



FCC PART 15 B TEST REPORT

For

Huawei Technologies Co.,Ltd

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Test Model: eA380-123
FCC ID: QISEA380-123

Report Type: Original Report	Product Name: LTE CPE
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The **Huawei Technologies Co.,Ltd**'s product, model number: **eA380-123** (**FCC ID: QISEA380-123**) (the "EUT") in this report was a **LTE CPE**, which was measured approximately: 25.8 cm (L) x 22 cm (W) x 6.6 cm (H), rated input voltage: DC54V from POE Port. The highest operation frequency is 2690 MHz.

**All measurement and test data in this report was gathered from final production sample, serial number: 170511006 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-02-08, and EUT conformed to test requirement.*

Objective

This test report is prepared on behalf of **Huawei Technologies Co.,Ltd** in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Rules Part 15 B Class B.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: QISEA280-135.
FCC Part 27 PCB submissions with FCC ID: QISEA280-135.

Test Methodology

All measurements contained in this report were 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 of the measurements detailed in this Test Report were performed by Bay Area Compliance Laboratories Corp. (Chengdu).

The Bay Area Compliance Laboratories Corp. Chengdu's measurement Uncertainties (calculated for a k=2 Coverage Factor corresponding to approximately 95% Coverage) were as follows:

-For all of the AC Line Conducted Emissions Tests reported herein: ± 3.17 dB.

-For of all of the direct Radiated Emissions Tests reported herein are:

30 MHz to 200 MHz: ± 4.7 dB;

200 MHz to 1 GHz: ± 6.0 dB;

1 GHz to 6 GHz: ± 5.13 dB; and,

6 GHz to 40 GHz: ± 5.47 dB.

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

The software "Lan test.exe" was used in testing.

Equipment Modifications

No modification was made to the EUT tested.

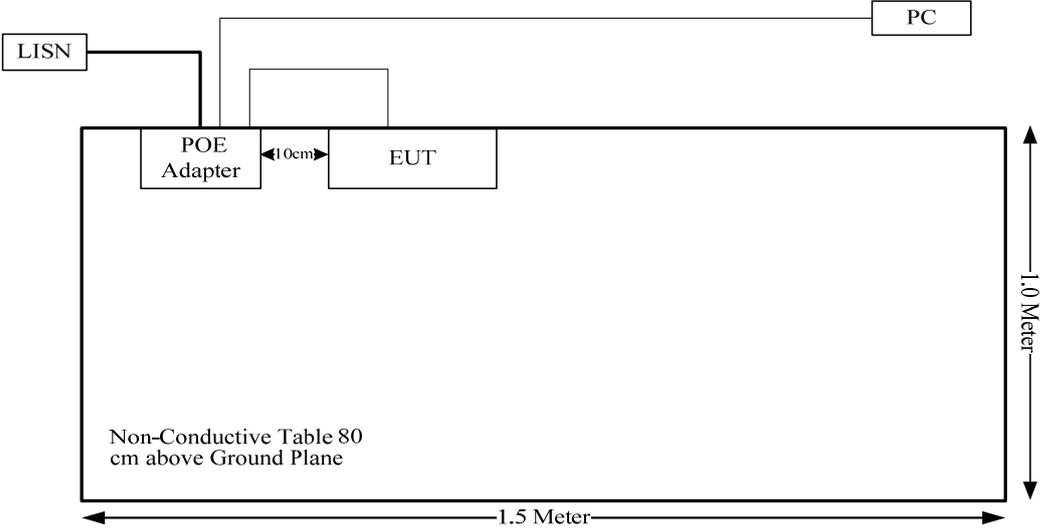
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	PC	8176	99Y7315
Huawei	POE	POE35-54V	N/A

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	1.0	EUT	POE Adapter
RJ45 Cable	No	No	1.0	POE Adapter	PC

Configuration of Test Setup

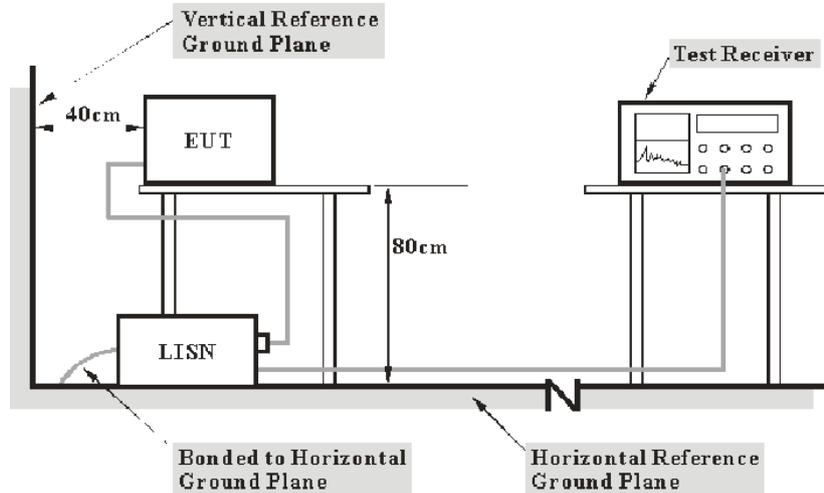


SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

FCC§15.107 - CONDUCTED EMISSIONS

EUT Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the main lisen with a 120V/60Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2016-12-02	2017-12-01
SOLAR ELECTRONICS	L.I.S.N.	9252-50-24 -BNC	984413	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	DE14781	2016-10-31	2017-10-30
Unknown	Conducted Cable	Unknown	NO.5	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

* **Statement of Traceability:** BAACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF : voltage division factor of AMN or ISN

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

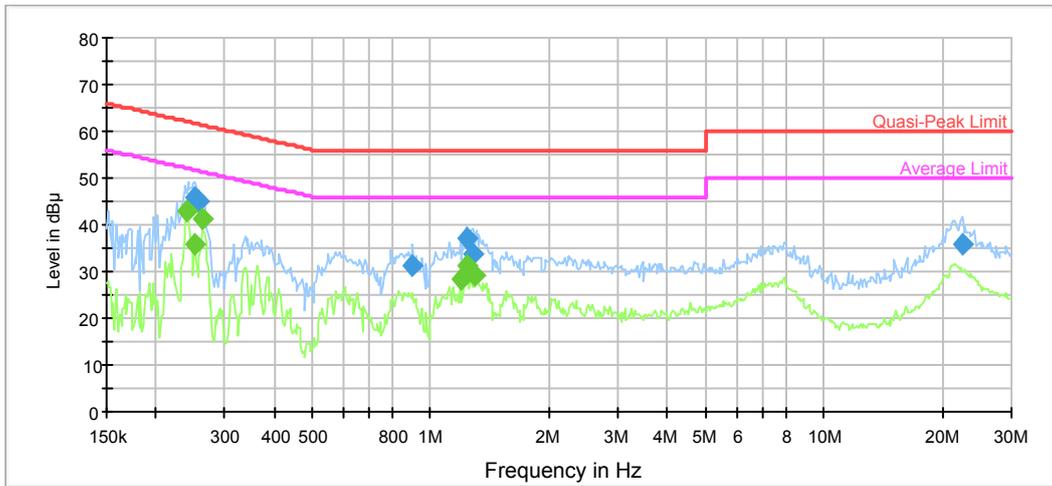
Environmental Conditions

Temperature:	27°C
Relative Humidity:	50%
ATM Pressure:	100 kPa

The testing was performed by Lorin Bian on 2017-05-31.

Test Mode: Operating

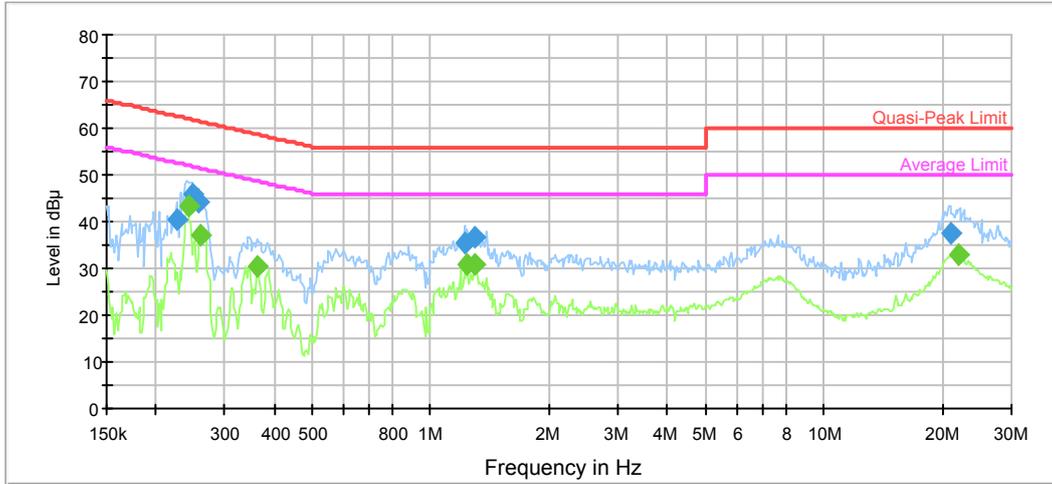
AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.251783	45.7	9.000	L1	19.7	16.0	61.7	Compliance
0.257874	45.2	9.000	L1	19.7	16.3	61.5	Compliance
0.900972	31.1	9.000	L1	19.7	24.9	56.0	Compliance
1.239175	37.3	9.000	L1	19.7	18.7	56.0	Compliance
1.279307	33.7	9.000	L1	19.7	22.3	56.0	Compliance
22.530262	35.7	9.000	L1	20.1	24.3	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.240029	42.9	9.000	L1	19.7	9.2	52.1	Compliance
0.251783	35.9	9.000	L1	19.7	15.8	51.7	Compliance
0.264113	41.1	9.000	L1	19.7	10.2	51.3	Compliance
1.190776	28.3	9.000	L1	19.7	17.7	46.0	Compliance
1.239175	31.3	9.000	L1	19.7	14.7	46.0	Compliance
1.289541	29.4	9.000	L1	19.7	16.6	46.0	Compliance

AC120V, 60Hz, Neutral:



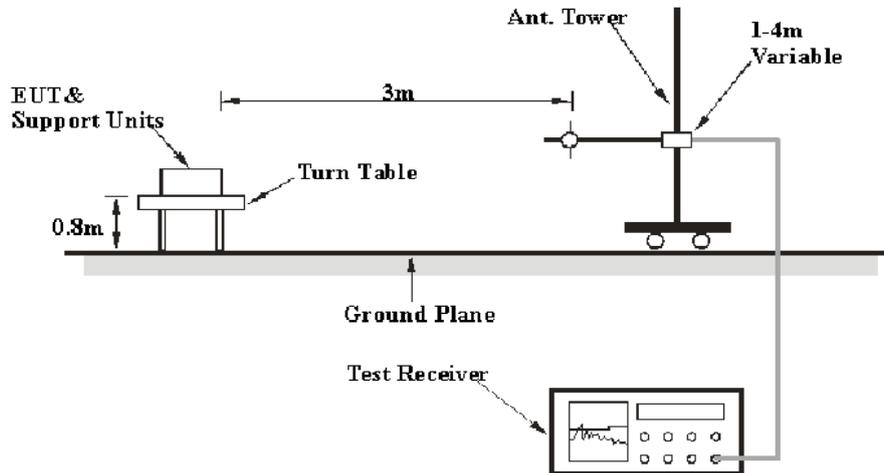
Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.227007	40.3	9.000	N	19.6	22.3	62.6	Compliance
0.247802	45.7	9.000	N	19.6	16.1	61.8	Compliance
0.257874	44.3	9.000	N	19.6	17.2	61.5	Compliance
1.219583	35.4	9.000	N	19.6	20.6	56.0	Compliance
1.289541	36.8	9.000	N	19.6	19.2	56.0	Compliance
20.971112	37.4	9.000	N	20.0	22.6	60.0	Compliance

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.241949	43.5	9.000	N	19.6	8.5	52.0	Compliance
0.259937	37.2	9.000	N	19.6	14.2	51.4	Compliance
0.363254	30.4	9.000	N	19.6	18.3	48.7	Compliance
1.239175	30.7	9.000	N	19.6	15.3	46.0	Compliance
1.289541	30.7	9.000	N	19.6	15.3	46.0	Compliance
21.998074	32.7	9.000	N	20.0	17.3	50.0	Compliance

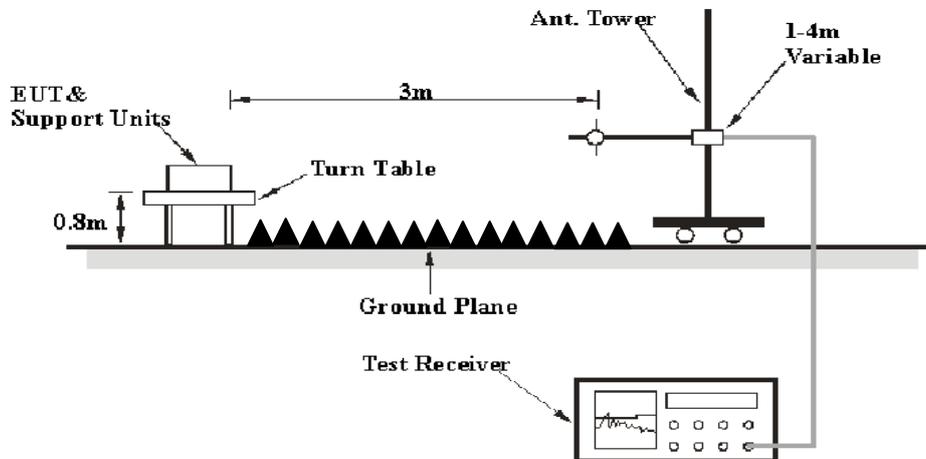
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 13.5 GHz.

During the radiated emission test, the EMI test receiver was 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	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde &Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A121808	2016-04-10	2019-04-09
Rohde &Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
EMCT	Semi-Anechoic Chamber	966	966-1	2015-04-24	2018-04-23
Unknown	RF Cable (below 1GHz)	Unknown	NO.1	2016-11-10	2017-11-09
Unknown	RF Cable (below 1GHz)	Unknown	NO.4	2016-11-10	2017-11-09
Unknown	RF Cable(above 1GHz)	Unknown	NO.2	2016-11-10	2017-11-09
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1312	2016-08-18	2017-08-18
Quinstar	Amplifier	QLW-1840553 6-JO	15964001032	2016-08-18	2017-08-18
Agilent	Spectrum Analyzer	8564E	5943A01752	2016-08-18	2017-08-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113 024	2014-06-16	2017-06-15

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Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

Environmental Conditions

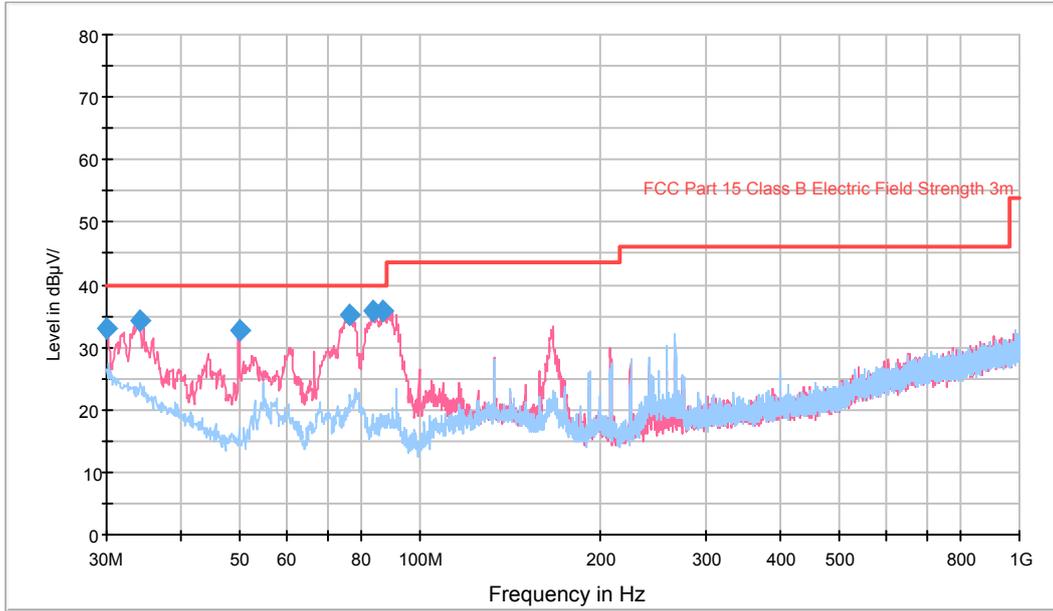
Temperature:	27 °C
Relative Humidity:	58 %
ATM Pressure:	100.1 kPa

* The testing was performed by Lorin Bian on 2017-05-23.

Test Result: Compliance

Test Mode: Operating

1) 30MHz-1GHz:



Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.000000	33.0	100.0	V	163.0	-1.0	7.0	40.0
34.001250	34.2	100.0	V	154.0	-3.7	5.8	40.0
50.006250	32.7	100.0	V	100.0	-12.9	7.3	40.0
76.075000	35.1	100.0	V	180.0	-12.6	4.9	40.0
83.471250	35.7	100.0	V	180.0	-12.9	4.3	40.0
86.381250	35.8	100.0	V	180.0	-13.1	4.2	40.0

2) 1-13.5 GHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB)					
4702	47.43	PK	H	30.45	5.17	26.86	56.19	74.00	17.81
4702	38.89	AV	H	30.45	5.17	26.86	47.65	54.00	6.35
8302	45.28	PK	H	36.14	6.91	26.82	61.51	74.00	12.49
8302	26.47	AV	H	36.14	6.91	26.82	42.70	54.00	11.30
9304	42.76	PK	H	36.92	7.66	26.22	61.12	74.00	12.88
9304	23.88	AV	H	36.92	7.66	26.22	42.24	54.00	11.76
3928	46.82	PK	V	28.71	4.81	26.56	53.78	74.00	20.22
3928	27.57	AV	V	28.71	4.81	26.56	34.53	54.00	19.47
6928	45.38	PK	V	34.17	6.08	26.30	59.33	74.00	14.67
6928	26.55	AV	V	34.17	6.08	26.30	40.50	54.00	13.50
8308	44.79	PK	V	36.15	6.90	26.82	61.02	74.00	12.98
8308	25.49	AV	V	36.15	6.90	26.82	41.72	54.00	12.28

***** **END OF REPORT** *****