TEST REPORT

Product	:	Embedded UHF Module M950
Trade mark	:	N/A
Model/Type reference	:	OEM-UHF-M950
Serial number	:	N/A
Ratings	:	5 Vdc
FCC ID	:	S6A-M950
Report number	:	EED32H000522
Date	:	Jul. 22, 2015
Regulations	:	See below

Test Standards	Results
☒ 47 CFR FCC Part 15 Subpart C 15.247: 2014	PASS

Prepared for:

iDTRONIC GmbH

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Prepared by:

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Approved by: Jimmy Li Date: Jul. 22, 2015

Jimmy Li
Lab manager

Check No.: 1727822002

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N/A means not applicable.

1. GENERAL INFORMATION

Applicant:	iDTRONIC GmbH Donnersbergweg 1, Ludwigshafen am Rhein, 67059, Germany
Manufacturer:	iDTRONIC GmbH Donnersbergweg 1, Ludwigshafen am Rhein, 67059, Germany
FCC ID:	S6A-M950
Product:	Embedded UHF Module M950
Trade mark:	N/A
Model/Type reference:	OEM-UHF-M950
Serial Number:	N/A
Report Number:	EED32H000522
Sample Received Date:	May 13, 2015
Sample tested Date:	May 13, 2015 to Jul. 22, 2015

The above equipment was tested by Centre Testing International (Shenzhen) Corporation for compliance with the requirements set forth in the FCC Rules and the measurement procedure according to ANSI C63.10:2013.

2. TEST SUMMARY

No.	Test Item	Rule	Test Result
1	20dB Bandwidth	FCC 15.247(a)(1)	**PASS**
2	Carrier Frequency Separation	FCC15.247(a)(1)	**PASS**
3	Number of Hopping Frequency	FCC 15.247(a)(iii)	**PASS**
4	Time of Occupancy (Dwell Time)	FCC 15.247(a)(iii)	**PASS**
5	Maximum Peak Conducted Output Power	FCC 15.247(b)(1)	**PASS**
6	Conducted Bandedge Emission / Conducted Spurious Emission	FCC PART15.247(d)	**PASS**
7	Radiated Bandedge Emission / Radiated Spurious Emission	FCC PART15.247(d)	**PASS**
8	Pseudorandom Frequency Hopping Sequence	FCC PART15.247(b)(4) TCB Exclusion List (7 July 2002)	**PASS**
9	AC Conducted Emission	FCC PART15.207	**PASS**
10	Antenna Requirements *	FCC PART15.203	**PASS** (See Notes)

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

3. PRODUCT INFORMATION

Items	Description
Rating	5 Vdc
Type of Modulation	FHSS
Antenna Type	Integral antenna
Frequency Range	902.75 ~ 927.25MHz
Gain	3dBi

List of frequencies:

No.	Frequency (MHz)	No.	Frequency (MHz)	No.	Frequency (MHz)	No.	Frequency (MHz)	No.	Frequency (MHz)
1	902.75	11	907.75	21	912.75	31	917.75	41	922.75
2	903.25	12	908.25	22	913.25	32	918.25	42	923.25
3	903.75	13	908.75	23	913.75	33	918.75	43	923.75
4	904.25	14	909.25	24	914.25	34	919.25	44	924.25
5	904.75	15	909.75	25	914.75	35	919.75	45	924.75
6	905.25	16	910.25	26	915.25	36	920.25	46	925.25
7	905.75	17	910.75	27	915.75	37	920.75	47	925.75
8	906.25	18	911.25	28	916.25	38	921.25	48	926.25
9	906.75	19	911.75	29	916.75	39	921.75	49	926.75
10	907.25	20	912.25	30	917.25	40	922.25	50	927.25

The device has 4 antenna ports, and it incorporates only a SISO function.
Pre-scan under all rate at lowest, middle and highest channel, find the transmitter power as below:

Frequency (MHz)	Peak Power @ antenna 0 (dBm)	Peak Power @ antenna 1 (dBm)	Peak Power @ antenna 2 (dBm)	Peak Power @ antenna 3 (dBm)
902.75	-3.78	-3.89	-3.91	-4.01
914.75	-3.63	-3.81	-3.99	-4.05
927.25	-3.66	-3.78	-3.92	-4.09

Pre-scan all mode and data rates and positions, find worse case mode are chosen to the report, the worst case mode is in antenna 0 and all the test data in this report is in antenna 0 mode.

4. MEASUREMENT UNCERTAINTY

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement items	Uncertainty
Conducted Emission Test	3.2 dB
Radiated Emissions / Bandedge Emission	4.5 dB

5. SUPPORT EQUIPMENT LIST

Device Type	Brand	Model	Data Cable	Remark
Notebook	Lenovo	E42L	N/A	FCC DOC
Mouse	L.Selectron	M004	Un-shielded 1.2M	FCC DOC

6. TEST EQUIPMENT LIST

Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06/02/2015	06/01/2016
Receiver	R&S	ESCI	100435	07/09/2015	07/08/2016
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	618	06/18/2015	06/17/2016
Multi device Controller	maturo	NCD/070/10711112	---	N/A	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/08/2015	07/07/2016
Microwave Preamplifier	Agilent	8449B	3008A02425	03/20/2015	03/19/2016
Spectrum Analyzer	R&S	FSP40	100416	07/07/2015	07/06/2016
Receiver	R&S	ESCI	100009	07/20/2015	07/19/2016
LISN	R&S	ENV216	100098	07/20/2015	07/19/2016

7. 20dB Bandwidth Measurement

7.1. LIMITS

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.2. BLOCK DIAGRAM OF TEST SETUP

7.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

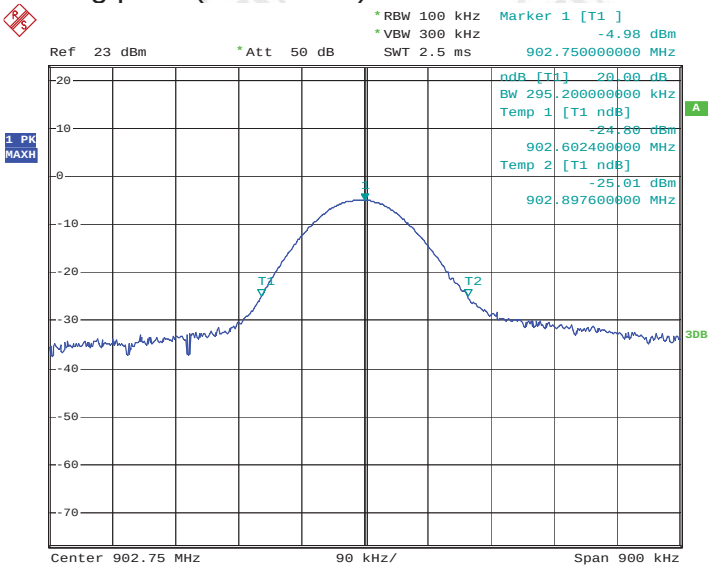
3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.

4. Measure and record the results in the test report.

7.4. TEST RESULT

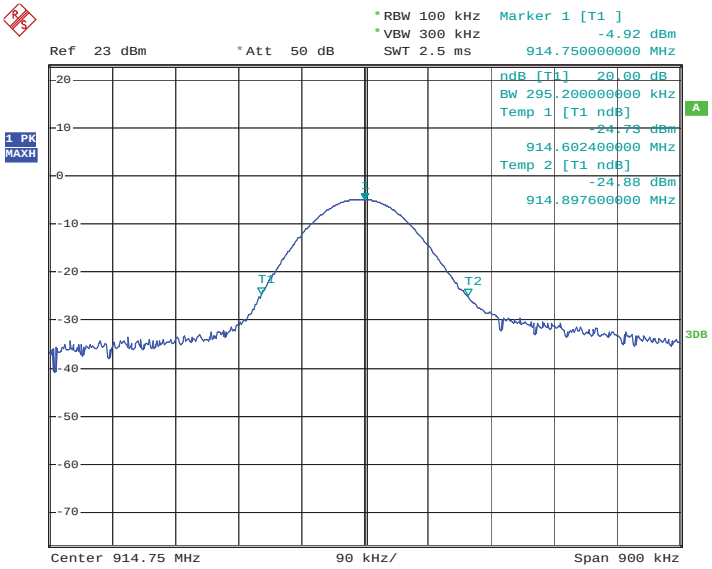
Frequency (MHz)	20dB BW (kHz)
902.75	295.2
914.75	295.2
927.25	293.4

Please see the following plots (worst case):



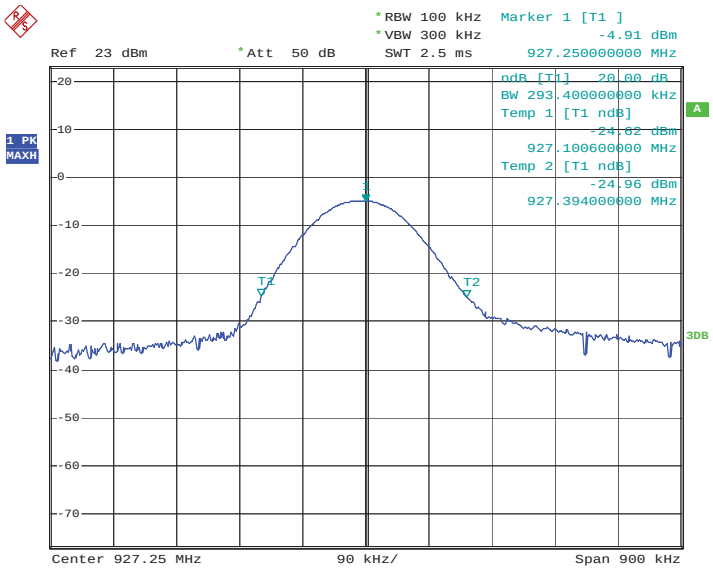
Date: 22.JUL.2015 12:13:53

902.75MHz



Date: 22.JUL.2015 12:15:53

914.75MHz



Date: 22.JUL.2015 12:18:17

927.25MHz

8. CARRIER FREQUENCY SEPARATION

8.1. LIMITS

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

8.2. BLOCK DIAGRAM OF TEST SETUP

8.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Enable the EUT hopping function.

