FCC RF Test Report

(DTS)

Applicant:	Automotive Data Solutions Inc.
Address of Applicant:	8400 Bougainville Montreal Quebec Canada H4P 2G1

Equipment Under Test (EUT)

Product Name:	CAR ALARM
Model No.:	TR2410ATL
FCC ID:	2AEPJ-TR2410ATL
Applicable Standards:	FCC CFR Title 47 Part 15C (§15.247)
Date of Sample Receipt:	10 Mar., 2022
Date of Test:	11 Mar., to 02 Apr., 2022
Date of Report Issued:	02 Apr., 2022
Test Result:	PASS

Tested by:	Mike.ou ***Test Engineer***	***Date:***	*02 Apr., 2022*
Reviewed by:	Vimen Zhang ***Project Engineer***	***Date:***	*02 Apr., 2022*
Approved by:	***Manager***	***Date:***	*02 Apr., 2022*

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

2 Version

Version No.	Date	Description
00	*02 Apr., 2022*	*Original*

3 Contents

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4 General Information

4.1 Client Information

Applicant:	Automotive Data Solutions Inc.
Address:	8400 Bougainville Montreal Quebec Canada H4P 2G1
Manufacturer/ Factory:	DONGGUAN PORTMAN ELECTRONIC SCIENCE AND TECHNOLOGY CO., LTD.
Address:	NO.10, LUYI 2 ROAD, TANGXIA TOWN, DONGGUAN CITY GUANGDONG PROVINCE

4.2 General Description of E.U.T.

Product Name:	CAR ALARM
Model No.:	TR2410ATL
Operation Frequency:	915 MHz
Channel Numbers:	1
Modulation Technology:	LoRa
Antenna Type:	Internal Antenna
Antenna Gain:	-1.25dBi (declare by applicant)
Power Supply:	DC3V (Battery CR2450)
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

4.3 Test Mode and Test Environment

Test Mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation
Operating Environment:	
Temperature:	15℃ ~ 35℃
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1010 mbar

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Radiated Emission (30MHz ~ 1GHz) (3m SAC)	±4.45 dB
Radiated Emission (1GHz ~ 18GHz) (3m SAC)	±5.34 dB
Radiated Emission (18GHz ~ 40GHz) (3m SAC)	±5.34 dB

Note: *All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.*

4.6 Additions to, Deviations, or Exclusions from the Method

No

4.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

4.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://jyt.lets.com

4.9 Test Instruments List

Radiated Emission(3m SAC):					
Test Equipment	**Manufacturer**	**Model No.**	**Manage No.**	**Cal.Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	ETS	9m*6m*6m	WXJ001-1	01-19-2021	01-18-2024
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ002	02-17-2022	02-16-2023
Biconical Antenna	Schwarzbeck	VUBA9117	WXJ002-1	06-20-2021	06-19-2022
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-2	02-17-2022	02-16-2023
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-3	06-18-2021	06-17-2022
Pre-amplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9743B	WXG001-7	02-17-2022	02-16-2023
Pre-amplifier (1GHz ~ 18GHz)	SKET	LNPA_0118G-50	WXG001-3	02-17-2022	02-16-2023
Pre-amplifier (18GHz ~ 40GHz)	RF System	TRLA-180400G45B	WXG001-9	02-17-2022	02-16-2023
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	02-17-2022	02-16-2023
Spectrum Analyzer	KEYSIGHT	N9010B	WXJ004-2	11-27-2021	11-26-2022
Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	04-06-2021	04-05-2022
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-8M	WXG001-4	02-17-2022	02-16-2023
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG001-5	02-17-2022	02-16-2023
Coaxial Cable (18GHz ~ 40GHz)	JYTSZ	JYT3M-40G-SS-8M	WXG001-7	02-17-2022	02-16-2023
Test Software	Tonscend	TS+	Version: 3.0.0.1		

Conducted Method:					
Test Equipment	**Manufacturer**	**Model No.**	**Manage No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Spectrum Analyzer	Rohde & Schwarz	FSP 30	WXJ004	01-20-2022	01-20-2023
DC Power Supply	Keysight	E3642A	WXJ025-2	10-25-2021	10-24-2022

5 Measurement Setup and Procedure

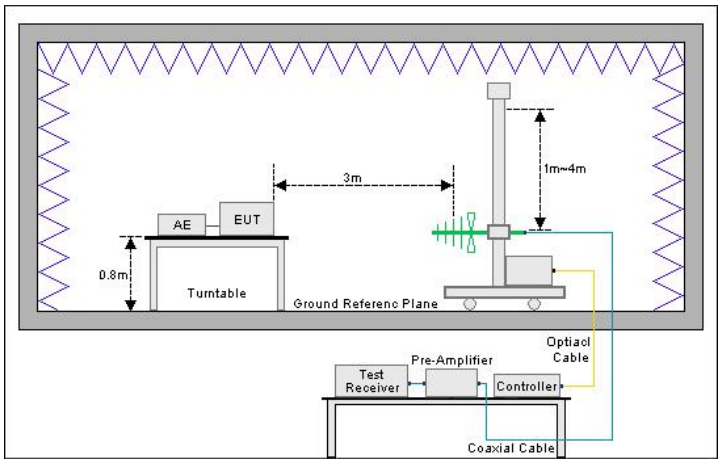
5.1 Test Channel

According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:	
Test channel:	915MHz

