

**TEST REPORT
FROM
RFI GLOBAL SERVICES LTD**

Test of: Orthogon Systems Ltd
PTP54600 Connectorised

To: FCC Part 15.407: 2006

Test Report Serial No:
RFI/RPTE1/RP49281JD01A

This Test Report Is Issued Under The Authority
Of Brian Watson, Operations Director:



Tested By: Ian Watch



Checked By: Alan McHale



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Test Dates: 11 September 2007 to 17 September 2007

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1. Client Information

| | |
|----------------------|--|
| Company Name: | Orthogon Systems Ltd |
| Address: | Unit A1 Linhay Business Park Eastern Road Ashburton Devon TQ13 7UP UK |
| Contact Name: | Mr C Fisher |

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2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification of Equipment Under Test (EUT)

| | |
|---------------------------------|--------------------------|
| Description: | Wireless Ethernet Bridge |
| Brand Name: | Motorola |
| Model Name or Number: | PTP54600 Connectorised |
| Serial Number: | 0004568026FB |
| Hardware Version Number: | D05-R01-C |
| Software Version Number: | B1236 |
| FCC ID Number: | QWP54100 |
| Country of Manufacture: | UK |
| Date of Receipt: | 11 September 2007 |

| | |
|--------------------------------|-------------------|
| Description: | Power Supply |
| Brand Name: | Motorola |
| Model Name or Number: | Power IDU |
| Serial Number: | 0604018587 |
| FCC ID Number: | QWP54100 |
| Country of Manufacture: | China |
| Date of Receipt: | 11 September 2007 |

2.2. Description of EUT

The equipment under test is a Point to Point wireless Ethernet bridge.

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

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2.4. Additional Information Related to Testing

| | | | |
|--|---|-----------------------|--------------------------------|
| Power Supply Requirement: | Nominal 110V, 60 Hz AC Mains Supply | | |
| Intended Operating Environment: | Residential, Commercial | | |
| Equipment Category: | UNII | | |
| Type of Unit: | Base Station (Fixed use) | | |
| Interface Ports: | Horizontal and Vertical Antenna PIDU | | |
| Transmit Frequency Range: | 5486 MHz to 5708 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | - | 5486 MHz |
| | Middle | - | 5590 MHz |
| | Top | - | 5708 MHz |
| Receive Frequency Range: | 5486 MHz to 5708 MHz | | |
| Receive Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | - | 5486 MHz |
| | Middle | - | 5590 MHz |
| | Top | - | 5708 MHz |

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2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

| | |
|-------------------------------|--|
| Description: | Slave ODU |
| Brand Name: | Motorola |
| Model Name or Number: | PTP54600 |
| Serial Number: | 000456802470 |
| Cable Length and Type: | 0.6 m, 50 ohm co-axial including 40 dB attenuation |
| Connected to Port: | Separate connections to horizontal antenna port and vertical antenna port. |

| | |
|-------------------------------|----------------------------|
| Description: | Power supply for Slave ODU |
| Brand Name: | Motorola |
| Model Name or Number: | PIDU |
| Serial Number: | 0604018525 |
| Cable Length and Type: | 1 m CAT5 |
| Connected to Port: | PIDU of Slave ODU |

| | |
|-------------------------------|-------------------------|
| Description: | Computer |
| Brand Name: | Acer |
| Model Name or Number: | Travelmate 4021 Imi |
| Serial Number: | LXTAH 0508353100905EM00 |
| Cable Length and Type: | 4 m, CAT5 |
| Connected to Port: | RJ45 on PIDU |

| | |
|-------------------------------|--------------------------|
| Description: | 6 ft Antenna |
| Brand Name: | Andrew |
| Model Name or Number: | P6f-52-N7A |
| Serial Number: | 07DESA0267474 |
| Cable Length and Type: | 2 m, 50 ohm, 1.2 dB Loss |
| Connected to Port: | Vertical Antenna |

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3. Test Specification, Methods and Procedures

3.1. Test Specifications

| | |
|------------|--|
| Reference: | FCC Part 15 Subpart E: 2006 (Sections 15.407). |
| Title: | Code of Federal Regulations, Part 15 (47CFR) Radio Frequency Devices. |

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003

Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)

Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)

Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)

Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)

Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

At the client's request, the dynamic frequency selection (DFS) test was not performed.

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5. Operation of the EUT During Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated.

As a master device, transmitting ACQ, BPSK, QPSK, 16QAM, 64QAM and 256QAM, and operating back to back with a slave unit unless otherwise stated in this report.

Operating on the bottom, middle or top channel, as per each test case requirement.

Radiated emissions in stand alone mode/acquisition mode

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

With power output set for operation with a 4 ft diameter antenna – gain 34.9 dBi

As Master unit linked to a Slave unit

For radiated emissions – connected to a 6 ft diameter antenna with power output set for a 4 ft antenna.

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6. Summary of Test Results

| Range of Measurements | Specification Reference | Port Type | Compliance Status |
|--|--------------------------------|-------------------|--------------------------|
| Transmitter AC Conducted Emissions | Section 15.207 | AC Mains | Complied |
| Transmitter Peak Transmit Power | Section 15.407(a) | Antenna Terminals | Complied |
| Transmitter Peak Power Spectral Density | Section 15.407(a) | Antenna Terminals | Complied |
| Transmitter Modulation Envelope Peak Excursion Ratio | Section 15.407(a)(6) | Antenna Terminals | Complied |
| Transmitter Emission Bandwidth | Section 15.403(i) | Antenna Terminals | Complied |
| Transmitter Conducted Emissions | Sections 15.407(b) & 15.209(a) | Antenna Terminals | Complied |
| Transmitter Radiated Emissions | Sections 15.407(b) & 15.209(a) | Antenna | Complied |
| Transmitter Band Edge Radiated Emissions | Section 15.407(b) | Antenna | Complied |

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, England.

FCC Site Registration Number: 90895

IC Site Registration Number: 3485

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7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%.

Please refer to Section 8 for details of measurement uncertainties.

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7.2. Test Results

7.2.1. Transmitter AC Conducted Spurious Emissions

Results:

Top Channel: Quasi-Peak Detector Measurements on Live and Neutral Lines

| Frequency (MHz) | Line | Level (dB μ V) | Limit (dB μ V) | Margin (dB) | Result |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 0.166000 | Live | 44.2 | 65.2 | 21.0 | Complied |
| 0.174000 | Neutral | 47.1 | 64.8 | 17.7 | Complied |
| 0.198000 | Live | 40.5 | 63.7 | 23.2 | Complied |
| 0.226000 | Live | 38.0 | 62.6 | 24.6 | Complied |
| 0.290000 | Live | 37.2 | 60.5 | 23.3 | Complied |
| 0.350000 | Live | 41.1 | 59.0 | 17.9 | Complied |
| 0.406000 | Live | 36.5 | 57.7 | 21.2 | Complied |
| 0.522000 | Live | 32.7 | 56.0 | 23.3 | Complied |
| 26.258000 | Neutral | 36.4 | 60.0 | 23.6 | Complied |
| 26.822000 | Neutral | 37.9 | 60.0 | 22.1 | Complied |

Top Channel: Average Detector Measurements on Live and Neutral Lines

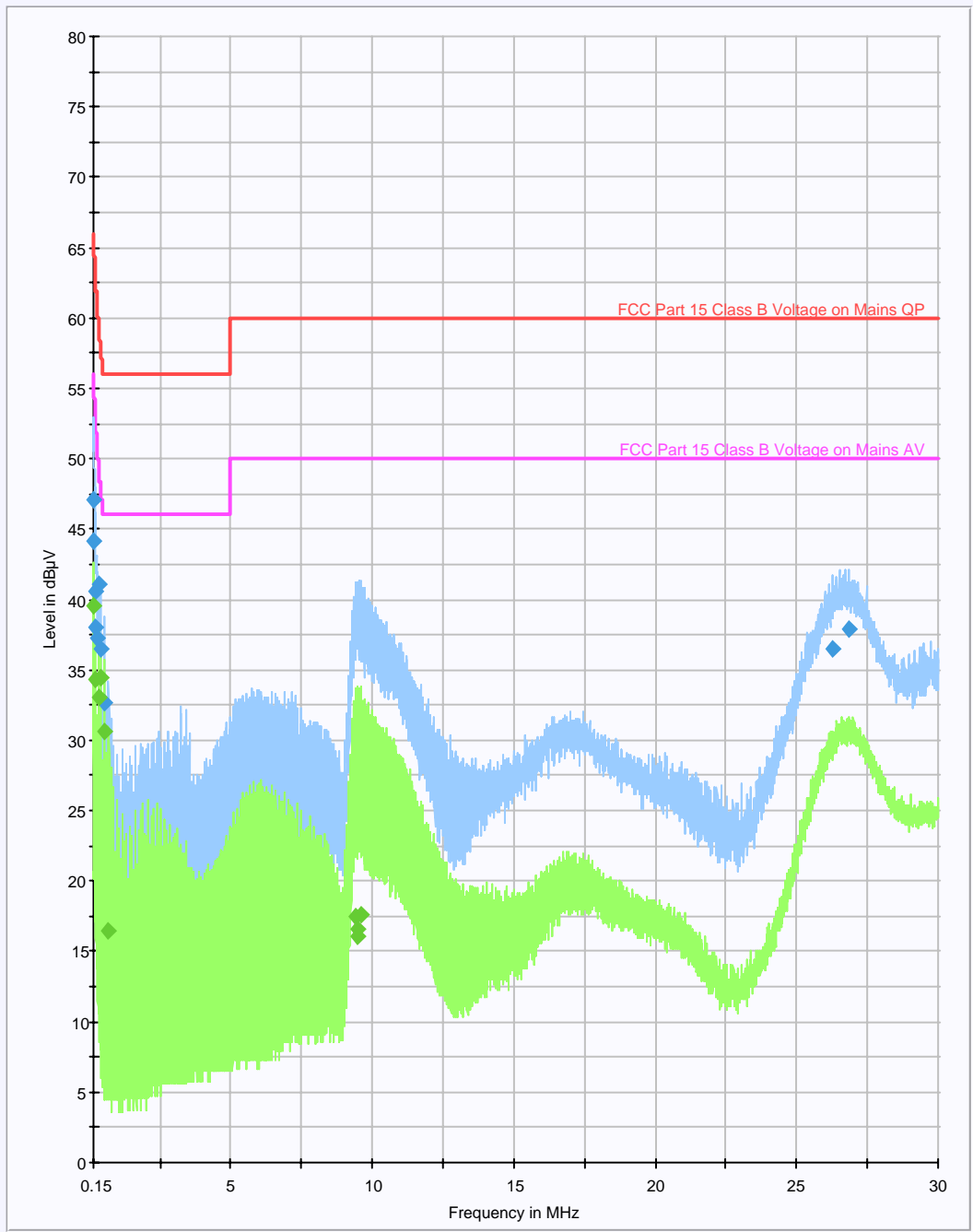
| Frequency (MHz) | Line | Level (dB μ V) | Limit (dB μ V) | Margin (dB) | Result |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 0.174000 | Neutral | 39.6 | 54.8 | 15.2 | Complied |
| 0.230000 | Live | 34.3 | 52.4 | 18.1 | Complied |
| 0.346000 | Live | 33.0 | 49.1 | 16.1 | Complied |
| 0.406000 | Live | 34.4 | 47.7 | 13.3 | Complied |
| 0.522000 | Live | 30.6 | 46.0 | 15.4 | Complied |
| 0.694000 | Live | 16.5 | 46.0 | 29.5 | Complied |
| 9.402000 | Neutral | 17.5 | 50.0 | 32.5 | Complied |
| 9.446000 | Neutral | 16.6 | 50.0 | 33.4 | Complied |
| 9.502000 | Live | 16.0 | 50.0 | 34.0 | Complied |
| 9.634000 | Live | 17.6 | 50.0 | 32.4 | Complied |

Note(s):

1. At the clients request, the EUT was tested as a Class B device.

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Transmitter AC Conducted Spurious Emissions (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

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7.2.2. Transmitter Peak Transmit Power

| Antenna Details: | |
|--------------------------|------|
| Gain (dBi): | 34.9 |
| Antenna Cable Loss (dB): | 1.2 |

There was no variation in output power over voltage extremes of 85% and 115% of nominal voltage.

The conducted limit was calculated as: 24 – Antenna Gain – Allowed 6dBi – Antenna Cable loss.

Example:- 24dBm – (34.9dBi – 6dBi – 1.2dB) = -3.7dBm

Results: Bottom Channel 5479 MHz

| Conducted Output Power (dBm) | | | | Limit (dBm) | Margin (dB) | Result |
|------------------------------|--------|--------|-----------|-------------|-------------|----------|
| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -12.5 | -11.1 | -8.7 | -3.7 | 5.0 | Complied |
| BPSK | -8.5 | -7.7 | -5.1 | -3.7 | 1.4 | Complied |
| QPSK | -8.5 | -7.7 | -5.1 | -3.7 | 1.4 | Complied |
| 16QAM | -8.6 | -7.6 | -5.1 | -3.7 | 1.4 | Complied |
| 64QAM | -8.5 | -7.6 | -5.0 | -3.7 | 1.3 | Complied |
| 256QAM | -8.5 | -7.6 | -5.0 | -3.7 | 1.3 | Complied |

Results: Middle Channel 5590 MHz

| Conducted Output Power (dBm) | | | | Limit (dBm) | Margin (dB) | Result |
|------------------------------|--------|--------|-----------|-------------|-------------|----------|
| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -12.6 | -10.6 | -8.5 | -3.7 | 4.8 | Complied |
| BPSK | -8.4 | -7.5 | -4.9 | -3.7 | 1.2 | Complied |
| QPSK | -8.4 | -7.5 | -4.9 | -3.7 | 1.2 | Complied |
| 16QAM | -8.4 | -7.5 | -4.9 | -3.7 | 1.2 | Complied |
| 64QAM | -8.4 | -7.5 | -4.9 | -3.7 | 1.2 | Complied |
| 256QAM | -8.5 | -7.5 | -4.9 | -3.7 | 1.2 | Complied |

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Transmitter Peak Transmit Power (Continued)**Results: Top Channel 5708 MHz**

| Conducted Output Power (dBm) | | | | Limit (dBm) | Margin (dB) | Result |
|------------------------------|--------|--------|-----------|-------------|-------------|----------|
| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -11.8 | -12.2 | -9.0 | -3.7 | 5.3 | Complied |
| BPSK | -8.8 | -8.3 | -5.5 | -3.7 | 1.8 | Complied |
| QPSK | -8.9 | -8.3 | -5.5 | -3.7 | 1.8 | Complied |
| 16QAM | -9.0 | -8.3 | -5.5 | -3.7 | 1.8 | Complied |
| 64QAM | -9.0 | -8.3 | -5.5 | -3.7 | 1.8 | Complied |
| 256QAM | -9.0 | -8.3 | -5.5 | -3.7 | 1.8 | Complied |

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7.2.3. Transmitter Peak Power Spectral Density

Results: Bottom Channel 5486 MHz

| Conducted Output Power (dBm) | | | | Limit (dBm) | Margin (dB) | Result |
|------------------------------|--------|--------|-----------|-------------|-------------|----------|
| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -20.8 | -19.6 | -17.1 | -16.7 | 0.4 | Complied |
| BPSK | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| QPSK | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| 16QAM | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| 64QAM | -21.3 | -20.6 | -17.9 | -16.7 | 1.2 | Complied |
| 256QAM | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |

Results: Middle Channel 5590 MHz

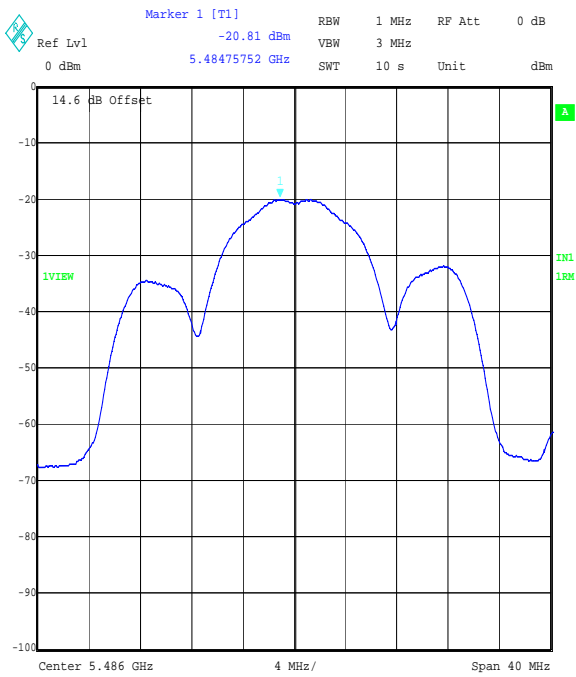
| Conducted Output Power (dBm) | | | | Limit (dBm) | Margin (dB) | Result |
|------------------------------|--------|--------|-----------|-------------|-------------|----------|
| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -21.1 | -19.4 | -17.2 | -16.7 | 0.5 | Complied |
| BPSK | -21.4 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| QPSK | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| 16QAM | -21.3 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| 64QAM | -21.4 | -20.5 | -17.9 | -16.7 | 1.2 | Complied |
| 256QAM | -21.3 | -20.6 | -17.9 | -16.7 | 1.2 | Complied |

Results: Top Channel 5708 MHz

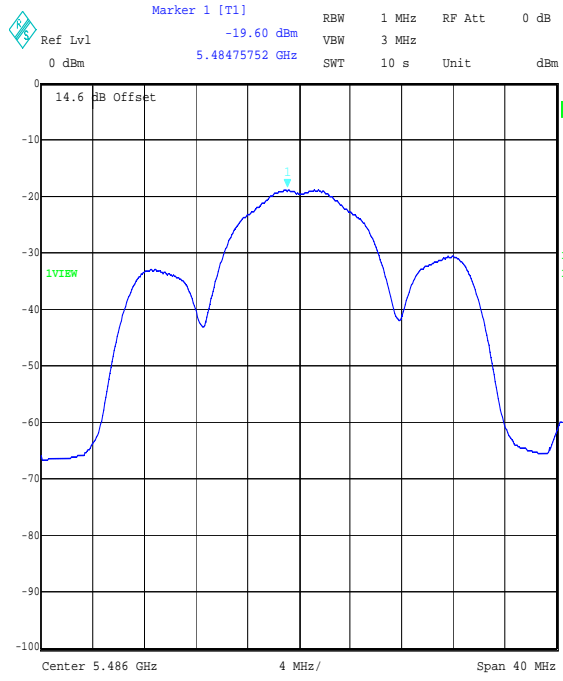
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| Mode | Port H | Port V | Aggregate | | | |
| ACQ | -21.3 | -19.9 | -17.5 | -16.7 | 0.8 | Complied |
| BPSK | -21.7 | -20.8 | -18.2 | -16.7 | 1.5 | Complied |
| QPSK | -21.7 | -20.8 | -18.2 | -16.7 | 1.5 | Complied |
| 16QAM | -21.6 | -20.7 | -18.1 | -16.7 | 1.4 | Complied |
| 64QAM | -21.6 | -20.8 | -18.2 | -16.7 | 1.5 | Complied |
| 256QAM | -21.7 | -20.8 | -18.2 | -16.7 | 1.5 | Complied |

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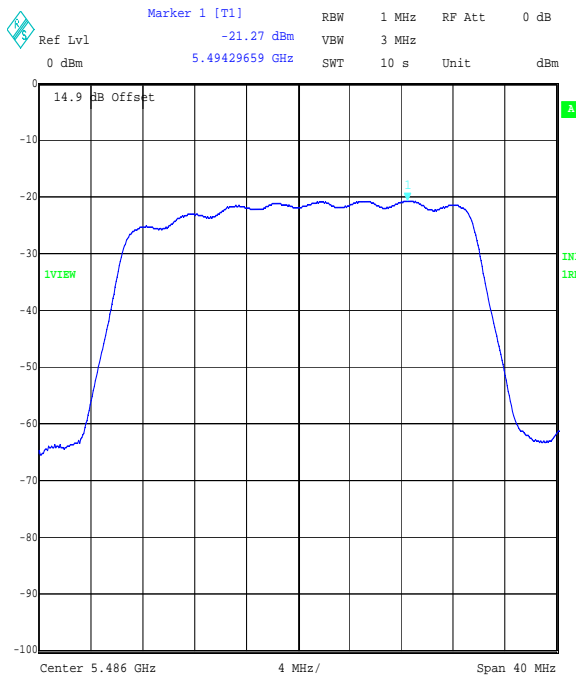
Transmitter Peak Power Spectral Density (Continued)



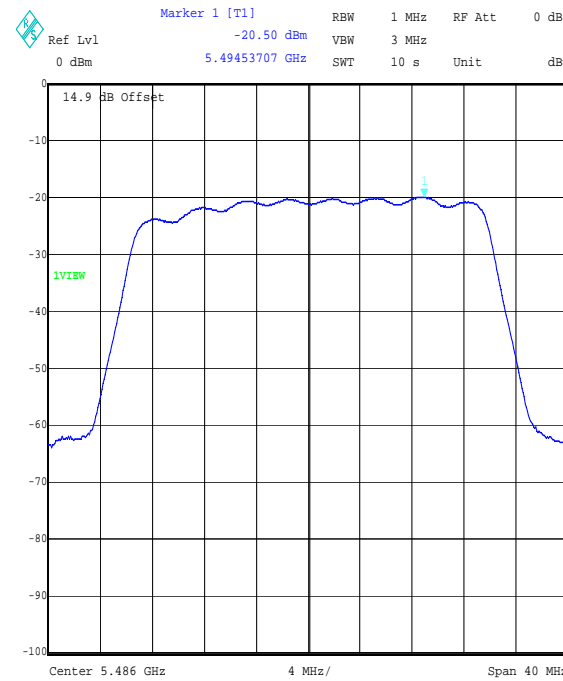
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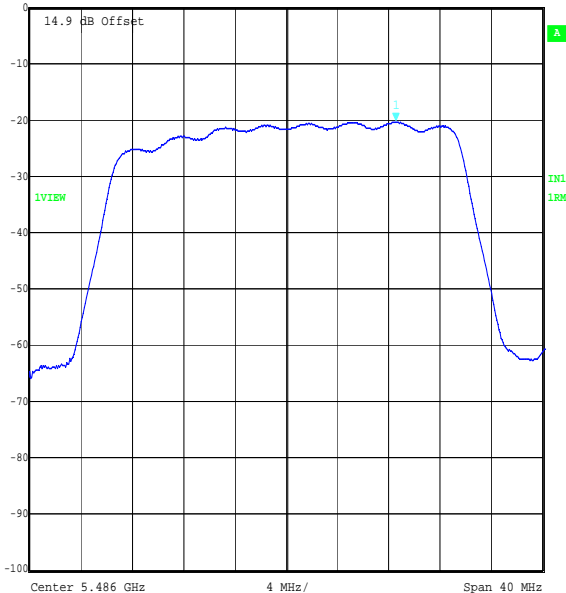


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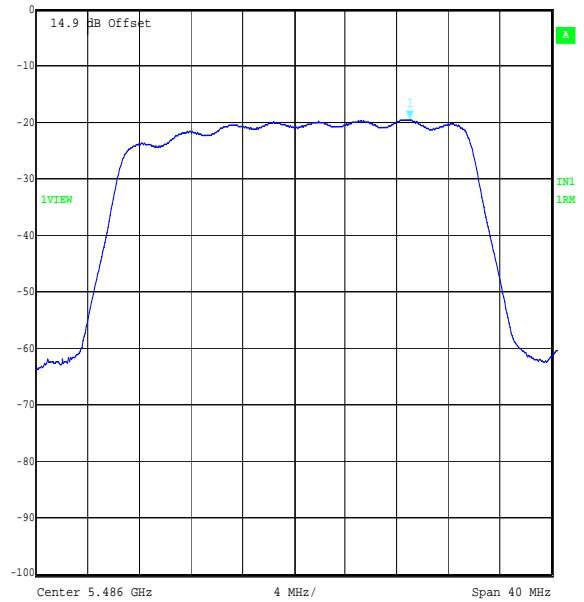
Transmitter Peak Power Spectral Density (Continued)

Marker 1 [T1] RBW 1 MHz RF Att 0 dB
Ref Lvl -21.34 dBm VBW 3 MHz
0 dBm 5.49437675 GHz SWT 10 s Unit dBm



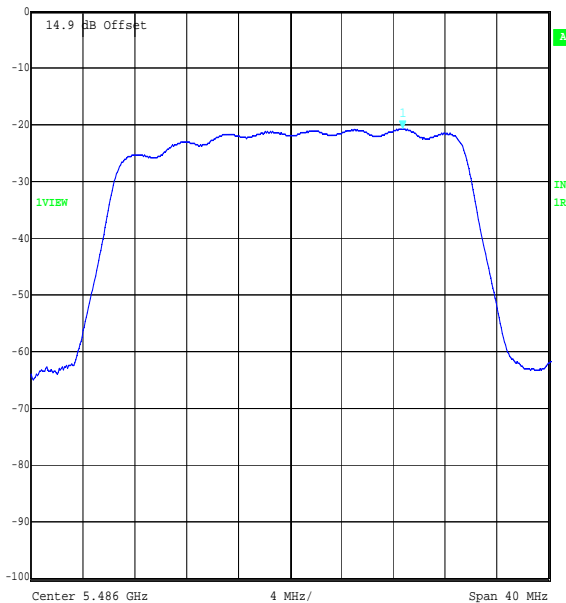
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0 dBm 5.49461723 GHz SWT 10 s Unit dBm



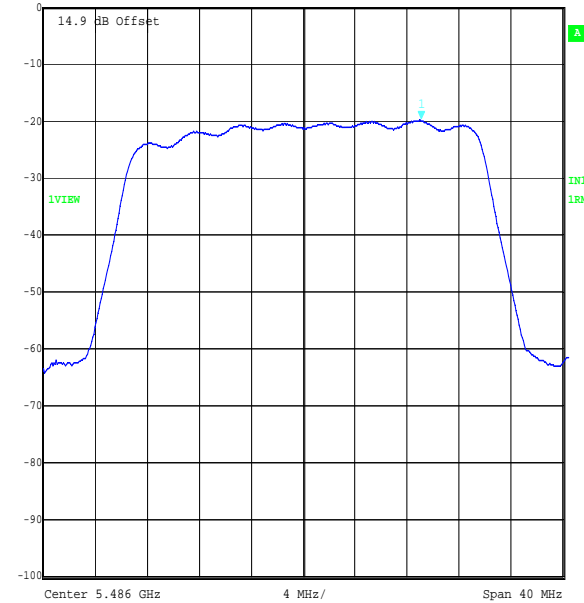
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Ref Lvl -21.34 dBm VBW 3 MHz
0 dBm 5.49453707 GHz SWT 10 s Unit dBm



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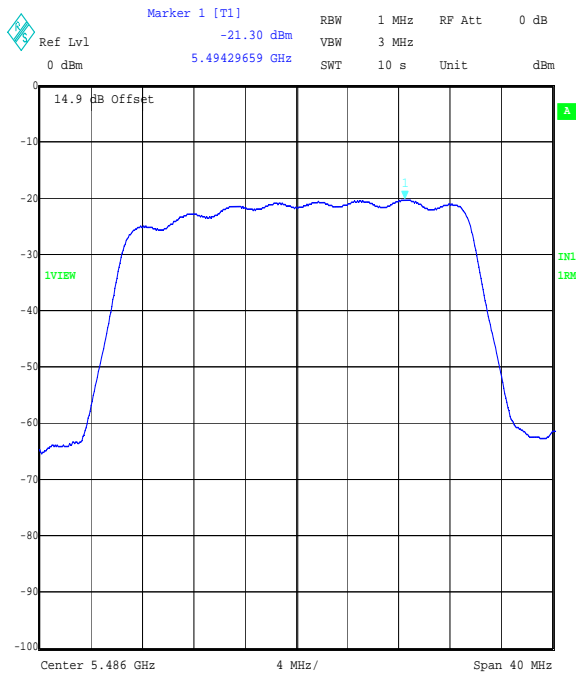
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0 dBm 5.49469739 GHz SWT 10 s Unit dBm



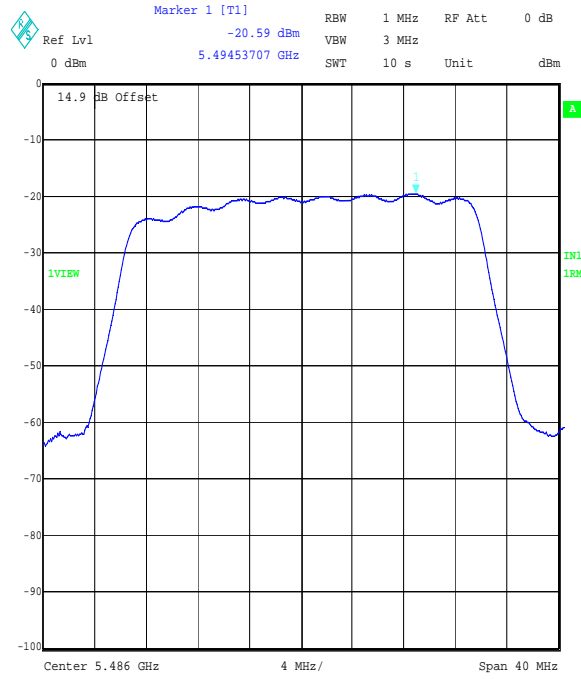
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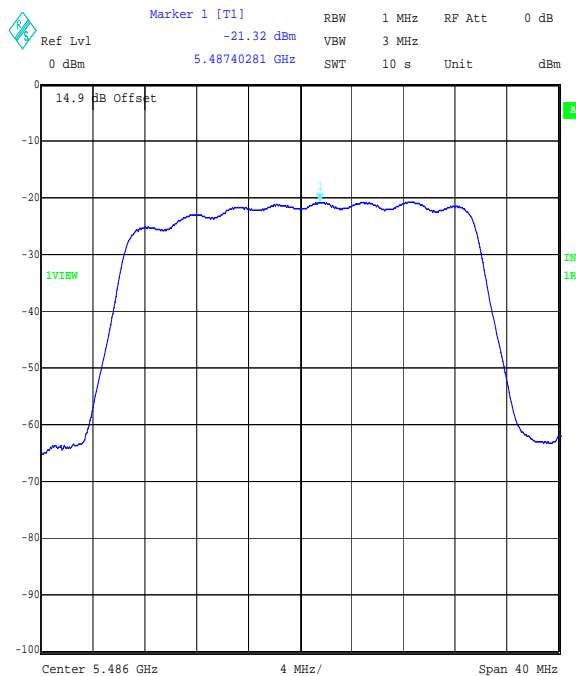
Transmitter Peak Power Spectral Density (Continued)



