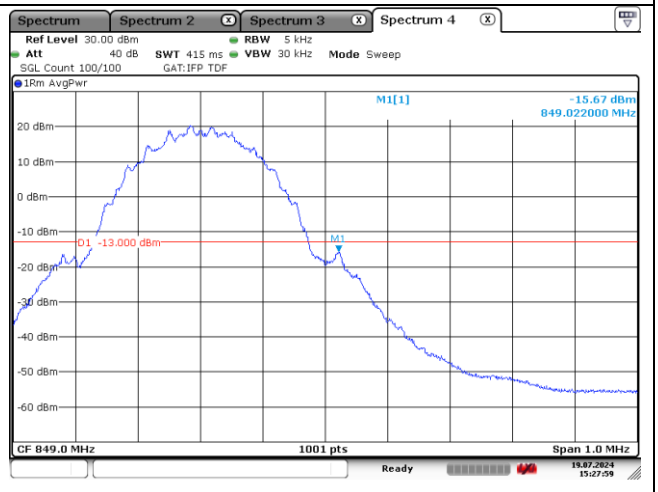
GSM 850 VOICE Low Channel



GSM 850 VOICE High Channel

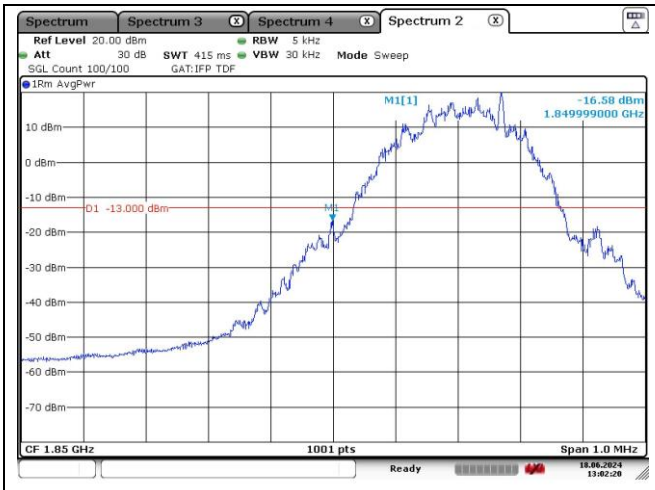


GSM 850 EDGE Low Channel

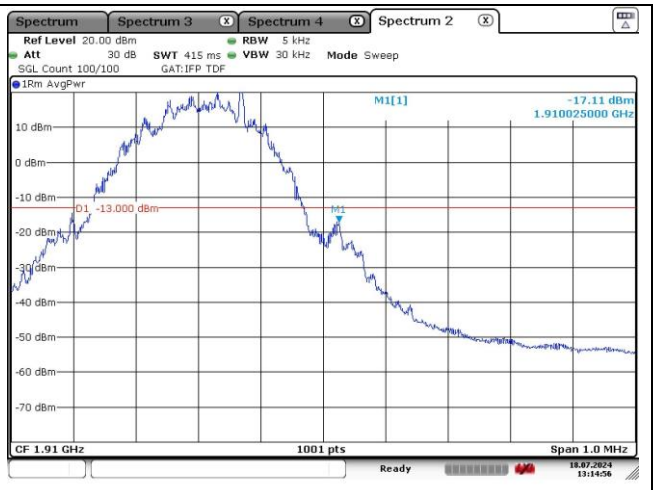


GSM 850 EDGE High Channel

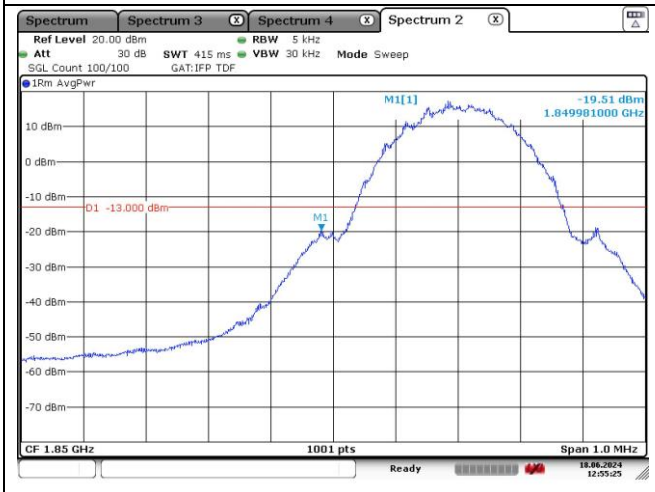
GSM 1900



GSM 1900 VOICE Low Channel



GSM 1900 VOICE High Channel



GSM 1900 EDGE Low Channel

GSM 1900 EDGE High Channel

8. Frequency Stability

8.1. Limit

- § 2.1055 (a), § 2.1055 (d) & following:

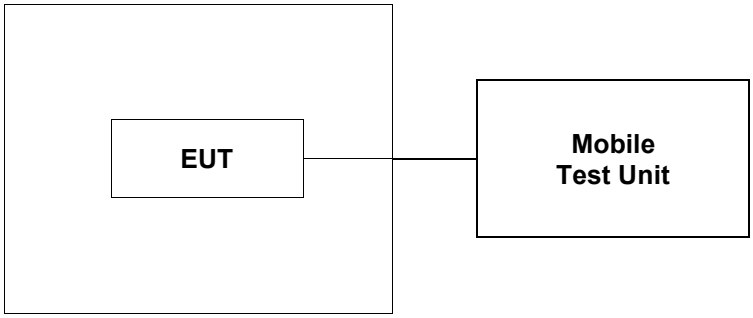
- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.
For Mobile devices operating in the 824 to 849 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

- §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

- §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

8.2. Test Procedure

1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Mobile Test Unit via feed-through attenuators.
2. The EUT was placed inside the temperature chamber.
3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from Mobile Test Unit.



8.3. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

WCDMA Ⅱ mode at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	4.10	-3.20	-0.002 34
40		2.80	0.000 85
30		-1.80	-0.001 60
20(Ref.)		1.20	-
10		2.60	0.000 74
0		2.30	0.000 59
-10		1.80	0.000 32
-20		3.50	0.001 22
-30		3.60	0.001 28
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.49 (85%)	1.90	0.000 37
	4.72 (115%)	0.90	-0.000 16

WCDMA Ⅳ mode at middle channel

