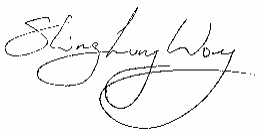
TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Satellite Tracking Of People LLC
BluTag4

To: FCC Part 22: 2005 (Subpart H) and
FCC Part 24: 2005 (Subpart E)

Test Report Serial No:
RFI/RPTE1/RP48270JD03A

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: 10 August 2006	**Test Dates: 12 May 2006 to 17 May 2006**

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Test of: Satellite Tracking Of People LLC
BluTag4
To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

Table of Contents

1. Client Information

Company Name:	Satellite Tracking Of People LLC.
Address:	4801 Woodway Drive Suite 110W Houston Texas 77056
Contact Name:	Mr S Freathy

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)

Brand Name:	STOP
Model Name or Number:	BluTag4
Serial Number:	BB11-TRI002
FCC ID:	S5EAA90048
Country of Manufacture:	UK
Date of Receipt:	12 May 2006

Description:	Charging cradle
Brand Name:	STOP
Model Name or Number:	None stated
Serial Number:	None stated
Country of Manufacture:	Not Stated
Date of Receipt:	12 May 2006

Description:	AC Charger
Brand Name:	mpw
Model Name or Number:	SA071113
Serial Number:	None stated
Country of Manufacture:	China
Date of Receipt:	12 May 2006

2.2. Description of EUT

The equipment under test is a personal tracking device incorporating GSM, GPRS, 915 MHz and GPS technologies.

2.3. Modifications Incorporated in EUT

During the course of testing the EUT was not modified.

2.4. Additional Information Related to Testing

Power Supply Requirement:	Internal battery supply of 3.7 V (Supplied with dedicated 110V AC charger)
Equipment Category:	Portable (Standalone battery powered device)
Type of Unit:	Transceiver

FCC Part 22

Transmit Frequency Range:	824.2 MHz to 848 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
Receive Frequency Range:	869 MHz to 894 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8
Maximum Power Output (ERP):	28.9 dBm		

FCC Part 24

Transmit Frequency Range:	1850.2 MHz to 1909.8 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	1850.2
	Middle	190	1879.8
	Top	251	1909.8
Receive Frequency Range:	869 1930 MHz to 1990 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	1930.2
	Middle	190	1960.0
	Top	251	1989.8
Maximum Power Output (EIRP):	28.9 dBm		

2.5. Port Identification

Port	Description	Type/Length	Applicable
1	Charger Port	-	Y

2.6. Support Equipment

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

3. Test Specification, Methods and Procedures

Reference:	FCC Part 22: 2005 Subpart H (Cellular Radiotelephone Service)
Title:	Code of Federal Regulations, Part 22 (47CFR22) Personal Communication Services.

Reference:	FCC Part 24: 2005 Subpart E (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.

3.1. 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.

3.2. Definition of Measurement Equipment

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

4. Deviations from the Test Specification

There were no deviations from the test specification.

5. Operation of the EUT during Testing

5.1. Operating Modes

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

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 the frequency stability testing, measurements were performed at full power on the top and bottom channels of the assigned frequency block at -30ºC through to +50ºC 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 unless otherwise stated:

The EUT was configured with the AC charger cradle connected and in charging mode. For the frequency stability under voltage variation test, the EUT was connected to an external DC power supply via the use of a dummy battery.

6. Summary of Test Results

FCC Part 22

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Receiver/Idle AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2005 Section 15.107	AC Mains Input	Complied
Receiver/Idle Radiated Emissions	C.F.R. 47 FCC Part 15: 2005 Section 15.109	Enclosure	Complied
Transmitter Effective Radiated Power (ERP)	C.F.R. 47 FCC Part 22: 2005 Section 22.913(a)	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 22: 2005 Section 22.355	Antenna	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 22: 2005 Section 22.355	Antenna	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 22: 2005 Section 2.1049	Antenna	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 22: 2005 Section 2.1053/22.917	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 22: 2005 Section 2.1053/22.917	Antenna	Complied

Summary of Test Results (Continued)

FCC Part 24

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: 2005 Section 15.107	AC Mains Input	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: 2005 Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24: 2005 Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24: 2005 Section 24.235	Antenna	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24: 2005 Section 24.235	Antenna	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24: 2005 Section 24.238	Antenna	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24: 2005 Section 2.1053/24.238	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2: 2005 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

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 – FCC Part 22

7.2.1. Receiver/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 emission levels present on the AC Mains line of the EUT.

Results:

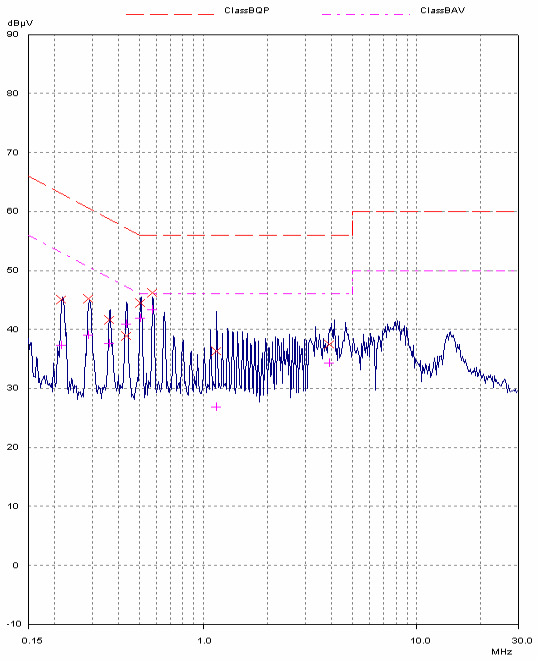
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21539	Neutral	45.12	62.99	17.87	Complied
0.28779	Neutral	25.25	60.59	15.34	Complied
0.36041	Neutral	41.59	58.72	17.13	Complied
0.43226	Neutral	38.95	57.21	18.26	Complied
0.50493	Neutral	44.44	56.00	11.56	Complied
0.57571	Neutral	46.22	56.00	9.78	Complied
1.15068	Neutral	36.26	56.00	19.74	Complied
3.89063	Neutral	37.43	56.00	18.57	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21539	Neutral	37.38	52.99	15.61	Complied
0.28779	Neutral	39.03	50.59	11.56	Complied
0.36041	Neutral	37.58	48.72	11.14	Complied
0.43226	Neutral	40.83	47.21	6.38	Complied
0.50493	Neutral	41.95	46.0	4.05	Complied
0.57571	Neutral	43.37	46.0	2.63	Complied
1.15068	Neutral	26.87	46.0	19.13	Complied
3.89063	Neutral	34.23	46.0	11.77	Complied

Receiver/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. Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109

The EUT was configured as for radiated emission - Part 22 measurements as described in Section 9 of this report.

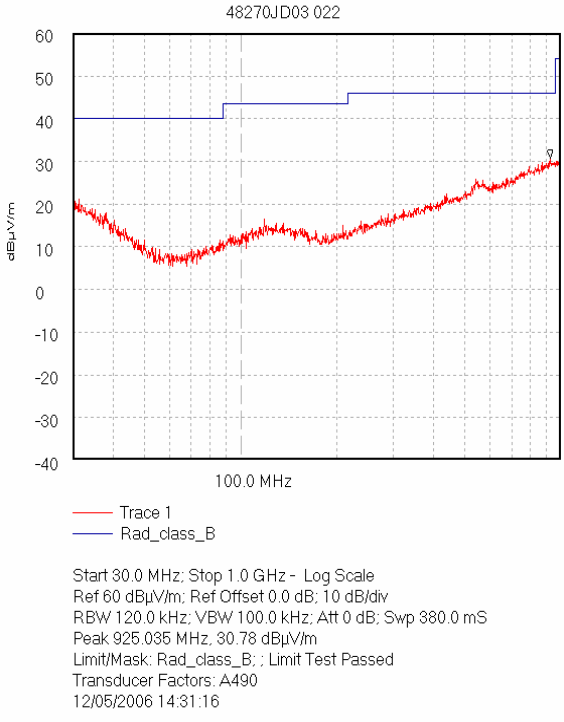
Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results:

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

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
925.035	Vertical	30.8	46.0	15.2	Complied

Note: *No spurious emissions were detected above the noise floor of the measuring receiver: The highest peak noise floor reading of the measuring receiver recorded was 30.8 dBμV/m at 925.035 MHz*



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

7.2.3. Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109

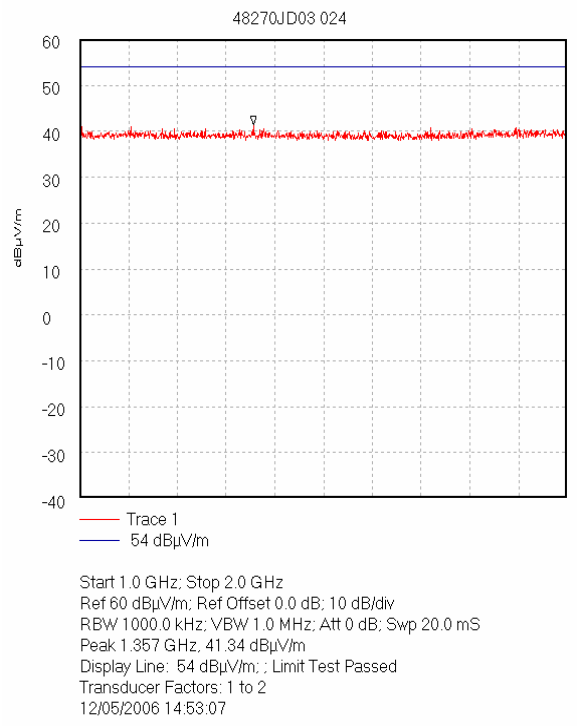
Results:

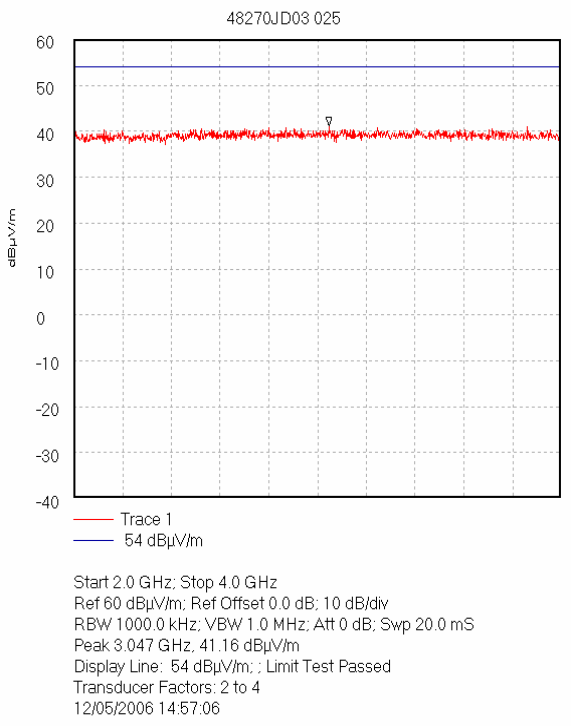
Electric Field Strength Measurements (Frequency Range: 1 to 12.5 GHz)

Peak Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3.047	Vertical	52.6	-11.4	41.2	54.0	12.8	Complied

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





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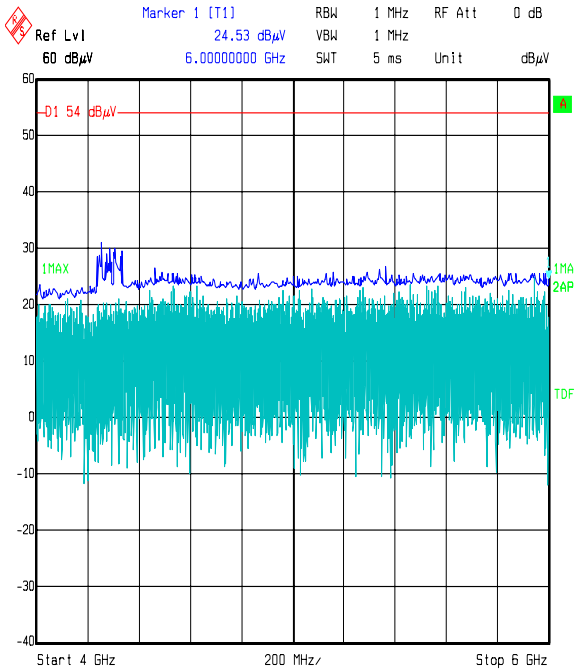
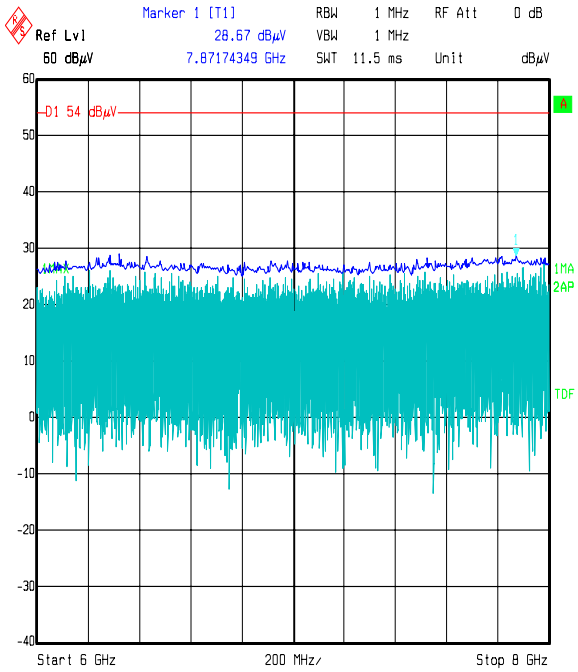
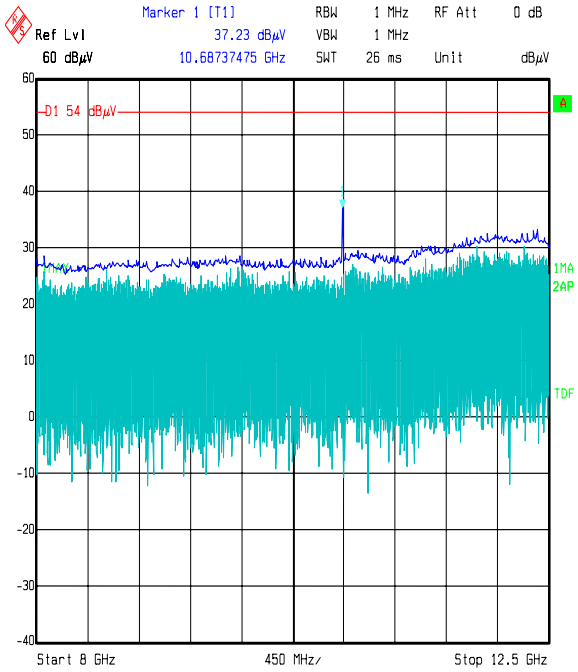
Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



Title: Satellite Tracking People 48270
Comment A: FCC 22 Top,Mid, & Bot channel
Date: 14.MAY 2006 17:51:14



Title: Satellite Tracking People 48270
Comment A: FCC 22 Top,Mid, & Bot channel
Date: 14.MAY 2006 18:25:31



Title: Satellite Tracking People 48270
Comment A: FCC 22 Top,Mid, & Bot channel
Date: 14.MAY 2006 18:36:16

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

Note: The emission at 10.687 GHz shown in the plot above is an ambient which is not produced by and does not emanate from the EUT and has been ignored for the purposes of measurement.

7.2.4. Transmitter Effective Radiated Power (ERP): Section 22.913(a)

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

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

Results:

Channel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	824.2	22.1	38.4	16.3	Complied
Middle	836.6	22.7	38.4	15.7	Complied
Top	848.8	22.7	38.4	15.7	Complied

7.2.5. Transmitter Frequency Stability (Temperature Variation): Section 22.355

The EUT was configured as for Part 2.1055 - 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 (824.2 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	824.200016	16	0.019	2.5	2.481	Complied
-20	824.199949	-51	0.062	2.5	2.438	Complied
-10	824.199934	-66	0.080	2.5	2.420	Complied
0	824.199969	-31	0.036	2.5	2.464	Complied
10	824.199981	-19	0.023	2.5	2.477	Complied
20	824.199963	-37	0.045	2.5	2.455	Complied
30	824.199967	-33	0.040	2.5	2.460	Complied
40	824.199972	-28	0.034	2.5	2.466	Complied
50	824.199954	-46	0.056	2.5	2.444	Complied

Top Channel (848.8 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	848.800034	34	0.040	2.5	2.460	Complied
-20	848.800017	17	0.020	2.5	2.480	Complied
-10	848.800014	14	0.016	2.5	2.484	Complied
0	848.799993	-7	0.008	2.5	2.492	Complied
10	848.800017	17	0.020	2.5	2.480	Complied
20	848.800019	19	0.022	2.5	2.478	Complied
30	848.800016	16	0.019	2.5	2.481	Complied
40	848.800023	23	0.027	2.5	2.473	Complied
50	848.800004	4	0.005	2.5	2.495	Complied

7.2.6. Transmitter Frequency Stability (Voltage Variation): Section 22.355

The EUT was configured as for Part 2.1055 - 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 (824.2 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.7	824.199963	-37	0.045	2.5	2.455	Complied
3.4	824.199949	-51	0.062	2.5	2.438	Complied

Top Channel (848.8 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.7	848.800019	19	0.022	2.5	2.478	Complied
3.4	848.800021	21	0.025	2.5	2.475	Complied

7.2.7. Transmitter Occupied Bandwidth: Section 2.1049

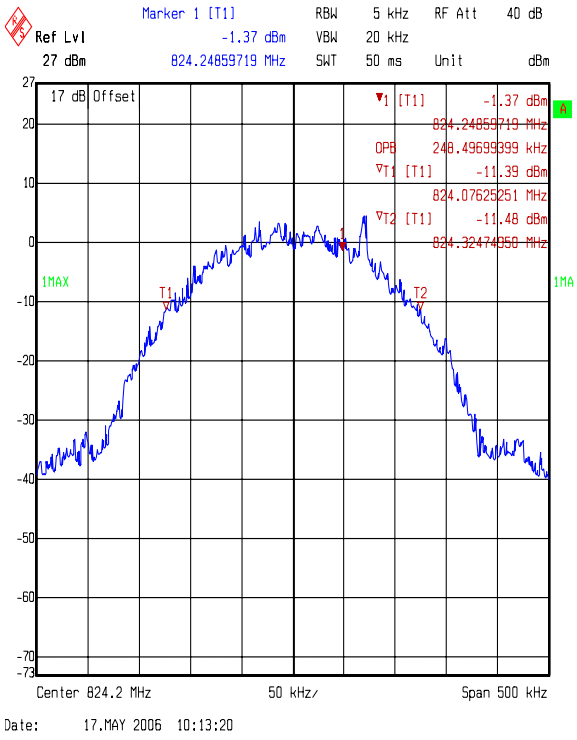
The EUT was configured as for occupied bandwidth measurements as described in Section 9 of this report.

