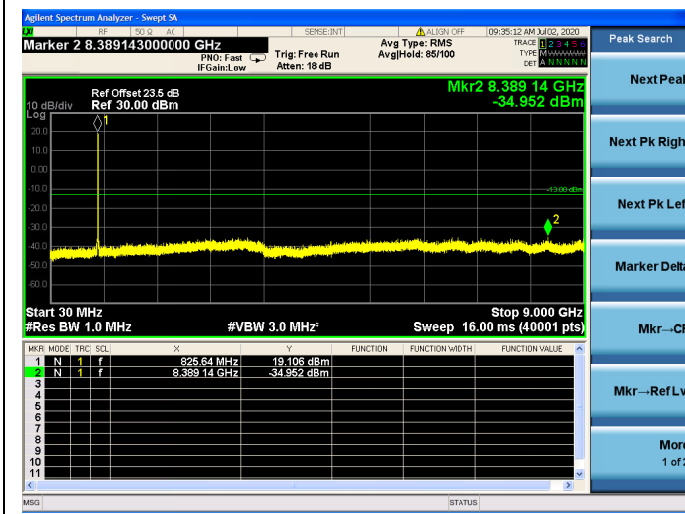
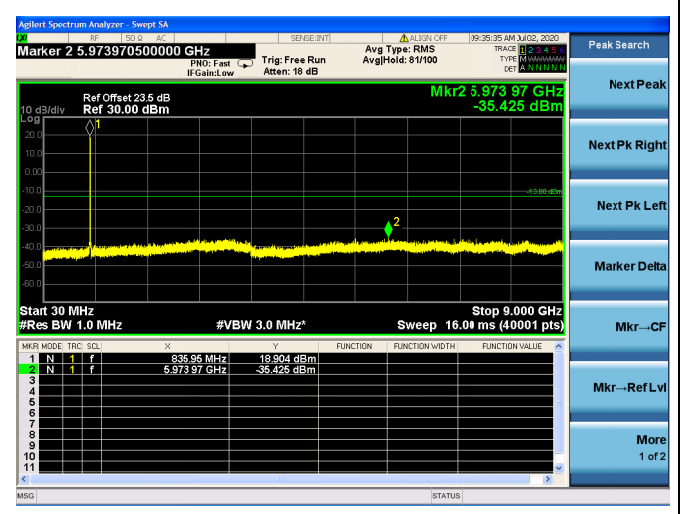




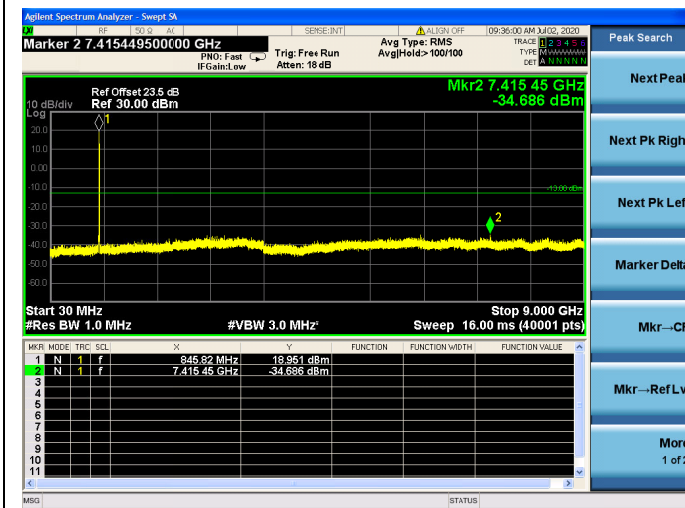
**WCDMA Band V CH4132 826.4MHz**



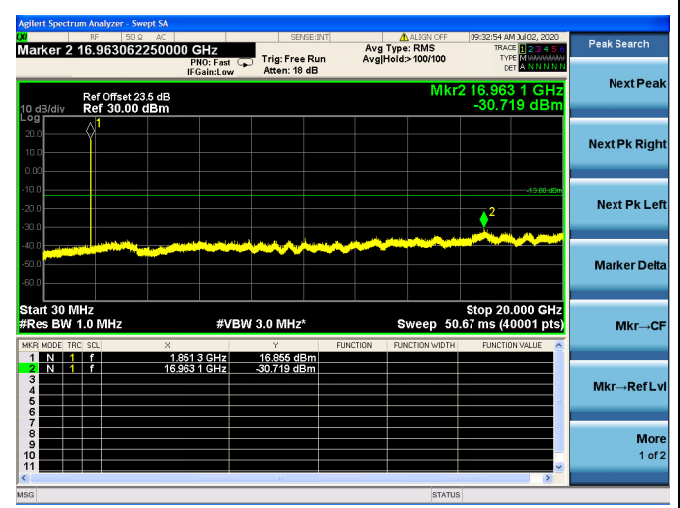
**WCDMA Band V CH4182 836.4MHz**



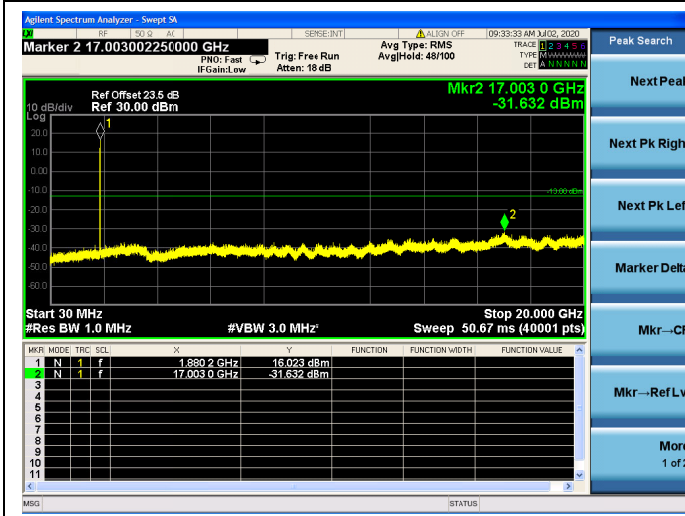
**WCDMA Band V CH4233 846.6MHz**



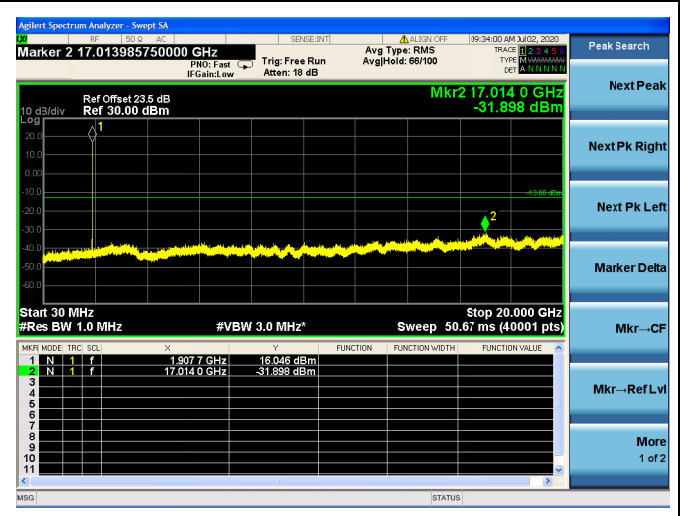
**WCDMA Band II CH9262 1852.4MHz**



**WCDMA Band II CH9400 1880.0MHz**

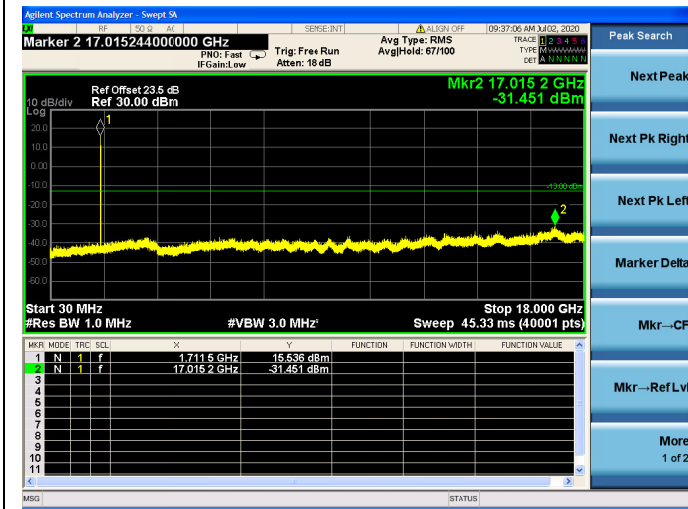


**WCDMA Band II CH9538 1907.6MHz**

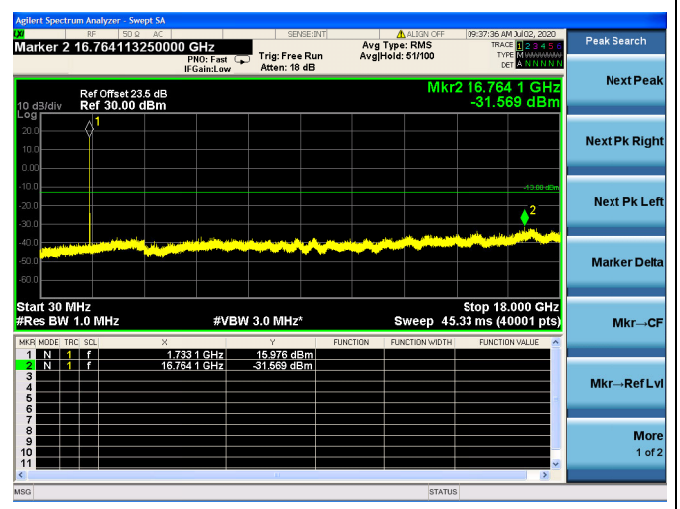




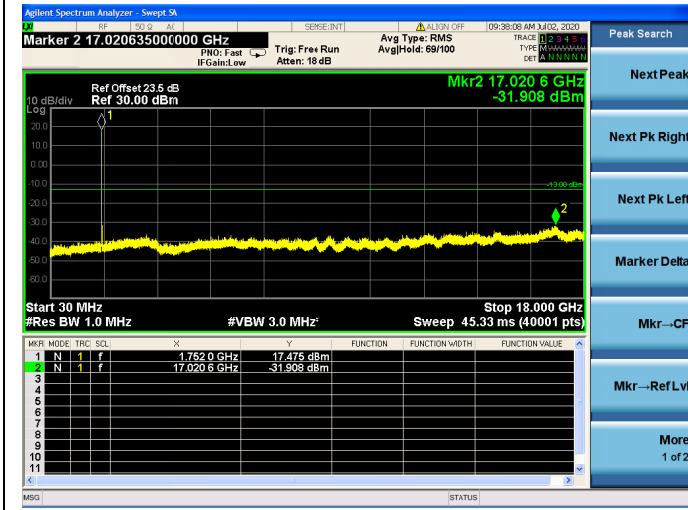
**WCDMA Band IV CH1312 1712.4MHz**



**WCDMA Band IV CH1413 1732.6MHz**



**WCDMA Band IV CH1513 1752.6MHz**



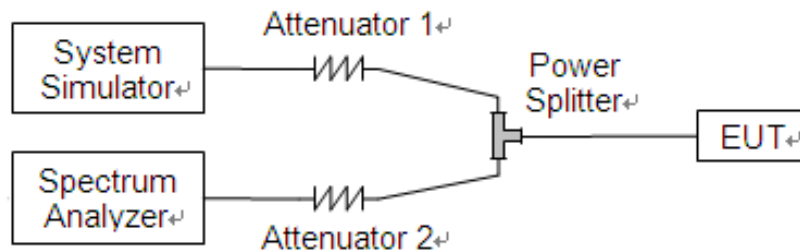
## 2.6. Band Edge

### 2.6.1. Requirement

According to FCC section 22.917(b), 24.238(b) and 27.53(h) in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

### 2.6.2. Test Description

Test Setup:

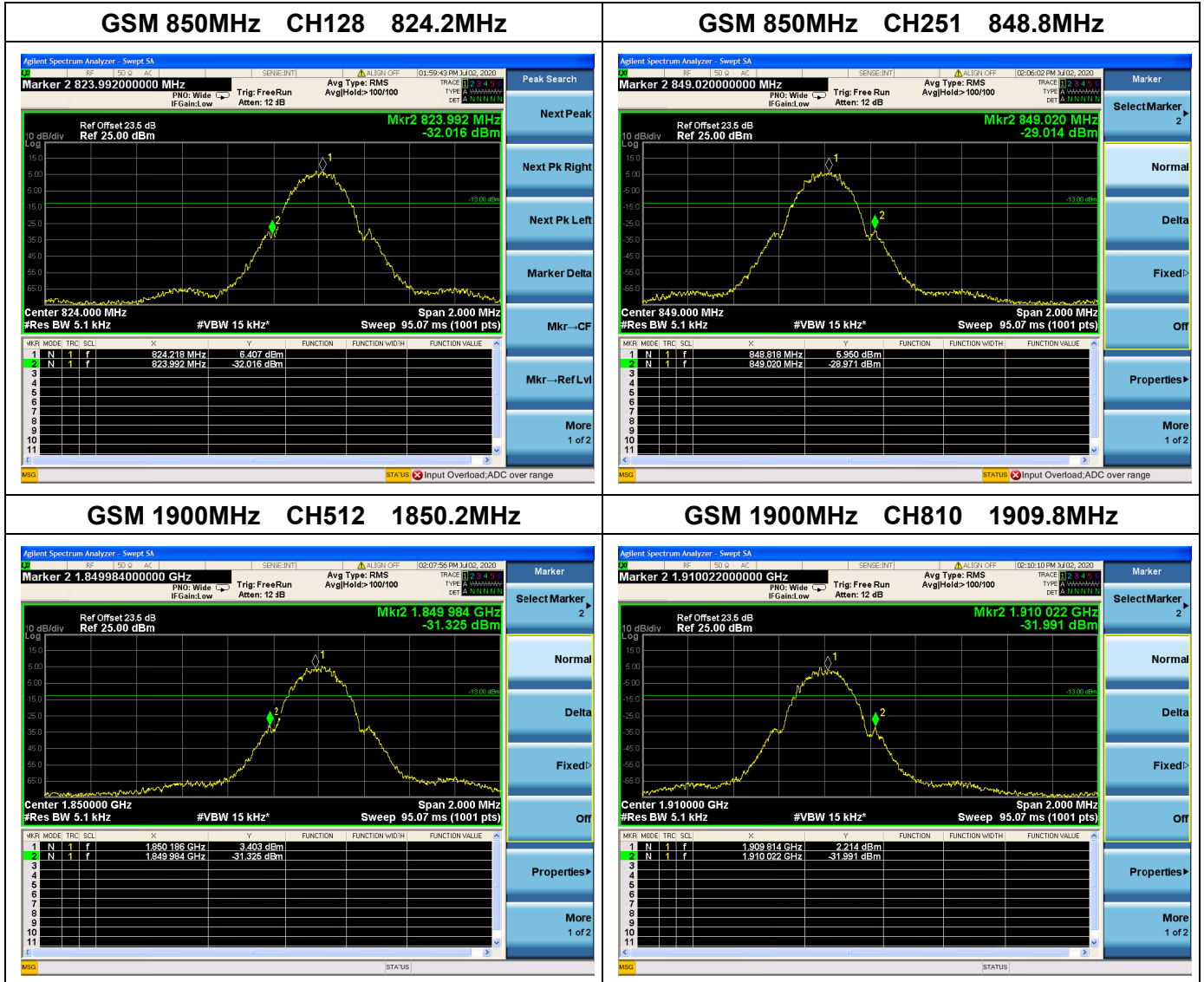


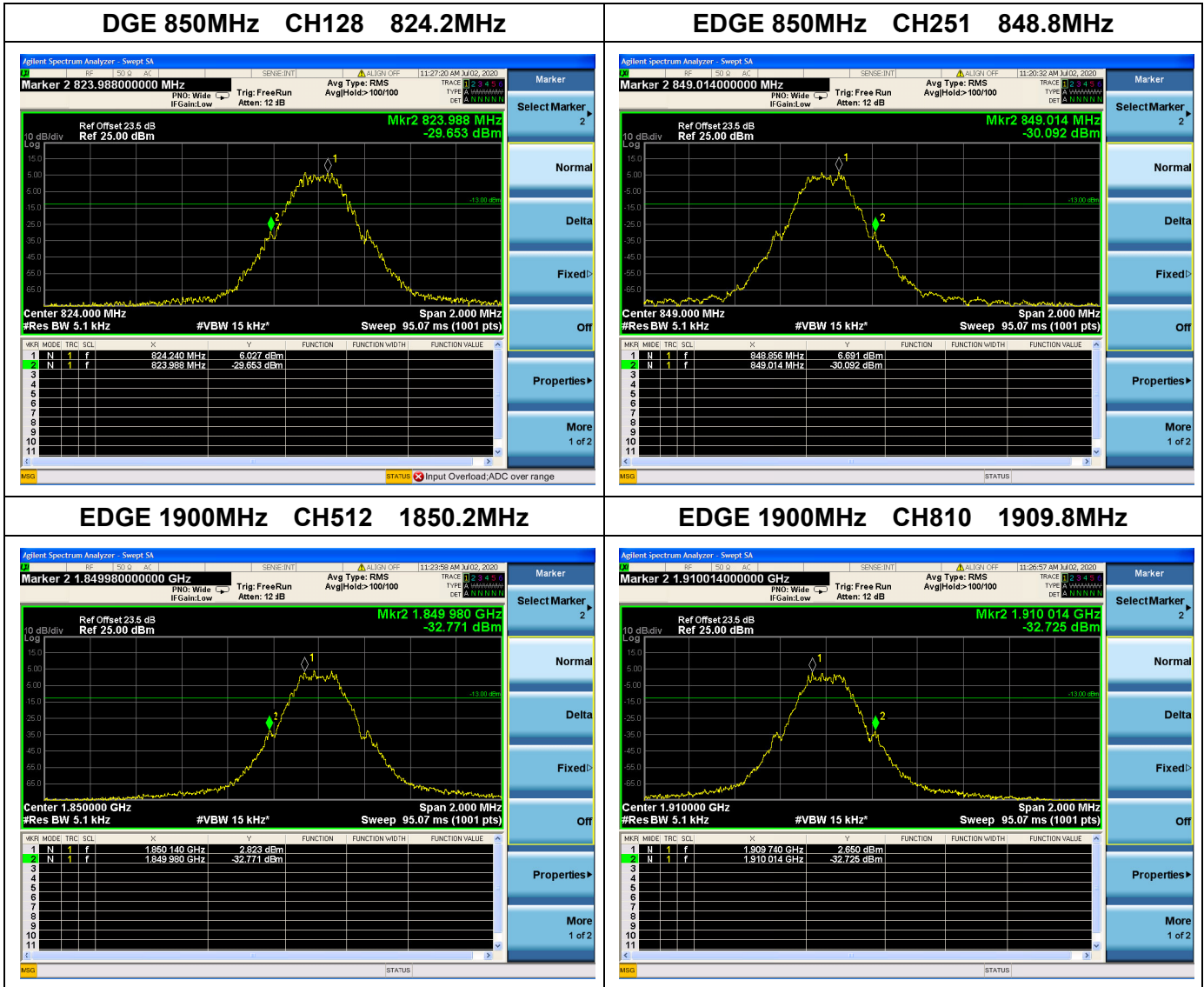
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

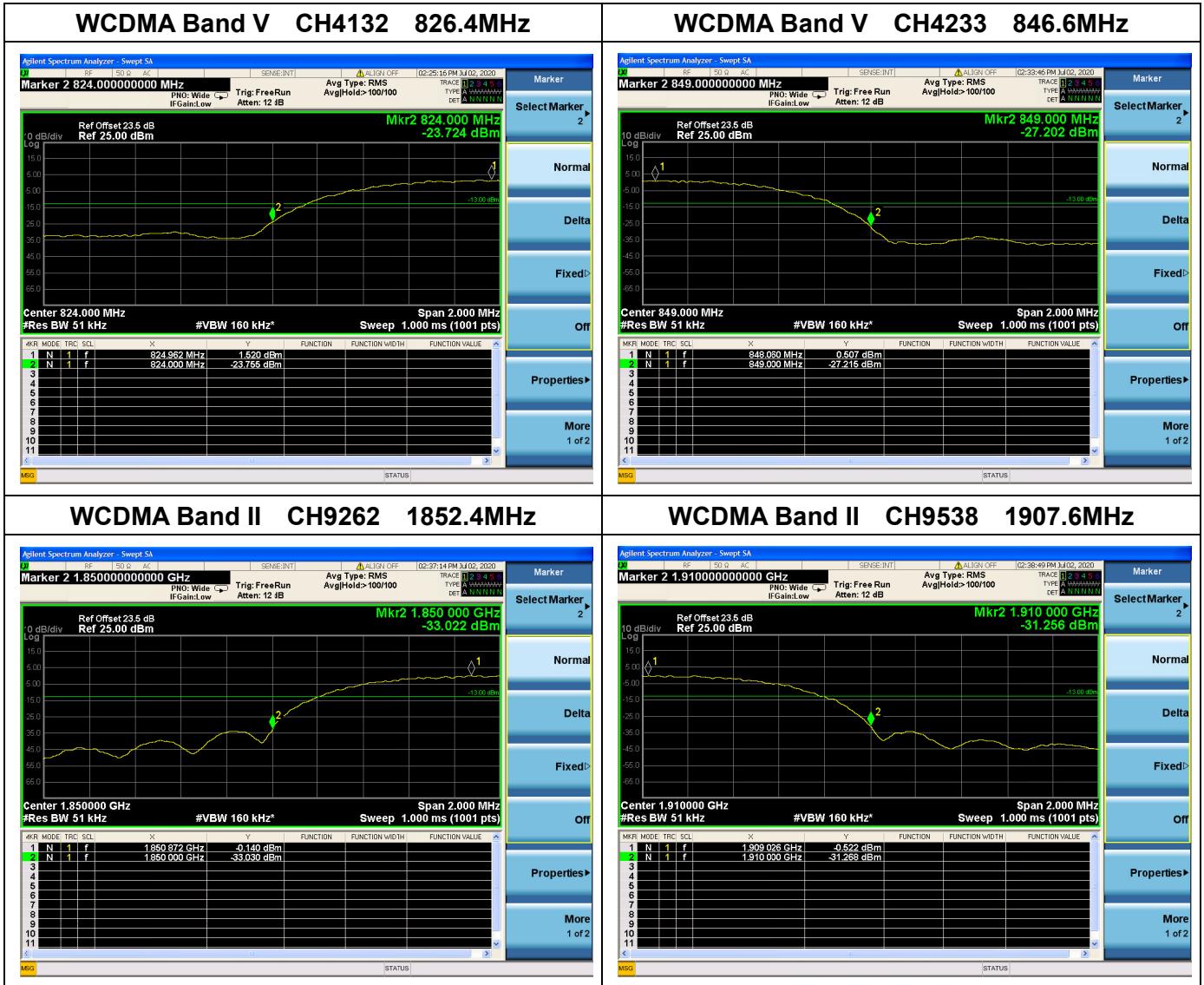


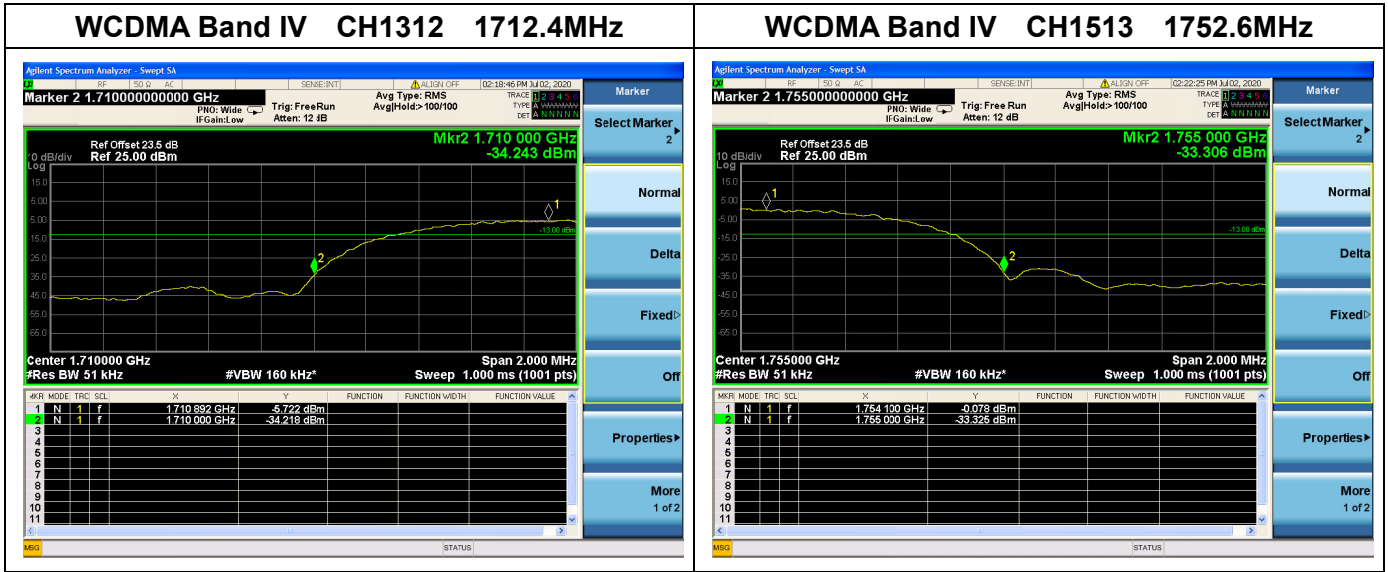
### 2.6.3. Test Result

The lowest and highest channels are tested to verify the band edge emissions.









## 2.7. Transmitter Radiated Power (EIRP/ERP)

### 2.7.1. Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

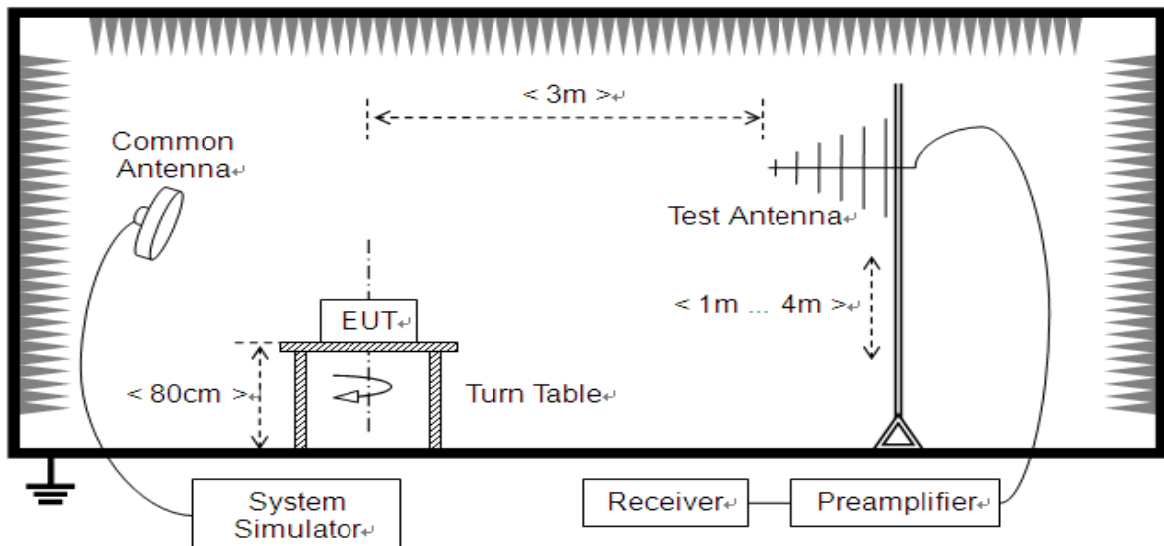
According to FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

According to FCC section 27.50, mobile, and portable (hand-held) stations is limited to 1 Watts e.i.r.p. peak power.

### 2.7.2. Test Description

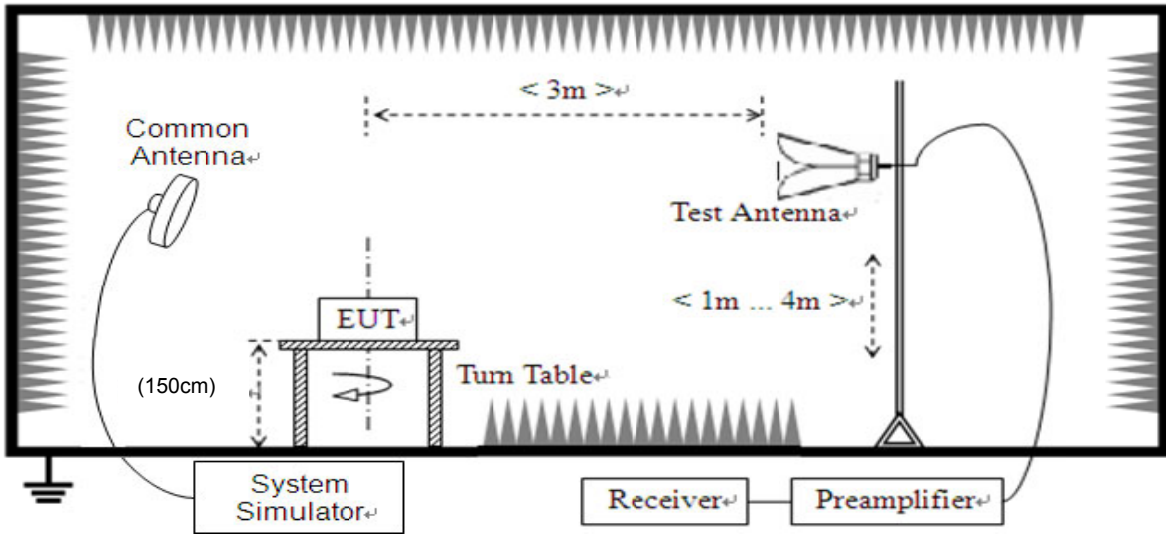
Test Setup:

1) Below 1GHz





2) Above 1GHz



The EUT is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded. Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.



### 2.7.3. Test Result

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST\_TX}} - P_{\text{SUBST\_RX}} - L_{\text{SUBST\_CABLES}} + G_{\text{SUBST\_TX\_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where  $A_{\text{SUBST}}$  is the final substitution correction including receive antenna gain.

$P_{\text{SUBST\_TX}}$  is signal generator level,

$P_{\text{SUBST\_RX}}$  is receiver level,

$L_{\text{SUBST\_CABLES}}$  is cable losses including TX cable,

$G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

$A_{\text{TOT}}$  is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{\text{TOT}}$  was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of  $A_{\text{TOT}}$ .



**GSM Test verdict:**

Band	Channel	Frequency (MHz)	PCL	Measured ERP		Limit		Verdict
				dBm	W	dBm	W	
GSM 850MHz	128	824.20	5	31.21	1.321	38.5	7	PASS
	190	836.60	5	31.29	1.346			PASS
	251	848.80	5	31.27	1.340			PASS
GPRS 850MHz	128	824.20	5	31.46	1.400	38.5	7	PASS
	190	836.60	5	31.26	1.337			PASS
	251	848.80	5	31.14	1.300			PASS
EDGE 850MHz	128	824.20	5	26.23	0.420	38.5	7	PASS
	190	836.60	5	26.01	0.399			PASS
	251	848.80	5	25.93	0.392			PASS

**Note 1:** For the GPRS and EDGE model, all the slots were tested and just the worst data were recorded in this report.

**Note 2:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.

Band	Channel	Frequency (MHz)	PCL	Measured EIRP		Limit		Verdict
				dBm	W	dBm	W	
GSM 1900MHz	512	1850.2	0	30.88	1.225	33	2	PASS
	661	1880.0	0	30.88	1.225			PASS
	810	1909.8	0	30.90	1.230			PASS
GPRS 1900MHz	512	1850.2	0	30.90	1.230	33	2	PASS
	661	1880.0	0	30.88	1.225			PASS
	810	1909.8	0	30.87	1.222			PASS
EDGE 1900MHz	512	1850.2	0	27.13	0.516	33	2	PASS
	661	1880.0	0	27.11	0.514			PASS
	810	1909.8	0	26.90	0.490			PASS

**Note 1:** For the GPRS and EDGE model, all the slots were tested and just the worst data were recorded in this report.

**Note 2:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.



**WCDMA Test verdict:**

Band	Channel	Frequency (MHz)	Measured ERP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA Band V	4132	826.4	23.44	0.221	38.5	7	PASS
	4182	836.4	23.33	0.215			PASS
	4233	846.6	23.36	0.217			PASS
HSDPA Band V	4132	826.4	23.02	0.200	38.5	7	PASS
	4182	836.4	22.96	0.198			PASS
	4233	846.6	22.97	0.198			PASS
HSUPA Band V	4132	826.4	22.90	0.195	38.5	7	PASS
	4182	836.4	22.84	0.192			PASS
	4233	846.6	22.90	0.195			PASS

**Note:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.

Band	Channel	Frequency (MHz)	Measured EIRP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA Band II	9262	1852.4	22.91	0.195	33	2	PASS
	9400	1880.0	23.04	0.201			PASS
	9538	1907.6	22.91	0.195			PASS
HSDPA Band II	9262	1852.4	21.91	0.155	33	2	PASS
	9400	1880.0	21.77	0.150			PASS
	9538	1907.6	21.86	0.153			PASS
HSUPA Band II	9262	1852.4	21.80	0.151	33	2	PASS
	9400	1880.0	21.75	0.150			PASS
	9538	1907.6	21.76	0.150			PASS

**Note:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.



Band	Channel	Frequency (MHz)	Measured EIRP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA Band IV	1312	1712.4	21.89	0.155	30	1	PASS
	1413	1732.6	21.61	0.145			PASS
	1513	1752.6	21.68	0.147			PASS
HSDPA Band IV	1312	1712.4	20.91	0.123	30	1	PASS
	1413	1732.6	21.02	0.126			PASS
	1513	1752.6	21.05	0.127			PASS
HSUPA Band IV	1312	1712.4	20.92	0.124	30	1	PASS
	1413	1732.6	21.03	0.127			PASS
	1513	1752.6	21.05	0.127			PASS

**Note:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.

## 2.8. Radiated Out of Band Emissions

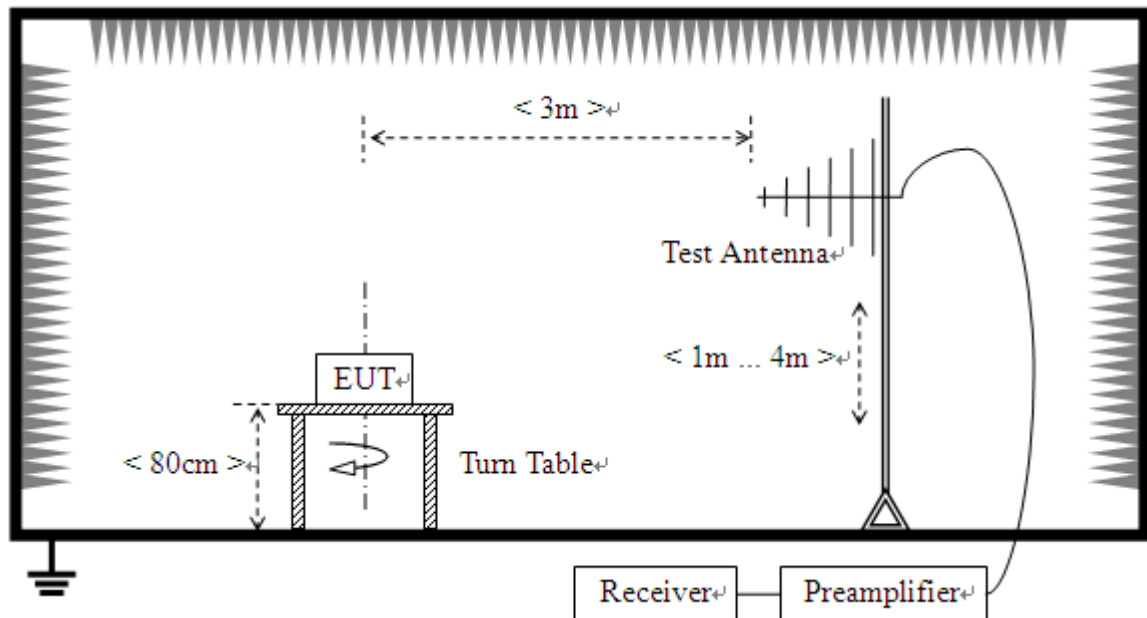
### 2.8.1. Requirement

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  $43+10*\log(P)$ dB. This calculated to be -13dBm.

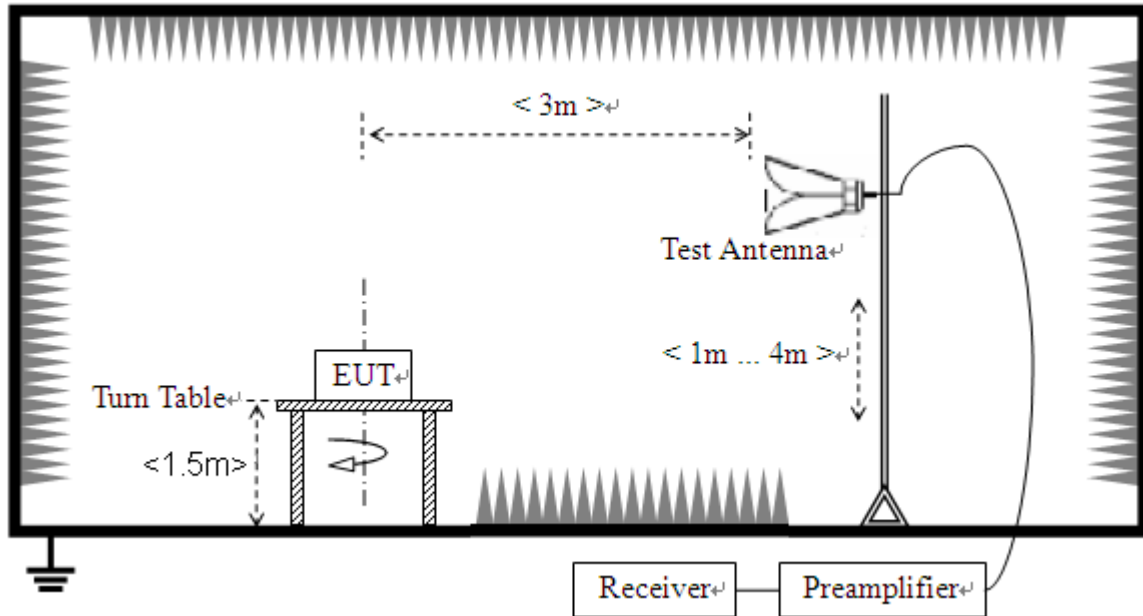
### 2.8.2. Test Description

Test Setup:

- 1) Below 1GHz



2) Above 1GHz



The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded. Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) and a Horn one (used for above 3 GHz), it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

### 2.8.3. Test Result

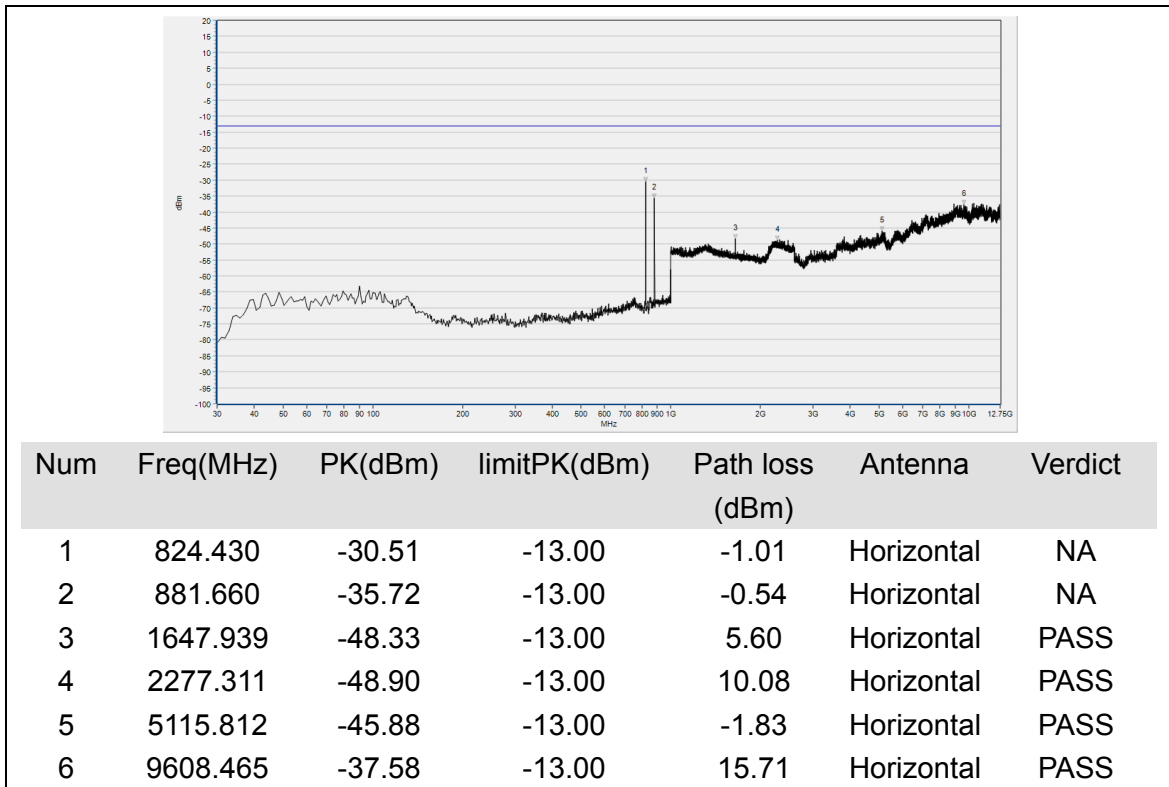
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions. The power of the EUT transmitting frequency should be ignored.

