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Report On

FCC Testing of the
ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5)
In accordance with FCC CFR 47 Part 15B

COMMERCIAL-IN-CONFIDENCE

FCC ID: QGGIPA239B

Document 75918441 Report 01 Issue 2

August 2012



Product Service

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COMMERCIAL-IN-CONFIDENCE

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ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5)
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August 2012

PREPARED FOR

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Building 2020
Cambourne Business Park
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Cambridge
CB23 6DW

PREPARED BY


Natalie Bennett
Senior Administrator (Technical)

APPROVED BY


Mark Jenkins
Authorised Signatory

DATED

22 August 2012


This report has been up-issued to Issue 2 to correct the model number on page 4.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);


S Milliken


T Guy





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SECTION 1

REPORT SUMMARY

FCC Testing of the
ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5)
In accordance with FCC CFR 47 Part 15B



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5) to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	ip.access Ltd
Model Number(s)	239B & E16 Enterprise Access Point
Serial Number(s)	000295-0000105698
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2011)
Incoming Release Date	Application Form 27 June 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO30803 06 July 2012
Start of Test	13 July 2012
Finish of Test	16 July 2012
Name of Engineer(s)	S Milliken T Guy



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Idle - with 12 V AC/DC Adapter				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	
Idle - with Pihong POE Inserter				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	
Idle - with Microsemi POE Inserter				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	



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1.3 APPLICATION FORM

APPLICANT'S DETAILS	
COMPANY NAME :	IP Access Ltd
ADDRESS :	Building 2020 Cambourne Business Park Cambourne Cambridge CB23 6DW
NAME FOR CONTACT PURPOSES :	Costa Panayi
TELEPHONE NO: 01954 713721	FAX NO: 01954 713799
	E-MAIL: costa.panayi@ipaccess.com

EQUIPMENT INFORMATION			
Model name/number	E16 Enterprise Access Point	Identification/Part number	nano3G 239B (Bands 2 & 5)
Hardware Version	XA	Software Version	573.1
Manufacturer	IP Access Ltd	Country of Origin	UK
FCC ID	QGGIPA239B	Industry Canada ID	N/A
Technical description (a brief description of the intended use and operation):			
The 239B E16 Access Point is a 16 user 3G Basestation operating in Bands 2 & 5 for the US market.			
<u>Supply Voltage:</u>			
<input checked="" type="checkbox"/>	AC mains	State AC voltage	110 V and AC frequency 60 Hz
<input checked="" type="checkbox"/>	POE DC (external)	State DC voltage	48 V and DC current 0.25 A
<input type="checkbox"/>	DC (internal)	State DC voltage V and Battery type
<u>Frequency characteristics:</u>			
Transmitter Frequency range	869 MHz to 894 MHz	Channel spacing	200 kHz (if channelized)
Receiver Frequency range (if different)	824 MHz to 849 MHz	Channel spacing	200 kHz (if channelized)
Designated test frequencies:			
Bottom: 871.4 MHz	Middle: 881.6 MHz	Top: 891.6 MHz	
Bottom: 1932.4 MHz	Middle: 1960.0 MHz	Top: 1987.6 MHz	
Intermediate Frequencies :	N/A		
Highest Internally Generated Frequency :	700 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	0.25 W (Band 2) 0.02 W (Band 5)	Minimum transmitter power (if variable)	N/A
<input checked="" type="checkbox"/>	Continuous transmission	State duty cycle	
<input type="checkbox"/>	Intermittent transmission	If intermittent, can transmitter be set to continuous transmit test mode?	Y/N
<u>Antenna characteristics:</u>			
<input type="checkbox"/>	Antenna connector	State impedance	ohm
<input type="checkbox"/>	Temporary antenna connector	State impedance	ohm
<input checked="" type="checkbox"/>	Integral antenna	State gain	0 dBi
<u>Modulation characteristics:</u>			
<input checked="" type="checkbox"/>	Amplitude	<input type="checkbox"/>	Other
<input type="checkbox"/>	Frequency	Details:	
<input checked="" type="checkbox"/>	Phase		
Can the transmitter operate un-modulated?	No		
ITU Class of emission:	5M00D1W		
<u>Battery/Power Supply</u>			
Model name/number	POE Power Supply	Identification/Part number	POE36U-1AT-R
Manufacturer	Phihong	Country of Origin	Taiwan
Model name/number	POE Single Port Midspan	Identification/Part number	PD-9001GR
Manufacturer	PowerDsine	Country of Origin	China
Model name/number	12VDC Power Adapter	Identification/Part number	PSC30R-120
Manufacturer	Phihong	Country of Origin	Taiwan
<u>Extreme conditions:</u>			
Maximum temperature	45 °C	Minimum temperature	0 °C
Maximum supply voltage V	Minimum supply voltage V



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I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature : Held on file at TÜV SÜD Product Service Ltd

Name : Costa Panayi

Position held : Product Design and Development Engineer

Date : 27th June 2012

TÜV Product Service Ltd formally certifies that the manufacturer's declaration as typed out in this report, is a true and accurate record of the original received from the applicant.



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was an ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5). A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 12 V AC/DC Adapter, Phihong POE Inserter and Microsemi POE Inserter..

