TEST REPORT
FROM
RADIO FREQUENCY
INVESTIGATION LTD.

Test Of: Danger Inc.
Tina PDA

To: FCC Part 15 and 24

Test Report Serial No:
RFI/MPTB1/RP44807JD04A

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: **pp**	**Checked By:**
Tested By: **PP**	**Release Version No:** **PDF01**
Issue Date: 15 August 2003	**Test Dates: 24 July 2003 to 30 July 2003**

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1. Client Information

Company Name:	Danger, Inc
Address:	124 University Avenue Palo Alto CA 94031 USA
Contact Name:	Markus Wallgren

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:	Danger
Model Name or Number:	Hiptop, Colour, tri-band
Unique Type Identification:	Tina PDA
Serial Number:	001028060029940
FCC ID Number:	P5J-IGKYA
Country of Manufacture:	Malaysia
Date of Receipt:	24 July 2003

2.2. Description Of EUT

The equipment under test is a GSM 1900 MHz, GPRS, Class 8, Class B-enabled PDA; non-removable lithium ion battery; head set-capable; battery recharger-capable; camera-capable; colour LCD.

2.3. Modifications Incorporated In EUT

The EUT has not been modified from what is described by the Model Number and Unique Type Identification stated above.

2.4. Additional Information Related To Testing

Power Supply Requirement:	Internal battery supply of 4.2V		
Intended Operating Environment:	Within GSM network		
Equipment Category:	Mobile		
Type of Unit:	GSM 1900MHz, GPRS PDA		
Weight:	175g		
Dimensions:	11.3 x 6.7 x 2.7 cm		
Interface Ports:	Head set/camera (2.5mm jack) Power USB Downlink IR Port		
Highest Fundamental Frequency	1909.8		
Transmit Frequency Range	1850.0 MHz to 1910.0 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	1930.0 MHz to 1990.0 MHz		
Receive Channels Tested	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1930.2
	Middle	660	1960.0
	Top	810	1989.8
Maximum Power Output (EIRP)	29.6 dBm		

2.5. Support Equipment

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

Description:	Battery Recharger
Brand Name:	CUI Stack
Model Name or Number:	EPAS-101W-05
Serial Number:	Not applicable
Cable Length And Type:	2m 2 way
Connected to Port:	Input

Description:	Battery Recharger
Brand Name:	Motorola
Model Name or Number:	14-0021-xx
Serial Number:	012908-00
Cable Length And Type:	2m 2 way
Connected to Port:	Input

Description:	Battery Recharger
Brand Name:	Sino American
Model Name or Number:	SA110A-0520-C
Serial Number:	Not applicable
Cable Length And Type:	2 m 2 way
Connected to Port:	Input

Support Equipment (Continued)

Description:	Camera
Brand Name:	Kyocera
Model Name or Number:	8CF-BA
Serial Number:	Not applicable
Cable Length And Type:	Not applicable
Connected to Port:	Head set (jack plug socket)

Description:	Wall adapter (Battery recharger)
Brand Name:	CUI Stack
Model Name or Number:	DPS050200UPS-P7-SZ
Serial Number:	Not stated
Cable Length And Type:	190cm, 1.3mm power connector
Connected to Port:	Power Plug

Description:	Wall adapter (Battery recharger)
Brand Name:	Sino-American
Model Name or Number:	SA110A-0520-C
Serial Number:	Not stated
Cable Length And Type:	154 cm
Connected to Port:	Power Plug

Description:	Wall adapter (Battery recharger)
Brand Name:	AOI Electronics Headset MFG
Model Name or Number:	M-12-44
Serial Number:	Not stated
Cable Length And Type:	124 cm
Connected to Port:	Power Plug

Support Equipment (Continued)

Description:	USB Cable
Brand Name:	Total Tech, Ltd.
Model Name or Number:	TTL-MNIB-1.8m-BK
Serial Number:	Not stated
Cable Length And Type:	180 cm
Connected to Port:	USB downlink port

Description:	Cigarette Lighter Adapter
Brand Name:	Powerlab
Model Name or Number:	01758
Serial Number:	Not stated
Cable Length And Type:	190 cm
Connected to Port:	Power Plug

3. Test Specification, Methods And Procedures

3.1. Test Specifications

Reference:	FCC Part 15
Title:	Code of Federal Regulations, Part 25 (47CFR22) Personal Communication Services.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

Reference:	FCC Part 24 Subpart E: 2002 (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

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

ANSI C63.4 (2001)
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 Conditions

The EUT was tested in a normal laboratory environment.

During testing, the EUT was powered by an internal battery supply of 4.2V

5.2. Operating Modes

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

GSM and GPRS. (GSM only tested as deemed worse case; GPRS does not effect amplitude, modulation bandwidth or frequency accuracy).

5.3. Configuration And Peripherals

The EUT was tested in the following configuration:

In call maximum power: hands-free and USB cable connected (Determined worse case through investigation unless otherwise stated)

Standby (PDA Mode): Camera and USB cable connected. Running the Rock and Rocket application (Determined worse case through investigation).

AC conducted tests were performed with the AC charger connected and without any accessories. (This was deemed the worst-case configuration through investigation for this mode)

6. Summary Of Test Results

Range Of Measurements	Specification Reference	Mode of Operation	Port Type	Compliancy Status
Receiver AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2002 Section 15.107	Receive	AC Mains Input	Complied
Receiver Radiated Emissions	C.F.R. 47 FCC Part 15: 2002 Section 15.109	Receive	Antenna	Complied
Carrier Output Power	Part 2 of CFR 47: 2002 Section 2.1046(a)	Transmit	Antenna Terminals	Complied
Effective Isotropic Radiated Power (EIRP)	Part 24 of CFR 47, Section 24.232	Transmit	Antenna	Complied
Frequency Stability (Temperature Variation)	Part 24 of CFR 47, Section 24.235	Transmit	Antenna Terminals	Complied
Frequency Stability (Voltage Variation)	Part 24 of CFR 47, Section 24.235	Transmit	Antenna Terminals	Complied
Occupied Bandwidth	Part 24 of CFR 47, Section 24.238	Transmit	Antenna Terminals	Complied
Radiated Out of Band Emissions	Part 24 of CFR 47, Section 24.238	Transmit	Antenna	Complied
Radiated Band Edges	Part 2 of CFR 47, Section 2.1053	Transmit	Antenna	Complied
Conducted Out of Band Emissions	Part 24 of CFR 47, Section 24.238	Transmit	Antenna Terminals	Complied
Conducted Emissions at Block Edges	Part 24 of CFR 47, Section 24.238	Transmit	Antenna Terminals	Complied

6.1. Location Of Tests

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

7. Measurements, Examinations And Derived Results

7.1. General Comments

7.1.1. This section contains test results only.

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

8. Test Results

8.1. Receiver AC Conducted Spurious Emissions: Section 15.107

8.1.1. The EUT was configured as for AC conducted emissions measurements as described in Section 9 of this report.

8.1.2. Tests were performed to identify the maximum emissions levels on the AC mains line of the EUT.

Results: Quasi-Peak Detector Measurements On Live And Neutral Lines

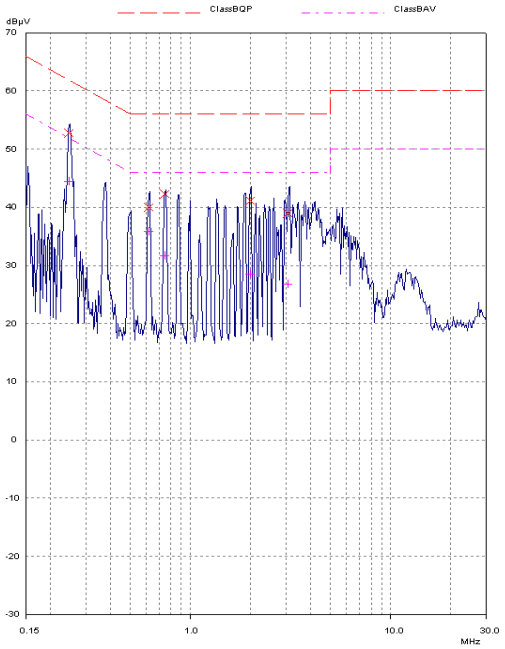
Frequency (MHz)	Line	Q-P Level (dBμV)	Q-P Limit (dBμV)	Margin (dB)	Result
0.24880	Neutral	52.60	61.80	9.20	Complied
3.11487	Neutral	41.02	56.00	14.98	Complied

Results: Average Detector Measurements On Live And Neutral Lines

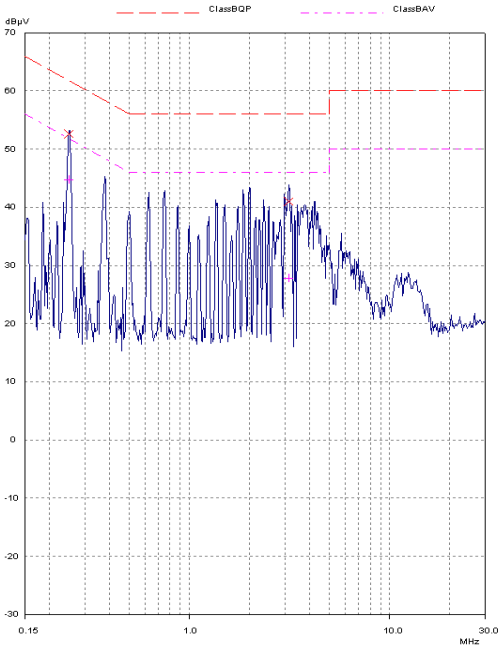
Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
0.24880	Neutral	44.71	51.80	7.09	Complied
3.11487	Neutral	27.84	46.00	18.18	Complied

Receiver AC Conducted Spurious Emissions Worst Case Configuration Verification

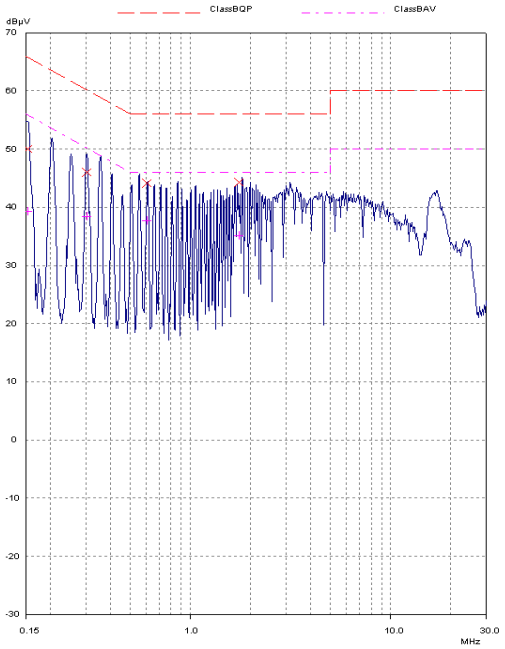
1900 PDA With CUI Charger and with Accessories



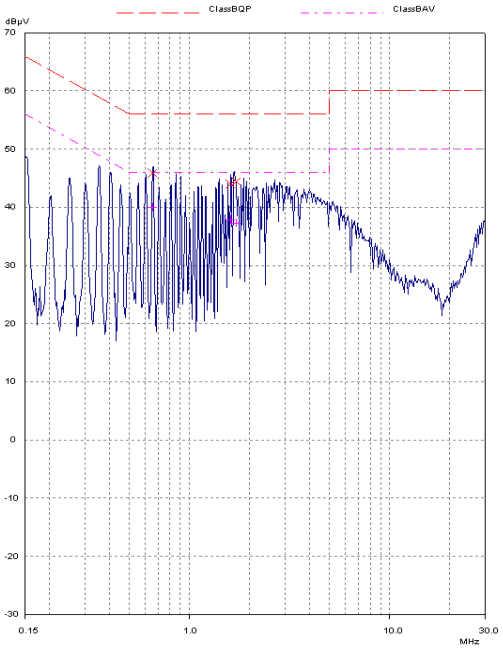
1900 PDA with CUI Charger but without Accessories



1900 PDA With Motorola Charger with Accessories

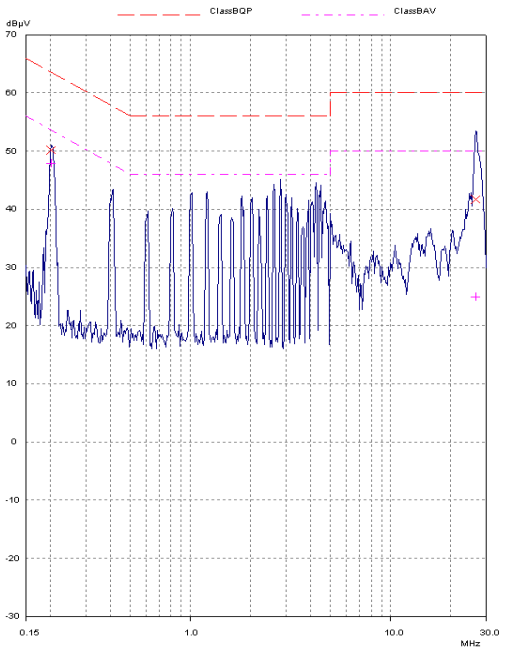


1900 PDA With Motorola Charger but without Accessories

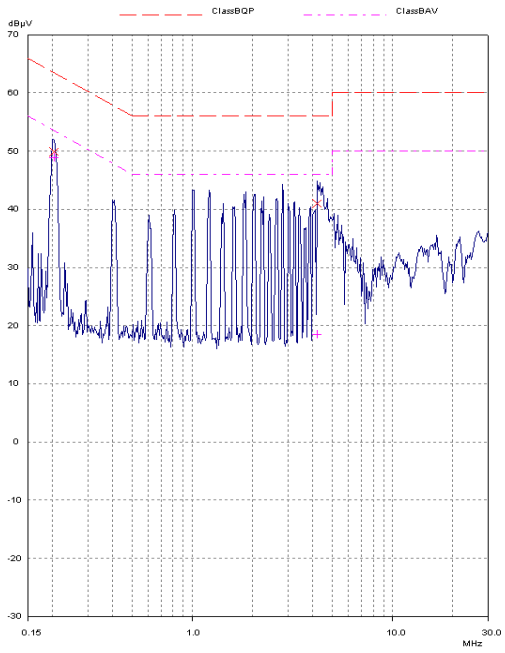


Receiver AC Conducted Spurious Emissions Worst Case Configuration Verification (Continued)

