

RF Exposure Report

Report No.: SA150713E08

FCC ID: U8G-P1813

Test Model: MAX Transit

Series Model: MAX transit Duo, MAX transit Quad, Pismo 813

Received Date: July 13, 2015

Test Date: Aug. 06, 2015

Issued Date: Sep. 02, 2015

Applicant: Pismo Labs Technology Limited

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
SA150713E08	Original release.	Sep. 02, 2015

1 Certificate of Conformity

Product: Upgradable transportation WiFi hotspot

Brand: Pepwave / Peplink / Pismo

Test Model: MAX Transit

Series Model: MAX transit Duo, MAX transit Quad, Pismo 813

Sample Status: MASS-PRODUCTION

Applicant: Pismo Labs Technology Limited

Test Date: Aug. 06, 2015

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D03

IEEE C95.1

The above equipment 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 :


Lori Chung / Specialist

Date: Sep. 02, 2015

Approved by :


May Chen / Manager

Date: Sep. 02, 2015

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

2.3 Classification

The antenna of this product, under normal use condition, is at least 24cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

For WLAN							
Antenna No.	Brand	Model	Ant. Gain (dBi)	Frequency range (GHz to GHz)	Antenna Type	Connector Type	
1	SmartAnt	SAA06-220690	3	2.4~2.4835	Dipole	RP-SMA	
			4~5.5	5.15~5.25			
			5~5-6	5.725~5.85			
For GPS							
Set	Brand	Model	Ant. Gain (dBi)	Frequency range (MHz)	Antenna Type	Connector Type	
1	Chang Hong	GPS-01	-1	1575.42 (±1.023MHz)	Magnetic	R-SMA Male	
For LTE							
Set	Transmitter Circuit	Brand	Model	Ant. Gain (dBi)	Frequency range (MHz to MHz)	Antenna Type	Connector Type
1	Cellular Main	Pulse	SPDA24700/2700	2	698-960	Dipole	R-SMA Male
	Cellular Diversity / Aux				1710-2170 2500-2700		

3 Calculation Result Of Maximum Conducted Power

For WLAN:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	379.799	6.01	24	0.20937	1
5180-5240	132.781	8.51	24	0.13017	1
5745-5825	252.981	9.01	24	0.27826	1

NOTE:

2412-2462MHz: Directional gain = 3dBi + 10log(2) = 6.01dB

5180-5240MHz: Directional gain = 5.5dBi + 10log(2) = 8.51dBi

5745-5825MHz: Directional gain = 6dBi + 10log(2) = 9.01dBi

For WWAN (2G/3G) / LTE (4G) - Cellular1_FCC ID: N7NMC7355, Model No.: MC7354:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Source-Based Time-Averaged Power Density (mW/cm ²)	Limit (mW/cm ²)
824-849	2000	2	24	0.10948	0.5493

Note: 1. Limit of Power Density = F/1500

2. Calculations for RF Exposure compliance in the cellular and PCS bands are base on the maximum source based time-average power obtained from 2-Slot GPRS operation. The resulting duty cycle factor is 2/8, or 6.02dB.

For WWAN (2G/3G) / LTE (4G) – Cellular2_FCC ID: N7NMC7355, Model No.: MC7354:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Source-Based Time-Averaged Power Density (mW/cm ²)	Limit (mW/cm ²)
824-849	2000	2	24	0.10948	0.5493

Note: 1. Limit of Power Density = F/1500

2. Calculations for RF Exposure compliance in the cellular and PCS bands are base on the maximum source based time-average power obtained from 2-Slot GPRS operation. The resulting duty cycle factor is 2/8, or 6.02dB.

Conclusion:

All of the WLAN/2G/3G/LTE can transmit simultaneously, the formula of calculated the MPE is

$$CPD1 / LPD1 + CPD2 / LPD2 +etc. < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.20937 / 1 + 0.27826 / 1 + 0.10948 / 0.5493 + 0.10948 / 0.5493 = 0.886$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

Appendix

MPE Evaluation for FCC ID: N7NMC7355 Radio Module

Mode	Equipment Category	Max Transmitter Duty Cycle	Transmitter Range (MHz)		Maximum		Antenna Gain (dBi)	Distance to Human Body (cm)	Power Density (mW/cm ²)		Ratio
			Start	Stop	(dBm)	(W)			Vaule	Limit	
GPRS	Class 10	25%	824	849	33	2	2	27	0.0865	0.54933	0.15746455
		25%	1850	1910	30	1	3	27	0.05445	1	0.05445
EDGE	Class 10	25%	824	849	28	0.63	2	27	0.02725	0.54933	0.04960588
		25%	1850	1910	27	0.5	3	27	0.02723	1	0.02723
	Class 11	37.50%	824	849	26.2	0.42	2	27	0.02725	0.54933	0.04960588
		37.50%	1850	1910	25.2	0.33	3	27	0.02695	1	0.02695
	Class 12	50%	824	849	25	0.32	2	27	0.02768	0.54933	0.05038866
		50%	1850	1910	24	0.25	3	27	0.02723	1	0.02723
CDMA	EvDo	100%	824	849	25	0.32	2	27	0.05536	0.54933	0.10077731
		100%	1850	1910	25	0.32	3	27	0.0697	1	0.0697
		100%	817	824	25	0.32	2	27	0.05536	0.54466	0.10164139
UMTS	HSDPA HSUPA	100%	824	849	24	0.25	2	27	0.04325	0.54933	0.07873227
		100%	1710	1755	24	0.25	3	27	0.05445	1	0.05445
		100%	1850	1910	24	0.25	3	27	0.05445	1	0.05445
LTE	Band 17	100%	704	716	24	0.25	2	27	0.04325	0.46933	0.09215264
	Band 13	100%	777	787	24	0.25	2	27	0.04325	0.518	0.08349421
	Band 5	100%	824	849	24	0.25	2	27	0.04325	0.54933	0.07873227
	Band 4	100%	1710	1755	24	0.25	3	27	0.05445	1	0.05445
	Band 2	100%	1850	1910	24	0.25	3	27	0.05445	1	0.05445
	Band 25	100%	1850	1915	24	0.25	3	27	0.05445	1	0.05445

Note:

1. The ratios which were indicated in bold type of the max ratio.
2. 698~960MHz: Antenna gain is 2dBi
3. 1710~2700MHz: Antenna gain is 3dBi

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