TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console

To: FCC Part 24: 2004 (Subpart E)

Test Report Serial No:
RFI\MPTE1\RP46498JD06A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Steven Wong 	**Checked By: Tony Henriques** 
Report Copy No: PDF01	
Issue Date: 16 August 2005	**Test Dates: 15 March 2005 to 16 June 2005**

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.
This report may be copied in full. The results in this report apply only to the sample(s) tested.

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

This page has been left intentionally blank.

Table of Contents

1. Client Information

Company Name:	Gizmondo Europe Limited
Address:	1 Meadow Gate Avenue Farnborough Business Park Farnborough Hampshire GU14 6FG
Contact Name:	Mr John Mack

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)

Model Name:	Gizmondo
Model Number:	GZ020
IMEI Number:	350390011249597
FCC ID Number:	THGGIZMONDO
Serial Number:	G1F050140007
Country of Manufacture:	China
Date of Receipt:	15 March 2005

2.2. Accessories

The following accessories were supplied with the EUT:

Description:	AC Charger
Brand Name:	Gizmondo
Model Number:	FW7650/151967
Serial Number:	None Stated
Cable Length and Type:	2m co-axial
Connected to Port:	DC Input

Description:	Earphones
Brand Name:	Gizmondo
Model Name or Number:	None Stated
Serial Number:	Not Applicable
Cable Length and Type:	1.0m 3 Core
Connected to Port:	Earphone

Description:	USB Cable
Brand Name:	None Stated
Model Name or Number:	AWM 2725
Serial Number:	E148114-D
Cable Length and Type:	1.8m, AWM
Connected to Port:	USB port of EUT

2.3. Description of EUT

The equipment under test is a games console with GSM 1900 capabilities (no voice function), *Bluetooth** and GPS capabilities.

* The *Bluetooth*® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by RFI Global Services Ltd. is under license. Other trademarks and trade names are those of their respective owners.

2.4. Modifications Incorporated in EUT

During the course of testing the EUT was not modified.

2.5. Additional Information Related to Testing

Power Supply Requirement:	Nominal 110 V 60 Hz AC Mains supply via AC charger. Internal battery supply of 3.7 Volts.		
Intended Operating Environment:	Within GSM network coverage (for GSM 1900 operation)		
Equipment Category:	Portable		
Type of Unit:	Transceiver		
Transmit Frequency Range:	1850.2 MHz to 1909.8 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
Receive Frequency Range:	1930.2 MHz to 1989.8 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1930.2
	Middle	660	1960.0
	Top	810	1989.8
Maximum Peak Power Output (EIRP)	25.6 dBm		

2.6. Port Identification

Port	Description	Type/Length
1	Enclosure	-
2	USB	1.8 m, AWM
3	3.5 mm Stereo for headphones	1.0 m, 3 Core
4	SD Card	-
5	DC Input	2.0m, co-axial

2.7. Support Equipment

No support equipment was used to exercise the EUT during testing.

3. Test Specification, Methods and Procedures

3.1. Test Specifications

Reference:	FCC Part 24 Subpart E: 2004 (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003
Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.3. Definition of Measurement Equipment

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

4. Deviations from the Test Specification

None.

5. Operation of the EUT during Testing

5.1. Operating Modes

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

Preliminary radiated scans were performed on the EUT with the accessories stated in section 2.5 of this report connected and then disconnected. The combination that exhibited the worst-case mode of operation was then used to perform final measurements.

In both idle and transmit modes this was found to be with the EUT fitted with the earphones, USB cable and AC charger.

Transmitter Modes:

For carrier output power, occupied bandwidth and final transmitter radiated measurements, testing was performed at full power on top, middle and bottom channels of the assigned frequency block.

For frequency stability testing, measurements were performed at full power on the top and bottom channels of the assigned frequency block at -30 ºC through to +50 ºC in 10º increments.

All transmitter radiated spurious pre-scan tests were performed at full power on the top channel of the assigned frequency block. Final measurements were then performed on the top, middle and bottom channels if an emission was identified.

Receiver/Idle Modes:

Testing was performed with the call terminated from the GSM Test Simulator and the phone left in its Idle mode.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

Configured with earphones, USB cable and AC charger.

For the frequency stability (voltage variation) tests, the EUT was powered via an external DC power supply which replaced the normal battery supply in order to allow for the variation of DC voltage to the device.

6. Summary of Test Results

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Idle Mode AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2004 Section 15.107	AC Mains Input	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: 2004 Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24: 2004 Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24: 2004 Section 24.235	Antenna	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24: 2004 Section 24.235	Antenna	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24: 2004 Section 24.238	Antenna	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24: 2004 Section 2.1053/24.238	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2: 2004 Section 2.1053/24.238	Antenna	Complied

6.1. Location of Tests

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

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%.
Please refer to section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1. Idle Mode AC Conducted Spurious Emissions: Section 15.107

The EUT was configured as for ac conducted emission measurements as described in section 9 of this report.

Tests were performed to identify the maximum emissions levels present on the ac mains line of the EUT.

Results:

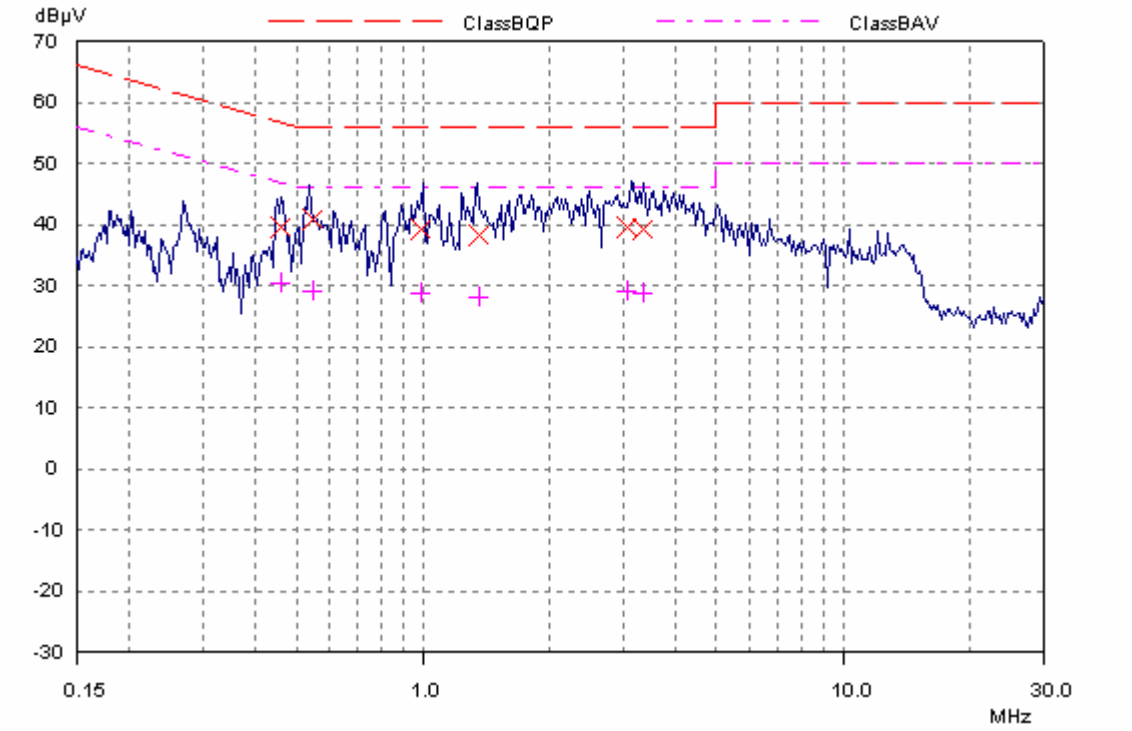
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.45965	L	39.56	56.70	17.14	Complied
0.54635	N	40.87	56.00	15.13	Complied
0.99295	N	39.30	56.00	16.70	Complied
1.3702	N	38.16	56.00	17.84	Complied
3.09238	L	39.58	56.00	16.42	Complied
3.3592	N	39.33	56.00	16.67	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.45965	L	30.19	46.70	16.51	Complied
0.54635	L	29.17	46.00	16.83	Complied
0.99295	L	28.58	46.00	17.42	Complied
1.3702	L	27.90	46.00	18.10	Complied
3.09238	L	29.12	46.00	16.88	Complied
3.3592	L	28.86	46.00	17.14	Complied

Idle Mode 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. Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range 30 to 1000 MHz)

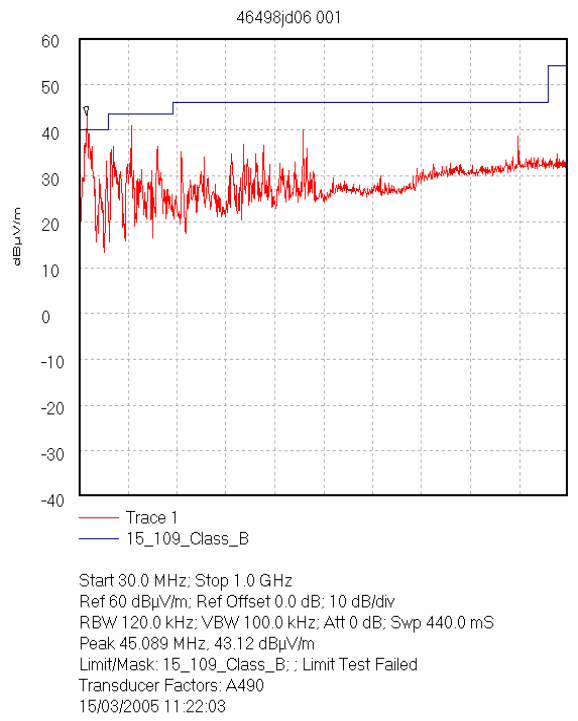
The EUT was configured as for receiver radiated emission testing as described in section 9 of this report.

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

Results:

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
45.552	Vert.	17.8	40.0	22.2	Complied
83.780	Vert.	15.5	40.0	24.5	Complied
133.640	Vert.	19.8	43.5	23.7	Complied
185.624	Vert.	18.3	43.5	25.2	Complied
234.665	Vert.	13.7	46.0	32.3	Complied
277.571	Vert.	16.5	46.0	39.5	Complied
359.620	Vert.	25.1	46.0	20.9	Complied
382.423	Vert.	27.6	46.0	18.4	Complied
396.002	Vert.	28.2	46.0	17.8	Complied
474.407	Vert.	22.0	46.0	24.0	Complied

Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range 30 to 1000 MHz) (Continued)



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

7.2.3. Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz)

Results:

Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
8.116232	Vert.	19.2	30.3	1.7	51.2	74.0	22.8	Complied

Average Level:

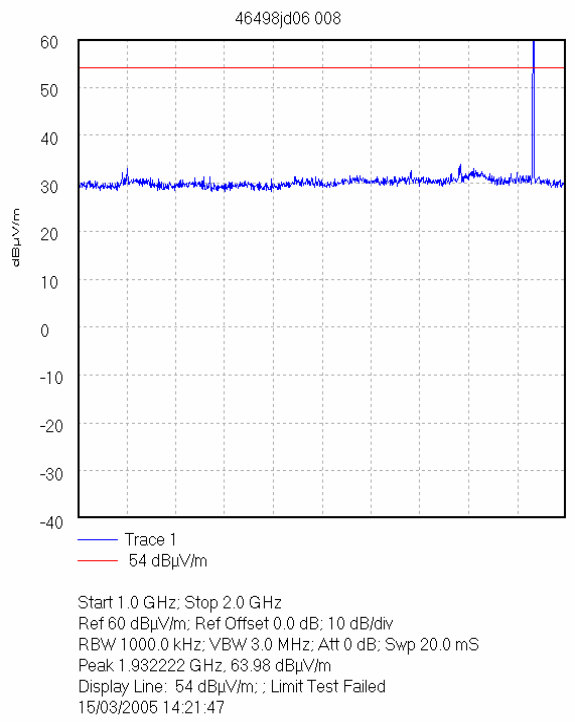
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
8.116232	Vert.	3.2	30.3	1.7	35.2	54.0	18.8	Complied

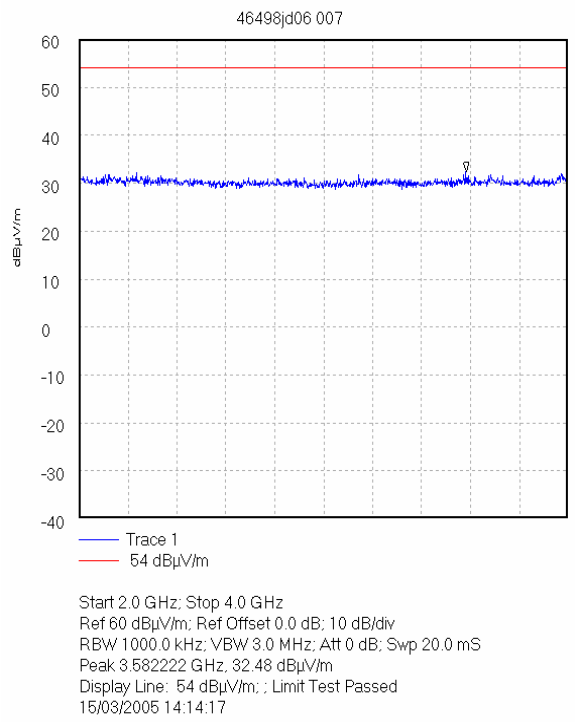
Note(s):

1. *No spurious emissions from the EUT were detected above the noise floor of the measuring receiver; therefore, the highest peak (and average) noise floor readings of the measuring receiver were recorded as shown in the table above.*

Test of: **Gizmondo Europe Limited**
Gizmondo GZ020 Handheld Console
To: **FCC Part 24: 2004 (Subpart E)**

Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz) (Continued)



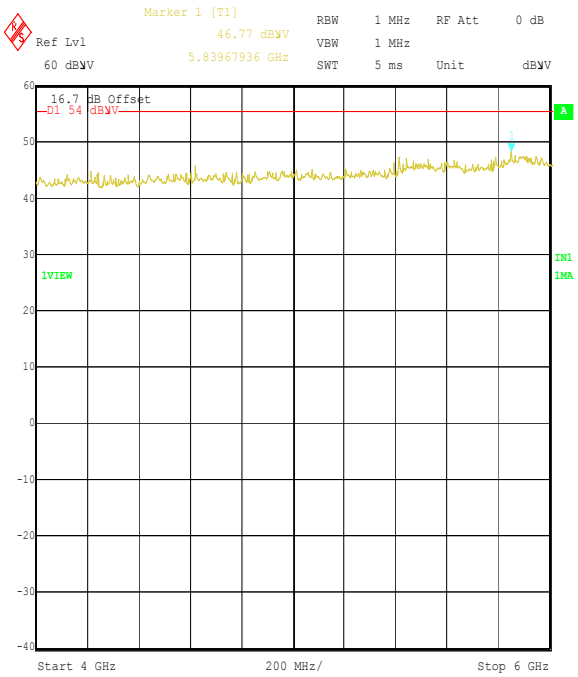


Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

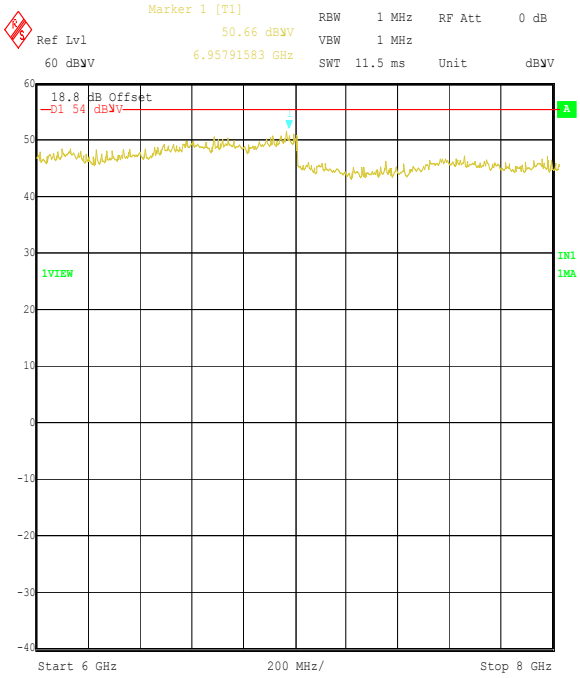
Note: the emission shown in plot 46498jd06 008 at 1.932222 GHz emanates from the GSM test set and not the EUT. Because the emission is not from the EUT no level has been recorded in the preceding results table.

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

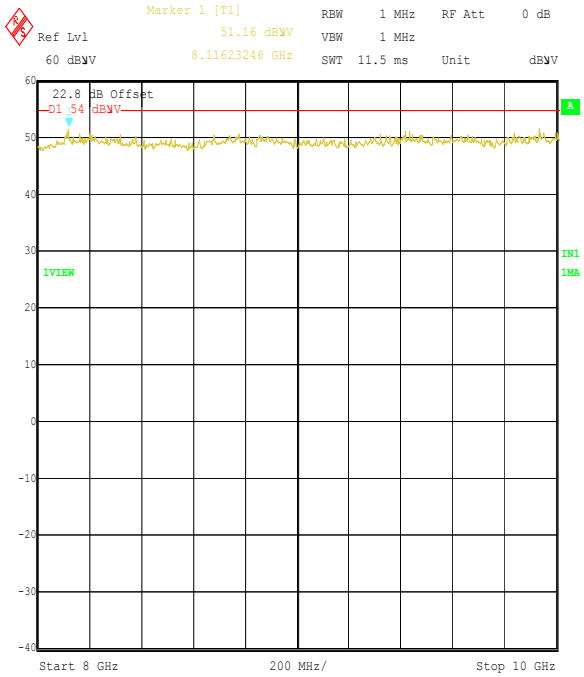
Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz) (Continued)



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Receiver Radiated Emissions
Date: 27.MAY.2005 16:19:25



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Receiver Radiated Emissions
Date: 27.MAY.2005 16:20:39



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Receiver Radiated Emissions at Top Channel
Date: 27.MAY.2005 15:16:50

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

7.2.4. Transmitter Effective Isotropic Radiated Power (EIRP): Section 24.232

The EUT was configured as for effective isotropic radiated power as described in section 9 of this report.

Tests were performed to identify the maximum effective isotropic radiated power (EIRP).

Results:

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)	Result
Bottom	1850.2	Vert.	25.6	33.0	7.4	Complied
Middle	1879.8	Vert.	24.0	33.0	9.0	Complied
Top	1909.8	Vert.	23.6	33.0	9.4	Complied

7.2.5. Transmitter Frequency Stability (Temperature Variation): Section 24.235

The EUT was configured as for frequency stability measurements as described in section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in ambient temperature.

Results:

Bottom Channel (1850.2 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	See Note 1 below				
-20	See Note 1 below				
-10	15	1850.200015	1850.0	0.200015	Complied
0	17	1850.200017	1850.0	0.200017	Complied
10	15	1850.200015	1850.0	0.200015	Complied
20	17	1850.200017	1850.0	0.200017	Complied
30	4	1850.200004	1850.0	0.200004	Complied
40	3	1850.200003	1850.0	0.200003	Complied
50	9	1850.200009	1850.0	0.200009	Complied

Note(s):

1. *The EUT ceased to function at temperatures below -10°C and consequently it was not possible to perform testing at either -20°C or -30°C. It is confirmed that the EUT did not function at any intermediate temperature between -10°C and -20°C.*

Transmitter Frequency Stability (Temperature Variation): Section 24.235 (Continued)

Results:

Top Channel (1909.8 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	See Note 1 below				
-20	See Note 1 below				
-10	51	1909.800051	1910.0	0.199949	Complied
0	58	1909. 800058	1910.0	0.199942	Complied
10	48	1909. 800048	1910.0	0.199952	Complied
20	38	1909. 800038	1910.0	0.199962	Complied
30	44	1909. 800044	1910.0	0.199956	Complied
40	38	1909. 800038	1910.0	0.199962	Complied
50	42	1909. 800042	1910.0	0.199958	Complied

Note(s):

1. *The EUT ceased to function at temperatures below -10°C and consequently it was not possible to perform testing at either -20°C or -30°C. It is confirmed that the EUT did not function at any intermediate temperature between -10°C and -20°C.*

7.2.6. Transmitter Frequency Stability (Voltage Variation): Section 24.235

The EUT was configured as for frequency stability measurements as described in section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in nominal operating voltage.

Results:

Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.7	17	1850.200017	1850	0.200017	Complied
3.5	0	1850.200000	1850	0.200000	Complied

Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.7	38	1909.800038	1910	0.199962	Complied
3.5	43	1909.800043	1910	0.199957	Complied

7.2.7. Transmitter Occupied Bandwidth: Section 24.238

The EUT was configured as for occupied bandwidth measurements as described in section 9 of this report.

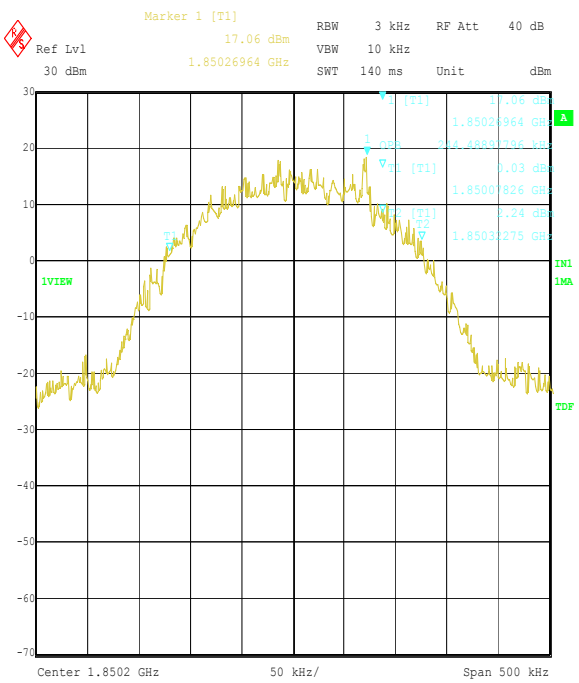
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

Results:

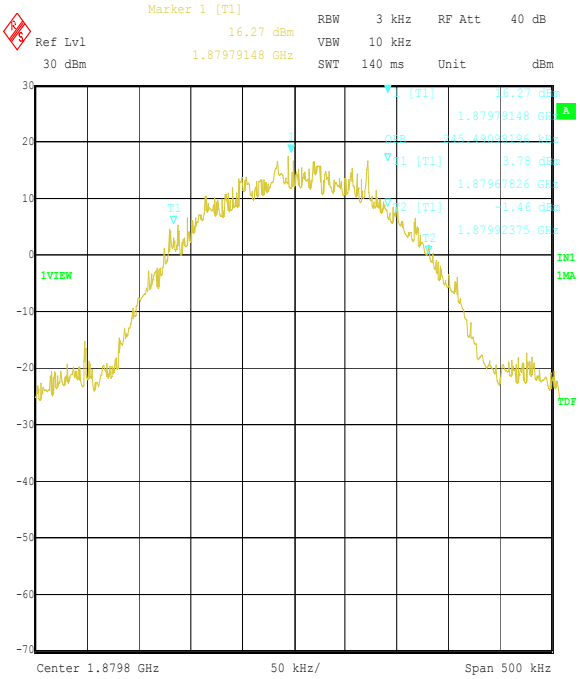
Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	3.0	10.0	244.488978
Middle	1879.8	3.0	10.0	245.490982
Top	1909.8	3.0	10.0	246.492986

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

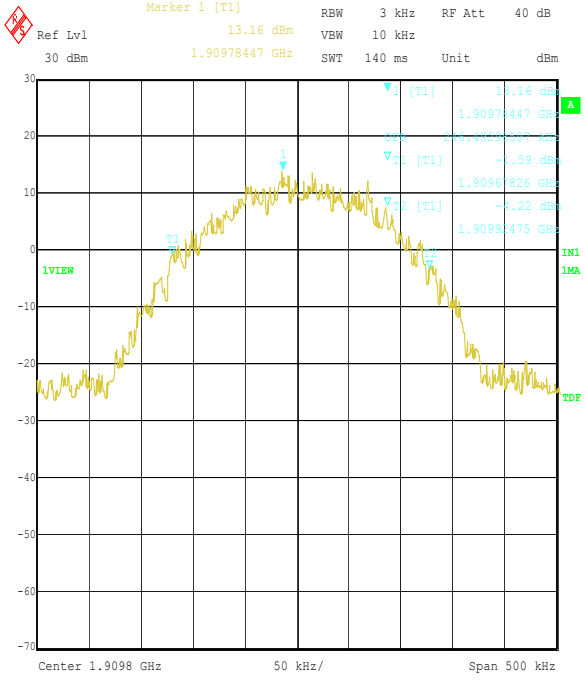
Transmitter Occupied Bandwidth: Section 24.238 (Continued)



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Occupied Power Bandwidth Bottom Channel
Date: 27.MAY.2005 14:33:45



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Occupied Power Bandwidth Middle Channel
Date: 27.MAY.2005 14:31:56



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Occupied Power Bandwidth Top Channel
Date: 27.MAY.2005 14:30:18

Note: The occupied bandwidth is measured using the internal OBW function of the measurement analyser. The analyser automatically configures the measurement bandwidths to make an accurate measurement.
The results can be observed in the right hand corner of the graphs

.

7.2.8. Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238

The EUT was configured as for transmitter radiated emission testing as described in section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results:

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3700.419	-30.0	-13.0	17.0	Complied

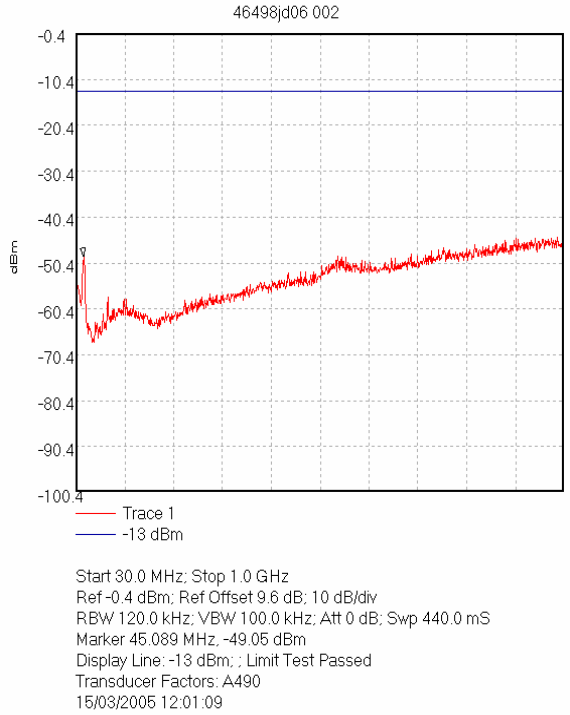
Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3759.341	-29.5	-13.0	16.5	Complied

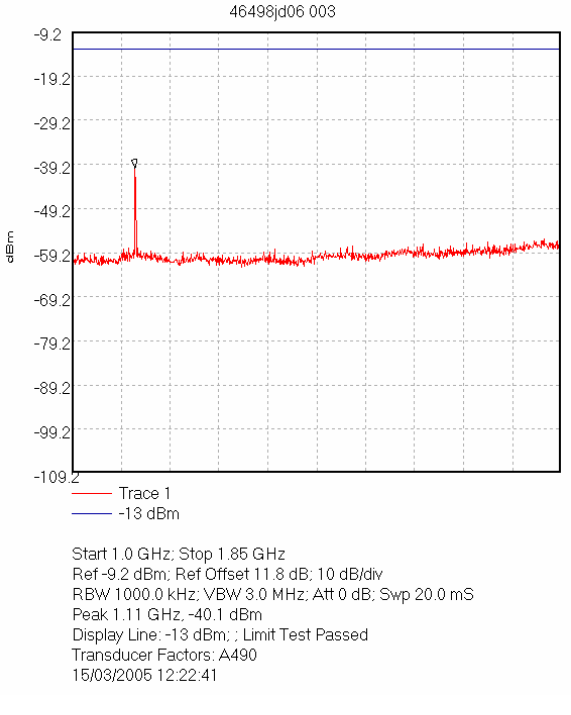
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3819.350	-29.4	-13.0	16.4	Complied

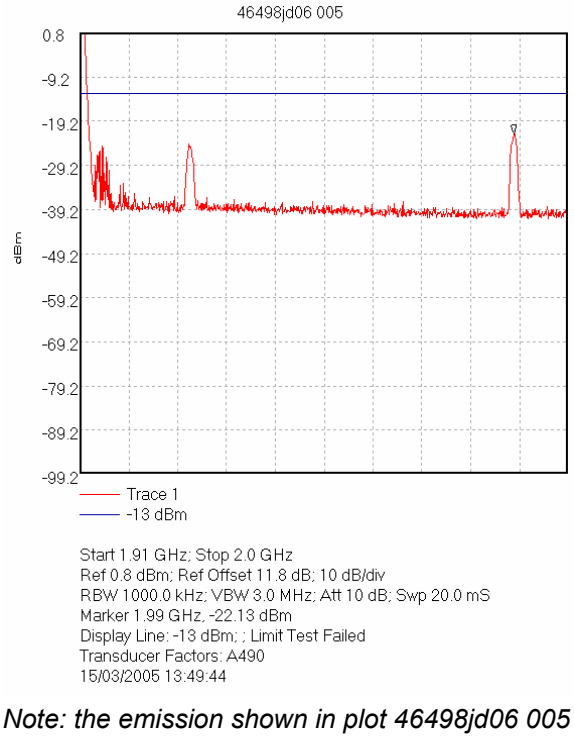
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



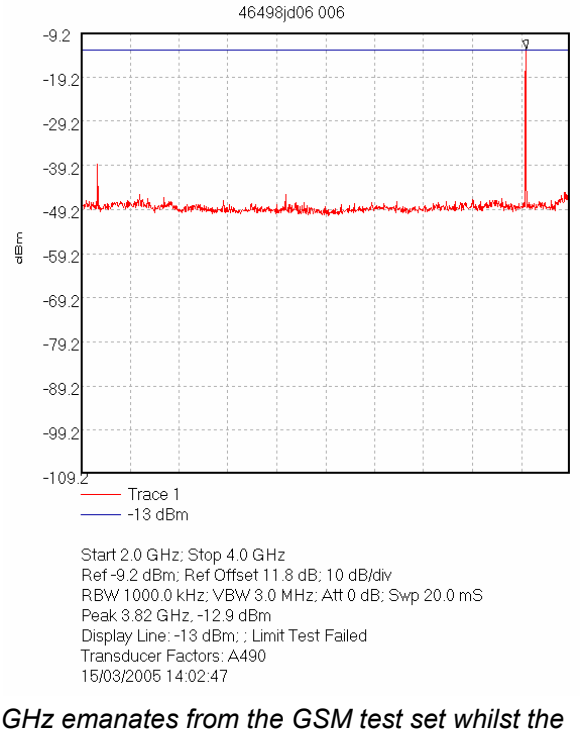
Start 30.0 MHz; Stop 1.0 GHz
Ref -0.4 dBm; Ref Offset 9.6 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 440.0 mS
Marker 45.089 MHz, -49.05 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
15/03/2005 12:01:09



Start 1.0 GHz; Stop 1.85 GHz
Ref -9.2 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 3.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.11 GHz, -40.1 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
15/03/2005 12:22:41



Start 1.91 GHz; Stop 2.0 GHz
Ref 0.8 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 3.0 MHz; Att 10 dB; Swp 20.0 mS
Marker 1.99 GHz, -22.13 dBm
Display Line: -13 dBm; ; Limit Test Failed
Transducer Factors: A490
15/03/2005 13:49:44

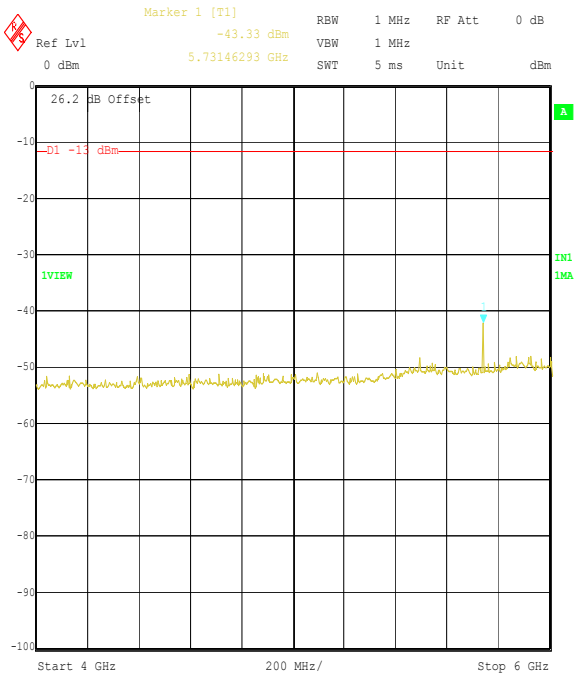


Start 2.0 GHz; Stop 4.0 GHz
Ref -9.2 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 3.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.82 GHz, -12.9 dBm
Display Line: -13 dBm; ; Limit Test Failed
Transducer Factors: A490
15/03/2005 14:02:47

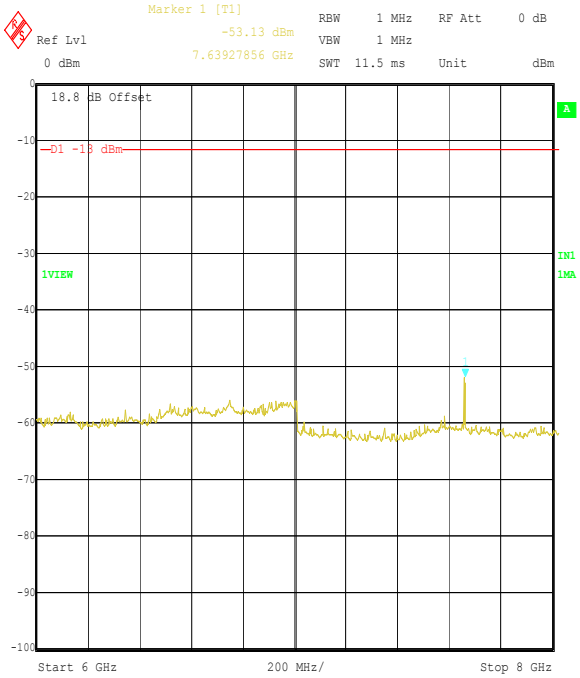
Note: the emission shown in plot 46498jd06 005 at 1.93 GHz emanates from the GSM test set whilst the emission at 1.99 GHz is an ambient and neither are from the EUT. Because these emissions are not from the EUT no levels have been recorded in the preceding results table.

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

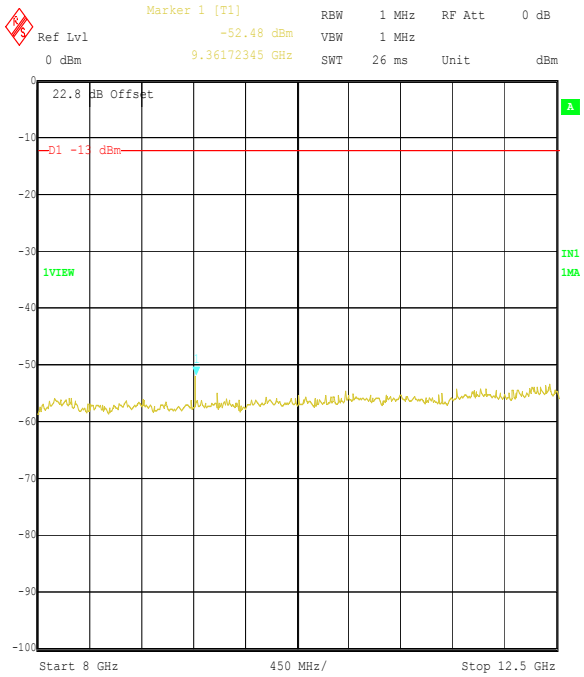
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



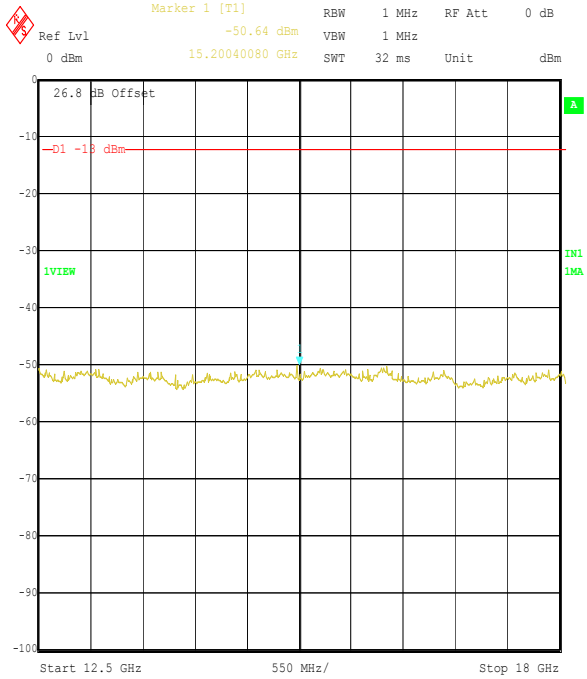
Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Radiated Emissions at Top Band Edges
Date: 27.MAY.2005 14:53:36



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Radiated Emissions at Top Channel
Date: 27.MAY.2005 15:07:43



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Radiated Emissions at Top Channel
Date: 27.MAY.2005 15:10:57

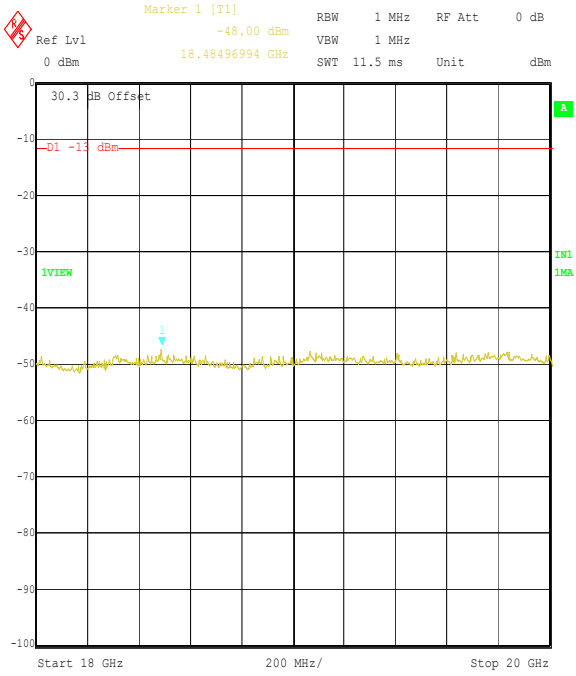


Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Radiated Emissions at Top Channel
Date: 27.MAY.2005 15:21:02

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

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



Title: 46498JD01 Gizmondo FCC Part 24
Comment A: Transmitter Radiated Emissions at Top Channel
Date: 27.MAY.2005 15:24:02

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

7.2.9. Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238 (Continued)

Results:

Integrated Power Over 1 MHz Strip Band: 1911 to 1912 MHz

1st 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	31.455	6	30.058
2	29.308	7	28.536
3	31.338	8	31.915
4	33.383	9	37.635
5	30.398	10	36.421
Total Peak Power:	320.437 nW/MHz		

Integrated Power Over 1 MHz Strip Band: 1912 to 1913 MHz

2nd 1 MHz block immediately outside adjacent frequency block

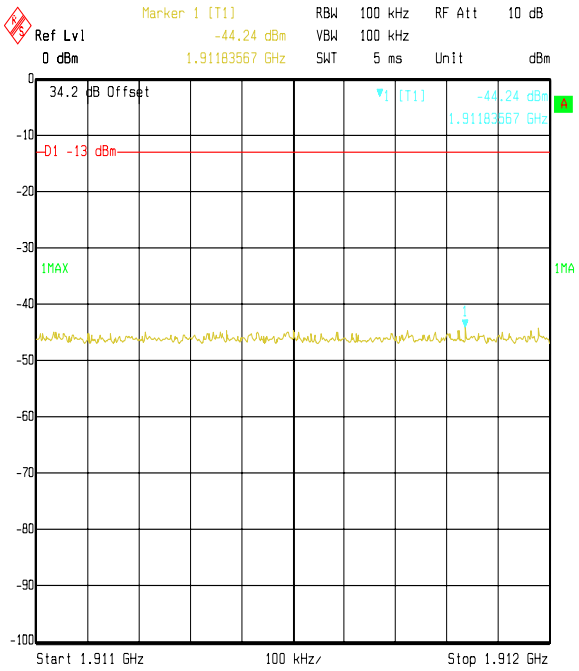
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	33.320	6	28.656
2	28.603	7	32.110
3	26.964	8	35.049
4	26.613	9	31.250
5	36.268	10	28.217
Total Peak Power:	307.050 nW/MHz		

Results:

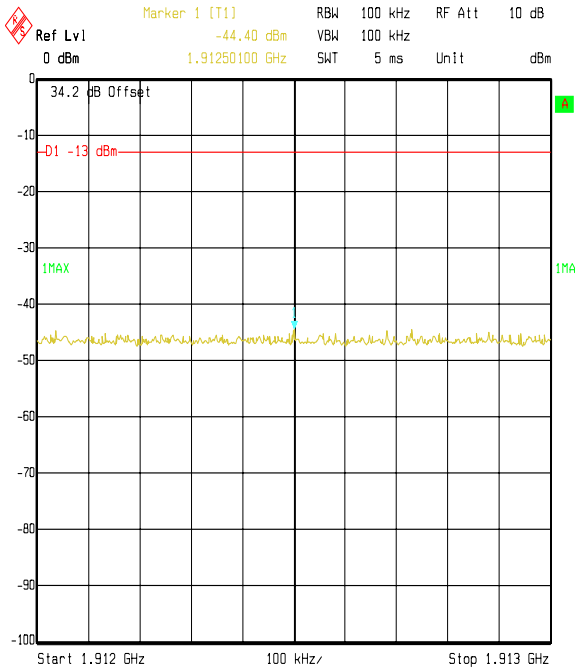
Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	320.437	-34.9	-13.0	21.9	Complied
1912 to 1913	307.050	-35.1	-13.0	22.1	Complied

Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

Transmitter Out of Band Radiated Emissions: Section 2.1051/24.238 (Continued)



Title: 46498JD06 Gizmondo FCC P24 Bandstrips Measurements
Comment A: Top Channel
Date: 27.MAY 2005 15:29:21



Title: 46498JD04 Gizmondo FCC P24 Bandstrips Measurements
Comment A: Top Channel
Date: 27.MAY 2005 15:31:16

7.2.10. Transmitter Radiated Emissions at Band Edges: Section 2.1053 & 24.238

The EUT was configured as for transmitter radiated emissions testing described in section 9 of this report.

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

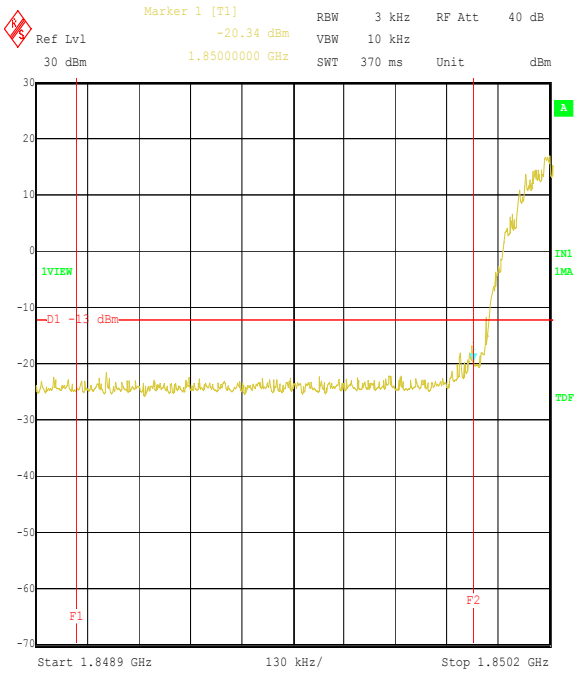
Results:

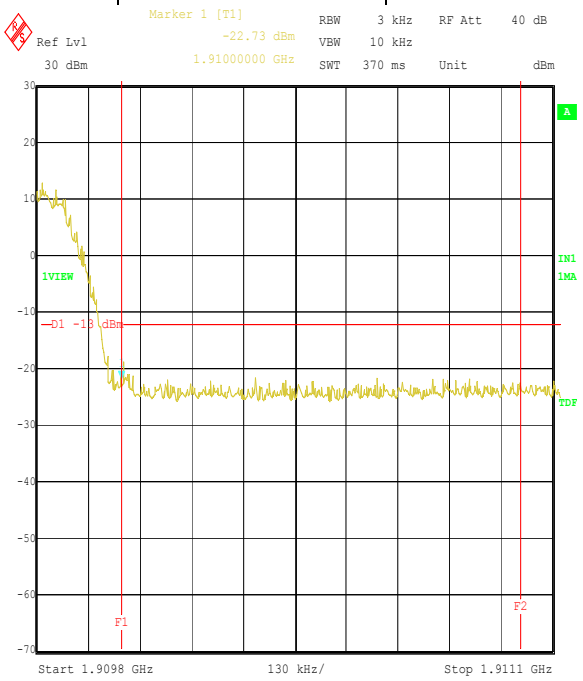
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-20.3	-13.0	7.3	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-22.7	-13.0	9.7	Complied





8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	±1.78 dB
Frequency Stability	Not applicable	95%	±20 Hz
Minimum Bandwidth	Not applicable	95%	±0.12%
Occupied Bandwidth	1850 to 1910 MHz	95%	±0.12%
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±5.26 dB
Radiated Spurious Emissions	1 GHz to 26 GHz	95%	±3.03 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.

9. Measurement Methods

9.1. Effective Isotropic Radiated Power (EIRP)

EIRP measurements were performed in accordance with the standard, against appropriate limits.

The EIRP was measured with the EUT arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4. The transmitter was fitted with an integral antenna; therefore all radiated tests were performed with the unit operating into the integral antenna.

The level of the EIRP was measured using a spectrum analyser.

The test antenna was positioned in the horizontal plane. The EUT was oriented in the X plane. The test antenna was then raised and lowered until a maximum peak was observed. The turntable was then rotated through 360 degrees and the maximum peak reading obtained. The height search was then repeated to take into consideration the new angular position of the turntable. The maximum reading observed was then recorded. This procedure was then repeated with the EUT oriented in the Y and Z planes. The highest reading taken in all 3 planes was recorded. The entire procedure was then repeated with the test antenna set in the vertical polarity.

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

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

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

All measurements were performed using broadband Horn antennas.

Effective Isotropic Radiated Power (EIRP) (Continued)

Circumstances where the signal generator could not produce the desired power substitution was performed with the signal generator set to 0 dBm. The radiated signal was maximised as previously described. The level indicated on the measuring receiver was noted. The delta between this level and the maximum level for the EUT was calculated and also noted. The EIRP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated EIRP to obtain the substituted EUT EIRP.

Delta (dB) = EUT – SG

where :

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual EIRP is calculated as:

EIRP SG= Signal Generator Level - Cable Loss + Antenna Gain

The EUT EIRP is calculated as:

EIRP EUT = EIRP SG + Delta.

The test equipment settings for EIRP measurements were as follows:

Receiver Function	Setting
Detector Type:	Peak
Mode:	Not applicable
Bandwidth:	1 MHz
Amplitude Range:	100 dB
Sweep Time:	Coupled

9.2. Frequency Stability

The EUT was situated within an environmental test chamber and connected directly to the GSM test set via an access port.

Measurements were performed with the EUT operating under extremes of temperature in 10 degree increments within the range -30 to 50 ºC.

Measurements were also performed at voltage extremes between the declared nominal supply voltage and at the declared endpoint voltage (for hand carried battery operated equipment) or by varying the primary supply voltage from 85% to 115% of the nominal value for all other equipment types.

The requirement was to determine the frequency stability of the device under specified environmental operating conditions and ensure they remained within specified operating parameters.

Measurements were made on the top and bottom channels.

The EUT was switched off for a minimum of 30 minutes between each stage of testing while the environmental chamber stabilised at the next temperature within the stated temperature range.

Once the environmental chamber had reached thermal equilibrium, the nominal frequency of the EUT was measured and recorded. The recorded frequency was compared to the applicants declared operating frequency band edges.

In order to show compliance, the measured frequency must remain within the declared frequency band.

The reported data shows the nominal frequency drift and its margin from the band edge. If this margin is positive, the result is compliant. If it goes negative, the result is a non-compliance. There is also a frequency graph presented offering the frequency variation around nominal frequency.

9.3. Occupied Bandwidth

The EUT was connected to a spectrum analyser enabled with an occupied bandwidth function and a GSM test set via a bi-directional coupler to its antenna port.

Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom middle and top channels.

As the EUT is a PCS phone, no modulation input port was available. A call was therefore set up using the PCS/GSM simulator and using normal modulation. The occupied bandwidth was measured in this configuration.

The Occupied Bandwidth was measured using the built in occupied bandwidth function of the Rohde and Schwarz FSEB or ESIB spectrum analyser. It was set to measure the bandwidth where 99% of the signal power was contained. The analyser settings were set as per those outlined in the spectrum analyser user manual for this measurement, i.e., RBW $\geq$1% of occupied bandwidth. A value of 3 kHz was used.

9.4. 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

9.5. Transmitter Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 10 times the highest fundamental frequency. The scans were performed within a screened chamber in order to identify frequencies on which the EUT was generating spurious. This procedure identified the frequencies from the EUT, which required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

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

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

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

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

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

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

The limit in the standard states that emissions shall be attenuated by at least 43+10 log (P) dB below the transmitter power (P), where (P) is the maximum measured fundamental power for the channel under test. This limit always reduces to -13 dBm therefore, the limit line presented on the accompanying plots is set to -13 dBm.

Any spurious measured were then compared to the -13 dBm limit. The requirement is for the emission to be less than -13 dBm. The margin between emission and limit is recorded and should always be positive to indicate compliance.

All measurements were performed using broadband horn antennas.

Transmitter Radiated Emissions (Continued)

It should be noted that FCC Part 24.238 states that the 1st MHz band immediately adjacent to the applicants declared frequency block may be measured using a resolution bandwidth of at least 1% of the emission bandwidth. This bandwidth was found by calculating 1% of the bandwidth measured in the transmitter occupied bandwidth section of this report. The next largest available bandwidth above this calculated figure was, therefore, used i.e. 3 kHz.

The measurements in the 2nd and 3rd 1 MHz blocks away from the adjacent 1 MHz block from 1911 MHz to 1912 MHz and 1912 MHz to 1913 MHz were carried out using an analyser span of 1 MHz and a 100 kHz receiver resolution bandwidth (RBW). 10 linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were integrated to give the emission level in an equivalent 1 MHz bandwidth.

9.6. Receiver Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to the upper frequency detailed in Section 15.33(b) were performed within a screened chamber in order to identify frequencies on which the EUT was generating interference. This determined the frequencies from the EUT, which required further examination. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit. Levels within 20 dB of this limit were measured where possible on occasion the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a quasi peak detector was used for measurements below 1000 MHz, for measurements above 1000 MHz average and peak detectors were used.

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

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

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 <1 GHz	Final Measurements ≥1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	(120 kHz <1 GHz) (1 MHz ≥1 GHz)	120 kHz	1 MHz (If Applicable)
Amplitude Range:	60 dB	20 dB	20 dB (typical)
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
A004	LISN	Rohde & Schwarz	ESH3-Z5	890 604/027
A027	Horn Antenna	Eaton	9188-2	301
A028	Horn Antenna	Eaton	91888-2	304
A031	Horn Antenna	Eaton	91889-2	557
A1360	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	A1360-20112003
A254	Horn Antenna	Flann Microwave	14240-20	139
A428	Horn Antenna	Flann	12240-20	134
A429	Horn Antenna	Flann	16240-20	561
A430	Horn Antenna	Flann	18240-20	425
A436	Horn Antenna	Flann	20240-20	330
A490	Bilog Antenna	Chase	CBL6111A	1590
E013	Environmental Chamber	Sanyo	ATMOS chamber	None
L0753	GSM Test Set	Anritsu	MT8820A	6K00000633
M003	Spectrum Monitor	Rohde & Schwarz	EZM	883 580/008
M023	Receiver	Rohde & Schwarz	ESVP	872 991/027
M028	Spectrum Analyser	Rohde & Schwarz	FSB	860 001/009 (RU); 860 161/007 (DU)
M088	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:835862/018 RU:835387/006
M1093	GSM Test Set	Will tek	4202S	0513018
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K
M128	DVM	Fluke	76	65340273
M505/ M506	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	825316/010 (DU) 827060/004 (RU)
S006	DC Power Supply	Rohde & Schwarz	NGPE 40/40	192.0332.41
S201	Site 1	RFI	1	None
S202	Site 2	RFI	2	S202-15011990

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

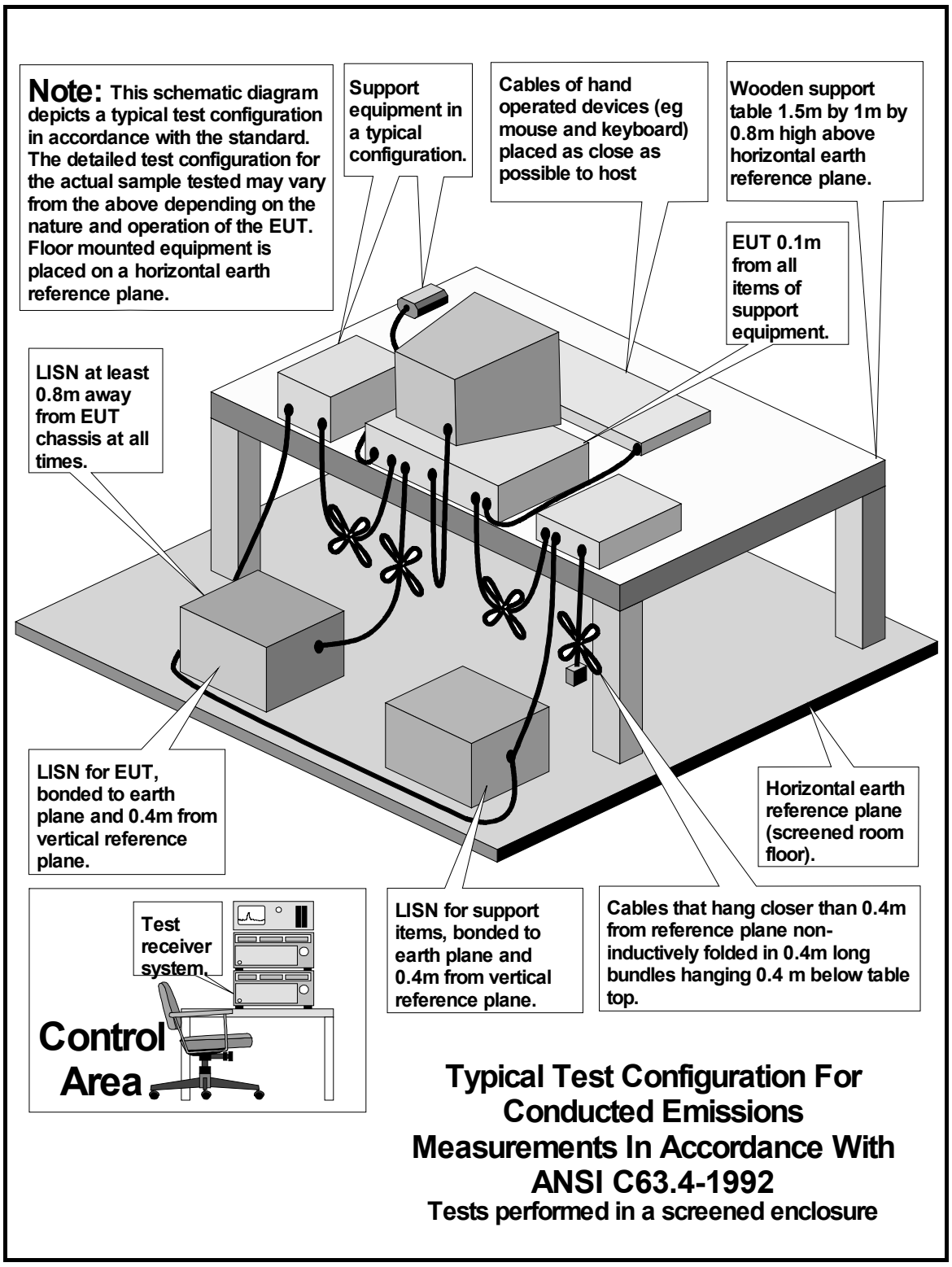
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\46498JD06\EMICON	Test configuration for measurement of conducted emissions.
DRG\46498JD06\EMIRAD	Test configuration for measurement of radiated emissions.

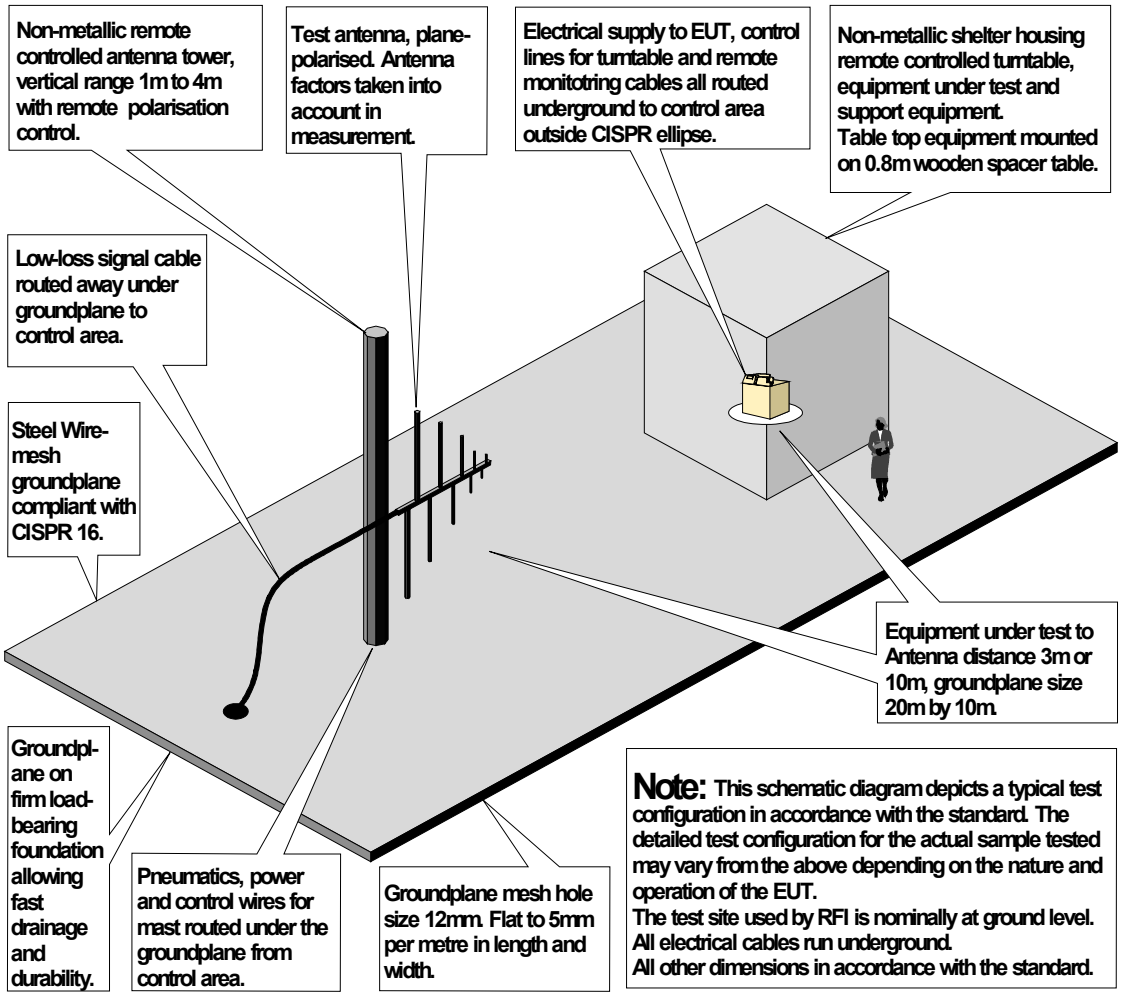
Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

DRG\46498JD06\EMICON



Test of: Gizmondo Europe Limited
Gizmondo GZ020 Handheld Console
To: FCC Part 24: 2004 (Subpart E)

DRG\46498JD06\EMIRAD



Test Configuration For Radiated Emissions Measurements
Reflection-free area: >60m by 52m
(CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse