

# **KDB 178919 D01**

## **FCC RADIO TEST REPORT**

### **FCC ID: 2BBDIVBK30C21**

**Product:** Telematics Headunit

**Trade Mark:**

**JETOUR**

**Model No.:** 30C21

**Family Model:** N/A

**Report No.:** S24121204713004

**Issue Date:** Jan 03, 2025

#### **Prepared for**

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#### **Prepared by**

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Wuxi Auto-link World Information Technology Co., Ltd  
**Address** ..... : No. 2, Gaokai Road, Economic Development Zone, Wuxi City, Jiangsu Province, P .R. China  
**Manufacturer's Name** ..... : Wuxi Auto-link World Information Technology Co., Ltd  
**Address** ..... : No. 2, Gaokai Road, Economic Development Zone, Wuxi City, Jiangsu Province, P .R. China

**Product description**

**Product name** ..... : Telematics Headunit

**Trademark** ..... :



**Model and/or type reference** ..... : 30C21

**Family Model** ..... : N/A

**Test Sample number** ..... : S241212047015

**Date of Test** ..... : Dec 27, 2024 ~ Jan 03, 2025

**Standards** ..... : FCC Part15.407

**Test procedure** ..... ANSI C63.10-2013  
KDB 789033 D02 General UNII Test Procedures New Rules v02r01  
KDB 905462 D03 Client Without DFS New Rules v01r02  
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02  
KDB 178919 D01

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Revision History

Report No.	Version	Description	Issued Date
S24121204713004	Rev.01	Initial issue of report	Jan 03, 2025

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.209(a), 15.407 (b)(1) 15.407 (b)(2) 15.407 (b)(3) 15.407 (b)(4) 15.407(b)(8)(9)	Radiated Emissions	PASS	
15.203	Antenna Requirement	PASS	

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

## 1.1 FACILITIES AND ACCREDITATIONS

### FACILITIES

All measurement facilities used to collect the measurement data are located at No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### LABORATORY ACCREDITATIONS AND LISTINGS

#### Site Description

CNAS-Lab. : The Certificate Registration Number is L5516.

IC-Registration : The Certificate Registration Number is 9270A.  
CAB identifier:CN0074

FCC- Accredited : Test Firm Registration Number: 463705.  
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01

Name of Firm : Shenzhen NTEK Testing Technology Co., Ltd.

Site Location : No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.


## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.80\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(9KHz~30MHz)	$\pm 6\text{dB}$
5	All emissions, radiated(30MHz~1GHz)	$\pm 2.64\text{dB}$
6	All emissions, radiated(1GHz~6GHz)	$\pm 2.40\text{dB}$
7	All emissions, radiated( > 6GHz)	$\pm 2.52\text{dB}$
8	Temperature	$\pm 0.5^{\circ}\text{C}$
9	Humidity	$\pm 2\%$

## 1. GENERAL INFORMATION

### 1.1 GENERAL DESCRIPTION OF EUT

Equipment	Telematics Headunit	
Trade Mark		
Model Name	30C21	
Family Model	N/A	
Model Difference	N/A	
FCC ID	2BBDIVBK30C21	
Product Description	Mode Supported	<input checked="" type="checkbox"/> 802.11a <input checked="" type="checkbox"/> 802.11n(HT20) <input checked="" type="checkbox"/> 802.11n(HT40) <input checked="" type="checkbox"/> 802.11ac(HT20) <input checked="" type="checkbox"/> 802.11ac(HT40) <input checked="" type="checkbox"/> 802.11ac(HT80)
	Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS9
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
	Operating Frequency Range	<input checked="" type="checkbox"/> U-NII-1: 5150 MHz ~5250MHz <input checked="" type="checkbox"/> U-NII-3: 5725 MHz ~5850 MHz
	Function:	<input type="checkbox"/> Outdoor AP <input type="checkbox"/> Indoor AP <input type="checkbox"/> Fixed P2P <input checked="" type="checkbox"/> Client
	DFS type:	<input type="checkbox"/> master devices <input type="checkbox"/> Slave devices with radar detection <input checked="" type="checkbox"/> Slave devices without radar detection
	Support TPC	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	Smart system	<input checked="" type="checkbox"/> SISO for 802.11a/n/ac <input checked="" type="checkbox"/> MIMO for 802.11n/ac
	Antenna Type	Ant 1:Internal Antenna; Ant 2: Internal Antenna
	Antenna Gain	5.2G:Ant 1: 3.49 dBi; Ant 2: 0.93 dBi 5.8G: Ant 1: 1.47 dBi; Ant 2: -0.32 dBi
Based on the application, features, or specification exhibited in User's Manual, More details of EUT technical specification, please refer to the User's Manual.		
Adapter	N/A	
Battery	N/A	
Power supply	DC 12.0V	
Connecting I/O Port(s)	Please refer to the User's Manual	
HW Version	N/A	
SW Version	N/A	

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- Frequency and Channel list:

Band	20MHz		40MHz		80MHz	
	Channel	Frequency	Channel	Frequency	Channel	Frequency
U-NII-1	36	5180 MHz	38	5190 MHz	42	5210 MHz
	40	5200 MHz	46	5230 MHz	-	-
	44	5220 MHz				
	48	5240 MHz				
	136	5680 MHz				
	140	5700 MHz				
U-NII-3	149	5745 MHz	151	5755 MHz	155	5775 MHz
	153	5765 MHz	159	5795 MHz		
	157	5785 MHz				
	161	5805 MHz				
	165	5825 MHz				

- The module for 5G WIFI have two antenna. please refer to antenna list for more antenna information.

Table 1:

Antenna	Antenna Type	Antenna Gain(dBi)	
		5.2GWIFI	5.8GWIFI
1(main)	Internal Antenna	3.49	1.47
2(aux)	Internal Antenna	0.93	-0.32

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	1Tx, 1Rx , 2Tx, 2Rx



## 1.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

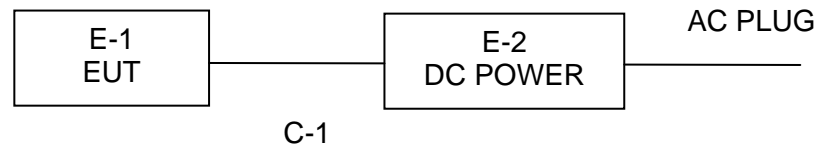
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n/ ac20 CH36/ CH40/ CH48CH149/CH157/CH165
Mode 2	802.11n40/ac40 CH38/CH46 /CH151/CH159
Mode 3	802.11ac80 CH42/ CH155

Mode	Frequency (MHz)	Power Setting
802.11n HT20	5180	10
	5200	10
	5240	10
	5745	10
	5785	10
	5825	10

Note:

The measurements are performed at the highest, middle, lowest available channels.

### 1.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



#### 1.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Manufacturer	Model	Series No.	Note
E-1	Telematics Headunit	N/A	30C21	N/A	EUT
E-2	DC POWER	N/A	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Note
C-1	Power Cable	N/A	NO	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) During the battery power test, the battery is fully charged.

## 1.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4440A	MY41000130	2024.04.26	2025.04.25	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024.04.25	2025.04.24	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2024.04.25	2025.04.24	1 year
4	Test Receiver	R&S	ESPI7	101318	2024.04.26	2025.04.25	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2024.05.12	2027.05.11	3 year
9	Amplifier	EMC	EMC051835SE	980246	2024.04.25	2025.04.24	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2024.05.17	2027.05.16	3 year
11	Power Meter	DARE	RPR3006W	15100041SN084	2024.04.25	2025.04.24	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2023.05.06	2026.05.05	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2023.05.06	2026.05.05	3 year
14	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
15	Filter	TRILTHIC	2400MHz	29	2024.04.26	2027.04.25	3 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& Aux Equipment which is scheduled for calibration every 3 years.

## 2. EMC EMISSION TEST

### 2.1 RADIATED EMISSION MEASUREMENT

#### 2.1.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

#### 2.1.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).  
According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	24000/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Remark : 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. For Frequency 9kHz~30MHz:

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

For Frequency above 30MHz:

Distance extrapolation factor =20log(Specific distance/ test distance)(dB);

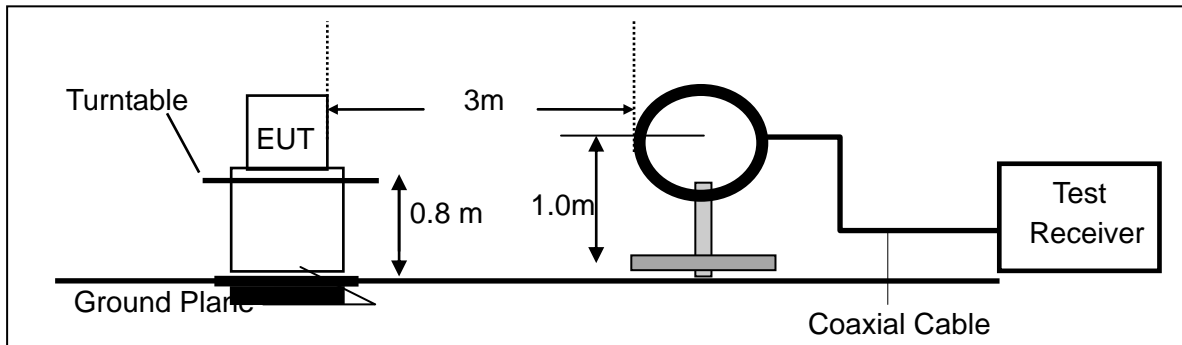
Limit line=Specific limits(dBuV) + distance extrapolation factor.

#### 2.1.3 MEASURING INSTRUMENTS

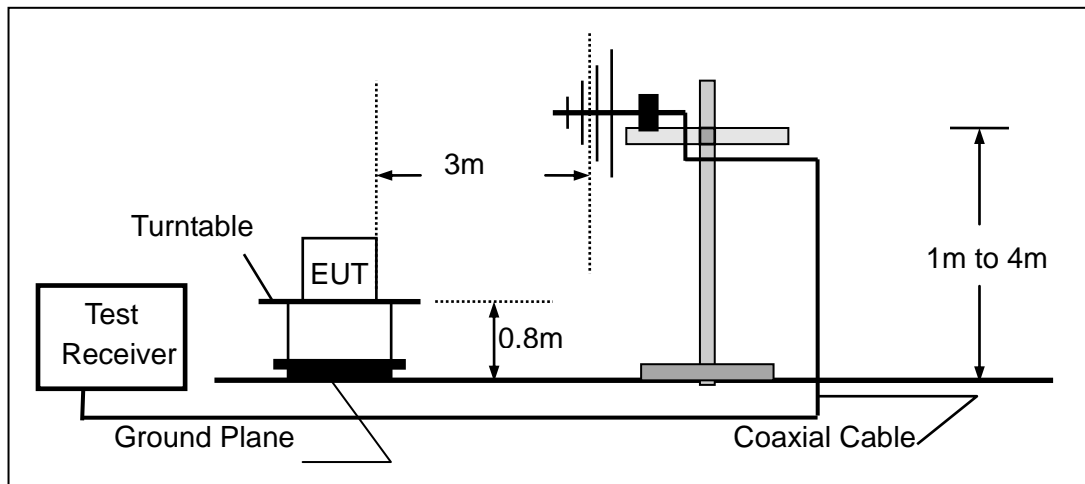
The Measuring equipment is listed in the section 1.2 of this test report.

## 2.1.4 TEST CONFIGURATION

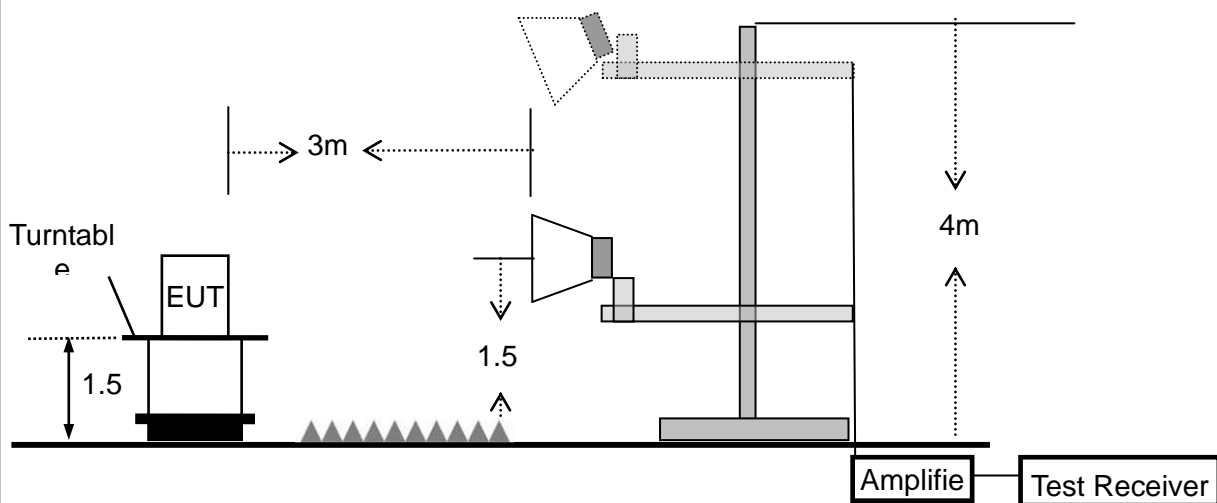
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



## 2.1.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.

Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where  $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW [kHz]})$ . , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

**2.1.6 TEST RESULTS (9KHZ – 30 MHZ)**

EUT :	Telematics Headunit	Model No.:	30C21
Temperature :	26 °C	Relative Humidity :	54%
Pressure:	1010 hPa	Test Voltage :	DC 12V
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



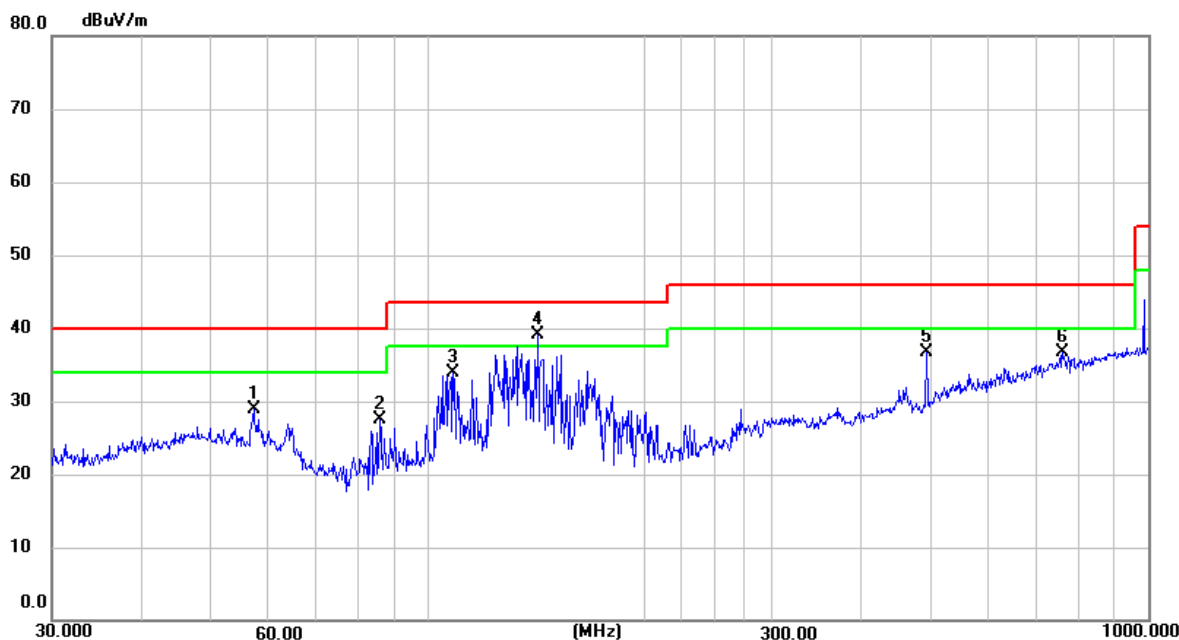
## 2.1.7 TEST RESULTS (30MHZ – 1GHZ)

