

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Connexion2 Ltd, Identicom t777

To: 47CFR15.107 and 47CFR15.109

Test Report Serial No: RFI-EMC-RP76894JD02A V2.0

Version 2.0 supersedes all previous versions

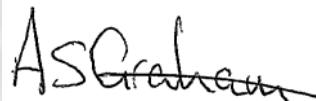
This test report is issued under the authority
of Chris Guy, Head of Global Approvals:



Checked By:

Andy Graham

Signature:



Date of Issue:

14 September 2011

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1. CUSTOMER DETAILS

Company Name:	Connexion2 Ltd
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Address:	Momentum House Church Lane Dinnington Yorkshire S25 2RG United Kingdom
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2. SUMMARY OF TESTING

2.1. Test Specification

Reference:	47CFR15.107 and 47CFR15.109
Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Radio Frequency Devices) – Sections 15.107 and 15.109.
Site Reference:	209735

2.2. Summary of Test Results

Clause	Measurement Type	Applicability	Result
15.109	Radiated Emissions (Enclosure)	Y	
15.107	Conducted Emissions (AC Mains Input / Output Ports)	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 GSM enabled lone worker security device complete with a man-down alarm and an in-built GPS receiver.

3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No	IMEI
E1	Lone worker device	Connection2 Ltd	Identicom t777	S10619002814	352024029230880
E2	AC/DC Adaptor	None Stated	SCP0750300P	None Stated	Not Applicable

3.3. Port Identification

Port	Description	Type
P1	Enclosure	-
P2	Charger Socket	DC Socket

3.4. Operating Modes

Mode Reference	Definition
Idle	The EUT was synchronised with a radio communication tester but not allocated a channel in the operating bands; GSN 850 and PCS 1900

NOTE: It was not possible to have the EUT synchronised with the radio communication tester when connected to the AC mains supply (via the AC/DC adaptor), therefore conducted emissions testing was performed with the EUT in a charging state and not synchronised with the radio communication tester.

Radio characteristics

GSM Bands tested:	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

Circuit Switched Voice/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
Intended Operating Environment:	Residential
Cycle Time:	< 1 s
Power Supply Requirement(s):	3.7 VDC (internal battery); 7 VDC (AC/DC adaptor)
Weight:	74 g
Dimensions:	100 x 70 x 12 mm
Antenna Type	Integral
Hardware Version Number:	EE09-TR1-BOM-2-007
Software Version Number:	EE09-05-02-t13

4. SUPPORT EQUIPMENT**4.1. Identification of Support Equipment**

Description	Manufacturer	Model No	Serial No
Radio Communication Tester	Rohde & Schwarz	CMU 200	116284

4.2. Interconnecting Cables

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

5. MONITORING PERFORMANCE

5.1. Overview

No immunity testing was 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 synchronised with the radio communication tester.
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):	The status of the communication link was monitored via the radio communication tester
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 11 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:	76894JD02	TEST SITE ID:	Site 1
EUT:	Identicom t777	TEMPERATURE:	30 °C to 30 °C
TEST ENGINEER:	Eric Phiri	RELATIVE HUMIDITY:	38 % to 38 %
DATE OF TEST:	27 Jul 2010	ATMOSPHERIC PRESSURE:	1003mb to 1003 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Meters
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class B
MEASUREMENT UNITS:	dBµV/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:	GSM 850 Idle
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarity	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
1	30.254	Vertical	Quasi-Peak	14.5	40.0	25.5	001	Complied
2	58.720	Vertical	Quasi-Peak	16.4	40.0	23.6	001	Complied
3	75.495	Vertical	Quasi-Peak	6.3	40.0	33.7	001	Complied
4	82.426	Vertical	Quasi-Peak	13.4	40.0	26.6	001	Complied
5	153.269	Vertical	Quasi-Peak	11.3	43.5	32.2	001	Complied
6	458.828	Vertical	Quasi-Peak	22.9	46.0	23.1	001	Complied
7	1000 to 4000	Refer to Note 1					002	Complied
8	4000 to 7000	Refer to Note 1					003	Complied

NOTES

- No emissions were noted above the noise floor of the measurement system. Therefore no further measurements were made.

TEST EQUIPMENT USED

RFI ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
K0001	5 m Semi-Anechoic Chamber	None Stated	25 Apr 2011	12
L1001	26.5 GHz Test Receiver	ESU26	28 Jan 2011	12
L1005	Radio Communication Tester	CMU200	Calibration not required	
A553	Bi-log Antenna	CBL6111A	16 Mar 2011	12
A1817	1 to 18 GHz Horn Antenna	3115	27 Nov 2010	12
C1088	5 m Cable	FA210A1050005050	30 Jun 2011	12
C1302	3 m Rosenberger Cable	FA210A1030005050	30 Jun 2011	12
C1303	8 m Rosenberger Cable	FA210A1080005050	23 Feb 2011	12
C1305	3 m Rosenberger Cable	FA210A1030005050	Calibration not required	
C1306	15 m Rosenberger Cable	FA210A0015005050	23 Feb 2011	12
A1834	3 dB N-Type Attenuator	8491B	30 Jun 2011	12
A1970	1 to 18 GHz Pre-Amp	None Stated	30 Sep 2010	03
G0543	Amplifier 9 kHz to 1 GHz	310N	30 Jun 2011	12

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:	76894JD02	TEST SITE ID:	Site 1
EUT:	Identicom t777	TEMPERATURE:	29 °C to 30 °C
TEST ENGINEER:	Eric Phiri	RELATIVE HUMIDITY:	38 % to 38 %
DATE OF TEST:	27 Jul 2010	ATMOSPHERIC PRESSURE:	1004mb to 1003 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Meters
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class B
MEASUREMENT UNITS:	dBµV/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:	PCS 1900 Idle
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarity	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
1	58.655	Vertical	Quasi-Peak	15.2	40.0	24.8	004	Complied
2	58.731	Vertical	Quasi-Peak	16.6	40.0	23.4	004	Complied
3	58.750	Vertical	Quasi-Peak	16.2	40.0	23.8	004	Complied
4	82.245	Vertical	Quasi-Peak	9.4	40.0	30.6	004	Complied
5	85.626	Vertical	Quasi-Peak	9.7	40.0	30.3	004	Complied
6	101.638	Vertical	Quasi-Peak	6.9	43.5	36.6	004	Complied
7	458.786	Horizontal	Quasi-Peak	24.5	46.0	21.5	004	Complied
8	1000 to 4000			Refer to Note 1			005	Complied
9	4000 to 7000			Refer to Note 2			006	Complied
10	7000 to 10000			Refer to Note 2			007	Complied

- 1 The emission noted at 1941 MHz is the transmission from the base station simulator and therefore no measurement was made.
- 2 No emissions were noted above the noise floor of the measurement system. Therefore no further measurements were made.

