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TEST REPORT

of

FCC Part 2 Subpart J, Part 22 Subpart C/H,
Part 24 Subpart E and Part 27 Subpart C

FCC ID: A3LSMT875

1. Equipment Under Test	:	Portable Tablet
2. Model Name	:	SM-T875
3. Variant Model Name(s)	:	-
4. Applicant	:	Samsung Electronics Co., Ltd.
5. Date of Receipt	:	2020.06.04
6. Date of Test(s)	:	2020.06.05 ~ 2020.07.09
7. Date of Issue	:	2020.07.20

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as receive

Tested by: **Jinhyoung Cho**

Technical Manager: **Jungmin Yang**

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
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- Designation number: KR0150

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.
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1.2. Details of Applicant

Applicant : Samsung Electronics Co., Ltd.
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Contact Person : Seo, Deok-ho
Phone No. : +82 10 3955 6246

1.3. Description of EUT

Kind of Product	Portable Tablet
Model Name	SM-T875
Power Supply	DC 3.86 V
Rated Power	WCDMA 2, 4: 23.5 ㏈m WCDMA 5: 24.5 ㏈m GSM 850: 32.5 ㏈m GSM 1 900: 29.5 ㏈m
Frequency Range	WCDMA 2: 1 850 ㎒ ~ 1 910 ㎒ WCDMA 4: 1 710 ㎒ ~ 1 755 ㎒ WCDMA 5: 824 ㎒ ~ 849 ㎒ GSM 850: 824 ㎒ ~ 849 ㎒ GSM 1 900: 1 850 ㎒ ~ 1 910 ㎒
Modulation Technique	QPSK, 16QAM, GMSK, 8PSK
Antenna Type	Metal Frame Antenna
Antenna Gain	824 ㎒ ~ 849 ㎒: -0.74 ㏈i 1 710 ㎒ ~ 1 780 ㎒: -0.53 ㏈i 1 850 ㎒ ~ 1 915 ㎒: -0.48 ㏈i

1.4. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	Agilent	E8257D	MY51501169	Nov. 11, 2019	Annual	Nov. 11, 2020
Spectrum Analyzer	R&S	FSV30	103210	Dec. 05, 2019	Annual	Dec. 05, 2020
Spectrum Analyzer	Agilent	N9030A	US51350132	Sep. 11, 2019	Annual	Sep. 11, 2020
Mobile Test Unit	R&S	CMW500	144034	Feb. 28, 2020	Annual	Feb. 28, 2021
Mobile Test Unit	R&S	CMW500	144032	May 08, 2020	Annual	May 08, 2021
Power Meter	Anritsu	ML2495A	1223004	Jun. 01, 2020	Annual	Jun. 01, 2021
Power Sensor	Anritsu	MA2411B	1207272	Jun. 01, 2020	Annual	Jun. 01, 2021
Temperature Chamber	ESPEC CORP.	PL-1J	15000796	Sep. 18, 2019	Annual	Sep. 18, 2020
Low Pass Filter	Mini-Circuits	NLP-1200+	V9500401023-2	Jun. 01, 2020	Annual	Jun. 01, 2021
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000-40SS	7	Mar. 04, 2020	Annual	Mar. 04, 2021
High Pass Filter	Wainwright Instrument GmbH	WHKX2.2/12.75G-10SS	8	Mar. 04, 2020	Annual	Mar. 04, 2021
High Pass Filter	Wainwright Instrument GmbH	WHK3.0/18G-10SS	344	May 18, 2020	Annual	May 18, 2021
High Pass Filter	Wainwright Instrument GmbH	WHK7.5/26.5G-6SS	15	Jun. 05, 2020	Annual	Jun. 05, 2021
Directional Coupler	KRYTAR	152613	122660	Jun. 11, 2020	Annual	Jun. 11, 2021
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 03, 2020	Annual	Mar. 03, 2021
Preamplifier	H.P.	8447F	2944A03909	Aug. 07, 2019	Annual	Aug. 07, 2020
Preamplifier	R&S	SCU 18	10117	Jun. 10, 2020	Annual	Jun. 10, 2021
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	May 08, 2020	Annual	May 08, 2021
Test Receiver	R&S	ESU26	100109	Feb. 18, 2020	Annual	Feb. 18, 2021
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 22, 2019	Biennial	Aug. 22, 2021
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	396	Mar. 21, 2019	Biennial	Mar. 21, 2021
Horn Antenna	R&S	HF906	100326	Feb. 14, 2020	Annual	Feb. 14, 2021
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	9170-540	Jul. 24, 2019	Biennial	Jul. 24, 2021
Antenna Master	Innco systems GmbH	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/38330516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.4 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	PL520-NMNM-4M (4 m)	20200324001	May 06, 2020	Semi-annual	Nov. 06, 2020
Coaxial Cable	RFONE	PL520-NMNM-10M (10 m)	20200324001	May 06, 2020	Semi-annual	Nov. 06, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 01/20	Feb. 13, 2020	Semi-annual	Aug. 13, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 05/20	Feb. 13, 2020	Semi-annual	Aug. 13, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 10/20	Feb. 13, 2020	Semi-annual	Aug. 13, 2020

▶ **Support Equipment**

Description	Manufacturer	Model	Serial Number
N/A	-	-	-

1.5. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2, 22, 24 and 27		
Section	**Test Item(s)**	**Result**
§22.913(a)(5) §24.232(c) §27.50(d)(4)	RF Radiated Output Power	Complied
§22.917(a) §24.238(a) §27.53(h)(1)	Spurious Radiated Emission	Complied
§2.1046	Conducted Output Power	Complied
§2.1049	Occupied Bandwidth	Complied
§22.913(d) §24.232(d) §27.50(d)(5)	Peak-Average Ratio	Complied
§22.917(a) §24.238(a) §27.53(h)(1)	Spurious Emission at Antenna Terminal	Complied
§22.917(a) §24.238(a) §27.53(h)(1)	Band Edge	Complied
§2.1055 §22.355 §24.235 §27.54	Frequency Stability	Complied

1.6. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

1.6.1. Conducted Test

Offset value (㏈) = Directional Coupler (㏈) + Cable loss (㏈)

1.6.2. Radiation test

- E.I.R.P. (㏈ m) = Measured level (㏈㎶) + Antenna factor (㏈/m) + Cable loss (㏈) + 20 Log D - 104.5; where D is the measurement distance in meters.
- E.R.P (㏈ m) = E.I.R.P. (㏈ m) - 2.15 (㏈)

1.7. Worst Case Configuration and Mode

The worst-case is based on the average conducted output power measurement investigation results. Output power measurements were measured on RMC, HSDPA, HSUPA Modulation. All testing was performed using RMC and HSDPA modulations to represent the worst case.

The radiation test of the EUT was investigated in three orthogonal orientations X, Y, and Z, and the worst case data is reported.

1.8. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radiated Emission, 9 ㎑ to 30 ㎒	± 3.59 ㏈
Radiated Emission, below 1 ㎓	± 5.88 ㏈
Radiated Emission, above 1 ㎓	± 5.94 ㏈

Uncertainty figures are valid to a confidence level of 95 %.

1.9. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL000923	2020.07.09	Initial
1	F690501-RF-RTL000923-1	2020.07.15	Revised max power in section 1.10, modified the equipment under test.
2	F690501-RF-RTL000923-2	2020.07.20	Modified the details of applicant.

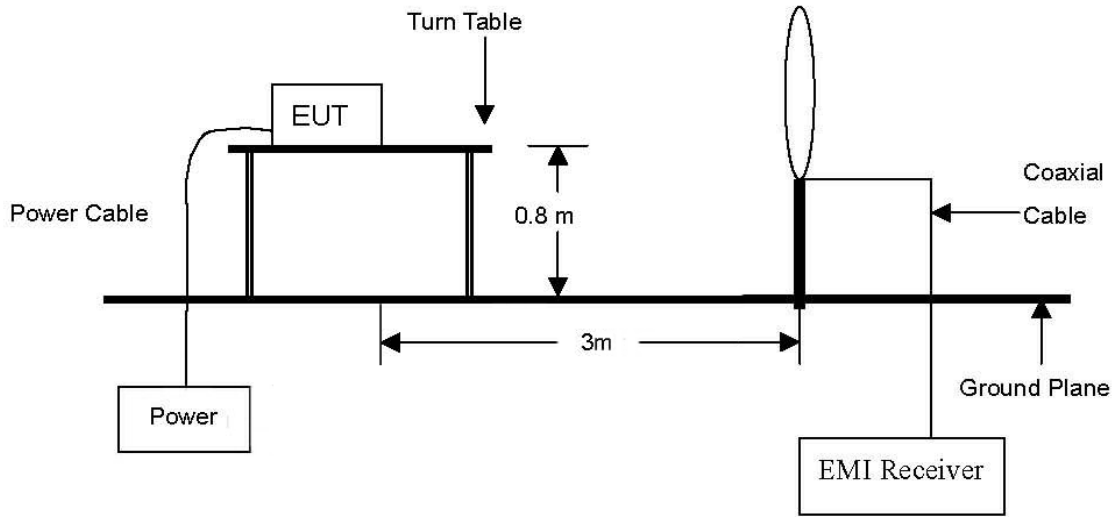
1.10. Emission Designator and Max Power

Mode	Frequency Range (㎒)	Modulation	Emission Designator	E.R.P. / E.I.R.P.	
				Max power (dB m)	Max power (㎽)
GSM 850	824.2 ~ 848.8	VOICE	242KGXW	30.60	1 148.15
		EDGE	245KG7W	23.23	210.38
GSM 1900	1 850.2 ~ 1 909.8	VOICE	240KGXW	29.09	810.96
		EDGE	230KG7W	23.71	234.96
WCDMA 2	1 852.4 ~ 1 907.6	RMC	4M14F9W	24.15	260.02
		HSDPA	4M14F9W	23.05	201.84
WCDMA 4	1 712.4 ~ 1 752.6	RMC	4M15 F9W	23.54	225.94
		HSDPA	4M15 F9W	22.70	186.21
WCDMA 5	826.4 ~ 846.6	RMC	4M15 F9W	24.00	251.19
		HSDPA	4M14 F9W	23.09	203.70

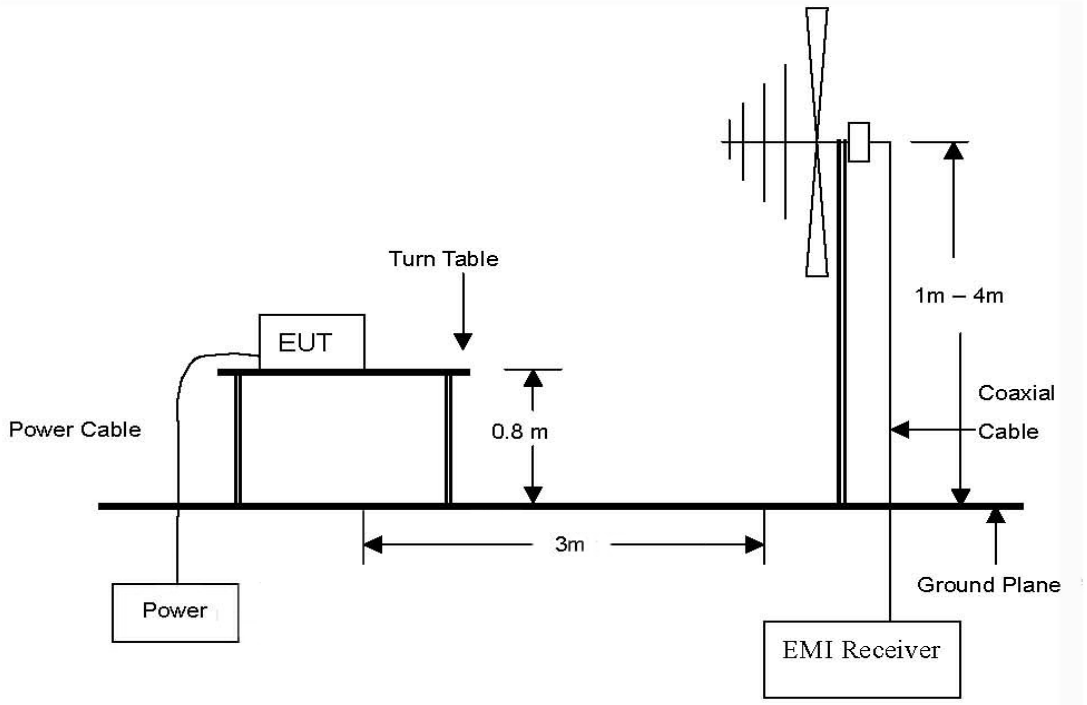
2. RF Radiated Output Power & Spurious Radiated Emission

2.1. Test setup

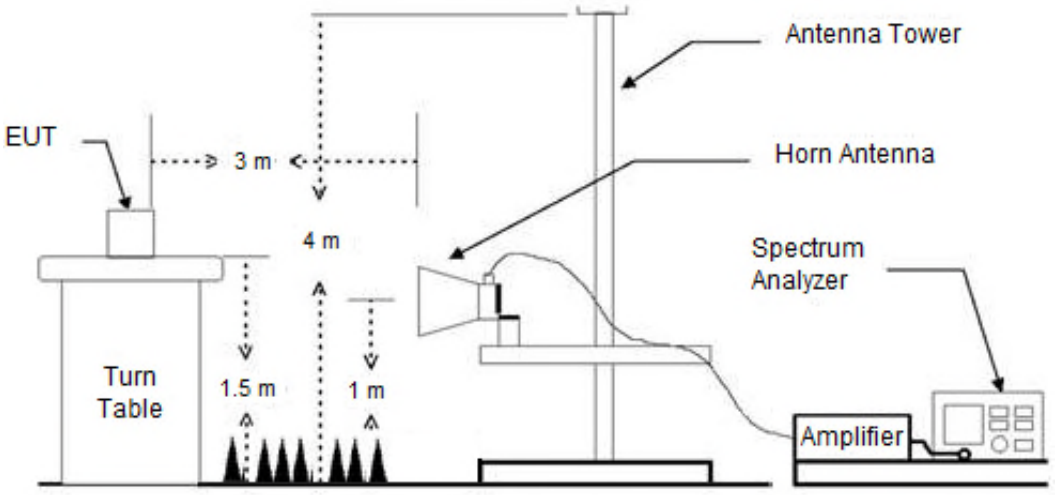
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 20 ㎓ Emissions.



2.2. Limit

2.2.1. Limit of Radiated Output Power

- §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

- §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

- §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1 710-1 755 ㎒ band and mobile and portable stations operating in the 1 695-1 710 ㎒ and 1 755-1 780 ㎒ bands are limited to 1 watt EIRP.

2.2.2. Limit of Spurious Radiated Emission

- §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) ㏈.

2.3. Test Procedure: Based on ANSI/TIA 603E: 2016 and ANSI C63.26-2015

1. On a test site, the EUT shall be placed at 0.8 m or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions occupied bandwidth, RBW = 1-5 % of the OBW (not to exceed 1 ㎒), VBW ≥ 3 x RBW, Detector = power averaging (rms), sweep time = auto, trace average at least 100 traces in power averaging (rms) mode, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. Radiated spurious emissions measurement method was set as follows:
   RBW = 100 ㎑ for emissions below 1 ㎓ and 1 ㎒ for emissions above 1 ㎓, VBW ≥ 3 x RBW,
   Detector = RMS, trace mode = max hold, per the guidelines of ANSI C63.26-2015 and KDB 971168 D01 Power Meas License Digital Systems v03r01.
6. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
7. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
8. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
9. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
10. The maximum signal level detected by the measuring receiver shall be noted.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

2.4. Test result for RF radiated output power

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

WCDMA 2

Frequency (㎒)	Mode	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
								(dB m)	(㎽)
1 852.40	RMC	85.04	H	27.52	5.24	117.80	-95.26	22.54	179.47
1 852.40		85.56	V	27.52	5.24	118.32	-95.26	23.06	202.30
1 880.00		85.93	H	27.74	5.36	119.03	-95.26	23.77	238.23
1 880.00		86.31	V	27.74	5.36	119.41	-95.26	24.15	260.02
1 907.60		85.31	H	27.84	5.42	118.57	-95.26	23.31	214.29
1 907.60		84.17	V	27.84	5.42	117.43	-95.26	22.17	164.82
1 852.40	HSDPA	84.11	H	27.52	5.24	116.87	-95.26	21.61	144.88
1 852.40		84.76	V	27.52	5.24	117.52	-95.26	22.26	168.27
1 880.00		84.88	H	27.74	5.36	117.98	-95.26	22.72	187.07
1 880.00		85.21	V	27.74	5.36	118.31	-95.26	23.05	201.84
1 907.60		84.33	H	27.84	5.42	117.59	-95.26	22.33	171.00
1 907.60		83.05	V	27.84	5.42	116.31	-95.26	21.05	127.35

WCDMA 4

Frequency (㎒)	Mode	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
								(dB m)	(㎽)
1 712.40	RMC	85.64	H	26.95	4.98	117.57	-95.26	22.31	170.22
1 712.40		83.84	V	26.95	4.98	115.77	-95.26	20.51	112.46
1 732.60		86.90	H	26.87	5.03	118.80	-95.26	23.54	225.94
1 732.60		86.72	V	26.87	5.03	118.62	-95.26	23.36	216.77
1 752.60		85.85	H	26.80	5.07	117.72	-95.26	22.46	176.20
1 752.60		86.86	V	26.80	5.07	118.73	-95.26	23.47	222.33
1 712.40	HSDPA	84.78	H	26.95	4.98	116.71	-95.26	21.45	139.64
1 712.40		83.15	V	26.95	4.98	115.08	-95.26	19.82	95.94
1 732.60		86.06	H	26.87	5.03	117.96	-95.26	22.70	186.21
1 732.60		85.98	V	26.87	5.03	117.88	-95.26	22.62	182.81
1 752.60		84.96	H	26.80	5.07	116.83	-95.26	21.57	143.55
1 752.60		85.79	V	26.80	5.07	117.66	-95.26	22.40	173.78

WCDMA 5

Frequency (㎒)	Mode	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P.	
								(dB m)	(㎽)
826.40	RMC	88.18	H	26.96	3.33	118.47	-97.41	21.06	127.64
826.40		89.78	V	26.96	3.33	120.07	-97.41	22.66	184.50
836.60		89.44	H	27.30	3.25	119.99	-97.41	22.58	181.13
836.60		90.42	V	27.30	3.25	120.97	-97.41	23.56	226.99
846.60		89.09	H	27.36	3.23	119.68	-97.41	22.27	168.66
846.60		90.82	V	27.36	3.23	121.41	-97.41	24.00	251.19
826.40	HSDPA	87.32	H	26.96	3.33	117.61	-97.41	20.20	104.71
826.40		88.64	V	26.96	3.33	118.93	-97.41	21.52	141.91
836.60		88.16	H	27.30	3.25	118.71	-97.41	21.30	134.90
836.60		89.56	V	27.30	3.25	120.11	-97.41	22.70	186.21
846.60		88.26	H	27.36	3.23	118.85	-97.41	21.44	139.32
846.60		89.91	V	27.36	3.23	120.50	-97.41	23.09	203.70

GSM 850

Frequency (㎒)	Mode	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P.	
								(dB m)	(㎽)
824.20	VOICE	96.21	H	26.88	3.32	126.41	-97.41	29.00	794.33
824.20		97.81	V	26.88	3.32	128.01	-97.41	30.60	1148.15
836.60		96.04	H	27.30	3.25	126.59	-97.41	29.18	827.94
836.60		97.31	V	27.30	3.25	127.86	-97.41	30.45	1109.17
848.80		94.82	H	27.45	3.24	125.51	-97.41	28.10	645.65
848.80		96.96	V	27.45	3.24	127.65	-97.41	30.24	1056.82
824.20	EDGE	90.44	H	26.88	3.32	120.64	-97.41	23.23	210.38
824.20		89.26	V	26.88	3.32	119.46	-97.41	22.05	160.32
836.60		89.99	H	27.30	3.25	120.54	-97.41	23.13	205.59
836.60		89.11	V	27.30	3.25	119.66	-97.41	22.25	167.88
848.80		89.63	H	27.45	3.24	120.32	-97.41	22.91	195.43
848.80		87.68	V	27.45	3.24	118.37	-97.41	20.96	124.74

GSM 1900

Frequency (㎒)	Mode	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P.	
								(dB m)	(㎽)
1 850.20	VOICE	88.73	H	27.50	5.23	121.46	-95.26	26.20	416.87
1 850.20		88.74	V	27.50	5.23	121.47	-95.26	26.21	417.83
1 880.00		91.25	H	27.74	5.36	124.35	-95.26	29.09	810.96
1 880.00		90.67	V	27.74	5.36	123.77	-95.26	28.51	709.58
1 909.80		86.90	H	27.82	5.42	120.14	-95.26	24.88	307.61
1 909.80		86.43	V	27.82	5.42	119.67	-95.26	24.41	276.06
1 850.20	EDGE	83.20	H	27.50	5.23	115.93	-95.26	20.67	116.68
1 850.20		83.07	V	27.50	5.23	115.80	-95.26	20.54	113.24
1 880.00		85.87	H	27.74	5.36	118.97	-95.26	23.71	234.96
1 880.00		85.05	V	27.74	5.36	118.15	-95.26	22.89	194.54
1 909.80		81.75	H	27.82	5.42	114.99	-95.26	19.73	93.97
1 909.80		81.33	V	27.82	5.42	114.57	-95.26	19.31	85.31

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dB㎶/m) = Measured Level (dB㎶) + Antenna Factor (dB/m) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dB㎶/m) + CF (dB).
4. E.R.P. (dB m) = E (dB㎶/m) + CF (dB) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
5. CF (dB) = 20 log D - 104.8; where D is the measurement distance in meters, According to KDB 971168 D01 v03r01 5.8.4.

