

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Enfora Inc, GSM2374-01

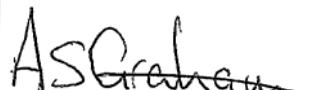
To: 47CFR15.109 and RSS-GEN Issue 3 December 2010

Test Report Serial No: RFI-EMC-RP78477JD25A V4.0

Version 4.0 supersedes all previous versions

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



Checked By:	Andy Graham
Signature:	
Date of Issue:	15 February 2011

This report is issued in portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.

This report may not be reproduced other than in full, except with the prior written approval of RFI Global Services Ltd. The results in this report apply only to the sample(s) tested.



RFI Global Services Ltd,  
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG, UK  
Tel. +44 (0) 1256 312000 Fax +44 (0) 1256 312001  
web: [www.rfi-global.com](http://www.rfi-global.com) email: [contactus@rfi-global.com](mailto:contactus@rfi-global.com)



This page has been left intentionally blank.

**TABLE OF CONTENTS**

<b>1. Customer Details .....</b>	<b>5</b>
<b>2. Summary of Testing .....</b>	<b>6</b>
<b>3. Equipment under Test (EUT) .....</b>	<b>7</b>
<b>4. Support Equipment.....</b>	<b>8</b>
<b>5. Monitoring Performance .....</b>	<b>9</b>
<b>6. Measurement Uncertainty .....</b>	<b>10</b>
<b>7. Measurements, Examinations and Derived Results .....</b>	<b>11</b>
<b>8. Photographs of EUT .....</b>	<b>14</b>
<b>9. Graphical Test Results .....</b>	<b>16</b>
<b>10. Test Configuration Drawing.....</b>	<b>21</b>

This page has been intentionally left blank.

**1. CUSTOMER DETAILS**

<b>Company Name:</b>	Enfora Inc
<b>Address:</b>	251 Renner Parkway Richardson Texas TX 75080 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	✓

#### Notes

1. Not applicable. The EUT is DC powered only.

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 vehicle mounted GSM / GPRS module

#### 3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No	IMEI
E1	GSM / GPRS Module	Enfora Inc	GSM2374-01	C402033520043	001036000210693

#### 3.3. Port Identification

Port	Description	Type
P1	Enclosure	-
P2	Data / Power	Custom (Enfora Inc)

#### 3.4. Operating Modes

Mode Reference	Definition
Idle	The EUT was in a standalone state.

#### Radio characteristics

GRPS Bands supported:	Rated Output Power (dBm)	Transmit Frequency range (MHz)	ARFCN	Transmit Frequency (MHz)	Receive Frequency range (MHz)	ARFCN	Receive Frequency (MHz)
GRPS 850	33	824 – 849	190	836.6	869 – 894	190	881.6
GRPS 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 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.
--------------	---

#### 3.6. Modifications

NOTE: No modifications were made to the EUT during the course of testing

#### 3.7. Additional Information Related to Testing

Equipment Category:	GSM / GPRS
Intended Operating Environment:	Vehicular/Residential
Cycle Time:	< 1 s
Power Supply Requirement(s):	12 VDC
Weight:	80 g
Dimensions:	45 x 55 x 27 mm
Antenna Type	Integral
Hardware Version Number:	A
Software Version Number:	1.1.4
FCC ID Number:	MIVGSM2374
Industry Canada Reference Number:	4160A-GSM2374

## 4. SUPPORT EQUIPMENT

### 4.1. Identification of Support Equipment

NOTE: No support equipment was used during the course of testing.

### 4.2. Interconnecting Cables

NOTE: No interconnecting cables were used during the course of testing.

## 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:	The EUT remained in a standalone condition.
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:	78477JD25	TEST SITE ID:	Site 1
EUT:	GSM 2374-01	TEMPERATURE:	23 °C to 23 °C
TEST ENGINEER:	Richard Hooper	RELATIVE HUMIDITY:	32 % to 32 %
DATE OF TEST:	16 Dec 2010	ATMOSPHERIC PRESSURE:	989 mb to 989 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Meters
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class B
MEASUREMENT UNITS:	dB $\mu$ 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 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 $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Graph No.	Result
1	57.549	Vertical	Quasi-Peak	15.9	40.0	24.1	GPH\78477JD25\001	Complied
2	88.265	Vertical	Quasi-Peak	22.4	43.5	21.1	GPH\78477JD25\001	Complied
3	91.227	Vertical	Quasi-Peak	28.2	43.5	15.3	GPH\78477JD25\001	Complied
4	91.301	Vertical	Quasi-Peak	28.9	43.5	14.6	GPH\78477JD25\001	Complied
5	121.011	Vertical	Quasi-Peak	28.5	43.5	15.0	GPH\78477JD25\001	Complied
6	137.903	Vertical	Quasi-Peak	31.0	43.5	12.5	GPH\78477JD25\001	Complied
7	165.658	Vertical	Quasi-Peak	22.8	43.5	20.7	GPH\78477JD25\001	Complied
8	1000 to 4000			Refer to Note 1			GPH\78477JD25\002	Complied
9	4000 to 7000			Refer to Note 1			GPH\78477JD25\003	Complied
10	7000 to 10000			Refer to Note 1			GPH\78477JD25\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.
- 3 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**

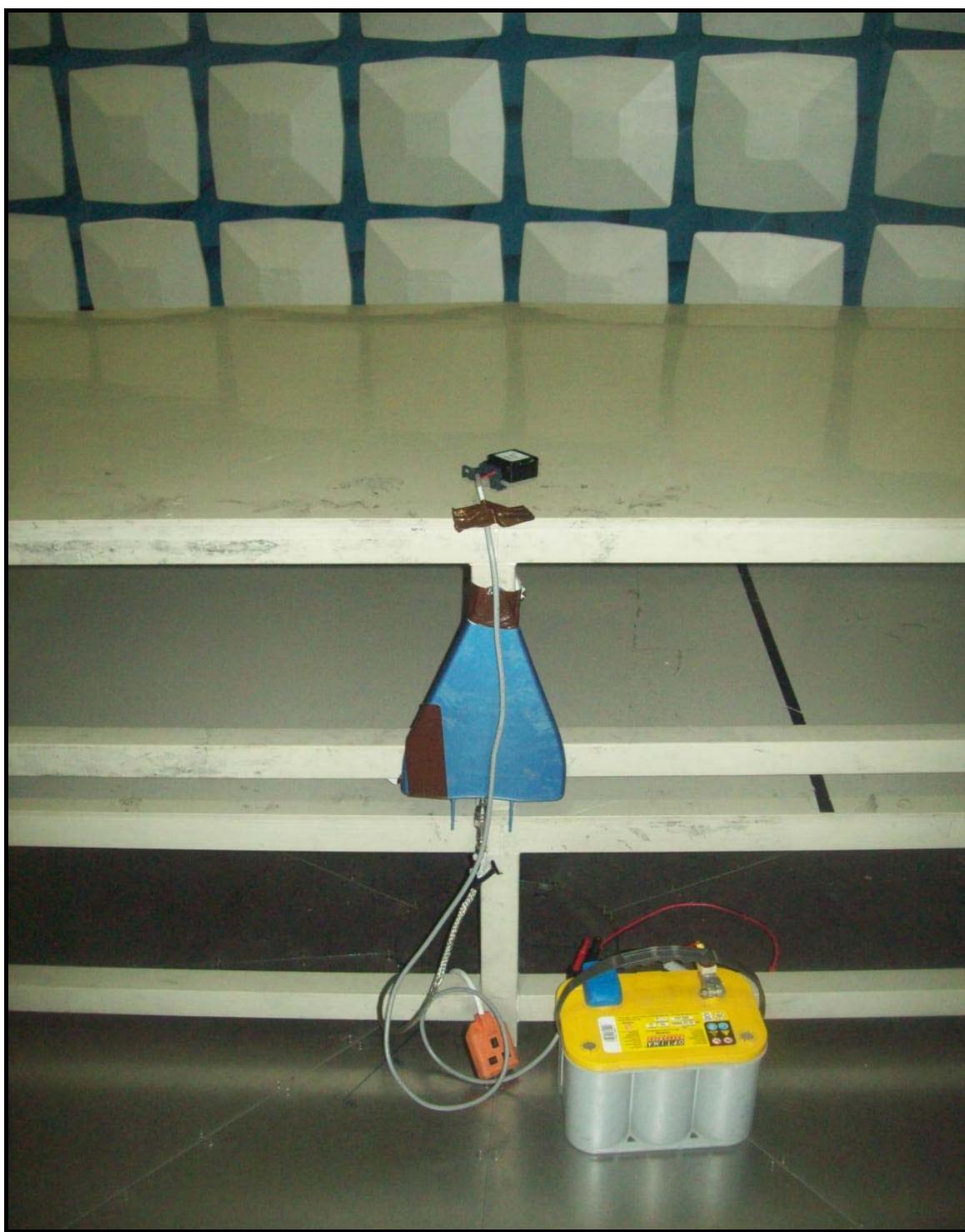
RFI ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
L1001	26.5 GHz Test Receiver	ESU26	28 Jan 2011	12
K0001	5 m Semi-Anechoic Chamber	None Stated	25 Apr 2011	12
M172	Electronic Environmental Monitor	BA-116	05 Jul 2011	12
G0543	Amplifier 9 kHz to 1 GHz	310N	30 Jun 2011	12
A1834	3 dB N-Type Attenuator	8491B	30 Jun 2011	12
C1303	8 m Rosenberger Cable	FA210A1080005050	23 Feb 2011	12
C1306	15 m Rosenberger Cable	FA210A0015005050	23 Feb 2011	12
C1302	3 m Rosenberger Cable	FA210A1030005050	30 Jun 2011	12
A553	Bi-log Antenna	CBL6111A	16 Mar 2011	12
C1304	3 m Rosenberger Cable	FA210A1030005050	22 Feb 2011	12

## 8. PHOTOGRAPHS OF EUT

This section contains the following photographs:

Photo Reference Number	Title
PHT\78477JD25\001	Test Configuration Photograph - Radiated Emissions

**PHT\78477JD25\001 - Test Configuration Photograph - Radiated Emissions**



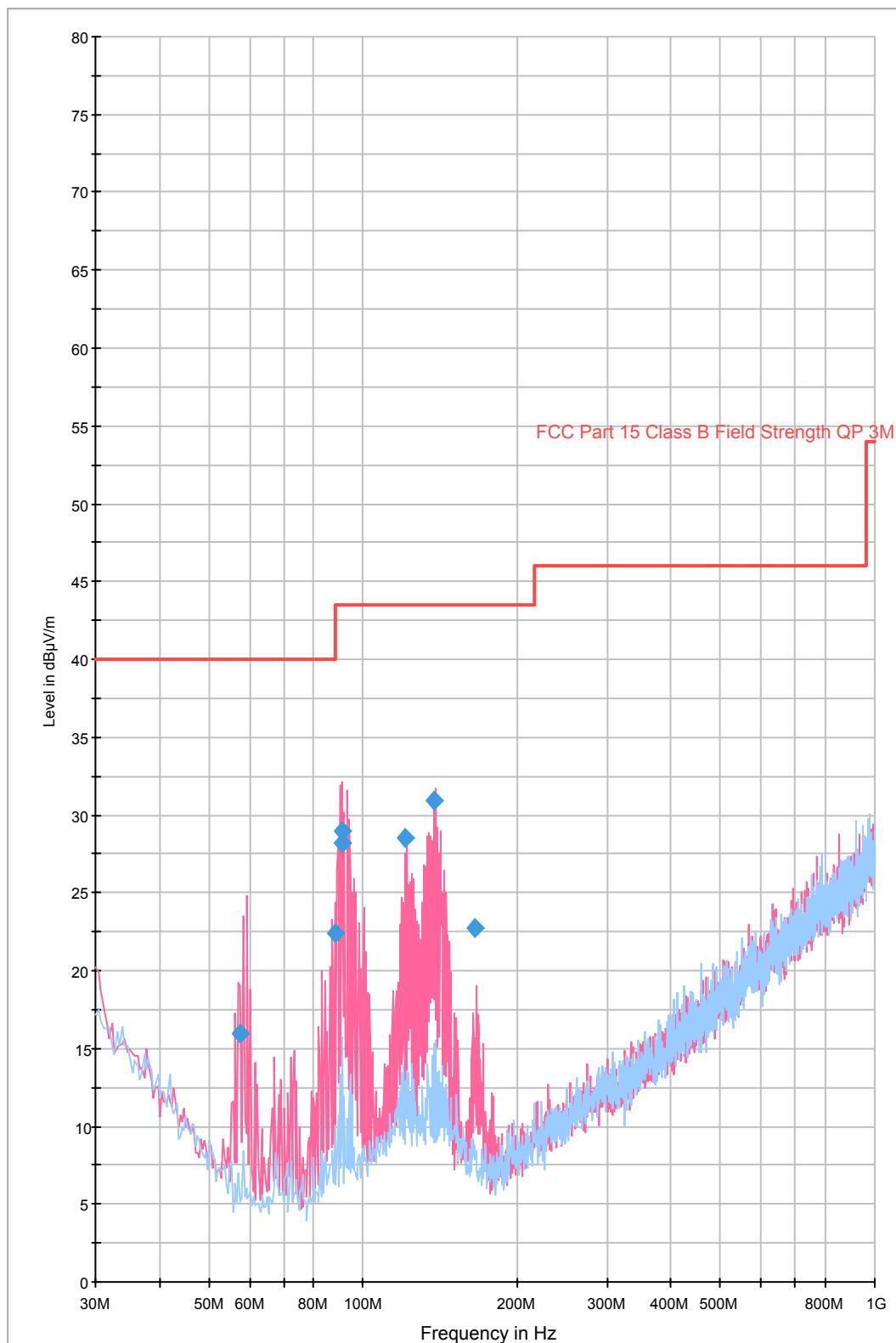
## 9. GRAPHICAL TEST RESULTS

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

Graph Number	Title
GPH\78477JD25\001	Radiated Emissions Pre-Scan (30 MHz to 1000 MHz)
GPH\78477JD25\002	Radiated Emissions Pre-Scan (1000 MHz to 4000 MHz)
GPH\78477JD25\003	Radiated Emissions Pre-Scan (4000 MHz to 7000 MHz)
GPH\78477JD25\004	Radiated Emissions Pre-Scan (7000 MHz to 10000 MHz)

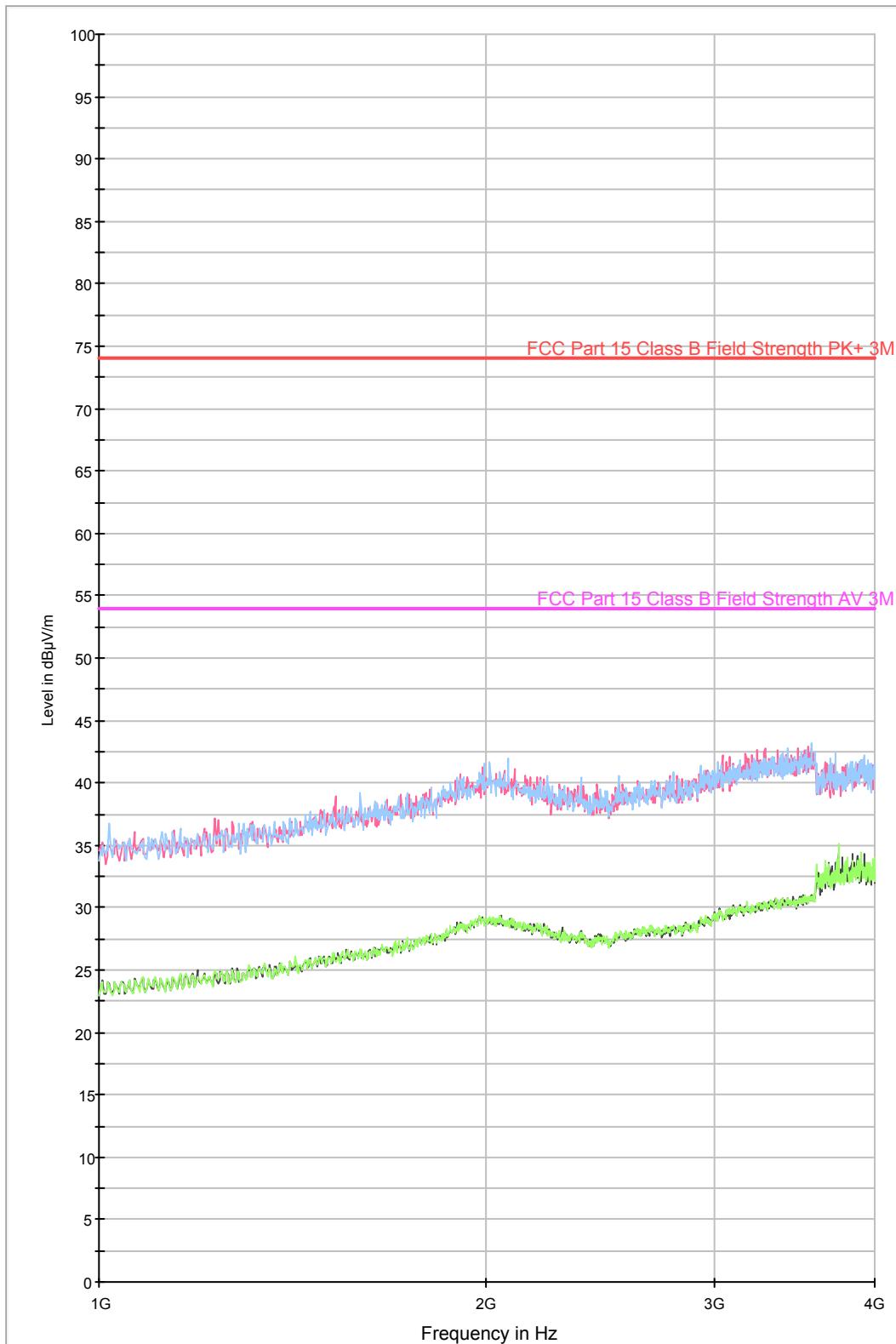
**GPH\78477JD25\001**

FCC Part 15.109 Radiated Emissions Class B 30M-1GHz 3m 45degree steps



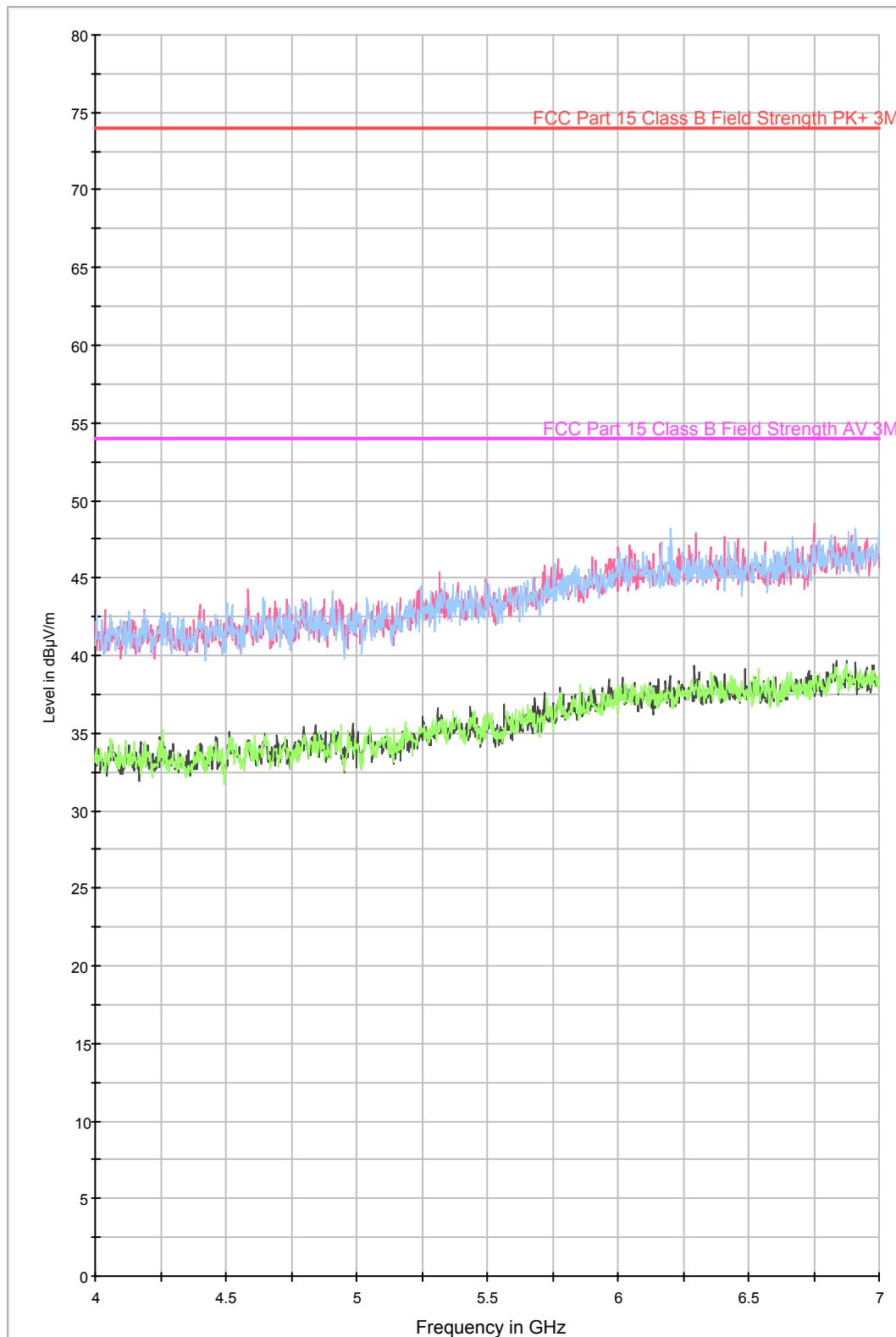
**GPH\78477JD25\002**

FCC Part 15.109 Radiated Emissions Class B 1-4GHz



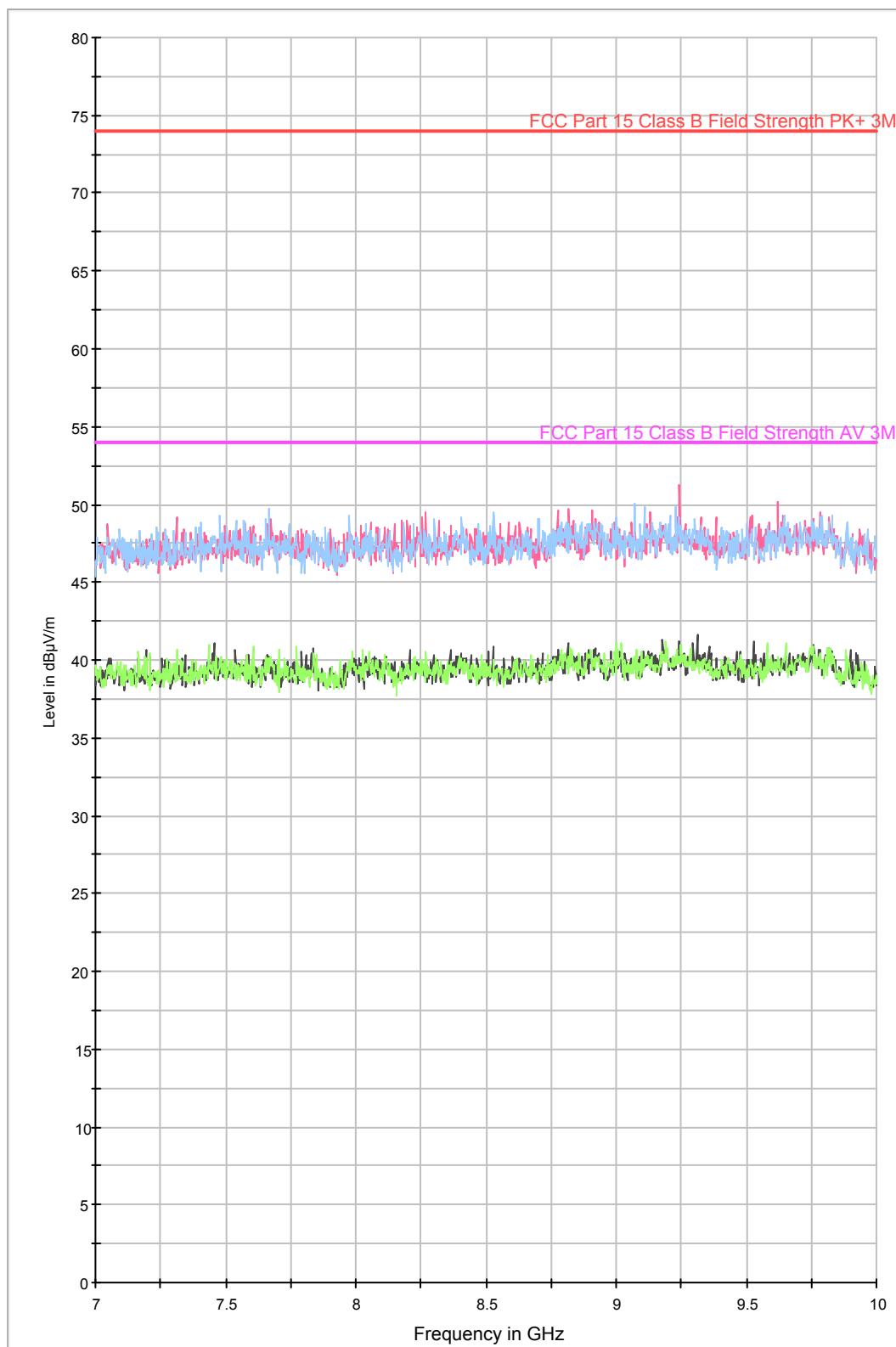
**GPH\78477JD25\003**

FCC Part 15.109 Radiated Emissions Class B 4-7GHz



**GPH\78477JD25\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\78477JD25\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

**DRG\78477JD25\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**