TEST EQUIPMENT USED

RFI ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
K0001	5 m Semi-Anechoic Chamber	None Stated	25 Apr 2011	12
L1001	26.5 GHz Test Receiver	ESU26	28 Jan 2011	12
L1005	Radio Communication Tester	CMU200	Calibration not required	
A553	Bi-log Antenna	CBL6111A	16 Mar 2011	12
A1817	1 to 18 GHz Horn Antenna	3115	27 Nov 2010	12
C1088	5 m Cable	FA210A1050005050	30 Jun 2011	12
C1302	3 m Rosenberger Cable	FA210A1030005050	30 Jun 2011	12
C1303	8 m Rosenberger Cable	FA210A1080005050	23 Feb 2011	12
C1305	3 m Rosenberger Cable	FA210A1030005050	Calibration not required	
C1306	15 m Rosenberger Cable	FA210A0015005050	23 Feb 2011	12
A1834	3 dB N-Type Attenuator	8491B	30 Jun 2011	12
A1970	1 to 18 GHz Pre-Amp	None Stated	30 Sep 2010	03
G0543	Amplifier 9 kHz to 1 GHz	310N	30 Jun 2011	12

CONDUCTED 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:	76894JD02	TEST SITE ID:	Site 8
EUT:	Identicom t777	TEMPERATURE:	30 °C to 30 °C
TEST ENGINEER:	Eric Phiri	RELATIVE HUMIDITY:	38 % to 38 %
DATE OF TEST:	12 September 2011	ATMOSPHERIC PRESSURE:	1003 mb to 1003 mb
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class B
CATEGORY:	Not applicable	MEASUREMENT METHOD:	LISN (AC)

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)	Line	Detector	Level (dBμV)	Limit (dBμV)	Margin (dB)	Graph No.	Result
1	0.182	Live	Quasi-Peak	36.0	64.4	28.4	008	Complied
2	0.303	Live	Quasi-Peak	33.9	60.2	26.3	008	Complied
3	0.425	Live	Quasi-Peak	30.3	57.4	27.1	008	Complied
4	0.785	Live	Quasi-Peak	30.2	56.0	25.8	008	Complied
5	2.108	Live	Quasi-Peak	29.8	56.0	26.2	008	Complied
6	4.754	Live	Quasi-Peak	27.7	56.0	28.3	008	Complied
7	16.143	Live	Quasi-Peak	15.4	60.0	44.6	008	Complied
8	0.182	Live	Average (CISPR)	24.2	54.4	30.2	008	Complied
9	0.303	Live	Average (CISPR)	25.2	50.2	24.9	008	Complied
10	0.420	Live	Average (CISPR)	25.1	47.4	22.4	008	Complied
11	0.780	Live	Average (CISPR)	23.6	46.0	22.4	008	Complied
12	2.103	Live	Average (CISPR)	22.4	46.0	23.6	008	Complied
13	4.686	Live	Average (CISPR)	20.5	46.0	25.5	008	Complied
14	16.143	Live	Average (CISPR)	9.3	50.0	40.7	008	Complied

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
15	0.299	Neutral	Quasi-Peak	35.5	60.3	24.8	009	Complied
16	0.420	Neutral	Quasi-Peak	35.1	57.4	22.3	009	Complied
17	0.780	Neutral	Quasi-Peak	34.9	56.0	21.1	009	Complied
18	1.077	Neutral	Quasi-Peak	34.7	56.0	21.3	009	Complied
19	1.977	Neutral	Quasi-Peak	35.9	56.0	20.1	009	Complied
20	5.033	Neutral	Quasi-Peak	34.7	60.0	25.3	009	Complied
21	0.299	Neutral	Average (CISPR)	29.7	50.3	20.5	009	Complied
22	0.420	Neutral	Average (CISPR)	29.7	47.4	17.8	009	Complied
23	0.780	Neutral	Average (CISPR)	29.0	46.0	17.0	009	Complied
24	1.077	Neutral	Average (CISPR)	28.0	46.0	18.0	009	Complied
25	1.977	Neutral	Average (CISPR)	26.1	46.0	19.9	009	Complied
26	5.033	Neutral	Average (CISPR)	23.6	50.0	26.4	009	Complied

NOTES

N/A During measurement the engineer did not record any specific notes relevant to report.

TEST EQUIPMENT USED

RFI ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
K0008	Conducted AC Emissions / RF immunity Laboratory	None Stated	Calibration not required	
A1829	N-Type Pulse Limiter	ESH3-Z2	05 Mar 2012	12
A649	Single Phase LISN	ESH3-Z5	05 Apr 2012	12
C363	3m cable	RG142	05 Mar 2012	12
M1263	EMI Test Receiver	ESIB7	13 Jul 2012	12

8. PHOTOGRAPHS OF EUT

This section contains the following photographs:

Photo Reference Number	Title
PHT\76894JD02\001	Test Configuration Photograph - Radiated Emissions
PHT\76894JD02\002	Test Configuration Photograph - Conducted Emissions

PHT\76894JD02\001 - Test Configuration Photograph - Radiated Emissions



PHT76894JD02\002 - Test Configuration Photograph - Conducted Emissions



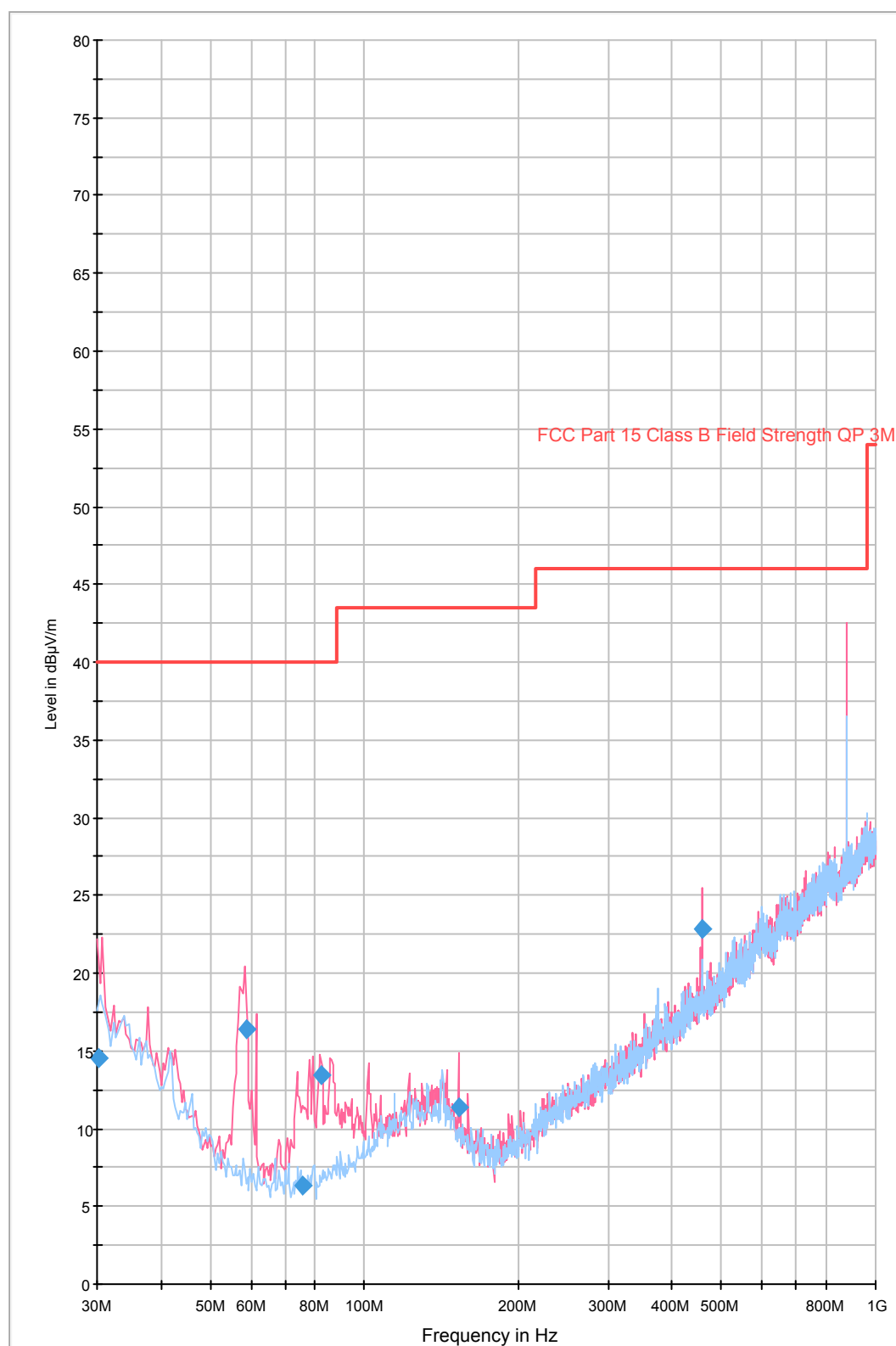
9. GRAPHICAL TEST RESULTS

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\76894JD02\001	Radiated Emissions (GSM 850 Idle) Pre-Scan (30 MHz to 1000 MHz)
GPH\76894JD02\002	Radiated Emissions (GSM 850 Idle) Pre-Scan (1000 MHz to 4000 MHz)
GPH\76894JD02\003	Radiated Emissions (GSM 850 Idle) Pre-Scan (4000 MHz to 7000 MHz)
GPH\76894JD02\004	Radiated Emissions (PCS 1900 Idle) Pre-Scan (30 MHz to 1000 MHz)
GPH\76894JD02\005	Radiated Emissions (PCS 1900 Idle) Pre-Scan (1000 MHz to 4000 MHz)
GPH\76894JD02\006	Radiated Emissions (PCS 1900 Idle) Pre-Scan (4000 MHz to 7000 MHz)
GPH\76894JD02\007	Radiated Emissions (PCS 1900 Idle) Pre-Scan (7000 MHz to 10000 MHz)
GPH\76894JD02\008	Conducted Emissions (Live) Pre-Scan (0.15 MHz to 30 MHz)
GPH\76894JD02\009	Conducted Emissions (Neutral) Pre-Scan (0.15 MHz to 30 MHz)

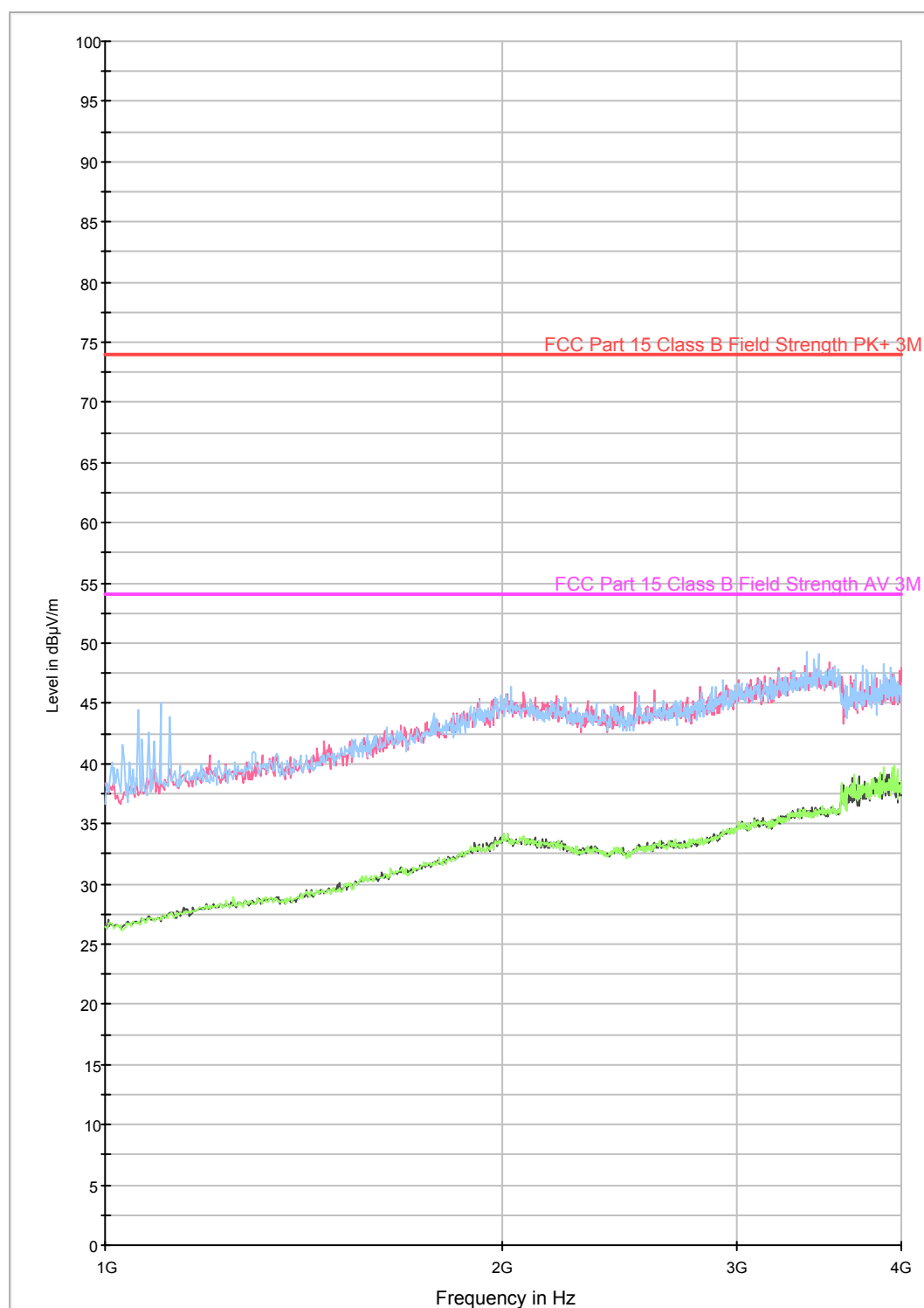
GPH176894JD02\001

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



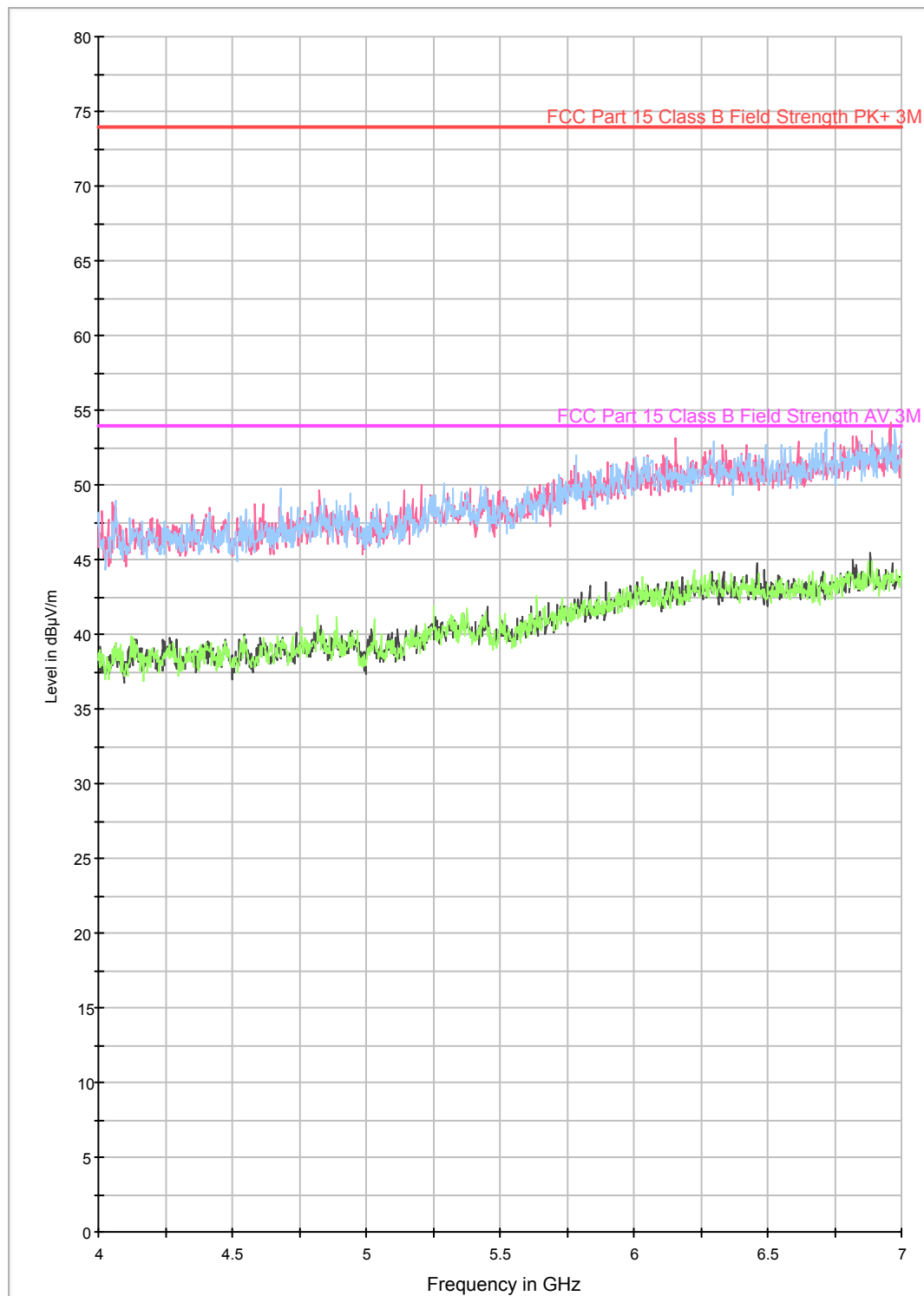
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FCC Part 15.109 Radiated Emissions Class B 1-4GHz



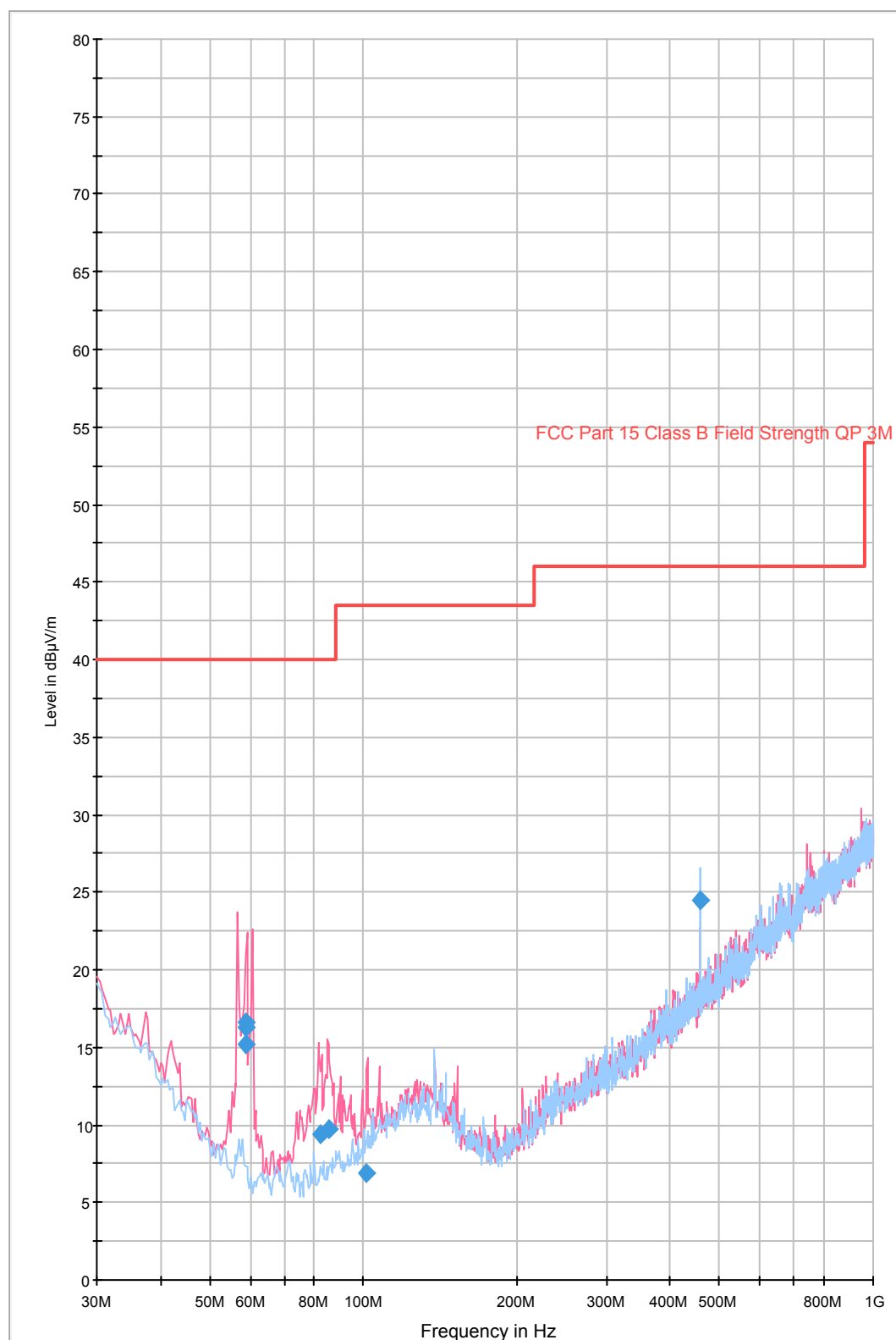
GPH176894JD02\003

FCC Part 15.109 Radiated Emissions Class B 4-7GHz



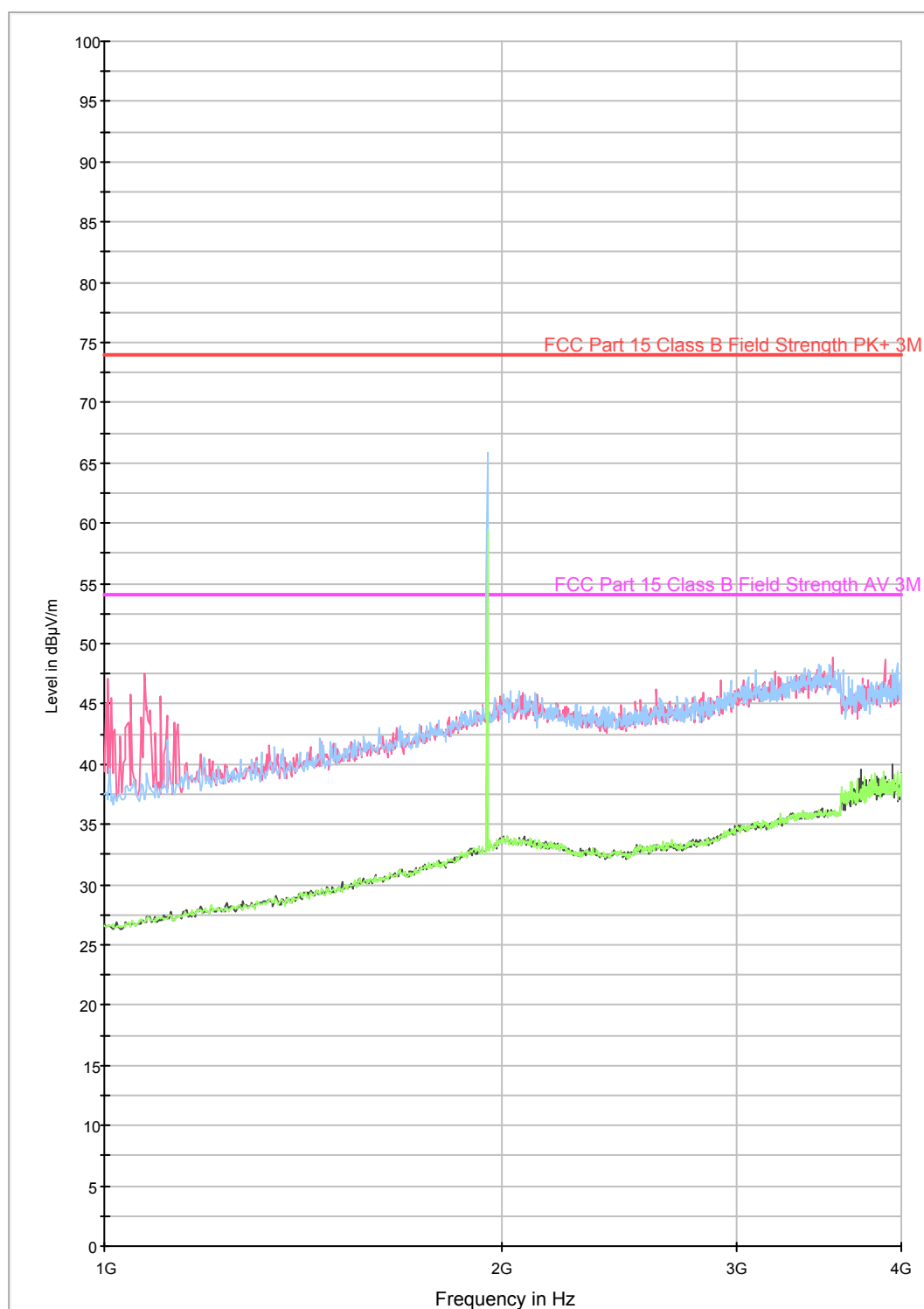
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FCC Part 15.109 Radiated Emissions Class B 30MHz-1GHz 3m



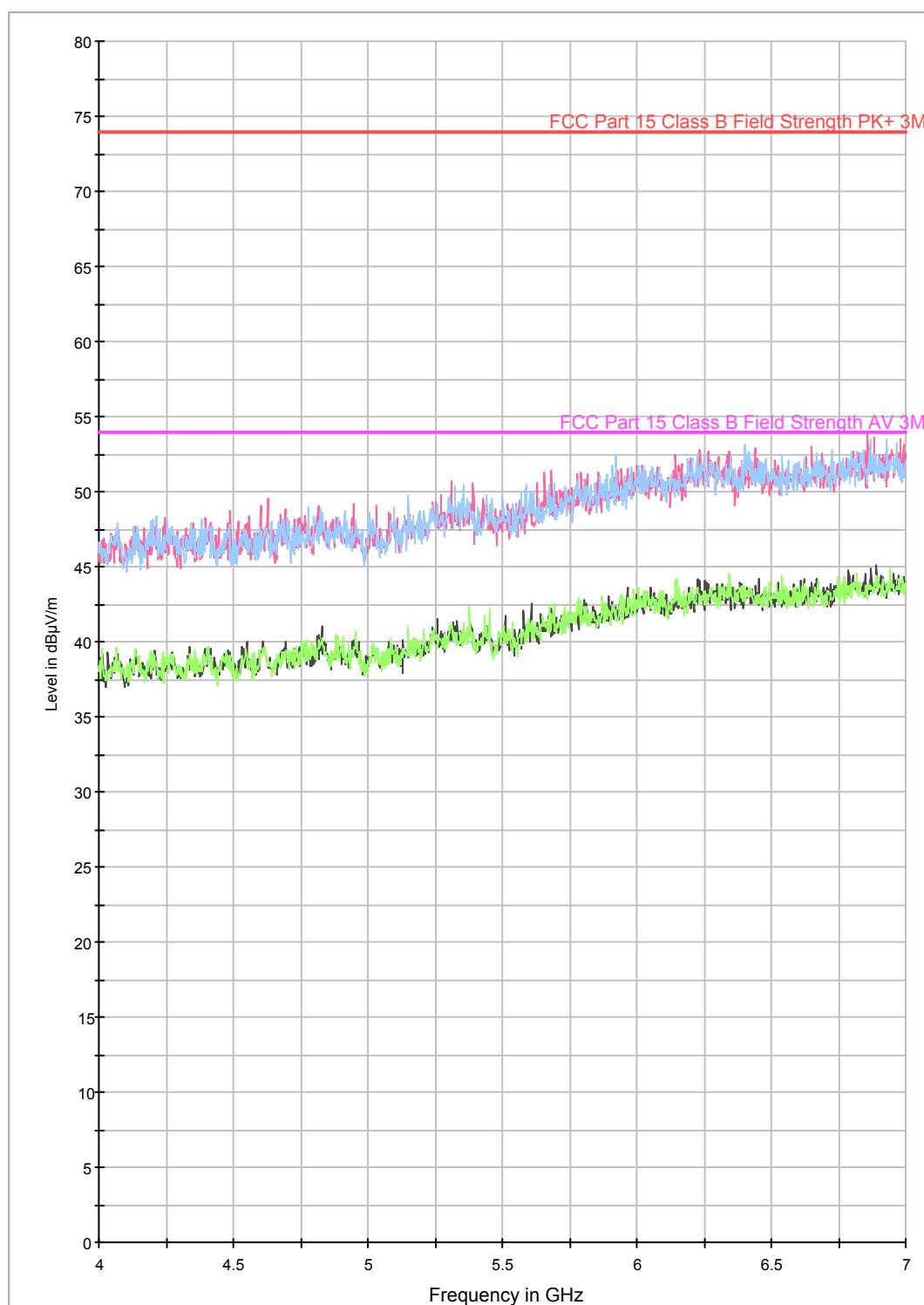
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FCC Part 15.109 Radiated Emissions Class B 1-4GHz



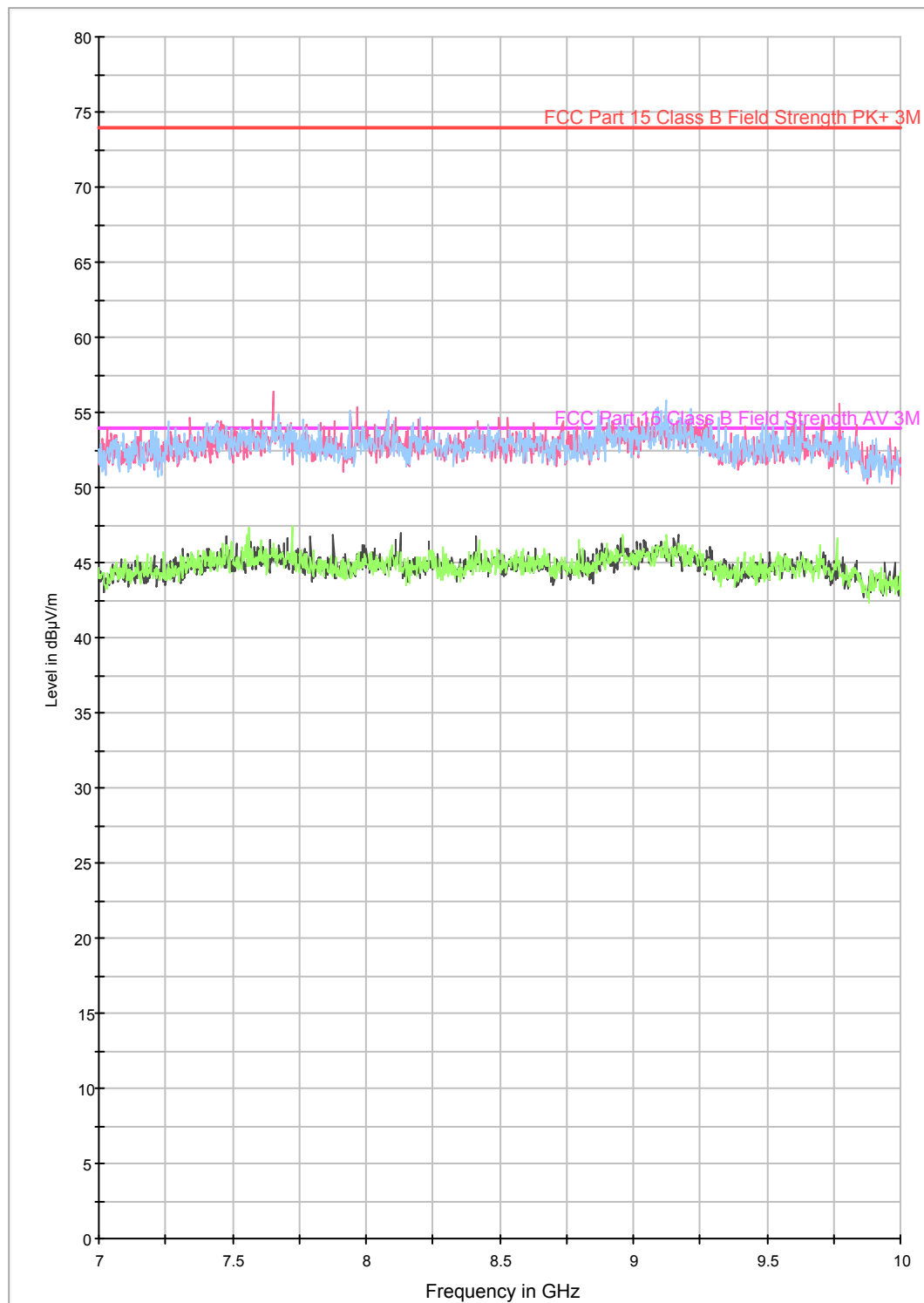
GPH176894JD02\006

FCC Part 15.109 Radiated Emissions Class B 4-7GHz



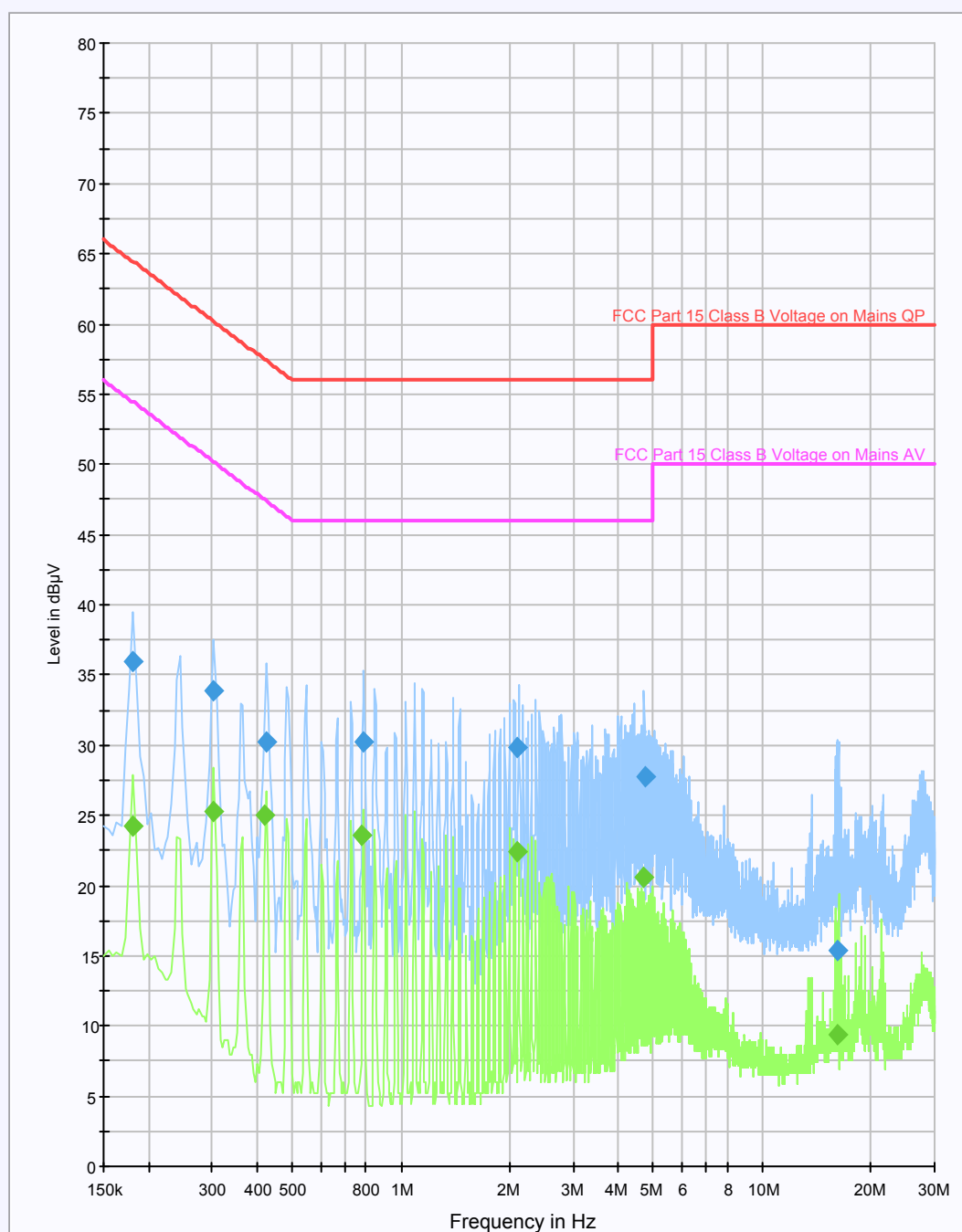
GPH\76894JD02\007

FCC Part 15.109 Radiated Emissions Class B 7-10GHz



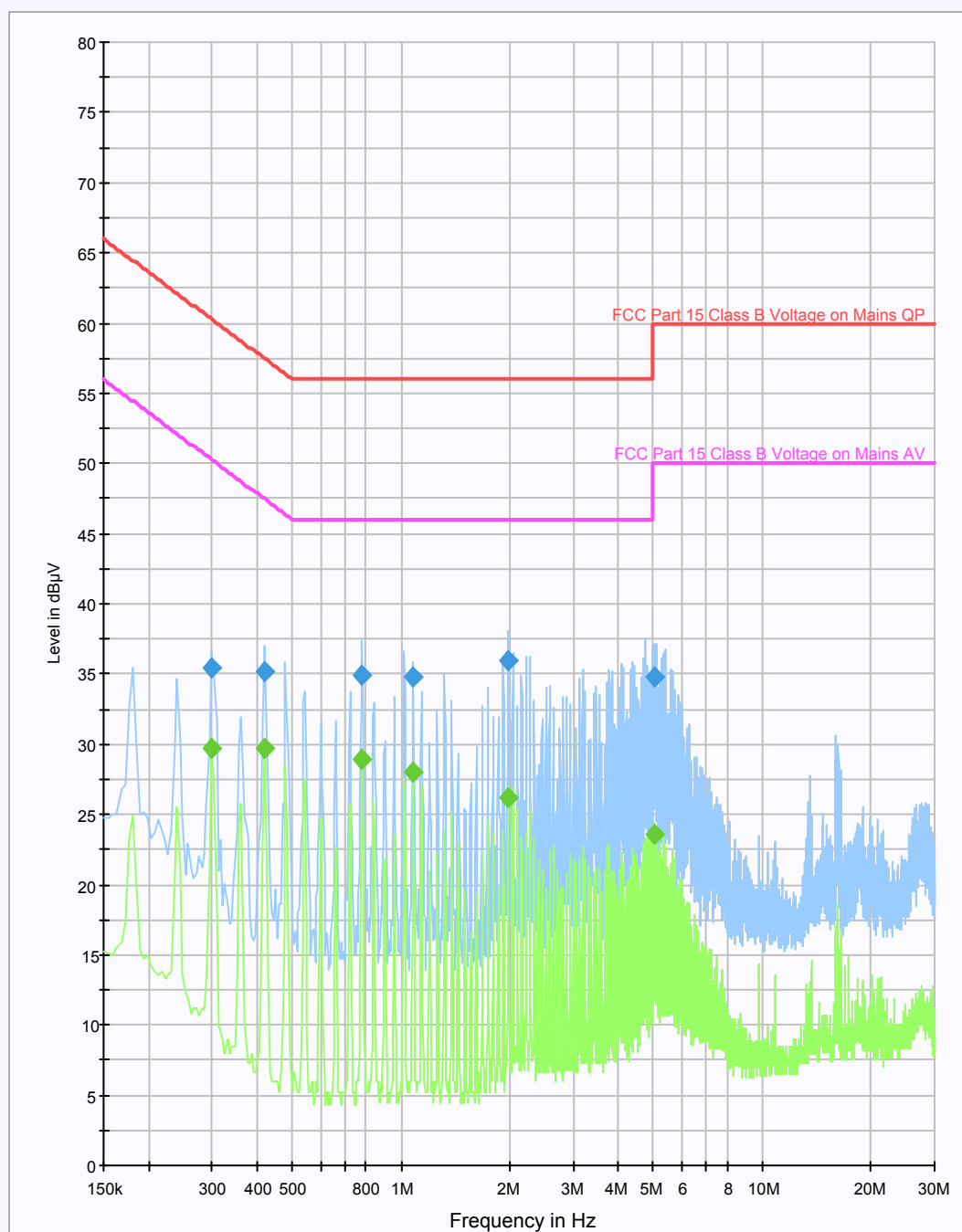
GPH176894JD02\008

FCC Part 15 Class B Voltage with 2-Line-LISN Live



GPH\76894JD02\009

FCC Part 15 Class B Voltage with 2-Line-LISN Neutral



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\76894JD02\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

DRG\76894JD02\001 - Schematic diagram of the EUT, support equipment and interconnecting cables used for the test