Reference Frequency: 1 732.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	4.10	3.40	0.001 44
40		2.10	0.000 69
30		1.90	0.000 58
20(Ref.)		0.90	-
10		-0.60	-0.000 87
0		1.10	0.00012
-10		0.60	-0.000 17
-20		2.40	0.000 87
-30		-2.80	-0.002 14
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.49 (85%)	0.60	-0.000 17
	4.72 (115%)	1.10	0.000 12

WCDMA Ⅴ mode at middle channel

Reference Frequency: 836.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	4.10	2.50	0.006 34
40		3.70	0.007 77
30		-2.90	-0.000 12
20(Ref.)		-2.80	-
10		3.30	0.007 29
0		-1.60	0.001 43
-10		1.60	0.005 26
-20		2.60	0.006 45
-30		-2.90	-0.000 12
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.49 (85%)	2.30	0.006 10
	4.72 (115%)	0.60	0.004 06

GSM 850 mode at middle channel

Reference Frequency: 836.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	4.10	3.60	0.002 51
40		-2.90	-0.005 26
30		-1.90	-0.004 06
20(Ref.)		1.50	-
10		-0.70	-0.002 63
0		-1.00	-0.002 99
-10		-1.40	-0.003 47
-20		3.60	0.002 51
-30		3.20	0.002 03
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.49 (85%)	-2.10	-0.004 30
	4.72 (115%)	-1.70	-0.003 83

GSM 1900 mode at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	4.10	2.30	0.002 34
40		3.40	0.002 93
30		3.50	0.002 98
20(Ref.)		-2.10	-
10		2.10	0.002 23
0		2.30	0.002 34
-10		-1.40	0.000 37
-20		-2.30	-0.000 11
-30		3.20	0.002 82
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**Ppm**
20	3.49 (85%)	3.40	0.002 93
	4.72 (115%)	-1.70	0.000 21

- End of the Test Report -