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Report On

FCC Testing of the
Covidence A/S Oculus

In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 90

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FCC ID: SQ7-OTX-64, SQ7-OTX-32 and SQ7-OTX-16

Document 75922251 Report 02 Issue 2

August 2013



Product Service

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COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the
Covidence A/S Oculus
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 90

Document 75922251 Report 02 Issue 2

August 2013

PREPARED FOR

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Mark Jenkins
Authorised Signatory

DATED

22 August 2013

This report has been up-issued to Issue 2 to correct typographical errors in section 2.5.7.

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 90. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler

M Hardy

A Guy



S Bennett



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Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Covidence A/S Oculus
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 90



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Covidence A/S Oculus to the requirements of FCC CFR 47 Part 2 and FCC CFR 47 Part 90.

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	Covidence A/S
Model Number(s)	Oculus TX, 64GB
Serial Number(s)	C1009814
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 2 (2012) FCC CFR 47 Part 90 (2012)
Incoming Release Date	Application Form 16 April 2013
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	Paid in advance Not Applicable
Start of Test	24 April 2013
Finish of Test	27 June 2013
Name of Engineer(s)	G Lawler M Hardy A Guy S Bennett
Related Document(s)	ANSI C63.4: 2009



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 90 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	Pt 2	Pt 90			
Transmit - 12.5 kHz					
2.1	2.1046	90.205	Effective Radiated Power	Pass	
2.2	2.1047	90.207	Type of Emissions	Pass	
2.3	2.1049	90.209	Bandwidth Limitations	Pass	
2.4	2.1051	90.210	Emission Mask	Pass	
2.5	2.1046	90.210	Power and Antenna Height Limits	Pass	
2.6	2.1055	90.213	Frequency Stability	Pass	
2.7	-	90.214	Transient Frequency Behaviour	Pass	
Transmit - 12.5 kHz (AC Supply)					
2.6	2.1055	90.213	Frequency Stability	Pass	



1.3 APPLICATION FORM

APPLICANT'S DETAILS	
COMPANY NAME :	Covidence A/S.....
ADDRESS :	Strandvejen 2A.....
	8410 Roende.....
	Denmark.....
NAME FOR CONTACT PURPOSES :	Jimmi Hansen.....
TELEPHONE NO: +45 88809000.....	FAX NO:
	E-MAIL: jmh@covidence.com

EQUIPMENT INFORMATION	
Model name/number Oculus TX, 64GB.	
Identification/Part number 11002720	
There are following versions with the same BOM list:	
Oculus TX, 16GB. Part number 11002620	
Oculus TX, 32GB memory., Part number 11002320	
Hardware Version	XANDRA_V3C.....
Manufacturer	Covidence A/S....
FCC ID	
Software Version	1.17.....
Country of Origin	Denmark.....
Industry Canada ID	
Technical description (a brief description of the intended use and operation):	
Oculus is a digital audio and video recorder. The version with built-in audio transmitter is a special version of the standard Oculus.	
<u>Supply Voltage:</u>	
☐ AC mains	State AC voltage V and AC frequency Hz
☒ DC (external)	State DC voltage: 5-15V and DC current: Less than 0.5 A
☒ DC (internal)	State DC voltage: 3V and Battery type: 2x Energizer L92.
<u>Frequency characteristics:</u>	
Transmitter Frequency range 150 MHz to 174 MHz	
Channel spacing 12.5kHz and 15kHz (if channelized)	
Receiver Frequency range MHz to MHz	Channel spacing (if channelized)
(if different)	
Designated test frequencies:	
Bottom: MHz Middle: MHz	Top: MHz
Intermediate Frequencies : MHz	
Highest Internally Generated Frequency : 14.4 MHz	
<u>Power characteristics:</u>	
Maximum transmitter power 0.250 W	Minimum transmitter power 0.200 W (if variable)
☒ Continuous transmission	State duty cycle
☐ Intermittent transmission	
If intermittent, can transmitter be set to continuous transmit test mode? Y/N	
<u>Antenna characteristics:</u>	
☒ Antenna connector	State impedance: 50 ohm
☐ Temporary antenna connector	State impedance ohm
☐ Integral antenna Type	State gain dBi
☒ External Antenna Type	State gain: 0 dBi
<u>Modulation characteristics:</u>	
☐ Amplitude	[] Other
☒ Frequency	Details: (GMSK, QSPK etc)
☐ Phase	
Can the transmitter operate un-modulated? Yes	
ITU Class of emission: NBFM Voice – Designator: 12K5F3	



Product Service

<u>Power Supply</u>			
Model name/number	Power Supply, 100-240VAC -> 6.0VDC/800mA, US		
Identification/Part number	16100503		
Manufacturer	Friwo	Country of Origin:	Germany
<u>Power Supply</u>			
Model name/number	Power Supply, 100-240VAC -> 6.0VDC/800mA, EU		
Identification/Part number	16100501		
Manufacturer	Friwo	Country of Origin:	Germany
<u>Battery</u>			
Model name/number	AAA Lithium-batteries Energizer L92		
Identification/Part number	16110100.....		
Manufacturer	Energizer.....	Country of Origin	USA.....
<u>Ancillaries (if applicable)</u>			
Model name/number		Identification/Part number	
Manufacturer		Country of Origin	
<u>Extreme conditions:</u>			
Maximum temperature	55 °C	Minimum temperature	-15 °C
Maximum supply voltage:	External DC= 15 V Minimum supply voltage: Internal DC= 3V		

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 TUV
 Name : Jimmi Hansen
 Position held : CEO
 Date : 16 April 2013



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Covidence A/S Oculus. 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 120 V AC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: C1009814			
0	As supplied by manufacturer.	N/A	N/A
1	Manufacturer mod to fix Emission Mask failure	Manufacturer	09 May 2013
2	Modification by manufacturer to improve radiated spurious emissions	Manufacturer	10 June 2013

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Covidence A/S Oculus
In accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 90



Product Service

2.1 EFFECTIVE RADIATED POWER

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 90, Clause 90.205

2.1.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 0

2.1.3 Date of Test

19 May 2013

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 Polarisations. 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	20.3°C
Relative Humidity	38.0%



Product Service

2.1.7 Test Results

Transmit - 12.5 kHz

3.0 V DC Supply

Frequency	Result (dBm)	Result (W)
150.0125 MHz	17.46	0.055
162.000 MHz	12.34	0.017
173.9875 MHz	13.30	0.021

Limit

No limit specified for portable devices in the 150-174 MHz band.

The output power shall not exceed by more than 20% the manufacturers rated output power as defined in 90.205(s)



Product Service

2.2 TYPE OF EMISSIONS

2.2.1 Specification Reference

FCC CFR 47 Part 2 , Clause 2.1047
FCC CFR 47 Part 90, Clause 90.207

2.2.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 0

2.2.3 Date of Test

29 April 2013

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

The FM demodulated output was measured on a FSQ Spectrum Analyser.

Deviation measurements were made with the audio input level set to 90mV (typical input level to give 50% deviation) over a range of 100Hz to 5kHz.

Measurements were repeated at input levels : 90mV+16dB, 90mV+20dB and 90mV+23dB. The audio freq response was plotted as a function of Audio input freq against output deviation.

2.2.6 Environmental Conditions

Ambient Temperature	25.0°C
Relative Humidity	23.3%

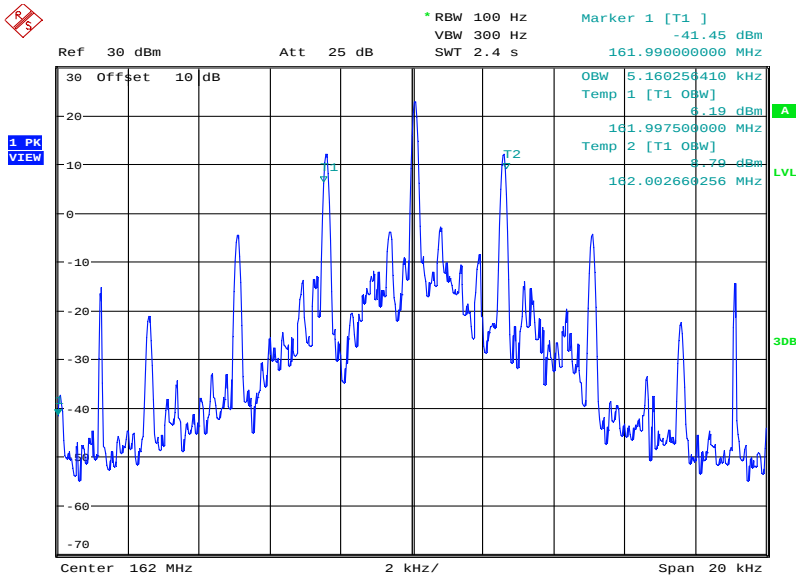


Product Service

2.2.7 Test Results

Transmit - 12.5 kHz

3.0 V DC Supply



Date: 24.APR.2013 15:49:57



Product Service

2.3 BANDWIDTH LIMITATIONS

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 90, Clause 90.209

2.3.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 0

2.3.3 Date of Test

24 April 2013

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The EUT was modulated with audio frequencies from 300Hz to 3kHz at a constant level to establish which frequency gave the maximum deviation response (2100Hz). At this frequency the audio level was adjusted to give 1.25kHz deviation (50%). This level was then increased by 16dB. The audio frequency was then set to 2500Hz. The 99% OBW was measured on B M and T channels.

2.3.6 Environmental Conditions

Ambient Temperature	22.0°C
Relative Humidity	43.0%



Product Service

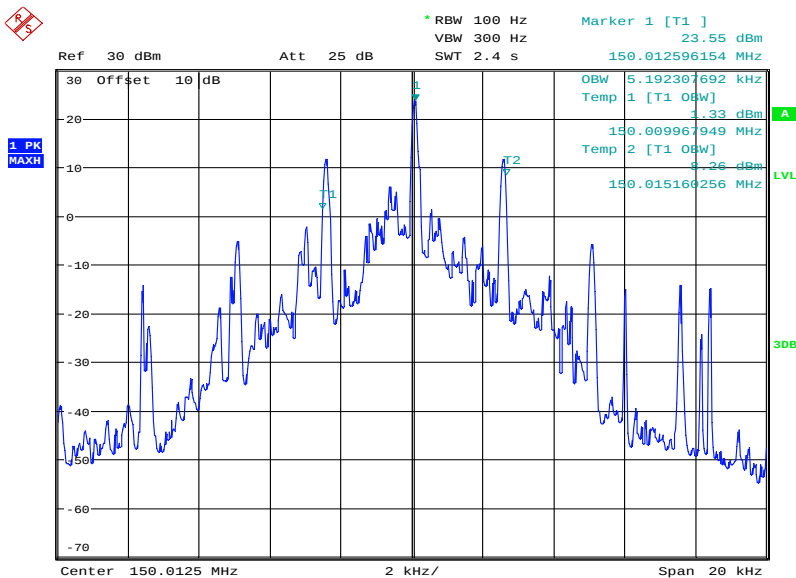
2.3.7 Test Results

Transmit - 12.5 kHz

3.0 V DC Supply

Frequency (MHz)	Occupied Bandwidth (kHz)
150.0125 MHz	5.19
162.000 MHz	5.16
173.9875 MHz	5.19

150.0125 MHz

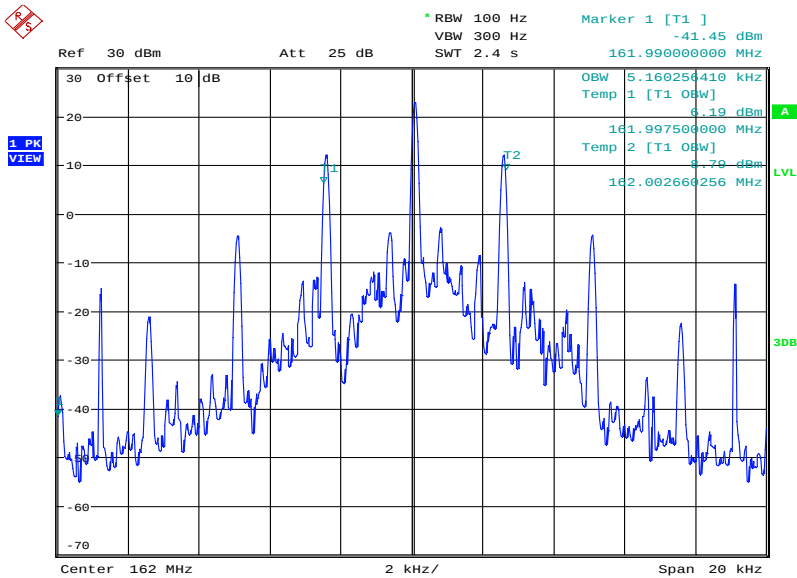


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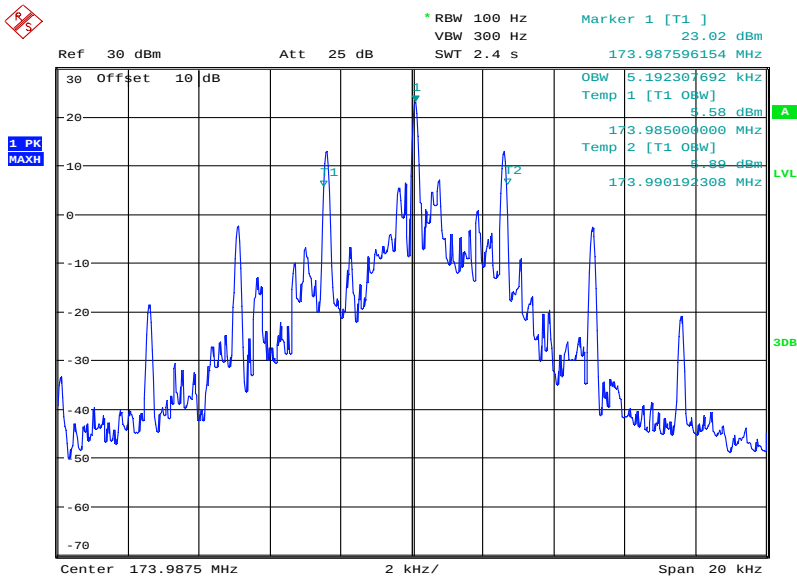
Product Service

162.000 MHz



Date: 24.APR.2013 15:49:57

173.9875 MHz



Date: 24.APR.2013 15:54:18

Limit

11.25 kHz



Product Service

2.4 EMISSION MASK

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 90, Clause 90.210

2.4.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 2

2.4.3 Date of Test

19 May 2013, 12 June 2013 & 14 June 2013

2.4.4 Test Equipment Used

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

2.4.5 Test Procedure

Using a spectrum analyser and attenuator(s), the output power of the EUT was measured at the antenna terminals.

The EUT supports FM transmission and was tested in this mode of operation.

2.4.6 Environmental Conditions

Ambient Temperature	20.5 - 22.3°C
Relative Humidity	32.5 - 46.4%



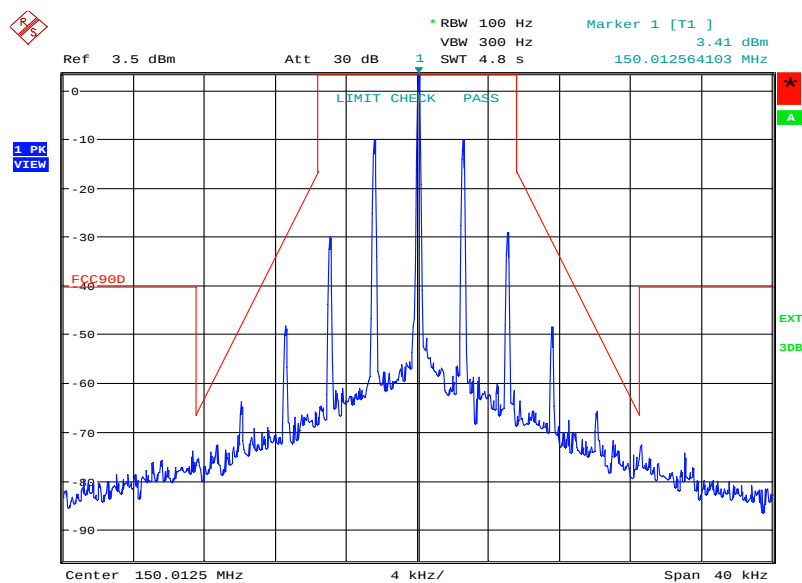
2.4.7 Test Results

Transmit - 12.5 kHz

3.0 V DC

Conducted

150.0125 MHz

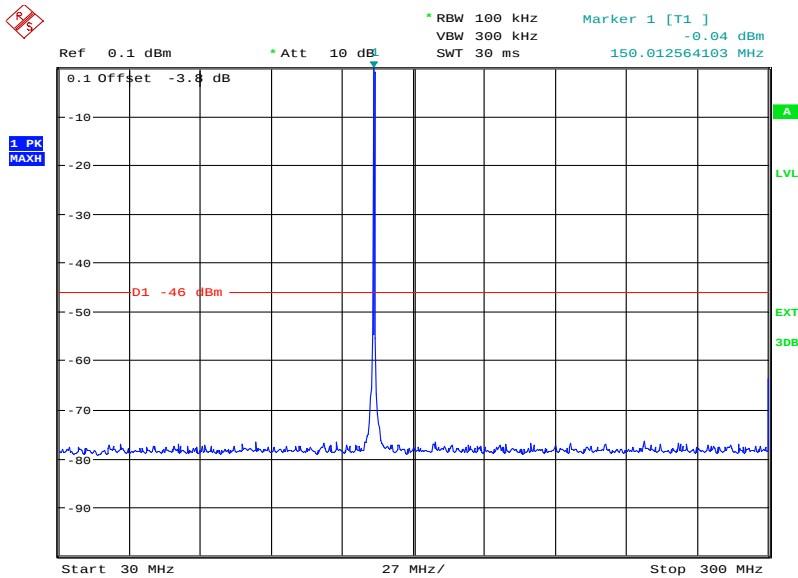


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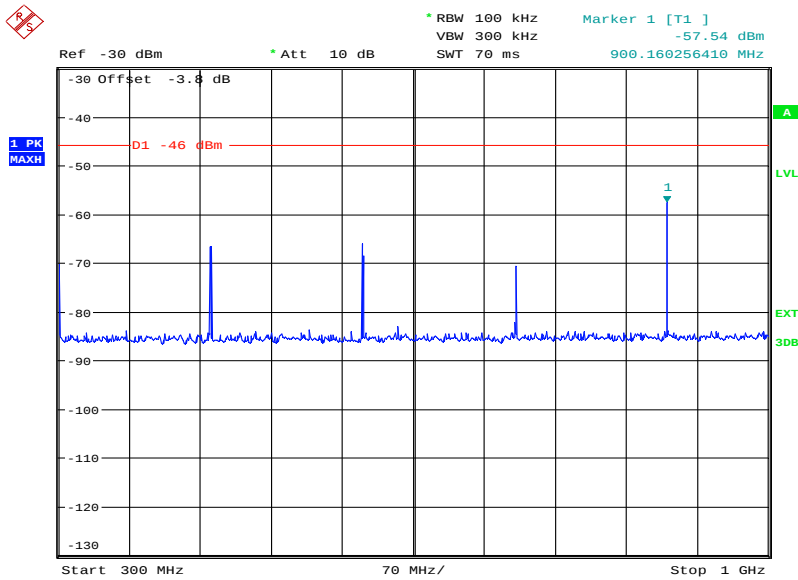
Product Service

30 MHz to 300 MHz



Date: 13.JUN.2013 10:33:38

300 MHz to 1 GHz

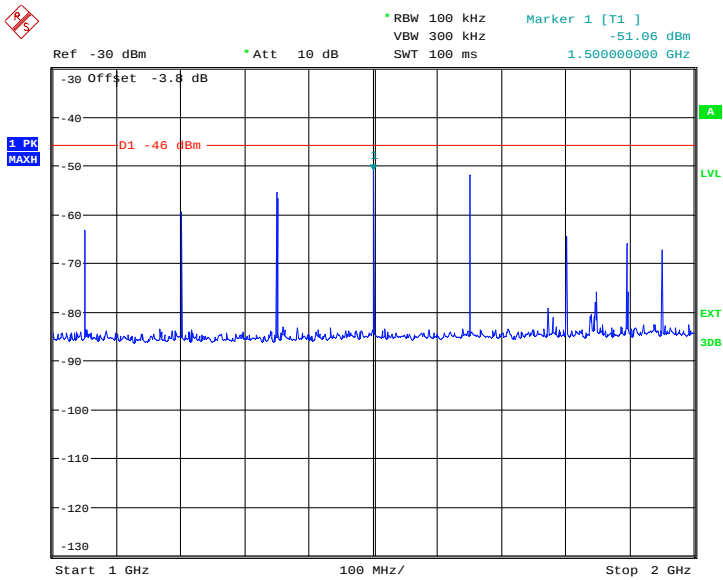


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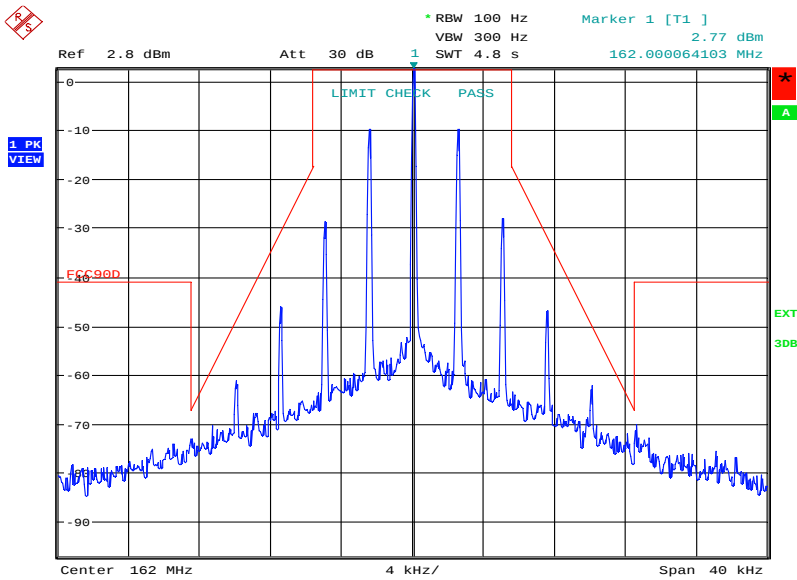
Product Service

1 GHz to 2 GHz



Date: 13.JUN.2013 10:38:37

162.000 MHz

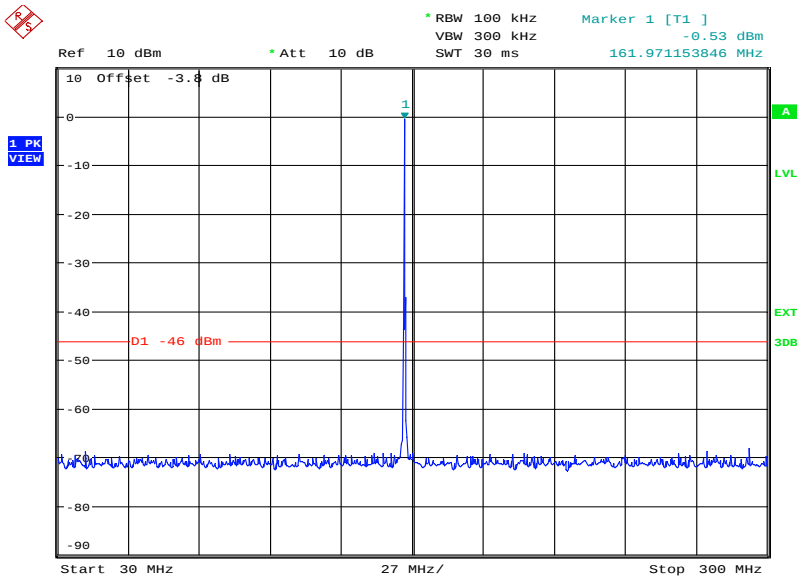


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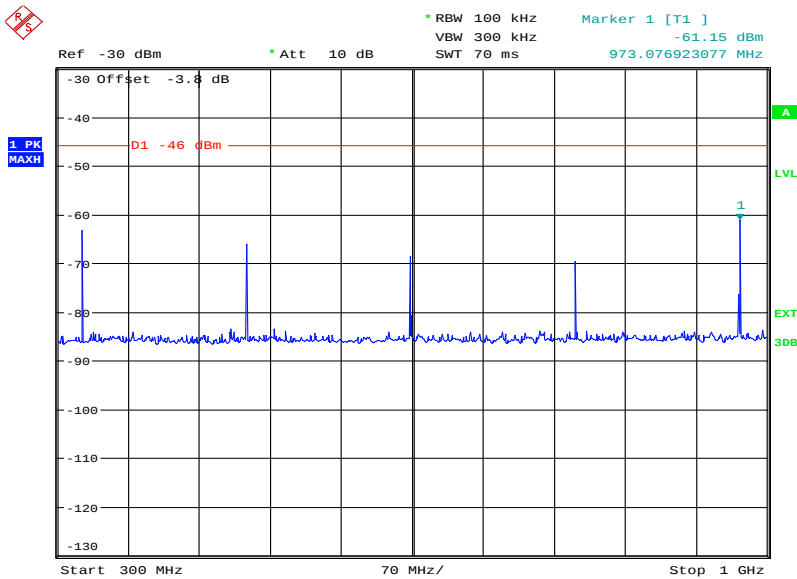
Product Service

30 MHz to 300 MHz



Date: 13.JUN.2013 11:01:51

300 MHz to 1 GHz

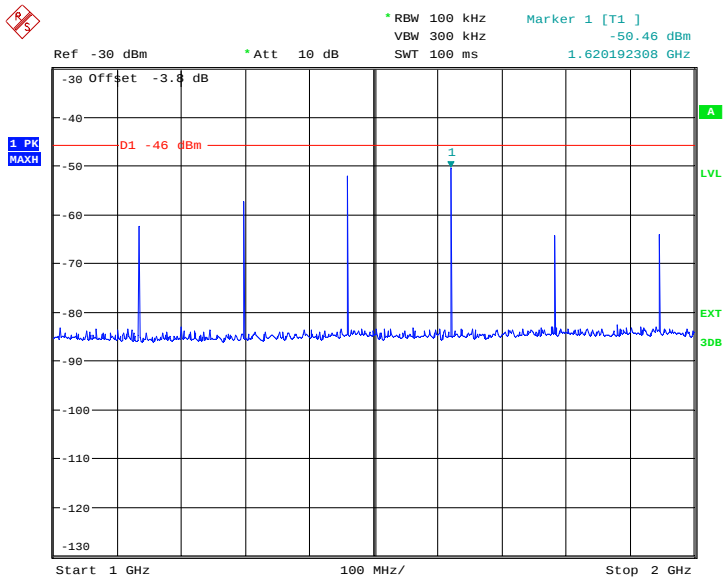


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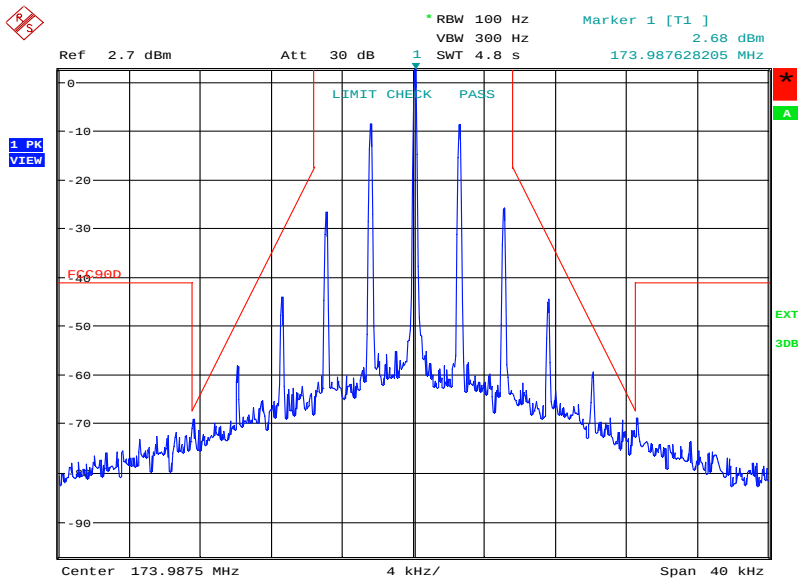
Product Service

1 GHz to 2 GHz



Date: 13.JUN.2013 11:05:32

173.9875 MHz

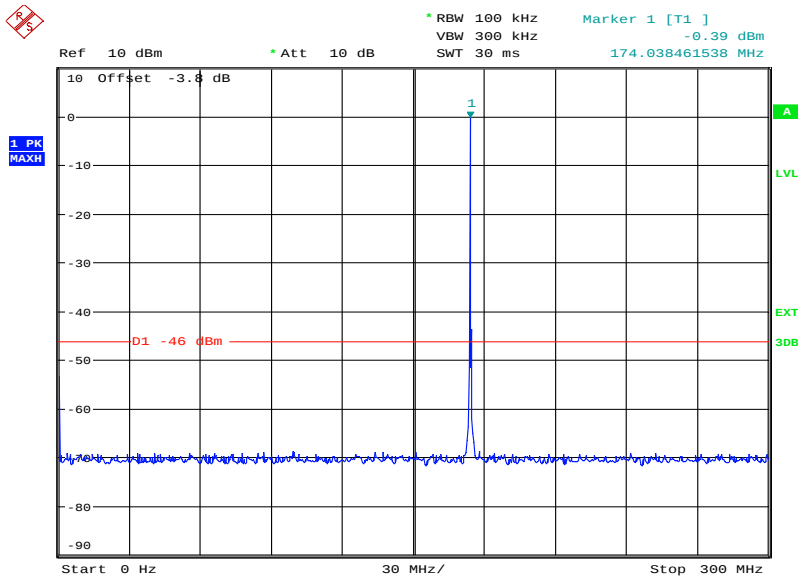


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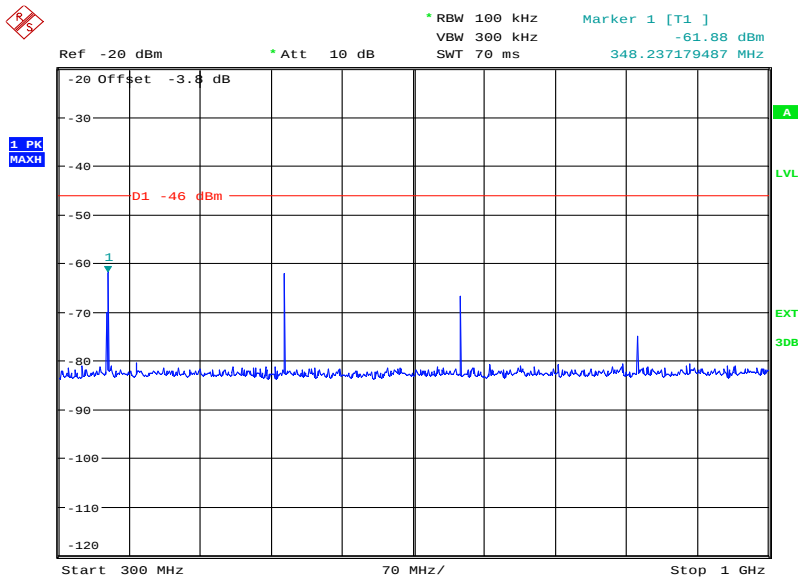
Product Service

30 MHz to 300 MHz



Date: 13.JUN.2013 11:10:23

300 MHz to 1 GHz

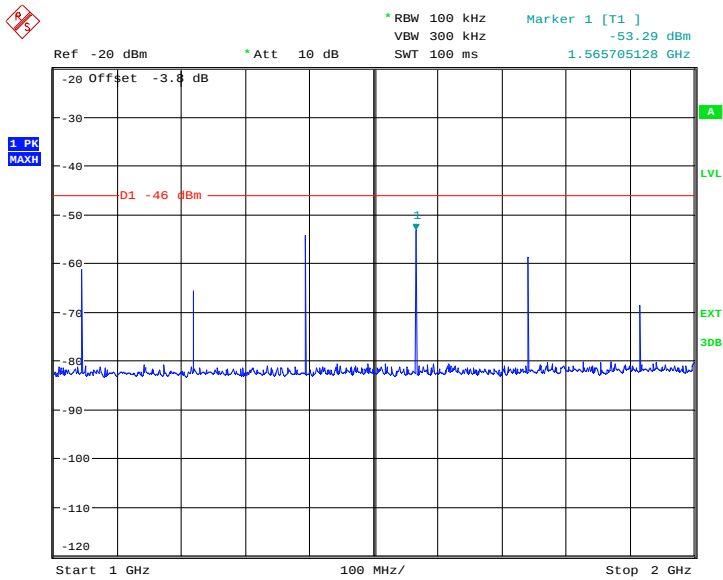


Date: 13.JUN.2013 11:12:05



Product Service

1 GHz to 2 GHz



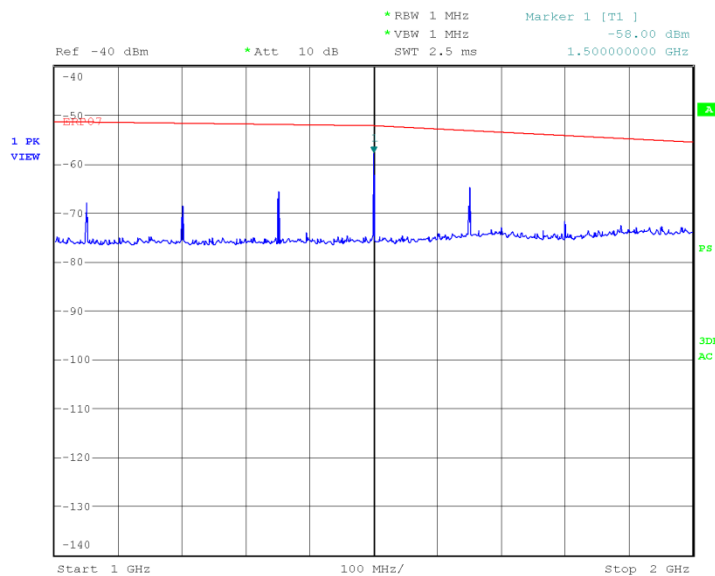
Date: 13.JUN.2013 11:12:49



Product Service

Radiated150.0125 MHz30 MHz to 1 GHz

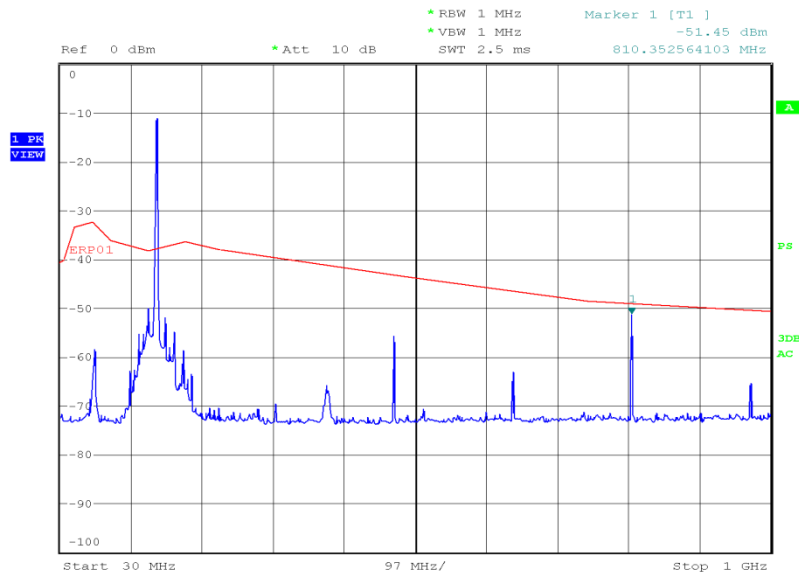
Date: 14.JUN.2013 03:53:36

1 GHz to 2 GHz

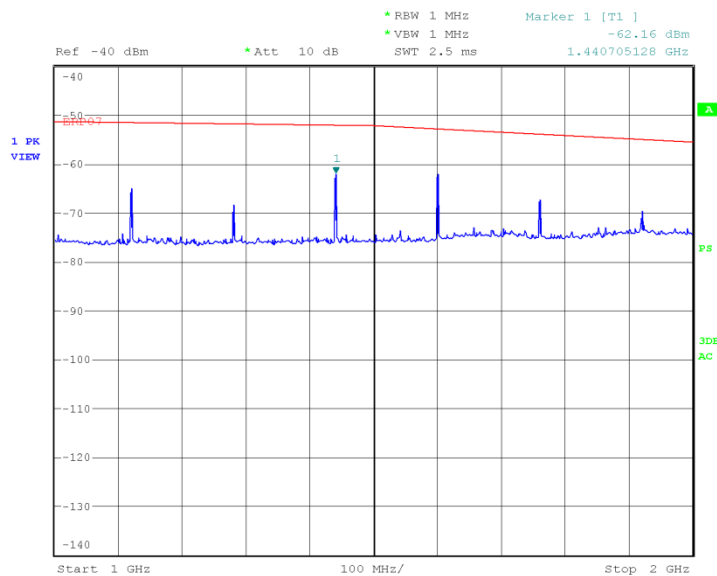
Date: 14.JUN.2013 04:22:10



Product Service

162.000 MHz30 MHz to 1 GHz

Date: 14.JUN.2013 02:56:06

1 GHz to 2 GHz

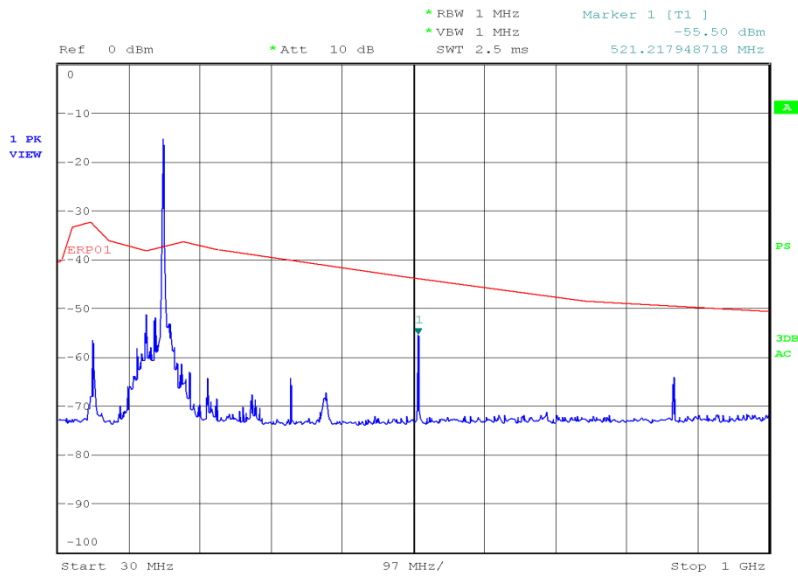
Date: 14.JUN.2013 04:38:40



Product Service

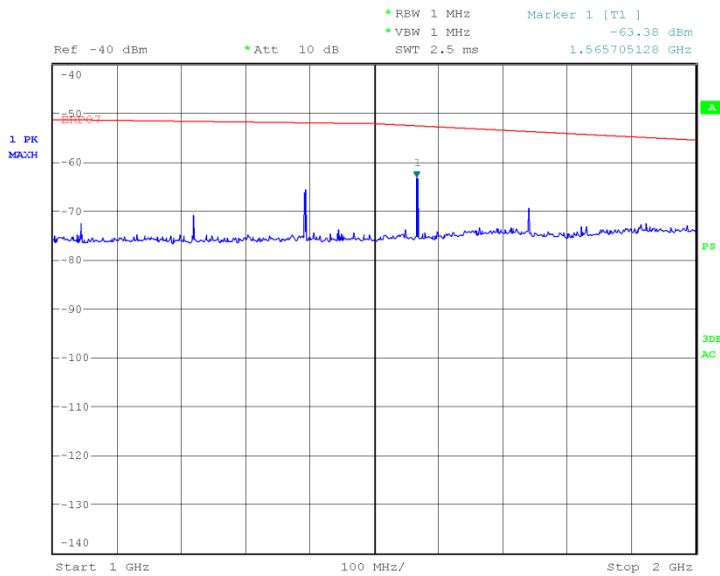
173.9875 MHz

30 MHz to 1 GHz



Date: 14.JUN.2013 03:26:45

1 GHz to 2 GHz



Date: 14.JUN.2013 04:52:11



Product Service

Limit

On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz, but not more than 10 kHz: At least $83 \log(f_d/5)$ dB;

On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least $29 \log(f_d/11)$ dB or 50 dB, whichever is the lesser attenuation;

On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log(P)$ dB.



Product Service

2.5 POWER AND ANTENNA HEIGHT LIMITS

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 90, Clause 90.210

2.5.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 2

2.5.3 Date of Test

14 June 2013

2.5.4 Test Equipment Used

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

2.5.5 Test Procedure

Using a spectrum analyser and attenuator(s), the output power of the EUT was measured at the antenna terminals.

The EUT supports FM transmission and was tested in this mode of operation.

2.5.6 Environmental Conditions

Ambient Temperature	22.3°C
Relative Humidity	32.4%



Product Service

2.5.7 Test Results

Transmit - 12.5 kHz

3.0 V DC Supply

Frequency (MHz)	Average Power	
	dBm	W
150.0125 MHz	24.28	0.267
162.000 MHz	23.95	0.248
173.9875 MHz	23.98	0.250

Limit

	Service Area Radius (km)									
	3	8	13	16	24	32	40	48	64	80
Maximum ERP (W) ¹	2	100	² 500	² 500	² 500	² 500	² 500	² 500	² 500	² 500
Up to reference HAAT (m) ³	15	15	15	27	63	125	250	410	950	2700

¹ Maximum ERP indicated provides for a 39 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig.29 (see §73.699, Fig 10b).

² Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 39 dBu.

³ When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation: $ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.

⁴ Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 39 dBu.



Product Service

2.6 FREQUENCY STABILITY

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 90, Clause 90.213

2.6.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 0

2.6.3 Date of Test

25 April 2013, 26 April 2013 & 27 June 2013

2.6.4 Test Equipment Used

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

2.6.5 Test Procedure

The EUT was set to transmit on maximum power unmodulated. In accordance with 2.1055, the temperature was varied from -30°C to +50° in 10° steps. Measurements were made using a frequency counter on the Top, Middle and Bottom channels. The supply voltage was varied to extremes at Ambient temperature only.

2.6.6 Environmental Conditions

Ambient Temperature	20.0 - 25.0°C
Relative Humidity	24.0 - 42.7%



2.6.7 Test Results

Transmit - 12.5 kHz

3.0 V DC

Temperature Interval	Supply Voltage	Frequency (Hz)		
		150.0125 MHz	162.000 MHz	173.9875 MHz
-30°C	3.0 V DC	-286.9	-145.0	-152.0
-20°C	3.0 V DC	-81.0	-107.0	-147.0
-10°C	3.0 V DC	-5.0	-1.0	-17.0
0°C	3.0 V DC	31.0	33.0	40.0
+10°C	3.0 V DC	-26.0	-42.0	-42.0
	2.55 V DC	-86.0	-95.0	-90.0
+20°C	3.0 V DC	-81.9	607.0	-90.0
-30°C	3.0 V DC	-78.0	-85.0	-90.5
+40°C	3.0 V DC	-21.0	-18.5	-33.0
+50°C	3.0 V DC	65.0	71.0	70.0
+55°C	3.0 V DC	48.0	58.0	62.0
Maximum Frequency Error (kHz)		0.287	0.607	0.152
Maximum Frequency Error (ppm)		1.91	3.75	0.87

Limit

The frequency error shall not exceed 5ppm



Product Service

Transmit - 12.5 kHz (AC Supply)

120 V AC

Temperature Interval	Supply Voltage	Frequency (Hz)		
		150.0125 MHz	162.000 MHz	173.9875 MHz
-30°C	120 V AC	-289.0	-169.0	-132.0
-20°C	120 V AC	-102.0	-98.00	-160.0
-10°C	120 V AC	-7.0	-11.0	0.0
0°C	120 V AC	28.0	30.0	36.0
+10°C	120 V AC	-37.0	-41.0	-39.0
+20°C	120 V AC	-89.0	-93.0	-87.0
	102 V AC	-84.0	-96.0	-89.0
-30°C	120 V AC	-72.0	-85.0	-89.0
+40°C	120 V AC	-15.0	-32.0	-27.0
+50°C	120 V AC	69.0	63.0	46.0
+55°C	120 V AC	-3.0	64.0	57.0
Maximum Frequency Error (kHz)		0.289	0.169	0.160
Maximum Frequency Error (ppm)		1.93	1.04	0.92

Limit

The frequency error shall not exceed 5ppm



Product Service

2.7 TRANSIENT FREQUENCY BEHAVIOUR

2.7.1 Specification Reference

FCC CFR 47 Part 90, Clause 90.214

2.7.2 Equipment Under Test and Modification State

Oculus S/N: C1009814 - Modification State 0

2.7.3 Date of Test

29 April 2013

2.7.4 Test Equipment Used

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

2.7.5 Test Procedure

The EUT was set to transmit at full power on T, M and B channels. The switch On and switch Off frequency transients were measured on a FSQ Spectrum Analyser using In House Test Software 'Transients V 1_0_1'.

2.7.6 Environmental Conditions

Ambient Temperature	22.5°C
Relative Humidity	26.6%



2.7.7 Test Results

Transmit - 12.5 kHz

3.0 V DC Supply

Transient Period	Frequency Difference (kHz)		
	150.0125 MHz	162.000 MHz	173.9875 MHz
T ₁	0.206	0.107	0.438
T ₂	0.202	0.220	0.851
T ₃	0.268	0.146	0.677

Limit

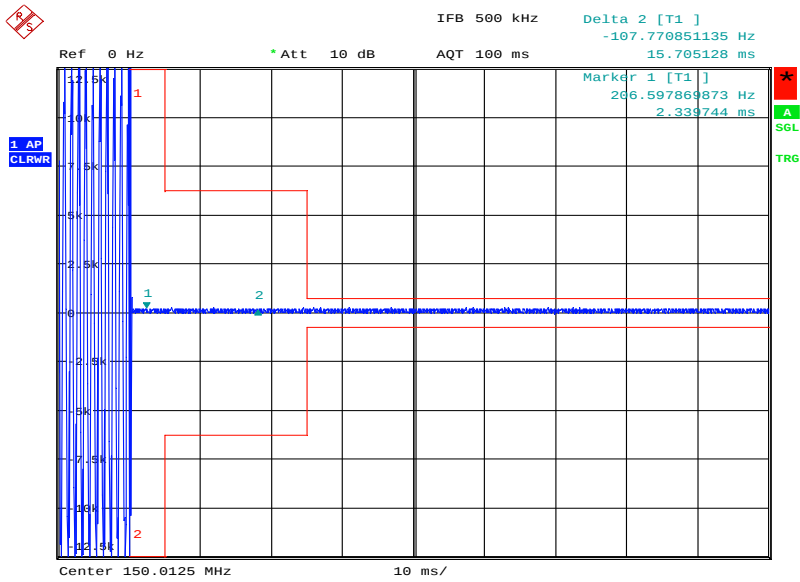
Time Interval	Maximum Frequency Difference	421 to 512MHz, 25kHz Channels
T ₁	± 25.0KHz	10.0ms
T ₂	± 12.5kHz	25.0ms
T ₃	± 25.0kHz	10.0ms



Product Service

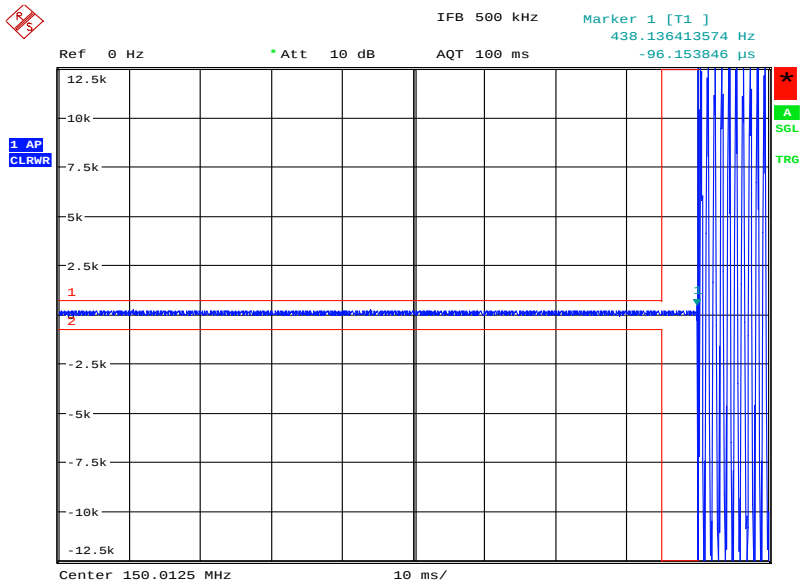
150.0125 MHz

T₁ and T₂



Date: 29.APR.2013 16:24:56

T₃



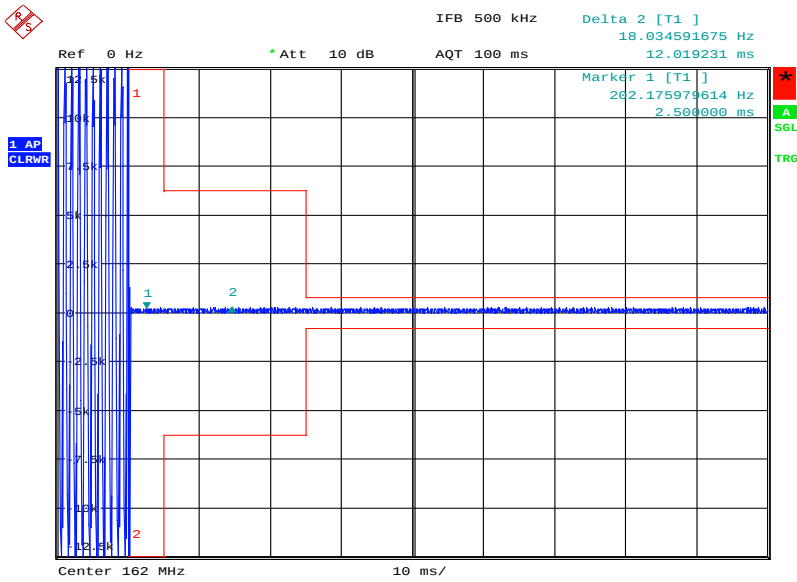
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Product Service

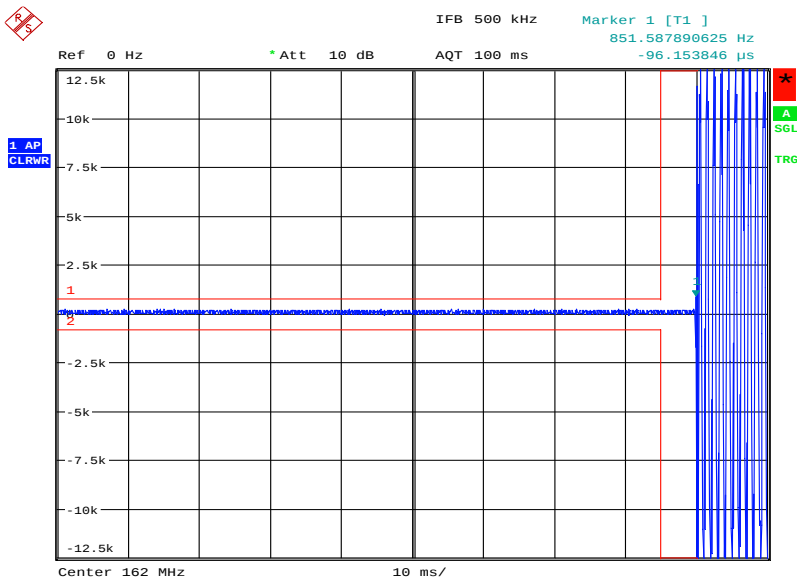
162.000 MHz

T₁ and T₂



Date: 29.APR.2013 16:19:06

T₃



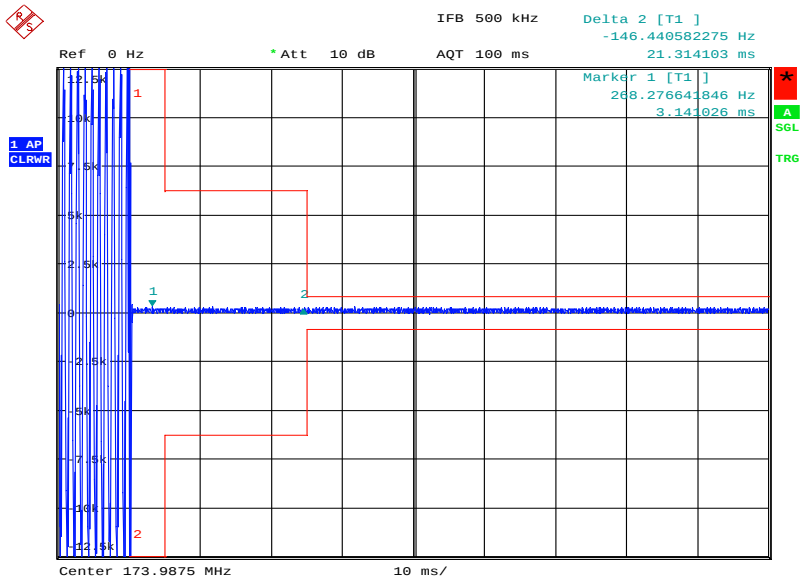
Date: 29.APR.2013 16:21:03



Product Service

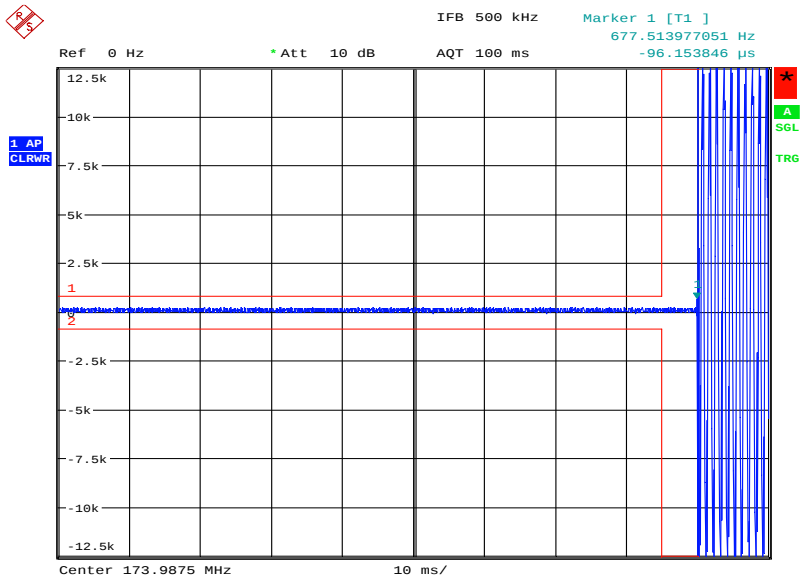
173.9875 MHz

T₁ and T₂



Date: 29.APR.2013 16:29:21

T₃



Date: 29.APR.2013 16:30:25



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 Radiated Power					
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Jan-2014
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Biconnical)	Schaffner	VBA6106A	3106	12	30-Aug-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-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	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Section 2.2 - Types of Emission					
Modulation Analyser	Hewlett Packard	8901B	45	12	18-Jul-2013
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	25-Jan-2014
Hygrometer	Rotronic	I-1000	1386	12	18-Apr-2014
High Pass Filter	Mini-Circuits	NHP-300	1640	12	15-Aug-2013
Audio Analyser	Hewlett Packard	8903B	1881	12	29-Oct-2013
Sensor	Hewlett Packard	11722A	2787	12	28-Aug-2013
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	27-Jun-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Jun-2013
Section 2.3 - Bandwidth Limitations					
Modulation Analyser	Hewlett Packard	8901B	45	12	18-Jul-2013
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	25-Jan-2014
Hygrometer	Rotronic	I-1000	1386	12	18-Apr-2014
High Pass Filter	Mini-Circuits	NHP-300	1640	12	15-Aug-2013
Audio Analyser	Hewlett Packard	8903B	1881	12	29-Oct-2013
Sensor	Hewlett Packard	11722A	2787	12	28-Aug-2013
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	27-Jun-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Jun-2013



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 – Emission Mask					
Modulation Analyser	Hewlett Packard	8901B	45	12	18-Jul-2013
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	25-Jan-2014
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	3-Apr-2014
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	9-Nov-2013
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Jan-2014
Hygrometer	Rotronic	I-1000	1386	12	18-Apr-2014
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
High Pass Filter	Mini-Circuits	NHP-300	1640	12	15-Aug-2013
Audio Analyser	Hewlett Packard	8903B	1881	12	29-Oct-2013
Sensor	Hewlett Packard	11722A	2787	12	28-Aug-2013
Antenna (Biconnical)	Schaffner	VBA6106A	3106	12	30-Aug-2013
Antenna (Log Periodic)	Schaffner	UPA6108	3108	12	5-Apr-2014
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	27-Jun-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
Leakage Current Meter	Simpson	228	3196	12	21-Sep-2013
Leakage Current Meter	Simpson	228	3197	12	29-Nov-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Jun-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	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Section 2.5 – Conducted Power					
Modulation Analyser	Hewlett Packard	8901B	45	12	18-Jul-2013
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	25-Jan-2014
Hygrometer	Rotronic	I-1000	1386	12	18-Apr-2014
High Pass Filter	Mini-Circuits	NHP-300	1640	12	15-Aug-2013
Audio Analyser	Hewlett Packard	8903B	1881	12	29-Oct-2013
Sensor	Hewlett Packard	11722A	2787	12	28-Aug-2013
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	27-Jun-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Jun-2013
Section 2.6 – Frequency Stability					
Modulation Analyser	Hewlett Packard	8901B	45	12	18-Jul-2013
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	25-Jan-2014
Hygrometer	Rotronic	I-1000	1386	12	18-Apr-2014
High Pass Filter	Mini-Circuits	NHP-300	1640	12	15-Aug-2013
Audio Analyser	Hewlett Packard	8903B	1881	12	29-Oct-2013
Sensor	Hewlett Packard	11722A	2787	12	28-Aug-2013
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	27-Jun-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Jun-2013
Counter	Hewlett Packard	53181A	159	12	28-May-2014
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Power Passport: 50, 60 or 400Hz Power Supply	Behlman Hauppauge	P1350-CE	1434	-	TU
DC Power Supply Unit	Farnell	LT30-2	2116	-	TU
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013



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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.7 – Transient Frequency Behaviour					
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2014
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	23-Jul-2013
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	TU
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Attenuator (30dB, 150W)	Narda	769-30	3369	12	28-May-2013
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	24-Aug-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
Combiner/Splitter	Weinschel	1506A	3877	12	19-Mar-2014
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4105	12	25-Oct-2013
2 Metre N Type Cable	Rhophase	NPS-1601A-2000-NPS	4108	12	1-Jun-2013

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Emission Mask	Radiated: ± 3.08 dB Conducted: ± 3.454 dB
Effective Radiated Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Power and Antenna Height Limits	± 0.70 dB
Transient Frequency Behaviour	± 0.2 Hz
Frequency Stability	± 42.47 Hz
Bandwidth Limitations	± 16.74 kHz



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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