FCC Test Report

Report No.: AGC00210190532FE03

FCC ID	:	2AFDGBS012
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Barcode Scanner
BRAND NAME	:	HOOTOO
MODEL NAME	:	HT-BS012, FG-WX2106
APPLICANT	:	SUNVALLEYTEK INTERNATIONAL, INC.
DATE OF ISSUE	:	Jun. 21, 2019
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 21, 2019	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	SUNVALLEYTEK INTERNATIONAL, INC.
Address	46724 Lakeview Blvd, Fremont, CA 94538
manufacturer	Shenzhen NearbyExpress Technology Development Company Limited
Address	333 Bulong Road, Jialianda Industrial Park, Building 1, Bantian, Longgang District, Shenzhen, China
Factory	Farsun Photoelectric Science Technologies Co., Ltd
Address	NO.6 Heng Hui Road, San Zao Town, Jin Wan District, Zhuhai, Guangdong
Product Designation	Barcode Scanner
Brand Name	HOOTOO
Test Model	HT-BS012
Series Model	FG-WX2106
Model Difference	All the same except for the structure and color of the shell.
Date of test	Jun. 11, 2019 to Jun. 21, 2019
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Tested By Draven Li

Draven Li(Li Ming Liang) Jun. 21, 2019

Reviewed By Max Zhang

Max Zhang(Zhang Yi) Jun. 21, 2019

Approved By Forrest Lei

Forrest Lei(Lei Yonggang)
Authorized Officer Jun. 21, 2019

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2.40865 GHz to 2.43265GHz
Maximum field strength	91.44dBuV/m(AVG)@3m
Modulation	MSK
Number of channels	4
Antenna Gain	1.2dBi
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)
Hardware Version	FG-WX2106
Software Version	V1.0
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCY

EUT Channel List

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	01	2408.65MHZ
	02	2416.65MHZ
	03	2424.65MHz
	04	2432.65MHZ

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel MSK
2	Middle channel MSK
3	High channel MSK

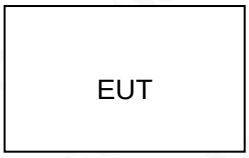
Note:

1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

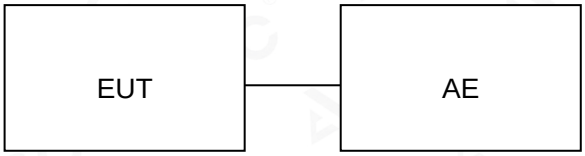
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure :



Conducted Emission Configure:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Barcode Scanner	HT-BS012	2AFDGBS012	EUT
2	Adapter	KUANTEN	KT05W050100USU	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 10, 2019	Jun. 09, 2020
LISN	R&S	ESH2-Z5	100086	Aug. 28, 2018	Aug. 27, 2019

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 10, 2019	Jun. 09, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	Micro-tronics	087	N/A	Jun. 10, 2019	Jun. 09, 2020
Attenuator	Weinachel Corp	58-30-33	N/A	Jun. 10, 2019	Jun. 09, 2020
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

7. RADIATED EMISSION

7.1TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use minimum resolution bandwidth of 1 MHz. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

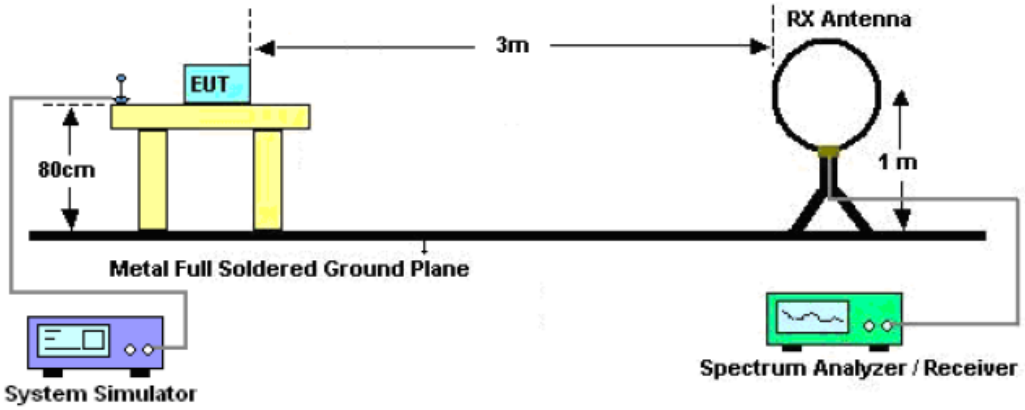
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz RBW 1.5MHz/ VBW 5MHz for Peak, RBW 1.5MHz/10Hz for Average

