FCC PART 15B CLASS B

MEASUREMENT AND TEST REPORT

For

Beijing InHand Networks Technology Co., Ltd.

Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing

Tested Model: VT310
FCC ID: 2AANYVT310

Report Type:	**Equipment Name:**
Original Report	Vehicle Tracker

Report Number:	RSC200603003
Date of Report Issue:	2020-06-24
Reviewed By:	Sula Huang
Prepared By:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: +86-28-65525123 Fax: +86-28-65525125 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Beijing InHand Networks Technology Co., Ltd.
Product	Vehicle Tracker
Tested Model	VT310
FCC ID	2AANYVT310
Voltage	DC 9-48V
Highest operating frequency	2155MHz
Measure approximately	141 mm (L) x 81 mm (W) x 32 mm (H)
Sample serial number	200603003/01 (assigned by the BACL, Chengdu)
Sample/EUT Status	The test sample was in good condition and received: 2020-06-03

Note: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Objective

The report was prepared on behalf of **Beijing InHand Networks Technology Co., Ltd.** in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 15 Subpart B Class B limits.

Related Submittal(s)/Grant(s)

No

Measurement Uncertainty

Item			Measurement Uncertainty	U_{cispr}
Radiated Emission	30MHz-200MHz	H	4.31 dB	6.3dB
		V	4.57 dB	6.3dB
	200MHz-1GHz	H	4.68 dB	6.3dB
		V	5.78 dB	6.3dB
	1GHz-6GHz		4.56 dB	5.2dB
	6GHz-18GHz		4.57 dB	5.5dB

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the corresponding inclusion factor K when the inclusion probability is about 95%.

Test Methodology

All measurements contained in this report are conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement is performed at BACL. The radiated testing is performed at an antenna-to-EUT distance of 3 Meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4324.01) and the FCC designation No. CN1186 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

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SYSTEM TEST CONFIGURATION

Justification

The system is configured for testing in a typical fashion (as a normally used by a typical user).

Test Mode 1: DC 12V

Test Mode 2: DC 48V

Test Mode 3: Built-in battery

EUT Exercise Software

Secure CRT

Special Accessories

No special accessories were supplied by BACL.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
-	R load * 3	120Ω	-
-	R load * 5	50Ω	-
DELL	Laptop	E5430	-
Zhaoxin	DC supply	RXN-305D	-

External I/O Cable

Cable Description	Length (m)	From	To
Shielded RS232 Cable	1.5m	EUT	Laptop
Unshielded Digital & analog Signal Cable	0.4m x 5	EUT	50ΩR load*5
Unshielded CAN Line Cable	0.4m x 2	EUT	120ΩR load*2
Unshielded J1708 Line Cable	0.4m	EUT	120ΩR load
Unshielded DC Cable	1.0m	EUT	DC supply

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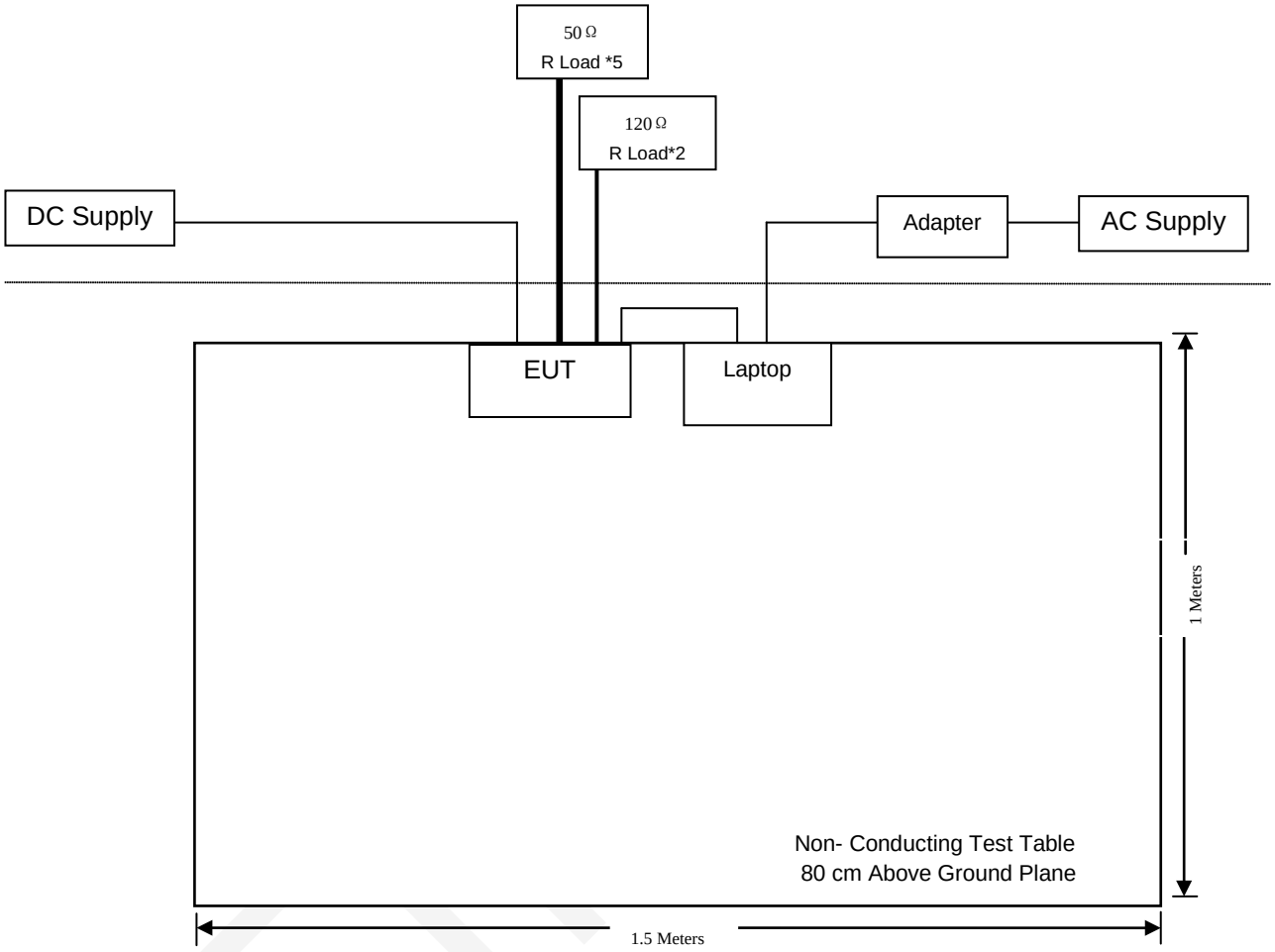
Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Standard	Description	Result
FCC §15.109	Radiated Emission	Compliance

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

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TEST EQUIPMENTS LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMCT	Semi-Anechoic Chamber	966	001	2017-05-18	2022-05-17
SONOMA INSTRUMENT	Amplifier	310 N	186684	2019-09-06	2020-09-05
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2019-12-10	2022-12-09
INMET	Attenuator	18N-6dB	N/A	2019-10-17	2020-10-16
Rohde & Schwarz	EMI Test Receiver	ESR3	102456	2020-04-13	2021-04-12
Unknown	RF Cable (Below 1GHz)	L-E005	000005	2019-09-06	2020-09-05
Unknown	RF Cable (Below 1GHz)	T-E128	000128	2019-10-17	2020-10-16
Unknown	RF Cable (Below 1GHz)	T-E237	233522-001	2019-07-19	2020-07-18
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSU26	200835	2020-04-13	2021-04-12
EMCO	Horn Antenna	3115	2192	2019-09-25	2021-09-24
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2019-09-20	2020-09-19
Unknown	RF Cable (Above 1GHz)	T-E069	000069	2019-07-24	2020-07-23
Micro-coax	RF Cable (Above 1GHz)	T-E209	MFR 64639 2310	2019-07-19	2020-07-18

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FCC §15.109 RADIATED EMISSION TEST

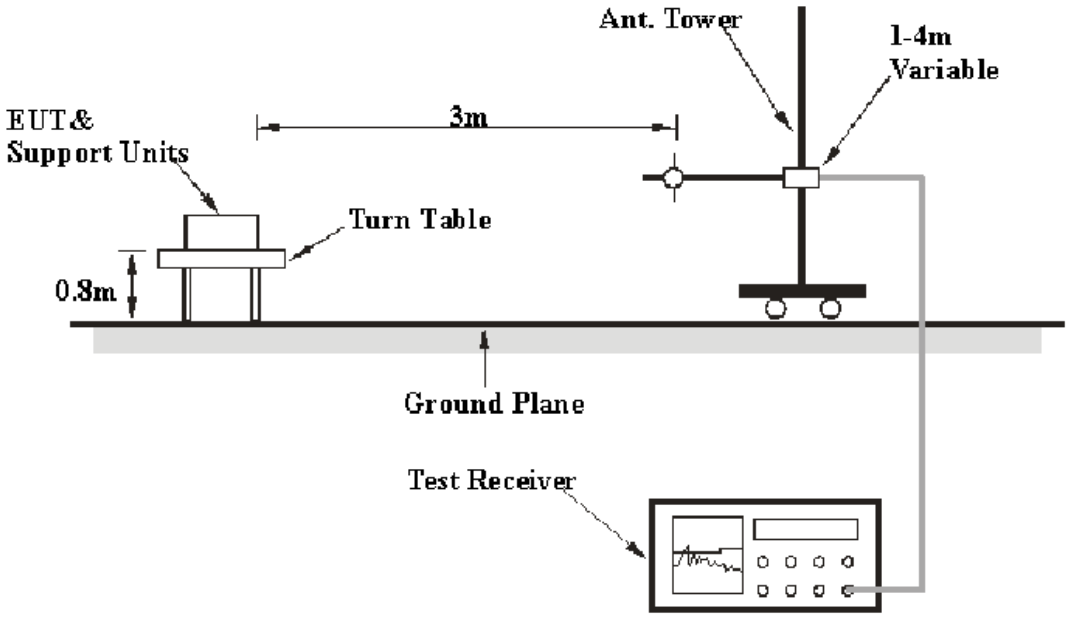
Applicable Standard

FCC §15.109

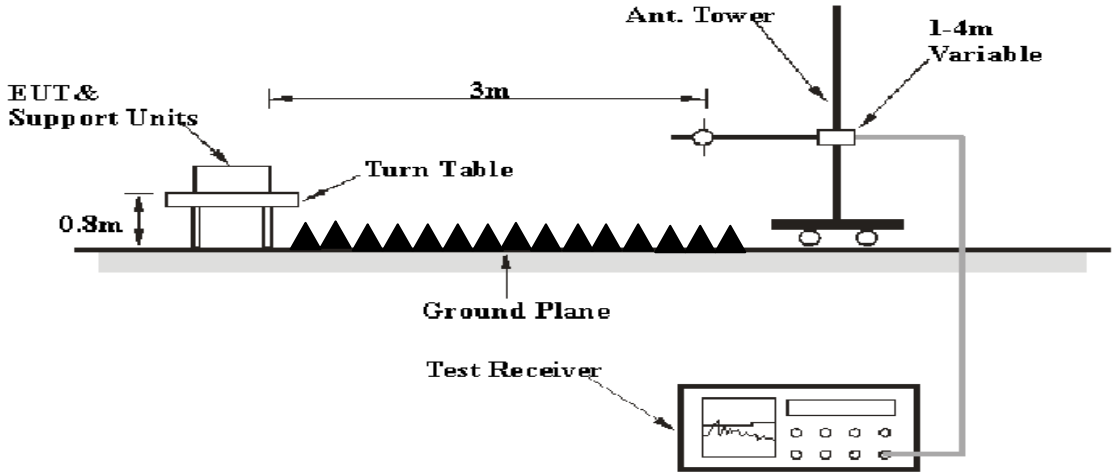
EUT Setup

The radiated emission tests were performed in the 3 meter Semi Anechoic Chamber, using the setup in accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15B Class B limits.

Below 1GHz:



Above 1GHz:



The excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

EMI Test Receiver Setup

The frequency range was investigated from 30 MHz to 13 GHz.

During the radiated emission test, the EMI test receiver or Spectrum Analyzer is set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	AV

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data were recorded in the quasi-peak detection mode from 30 MHz to 1 GHz. Peak and average detection mode above 1 GHz.

The EUT was in the normal operating mode during the final qualification test to represent the worst case results.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Corrected Amplitude

Summary of Test Results

According to the data in the following, the EUT complied with the FCC Part 15.109 Class B limit.

Test Data

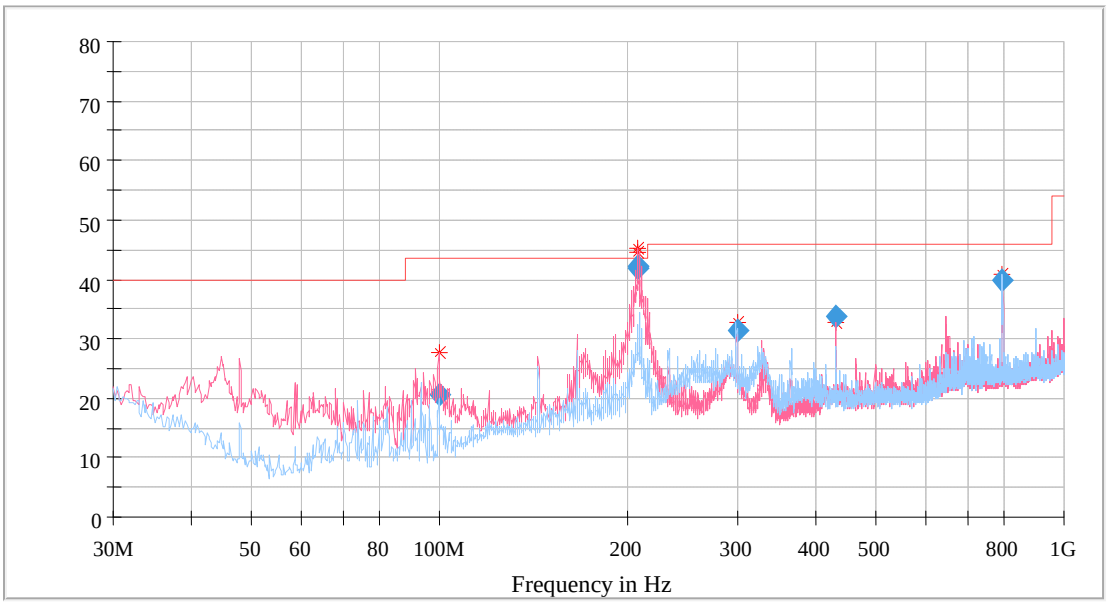
Test Environment Conditions

Temperature:	25 °C
Relative Humidity:	60 %
ATM Pressure:	96.2 kPa

The testing was performed by Godfery Bai on 2020-06-23.

Test mode 1: (worst case)

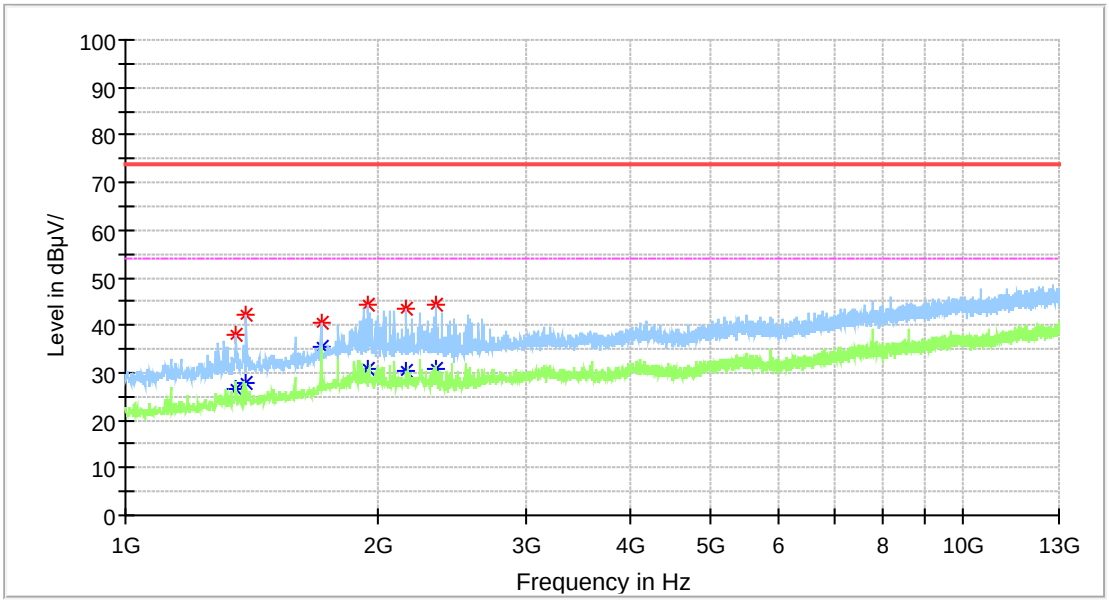
Below 1GHz:



Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
99.661300	20.43	43.50	23.07	200.0	120.000	120.0	V	290.0	-15.2
207.759500	41.99	43.50	1.51	200.0	120.000	105.0	V	315.0	-14.2
207.775900	42.23	43.50	1.27	200.0	120.000	103.0	V	0.0	-14.2
299.292400	31.45	46.00	14.55	200.0	120.000	105.0	H	77.0	-11.3
431.983900	33.89	46.00	12.11	200.0	120.000	124.0	V	105.0	-7.9
798.215400	39.67	46.00	6.33	200.0	120.000	102.0	H	80.0	-2.3

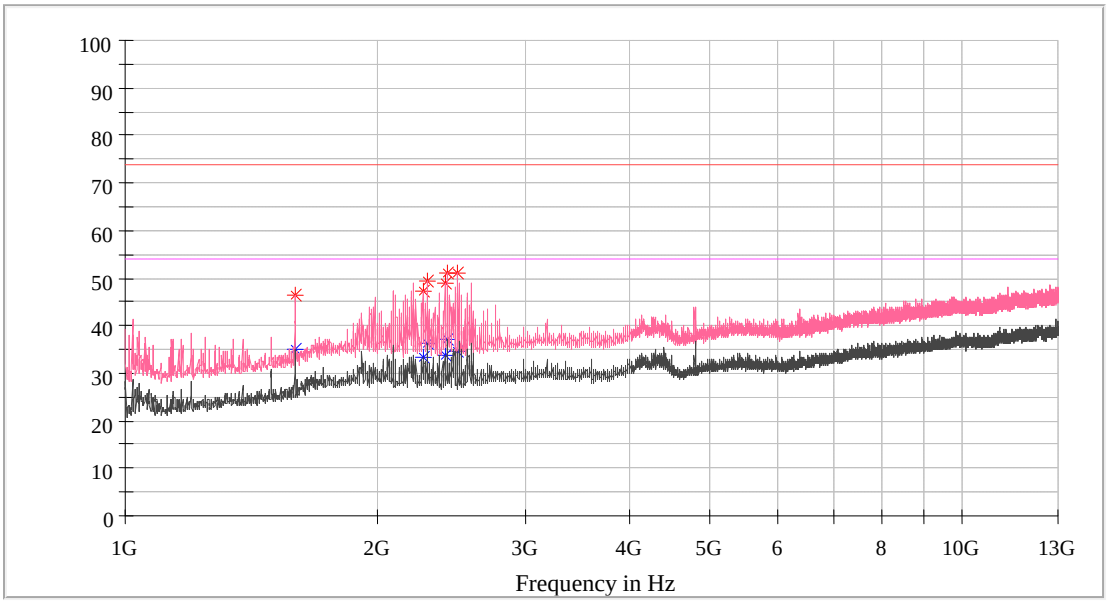
Above 1GHz:

Horizontal



Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1356.400000	38.00	---	74.00	36.00	100.0	H	359.0	-0.2
1356.400000	---	26.40	54.00	27.60	100.0	H	359.0	-0.2
1394.800000	42.32	---	74.00	31.68	100.0	H	162.0	-0.1
1394.800000	---	28.05	54.00	25.95	100.0	H	162.0	-0.1
1710.400000	40.67	---	74.00	33.33	100.0	H	227.0	2.4
1710.400000	---	35.56	54.00	18.44	100.0	H	227.0	2.4
1948.000000	---	30.87	54.00	23.13	100.0	H	3.0	4.4
1948.000000	44.24	---	74.00	29.76	100.0	H	3.0	4.4
2158.000000	---	30.57	54.00	23.43	100.0	H	340.0	4.7
2162.800000	43.37	---	74.00	30.63	100.0	H	78.0	4.7
2345.200000	---	30.85	54.00	23.15	100.0	H	51.0	4.6
2345.200000	44.41	---	74.00	29.59	100.0	H	51.0	4.6

Vertical



Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1596.400000	---	34.89	54.00	19.11	100.0	V	70.0	1.3
1596.400000	46.56	---	74.00	27.44	100.0	V	70.0	1.3
2264.800000	47.22	---	74.00	26.78	100.0	V	136.0	4.6
2266.000000	---	33.29	54.00	20.71	100.0	V	238.0	4.6
2294.800000	---	36.21	54.00	17.79	100.0	V	337.0	4.6
2294.800000	49.16	---	74.00	24.84	100.0	V	337.0	4.6
2406.400000	---	33.90	54.00	20.10	100.0	V	359.0	4.5
2406.400000	49.15	---	74.00	24.85	100.0	V	359.0	4.5
2424.400000	---	36.95	54.00	17.05	100.0	V	0.0	4.5
2424.400000	50.93	---	74.00	23.07	100.0	V	0.0	4.5
2498.800000	---	34.64	54.00	19.36	100.0	V	40.0	4.5
2498.800000	50.95	---	74.00	23.05	100.0	V	40.0	4.5

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Margin = Limit- Corr. Amplitude

END OF REPORT