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RF Exposure Evaluation Report

Report No. : CQASZ20190300002EX-03
Applicant: Grace Digital Inc
Address of Applicant: 10531 4S Commons Drive #166 Suite #430 San Diego, CA 92127, United States
Manufacturer: NEO Telecom Corporation
Address of Manufacturer: 7F, 674-24, Anyang Dong, Manan Gu, Anyang City, Kyunggi Do South Korea
Equipment Under Test (EUT):
Product: EcoSoundstation
Model No.: GDI-EXSNDST800, GDI-EXSNDST801, GDI-EXSNDST802, GDI-EXSNDST803, GDI-EXSNDST804, GDI-EXSNDST805, GDI-EXSNDST806, GDI-EXSNDST807, GDI-EXSNDST808, GDI-EXSNDST809, GDI-EXSNDST8010, GDI-EXSNDST811, GDI-EXSNDST812, GDI-EXSNDST813, GDI-EXSNDST814, GDI-EXSNDST815, GDI-EXSNDST816, GDI-EXSNDST817, GDI-EXSNDST818, GDI-EXSNDST819, GDI-EXSNDST820
Test Model No.: GDI-EXSNDST800
Brand Name: ECOXGEAR
FCC ID: 2AAUI-GDIEXSNDST
Standards: 47 CFR Part 15, Subpart C
Date of Test: 2019-03-08 to 2019-04-10
Date of Issue: 2019-04-10
Test Result : PASS*

Tested By:

Daisy Qin

(Daisy Qin)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190300002EX-03	Rev.01	Initial report	2019-04-10

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3 General Information

3.1 Client Information

Applicant:	Grace Digital Inc
Address of Applicant:	10531 4S Commons Drive #166 Suite #430 San Diego, CA 92127,United States
Manufacturer:	NEO Telecom Corporation
Address of Manufacturer:	7F, 674-24, Anyang Dong, Manan Gu, Anyang City, Kyunggi Do South Korea

3.2 General Description of EUT

Product Name:	EcoSoundstation
All Model No.:	GDI-EXSNDST800, GDI-EXSNDST801, GDI-EXSNDST802, GDI-EXSNDST803, GDI-EXSNDST804, GDI-EXSNDST805, GDI-EXSNDST806, GDI-EXSNDST807, GDI-EXSNDST808, GDI-EXSNDST809, GDI-EXSNDST8010, GDI-EXSNDST811, GDI-EXSNDST812, GDI-EXSNDST813, GDI-EXSNDST814, GDI-EXSNDST815, GDI-EXSNDST816, GDI-EXSNDST817, GDI-EXSNDST818, GDI-EXSNDST819, GDI-EXSNDST820
Test Model No.:	GDI-EXSNDST800
Trade Mark:	ECOXGEAR
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.2
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Power Supply:	battery:DC12V AC 120V 50/60Hz

3.3 General Description of Bluetooth

Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems

3.4 General Description of BLE

Modulation Type:	GFSK
Transfer Rate:	1Mbps
Number of Channel:	40

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{[\sqrt{f(\text{GHz})}]^2} \right] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

☐ $f(\text{GHz})$ is the RF channel transmit frequency in GHz

☐ Power and distance are rounded to the nearest mW and mm before calculation¹⁷

☐ The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

1) For BLE

Measurement Data

GFSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.811	3	3	1.995	0.618	3.0
Middle (2440MHz)	1.463	1.5	1.5	1.413	0.441	
Highest (2480MHz)	2.980	3	3	1.995	0.628	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190300002EX-02

2) For EDR/BDR

Measurement Data

GFSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.803	3	3	1.995	0.618	3.0
Middle (2441MHz)	1.415	1.5	1.5	1.413	0.441	
Highest (2480MHz)	2.803	3	3	1.995	0.628	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

π/4DQPSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.103	2.5	2.5	1.778	0.551	3.0
Middle (2441MHz)	0.933	1.0	1	1.259	0.393	
Highest (2480MHz)	2.106	2.5	2.5	1.778	0.560	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

8DPSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.216	2.5	2.5	1.778	0.551	3.0
Middle (2441MHz)	1.061	1.5	1.5	1.413	0.441	
Highest (2480MHz)	2.161	2.5	2.5	1.778	0.560	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190300002EX-01