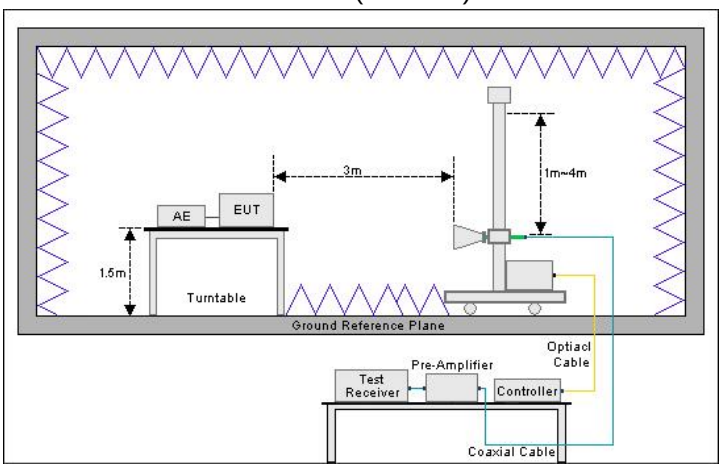
5.2 Test Setup

1) Radiated emission measurement:

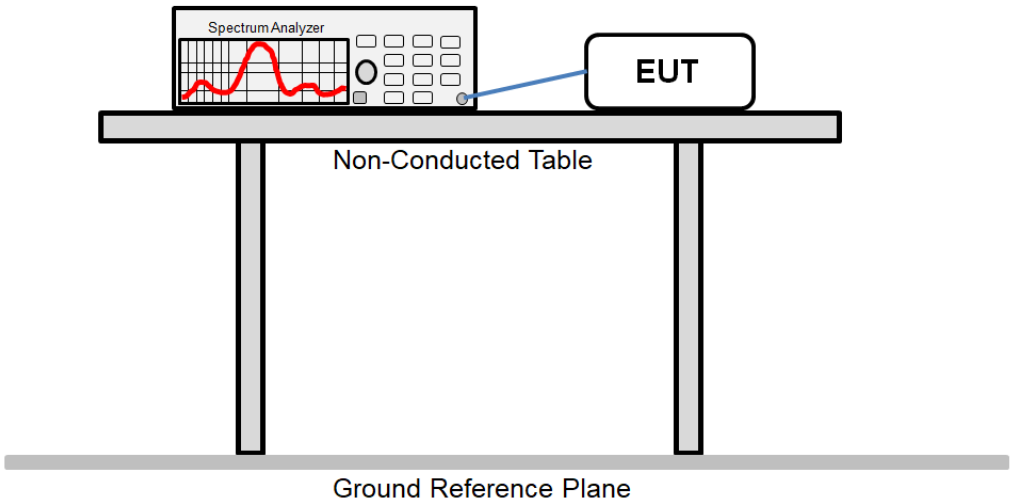
Below 1GHz (3m SAC)



Above 1GHz (3m SAC)



2) Conducted test method



5.3 Test Procedure

Test method	Test step
Radiated emission	**For below 1GHz:** 1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. **For above 1GHz:** 1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	1. The antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

6 Test Results

6.1 Summary

6.1.1 Clause and Data Summary

Test items	Standard clause	Test data	Result
Antenna Requirement	15.203 15.247 (b)(4)	See Section 6.2	Pass
AC Power Line Conducted Emission	15.207	See Section 6.3	N/A
Conducted Output Power	15.247 (b)(3)	See Section 6.4	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	See Section 6.5	Pass
Power Spectral Density	15.247 (e)	See Section 6.6	Pass
Spurious Emission	15.205 15.209 15.247 (d)	See Section 6.7	Pass
Remark: *1. Pass: The EUT complies with the essential requirements in the standard.* *2. N/A: EUT is powered by DC 3V not applicable of the test item.* *3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).*			
Test Method:	*ANSI C63.10-2013* *KDB 558074 D01 15.247 Meas Guidance v05r02*		