1900 PDA with Sino-American Charger with Accessories

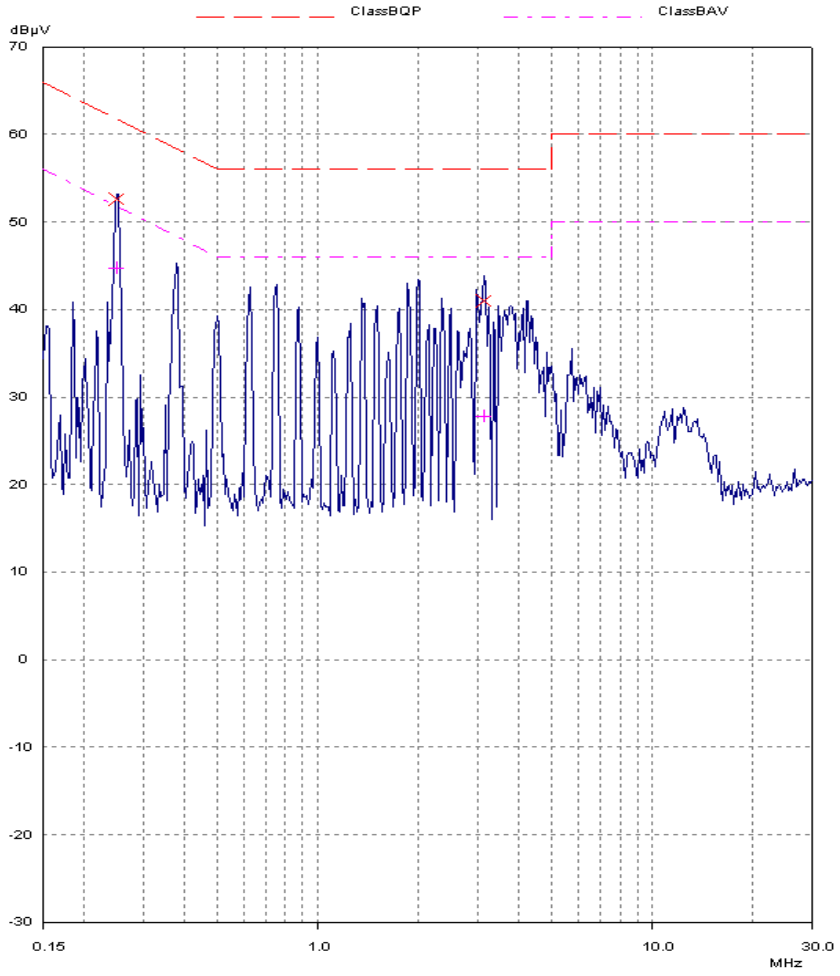


1900 PDA with Sino-American Charger without Accessories



Receiver AC Conducted Spurious Emissions Final Worst Case Configuration

1900 PDA CUI including Charger without Accessories



8.2. Receiver Radiated Emission: Section 15.109

8.2.1. The EUT was configured as for receiver-radiated emissions testing as described in Section 9 of this report.

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

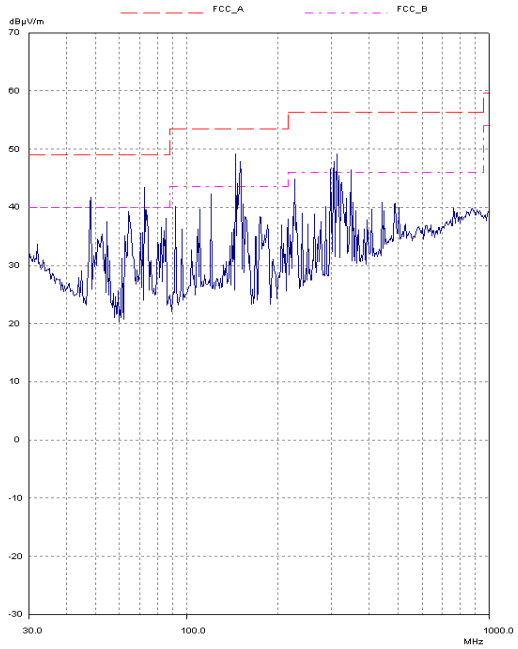
Result:

Frequency (MHz)	Polarity (H/V)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
47.8280	Vert.	18.2	40.0	21.8	Complied
71.2073	Vert.	13.5	40.0	26.5	Complied
143.9855	Vert.	14.5	43.5	29.0	Complied
149.8571	Vert.	14.1	43.5	29.4	Complied
305.8919	Horiz.	15.2	46.0	30.8	Complied
313.7171	Horiz.	14.8	46.0	31.2	Complied

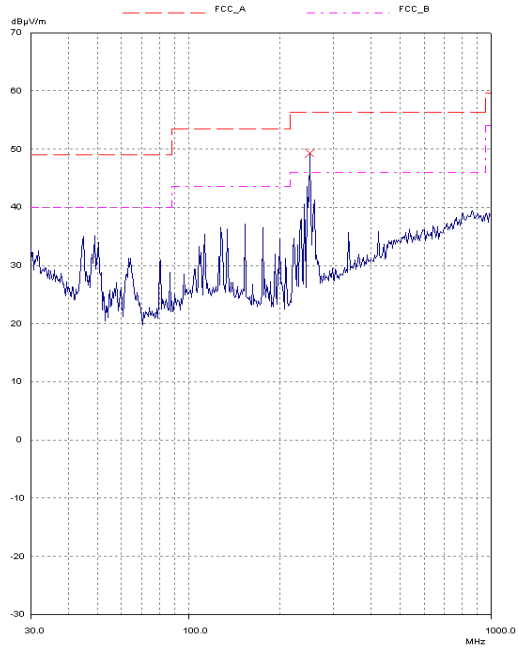
Test Of: Danger Inc.
Tina PDA
To: FCC Part 15 and 24

