

# RF Exposure Evaluation Report

Product Name : V2X DSRC Module

Model No. : VTX-301

FCC ID : NUK-VTX3012

Applicant : Unex Technology Corporation

Address : 7F-2, No. 100, Sec. 1, Jiafeng 11th Rd., Zhubei City,  
Hsinchu County 30273, Taiwan, R.O.C.

Date of Receipt : Feb. 05, 2020

Date of Declaration : Apr. 23, 2020

Report No. : 2020046R-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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Issued Date: Apr. 23, 2020

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|                     |   |   |
|---------------------|---|---|
| Product Name        | V2X DSRC Module   |   |
| Applicant           | Unex Technology Corporation   |   |
| Address             | 7F-2, No. 100, Sec. 1, Jiafeng 11th Rd., Zhubei City, Hsinchu County<br>30273, Taiwan, R.O.C. |   |
| Manufacturer        | Unex Technology Corporation   |   |
| Model No.           | VTX-301   |   |
| FCC ID.             | NUK-VTX3012   |   |
| Trade Name          | Unex  |   |
| 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 :

Jinn Chen

( Senior Adm. Specialist / Jinn Chen )

Tested By :

wenlee

( Senior Engineer / Wen Lee )

Approved By :



( Director / Vincent Lin )

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                    |  |
|--------------------|--|
| Product Name       | V2X DSRC Module  |
| Trade Name         | Unex   |
| Model No.          | VTX-301  |
| FCC ID.            | NUK-VTX3012  |
| Frequency Range    | 5745-5825MHz (10MHz Bandwidth)<br>5860-5920MHz (10MHz Bandwidth)       |
| Channel Number     | 5745-5825MHz (10MHz Bandwidth): 9<br>5860-5920MHz (10MHz Bandwidth): 7 |
| Type of Modulation | OFDM   |
| Antenna Type       | OMNI Antenna   |
| Channel Control    | Auto   |
| Antenna Gain       | Refer to the table “Antenna List”                                      |

#### Antenna List

| No. | Manufacturer                | Part No. | Antenna Type | Peak Gain                |
|-----|-----------------------------|----------|--------------|--------------------------|
| 1   | Unex Technology Corporation | EX-30    | OMNI Antenna | 3.73dBi for 5745-5825MHz |
| 2   | Unex Technology Corporation | EX-32    | OMNI Antenna | 5.5dBi for 5860-5920MHz  |

## 2. RF Exposure Evaluation

### 2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance  $\geq 20$  cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

### 2.2. 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                              | 6                      |
| 1500-100,000  | --                            | --                            | 1                                   | 30                     |

F= Frequency in MHz

Friis Formula

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

Where

Pd = power density in mW/cm<sup>2</sup>

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

### 2.3. Test Result of RF Exposure Evaluation

Product : V2X DSRC Module  
 Test Item : RF Exposure Evaluation

#### 5GHz wireless 5745-5825MHz Peak Gain: 3.73dBi

| Band | Frequency (MHz) | Conducted maximum Peak Power (dBm) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Pass/Fail |
|------|-----------------|------------------------------------|------------------------------|--|-----------------------------|-----------|
| 5G   | 5745            | 19.98                              | 99.541                       | 0.0467   | 1                           | Pass      |

Note: The Maximum conducted output power is refer to report No.: 2020046R-E3032110123, from the DEKRA.

#### 5GHz wireless 5860-5920MHz Peak Gain: 5.5dBi

| Band | Frequency (MHz) | Conducted maximum Average Power (dBm) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Pass/Fail |
|------|-----------------|---------------------------------------|------------------------------|--|-----------------------------|-----------|
| 5G   | 5860            | 19.98                                 | 99.541                       | 0.0703   | 1                           | Pass      |

Note: The Maximum conducted output power is refer to report No.: 2020046R-RFUSP76V01, 2020046R-RFUSP77V00 from the DEKRA.