TEST REPORT

DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No. : DREFCC2112-0210

2. Client / Applicant

   • Name : The Whistler Group

   • Address : 168 Ayer Rd. Littleton, MA. 01460

3. Use of Report : Grant of Certification

4. Product Name / Model Name : Radar Detector / Titan XR
   (FCC ID : HSXWH50)

5. Test Standard : ANSI C63.4 : 2014
   FCC Part 15 Subpart B
   (Radar detector)

6. Date of Test : Dec. 04. 2021

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : Temperature (21) °C , Humidity (42) % R.H.

9. Test Result : Refer to the attached Test Result

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by	Reviewed by
	Name : JunSeo Park (signature)	Name : HyungJun Kim (signature)

Dec. 09. 2021

DT&C Co., Ltd.

This test report is a general report that does not use the KOLAS accreditation mark and is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

CONTENTS

1. General Remarks

This report contains the result of tests performed by :

DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042
http://www.dtnc.net
Tel: +82-31-321-2664 Fax: +82-31-321-1664

2. Test Laboratory

DT&C Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

Certificate	Nation	Agency	Code	Remark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
	South Africa	SABS	0006	ISO/IEC 17025
	Ghana	NCA	NCA agreement 23rd,Oct,2018	-
Site Filing	USA	FCC	KR0034	Designation
	Canada	IC	KR0034	Designation
	Japan	VCCI	C-1427, R-3385, R-14076, R-14180, R-14496, T-11442, G-10338, G-10754, G-10815, G-20051	Registered
Certification	Korea	KC	KR0034	Designation
	Germany	TUV	CARAT 089112 0008 Rev.00	ISO/IEC 17025
	Russia	RMRS	17.10189.296	ISO/IEC 17025

Quality control in the testing laboratory is implemented as per ISO/IEC 17025
which is the “General requirements for the competent of calibration and testing laboratory”.

3. General Information of EUT

Applicant	The Whistler Group 168 Ayer Rd. Littleton, MA. 01460
Manufacturer	RDX Inc. 1106 (Daeryung Techno Town 8Cha), 96, Gamasan-ro, Geumcheon-gu, Seoul, Korea 08501
Factory	RADIX Telecom Phils., Ind. Inc. SUNPINO BLDG. BLK. 6 LOT 10 PHASE II CEPZ, ROSARIO CAVITE 4106 PHILIPPINES
Product Name	Radar Detector
Model Name	Titan XR
Add Model Name	None
Add Model Difference	None
S/W version	None
H/W version	None
RF Module Name	None
Maximum Internal Frequency	36 GHz
Rated Power	DC 12 V
FCC ID	HSXWH50
Remarks	- Radar Frequencies 10.500 - 10.550 GHz (X Band) 24.050 - 24.250 GHz (K Band) 33.400 - 36.000 GHz (Ka Superwideband)

Related Submittal(s) / Grant(s)
Original submittal only

4. EUT Operations and Test Configurations

4.1 Principle of Configuration Selection

Emission :
The equipment under test (EUT) was configured to measure its highest possible radiation level.
The test modes were adapted accordingly in reference to the instructions for use.
For each testing mode different configurations were used,
Refer to the individual tests.

4.2 EUT Operation Mode

No.	Mode	Description
1	Normal Operation	EUT is the state in which the radar function is activated EUT is tested by connecting the cigar jack USB OUTPUT to the cement resistor.
* USB ports are FW, DSP, and Used only for database updates		

4.3 Test Configuration Mode

No.	Mode	Description
1	Normal Operation	EUT is receiving power from DC POWER SUPPLY

4.4 Supported Equipment

Used*	Product Type	Manufacturer	Model	Remarks
AE	Speaker	N/A	N/A	N/A

*Abbreviations:
AE - Auxiliary/Associated Equipment, or
SIM - Simulator

4.5 EUT In/Output Port

Name	Type*	Cable Max. >3 m	Cable Shielded	Cable Back shell	Remarks
POWER PORT	DC	1.0	Non shield	Plastic	None
External Audio Port	I/O	1.5	Shield	Plastic	None
USB OUTPUT	DC	1.0	Shield	Plastic	None

*Abbreviations:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port
TP = Telecommunication Ports

4.6 Test Voltage and Frequency

Case	Voltage (V)	Frequency (Hz)	Phases	Remarks
1	DC 12	-	-	None

5. Test Summary

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4:2014	**N/A (Note 1)**
Radiated Disturbance	ANSI C63.4:2014	**C**
C=Comply N/C=Not Comply N/T=Not Tested N/A=Not Applicable		
Note) This test was not required because EUT was used DC power.		

