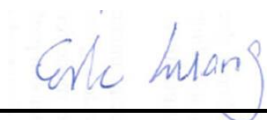


RF Exposure Evaluation Report

APPLICANT : Green Packet Berhad, Taiwan
EQUIPMENT : TDD-LTE Band 41 Indoor CPE
BRAND NAME : Green Packet
MODEL NAME : DT-235
FCC ID : W9V-DT235-GP
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA412441	Rev. 01	Initial issue of report	Mar. 31, 2014
FA412441	Rev. 02	Revise WLAN Gain.	Apr. 07, 2014

1. Administration Data

1.1. Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

1.2. Applicant

Company Name	Green Packet Berhad, Taiwan
Address	6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan

1.3. Manufacturer

Company Name	Green Packet Berhad, Taiwan
Address	6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	TDD-LTE Band 41 Indoor CPE
Brand Name	Green Packet
Model Name	DT-235
FCC ID	W9V-DT235-GP
Wireless Technology and Frequency Range	LTE Band 41: 2498.7 MHz ~ 2687.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Mode	• LTE: QPSK, 16QAM • 802.11b/g/n HT20/HT40
Antenna Type	WWAN: Omni Antenna WLAN: PCB Antenna
HW Version	miniPCI e, LTE module: WLTCS-101_V02 main: WLTXFSR-100GN_V00
SW Version	01.01.02.018
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Maximum RF average output power among production units

LTE Band 41				
Average power(dBm)				
Modulation	BW (MHz)	RB size	Target MPR	Power
QPSK	20	≤ 18	0	23.0
QPSK	20	> 18	0	23.0
16QAM	20	≤ 18	0	23.0
16QAM	20	> 18	0	23.0
QPSK	15	≤ 16	0	23.0
QPSK	15	> 16	0	23.0
16QAM	15	≤ 16	0	23.0
16QAM	15	> 16	0	23.0
QPSK	10	≤ 12	0	23.0
QPSK	10	> 12	0	23.0
16QAM	10	≤ 12	0	23.0
16QAM	10	> 12	0	23.0
QPSK	5	≤ 8	0	23.0
QPSK	5	> 8	0	23.0
16QAM	5	≤ 8	0	23.0
16QAM	5	> 8	0	23.0

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)									
		Ant 0				Ant 1				Ant 0+1	
		11b	11g	HT20	HT40	11b	11g	HT20	HT40	HT20	HT40
2.4GHz Band	2412	13.5	11.5	11.5		13.5	11.5	11		14.5	
	2422				11.5				10		14
	2437	13.5	11.5	11.5	11.5	13.5	11.5	11	11	14.5	14
	2452				11.5				9		14
	2462	13.5	11.5	11.5		13.5	11.5	11		14.5	



The table below summarized necessary items addressed in KDB 941225 D05 v02.

FCC ID			W9V-DT235-GP																																											
EUT			TDD-LTE Band 41 Indoor CPE																																											
Operating Frequency Range of each LTE transmission band			LTE Band 41: 2498.7 MHz ~ 2687.3 MHz																																											
Channel Bandwidth			LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz																																											
Transmission (H, M, L) channel numbers and frequencies in each LTE band																																														
LTE Band 41																																														
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz																																							
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)																																						
L	39677	2498.7	39702	2501.2	39727	2503.7	39752	2506.2																																						
M	40620	2593	40620	2593	40620	2593	40620	2593																																						
H	41563	2687.3	41538	2684.8	41513	2682.3	41488	2679.8																																						
uplink modulations used			QPSK, and 16QAM																																											
LTE Voice / Data requirements			Data only																																											
LTE MPR permanently built-in by design			Yes, per 3GPP TS 36.101 v11.0.0																																											
			Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3																																											
			<table><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table>						Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																							
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16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																							



4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) 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
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculations

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
LTE Band 41	2498.7	6.9	23.0	29.9	0.98	977.24	0.195	1.000	0.195
WLAN2.4GHz Band	2412	2.61	14.5	17.1	0.05	51.40	0.010	1.000	0.010

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band

5.2. Collocated Power Density Calculations

Maximum WLAN Power Density / Limit	Maximum WWAN Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN
0.010	0.195	0.205

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN
2. Considering the collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.