

EMC Technologies (NZ) Ltd

Test Report No 70528.1

Report date: 29 June 2007

TEST REPORT

Trio DataCom O Series Radio Modem Module

tested for compliance with the

Code of Federal Regulations (CFR) 47

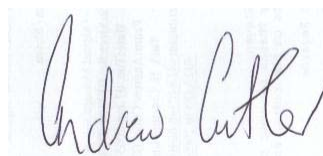
Part 15 – Radio Frequency Devices, Subpart C – Intentional Radiators

Section 15.247 – Operation in the band 902 – 928 MHz

for

Trio DataCom Pty Ltd

This Test Report is issued with the authority of:



Andrew Cutler - General Manager



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1. CLIENT INFORMATION

Company Name Trio DataCom Pty Ltd

Address 41 Aster Avenue
Carrum Downs

State Victoria 3201

Country Australia

Contact Mr David Rowntree

2. DESCRIPTION OF TEST SAMPLE

Brand Name Trio DataCom

Range O Series

Model Number OM900-00001-D00

Product Radio Modem Module

Manufacturer Trio DataCom Pty Ltd

Country of Origin Australia

Serial Number 44900

FCC ID NI8OM900

This RF module has the following options which are identified as follows:

OM900-00001-XY0 where

X = Software option which is unrelated to RF compliance

Y = 0 or H which relates to safety approvals and is not related to RF compliance

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3. RESULT SUMMARY AND COMPLIANCE STATEMENT

The **Trio DataCom O Series Radio Modem Module** complies with 47 CFR Part 15.

Testing was carried out in accordance with the test methods defined in 47 CFR Part 15 and in particular Sections, 15.111, 15.205, 15.207, 15.209 and 15.247.

<u>CLAUSE</u>	<u>TEST PERFORMED</u>	<u>RESULT</u>
15.111	Antenna power conduction for receivers	Complies
15.203	Antenna requirement	Complies
15.205	Operation in restricted bands	Complies
15.207	Conducted emissions	Complies
15.209	Radiated emissions	Complies
15.247:		
(a)(1)	Hopping channel separation	Complies
(a)(1)(i)	Channel occupancy / bandwidth	Complies
(b)(2)	Peak output power	Complies
(b)(4)	Antenna gain less than 6 dBi	Complies
(d)	Out of band emissions	Complies
(g)	Use of all available channels	Not applicable
(h)	Intelligent frequency hopping	Not applicable
(i)	Radio frequency hazards	Complies

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4. ARTICLES SUBMITTED

The following items were submitted:

- 902 – 928 MHz frequency hopping spread spectrum transceiver module
- Marathon Series BMY890K Yagi Antenna
- Marathon Series BGY890K Yagi Antenna
- Marathon Series BMO902J Omni Directional Antenna
- Gaurdian Series BGO902G Omni Directional Antenna

The transmitter module was mounted on the test board which has no external user controls.

In order to test the device the client supplied software that allowed the control of key parameters.

5. TEST SAMPLE DESCRIPTION

The sample tested is a frequency hopping spread spectrum transceiver with the following specifications:

Rated Transmitter Maximum Output Power

1 watt (30 dBm).

Power can be adjusted from 10 dBm up to 30 dBm in 0.1 dB steps

FCC frequency allocation

902 – 928 MHz

Operating frequency ranges

902 – 928 MHz

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Test frequencies

902.394 MHz, 915.0000 MHz, 927.606 MHz

Number of channels

67

Channel spacing

382 kHz

Hopping sequence

Pseudo random sequence.

Power Supply

This system is not sold with an AC power supply

Conducted measurements have been carried out using a representative 110 Vac to 5 Vdc and 3.3 Vdc power supply.

External Ports and Terminations

- Antenna 1 port (unique connector). A yagi or omni directional antenna was attached to this port.
- Antenna 2 antenna port (unique connector). This port was left unterminated.
- System port serial port. A laptop computer was attached to this port using a 20 cm length of data cable.
- Port A serial port. This port was not terminated.
- Port B serial port. This port was terminated with a 1.2 metre length of data cable and a laptop computer that was not powered.

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6. ATTESTATION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification with the following conditions:

The test sample was selected by the client.

The report relates only to the sample tested.

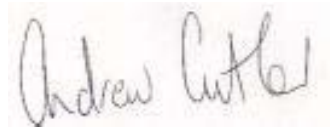
This report does not contain corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

In addition this equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations.

To the best of my knowledge, these tests were performed using measurement procedures that are consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards.

I further certify that the necessary measurements were made by EMC Technologies NZ Ltd, 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand.



Andrew Cutler
General Manager
EMC Technologies NZ Ltd

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7. RESULTS

Section 15.111(a) – Antenna power conduction limits for receivers

In accordance with Section 15.109 (f) receiver power conduction measurements have been made at the antenna terminals.

When the device was transmitting on a fixed frequency the receiver local oscillator was observed to be hopping approximately 204 MHz above the transmit frequency.

A band of emissions were observed with the highest emission being recorded using a spectrum analyser operating in peak hold mode.

Channel	Emission (MHz)	Emission level (dBm)	Limit (dBm)
0	1106.433	-59.5	-57.0
33	1119.038	-59.8	-57.0
66	1131.645	-59.9	-57.0
66	5658.208	-74.7	-57.0
66	7921.488	-75.3	-57.0

All other emissions observed up to 11 GHz were less than -77.0 dBm.

In accordance with Section 15.31(o) only levels within 20 dB of the limit have been reported.

In the range 30 – 11000 MHz the power at the antenna terminal shall not exceed 2 nW (-57 dBm).

Result: Complies.

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Section 15.203 – Antenna requirement

This module is to be used with a range of yagi and omni directional antennas details of which are included in this report.

These antennas are connected to the module using a unique connector (MMCX connectors).

Section 15.205 – Restricted bands of operation

Refer to measurements made with reference to Section 15.247 (d).

Section 15.207 – Conducted emissions

Measurements have been carried out using a representative power supply.

Conducted emissions testing was carried out over the frequency range of 150 kHz to 30 MHz using a 50 ohms / 50 microhenry artificial mains network.

Testing was carried out at the laboratory's MacKelvie Street screened room.

The device was placed on top of the test table, which is 1m x 1.5m, 80cm above the screened room floor which acts as the horizontal ground plane.

In addition the device was positioned 40cm away from the screened room wall which acts as the vertical ground plane.

The artificial mains network was bonded to the screened room floor. At all times the device was kept more than 80cm from the artificial mains network.

Quasi peak measurements were made with a receiver bandwidth of 9 kHz with a combined plot being produced showing the results of testing on the phase and neutral AC supply lines.

Measurement uncertainty with a confidence interval of 95% is:

- Mains terminal tests (0.15 - 30 MHz) ± 2.2 dB

Result: Complies with a 17.9 dB margin at 0.285 MHz (Average)

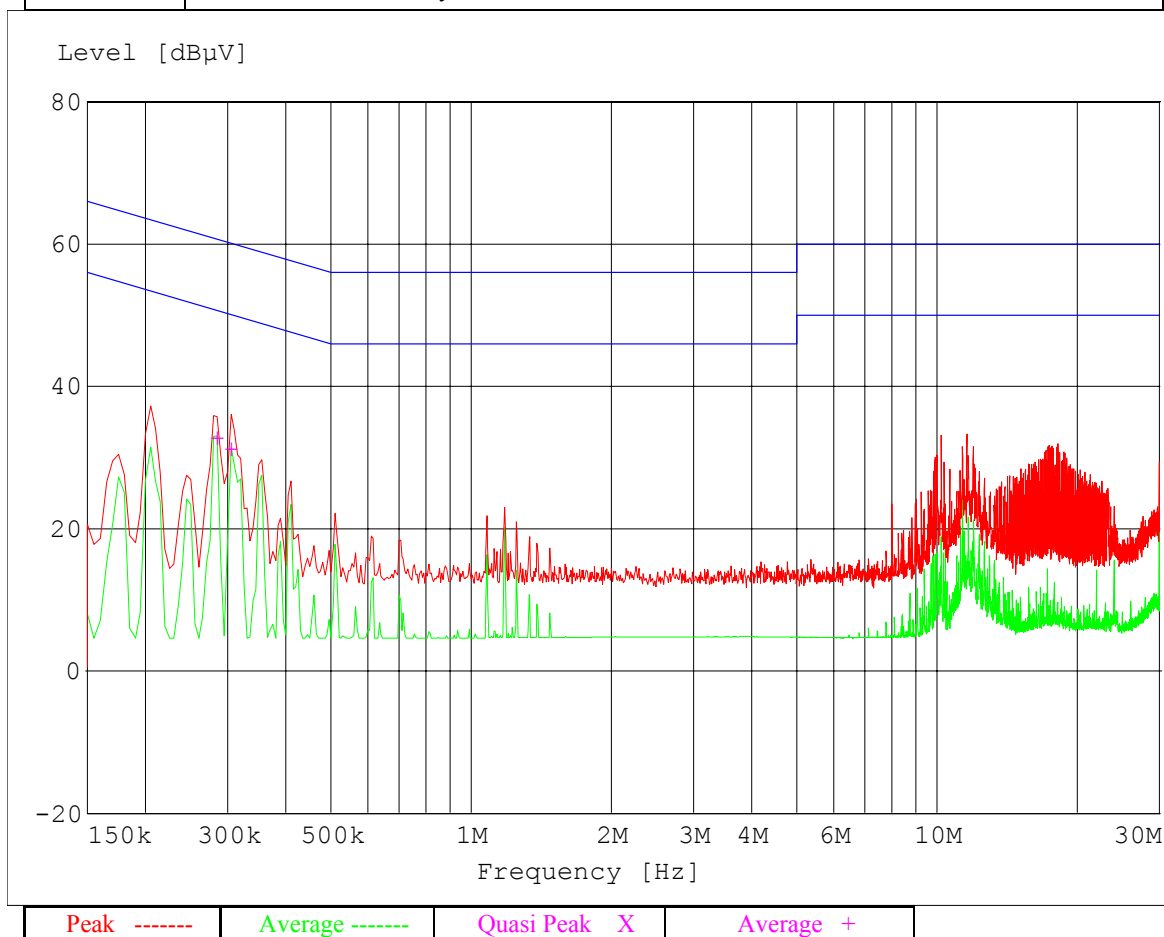
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Conducted Emissions Test

Comments: Device tested when powered at 3.3 and 5.0 Vdc using a representative 110 Vac power supply when operating in frequency hopping mode sending data at 256 kB/sec with a power output of 30 dBm into a dummy load.



Quasi-Peak Measurements

Frequency MHz	Level dBμV	Limit dBμV	Margin dB	Phase	Rechecks dBμV

Average Measurements

Frequency MHz	Level dBμV	Limit dBμV	Margin dB	Phase	Rechecks dBμV
0.285000	32.70	50.6	17.9	L1	
0.305000	31.20	50.1	18.9	L1	

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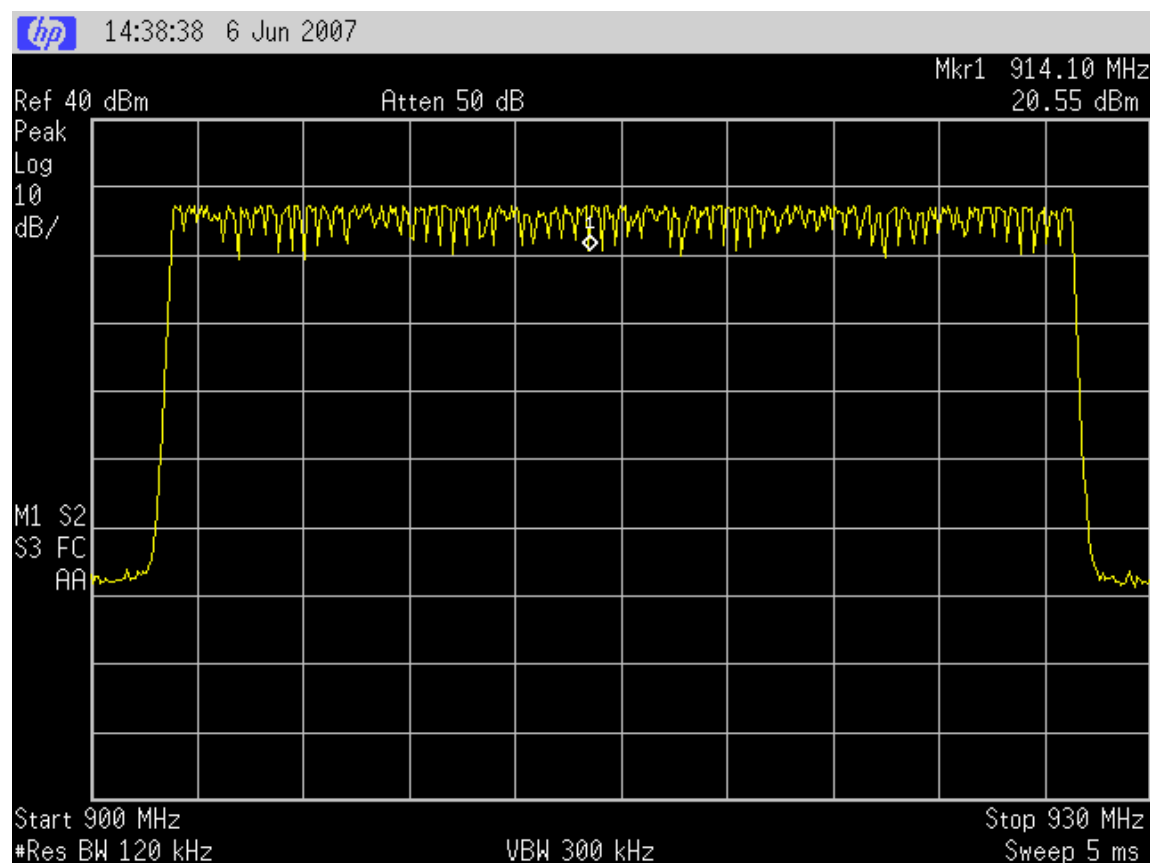
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Section 15.209 – Radiated emissions

In accordance with section 15.247(c) attenuation below the general limits specified in Section 15.209(a) except those emissions that fall within the restricted bands defined in Section 15.205(a).

Section 15.247 (a) (1) (i) - Channel occupancy / bandwidth

This device has been configured to operate using 67 channels spaced at 382 kHz.



67 channels can be observed above between 902.1 MHz and 927.9 MHz at the -20 dBc points.

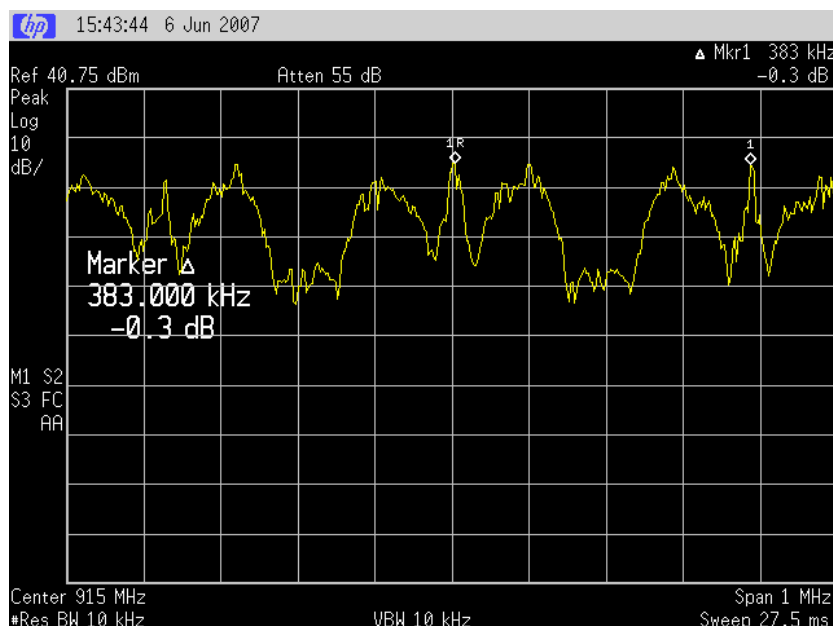
If the 20 dB bandwidth exceeds 250 kHz at least 25 hopping channels shall be used.

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The device is required to operate with channel frequencies separated by 25 kHz or the 20 dB bandwidth of the hopping channel which ever is greater.



The client has stated that the channels have a 382 kHz separation which has been measured to be 383 kHz.

Initial measurements were made on channel 66 to determine the worst case data rate which appears to be 256 kB/sec however the other data rates were approximately the same.

Measurements were made of the 20 dB bandwidth to ensure that it was not greater than the channel separation and the bandwidth does not exceed 500 kHz.

The results are as follows when 256 kB/sec was used:

Frequency	20 dB Bandwidth
902.375 MHz	370 kHz
915.000 MHz	368 kHz
927.625 MHz	375 kHz

Plots of these measurements are detailed below.

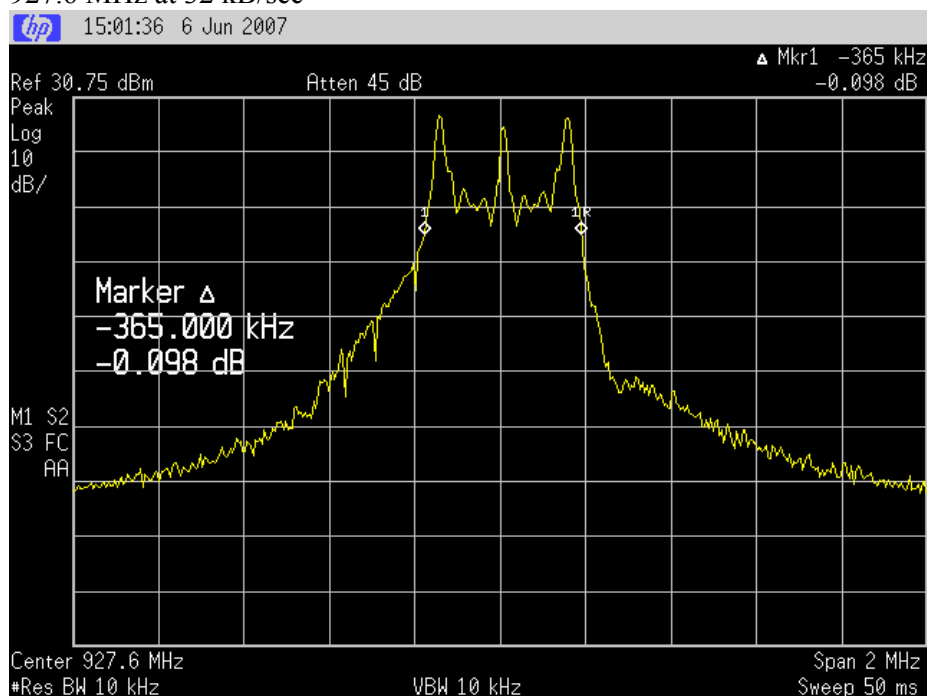
All data rates have 20 dB bandwidths less than the channel separation.

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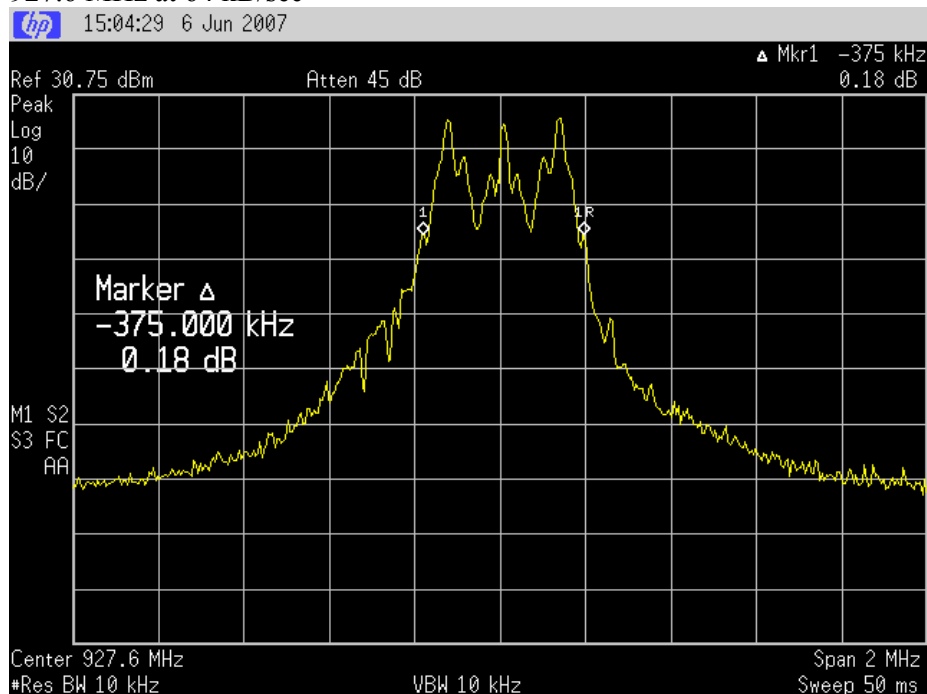
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927.6 MHz at 32 kB/sec



927.6 MHz at 64 kB/sec



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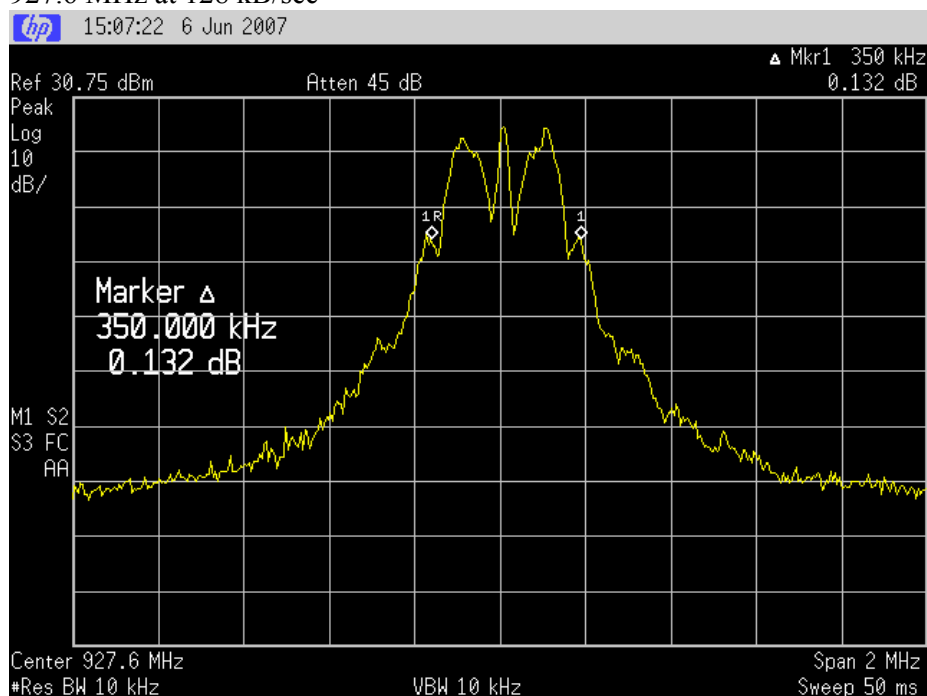
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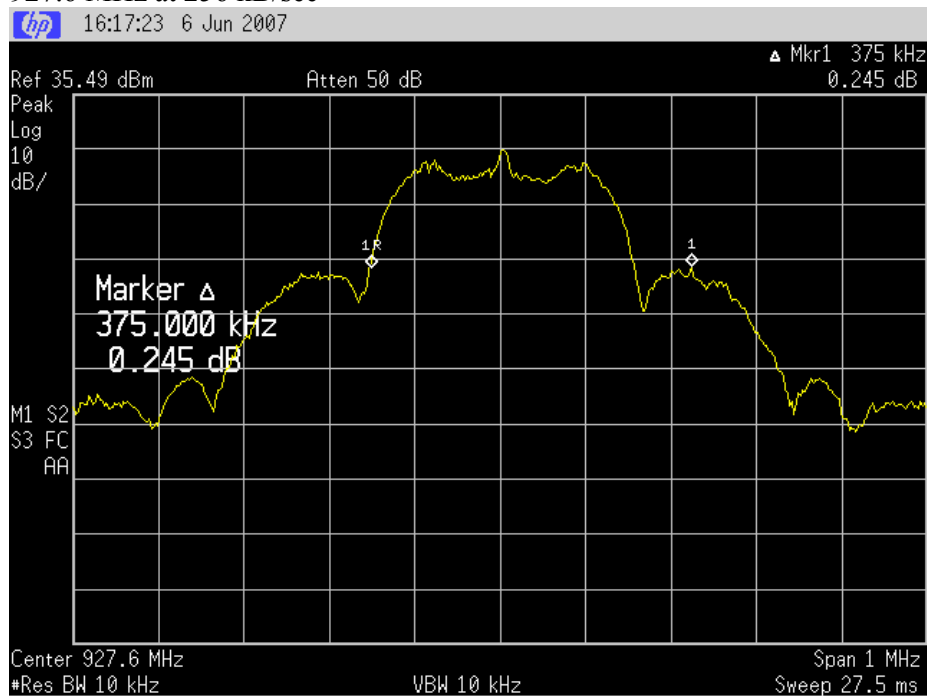
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927.6 MHz at 128 kB/sec



927.6 MHz at 256 kB/sec



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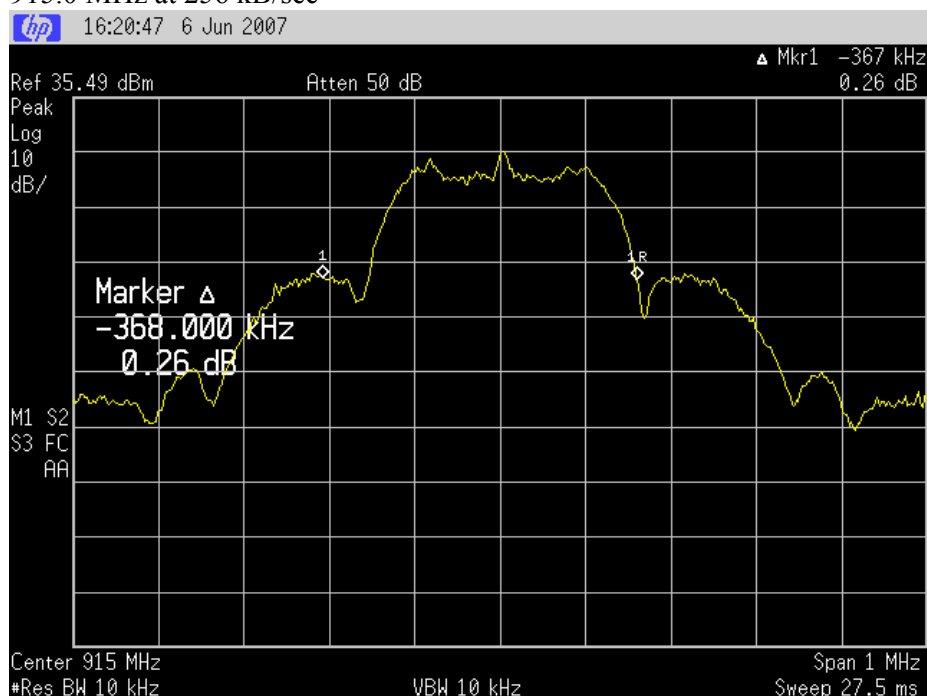
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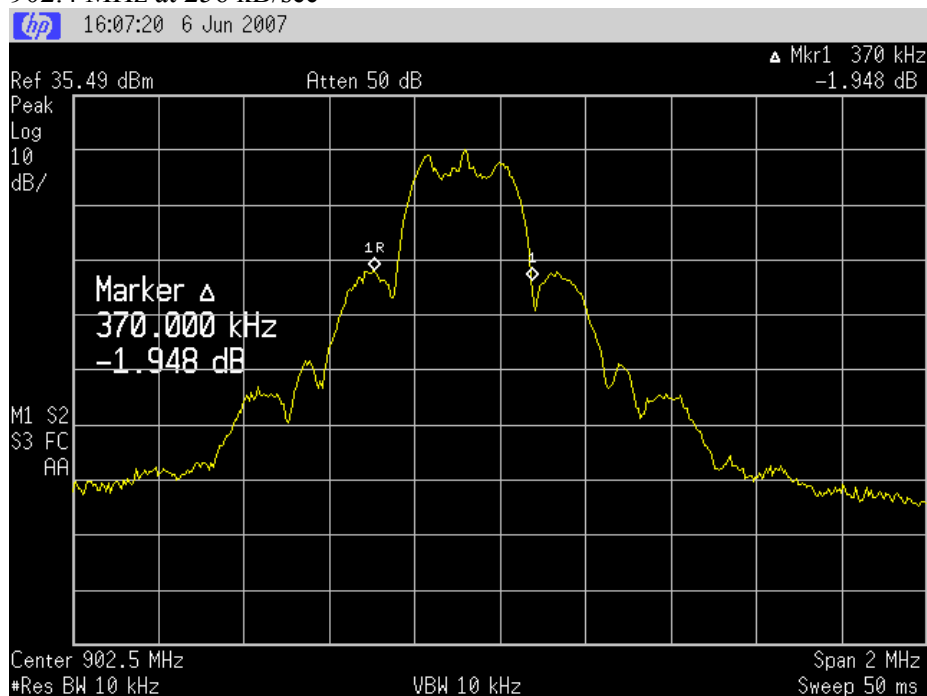
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915.0 MHz at 256 kB/sec



902.4 MHz at 256 kB/sec



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As the 20 dB bandwidth is greater than 250 kHz the average time of occupancy shall not be greater than 0.4 seconds in any 10 second period.

The supplied software allowed the hop interval to be varied.

All measurements were carried out using a spectrum analyser with a 0 Hz span when tuned to 915 MHz (channel 33).

The average number of transmissions on channel 33 were recorded after observing at least six 10 second sweeps.

The worst case channel dwell time has been recorded after an observation period of approximately 2 minutes.

Hop interval (mS)	Transmissions in 10 seconds	Channel Dwell (mS)	Dwell Time (mS)	Limit (mS)
25	6	21.9	131.4	400.0
30	5	26.5	132.5	400.0
50	3	45.5	126.5	400.0
100	2	94.0	188.0	400.0
250	1	247.5	247.5	400.0

Result: Complies

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Section 15.247 (b) (2)– Peak output power

Measurements were carried out at the RF output terminals of the transmitter using a spectrum analyser.

Measurements were carried out using a span of 10 MHz and a resolution bandwidth of 1 MHz.

Measurements were made using the 110Vac representative power supply where the 110 Vac input voltage was varied between –15% and +15%.

Frequency	RF power output (dBm)		
	-15%	Nominal	+15%
902.394	29.99	29.99	29.99
915.000	29.79	29.79	29.79
927.606	29.61	29.61	29.61

The nominal power of this device is +30 dBm.

Limits:

The maximum peak output power for frequency hopping systems operating in the 902 – 928 MHz band shall not exceed 1 watt (+30 dBm) for systems employing at least 50 channels.

Result: Complies

Measurement Uncertainty: ± 0.5 dB

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Section 15.247 (b)(4) Radiated transmitter power

Frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)	Tx Power (dBm)
BGY890K						
902.394	128.7	33.5	36.0	Horizontal	2.5	23.8
915.000	129.2	34.0	36.0	Horizontal	2.0	23.8
927.606	128.3	33.1	36.0	Horizontal	2.9	23.8
BMV890K						
902.394	129.2	34.0	36.0	Horizontal	2.0	23.8
915.000	129.2	34.0	36.0	Horizontal	2.0	23.8
927.606	129.1	33.9	36.0	Horizontal	2.1	23.8
BGO902G						
902.394	129.0	33.8	36.0	Horizontal	2.2	27.8
915.000	129.2	34.0	36.0	Horizontal	2.0	27.8
927.606	129.3	34.1	36.0	Horizontal	1.9	27.8
BMO902J						
902.394	127.6	32.4	36.0	Horizontal	3.6	24.8
915.000	126.8	31.6	36.0	Horizontal	4.4	24.8
927.606	127.1	31.9	36.0	Horizontal	4.1	24.8

Device was tested on an open area test site at a distance of 3 metres.

Testing was carried out using a resolution bandwidth of 1 MHz while the device was being modulated at a rate of 256 kB/sec while transmitting data.

The transmitter output power was reduced in order that the radiated power would not exceed +36 dBm with any of the above mentioned antennas attached

Limit:

The conducted power shall not exceed 1 watt (+30 dBm) and the antenna system gain shall not exceed 6 dBi. Therefore the radiated power shall not exceed +36 dBm EIRP.

Result: Complies

Measurement Uncertainty: ± 4.1 dB

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Section 15.247 (b) (5) – Radio Frequency Hazard Information

As per Section 15.247 (b) (4) spread spectrum transmitters operating in the 902 – 928 MHz band are required to be operated in a manner that ensures that the public is not exposed to RF energy levels in accordance with CFR 47, Section 1.1307(b)(1).

In accordance with this section, and also Section 2.1091, this device has been defined as a mobile device whereby a distance of 20 cm can normally be maintained between the user and the device.

In accordance with Section 1.1310 the Maximum Permissible Exposure (MPE) limits for the General Population / Uncontrolled Exposure of f/1500 have been applied.

The maximum distance from the antenna at which the MPE is met or exceeded is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain and separation distance in metres:

$$E, \text{ V/m} = (\sqrt{30 * P * G}) / d$$

$$\text{Power density, mW/m}^2 = E^2 / 3770$$

$$E \text{ for MPE: } (902/1500) = E^2 / 3770$$

$$E = \sqrt{(902/1500) * 3770}$$

$$E = \underline{47.6 \text{ V/m}}$$

The maximum radiated power measured was +34.1 dBm or 2.6 watts.

Therefore:

$$E = \sqrt{30 * P * G} / d$$

$$d = \sqrt{30 * P * G} / E$$

$$d = \sqrt{30 * 2.6} / 47.6$$

$$d = \underline{0.19 \text{ m or } 19 \text{ cm}}$$

In order to meet the MPE requirement for mobile devices a minimum safe distance greater than 20 cm will be required.

Result: Complies

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Section 15.247 (c) – Out of band emissions

Measurements were made at the antenna port with a resolution bandwidth of 100 kHz.

Frequency: 902.394 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
1804.600	-38.7	+10.0
2706.950	-43.4	+10.0
3609.300	-59.4	+10.0
4511.530	-58.1	+10.0
5414.850	-52.8	+10.0
6316.100	-63.6	+10.0
7218.530	-64.0	+10.0
8121.600	-58.4	+10.0
9024.800	-76.9	+10.0

Frequency: 915.000 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
1830.000	-39.9	+10.0
2745.000	-43.4	+10.0
3660.000	-62.3	+10.0
4575.000	-59.9	+10.0
5490.000	-49.3	+10.0
6405.000	-62.2	+10.0
7320.000	-67.5	+10.0
8235.000	-62.7	+10.0
9150.000	-66.2	+10.0

Frequency: 927.606 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
1855.212	-37.1	+10.0
2782.818	-42.3	+10.0
3710.424	-51.3	+10.0
4638.030	-54.6	+10.0
5565.636	-42.2	+10.0
6493.242	-54.0	+10.0
7420.848	-58.5	+10.0
8348.454	-53.7	+10.0
9276.060	-66.2	+10.0

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Limit:

In any 100 kHz bandwidth outside the frequency band of operation, the RF power produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Result: Complies

Measurement Uncertainty: ± 3.3 dB

Band edge measurements:

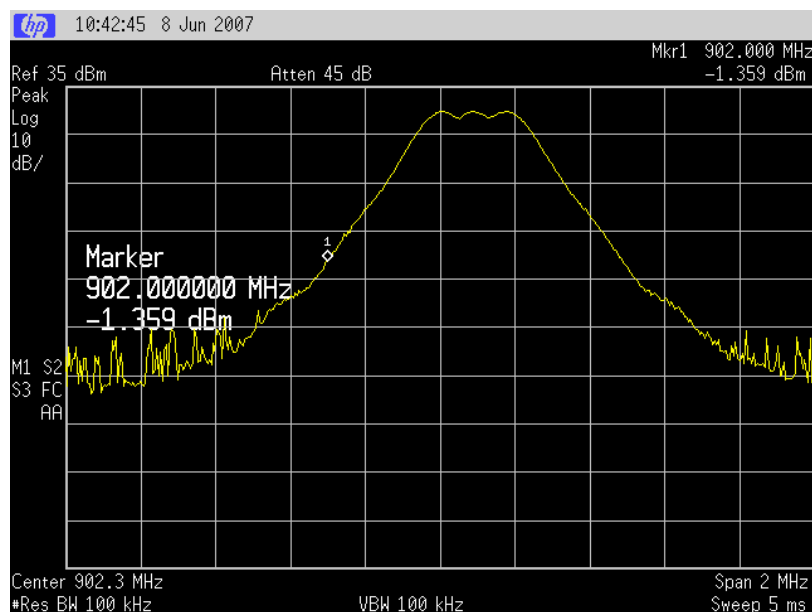
At the band edges of 902 MHz and 928 MHz all emissions are required to be attenuated by more than 20 dB relative to the highest emission level observed in the band of operation.

The rated power of this device is +30 dBm with highest measurement being +29.8 dBm which is approximately +30 dBm.

Therefore at the band edge all levels will need to be less than +10 dBm when measured with a 100 kHz resolution bandwidth.

Results

Frequency (MHz)	Level (dBm)	Limit (dBm)
902.000	-1.359	+10.0
928.000	-2.257	+10.0



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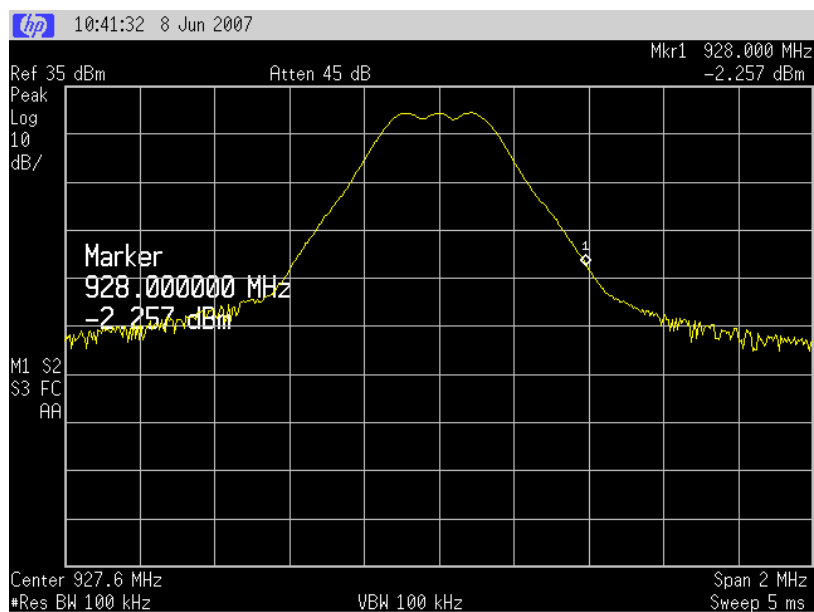
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Result: Complies

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Restricted band radiated emission measurements

A number of out of band emissions have been shown to fall within the restricted bands of operation as defined in section 15.205(a).

Radiated emission measurements were carried out with the limits as per section 15.209 applied when these emissions fell within the restricted bands.

Testing was carried out at EMC Technologies NZ Ltd Open Area Test Site, which is located at Driving Creek, Orere Point, Auckland. Details of this site have been filed with the Commission, Registration Number: 90838, which was last updated in Jan 2007..

The device was placed on the test table top which was a total of 0.8 m above the test site ground plane.

Measurements of the radiated field were made with the antenna located at a 3 m horizontal distance from the boundary of the device under test.

Measurements below 1000 MHz were made using an Quasi Peak Detector with a bandwidth of 120 kHz.

Measurements above 1000 MHz were made using an average detector with a bandwidth of 1.0 MHz and also a peak detector with a bandwidth of 1.0 MHz.

When an emission is located, it is positively identified and its maximum level is found by rotating the automated turntable, and by varying the antenna height with an automated antenna tower. The emission is measured in both vertical and horizontal antenna polarisations.

The emission level is determined in field strength by taking the following into consideration:

Level (dBµV/m) = Receiver Reading (dBµV) + Antenna Factor (dB) + Coax Loss (dB)

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General emissions carried out using a BGY890K antenna.

A limit of 109 dBuV/m has been applied based upon an average level of 129 dBuV/m.

Frequency MHz	Vertical dBuV/m	Horizontal dBuV/m	Limit dBuV/m	Margin dB	Antenna Polarity
Restricted Bands					
40 MHz Emissions					
120.000		23.6	43.5	19.9	Horizontal
160.000	29.0	30.0	43.5	13.5	Horizontal
200.000	28.1	29.3	43.5	14.2	Horizontal
240.000	35.3	43.6	46.0	2.4	Horizontal
280.000	34.5	35.1	46.0	10.9	Horizontal
400.000	34.8	42.6	46.0	3.4	Horizontal
Unrestricted Bands					
103 MHz Emissions					
103.218	28.8	26.2	109.0	80.2	Vertical
206.433	33.4	38.2	109.0	70.8	Horizontal
309.653	30.3	38.8	109.0	70.2	Horizontal
412.868	39.6	38.9	109.0	69.4	Vertical
722.499	37.5	42.0	109.0	67.0	Horizontal
40 MHz Emissions					
42.500	33.3	20.6	109.0	75.7	Vertical
45.000	25.0	22.3	109.0	84.0	Vertical
80.000	27.6	35.6	109.0	73.4	Horizontal
193.523	32.1	29.7	109.0	76.9	Vertical
320.000	41.0	51.1	109.0	57.9	Horizontal
360.000	36.5	50.1	109.0	58.9	Horizontal
440.000	32.5	38.1	109.0	70.9	Horizontal
480.000	36.1		109.0	72.9	Vertical
520.000	34.5		109.0	74.5	Vertical
560.000	41.0	44.9	109.0	64.1	Horizontal
600.000	33.4	36.9	109.0	72.1	Horizontal
640.000	44.6	47.5	109.0	61.5	Horizontal
680.000	29.5		109.0	79.5	Vertical
720.000	39.0	36.7	109.0	70.0	Vertical
760.000	25.3	31.0	109.0	78.0	Horizontal
800.000	37.6	43.1	109.0	65.9	Horizontal
840.000	32.3	37.2	109.0	71.8	Horizontal
880.000	32.1	40.4	109.0	68.6	Horizontal

EMC Technologies (NZ) Ltd

Test Report No 70528.1

Report date: 29 June 2007

BGY890K Yagi Antenna

Frequency MHz	Vertical dBuV/m	Horizontal dBuV/m	Limit dBuV/m	Margin dB	Antenna Polarity	Detector
902 MHz Tx						
1804.600	> 40.0	47.3	108.0	607	Horizontal	Average
1804.600	> 50.0	62.1	108.0	45.9	Horizontal	Peak
2706.900	> 40.0	46.7	54.0	7.3	Horizontal	Average
2706.900	> 50.0	60.5	74.0	13.5	Horizontal	Peak
915 MHz Tx						
1830.000	> 40.0	46.3	109.0	627	Horizontal	Average
1830.000	> 50.0	64.0	109.0	45	Horizontal	Peak
2745.000	> 40.0	46.9	54.0	7.1	Horizontal	Average
2745.000	> 50.0	59.1	74.0	14.9	Horizontal	Peak
927 MHz Tx						
1804.600	> 40.0	44.6	108.0	63.4	Horizontal	Average
1804.600	> 50.0	62.3	108.0	45.7	Horizontal	Peak
2706.900	> 40.0	44.5	54.0	9.5	Horizontal	Average
2706.900	> 50.0	57.9	74.0	16.1	Horizontal	Peak

Measurements were attempted up to 10 x Fc on each operating frequency with no emissions being detected with 20 dB of the restricted frequency limit or the -20 dBc limit at each of these frequencies when this antenna was utilised.

EMC Technologies (NZ) Ltd

Test Report No 70528.1

Report date: 29 June 2007

BM Y890K Yagi Antenna

Frequency MHz	Vertical dBuV/m	Horizontal dBuV/m	Limit dBuV/m	Margin dB	Antenna Polarity	Detector
902 MHz Tx						
1804.600	> 40.0	46.2	109.0	62.8	Horizontal	Average
1804.600	> 50.0	62.4	109.0	46.6	Horizontal	Peak
2706.900	> 40.0	45.3	54.0	8.7	Horizontal	Average
2706.900	> 50.0	57.2	74.0	16.8	Horizontal	Peak
915 MHz Tx						
1830.000	> 40.0	46.9	109.0	62.1	Horizontal	Average
1830.000	> 50.0	64.5	109.0	44.5	Horizontal	Peak
2745.000	> 40.0	47.0	54.0	7.0	Horizontal	Average
2745.000	> 50.0	59.5	74.0	14.5	Horizontal	Peak
927 MHz Tx						
1804.600	> 40.0	45.3	109.0	63.7	Horizontal	Average
1804.600	> 50.0	62.2	109.0	46.8	Horizontal	Peak
2706.900	> 40.0	46.9	54.0	7.1	Horizontal	Average
2706.900	> 50.0	58.2	74.0	15.8	Horizontal	Peak

Measurements were attempted up to 10 x Fc on each operating frequency with no emissions being detected with 20 dB of the restricted frequency limit or the -20 dBc limit at each of these frequencies when this antenna was utilised.

EMC Technologies (NZ) Ltd

Test Report No **70528.1**

Report date: 29 June 2007

BGO902G Omni Directional Antenna

Frequency MHz	Vertical dBuV/m	Horizontal dBuV/m	Limit dBuV/m	Margin dB	Antenna Polarity	Detector
902 MHz Tx						
1804.600	> 40.0	44.9	109.0	64.1	Horizontal	Average
1804.600	> 50.0	62.4	109.0	46.6	Horizontal	Peak
2706.900	> 40.0	44.9	54.0	9.1	Horizontal	Average
2706.900	> 50.0	56.9	74.0	17.1	Horizontal	Peak
915 MHz Tx						
1830.000	> 40.0	44.5	109.0	64.5	Horizontal	Average
1830.000	> 50.0	61.9	109.0	47.1	Horizontal	Peak
2745.000	> 40.0	44.9	54.0	9.1	Horizontal	Average
2745.000	> 50.0	61.4	74.0	12.6	Horizontal	Peak
927 MHz Tx						
1804.600	> 40.0	46.6	109.0	62.4	Horizontal	Average
1804.600	> 50.0	64.0	109.0	45.0	Horizontal	Peak
2706.900	> 40.0	47.3	54.0	6.7	Horizontal	Average
2706.900	> 50.0	61.6	74.0	12.4	Horizontal	Peak

Measurements were attempted up to 10 x Fc on each operating frequency with no emissions being detected with 20 dB of the restricted frequency limit or the -20 dBc limit at each of these frequencies when this antenna was utilised.

EMC Technologies (NZ) Ltd

Test Report No 70528.1

Report date: 29 June 2007

BMO902J Omni Directional Antenna

Frequency MHz	Vertical dBuV/m	Horizontal dBuV/m	Limit dBuV/m	Margin dB	Antenna Polarity	Detector
902 MHz Tx						
1804.600	> 40.0	45.1	107.0	61.9	Horizontal	Average
1804.600	> 50.0	62.4	107.0	44.6	Horizontal	Peak
2706.900	> 40.0	44.9	54.0	9.1	Horizontal	Average
2706.900	> 50.0	65.5	74.0	8.5	Horizontal	Peak
915 MHz Tx						
1830.000	> 40.0	44.3	107.0	62.7	Horizontal	Average
1830.000	> 50.0	61.9	107.0	45.1	Horizontal	Peak
2745.000	> 40.0	44.3	54.0	9.7	Horizontal	Average
2745.000	> 50.0	61.4	74.0	12.6	Horizontal	Peak
927 MHz Tx						
1804.600	> 40.0	45.6	107.0	61.4	Horizontal	Average
1804.600	> 50.0	64.0	107.0	43.0	Horizontal	Peak
2706.900	> 40.0	45.9	54.0	8.1	Horizontal	Average
2706.900	> 50.0	61.6	74.0	12.4	Horizontal	Peak

Measurements were attempted up to 10 x Fc on each operating frequency with no emissions being detected within 20 dB of the restricted frequency limit or the -20 dBc limit at each of these frequencies when this antenna was utilised.

Where an emission falls outside of the restricted bands a limit being -20 dB below the highest fundamental emission level has been applied (between 126.8 to 129.3 dBuV/m).

The general limits as per section 15.209(a) have been applied to those emissions falling within the restricted bands.

Result: Complies

Measurement uncertainty with a confidence interval of 95% is ± 4.1 dB over the range 30 – 10000 MHz.

EMC Technologies (NZ) Ltd

Test Report No **70528.1**

Report date: 29 June 2007

8. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial #	Asset
Aerial Controller	EMCO	1090	9112-1062	RFS 3710
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612
Log Periodic Antenna	Schwarzbeck	VUSLP 9111	9111-228	3785
Horn Antenna	EMCO	3115	9511-4629	E1526
VHF Dipole Antenna	Schwarzbeck	VHA 9103	-	RFS 3603
Horn Antenna	Electrometrics	RGA-60	6234	E1494
Coax Cable	Sucoflex	104PA	2736/4PA	-
Measurement Receiver	Rohde & Schwarz	ESCS 30	847124/020	E1595
Spectrum Analyzer	Hewlett Packard	E7405A	US39150142	3776
Microwave Pre Amplifier	Hewlett Packard	8349B	2644A01659	-

9. ACCREDITATIONS

Testing was carried out at EMC Technologies NZ Ltd Open Area Test Site, which is located at Driving Creek, Orere Point, Auckland. Details of this site have been filed with the Commission, Registration Number: 90838, which was last updated in January 2007.

The tests were carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025: 2005.

All measurement equipment has been calibrated in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025: 2005.

EMC Technologies (NZ) Ltd

Test Report No 70528.1

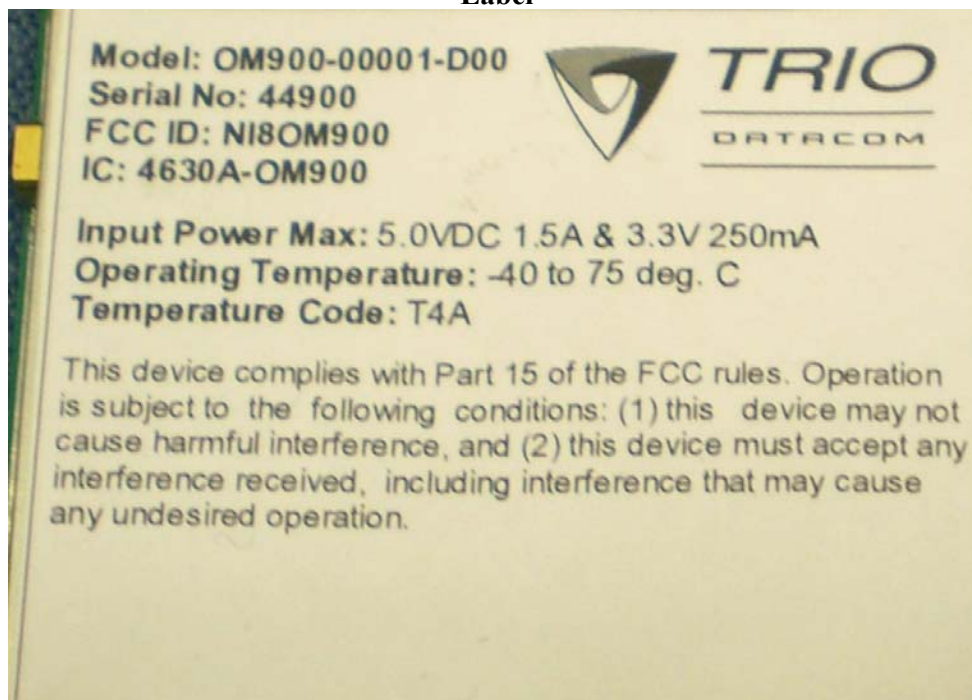
Report date: 29 June 2007

10. PHOTOGRAPH (S)

Internal / External views



Label

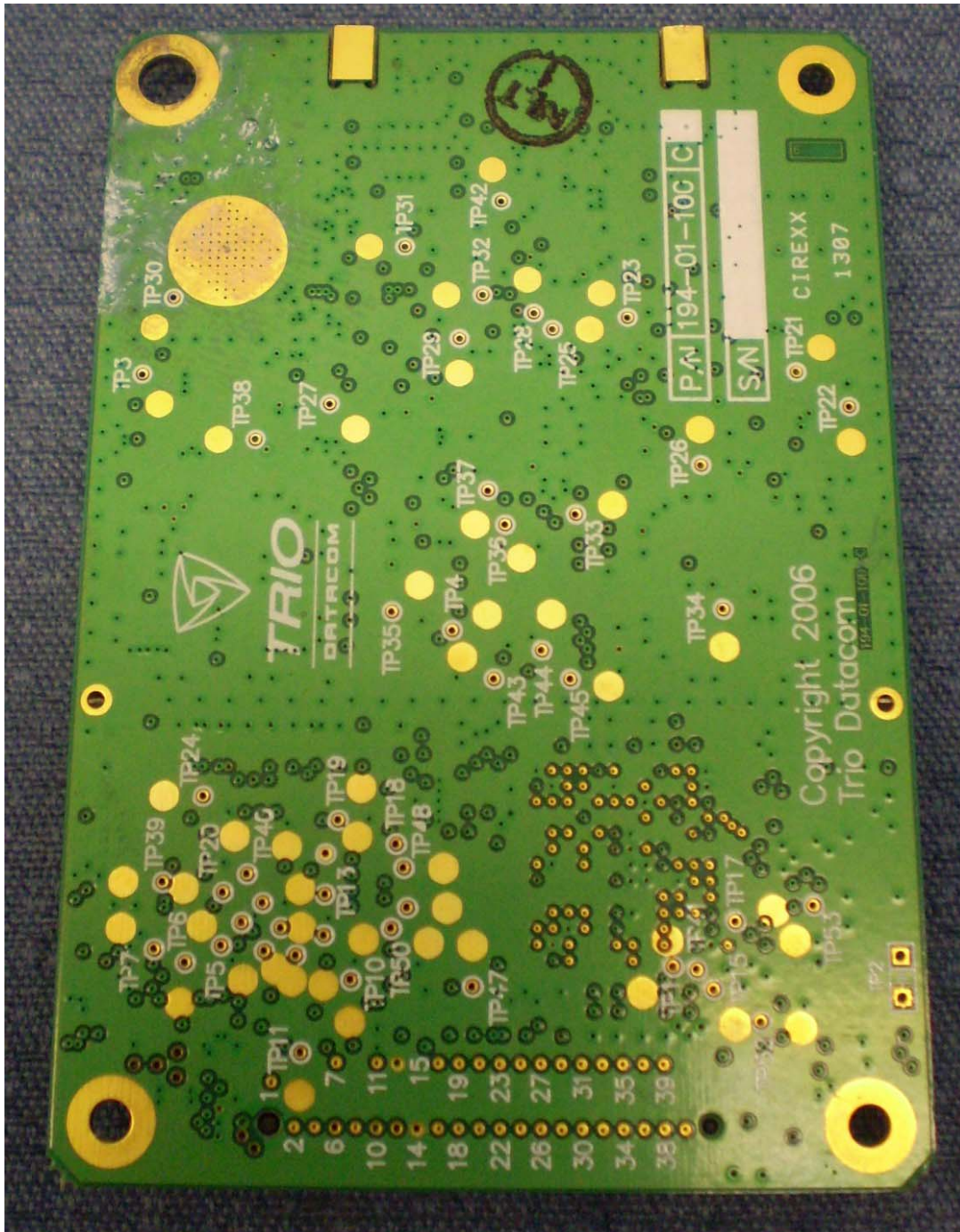


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Main Boards



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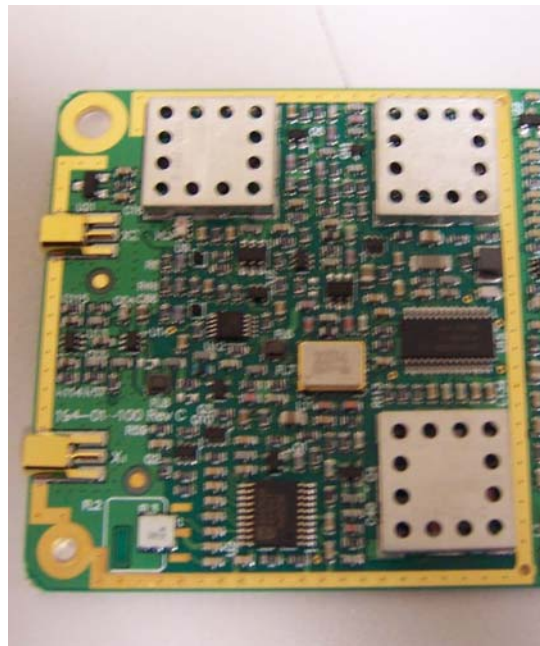
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RF Module



RF Module underneath the shield



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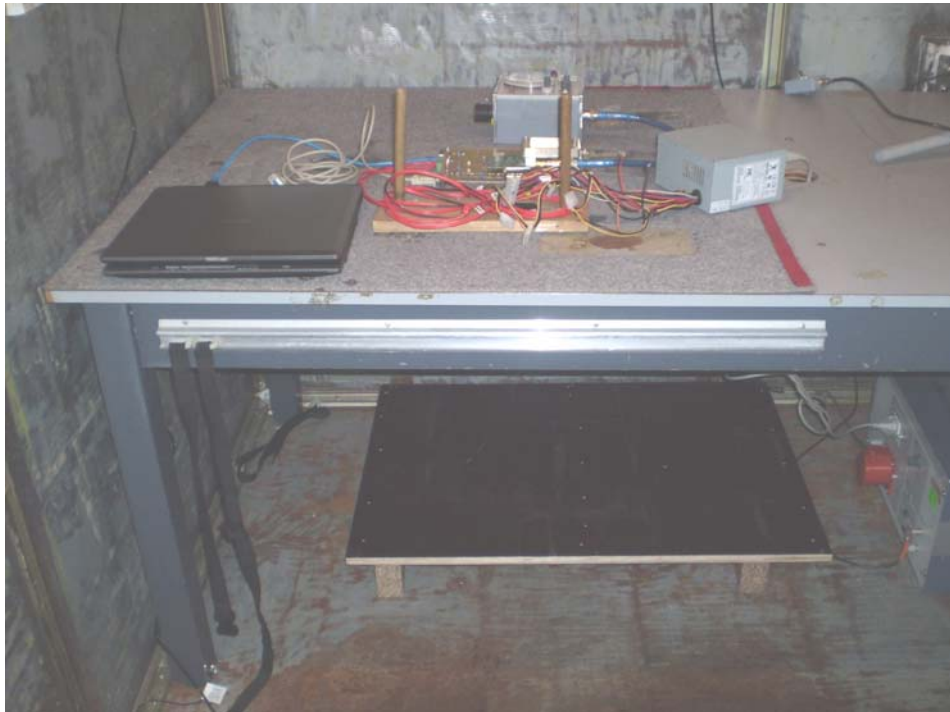
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Conducted emissions test set up:



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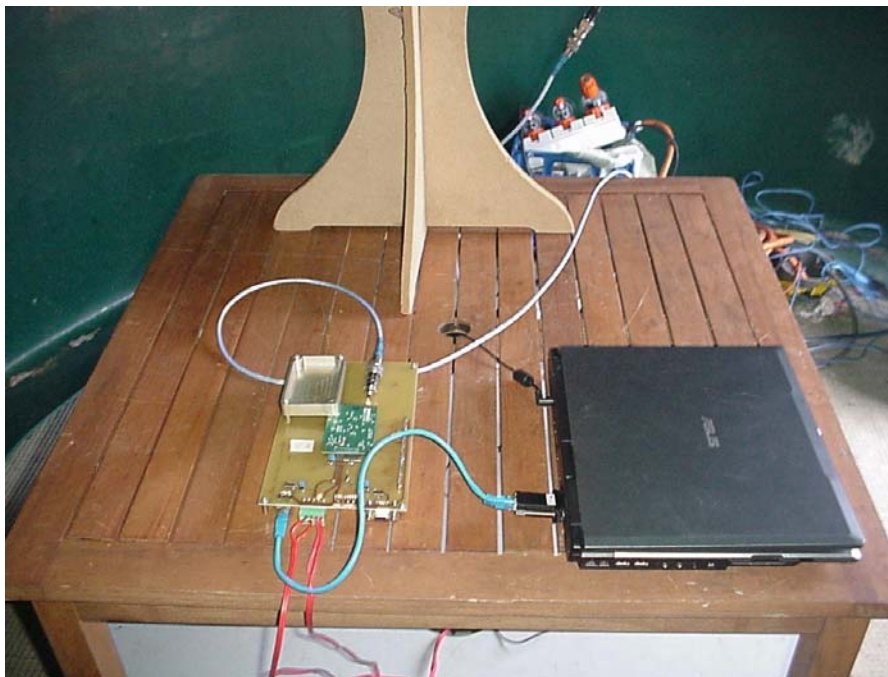
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Radiated emissions test set up

General Test Set Up



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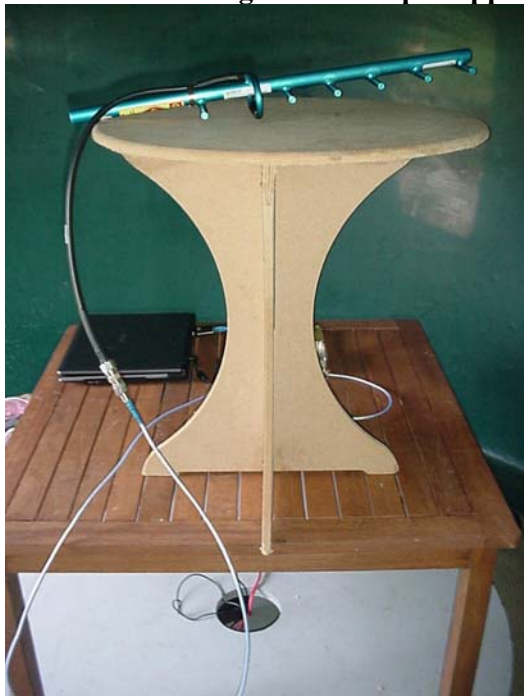
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Yagi Test Set Up – Applicable to both antennas tested



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Test Report No 70528.1

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BMO902J Omni Directional Antenna Test Set Up



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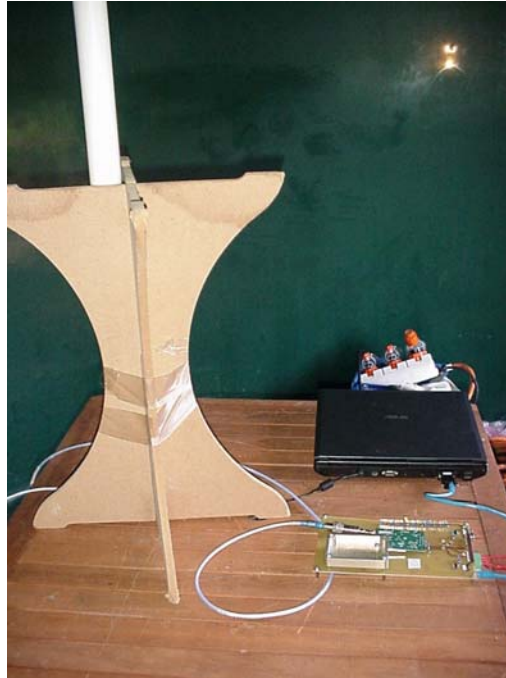
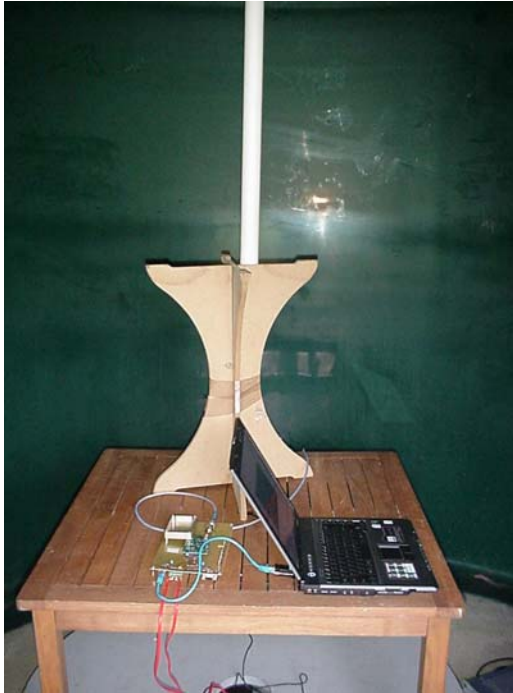
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BGO902G Omni Directional Antenna Test Set Up



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