The data in this test report are traceable to the national or international standards.

- Conducted Disturbance

Frequency [MHz]	Pol.	Result [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]
-	-	-	-	-	-

-Radiated Disturbance

Frequency [MHz]	Pol.	Result [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]
12087.770	V	30.46	Cispr - Average	54.00	23.54

6. Test Environment

Test Items	Test date (YYYY-MM-DD)	Temp. (℃)	Humidity (% R.H.)	Pressure (kPa)
Radiated Disturbance	2021-12-04	21	42	-

7. Test Results : Emission

7.1 Conducted Disturbance

ANSI C63.4	Mains terminal disturbance voltage	Result
Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. The measuring port of the LISN for EUT was connected to spectrum analyzer. Using conducted emission test software, the emissions were scanned with peak detector mode. After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and CISPR Average detector. For (0.15 ~ 30) MHz frequency range, Quasi-Peak detector with 10 kHz RBW and 30 kHz VBW was used. By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission.		**Not Applicable**

Fully configured sample scanned over the following frequency range	**Frequency range on each side of line**	**Measurement Point**
	150 kHz to 30 MHz	**Mains**
EUT mode (Refer to clauses 4)	**Test configuration mode**	**N/A**
	EUT Operation mode	**N/A**

Limits – Class A

Frequency (MHz)	**Limit dBµV**	
	Quasi-Peak	**Average**
0.15 to 0.50	79	66
0.50 to 30	73	60

Limits – Class B

Frequency (MHz)	**Limit dBµV**	
	Quasi-Peak	**Average**
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Measurement Instrument					
Description	**Model**	**Manufacturer**	**Identifier**	**Cal. Date**	**Cal. Due**
-	-	-	-	-	-

Calculation

N : Neutral phase, L1 : Live phase
C.FACTOR(dB) : Pulse Limiter(dB) + Cable loss(dB) + Insertion loss of LISN(dB)
Result(dBµV) : Reading Value(dBµV) + C.FACTOR(dB)
Margin(dB) : Limit(dBµV) - Result(dBµV)

Mains terminal disturbance voltage _Measurement data			
Test configuration mode	**N/A**	**EUT Operation mode**	**N/A**
Test voltage (V)	**N/A**	**Test Frequency (Hz)**	**N/A**

7.2 Radiated Disturbance

ANSI C63.4	Radiated disturbance 30 MHz –30 GHz**	Result
Method: Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 or 3 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. For final measurement below 1 GHz frequency range, Quasi-Peak detector with (RBW = 120 kHz Bandwidth) was used. For final measurement above 1 GHz frequency range, Peak detector with (RBW = 1 MHz Bandwidth) and CISPR Average detector with (RBW = 1 MHz Bandwidth) were used.		**Comply**

EUT mode (Refer to clauses 4)	**Test configuration mode**	**1**
	EUT Operation mode	**1**

Radiated Disturbance below 1 000 MHz

Frequency range (MHz)	**Quasi-peak limit dBµV/m**		
	Class A		**Class B**
	3 m distance	**10 m distance**	**3 m distance**
30 to 88	49.1	39.1	40
88 to 216	53.5	43.5	43.5
216 to 960	56.4	46.4	46
960 to 1 000	59.5	49.5	54

According to 15.109(g), as an alternative to the radiated emission limit shown above, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22 shown.