6.1.2 Test Limit

<table>
<tr><th>Test items</th><th>Limit</th></tr>
<tr><td>Conducted Output Power</td><td>For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.</td></tr>
<tr><td>6dB Emission Bandwidth</td><td>The minimum 6 dB bandwidth shall be at least 500 kHz.</td></tr>
<tr><td>99% Occupied Bandwidth</td><td>N/A</td></tr>
<tr><td>Power Spectral Density</td><td>For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.</td></tr>
<tr><td>Spurious Emission</td><td>In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)):
<table>
<tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBµV/m)</th><th rowspan="2">Detector</th></tr>
<tr><th>@ 3m</th><th>@ 10m</th></tr>
<tr><td>30 – 88</td><td>40.0</td><td>30.0</td><td>Quasi-peak</td></tr>
<tr><td>88 – 216</td><td>43.5</td><td>33.5</td><td>Quasi-peak</td></tr>
<tr><td>216 – 960</td><td>46.0</td><td>36.0</td><td>Quasi-peak</td></tr>
<tr><td>960 – 1000</td><td>54.0</td><td>44.0</td><td>Quasi-peak</td></tr>
<tr><td colspan="4">Note: The more stringent limit applies at transition frequencies.</td></tr>
<tr><th rowspan="2">Frequency</th><th colspan="3">Limit (dBµV/m) @ 3m</th></tr>
<tr><th colspan="2">Average</th><th>Peake</th></tr>
<tr><td>Above 1 GHz</td><td colspan="2">54.0</td><td>74.0</td></tr>
<tr><td colspan="4">Note: The measurement bandwidth shall be 1 MHz or greater.</td></tr>
</table>
</td></tr>
</table>

6.2 Antenna requirement

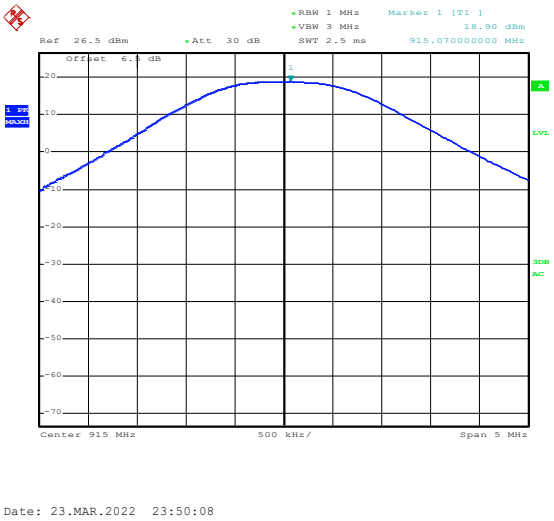
Standard requirement:	FCC Part 15 C Section 15.203 /247(b)(4)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
The antenna is an Internal Antenna which cannot replace by end-user, the best case gain of the antenna is -1.25 dBi. See product internal photos for details.	

6.3 Conducted Output Power

Test Channel	Maximum Output Power (dBm)	Limit(dBm)	Result
915MHz	18.90	30.00	Pass

Test plot as follows:

915MHz



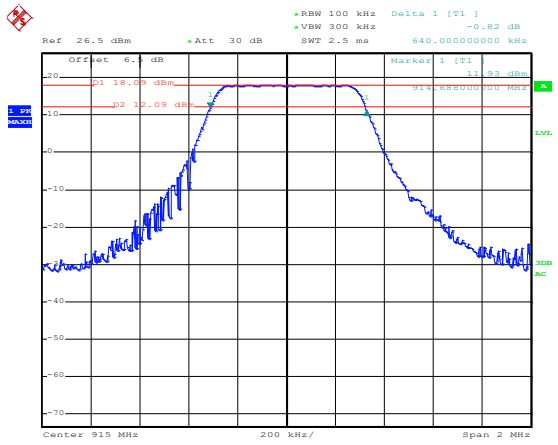
6.4 Emission Bandwidth

Test Channel	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
915MHz	0.640	>500	Pass
Test Channel	99% Occupy Bandwidth (MHz)	Limit (kHz)	Result
915MHz	0.504	N/A	N/A

Test plot as follows:

6dB EBW

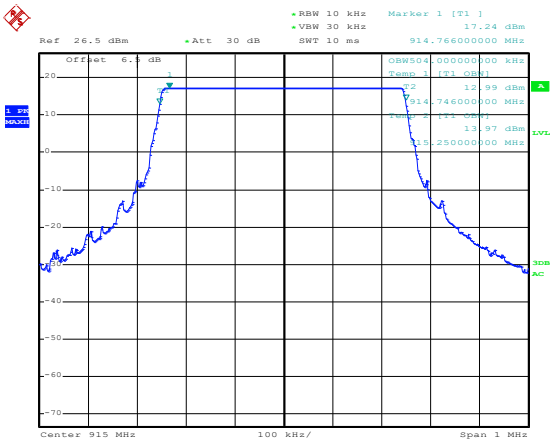
Lowest channel



Date: 23.MAR.2022 23:55:16

99% OBW

Lowest channel



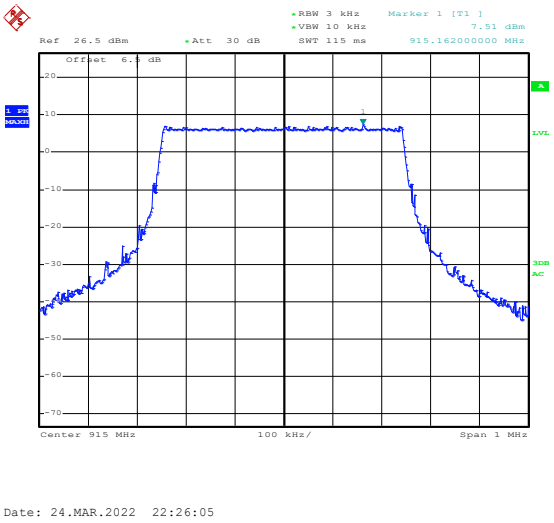
Date: 30.MAR.2022 00:46:34

6.5 Power Spectral Density

Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
915MHz	7.51	8.00	Pass

Test plot as follows:

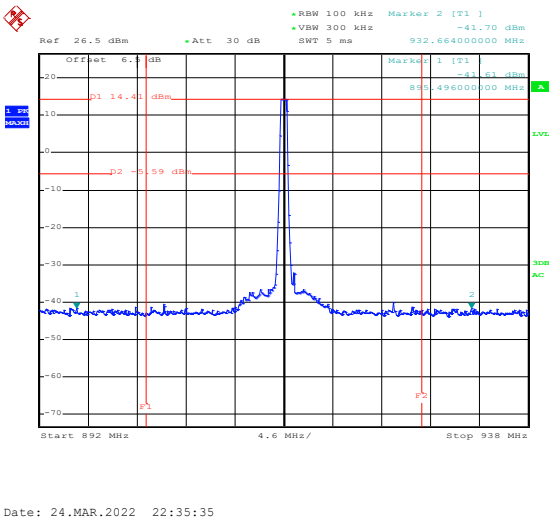
915MHz



6.6 Spurious Emission

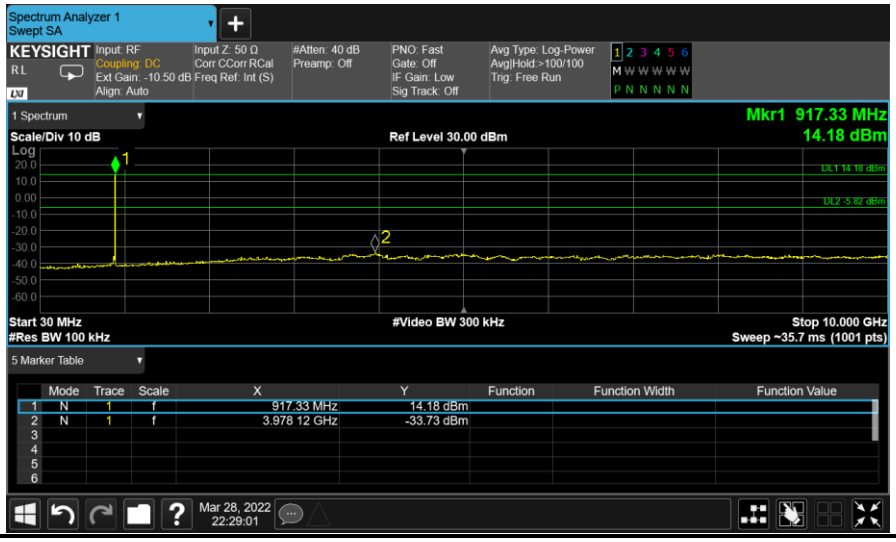
6.6.1 Band-edge Emission

915MHz



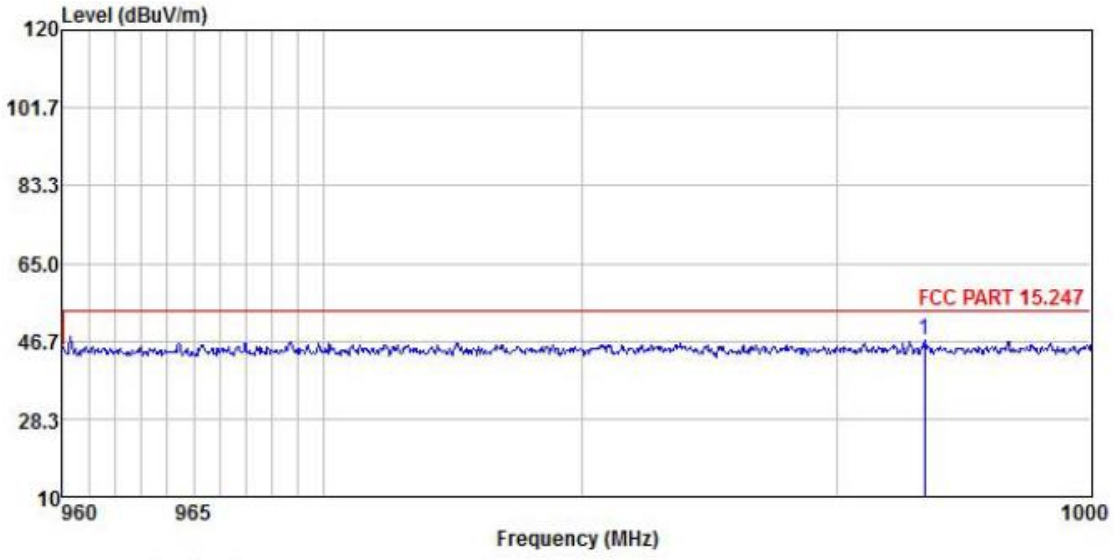
6.6.2 Conducted Spurious Emission

915MHz



6.6.3 Emissions in Restricted Frequency Bands

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	960 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	DC 3V		

