



# RF EXPOSURE REPORT

**REPORT NO.:** SA131210E02

**MODEL NO.:** Balance One, Balance, MAX,  
Pismo805

**FCC ID:** U8G-P1805

**RECEIVED:** Dec. 10, 2013

**TESTED:** Feb. 06, 2014

**ISSUED:** Apr. 02, 2014

**APPLICANT:** Pismo Labs Technology Limited

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA131210E02	Original release	Apr. 02, 2014



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## 1. CERTIFICATION

**PRODUCT:** Pepwave / Peplink / Pismo Wireless Product

**BRAND NAME:** Pepwave/Peplink / Pismo

**MODEL NO.:** Balance One, Balance, MAX, Pismo805

**TEST SAMPLE:** ENGINEERING SAMPLE

**APPLICANT:** Pismo Labs Technology Limited

**TESTED DATE:** Feb. 06, 2014

**STANDARDS:** FCC Part 2 (Section 2.1091)  
FCC OET Bulletin 65, Supplement C (01-01)  
IEEE C95.1

The above equipment (Model: Balance One) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** Midoli Peng , **DATE:** Apr. 02, 2014  
( Midoli Peng, Specialist )

**APPROVED BY :** May Chen , **DATE:** Apr. 02, 2014  
( May Chen, Manager )



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## 2. RF EXPOSURE LIMIT

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm <sup>2</sup> )	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

## 3. MPE CALCULATION FORMULA

$$Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

r = distance between observation point and center of the radiator in cm

## 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 22cm away from the body of the user. So, this device is classified as **Mobile Device**.



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## 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

For 2.4GHz						
Transmitter Circuit	Brand	Antenna Type	Gain (dBi) (Include cable loss)	Connector Type	Cable Length (cm)	Frequency range (MHz to MHz)
Chain (0) Ant. 1	SmartAnt	PIFA	3.73	i-pex	20	2400 ~ 2483.5
Chain (1) Ant. 2	SmartAnt	PIFA	4.51	i-pex	20	2400 ~ 2483.5
For 5GHz						
Transmitter Circuit	Brand	Antenna Type	Gain (dBi) (Include cable loss)	Connector Type	Cable Length (cm)	Frequency range (MHz to MHz)
Chain (0) Ant. 3	SmartAnt	PIFA	2.14	i-pex	20	5150 ~ 5250
			4.22			5725 ~ 5850
Chain (1) Ant. 4	SmartAnt	PIFA	1.85	i-pex	20	5150 ~ 5250
			2.11			5725 ~ 5850



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## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For WLAN: 15.247(2.4GHz)

802.11b

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2472	960.624	7.14	22	0.81752	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.14 \text{dBi}$

802.11g

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2472	953.975	7.14	22	0.81186	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.14 \text{dBi}$

802.11n(HT20)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2472	968.385	7.14	22	0.82412	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.14 \text{dBi}$

802.11n(HT40)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2472	954.066	7.14	22	0.81194	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.14 \text{dBi}$



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## For WLAN: 15.247(5GHz)

### 802.11a

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 - 5825	196.869	6.24	22	0.13618	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.24 \text{ dBi}$

### 802.11n(HT20)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 - 5825	188.844	6.24	22	0.13063	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.24 \text{ dBi}$

### 802.11n(HT40)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 - 5825	172.842	6.24	22	0.11956	1.00

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.24 \text{ dBi}$



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For WLAN: 15.407(5GHz)

802.11a

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 -5240	45.525	5.01	22	0.02372	1.00

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.01 \text{dBi}$$

802.11n(HT20)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 -5240	45.242	5.01	22	0.02358	1.00

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.01 \text{dBi}$$

802.11n(HT40)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 -5240	48.477	5.01	22	0.02526	1.00

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.01 \text{dBi}$$

## CONCLUSION:

Both of the 2.4GHz and 5GHz can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD}_1 / \text{LPD}_1 + \text{CPD}_2 / \text{LPD}_2 + \dots \text{etc.} < 1$$

**CPD = Calculation power density**

**LPD = Limit of power density**

Therefore, the worst-case situation is  $0.82412 / 1 + 0.13618 / 1 = 0.960$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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