TEST REPORT

TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: SMA Sunnyview

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

Test Report Serial No: RFI-EMC-RP82895JD06A V2.0

Version 2.0 supersedes all previous versions

This Test Report Is Issued Under the Authority Of John Newell, Group Quality Manager	
Checked By:	**Gareth Bragg**
Signature:	
Date of Issue:	**25 May 2012**

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2006

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UKAS TESTING
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1. CUSTOMER DETAILS

Company Name:	SMA Solar Technology AG
Address:	Sonnenallee 1 34266 Niesteta Germany

2. MANUFACTURER DETAILS

Company Name:	SMA Solar Technology AG
Address:	Sonnenallee 1 34266 Niesteta Germany

3. SUMMARY OF TESTING

3.1. Test Specification

Reference:	47CFR15.107 and 47CFR15.109
Title:	Code of Federal Regulations - Title 47 (Telecommunication) 2010: Part 15 (Radio Frequency Devices) - Subpart B (Unintentional Radiators) - Sections 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

3.2. 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

3.3. 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.

3.4. 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.

4. EQUIPMENT UNDER TEST (EUT)

4.1. Description of EUT

The EUT was a wireless device that communicated with a remote host, via *Bluetooth* or Wi-Fi, and displayed and stored PV system performance data.

4.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No	Bluetooth Address
E3	SMA Display	SMA Sunny View	Sunny View GR1	0161000039	00:07:80:4D:39:5E
E4	AC/DC Adaptor	Phihong	PSC12R-050	P10307879A1	Not Applicable

4.3. Port Identification

Port	Description	Type
P1	Enclosure	-
P2	Power Entry	micro USB
P3	Data	micro SD

4.4. Operating Modes

Mode Reference	Definition
Standby	The EUT was powered on with its *Bluetooth* and Wi-Fi modules in an idle state

4.5.Radio characteristics

Technology type	*Bluetooth*
Transmit Frequency Range (MHz):	2402 to 2480
Transmit Channel Tested (MHz):	2402 to 2480 (Frequency Hopping Spread Spectrum)
Rated Output Power (dBm):	18
Receive Frequency Range (MHz):	2402 to 2480
Receive Channel Tested (MHz):	2402 to 2480 (Frequency Hopping Spread Spectrum)
Technology type	Wi-Fi
Transmit Frequency Range (MHz):	2412 to 2472
Transmit Channel Tested (MHz):	2412
Rated Output Power (dBm):	18
Receive Frequency Range (MHz):	2412 to 2472
Receive Channel Tested (MHz):	2412

4.6. 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.

4.7. Modifications

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

4.8. Additional Information Related to Testing

Equipment Category:	*Bluetooth* and Wi-Fi
Intended Operating Environment:	Residential
Cycle Time:	10 s
Power Supply Requirement(s):	110 VAC to 240 VAC
Weight:	300 g
Dimensions:	151 x 108 x 23 mm
Hardware version Number:	A1
Software Version Number:	OS version: 3.4 and Application version: 0.0.2.90.B
FCC ID Number:	SVF-SUNNYVIEW
Industry Canada Certification Number:	9440A-SUNNYVIEW

5. SUPPORT EQUIPMENT

5.1. Identification of Support Equipment

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

5.2. Interconnecting Cables

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

6. MONITORING PERFORMANCE

6.1. Overview

No immunity testing was performed; therefore performance criteria were not applicable.

6.2. Monitoring EUT Performance during Testing

For the purposes of testing, the term "*operate as intended*" was defined as:	The EUT was powered on with its *Bluetooth* and Wi-Fi modules in an idle state
For the purposes of testing, an "*unintentional response*" 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

7. MEASUREMENT UNCERTAINTY

7.1. 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.

7.2. 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.

8. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

8.1. General Comments

8.1.1. This section contains the test result sheets for the measurements listed in Section *3.2. Summary of Test Results* (above).

8.1.2. 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.

8.1.3. Please refer to Section *7. 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:	82895JD06	**TEST SITE ID:**	Site 1
EUT:	Sunny View GR1	**TEMPERATURE:**	24 °C to 24 °C
TEST ENGINEER:	Allen Hefford	**RELATIVE HUMIDITY:**	27 % to 27 %
DATE OF TEST:	26 Jan 2012	**ATMOSPHERIC PRESSURE:**	1001 mb to 1001 mb
FIELD TYPE:	Electric Field	**MEASUREMENT DISTANCE:**	3 Metres
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:	Standby
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarity	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
1	33.195	Vertical	Quasi-Peak	25.7	40.0	14.3	001	Complied
2	59.432	Vertical	Quasi-Peak	25.8	40.0	14.2	001	Complied
3	69.796	Vertical	Quasi-Peak	33.1	40.0	7.0	001	Complied
4	124.891	Vertical	Quasi-Peak	23.0	43.5	20.5	001	Complied
5	165.374	Vertical	Quasi-Peak	22.4	43.5	21.1	001	Complied
6	425.471	Horizontal	Quasi-Peak	16.6	46.0	29.4	001	Complied
7	621.842	Horizontal	Quasi-Peak	30.3	46.0	15.7	001	Complied
8	785.504	Vertical	Quasi-Peak	27.5	46.0	18.5	001	Complied
9	958.673	Horizontal	Quasi-Peak	23.0	46.0	23.0	001	Complied
10	1000 to 12750	Refer to 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.

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	5 m Semi-Anechoic Chamber	None Stated	29 May 2012	12
M1273	EMI Test Receiver	ESIB 26	04 Feb 2012	12
C1415	3 m RF cable	239-0088-3000	09 Nov 2012	12
C1410	1 m RF cable	239-0088-1000	09 Nov 2012	12
A1227	Pre Amp	8449B	09 Nov 2012	12
A1817	1 to 18 GHz Horn Antenna	3115	03 Feb 2012	12
A553	Bi-log Antenna	CBL6111A	26 Mar 2012	12
C1401	2 m RF cable	APCAAPCAT40L-2000	17 Apr 2012	12
A1834	3 dB N-Type Attenuator	8491B	26 Jul 2012	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:	82895JD06	**TEST SITE ID:**	Site 1
EUT:	Sunny View GR1	**TEMPERATURE:**	25 °C to 25 °C
TEST ENGINEER:	Allen Hefford	**RELATIVE HUMIDITY:**	24 % to 24 %
DATE OF TEST:	26 Jan 2012	**ATMOSPHERIC PRESSURE:**	1001 mb to 1001 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:	Standby
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
1	0.528	Live 1	Quasi-Peak	42.7	56.0	13.3	006	Complied
2	0.533	Live 1	Quasi-Peak	43.0	56.0	13.0	006	Complied
3	1.698	Live 1	Quasi-Peak	37.0	56.0	19.0	006	Complied
4	2.765	Live 1	Quasi-Peak	36.0	56.0	20.0	006	Complied
5	5.753	Live 1	Quasi-Peak	27.8	60.0	32.2	006	Complied
6	12.575	Live 1	Quasi-Peak	30.6	60.0	29.4	006	Complied
7	18.222	Live 1	Quasi-Peak	34.0	60.0	26.0	006	Complied
8	21.291	Live 1	Quasi-Peak	31.7	60.0	28.3	006	Complied
9	25.098	Live 1	Quasi-Peak	23.0	60.0	37.0	006	Complied
10	29.702	Live 1	Quasi-Peak	19.4	60.0	40.6	006	Complied
11	0.528	Live 1	Average (CISPR)	25.3	46.0	20.7	006	Complied
12	1.631	Live 1	Average (CISPR)	17.9	46.0	28.1	006	Complied
13	2.769	Live 1	Average (CISPR)	18.0	46.0	28.0	006	Complied
14	5.802	Live 1	Average (CISPR)	14.3	50.0	35.7	006	Complied
15	12.570	Live 1	Average (CISPR)	14.5	50.0	35.5	006	Complied

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
16	18.281	Live 1	Average (CISPR)	16.8	50.0	33.2	006	Complied
17	21.314	Live 1	Average (CISPR)	15.0	50.0	35.0	006	Complied
18	25.022	Live 1	Average (CISPR)	11.6	50.0	38.4	006	Complied
19	29.661	Live 1	Average (CISPR)	10.4	50.0	39.6	006	Complied
20	0.204	Neutral	Quasi-Peak	35.0	63.4	28.4	007	Complied
21	0.524	Neutral	Quasi-Peak	45.7	56.0	10.3	007	Complied
22	1.253	Neutral	Quasi-Peak	38.3	56.0	17.7	007	Complied
23	2.724	Neutral	Quasi-Peak	38.1	56.0	17.9	007	Complied
24	2.783	Neutral	Quasi-Peak	37.8	56.0	18.2	007	Complied
25	6.405	Neutral	Quasi-Peak	30.0	60.0	30.0	007	Complied
26	8.529	Neutral	Quasi-Peak	30.9	60.0	29.1	007	Complied
27	15.275	Neutral	Quasi-Peak	30.5	60.0	29.5	007	Complied
28	22.776	Neutral	Quasi-Peak	25.2	60.0	34.8	007	Complied
29	29.639	Neutral	Quasi-Peak	18.7	60.0	41.3	007	Complied
30	0.195	Neutral	Average (CISPR)	26.5	53.8	27.3	007	Complied
31	0.533	Neutral	Average (CISPR)	30.7	46.0	15.3	007	Complied
32	1.262	Neutral	Average (CISPR)	22.7	46.0	23.3	007	Complied
33	6.342	Neutral	Average (CISPR)	17.4	50.0	32.6	007	Complied
34	8.534	Neutral	Average (CISPR)	15.5	50.0	34.5	007	Complied
35	15.293	Neutral	Average (CISPR)	16.0	50.0	34.0	007	Complied
36	22.862	Neutral	Average (CISPR)	14.0	50.0	36.0	007	Complied
37	29.630	Neutral	Average (CISPR)	10.7	50.0	39.3	007	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
K0001	5 m Semi-Anechoic Chamber	None Stated	29 May 2012	12
A1829	N-Type Pulse Limiter	ESH3-Z2	05 Mar 2012	12
A004	Single phase LISN	ESH3-Z5	14 Sep 2012	12
C1401	2 m RF cable	APCAAPCAT40L-2000	17 Apr 2012	12
C1415	3 m RF cable	239-0088-3000	09 Nov 2012	12
M1273	EMI Test Receiver	ESIB 26	04 Feb 2012	12

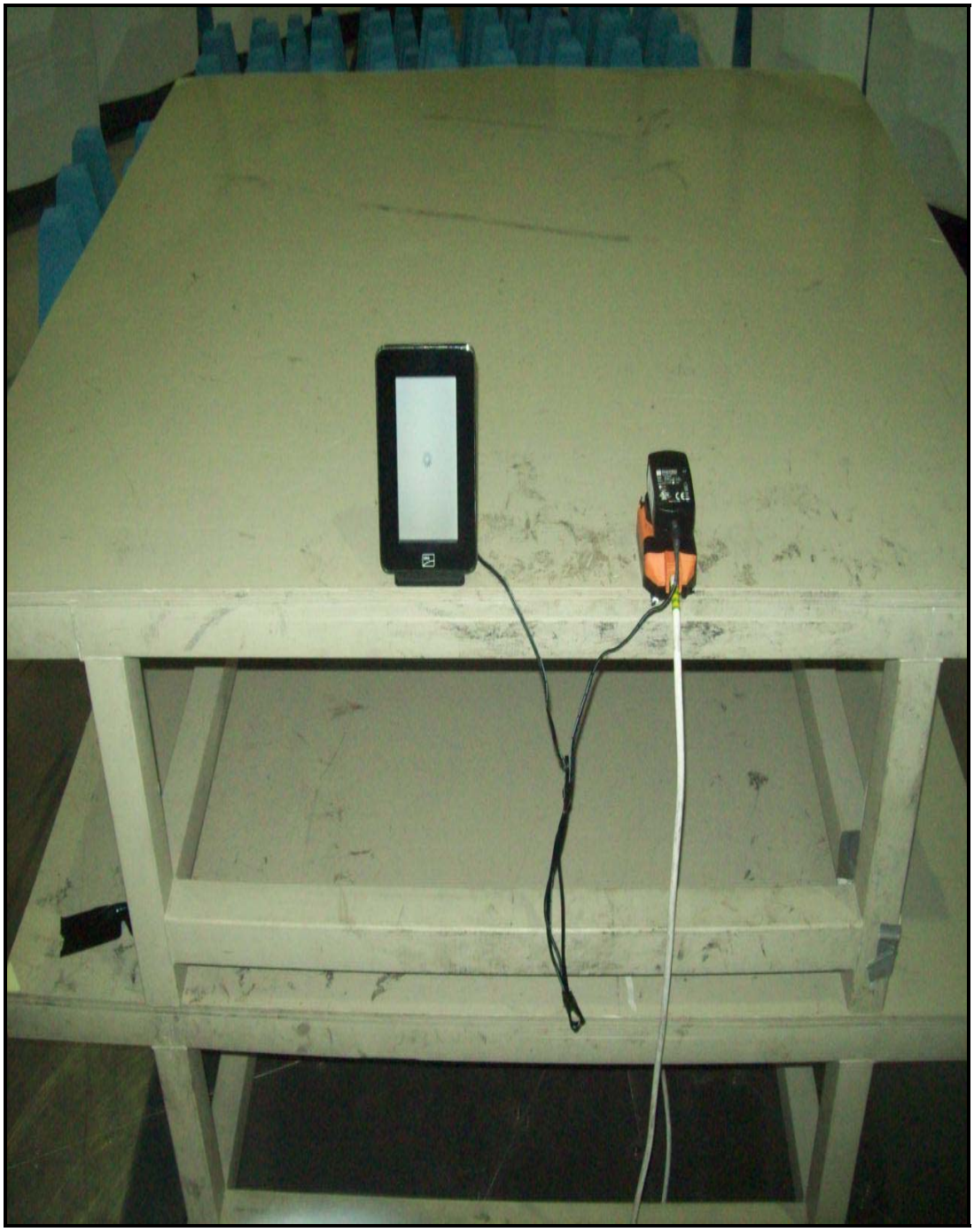
9. PHOTOGRAPHS OF EUT

This section contains the following photographs:

Photo Reference Number	Title
PHT\82895JD06\001	Test Configuration Photograph - Conducted Emissions
PHT\82895JD06\002	Test Configuration Photograph - Radiated Emissions

