



Report No.: RZA2010-0989_15C-BT



Part 15C

TEST REPORT

Product Name GSM /WCDMA dual mode mobile phone

FCC ID WLPW110

Model W110

Client Shanghai Longcheer3g Technology Co.,Ltd

TA Technology (Shanghai) Co., Ltd.



GENERAL SUMMARY

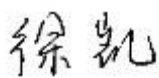
Product Name	GSM /WCDMA dual mode mobile phone	Model	W110
FCC ID	WLPW110	Report No.	RZA2010-0989_15C-BT
Client	Shanghai Longcheer3g Technology Co.,Ltd		
Manufacturer	Shanghai Longcheer3g Technology Co.,Ltd		
Reference Standard(s)	<p>FCC CFR47 Part 15C (2009-12) Radio Frequency Devices</p> <p>15.205 Restricted bands of operation;</p> <p>15.207 Conducted limits;</p> <p>15.209 Radiated emission limits; general requirements;</p> <p>15.247 Operation within the bands 902-928 MHz,2400-2483.5 MHz, and 5725-5850MHz.</p> <p>ANSI C63.4 Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40GHz. (2003)</p> <p>DA00-705 Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System.(2000)</p>		
Conclusion	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards.</p> <p>General Judgment: Pass</p> <p>(Stamp)</p> <p>Date of issue: July 19th, 2010</p>		
Comment	The test result only responds to the measured sample.		

Approved by



Yang Weizhong

Revised by



Xu Kai

Performed by



Du Ruwei

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1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
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Website: <http://www.ta-shanghai.com>
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1.3. Applicant Information

Company: Shanghai Longcheer3g Technology Co.,Ltd
Address: No.1,Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai
City: Shanghai
Postal Code: 201204
Country: P.R. China
Contact: Zhengfang hu
Telephone: +86-21-64088898
Fax: +86-21-54970816

1.4. Manufacturer Information

Company: Shanghai Longcheer3g Technology Co.,Ltd
Address: No.1,Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai
City: Shanghai
Postal Code: 201204
Country: P.R. China
Telephone: +86-21-64088898
Fax: +86-21-54970816

1.5. Information of EUT

General information

Name of EUT:	GSM /WCDMA dual mode mobile phone	
IMEI:	355077010016854	
Device Operating Configurations:		
Mode	Basic Rate	Enhanced Data Rate(EDR)
Modulation	GFSK	8DQPSK
Packet Type:(Maximum Payload)	DH5	3DH5
Max Conducted Power	2.15dBm	
Antenna Type:	Internal Antenna	
Power Supply:	Battery or Charger	
Rated Power Supply Voltage:	3.7V	
Extreme Voltage:	Minimum: 3.5V Maximum: 4.2V	
Extreme Temperature:	Lowest: -10°C Highest: +55°C	
Operating Frequency Range(s)	2400 ~ 2483.5 MHz	
Hardware Version:	LQWM232A	
Software Version:	LQWHM01.1.0	

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Auxiliary equipment details

AE1: Battery

Model: BL-96
Manufacturer: i-mobile
S/N: BAK0810061300286

AE2: Travel Charger

Model: ASUC1-052050
Manufacturer: AQUILSTAR PRECISION INDUSTRIAL(SHEN ZHEN)CO.,LTD.
S/N: /

AE3: Headset

Model: TJ-090057
Manufacture: HONG Kong Tenji Technology Industrial Co., Ltd.
S/N: /

Equipment Under Test (EUT) is GSM /WCDMA dual mode mobile phone with internal antenna. It consists of mobile phone, battery and charger , the detail about these is in chapter 1.5 in this report. The EUT supports Bluetooth.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from July 1, 2010 to July 13, 2010.

2. Test Information

2.1. Summary of test results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Peak Power Output -Conducted	15.247(b)(1)	PASS
2	Occupied Bandwidth (20dB)	15.247(a)(1)	PASS
3	Frequency Separation	15.247(a)(1)	PASS
4	Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	PASS
5	Band Edge Compliance	15.247(d)	PASS
6	Spurious Radiated Emissions in the restricted band	15.247(d),15.205,15.209	PASS
7	Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
8	Spurious RF Conducted Emissions	15.247(d)	PASS
9	Radiates Emission	15.247(d),15.205,15.209	PASS
10	AC Power Line Conducted Emission	15.207	PASS

2.2. Peak Power Output –Conducted

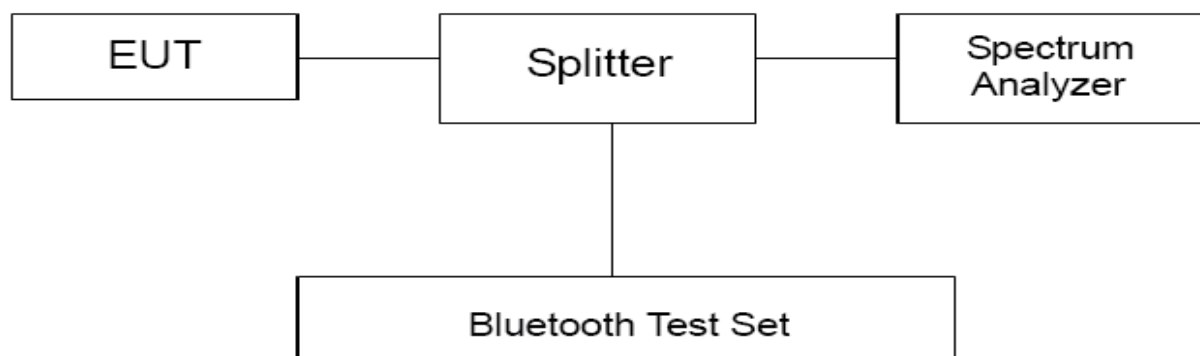
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The EUT is controlled by the Bluetooth test set to ensure max power transmission with proper modulation. These measurements have been tested at following channels: 0, 39, and 78.

Test Setup



Limits

Rule Part 15.247 (b) (1) specifies that " For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts."

Peak Output Power	$\leq 1\text{W}$ (30dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 0.44$ dB.

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Test Results

Channel	Frequency (MHz)	Peak Output Power (dBm)		Conclusion
		DH5	3DH5	
0	2402	-0.96	1.02	PASS
39	2441	-0.17	1.79	PASS
78	2480	0.27	2.15	PASS

2.3. Occupied Bandwidth (20dB)

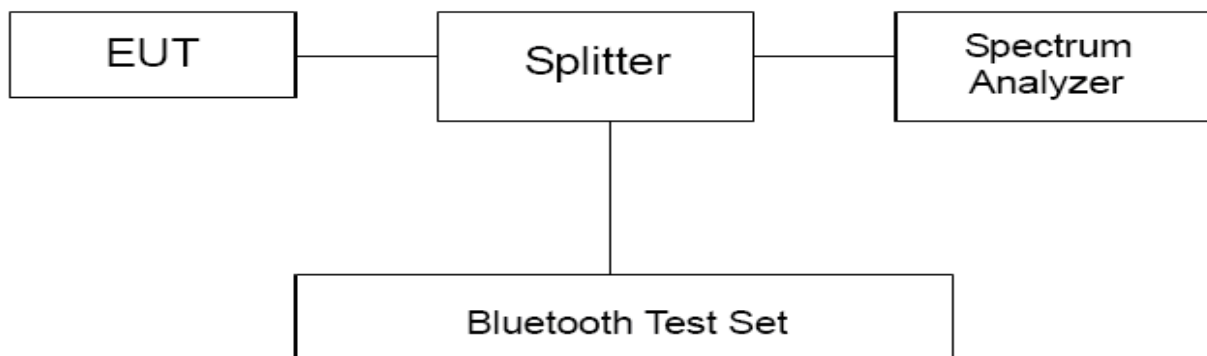
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 10 kHz on spectrum analyzer. -20dB occupied bandwidths are recorded.

Test Setup



Limits

No specific occupied bandwidth requirements in part 15.247(a) (1).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 936$ Hz.

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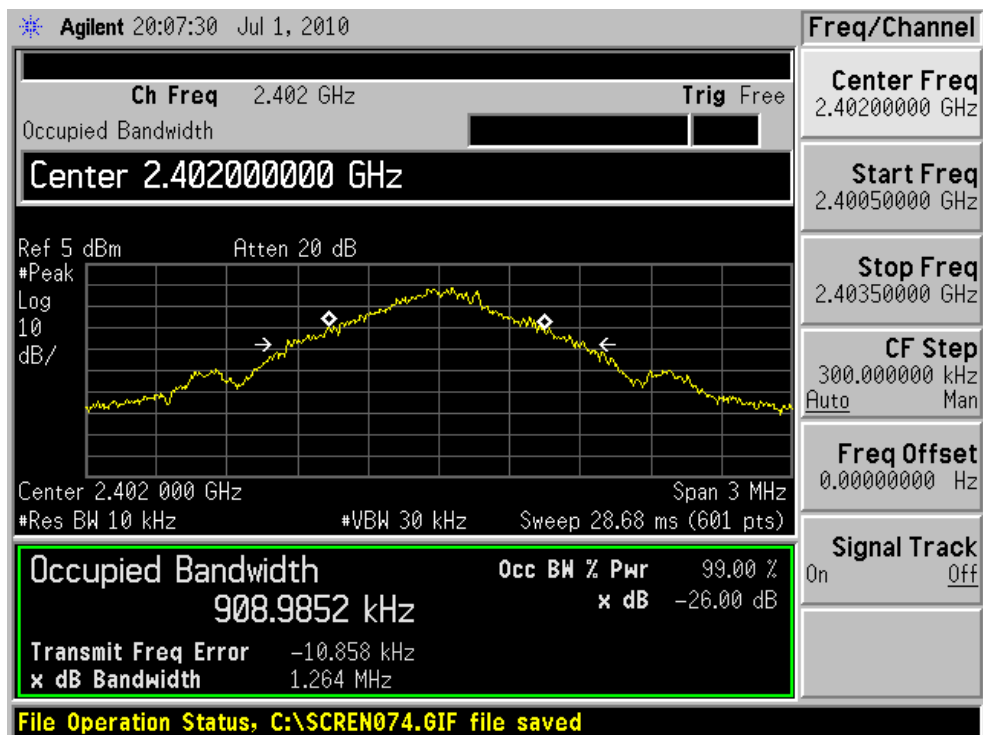
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Test Results

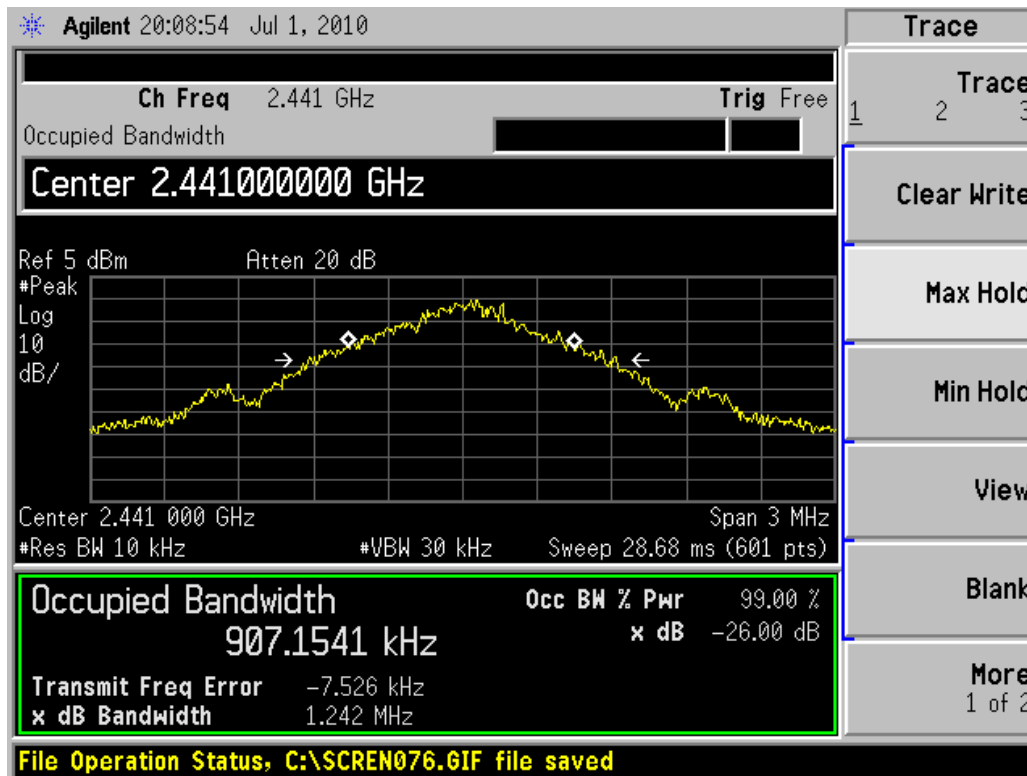
DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	908.99
39	2441	907.15
78	2480	913.98



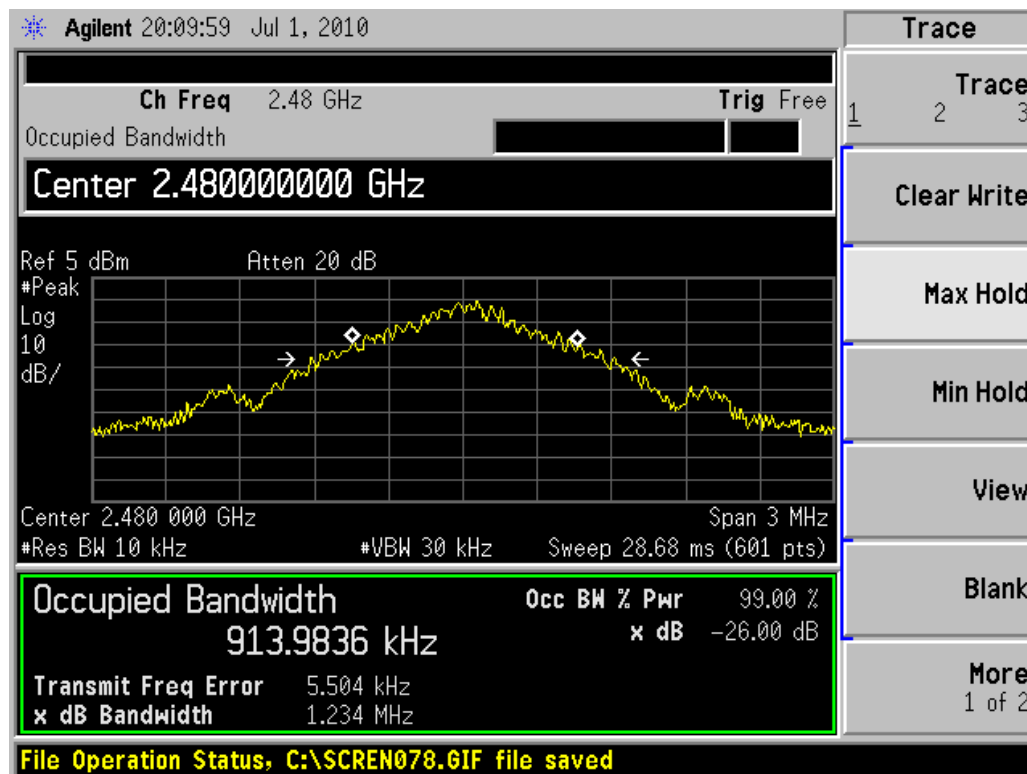
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

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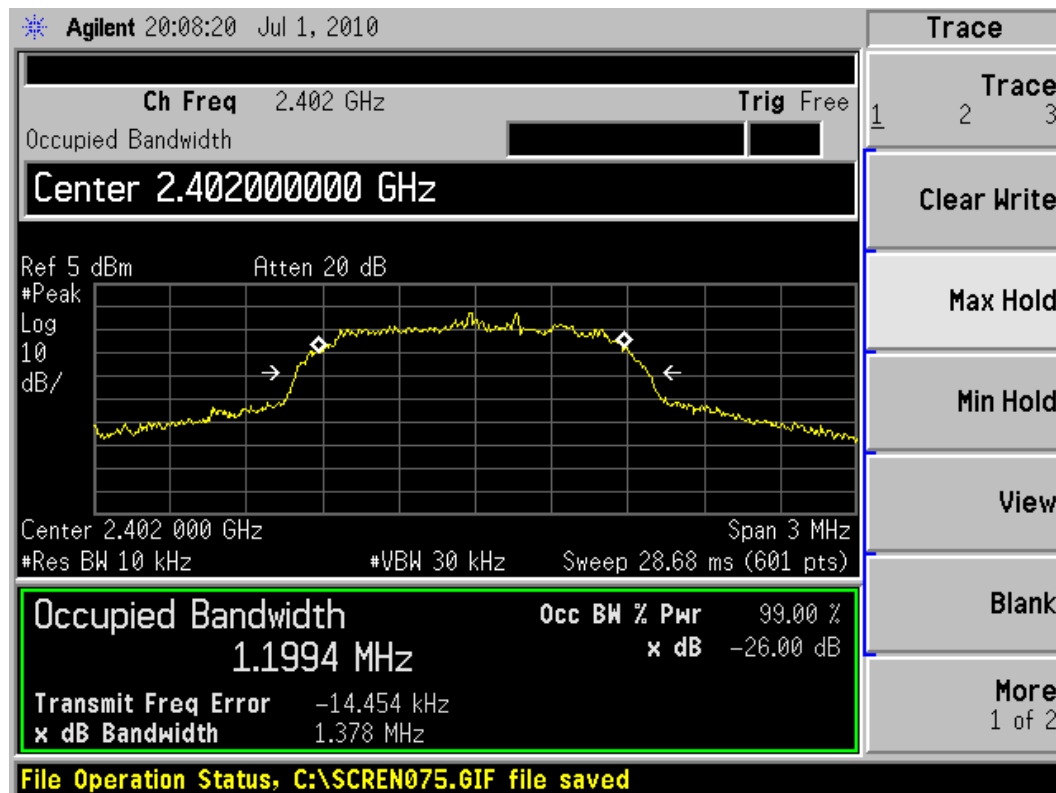
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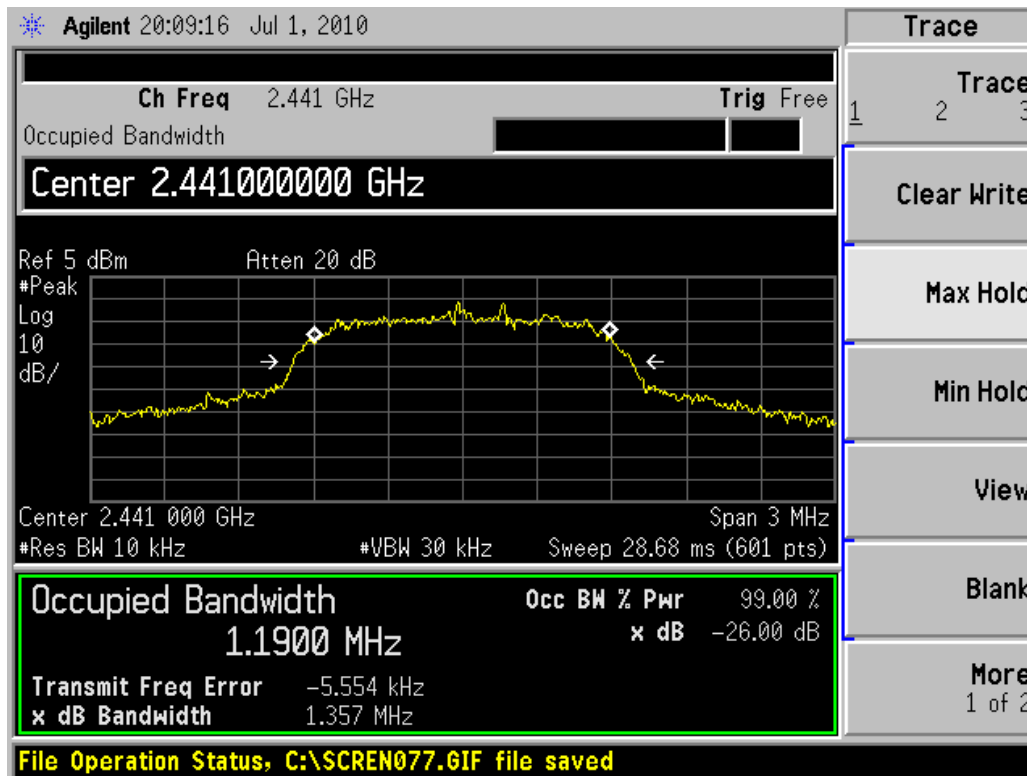
3DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1199.4
39	2441	1190
78	2480	1195



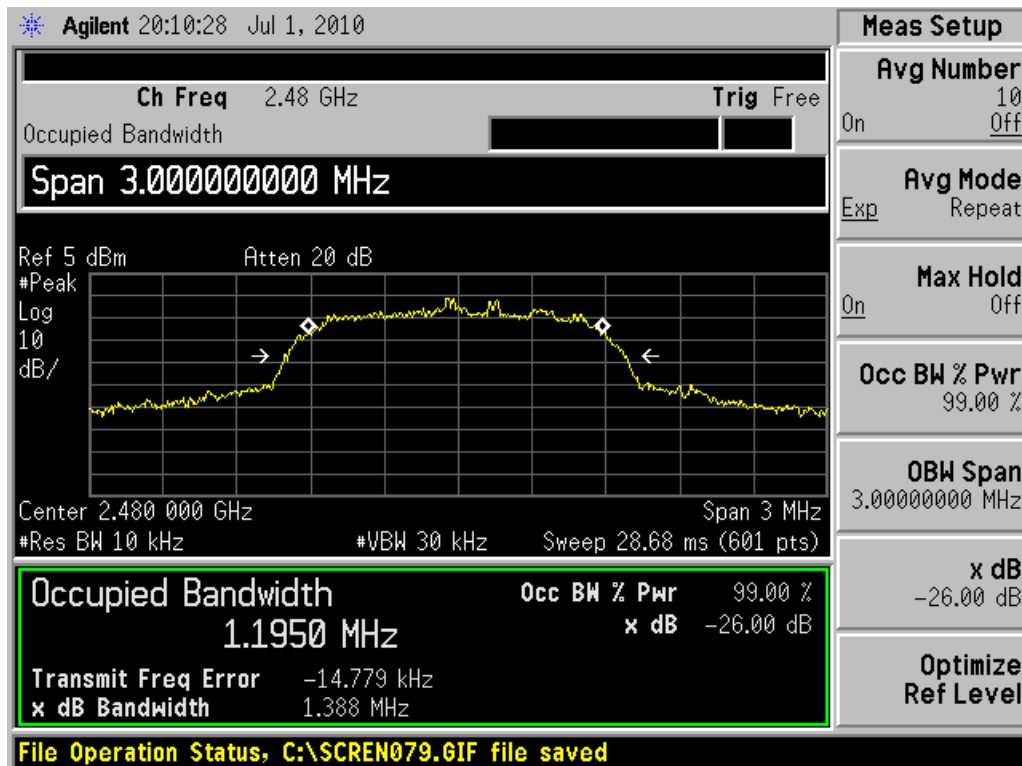
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

2.4. Frequency Separation

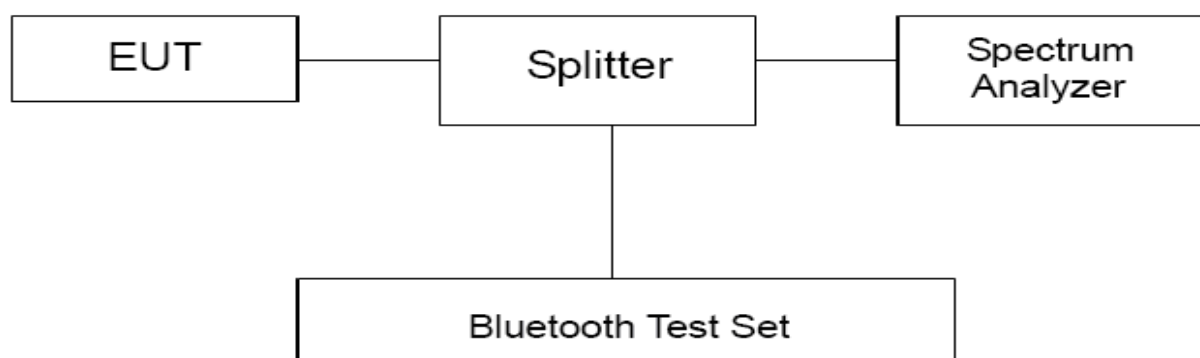
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements. The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Set EUT ON Hopping on mode.

Test setup



Limits

Rule Part 15.247(a)(1) specifies that “Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. ”

Note: The value of two-thirds of 20 dB bandwidth is always greater than 25 kHz.

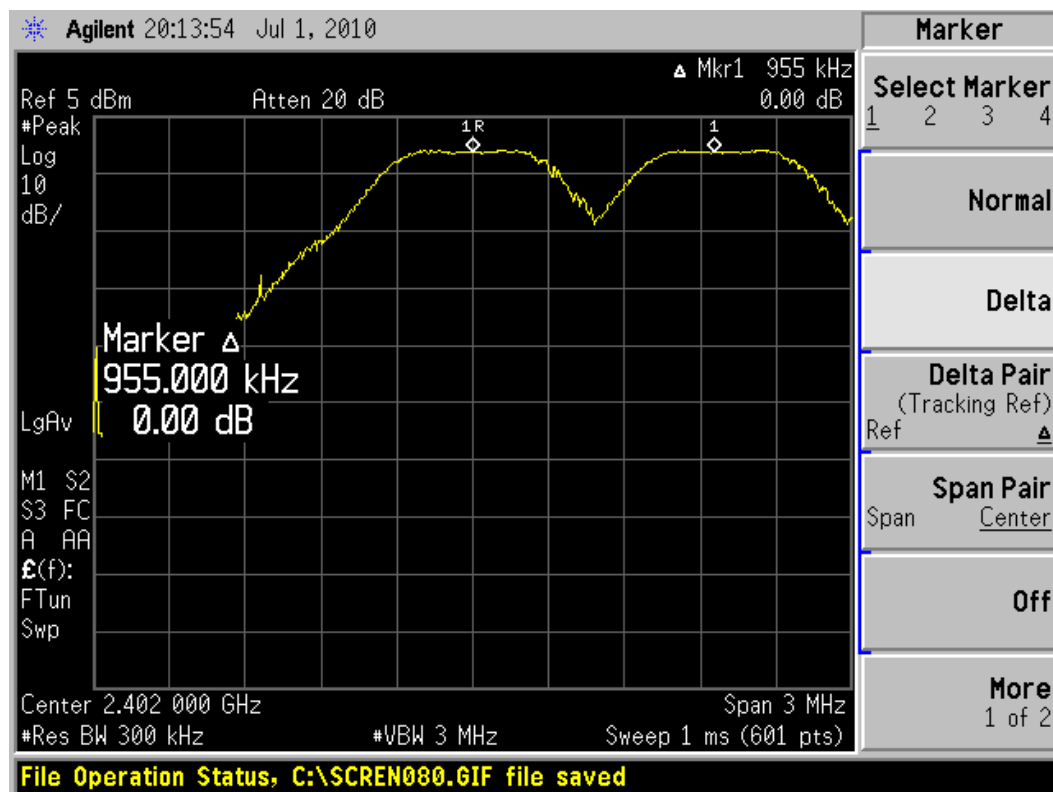
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 936$ Hz.

Test Results:

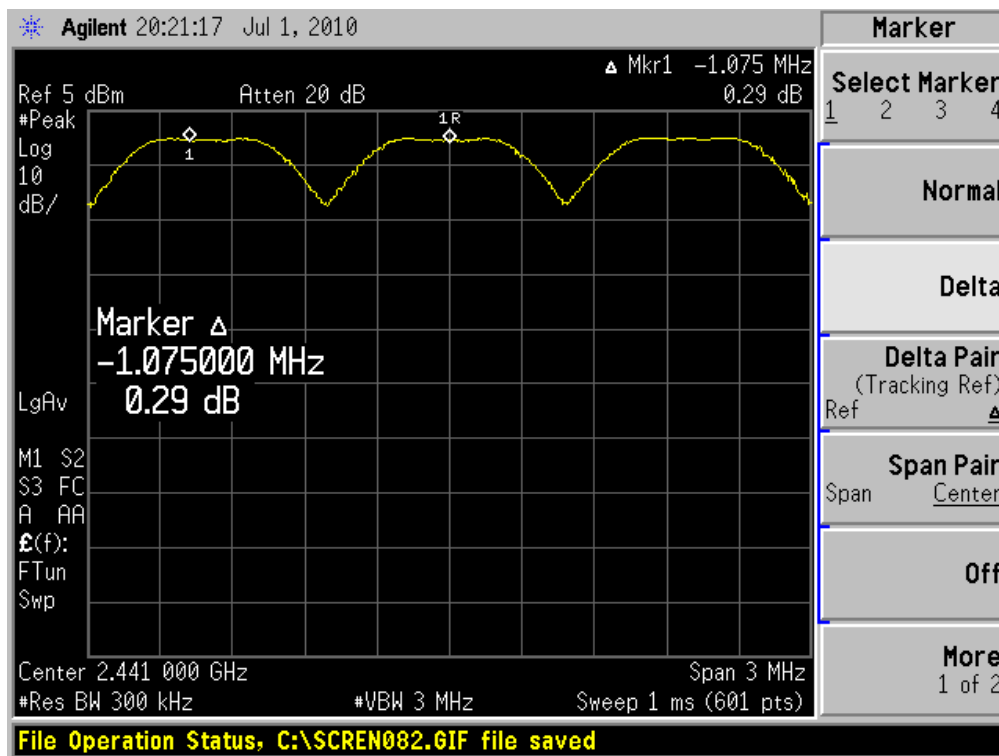
DH5

Carrier frequency (MHz)	Carrier frequency separation(kHz)	Limit(kHz)	Conclusion
2402	955	605.99	PASS
2441	1075	604.77	PASS
2480	1035	609.32	PASS



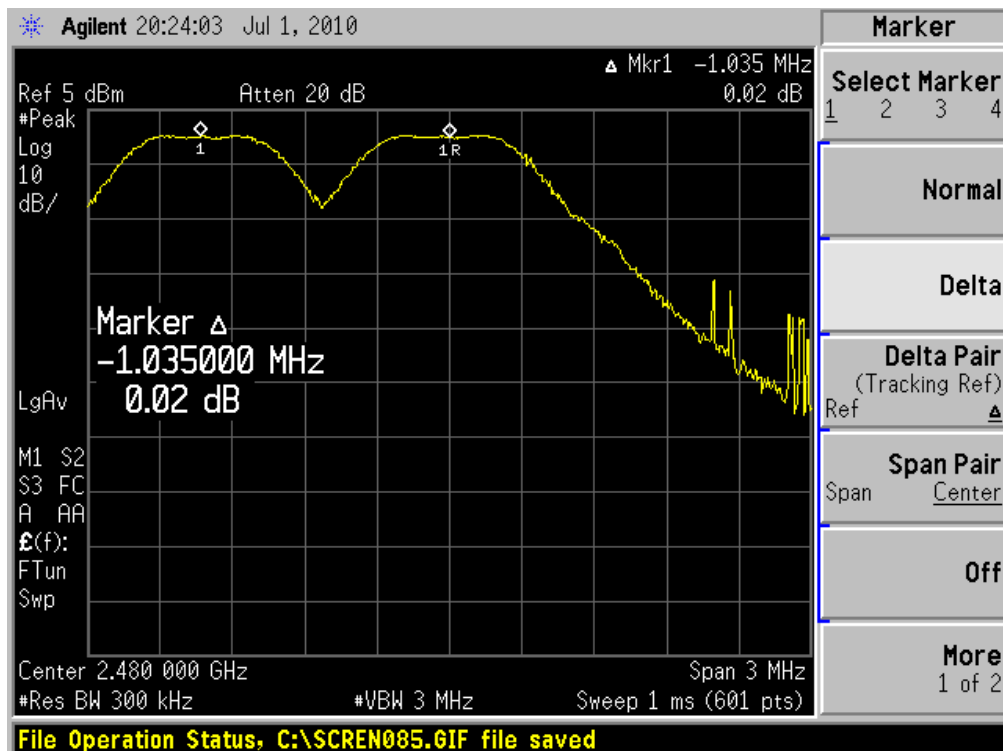
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

