

**TEST REPORT
FROM
RFI GLOBAL SERVICES LTD**

Test of: Connected Development LLC, Thermofisher (Telit 864-G)

To: 47CFR15.107, 47CFR15.109 and RSS-GEN Issue 3 December 2010

Test Report Serial No: RFI-EMC-RP81737JD05A V4.0

Version 4.0 supersedes all previous versions

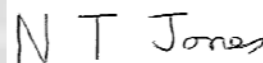
This test report is issued under the authority
of Chris Guy, Head of Global Approvals:



Checked By:

Nicholas Jones

Signature:



Date of Issue:

12 October 2011

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1. CUSTOMER DETAILS

Company Name:	Connected Development LLC
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Address:	5020 Weston Parkway Suite 215 Cary, NC 27513 United States
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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) – Section 15.107 and 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
EMISSIONS				
15.109	RSS-Gen 4.10 RSS-Gen 6.1	Radiated Emissions (Enclosure)	Y	
15.107	RSS-GEN 7.2.4	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 / GPRS enabled toxic substance detector

3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No	IMEI
E1	Toxic Substance Detector	Thermo Scientific	TruDefender FTi	None Stated	35626502071608902

3.3. Port Identification

Port	Description	Type
P1	Enclosure	-
P2	Data I/O	USB Micro B
P3	Charging	Proprietary

3.4. Operating Modes

Mode Reference	Definition
Idle	The EUT was synchronised with a radio communication tester but not allocated a channel in the PCS 1900 operating band

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		Circuit Switched Voice/Data, Packet Switched Data GPRS					

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 to the EUT during the course of testing

3.7. Additional Information Related to Testing

Equipment Category:	GSM / GPRS
Intended Operating Environment:	Light Industrial / Commercial
Cycle Time:	< 1 s
Power Supply Requirement(s):	3.7 VDC (internal battery)
Weight:	1.54 kg
Dimensions:	197 x 112 x 60 mm
Antenna Type	Integral
Hardware Version:	F
Software Version:	001
FCC ID Number:	Z4HTDFTI
Industry Canada Certification Number:	None Stated

4. SUPPORT EQUIPMENT

4.1. Identification of Support Equipment

Description	Manufacturer	Model No	Serial No
Radio Communication Tester	Rohde & Schwarz	CMU 200	835687/011

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 synchronised with the radio communication tester but not allocated a channel in the PCS 1900 operating band
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 indicated 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 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:	81737JD05	TEST SITE ID:	Site 1
EUT:	ThermoFisher (Telit 864-G)	TEMPERATURE:	27 °C to 27 °C
TEST ENGINEER:	Eric Phiri	RELATIVE HUMIDITY:	26 % to 26 %
DATE OF TEST:	14 Jun 2011	ATMOSPHERIC PRESSURE:	1005 mb to 1004 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Metres
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class A
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:	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	39.223	Vertical	Quasi-Peak	31.402	49.55	18.15	001	Complied
2	60.001	Vertical	Quasi-Peak	17.416	49.55	32.13	001	Complied
3	80.430	Vertical	Quasi-Peak	27.643	49.55	21.90	001	Complied
4	107.982	Vertical	Quasi-Peak	24.576	53.98	29.40	001	Complied
5	126.044	Horizontal	Quasi-Peak	29.366	53.98	24.61	001	Complied
6	224.672	Horizontal	Quasi-Peak	31.052	56.90	25.85	001	Complied
7	291.785	Horizontal	Quasi-Peak	47.314	56.90	9.58	001	Complied
8	409.361	Horizontal	Quasi-Peak	30.945	56.90	25.95	001	Complied
9	528.669	Horizontal	Quasi-Peak	28.739	56.90	28.16	001	Complied
10	1000 to 12750	See Note 1					002 to 005	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
K0001	5m Semi-Anechoic Chamber	N/A	29 May 2012	12
M1273	20 Hz - 26.6 GHz EMI Test Receiver, Rohde & Schwarz	ESIB 26	04 Feb 2012	12
A1817	1-18GHz Horn Antenna	3115	03 Feb 2012	12
A553	Bi-log Antenna	CBL6111A	26 Mar 2012	12
G0543	Amplifier 9KHz - 1GHZ	310N	30 Jun 2011	12
C1407	15 metre RF cable	262-0941-15M0	15 Apr 2012	12
C1302	3m Rosenberger Cable	FA210A1030005050	31 Mar 2012	12
C1305	3m Rosenberger Cable	FA210A1030005050	Calibration not required	N/A
A1516	Universal Radio Communications Tester	CMU200	Calibration not required	N/A

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:	81737JD05	TEST SITE ID:	Site 8	
EUT:	ThermoFisher (Telit 864-G)	TEMPERATURE:	27 °C	to 27 °C
TEST ENGINEER:	Eric Phiri	RELATIVE HUMIDITY:	26 %	to 26 %
DATE OF TEST:	14 Jun 2011	ATMOSPHERIC PRESSURE:	1005 mb	to 1004 mb
UNCERTAINTY (±):	±3.99 dB	EQUIPMENT CLASS:	Class A	
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	0.186	Live 1	Quasi-Peak	47.159	79.00	31.84	002	Complied
2	0.191	Live 1	Quasi-Peak	48.456	79.00	30.54	002	Complied
3	0.254	Live 1	Quasi-Peak	40.938	79.00	38.06	002	Complied
4	0.317	Live 1	Quasi-Peak	36.988	79.00	42.01	002	Complied
5	0.375	Live 1	Quasi-Peak	33.524	79.00	45.48	002	Complied
6	0.398	Live 1	Quasi-Peak	33.062	79.00	45.94	002	Complied
7	0.191	Live 1	Average (CISPR)	35.962	66.00	30.04	002	Complied
8	0.263	Live 1	Average (CISPR)	17.206	66.00	48.79	002	Complied
9	0.312	Live 1	Average (CISPR)	29.974	66.00	36.03	002	Complied
10	0.429	Live 1	Average (CISPR)	20.929	66.00	45.07	002	Complied
11	0.434	Live 1	Average (CISPR)	28.042	66.00	37.96	002	Complied
12	0.501	Live 1	Average (CISPR)	19.025	60.00	40.98	002	Complied
13	0.560	Live 1	Average (CISPR)	17.630	60.00	42.37	002	Complied
14	0.168	Neutral	Quasi-Peak	48.440	79.00	30.56	003	Complied
15	0.186	Neutral	Quasi-Peak	38.551	79.00	40.45	003	Complied
16	0.254	Neutral	Quasi-Peak	33.647	79.00	45.35	003	Complied
17	0.186	Neutral	Average (CISPR)	22.887	66.00	43.11	003	Complied
18	0.249	Neutral	Average (CISPR)	22.418	66.00	43.58	003	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 Emissions / RF immunity Laboratory	N/A	Calibration not required	
C363	3m cable	RG142	05 Mar 2012	12
M1273	20 Hz - 26.6 GHz EMI Test Receiver, Rohde & Schwarz	ESIB 26	04 Feb 2012	12
A1830	N-Type Pulse Limiter	ESH3-Z2	05 Mar 2012	12
A067	Line Impedance Stabilization Network	ESH3-Z5	02 Jun 2012	12

8. PHOTOGRAPHS OF EUT

This section contains the following photographs:

Photo Reference Number	Title
PHT\81737JD05\001	Test Configuration Photograph - Radiated Emissions
PHT\81737JD05\002	Test Configuration Photograph - Conducted Emissions

PHT\81737JD05\001 - Test Configuration Photograph - Radiated Emissions



PHT\81737JD05\002 - Test Configuration Photograph - Conducted Emissions



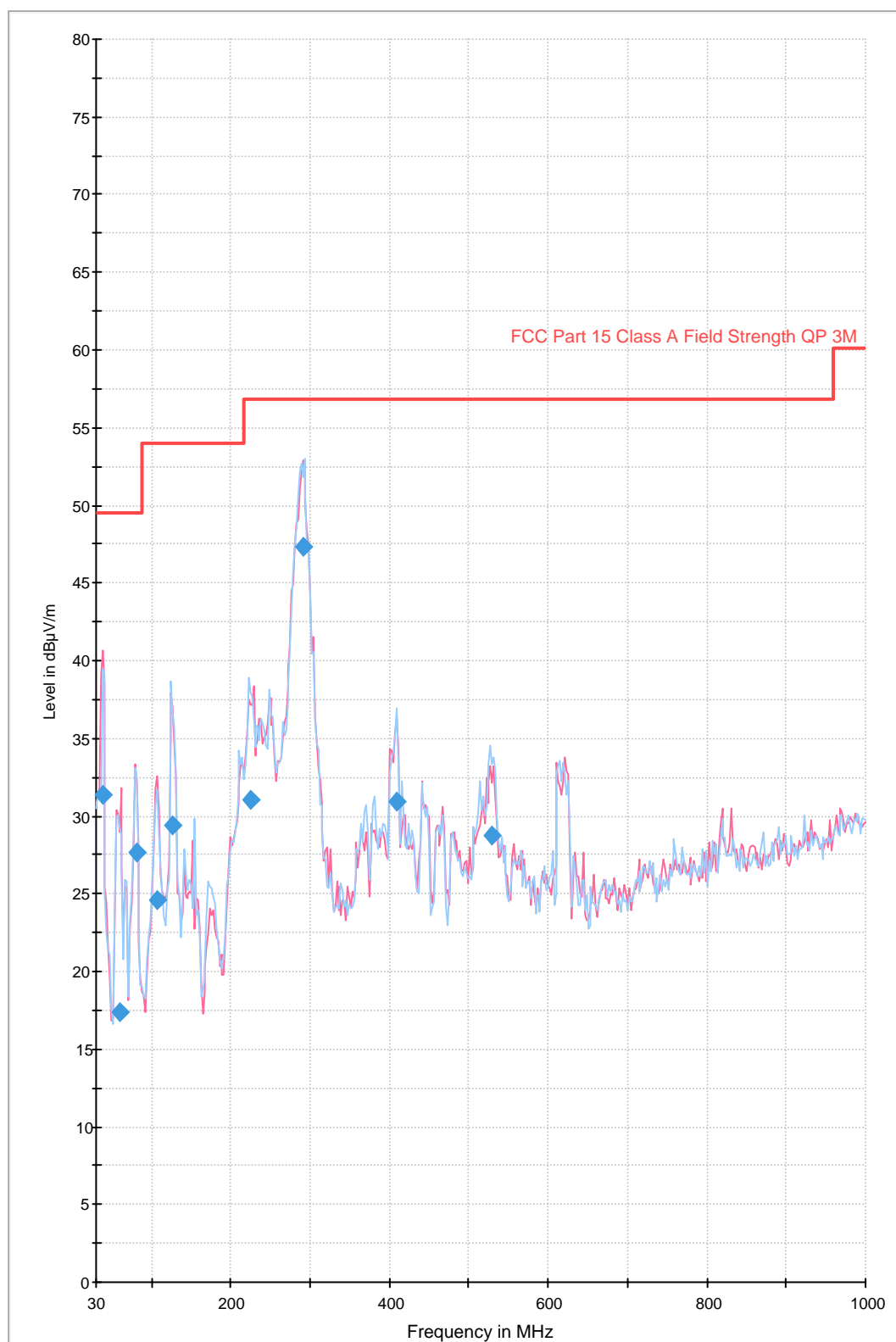
9. GRAPHICAL TEST RESULTS

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

Graph Reference Number	Title
GPH\81737JD05\001	Radiated Emissions (30 MHz to 1000 MHz)
GPH\81737JD05\002	Radiated Emissions (1 GHz to 4 GHz)
GPH\81737JD05\003	Radiated Emissions (4 GHz to 7 GHz)
GPH\81737JD05\004	Radiated Emissions (7 GHz to 10 GHz)
GPH\81737JD05\005	Radiated Emissions (10 GHz to 12.75 GHz)
GPH\81737JD05\006	Conducted Emissions (0.15 MHz to 30 MHz) on Live Line
GPH\81737JD05\007	Conducted Emissions (0.15 MHz to 30 MHz) on Neutral Line

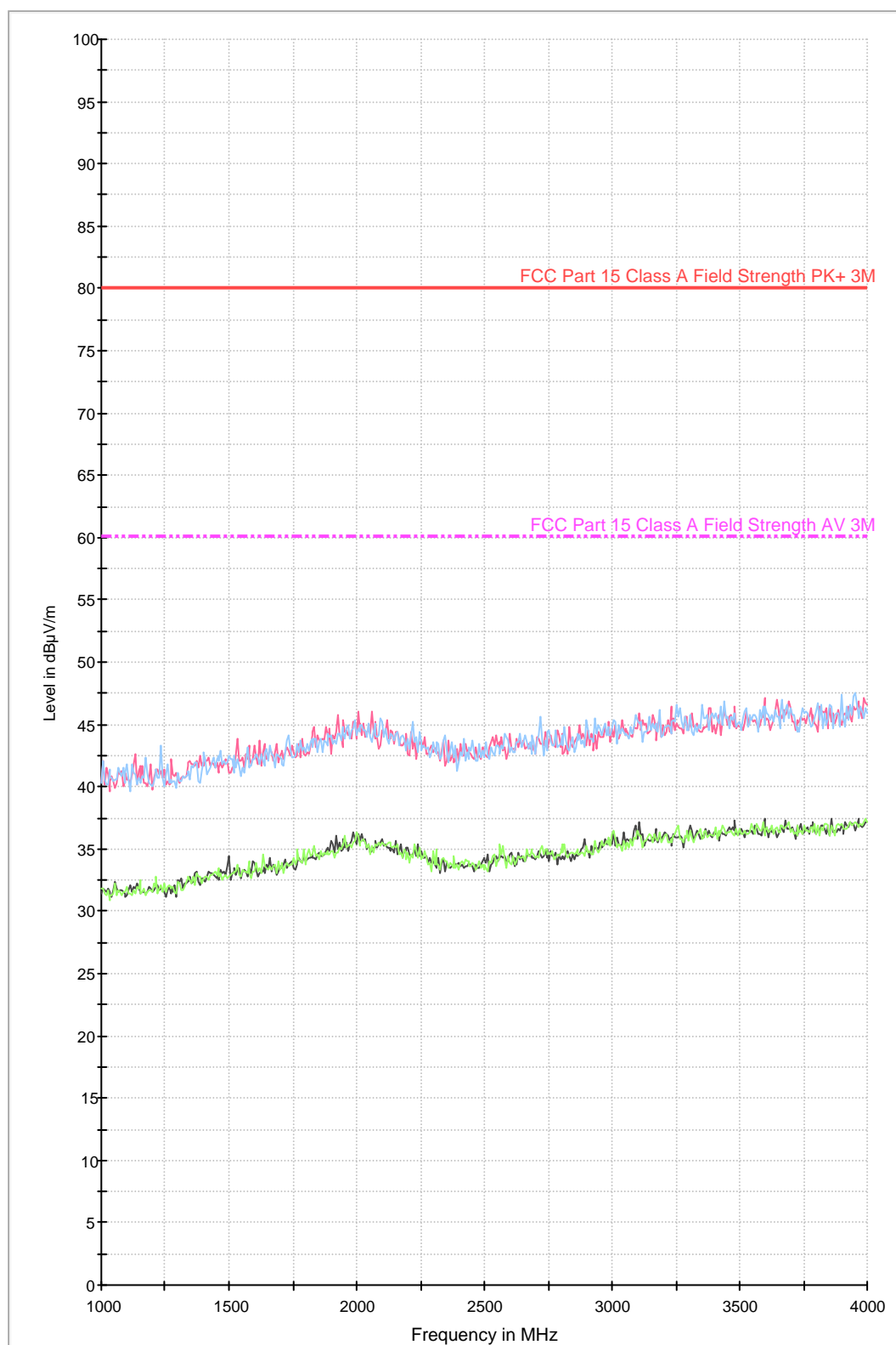
GPH81737JD05\001

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



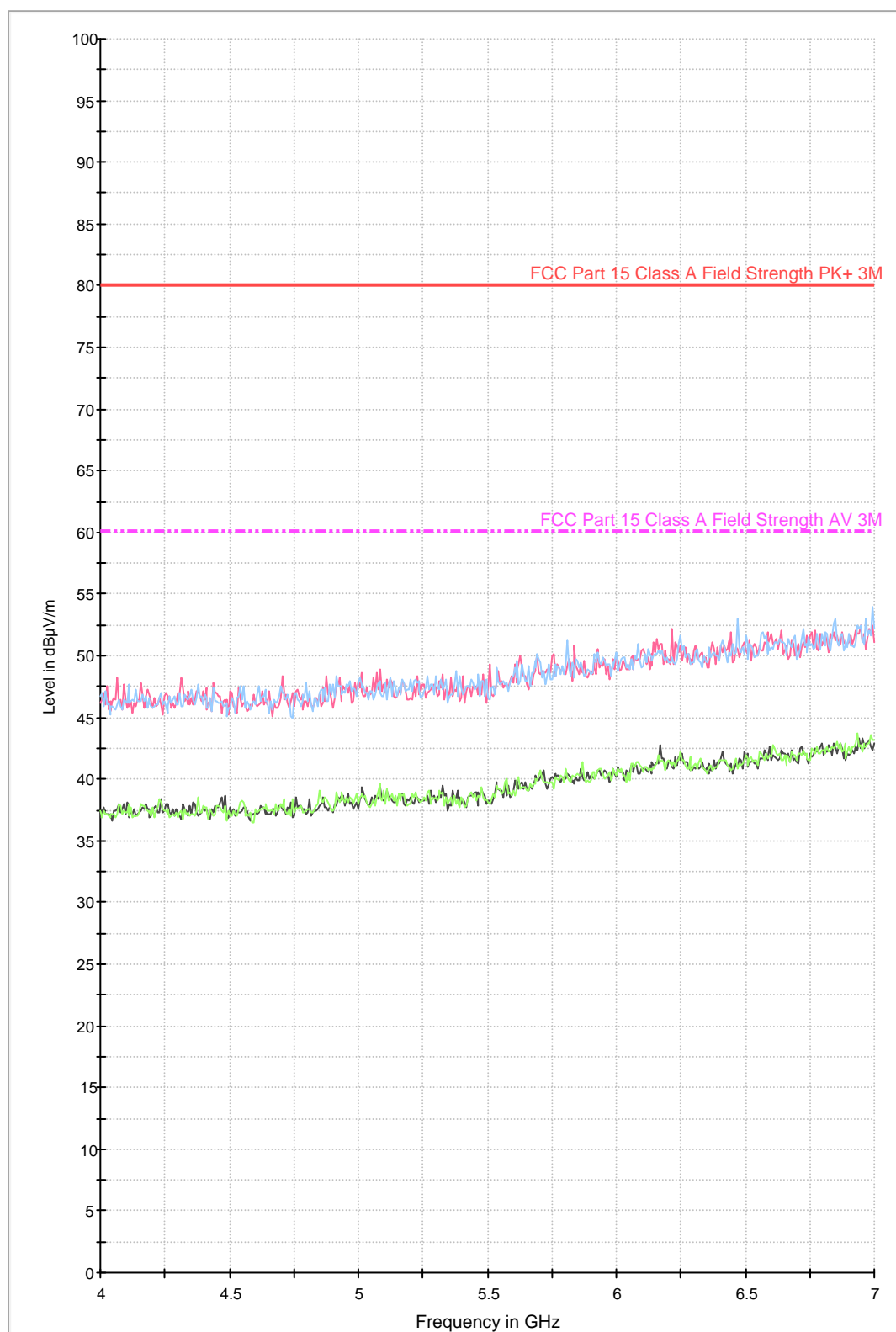
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FCC Part 15.109 Radiated Emissions Class A 1-4GHz



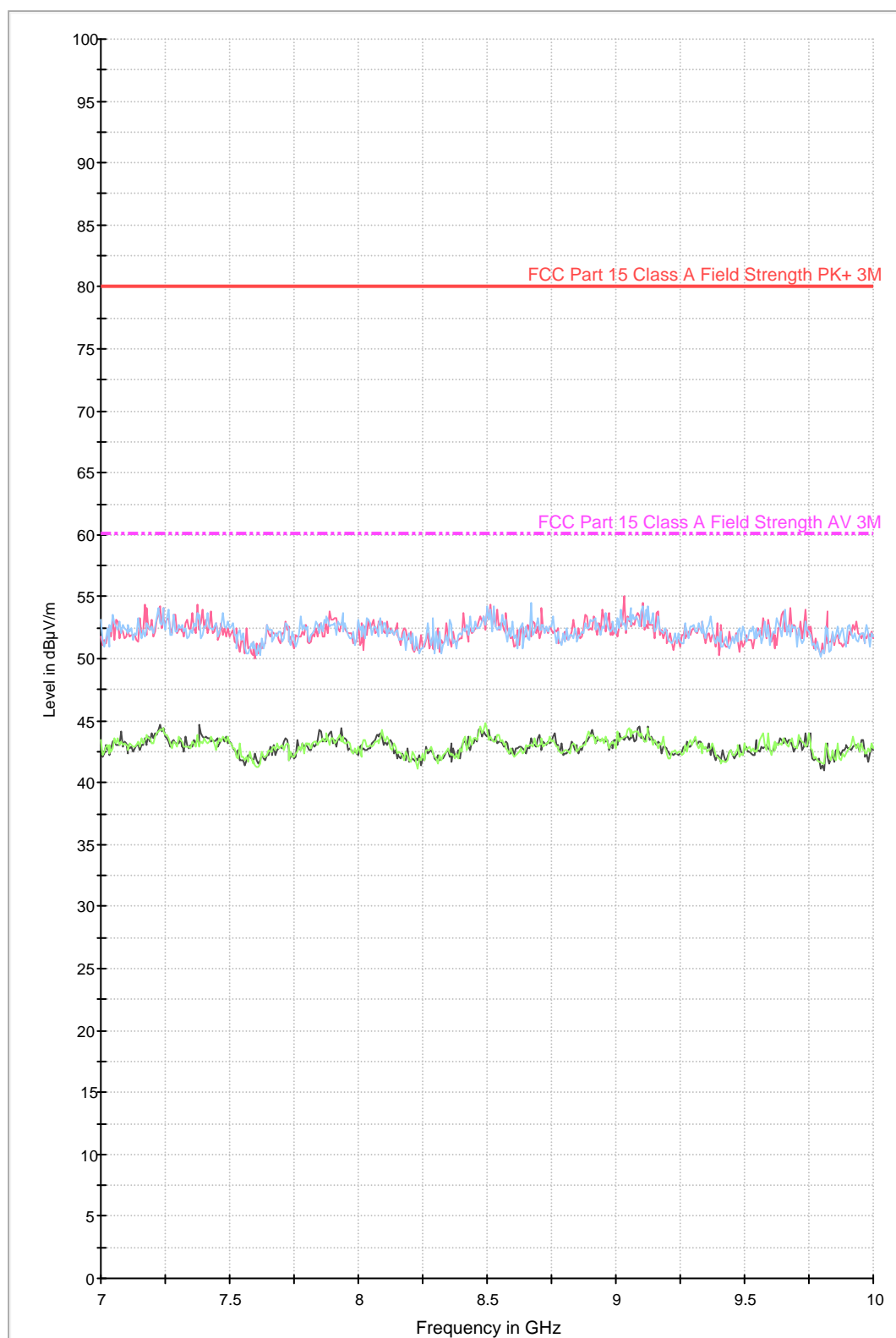
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FCC Part 15.109 Radiated Emissions Class A 4-7GHz



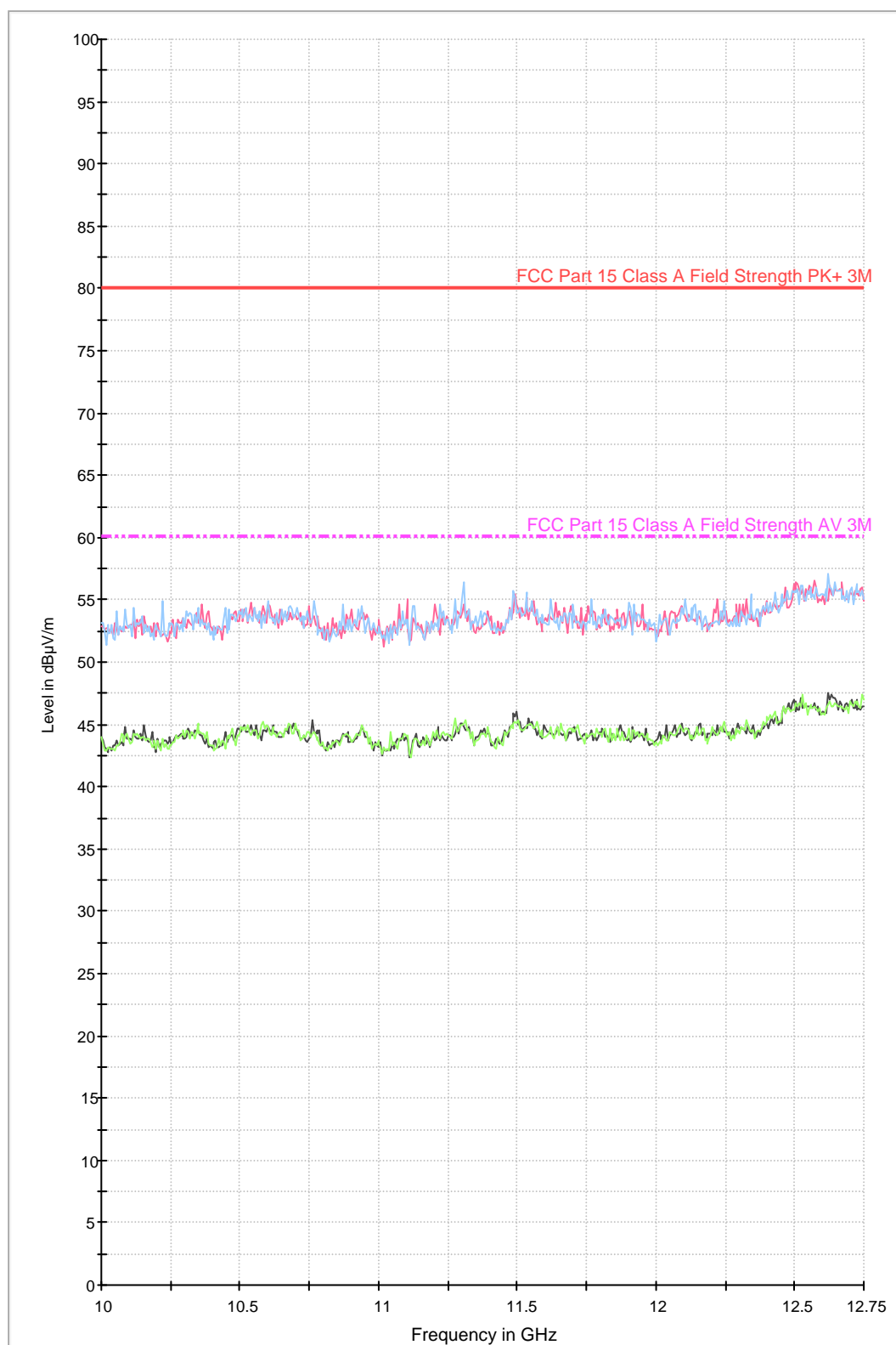
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FCC Part 15.109 Radiated Emissions Class A 7-10GHz



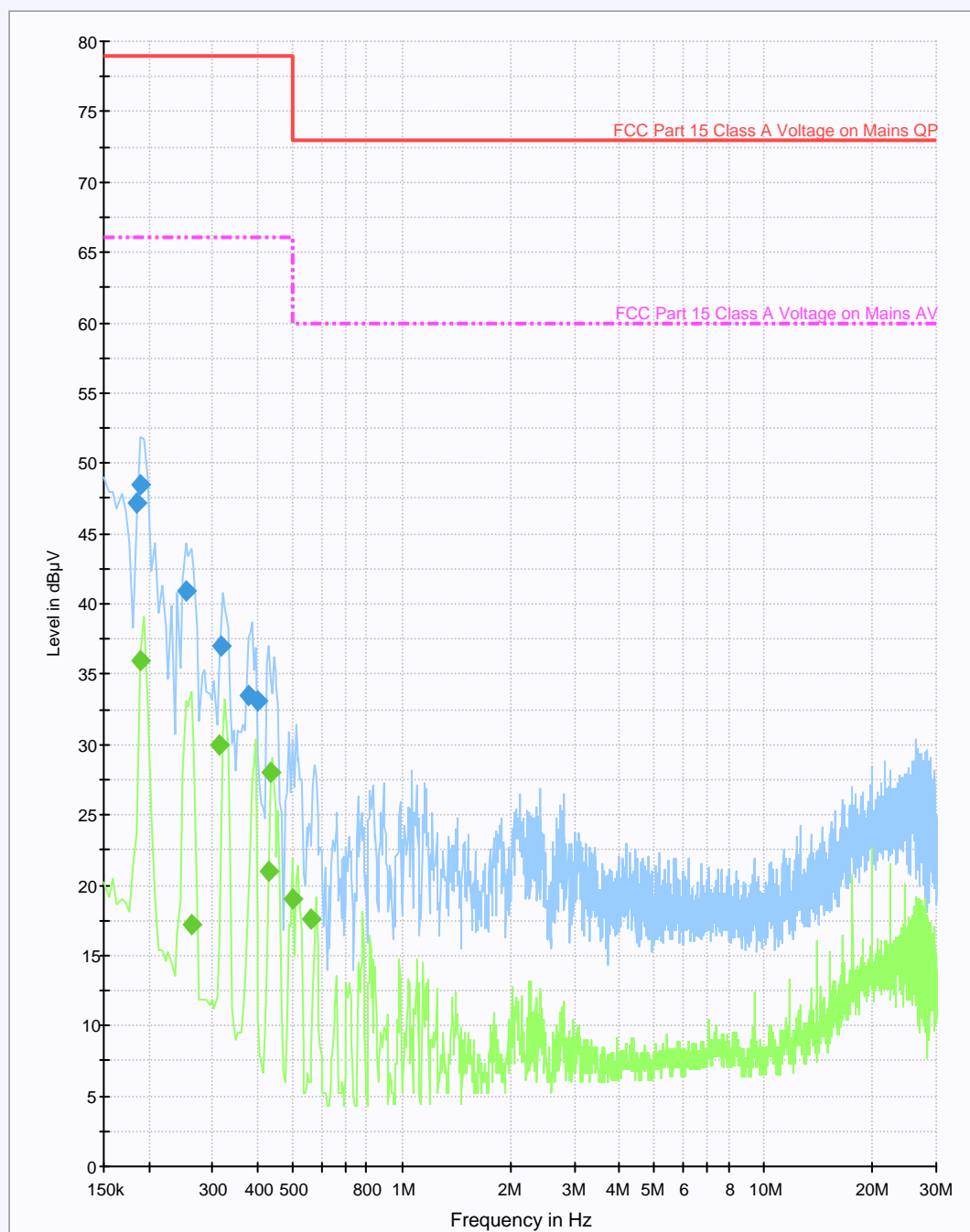
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FCC Part 15.109 Radiated Emissions Class A 10-12.75GHz



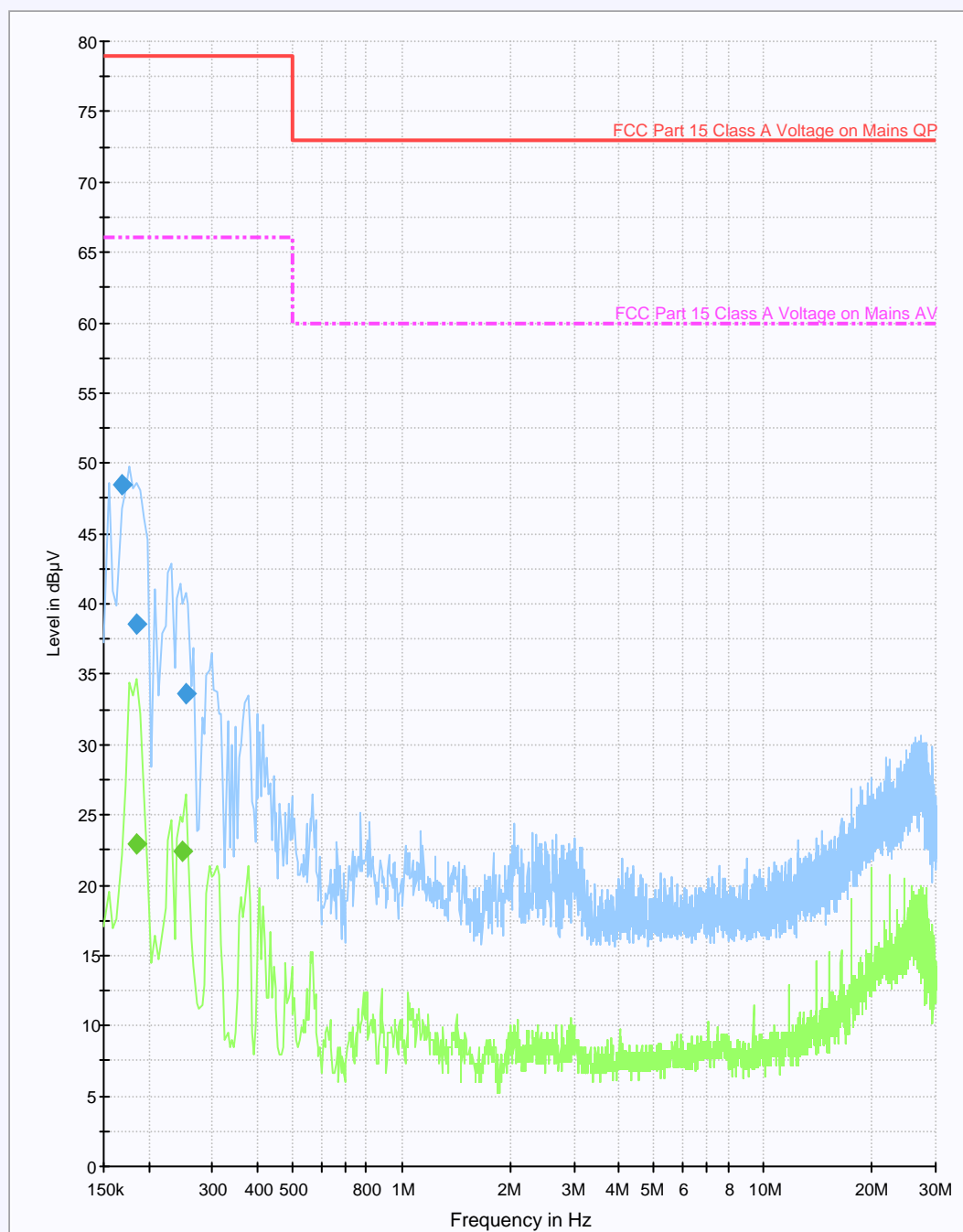
GPH\81737JD05\006

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



GPH81737JD05\007

FCC Part 15 Class A 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\81737JD05\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test.

DRG\81737JD05\001 - Schematic diagram of the EUT, support equipment and interconnecting cables used for the test.