



RF Exposure Evaluation Report

Equipment : Internet of Things Gateway
Brand Name : DELL
Model No. : N03G
FCC ID : E2K-N03G
Standard : 47 CFR Part 2.1091
**Applicant/
Manufacturer** : Dell Inc.
One Dell Way, Round Rock, Texas 78682, USA

The product sample received on Jan. 26, 2017 and completely tested on May 03, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit.

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Jordan Hsiao / Manager





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PHOTOGRAPHS OF EUT v01



REVISION HISTORY

Table with 4 columns: REPORT NO., VERSION, DESCRIPTION, ISSUED DATE. Contains two rows of revision history.



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2472	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Zigbee	2400-2483.5	2405-2480	DSSS (O-QPSK)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK) LE: DSSS (GFSK)

1.2 Testing Location

Testing Location		
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input type="checkbox"/>	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) TEL : 886-3-656-9065 FAX : 886-3-656-9085

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	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)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

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:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

FCC REP Co-TX(Zigbee +BT)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;Zigbee	0.10	7.88	7.98	0.00628	20	0.00125	1.00000	0.00125
2.4G;BT-BR	1.30	12.91	14.21	0.02636	20	0.00524	1.00000	0.00524
							Sum Ratio	0.00649
							Ratio Limit	1

FCC REP Co-TX(Zigbee+ Wifi)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;Zigbee	0.10	7.88	7.98	0.00628	20	0.00125	1.00000	0.00125
2.4G;G1D	1.30	13.78	15.08	0.03221	20	0.00641	1.00000	0.00641
							Sum Ratio	0.00766
							Ratio Limit	1