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Test Report

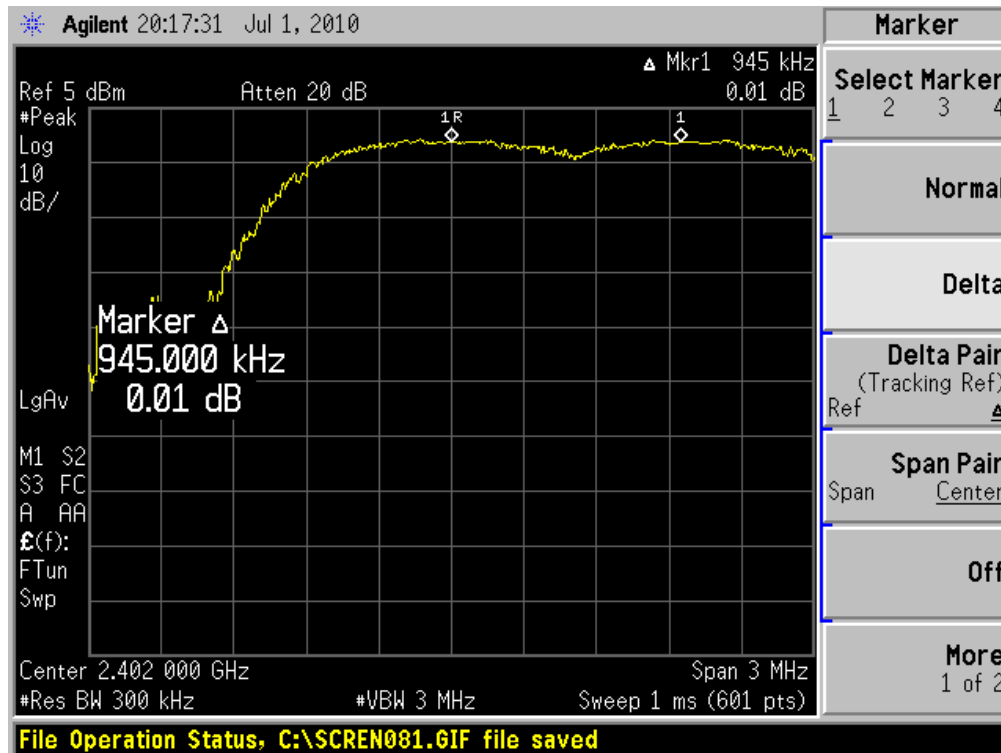
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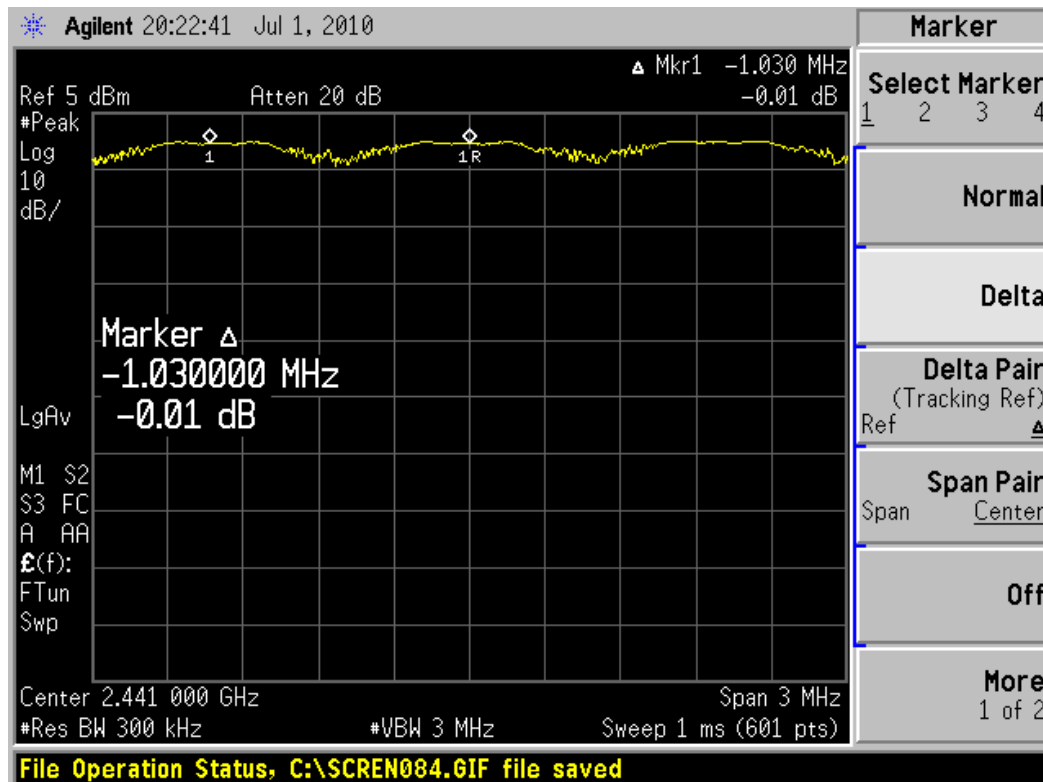
3DH5

Carrier frequency (MHz)	Carrier frequency separation(kHz)	Limit(kHz)	Conclusion
2402	945	799.60	PASS
2441	1030	793.33	PASS
2480	1035	796.67	PASS



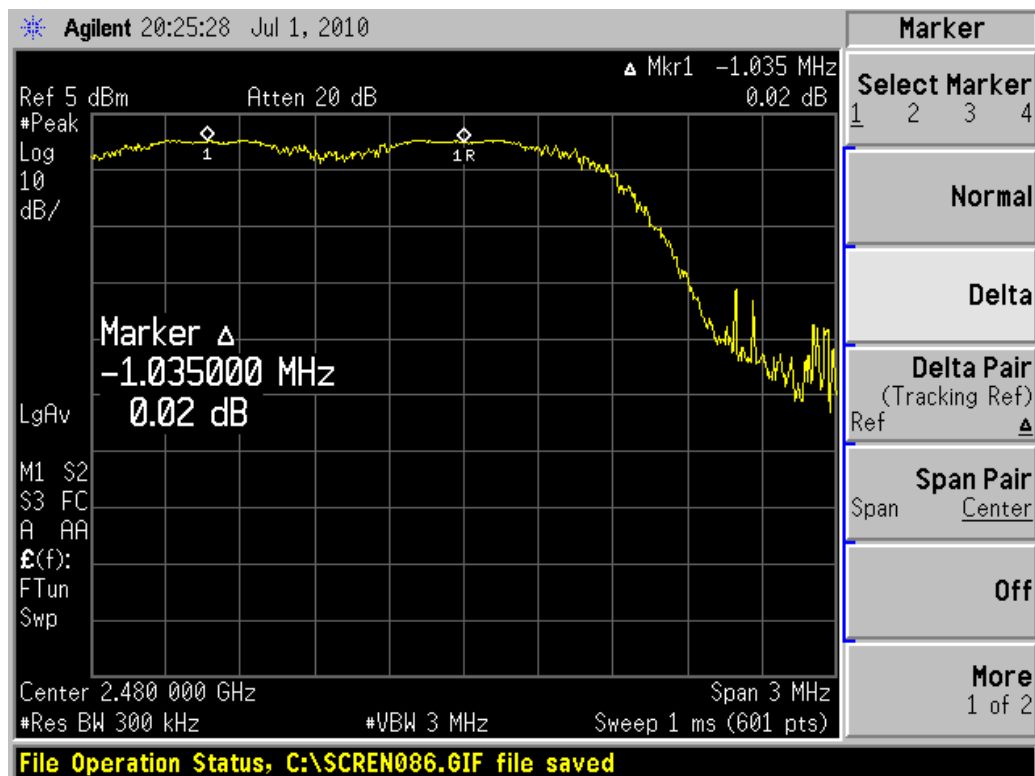
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

2.5. Time of Occupancy (Dwell Time)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

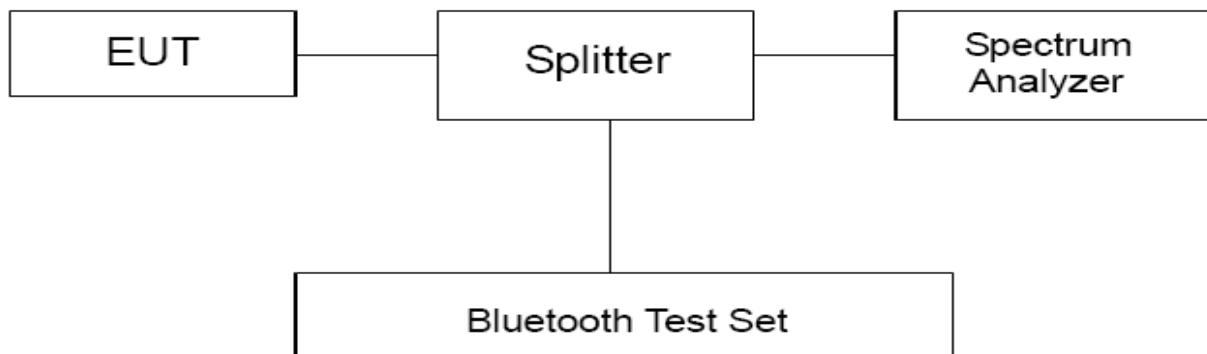
Methods of Measurement

The Equipment Under Test (EUT) was set up in a shielded room to perform the dwell time measurements. The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The time slot length is measured of three different packet types, which are available in the Bluetooth technology. Those are DH1, DH3 and DH5 packets. The dwell time is calculated by:

Dwell time = time slot length * hop rate * 0.4s with:

- hop rate = $1600 \times 1/s$ for DH1 packets = 1600
- hop rate = $1600/3 \times 1/s$ for DH3 packets = 533.33
- hop rate = $1600/5 \times 1/s$ for DH5 packets = 320

Test Setup



Limits

Rule Part 22.913(a) specifies that " Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.."

Dwell time	$\leq 400\text{ms}$
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U_{\text{DH1}} = 0.64\text{ms}$, $U_{\text{DH3}} = 0.80\text{ms}$, $U_{\text{DH5}} = 0.70\text{ms}$.

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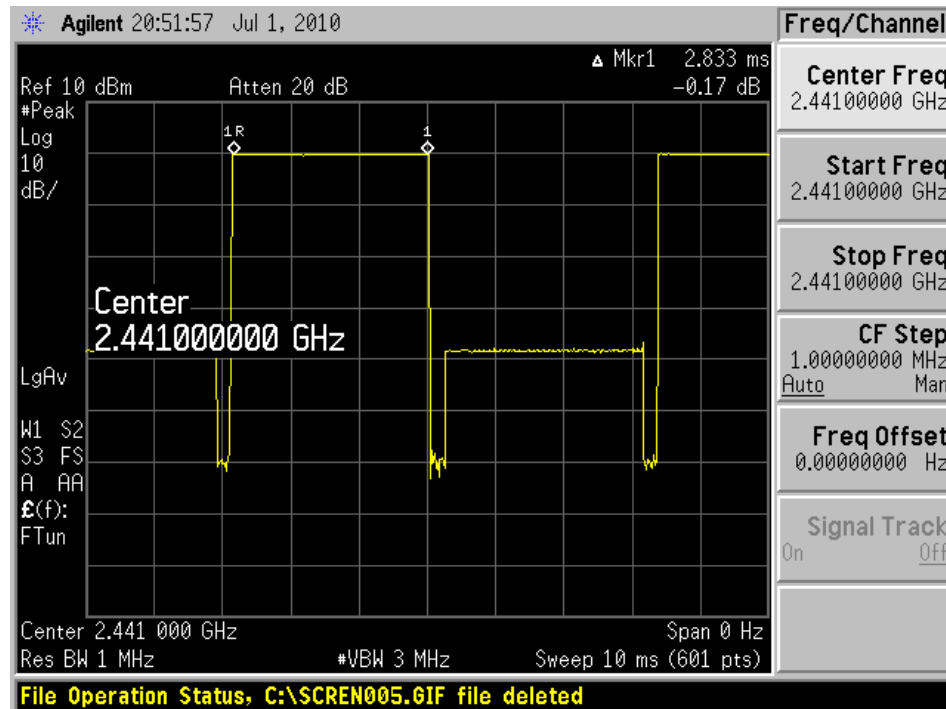
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Test Results:

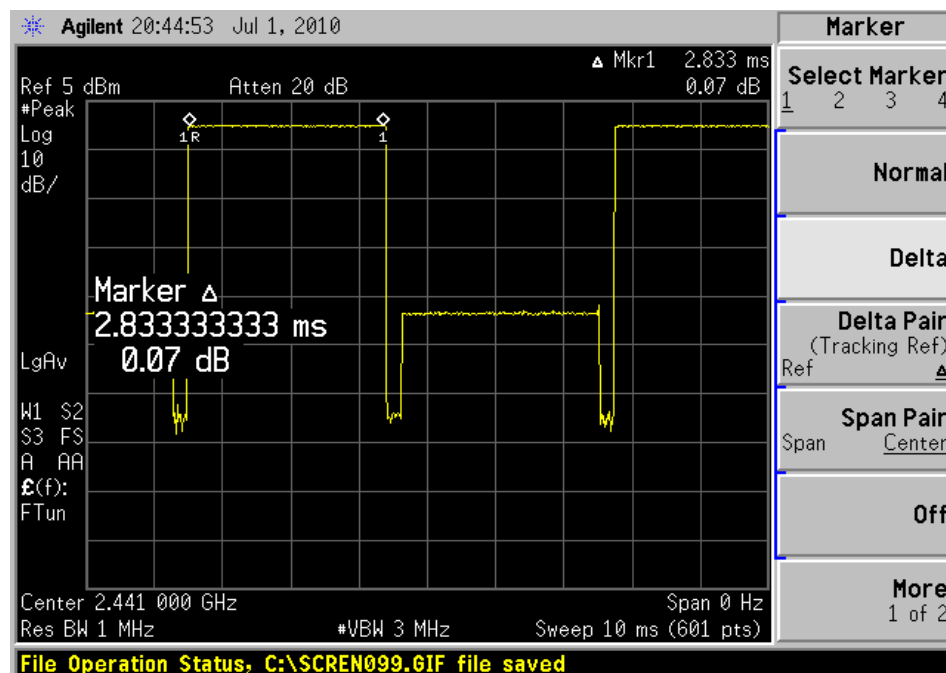
CH 39

Packet type	hop rate (1/s)	Time slot length(ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH5	320	2.83	362.24	400	PASS
3DH5	320	2.83	362.24	400	PASS

Note: Dwell time = time slot length * hop rate * 0.4s



Carrier frequency (MHz): 2441,DH5



Carrier frequency (MHz): 2441,3DH5

2.6. Band Edge Compliance

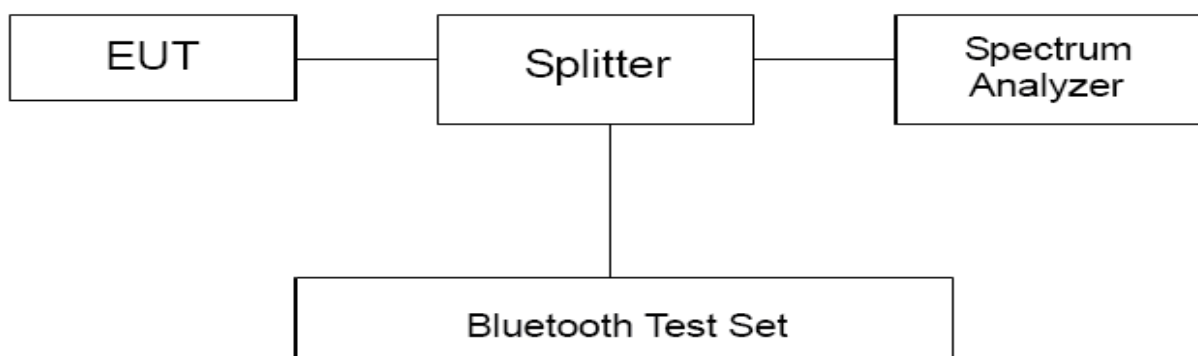
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements. The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The band edge of the lowest and highest channels were measured. The peak detector is used. Spectrum analyzer plots are included on the following pages. Set EUT on Hopping on mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.”

Limit	≥ 20 dB
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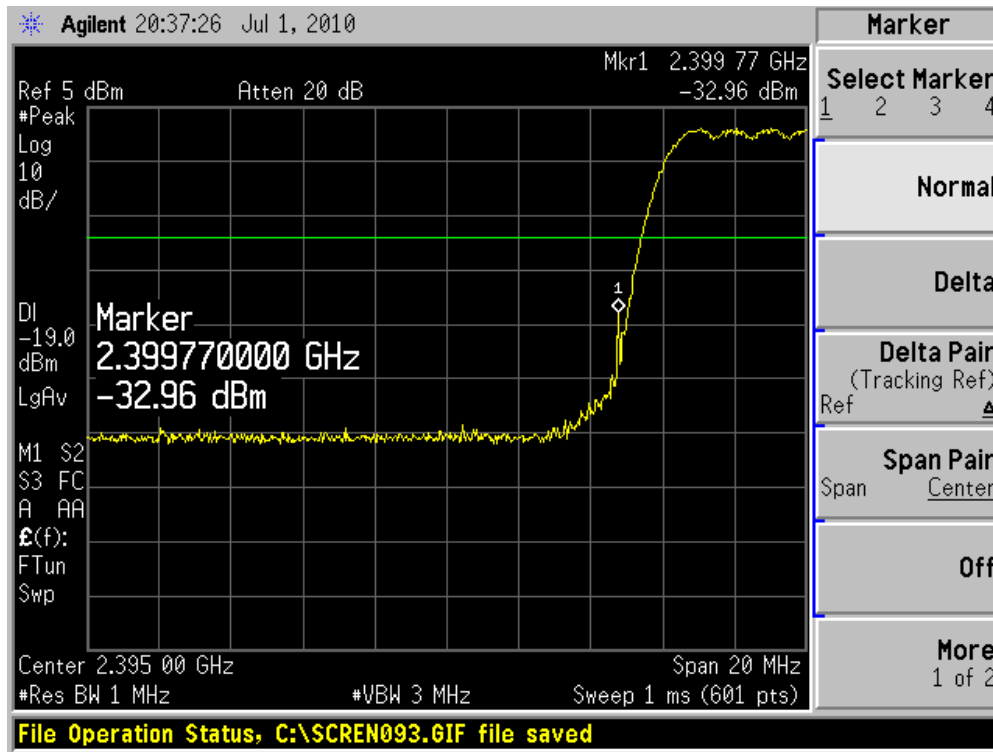
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

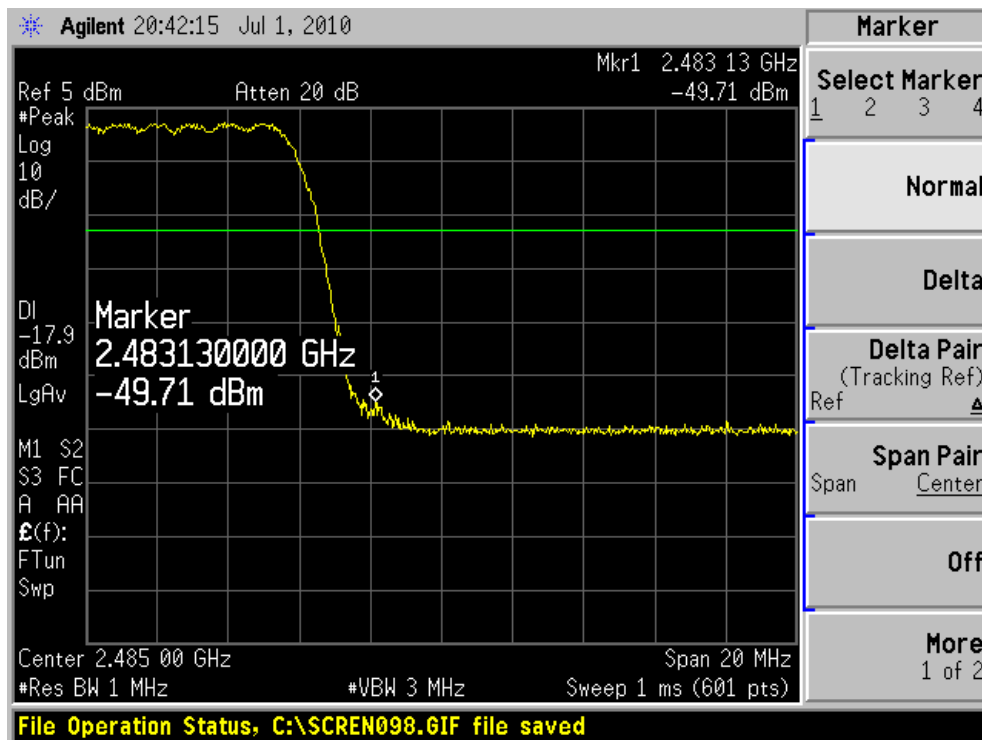
Test Results: PASS

DH5



Carrier frequency (MHz): 2402

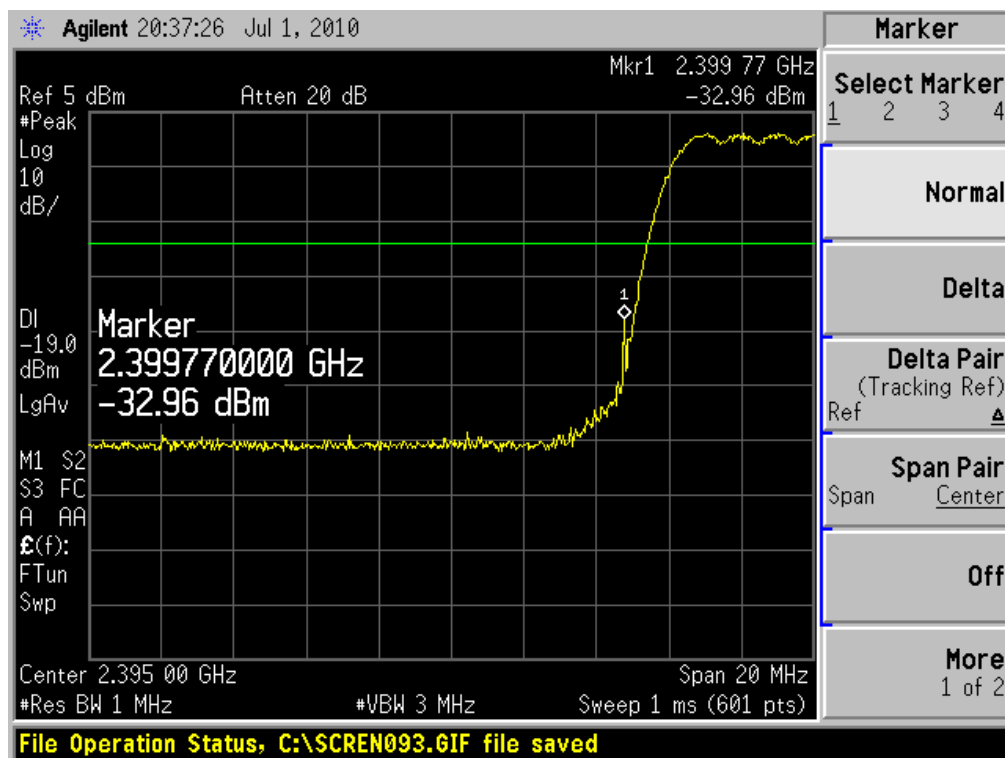
Channel No.:0



Carrier frequency (MHz): 2480

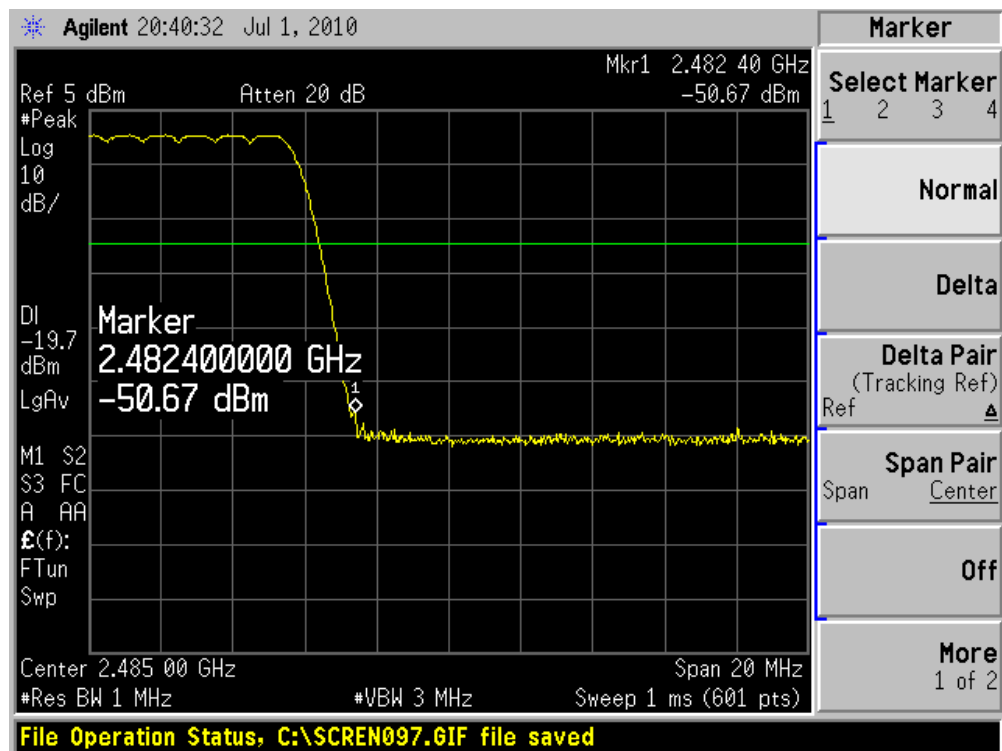
Channel No.:78

3DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

Channel No.:78

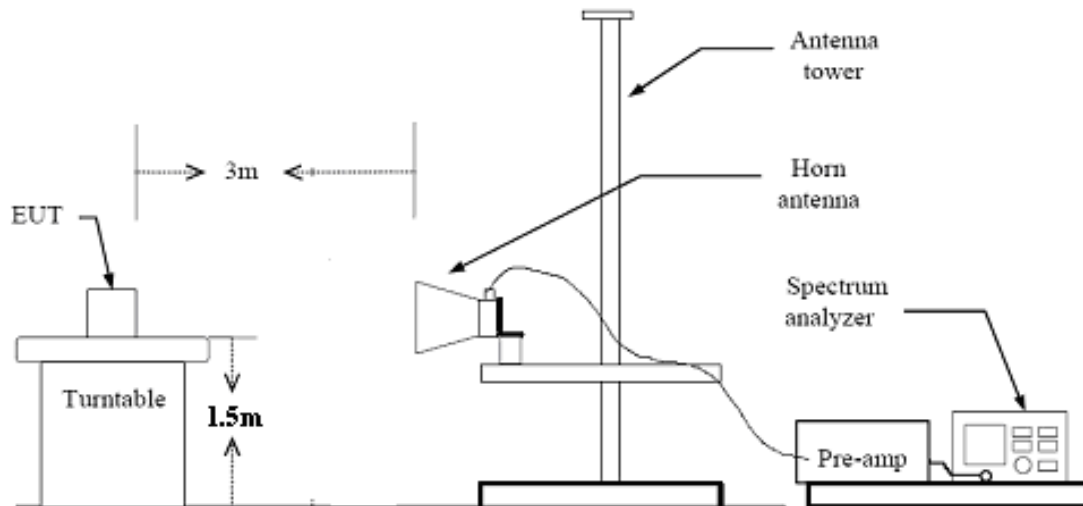
2.7. Spurious Radiated Emissions in the Restricted Band

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Test setup



Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

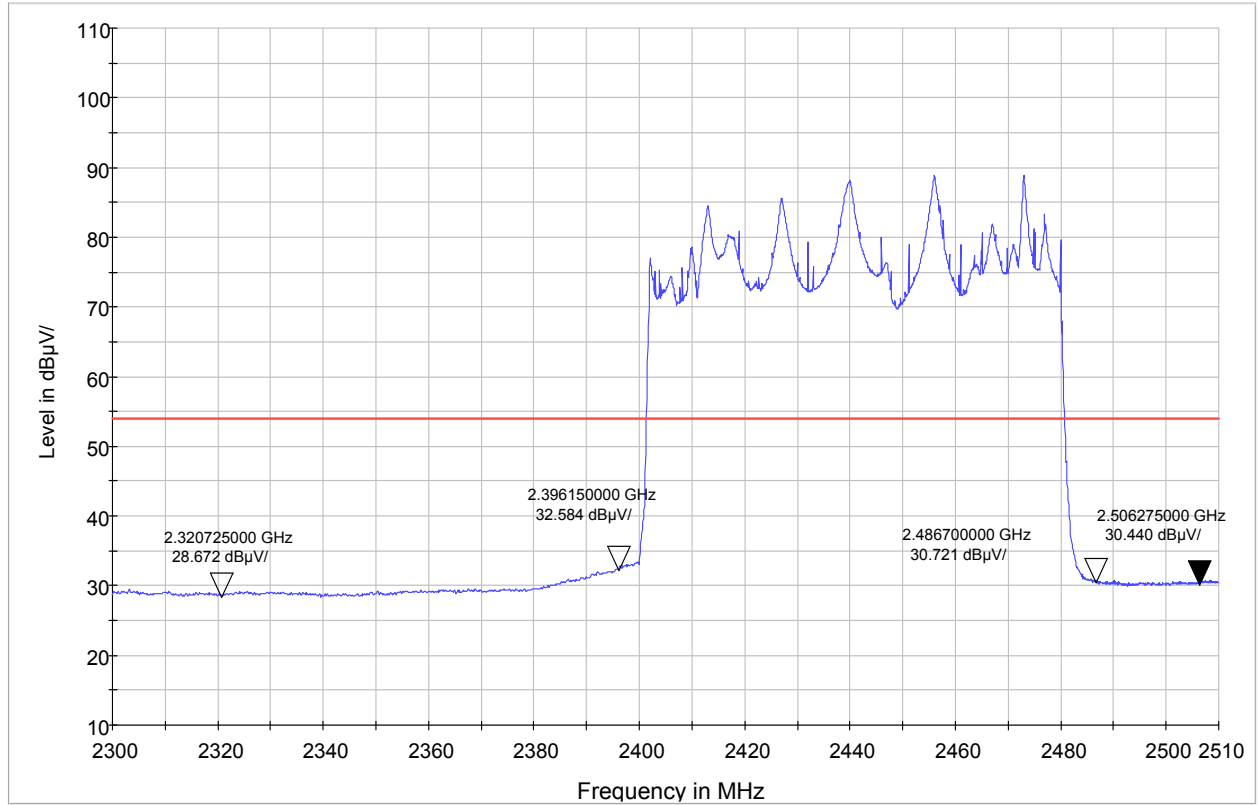
There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U=3.92$ dB.