EUT :	Telematics Headunit	Model No.:	30C21
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	802.11n20 mimo mode		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	57.1914	9.70	19.18	28.88	40.00	-11.12	QP
V	85.5973	12.79	14.62	27.41	40.00	-12.59	QP
V	108.2664	16.04	17.91	33.95	43.50	-9.55	QP
V	141.8262	24.78	14.38	39.16	43.50	-4.34	QP
V	492.4685	12.30	24.42	36.72	46.00	-9.28	QP
V	760.7033	7.68	29.01	36.69	46.00	-9.31	QP

### Remark:

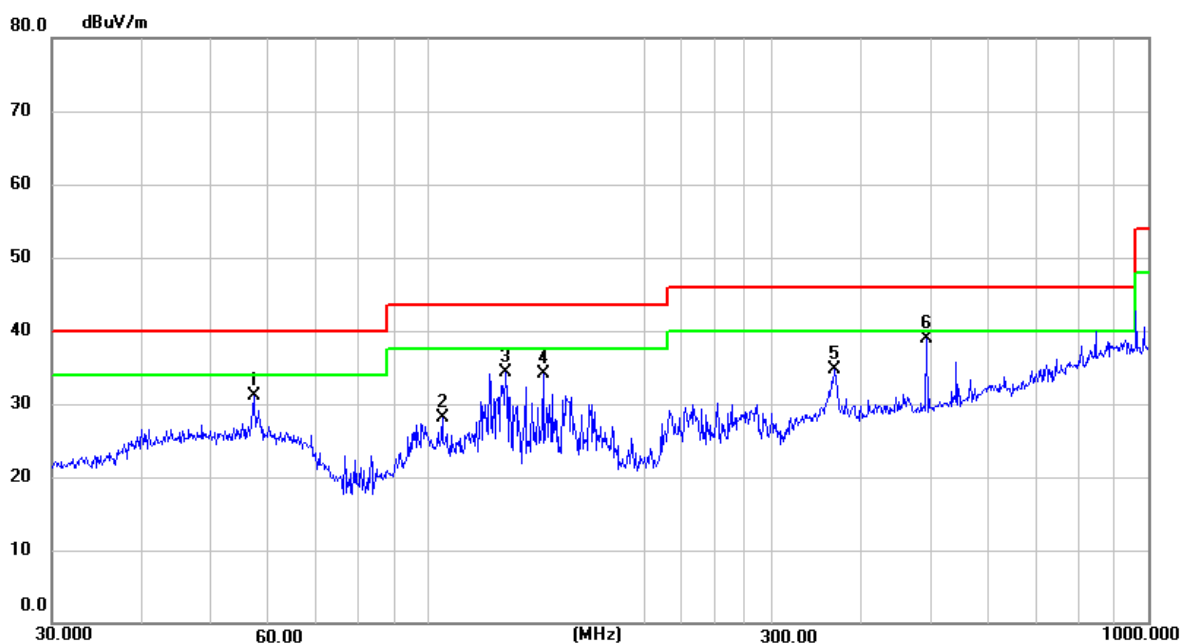
Emission Level= ReadingLevel+ Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	57.1914	11.99	19.18	31.17	40.00	-8.83	QP
H	104.5360	9.97	18.15	28.12	43.50	-15.38	QP
H	128.1130	19.28	15.04	34.32	43.50	-9.18	QP
H	144.3343	19.56	14.49	34.05	43.50	-9.45	QP
H	366.8231	12.47	22.23	34.70	46.00	-11.30	QP
H	492.4685	14.44	24.42	38.86	46.00	-7.14	QP

**Remark:**

Emission Level= ReadingLevel+ Factor, Margin= Emission Level - Limit



Note: All modes have been tested, just the worst mode has been recorded in the re

## **2.3 ANTENNA REQUIREMENT**

### **2.3.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **2.3.2 EUT ANTENNA**

The EUT antenna is permanent attached Internal Antenna. It comply with the standard requirement.

END OF REPORT