



RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-ZTEN9131
Product LTE/WCDMA/GSM /CDMA
Multi -Mode Digital Mobile Phone
Model N9131
Report No. RXA1603-0039RF01R1
Issue Date April 28, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2015)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of Measurement 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
Date of Testing: March 21, 2016~ April 11, 2016			



1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of TA technology (shanghai) co., Ltd. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

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

FCC (recognition number is 428261)

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

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

A2LA(Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
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2 General Description of Equipment under Test

Client Information

Applicant	ZTE Coporation
Applicant address	ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District
Manufacturer	ZTE Coporation
Manufacturer address	ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District

General information

Model:	N9131		
MEID:	99000680000315		
HW Version:	cuzA		
SW Version:	N9131V1.0.0B01		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	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	11.2 dBm		
Tested Frequency Range(s):	2400 ~ 2483.5 MHz		
EUT Accessory			
Battery	Manufacturer: SCUD(FUJIAN)ELECTRONICS Model: Li3922T44P6h903546 Power Rating: DC 3.84V, Li-ion		
Adapter	Manufacturer: RUIJING Model: STC-A508A-Z M5		
Note: 1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.			



2.1 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 15C (2015) Radio Frequency Devices

ANSI C63.10 (2013)

DA00-705 Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System.(2000)

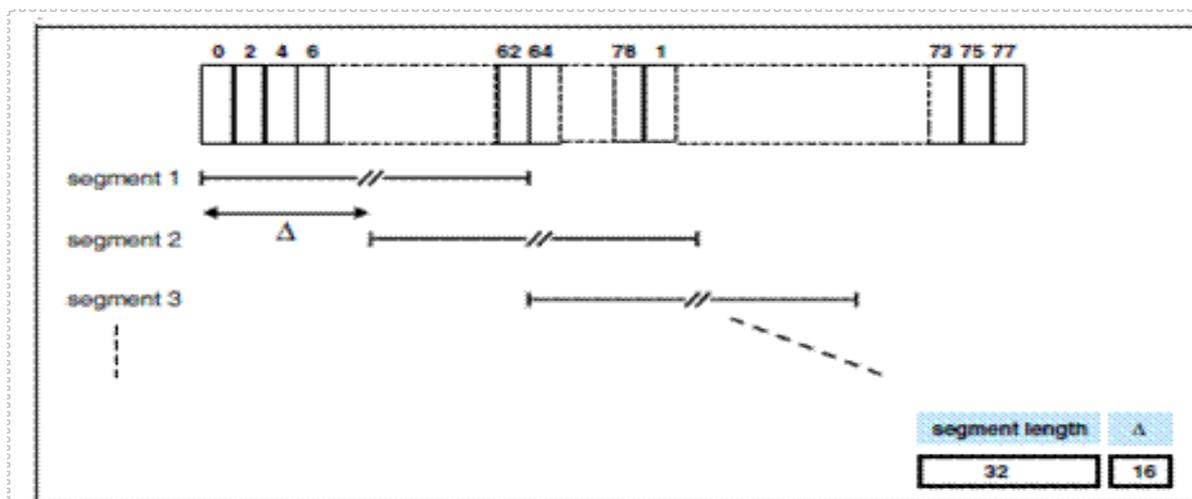
3 Information about the FHSS characteristics

3.1 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.

3.2 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.

3.3 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.

4 Test Information

4.1 Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

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.

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 3DH5 for 8DQPSK modulation, For RSE and CSE, only the maximum RF output power is chosen.

4.2 Peak Power Output –Conducted

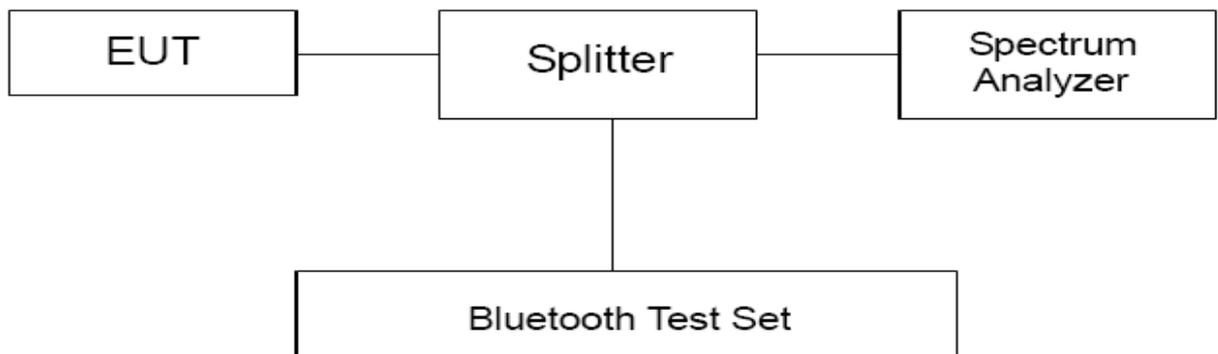
Ambient condition

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. 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	≤ 0.125W (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.

**Test Results**

Channel	Frequency (MHz)	Peak Output Power (dBm)			Conclusion
		DH5	2DH5	3DH5	
0	2402	8.3	6.8	6.8	PASS
39	2441	11.2	9.7	9.7	PASS
78	2480	10.2	8.7	8.7	PASS

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

4.3 Occupied Bandwidth (20dB)

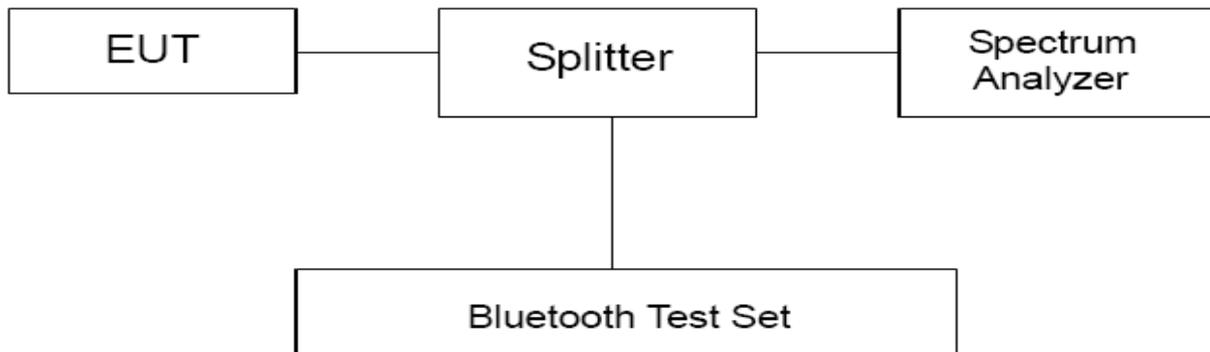
Ambient condition

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 30kHz and VBW is set to 100kHz 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.

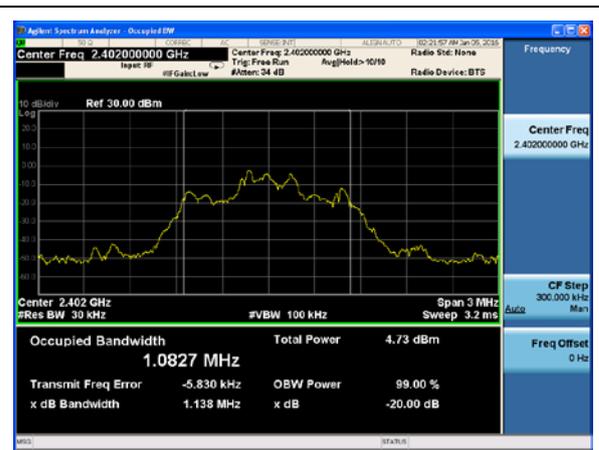


Test Results

Mode	Channel	Frequency (MHz)	20dB Bandwidth(kHz)
DH5	0	2402	1045
DH5	39	2441	1046
DH5	78	2480	1045
2DH5	0	2402	1138
2DH5	39	2441	1121
2DH5	78	2480	1135
3DH5	0	2402	1189
3DH5	39	2441	1192
3DH5	78	2480	1186



DH5, Carrier frequency (MHz): 2402



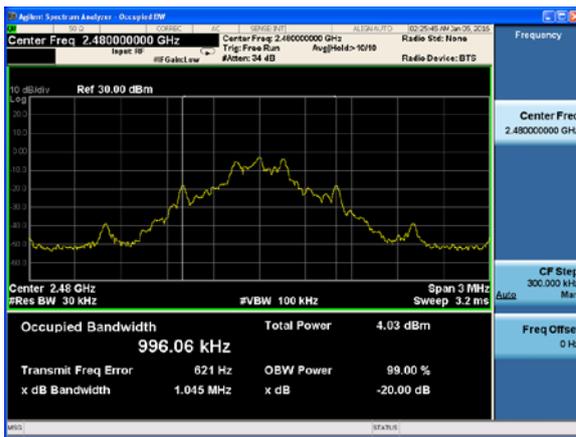
2DH5, Carrier frequency (MHz): 2402



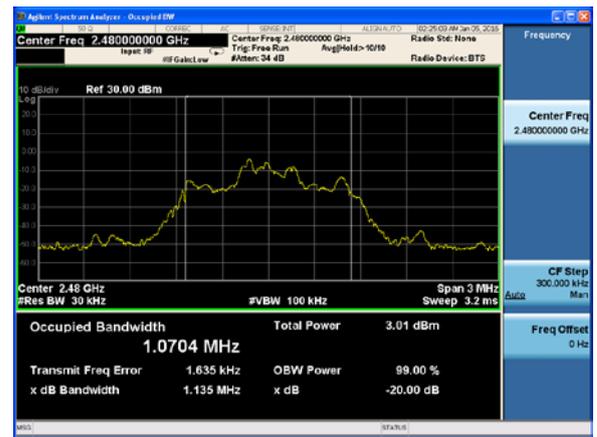
DH5, Carrier frequency (MHz): 2441



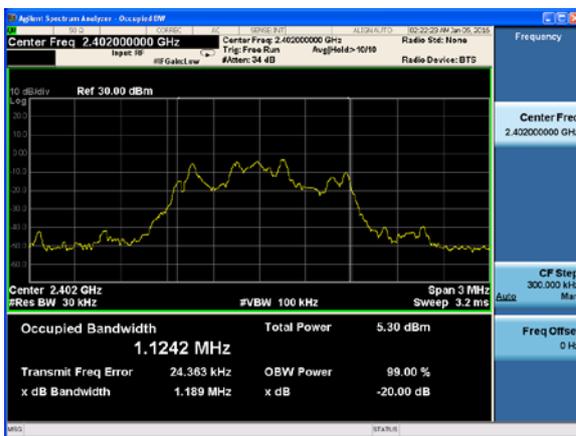
2DH5, Carrier frequency (MHz): 2441



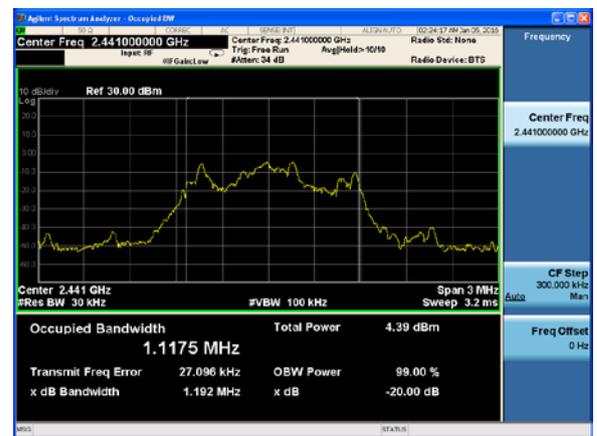
DH5, Carrier frequency (MHz): 2480



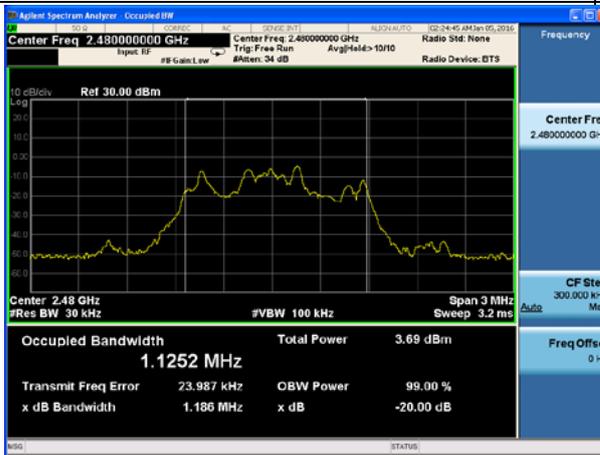
2DH5, Carrier frequency (MHz): 2480



3DH5, Carrier frequency (MHz): 2402



3DH5, Carrier frequency (MHz): 2441



3DH5, Carrier frequency (MHz): 2480

4.4 Frequency Separation

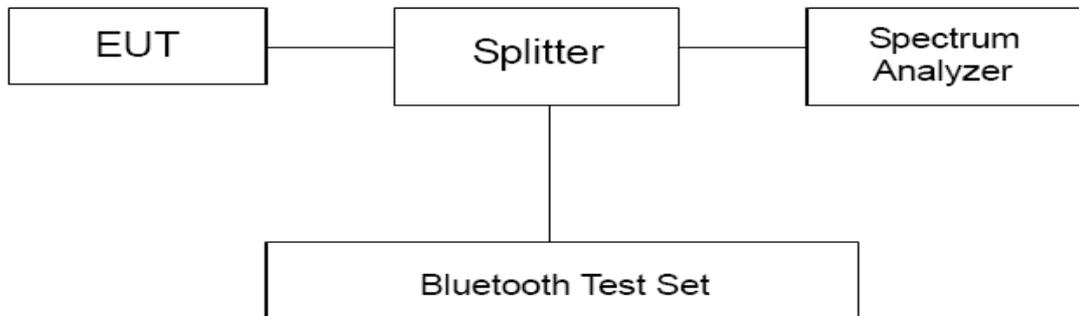
Ambient condition

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 30 kHz and VBW is set to 100kHz 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.

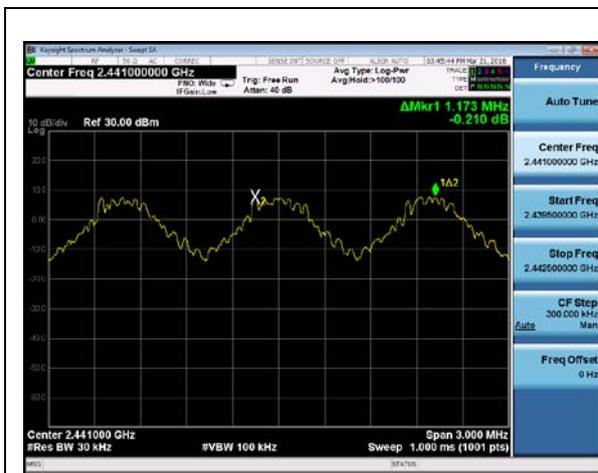
Measurement Uncertainty

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

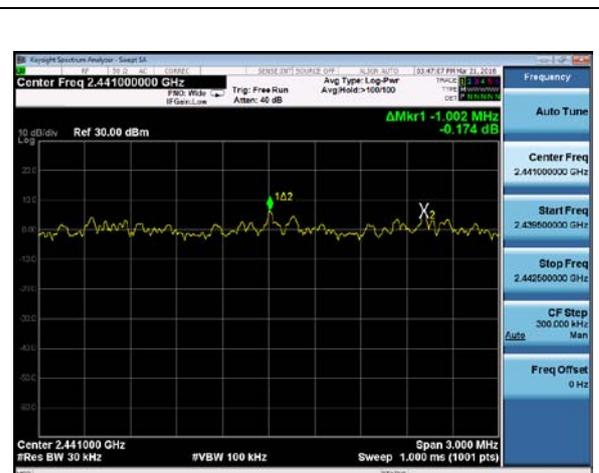
Test Results:

Packet type	Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth(kHz)	Limit (kHz)	Conclusion
DH5	2441	1173	1046	697.33	PASS
2DH5	2441	1002	1121	747.33	PASS
3DH5	2441	1002	1192	794.67	PASS

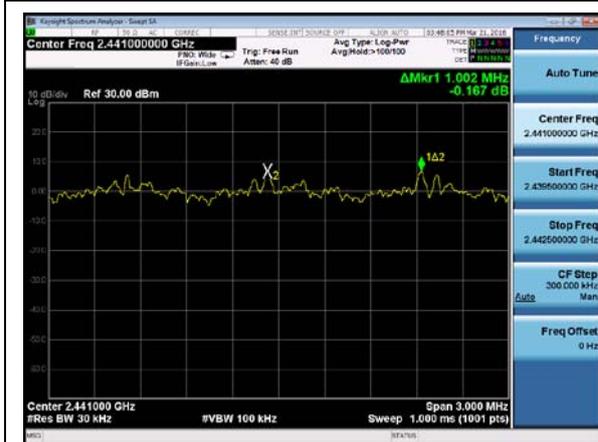
Note: The limit is two-thirds of 20 dB bandwidth.



DH5 Carrier frequency (MHz): 2441



2DH5 Carrier frequency (MHz): 2441



3DH5 Carrier frequency (MHz): 2441

4.5 Time of Occupancy (Dwell Time)

Ambient condition

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

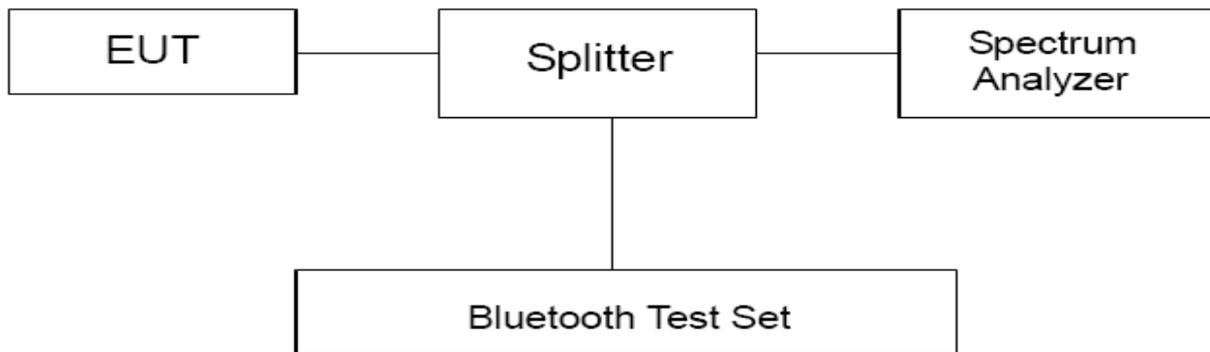
Methods of Measurement

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 1MHz 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 * 1/s for DH1 packet =1600
- hop rate=1600/3 * 1/s for DH3 packet =533.33
- hop rate=1600/5 * 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	≤ 400ms
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Measurement Uncertainty

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

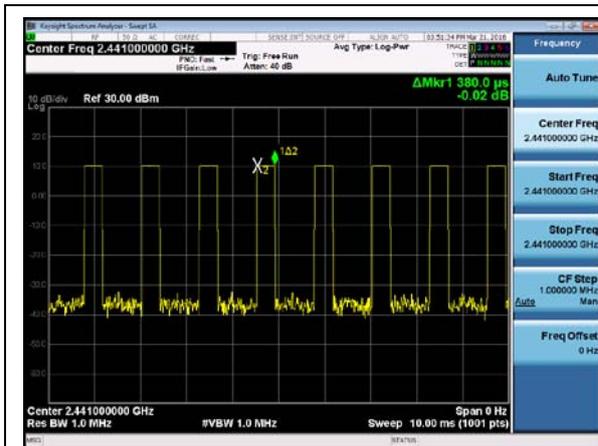
Requirements	Uncertainty	
Dwell Time	DH1	$U=0.64\text{ms}$
	DH3	$U=0.80\text{ms}$
	DH5	$U=0.70\text{ms}$
	2DH1	$U=0.64\text{ms}$
	2DH3	$U=0.80\text{ms}$
	2DH5	$U=0.70\text{ms}$
	3DH1	$U=0.64\text{ms}$
	3DH3	$U=0.80\text{ms}$
	3DH5	$U=0.70\text{ms}$



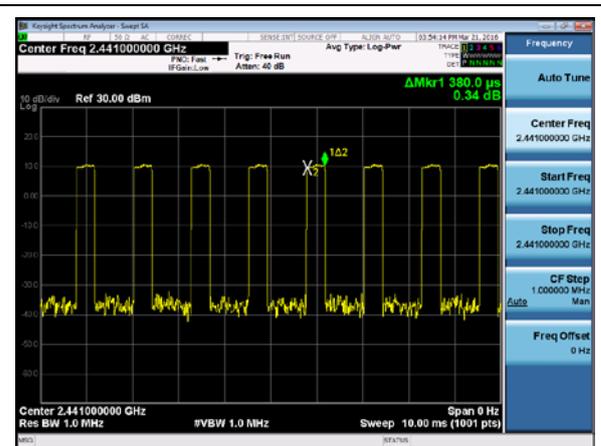
Test Results:

Channel 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	1.64	349.86	400	PASS
2DH5	320	2.88	368.64	400	PASS
3DH1	1600	0.38	243.20	400	PASS
3DH3	533.33	1.63	347.73	400	PASS
3DH5	320	2.79	357.12	400	PASS

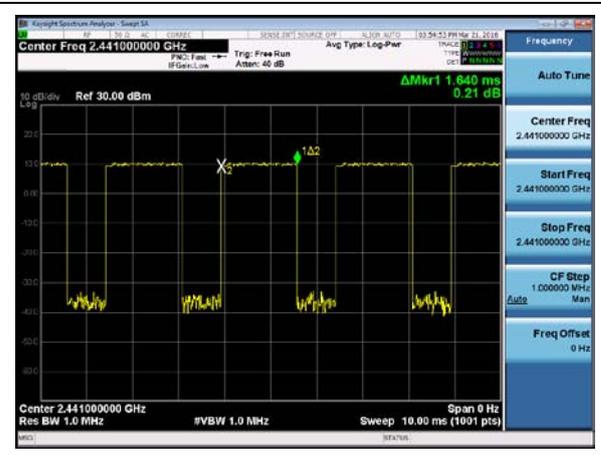
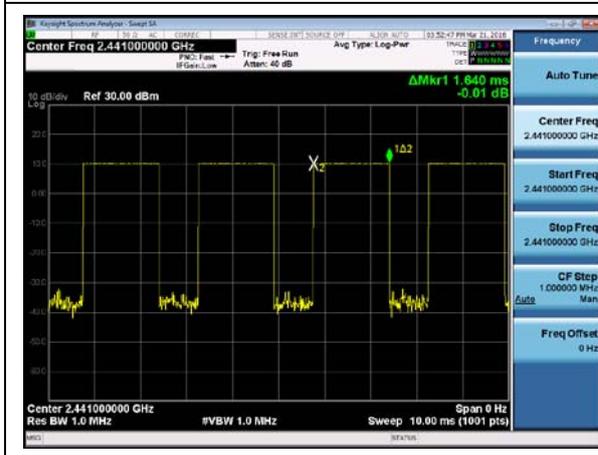
Note: Dwell time = time slot length * hop rate * 0.4s



Carrier frequency (MHz): 2441, DH1

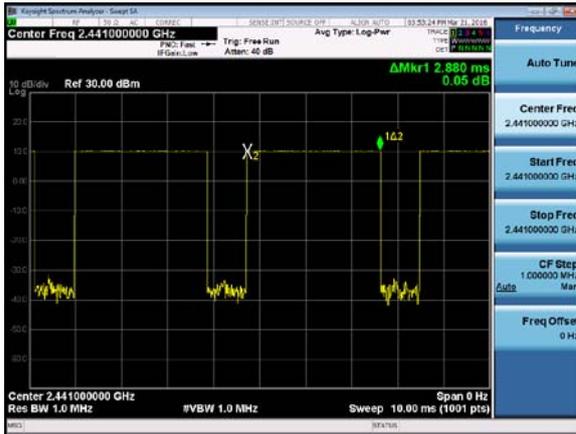


Carrier frequency (MHz): 2441, 2DH1

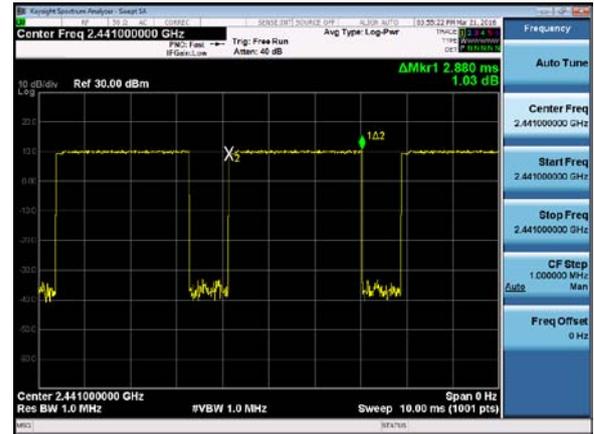




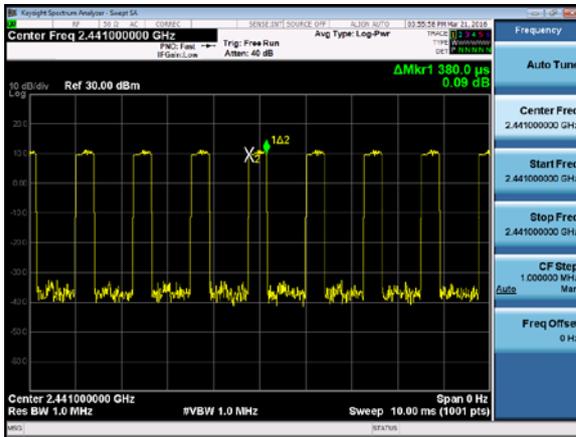
Carrier frequency (MHz): 2441, DH3



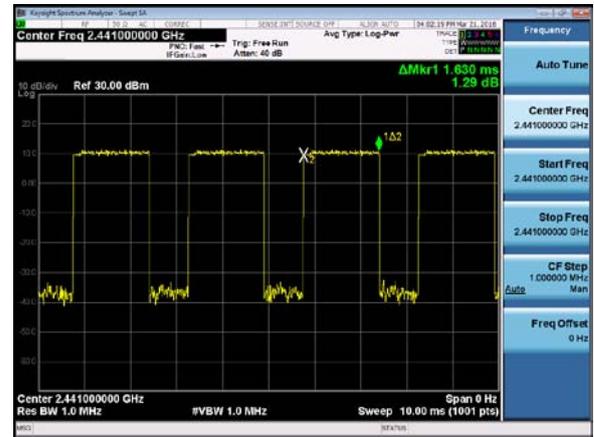
Carrier frequency (MHz): 2441, 2DH3



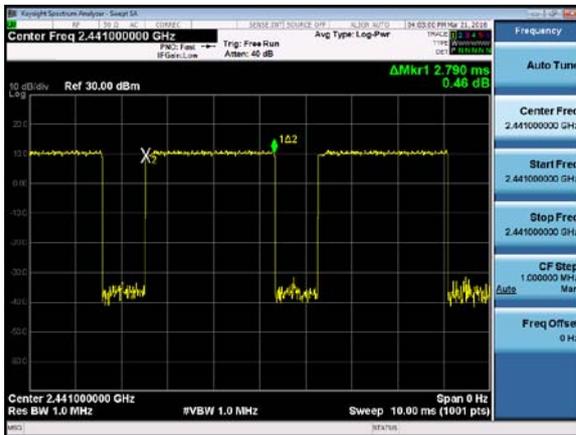
Carrier frequency (MHz): 2441, DH5



Carrier frequency (MHz): 2441, 2DH5



Carrier frequency (MHz): 2441, 3DH1



Carrier frequency (MHz): 2441, 3DH3



Carrier frequency (MHz): 2441, 3DH5

4.6 Band Edge Compliance

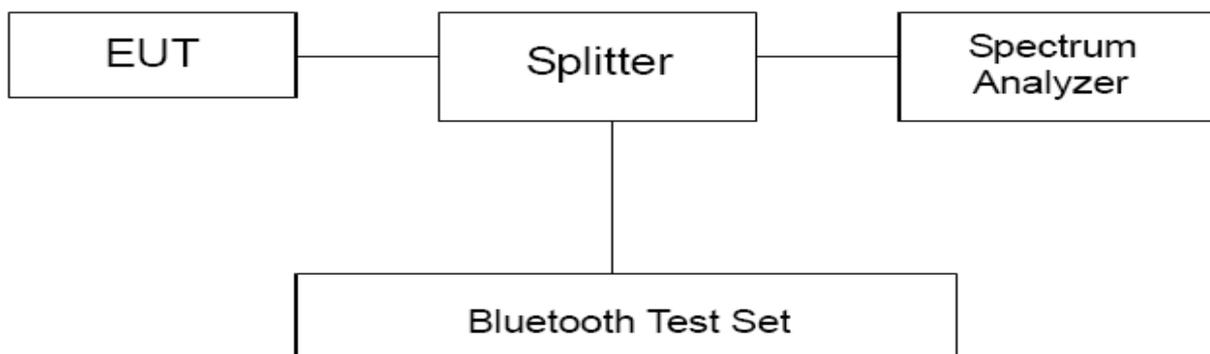
Ambient condition

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

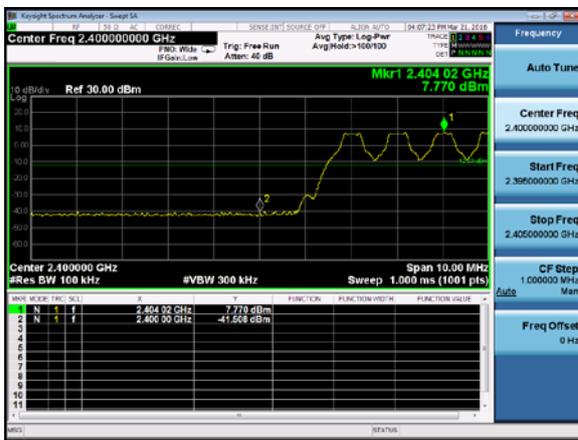
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

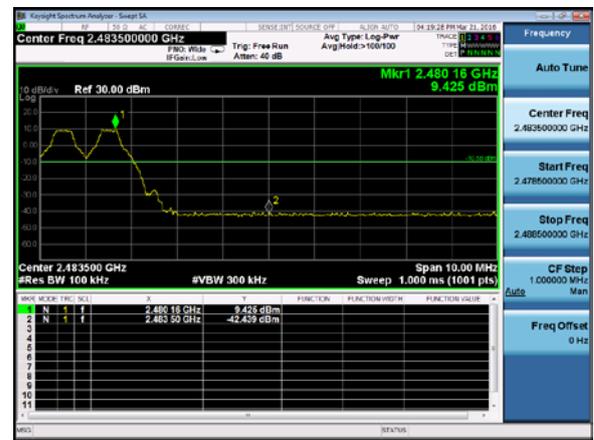


Test Results

Hopping On-DH5

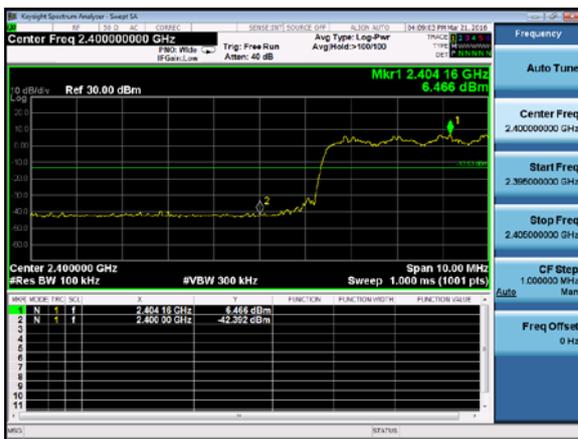


Carrier frequency (MHz): 2402



Carrier frequency (MHz): 2480

Hopping On-2DH5

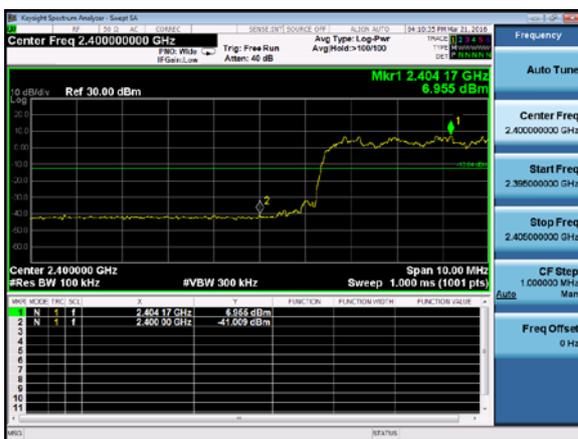


Carrier frequency (MHz): 2402



Carrier frequency (MHz): 2480

Hopping On-3DH5



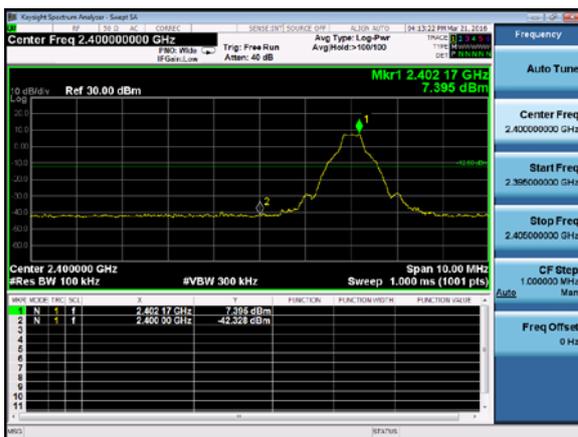
Carrier frequency (MHz): 2402



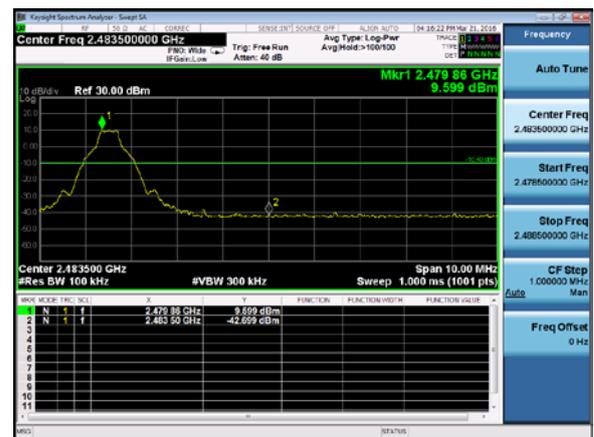
Carrier frequency (MHz): 2480



Hopping Off-DH5



Carrier frequency (MHz): 2402



Carrier frequency (MHz): 2480

Hopping Off -2DH5



Carrier frequency (MHz): 2402

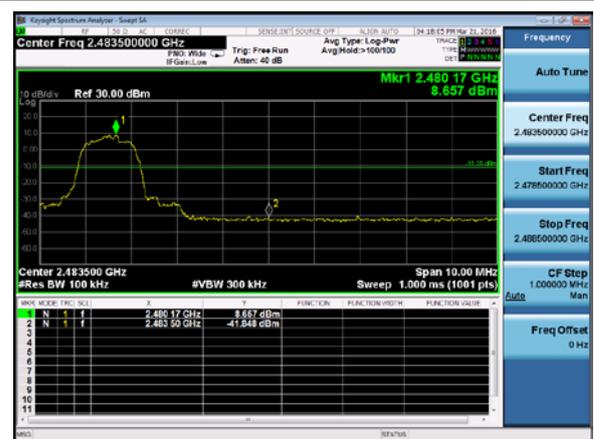


Carrier frequency (MHz): 2480

Hopping Off -3DH5



Carrier frequency (MHz): 2402



Carrier frequency (MHz): 2480

4.7 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.

Set the spectrum analyzer in the following:

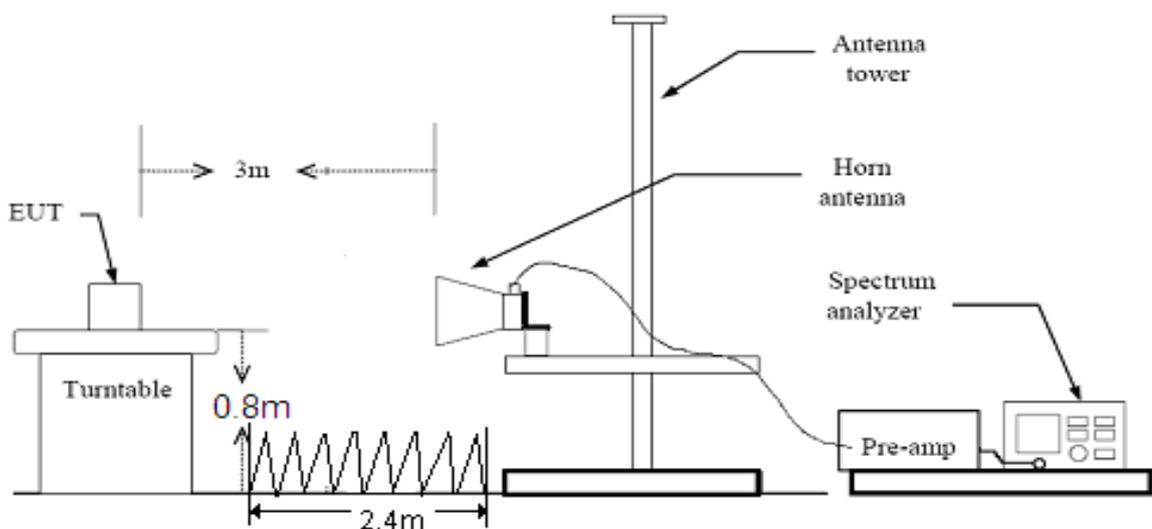
- (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
- (b) The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate 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

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)
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.

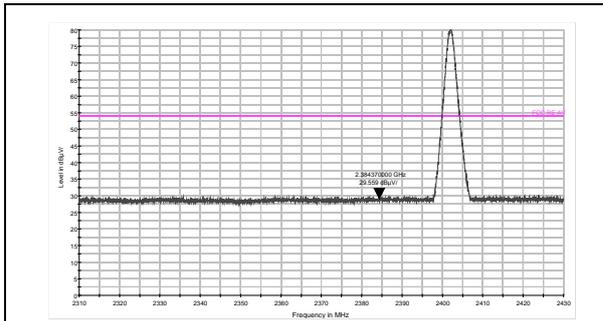
Peak Limit=74dBuV/m

Average Limit=54dBuV/m

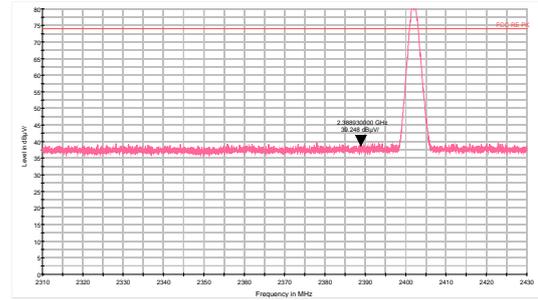
Measurement Uncertainty

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.

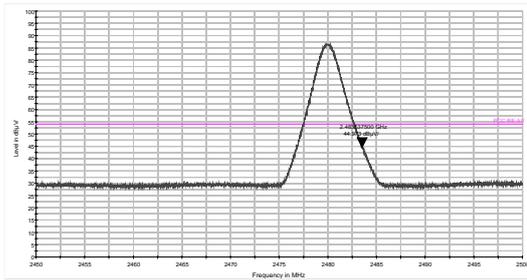
Test Results:



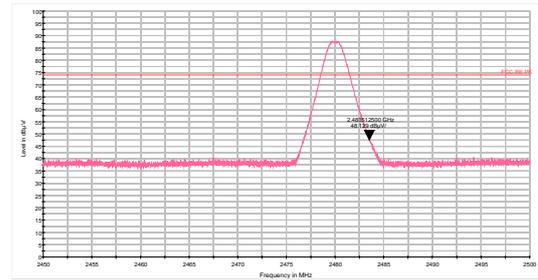
GFSK_CH0_2.31-2.43GHz_AV



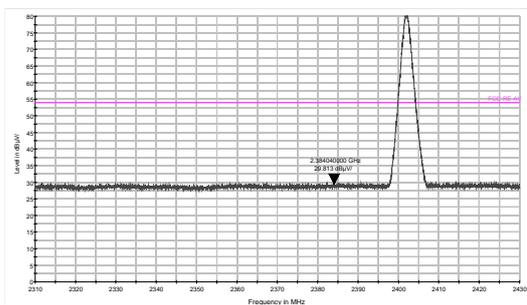
GFSK_CH0_2.31-2.43GHz_PK



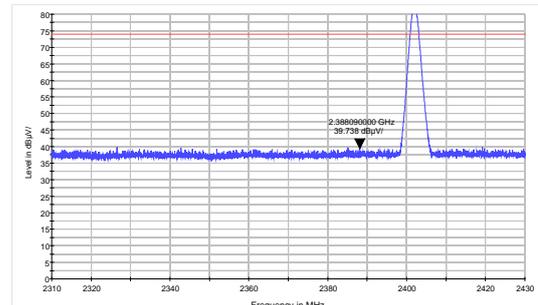
GFSK_CH78_2.45-2.5GHz_AV



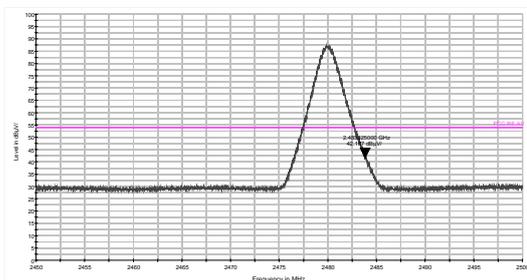
GFSK_CH78_2.45-2.5GHz_PK



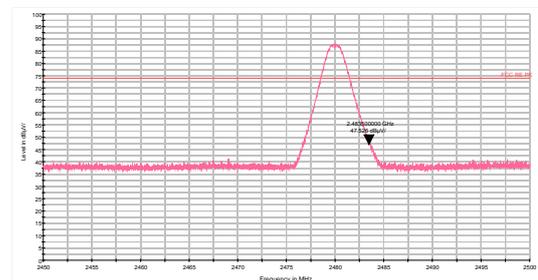
EDR_CH0_2.31-2.43GHz_AV



EDR_CH0_2.31-2.43GHz_PK



EDR_CH78_2.45-2.5GHz_AV



EDR_CH78_2.45-2.5GHz_PK

4.8 Number of hopping Frequency

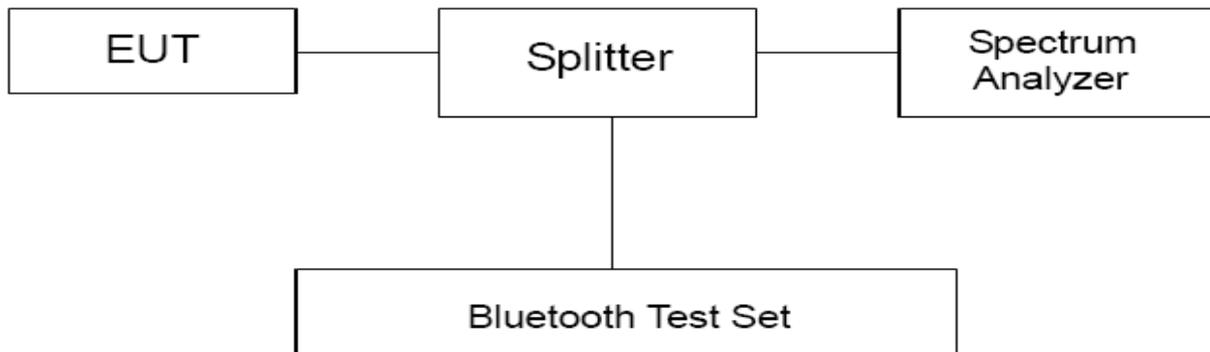
Ambient condition

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 1MHz and VBW is set to 1 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.”

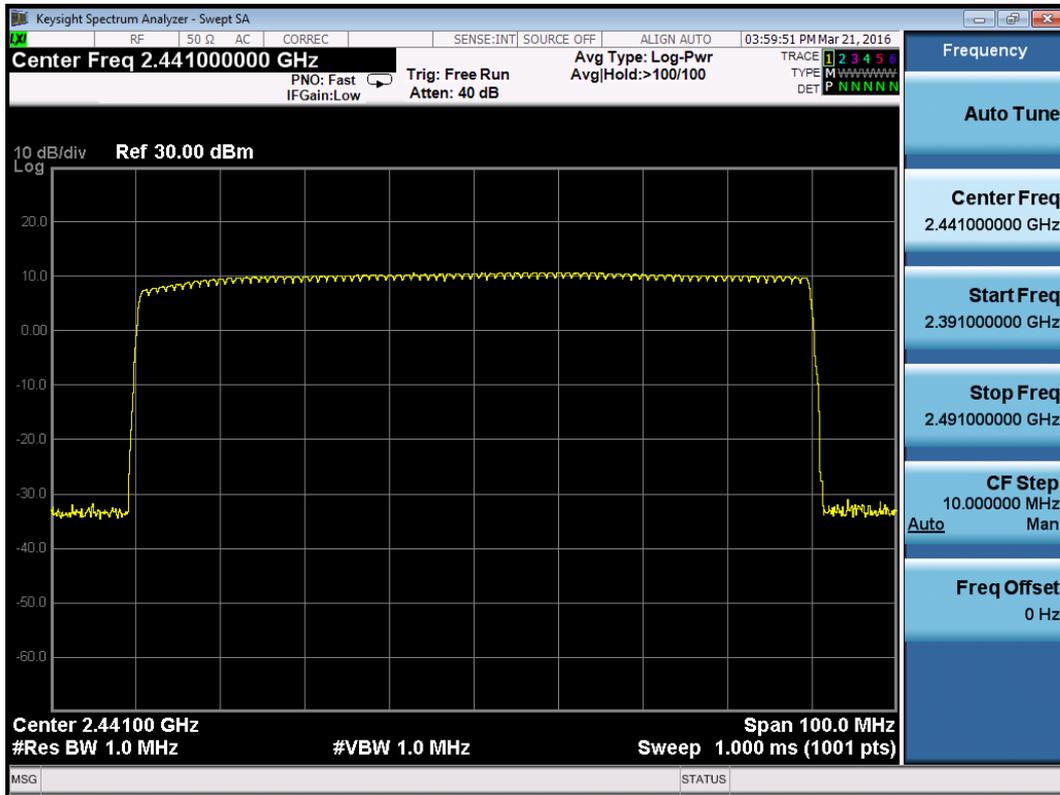
Limits	≥ 15 channels
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Test Results:

DH5

Number of hopping channels	conclusion
79	PASS

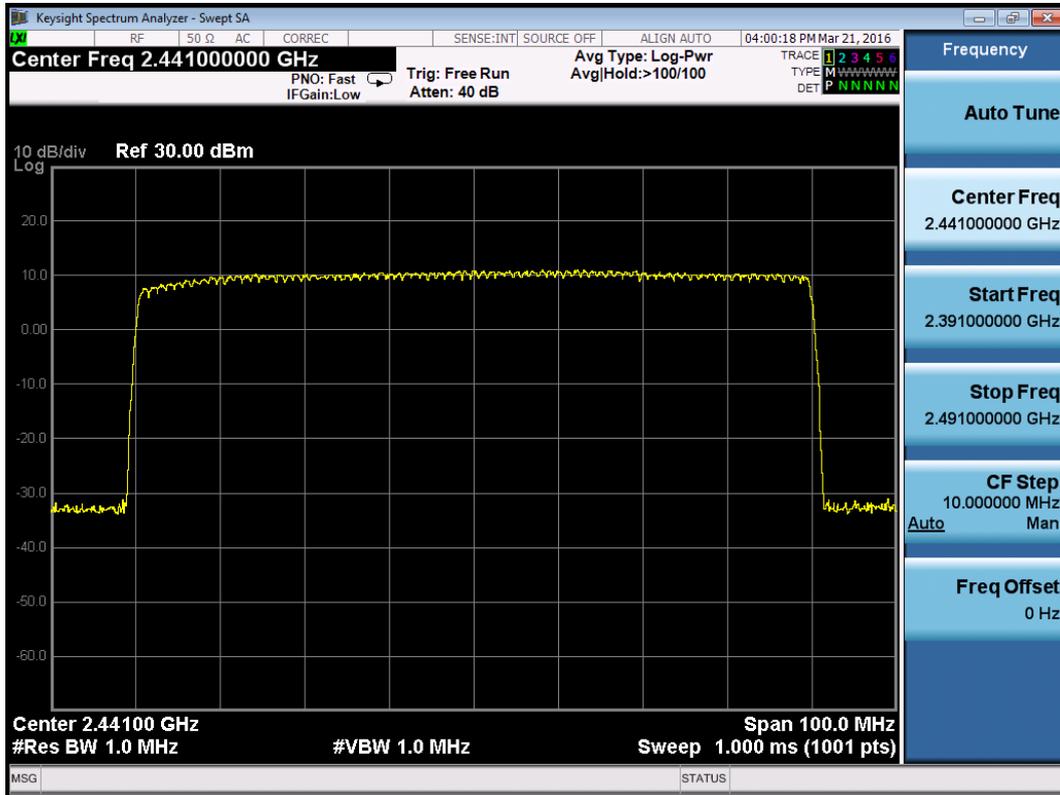


2400 MHz – 2483.5 MHz



2DH5

Number of hopping channels	conclusion
79	PASS

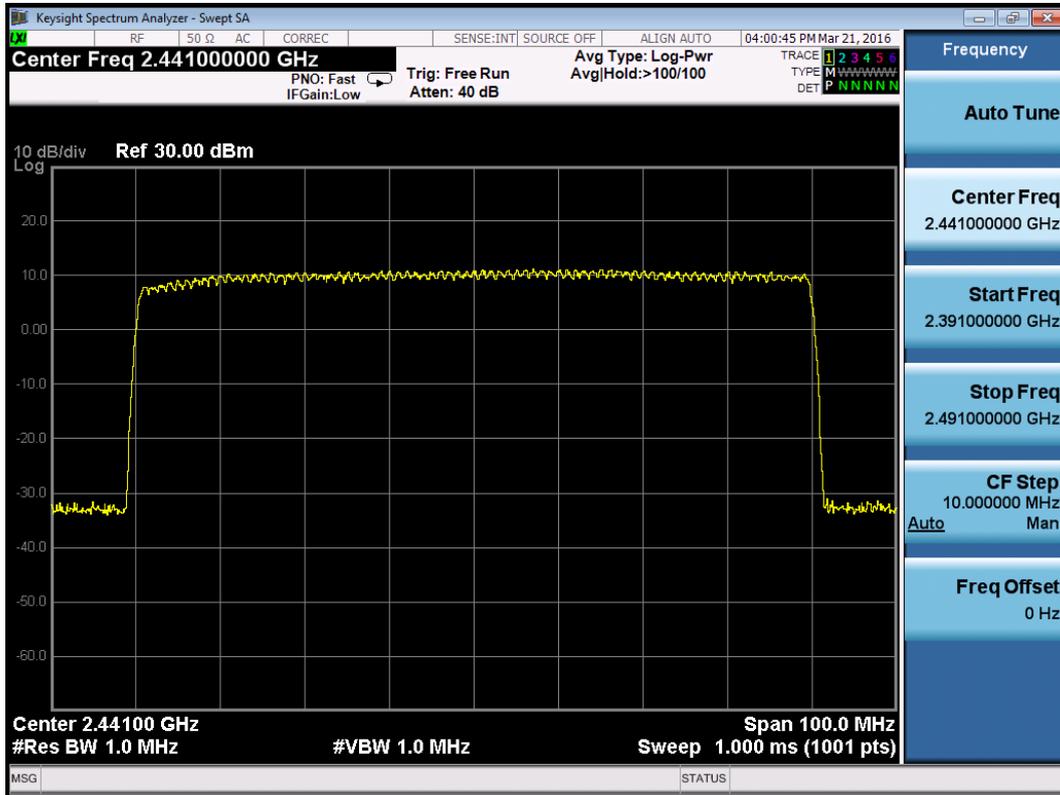


2400 MHz – 2483.5 MHz



3DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz – 2483.5 MHz

4.9 Spurious RF Conducted Emissions

Ambient condition

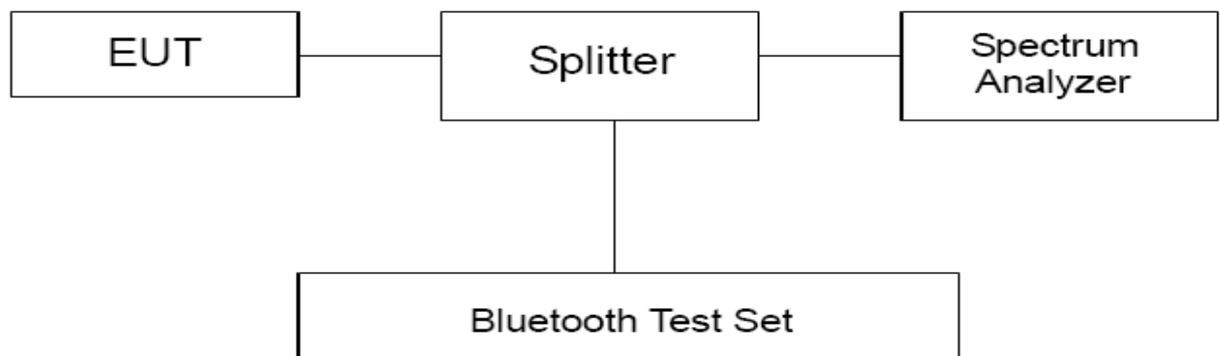
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 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) pacifies 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
DH5	2402	5.175	-14.825
	2441	8.152	-11.848
	2480	1.453	-18.547
EDR (3DH5)	2402	12.773	-7.227
	2441	3.925	-16.075
	2480	5.081	-14.919

**Measurement Uncertainty**

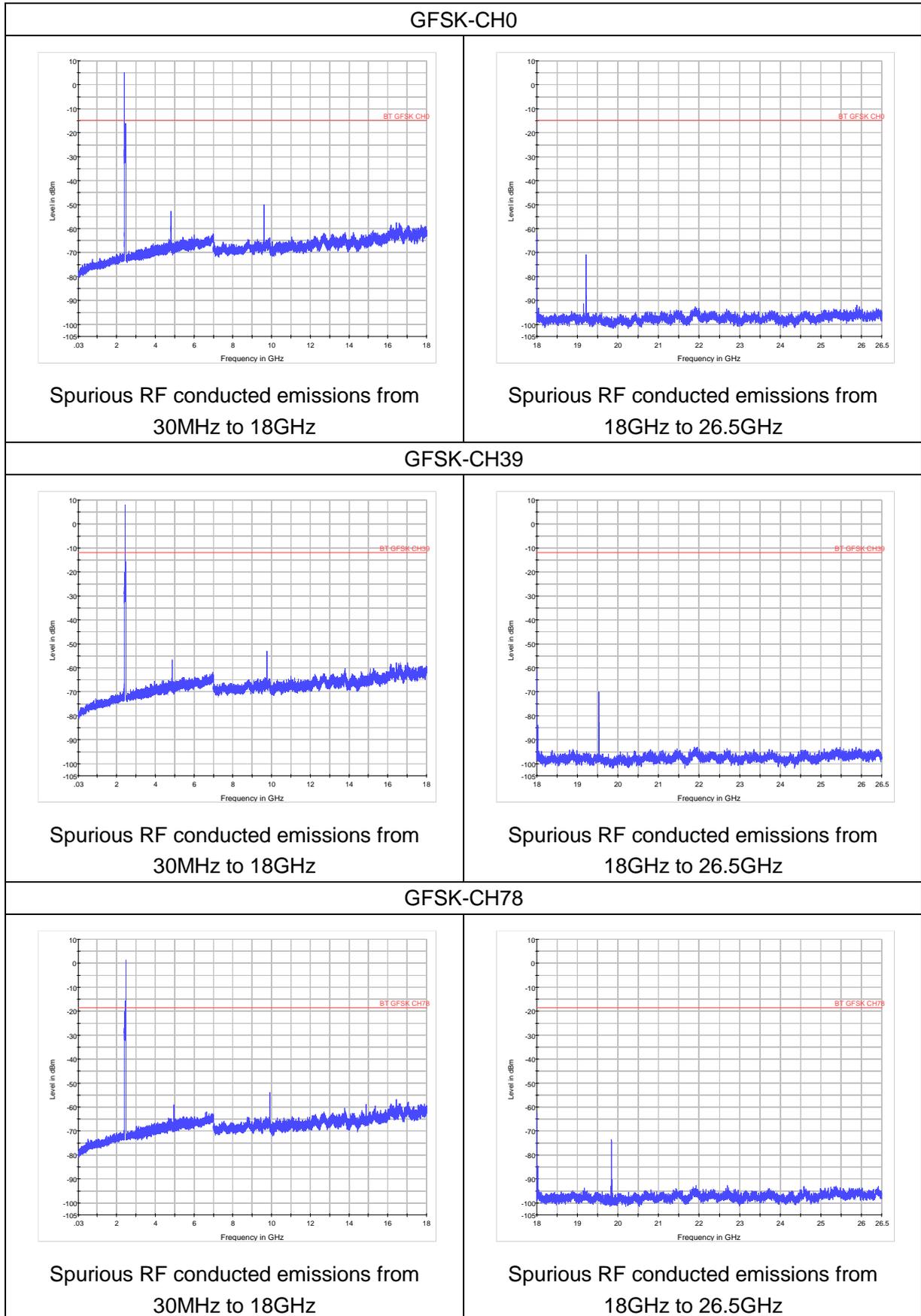
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

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



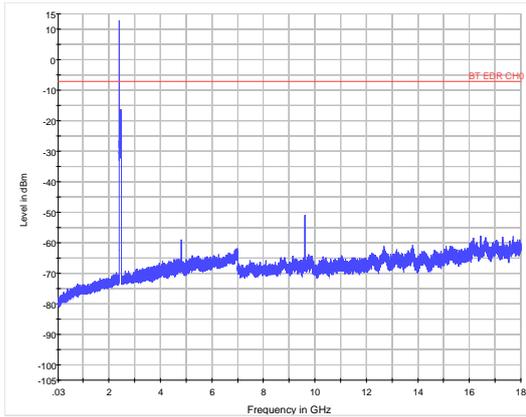
Test Results:

Note: The signal beyond the limit is carrier.

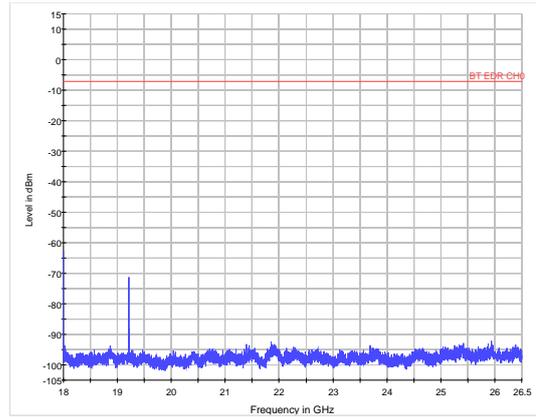




EDR-CH0:

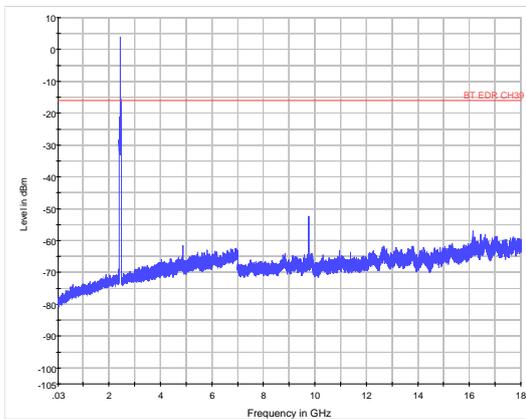


Spurious RF conducted emissions from 30MHz to 18GHz

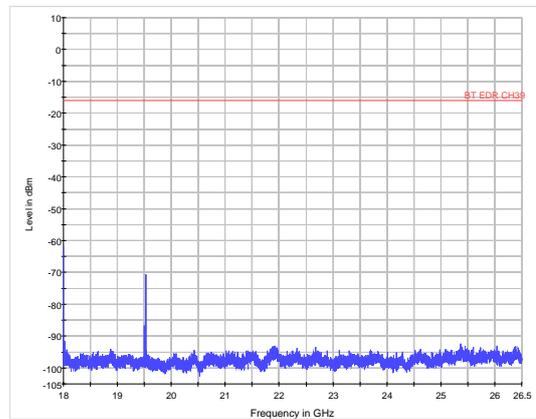


Spurious RF conducted emissions from 18GHz to 26.5GHz

EDR-CH39:

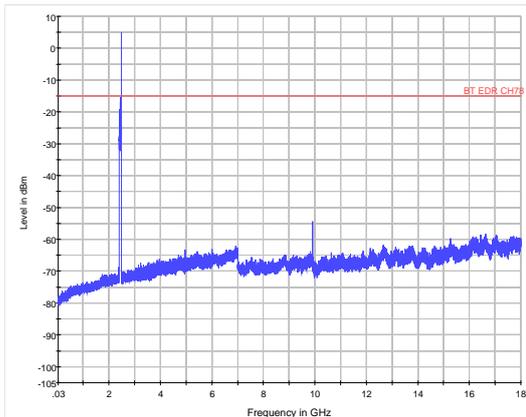


Spurious RF conducted emissions from 30MHz to 18GHz

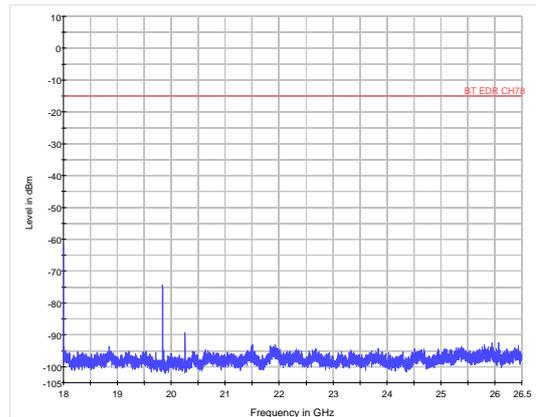


Spurious RF conducted emissions from 18GHz to 26.5GHz

EDR-CH78:



Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

4.10 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 C63.10-2013. 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

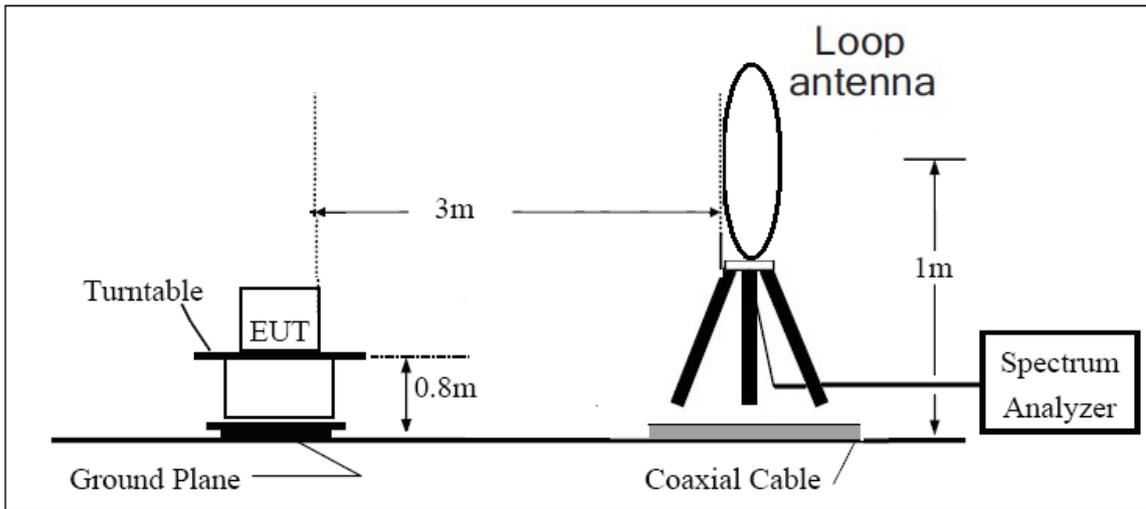
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

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. Then this mode was measured in the following mode: EUT with cradle and EUT without cradle. The worst emission was found in EUT with cradle mode and the worst case was recorded.

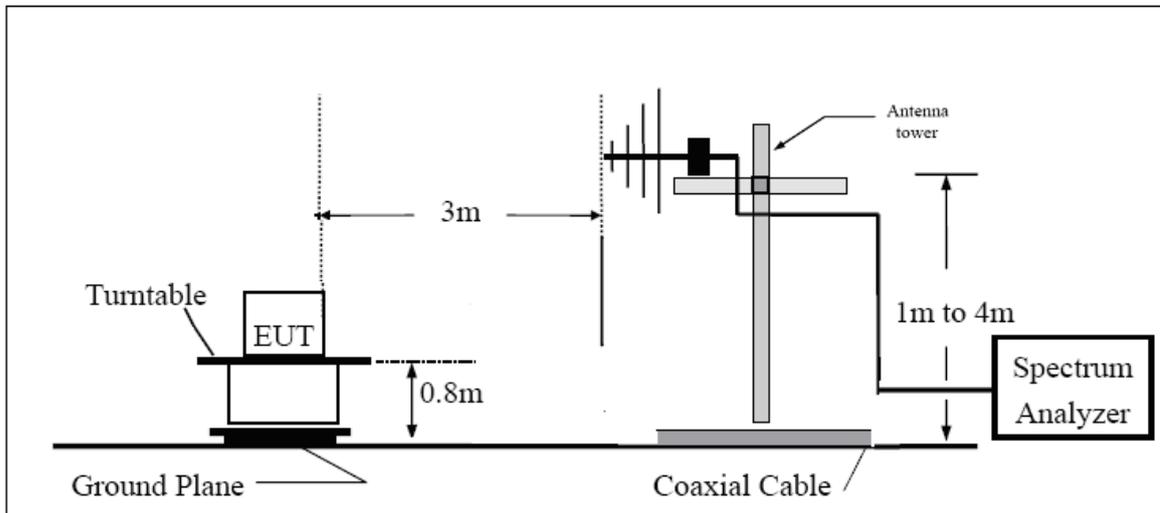
The test is in transmitting mode.

Test setup

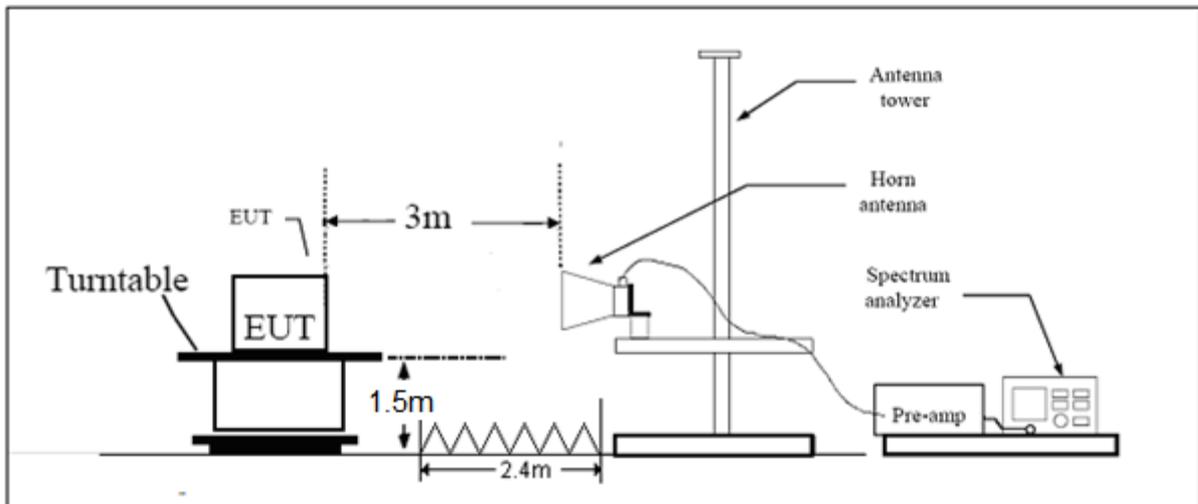
9KHz~~~ 30MHz



30MHz~~~ 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)
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

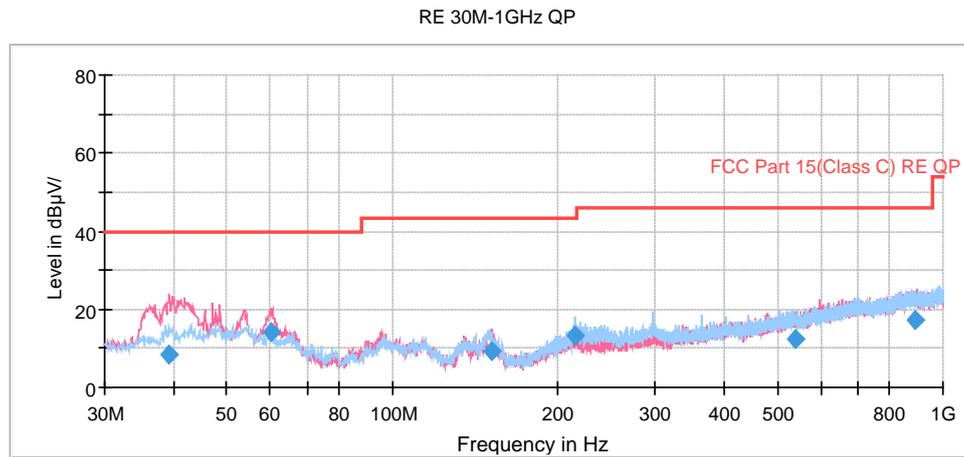
Test result

Sweep from 9 kHz to 30MHz, and the emissions more than 20 dB below the permissible value are not reported.

The following graphs display the maximum values of horizontal and vertical by software.

For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

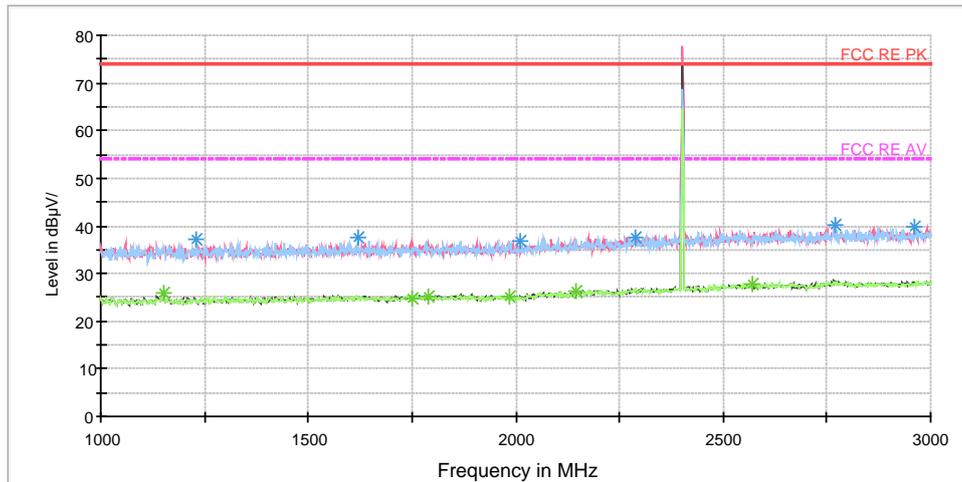
GFSK-Channel 0



Radiates Emission from 30MHz to 1GHz

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

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
39.237910	8.3	100.0	V	126.0	29.5	-21.2	31.7	40.0
60.040772	14.1	100.0	V	191.0	37.3	-23.2	25.9	40.0
151.506572	9.4	100.0	V	197.0	38.6	-29.2	34.1	43.5
214.366000	13.1	125.0	H	73.0	38.7	-25.6	30.4	43.5
541.367250	12.2	125.0	H	28.0	30.5	-18.3	33.8	46.0
893.564750	17.5	122.0	V	94.0	30.2	-12.7	28.5	46.0



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

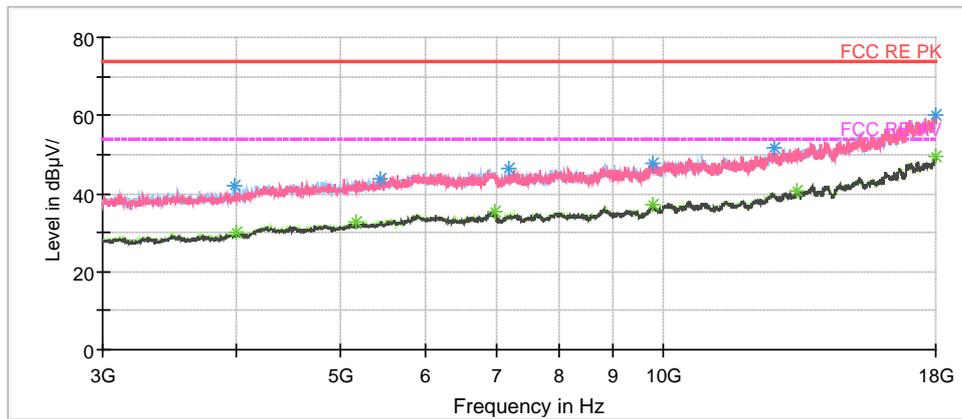
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.250000	35.4	150	V	79.0	46.2	-10.8	38.6	74
1748.750000	34.4	150	H	12.0	42.9	-8.5	39.6	74
1791.250000	35.5	150	H	168.0	43.8	-8.3	38.5	74
1985.000000	36.4	150	V	180.0	44.3	-7.9	37.6	74
2145.000000	35.4	150	V	40.0	42.3	-6.9	38.6	74
2571.250000	37.2	150	V	175.0	41.9	-4.7	36.8	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.250000	25.8	150	V	79.0	36.6	-10.8	28.2	54
1748.750000	24.9	150	H	12.0	33.4	-8.5	29.1	54
1791.250000	25.3	150	H	168.0	33.6	-8.3	28.7	54
1985.000000	25.0	150	V	180.0	32.9	-7.9	29.0	54
2145.000000	26.2	150	V	40.0	33.1	-6.9	27.8	54
2571.250000	27.7	150	V	175.0	32.4	-4.7	26.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



RE 3-18GHz PK+AV



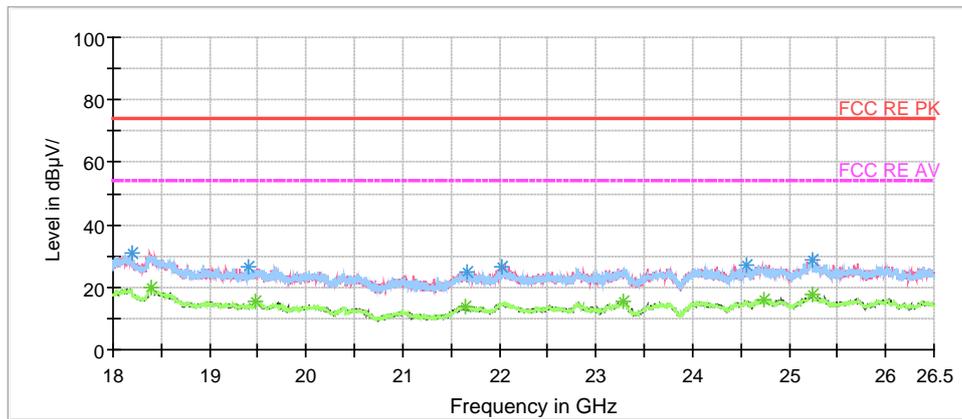
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4003.125000	40.8	150	H	77.0	41.3	0.5	33.2	74
5171.250000	41.4	150	H	281.0	45.0	3.6	32.6	74
6967.500000	44.1	150	H	353.0	50.7	6.6	29.9	74
9781.875000	45.6	150	H	0.0	57.7	12.1	28.4	74
13346.250000	49.6	150	H	182.0	65.4	15.8	24.4	74
17998.125000	58.8	150	V	203.0	84.2	25.4	15.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4003.125000	29.9	150	H	77.0	30.4	0.5	24.1	54
5171.250000	32.8	150	H	281.0	36.4	3.6	21.2	54
6967.500000	35.3	150	H	353.0	41.9	6.6	18.7	54
9781.875000	37.0	150	H	0.0	49.1	12.1	17.0	54
13346.250000	40.8	150	H	182.0	56.6	15.8	13.2	54
17998.125000	49.6	150	V	203.0	75.0	25.4	4.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

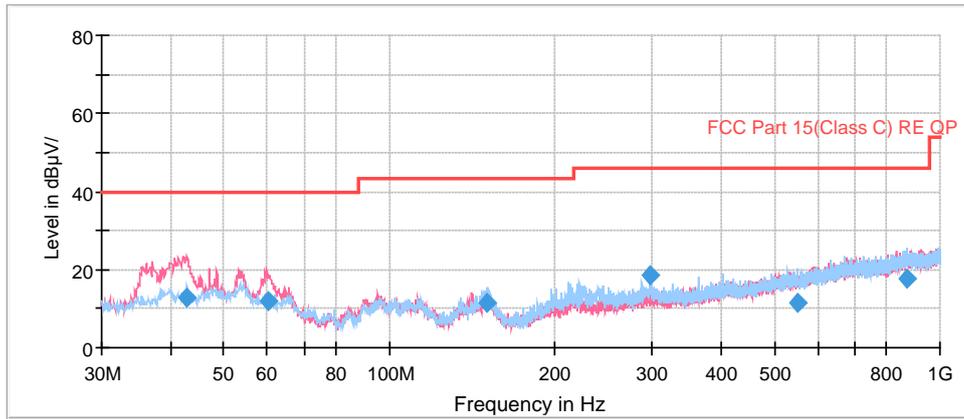
Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18395.250000	30.1	H	54.0	35.0	-4.9	43.9	74
19467.312500	25.1	H	90.0	33.2	-8.1	48.9	74
21640.125000	22.9	V	54.0	32.0	-9.1	51.1	74
23278.500000	24.8	H	0.0	32.0	-7.2	49.2	74
24739.437500	25.1	V	90.0	31.5	-6.4	48.9	74
25234.562500	27.0	H	8.0	33.0	-6.0	47.0	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18395.250000	19.9	H	54.0	24.8	-4.9	34.1	54
19467.312500	15.6	H	90.0	23.7	-8.1	38.4	54
21640.125000	14.0	V	54.0	23.1	-9.1	40.0	54
23278.500000	15.5	H	0.0	22.7	-7.2	38.5	54
24739.437500	16.2	V	90.0	22.6	-6.4	37.8	54
25234.562500	17.7	H	8.0	23.7	-6.0	36.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

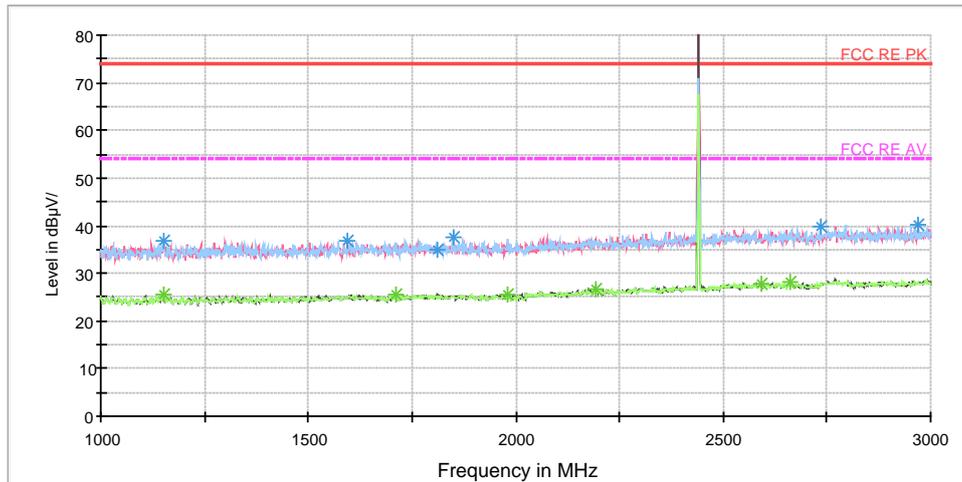


RE 30M-1GHz QP



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)
42.905369	12.6	99.0	V	9.0	33.2	-20.6	27.4	40.0
60.038878	11.8	99.0	V	177.0	35.0	-23.2	28.2	40.0
150.062406	11.4	125.0	H	99.0	40.6	-29.2	32.1	43.5
297.010000	18.5	123.0	H	351.0	41.9	-23.4	27.5	46.0
552.961250	11.6	125.0	H	152.0	30.0	-18.4	34.4	46.0
873.790750	17.6	100.0	H	217.0	30.5	-12.9	28.4	46.0



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

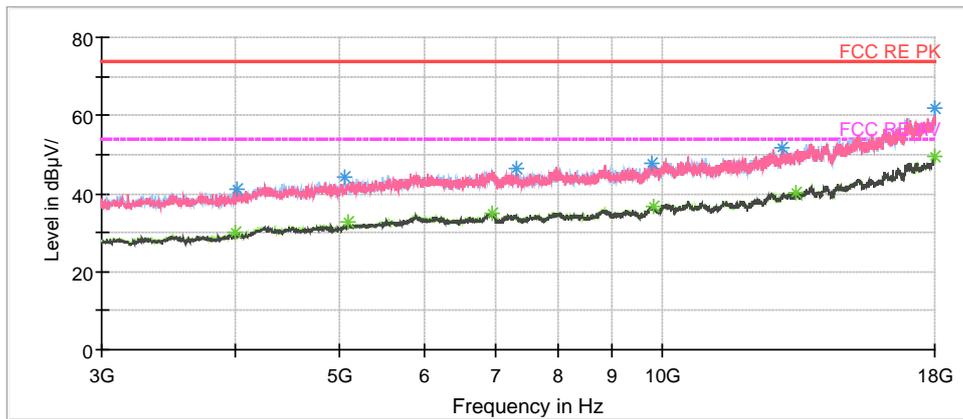
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.250000	36.8	150	H	0.0	47.6	-10.8	37.2	74
1711.250000	36.3	150	H	7.0	45.0	-8.7	37.7	74
1981.250000	35.2	150	V	170.0	43.1	-7.9	38.8	74
2195.000000	36.5	150	V	180.0	43.1	-6.6	37.5	74
2591.250000	37.2	150	V	180.0	41.9	-4.7	36.8	74
2661.250000	37.7	150	V	175.0	42.3	-4.6	36.3	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.250000	25.6	150	H	0.0	36.4	-10.8	28.4	54
1711.250000	25.6	150	H	7.0	34.3	-8.7	28.4	54
1981.250000	25.4	150	V	170.0	33.3	-7.9	28.6	54
2195.000000	26.5	150	V	180.0	33.1	-6.6	27.5	54
2591.250000	27.6	150	V	180.0	32.3	-4.7	26.4	54
2661.250000	28.1	150	V	175.0	32.7	-4.6	25.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



RE 3-18GHz PK+AV



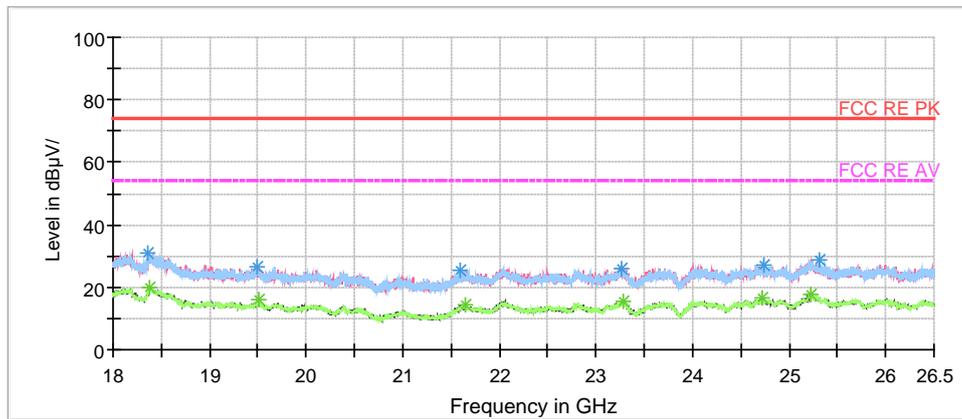
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4003.125000	39.5	150	H	62.0	40.0	0.5	34.5	74
5096.250000	42.0	150	H	180.0	45.6	3.6	32.0	74
6945.000000	44.2	150	H	62.0	50.9	6.7	29.8	74
9832.500000	46.6	150	V	0.0	58.5	11.9	27.4	74
13351.875000	49.2	150	V	69.0	65.0	15.8	24.8	74
17996.250000	59.6	150	V	100.0	85.0	25.4	14.4	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4003.125000	30.1	150	H	62.0	30.6	0.5	23.9	54
5096.250000	32.5	150	H	180.0	36.1	3.6	21.5	54
6945.000000	35.0	150	H	62.0	41.7	6.7	19.0	54
9832.500000	36.9	150	V	0.0	48.8	11.9	17.1	54
13351.875000	40.3	150	V	69.0	56.1	15.8	13.7	54
17996.250000	49.5	150	V	100.0	74.9	25.4	4.5	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

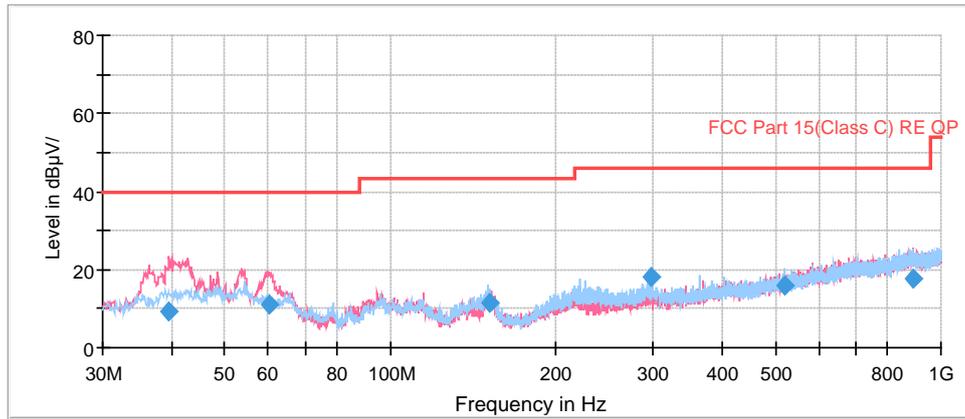
Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18379.312500	28.7	V	81.0	33.5	-4.8	45.3	74
19506.625000	24.8	H	64.0	32.3	-7.5	49.2	74
21652.875000	23.2	V	90.0	32.4	-9.2	50.8	74
23291.250000	23.6	V	89.0	30.6	-7.0	50.4	74
24721.375000	26.1	V	90.0	32.4	-6.3	47.9	74
25227.125000	27.0	H	0.0	32.9	-5.9	47.0	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18379.312500	19.8	V	81.0	24.6	-4.8	34.2	54
19506.625000	15.9	H	64.0	23.4	-7.5	38.1	54
21652.875000	14.5	V	90.0	23.7	-9.2	39.5	54
23291.250000	15.4	V	89.0	22.4	-7.0	38.6	54
24721.375000	16.6	V	90.0	22.9	-6.3	37.4	54
25227.125000	17.9	H	0.0	23.8	-5.9	36.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



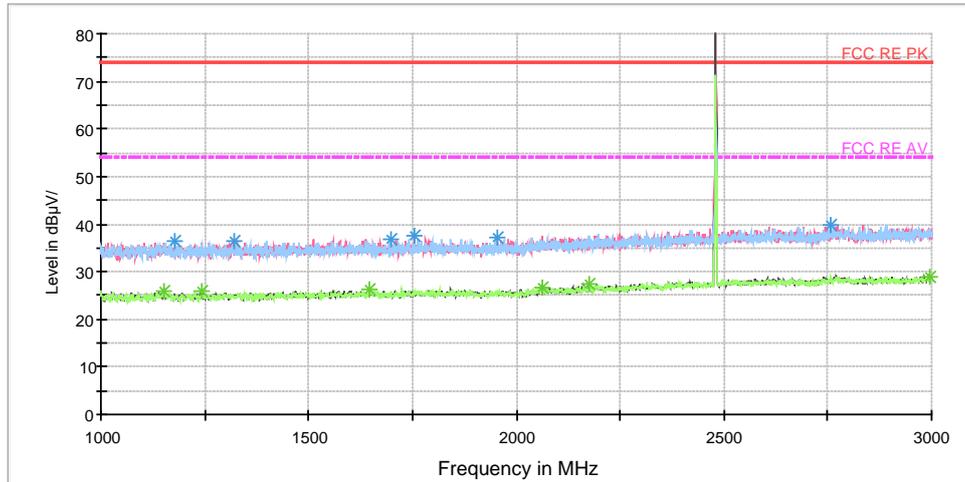
RE 30M-1GHz QP



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)
39.479803	9.2	98.0	V	18.0	30.2	-21.0	30.8	40.0
60.241719	11.1	100.0	V	0.0	34.3	-23.2	28.9	40.0
150.907140	11.6	124.0	H	105.0	40.8	-29.2	31.9	43.5
297.010000	18.1	124.0	H	39.0	41.5	-23.4	27.9	46.0
519.749250	16.1	101.0	H	8.0	35.1	-19.0	29.9	46.0
887.903000	17.6	124.0	V	22.0	30.3	-12.7	28.4	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



Radiates Emission from 1GHz to 3GHz

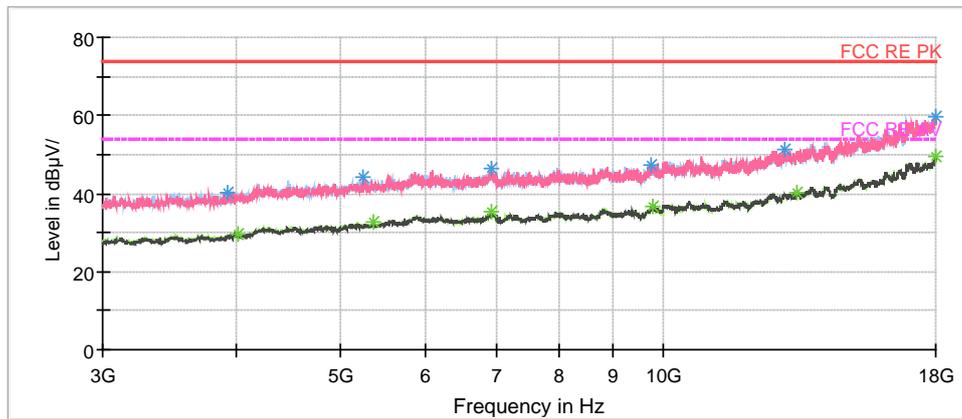
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1150.000000	35.3	150	V	104.0	46.1	-10.8	38.7	74
1242.000000	34.1	150	V	126.0	44.5	-10.4	39.9	74
1647.500000	34.0	150	H	31.0	42.8	-8.8	40.0	74
2061.500000	35.2	150	V	175.0	42.6	-7.4	38.8	74
2176.000000	35.5	150	V	147.0	42.2	-6.7	38.5	74
2994.000000	38.9	150	V	180.0	42.9	-4.0	35.1	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1150.000000	26.1	150	V	104.0	36.9	-10.8	27.9	54
1242.000000	25.8	150	V	126.0	36.2	-10.4	28.2	54
1647.500000	26.3	150	H	31.0	35.1	-8.8	27.7	54
2061.500000	26.6	150	V	175.0	34.0	-7.4	27.4	54
2176.000000	27.4	150	V	147.0	34.1	-6.7	26.6	54
2994.000000	29.1	150	V	180.0	33.1	-4.0	24.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



RE 3-18GHz PK+AV



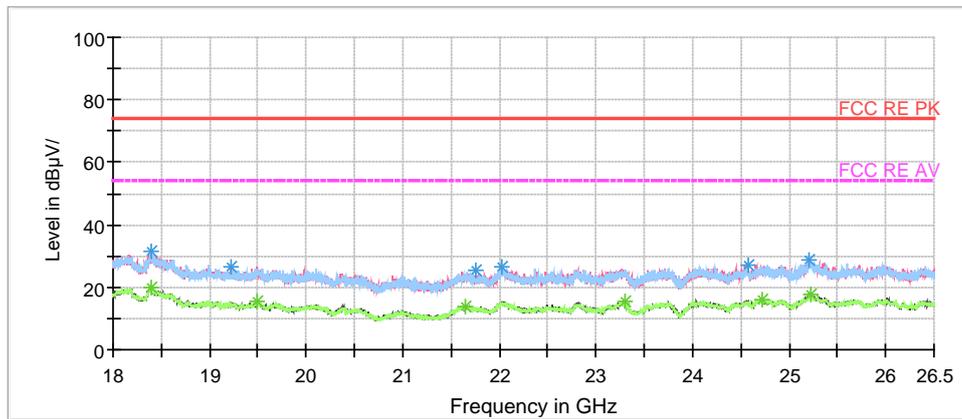
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4020.000000	38.9	150	H	94.0	39.4	0.5	35.1	74
5371.875000	41.4	150	V	0.0	45.1	3.7	32.6	74
6918.750000	44.2	150	H	62.0	51.1	6.9	29.8	74
9810.000000	46.0	150	H	180.0	58.2	12.2	28.0	74
13342.500000	49.1	150	H	94.0	64.8	15.7	24.9	74
17994.375000	59.8	150	H	180.0	85.1	25.3	14.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4020.000000	29.7	150	H	94.0	30.2	0.5	24.3	54
5371.875000	32.6	150	V	0.0	36.3	3.7	21.4	54
6918.750000	35.3	150	H	62.0	42.2	6.9	18.7	54
9810.000000	36.9	150	H	180.0	49.1	12.2	17.1	54
13342.500000	40.4	150	H	94.0	56.1	15.7	13.6	54
17994.375000	49.4	150	H	180.0	74.7	25.3	4.6	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

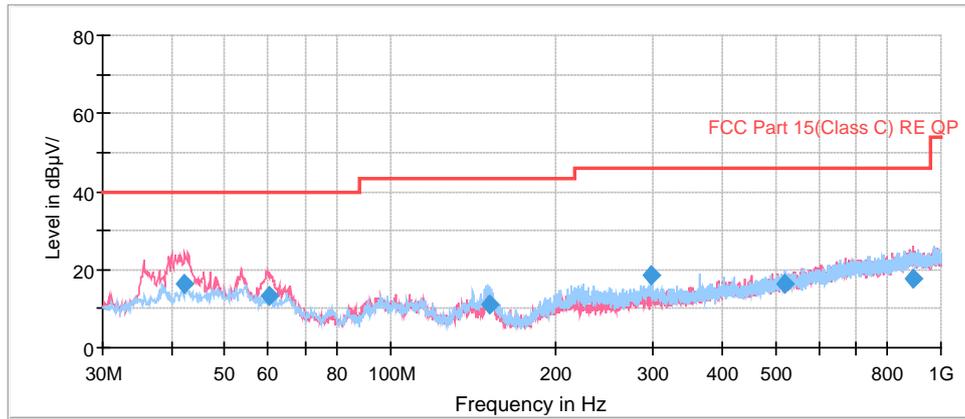
Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18393.125000	30.5	H	0.0	35.4	-4.9	43.5	74
19490.687500	24.3	H	1.0	31.9	-7.6	49.7	74
21639.062500	24.0	H	0.0	33.1	-9.1	50.0	74
23293.375000	23.5	H	9.0	30.5	-7.0	50.5	74
24725.625000	25.9	H	0.0	32.1	-6.2	48.1	74
25231.375000	26.6	H	28.0	32.5	-5.9	47.4	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18393.125000	20.0	H	0.0	24.9	-4.9	34.0	54
19490.687500	15.6	H	1.0	23.2	-7.6	38.4	54
21639.062500	14.0	H	0.0	23.1	-9.1	40.0	54
23293.375000	15.3	H	9.0	22.3	-7.0	38.7	54
24725.625000	16.1	H	0.0	22.3	-6.2	37.9	54
25231.375000	17.8	H	28.0	23.7	-5.9	36.2	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

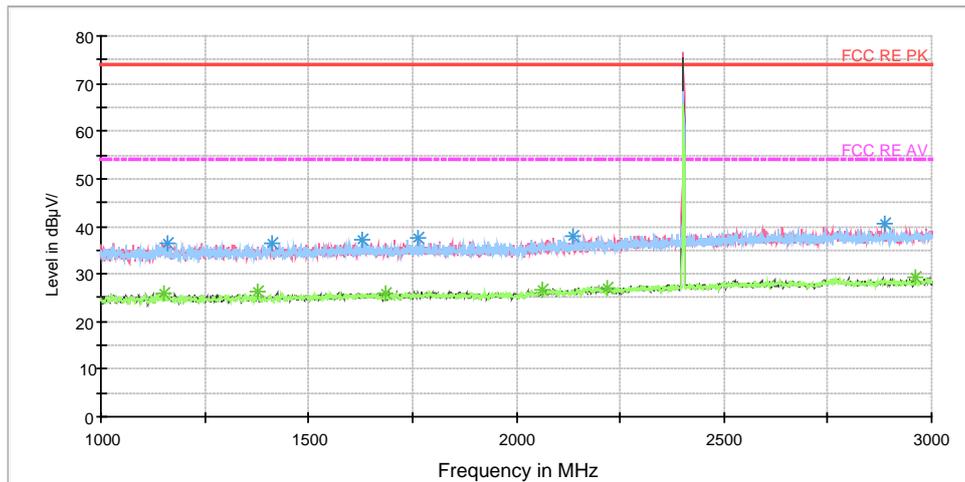


RE 30M-1GHz QP



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)
42.140634	16.4	100.0	V	210.0	36.8	-20.4	23.6	40.0
60.078878	13.2	100.0	V	101.0	36.4	-23.2	26.8	40.0
151.029034	11.0	125.0	H	103.0	40.2	-29.2	32.5	43.5
297.010000	18.4	124.0	H	104.0	41.8	-23.4	27.6	46.0
519.750500	16.5	100.0	H	87.0	35.5	-19.0	29.5	46.0
891.966000	17.5	125.0	V	90.0	30.2	-12.7	28.5	46.0



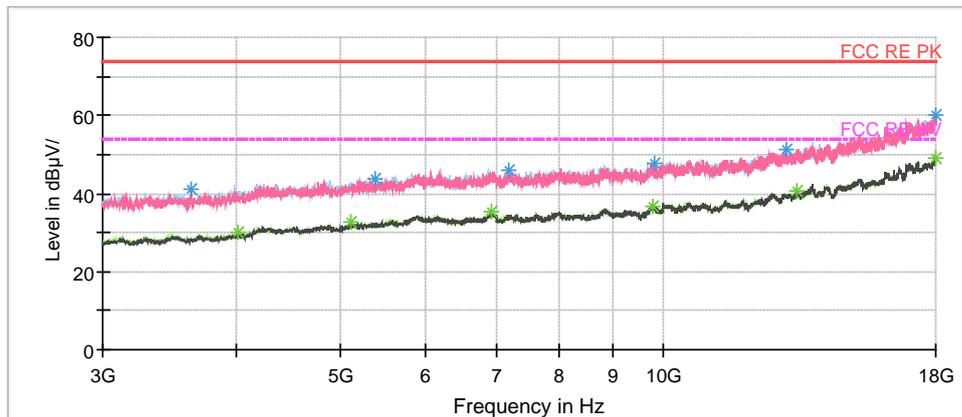
Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.500000	35.1	150	H	64.0	45.9	-10.8	38.9	74
1377.500000	35.2	150	V	180.0	45.1	-9.9	38.8	74
1685.000000	34.4	150	H	64.0	43.1	-8.7	39.6	74
2065.000000	36.6	150	V	180.0	43.9	-7.3	37.4	74
2221.000000	36.5	150	V	180.0	43.0	-6.5	37.5	74
2963.000000	38.8	150	H	75.0	42.9	-4.1	35.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.500000	25.9	150	H	64.0	36.7	-10.8	28.1	54
1377.500000	26.2	150	V	180.0	36.1	-9.9	27.8	54
1685.000000	26.0	150	H	64.0	34.7	-8.7	28.0	54
2065.000000	26.7	150	V	180.0	34.0	-7.3	27.3	54
2221.000000	26.9	150	V	180.0	33.4	-6.5	27.1	54
2963.000000	29.1	150	H	75.0	33.2	-4.1	24.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 3-18GHz PK+AV



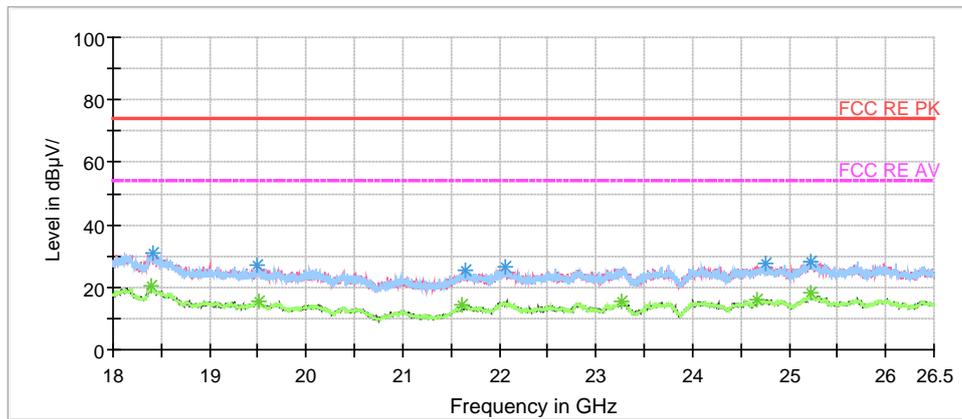
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4008.750000	40.9	150	H	180.0	41.4	0.5	33.1	74
5120.625000	41.2	150	V	9.0	44.8	3.6	32.8	74
6913.125000	44.7	150	V	0.0	51.6	6.9	29.3	74
9804.375000	45.8	150	H	93.0	58.0	12.2	28.2	74
13346.250000	49.9	150	H	78.0	65.7	15.8	24.1	74
17986.875000	58.5	150	H	180.0	83.7	25.2	15.5	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4008.750000	29.9	150	H	180.0	30.4	0.5	24.1	54
5120.625000	32.5	150	V	9.0	36.1	3.6	21.5	54
6913.125000	35.4	150	V	0.0	42.3	6.9	18.6	54
9804.375000	36.8	150	H	93.0	49.0	12.2	17.2	54
13346.250000	40.6	150	H	78.0	56.4	15.8	13.4	54
17986.875000	49.3	150	H	180.0	74.5	25.2	4.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

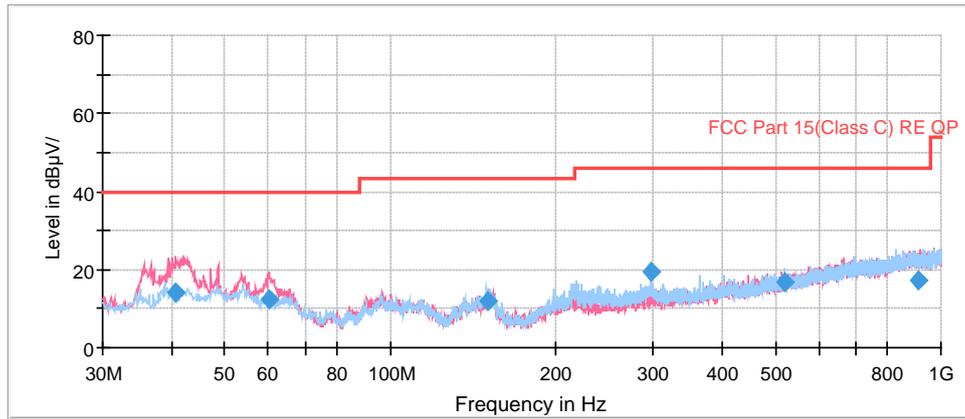
Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18393.125000	29.5	V	200.0	34.4	-4.9	44.5	74
19514.062500	24.2	H	81.0	31.7	-7.5	49.8	74
21618.875000	22.8	V	48.0	31.8	-9.0	51.2	74
23270.000000	24.7	H	111.0	31.9	-7.2	49.3	74
24666.125000	24.4	V	189.0	31.5	-7.1	49.6	74
25223.937500	26.8	V	76.0	32.7	-5.9	47.2	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18393.125000	20.2	V	200.0	25.1	-4.9	33.8	54
19514.062500	15.5	H	81.0	23.0	-7.5	38.5	54
21618.875000	14.3	V	48.0	23.3	-9.0	39.7	54
23270.000000	15.6	H	111.0	22.8	-7.2	38.4	54
24666.125000	16.1	V	189.0	23.2	-7.1	37.9	54
25223.937500	18.0	V	76.0	23.9	-5.9	36.0	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

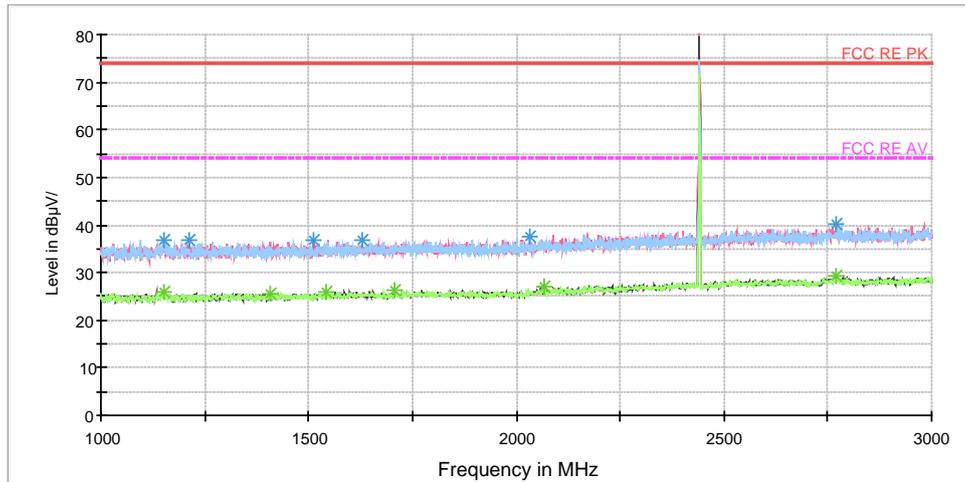


RE 30M-1GHz QP



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)
40.648325	14.1	100.0	V	330.0	34.7	-20.6	25.9	40.0
60.120772	12.6	100.0	V	236.0	35.8	-23.2	27.4	40.0
150.169488	12.0	125.0	H	101.0	41.2	-29.2	31.5	43.5
297.009250	19.3	122.0	H	22.0	42.7	-23.4	26.7	46.0
519.749250	16.7	100.0	H	22.0	35.7	-19.0	29.3	46.0
911.746750	17.0	100.0	V	74.0	30.0	-13.0	29.0	46.0



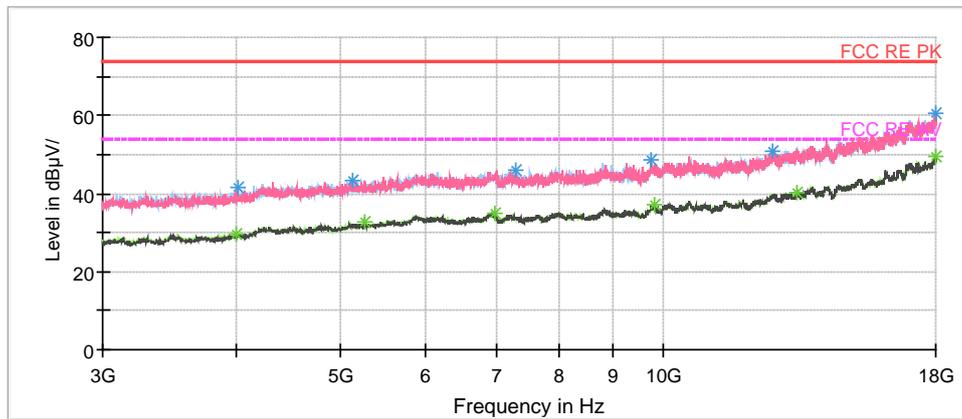
Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1152.000000	34.7	150	H	0.0	45.5	-10.8	39.3	74
1408.500000	34.5	150	H	0.0	44.3	-9.8	39.5	74
1542.500000	34.3	150	V	179.0	43.5	-9.2	39.7	74
1708.500000	35.4	150	H	0.0	44.1	-8.7	38.6	74
2069.000000	35.0	150	H	7.0	42.3	-7.3	39.0	74
2769.500000	38.9	150	V	38.0	43.2	-4.3	35.1	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1152.000000	25.8	150	H	0.0	36.6	-10.8	28.2	54
1408.500000	25.7	150	H	0.0	35.5	-9.8	28.3	54
1542.500000	25.9	150	V	179.0	35.1	-9.2	28.1	54
1708.500000	26.1	150	H	0.0	34.8	-8.7	27.9	54
2069.000000	27.0	150	H	7.0	34.3	-7.3	27.0	54
2769.500000	29.2	150	V	38.0	33.5	-4.3	24.8	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 3-18GHz PK+AV



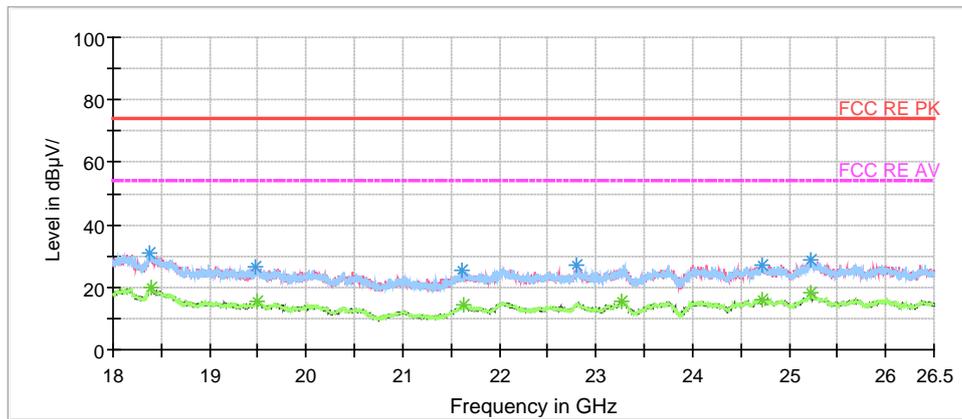
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4001.250000	38.6	150	H	89.0	39.1	0.5	35.4	74
5280.000000	40.9	150	V	0.0	44.7	3.8	33.1	74
6975.000000	44.8	150	H	180.0	51.3	6.5	29.2	74
9828.750000	45.8	150	V	0.0	57.8	12.0	28.2	74
13344.375000	49.6	150	H	180.0	65.3	15.7	24.4	74
17981.250000	58.4	150	H	180.0	83.6	25.2	15.6	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4001.250000	29.8	150	H	89.0	30.3	0.5	24.2	54
5280.000000	32.6	150	V	0.0	36.4	3.8	21.4	54
6975.000000	35.1	150	H	180.0	41.6	6.5	18.9	54
9828.750000	36.9	150	V	0.0	48.9	12.0	17.1	54
13344.375000	40.3	150	H	180.0	56.0	15.7	13.7	54
17981.250000	49.4	150	H	180.0	74.6	25.2	4.6	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

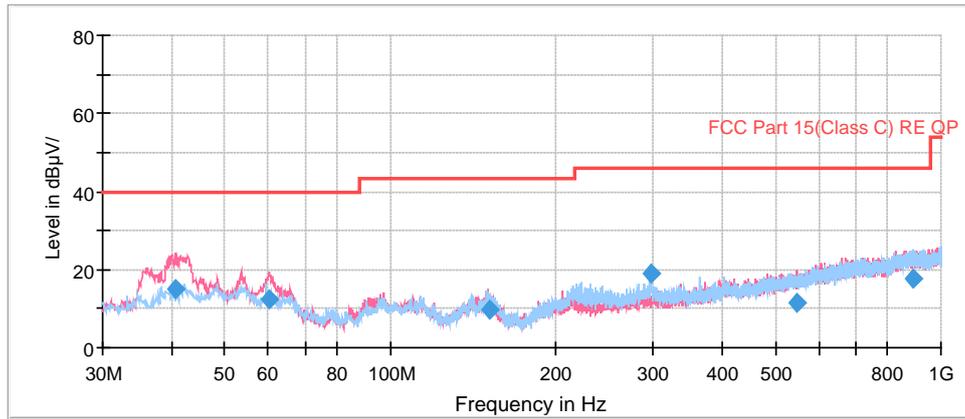
Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18386.750000	30.2	H	60.0	35.0	-4.8	43.8	74
19492.812500	25.7	V	138.0	33.3	-7.6	48.3	74
21635.875000	24.3	V	120.0	33.4	-9.1	49.7	74
23259.375000	23.8	H	20.0	31.2	-7.4	50.2	74
24724.562500	26.4	V	200.0	32.6	-6.2	47.6	74
25232.437500	26.6	H	26.0	32.5	-5.9	47.4	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18386.750000	19.9	H	60.0	24.7	-4.8	34.1	54
19492.812500	15.7	V	138.0	23.3	-7.6	38.3	54
21635.875000	14.2	V	120.0	23.3	-9.1	39.8	54
23259.375000	15.4	H	20.0	22.8	-7.4	38.6	54
24724.562500	16.3	V	200.0	22.5	-6.2	37.7	54
25232.437500	18.0	H	26.0	23.9	-5.9	36.0	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

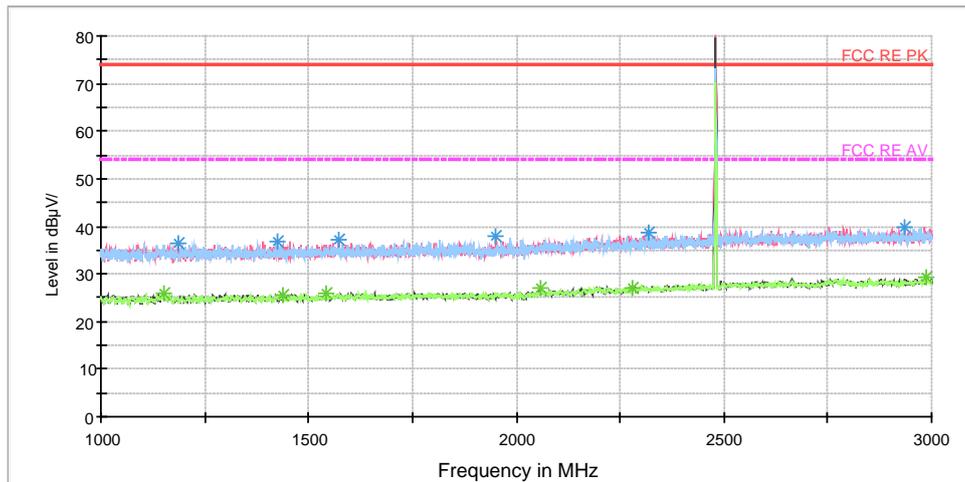


RE 30M-1GHz QP



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)
40.647378	15.2	102.0	V	151.0	35.8	-20.6	24.8	40.0
60.160772	12.4	101.0	V	102.0	35.6	-23.2	27.6	40.0
150.988088	9.9	101.0	V	168.0	39.1	-29.2	33.6	43.5
297.010000	18.9	123.0	H	229.0	42.3	-23.4	27.1	46.0
547.769750	11.6	125.0	V	294.0	29.9	-18.3	34.4	46.0
892.491500	17.8	100.0	H	63.0	30.5	-12.7	28.2	46.0



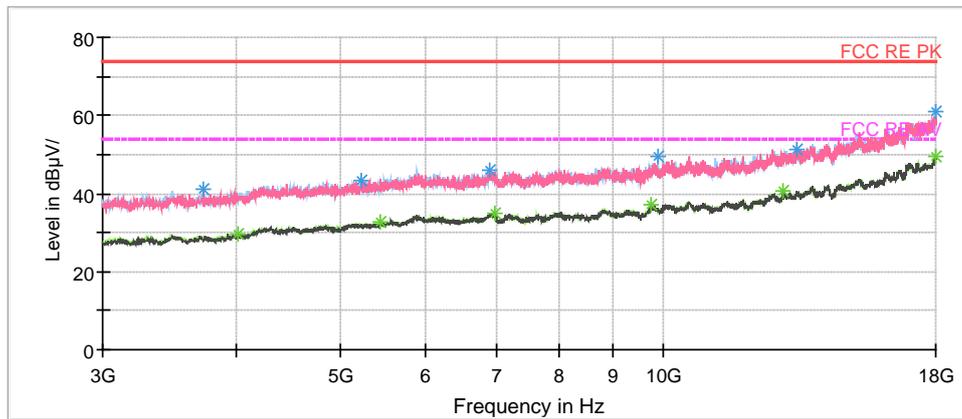
Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1153.500000	35.0	150	V	169.0	45.8	-10.8	39.0	74
1439.000000	34.3	150	H	6.0	44.0	-9.7	39.7	74
1542.000000	34.2	150	H	4.0	43.5	-9.3	39.8	74
2058.000000	35.1	150	V	173.0	42.5	-7.4	38.9	74
2280.500000	35.5	150	V	173.0	41.6	-6.1	38.5	74
2988.000000	37.8	150	H	2.0	41.8	-4.0	36.2	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1153.500000	26.0	150	V	169.0	36.8	-10.8	28.0	54
1439.000000	25.7	150	H	6.0	35.4	-9.7	28.3	54
1542.000000	26.0	150	H	4.0	35.3	-9.3	28.0	54
2058.000000	26.9	150	V	173.0	34.3	-7.4	27.1	54
2280.500000	27.0	150	V	173.0	33.1	-6.1	27.0	54
2988.000000	29.3	150	H	2.0	33.3	-4.0	24.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 3-18GHz PK+AV



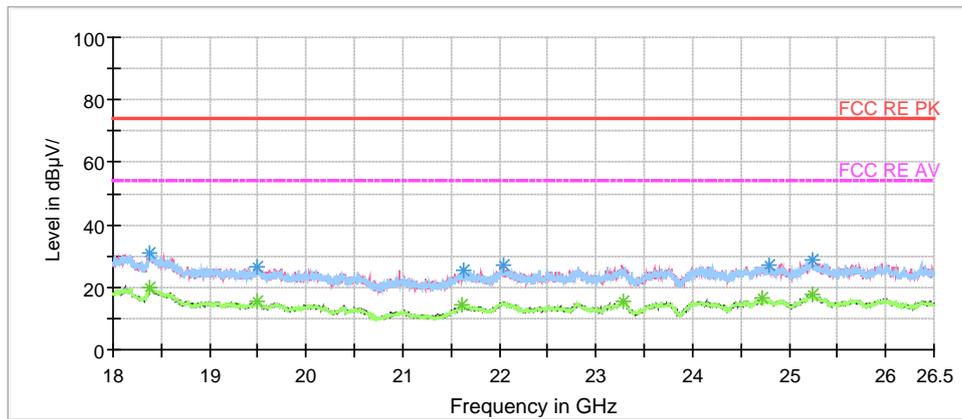
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4016.250000	39.2	150	H	225.0	39.7	0.5	34.8	74
5445.000000	41.9	150	H	225.0	45.7	3.8	32.1	74
6967.500000	43.5	150	V	45.0	50.1	6.6	30.5	74
9759.375000	45.4	150	V	45.0	57.2	11.8	28.6	74
12982.500000	50.1	150	V	163.0	66.3	16.2	23.9	74
17981.250000	59.3	150	H	225.0	84.5	25.2	14.7	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4016.250000	29.6	150	H	225.0	30.1	0.5	24.4	54
5445.000000	32.6	150	H	225.0	36.4	3.8	21.4	54
6967.500000	35.1	150	V	45.0	41.7	6.6	18.9	54
9759.375000	36.9	150	V	45.0	48.7	11.8	17.1	54
12982.500000	40.6	150	V	163.0	56.8	16.2	13.4	54
17981.250000	49.3	150	H	225.0	74.5	25.2	4.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18384.625000	29.6	H	120.0	34.4	-4.8	44.4	74
19494.937500	24.9	V	200.0	32.5	-7.6	49.1	74
21617.812500	23.1	H	20.0	32.1	-9.0	50.9	74
23275.312500	25.0	V	200.0	32.2	-7.2	49.0	74
24719.250000	24.7	H	35.0	31.0	-6.3	49.3	74
25234.562500	27.3	V	170.0	33.3	-6.0	46.7	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18384.625000	20.0	H	120.0	24.8	-4.8	34.0	54
19494.937500	15.6	V	200.0	23.2	-7.6	38.4	54
21617.812500	14.1	H	20.0	23.1	-9.0	39.9	54
23275.312500	15.5	V	200.0	22.7	-7.2	38.5	54
24719.250000	16.5	H	35.0	22.8	-6.3	37.5	54
25234.562500	17.9	V	170.0	23.9	-6.0	36.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

4.11 Conducted Emission

Ambient condition

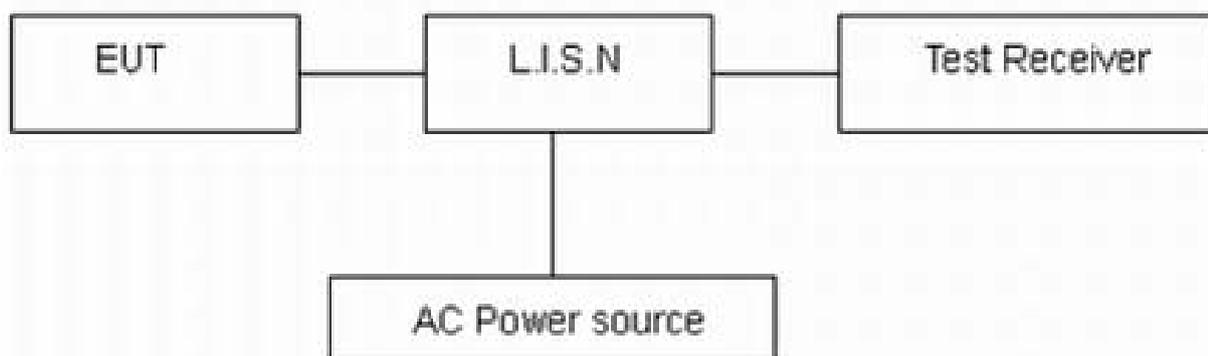
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 C63.10-2009. 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 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.

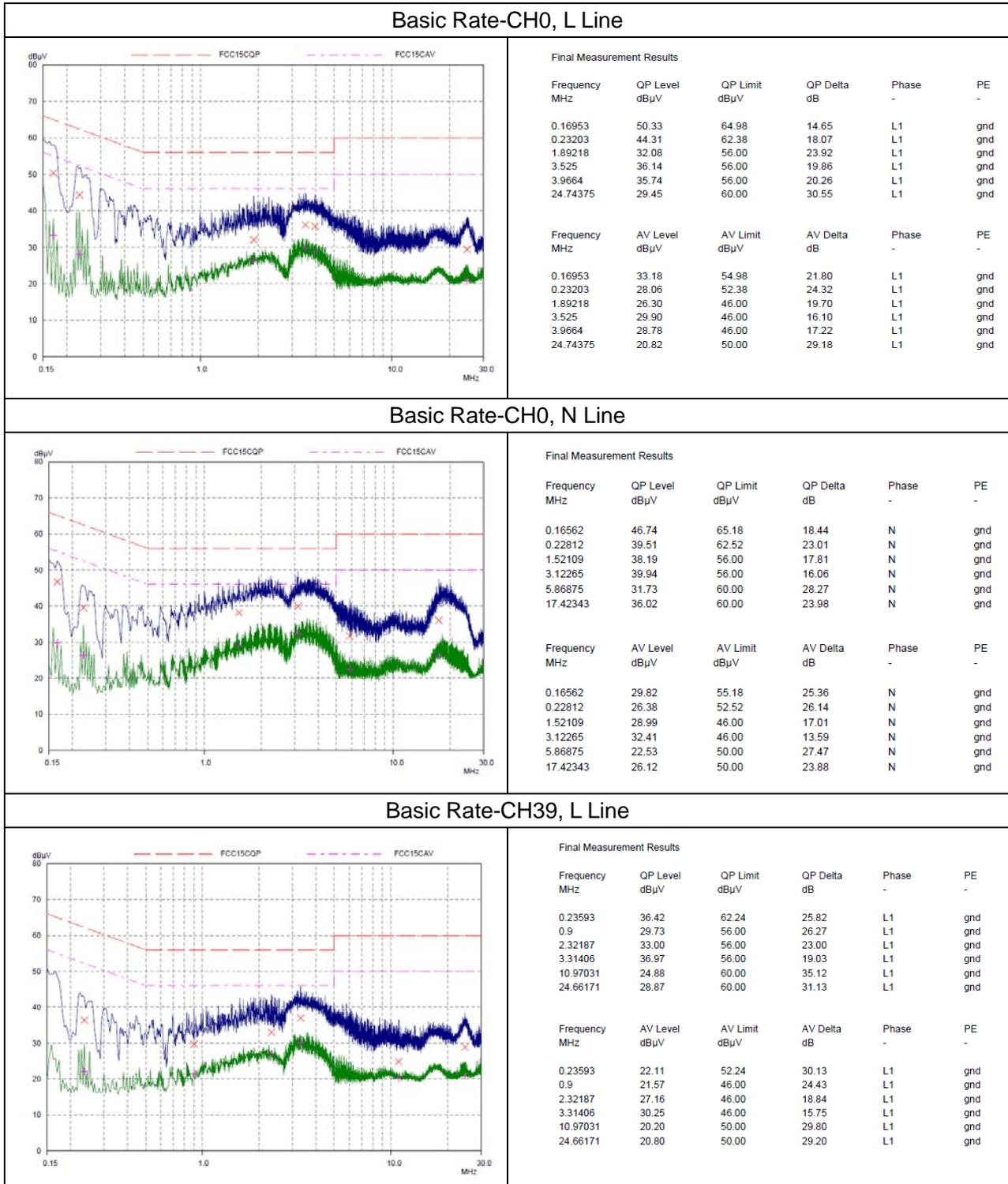
Measurement Uncertainty

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.

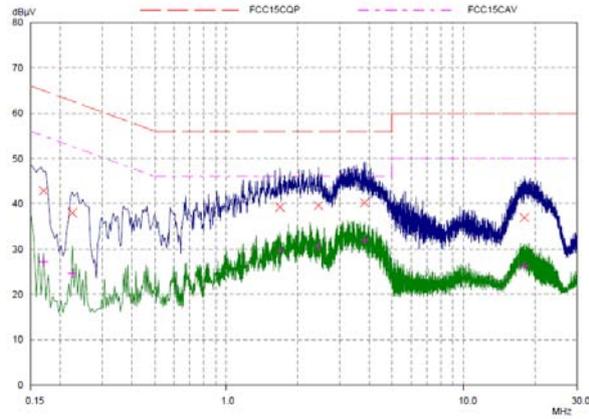


Test Results:

Following plots, Blue trace uses the peak detection, Green trace uses the average detection. Basic Rate-CH0



Basic Rate-CH39, N Line

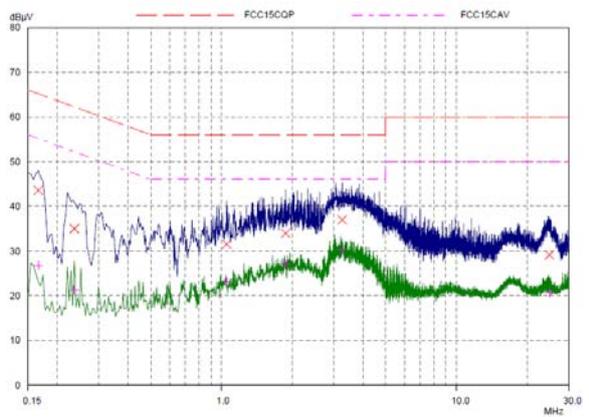


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.16953	42.91	64.98	22.07	N	gnd
0.22421	38.01	62.66	24.65	N	gnd
1.68125	39.25	56.00	16.75	N	gnd
2.44296	39.58	56.00	16.42	N	gnd
3.81796	40.21	56.00	15.79	N	gnd
18.00937	36.97	60.00	23.03	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.16953	27.32	54.98	27.66	N	gnd
0.22421	24.72	52.66	27.94	N	gnd
1.68125	29.69	46.00	16.31	N	gnd
2.44296	30.61	46.00	15.39	N	gnd
3.81796	32.10	46.00	13.90	N	gnd
18.00937	26.26	50.00	23.74	N	gnd

Basic Rate-CH78, L Line

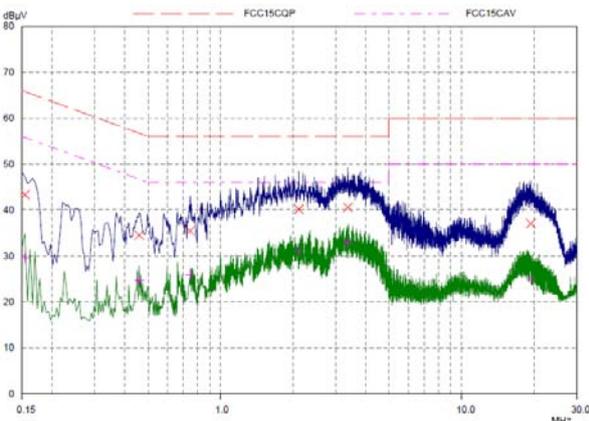


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.16562	43.55	65.18	21.63	L1	gnd
0.23593	35.02	62.24	27.22	L1	gnd
1.04843	31.57	56.00	24.43	L1	gnd
1.87265	33.99	56.00	22.01	L1	gnd
3.25937	37.01	56.00	18.99	L1	gnd
24.85703	29.11	60.00	30.89	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.16562	26.79	55.18	28.39	L1	gnd
0.23593	21.29	52.24	30.95	L1	gnd
1.04843	23.15	46.00	22.85	L1	gnd
1.87265	27.04	46.00	18.96	L1	gnd
3.25937	30.31	46.00	15.69	L1	gnd
24.85703	20.77	50.00	29.23	L1	gnd

Basic Rate-CH78, N Line



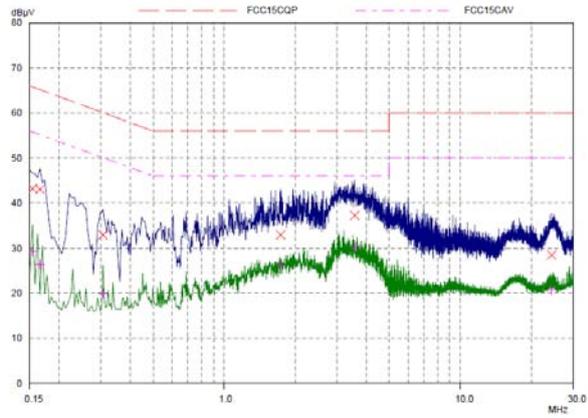
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.1539	43.34	65.79	22.45	N	gnd
0.45859	34.54	56.72	22.18	N	gnd
0.74765	35.45	56.00	20.55	N	gnd
2.11093	40.15	56.00	15.85	N	gnd
3.36875	40.56	56.00	15.44	N	gnd
19.35703	37.05	60.00	22.95	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.1539	29.66	55.79	26.13	N	gnd
0.45859	24.68	46.72	22.04	N	gnd
0.74765	25.91	46.00	20.09	N	gnd
2.11093	31.07	46.00	14.93	N	gnd
3.36875	32.90	46.00	13.10	N	gnd
19.35703	24.80	50.00	25.20	N	gnd



EDR-CH0, L Line

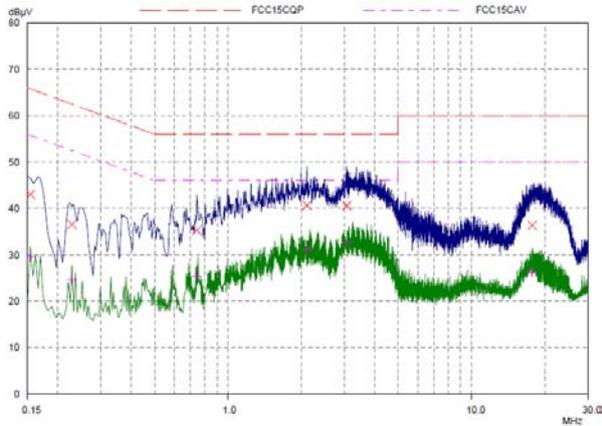


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.1539	43.24	65.79	22.55	L1	gnd
0.16562	43.08	65.18	22.10	L1	gnd
0.30625	32.91	60.07	27.16	L1	gnd
1.73203	32.92	56.00	23.08	L1	gnd
3.56406	37.27	56.00	18.73	L1	gnd
24.37656	28.50	60.00	31.50	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.1539	29.30	55.79	26.49	L1	gnd
0.16562	26.41	55.18	28.77	L1	gnd
0.30625	19.90	50.07	30.17	L1	gnd
1.73203	26.23	46.00	19.77	L1	gnd
3.56406	30.25	46.00	15.75	L1	gnd
24.37656	20.72	50.00	29.28	L1	gnd

EDR-CH0, N Line

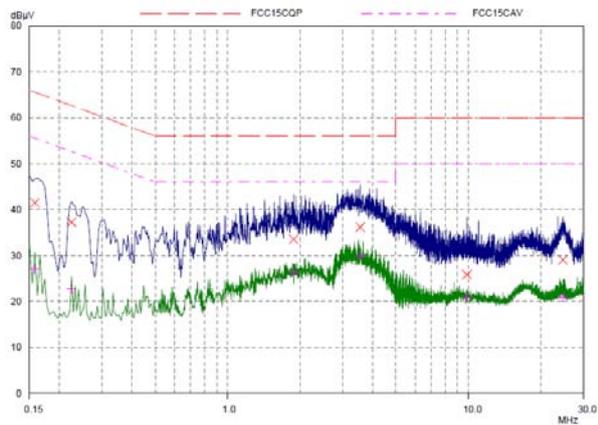


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.1539	43.02	65.79	22.77	N	gnd
0.22812	36.59	62.52	25.93	N	gnd
0.74375	35.29	56.00	20.71	N	gnd
2.10703	40.67	56.00	15.33	N	gnd
3.06796	40.62	56.00	15.38	N	gnd
17.74375	36.38	60.00	23.62	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.1539	29.66	55.79	26.13	N	gnd
0.22812	24.68	52.52	27.84	N	gnd
0.74375	25.35	46.00	20.65	N	gnd
2.10703	31.14	46.00	14.86	N	gnd
3.06796	32.64	46.00	13.36	N	gnd
17.74375	26.20	50.00	23.80	N	gnd

EDR-CH39, L Line



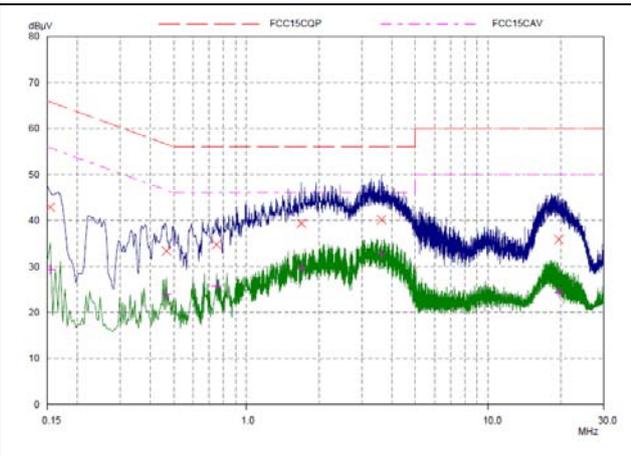
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15781	41.52	65.58	24.06	L1	gnd
0.22421	37.24	62.66	25.42	L1	gnd
1.87656	33.54	56.00	22.46	L1	gnd
3.55625	36.21	56.00	19.79	L1	gnd
9.85703	25.86	60.00	34.14	L1	gnd
24.67343	29.05	60.00	30.95	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.15781	27.00	55.58	28.58	L1	gnd
0.22421	22.73	52.66	29.93	L1	gnd
1.87656	26.43	46.00	19.57	L1	gnd
3.55625	29.82	46.00	16.18	L1	gnd
9.85703	20.85	50.00	29.15	L1	gnd
24.67343	20.95	50.00	29.05	L1	gnd



EDR-CH39, N Line

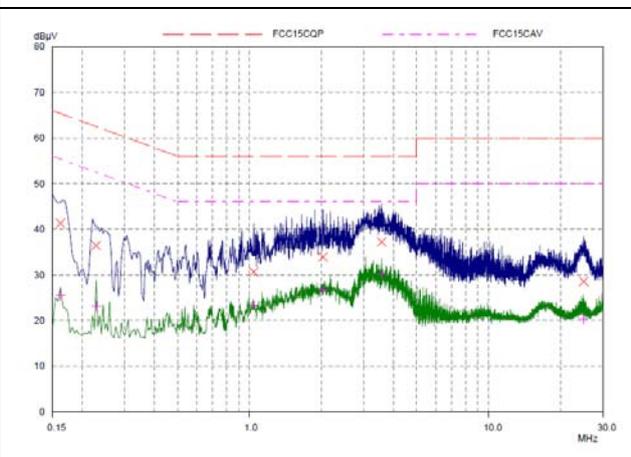


Final Measurement Results

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	Phase	PE
0.1539	42.92	65.79	22.87	N	gnd
0.4664	33.37	56.58	23.21	N	gnd
0.75156	34.79	56.00	21.21	N	gnd
1.68515	39.39	56.00	16.61	N	gnd
3.61875	40.16	56.00	15.84	N	gnd
19.63437	35.87	60.00	24.13	N	gnd

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB	Phase	PE
0.1539	29.34	55.79	26.45	N	gnd
0.4664	23.94	46.58	22.64	N	gnd
0.75156	25.76	46.00	20.24	N	gnd
1.68515	29.69	46.00	16.31	N	gnd
3.61875	32.64	46.00	13.36	N	gnd
19.63437	24.30	50.00	25.70	N	gnd

EDR-CH78,L Line

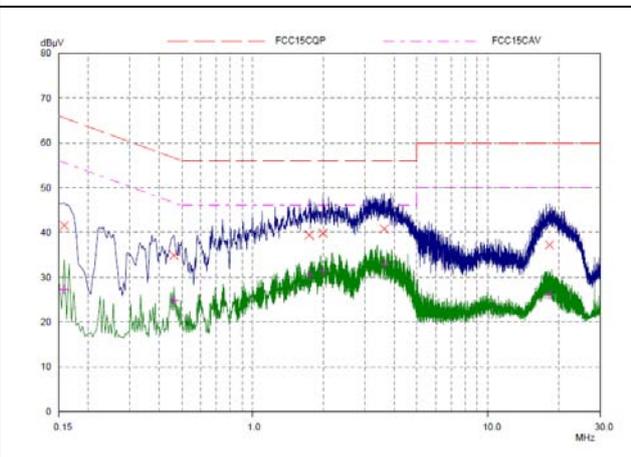


Final Measurement Results

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	Phase	PE
0.16171	41.33	65.38	24.05	L1	gnd
0.22812	36.45	62.52	26.07	L1	gnd
1.04062	30.68	56.00	25.32	L1	gnd
2.025	33.97	56.00	22.03	L1	gnd
3.56796	37.24	56.00	18.76	L1	gnd
24.93906	28.56	60.00	31.44	L1	gnd

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB	Phase	PE
0.16171	25.53	55.38	29.85	L1	gnd
0.22812	23.16	52.52	29.36	L1	gnd
1.04062	23.33	46.00	22.67	L1	gnd
2.025	26.72	46.00	19.28	L1	gnd
3.56796	30.18	46.00	15.82	L1	gnd
24.93906	20.40	50.00	29.60	L1	gnd

EDR-CH78, N Line



Final Measurement Results

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	Phase	PE
0.15781	41.56	65.58	24.02	N	gnd
0.4625	34.87	56.65	21.78	N	gnd
1.73984	39.42	56.00	16.58	N	gnd
1.98984	39.86	56.00	16.14	N	gnd
3.62656	40.77	56.00	15.23	N	gnd
18.29062	37.22	60.00	22.78	N	gnd

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB	Phase	PE
0.15781	27.29	55.58	28.29	N	gnd
0.4625	24.90	46.65	21.75	N	gnd
1.73984	30.53	46.00	15.47	N	gnd
1.98984	31.30	46.00	14.70	N	gnd
3.62656	32.85	46.00	13.15	N	gnd
18.29062	26.06	50.00	23.94	N	gnd



5 Main Test Instruments

Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time
BT Base Station Simulator	CBT	R&S	100271	2015-05-25	2016-05-24
Loop Antenna	FMZB1519	SCHWARZBECK	1519-047	2014-02-29	2017-02-28
EMI Test Receiver	ESCS30	R&S	100138	2015-12-17	2016-12-16
LISN	ENV216	R&S	101171	2015-12-18	2016-12-17
EMI Test Receiver	ESCI	R&S	100948	2015-05-25	2016-05-24
TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2013-11-25	2016-11-24
Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2015-07-01	2018-06-30
Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
Spectrum Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
Spectrum Analyzer	N9010A	Agilent	MY47191109	2015-05-22	2016-05-21
Standard Gain Horn	3160-09	ETS-Lindgren	00102644	2015-05-19	2018-05-18
RF Cable	SMA 15cm	Agilent	0001	2015-03-09	2016-05-08

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