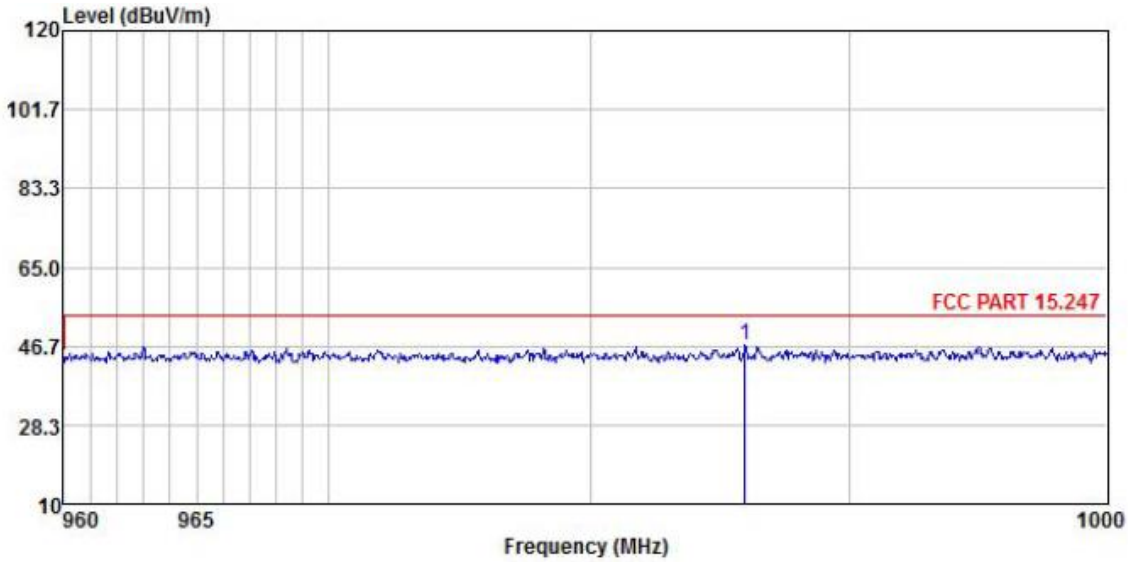


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	993.409	20.09	23.06	3.65	0.00	46.80	54.00	-7.20	QP

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Channel:	960 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC 3V		

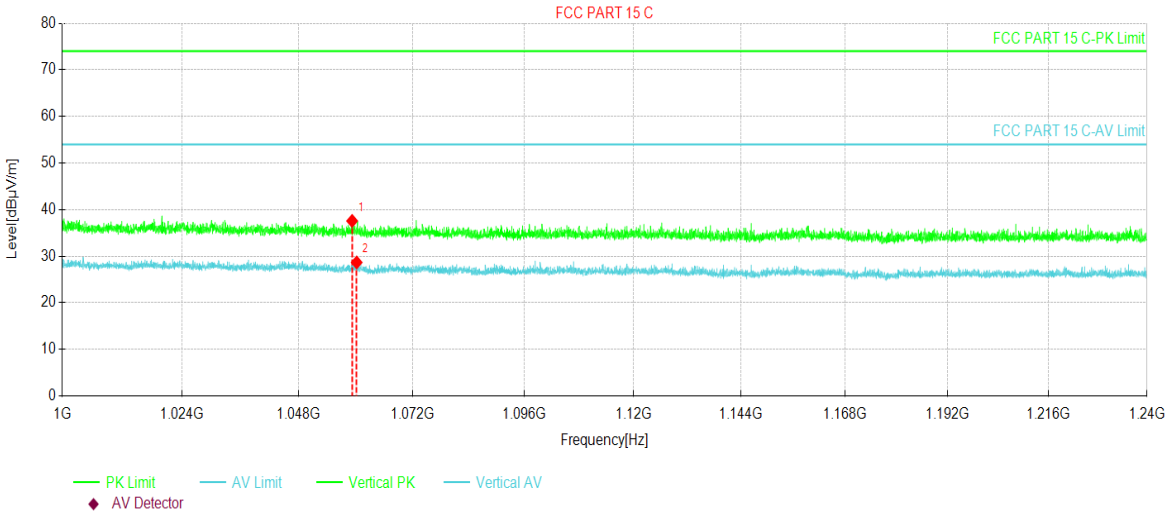


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	985.935	20.17	23.02	3.62	0.00	46.81	54.00	-7.19	QP

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Channel:	1000 MHz ~ 1240 MHz	Polarization:	Vertical
Test Voltage:	DC 3V		

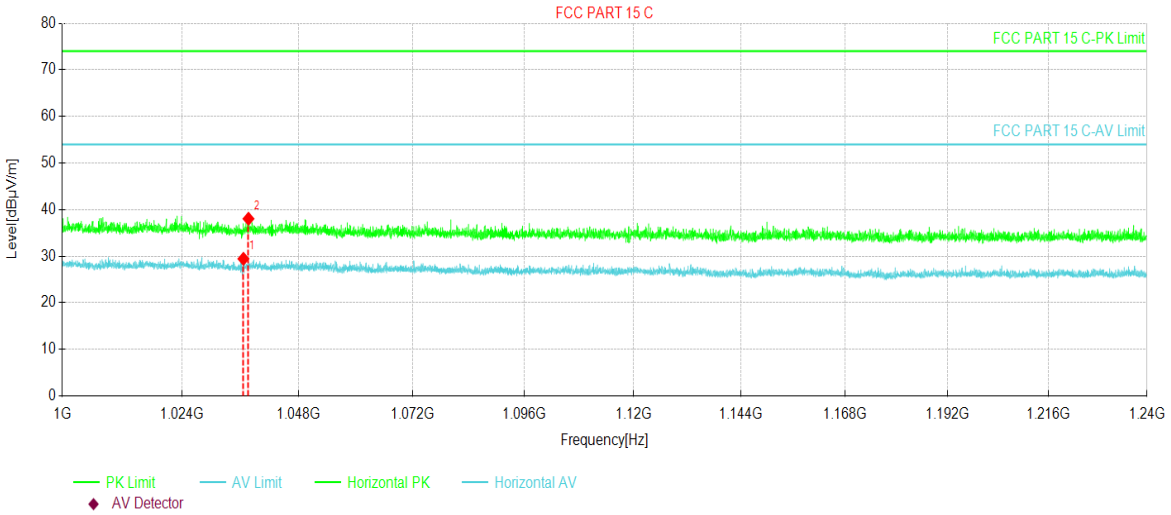


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	1059.16	60.02	37.56	-22.46	74.00	36.44	PK	Vertical
2	1060.12	51.13	28.65	-22.48	54.00	25.35	AV	Vertical

Remark:

1. Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Channel:	1000 MHz ~ 1240 MHz	Polarization:	Horizontal
Test Voltage:	DC 3V		



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	1036.57	51.54	29.43	-22.11	54.00	24.57	AV	Horizontal
2	1037.62	60.15	38.03	-22.12	74.00	35.97	PK	Horizontal

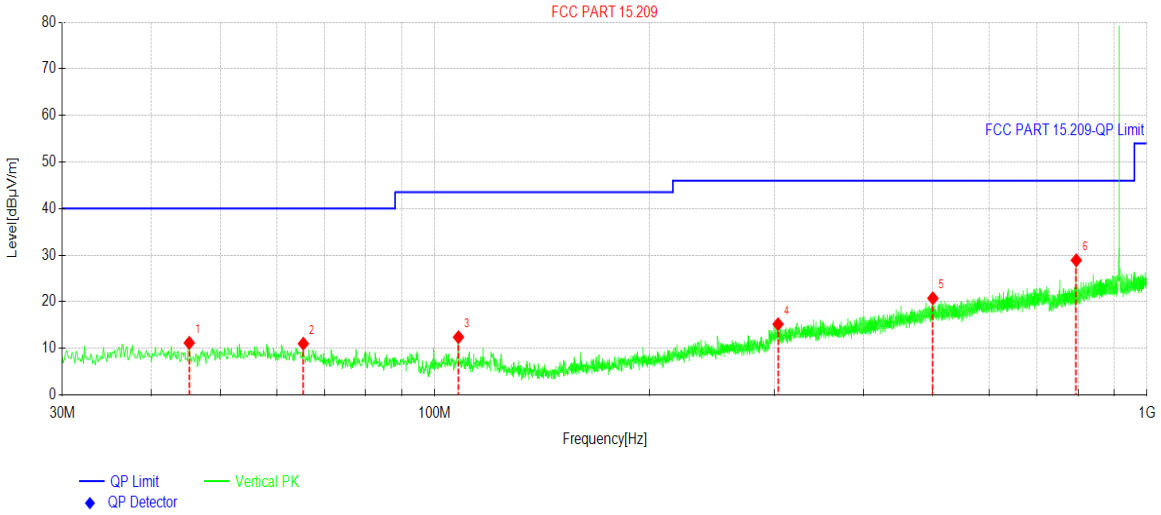
Remark:

1. Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

6.6.4 Emissions in Non-restricted Frequency Bands

Below 1GHz:

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	DC 3V		

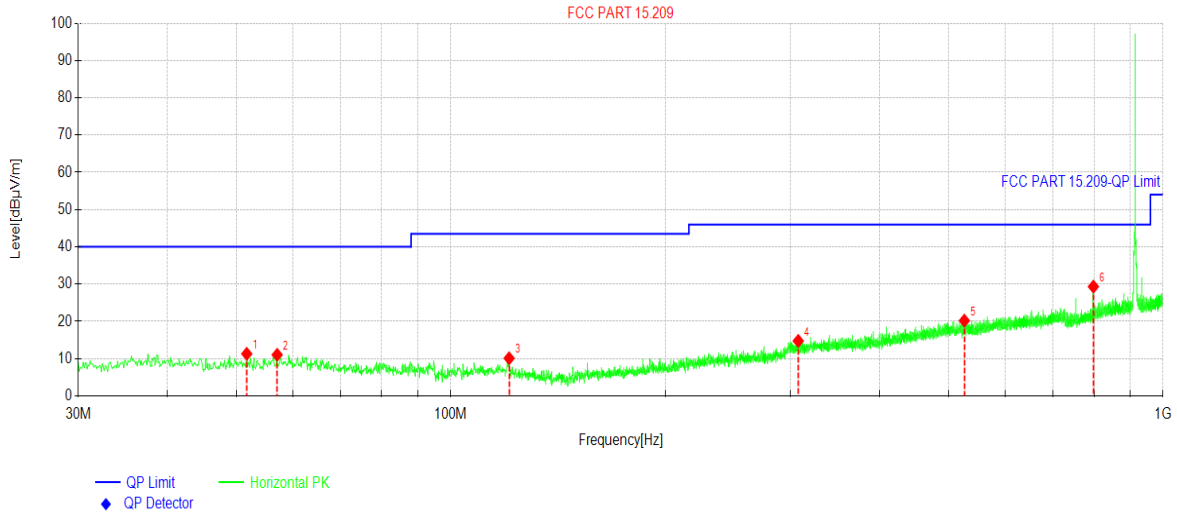


Suspected Data List								
NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	45.2305	28.57	11.17	-17.40	40.00	28.83	PK	Vertical
2	65.4085	28.88	11.00	-17.88	40.00	29.00	PK	Vertical
3	107.995	30.45	12.39	-18.06	43.50	31.11	PK	Vertical
4	303.470	29.25	15.17	-14.08	46.00	30.83	PK	Vertical
5	500.497	30.22	20.74	-9.48	46.00	25.26	PK	Vertical
6	795.794	34.57	28.90	-5.67	46.00	17.10	PK	Vertical

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC 3V		



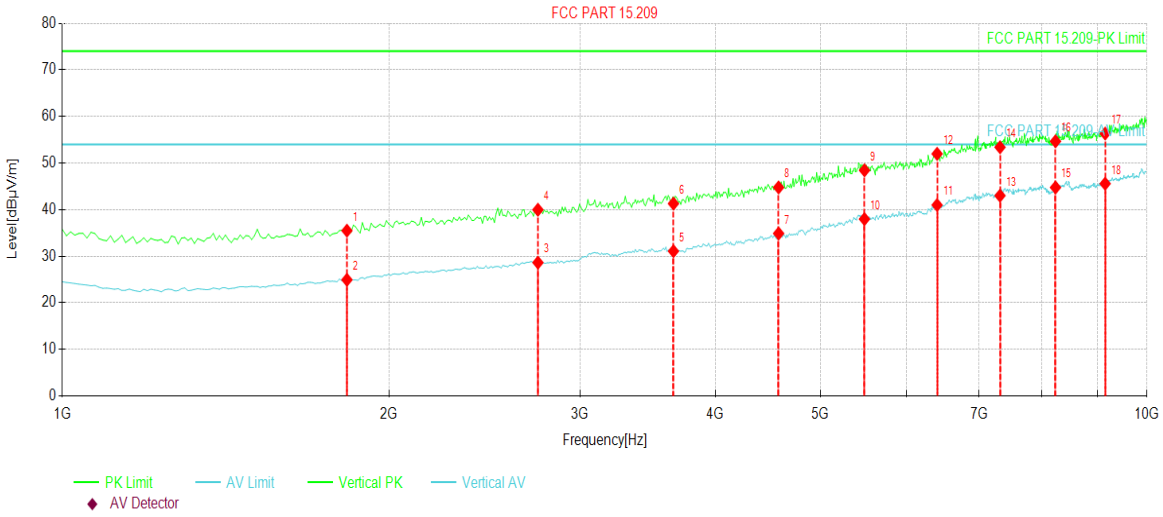
Suspected Data List								
NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	51.7302	28.34	11.28	-17.06	40.00	28.72	PK	Horizontal
2	57.0657	28.07	11.02	-17.05	40.00	28.98	PK	Horizontal
3	120.801	28.34	10.09	-18.25	43.50	33.41	PK	Horizontal
4	307.544	28.76	14.74	-14.02	46.00	31.26	PK	Horizontal
5	526.107	29.63	20.19	-9.44	46.00	25.81	PK	Horizontal
6	798.607	34.94	29.32	-5.62	46.00	16.68	PK	Horizontal

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Above 1GHz:

Product Name:	CAR ALARM	**Product Model:**	TR2410ATL
Test By:	Mike	**Test mode:**	Tx mode
Test Frequency:	1 GHz ~ 10 GHz	**Polarization:**	Vertical
Test Voltage:	DC 3V		