PHT\82895JD06\001 - Test Configuration Photograph - Conducted Emissions

PHT\82895JD06\002 - Test Configuration Photograph - Radiated Emissions



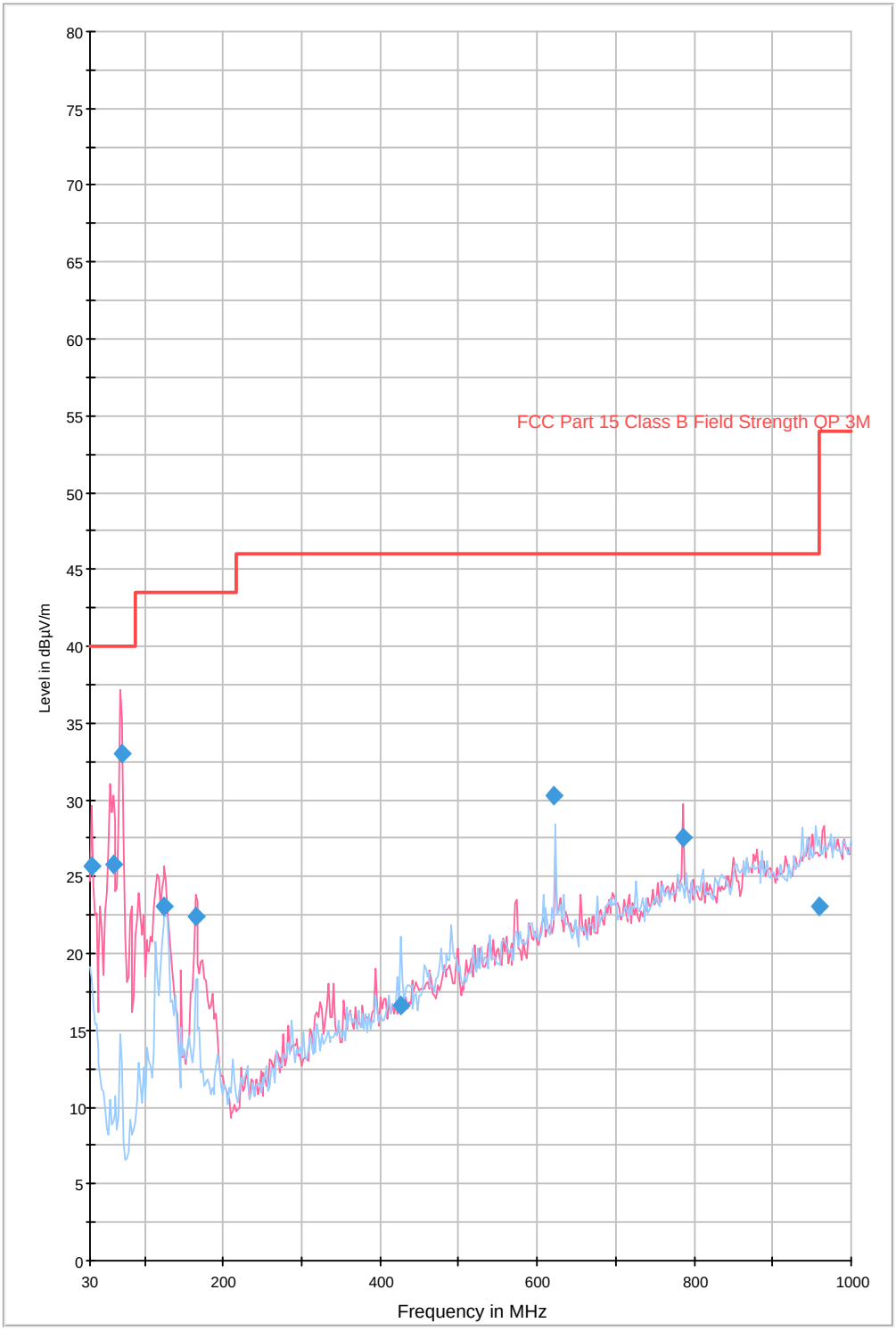
10. GRAPHICAL TEST RESULTS

10.1. This section contains the graphical results for the measurements listed in Section *3.2. Summary of Test Results* (above).

Graph Reference Number	Title
GPH\82895JD06\001	Radiated Emissions Pre-Scan (30 MHz to 1000 MHz)
GPH\82895JD06\002	Radiated Emissions Pre-Scan (1000 MHz to 4000 MHz)
GPH\82895JD06\003	Radiated Emissions Pre-Scan (4000 MHz to 7000 MHz)
GPH\82895JD06\004	Radiated Emissions Pre-Scan (7000 MHz to 10000 MHz)
GPH\82895JD06\005	Radiated Emissions Pre-Scan (10000 MHz to 12750 MHz)
GPH\82895JD06\006	Conducted Emissions Live Line Pre-Scan (150 kHz to 30 MHz)
GPH\82895JD06\007	Conducted Emissions Neutral Line Pre-Scan (150 kHz to 30 MHz)

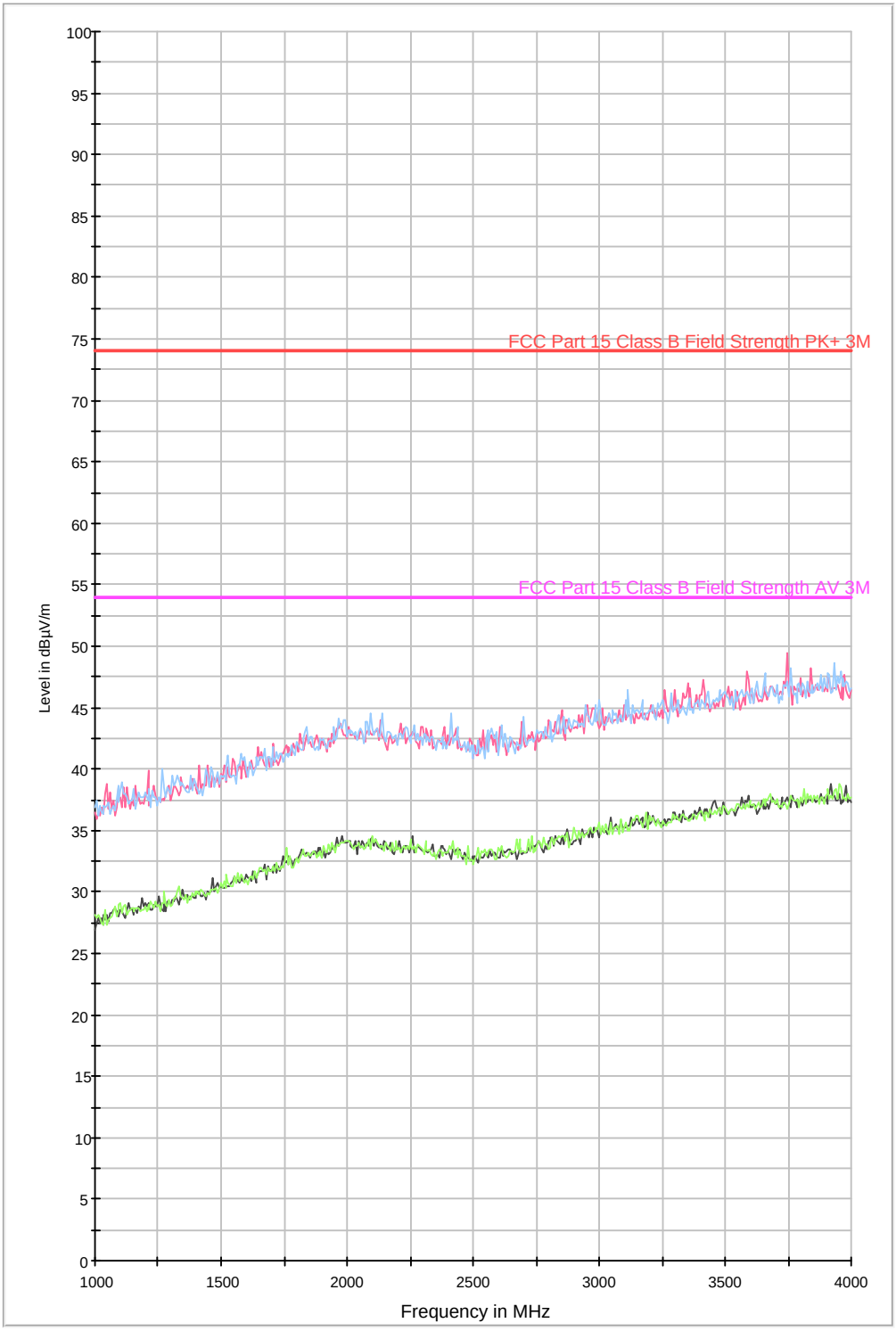
GPH\82895JD06\001

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



GPH\82895JD06\002

FCC Part 15.109 Radiated Emissions Class B 1-4GHz



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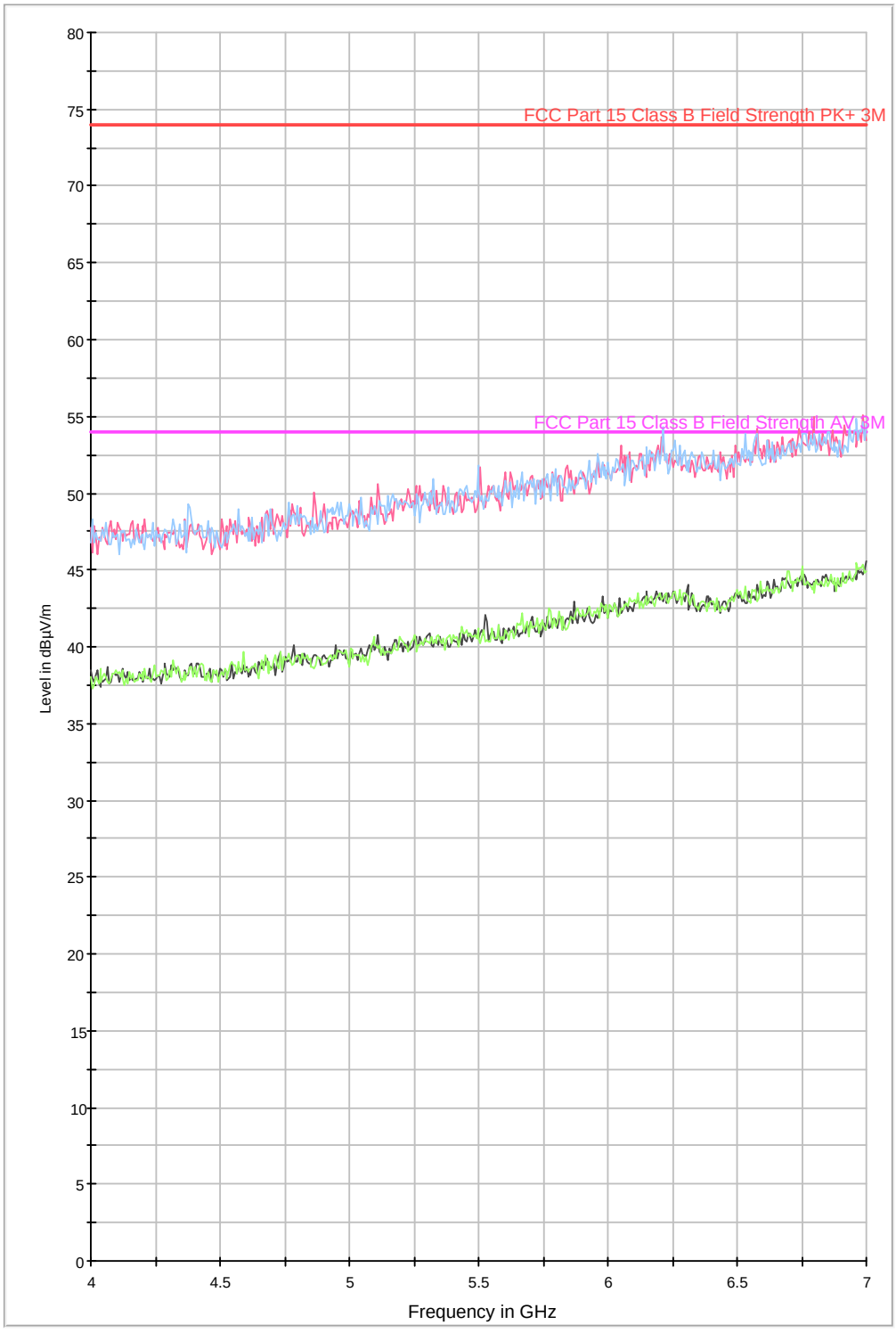
FCC Part 15.109 Radiated Emissions Class B 4-7GHz



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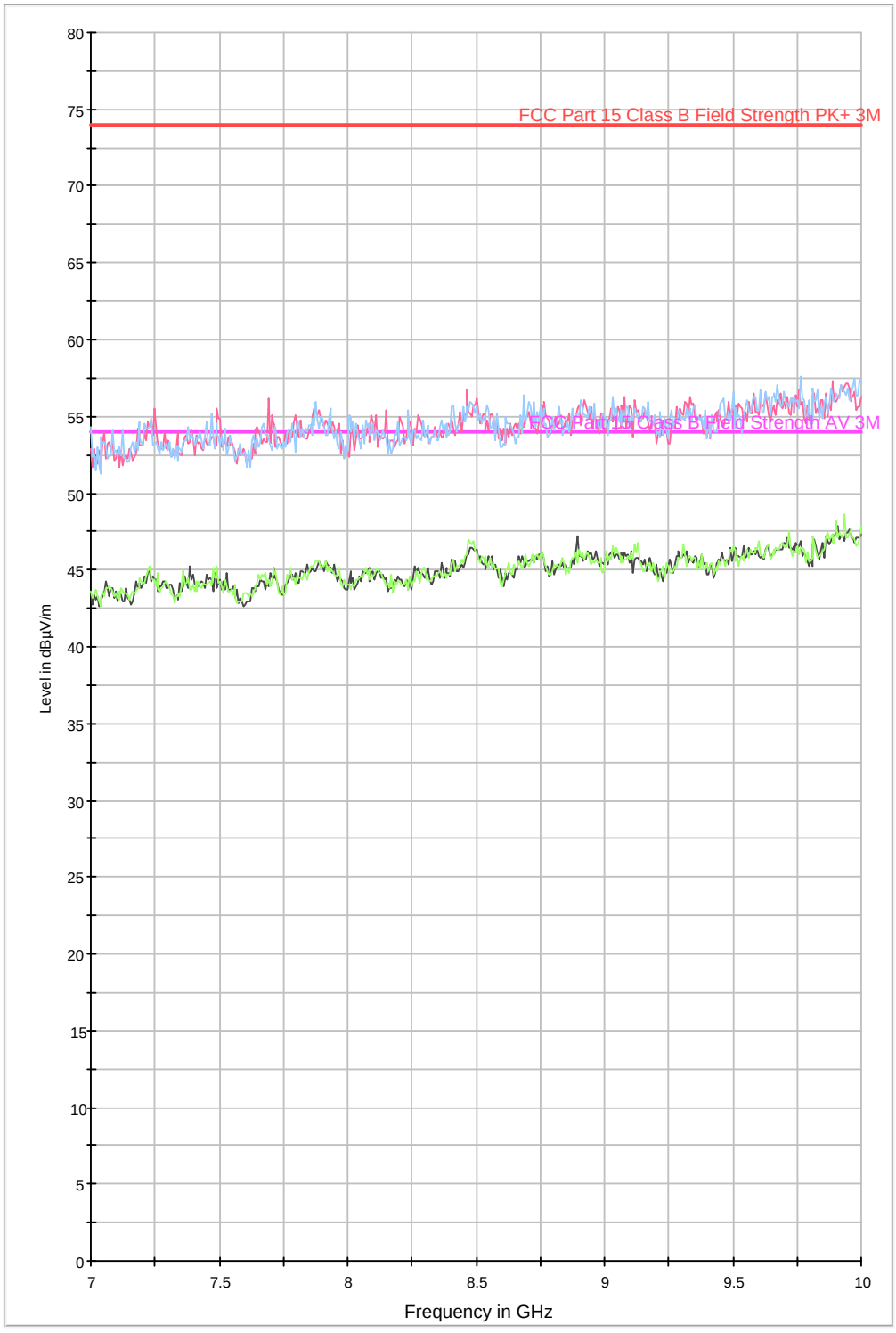
FCC Part 15.109 Radiated Emissions Class B 7-10GHz



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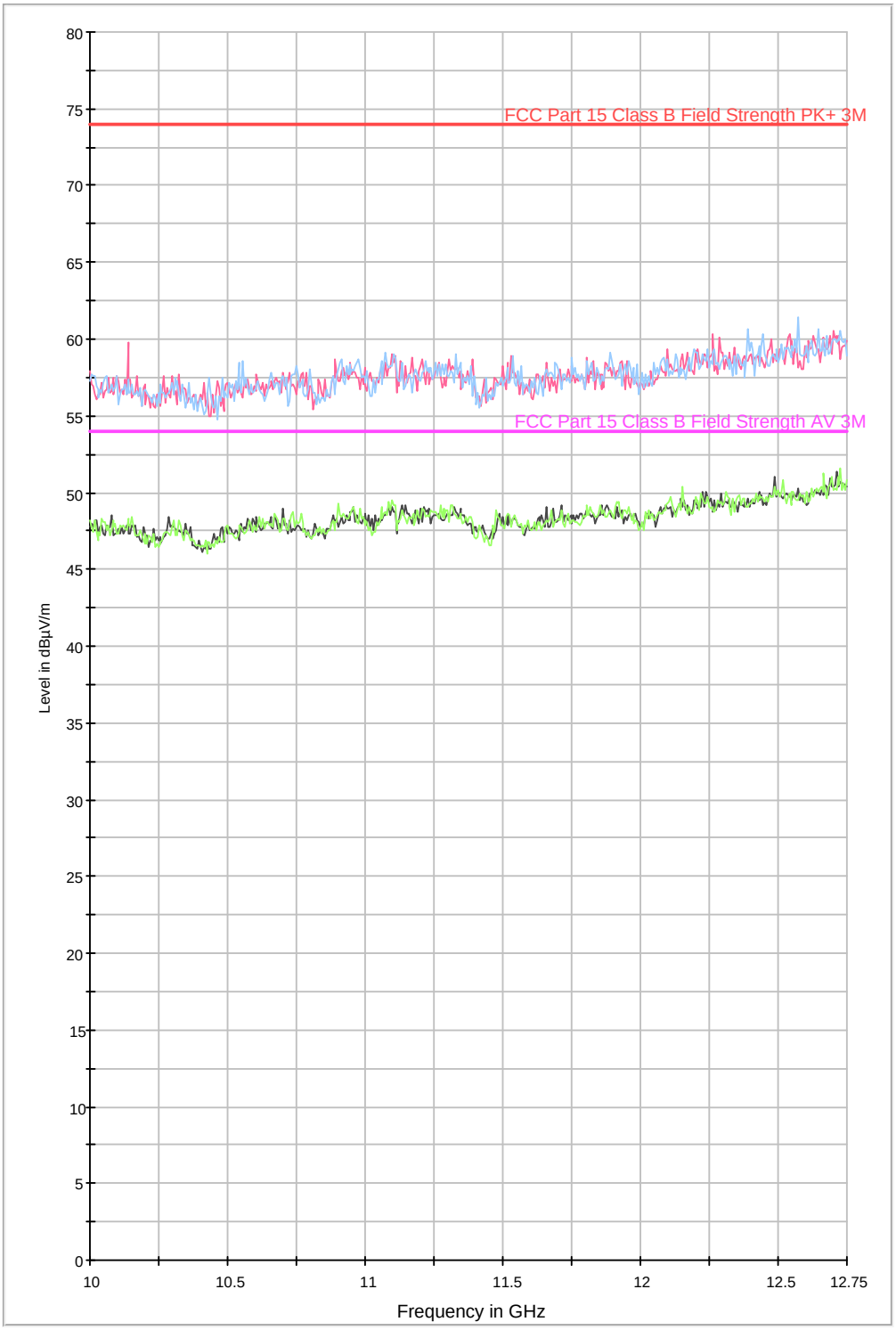
FCC Part 15.109 Radiated Emissions Class B 10-12.75GHz



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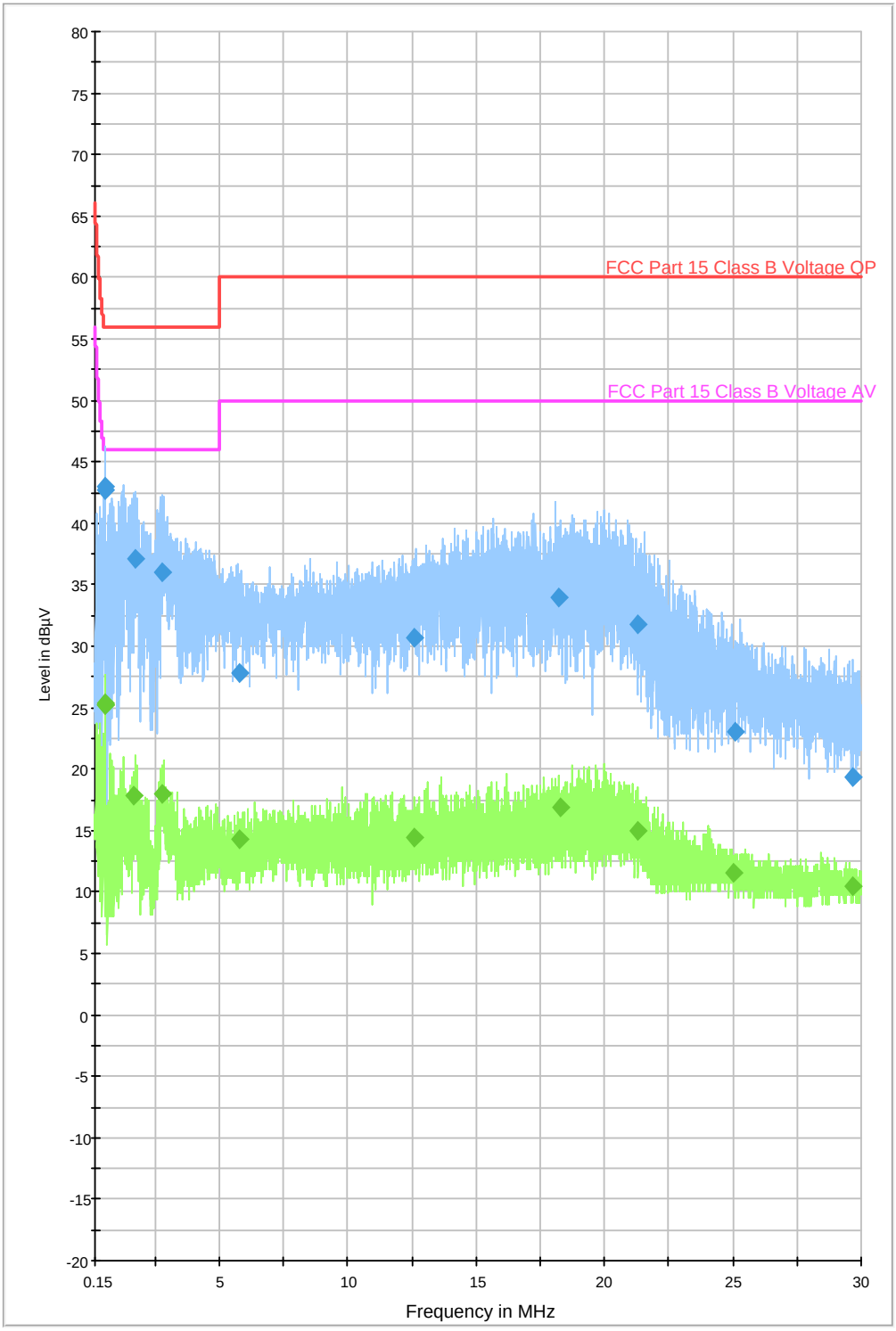
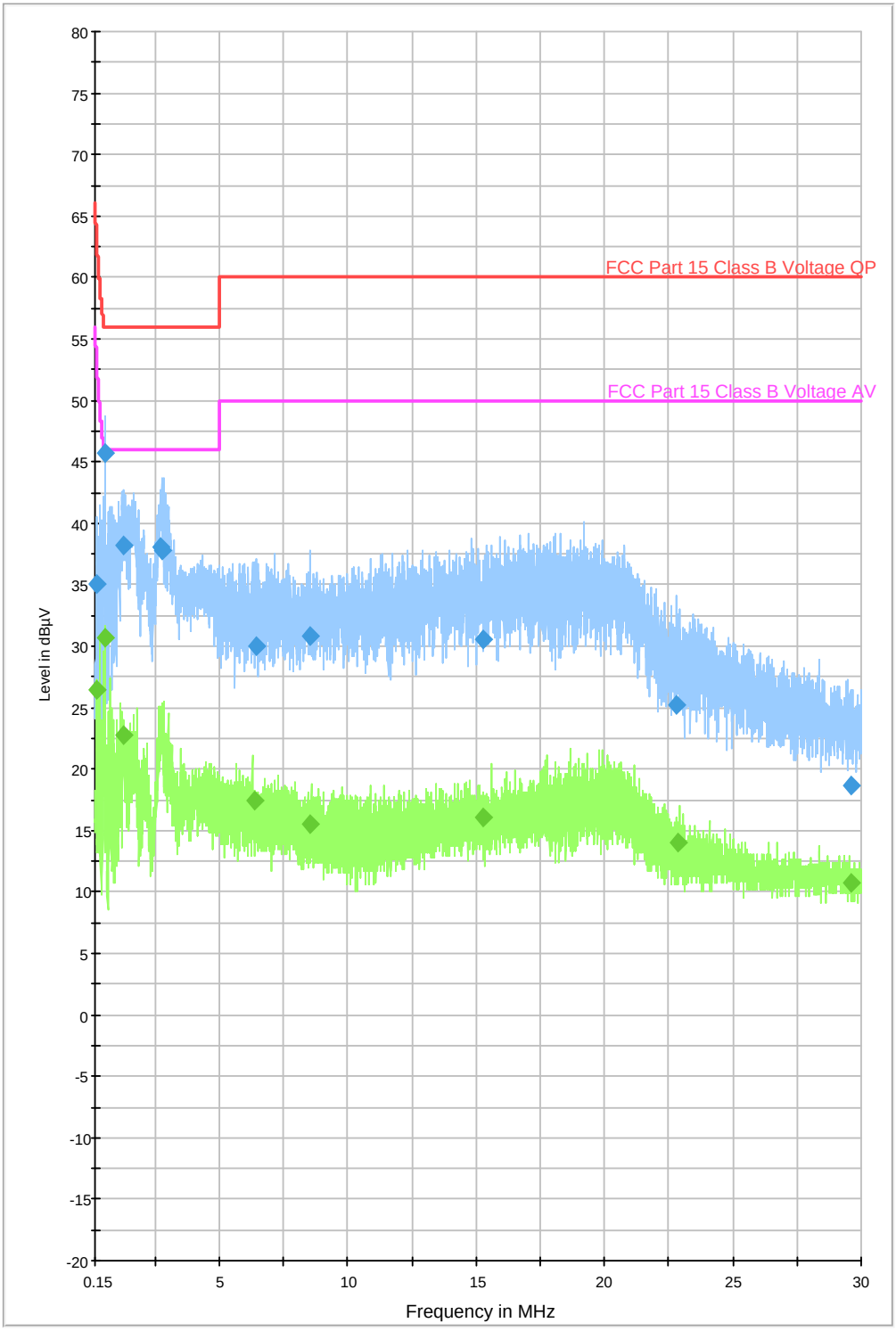
FCC Part 15.107 Conducted Emissions Class B Live



GPH\82895JD06\007

FCC Part 15.107 Conducted Emissions Class B Neutral

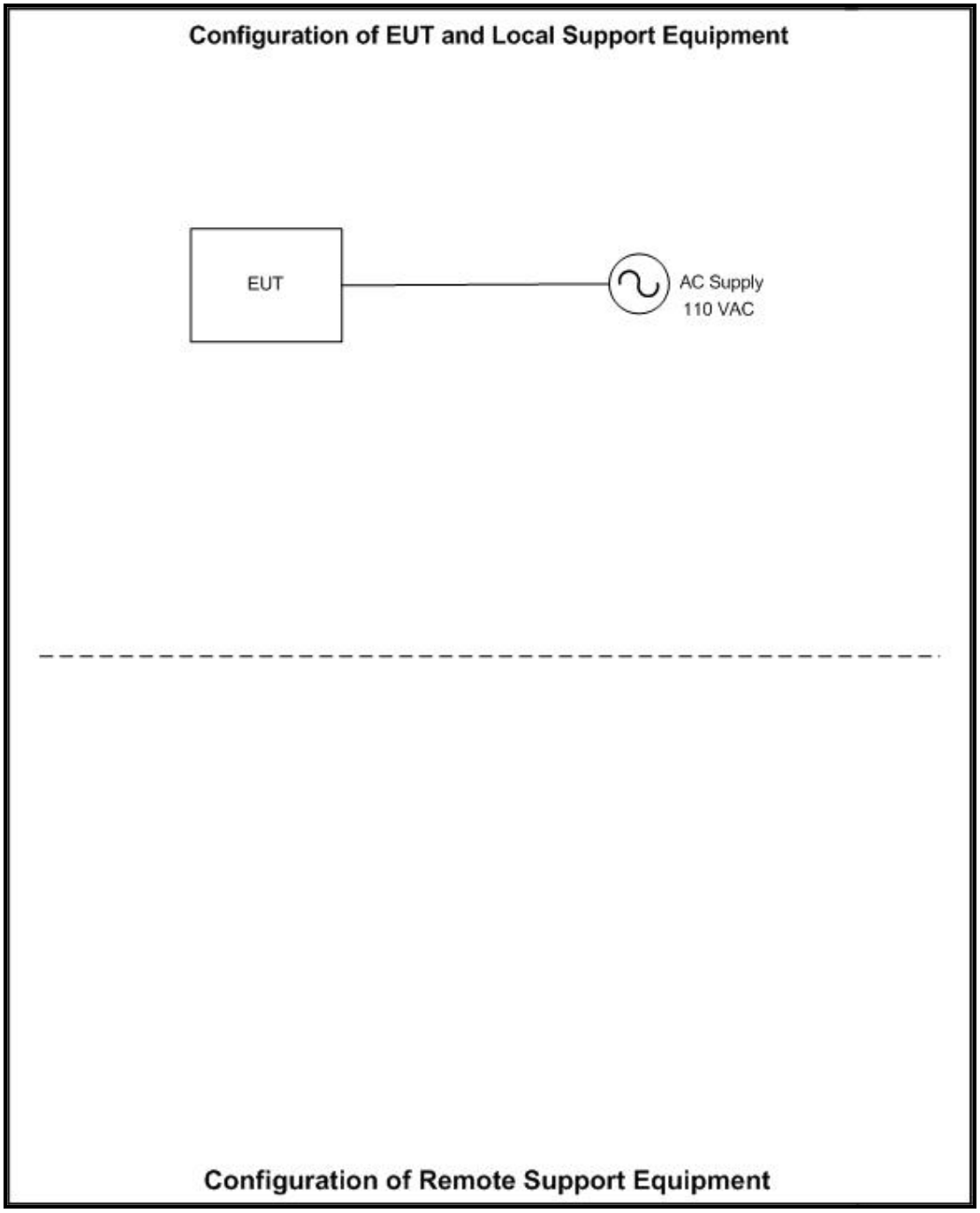


11. TEST CONFIGURATION DRAWING

11.1. 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\82895JD06\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

DRG\82895JD06\001 - Schematic diagram of the EUT, support equipment and interconnecting cables used for the test



12. REPORT REVISION HISTORY

12.1. This section contains the report revision history.

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version.
2.0	Front Page	-	Customer requested “Test of” description to state SMA Sunnyview
	5	1	Customer requested that customer details be amended
	5	2	Customer requested that manufacturer details be amended
	8	4	FCC ID, IC ID, Hardware Version and Software Version details added