RF Exposure Evaluation Declaration

Product Name	:	LTE Module
Model No.	:	EIGR-C3&EIGR-C3X
FCC ID	:	2AU57EIGR-C3

Applicant	:	Contemporary Control Systems, Inc.
Address	:	2431 Curtiss Street Downers Grove, Illinois United States

Date of Receipt	:	Nov. 14, 2019
Test Date		Nov. 15, 2019 ~ Dec. 05, 2019
Issued Date	:	Jan. 14, 2020
Report No.	:	19B2081R-RF-US-P20V01
Report Version	:	V1.0

Test Report Certification

Issued Date : Jan. 14, 2020
Report No. : 19B2081R-RF-US-P20V01

Product Name	:	LTE Module
Applicant	:	Contemporary Control Systems, Inc.
Address	:	2431 Curtiss Street Downers Grove, Illinois United States
Manufacturer	:	Contemporary Control Systems, Inc.
Address	:	2431 Curtiss Street Downers Grove, Illinois United States
Model No.	:	EIGR-C3&EIGR-C3X
FCC ID	:	2AU57EIGR-C3
EUT Voltage	:	DC 24V
Test Voltage	:	DC 24V
Brand Name		CTRLINK
Applicable Standard	:	KDB 447498D01v06 FCC Part1.1310
Test Result	:	Complied
Performed Location	:	DEKRA Testing and Certification (Suzhou) Co., Ltd. No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: CN1199

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Approved By : Jack zhang

(Supervisor: Jack Zhang)

1. RF Exposure Evaluation

1.1. 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

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4*pi*r2)

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd is the limit of MPE, 1 mW/cm2. 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.

1.2. Test Procedure

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

The temperature and related humidity: 18℃and 78％ RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	LTE Module
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna Information:

Antenna manufacturer	N/A					
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX	☐	3*TX+3*RX
Antenna technology	☒	SISO				
	☐	MIMO	☐	Basic		
			☐	Sectorized antenna systems		
			☐	Cross-polarized antennas		
			☐	Unequal antenna gains, with equal transmit powers		
			☐	Spatial Multiplexing		
			☐	CDD		
			☐	Beam-forming		
Antenna Type	☒	External	☒	Dipole		
	☐	Internal	☐	PIFA		
			☐	PCB		
			☐	Ceramic Chip Antenna		
			☐	Metal plate type F antenna		
			☐	Cross-polarize Antenna		
Antenna Gain	Band 4: 3.51dBi for 1Y001J, 3.75dBi for 2H032C Band 13: 1.51dBi for 1Y001J, 4.47dBi for 2H032C					

Note: The EUT has two antennas, model 1Y001J and 2H032C.

- Output Power into Antenna & RF Exposure Evaluation Distance
- Standalone modes

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 20 cm (mW/cm2)	Power Density Limit at R = 20 cm (mW/cm2)
LTE Band 4	1710-1755	23.39	3.75	0.10	1.0
LTE Band 13	777-787	23.33	4.47	0.12	1.0

Note: The transmission power density is 0.12mW/cm^2 for EUT, without any other radio equipment.

The End