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FCC PART 15 SUBPART C TEST REPORT

FCC Part 15.247

Report Reference No.....:	**CTL1605181770-WF**
Compiled by (position+printed name+signature)..:	File administrators Jacky Chen
Name of the organization performing the tests (position+printed name+signature)..:	Test Engineer Happy Guo
Approved by (position+printed name+signature)..:	Manager Tracy Qi
Date of issue.....:	June 18, 2016
Test Firm.....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address.....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Applicant's name.....:	**SID Global Sdn Bhd**
Address.....:	11 BK 5A / 2 Bandar Kinrara, 47100 Puchong, Selangor, Malaysia
Test specification:	
Standard .....:	FCC Part 15.247: Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
Master TRF.....:	Dated 2011-01

Test item description ..... :	UHF RFID Reader
FCC ID……..:	2AIUA-UR-001
Trade Mark .....:	SID
Model/Type reference.....:	UF/UR-001
Work frequency .....:	902.5-927.5 MHz
Type of modulation.....:	GFSK
Antenna Gain .....:	2dBi
Antenna type .....:	External
Result.....:	**Positive**

TEST REPORT

Test Report No. :	CTL1605181770-WF	June 18, 2016 Date of issue

Equipment under Test	:	UHF RFID Reader
Model /Type	:	UF/UR-001
Applicant	:	**SID Global Sdn Bhd**
Address	:	11 BK 5A / 2 Bandar Kinrara, 47100 Puchong, Selangor, Malaysia
Manufacturer	:	**SID Global China**
Address	:	Block A, 4th Floor, Zhong Jin Industrial Park, NO.3 PuSha South Road. ShaHu Village, TangXia Town, DongGuan City, GuangDong Province, China

Test Result according to the standards on page 5:	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

ANSI C63.4-2014

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	June 03, 2016
Testing commenced on	:	June 03, 2016
Testing concluded on	:	June 18, 2016

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	●	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

2.3. Short description of the Equipment under Test (EUT)

Name of EUT	UHF RFID Reader
Model Number	UF/UR-001
Antenna Type	External
Antenna Gain	2dBi
Operation frequency	902.5-927.5 MHz
Modulation Type	GFSK

Channels list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	902.5	21	912.5	41	922.5
02	903.0	22	913.0	42	923.0
03	903.5	23	913.5	43	923.5
04	904.0	24	914.0	44	924.0
05	904.5	25	914.5	45	924.5
06	905.0	26	915.0	46	925.0
07	905.5	27	915.5	47	925.5
08	906.0	28	916.0	48	926.0
09	906.5	29	916.5	49	926.5
10	907.0	30	917.0	50	927.0
11	907.5	31	917.5	51	927.5
12	908.0	32	918.0		
13	908.5	33	918.5		
14	909.0	34	919.0		
15	909.5	35	919.5		
16	910.0	36	920.0		
17	910.5	37	920.5		
18	911.0	38	921.0		
19	911.5	39	921.5		
20	912.0	40	922.0		

2.4. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. There are 51 channels of EUT, and the test carried out at the lowest channel, middle channel and highest channel.

Test Mode	Test Channel	Test Frequency
1	Low Channel	902.5 MHz
2	Middle Channel	915.0 MHz
3	High Channel	927.5 MHz

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

○ - supplied by the manufacturer
● - supplied by the lab

○	AC adapter	Manufacturer :	SID Global China
		Model No. :	RWX02-ADCW-120200U

2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AIUA-UR-001 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 (2013) and CISPR Publication 22.

3.2. Test Facility

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. 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 970318, December 19, 2013.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

3.5. Test Description

FCC PART 15 Subpart C		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)	20dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.247(a)(1)	Frequency Separation	PASS
FCC Part 15.247(a)(1)(iii)	Number of hopping frequency	PASS
FCC Part 15.247(a)(1)(iii)	Time of Occupancy	PASS

Remark: The measurement uncertainty is not included in the test result.

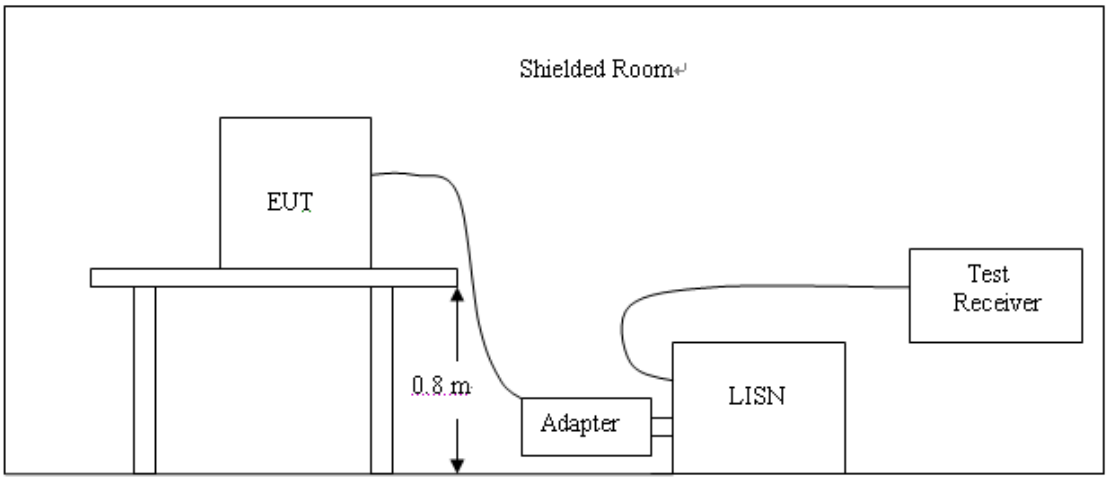
3.6. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
ULTRA-ROADBAND ANTENNA	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2016/05/21	2017/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2016/05/21	2017/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/05/19	2017/05/18
Active Loop Antenna	Daze	ZN30900A	N/A	2016/05/19	2017/05/18
LISN	R&S	ENV216	3560.6550.12	2016/06/02	2017/06/01
LISN	R&S	ESH2-Z5	860014/010	2016/06/02	2017/06/01
ISN	FCC	F-071115-1057-1-09	11229	2016/05/19	2017/05/18
Amplifier	Agilent	8349B	3008A02306	2016/05/19	2017/05/18
Amplifier	Agilent	8447D	2944A10176	2016/05/19	2017/05/18
Transient Limiter	SCHWARZCECK	VTSD 9561F	9666	2016/06/02	2017/06/01
Radio Communication Tester	R&S	CMU200	115419	2016/05/22	2017/05/21
Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/05/20	2017/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2016/05/20	2017/05/19
Power Meter	Agilent	U2531A	TW53323507	2016/05/21	2017/05/20
Power Sensor	Agilent	U2021XA	MY5365004	2016/05/21	2017/05/20
Climate Chamber	ESPEC	EL-10KA	A20120523	2016/05/20	2017/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2016/05/20	2017/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2016/05/20	2017/05/19

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC5V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

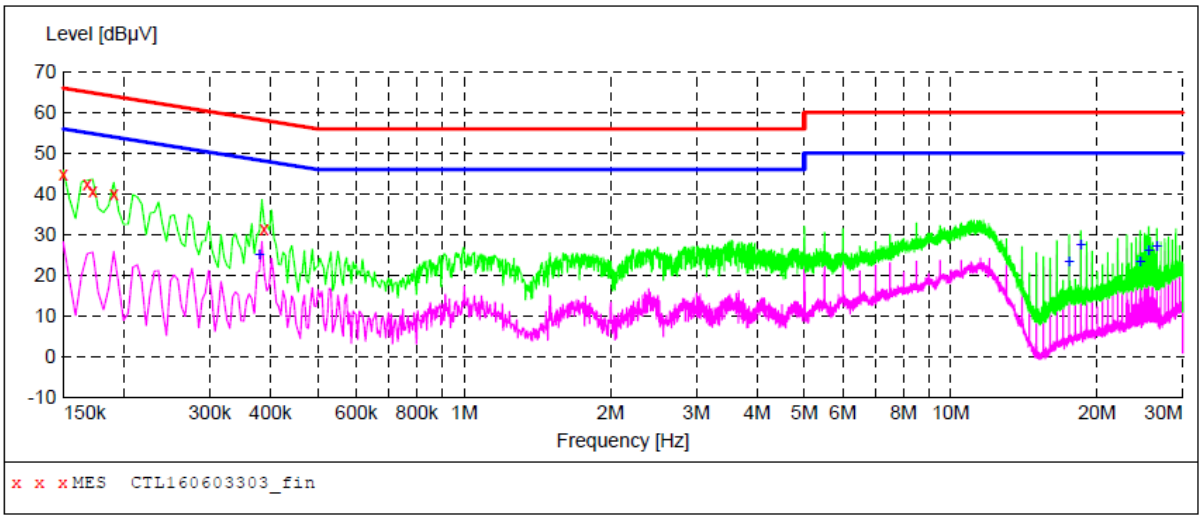
Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

The datum recorded below (Mode 1) is the worst case for all the test mode

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160603303_fin"

6/3/2016 5:04PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150001	44.80	10.2	66	21.2	QP	N	GND
0.168001	42.40	10.2	65	22.7	QP	N	GND
0.172501	40.70	10.2	65	24.1	QP	N	GND
0.190501	40.10	10.2	64	23.9	QP	N	GND
0.388501	31.50	10.2	58	26.6	QP	N	GND

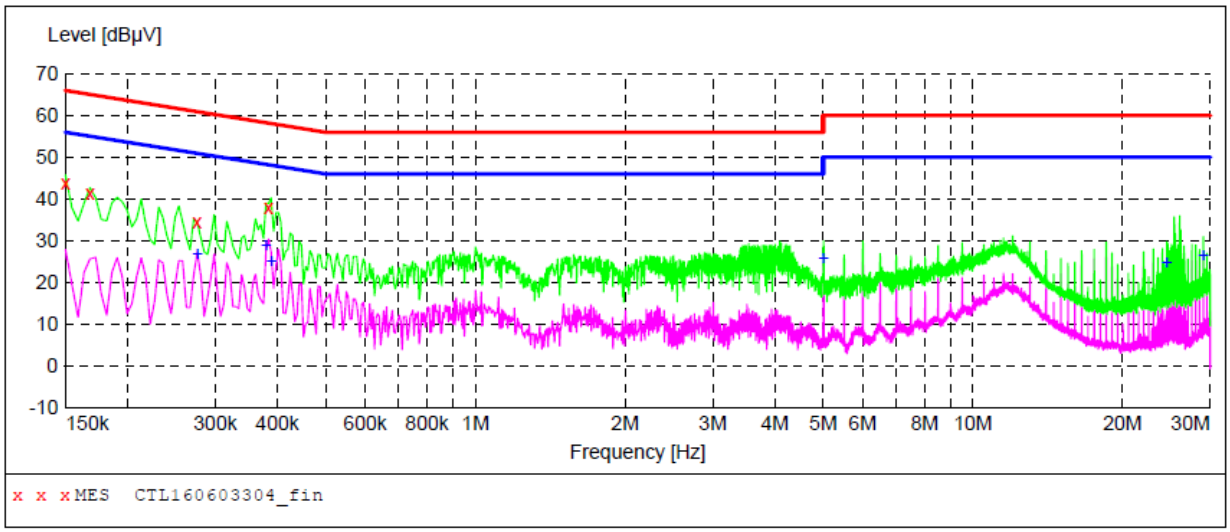
MEASUREMENT RESULT: "CTL160603303_fin2"

6/3/2016 5:04PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.379501	25.20	10.2	48	23.1	AV	N	GND
17.524501	23.40	10.8	50	26.6	AV	N	GND
18.528001	27.40	10.9	50	22.6	AV	N	GND
24.535501	23.30	11.1	50	26.7	AV	N	GND
25.539001	26.20	11.1	50	23.8	AV	N	GND
26.542501	27.20	11.2	50	22.8	AV	N	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160603304_fin"

6/3/2016 5:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150001	43.90	10.2	66	22.1	QP	L1	GND
0.168001	41.50	10.2	65	23.6	QP	L1	GND
0.276001	34.60	10.2	61	26.3	QP	L1	GND
0.384001	38.00	10.2	58	20.2	QP	L1	GND

MEASUREMENT RESULT: "CTL160603304_fin2"

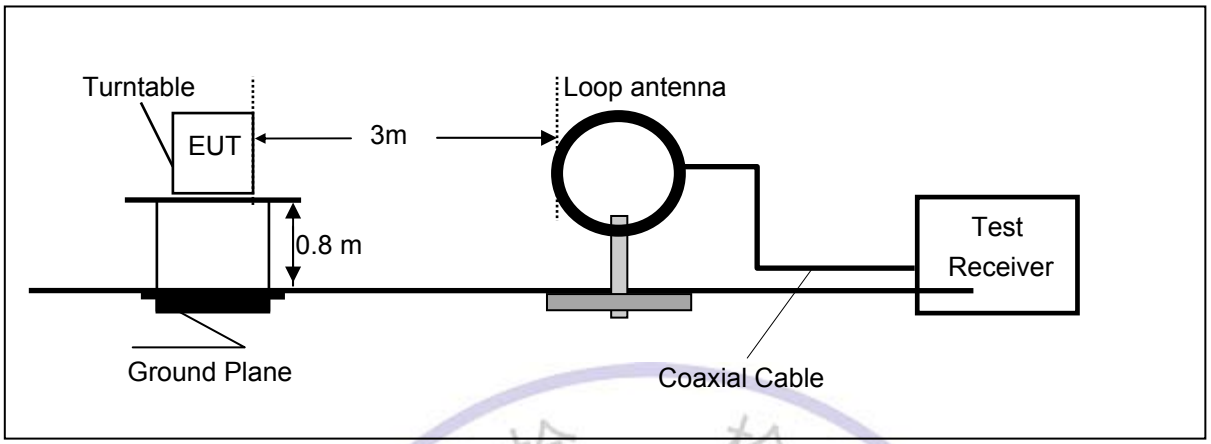
6/3/2016 5:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.276001	27.00	10.2	51	23.9	AV	L1	GND
0.379501	29.10	10.2	48	19.2	AV	L1	GND
0.388501	25.30	10.2	48	22.8	AV	L1	GND
5.010001	25.90	10.4	50	24.1	AV	L1	GND
24.553501	24.80	11.1	50	25.2	AV	L1	GND
29.067001	26.50	11.2	50	23.5	AV	L1	GND

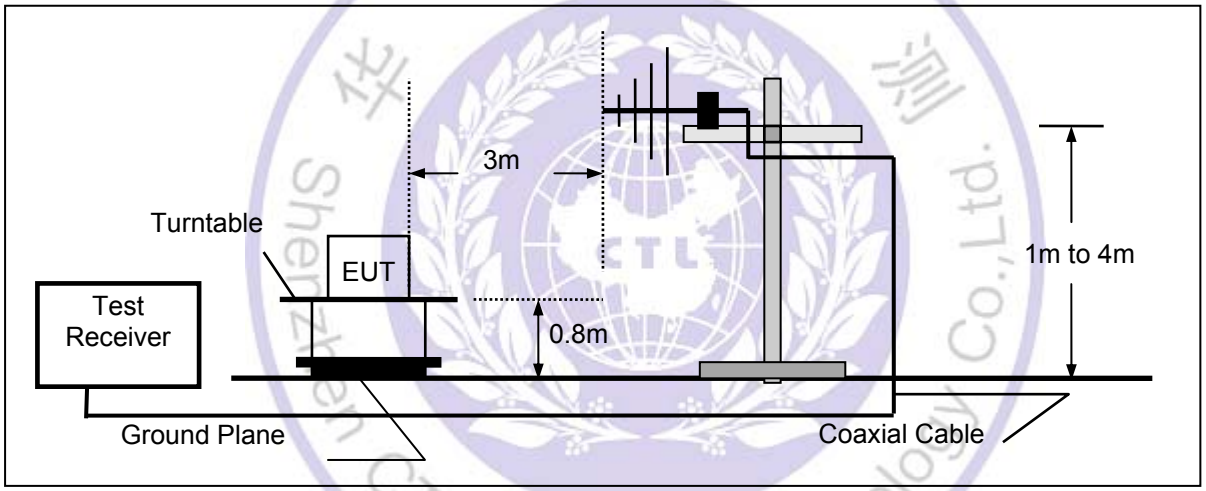
4.2. Radiated Emission

TEST CONFIGURATION

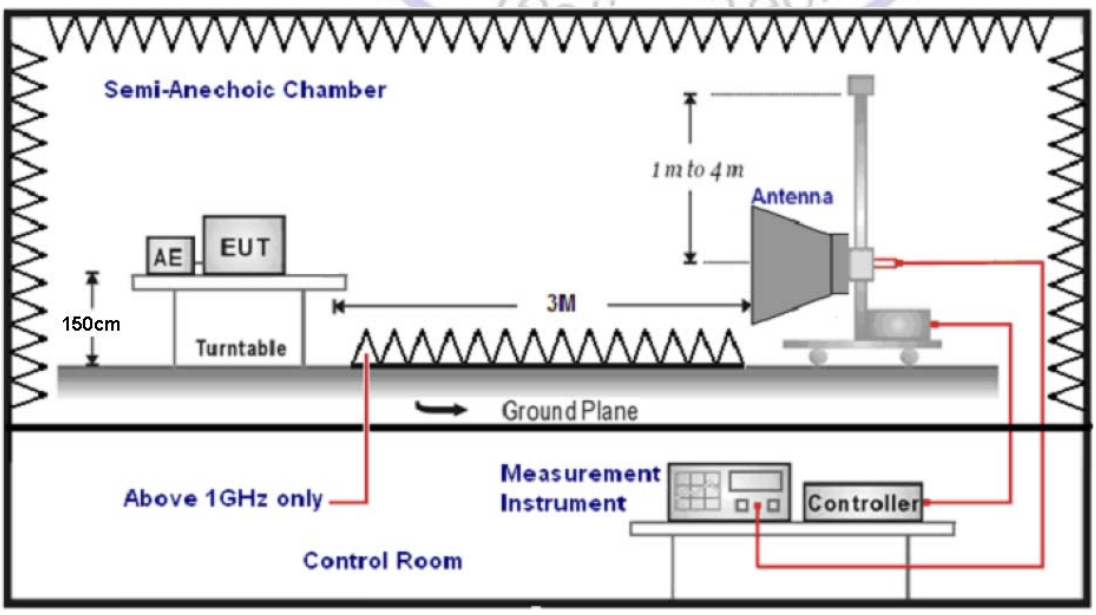
Radiated Emission Test Set-Up
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1 The EUT was placed on a turn table which is 0.8m above ground plane and 1.5m above ground plane above 1GHz.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The fundamental frequency is 902-928MHz, So the radiation emissions frequency range were tested from 9KHz to 10GHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL – AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

Per 15.247 (c) In any 100 KHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100 KHz bandwidth within the band that contains the highest level of the desired power.

TEST RESULTS

9KHz-30MHz:

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

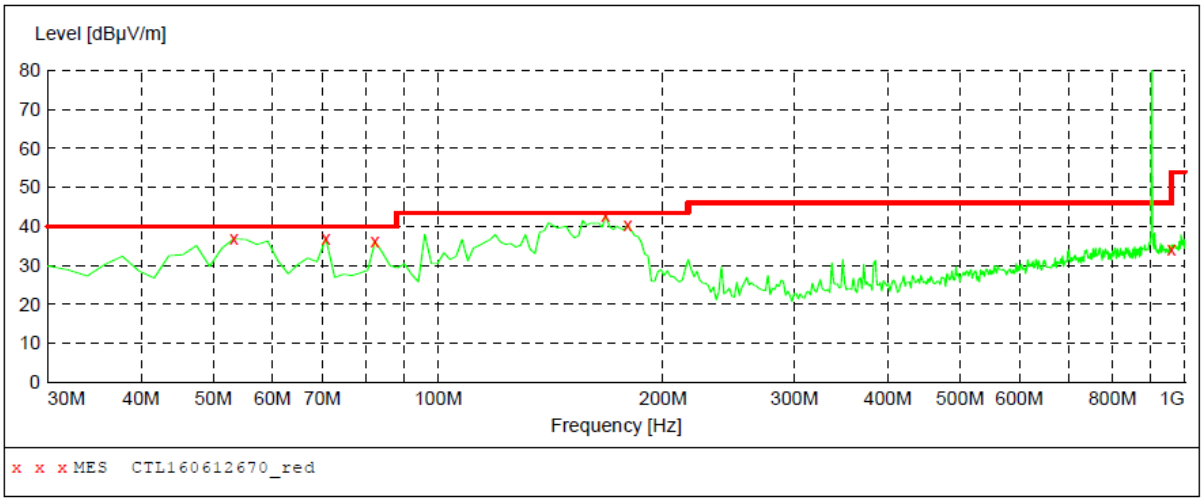
Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Dstance extrapolation factor= 40 log (specific distance/ test distance) (dB);
Limit line= specific limits (dBuV) + distance extrapolation factor.

30M~ 1GHz
The radiated measurement are performed the each test mode, the datum recorded below (mode 1) is the worst case for all the test mode

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL160612670_red"

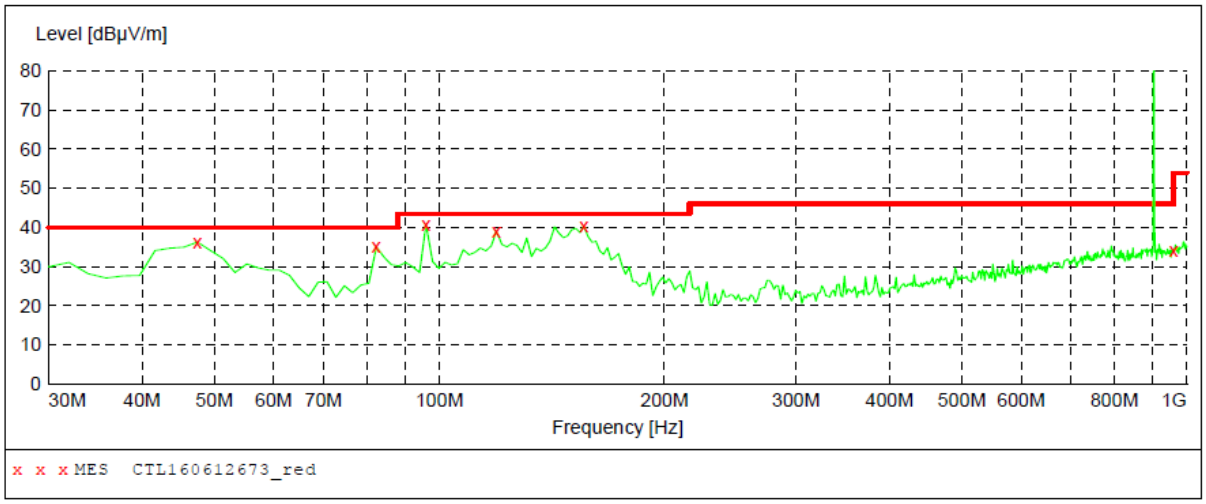
6/12/2016 12:32PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	36.80	8.0	40.0	3.2	---	0.0	0.00	HORIZONTAL
70.740000	36.80	8.2	40.0	3.2	---	0.0	0.00	HORIZONTAL
82.380000	36.20	8.7	40.0	3.8	---	0.0	0.00	HORIZONTAL
167.740000	42.70	13.4	43.5	0.8	---	0.0	0.00	HORIZONTAL
179.380000	40.30	13.0	43.5	3.2	---	0.0	0.00	HORIZONTAL
960.000000	34.20	26.0	54.0	19.8	---	0.0	0.00	HORIZONTAL

SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL160612673_red"

6/12/2016 1:28PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	36.20	8.7	40.0	3.8	---	0.0	0.00	VERTICAL
82.380000	35.00	8.7	40.0	5.0	---	0.0	0.00	VERTICAL
95.960000	40.70	10.2	43.5	2.8	---	0.0	0.00	VERTICAL
119.240000	39.10	14.7	43.5	4.4	---	0.0	0.00	VERTICAL
156.100000	40.30	13.7	43.5	3.2	---	0.0	0.00	VERTICAL
960.000000	34.00	26.0	54.0	20.0	---	0.0	0.00	VERTICAL

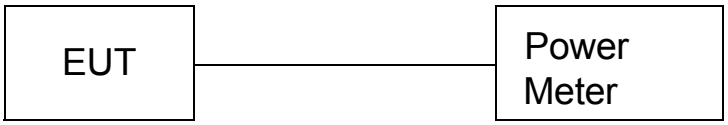
All Vertical and Horizontal polarity have been tested , only worse case is reported

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	1805	68.6	-0.4	68.2	74	5.8	PK
	V	1805	50.1	-0.4	49.7	54	4.3	AV
	V	2707.5	63.4	2.1	65.5	74	8.5	PK
	V	2707.5	42.0	2.1	44.1	54	9.9	AV
	V	3610	59.8	3.5	63.3	74	10.7	PK
	V	3610	39.3	3.5	42.8	54	11.2	AV
	H	10000	31.7	18.9	50.6	54(Note 4)	3.4	PK
26	V	1830	68.2	-0.3	67.9	74	6.1	PK
	V	1830	48.6	-0.3	48.3	54	5.7	AV
	V	2745	62.6	2.8	65.4	74	8.6	PK
	V	2745	44.0	2.1	46.1	54	7.9	AV
	V	3660	58.6	3.5	62.1	74	11.9	PK
	V	3660	39.9	3.5	43.4	54	10.6	AV
	H	10000	31.7	18.9	50.6	54(Note 4)	3.4	PK
51	V	1855	66.5	-0.3	66.2	74	7.8	PK
	V	1855	46.2	-0.3	45.9	54	8.1	AV
	V	2782.5	62.1	2.3	64.4	74	9.6	PK
	V	2782.5	39.2	2.3	41.5	54	12.5	AV
	V	3710	60.9	3.8	64.7	74	9.3	PK
	V	3710	39.4	3.8	43.2	54	10.8	AV
	H	10000	31.7	18.9	50.6	54(Note 4)	3.4	PK

Note: 1. Measure Level = Reading Level + Factor.
2. The test results which are attenuated more than 20 dB below the permissible value limit , therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
Remark: RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value
4. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to C63.10 -2013,The EUT was directly connected to the power meter / spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Use the wideband power meter to test peak power and record the result.

LIMIT

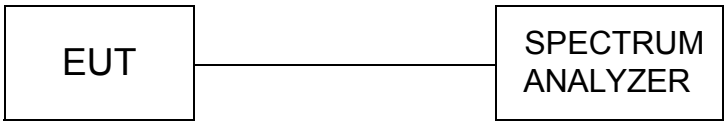
The Maximum Peak Output Power Measurement limit is 30dBm.

TEST RESULTS

Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
902.5	24.82	30	PASS
915.0	23.28	30	PASS
927.5	23.86	30	PASS

4.4. 20dB Bandwidth

TEST CONFIGURATION



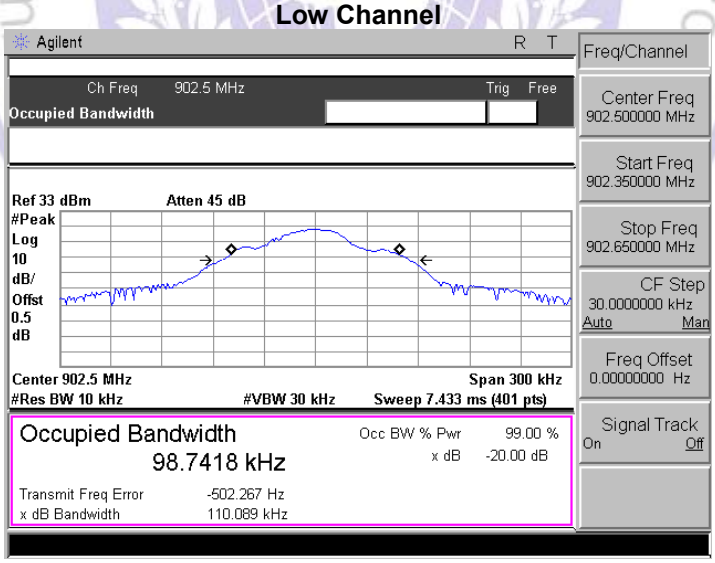
TEST PROCEDURE

According to ANSI C63.10: 2013.
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel
RBW ≧ 1% of the 20dB bandwidth, VBW ≧ RBW, Sweep = auto, Detector function = peak, Trace = max hold
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize.
Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

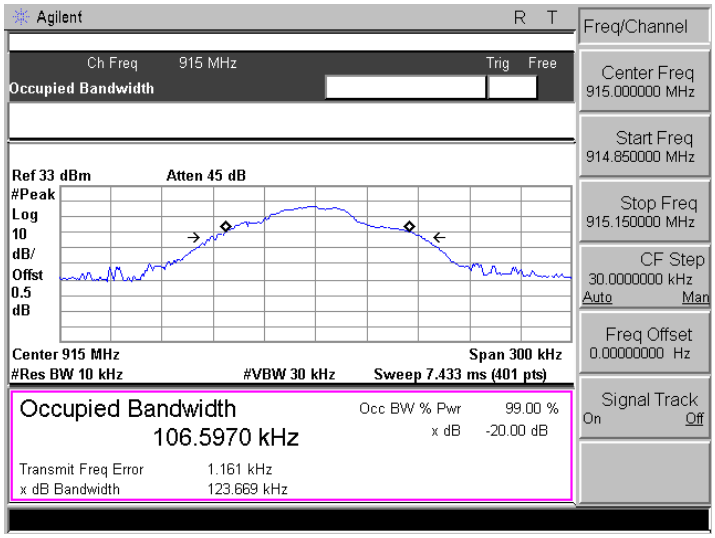
TEST RESULTS

CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (KHz)	LIMIT (KHz)	PASS/FAIL
902.5	110.089	/	PASS
915.0	123.669	/	PASS
927.5	104.413	/	PASS

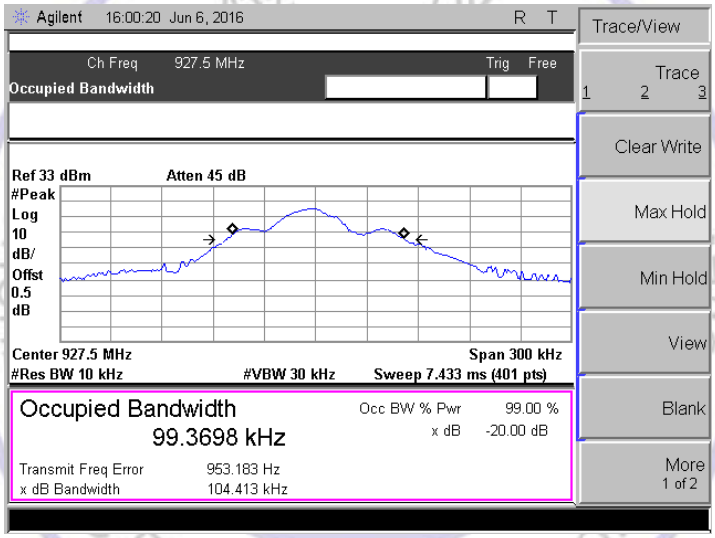
Low Channel



Middle Channel

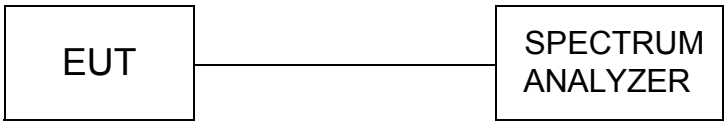


High Channel



4.5. Frequency Separation

TEST CONFIGURATION



TEST PROCEDURE

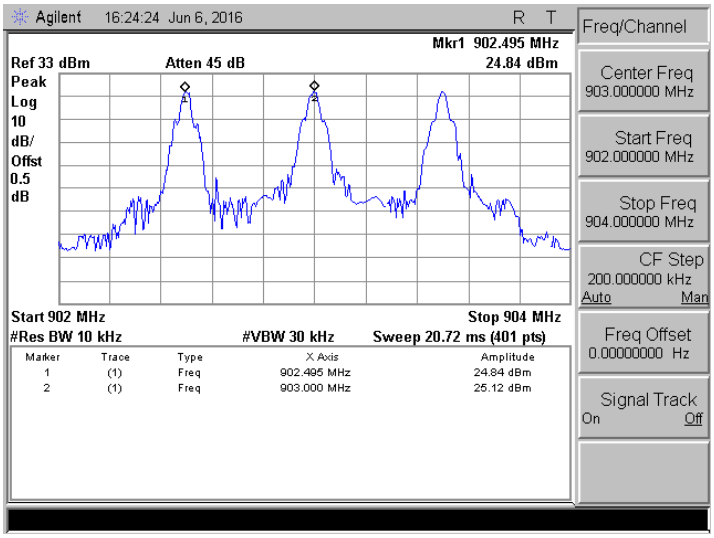
According to ANSI C63.10: 2013.
The EUT must have its hopping function enabled.
Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≧ 1% of the span
Video (or Average) Bandwidth VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

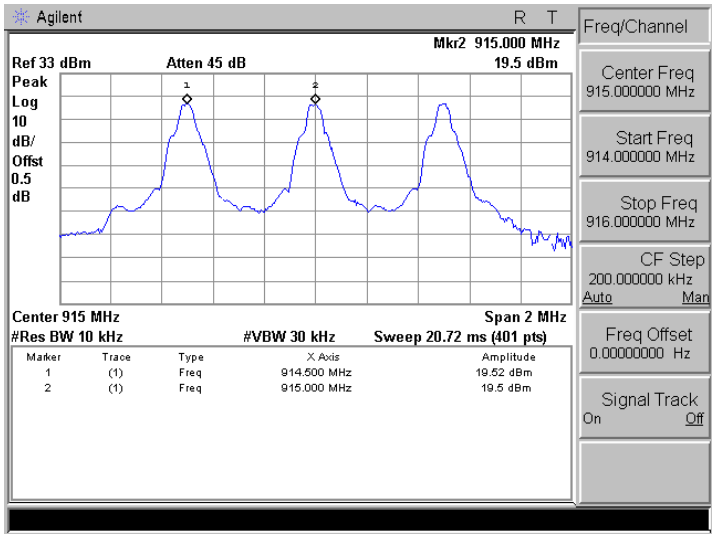
LIMIT

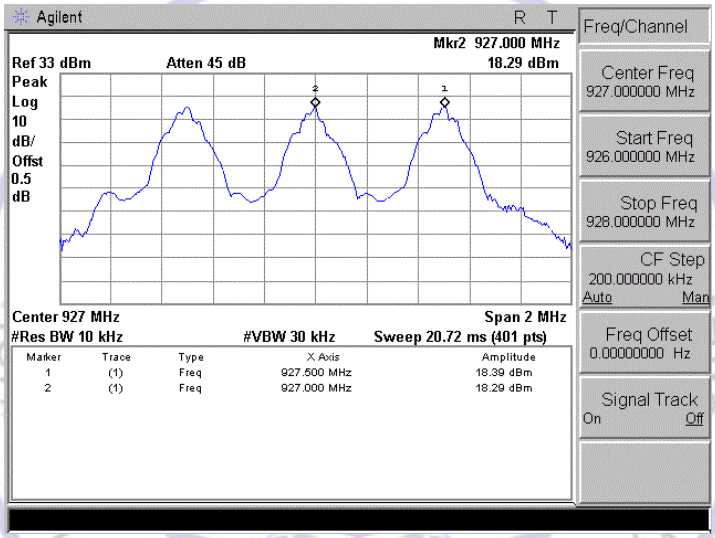
Per 15.247 (a)(1) At least 25 KHz or 20 dB bandwidth of the hopping Channel, whichever is greater

TEST RESULTS

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	902.5	0.505	0.025MHz or 20dB bandwidth	Pass
Adjacency Channel	903.0			
Middle Channel	915.0	0.500	0.025MHz or 20dB bandwidth	Pass
Adjacency Channel	914.5			
High Channel	927.5	0.500	0.025MHz or 20dB bandwidth	Pass
Adjacency Channel	927.0			

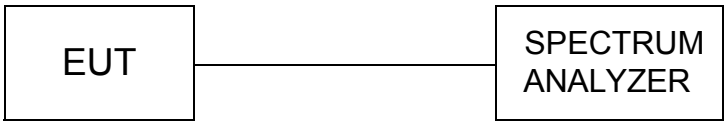






4.6. Number of hopping frequency

TEST CONFIGURATION



TEST PROCEDURE

According to ANSI C63.10: 2013.
The EUT must have its hopping function enabled.
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
Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

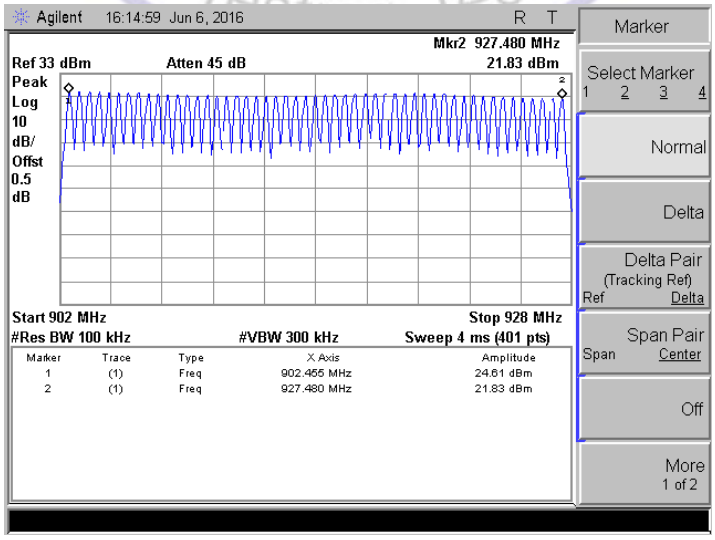
LIMIT

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

TEST RESULTS

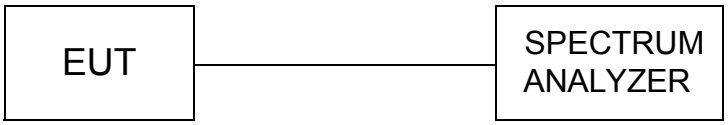
Hopping Channel Frequency Range (MHz)	Number of Hopping Channel	Limit
902-928	51	≥15

Photos of Number of hopping channel Measurement



4.7. Time Of Occupancy(Dwell Time)

TEST CONFIGURATION



TEST PROCEDURE

According to ANSI C63.10: 2013.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1MHz

VBW ≧ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

LIMIT

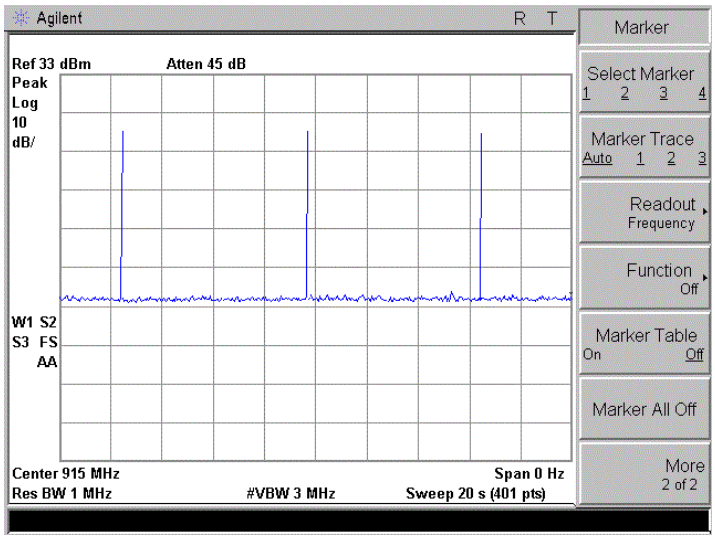
if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period

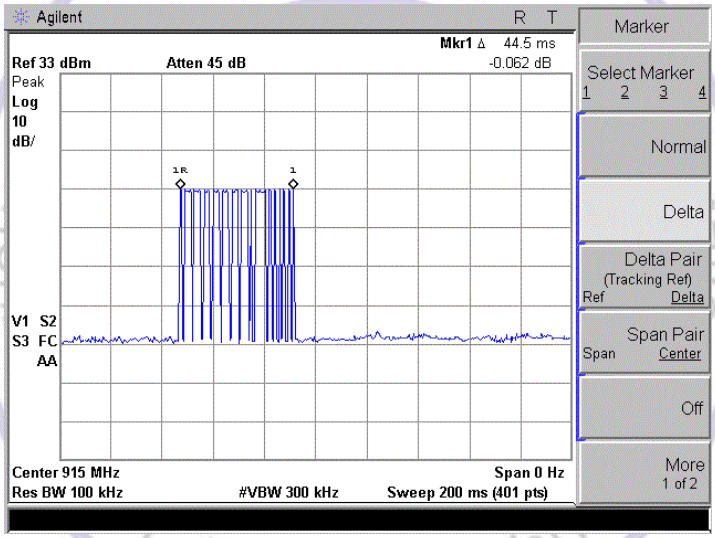
TEST RESULTS

Frequency (MHz)	No. of burst	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
915	3	44.5	133.5	400	Pass

Dwell Time= No. of burst* Pulse Width

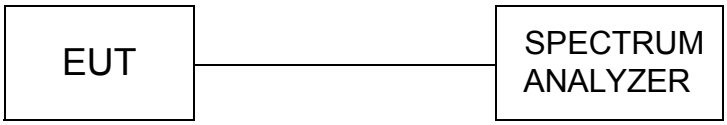
Photos of Dwell Time Measurement：





4.8. Spurious RF Conducted Emissions and bandedge

TEST CONFIGURATION



TEST PROCEDURE

According to ANSI C63.10: 2013.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100KHz, VBW ≧ RBW, Sweep =auto, Detector function = peak, Trace = max hold

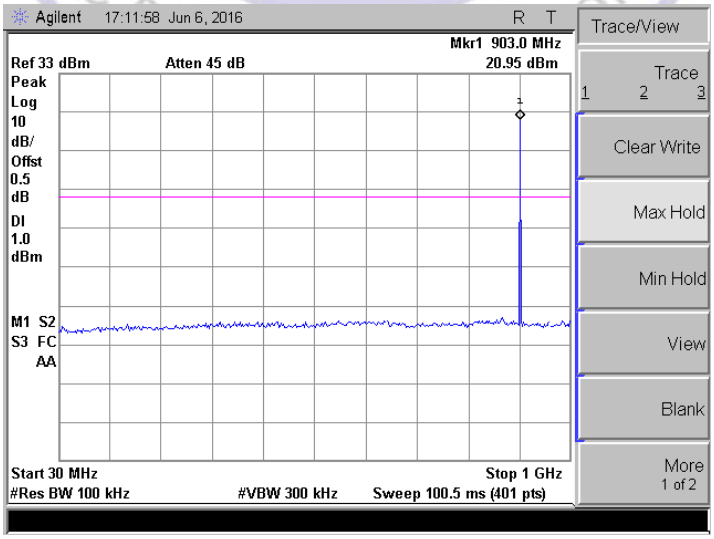
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

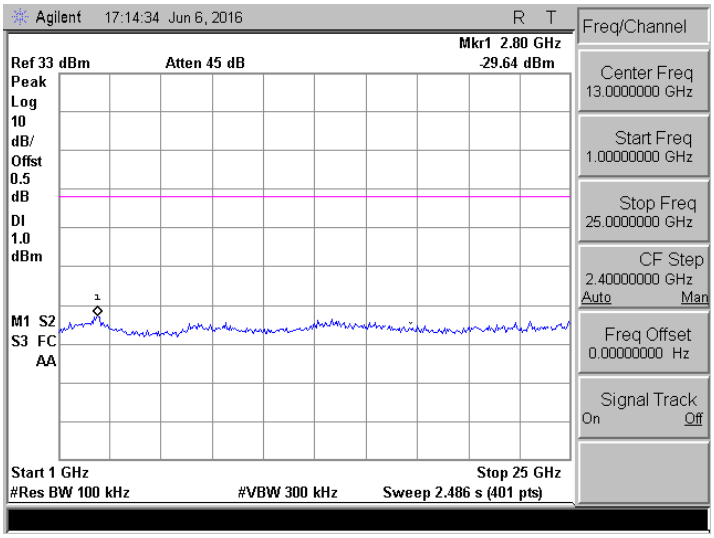
LIMIT

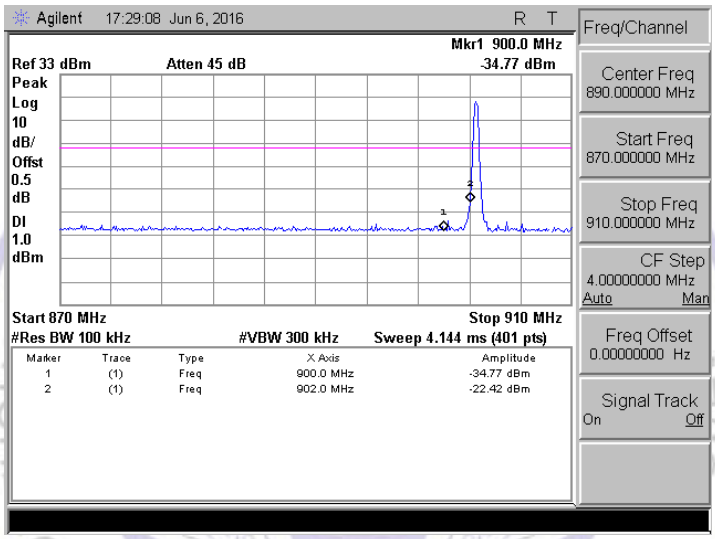
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

TEST RESULT

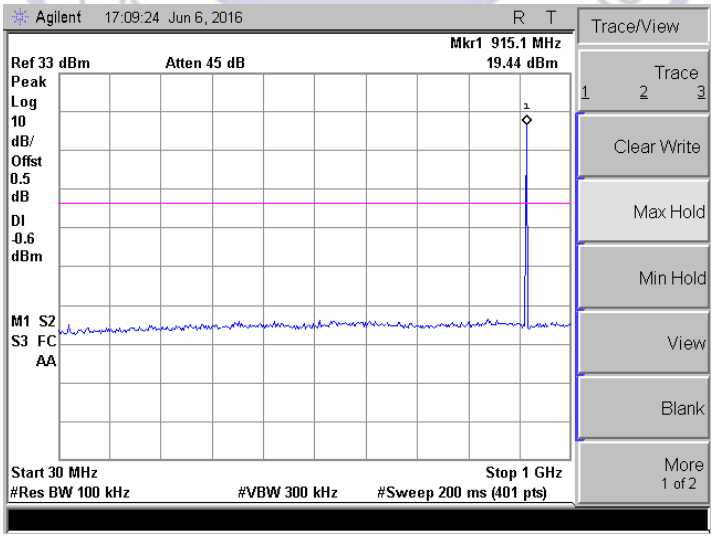
Low Channel

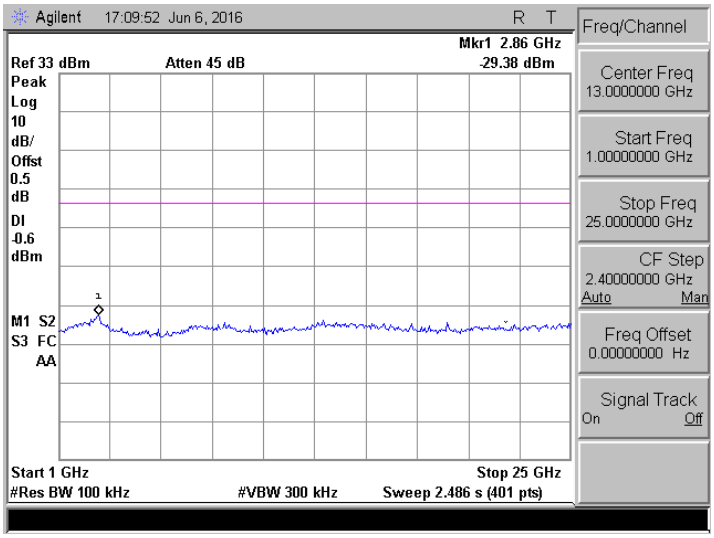




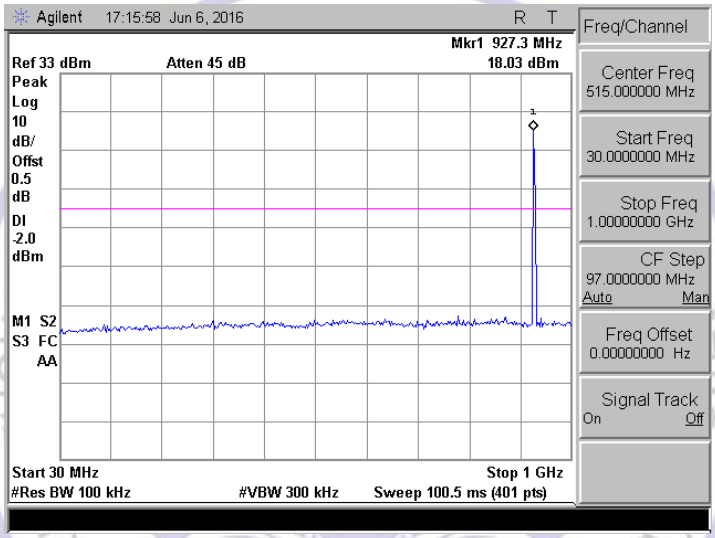


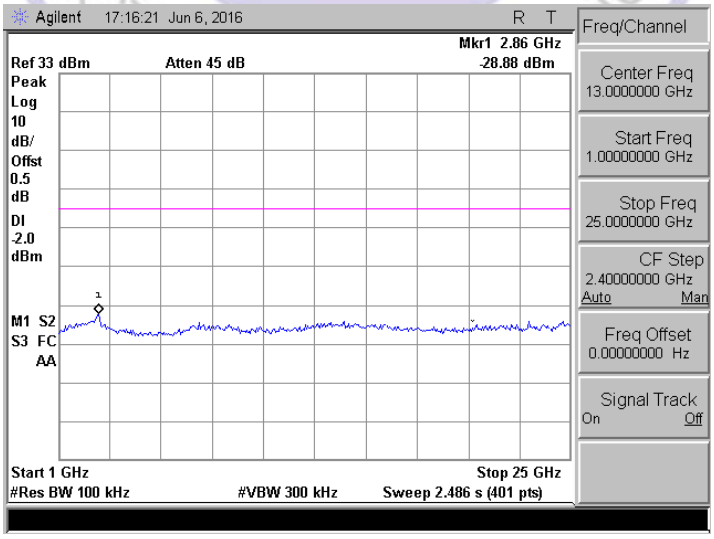
Middle Channel

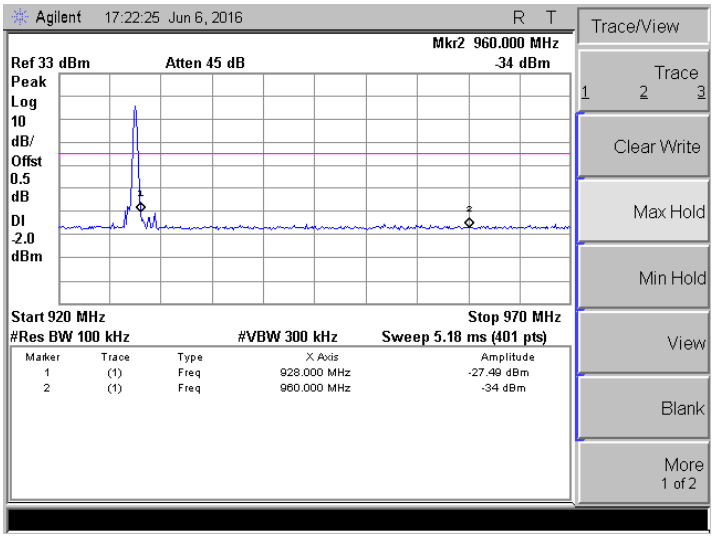




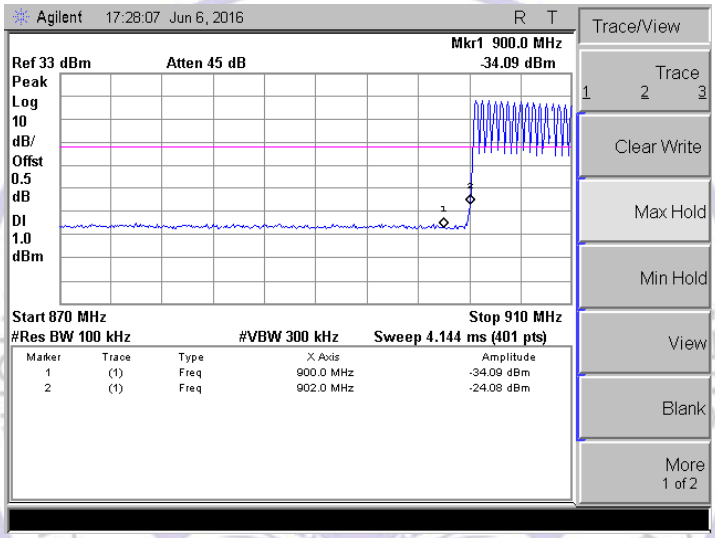
High Channel

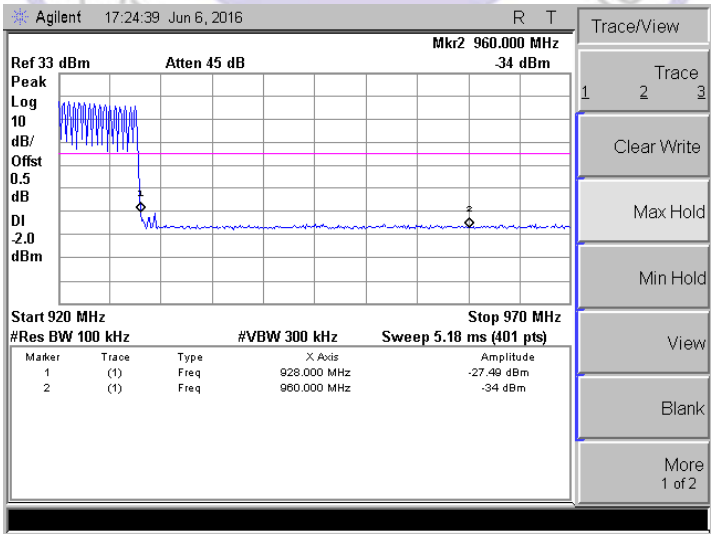






Hopping Mode





4.9. Antenna Requirement

Standard Applicable

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 (c), 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.

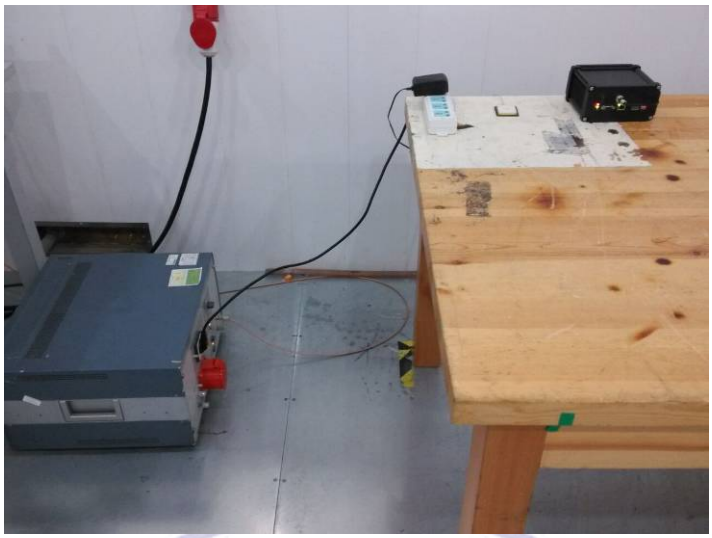
Refer to statement below for compliance.

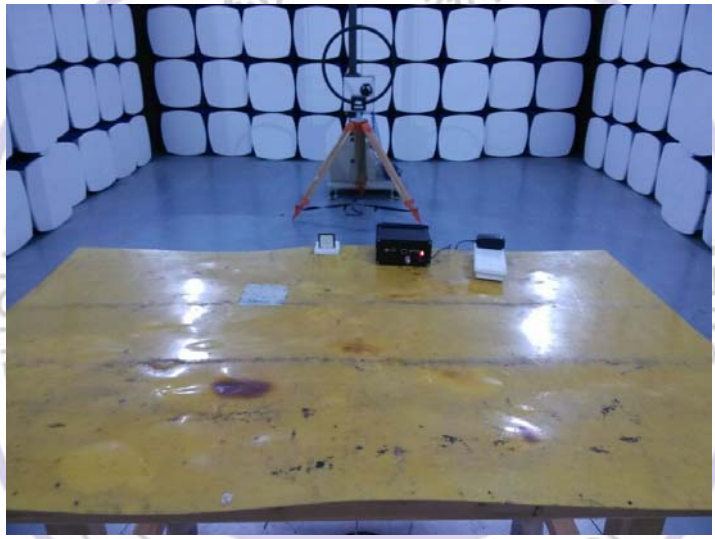
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

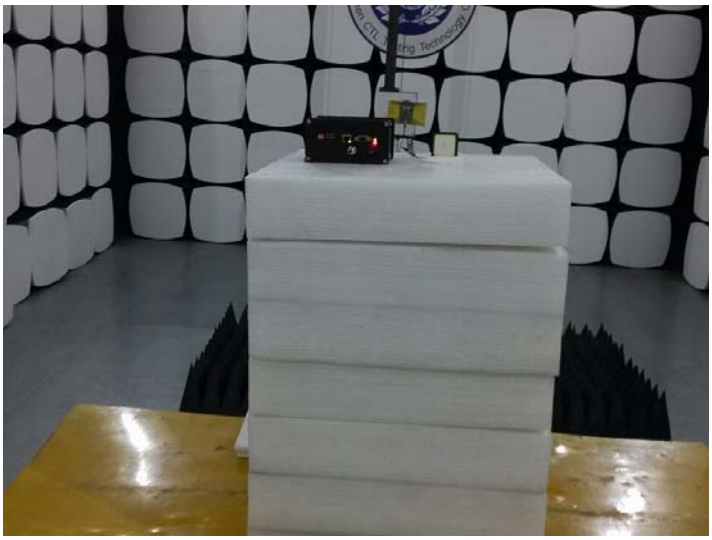
Antenna Connected Construction

The antenna used in this product is external unstandard Antenna , The directional gains of antenna used for transmitting is 2 dBi.

5. Test Setup Photos of the EUT

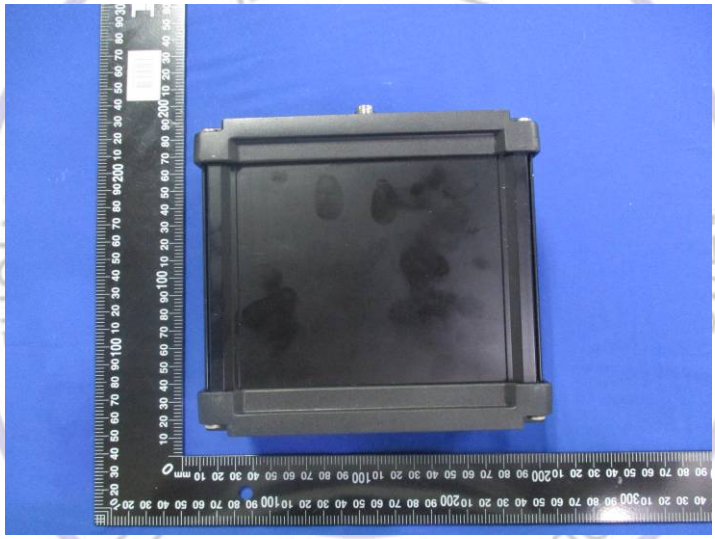




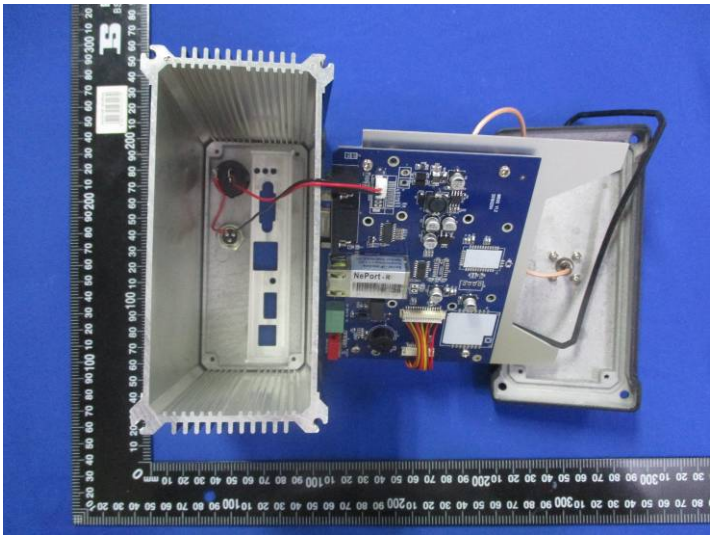


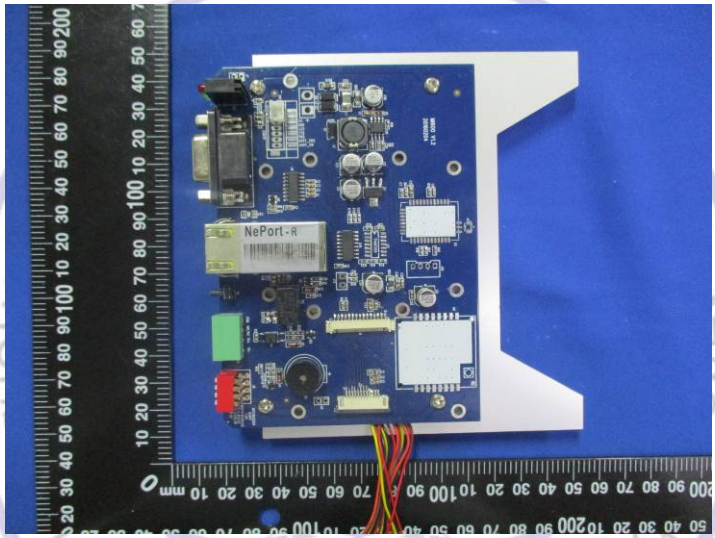
6. External and Internal Photos of the EUT

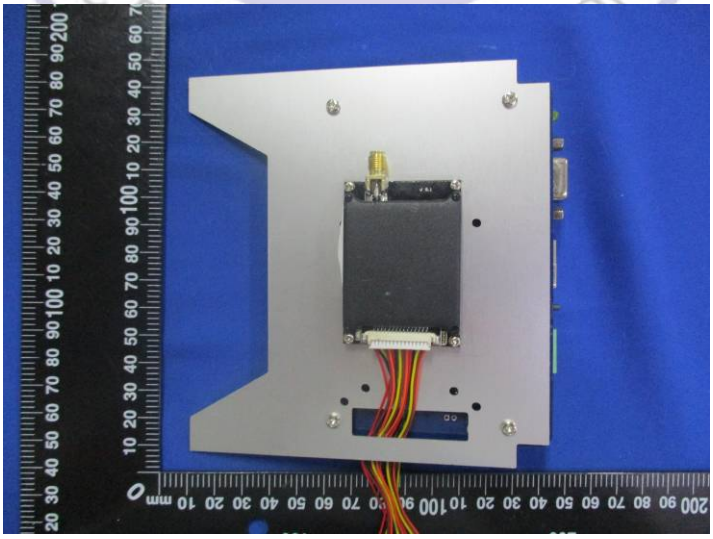
External Photos of EUT

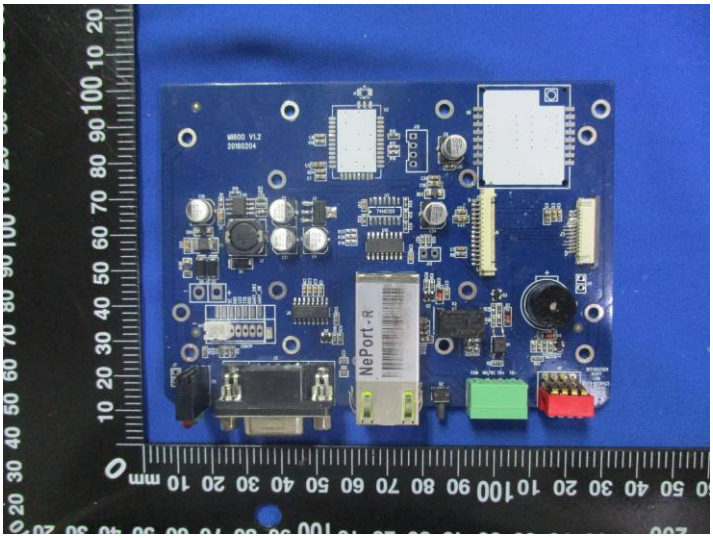


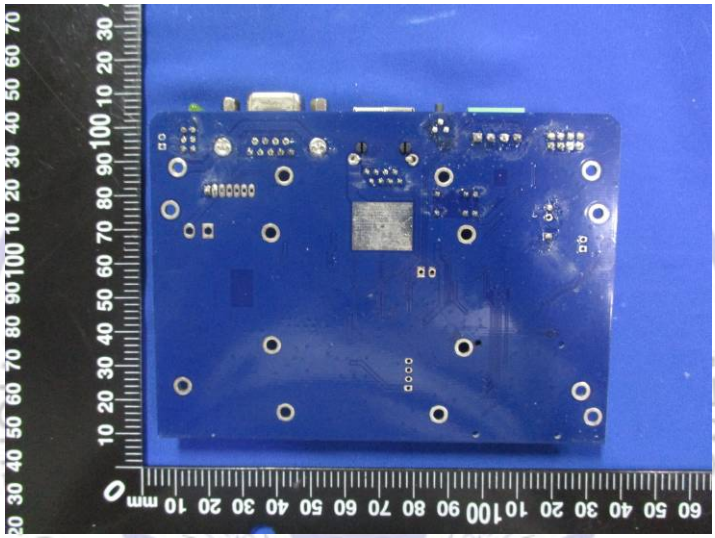
Internal Photos of EUT

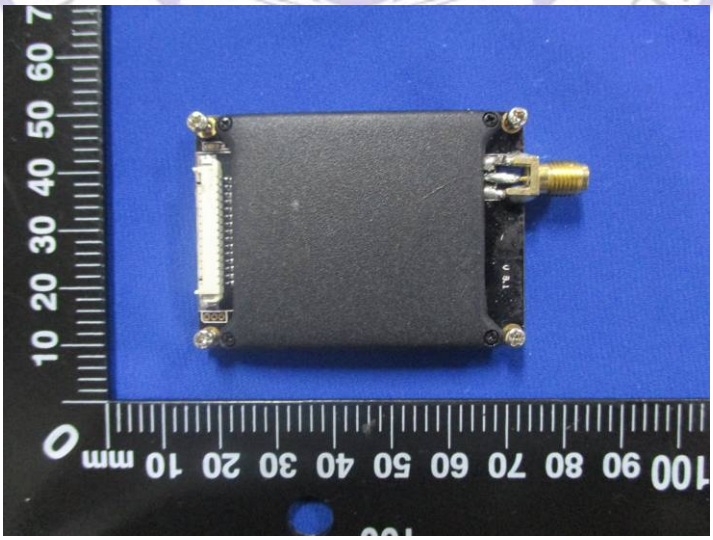


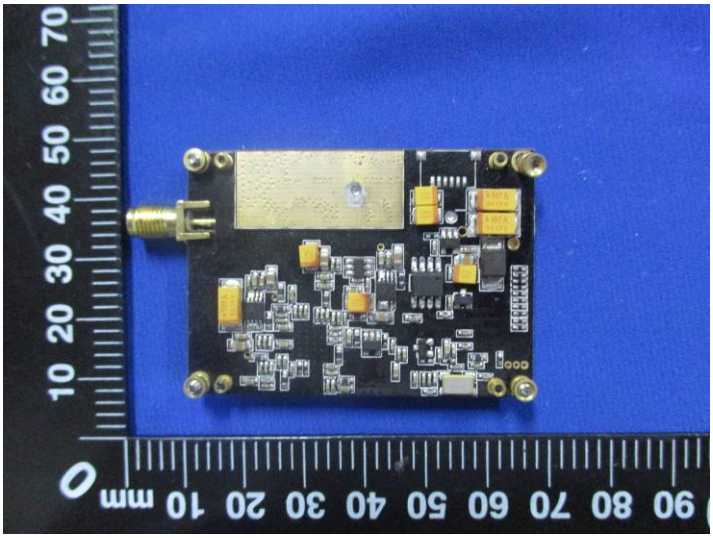


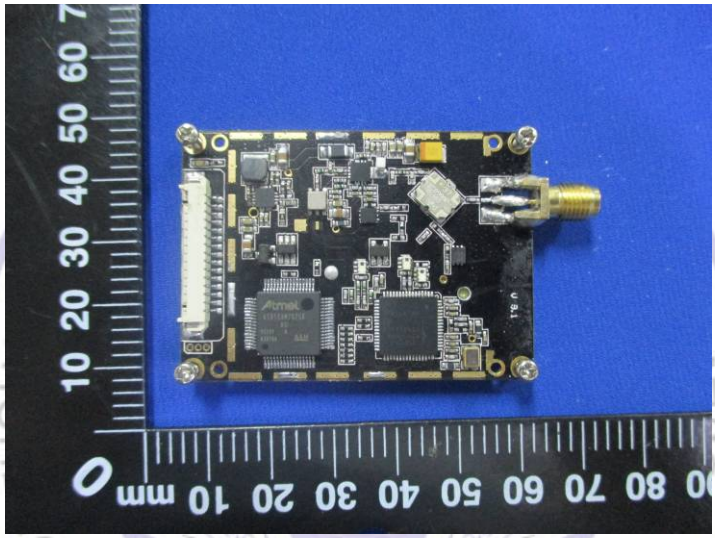



NePort-R

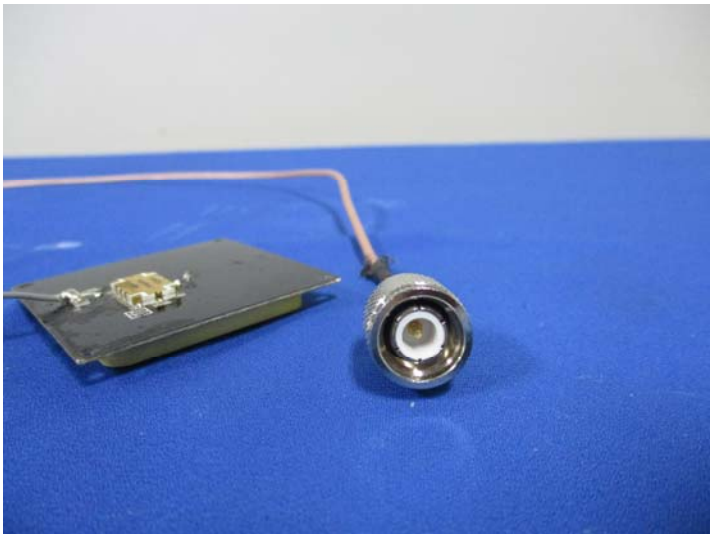








Antenna



AC/DC adapter

.....End of Report.....