



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

Report No.: SZEM170600659002
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TEST REPORT

Application No.: SZEM1706006590CR
Applicant: Notch Interfaces Inc.
Address of Applicant: 630 Flushing Ave Brooklyn NY 11206 USA
Manufacturer: PC Partner Limited
Address of Manufacturer: 19/F., Shatin Galleria, 18-24 Shan Mei Street, Fo Tan, Shatin, N.T., Hong Kong
Factory: PC Partner Limited, Dongguan branch
Address of Factory: San Tun Management Zone, Houjie, Dongguan, Guangdong Province, The Peoples' Republic of China
Equipment Under Test (EUT):
EUT Name: Notch Notion Capture Sensor 2
Model No.: NSBL2
Trade mark: NOTCH
FCC ID: 2AI9F-NSBL2
Standards: 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2017-06-27
Date of Test: 2017-07-01 to 2017-07-12
Date of Issue: 2017-07-17

Test Result :	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



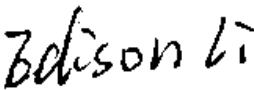

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-07-17		Original

Authorized for issue by:				
				
		Edison Li /Project Engineer		
				
		Eric Fu /Reviewer		



2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V, 70mAh, Li-polymer battery
Operation Frequency:	2410MHz to 2480MHz
Modulation Type:	GFSK
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	3dBi

Operation Frequency each of channel

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2410.00	19	2428.00	37	2446.00	55	2464.00
2	2411.00	20	2429.00	38	2447.00	56	2465.00
3	2412.00	21	2430.00	39	2448.00	57	2466.00
4	2413.00	22	2431.00	40	2449.00	58	2467.00
5	2414.00	23	2432.00	41	2450.00	59	2468.00
6	2415.00	24	2433.00	42	2451.00	60	2469.00
7	2416.00	25	2434.00	43	2452.00	61	2470.00
8	2417.00	26	2435.00	44	2453.00	62	2471.00
9	2418.00	27	2436.00	45	2454.00	63	2472.00
10	2419.00	28	2437.00	46	2455.00	64	2473.00
11	2420.00	29	2438.00	47	2456.00	65	2474.00
12	2421.00	30	2439.00	48	2457.00	66	2475.00
13	2422.00	31	2440.00	49	2458.00	67	2476.00
14	2423.00	32	2441.00	50	2459.00	68	2477.00
15	2424.00	33	2442.00	51	2460.00	69	2478.00
16	2425.00	34	2443.00	52	2461.00	70	2479.00
17	2426.00	35	2444.00	53	2462.00	71	2480.00
18	2427.00	36	2445.00	54	2463.00		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH1)	2410MHz
The middle channel (CH36)	2445MHz
The highest channel (CH71)	2480MHz



4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%



4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28

RF Conducted Test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09



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Field Strength of the Fundamental Signal (15.249(a))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2017-03-05	2020-03-05
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-14	2017-06-16	2020-06-15
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Pre-amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-10	2016-10-17	2017-10-17
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14
Band filter	N/A	N/A	SEM023-01	N/A	N/A



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Restricted Band Around Fundamental Frequency					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2017-03-05	2020-03-05
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-14	2017-06-16	2020-06-15
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Pre-amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-10	2016-10-17	2017-10-17
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14
Band filter	N/A	N/A	SEM023-01	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

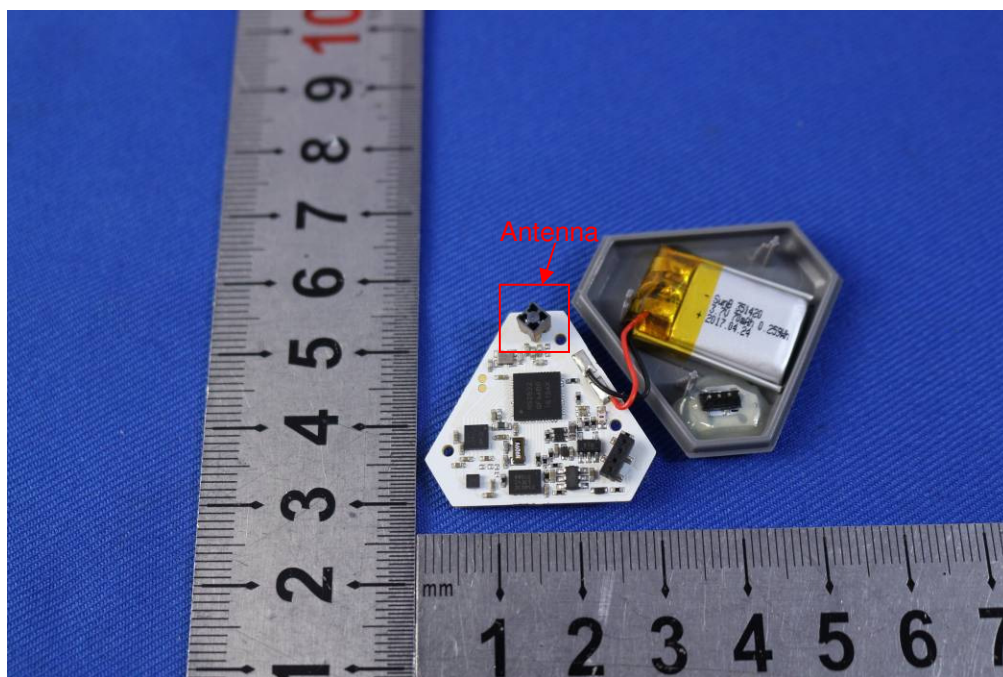
6.1.2 Conclusion

Standard Requirement:

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, 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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3dBi.





7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency range (MHz)	Limit (dBuV)	
	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.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

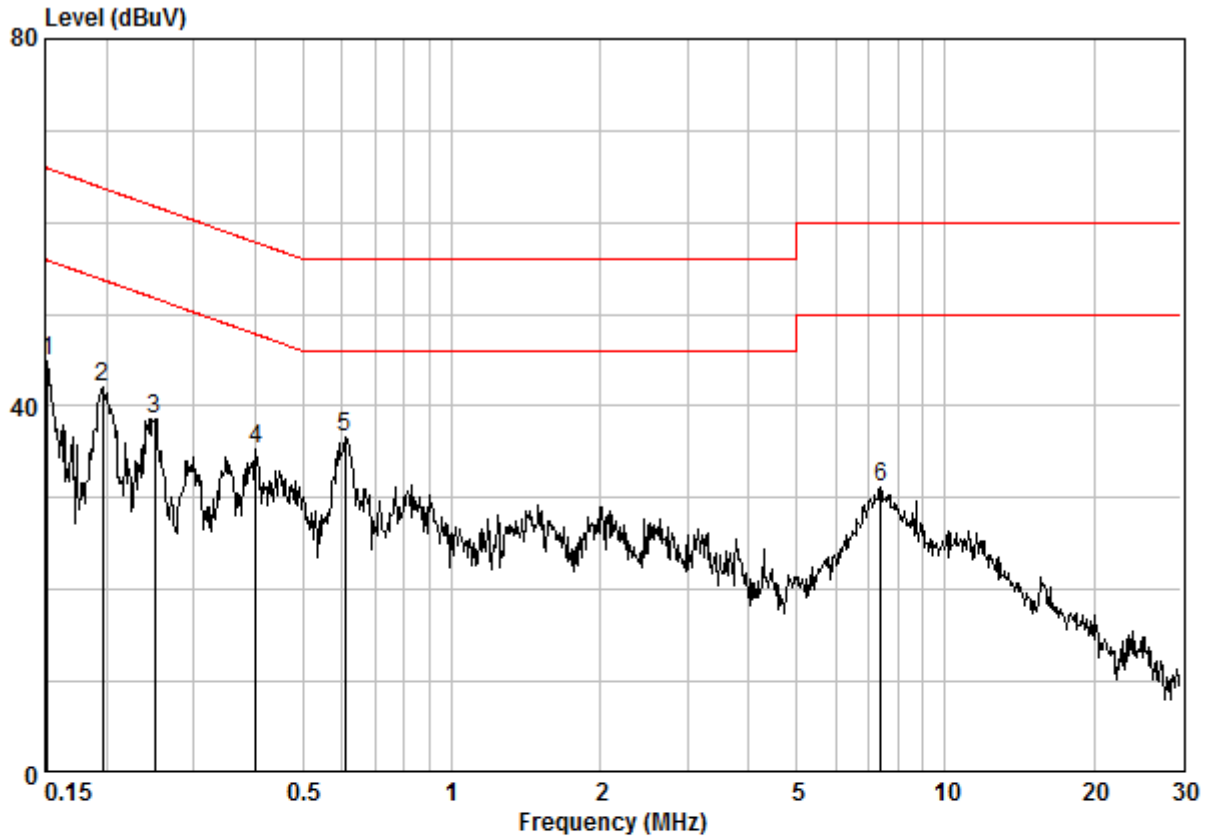
Test mode: d: Charge + TX mode Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

