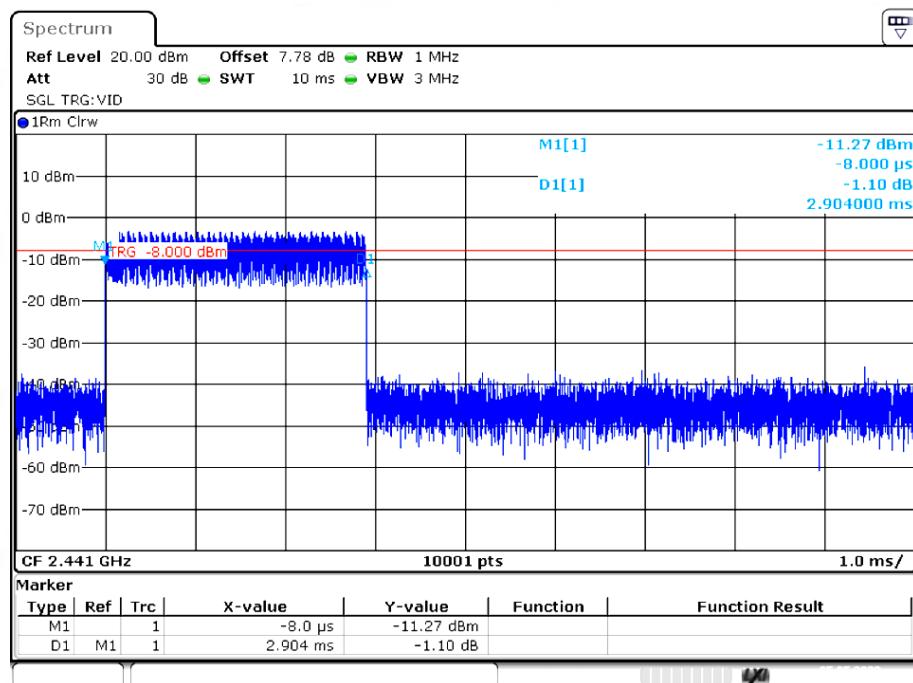
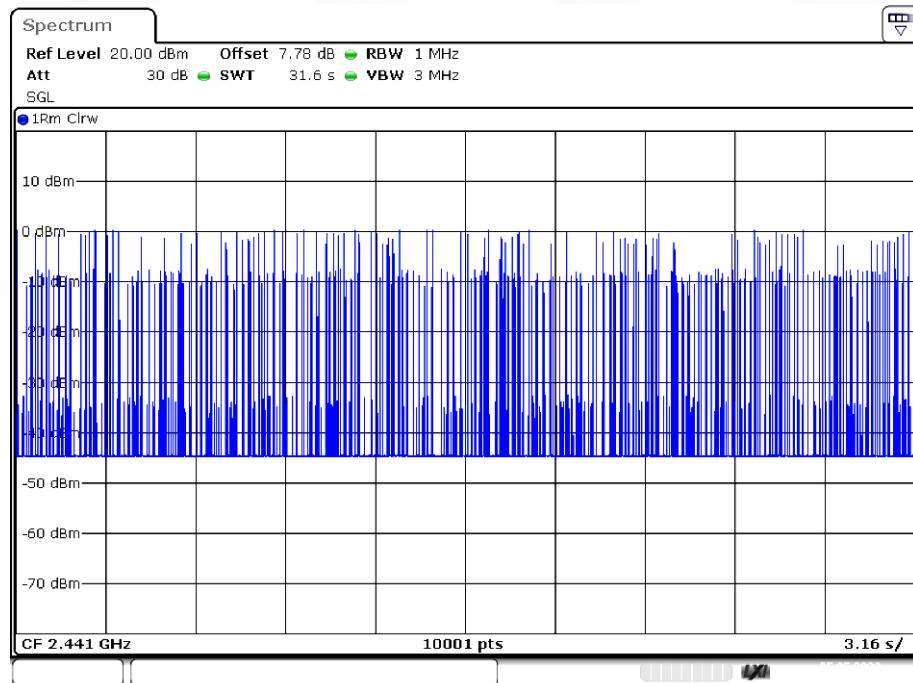
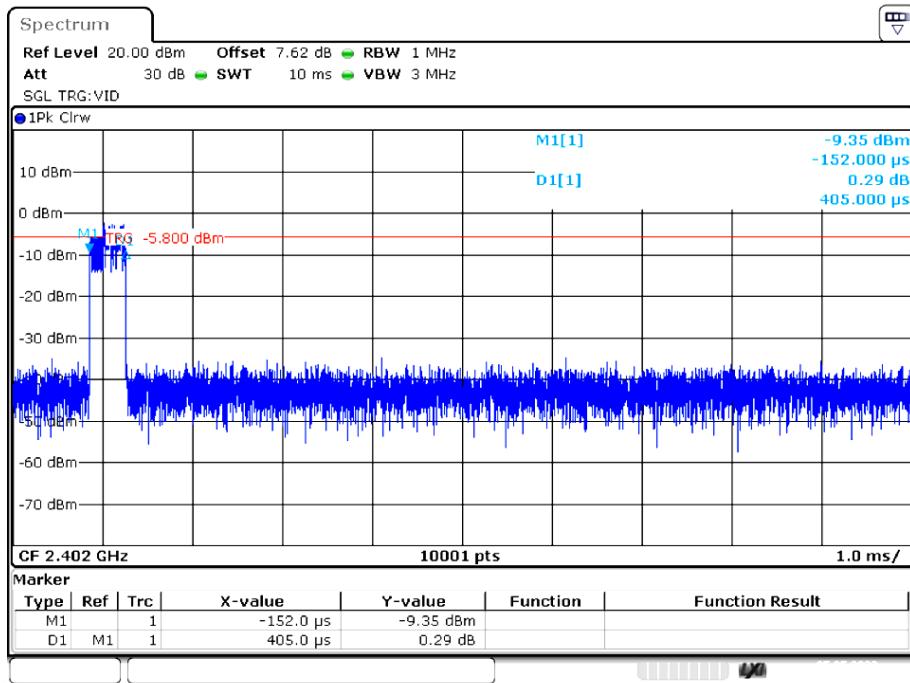
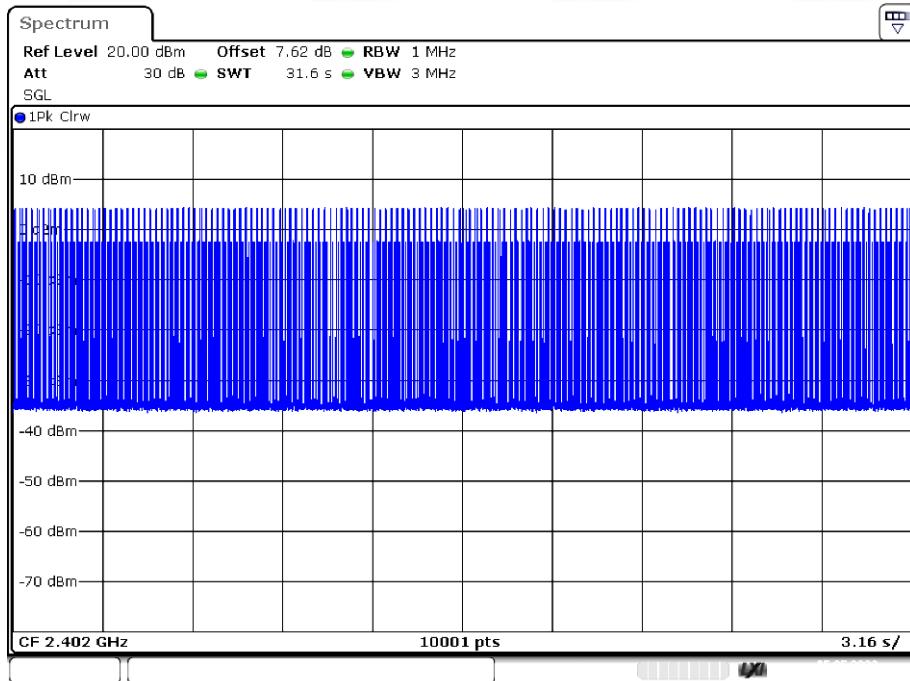
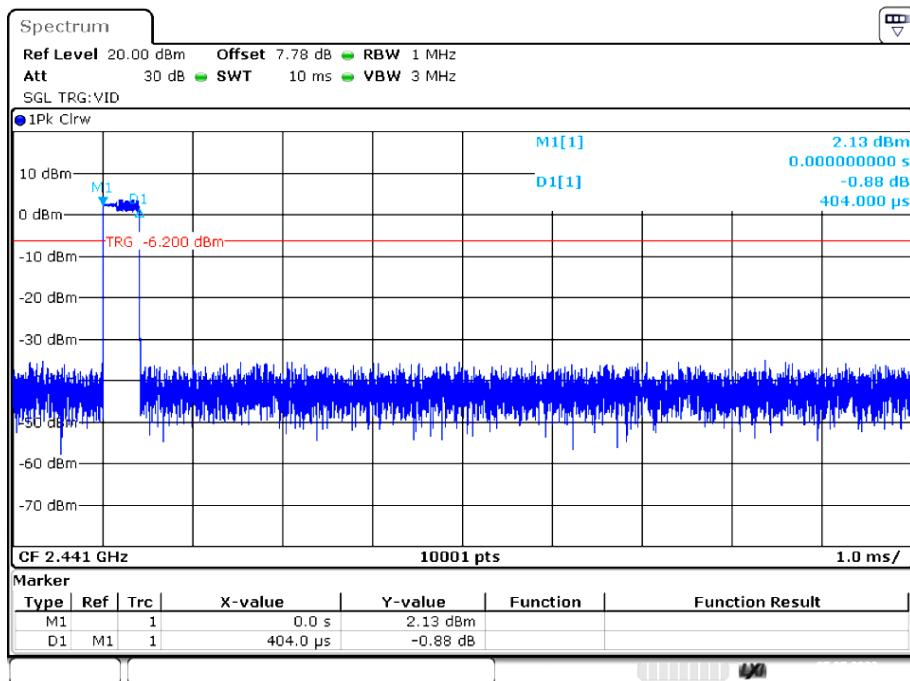
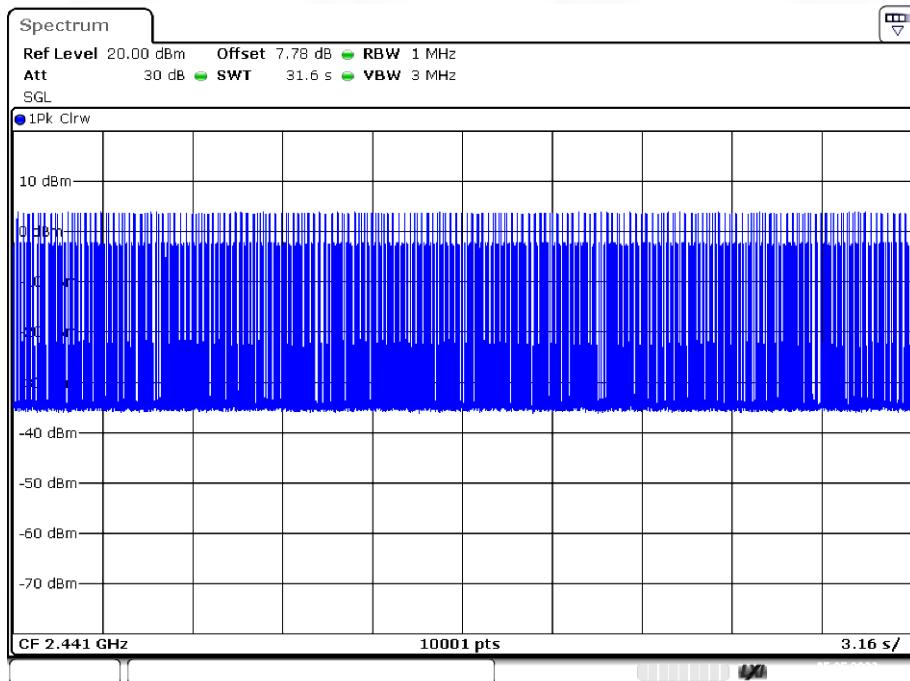
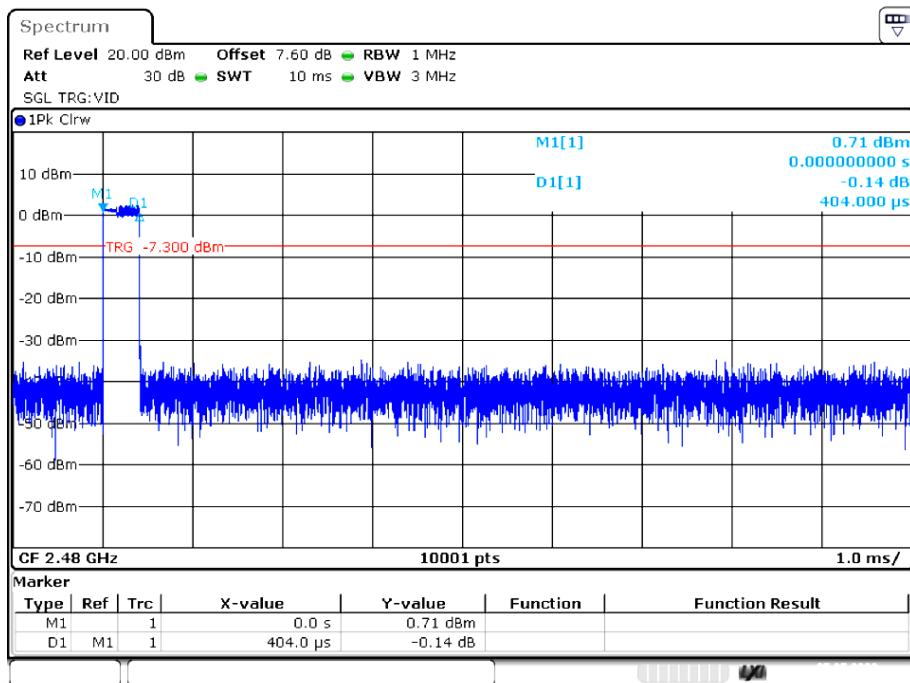


Dwell NVNT 2-DH5 2441MHz Ant1 One Burst

Dwell NVNT 2-DH5 2441MHz Ant1 Accumulated


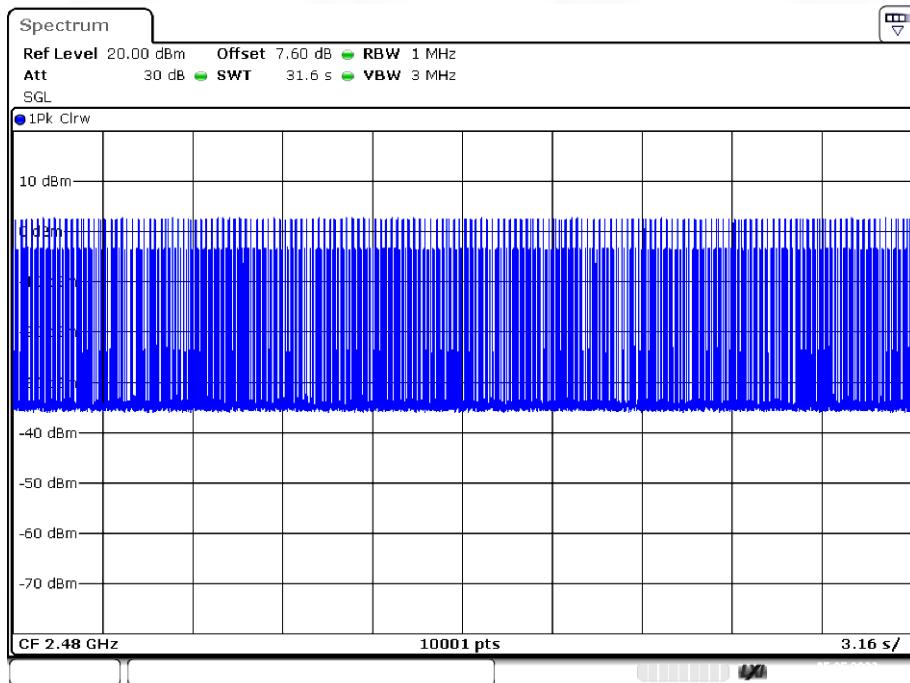
Dwell NVNT 3-DH1 2402MHz Ant1 One Burst

Dwell NVNT 3-DH1 2402MHz Ant1 Accumulated


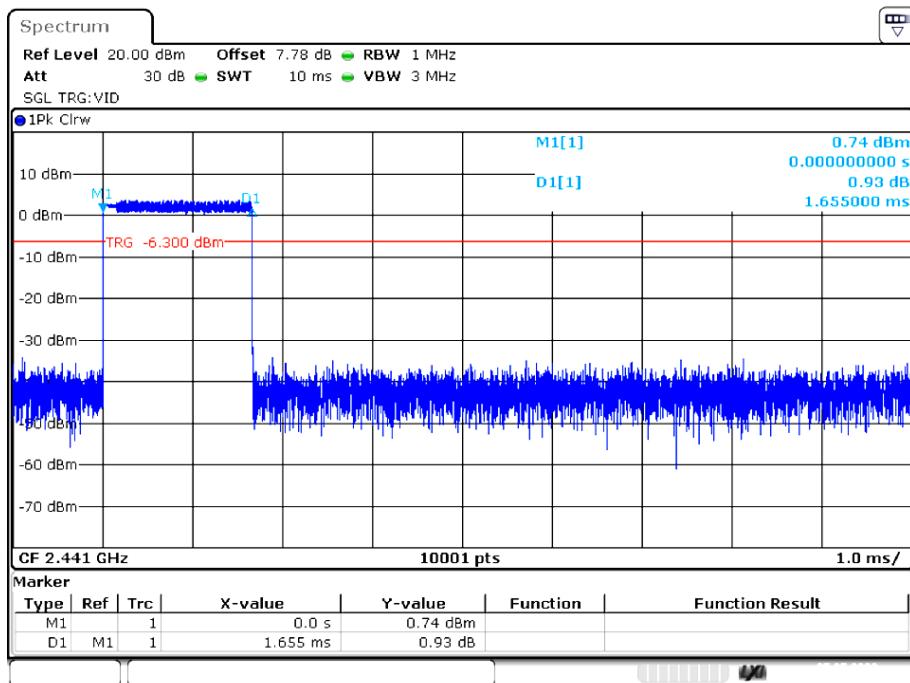
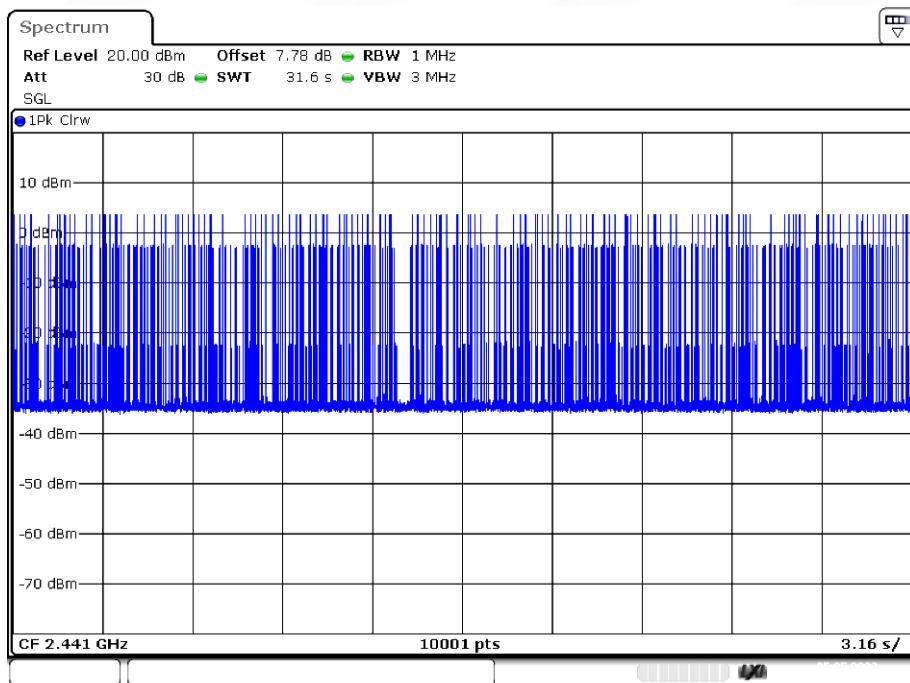
Dwell NVNT 3-DH1 2441MHz Ant1 One Burst

Dwell NVNT 3-DH1 2441MHz Ant1 Accumulated


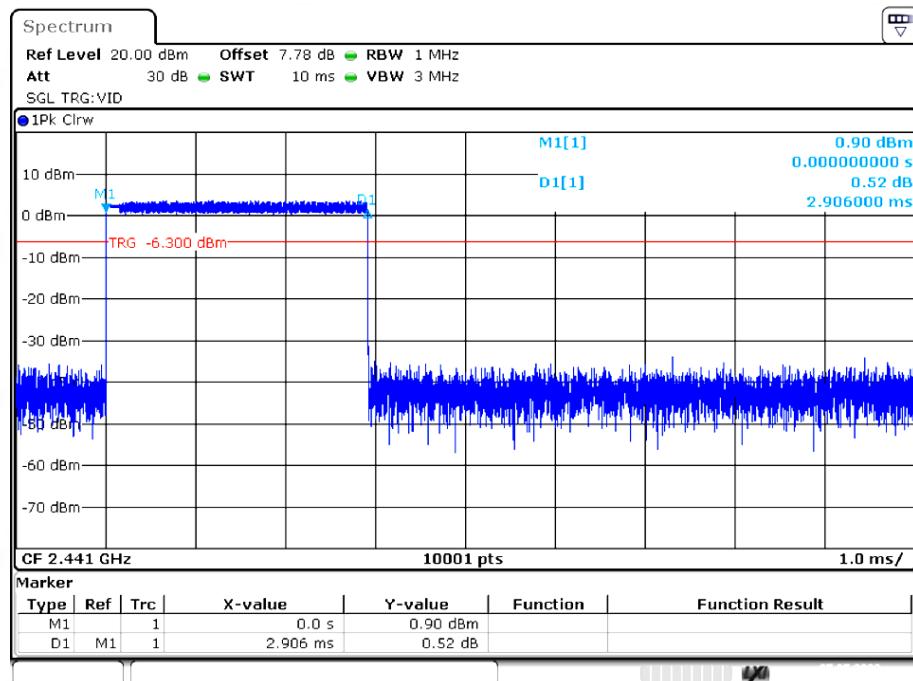
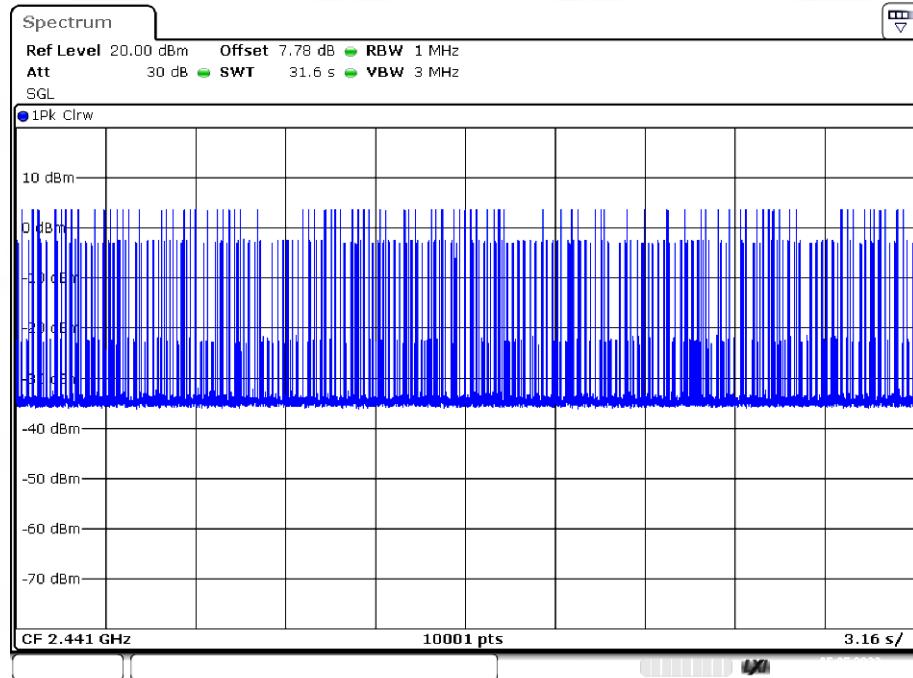
Dwell NVNT 3-DH1 2480MHz Ant1 One Burst



Dwell NVNT 3-DH1 2480MHz Ant1 Accumulated



Dwell NVNT 3-DH3 2441MHz Ant1 One Burst

Dwell NVNT 3-DH3 2441MHz Ant1 Accumulated


Dwell NVNT 3-DH5 2441MHz Ant1 One Burst

Dwell NVNT 3-DH5 2441MHz Ant1 Accumulated


8. RADIATED EMISSIONS

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

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)

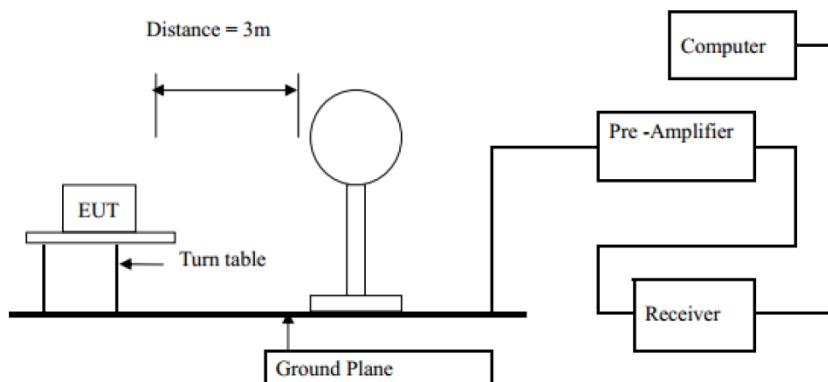
15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/

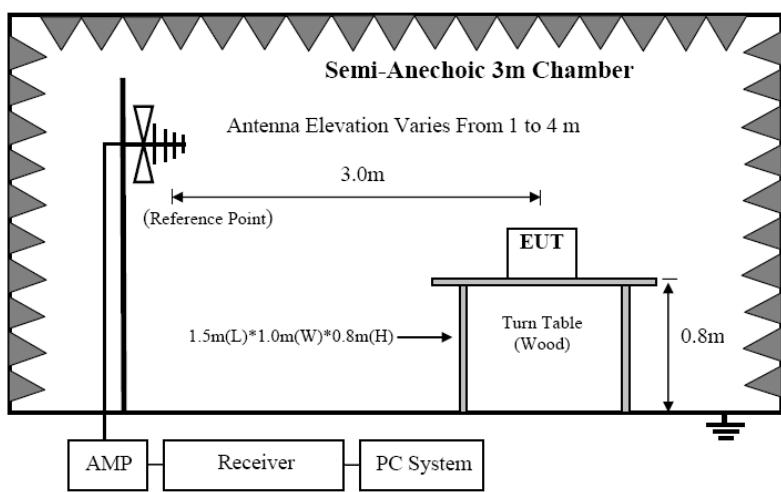
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 88	3	100	40.0
88 216	3	150	43.5
216 960	3	200	46.0
960 1000	3	500	54.0
Above 1000	3	74.0 dB(μ V)/m (Peak) 54.0 dB(μ V)/m (Average)	

8.2. Block Diagram of Test setup

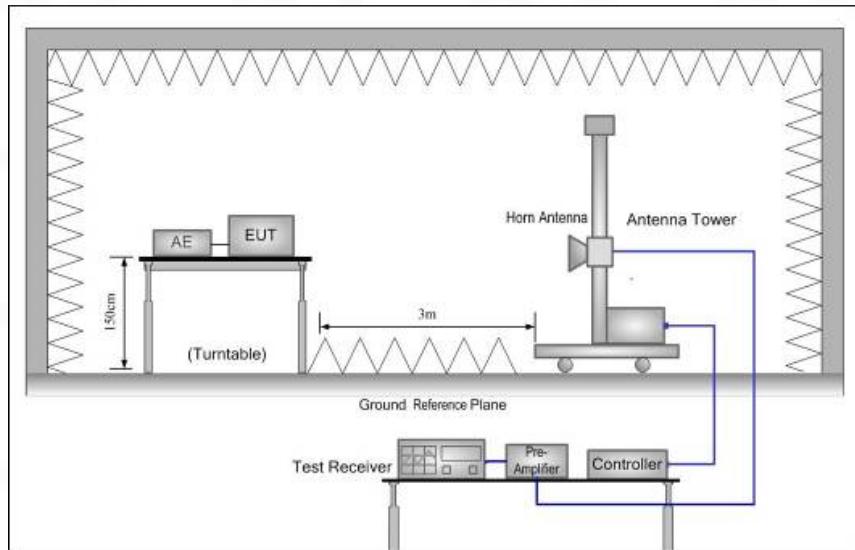
8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and simulator as shown in section 1.4 and 6.1
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI

C63.10:2013 on Radiated Emission test.

(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT's highest frequency.

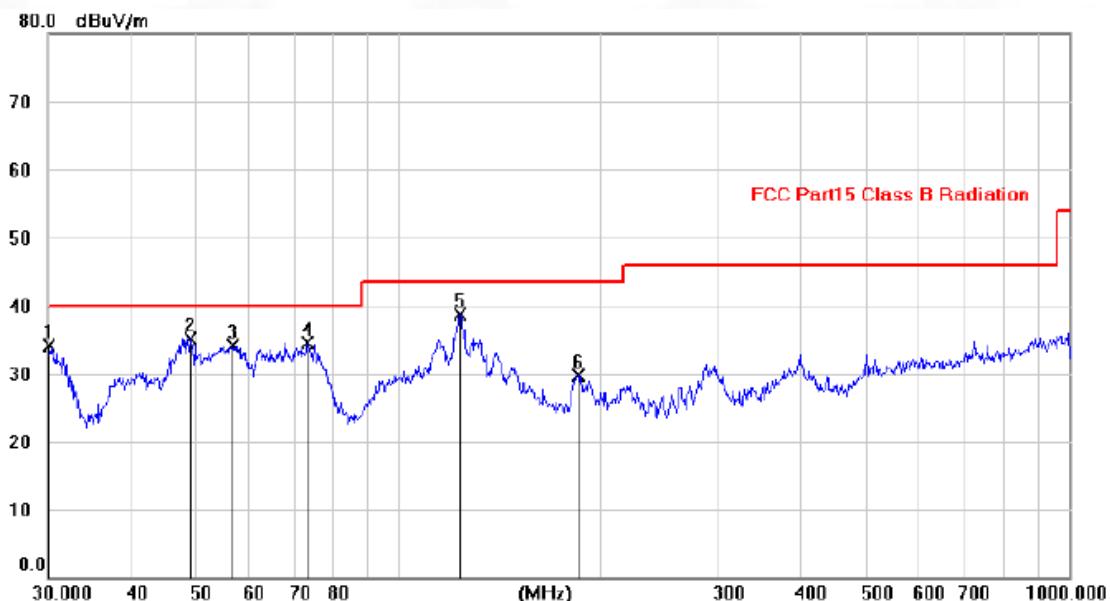
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

From 30MHz to 1000MHz: Conclusion: PASS

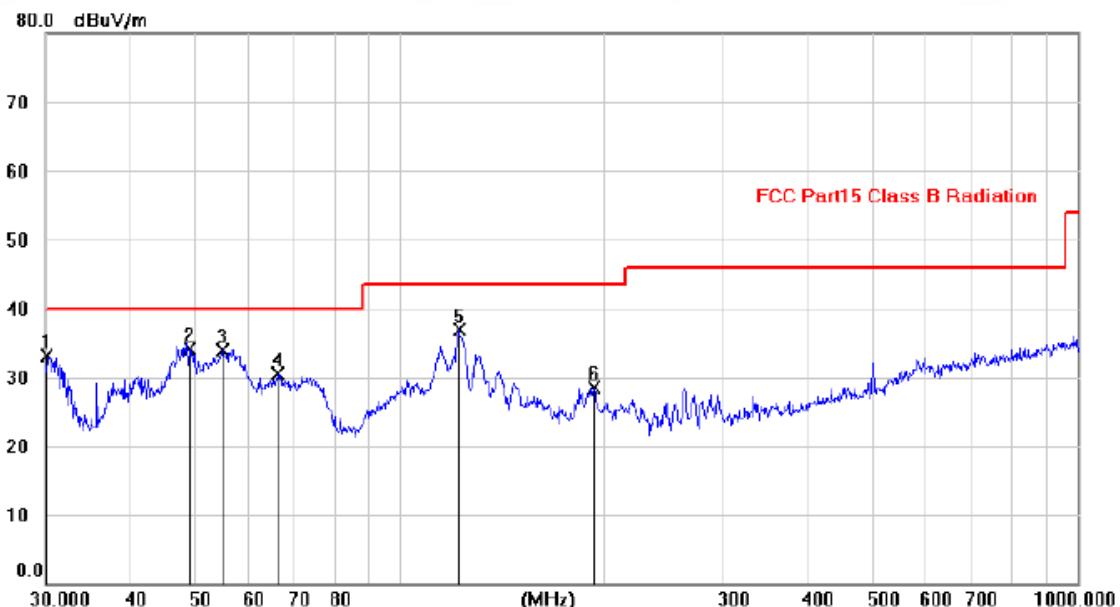
Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Antenna Height	Table Degree		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.0597	20.66	13.52	34.18	40.00	-5.82	peak			
2		48.9172	21.13	14.03	35.16	40.00	-4.84	peak			
3		56.6790	20.74	13.46	34.20	40.00	-5.80	peak			
4		73.1111	23.73	10.81	34.54	40.00	-5.46	peak			
5	*	123.5395	25.49	13.23	38.72	43.50	-4.78	peak			
6		185.2678	17.74	12.04	29.78	43.50	-13.72	peak			

Note: 1. *:Maximum data; x:Over limit; !:over margin.

2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Horizontal:


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	
1		30.0491	19.68	13.52	33.20	40.00	-6.80	peak			
2	*	48.8943	20.04	14.04	34.08	40.00	-5.92	peak			
3		54.7644	20.31	13.61	33.92	40.00	-6.08	peak			
4		66.1268	18.36	12.10	30.46	40.00	-9.54	peak			
5		122.3754	23.82	13.17	36.99	43.50	-6.51	peak			
6		193.1622	17.25	11.29	28.54	43.50	-14.96	peak			

Note: 1. *:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2402MHz was listed in this report.



From 1G-25GHz

Test Mode: GFSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	48.07	V	33.93	10.18	34.26	57.92	74	-16.08	PK
4804	36.15	V	33.93	10.18	34.26	46.00	54	-8.00	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	47.33	H	33.93	10.18	34.26	57.18	74	-16.82	PK
4804	35.06	H	33.93	10.18	34.26	44.91	54	-9.09	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX Mid									
4882	49.08	V	33.95	10.20	34.26	58.97	74	-15.03	PK
4882	35.86	V	33.95	10.20	34.26	45.75	54	-8.25	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	48.80	H	33.95	10.20	34.26	58.69	74	-15.31	PK
4882	34.27	H	33.95	10.20	34.26	44.16	54	-9.84	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX High									
4960	47.86	V	33.98	10.22	34.25	57.81	74	-16.19	PK
4960	33.66	V	33.98	10.22	34.25	43.61	54	-10.39	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	46.23	H	33.98	10.22	34.25	56.18	74	-17.82	PK
4960	32.62	H	33.98	10.22	34.25	42.57	54	-11.43	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/





Test Report Number: BTF230612R00302

Note:

- 1, Result = Read level + Antenna factor + cable loss-Amp factor
- 2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.



Test Mode: π/4 DQPSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	48.63	V	33.93	10.18	34.26	58.48	74	-15.52	PK
4804	36.64	V	33.93	10.18	34.26	46.49	54	-7.51	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	47.02	H	33.93	10.18	34.26	56.87	74	-17.13	PK
4804	35.36	H	33.93	10.18	34.26	45.21	54	-8.79	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX Mid									
4882	49.67	V	33.95	10.20	34.26	59.56	74	-14.44	PK
4882	35.13	V	33.95	10.20	34.26	45.02	54	-8.98	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	48.29	H	33.95	10.20	34.26	58.18	74	-15.82	PK
4882	34.29	H	33.95	10.20	34.26	44.18	54	-9.82	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX High									
4960	47.47	V	33.98	10.22	34.25	57.42	74	-16.58	PK
4960	33.94	V	33.98	10.22	34.25	43.89	54	-10.11	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	46.32	H	33.98	10.22	34.25	56.27	74	-17.73	PK
4960	32.38	H	33.98	10.22	34.25	42.33	54	-11.67	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/



Test Report Number: BTF230612R00302

Note:

- 1, Result = Read level + Antenna factor + cable loss-Amp factor
- 2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.



Test Mode: 8DPSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	48.70	V	33.93	10.18	34.26	58.55	74	-15.45	PK
4804	36.87	V	33.93	10.18	34.26	46.72	54	-7.28	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	47.18	H	33.93	10.18	34.26	57.03	74	-16.97	PK
4804	35.48	H	33.93	10.18	34.26	45.33	54	-8.67	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: 8DPSK TX Mid									
4882	49.62	V	33.95	10.20	34.26	59.51	74	-14.49	PK
4882	35.18	V	33.95	10.20	34.26	45.07	54	-8.93	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	48.34	H	33.95	10.20	34.26	58.23	74	-15.77	PK
4882	34.39	H	33.95	10.20	34.26	44.28	54	-9.72	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: 8DPSK TX High									
4960	47.18	V	33.98	10.22	34.25	57.13	74	-16.87	PK
4960	33.96	V	33.98	10.22	34.25	43.91	54	-10.09	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	46.05	H	33.98	10.22	34.25	56.00	74	-18.00	PK
4960	32.85	H	33.98	10.22	34.25	42.80	54	-11.20	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/



Test Report Number: BTF230612R00302

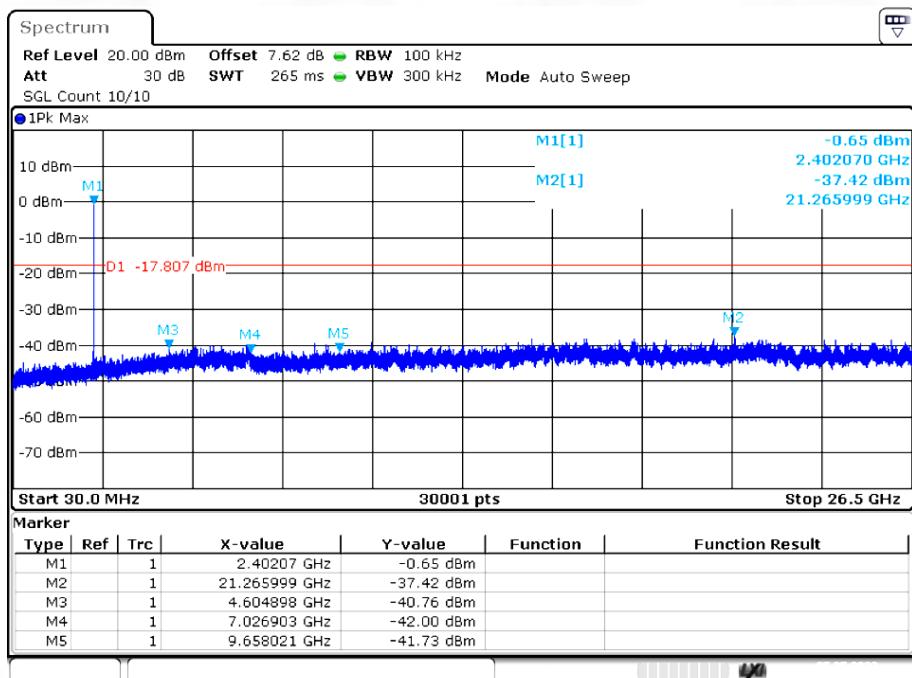
Note:

- 1, Result = Read level + Antenna factor + cable loss-Amp factor
- 2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

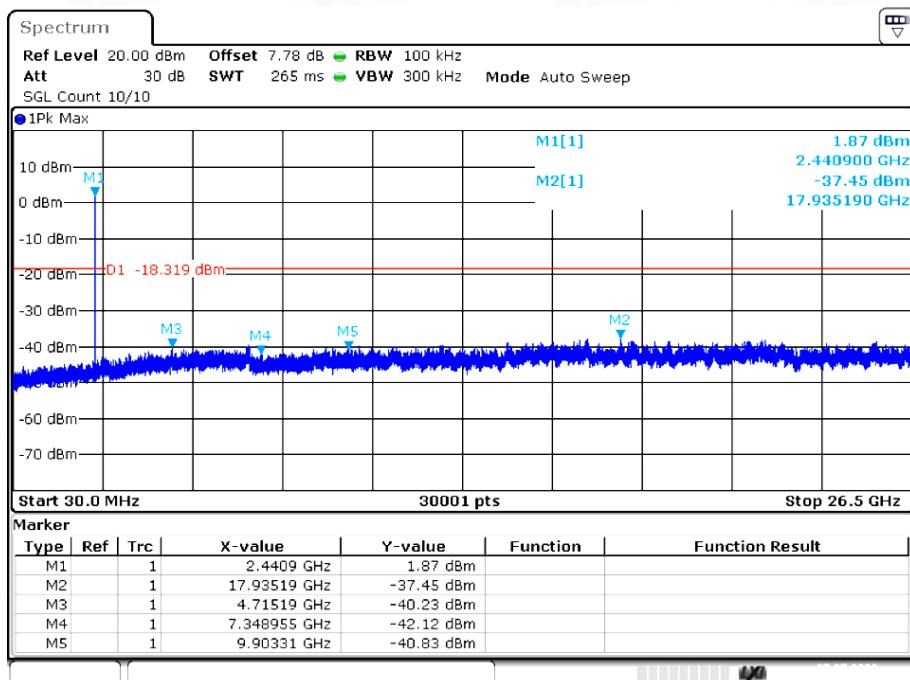


Conducted RF Spurious Emission

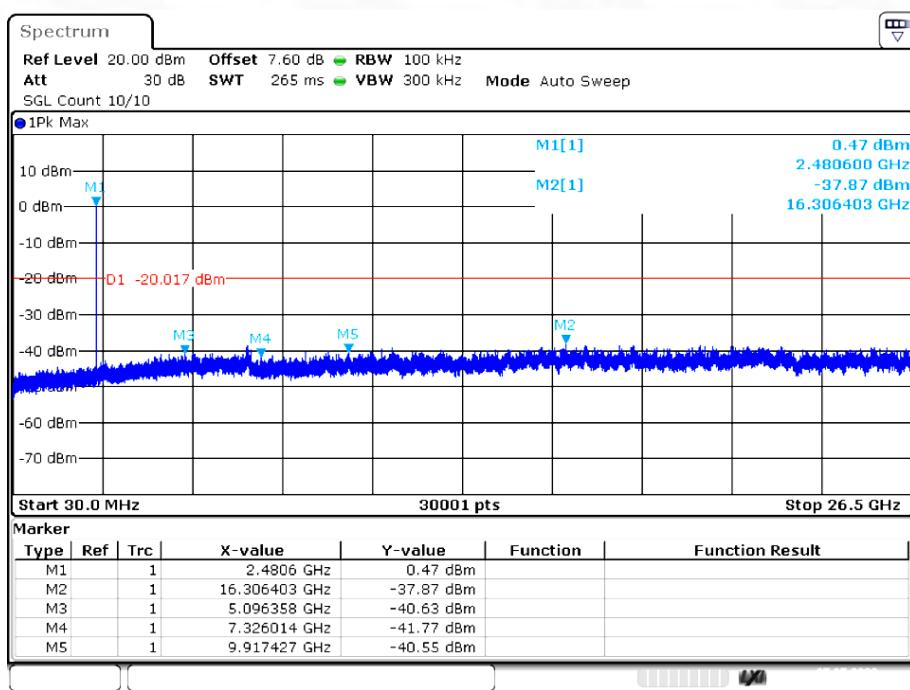
Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Emission



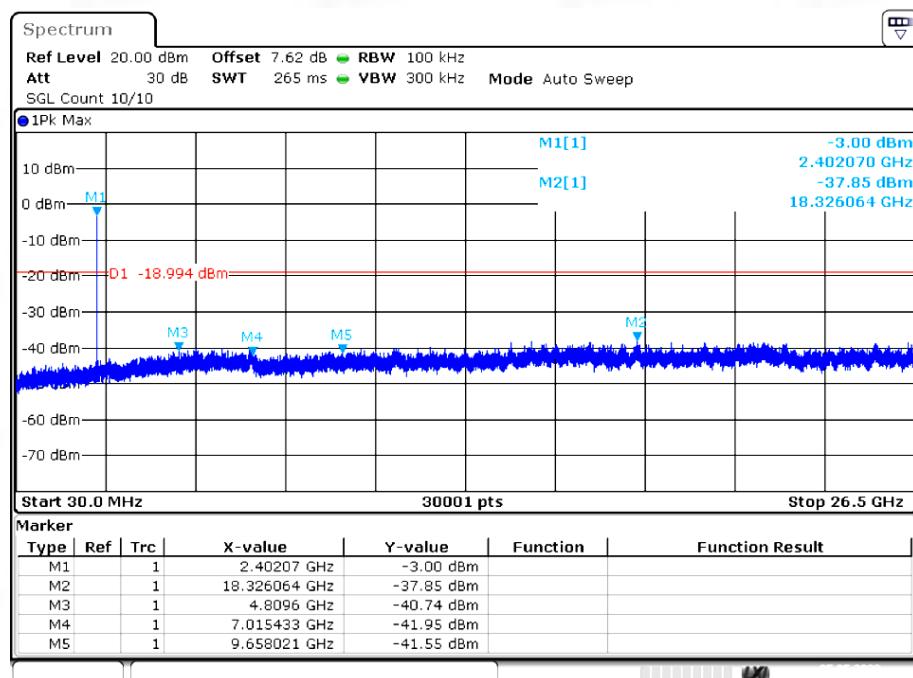
Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Emission

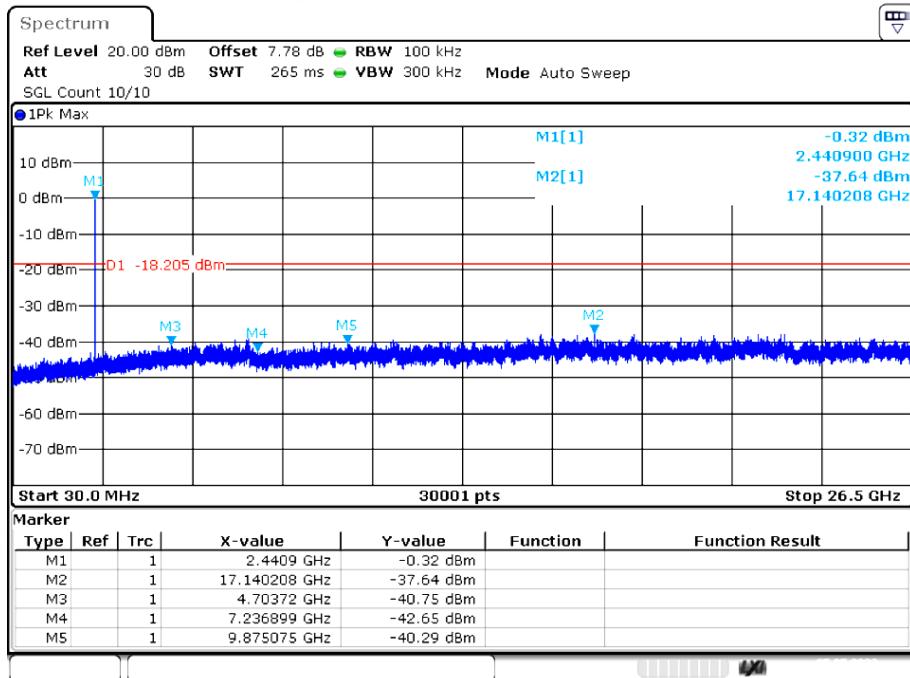
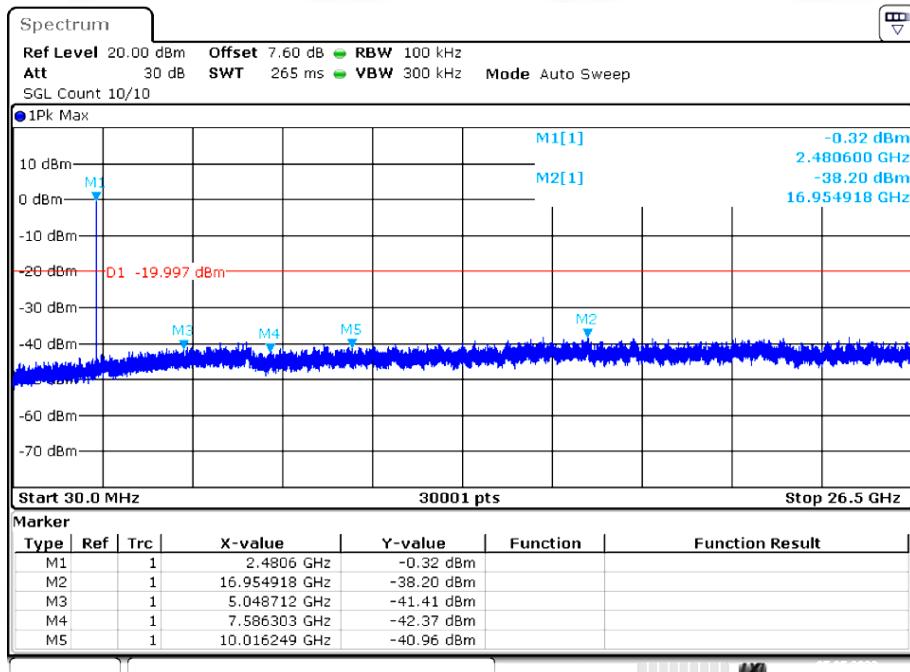


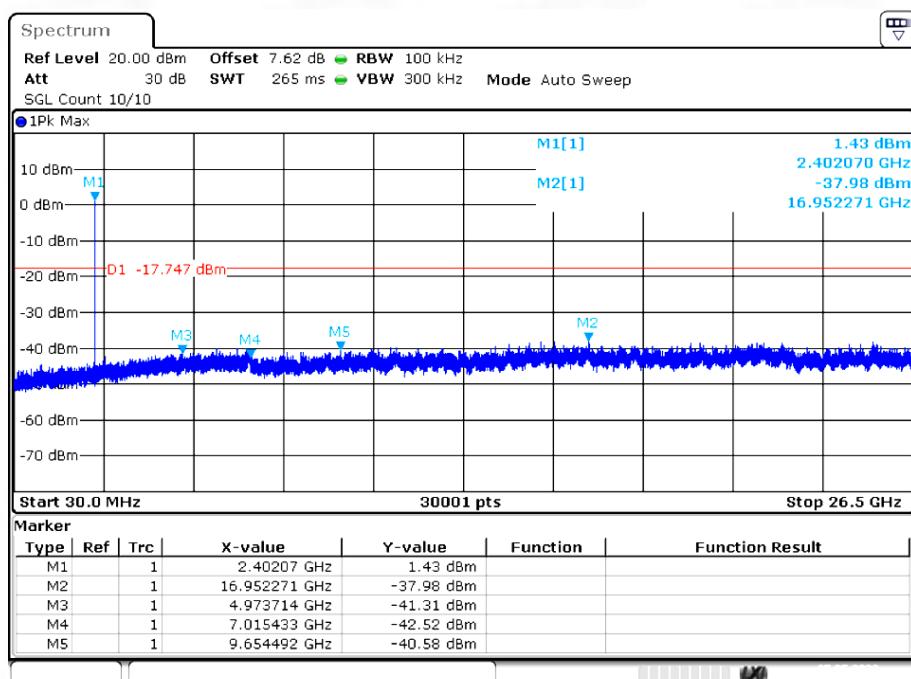
Tx. Spurious NVNT 1-DH1 2480MHz Ant1 Emission

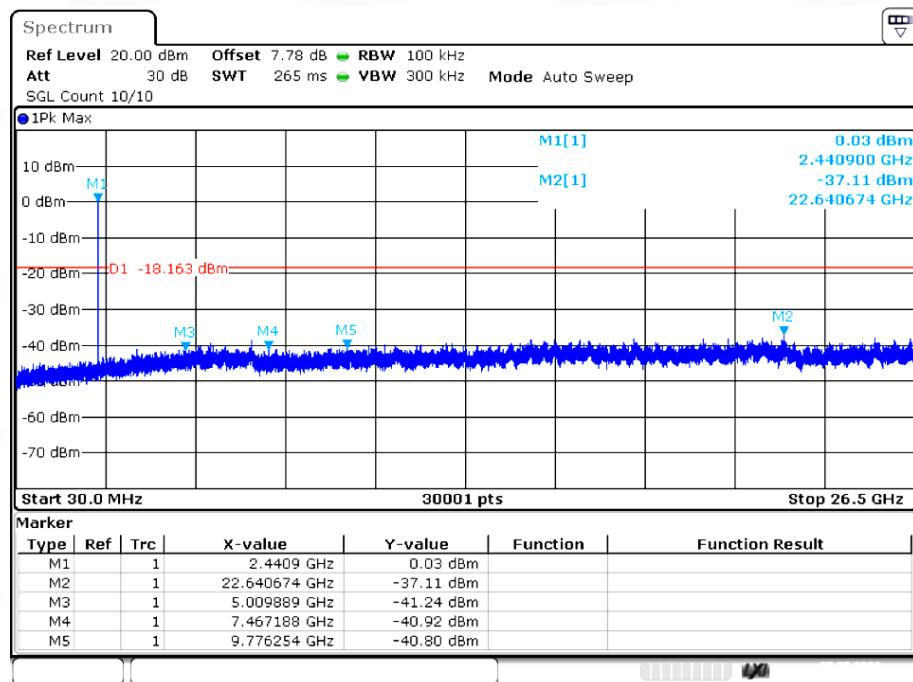
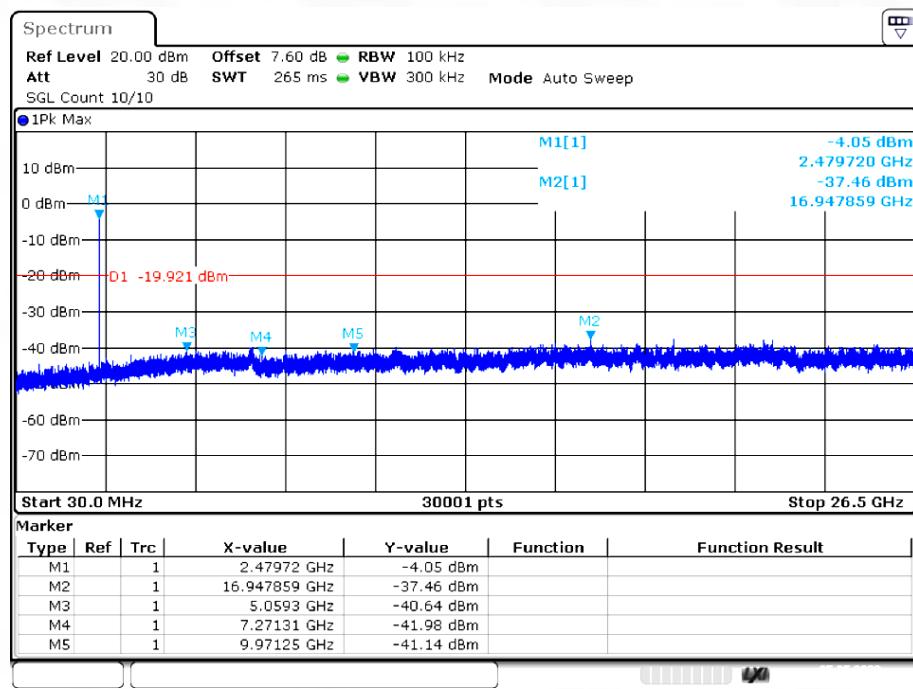


Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Emission



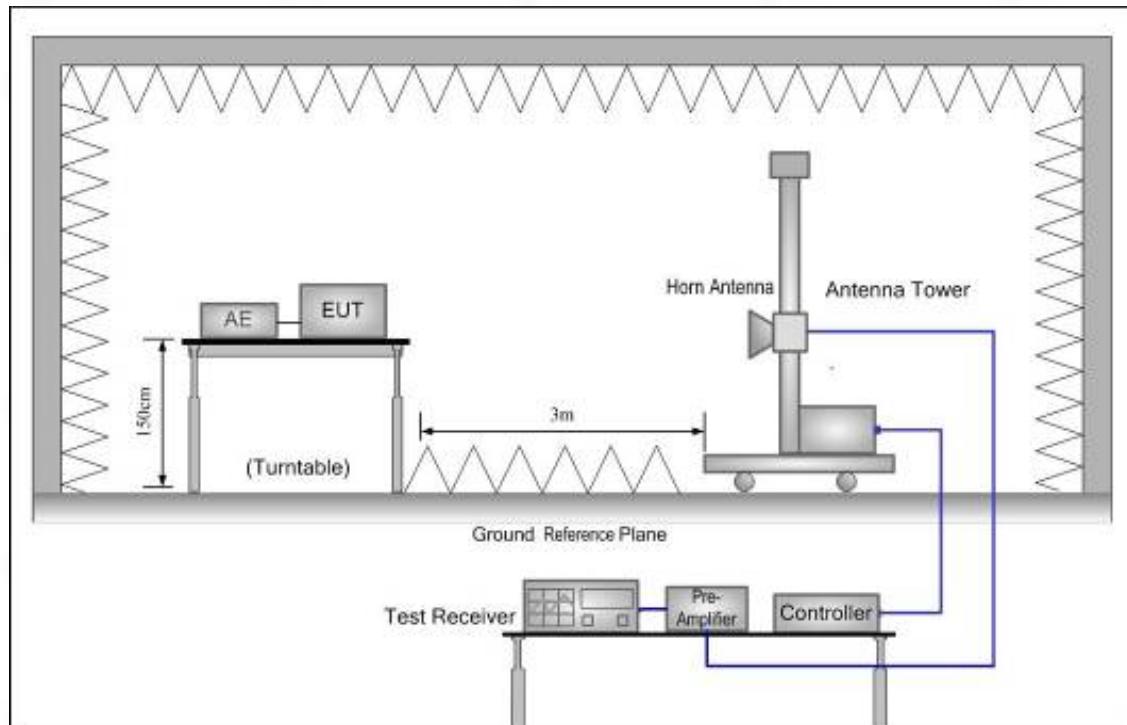
Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Emission

Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Emission


Tx. Spurious NVNT 3-DH1 2402MHz Ant1 Emission

Tx. Spurious NVNT 3-DH1 2441MHz Ant1 Emission


Tx. Spurious NVNT 3-DH1 2480MHz Ant1 Emission


9. BAND EDGE COMPLIANCE

9.1. Block Diagram of Test Setup



9.2. Limit

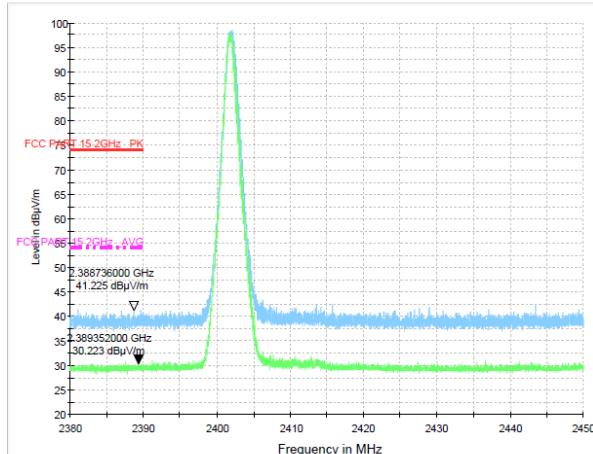
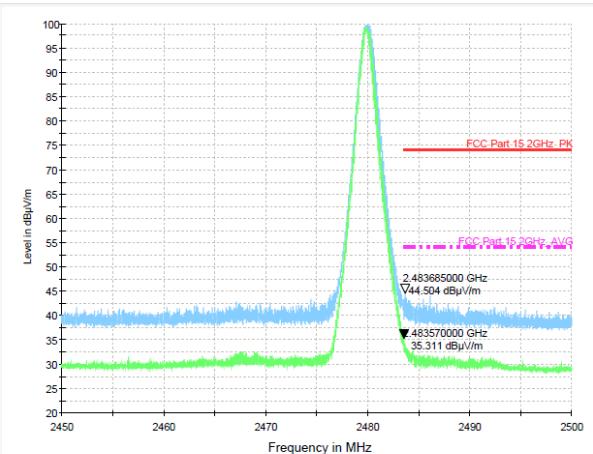
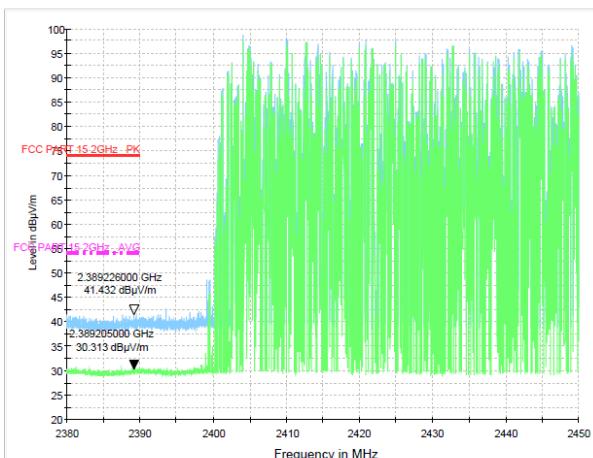
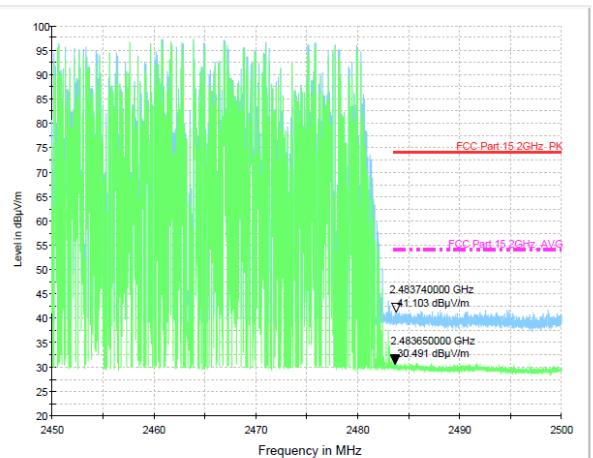
All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested , only worse case is reported.

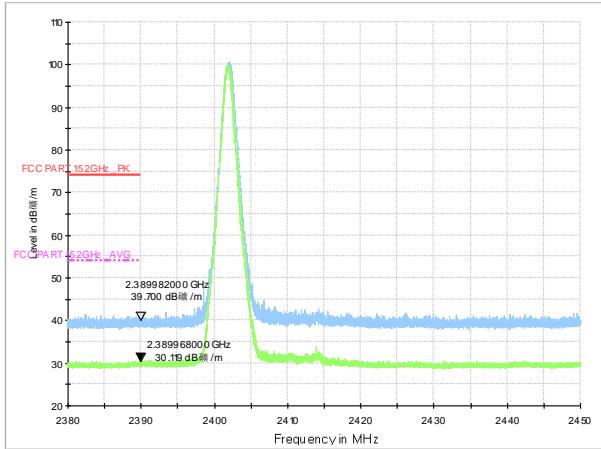
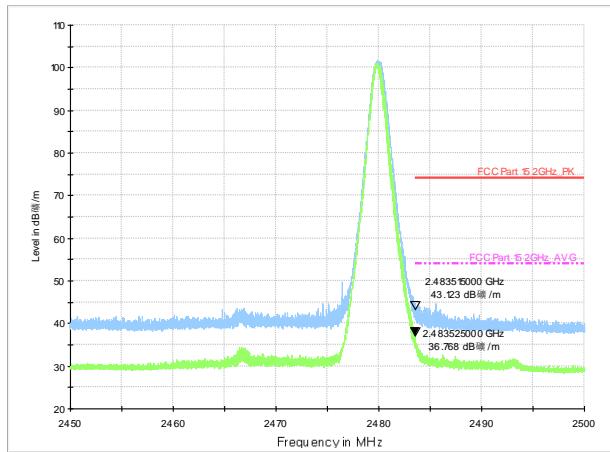
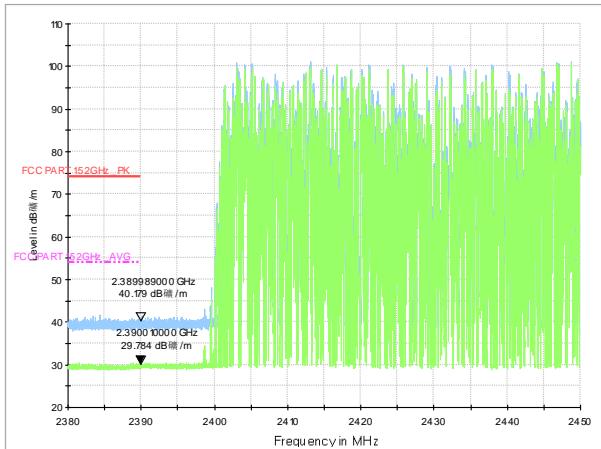
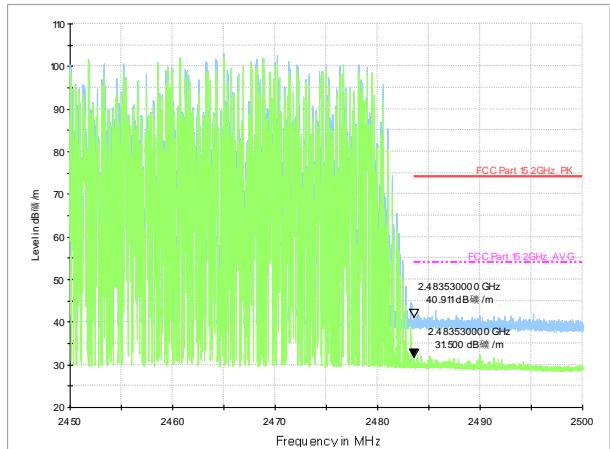
9.4. Test Result

PASS. (See below detailed test data)

Test Mode: GFSK-Low Hopping-off

Test Mode: GFSK-High Hopping-off

Test Mode: GFSK-Low Hopping-on

Test Mode: GFSK-High Hopping-on


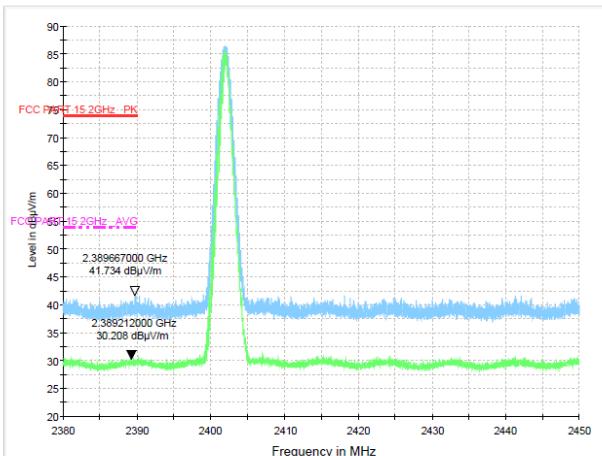
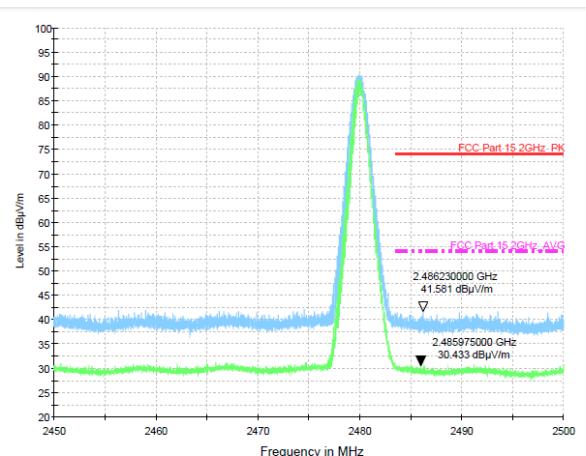
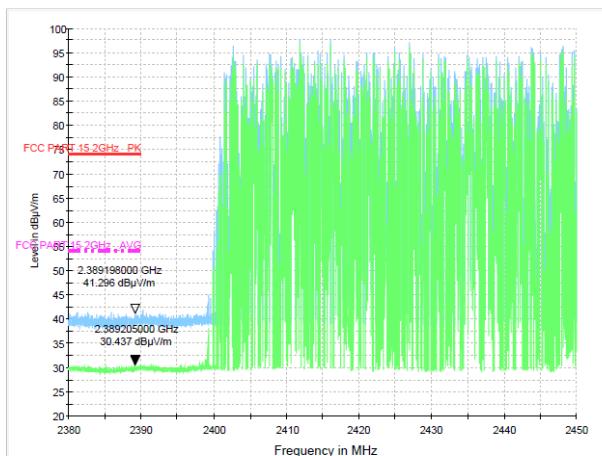
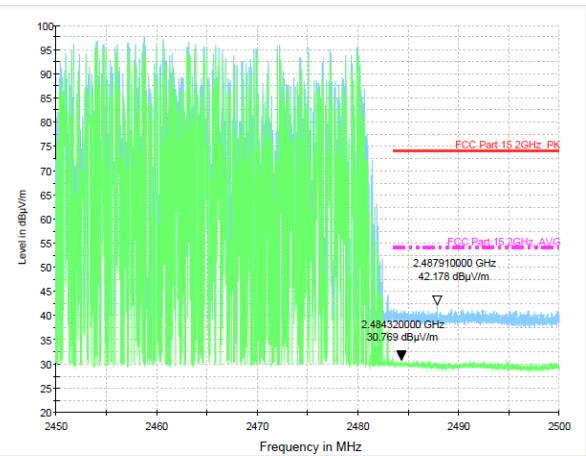
Note: 1. *:Maximum data; x:Over limit; !:over margin.

2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Test Mode: $\pi/4$ DQPSK-Low Hopping-off

Test Mode: $\pi/4$ DQPSK-High Hopping-off

Test Mode: $\pi/4$ DQPSK-Low Hopping-on

Test Mode: $\pi/4$ DQPSK-High Hopping-on


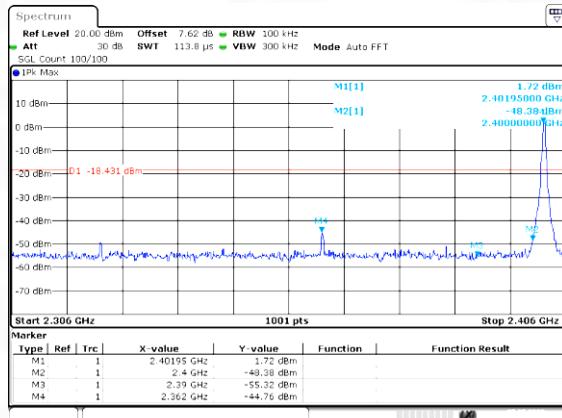
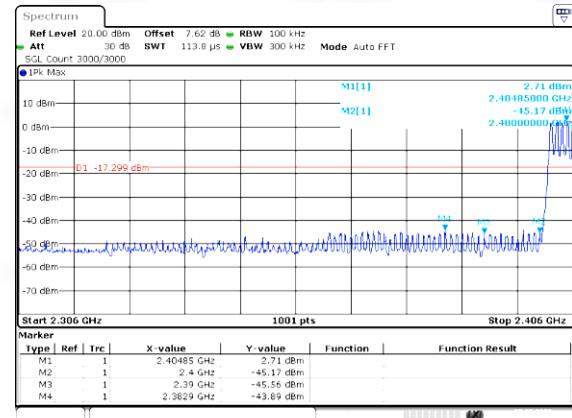
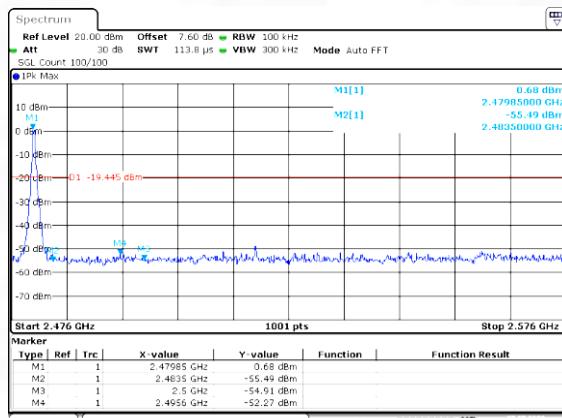
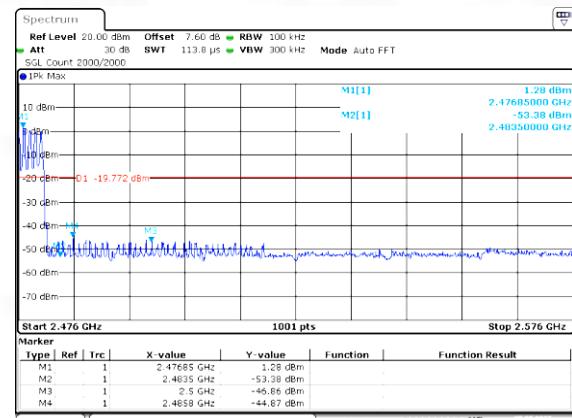
Note: 1. *:Maximum data; x:Over limit; !:over margin.

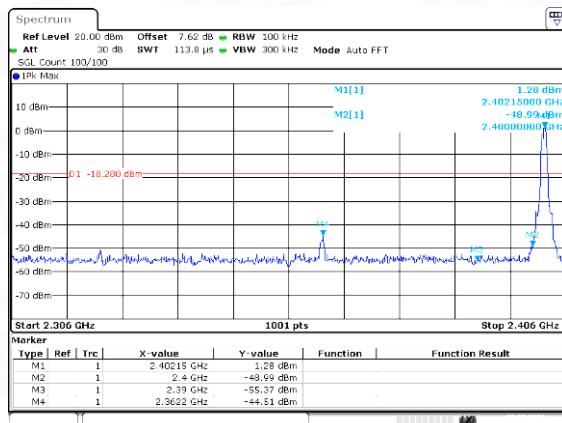
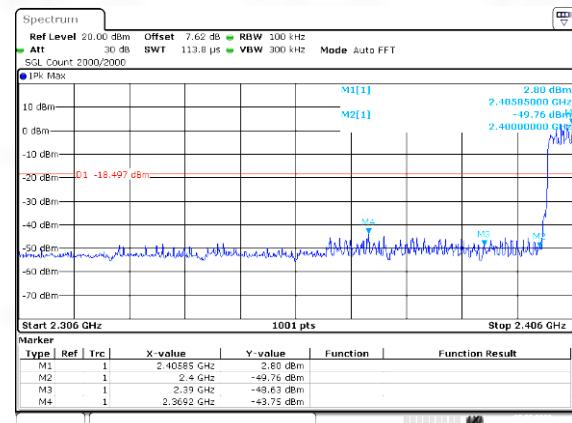
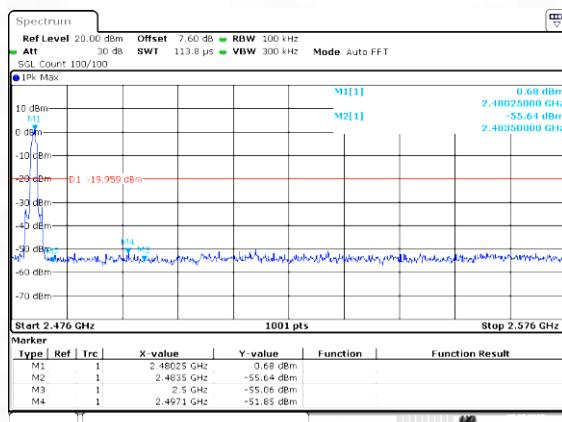
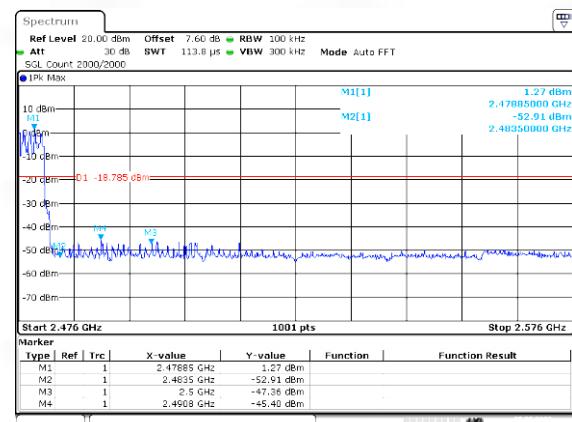
2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

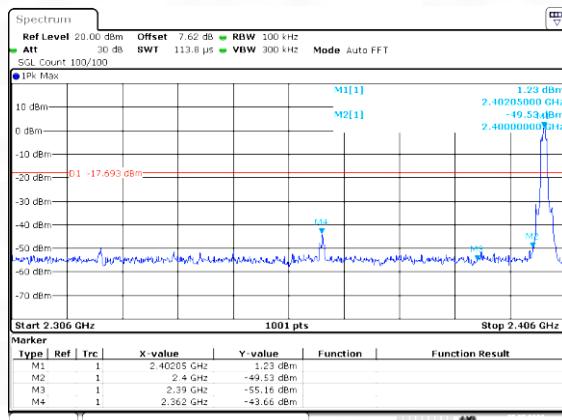
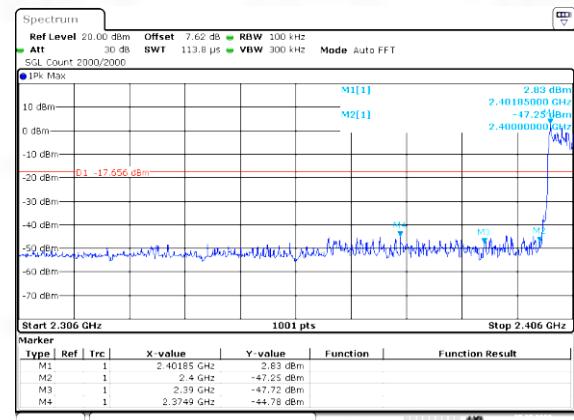
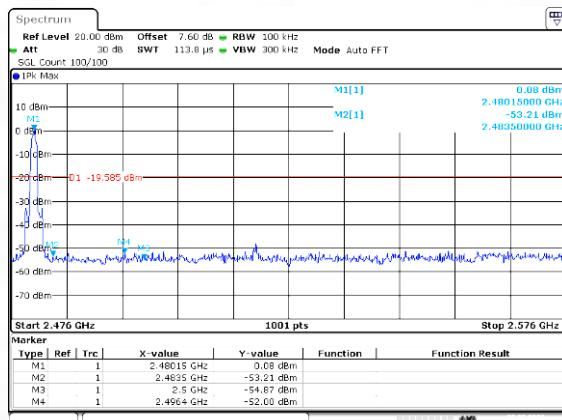
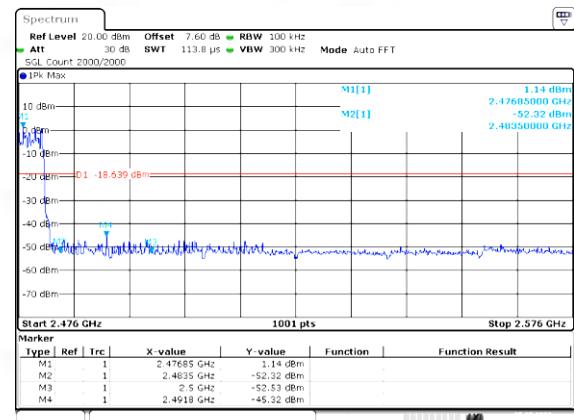
Test Mode: 8DPSK-Low Hopping-off

Test Mode: 8DPSK-High Hopping-off

Test Mode: 8DPSK-Low Hopping-on

Test Mode: 8DPSK-High Hopping-on


Note: 1. *:Maximum data; x:Over limit; !:over margin.

2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

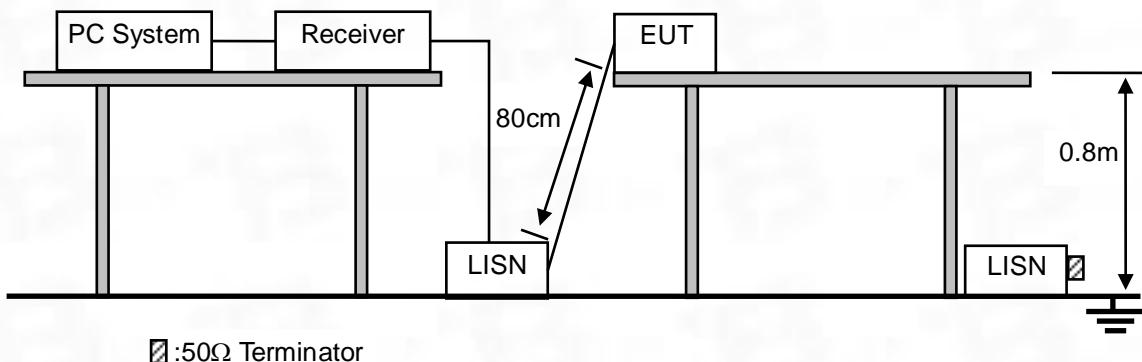
Conducted Method
GFSK Mode:
Test channel:
Lowest channel

No-hopping mode

Hopping mode
Test channel:
Highest channel

No-hopping mode

Hopping mode

Pi/4QPSK Mode:
Test channel:

No-hopping mode
Lowest channel

Hopping mode
Test channel:
Highest channel

No-hopping mode

Hopping mode

8DPSK Mode:
Test channel:
Lowest channel

No-hopping mode

Hopping mode
Test channel:
Highest channel

No-hopping mode

Hopping mode

10. POWER LINE CONDUCTED EMISSIONS

10.1. Block Diagram of Test Setup



10.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(µV)	Average Level dB(µV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

10.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in 10.1
- (3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization

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network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.

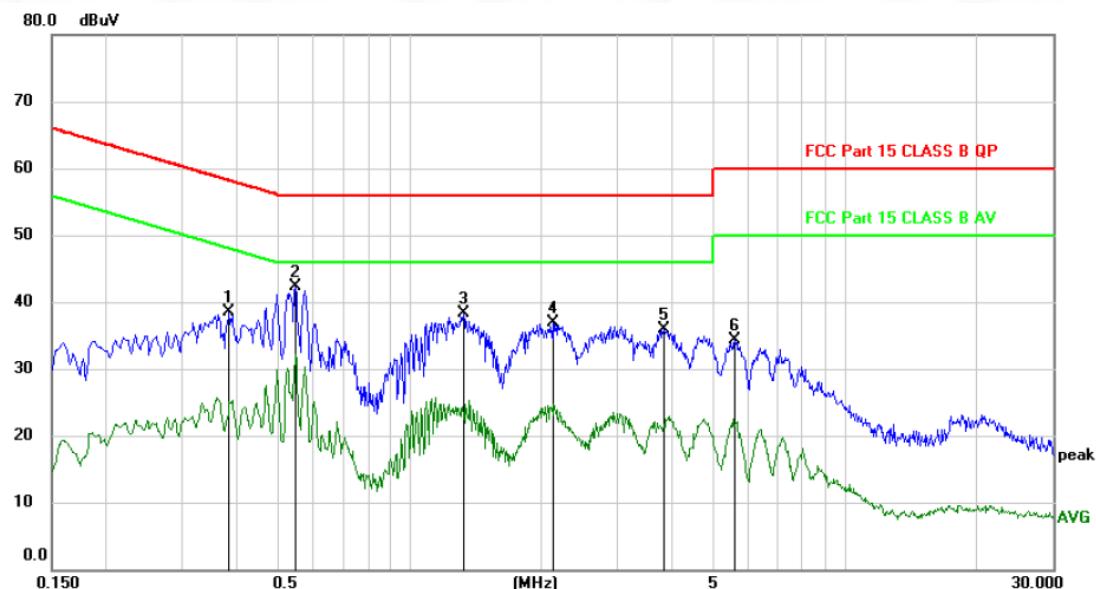
(4) The bandwidth of test receiver is set at 10KHz.

(5) The frequency range from 150 KHz to 30MHz is checked.

10.4. Test Result

Pass

Polarity: L

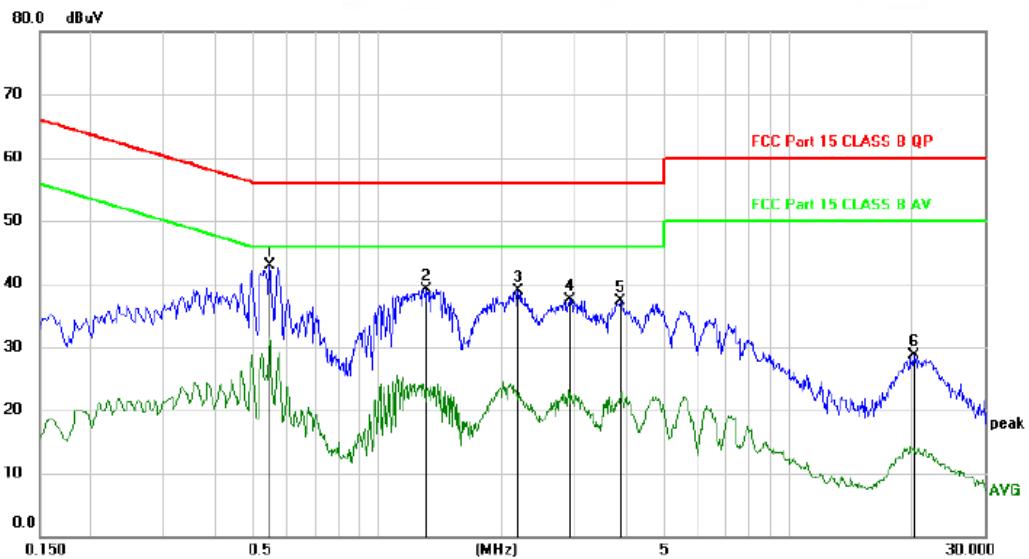


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure-ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.3840	28.35	10.14	38.49	58.19	-19.70	peak	
2	*	0.5460	31.98	10.27	42.25	56.00	-13.75	peak	
3		1.3260	27.79	10.42	38.21	56.00	-17.79	peak	
4		2.1270	26.52	10.42	36.94	56.00	-19.06	peak	
5		3.8370	25.39	10.56	35.95	56.00	-20.05	peak	
6		5.5770	23.55	10.66	34.21	60.00	-25.79	peak	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Polarity: N


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.5460	32.61	10.27	42.88	56.00	-13.12	peak	
2		1.3140	28.75	10.42	39.17	56.00	-16.83	peak	
3		2.1900	28.41	10.43	38.84	56.00	-17.16	peak	
4		2.9310	27.06	10.49	37.55	56.00	-18.45	peak	
5		3.8850	26.79	10.56	37.35	56.00	-18.65	peak	
6		20.1240	17.56	11.06	28.62	60.00	-31.38	peak	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

11. ANTENNA REQUIREMENTS

11.1. Limit

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.

11.2. Result

The use of an antenna that is uniquely coupled to the intended radiator shall be considered sufficient to comply with the provisions of this section.

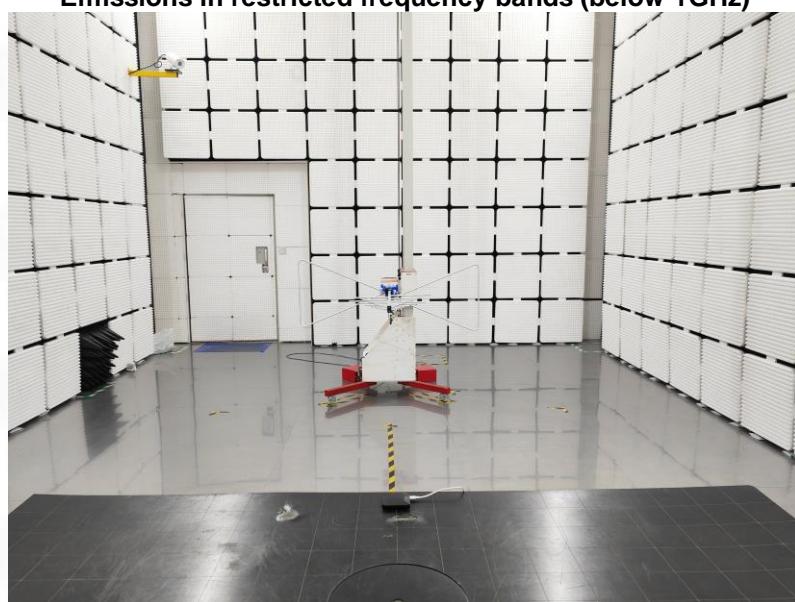
12. TEST SETUP PHOTO

12.1. Photo of Radiated Emission test

**Band edge emissions (Radiated)
Emissions in restricted frequency bands (above 1GHz)**



Emissions in restricted frequency bands (below 1GHz)



12.2.Photo of Conducted Emission test

Conducted Emission at AC power line



Test Report Number: BTF230612R00302



BTF Testing Lab (Shenzhen) Co., Ltd.

F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street,
Bao'an District, Shenzhen, China

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EMC Test Report