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) ㏈.

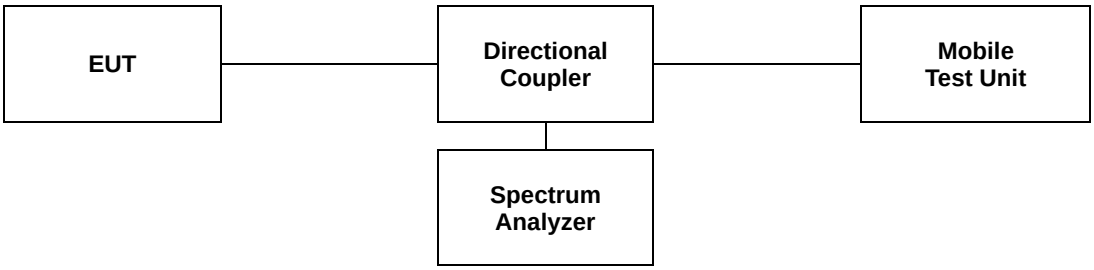
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §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.

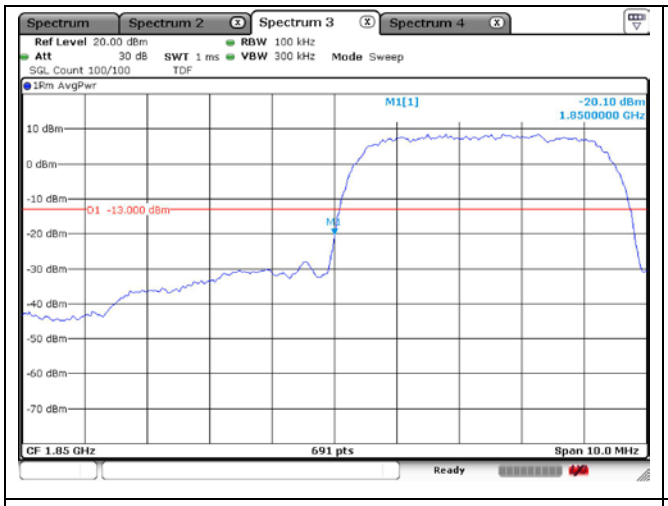


7.3. Test Results

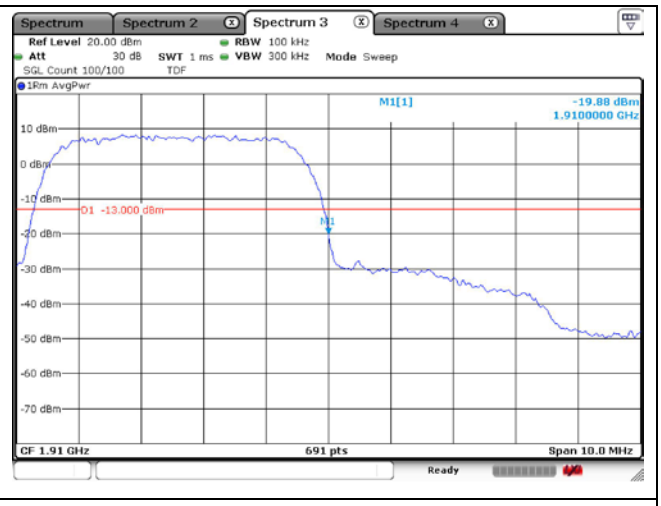
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

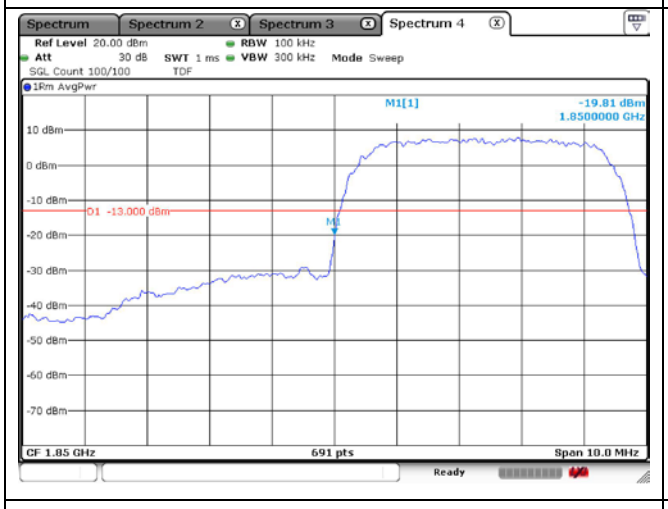
WCDMA Ⅱ



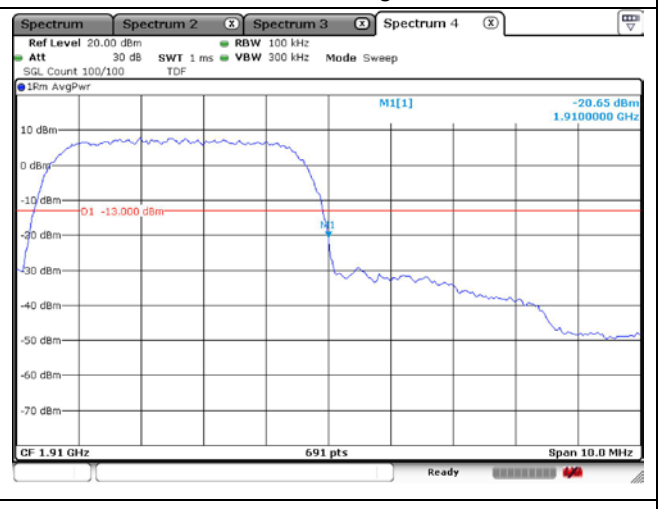
WCDMA Ⅱ RMC Low Channel



WCDMA Ⅱ RMC High Channel

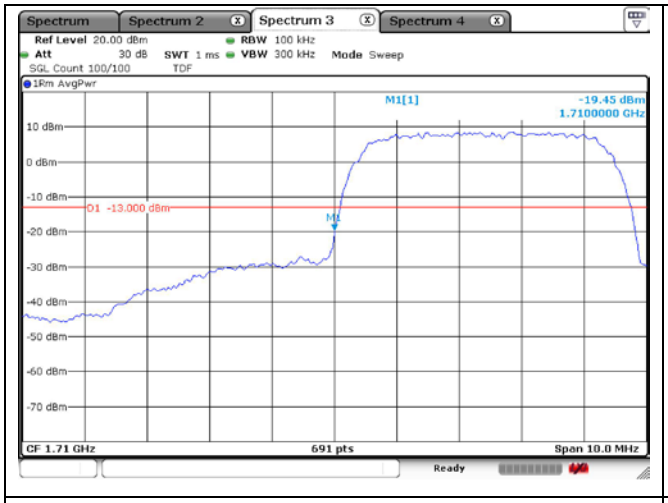


WCDMA Ⅱ HSDPA Low Channel

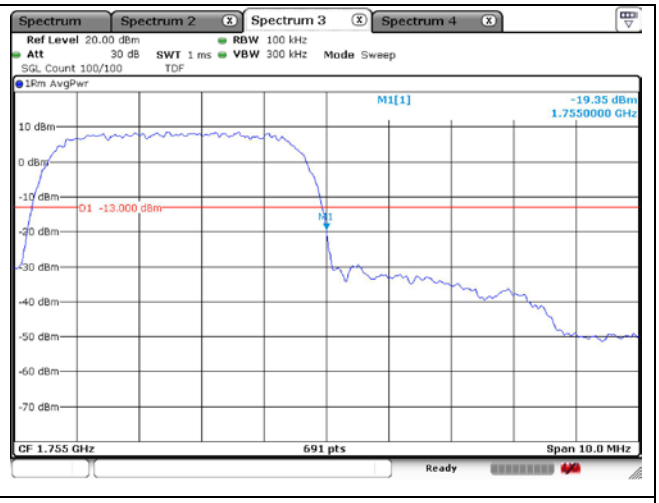


WCDMA Ⅱ HSDPA High Channel

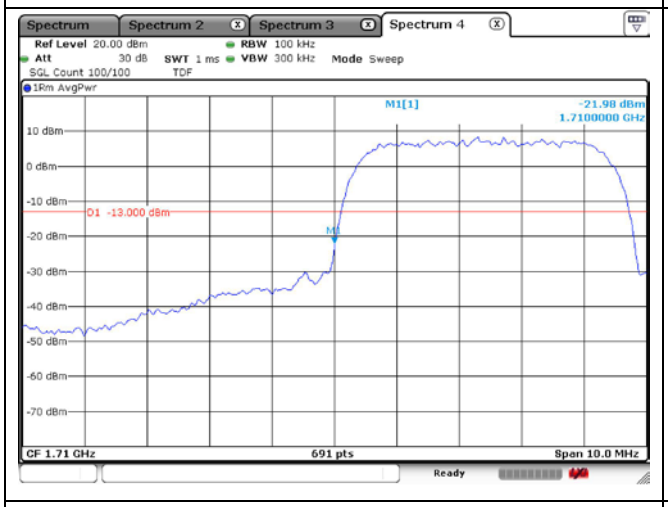
WCDMA Ⅳ



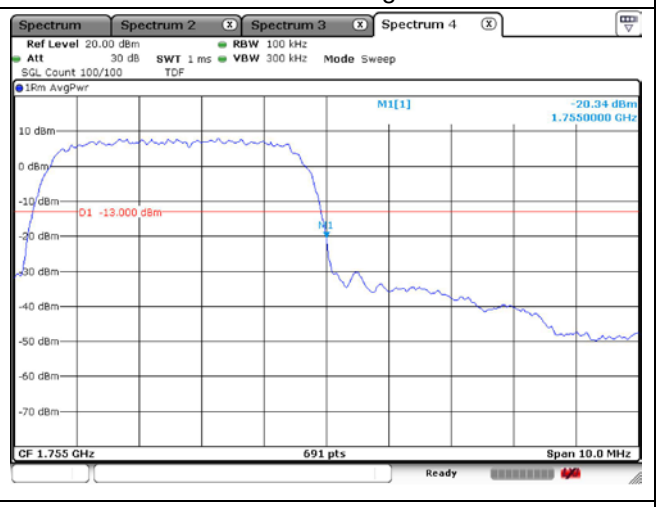
WCDMA Ⅳ RMC Low Channel



WCDMA Ⅳ RMC High Channel

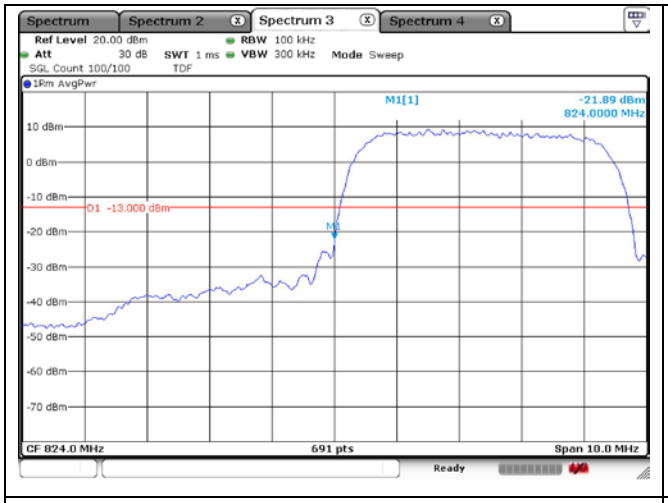


WCDMA Ⅳ HSDPA Low Channel

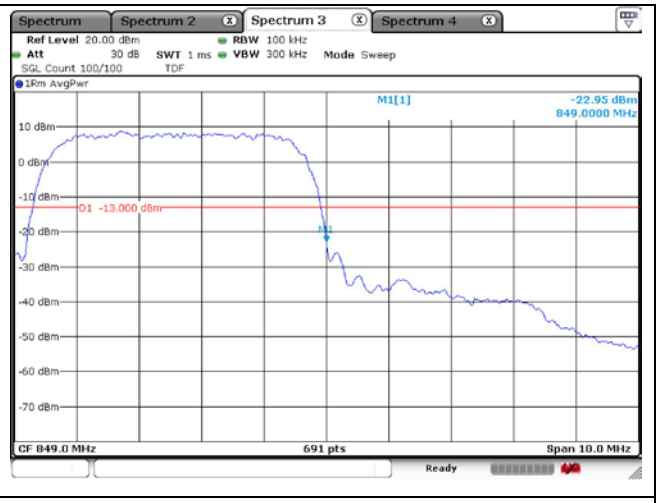


WCDMA Ⅳ HSDPA High Channel

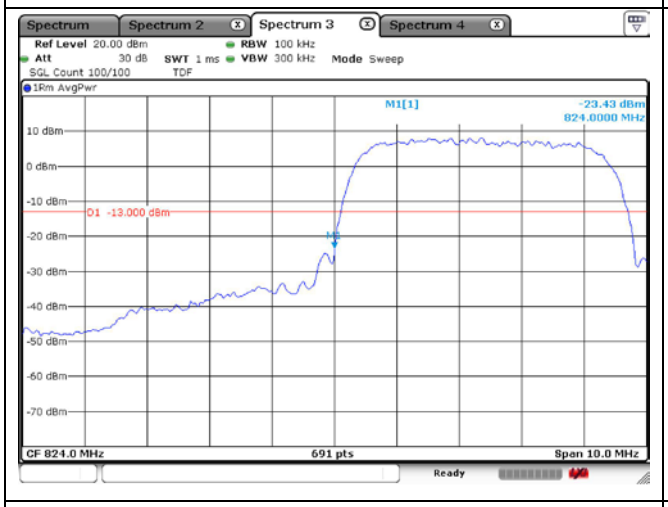
WCDMA Ⅴ



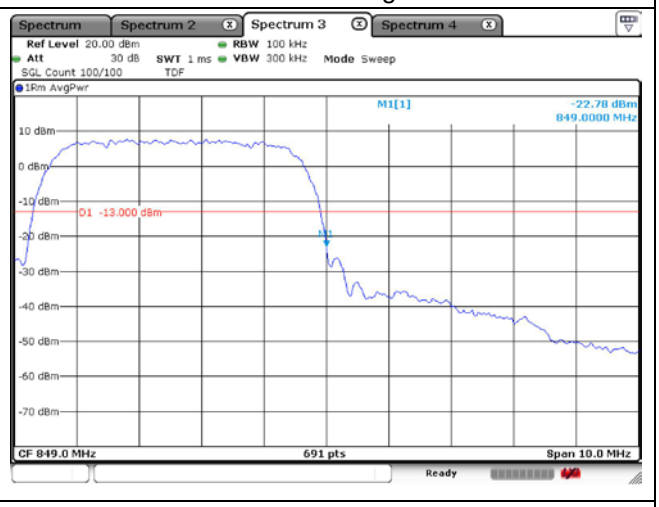
WCDMA Ⅴ RMC Low Channel



WCDMA Ⅴ RMC High Channel

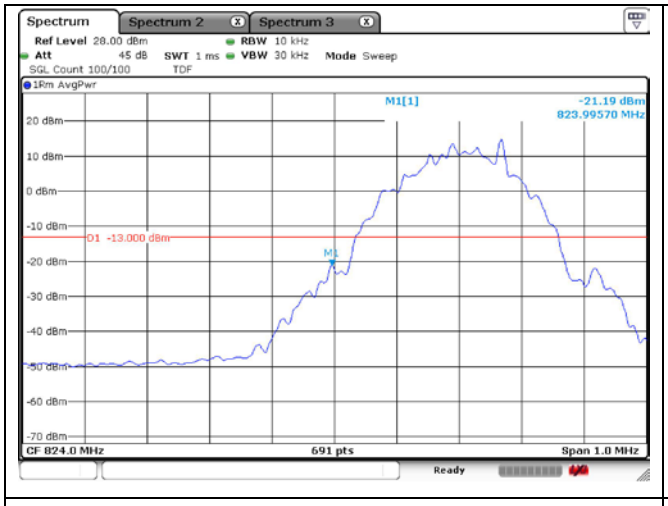


WCDMA Ⅴ HSDPA Low Channel

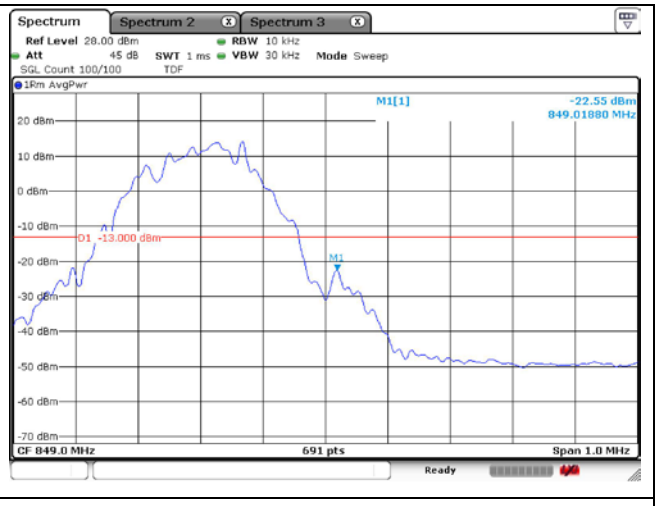


WCDMA Ⅴ HSDPA High Channel

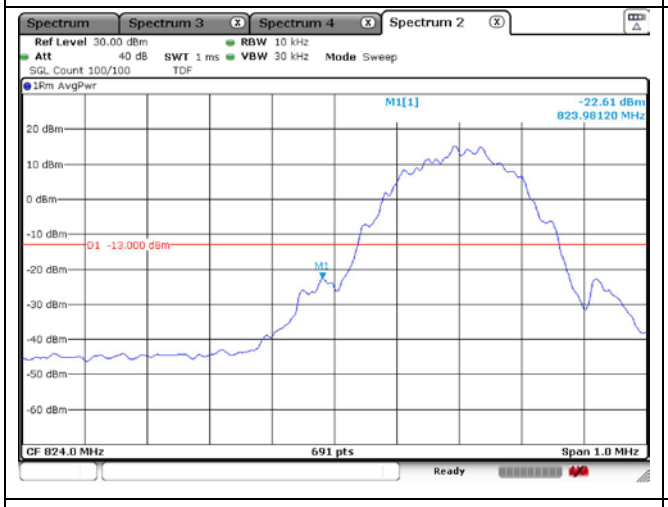
GSM 850



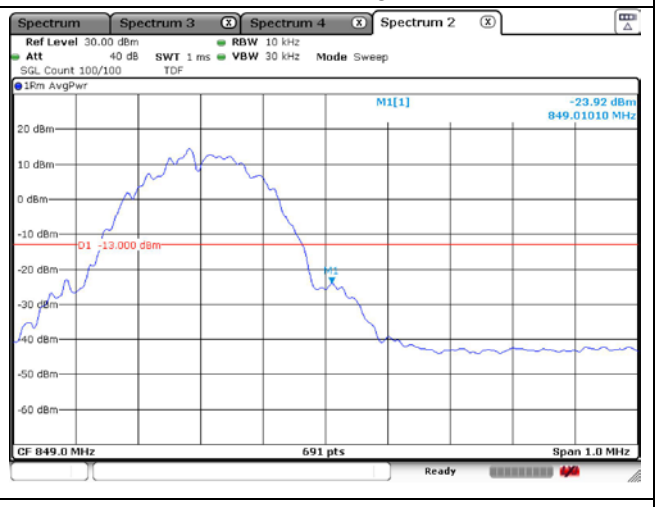
GSM 850 VOICE Low Channel



GSM 850 VOICE High Channel

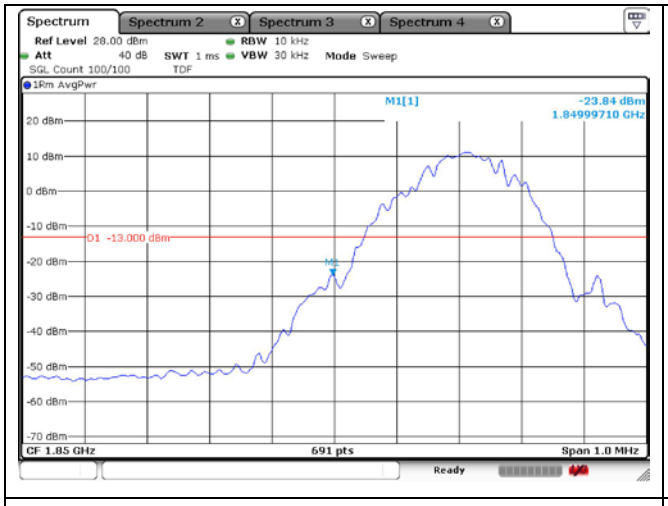