Frequency range (MHz)	**Quasi-peak limit dBµV/m**	
	Class A (10 m distance)	**Class B (10 m distance)**
30 to 230	40	30
230 to 1 000	47	37

Radiated Disturbance for above 1 000 MHz at a measurement distance of 3 m

Frequency range (GHz)	**Peak limit dBµV/m**		**Average limit dBµV/m**	
	Class A	**Class B**	**Class A**	**Class B**
1 to 40	80	74	60	54

The test frequency range of Radiated Disturbance measurements are listed below.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	**Upper frequency of measurement range (MHz)**
Below 108	1 000
108 – 500	2 000
500 – 1 000	5 000
Above 1 000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Measurement Instrument					
Description	**Model**	**Manufacturer**	**Identifier**	**Cal. Date**	**Cal. Due**
MEASUREMENT SOFTWARE	EMI-R VER. 2.00.0147	TSJ	N/A	N/A	N/A
EMI TEST RECEIVER	ESU	ROHDE&SCHWARZ	100469	2021-11-12	2022-11-12
HORN ANTENNA	EM-6969	ELECTRO-METRICS	156	2020-12-29	2021-12-29
PREAMPLIFIER	MLA-0618-B03-34	TSJ	1785642	2020-12-24	2021-12-24
(NOTE : THE MEASUREMENT ANTENNAS WERE CALIBRATED IN ACCORDANCE TO THE REQUIREMENTS OF C63.5-2017.)					

Calculation

Result(dBuV/m) : Reading Value(dBuV) + Cable loss(dB) - Pre amplifier gain(dB) + Ant. Factor(dB)
Margin : Limit(dBuV/m) - Result(dBuV/m)

Radiated disturbance at (11.7 ~ 12.2) GHz _Peak Measurement data			
Test configuration mode	**1**	**EUT Operation mode**	**1**
Test voltage (V)	**DC 12**	**Test Frequency (Hz)**	**-**

RADIATED EMISSION

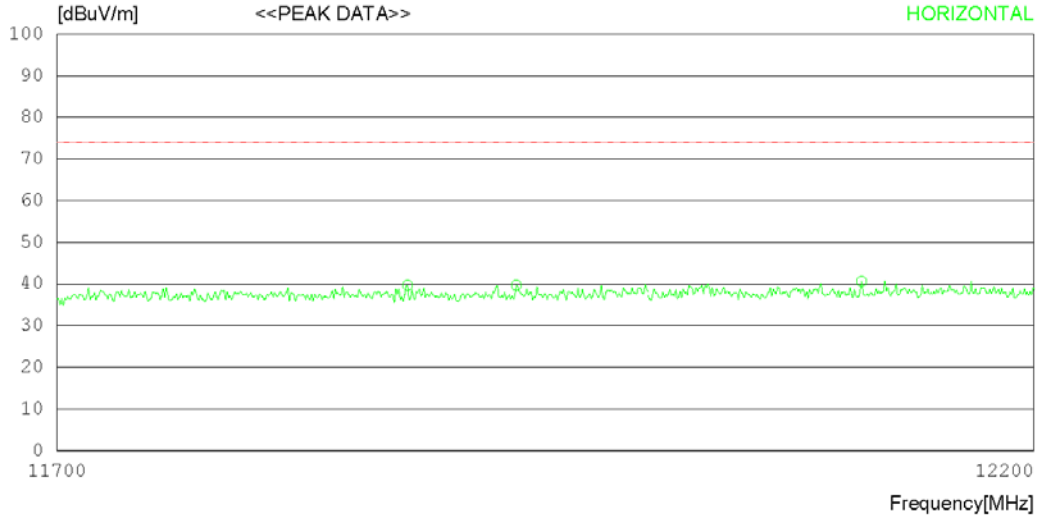
Date 2021-12-04

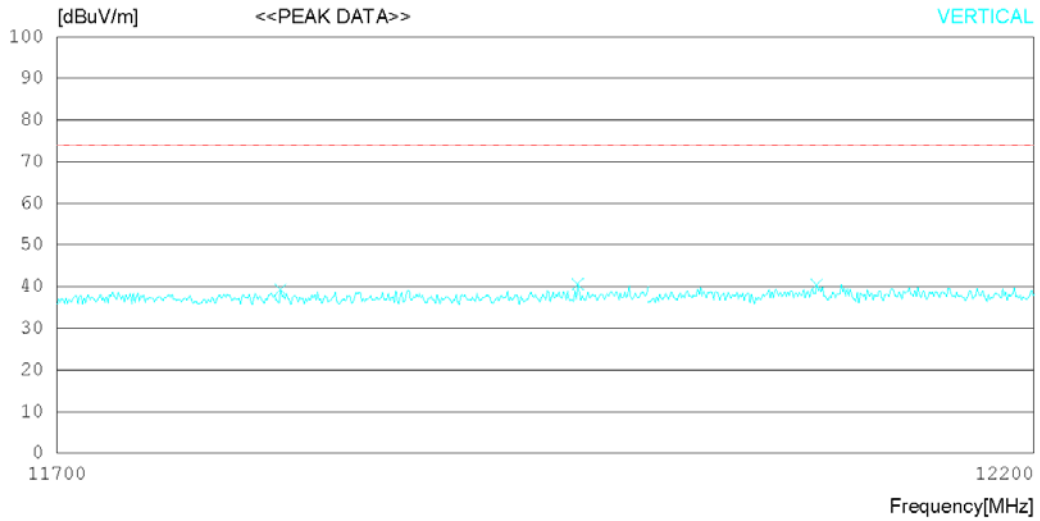
Order No. DTNC2111-09136
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Peak)

Antenna Factor
1. EMC-233-A_EM-6969_156_2020.12.29
Cable Loss
1. #27_C1_Ant to Bottom_3m_창의_1-18G_2021.02.25
2. #28_C2_Bottom to Amp(Filter,Receiver)_3m_창의_1-18G_2021.02.25
Pre Amp Gain
1. EMC-233-M_MLA-0618-B03-34_2020.12.24





RADIATED EMISSION

Date 2021-12-04

Order No. DTNC2111-09136
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Peak)

Antenna Factor
1. EMC-233-A_EM-6969_156_2020.12.29
Cable Loss
1. #27_C1_Ant to Bottom_3m_창의_1-18G_2021.02.25
2. #28_C2_Bottom to Amp(Filter,Receiver)_3m_창의_1-18G_2021.02.25
Pre Amp Gain
1. EMC-233-M_MLA-0618-B03-34_2020.12.24

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- HORIZONTAL ------										
1	11877.000	27.80	32.80	17.57	38.51	39.66	74.0	34.34	112	166
2	11932.500	27.90	32.80	17.49	38.54	39.65	74.0	34.35	233	0
3	12110.250	28.70	32.90	17.62	38.61	40.61	74.0	33.39	246	358
----- VERTICAL ------										
4	11812.500	27.40	32.73	17.64	38.47	39.30	74.0	34.7	232	55
5	11964.000	28.90	32.80	17.46	38.56	40.60	74.0	33.4	220	0
6	12087.000	28.60	32.90	17.57	38.61	40.46	74.0	33.54	313	33

Radiated disturbance at (11.7 ~ 12.2) GHz _ Average Measurement data			
Test configuration mode	**1**	**EUT Operation mode**	**1**
Test voltage (V)	**DC 12**	**Test Frequency (Hz)**	**-**

RADIATED EMISSION

Date 2021-12-04

Order No. DTNC2111-09136
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

Antenna Factor
1. EMC-233-A_EM-6969_156_2020.12.29
Cable Loss
1. #27_C1_Ant to Bottom_3m_창의_1-18G_2021.02.25
2. #28_C2_Bottom to Amp(Filter,Receiver)_3m_창의_1-18G_2021.02.25
Pre Amp Gain
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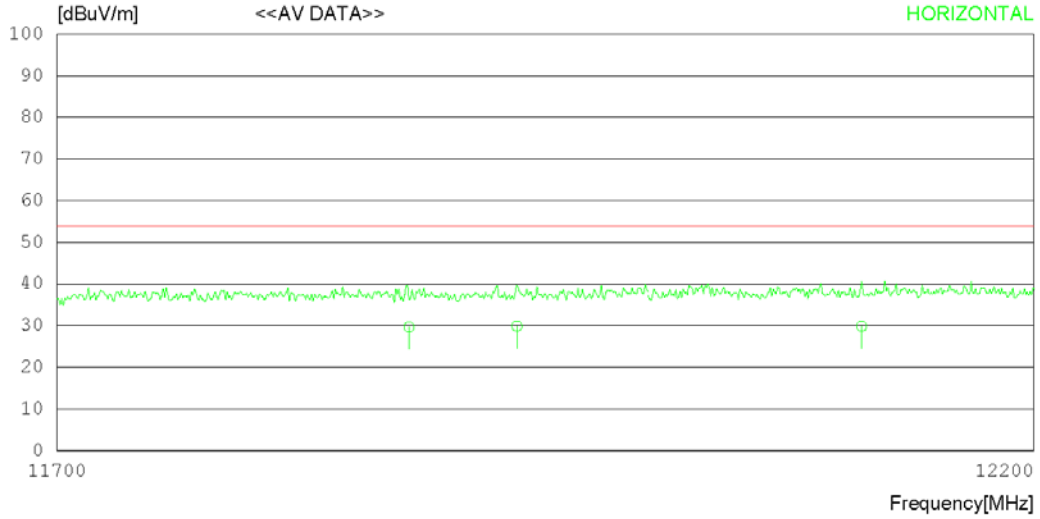

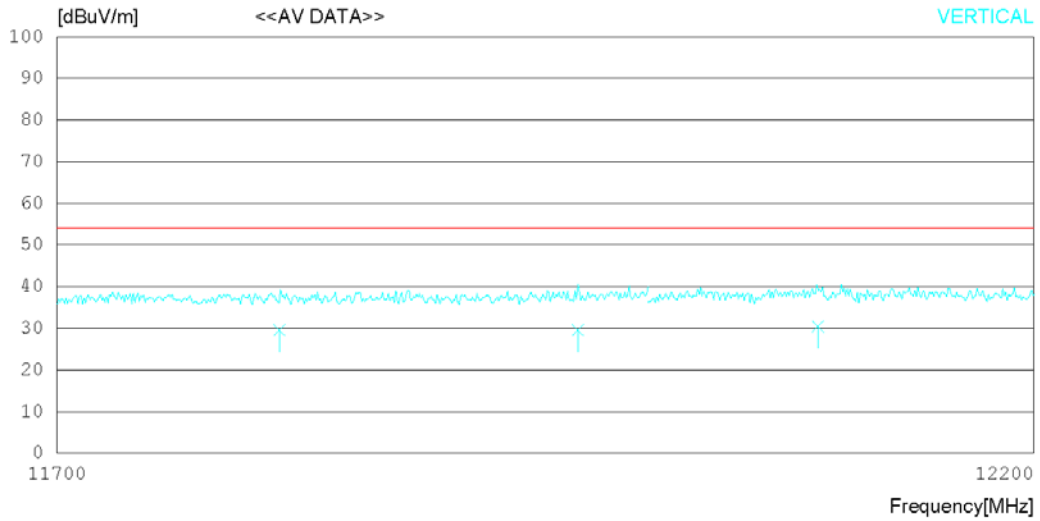

RADIATED EMISSION

Date 2021-12-04

Order No. DTNC2111-09136
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

Antenna Factor
1. EMC-233-A_EM-6969_156_2020.12.29
Cable Loss
1. #27_C1_Ant to Bottom_3m_창의_1-18G_2021.02.25
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Pre Amp Gain
1. EMC-233-M_MLA-0618-B03-34_2020.12.24

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- HORIZONTAL ------										
1	11877.670	17.80	32.80	17.56	38.51	29.65	54.00	24.35	322	78
2	11932.790	18.10	32.80	17.49	38.54	29.85	54.00	24.15	112	110
3	12110.310	17.90	32.90	17.62	38.61	29.81	54.00	24.19	220	223
----- VERTICAL ------										
4	11812.120	17.70	32.72	17.64	38.47	29.59	54.00	24.41	232	305
5	11964.040	17.90	32.80	17.46	38.56	29.60	54.00	24.40	112	42
6	12087.770	18.60	32.90	17.57	38.61	30.46	54.00	23.54	220	132

8. Revision History

Date	Description	Revised By	Reviewed By
Dec. 09. 2021	Initial report	JunSeo Park	HyungJun Kim

-End of test report-