gobandit GmbH

Sport Camera

Main Model: gobandit LIVE GBZ0500
Serial Model: N/A

14th June, 2012
Report No.: 12070058-FCC-R2
(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
Back Huang	Alex Liu	
Back Huang **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report

To: FCC Part 15.249: 2012

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Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
Hong Kong	OFTA (US002)	RF , Telecom

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CONTENTS

1 EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programme was to demonstrate compliance of the gobandit GmbH, Sport Camera and model: gobandit LIVE GBZ0500 against the current Stipulated Standards. The Sport Camera has demonstrated compliance with the FCC 15.249: 2012.

EUT Information

EUT Description	:	**Sport Camera**
Main Model	:	**gobandit LIVE GBZ0500**
Serial Model	:	**N/A**
Antenna Gain	:	**WIFI: 2 dBi** **ANT+: 2 dBi** **GPS: 2 dBi**
Input Power	:	**LITHIUM ION BATTERY PACK** **MODEL NO.:CB-PB(NP60)** **3.7V 1200mAh 4.44Wh**
Classification Per Stipulated Test Standard	:	**FCC 15.249: 2012**

2 TECHNICAL DETAILS

Purpose	**Compliance testing of Sport Camera with stipulated standard**
Applicant / Client	**gobandit GmbH Max-Planck-Strasse 4, D-85609 Aschheim/Dornach, Germany**
Manufacturer	**AIPTEK Technology (Wu Jiang) Co., Ltd. NO.518 Yun Li Road, TongLi Town , WuJiang City , China**
Laboratory performing the tests	**SIEMIC Laboratories 2206 Ringwood Avenue, San Jose,CA 95131,USA Tel:1(408)526 1188 FAX:1(408)526 1088 Email:info@siemic.com**
Test report reference number	**12070058-FCC-R2**
Date EUT received	**6th April, 2012**
Standard applied	**FCC 15.249: 2012**
Dates of test (from – to)	**11th June, 2012**
No of Units	**#1**
Equipment Category	**DXX**
Trade Name	**gobandit**
RF Operating Frequency (ies)	**WIFI: 802.11b/g : 2412-2462 MHz ANT+: 2401.048-2482.048MHz GPS:1575.42MHz(Rx)**
Number of Channels	**WIFI: 11CH ANT+: 82CH**
Modulation	**WIFI: DSSS/OFDM ANT+: GFSK**
FCC ID	**YJTGBZ005**

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

Spread Spectrum System/Device

Test Results Summary

Test Standard	Description	Pass / Fail
§15.205(a), §15.209(a), §15.249, §15.35.	Radiated Emissions	Pass

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Radiated Emissions

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (3m & 10m) & 1GHz above (3m) is +5.6/-4.5dB.
4. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5. Test date : 11th June, 2012
   Tested By : Back Huang

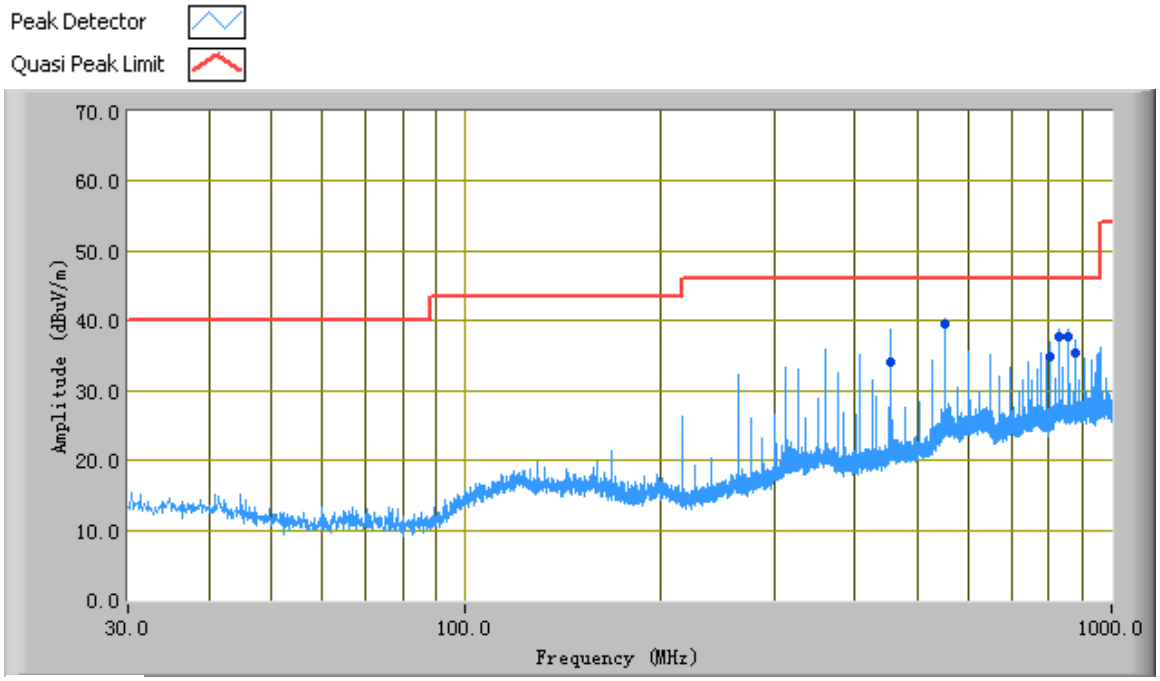
Standard Requirement:

The emissions from the Low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges.

Test Result: Pass

Test Mode:	GFSK Transmitting

Below 1GHz



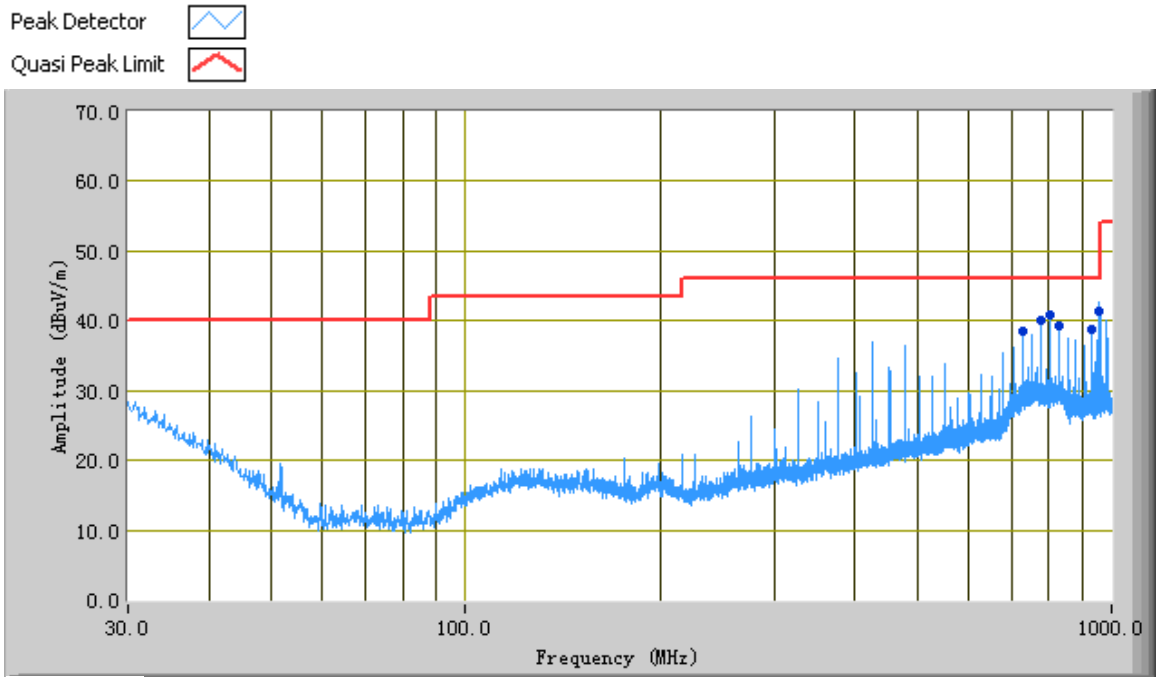
Test Data

Polarity Horizontal

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
551.99	39.70	102.00	H	158.00	-24.91	46.00	-6.30
854.89	37.64	240.00	H	102.00	-21.38	46.00	-8.36
829.75	37.65	67.00	H	102.00	-20.73	46.00	-8.35
455.85	34.04	87.00	H	187.00	-28.81	46.00	-11.96
880.03	35.06	234.00	H	101.00	-21.06	46.00	-10.94
804.56	34.33	137.00	H	371.00	-22.79	46.00	-11.67

Test Mode:	GFSK Transmitting

Below 1GHz



Test Data

Polarity Vertical

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
955.47	41.48	231.00	V	105.00	-20.12	46.00	-4.52
804.61	41.04	220.00	V	134.00	-19.32	46.00	-4.96
779.47	40.15	112.00	V	137.00	-18.42	46.00	-5.85
829.74	49.06	125.00	V	131.00	-18.08	46.00	-6.94
729.17	38.59	197.00	V	152.00	-20.15	46.00	-7.41
930.32	38.78	224.00	V	110.00	-20.19	46.00	-7.22

Test Mode:	GFSK Transmitting

Above 1 GHz

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Result
Low Channel (2401.048 MHz)											
2401.048	93.42	PK	168	1.4	V	28.5	2.0	26.71	97.21	114	pass
2401.048	91.73	PK	154	1.5	H	28.5	2.0	26.71	95.52	114	pass
2401.048	69.40	AV	168	1.4	V	28.5	2.0	26.71	73.19	94	pass
2401.048	67.68	AV	154	1.5	H	28.5	2.0	26.71	71.47	94	pass
Middle Channel (2441.048 MHz)											
2441.048	91.86	PK	165	1.4	V	28.5	2.0	26.71	95.65	114	pass
2441.048	89.39	PK	152	1.5	H	28.5	2.0	26.71	93.18	114	pass
2441.048	67.74	AV	165	1.4	V	28.5	2.0	26.71	71.53	94	pass
2441.048	66.05	AV	152	1.5	H	28.5	2.0	26.71	69.84	94	pass
High Channel (2482.048 MHz)											
2482.048	89.27	PK	168	1.4	V	28.5	2.0	26.71	93.06	114	pass
2482.048	87.25	PK	156	1.5	H	28.5	2.0	26.71	91.04	114	pass
2482.048	65.89	AV	168	1.4	V	28.5	2.0	26.71	69.68	94	pass
2482.048	63.18	AV	156	1.5	H	28.5	2.0	26.71	66.97	94	pass

Spurious Emission:

Low Channel (2401.048 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4802.096	45.21	PK	210	1.1	V	34	2.6	26.79	55.02	74	-18.98
4802.096	45.73	PK	160	1.2	H	33.8	2.6	26.79	55.34	74	-18.66
4802.096	35.06	AV	210	1.1	V	34	2.6	26.79	44.87	54	-9.13
4802.096	35.12	AV	160	1.2	H	33.8	2.6	26.79	44.73	54	-9.27
1453.48	40.34	PK	155	1.2	V	27.5	1.8	26.68	42.96	74	-31.04
1453.48	40.43	PK	212	1.1	H	25.2	1.8	26.68	40.75	74	-33.25
1453.48	33.76	AV	155	1.2	V	27.5	1.8	26.68	36.38	54	-17.62
1453.48	33.63	AV	212	1.1	H	25.2	1.8	26.68	33.95	54	-20.05

Middle Channel (2441.048 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4882.096	44.18	PK	120	1.2	V	33.6	2.6	26.78	53.60	74	-20.40
4882.096	44.02	PK	152	1.1	H	33.8	2.6	26.78	53.64	74	-20.36
4882.096	34.57	AV	120	1.2	V	33.6	2.6	26.78	43.99	54	-10.01
4882.096	34.41	AV	152	1.1	H	33.8	2.6	26.78	44.03	54	-9.97
1443.68	40.68	PK	165	1.1	V	27.4	1.8	26.68	43.20	74	-30.80
1443.68	40.57	PK	218	1.1	H	25.2	1.8	26.68	40.89	74	-33.11
1443.68	33.81	AV	165	1.1	V	27.4	1.8	26.68	36.33	54	-17.67
1443.68	33.74	AV	218	1.1	H	25.2	1.8	26.68	34.06	54	-19.94

High Channel (2482.048 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4964.096	42.84	PK	158	1.1	V	34.6	2.7	26.75	53.39	74	-20.61
4964.096	42.71	PK	150	1.1	H	34.7	2.7	26.75	53.36	74	-20.64
4964.096	33.92	AV	158	1.1	V	34.6	2.7	26.75	44.47	54	-9.53
4964.096	33.83	AV	150	1.1	H	34.7	2.7	26.75	44.48	54	-9.52
1445.06	40.54	PK	157	1.1	V	27.4	1.8	26.68	43.06	74	-30.94
1445.06	40.52	PK	213	1.2	H	25.2	1.8	26.68	40.84	74	-33.16
1445.06	33.71	AV	157	1.1	V	27.4	1.8	26.68	36.23	54	-17.77
1445.06	33.67	AV	213	1.2	H	25.2	1.8	26.68	33.99	54	-20.01

Spurious emissions in restricted band

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2389.43	37.42	AV	123	1.1	V	30.2	1.6	26.83	42.39	54	-11.61
2483.72	35.19	AV	146	1.1	V	30.5	1.8	26.83	40.66	54	-13.34
2389.43	37.26	AV	167	1.2	H	30.4	1.6	26.83	42.43	54	-11.57
2483.72	35.28	AV	145	1.1	H	30.6	1.8	26.83	40.85	54	-13.15
2389.43	46.41	PK	123	1.1	V	30.2	1.6	26.83	51.38	74	-22.62
2483.72	43.87	PK	146	1.1	V	30.5	1.8	26.83	49.34	74	-24.66
2389.43	46.32	PK	167	1.2	H	30.4	1.6	26.83	51.49	74	-22.51
2483.72	43.92	PK	145	1.1	H	30.6	1.8	26.83	49.49	74	-24.51

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Calibration Date	Calibration Due Date
AC Conducted Emissions			
R&S EMI Test Receiver	ESPI3	05/25/2012	05/25/2013
R&S LISN	LI-115	05/25/2012	05/25/2013
Radiated Emissions			
Spectrum Analyzer	8563E	01/10/2012	01/10/2013
EMI Receiver	ESPI3	05/18/2012	05/18/2013
Antenna(1 ~18GHz)	3115	6/2/2012	6/2/2013
Antenna (30MHz~2GHz)	JB1	05/24/2012	05/24/2013
Chamber	3m	4/13/2012	4/13/2013
Pre-Amplifier(1 ~ 18GHz)	AMF-7D-00101800-30-10P	5/24/2012	5/24/2013
Horn Antenna (18~40GHz)	AH-840	7/23/2011	7/23/2012
Microwave Pre-Amp (18~40GHz)	PA-840	Every 2000 Hours	
Signal Analyzer	8665B	1/21/2012	1/21/2013
Temperature/Humidity Chamber	1007H	06/02/2012	06/02/2013
ADIVIC MP9000-RF station	MP9000	01/10/2012	01/10/2013

Annex A. ii. RADIATED EMISSIONS TEST DESCRIPTION

Limit

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

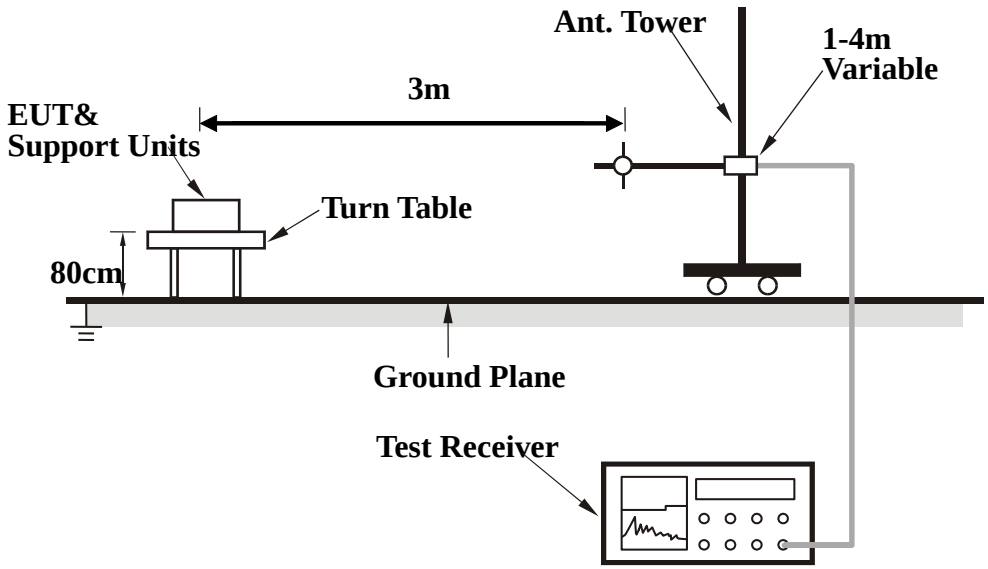
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS) or 3m EMC chamber.

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured was complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Description of Radiated Emissions Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the scan on four different antenna heights, 2 antenna polarity, and 360 degrees table rotation. For example, the program was set to run 30 MHz to 1 GHz scan; the program will first start from a meter antenna height and divide the 30 MHz to 1 GHz into 10 separate parts of maximum hold sweeps. Each parts of maximum hold sweep, the program will collect the data from 0 degree to 360 degrees table rotation. After the program complete the 1m scan, the antenna continues to rise to 2m and continue the scan. The step will repeated for all specified antenna height and polarity. This program will perform the Quasi Peak measurement after the signal maximization process and pre-scan routine. The final measurement will be base on the pre-scan data reduction result.

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

And the average value is

Average = Peak Value + Duty Factor or

Set RBW = 1MHz, VBW = 10Hz.

Note:

If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Please see attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

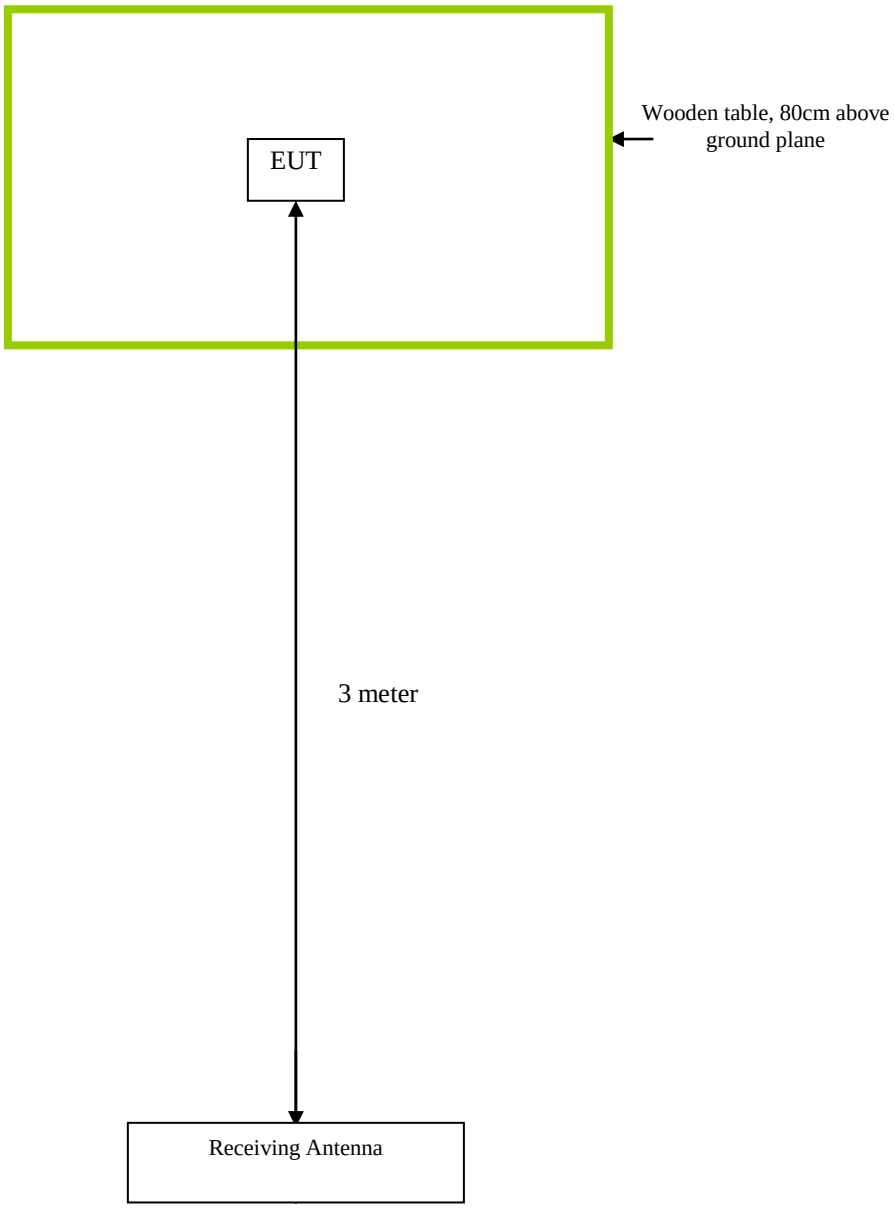
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
Gateway Laptop	MS2288 & LXWHF02013951C3CA92200	N/A

Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. DECLARATION OF SIMILARITY

NONE