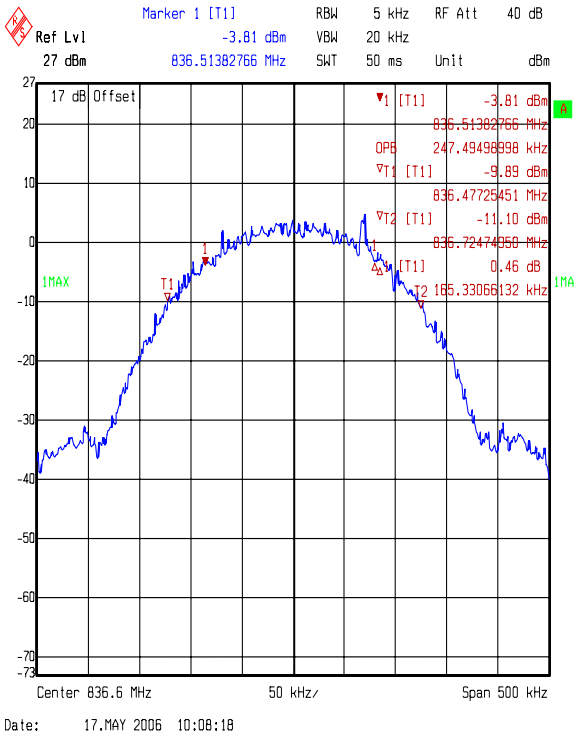
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

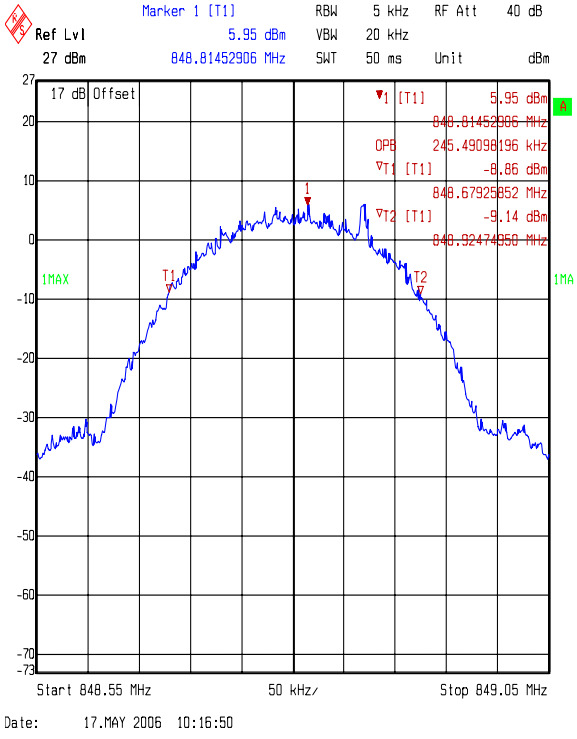
Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	824.2	5.0	20.0	248.249
Middle	836.6	5.0	20.0	247.495
Top	848.8	5.0	20.0	245.491

Transmitter Occupied Bandwidth: Section 2.1049 (Continued)







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 & 22.917

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
1648.8	-16.0	-13.0	3.0	Complied
4021.0	-36.7	-13.0	23.7	Complied
4945.2	-38.9	-13.0	25.9	Complied
5769.4	-38.3	-13.0	25.3	Complied

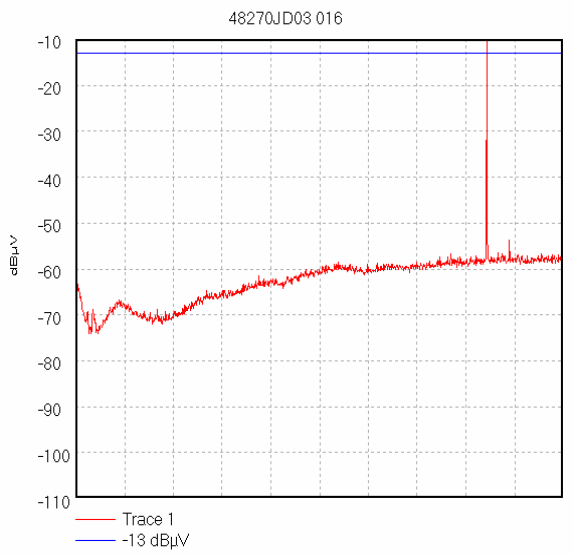
Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1673.2	-15.4	-13.0	2.4	Complied
4183.0	-37.9	-13.0	24.9	Complied
5019.6	-38.2	-13.0	25.2	Complied
5856.2	-39.7	-13.0	26.7	Complied

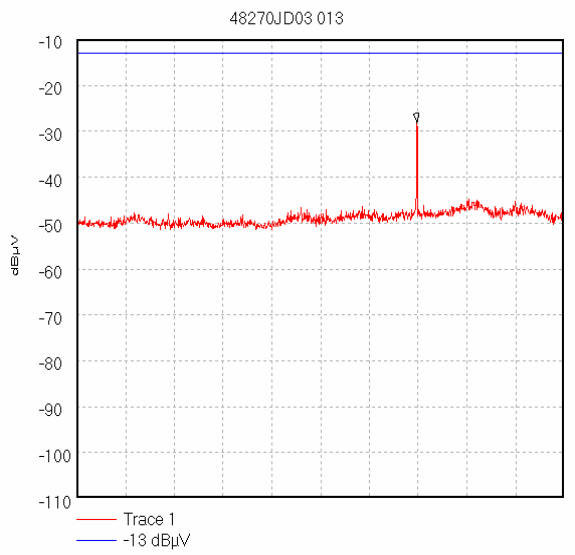
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1697.6	-17.3	-13.0	4.3	Complied
4244.0	-38.8	-13.0	25.8	Complied
5092.8	-37.0	-13.0	24.0	Complied
5941.6	-40.7	-13.0	27.7	Complied

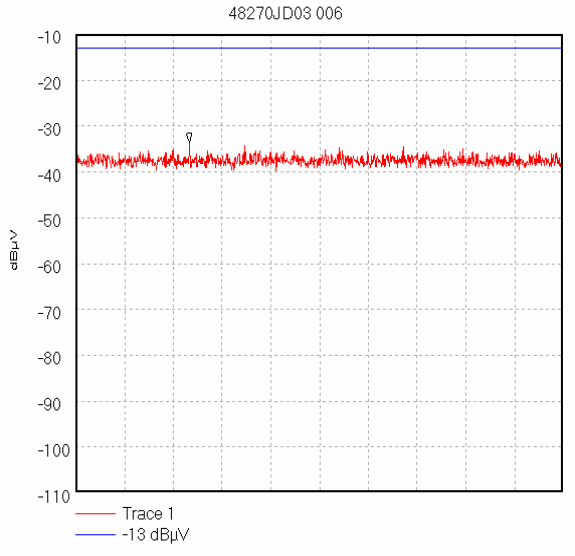
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917 (Continued)



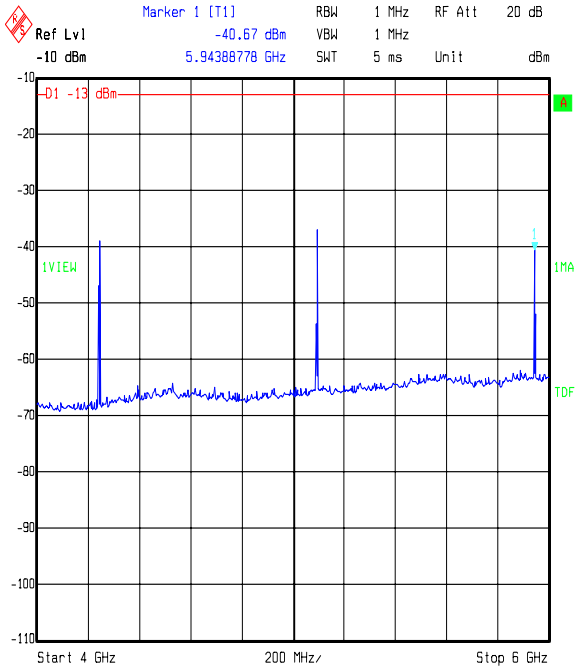
Start 30.0 MHz; Stop 1.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 620.0 mS
Peak 848.033333 MHz, -6.02 dBµV
Display Line: -13 dBµV; ; Limit Test Failed
Transducer Factors: A1037
12/05/2006 13:57:06



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.697778 GHz, -28.08 dBµV
Display Line: -13 dBµV; ; Limit Test Passed
Transducer Factors: 1 to 2
12/05/2006 12:12:55



Start 2.0 GHz; Stop 4.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 2.466667 GHz, -33.56 dBµV
Display Line: -13 dBµV; ; Limit Test Passed
Transducer Factors: 2 to 4
12/05/2006 11:20:35



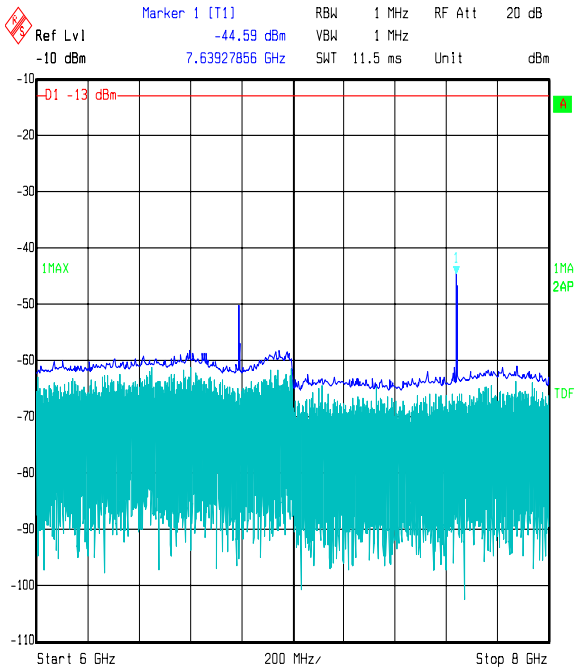
Title: Satellite Tracking People 48270
Comment A: FCC 22 Top channel
Date: 14.MAY 2006 14:12:35

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

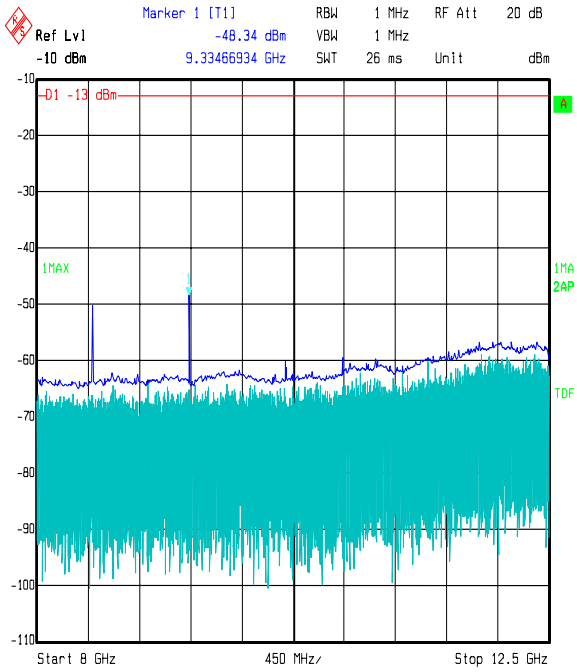
Note: The emission at 848.033 MHz shown in plot 48270JD03 016 is the wanted transmitter fundamental and, therefore, was ignored for the purpose of spurious emissions measurements..

Test of: Satellite Tracking Of People LLC
BluTag4
To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

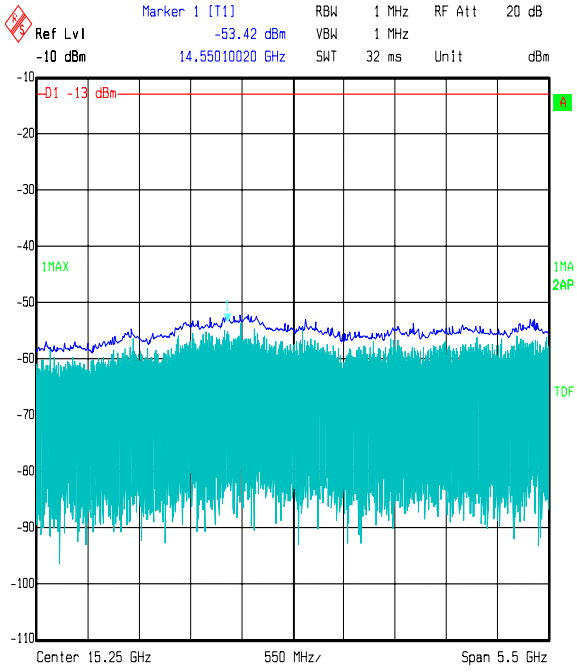
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917 (Continued)



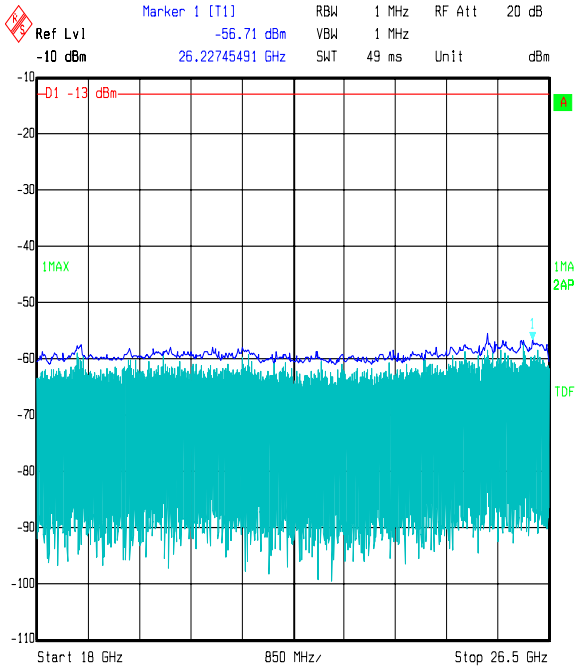
Title: Satelite Tracking People 48270
Comment A: FCC 22 Top channel
Date: 14.MAY 2006 15:06:32



Title: Satelite Tracking People 48270
Comment A: FCC 22 Top channel
Date: 14.MAY 2006 16:33:25



Title: Satelite Tracking People 48270
Comment A: FCC 22 Top channel
Date: 14.MAY 2006 16:48:23



Title: Satelite Tracking People 48270
Comment A: FCC 22 Top channel
Date: 14.MAY 2006 17:21:41

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

7.2.9. Transmitter Radiated Emissions at Band Edges: Section 2.1053/22.917

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

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

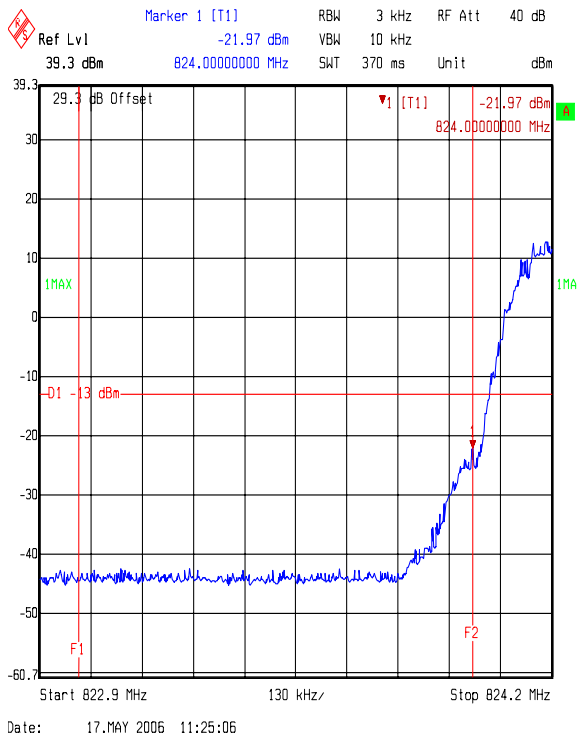
Results:

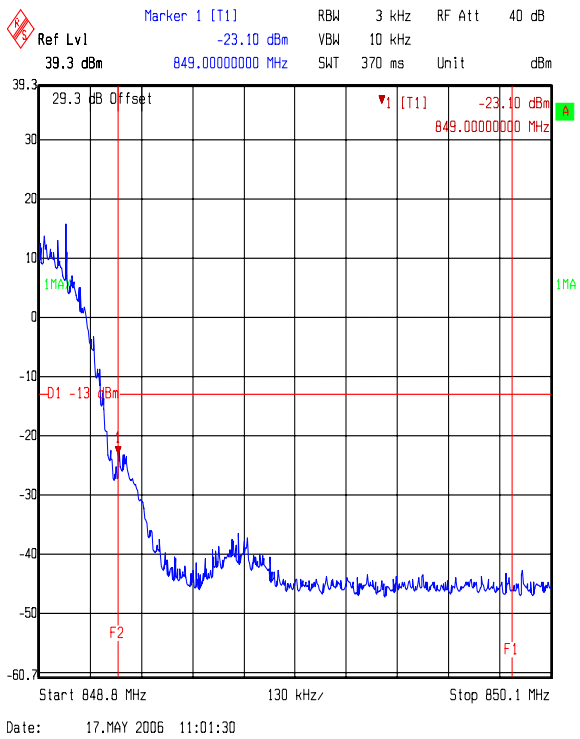
Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-22.0	-13.0	11.9	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
849	-23.1	-13.0	10.1	Complied





7.3. Test Results – FCC Part 24

7.3.1. 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:

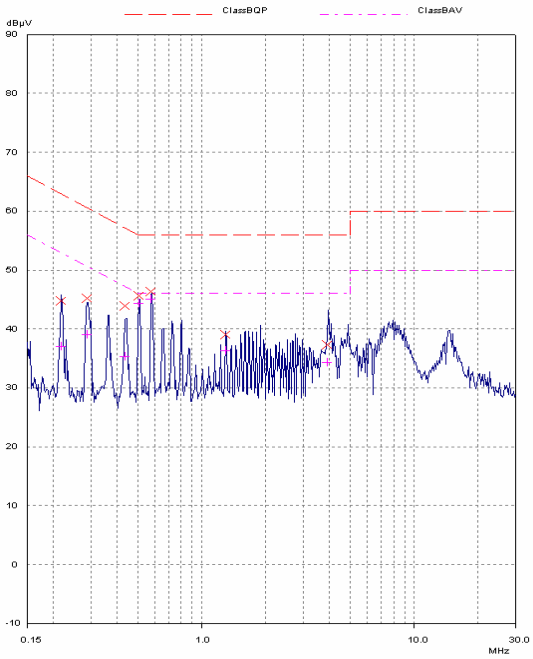
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21709	Neutral	44.79	62.93	18.14	Complied
0.28820	Neutral	45.25	60.58	15.33	Complied
0.43287	Neutral	43.85	57.20	13.35	Complied
0.50441	Neutral	45.61	56.00	10.39	Complied
0.57591	Neutral	46.37	56.00	9.63	Complied
1.29557	Neutral	39.00	56.00	17.00	Complied
3.88858	Neutral	37.28	56.00	18.72	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21709	Neutral	37.07	52.93	15.86	Complied
0.28820	Neutral	39.03	50.58	11.55	Complied
0.43287	Neutral	35.30	47.20	11.90	Complied
0.50441	Neutral	44.31	46.00	1.69	Complied
0.57591	Neutral	45.07	46.00	0.93	Complied
1.29557	Neutral	36.34	46.00	9.66	Complied
3.88858	Neutral	34.33	46.00	11.67	Complied

Idle Mode AC Conducted Spurious Emissions: Section 15.107 (Continued)



7.3.2. Idle Mode Radiated Spurious Emissions: Section 15.109

The EUT was configured as for receiver radiated emission - Part 24 testing as described in Section 9 of this report.

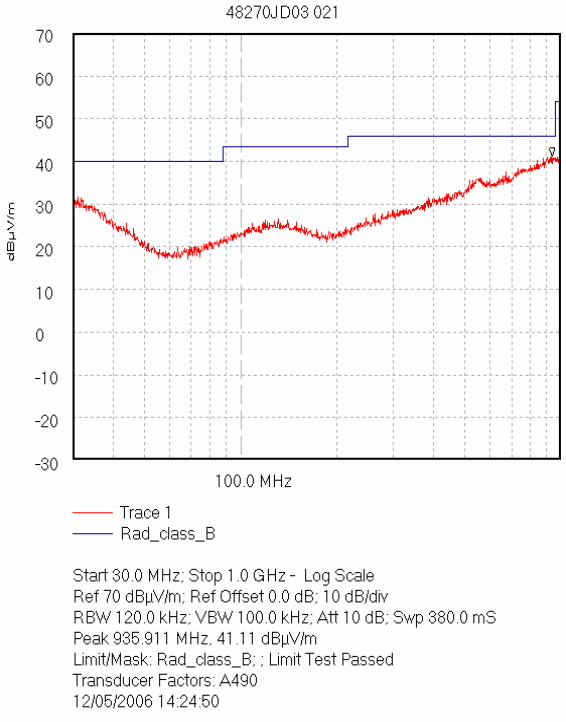
Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results:

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

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
935.911	Vertical	41.1	46.0	4.9	Complied

Note: *No spurious emissions were detected above the noise floor of the measuring receiver: The highest peak noise floor reading of the measuring receiver recorded was 41.1 dBµV/m at 935.911 MHz*



7.3.3. Idle Mode Radiated Spurious Emissions: Section 15.109

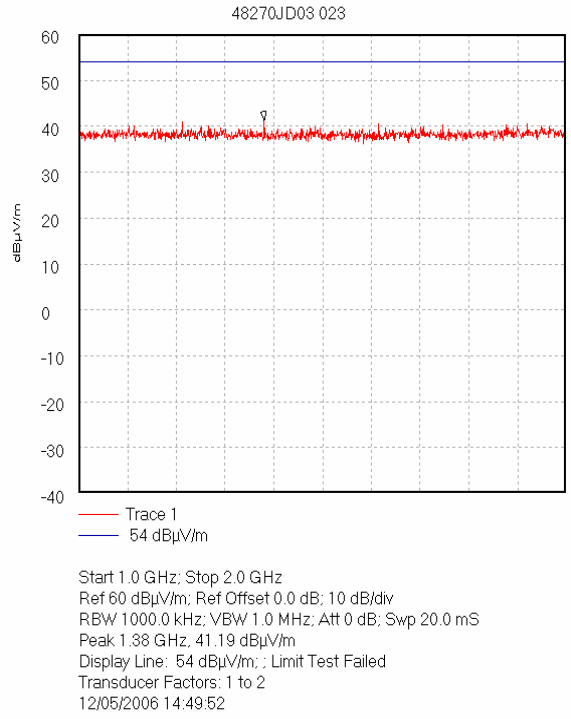
Results:

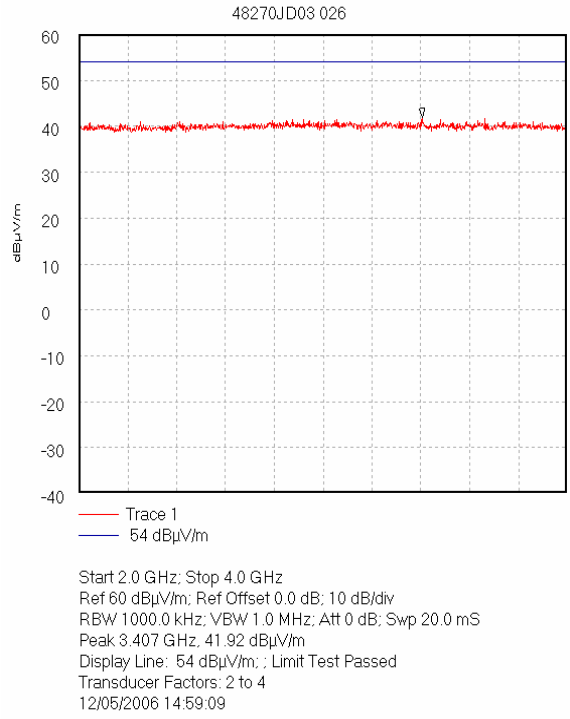
Electric Field Strength Measurements (Frequency Range: 1 to 12.5 GHz)

Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
1.380	Vertical	53.6	-12.4	41.2	54.0	12.8	Complied

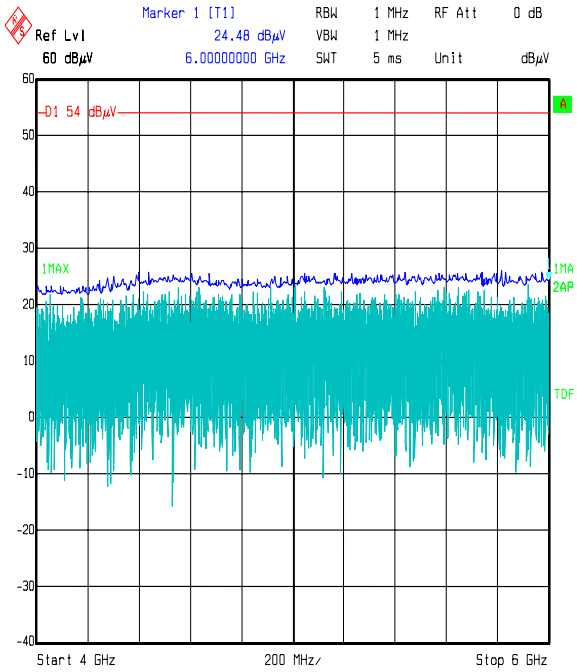
Note: No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit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



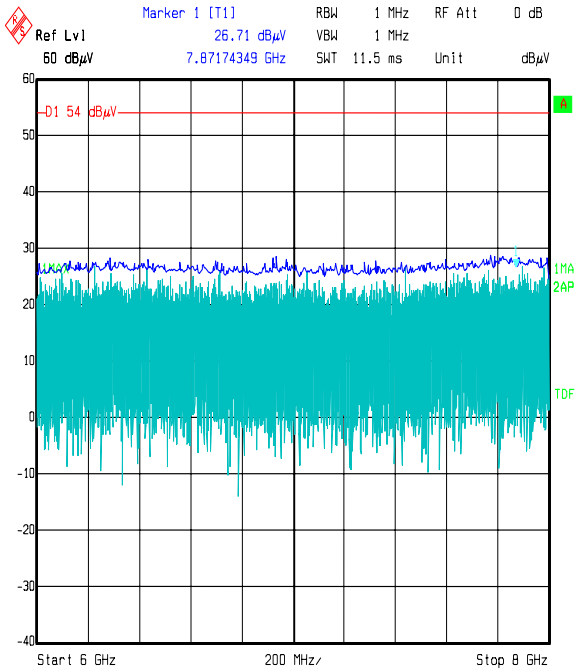


Test of: Satellite Tracking Of People LLC
BluTag4
To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

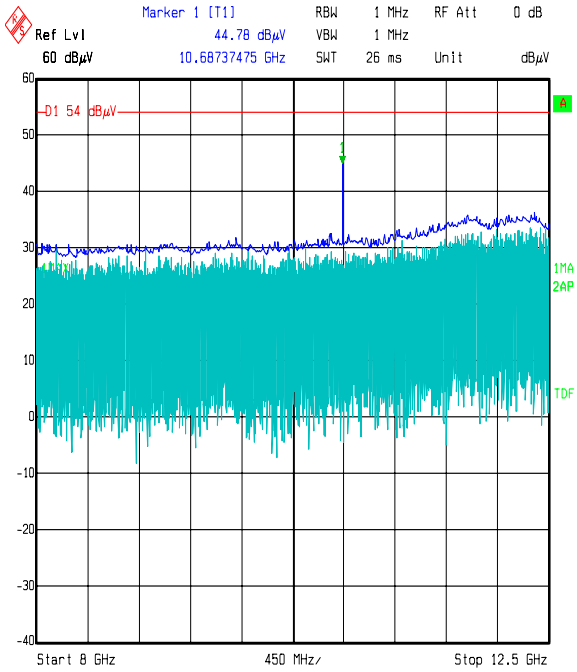
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



Title: Satellite Tracking People 48270
Comment A: FCC 24 Top,Mid, & Bot channel
Date: 14.MAY 2006 17:59:00



Title: Satellite Tracking People 48270
Comment A: FCC 24 Top,Mid, & Bot channel
Date: 14.MAY 2006 18:13:21



Title: Satellite Tracking People 4820
Comment A: FCC 24 Top,Mid, & Bot channel
Date: 14.MAY 2006 18:41:42

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

Note: The emission at 10.687 GHz shown in the plot above is an ambient which is not produced by and does not emanate from the EUT and has been ignored for the purposes of measurement.

7.3.4. 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	28.9	33.0	4.1	Complied
Middle	1879.8	Vert	26.6	33.0	6.4	Complied
Top	1909.8	Vert	25.5	33.0	7.5	Complied

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

The EUT was configured as for frequency Part 24 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	-110	1850.199890	1850.0	0. 199890	Complied
-20	-98	1850.199902	1850.0	0. 199902	Complied
-10	-112	1850.199888	1850.0	0.199888	Complied
0	-172	1850.199828	1850.0	0.199828	Complied
10	-112	1850.199888	1850.0	0.199888	Complied
20	-132	1850.199868	1850.0	0.199868	Complied
30	-142	1850.199858	1850.0	0.199858	Complied
40	-126	1850.199874	1850.0	0.199874	Complied
50	-152	1850.199848	1850.0	0.199848	Complied

Top Channel (1909.8 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	37	1909.800037	1910.0	0.199963	Complied
-20	4	1909.800004	1910.0	0.199996	Complied
-10	25	1909.800025	1910.0	0.199975	Complied
0	22	1909.800022	1910.0	0.199978	Complied
10	33	1909.800033	1910.0	0.199967	Complied
20	50	1909.800050	1910.0	0.199950	Complied
30	46	1909.800046	1910.0	0.199954	Complied
40	25	1909.800025	1910.0	0.199975	Complied
50	52	1909.800052	1910.0	0.199948	Complied

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

The EUT was configured as for frequency Part 24 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	-131	1850.199869	1850	0.199869	Complied
3.4	-98	1850.199902	1850	0.199902	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	50	1909.800050	1910	0.199950	Complied
3.4	62	1909.800062	1910	0.199938	Complied

7.3.7. Transmitter Occupied Bandwidth: Section 24.238

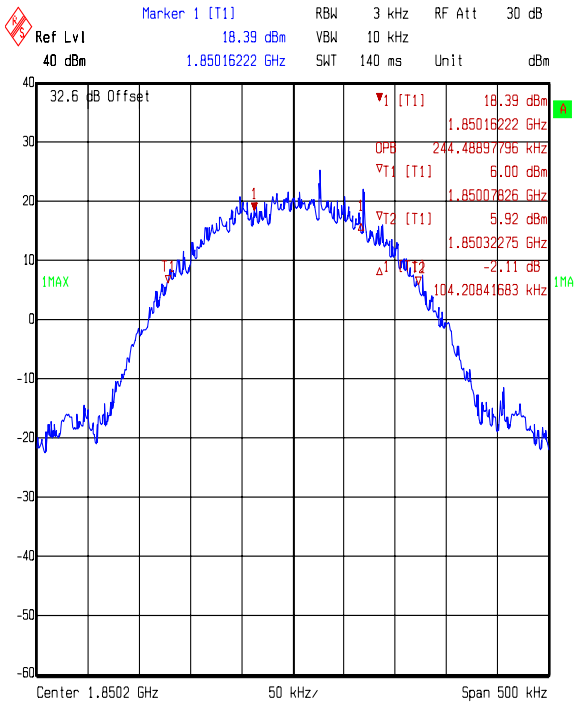
The EUT was configured as for occupied bandwidth measurements as described in Section 9 of this report.

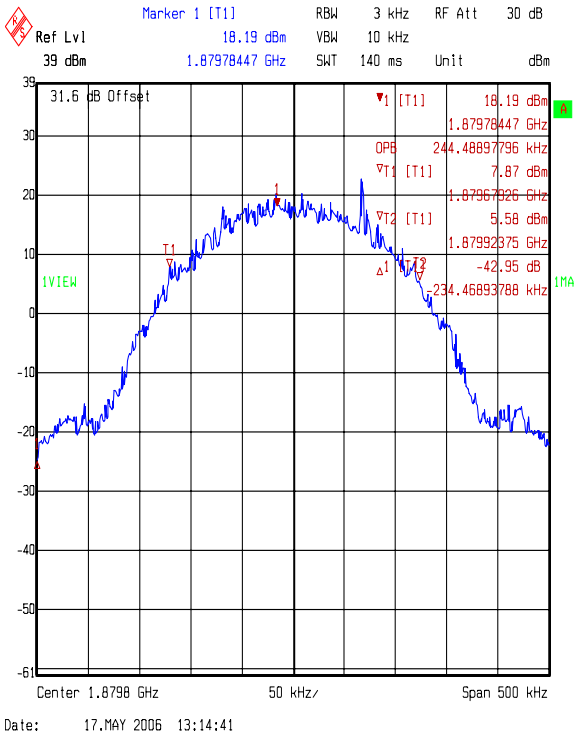
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

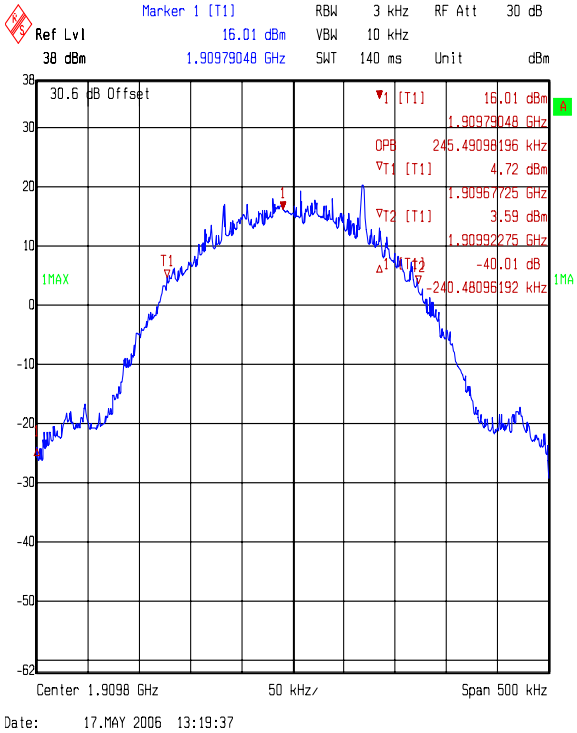
Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	3.0	10.0	244.490
Middle	1879.8	3.0	10.0	244.490
Top	1909.8	3.0	10.0	245.491

Transmitter Occupied Bandwidth: Section 24.238 (Continued)







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.

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

The EUT was configured as for transmitter radiated emission - Part 24 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
5550.6	-22.6	-13.0	9.6	Complied
4625.3	-31.6	-13.0	18.6	Complied
7400.8	-29.6	-13.0	16.6	Complied
9251.0	-33.8	-13.0	20.8	Complied
11101.2	-40.0	-13.0	27.0	Complied

Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5639.4	-22.3	-13.0	9.3	Complied
7519.2	-29.8	-13.0	16.8	Complied
11278.8	-32.0	-13.0	19.0	Complied
8459.9	-45.6	-13.0	32.6	Complied

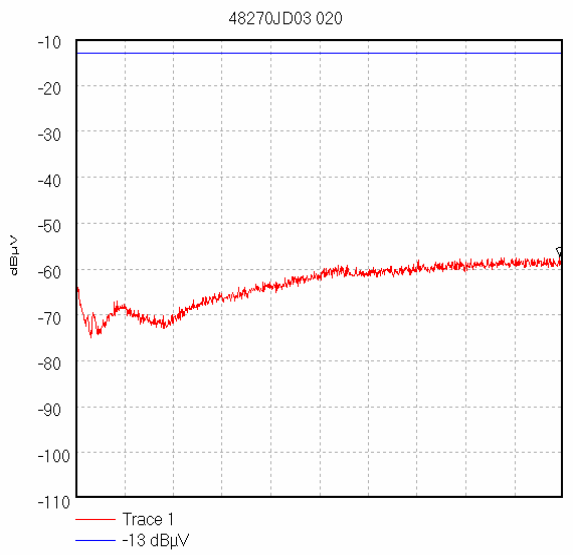
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5729.4	-24.4	-13.0	11.4	Complied
7639.2	-29.2	-13.0	16.2	Complied
9549.0	-43.0	-13.0	30.0	Complied
11458.8	-47.8	-13.0	34.8	Complied

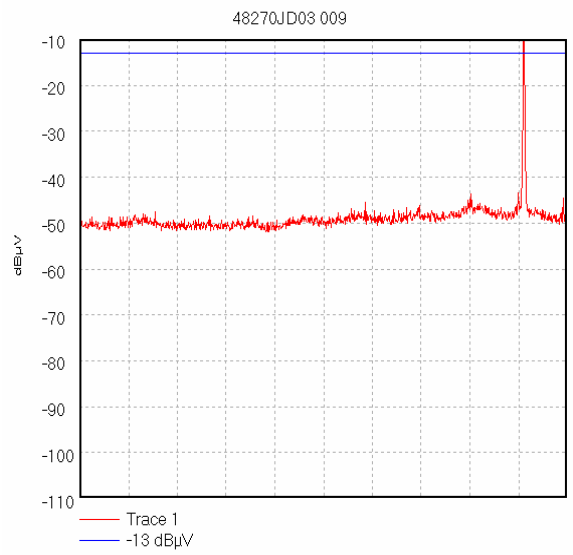
Note(s):

1. *The high emission found in plot 48270JD02 009 is in fact the fundament carrier at 1909.8 MHz. Therefore no measurements are required for spurious emissions.*

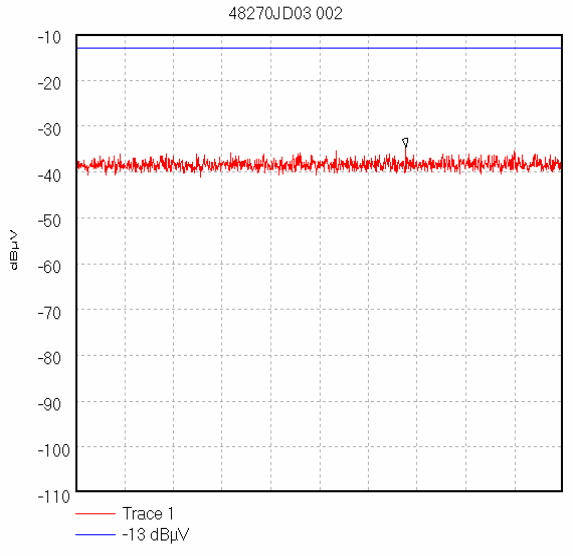
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



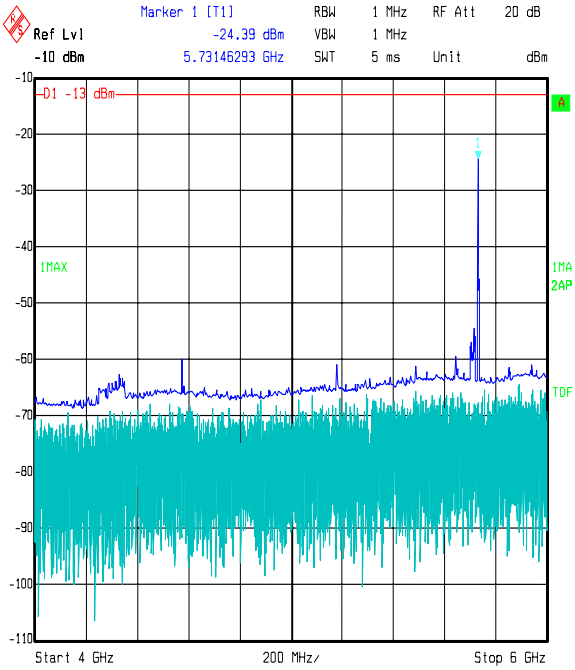
Start 30.0 MHz; Stop 1.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 620.0 mS
Peak 993.533333 MHz, -57.33 dBµV
Display Line: -13 dBµV; ; Limit Test Passed
Transducer Factors: A1037
12/05/2006 14:08:54



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.912222 GHz, -6.02 dBµV
Display Line: -13 dBµV; ; Limit Test Failed
Transducer Factors: 1 to 2
12/05/2006 11:48:02



Start 2.0 GHz; Stop 4.0 GHz
Ref -10 dBµV; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 3.355556 GHz, -34.73 dBµV
Display Line: -13 dBµV; ; Limit Test Passed
Transducer Factors: 2 to 4
12/05/2006 10:20:29

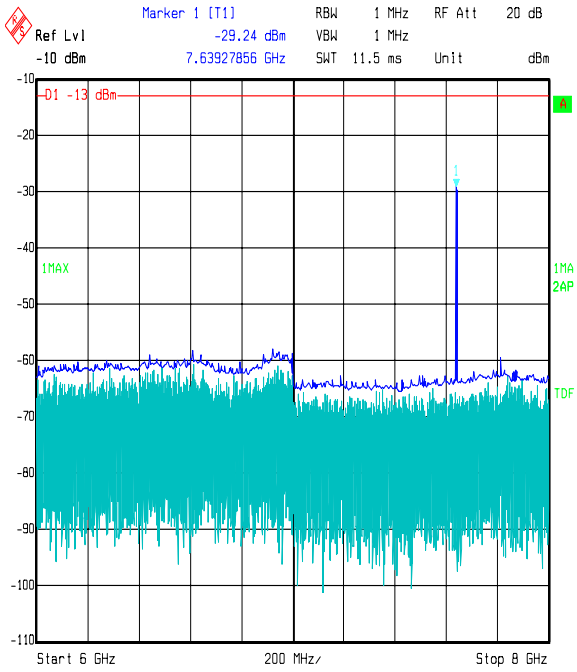


Title: Satellite Tracking People 48270
Comment A: FCC 24 Top channel
Date: 14.MAY 2006 14:43:35

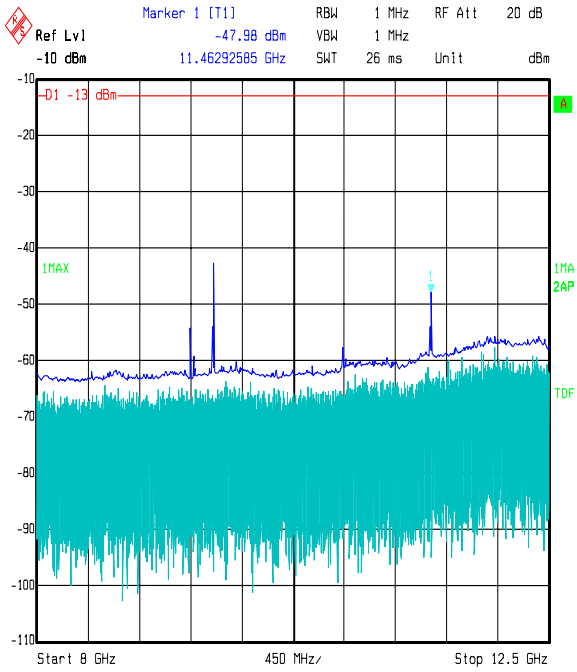
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Note: The emission at 1912.222 MHz shown in plot 48270JD03 009 is the wanted transmitter fundamental and, therefore, was ignored for the purpose of spurious emissions measurements.

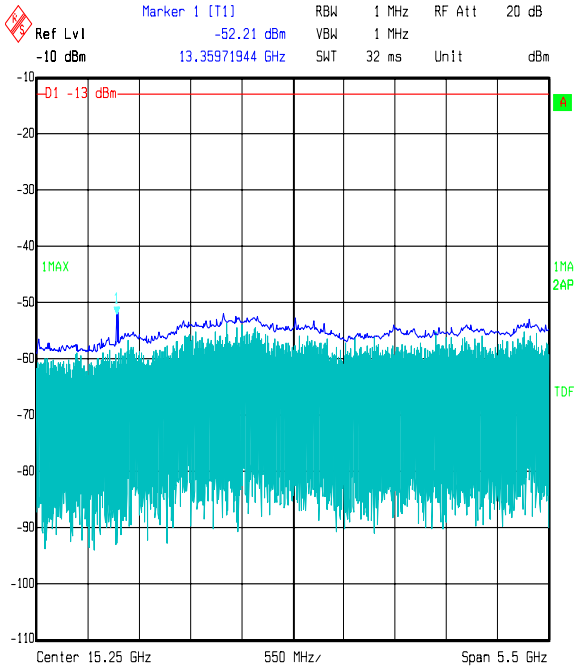
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



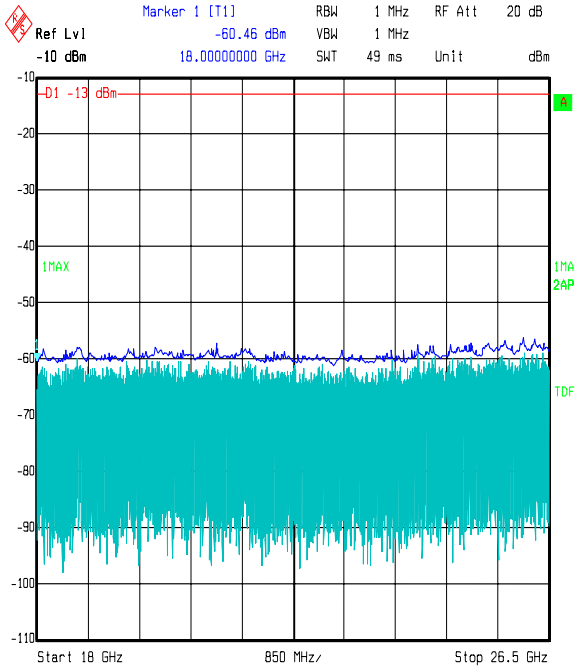
Title: Satelite Tracking People 48270
Comment A: FCC 24 Top channel
Date: 14.MAY 2006 15:14:51



Title: Satelite Tracking People 48270
Comment A: FCC 24 Top channel
Date: 14.MAY 2006 16:01:45



Title: Satelite Tracking People 48270
Comment A: FCC 24 Top channel
Date: 14.MAY 2006 17:01:57



Title: Satelite Tracking People 48270
Comment A: FCC 24 Top channel
Date: 14.MAY 2006 17:08:48

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

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

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

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	419.163	6	307.576
2	242.119	7	414.867
3	316.489	8	400.362
4	265.145	9	327.648
5	317.379	10	381.330
Total Peak Power:	3392.078 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	289.682	6	282.977
2	280.865	7	367.471
3	273.724	8	291.997
4	286.444	9	290.089
5	317.974	10	299.054
Total Peak Power:	2980.277 nW/MHz		

Results:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	3392.078	-24.7	-13.0	11.7	Complied
1912 to 1913	2980.277	-25.3	-13.0	12.3	Complied

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

The EUT was configured as for transmitter radiated emissions – Part 24 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.

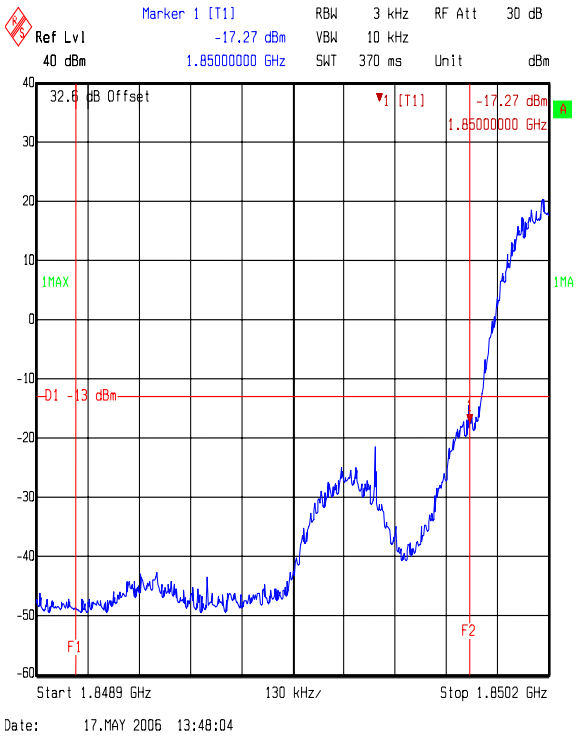
Results:

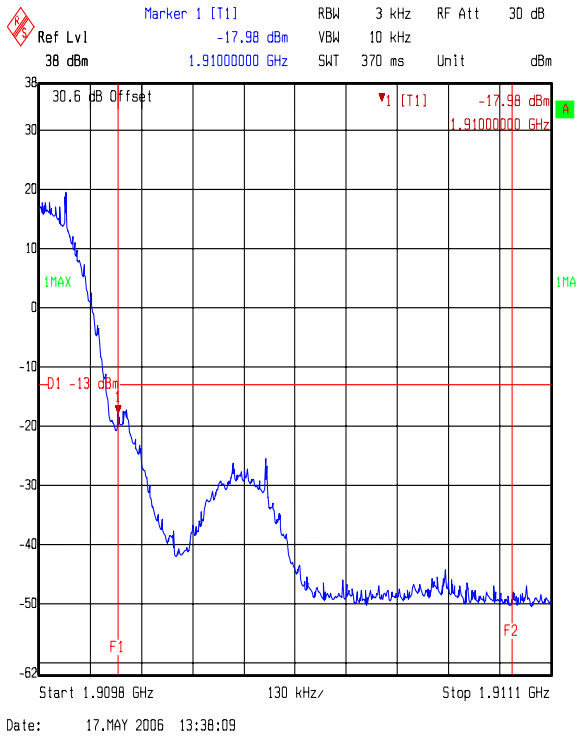
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-17.3	-13.0	4.3	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-18.0	-13.0	5.0	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%	±3.72 dB
Effective Radiated Power (ERP)	Not applicable	95%	±2.94 dB
Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	±2.94 dB
Frequency Stability	Not applicable	95%	±11.4 ppm
Occupied Bandwidth	824 to 849 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%	±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.

9. Measurement Methods

9.1. Effective Radiated Power (ERP) – FCC Part 22

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

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

The level of the ERP 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 ERP measurements a dipole antenna was used. 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 ERP was calculated as:-

ERP = Signal Generator Level - Cable Loss + Antenna Gain

Effective Radiated Power (ERP) (Continued)

Circumstances where the signal generator could not produce the desired power, substitutions were 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 ERP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated ERP to obtain the substituted EUT ERP.

Delta (dB) = EUT – SG

Where:

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual ERP is calculated as:

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

The EUT ERP is calculated as:

ERP EUT = ERP SG + Delta.

The test equipment settings for ERP measurements were as follows:

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

9.2. Effective Isotropic Radiated Power (EIRP) – FCC Part 24

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, substitutions were 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

9.3. Frequency Stability - FCC Part 2.1055

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.

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.

The frequency error measured was converted to an error in ppm using the following formula as defined by TIA_EIA_603A:-

$$\text{ppm error} = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

where MCF_{MHz} is the measured carrier frequency in MHz
ACF_{MHz} is the assigned carrier frequency in MHz

The measured ppm had to be less then the relevant limits in order to comply.

9.4. Frequency Stability – FCC Part 24

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 non-compliant. There is also a frequency graph presented offering the frequency variation around nominal frequency.

9.5. 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 thus 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.

9.6. AC Mains Conducted Emissions

AC Mains conducted emission 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 110V 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

9.7. Transmitter Radiated Emissions – FCC Part 22

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 radiated power was calculated as:-

EIRP/ERP = Signal Generator Level - Cable Loss + Antenna Gain

Transmitter Radiated Emissions (Continued)

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 -13dBm therefore, the limit line presented on the accompanying plots is set to -13dBm.

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

It should be noted that FCC Part 22.917 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.

9.8. Transmitter Radiated Emissions – FCC Part 24

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.

9.9. Receiver Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 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 20dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20dB 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 <1GHz	Final Measurements ≥1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	(120 kHz <1GHz) (1MHz ≥1GHz)	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.
A028	Horn Antenna	Eaton	91888-2	304
A031	Horn Antenna	Eaton	91889-2	557
A1037	Bilog Antenna	Chase EMC	CBL6112B	2413
A1142	Directional Coupler	Omni Spectra	2026-6004-10	026
A1534	Preamplifier 1-26.5 GHz	Hewlett Packard	8449B OPT H02	3008A00405
A254	Horn Antenna	Flann Microwave	14240-20	139
A255	Horn Antenna	Flann Microwave	16240-20	519
A259	Bilog Antenna	Chase	CBL6111	1513
A428	Horn Antenna	Flann	12240-20	134
A430	Horn Antenna	Flann	18240-20	425
A436	Horn Antenna	Flann	20240-20	330
A505	LISN	Rohde & Schwarz	ESH2-Z5	829535/003
A506	Log Periodic Antenna	Rohde & Schwarz	HL223	827154/12
L0802	Environmental Chamber	Gallenkamp Industrial	FE300.T.R75	6974
M028	Spectrum Analyser	Rohde & Schwarz	FSB	860 001/009 (RF), 860 161/007 (DU)
M1140	Radio Communications Analyser	Anritsu	MT8820A	6K0000647
M1269	True RMS Multimeter	Fluke	179	90250210
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016
M505/ M506	Spectrum Analyser	Rohde & Schwarz	ESBI	825316/010 (DU); 827060/004 (RF)
S0520	DC Power Supply	GW instek	GPC-3030	E835141
S201	Site 1	RFI	1	
S202	Site 2	RFI	2	S202-15011990

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

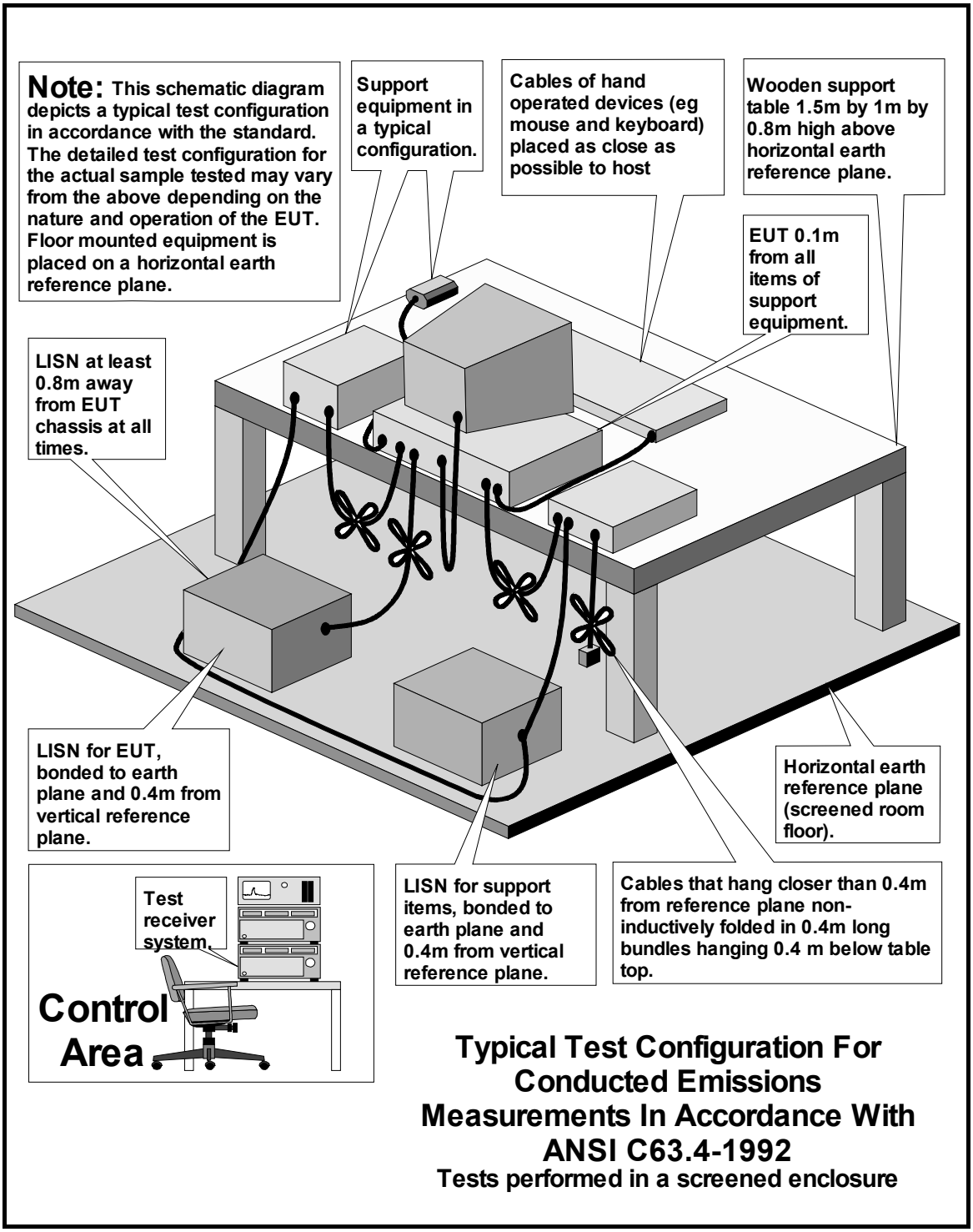
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

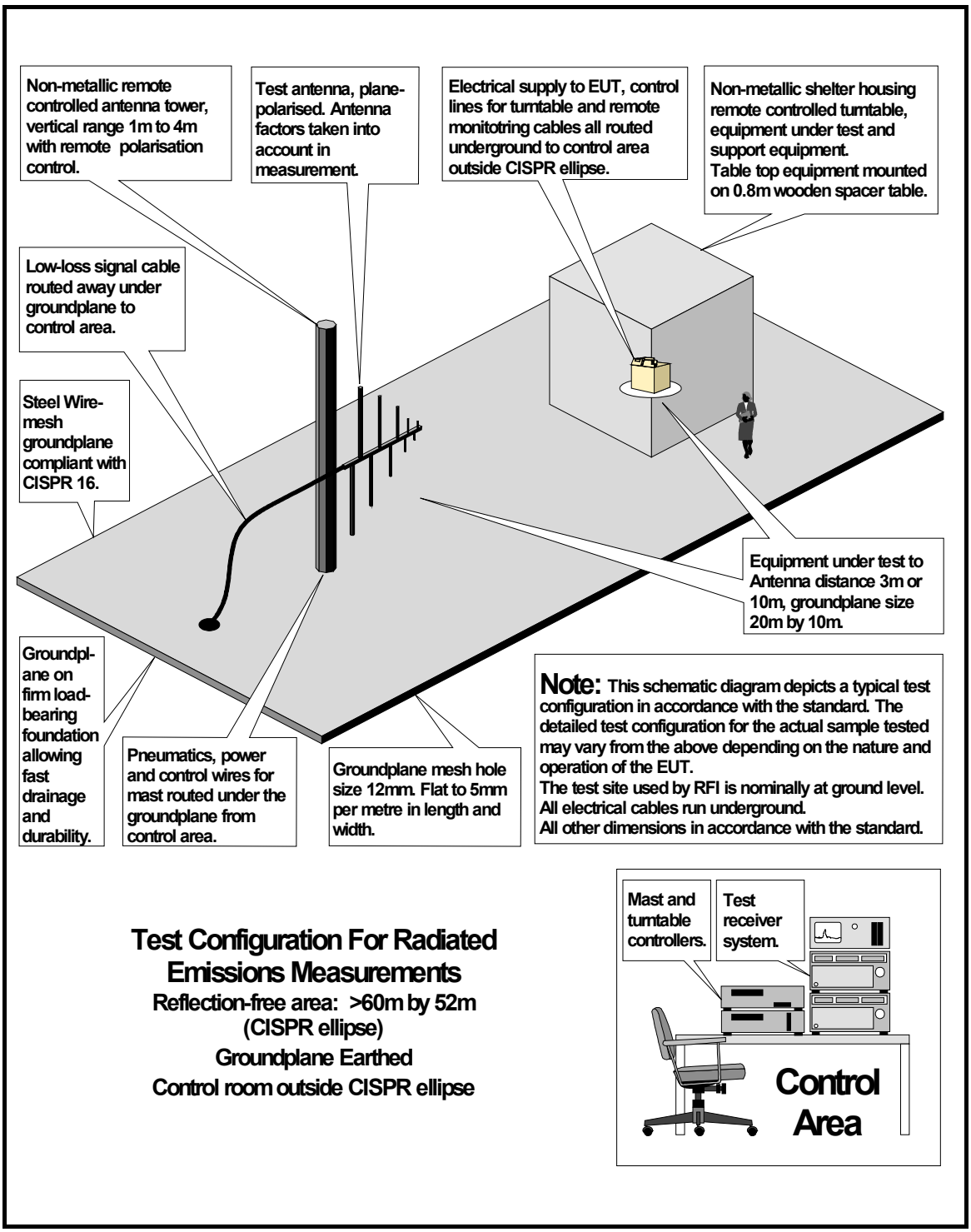
Drawing Reference Number	Title
DRG\48270JD03\EMICON	Test configuration for measurement of conducted emissions.
DRG\48270JD03\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Satellite Tracking Of People LLC
BluTag4
To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

DRG\48270JD03\EMICON



DRG\48270JD03\EMIRAD



Test Configuration For Radiated Emissions Measurements

Reflection-free area: >60m by 52m (CISPR ellipse)

Groundplane Earthed

Control room outside CISPR ellipse

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