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical		
GSM 850MHz	128	824.2	< -25	< -25	-13	PASS
	190	836.6	< -25	< -25		PASS
	251	848.8	< -25	< -25		PASS
GSM 1900MHz	512	1850.2	< -25	< -25	-13	PASS
	661	1880.0	< -25	< -25		PASS
	810	1909.8	< -25	< -25		PASS
EDGE 850MHz	128	824.2	< -25	< -25	-13	PASS
	190	836.6	< -25	< -25		PASS
	251	848.8	< -25	< -25		PASS
EDGE 1900MHz	512	1850.2	< -25	< -25	-13	PASS
	661	1880.0	< -25	< -25		PASS
	810	1909.8	< -25	< -25		PASS
WCDMA Band V	4132	826.4	< -25	< -25	-13	PASS
	4182	836.4	< -25	< -25		PASS
	4233	846.6	< -25	< -25		PASS
WCDMA Band II	9262	1852.4	< -25	< -25	-13	PASS
	9400	1880.0	< -25	< -25		PASS
	9538	1907.6	< -25	< -25		PASS
WCDMA Band IV	1312	1712.4	< -25	< -25	-13	PASS
	1413	1732.6	< -25	< -25		PASS
	1513	1752.6	< -25	< -25		PASS

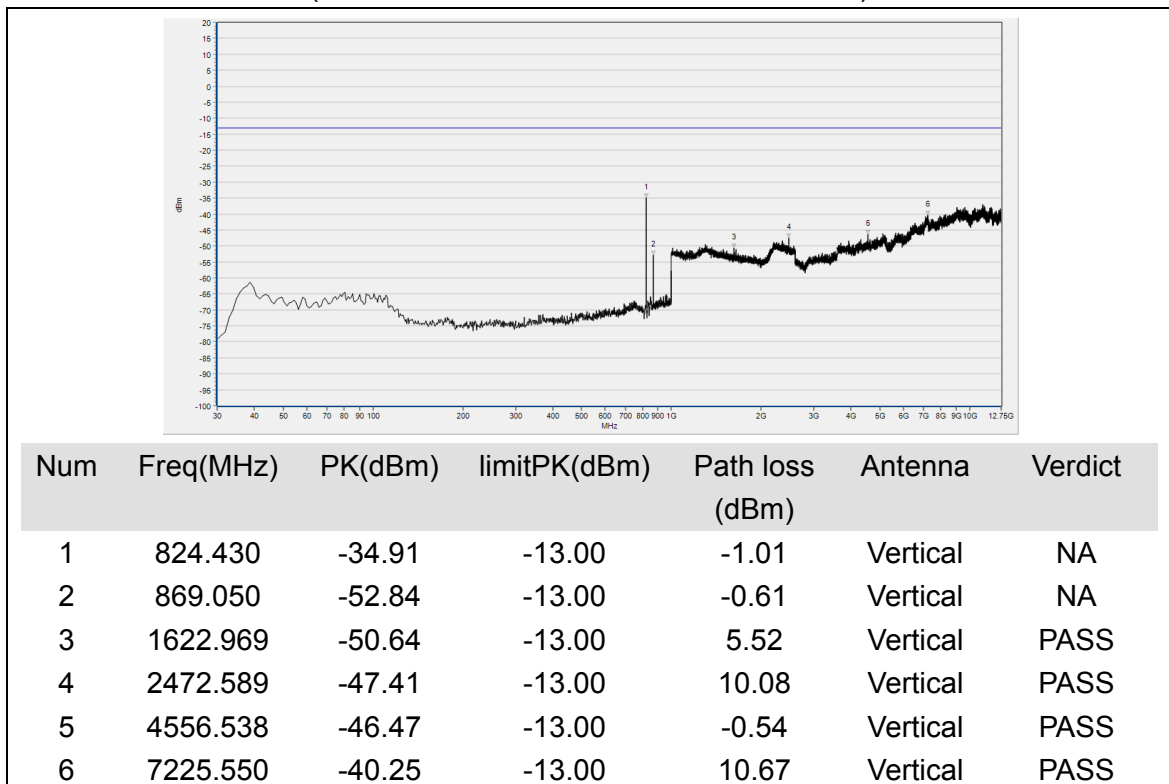
**Note 1:** All test mode and condition mentioned were considered and evaluated respectively by performing full test, only the worst data were recorded and reported.

**Note 2:** All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

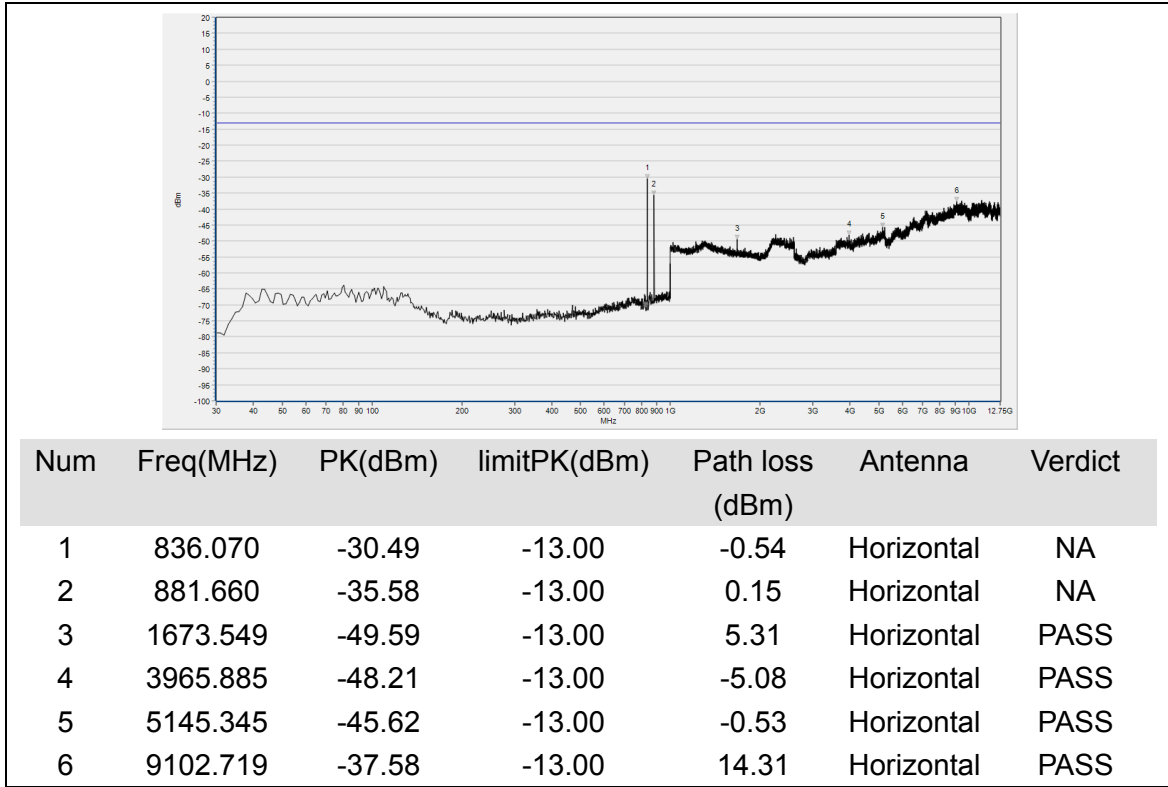




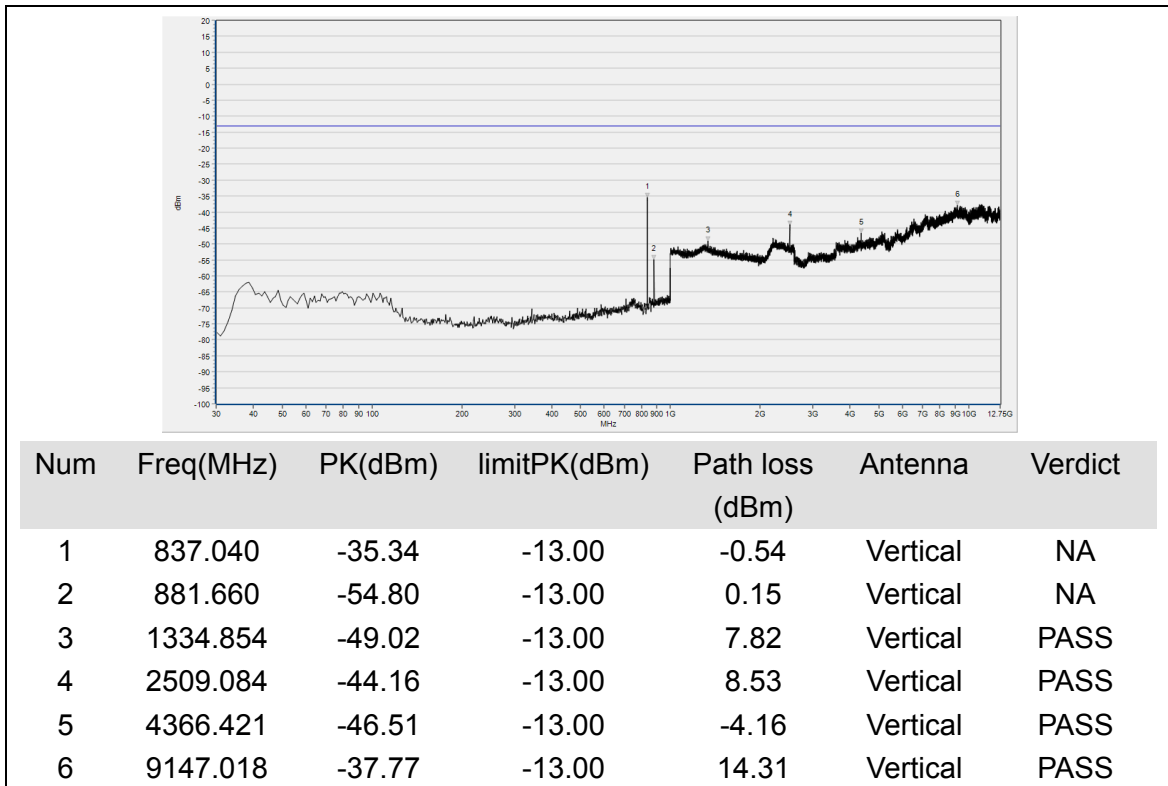
(GSM 850MHz, Channel = 128, Horizontal)



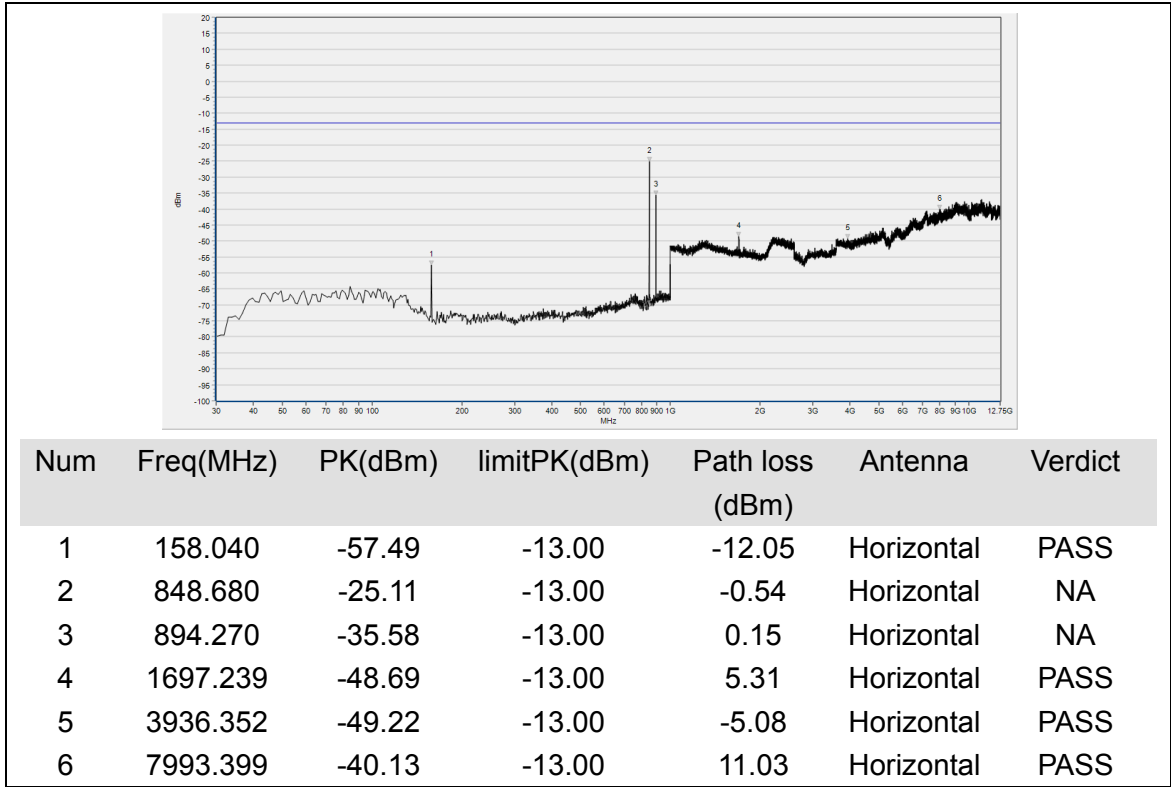
(GSM 850MHz, Channel = 128, Vertical)



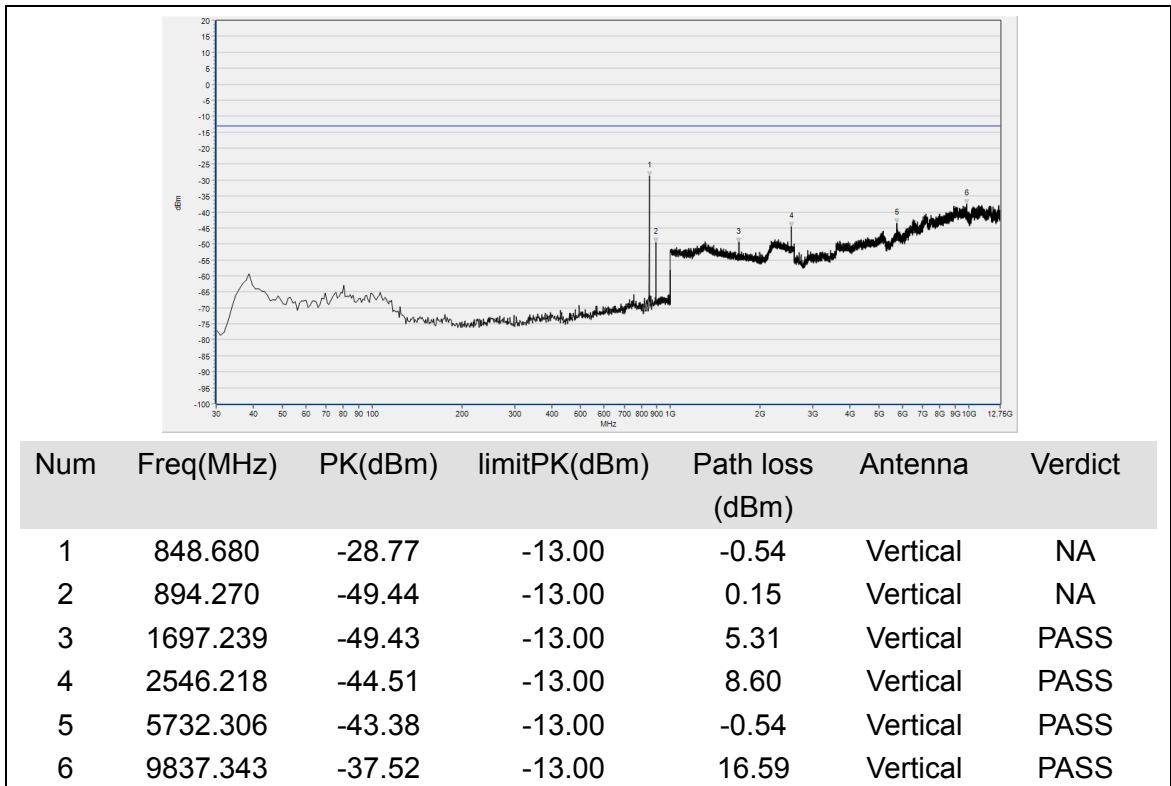
(GSM850MHz, Channel = 190, Horizontal)



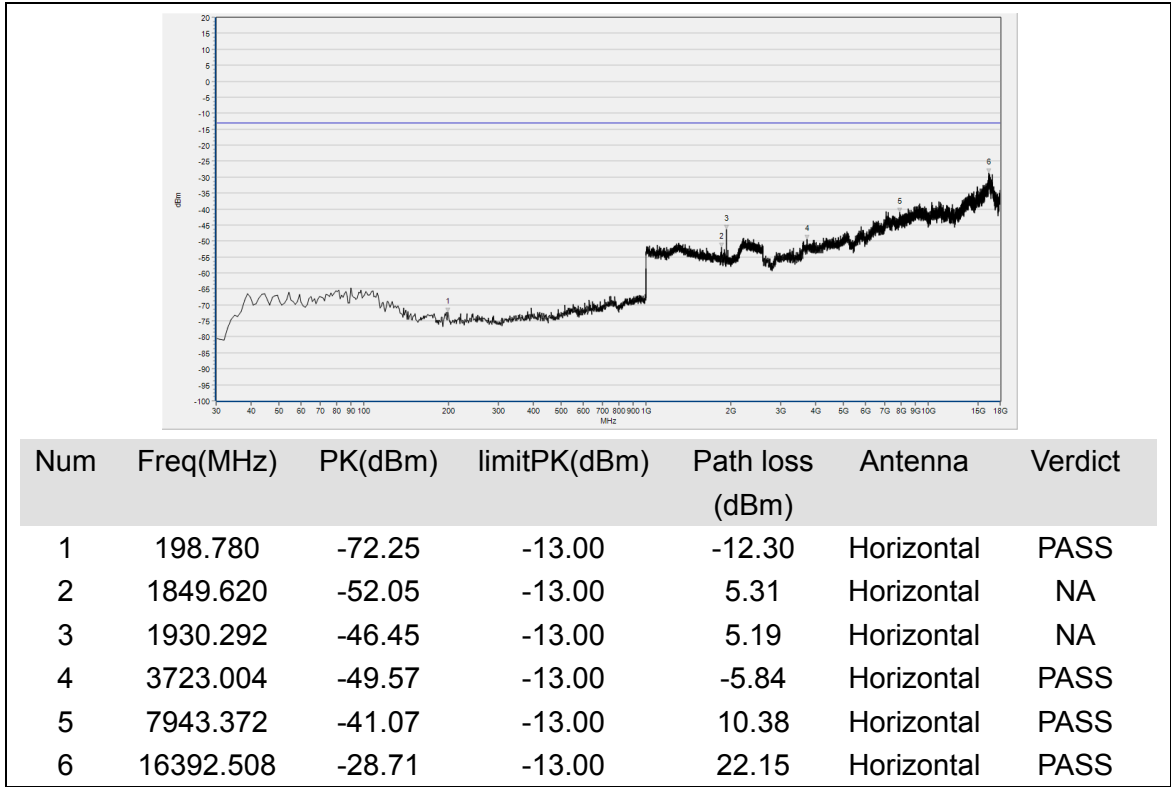
(GSM 850MHz, Channel = 190, Vertical)



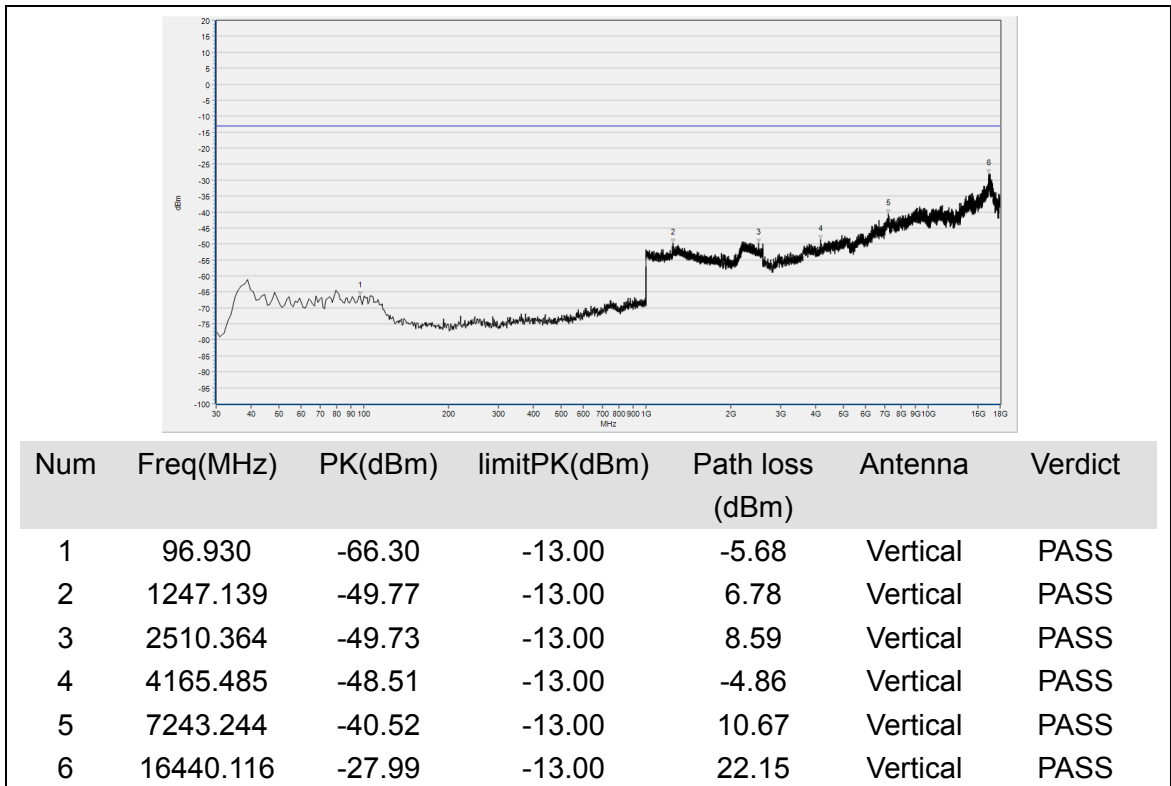
(GSM 850MHz, Channel = 251, Horizontal)



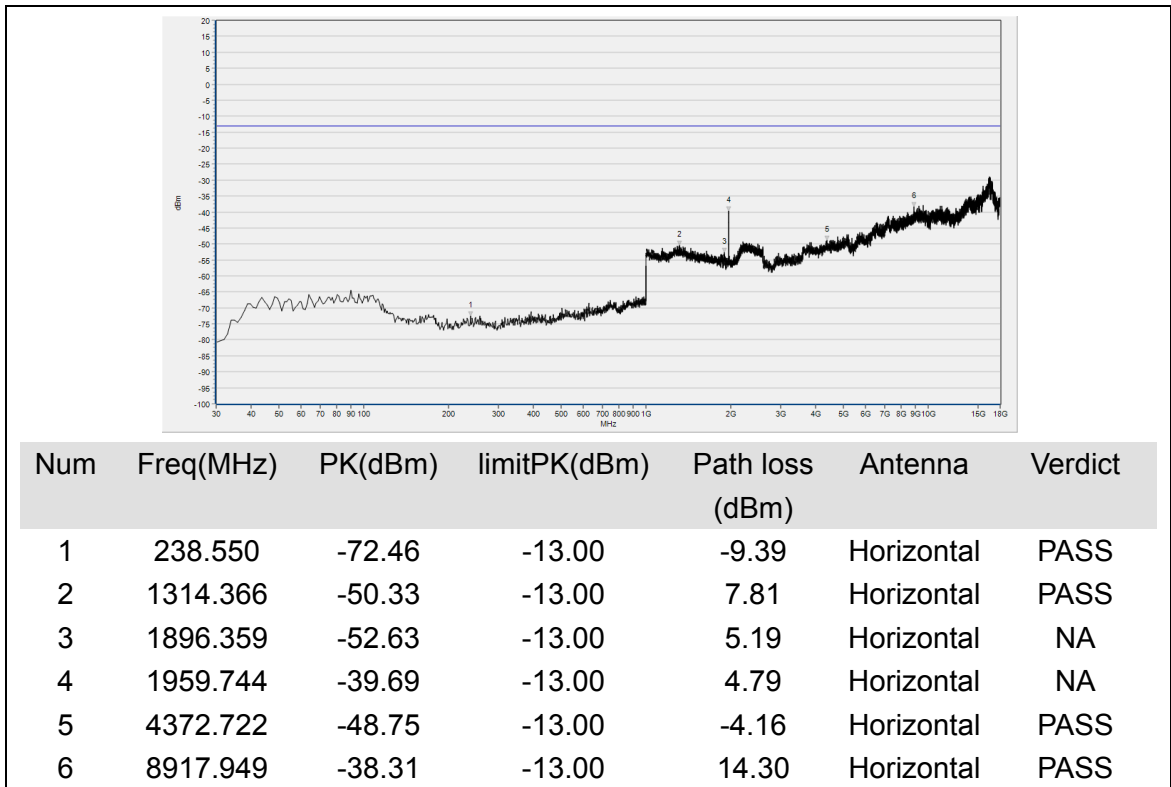
(GSM 850MHz, Channel = 251, Vertical)



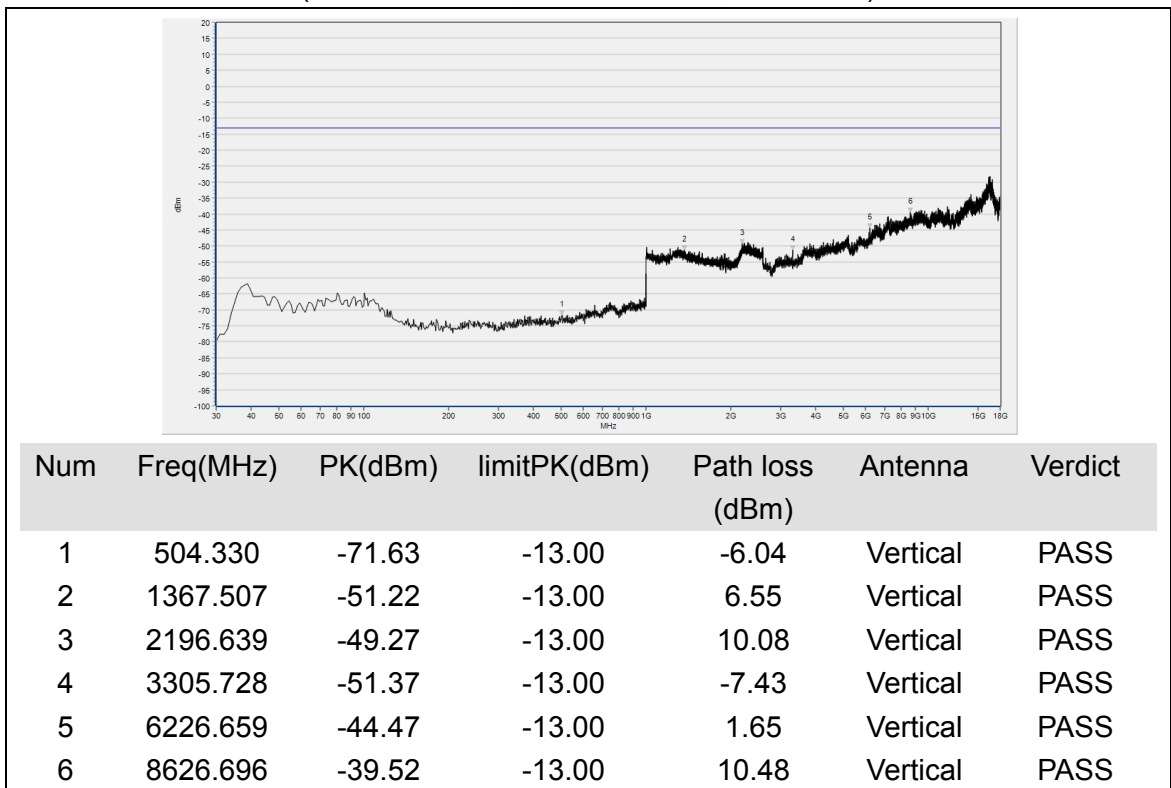
(GSM 1900MHz, Channel = 512, Horizontal)



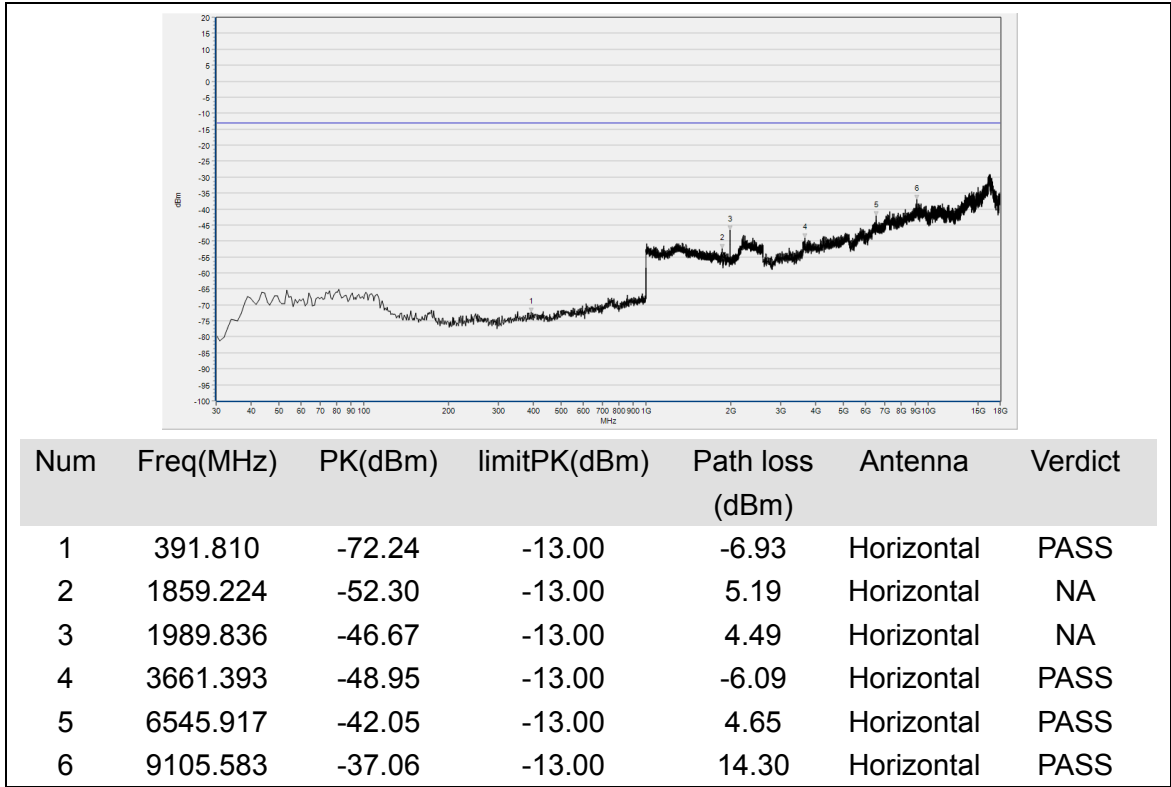
(GSM 1900MHz, Channel = 512, Vertical)



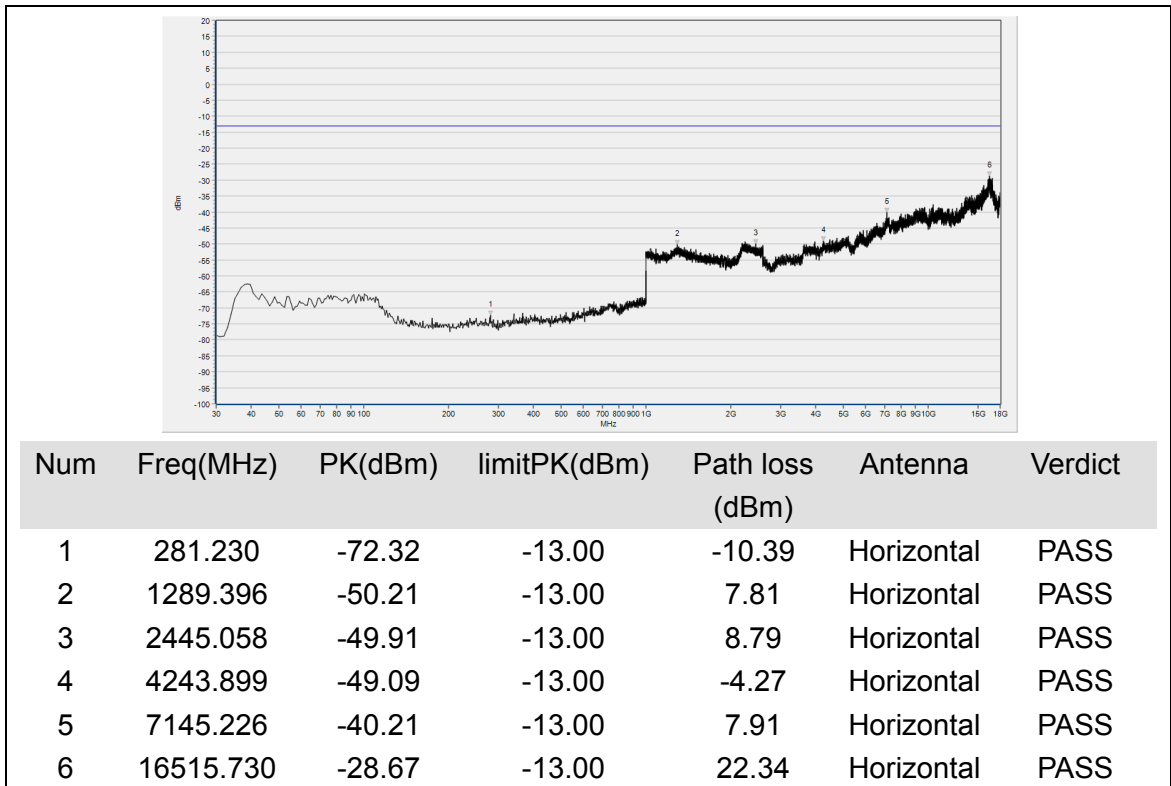
(GSM 1900MHz, Channel = 661, Horizontal)



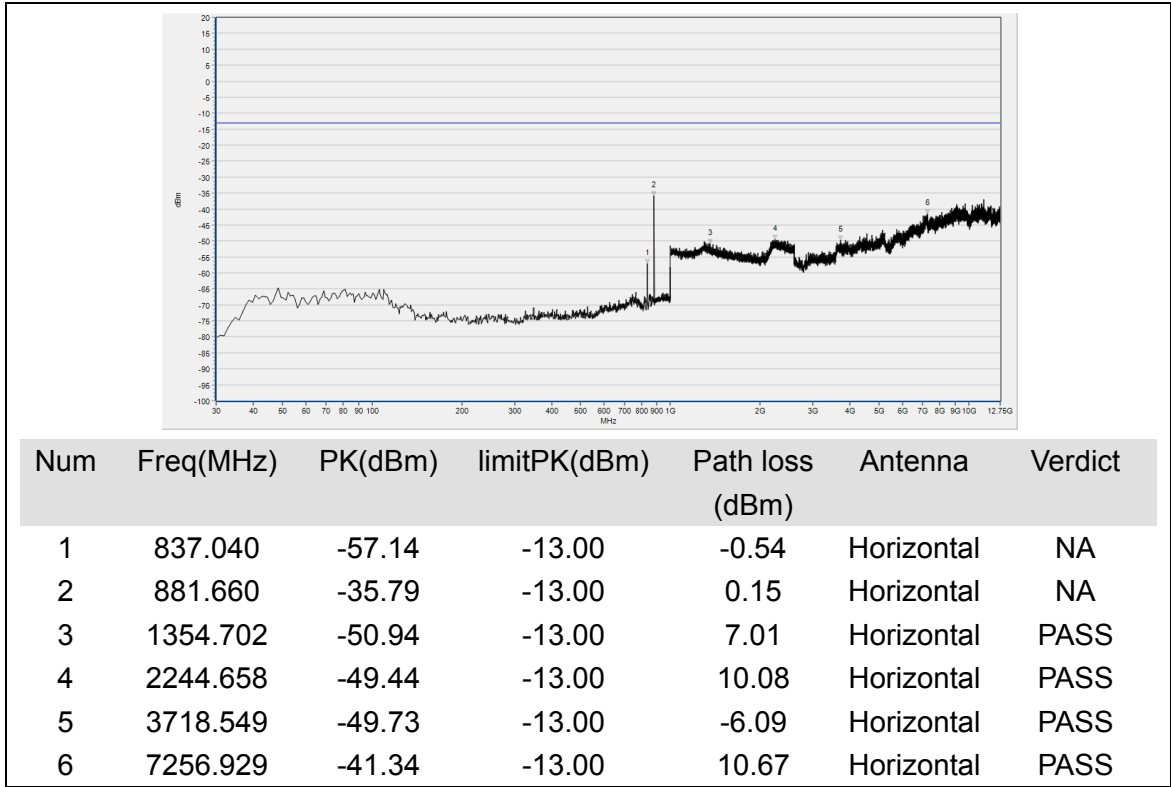
(GSM 1900MHz, Channel = 661, Vertical)



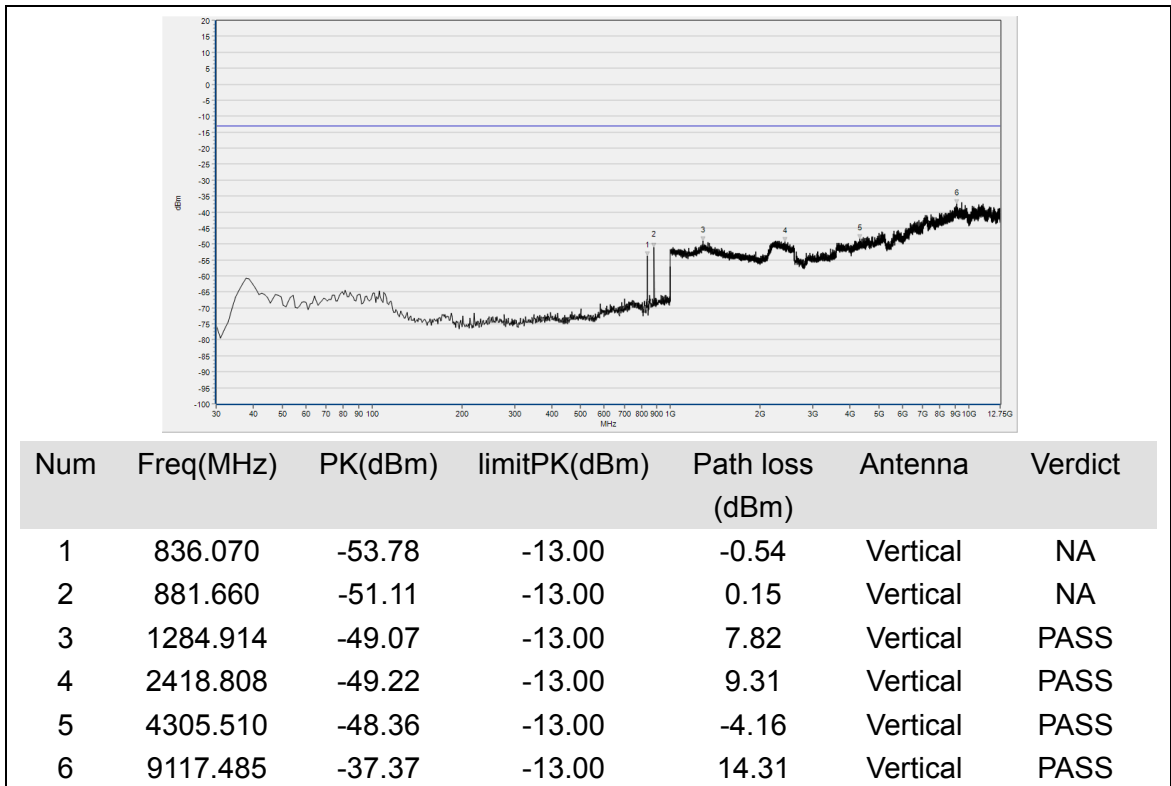
(GSM 1900MHz, Channel = 810, Horizontal)



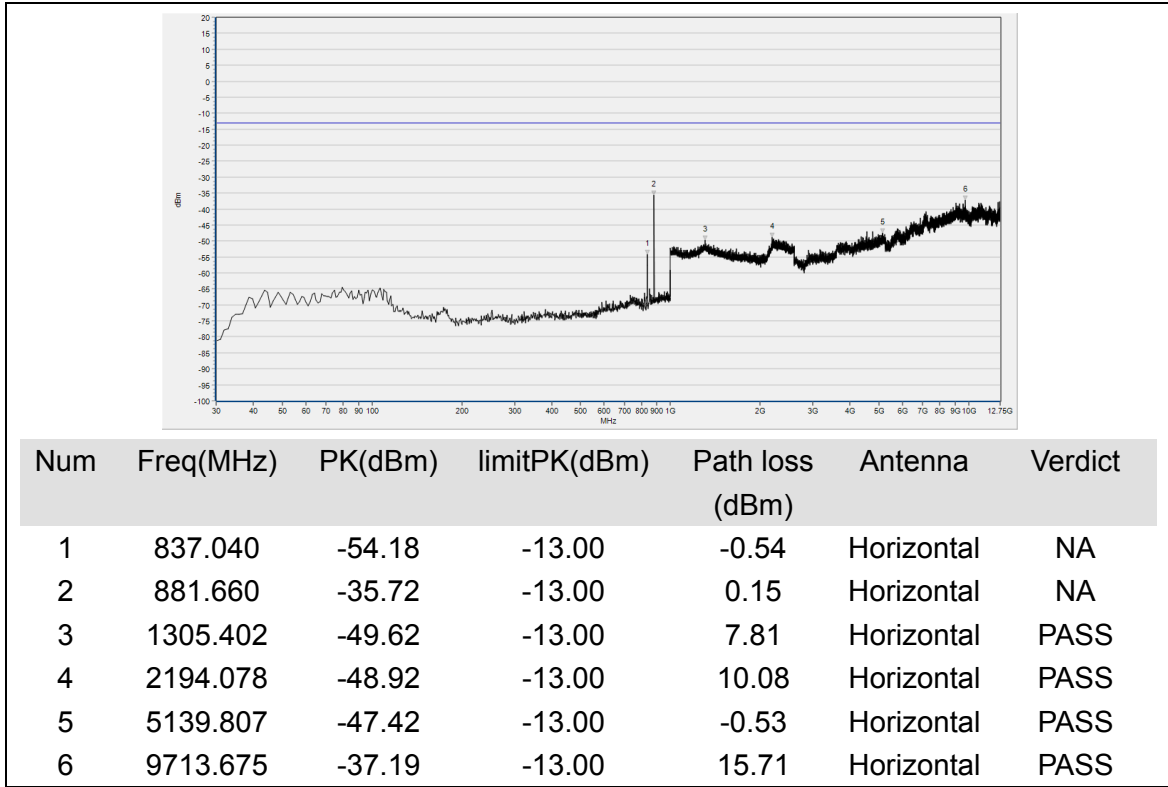
(GSM 1900MHz, Channel = 810, Vertical)



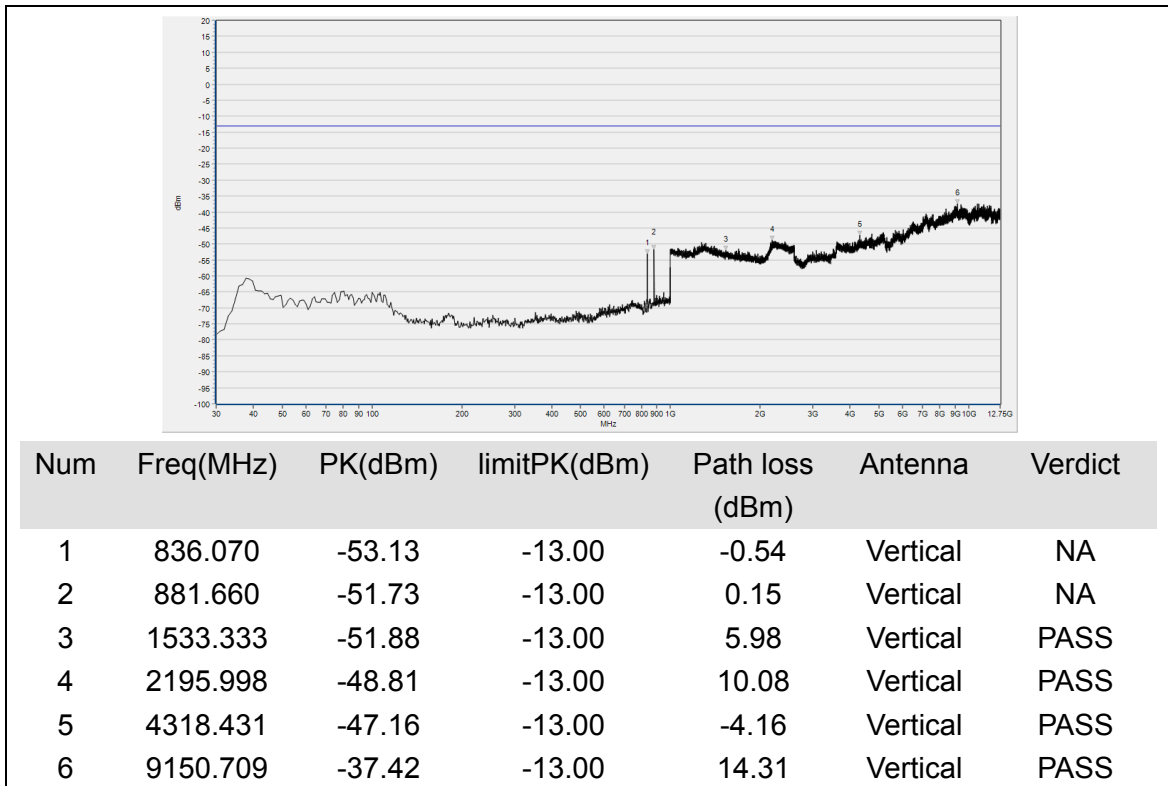
(EDGE 850MHz, Channel = 128, Horizontal)



(EDGE 850MHz, Channel = 128, Vertical)

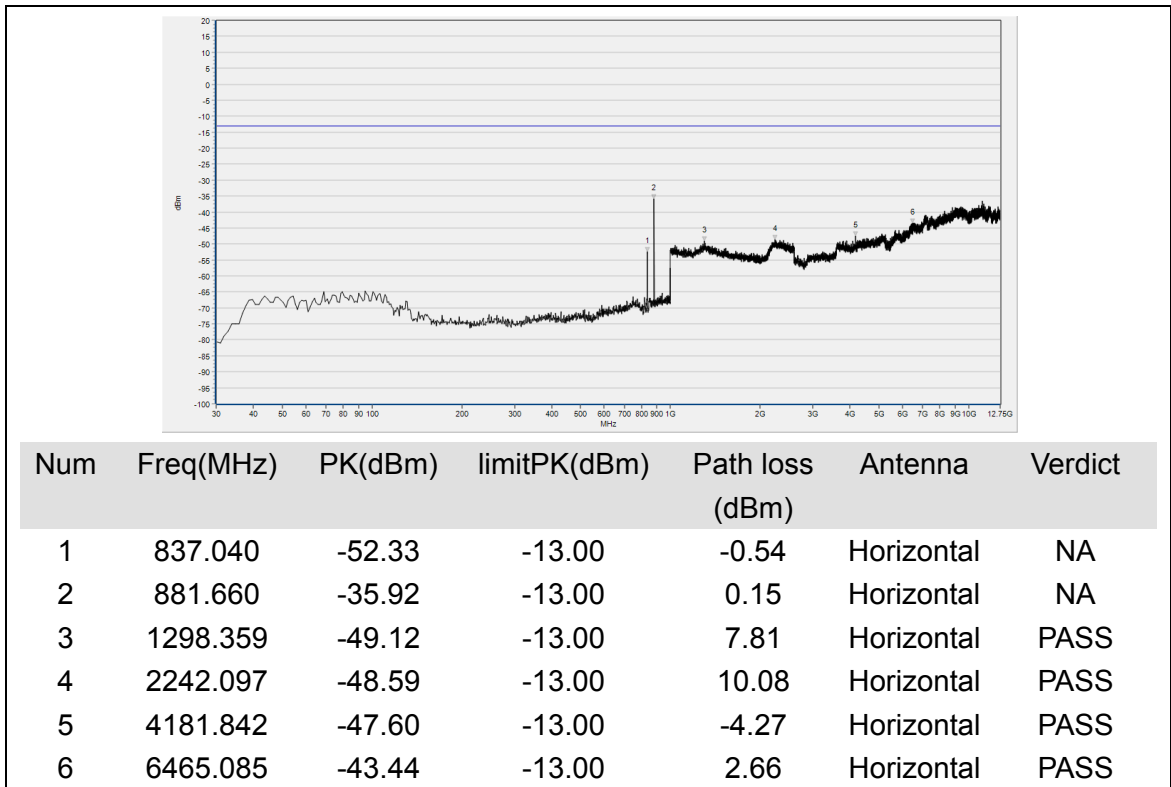


(EDGE 850MHz, Channel = 190, Horizontal)

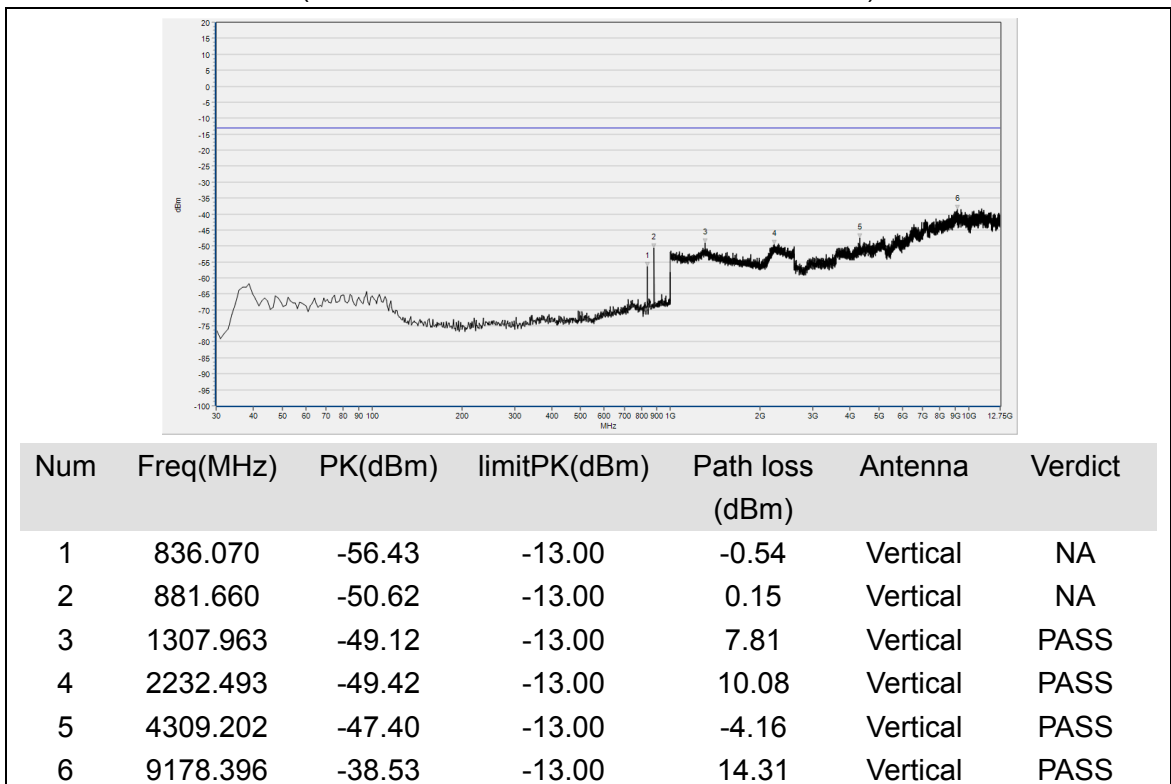


(EDGE 850MHz, Channel = 190, Vertical)

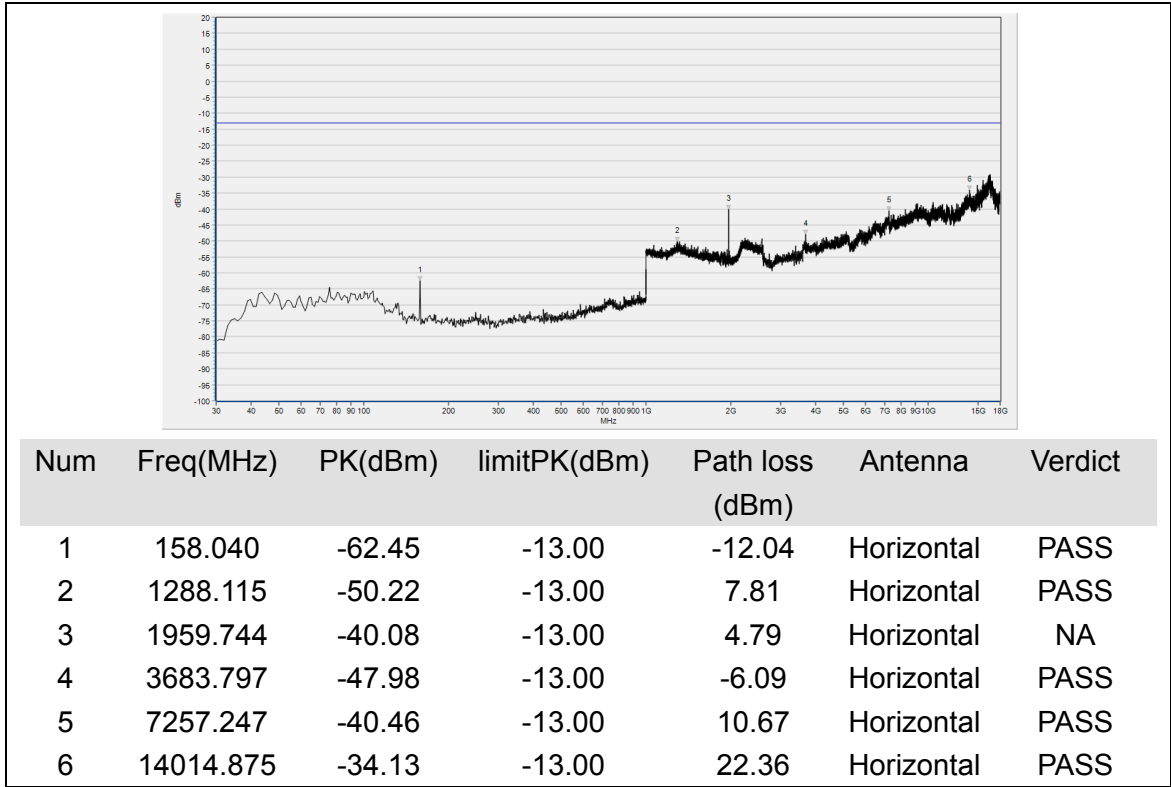




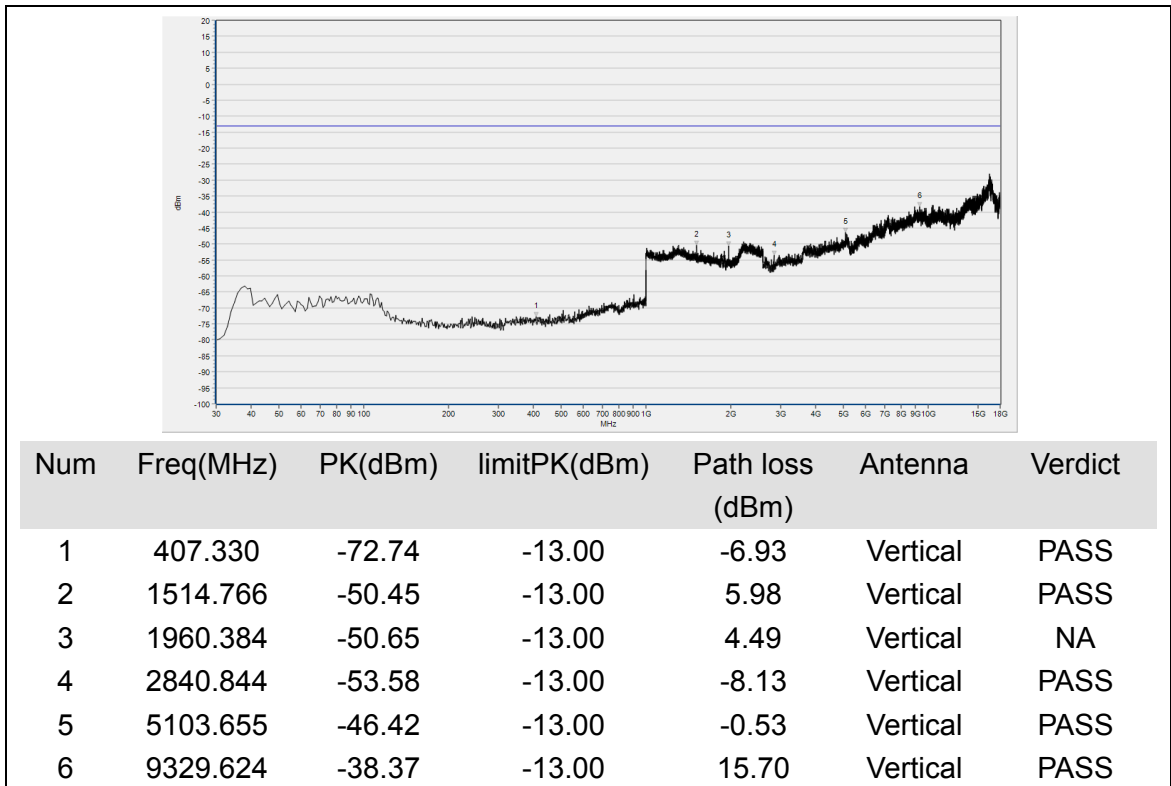
(EDGE 850MHz, Channel = 251, Horizontal)



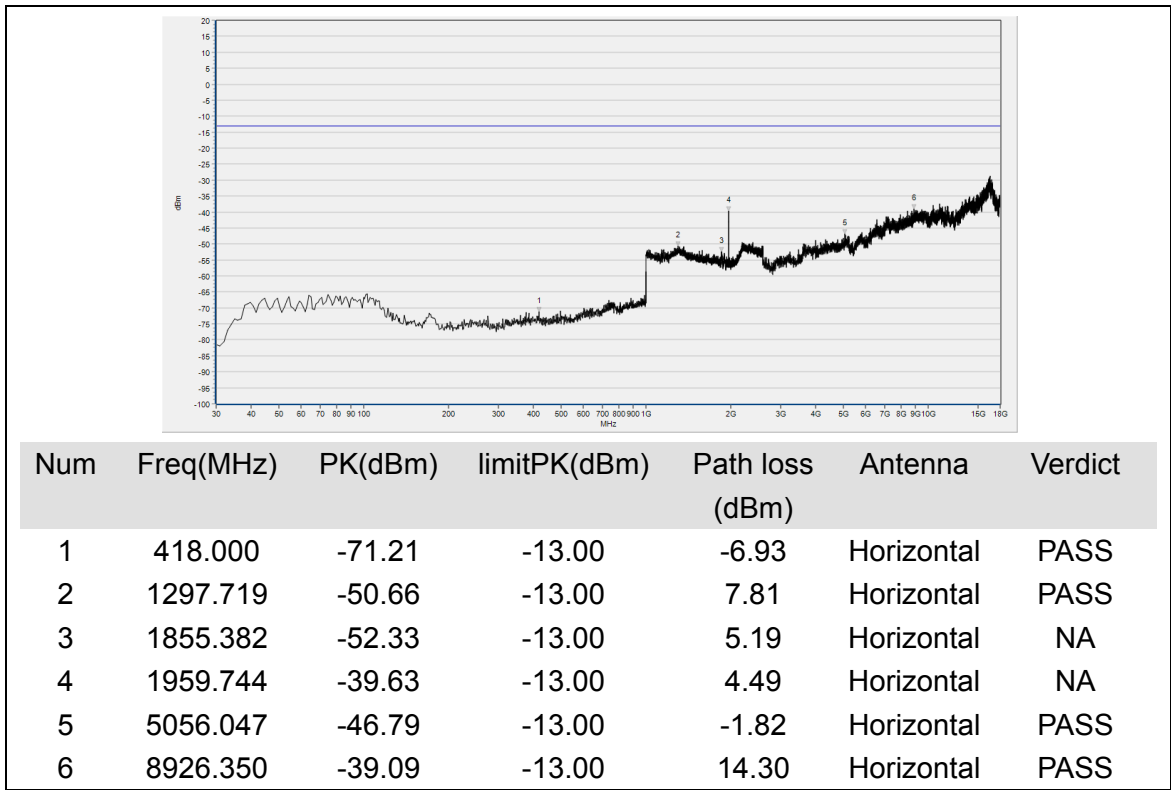
(EDGE 850MHz, Channel = 251, Vertical)