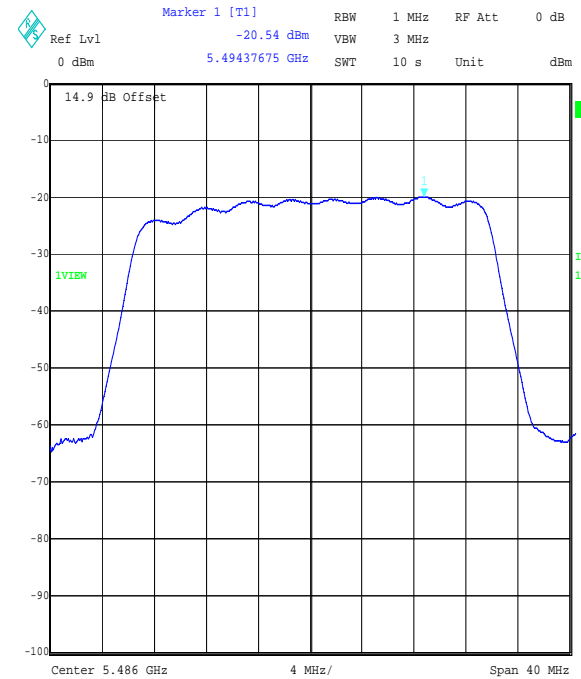
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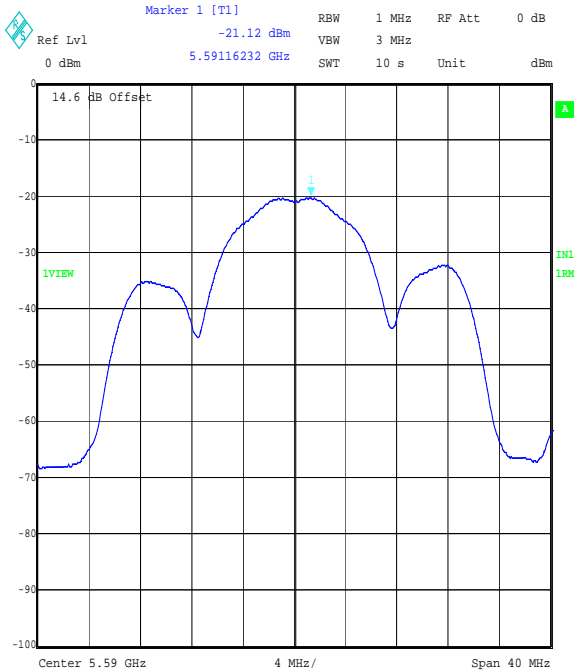
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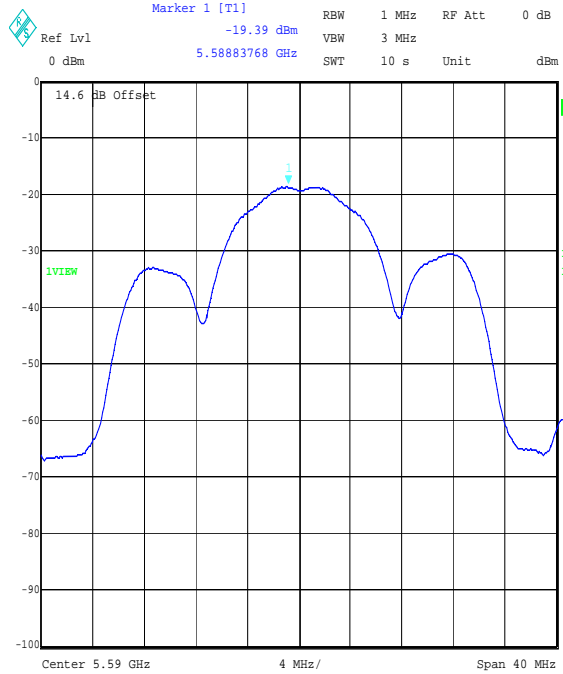
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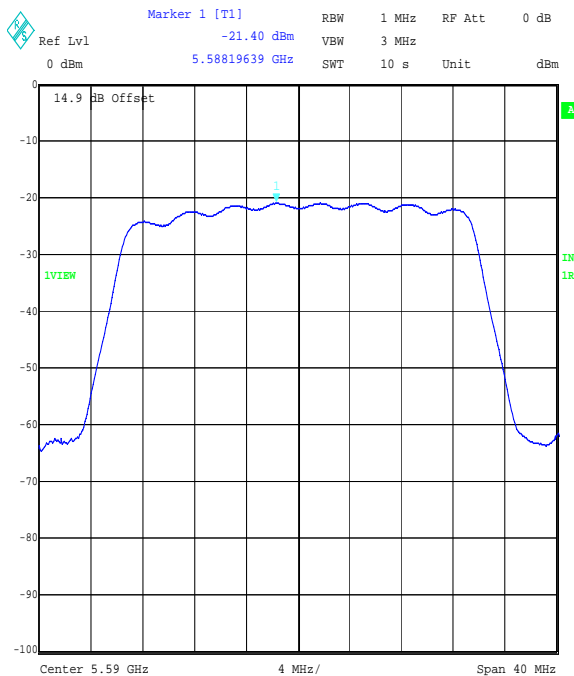
Transmitter Peak Power Spectral Density (Continued)



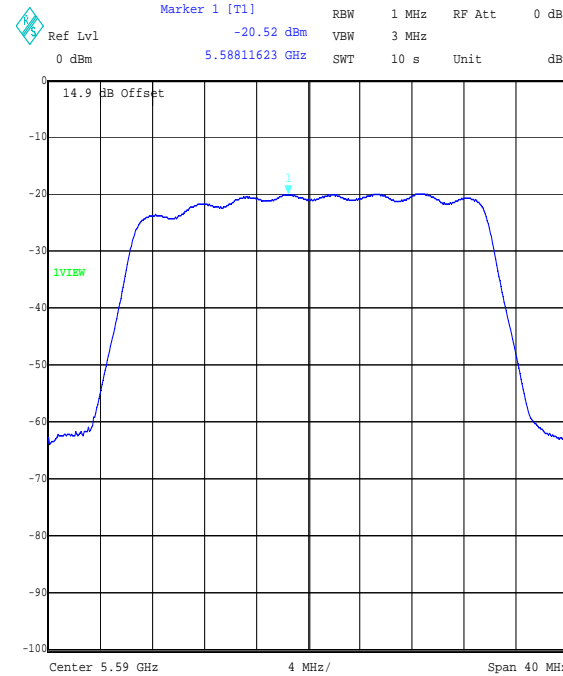
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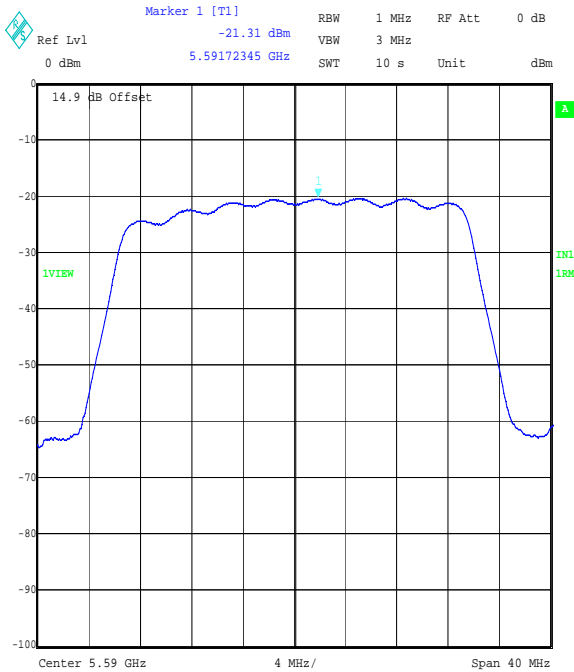
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Comment A: PSD BPSK MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 15:55:16



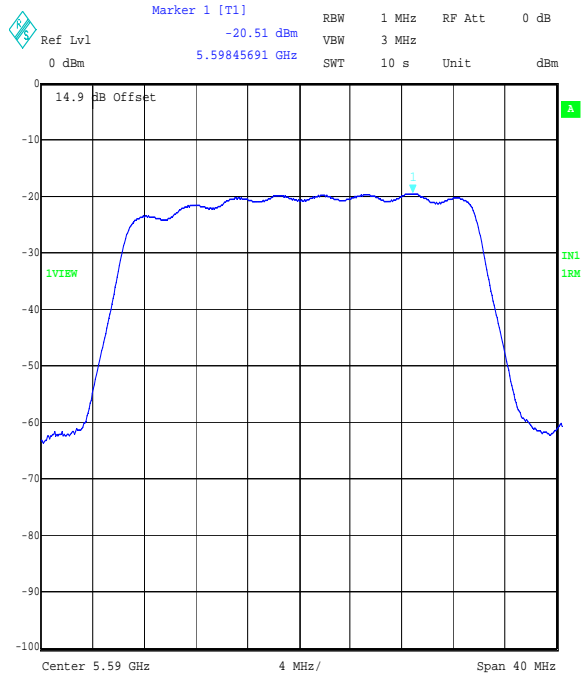
Title: 49281JD01 FCC15.407
Comment A: PSD BPSK MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 16:43:25

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

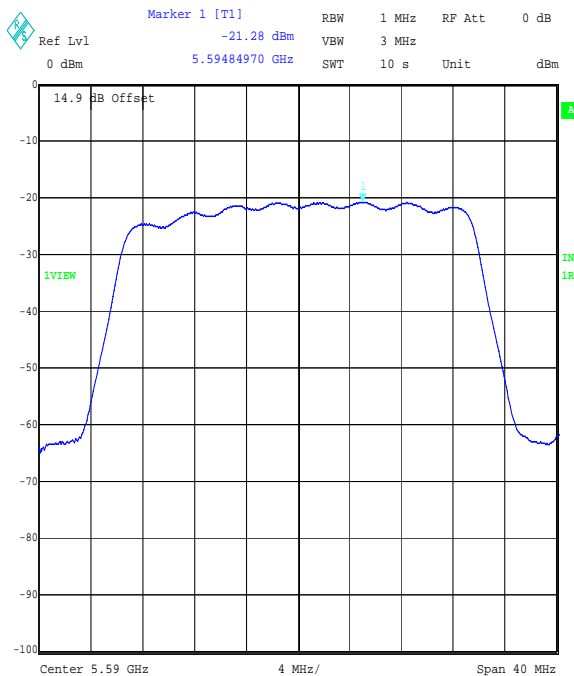
Transmitter Peak Power Spectral Density (Continued)



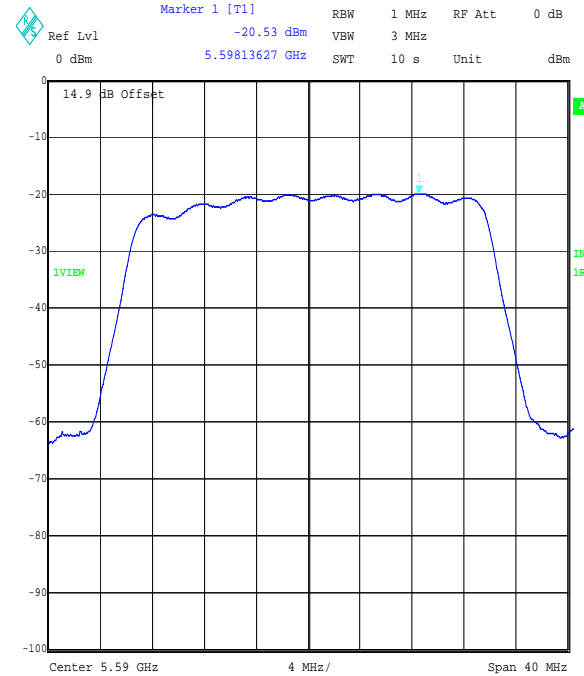
Title: 49281JD01 FCC15.407
Comment A: PSD QPSK MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 16:13:50



Title: 49281JD01 FCC15.407
Comment A: PSD QPSK MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 16:41:49



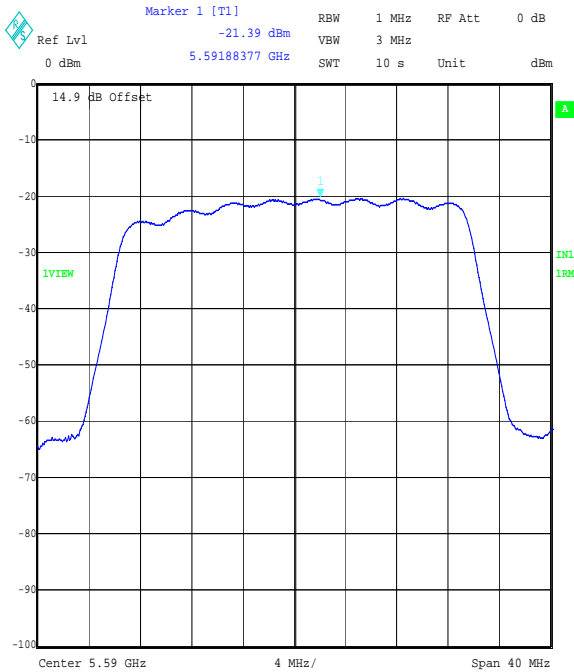
Title: 49281JD01 FCC15.407
Comment A: PSD 16QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 16:25:08



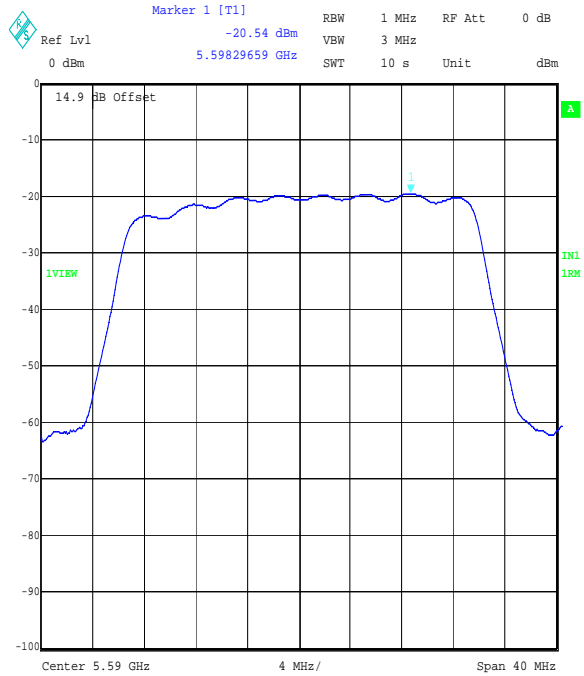
Title: 49281JD01 FCC15.407
Comment A: PSD 16QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 16:39:36

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

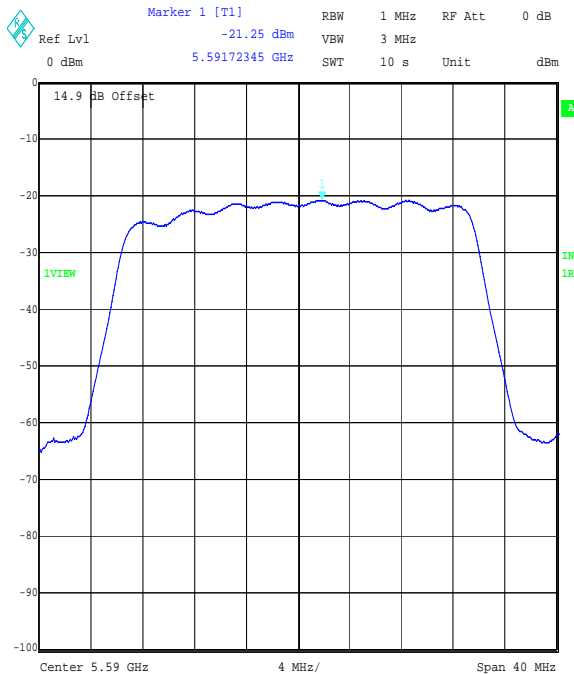
Transmitter Peak Power Spectral Density (Continued)



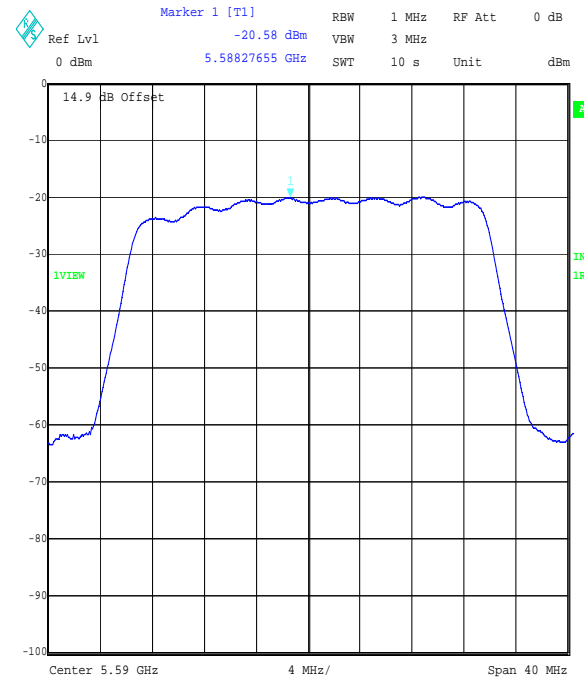
Title: 49281JD01 FCC15.407
Comment A: PSD 64QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 16:27:40



Title: 49281JD01 FCC15.407
Comment A: PSD 64QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 16:37:53



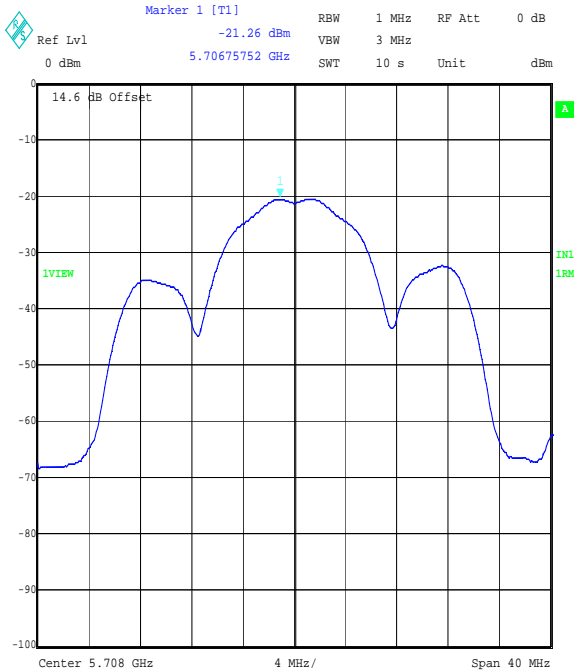
Title: 49281JD01 FCC15.407
Comment A: PSD 256QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 16:29:39



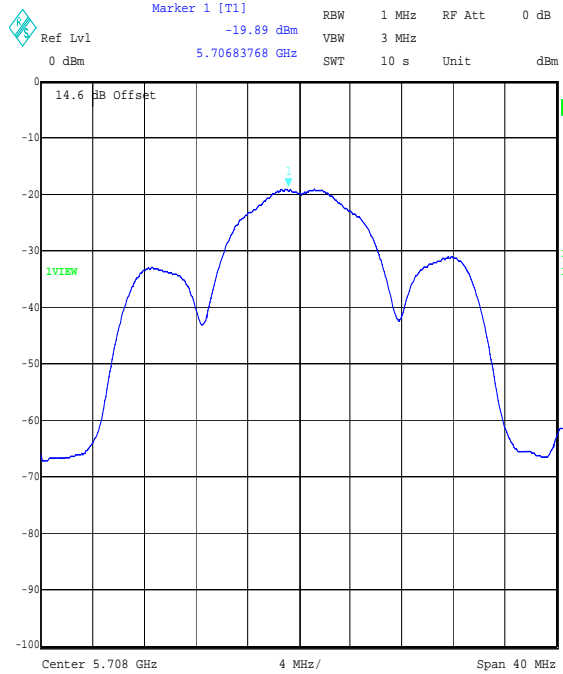
Title: 49281JD01 FCC15.407
Comment A: PSD 256QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 16:34:36

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

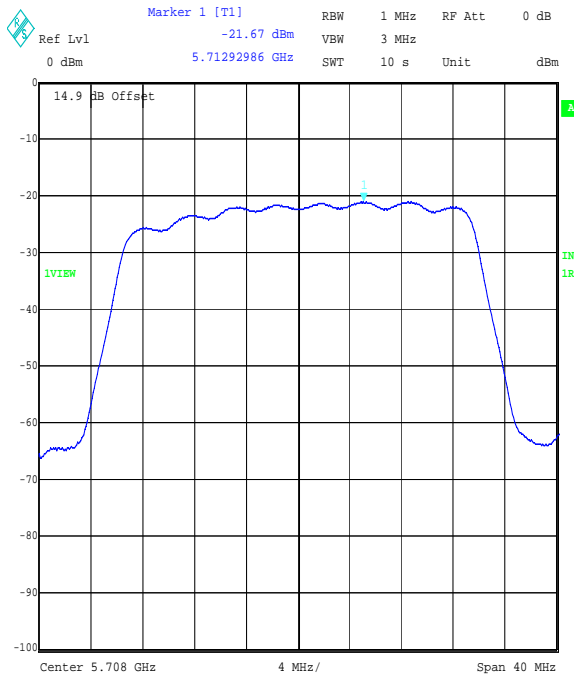
Transmitter Peak Power Spectral Density (Continued)



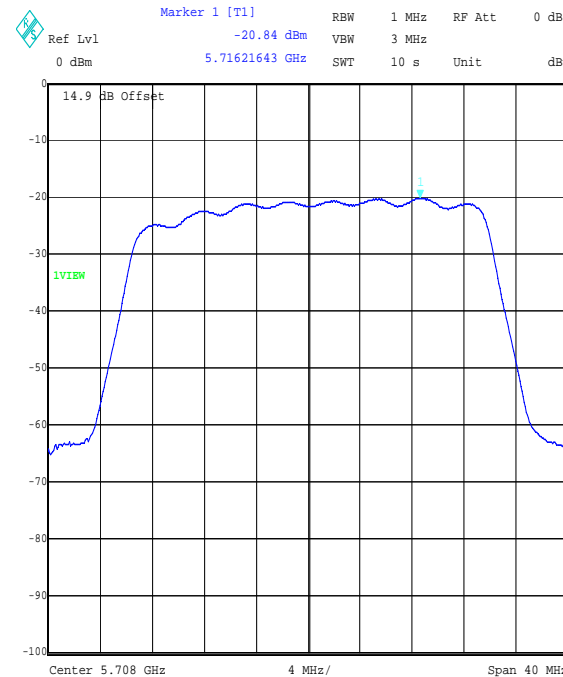
Title: 49281JD01 FCC15.407
Comment A: PSD ACQ MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:25:38



Title: 49281JD01 FCC15.407
Comment A: PSD ACQ MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 18:03:02



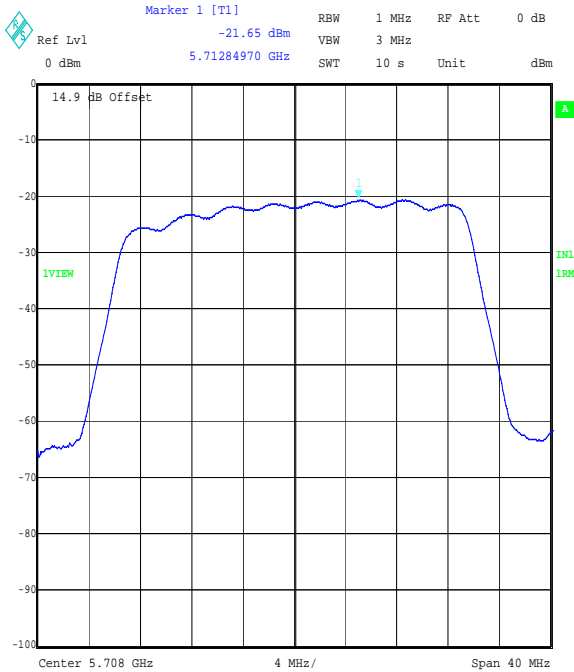
Title: 49281JD01 FCC15.407
Comment A: PSD BPSK MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:31:03



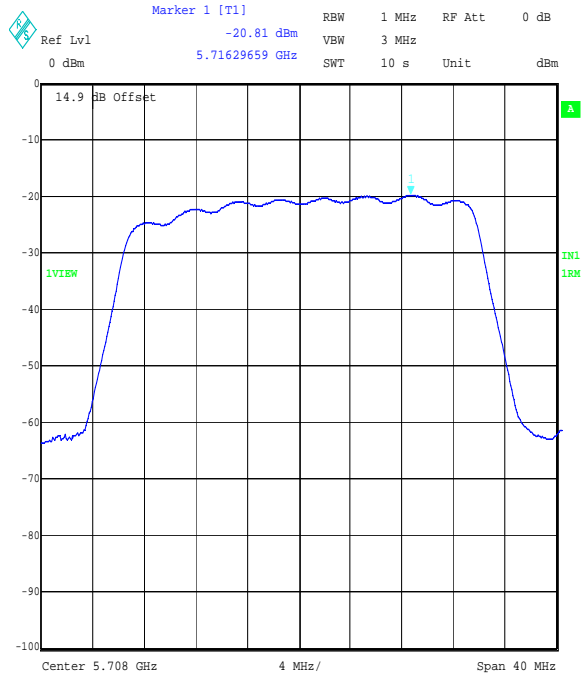
Title: 49281JD01 FCC15.407
Comment A: PSD BPSK MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 18:00:18

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

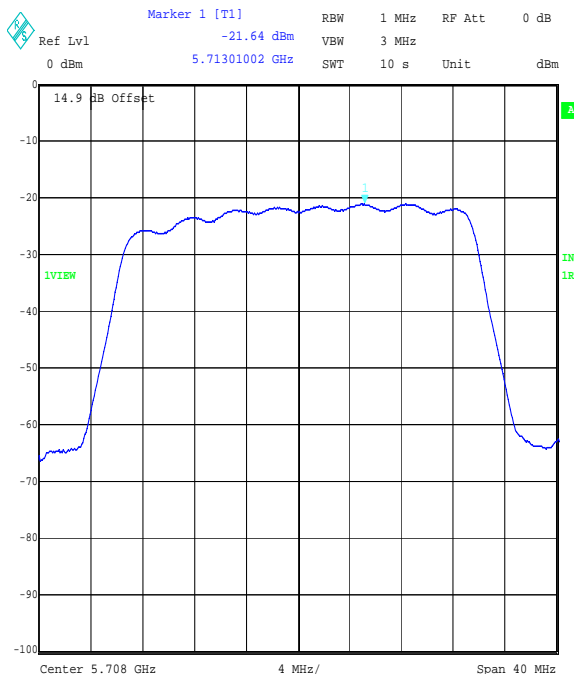
Transmitter Peak Power Spectral Density (Continued)



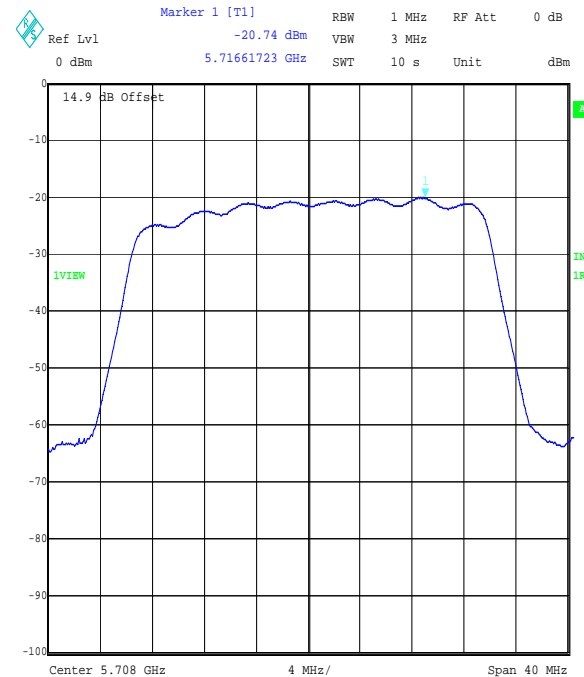
Title: 49281JD01 FCC15.407
Comment A: PSD QPSK MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:34:21



Title: 49281JD01 FCC15.407
Comment A: PSD QPSK MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 17:56:53



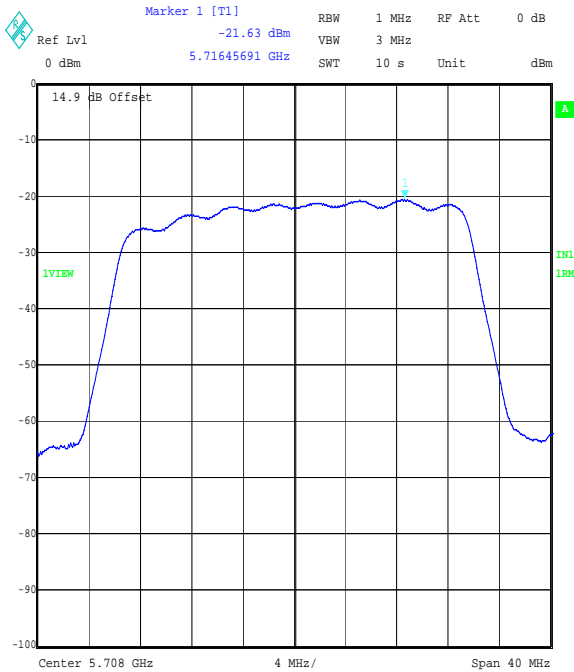
Title: 49281JD01 FCC15.407
Comment A: PSD 16QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:36:55



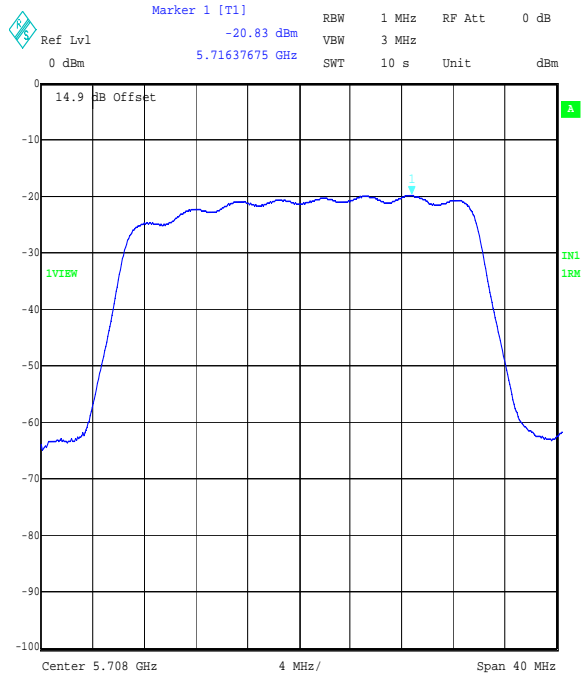
Title: 49281JD01 FCC15.407
Comment A: PSD 16QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 17:54:24