7.1.2 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

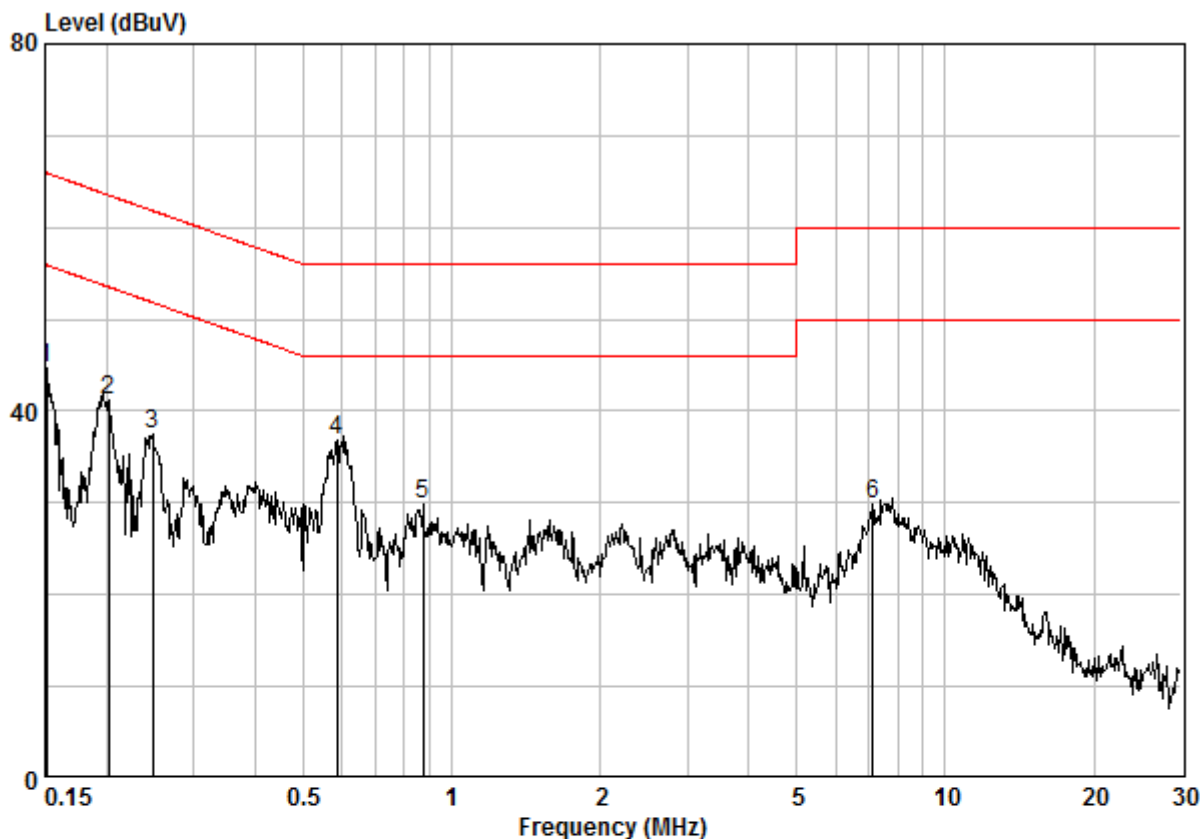
Mode:d; Line:Live Line



Site : Shielding Room
Condition : CE LINE
Job No. : 06590CR
Test Mode : d

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15160	0.02	9.64	35.32	44.98	55.91	-10.93	Peak
2	0.19654	0.02	9.64	32.32	41.98	53.76	-11.77	Peak
3	0.25078	0.02	9.64	28.91	38.57	51.73	-13.16	Peak
4	0.40187	0.02	9.64	25.61	35.27	47.81	-12.54	Peak
5 @	0.60752	0.02	9.65	26.92	36.59	46.00	-9.41	Peak
6	7.407	0.09	9.80	21.30	31.19	50.00	-18.81	Peak

Mode:d; Line:Neutral Line



Site : Shielding Room
Condition : CE NEUTRAL
Job No. : 06590CR
Test Mode : d

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15080	0.02	9.64	34.93	44.59	55.96	-11.37	Peak
2	0.20181	0.02	9.63	31.56	41.21	53.54	-12.32	Peak
3	0.24814	0.02	9.63	27.84	37.49	51.82	-14.33	Peak
4 @	0.58540	0.02	9.63	27.11	36.76	46.00	-9.24	Peak
5	0.87566	0.03	9.64	20.13	29.80	46.00	-16.20	Peak
6	7.137	0.08	9.77	19.98	29.83	50.00	-20.17	Peak

7.2 20dB Bandwidth

Test Requirement: 47 CFR Part 15, Subpart C 15.215
 Test Method: ANSI C63.10 (2013) Section 6.9
 Limit: N/A

7.2.1 E.U.T. Operation

Operating Environment:

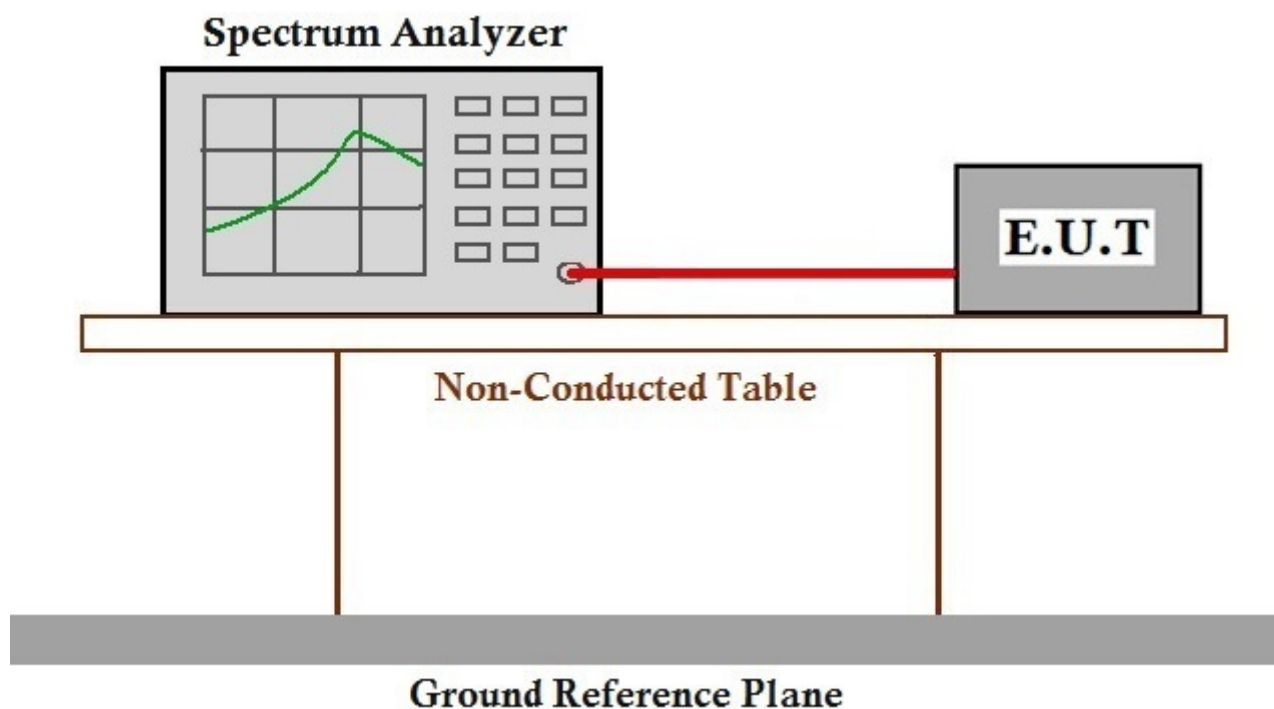
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: c: TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation for 2.4G.

d: Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

The worst case for final test: c: TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation for 2.4G.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

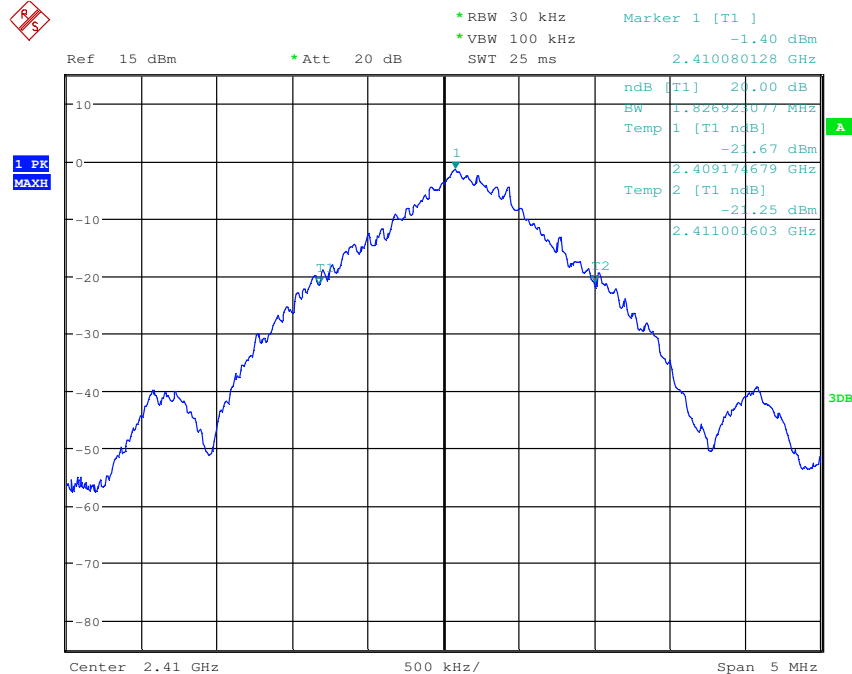
Measurement Data

Test Channel	20dB bandwidth (MHz)	Results
Lowest	1.83	Pass
Middle	1.81	Pass
Highest	2.83	Pass

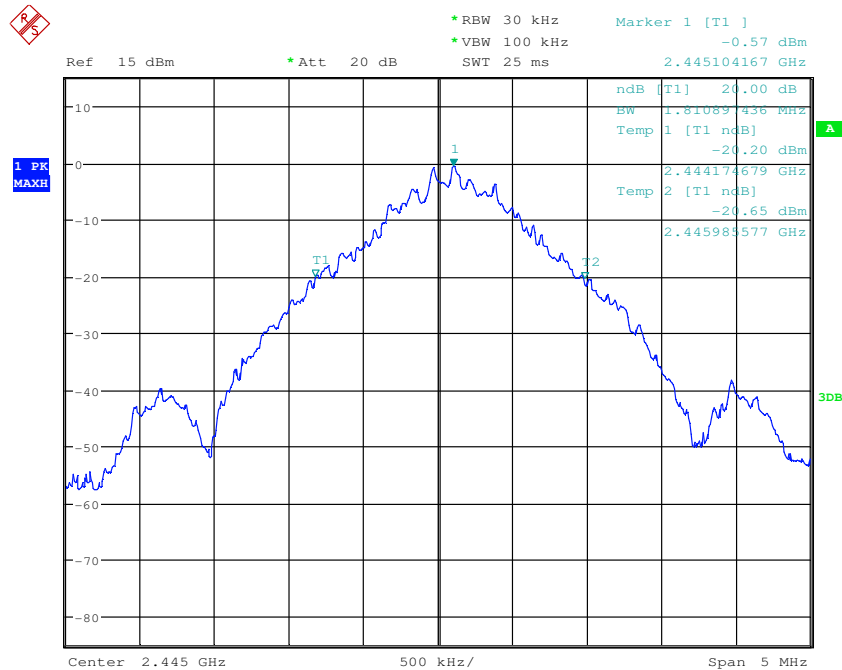


Test plot as follows:

Test channel:	Lowest
---------------	--------

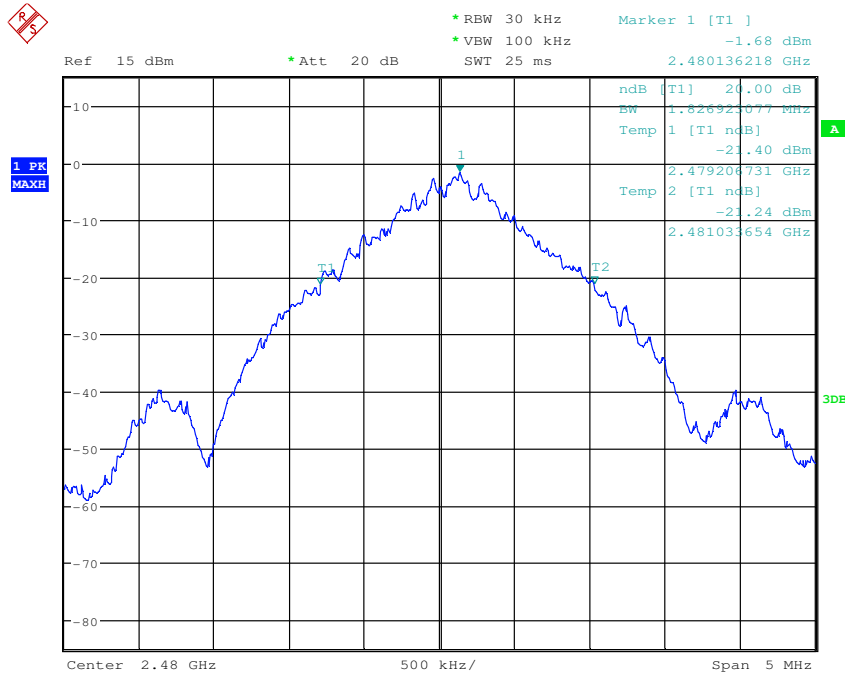


Test channel:	Middle
---------------	--------





Test channel:	Highest
---------------	---------





7.3 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)
Test Method: ANSI C63.10 (2013) Section 6.5&6.6
Measurement Distance: 3m
Limit:

Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar
Pretest these c: TX mode_Keep the EUT in continuously transmitting mode with GFSK
mode to find the modulation for 2.4G.
worst case: d: Charge + TX mode_Keep the EUT in charging and continuously transmitting
mode with GFSK modulation for 2.4G.
The worst case d: Charge + TX mode_Keep the EUT in charging and continuously transmitting
for final test: mode with GFSK modulation for 2.4G.

7.3.2 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel,the middle channel,the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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Shenzhen Branch

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Peak value:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2410.45	29.14	5.35	37.96	96.51	93.04	114.00	-20.96	Horizontal
2409.889	29.14	5.35	37.96	87.74	84.27	114.00	-29.73	Vertical
2445.46	29.24	5.38	37.96	95.30	91.96	114.00	-22.04	Horizontal
2444.820	29.24	5.38	37.96	89.49	86.15	114.00	-27.85	Vertical
2479.781	29.34	5.41	37.95	94.23	91.03	114.00	-22.97	Horizontal
2477.719	29.34	5.41	37.95	87.28	84.08	114.00	-29.92	Vertical



7.4 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 3m

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
Above 1GHz	74.0	Peak Value
Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.		



7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: c: TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation for 2.4G.

d: Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

The worst case for final test: d: Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

7.4.2 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel,the middle channel,the Highest channel.

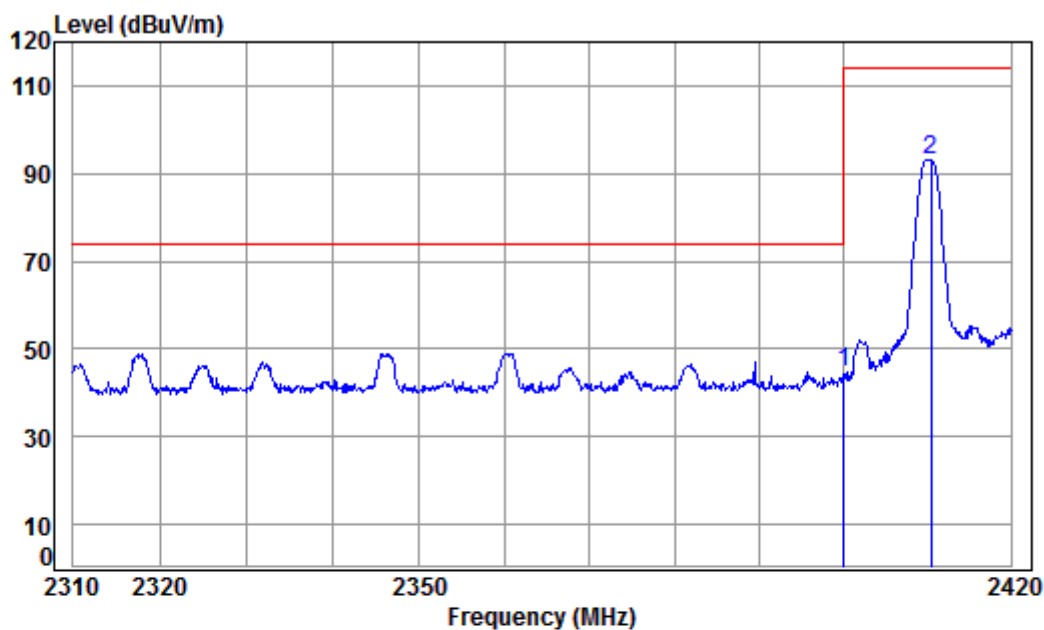
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Mode:d; Polarization:Horizontal; Modulation Type:GFSK; Channel:Low



Condition: 3m HORIZONTAL

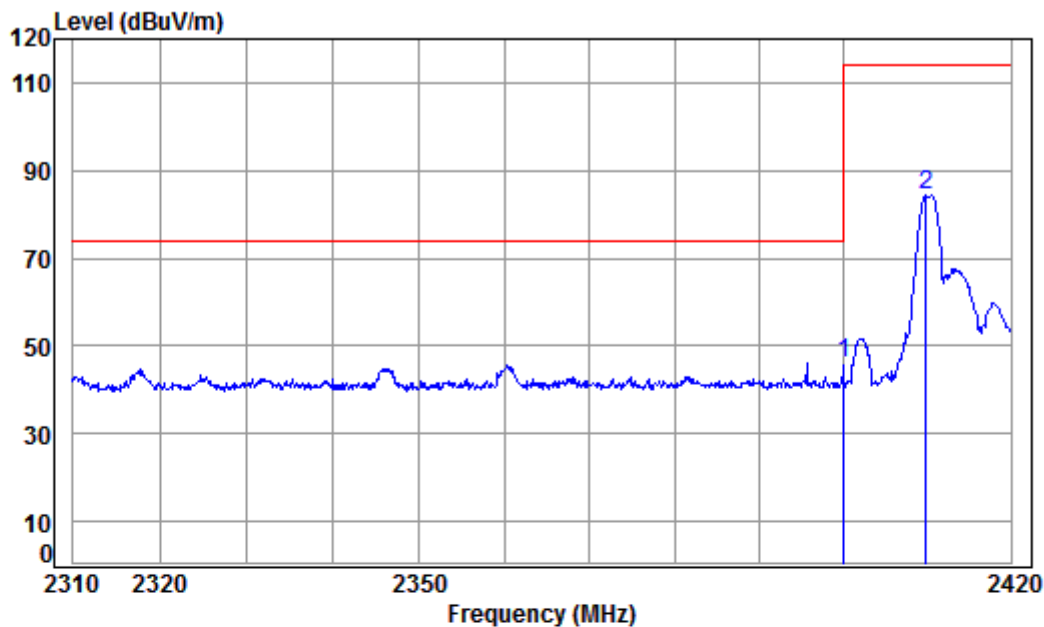
Job No : 06590CR

Mode : 2410 Band edge

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2400.000	5.34	29.09	37.96	48.05	44.52	74.00	-29.48 peak
2	pp 2410.450	5.35	29.14	37.96	96.51	93.04	114.00	-20.96 peak



Mode:d; Polarization:Vertical; Modulation Type:GFSK; Channel:Low



Condition: 3m VERTICAL

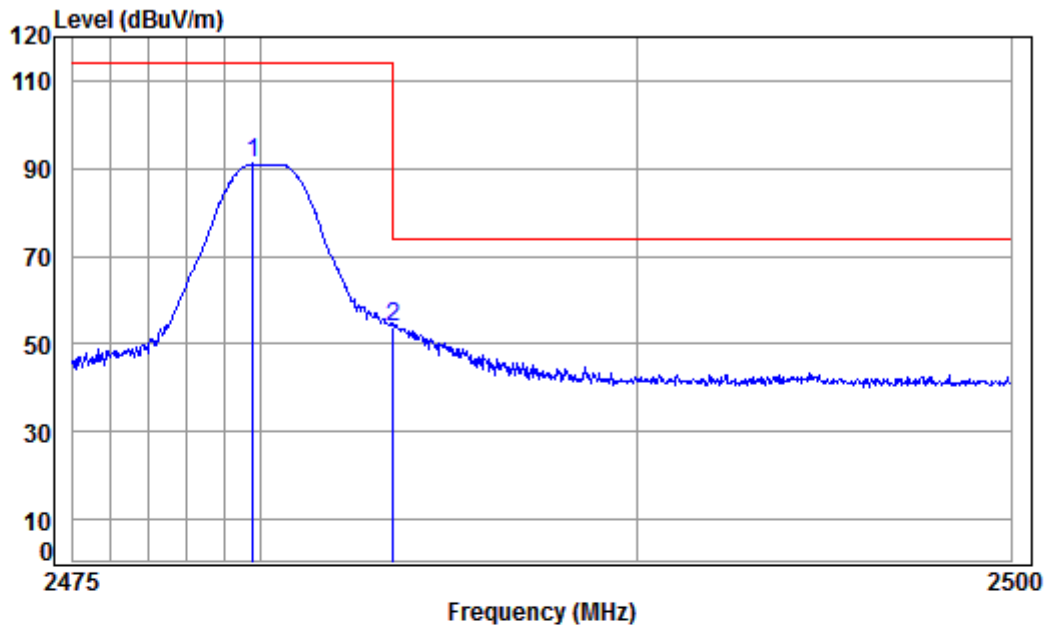
Job No : 06590CR

Mode : 2410 Band edge

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2400.000	5.34	29.09	37.96	49.74	46.21	74.00	-27.79 peak
2	2409.889	5.35	29.14	37.96	87.74	84.27	114.00	-29.73 peak



Mode:d; Polarization:Horizontal; Modulation Type:GFSK; Channel:High



Condition: 3m HORIZONTAL

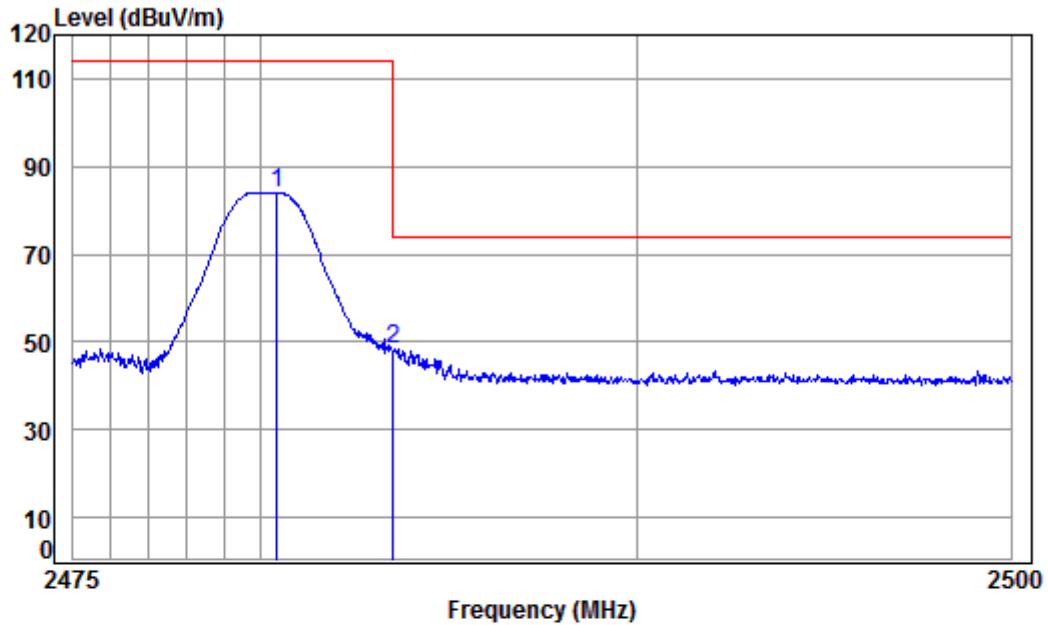
Job No : 06590CR

Mode : 2480 Band edge

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2479.781	5.41	29.34	37.95	94.23	91.03	114.00	-22.97	peak
2 pp	2483.500	5.41	29.35	37.95	57.17	53.98	74.00	-20.02	peak



Mode:d; Polarization:Vertical; Modulation Type:GFSK; Channel:High



Condition: 3m VERTICAL

Job No : 06590CR

Mode : 2480 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2480.429	5.41	29.34	37.95	87.28	84.08	114.00	-29.92	peak
2 pp	2483.500	5.41	29.35	37.95	51.75	48.56	74.00	-25.44	peak



7.5 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: c: TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation for 2.4G.

d: Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

The worst case for final test: d: Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation for 2.4G.

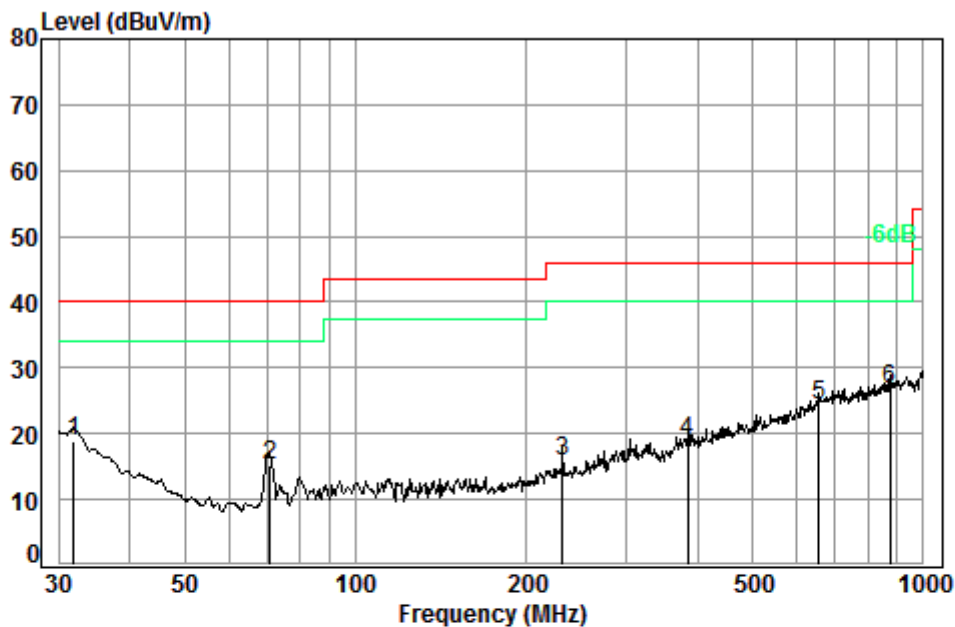
7.5.2 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



Below 1GHz:

Mode:d; Polarization:Horizontal; Modulation Type:GFSK; Channel:Low



Condition: 3m HORIZONTAL

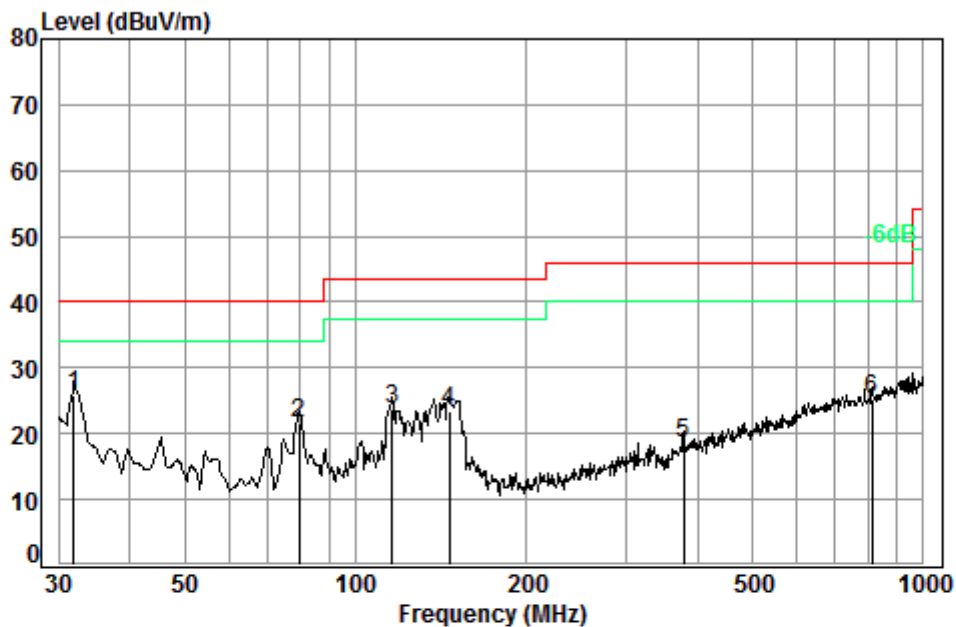
Job No. : 06590CR

Test mode: d

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.95	0.60	17.61	27.35	28.04	18.90	40.00	-21.10
2	70.83	0.83	6.97	27.25	34.63	15.18	40.00	-24.82
3	231.72	1.58	11.71	26.59	29.19	15.89	46.00	-30.11
4	385.28	2.16	16.12	27.03	27.48	18.73	46.00	-27.27
5	654.23	2.81	20.74	27.47	28.21	24.29	46.00	-21.71
6 pp	875.25	3.50	23.00	26.89	27.26	26.87	46.00	-19.13



Mode:d; Polarization:Vertical; Modulation Type:GFSK; Channel:Low



Condition: 3m VERTICAL

Job No. : 06590CR

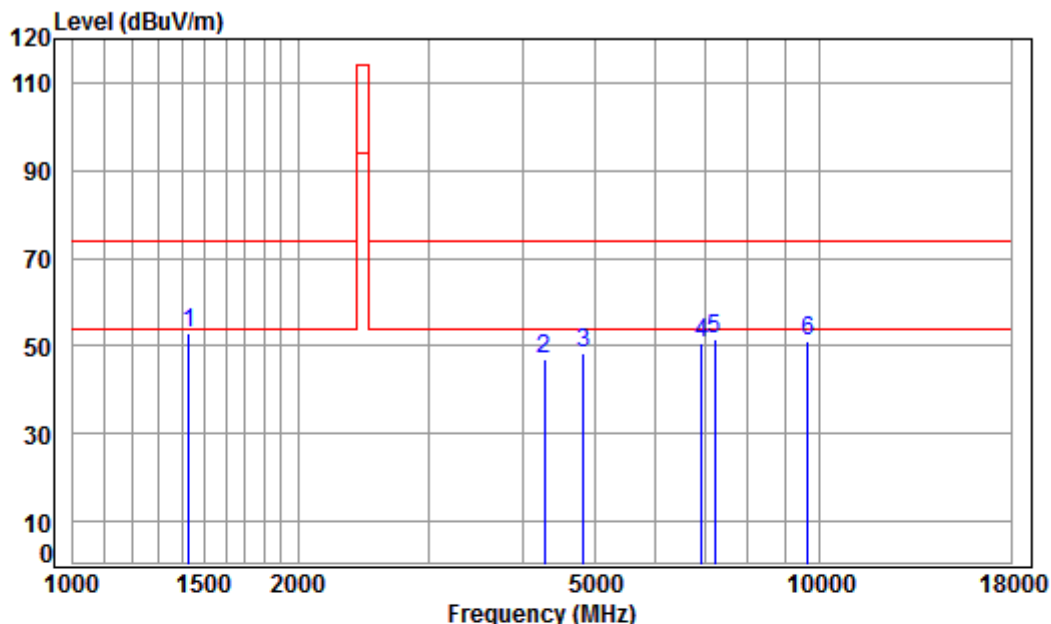
Test mode: d

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	31.95	0.60	17.61	27.35	34.98	25.84	40.00	-14.16
2	79.52	1.09	7.66	27.23	40.01	21.53	40.00	-18.47
3	116.13	1.25	8.17	27.09	41.36	23.69	43.50	-19.81
4	146.37	1.31	8.67	26.93	40.49	23.54	43.50	-19.96
5	378.58	2.14	16.04	26.99	27.24	18.43	46.00	-27.57
6	813.11	3.26	22.26	27.23	26.93	25.22	46.00	-20.78



Above 1GHz:

Mode:d; Polarization:Horizontal; Modulation Type:GFSK;



Condition: 3m HORIZONTAL

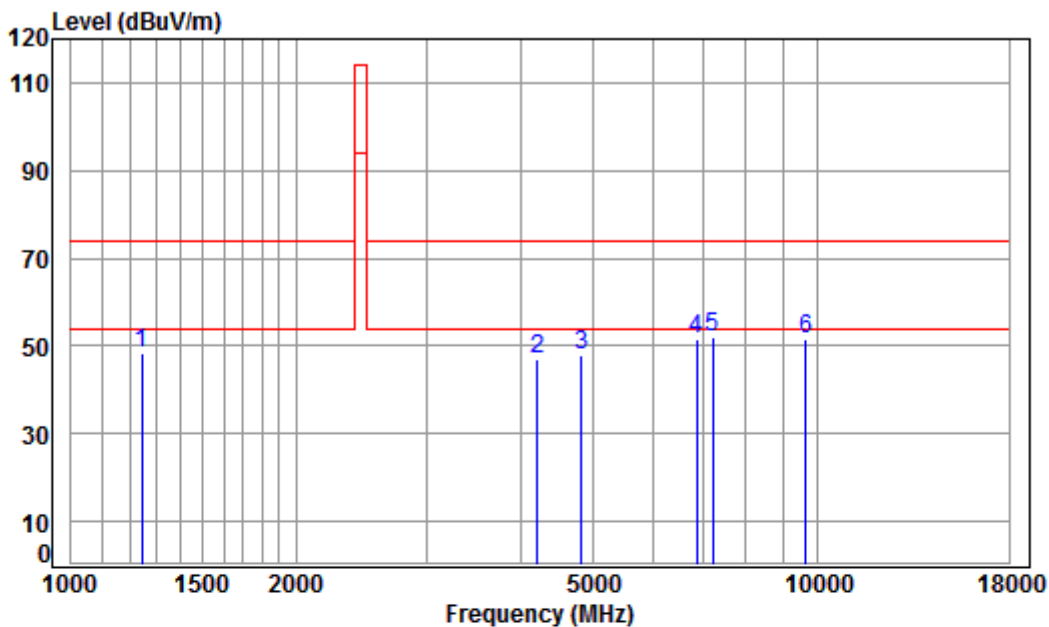
Job No : 06590CR

Mode : 2410 TX RSE

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	1431.047	4.39	25.52	38.06	61.30	53.15	74.00	-20.85	peak
2	4279.589	7.03	33.60	38.14	44.55	47.04	74.00	-26.96	peak
3	4820.000	7.75	34.19	38.41	44.86	48.39	74.00	-25.61	peak
4	6934.778	9.45	36.32	37.37	42.27	50.67	74.00	-23.33	peak
5	7230.000	9.67	36.41	37.09	42.76	51.75	74.00	-22.25	peak
6	9640.000	11.09	37.53	35.08	37.72	51.26	74.00	-22.74	peak



Mode:d; Polarization:Vertical; Modulation Type:GFSK;



Condition: 3m VERTICAL

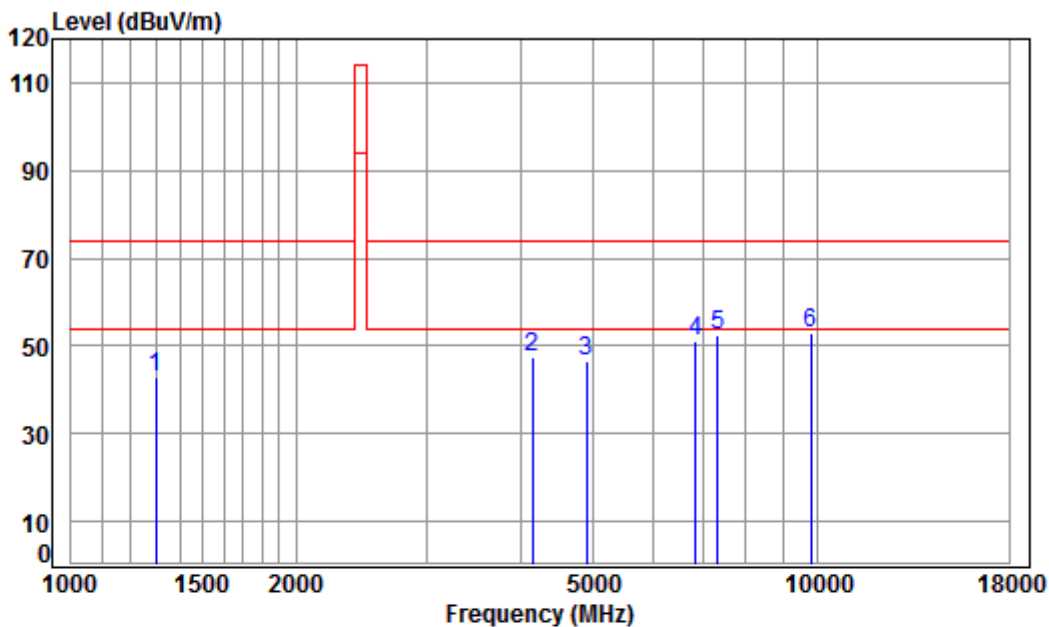
Job No : 06590CR

Mode : 2410 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1245.663	4.14	24.70	38.08	57.79	48.55	74.00	-25.45	peak
2	4206.011	6.95	33.60	38.10	44.75	47.20	74.00	-26.80	peak
3	4820.000	7.75	34.19	38.41	44.30	47.83	74.00	-26.17	peak
4	6874.906	9.40	36.16	37.43	43.31	51.44	74.00	-22.56	peak
5 pp	7230.000	9.67	36.41	37.09	43.07	52.06	74.00	-21.94	peak
6	9640.000	11.09	37.53	35.08	37.80	51.34	74.00	-22.66	peak



Mode:d; Polarization:Horizontal; Modulation Type:GFSK; Channel:middle



Condition: 3m HORIZONTAL

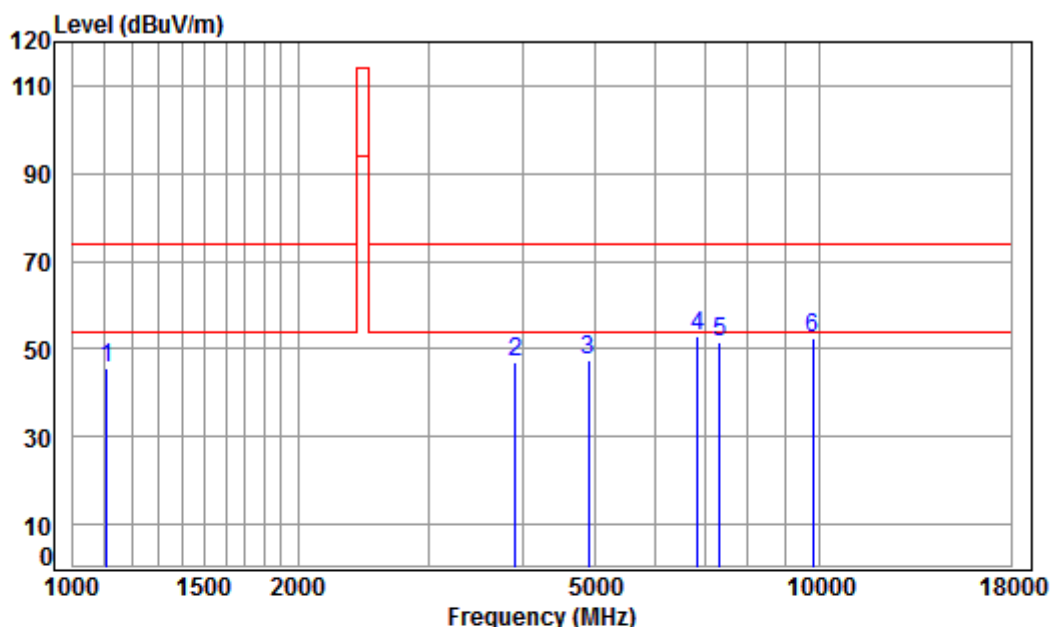
Job No : 06590CR

Mode : 2445 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1297.103	4.22	24.94	38.07	51.91	43.00	74.00	-31.00	peak
2	4145.664	6.88	33.60	38.07	45.03	47.44	74.00	-26.56	peak
3	4890.000	7.85	34.31	38.44	42.76	46.48	74.00	-27.52	peak
4	6855.063	9.38	36.10	37.44	43.14	51.18	74.00	-22.82	peak
5	7335.000	9.74	36.36	37.00	43.26	52.36	74.00	-21.64	peak
6 pp	9780.000	11.23	37.56	35.01	38.99	52.77	74.00	-21.23	peak



Mode:d; Polarization:Vertical; Modulation Type:GFSK; Channel:middle



Condition: 3m VERTICAL

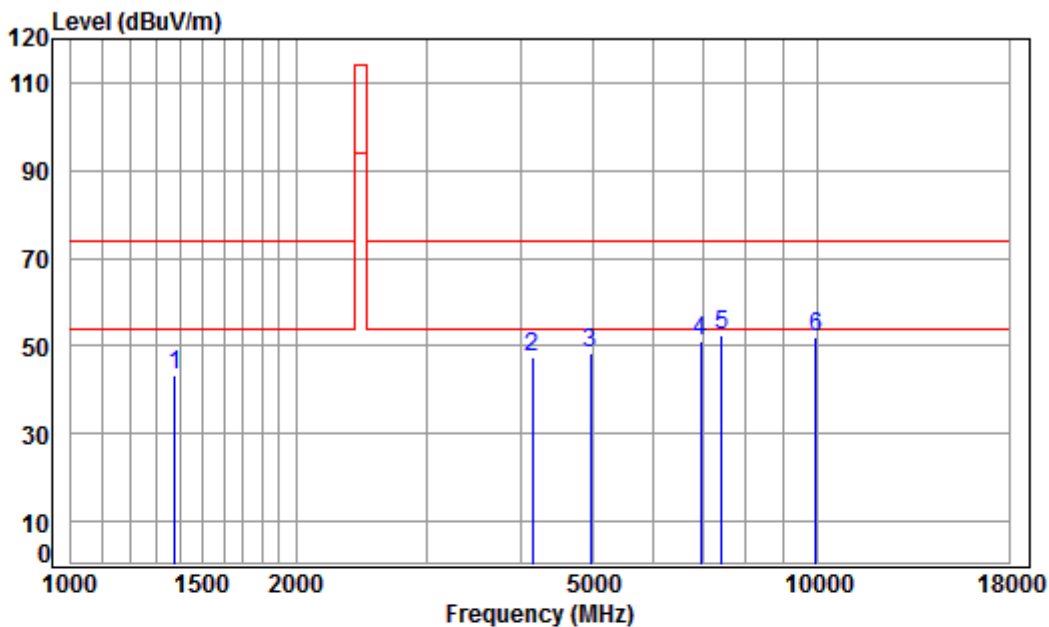
Job No : 06590CR

Mode : 2445 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1109.660	3.94	24.02	38.09	55.70	45.57	74.00	-28.43	peak
2	3912.809	6.63	33.37	37.99	45.03	47.04	74.00	-26.96	peak
3	4890.000	7.85	34.31	38.44	43.55	47.27	74.00	-26.73	peak
4 pp	6855.063	9.38	36.10	37.44	45.03	53.07	74.00	-20.93	peak
5	7335.000	9.74	36.36	37.00	42.63	51.73	74.00	-22.27	peak
6	9780.000	11.23	37.56	35.01	38.55	52.33	74.00	-21.67	peak



Mode:d; Polarization:Horizontal; Modulation Type:GFSK; Channel:High



Condition: 3m HORIZONTAL

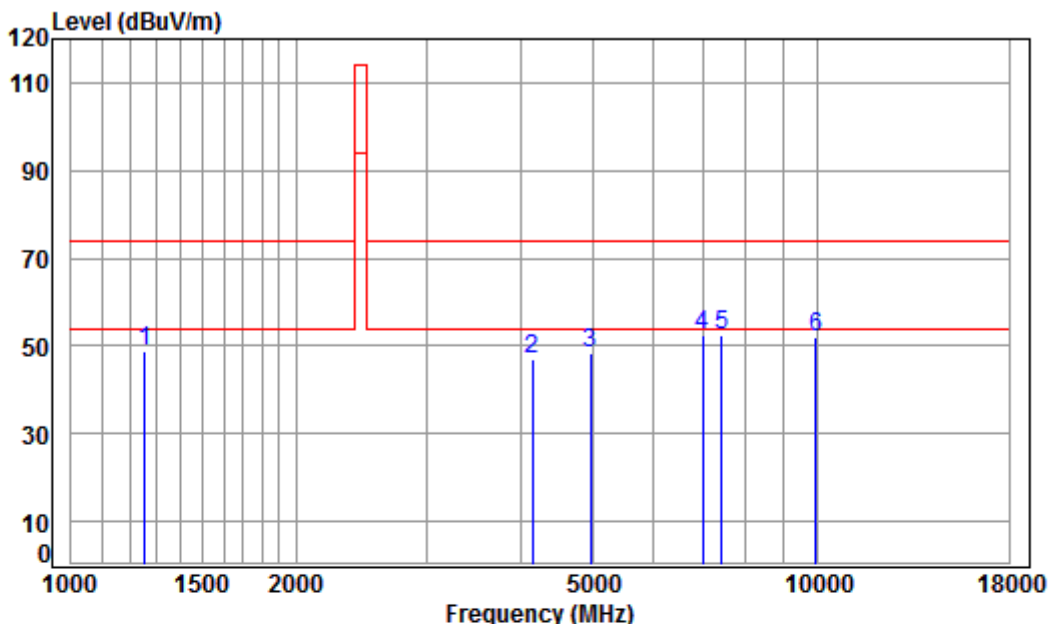
Job No : 06590CR

Mode : 2480 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1378.273	4.32	25.30	38.06	51.93	43.49	74.00	-30.51	peak
2	4145.664	6.88	33.60	38.07	45.07	47.48	74.00	-26.52	peak
3	4960.000	7.95	34.43	38.48	44.55	48.45	74.00	-25.55	peak
4	6954.852	9.47	36.38	37.35	42.70	51.20	74.00	-22.80	peak
5 pp	7440.000	9.81	36.32	36.90	43.14	52.37	74.00	-21.63	peak
6	9920.000	11.36	37.58	34.94	37.93	51.93	74.00	-22.07	peak



Mode:d; Polarization:Vertical; Modulation Type:GFSK; Channel:High



Condition: 3m VERTICAL

Job No : 06590CR

Mode : 2480 TX RSE

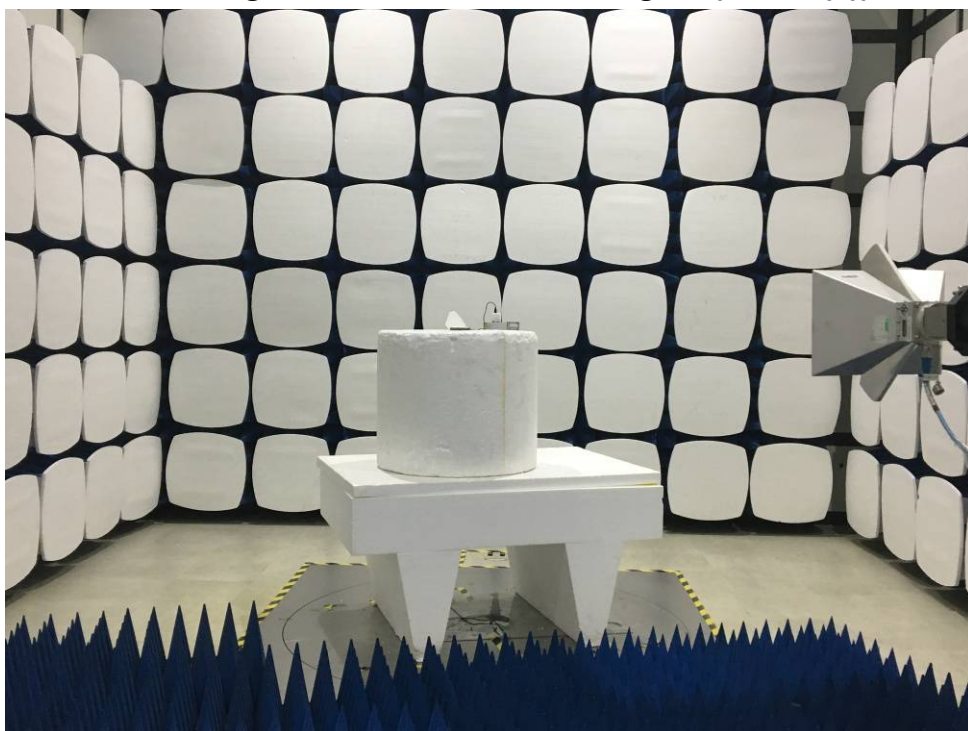
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1256.512	4.16	24.75	38.07	57.88	48.72	74.00	-25.28	peak
2	4145.664	6.88	33.60	38.07	44.57	46.98	74.00	-27.02	peak
3	4960.000	7.95	34.43	38.48	44.68	48.58	74.00	-25.42	peak
4	6995.172	9.51	36.49	37.30	43.63	52.33	74.00	-21.67	peak
5 pp	7440.000	9.81	36.32	36.90	43.30	52.53	74.00	-21.47	peak
6	9920.000	11.36	37.58	34.94	37.95	51.95	74.00	-22.05	peak

8 Photographs

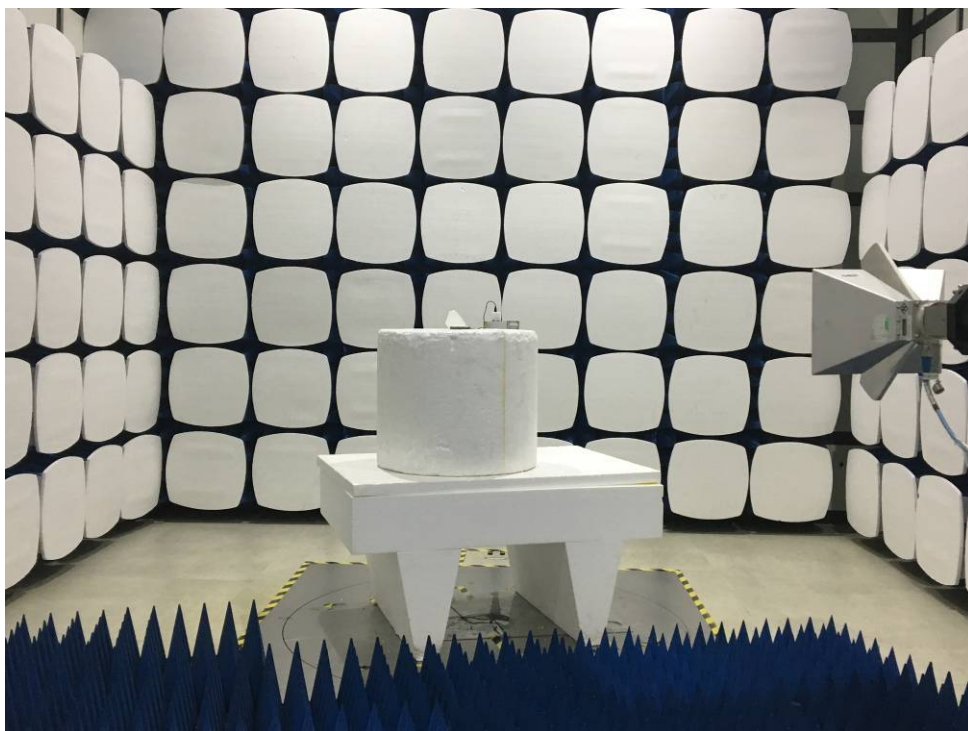
8.1 Conducted Emissions at AC Power Line (150kHz-30MHz) Test Setup



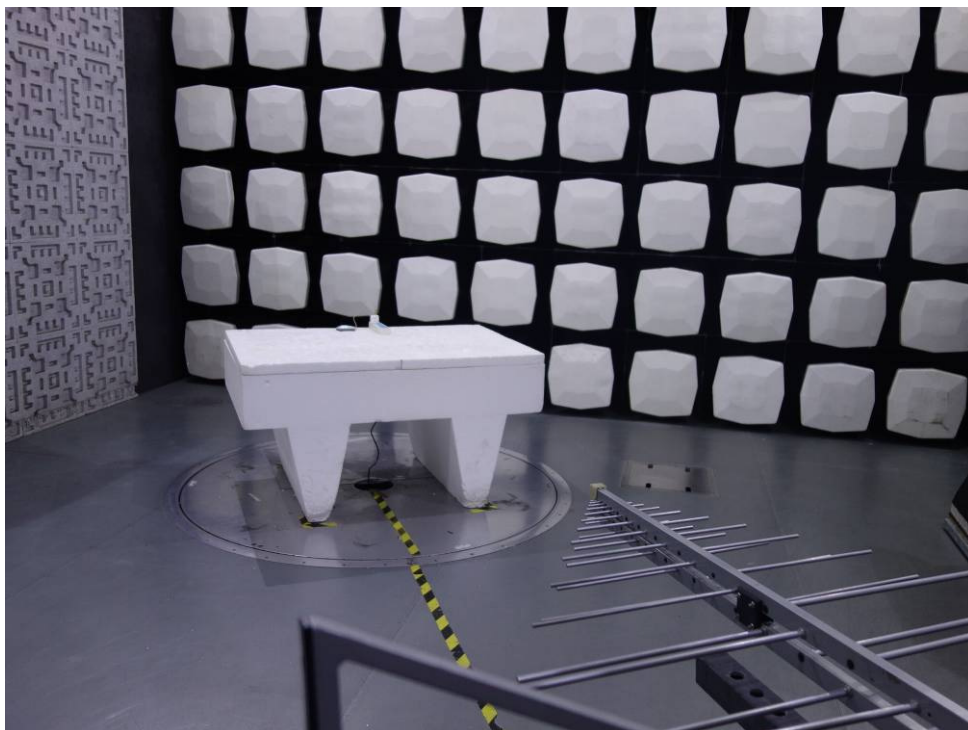
8.2 Field Strength of the Fundamental Signal (15.249(a)) Test Setup



8.3 Restricted Band Around Fundamental Frequency Test Setup



8.4 Radiated Emissions Test Setup





8.5 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1706006590