2.5. Spurious radiated emission

WCDMA 2 (RMC)

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 852.4 ㎒)									
3 702.16	46.09	H	32.30	-37.11	41.28	-95.26	-53.98	-13	-40.98
3 706.05	45.49	V	32.29	-37.08	40.70	-95.26	-54.56	-13	-41.56
Middle Channel (1 880.0 ㎒)									
3 762.60	49.89	H	32.23	-36.89	45.23	-95.26	-50.03	-13	-37.03
3 762.30	49.63	V	32.22	-36.89	44.96	-95.26	-50.30	-13	-37.30
High Channel (1 907.6 ㎒)									
3 816.50	49.23	H	32.30	-36.96	44.57	-95.26	-50.69	-13	-37.69
3 813.80	49.85	V	32.30	-36.97	45.18	-95.26	-50.08	-13	-37.08

WCDMA 2 (HSDPA)

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 852.4 ㎒)									
3 705.23	44.17	H	32.29	-37.09	39.37	-95.26	-55.89	-13	-42.89
3 706.11	43.16	V	32.29	-37.08	38.37	-95.26	-56.89	-13	-43.89
Middle Channel (1 880.0 ㎒)									
3 763.24	48.76	H	32.23	-36.89	44.10	-95.26	-51.16	-13	-38.16
3 761.36	48.88	V	32.22	-36.89	44.21	-95.26	-51.05	-13	-38.05
High Channel (1 907.6 ㎒)									
3 814.70	48.10	H	32.30	-36.96	43.44	-95.26	-51.82	-13	-38.82
3 815.53	48.45	V	32.30	-36.96	43.79	-95.26	-51.47	-13	-38.47

WCDMA 4 (RMC)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 712.4 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.6 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
High Channel (1 752.6 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

WCDMA 4 (HSDPA)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 712.4 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.6 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
High Channel (1 752.6 ㎒)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

WCDMA 5 (RMC)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.4 ㎒)									
1 650.25	57.02	H	25.81	-40.46	42.37	-97.41	-55.04	-13	-42.04
1 650.11	48.82	V	25.80	-40.46	34.16	-97.41	-63.25	-13	-50.25
Middle Channel (836.6 ㎒)									
1 670.75	52.39	H	26.30	-40.42	38.27	-97.41	-59.14	-13	-46.14
1 670.63	49.11	V	26.30	-40.42	34.99	-97.41	-62.42	-13	-49.42
High Channel (846.6 ㎒)									
1 694.90	48.91	H	26.88	-40.39	35.40	-97.41	-62.01	-13	-49.01
1 694.85	48.53	V	26.88	-40.39	35.02	-97.41	-62.39	-13	-49.39

WCDMA 5 (HSDPA)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.4 ㎒)									
1 650.16	55.48	H	25.80	-40.46	40.82	-97.41	-56.59	-13	-43.59
1 651.48	46.17	V	25.84	-40.46	31.55	-97.41	-65.86	-13	-52.86
Middle Channel (836.6 ㎒)									
1 671.24	51.33	H	26.31	-40.42	37.22	-97.41	-60.19	-13	-47.19
1 672.30	50.05	V	26.34	-40.41	35.98	-97.41	-61.43	-13	-48.43
High Channel (846.6 ㎒)									
1 695.15	47.24	H	26.88	-40.39	33.73	-97.41	-63.68	-13	-50.68
1 692.36	47.88	V	26.82	-40.39	34.31	-97.41	-63.10	-13	-50.10

GSM 850 (VOICE)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (824.2 ㎒)									
1 648.54	61.48	H	25.78	-40.48	46.78	-97.41	-50.63	-13	-37.63
1 648.24	56.98	V	25.77	-40.48	42.27	-97.41	-55.14	-13	-42.14
2 472.44	58.01	H	28.41	-38.54	47.88	-97.41	-49.53	-13	-36.53
2 472.58	52.85	V	28.41	-38.54	42.72	-97.41	-54.69	-13	-41.69
Middle Channel (836.6 ㎒)									
1 673.06	61.63	H	26.35	-40.41	47.57	-97.41	-49.84	-13	-36.84
1 673.30	60.98	V	26.36	-40.41	46.93	-97.41	-50.48	-13	-37.48
2 509.70	57.89	H	28.30	-38.83	47.36	-97.41	-50.05	-13	-37.05
2 509.68	56.51	V	28.30	-38.83	45.98	-97.41	-51.43	-13	-38.43
High Channel (848.8 ㎒)									
1 697.55	59.56	H	26.94	-40.39	46.11	-97.41	-51.30	-13	-38.30
1 697.42	64.18	V	26.94	-40.39	50.73	-97.41	-46.68	-13	-33.68
2 546.42	54.45	H	28.30	-38.79	43.96	-97.41	-53.45	-13	-40.45
2 546.24	53.04	V	28.30	-38.79	42.55	-97.41	-54.86	-13	-41.86

GSM 850 (EDGE)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (824.2 ㎒)									
1 648.38	61.69	H	25.77	-40.48	46.98	-97.41	-50.43	-13	-37.43
1 648.10	61.64	V	25.77	-40.48	46.93	-97.41	-50.48	-13	-37.48
2 472.78	58.00	H	28.41	-38.54	47.87	-97.41	-49.54	-13	-36.54
2 472.50	51.98	V	28.41	-38.54	41.85	-97.41	-55.56	-13	-42.56
Middle Channel (836.6 ㎒)									
1 673.36	66.14	H	26.36	-40.41	52.09	-97.41	-45.32	-13	-32.32
1 672.92	70.74	V	26.35	-40.41	56.68	-97.41	-40.73	-13	-27.73
2 509.74	57.35	H	28.30	-38.83	46.82	-97.41	-50.59	-13	-37.59
2 519.72	55.64	V	28.30	-38.84	45.10	-97.41	-52.31	-13	-39.31
High Channel (848.8 ㎒)									
1 697.38	61.20	H	26.94	-40.39	47.75	-97.41	-49.66	-13	-36.66
1 697.72	59.35	V	26.95	-40.39	45.91	-97.41	-51.50	-13	-38.50
2 546.48	53.75	H	28.30	-38.79	43.26	-97.41	-54.15	-13	-41.15
2 546.24	51.60	V	28.30	-38.79	41.11	-97.41	-56.30	-13	-43.30

GSM 1 900 (VOICE)

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 850.2 ㎒)									
3 700.48	52.84	H	32.30	-37.12	48.02	-95.26	-47.24	-13	-34.24
3 700.28	52.50	V	32.30	-37.12	47.68	-95.26	-47.58	-13	-34.58
9 253.43	39.22	H	37.01	-33.20	43.03	-95.26	-52.23	-13	-39.23
9 251.26	39.01	V	37.01	-33.19	42.83	-95.26	-52.43	-13	-39.43
Middle Channel (1 880.0 ㎒)									
3 760.04	56.29	H	32.22	-36.89	51.62	-95.26	-43.64	-13	-30.64
3 760.08	54.41	V	32.22	-36.89	49.74	-95.26	-45.52	-13	-32.52
9 400.24	39.52	H	37.40	-33.16	43.76	-95.26	-51.50	-13	-38.50
9 400.16	39.88	V	37.40	-33.16	44.12	-95.26	-51.14	-13	-38.14
High Channel (1 909.8 ㎒)									
3 819.50	57.11	H	32.30	-36.95	52.46	-95.26	-42.80	-13	-29.80
3 819.67	54.12	V	32.30	-36.95	49.47	-95.26	-45.79	-13	-32.79
9 549.52	41.16	H	37.50	-33.04	45.62	-95.26	-49.64	-13	-36.64
9 549.34	39.63	V	37.50	-33.04	44.09	-95.26	-51.17	-13	-38.17

GSM 1 900 (EDGE)

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 850.2 ㎒)									
3700.54	54.76	H	32.30	-37.12	49.94	-95.26	-45.32	-13	-32.32
3700.36	56.85	V	32.30	-37.12	52.03	-95.26	-43.23	-13	-30.23
9 252.26	41.16	H	37.01	-33.20	44.97	-95.26	-50.29	-13	-37.29
9 253.11	40.25	V	37.01	-33.20	44.06	-95.26	-51.20	-13	-38.20
Middle Channel (1 880.0 ㎒)									
3 760.04	55.58	H	32.22	-36.89	50.91	-95.26	-44.35	-13	-31.35
3 760.10	52.76	V	32.22	-36.89	48.09	-95.26	-47.17	-13	-34.17
9 400.26	41.26	H	37.40	-33.16	45.50	-95.26	-49.76	-13	-36.76
9 400.11	41.35	V	37.40	-33.16	45.59	-95.26	-49.67	-13	-36.67
High Channel (1 909.8 ㎒)									
3 819.50	56.72	H	32.30	-36.95	52.07	-95.26	-43.19	-13	-30.19
3 819.88	54.14	V	32.30	-36.95	49.49	-95.26	-45.77	-13	-32.77
9 548.98	42.16	H	37.50	-33.04	46.62	-95.26	-48.64	-13	-35.64
9 550.26	40.88	V	37.50	-33.04	45.34	-95.26	-49.92	-13	-36.92

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dB㎶/m) = Measured Level (dB㎶) + Antenna Factor (dB/m) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dB㎶/m) + CF (dB).
4. E.R.P. (dB m) = E (dB㎶/m) + CF (dB) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
5. CF (dB) = 20 log D - 104.8; where D is the measurement distance in meters, According to KDB 971168 D01 v03r01 5.8.4.
6. The frequency spectrum is examined from 9 ㎑ to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

3. Conducted Output Power

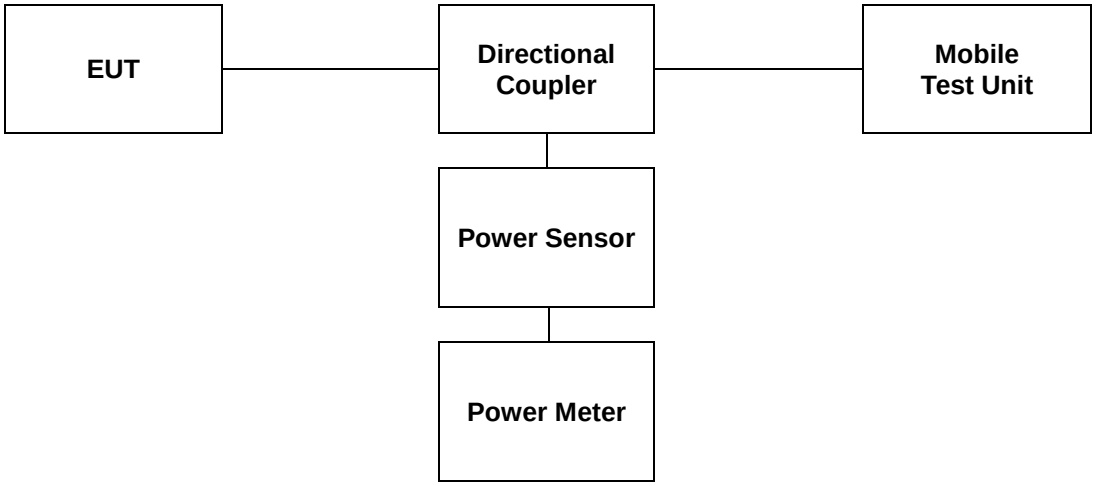
3.1. Limit

CFR 47, Section FCC §2.1046.

3.2. Test Procedure

Output power shall be measured at the RF output terminals for all configurations.

1. The RF output of the transmitter was connected to the input of the mobile test unit in order to establish communication with the EUT.
2. The EUT was set up for the max. output power with pseudo random data modulation by using mobile test unit parameters.
3. The measurement performed using a wideband RF power meter.
4. This EUT was tested under all configurations and the highest power was investigated and reported.



3.3. Test Result

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

Band	3GPP Release Version	Channel		9262	9400	9538
		Frequency (㎒)		1 852.4	1 880.0	1 907.6
WCDMA 2	99	WCDMA	RMC	23.50	23.83	23.49
	5	HSDPA	Subtest 1	22.43	22.78	22.44
	5		Subtest 2	22.48	22.75	22.38
	5		Subtest 3	21.98	22.36	21.88
	5		Subtest 4	21.89	22.28	21.95
	6	HSUPA	Subtest 1	22.47	22.76	22.45
	6		Subtest 2	22.05	22.26	22.00
	6		Subtest 3	22.46	22.80	22.48
	6		Subtest 4	22.45	22.79	22.46
	6		Subtest 5	22.39	22.82	22.44
	7	HSPA+		22.06	22.04	22.12
	8	DC-HSDPA	Subtest 1	23.29	23.39	23.38
	8		Subtest 2	23.25	23.35	23.36
	8		Subtest 3	22.79	22.97	22.95
	8		Subtest 4	22.76	22.94	22.89

Band	3GPP Release Version	Channel		1312	1413	1513
		Frequency (㎒)		1 712.4	1 732.6	1 752.6
WCDMA 4	99	WCDMA	RMC	23.34	23.83	23.33
	5	HSDPA	Subtest 1	22.30	22.74	22.75
	5		Subtest 2	22.35	22.75	22.69
	5		Subtest 3	21.81	22.29	22.32
	5		Subtest 4	21.79	22.27	22.10
	6	HSUPA	Subtest 1	22.35	22.68	22.59
	6		Subtest 2	22.02	22.16	22.09
	6		Subtest 3	22.30	22.67	22.78
	6		Subtest 4	22.36	22.65	22.73
	6		Subtest 5	22.22	22.22	22.21
	7	HSPA+		22.18	22.21	22.20
	8	DC-HSDPA	Subtest 1	23.20	23.31	23.21
	8		Subtest 2	23.15	23.27	23.13
	8		Subtest 3	22.78	22.80	22.83
	8		Subtest 4	22.75	22.78	22.80

Band	3GPP Release Version	Channel		4132	4182	4233
		Frequency (㎒)		826.4	836.6	846.6
WCDMA 5	99	WCDMA	RMC	24.45	24.41	24.40
	5	HSDPA	Subtest 1	23.46	23.41	23.42
	5		Subtest 2	23.47	23.41	23.40
	5		Subtest 3	22.95	22.91	22.91
	5		Subtest 4	22.97	22.89	22.92
	6	HSUPA	Subtest 1	23.46	23.27	23.37
	6		Subtest 2	21.44	21.37	21.36
	6		Subtest 3	20.45	20.14	20.38
	6		Subtest 4	21.25	21.14	21.19
	6		Subtest 5	23.43	23.36	23.37
	7	HSPA+		23.45	23.34	23.47
	8	DC-HSDPA	Subtest 1	24.27	24.37	24.26
	8		Subtest 2	24.25	24.32	24.21
	8		Subtest 3	23.77	23.87	23.76
	8		Subtest 4	23.72	23.85	23.74

Band	Channel	Frequency (㎒)	GSM	GPRS				EDGE			
			Voice	1 Tx slot	2 Tx slot	3 Tx slot	4 Tx slot	1 Tx slot	2 Tx slot	3 Tx slot	4 Tx slot
			(dB m)	(dB m)	(dB m)	(dB m)	(dB m)	(dB m)	(dB m)	(dB m)	(dB m)
GSM 850	128	824.2	32.73	32.68	31.30	29.20	27.40	26.30	24.85	22.87	21.80
	190	836.6	32.81	32.59	31.35	29.38	27.50	26.71	25.15	23.18	22.12
	251	848.8	32.78	32.36	31.42	29.37	27.38	26.41	24.77	22.81	21.75
GSM 1 900	512	1 850.2	28.92	28.99	27.55	26.00	24.02	25.17	23.64	21.70	20.31
	661	1 880.0	29.58	29.66	27.95	26.53	24.51	25.60	24.04	21.91	20.89
	810	1 909.8	29.09	29.20	27.44	26.00	23.84	25.22	23.68	21.60	20.40

4. Occupied Bandwidth

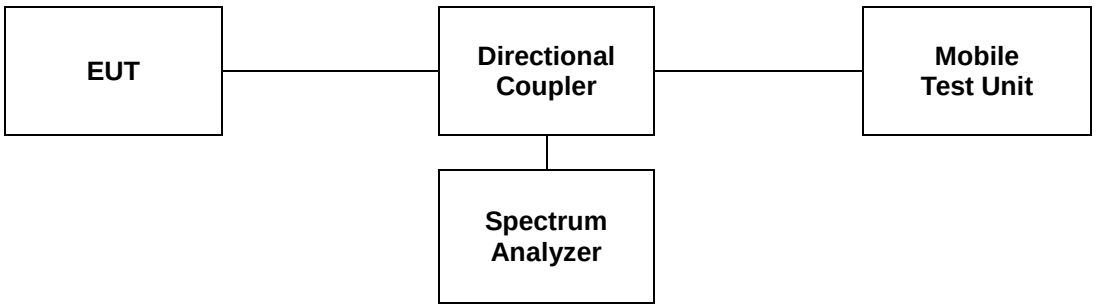
4.1. Limit

CFR 47, Section FCC §2.1049.

4.2. Test Procedure

The test follows section 5.4.4 of ANSI C63.26-2015.

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 × 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 ≥ 3 × 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).



4.3 Test Results

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

Band	Mode	Frequency (㎒)	Occupied Bandwidth (㎒)
WCDMA 2	RMC	1 880.0	4.139
	HSDPA		4.139
WCDMA 4	RMC	1 732.6	4.153
	HSDPA		4.153
WCDMA 5	RMC	836.6	4.153
	HSDPA		4.139

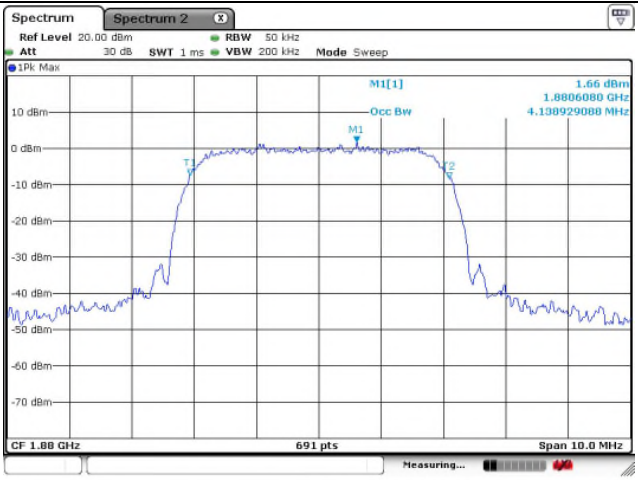
Band	Mode	Frequency (㎒)	Occupied Bandwidth (㎒)
GSM 850	VOICE	836.6	0.242
	EDGE		0.245
GSM 1 900	VOICE	1 880.0	0.240
	EDGE		0.230

Note;

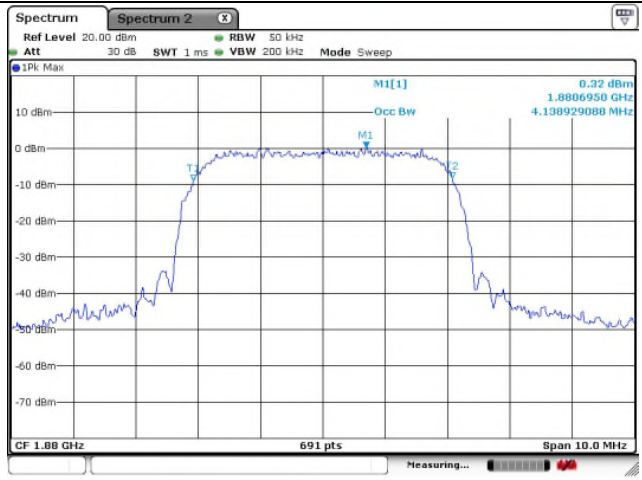
There is no limit required and power is the same for low, middle and high channel; therefore, All channels were tested but only middle channel was reported.

