

## RF Exposure Evaluation declaration

Product Name : LV55

Model No. : LVSKIHP

FCC ID : NKR-LVSK-IHP

Applicant : Wistron NeWeb Corporation

Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan

Date of Receipt : Jul. 29, 2020

Date of Declaration : Aug. 19, 2020

Report No. : 2071064R-E3082100013

Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Issued Date: Aug. 19, 2020

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|                     |                                                              |                                                                                                                                     |
|---------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Product Name        | LV55                                                         |                                                                                                                                     |
| Applicant           | Wistron NeWeb Corporation                                    |                                                                                                                                     |
| Address             | 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan |                                                                                                                                     |
| Manufacturer        | Wistron NeWeb Corporation                                    |                                                                                                                                     |
| Model No.           | LVSKIHP                                                      |                                                                                                                                     |
| FCC ID.             | NKR-LVSK-IHP                                                 |                                                                                                                                     |
| Trade Name          | WNC                                                          |                                                                                                                                     |
| Applicable Standard | KDB 447498 D01 v06                                           | <input checked="" type="checkbox"/> Minimum test separation distance $\geq 20$ cm<br><input type="checkbox"/> For low power devices |
| Test Result         | Complied                                                     |                                                                                                                                     |

Documented By

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Approved By

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( Director / Vincent Lin )

## **Revision History**

| Report No.           | Version | Description              | Issued Date |
|----------------------|---------|--------------------------|-------------|
| 2071064R-E3082100013 | V1.0    | Initial issue of report. | 2020-08-19  |

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                      |                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name         | LV55                                                                                                                                                                                                                                                                                                                                                                                             |
| Model No.            | LVSKIHP                                                                                                                                                                                                                                                                                                                                                                                          |
| Trade Name           | WNC                                                                                                                                                                                                                                                                                                                                                                                              |
| FCC ID               | NKR-LVSK-IHP                                                                                                                                                                                                                                                                                                                                                                                     |
| WLAN/BT TX Frequency | BT: 2402 – 2480MHz<br>802.11b/g/n/ax-20MHz: 2412-2462MHz, 5260-5320MHz, 5500-5700MHz<br>802.11n/ax-40MHz:2422-2452MHz, 5270-5310MHz, 5510-5670MHz<br>802.11a/n/ac/ax-20MHz: 5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5720MHz, 5745-5825MHz<br>802.11n/ac/ax-40MHz: 5190-5230, 5270-5310MHz, 5510-5670MHz, 5710MHz , 5755-5795MHz<br>802.11ac/ax-80MHz: 5210MHz, 5290MHz, 5530-5690MHz , 5775MHz |
| WWAN TX Frequency    | LTE Band 2/ NR ENDC n2: 1850~1910MHz<br>LTE Band 5/ NR ENDC n5: 824MHz ~849MHz<br>LTE Band 13: 777~787MHz<br>LTE Band 48: 3550~3700MHz<br>LTE Band 66/ NR ENDC n66:1710MHz~1780MHz<br>NR ENDC n260:37GHz~40GHz<br>NR ENDC n261:27.5GHz~28.35GHz                                                                                                                                                  |
| HW Version           | 0.0.2                                                                                                                                                                                                                                                                                                                                                                                            |
| SW Version           | 0.23.9.1dbg                                                                                                                                                                                                                                                                                                                                                                                      |
| Antenna Type         | Dipole Antenna (WWAN/WLAN)<br>PIFA Antenna (Bluetooth)                                                                                                                                                                                                                                                                                                                                           |

## 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/cm <sup>2</sup> ) | 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                              | 30                     |
| 1500-100,000                                              | --                            | --                            | 1                                   | 30                     |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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.