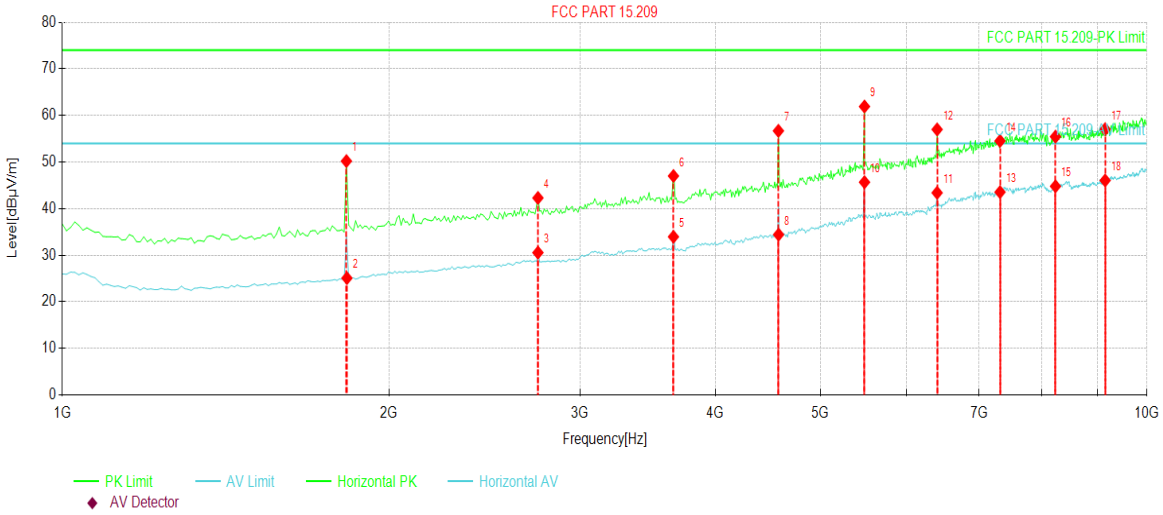


Suspected Data List								
NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	1830.00	56.70	35.48	-21.22	74.00	38.52	PK	Vertical
2	1830.00	46.14	24.92	-21.22	54.00	29.08	AV	Vertical
3	2745.00	46.19	28.62	-17.57	54.00	25.38	AV	Vertical
4	2745.00	57.53	39.96	-17.57	74.00	34.04	PK	Vertical
5	3660.00	45.70	31.07	-14.63	54.00	22.93	AV	Vertical
6	3660.00	55.91	41.28	-14.63	74.00	32.72	PK	Vertical
7	4575.00	45.31	34.87	-10.44	54.00	19.13	AV	Vertical
8	4575.00	55.19	44.75	-10.44	74.00	29.25	PK	Vertical
9	5490.00	54.50	48.43	-6.07	74.00	25.57	PK	Vertical
10	5490.00	44.03	37.96	-6.07	54.00	16.04	AV	Vertical
11	6405.00	43.70	40.97	-2.73	54.00	13.03	AV	Vertical
12	6405.00	54.69	51.96	-2.73	74.00	22.04	PK	Vertical
13	7320.00	42.94	42.99	0.05	54.00	11.01	AV	Vertical
14	7320.00	53.33	53.38	0.05	74.00	20.62	PK	Vertical
15	8235.00	43.62	44.75	1.13	54.00	9.25	AV	Vertical
16	8235.00	53.53	54.66	1.13	74.00	19.34	PK	Vertical
17	9150.00	54.10	56.32	2.22	74.00	17.68	PK	Vertical
18	9150.00	43.33	45.55	2.22	54.00	8.45	AV	Vertical

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	CAR ALARM	Product Model:	TR2410ATL
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	1 GHz ~ 10 GHz	Polarization:	Horizontal
Test Voltage:	DC 3V		



Suspected Data List

NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	1828.00	71.45	50.19	-21.26	74.00	23.81	PK	Horizontal
2	1830.00	46.28	25.06	-21.22	54.00	28.94	AV	Horizontal
3	2745.00	48.11	30.54	-17.57	54.00	23.46	AV	Horizontal
4	2745.00	59.85	42.28	-17.57	74.00	31.72	PK	Horizontal
5	3660.00	48.58	33.95	-14.63	54.00	20.05	AV	Horizontal
6	3660.00	61.62	46.99	-14.63	74.00	27.01	PK	Horizontal
7	4573.00	67.16	56.68	-10.48	74.00	17.32	PK	Horizontal
8	4575.00	44.85	34.41	-10.44	54.00	19.59	AV	Horizontal
9	5490.00	67.98	61.91	-6.07	74.00	12.09	PK	Horizontal
10	5490.00	51.73	45.66	-6.07	54.00	8.34	AV	Horizontal
11	6405.00	46.12	43.39	-2.73	54.00	10.61	AV	Horizontal
12	6405.00	59.71	56.98	-2.73	74.00	17.02	PK	Horizontal
13	7320.00	43.49	43.54	0.05	54.00	10.46	AV	Horizontal
14	7320.00	54.47	54.52	0.05	74.00	19.48	PK	Horizontal
15	8235.00	43.66	44.79	1.13	54.00	9.21	AV	Horizontal
16	8235.00	54.31	55.44	1.13	74.00	18.56	PK	Horizontal
17	9150.00	54.82	57.04	2.22	74.00	16.96	PK	Horizontal
18	9150.00	43.82	46.04	2.22	54.00	7.96	AV	Horizontal

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

------End of report------