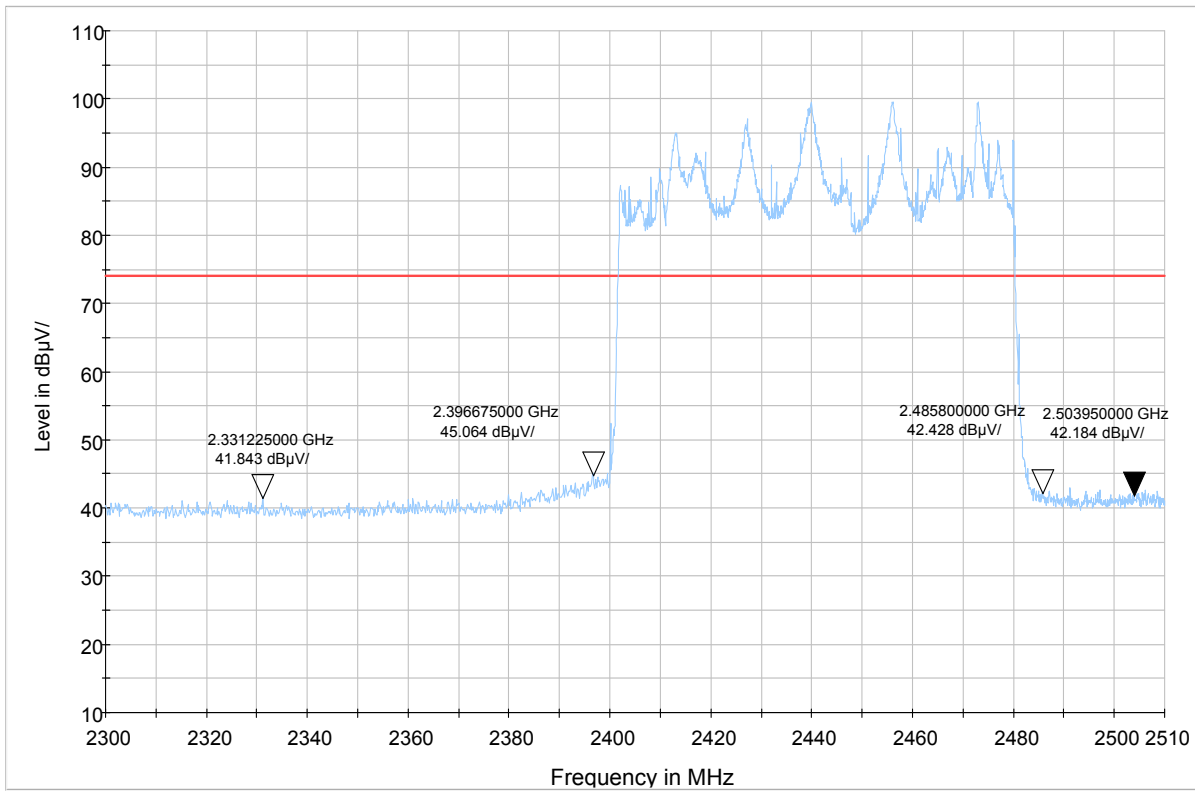
Test Results:

Basic Rate- Channel 0



Note: The signal beyond the limit is carrier

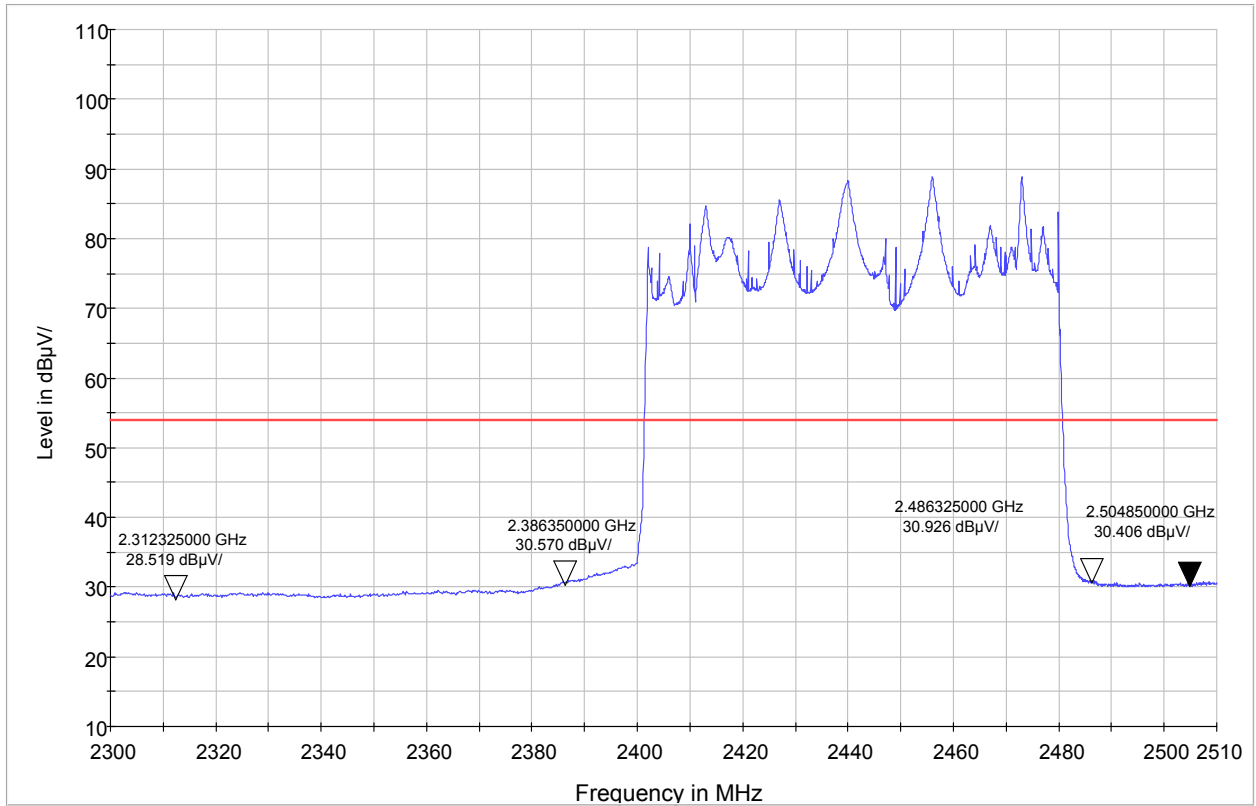
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2320.725	28.672	150.0	Vertical	45.0	54
2396.15	32.584	150.0	Vertical	180.0	54
2486.7	30.721	150.0	Vertical	135.0	54
2506.275	30.44	150.0	Vertical	90.0	54



Note: The signal beyond the limit is carrier

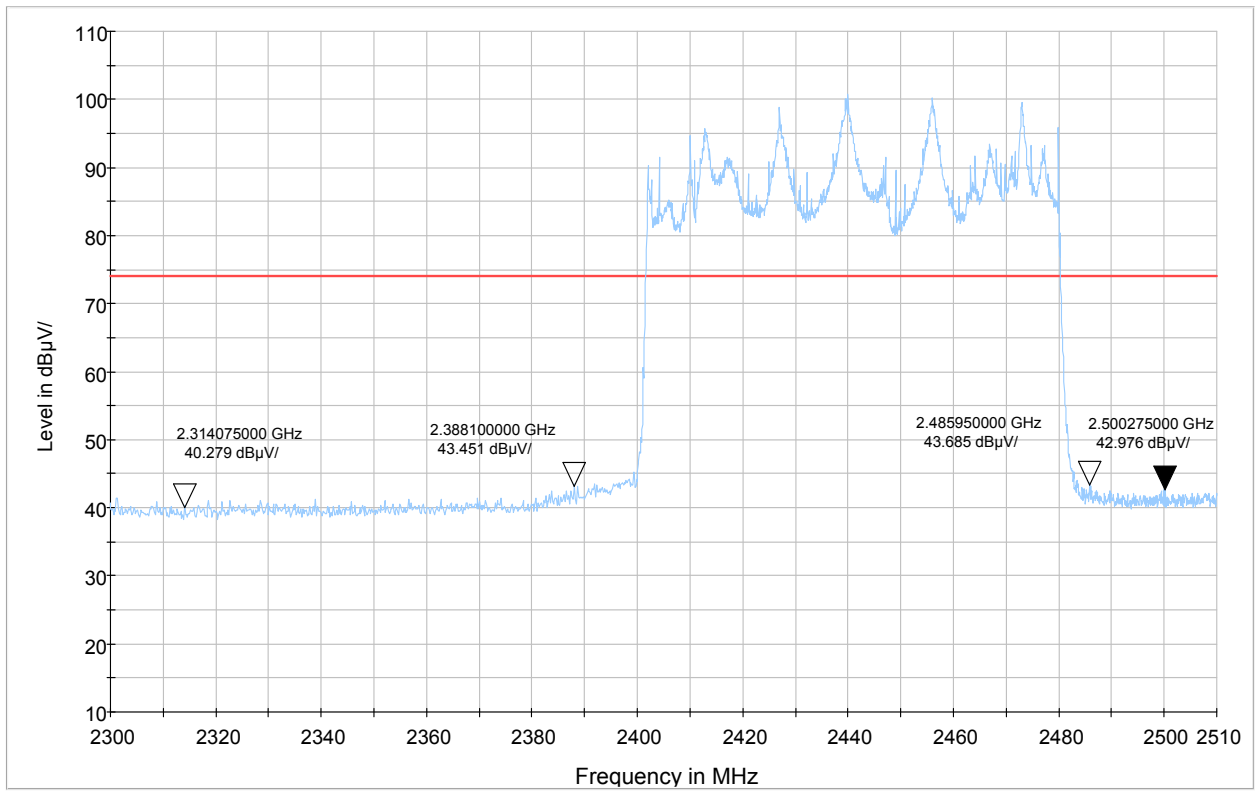
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2331.23	41.843	150.0	Vertical	0.0	74
2396.675	45.064	150.0	Vertical	90.0	74
2485.8	42.428	150.0	Vertical	135.0	74
2503.95	42.184	150.0	Vertical	270.0	74

Basic Rate- Channel 39



Note: The signal beyond the limit is carrier

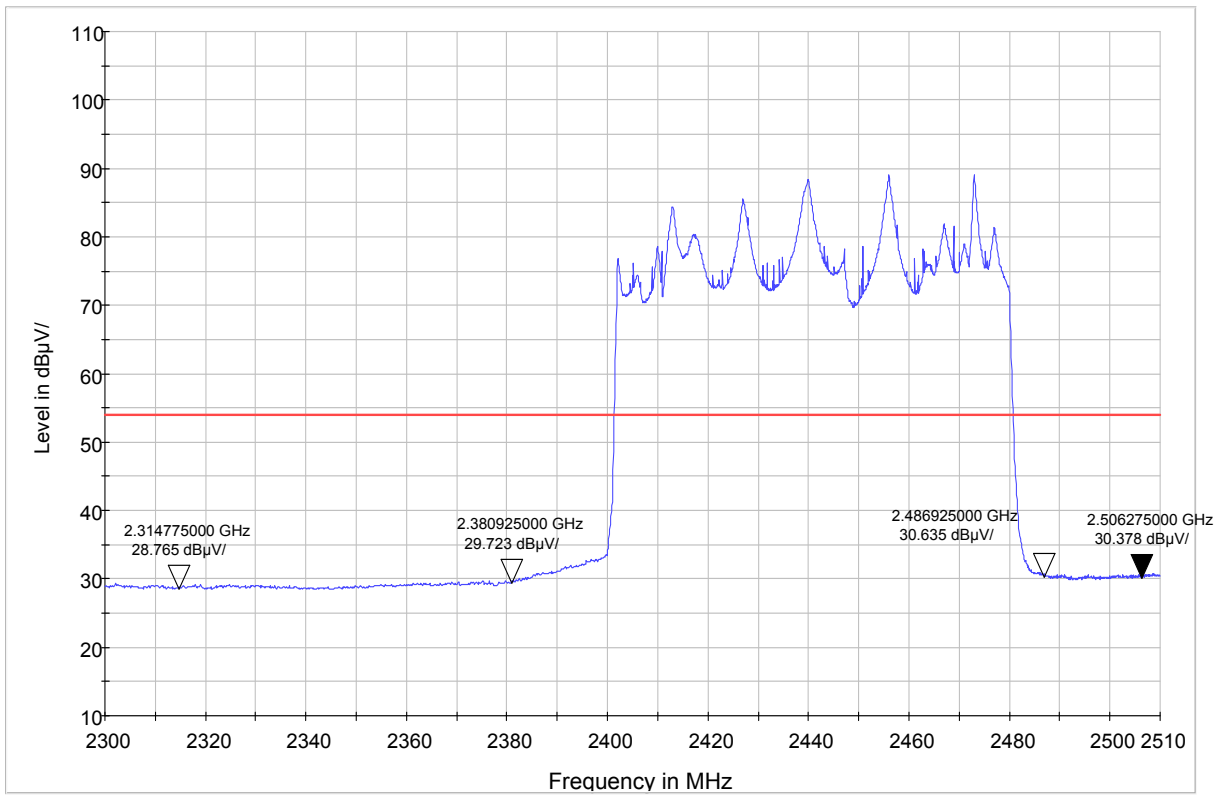
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2312.325	28.519	150.0	Vertical	90.0	54
2386.35	30.57	150.0	Vertical	180.0	54
2486.325	30.926	150.0	Vertical	225.0	54
2504.85	30.406	150.0	Vertical	90.0	54



Note: The signal beyond the limit is carrier

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2314.075	40.279	150.0	Vertical	90.0	74
2388.1	43.451	150.0	Vertical	180.0	74
2485.95	43.685	150.0	Vertical	225.0	74
2500.275	42.976	150.0	Vertical	90.0	74

Basic Rate- Channel 78



Note: The signal beyond the limit is carrier

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2314.775	28.765	150.0	Vertical	90.0	54
2380.925	29.723	150.0	Vertical	135.0	54
2486.925	30.635	150.0	Vertical	180.0	54
2506.275	30.378	150.0	Vertical	225.0	54

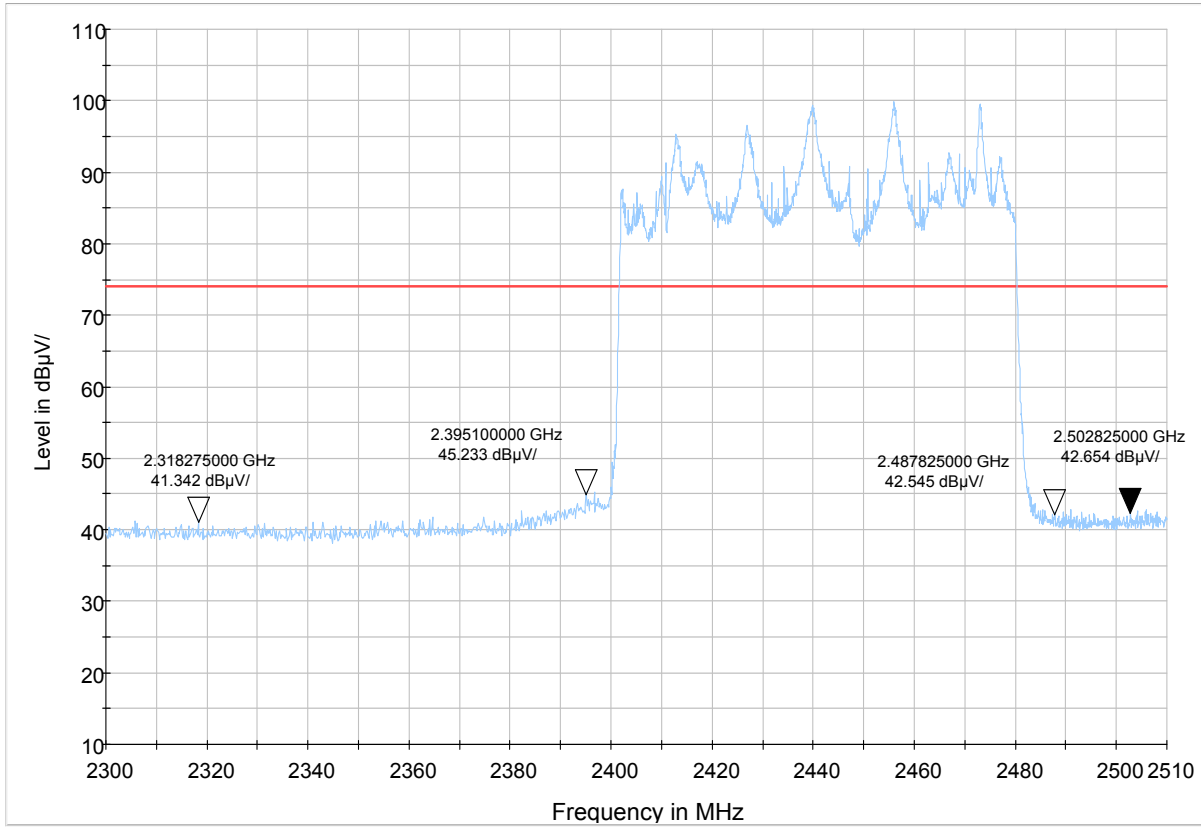
TA Technology (Shanghai) Co., Ltd.

Test Report

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Note: The signal beyond the limit is carrier

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Limit (dBuV/m)
2318.275	41.342	150.0	Vertical	45.0	74
2395.1	45.233	150.0	Vertical	135.0	74
2487.625	42.545	150.0	Vertical	180.0	74
2502.825	42.654	150.0	Vertical	135.0	74

2.8. Number of hopping Frequency

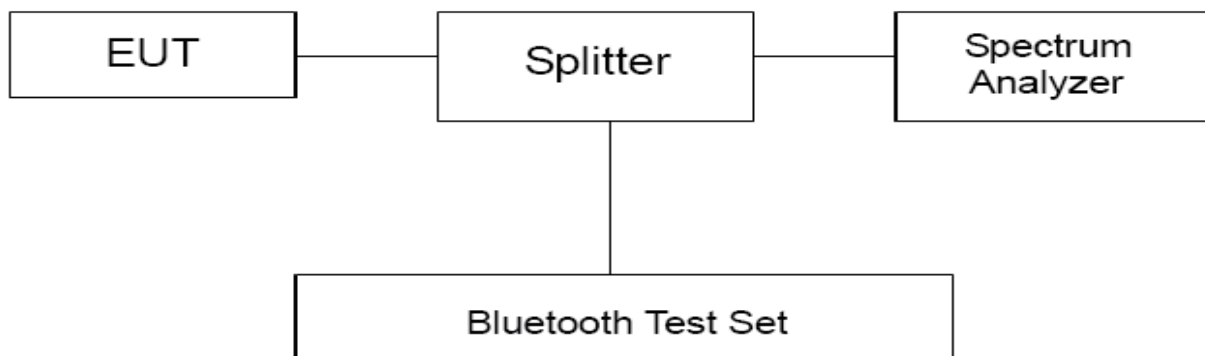
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements. The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Set EUT ON Hopping on mode.

Test setup



Limits

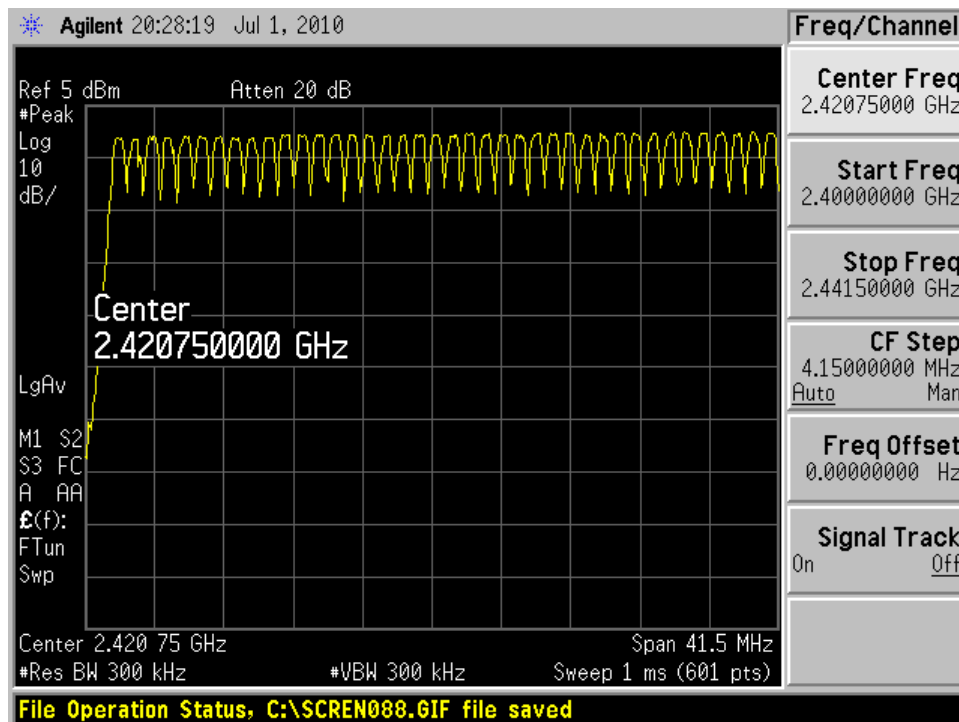
Rule Part 15.247(a) (1) (iii) specifies that "Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels..".

Limits	≥ 75 channels
--------	--------------------

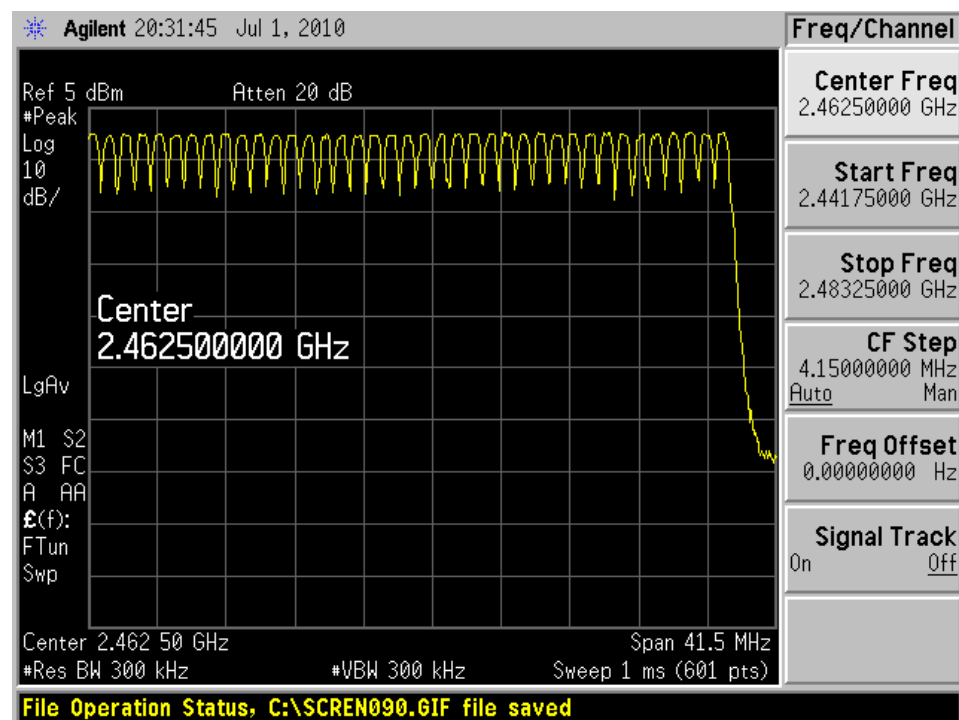
Test Results:

DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2441 MHz



2441 MHz – 2483.5 MHz

TA Technology (Shanghai) Co., Ltd.

Test Report

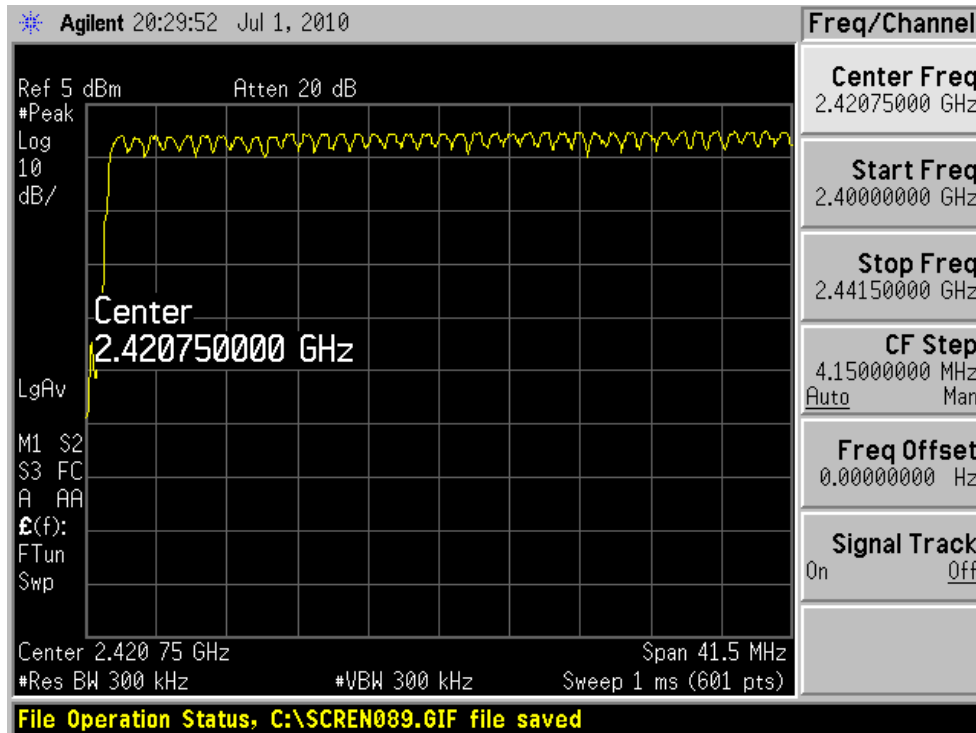
Registration Num:428261

Report No.: RZA2010-0989_15C-BT

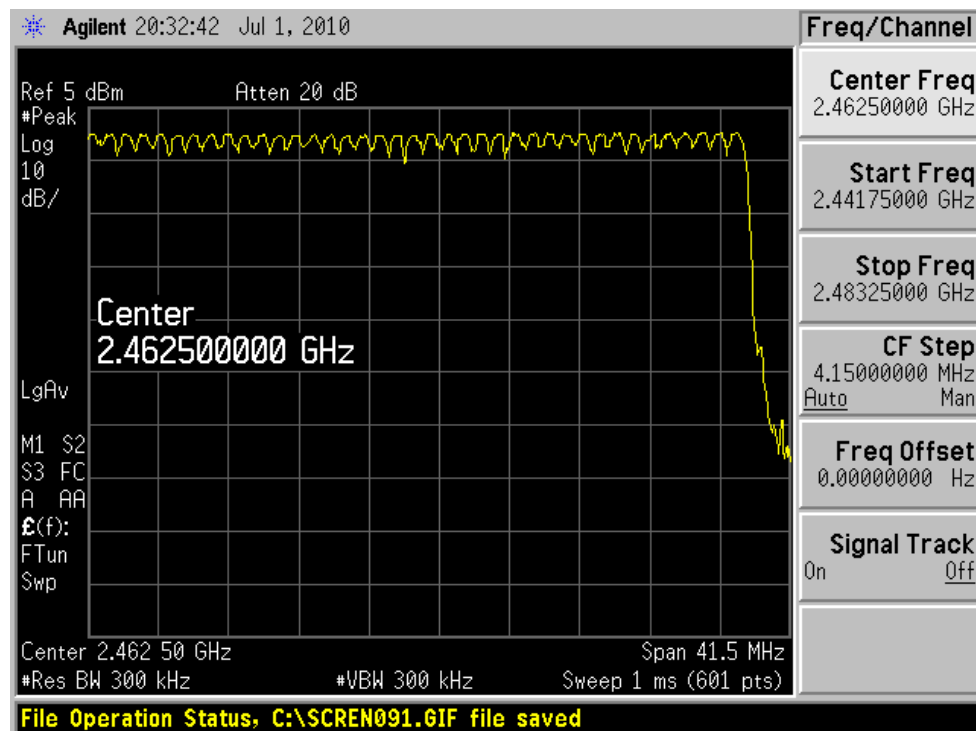
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3DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2441 MHz



2441 MHz – 2483.5 MHz

2.9. Spurious RF Conducted Emissions

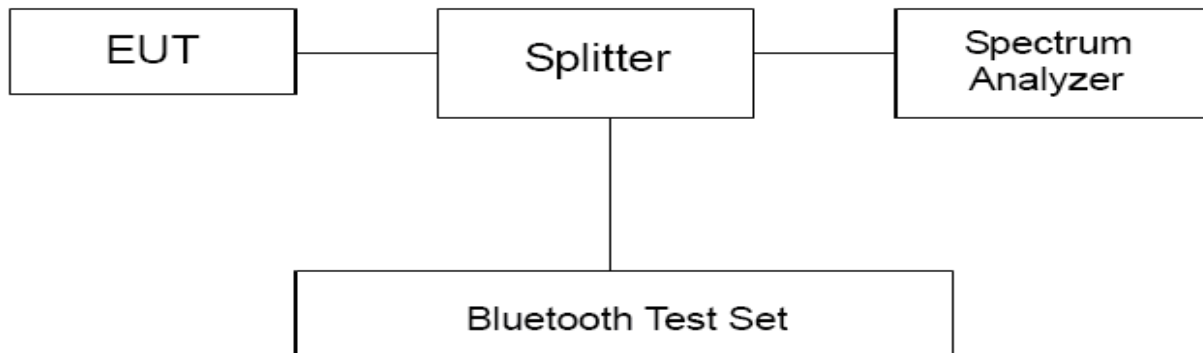
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The spectrum analyzer scans from 30MHz to 26GHz. The peak detector is used and RBW is set to 100 kHz on spectrum analyzer.

Test setup



Limits

Rule Part 15.247(d) specifies that "In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power."

Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
Basic Rate	2402	-0.96	≤ -20.96
	2441	-0.17	≤ -20.17
	2480	0.27	≤ -19.73
EDR	2402	1.02	≤ -18.98
	2441	1.79	≤ -18.21
	2480	2.15	≤ -17.85

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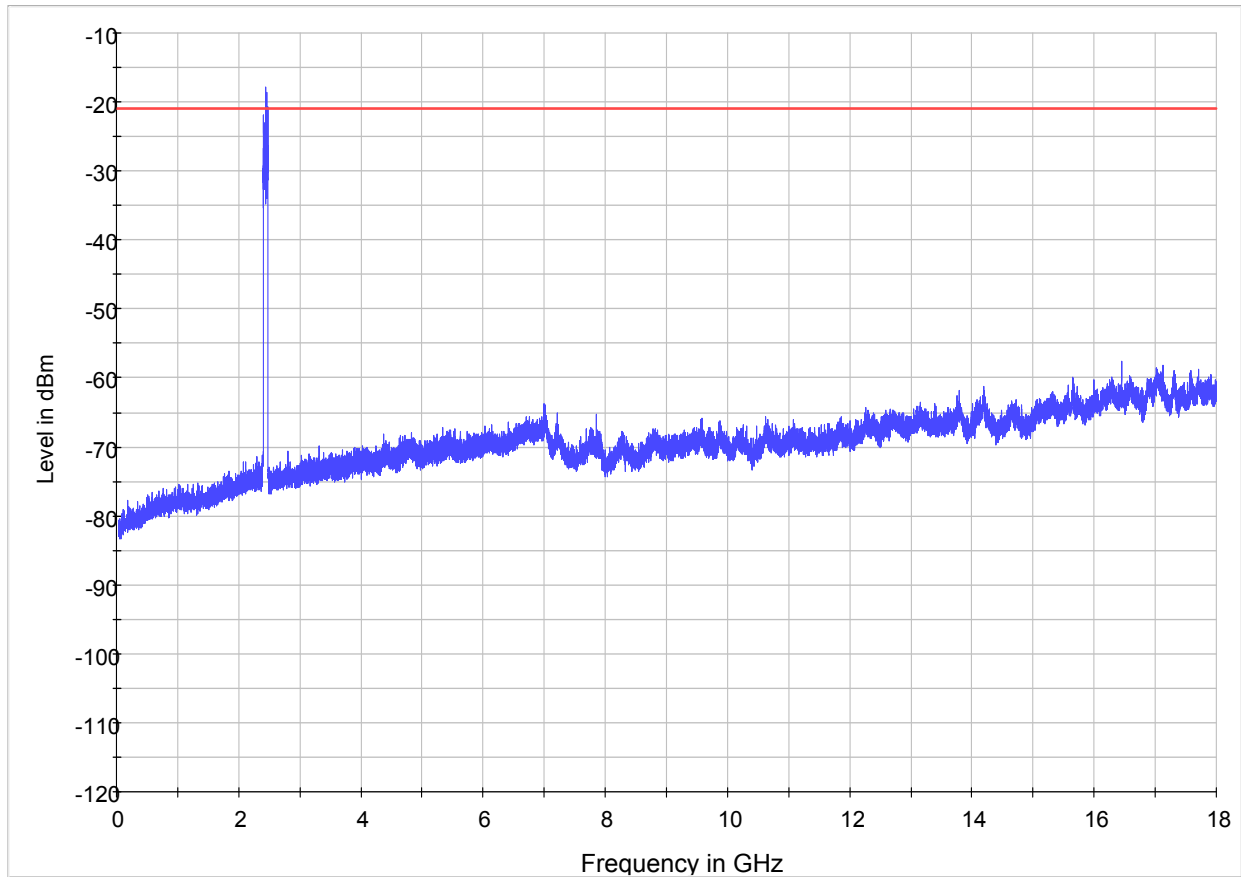
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

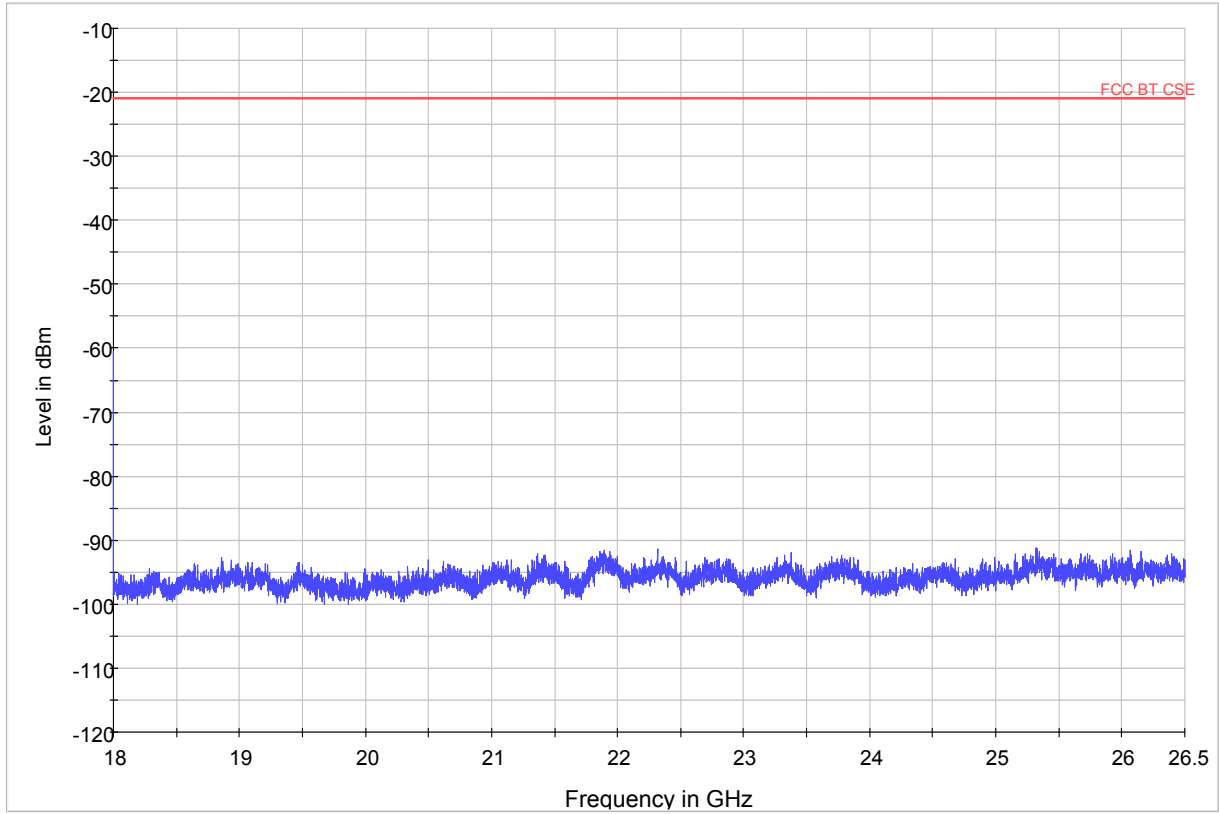
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

Test Results:

Basic Rate-CH0:



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2402
Spurious RF conducted emissions from 30MHz to 18GHz

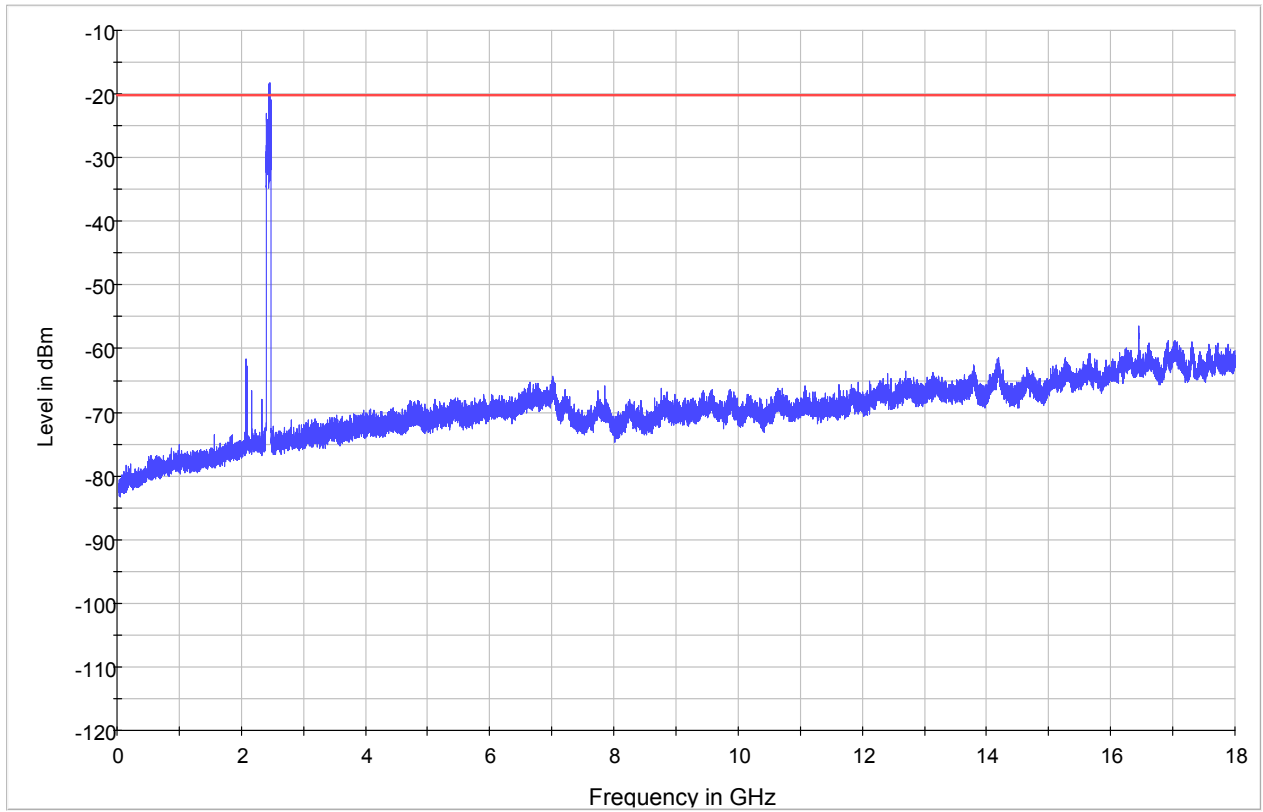


Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.0 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4804	Nf	-20.96
3	7206	Nf	-20.96
4	9608	Nf	-20.96
5	12010	Nf	-20.96
6	14412	Nf	-20.96
7	16814	Nf	-20.96
8	19216	Nf	-20.96
9	21618	Nf	-20.96
10	24020	Nf	-20.96
Nf: noise floor			

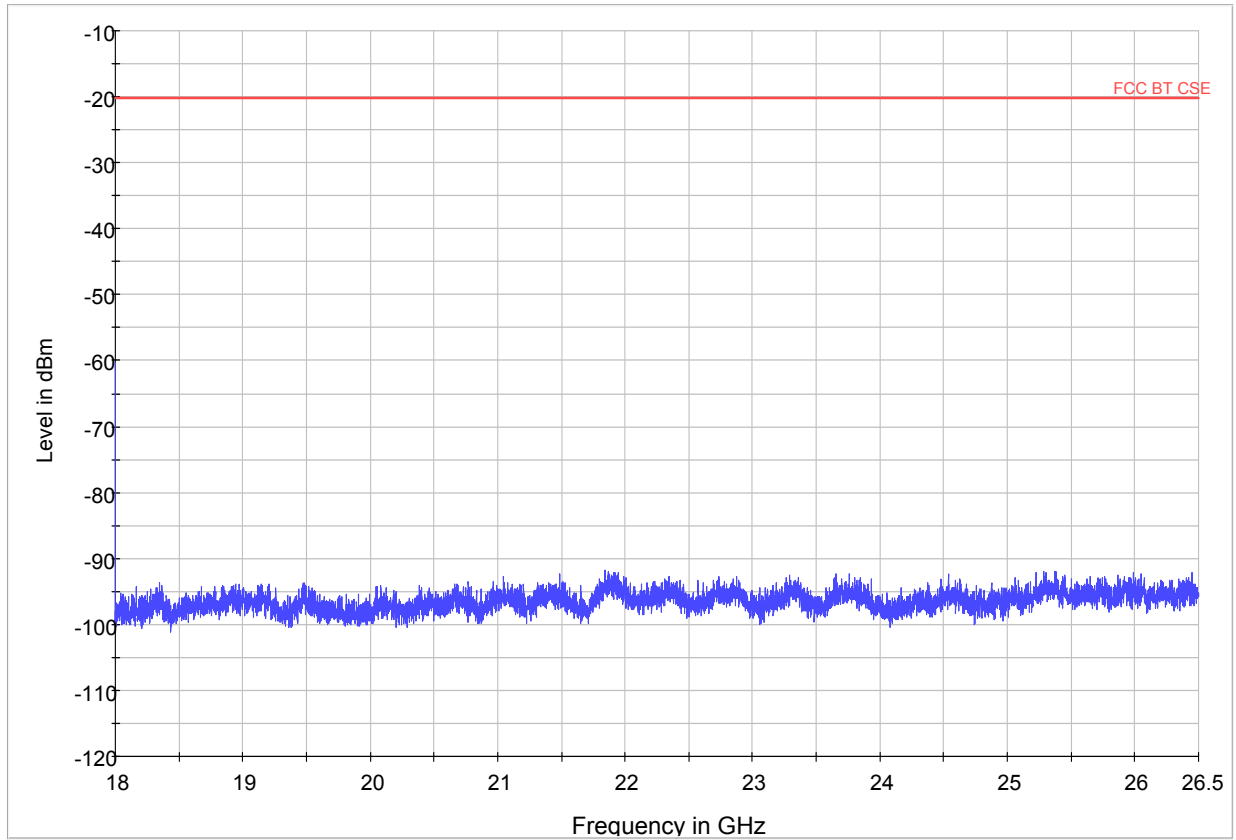
Note: The other Spurious RF conducted emissions level is no more than noise floor.

Basic Rate-CH39:



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2441

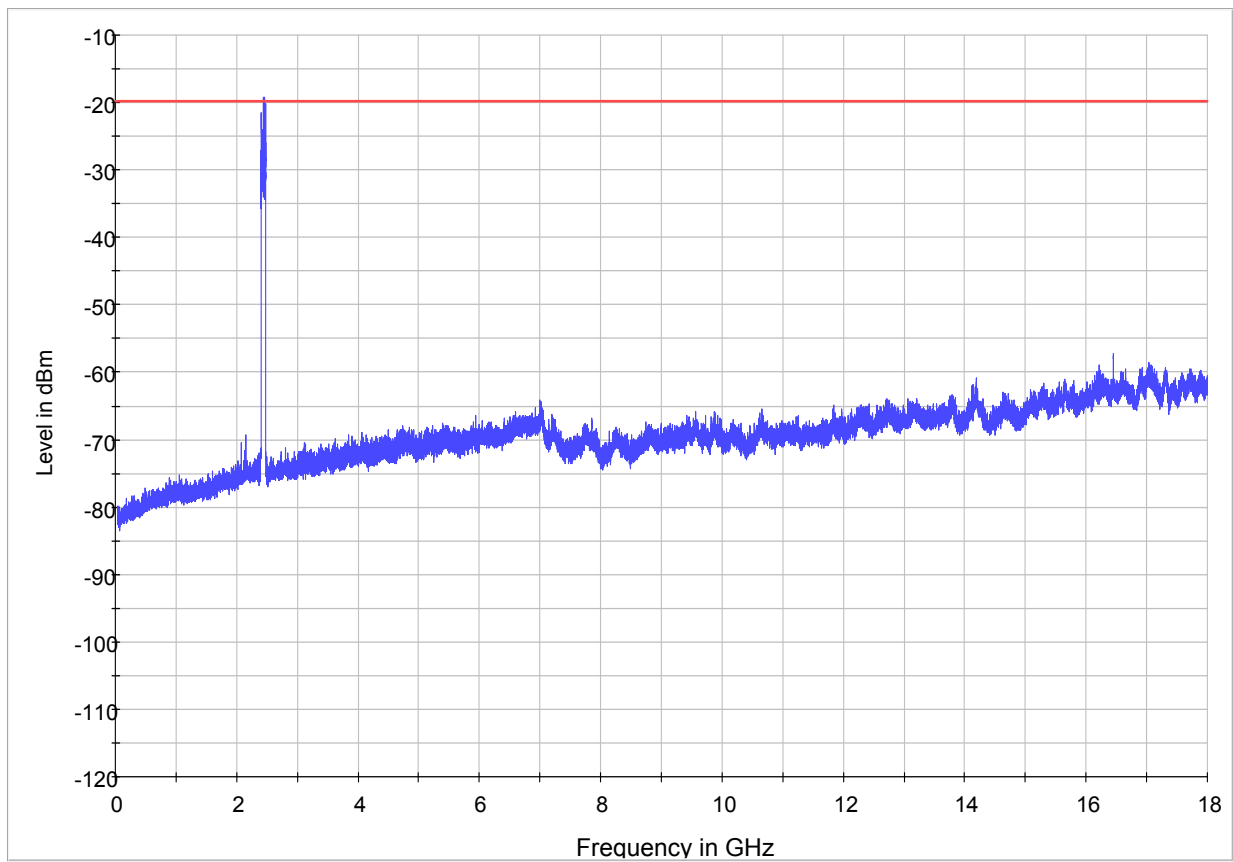
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

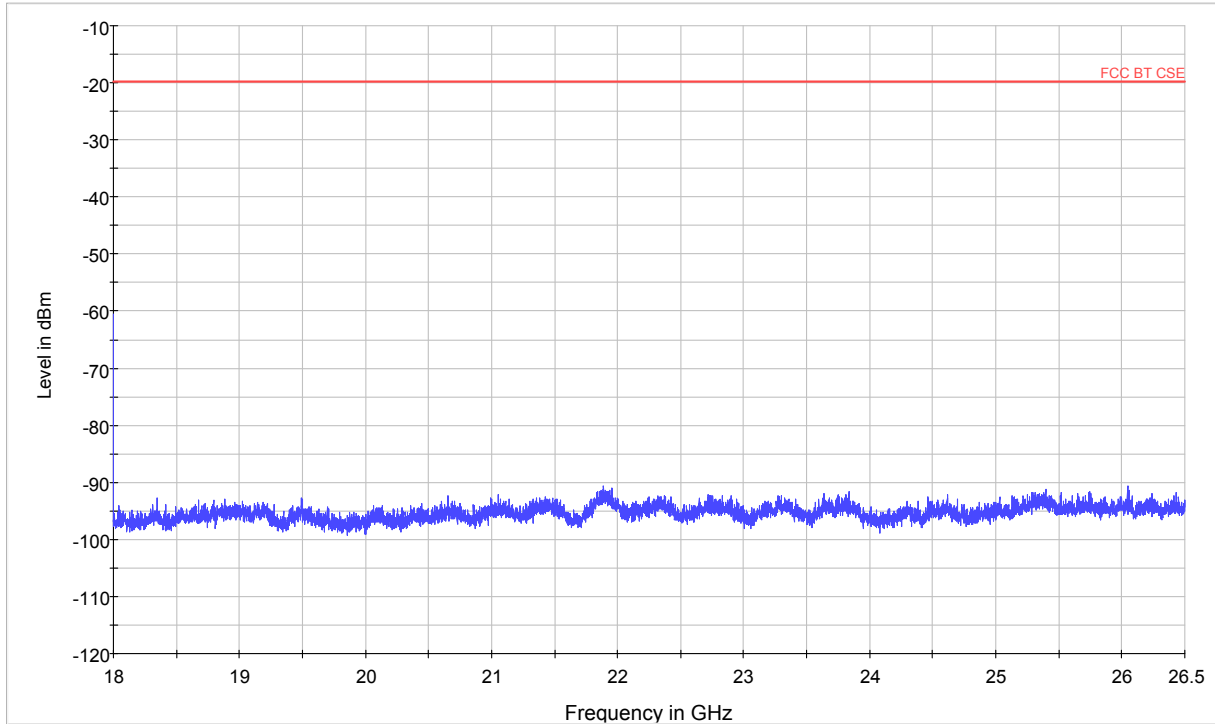
Harmonic	TX ch.39 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4882	Nf	-20.17
3	7323	Nf	-20.17
4	9764	Nf	-20.17
5	12205	Nf	-20.17
6	14646	Nf	-20.17
7	17087	Nf	-20.17
8	19528	Nf	-20.17
9	21969	Nf	-20.17
10	24410	Nf	-20.17
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

Basic Rate-CH78:

Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2480

Spurious RF conducted emissions from 30MHz to 18GHz

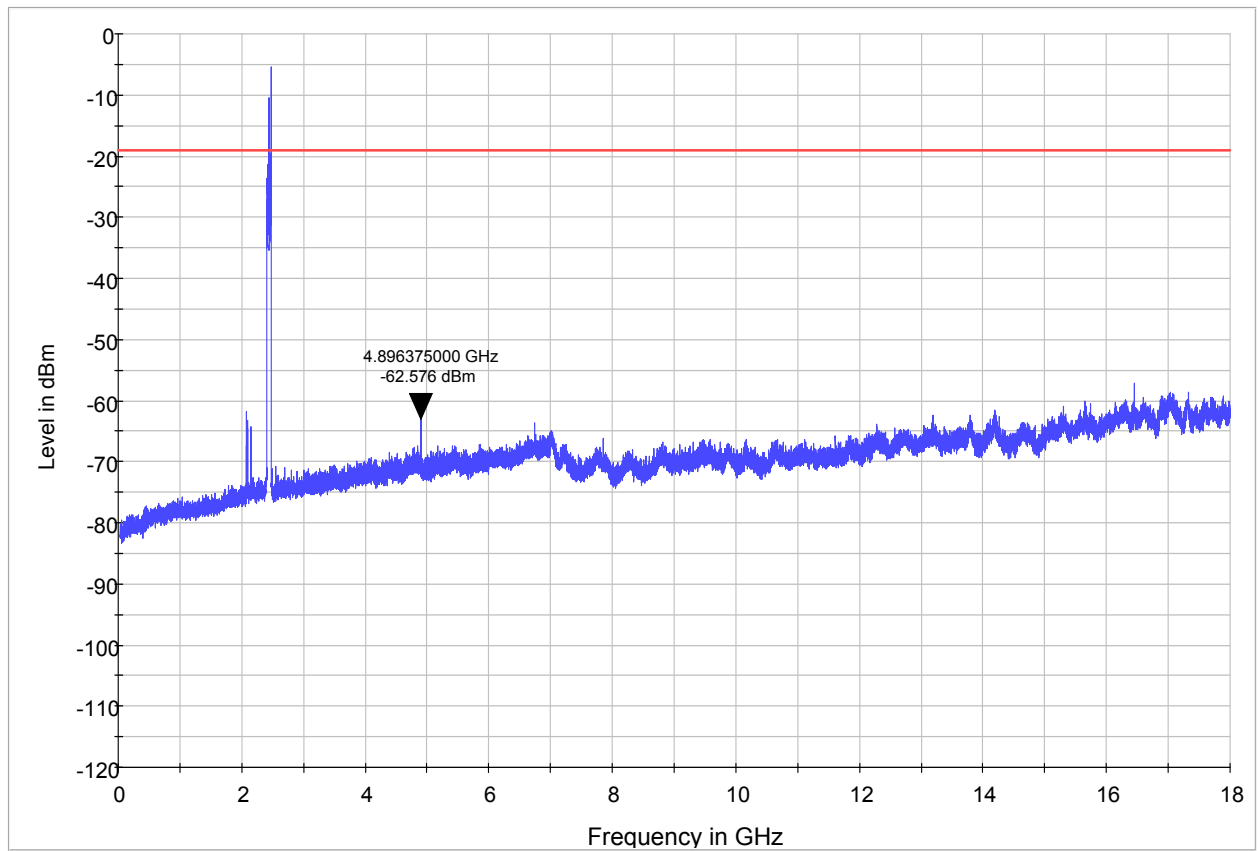


Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.78 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4960	Nf	-19.73
3	7440	Nf	-19.73
4	9920	Nf	-19.73
5	12400	Nf	-19.73
6	14880	Nf	-19.73
7	17360	Nf	-19.73
8	19840	Nf	-19.73
9	22320	Nf	-19.73
10	24800	Nf	-19.73
Nf: noise floor			

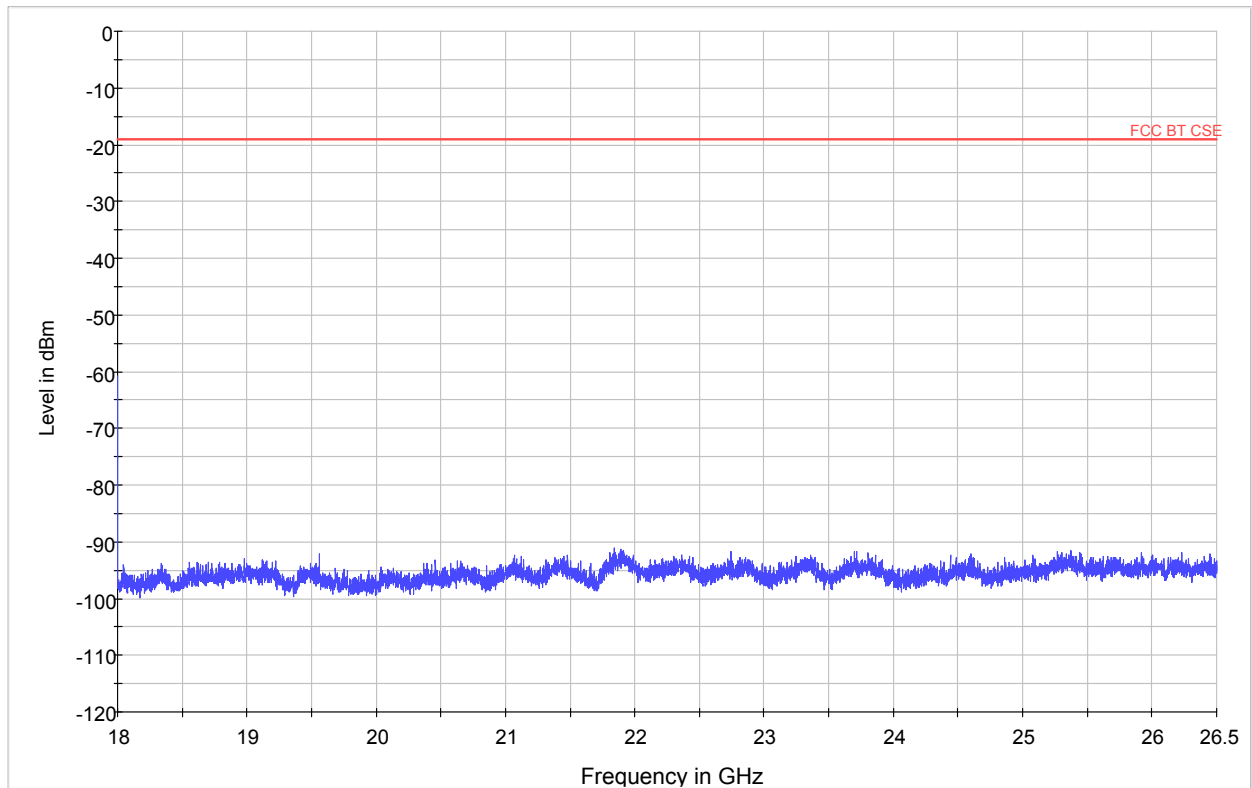
Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH0:



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2402

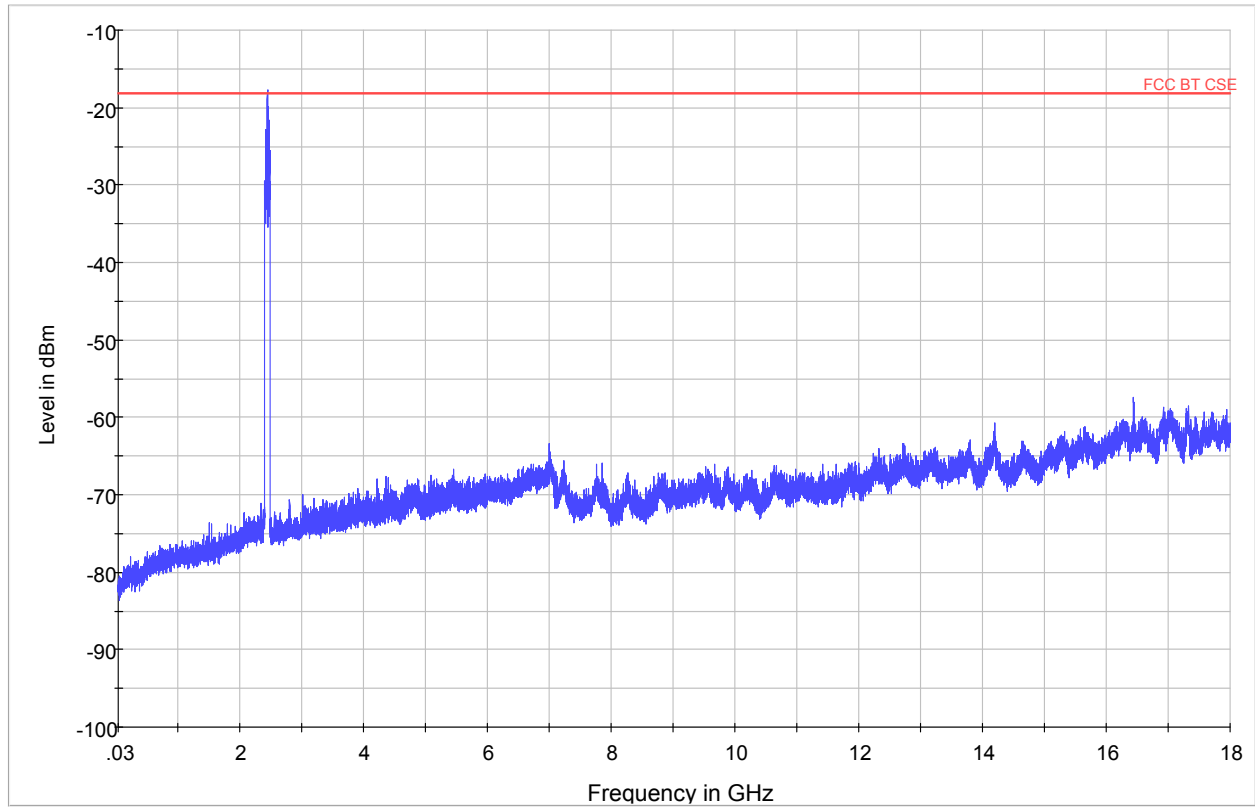
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

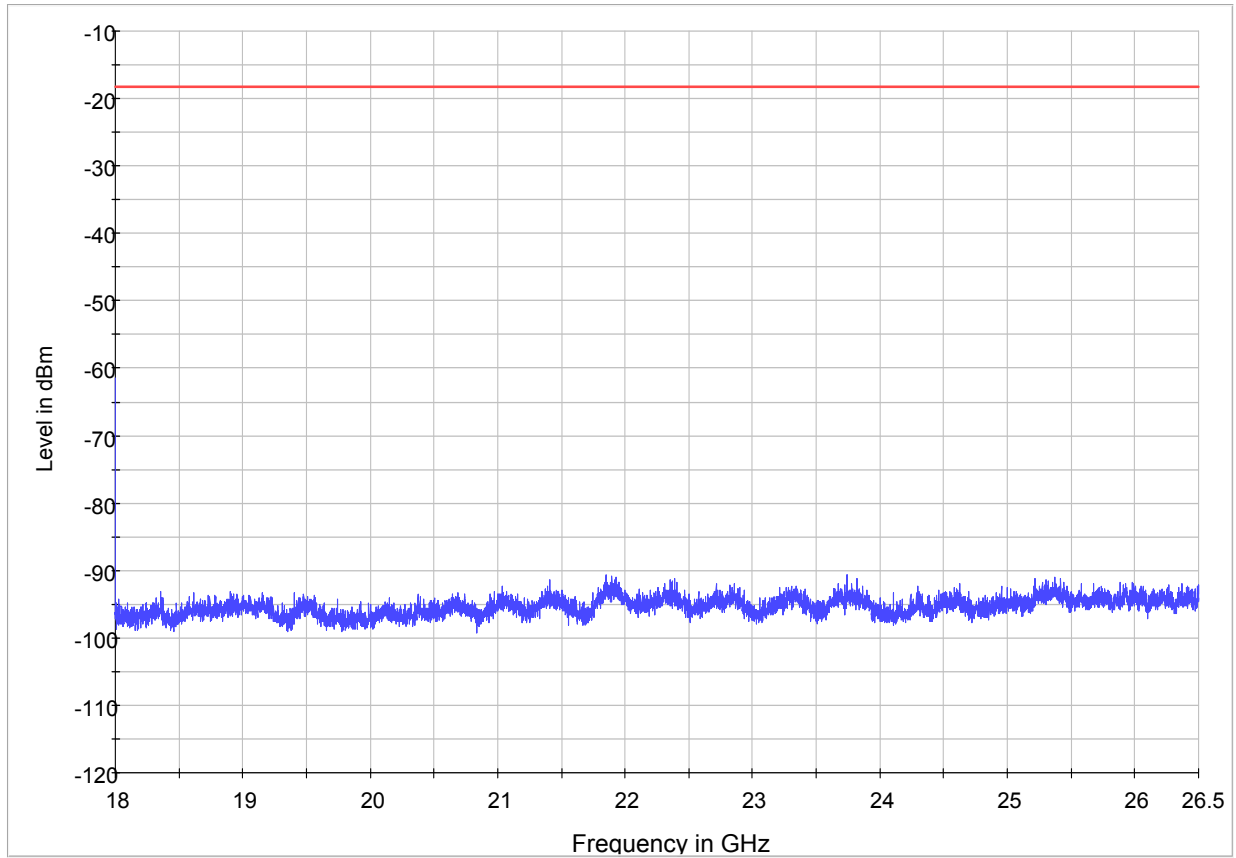
Harmonic	TX ch.0 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4896.375	-62.576	-18.98
3	7206	Nf	-18.98
4	9608	Nf	-18.98
5	12010	Nf	-18.98
6	14412	Nf	-18.98
7	16814	Nf	-18.98
8	19216	Nf	-18.98
9	21618	Nf	-18.98
10	24020	Nf	-18.98
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH39:

Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2441

Spurious RF conducted emissions from 30MHz to 18GHz

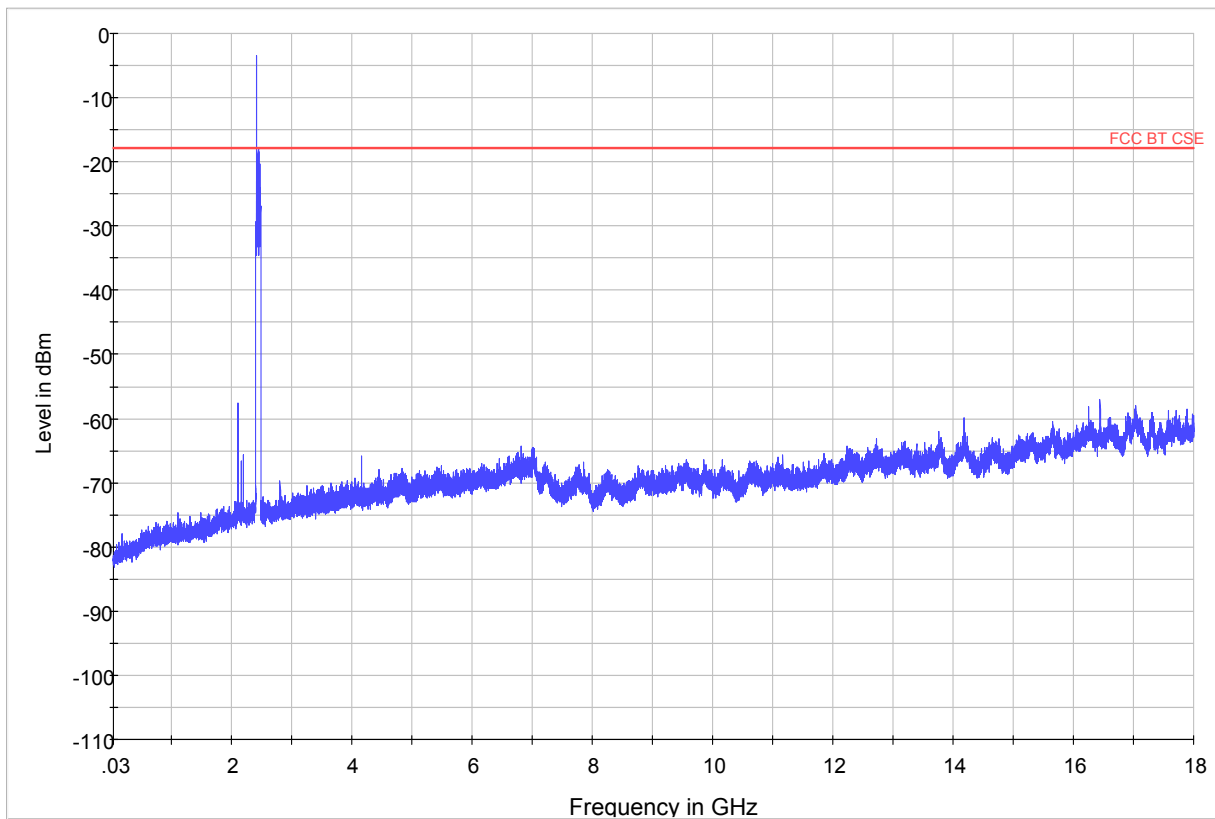


Spurious RF conducted emissions from 18GHz to 26.5GHz

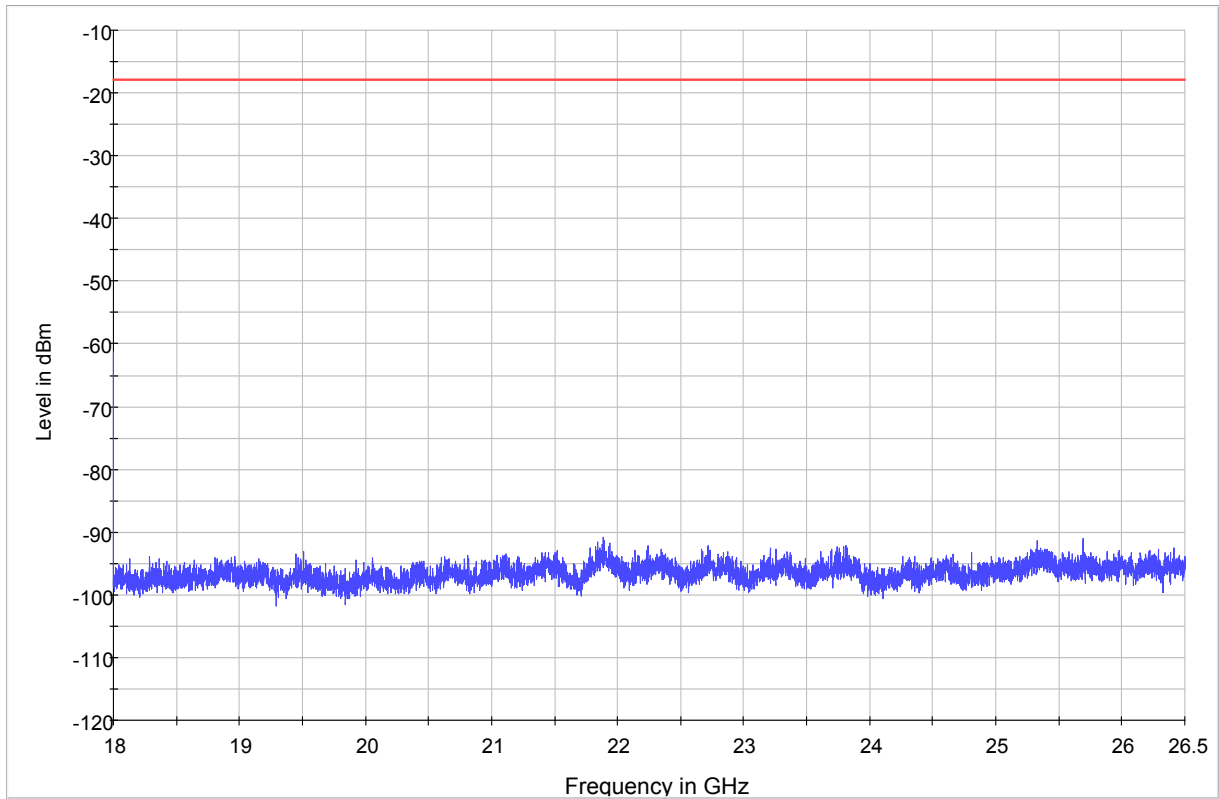
Harmonic	TX ch.39 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4882	Nf	-18.21
3	7323	Nf	-18.21
4	9764	Nf	-18.21
5	12205	Nf	-18.21
6	14646	Nf	-18.21
7	17087	Nf	-18.21
8	19528	Nf	-18.21
9	21969	Nf	-18.21
10	24410	Nf	-18.21
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH78:



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2480
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.78 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4960	Nf	-17.85
3	7440	Nf	-17.85
4	9920	Nf	-17.85
5	12400	Nf	-17.85
6	14880	Nf	-17.85
7	17360	Nf	-17.85
8	19840	Nf	-17.85
9	22320	Nf	-17.85
10	24800	Nf	-17.85
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

2.10. Radiates Emission

Ambient condition

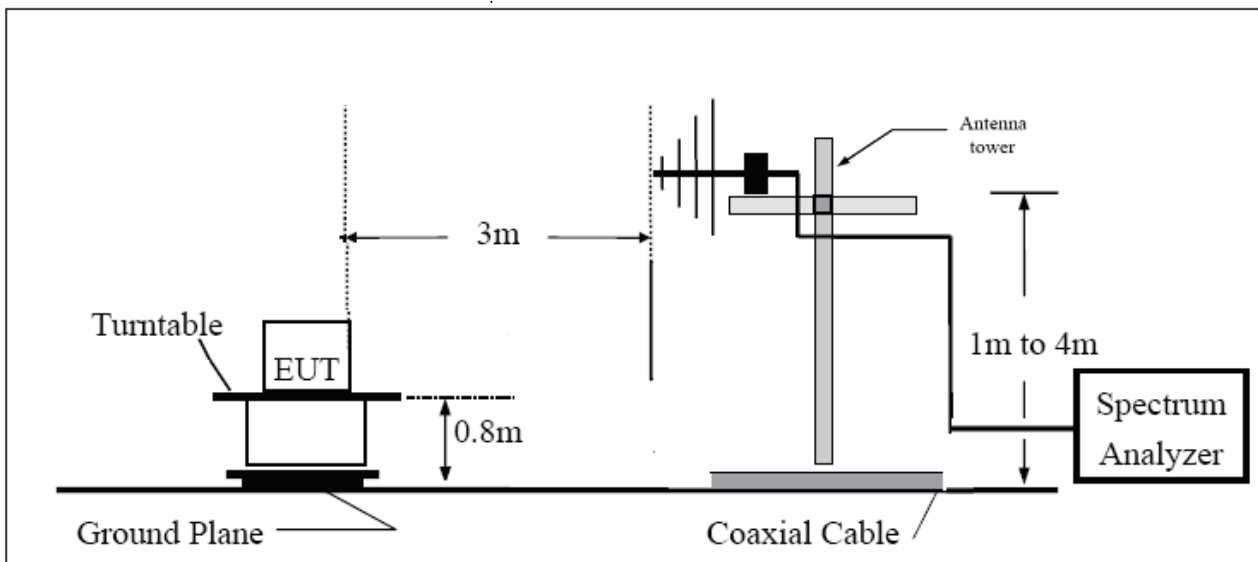
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	102.5kPa

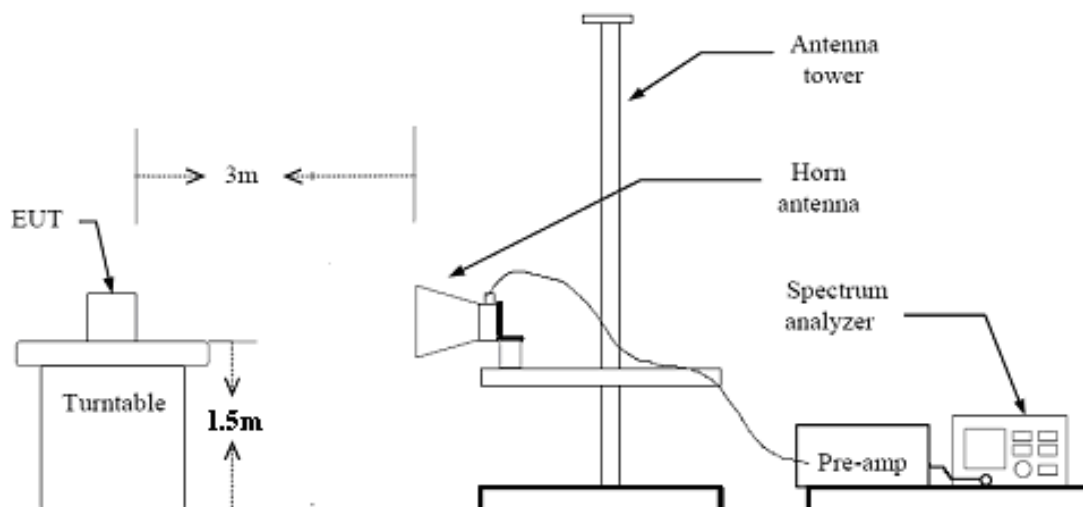
Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.4-2003. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Sweep the whole frequency band through the range from 30MHz to 26GHz during the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Test setup

Below 1GHz



Above 1GHz**Limits**

Rule Part 15.247(d) specifies that "In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))."

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

§15.35(b)

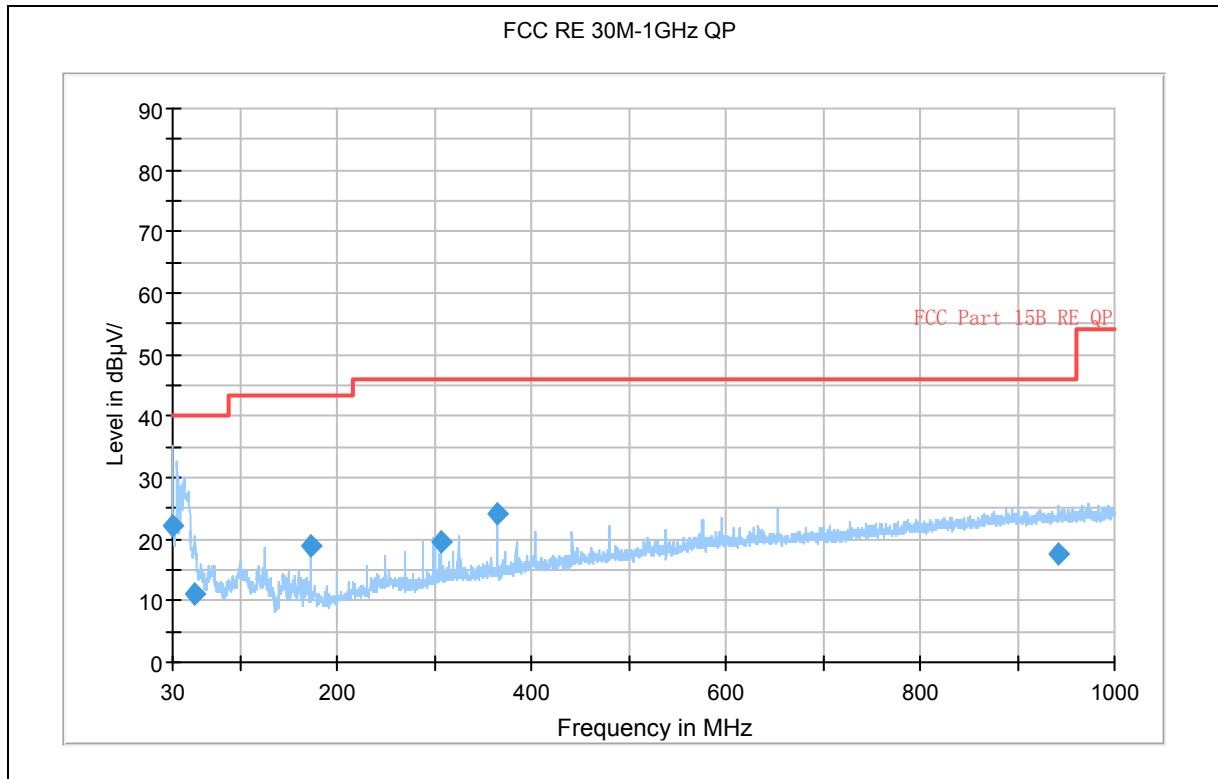
There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U=3.92$ dB.

Test result

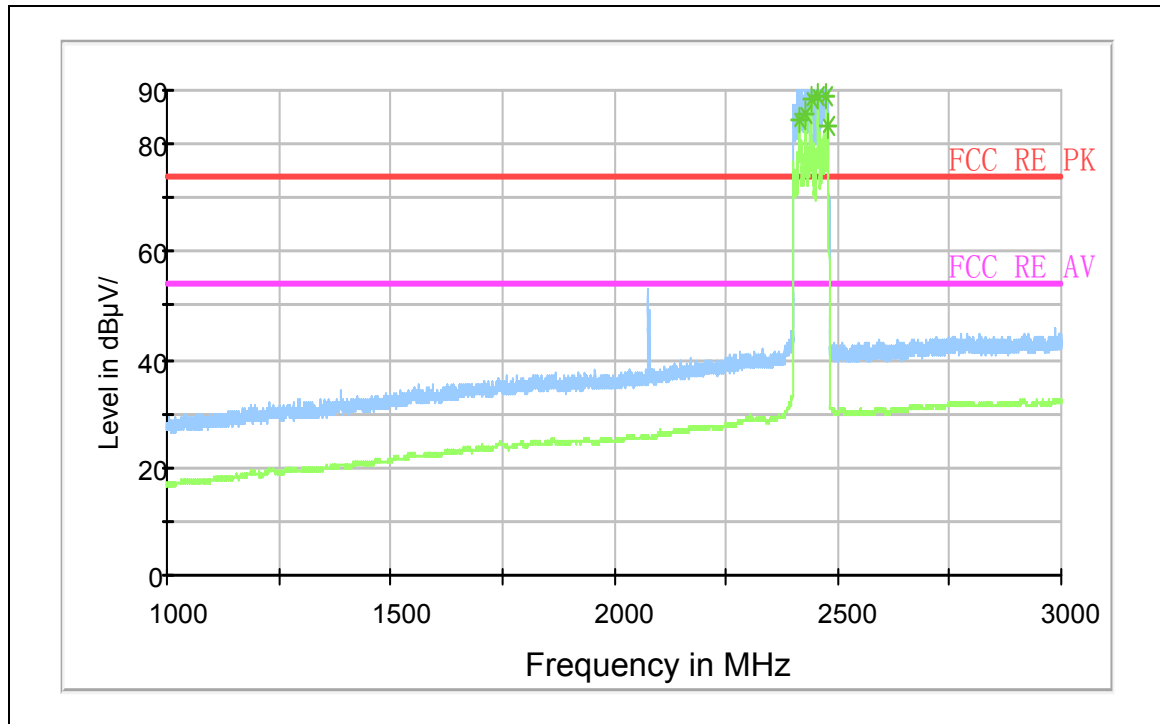
Basic Rate-Channel 0



Radiates Emission from 30MHz to 1GHz

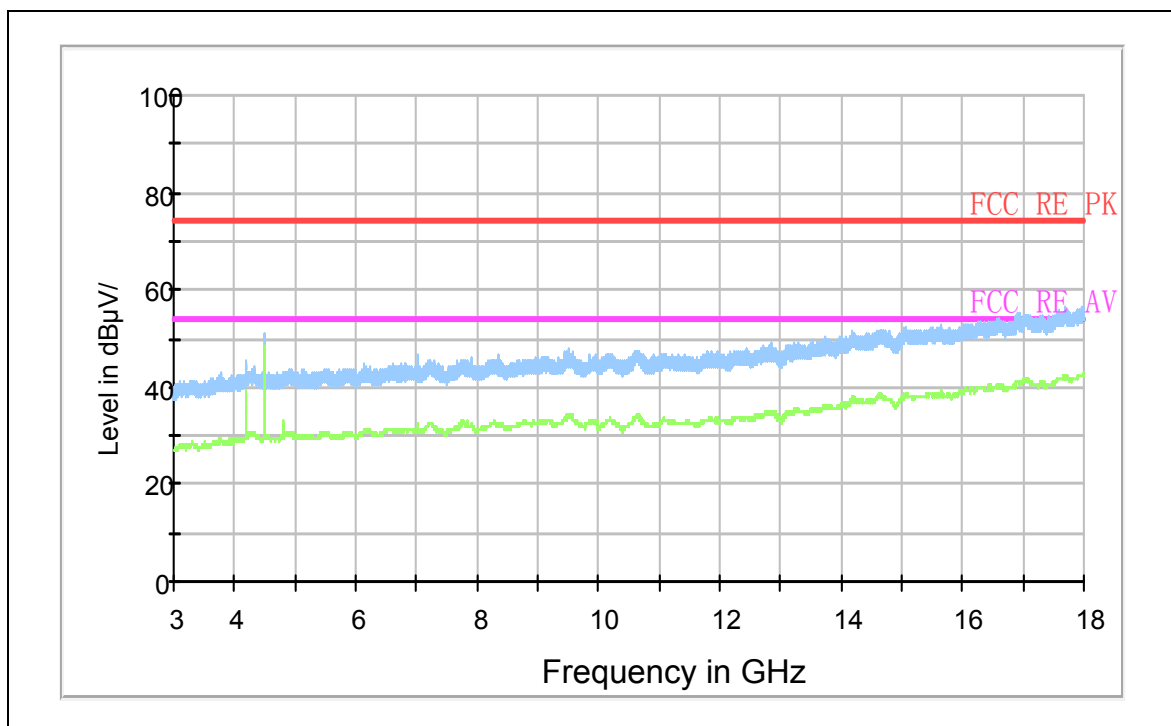
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
30.000000	22.1	100.0	V	15.0	17.9	40.0
53.527500	11.1	100.0	V	220.0	28.9	40.0
172.792500	19.0	100.0	V	233.0	24.5	43.5
307.177500	19.4	100.0	H	49.0	26.6	46.0
364.810000	24.3	100.0	H	16.0	21.7	46.0
941.957500	17.8	125.0	V	45.0	28.2	46.0

Note: All emissions level measured above 1GHz was more than 10dB below the limit

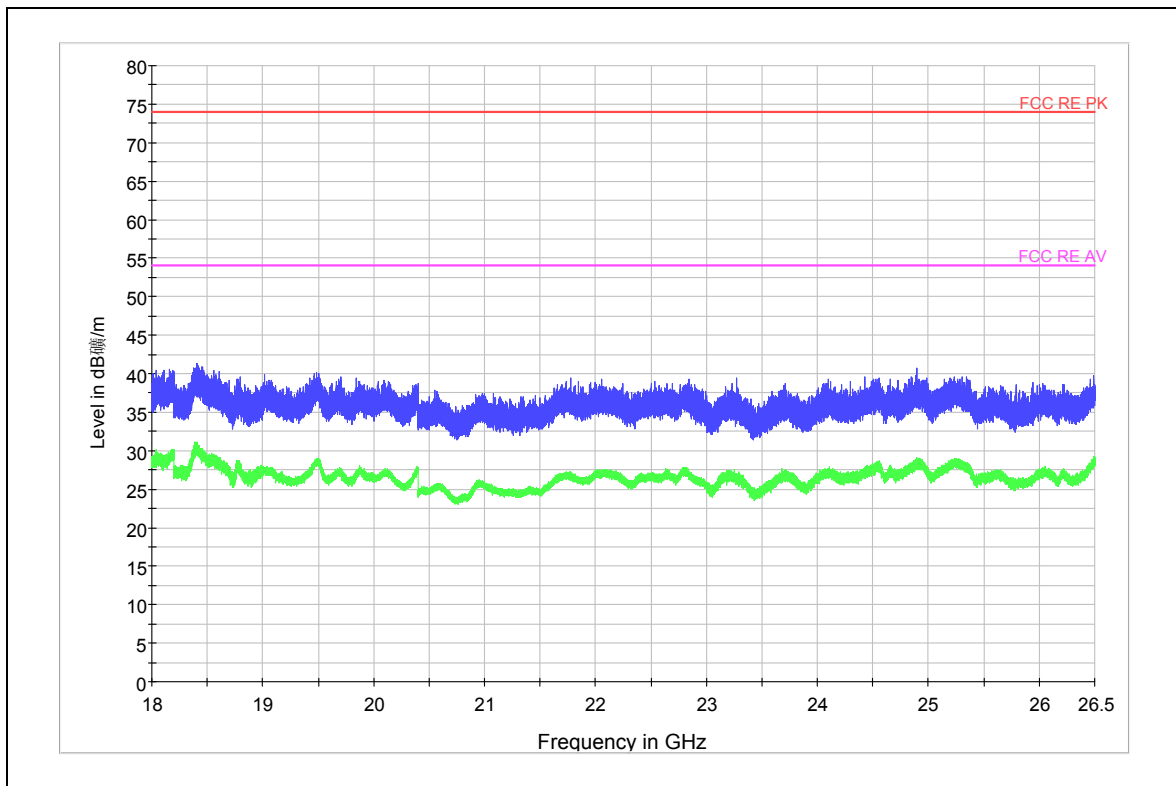


Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

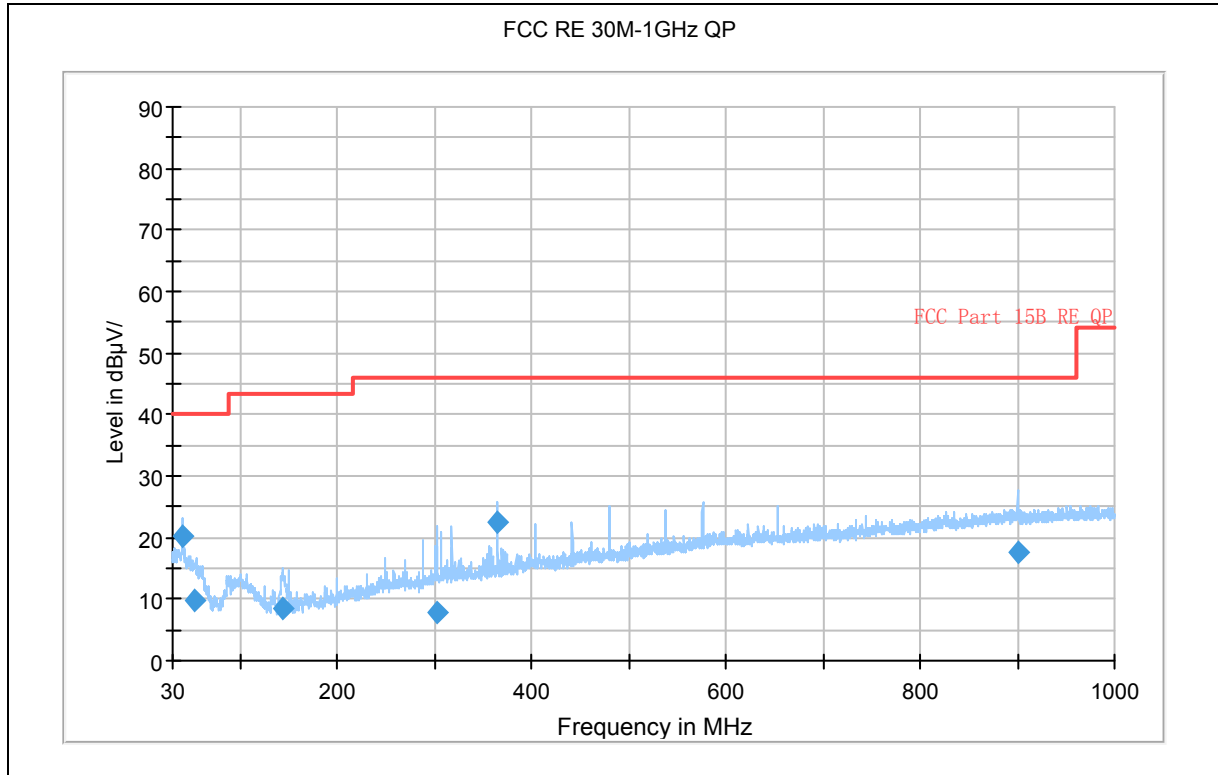


Radiates Emission from 3GHz to 18GHz



Radiates Emission from 18GHz to 26.5GHz

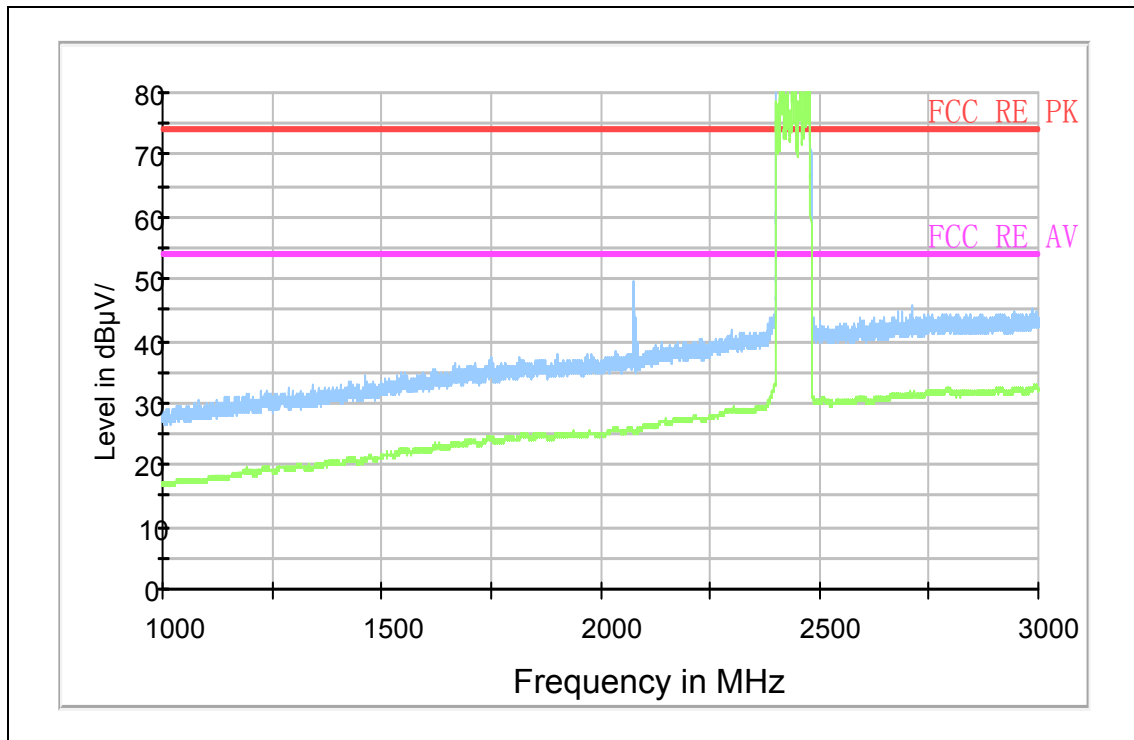
Basic Rate-Channel 39



Radiates Emission from 30MHz to 1GHz

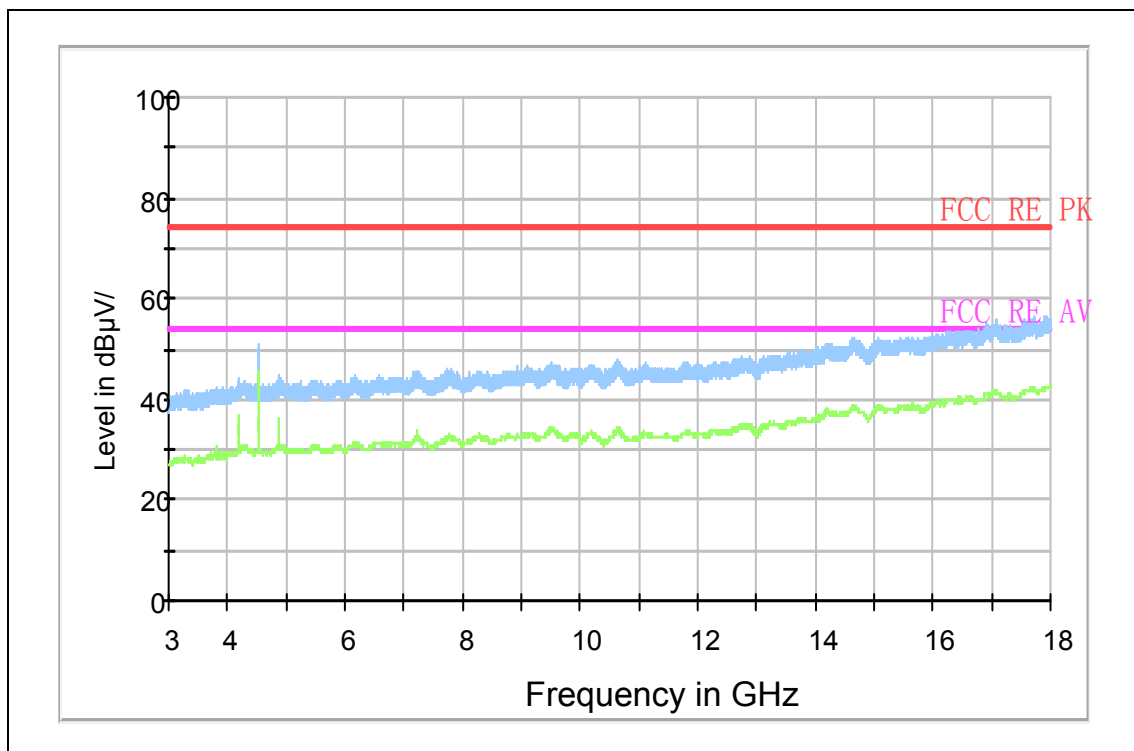
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
40.022500	20.2	100.0	V	0.0	19.8	40.0
53.650000	9.8	100.0	H	37.0	30.2	40.0
144.010000	8.3	100.0	V	45.0	35.2	43.5
302.892500	7.9	100.0	H	45.0	38.1	46.0
364.810000	22.4	100.0	H	16.0	23.6	46.0
900.090000	17.5	100.0	H	285.0	28.6	46.0

