

## **TEST REPORT**

#### Date: 2013-03-25 Report No.: 60.870.13.008.01F

Applicant:	Binatone Electronics International Ltd. Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong				
Description of Samples:		Baby Monitor (Baby Unit) MOTOROLA MBP43BU VLJ-MBP43BU			
Date Samples Received:	2013-02-04				
Date Tested:	2013-02-05 to 2013-02-27				
Investigation Requested:	FCC Part 15 Subpart C, Section 15.247				
Conclusions:	The submitted p roduct C <u>OMPLIED</u> w ith the requirements of Federal Communications Commission [FCC] Rul es a nd Regulations Parr 15. The test s were performed in accordance with the standards described above and on Section 2.2 in this Test Report.				
Remarks:					

Checked by:

Approved by:-

Ray Cheung Project Engineer Wireless & Telecom Department Jeff Pong Operation Manager Wireless & Telecom Department



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External EUT Photos

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Internal EUT Photos



#### 1.0 General Details

#### 1.1 Test Laboratory

SEM. Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen Registration Number: 994117

Test By:

Johnsti John Zhi

#### 1.2 Applicant Details Applicant

**Binatone Electronics International Ltd.** Floor 23A, 9 Des Voeux Road West, Sheung Wan Hong Kong

#### Manufacturer

#### Alford Industries Ltd. Unit 02, 6<sup>th</sup> Floor, Yen Sheng Centre, 64 Hoi Yuen Road, Kwun Tong, Kowloon, HK



#### 1.3 Equipment Under Test [EUT]

#### **Description of EUT**

Product Description:	Baby Monitor (Baby Unit)
Model No.:	MBP43BU
Brand Name:	MOTOROLA
FCCID:	VLJ-MBP43BU
Rating:	- DC 5.9V, 1000mA powered by AC/DC power adaptor
Operated Frequency:	2410.875 – 2471.625 MHz
No. of Operated Channel:	19
Accessories and Auxiliary Equipments:	- AC/DC power adaptor.

Antenna Type: Manufacture of Antenna: Antenna Gain: Antenna Model: Integral Alford Industries Ltd. 0 dBi N/A

#### **General Operation of EUT**

The Equipment Under Test (EUT) is a camera of wireless baby monitor system which operated at 2.4GHz.

FHSS Operation Principle:

This module is controlled by microchip to generate Pseudorandom Frequency Hopping Sequence, this module support 19 hopping channels. Refer to section 4.5 of this report to have more detail of Pseudorandom Hopping Algorithm.

#### 1.4 Related Submittal(s) Grants

This is a signal application subjected to Certificate Authorization.



#### 2.0 Technical Details

#### 2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4: 2003

#### 2.2 Test Standards and Results Summary Tables

Test Condition	Test Requirement	Test Re	sult
		Pass	N/A
Number of Frequency Hopping	Section 15.247 (a1)		
20dB Bandwidth Measurement	Section 15.247 (a1)		
Hopping Channel Carrier Frequency Separation	Section 15.247 (a1)		
Average Time of Occupancy	Section 15.247 (a1)		
Pseudorandom Hopping Algorithm	Section 15.247 (a1)		
Band Edge Measurement	Section 15.247		
Maximum Output Power	Section 15.247 ( b1 )		
Out of Band Emission	Section 15.247 ( d )		
Radiated Emission in Restricted Band	Section 15.247 ( d )		
Conducted Emission on AC Mains	Section 15.207		
RF Exposure	Section 15.247 ( i )		
Antenna Requirement	Section 15.203	See note 1	

Note 1 : The EUT uses a permanently attached antenna, which in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

Remark: N/A - Not Applicable



#### 3.0 Test Methodology

#### 3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site \*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

#### 3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor System Factor = AF + CF + FA – PA

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

#### 3.3 Conducted Emissions

The test was performed in accordance with ANSI C63.4: 2003, with the following: initial measurements were performed in peak and average detection modes on the live line of personal computer, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.



#### 4.0 Test Results

#### 4.1 Number of Hopping Frequency

Test Requirement: Test Date: Mode of Operation: Detector Function: FCC part 15 section 15.247 (a1)(iii) 2013-02-05 Transmitting mode. Max Hold

#### **Result: PASS**

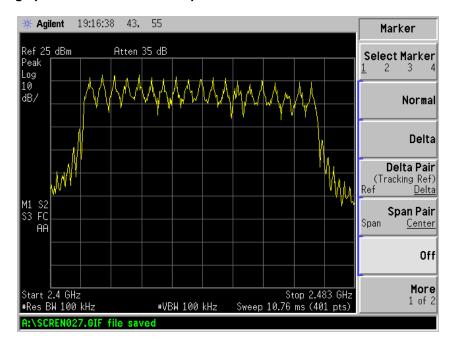
#### **Measured Result :**

Operating Channel Frequency in sequence (MHz):

2410.875 ; 2414.25 ; 2417.625 ; 2421 ; 2424.375 ; 2427.75 ; 2431.125 ; 2434.5 ; 2437.875 ; 2441.25 ; 2444.625 ; 2448 ; 2451.375 ; 2454.75 ; 2458.125 ; 2461.5 ; 2464.875 ; 2468.25 ; 2471.625

#### Limit for Number of Hopping Channel [Section 15.247 (a1)(iii)]

At least 15 non-overlapping channels for 2400-2483.5MHz.



#### Result data graph shows the number of operation channels:



#### 4.2 20dB Bandwidth Measurement

Test Requirement: Test Date: Mode of Operation: Detector Function: FCC part 15 section 15.247 (a1) 2013-02-05 Transmitting mode. Max Hold

#### Test Setup:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Channel	Measured frequency (MHz)	20dB Bandwidth (MHz)
Lowest	2410.875	4.090
Middle	2444.625	4.077
Highest	2471.625	4.094

This result is used for checking the hopping channel carrier frequencies separation.

#### Agilent 19:40:13 43, 55 Freq/Channel Ch Freq 2.411 GHz Trig Free Center Freq Occupied Bandwidth 2.41100000 GHz Center 2.411000000 GHz Start Freq 2.40600000 GHz Ref 25 dBm Atten 35 dB #Peak Stop Freq 2.41600000 GHz Log 10 dB/ **CF** Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Center 2.411 GHz #Res BW 300 kHz Span 10 MHz #VBW 1 MHz Sweep 4 ms (401 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % Ωn. <u>Off</u> -20.00 dB 3.6939 MHz x dB Scale Type -142.215 kHz **Transmit Freq Error** Log Lin x dB Bandwidth 4.090 MHz

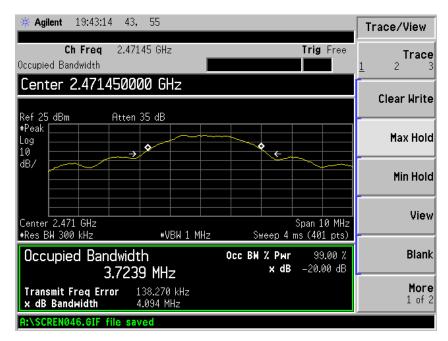
#### Result data graph shows 20 dB bandwidth of Lowest Channel, BW = 4.090MHz



Ch Freq     2.44447 GHz     Trig     Free       Occupied Bandwidth	<u>1</u> 23 Clear Write
	Clear Write
Ner Zuldhi Mitteli buldo	
*Peak Log 10	Max Hold
dB/	Min Hold
Center 2.444 GHz Span 10 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts)	View
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 3.7218 MHz × dB -20.00 dB	Blank
Transmit Freq Error 117.676 kHz × dB Bandwidth 4.077 MHz A:\SCREN045.GIF file saved	More 1 of 2

Result data graph shows 20 dB bandwidth of Middle Channel, BW = 4.077MHz

Result data graph shows 20 dB bandwidth of Highest Channel, BW = 4.094MHz





#### 4.3 Hopping Channel Carrier Frequency Separation

Test Requirement: Test Date: Mode of Operation: Detector Function: FCC part 15 section 15.247 (a1) 2013-02-05 Transmitting mode. Max Hold

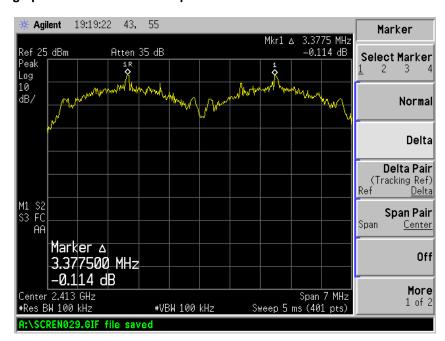
#### **Result: PASS**

#### **Measured Result :**

Refer to the delta marker, the frequency separation between two adjacent channels is 3.378MHz, therefore, the requirement of channel separated by a minimum of 25kHz of the hopping channel is applied.

#### Limits for Hopping Channel Separation [Section 15.247 (a1)]:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25KHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.



#### Result data graph shows the channel separation:



#### 4.4 Average Time of Channel Occupancy

Test Requirement: Test Date: Mode of Operation: Detector Function: FCC part 15 section 15.247 (a1)(iii) 2013-02-05 Transmitting mode. Zero span, Sweep time 1s

#### **Result : PASS**

#### **Measured Result :**

Each transmission only 19 channels will be used.

Observe time = 19 channels × 0.4s =7. 6s

There are 15 pulses within 1s

And one set of pulses = 360us

Therefore, the average channel occupancy times (ms)

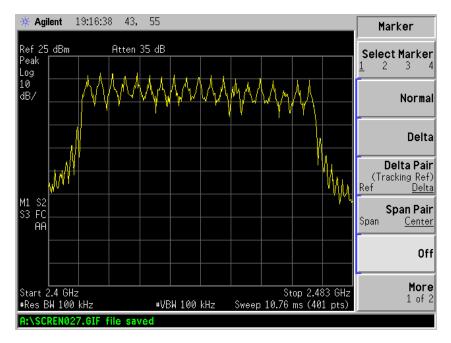
= 360us x 15 x 10

So, total transmitting time is 0.054s. (<0.4s).

#### Limits for Average Time of Occupancy [ Section 15.247 (a1)(iii) ]:

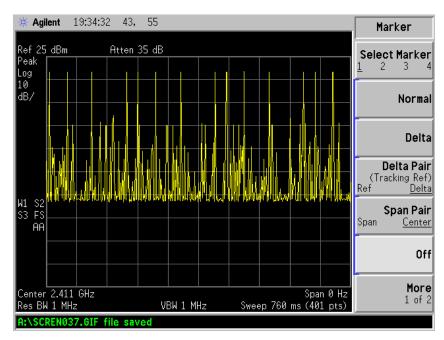
The average time of occupancy on any channel shall not be greater than 0.4 second within a period of 0.4 seconds multiplied by the number of hopping channels employed.





Result data graph shows total 19 channels are used

#### Result data graph shows total 15 pulses with 760ms



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Marker							55	9 43,	19:32:00	lent :	🔆 Agi
<b>Select Marker</b> <u>1</u> 2 3 4	360 µs –0.06 dB		Mkr				85 dB 1 R ♦	Atten		i dBm	Ref 25 Peak Log
Norma											10 dB/
Delta											
<b>Delta Pair</b> (Tracking Ref) Ref <u>Delta</u>											
<b>Span Pair</b> Span <u>Center</u>	ant and a second	A-0		any and a	M		,	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	n de manere de la companya de la com La companya de la comp		M1 S2 S3 VC AA
Off							Js		er ∆ 0000 06 dE	360	
More 1 of 2	pan 0 Hz 401 pts)		Sweep 4		MHz	BW 1 M	V		GHz	2.411	

Result data graph zooms into detail, one pulse period is 360us



#### 4.5 Pseudorandom Hopping Algorithm

#### **Pseudorandom Frequency Hopping**

MBP43BU uses FHSS technology with 19 hopping frequencies. Each channel frequency is selected from a p seudorandom ordered list of hopping frequencies, from 2410.875MHz to 2471.625MHz. A single data frame is transmitted on each frequency location b efore skipping to the next hopping frequency in the list.

Pseudorandom Frequency Hopping Sequence

2410.875 ; 2414.25 ; 2417.625 ; 2421 ; 2424.375 ; 2427.75 ; 2431.125 ; 2434.5 ; 2437.875 ; 2441.25 ; 2444.625 ; 2448 ; 2451.375 ; 2454.75 ; 2458.125 ; 2461.5 ; 2464.875 ; 2468.25 ; 2471.625

#### Requirement for Pseudorandom Hopping Algorithm [Section 15.247 (a1)]:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on average by the transmitter.



#### 4.6 Band Edge Measurement

Test Requirement: Test Date: Mode of Operation: Detector Function: FCC part 15 section 15.247 2013-02-13 Transmitting mode. Max Hold

#### **Result: PASS**

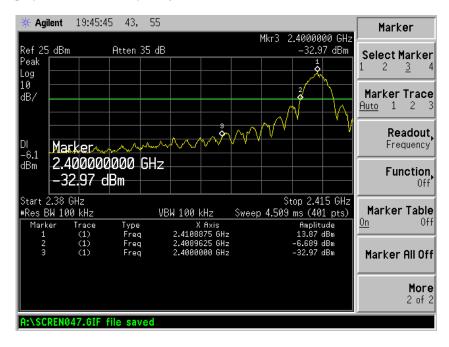
#### **Measured Result :**

Refer to the figure, it shows the frequency of lower band edge and upper band edge separately.

#### Limits of Band Edge for Carrier Frequencies Operated within the Bands [Section 15.247]:

The carrier frequencies should operate within 2400-2483.5MHz.

#### Result data graph shows the frequency of lowest channel.





🔆 Agilent 19:47	:30 43, 55				Marker
Ref 25 dBm	Atten 35 dB		Mkr3	2.48350 GHz -36.69 dBm	
Peak <u>1</u> Log <b>\$</b> .					<b>Select Marker</b> 1 2 <u>3</u> 4
10 dB/					Normal
DI -11.3 Marker	m		when		Delta
dBm 2.48350 -36.69	10000 GHz dBm				<b>Delta Pair</b> (Tracking Ref) Ref <u>Delta</u>
Start 2.467 GHz #Res BW 100 kHz	VB	W 100 kHz	Sweep 4.223	Stop 2.5 GHz ms (401 pts)	Span Pair
Marker Trace 1 (1)	Type Freg	X Axis 2.47148 GHz		Amplitude 8.699 dBm	Span <u>Center</u>
$ \begin{array}{cccc} 1 & (1) \\ 2 & (1) \\ 3 & (1) \end{array} $	Freq Freq Freq	2.47148 6H2 2.47361 GHz 2.48350 GHz		-13.31 dBm -36.69 dBm	Off
					More 1 of 2
A:\SCREN048.GIF	file saved				

Result data graph shows the frequency of highest channel.



#### 4.7 Maximum Output Power

Test Requirement:	FCC part 15 section 15.247 (a1)
Test Method:	ANSI C63.4:2003
Test Date:	2013-02-27
Mode of Operation:	Transmitting mode.
Detector Function:	Peak
Measurement BW:	RBW 1MHz ; VBW 1MHz

#### Test Setup:



#### Result : PASS

Frequency	Peak Out	out Power	Limit		
(MHz)	(dBm)	(W)	(dBm)	(W)	
Lowest Channel : 2410.875	18.58	0.072	21	0.125	
Middle Channel : 2444.625	16.82	0.048	21	0.125	
Highest Channel : 2471.625	14.41	0.028	21	0.125	

#### Limits for Maximum Output Power [ Section 15.247 (a1)(iii) ]:

For frequency hopping systems employing at least 75 hopping channels: 1 Watt For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts



🔆 Agilent 💠	19:37:27 43	, 55				Mkr1	0 /11 1	2E CU-	Peak Search
Ref 25 dBm Peak	Atten	35 dB				MKLT		25 GHz 8 dBm	Meas Tools•
Log 10 dB/				<u> </u>			$\left  \right $		
									Next Peak
									Next Pk Right
									Next Pk Left
M1 S2 S3 FC									Min Search
AA Mark									
	1225000 58 dBm	GHz							Pk-Pk Search
Center 2.411 #Res BW 3 MH	GHz	VE	3W 3 MI	Hz	Sr	veep 4	Span : ms (40	LO MHz 1 pts)	More 1 of 2
A:\SCREN04	0.GIF file sa	ved							

Result data graph shows the frequency of lowest channel

Result data graph shows the frequency of middle channel

<b>* Agilent</b> 19:38:07 43	3, 55				Mkr1	2 4 4 4 6	50 GHz	Peak Search
Ref 25 dBm Atter Peak Log	<u>1 35 dB</u>						32 dBm	Meas Tools⊦
10 dB/								Next Peak
								Next Pk Right
								Next Pk Left
M1 \$2 \$3 FC AA								Min Search
Marker 2.444950000 16.82 dBm	GHz							Pk-Pk Search
Center 2.444 GHz #Res BW 3 MHz	VI	BW 3 MI	Hz	Sr	и еер 4	Spant ms (40	10 MHz 11 pts)	More 1 of 2
A:\SCREN041.GIF file sa	aved							



<b>* Agilent</b> 19:38:36 43,	55	Mkr1	2.472100 GHz	Peak Search
Ref 25 dBm Atten Peak Log	35 dB	1	14.41 dBm	Meas Tools∙
10 dB/				Next Peak
				Next Pk Right
				Next Pk Left
M1 \$2 \$3 FC AA				Min Search
Marker 2.472100000 14.41 dBm	GHz			Pk-Pk Search
Center 2.471 GHz #Res BW 3 MHz	VBW 3 MHz	Sweep 4	Span 10 MHz 1 ms (401 pts)	<b>More</b> 1 of 2
A:\SCREN042.GIF file sav	ved			

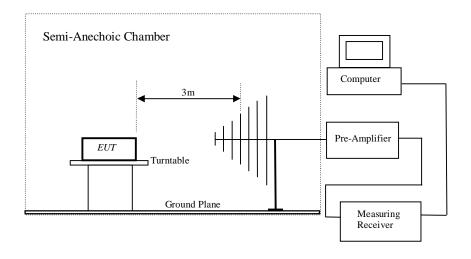
Result data graph shows the frequency of highest channel



#### 4.8 Out of Band Emissions and Emissions in Restricted Bands

Test Requirement: Test Method: Test Date: Mode of Operation: Detector Function: Measurement BW: FCC part 15 section 15.247 (d ) ANSI C63.4:2003 2013-02-27 Transmitting mode. Peak RBW 100KHz ; VBW 300KHz

#### **Test Setup:**





#### **Result : PASS**

#### **Out of Frequency Band Emissions:**

For out of band emissions that are close to o r exceed 20dB attenuation requirement, and emission f alls into restricted ban d, radiated emission was p erformed in orde r to s how compliance with the general radiated emission requirement.

#### **Result Summary:**

Refer to the emission data graph, result shows that the significant emissions detected are with more than 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

#### Limits for Out of Frequency Band Emission [ Section 15.247 (d) ]:

In any 100kHz bandwidth outside the frequency b and in w hich t he spread spectrum or digitally mod ulated intentional rad iator is ope rating, the r adio frequency p ower t hat is produced by the intentional ra diator s hall be at least 20 dB below that in the 10 0kHz bandwidth within the band that contains the highest level of t he desired power. Attenuation below the general limits specified in Section 15.209(a) is not required.

	Field Strength	Field Strength
Frequency (MHz)	[µV/m]	[dBµV/m]
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

#### Limit for Radiated Emission Falling in Restricted Bands [Section 15.209]:

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.



#### **Result : PASS**

#### All Emission and Emissions Fall into Restricted Band were recorded as below:

	Radiated Emissions							
	Emissions Frequency	E-Field Polarity	Reading	System Factor	Field strength at 3m	Limit	Delta to Limit	
	MHz		dBuV/m	dB	dBuV/m	dBuV/m	dBuV/m	
	Lowest Chann		ubuv/m		abuv/m	abav/iii		
PK	1357.25	V	64.40	-14.90	49.50	74.00	-24.50	
PK	3933.37	v	46.97	-5.16	41.81	74.00	-32.19	
PK	1357.25	Ĥ	62.38	-14.90	47.48	74.00	-26.52	
PK	3933.37	н	46.92	-5.16	41.76	74.00	-32.24	
<u> </u>	0000.07		-10.0L	0.10	71.70	77.00	02.27	
	Middle Chann	el		l	Į		1	
PK	1364.18	V	65.21	-14.88	50.33	74.00	-23.67	
PK	3933.37	V	46.95	-5.16	41.79	74.00	-32.21	
PK	1364.18	H	64.02	-14.88	49.14	74.00	-24.86	
PK	3913.39	Н	47.83	-5.23	42.60	74.00	-31.40	
	Highest Chani	nel						
PK	1371.15	V	70.81	-14.87	55.94	74.00	-18.06	
PK	3913.39	V	47.43	-5.23	42.20	74.00	-31.80	
PK	1371.15	Н	68.85	-14.87	53.98	74.00	-20.02	
PK	3893.52	Н	47.26	-5.29	41.97	74.00	-32.03	
	Spurious Emis	ssions					•	
QP	31.73	V	28.05	8.33	36.38	40.00	-3.62	
QP	144.33	V	34.29	3.46	37.75	43.50	-5.75	
QP	155.91	V	33.14	3.61	36.75	43.50	-6.75	
QP	192.42	V	37.73	4.31	42.04	43.50	-1.46	
QP	240.83	V	30.52	7.02	37.54	46.00	-8.46	
QP	289.00	V	30.60	9.67	40.27	46.00	-5.73	
QP	192.42	Н	38.41	4.31	42.72	43.50	-0.78	
QP	240.83	Н	31.69	7.02	38.71	46.00	-7.29	
QP	289.00	Н	30.86	9.67	40.53	46.00	-5.47	
QP	361.71	Н	29.52	10.69	40.21	46.00	-5.79	
QP	385.28	Н	29.04	10.87	39.91	46.00	-6.09	
QP	528.25	Н	25.10	12.97	38.07	46.00	-7.93	

Refer to Figures shows the worst case channel's emission data graph from 30MHz-26GHz.



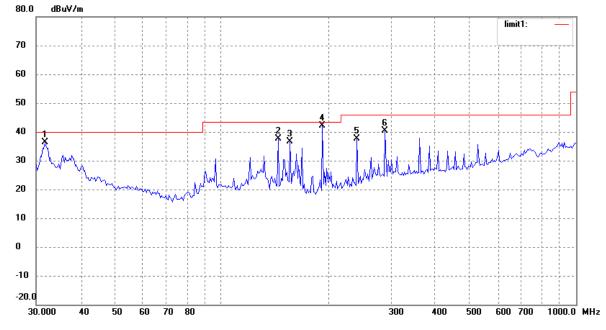
#### **Result Summary:**

- 1) Communication mode: All other emissions are more than 20dB below FCC part 15.209 limit.
- 2) No further spurious emissions found between 30 MHz and lowest internal used/generated frequency and from 30MHz to 1GHz.

#### Remarks:

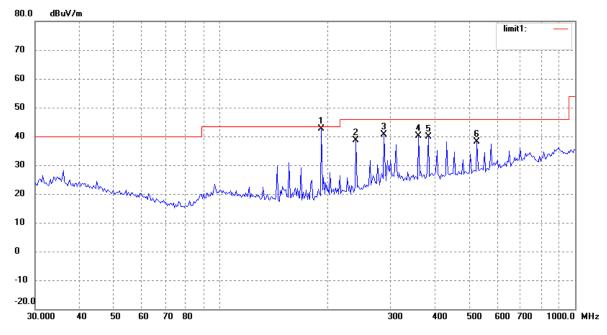
- 1. "\*" Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- 2. Emission level with more than 20dB below the FCC required limit is not mentioned in table.
- 3. Delta to Limit = Field strength  $(dB\mu V/m) Limit (dB\mu V/m)$ .
- 4. Calculated measurement uncertainty: 9kHz -30MHz: 1.8dB. 30MHz -1GHz: 5.2dB. 1GHz -18GHz: 5.1dB.





#### Radiated emission data graph (Vertical polarization, 30MHz-1GHz)

Remark: Only background noise was measured from 1GHz-26GHz excluding the operation frequency relational.



#### Radiated emission data graph (Horizontal polarization, 30MHz-1GHz)

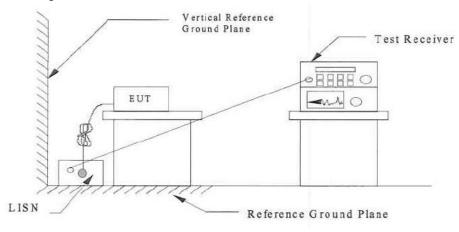
Remark: Only background noise was measured from 1GHz-26GHz excluding the operation frequency relational.



#### 4.9 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC part 15 Section 15.207 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2013-02-27
Mode of Operation:	-Transmitting mode
Detector Function:	CISPR Quasi Peak
Measurement BW:	100 kHz
Worst Case Channel:	1

#### Test Setup:



#### **Results: PASS**

- Refer Figure and tables the result.

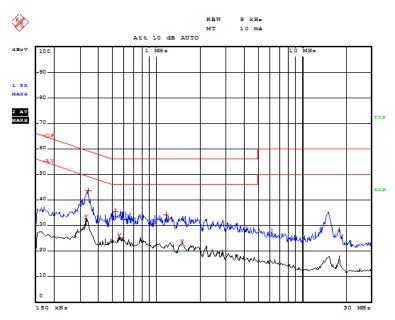
#### Limits for Conducted Emission [ Section 15.207]:

Frequency Range	Quasi-Peak Limit	Average Limit
[MHz]	[dBµV]	[dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

Remarks: Calculated measurement uncertainty: ±2.8dB



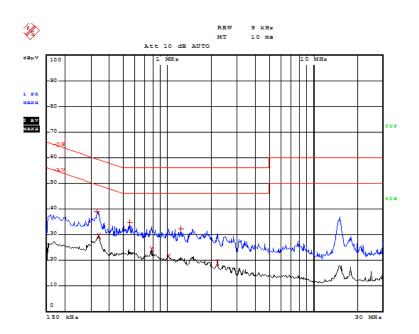


Result data graph shows the conducted emission (Live).

Refer to the following table for the result details:

	Conducted Emission						
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBµV)	Limit (dBµV)	Margin		
0.330	AV	L	33.17	49.45	-16.28		
0.338	QP	L	43.70	59.24	-15.54		
0.518	QP	L	35.65	56.00	-20.35		
0.562	AV	L	25.74	46.00	-20.26		
1.162	QP	L	34.16	56.00	-21.84		
1.506	AV	Ĺ	23.50	46.00	-22.50		





Result data graph shows the conducted emission (Neutral).

Refer to the following table for the result details:

Conducted Emission					
Frequency	Detector	Phase	Result	Limit	Margin
(MHz)	(QP/AV)		(dBµV)	(dBµV)	_
0.334	QP	N	38.92	59.34	-20.42
0.338	AV	Ν	29.43	49.24	-19.81
0.554	QP	Ν	34.75	56.00	-21.25
0.778	AV	N	24.33	46.00	-21.67
1.030	AV	N	21.74	56.00	-34.26
1.250	QP	Ν	32.47	56.00	-23.53
2.198	AV	N	19.23	46.00	-26.77



#### 5.0 RF Exposure Compliance Requirement

Test Requirement:	FCC part 15 section 15.247 (i)
Test Method:	FCC part 15 section 1.1307 (b1)
	OET Bulletin 65, Edition 01-01

#### **Results: PASS**

Systems op eration u nder the provision of this section shall be operated in a m anner t hat ensures the p ublic is not exposed to radio frequency energy levels in excess of the Commission's guideline,

The EUT is considered as a mobile device according to OET Bulletin 65, E dition 0 1-01, therefore distance to human body of min. 20cm is determined.

Frequency Band:	2.410.875 GHz ~2.471.625GHz
Device Category:	<ul> <li>Portable (&lt; 20cm separation )</li> <li>Mobile (&gt;20cm separation )</li> <li>Others :</li> </ul>
Exposure Classification:	Occupational/ Controlled exposure     General Population / Uncontrolled exposure
Max. Output Power	72.11mW
Antenna Gain	0 dBi ( Numeric gain:1)
Evaluation Applied:	<ul> <li>☑ MPE Evaluation</li> <li>☑ SAR Evaluation</li> </ul>

MPE calculation:

The radiated (EIRP) = 72.11mW

The power density at 20cm from the antenna : = EIRP /  $4\pi$   $R^2$  = 0.0143mW /  $cm^2$ 

#### Limits for General Population/Uncontrolled Exposure [OET Bulletin 65, Edition 01-01]:

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time $ E ^2$ , $ H ^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)^*$	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30



#### 6.0 List of Measurement Equipment

Description	Manufacturer	Model no.	Serial no.	CAL due		
Spectrum Analyzer	Agilent	E4402B	US41192821	27 Mar 2013		
Test Receiver	R & S	ESI26	838786/013	27 Mar 2013		
DC Power Supply	LW	APR-3003	N/A	15 Jul 2013		
Spectrum Analyzer	R & S	FSP30	836079/035	27 Mar 2013		
Positioning Controller	C&C	CC-C-1F	N/A	19 Dec 2013		
RF Switch	EM	EMSW18	SW060023	19 Dec 2013		
Pre-amplifier	Agilent	8447F	3113A06717	27 Mar 2013		
Pre-amplifier	Compliance Direction	PAP-1G18	24002	27 Mar 2013		
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	24 Feb 2014		
Horn Antenna	ETS	3117	00086197	24 Feb 2014		
Anechoic chamber	Albatross Projects	MCDC	SW060023	19 Mar 2013		

#### **Radiated Emission and Bandwidth Emissions**

#### **Conducted Emissions**

Description	Manufacturer	Model no.	Serial no.	CAL due
Test Receiver	Rohde & Schwarz	ESPI	101611	27 Mar 2013
L.I.S.N	Schwarzbeck	NSLK8126	8126-224	27 Mar 2013
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	27 Mar 2013
AMN	EMCO	3825/2	11967C	27 Mar 2013

N/A Not Applicable or Not Available



## Appendix A

Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU

Photo of Test Setup:

**Radiated Emissions** 





## Appendix A

Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU

Photo of Test Setup:

#### **Conducted Emissions**





Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU







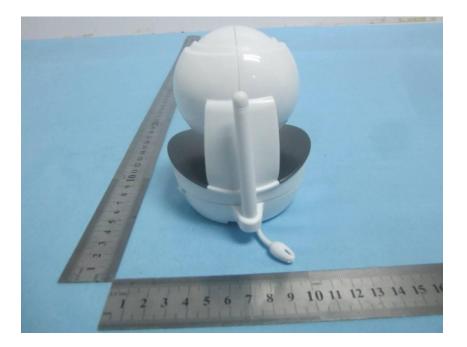
Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU

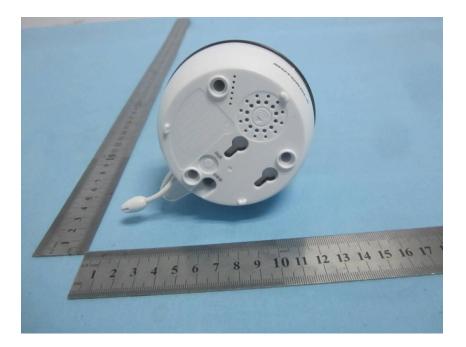






Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU







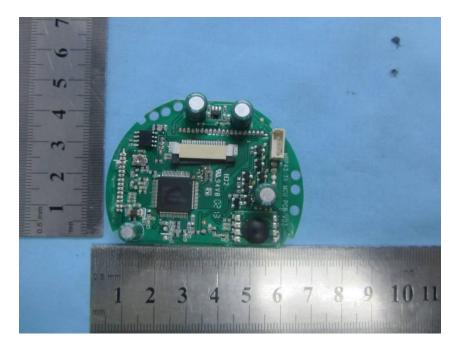
Date: 2013-03-25 Report No.: 60.870.13.008.01F Model No.: MBP43BU





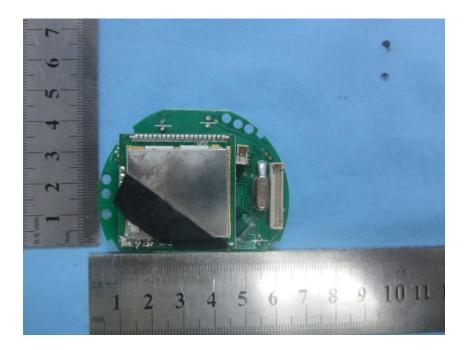
Date: 2013-03-25 Report No.: 60.870.12.008.01F Model No.: MBP43BU

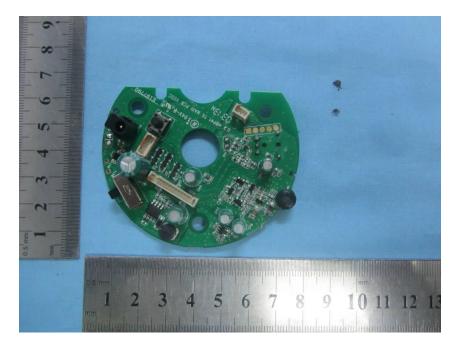






Date: 2013-03-25 Report No.: 60.870.12.008.01F Model No.: MBP43BU







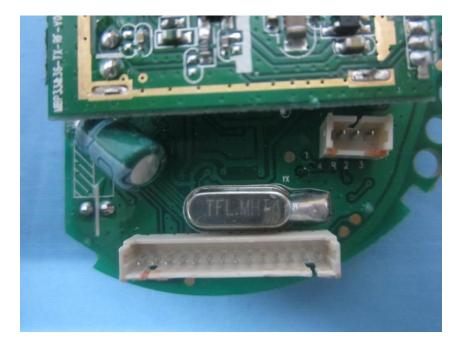
Date: 2013-03-25 Report No.: 60.870.12.008.01F Model No.: MBP43BU

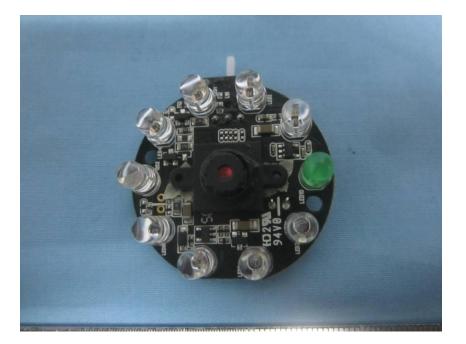






Date: 2013-03-25 Report No.: 60.870.12.008.01F Model No.: MBP43BU







Date: 2013-03-25 Report No.: 60.870.12.008.01F Model No.: MBP43BU

