

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Connected Development LLC, Mackay Meter

To: 47CFR15.109 and RSS-GEN Issue 3

Test Report Serial No: RFI-EMC-RP81979JD07A V2.0

Version 2.0 supersedes all previous versions

**This test report is issued under the authority
of Chris Guy, Head of Global Approvals:**

C. W.

Checked By:	Nicholas Jones
Signature:	N T Jones
Date of Issue:	09 September 2011

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1. CUSTOMER DETAILS

Company Name:	Connected Development LLC
Address:	5020 Weston Parkway Suite 215 Cary, NC 27513 United States

2. SUMMARY OF TESTING

2.1. Test Specification

Reference:	47CFR15.109
Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Radio Frequency Devices) – Section 15.109.
Reference:	RSS-GEN Issue 3 December 2010
Title:	General Requirements and Information for the Certification of Radio Apparatus
Site Registration:	FCC: 209735 Industry Canada: 3245B-2

2.2. Summary of Test Results

FCC Reference	IC Reference	Measurement Type	Applicability	Result
15.109	RSS-Gen 4.10 RSS-Gen 6.1	Radiated Emissions (Enclosure)	Y	

KEY:  = Complied  = Did not comply

2.3. Location of Testing

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire RG24 8AH.

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above, nor from the requirements defined in the basic standards called up within it.

3. EQUIPMENT UNDER TEST (EUT)

3.1. Description of EUT

The EUT was a remote GSM Parking Meter.

3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No	IMEI
E1	Enclosure	Mackay Meter	22GD4000000	9000001	352421040133521

3.3. Port Identification

Port	Description	Type
P1	Enclosure	-

3.4. Operating Modes

Mode Reference	Definition
Idle	The EUT was in a stand-alone state scanning for a network

Radio characteristics

GSM Bands supported:	Rated Output Power (dBm)	Transmit Frequency range (MHz)	ARFCN	Transmit Frequency (MHz)	Receive Frequency range (MHz)	ARFCN	Receive Frequency (MHz)
GSM 850	33	824 – 849	190	836.6	869 – 894	190	881.6
PCS 1900	30	1850 – 1910	660	1879.8	1930 – 1990	660	1959.8

Supported Technologies e.g. Circuit Switched Voice/Data, Packet Switched Data GPRS/ EDGE

Packet switched data

3.5. Configuration and Peripherals

Description:	Please refer to the Test Configuration and Photograph section for schematic drawing(s) and/or photograph(s) of the test configuration(s) employed in the course of testing.
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3.6. Modifications

NOTE: No modifications were made during the course of testing

3.7. Additional Information Related to Testing

Equipment Category:	GSM mobile
Intended Operating Environment:	Commercial / industrial
Cycle Time:	< 1 second
Power Supply Requirement(s):	Internal Batteries / Solar Cell
Weight:	8.3 kg
Dimensions:	300 x 180 x 180 mm
Antenna Type	Integral
FCC ID:	ZPZ0711MGSOLO
IC Number:	9753A-MGSOLO

4. SUPPORT EQUIPMENT

4.1. Identification of Support Equipment

NOTE: No support equipment or interconnecting cables were required for this test.

5. MONITORING PERFORMANCE

5.1. Overview

Only emissions tests were performed. Therefore performance criteria were not applicable.

5.2. Monitoring EUT Performance during Testing

For the purposes of testing, the term “ <i>operate as intended</i> ” was defined as:	Not Applicable
For the purposes of testing, an “ <i>unintentional response</i> ” was defined as:	Not Applicable
Method used to determine whether user control functions and stored data were lost after the EMC exposure:	Not Applicable
Method used to verify that a communications link was established and maintained (if appropriate):	Not Applicable
Method of assessment of level of performance or degradation of performance during and/or after EMC exposure:	Not Applicable

6. MEASUREMENT UNCERTAINTY

6.1. Overview

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement regarding the uncertainty of approximation.

The measurement uncertainty may need to be taken into account when interpreting the test results included within this test report.

6.2. Method of calculation

The methods used to calculate the uncertainties included within this test report are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the United Kingdom Accreditation Service (UKAS) is followed.

7. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

7.1. General Comments

7.1.1. This section contains the test result sheets for the measurements listed in Section 2.2. *Summary of Test Results* (above).

7.1.2. The measurement uncertainties stated in the test result sheets were calculated in accordance with documented best practice and represent a confidence level of 95%. Where only confidence level is given, it has been demonstrated that the relevant items of test equipment used meet the specified requirements in the standard with at least this level of confidence.

7.1.3. Please refer to Section 6. *Measurement Uncertainty* on page 10 for details of our treatment of measurement uncertainty.

RADIATED EMISSIONS - TEST RESULTS

This test is covered by the scope of RFI's UKAS Accreditation under ISO/IEC 17025: 2005.

GENERAL INFORMATION

RFI JOB NUMBER:	81979JD07	TEST SITE ID:	Site 1
EUT:	Mackay Meter	TEMPERATURE:	30 °C to 30 °C
TEST ENGINEER:	Graeme Morris	RELATIVE HUMIDITY:	37 % to 37 %
DATE OF TEST:	21 Jul 2011	ATMOSPHERIC PRESSURE:	1013mb to 1013 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Metres
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class B
MEASUREMENT UNITS:	dB μ V/m	TEST ENVIRONMENT:	Test Site

TEST SPECIFICATION DETAILS

The EUT has been configured and tested in accordance with the methods and procedures detailed within the following basic standard:

REFERENCE:	ANSI C63.4: 2009
TITLE:	American National Standard for the Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

COMMENTS

None

DEVIATIONS FROM TEST SPECIFICATION

There were no deviations from the test configuration and measurement arrangements defined in the test specification (identified above).

EUT RELATED

OPERATING MODE:	Idle
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarity	Detector	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Graph No.	Result
1	30 to 10000			Refer to Note 1.			001 to 004	Complied

NOTES

- 1 No emissions were noted above the noise floor of the measurement system. Therefore no further measurements were made.
- 2 Measurements below 1 GHz were performed in a semi-anechoic chamber at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Pre-scans and final measurements above 1 GHz were performed in a semi-anechoic chamber at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

TEST EQUIPMENT USED

RFI ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
M1590	26.5GHz Test Receiver	ESU26	15 Jun 2012	12
K0001	5m Semi-Anechoic Chamber	N/A	29 May 2012	12
A1925	Hi Resolution Monitor	PVD1700DG	Calibration not required	N/A
A553	Bi-log Antenna	CBL6111A	26 Mar 2012	12
A1919	Camera System	Scout	Calibration not required	N/A
C1163	1m N-Type Cable	FA210A1010007070	Calibrated before use	N/A
C1305	3m Rosenberger Cable	FA210A1030005050	Calibration not required	N/A

8. PHOTOGRAPHS OF EUT

This section contains the following photographs:

Photo Reference Number	Title
PHT\81979JD07\001	Test Configuration Photograph - Radiated Emissions

PHT\81979JD07\001 - Test Configuration Photograph - Radiated Emissions



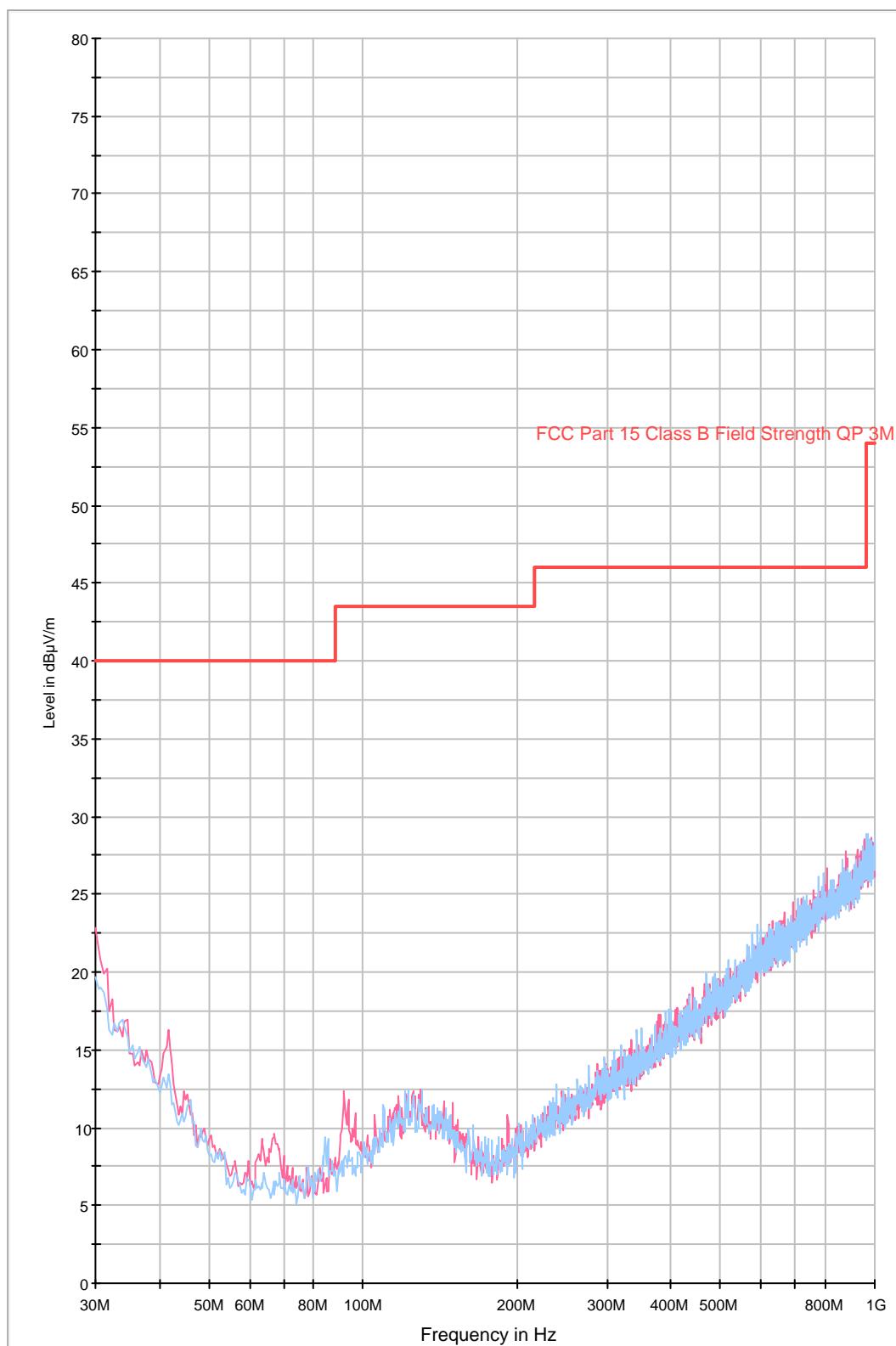
9. GRAPHICAL TEST RESULTS

9.1. This section contains the graphical results for the measurements listed in Section 2.2. *Summary of Test Results* (above).

Graph Reference Number	Title
GPH\81979JD07\001	Radiated Emissions (30 MHz to 1000 MHz)
GPH\81979JD07\002	Radiated Emissions (1 GHz to 4 GHz)
GPH\81979JD07\003	Radiated Emissions (4 GHz to 7 GHz)
GPH\81979JD07\004	Radiated Emissions (7 GHz to 10 GHz)

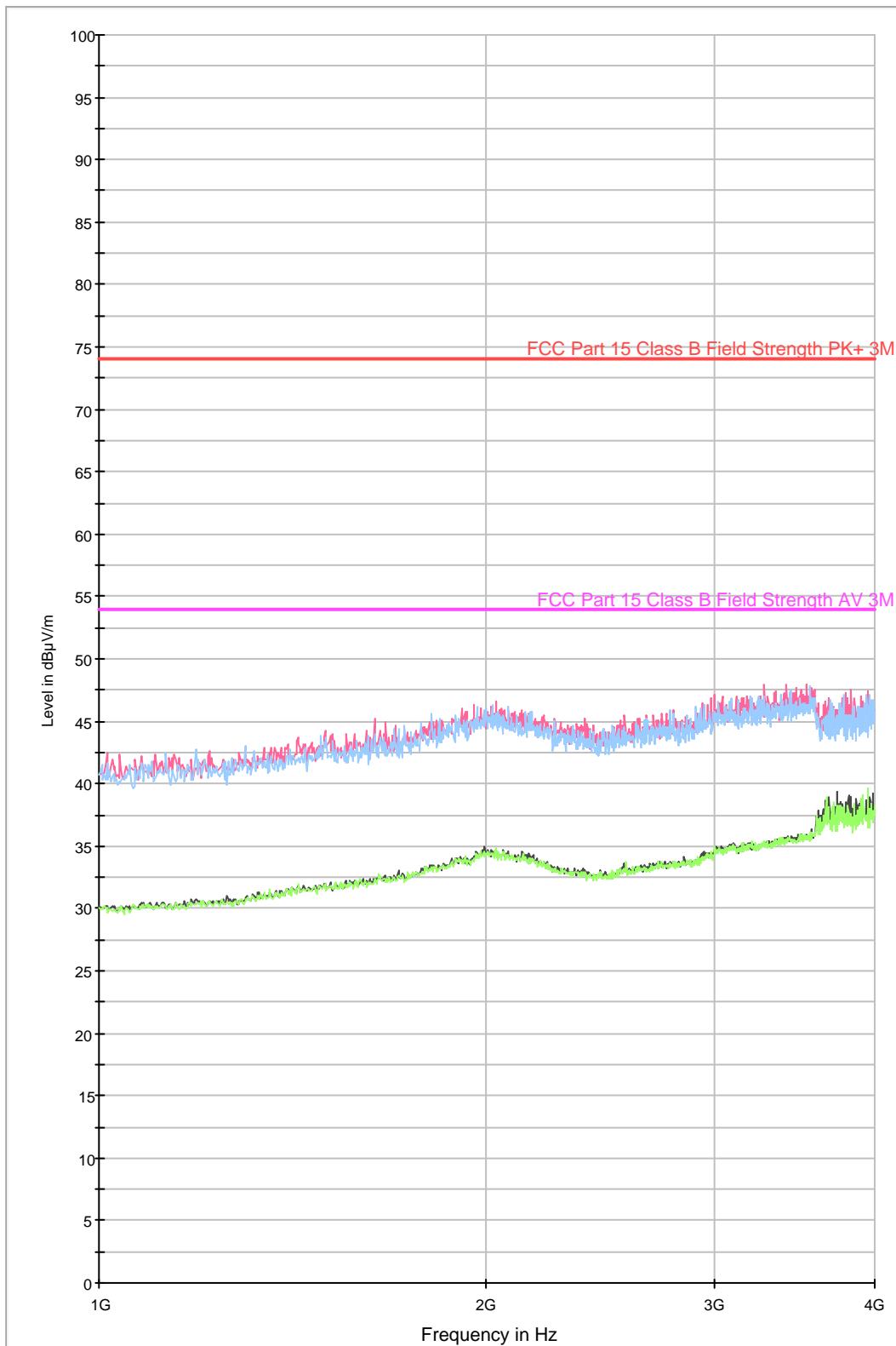
GPH\81979JD07\001

FCC Part 15.109 Radiated Emissions Class B 30MHz-1GHz 3m



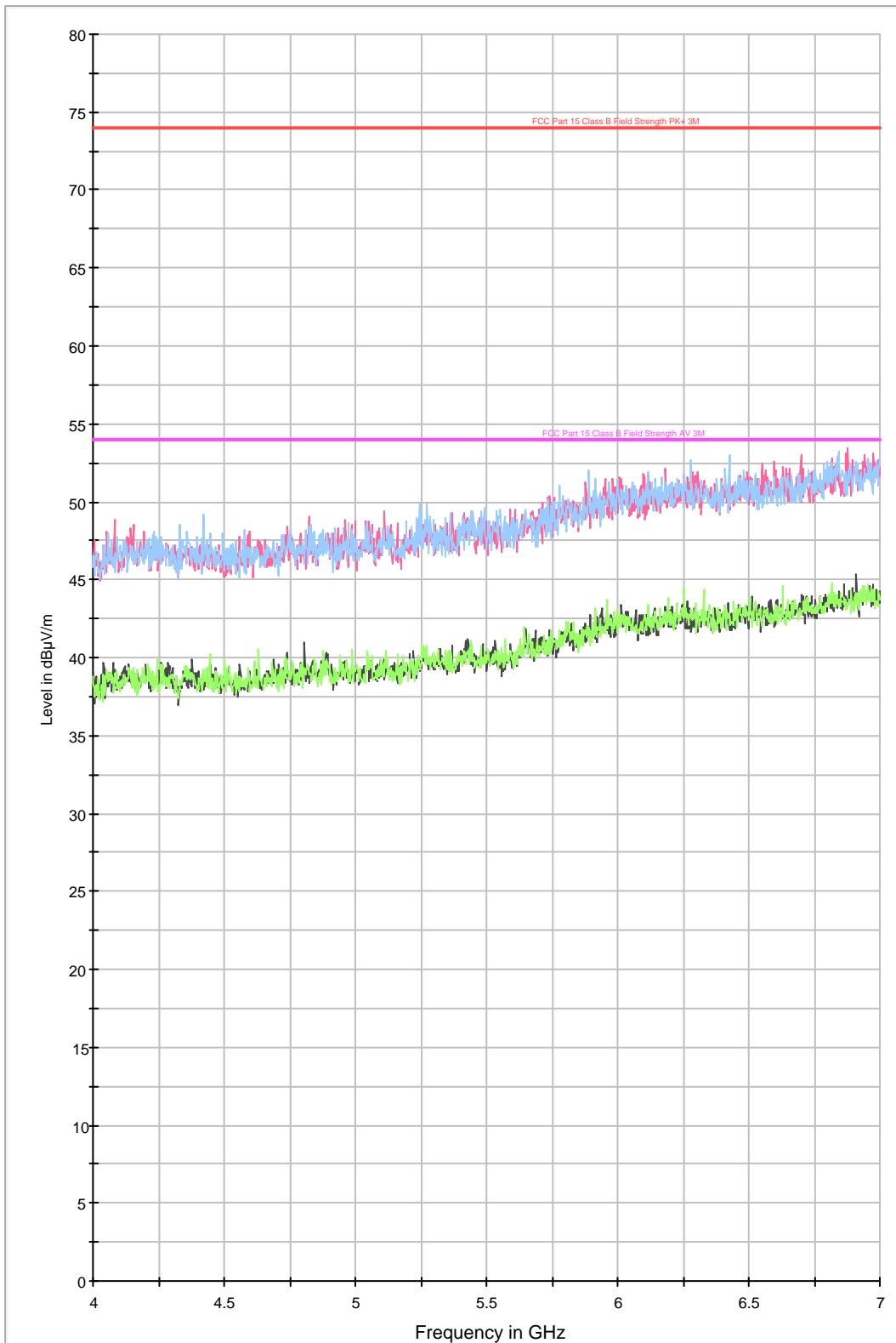
GPH\81979JD07\002

FCC Part 15.109 Radiated Emissions Class B 1-4GHz



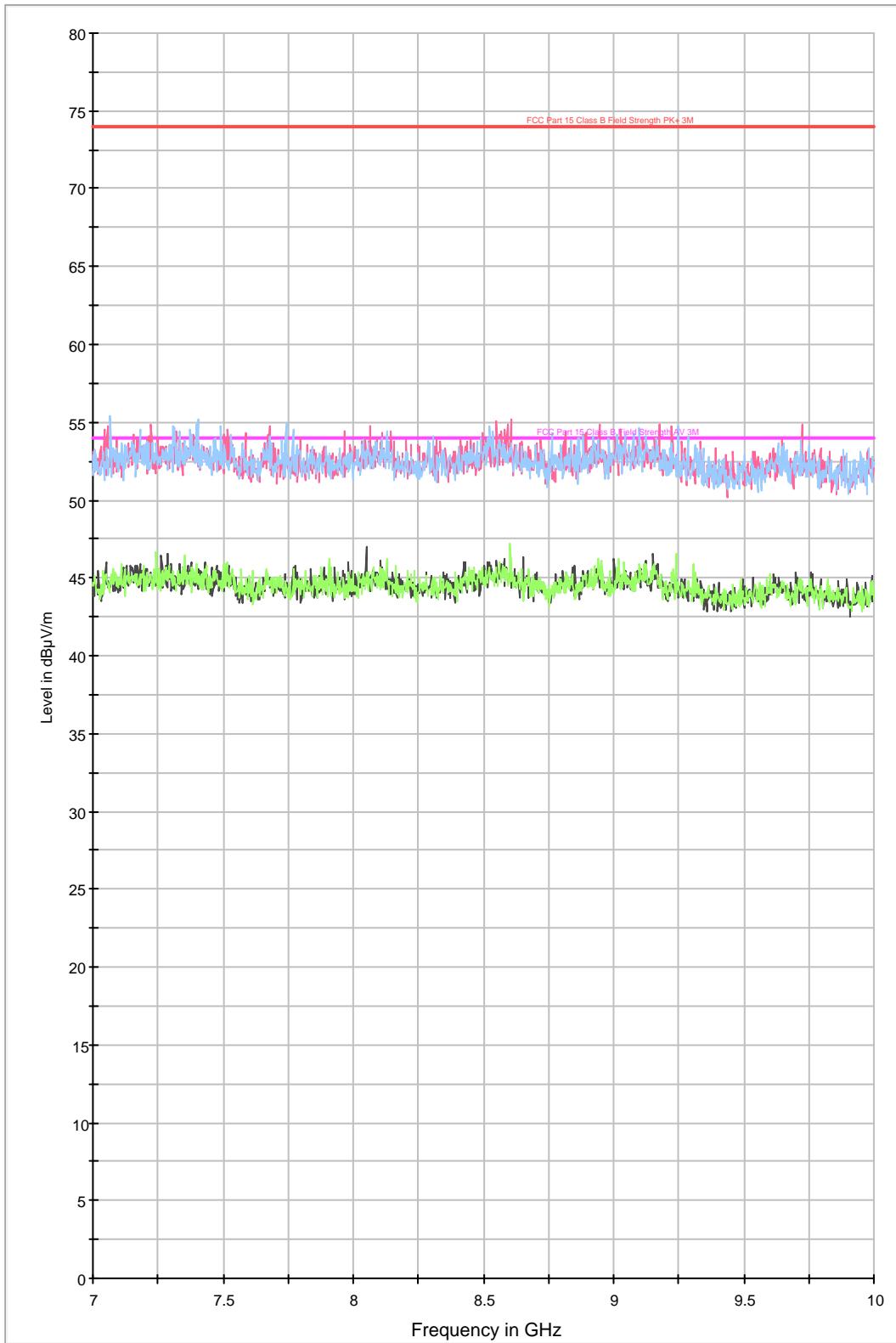
GPH\81979JD07\003

FCC Part 15.109 Radiated Emissions Class B 4-7GHz



GPH\81979JD07\004

FCC Part 15.109 Radiated Emissions Class B 7-10GHz



10. TEST CONFIGURATION DRAWING

10.1. This section contains the Test Configuration Drawings for the measurements listed in Section 7: Measurements, Examinations and Derived Results.

Test Configuration Reference Number	Title
DRG\81979JD07\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

DRG\81979JD07\001 - Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

Configuration of EUT and Local Support Equipment



Configuration of Remote Support Equipment