Note: All emissions level measured above 1GHz was more than 10dB below the limit

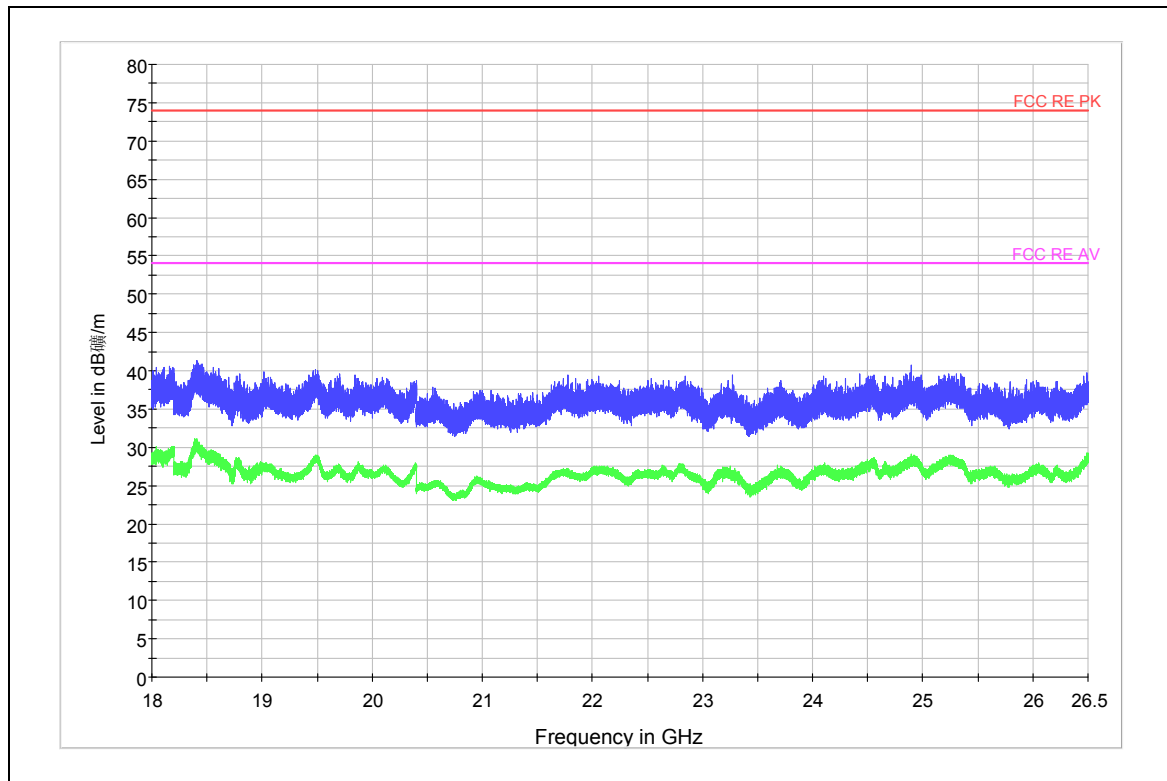


Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

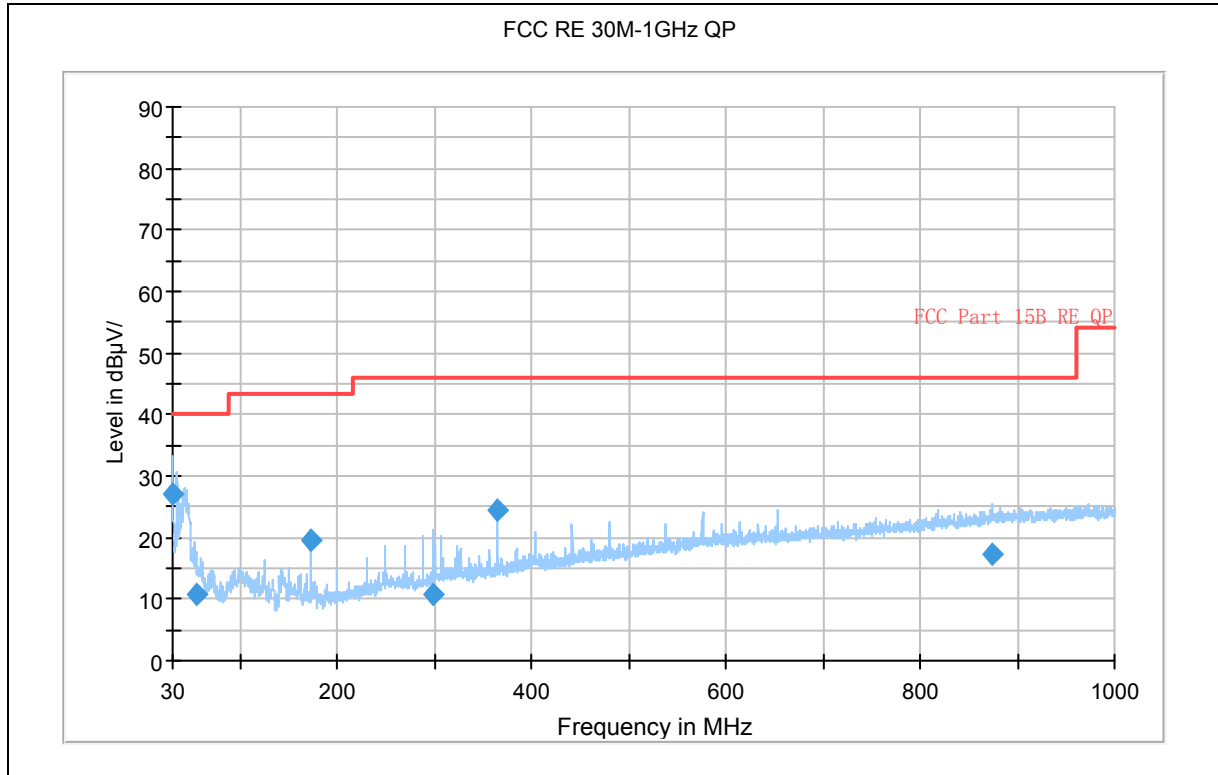


Radiates Emission from 3GHz to 18GHz



Radiates Emission from 18GHz to 26.5GHz

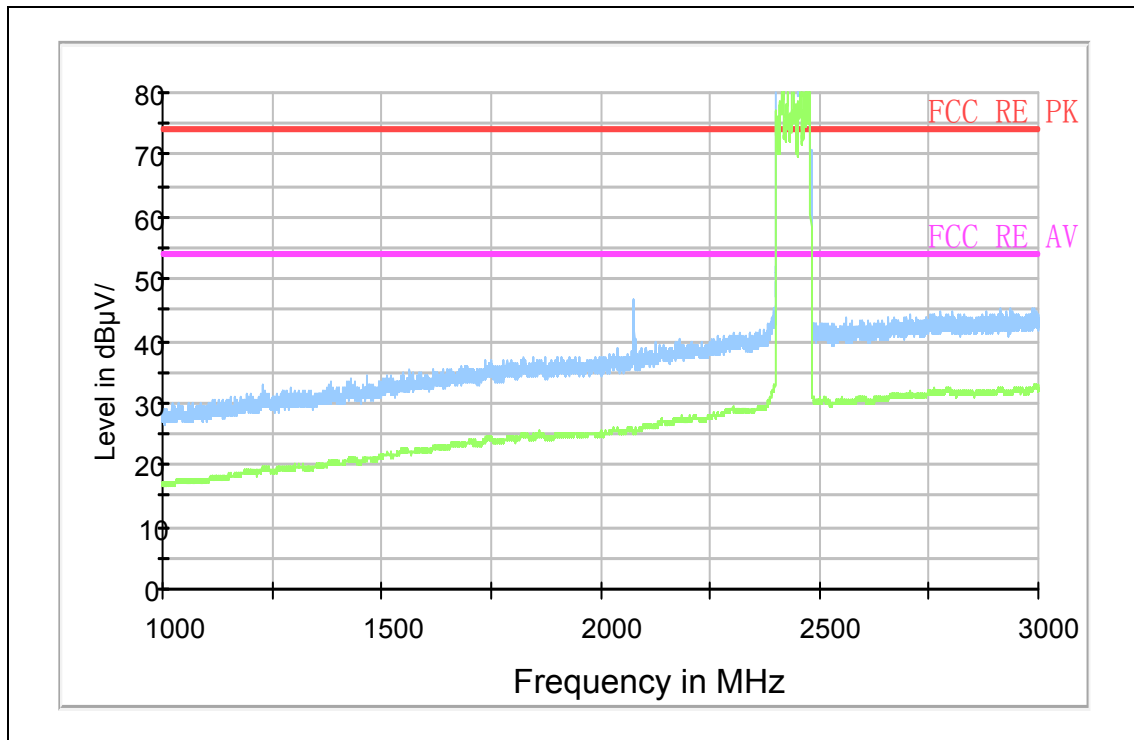
Basic Rate-Channel 78



Radiates Emission from 30MHz to 1GHz

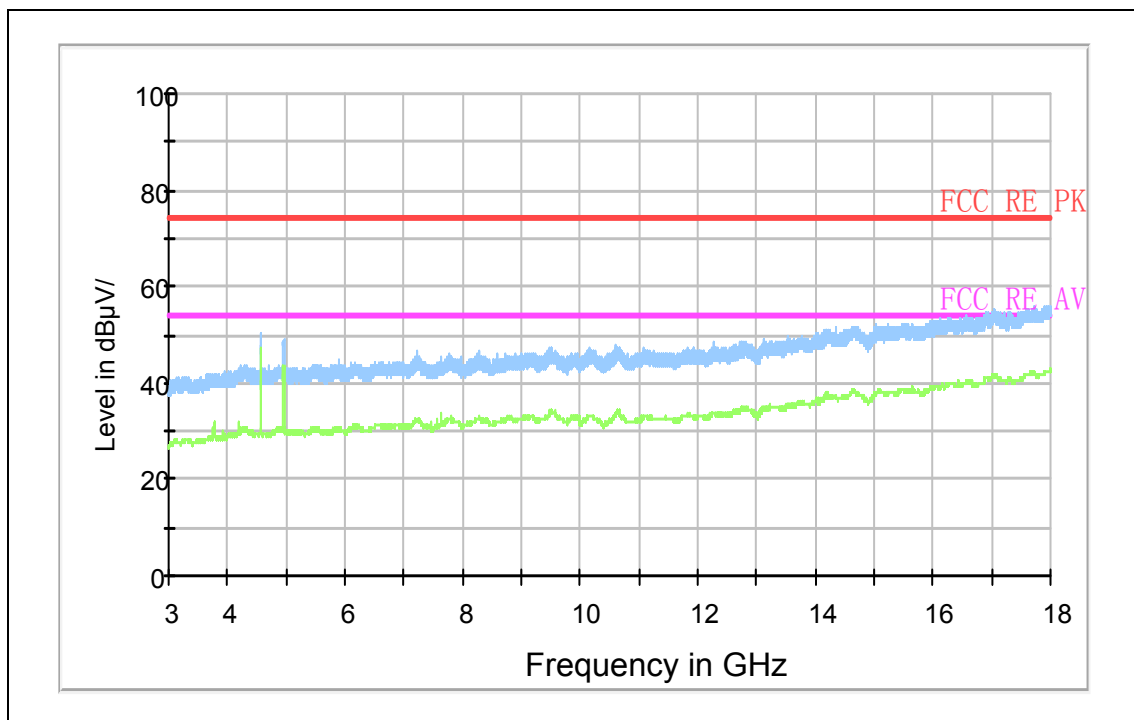
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
30.240000	26.9	100.0	V	0.0	13.1	40.0
54.007500	10.8	116.0	V	151.0	29.2	40.0
172.792500	19.7	100.0	V	232.0	23.8	43.5
298.972500	10.6	100.0	H	192.0	35.4	46.0
364.810000	24.5	100.0	H	16.0	21.5	46.0
874.947500	17.3	100.0	H	11.0	28.7	46.0

Note: All emissions level measured above 1GHz was more than 10dB below the limit

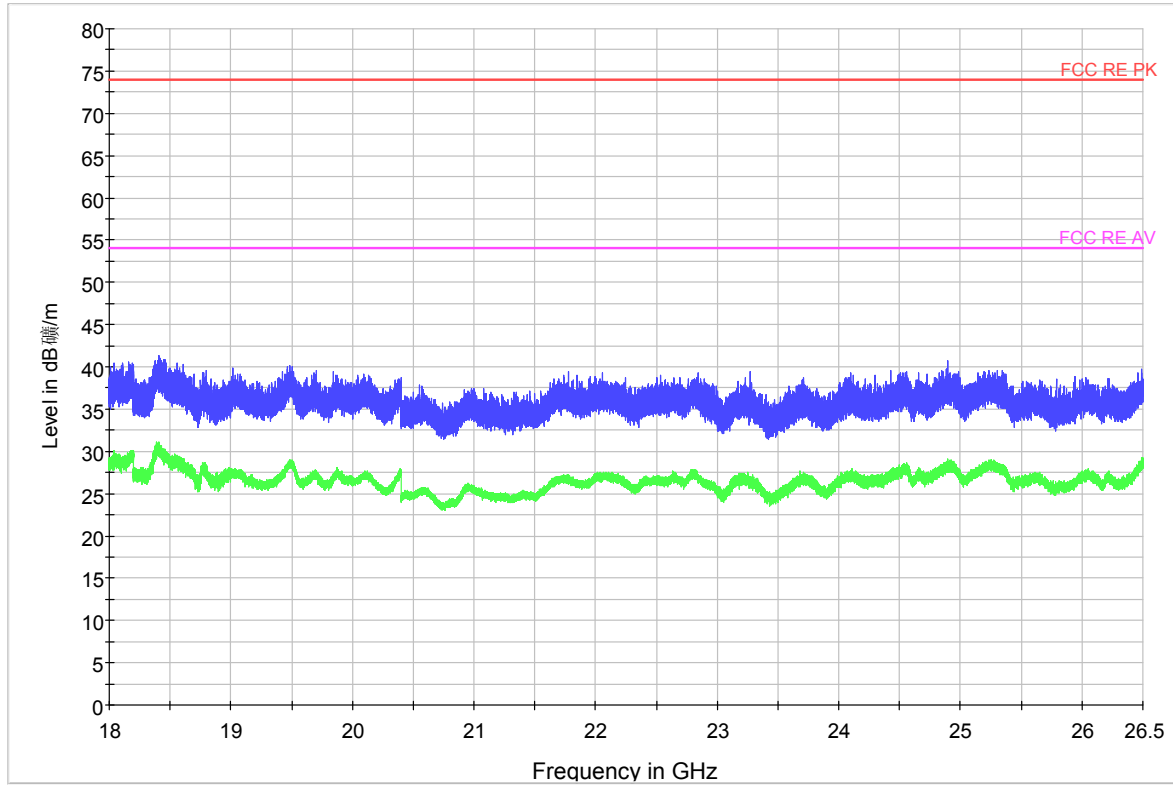


Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

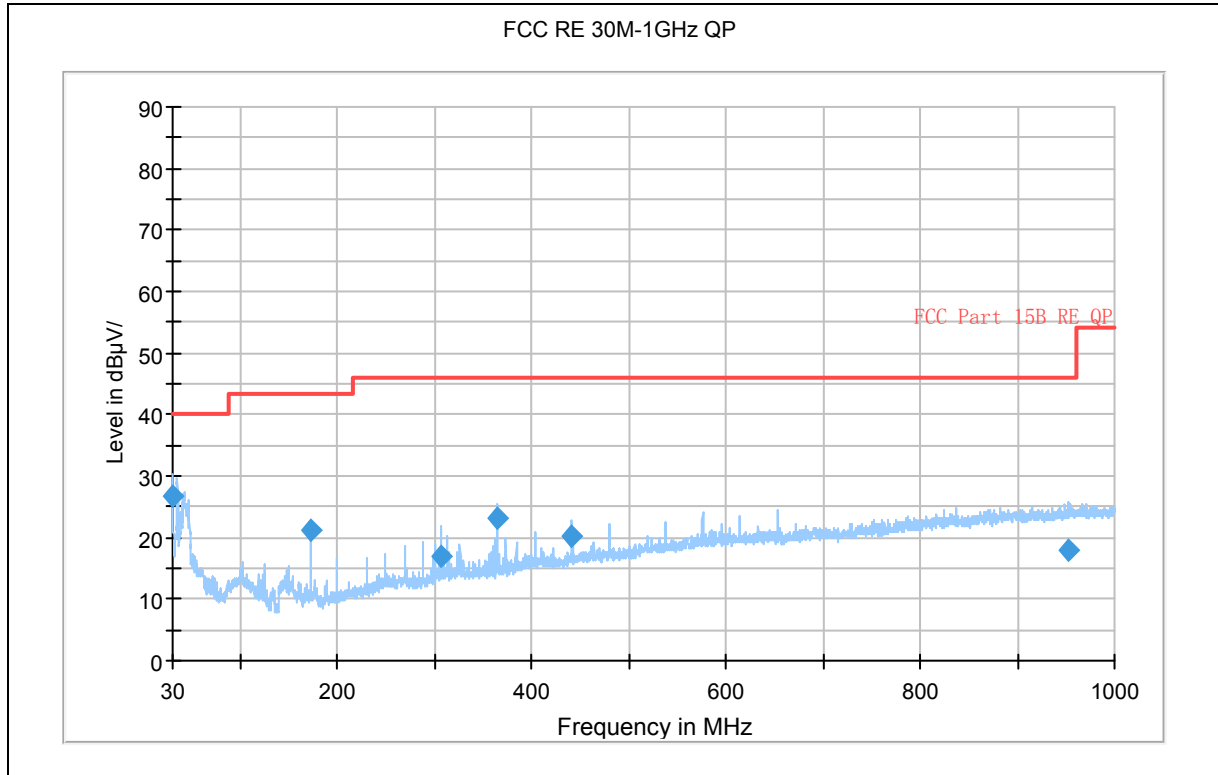


Radiates Emission from 3GHz to 18GHz



Radiates Emission from 18GHz to 26.5GHz

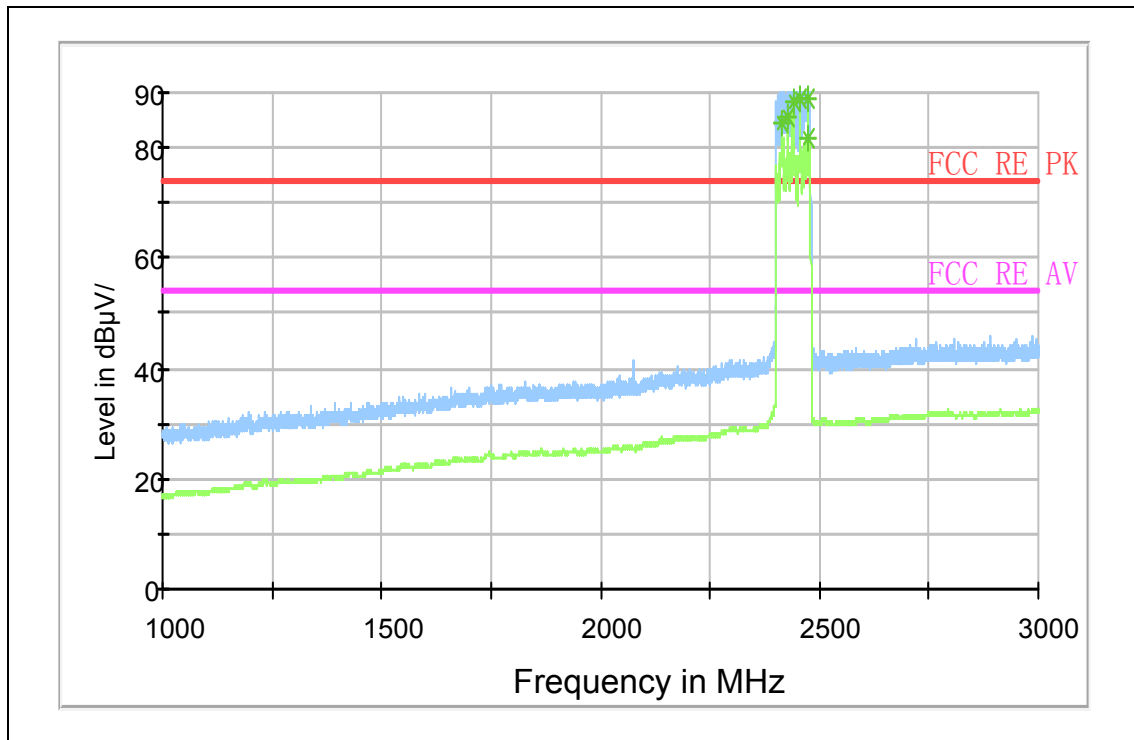
EDR-Channel 0



Radiates Emission from 30MHz to 1GHz

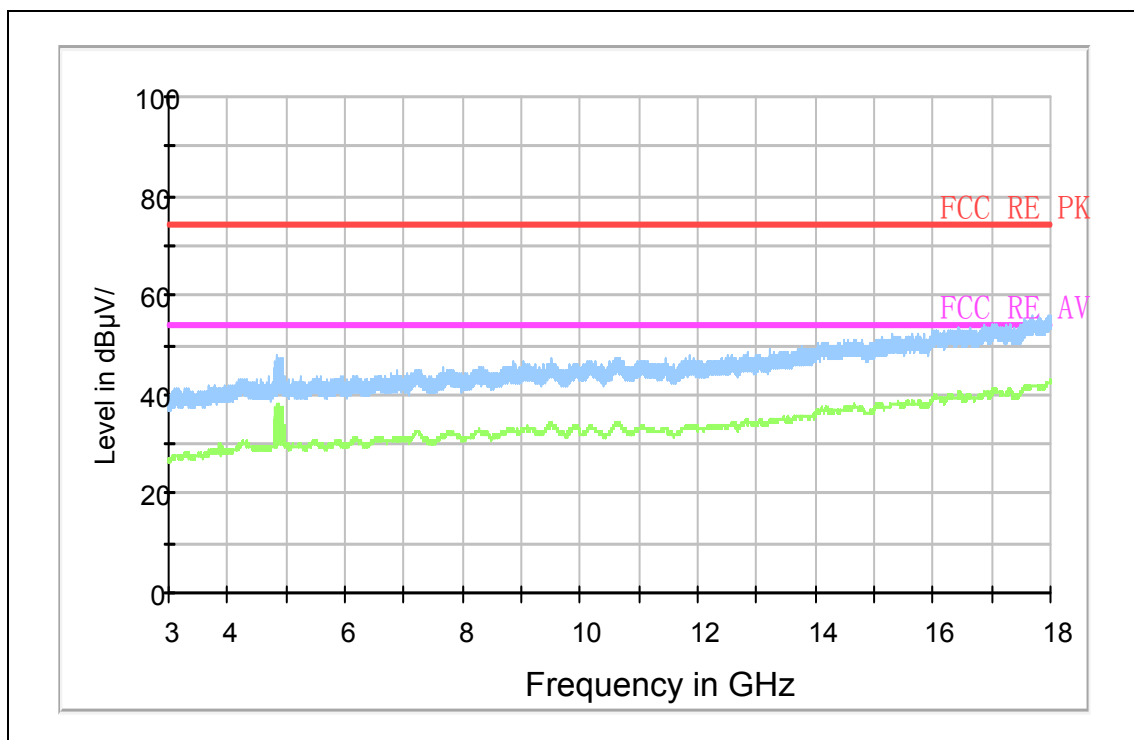
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
30.040000	26.7	100.0	V	11.0	13.3	40.0
172.792500	21.1	100.0	V	258.0	22.4	43.5
307.177500	16.8	100.0	H	18.0	29.2	46.0
364.810000	23.0	100.0	H	33.0	23.0	46.0
441.602500	20.2	115.0	V	18.0	25.8	46.0
952.395000	17.8	100.0	H	116.0	28.2	46.0

Note: All emissions level measured above 1GHz was more than 10dB below the limit

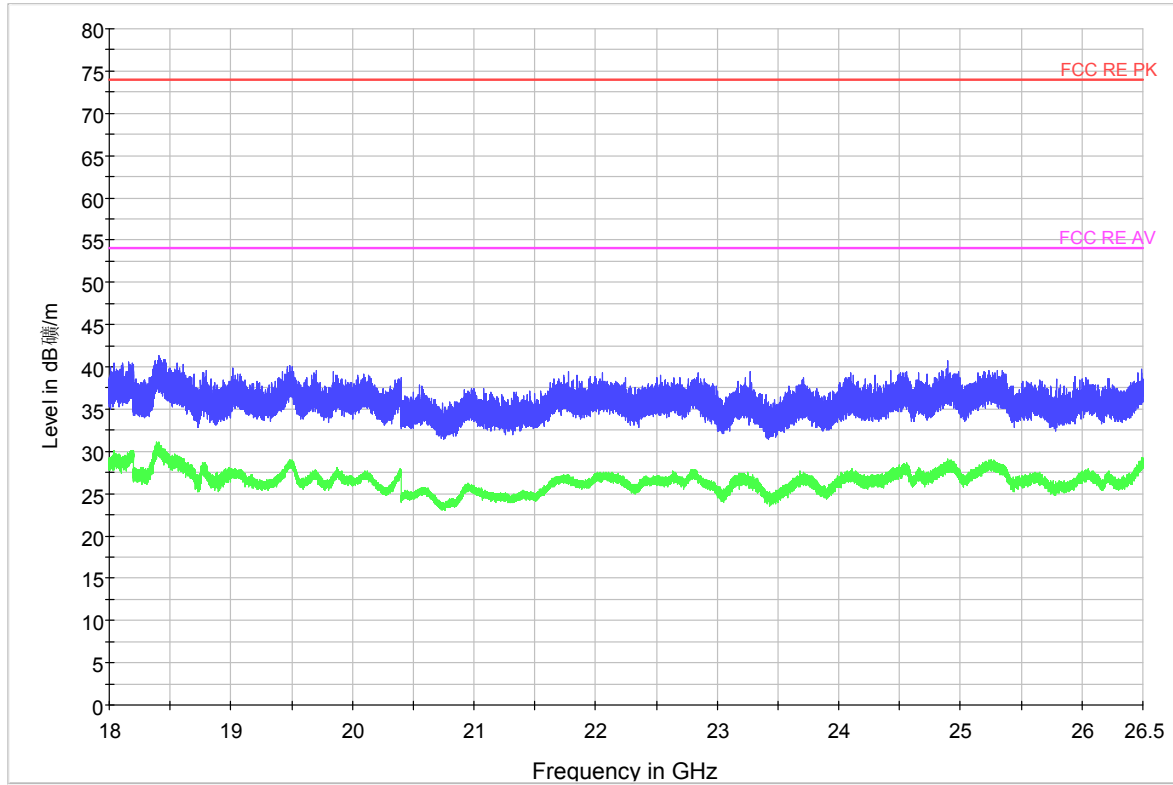


Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

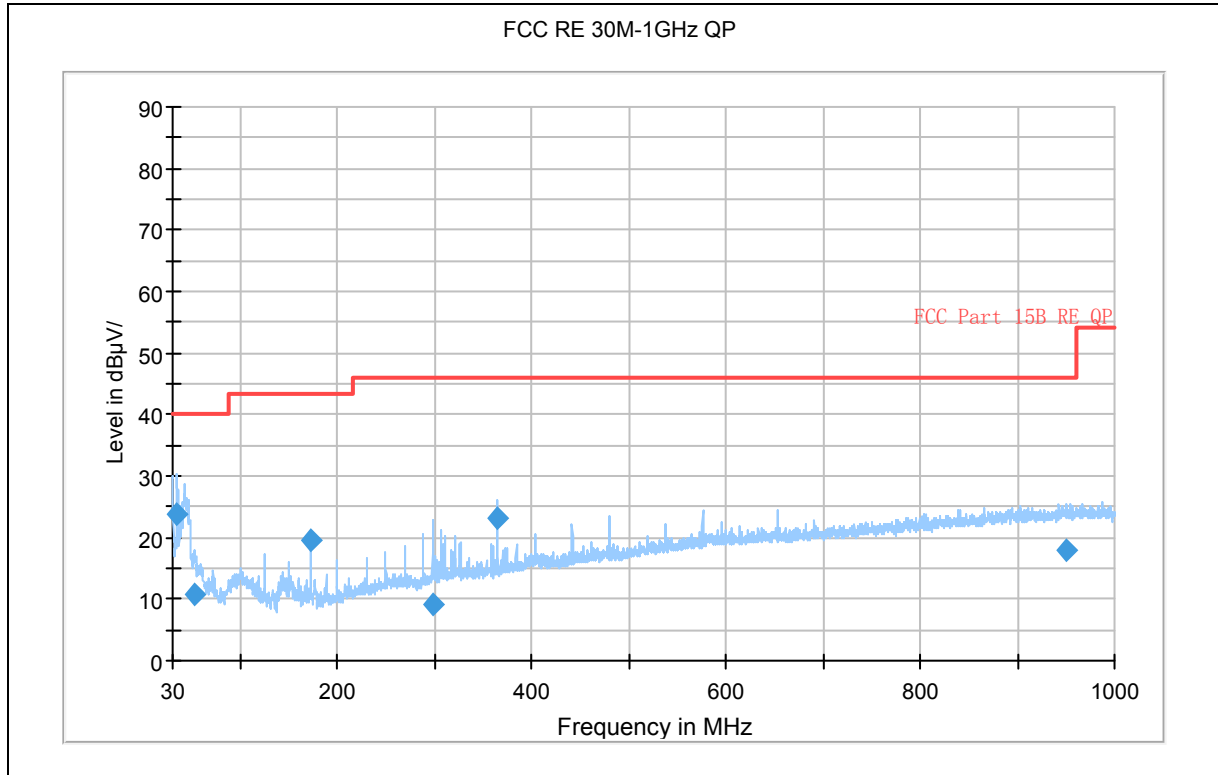


Radiates Emission from 3GHz to 18GHz



Radiates Emission from 18GHz to 26.5GHz

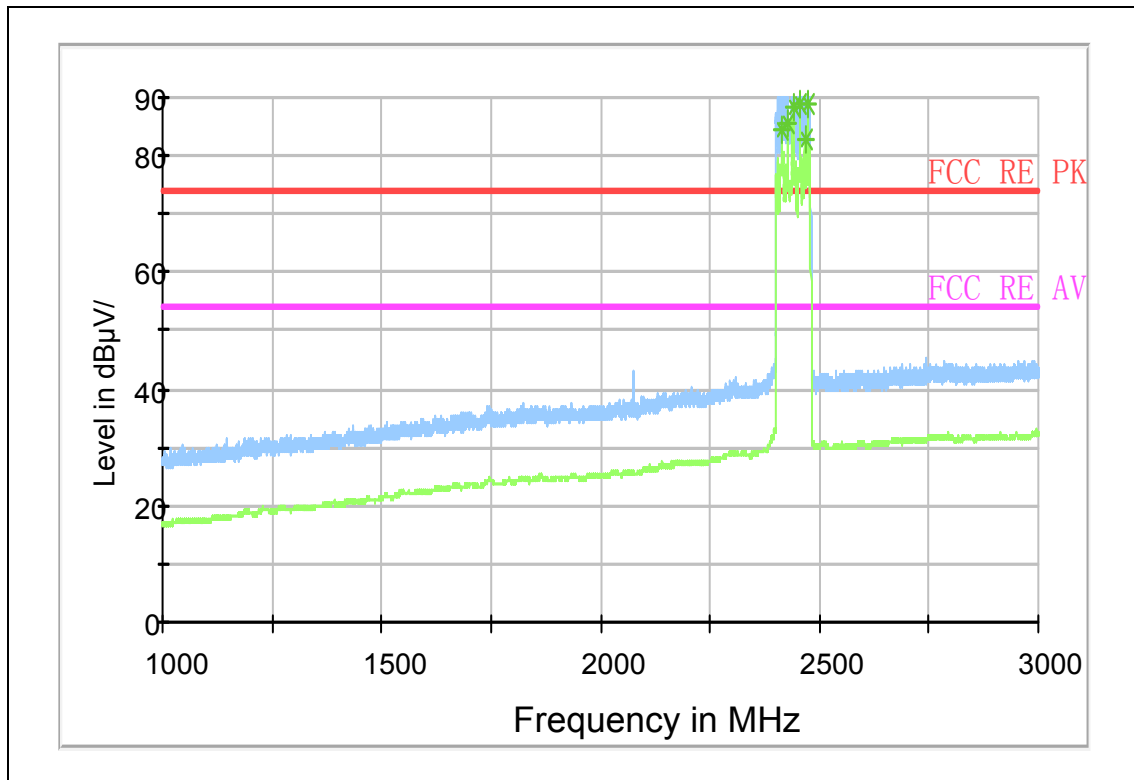
EDR-Channel 39



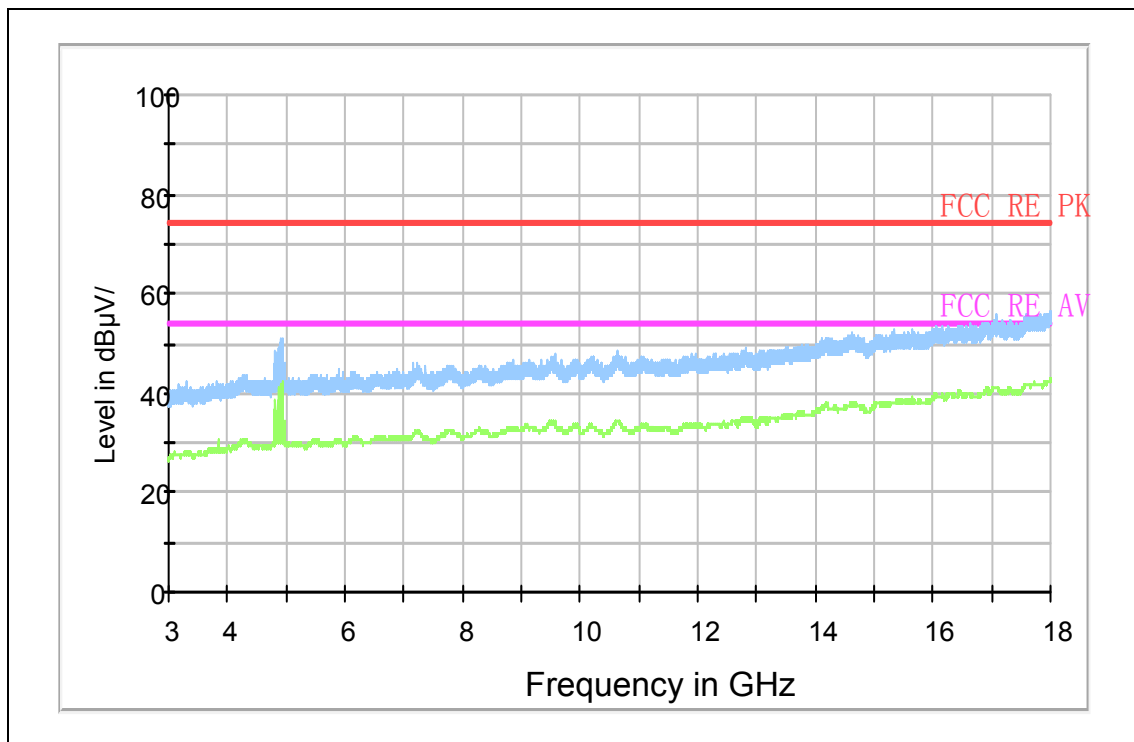
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
34.887500	23.7	100.0	V	54.0	16.3	40.0
53.567500	10.8	100.0	V	144.0	29.2	40.0
172.792500	19.7	100.0	V	236.0	23.8	43.5
298.607500	9.0	100.0	H	171.0	37.0	46.0
364.810000	23.3	100.0	H	34.0	22.7	46.0
950.332500	17.8	119.0	V	342.0	28.2	46.0

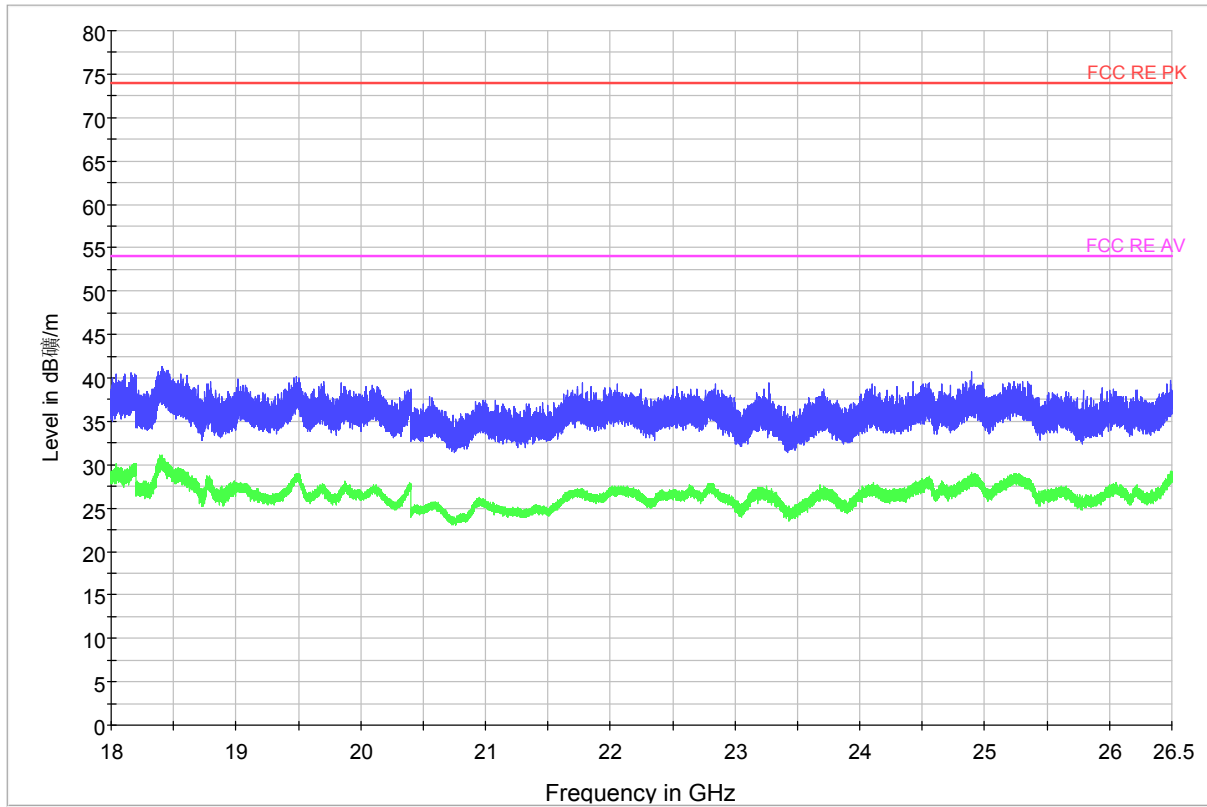
Note: All emissions level measured above 1GHz was more than 10dB below the limit



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

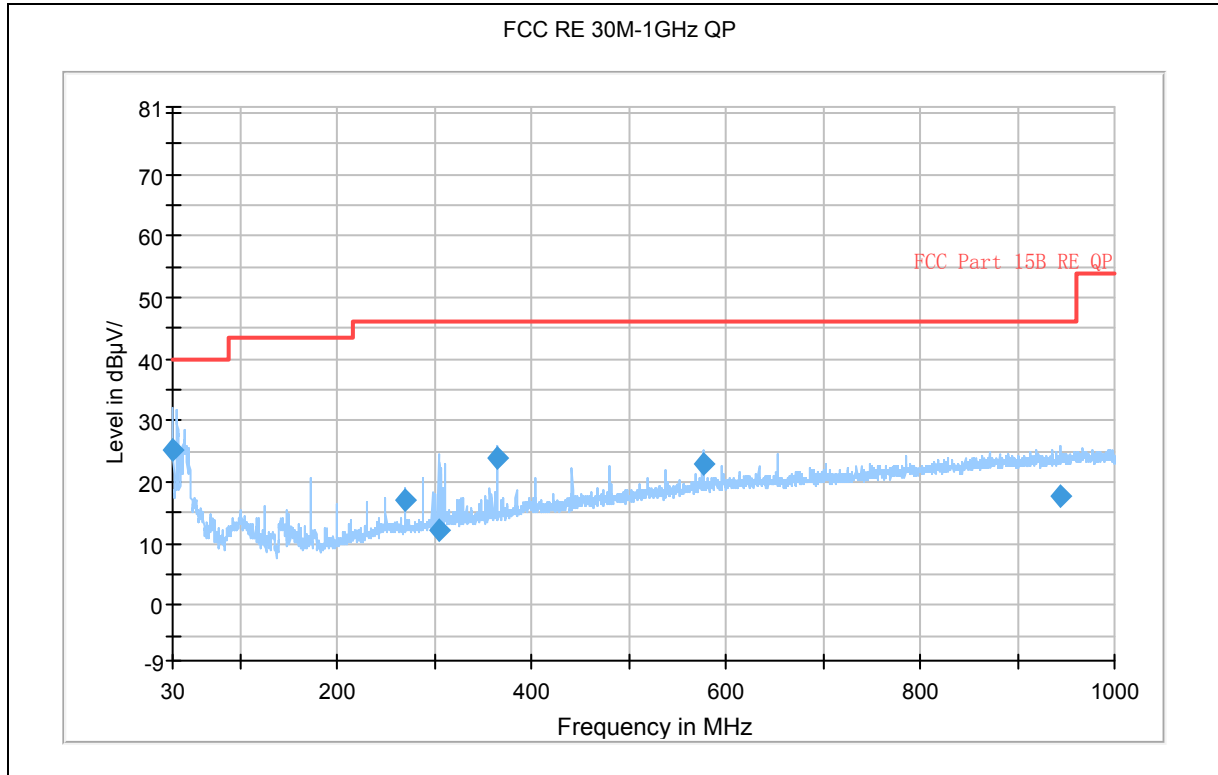


Radiates Emission from 3GHz to 18GHz



Radiates Emission from 18GHz to 26.5GHz

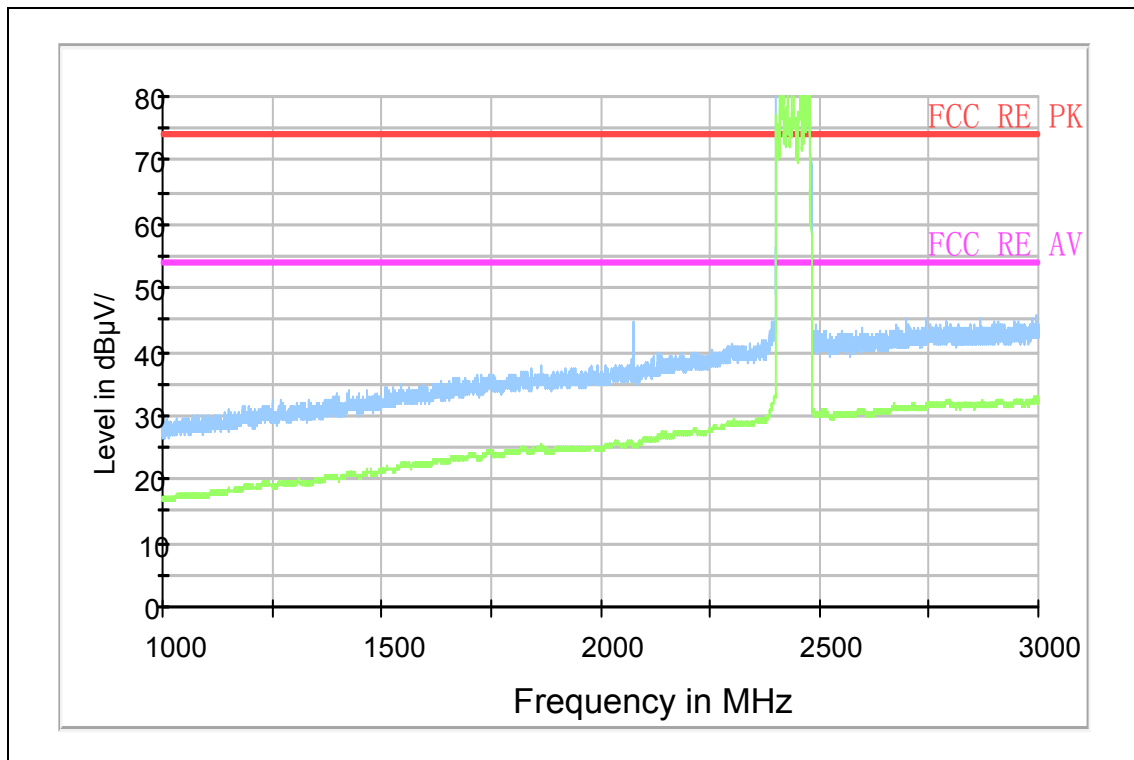
EDR-Channel 78



Radiates Emission from 30MHz to 1GHz

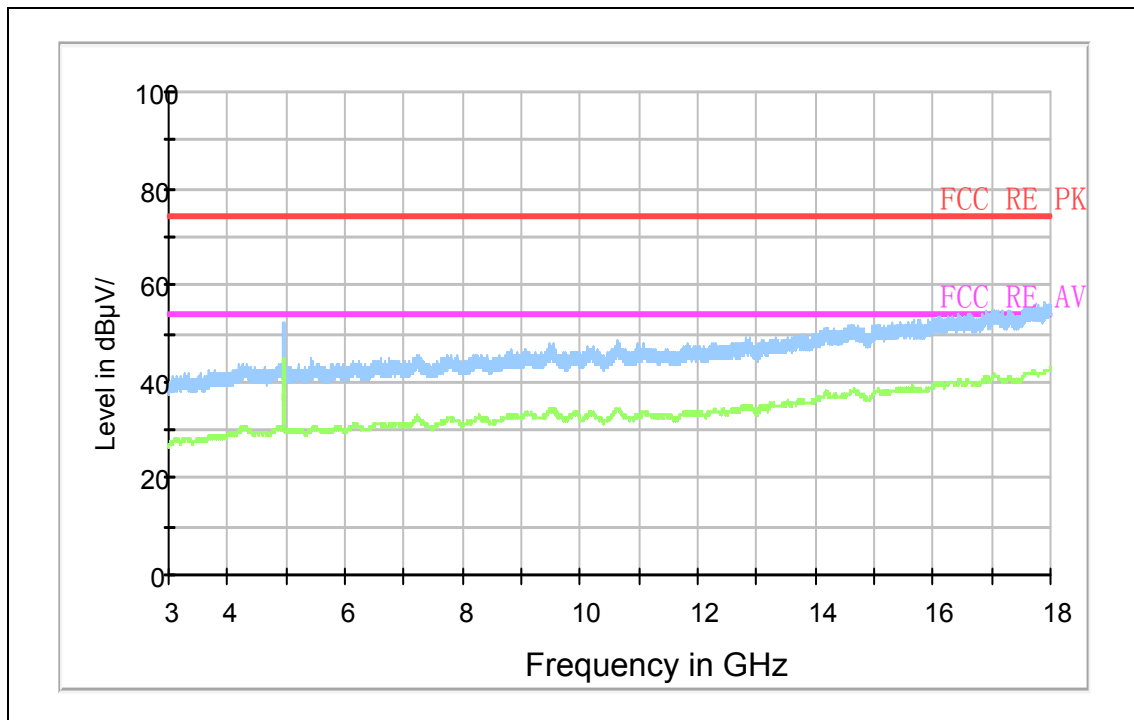
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
30.080000	25.3	100.0	V	0.0	14.7	40.0
268.782500	17.1	100.0	H	34.0	28.9	46.0
303.580000	12.3	125.0	H	210.0	33.7	46.0
364.810000	23.9	100.0	H	16.0	22.1	46.0
575.990000	23.0	125.0	H	2.0	23.0	46.0
944.592500	17.8	125.0	V	50.0	28.2	46.0

Note: All emissions level measured above 1GHz was more than 10dB below the limit



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



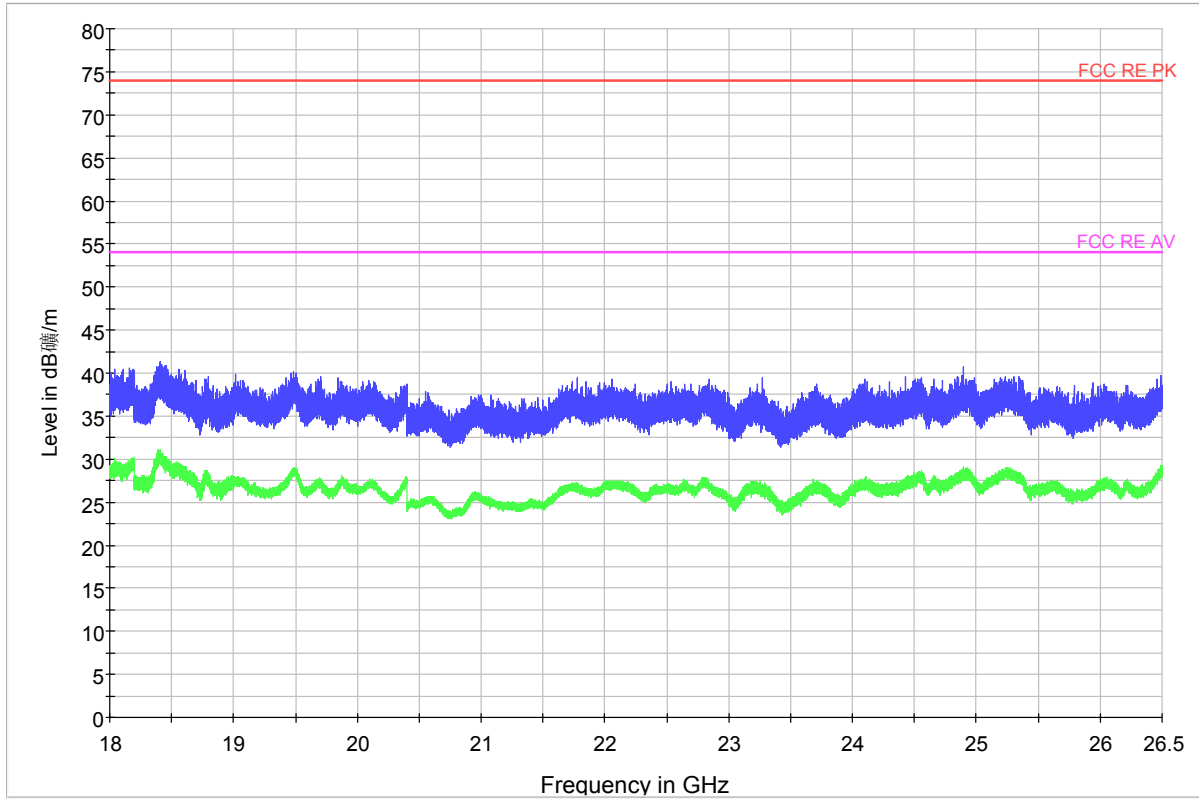
Radiates Emission from 3GHz to 18GHz

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Radiates Emission from 18GHz to 26.5GHz

2.11. Conducted Emission

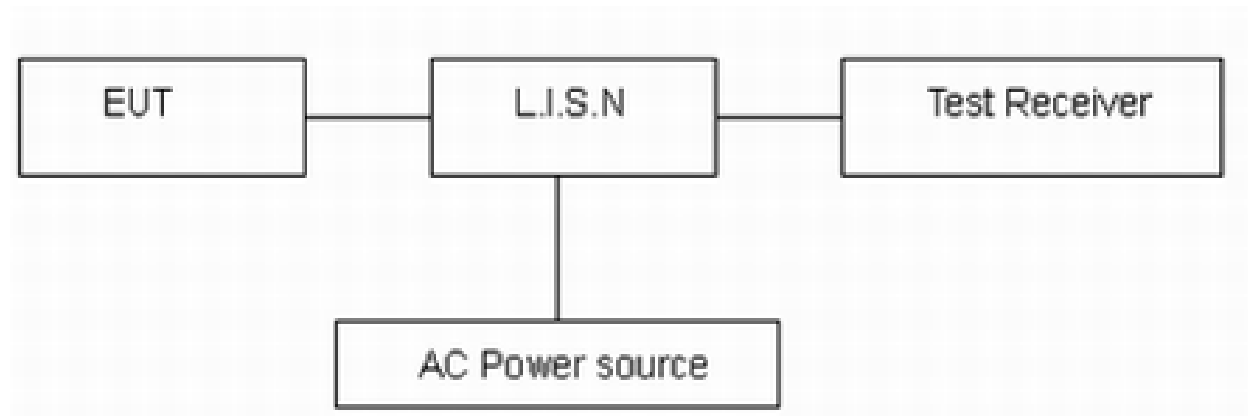
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2003. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. The measurement result should include both L line and N line.

Test Setup



Note: AC Power source is used to change the voltage from 220V/50Hz to 110V/60Hz.

Limits

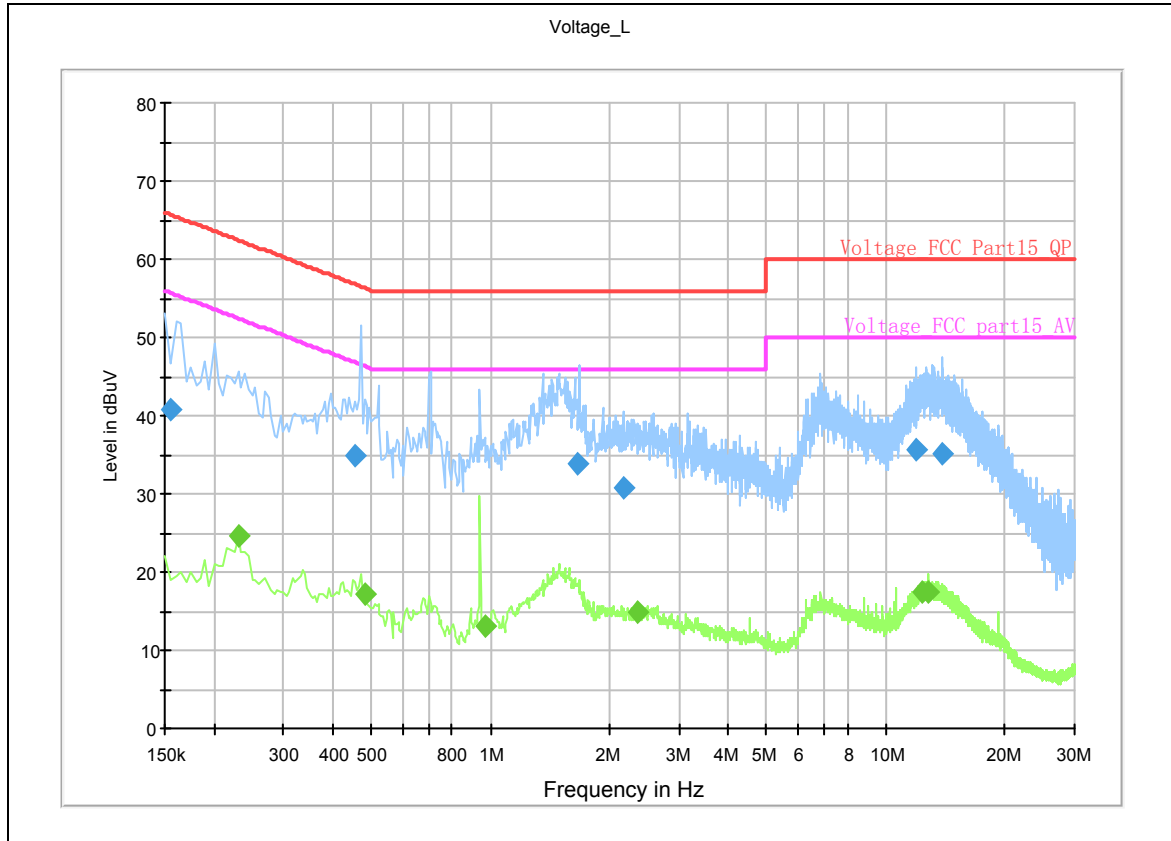
Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

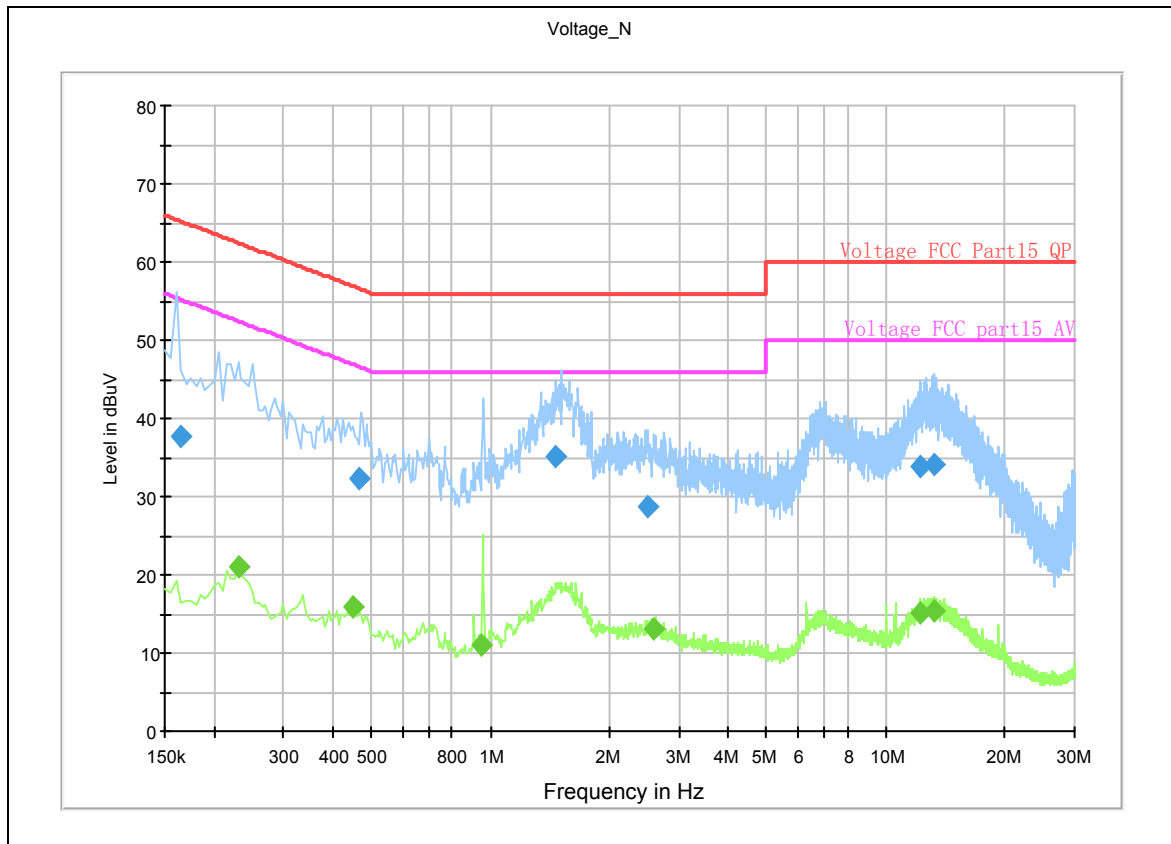
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.69$ dB.

Test Results:

Basic Rate-CH0



L Line

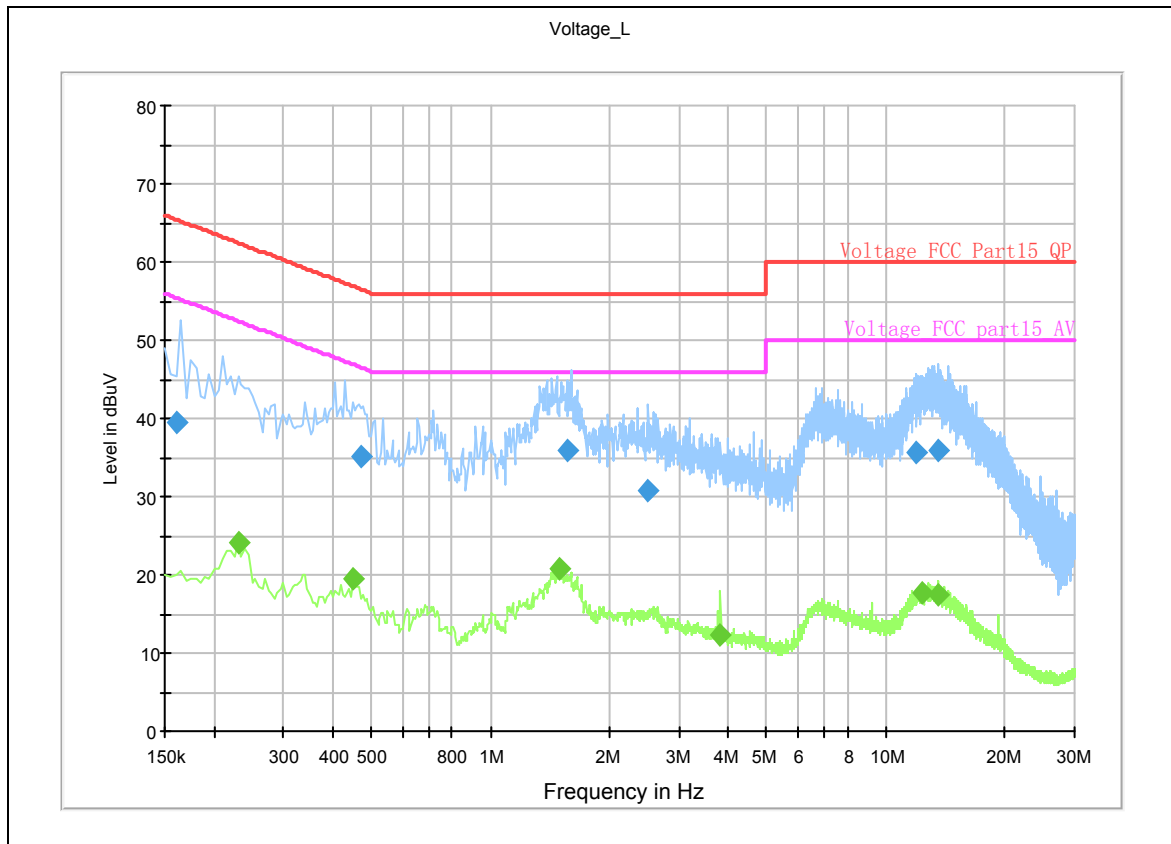


N Line

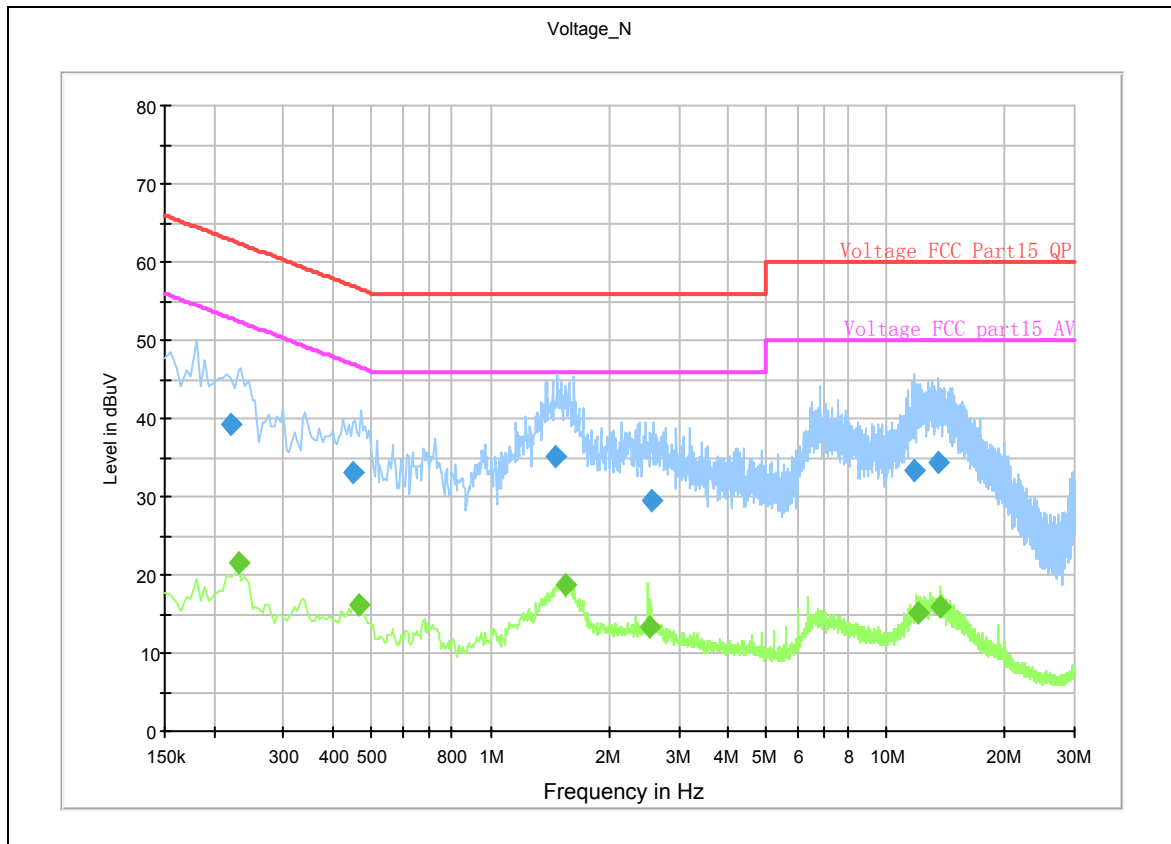
Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)
0.95	Average	N	11.1	46	34.9
0.975	Average	L	13.2	46	32.8
2.35	Average	L	14.8	46	31.2
2.59	Average	N	13.1	46	32.9
12.225	Average	N	15.2	50	34.8
13.23	Average	N	15.4	50	34.6
0.465	Quasi-peak	N	32.2	56.6	24.4
1.66	Quasi-peak	L	33.8	56	22.2
2.16	Quasi-peak	L	30.7	56	25.3
2.505	Quasi-peak	N	28.7	56	27.3
12.255	Quasi-peak	N	33.9	60	26.1
13.225	Quasi-peak	N	34	60	26

Basic Rate-CH39



L Line

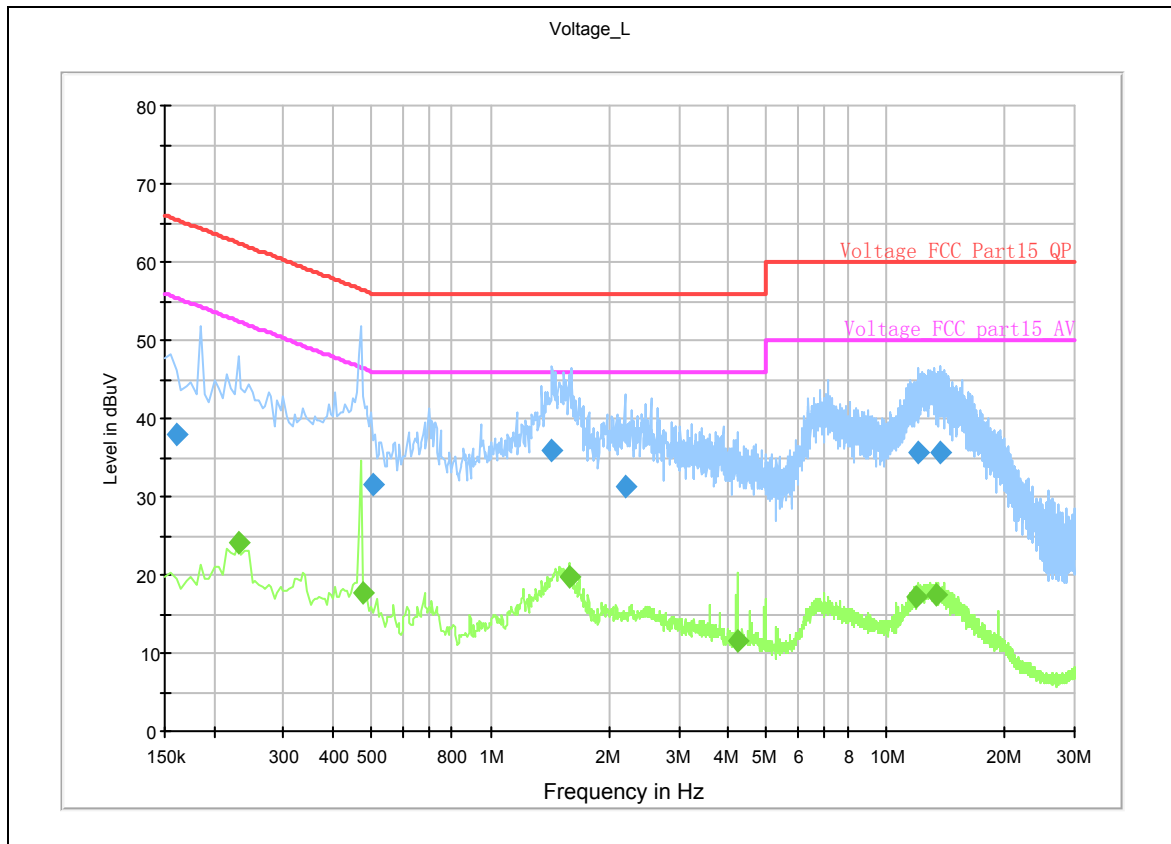


N Line

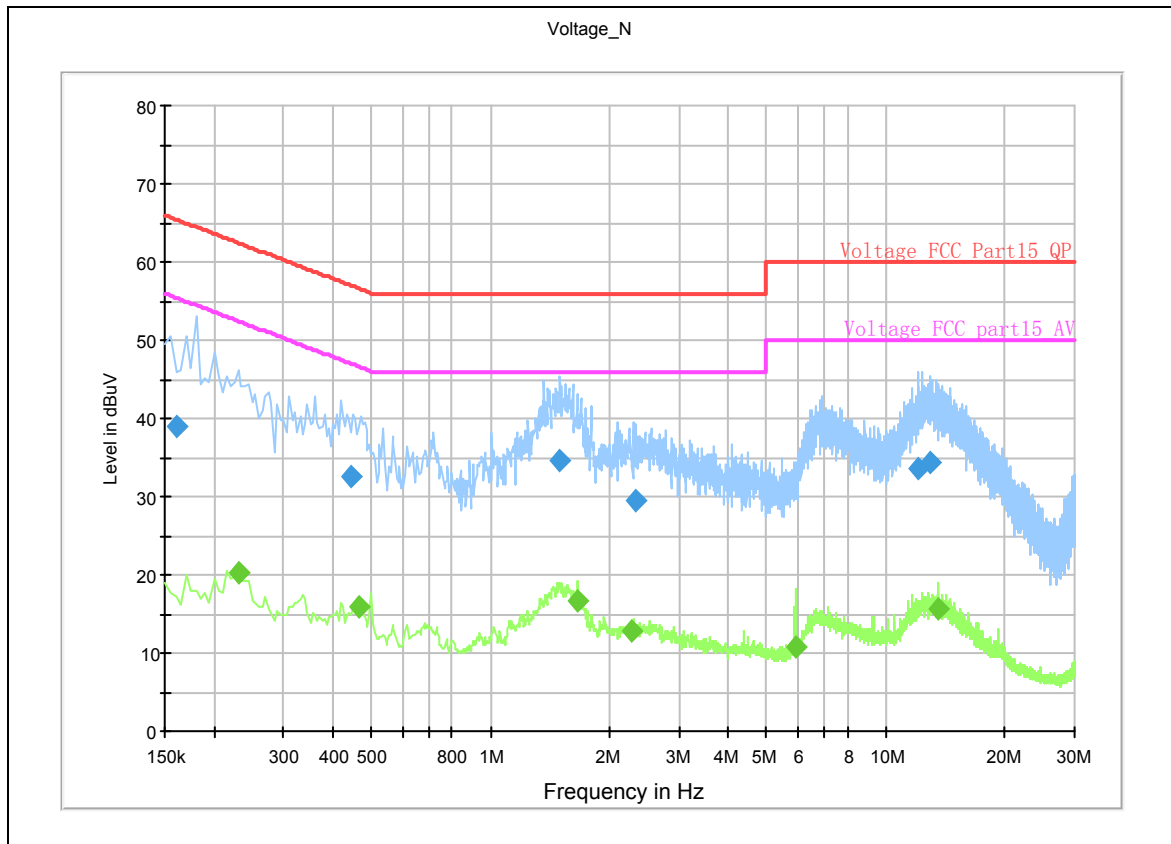
Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.465	Average	N	16.1	46.6	30.5
2.525	Average	N	13.3	46	32.7
3.78	Average	L	12.2	46	33.8
12.005	Average	N	15.2	50	34.8
13.61	Average	L	17.3	50	32.7
13.78	Average	N	15.9	50	34.1
0.45	Quasi-peak	N	33	56.9	23.9
0.47	Quasi-peak	L	35	56.5	21.5
2.495	Quasi-peak	L	30.8	56	25.2
2.55	Quasi-peak	N	29.4	56	26.6
11.785	Quasi-peak	N	33.2	60	26.8
13.62	Quasi-peak	N	34.4	60	25.6

Basic Rate-CH78



L Line

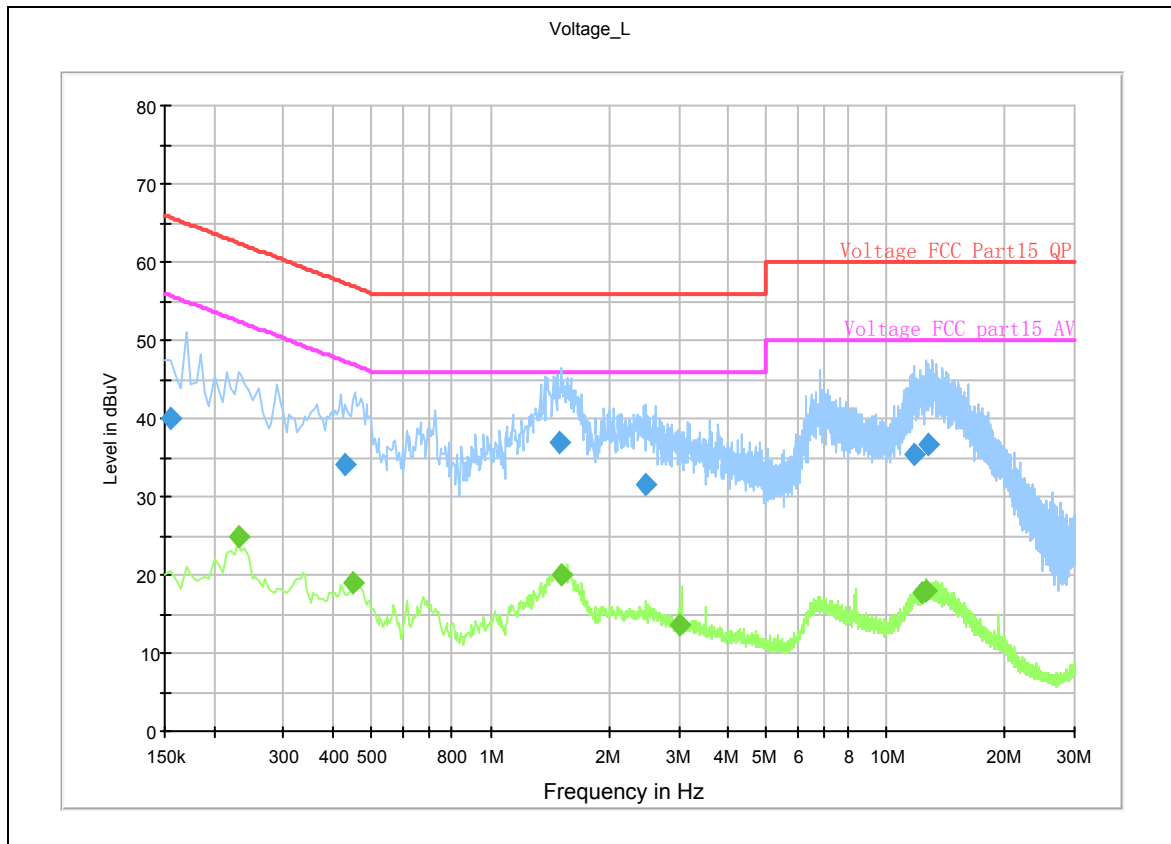


N Line

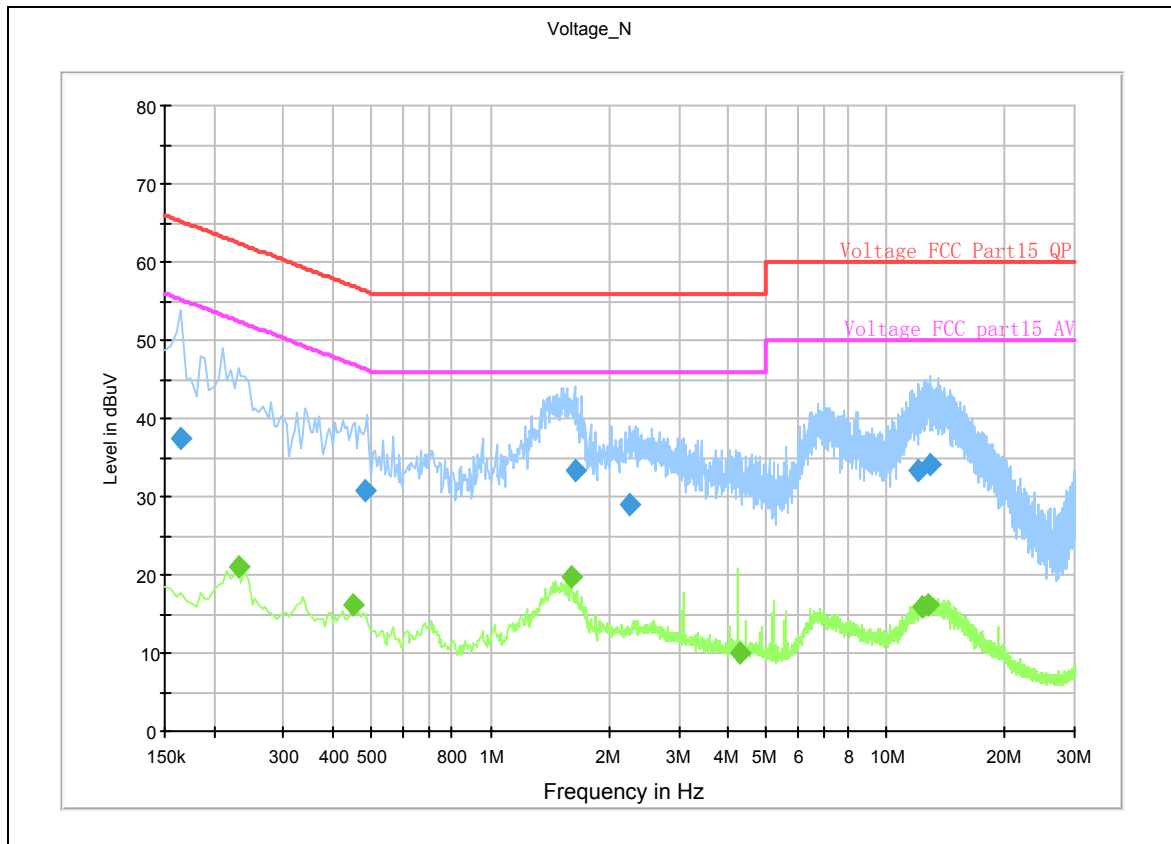
Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)
0.465	Average	N	15.8	46.6	30.8
1.66	Average	N	16.7	46	29.3
2.265	Average	N	12.9	46	33.1
4.235	Average	L	11.5	46	34.5
5.95	Average	N	10.7	50	39.3
13.525	Average	N	15.7	50	34.3
0.445	Quasi-peak	N	32.5	57	24.5
0.505	Quasi-peak	L	31.6	56	24.4
2.2	Quasi-peak	L	31.4	56	24.6
2.33	Quasi-peak	N	29.6	56	26.4
12.06	Quasi-peak	N	33.6	60	26.4
12.905	Quasi-peak	N	34.5	60	25.5

EDR-CH0



L Line

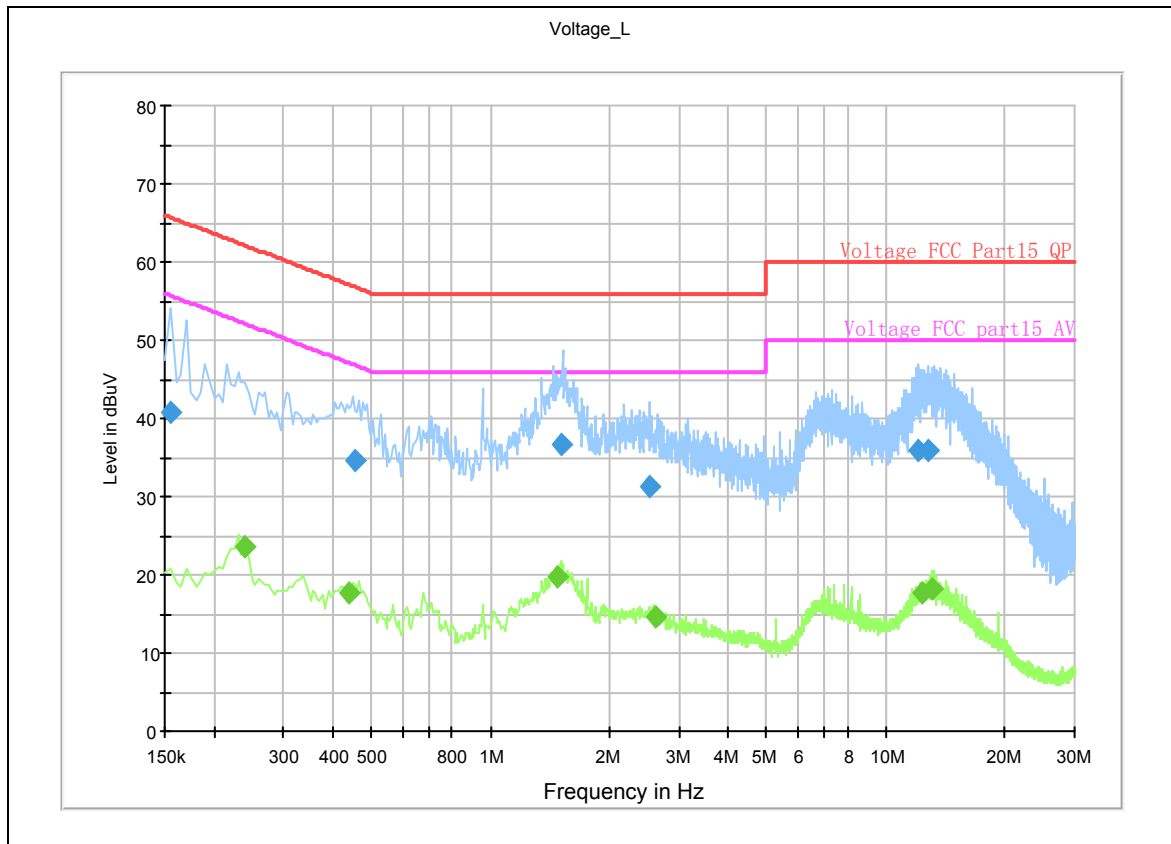


N Line

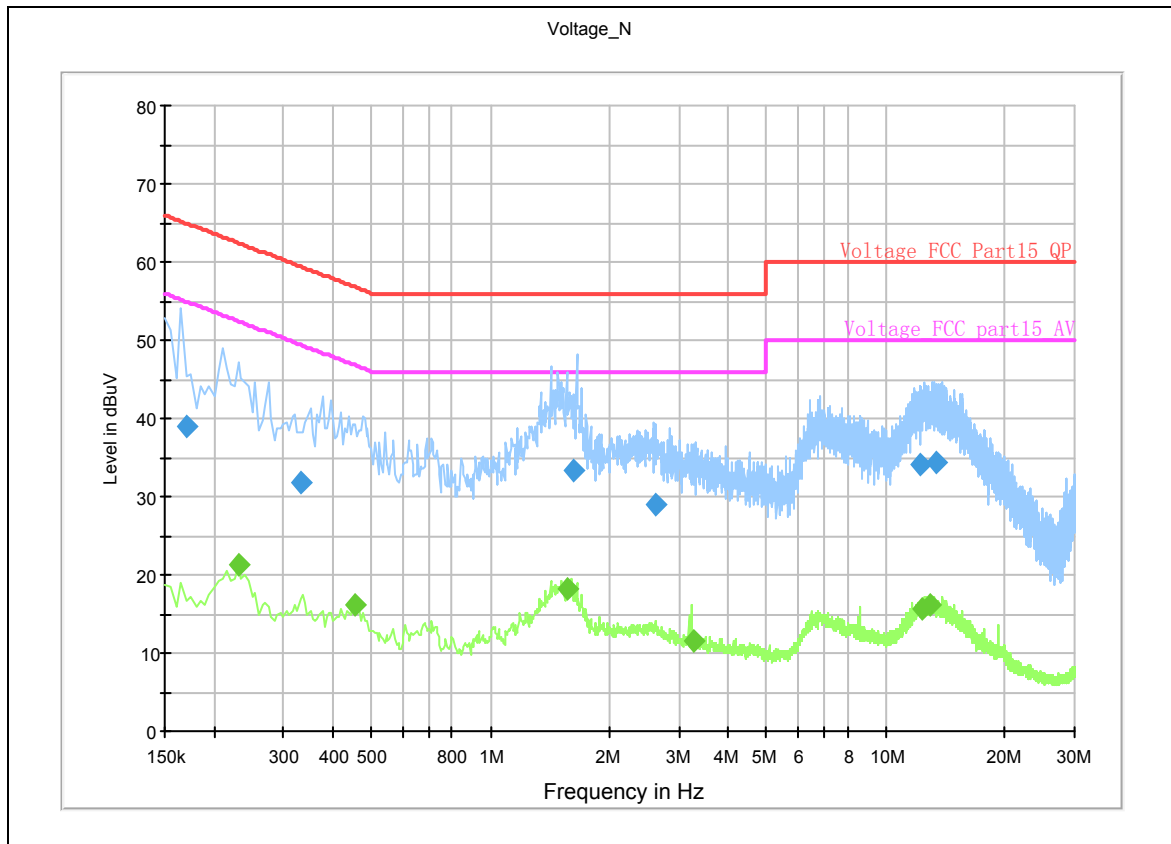
Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.45	Average	N	16.1	46.9	30.8
3.01	Average	L	13.6	46	32.4
4.27	Average	N	10	46	36
12.315	Average	N	16	50	34
12.315	Average	L	17.6	50	32.4
12.83	Average	N	16.1	50	33.9
0.43	Quasi-peak	L	34.1	57.3	23.2
0.48	Quasi-peak	N	30.6	56.3	25.7
1.635	Quasi-peak	N	33.3	56	22.7
2.24	Quasi-peak	N	29.1	56	26.9
2.46	Quasi-peak	L	31.6	56	24.4
12.015	Quasi-peak	N	33.4	60	26.6

EDR-CH39



L Line

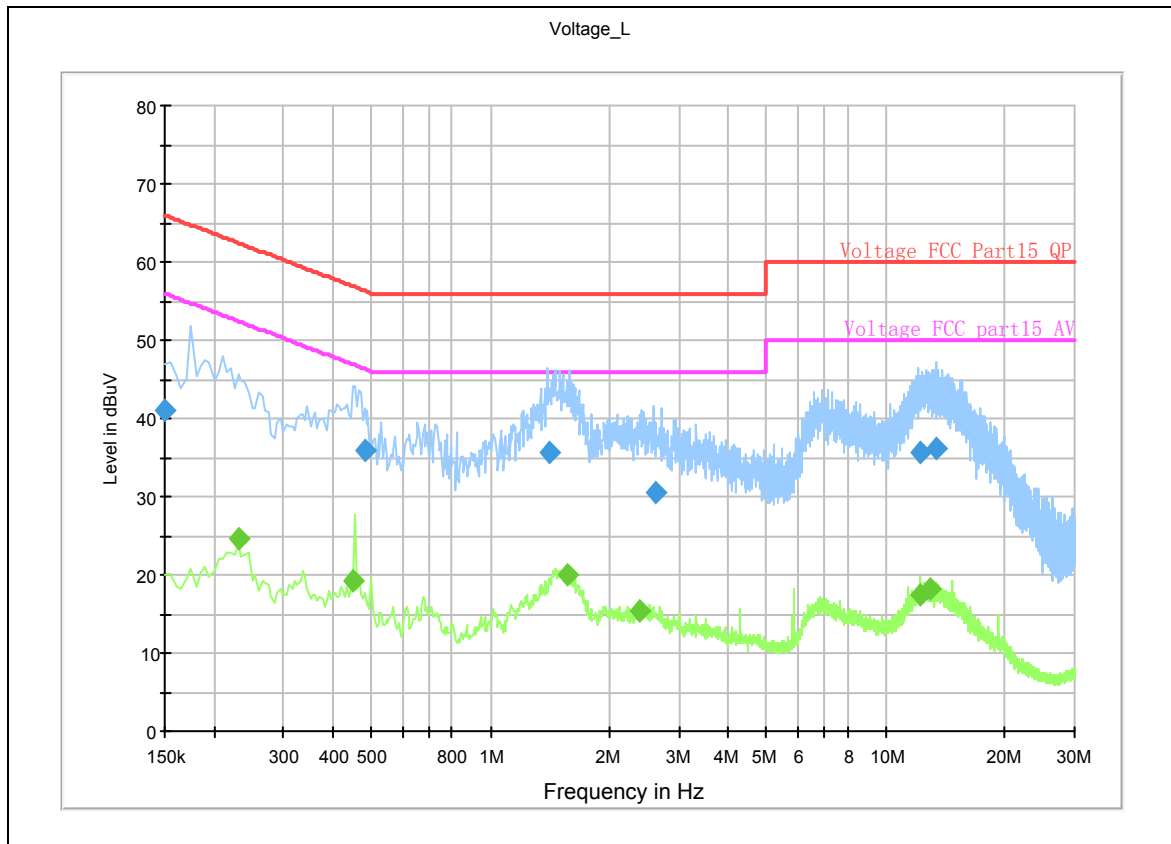


N Line

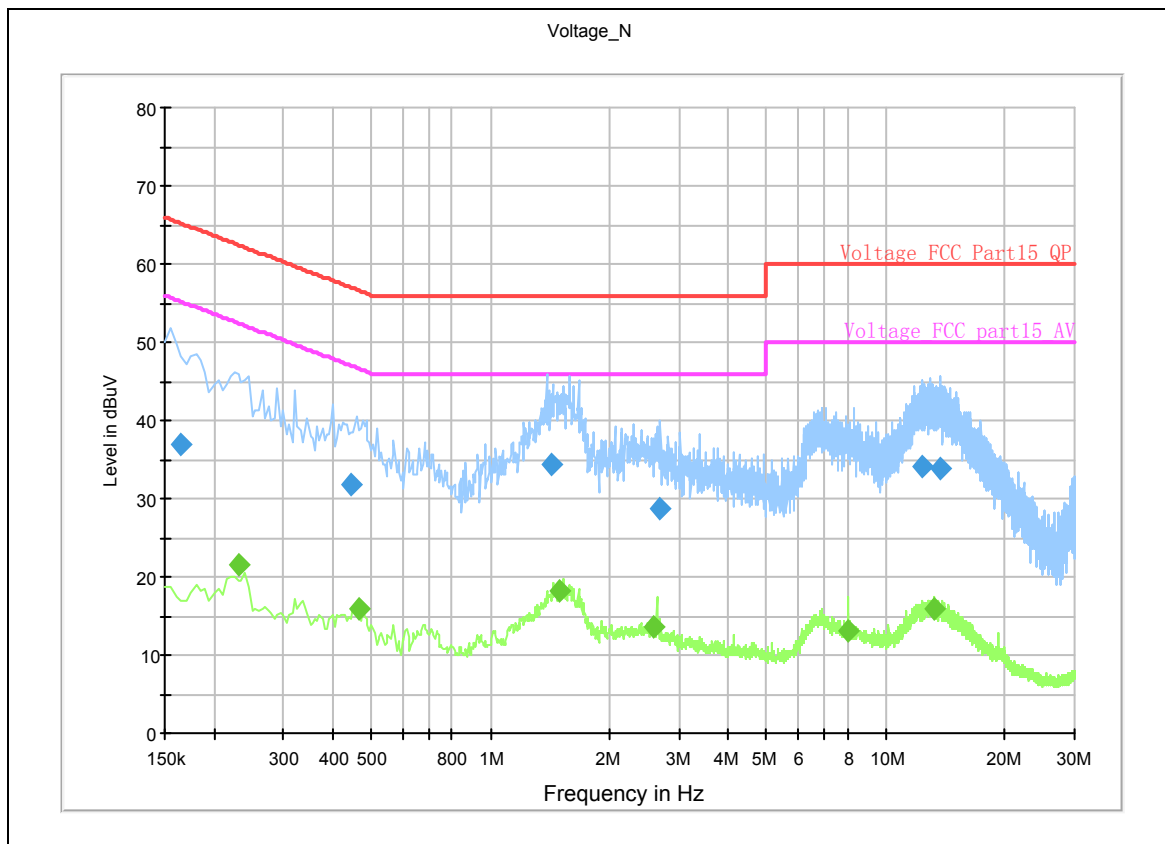
Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.455	Average	N	16.1	46.8	30.7
2.615	Average	L	14.7	46	31.3
3.27	Average	N	11.6	46	34.4
12.29	Average	L	17.7	50	32.3
12.365	Average	N	15.7	50	34.3
13.015	Average	N	16.1	50	33.9
0.33	Quasi-peak	N	31.8	59.5	27.7
1.625	Quasi-peak	N	33.3	56	22.7
2.53	Quasi-peak	L	31.3	56	24.7
2.63	Quasi-peak	N	28.9	56	27.1
12.275	Quasi-peak	N	34	60	26
13.345	Quasi-peak	N	34.5	60	25.5

EDR-CH78



L Line



N Line

Conducted Emission from 150 KHz to 30 MHz

Frequency (MHz)	Detector	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)
0.465	Average	N	15.9	46.6	30.7
2.385	Average	L	15.3	46	30.7
2.6	Average	N	13.6	46	32.4
8.06	Average	N	13.2	50	36.8
12.195	Average	L	17.4	50	32.6
13.235	Average	N	15.9	50	34.1
0.445	Quasi-peak	N	31.9	57	25.1
1.42	Quasi-peak	N	34.3	56	21.7
2.63	Quasi-peak	L	30.6	56	25.4
2.68	Quasi-peak	N	28.8	56	27.2
12.36	Quasi-peak	N	34	60	26
13.8	Quasi-peak	N	33.7	60	26.3

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3. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	BT Base Station Simulator	CBT	R&S	1153.9000.35	2010-04-07	One year
02	Signal Analyzer	FSV	R&S	100815	2010-06-28	One year
03	Signal generator	SMR27	R&S	1606.6000.02	2010-06-28	One year
04	Spectrum Analyzer	E4445A	Agilent	MY46181146	2010-06-07	One year
05	EMI Test Receiver	ESCI	R&S	100948	2010-06-29	One year
06	Trilog Antenna	VULB 9163	SCHWARZBECK	9163-391	2010-05-13	One year
07	Horn Antenna	HF907	R&S	100125	2009-07-20	One year
08	AC Power Source	AFC-11005G	APC	F309040118	2009-07-25	One year
09	Power Splitter	11667A	Agilent	52960	NA	NA
10	Semi-Anechoic Chamber	9.6*6.7*6.6m	ETS-Lindgren	NA	NA	NA
11	EMI test software	ES-K1	R&S	NA	NA	NA

*****END OF REPORT BODY*****

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



Picture 1-1: EUT



Picture 1-2: Battery

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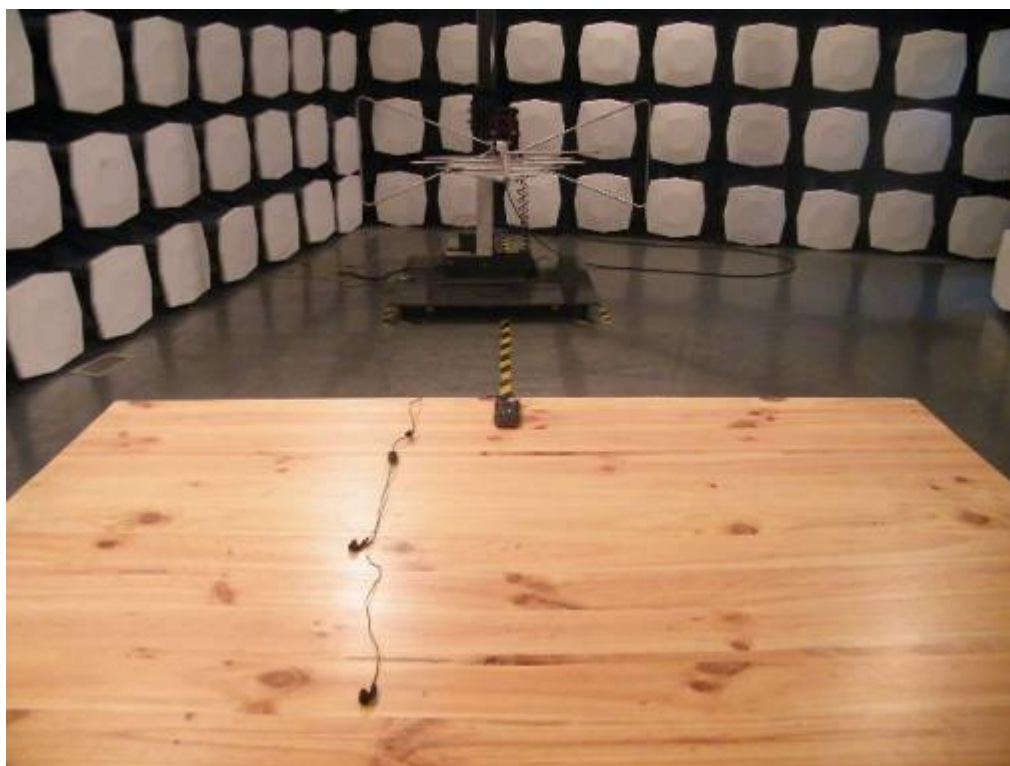
Picture 1-3: Charger



Picture 1-4: Earphone

Picture 1 EUT

A.2 Test Setup



Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup