RADIO FREQUENCY RADIATION EXPOSURE REPORT

Mobiles /Fixed Base Station
Maximum Permissible Exposure (MPE)

OF

Product Name:	**HSPA+ WiFi Router**
Brand Name:	**BandLuxe™**
Model Name:	**R305, R205**
Model Different:	**Different data rate:** **R305: Downlink to 21Mbps** **R205: Downlink to 14.4Mbps**
FCC ID:	**UZI-R305**
Report No.:	**EI/2009/50006**
Issue Date:	**May. 27, 2009**
Prepared for:	**BandRich Inc.** **7F., No. 188, Baociao Rd., Sindian City, Taipei County 23146, Taiwan (R.O.C.)**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

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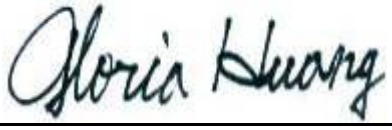
VERIFICATION OF COMPLIANCE

Applicant:	BandRich Inc. 7F., No. 188, Baociao Rd., Sindian City, Taipei County 23146, Taiwan (R.O.C.)
Product Name:	HSPA+ WiFi Router
Brand Name:	BandLuxe™
FCC ID:	UZI-R305
Model No.:	R305, R205
Model Difference:	Different data rate: R305: Downlink to 21Mbps R205: Downlink to 14.4Mbps
File Number:	EI/2009/50006
Date of test:	May, 11, 2009 ~ May, 18, 2009
Date of EUT Received:	May, 11, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091 and RSS102.

The test results of this report relate only to the tested sample identified in this report.

Test By:		***Date***	May. 27, 2009
	Bondi Liu / Engineer		
Prepared By:		***Date***	May. 27, 2009
	Gloria Huang / Clerk		
Approved By:		***Date***	May. 27, 2009
	Vincent Su/Manager		

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Report Version

Version No.	Date	Description
00	May. 27, 2009	Initial creation of document

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1. GENERAL INFORMATION

General:

Product Name:	HSPA+ WiFi Router	
Brand Name:	BandLuxe™	
Model Name:	R305, R205	
Model Difference:	Different data rate: R305: Downlink to 21Mbps R205: Downlink to 14.4Mbps	
Simple Hands-Free (SHF):	N/A	
Data Cable (USB):	N/A	
Power Supply:	12Vdc by AC/DC power adapter	
	Adapter:	Model: DSA-12G-12 FUS 120120, Supplier: DVE

WCDMA:

	Operating Frequency		Rated Power
Cellular Phone Standards Frequency Range and Power:	WCDMA/HSUPA/HSDPA Band IV	1710MHz – 1755MHz	25 dBm
	HSUPA data rate: uplink up to 5.7Mbps HSDPA data rate: downlink up to 21Mbps(R305) HSDPA data rate: downlink up to 14.4Mbps(R205)		
Type of Emission:	WCDMA Band IV: 4M23F9W		
Hardware Version:	V00		
Software Version:	N/A		
IMEI:	35546903		

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WLAN: 802.11 b/g & 802.11n (20M)

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Transmit Power:	☒802.11 b: 15.28 dBm ☒802.11 g: 14.38 dBm ☒802.11n (20M): 14.28 dBm
Modulation Technology:	☒DSSS, ☒OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11n (20M):6.5/13/19.5/26/39/52/58.5/65 Mbps
Antenna Designation:	PIFA Antenna, 3dBi.
Type of Emission:	802.11 b/g:16M3D1D 802.11n (20M): 17M4D1D

802.11n (40M)

Frequency Range:	2422 – 2452 MHz
Channel number:	7 channels
Transmit Power:	☒802.11n (40M): 14.36 dBm
Modulation Technology:	☐DSSS, ☒OFDM
Modulation type:	64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11n (40M): 6.5/13.5/27/40.5/54/81/108/121.5/135 Mbps
Antenna Designation:	PIFA Antenna, 3dBi.
Type of Emission:	35M7D1D

This report applies for WCDMA/HSDPA/HSUPA Bands IV and IEEE 802.11 b/g/n Standard.

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1.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
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
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

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1.2 Maximum Permissible Exposure (MPE) Evaluation

MPE Prediction (802.11b/g)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

2412MHz

Maximum peak output power at antenna input terminal:	15.28	(dBm)
Maximum peak output power at antenna input terminal:	33.72873087	(mW)
Duty cycle:	100	(%)
Maximum Pav :	33.72873087	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0133952	(mW/cm^2)
Measurement Result:		
The predicted power density level at 20 cm is	0.13395236	(W/m^2)
This is below the uncontrolled exposure limit of 1 mW/cm	2412	MHz

Measurement Result

The predicted power density level at 20 cm is 0.133952 W/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2412MHz.

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MPE Prediction 802.11n (20M)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

The worst case: 802.11n (20M)

Maximum peak output power at antenna input terminal:	14.28	(dBm)
Maximum peak output power at antenna input terminal:	26.79168325	(mW)
Duty cycle:	100	(%)
Maximum Pav :	26.79168325	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0106402	(mW/cm^2)
Measurement Result:		
The predicted power density level at 20 cm is	0.106402142	(W/m^2)
This is below the uncontrolled exposure limit of 1 mW/cm	2412	MHz

Measurement Result

The predicted power density level at 20 cm is 0.106402 W/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 2412MHz.

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MPE Prediction 802.11n (40M)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

The worst case: 802.11a mode

Maximum peak output power at antenna input terminal:	14.36	(dBm)
Maximum peak output power at antenna input terminal:	27.28977783	(mW)
Duty cycle:	100	(%)
Maximum Pav :	27.28977783	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2422	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0108380	(mW/cm^2)
Measurement Result:		
The predicted power density level at 20 cm is	0.108380305	(W/m^2)
This is below the uncontrolled exposure limit of 1 mW/cm	2422	MHz

Measurement Result

The predicted power density level at 20 cm is 0.10838 W/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 2422MHz.

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Maximum Permissible Exposure (MPE) Evaluation

In this application we seek R305 WCDMA/HSDPA/HSUPA band IV. Based on the FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, we have concluded that the R305 will comply with the FCC rules on RF exposure for mobile devices if the antenna gain does not exceed 0.6 dBi (The max. gain) in WCDMA/HSDPA/HSUPA Band IV. The following analysis will demonstrate such compliance. The analysis will be done in two US bands.

Operation in WCDMA/HSDPA/HSUPA band IV (1712.4MHz – 1752.6MHz)

The EIRP power of R305 is 12.95dBm at WCDMA band IV. Take the worst case of power density can be expressed as follows:

EIRP =12.95 dBm = 20mW

Power Density = EIRP*Duty Cycle/($4\pi R^2$)

=20*1/(4*π*20^2) = 0.00398mW/cm^2

where Duty Cycle is 1 for WCDMA mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

MPE limit = 1mW/cm^2

As we can see the resulted power density is below the MPE limit, therefore R305 in WCDMA/HSDPA/HSUPA band IV is compliant with the FCC rules on RF exposure.

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