

# 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 : May. 29, 2020

Date of Declaration : July 17, 2020

Report No. : 2050962R-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 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: July 17, 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 <input type="checkbox"/> For low power devices
Test Result	Complied	

Documented By : Anny Chou  
 ( Senior Adm. Specialist / Anny Chou )

Tested By : wenLee  
 ( Supervisor / Wen Lee )

Approved By : [Signature]  
 ( Director / Vincent Lin )

## Revision History

<b>Report No.</b>	<b>Version</b>	<b>Description</b>	<b>Issued Date</b>
2050962R-E3082100013	V1.0	Initial issue of report.	2020-07-17

## 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 802.11b/g/n/ax-20MHz: 2412-2462MHz 802.11n/ax-40MHz:2422-2452MHz 802.11a/n/ac/ax-20MHz: 5180-5240MHz, 5745-5825MHz 802.11n/ac/ax-40MHz: 5190-5230, 5755-5795MHz 802.11ac/ax-80MHz: 5210MHz, 5775MHz
WWAN TX Frequency	LTE Band 2/ NR ENDC n2: 1850~1910MHz LTE Band 5/ NR ENDC n5: 824MHz ~849MHz LTE Band 13: 777~787MHz LTE Band 66/ NR ENDC n66:1710MHz~1780MHz NR ENDC n260:37GHz~40GHz NR ENDC n261:27.5GHz~28.35GHz
HW Version	0.0.2
SW Version	0.23.9.1dbg
Antenna Type	Dipole Antenna (WWAN/WLAN) 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)
<b>(A) Limits for Occupational/ Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Population/ Uncontrolled Exposures</b>				
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	25764.99	20	48	0.8898906	0.9982	1
BT	3.35	2.21	5.56	3.60	100	48	0.0001243		
LTE (Standalone)	23.76	3.28	27.04	505.82	100	48	0.0174706		
WiFi 2.4GHz	24.64	3.36	28	630.96	100	48	0.0217925		
WiFi 5GHz	27.78	5.22	33	1995.26	100	48	0.0689139		

## 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	25764.99	20	48	0.8898906	0.9952	1
BT	3.35	2.21	5.56	3.60	100	48	0.0001243		
LTE (CA_PCC)	20.29	1.76	22.05	160.33	100	48	0.0055374		
LTE (CA_SCC)	21.96	2.15	24.11	257.63	100	48	0.0088983		
WiFi 2.4GHz	24.64	3.36	28	630.96	100	48	0.0217925		
WiFi 5GHz	27.78	5.22	33	1995.26	100	48	0.0689139		

## Note:

- The EIRP power is refer to report No.: 2050525R-E3042110012, 2050962R-E3042110012-A, 2050962R-E3032110108, 2050962R-E3032110114, 2050962R-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 4:1 ratio for DL/UL, where the UL is from the CPE device. The 4:1 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 568 symbols are downlink and the remaining 132 symbols are uplink. Thus,  $132/700 = 18.9\%$  duty cycle for the CPE and set the duty cycle as 20% for 5G FR2 MPE.