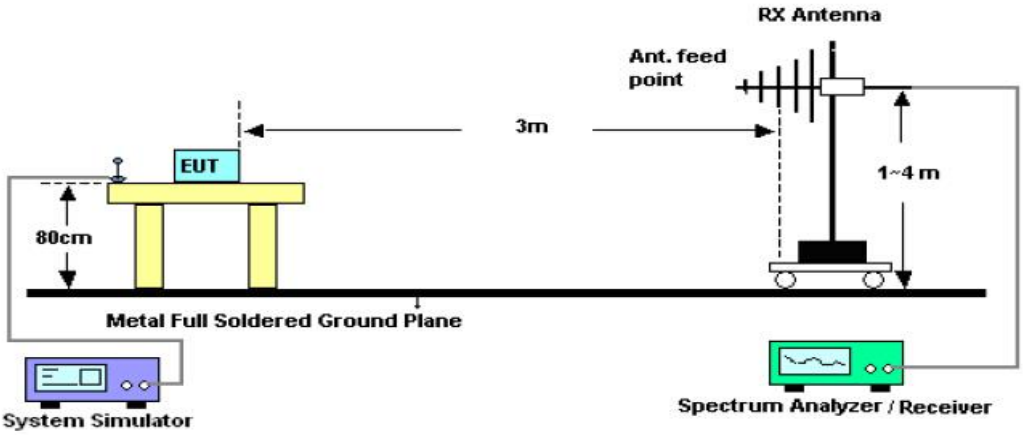
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

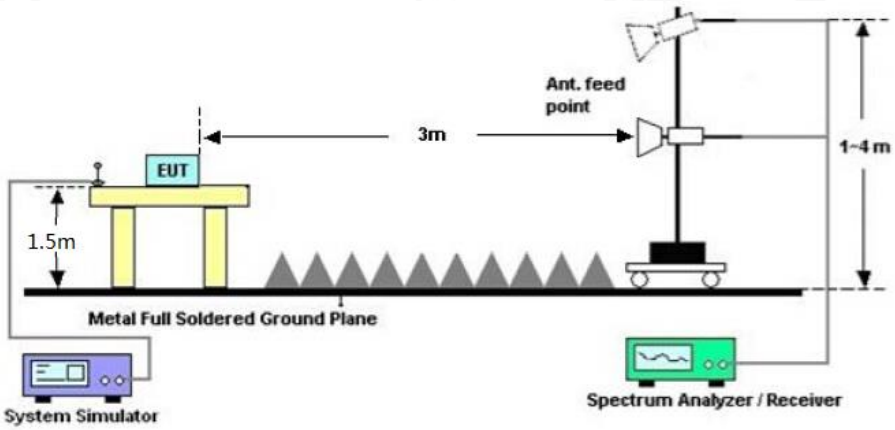
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



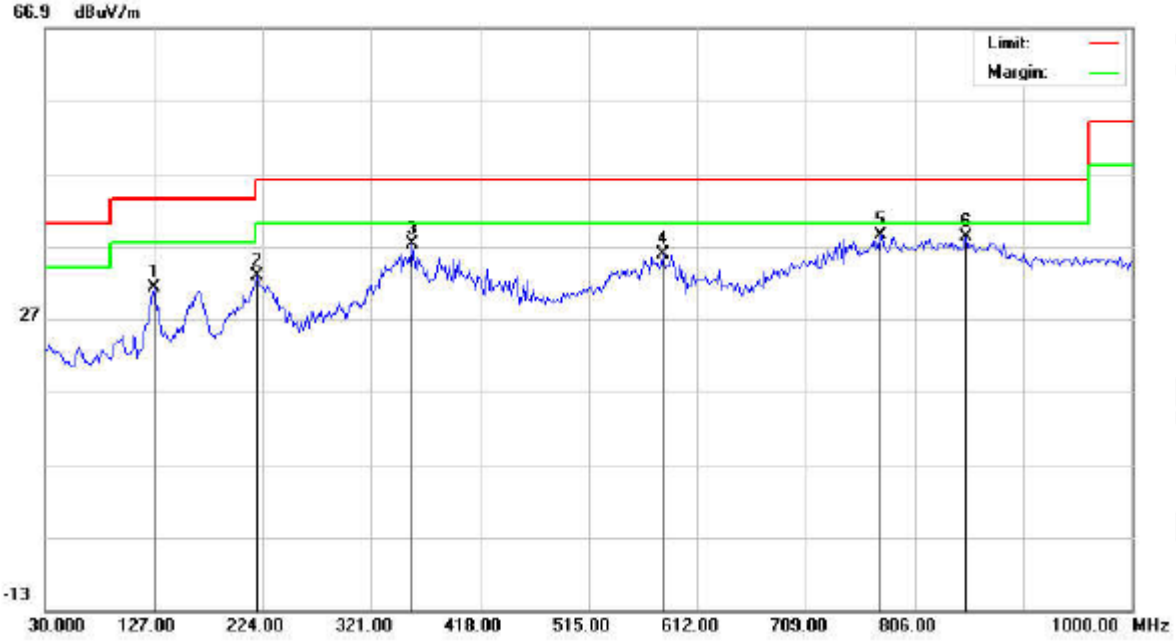
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

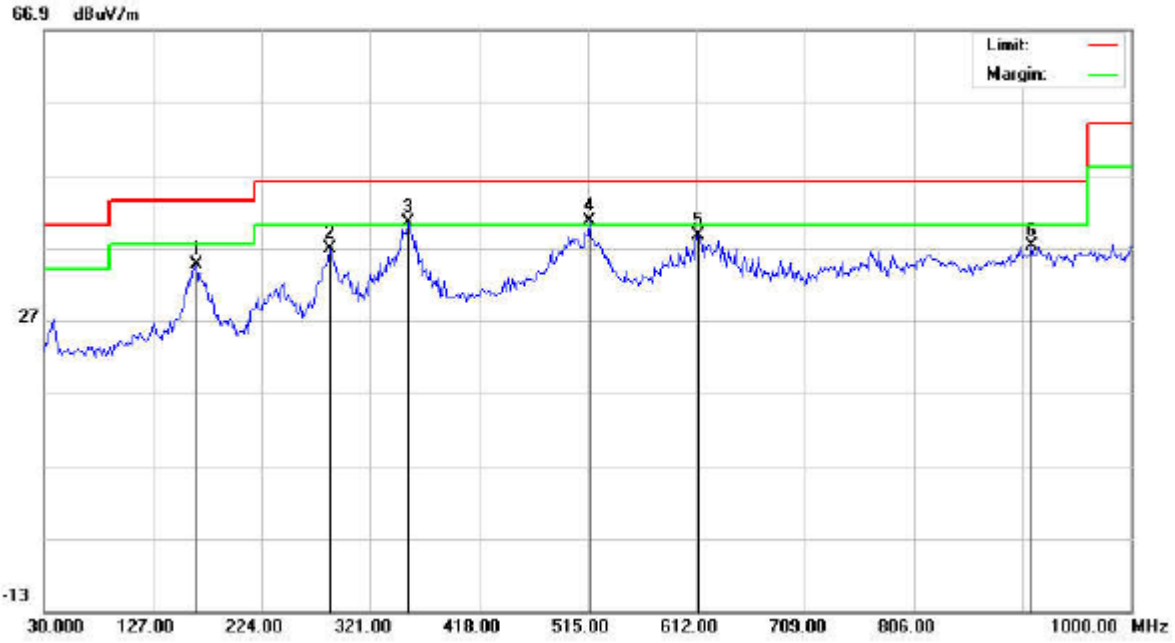
RADIATED EMISSION 30MHz- 1GHZ FOR BLE

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		127.0000	12.81	18.41	31.22	43.50	-12.28	peak			
2		219.1499	15.67	17.19	32.86	46.00	-13.14	peak			
3		358.1831	15.65	21.51	37.16	46.00	-8.84	peak			
4		581.2833	9.27	26.58	35.85	46.00	-10.15	peak			
5	*	775.2833	8.64	29.85	38.49	46.00	-7.51	peak			
6		851.2667	7.07	31.07	38.14	46.00	-7.86	peak			

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Vertical



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		165.8000	16.03	18.59	34.62	43.50	-8.88	peak			
2		285.4331	17.04	19.81	36.85	46.00	-9.15	peak			
3	!	354.9500	19.03	21.40	40.43	46.00	-5.57	peak			
4	*	516.6165	15.37	25.32	40.69	46.00	-5.31	peak			
5		613.6165	11.57	27.11	38.68	46.00	-7.32	peak			
6		911.0833	5.32	31.80	37.12	46.00	-8.88	peak			

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

The mode 1 is the worst case, and only the data of the worst case recorded in this test report.

FIELD STRENGTH OF FUNDAMENTAL FOR BLE

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK for BLE	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2408.65	47.30	49.05	96.35	114.00	-17.65	peak
2408.65	42.39	49.05	91.44	94.00	-2.56	AVG
2424.65	46.29	49.12	95.41	114.00	-18.59	peak
2424.65	41.63	49.12	90.75	94.00	-3.25	AVG
2432.65	47.16	49.25	96.41	114.00	-17.59	peak
2432.65	41.77	49.25	91.02	94.00	-2.98	AVG
Remark:						
Factor = Antenna Factor + Cable Loss						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK for BLE	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2408.65	45.50	49.05	94.55	114.00	-19.45	peak
2408.65	40.21	49.05	89.26	94.00	-4.74	AVG
2424.65	44.89	49.12	94.01	114.00	-19.99	peak
2424.65	39.61	49.12	88.73	94.00	-5.27	AVG
2432.65	45.10	49.25	94.35	114.00	-19.65	peak
2432.65	40.01	49.25	89.26	94.00	-4.74	AVG
Remark:						
Factor = Antenna Factor + Cable Loss						

RADIATED EMISSION ABOVE 1GHZ FOR BLE

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4817.3	51.63	0.08	51.71	74.00	-22.29	peak
4817.3	47.96	0.08	48.04	54.00	-5.96	AVG
7225.95	42.84	2.21	45.05	74.00	-28.95	peak
7225.95	39.36	2.21	41.57	54.00	-12.43	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4817.3	53.63	0.08	53.71	74.00	-20.29	peak
4817.3	46.96	0.08	47.04	54.00	-6.96	AVG
7225.95	43.80	2.21	46.01	74.00	-28.00	peak
7225.95	42.44	2.21	44.65	54.00	-9.35	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4849.3	51.57	0.14	51.71	74.00	-22.29	peak
4849.3	46.91	0.14	47.05	54.00	-6.95	AVG
7273.95	46.64	2.36	49.00	74.00	-25.00	peak
7273.95	44.34	2.36	46.70	54.00	-7.30	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4849.3	51.33	0.14	51.47	74.00	-22.53	peak
4849.3	48.44	0.14	48.58	54.00	-5.42	AVG
7273.95	46.69	2.36	49.05	74.00	-24.96	peak
7273.95	43.64	2.36	46.00	54.00	-8.00	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 3	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4865.3	51.50	0.22	51.72	74.00	-22.28	peak
4865.3	47.83	0.22	48.05	54.00	-5.95	AVG
7297.95	45.34	2.64	47.98	74.00	-26.02	peak
7297.95	42.86	2.64	45.50	54.00	-8.50	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4865.3	50.25	0.22	50.47	74.00	-23.53	peak
4865.3	48.29	0.22	48.51	54.00	-5.49	AVG
7297.95	44.76	2.64	47.40	74.00	-26.60	peak
7297.95	41.91	2.64	44.55	54.00	-9.45	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: Other emissions from 8G to 25 GHz are considered as ambient noise. No recording in the test report.
Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
The “Factor” value can be calculated automatically by software of measurement system.

8. BAND EDGE EMISSION

8.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

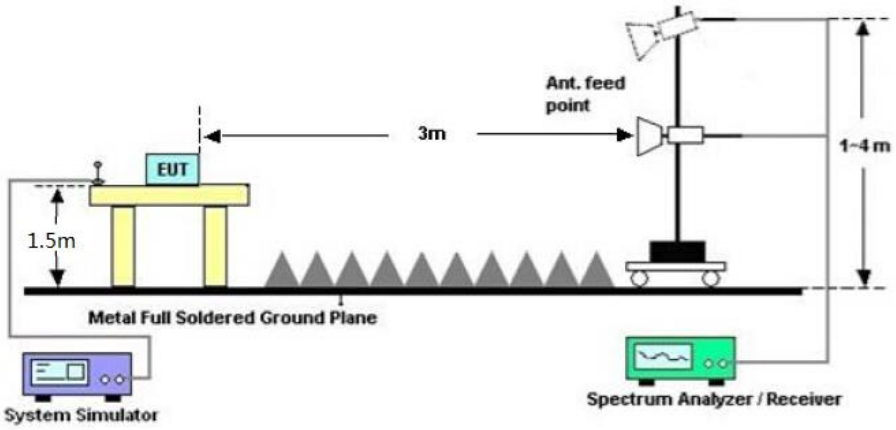
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz ; VBW=3MHz / Sweep=AUTO

3. Other procedures refer to clause 7.2.

8.2 TEST SETUP

RADIATED EMISSION TEST SETUP



8.3 RADIATED TEST RESULT

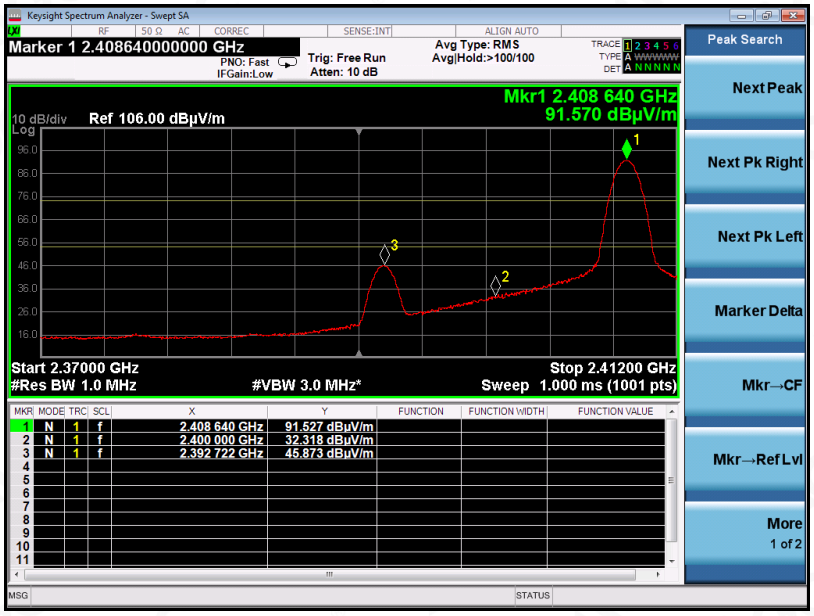
Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 1	Polarization：	Horizontal

PK Value

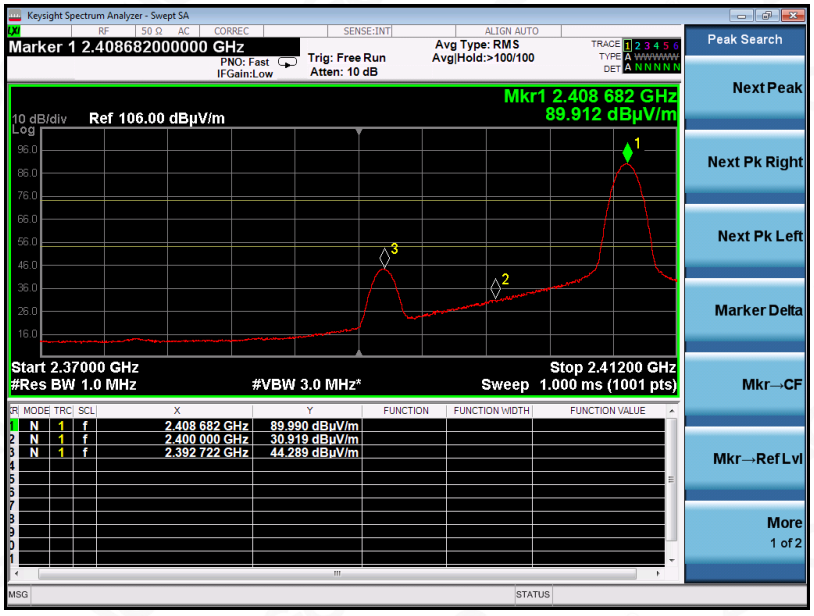
AV Value



EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 1	Polarization：	Vertical

PK Value

AV Value



EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 3	Polarization：	Horizontal

PK Value

AV Value

EUT：	Barcode Scanner	Model Name. ：	HT-BS012
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC120V
Test Mode ：	Mode 3	Polarization：	Vertical

PK Value

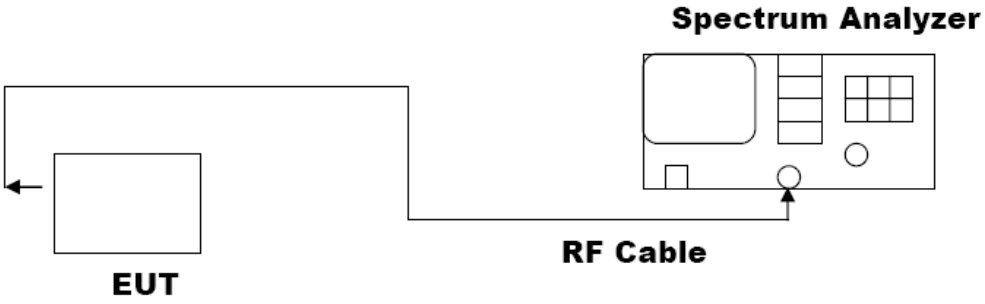
AV Value

9. 20DB BANDWIDTH

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 30 KHz, VBW≥3×RBW.
4. Set SPA Trace 1 Max hold, then View.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

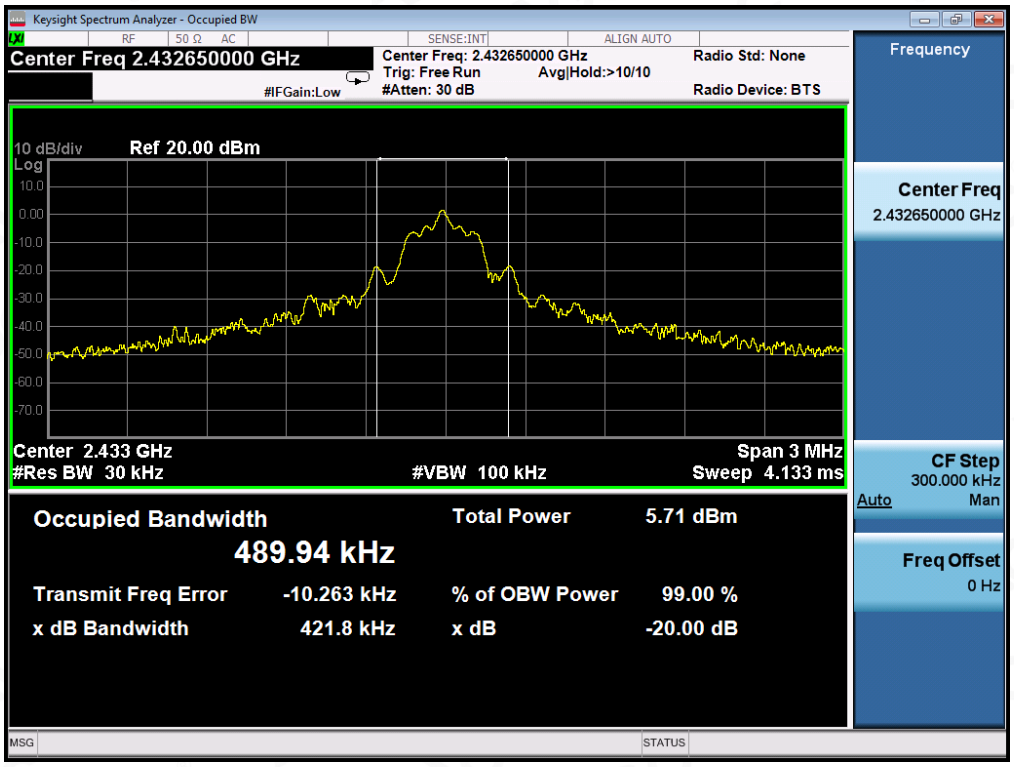


9.3. MEASUREMENT RESULTS

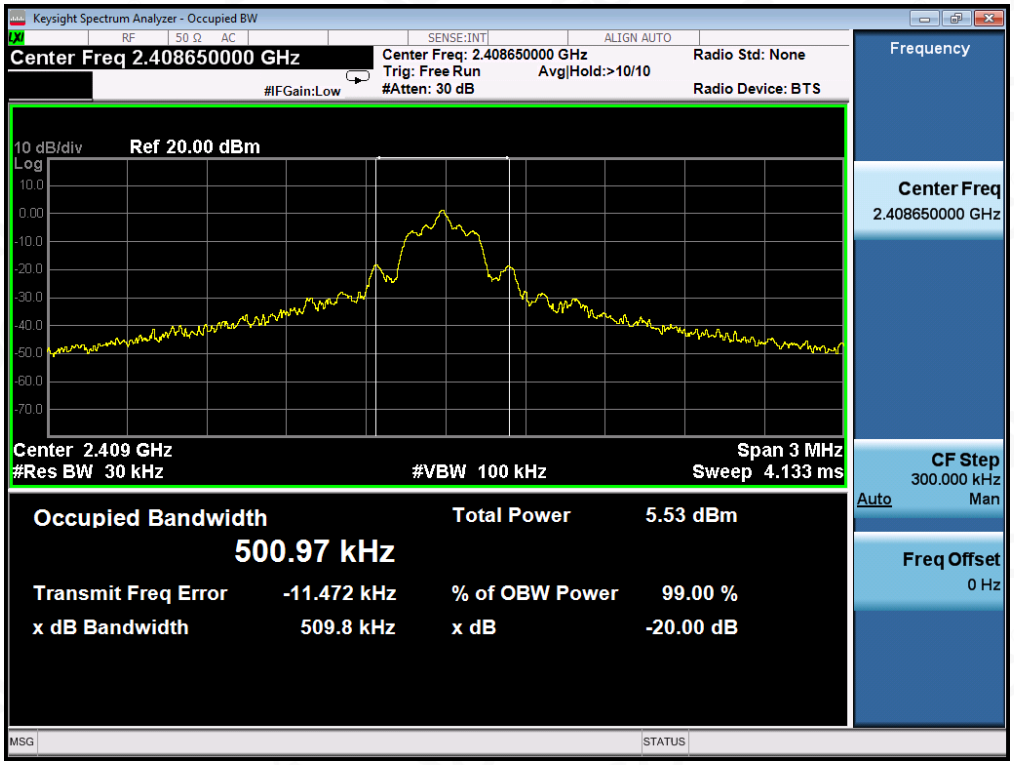
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	MSK for EUT

Test Data (MHz)		Criteria
Low Channel	0.4218	PASS
Middle Channel	0.5098	PASS
High Channel	0.5143	PASS

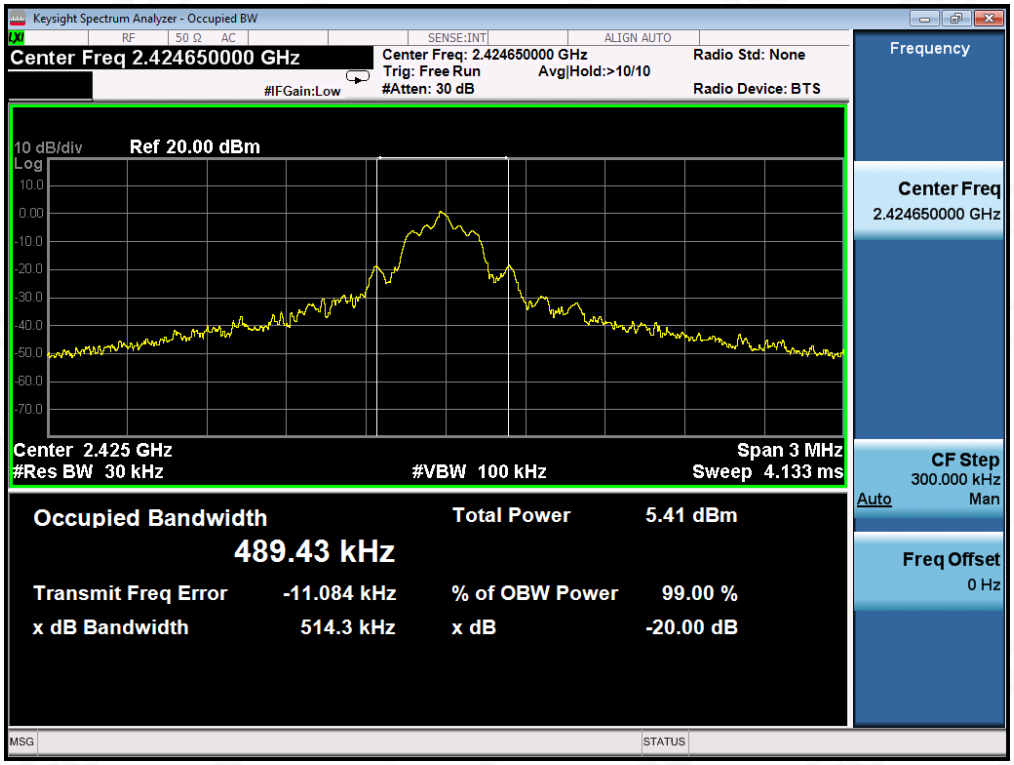
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



10. FCC LINE CONDUCTED EMISSION TEST

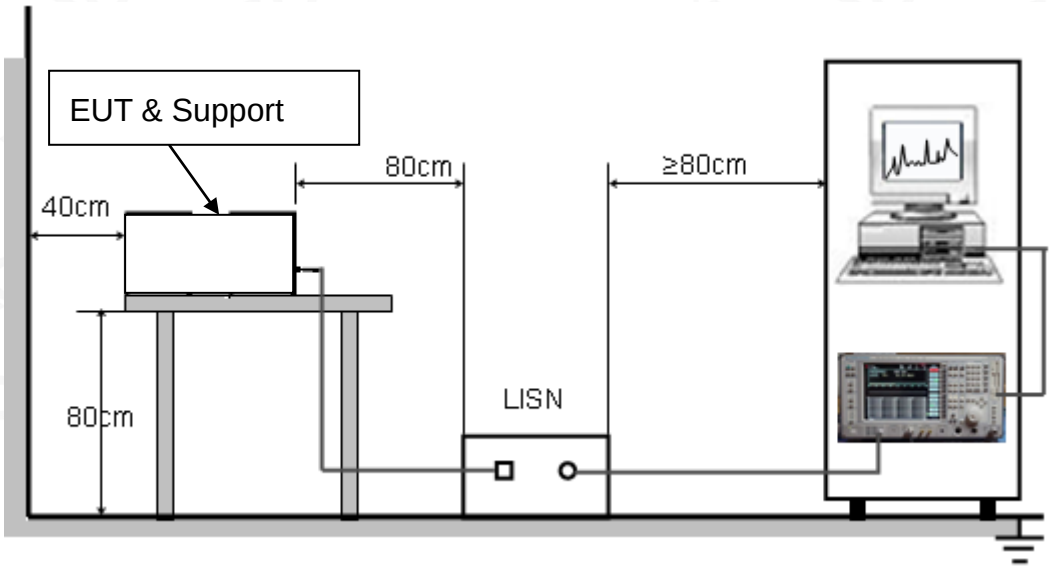
10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When 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 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. The 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.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.