

TEST REPORT

Applicant: Attenti US, Inc.

Address of Applicant: 1838 Gunn Highway, Odessa, Florida, United States, 33556

Manufacturer: Attenti US, Inc.

Address of Manufacturer: 1838 Gunn Highway, Odessa, Florida, United States, 33556

Equipment Under Test (EUT)

Product Name: Tracker 200

Model No.: TRC-200-NA-9-00

FCC ID: NC3TRACKER-200

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22
FCC CFR Title 47 Part 24

Date of sample receipt: February 13, 2023

Date of Test: February 13, 2023-March 14, 2023

Date of report issued: March 14, 2023

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Luo

Laboratory Manager

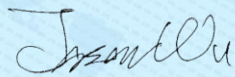
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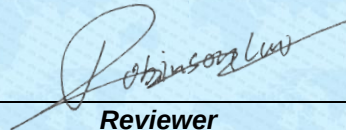
TESTING
NVLAP LAB CODE 600179-0

2 Version

Version No.	Date	Description
00	March 14, 2023	Original

Prepared By:**Project Engineer****Date:**

March 14, 2023

Check By:
Reviewer**Date:**

March 14, 2023

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4 Test Summary

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 22.913 Part 24.232	Pass
Peak-to-Average Ratio	Part 2.1046 Part 24.232	Pass
99% Occupied Bandwidth & 26dB Bandwidth	Part 2.1049	Pass
Modulation Characteristics	Part 2.1047	N/A
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 Part 24.238	Pass
Spurious Radiation Emissions	Part 2.1053 Part 22.917 Part 24.238	Pass
Out of band emission, Band Edge	Part 2.1051 Part 22.917 Part 24.238	Pass
Frequency stability vs. temperature	Part 2.1055 Part 22.355 Part 24.235	Pass
Frequency stability vs. voltage	Part 2.1055 Part 22.355 Part 24.235	Pass

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. N/A: Not applicable.

5 General Information

5.1 General Description of EUT

Product Name:	Tracker 200
Model No.:	TRC-200-NA-9-00
Test sample(s) ID:	GTS2023020187-1
Sample(s) Status:	Engineer sample
S/N:	2PC1039A00300042220002
Support Bands:	WCDMA Band II, WCDMA Band V
TX Frequency:	WCDMA Band II: 1850MHz -1910MHz WCDMA Band V: 824MHz -849MHz
Modulation type:	WCDMA Band II/V: QPSK 16QAM
Antenna type:	Integral Antenna
Antenna gain:	WCDMA Band II: 2.9dBi WCDMA Band V: 1.0dBi
Power supply:	DC 3.6V, 2280mAh 8.20wh Battery

Operation Frequency List:

WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
⋮	⋮	⋮	⋮
4181	836.20	9399	1879.80
4182	836.40	9400	1880.00
4183	836.60	9401	1880.20
⋮	⋮	⋮	⋮
4232	846.40	9537	1907.40
4233	846.60	9538	1907.60

Final test channel:

WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
4132	826.40	9262	1852.40
4183	836.60	9400	1880.00
4233	846.60	9538	1907.60

5.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 /24 of the FCC CFR 47 Rules.

5.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26:2015 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 02, 2020	July 01, 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 22, 2022	April 21, 2023
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 20, 2023	March 19, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June 12, 2022	June 11, 2023
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 23, 2022	June 22, 2023
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	April 22, 2022	April 21, 2023
9	Coaxial Cable	GTS	N/A	GTS211	April 22, 2022	April 21, 2023
10	Coaxial cable	GTS	N/A	GTS210	April 22, 2022	April 21, 2023
11	Coaxial Cable	GTS	N/A	GTS212	April 22, 2022	April 21, 2023
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	April 22, 2022	April 21, 2023
13	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 23, 2022	June 22, 2023
14	Band filter	Amindeon	82346	GTS219	June 23, 2022	June 22, 2023
15	Power Meter	Anritsu	ML2495A	GTS540	June 23, 2022	June 22, 2023
16	Power Sensor	Anritsu	MA2411B	GTS541	June 23, 2022	June 22, 2023
17	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 22, 2022	April 21, 2023
18	Splitter	Agilent	11636B	GTS237	June 23, 2022	June 22, 2023
19	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023
20	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 22, 2022	April 21, 2023
21	Breitband hornantenna	SCHWARZBECK	BBHA 9170	GTS579	Oct. 16, 2022	Oct. 15, 2023
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 16, 2022	Oct. 15, 2023
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 16, 2022	Oct. 15, 2023
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June 23, 2022	June 22, 2023
25	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 22, 2022	April 21, 2023

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	April 25, 2022	April 24, 2023
2	Barometer	KUMAO	SF132	GTS647	July 26, 2022	July 25, 2023

7 System test configuration

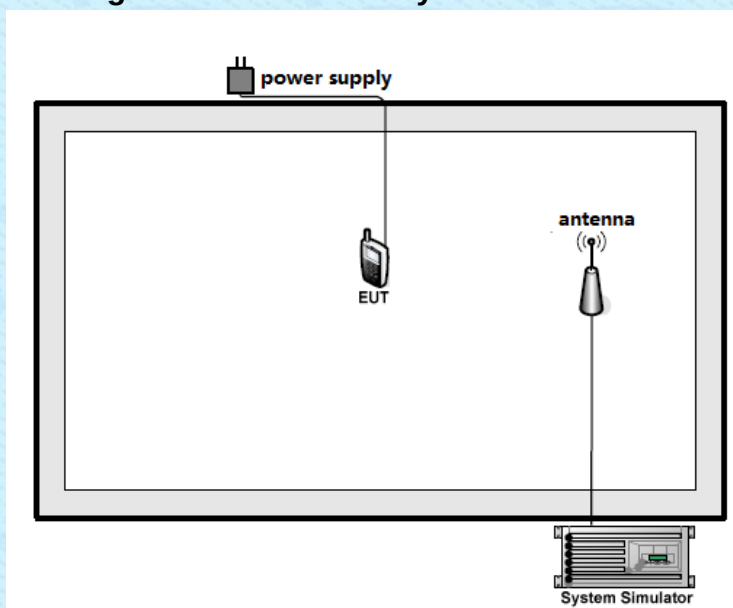
7.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on the worst emission.

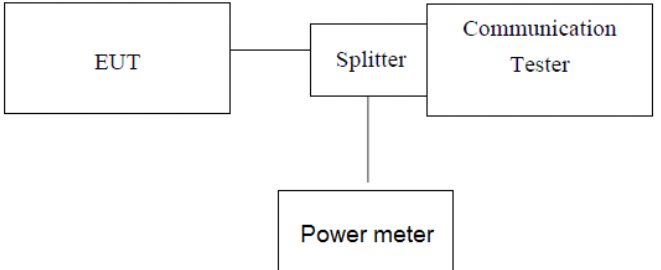
Test modes are chosen to be reported as the worst case configuration below:

Test modes		
Band	Radiated	Conducted
WCDMA Band II	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link
WCDMA Band V	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link

7.2 Configuration of Tested System

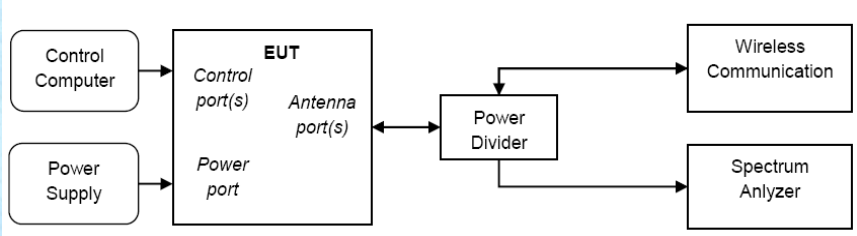


7.3 Conducted Average Output Power and ERP/EIRP

Test Requirement:	FCC part 22.913 & FCC part 24.232 & FCC part 2.1046
Test Method:	FCC KDB 971168 D01 V03r01 Section
Limit:	WCDMA Band V: 7W(38.45dBm) WCDMA Band II: 2W(33.01dBm)
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst power. 6. EIRP=measured power+ antenna gain ERP=EIRP-2.15
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

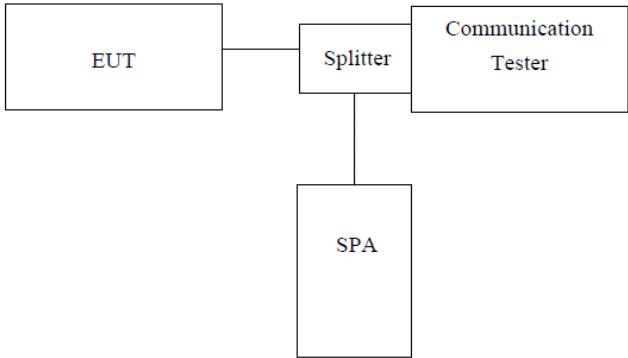
Measurement Data: The detailed test data see Appendix

7.4 Peak-to-Average Ratio

Test Requirement:	FCC part 24.232 & FCC part 2.1046
Test Method:	FCC KDB 971168 D01 V03r01 Section
Limit:	13db
Test setup:	 <pre> graph LR CC[Control Computer] --> EUT[EUT] PS[Power Supply] --> EUT EUT --> PD[Power Divider] PD --> WC[Wireless Communication] PD --> SA[Spectrum Analyzer] </pre>
Test Procedure:	A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode. Test Settings 1. The signal analyzer's CCDF measurement profile enabled 2. Frequency= carrier center frequency 3. Measurement BW > EBW of signal 4. for continuous transmissions, set to 1ms 5. Record the maximum PAPR level associated with a probability of 0.1%.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix

7.5 Occupy Bandwidth

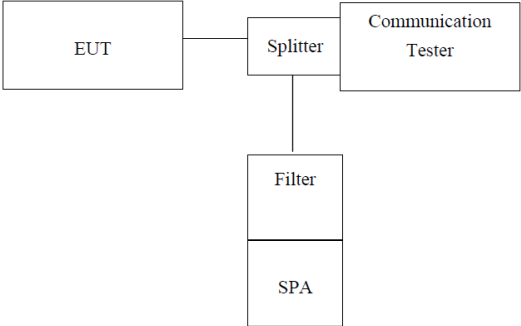
Test Requirement:	FCC part2.1049
Test Method:	FCC KDB 971168 D01 V03r01 Section
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix

7.6 MODULATION CHARACTERISTIC

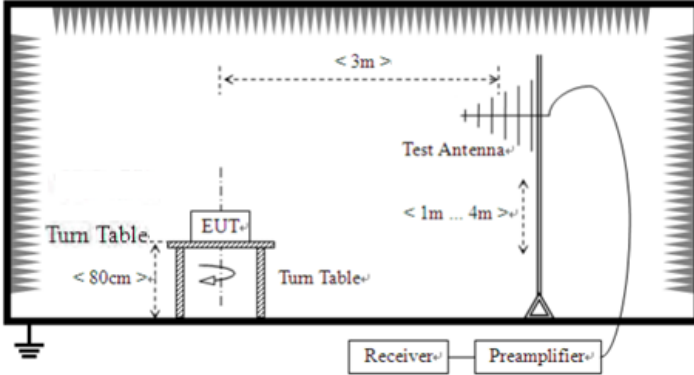
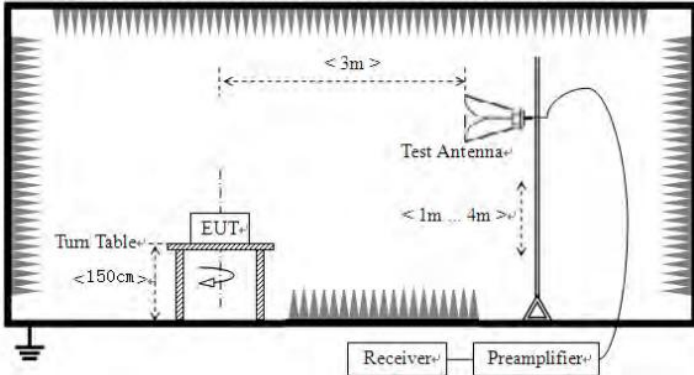
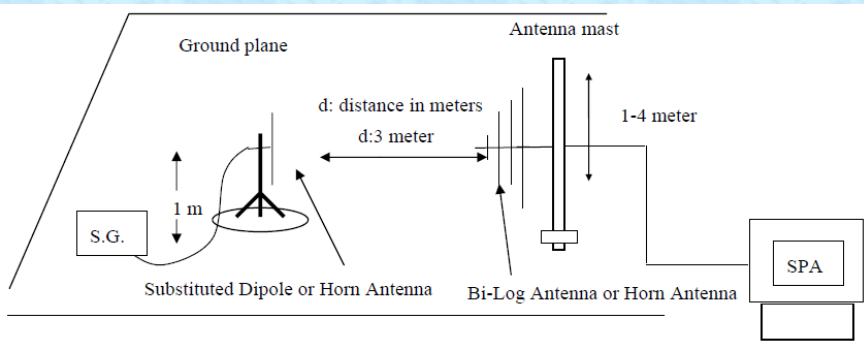
According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

7.7 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917 and FCC part 24.238 & FCC part 2.1051
Test Method:	FCC KDB 971168 D01 V03r01 Section
Limit:	-13dBm
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix

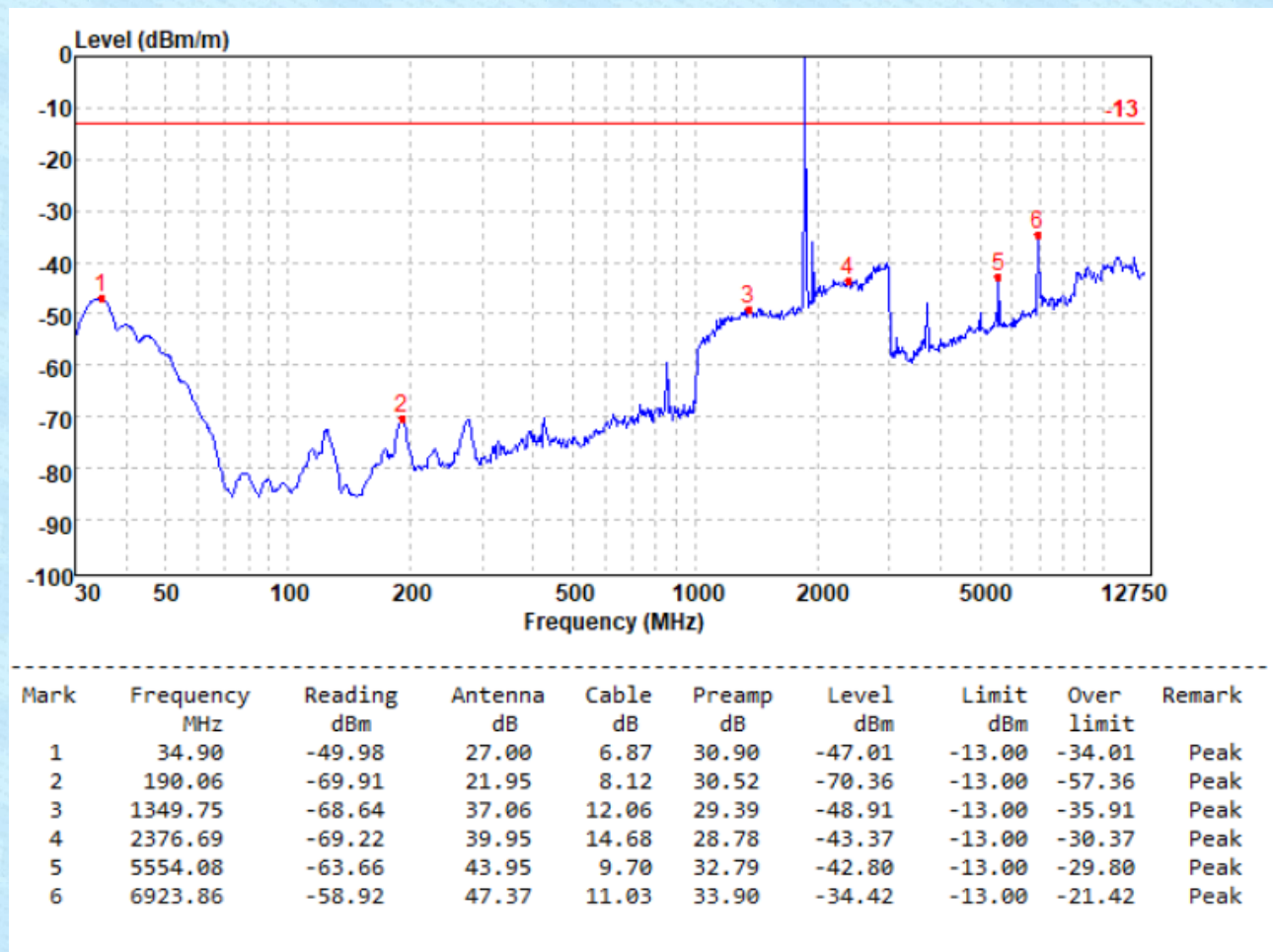
7.8 Spurious Radiation Emissions

Test Requirement:	FCC part 2.1053 & FCC part 22.917 & FCC part 24.238
Test Method:	FCC KDB 971168 D01 V03r01 Section & ANSI C63.26:2015
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

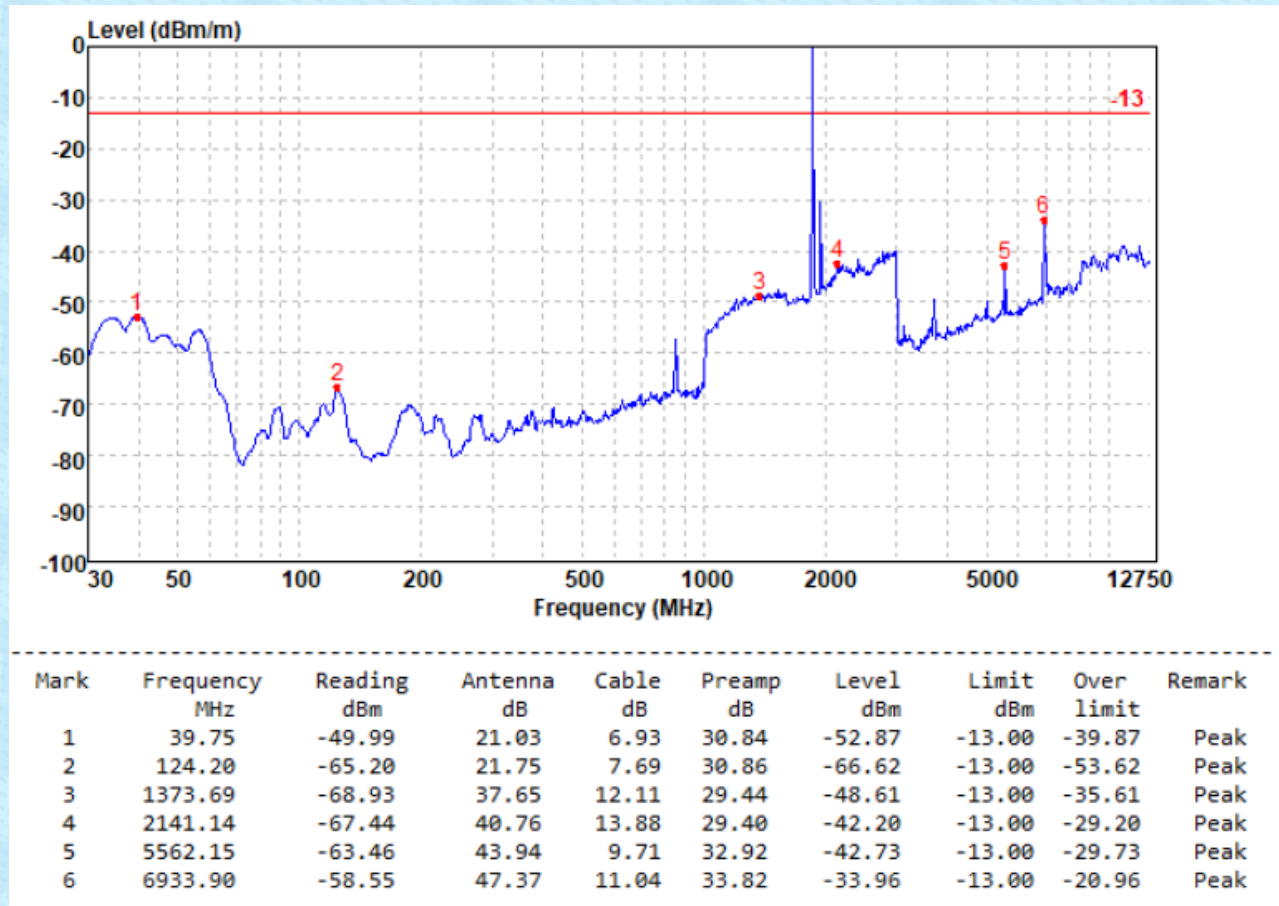
Measurement Data

Test mode:	WCDMA Band II	Test channel:	Lowest
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Horizontal:

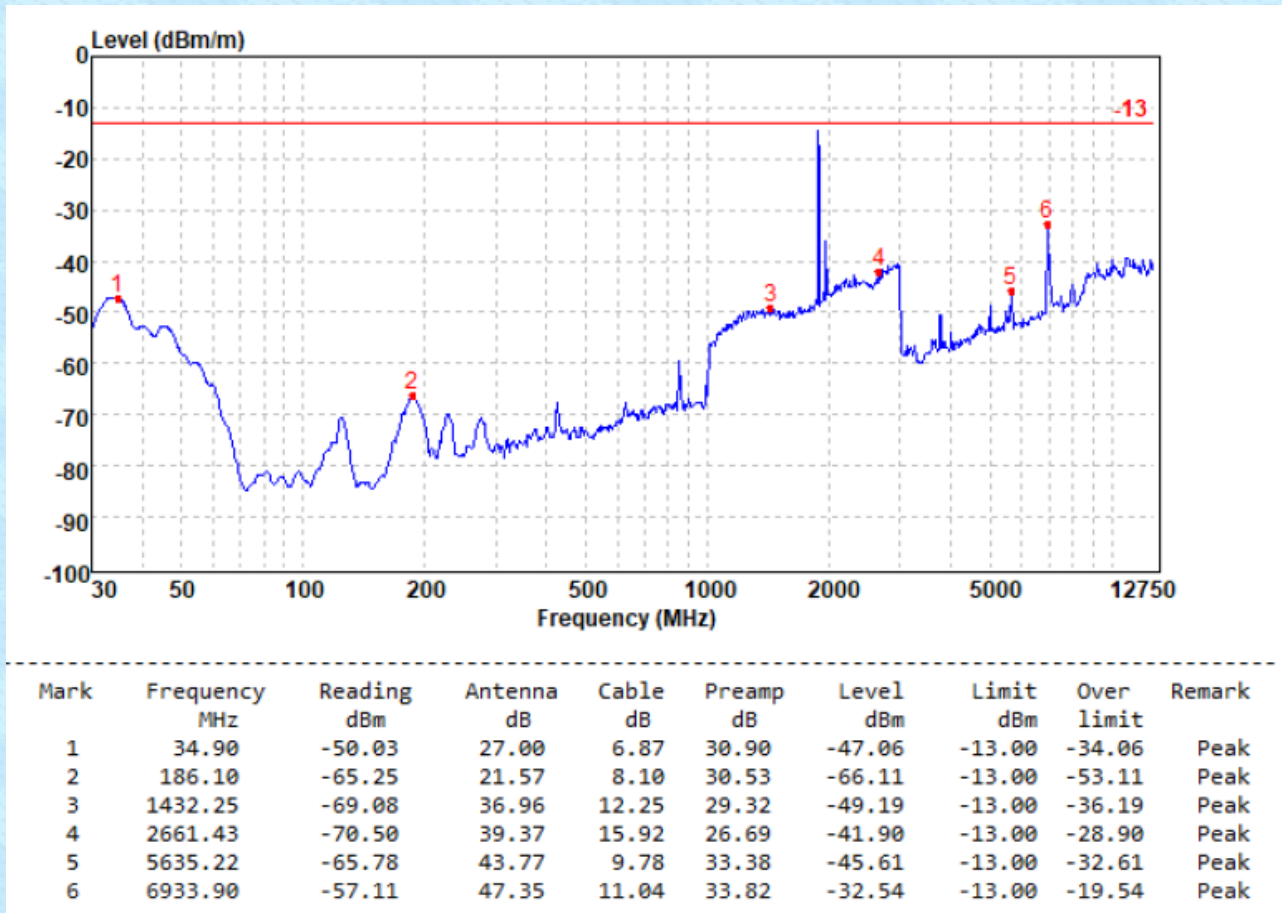


Vertical:

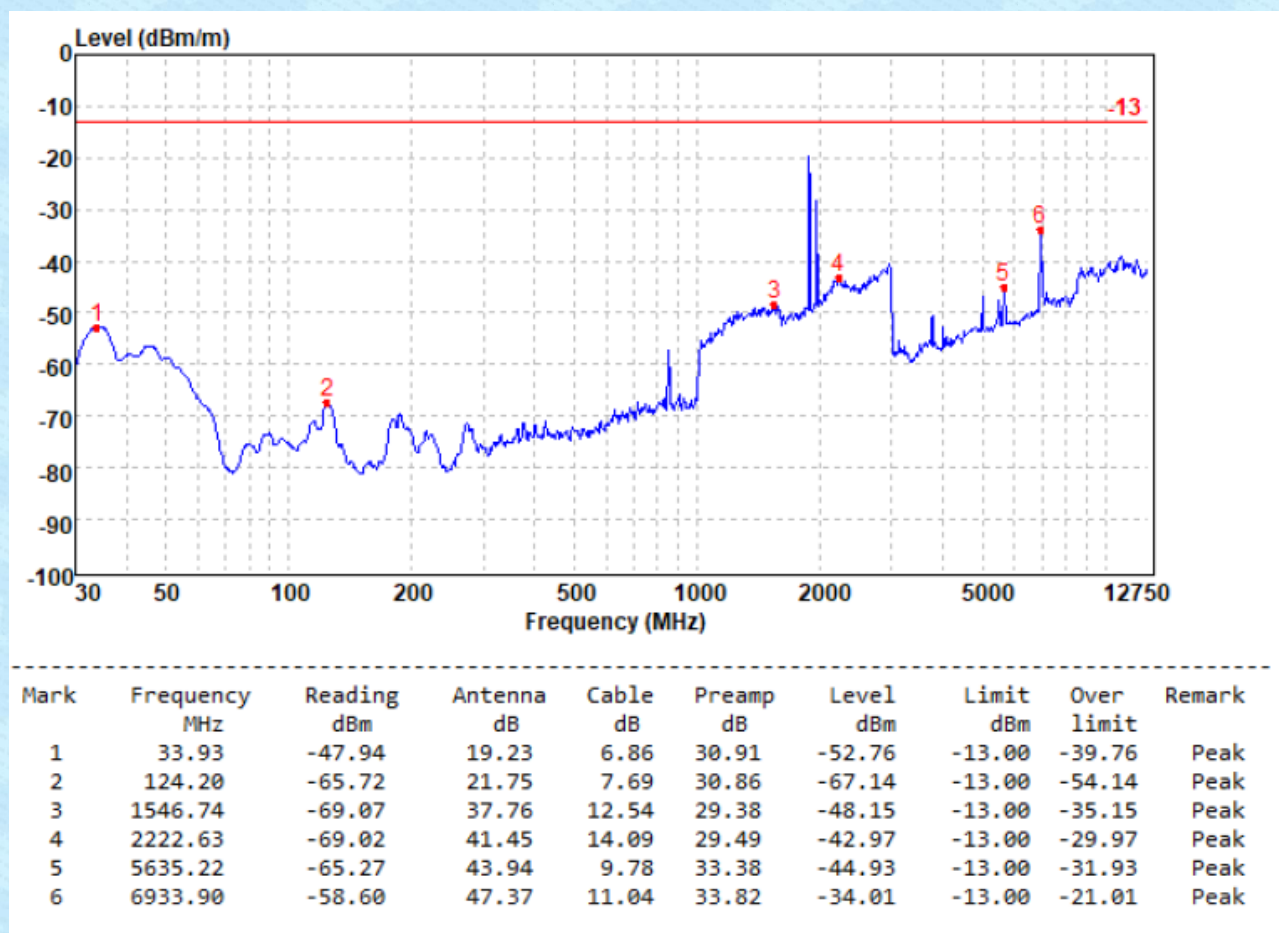


Test mode:	WCDMA Band II	Test channel:	Middle
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Horizontal:

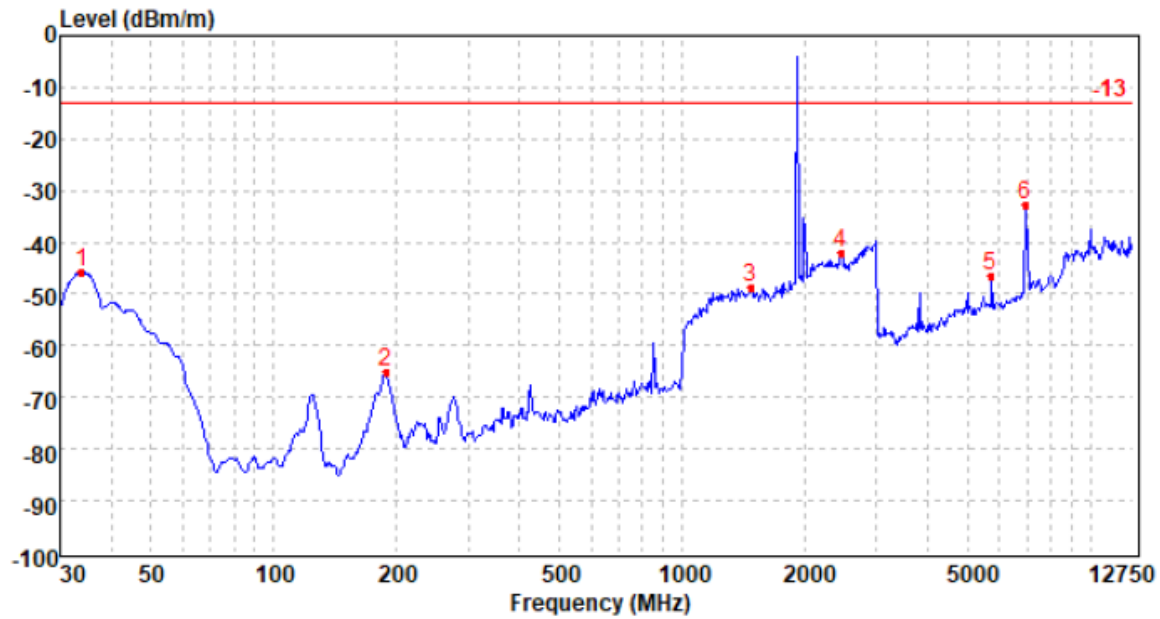


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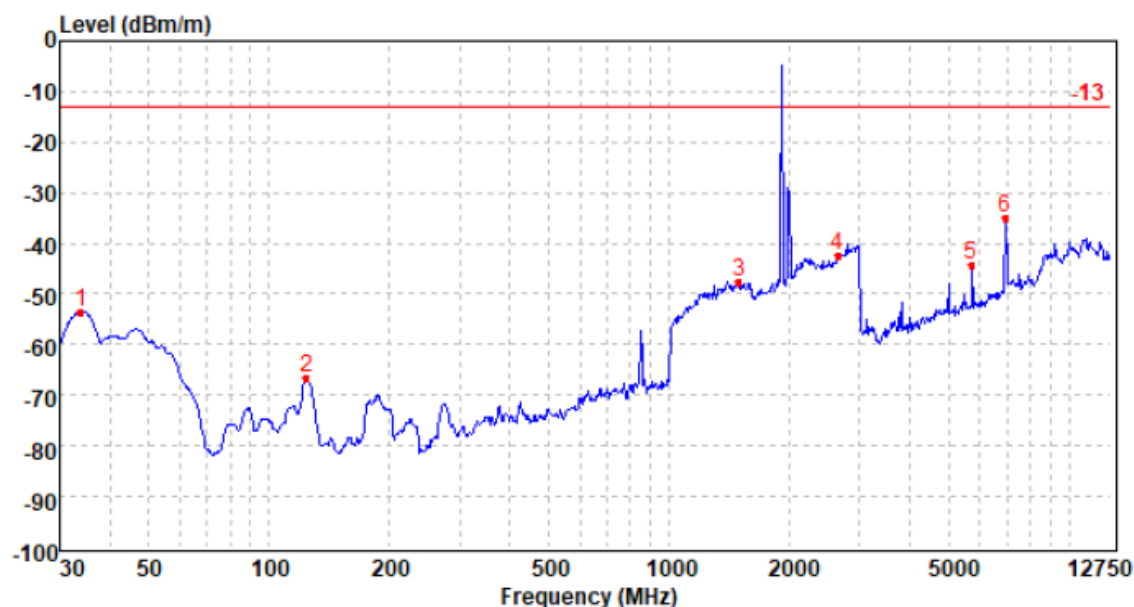
Test mode:	WCDMA Band II	Test channel:	Highest
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Horizontal:



Mark	Frequency MHz	Reading dBm	Antenna dB	Cable dB	Preamplifier dB	Level dBm	Limit dBm	Over limit	Remark
1	33.93	-48.63	26.84	6.86	30.91	-45.84	-13.00	-32.84	Peak
2	188.07	-64.44	21.77	8.11	30.52	-65.08	-13.00	-52.08	Peak
3	1475.37	-68.48	36.69	12.35	29.37	-48.81	-13.00	-35.81	Peak
4	2453.62	-68.25	39.52	15.05	28.17	-41.85	-13.00	-28.85	Peak
5	5717.54	-66.86	43.89	9.88	33.43	-46.52	-13.00	-33.52	Peak
6	6933.90	-57.22	47.35	11.04	33.82	-32.65	-13.00	-19.65	Peak

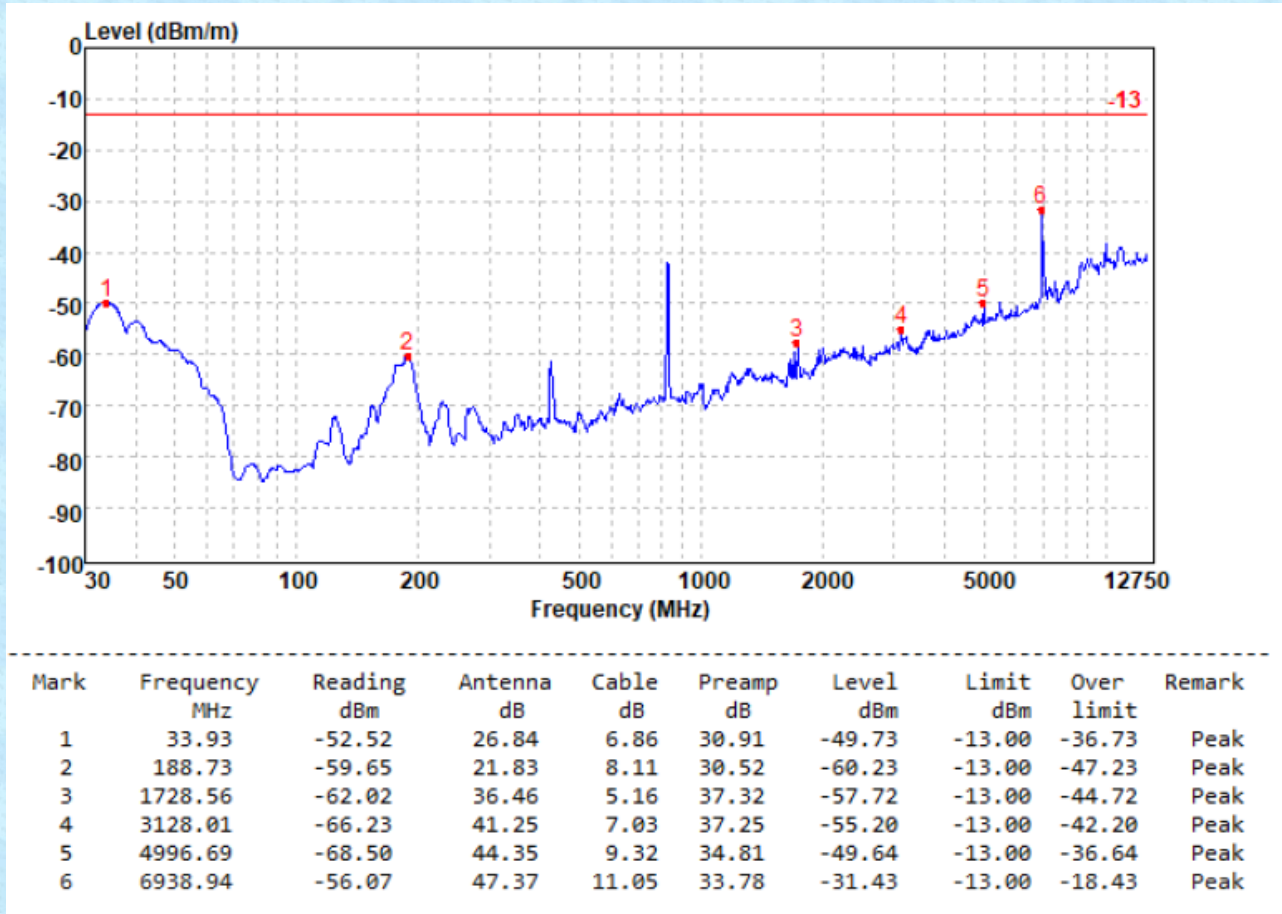
Vertical:



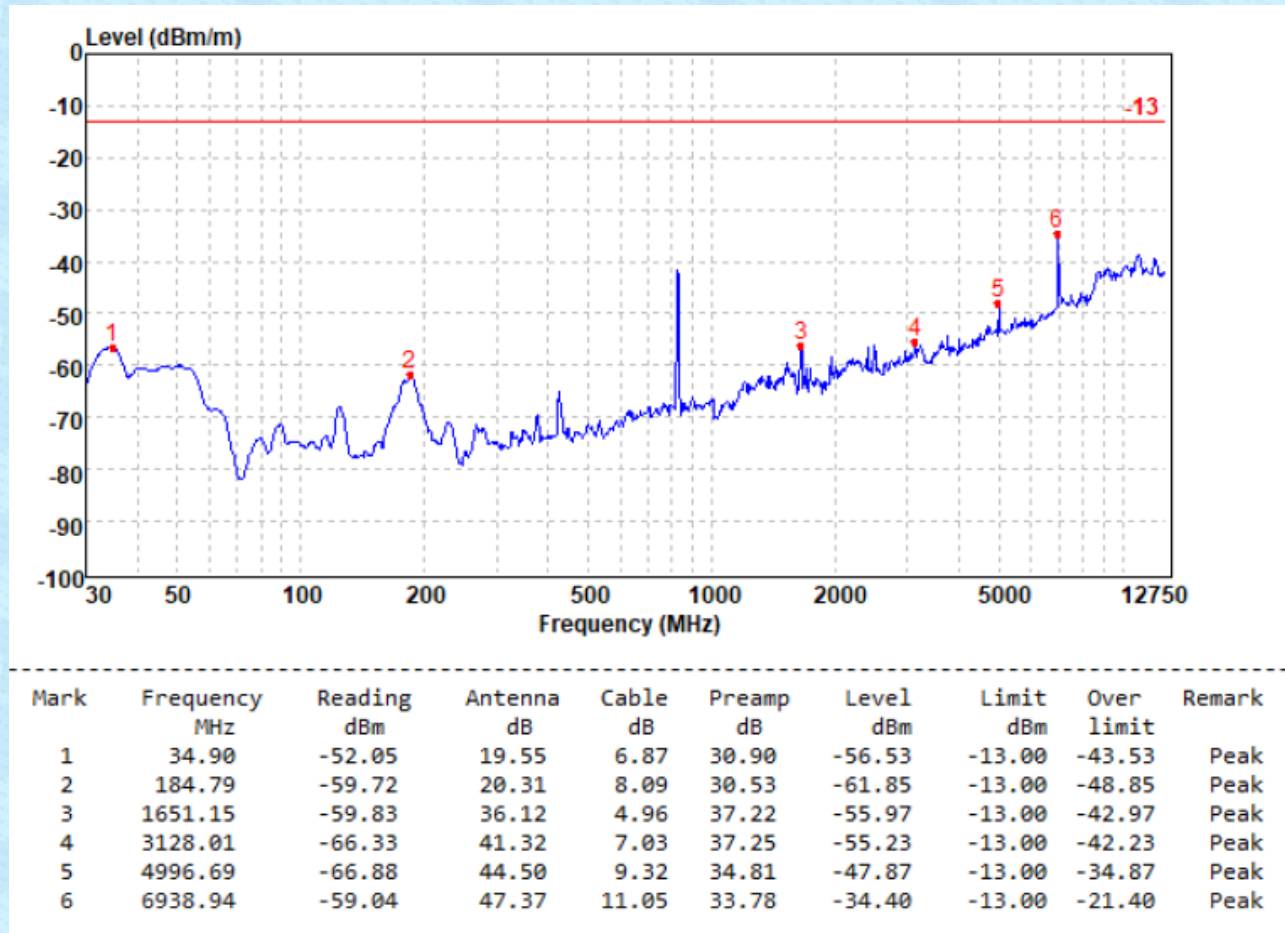
Mark	Frequency MHz	Reading dBm	Antenna dB	Cable dB	Preamp dB	Level dBm	Limit dBm	Over limit	Remark
1	33.93	-48.72	19.23	6.86	30.91	-53.54	-13.00	-40.54	Peak
2	124.20	-64.98	21.75	7.69	30.86	-66.40	-13.00	-53.40	Peak
3	1501.53	-68.25	37.76	12.41	29.57	-47.65	-13.00	-34.65	Peak
4	2652.67	-70.96	39.56	15.87	26.72	-42.25	-13.00	-29.25	Peak
5	5717.54	-64.82	44.04	9.88	33.43	-44.33	-13.00	-31.33	Peak
6	6923.86	-59.57	47.37	11.03	33.90	-35.07	-13.00	-22.07	Peak

Test mode:	WCDMA Band V	Test channel:	Lowest
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Horizontal:

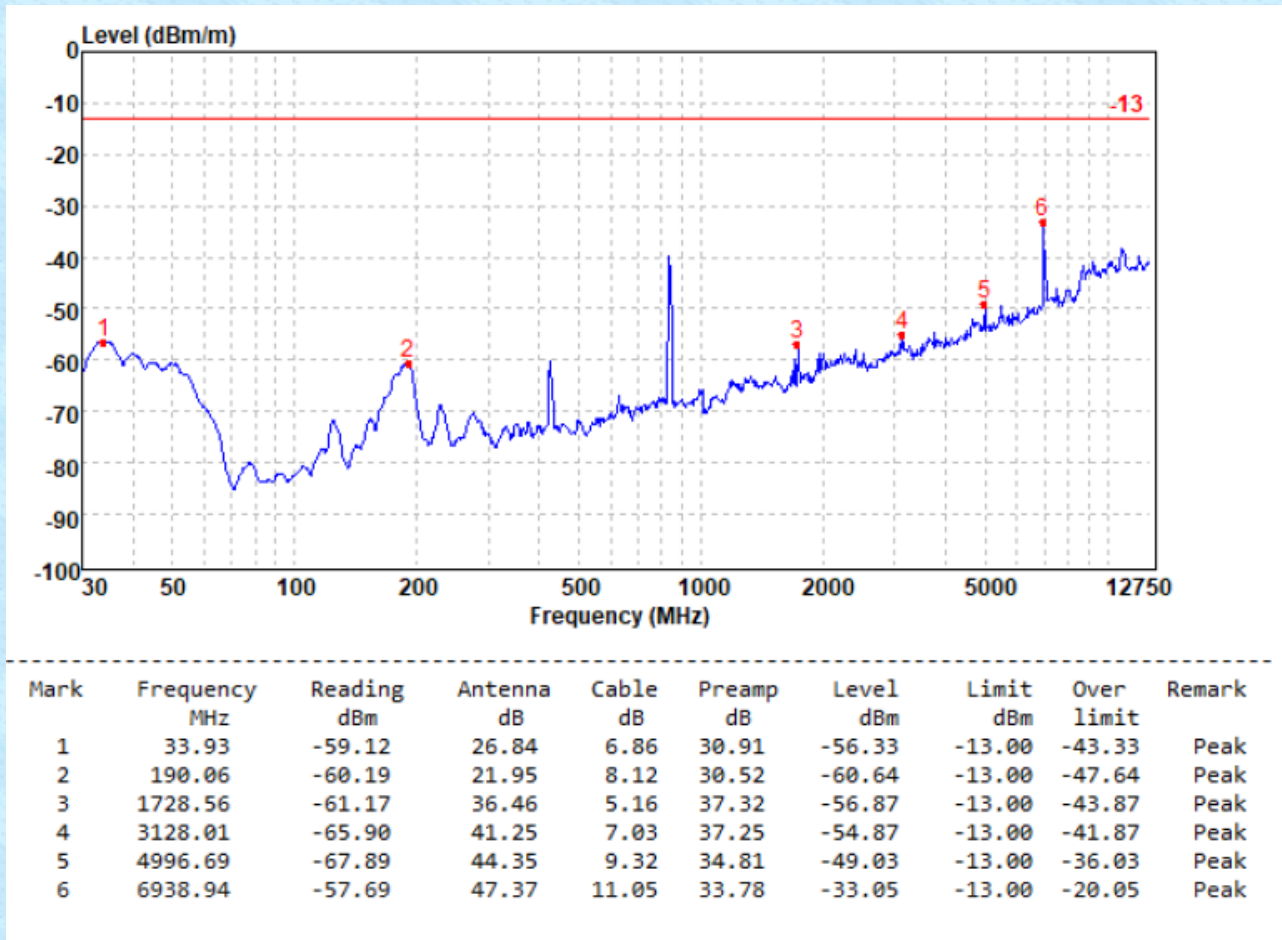


Vertical:

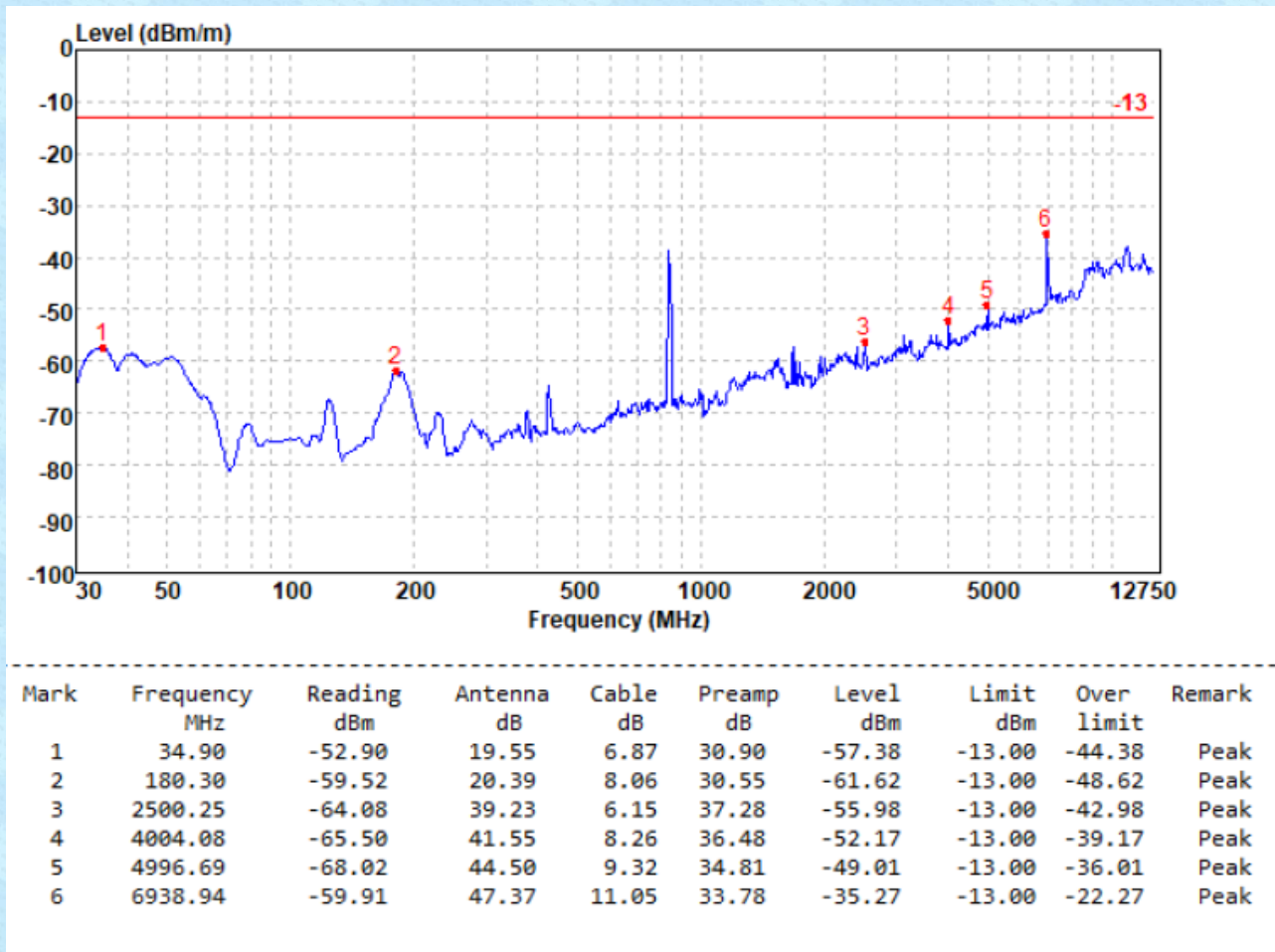


Test mode:	WCDMA Band V	Test channel:	Middle
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Horizontal:

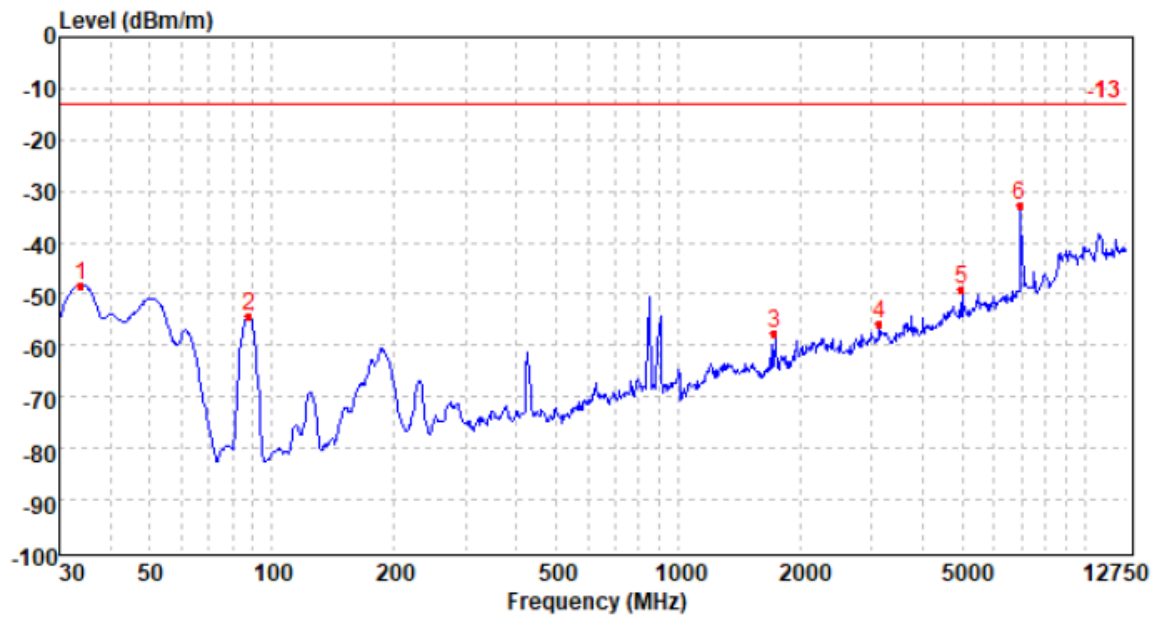


Vertical:



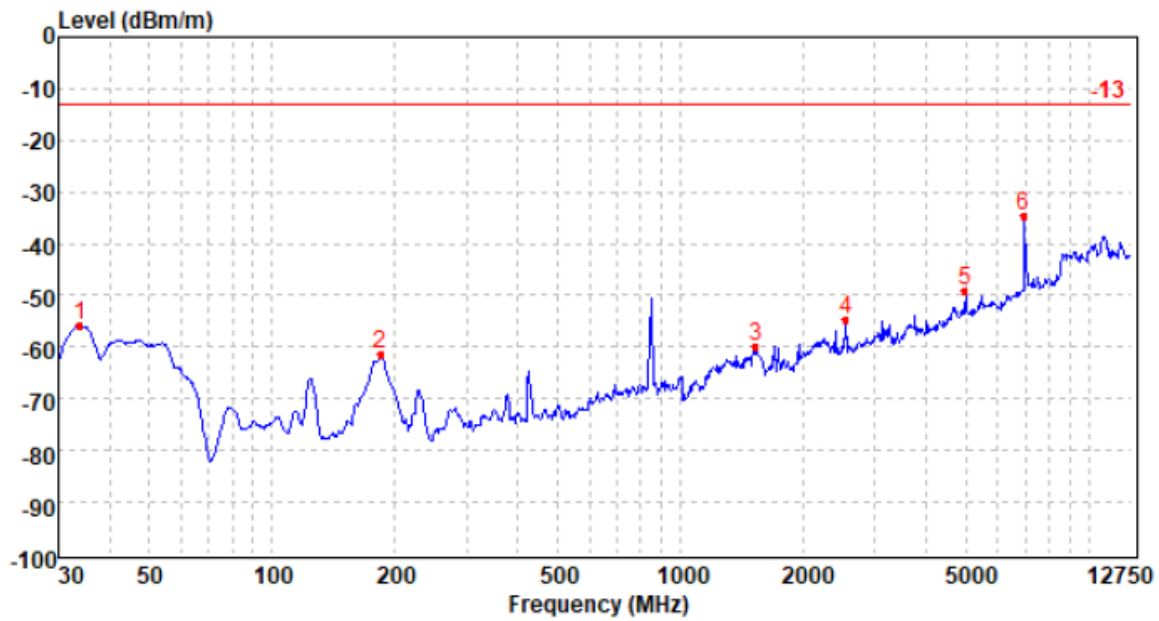
Test mode:	WCDMA Band V	Test channel:	Highest
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Horizontal:



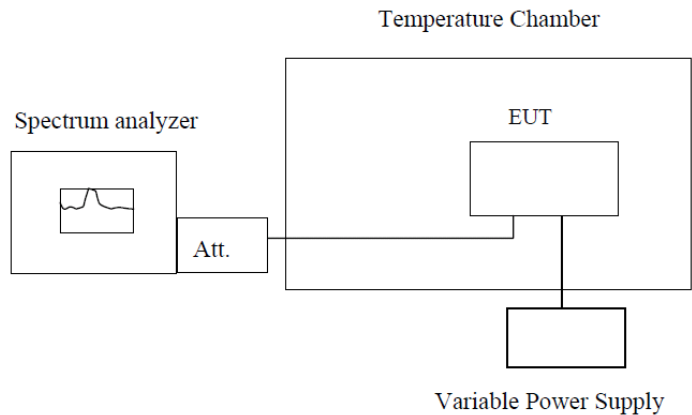
Mark	Frequency MHz	Reading dBm	Antenna dB	Cable dB	Preamp dB	Level dBm	Limit dBm	Over limit	Remark
1	33.93	-51.09	26.84	6.86	30.91	-48.30	-13.00	-35.30	Peak
2	87.68	-48.16	17.33	7.40	30.84	-54.27	-13.00	-41.27	Peak
3	1728.56	-61.99	36.46	5.16	37.32	-57.69	-13.00	-44.69	Peak
4	3128.01	-66.81	41.25	7.03	37.25	-55.78	-13.00	-42.78	Peak
5	4996.69	-67.94	44.35	9.32	34.81	-49.08	-13.00	-36.08	Peak
6	6938.94	-57.40	47.37	11.05	33.78	-32.76	-13.00	-19.76	Peak

Vertical:



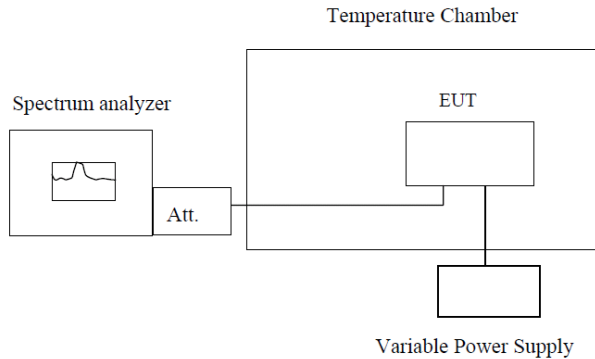
Mark	Frequency MHz	Reading dBm	Antenna dB	Cable dB	Preamplifier dB	Level dBm	Limit dBm	Over limit	Remark
1	33.93	-51.07	19.23	6.86	30.91	-55.89	-13.00	-42.89	Peak
2	184.79	-59.22	20.31	8.09	30.53	-61.35	-13.00	-48.35	Peak
3	1529.75	-65.36	37.76	4.73	36.91	-59.78	-13.00	-46.78	Peak
4	2545.20	-62.89	39.20	6.26	37.28	-54.71	-13.00	-41.71	Peak
5	4996.69	-68.14	44.50	9.32	34.81	-49.13	-13.00	-36.13	Peak
6	6938.94	-59.20	47.37	11.05	33.78	-34.56	-13.00	-21.56	Peak

7.9 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC part 22.355 and FCC part 24.235 and Part 27.54
Test Method:	FCC Part2.1055
Limit:	$\pm 2.5\text{ppm}$
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of $+50^{\circ}\text{C}$ reached.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix

7.10 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC part 22.355 and FCC part 24.235
Test Method:	FCC Part2.1055
Limit:	$\pm 2.5\text{ppm}$
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----