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is  $\leq 1.0$

## 2.2. Test Result of RF Exposure Evaluation

Product : LV55  
 Test Item : RF Exposure Evaluation  
 Test Site : N/A

### Simultaneous Transmission Configurations 1:

| Type        | Conducted Power (dBm) | Antenna Gain (dBi) | EIRP Power (dBm) | EIRP Power (mW) | Duty cycle (%) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Total Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-------------|-----------------------|--------------------|------------------|-----------------|----------------|---------------|-------------------------------------|-------------------------------------------|-----------------------------|
| 5G FR1      | 24.54                 | 3.28               | 27.82            | 605.34          | 100            | 20            | 0.1204285                           | 0.7442                                    | 1                           |
| BT          | 3.35                  | 2.21               | 5.56             | 3.60            | 100            | 20            | 0.0007157                           |                                           |                             |
| LTE         | 23.76                 | 3.28               | 27.04            | 505.82          | 100            | 20            | 0.1006304                           |                                           |                             |
| WiFi 2.4GHz | 24.64                 | 3.36               | 28               | 630.96          | 100            | 20            | 0.1255247                           |                                           |                             |
| WiFi 5GHz   | 27.78                 | 5.22               | 33               | 1995.26         | 100            | 20            | 0.3969439                           |                                           |                             |

### Simultaneous Transmission Configurations 2:

| Type             | Conducted Power (dBm) | Antenna Gain (dBi) | EIRP Power (dBm) | EIRP Power (mW) | Duty cycle (%) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Total Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|------------------|-----------------------|--------------------|------------------|-----------------|----------------|---------------|-------------------------------------|-------------------------------------------|-----------------------------|
| 5G FR2           | N/A                   | N/A                | 51.1             | 32206.24        | 25             | 54            | 0.8789043                           | 0.9645                                    | 1                           |
| BT               | 3.35                  | 2.21               | 5.56             | 3.60            | 100            | 54            | 0.0000982                           |                                           |                             |
| LTE (Standalone) | 23.76                 | 3.28               | 27.04            | 505.82          | 100            | 54            | 0.0138039                           |                                           |                             |
| WiFi 2.4GHz      | 24.64                 | 3.36               | 28               | 630.96          | 100            | 54            | 0.0172187                           |                                           |                             |
| WiFi 5GHz        | 27.78                 | 5.22               | 33               | 1995.26         | 100            | 54            | 0.0544505                           |                                           |                             |

## Simultaneous Transmission Configurations 3:

| Type         | Conducted Power (dBm) | Antenna Gain (dBi) | EIRP Power (dBm) | EIRP Power (mW) | Duty cycle (%) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Total Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|--------------|-----------------------|--------------------|------------------|-----------------|----------------|---------------|-------------------------------------|-------------------------------------------|-----------------------------|
| 5G FR2       | N/A                   | N/A                | 51.1             | 32206.24        | 25             | 54            | 0.8789043                           | 0.9621                                    | 1                           |
| BT           | 3.35                  | 2.21               | 5.56             | 3.60            | 100            | 54            | 0.0000982                           |                                           |                             |
| LTE (CA_PCC) | 20.29                 | 1.76               | 22.05            | 160.32          | 100            | 54            | 0.0043752                           |                                           |                             |
| LTE (CA_SCC) | 21.96                 | 2.15               | 24.11            | 257.63          | 100            | 54            | 0.0070307                           |                                           |                             |
| WiFi 2.4GHz  | 24.64                 | 3.36               | 28               | 630.96          | 100            | 54            | 0.0172187                           |                                           |                             |
| WiFi 5GHz    | 27.78                 | 5.22               | 33               | 1995.26         | 100            | 54            | 0.0544505                           |                                           |                             |

## Note:

- The EIRP power is refer to report No.: 2050525R-E3042110012, 2050962R-E3042110012-A, 2050962R-E3032110108, 2050962R-E3032110114, 2050962R-E3032110126, 2071064R-E3032110126 from the DEKRA.
- Per the 5GTF specification, the 5G mmWave operates with a radio frame length of 10ms (50 subframes per 10ms frame) and this device operates using a 3:1 ratio for DL/UL, where the UL is from the CPE device. The 3:1 ratio for DL/UL operation is fixed and cannot be changed by the end user. Within each 10ms frame there are 700 symbols, of which 533 symbols are downlink and the remaining 167 symbols are uplink. Thus,  $167/700 = 23.86\%$  duty cycle for the CPE and set the duty cycle as 25% for 5G FR2 MPE.