TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Ampy Metering Ltd
Remote Metering Telemetry System - Outstation

To: FCC Part 15.249: 2006

Test Report Serial No:
RFI/RPTE3/RP48972JD03B

Supersedes Test Report Serial No:
RFI/RPTE2/RP48972JD03B

This Test Report Is Issued Under The Authority Of Michael Derby, Wireless Radio Performance Group Leader: 	
Tested By: Ian Watch 	**Checked By: Michael Derby** 
Report Copy No: PDF01	
Issue Date: 03 July 2007	**Test Dates: 15 March 2007 to 25 April 2007**

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Test of: Ampy Metering Ltd
Remote Metering Telemetry System - Outstation
To: FCC Part 15.249: 2006

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1. Client Information

Company Name:	Ampy Metering Ltd
Address:	Spalding Road Frognall Deeping St. James Peterborough PE6 8SE UK
Contact Name:	Mr D Coley

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:	Electricity Meter
Brand Name:	Ampy
Model Name or Number:	ANSI Radio Based 2-Way Communicating Smart Meter
Serial Number:	6R534
Hardware Version:	5252A-04
Software Version:	5252.A.00.02.01
FCC ID Number:	U3R-5252
Country of Manufacture:	UK
Date of Receipt:	15 March 2007

Description:	Radio Module - Constant Tx, High Power, Bottom Channel.
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1402070119
Hardware Version:	6RP1B109
Software Version:	F.001
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Description:	Radio Module - Constant Tx, High Power, Middle Channel.
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1402070130
Hardware Version:	6RP1B109
Software Version:	F.012
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Identification of Equipment Under Test (EUT) (Continued)

Description:	Radio Module - Constant Tx, High Power, Top Channel.
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1402070129
Hardware Version:	6RP1B109
Software Version:	F.013
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Description:	Radio Module – Non Hopping, Bottom Channel, Bursting
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1601070036
Hardware Version:	6RP1B109
Software Version:	F.003
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Description:	Radio Module – Non Hopping, Mid Channel, Bursting
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1601070050
Hardware Version:	6RP1B109
Software Version:	F.004
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Identification of Equipment Under Test (EUT) (Continued)

Description:	Radio Module – Non Hopping, Top Channel, Bursting
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1402070114
Hardware Version:	6RP1B109
Software Version:	F.006
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Description:	Radio Module – Hopping, Middle Sub-Band
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1601070041
Hardware Version:	6RP1B109
Software Version:	F.009
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Description:	Radio Module – Hopping, Top Sub-Band, Compressed Frame
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1601070043
Hardware Version:	6RP1B109
Software Version:	F.008
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Identification of Equipment Under Test (EUT) (Continued)

Description:	Radio Module – receive Mode, Scanning
Brand Name:	Plextek
Model Name or Number:	6RP1CD05
Serial Number:	A1601070045
Hardware Version:	6RP1B109
Software Version:	3.040
Country of Manufacture:	China
Date of Receipt:	15 March 2007

Note(s):

1. *One meter was used for all tests with a number of different radio modules. The reason for this is that access to the serial port on the radio module cannot be gained in order to switch the unit into different modes.*
2. *ECR 6RYR1901 was applied to all radio PCBs prior to testing between the 23rd and 25th April 2007. Details of the relevant modifications covered by this ECR are given in section 2.7.*

2.2. Accessories

The following accessories were supplied with the EUT:

Description:	Milbank – Metal cabinet (normally fitted to a wall) that the meter is attached to.
Brand Name:	Milbank
Model Name or Number:	Type 3R Enclosure
Serial Number:	7551 (Ampy RD1243)
Cable Length and Type:	Standard length power/mains cable with UK Plug
Connected to Port:	Voltage supply input

2.3. Description of EUT

The equipment under test is an electricity meter with transceiver system designed for remote meter reading telemetry, operating in the USA 902-928 MHz band.

A single base station communicates with many outstations using normal mode (frequency hopping).

The outstation can also act as a relay for those outstations that have poor communications to a base station, using a point-to-point, low power, non-hopping mode.

2.4. Modifications Incorporated in the EUT

AC conducted emissions were performed on 15th March 2007. Following that test, the modifications to the endpoint radio board carried out are as follows)PCBs built to 6RP1B109):

1. A change to component values of an inductor and 2 resistors in the RF attenuator, in the transmitter. This is to reduce the transmit power in the low power mode.

2. A track going from the output of a linear voltage regulator on the radio board to a test point which is unused was cut in order to improve emissions.

These modifications were carried out on all boards prior to being submitted for testing between the 23rd and 25th April 2007. RFI's customer have stated that the modifications do not affect the AC supply to the meter and therefore conducted AC emissions are also unaffected and were not retested.

These modifications are detailed in Plextek ECR 6RYR1901.

A declaration from RFI's customer can be found in Appendix 3.

2.5. Additional Information Related to Testing

Power Supply Requirement:	230 V, 60 Hz		
Intended Operating Environment:	Electricity Meter which could be mounted to the side of a building (Residential / Commercial)		
Equipment Category:	FCC Part 15 (902 – 928 MHz)		
Type of Unit:	Transceiver		
Transmit Frequency Range:	911.975 MHz to 919.625 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	911.975
	Middle	6	916.550
	Top	11	919.625
Receive Frequency Range:	911.975 MHz to 919.625 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	911.975
	Middle	6	916.550
	Top	11	919.625
Highest Fundamental Frequency:	919.625 MHz		
Occupied Bandwidth:	3.883 kHz		
Transmitter Field Strength:	91.0 dBµV/m		

2.6. Port Identification

Port	Description	Type/Length	Applicable
1	Mains	230 V, 60 Hz	-

2.7. Support Equipment

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

Description:	Step Up Transformer
Brand Name:	Goldsource
Model Name or Number:	ST-500
Serial Number:	GS06022003738
Cable Length and Type:	Standard length power/mains cable, with IEC plug UK/US plug required for output
Connected to Port:	Connects to Milbank mains input Converts 110V supply to the 230V required by the EUT

3. Test Specification, Methods and Procedures

3.1. Test Specifications

Reference:	FCC Part 15 Subpart C: 2006 (Sections 15.249).
Title:	Code of Federal Regulations, Part 15 (47CFR215) Radio Frequency Devices.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1996)
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.

DA00-705 (2000)
Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

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

There were no deviations from the test specification.

5. Operation of the EUT During Testing

5.1. Operating Modes

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

Local Communications Channel (LCC) mode, single channel, low power, bursting.

Receive mode – scanning.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

The step up transformer was connected to a 110 V 60 Hz supply and provided a 230 V 60 Hz supply to the EUT.

The meter containing radio module was fitted into the Milbank cabinet.

6. Summary of Test Results

Range of Measurements	Section Reference	Port Type	Compliancy Status
Receiver AC Conducted Spurious Emissions (150 kHz to 30 MHz)	Section 15.107	AC Mains	Complied
Receiver Radiated Spurious Emissions	Section 15.109	Enclosure	Complied
Transmitter Fundamental Fieldstrength	Section 15.249(a)	Antenna	Complied
Transmitter 20 dB Bandwidth	Section 2.1049	Antenna	Complied
Transmitter Radiated Spurious Emissions	Section 15.249(a)(d)(e) & 15.209	Antenna	Complied
Transmitter Band Edge Radiated Emissions	Section 15.249(d) & 15.209	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, UK.

7. Measurements, Examinations and Derived Results

7.1. General Comments

7.1.1. This section contains test results only.

7.1.2. 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.

7.2. Test Results

7.2.1. Receiver AC Conducted Spurious Emissions: Section 15.107

7.2.1.1. The EUT was configured for AC conducted emissions measurements, as described in Section 8 of this report.

7.2.1.2. Tests were performed to identify the maximum emission levels on the AC mains line of the EUT.

Results:

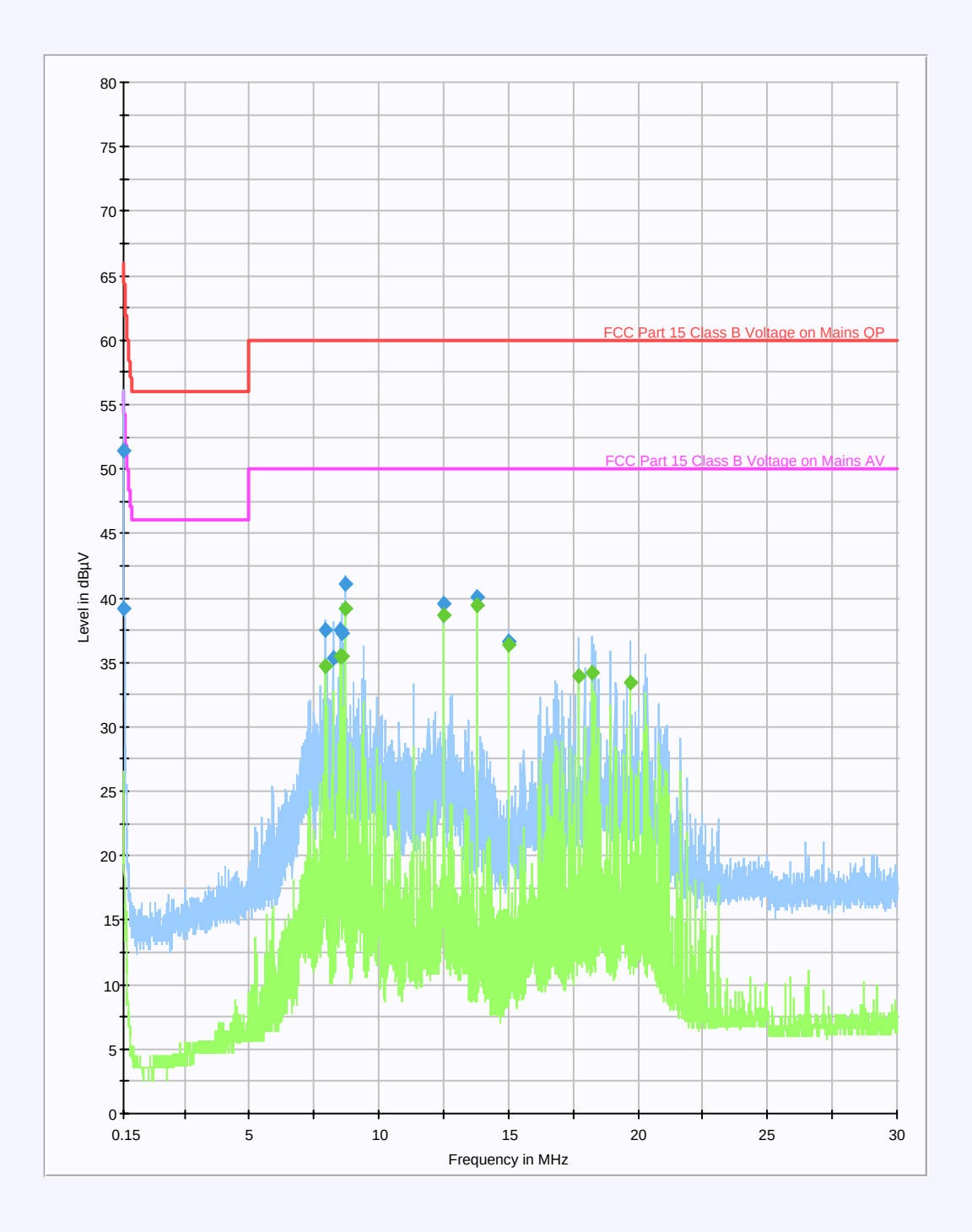
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.150000	Live	51.4	66.0	14.6	Complied
0.174000	Live	39.2	64.8	25.6	Complied
7.922000	Live	37.5	60.0	22.5	Complied
8.230000	Live	35.3	60.0	24.7	Complied
8.502000	Live	37.6	60.0	22.4	Complied
8.594000	Live	37.3	60.0	22.7	Complied
8.718000	Live	41.1	60.0	18.9	Complied
12.522000	Live	39.6	60.0	20.4	Complied
13.774000	Live	40.0	60.0	20.0	Complied
15.026000	Live	36.6	60.0	23.4	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
7.922000	Live	34.7	50.0	15.3	Complied
8.502000	Live	35.4	50.0	14.6	Complied
8.594000	Live	35.5	50.0	14.5	Complied
8.718000	Live	39.2	50.0	10.8	Complied
12.522000	Live	38.7	50.0	11.4	Complied
13.774000	Live	39.5	50.0	10.5	Complied
15.026000	Neutral	36.3	50.0	13.7	Complied
17.694000	Neutral	33.9	50.0	16.1	Complied
18.242000	Neutral	34.2	50.0	15.8	Complied
19.710000	Neutral	33.4	50.0	16.6	Complied

Receiver AC Conducted Spurious Emissions: Section 15.107 (Continued)



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

7.2.2. Receiver Radiated Spurious Emissions: Section 15.109

7.2.3. Electric Field Strength Measurements (Frequency Range: 30 MHz to 1000 MHz)

7.2.3.1. The EUT was configured for radiated emissions testing, as described in Section 8 of this report.

7.2.3.2. Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results:

Frequency (MHz)	Antenna Polarity	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
147.835	Horizontal	31.6	43.5	11.9	Complied

Note(s):

1. *All other emissions were found to be ambient more than 10 dB below the specified limit.*

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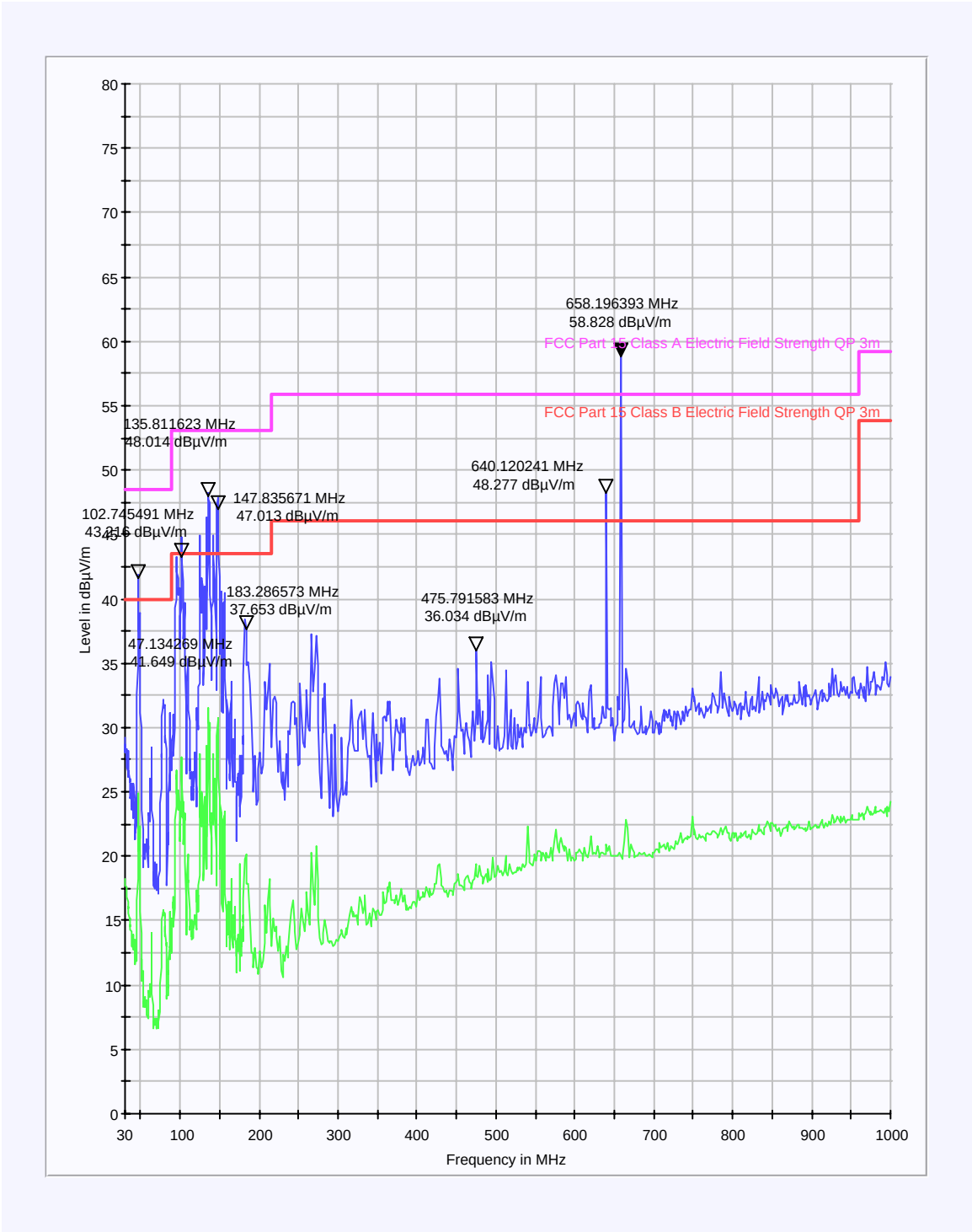
Receiver Radiated Spurious Emissions: Section 15.109 (Continued)



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

Some ambient signals were observed within the screened room and are shown on this plot. Investigations were performed to confirm they were not coming from the EUT.

7.2.4. Receiver Radiated Spurious Emissions: Section 15.109 (Continued)

7.2.5. Electric Field Strength Measurements (Frequency Range: 1 GHz to 5 GHz)

Results:

Highest Peak Level:

Frequency (MHz)	Antenna Polarity	Detector Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5791.583	Horizontal	40.8	-3.8	37.0	54.0	17.0	5.0	Complied

Note(s):

1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.*

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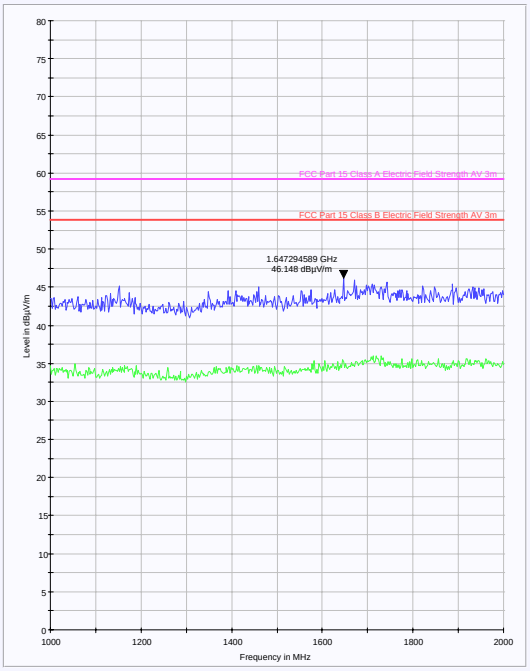
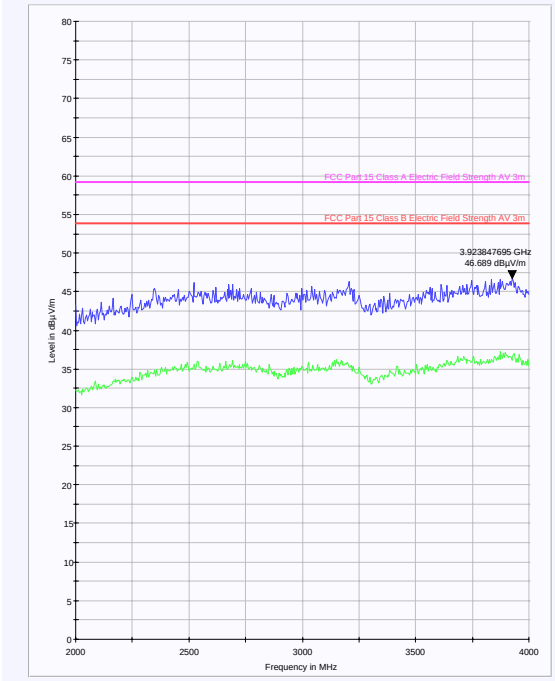
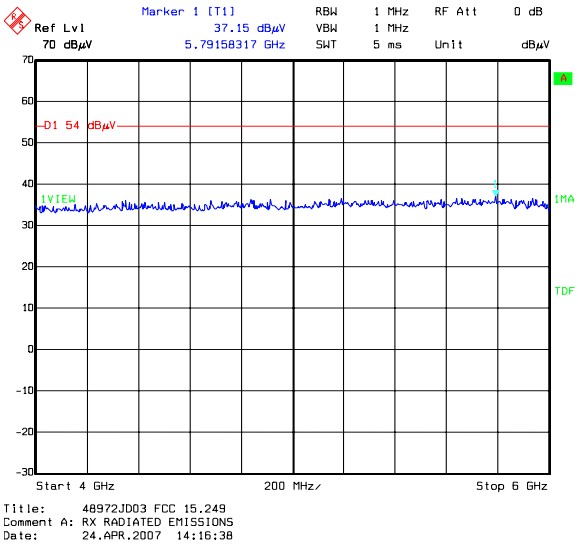
Receiver Radiated Spurious Emissions: Section 15.109 (Continued)







Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

7.2.6. Transmitter Fundamental Fieldstrength Section 15.249(a)

7.2.6.1. The EUT was configured for radiated emissions testing, as described in Section 8 of this report.
7.2.6.2. Tests were performed to identify the maximum field strength of the fundamental frequency.

Results:

AC Powered Devices

Channel	Input Voltage (AC)	Detector Level (dBµV)	Transducer Factor (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
Bottom	176	56.2	33.6	89.8	94.0	4.2	Complied
Bottom	230	56.2	33.6	89.8	94.0	4.2	Complied
Bottom	280	56.2	33.6	89.8	94.0	4.2	Complied
Middle	176	57.3	33.7	91.0	94.0	3.0	Complied
Middle	230	57.3	33.7	91.0	94.0	3.0	Complied
Middle	280	57.3	33.7	91.0	94.0	3.0	Complied
Top	176	57.0	33.8	90.8	94.0	3.2	Complied
Top	230	57.0	33.8	90.8	94.0	3.2	Complied
Top	280	56.7	33.8	90.5	94.0	3.5	Complied

Note(s):

1. *These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.*
2. *The customer requested that the tests were performed at the EUT designed operating voltage range of 176 to 280V which is greater than the FCC requirements.*

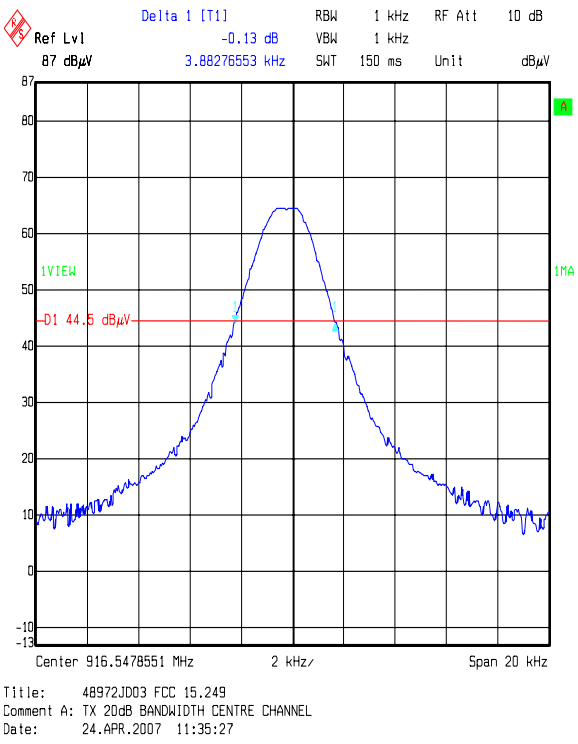
7.2.7. Transmitter 20 dB Bandwidth: Section 2.1049

7.2.7.1. The EUT was configured for 20 dB bandwidth measurements, as described in Section 8 of this report.

7.2.7.2. Tests were performed to identify the 20 dB bandwidth.

Results:

Transmitter 20 dB Bandwidth (kHz)
3.883



7.2.8. Transmitter Radiated Emissions: Section 15.249(a)(d)(e) & Section 15.209

7.2.9. Electric Field Strength Measurements: 30 MHz to 1000 MHz

7.2.9.1. The EUT was configured for radiated emissions testing, as described in Section 8 of this report.

7.2.9.2. Tests were performed to identify the maximum radiated spurious emission levels.

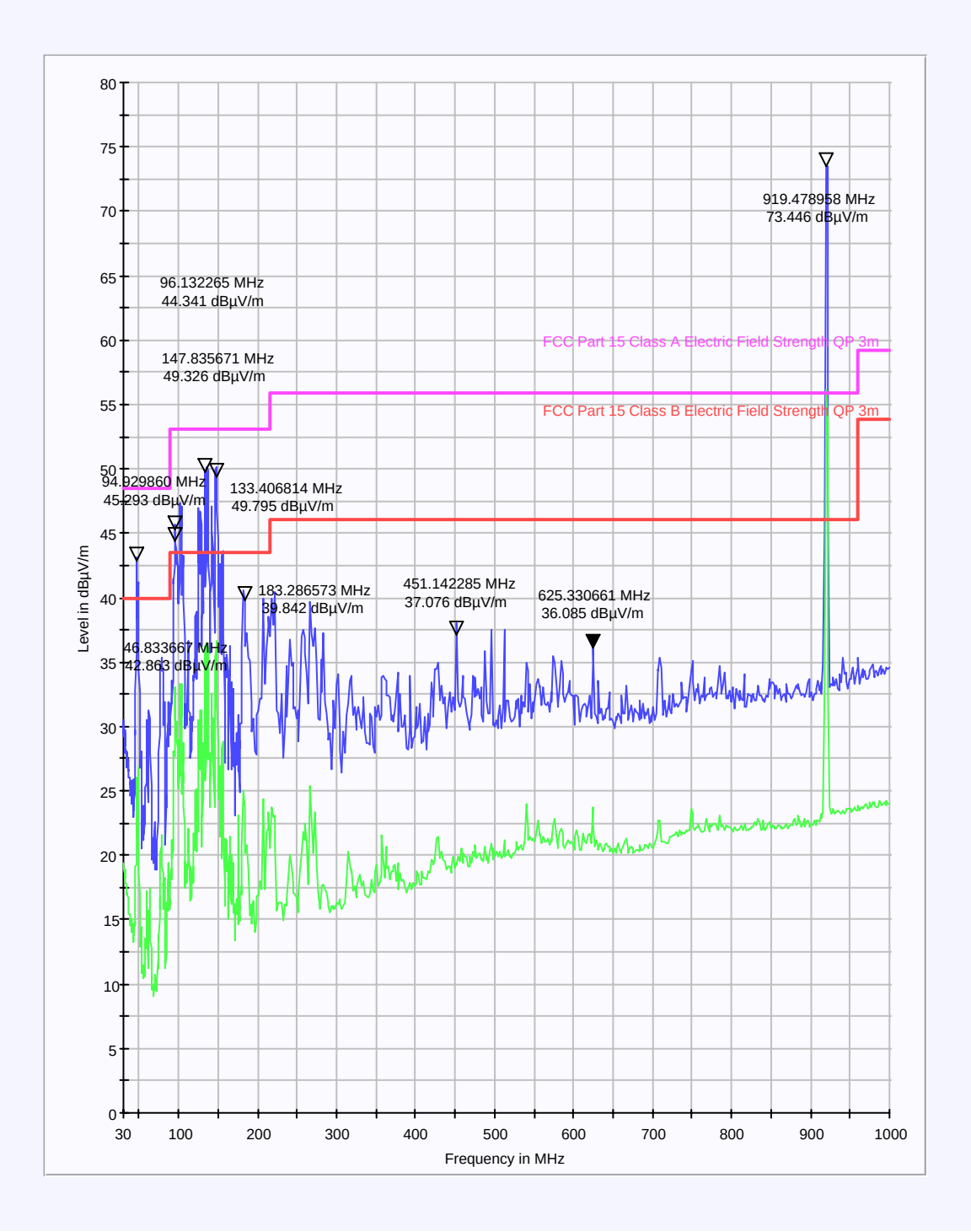
Results:

Frequency (MHz)	Antenna Polarity	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
147.835	Horizontal	31.6	43.5	11.9	Complied

Note(s):

1. *All other emissions were found to be ambient more than 10 dB below the specified limit.*

Transmitter Radiated Emissions: Section 15.249(a)(d)(e) & Section 15.209 (Continued)



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

Some ambient signals were observed within the screened room and are shown on this plot. Investigations were performed to confirm they were not coming from the EUT.

Transmitter Radiated Emissions: Section 15.249(a)(d)(e) & Section 15.209 (Continued)

7.2.10. Electric Field Strength Measurements (Frequency Range: 1 GHz to 10 GHz)

Results:

Highest Average Level:

Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Antenna Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1839.244	Horizontal	46.2	-6.5	39.7	54.0	14.3	Complied

Note(s):

1. *The FCC part 15.249(a) limit applied as the above emissions is the 2nd harmonic.*
2. *All other emissions were found to be at least 10 dB below the limit.*

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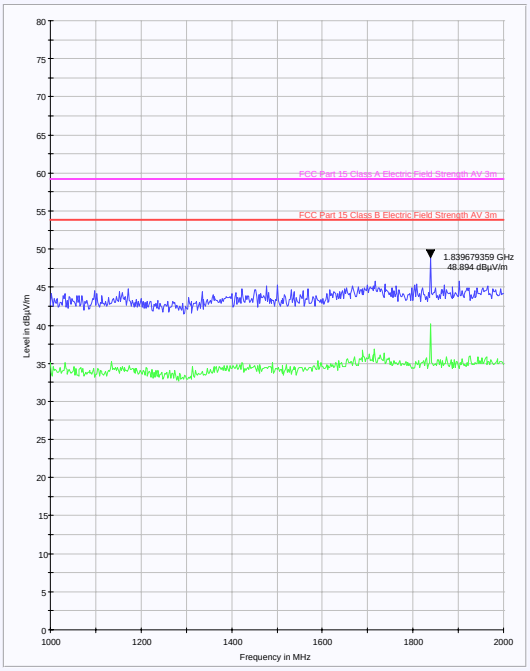
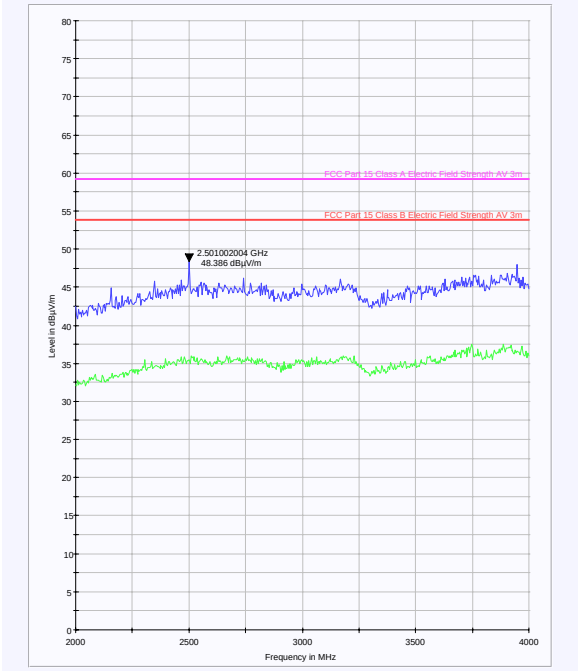
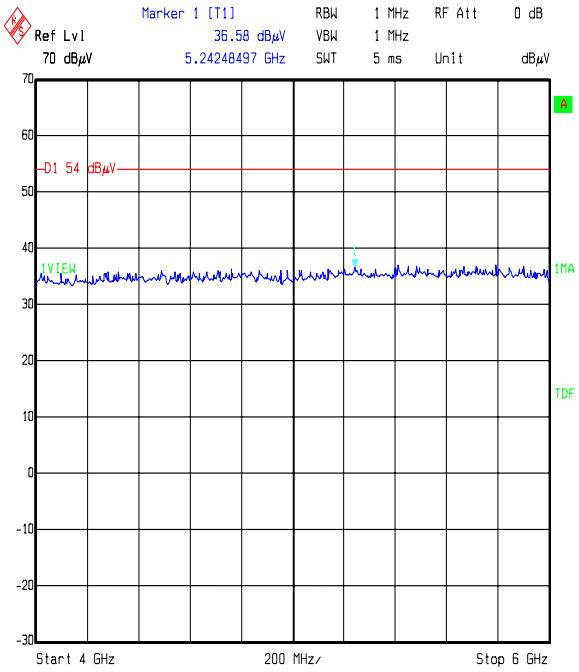
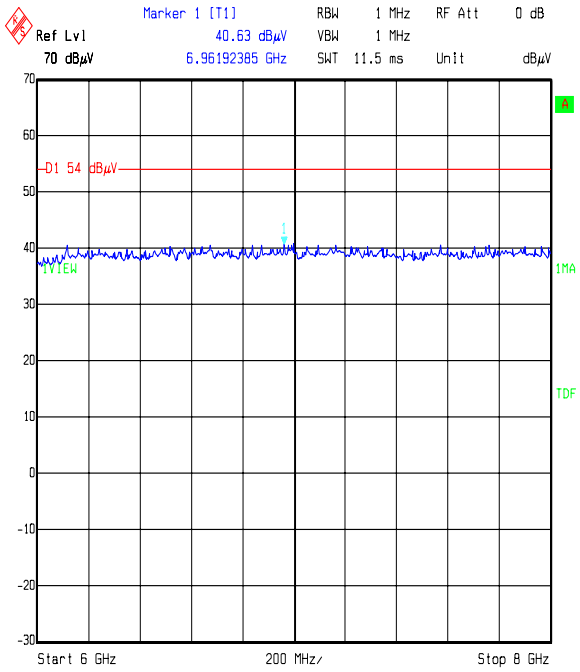
Transmitter Radiated Emissions: Section 15.249(a)(d)(e) & Section 15.209 (Continued)







Title: 48972JD03 FCC 15.249
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 24.APR.2007 14:10:58



Title: 48972JD03 FCC 15.249
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 24.APR.2007 14:26:19

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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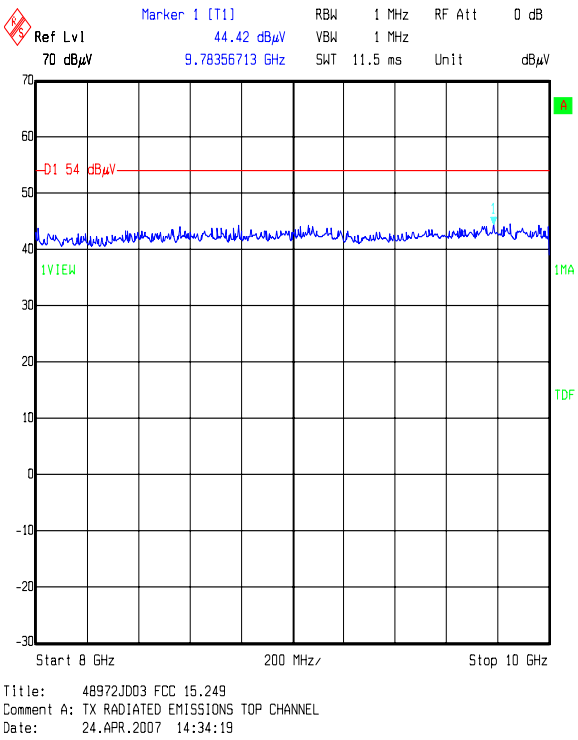
Transmitter Radiated Emissions: Section 15.249(a)(d)(e) & Section 15.209 (Continued)



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

7.2.11. Transmitter Radiated Emissions at Band Edges: Section 15.249(d) & 15.209

7.2.11.1. The EUT was configured for transmitter radiated emissions testing, as described in Section 8 of this report.

7.2.11.2. Tests were performed to identify the maximum emissions level at the band edges of the frequency band that the EUT will operate over.

Results:

Bottom Band Edge

Frequency (MHz)	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
902	40.1	46.0	5.9	Complied

Top Band Edge

Frequency (MHz)	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
928	40.3	46.0	5.7	Complied

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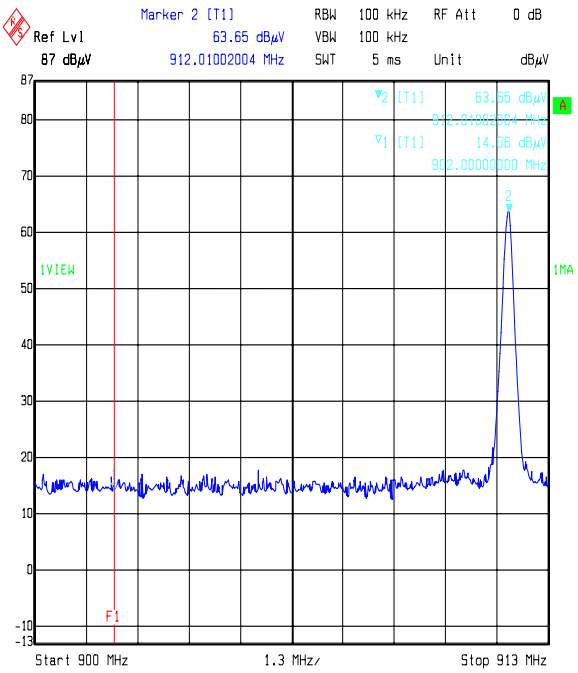
Transmitter Radiated Emissions at Band Edges: Section 15.249(d) & 15.209 (Continued)



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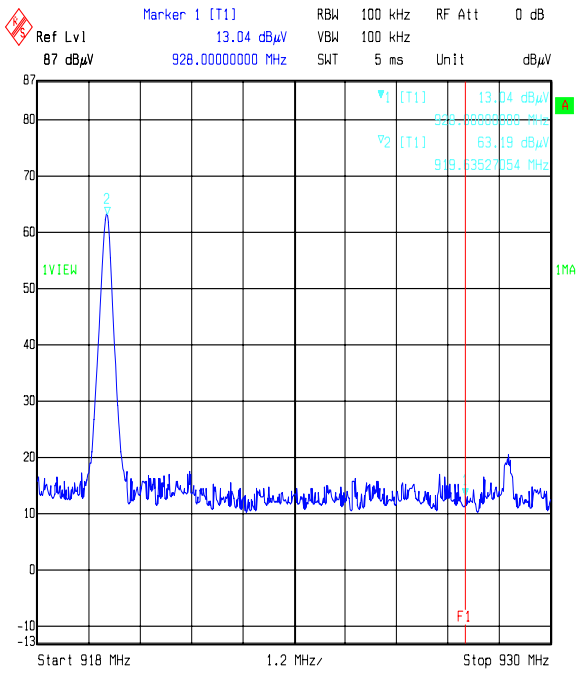
Comment A: TRANSMITTER RADIATED EMISSIONS AT LOWER BAND EDGE
Date: 24.APR.2007 11:47:02



Title: 48972JD03 FCC 15.249
Comment A: TRANSMITTER RADIATED EMISSIONS AT UPPER BAND EDGE
Date: 24.APR.2007 11:53:01

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

8. Measurement Methods

8.1. 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

8.2. 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. In either case the measurement was made at the appropriate distance using a measuring receiver with a Quasi-Peak detector for measurements below 1000 MHz and an Average detector for measurements above 1000 MHz. For the final measurements the EUT was arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2001 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 dBμV 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

8.3. Transmitter 20 dB Bandwidth

The EUT and spectrum analyser was configured for transmitter radiated emissions measurements.

To determine the occupied bandwidth, a resolution bandwidth of 10 kHz was used, which is greater than 1% of the 20 dB bandwidth. A video bandwidth of a least the same value 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 20 dB below the peak level. The bandwidth was determined at the points where the 20 dB reference crossed the profile of the emission.

9. Measurement Uncertainty

9.1. 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.

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

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

9.4. 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
Occupied Bandwidth	N/A	95%	+/- 0.12 %
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	+/- 1.78 dB

9.5. 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A028	9188-2 Horn Antenna 1-2 GHz	Eaton	91888-2	304	08 Jun 2006	36
A031	2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	557	08 Jun 2006	36
A059	3146 Log Periodic Antenna	EMCO	3146	8902-2378	09 May 2006	12
A1037	Green Bilog Antenna	Chase EMC Ltd	CBL6112 B	2413	20 Sep 2006	12
A1069	Single Phase LISN	Rohde & Schwarz	ESH3-Z5	837469/012	09 Feb 2007	12
A1534	Preamplifier 1-26.5 GHz	Hewlett Packard	8449B OPT H02	3008A00405	Cal before use	-
A1830	N-Type Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	Cal before use	-
A253	WG 12 Microwave Horn	Flann Microwave	12240-20	128	17 Nov 2006	36
A254	WG 14 Microwave Horn	Flann Microwave	14240-20	139	17 Nov 2006	36
A255	WG 16 Microwave Horn	Flann Microwave	16240-20	519	17 Nov 2006	36
A259	Bilog Antenna	Chase	CBL6111	1513	13 Mar 2007	12
C1065	20m cable	Rosenberger	UFA210-1-7872	0985	Cal before use	-
C1081	UFA210A Rosenberger Cable	Rosenberger	FA210A1020M5050	28463-2	Cal before use	-
C1268	7.5m BNC Coaxial Cable	Rosenberger	FA210A0075008080	49356-1	Cal before use	-
C151	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Cal before use	-

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
C160	Cables	Rosenberger	UFA210A-1-1181-70x70	None	Cal before use	-
C340	1m cable	Andrews	None	None	Cal before use	-
C348	Cable	Rosenberger	UFA210A-1-1181-70x70	2993	Cal before use	-
C363	3m cable	Rosenberger	RG142	None	Cal before use	-
C461	DC to 18GHz Rosenberger	Rosenberger	UFA210A-1-1182-704704	98H0305	Cal before use	-
C468	10m Cable	Rosenberger	UFA210A-1-3937-504504	98L0440	Cal before use	-
M024	EZM Spectrum Monitor	Rohde & Schwarz	EZM	873 952/006	Not calibrated	-
M044	ESVP Receiver	Rohde & Schwarz	ESVP	891 845/026	06 Mar 2007	12
M1242	Spectrum Analyser	Rohde & Schwarz, Inc.	FSEM30	845986_022	08 Sep 2006	12
M1263	EMI Test Receiver	Rohde & Schwarz	ESIB7	100265	25 Jan 2007	12
S0539	Variable AC Power Supply	Kikusui	PCR 1000L	13010170	Cal before use	-
S201	3m & 10m OATS	RFI	1		18 Jul 2006	12
S202	3m OATS	RFI	2	S202-15011990	17 Nov 2006	12
S212	Emissions Screened Room	RFI	12		Not calibrated	-

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

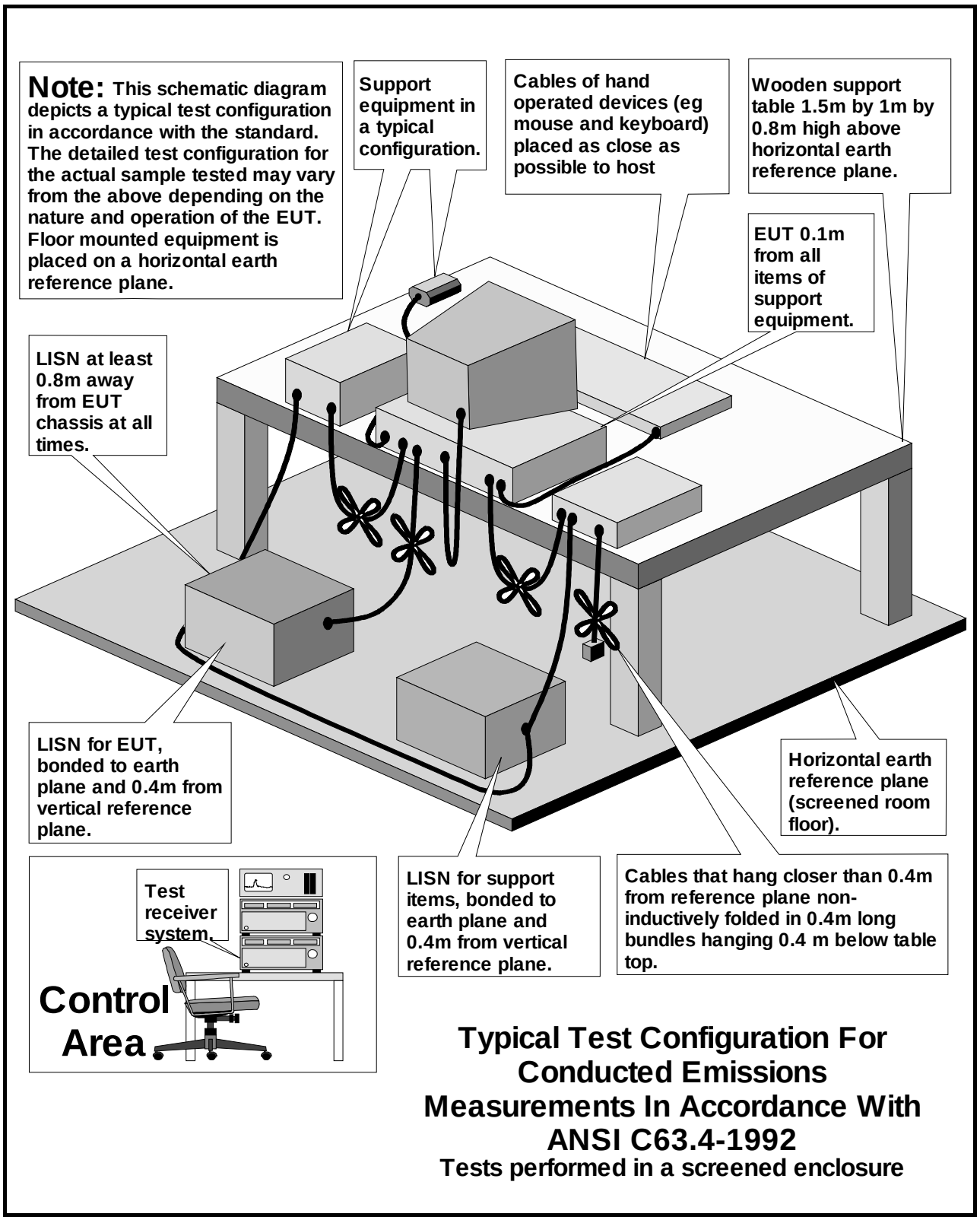
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\48972JD03B\EMICON	Test configuration for measurement of conducted emissions.
DRG\48972JD03B\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Ampy Metering Ltd
Remote Metering Telemetry System - Outstation
To: FCC Part 15.249: 2006

DRG\48972JD03B\EMICON

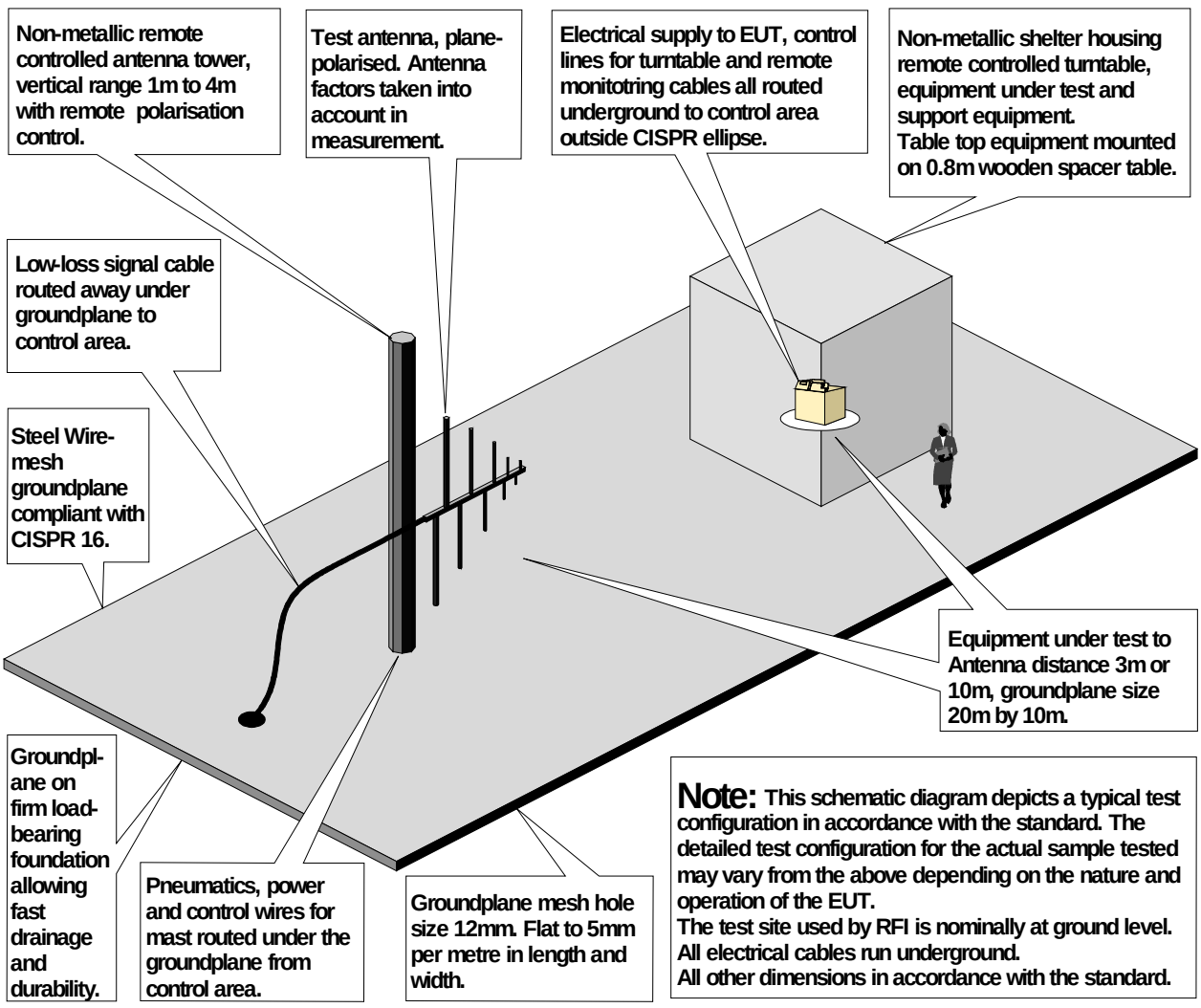


Typical Test Configuration For Conducted Emissions Measurements In Accordance With ANSI C63.4-1992

Tests performed in a screened enclosure

Test of: **Ampy Metering Ltd**
Remote Metering Telemetry System - Outstation
To: **FCC Part 15.249: 2006**

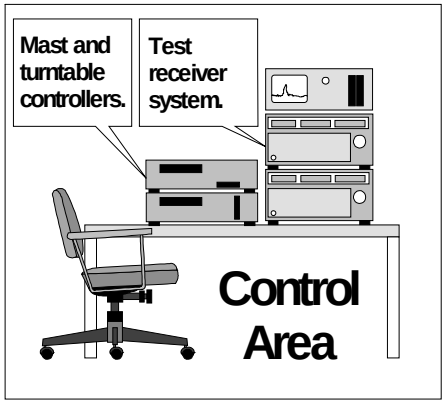
DRG\48972JD03B\EMIRAD



Note: This schematic diagram depicts a typical test configuration in accordance with the standard. The detailed test configuration for the actual sample tested may vary from the above depending on the nature and operation of the EUT.
The test site used by RFI is nominally at ground level.
All electrical cables run underground.
All other dimensions in accordance with the standard.

Test Configuration For Radiated Emissions Measurements

Reflection-free area: >60m by 52m (CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse



Appendix 3. Declaration from Customer

This appendix contains the Declaration from Customer document which is not included in the total number of pages for this report.

Plextek Limited, London Road, Great Chesterford, Essex, CB10 1NY, UK
Telephone: +44 (0)1799 533200 Fax: +44 (0)1799 533201
Website: http://www.plextek.com Email: post@plextek.co.uk

Electronics Design & Consultancy

Telecommunication Certification Body,
RFI Global Services Ltd.,
Pavilion A,
Ashwood Park,
Basingstoke,
Hampshire,
RG23 8BG,
United Kingdom.

Our ref: 6RC013 01

Date : 29 June, 2007

To whom it may concern,

Declaration of Implementation of Changes to Ampy 5252 Meter

Date of testing at RFI: 15th March to 25th April 2007

FCC ID: U3R-5252

During testing of this equipment, there was a failure of Part 15.247 radiated emissions above 1GHz and also a failure of Part 15.249 radiated transmit power. The following modifications were carried out on all radio modules used in tests between 23rd and 25th April 2007 in order to remedy these failures:

1. A track going from the output of a linear voltage regulator (U5) to an unused test point was cut in order to reduce harmonic emissions and meet the requirements of Part 15.247.
2. R22 and R52 were changed from 68R to 82R and L12 was changed from 47nH to 39nH. These are components in the attenuator in the transmitter section and these changes reduce the output power in the low power mode by approximately 2dB in order to meet the requirements of Part 15.249.

Following these changes, all tests apart from AC conducted emissions were repeated. It should be noted that these changes do not affect the power supply and therefore do not affect the AC conducted emissions.

This letter is to declare that this change will be implemented in all equipment that bears this FCC ID number.

Yours faithfully,

pp C. Smithers

Mark Hunter

Senior Project Consultant.

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