RF Exposure Evaluation Declaration

Product Name	:	Edge Lite
Trade Name	:	Edge Lite
Model No.	:	SHIO-EL-NB
FCC ID	:	2AVDX-GC474264

Applicant	:	Softhard.IO Ltd.
Address	:	Entrepreneurship Center, Cyberport 3, Core F, 100 Cyberport Road, Hong Kong

Date of Receipt	:	Dec. 11, 2019
Date of Declaration	:	May 04, 2020
Report No.	:	19C0179R-E3032410101
Report Version	:	V1.0

Testing Laboratory
3024

RF Exposure Evaluation Declaration

Issued Date : May 04, 2020

Report No. : 19C0179R-E3032410101

Product Name	:	Edge Lite
Applicant	:	Softhard.IO Ltd.
Address	:	Entrepreneurship Center, Cyberport 3, Core F, 100 Cyberport Road, Hong Kong
Manufacturer	:	Softhard.IO Ltd.
Address	:	Entrepreneurship Center, Cyberport 3, Core F, 100 Cyberport Road, Hong Kong
Trade Name	:	Edge Lite
Model No.	:	SHIO-EL-NB
FCC ID	:	2AVDX-GC474264
EUT Voltage	:	DC 3.7V
Testing Voltage	:	DC 3.7V
Applicable Standard	:	FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.
Test Lab	:	Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C. TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result	:	Complied

Tested By : Max Chang

(Max Chang / Senior Engineer)

Approved By : Louis Hsu

(Louis Hsu / Deputy Manager)

Revision History

Report No.	Version	Description	Issued Date
19C0179R-E3032410101	V1.0	Initial issue of report	May 04, 2020

1.1. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required	Test Site
Temperature (°C)	Peak Output Power	15 - 35	3
Humidity (%RH)		25 - 75	

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : FCC Registration Number: TW3024

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No. 75-2, 3rd Lin, WangYe Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 3. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-592-8858 2. +886-3-582-8001 3. +886-3-582-8001
Fax number	1. +886-3-592-8859 2. +886-3-582-8958 3. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw

1.2. List of Test Equipment

Peak Output Power / SR12-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2020/03/30	2021/03/29
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2020/02/21	2021/02/20
Spectrum Analyzer	Keysight	N9030B	MY57140404	2019/06/18	2020/06/17
Spectrum Analyzer	Keysight	N9010B	MY57110159	2019/05/03	2020/05/02
Wireless Conn. Tseter	R&S	CMW500	157118	2019/08/08	2020/08/07
Wideband Radio Communication Tester	R&S	CMW500	106071	2020/02/03	2021/02/02

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

1.3. Uncertainty

Test item	Uncertainty
Peak Output Power	±1.27 dB

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2. RF Exposure Evaluation

2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m2)	Reference Period (minutes)
0.003-1023	170	180	-	Instantaneous*
0.1-10	-	1.6/ f	-	6**
1.29-10	193/ f 0.5	-	-	6**
10-20	61.4	0.163	10	6
20-48	129.8/ f 0.25	0.3444/ f 0.25	44.72/ f 0.5	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 f 0.25	0.04138 f 0.25	0.6455f0.5	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/ f 1.2
150000-300000	0.354 f 0.5	9.40 x 10-4 f 0.5	3.33 x 10-4 f	616000/ f 1.2
Note: f is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).				

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in W/m^2

Pout = output power to antenna in W

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd is the limit of MPE $0.02619 f^{0.6834}$ W/m^2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

2.3. Test Result of RF Exposure Evaluation

Product	Edge Lite
Test Mode	Transmit
Test Condition	RF Exposure Evaluation

LTE Band NB-IoT

Band	Frequency (MHz) (Lowest Frequency)	Maximum conducted output power (per tune-up) (dBm)	Maximum conducted output power (per tune-up) (mW)	Power Density (mW/cm^2)	Duty cycle (%)	MPE limit (mW/cm^2)	EIRP /ERP limit (W)	Evaluation distance for compliance with MPE limits (cm)	Antenna gain to meet EIRP/ERP limit (dBi)	Maximun antenna gain to meet all the limits (dBi)	Maximun antenna gain to meet all the limits per frequency band (dBi)
LTE Band 12	700.5	16.34	43.05	0.003	100	0.467	3.00	20	20.58	6	6