Receiver Radiated Emissions Worst Case Configuration Verification

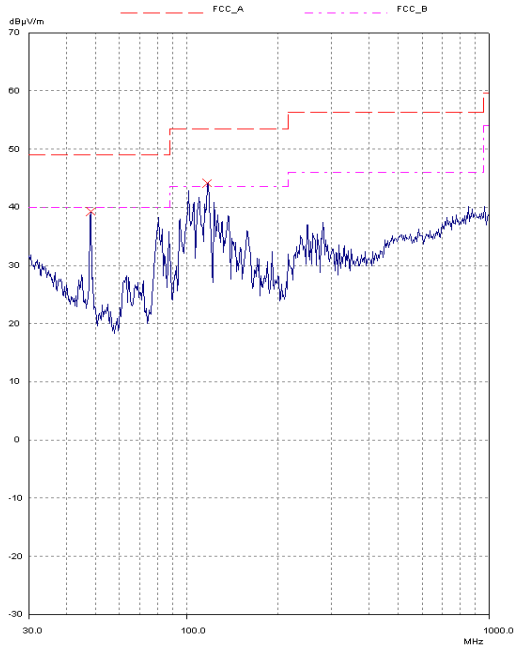
1900 PDA CUI with Accessories



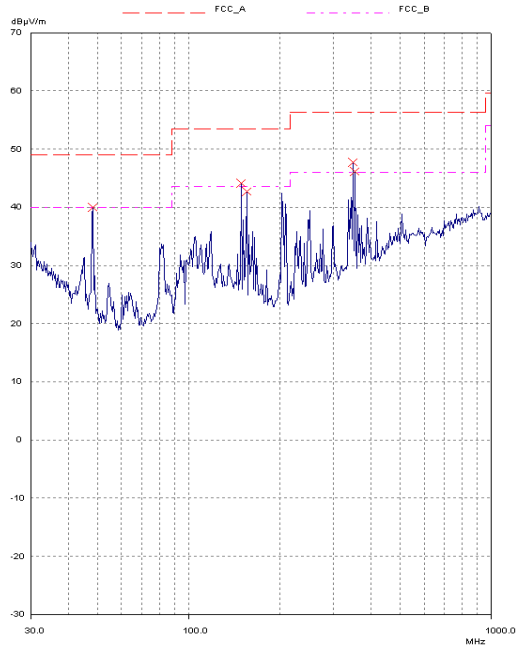
1900 PDA CUI without Accessories



1900 PDA Motorola with Accessories



1900 PDA Motorola without Accessories



Receiver Radiated Emission: Section 15.109 (Continued)

8.2.3. The EUT was configured as for receiver-radiated emissions testing as described in Section 9 of this report.

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

Results:

Highest Average Level:

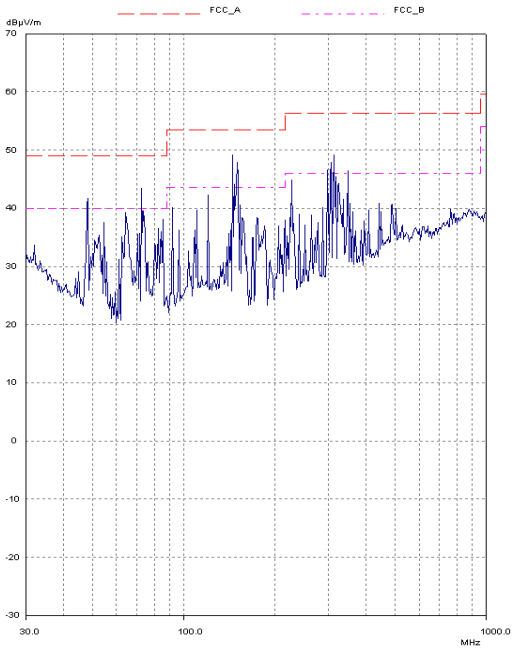
Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Result
9.984373	Vert.	2.81	18.1	2.3	23.21	54.0	30.79	Complied

Highest Peak Level:

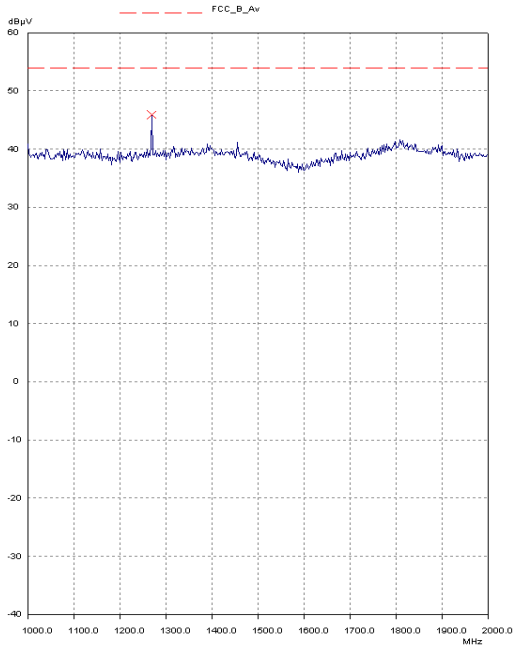
Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Result
9.984373	Vert.	15.96	18.1	2.3	36.36	74.0	37.64	Complied

Receiver Radiated Emissions Final Worst Case Configuration

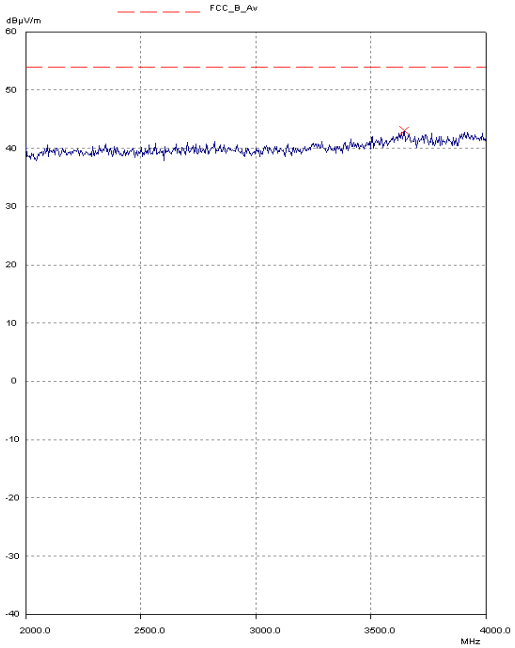
1900 PDA CUI with Accessories (30.0 MHz to 1.0 GHz)



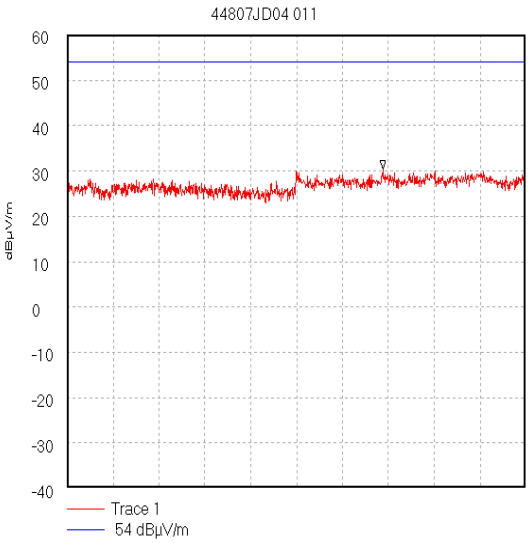
1900 PDA CUI with Accessories (1.0 GHz to 2.0 GHz)



1900 PDA CUI with Accessories (2.0 GHz to 4.0 GHz)



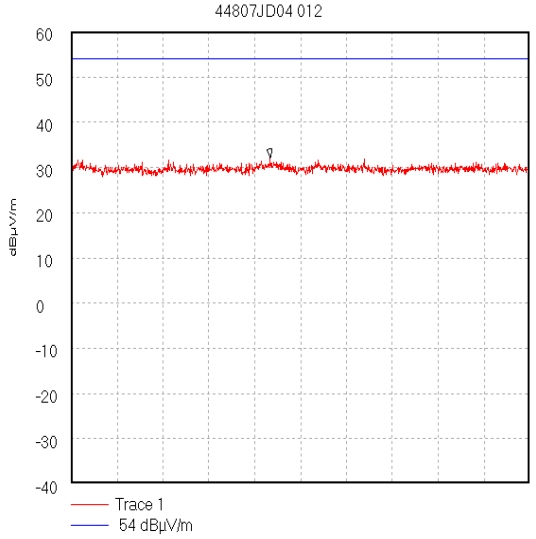
1900 PDA CUI with Accessories (4.0 GHz to 6.0 GHz)