- Test plots

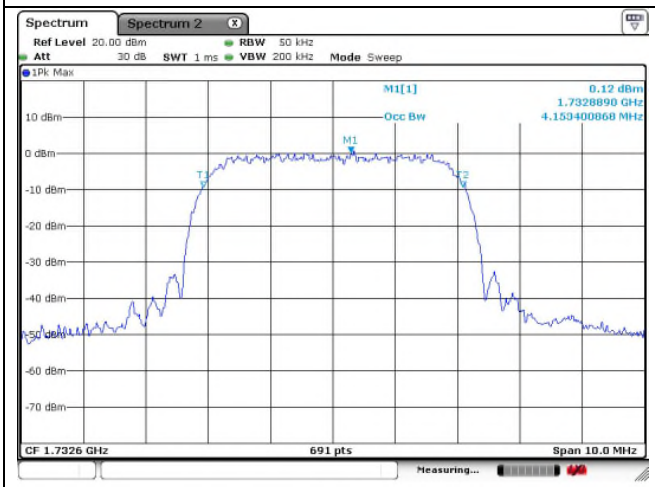
WCDMA



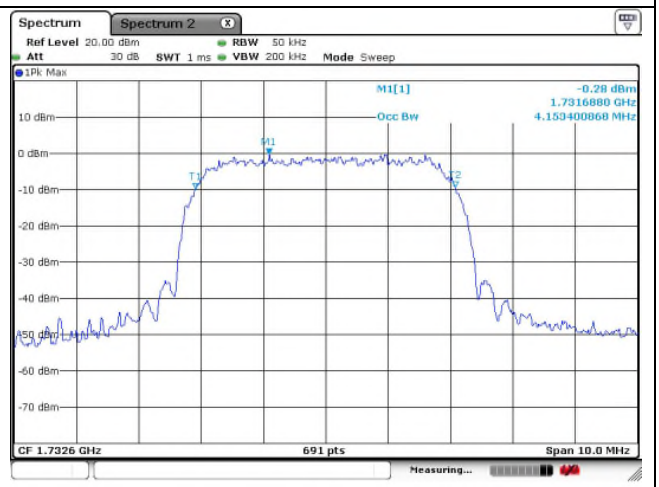
WCDMA BAND 2 RMC Middle Channel



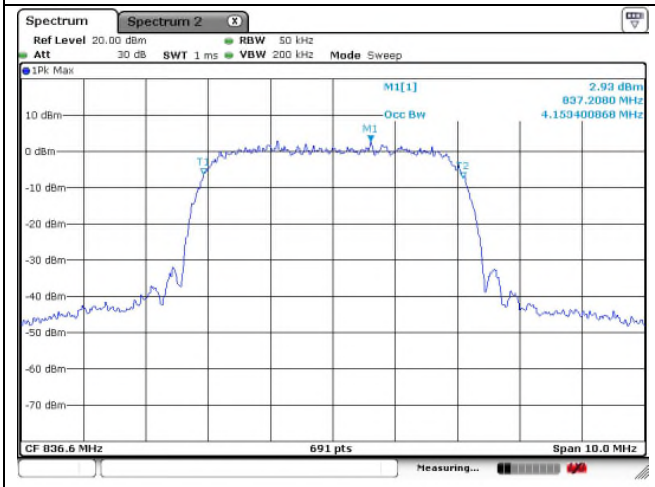
WCDMA BAND 2 HSDPA Middle Channel



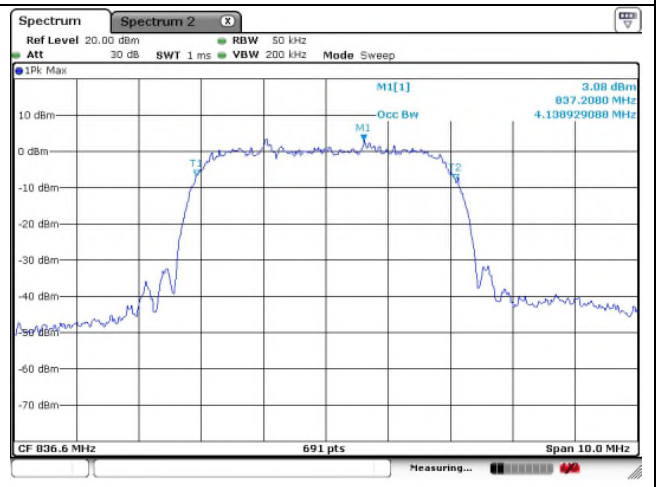
WCDMA BAND 4 RMC Middle Channel



WCDMA BAND 4 HSDPA Middle Channel



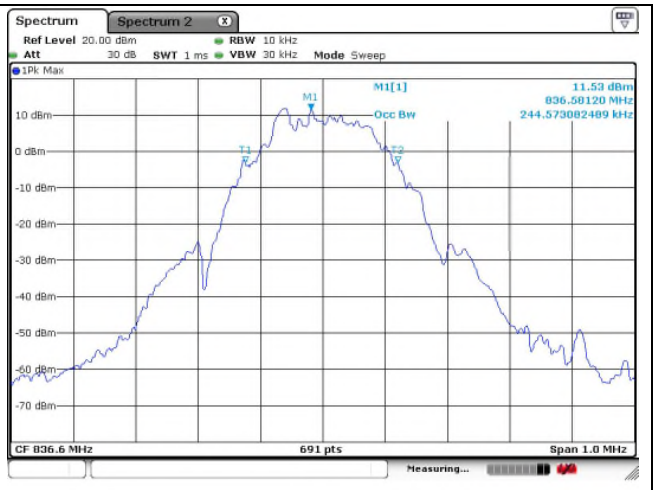
WCDMA BAND 5 RMC Middle Channel



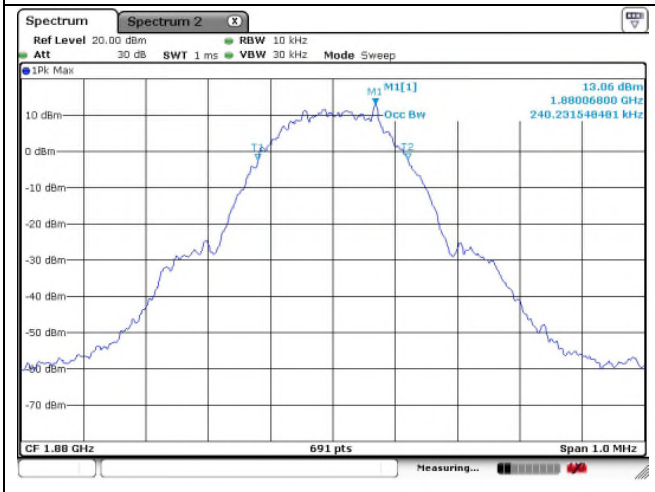
WCDMA BAND 5 HSDPA Middle Channel

GSM

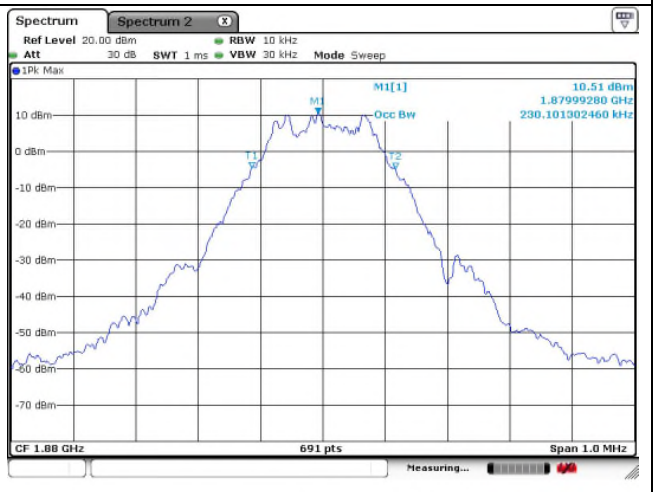
GSM 850 VOICE Middle Channel



GSM 850 EDGE Middle Channel



GSM 1 900 VOICE Middle Channel



GSM 1 900 EDGE Middle Channel

5. Peak-Average Ratio

5.1. Limit

- §22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 ㏈.

- §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㏈.

- §27.50(d)(5), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㏈.

5.2. Test Procedure

The test follows section 5.2.3.4 of ANSI C63.26-2015.

See instrumentation-specific application literature for further guidance regarding use of the CCDF capability. The following guidelines are offered for performing a CCDF measurement.

a. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.

b. Set the number of counts to a value that stabilizes the measured CCDF curve.

c. Set the measurement interval as follows:

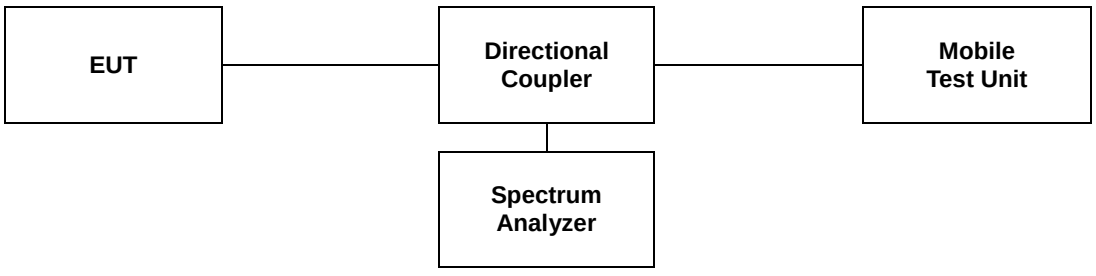
1) For continuous transmissions, set to greater of [10 x (number of points in sweep) x (transmission symbol period)] or 1 ㎳.

2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.

3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.

d. Record the maximum PAPR level associated with a probability of 0.1 %.

e. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.



5.3 Test Results

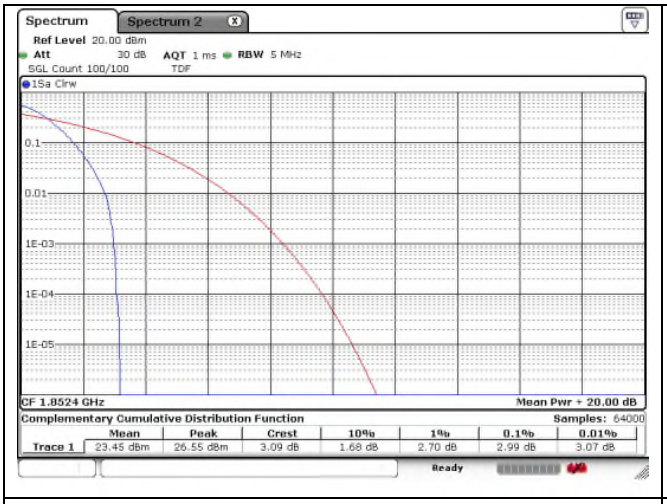
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Band	Frequency (㎒)	PAR (dB)	
		RMC	HSDPA
WCDMA 2	1 852.4	2.99	3.30
	1 880.0	3.01	3.36
	1 907.6	3.04	3.33
WCDMA 4	1 712.4	2.99	3.33
	1 732.6	2.96	3.33
	1 752.6	3.04	3.30
WCDMA 5	826.4	2.96	3.28
	836.6	2.99	3.30
	846.6	2.96	3.30

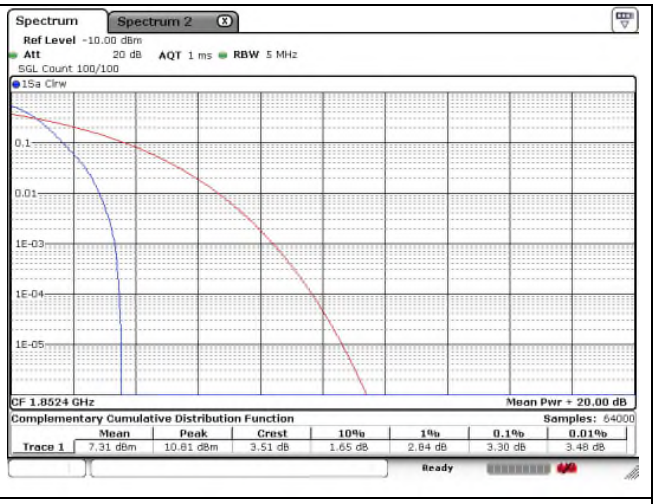
Band	Frequency (㎒)	PAR (dB)	
		VOICE	EDGE
GSM 850	824.2	8.29	8.41
	836.6	8.14	8.43
	848.8	7.97	8.17
GSM 1 900	1 850.2	8.43	8.93
	1 880.0	8.17	8.17
	1 909.8	8.81	8.23

- Test plots

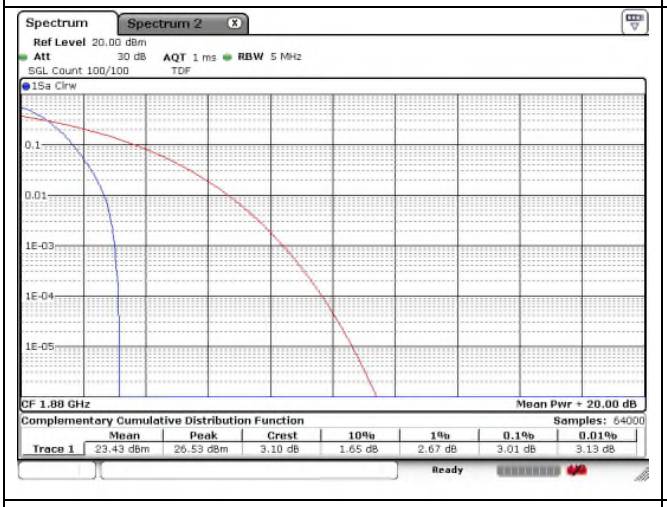
WCDMA



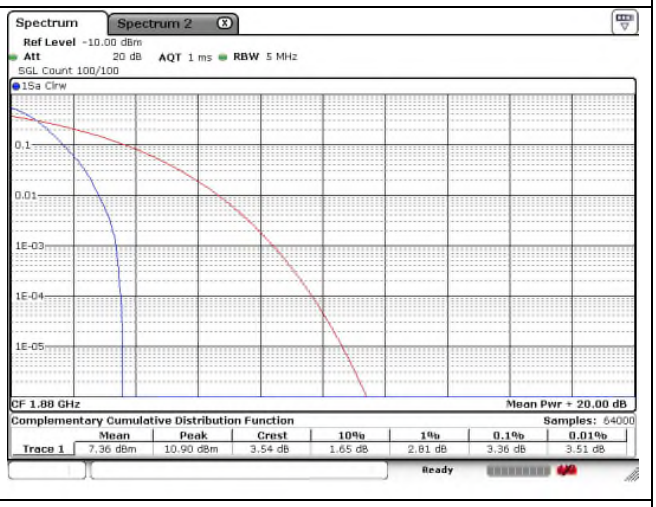
WCDMA BAND 2 RMC Low Channel



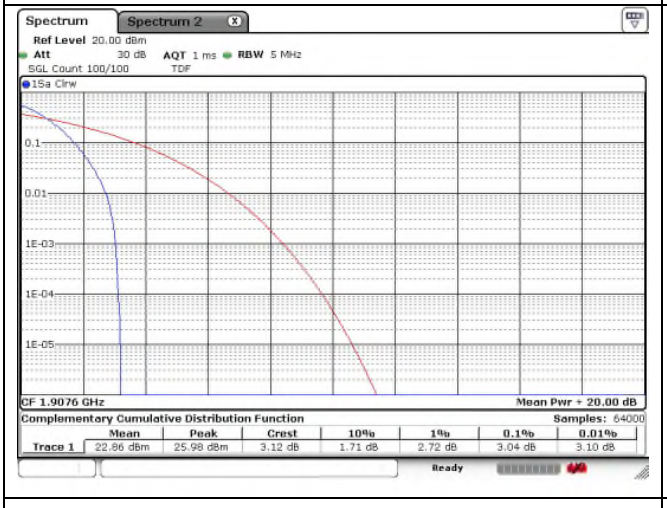
WCDMA BAND 2 HSDPA Low Channel



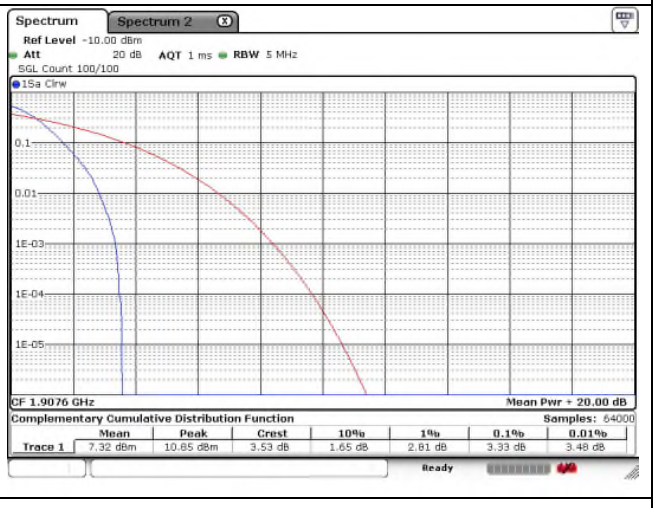
WCDMA BAND 2 RMC Middle Channel



WCDMA BAND 2 HSDPA Middle Channel

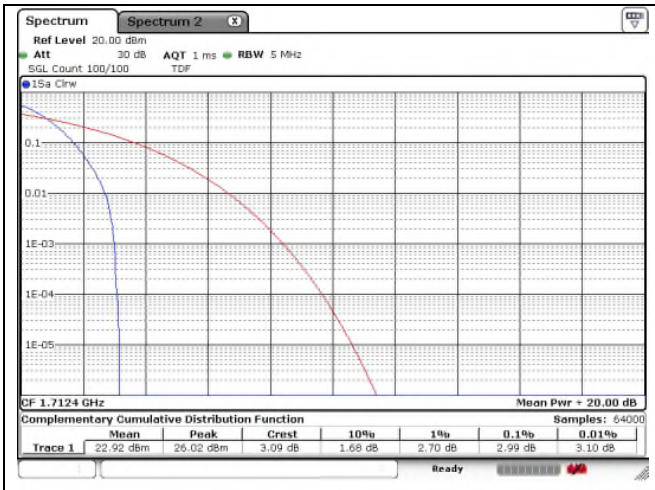


WCDMA BAND 2 RMC High Channel

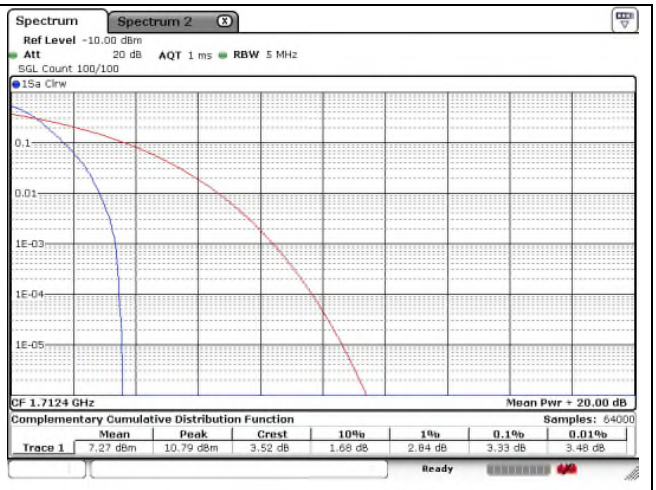


WCDMA BAND 2 HSDPA High Channel

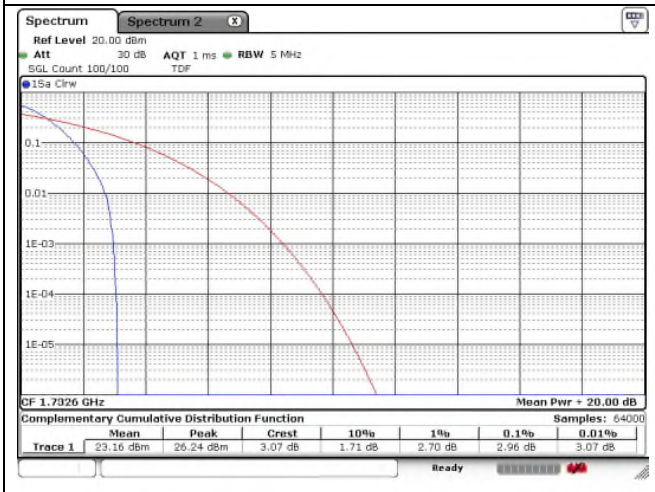
WCDMA



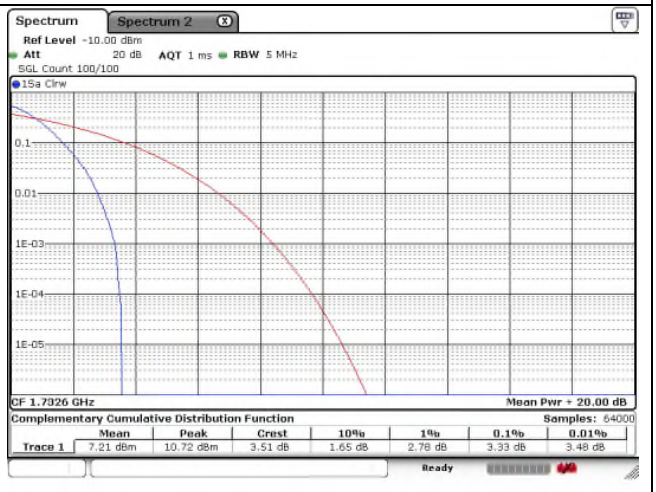
WCDMA BAND 4 RMC Low Channel



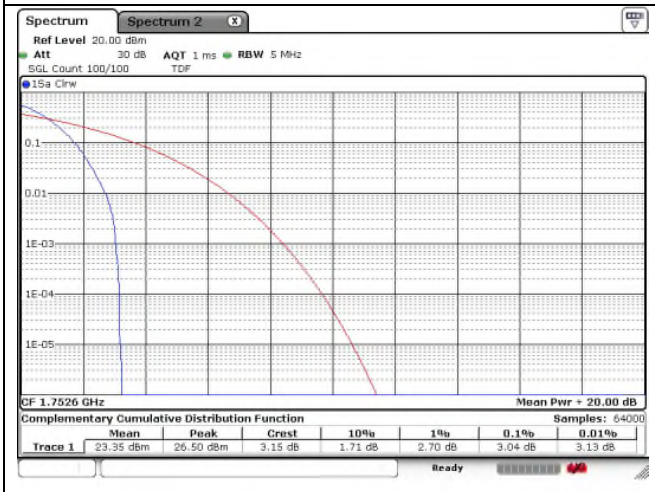
WCDMA BAND 4 HSDPA Low Channel



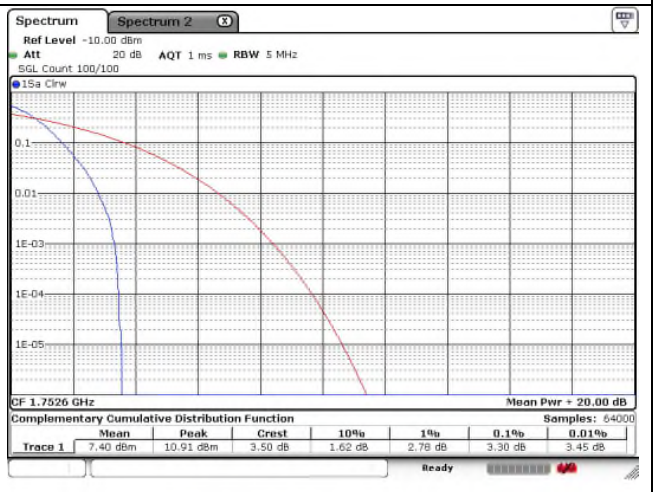
WCDMA BAND 4 RMC Middle Channel



WCDMA BAND 4 HSDPA Middle Channel

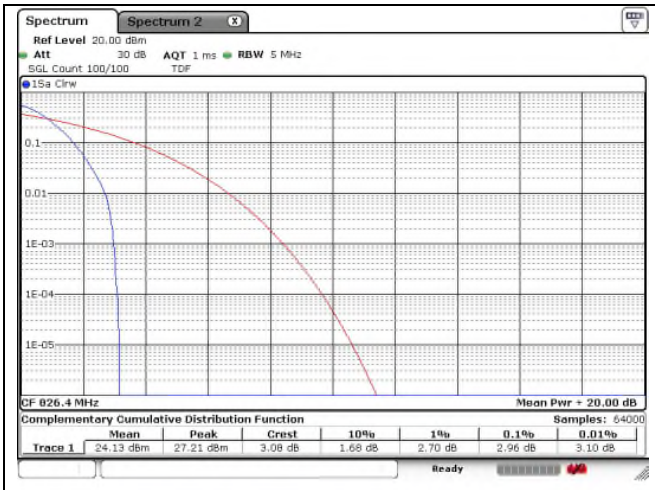


WCDMA BAND 4 RMC High Channel

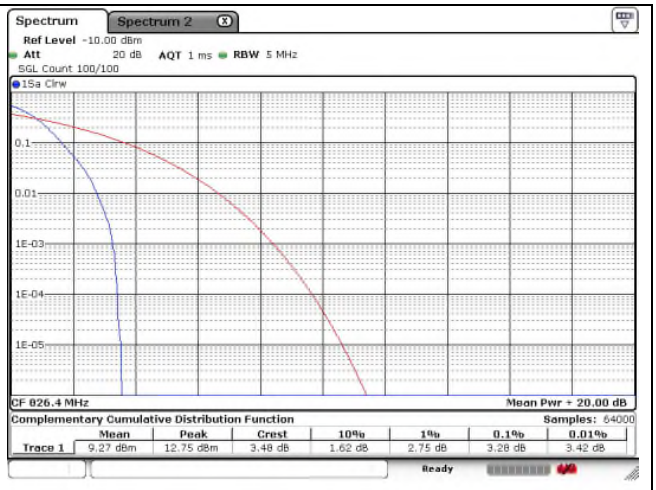


WCDMA BAND 4 HSDPA High Channel

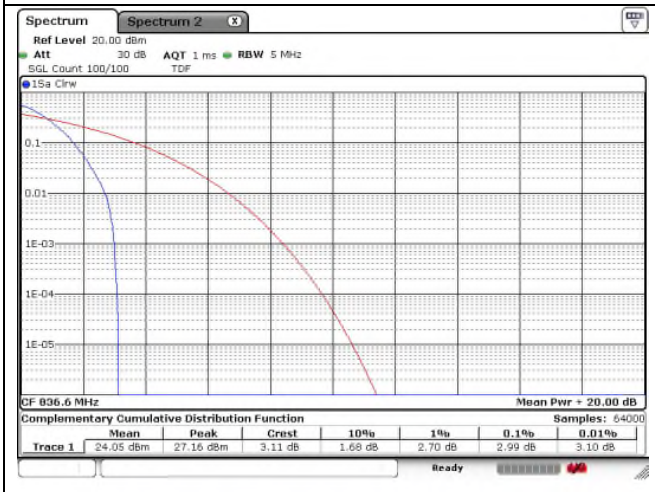
WCDMA



WCDMA BAND 5 RMC Low Channel



WCDMA BAND 5 HSDPA Low Channel



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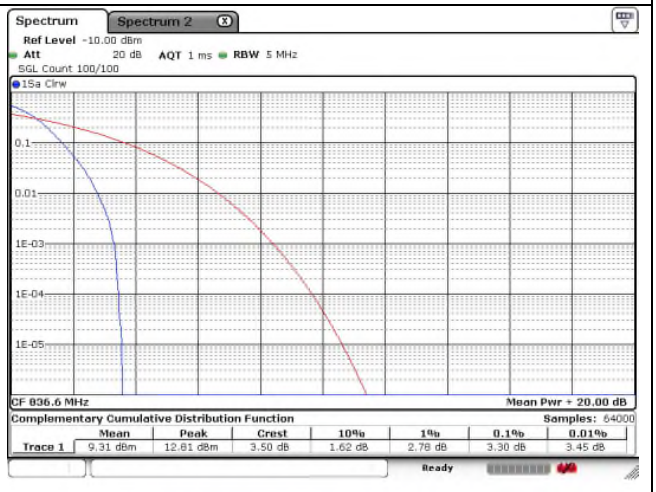
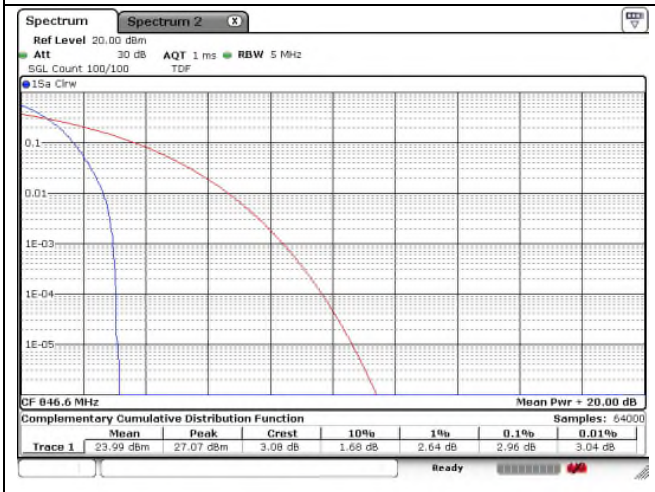
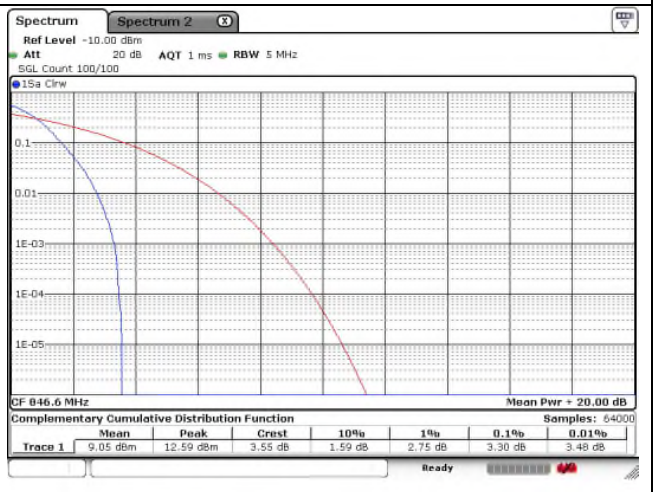


WCDMA BAND 5 HSDPA Middle Channel

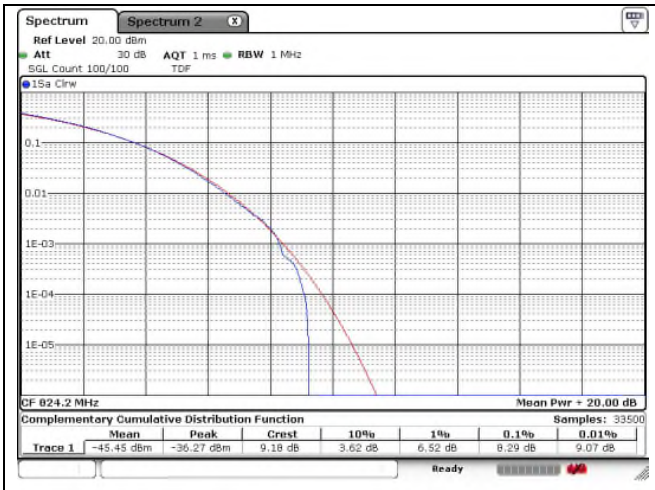


WCDMA BAND 5 RMC High Channel

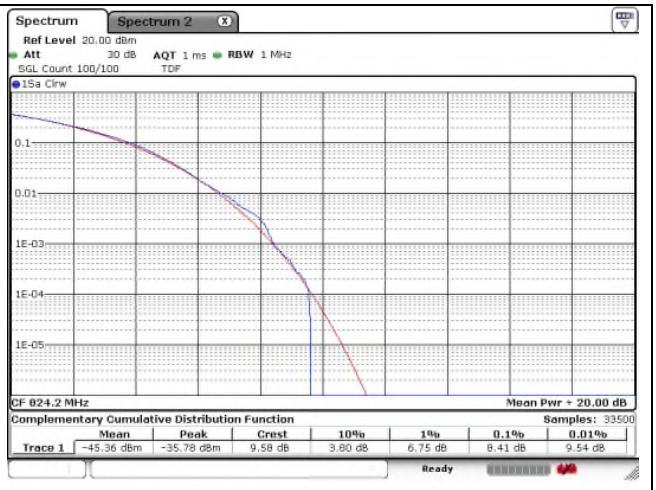


WCDMA BAND 5 HSDPA High Channel

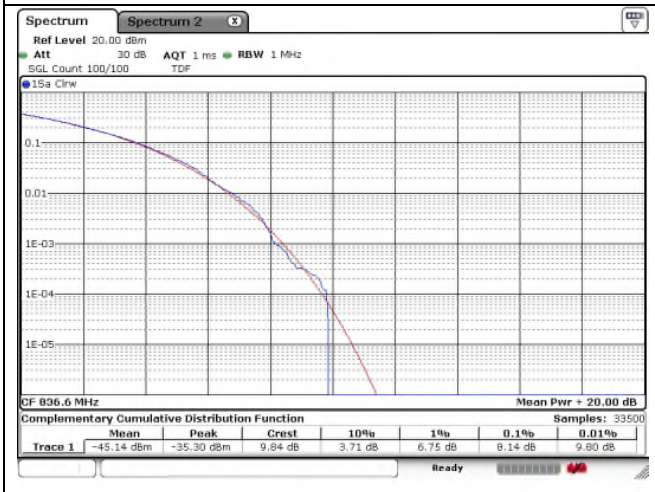
GSM



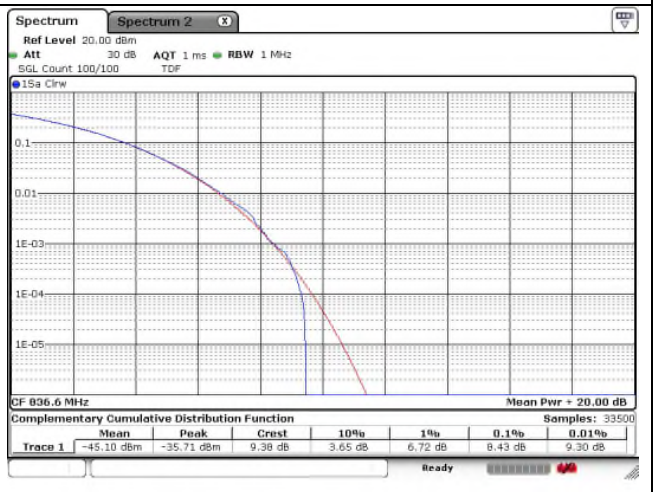
GSM 850 VOICE Low Channel



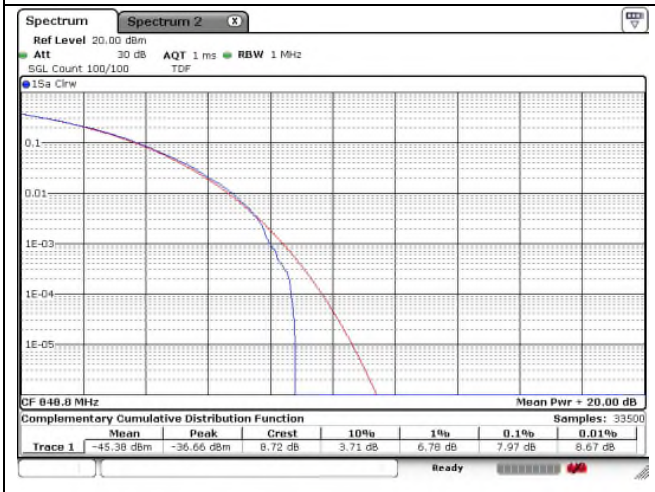
GSM 850 EDGE Low Channel



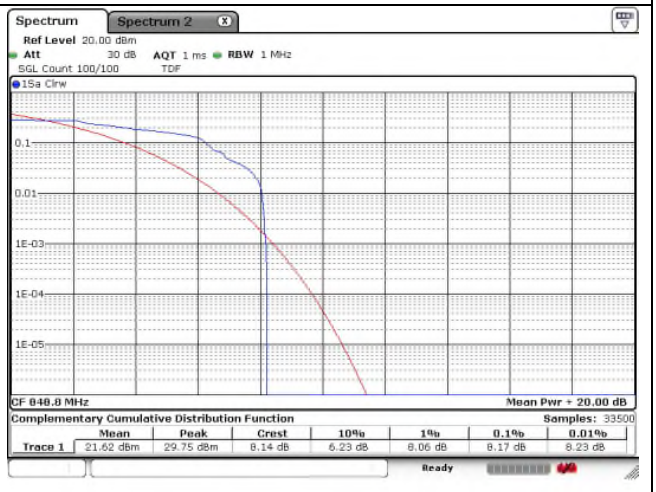
GSM 850 VOICE Middle Channel



GSM 850 EDGE Middle Channel

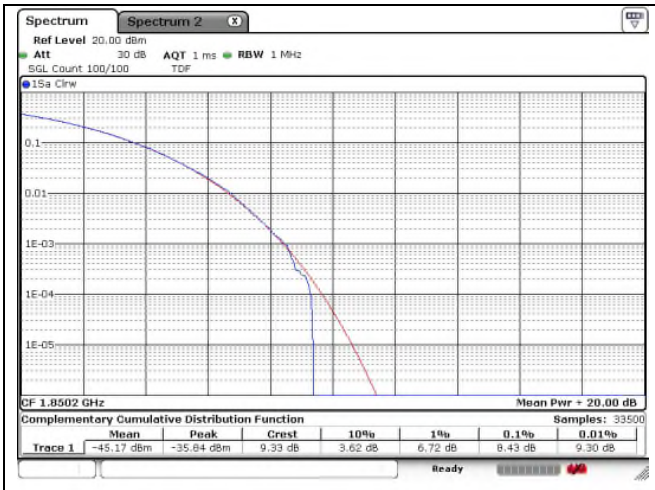


GSM 850 VOICE High Channel

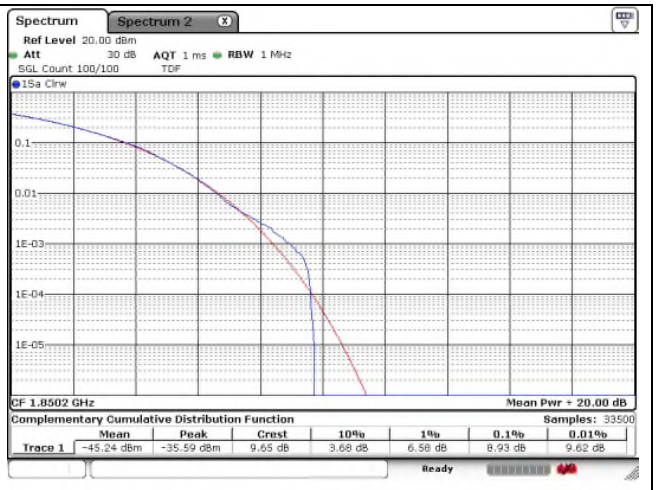


GSM 850 EDGE High Channel

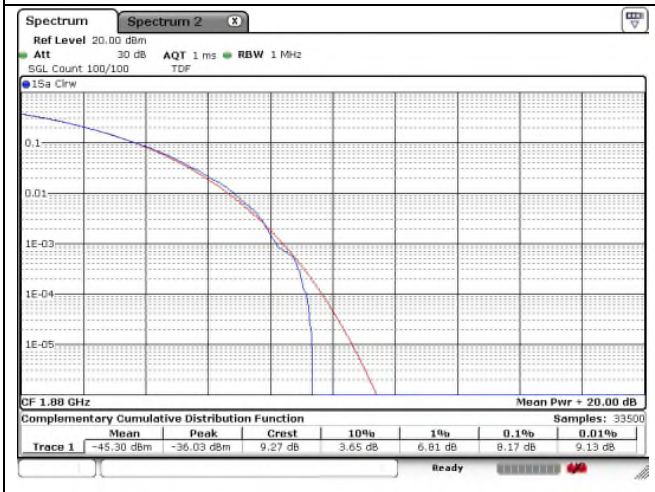
GSM



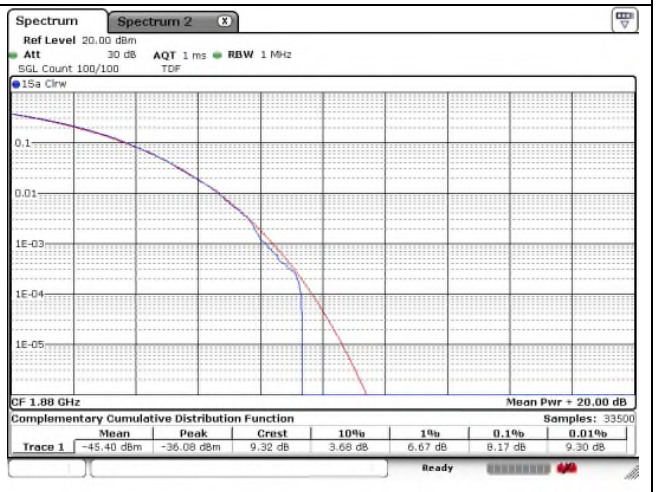
GSM 1 900 VOICE Low Channel



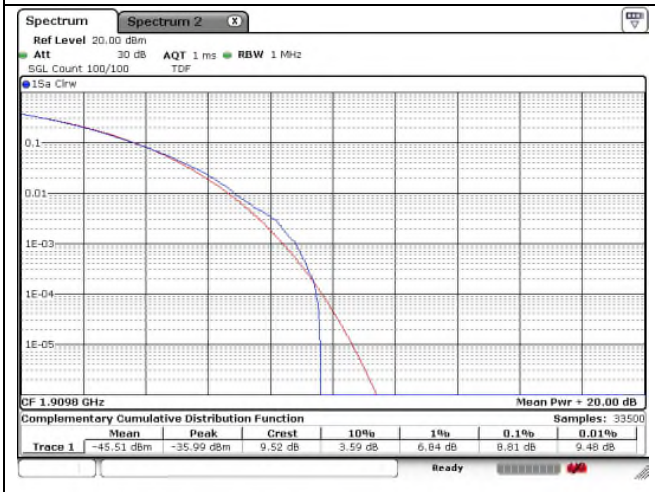
GSM 1 900 EDGE Low Channel



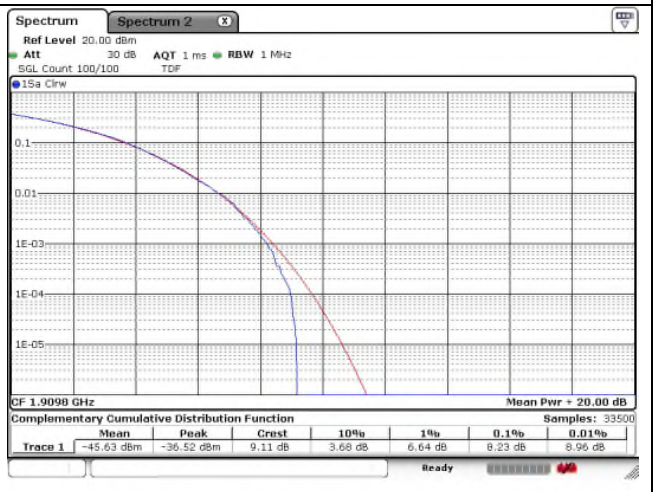
GSM 1 900 VOICE Middle Channel



GSM 1 900 EDGE Middle Channel



GSM 1 900 VOICE High Channel



GSM 1 900 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) ㏈.

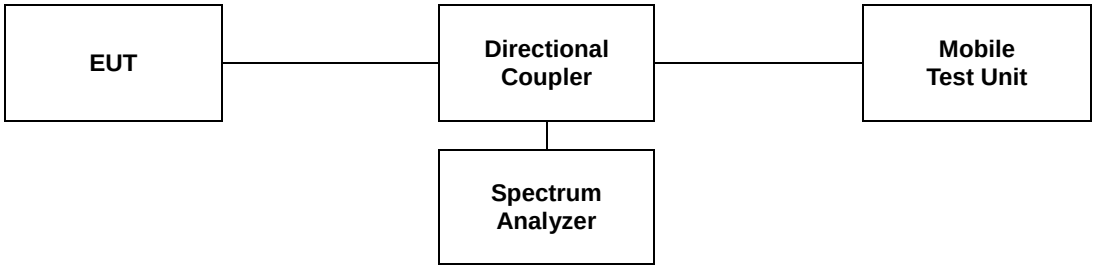
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §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 = Peak.
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;

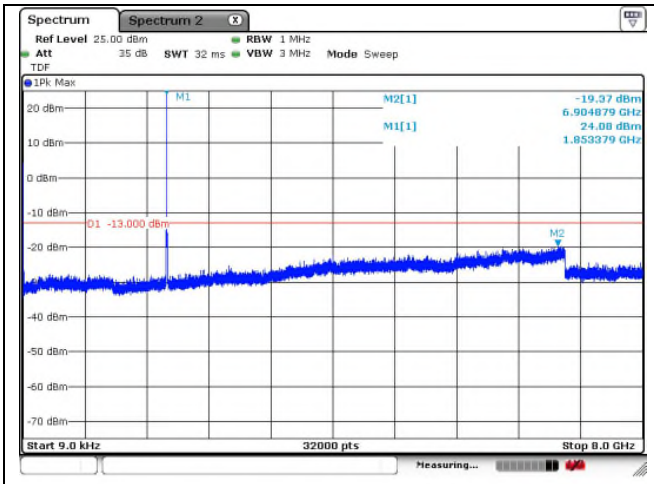
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 ㎑ or greater for frequencies less than 1 ㎓ and frequencies greater than 1 ㎓. However, in the 1 ㎒ bands immediately outside and adjacent to the frequency block a resolution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

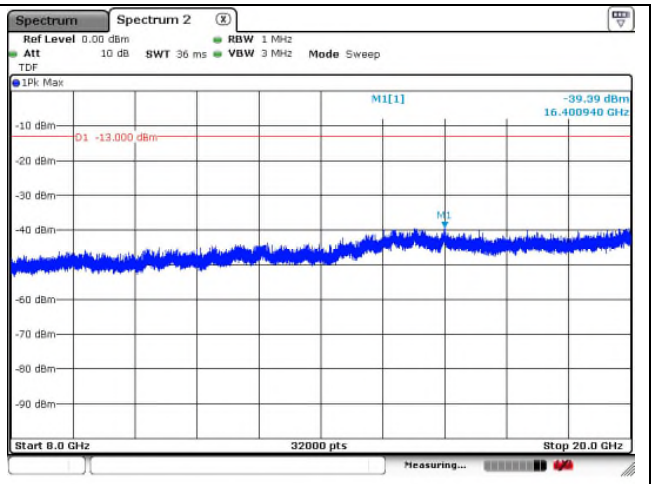
6.3. Test Results

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

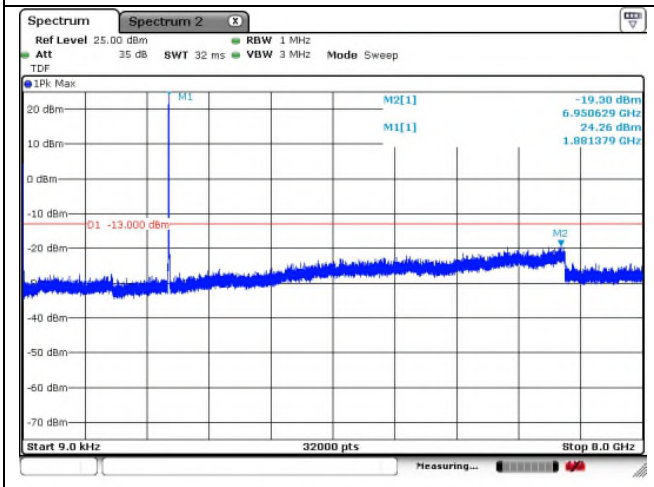
- Test plots

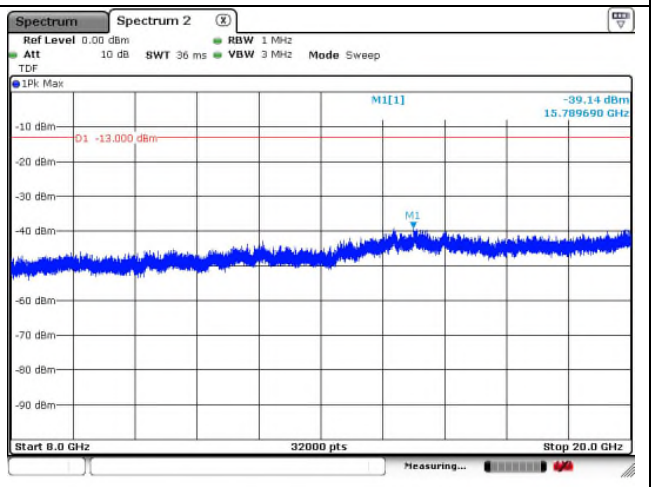
WCDMA 2



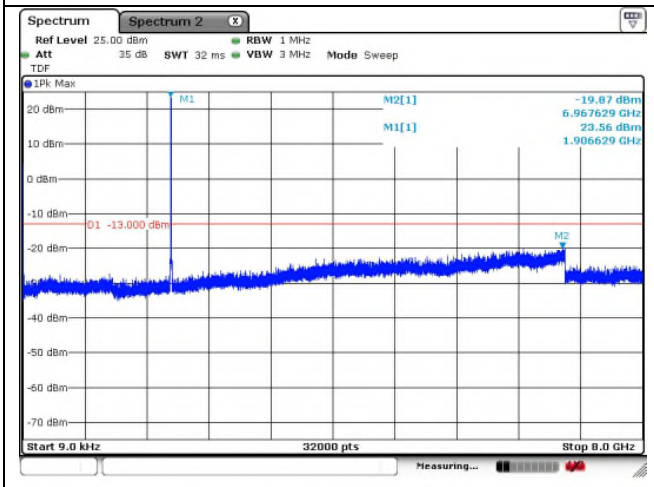


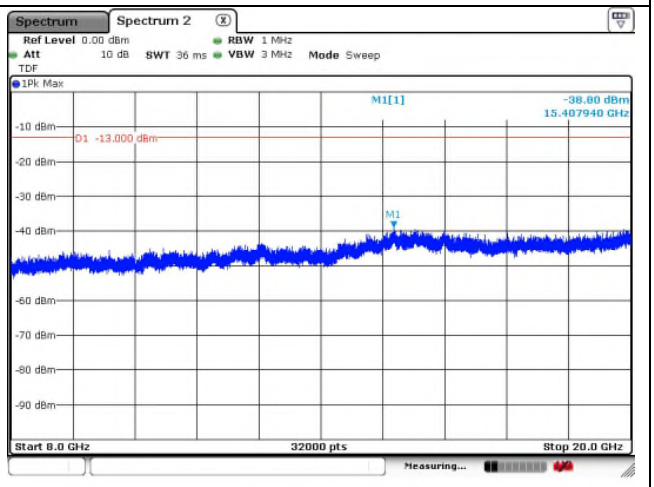
WCDMA 2 RMC Low Channel





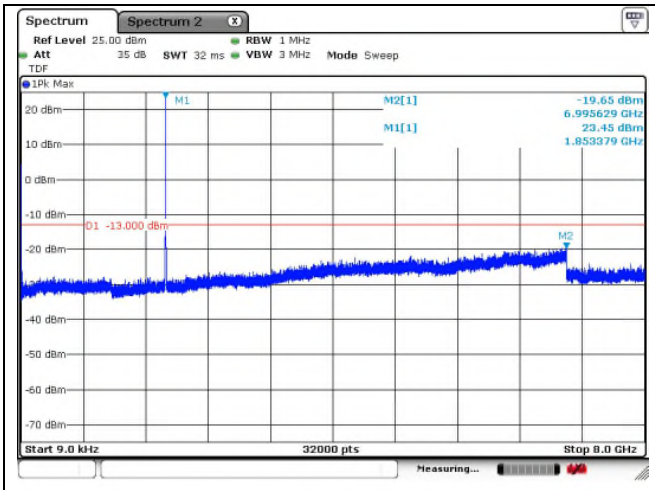
WCDMA 2 RMC Middle Channel

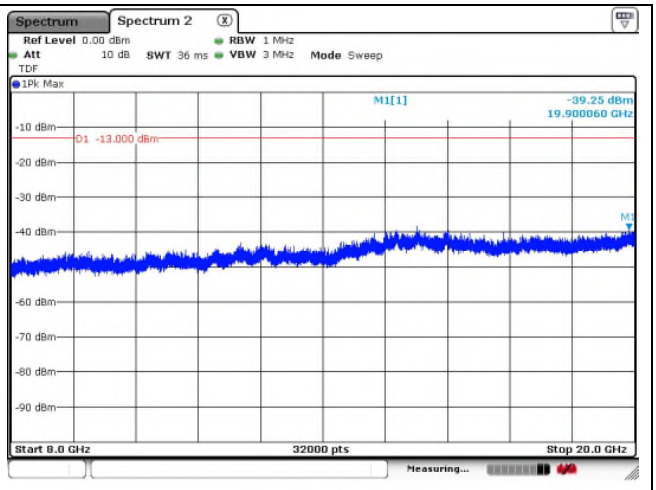




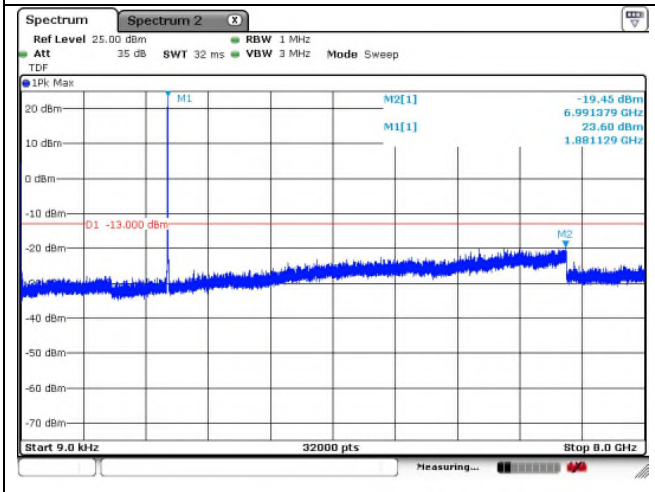
WCDMA 2 RMC High Channel

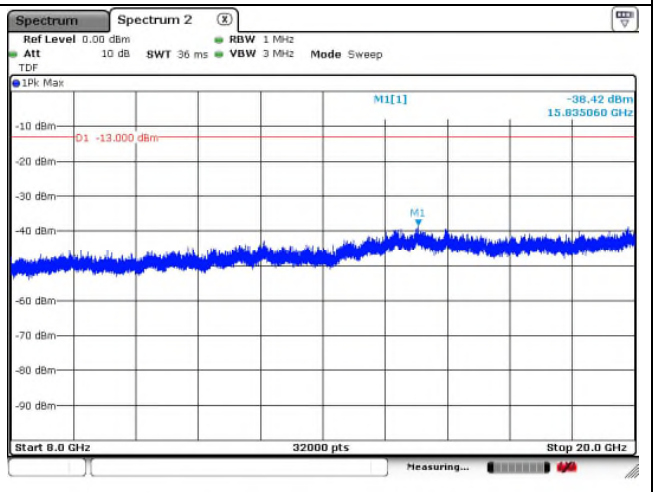
WCDMA 2



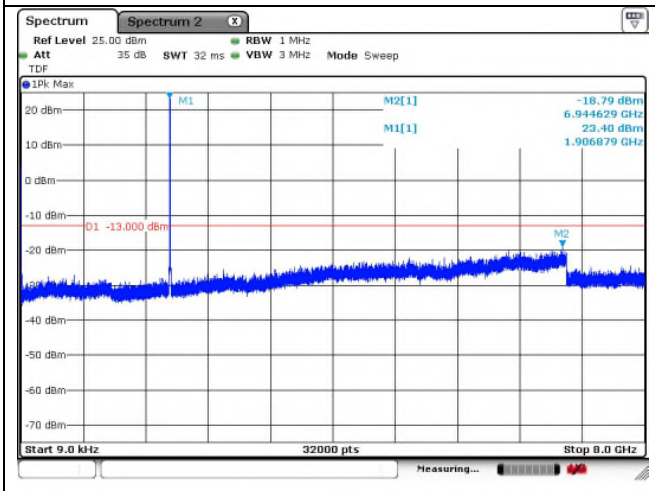


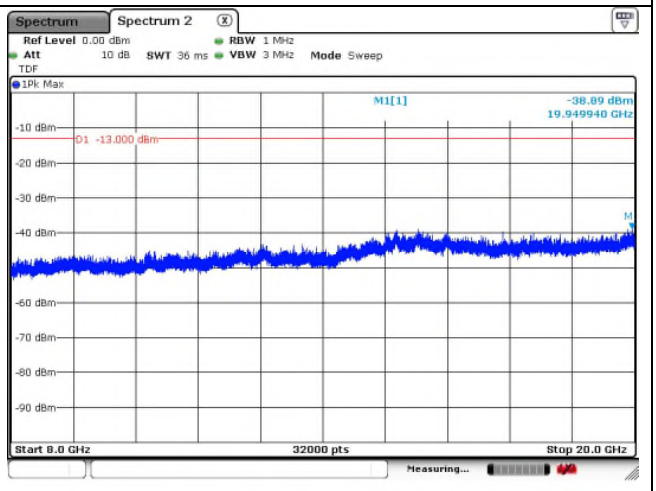
WCDMA 2 HSDPA Low Channel





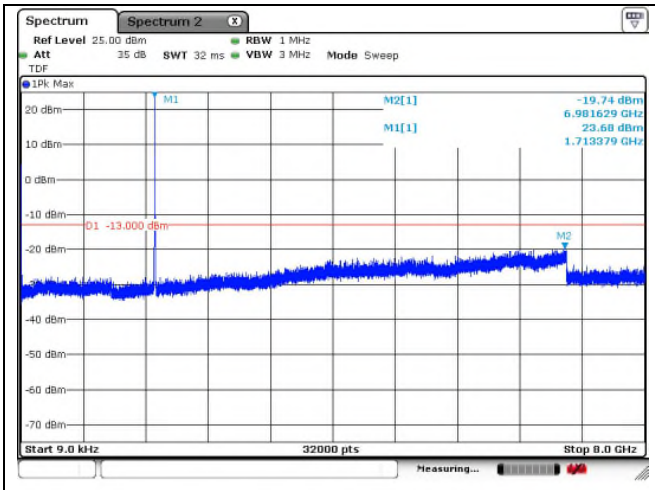
WCDMA 2 HSDPA Middle Channel

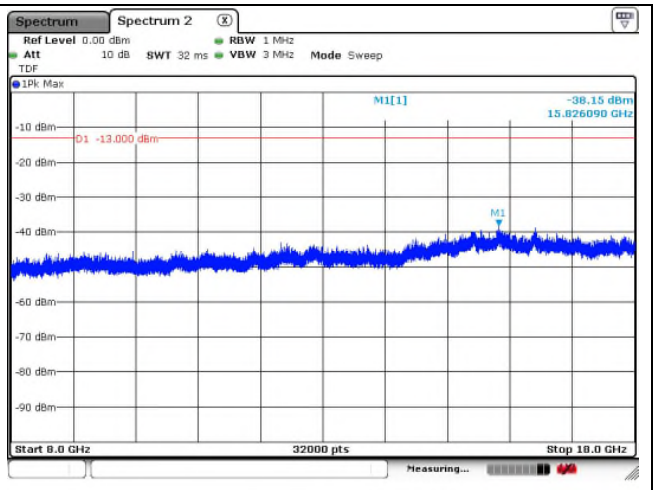




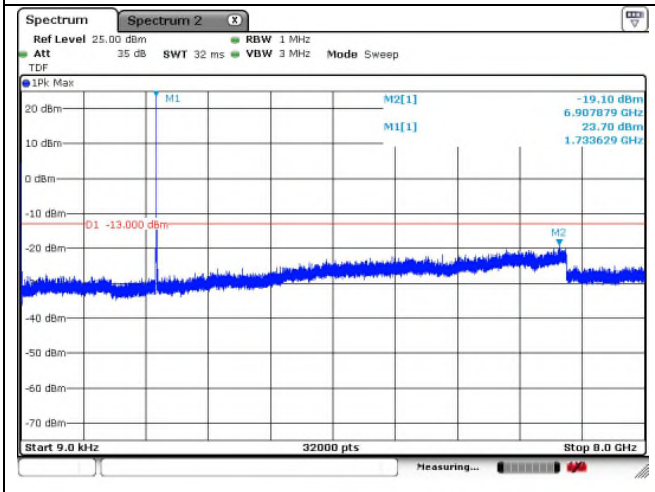
WCDMA 2 HSDPA High Channel

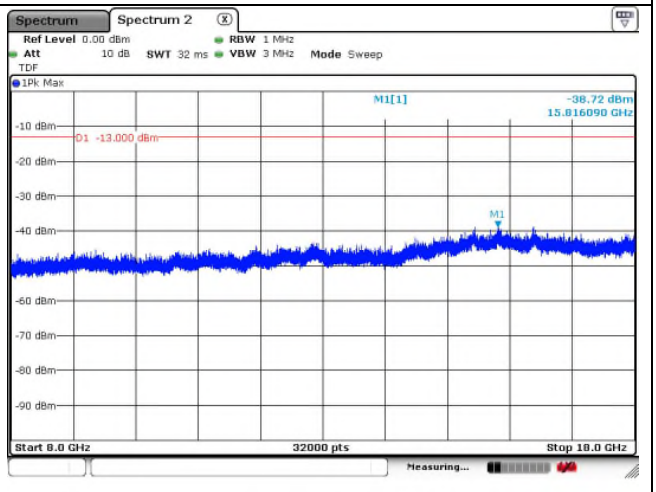
WCDMA 4





WCDMA 4 RMC Low Channel





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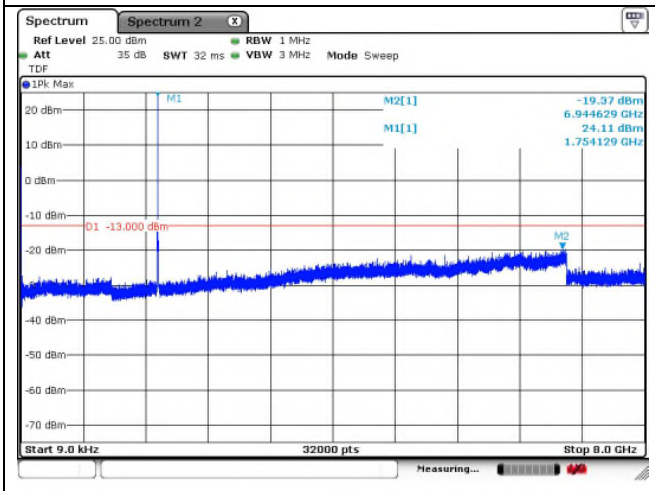
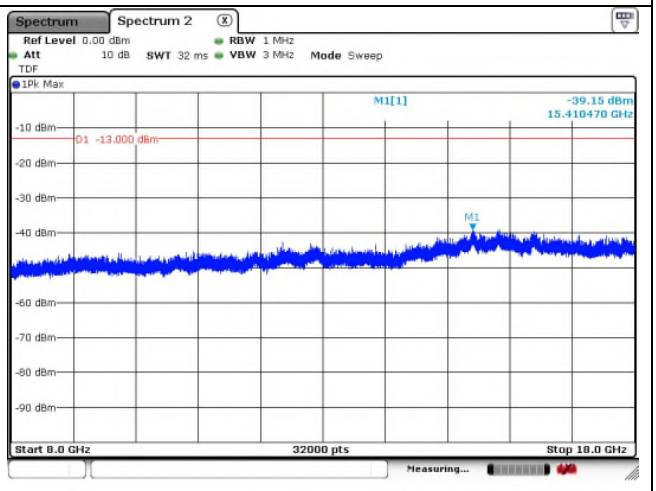
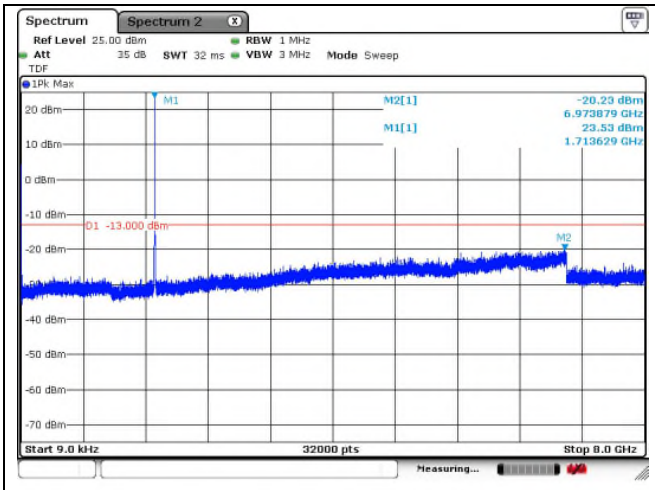
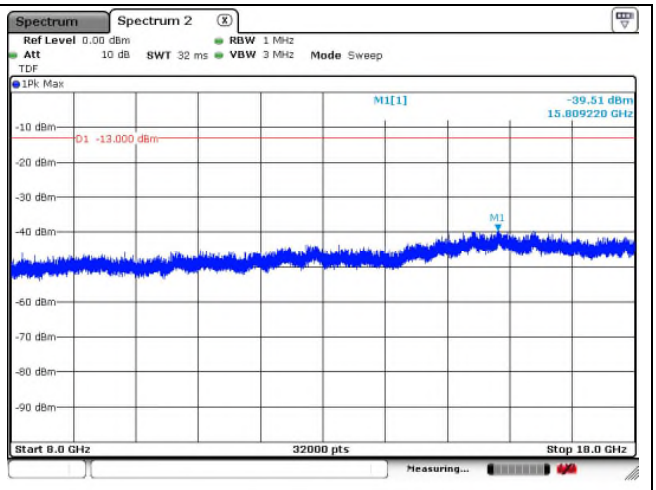




WCDMA 4 RMC High Channel

WCDMA 4





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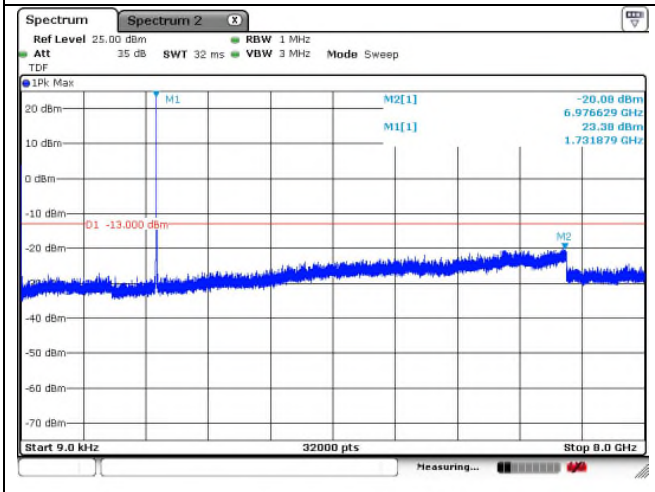

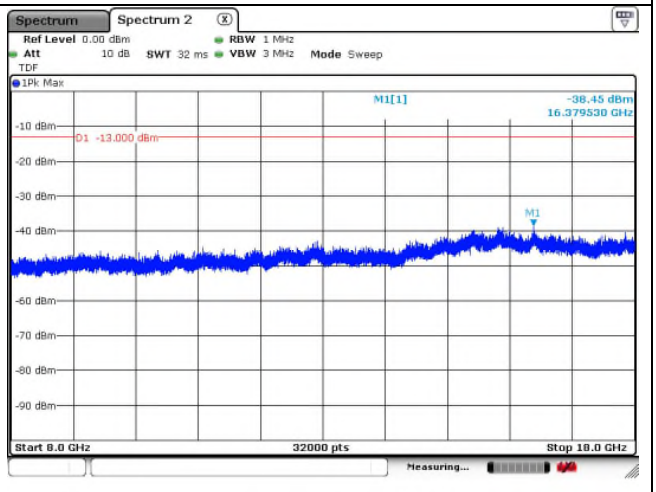

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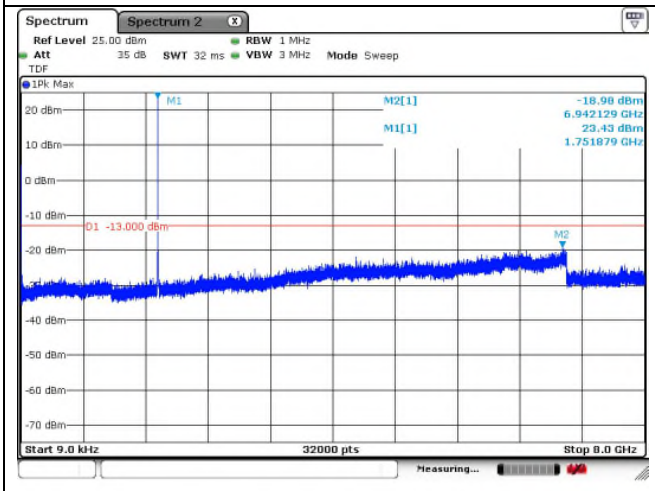
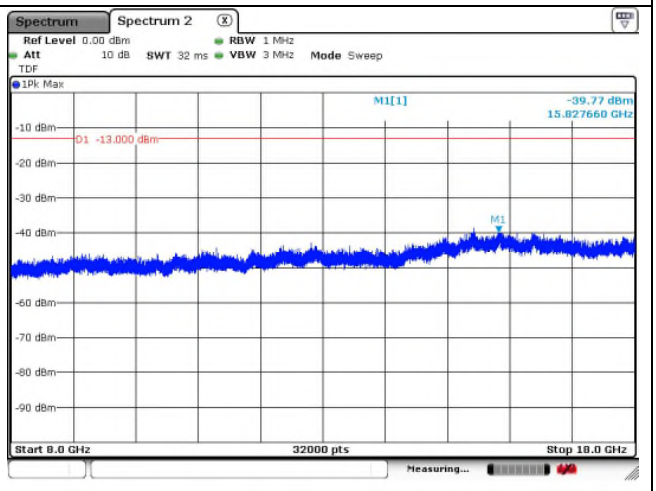
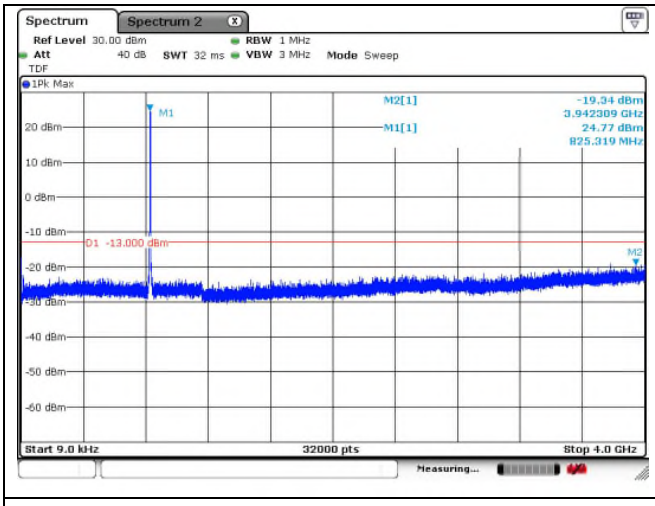
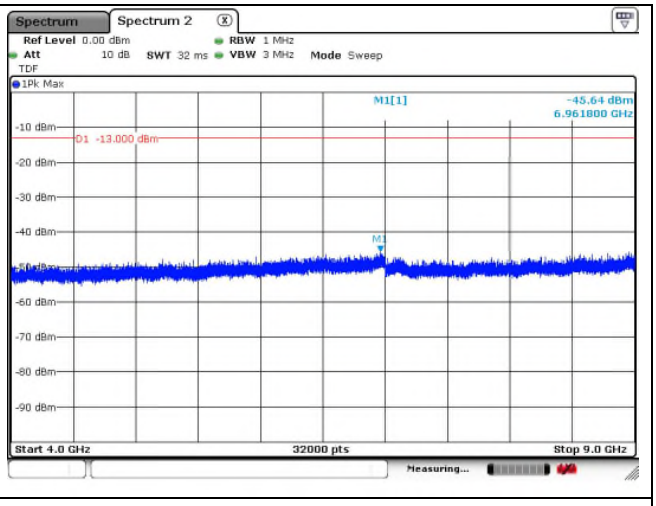




WCDMA 4 HSDPA High Channel

WCDMA 5





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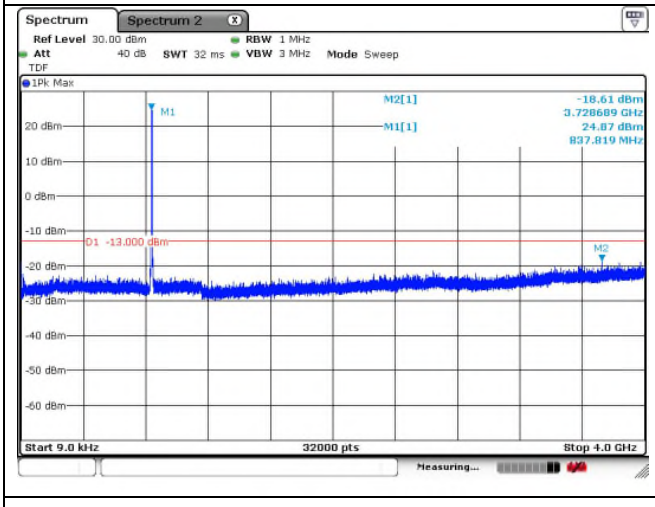

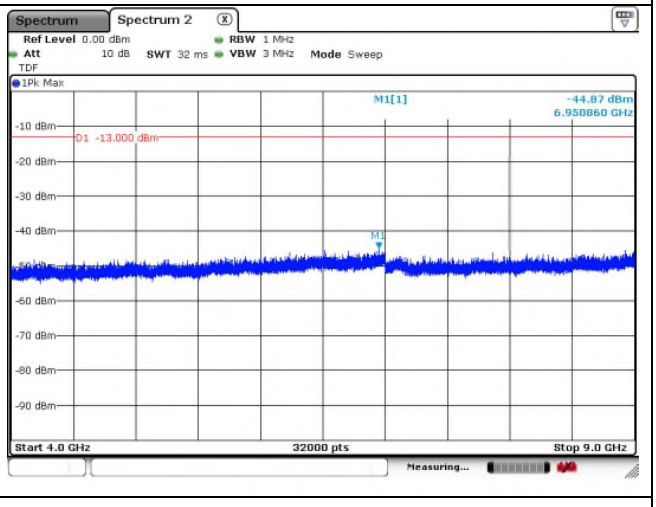

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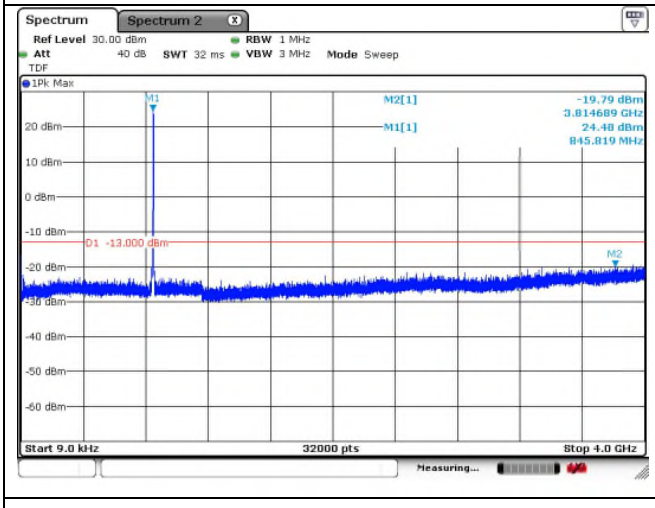
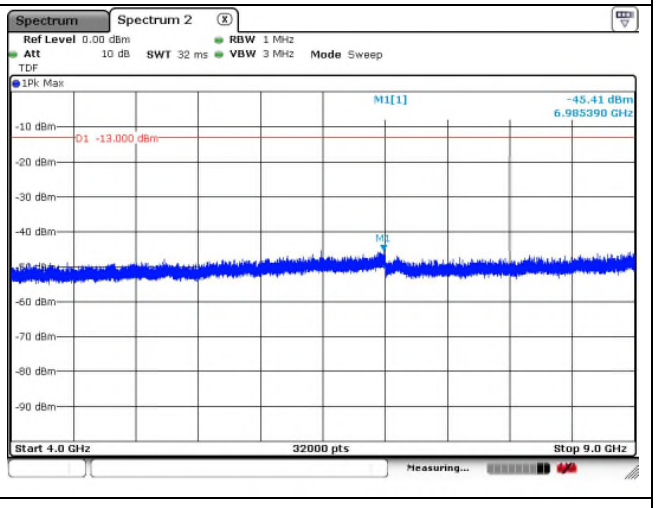
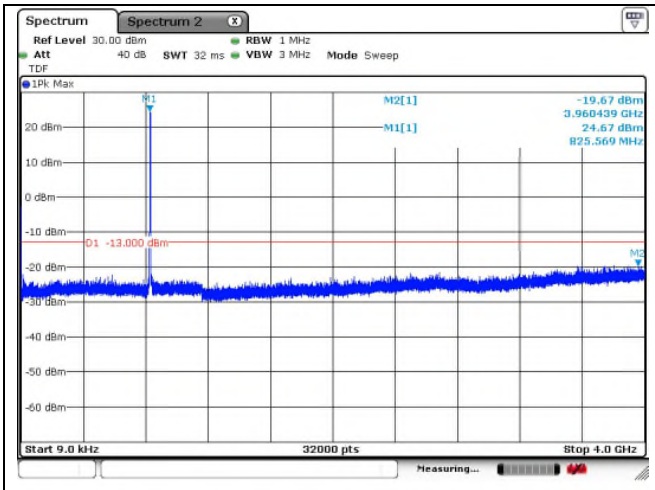
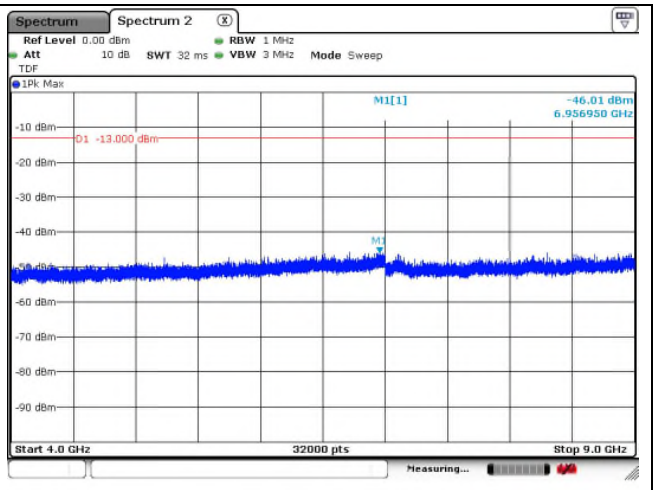




WCDMA 5 RMC High Channel

WCDMA 5





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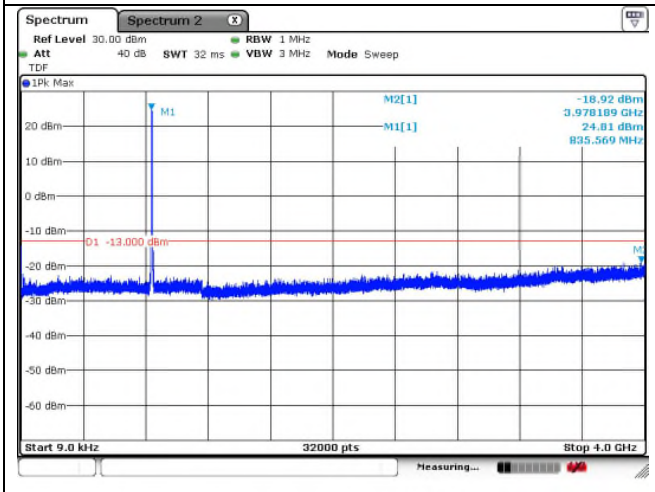

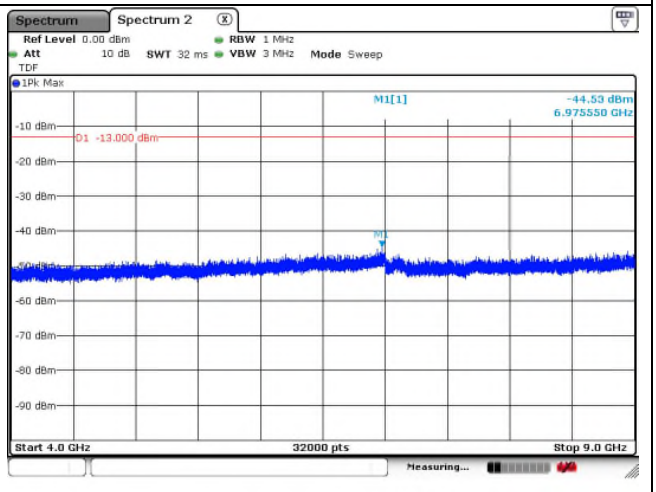

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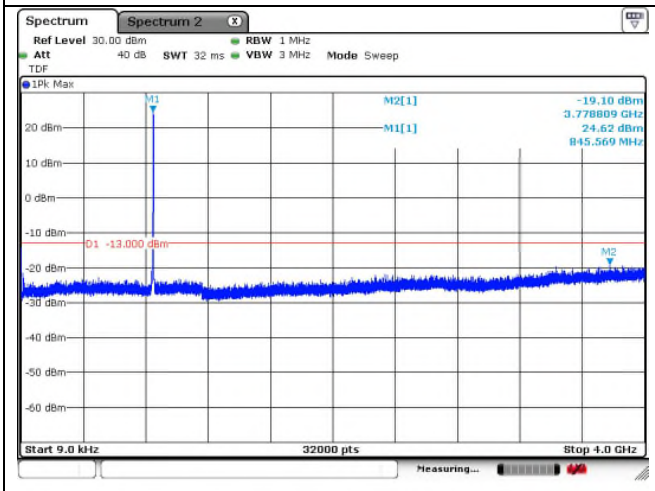
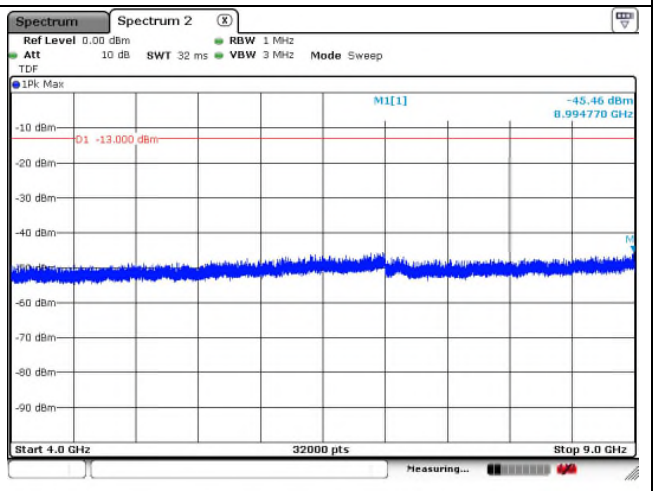
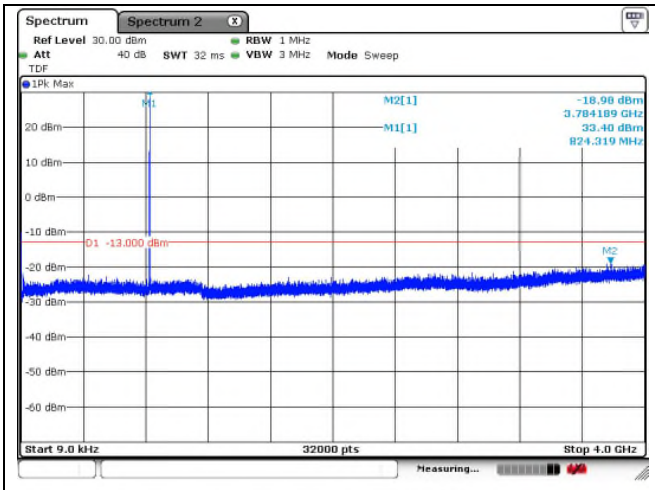
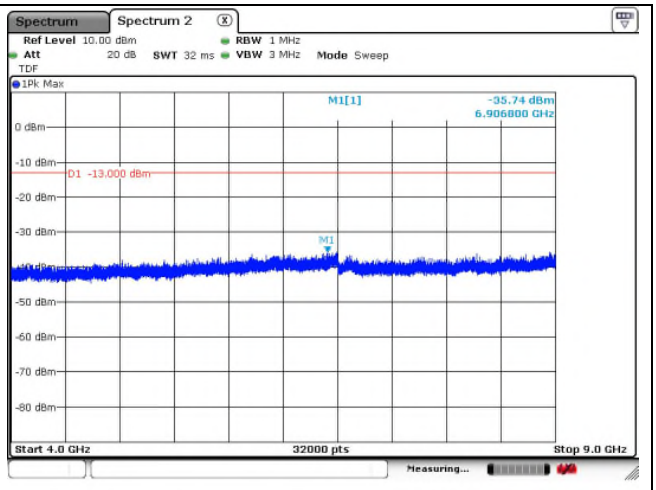




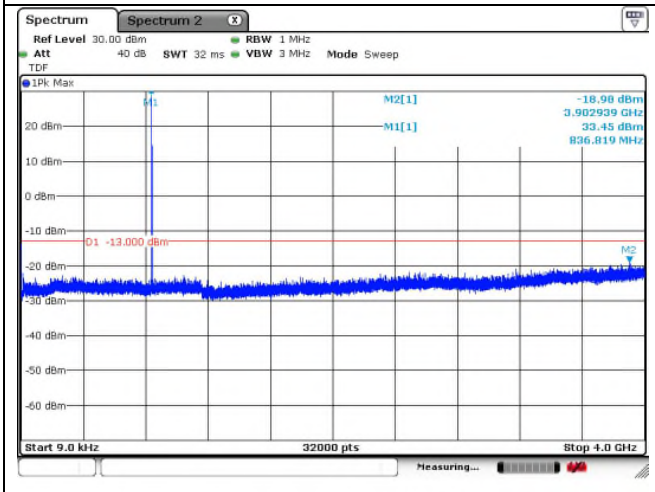
WCDMA 5 HSDPA High Channel

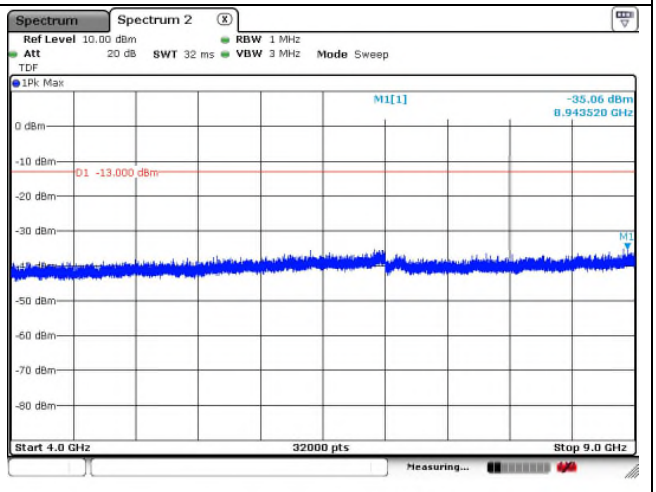
GSM 850



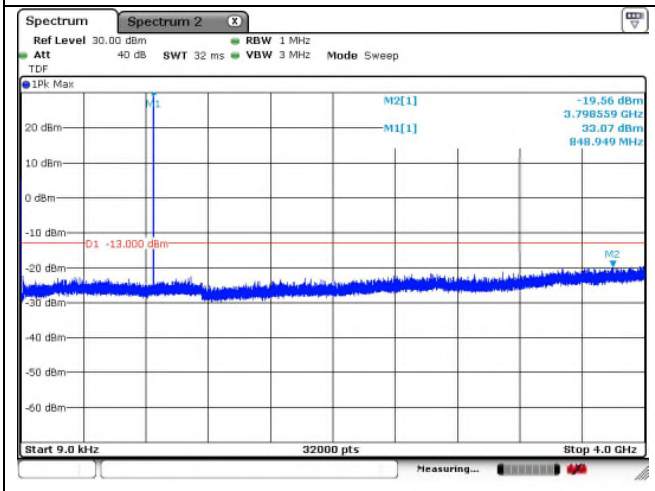


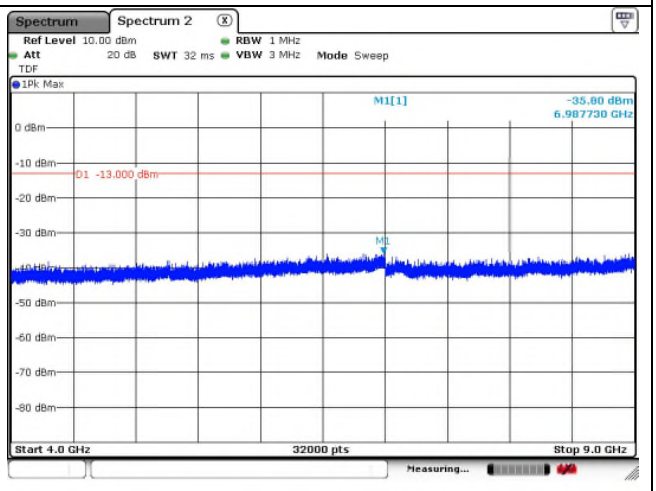
GSM 850 VOICE Low Channel





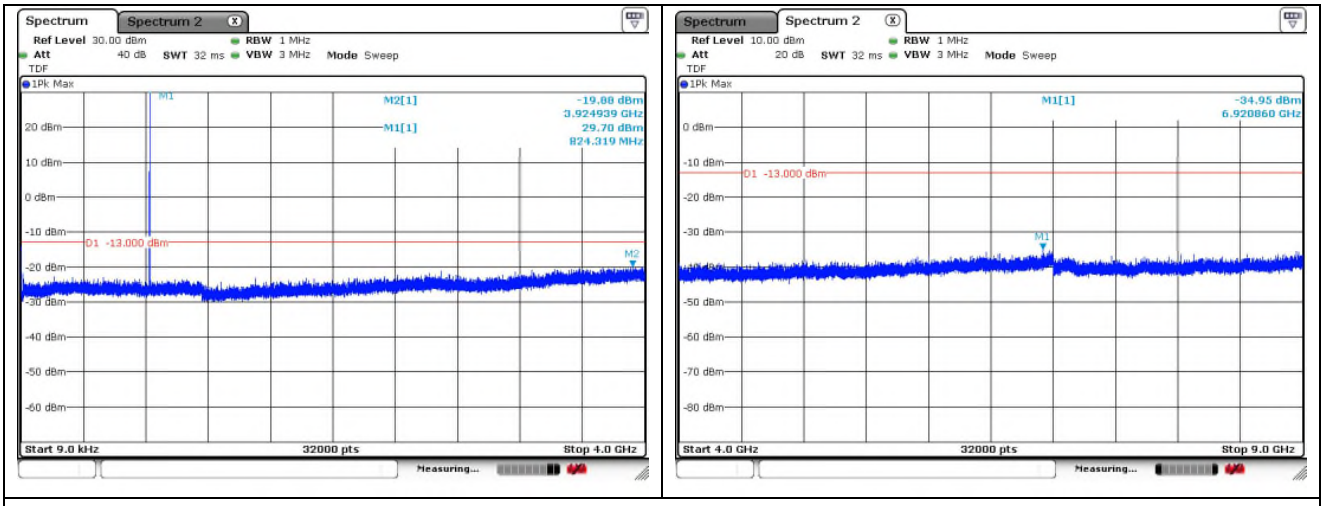
GSM 850 VOICE Middle Channel



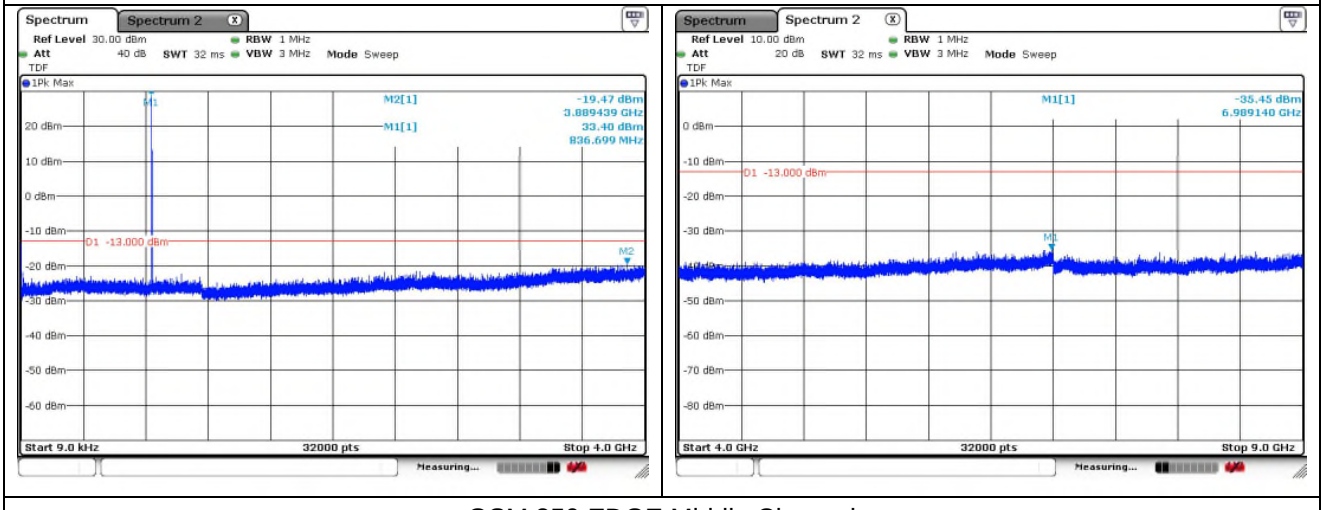


GSM 850 VOICE High Channel

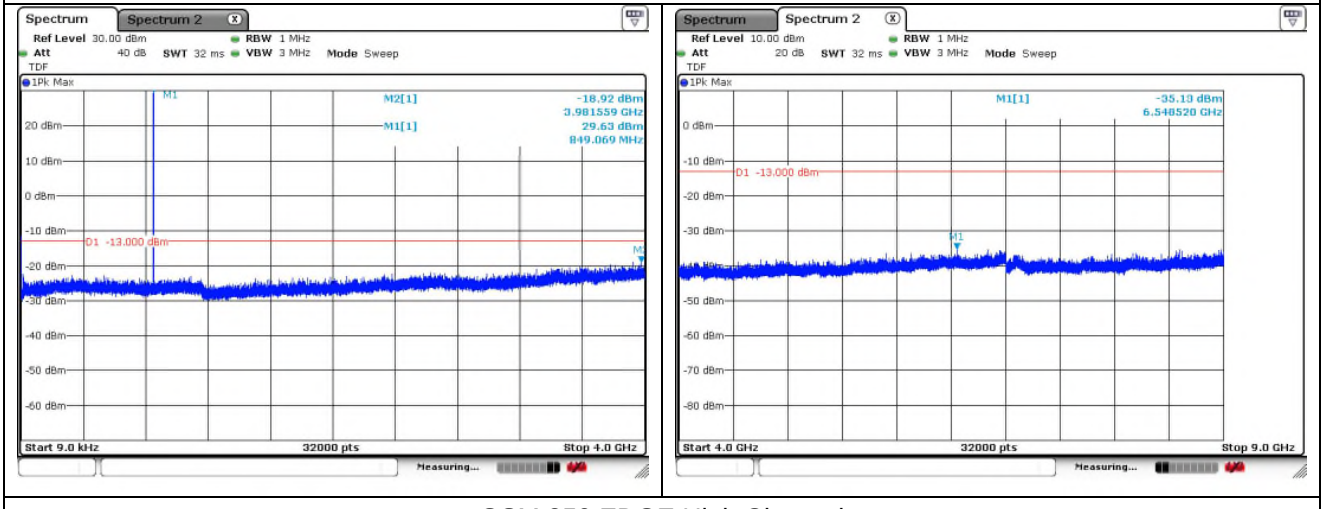
GSM 850



GSM 850 EDGE Low Channel

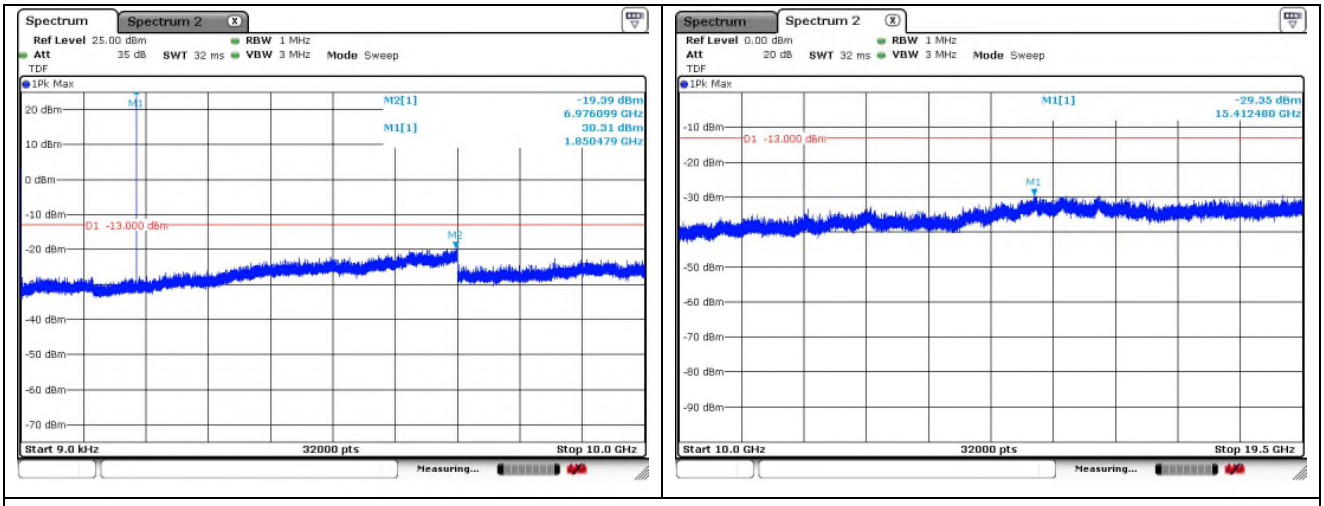


GSM 850 EDGE Middle Channel



GSM 850 EDGE High Channel

GSM 1 900



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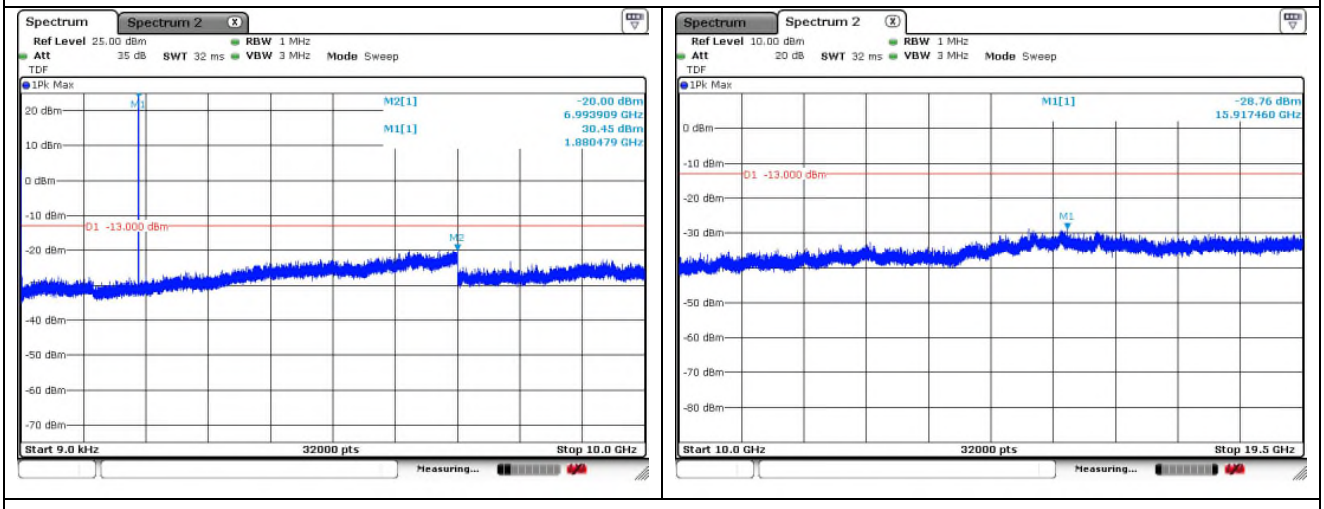
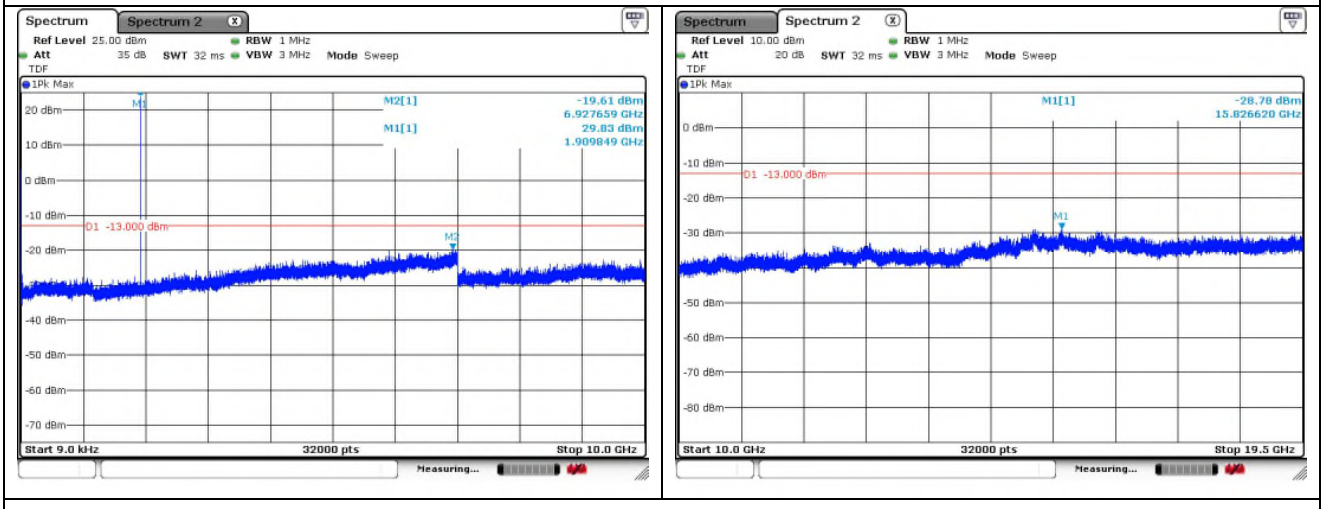
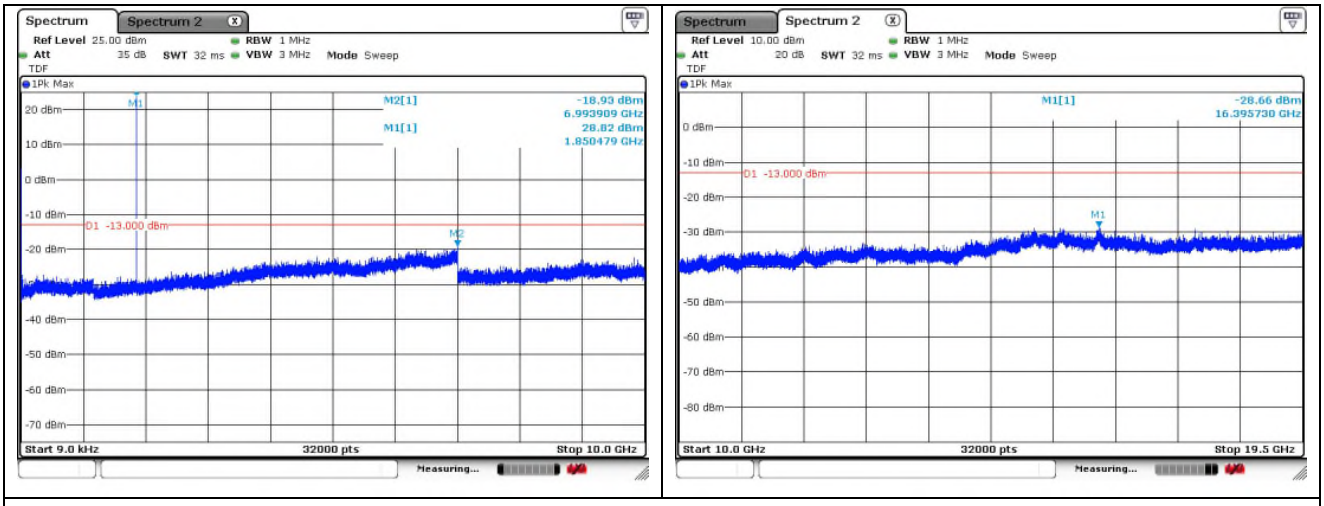


GSM 1 900 VOICE Middle Channel



GSM 1 900 VOICE High Channel

GSM 1 900



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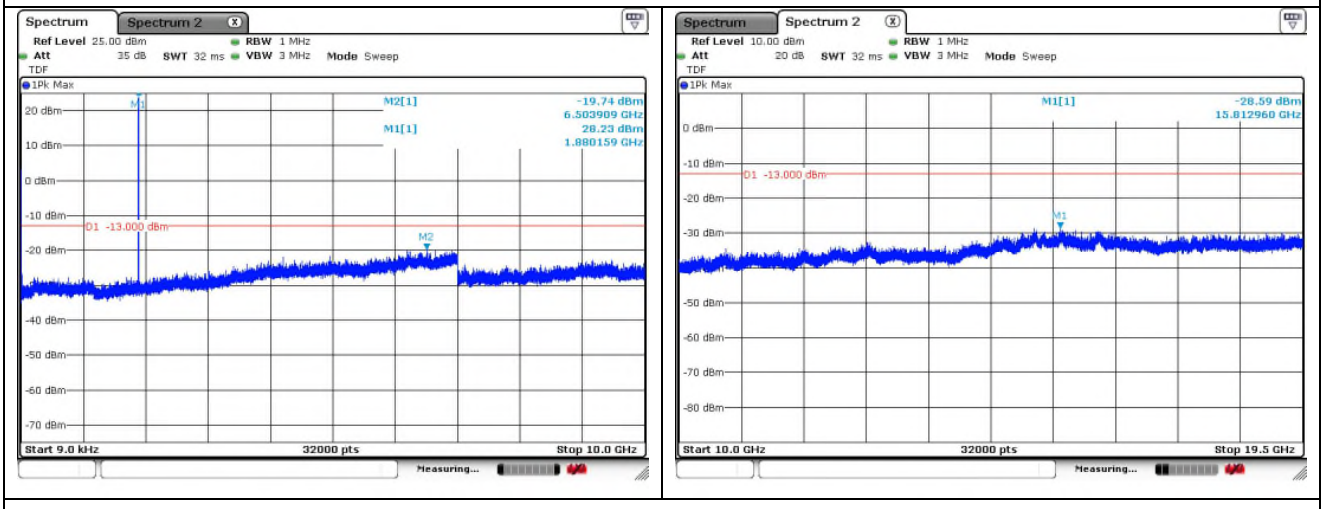
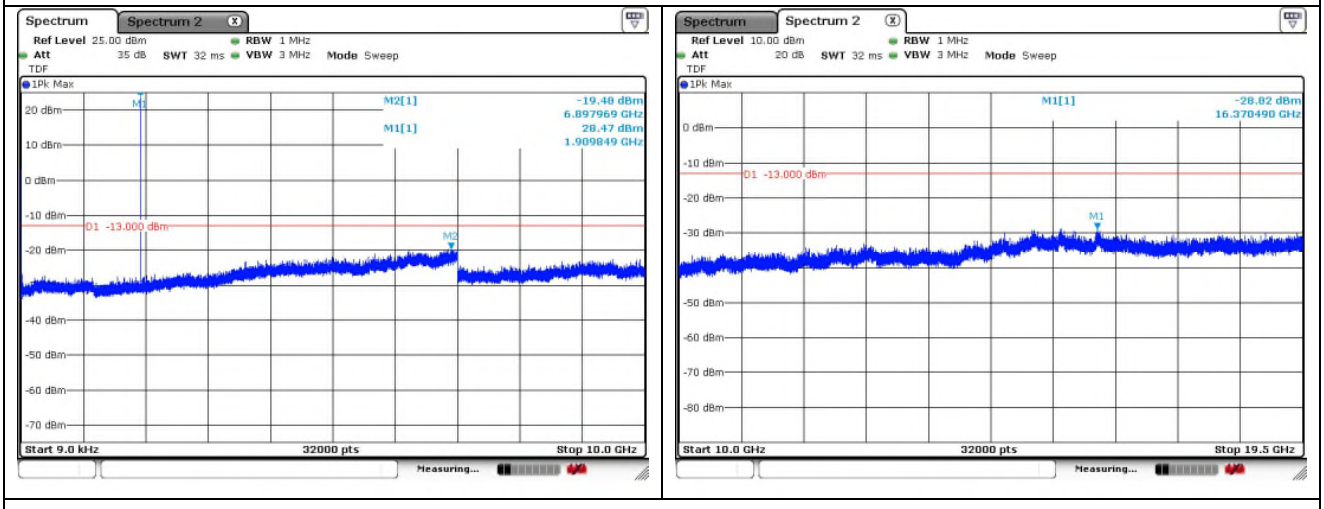


GSM 1 900 EDGE Middle Channel



GSM 1 900 EDGE 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) ㏈.

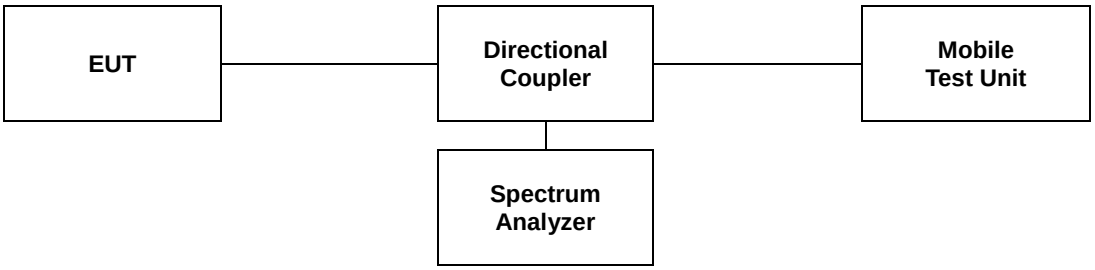
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㏈.

- §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 5.7.3 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.

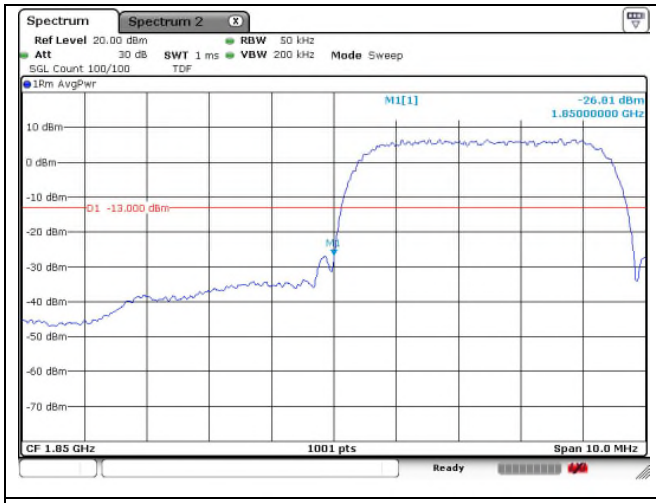


7.3. Test Results

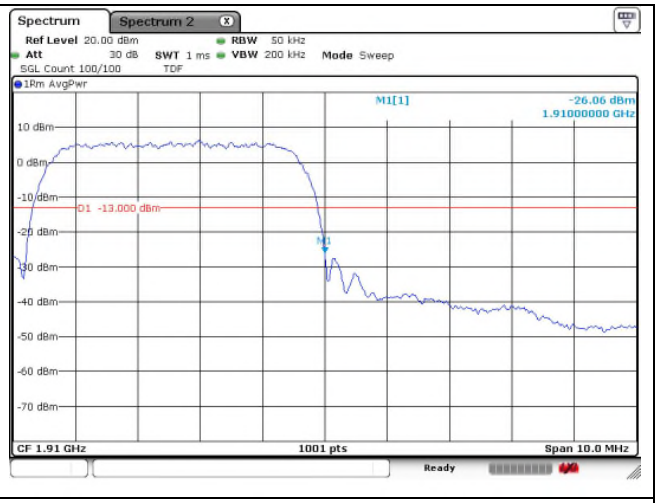
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

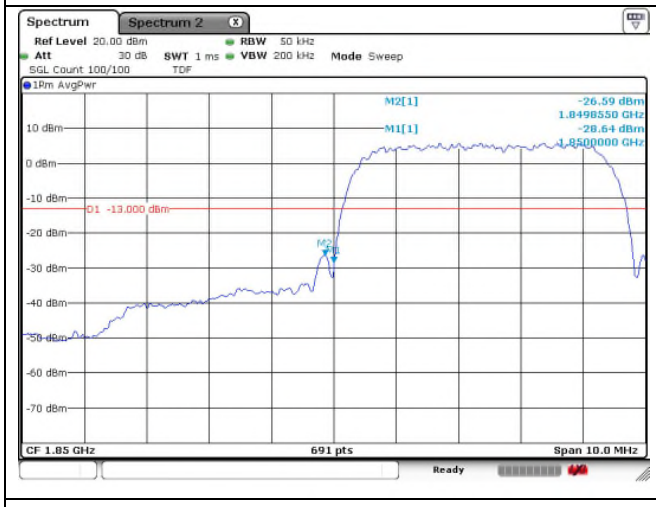
WCDMA 2



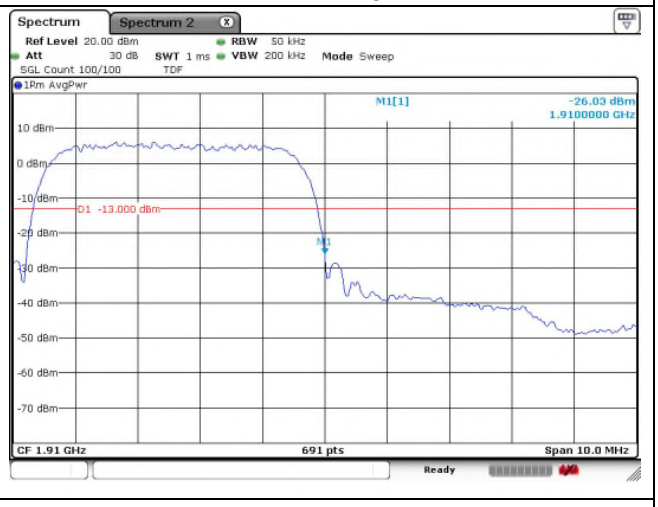
WCDMA 2 RMC Low Channel



WCDMA 2 RMC High Channel

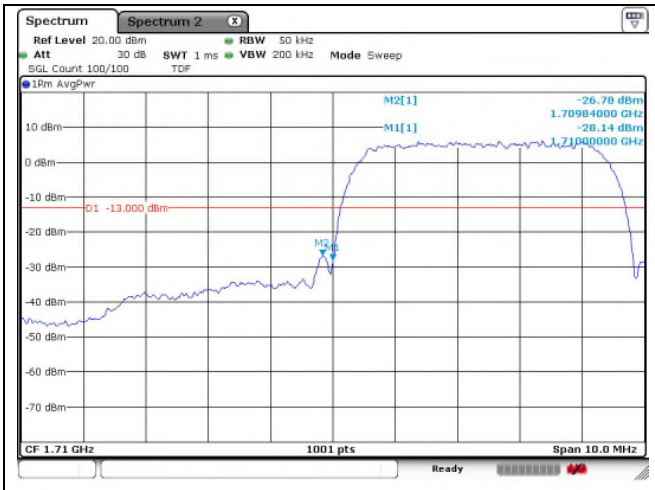


WCDMA 2 HSDPA Low Channel



WCDMA 2 HSDPA High Channel

WCDMA 4



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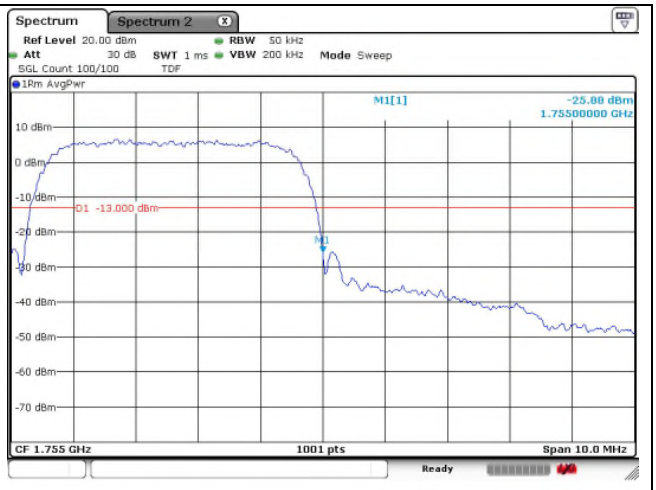

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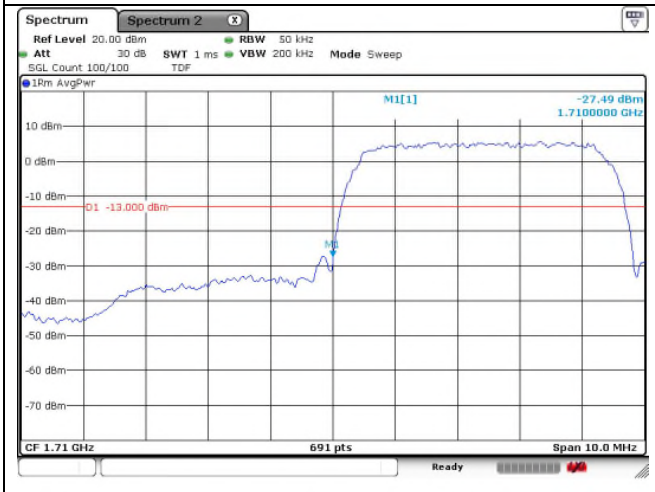

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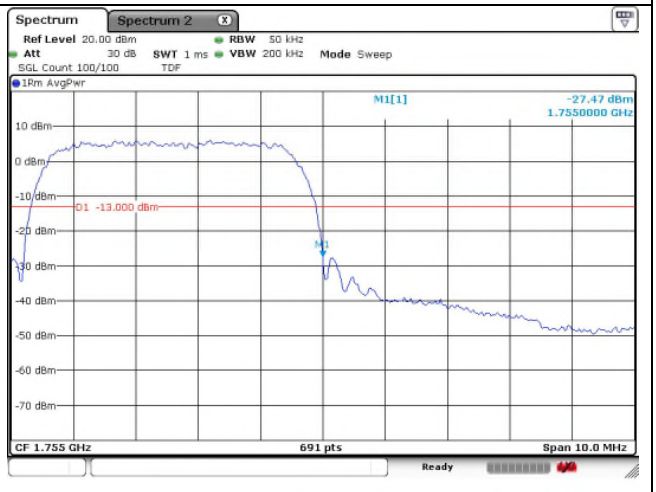
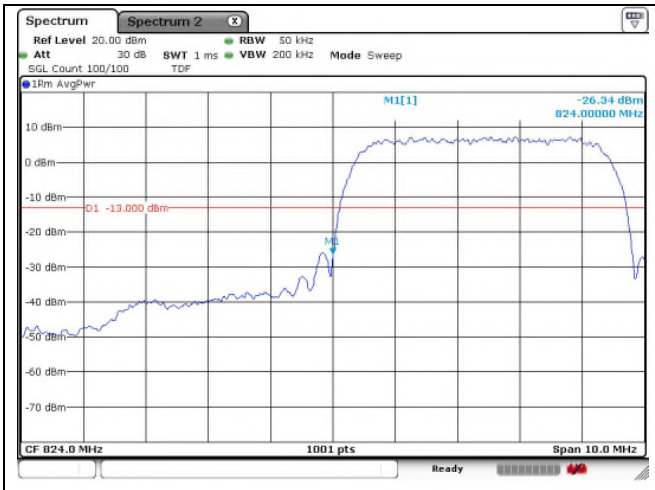
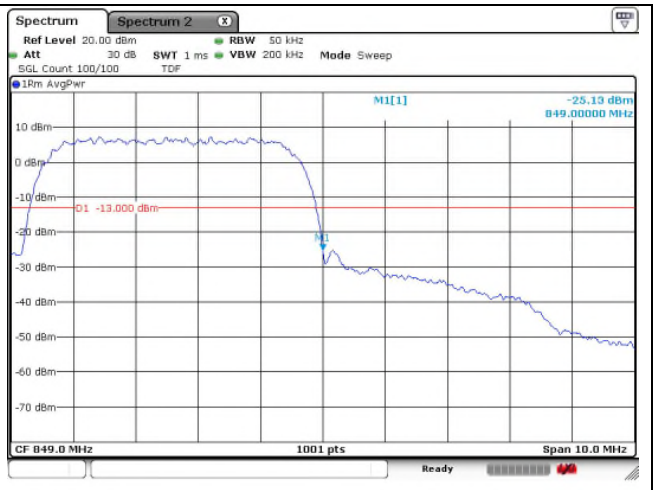


WCDMA 4 HSDPA High Channel

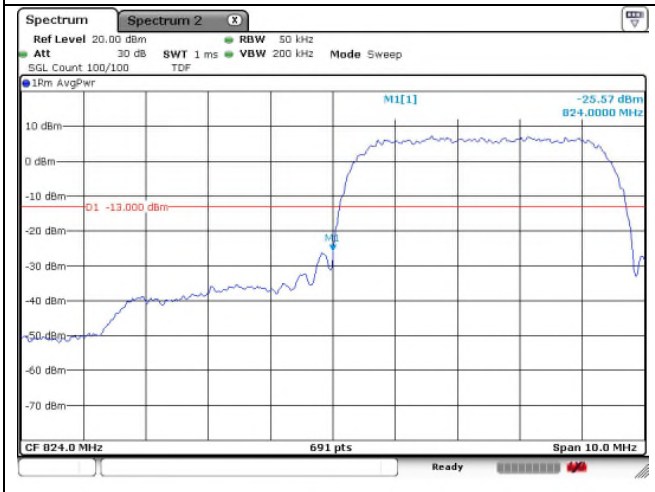
WCDMA 5



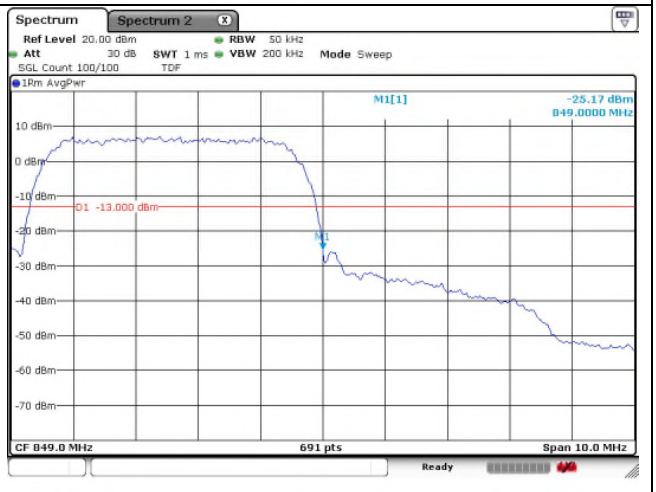
WCDMA 5 RMC Low Channel



WCDMA 5 RMC High Channel

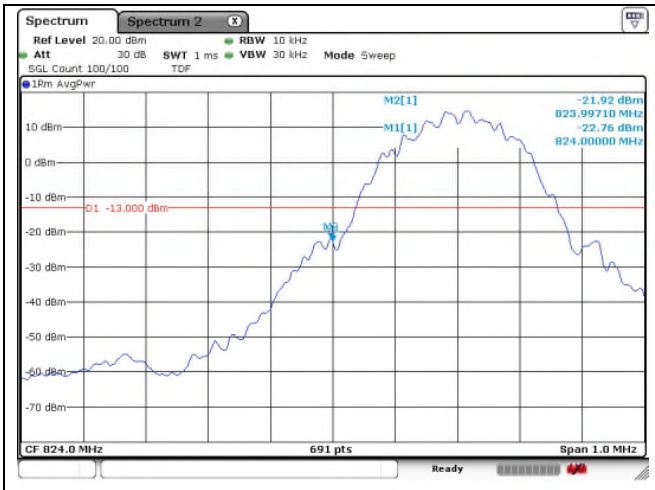


WCDMA 5 HSDPA Low Channel

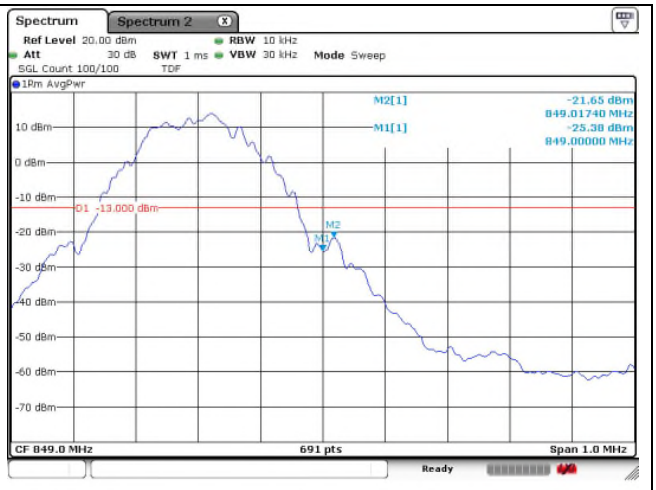


WCDMA 5 HSDPA High Channel

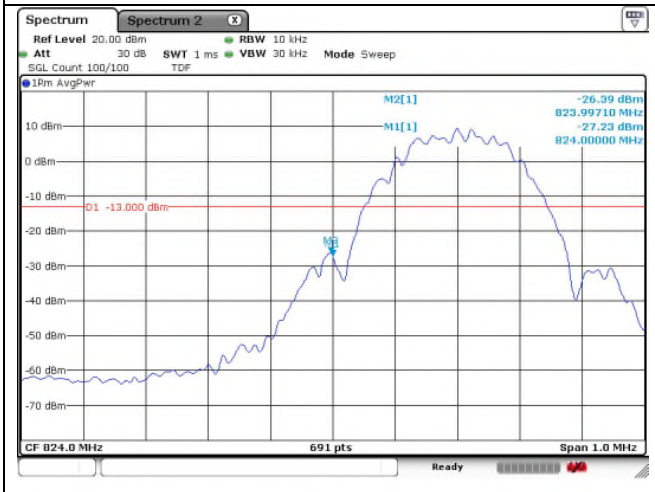
GSM 850



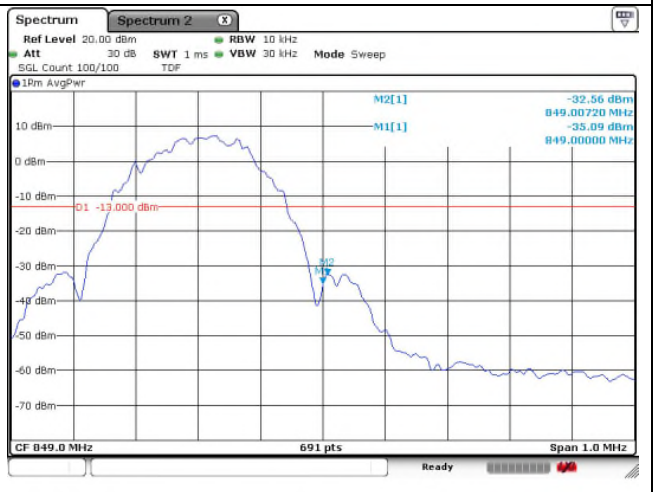
GSM 850 VOICE Low Channel



GSM 850 VOICE High Channel

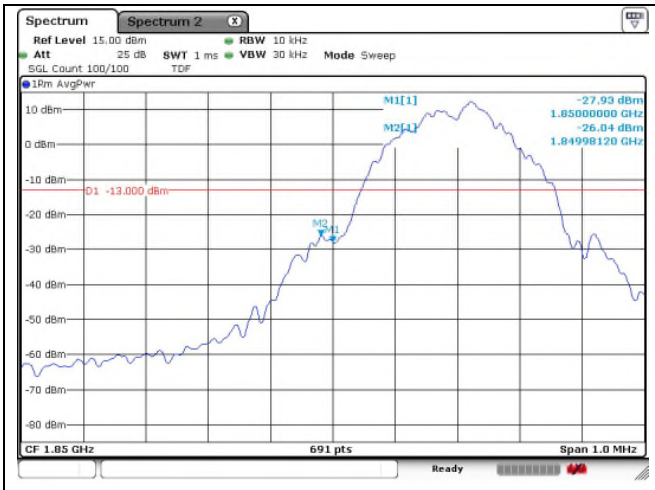


GSM 850 EDGE Low Channel

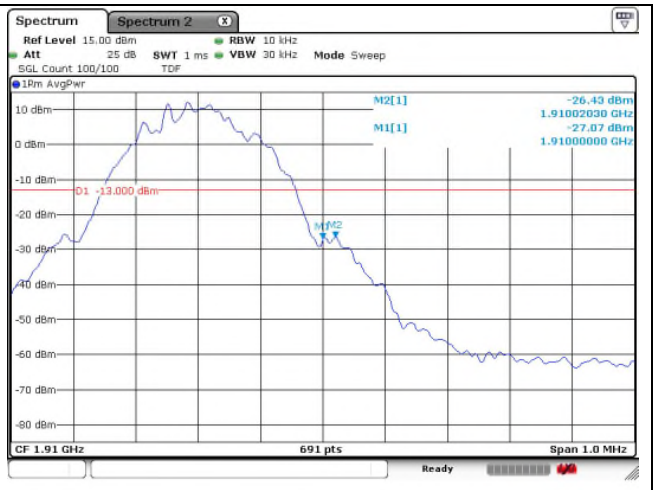


GSM 850 EDGE High Channel

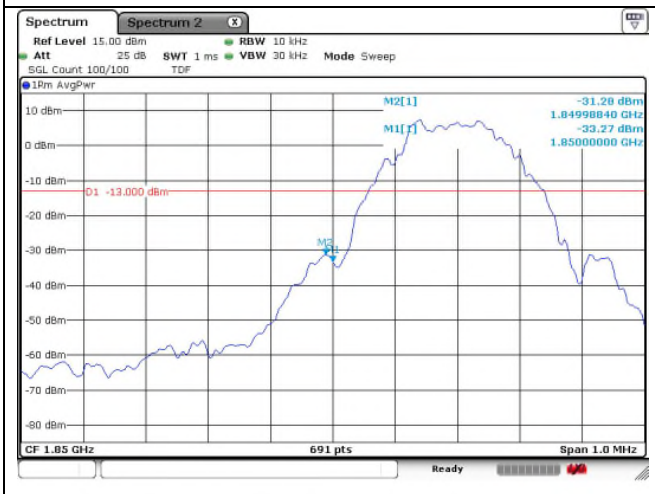
GSM 1 900



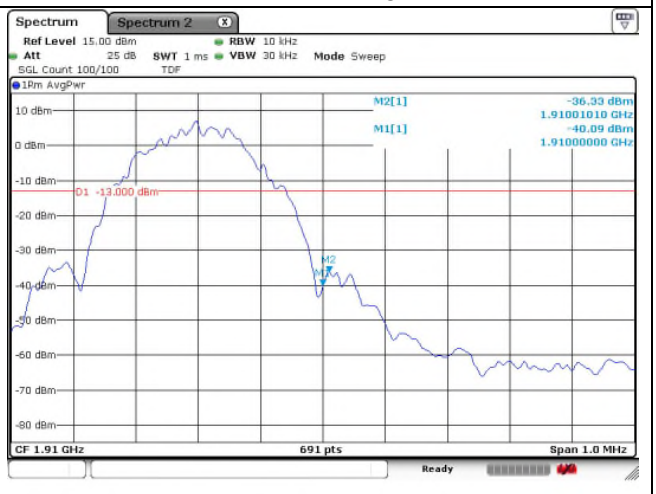
GSM 1 900 VOICE Low Channel



GSM 1 900 VOICE High Channel



GSM 1 900 EDGE Low Channel



GSM 1 900 EDGE High Channel

8. Frequency Stability

8.1. Limit

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

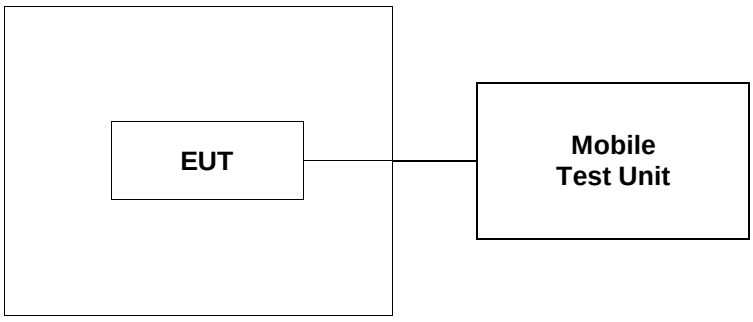
- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.
For Mobile devices operating in the 824 to 849 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 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 2 mode at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.86	16.77	0.008 9
40		16.81	0.008 9
30		15.92	0.008 5
23		16.69	0.008 9
10		18.31	0.009 7
0		24.28	0.012 9
-10		25.03	0.013 3
-20		25.61	0.013 6
-30		26.13	0.013 9
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
23	4.439	15.51	0.008 2
	3.281	16.63	0.008 8

WCDMA 4 mode at middle channel

Reference Frequency: 1 732.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.86	-15.59	-0.009 0
40		-15.17	-0.008 8
30		-15.14	-0.008 7
23		-15.28	-0.008 8
10		-15.45	-0.008 9
0		-16.45	-0.009 5
-10		-14.89	-0.008 6
-20		-14.95	-0.008 6
-30		-15.36	-0.008 9
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
23	4.439	-15.11	-0.008 7
	3.281	-15.34	-0.008 9

WCDMA 5 mode at middle channel

Reference Frequency: 836.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.86	2.37	0.002 8
40		3.33	0.004 0
30		-2.96	-0.003 5
23		3.32	0.004 0
10		4.56	0.005 5
0		5.97	0.007 1
-10		6.21	0.007 4
-20		6.12	0.007 3
-30		6.35	0.007 6
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
23	4.439	4.11	0.004 9
	3.281	3.78	0.004 5

GSM 850 mode at middle channel

Reference Frequency: 836.6 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.86	17.63	0.021 1
40		14.88	0.017 8
30		15.82	0.018 9
23		15.66	0.018 7
10		11.17	0.013 4
0		13.30	0.015 9
-10		17.37	0.020 8
-20		16.24	0.019 4
-30		18.21	0.021 8
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
23	4.439	16.13	0.019 3
	3.281	15.82	0.018 9

GSM 1 900 mode at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.86	24.47	0.013 0
40		23.44	0.012 5
30		25.60	0.013 6
23		25.05	0.013 3
10		27.64	0.014 7
0		34.29	0.018 2
-10		27.86	0.014 8
-20		28.19	0.015 0
-30		27.15	0.014 4
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V_{dc})**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
23	4.439	24.78	0.013 2
	3.281	25.36	0.013 5

- End of the Test Report -