

# FCC Part 15B Measurement and Test Report

For

**KZ BroadBand Technologies, Ltd.**

**1601 Tower C, Skyworth Building, High-tech Industrial Park, Nanshan**

**District, Shenzhen, China**

**FCC ID: A28AM4000D12**

<b>Test Rule(s):</b>	<u>FCC Part 15 Subpart B</u>
<b>Product Description:</b>	<u>LTE Outdoor CPE</u>
<b>Tested Model:</b>	<u>AirMaster 4000D B12/17</u>
<b>Report No.:</b>	<u>STR16118193I-2</u>
<b>Tested Date:</b>	<u>2016-11-22 to 2016-11-25</u>
<b>Issued Date:</b>	<u>2016-11-28</u>
<b>Tested By:</b>	<u>Iven Guo / Engineer</u> <i>Iven Guo</i>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: KZ BroadBand Technologies, Ltd.  
Address of applicant: 1601 Tower C, Skyworth Building, High-tech Industrial Park, Nanshan District, Shenzhen, China

Manufacturer: KZ BroadBand Technologies, Ltd.  
Address of manufacturer: 1601 Tower C, Skyworth Building, High-tech Industrial Park, Nanshan District, Shenzhen, China

General Description of EUT	
Product Name:	LTE Outdoor CPE
Trade Name:	AirMaster
Model No.:	AirMaster 4000D B12/17
Adding Model(s):	My-PRO-KZ-B12-B17, AirMaster 4000P B12/17 AirMaster 4000M B12/17
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model AirMaster 4000D B12/17, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 48V
Rated Current:	0.32A (POE)
Rated Power:	/
Power Adapter Model:	Model: G0549-480-032 Input: 100-240V,50/60Hz, Output: DC48V,0.32A
Lowest Internal Frequency:	32.768kHz

## 1.2 Test Standards

The following report is prepared on behalf of the KZ BroadBand Technologies, Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 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.

## 1.4 Test Facility

### **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

### **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2<sup>nd</sup> Road, Bao'an District, Shenzhen, P.R.C (518101).

## 1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Operating	Connected to PC, PING IP

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
adapter Cable	0.6	Shielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

## 1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

### 1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2016-06-04	2017-06-03
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2016-06-04	2017-06-03
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2016-06-04	2017-06-03
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2016-06-04	2017-06-03
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2016-06-04	2017-06-03
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2016-06-04	2017-06-03
SEMT-1042	Horn Antenna	ETS	3117	00086197	2016-06-04	2017-06-03
SEMT-1121	Horn Antenna	ETS	3116B	00088203	2016-06-04	2017-06-03
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2016-06-04	2017-06-03
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2016-06-04	2017-06-03
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2016-06-04	2017-06-03
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2016-06-04	2017-06-03

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## 2. SUMMARY OF TEST RESULTS

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<b>FCC Rules</b>	<b>Description of Test Item</b>	<b>Result</b>
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

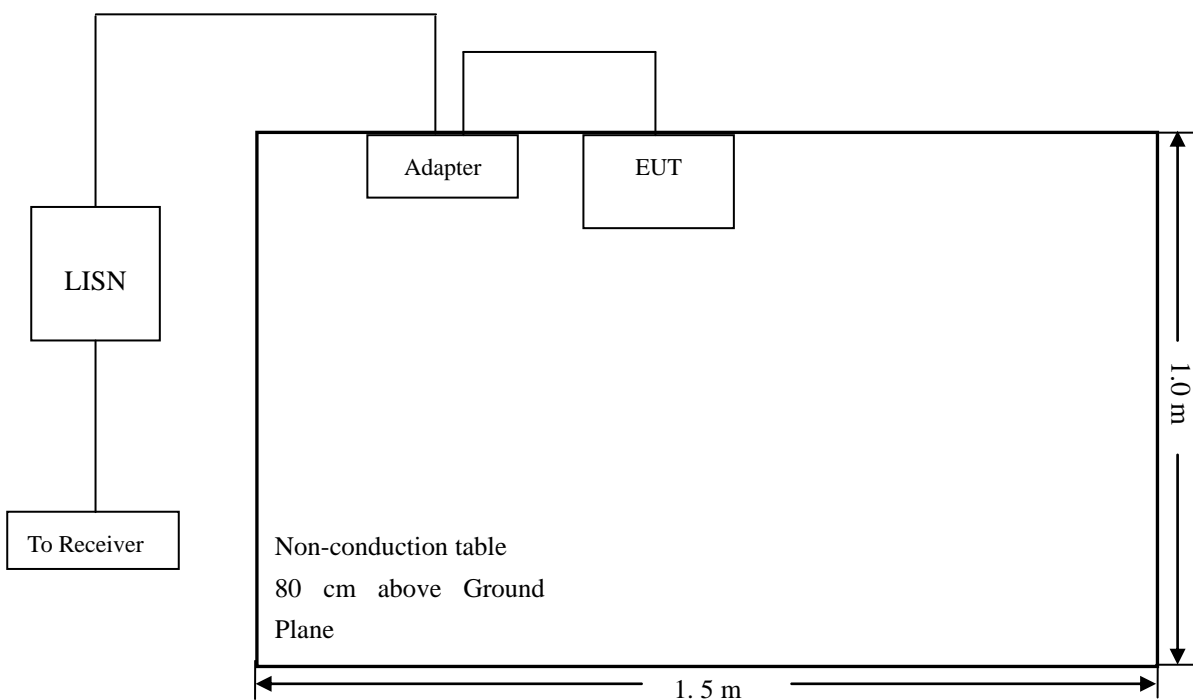
N/A: not applicable

### 3. Conducted Emissions

#### 3.1 Test Procedure

Test is conducting under the description of 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.

#### 3.2 Basic Test Setup Block Diagram



#### 3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

#### 3.4 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

**-8.07 dB at 0.1500 MHz in the Line, QP detector, 0.15-30MHz**

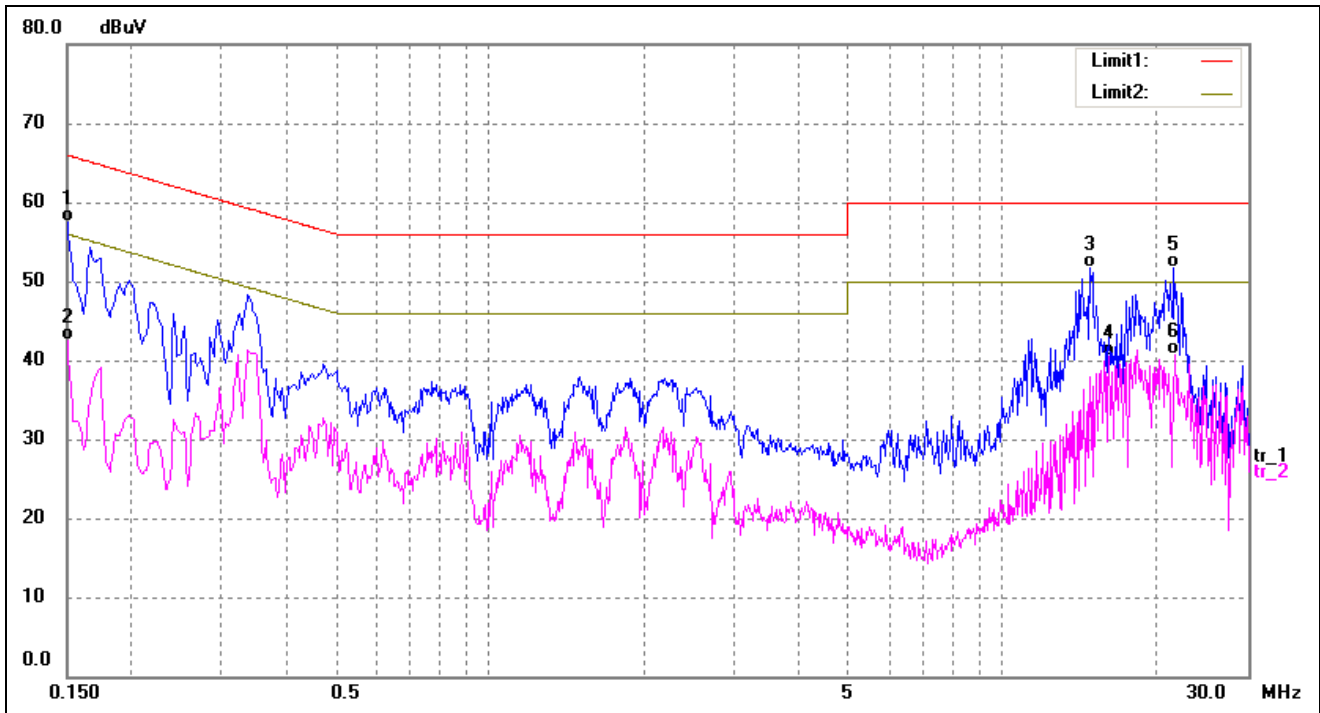


### 3.5 Conducted Emissions Test Data

#### Plot of Conducted Emissions Test Data

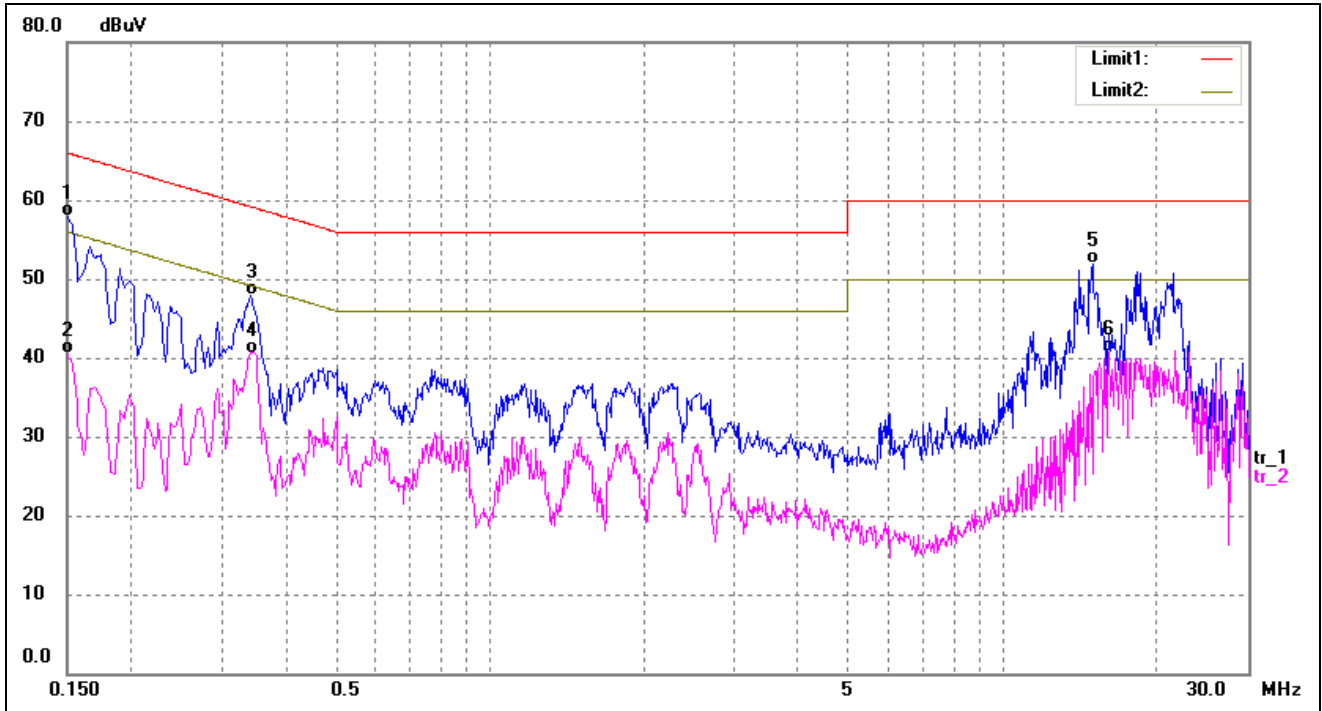
EUT: *LTE Outdoor CPE*  
 Tested Model: *AirMaster 4000D B12/17*  
 Operating Condition: *TM1*  
 Comment: *DC 48V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	47.59	9.85	57.44	66.00	-8.56	QP
2	0.1500	32.61	9.85	42.46	56.00	-13.54	AVG
3	14.7820	42.07	9.61	51.68	60.00	-8.32	QP
4	16.1260	30.78	9.63	40.41	50.00	-9.59	AVG
5*	21.5020	42.10	9.68	51.78	60.00	-8.22	QP
6	21.6620	31.11	9.68	40.79	50.00	-9.21	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1500	48.07	9.85	57.92	65.99	-8.07	QP
2	0.1500	30.61	9.85	40.46	55.99	-15.53	AVG
3	0.3420	38.12	9.80	47.92	59.15	-11.23	QP
4	0.3420	30.66	9.80	40.46	49.15	-8.69	AVG
5	14.9460	42.24	9.61	51.85	60.00	-8.15	QP
6	16.1220	30.99	9.63	40.62	50.00	-9.38	AVG

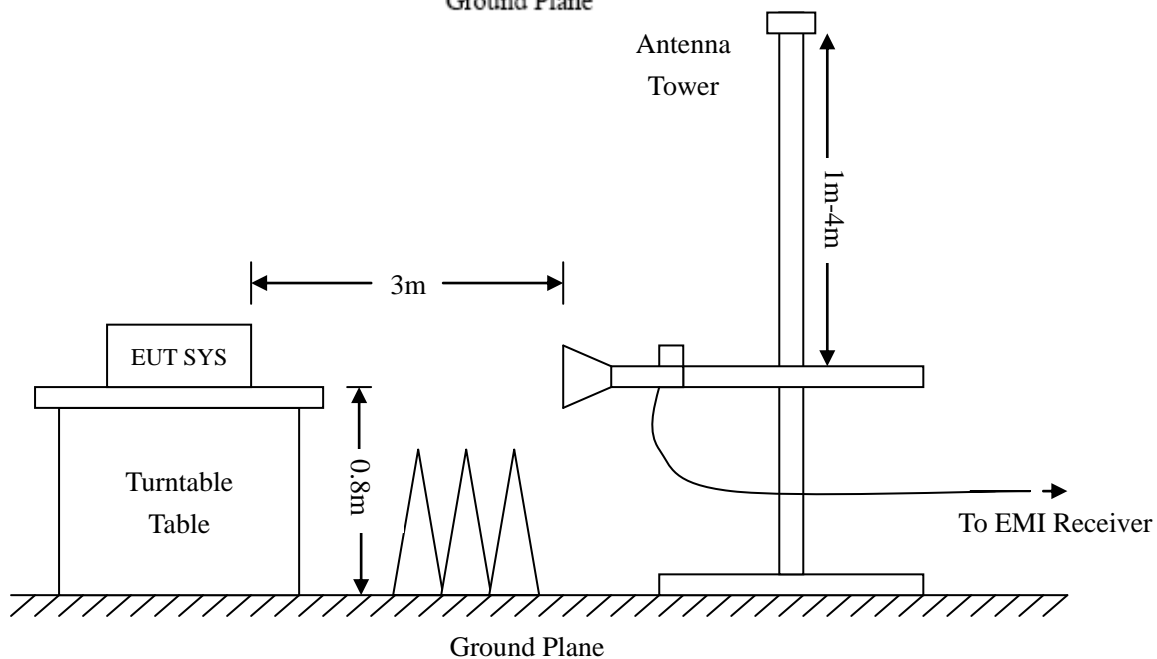
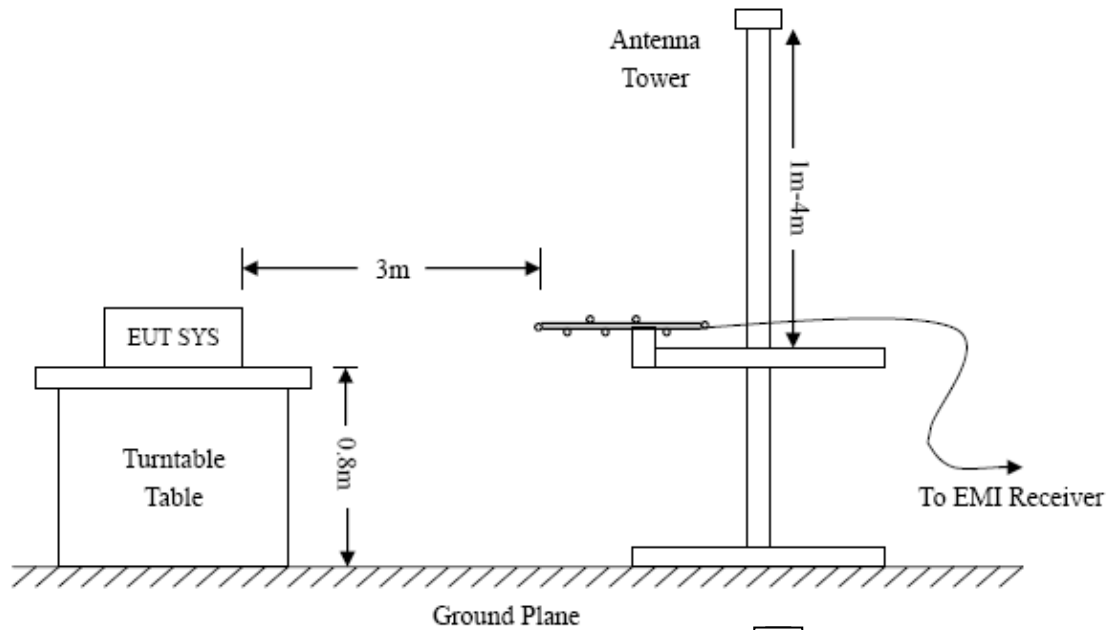
## 4. Radiated Emissions

### 4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

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

The spacing between the peripherals was 10 cm.



### 4.2 Test Receiver Setup

Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

### 4.3 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

### 4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

### 4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-2.16 dB at 125.0066 MHz in the Vertical polarization, 30MHz to 1 GHz, 3Meters**

**Plot of Radiated Emissions Test Data**

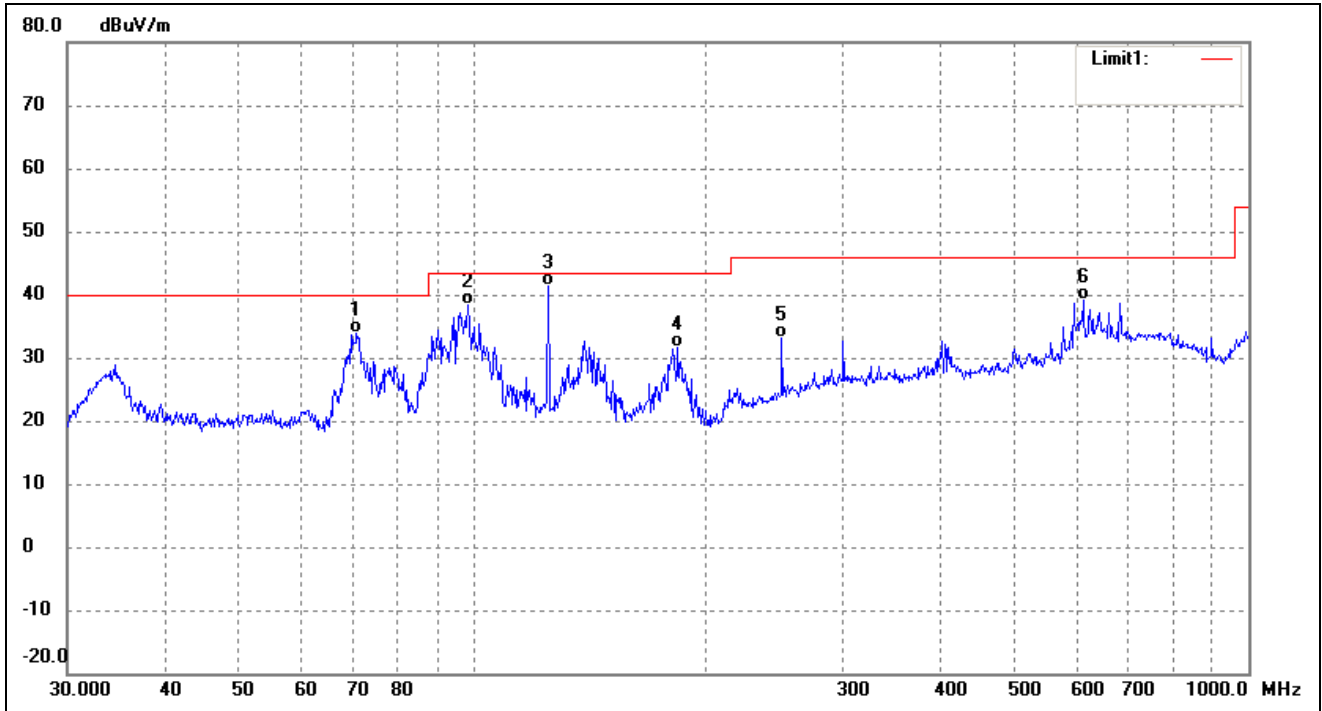
EUT: *LTE Outdoor CPE*  
 Tested Model: *AirMaster 4000D B12/17*  
 Operating Condition: *TM1*  
 Comment: *DC 48V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	90.2205	32.68	3.44	36.12	43.50	-7.38	0	100	QP
2	125.0066	32.87	4.40	37.27	43.50	-6.23	0	100	QP
3	139.3613	28.29	3.21	31.50	43.50	-12.00	0	100	QP
4	183.8440	32.09	2.61	34.70	43.50	-8.80	0	100	QP
5	250.3012	26.92	9.32	36.24	46.00	-9.76	0	100	QP
6	665.8035	19.19	17.90	37.09	46.00	-8.91	0	100	QP

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	70.8315	31.15	2.77	33.92	40.00	-6.08	0	100	QP
2	98.4866	33.60	4.71	38.31	43.50	-5.19	0	100	QP
3	125.0066	36.94	4.40	41.34	43.50	-2.16	0	100	QP
4	183.8440	29.07	2.61	31.68	43.50	-11.82	0	100	QP
5	250.3012	23.79	9.32	33.11	46.00	-12.89	0	100	QP
6	612.0642	21.22	17.92	39.14	46.00	-6.86	0	100	QP

Note: Testing is carried out with frequency rang 30MHz to the 26GHz, which above 1GHz are attenuated more than 20 dB below the permissible value and are not showed in the test report.

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