Start 4.0 GHz; Stop 6.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 5.378 GHz, 30.35 dBµV/m
Display Line: 54 dBµV/m; ; Limit Test Passed
Transducer Factors: 4to6g_Horn
29/07/2003 16:00:00

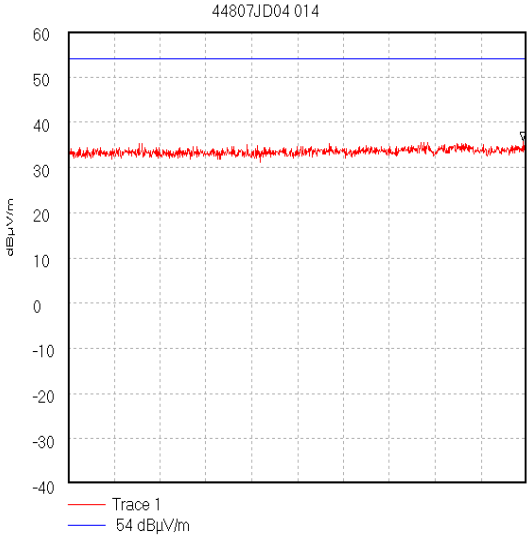
Receiver Radiated Emissions Final Worst Case Configuration

1900 PDA CUI with Accessories (6.0 GHz to 8.0 GHz)



Start 6.0 GHz; Stop 8.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 6.869 GHz, 32.1 dBµV/m
Display Line: 54 dBµV/m; ; Limit Test Passed
Transducer Factors: 6to8g_Horn
29/07/2003 16:03:52

1900 PDA CUI with Accessories (8.0 GHz to 10.0 GHz)



Start 8.0 GHz; Stop 10.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 9.984 GHz, 35.86 dBµV/m
Display Line: 54 dBµV/m; ; Limit Test Passed
Transducer Factors: 8to12G_Horn
29/07/2003 16:09:58

8.3. Transmitter Carrier Output Power: Section 2.1046(a)

8.3.1. The EUT was configured as for Effective Radiated Power as described in Section 9 of this report.

8.3.2. Tests were performed to identify the maximum Carrier Output Power.

Results:

Channel	Measured Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	28.3	33.0	4.7	Complied
Middle	1879.8	28.0	33.0	5.0	Complied
Top	1909.8	27.7	33.0	5.3	Complied

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

8.4.1. The EUT was configured as for Effective Isotropic Radiated Power as described in Section 9 of this report.

8.4.2. Tests were performed to identify the maximum Effective Isotropic Radiated Power (EIRP).

Results:

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter ERP (dBm)	Limit ERP (dBm)	Margin (dB)	Result
Bottom	1850.223	Vert.	28.2	33.0	4.8	Complied
Middle	1879.816	Vert.	28.3	33.0	4.7	Complied
Top	1909.814	Vert.	29.6	33.0	3.4	Complied

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

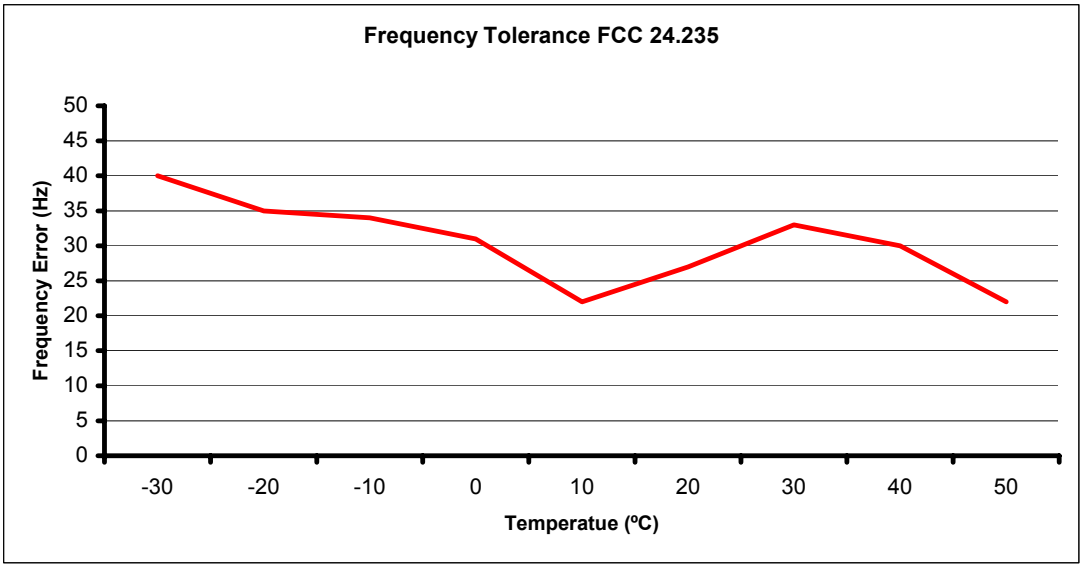
8.5.1. The EUT was configured as for frequency stability measurements as described in Section 9 of this report.

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

Results Bottom Channel (1850.2 MHz)

Temp (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Margin From Block Edge (MHz)	Result
-30	40	1850.200040	0.200040	Complied
-20	35	1850.200035	0.200035	Complied
-10	34	1850.200034	0.200034	Complied
0	31	1850.200031	0.200031	Complied
10	22	1850.200022	0.200022	Complied
20	27	1850.200027	0.200027	Complied
30	33	1850.200033	0.200033	Complied
40	30	1850.200030	0.200030	Complied
50	22	1850.200022	0.200022	Complied

Frequency Variation From 1850.2MHz

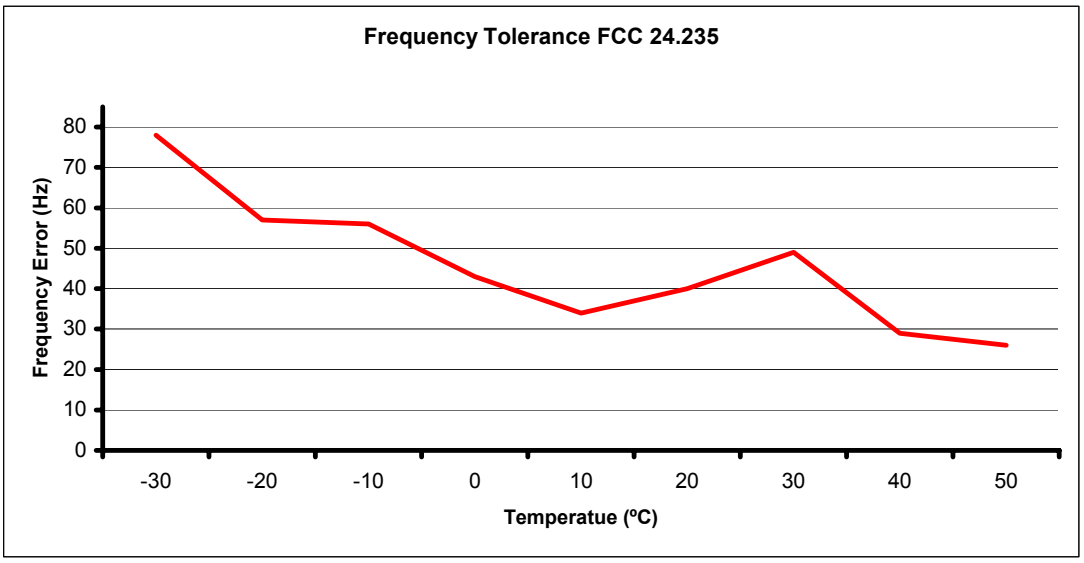


Transmitter Frequency Stability (Temperature Variation): Section 24.235 (continued)