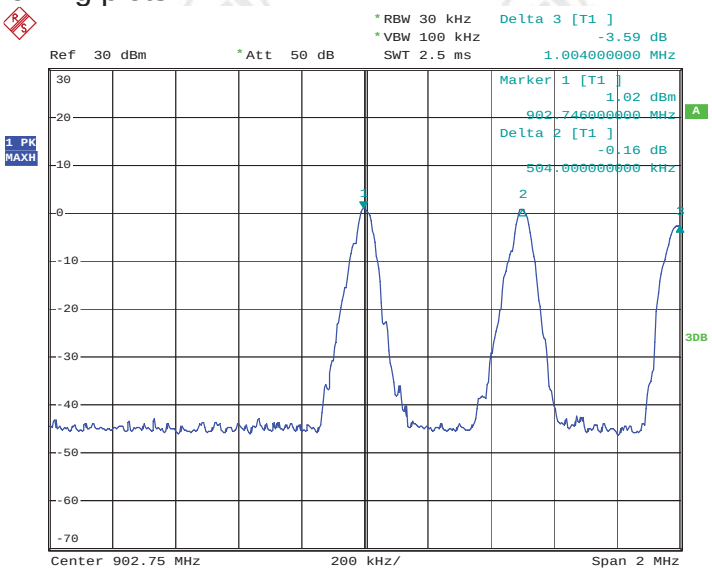
4. Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.

5. Measure and record the results in the test report.

8.4. TEST RESULT

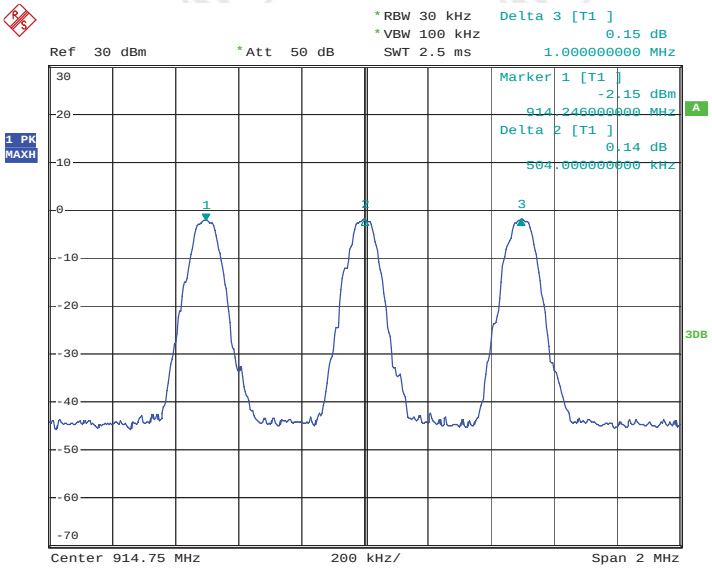
Carrier Frequency Separation: 0.5MHz

Please see the following plots:



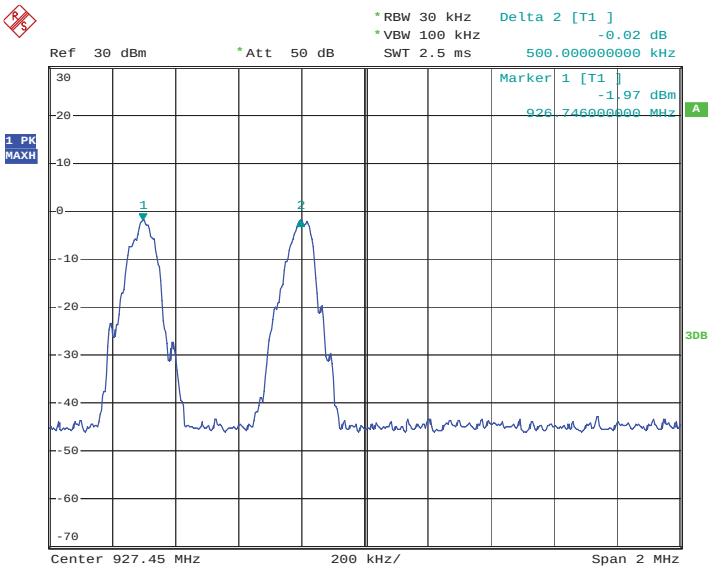
Date: 14.MAY.2015 20:45:30

Low channel



Date: 14.MAY.2015 20:48:45

Middle channel



Date: 14.MAY.2015 20:51:18

High channel

9. NUMBER OF HOPPING FREQUENCY

9.1. LIMITS

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

9.2. BLOCK DIAGRAM OF TEST SETUP

9.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Enable the EUT hopping function.

4. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.

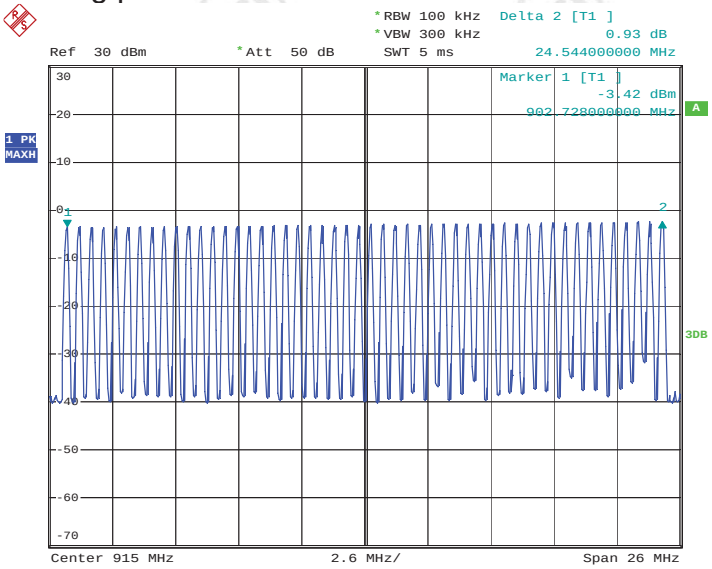
5. The number of hopping frequency used is defined as the number of total channel.

6. Record the measurement data derived from spectrum analyzer.

9.4. TEST RESULT

Number of Hopping Frequency is 50, with frequency space = 0.5MHz.

Please see the following plots:



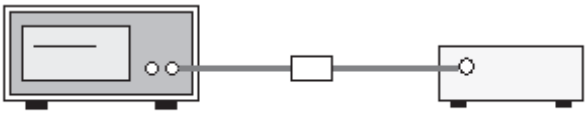
Date: 14.MAY.2015 18:00:48

10. TIME OF OCCUPANCY (DWELL TIME)

10.1. LIMITS

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

10.2. BLOCK DIAGRAM OF TEST SETUP



10.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable.

The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Enable the EUT hopping function.

4. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.

5. Measure and record the results in the test report.

10.4. TEST RESULT

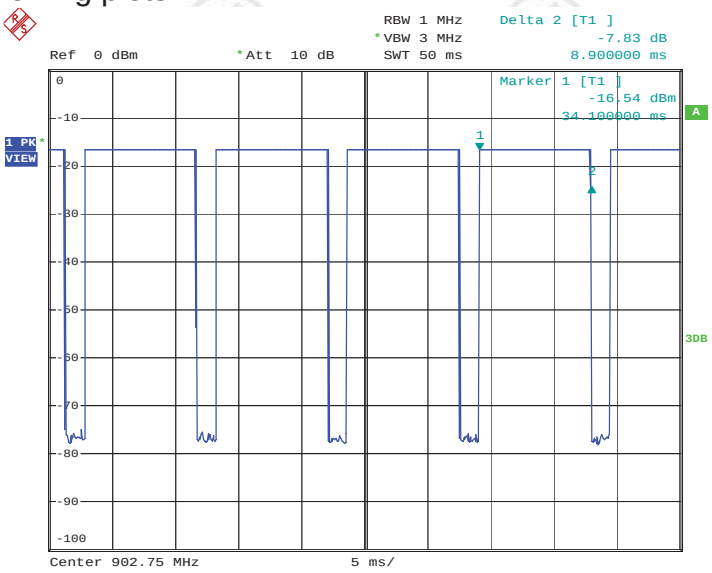
A period time = 0.4 (ms) * 50 = 20 (s)
N=19

CH Low:
Time slot =8.9ms
Dwell time=N*T=19*8.9=169.1ms

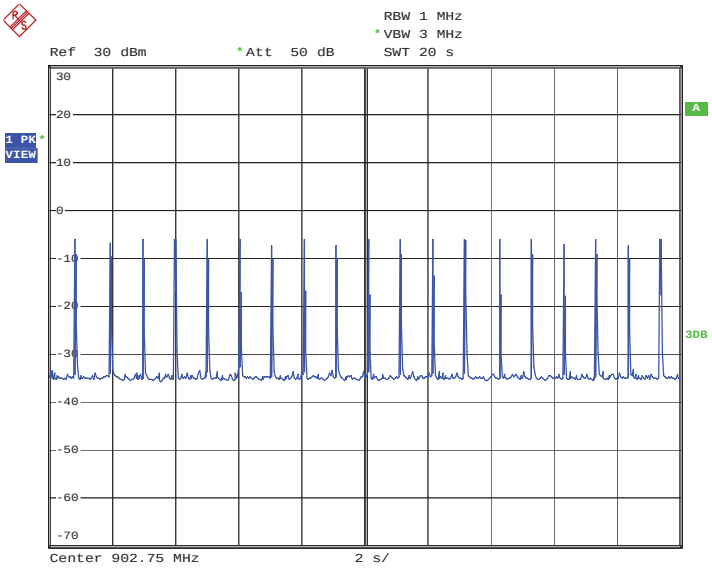
CH Mid:
Time slot = 8.9ms
Dwell time= N*T= 19*9.0=171ms

CH High:
Time slot = 8.9ms
Dwell time= N*T= 19*8.9=169.1ms

Please see the following plots:

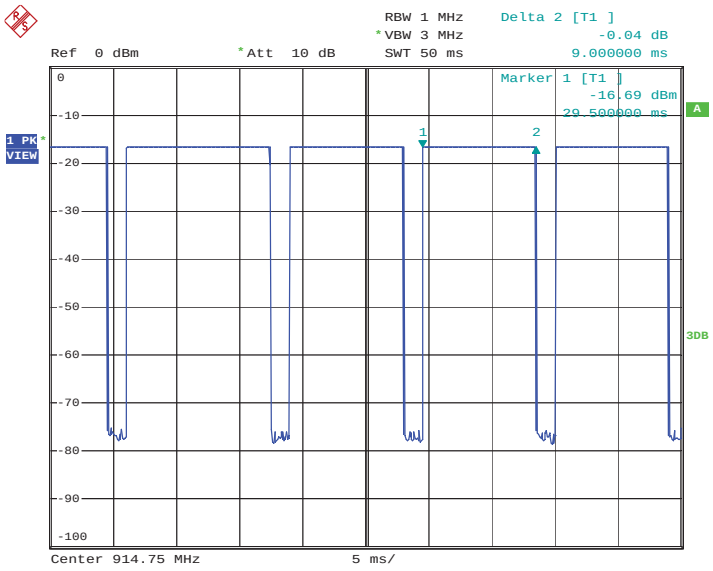


Date: 25.JUN.2015 15:21:01

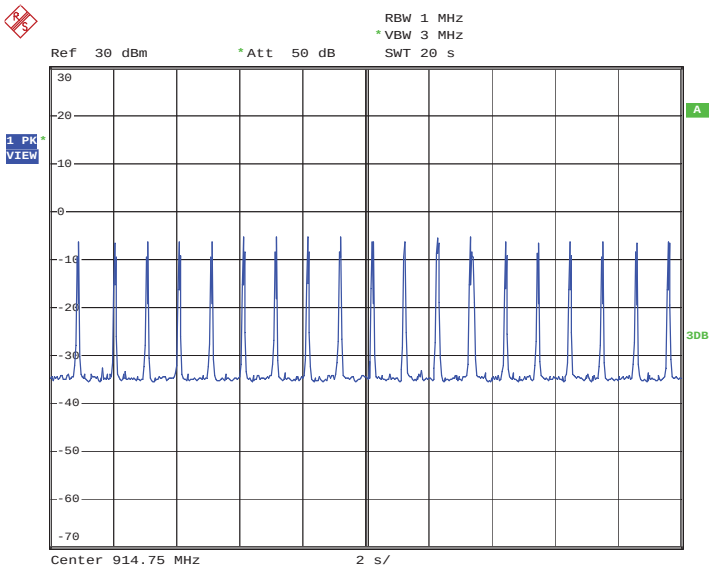


Date: 28.MAY.2015 19:48:40

902.75MHz

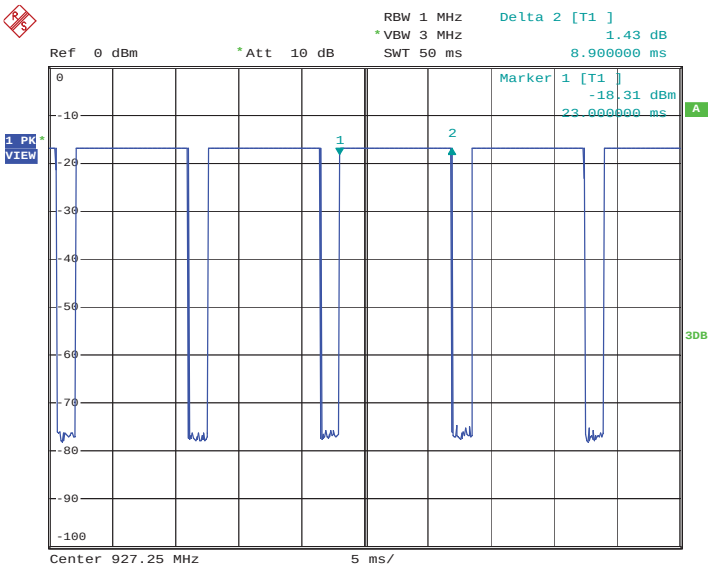


Date: 25.JUN.2015 15:24:50

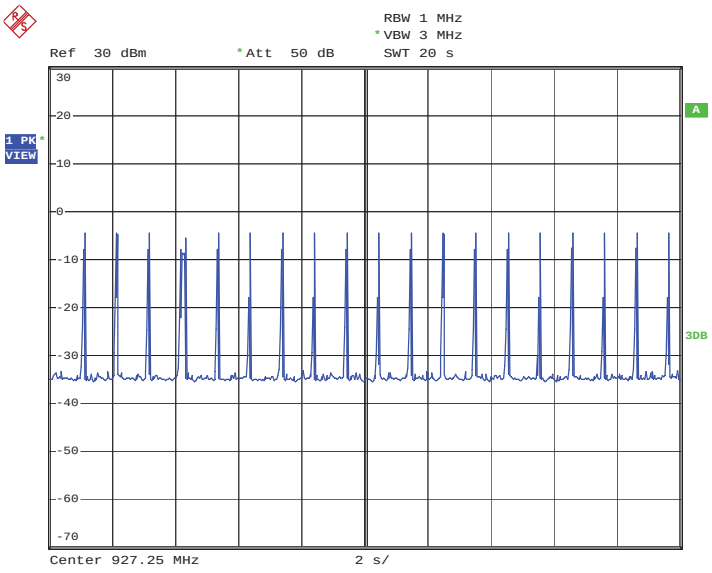


Date: 28.MAY.2015 19:52:57

914.75MHz



Date: 25.JUN.2015 15:27:56



Date: 28.MAY.2015 19:57:24

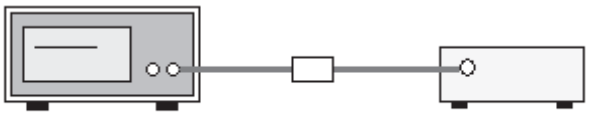
927.25MHz

11. MAXIMUM PEAK CONDUCTED OUTPUT POWER MEASUREMENT

11.1. LIMITS

The limit for peak output power is 1Watt (30dBm).

11.2. BLOCK DIAGRAM OF TEST SETUP



11.3. TEST PROCEDURE

1. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

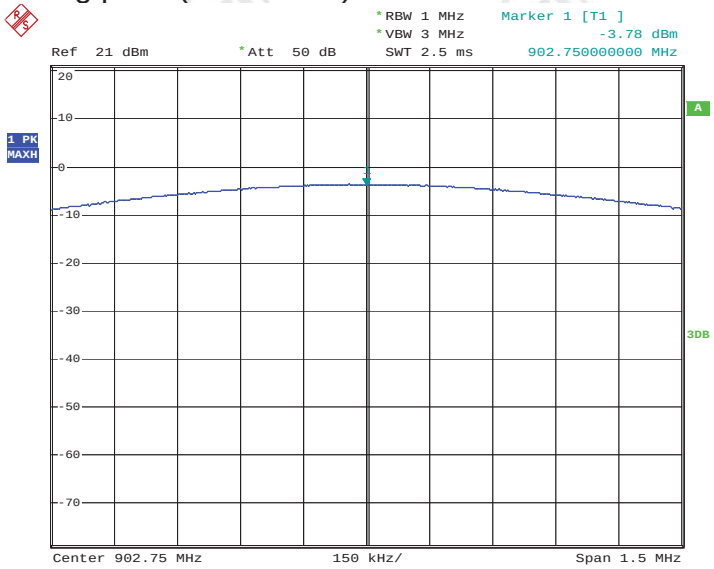
3. Measure the conducted output power with cable loss and record the results in the test report.

4. Measure and record the results in the test report.

11.4. TEST RESULT

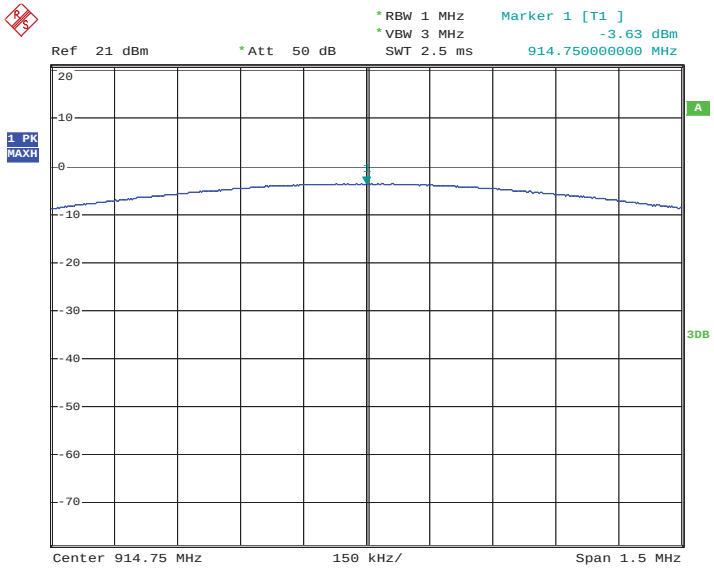
Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result (Pass / Fail)
902.75	-3.78	30	Pass
914.75	-3.63	30	Pass
927.25	-3.66	30	Pass

Please see the following plots (worst case):



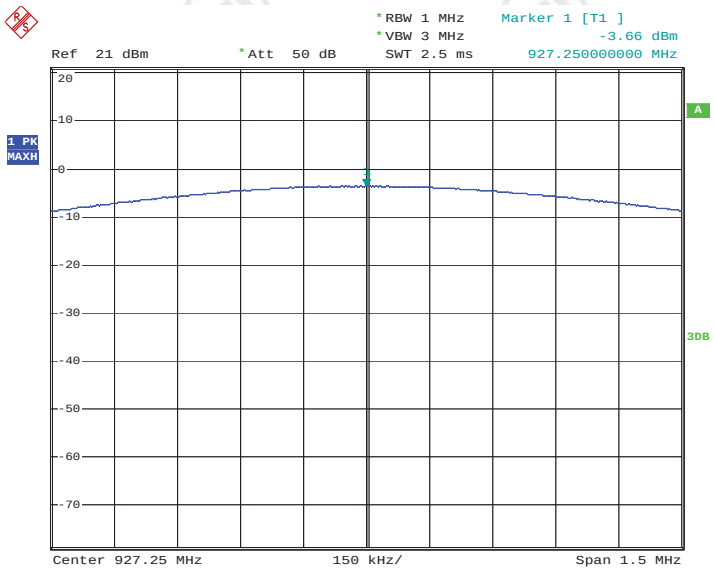
Date: 22.JUL.2015 12:29:46

902.75MHz



Date: 22.JUL.2015 12:26:39

914.75MHz



Date: 22.JUL.2015 12:22:54

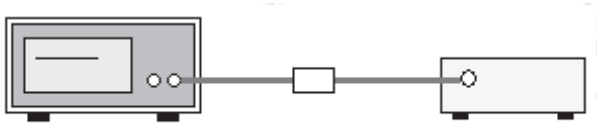
927.25MHz

12. CONDUCTED BANDEDGE EMISSION MEASUREMENT

12.1. LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

12.2. BLOCK DIAGRAM OF TEST SETUP



12.3. TEST PROCEDURE

1. Set to the maximum power setting and enable the EUT transmit continuously.

2. Set RBW = 100 kHz, VBW = 300 kHz (≥ RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

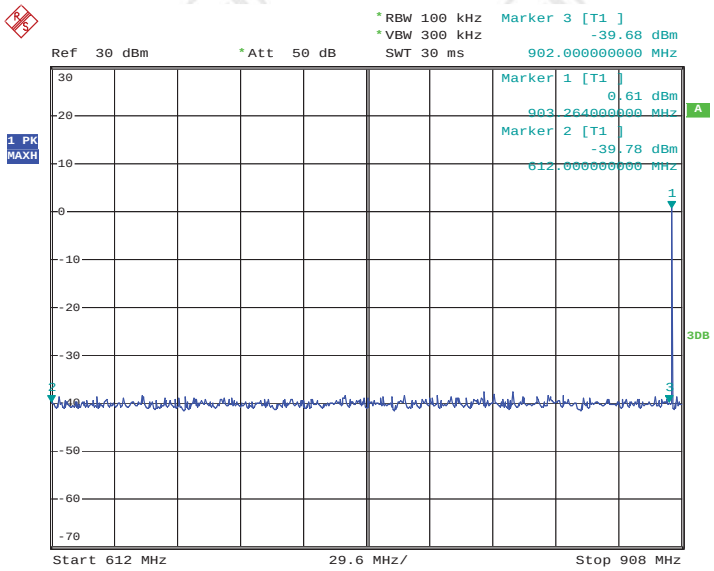
3. Enable hopping function of the EUT and then repeat step 1 and 2.

4. Measure and record the results in the test report.

12.4. TEST RESULT

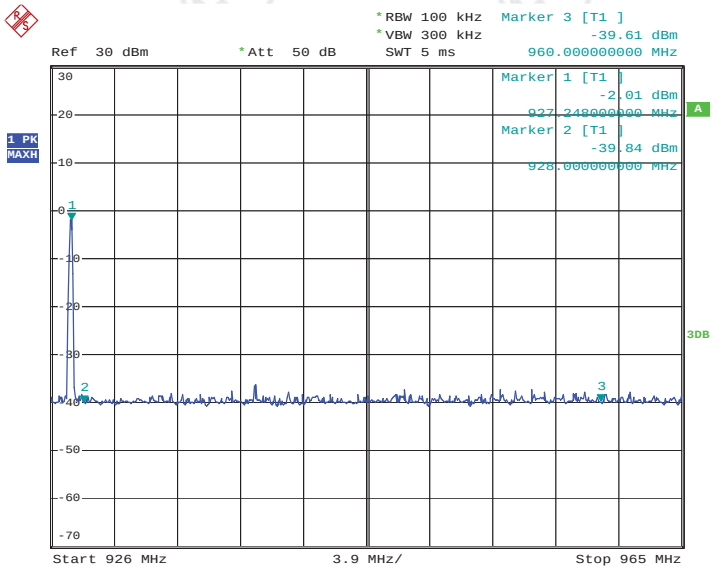
Pass.

Hopping off mode:



Date: 14.MAY.2015 20:41:19

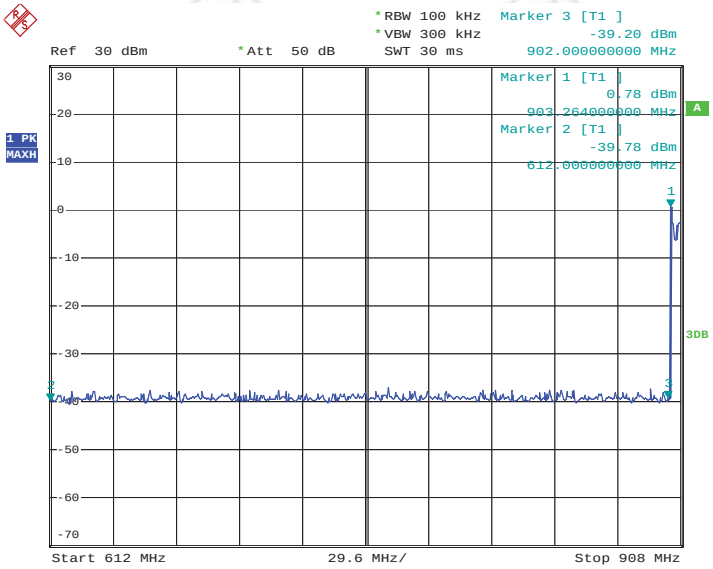
Low channel



Date: 14.MAY.2015 20:39:02

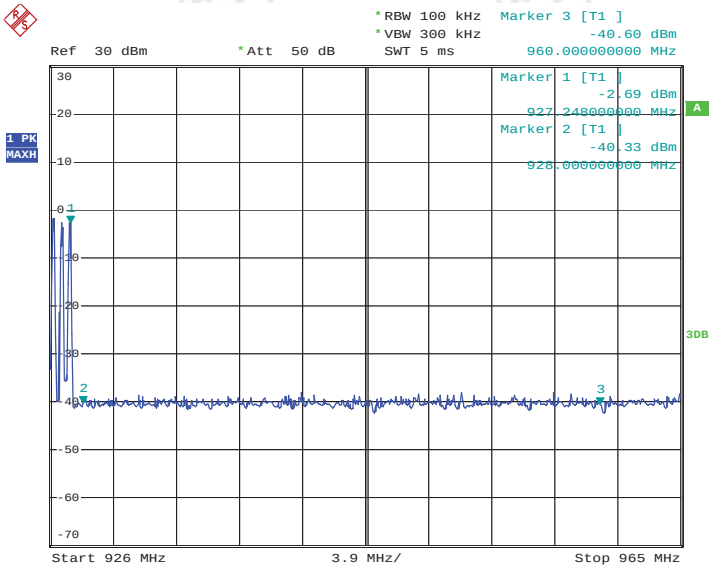
High channel

Hopping mode:



Date: 14.MAY.2015 20:42:09

Low channel



Date: 14.MAY.2015 20:39:46

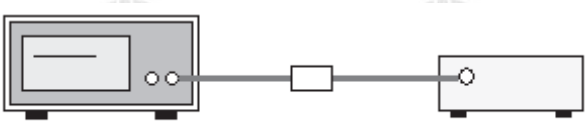
High channel

13. CONDUCTED SPURIOUS EMISSION MEASUREMENT

13.1. LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

13.2. BLOCK DIAGRAM OF TEST SETUP



13.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.

2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

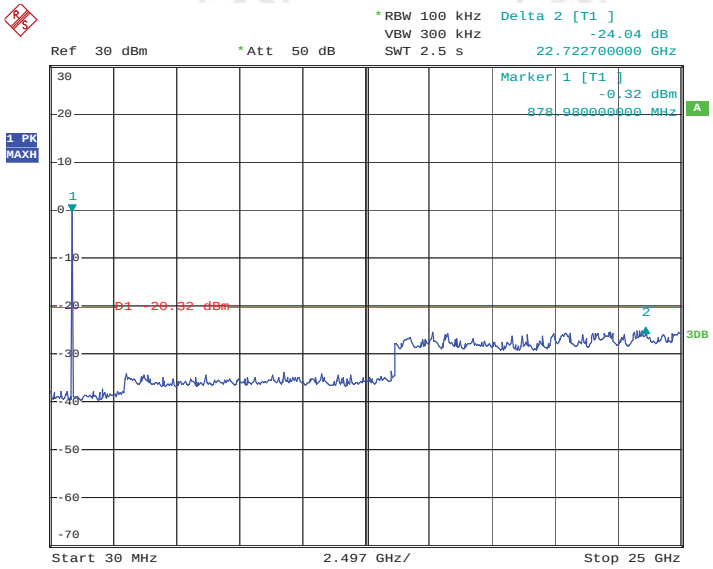
4. Measure and record the results in the test report.

5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

13.4. TEST RESULT

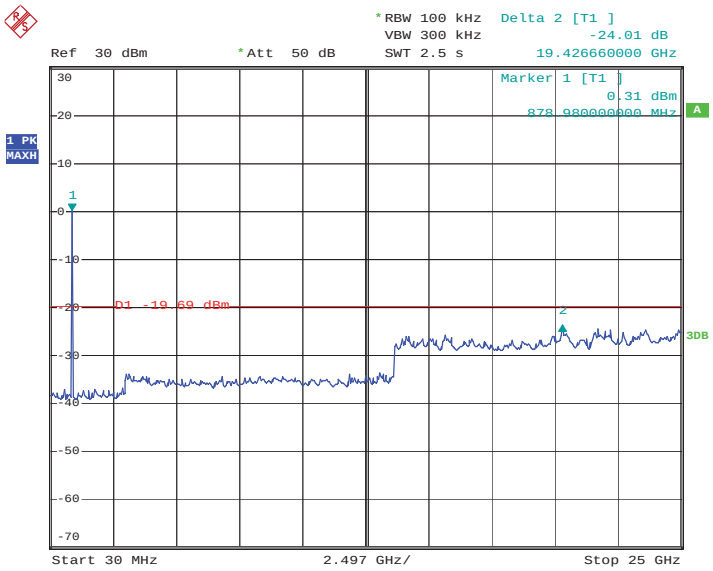
Pass.

Please see the following plots:



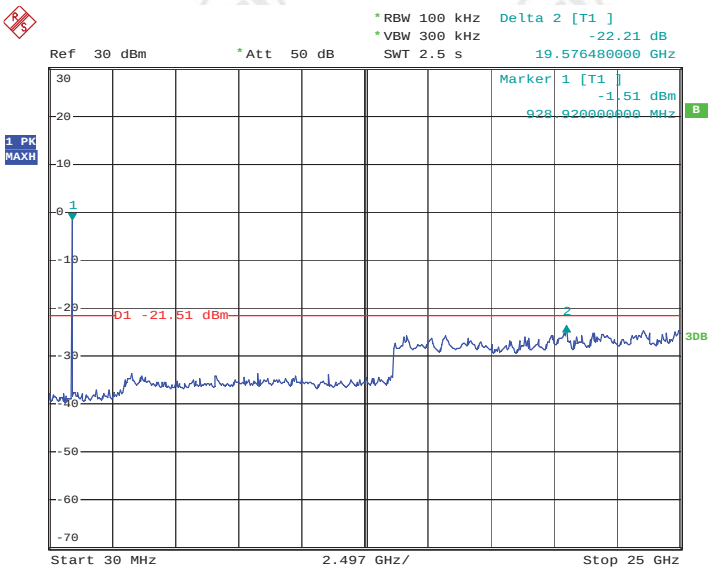
Date: 28.MAY.2015 18:34:16

902.75MHz



Date: 28.MAY.2015 18:32:46

914.75MHz



Date: 28.MAY.2015 18:24:38

927.25MHz

14. RADIATED BANDEDGE EMISSION / RADIATED SPURIOUS EMISSION MEASUREMENT

14.1. LIMITS

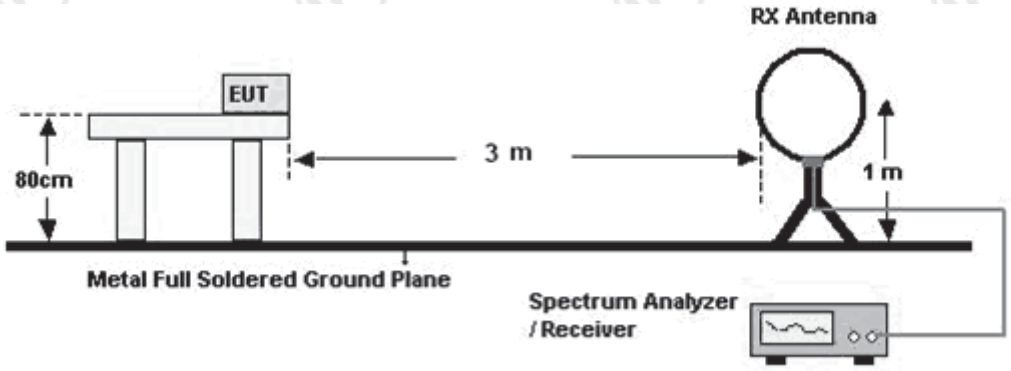
The field strength of any emissions, which appear outside of operating frequency band and restricted band specified on FCC 15.205(a), shall not exceed the general radiated emission limits as below.

Frequency (MHz)	Field strength (μV/m)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

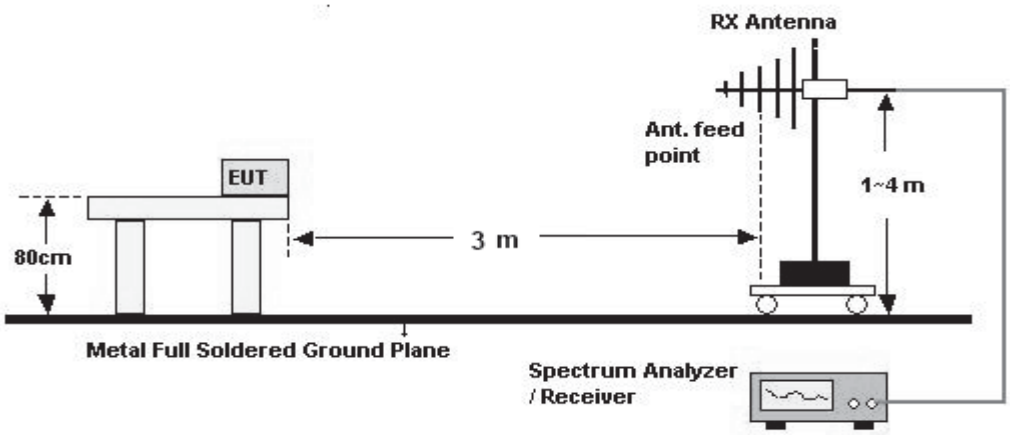
Note: the tighter limit applies at the band edges.

14.2. BLOCK DIAGRAM OF TEST SETUP

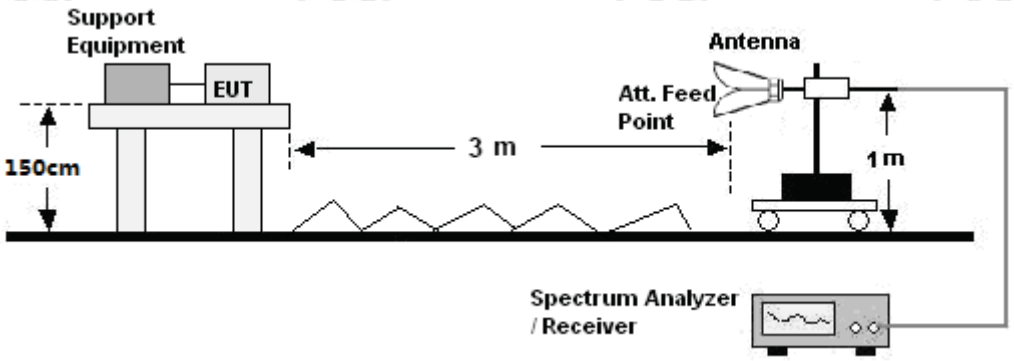
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30 - 1000MHz



For radiated emissions from 1GHz to 25GHz



14.3. TEST PROCEDURE

Below 30MHz

a. The Product is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.

b. For each suspected emission, the Product was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.

c. The test frequency analyzer system was set to Peak Detect (300Hz RBW in 9kHz to 150kHz and 10kHz RBW in 150kHz to 30MHz) Function and Specified Bandwidth with Maximum Hold Mode.

30MHz ~ 1GHz:

a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 100 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value (120 kHz RBW): vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The EUT was placed on the non-conductive turntable 1.5 m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

14.4. TEST RESULT

All the modes of operation (X, Y, Z) were investigated and the worst-case emissions are reported.

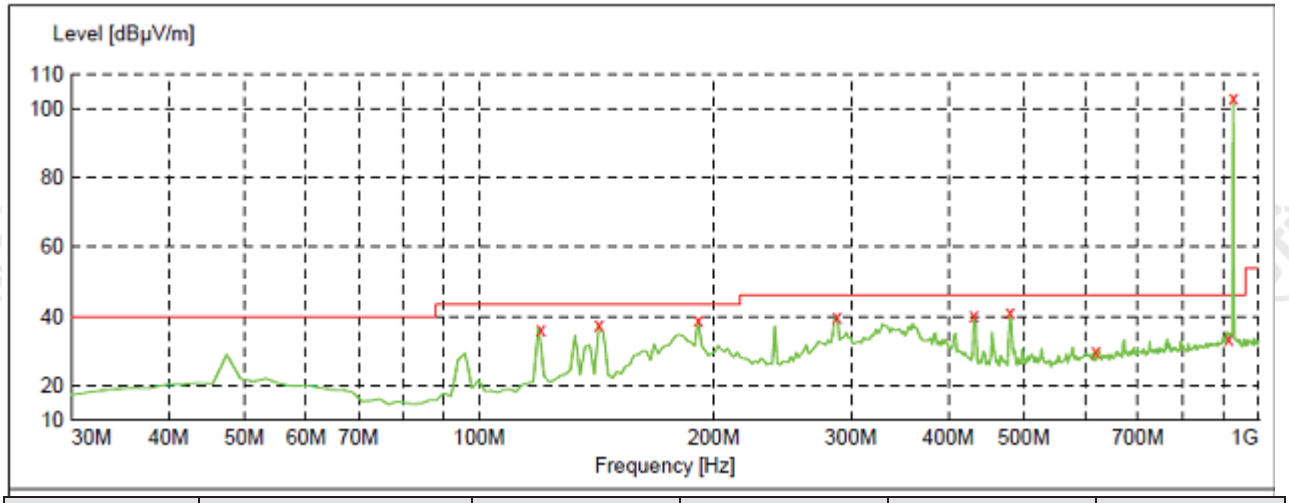
A. Below 30MHz:

No emissions were found higher than the background below 30MHz and background is lower than the limit, so it deems to compliance with the limit without recorded.

B. 30MHz ～ 1GHz:

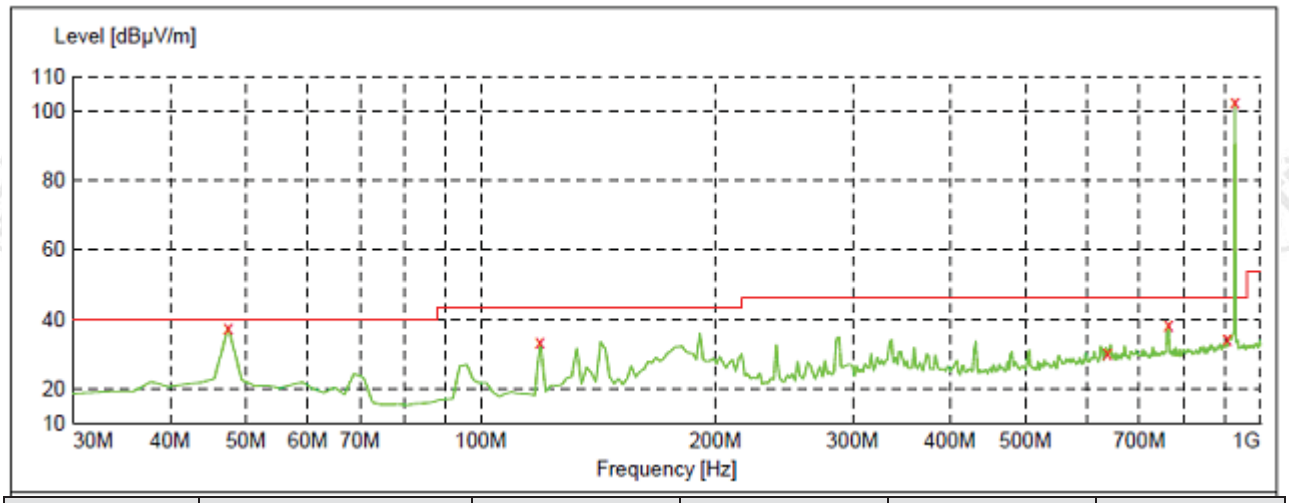
902.75MHz:

H:



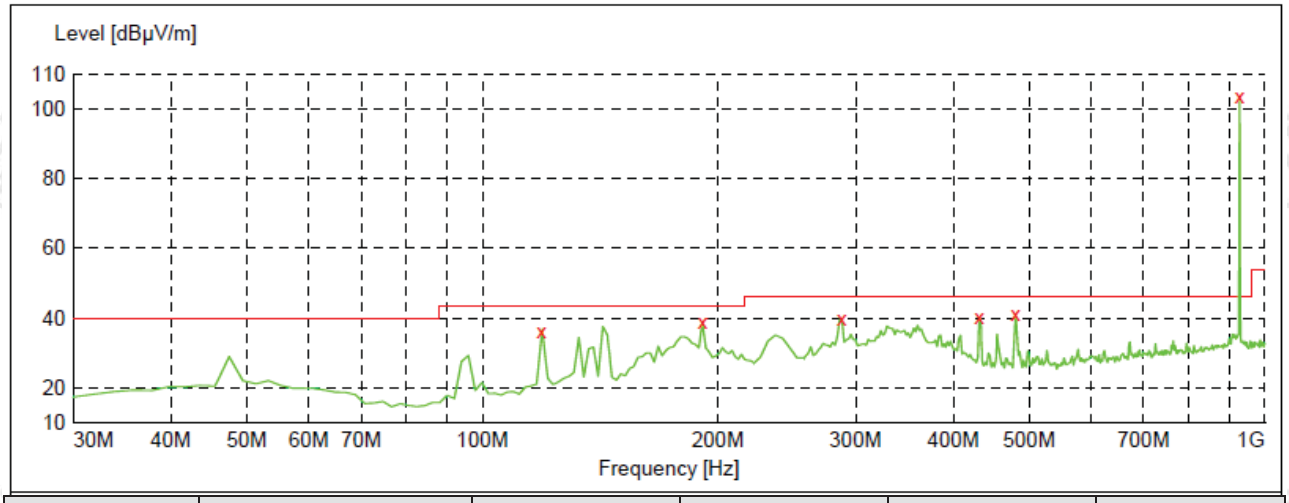
Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
104.10	36.2	43.5	QP	H	P
142.10	37.4	43.5	QP	H	P
191.11	38.1	43.5	QP	H	P
288.12	39.5	46	QP	H	P
431.21	40.8	46	QP	H	P
480.00	41.7	46	QP	H	P
614.00	30.4	46	QP	H	P
902.00	30.1	46	QP	H	P
902.75	101.1	--	PK	H	--

V:



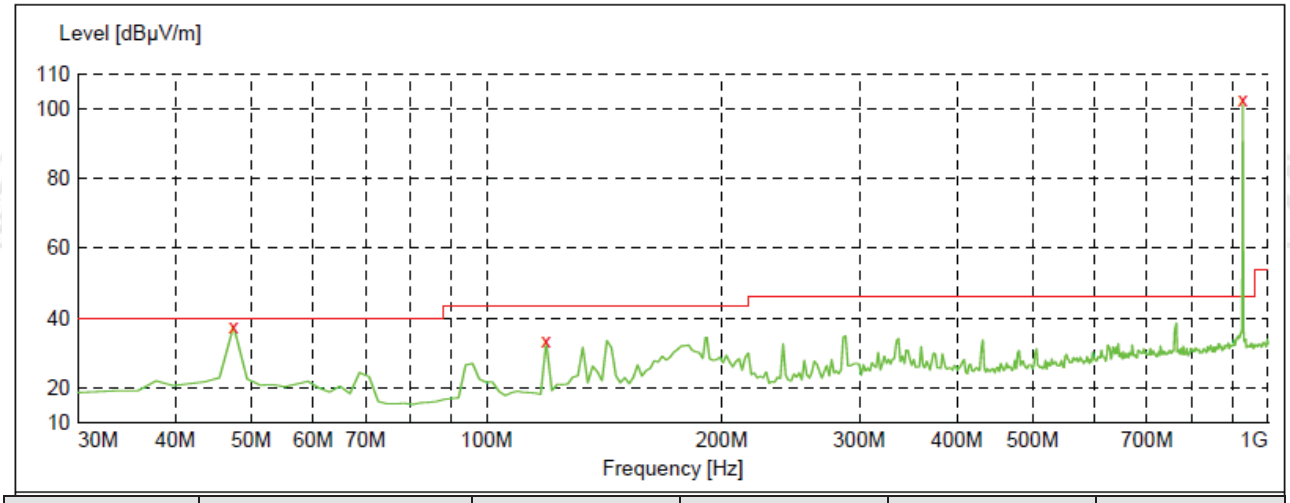
Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
47.50	37.1	40	QP	V	P
119.30	33.4	43.5	QP	V	P
614.00	36.6	46	QP	V	P
763.30	38.9	46	QP	V	P
902.00	36.8	46	QP	V	P
902.75	101.3	--	PK	V	--

914.75MHz:
H:



Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
140.00	36.8	43.5	QP	H	P
192.10	37.5	43.5	QP	H	P
288.00	40.4	46	QP	H	P
430.10	40.2	46	QP	H	P
480.00	41.3	46	QP	H	P
914.75	101.7	--	PK	H	--

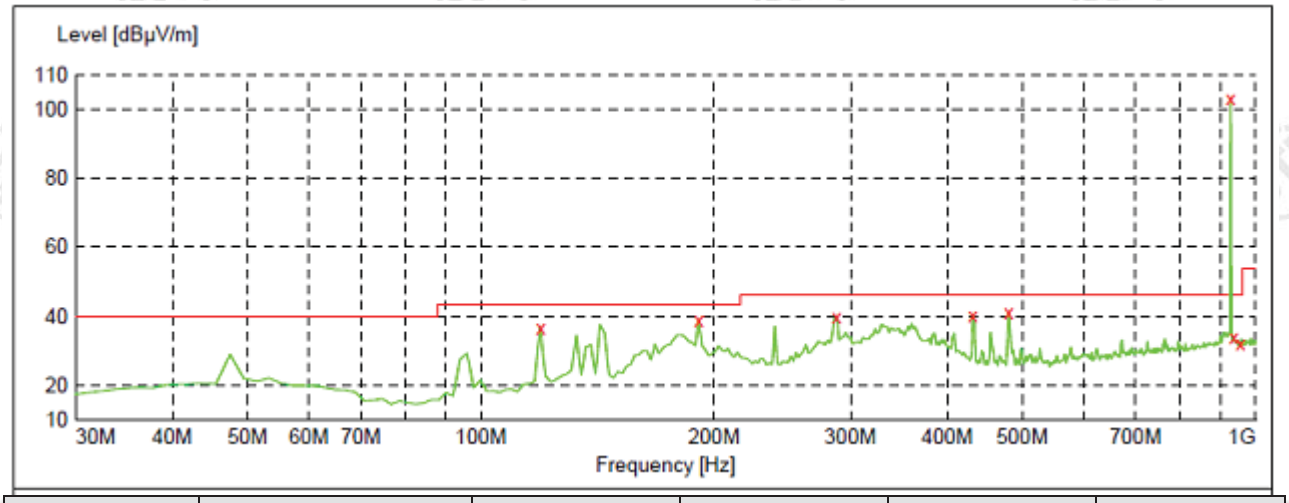
V:



Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
47.50	36.4	40	QP	V	P
119.2	32.1	43.5	QP	V	P
914.75	101.1	--	PK	V	--

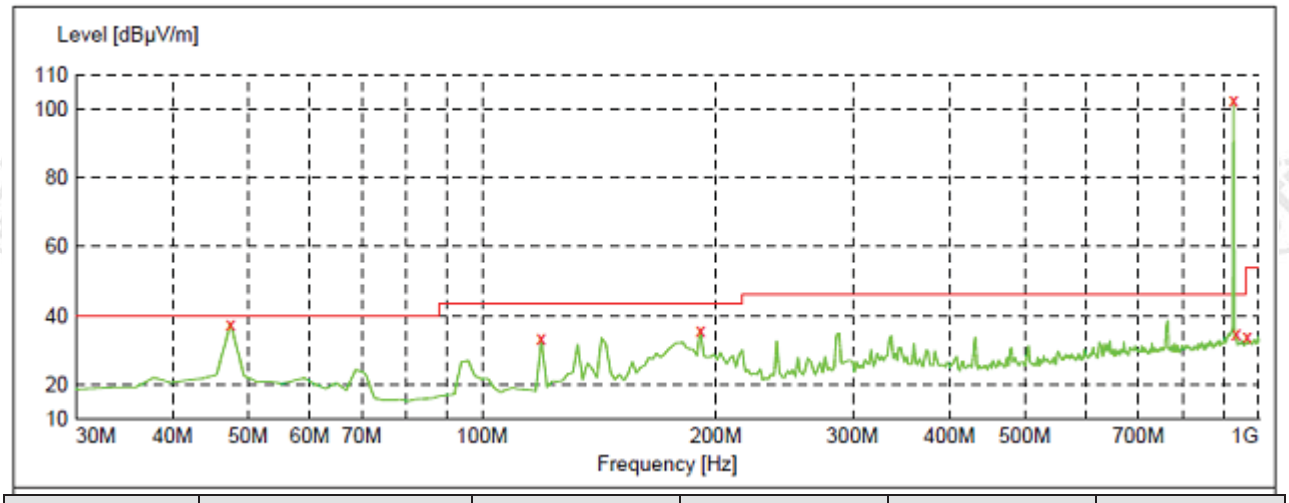
927.25MHz:

H:



Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
104.50	36.1	43.5	QP	H	P
191.00	38.1	43.5	QP	H	P
288.00	39.3	46	QP	H	P
430.20	41.1	46	QP	H	P
480.00	41.2	46	QP	H	P
927.25	101.0	--	PK	H	--
928.00	30.1	46	QP	H	P
960.00	30.3	46	QP	H	P

V:



Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
47.50	37.1	40	QP	V	P
118.00	34.4	43.5	QP	V	P
190.0	35.2	46	QP	V	P
927.25	101.2	--	PK	V	--
928.00	30.2	46	QP	V	P
960.00	30.4	46	QP	V	P

C. 1GHz ～ 10GHz:

The test data of low channel, middle channel and high channel are almost same in frequency bands 1GHz to 10GHz, and the worst data are chosen as representative in below:

Test Results-(Measurement Distance: 3m)_Channel low_902.75MHz:

Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
1805.50	36.16	74	PK	H	P
2708.25	42.13	74	PK	H	P
1805.50	36.81	74	PK	V	P
2708.25	40.11	74	PK	V	P

Test Results-(Measurement Distance: 3m)_Channel low_914.75MHz:

Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
1829.50	38.01	74	PK	H	P
2744.25	43.21	74	PK	H	P
1829.50	36.11	74	PK	V	P
2744.25	43.91	74	PK	V	P

Test Results-(Measurement Distance: 3m)_Channel low_927.25MHz:

Frequency (MHz)	Measurement (dBuV/m)	Limit (dBuV/m)	Detector Type	Antenna (H/V)	Result (P/F)
1854.50	38.81	74	PK	H	P
2781.75	42.14	74	PK	H	P
1854.50	39.01	74	PK	V	P
2781.75	43.11	74	PK	V	P

Remark:

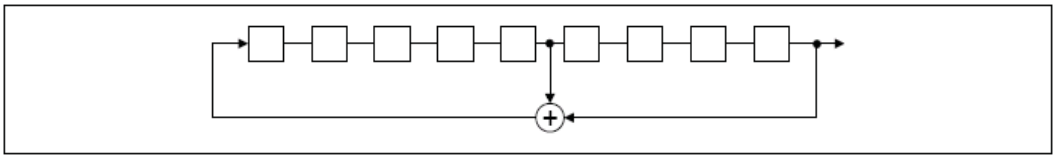
1. The above tables show that the frequencies peak data are all below the average limit, so the average data of these frequencies are deems to fulfill the average limits and not reported.
2. All outside of operating frequency band and restricted band specified are below 15.209.

15. Pseudorandom Frequency Hopping Sequence

15.1. EUT PSEUDORANDOM FREQUENCY HOPPING SEQUENCE

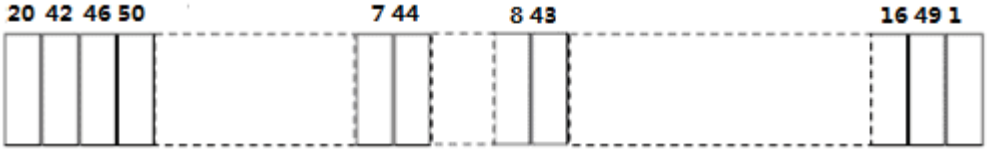
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift registers stages: 9
- Length of pseudo-random sequence: 2^9 -1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

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

The device does not have the ability to be coordinated with other FHSS systems in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

16. AC CONDUCTED EMISSION TEST

16.1. LIMITS

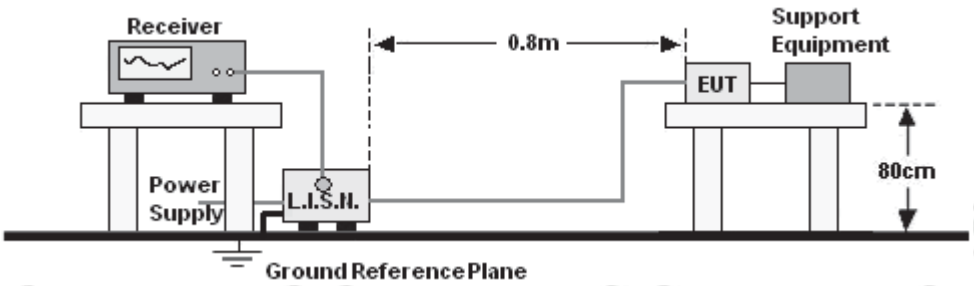
Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

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

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

16.2. BLOCK DIAGRAM OF TEST SETUP



16.3. PROCEDURE OF CONDUCTED EMISSION TEST

a. The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

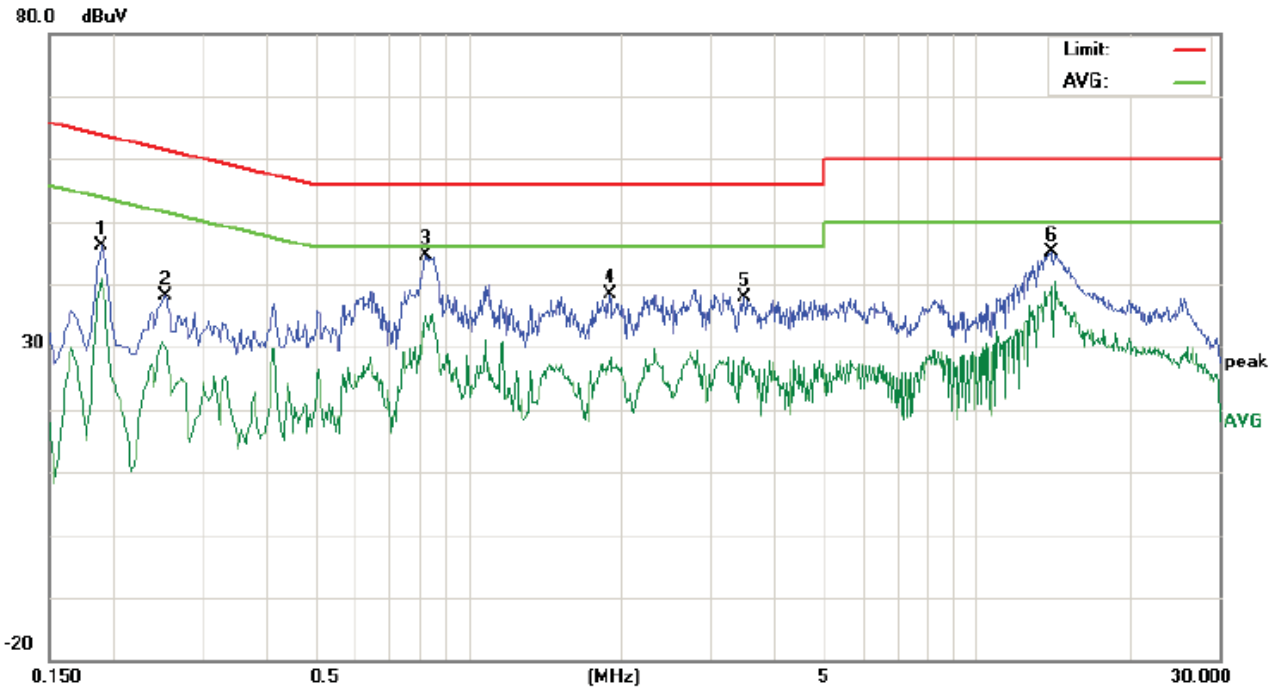
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

16.4. GRAPHS AND DATA

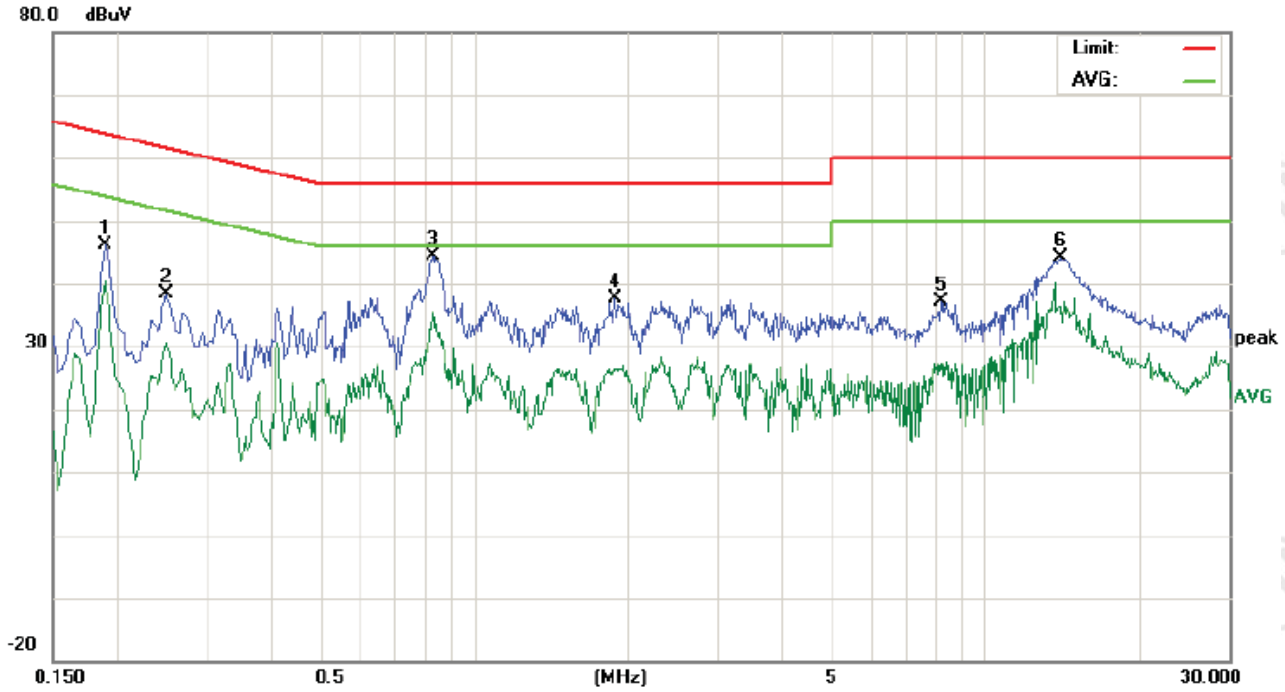
Product	:	Embedded UHF Module M950	**Model/Type reference**	:	OEM-UHF-M950
Power	:	AC 120V, 60Hz	**Temperature**	:	21℃
Mode	:	Keeping TX	**Humidity**	:	52%

L:



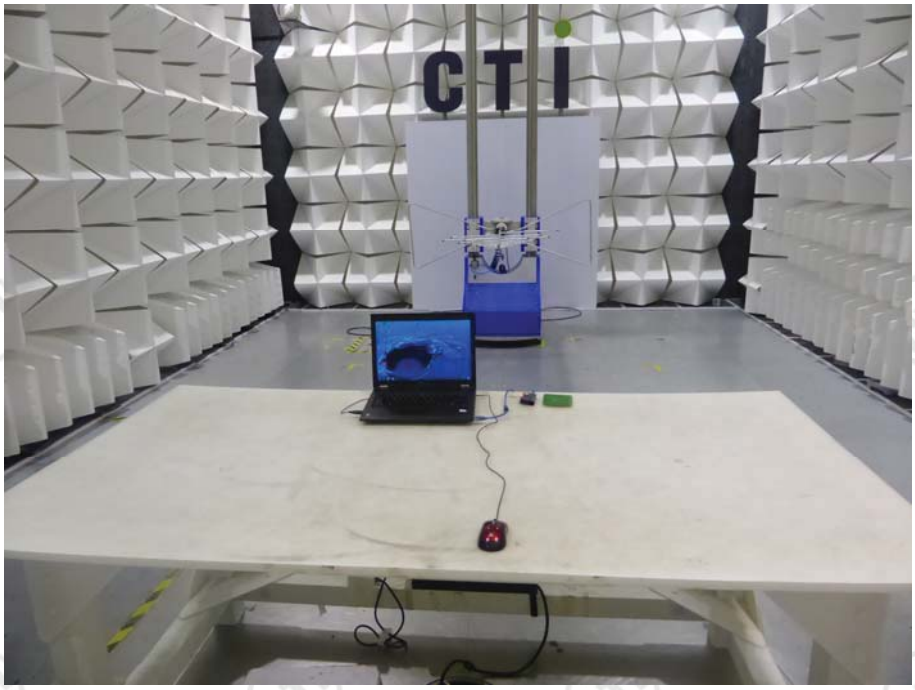
No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1900	36.19		30.97	9.90	46.09		40.87	64.03	54.03	-17.94	-13.16	P	
2	0.2540	28.17		20.17	9.90	38.07		30.07	61.62	51.62	-23.55	-21.55	P	
3	0.8300	34.77		25.05	9.90	44.67		34.95	56.00	46.00	-11.33	-11.05	P	
4	1.9060	28.57		17.64	9.90	38.47		27.54	56.00	46.00	-17.53	-18.46	P	
5	3.4940	28.00		18.51	9.90	37.90		28.41	56.00	46.00	-18.10	-17.59	P	
6	14.0500	35.08		29.73	9.92	45.00		39.65	60.00	50.00	-15.00	-10.35	P	

N:

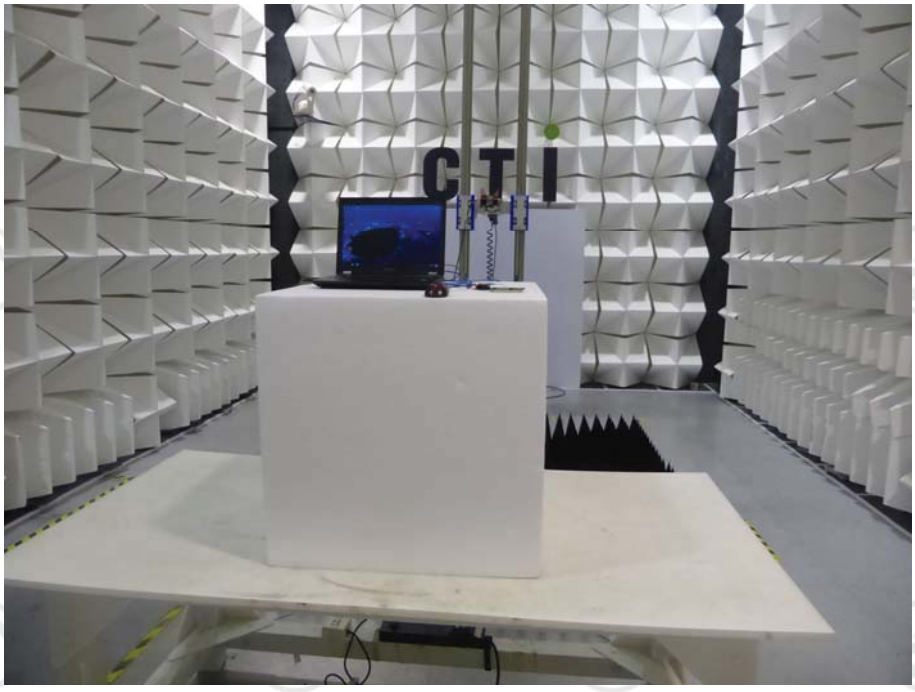


No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1900	36.32		30.57	9.90	46.22		40.47	64.03	54.03	-17.81	-13.56	P	
2	0.2500	28.43		20.74	9.90	38.33		30.64	61.75	51.75	-23.42	-21.11	P	
3	0.8340	34.60		25.51	9.90	44.50		35.41	56.00	46.00	-11.50	-10.59	P	
4	1.8900	27.62		16.59	9.90	37.52		26.49	56.00	46.00	-18.48	-19.51	P	
5	8.2340	27.18		17.45	9.94	37.12		27.39	60.00	50.00	-22.88	-22.61	P	
6	14.0500	34.09		26.15	9.92	44.01		36.07	60.00	50.00	-15.99	-13.93	P	

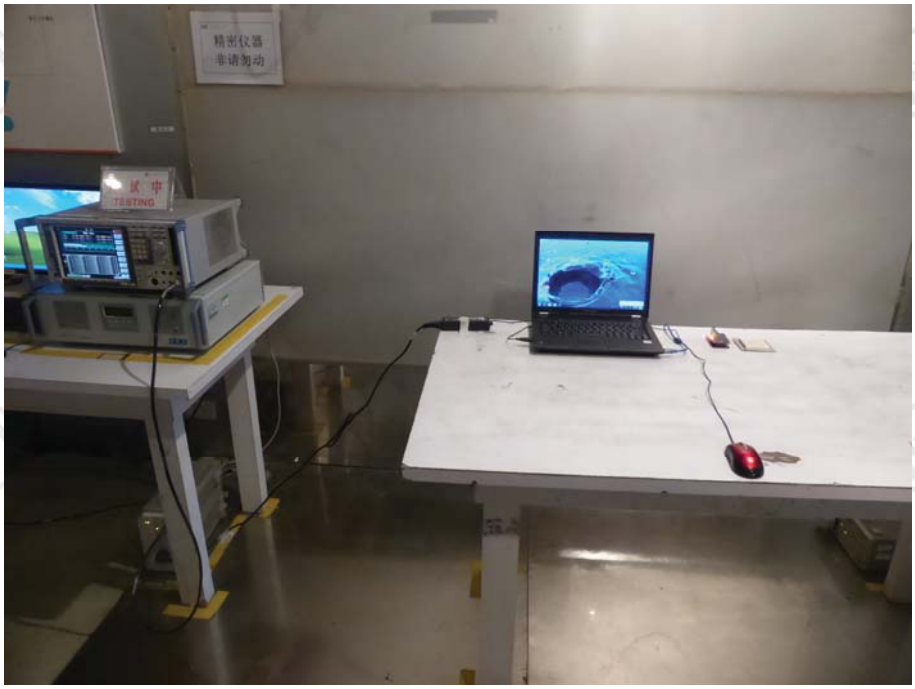
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



TEST SETUP OF RADIATED EMISSION (30MHz-1GHz)



TEST SETUP OF RADIATED EMISSION (above 1GHz)



TEST SETUP OF CONDUCTED EMISSION

APPENDIX 2 PHOTOGRAPHS OF PRODUCT

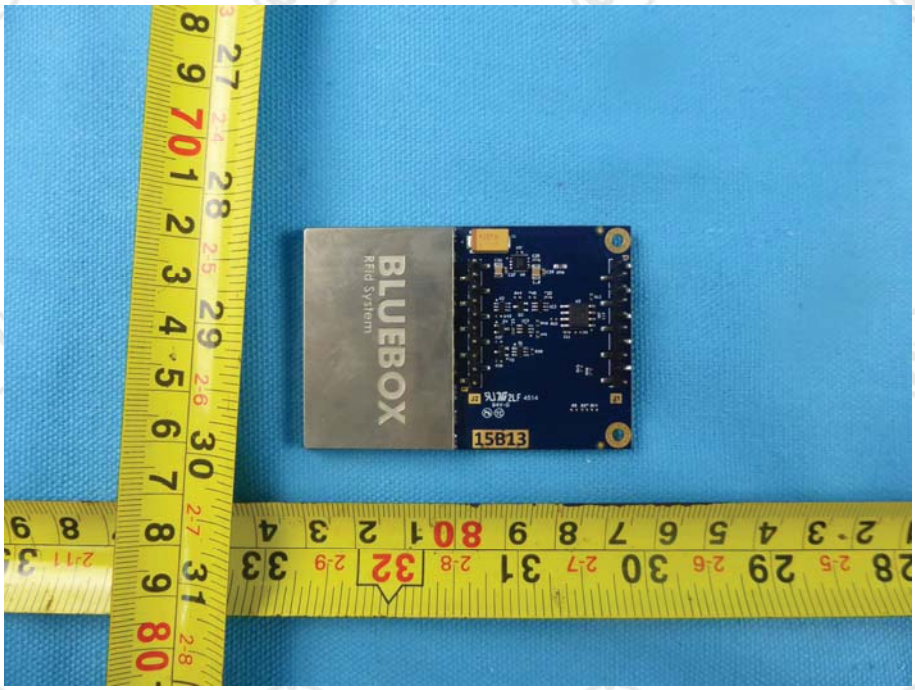


Fig.1- View of EUT-1

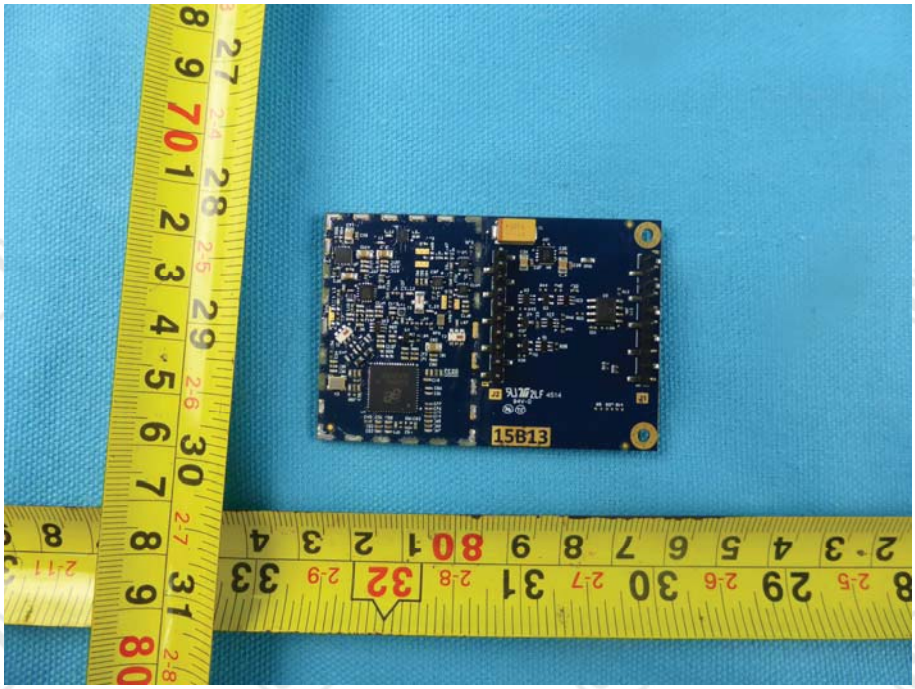


Fig.2- View of EUT-2

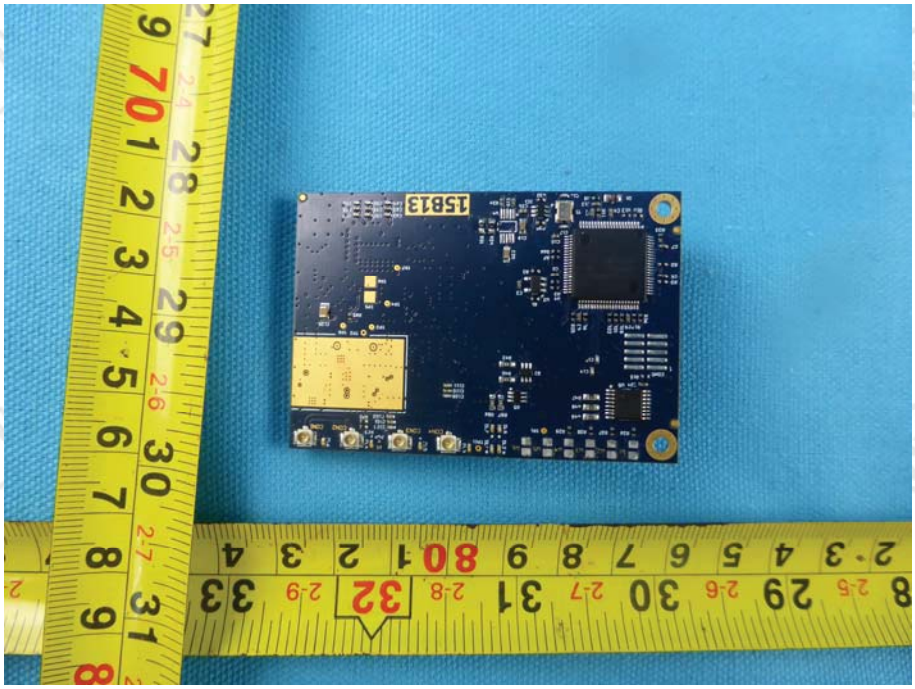


Fig.3- View of EUT-3

*** End of Report ***