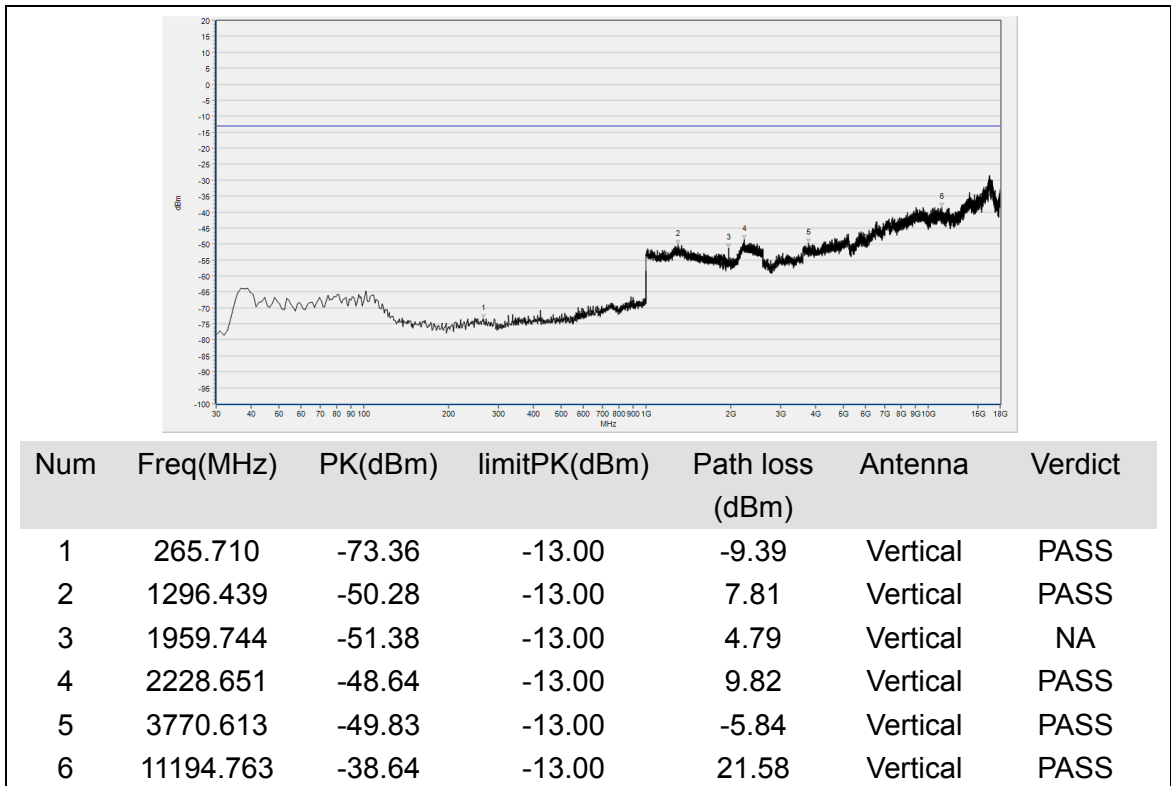
(EDGE 1900MHz, Channel = 512, Horizontal)



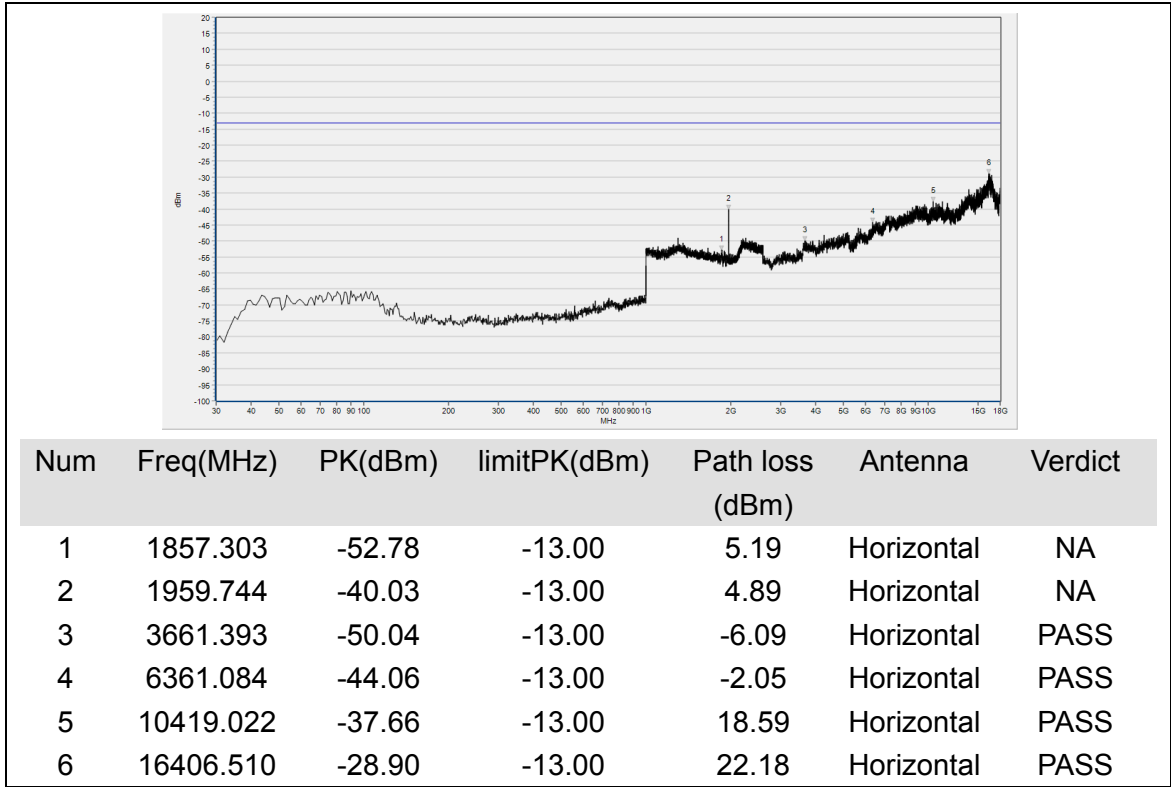
(EDGE 1900MHz, Channel = 512, Vertical)



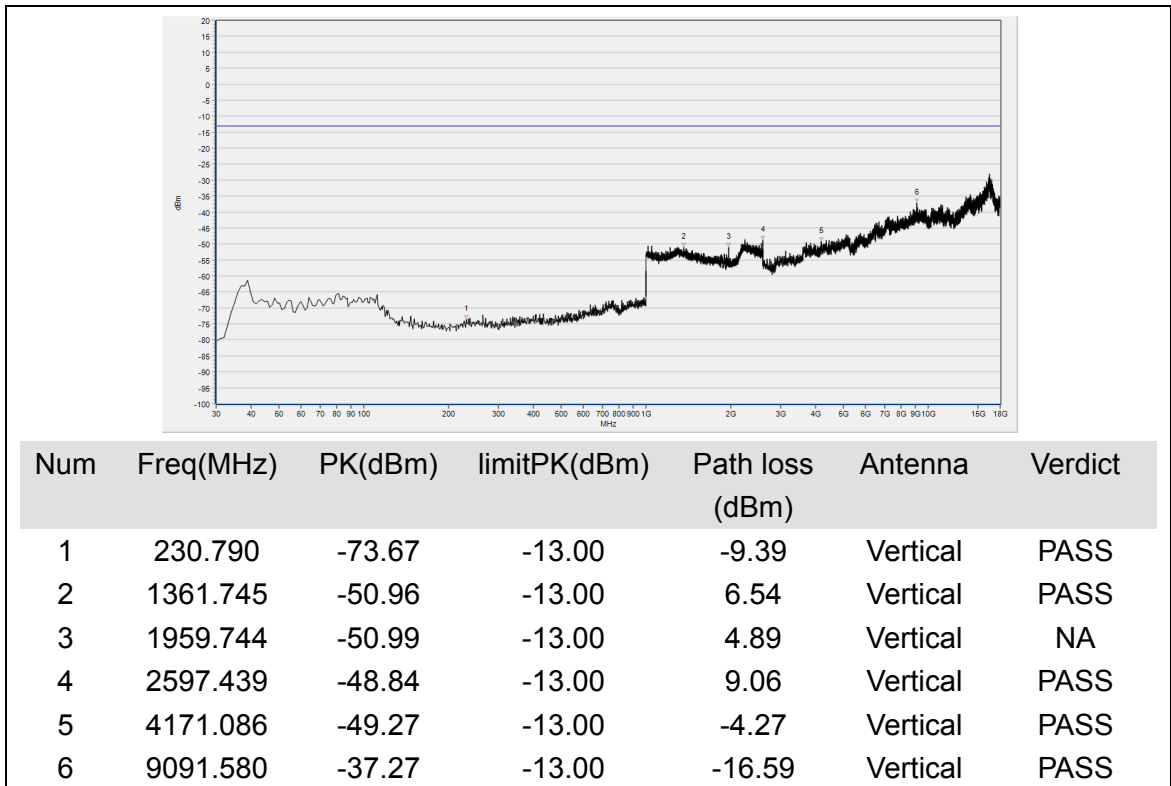
(EDGE 1900MHz, Channel = 661, Horizontal)



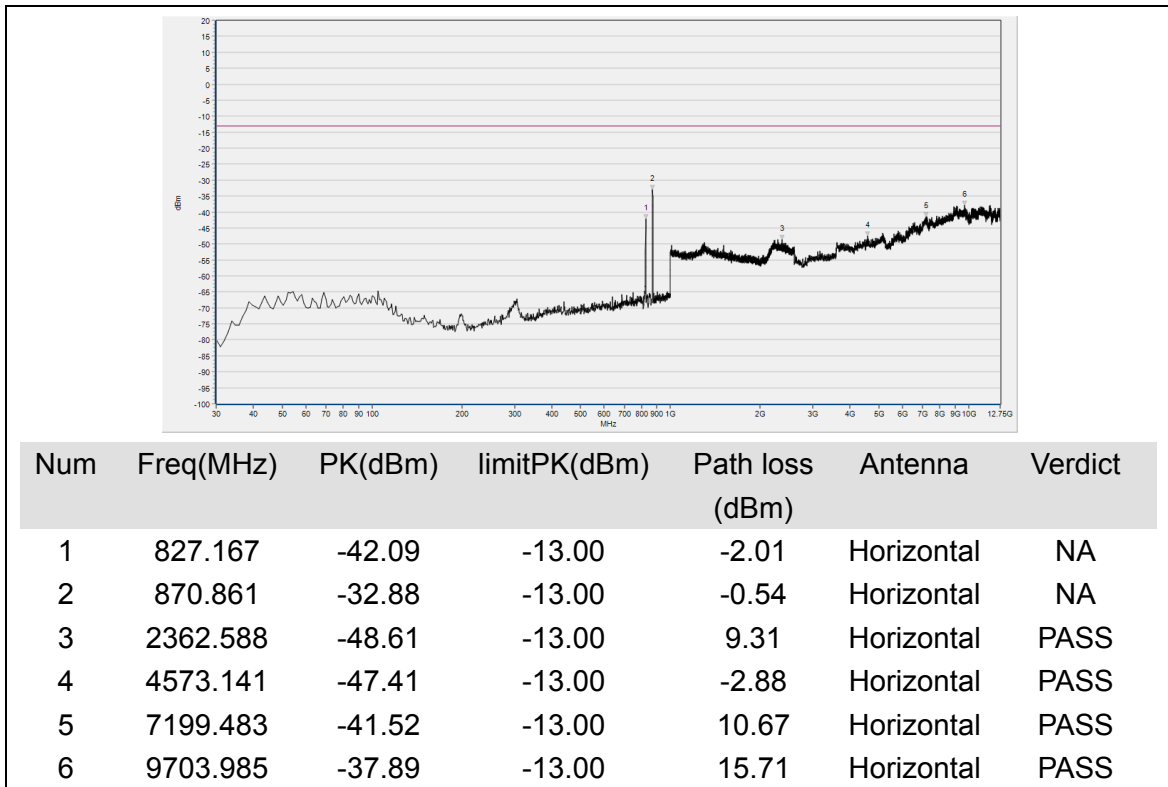
(EDGE 1900MHz, Channel = 661, Vertical)



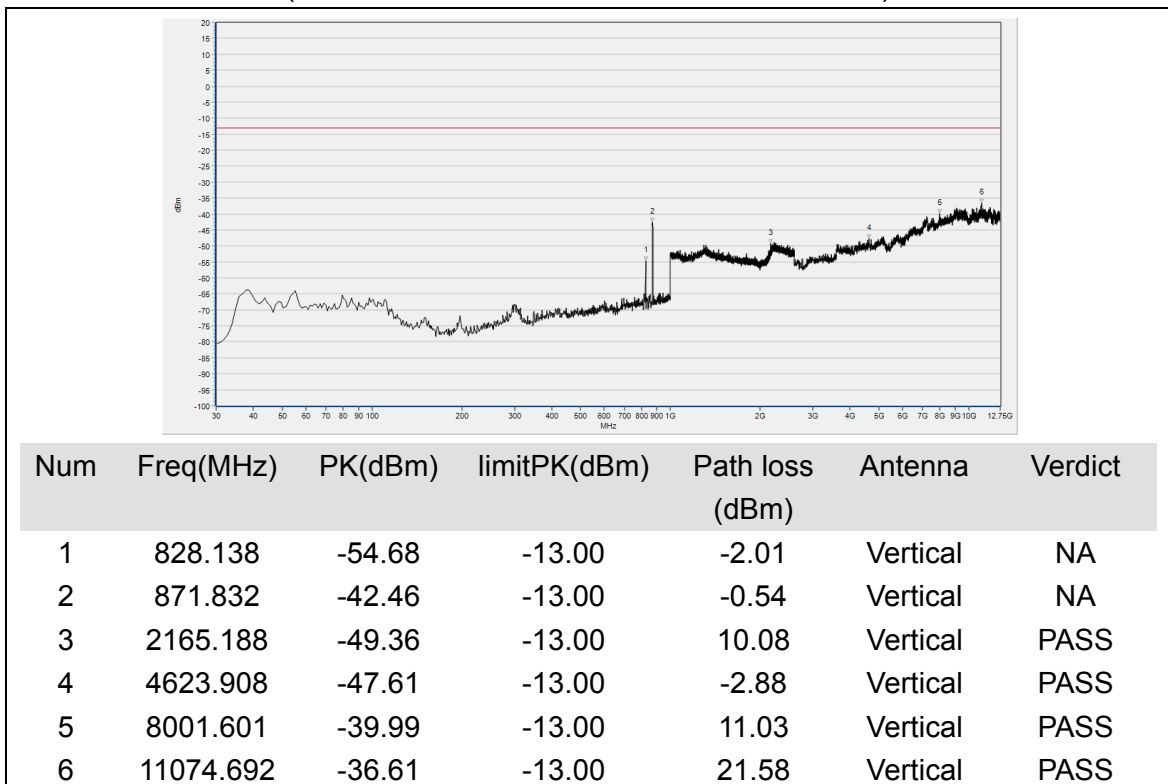
(EDGE 1900MHz, Channel = 810, Horizontal)



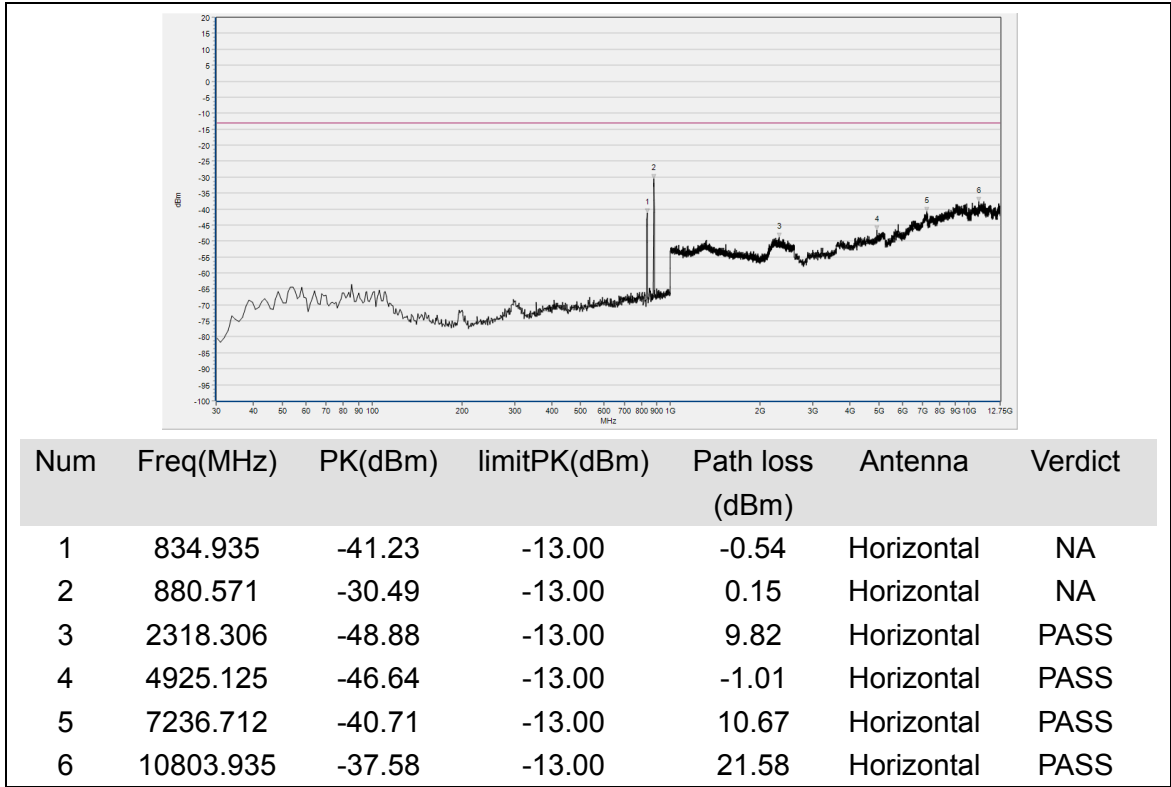
(EDGE 1900MHz, Channel = 810, Vertical)



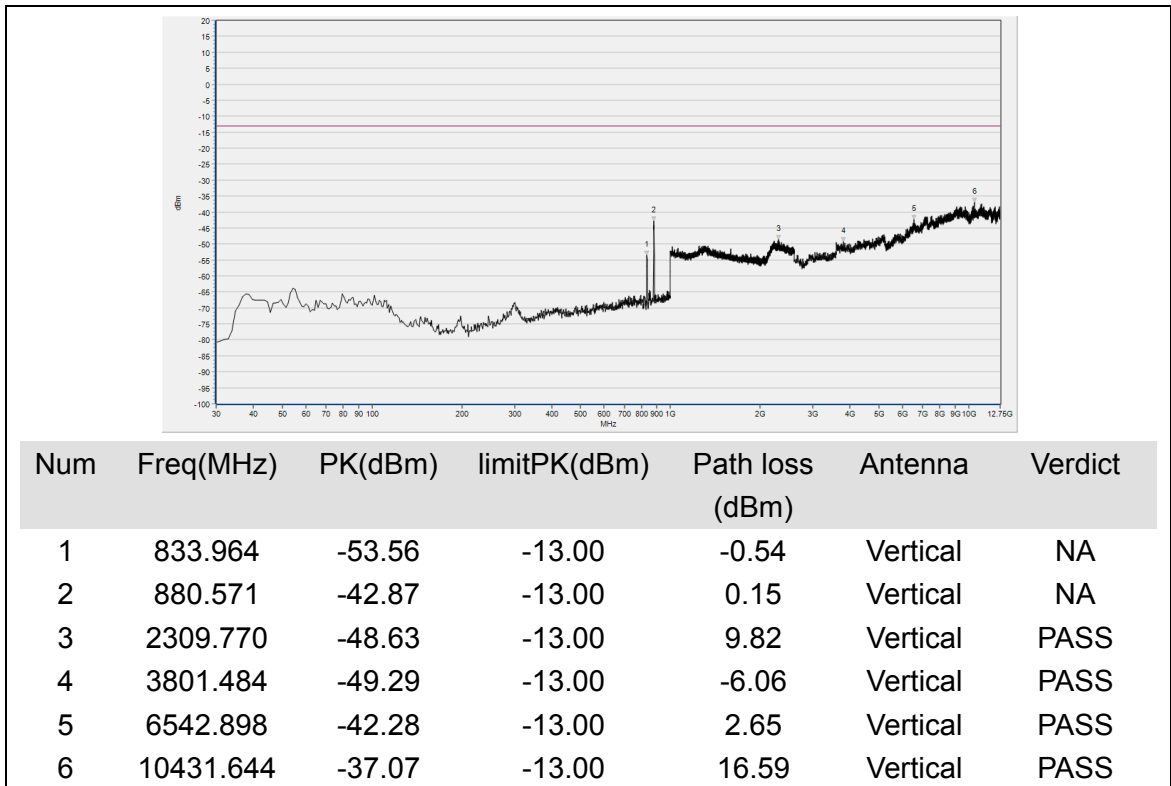
(WCDMA Band V, Channel = 4132, Horizontal)



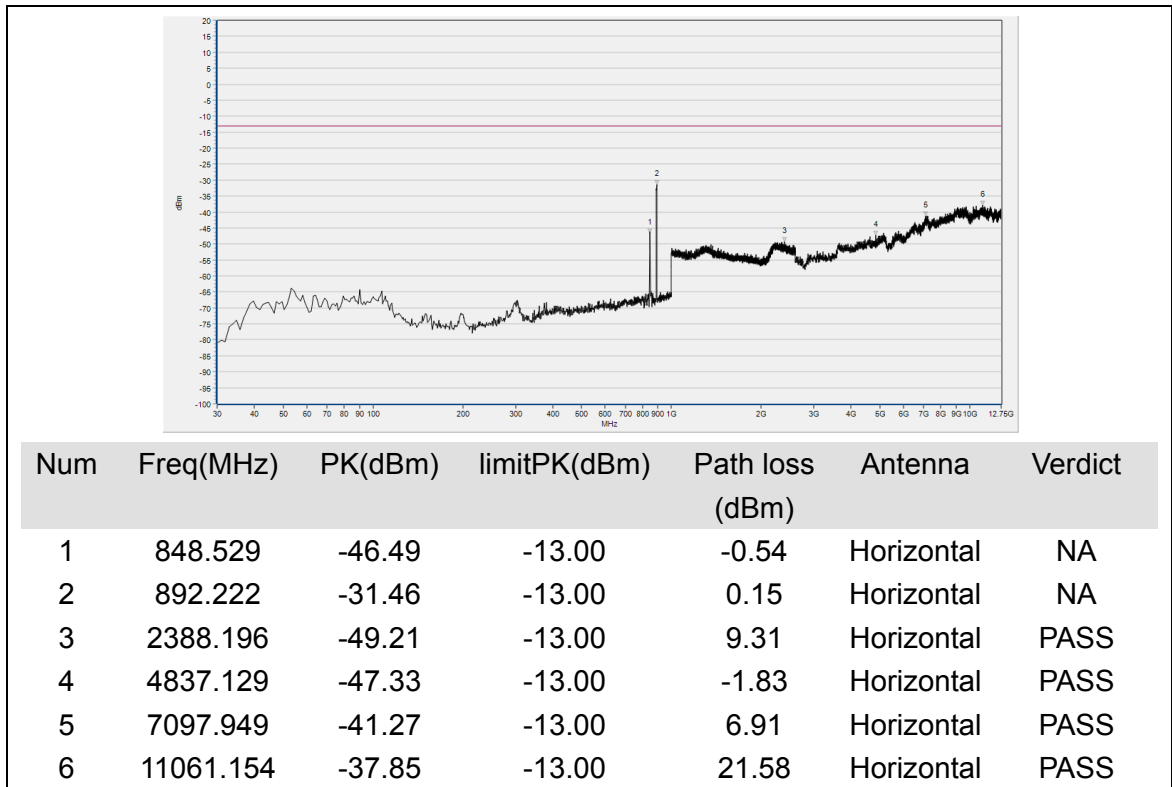
(WCDMA Band V, Channel = 4132, Vertical)



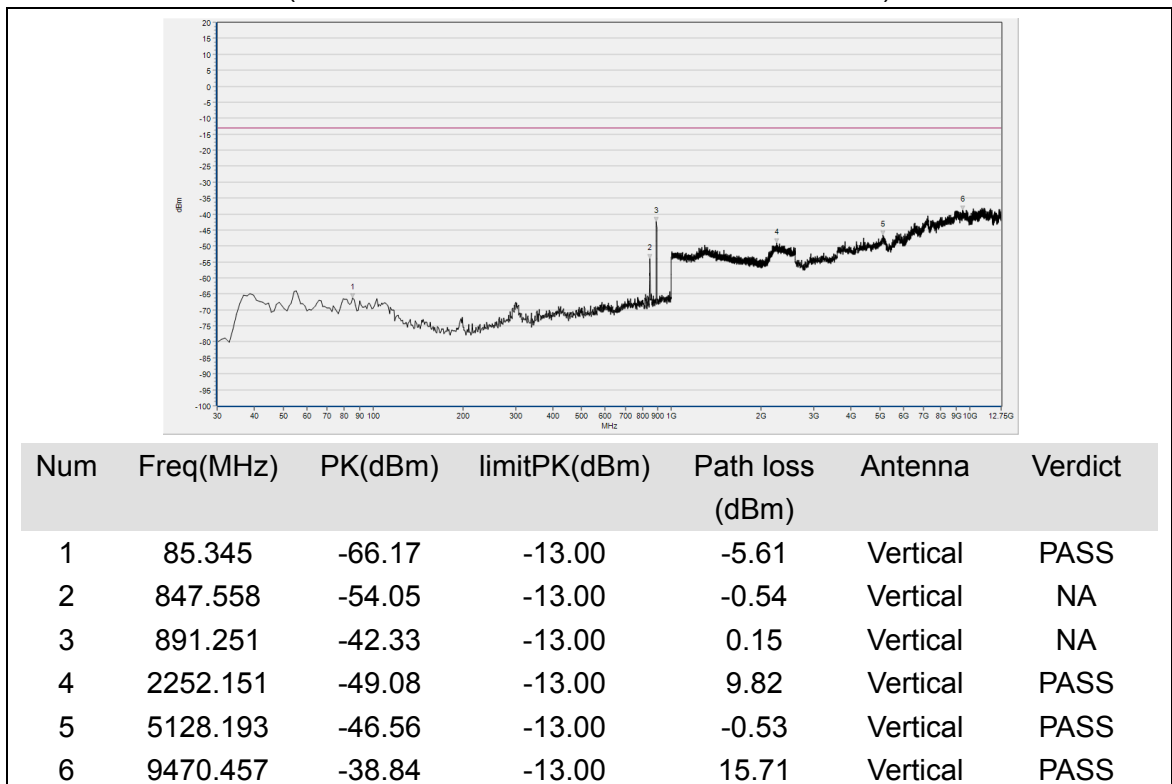
(WCDMA Band V, Channel = 4182, Horizontal)



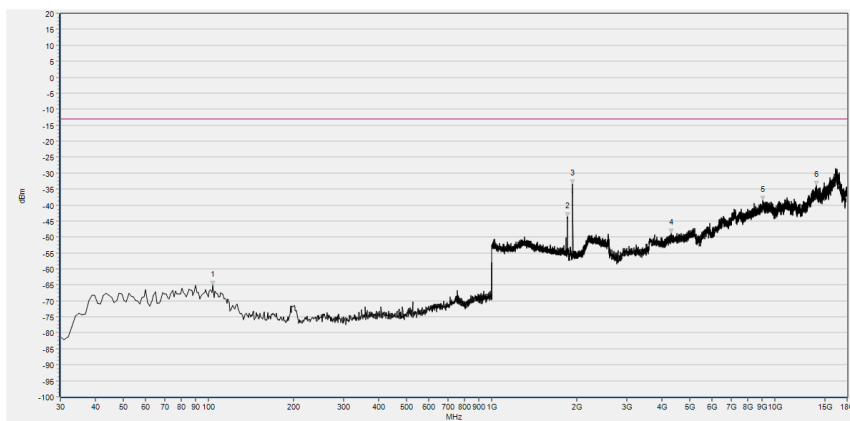
(WCDMA Band V, Channel = 4182, Vertical)



(WCDMA Band V, Channel = 4233, Horizontal)

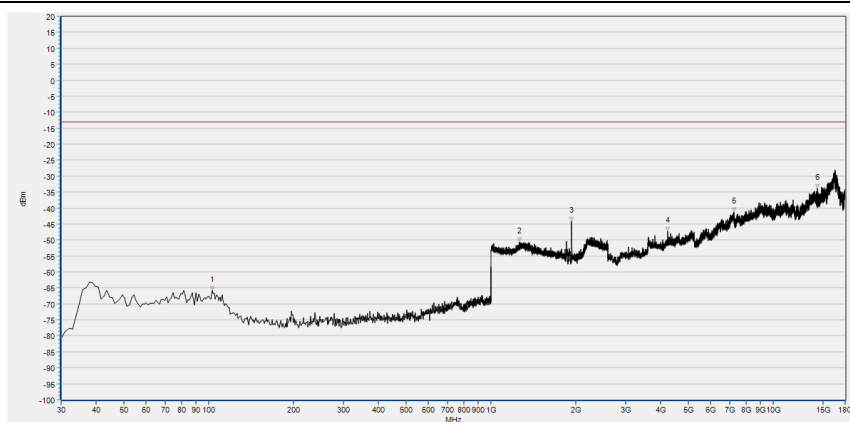


(WCDMA Band V, Channel = 4233, Vertical)



Num	Freq(MHz)	PK(dBm)	limitPK(dBm)	Path loss (dBm)	Antenna	Verdict
1	103.720	-65.04	-13.00	-5.22	Horizontal	PASS
2	1850.900	-43.79	-13.00	5.31	Horizontal	NA
3	1933.493	-33.34	-13.00	5.19	Horizontal	NA
4	4311.111	-48.92	-13.00	-4.16	Horizontal	PASS
5	9043.972	-38.50	-13.00	14.31	Horizontal	PASS
6	14051.282	-33.90	-13.00	22.36	Horizontal	PASS

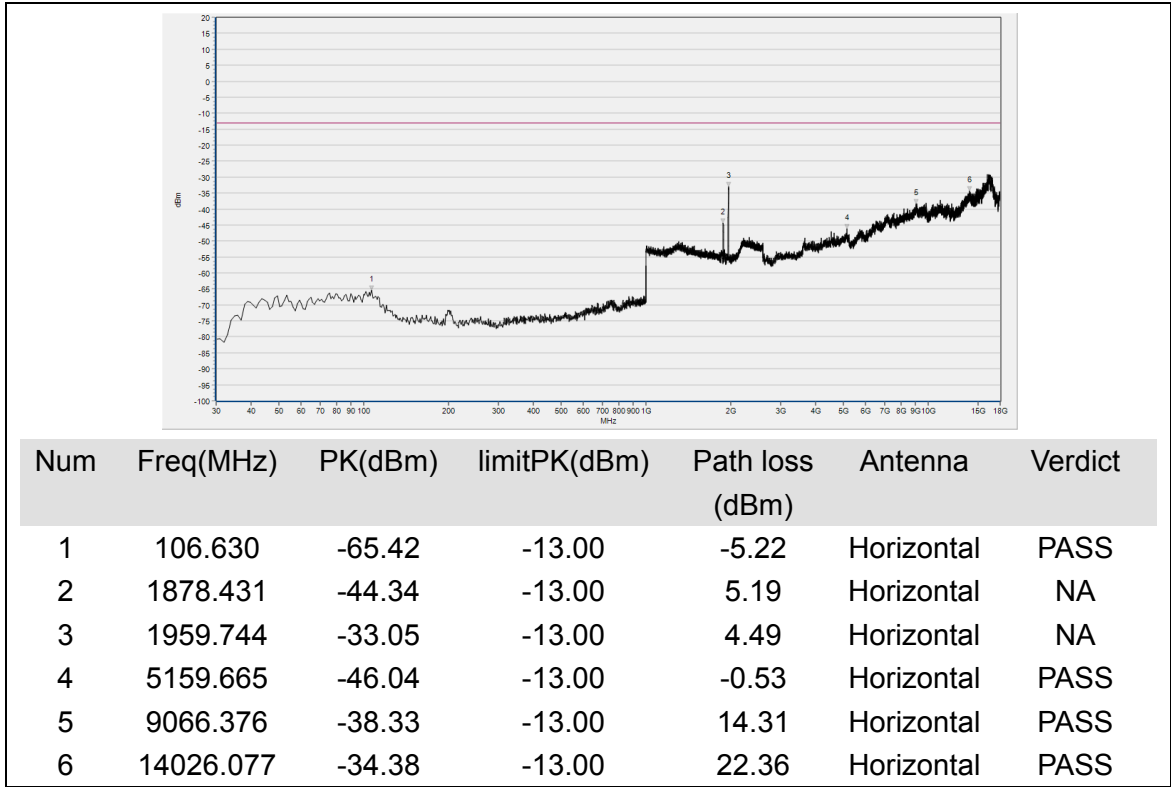
(WCDMA Band II, Channel = 9262, Horizontal)



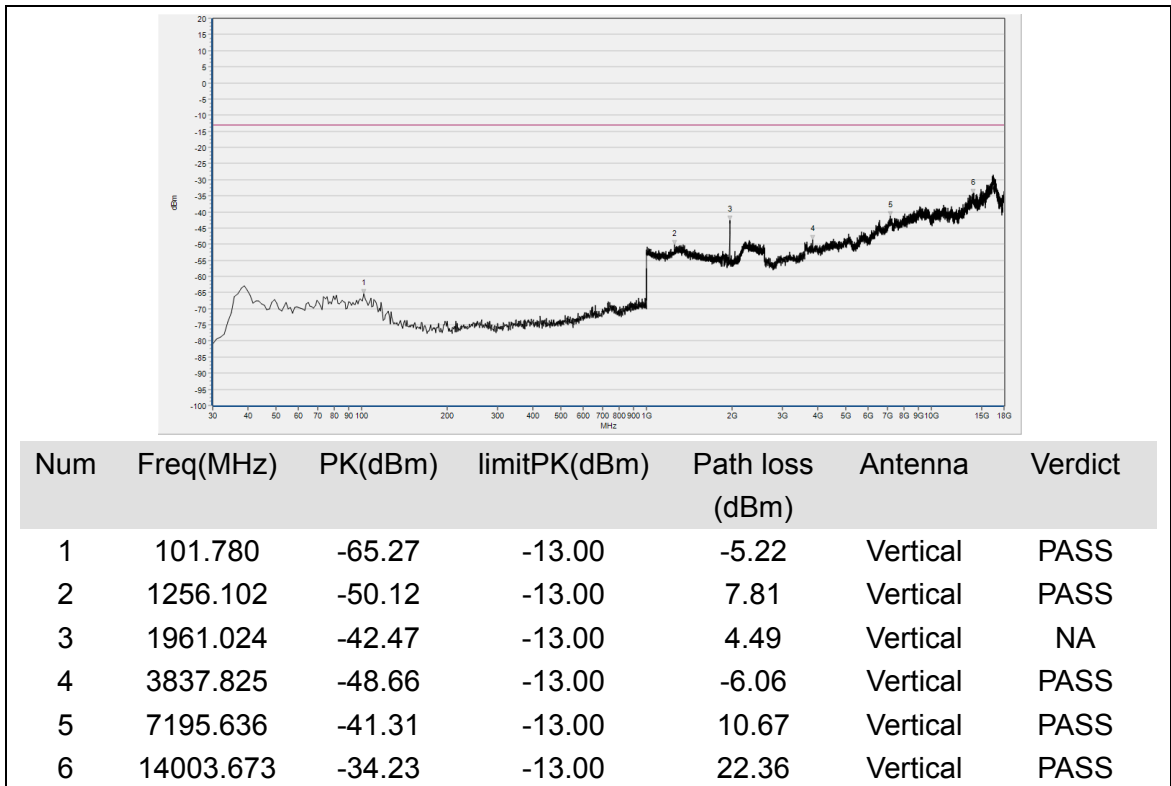
Num	Freq(MHz)	PK(dBm)	limitPK(dBm)	Path loss (dBm)	Antenna	Verdict
1	102.750	-65.90	-13.00	-5.22	Vertical	PASS
2	1265.706	-50.67	-13.00	7.81	Vertical	PASS
3	1932.853	-44.22	-13.00	5.19	Vertical	NA
4	4227.096	-47.28	-13.00	-4.27	Vertical	PASS
5	7257.247	-41.24	-13.00	10.67	Vertical	PASS
6	14376.141	-33.96	-13.00	22.36	Vertical	PASS

(WCDMA Band II, Channel = 9262, Vertical)

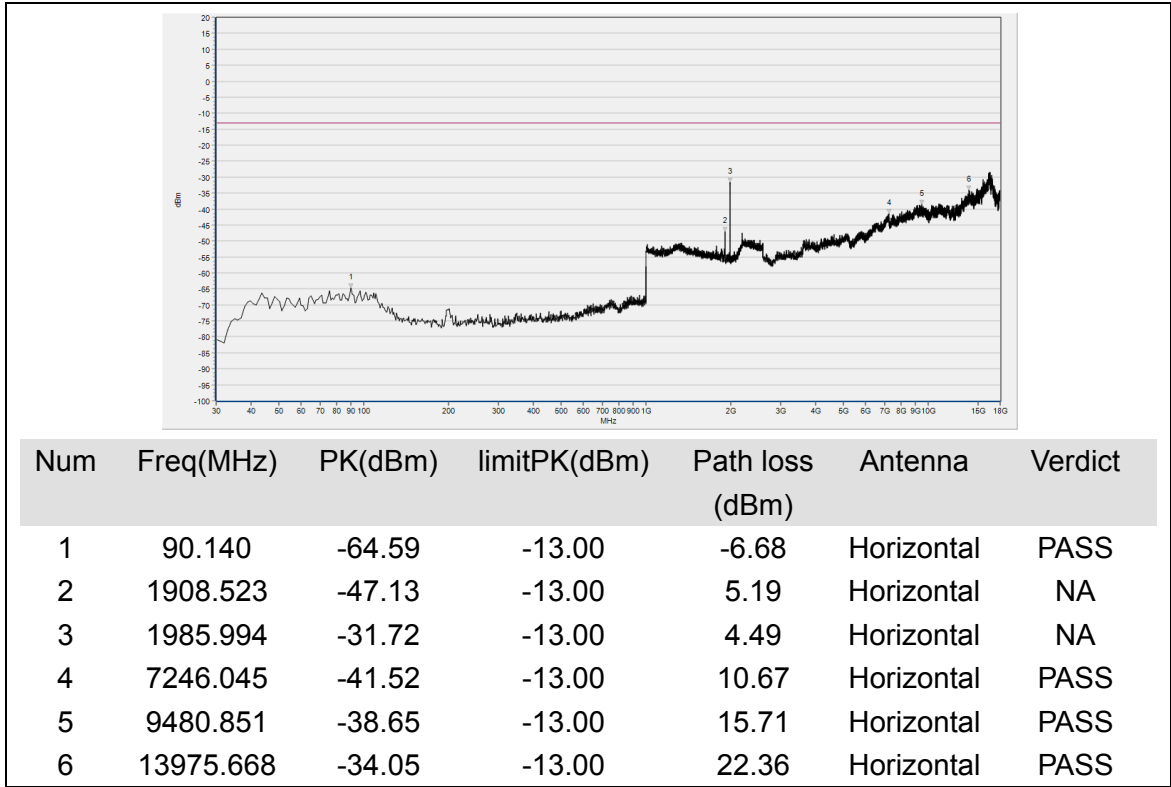




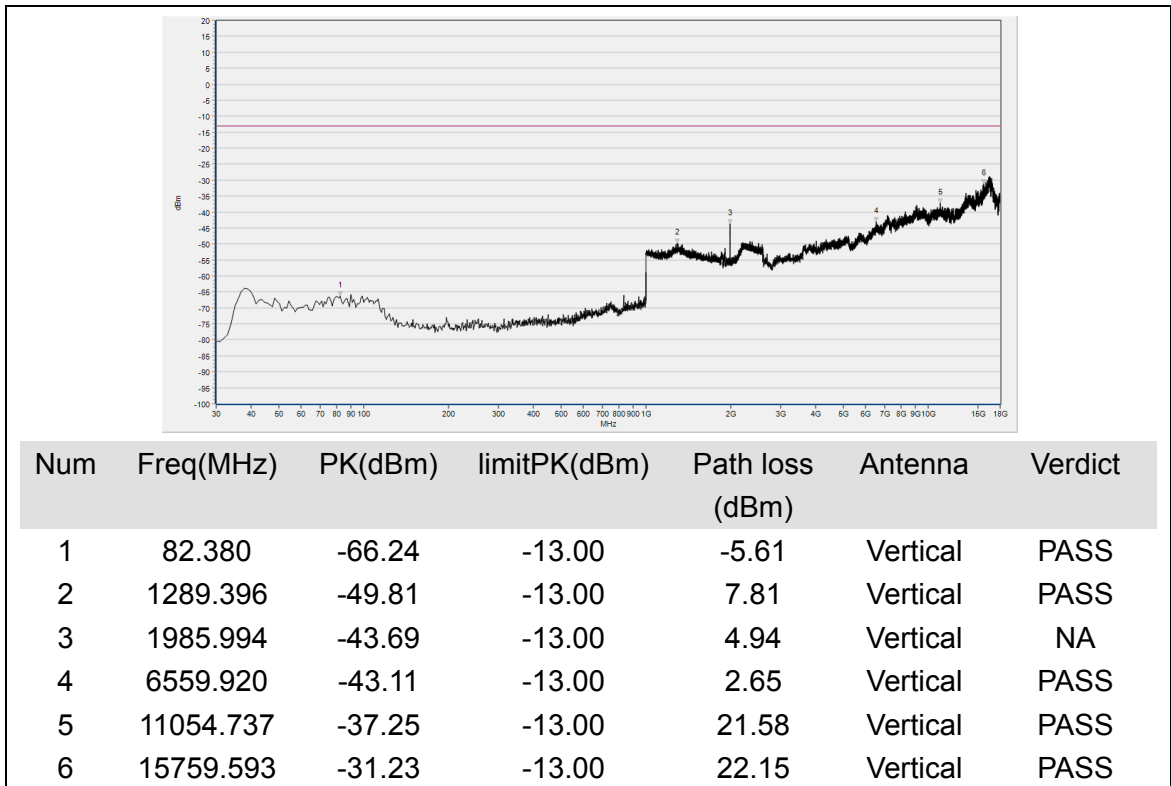
(WCDMA Band II, Channel = 9400, Horizontal)



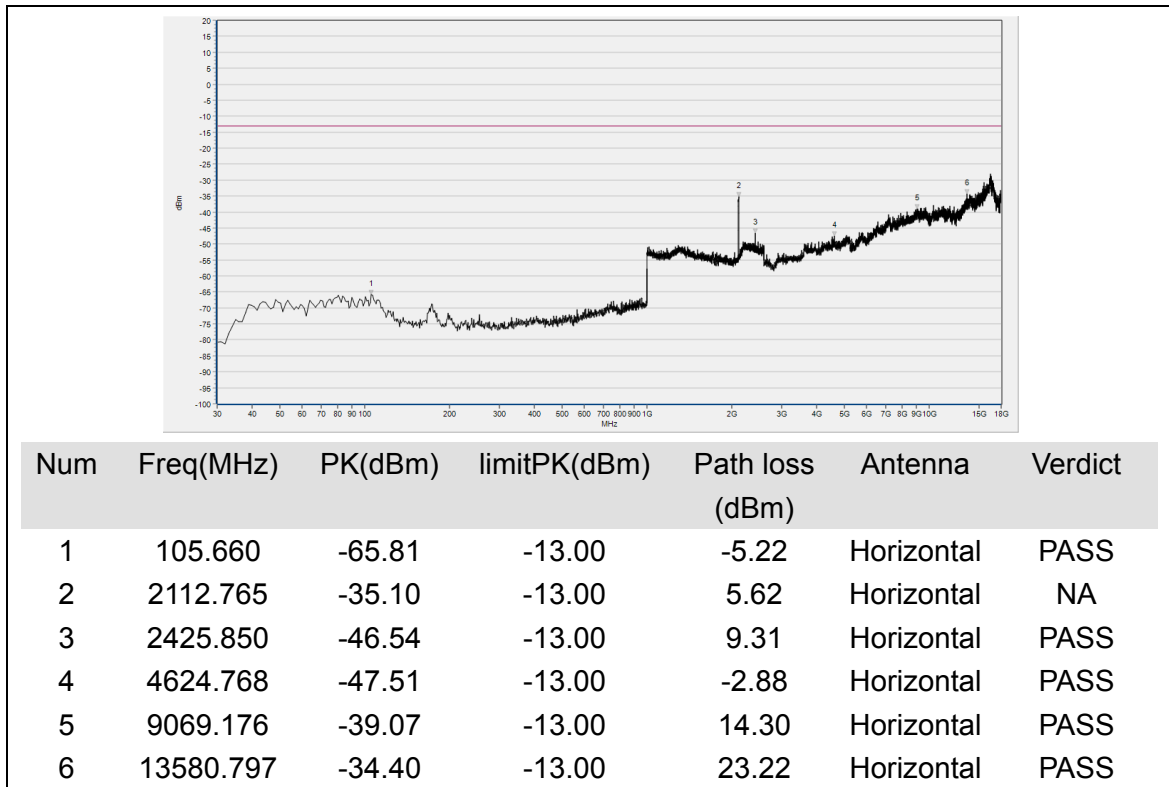
(WCDMA Band II, Channel = 9400, Vertical)



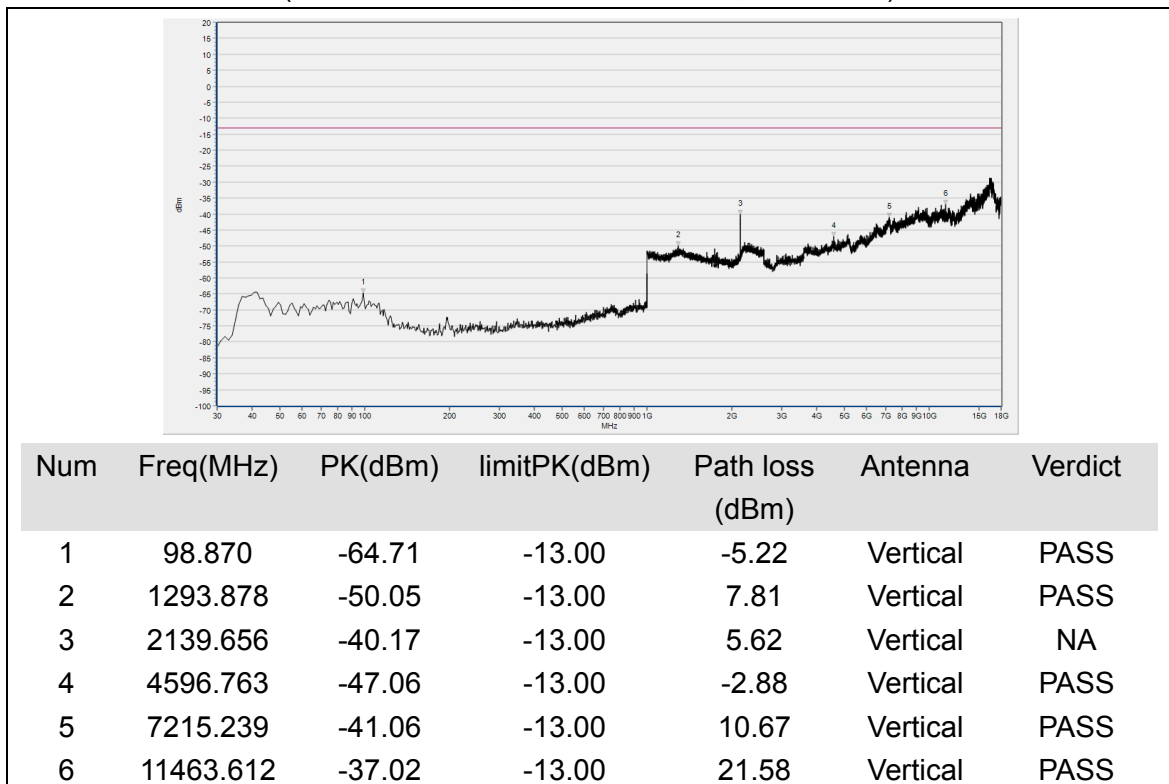
(WCDMA Band II, Channel = 9538, Horizontal)



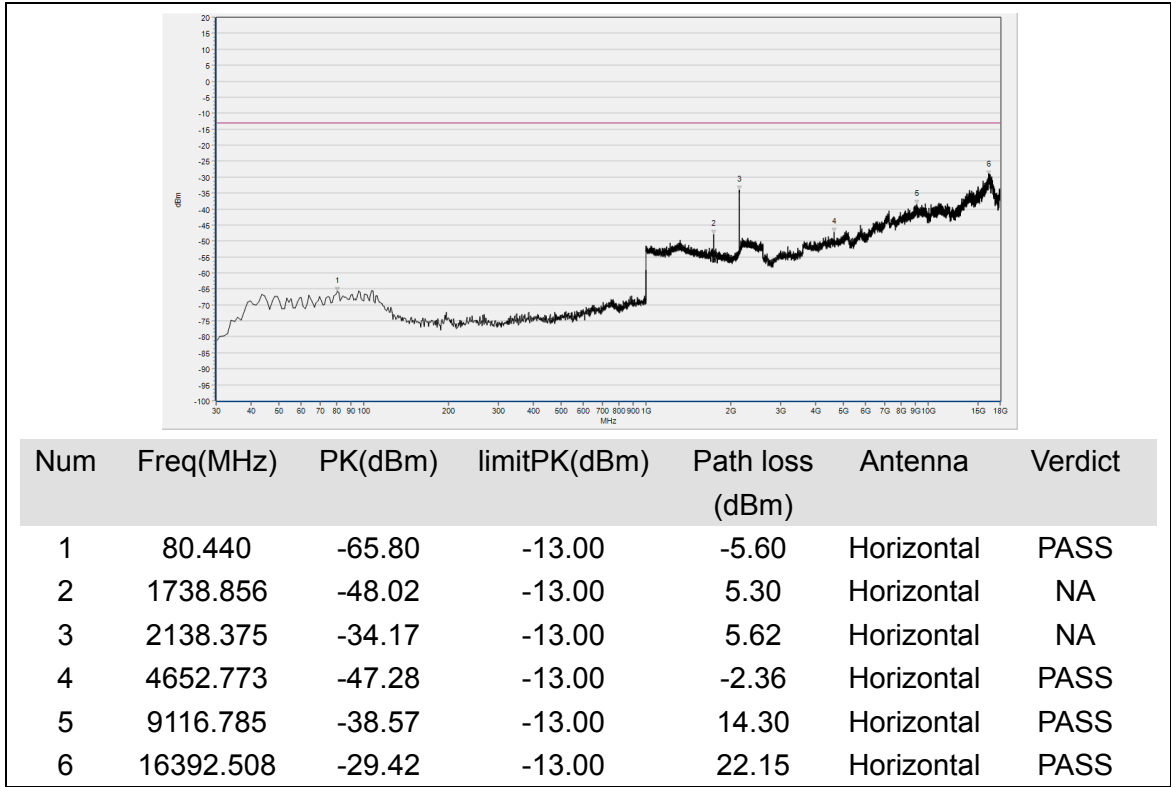
(WCDMA Band II, Channel = 9538, Vertical)



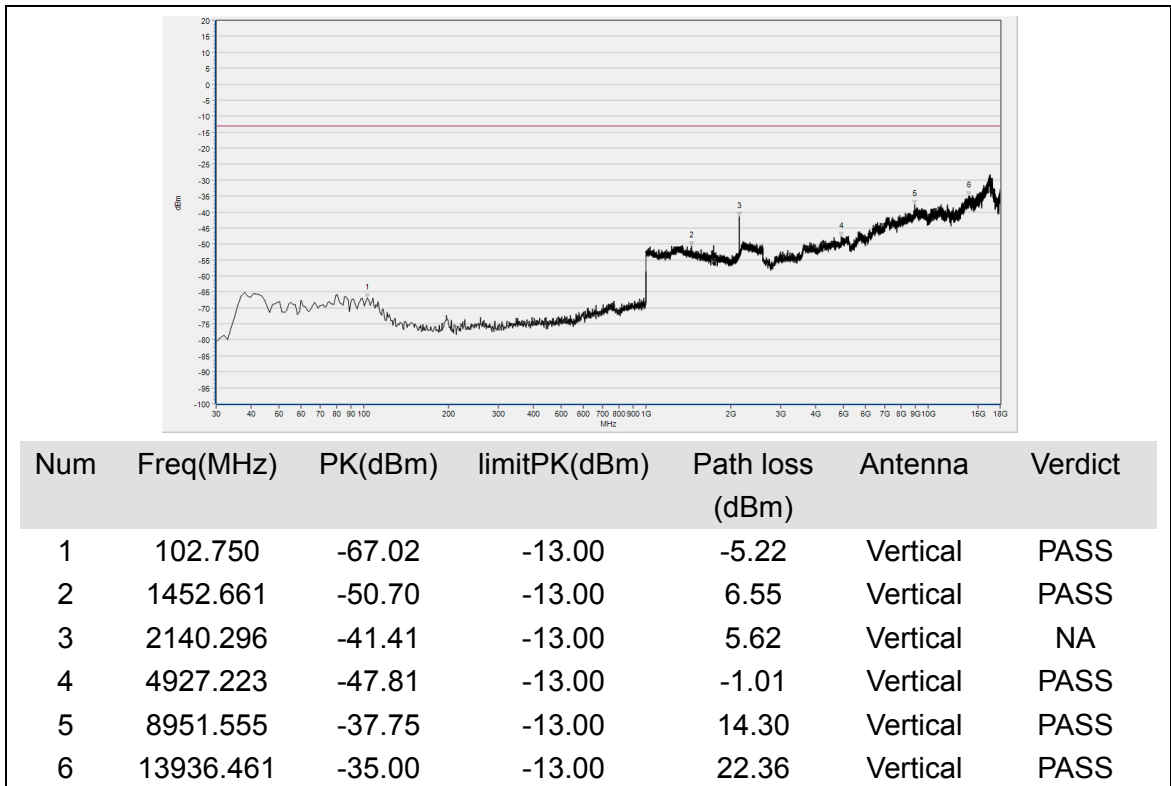
(WCDMA Band IV, Channel = 1312, Horizontal)



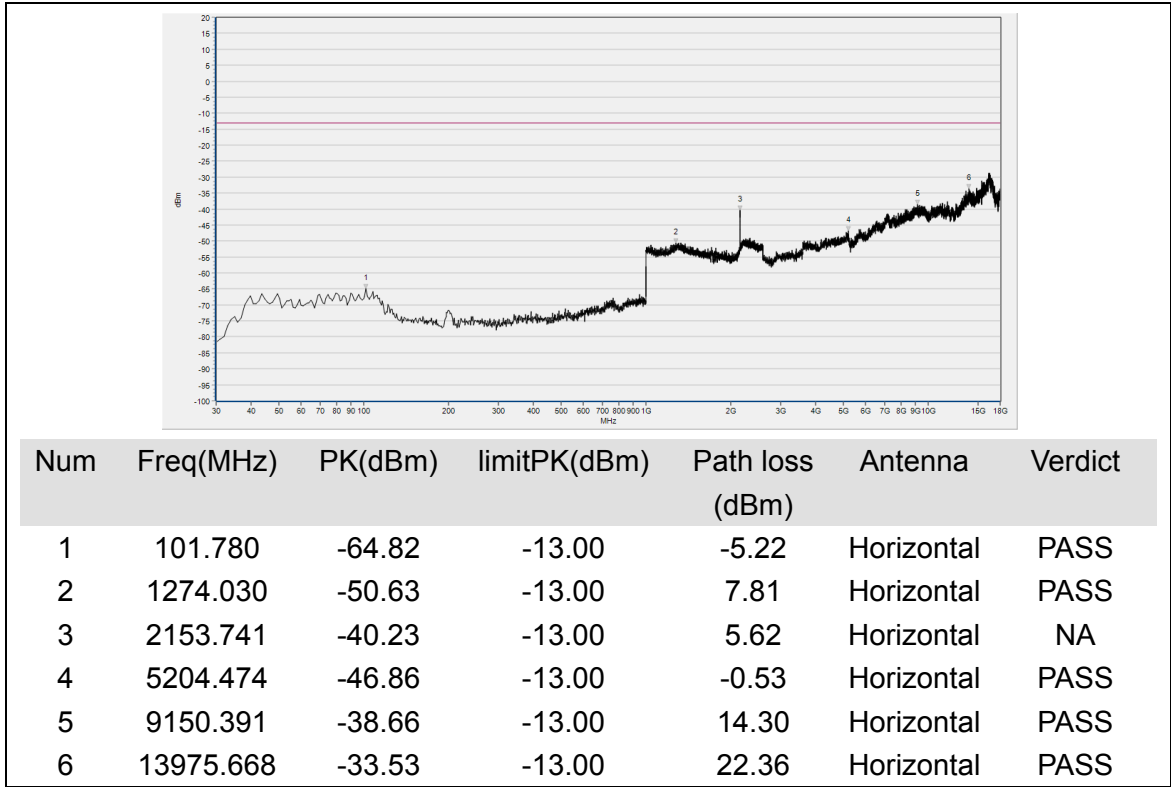
(WCDMA Band IV, Channel = 1312, Vertical)



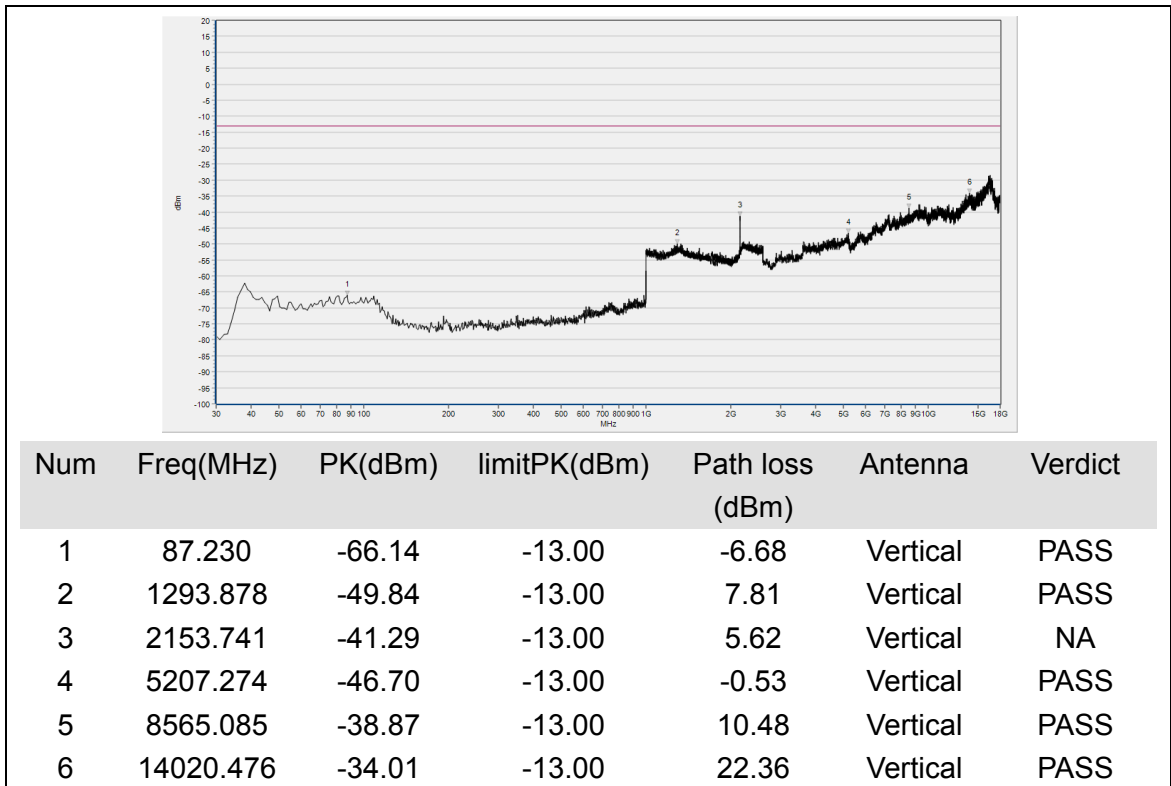
(WCDMA Band IV, Channel = 1413, Horizontal)



(WCDMA Band IV, Channel = 1413, Vertical)



(WCDMA Band IV, Channel = 1513, Horizontal)



(WCDMA Band IV, Channel = 1513, Vertical)



## Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Output Power	$\pm 2.22\text{dB}$
Bandwidth	$\pm 5\%$
Conducted Spurious Emission	$\pm 2.77\text{ dB}$
Radiated Emission	$\pm 2.95\text{dB}$

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$



## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Laboratory Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
<b>Telephone:</b>	+86 755 36698555
<b>Facsimile:</b>	+86 755 36698525

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

### 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



#### 4. Test Equipments Utilized

##### 4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2020.04.15	2021.04.14
Attenuator 1	(N/A.)	10dB	Resnet	2020.04.15	2021.04.14
Attenuator 2	(N/A.)	3dB	Resnet	2020.04.15	2021.04.14
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2020.07.28	2021.07.27
Wireless synthesizer	MY48364176	8960 -E5515C	Agilent	2020.04.15	2021.04.14
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	2020.01.13	2021.01.12
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	(N/A)	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	N/A	N/A
Computer	T430i	Think Pad	Lenovo	N/A	N/A



**4.2 Radiated Test Equipments**

<b>Equipment Name</b>	<b>Serial No.</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Cal. Date</b>	<b>Cal. Due</b>
System Simulator	152038	CMW500	R&S	2020.01.13	2021.01.12
Receiver	MY54130016	N9038A	Agilent	2020.07.28	2021.07.27
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.05.24	2022.05.23
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2020.07.28	2021.07.27
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2020.07.28	2021.07.27
Notch Filter	N/A	WRCG-GSM 850	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCG-GSM 1900	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV-W Band V	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV-W Band II	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV-W Band IV	Wainwright	2019.12.01	2020.11.30
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT