



Part 15C

TEST REPORT

Product Name	Smartisan T1
Model	SM701
FCC ID	2AEUYSM701
Applicant	Smartisan Technology Co., Ltd
Manufacturer	Smartisan Technology Co., Ltd
Date of issue	July 22, 2015

TA Technology (Shanghai) Co., Ltd.

TA Technology (Shanghai) Co., Ltd.
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GENERAL SUMMARY

Reference Standard(s)	FCC CFR47 Part 15C (2013) Radio Frequency Devices 15.205 Restricted bands of operation; 15.207 Conducted limits; 15.209 Radiated emission limits; general requirements; 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz. 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. (2009) DA00-705 Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System.(2000)
Conclusion	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. General Judgment: Pass
Comment	The test result only responds to the measured sample.

Approved by Kai Xu
Kai Xu
Director

Revised by Lingling Kang
Lingling Kang
RF Manager

Performed by Changxu Wan
Changxu Wan
RF Engineer

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1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

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. The sample under test was selected by the Client. This report only refers to the item that has undergone the test.

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of **TA Technology (Shanghai) Co., Ltd.**

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1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
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Contact: Xu Kai
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Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

1.3. Applicant Information

Company: Smartisan Technology Co., Ltd
Address: 7th Floor, Motorola Building, 1 East Wangjing Road, Chaoyang District,
Beijing, 100102, P.R. China

1.4. Manufacturer Information

Company: Smartisan Technology Co., Ltd
Address: 7th Floor, Motorola Building, 1 East Wangjing Road, Chaoyang District,
Beijing, 100102, P.R. China

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1.5. Information of EUT

General information

Name of EUT:	Smartisan T1		
IMEI:	864516020009106		
Hardware Version:	MMR500003C		
Software Version:	V1.5.0		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Test Mode	Basic Rate	Enhanced Data Rate(EDR)	
Modulation Type:	Frequency Hopping Spread Spectrum (FHSS)		
	GFSK	$\pi/4$ DQPSK	8DQPSK
Packet Type:(Maximum Payload)	DH5	2DH5	3DH5
Max. Conducted Power	9.6 dBm		
Power Supply:	Battery or Charger (AC Adapter)		
Operating Frequency Range(s)	2402 ~ 2480MHz		
Tested Frequency Range(s)	2400 ~ 2483.5 MHz		

1.6. Test Date

The test is performed from June 20, 2015 to June 29, 2015.

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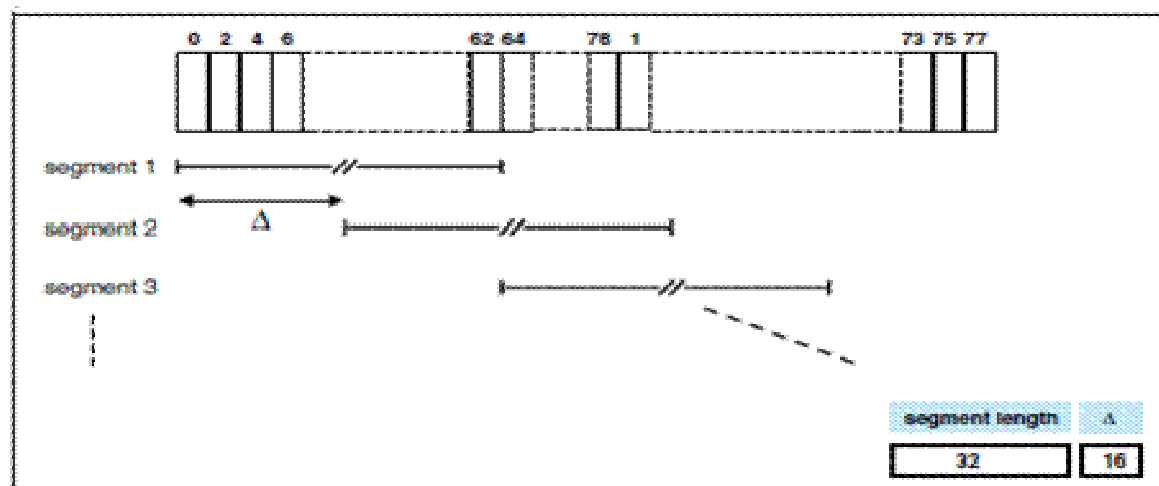
2. Information about the FHSS characteristics

2.1. Pseudorandom Frequency Hopping Sequence

Frequency Hopping Systems. A spread spectrum system in which the carrier is modulated with the coded information in a conventional manner causing a conventional spreading of the RF energy about the frequency carrier. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence. The wide RF bandwidth needed by such a system is not required by spreading of the RF energy about the carrier but rather to accommodate the range of frequencies to which the carrier frequency can hop. The test of a frequency hopping system is that the near term distribution of hops appears random, the long term distribution appears evenly distributed over the hop set, and sequential hops are randomly distributed in both direction and magnitude of change in the hop set.

The selection scheme chooses a segment of 32 hop frequencies spanning about 64 MHz and visits these hops in a pseudo-random order. Next, a different 32-hop segment is chosen, etc. In the page, master page response, slave page response, page scan, inquiry, inquiry response and inquiry scan hopping sequences, the same 32-hop segment is used all the time (the segment is selected by the address; different devices will have different paging segments).

When the basic channel hopping sequence is selected, the output constitutes a pseudo-random sequence that slides through the 79 hops. The principle is depicted in the figure below.



Hop selection scheme in CONNECTION state.

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45, etc.

Each frequency used equally on the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

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2.2. Equal Hopping Frequency Use

All Bluetooth units participating in the Pico net are time and hop-synchronized to the channel. Each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

2.3. System Receiver Input Bandwidth

Each channel bandwidth is 1MHz. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

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3. Test Information

3.1. Test Mode

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

EUT is stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate.

Test Modes		
Band	Radiated Test Cases	Conducted Test Cases
BT	DH5 GFSK(Channel 0/39/78)	DH5 GFSK(Channel 0/39/78) 2DH5 $\pi/4$ -DQPSK(Channel 0/39/78) 3DH5 8DQPSK(Channel 0/39/78)

Note: The maximum RF output power levels are DH5 for GFSK modulation, For RSE and CSE, only the maximum RF output power is chosen.

3.2. 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

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3.3. Peak Power Output –Conducted

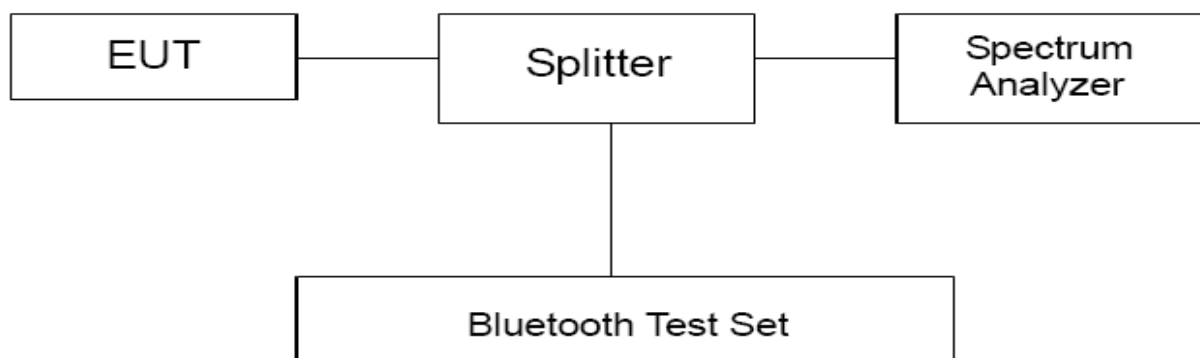
Ambient condition

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. The peak detector is used. RBW is set to 2 MHz; VBW is set to 6 MHz. 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	$\leq 0.125\text{W}$ (21dBm)
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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

Note: The measured power density (dBm) has the offset with cable loss already.

Channel	Peak Output Power (dBm)			Conclusion
	CH0/2402	CH39/2441	CH78/2480	
DH1	8.7	9.5	8.9	PASS
DH3	8.6	9.5	8.9	PASS
DH5	8.7	9.6	9.0	PASS
2DH1	7.0	7.8	7.2	PASS
2DH3	7.0	7.9	7.3	PASS
2DH5	7.3	8.1	7.5	PASS
3DH1	7.2	8.0	7.4	PASS
3DH3	7.2	8.0	7.4	PASS
3DH5	7.4	8.2	7.6	PASS

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3.4. Occupied Bandwidth (20dB)

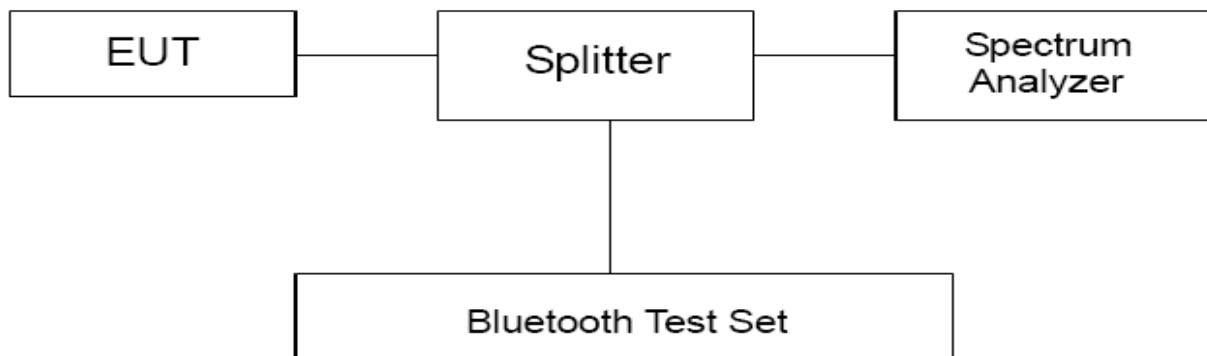
Ambient condition

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 20kHz and VBW is set to 60kHz 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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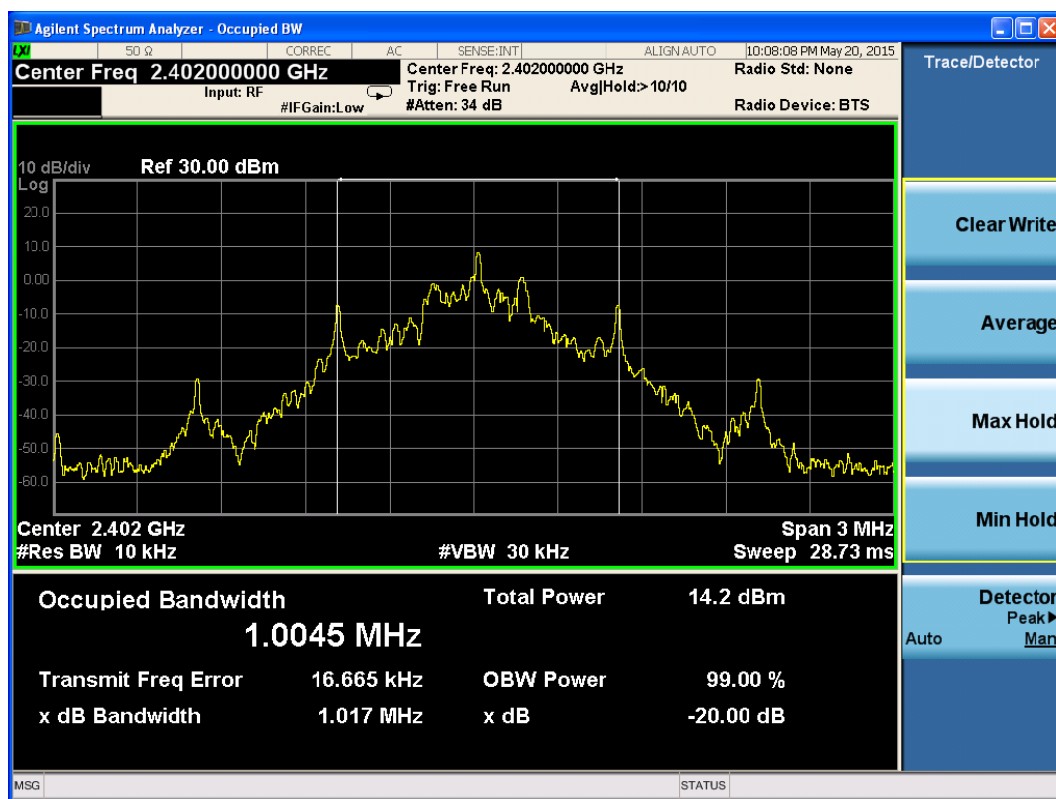
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Test Results

DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1017
39	2441	1018
78	2480	1018



Carrier frequency (MHz): 2402

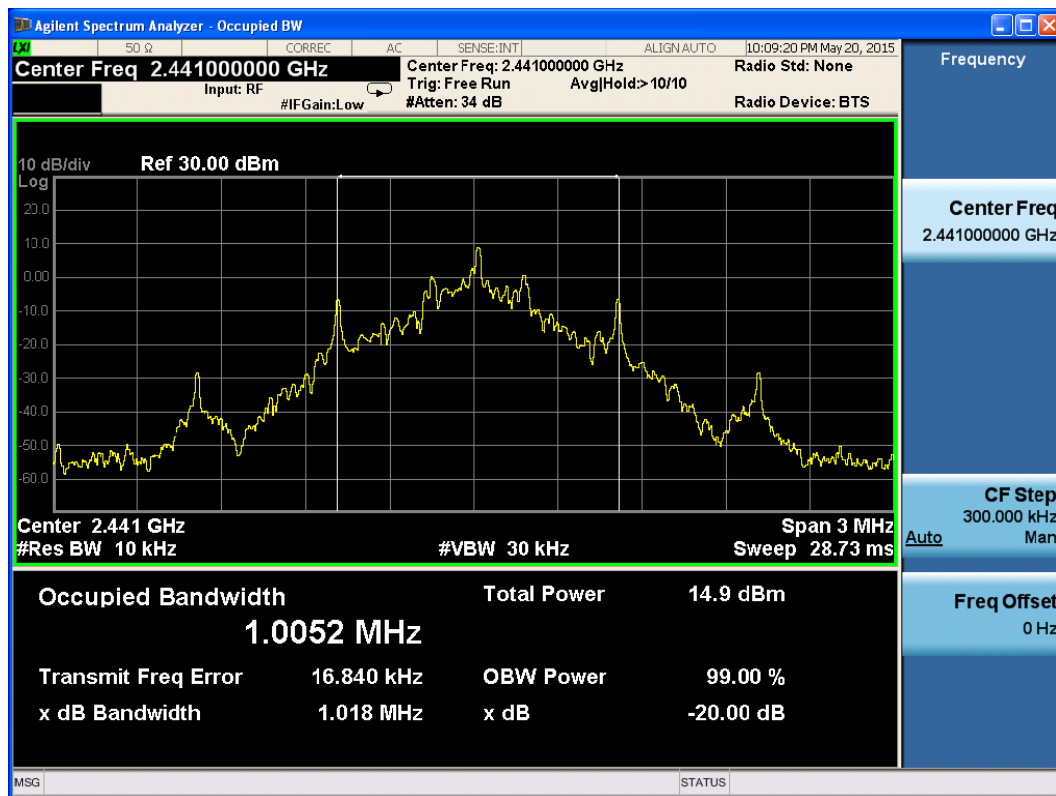
Channel No.: 0

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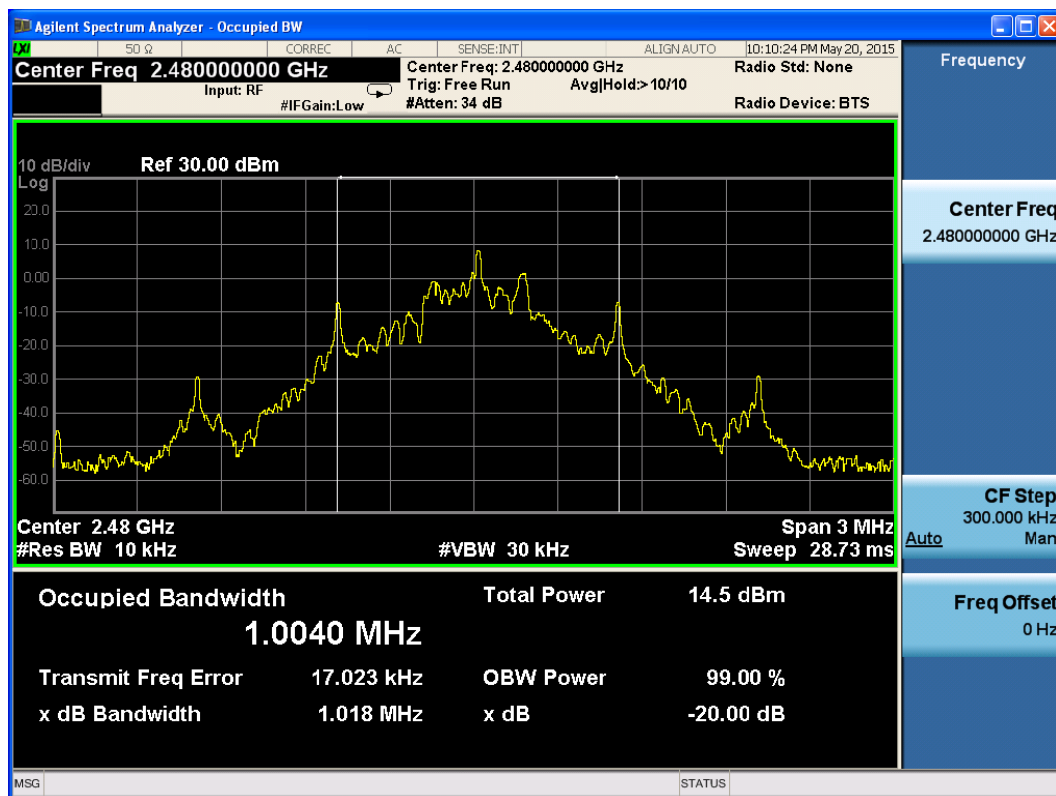
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Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

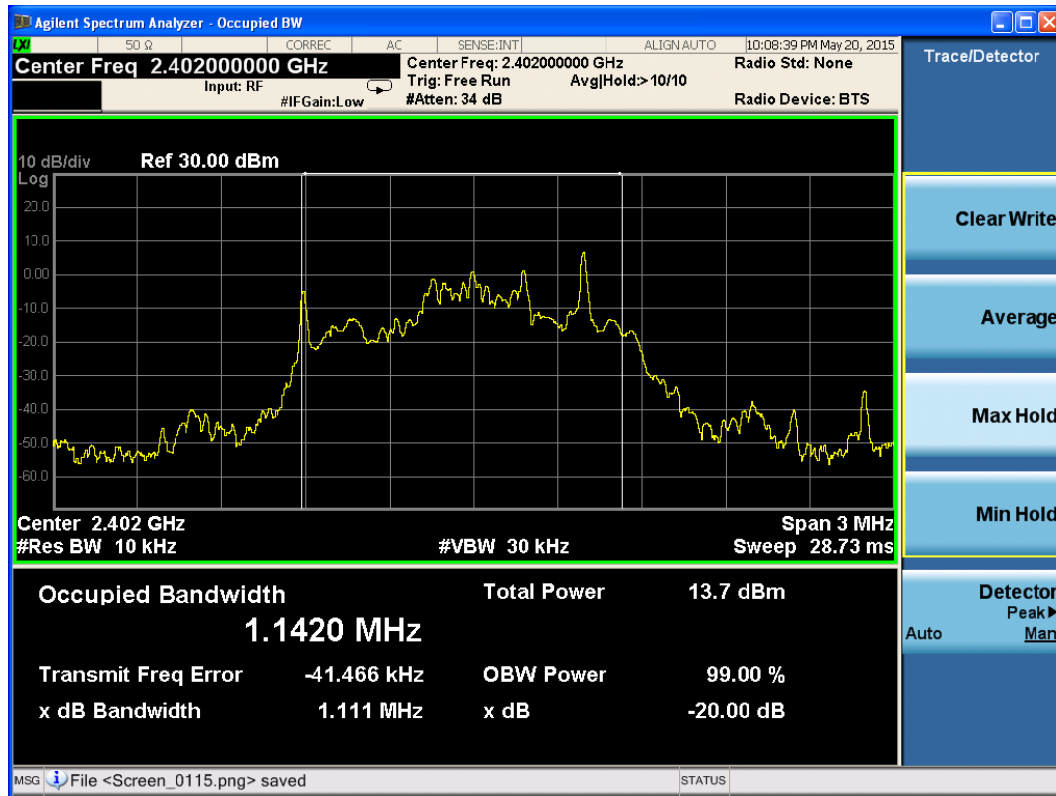
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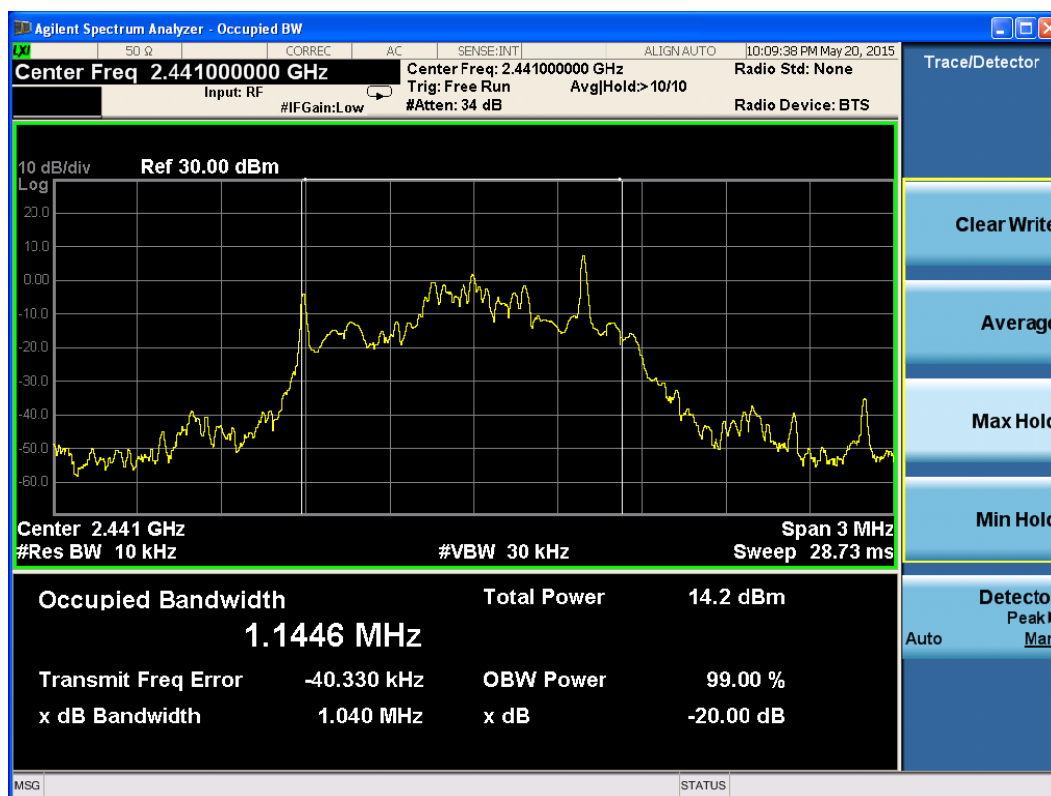
2DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1111
39	2441	1040
78	2480	1041



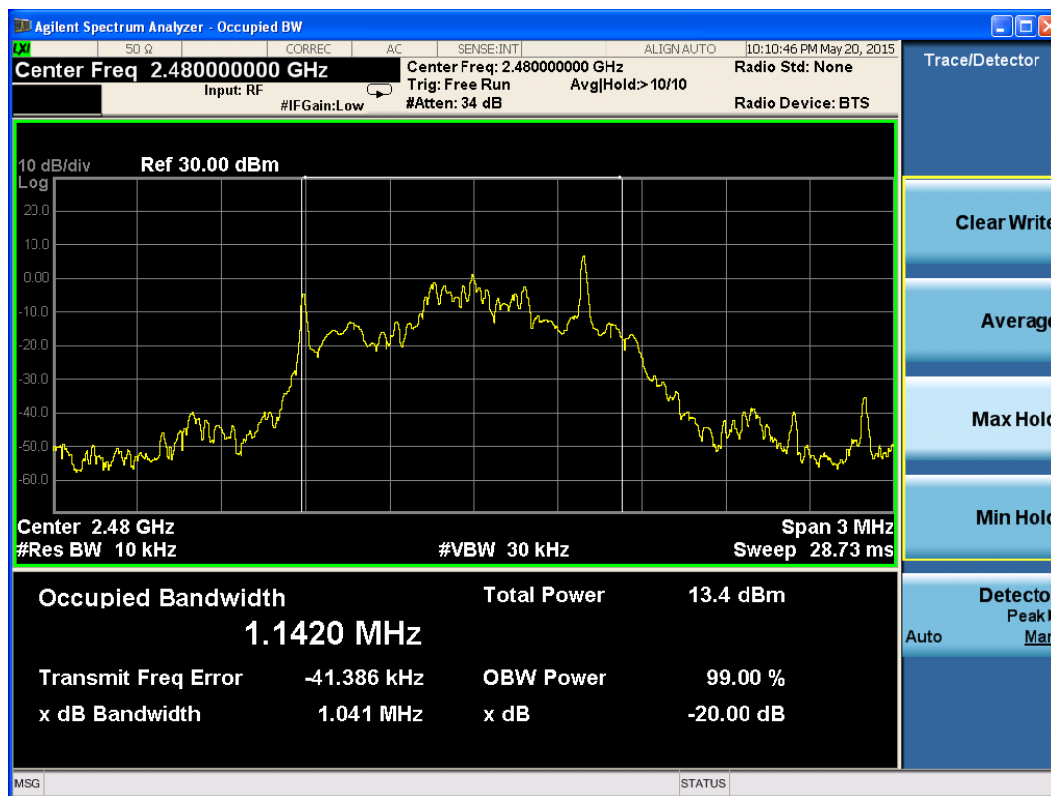
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

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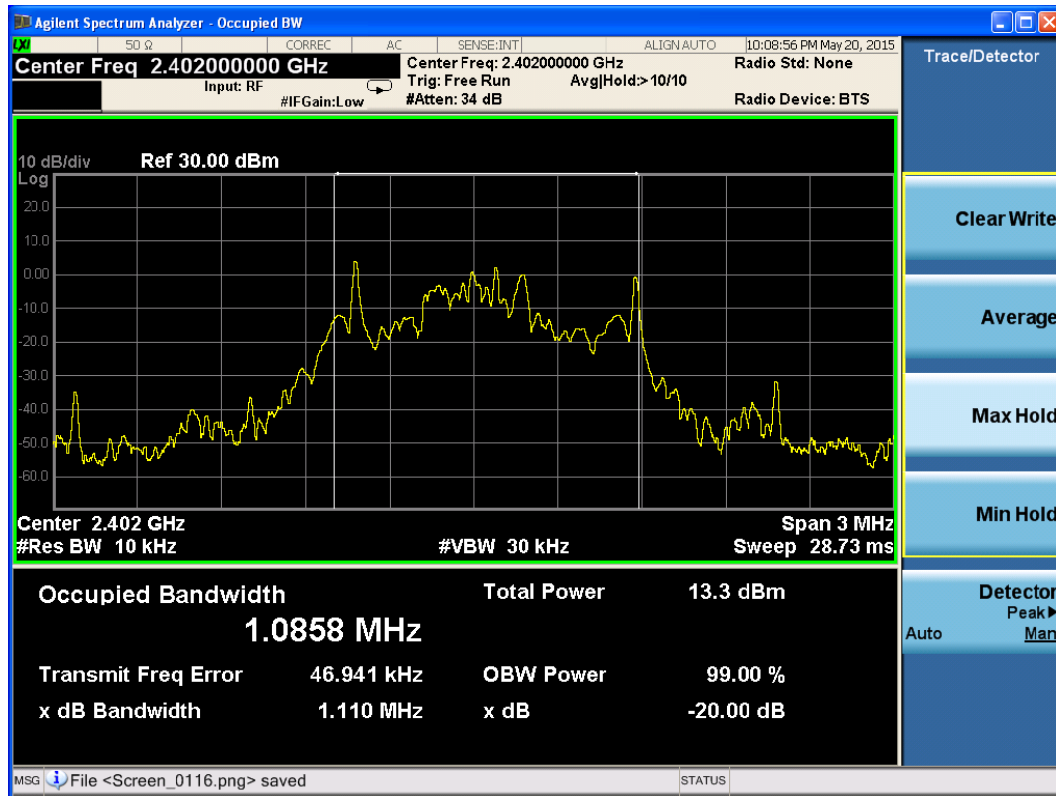
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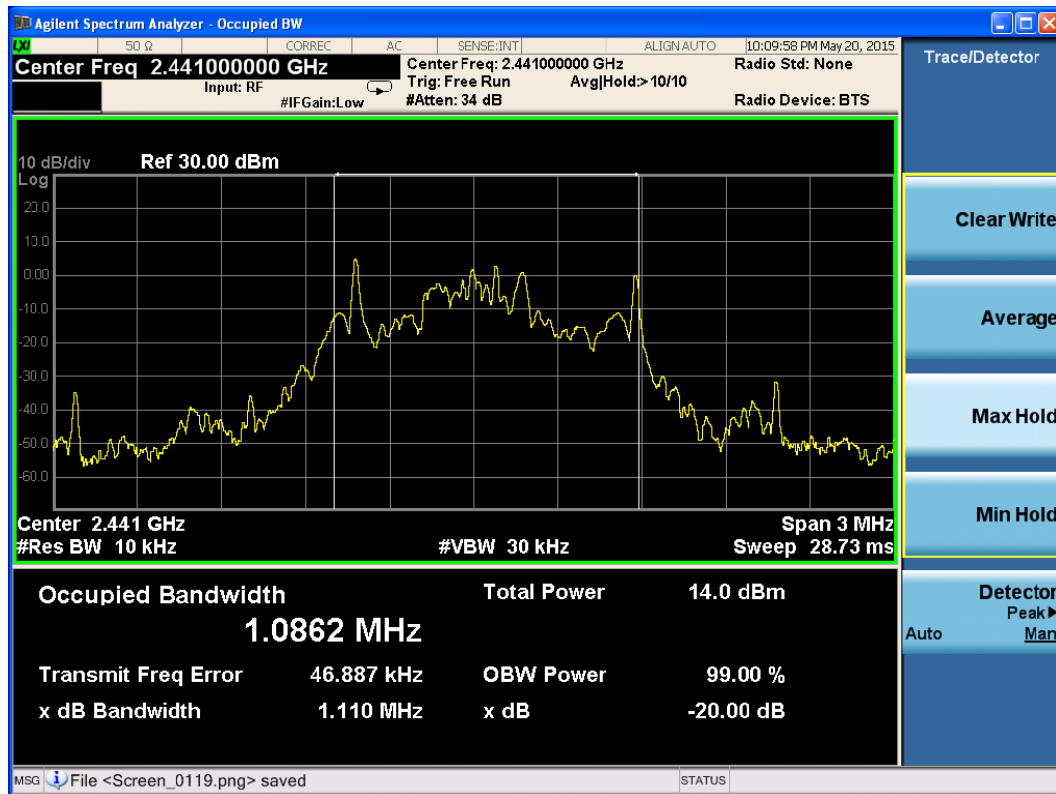
3DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1110
39	2441	1110
78	2480	1109



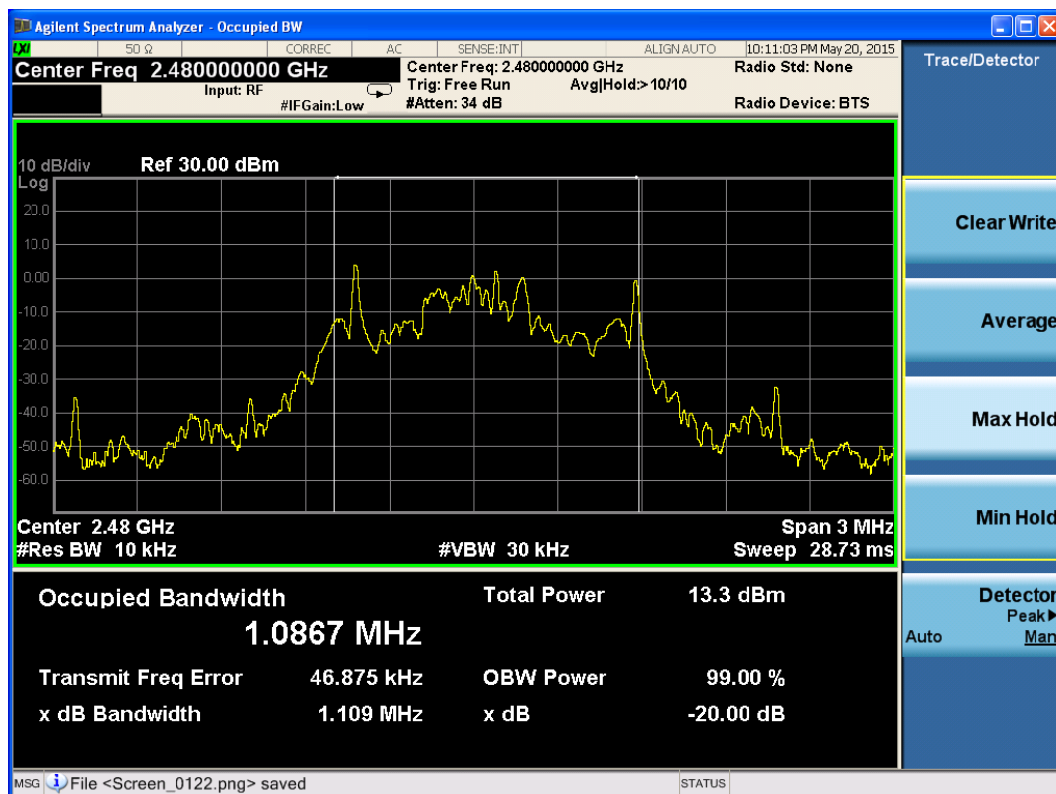
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

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3.5. Frequency Separation

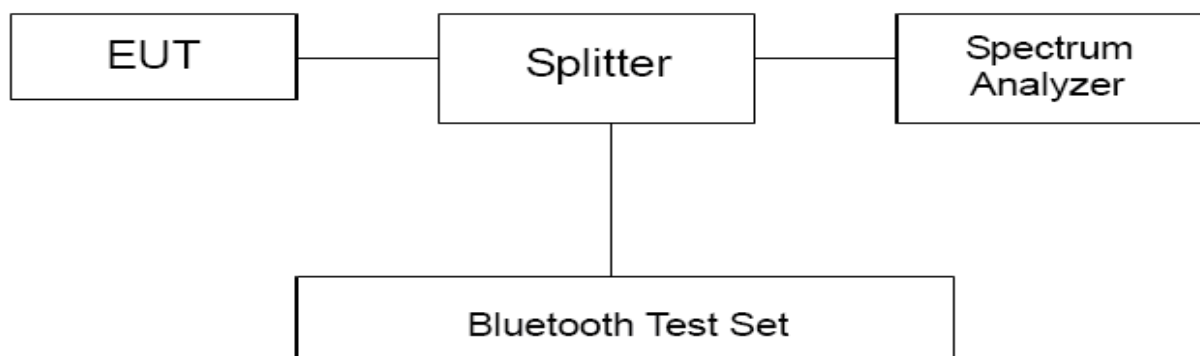
Ambient condition

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. RBW is set to 300 kHz and VBW is set to 3MHz on spectrum analyzer. 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.

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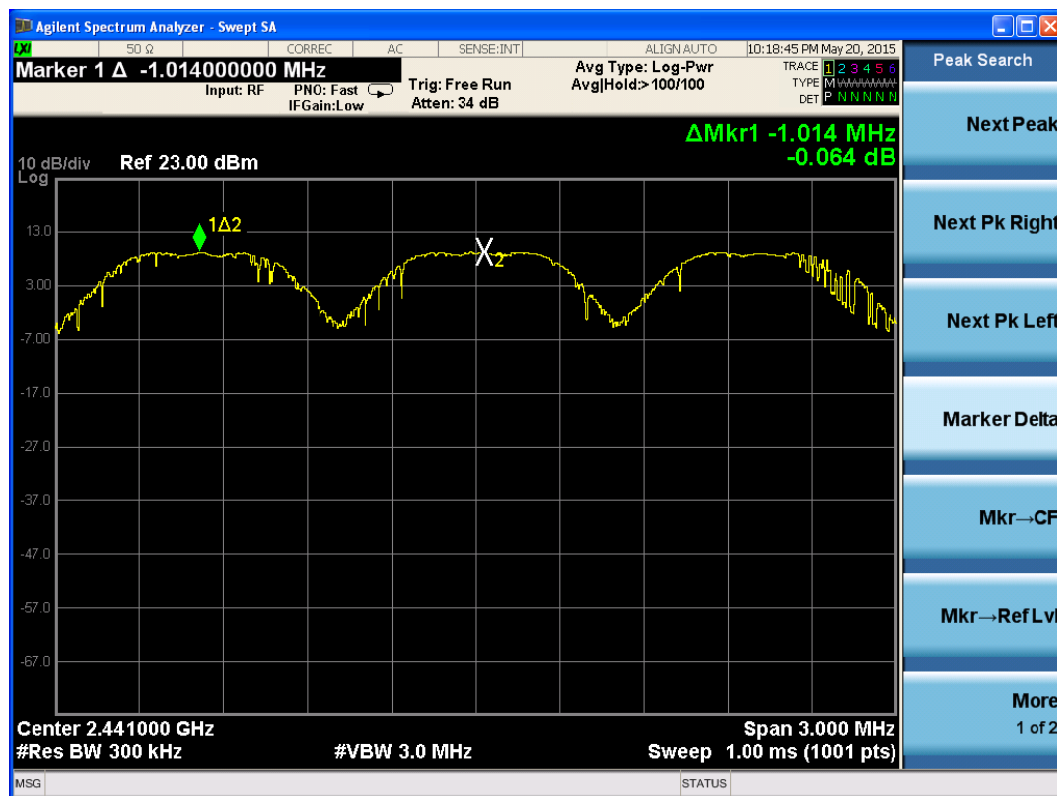
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Test Results:

DH5

Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2441	1014	1018	678.67	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



Carrier frequency (MHz): 2441

Channel No.:39

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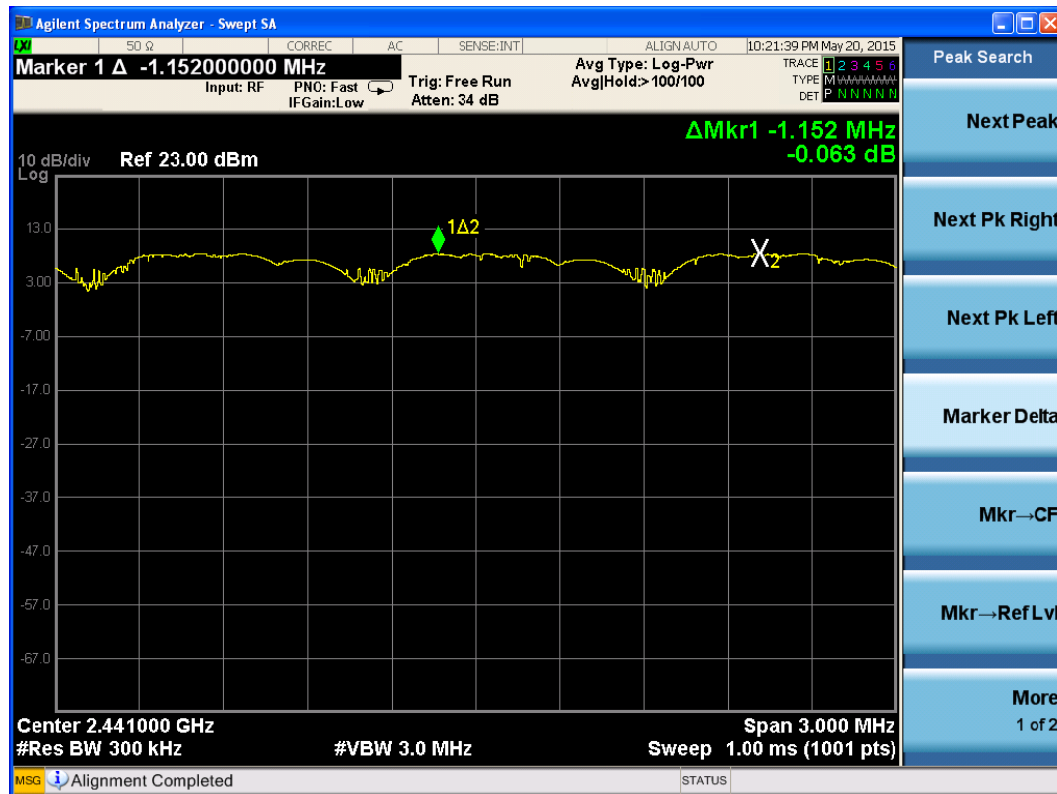
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2DH5

Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2441	1152	1040	693.33	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



Carrier frequency (MHz): 2441

Channel No.:39

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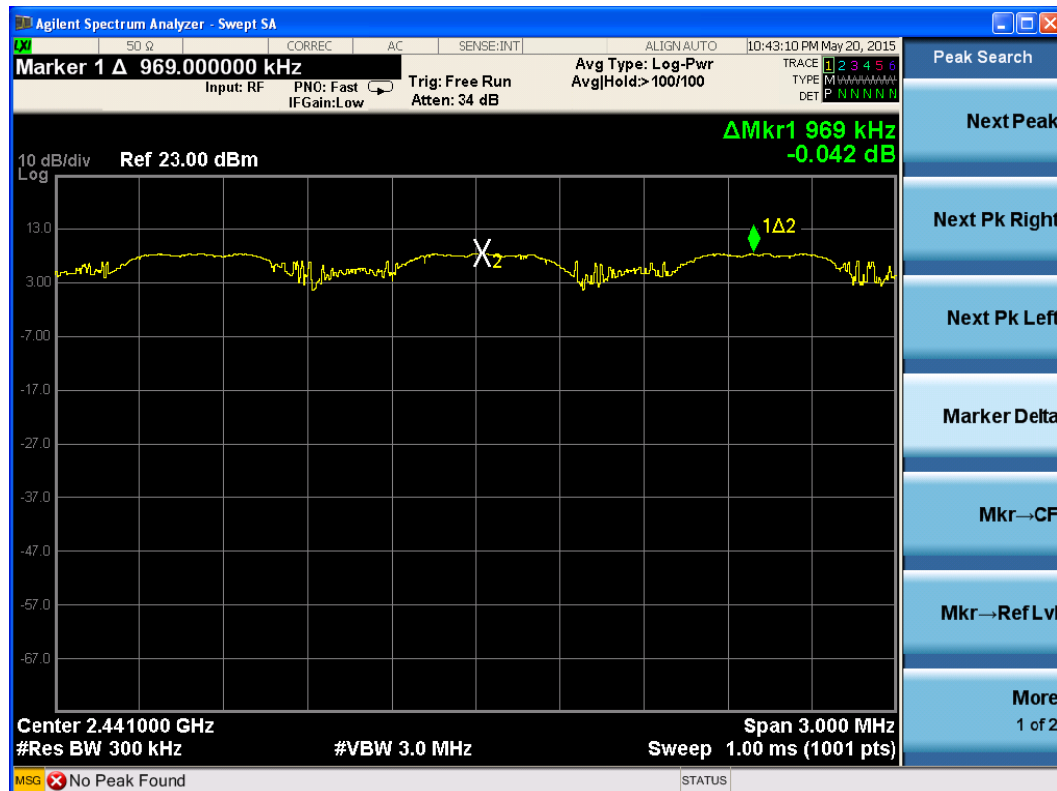
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3DH5

Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2441	1969	1110	740	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



Carrier frequency (MHz): 2441

Channel No.:39

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3.6. Time of Occupancy (Dwell Time)

Ambient condition

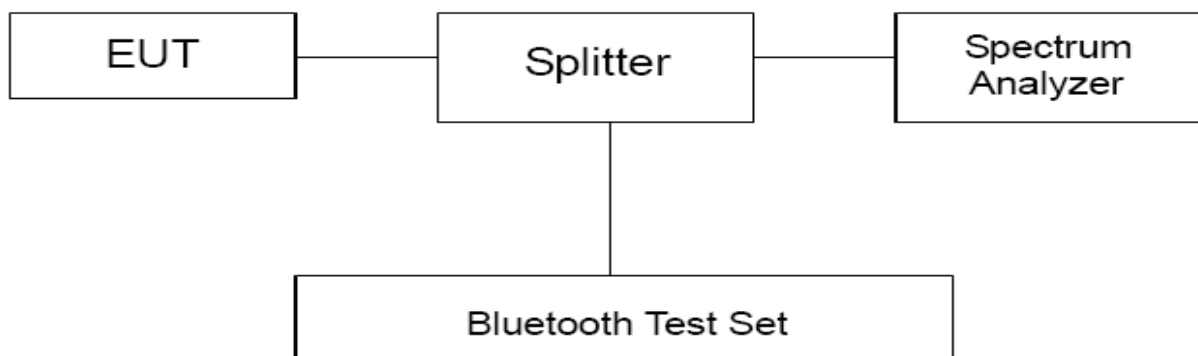
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 3MHz on spectrum analyzer. 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 packet = 1600
- hop rate = $1600/3 \times 1/s$ for DH3 packet = 533.33
- hop rate = $1600/5 \times 1/s$ for DH5 packet = 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 $k = 2$.

Requirements	Uncertainty	
Dwell Time	DH1	$U = 0.64\text{ms}$
	DH3	$U = 0.80\text{ms}$
	DH5	$U = 0.70\text{ms}$
	2DH1	$U = 0.64\text{ms}$
	2DH3	$U = 0.80\text{ms}$
	2DH5	$U = 0.70\text{ms}$
	3DH1	$U = 0.64\text{ms}$
	3DH3	$U = 0.80\text{ms}$
	3DH5	$U = 0.70\text{ms}$

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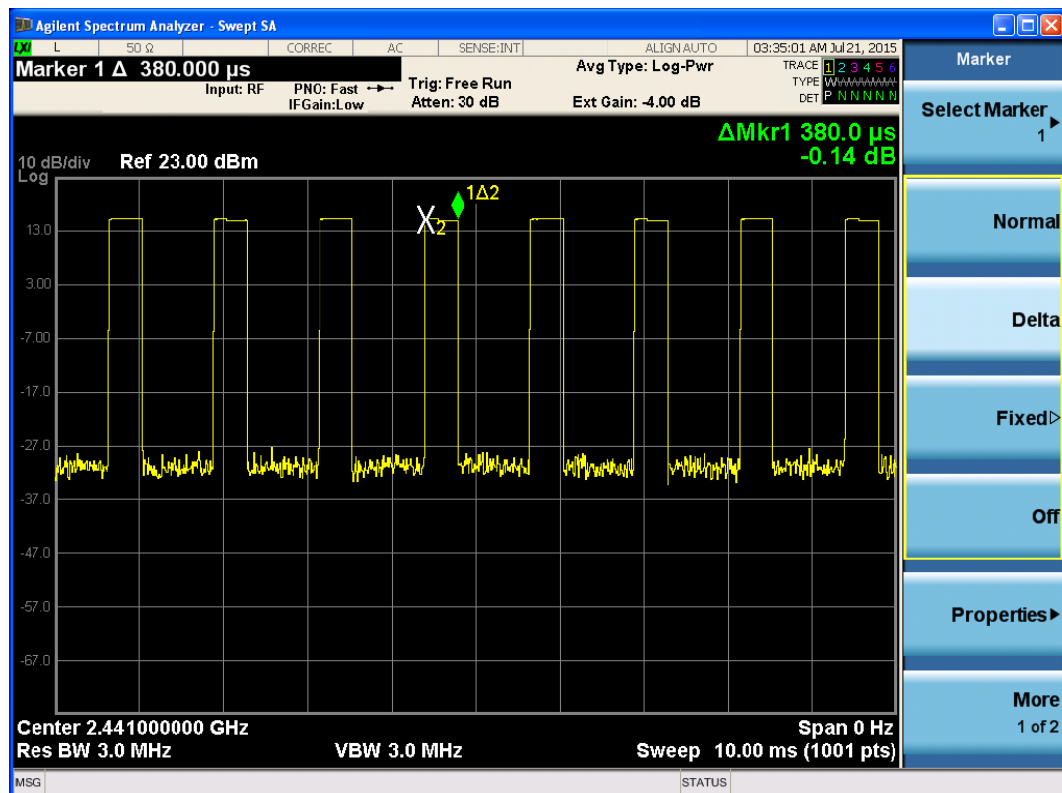
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Test Results:

CH 39

Packet type	hop rate (1/s)	Time slot length(ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH1	1600	0.38	243.20	400	PASS
DH3	533.33	1.64	349.86	400	PASS
DH5	320	2.88	368.64	400	PASS
2DH1	1600	0.38	243.20	400	PASS
2DH3	533.33	1.63	347.73	400	PASS
2DH5	320	2.88	368.64	400	PASS
3DH1	1600	0.39	249.60	400	PASS
3DH3	533.33	1.64	349.86	400	PASS
3DH5	320	2.88	368.64	400	PASS

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

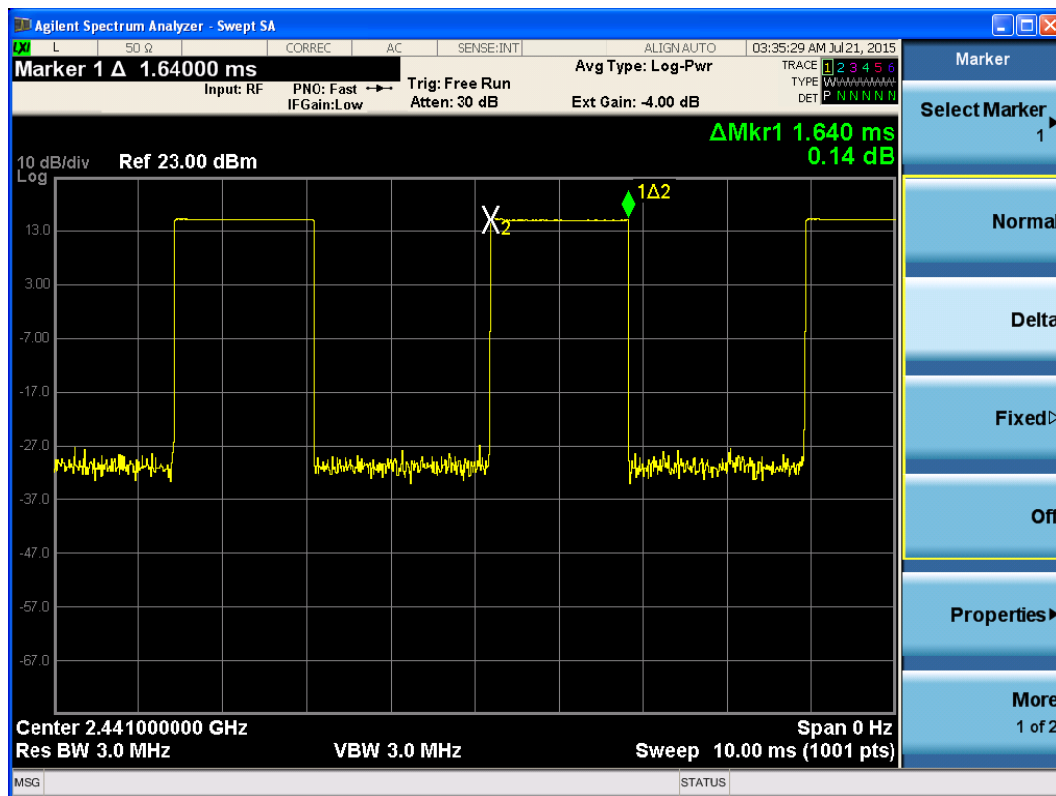


Carrier frequency (MHz): 2441, DH1

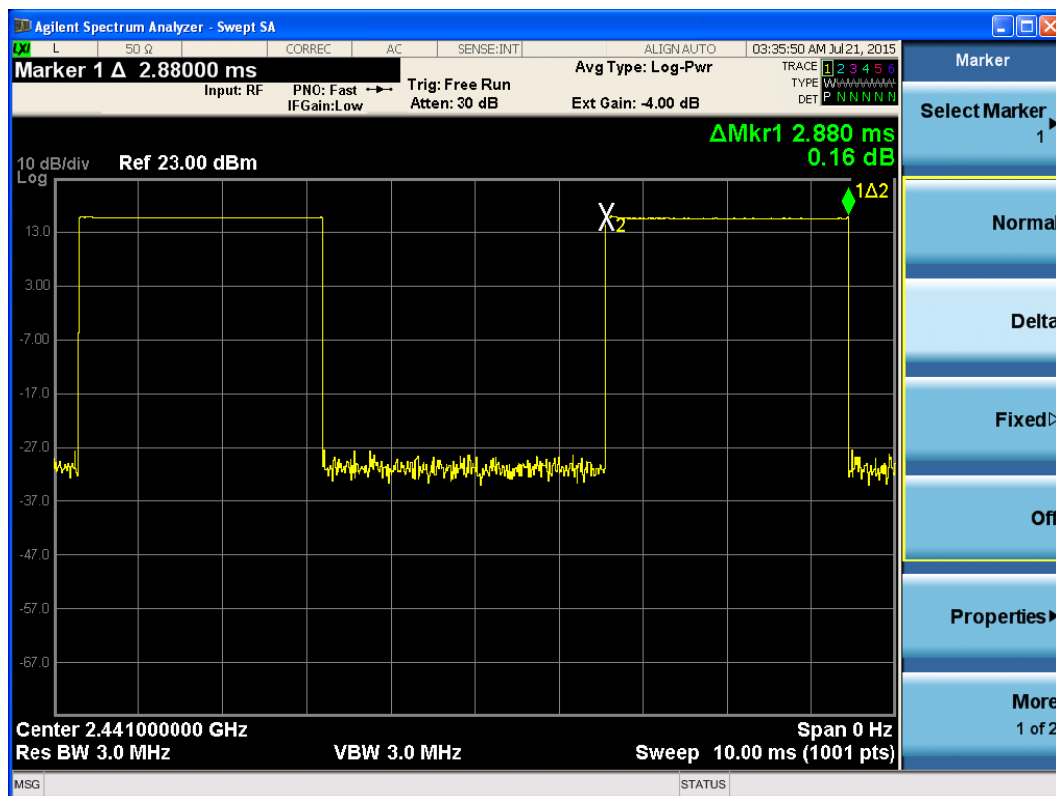
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Carrier frequency (MHz): 2441, DH3

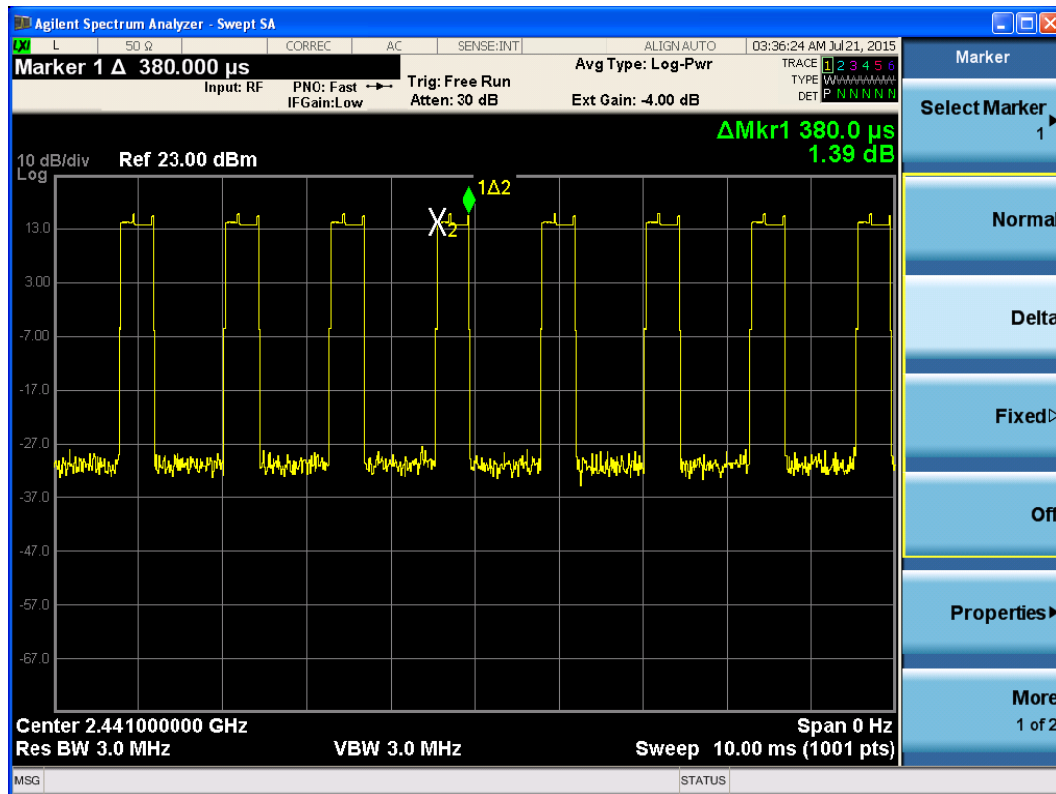


Carrier frequency (MHz): 2441, DH5

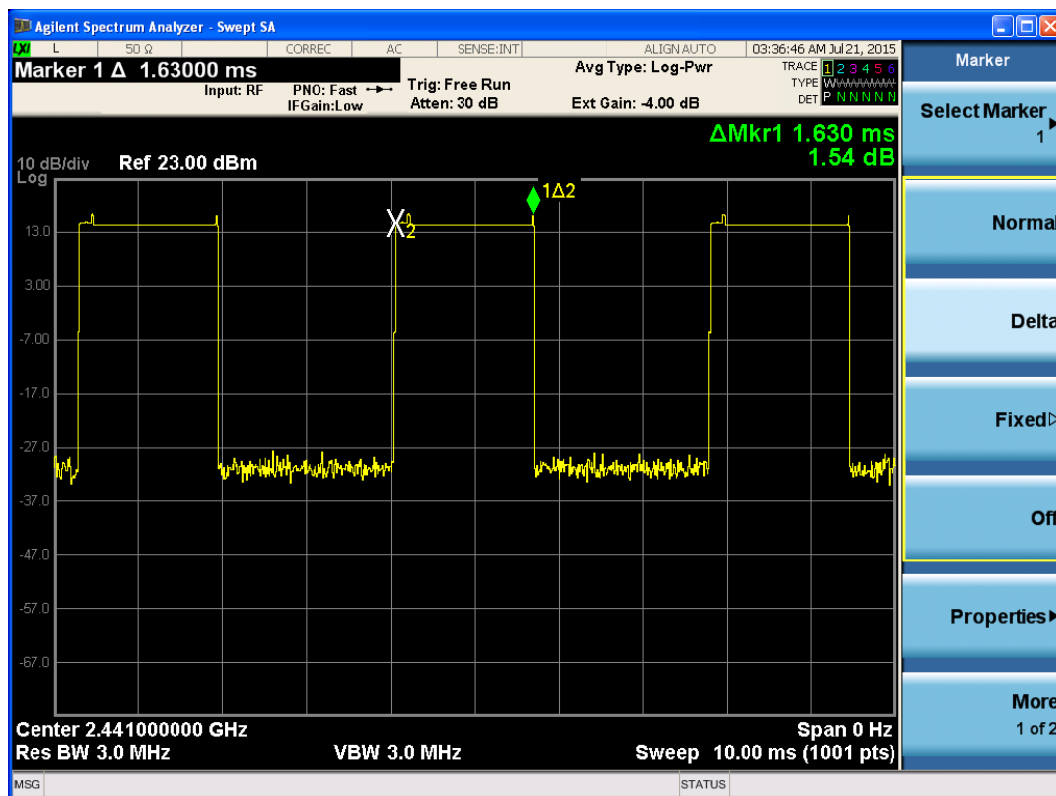
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Carrier frequency (MHz): 2441, 2DH1

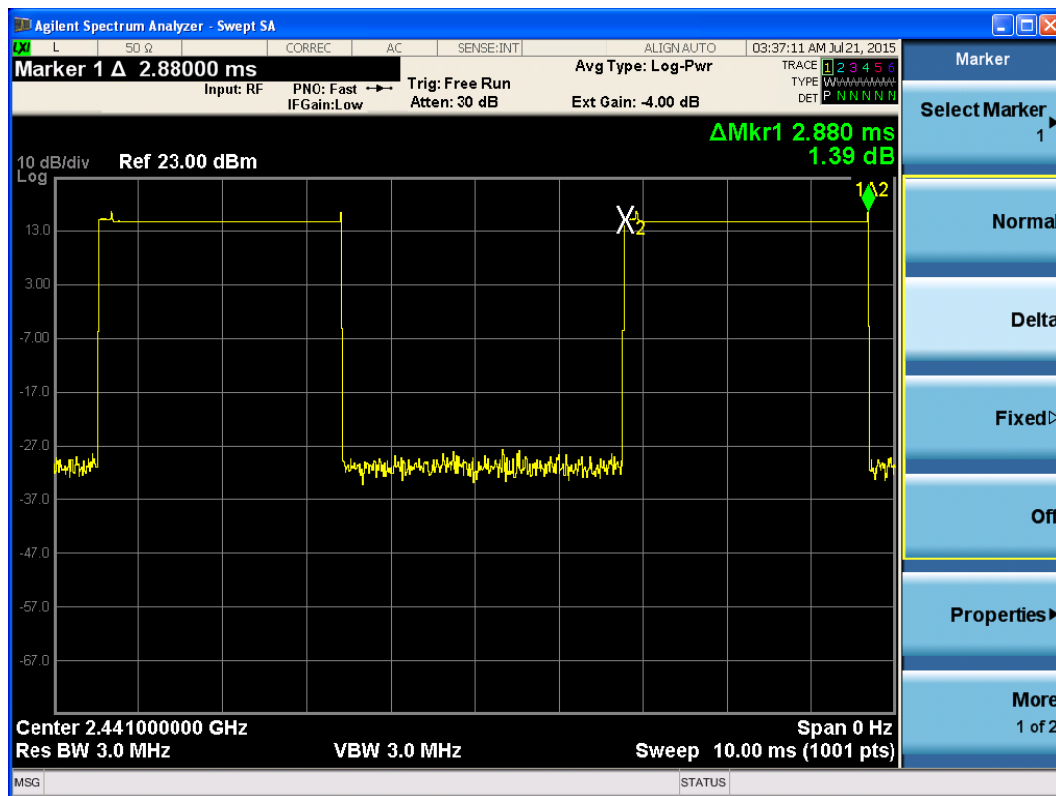


Carrier frequency (MHz): 2441, 2DH3

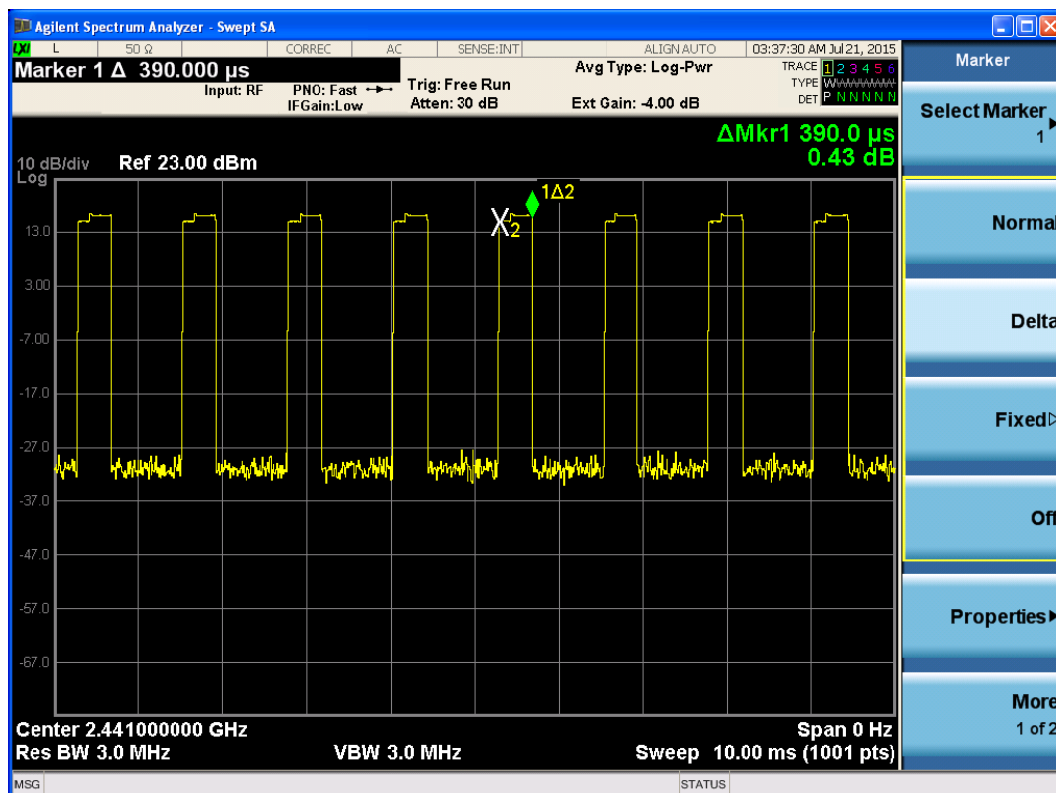
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Carrier frequency (MHz): 2441, 2DH5

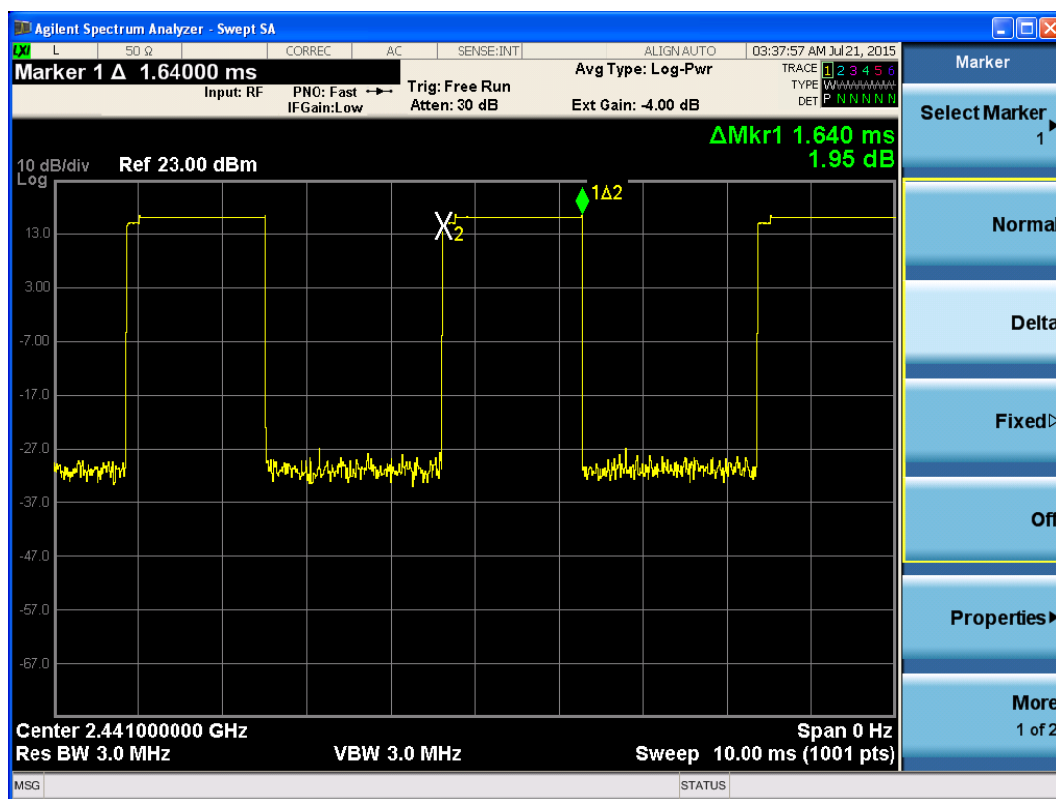


Carrier frequency (MHz): 2441, 3DH1

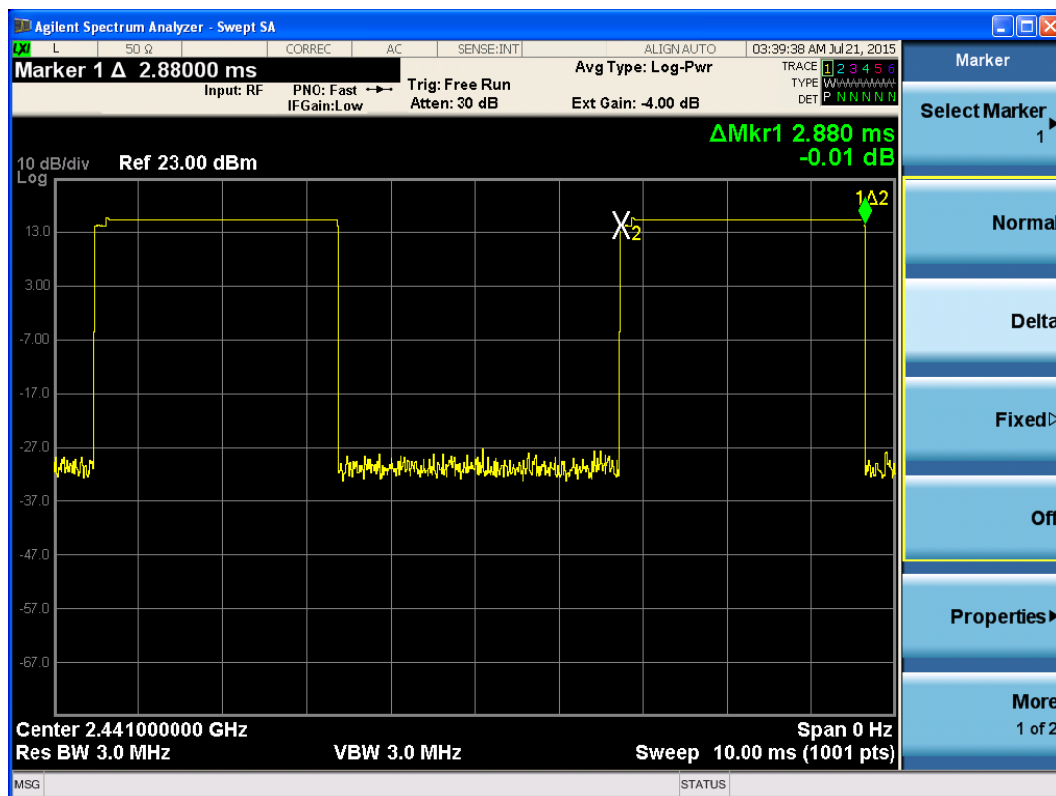
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Carrier frequency (MHz): 2441, 3DH3



Carrier frequency (MHz): 2441, 3DH5

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3.7. Band Edge Compliance

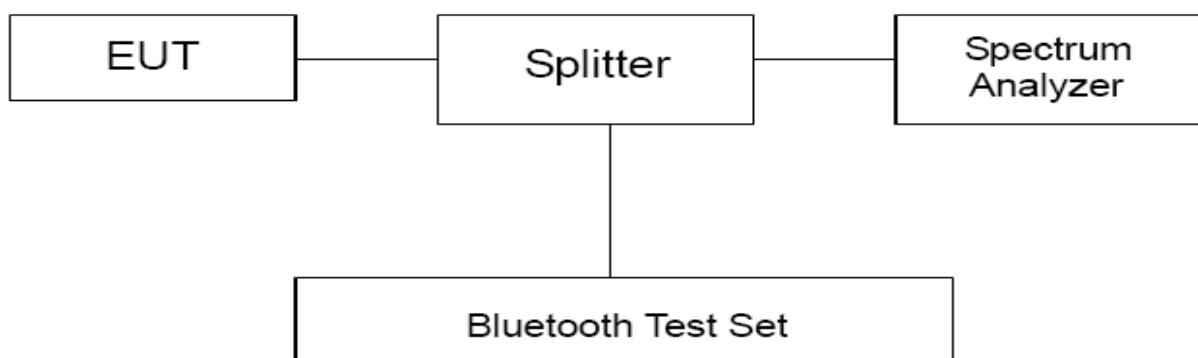
Ambient condition

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 lowest and highest channels were measured. The peak detector is used. RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. EUT test for Hopping On mode and Hopping Off 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.”

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

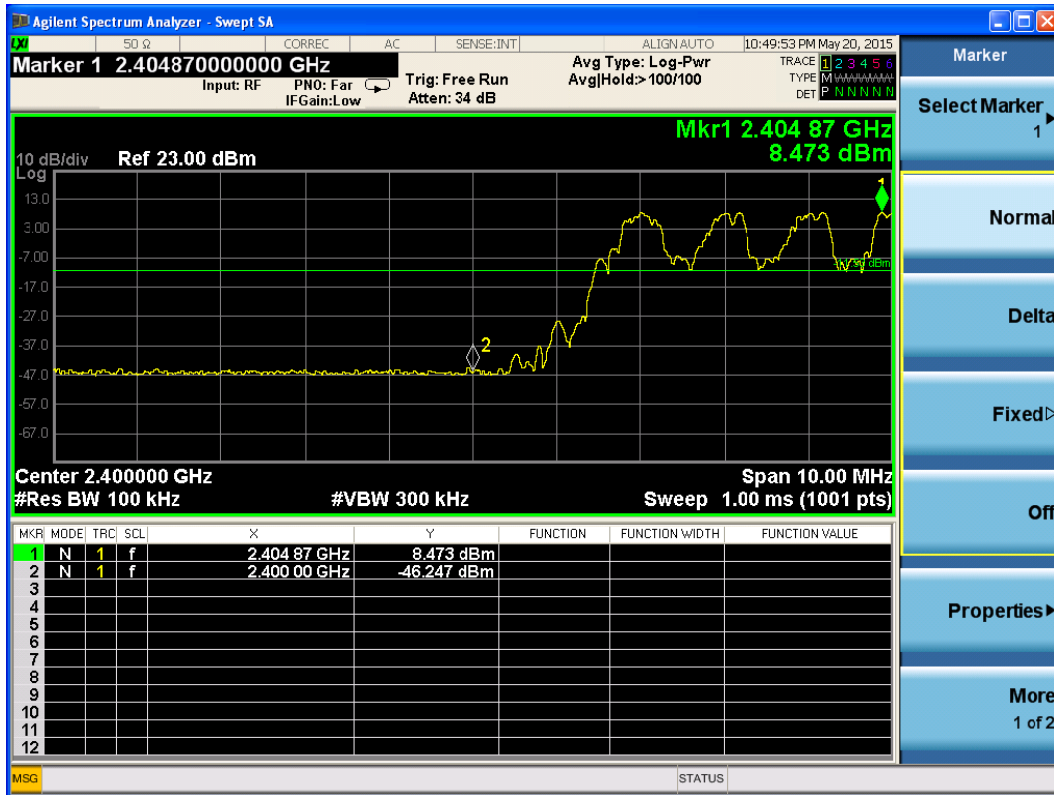
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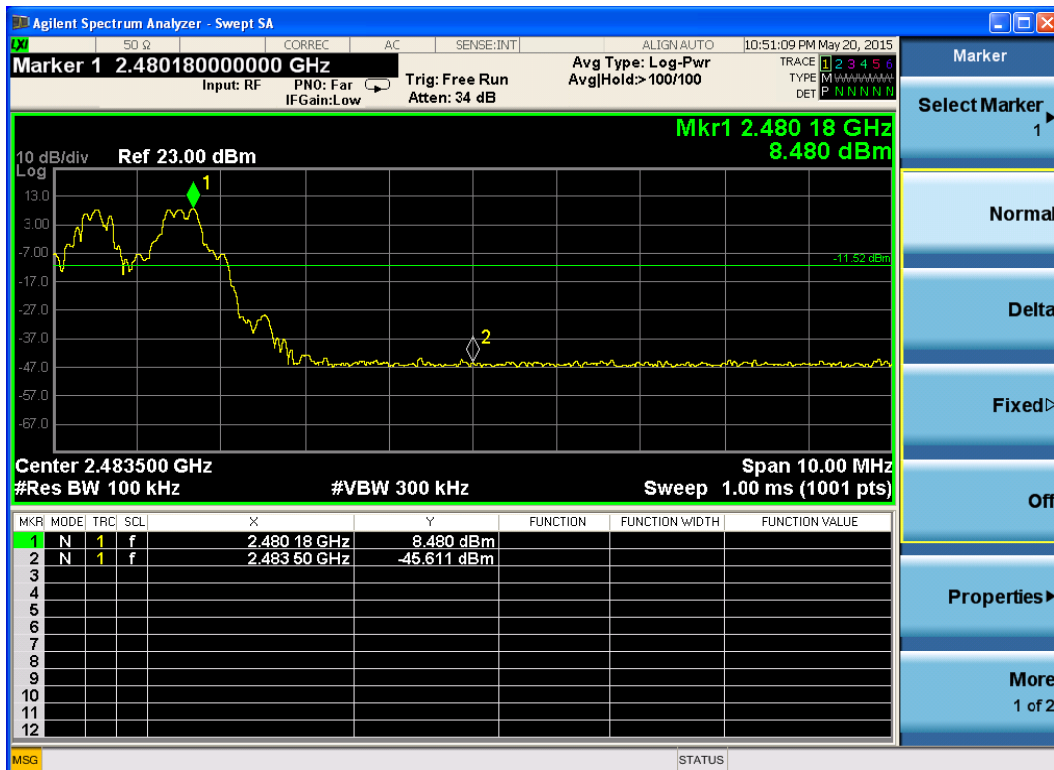
Test Results: PASS

Hopping On-DH5-



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

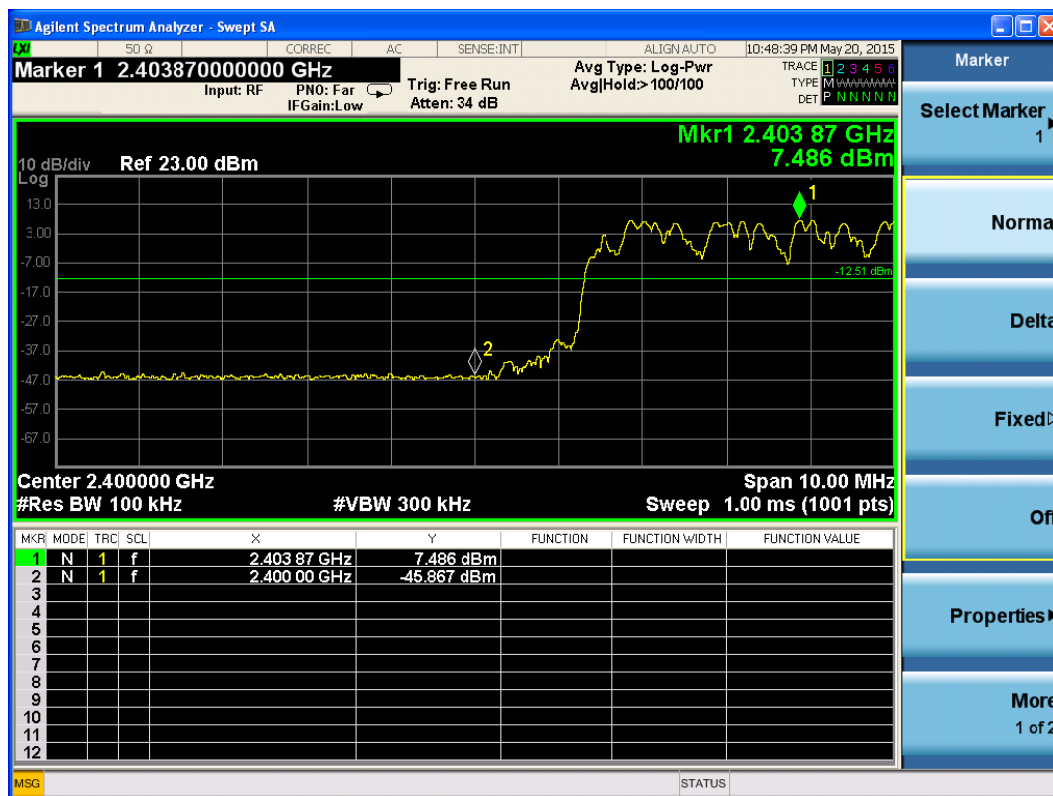
Channel No.:78

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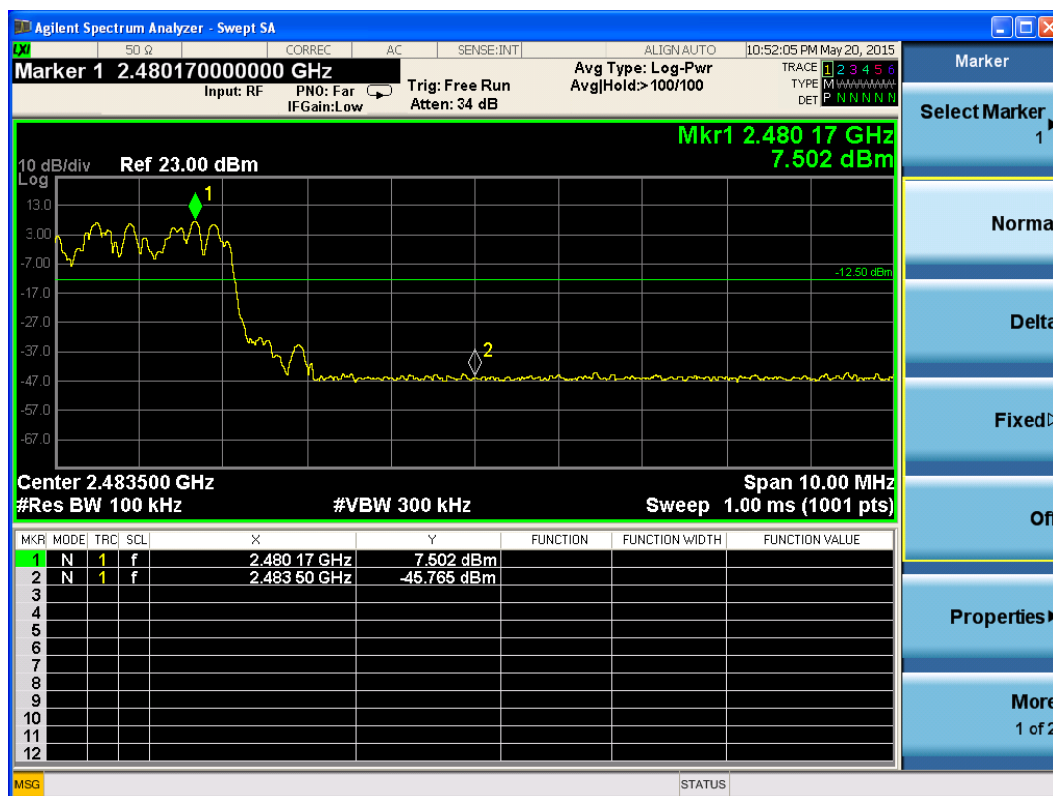
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Hopping On-2DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

Channel No.:78

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Hopping On-3DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

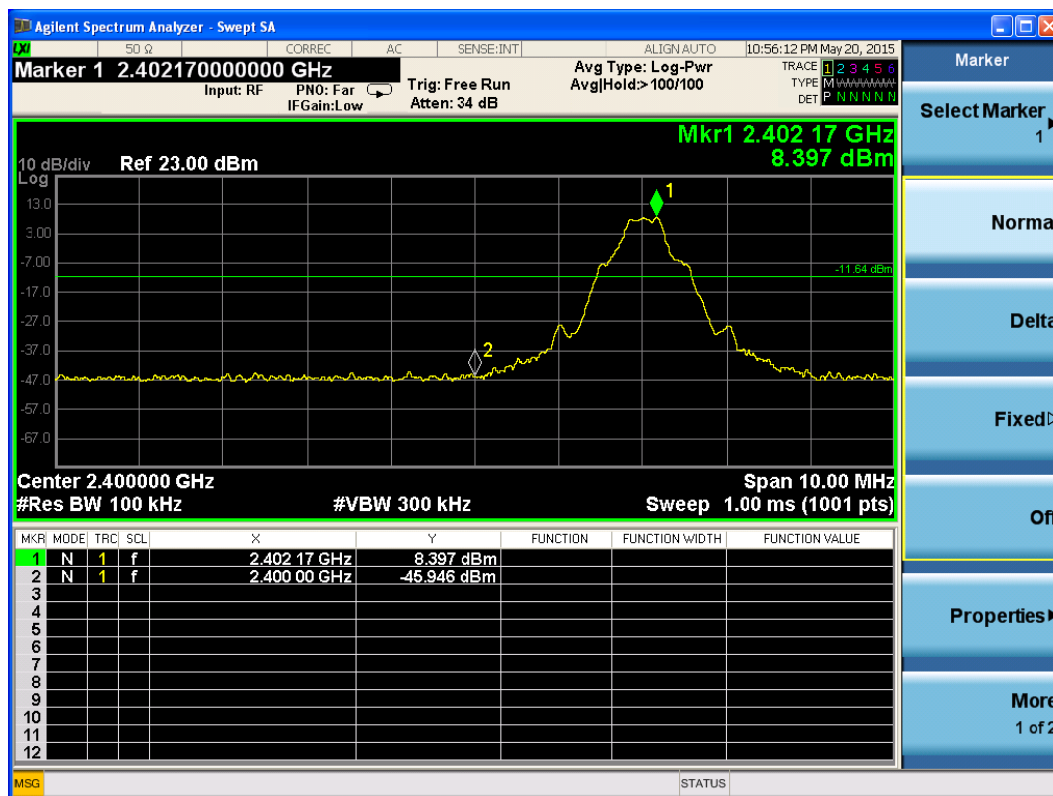
Channel No.:78

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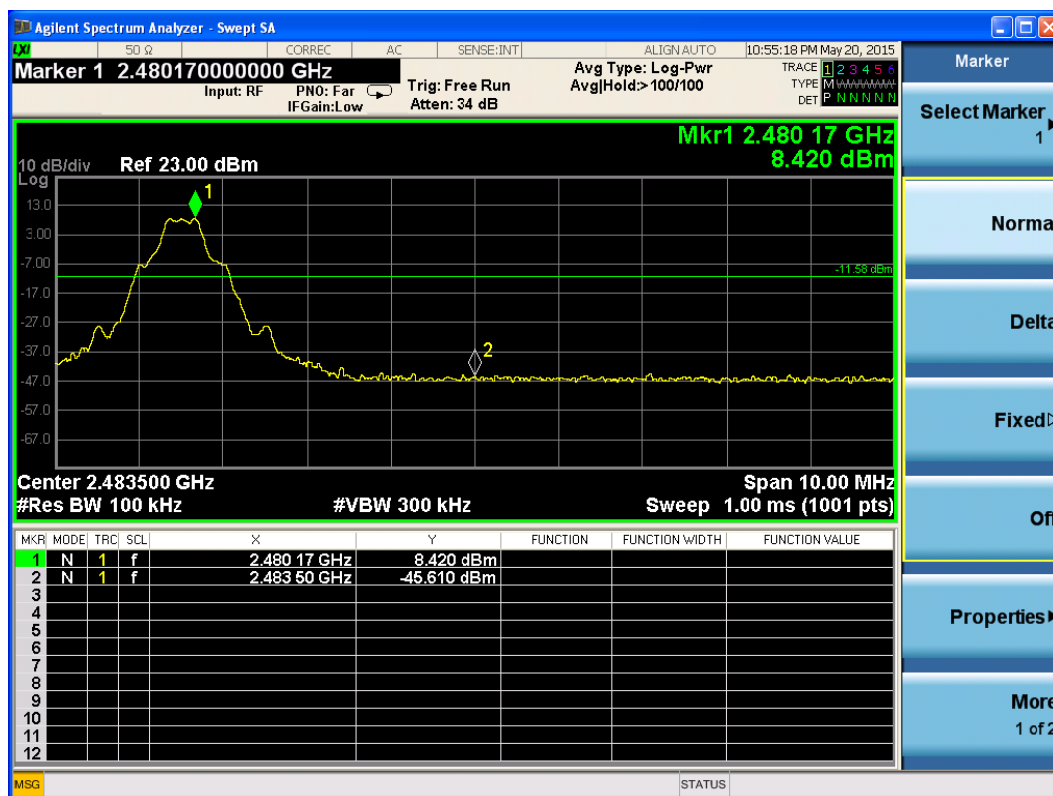
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Hopping Off-DH5-



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

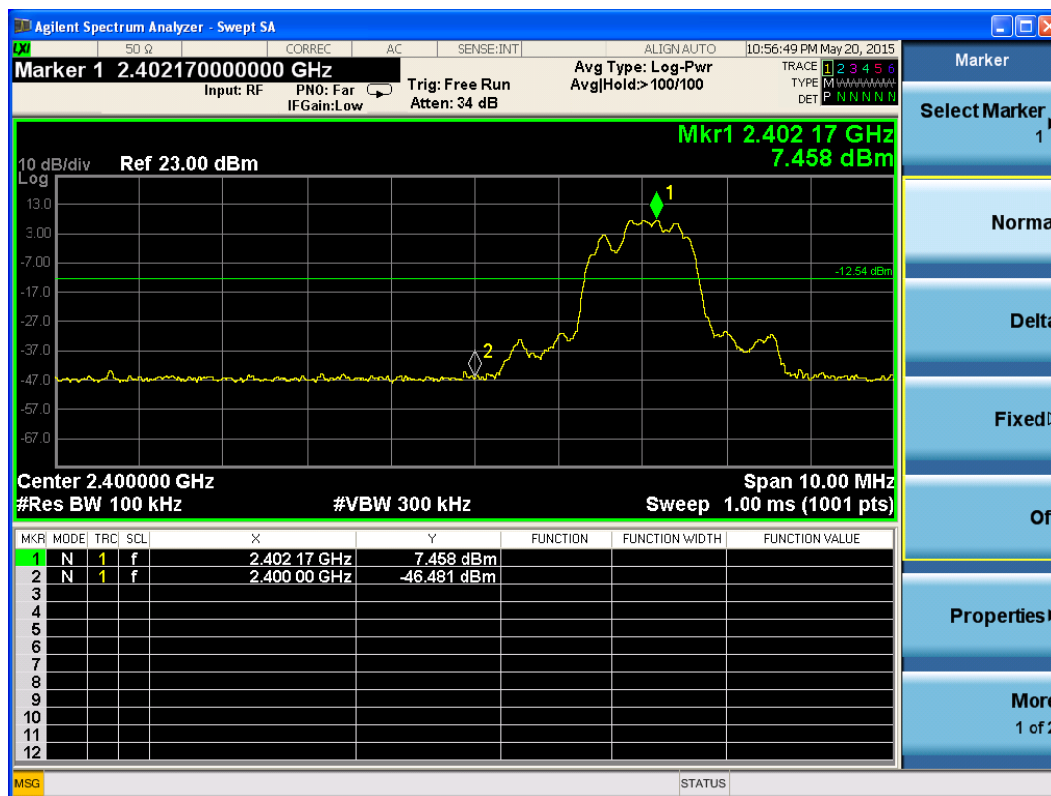
Channel No.:78

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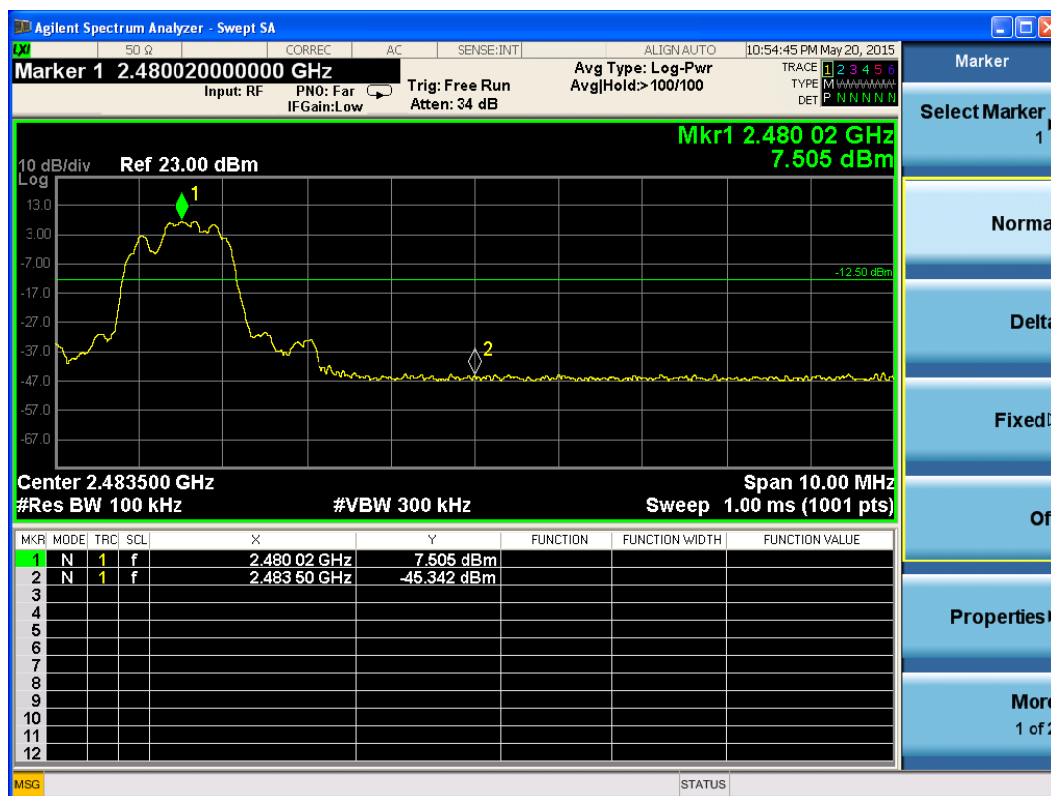
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Hopping Off-2DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

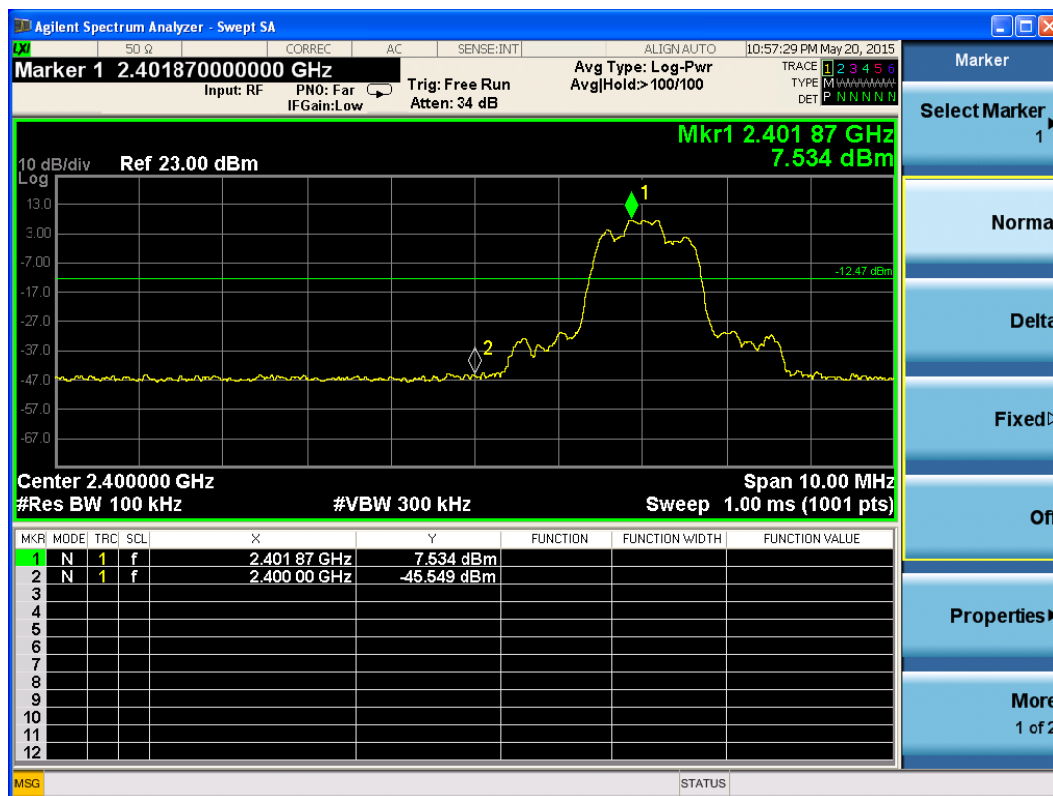
Channel No.:78

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Report No.: RXA1505-0075RF03R1

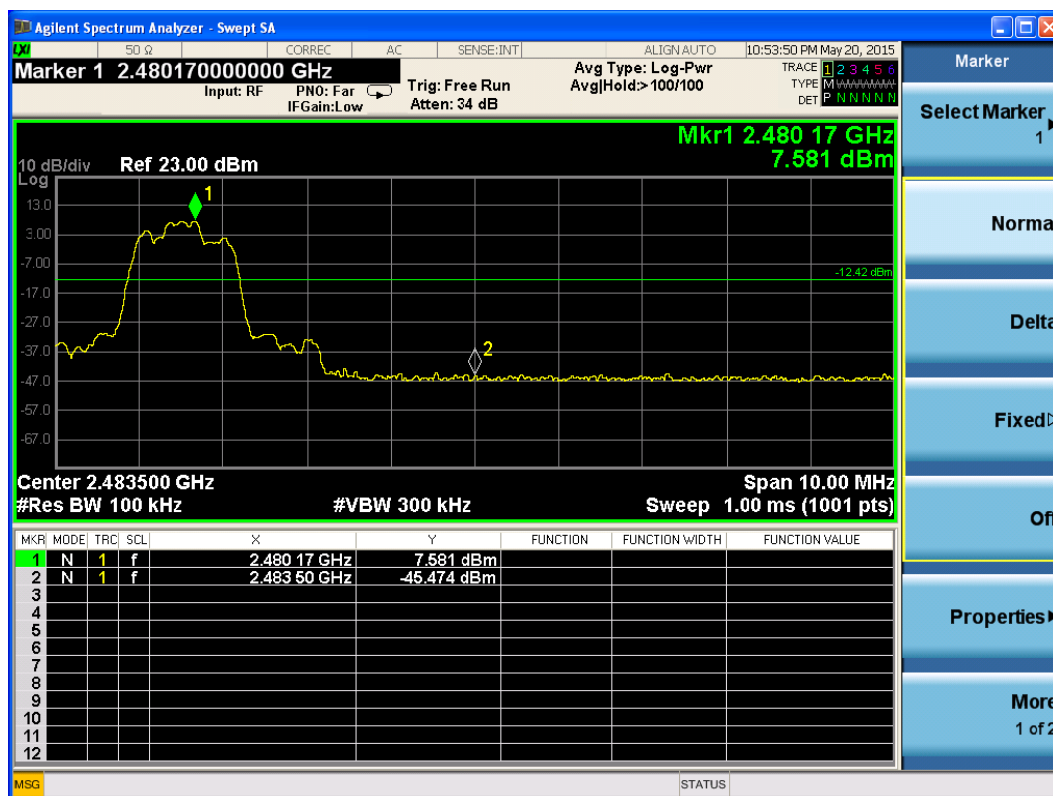
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Hopping Off-3DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

Channel No.:78

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3.8. 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.

Set the spectrum analyzer in the following:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

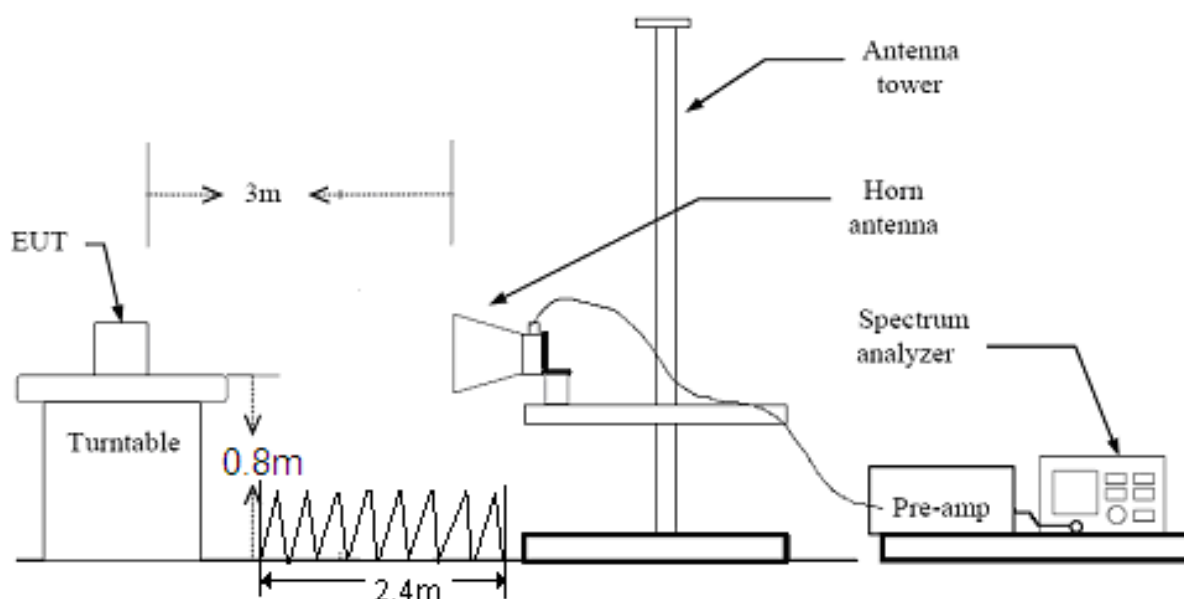
(b) The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.

If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak- average correction factor, derived from the appropriate duty cycle calculation.

This setting method can refer to **DA00-705**.

The test is in transmitting mode. The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis) and docking mode. The worst emission was found in stand-up position (Y axis) and the worst case was recorded.

Test setup



Note: Area side:2.4mX3.6m

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Limits

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

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.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

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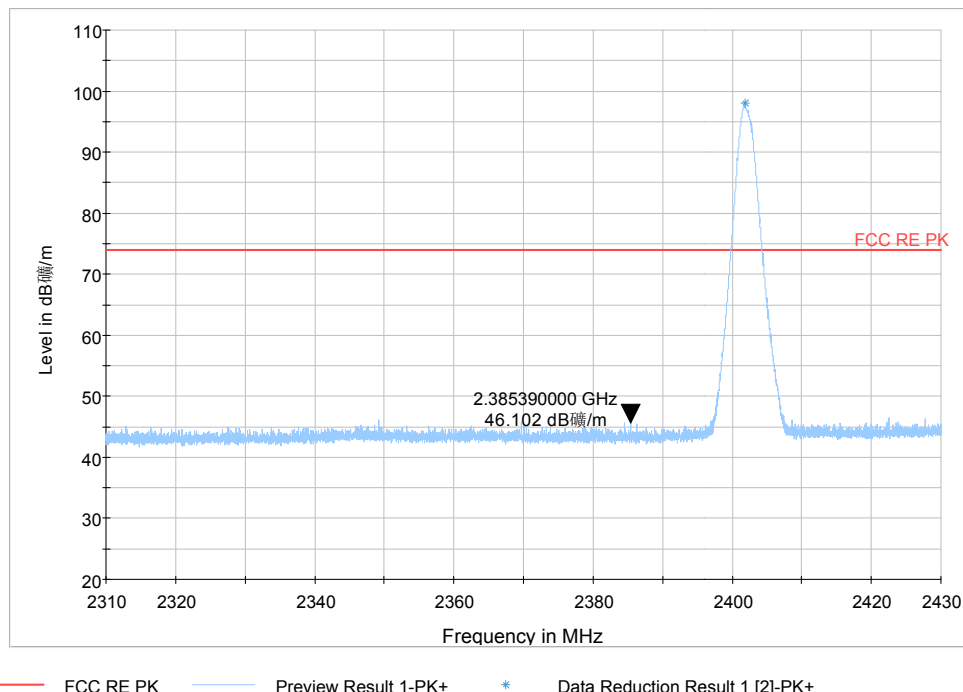
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Test Results:

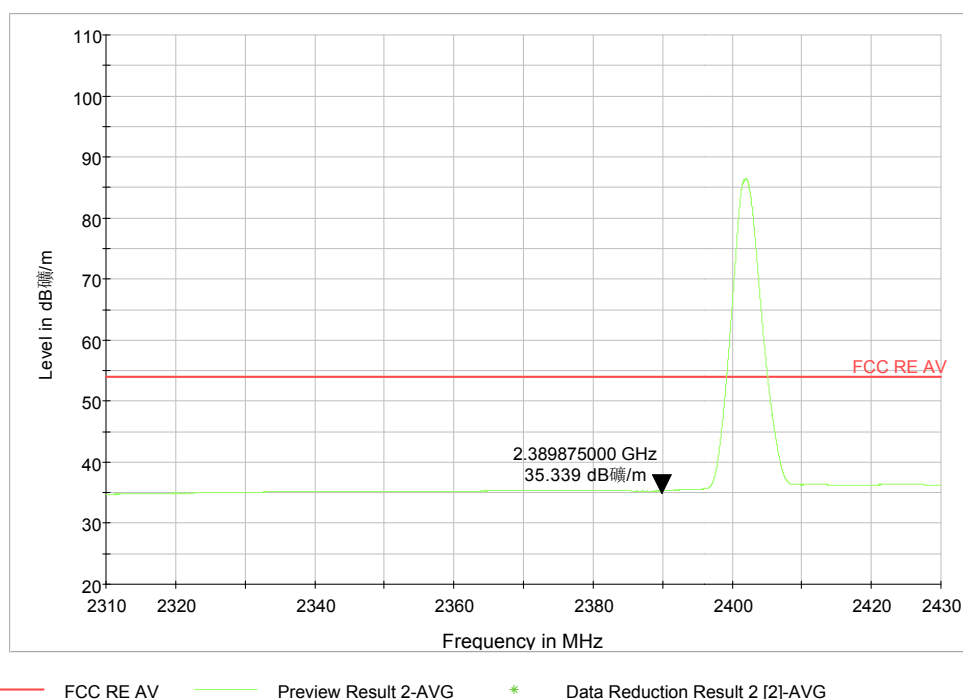
EDR- Channel 0



lower band edge Peak-CH 0

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)



lower band edge average-CH 0

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

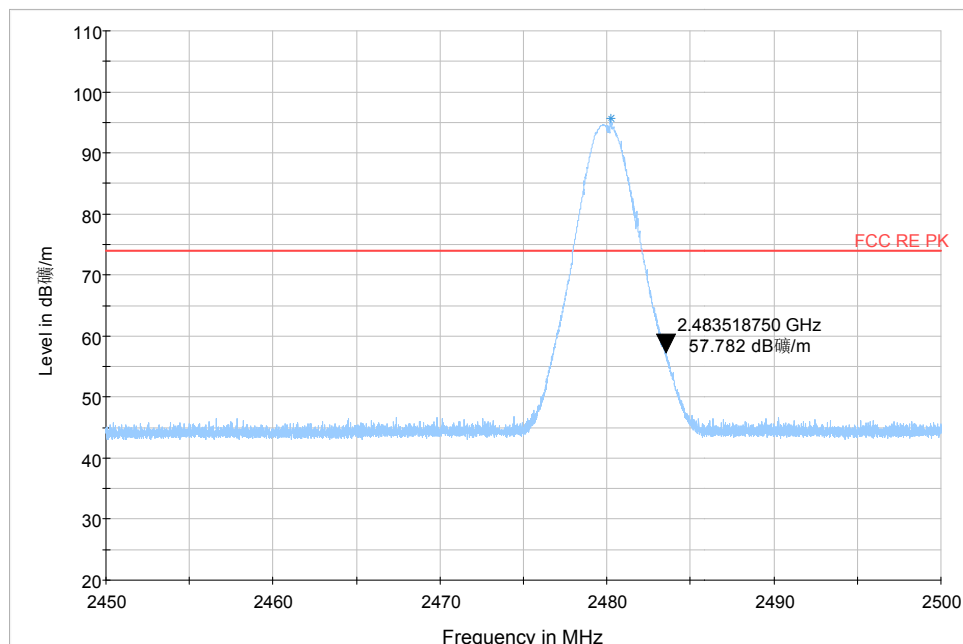
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EDR- Channel 78

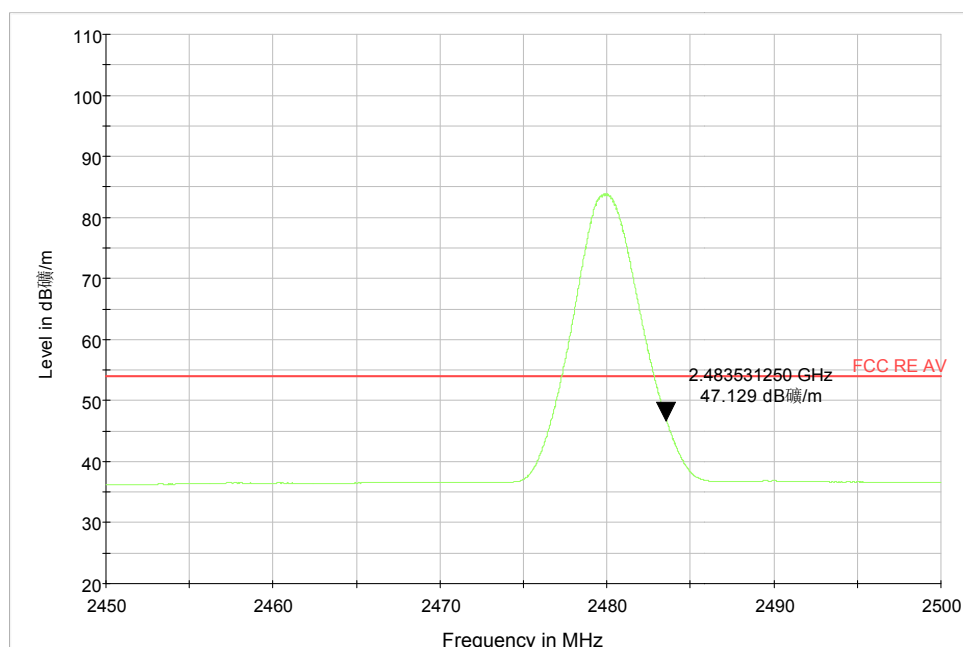


— FCC RE PK — Preview Result 1-PK+ * Data Reduction Result 1 [2]-PK+

Higher band edge Peak-CH 78

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)



— FCC RE AV — Preview Result 2-AVG * Data Reduction Result 2 [2]-AVG

Higher band edge average-CH 78

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

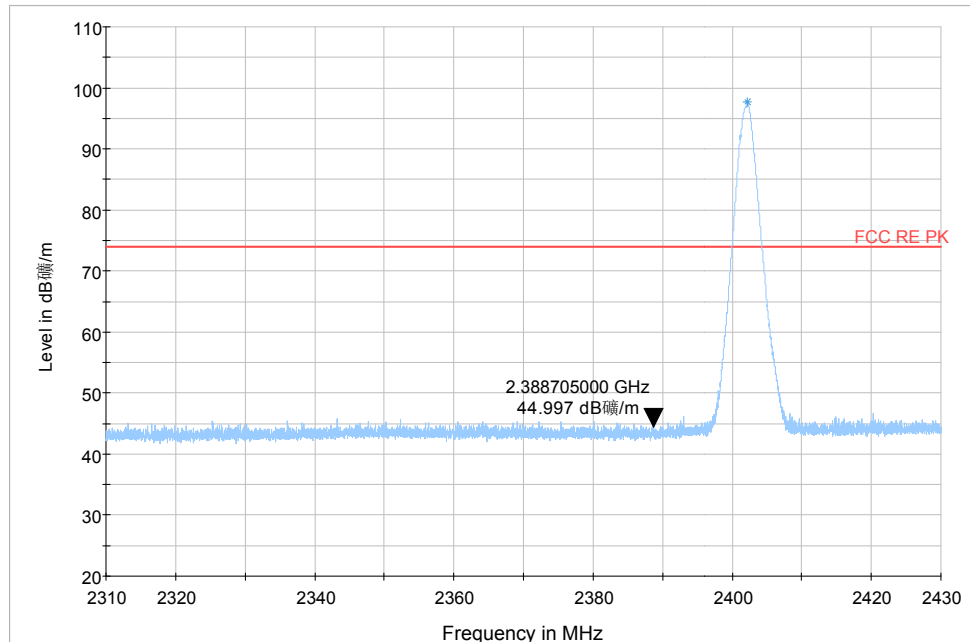
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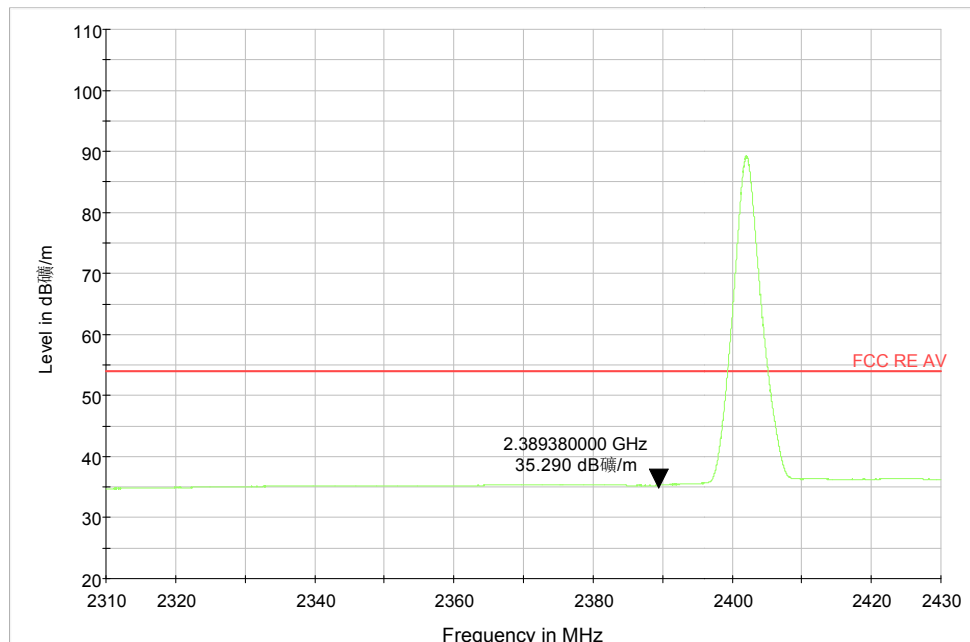
GFSK- Channel 0



lower band edge Peak-CH 0

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)



lower band edge average-CH 0

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

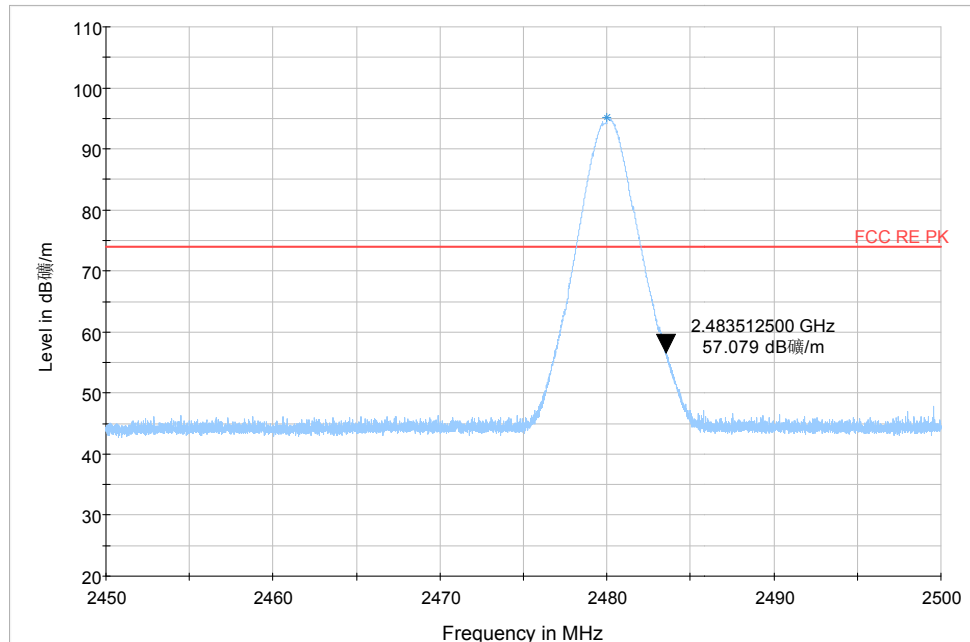
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GFSK- Channel 78

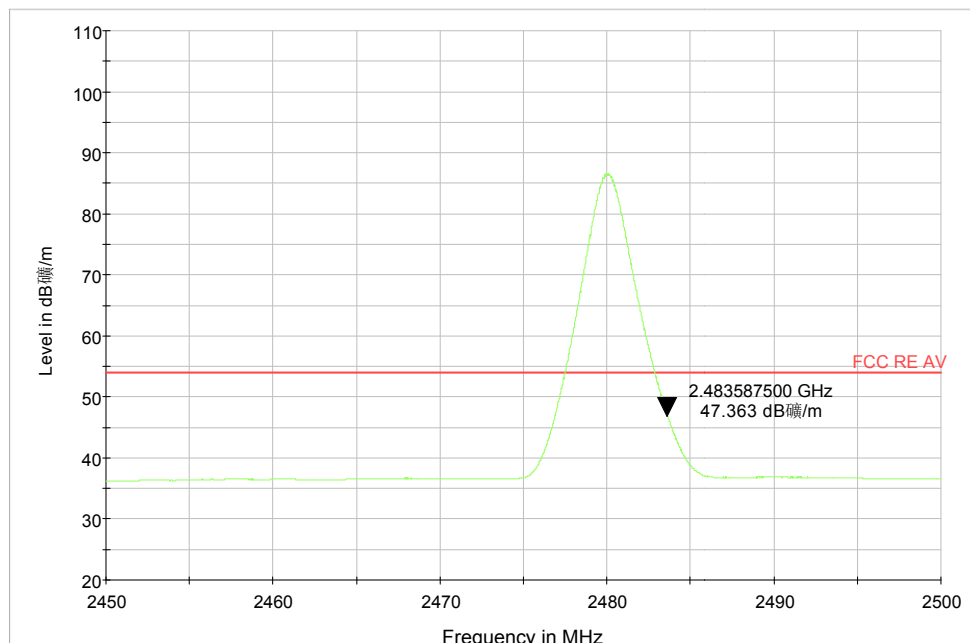


— FCC RE PK — Preview Result 1-PK+ * Data Reduction Result 1 [2]-PK+

Higher band edge Peak-CH 78

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dBm/m) in the test plot =(level in dBuV/m)



— FCC RE AV — Preview Result 2-AVG * Data Reduction Result 2 [2]-AVG

Higher band edge average-CH 78

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier, a font (Level in dBm/m) in the test plot =(level in dBuV/m)

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3.9. Number of hopping Frequency

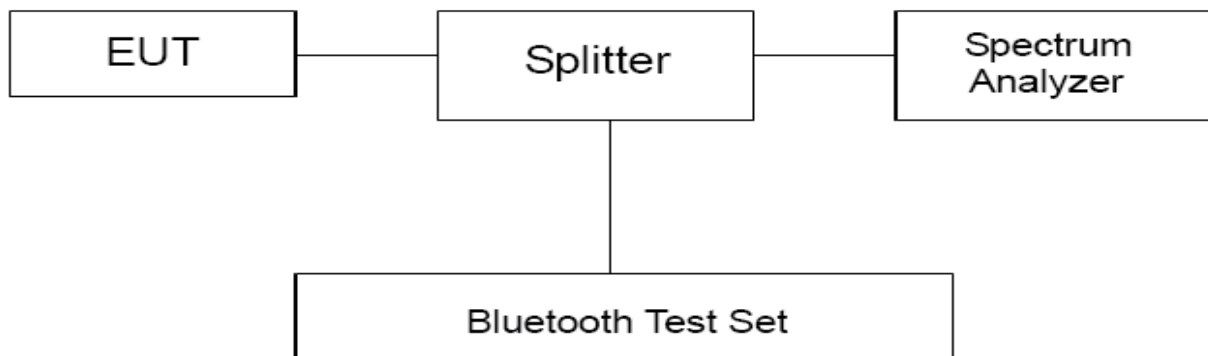
Ambient condition

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. RBW is set to 1 MHz and VBW is set to 3 MHz on spectrum analyzer. 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	≥ 15 channels
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Test Report

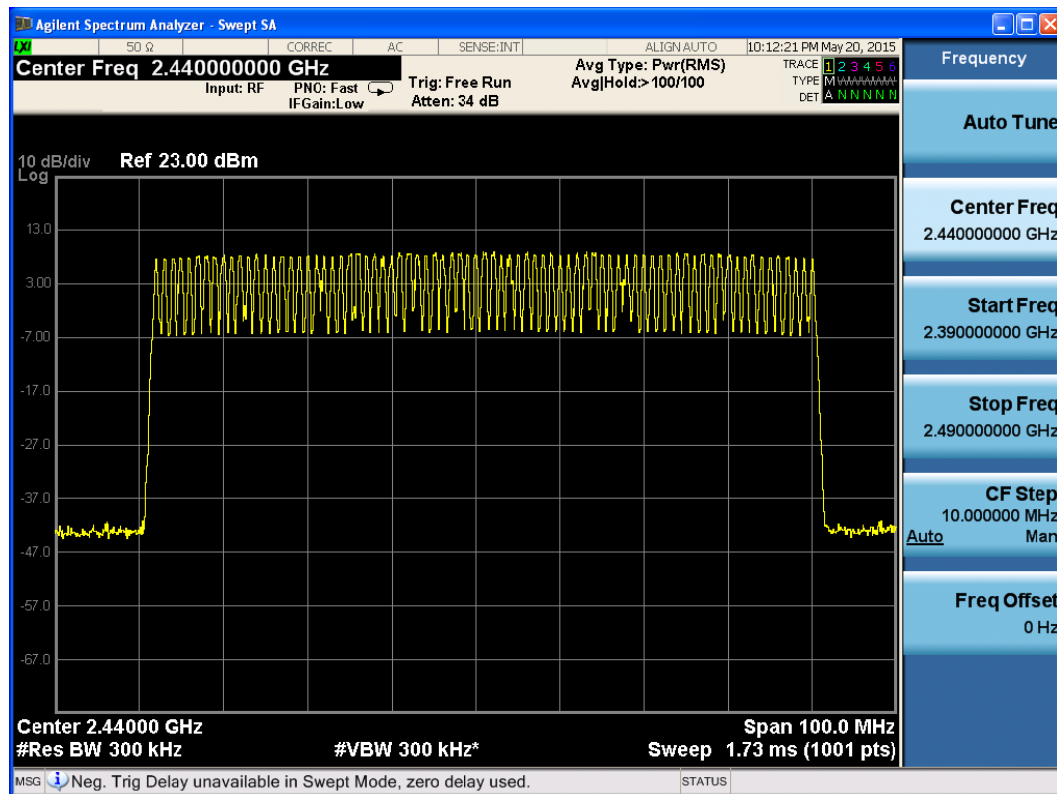
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Test Results:

DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2483.5 MHz

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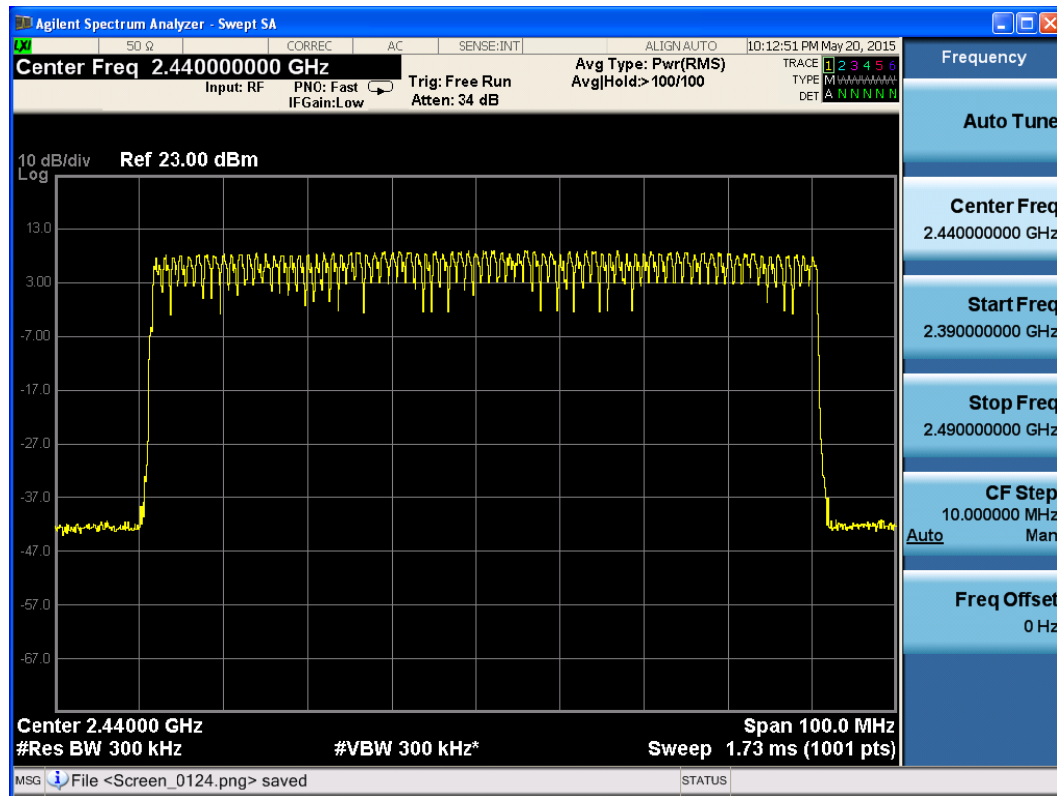
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2DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2483.5 MHz

TA Technology (Shanghai) Co., Ltd.

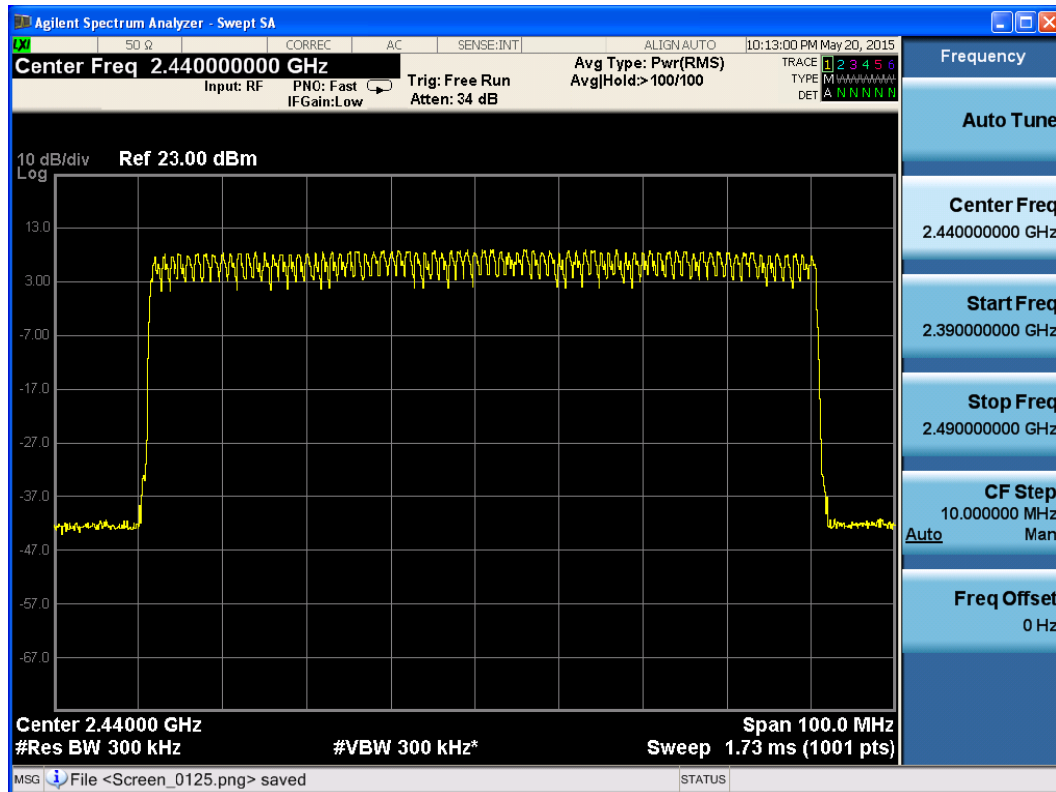
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3DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2483.5 MHz

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3.10. Spurious RF Conducted Emissions

Ambient condition

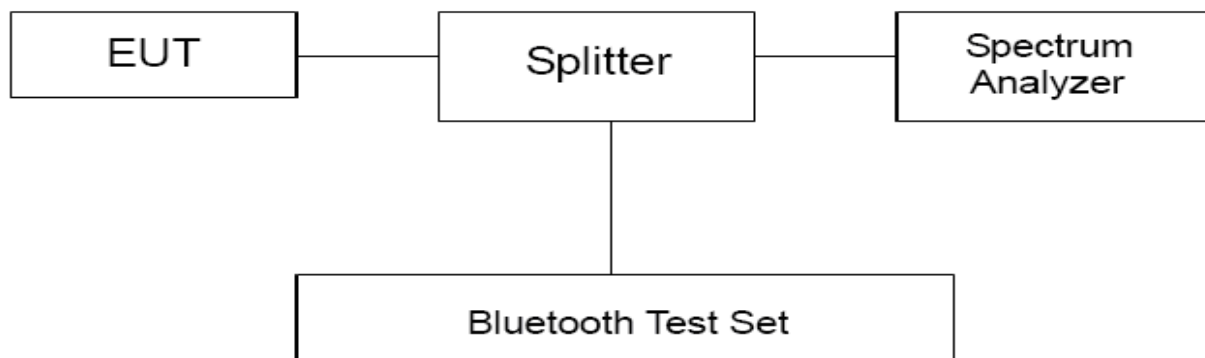
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

The test is in transmitting 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 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	2402	8.7	≤ -11.3
	2441	9.6	≤ -10.4
	2480	9.0	≤ -11
EDR	2402	7.4	≤ -12.6
	2441	8.2	≤ -11.8
	2480	7.6	≤ -12.4

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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

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Test Report

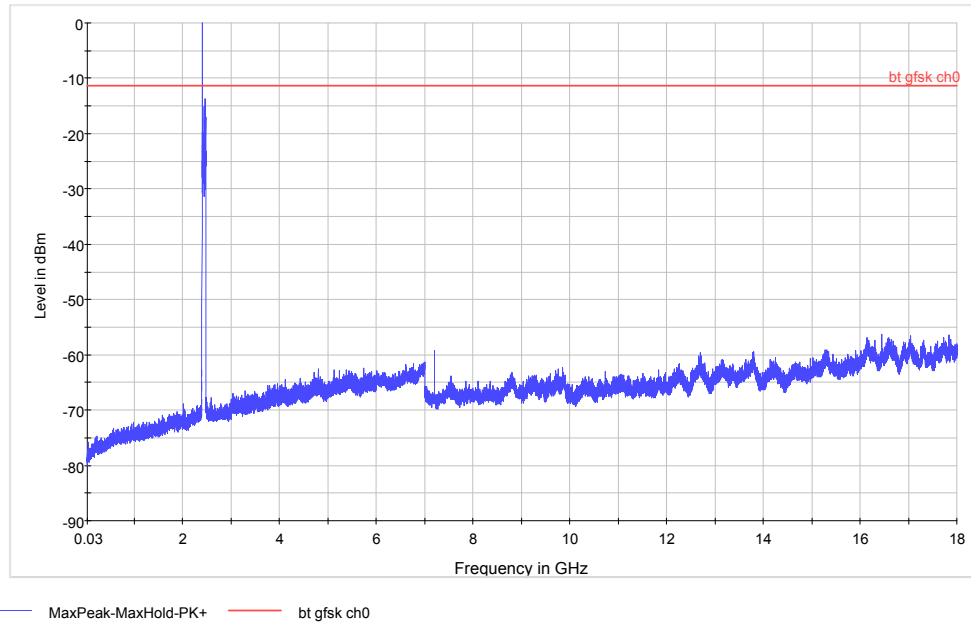
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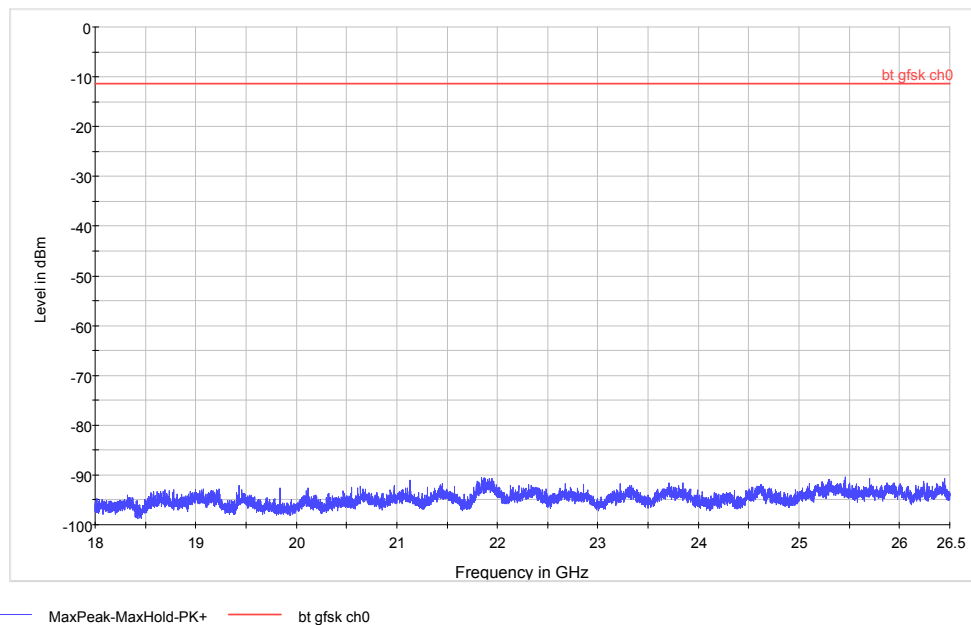
Test Results:

BASIC Rate

DH5-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

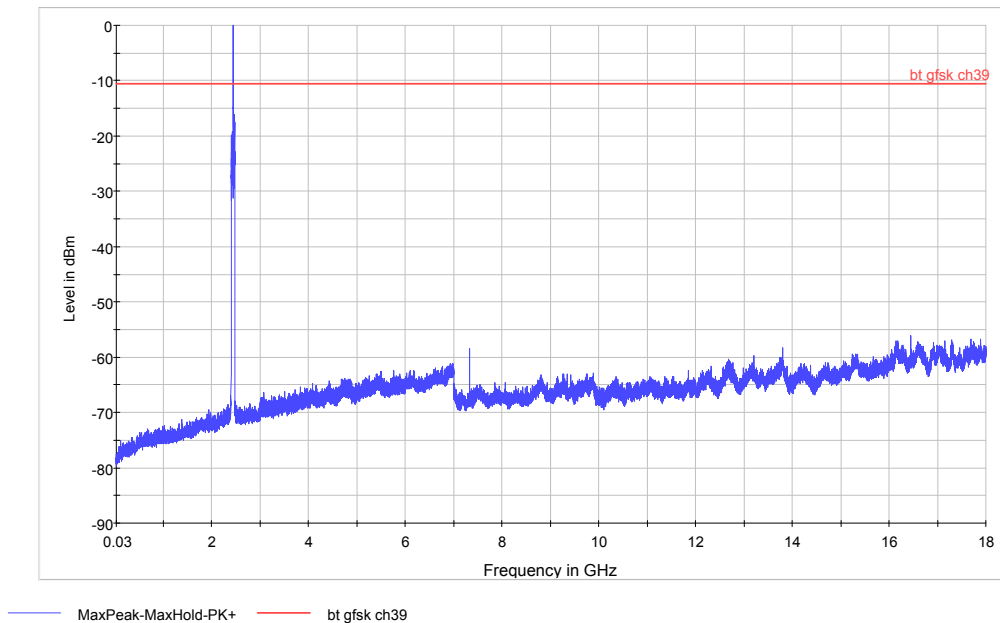
TA Technology (Shanghai) Co., Ltd.

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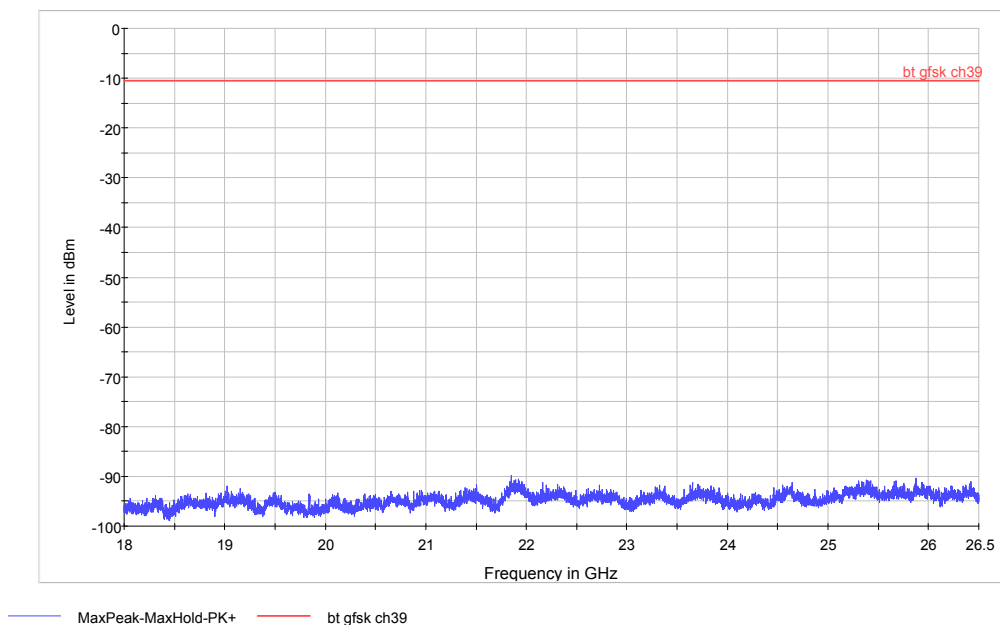
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DH5-CH39:



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

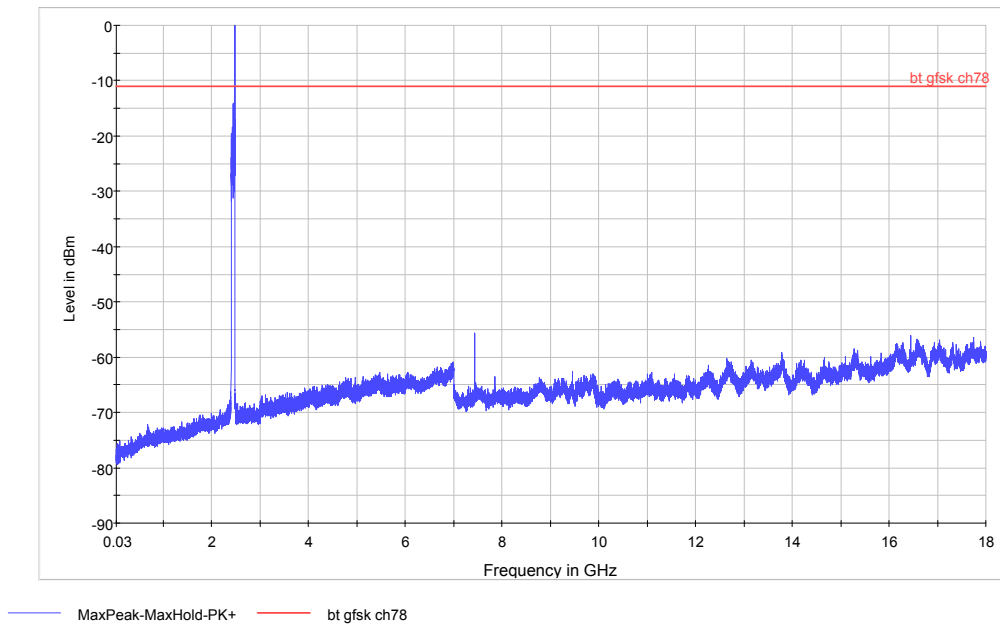
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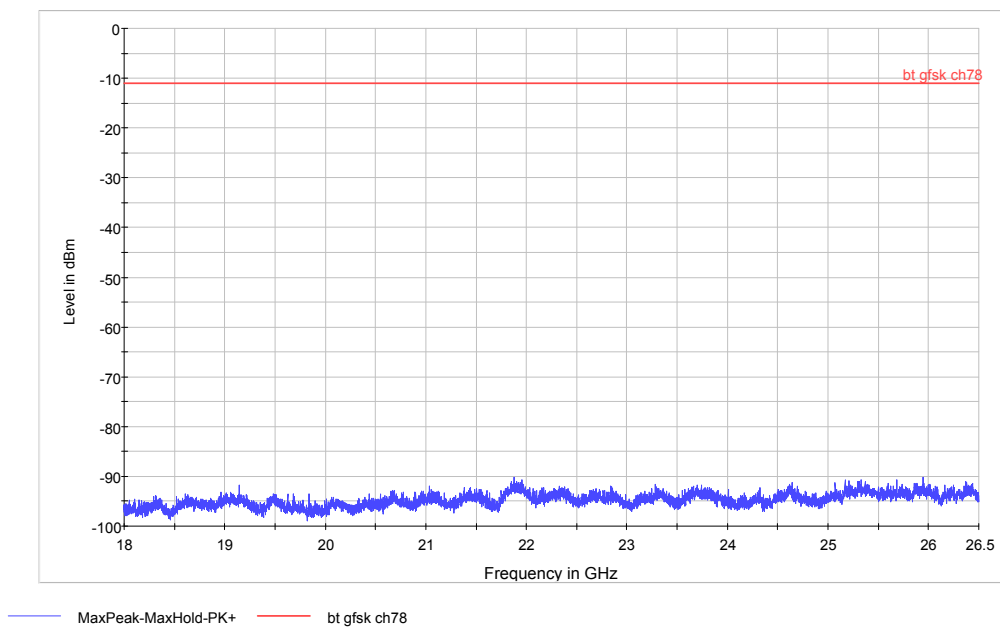
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DH5-CH78:



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

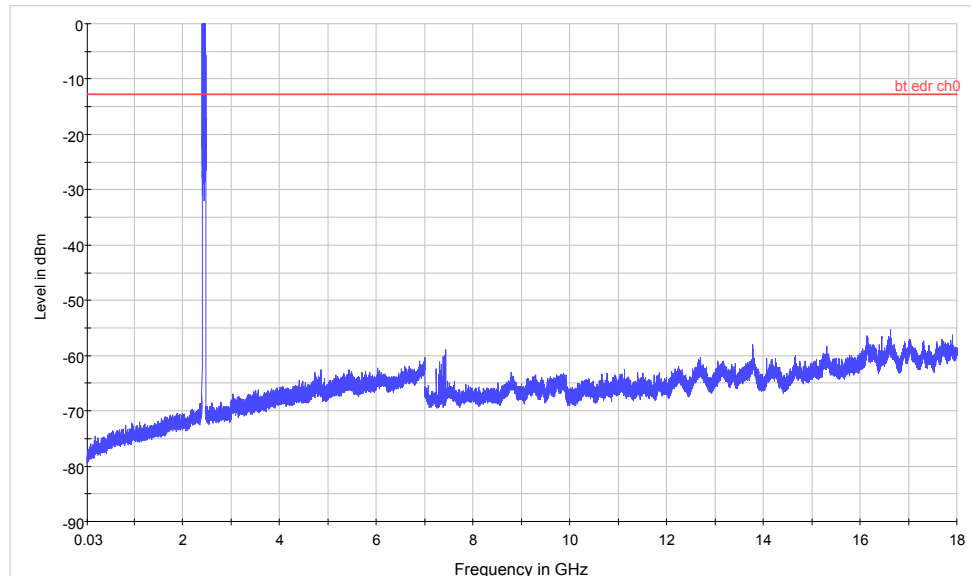
TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RXA1505-0075RF03R1

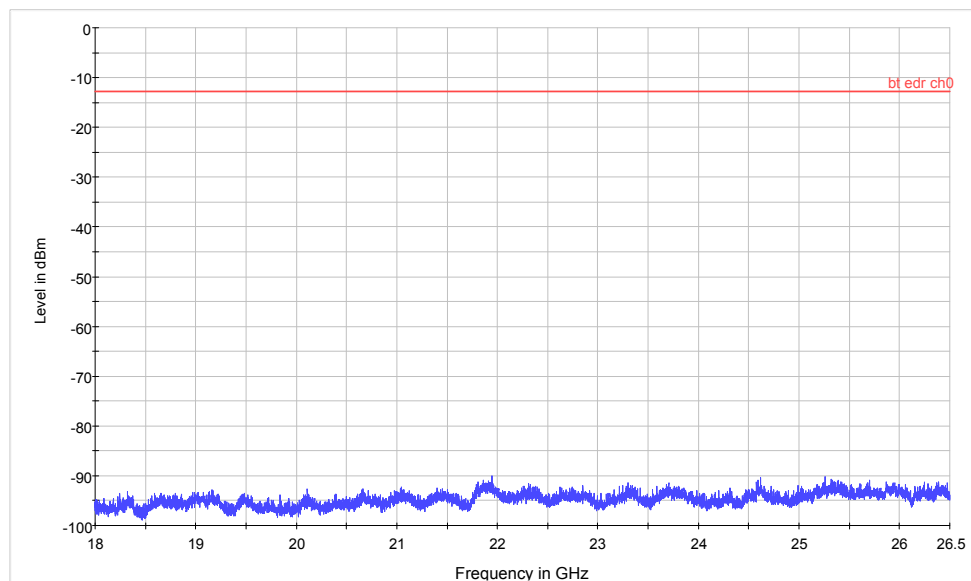
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EDR-CH0:



MaxPeak-MaxHold-PK+ bt edr ch0

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



MaxPeak-MaxHold-PK+ bt edr ch0

Spurious RF conducted emissions from 18GHz to 26.5GHz

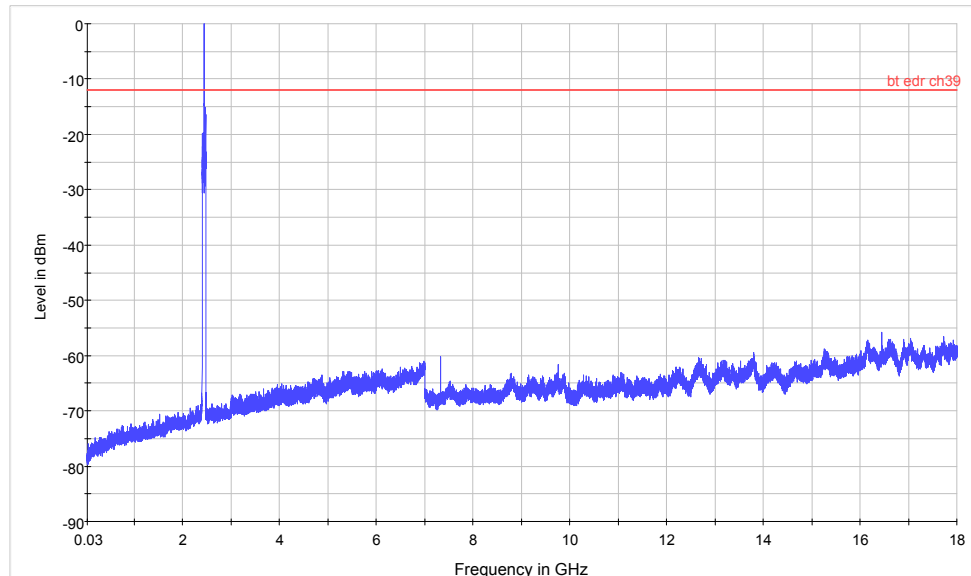
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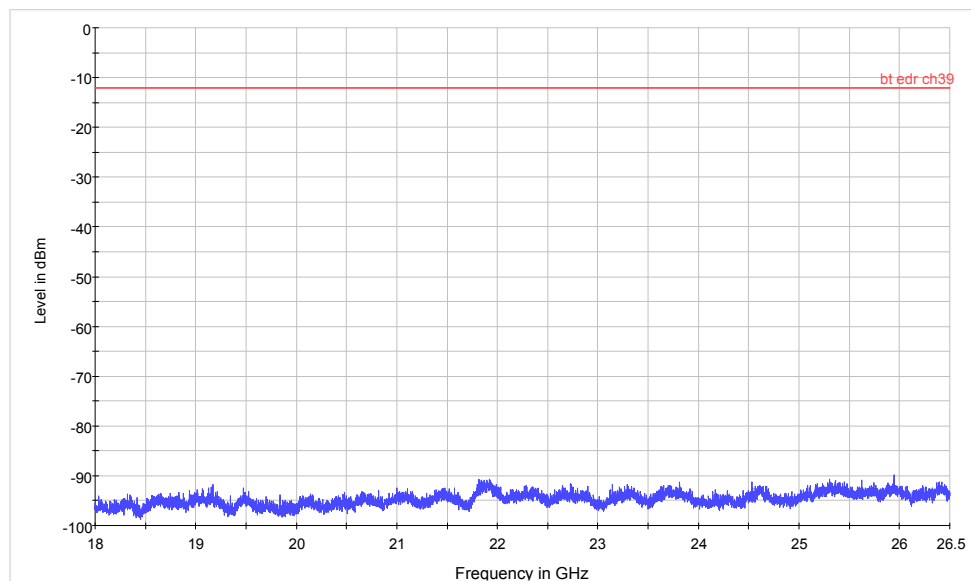
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EDR -CH39:



MaxPeak-MaxHold-PK+ bt edr ch39

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



MaxPeak-MaxHold-PK+ bt edr ch39

Spurious RF conducted emissions from 18GHz to 26.5GHz

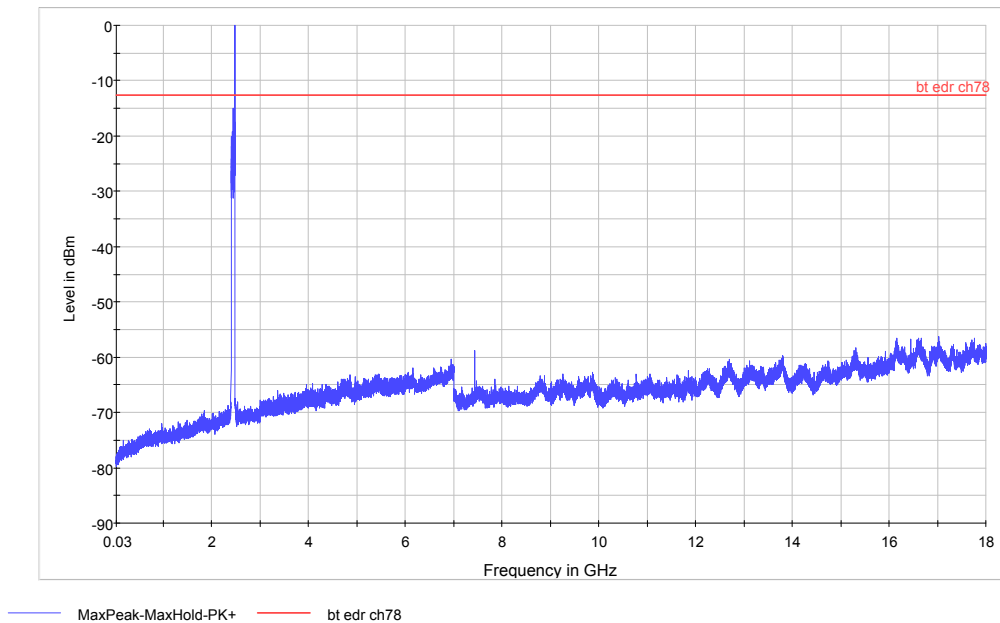
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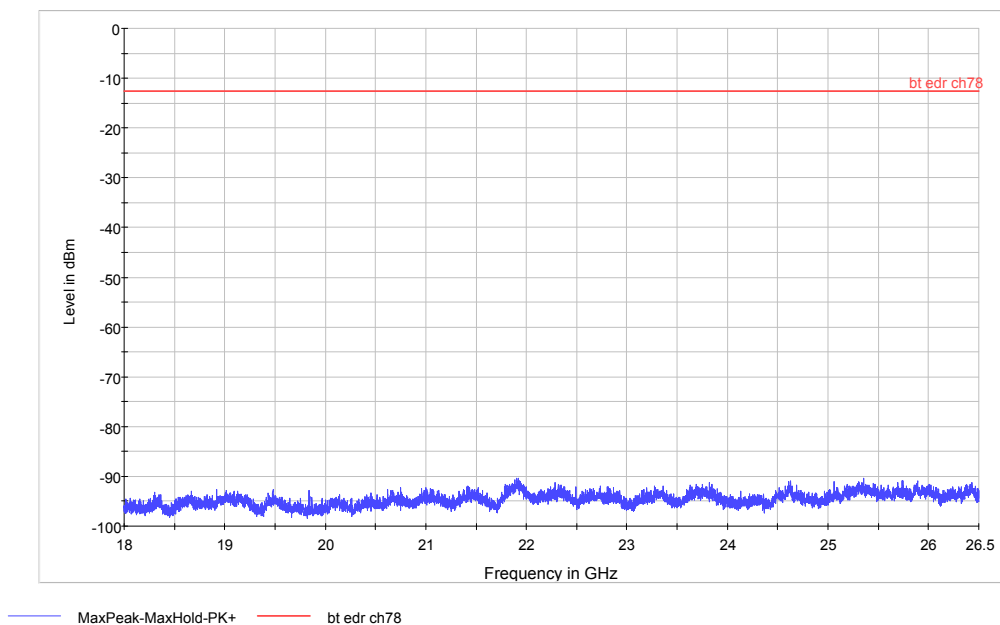
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EDR-CH78:



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

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3.11. 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 C63.4-2009. 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 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, 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.

Set the spectrum analyzer in the following:

Below 1GHz (detector: Peak and Quasi-Peak)

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz(detector: Peak):

(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

The test is in transmitting mode.

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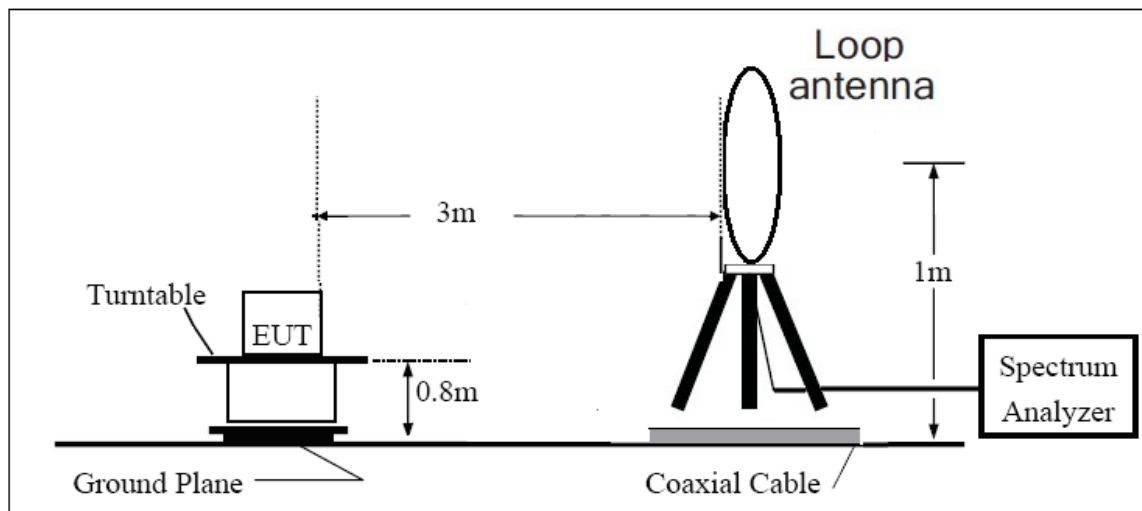
Test Report

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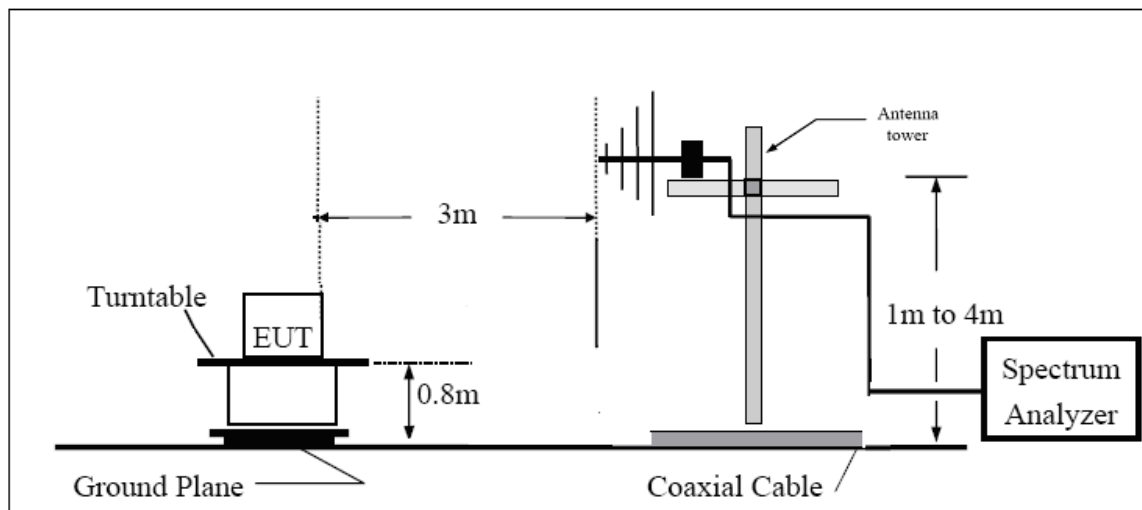
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Test setup

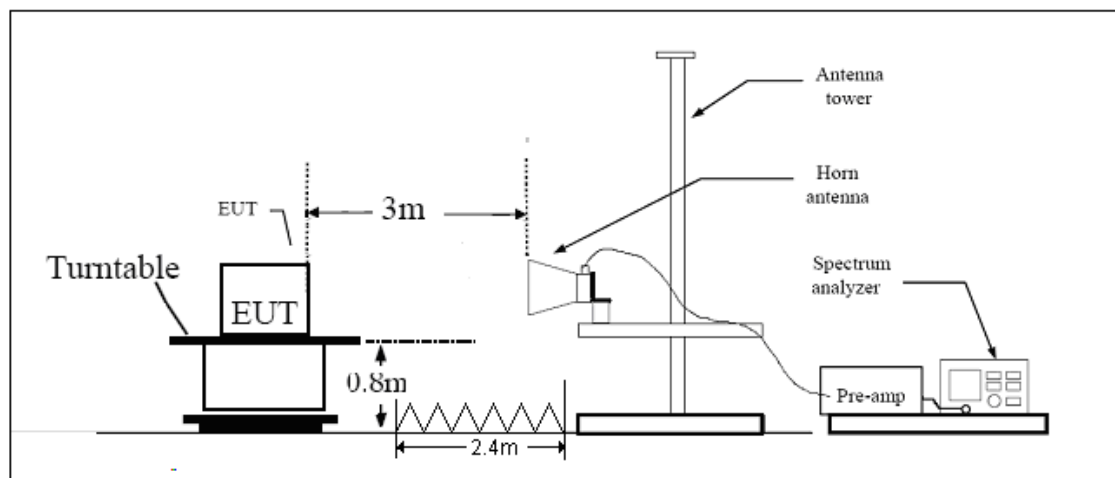
9KHz~~~ 30MHz



30MHz~~~ 1GHz



Above 1GHz



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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)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
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 $k = 1.96$.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

TA Technology (Shanghai) Co., Ltd.

Test Report

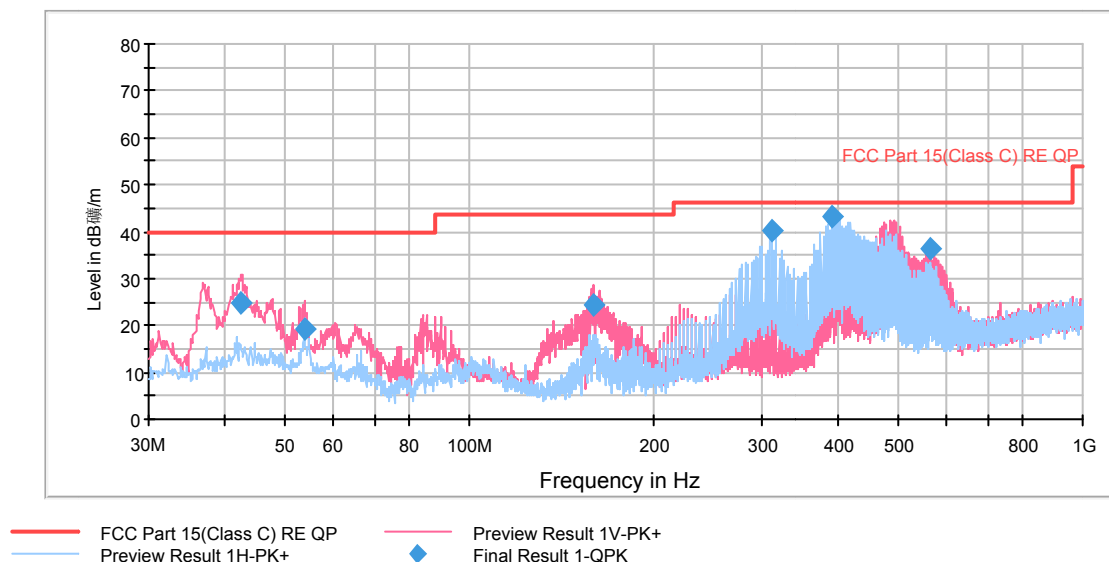
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Test result

EDR-Channel 0

RE 30M-1GHz QP



Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
42.503475	24.6	100.0	V	337.0	3.6	-21.0	15.4	40.0
53.791534	19.3	100.0	V	112.0	-3.0	-22.3	20.7	40.0
160.020050	24.3	100.0	V	337.0	-4.5	-28.8	19.2	43.5
310.394000	40.1	100.0	H	67.0	17.1	-23.0	5.9	46.0
390.379000	43.4	103.0	H	45.0	22.4	-21.0	2.6	46.0
566.394000	36.5	100.0	V	68.0	19.1	-17.4	9.5	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

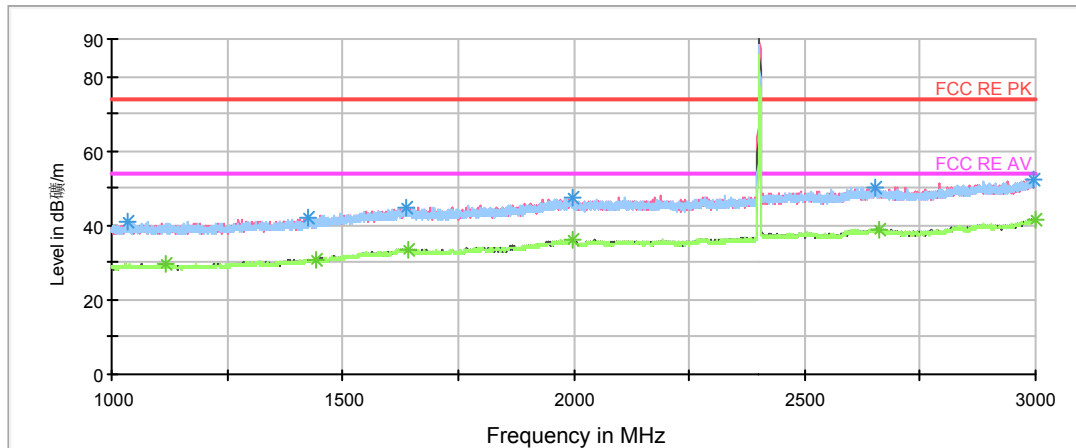
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RE 1G-3GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [2]-PK+
 — FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [2]-AVG

Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier. A font (Level in dBμV/m) in the test plot =(level in dBuV/m)

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

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1117.500000	38.6	103.0	H	59.0	28.9	-9.7	35.4	74
1442.000000	39.4	103.0	H	11.0	31.5	-7.9	34.6	74
1643.000000	43.6	103.0	V	129.0	38.4	-5.2	30.4	74
1997.500000	45.8	103.0	V	293.0	42.8	-3.0	28.2	74
2660.250000	48.3	103.0	H	59.0	48.1	-0.2	25.7	74
2999.500000	51.8	103.0	V	213.0	50.4	-1.4	22.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1117.500000	29.7	103.0	H	59.0	20.0	-9.7	24.3	54
1442.000000	30.8	103.0	H	11.0	22.9	-7.9	23.2	54
1643.000000	33.7	103.0	V	129.0	28.5	-5.2	20.3	54
1997.500000	36.3	103.0	V	293.0	33.3	-3.0	17.7	54
2660.250000	38.9	103.0	H	59.0	38.7	-0.2	15.1	54
2999.500000	41.7	103.0	V	213.0	40.3	-1.4	12.3	54

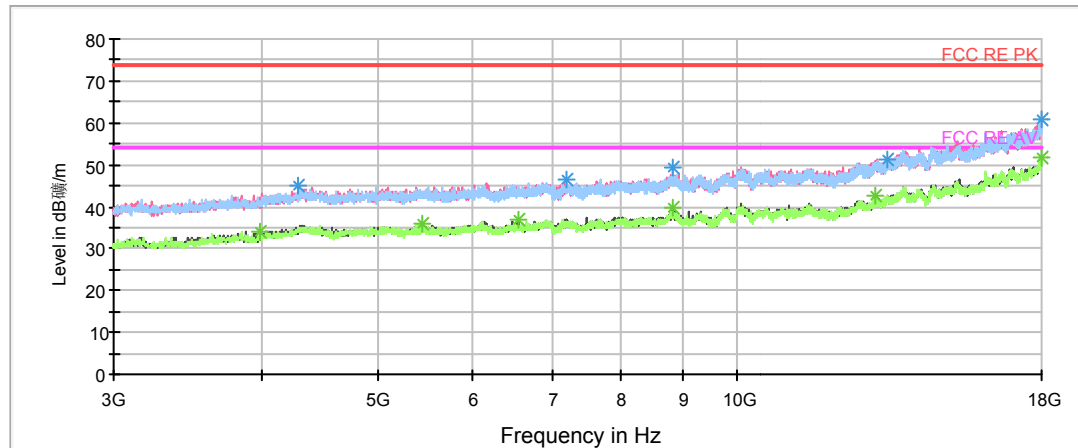
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RE 3-18GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [1]-PK+
 — FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [1]-AVG

Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4286.250000	45.0	100.0	V	342.0	42.1	2.9	29.0	74
7194.375000	46.4	100.0	H	133.0	38.7	7.7	27.6	74
8827.500000	49.1	100.0	H	140.0	39.7	9.4	24.9	74
13351.875000	51.4	202.0	V	166.0	36.9	14.5	22.6	74
17977.500000	60.7	202.0	V	315.0	36.4	24.3	13.3	74

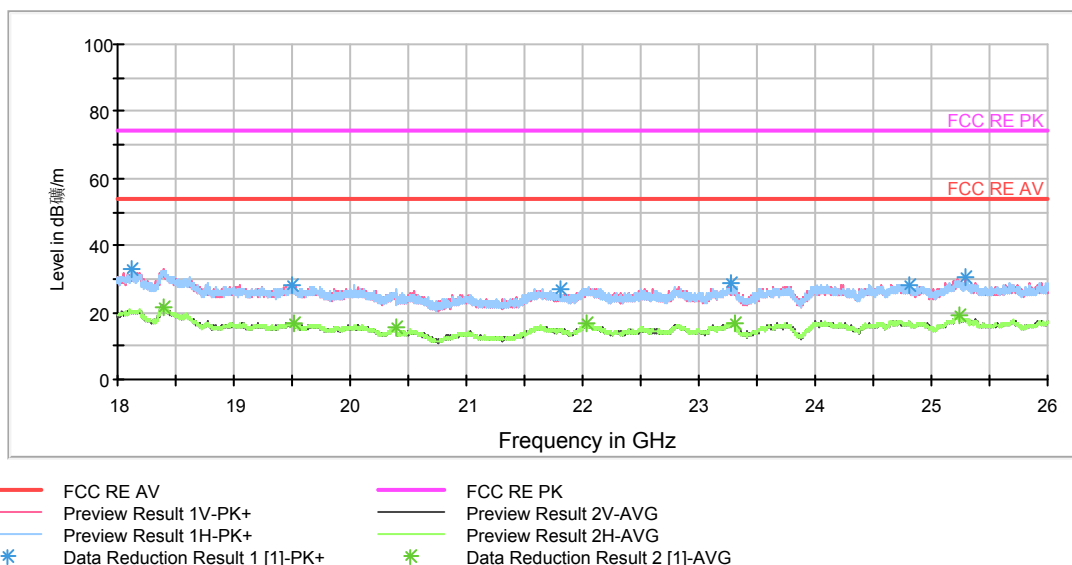
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4286.250000	34.3	100.0	V	342.0	31.4	2.9	19.7	54
7194.375000	35.6	100.0	H	133.0	27.9	7.7	18.4	54
8827.500000	37.6	100.0	H	140.0	28.2	9.4	16.4	54
13351.875000	41.8	202.0	V	166.0	27.3	14.5	12.2	54
17977.500000	50.4	202.0	V	315.0	26.1	24.3	3.6	54

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Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18397.375000	31.2	H	248.0	26.9	-4.3	42.8	74
19521.500000	25.7	V	324.0	19.3	-6.4	48.3	74
20388.500000	25.7	V	99.0	18.4	-7.3	48.3	74
22039.625000	25.7	V	357.0	18.3	-7.4	48.3	74
23302.937500	26.5	V	257.0	20.3	-6.2	47.5	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18397.375000	21.8	H	248.0	17.5	-4.3	32.2	54
19521.500000	16.7	V	324.0	10.3	-6.4	37.3	54
20388.500000	15.4	V	99.0	8.1	-7.3	38.6	54
22039.625000	16.6	V	357.0	9.2	-7.4	37.4	54
23302.937500	16.7	V	257.0	10.5	-6.2	37.3	54

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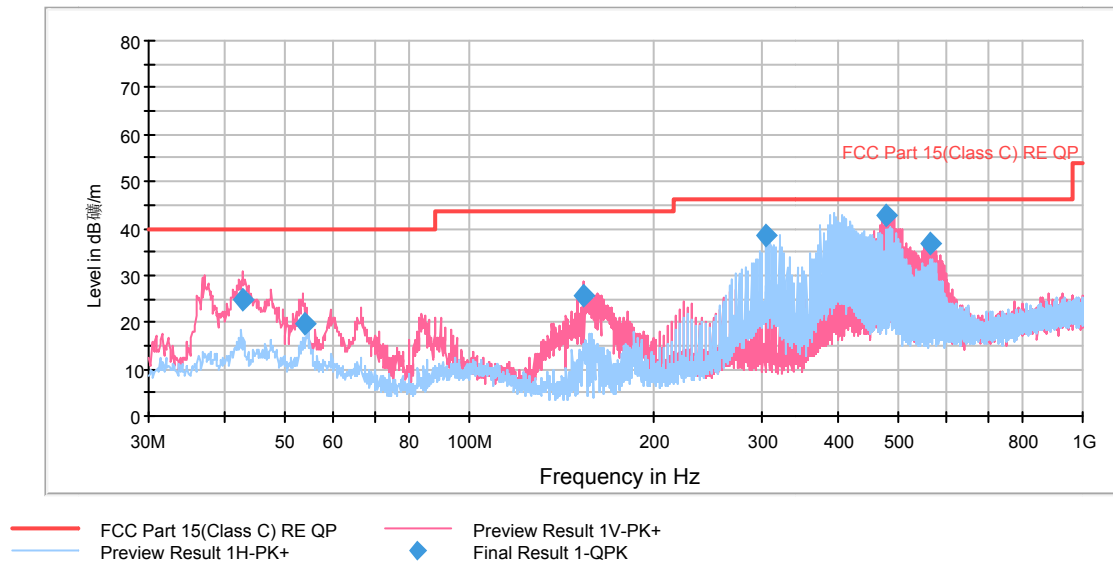
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EDR-Channel 39

RE 30M-1GHz QP



Radiates Emission from 30MHz to 1GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
42.664422	24.7	103.0	V	112.0	3.7	-21.0	15.3	40.0
53.872481	19.5	100.0	V	157.0	-2.8	-22.3	20.5	40.0
153.609866	25.9	100.0	V	337.0	-3.3	-29.2	17.6	43.5
303.985000	38.5	102.0	H	81.0	15.3	-23.2	7.5	46.0
479.998750	42.8	102.0	V	97.0	23.5	-19.3	3.2	46.0
563.209500	36.8	100.0	V	67.0	19.4	-17.4	9.2	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

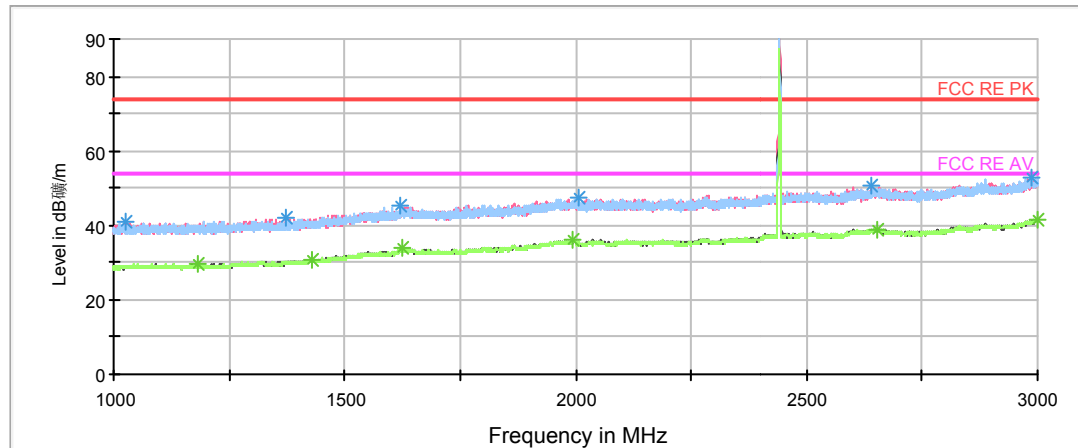
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RE 1G-3GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [2]-PK+
 — FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [2]-AVG

Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier. a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

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

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.000000	38.5	103.0	V	52.0	29.0	-9.5	35.5	74
1431.000000	40.3	103.0	V	192.0	32.2	-8.1	33.7	74
1625.500000	43.8	103.0	H	31.0	38.7	-5.1	30.2	74
1992.750000	46.1	103.0	V	357.0	43.1	-3.0	27.9	74
2652.250000	49.0	103.0	H	171.0	48.9	-0.1	25.0	74
3000.000000	51.5	103.0	H	0.0	50.0	1.5	22.5	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.000000	29.6	103.0	V	52.0	20.1	-9.5	24.4	54
1431.000000	30.8	103.0	V	192.0	22.7	-8.1	23.2	54
1625.500000	33.9	103.0	H	31.0	28.8	-5.1	20.1	54
1992.750000	36.1	103.0	V	357.0	33.1	-3.0	17.9	54
2652.250000	38.9	103.0	H	171.0	38.8	-0.1	15.1	54
3000.000000	41.7	103.0	H	0.0	40.2	1.5	12.3	54

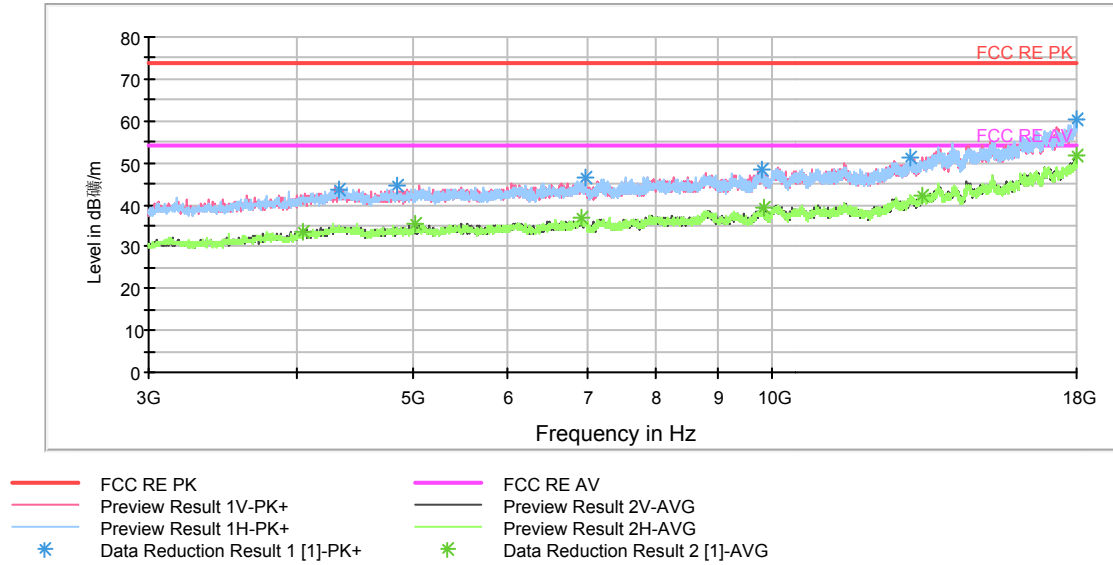
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RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4329.375000	43.7	100.0	V	325.0	40.8	2.9	30.3	74
4848.750000	44.6	100.0	V	200.0	41.9	2.7	29.4	74
6973.125000	46.5	100.0	V	256.0	41.0	5.5	27.5	74
9806.250000	48.2	100.0	H	153.0	36.9	11.3	25.8	74
13036.875000	51.3	100.0	H	10.0	36.9	14.4	22.7	74
17994.375000	60.2	100.0	V	221.0	35.6	24.6	13.8	74

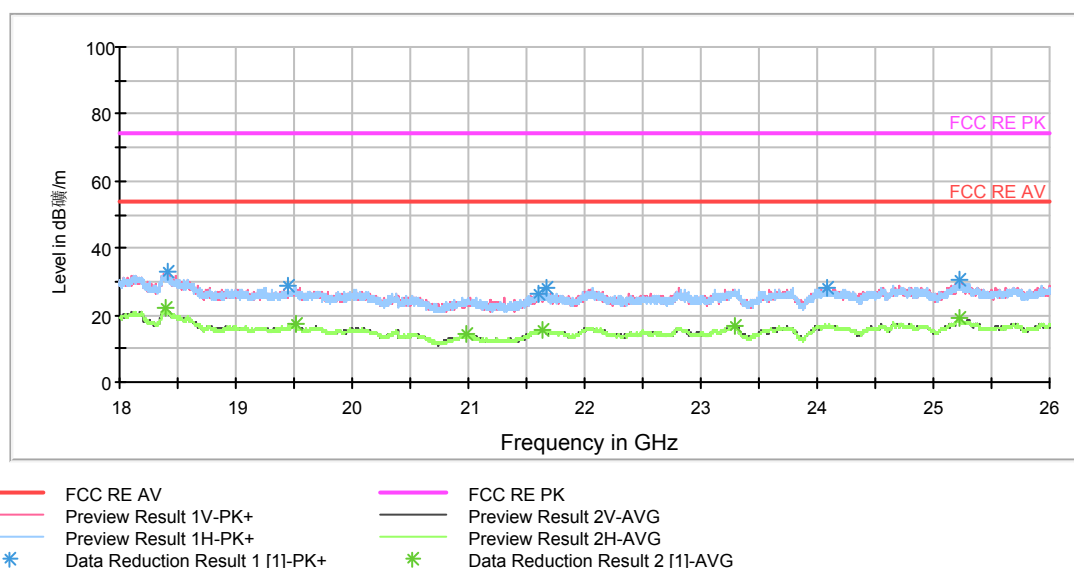
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4329.375000	33.8	100.0	V	325.0	30.9	2.9	20.2	54
4848.750000	33.6	100.0	V	200.0	30.9	2.7	20.4	54
6973.125000	35.5	100.0	V	256.0	30.0	5.5	18.5	54
9806.250000	37.9	100.0	H	153.0	26.6	11.3	16.1	54
13036.875000	40.8	100.0	H	10.0	26.4	14.4	13.2	54
17994.375000	50.8	100.0	V	221.0	26.2	24.6	3.2	54

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Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18397.000000	30.7	H	38.0	26.4	-4.3	43.3	74
19512.000000	26.3	H	59.0	19.8	-6.5	47.7	74
20978.000000	23.9	V	0.0	16.3	-7.6	50.1	74
21645.000000	25.4	H	38.0	17.3	-8.1	48.6	74
23297.000000	25.9	H	223.0	19.8	-6.1	48.1	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18397.000000	22.0	H	38.0	17.7	-4.3	32.0	54
19512.000000	17.2	H	59.0	10.7	-6.5	36.8	54
20978.000000	14.5	V	0.0	6.9	-7.6	39.5	54
21645.000000	15.8	H	38.0	7.7	-8.1	38.2	54
23297.000000	16.7	H	223.0	10.6	-6.1	37.3	54

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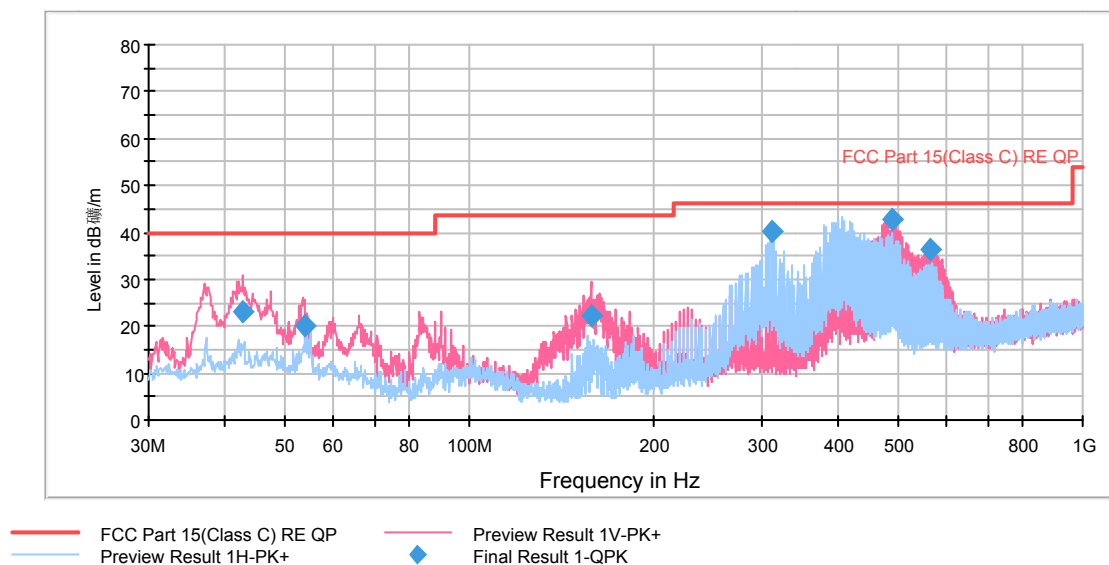
Test Report

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EDR-Channel 78

RE 30M-1GHz QP



Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBu/m) in the test plot =(level in dBuV/m)

Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
42.838078	23.2	100.0	V	157.0	2.1	-21.1	16.8	40.0
53.751534	20.0	101.0	V	180.0	-2.3	-22.3	20.0	40.0
157.962060	22.1	100.0	V	337.0	-6.9	-29.0	21.4	43.5
310.394000	40.3	100.0	H	82.0	17.3	-23.0	5.7	46.0
489.593500	42.7	102.0	V	97.0	23.8	-18.9	3.3	46.0
563.209500	36.4	100.0	V	90.0	19.0	-17.4	9.6	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

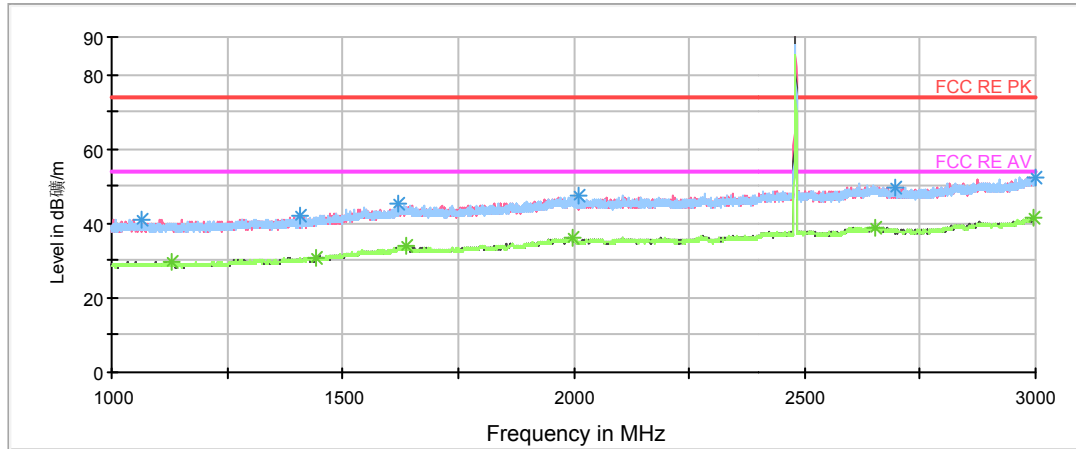
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RE 1G-3GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [2]-PK+
 — FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [2]-AVG

Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier. a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

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

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1131.000000	39.7	103.0	V	314.0	30.1	-9.6	34.3	74
1441.750000	41.1	103.0	H	29.0	33.2	-7.9	32.9	74
1636.250000	43.1	103.0	V	82.0	38.0	-5.1	30.9	74
1997.750000	45.4	103.0	V	266.0	42.4	-3.0	28.6	74
2652.250000	49.3	103.0	V	94.0	49.2	-0.1	24.7	74
2997.000000	51.4	103.0	H	71.0	50.0	1.4	22.6	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1131.000000	29.7	103.0	V	314.0	20.1	-9.6	24.3	54
1441.750000	30.9	103.0	H	29.0	23.0	-7.9	23.1	54
1636.250000	33.8	103.0	V	82.0	28.7	-5.1	20.2	54
1997.750000	36.1	103.0	V	266.0	33.1	-3.0	17.9	54
2652.250000	38.6	103.0	V	94.0	38.5	-0.1	15.4	54
2997.000000	41.6	103.0	H	71.0	40.2	1.4	12.4	54

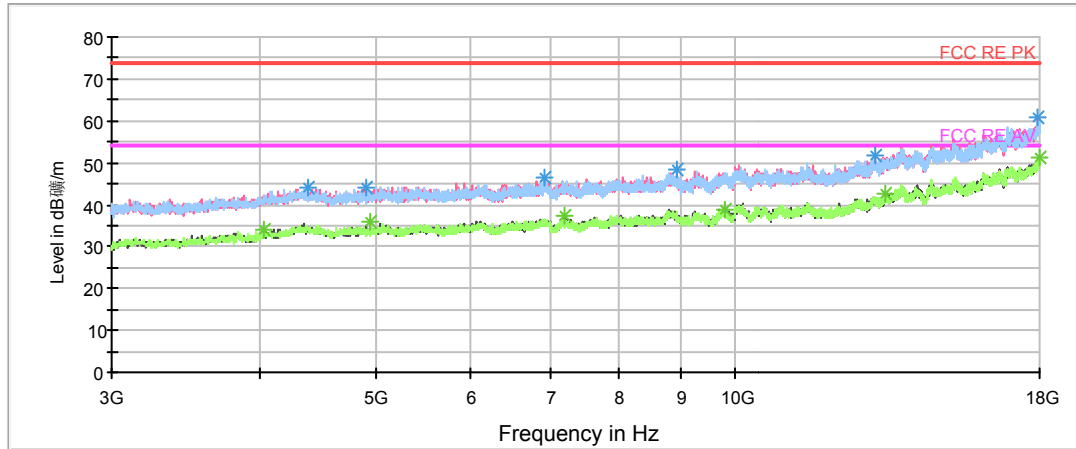
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RE 3-18GHz PK+AV



— FCC RE PK
— FCC RE AV
— Preview Result 1V-PK+
— Preview Result 2V-AVG
— Preview Result 1H-PK+
— Preview Result 2H-AVG
* Data Reduction Result 1 [1]-PK+
* Data Reduction Result 2 [1]-AVG

Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4385.625000	44.1	100.0	H	0.0	41.5	-2.6	29.9	74
4910.625000	44.2	100.0	V	190.0	41.1	-3.1	29.8	74
6926.250000	46.4	100.0	V	39.0	40.7	-5.7	27.6	74
8919.375000	48.4	100.0	V	126.0	38.4	-10.0	25.6	74
13093.125000	51.5	100.0	V	288.0	37.1	-14.4	22.5	74
17955.000000	60.9	100.0	V	281.0	36.9	-24.0	13.1	74

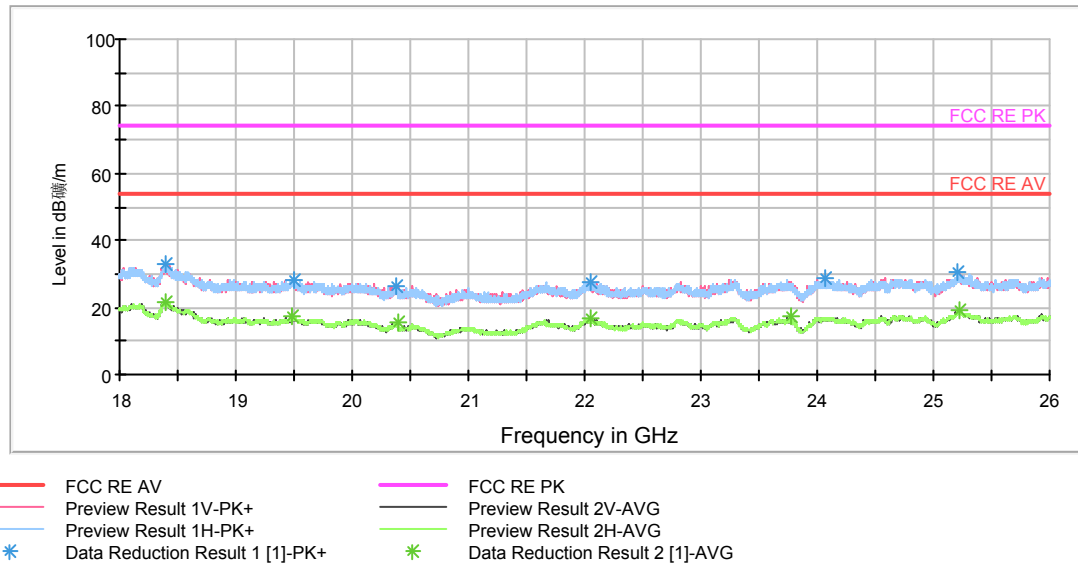
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4385.625000	34.3	100.0	H	0.0	31.7	-2.6	19.7	54
4910.625000	33.0	100.0	V	190.0	29.9	-3.1	21.0	54
6926.250000	36.3	100.0	V	39.0	30.6	-5.7	17.7	54
8919.375000	37.2	100.0	V	126.0	27.2	-10.0	16.8	54
13093.125000	41.2	100.0	V	288.0	26.8	-14.4	12.8	54
17955.000000	49.6	100.0	V	281.0	25.6	-24.0	4.4	54

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Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dB μ V/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dB μ V/m)	Polarization	Azimuth (deg)	Reading value (dB μ V/m)	Correct Factor (dB)	Margin (dB)	Limit (dB μ V/m)
18401.000000	32.7	H	0.0	28.3	-4.4	41.3	74
19485.000000	26.4	V	263.0	19.7	-6.7	47.6	74
20393.000000	24.8	H	80.0	17.5	-7.3	49.2	74
22057.000000	26.2	H	325.0	18.7	-7.5	47.8	74
23774.000000	26.8	H	0.0	20.0	-6.8	47.2	74
25226.000000	28.5	V	228.0	23.2	-5.3	45.5	74

Frequency (MHz)	Average (dB μ V/m)	Polarization	Azimuth (deg)	Reading value (dB μ V/m)	Correct Factor (dB)	Margin (dB)	Limit (dB μ V/m)
18401.000000	21.8	H	0.0	17.4	-4.4	32.2	54
19485.000000	17.1	V	263.0	10.4	-6.7	36.9	54
20393.000000	15.7	H	80.0	8.4	-7.3	38.3	54
22057.000000	16.5	H	325.0	9.0	-7.5	37.5	54
23774.000000	17.1	H	0.0	10.3	-6.8	36.9	54
25226.000000	19.4	V	228.0	14.1	-5.3	34.6	54

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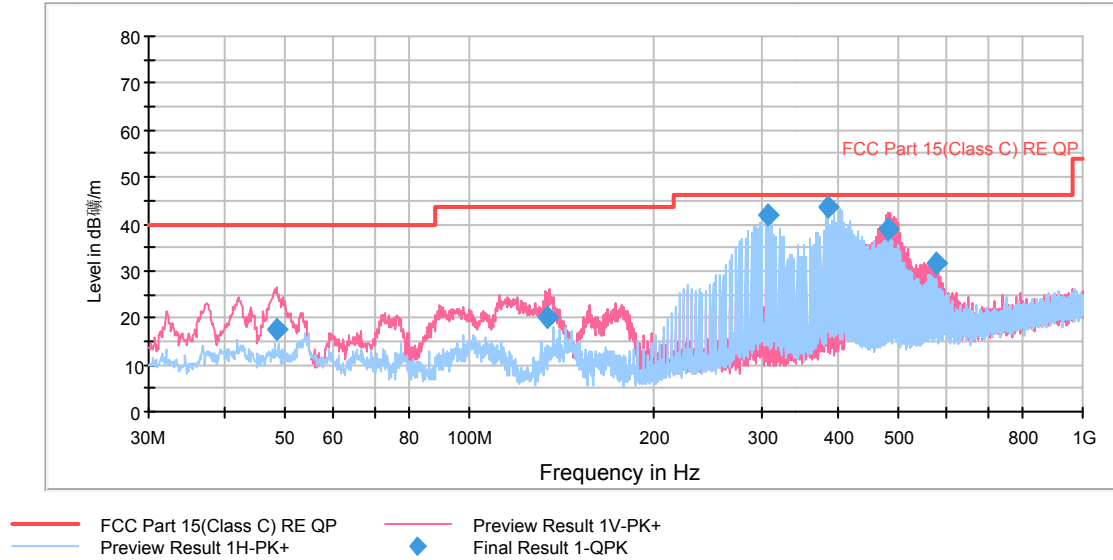
Test Report

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GFSK-Channel 0

RE 30M-1GHz QP



Radiates Emission from 30MHz to 1GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
48.468925	17.5	100.0	V	90.0	-4.1	-21.6	22.5	40.0
134.423100	20.3	103.0	V	22.0	-8.8	-29.1	23.2	43.5
307.209500	42.1	129.0	H	22.0	19.0	-23.1	3.9	46.0
384.010000	43.8	101.0	H	270.0	22.6	-21.2	2.2	46.0
483.184500	39.0	119.0	V	141.0	19.8	-19.2	7.0	46.0
575.988750	31.6	100.0	V	224.0	14.4	-17.2	14.4	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

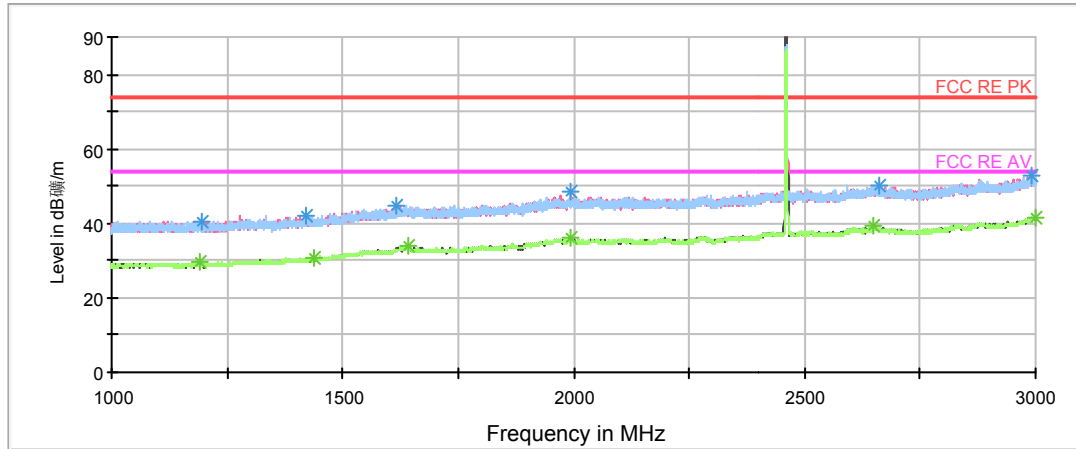
TA Technology (Shanghai) Co., Ltd.

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RE 1G-3GHz PK+AV



— FCC RE PK
— Preview Result 1V-PK+
— Preview Result 1H-PK+
* Data Reduction Result 1 [2]-PK+
— FCC RE AV
— Preview Result 2V-AVG
— Preview Result 2H-AVG
* Data Reduction Result 2 [2]-AVG

Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

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

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1189.000000	39.5	100.0	H	0.0	29.9	-9.6	34.5	74
1437.750000	41.1	100.0	H	145.0	33.1	-8.0	32.9	74
1641.500000	43.2	100.0	H	0.0	38.1	-5.1	30.8	74
1993.250000	45.6	100.0	V	0.0	42.6	-3.0	28.4	74
2649.250000	48.7	100.0	H	33.0	48.6	-0.1	25.3	74
3000.000000	51.1	100.0	H	237.0	49.6	1.5	22.9	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1189.000000	29.4	100.0	H	0.0	19.8	-9.6	24.6	54
1437.750000	30.8	100.0	H	145.0	22.8	-8.0	23.2	54
1641.500000	33.9	100.0	H	0.0	28.8	-5.1	20.1	54
1993.250000	36.0	100.0	V	0.0	33.0	-3.0	18.0	54
2649.250000	39.2	100.0	H	33.0	39.1	-0.1	14.8	54
3000.000000	41.7	100.0	H	237.0	40.2	1.5	12.3	54

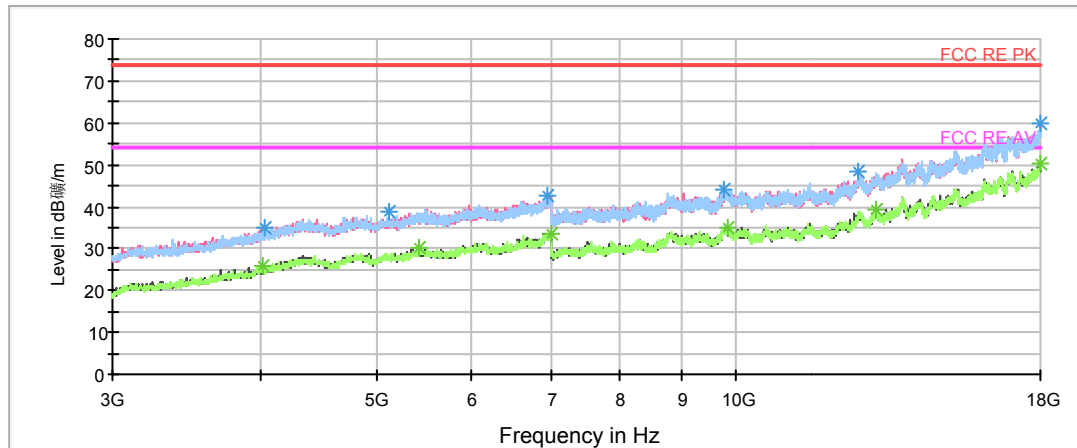
TA Technology (Shanghai) Co., Ltd.

Test Report

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RE 3-18GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [1]-PK+
 — FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [1]-AVG

Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4006.875000	33.6	100.0	V	204.0	32.6	-1.0	40.4	74
5416.875000	37.2	100.0	H	20.0	34.1	-3.1	36.8	74
6988.125000	42.8	100.0	V	121.0	37.4	-5.4	31.2	74
9825.000000	43.3	100.0	H	205.0	32.1	-11.2	30.7	74
13130.625000	46.5	100.0	H	27.0	32.4	-14.1	27.5	74
17988.750000	58.2	100.0	H	240.0	33.7	-24.5	15.8	74

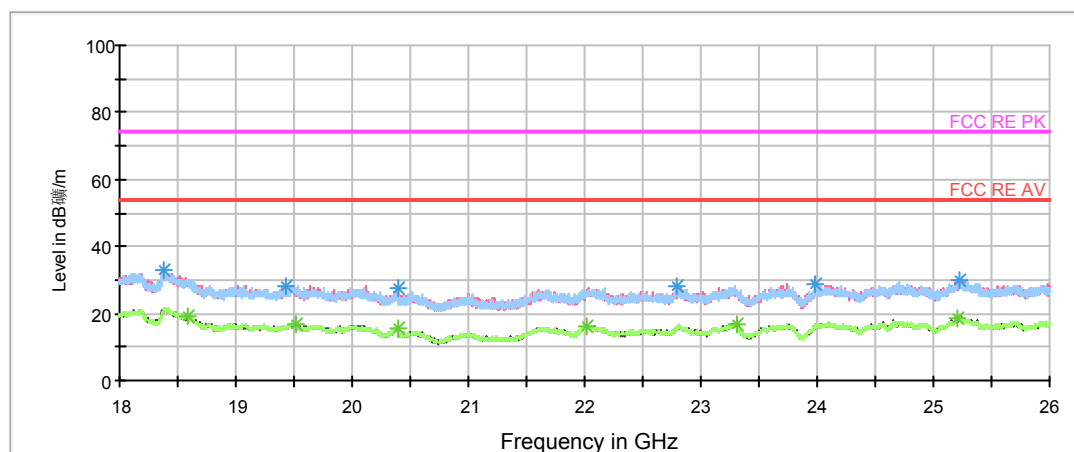
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4006.875000	25.9	100.0	V	204.0	24.9	-1.0	28.1	54
5416.875000	30.0	100.0	H	20.0	26.9	-3.1	24.0	54
6988.125000	33.6	100.0	V	121.0	28.2	-5.4	20.4	54
9825.000000	35.2	100.0	H	205.0	24.0	-11.2	18.8	54
13130.625000	39.4	100.0	H	27.0	25.3	-14.1	14.6	54
17988.750000	50.4	100.0	H	240.0	25.9	-24.5	3.6	54

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— FCC RE AV
 — FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 2V-AVG
 — Preview Result 1H-PK+
 — Preview Result 2H-AVG
 * Data Reduction Result 1 [1]-PK+
 * Data Reduction Result 2 [1]-AVG

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18586.000000	29.2	V	171.0	24.1	-5.1	44.8	74
19519.000000	26.3	H	152.0	19.9	-6.4	47.7	74
20394.000000	25.0	V	177.0	17.7	-7.3	49.0	74
22015.000000	25.3	V	219.0	17.8	-7.5	48.7	74
23311.000000	25.8	V	339.0	19.5	-6.3	48.2	74
25199.000000	27.5	H	213.0	21.5	-6.0	46.5	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18586.000000	19.5	V	171.0	14.4	-5.1	34.5	54
19519.000000	17.0	H	152.0	10.6	-6.4	37.0	54
20394.000000	15.4	V	177.0	8.1	-7.3	38.6	54
22015.000000	16.2	V	219.0	8.7	-7.5	37.8	54
23311.000000	16.8	V	339.0	10.5	-6.3	37.2	54
25199.000000	18.7	H	213.0	12.7	-6.0	35.3	54

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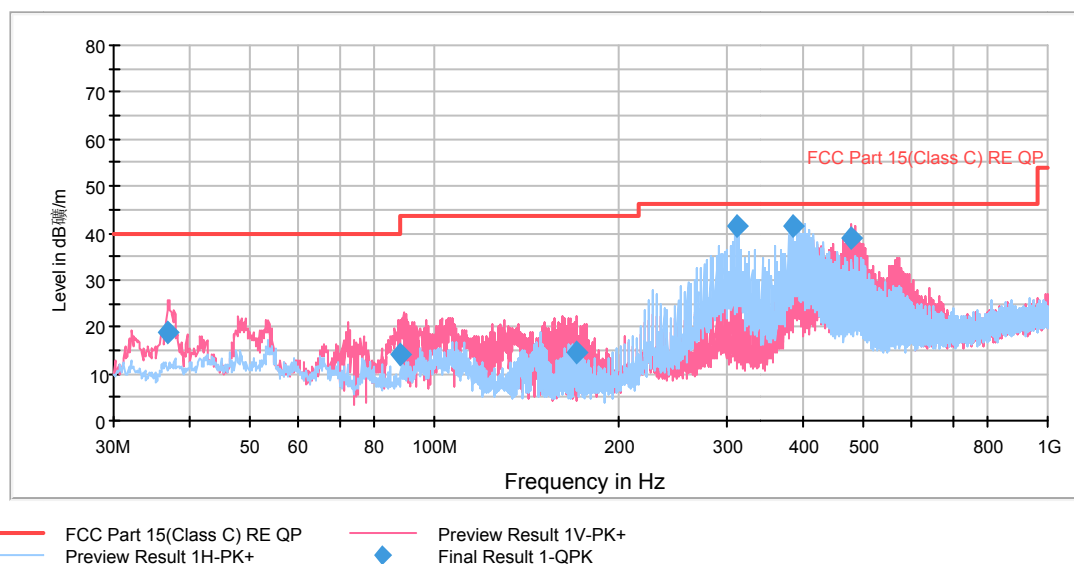
Test Report

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GFSK-Channel 39

RE 30M-1GHz QP



Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
36.881975	18.8	100.0	V	0.0	-2.8	-21.6	21.2	40.0
87.691181	14.0	100.0	V	60.0	-12.1	-26.1	26.0	40.0
170.623375	14.6	100.0	V	240.0	-13.7	-28.3	28.9	43.5
310.394000	41.4	129.0	H	22.0	18.4	-23.0	4.6	46.0
384.010000	41.3	100.0	H	270.0	20.1	-21.2	4.7	46.0
479.998750	39.1	103.0	V	0.0	19.8	-19.3	6.9	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

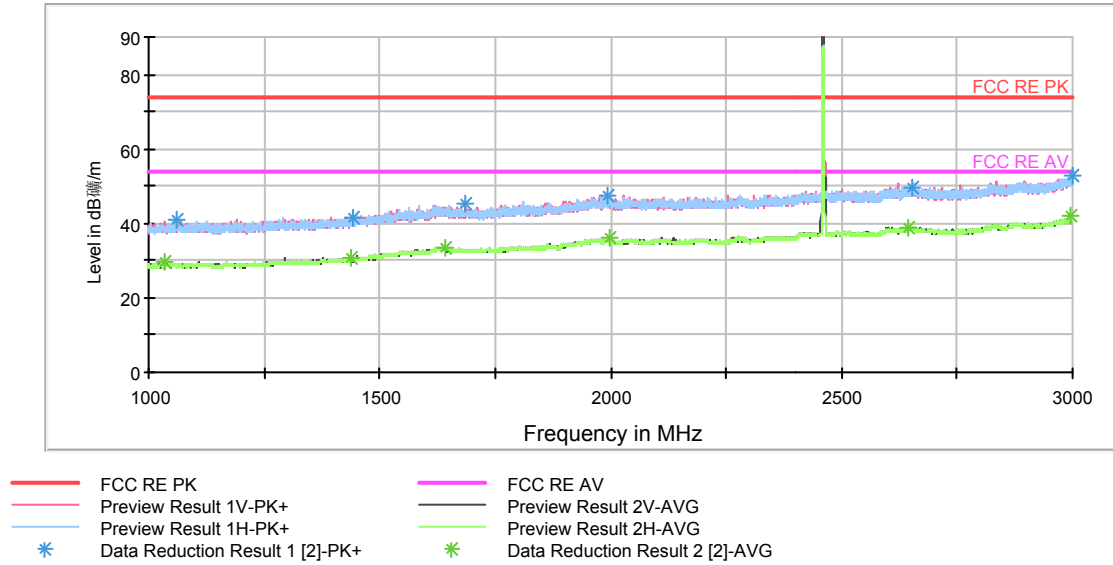
TA Technology (Shanghai) Co., Ltd.

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RE 1G-3GHz PK+AV



Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

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

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value	Correct Factor	Margin (dB)	Limit (dBuV/m)
1036.250000	37.9	100.0	H	73.0	27.9	-10.0	36.1	74
1437.000000	39.8	100.0	H	79.0	31.8	-8.0	34.2	74
1640.500000	43.1	100.0	H	127.0	38.0	-5.1	30.9	74
1999.000000	46.1	100.0	H	50.0	43.1	-3.0	27.9	74
2644.750000	48.2	100.0	H	103.0	48.0	-0.2	25.8	74
2997.000000	52.3	100.0	H	317.0	50.9	1.4	21.7	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value	Correct Factor	Margin (dB)	Limit (dBuV/m)
1036.250000	29.5	100.0	H	73.0	19.5	-10.0	24.5	54
1437.000000	30.8	100.0	H	79.0	22.8	-8.0	23.2	54
1640.500000	33.5	100.0	H	127.0	28.4	-5.1	20.5	54
1999.000000	35.9	100.0	H	50.0	32.9	-3.0	18.1	54
2644.750000	39.0	100.0	H	103.0	38.8	-0.2	15.0	54
2997.000000	41.9	100.0	H	317.0	40.5	1.4	12.1	54

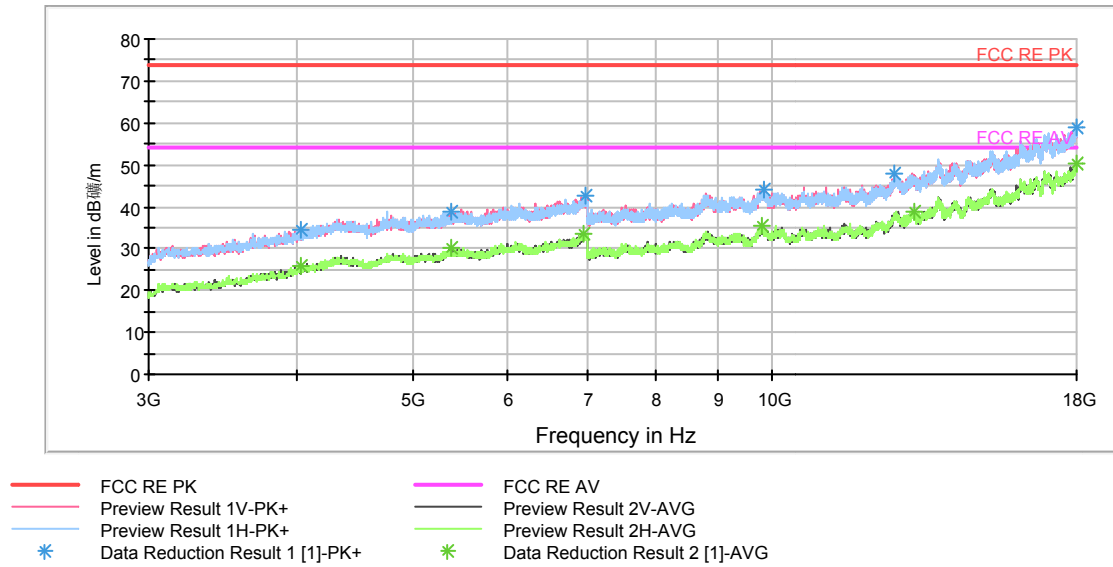
TA Technology (Shanghai) Co., Ltd.

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RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

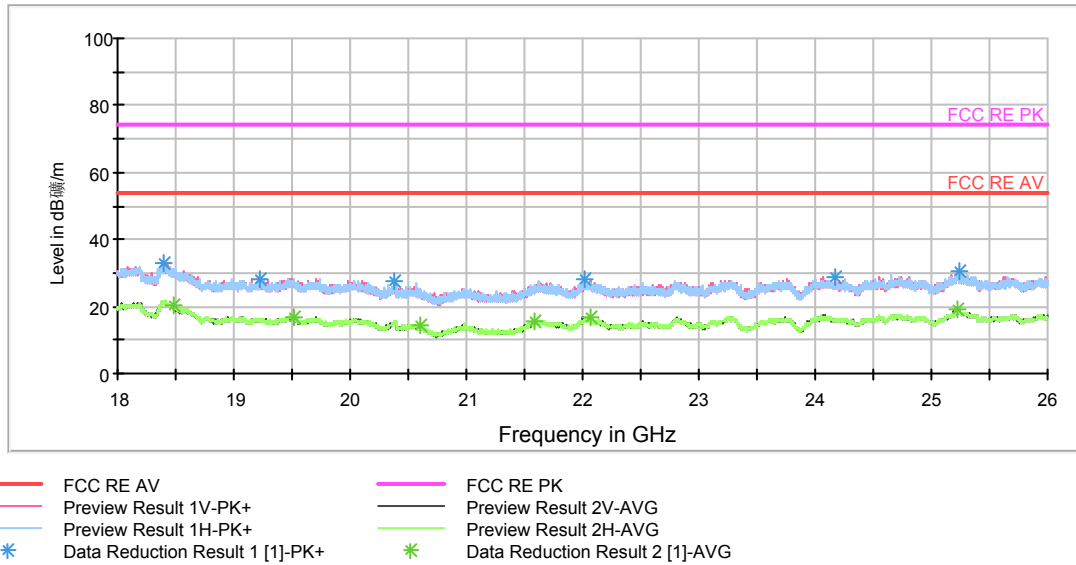
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4021.875000	33.7	100.0	H	120.0	32.7	-1.0	40.3	74
5381.250000	37.3	100.0	V	250.0	34.3	-3.0	36.7	74
6946.875000	41.1	100.0	H	29.0	35.5	-5.6	32.9	74
9810.000000	43.3	100.0	V	305.0	32.0	-11.3	30.7	74
13145.625000	47.5	100.0	V	243.0	33.5	-14.0	26.5	74
17996.250000	57.8	100.0	V	243.0	33.2	-24.6	16.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4021.875000	26.1	100.0	H	120.0	25.1	-1.0	27.9	54
5381.250000	30.1	100.0	V	250.0	27.1	-3.0	23.9	54
6946.875000	33.7	100.0	H	29.0	28.1	-5.6	20.3	54
9810.000000	35.4	100.0	V	305.0	24.1	-11.3	18.6	54
13145.625000	39.0	100.0	V	243.0	25.0	-14.0	15.0	54
17996.250000	50.1	100.0	V	243.0	25.5	24.6	3.9	54

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Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dB μ V/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dB μ V/m)	Polarization	Azimuth (deg)	Reading value (dB μ V/m)	Correct Factor (dB)	Margin (dB)	Limit (dB μ V/m)
18481.000000	29.8	V	311.0	24.6	-5.2	44.2	74
19521.000000	26.5	H	87.0	20.1	-6.4	47.5	74
20603.000000	24.5	H	0.0	16.7	-7.8	49.5	74
21594.000000	25.6	V	205.0	18.0	-7.6	48.4	74
22063.000000	26.3	V	143.0	18.8	-7.5	47.7	74
25222.000000	28.8	V	0.0	23.5	-5.3	45.2	74

Frequency (MHz)	Average (dB μ V/m)	Polarization	Azimuth (deg)	Reading value (dB μ V/m)	Correct Factor (dB)	Margin (dB)	Limit (dB μ V/m)
18481.000000	20.1	V	311.0	14.9	-5.2	33.9	54
19521.000000	17.0	H	87.0	10.6	-6.4	37.0	54
20603.000000	14.1	H	0.0	6.3	-7.8	39.9	54
21594.000000	15.8	V	205.0	8.2	-7.6	38.2	54
22063.000000	16.6	V	143.0	9.1	-7.5	37.4	54
25222.000000	19.0	V	0.0	13.7	-5.3	35.0	54

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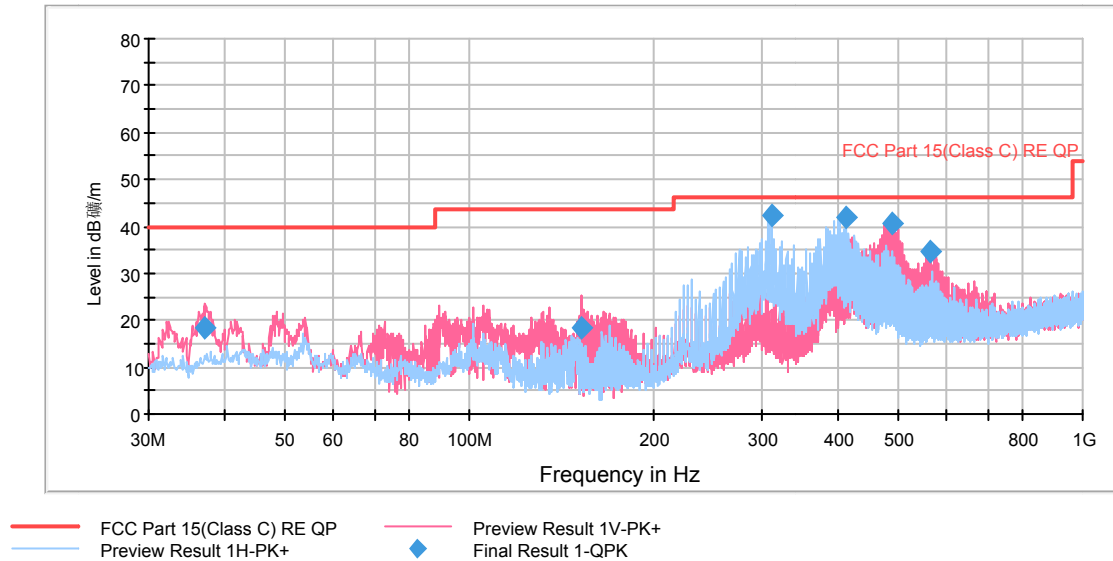
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GFSK -Channel 78

RE 30M-1GHz QP



Radiates Emission from 30MHz to 1GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
37.060866	18.3	129.0	V	135.0	-3.2	-21.5	21.7	40.0
151.999450	18.3	100.0	V	180.0	-11.0	-29.3	25.2	43.5
310.395250	42.5	100.0	H	68.0	19.5	-23.0	3.5	46.0
412.794250	41.8	100.0	H	253.0	21.1	-20.7	4.2	46.0
489.594750	40.6	101.0	V	135.0	21.7	-18.9	5.4	46.0
566.394000	34.5	100.0	V	73.0	17.1	-17.4	11.5	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

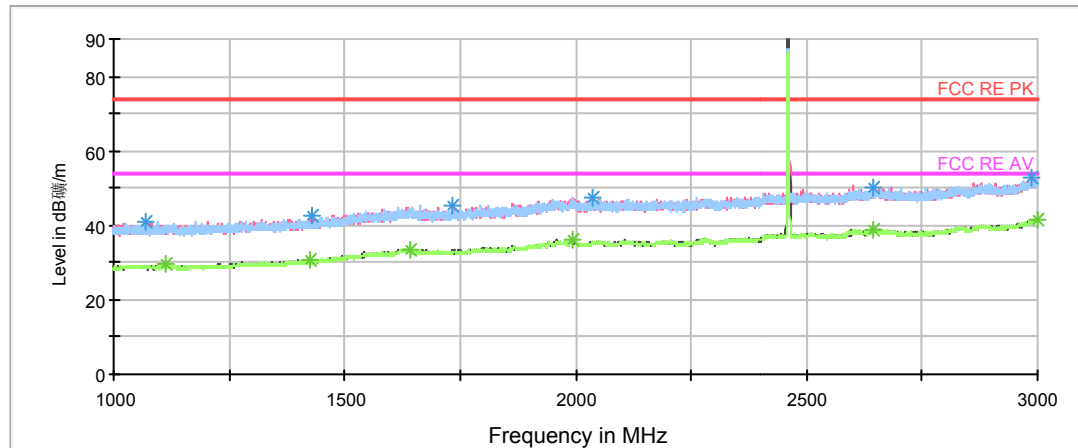
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RE 1G-3GHz PK+AV



— FCC RE PK
 — Preview Result 1V-PK+
 — Preview Result 1H-PK+
 * Data Reduction Result 1 [2]-PK+

— FCC RE AV
 — Preview Result 2V-AVG
 — Preview Result 2H-AVG
 * Data Reduction Result 2 [2]-AVG

Radiates Emission from 1GHz to 3GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: The signal beyond the limit is carrier. a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1114.500000	39.0	100.0	V	181.0	29.2	-9.8	35.0	74
1424.250000	40.3	100.0	H	0.0	32.2	-8.1	33.7	74
1642.500000	43.1	100.0	V	145.0	37.9	-5.2	30.9	74
1992.750000	45.2	100.0	V	301.0	42.2	-3.0	28.8	74
2644.250000	47.9	100.0	H	0.0	47.7	-0.2	26.1	74
3000.000000	50.7	100.0	H	85.0	49.2	1.5	23.3	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1114.500000	29.7	100.0	V	181.0	19.9	-9.8	24.3	54
1424.250000	30.9	100.0	H	0.0	22.8	-8.1	23.1	54
1642.500000	33.6	100.0	V	145.0	28.4	-5.2	20.4	54
1992.750000	35.9	100.0	V	301.0	32.9	-3.0	18.1	54
2644.250000	38.9	100.0	H	0.0	38.7	-0.2	15.1	54
3000.000000	41.5	100.0	H	85.0	40.0	1.5	12.5	54

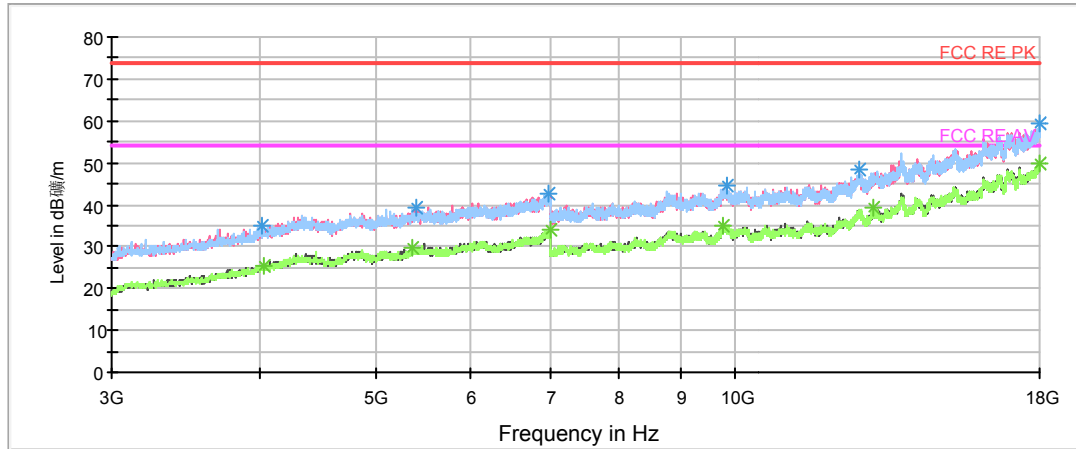
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RE 3-18GHz PK+AV



— FCC RE PK
— FCC RE AV
— Preview Result 1V-PK+
— Preview Result 2V-AVG
— Preview Result 1H-PK+
— Preview Result 2H-AVG
* Data Reduction Result 1 [1]-PK+
* Data Reduction Result 2 [1]-AVG

Radiates Emission from 3GHz to 18GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dBμV/m) in the test plot =(level in dBuV/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4031.250000	32.8	100.0	H	157.0	31.7	-1.1	41.2	74
5364.375000	36.4	100.0	V	324.0	33.5	-2.9	37.6	74
6991.875000	41.2	100.0	H	95.0	35.8	-5.4	32.8	74
9759.375000	42.7	100.0	H	108.0	32.0	-10.7	31.3	74
13053.750000	45.8	100.0	V	0.0	31.4	-14.4	28.2	74
17990.625000	58.6	100.0	V	297.0	34.1	-24.5	15.4	74

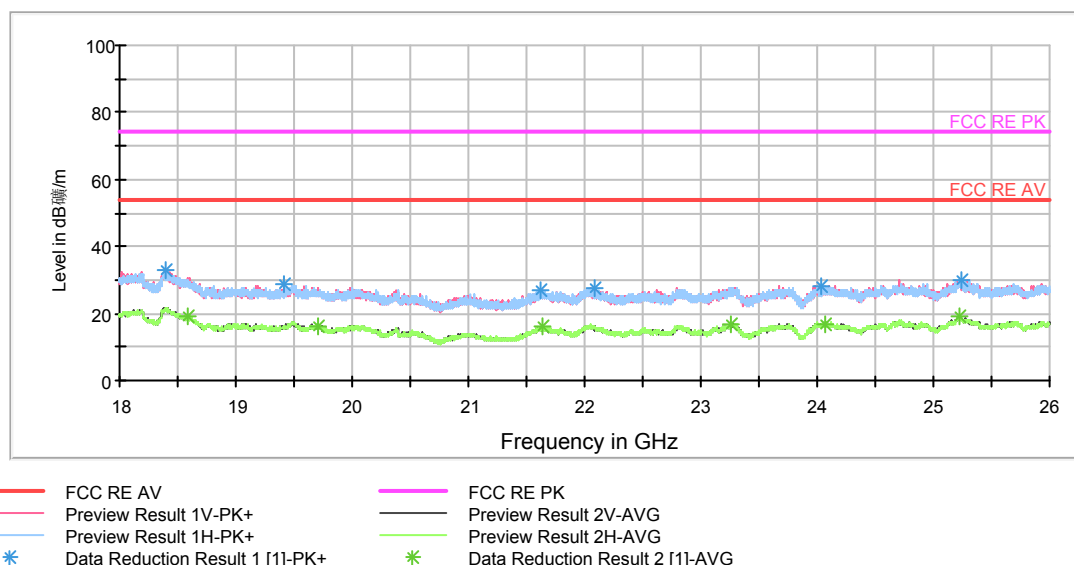
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4031.250000	25.5	100.0	H	157.0	24.4	-1.1	28.5	54
5364.375000	29.7	100.0	V	324.0	26.8	-2.9	24.3	54
6991.875000	34.1	100.0	H	95.0	28.7	-5.4	19.9	54
9759.375000	35.1	100.0	H	108.0	24.4	-10.7	18.9	54
13053.750000	39.1	100.0	V	0.0	24.7	-14.4	14.9	54
17990.625000	50.0	100.0	V	297.0	25.5	-24.5	4.0	54

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Note: This graph displays the maximum values of horizontal and vertical by software

Note: a font (Level in dB μ V/m) in the test plot =(level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 18GHz to 26GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18591.000000	30.2	V	263.0	25.1	-5.1	43.8	74
19712.000000	26.4	V	329.0	19.8	-6.6	47.6	74
21641.000000	24.8	H	298.0	16.7	-8.1	49.2	74
23264.000000	25.5	V	150.0	19.0	-6.5	48.5	74
24068.000000	25.9	V	323.0	19.1	-6.8	48.1	74
25229.000000	28.6	V	355.0	23.3	-5.3	45.4	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18591.000000	19.3	V	263.0	14.2	-5.1	34.7	54
19712.000000	16.4	V	329.0	9.8	-6.6	37.6	54
21641.000000	16.0	H	298.0	7.9	-8.1	38.0	54
23264.000000	16.8	V	150.0	10.3	-6.5	37.2	54
24068.000000	16.9	V	323.0	10.1	-6.8	37.1	54
25229.000000	19.1	V	355.0	13.8	-5.3	34.9	54

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3.12. Conducted Emission

Ambient condition

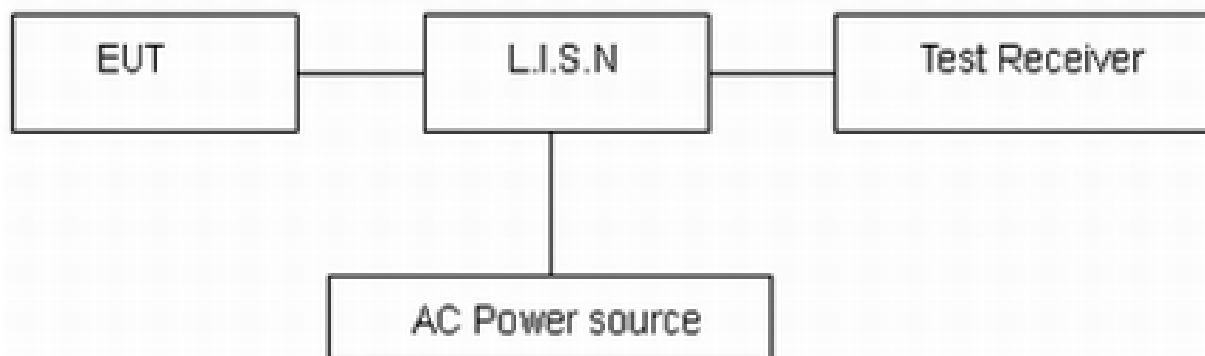
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 C63.4-2009. 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. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



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

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	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.

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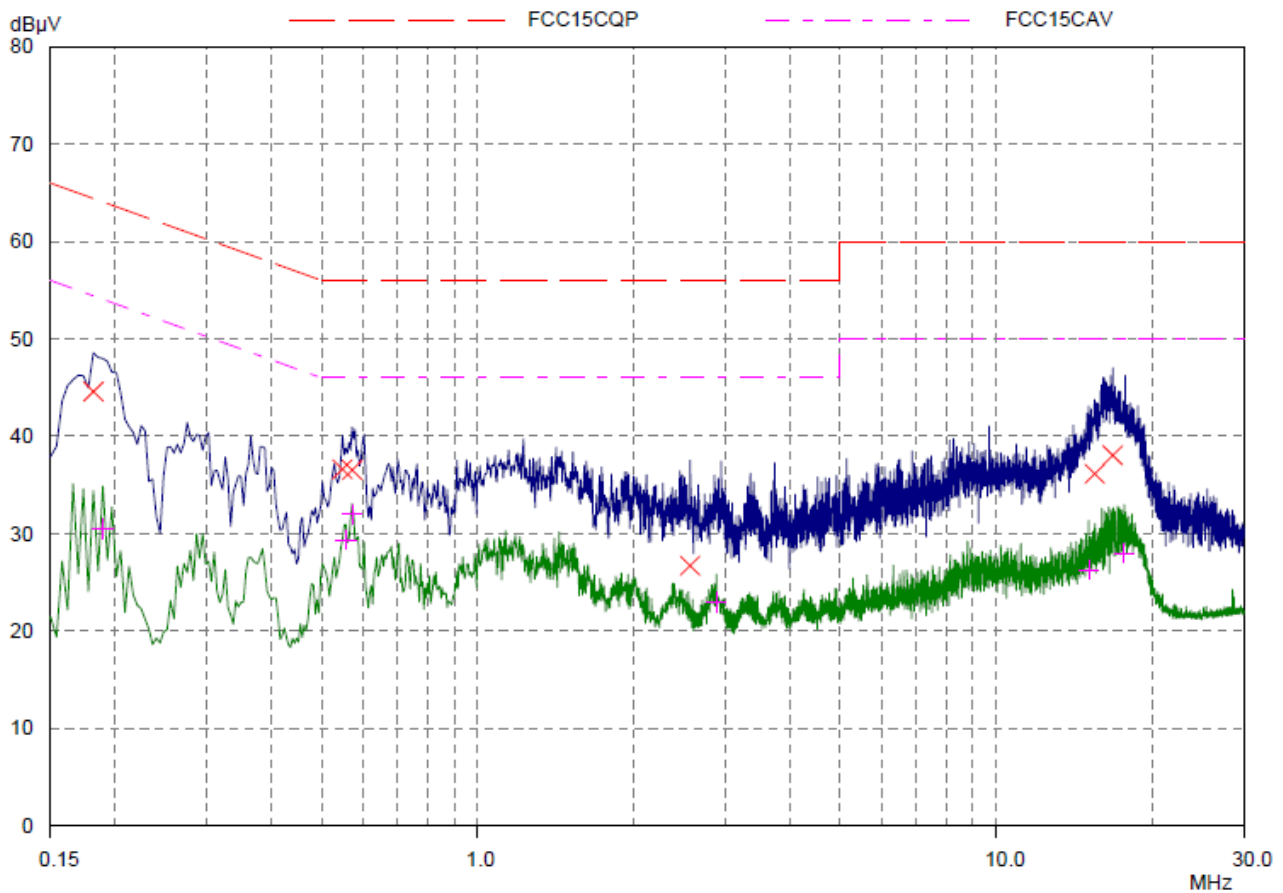
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Test Results:

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	44.59	64.43	19.84	L1	gnd
0.54843	36.61	56.00	19.39	L1	gnd
0.57187	36.54	56.00	19.46	L1	gnd
2.56796	26.72	56.00	29.28	L1	gnd
15.4625	36.16	60.00	23.84	L1	gnd
16.77109	38.05	60.00	21.95	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18906	30.49	54.08	23.59	L1	gnd
0.55625	29.36	46.00	16.64	L1	gnd
0.57187	31.99	46.00	14.01	L1	gnd
2.88437	22.94	46.00	23.06	L1	gnd
15.07187	26.28	50.00	23.72	L1	gnd
17.64218	27.98	50.00	22.02	L1	gnd

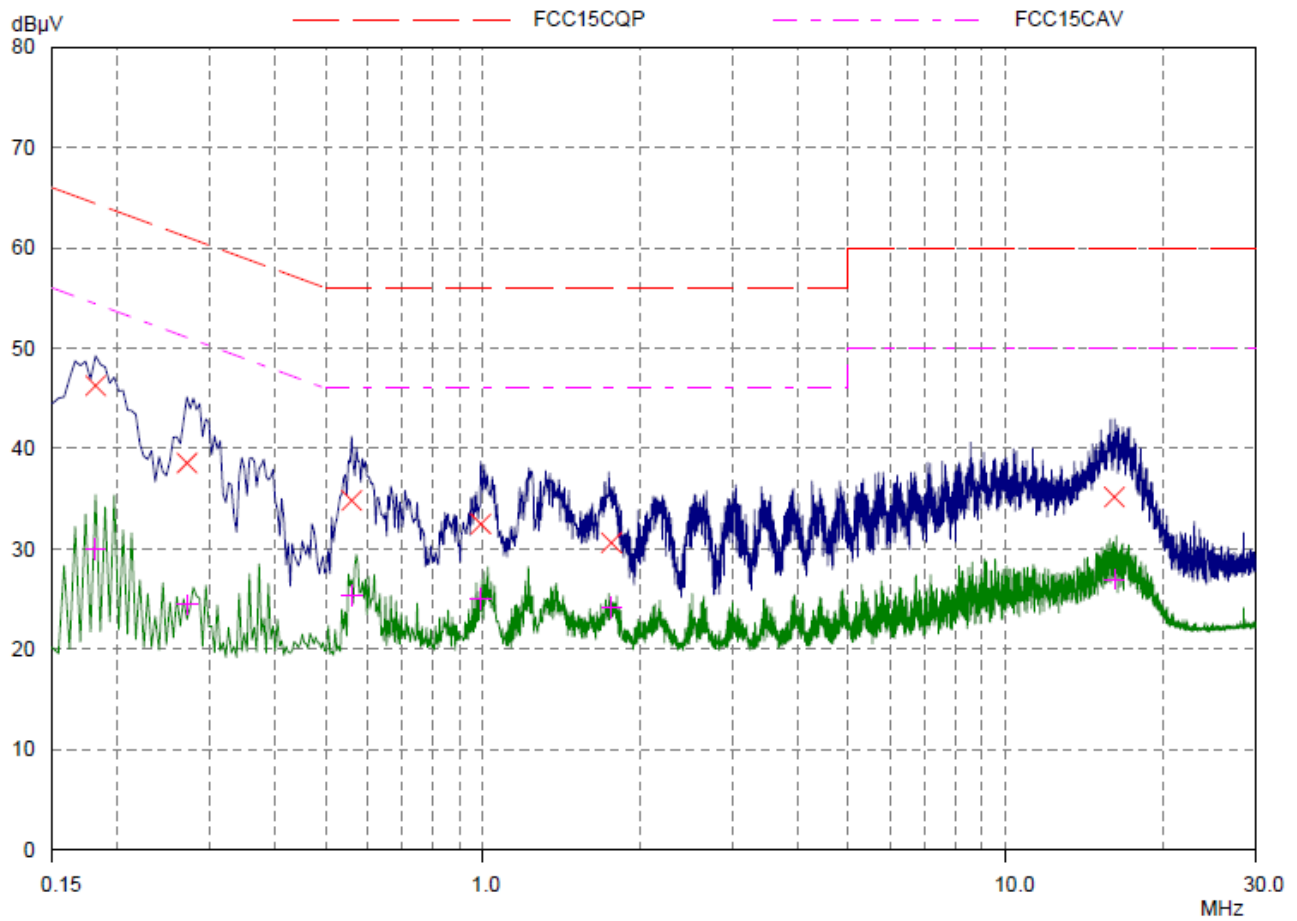
L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	46.27	64.43	18.16	N	gnd
0.27109	38.55	61.08	22.53	N	gnd
0.56015	34.84	56.00	21.16	N	gnd
0.98984	32.49	56.00	23.51	N	gnd
1.75937	30.62	56.00	25.38	N	gnd
16.14218	35.17	60.00	24.83	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18125	29.97	54.43	24.46	N	gnd
0.27109	24.44	51.08	26.64	N	gnd
0.56015	25.35	46.00	20.65	N	gnd
0.98984	25.04	46.00	20.96	N	gnd
1.75937	24.15	46.00	21.85	N	gnd
16.14218	26.96	50.00	23.04	N	gnd

N Line

Conducted Emission from 150 KHz to 30 MHz

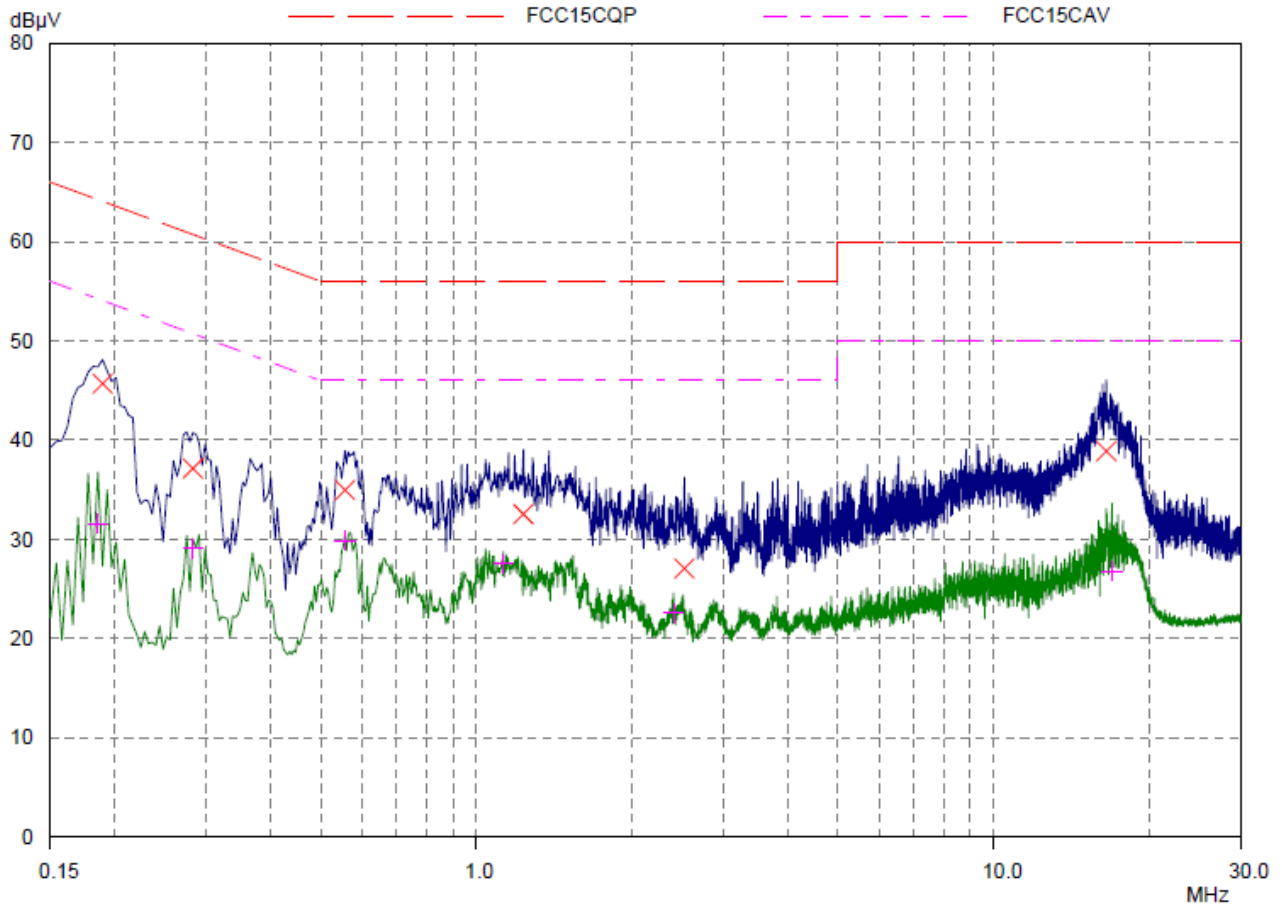
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18906	45.70	64.08	18.38	L1	gnd
0.28281	37.14	60.73	23.59	L1	gnd
0.55625	34.97	56.00	21.03	L1	gnd
1.23203	32.54	56.00	23.46	L1	gnd
2.52109	27.05	56.00	28.95	L1	gnd
16.50937	38.88	60.00	21.12	L1	gnd

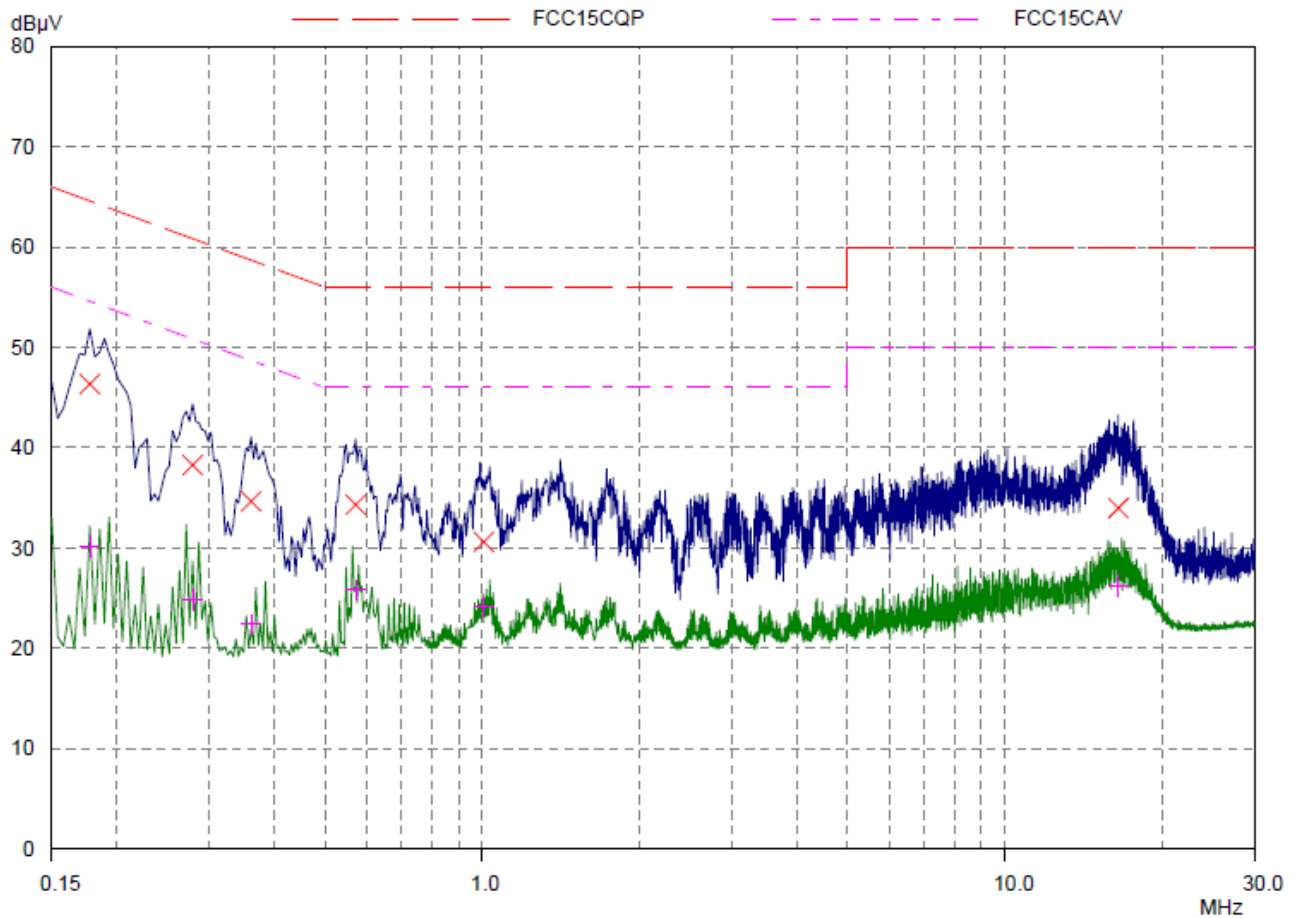
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18515	31.60	54.25	22.65	L1	gnd
0.28281	29.09	50.73	21.64	L1	gnd
0.55625	29.90	46.00	16.10	L1	gnd
1.12656	27.51	46.00	18.49	L1	gnd
2.4039	22.57	46.00	23.43	L1	gnd
16.91953	26.81	50.00	23.19	L1	gnd

L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.17734	46.34	64.61	18.27	N	gnd
0.2789	38.28	60.85	22.57	N	gnd
0.36093	34.66	58.71	24.05	N	gnd
0.57187	34.32	56.00	21.68	N	gnd
1.00546	30.62	56.00	25.38	N	gnd
16.4664	33.98	60.00	26.02	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.17734	30.14	54.61	24.47	N	gnd
0.2789	24.84	50.85	26.01	N	gnd
0.36093	22.39	48.71	26.32	N	gnd
0.57187	25.82	46.00	20.18	N	gnd
1.00546	24.11	46.00	21.89	N	gnd
16.4664	26.25	50.00	23.75	N	gnd

N Line

Conducted Emission from 150 KHz to 30 MHz

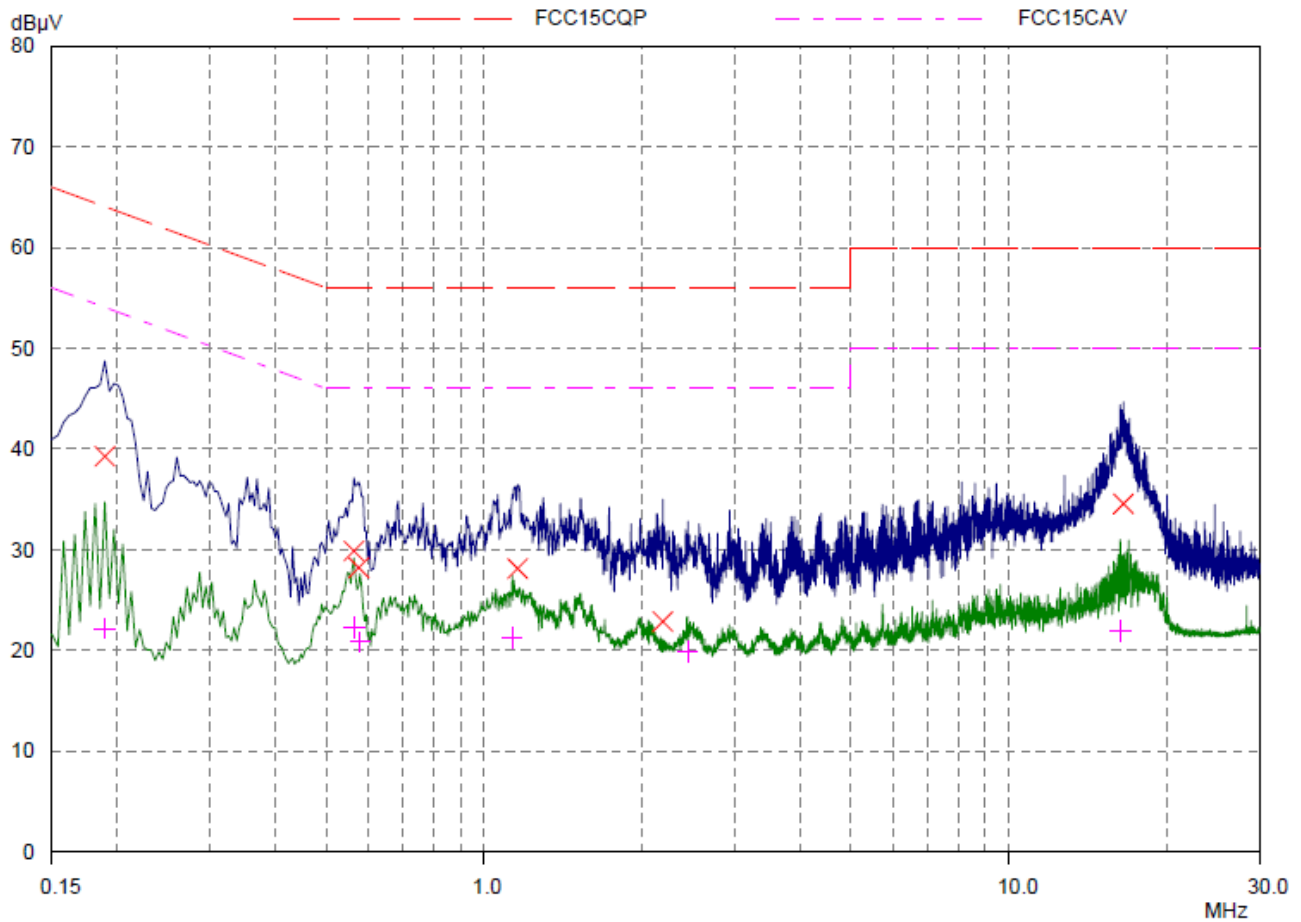
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18906	39.28	64.08	24.80	L1	gnd
0.56406	29.88	56.00	26.12	L1	gnd
0.57578	28.22	56.00	27.78	L1	gnd
1.15781	28.13	56.00	27.87	L1	gnd
2.18906	22.88	56.00	33.12	L1	gnd
16.52109	34.56	60.00	25.44	L1	gnd

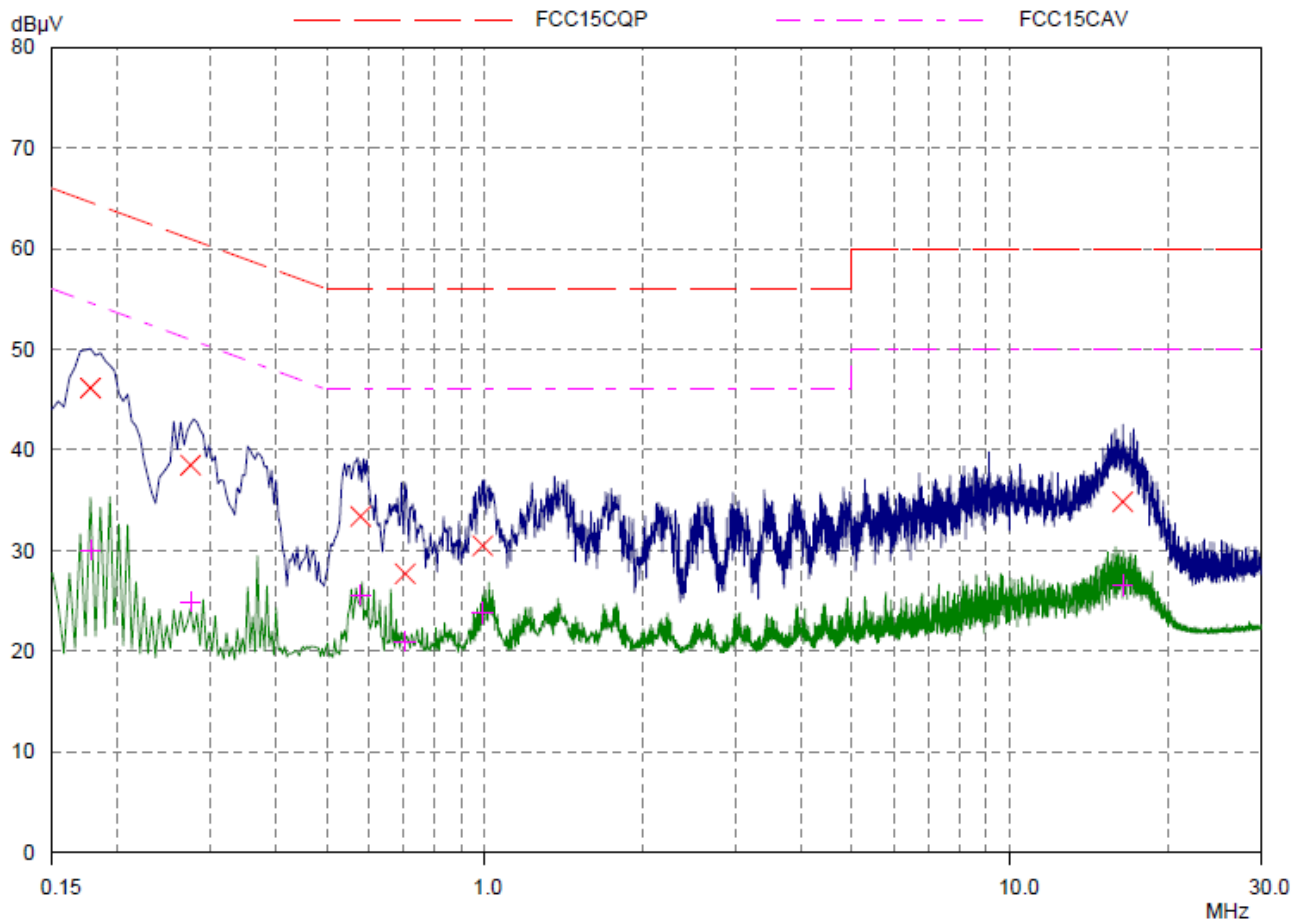
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18906	22.17	54.08	31.91	L1	gnd
0.56406	22.26	46.00	23.74	L1	gnd
0.57968	20.88	46.00	25.12	L1	gnd
1.13046	21.29	46.00	24.71	L1	gnd
2.43906	19.87	46.00	26.13	L1	gnd
16.29062	21.99	50.00	28.01	L1	gnd

L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.17734	46.16	64.61	18.45	N	gnd
0.275	38.49	60.97	22.48	N	gnd
0.57968	33.40	56.00	22.60	N	gnd
0.70468	27.70	56.00	28.30	N	gnd
0.98984	30.49	56.00	25.51	N	gnd
16.39609	34.86	60.00	25.14	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.17734	30.05	54.61	24.56	N	gnd
0.275	24.91	50.97	26.06	N	gnd
0.57968	25.59	46.00	20.41	N	gnd
0.70468	20.99	46.00	25.01	N	gnd
0.98984	23.81	46.00	22.19	N	gnd
16.39609	26.57	50.00	23.43	N	gnd

N Line

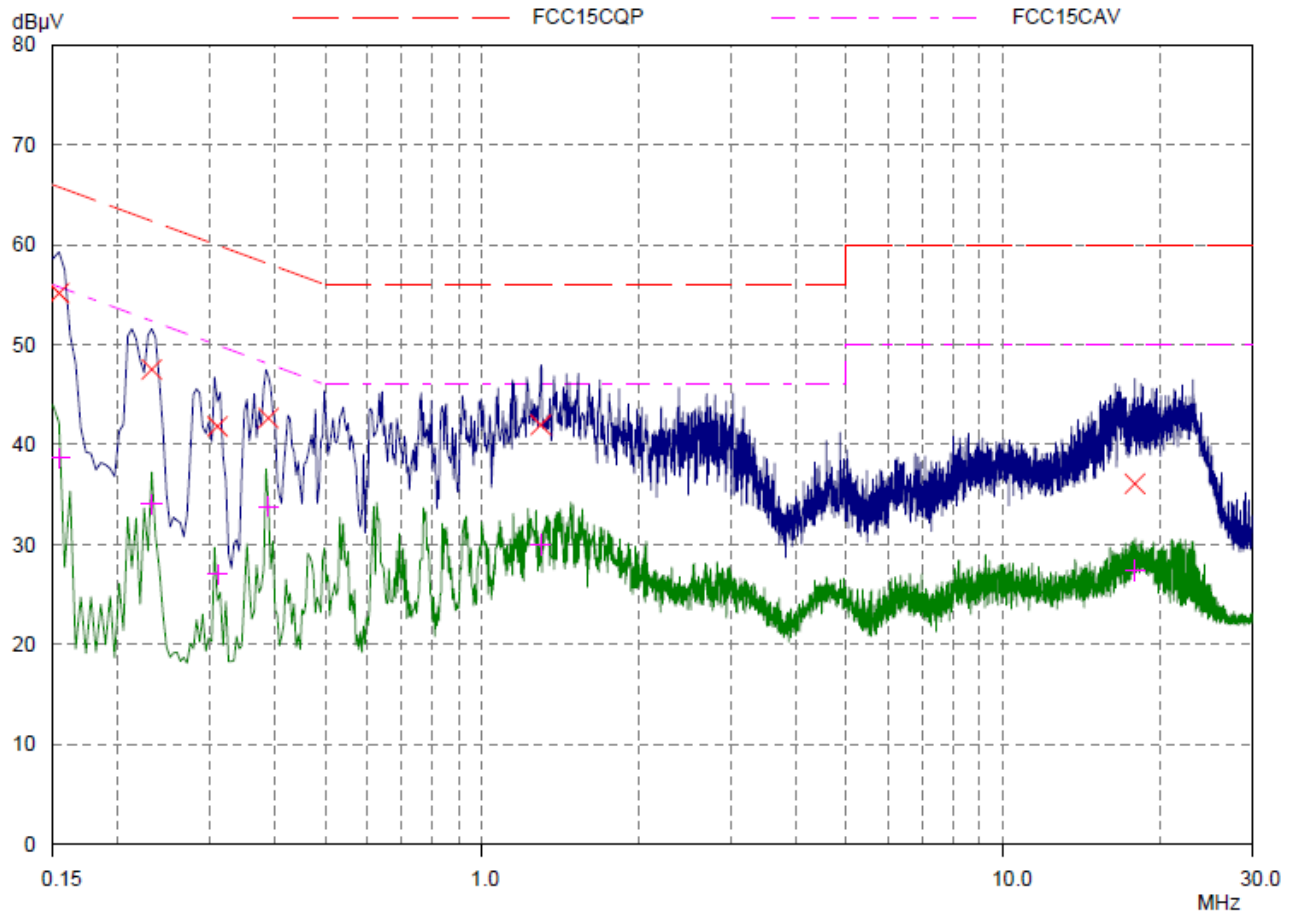
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.1539	55.16	65.79	10.63	L1	gnd
0.23203	47.52	62.38	14.86	L1	gnd
0.31015	41.83	59.97	18.14	L1	gnd
0.38828	42.65	58.10	15.45	L1	gnd
1.29453	41.97	56.00	14.03	L1	gnd
17.88828	36.09	60.00	23.91	L1	gnd

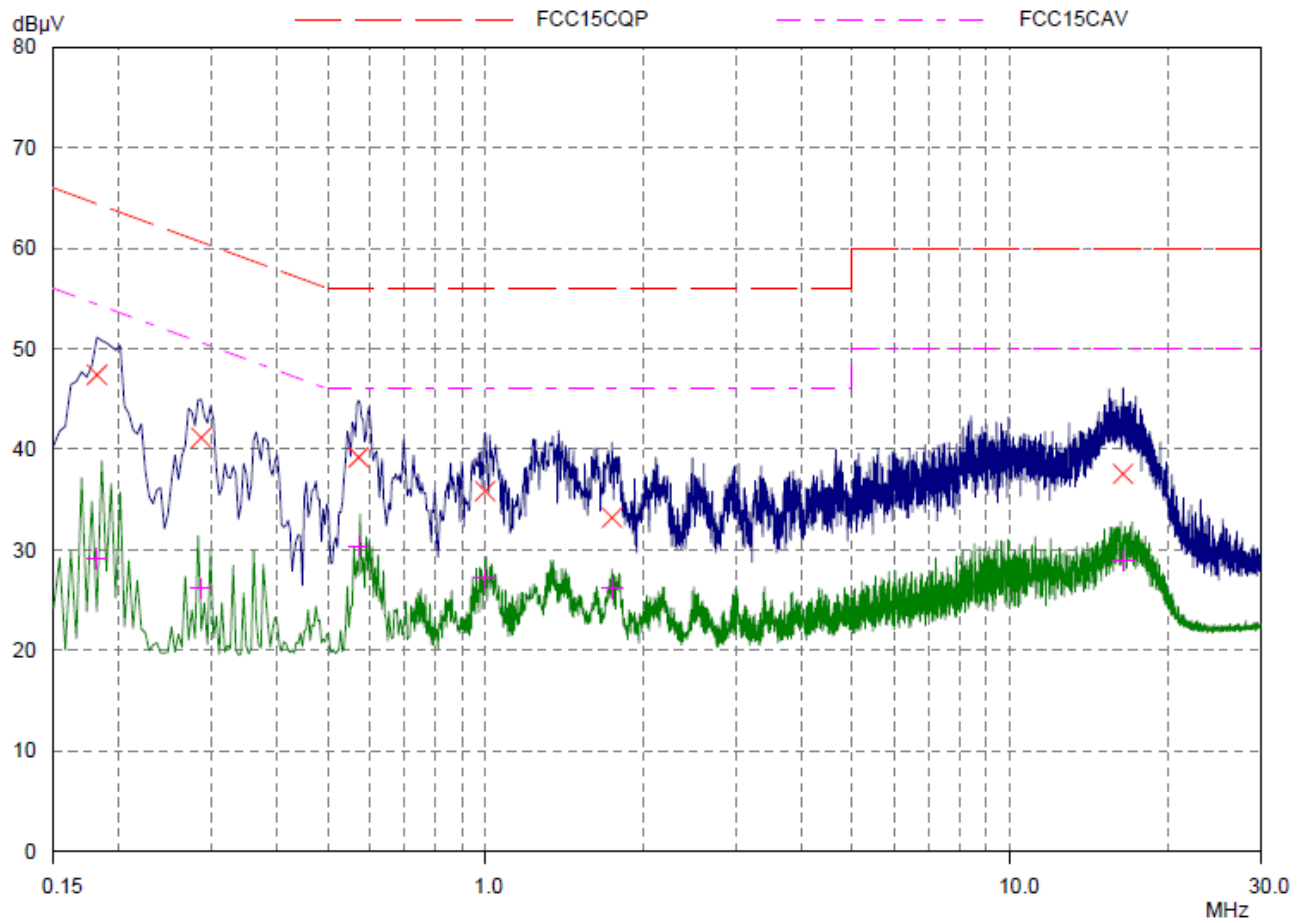
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.1539	38.65	55.79	17.14	L1	gnd
0.23203	34.04	52.38	18.34	L1	gnd
0.31015	27.02	49.97	22.95	L1	gnd
0.38828	33.80	48.10	14.30	L1	gnd
1.29453	29.99	46.00	16.01	L1	gnd
17.88828	27.44	50.00	22.56	L1	gnd

L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	47.41	64.43	17.02	N	gnd
0.28671	41.15	60.62	19.47	N	gnd
0.57187	39.22	56.00	16.78	N	gnd
0.99765	35.83	56.00	20.17	N	gnd
1.73984	33.20	56.00	22.80	N	gnd
16.41953	37.56	60.00	22.44	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18125	29.11	54.43	25.32	N	gnd
0.28671	26.17	50.62	24.45	N	gnd
0.57187	30.38	46.00	15.62	N	gnd
0.99765	27.22	46.00	18.78	N	gnd
1.73984	26.16	46.00	19.84	N	gnd
16.41953	28.89	50.00	21.11	N	gnd

N Line

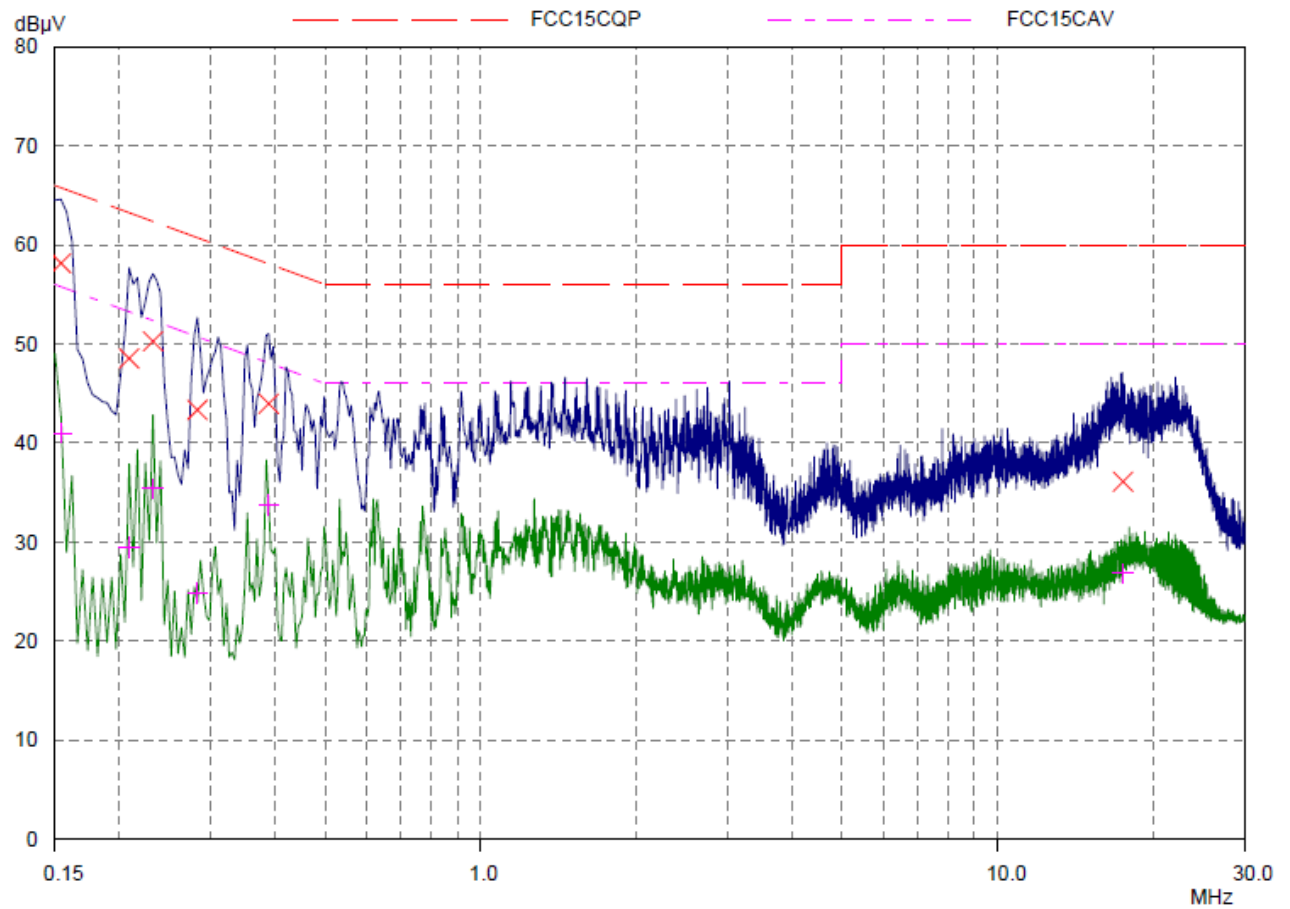
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.1539	58.16	65.79	7.63	L1	gnd
0.20859	48.53	63.26	14.73	L1	gnd
0.23203	50.28	62.38	12.10	L1	gnd
0.28281	43.34	60.73	17.39	L1	gnd
0.38828	43.97	58.10	14.13	L1	gnd
17.48593	36.10	60.00	23.90	L1	gnd

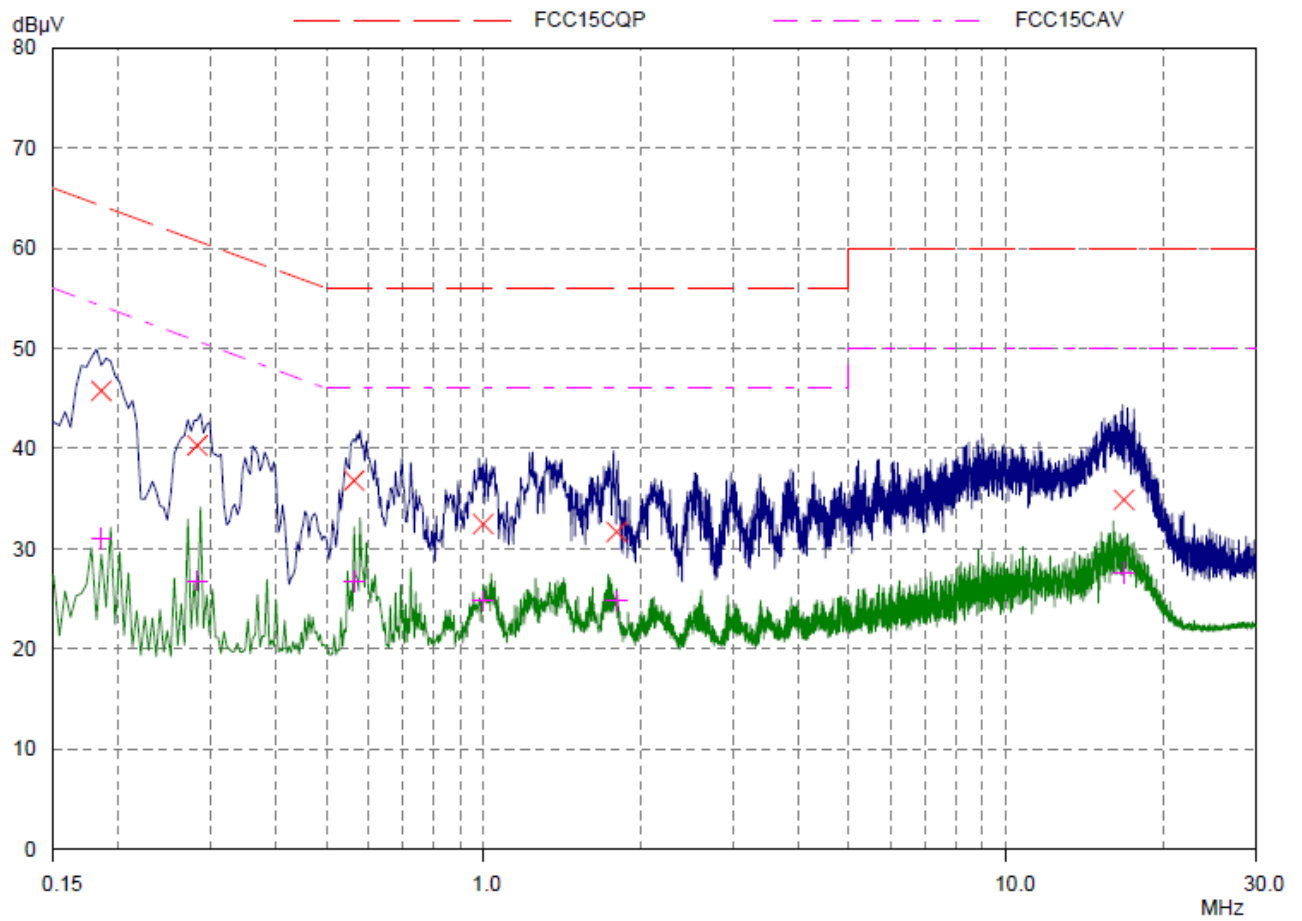
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.1539	41.00	55.79	14.79	L1	gnd
0.20859	29.51	53.26	23.75	L1	gnd
0.23203	35.38	52.38	17.00	L1	gnd
0.28281	24.84	50.73	25.89	L1	gnd
0.38828	33.74	48.10	14.36	L1	gnd
17.48593	26.83	50.00	23.17	L1	gnd

L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18515	45.77	64.25	18.48	N	gnd
0.28281	40.30	60.73	20.43	N	gnd
0.56406	36.80	56.00	19.20	N	gnd
0.99765	32.49	56.00	23.51	N	gnd
1.79453	31.67	56.00	24.33	N	gnd
16.80234	34.87	60.00	25.13	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18515	31.06	54.25	23.19	N	gnd
0.28281	26.79	50.73	23.94	N	gnd
0.56406	26.77	46.00	19.23	N	gnd
0.99765	24.78	46.00	21.22	N	gnd
1.79453	24.81	46.00	21.19	N	gnd
16.80234	27.64	50.00	22.36	N	gnd

N Line

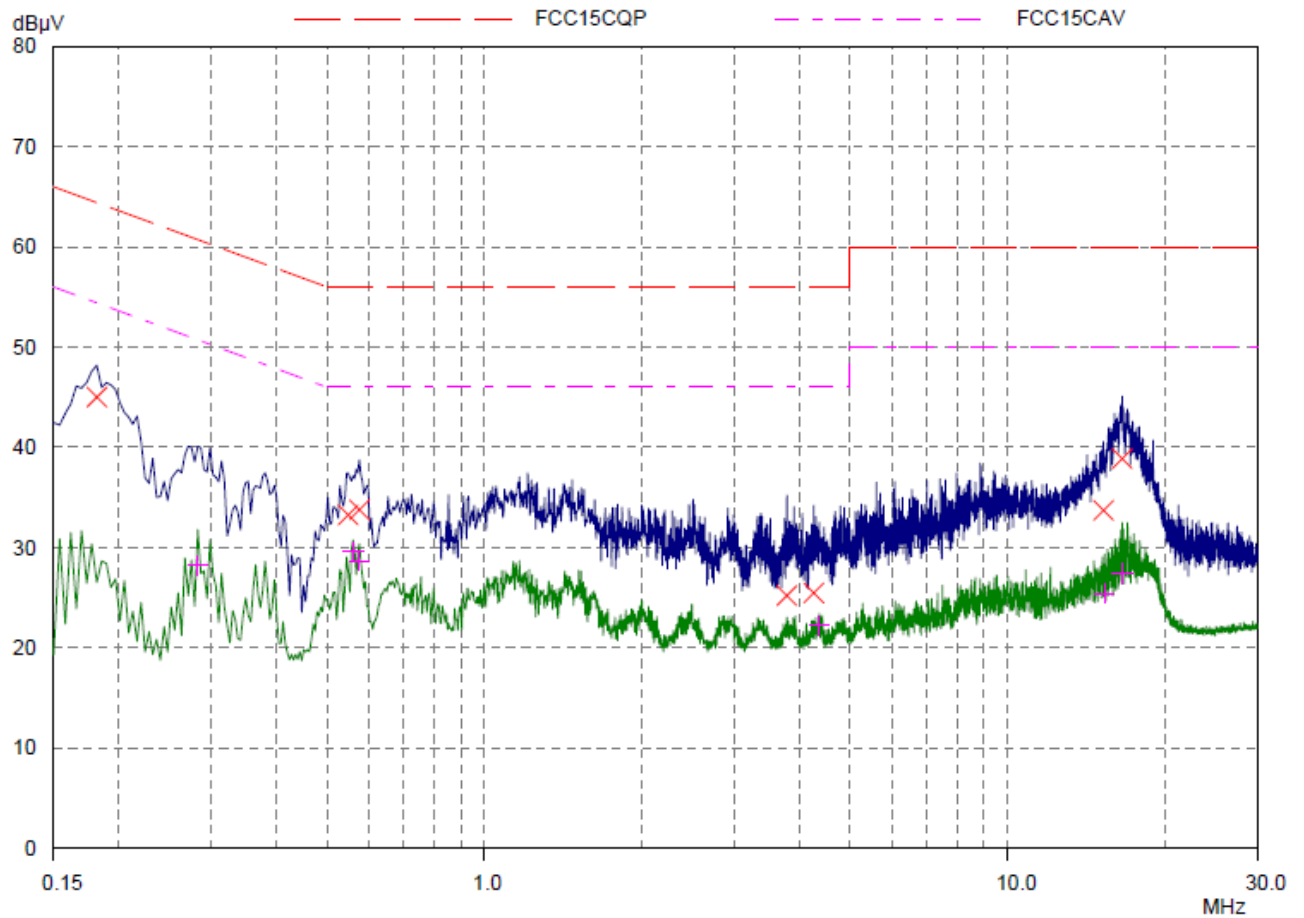
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	45.01	64.43	19.42	L1	gnd
0.54843	33.27	56.00	22.73	L1	gnd
0.57578	33.78	56.00	22.22	L1	gnd
3.78281	25.22	56.00	30.78	L1	gnd
4.25937	25.48	56.00	30.52	L1	gnd
15.24765	33.73	60.00	26.27	L1	gnd
16.55624	38.86	60.00	21.14	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.28281	28.22	50.73	22.51	L1	gnd
0.56015	29.57	46.00	16.43	L1	gnd
0.57578	28.68	46.00	17.32	L1	gnd
4.36093	22.24	46.00	23.76	L1	gnd
15.32968	25.42	50.00	24.58	L1	gnd
16.56796	27.47	50.00	22.53	L1	gnd

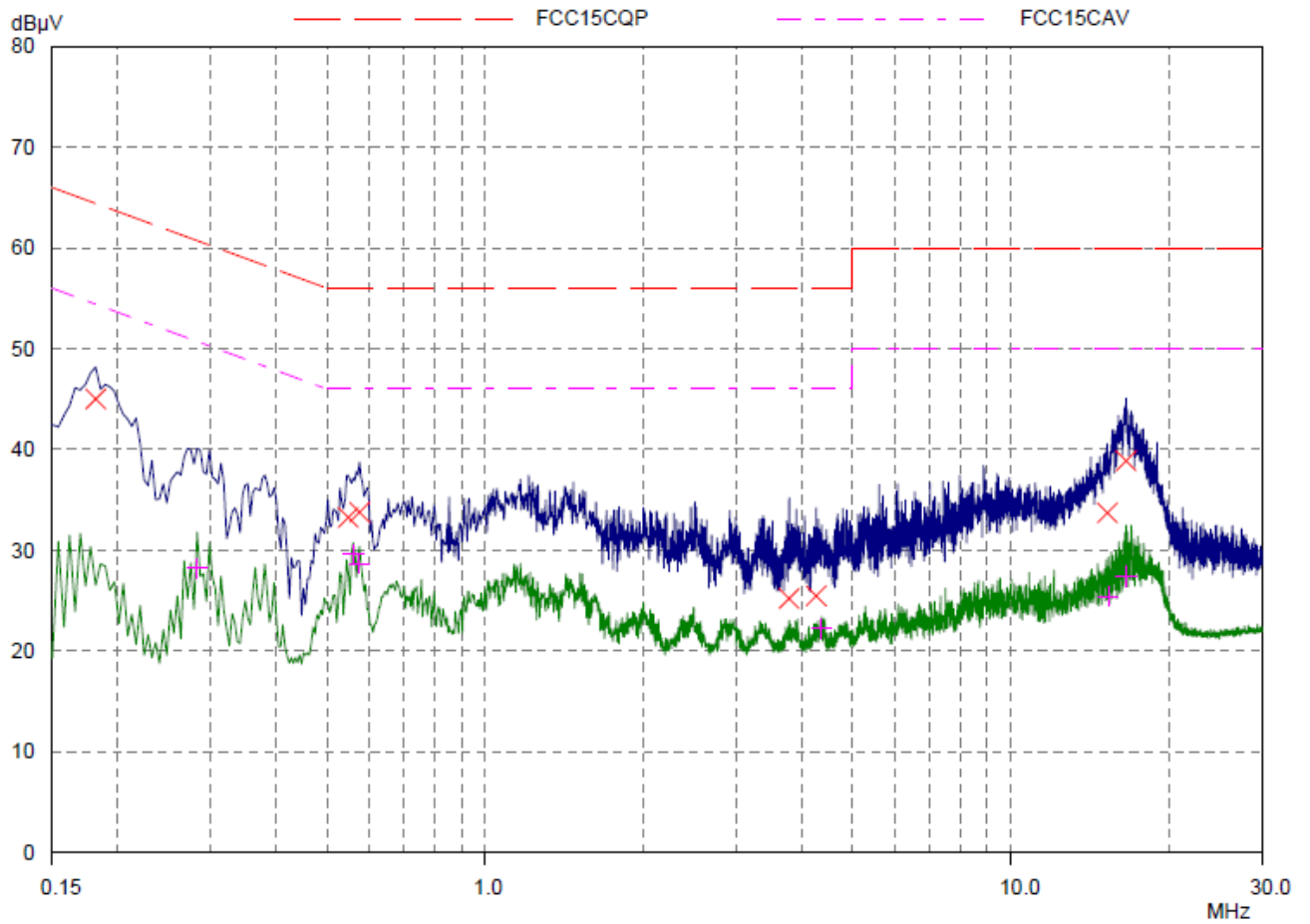
L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	45.01	64.43	19.42	L1	gnd
0.54843	33.27	56.00	22.73	L1	gnd
0.57578	33.78	56.00	22.22	L1	gnd
3.78281	25.22	56.00	30.78	L1	gnd
4.25937	25.48	56.00	30.52	L1	gnd
15.24765	33.73	60.00	26.27	L1	gnd
16.55624	38.86	60.00	21.14	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.28281	28.22	50.73	22.51	L1	gnd
0.56015	29.57	46.00	16.43	L1	gnd
0.57578	28.68	46.00	17.32	L1	gnd
4.36093	22.24	46.00	23.76	L1	gnd
15.32968	25.42	50.00	24.58	L1	gnd
16.56796	27.47	50.00	22.53	L1	gnd

N Line

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4. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time	Valid Period
01	BT Base Station Simulator	CBT	R&S	100271	2015-04-26	2016-04-25	1 year
02	Loop Antenna	FMZB1516	SCHWARZBECK	237	2014-06-29	2016-06-28	2 years
03	EMI Test Receiver	ESCS30	R&S	100138	2014-12-17	2015-12-16	1 year
04	LISN	ENV216	R&S	101171	2014-12-17	2015-12-16	1 year
05	EMI Test Receiver	ESCI	R&S	100948	2015-04-26	2016-04-25	1 year
06	TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2013-11-25	2016-11-24	3 years
07	Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2012-07-02	2015-07-01	3 years
08	PSG Analog Signal Generator	E8257D	Agilent	MY49281101	2015-04-26	2016-04-25	1 year
09	ESG Vector Signal Generator	E4438C	Agilent	MY49070900	2015-04-26	2016-04-25	1 year
10	Spectrum Analyzer	E4445A	Agilent	MY46181146	2015-04-26	2016-04-25	1 year
11	Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA	NA
12	MOB COMMS DC SUPPLY	66319D	Agilent	MY43004105	2015-04-26	2016-04-25	1 year
13	Power Sensor	E9304A	Agilent	MY50220022	2015-04-26	2016-04-25	1 year
14	Power Meter	E4418B	Agilent	MY50000623	2015-04-26	2016-04-25	1 year
15	Vibration table	ESS-050-120	dongling	D1007126	2013-08-21	2016-08-20	3 years
16	Spectrum Analyzer	FSV30	R&S	100815	2014-12-18	2015-12-17	1 year
17	Standard Gain Horn	3160-09	ETS-Lindgren	00102644	2015-05-19	2018-05-18	3 years
18	RF Cable	SMA 15cm	Agilent	0001	2015-06-07	2015-08-06	2 Months

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

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ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



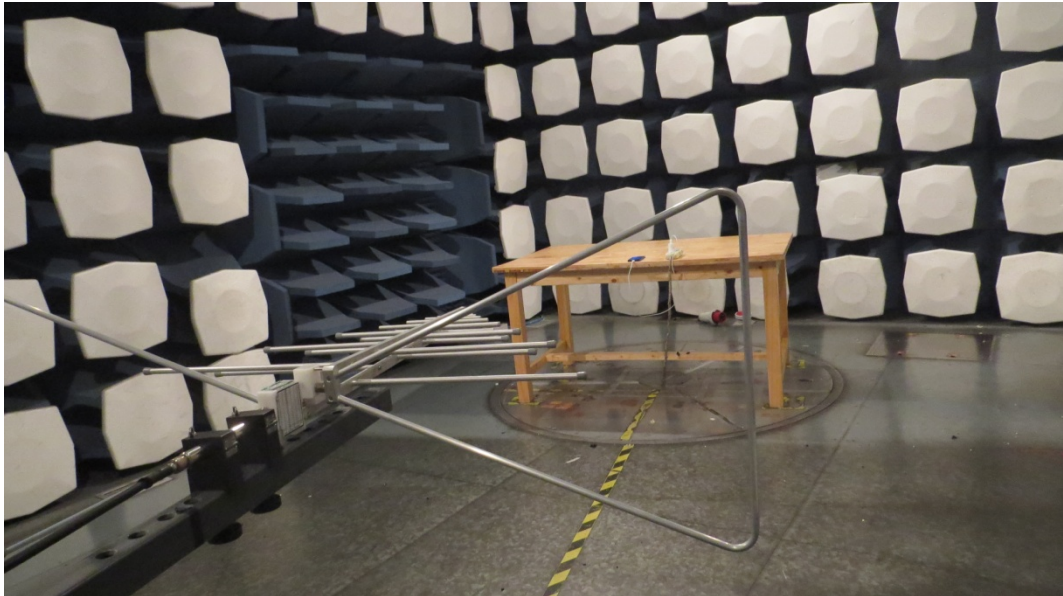
Picture 1 EUT

TA Technology (Shanghai) Co., Ltd. Test Report

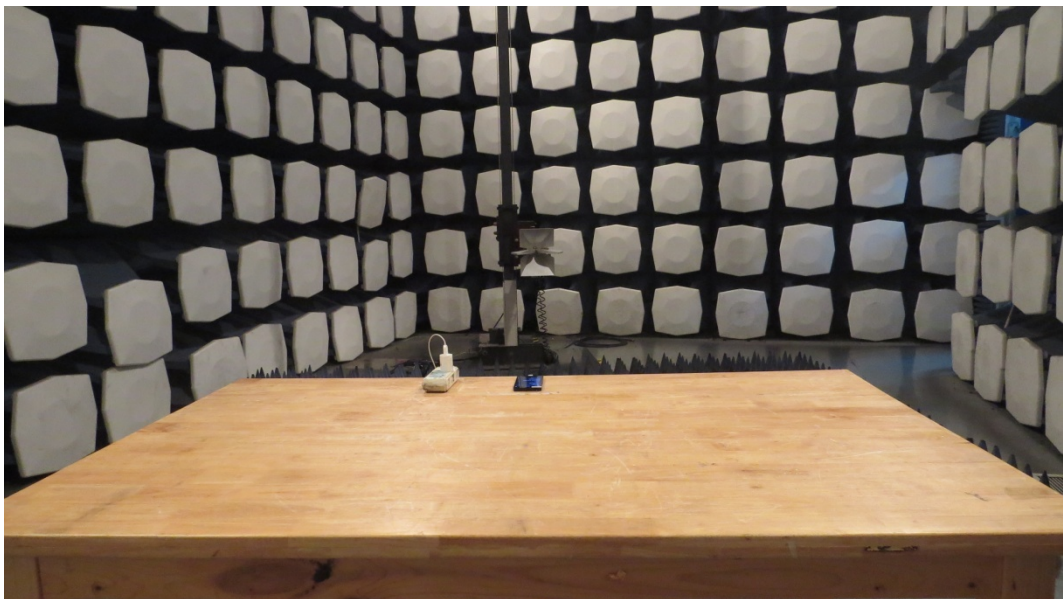
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A.2 Test Setup



30M Hz-1GHz



Above 1GHz

Picture 2 Radiated Emission Test Setup

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Picture 3 Conducted Emission Test Setup