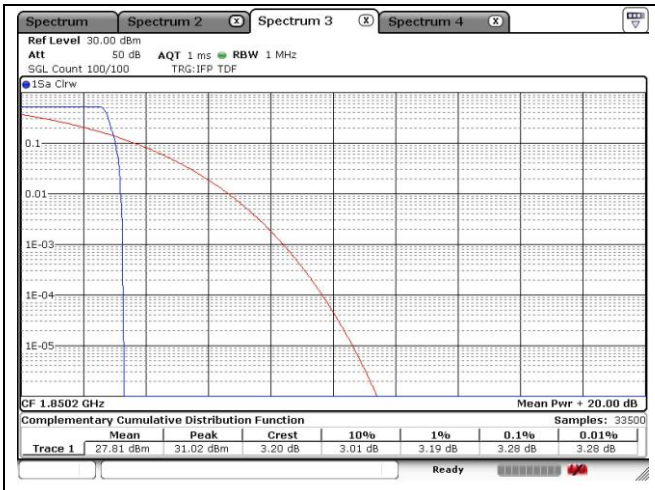
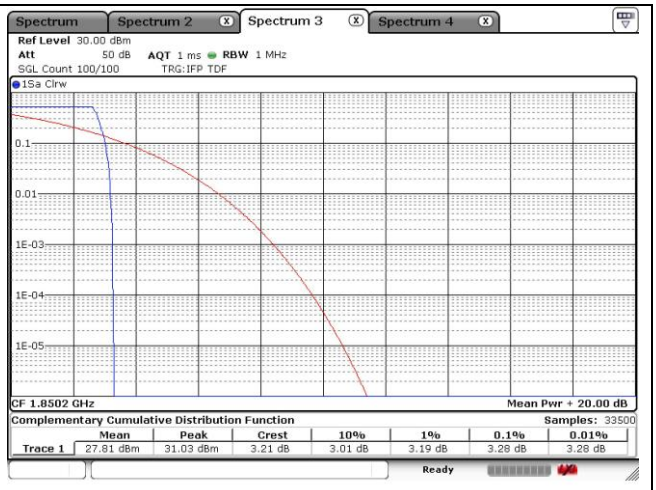
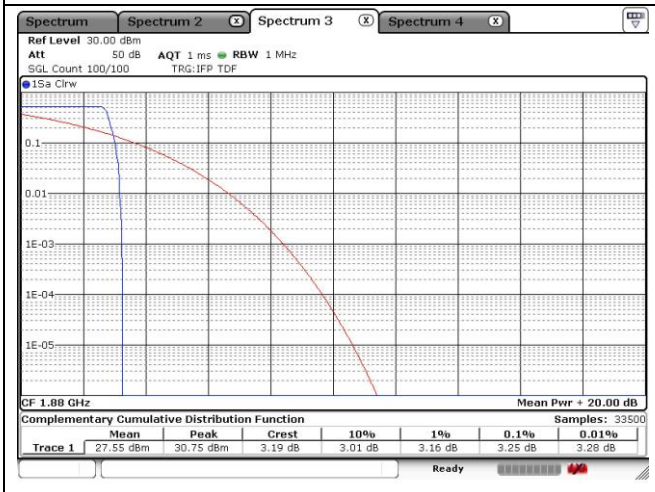
GSM 1900



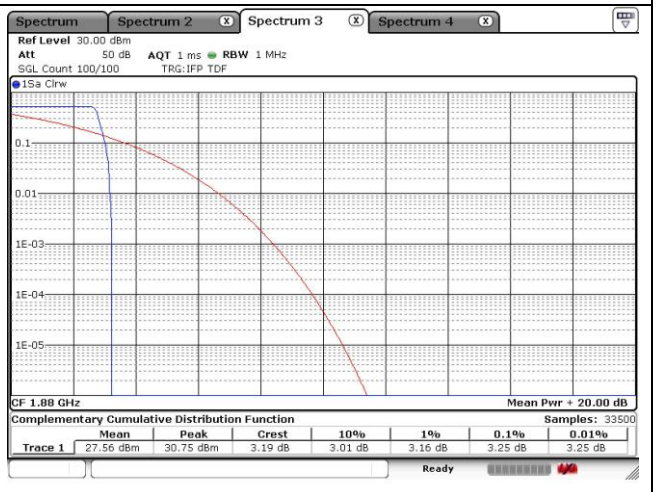
GSM 1900 VOICE Low Channel



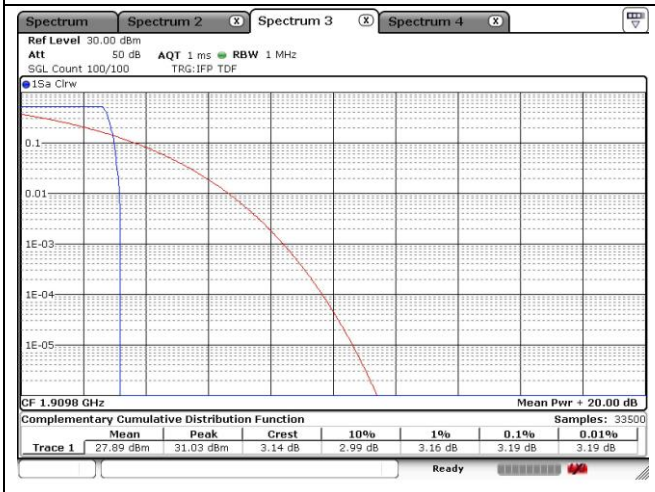
GSM 1900 EDGE Low Channel



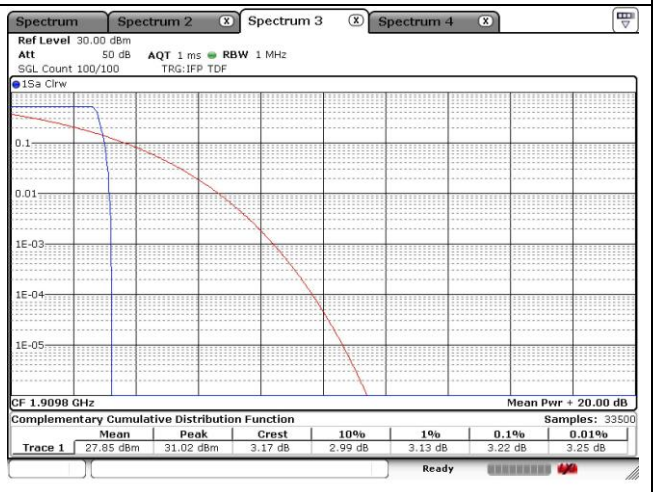
GSM 1900 VOICE Middle Channel



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) ㏈.

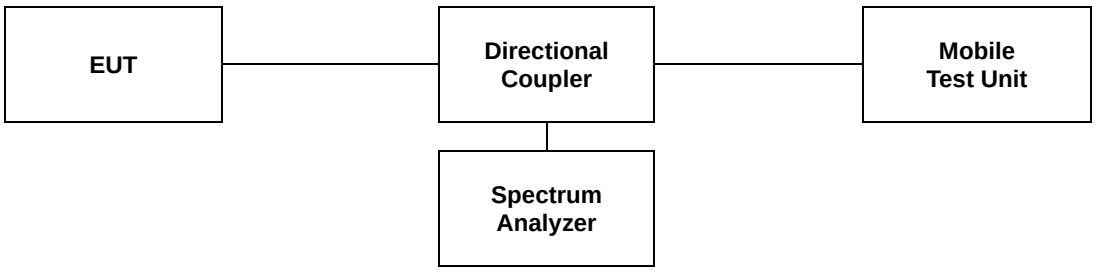
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §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;

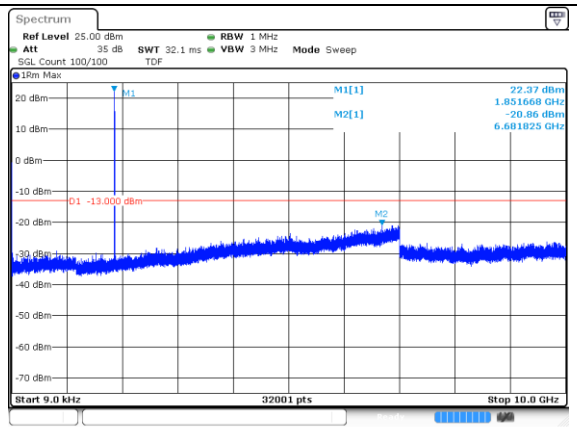
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 ㎑ or greater for frequencies less than 1 ㎓ and frequencies greater than 1 ㎓. However, in the 1 ㎒ bands immediately outside and adjacent to the frequency block a resolution 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.

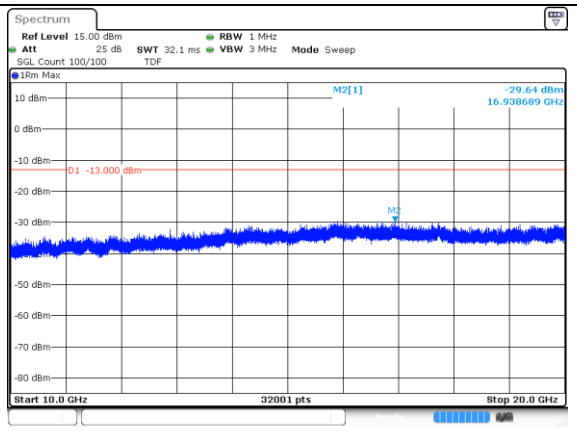
6.3. Test Results

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

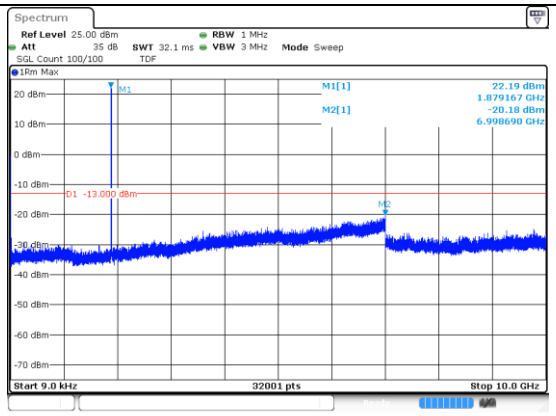
- Test plots

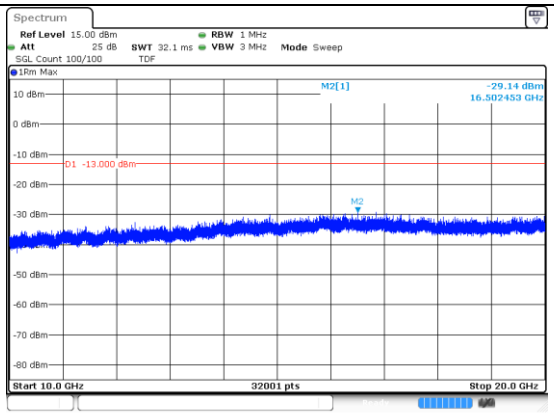
WCDMA Ⅱ



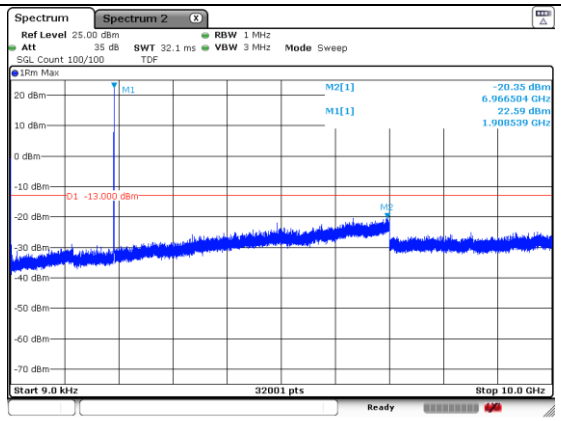


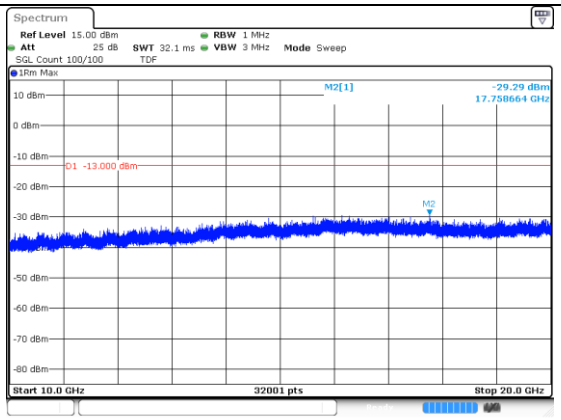
WCDMA Ⅱ RMC Low Channel





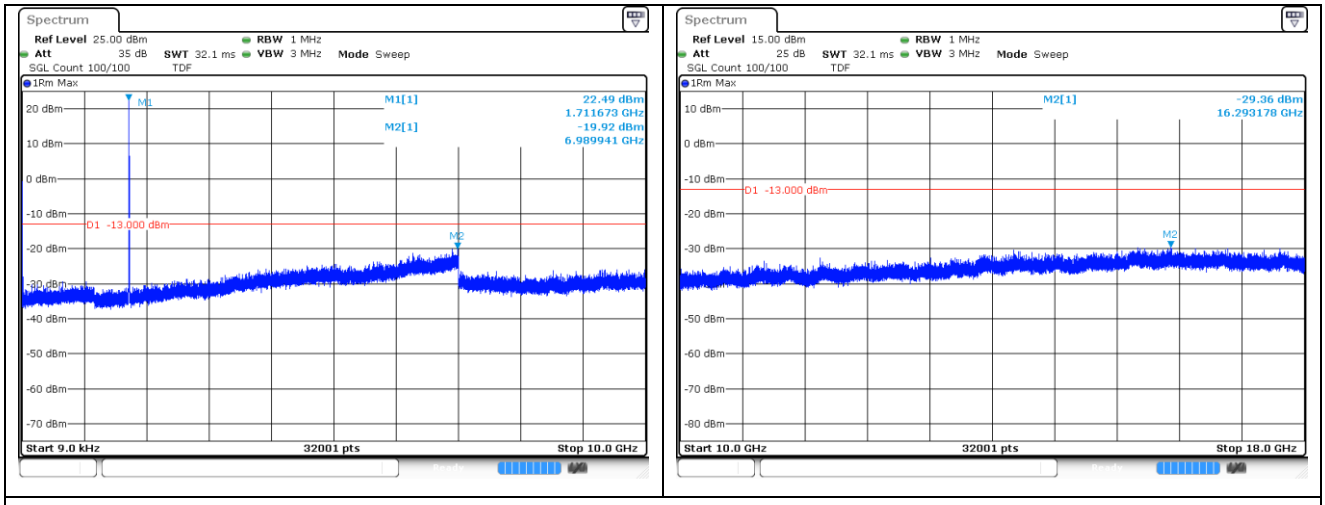
WCDMA Ⅱ RMC Middle Channel



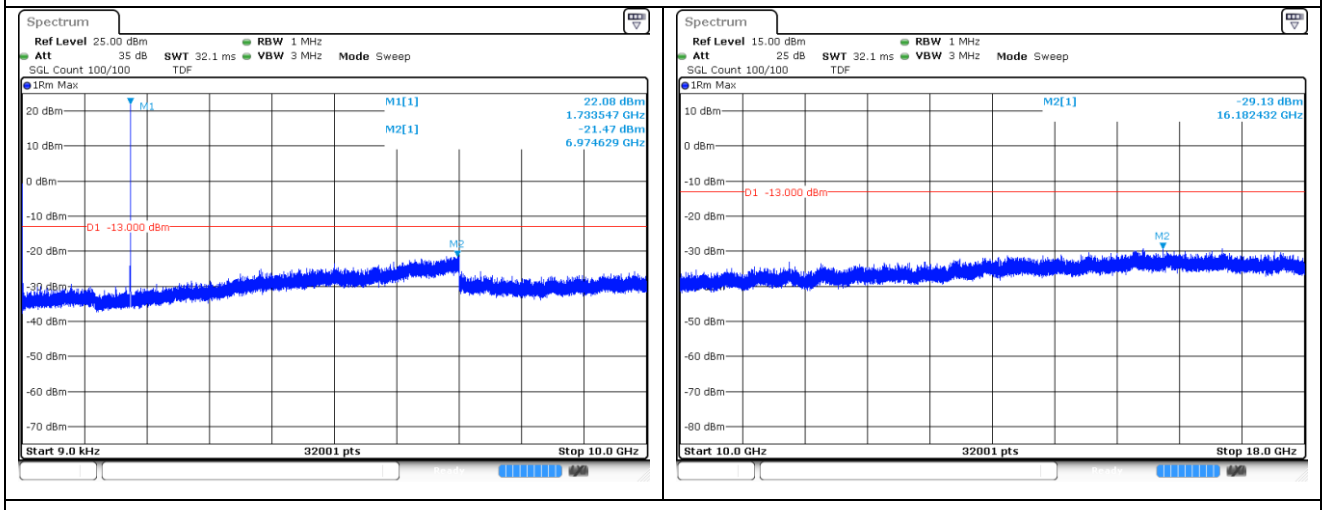


WCDMA Ⅱ RMC High Channel

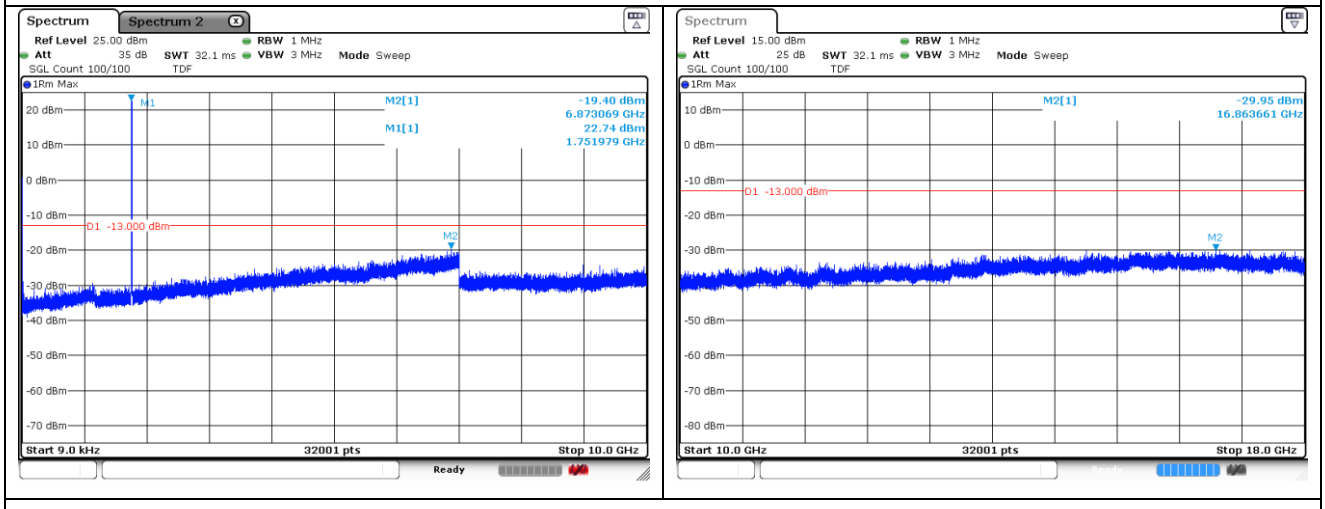
WCDMA Ⅳ



WCDMA Ⅳ RMC Low Channel

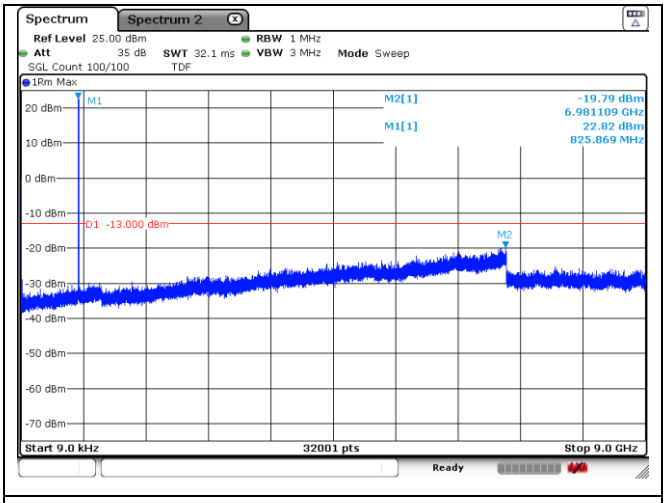


WCDMA Ⅳ RMC Middle Channel

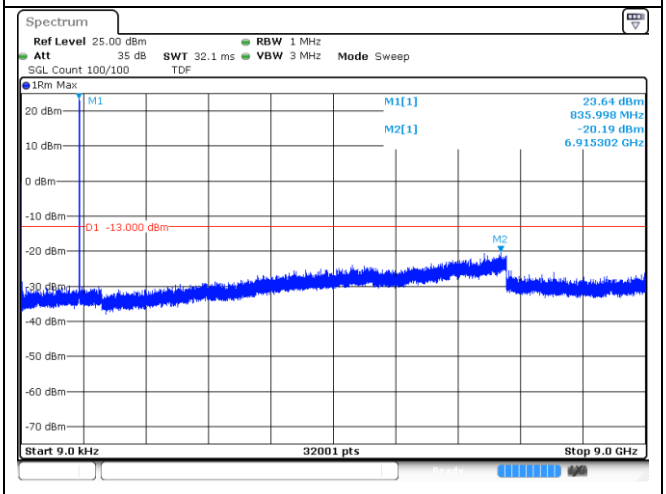


WCDMA Ⅳ RMC High Channel

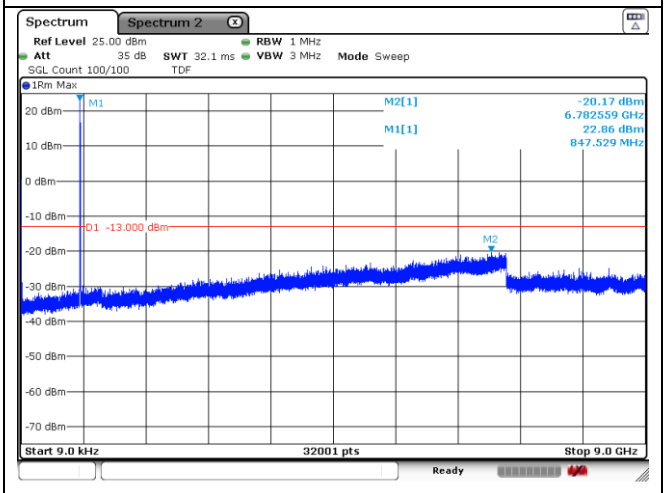
WCDMA Ⅴ



WCDMA Ⅴ RMC Low channel

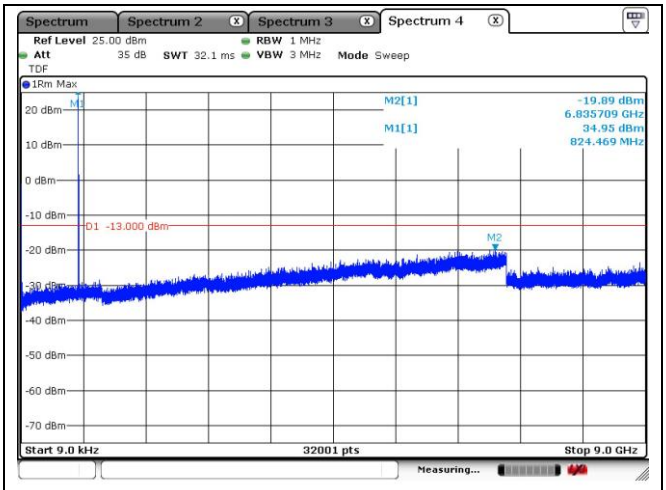


WCDMA Ⅴ RMC Middle channel

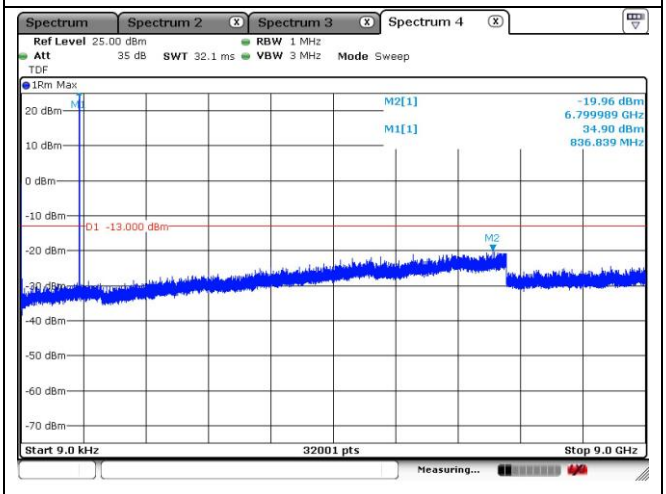


WCDMA Ⅴ RMC High channel

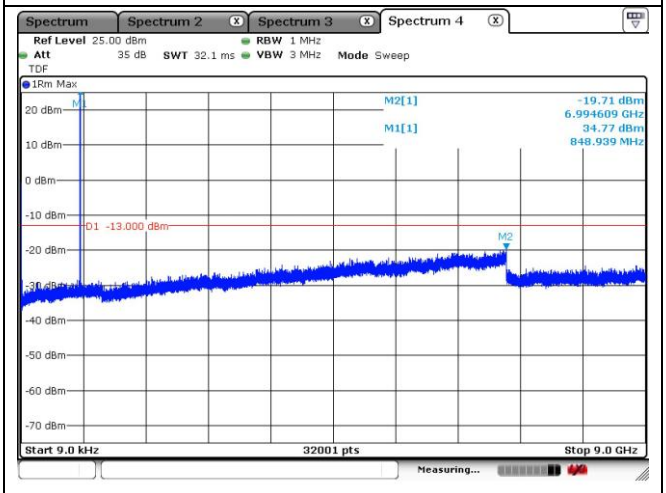
GSM 850



GSM 850 VOICE Low Channel

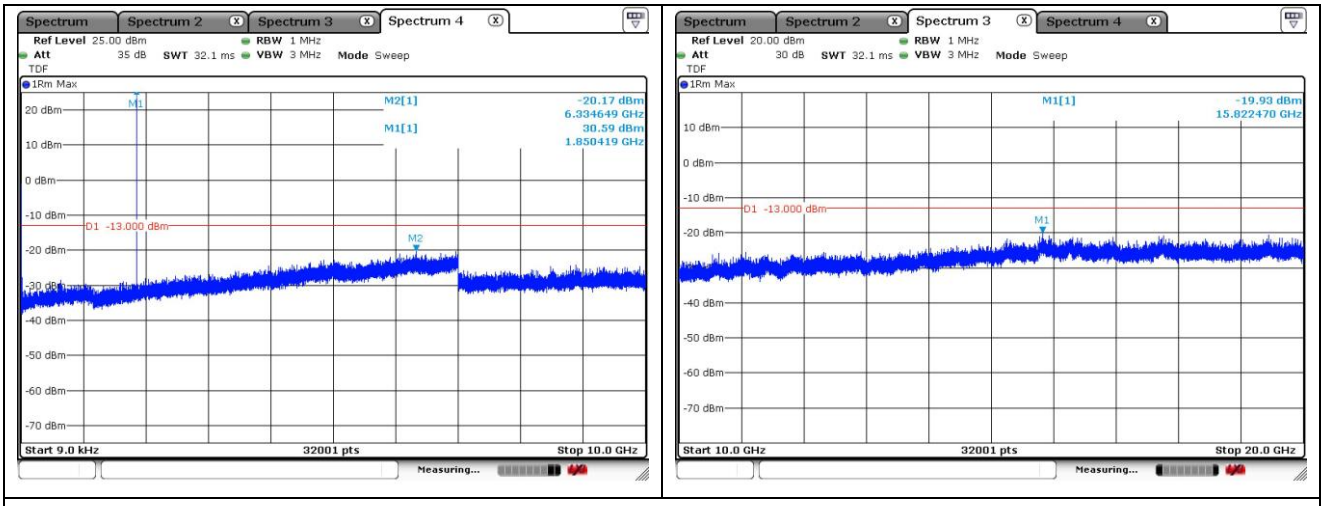


GSM 850 VOICE Middle Channel

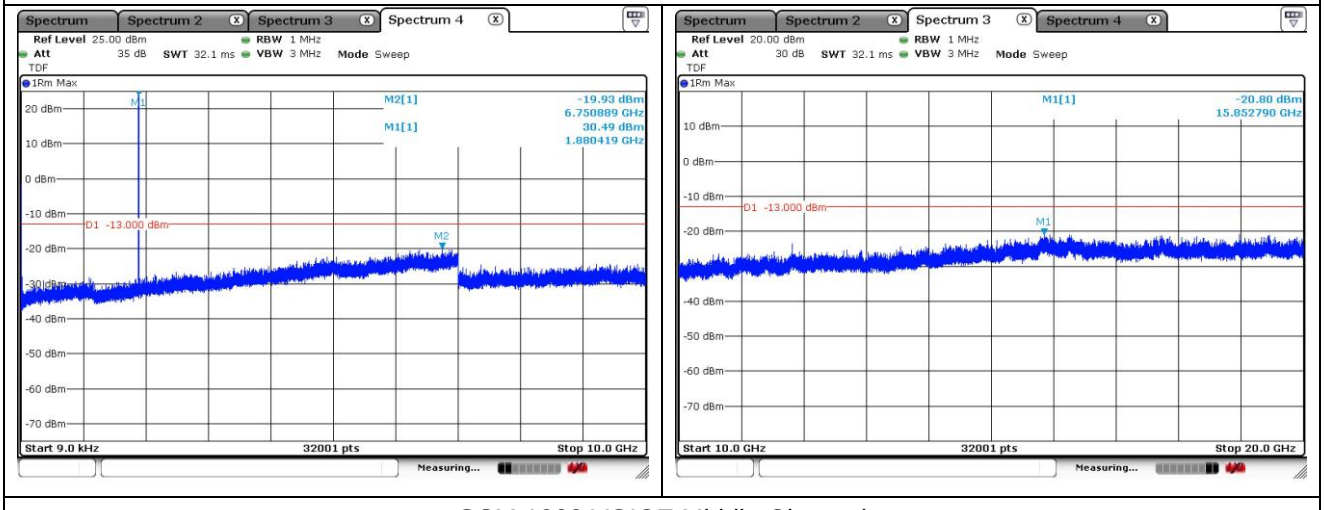


GSM 850 VOICE High Channel

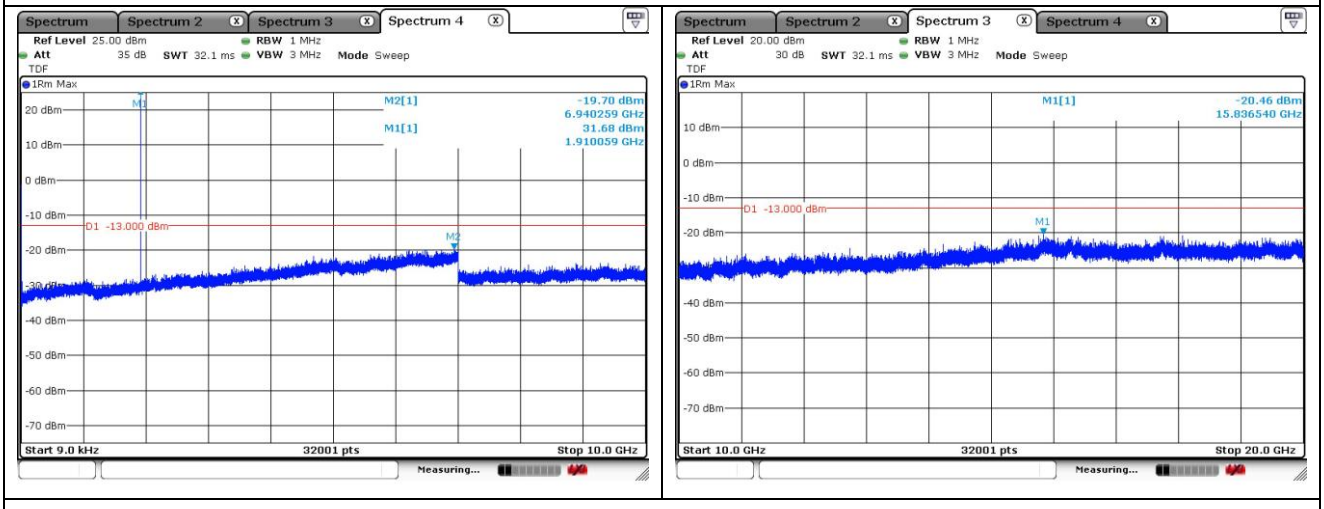
GSM 1900



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) ㏈.

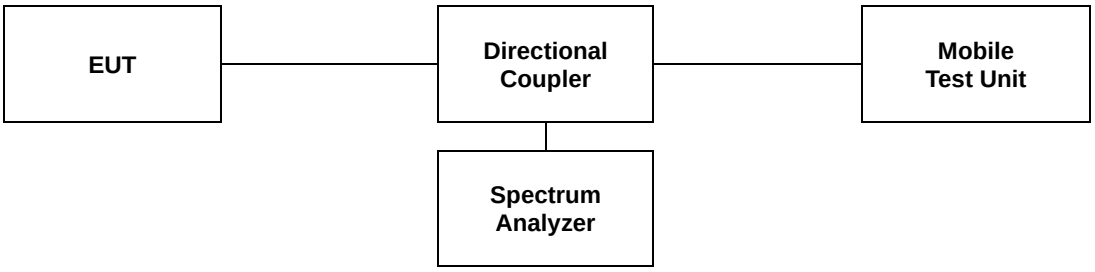
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §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.

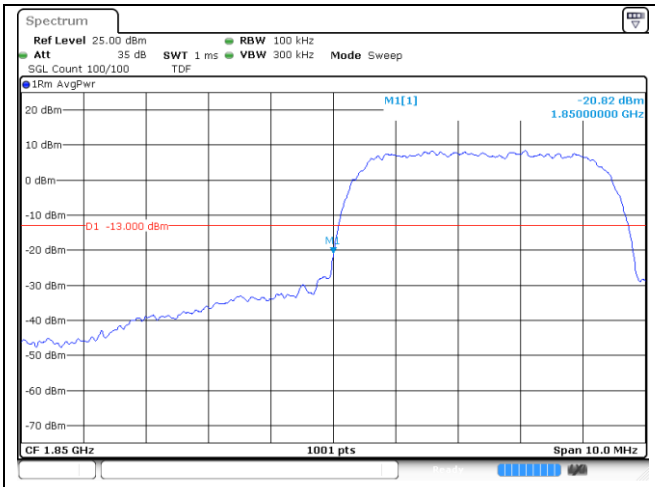


7.3. Test Results

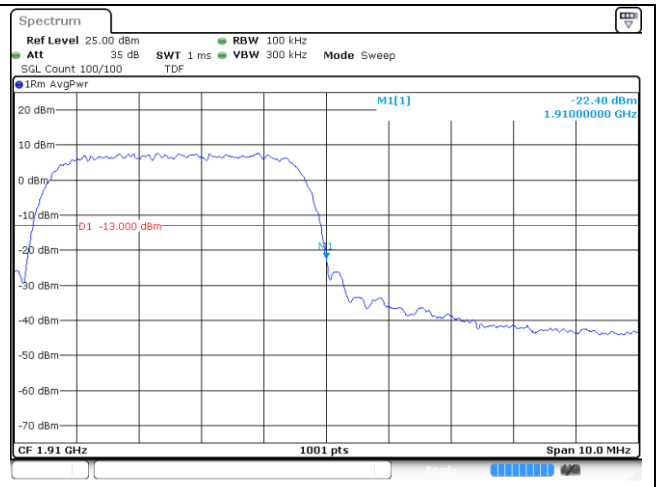
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

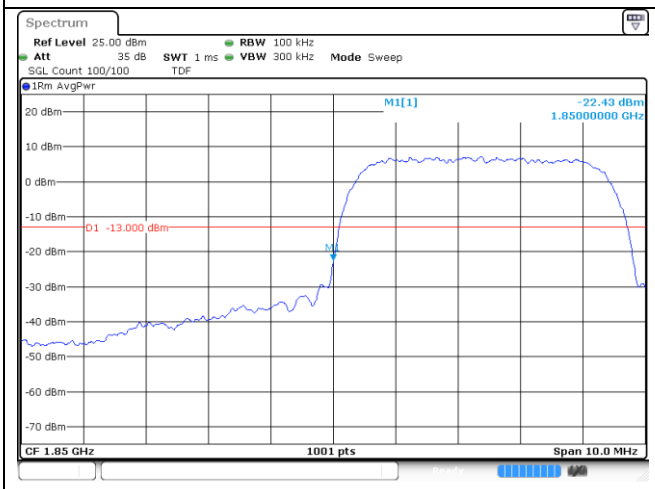
WCDMA Ⅱ



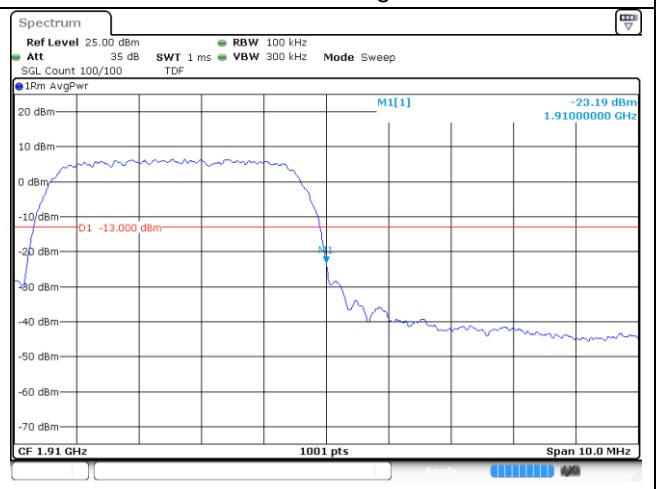
WCDMA Ⅱ RMC Low Channel



WCDMA Ⅱ RMC High Channel

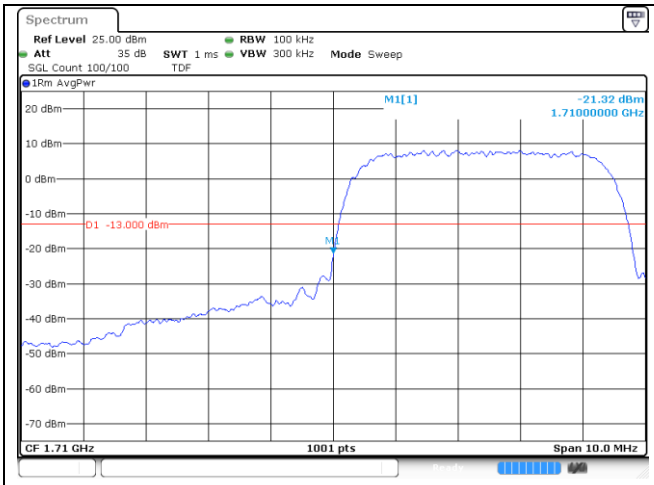


WCDMA Ⅱ HSDPA Low Channel

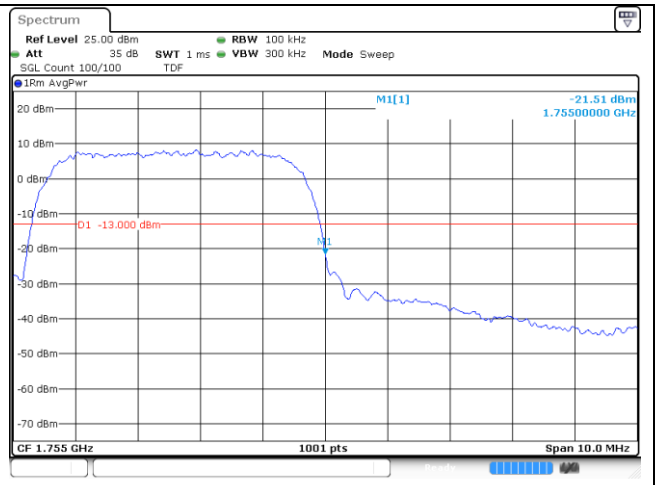


WCDMA Ⅱ HSDPA High Channel

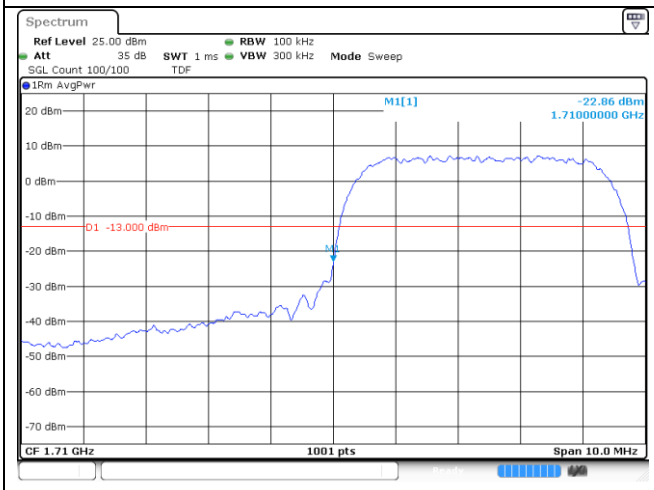
WCDMA Ⅳ



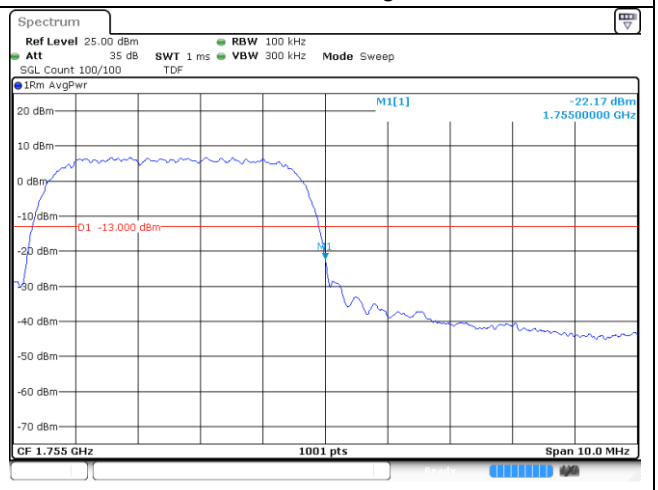
WCDMA Ⅳ RMC Low Channel



WCDMA Ⅳ RMC High Channel

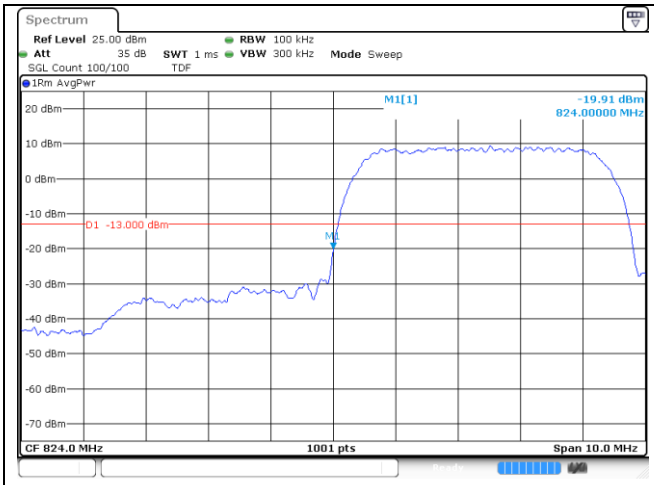


WCDMA Ⅳ HSDPA Low Channel

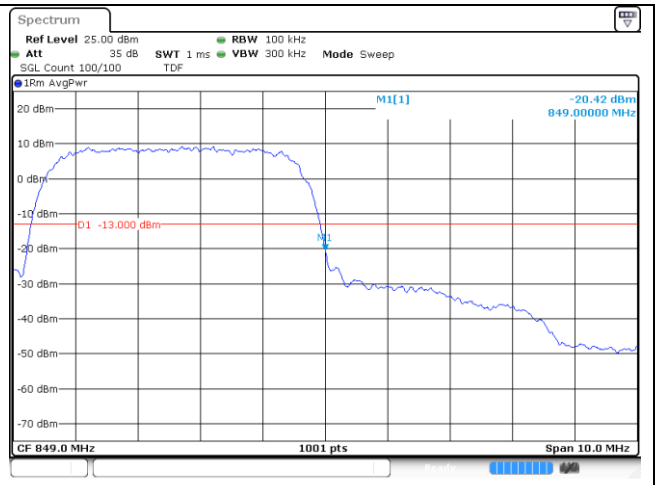


WCDMA Ⅳ HSDPA High Channel

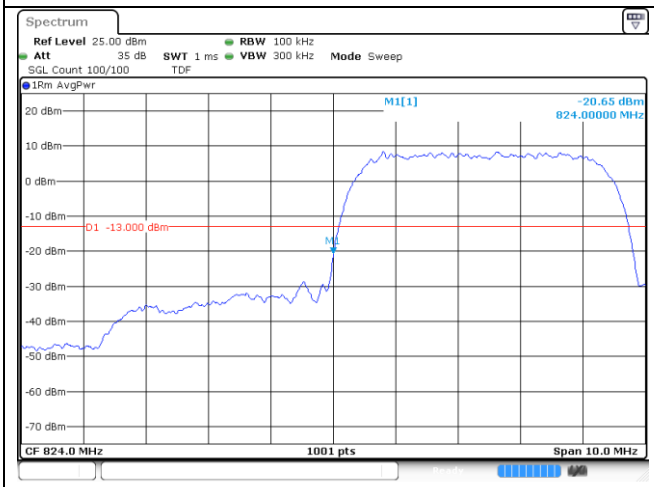
WCDMA Ⅴ



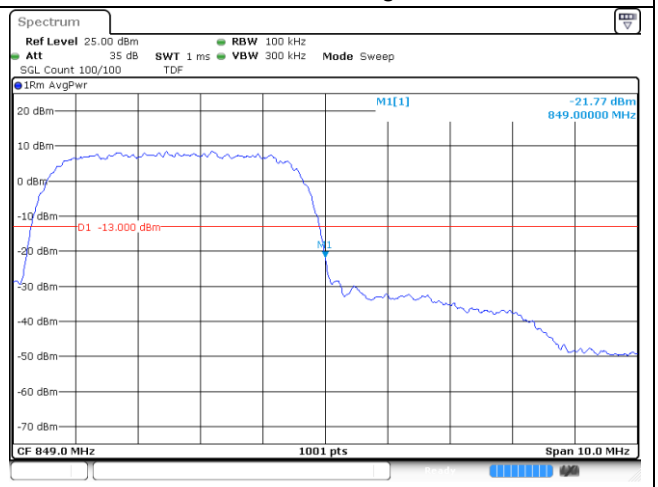
WCDMA Ⅴ RMC Low Channel



WCDMA Ⅴ RMC High Channel

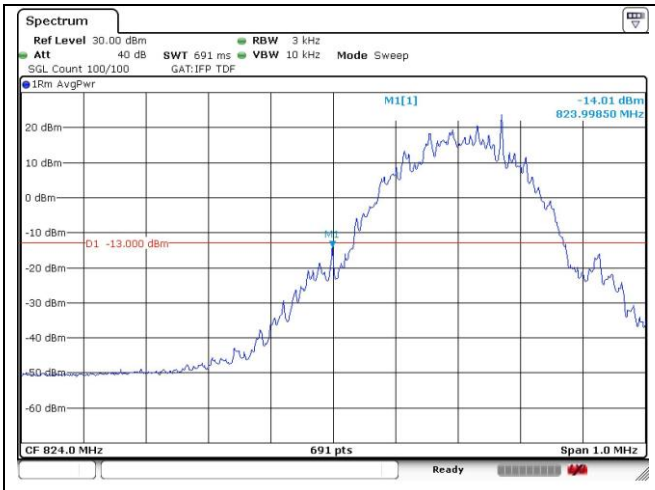


WCDMA Ⅴ HSDPA Low Channel

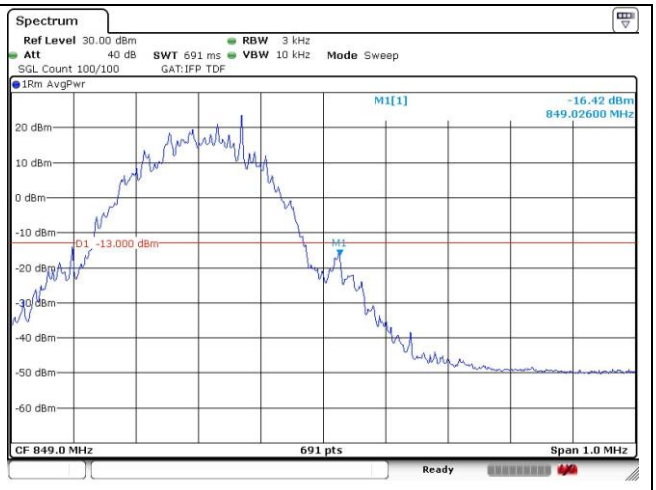


WCDMA Ⅴ HSDPA High Channel

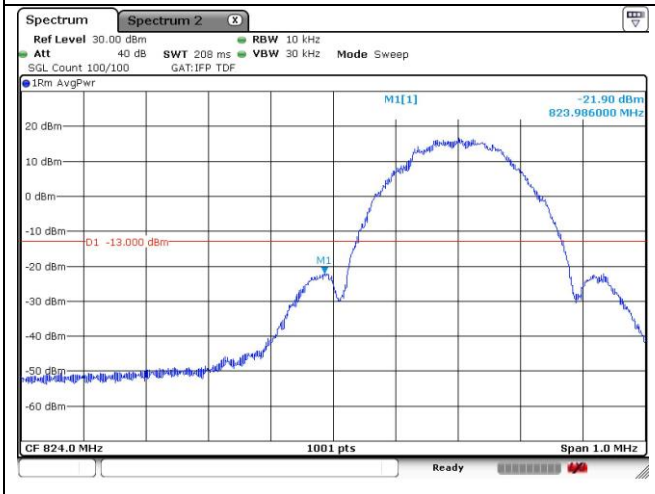
GSM 850



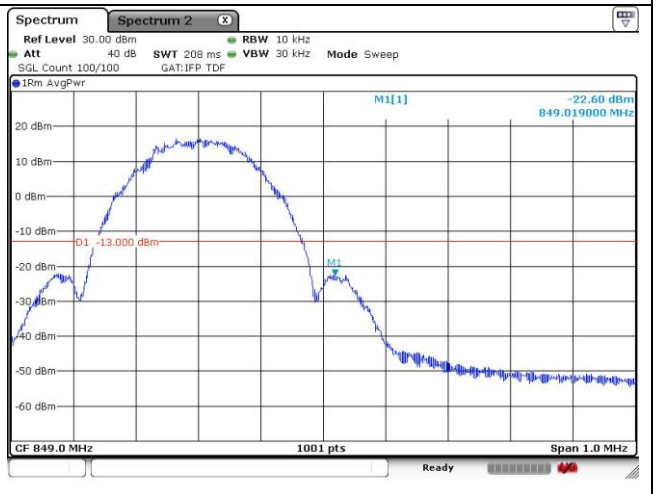
GSM 850 VOICE Low Channel



GSM 850 VOICE High Channel

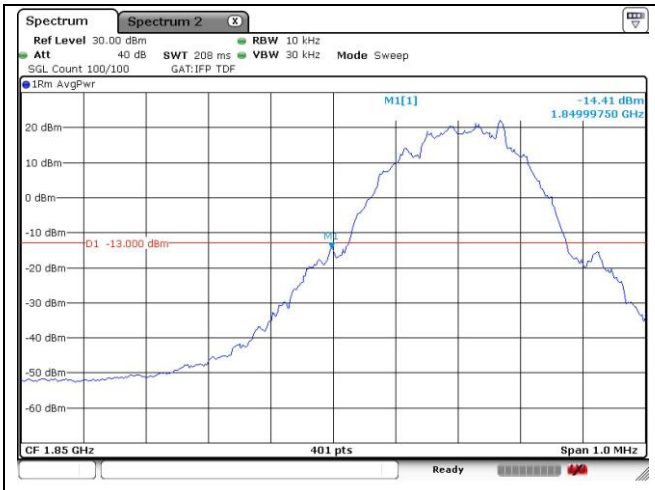


GSM 850 EDGE Low Channel

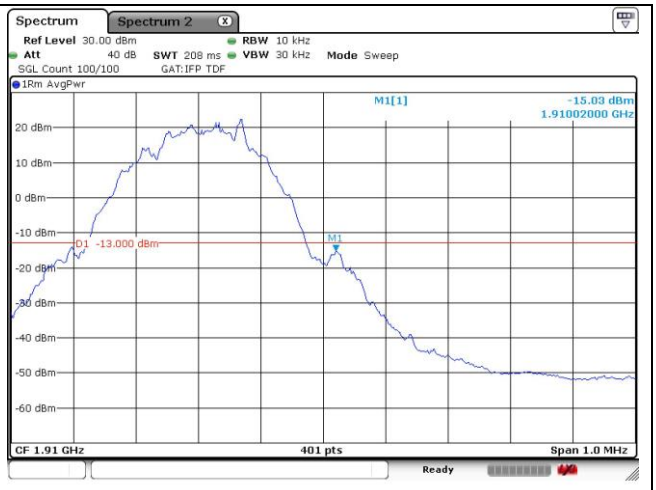


GSM 850 EDGE High Channel

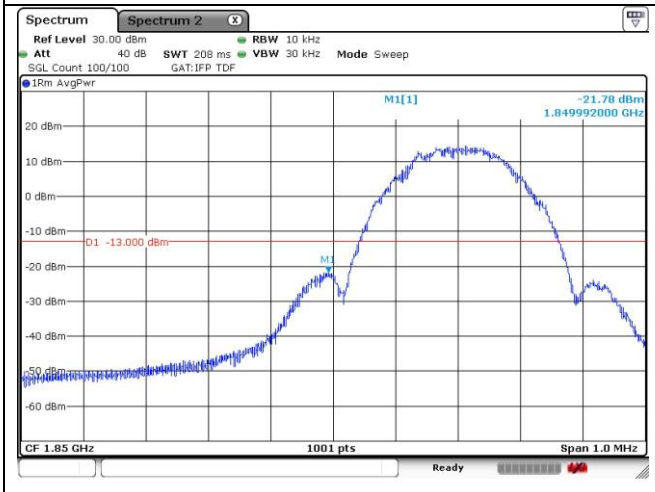
GSM 1900



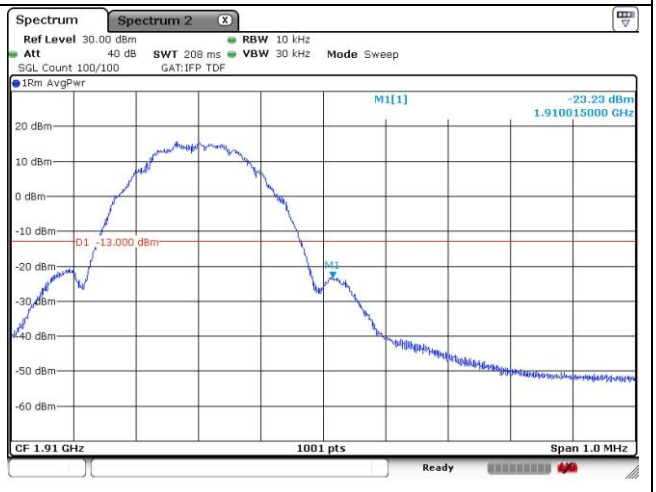
GSM 1900 VOICE Low Channel



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:

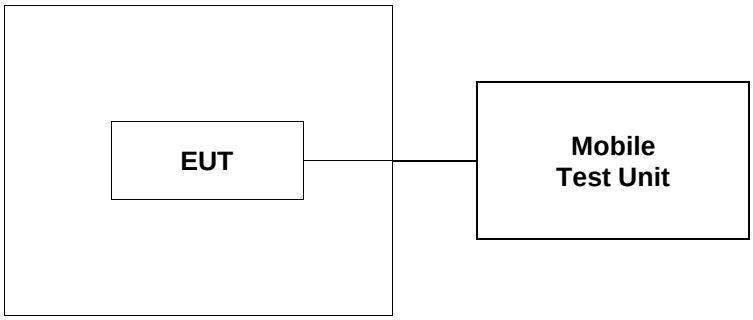
- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.
For Mobile devices operating in the 824 to 849 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 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	5	-0.26	-0.001 18
40		1.79	-0.000 09
30		-1.43	-0.001 80
20(Ref.)		1.96	-
10		1.44	-0.000 28
0		-0.57	-0.001 35
-10		-1.30	-0.001 73
-20		-0.97	-0.001 56
-30		-0.78	-0.001 46
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	4.25 (85%)	-1.70	-0.001 95
	5.75 (115%)	1.41	-0.000 29

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	5	-1.34	-0.000 25
40		-1.89	-0.000 57
30		-0.11	0.000 46
20(Ref.)		-0.91	-
10		0.75	0.000 96
0		-2.42	-0.000 87
-10		-1.28	-0.000 21
-20		-1.09	-0.000 10
-30		-1.21	-0.000 17
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	4.25 (85%)	0.76	0.000 96
	5.75 (115%)	-0.08	0.000 48

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	5	-0.65	-0.000 02
40		0.59	0.001 46
30		1.99	0.003 13
20(Ref.)		-0.63	-
10		2.46	0.003 69
0		-0.10	0.000 63
-10		0.77	0.001 67
-20		-0.14	0.000 59
-30		-1.65	-0.001 22
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	4.25 (85%)	-2.02	-0.001 66
	5.75 (115%)	1.00	0.001 95

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	5	0.41	-0.001 89
40		-2.12	-0.004 91
30		0.83	-0.001 39
20(Ref.)		1.99	-
10		-0.41	-0.002 87
0		-1.52	-0.004 20
-10		1.81	-0.000 22
-20		-1.61	-0.004 30
-30		-0.18	-0.002 59
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	4.25 (85%)	-0.05	-0.002 44
	5.75 (115%)	-1.14	-0.003 74

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	5	-2.00	-0.000 86
40		0.25	0.000 34
30		1.16	0.000 82
20(Ref.)		-0.39	-
10		1.84	0.001 19
0		0.03	0.000 22
-10		-2.50	-0.001 12
-20		-1.44	-0.000 56
-30		0.74	0.000 60
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	4.25 (85%)	-0.60	-0.000 11
	5.75 (115%)	0.27	0.000 35

- End of the Test Report -