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard or test plan were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC Testing of the
ip.access Ltd 239B E16 3G Enterprise Access Point (Bands 2 & 5)
In accordance with FCC CFR 47 Part 15B



2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.107

2.1.2 Equipment Under Test and Modification State

239B S/N: 000295-0000105698 - Modification State 0

2.1.3 Date of Test

16 July 2012

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

2.1.6 Environmental Conditions

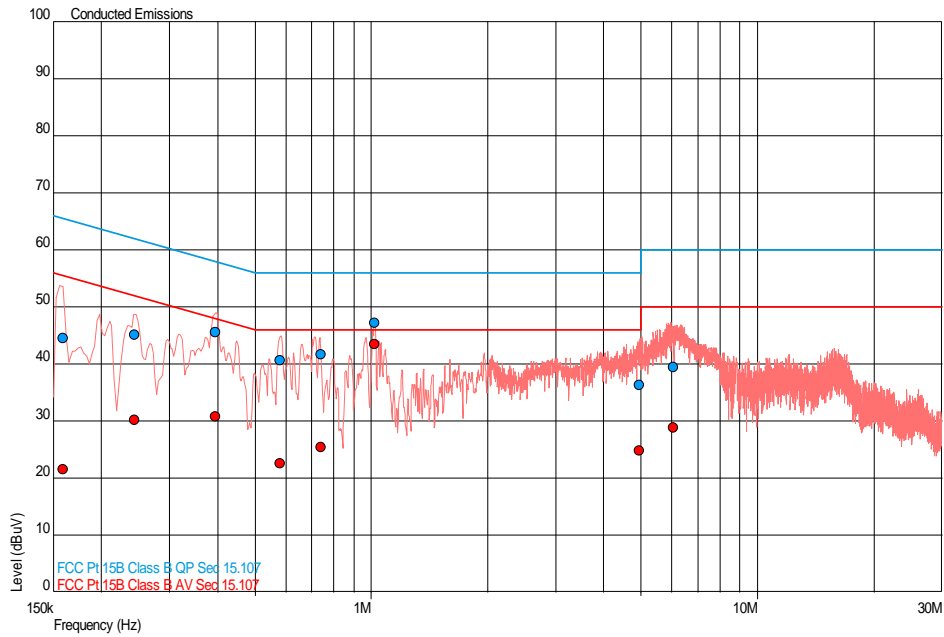
Ambient Temperature	22.0°C
Relative Humidity	51.0%



2.1.7 Test Results

Idle - with 12 V AC/DC Adapter

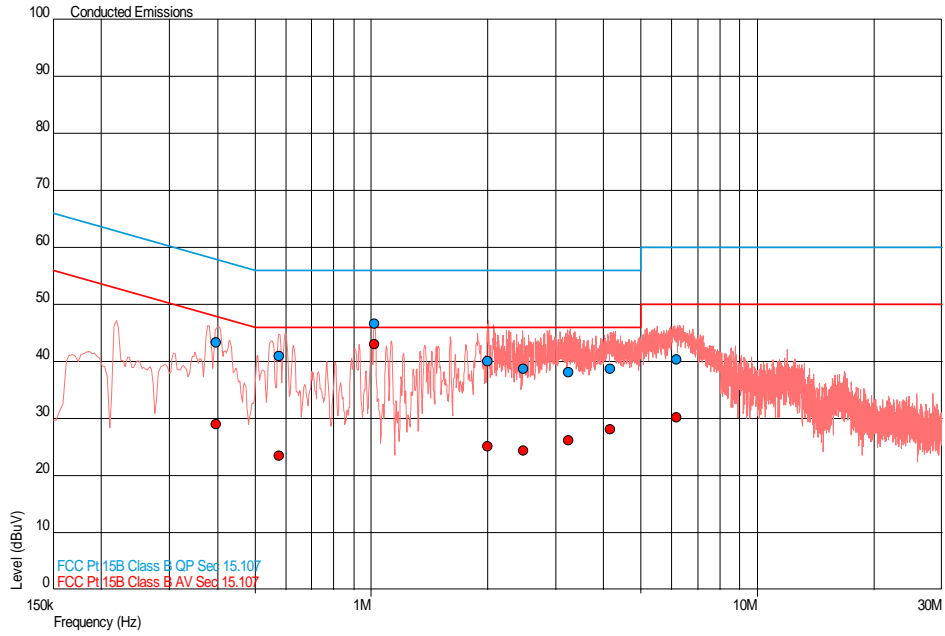
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.159	44.6	65.5	-20.9	21.6	55.5	-33.9
0.244	45.2	62.0	-16.8	30.3	52.0	-21.7
0.395	45.6	58.0	-12.4	30.9	48.0	-17.1
0.580	40.7	56.0	-15.3	22.7	46.0	-23.3
0.739	41.7	56.0	-14.3	25.5	46.0	-20.5
1.021	47.3	56.0	-8.7	43.5	46.0	-2.5
4.936	36.3	56.0	-19.7	24.9	46.0	-21.1
6.041	39.6	60.0	-20.4	28.8	50.0	-21.2



Neutral Line



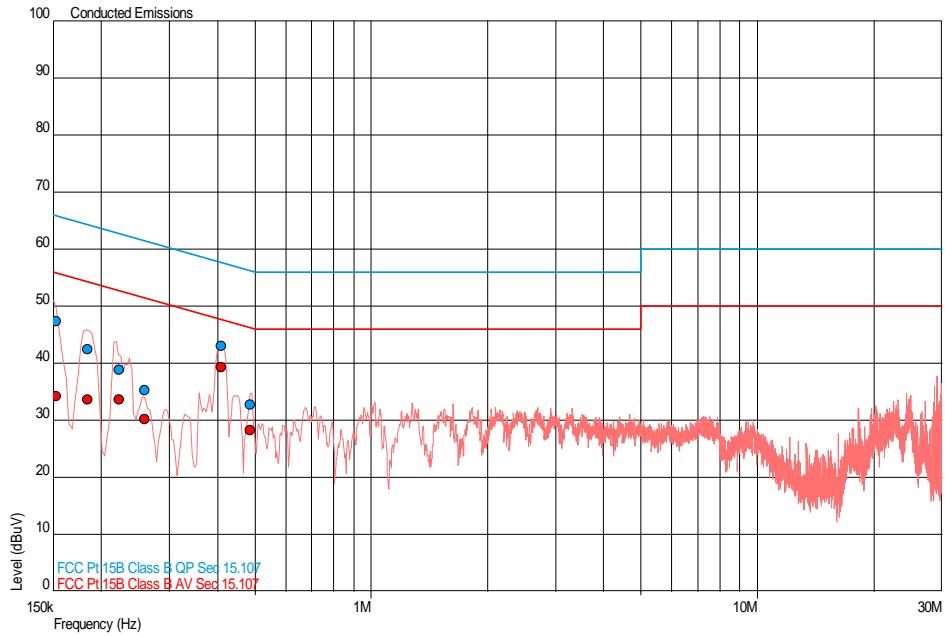
Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.396	43.3	57.9	-14.6	29.0	47.9	-19.0
0.576	40.9	56.0	-15.1	23.4	46.0	-22.6
1.020	46.7	56.0	-9.3	43.1	46.0	-2.9
1.998	40.1	56.0	-15.9	25.2	46.0	-20.8
2.482	38.7	56.0	-17.3	24.5	46.0	-21.5
3.243	38.2	56.0	-17.8	26.2	46.0	-19.8
4.150	38.7	56.0	-17.3	28.1	46.0	-17.9
6.179	40.3	60.0	-19.7	30.2	50.0	-19.8



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Idle - with Microsemi POE Inserter

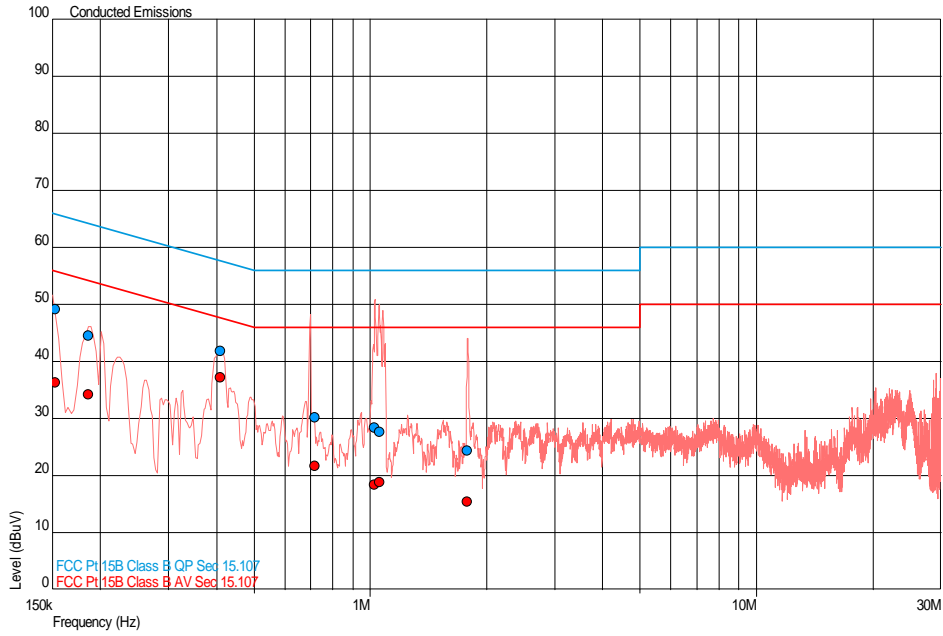
Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.153	47.4	65.8	-18.5	34.2	55.8	-21.6
0.184	42.5	64.3	-21.8	33.7	54.3	-20.6
0.222	38.8	62.7	-23.9	33.6	52.7	-19.1
0.259	35.4	61.5	-26.1	30.3	51.5	-21.2
0.408	43.0	57.7	-14.7	39.4	47.7	-8.3
0.485	32.7	56.3	-23.5	28.3	46.3	-18.0



Neutral Line

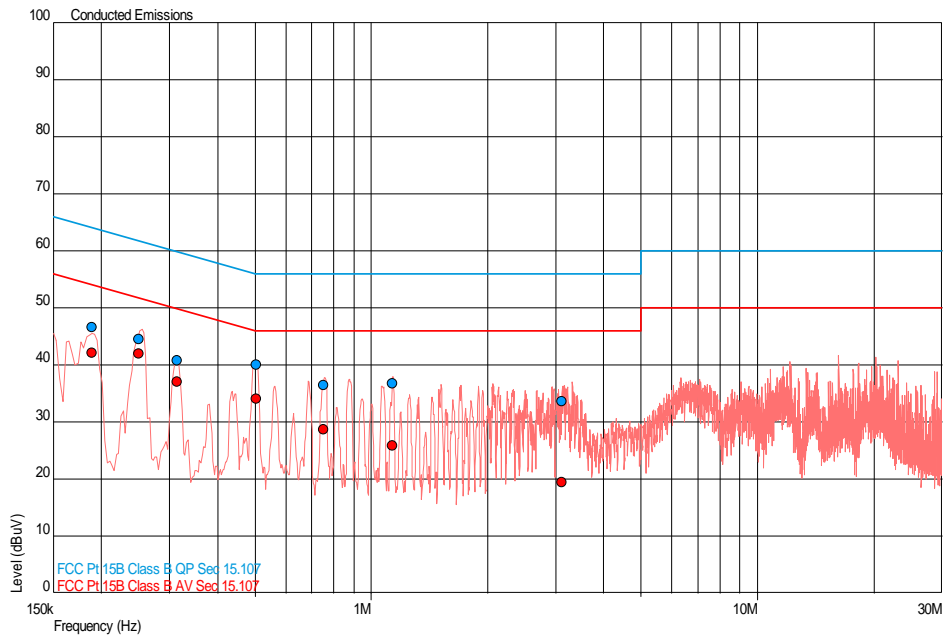


Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.152	49.3	65.9	-16.6	36.4	55.9	-19.5
0.186	44.5	64.2	-19.7	34.3	54.2	-19.9
0.408	41.8	57.7	-15.9	37.2	47.7	-10.5
0.717	30.3	56.0	-25.7	21.7	46.0	-24.3
1.025	28.4	56.0	-27.6	18.5	46.0	-27.5
1.058	27.7	56.0	-28.3	18.9	46.0	-27.1
1.783	24.4	56.0	-31.6	15.4	46.0	-30.6



Idle - with Phihong POE Inserter

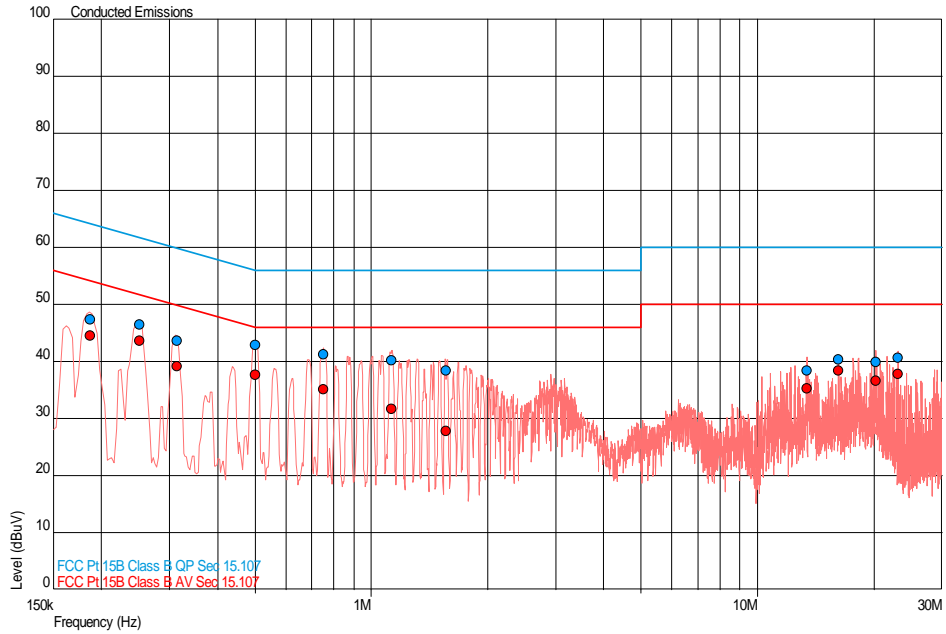
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.188	46.6	64.1	-17.5	42.2	54.1	-11.9
0.250	44.6	61.7	-17.1	42.0	51.7	-9.8
0.314	40.8	59.9	-19.1	37.0	49.9	-12.8
0.503	40.1	56.0	-15.9	34.1	46.0	-11.9
0.752	36.4	56.0	-19.6	28.7	46.0	-17.3
1.134	36.7	56.0	-19.3	25.9	46.0	-20.1
3.118	33.7	56.0	-22.3	19.6	46.0	-26.4



Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.187	47.3	64.2	-16.8	44.6	54.2	-9.6
0.251	46.4	61.7	-15.3	43.7	51.7	-8.0
0.314	43.7	59.9	-16.2	39.2	49.9	-10.7
0.500	42.9	56.0	-13.1	37.6	46.0	-8.4
0.750	41.2	56.0	-14.8	35.1	46.0	-10.9
1.128	40.2	56.0	-15.8	31.8	46.0	-14.2
1.558	38.4	56.0	-17.6	27.9	46.0	-18.1
13.420	38.5	60.0	-21.5	35.3	50.0	-14.7
16.229	40.4	60.0	-19.6	38.4	50.0	-11.6
20.257	39.9	60.0	-20.1	36.7	50.0	-13.3
23.130	40.7	60.0	-19.3	37.9	50.0	-12.1



2.2 RADIATED EMISSIONS

2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.2.2 Equipment Under Test and Modification State

239B S/N: 000295-0000105698 - Modification State 0

2.2.3 Date of Test

13 July 2012 & 14 July 2012

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 5th harmonic of the EUT's highest internally generated fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

2.2.6 Environmental Conditions

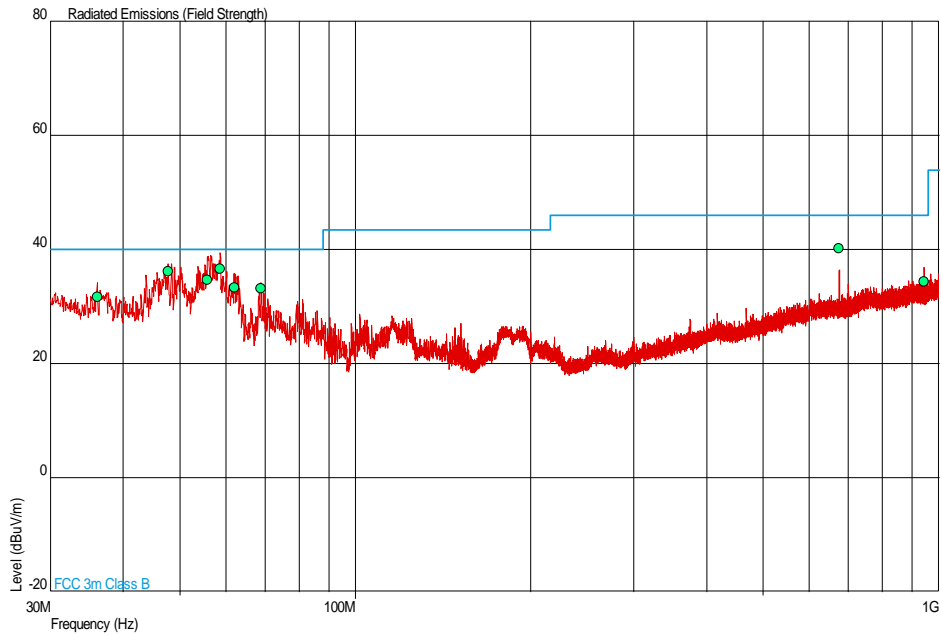
Ambient Temperature	21.0°C
Relative Humidity	52.0 - 56.0%



2.2.7 Test Results

Idle - with 12 V AC/DC Adapter

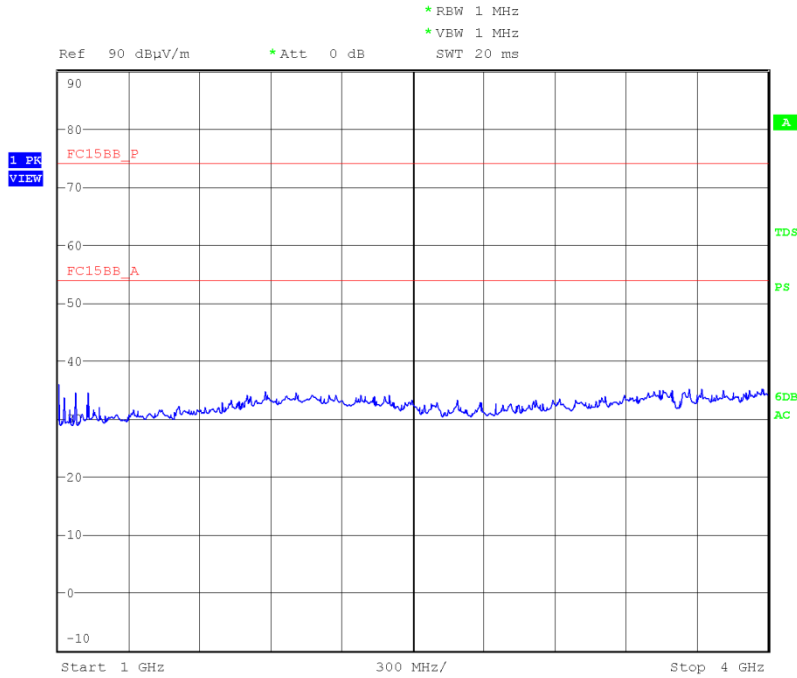
30 MHz to 1 GHz



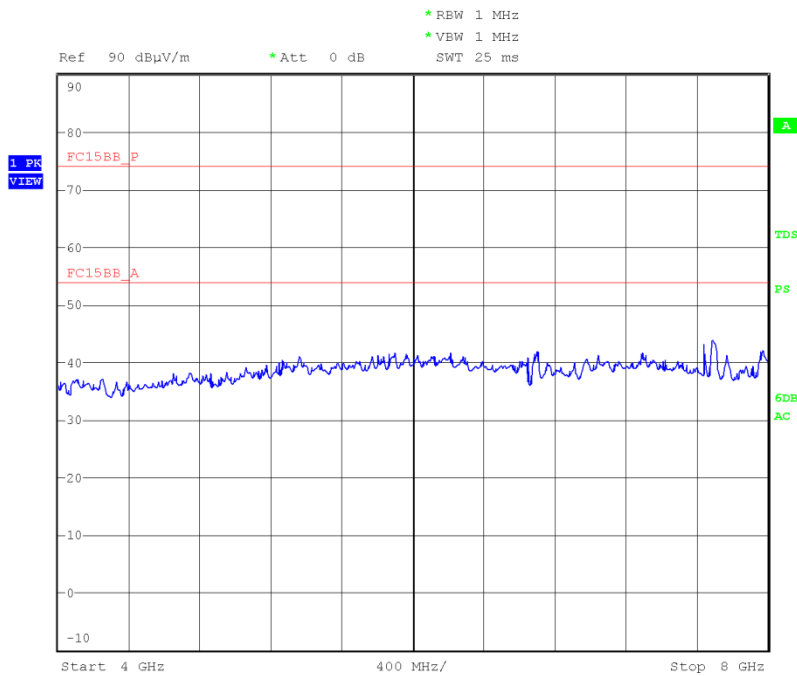
Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
36.113	31.7	38.5	40.0	100	-8.3	61.5	283	1.00	Vertical
47.781	36.1	63.8	40.0	100	-3.9	36.2	181	1.00	Vertical
55.830	34.7	54.3	40.0	100	-5.3	45.7	241	1.00	Vertical
58.729	36.6	67.6	40.0	100	-3.4	32.4	307	1.00	Vertical
62.014	33.3	46.2	40.0	100	-6.7	53.8	282	1.08	Vertical
68.994	33.3	46.2	40.0	100	-6.7	53.8	288	1.69	Vertical
674.991	40.3	103.5	46.0	200	-5.7	96.5	76	1.71	Vertical
943.998	34.3	51.9	46.0	200	-11.7	148.1	316	1.00	Vertical



1 GHz to 4 GHz

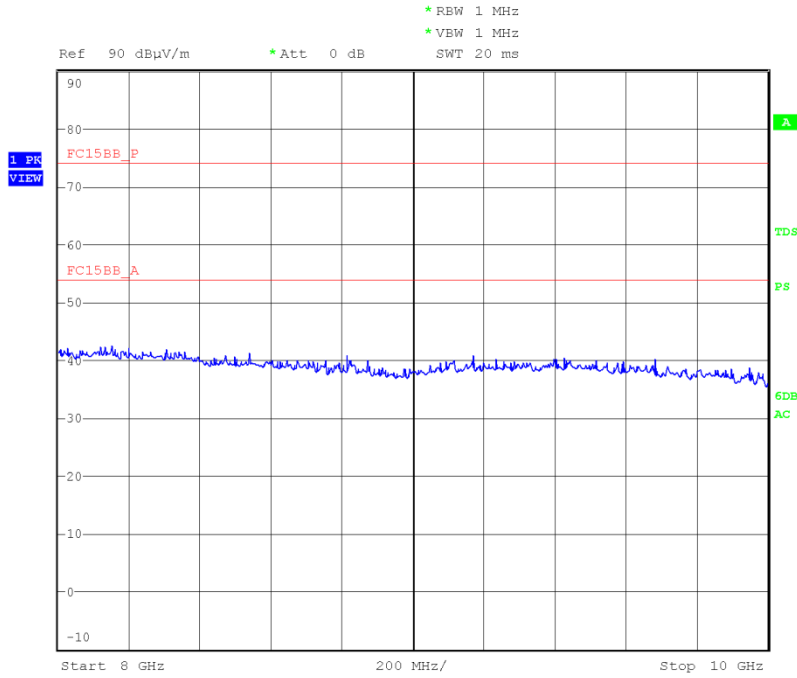


4 GHz to 8 GHz





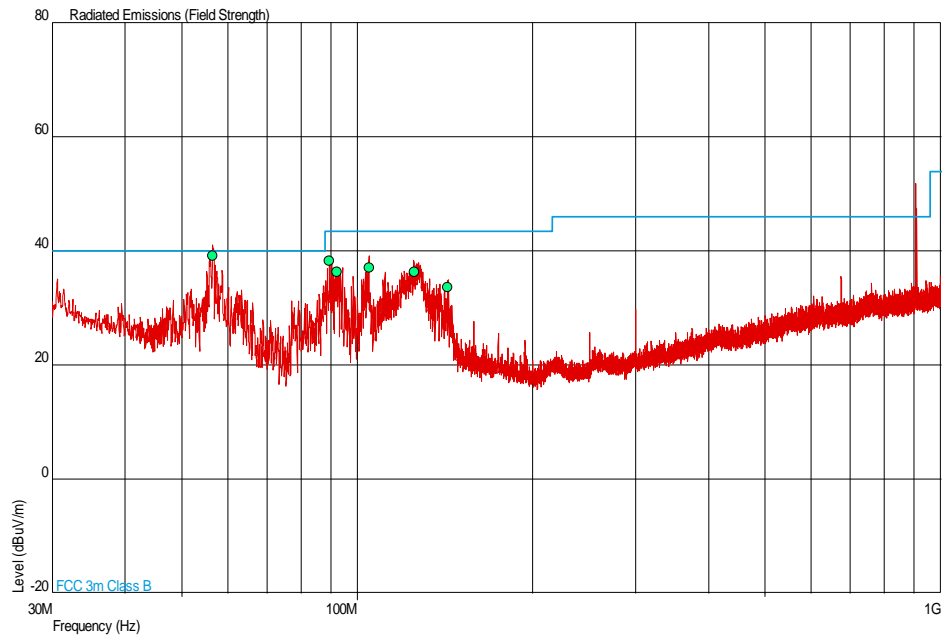
8 GHz to 10 GHz





Idle - with Microsemi POE Inserter

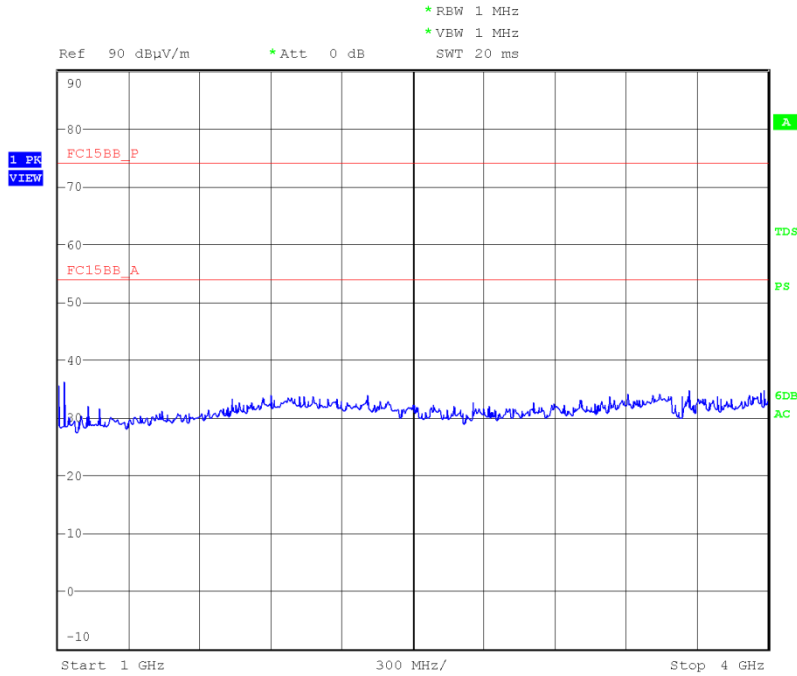
30 MHz to 1 GHz



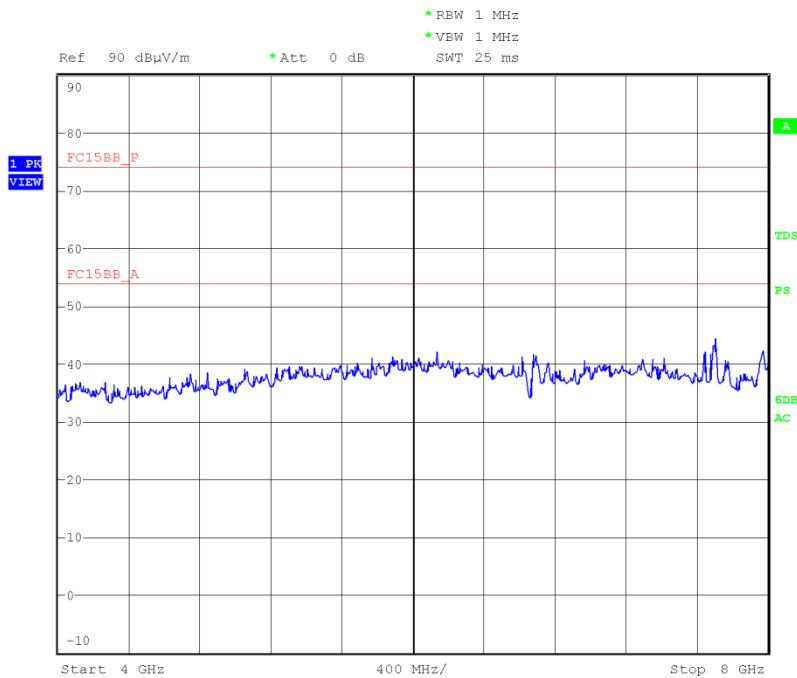
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
56.530	39.1	90.2	40.0	100	-0.9	9.8	182	1.00	Vertical
89.639	38.3	82.2	43.5	150	-5.2	67.8	88	1.00	Vertical
92.411	36.3	65.3	43.5	150	-7.2	84.7	160	1.00	Vertical
104.720	37.2	72.4	43.5	150	-6.3	77.6	360	1.00	Vertical
125.086	36.4	66.1	43.5	150	-7.1	83.9	267	1.00	Vertical
142.698	33.7	48.4	43.5	150	-9.8	101.6	318	1.00	Vertical



1 GHz to 4 GHz

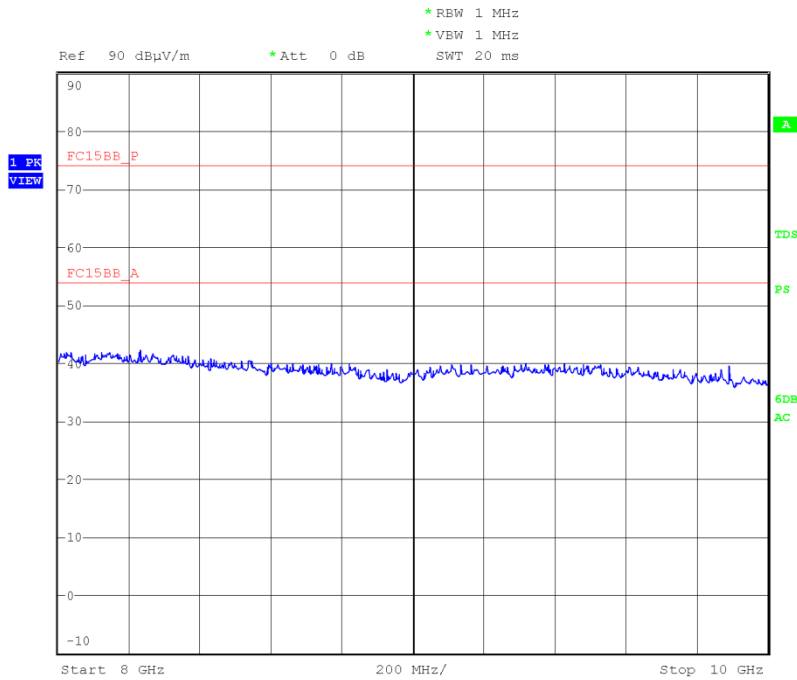


4 GHz to 8 GHz





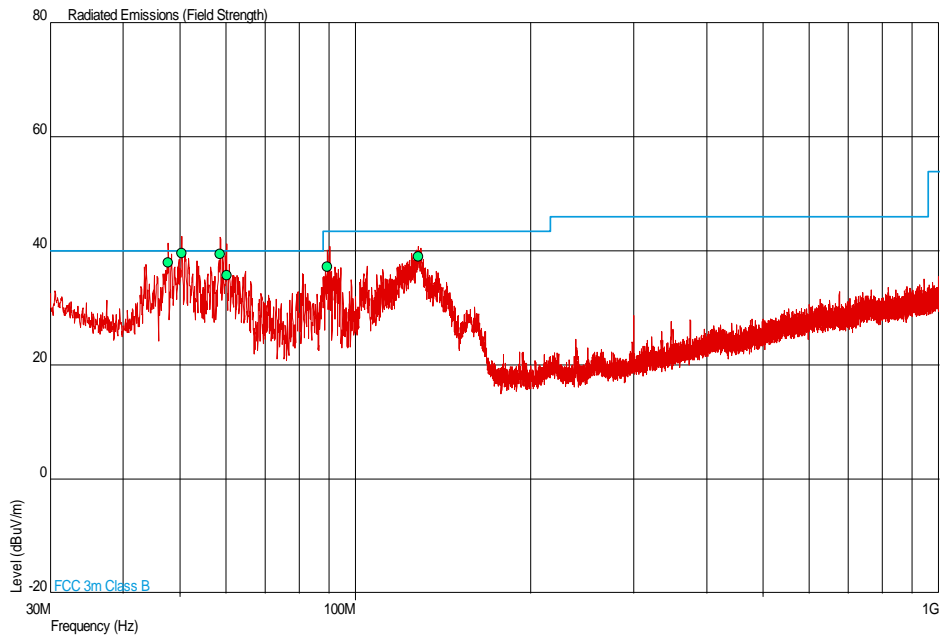
8 GHz to 10 GHz





Idle - with Phihong POE Inserter

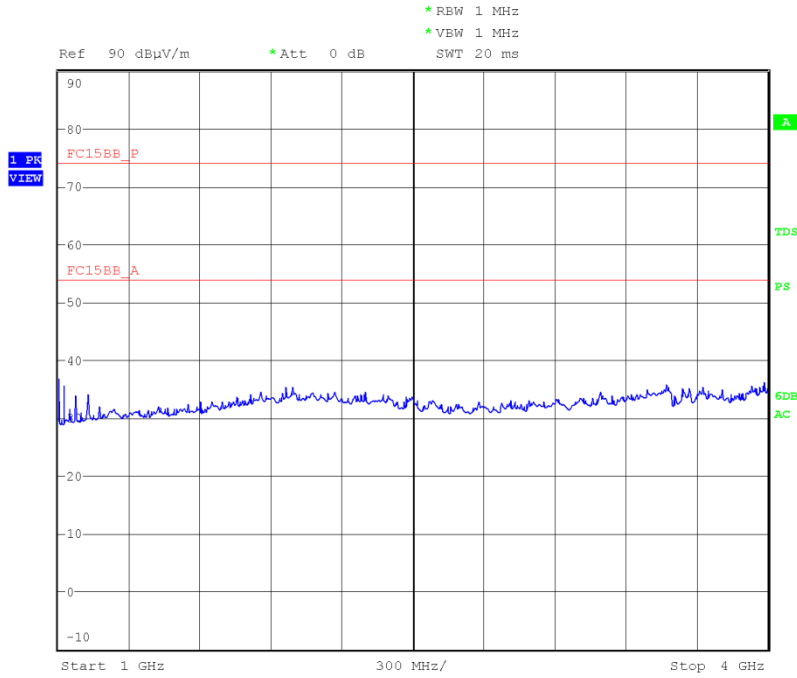
30 MHz to 1 GHz



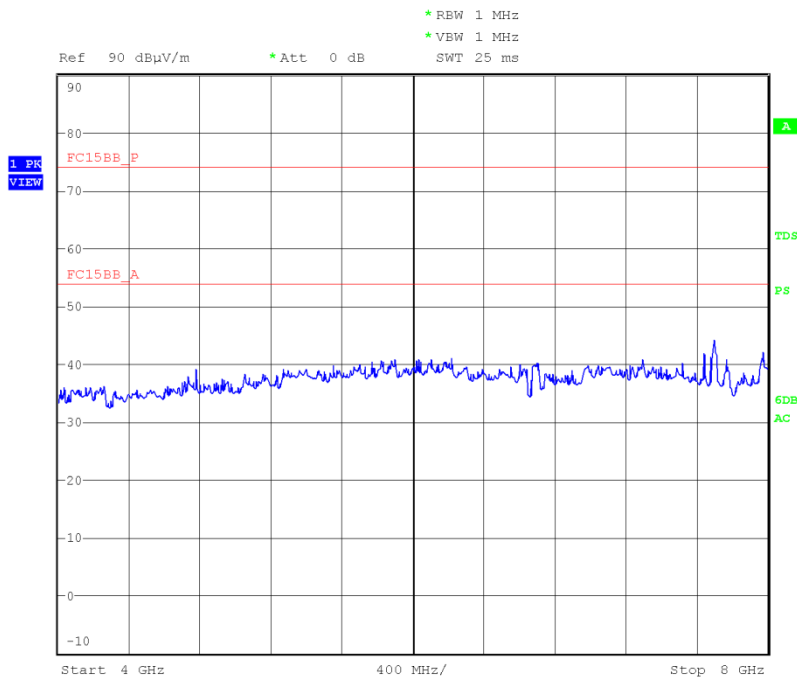
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
47.813	37.9	78.5	40.0	100	-2.1	21.5	76	1.00	Vertical
50.440	39.7	96.6	40.0	100	-0.3	3.4	66	1.00	Vertical
58.680	39.5	94.4	40.0	100	-0.5	5.6	37	1.00	Vertical
60.282	35.8	61.7	40.0	100	-4.2	88.3	61	1.03	Vertical
89.618	37.3	73.3	43.5	150	-6.2	76.7	73	1.08	Vertical
128.150	39.0	89.1	43.5	150	-4.5	60.9	299	1.00	Vertical



1 GHz to 4 GHz

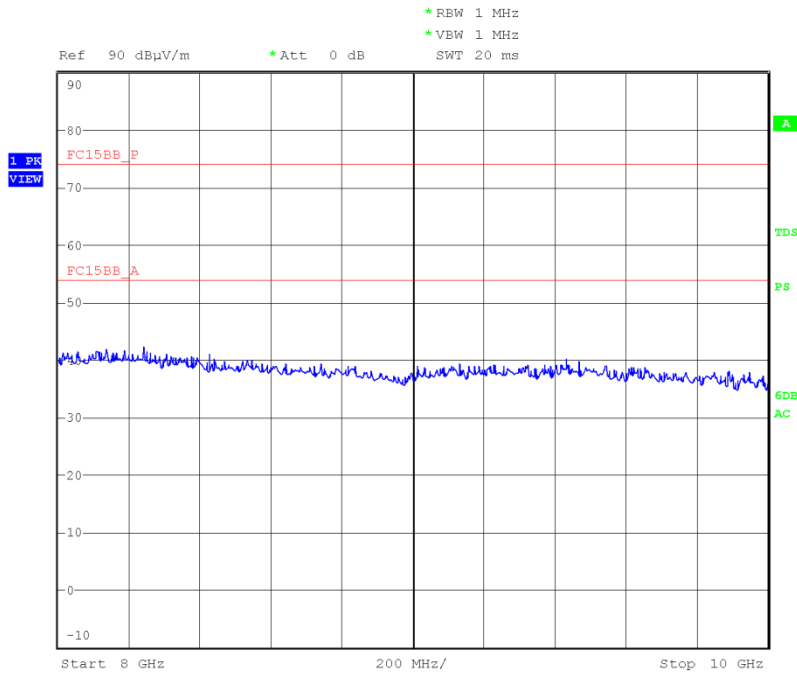


4 GHz to 8 GHz





8 GHz to 10 GHz





Product Service

SECTION 3

TEST EQUIPMENT USED



Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 and 2.2 – AC Line Conducted Emissions and Radiated Emissions					
Transient Limiter	Hewlett Packard	11947A	15	12	1-Dec-2012
3 phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	13-Jan-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012



Product Service

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Radiated Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
AC Line Conducted Emissions	± 3.2 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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