GSM 850 EDGE Low Channel

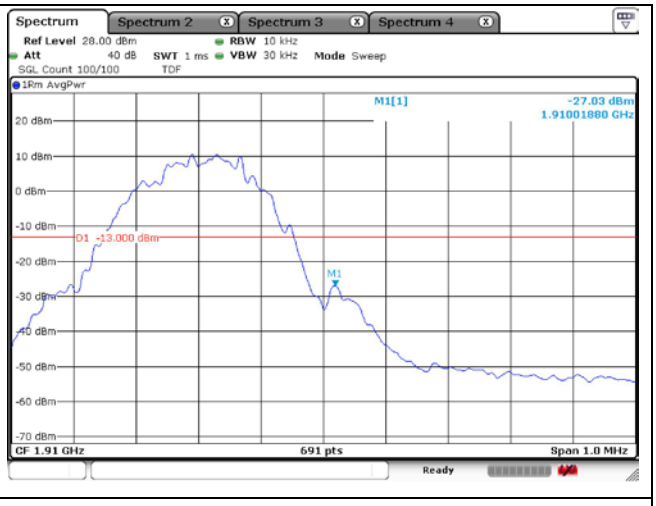


GSM 850 EDGE High Channel

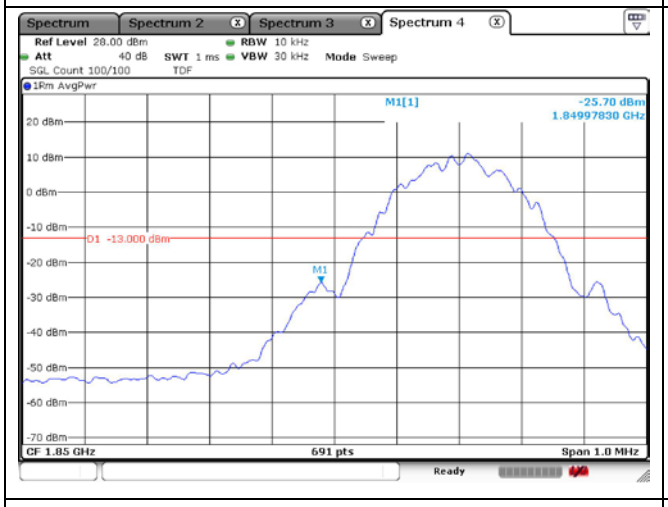
GSM 1900



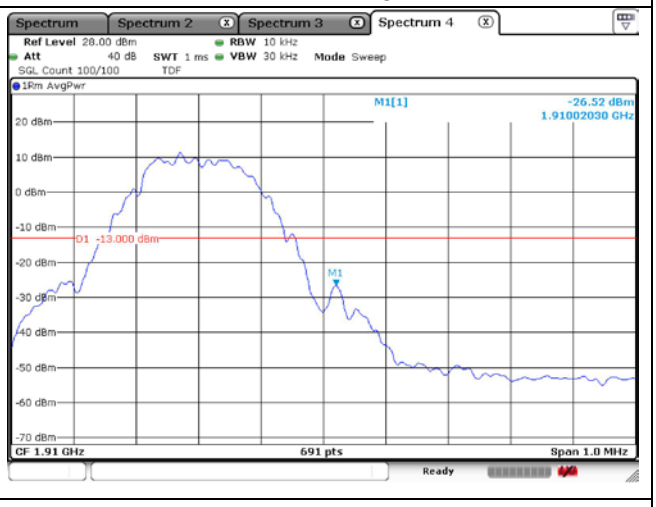
GSM 1900 VOICE Low Channel



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:

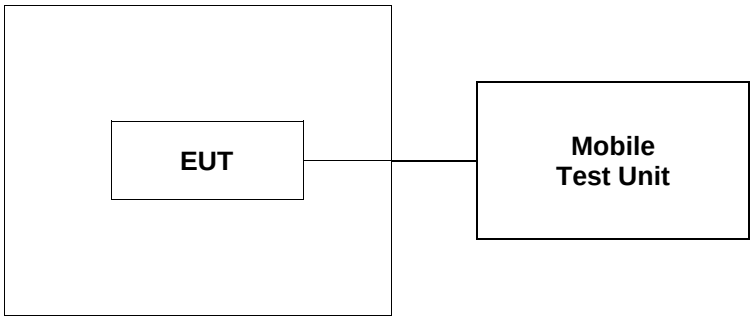
- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.
For Mobile devices operating in the 824 to 849 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 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	12.5	13.23	0.000 22
