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Report On

FCC Testing of the
ip.access Ltd 243BA S16 3G AP (Bands 2 & 5)
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 24

COMMERCIAL-IN-CONFIDENCE

FCC ID: QGGIPA243BA

Document 75918692 Report 06 Issue 1

October 2012



Product Service

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ip.access Ltd 243BA S16 3G AP (Bands 2 & 5)
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PREPARED FOR

ip.access Ltd
Building 2020
Cambourne Business Park
Cambourne
Cambridge
CB23 6DW

PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

10 October 2012

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 2 and FCC CFR 47 Part 24. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler





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SECTION 1

REPORT SUMMARY

FCC Testing of the
ip.access Ltd 243BA S16 3G AP (Bands 2 & 5)
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 24



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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 243BA S16 3G AP (Bands 2 & 5) to the requirements of FCC CFR 47 Part 2 and FCC CFR 47 Part 24.

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)	243BA
Serial Number(s)	000295-0000106246 Containing board 000106147 243BA030XA
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2011) FCC CFR 47 Part 24 (2011)
Incoming Release Date	Application Form 23 August 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO30806 06 July 2012
Start of Test	22 September 2012
Finish of Test	24 September 2012
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4: 2003



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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 2 and FCC CFR 47 Part 24 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	Pt 2	Pt 24			
Transmit with POE					
2.1	-	24.232(c)	Effective Isotropic Radiated Power	Pass	
2.2	2.1051	24.238	Emission for Broadband PCS Equipment	Pass	
Transmit with 12V AC/DC Adapter					
2.1	-	24.232(c)	Effective Isotropic Radiated Power	Pass	
2.2	2.1051	24.238	Emission for Broadband PCS Equipment	Pass	



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	nano3G S16 Access Point	Identification/Part number	243BA (Bands 2 & 5)
Hardware Version	XA	Software Version	SR2.7.573.0.7749_PL1
Manufacturer	IP Access Ltd	Country of Origin	UK
FCC ID	QGGIPA243BA	Industry Canada ID	N/A
Technical description (a brief description of the intended use and operation):			
The 243BA S16 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	5 MHz (if channelized)
	1930 MHz to 1990 MHz		
Receiver Frequency range (if different)	824 MHz to 849 MHz	Channel spacing	5 MHz (if channelized)
	1850 MHz to 1910 MHz		
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 :	1987.6 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	0.1 W (Band 2)	Minimum transmitter power	N/A
	0.1 W (Band 5)	(if variable)	
<input checked="" type="checkbox"/>	Continuous transmission		
<input type="checkbox"/>	Intermittent transmission	State duty cycle
	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 Single Port Midspan	Identification/Part number	PD-3501G
Manufacturer	PowerDsine	Country of Origin	Taiwan
Model name/number	POE Active Splitter	Identification/Part number	MIT-06I-1209-IP
Manufacturer	MSTronic	Country of Origin	China
Model name/number	Switching Adapter	Identification/Part number	PSA15R-090PV
Manufacturer	Phihong	Country of Origin	Taiwan
<u>Extreme conditions:</u>			
Maximum temperature	40 °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 : 23rd August 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.



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a ip.access Ltd 243BA S16 3G AP (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 DC supply.

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.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
ip.access Ltd 243BA S16 3G AP (Bands 2 & 5)
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 24



2.1 EFFECTIVE ISOTROPIC RADIATED POWER

2.1.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.232(c)

2.1.2 Equipment Under Test and Modification State

243BA S/N: 000295-0000106246 - Modification State 0

2.1.3 Date of Test

22 September 2012 & 24 September 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

Measurements of the fundamental from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisation. The fundamental frequency was maximised by adjusting the antenna height, antenna polarisation and turntable azimuth. A peak detector was used with the trace set to max hold. The maximum result was recorded.

The EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result (ERP) was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

2.1.6 Environmental Conditions

Ambient Temperature	19.1°C
Relative Humidity	36.0%



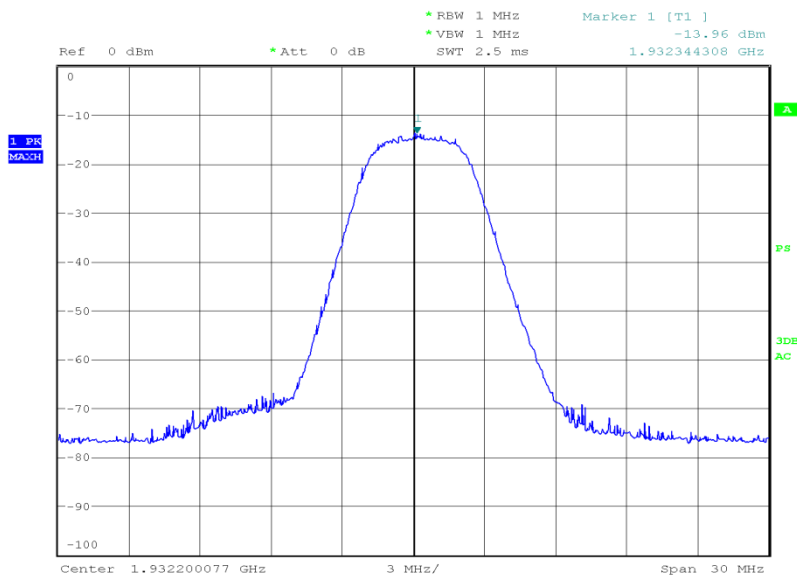
Product Service

2.1.7 Test Results

Transmit with 12V AC/DC Adapter

1932.40 MHz

Result (dBm)	Result (W)
32.86	1.932



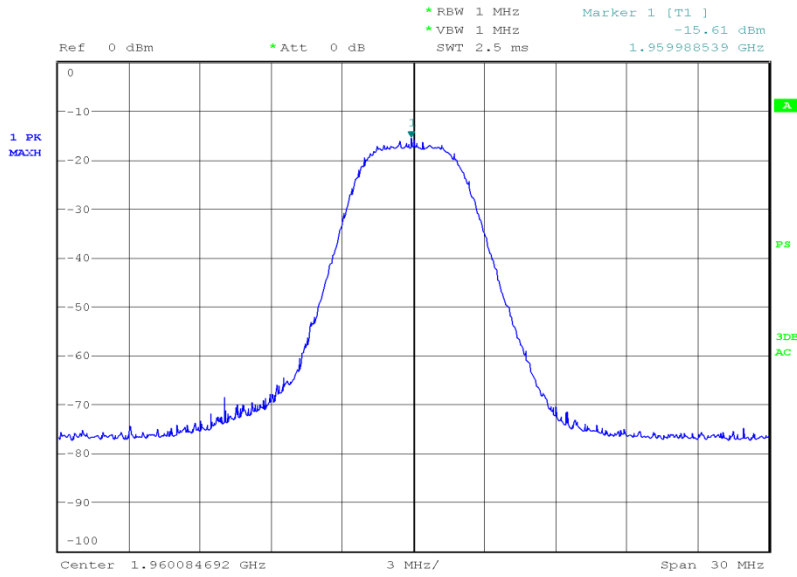
Date: 22.SEP.2012 22:37:10



Product Service

1960.00 MHz

Result (dBm)	Result (W)
31.39	1.377



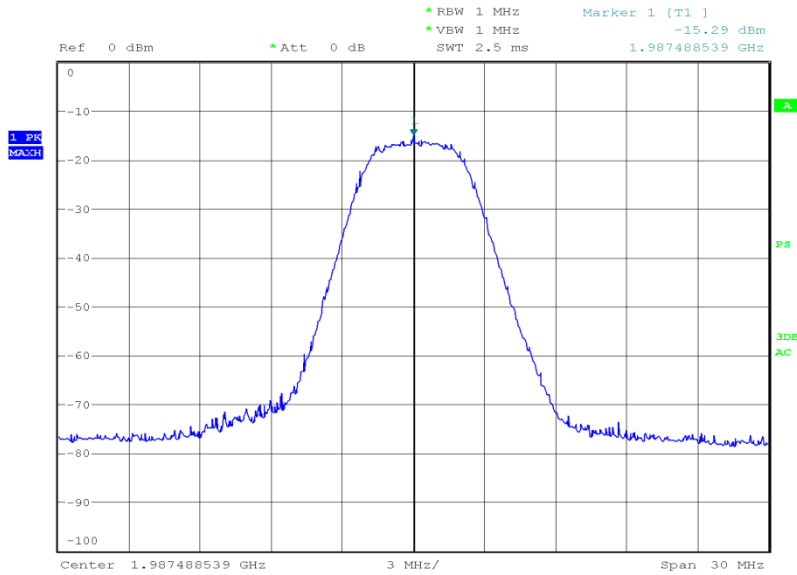
Date: 22.SEP.2012 22:43:22



Product Service

1987.60 MHz

Result (dBm)	Result (W)
31.32	1.355



Date: 22.SEP.2012 22:53:24

Limit Clause

Mobile – 7 W or 38.45 dBm
 Base Stations – 500 W or 57 dBm

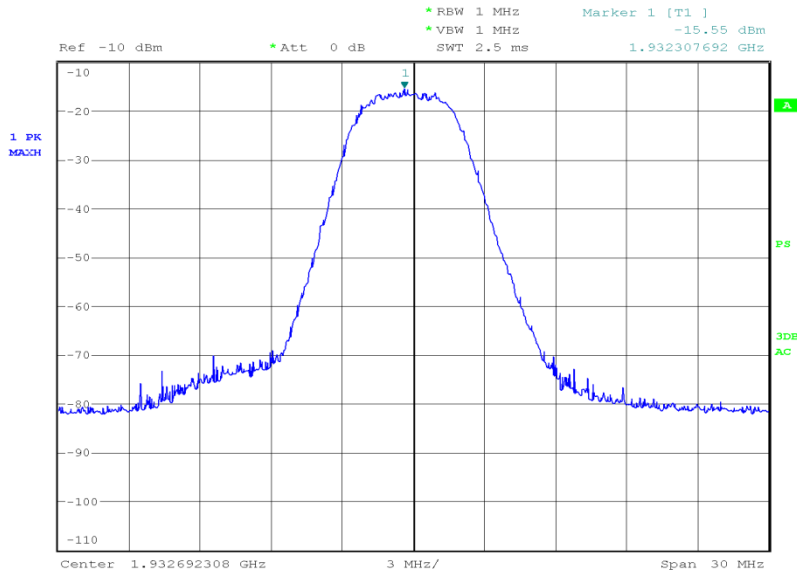


Product Service

Transmit with POE

1932.40 MHz

Result (dBm)	Result (W)
31.27	1.340



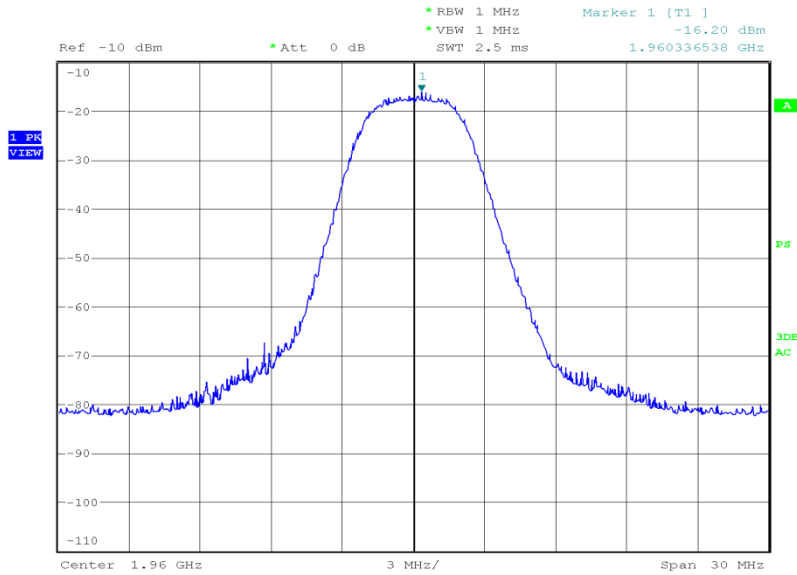
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Product Service

1960.00 MHz

Result (dBm)	Result (W)
30.80	1.202



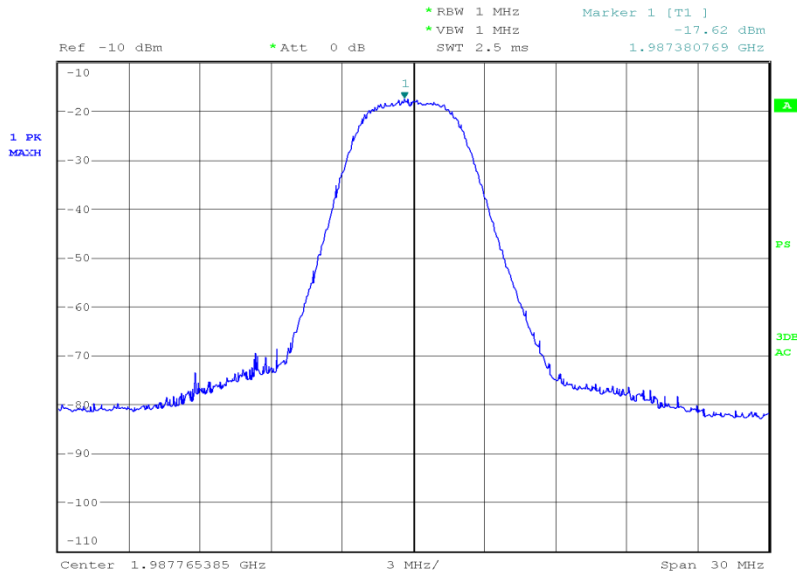
Date: 22.SEP.2012 21:20:04



Product Service

1987.60 MHz

Result (dBm)	Result (W)
28.99	0.793



Date: 22.SEP.2012 21:29:28

Limit Clause

Mobile – 7 W or 38.45 dBm
 Base Stations – 500 W or 57 dBm



2.2 EMISSION FOR BROADBAND PCS EQUIPMENT

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238

2.2.2 Equipment Under Test and Modification State

243BA S/N: 000295-0000106246 - Modification State 0

2.2.3 Date of Test

24 September 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 was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on full power on WCDMA modulation. The EUT was tested on bottom, middle and top channels at maximum power.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss. The measurements were performed at a 3m distance unless otherwise stated.

2.2.6 Environmental Conditions

Ambient Temperature	19.4 - 20.0°C
Relative Humidity	37.0 - 45.0%

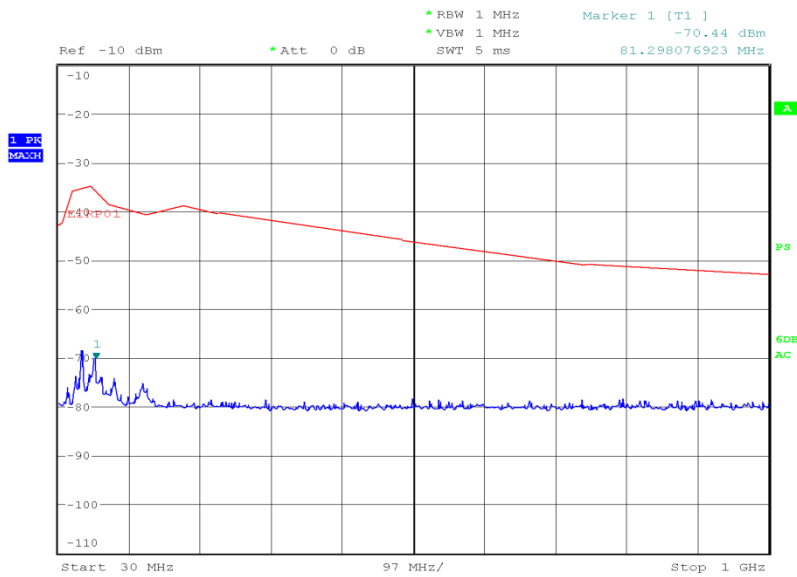


2.2.7 Test Results

Transmit with 12V AC/DC Adapter

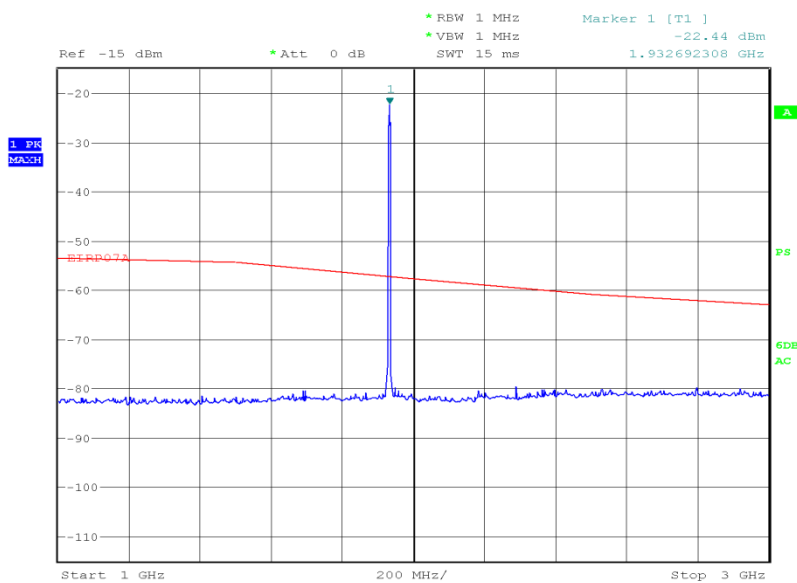
1932.40 MHz

30 MHz to 1 GHz



Date: 22.SEP.2012 20:13:31

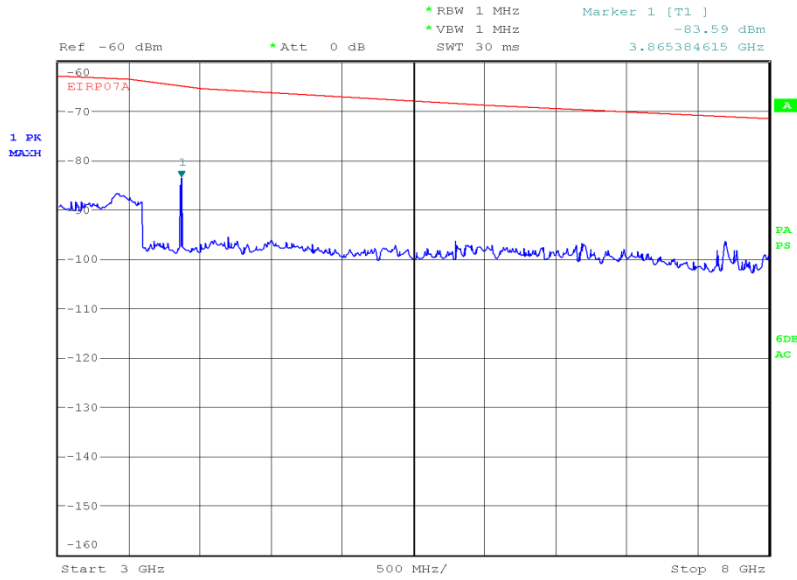
1 GHz to 3 GHz



Date: 23.SEP.2012 17:02:43

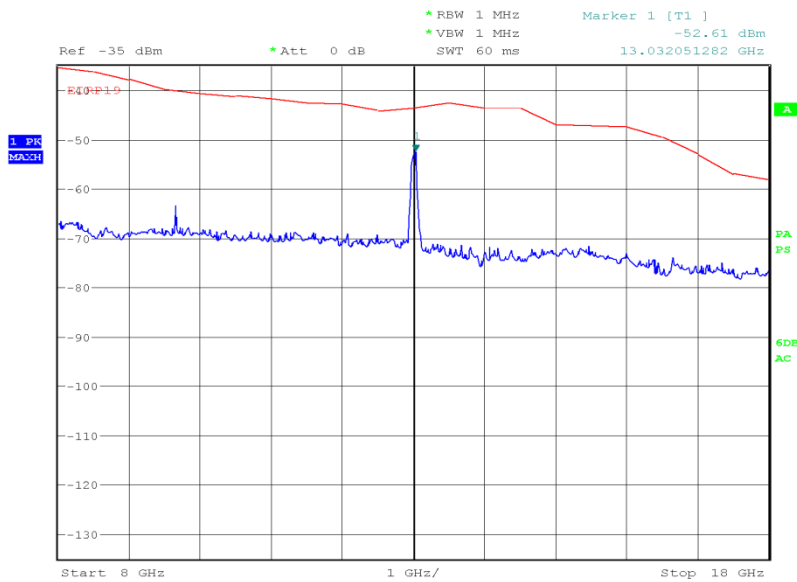


3 GHz to 8 GHz



Date: 23.SEP.2012 17:32:40

8 GHz to 18 GHz

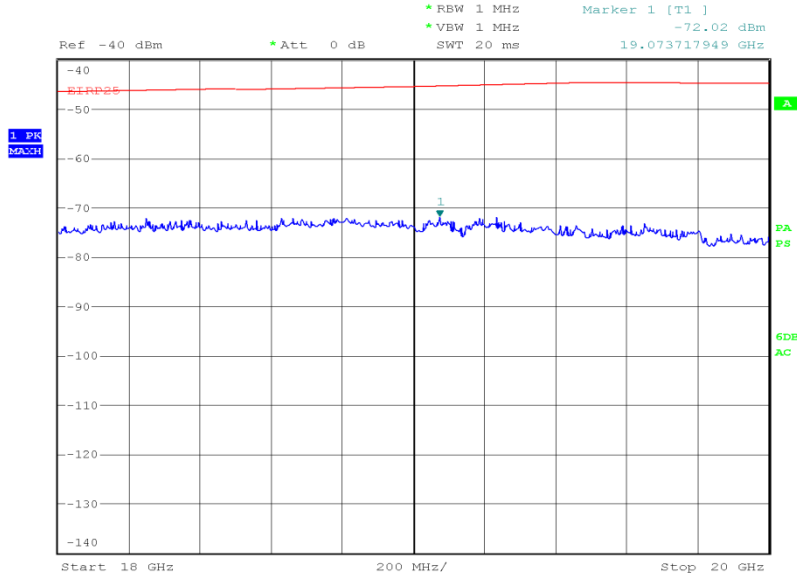


Date: 24.SEP.2012 18:12:39



Product Service

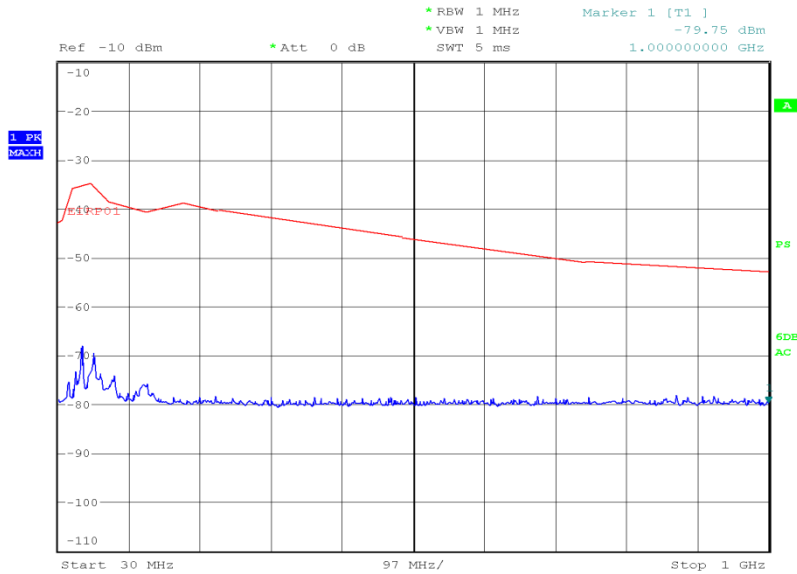
18 GHz to 20 GHz



Date: 24.SEP.2012 19:38:54

1960.00 MHz

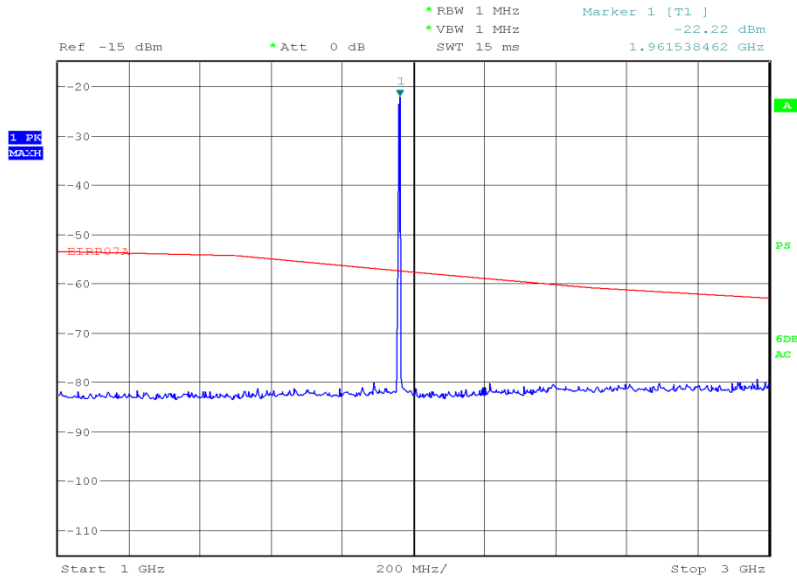
30 MHz to 1 GHz



Date: 22.SEP.2012 20:19:26

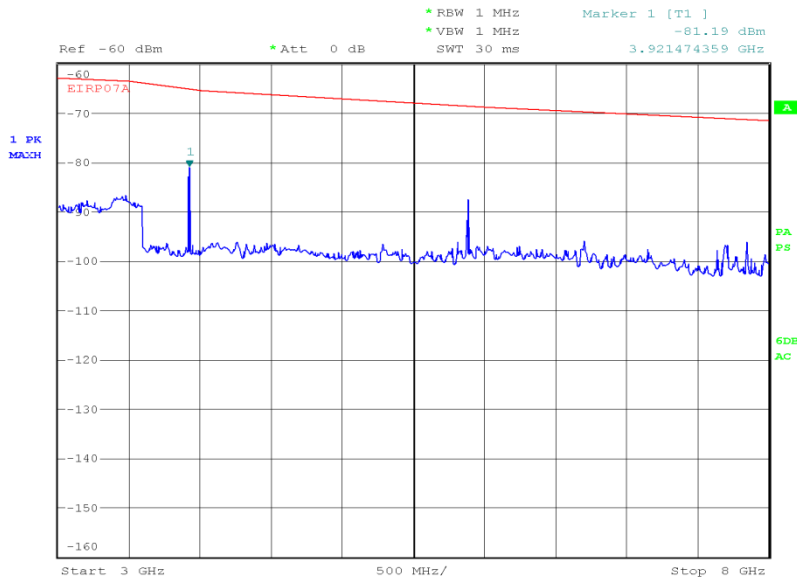


1 GHz to 3 GHz



Date: 23.SEP.2012 17:04:18

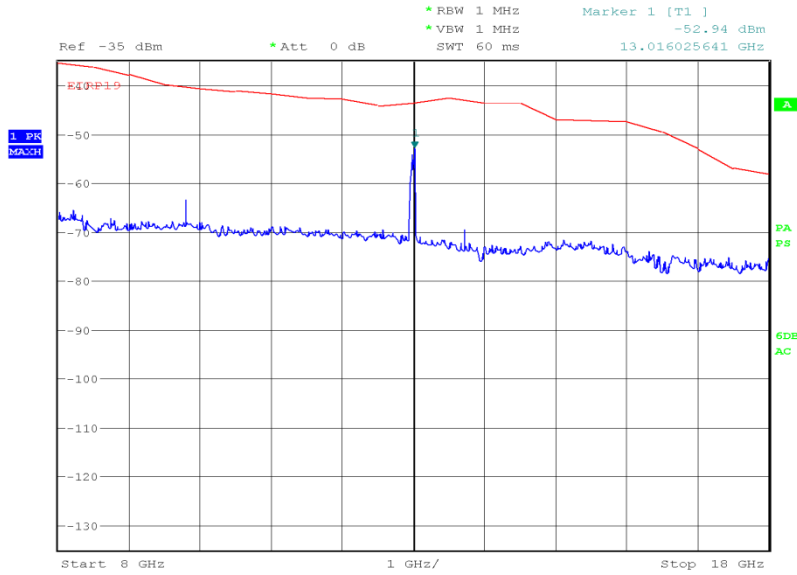
3 GHz to 8 GHz



Date: 23.SEP.2012 17:39:43

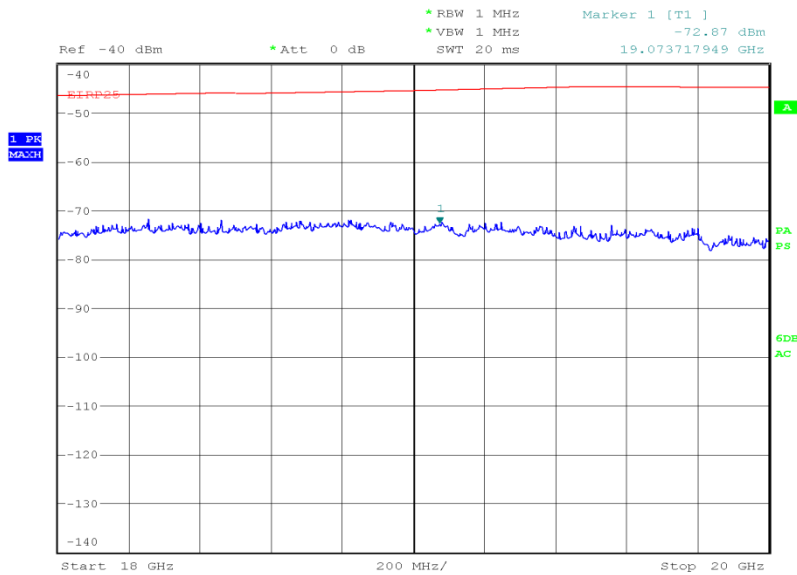


8 GHz to 18 GHz



Date: 24.SEP.2012 18:16:48

18 GHz to 20 GHz



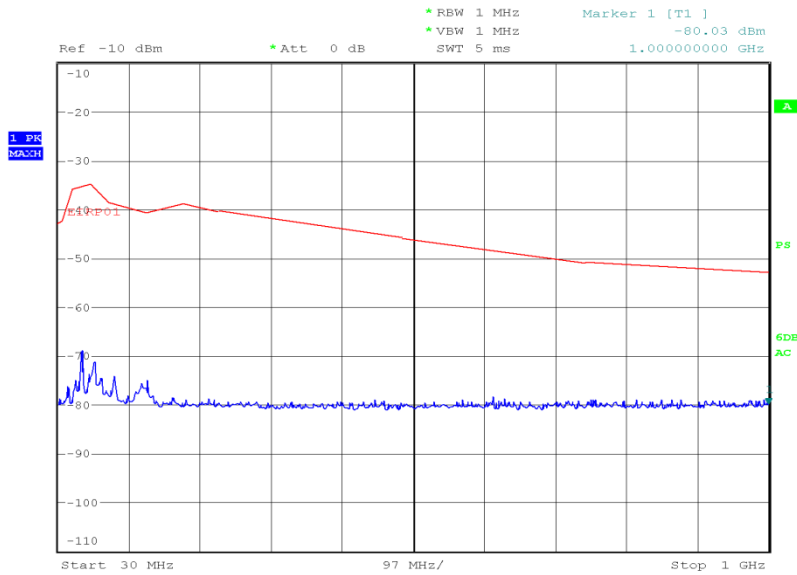
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Product Service

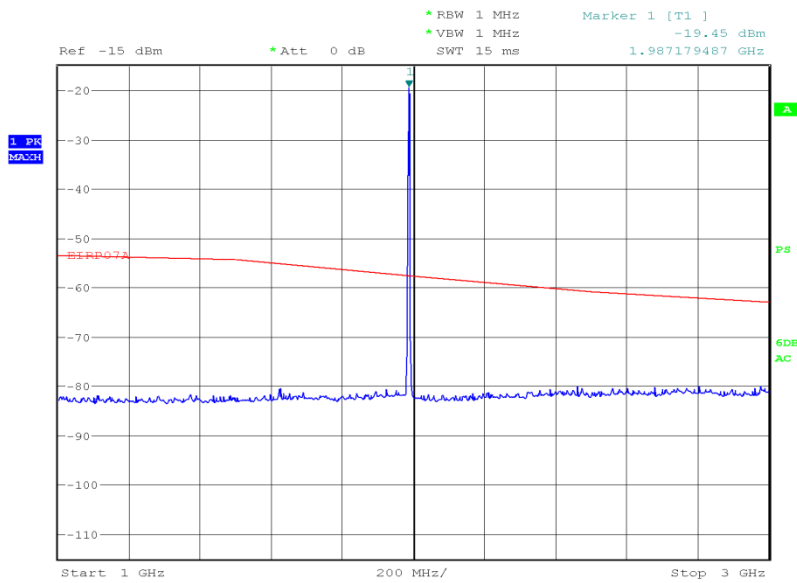
1987.60 MHz

30 MHz to 1 GHz



Date: 22.SEP.2012 20:21:13

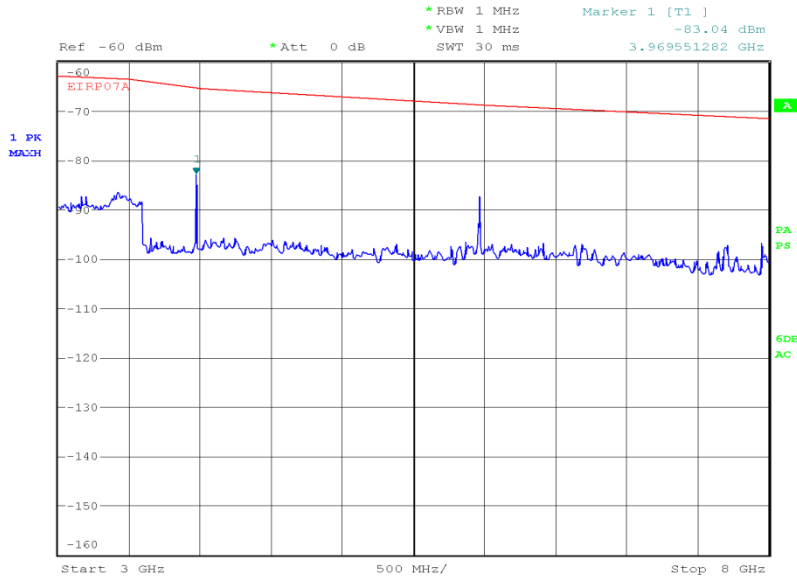
1 GHz to 3 GHz



Date: 23.SEP.2012 17:05:48

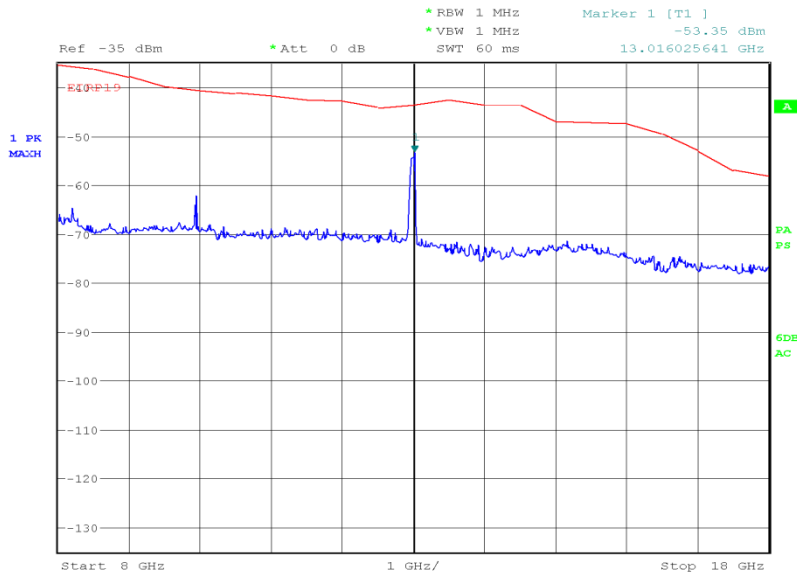


3 GHz to 8 GHz



Date: 23.SEP.2012 17:44:18

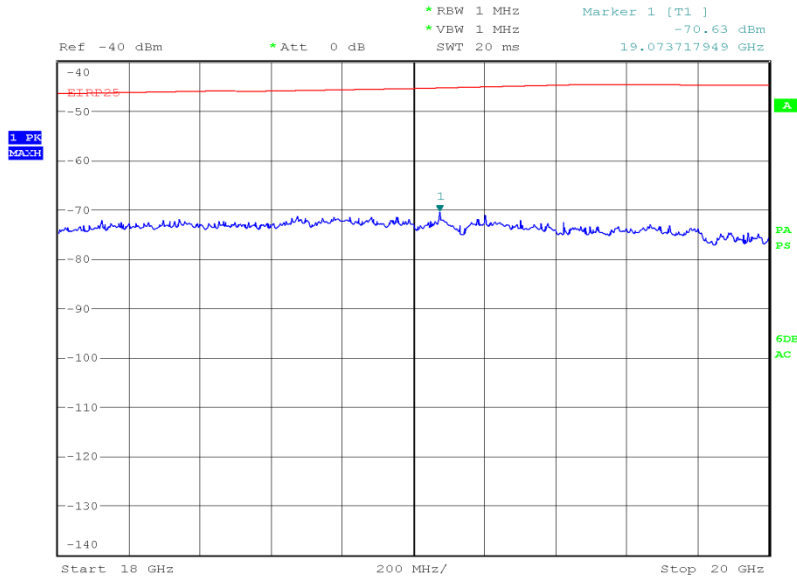
8 GHz to 18 GHz



Date: 24.SEP.2012 18:23:11



18 GHz to 20 GHz



Date: 24.SEP.2012 19:36:50

Limit Clause

43+10log(P) or -13 dBm

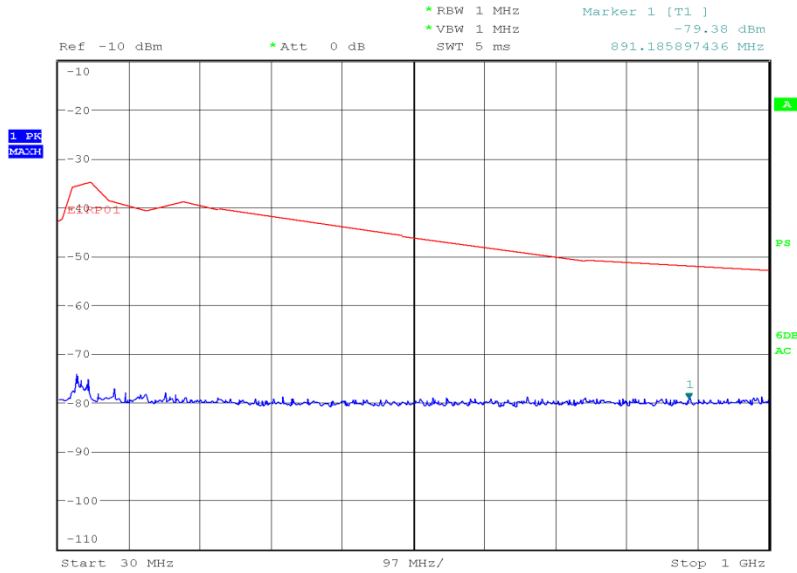


Product Service

Transmit with POE

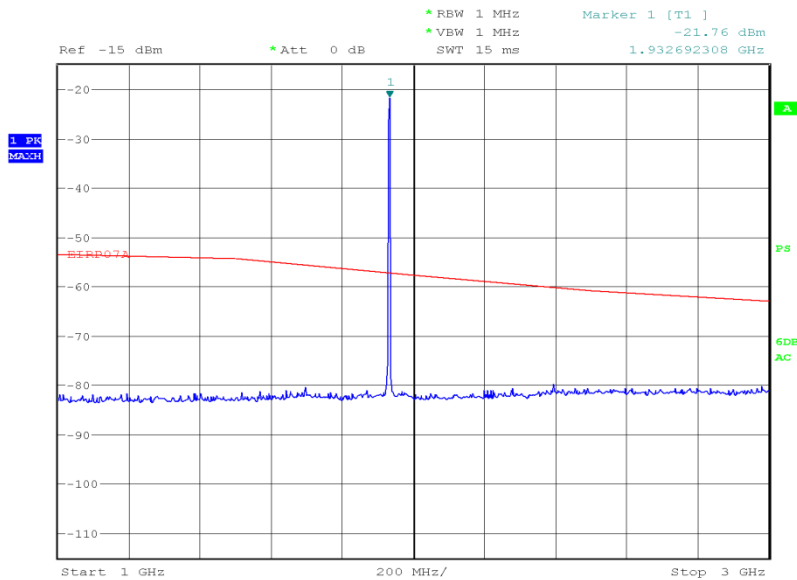
1932.40 MHz

30 MHz to 1 GHz



Date: 22.SEP.2012 20:52:07

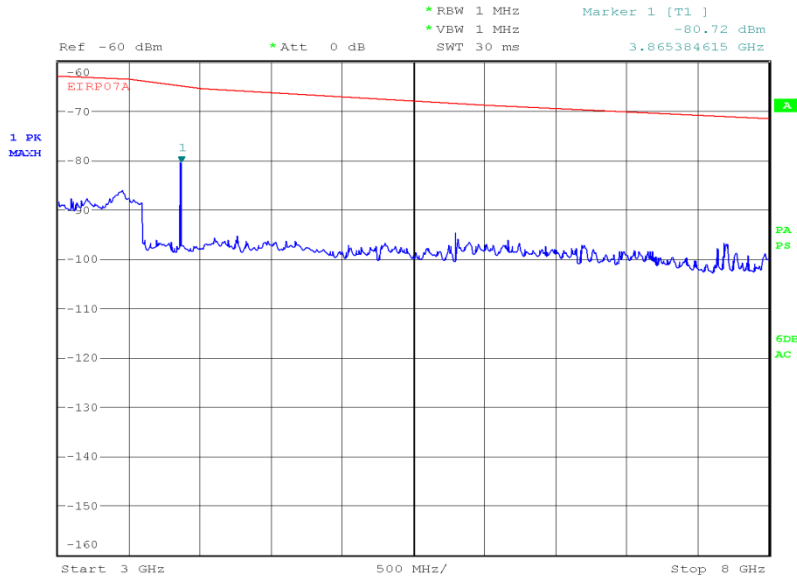
1 GHz to 3 GHz



Date: 23.SEP.2012 18:36:20

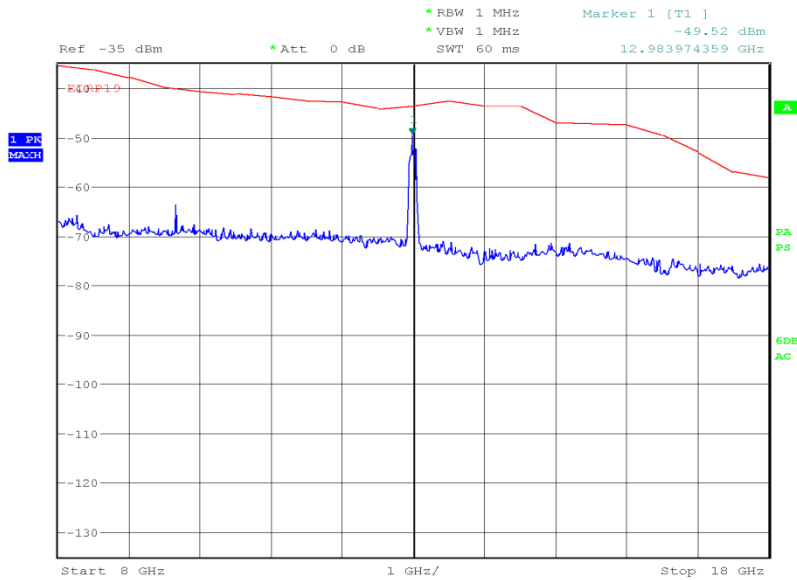


3 GHz to 8 GHz



Date: 23.SEP.2012 18:03:36

8 GHz to 18 GHz

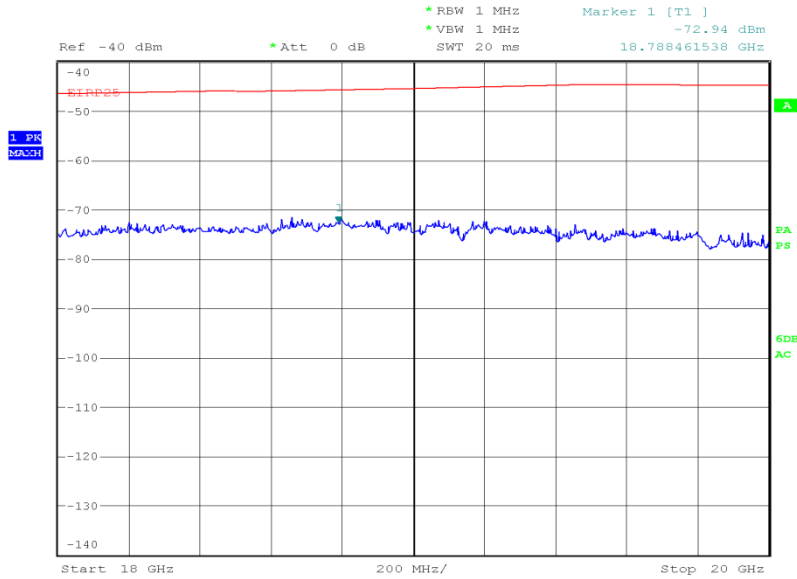


Date: 24.SEP.2012 17:18:35



Product Service

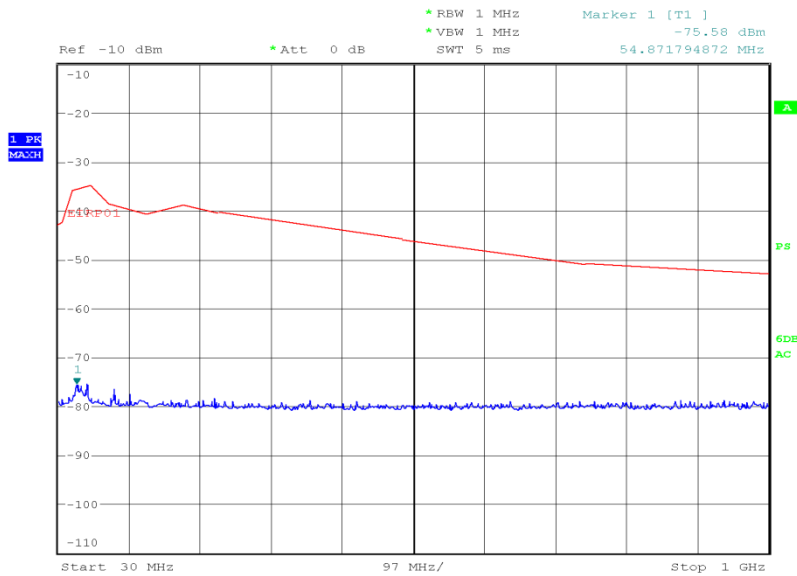
18 GHz to 20 GHz



Date: 24.SEP.2012 19:47:59

1960.00 MHz

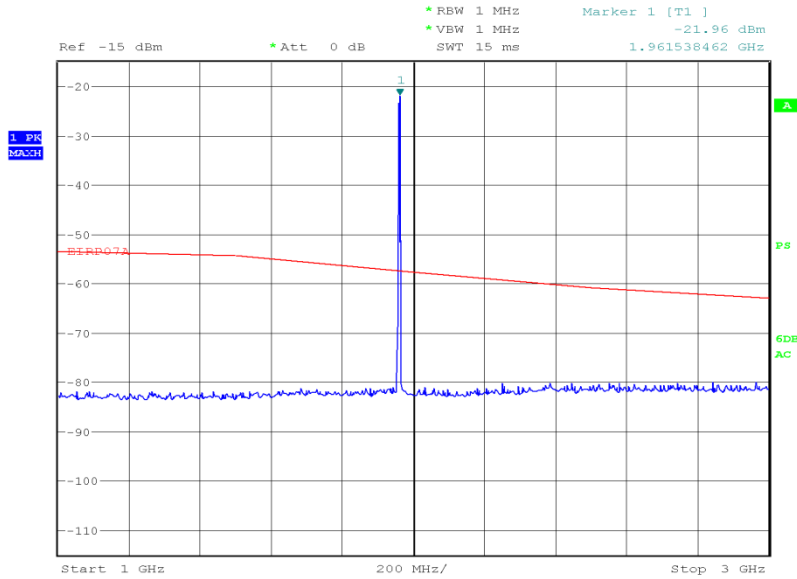
30 MHz to 1 GHz



Date: 22.SEP.2012 20:54:24

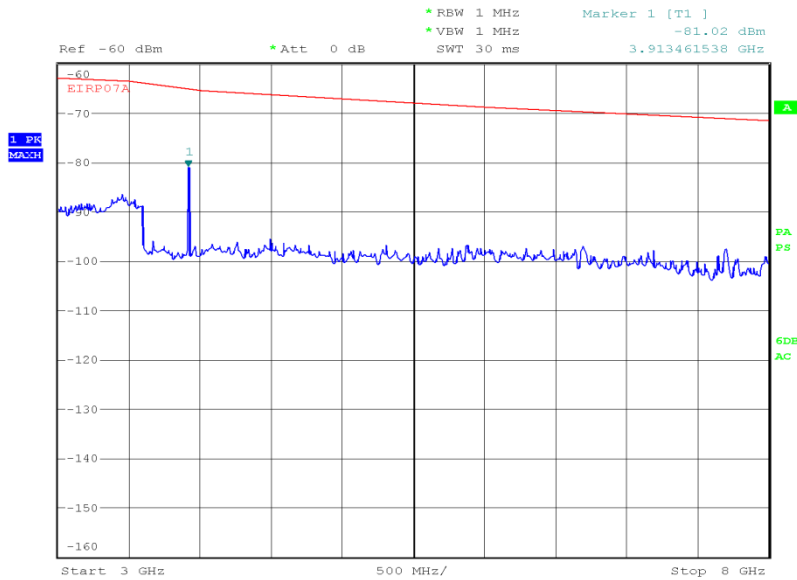


1 GHz to 3 GHz



Date: 23.SEP.2012 18:34:53

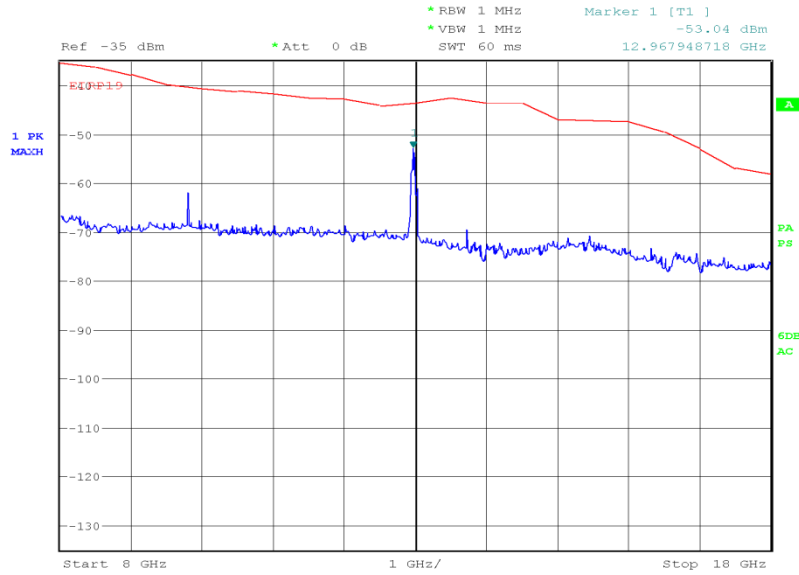
3 GHz to 8 GHz



Date: 23.SEP.2012 18:39:51

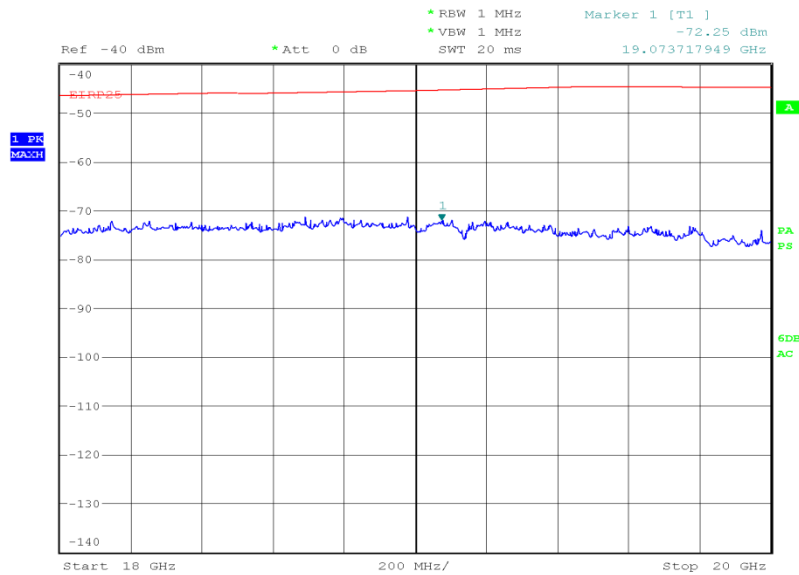


8 GHz to 18 GHz



Date: 24.SEP.2012 17:23:44

18 GHz to 20 GHz



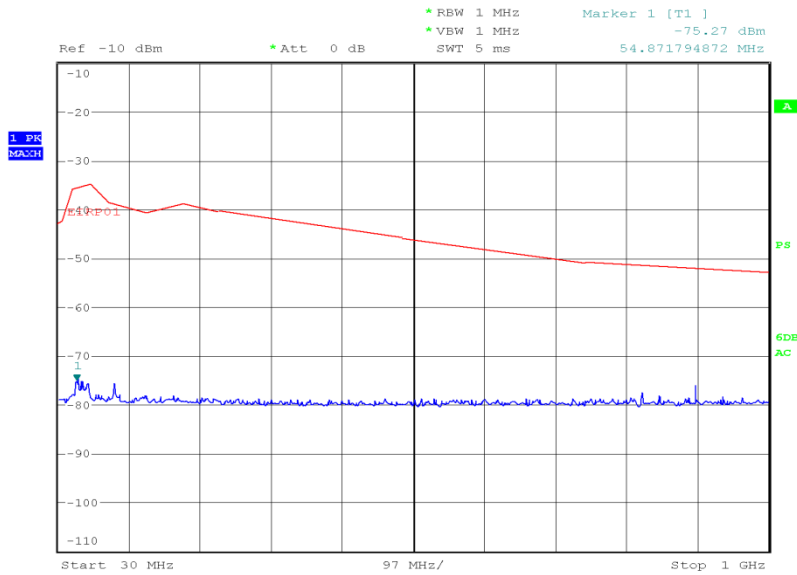
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Product Service

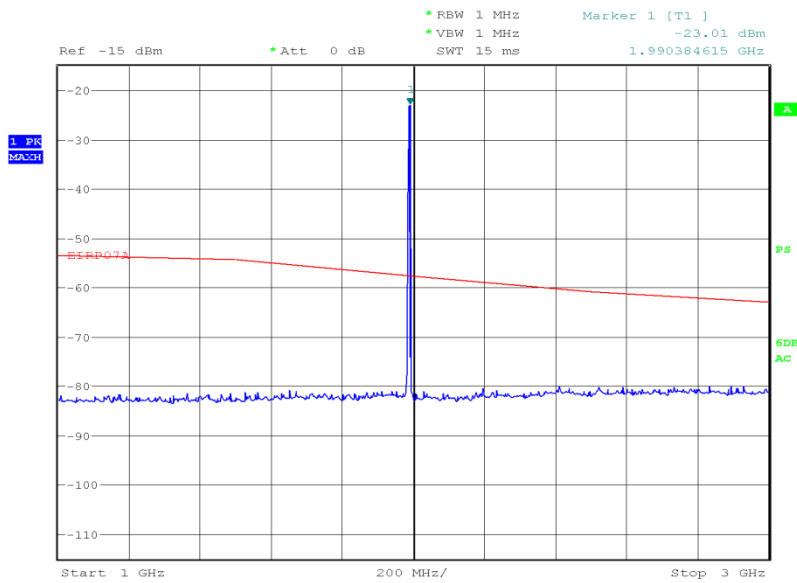
1987.60 MHz

30 MHz to 1 GHz



Date: 22.SEP.2012 21:01:23

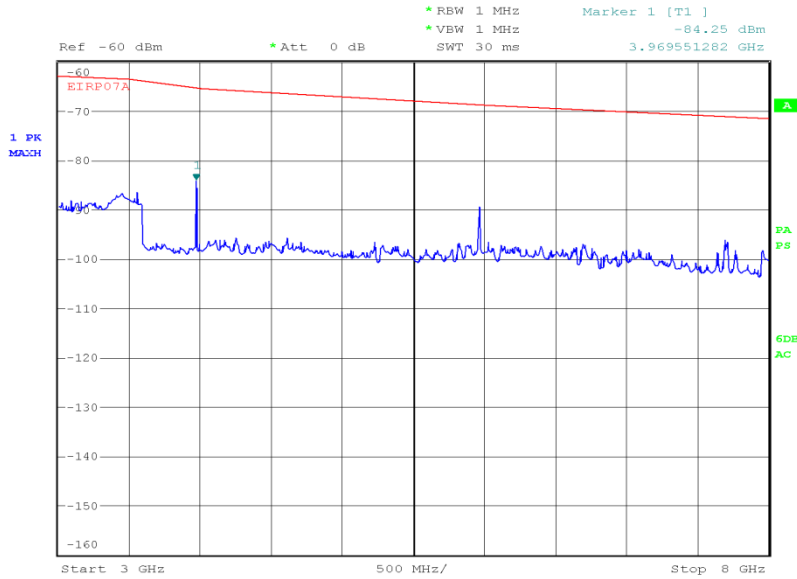
1 GHz to 3 GHz



Date: 23.SEP.2012 18:32:58

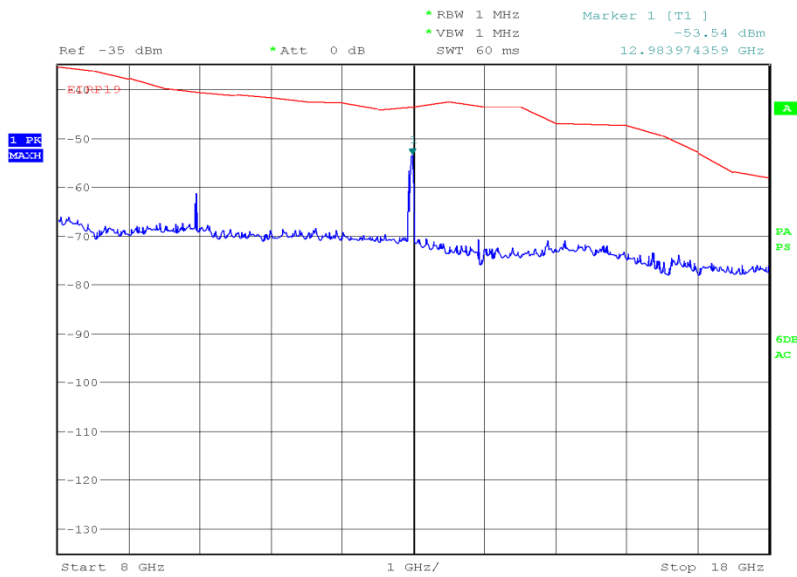


3 GHz to 8 GHz



Date: 23.SEP.2012 18:21:24

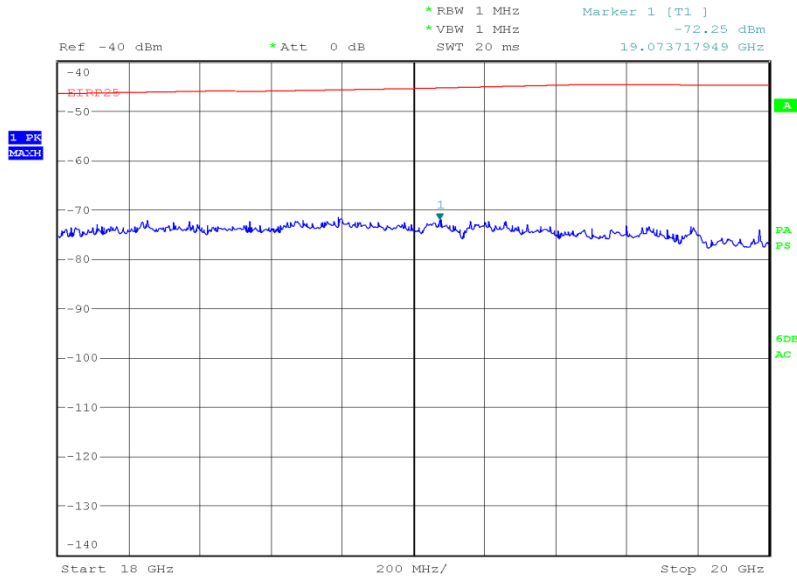
8 GHz to 18 GHz



Date: 24.SEP.2012 17:28:29



18 GHz to 20 GHz



Date: 24.SEP.2012 19:45:37

Limit Clause

43+10log(P) or -13 dBm



Product Service

SECTION 3

TEST EQUIPMENT USED



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- Effective Isotropic Radiated Power					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
Section 2.2 - R Emission for Broadband PCS Equipment					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	27-Sep-2013
Pre-Amplifier	Phase One	PS04-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	16-Apr-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	-	TU

TU – Traceability Unscheduled



Product Service

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Emission for Broadband PCS Equipment	± 3.08 dB
Effective Isotropic Radiated Power	± 3.08 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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