

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 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	☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Test Result	Complied	

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Tested By : wen Lee
(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) 5860-5920MHz (10MHz Bandwidth)
Channel Number	5745-5825MHz (10MHz Bandwidth): 9 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 ≥ 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 ²)	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: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 ²)	Limit (mW/cm ²)	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 ²)	Limit (mW/cm ²)	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.