40		12.32	-0.000 26
30		10.47	-0.001 24
20(Ref.)		12.81	-
10		15.69	0.001 53
0		13.26	0.000 24
-10		13.17	0.000 19
-20		12.00	-0.000 43
-30		13.97	0.000 62
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	14.22	0.000 75
	14.38 (115%)	13.24	0.000 23

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	12.5	14.33	0.000 24
40		13.44	-0.000 28
30		11.59	-0.001 34
20(Ref.)		13.92	-
10		16.82	0.001 67
0		14.31	0.000 23
-10		14.27	0.000 20
-20		13.13	-0.000 46
-30		15.08	0.000 67
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	12.43	-0.000 86
	14.38 (115%)	13.21	-0.000 41

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	12.5	3.02	0.000 13
40		2.74	-0.000 20
30		5.42	0.003 00
20(Ref.)		2.91	-
10		7.20	0.005 13
0		7.23	0.005 16
-10		8.70	0.006 92
-20		5.35	0.002 92
-30		6.07	0.003 78
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	3.15	0.000 29
	14.38 (115%)	2.33	-0.000 69

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	12.5	2.49	0.000 16
40		2.17	-0.000 23
30		4.90	0.003 04
20(Ref.)		2.36	-
10		6.65	0.005 13
0		6.67	0.005 15
-10		8.15	0.006 92
-20		4.82	0.002 94
-30		5.54	0.003 80
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	3.19	0.000 99
	14.38 (115%)	3.55	0.001 42

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	12.5	14.35	0.001 13
40		14.25	0.001 08
30		14.72	0.001 33
20(Ref.)		12.22	-
10		11.17	-0.000 56
0		11.98	-0.000 13
-10		14.02	0.000 96
-20		13.42	0.000 64
-30		16.96	0.002 52
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	14.95	0.001 45
	14.38 (115%)	15.14	0.001 55

- End of the Test Report -