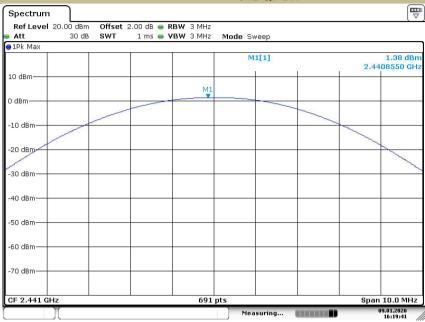


## Maximum Peak Conducted Output Power

Channel 39: 2441MHz π /4DQPSK

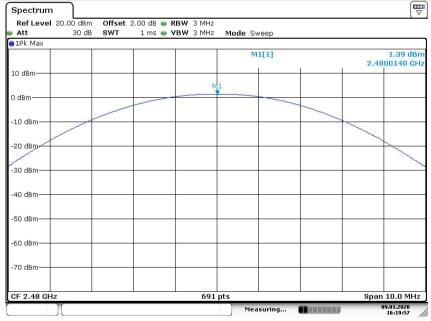


Date: 9.JAN.2020 16:19:41

## Test Model

## Maximum Peak Conducted Output Power

Channel 78: 2480MHz π /4DQPSK

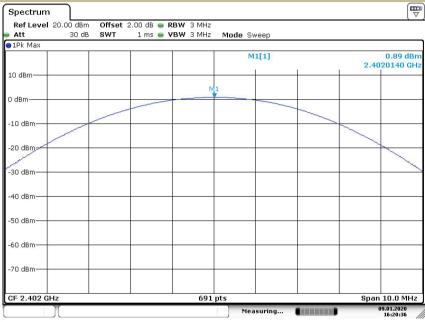


Date: 9.JAN.2020 16:19:56



## Maximum Peak Conducted Output Power

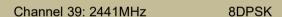
Channel 0: 2402MHz 8DPSK

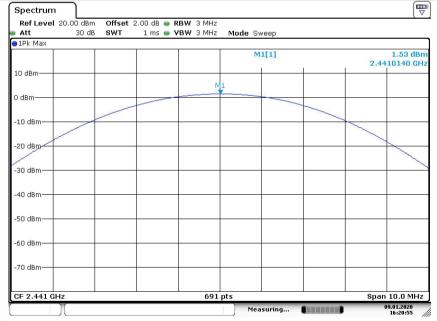


Date: 9.JAN.2020 16:20:36

## Test Model

## Maximum Peak Conducted Output Power



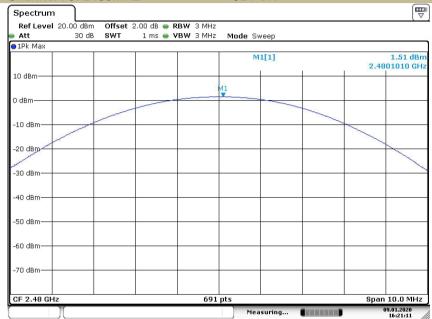


Date: 9.JAN.2020 16:20:55



## Maximum Peak Conducted Output Power

Channel 78: 2480MHz 8DPSK



Date: 9.JAN.2020 16:21:12



#### 9.6 CONDUCTED SUPRIOUS EMISSION

#### 9.6.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

#### 9.6.2 Conformance Limit

According to FCC Part 15.247(d):

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, based on either an RF conducted, provided the transmitter demonstrates compliance with the peak conducted power limits.

#### 9.6.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

#### 9.6.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

#### ■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DSS channel center frequency.

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.

Set the RBW = 100 kHz. Set the VBW ≥ 3 x RBW.

Set Detector = peak. Set Sweep time = auto couple.

Set Trace mode = max hold. Allow trace to fully stabilize.

Use the peak marker function to determine the maximum Maximum conducted level.

Note that the channel found to contain the maximum conducted level can be used to establish the reference level.

#### ■ Band-edge Compliance of RF Conducted Emissions

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW ≥ 1% of the span=100kHz Set VBW ≥ RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

#### ■ Conducted Spurious RF Conducted Emission

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.(30MHz to 25GHz). Set RBW = 100 kHz Set VBW  $\geq$  RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

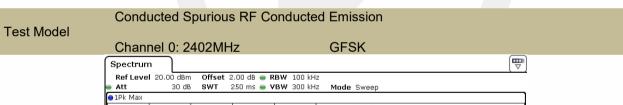


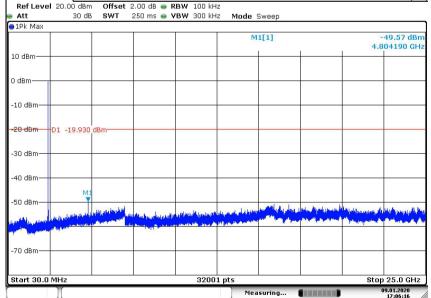
#### 9.6.5 Test Results

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result (GFSK) was report as below:



Date: 9.JAN.2020 17:03:24





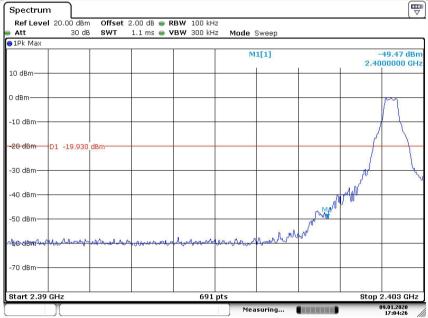
Date: 9.JAN.2020 17:06:16

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#### **Band-edge Conducted Emissions**

# Channel 0: 2402MHz GFSK



Date: 9.JAN.2020 17:04:26

#### Test Model

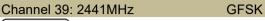
## Maximum Conducted Level RBW=100kHz

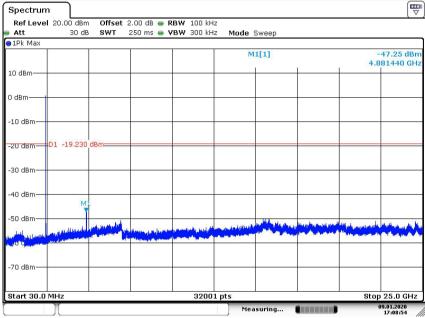


Date: 9.JAN.2020 17:06:53



## Conducted Spurious RF Conducted Emission

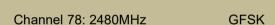


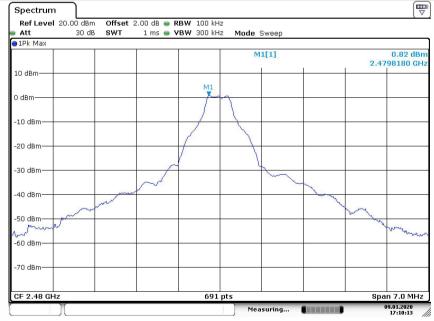


Date: 9.JAN.2020 17:08:54

#### Test Model

## Maximum Conducted Level RBW=100kHz



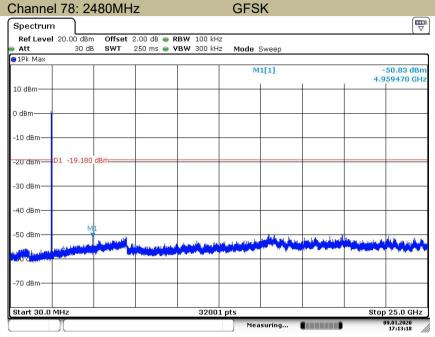


Date: 9.JAN.2020 17:10:13



## Conducted Spurious RF Conducted Emission **Test Model**

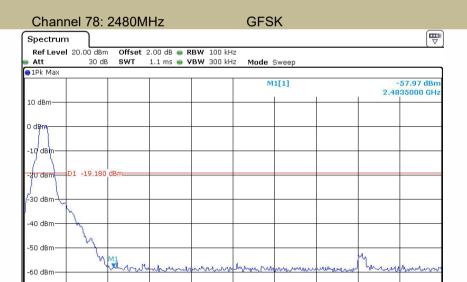
# Channel 78: 2480MHz



Date: 9.JAN.2020 17:13:17

## Test Model

## Band-edge Conducted Emissions



691 pts

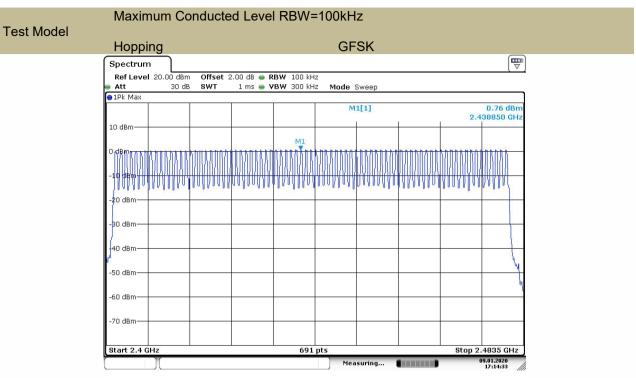
Stop 2.5 GHz

Date: 9.JAN.2020 17:10:45

Start 2.479 GHz

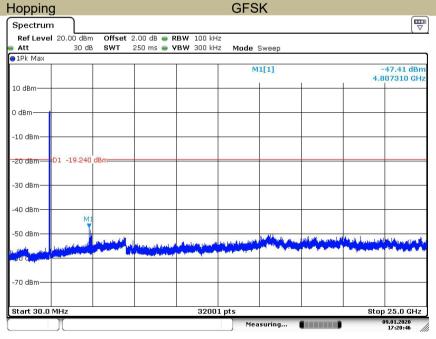
-70 dBm-





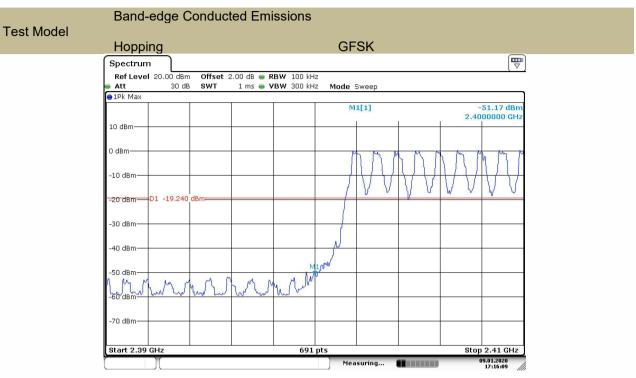
Date: 9.JAN.2020 17:14:33

# Conducted Spurious RF Conducted Emission Test Model



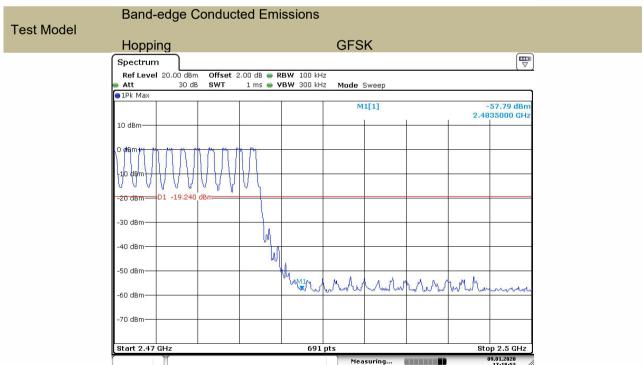
Date: 9.JAN.2020 17:20:46





Date: 9.JAN.2020 17:16:09

Date: 9.JAN.2020 17:18:53



深圳信测标准技术服务股份有限公司 地址:广东省深圳市南山区马家龙工业区69栋 网址:Http://www.emtek.com.cn 邮箱:cs.rep@emtek.com.cn EMTEK (Shenzhen) Co., Ltd. Add: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Http://www.emtek.com.cn E-mail: cs.rep@emtek.com.cn



#### 9.7 RADIATED SPURIOUS EMISSION

#### 9.7.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

#### 9.7.2 Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part15,205. Restricted bands

MHz         MHz         MHz         GHz           0.090-0.110         16.42-16.423         399.9-410         4.5-5.15           10.495-0.505         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         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	7 tooording to 1 OO 1 dit 10.2	Loo, recented barrae		
10.495-0.505         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         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	MHz	MHz	MHz	GHz
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         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	0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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       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	10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
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       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	2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
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       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	4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
6.215-6.218       74.8-75.2       1660-1710       10.6-12.7         6.26775-6.26825       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	4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
6.26775-6.26825         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	4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
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	6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
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	6.26775-6.26825	123-138	2200-2300	14.47-14.5
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	8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
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	8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
12.29-12.293 167.72-173.2 3332-3339 31.2-31.8	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
12.51975-12.52025 240-285 3345.8-3358 36.43-36.5	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)	12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41	13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

#### 9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

#### 9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

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VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for

For Below 1GHz:

 $VBW \geq RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

 $VBW \geq RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

 $VBW \geq RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If 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 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

#### 9.7.5 Test Results



## ■ Spurious Emission below 30MHz (9KHz to 30MHz)

Temperature:	29.5°C
Relative Humidity:	48%
ATM Pressure:	1011 mbar

Freq.	Ant.Pol.		ssion BuV/m)	Limit 3m	(dBuV/m)	Over(dB)		
(MHz)	H/V	PK	AV	PK	AV	PK	AV	

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =40log(Specific distance/ test distance)( dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor

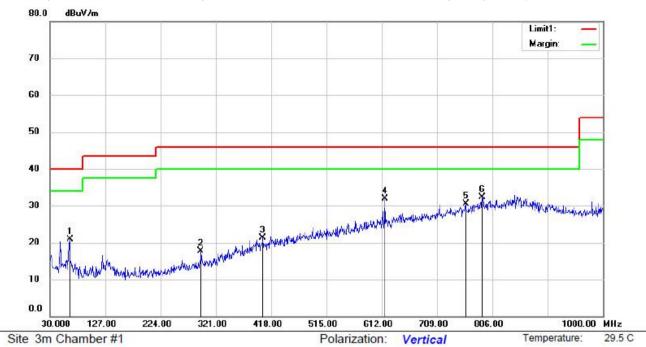




48 %

## ■ Spurious Emission below 1GHz (30MHz to 1GHz)

Bluetooth (GFSK, π/4DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:



Limit: (RE)FCC PART 15 CLASS B

Mode: BT LOW

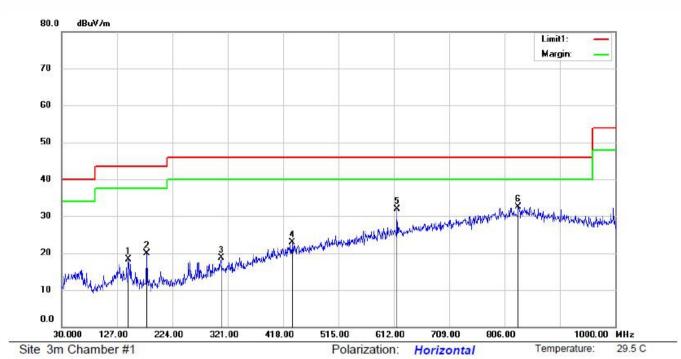
Note:

No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		65.2837	32.81	-11.94	20.87	40.00	-19.13	QP			
2	18	294.9312	28.01	-10.40	17.61	46.00	-28.39	QP			
3	8	403.5712	27.25	-5.87	21.38	46.00	-24.62	QP			
4		618.4262	32.34	-0.50	31.84	46.00	-14.16	QP			
5		760.2887	27.70	2.80	30.50	46.00	-15.50	QP			
6	*	789.2675	28.59	3.80	32.39	46.00	-13.61	QP			

Power: DC 12V



48 %



Limit: (RE)FCC PART 15 CLASS B

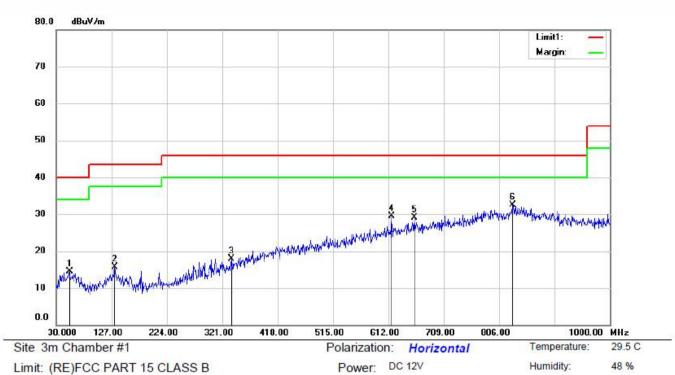
Mode: BT LOW

Note:

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		147.7337	32.18	-13.80	18.38	43.50	-25.12	QP			
2		179.3800	34.06	-14.06	20.00	43.50	-23.50	QP			
3		310.0874	28.83	-10.21	18.62	46.00	-27.38	QP			
4		435.3387	27.93	-4.95	22.98	46.00	-23.02	QP			
5		618.4262	32.47	-0.50	31.97	46.00	-14.03	QP			
6	*	831.0987	27.85	4.56	32.41	46.00	-13.59	QP			

Power: DC 12V





Limit: (RE)FCC PART 15 CLASS B

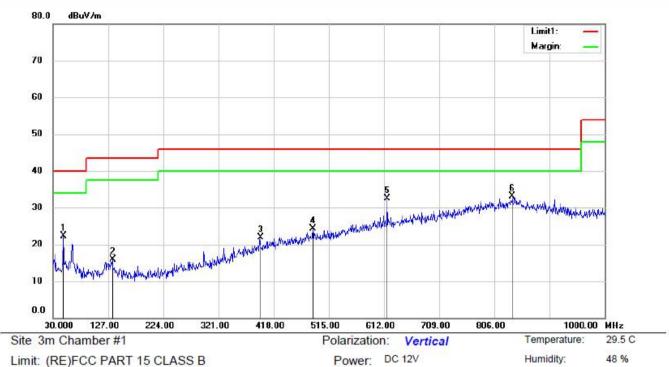
Mode: BT MIDDLE

Note:

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		54.0075	26.19	-11.69	14.50	40.00	-25.50	QP			
2		133.1837	29.72	-14.05	15.67	43.50	-27.83	QP			
3		337.9750	26.58	-8.59	17.99	46.00	-28.01	QP			
4		618.4262	30.07	-0.50	29.57	46.00	-16.43	QP			
5		658.3174	28.66	0.38	29.04	46.00	-16.96	QP			
6	*	830.1287	28.03	4.53	32.56	46.00	-13.44	QP			



48 %



Limit: (RE)FCC PART 15 CLASS B

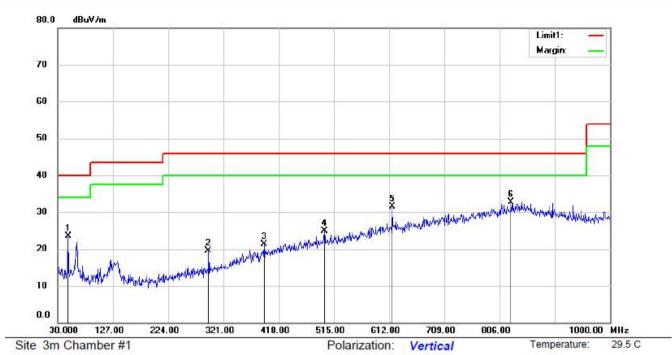
Mode: BT MIDDLE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		49.1574	34.22	-11.93	22.29	40.00	-17.71	QP			
2		135.1237	30.04	-14.04	16.00	43.50	-27.50	QP			
3		395.5687	28.15	-6.21	21.94	46.00	-24.06	QP			
4		487.5975	28.38	-4.11	24.27	46.00	-21.73	QP			
5		618.5475	32.91	-0.50	32.41	46.00	-13.59	QP			
6	*	838.4950	28.21	4.86	33.07	46.00	-12.93	QP			



48 %



Limit: (RE)FCC PART 15 CLASS B

Mode: BT HIGH

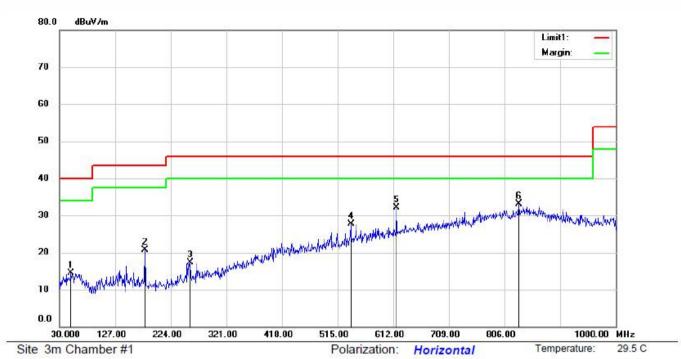
Note:

No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		49.1574	35.53	-11.93	23.60	40.00	-16.40	QP			
2		294.9312	29.81	-10.40	19.41	46.00	-26.59	QP			
3		393.1437	27.66	-6.33	21.33	46.00	-24.67	QP			
4	Į.	499.2375	28.36	-3.49	24.87	46.00	-21.13	QP			
5		618.4262	31.98	-0.50	31.48	46.00	-14.52	QP			
6	*	827.0974	28.38	4.39	32.77	46.00	-13.23	QP			

Power: DC 12V



48 %



Limit: (RE)FCC PART 15 CLASS B

Mode: BT HIGH

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		51.0974	26.17	-11.60	14.57	40.00	-25.43	QP			
2		179.3800	34.83	-14.06	20.77	43.50	-22.73	QP			
3	- 3	257.9500	29.20	-11.86	17.34	46.00	-28.66	QP			
4		538.2800	30.67	-2.98	27.69	46.00	-18.31	QP			
5	1	618.4262	32.51	-0.50	32.01	46.00	-13.99	QP			
6	*	831.7050	28.46	4.59	33.05	46.00	-12.95	QP			

Power: DC 12V



#### ■ Spurious Emission Above 1GHz (1GHz to 25GHz)

Bluetooth (GFSK, # /4DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:

Test mode:	GFSK	Frequency:	Channel 0: 2402MHz

Freq.	Ant.Pol.	Emission L	evel(dBuV/m)	Limit 3m	n(dBuV/m)	Over	(dB)
(MHz)	H/V	PK	AV	PK	AV	PK	AV
8172.300	V	52.37	40.16	74	54	-21.63	-13.84
9782.200	V	55.06	44.02	74	54	-18.94	-9.98
12019.4	V	57.05	45.15	74	54	-16.95	-8.85
7385.200	Н	49.85	40.12	74	54	-24.15	-13.88
9661.500	Н	55.40	43.15	74	54	-18.60	-10.85
12021.1	Н	57.71	45.44	74	54	-16.29	-8.56

Test mode:	GFSK	Frequency:	Channel 39: 2441MHz
------------	------	------------	---------------------

Freq.	Ant.Pol.	Emission Lev	rel(dBuV/m)	Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
	V	53.08	43.15	74	54	-20.92	-10.85
	V	54.89	43.74	74	54	-19.11	-10.26
	V	58.41	45.89	74	54	-15.59	-8.11
7117.450	Н	49.21	40.27	74	54	-24.79	-13.73
10458.80	Н	56.23	45.33	74	54	-17.77	-8.67
11997.3	Н	57.12	46.02	74	54	-16.88	-7.98

Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
7373.3	V	49.68	40.59	74	54	-24.32	-13.41
10002.35	V	54.95	43.56	74	54	-19.05	-10.44
12328.8	V	56.65	44.17	74	54	-17.35	-9.83
10707.85	Н	55.51	44.36	74	54	-18.49	-9.64
12027.9	Н	56.38	45.26	74	54	-17.62	-8.74
16190.35	Н	58.79	46.71	74	54	-15.21	-7.29

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

- (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
- (3)The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz Bluetooth (GFSK, π /4DQPSK, 8DPSK, Hopping) mode have been tested, and the worst result(GFSK, Hopping) was report as below:

		•••						
	Test mode:	GFSK	F	requency:	Chanr	nel 0: 2402MHz		
	Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
İ	2389.592	Н	45.26	74.00	-28.74	36.3	54.00	-17.7
İ	2389.848	V	46.91	74.00	-27.09	37.03	54.00	-16.97

Test mode:	GFSK	F	requency:	Chanr	nel 78: 2480MHz		
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2483.767	Н	42.80	74.00	-31.20	36.55	54.00	-17.45
2483.959	V	46.47	74.00	-27.53	36.46	54.00	-17.54

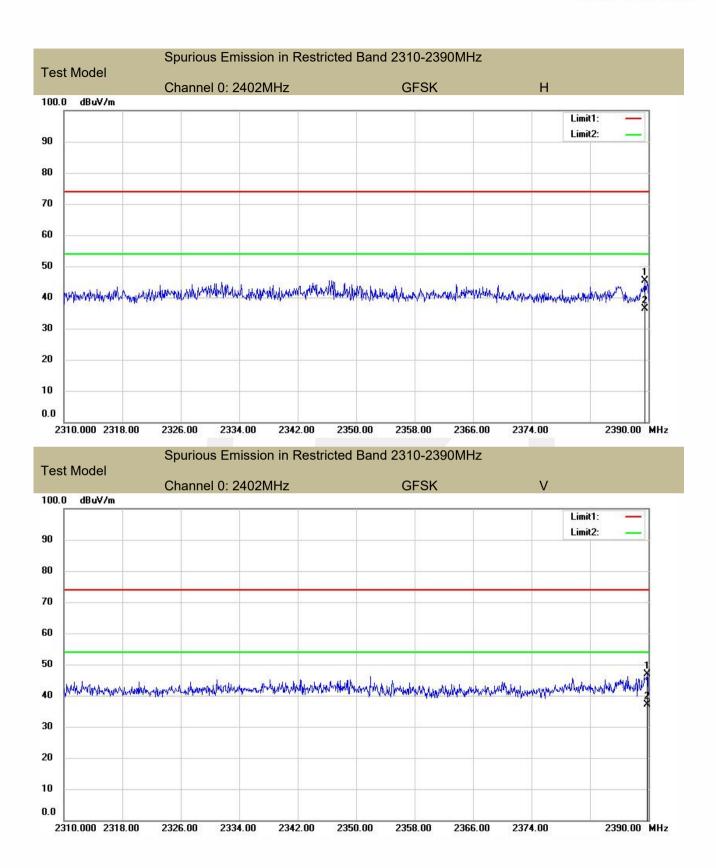
Test mode:	GFSK	F	requency:	Hoppi	ng		
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2390	Н	42.68	74.00	-31.32	38.23	54.00	-15.77
2483.5	Н	40.43	74.00	-33.57	35.22	54.00	-18.78
2390	V	42.24	74.00	-31.76	38.26	54.00	-15.74
2483.5	V	41.80	74.00	-32.20	37.98	54.00	-16.02

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

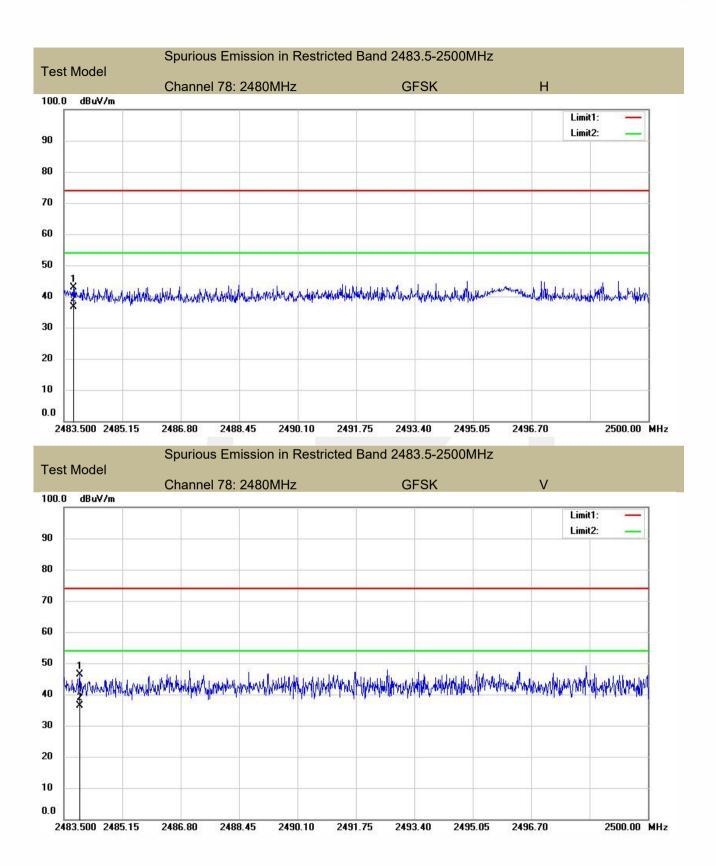
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

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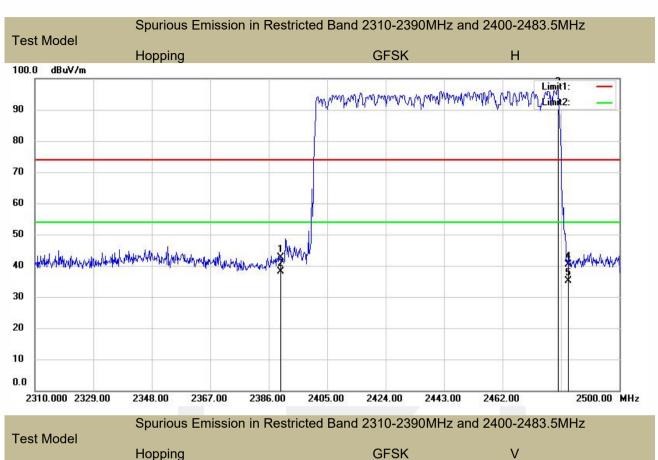


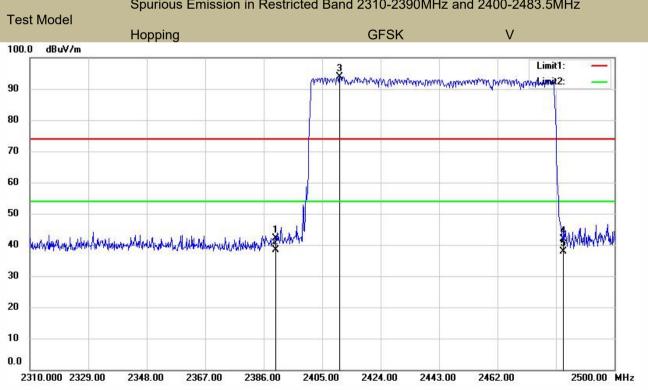




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#### 9.8 CONDUCTED EMISSION TEST

#### 9.8.1 Applicable Standard

According to FCC Part 15.207(a)

#### 9.8.2 Conformance Limit

Conducted Emission Limit					
Frequency(MHz) Quasi-peak Average					
0.15-0.5	66-56	56-46			
0.5-5.0	56	46			
5.0-30.0	60	50			

Note: 1. The lower limit shall apply at the transition frequencies

## 9.8.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

## 9.8.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Repeat above procedures until all frequency measured were complete.

#### 9.8.5 Test Results

N/A.

EUT is DC Powered.

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The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.



## 9.9 ANTENNA APPLICATION

#### 9.9.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

#### 9.9.2 Result

PASS.

The EUT	is F	PC Antenna, the gain is 2.0dBi.
Note:	$\boxtimes$	Antenna use a permanently attached antenna which is not replaceable.
		Not using a standard antenna jack or electrical connector for antenna replacement
		The antenna has to be professionally installed (please provide method of installation)
٧	vhich	in accordance to section 15.203, please refer to the internal photos.

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## Detail of factor for radiated emission

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

----- End of Report -----