



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: IPWireless 700 MHz V5 Node B Model AFB/VT

To: FCC Part 90: 2009 Subpart R

Test Report Serial No:
RFI-RPT-RP76943JD01B V3.0

Version 3.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of Brian Watson, COO Payments and Consultancy:		
	pp	
Checked By:	A. Henriques	
Signature:		
Date of Issue:	16 July 2010	

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RFI Global Services Ltd

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901

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1. Customer Information















Company Name:	IPWireless (UK) Ltd
Address:	Unit 7 Greenways Business Park Bellinger Close Chippenham Wiltshire SN15 1BN

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR90
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2009: Part 90 Subpart R (Regulations Governing the Licensing and Use of Frequencies in the 763-775 and 793-805 MHz Bands)
Site Registration:	209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	08 June 2010 to 23 June 2010

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 90.542(a)(3)	Transmitter Effective Radiated Power (ERP)	
Part 2.1049	Transmitter Occupied Bandwidth	
Part 90.539(d)	Transmitter Frequency Stability (Temperature & Voltage Variation)	
Part 90.210(n)	Transmitter Conducted Emissions Mask	
Part 90.543(e)	Transmitter Conducted Emissions (Out of Band)	
Part 90.543(e)	Transmitter Band Edge Conducted Emissions	
Part 90.543(e)(1)	Transmitter Conducted Emissions (769 to 775 MHz and 799 to 805 MHz bands)	
Part 90.543(f)	Transmitter Conducted Emissions (1559 MHz to 1610 MHz band)	
Part 90.543(e)	Transmitter Radiated Emissions (Out of Band)	
Part 90.543(e)	Transmitter Band Edge Radiated Emissions	
Part 90.543(e)(1)	Transmitter Radiated Emissions (769 to 775 MHz and 799 to 805 MHz bands)	
Part 90.543(f)	Transmitter Radiated Emissions (1559 MHz to 1610 MHz band)	
Key to Results		
 = Complied  = Did not comply		

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile Communications Equipment, Measurements and performance Standards
Reference:	ANSI C63.4 (2009)
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.

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Description:	Radio Shelf
Brand Name:	IPWireless
Model Name or Number:	AFB
Serial Number:	AFJ938000111
FCC ID Number:	PKTNODEBAFB1

Description:	Digital Shelf
Brand Name:	IPWireless
Model Name or Number:	VT
Serial Number:	W1J73700CJ16

Description:	Sector card 2 (part of VT Digital Shelf)
Brand Name:	IPWireless
Model Name or Number:	Sector card
Serial Number:	VU1J73700RV17

3.2. Description of EUT

The equipment under test was a W-CDMA Wireless Base Station comprising a radio shelf and a digital shelf intended for mounting into a 19" rack. Both shelves are connected together to create a Node B. The equipment utilizes Frequency Division Duplex technology.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Power Supply Requirement:	-48.0 V DC \pm 15%	
Type of Unit:	FDD Wireless base station transceiver	
Modulation Type:	QPSK, 16QAM, 64QAM	
Duty Cycle:	100%	
Antenna Ports:	Two x 7/16 female (marked ANT 1 and ANT 2)	
Antenna Gain:	Up to +20 dBi (stated)	
Chip Rate:	3.84 Mcps	
Channel Bandwidth:	5.0 MHz	
Transmit Operating Band :	763 MHz to 768 MHz	
Transmit Channel Tested:	Channel ID	Channel Frequency (MHz)
	Single	765.5
Receive Operating Band:	793 MHz to 798 MHz	

3.5. Support Equipment

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

Description:	DC Power supply
Brand Name:	Agilent
Model Name or Number:	E4356A
Serial Number:	MY41000617

Description:	Sector card 1 (part of VT Digital Shelf)
Brand Name:	IPWireless
Model Name or Number:	Sector card
Serial Number:	VU1J73700RQ17

Description:	Sector card 2 (part of VT Digital Shelf)
Brand Name:	IPWireless
Model Name or Number:	Sector card
Serial Number:	VU1J73700RV17

Description:	Sector card 3 (part of VT Digital Shelf)
Brand Name:	IPWireless
Model Name or Number:	Sector card
Serial Number:	VU1J73700RW17

Description:	30 dB RF attenuator
Brand Name:	NARDA
Model Name or Number:	776C-30
Serial Number:	522

Description:	Laptop PC
Brand Name:	Sony
Model Name or Number:	Vaio VGN-BX195VT
Serial Number:	None Stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Transmitting and receiving simultaneously.
- Constantly transmitting the maximum of 15 timeslots at full power (+40 dBm) with a chip rate of 3.84 Mcps.
- No tests were performed in receive/idle mode as the device is constantly transmitting.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The radio shelf and digital shelf connected together as required and powered from a bench DC power supply.
- Three sector cards were fitted to the digital shelf. Sector 2 card was connected to the radio shelf via the fibre optic cables. Sector 1 and 3 cards were not used during the testing and were only fitted in order to fill the card slots. This is a standard configuration of the EUT.
- The laptop PC was connected to the Ethernet port on the digital shelf by a CAT5 cable. A bespoke application on the laptop PC was used to configure the RF parameters of the EUT as required.
- RF Conducted emission tests - One RF port was connected to the measurement equipment using previously calibrated RF cables, filters and attenuators. The unused RF port was terminated with suitable loads or attenuators. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.
- RF Radiated emission/case radiation tests - Both RF ports were terminated with suitable loads or attenuators. The EUT was connected to a suitable bench power supply powered from a 120 VAC 60 Hz mains supply and the output set to 48 VDC. All active ports on the EUT were terminated and the client stated that un-terminated ports were either inoperative or disabled.
- For conducted and radiated emissions out of band testing, preliminary checks were made on all three modulation schemes and the mode which exhibited the highest emissions profile (i.e. 64QAM) was scanned across the required measurement frequency range. Where an emission was detected final emission measurements were performed on all three modulation schemes.
- The customer configured the EUT so that residual carrier breakthrough was present at the centre of the carrier in order to make frequency measurements.

5. Measurements, Examinations and Derived Results

5.1. General Comments

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 6. Measurement Uncertainty* for details.

5.2. Test Results

5.2.1. Transmitter Effective Radiated Power (ERP)

Test Summary:

FCC Part:	90.542(a)(3)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	32

Results: Antenna Port 1

Modulation	Frequency (MHz)	Conducted RF Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
QPSK	765.5	37.4	20	57.4	60.0	2.6	Complied
16QAM	765.5	37.3	20	57.3	60.0	2.6	Complied
64QAM	765.5	37.3	20	57.3	60.0	2.6	Complied

Results: Antenna Port 2

Modulation	Frequency (MHz)	Conducted RF Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
QPSK	765.5	38.0	20	58.0	60.0	2.0	Complied
16QAM	765.5	37.9	20	57.9	60.0	2.1	Complied
64QAM	765.5	37.9	20	57.9	60.0	2.1	Complied

Note(s):

1. Measurements were performed with the EUT transmitting on all supported modulation types on both Antenna Port 1 and Antenna Port 2.

5.2.2. Transmitter Occupied Bandwidth**Test Summary:**

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 and relevant annexes referencing FCC Part 2.1049 (see note below)

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	32

Results: Antenna Port 1

Modulation	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
QPSK	765.5	100	300	4.118
16QAM	765.5	100	300	4.118
64QAM	765.5	100	300	4.118

Results: Antenna Port 2

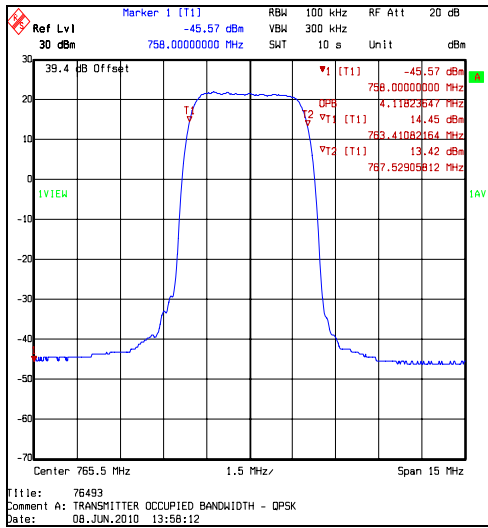
Modulation	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
QPSK	765.5	100	300	4.118
16QAM	765.5	100	300	4.118
64QAM	765.5	100	300	4.118

Note(s):

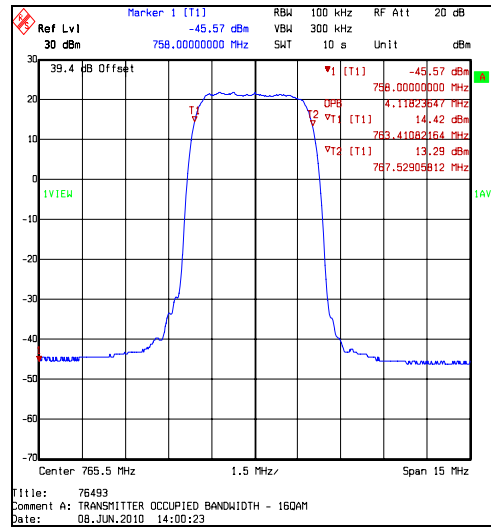
1. In lieu of the test method detailed in ANSI C63.4 Section 13.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.
2. Measurements were performed with the EUT transmitting on all supported modulation types on both Antenna Port 1 and Antenna Port 2.

Transmitter Occupied Bandwidth (continued)

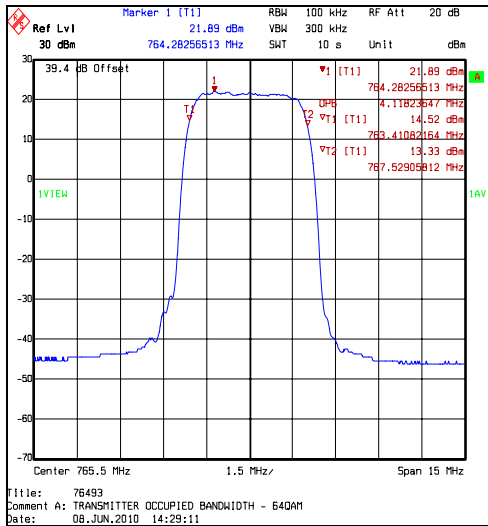
Antenna Port 1



QPSK



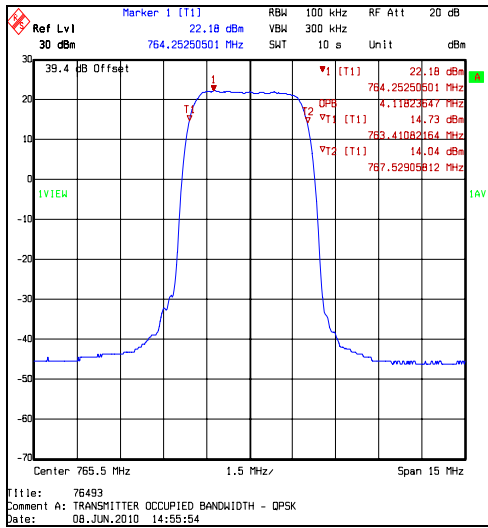
16QAM



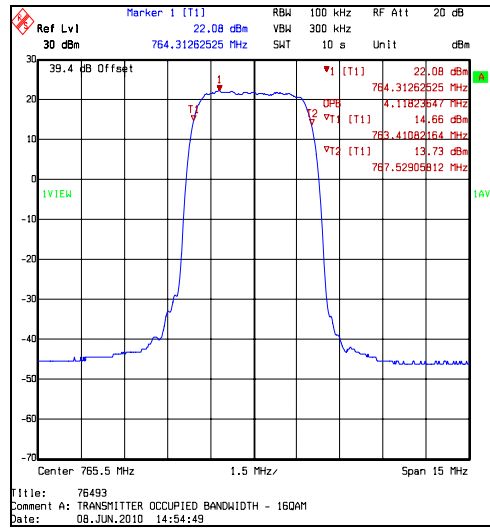
64QAM

Transmitter Occupied Bandwidth (continued)

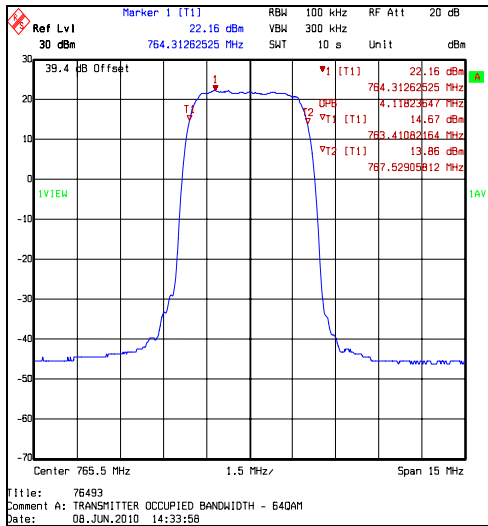
Antenna Port 2



QPSK



16QAM



64QAM

5.2.3. Transmitter Frequency Stability - Temperature Variation**Test Summary:**

FCC Part:	90.539(d)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC Part 2.1055

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	25

Results: Port 2

Temp (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin
-30	765.499797	203	0.3	1.0	0.7
-20	765.499909	91	0.1	1.0	0.9
-10	765.499909	91	0.1	1.0	0.9
0	765.499909	91	0.1	1.0	0.9
10	765.499909	90	0.1	1.0	0.9
20	765.499910	90	0.1	1.0	0.9
30	765.499909	91	0.1	1.0	0.9
40	765.499909	91	0.1	1.0	0.9
50	765.499909	91	0.1	1.0	0.9

Note(s):

1. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

5.2.4. Transmitter Frequency Stability - Voltage Variation**Test Summary:**

FCC Part:	90.539(d)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC Part 2.1055

Environmental Conditions:

Ambient Temperature (°C):	20
Relative Humidity (%):	29

Results: Port 2

Supply Voltage (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin
-40.8	765.499909	91	0.1	1.0	0.9
-48.0	765.499909	91	0.1	1.0	0.9
-55.2	765.499909	91	0.1	1.0	0.9

Note(s):

1. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

5.2.5. Transmitter Conducted Emissions Mask

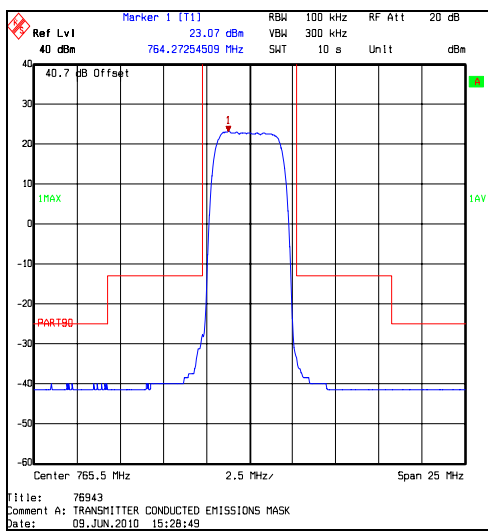
Test Summary:

FCC Part:	90.210(n) referencing Emissions Mask B as specified in 90.210(b)
Test Method Used	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC Part 2.1051

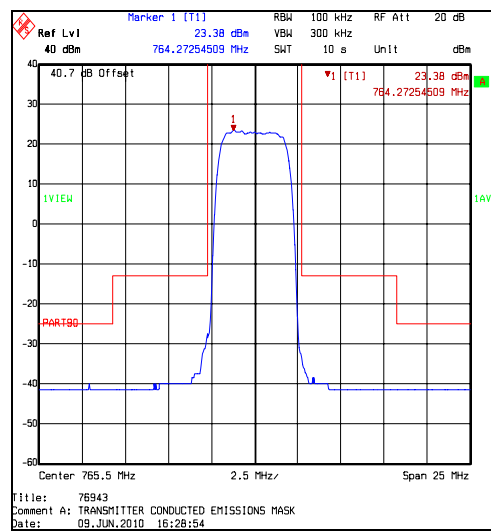
Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	38

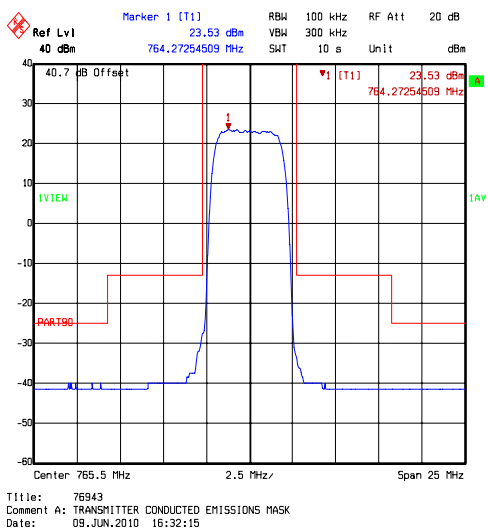
Results: Port 2



QPSK



16QAM



64QAM

Transmitter Conducted Emissions Mask (continued)**Note(s):**

1. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.
2. It was not possible to supply an unmodulated carrier at maximum peak power due to the design of the EUT therefore the mask was relative to the modulated maximum conducted carrier power measured.

5.2.6. Transmitter Conducted Emissions (Out of Band)**Test Summary:**

FCC Part:	90.543(e)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC Part 2.1051
Frequency Range:	9 kHz to 10 GHz

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	32

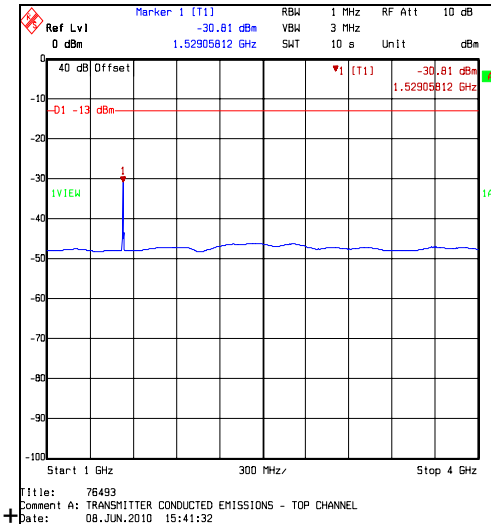
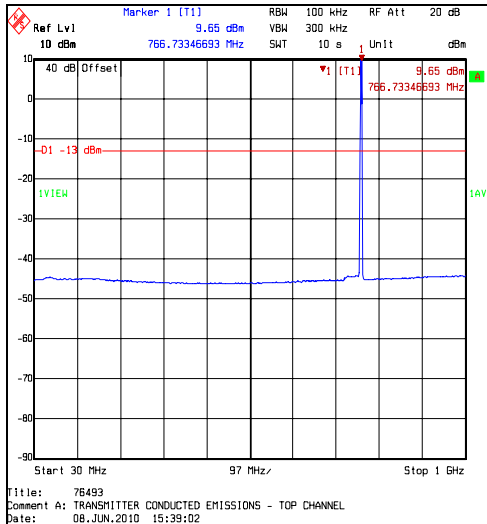
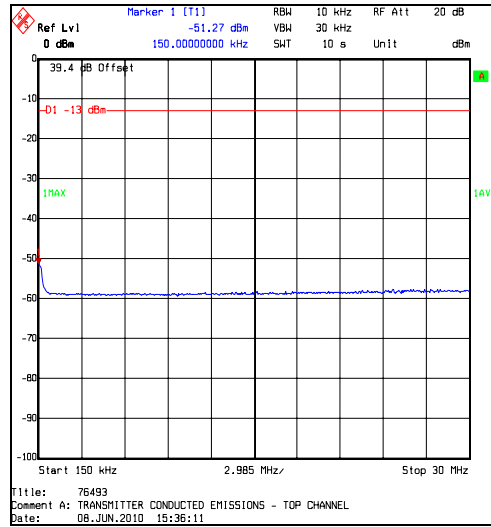
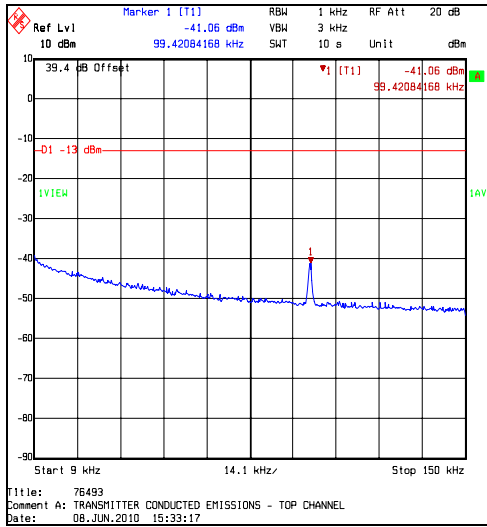
Results: Port 2

Modulation	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK	1529.187	-23.0	-13.0	10.0	Complied
16QAM	1528.838	-18.7	-13.0	5.7	Complied
64QAM	1528.886	-21.2	-13.0	8.2	Complied

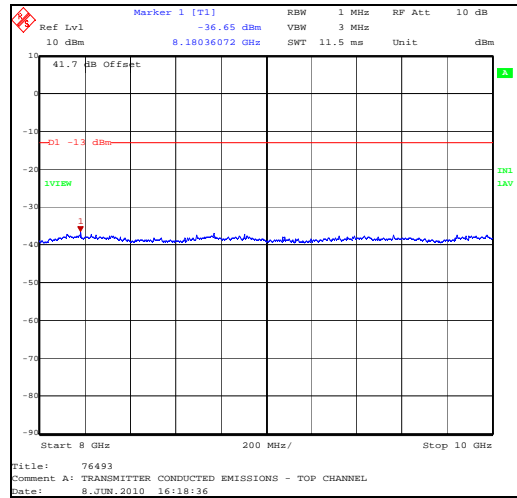
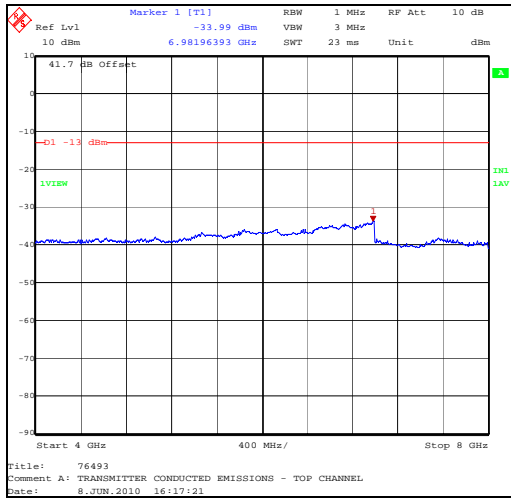
Note(s):

1. The emissions shown at approximately 765.5 MHz on the 30 MHz to 1 GHz plot is the carrier
2. All other emissions were >20 dB below the applicable limit or below the level of the noise floor of the measuring receiver.
3. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

Transmitter Conducted Emissions (Out of Band) (continued)



Transmitter Conducted Emissions (Out of Band) (continued)



5.2.7. Transmitter Band Edge Conducted Emissions

Test Summary:

FCC Part:	90.543(e)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC Part 2.1051

Environmental Conditions:

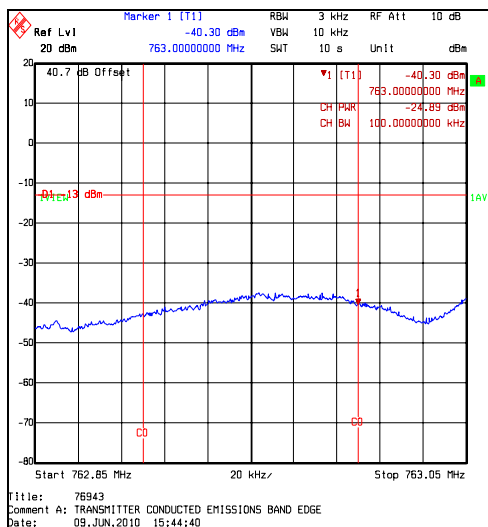
Temperature (°C):	22
Relative Humidity (%):	35

Results: Port 1

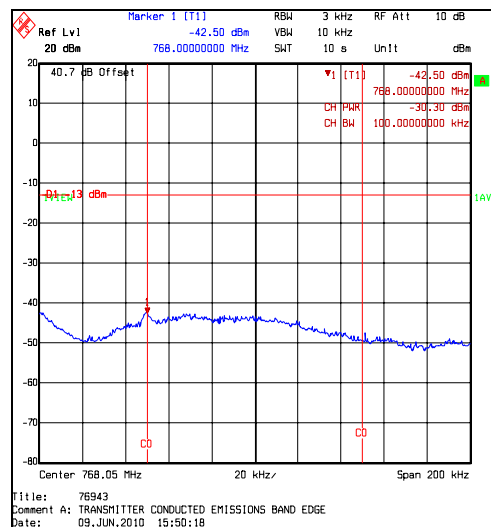
Modulation	Frequency of 100 kHz strip adjacent to block edge (MHz)	Level in 100 kHz strip adjacent to block edge (dBm)	Band edge limit (dBm)	Margin (dB)	Result
QPSK	763	-24.9	-13.0	11.9	Complied
QPSK	768	-30.3	-13.0	17.3	Complied
16QAM	763	-25.7	-13.0	12.7	Complied
16QAM	768	-30.2	-13.0	17.2	Complied
64QAM	763	-25.0	-13.0	12.0	Complied
64QAM	768	-29.5	-13.0	16.5	Complied

Note(s):

1. Measured using the channel power function of the spectrum analyser (channel bandwidth of 100 kHz).
2. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

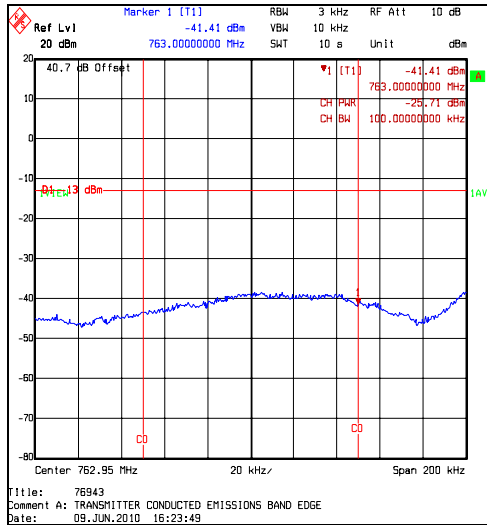


QPSK – Lower Band Edge

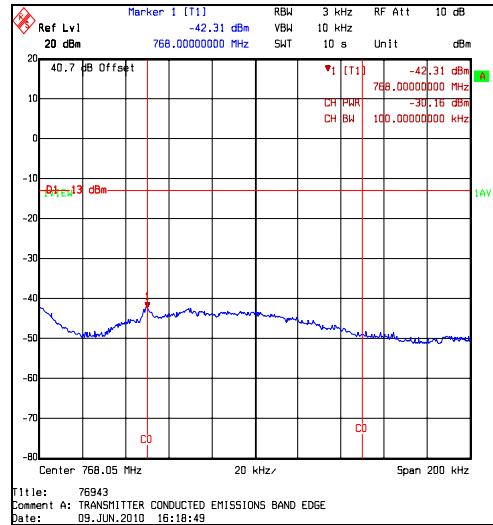


QPSK – Upper Band Edge

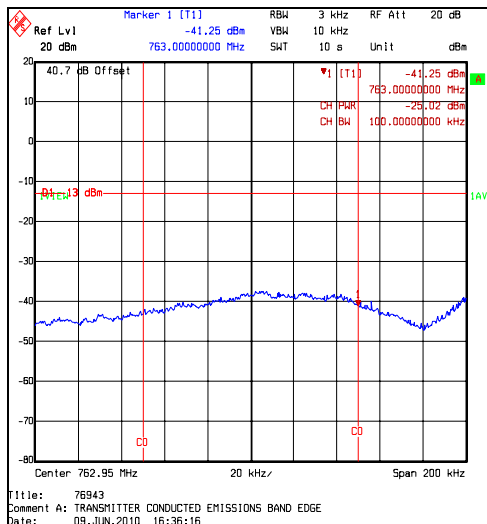
Transmitter Band Edge Conducted Emissions (continued)



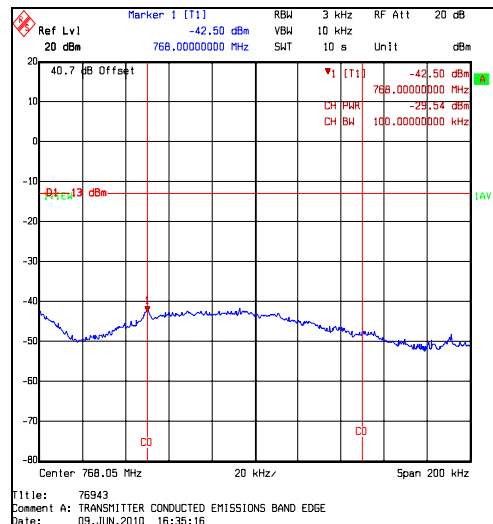
16QAM – Lower Band Edge



16QAM – Upper Band Edge



64QAM – Lower Band Edge



64QAM – Upper Band Edge

5.2.8. Transmitter Conducted Emissions (769 MHz to 775 MHz and 799 MHz to 805 MHz bands)**Test Summary:**

FCC Part:	90.543(e)(1)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC Part 2.1051
Frequency Range:	769 MHz to 805 MHz (includes bands 769 MHz to 775 MHz and 799 MHz to 805 MHz)

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	37

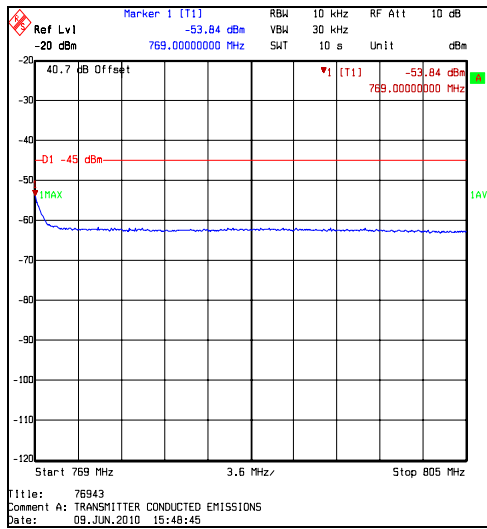
Results: Port 1

Modulation	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK	769.0	-53.8	-46.0	7.8	Complied
16QAM	769.0	-53.2	-46.0	7.2	Complied
64QAM	769.0	-54.8	-46.0	8.8	Complied

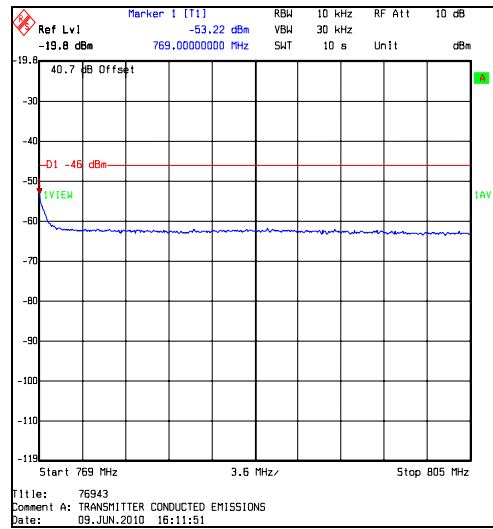
Note(s):

1. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

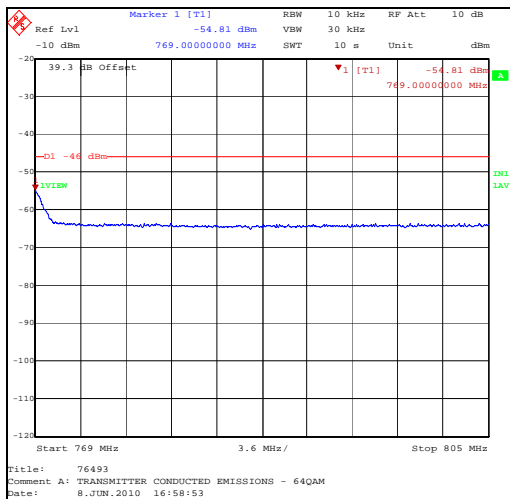
**Transmitter Conducted Emissions (769 MHz to 775 MHz and 799 MHz to 805 MHz bands)
(continued)**



QPSK



16QAM



64QAM

5.2.9. Transmitter Conducted Emissions (1559 MHz to 1610 MHz band) (continued)**Test Summary:**

FCC Part:	90.543(f)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC Part 2.1051
Frequency Range:	1559 MHz to 1610 MHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	36

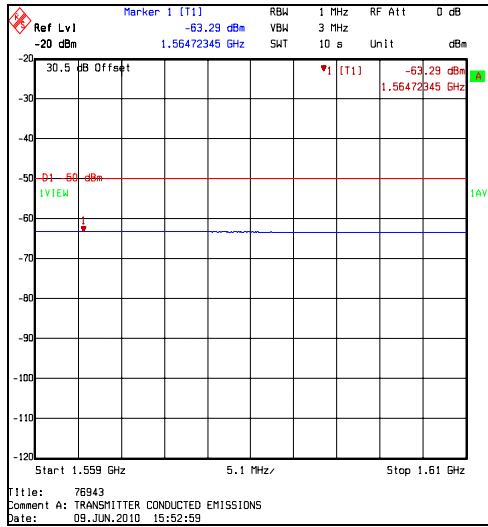
Results: Port 2

Modulation	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK	1564.723	-63.3	-50.0	13.3	Complied
16QAM	1559.204	-63.6	-50.0	13.6	Complied
64QAM	1559.211	-63.4	-50.0	13.4	Complied

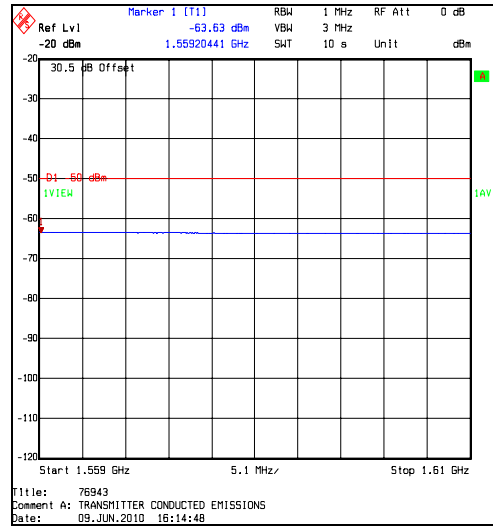
Note(s):

1. -80 dBW/MHz \equiv -50 dBm in a 1 MHz measurement bandwidth
2. No emissions were detected above the level of the noise floor of the measuring receiver.
3. Preliminary testing was performed on both antenna ports with the worse case port being selected for measurements.

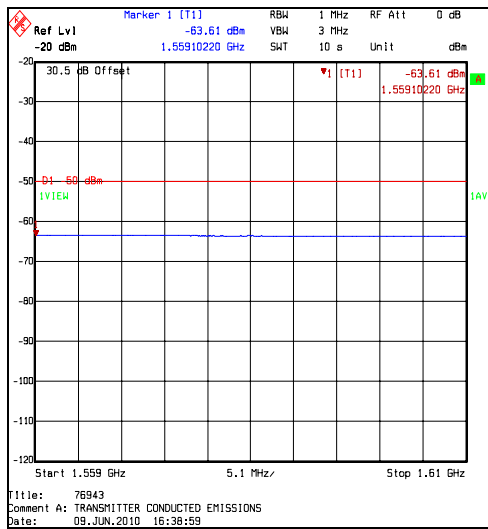
Transmitter Conducted Emissions (1559 MHz to 1610 MHz band) (continued)



QPSK



16QAM



64QAM

5.2.10. Transmitter Radiated Emissions (Out of Band)**Test Summary:**

FCC Part:	90.543(e)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053
Frequency Range:	30 MHz to 10 GHz

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	30

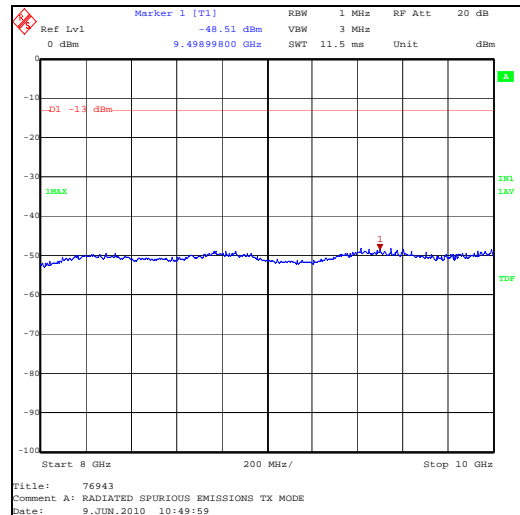
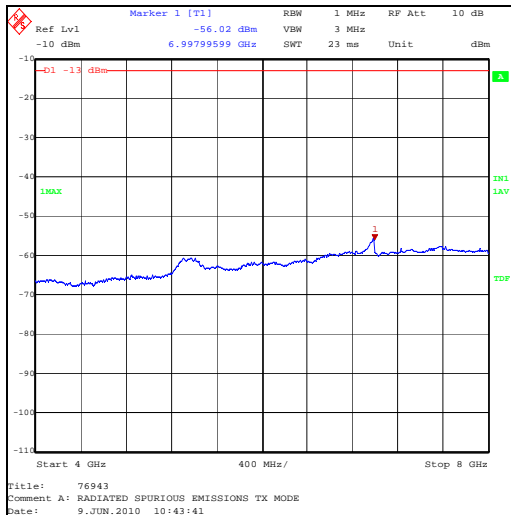
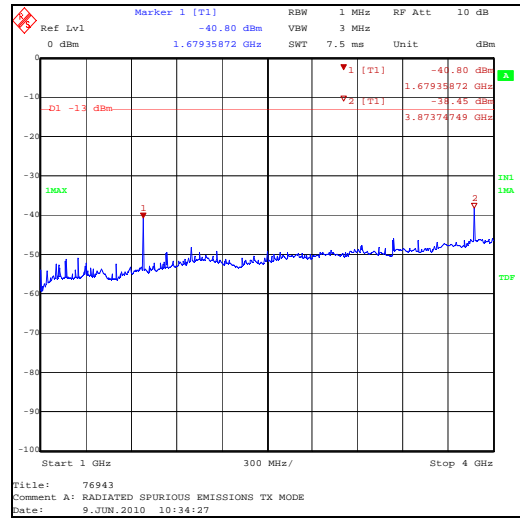
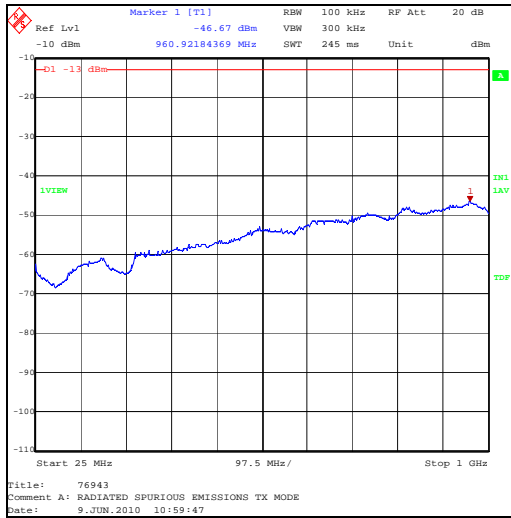
Results:

Modulation	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK					Note 1
16QAM					Note 1
64QAM					Note 1

Note(s):

1. All emissions were >20 dB below the applicable limit or below the level of the noise floor of the measuring receiver.

Transmitter Radiated Emissions (Out of Band) (continued)



5.2.11. Transmitter Band Edge Radiated Emissions

Test Summary:

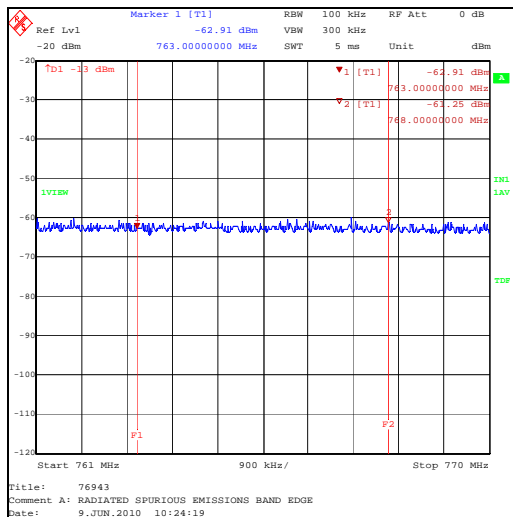
FCC Part:	90.543(e)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053

Environmental Conditions:

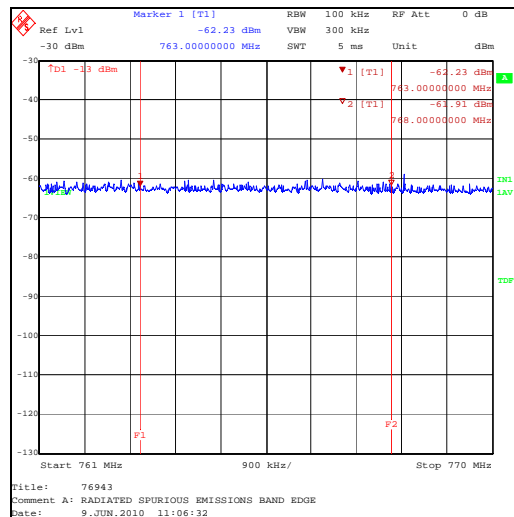
Temperature (°C):	22
Relative Humidity (%):	35

Results:

Modulation	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK	763.0	-62.9	-13.0	49.9	Complied
QPSK	768.0	-61.3	-13.0	48.3	Complied
16QAM	763.0	-62.2	-13.0	49.2	Complied
16QAM	768.0	-61.9	-13.0	48.9	Complied
64QAM	763.0	-64.4	-13.0	51.4	Complied
64QAM	768.0	-65.2	-13.0	52.2	Complied

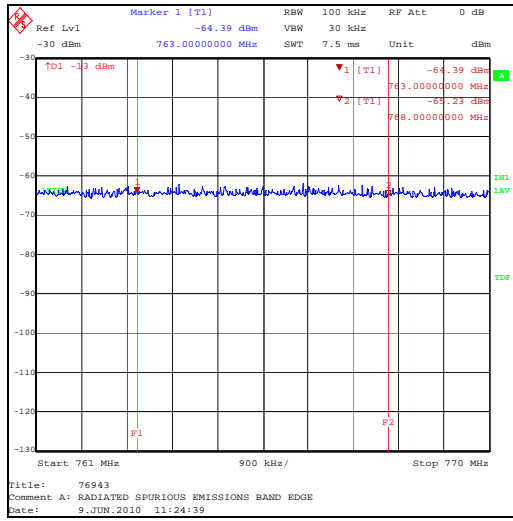


QPSK



16QAM

Transmitter Band Edge Radiated Emissions (continued)



64QAM

5.2.12. Transmitter Radiated Emissions (769 MHz to 775 MHz and 799 MHz to 805 MHz bands)**Test Summary:**

FCC Part:	90.543(e)(1)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053
Frequency Ranges:	769 MHz to 805 MHz (includes bands 769 MHz to 775 MHz and 799 MHz to 805 MHz)

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	29

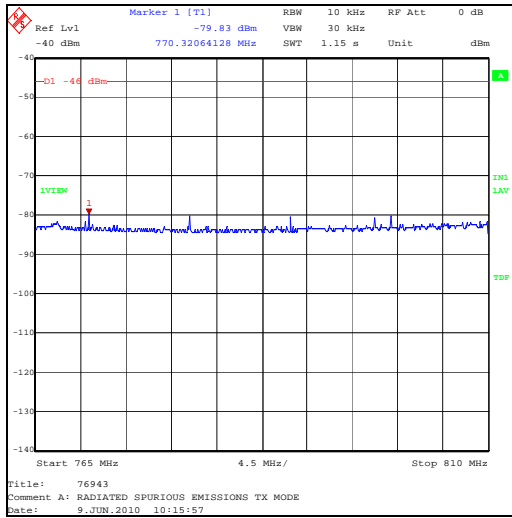
Results:

Modulation	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK			Note 1		
16QAM			Note 1		
64QAM			Note 1		

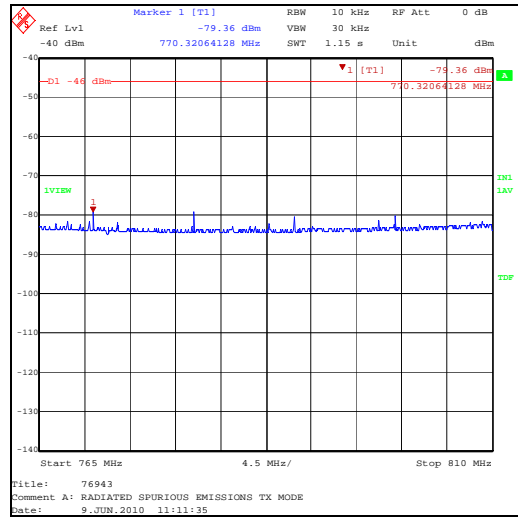
Note(s):

1. No emissions were detected were detected within 20 dB of the limit in the bands 769 MHz to 775 MHz and 799 MHz to 805 MHz.

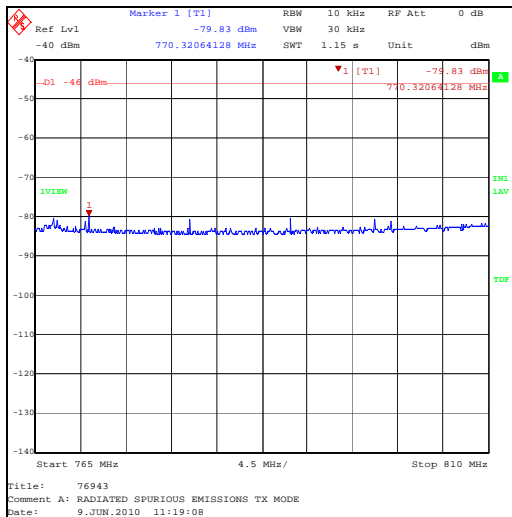
**Transmitter Radiated Emissions (769 MHz to 775 MHz and 799 MHz to 805 MHz bands)
(continued)**



QPSK



16QAM



64QAM

5.2.13. Transmitter Radiated Emissions (1559 MHz to 1610 MHz band)**Test Summary:**

FCC Part:	90.543(f)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053
Frequency Ranges:	1559 MHz to 1610 MHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	28

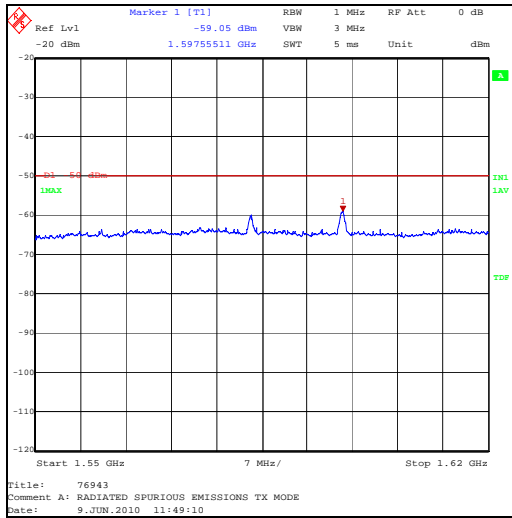
Results:

Modulation	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
QPSK	1597.555	-59.1	-50.0	9.1	Complied
16QAM	1597.555	-58.9	-50.0	8.9	Complied
64QAM	1597.555	-60.4	-50.0	10.4	Complied

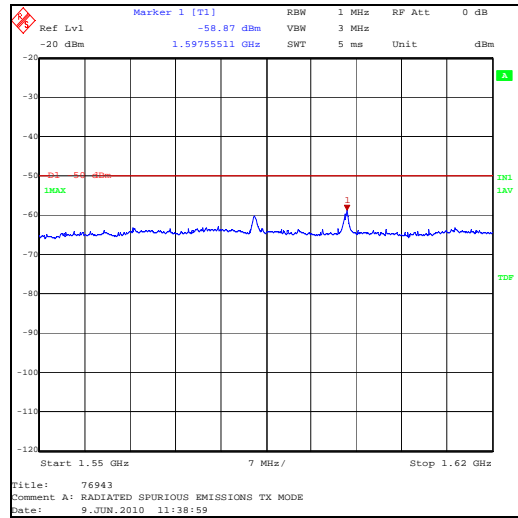
Note(s):

1. -80 dBW/MHz \equiv -50 dBm in a 1 MHz measurement bandwidth

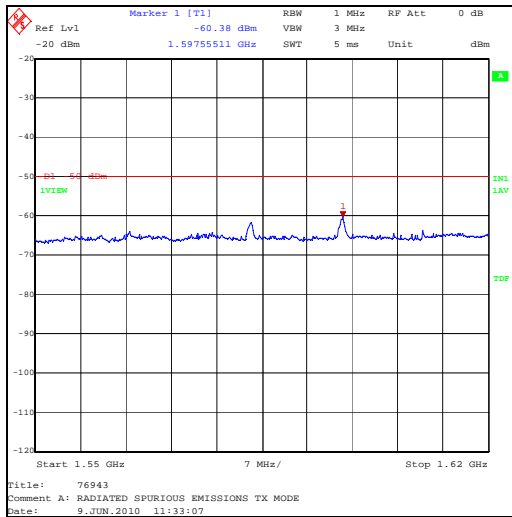
Transmitter Radiated Emissions (1559 MHz to 1610 MHz band) (continued)



QPSK



16QAM



64QAM

6. 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
Conducted Carrier Output Power	Not applicable	95%	±0.27 dB
Occupied Bandwidth	Not applicable	95%	±0.92 ppm
Conducted Spurious Emissions	9 kHz to 10 GHz	95%	±2.64 dB
Frequency Stability	Not applicable	95%	±0.92 ppm
Radiated Spurious Emissions	30 GHz to 10 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A1392	Attenuator	Huber + Suhner	757456	6820.17.B	Calibrated before use	-
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	27 Nov 2010	12
A288	Antenna	Chase	CBL6111A	1589	16 Mar 2011	12
E0516	Environmental Chamber	TAS	LT1000	23880706	Calibrated before use	-
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2010	12
M122	Digital Voltmeter	Fluke	77	64910017	23 Jun 2010	12
M1068	Thermometer	Iso-Tech	RS55	93102884	01 Oct 2010	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	18 Mar 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	10 Jul 2010	12

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