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

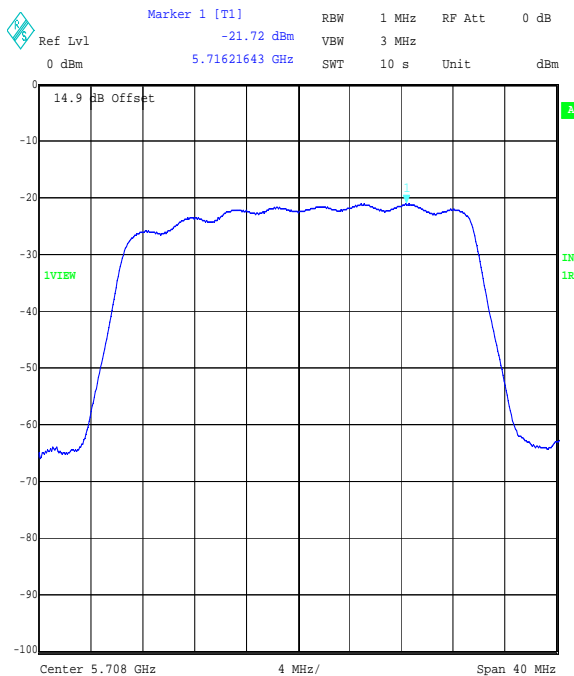
Transmitter Peak Power Spectral Density (Continued)



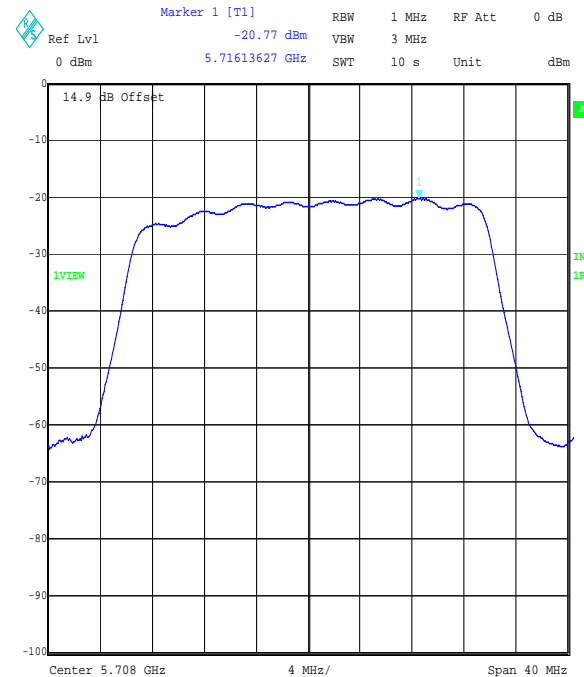
Title: 49281JD01 FCC15.407
Comment A: PSD 64QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:39:50



Title: 49281JD01 FCC15.407
Comment A: PSD 64QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 17:51:31



Title: 49281JD01 FCC15.407
Comment A: PSD 256QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 17:43:01



Title: 49281JD01 FCC15.407
Comment A: PSD 256QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 17:49:05

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

7.2.4. Transmitter Modulation Envelope Peak Excursion Ratio

Results: ACQ Port H

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 6.9 | <13.0 | 6.1 | Complied |
| Middle | 7.0 | <13.0 | 6.0 | Complied |
| Top | 6.9 | <13.0 | 6.1 | Complied |

Results: ACQ Port V

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 6.9 | <13.0 | 6.1 | Complied |
| Middle | 6.9 | <13.0 | 6.1 | Complied |
| Top | 6.9 | <13.0 | 6.1 | Complied |

Results: BPSK Port H

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 10.0 | <13.0 | 3.0 | Complied |
| Middle | 9.7 | <13.0 | 3.3 | Complied |
| Top | 9.3 | <13.0 | 3.7 | Complied |

Results: BPSK Port V

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 9.0 | <13.0 | 4.0 | Complied |
| Middle | 9.2 | <13.0 | 3.8 | Complied |
| Top | 9.2 | <13.0 | 3.8 | Complied |

Results: QPSK Port H

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 8.9 | <13.0 | 4.1 | Complied |
| Middle | 8.6 | <13.0 | 4.4 | Complied |
| Top | 9.0 | <13.0 | 4.0 | Complied |

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

Transmitter Modulation Envelope Peak Excursion Ratio (Continued)**Results: QPSK Port V**

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 9.5 | <13.0 | 4.5 | Complied |
| Middle | 9.9 | <13.0 | 3.1 | Complied |
| Top | 9.5 | <13.0 | 4.5 | Complied |

Results: 16QAM Port H

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 8.9 | <13.0 | 4.1 | Complied |
| Middle | 9.1 | <13.0 | 3.9 | Complied |
| Top | 9.5 | <13.0 | 3.5 | Complied |

Results: 16QAM Port V

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 9.5 | <13.0 | 4.5 | Complied |
| Middle | 9.0 | <13.0 | 4.0 | Complied |
| Top | 9.1 | <13.0 | 3.9 | Complied |

Results: 64QAM Port H

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 9.4 | <13.0 | 3.6 | Complied |
| Middle | 9.2 | <13.0 | 3.8 | Complied |
| Top | 9.3 | <13.0 | 3.7 | Complied |

Results: 64QAM Port V

| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 8.7 | <13.0 | 4.3 | Complied |
| Middle | 8.8 | <13.0 | 4.2 | Complied |
| Top | 9.5 | <13.0 | 4.5 | Complied |

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Transmitter Modulation Envelope Peak Excursion Ratio (Continued)**Results: 256QAM Port H**

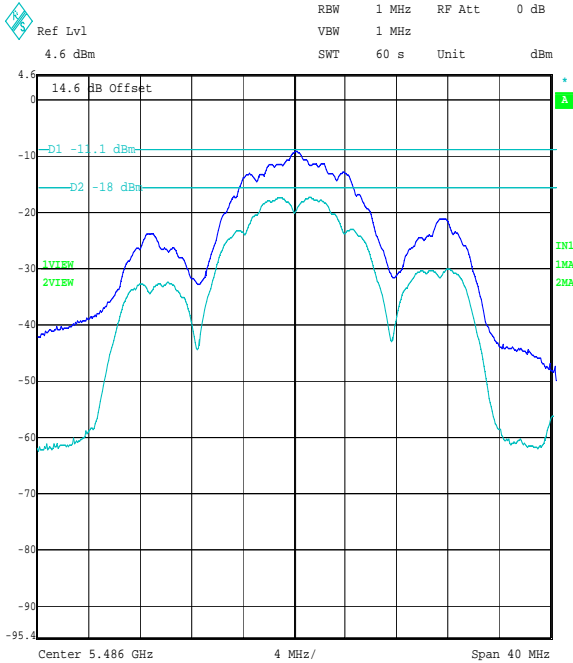
| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 8.8 | <13.0 | 4.2 | Complied |
| Middle | 9.5 | <13.0 | 3.5 | Complied |
| Top | 10.8 | <13.0 | 2.2 | Complied |

Results: 256QAM Port V

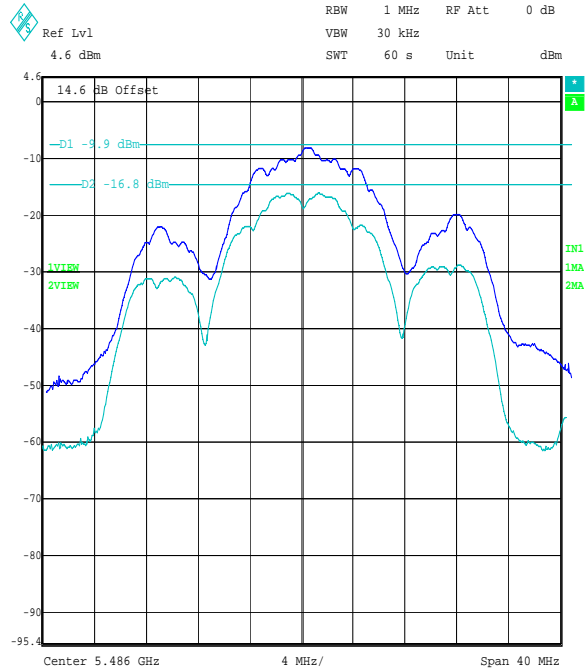
| Channel | Ratio (dB) | Limit (dB) | Margin (dB) | Result |
|---------|------------|------------|-------------|----------|
| Bottom | 8.9 | <13.0 | 4.1 | Complied |
| Middle | 8.9 | <13.0 | 4.1 | Complied |
| Top | 9.8 | <13.0 | 3.2 | Complied |

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

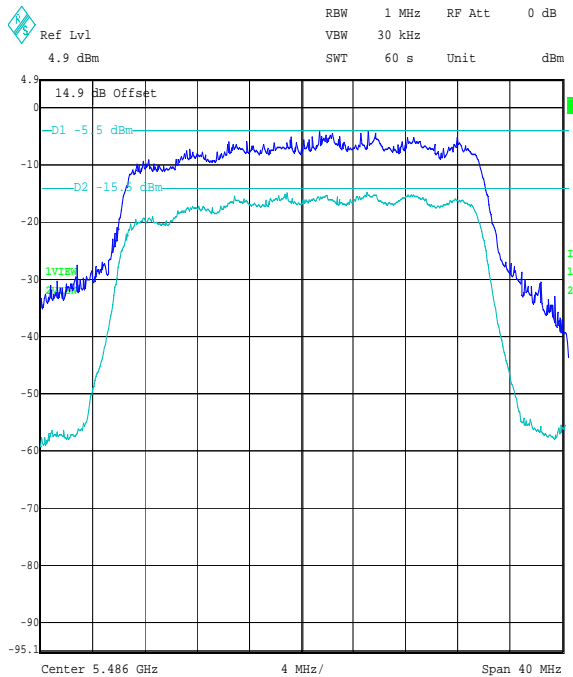
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



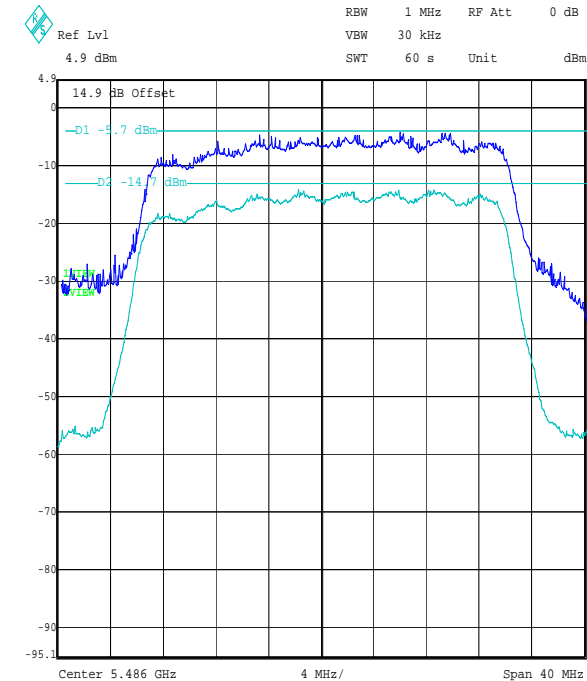
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION ACQ MODE BOTTOM CHANNEL H PORT
Date: 12.SEP.2007 20:36:55



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION ACQ MODE BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 20:27:08



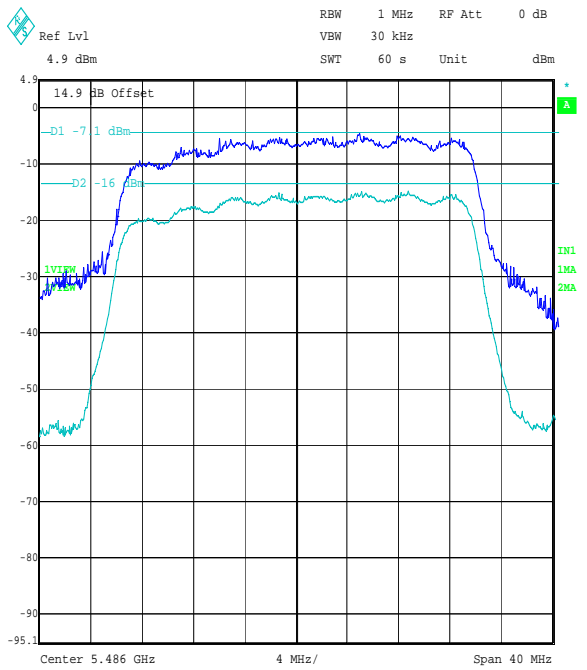
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION BPSK MODE BOTTOM CHANNEL H PORT
Date: 12.SEP.2007 20:43:41



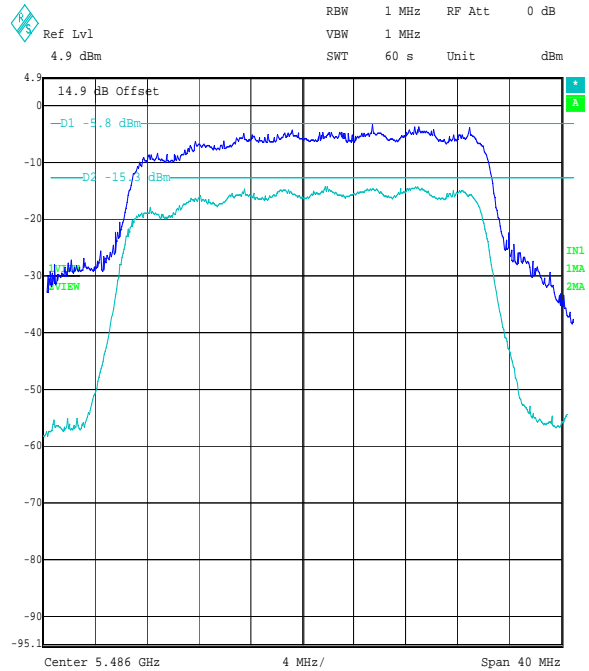
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION BPSK MODE BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 19:50:52

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

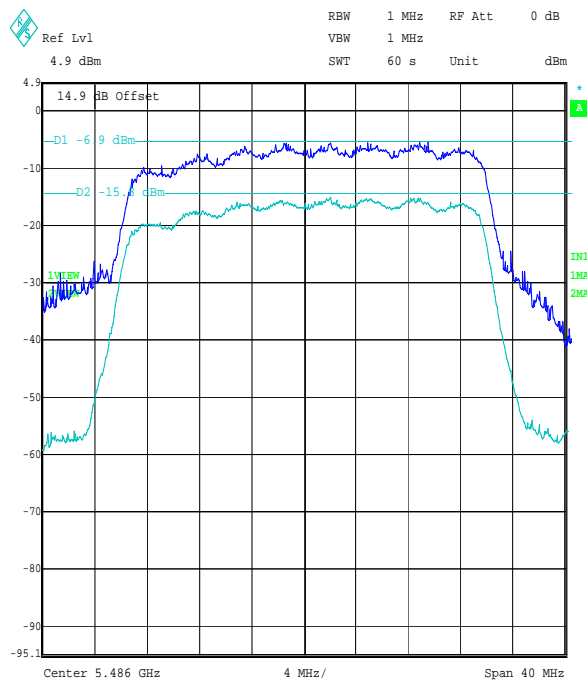
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



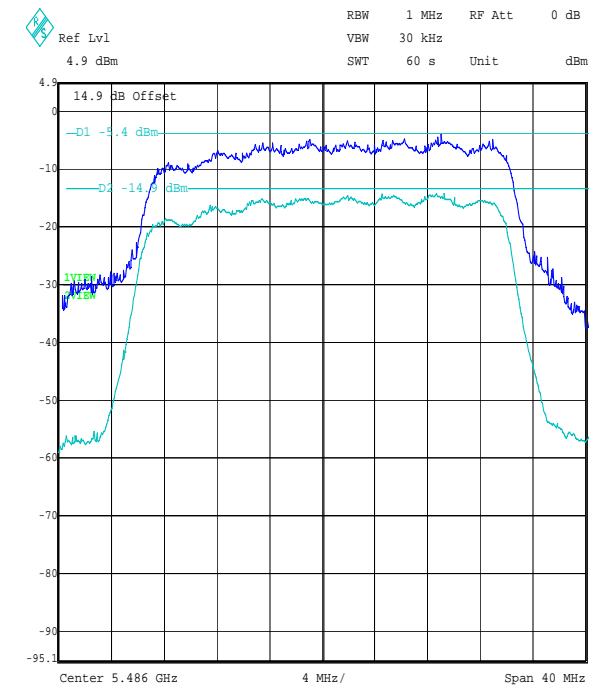
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION QPSK MODE BOTTOM CHANNEL H PORT
 Date: 12.SEP.2007 20:49:49



Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION QPSK MODE BOTTOM CHANNEL V PORT
 Date: 12.SEP.2007 19:58:49



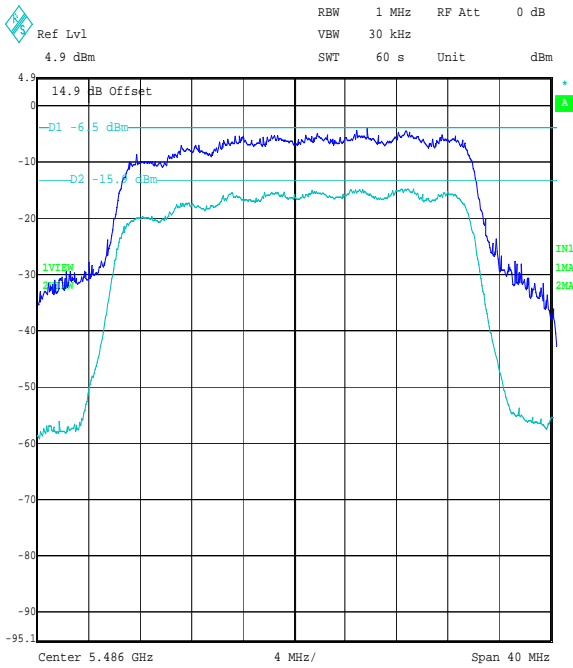
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 Date: 12.SEP.2007 20:54:56



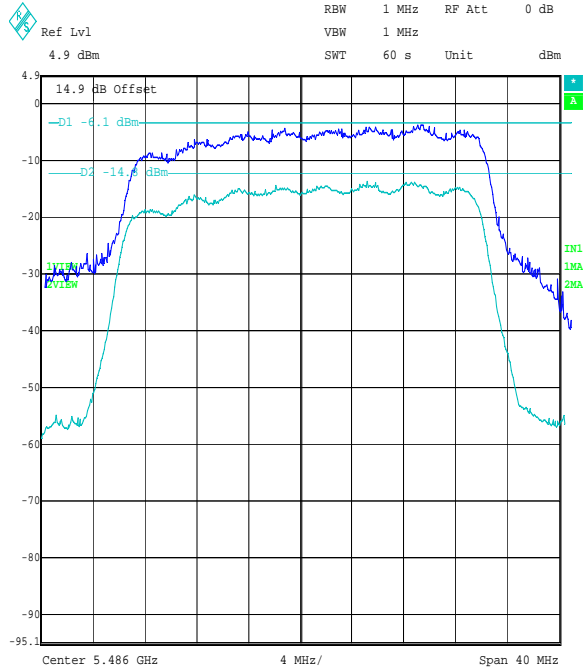
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION 16QAM MODE BOTTOM CHANNEL V PORT
 Date: 12.SEP.2007 20:05:28

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

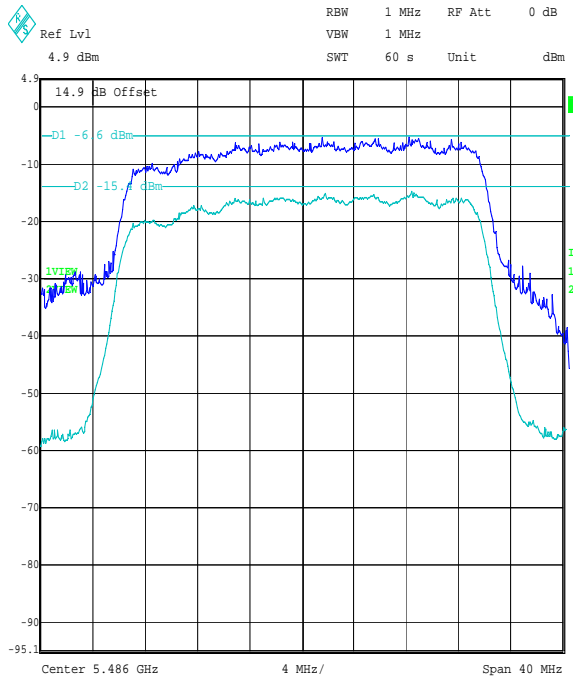
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



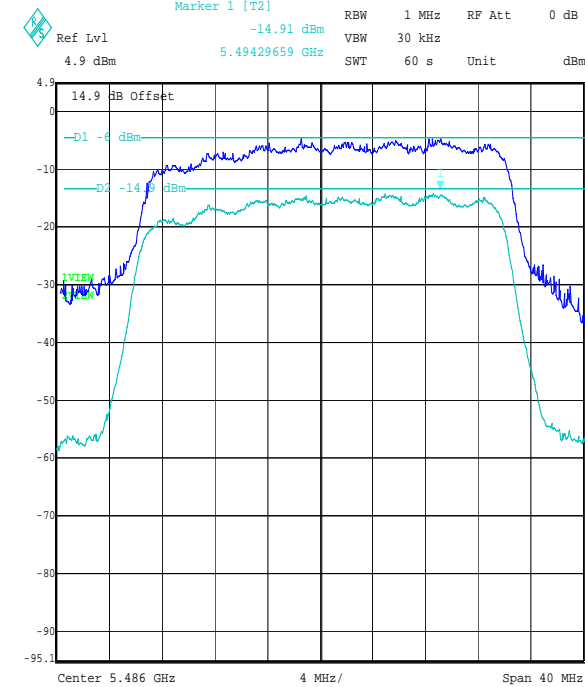
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE BOTTOM CHANNEL H PORT
Date: 12.SEP.2007 21:01:23



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 20:11:33



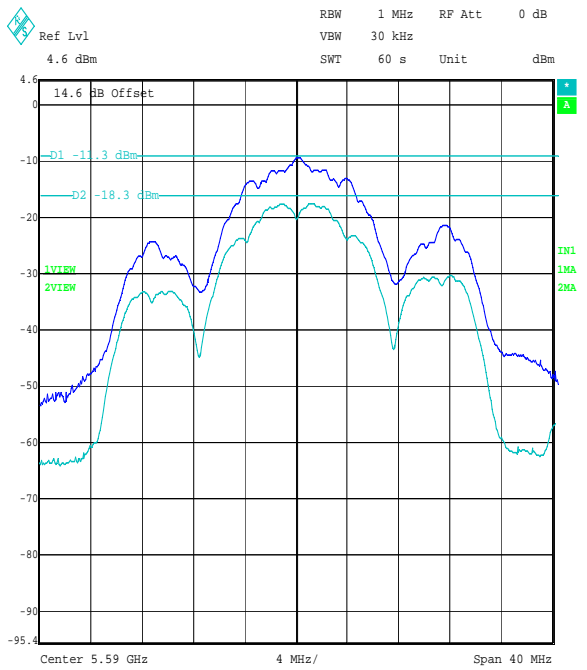
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE BOTTOM CHANNEL H PORT
Date: 12.SEP.2007 21:06:27



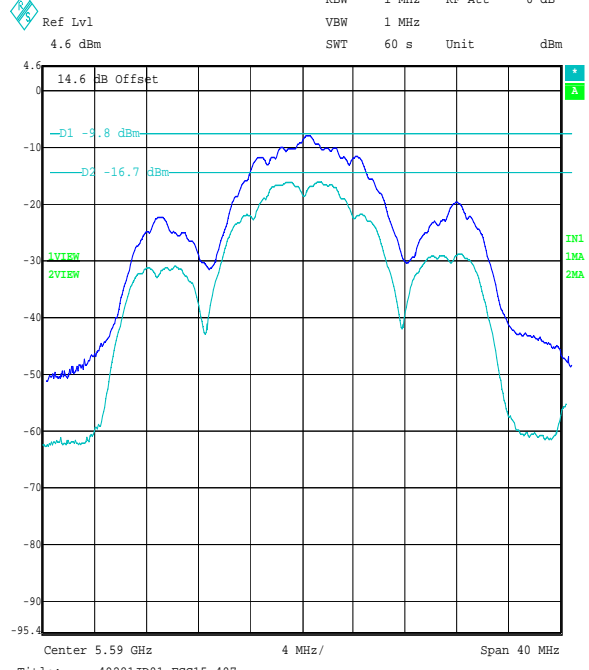
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 20:16:45

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

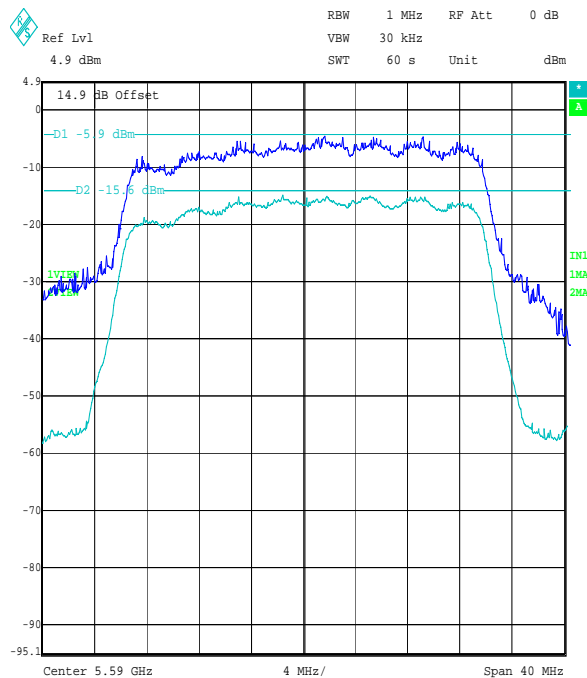
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



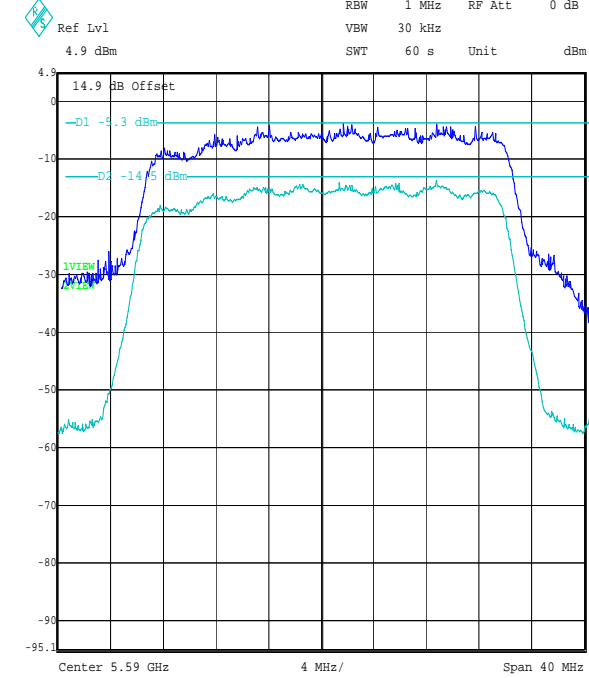
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION ACQ MODE MIDDLE CHANNEL H PORT
 Date: 12.SEP.2007 21:17:46



Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION ACQ MODE MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 22:11:46



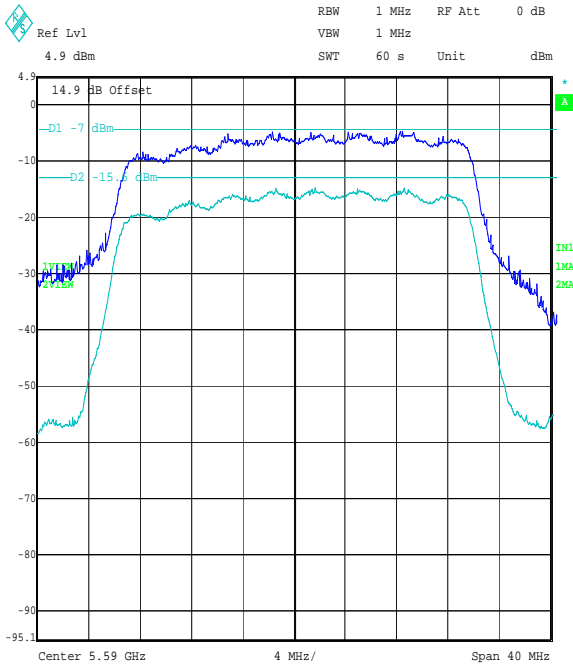
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 Date: 12.SEP.2007 21:27:32



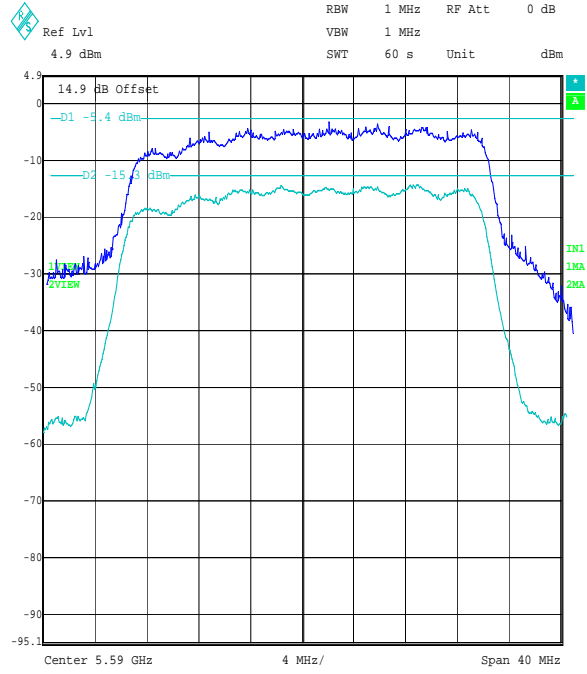
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION BPSK MODE MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 22:08:18

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

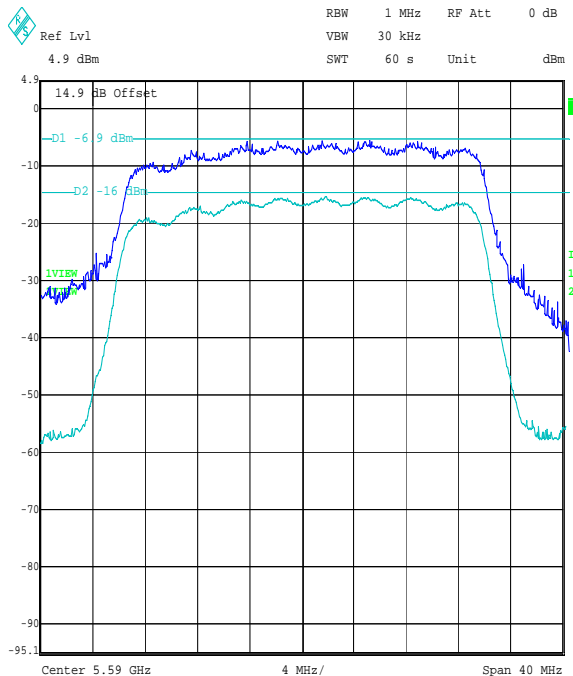
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



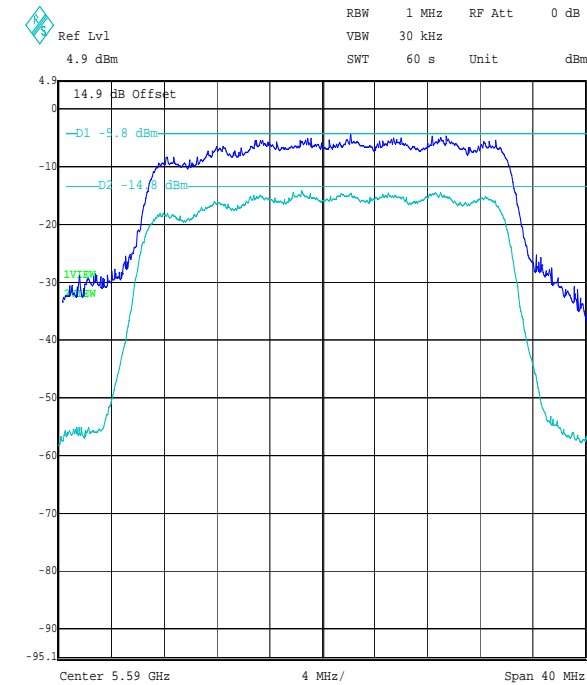
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION QPSK MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 21:31:47



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION QPSK MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 22:05:10



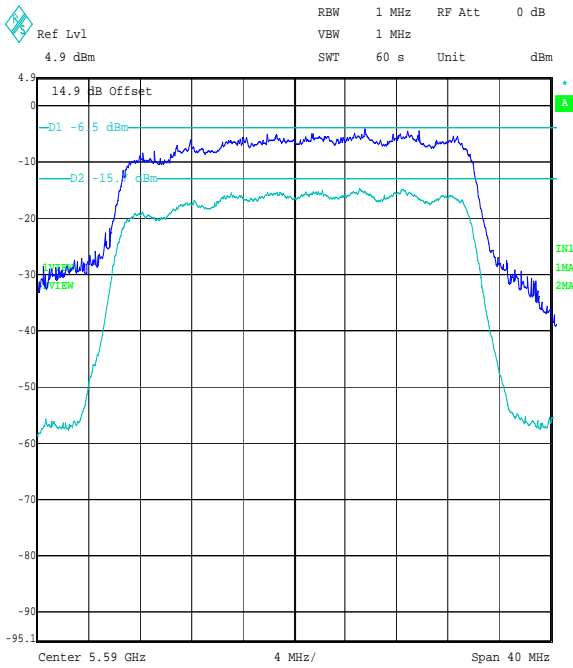
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 16QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 21:35:39



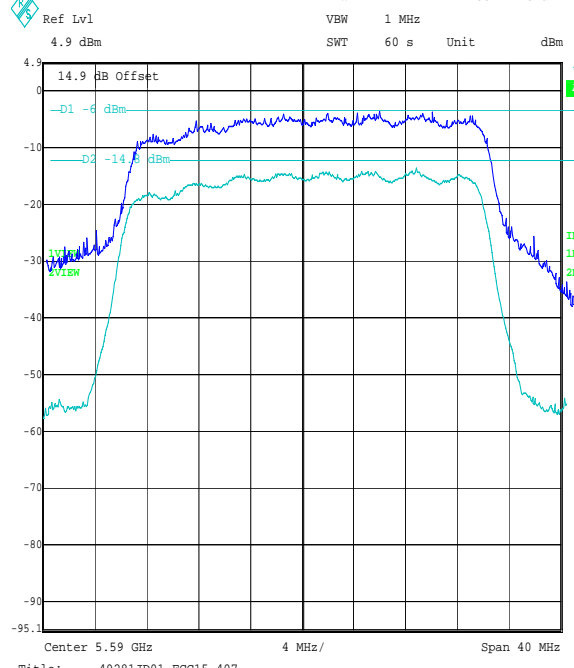
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 16QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 22:01:23

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

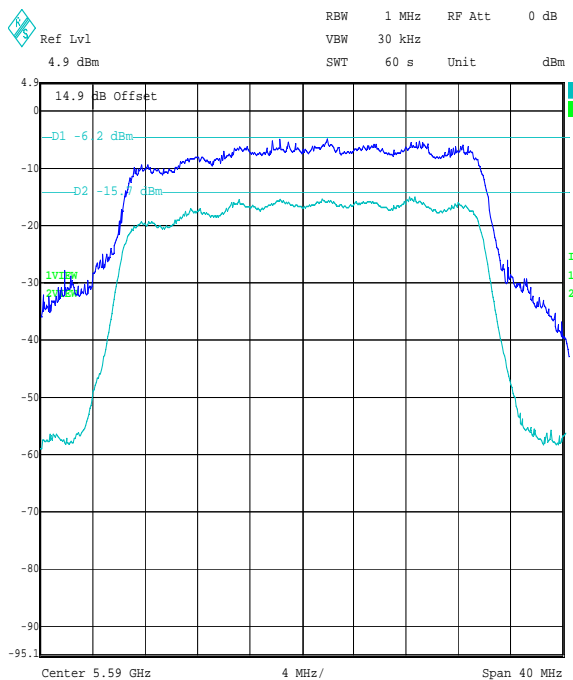
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



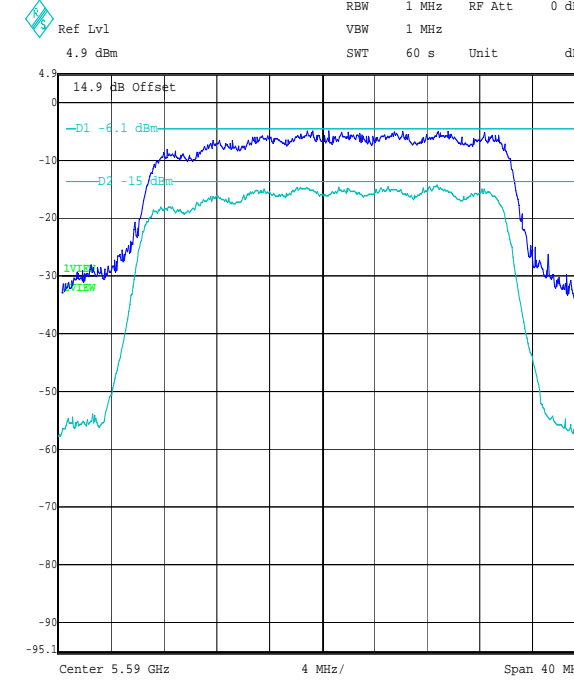
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 21:39:44



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 21:57:37



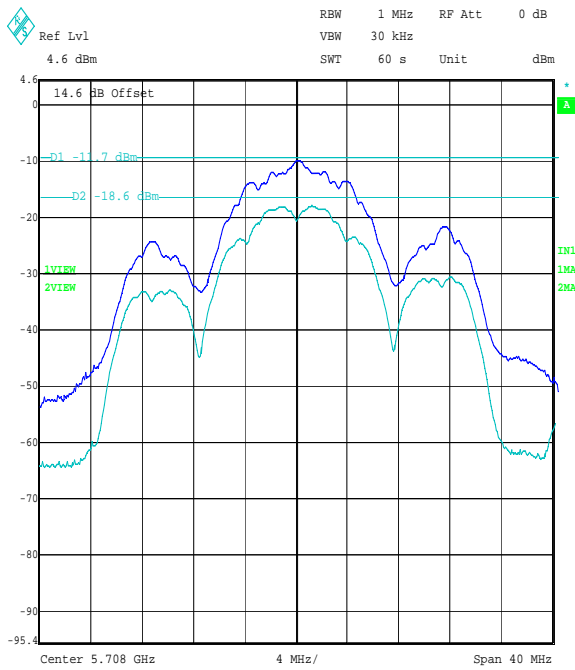
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE MIDDLE CHANNEL H PORT
Date: 12.SEP.2007 21:44:30



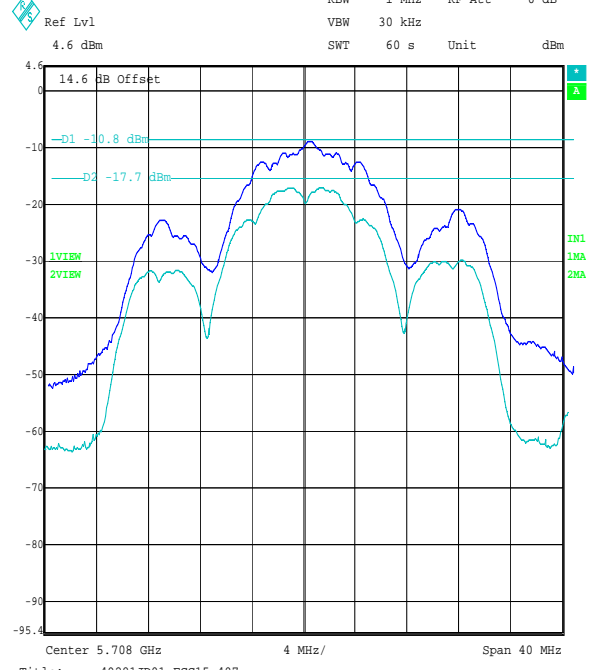
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 21:52:50

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

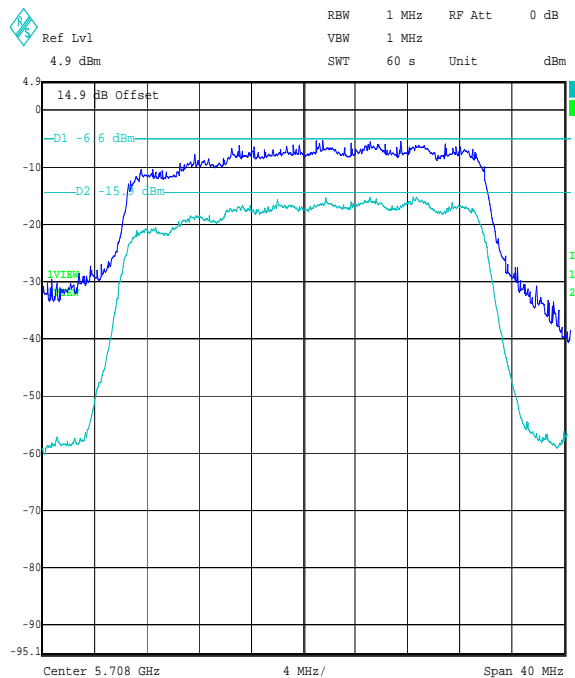
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



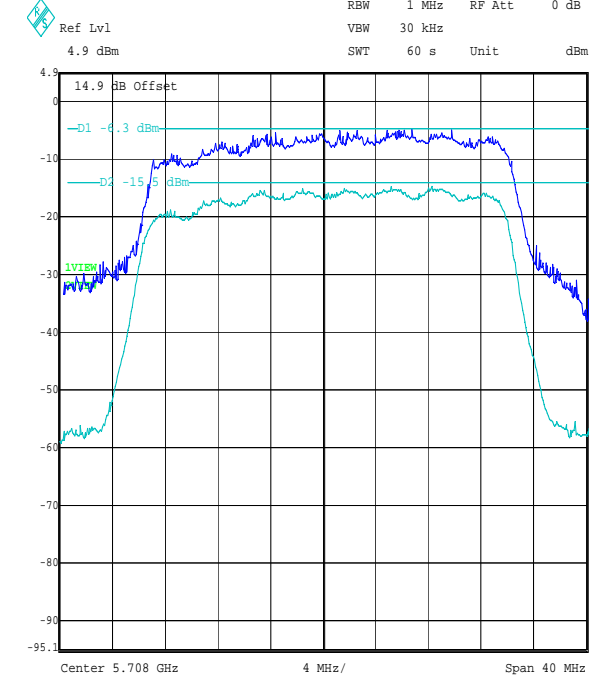
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION ACQ MODE TOP CHANNEL H PORT
 Date: 12.SEP.2007 23:02:30



Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION ACQ MODE TOP CHANNEL V PORT
 Date: 12.SEP.2007 22:15:52



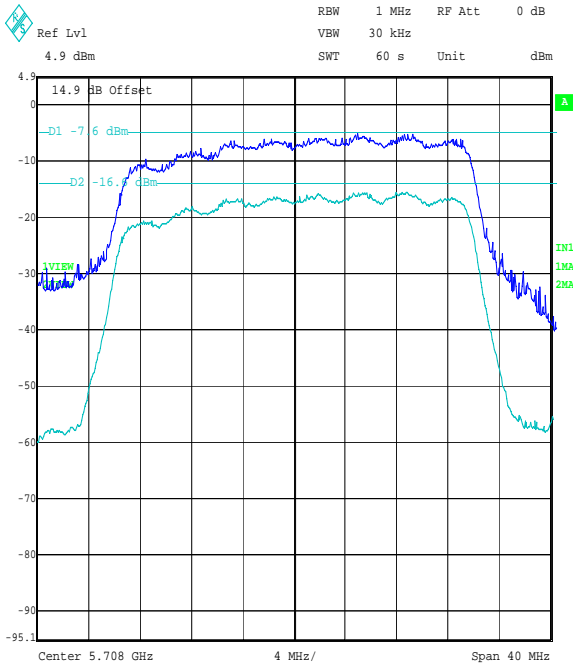
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION BPSK MODE TOP CHANNEL H PORT
 Date: 12.SEP.2007 22:57:54



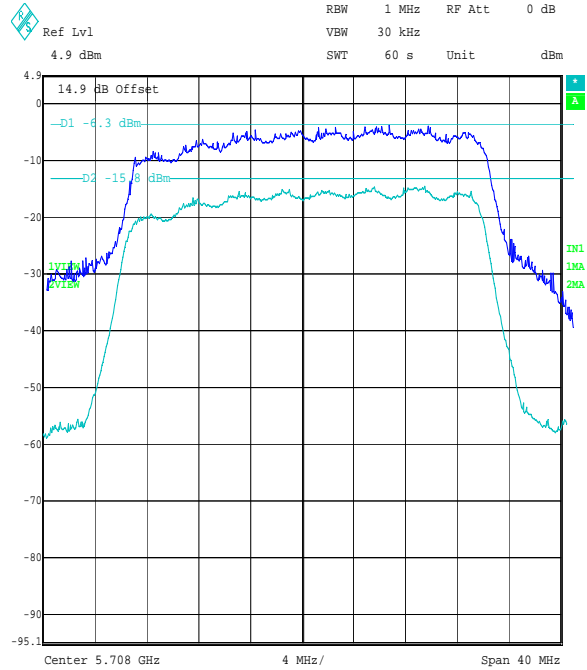
Title: 49281JD01 FCC15.407
 Comment A: PEAK EXCURSION BPSK MODE TOP CHANNEL V PORT
 Date: 12.SEP.2007 22:24:45

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

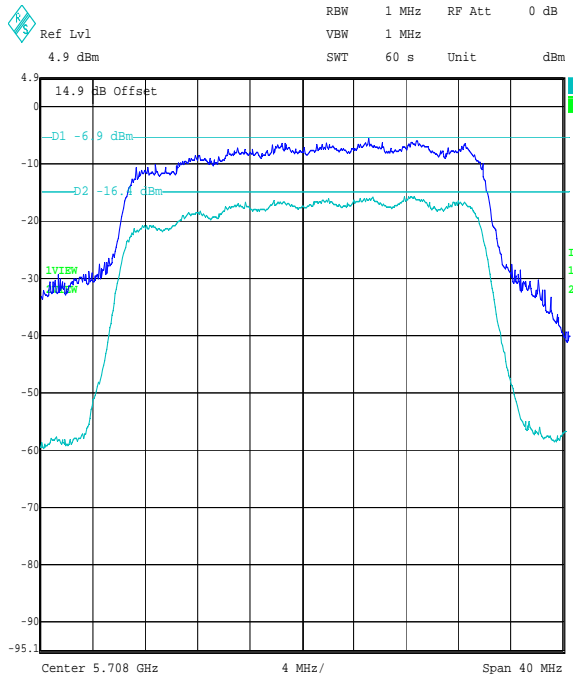
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



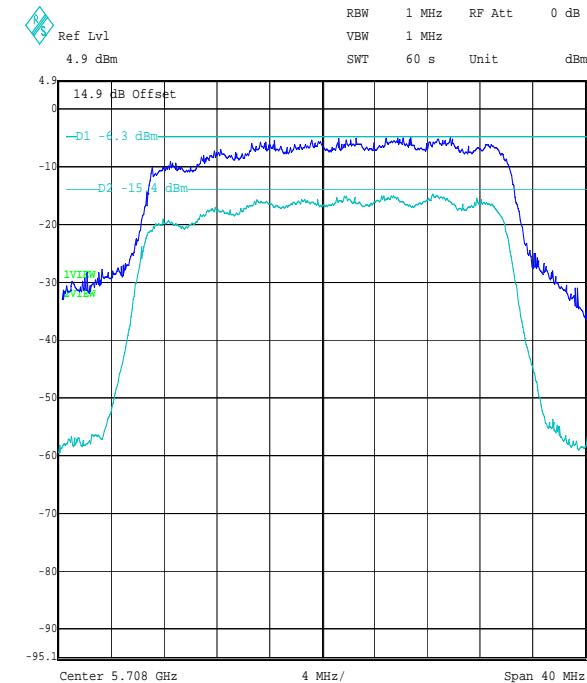
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION QPSK MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 22:54:20



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION QPSK MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 22:29:02



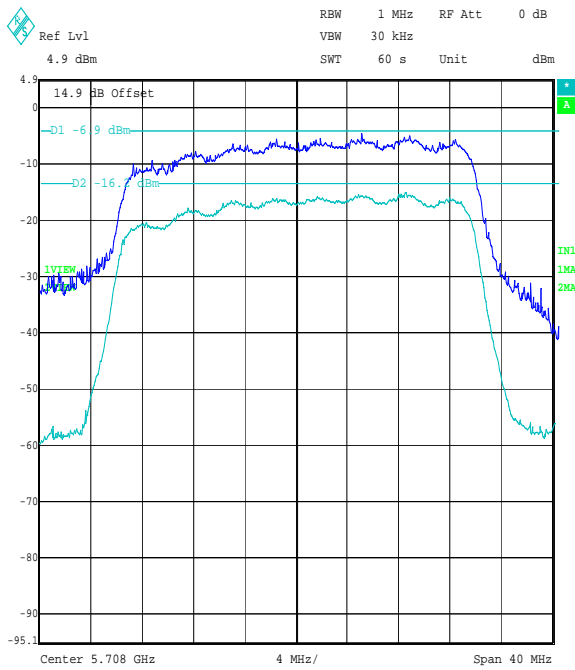
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 16QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 22:49:57



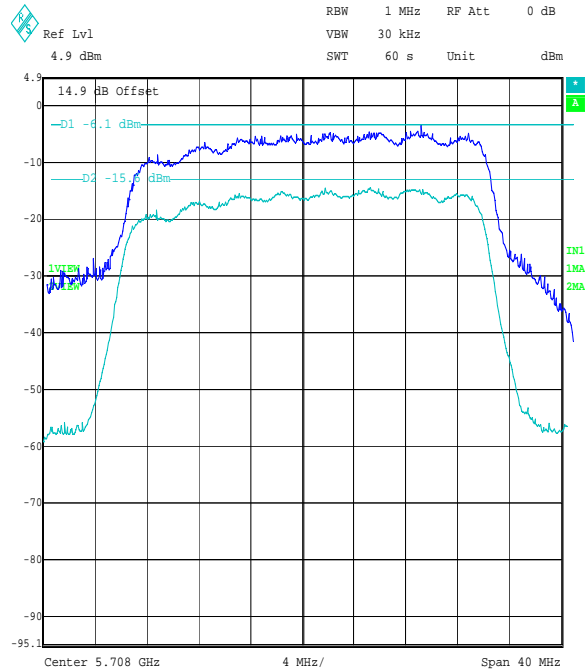
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 16QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 22:32:10

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

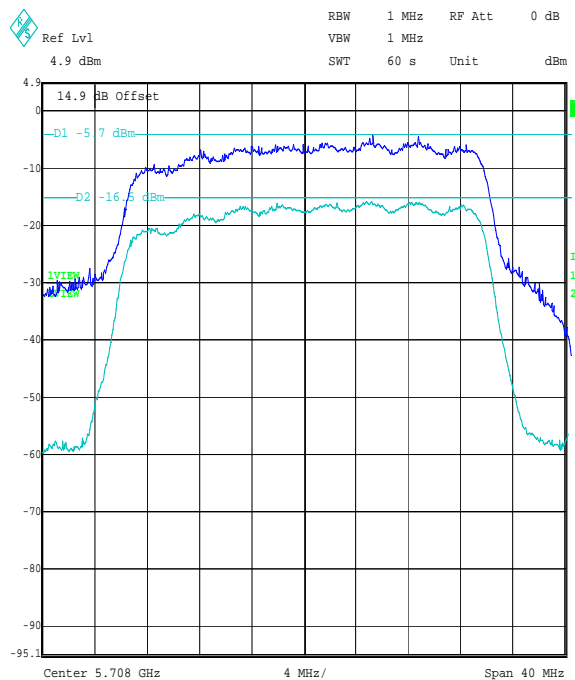
Transmitter Modulation Envelope Peak Excursion Ratio (Continued)



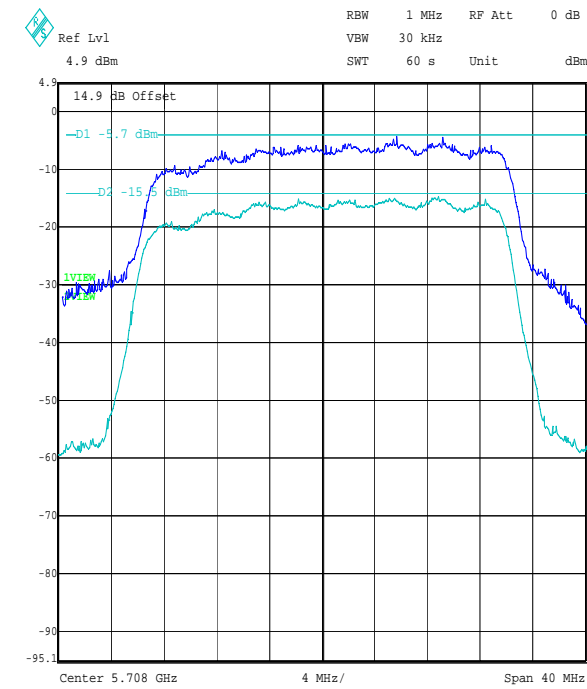
Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 22:46:54



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 64QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 22:35:25



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE TOP CHANNEL H PORT
Date: 12.SEP.2007 22:43:38



Title: 49281JD01 FCC15.407
Comment A: PEAK EXCURSION 256QAM MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 22:40:00

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

7.2.5. Transmitter Emission Bandwidth

Results: ACQ Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 26.6 | 27.6 |
| Middle | 100 | 100 | 26.4 | 27.6 |
| Top | 100 | 100 | 26.2 | 27.7 |

Results: BPSK Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 29.6 | 30.6 |
| Middle | 100 | 100 | 29.7 | 30.5 |
| Top | 100 | 100 | 29.6 | 30.6 |

Results: QPSK Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 29.6 | 30.6 |
| Middle | 100 | 100 | 29.7 | 30.6 |
| Top | 100 | 100 | 29.2 | 30.6 |

Results: 16QAM Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 29.2 | 30.6 |
| Middle | 100 | 100 | 29.6 | 30.6 |
| Top | 100 | 100 | 29.1 | 30.5 |

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

Transmitter Emission Bandwidth (Continued)

Results: 64QAM Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 29.1 | 30.6 |
| Middle | 100 | 100 | 29.6 | 30.6 |
| Top | 100 | 100 | 29.2 | 30.5 |

Results: 256 QAM Port V

| Channel | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | 20 dB Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|----------------------------|-----------------------|-----------------------|-----------------------|
| Bottom | 100 | 100 | 29.1 | 30.6 |
| Middle | 100 | 100 | 29.1 | 30.6 |
| Top | 100 | 100 | 29.1 | 30.1 |

Note(s):

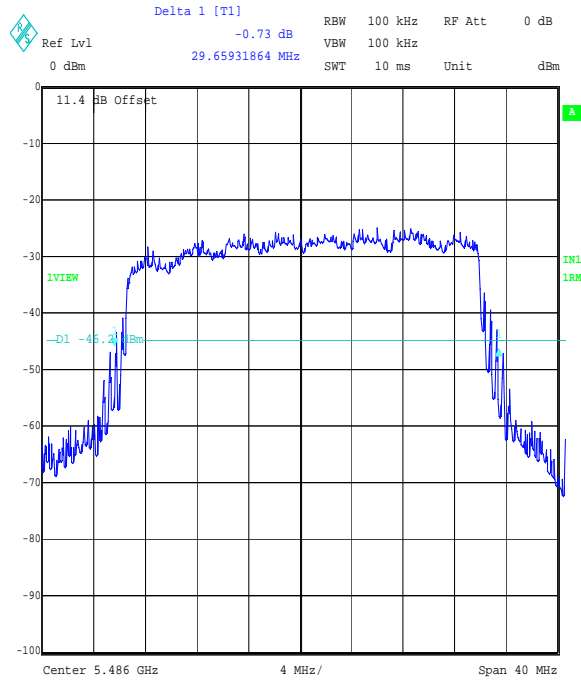
1. Port H exhibited similar results to Port V therefore only port V was tested.

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

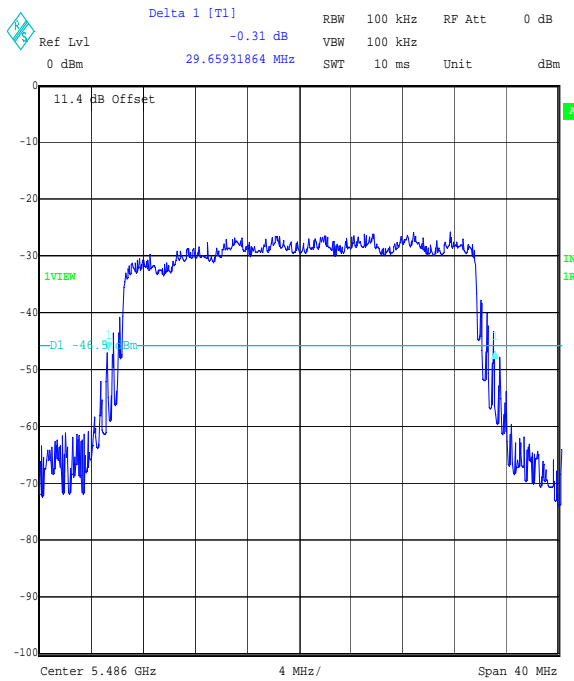
Transmitter Emission Bandwidth (Continued)



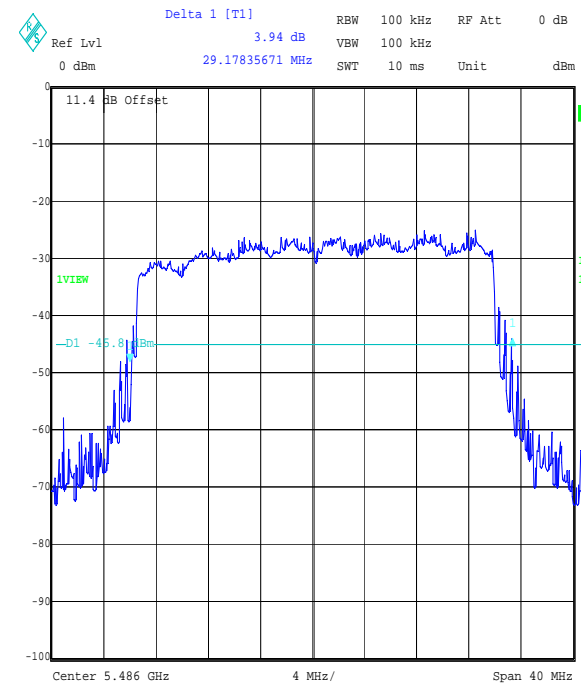
Title: 49281JD01 FCC15.407
 Comment A: 20 dB BANDWIDTH ACQ MODE BOTTOM CHANNEL V PORT
 Date: 11.SEP.2007 12:21:35



Title: 49281JD01 FCC15.407
 Comment A: 20dB BANDWIDTH BPSK BOTTOM CHANNEL V PORT
 Date: 12.SEP.2007 12:26:00



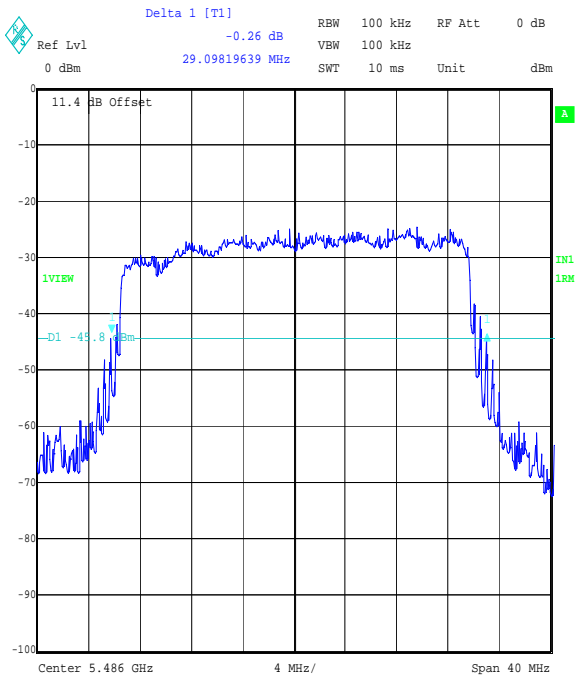
Title: 49281JD01 FCC15.407
 Comment A: 20dB BANDWIDTH QPSK BOTTOM CHANNEL V PORT
 Date: 12.SEP.2007 12:30:46



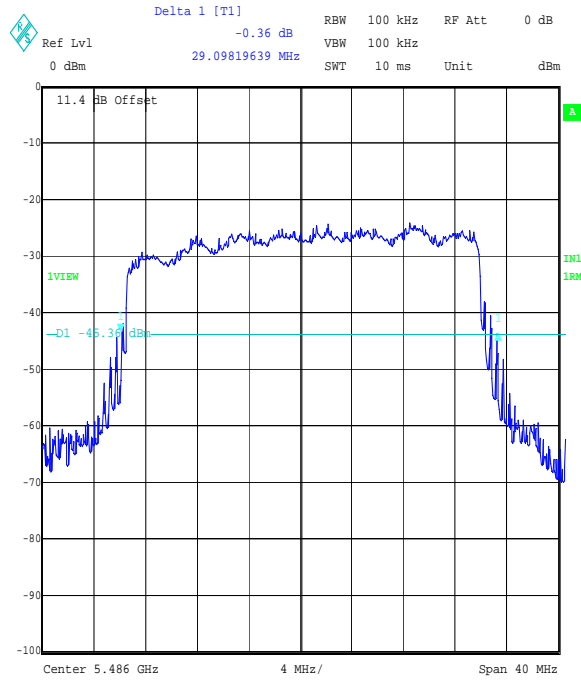
Title: 49281JD01 FCC15.407
 Comment A: 20dB BANDWIDTH 16 QAM BOTTOM CHANNEL V PORT
 Date: 12.SEP.2007 12:35:35

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

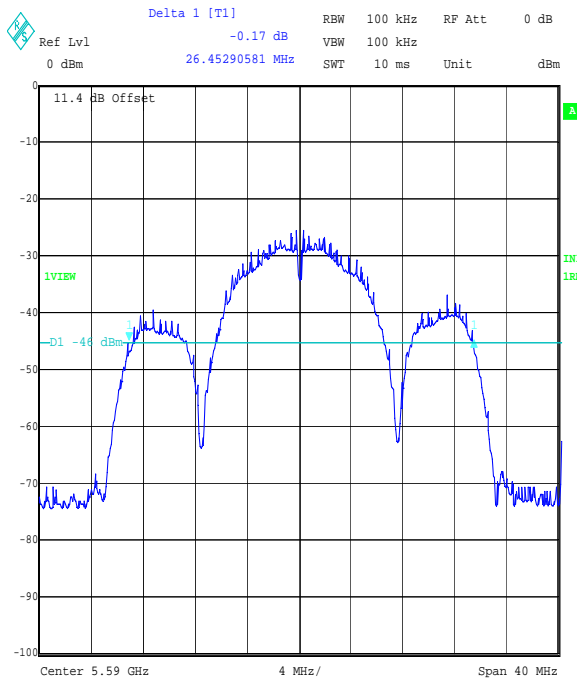
Transmitter Emission Bandwidth (Continued)



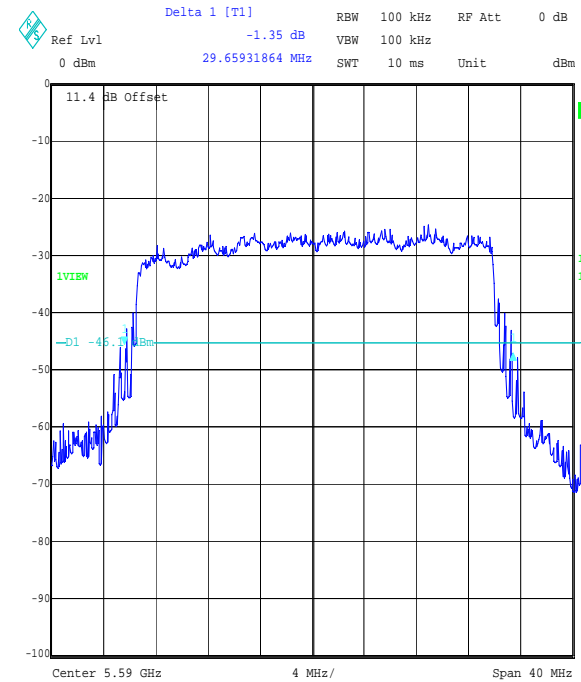
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 64 QAM BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 12:39:16



Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 256 QAM BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 12:15:03



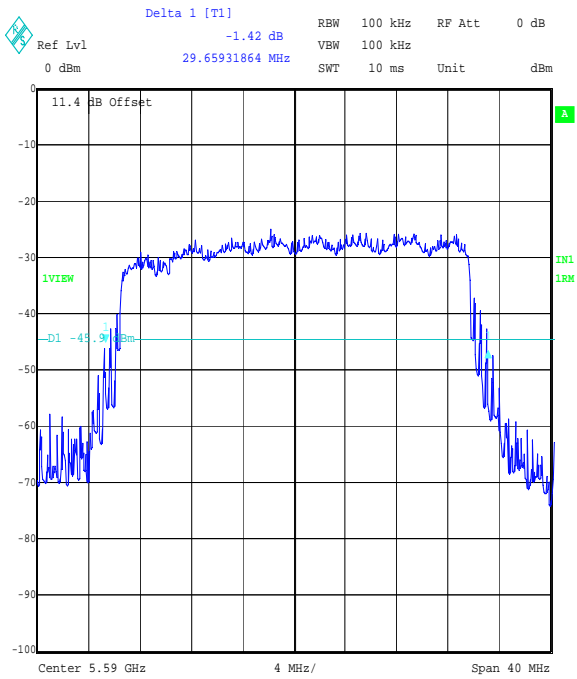
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH ACQ MODE MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:59:57



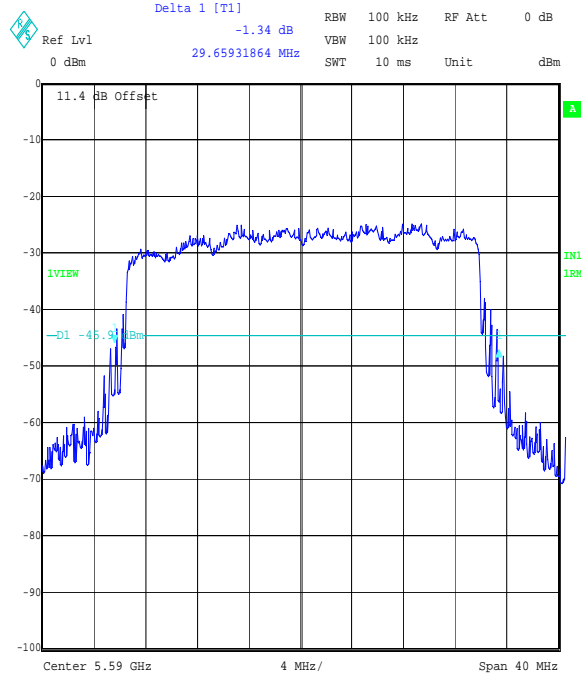
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH BPSK MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:30:55

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

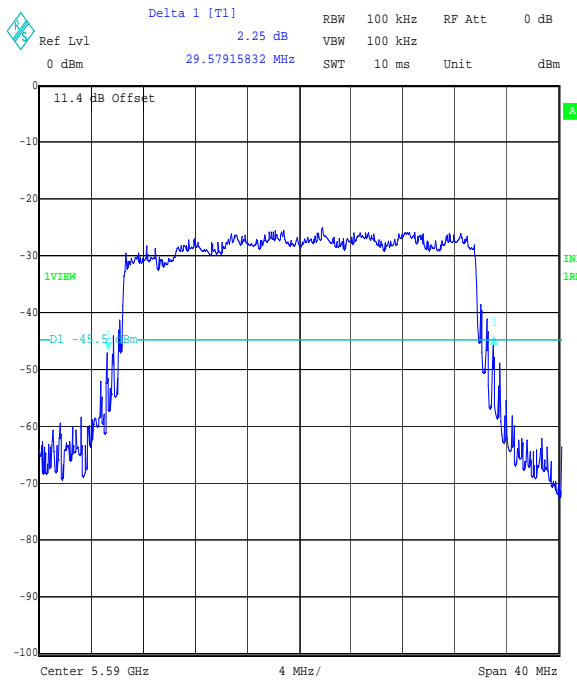
Transmitter Emission Bandwidth (Continued)



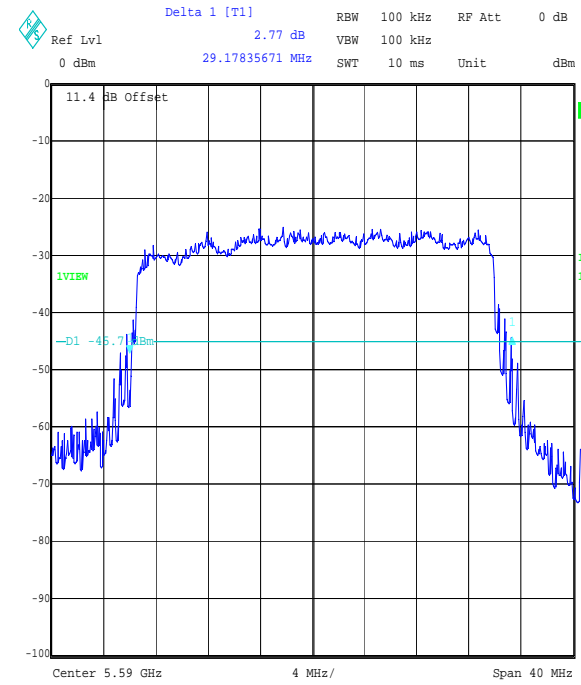
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH QPSK MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:35:31



Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 16 QAM MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:40:08



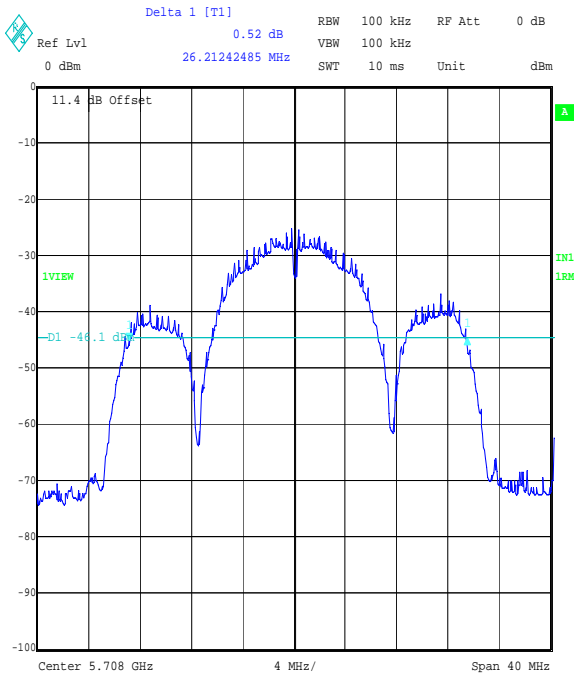
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 64 QAM MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:44:10



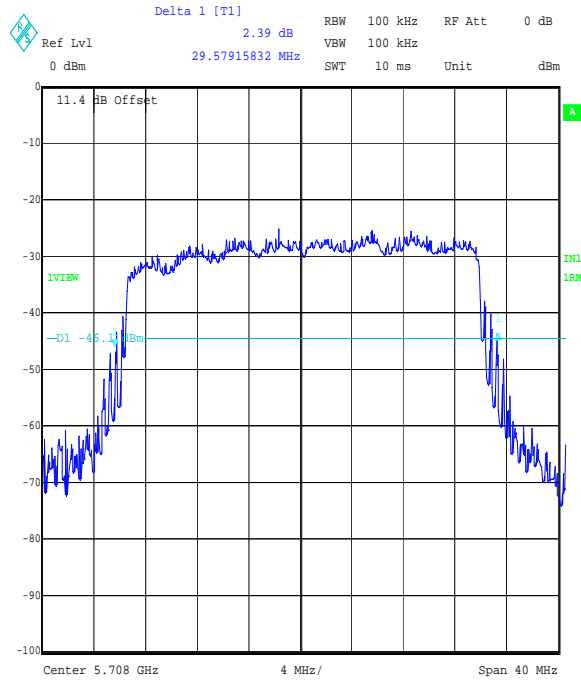
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 256 QAM MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:52:41

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

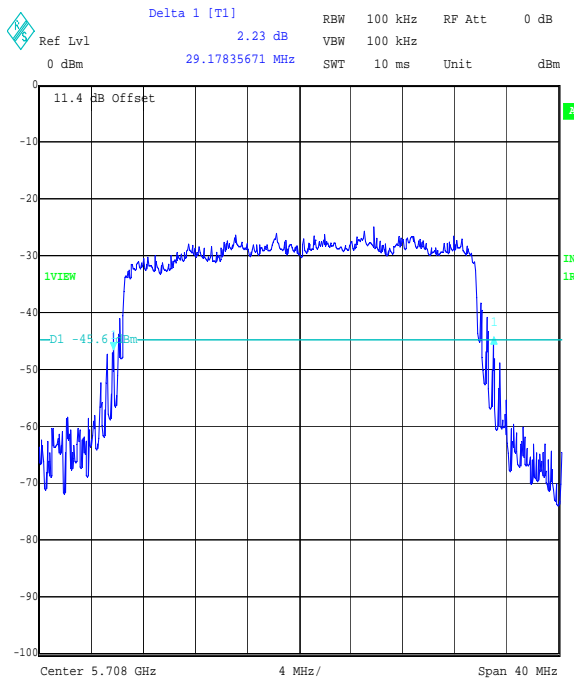
Transmitter Emission Bandwidth (Continued)



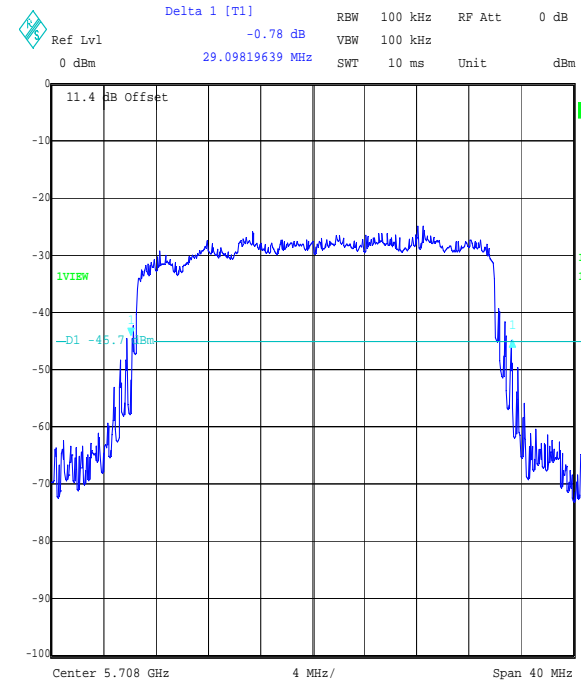
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH ACQ MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 14:11:41



Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH BPSK MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 14:19:58



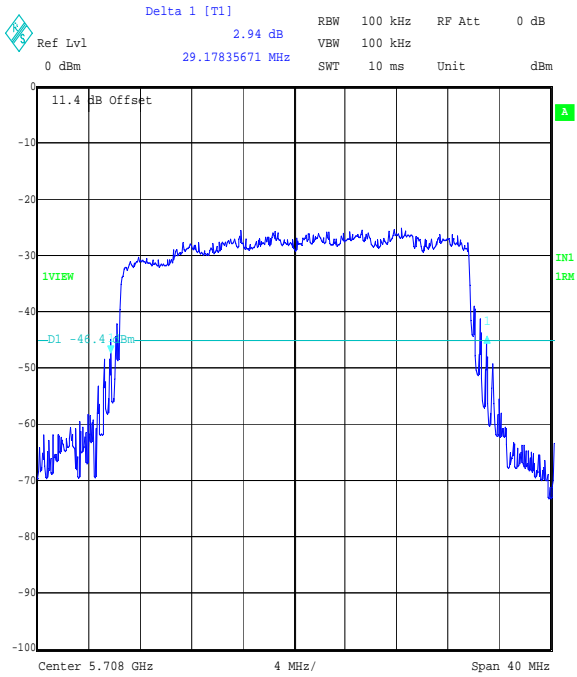
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH QPSK TOP CHANNEL V PORT
Date: 12.SEP.2007 14:25:30



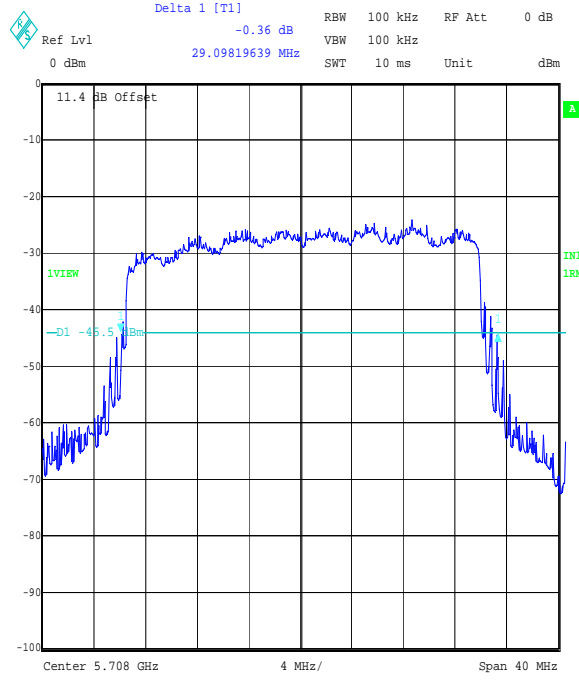
Title: 49281JD01 FCC15.407
Comment A: 20dB BANDWIDTH 16 QAM TOP CHANNEL V PORT
Date: 12.SEP.2007 14:30:34

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

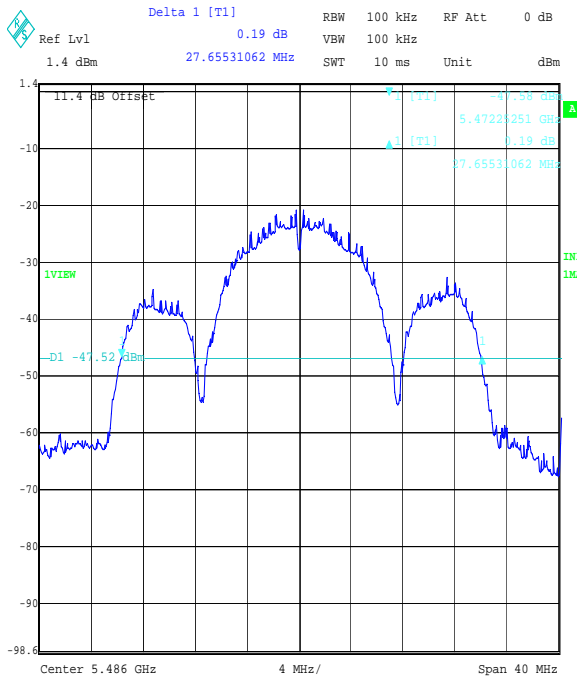
Transmitter Emission Bandwidth (Continued)



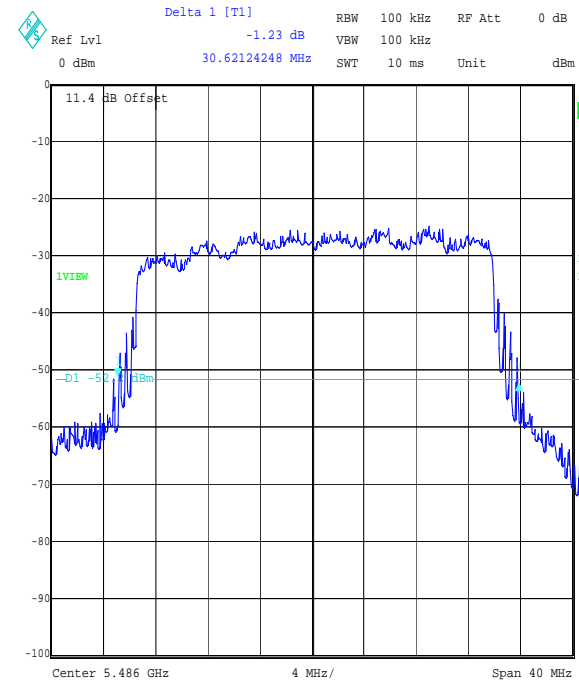
Title: 49281JD01 FCC15.407
 Comment A: 20dB BANDWIDTH 64 QAM TOP CHANNEL V PORT
 Date: 12.SEP.2007 14:34:44



Title: 49281JD01 FCC15.407
 Comment A: 20dB BANDWIDTH 256 QAM TOP CHANNEL V PORT
 Date: 12.SEP.2007 14:38:50



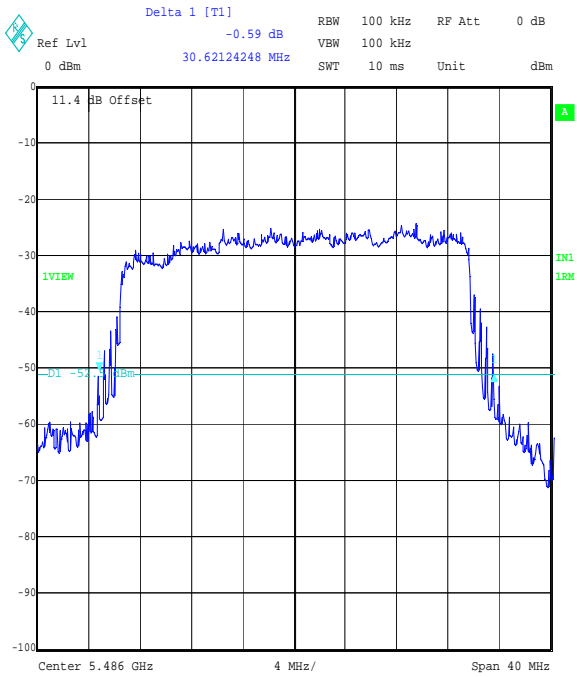
Title: 49281JD01 FCC15.407
 Comment A: 26 dB BANDWIDTH ACQ MODE BOTTOM CHANNEL V PORT
 Date: 11.SEP.2007 12:25:42



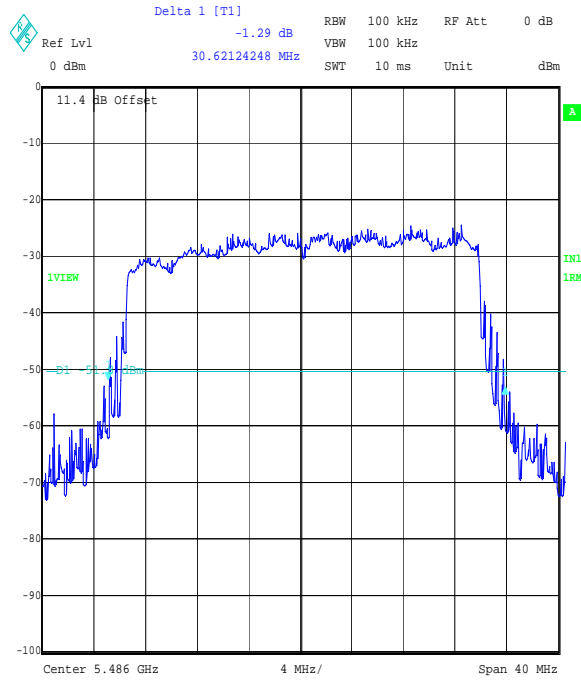
Title: 49281JD01 FCC15.407
 Comment A: 26dB BANDWIDTH BPSK BOTTOM CHANNEL CHANNEL V PORT
 Date: 12.SEP.2007 14:58:43

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

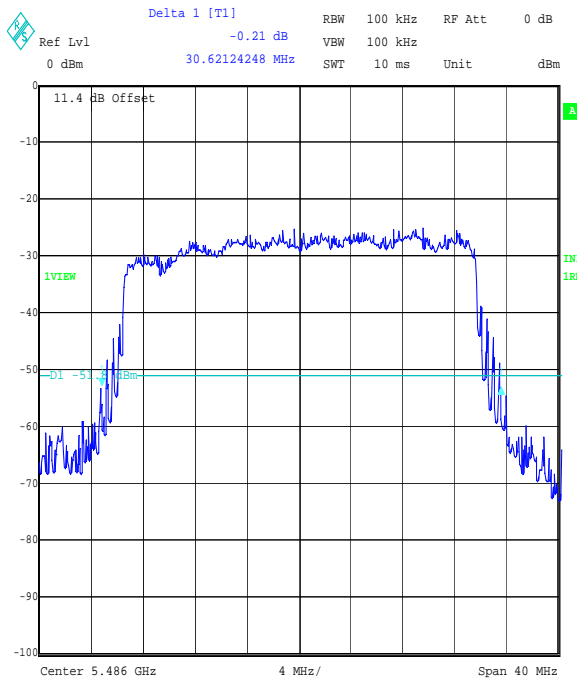
Transmitter Emission Bandwidth (Continued)



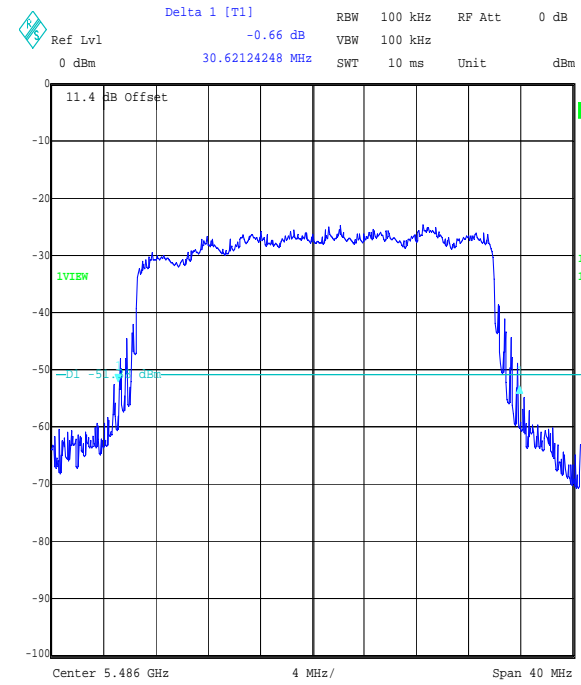
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH QPSK BOTTOM CHANNEL CHANNEL V PORT
Date: 12.SEP.2007 15:01:24



Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 16 QAM BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 12:37:08



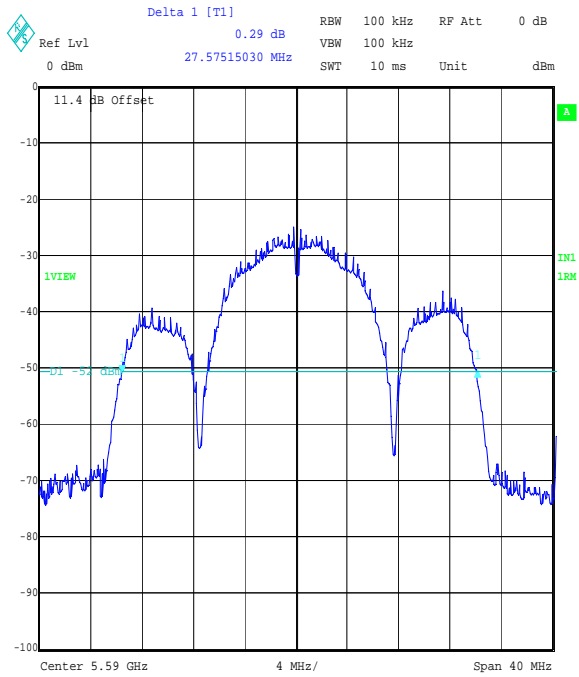
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 64 QAM BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 12:40:49



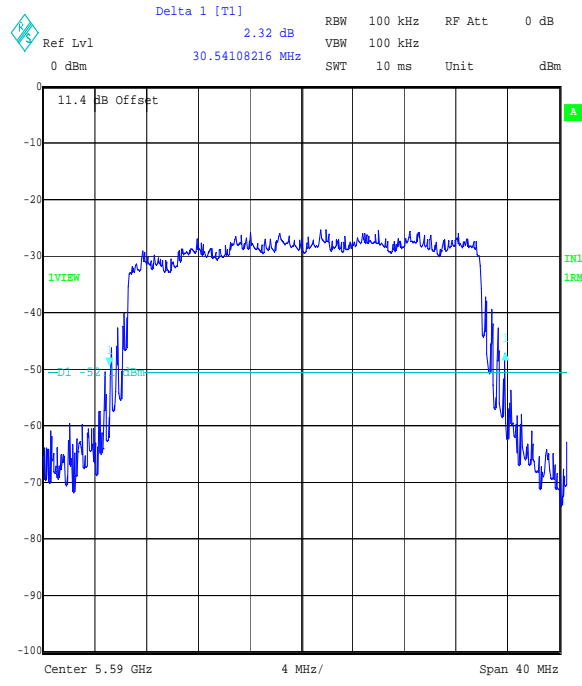
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 256 QAM BOTTOM CHANNEL V PORT
Date: 12.SEP.2007 12:18:26

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

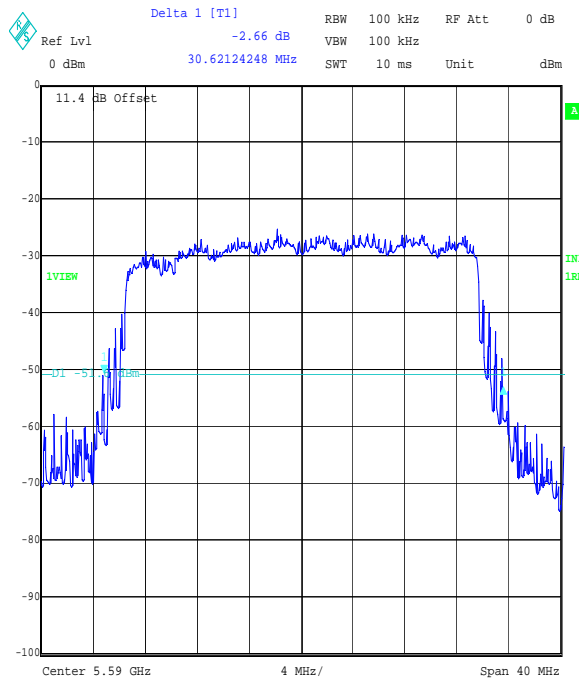
Transmitter Emission Bandwidth (Continued)



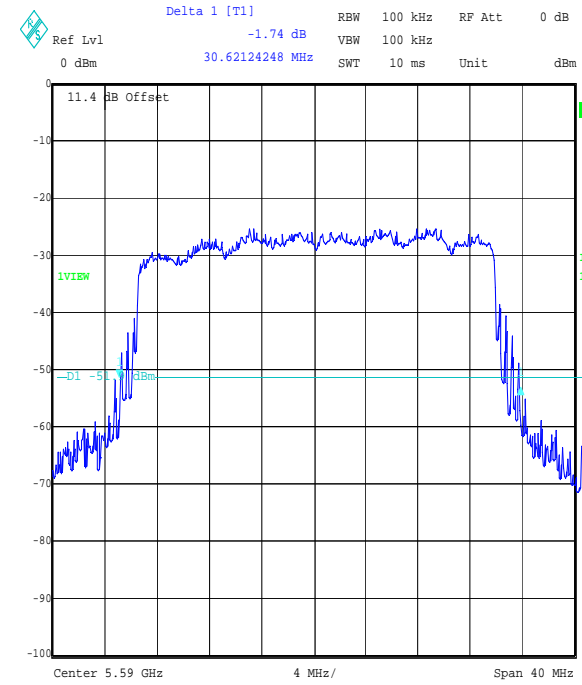
Title: 49281JD01 FCC15.407
 Comment A: 26dB BANDWIDTH ACQ MODE MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 15:13:38



Title: 49281JD01 FCC15.407
 Comment A: 26dB BANDWIDTH BPSK MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 15:10:48



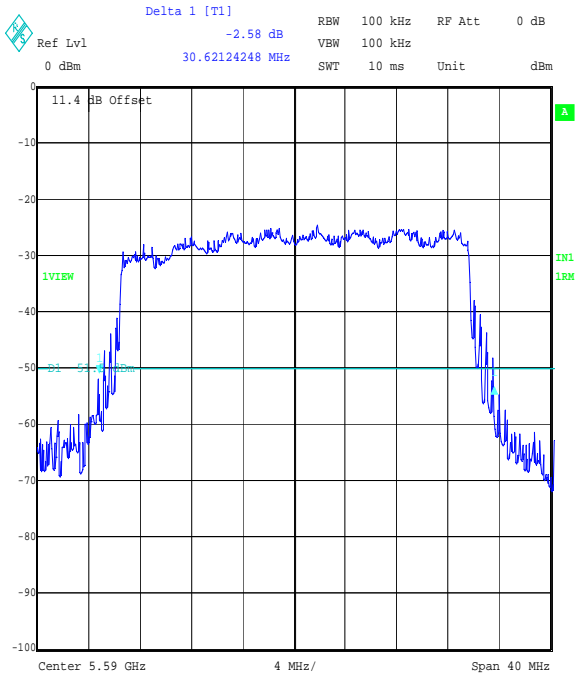
Title: 49281JD01 FCC15.407
 Comment A: 26dB BANDWIDTH QPSK MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 13:36:45



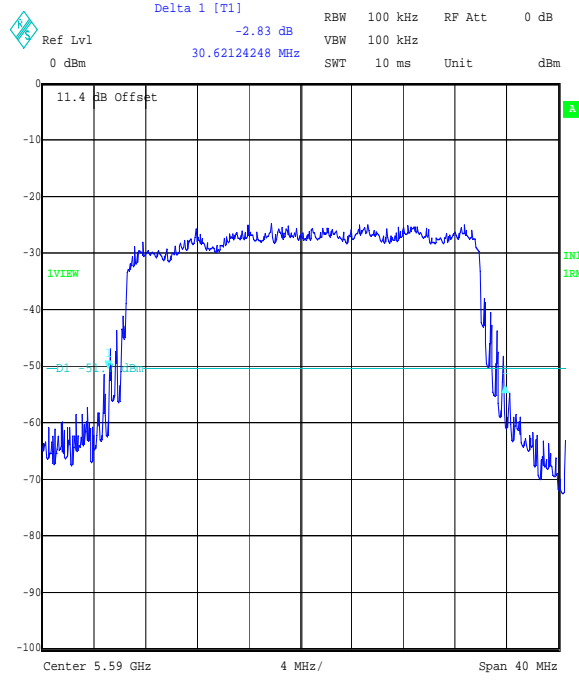
Title: 49281JD01 FCC15.407
 Comment A: 26dB BANDWIDTH 16 QAM MIDDLE CHANNEL V PORT
 Date: 12.SEP.2007 13:41:46

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

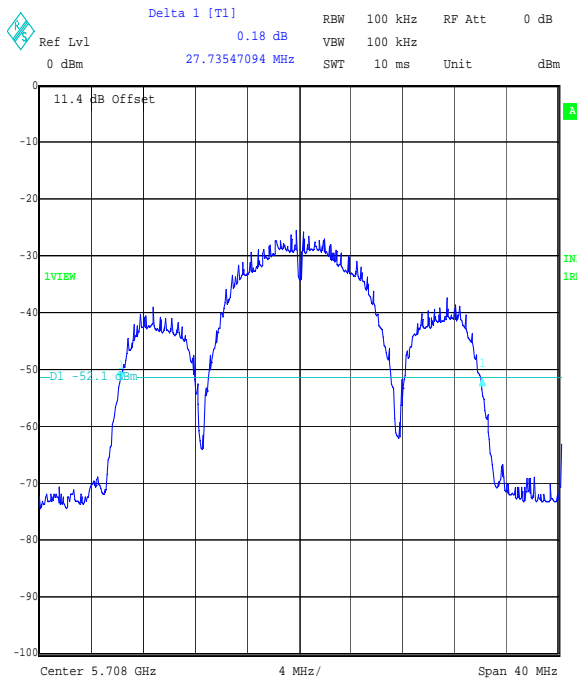
Transmitter Emission Bandwidth (Continued)



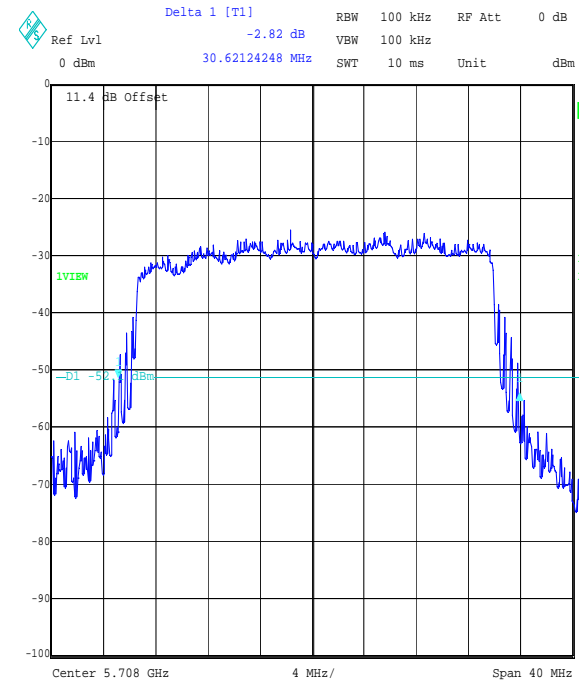
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 64 QAM MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:45:52



Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 256 QAM MIDDLE CHANNEL V PORT
Date: 12.SEP.2007 13:54:28



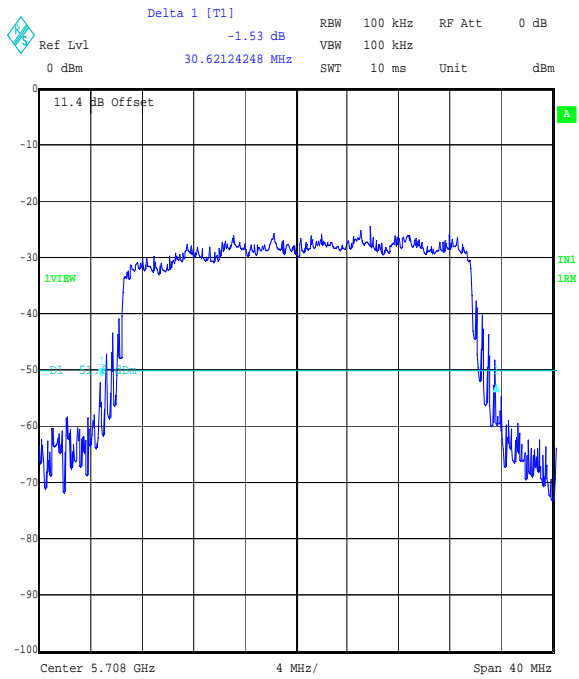
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH ACQ MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 14:16:53



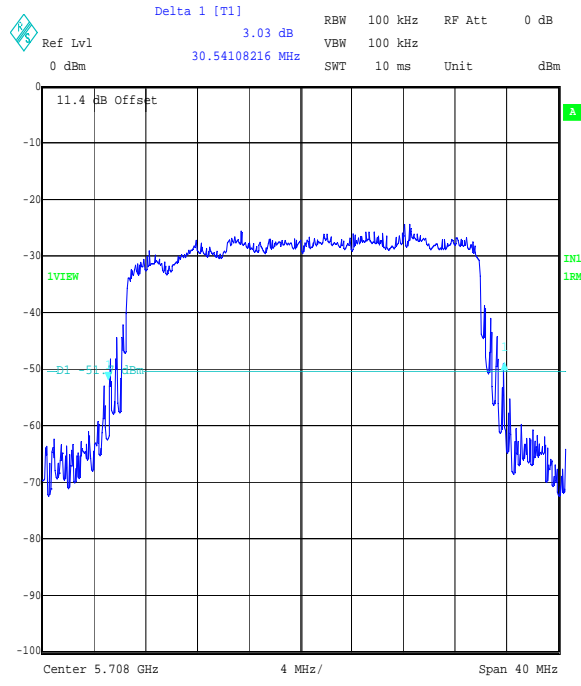
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH BPSK MODE TOP CHANNEL V PORT
Date: 12.SEP.2007 14:23:13

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

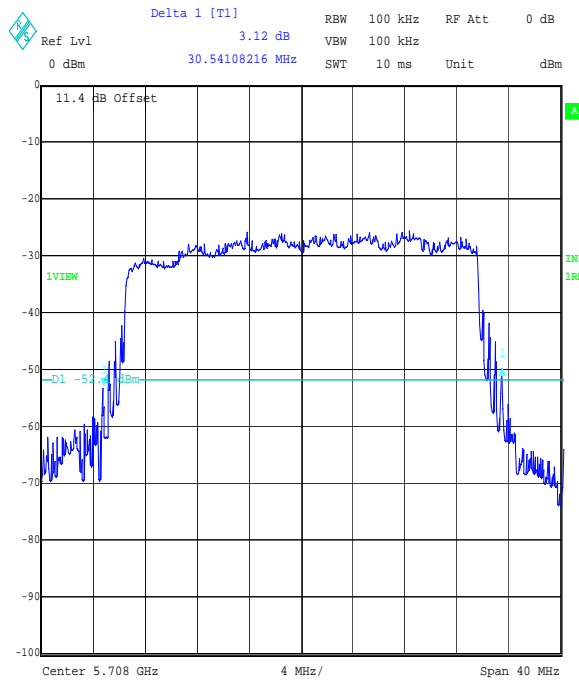
Transmitter Emission Bandwidth (Continued)



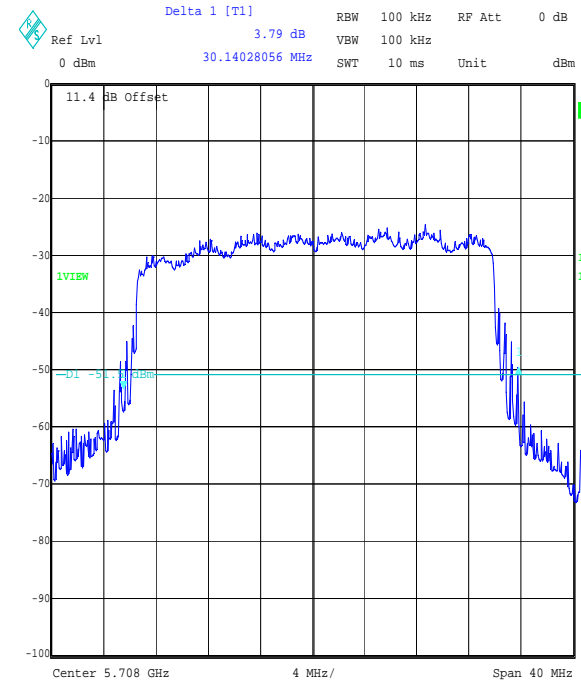
Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH QPSK TOP CHANNEL V PORT
Date: 12.SEP.2007 14:28:23



Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 16 QAM TOP CHANNEL V PORT
Date: 12.SEP.2007 14:32:29



Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 64 QAM TOP CHANNEL V PORT
Date: 12.SEP.2007 14:36:21



Title: 49281JD01 FCC15.407
Comment A: 26dB BANDWIDTH 256 QAM TOP CHANNEL V PORT
Date: 12.SEP.2007 14:41:18

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

7.2.6. Conducted Transmitter Spurious Emissions

For transmitters operating in the 5.47 GHz to 5.725 GHz band; all emissions outside of the 5.47 GHz to 5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

Only spurious emissions within 20 dB of the limit need be reported.

The limit shown in the table below is calculated as:

Limit – Antenna gain + allowed 6dBi gain + antenna cable loss – aggregate correction factor.

Example: $-27 \text{ dBm/MHz} - 33.4 \text{ dBi} + 6 \text{ dBi} + 1.2 \text{ dB} - 3 \text{ dB} = -56.2 \text{ dBm/MHz}$

Results: Bottom Channel

| Frequency (MHz) | Modulation Scheme | Peak Emission Level (dBm) | Limit (dBm/MHz) | Margin (dB) |
|-----------------|-------------------|---------------------------|-----------------|-------------|
| 0.058 | BPSK | -78.3 | -57.7 | 20.6 |
| 37321.643 | BPSK | -68.0 | -57.7 | 10.3 |

Results: Middle Channel

| Frequency (MHz) | Modulation Scheme | Peak Emission Level (dBm) | Limit (dBm/MHz) | Margin (dB) |
|-----------------|-------------------|---------------------------|-----------------|-------------|
| 0.058 | BPSK | -78.4 | -57.7 | 20.7 |
| 37321.643 | BPSK | -68.0 | -57.7 | 10.3 |

Results: Top Channel

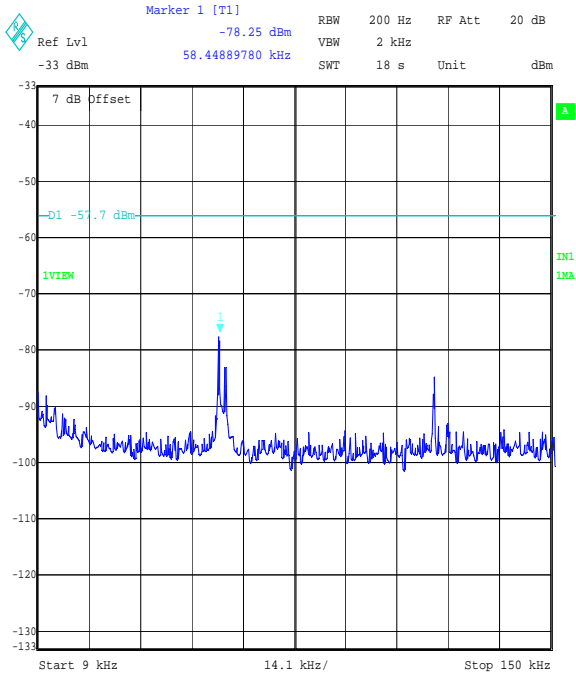
| Frequency (MHz) | Modulation Scheme | Peak Emission Level (dBm) | Limit (dBm/MHz) | Margin (dB) |
|-----------------|-------------------|---------------------------|-----------------|-------------|
| 0.058 | BPSK | -78.6 | -57.7 | 20.9 |
| 37321.643 | BPSK | -68.0 | -57.7 | 10.3 |

Note(s):

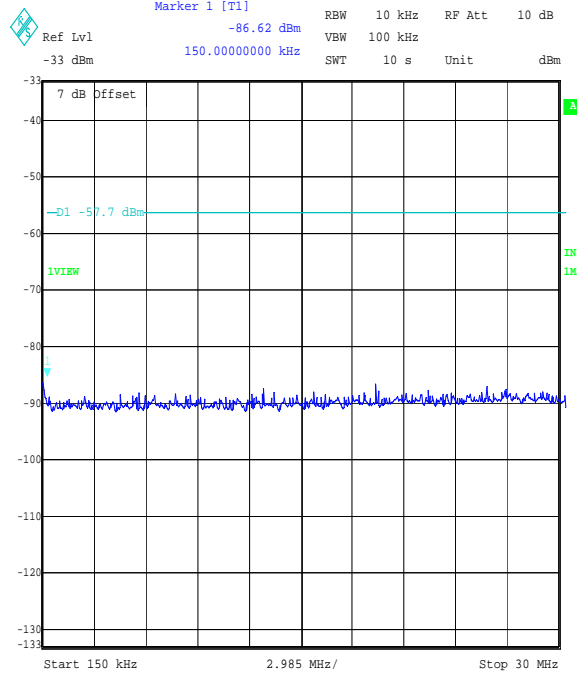
1. BPSK mode was found to be worst case with regards to output power and as such, all emissions measurements were performed in the BPSK mode of operation.
2. One emission was recorded at 58 kHz on all three channels. No other emissions within 20dB of the limit were observed therefore the highest noise floor levels were recorded in the tables above.

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

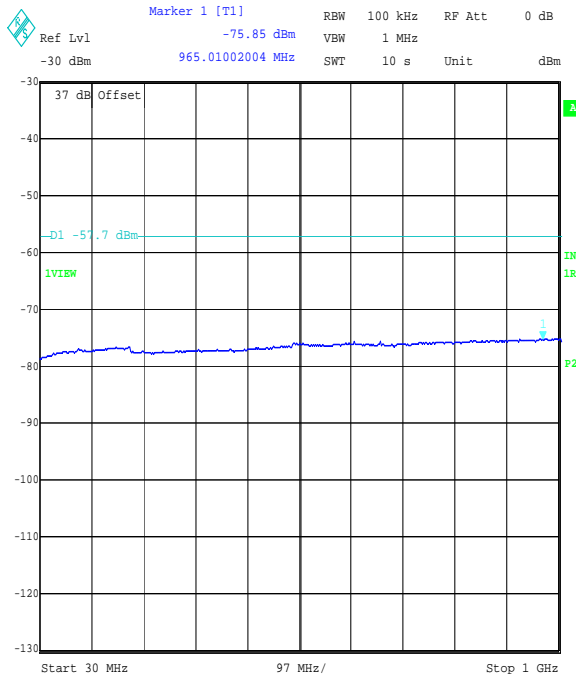
Conducted Transmitter Spurious Emissions (Continued)



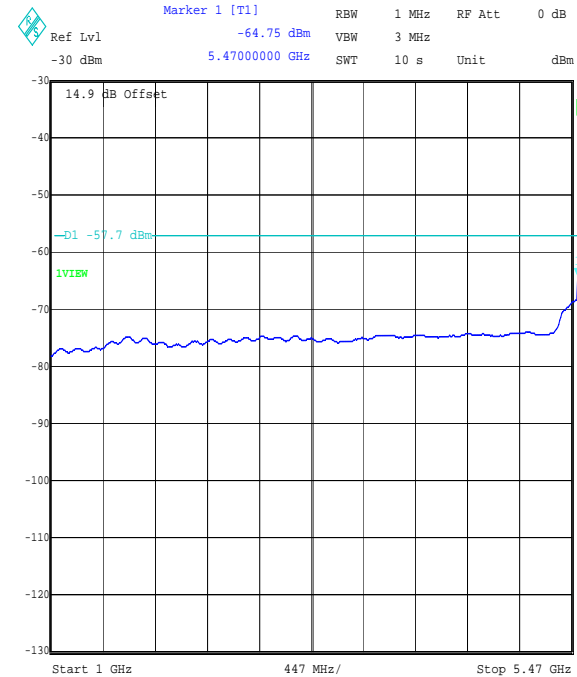
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT BOTTOM CHANNEL
Date: 13.SEP.2007 16:15:07



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT BOTTOM CHANNEL
Date: 13.SEP.2007 16:29:11



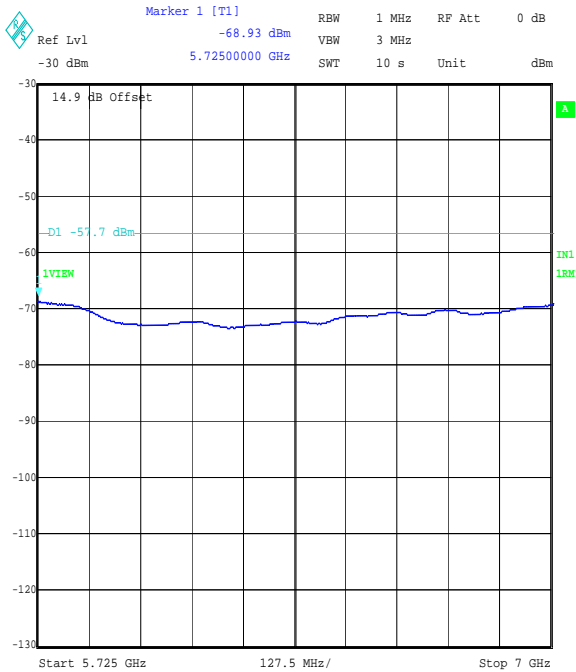
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 11:31:43



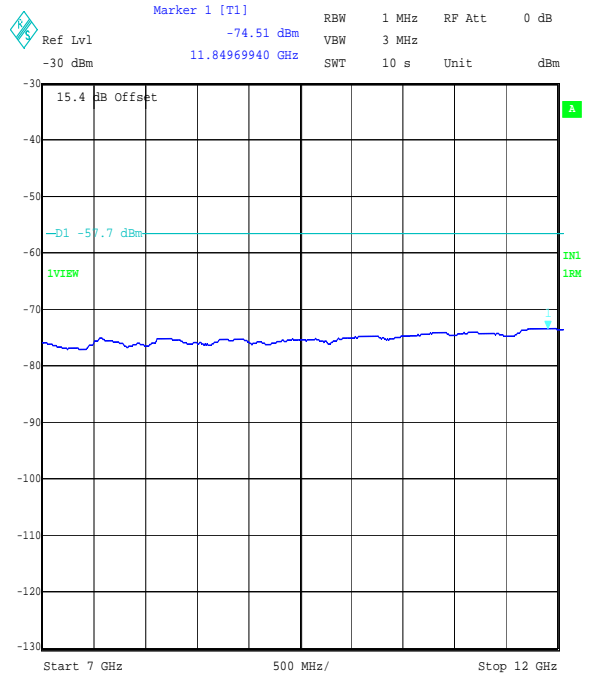
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:00:06

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

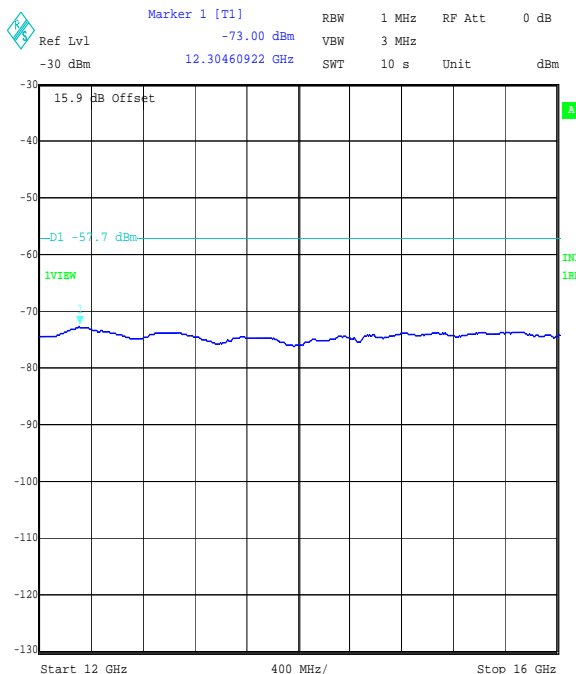
Conducted Transmitter Spurious Emissions (Continued)



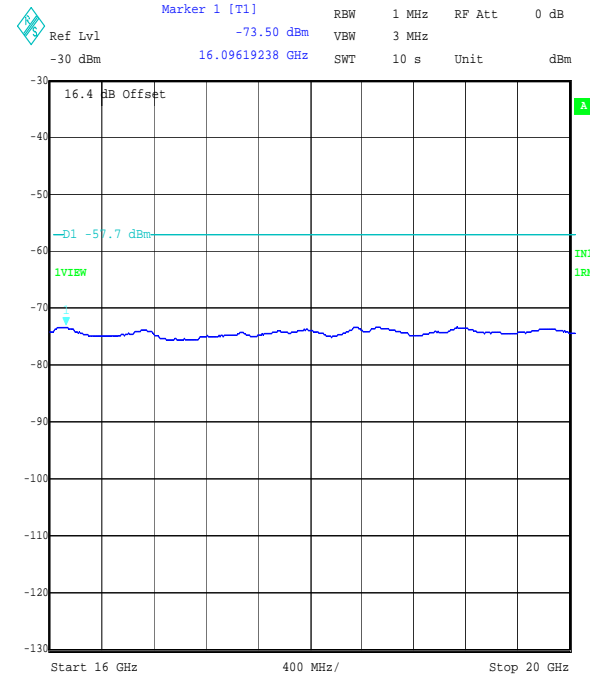
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:04:05



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:21:44



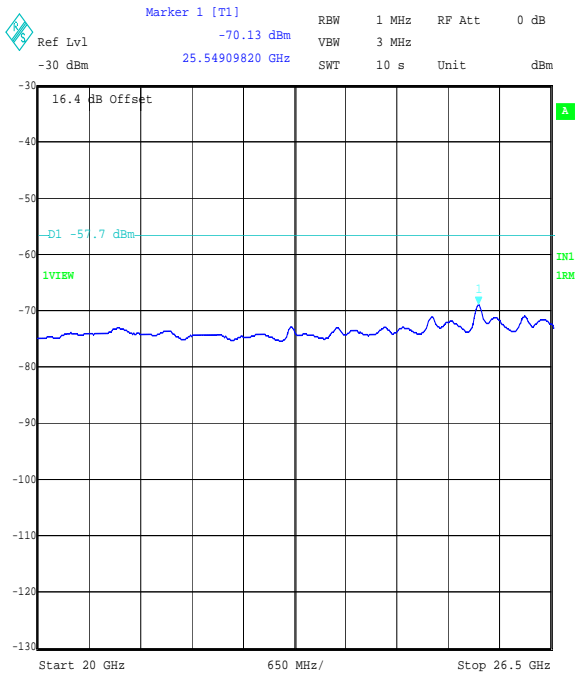
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:23:53



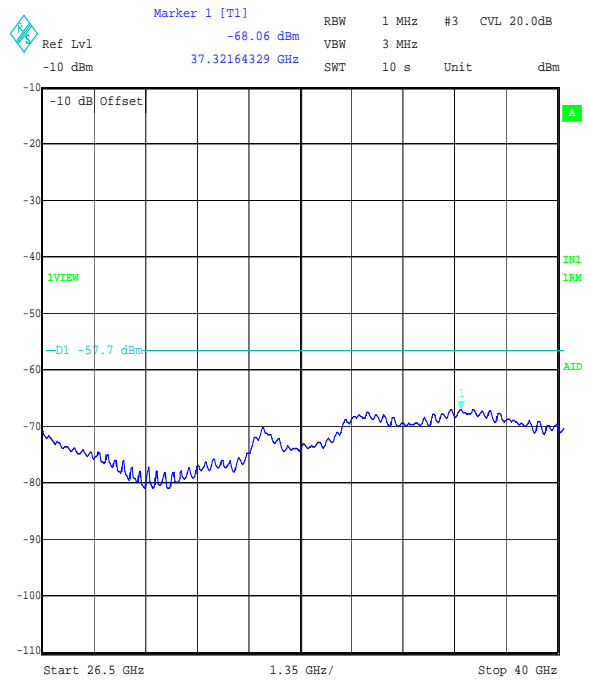
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 13:21:18

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Conducted Transmitter Spurious Emissions (Continued)



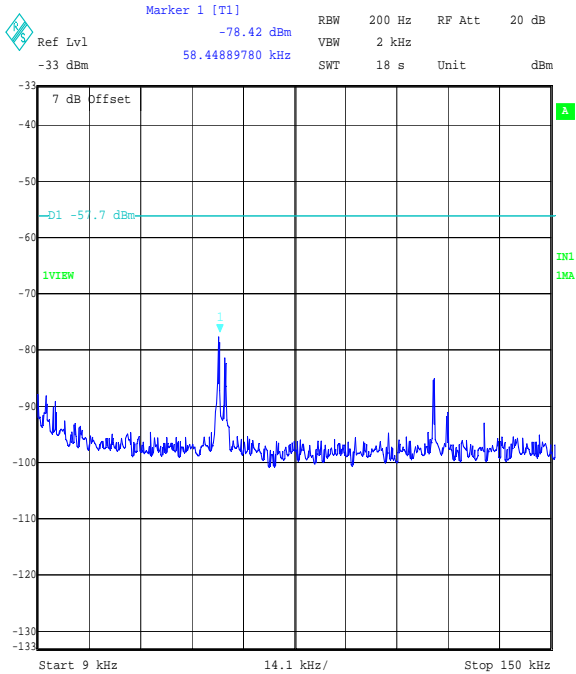
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 13:31:28



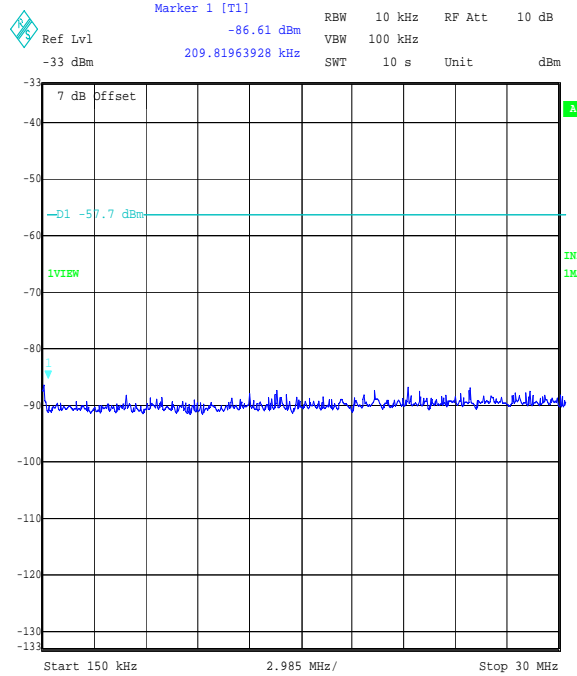
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 14:18:03

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

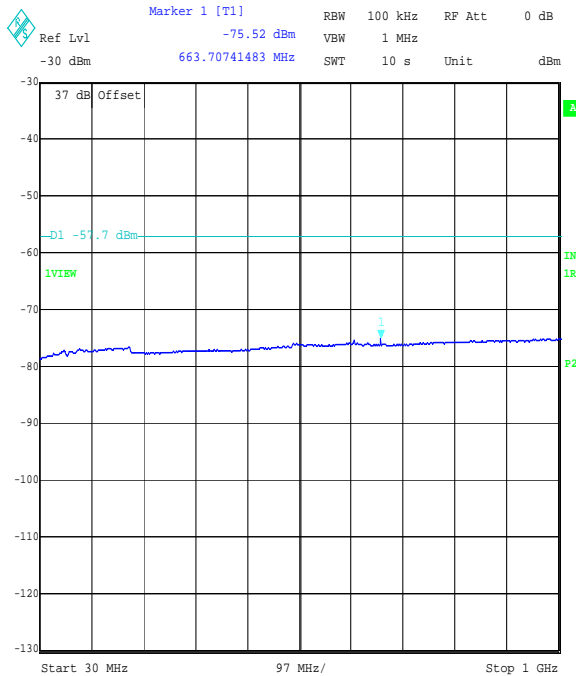
Conducted Transmitter Spurious Emissions (Continued)



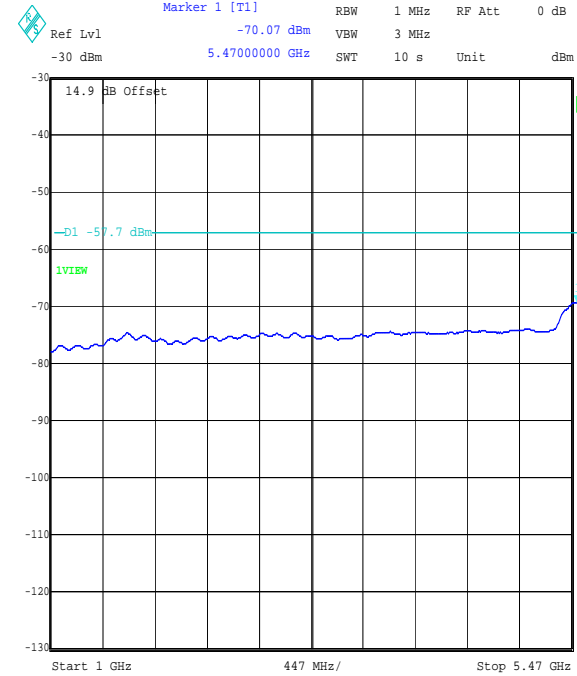
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT MIDDLE CHANNEL
Date: 13.SEP.2007 16:10:47



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT MIDDLE CHANNEL
Date: 13.SEP.2007 16:25:05



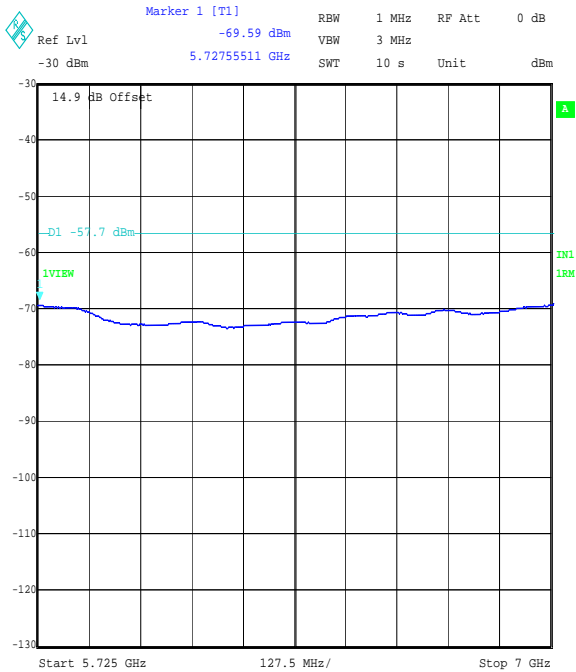
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 11:35:27



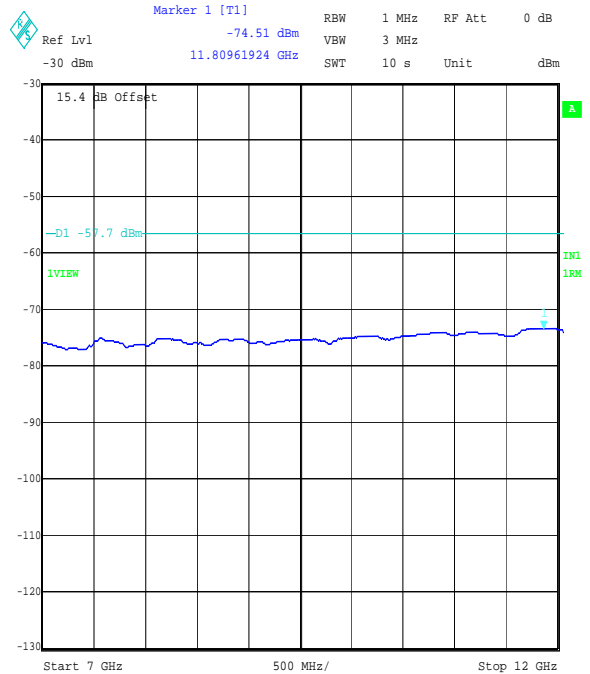
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 11:51:35

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

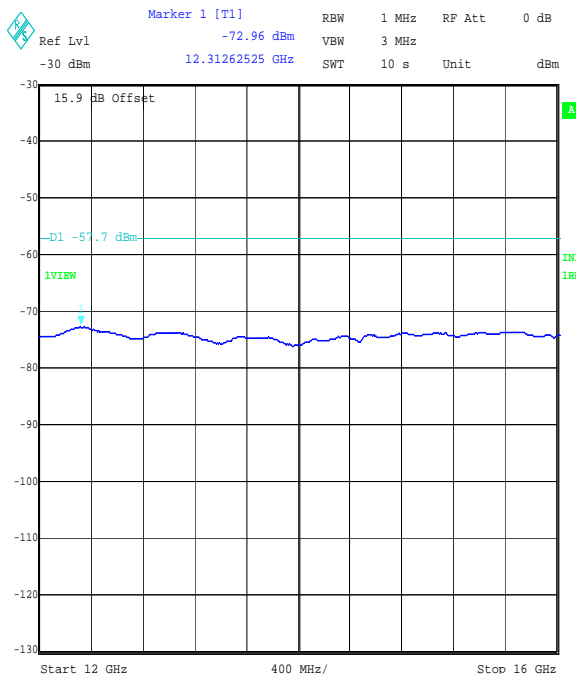
Conducted Transmitter Spurious Emissions (Continued)



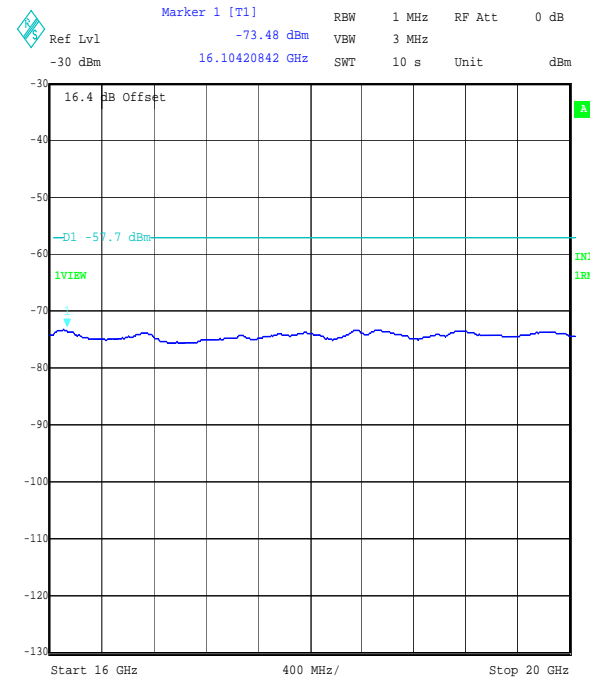
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:08:35



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:19:19



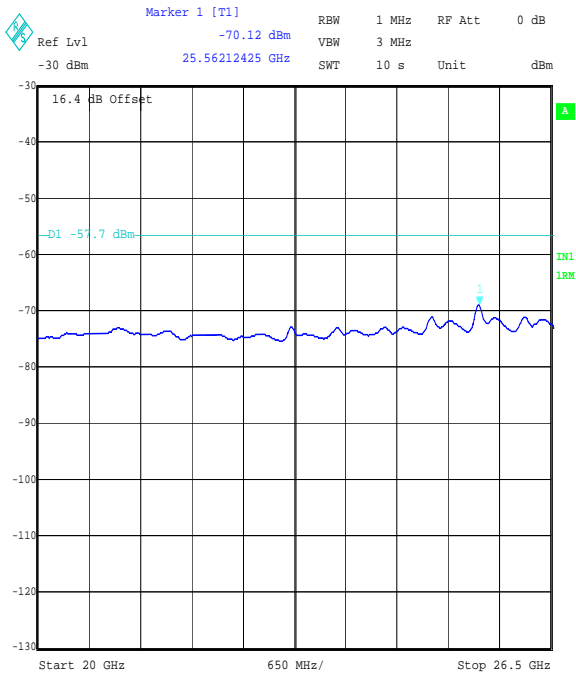
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:27:53



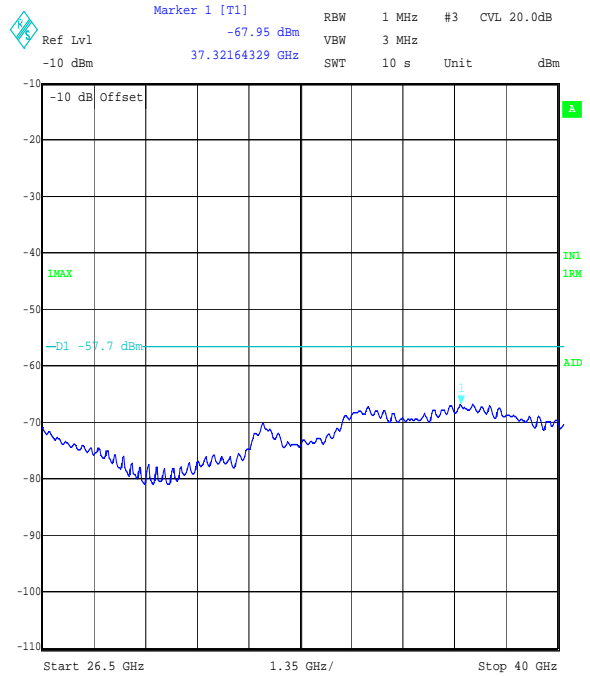
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 13:18:09

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

Conducted Transmitter Spurious Emissions (Continued)



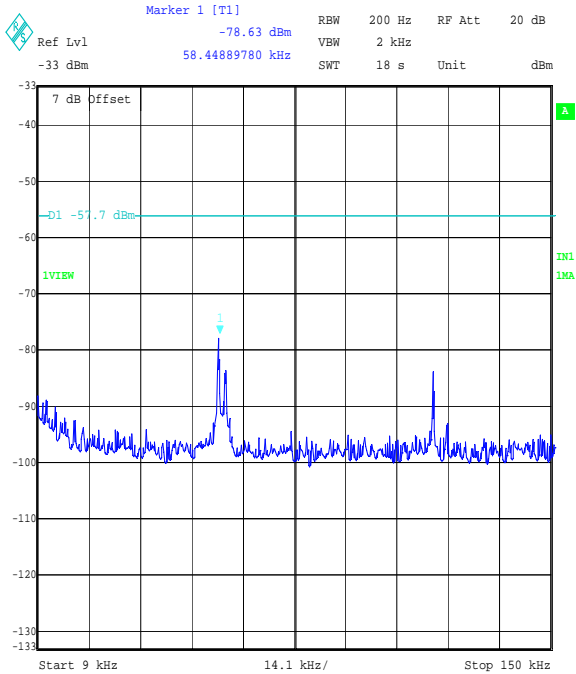
Title: 49281JD01 FCC15.407
 Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 13:30:14



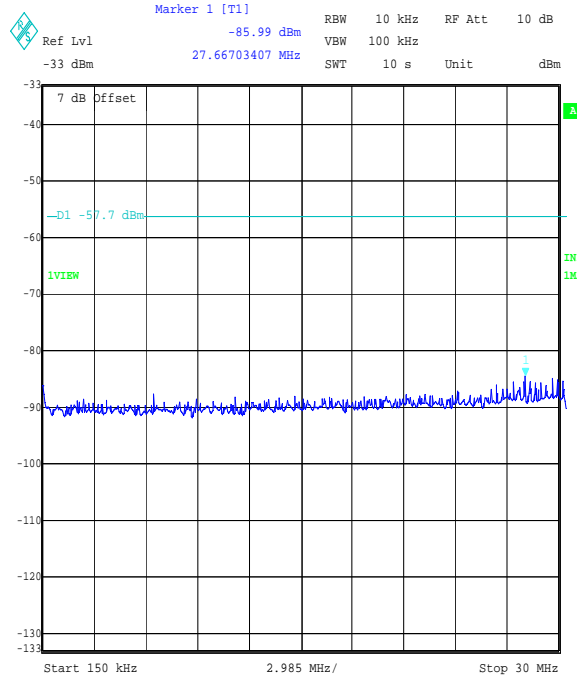
Title: 49281JD01 FCC15.407
 Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 14:08:00

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

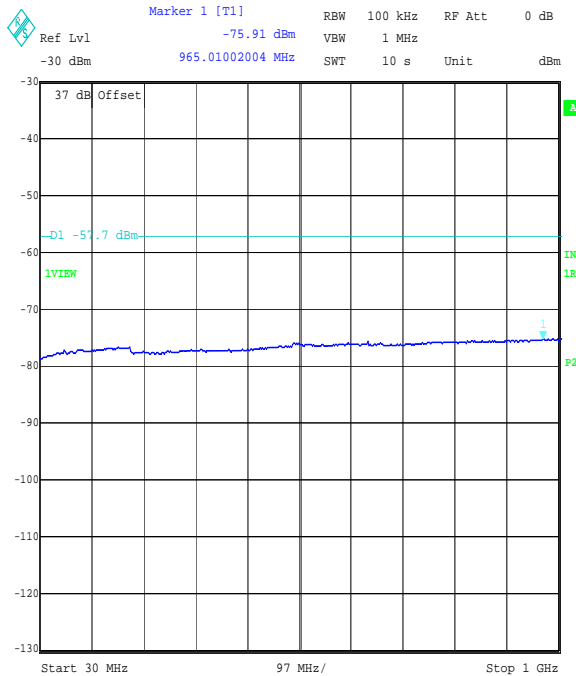
Conducted Transmitter Spurious Emissions (Continued)



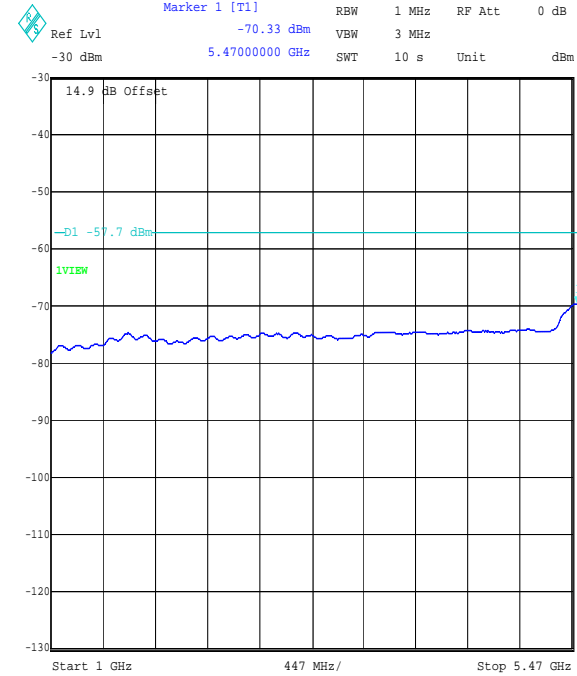
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT TOP CHANNEL
Date: 13.SEP.2007 16:03:28



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK H PORT TOP CHANNEL
Date: 13.SEP.2007 16:38:32



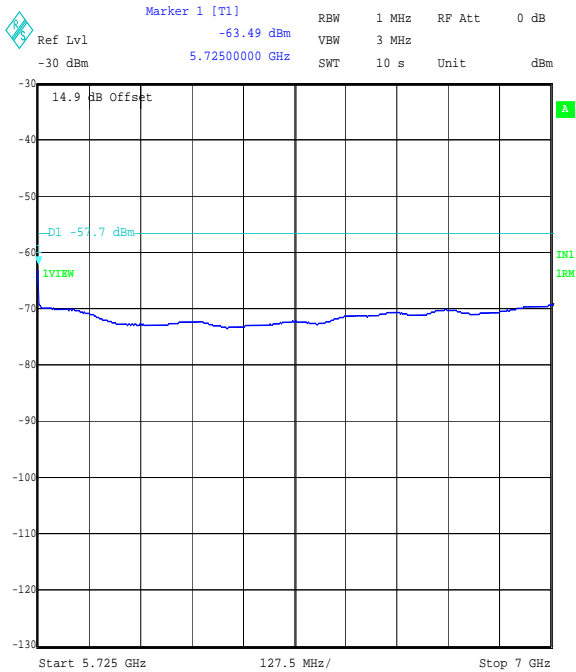
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 11:39:01



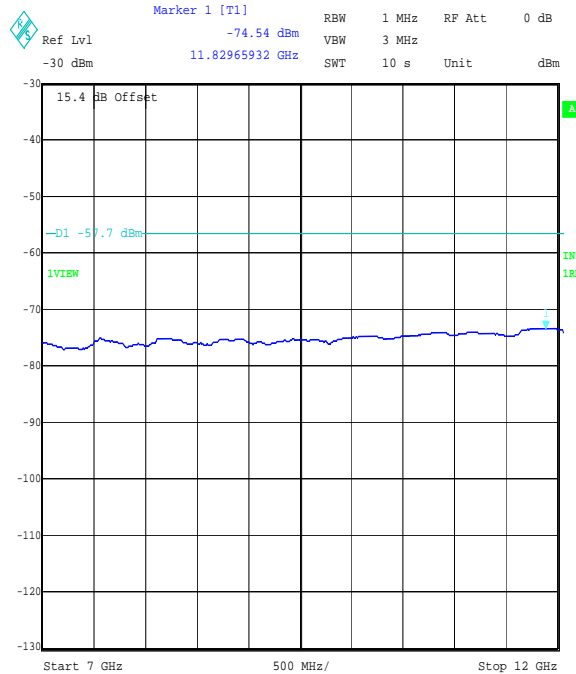
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 11:45:48

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

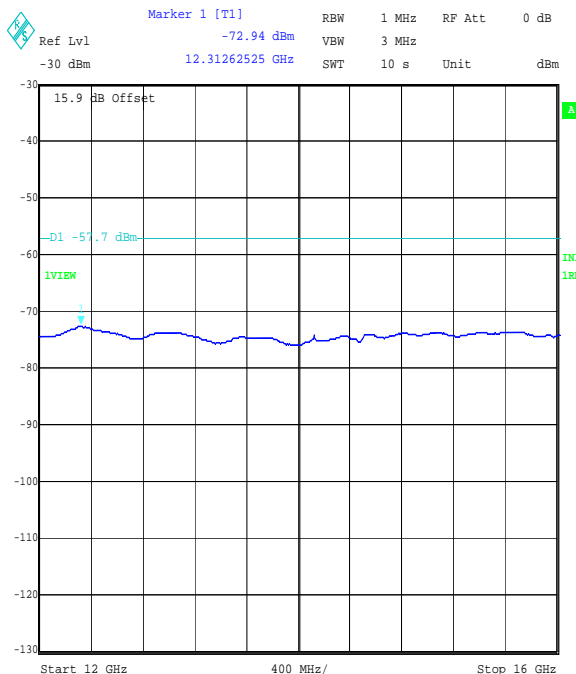
Conducted Transmitter Spurious Emissions (Continued)



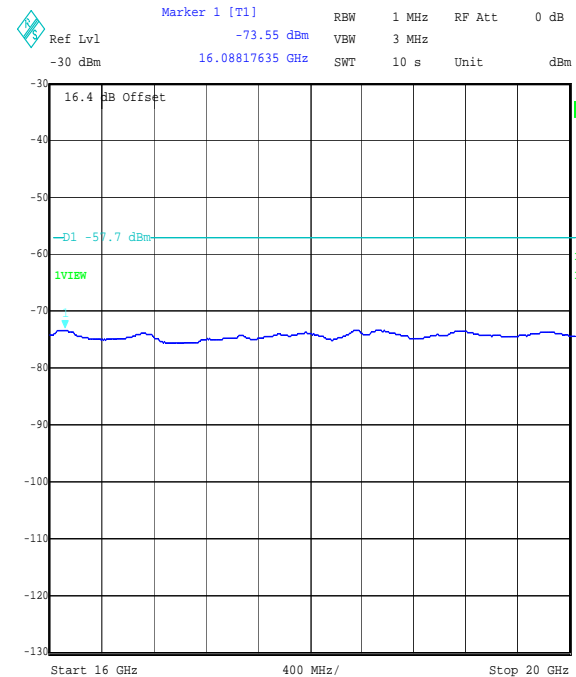
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:11:57



Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:16:56



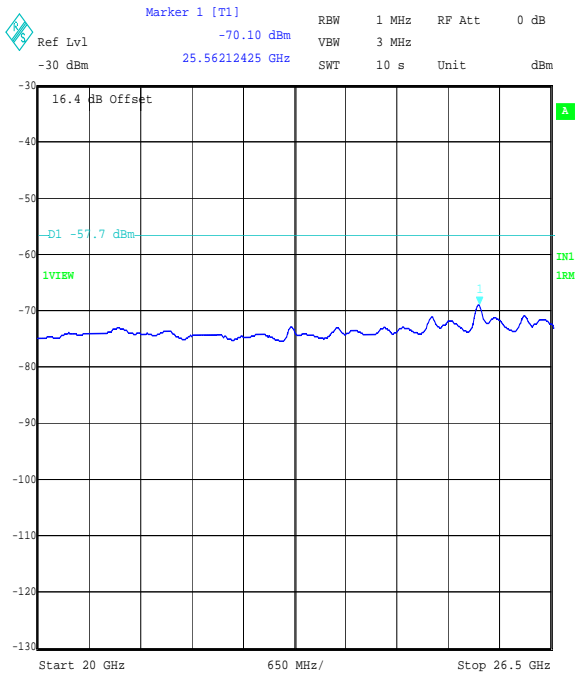
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 12:31:40



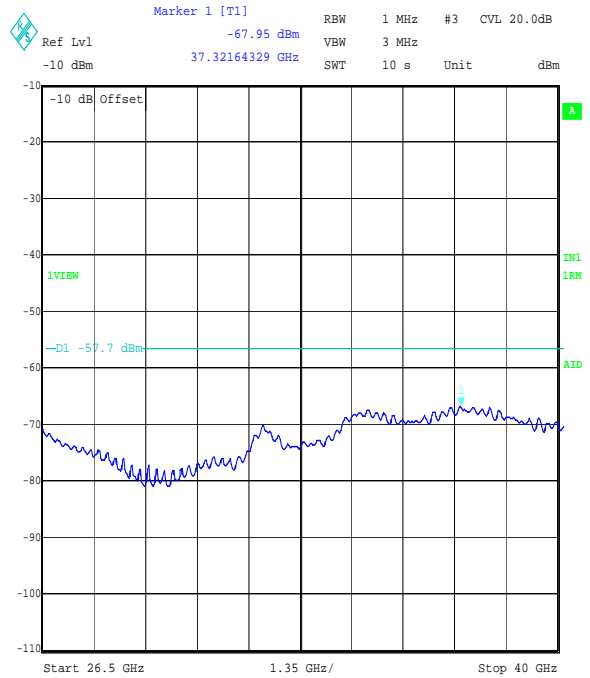
Title: 49281JD01 FCC15.407
Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
Date: 13.SEP.2007 13:15:12

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

Conducted Transmitter Spurious Emissions (Continued)



Title: 49281JD01 FCC15.407
 Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 13:33:31



Title: 49281JD01 FCC15.407
 Comment A: CONDUCTED SPURIOUS EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 14:12:04

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

7.2.7. Conducted Transmitter Spurious Emissions Band Edge

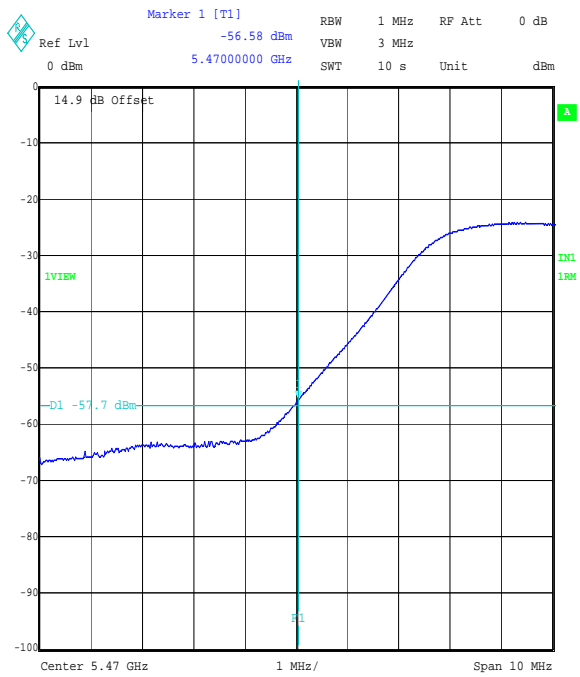
| Frequency (MHz) | Modulation Scheme | Peak Emission Level (dBm) | Limit (dBm/MHz) | Margin (dB) |
|-----------------|-------------------|---------------------------|-----------------|-------------|
| 5470.000 | BPSK | -58.2 | -57.7 | 0.5 |
| 5725.000 | BPSK | -62.3 | -57.7 | 4.6 |

Note(s):

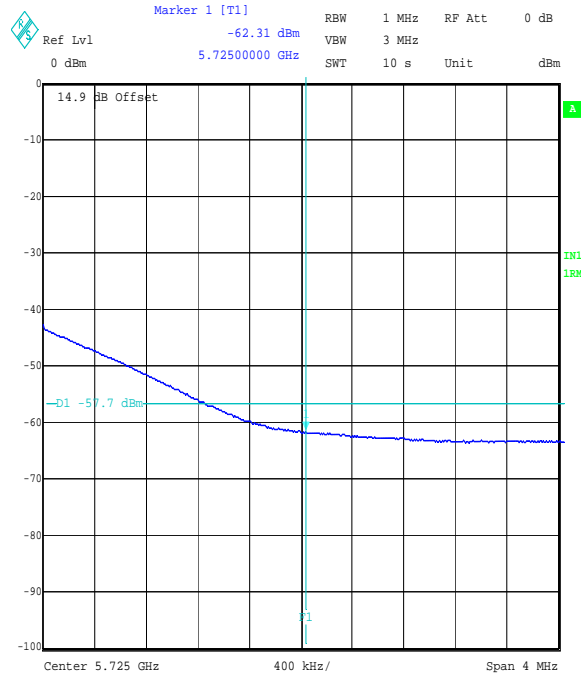
1. The lower band edge was measured using a lower RBW over 10, 1 MHz strips and the result integrated.
-

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

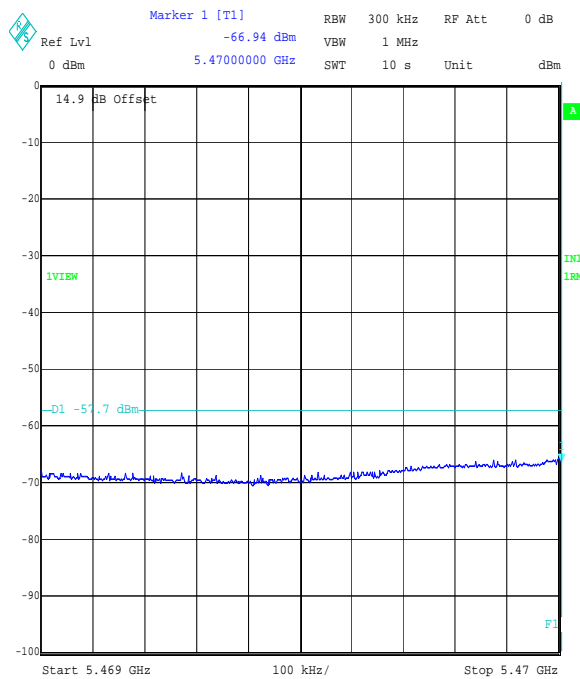
Conducted Transmitter Spurious Emissions Band Edge (Continued)



Title: 49281JD01 FCC15.407
 Comment A: LOWER BAND EDGE CONDUCTED EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 10:33:22



Title: 49281JD01 FCC15.407
 Comment A: UPPER BAND EDGE CONDUCTED EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 10:56:27



Title: 49281JD01 FCC15.407
 Comment A: LOWER BAND EDGE CONDUCTED EMISSIONS BPSK V PORT
 Date: 13.SEP.2007 10:36:05

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

7.2.8. Transmitter Radiated Emissions

Results:

Electric Field Strength Measurements: 30 MHz to 1000 MHz

Top Channel

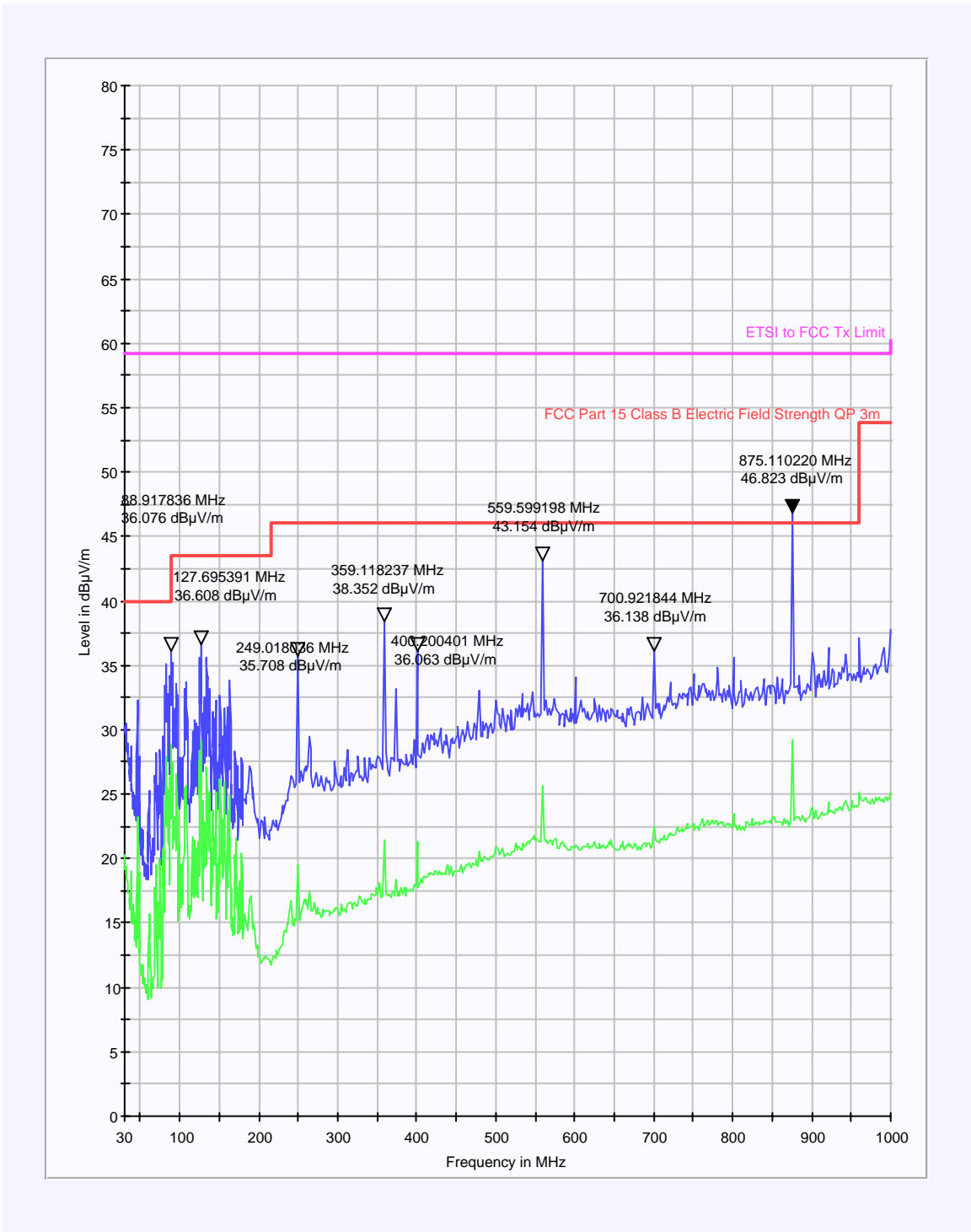
| Frequency (MHz) | Antenna Polarity | Q-P Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|--------------------------|----------------------|-------------|----------|
| 250.000 | Vertical | 19.4 | 46.0 | 26.6 | Complied |
| 360.000 | Vertical | 23.1 | 46.0 | 22.9 | Complied |
| 560.000 | Horizontal | 27.5 | 46.0 | 18.5 | Complied |
| 700.000 | Horizontal | 29.6 | 46.0 | 16.4 | Complied |
| 875.000 | Vertical | 45.1 | 46.0 | 0.9 | Complied |

Note(s):

1. *The preliminary scans showed similar emission levels for each mode below 1 GHz, therefore final radiated emissions measurements were performed with the EUT set to the top channel only. Emissions shown on the prescan plot but not recorded above were found to be below the noise floor or ambient.*
-

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Transmitter Radiated Emissions (Continued)



This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Transmitter Radiated Emissions (Continued)**Results:****Electric Field Strength Measurements (Frequency Range: 1 GHz to 40 GHz)****Top Channel**

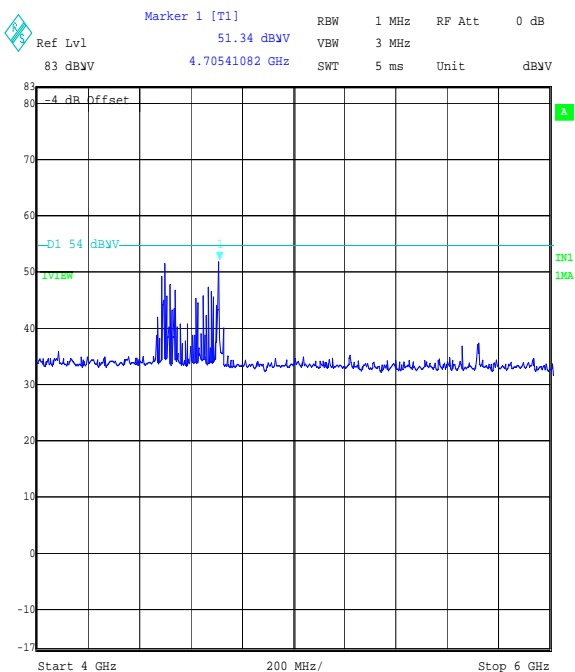
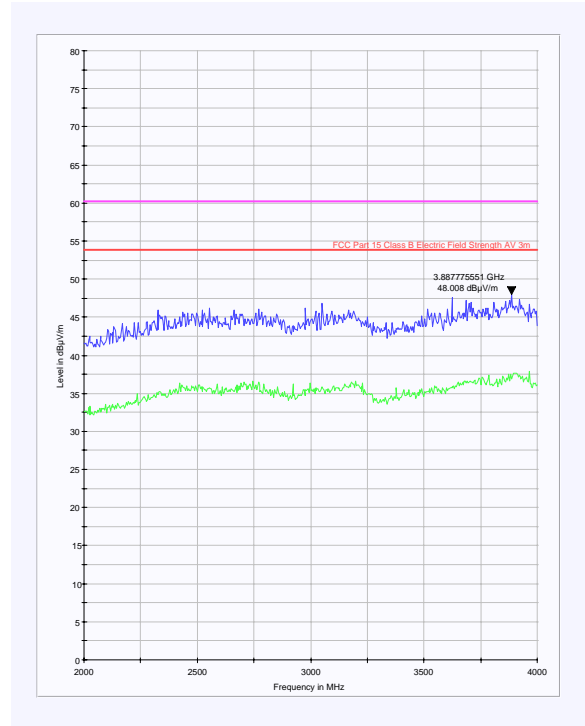
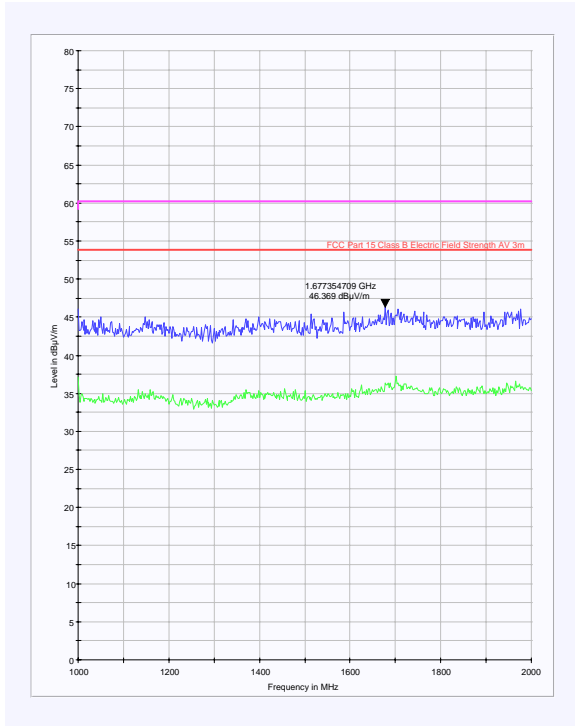
| Frequency (MHz) | Peak Emission Level (dBm/MHz) | Limit (dBm/MHz) | Margin (dB) | Result |
|-----------------|-------------------------------|-----------------|-------------|----------|
| 4496.001 | -45.6 | -27.0 | 18.6 | Complied |
| 4705.950 | -42.0 | -27.0 | 15.0 | Complied |
| 9071.943 | -48.9 | -27.0 | 26.5 | Complied |

Note(s):

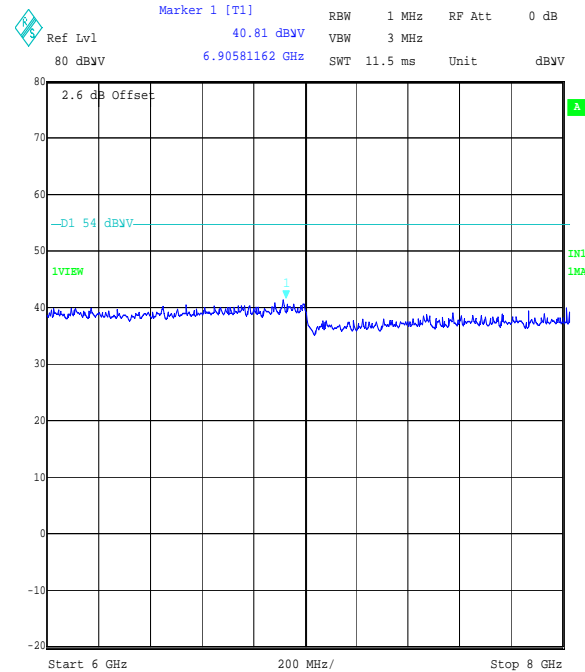
1. *The preliminary scans showed similar emission levels for each mode below 1 GHz, therefore final radiated emissions measurements were performed with the EUT set to the top channel only.*
-

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

Transmitter Radiated Emissions (Continued)



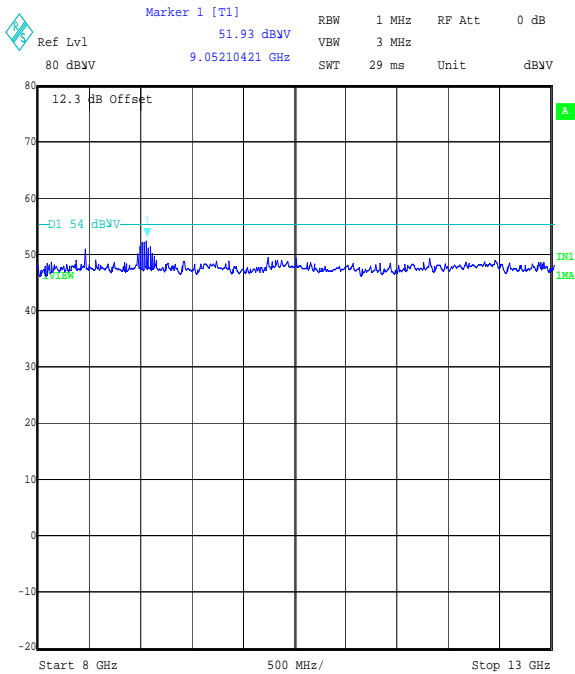
Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED SPURIOUS EMISSIONS ACQ MODE PK DET
 Date: 14.SEP.2007 13:48:02



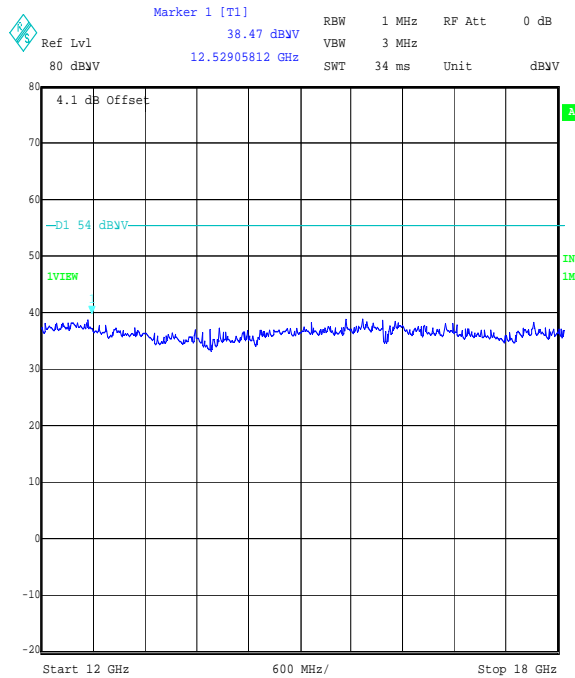
Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED EMISSIONS ACQ MODE PK DET
 Date: 17.SEP.2007 09:25:19

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

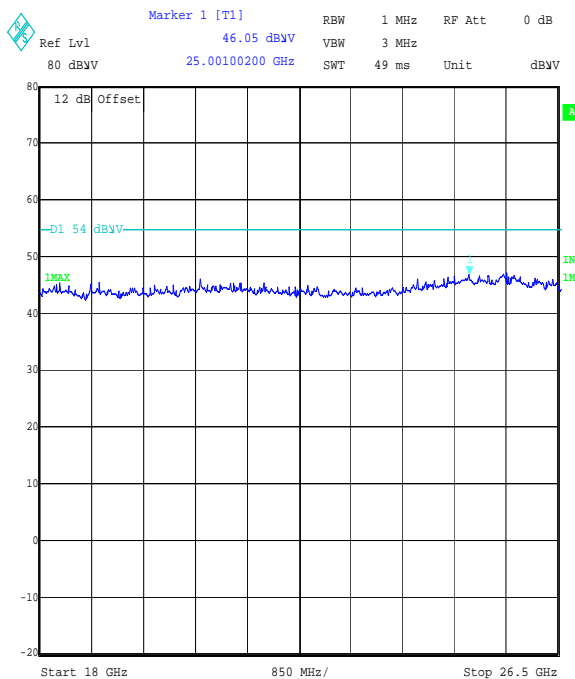
Transmitter Radiated Emissions (Continued)



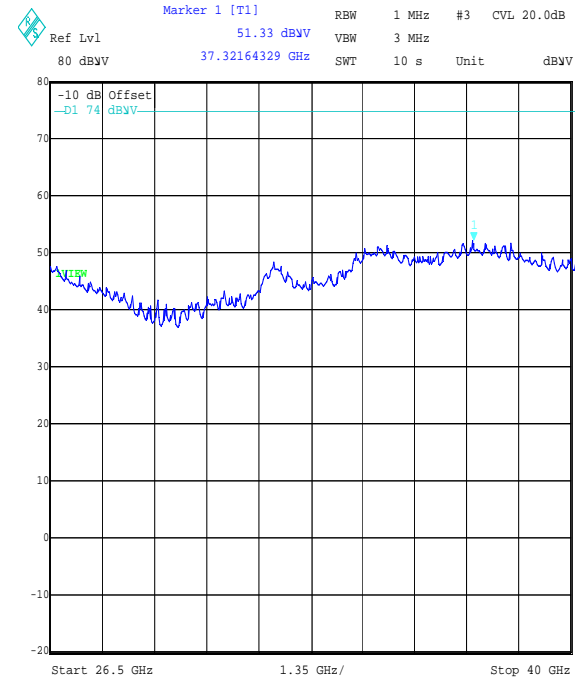
Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED EMISSIONS ACQ MODE PK DET
 Date: 17.SEP.2007 09:38:57



Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED SPURIOUS EMISSIONS ACQ MODE PK DET
 Date: 14.SEP.2007 15:45:54



Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED SPURIOUS EMISSIONS ACQ MODE PK DET
 Date: 14.SEP.2007 15:38:34



Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED SPURIOUS EMISSIONS ACQ MODE PK DET
 Date: 13.SEP.2007 14:52:47

Test of: Orthogon Systems Ltd
 PTP54600 Connectorised
 To: FCC Part 15.407: 2006

7.2.9. Transmitter Band Edge Radiated Emissions

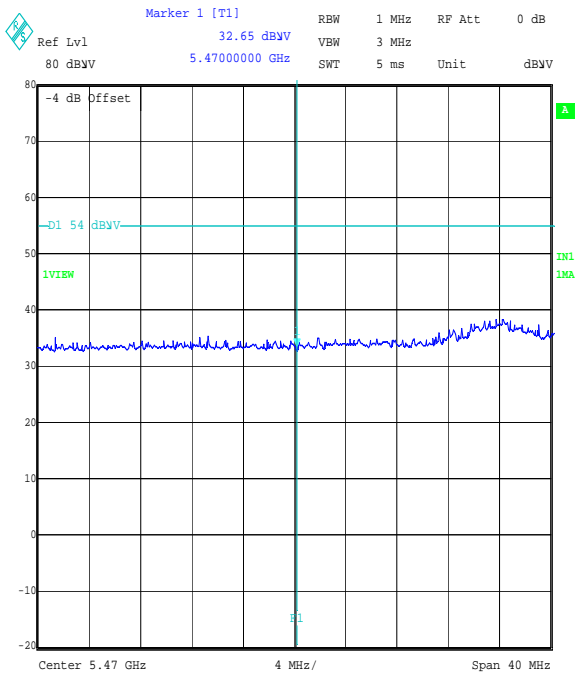
Results:

Bottom Band Edge

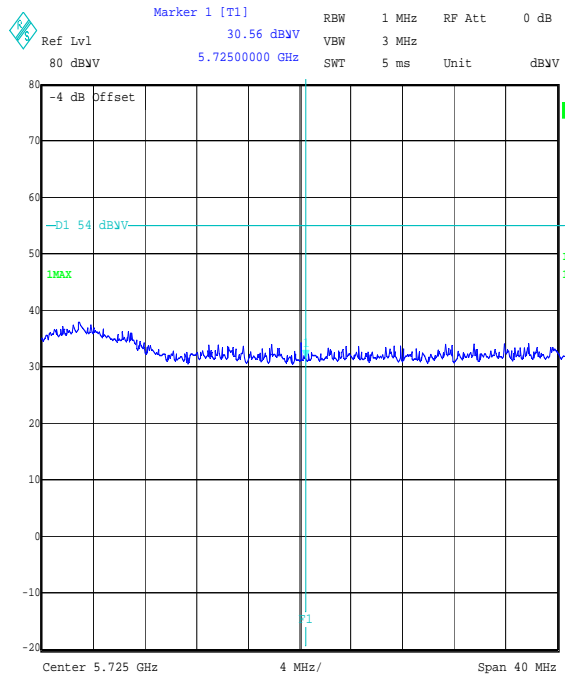
| Frequency (MHz) | Peak Emission Level (dBm/MHz) | Limit (dBm/MHz) | Margin (dB) | Result |
|-----------------|-------------------------------|-----------------|-------------|----------|
| 5470.0 | -62.5 | -27.0 | 35.5 | Complied |

Top Band Edge

| Frequency (MHz) | Peak Emission Level (dBm/MHz) | Limit (dBm/MHz) | Margin (dB) | Result |
|-----------------|-------------------------------|-----------------|-------------|----------|
| 5725.0 | -64.5 | -27.0 | 37.5 | Complied |



Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED BAND EDGE BOTTOM CHANNEL
 Date: 17.SEP.2007 09:59:37



Title: 49281JD01 FCC15.407
 Comment A: TX RADIATED BAND EDGE TOP CHANNEL
 Date: 14.SEP.2007 15:17:40

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

8. Measurement Uncertainty

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 of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

| Measurement Type | Range | Confidence Level (%) | Calculated Uncertainty |
|---------------------------------|--------------------|----------------------|------------------------|
| AC Conducted Spurious Emissions | 0.15 MHz to 30 MHz | 95% | +/- 3.25 dB |
| Peak Transmit Power | Not applicable | 95% | +/- 0.46 dB |
| Peak Power Spectral Density | Not applicable | 95% | +/- 1.2 dB |
| Emission Bandwidth | Not applicable | 95% | +/- 0.12 % |
| Radiated Spurious Emissions | 30 MHz to 1000 MHz | 95% | +/- 5.26 dB |
| Radiated Spurious Emissions | 1 GHz to 40 GHz | 95% | +/- 2.94 dB |

The methods used to calculate the above uncertainties 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 appropriate accreditation body is followed.

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Appendix 1. Test Equipment Used

| RFI No. | Instrument | Manufacturer | Type No. | Serial No. | Date Last Calibrated | Cal. Interval (Months) |
|---------|---------------------|-------------------------|----------------------|------------|--------------------------|------------------------|
| A027 | Horn Antenna | Eaton | 9188-2 | 301 | 08 Jun 2006 | 36 |
| A031 | Horn Antenna | Eaton | 91889-2 | 557 | 08 Jun 2006 | 36 |
| A1037 | Bilog Antenna | Chase EMC Ltd | CBL6112B | 2413 | 20 Sep 2006 | 12 |
| A1069 | LISN | Rohde & Schwarz | ESH3-Z5 | 837469/012 | 09 Feb 2007 | 12 |
| A1364 | Attenuator | Atlantic | AA40-10 | 1 | Calibrated before use | - |
| A1368 | Directional Coupler | Pasternack Enterprises. | PE2214-10 | None | Calibrated before use | - |
| A1534 | Preamplifier | Hewlett Packard | 8449B OPT H02 | 3008A00405 | Calibrated before use | - |
| A1830 | Pulse Limiter | Rhode & Schwarz | ESH3-Z2 | 100668 | 08 Jan 2007 | 12 |
| A253 | Horn Antenna | Flann Microwave | 12240-20 | 128 | 17 Nov 2006 | 36 |
| A254 | Horn Antenna | Flann Microwave | 14240-20 | 139 | 17 Nov 2006 | 36 |
| A255 | Horn Antenna | Flann Microwave | 16240-20 | 519 | 17 Nov 2006 | 36 |
| A256 | Horn Antenna | Flann Microwave | 18240-20 | 400 | 17 Nov 2006 | 36 |
| A259 | Bilog Antenna | Chase | CBL6111 | 1513 | 13 Mar 2007 | 12 |
| A366 | 26.5 to 40 GHz | MRI | FRR-400 | 169 | Calibration not required | 12 |
| A436 | Horn Antenna | Flann Microwave | 20240-20 | 330 | 24 Apr 2006 | 36 |
| C1027 | Cable | Rosenberger | FA210B-1-010M-30X30 | FA00C 7587 | 31 May 2007 | 12 |
| C1030 | Cable | Rosenberger | FA210B-1-010M-30X30 | FA00C 7590 | 31 May 2007 | 12 |
| C1083 | Cable | Rosenberger | 001 | 2799 | Calibrated before use | - |
| C1097 | Cable | Reynolds | 269-0078-2000 | None | Calibrated before use | - |
| C1166 | Cable | Rosenberger | FA210A102000 7070 | 43189-02 | Calibrated before use | - |
| C1265 | Cable | Rosenberger | FA210A102000 7070 | 49317-01 | Calibrated before use | - |
| C151 | Cable | Rosenberger | UFA210A-1-1181-70x70 | None | Calibrated before use | - |
| C160 | Cable | Rosenberger | UFA210A-1-1181-70x70 | None | Calibrated before use | - |

Test of: Orthogon Systems Ltd
PTP54600 Connectorised
To: FCC Part 15.407: 2006

Test Equipment Used (Continued)

| RFI No. | Instrument | Manufacturer | Type No. | Serial No. | Date Last Calibrated | Cal. Interval (Months) |
|---------|---------------------|-----------------|-----------------------|---------------|--------------------------|------------------------|
| C341 | Cable | Andrews | None | None | Calibrated before use | - |
| C348 | Cable | Rosenberger | UFA210A-1-1181-70x70 | 2993 | Calibrated before use | - |
| C363 | Cable | Rosenberger | RG142 | None | Calibrated before use | - |
| C461 | Cable | Rosenberger | UFA210A-1-1182-704704 | 98H0305 | Calibrated before use | - |
| M024 | Spectrum Monitor | Rohde & Schwarz | EZM | 873 952/006 | Calibrated before use | - |
| M044 | ESVP Receiver | Rohde & Schwarz | ESVP | 891 845/026 | 06 Mar 2007 | 12 |
| M1124 | Spectrum Analyser | Rohde & Schwarz | ESIB26 | 100046K | 20 Dec 2006 | 12 |
| M1263 | Test Receiver | Rohde & Schwarz | ESIB7 | 100265 | 25 Jan 2007 | 12 |
| M281 | Power Meter | Hewlett Packard | E4418A (EPM441A) | GB37170210-01 | 06 Jun 2007 | 12 |
| S0539 | Power Supply | Kikusui | PCR 1000L | 13010170 | Calibration not required | - |
| S201 | Open Area Test Site | RFI | 1 | None | 25 May 2007 | 12 |
| S209 | Screened Room | RFI | 9 | None | Calibrated before use | - |
| S212 | Screened Room | RFI | 12 | None | Calibrated before use | - |
| S216 | Microwave Lab. | RFI | 16 | None | Calibration not required | - |

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

All equipment was within calibration at the time of the test.

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Appendix 2. Measurement Methods

A2.1. AC Mains Conducted Emissions

AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane. The EUT was powered with 115V 60 Hz AC mains supplied via a Line Impedance Stabilisation Network (LISN).

Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

The test equipment settings for conducted emissions measurements were as follows:

| Receiver Function | Initial Scan | Final Measurements |
|--------------------------|---------------------|----------------------------|
| Detector Type: | Peak | Quasi-Peak (CISPR)/Average |
| Mode: | Max Hold | Not applicable |
| Bandwidth: | 10 kHz | 9 kHz |
| Amplitude Range: | 60 dB | 20 dB |
| Measurement Time: | Not applicable | > 1 s |
| Observation Time: | Not applicable | > 15 s |
| Step Size: | Continuous sweep | Not applicable |
| Sweep Time: | Coupled | Not applicable |

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A2.2. Idle Mode Radiated Emissions

Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. Any emission within 20 dB of the limit were then measured on the open area test site, except in cases where the noise floor was within 20 dB of the limit, in these cases the highest point of the noise floor was measured.

Where an emission fell inside a restricted band, measurements were made at the appropriate test distance using a measuring receiver with a Quasi-Peak detector for measurements below 1000 MHz and an Average and Peak detector for measurements above 1000 MHz. A peak detector was used for all other measurements.

For the final measurements the EUT was arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4.

All measurements on the open area test site were performed using broadband antennas.

On the open area test site, at each frequency where a signal was to be measured, the trace was maximised by rotating a turntable through 360°. The angle at which the maximum signal was observed was locked out. For frequencies below 1000 MHz the test antenna was varied in height between 1 m and 4 m in order to further maximise the target emission.

For frequencies above 1000 MHz where a horn antenna was used, height searching was performed to locate the optimal height of the horn with respect to the EUT. At this point the horn was locked off and the turntable was again rotated through 360° to maximise the target signal. It should be noted that the received signal from the EUT would diminish very quickly after it exits the beam width of the horn antenna, for this reason it may not be necessary to fully height search with the horns.

At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

Scans were performed to the upper frequency limits as stated in Section 15.33

The final field strength was determined as the indicated level in dB μ V plus cable loss and antenna factor.

The test equipment settings for radiated emissions measurements were as follows:

| Receiver Function | Initial Scan | Final Measurements Below 1 GHz | Final Measurements Above 1 GHz |
|-------------------|--------------------------------------|--------------------------------|--------------------------------|
| Detector Type: | Peak | Quasi-Peak (CISPR) | Peak / Average |
| Mode: | Max Hold | Not applicable | Max Hold |
| Bandwidth: | (120 kHz < 1 GHz) (1 MHz > 1 GHz) | 120 kHz | 1 MHz |
| Amplitude Range: | 100 dB | 100 dB | 100 dB |
| Step Size: | Continuous sweep | Not applicable | Not applicable |
| Sweep Time: | Coupled | Not applicable | Not applicable |

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A2.3. Transmitter Peak Transmit Power

Prior to testing being performed, a suitable RF attenuator and cable were calibrated for the required frequencies. For each frequency to be measured, the EUT was set to its maximum transmit power and the output power on both H and V ports was measured with a power meter. The power meter was corrected for both cable/attenuator loss and duty cycle correction factor.

The aggregate power was then calculated by adding the measured H and V port power levels. The stated limit was compared with the measured aggregate level, to show compliance. The Radiated port powers were calculated by subtracting the interconnecting cable loss and adding the proposed antenna gain. This value was then compared to the radiated limit. The result for both methods can be seen in the output power section of this report.

A2.4. Transmitter Peak Power Spectral Density

Prior to testing being performed, a suitable RF attenuator and cable were calibrated for the required frequencies. The calibrated level of the attenuator and cable were entered as an offset into the spectrum analyser to compensate for the losses in the measurement set up.

The analyzer bandwidth was set to 1 MHz and the peak value of the fundamental signal was recorded.

A2.5. Transmitter Modulation Envelope Peak Excursion Ratio

The test method use was that shown in the FCC procedure for UNII part 15 subpart E devices. The spectrum analyser frequency span was set to show the entire fundamental emission.

Trace 1 was set with a RBW = VBW = 1 MHz and the detector set to Max Hold.

Trace 2 was set with a RBW = 1 MHz and a VBW = 30 kHz.

The detector was set to Max Peak hold. The difference between the traces was reported.

A2.6. Transmitter Emission (20 dB / 26 dB) Bandwidth

To determine the occupied bandwidth, a resolution bandwidth of greater than 1% of the emission bandwidth was used. A video bandwidth of a least the same value or greater was used. The analyser was set for a maximum hold scan to capture the profile of the signal. The peak level was then determined, and a reference line was drawn 26 dB below the peak level. The bandwidth was determined at the points where the 26 dB reference crossed the profile of the emission.

The same process was used for the 20 dB bandwidth measurement, except the limit line was set to -20 dB relative to the carrier.

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A2.7. Transmitter Radiated Emissions

Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 40 GHz. The scans were performed within a screened chamber in order to identify frequencies on which the EUT was generating spurious. This procedure identified the frequencies from the EUT which required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit by characterising the screen room using a known signal source set at exactly the same location as the EUT. The signal source was derived from either a horn antenna or a dipole dependant on the frequency band under investigation. Any levels within 20 dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a Peak detector was used for final measurements at each frequency recorded in the screen room.

The levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the vertical polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the horizontal polarisation.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For EIRP measurements a Horn antenna whose gain was based on an isotropic antenna was used, ERP measurements were done using a dipole. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The EIRP was calculated as:-

$$\text{EIRP} = \text{Signal Generator Level} - \text{Cable Loss} + \text{Antenna Gain}$$

Note that the measurements in the 1st, 2nd and 3rd 1 MHz blocks away from band edge were performed using an analyser span of 1 MHz and a 100 kHz receiver resolution bandwidth (RBW). 10 linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were integrated to give the emission level in an equivalent 1 MHz bandwidth.

Note measurements below 1 GHz were performed according to the method of measurement detailed for idle mode radiated emissions.

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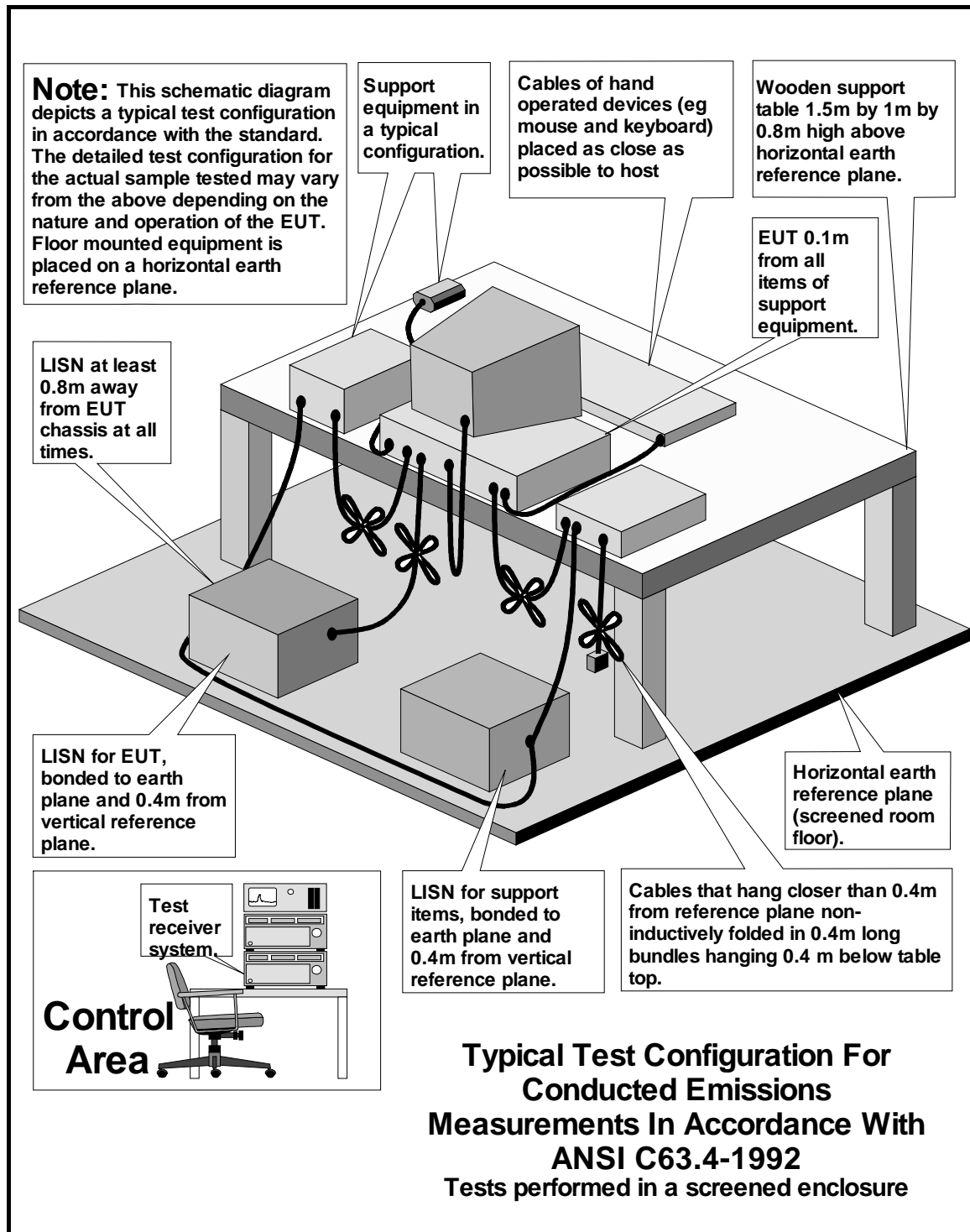
Appendix 3. Test Configuration Drawings

This appendix contains the following drawings:

| Drawing Reference Number | Title |
|---------------------------------|--|
| DRG\49281JD01\EMICON | Test configuration for measurement of conducted emissions. |
| DRG\49281JD01\EMIRAD | Test configuration for measurement of radiated emissions. |

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DRG\49281JD01\EMICON



Note: This diagram is also applicable for the latest version of ANSI C63.4-2003

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DRG\49281JD01\EMIRAD