Results Top Channel (1909.8 MHz)

Temp (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Margin From Block Edge (MHz)	Result
-30	78	1909.800078	0.199922	Complied
-20	57	1909.800057	0.199943	Complied
-10	56	1909.800056	0.199944	Complied
0	43	1909.800043	0.199957	Complied
10	34	1909.800034	0.199966	Complied
20	40	1909.80004	0.199960	Complied
30	49	1909.800049	0.199951	Complied
40	29	1909.800029	0.199971	Complied
50	26	1909.800026	0.199974	Complied

Frequency Variation From 1909.8MHz



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

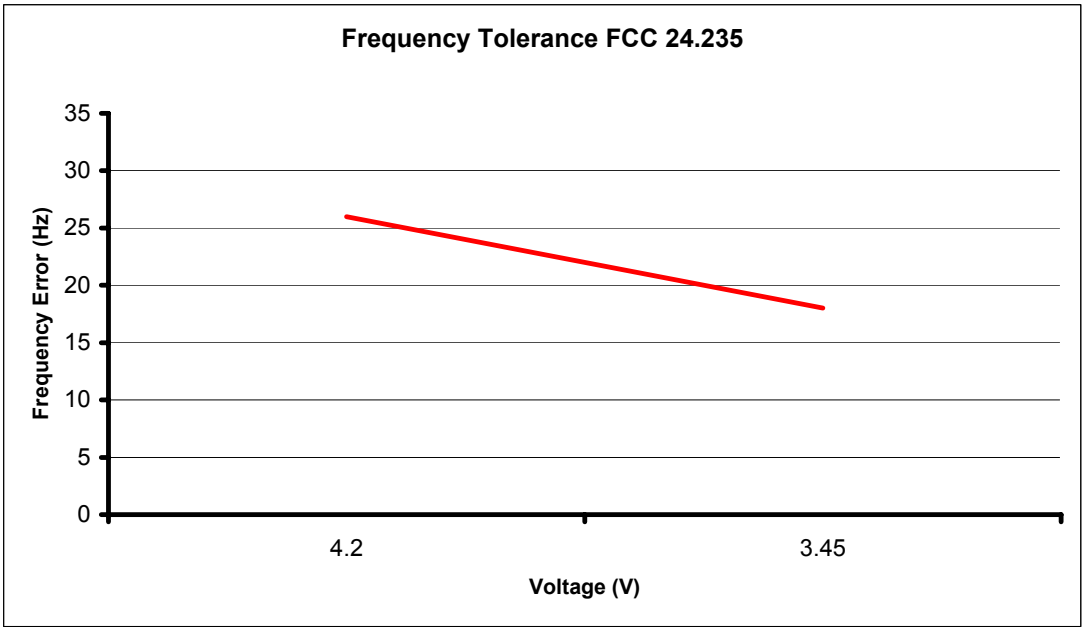
8.6.1. The EUT was configured as for frequency stability measurements as described in Section 11 of this report.

8.6.2. 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
4.2	26.0	1850.200026	1850.0	0.200026	Complied
3.45	18.0	1850.200018	1850.0	0.200018	Complied

Frequency Variation From 1850.2MHz

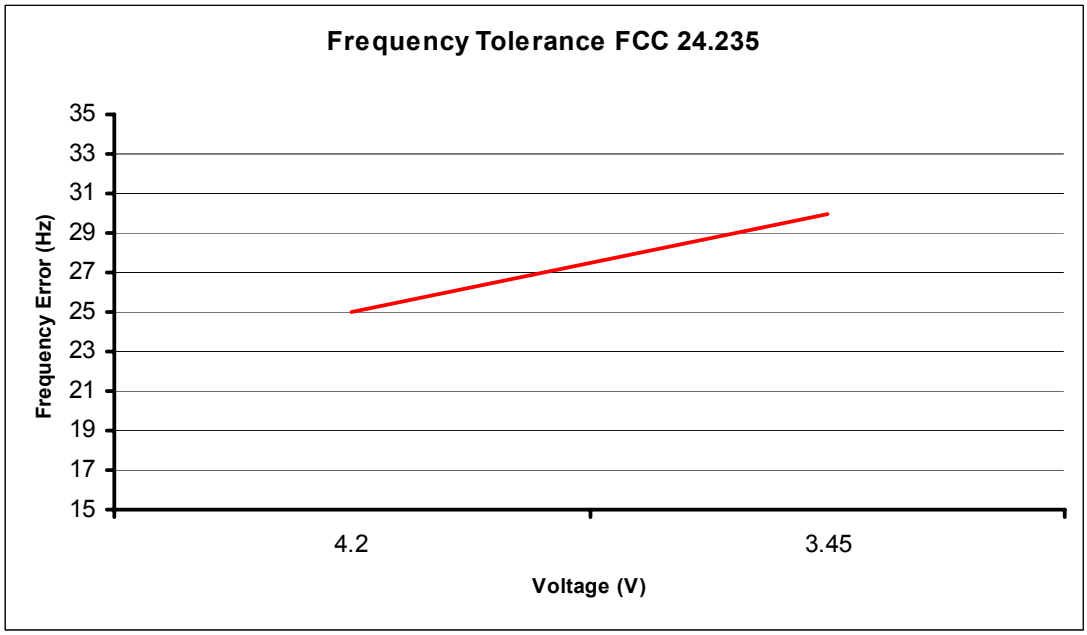


Transmitter Frequency Stability (Voltage Variation): Section 24.235 (Continued)

Results Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
4.2	25.0	1909.800025	1910.0	0.199975	Complied
3.45	30.0	1909.800030	1910.0	0.199970	Complied

Frequency Variation From 1909.8MHz



8.7. Transmitter Occupied Bandwidth: Section 24.238

8.7.1. The EUT was configured as for Occupied Bandwidth measurements as described in Section 9 of this report.

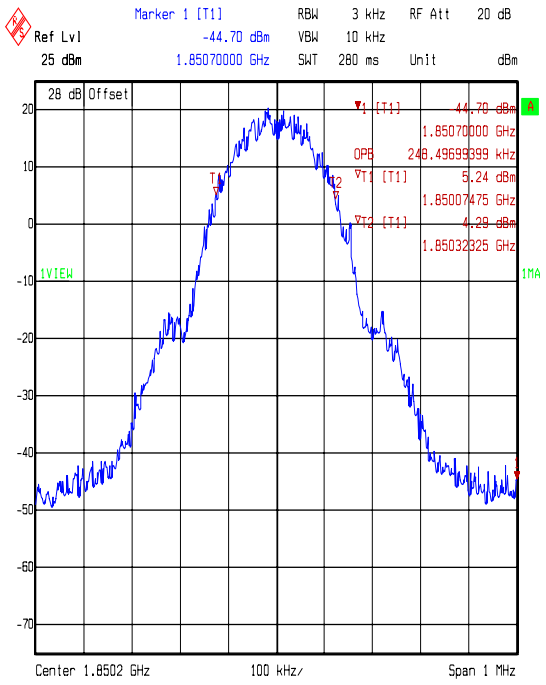
8.7.2. Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	3.0	10.0	248.497
Middle	1879.8	3.0	10.0	246.493
Top	1909.8	3.0	10.0	244.489

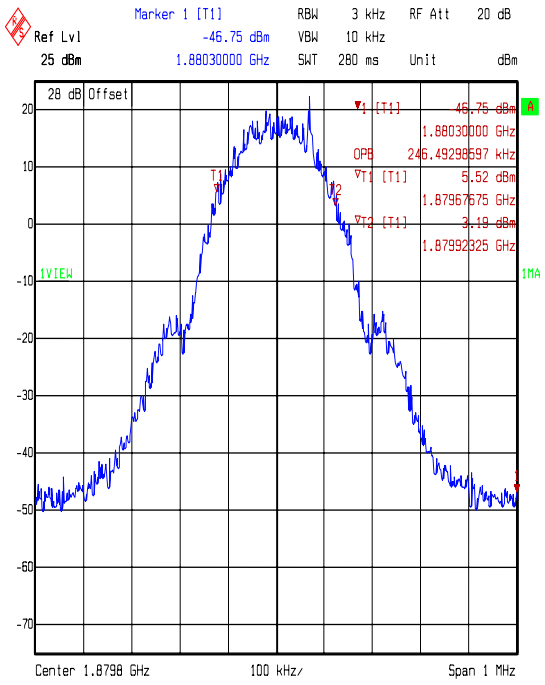
Transmitter Occupied Bandwidth

Bottom Channel



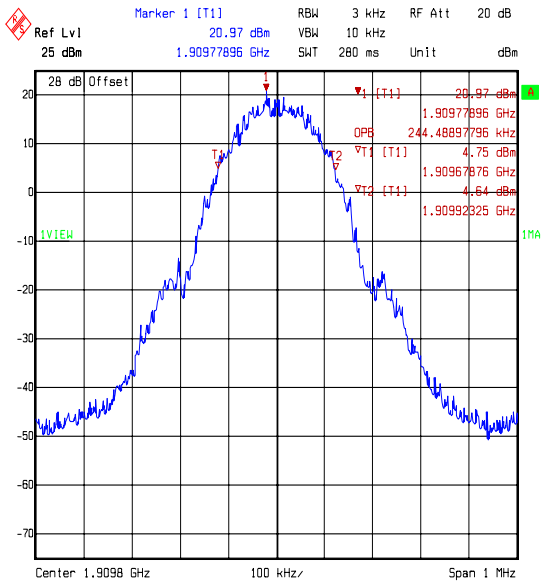
Title: Testing for Danger Inc. 44807JD04. EUT:Tina PDA.
Comment A: Transmitter Occupied Power Bandwidth. Tx on Bottom Channel. FCC 24.238.
Date: 1.AUG.2003 8:41:14

Middle Channel



Title: Testing for Danger Inc. 44807JD04. EUT:Tina PDA.
Comment A: Transmitter Occupied Power Bandwidth. Tx on Middle Channel. FCC 24.238.
Date: 1.AUG.2003 8:40:07

Top Channel



Title: Testing for Danger Inc. 44807JD04. EUT:Tina PDA.
Comment A: Transmitter Occupied Power Bandwidth. Tx on Top Channel. FCC 24.238.
Date: 1.AUG.2003 8:34:45

8.8. Transmitter Radiated Out of Band Emissions: Section 24.238

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

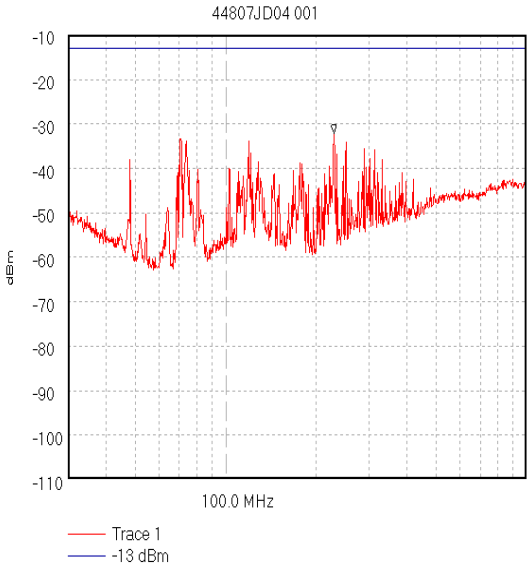
8.8.2. Tests were performed to identify the maximum transmitter radiated emission levels.

Result:

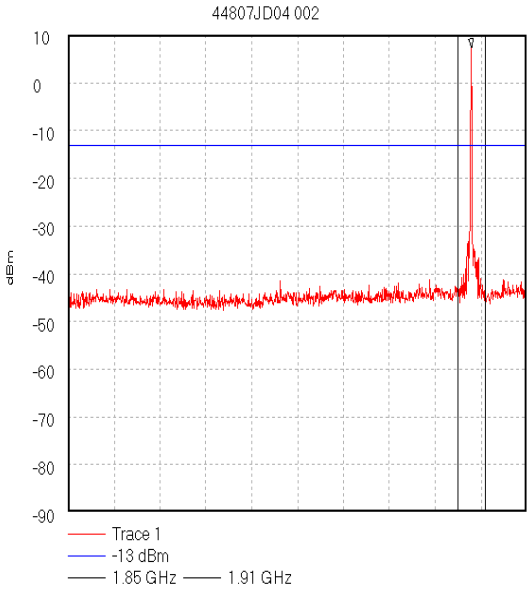
Channel	Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	7.400666	-29.83	-13.0	16.83	Complied
Middle	7.518916	-31.94	-13.0	18.94	Complied
Top	7.639477	-25.97	-13.0	12.97	Complied

Test Of: Danger Inc.
Tina PDA
To: FCC Part 15 and 24

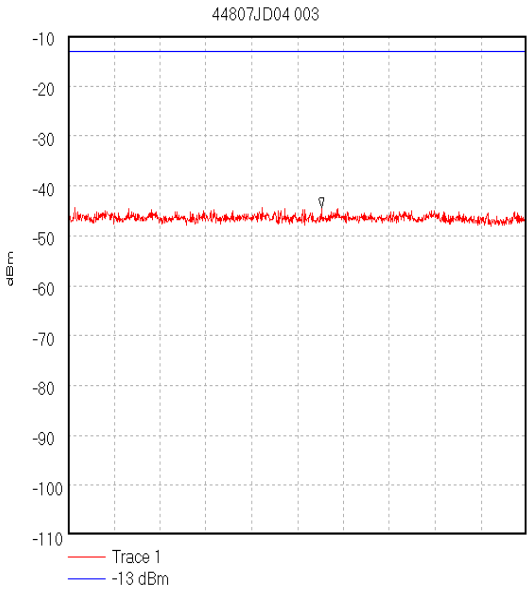
Transmitter Out of Band Emissions Middle Channel



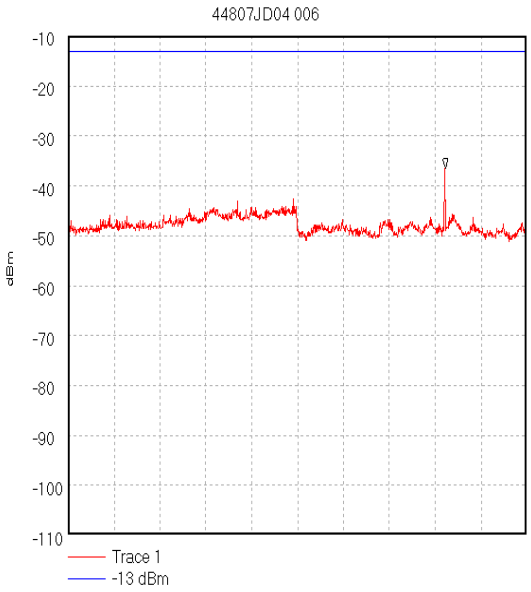
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 20.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 10 dB; Swp 380.0 mS
Peak 229.293 MHz, -32.06 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A1037
7/24/2003 2:58:55 PM



Start 1.0 GHz; Stop 2.0 GHz
Ref 10 dBm; Ref Offset 30.2 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 1.879 GHz, 7.36 dBm
Display Line: -13 dBm; ; Limit Test Failed
7/24/2003 3:09:16 PM

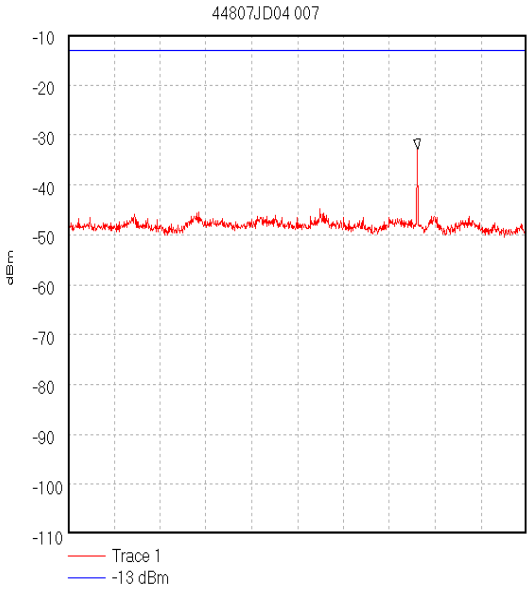


Start 2.0 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 37.7 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 3.104 GHz, -44.33 dBm
Display Line: -13 dBm; ; Limit Test Passed
7/24/2003 3:13:56 PM

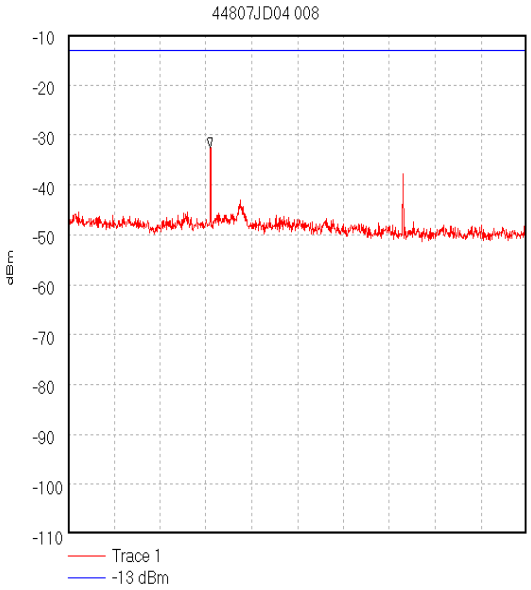


Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 34.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 5.644 GHz, -36.46 dBm
Display Line: -13 dBm;
29/07/2003 15:03:42

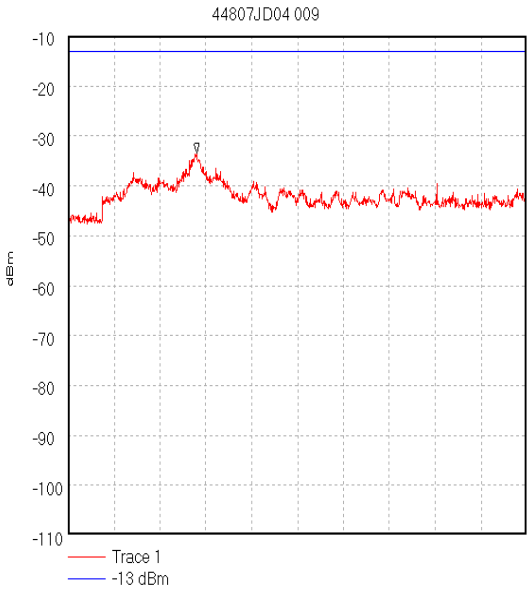
Transmitter Radiated Out of Band Emissions Middle Channel



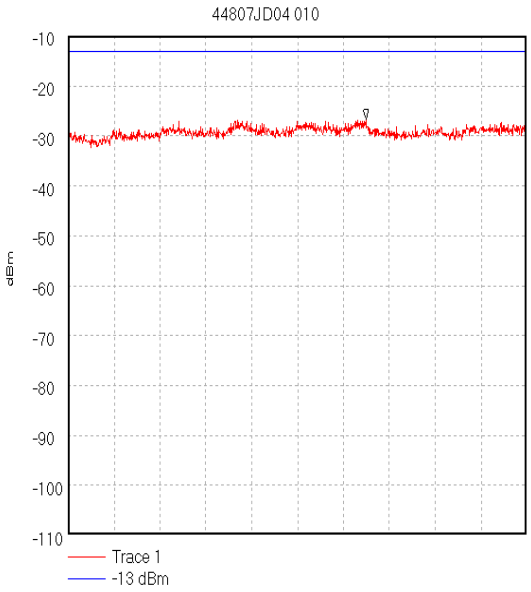
Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 36.2 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 7.524 GHz, -32.85 dBm
Display Line: -13 dBm;
29/07/2003 15:07:45



Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 39.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 9.395 GHz, -32.54 dBm
Display Line: -13 dBm;
29/07/2003 15:43:47



Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 41.3 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 14.04 GHz, -33.36 dBm
Display Line: -13 dBm;
29/07/2003 15:48:35



Start 18.0 GHz; Stop 20.0 GHz
Ref -10 dBm; Ref Offset 54.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 19.3 GHz, -26.6 dBm
Display Line: -13 dBm;
29/07/2003 15:51:55

8.9. Transmitter Radiated Emissions At Band Edges: Section 24.238

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

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

Results:

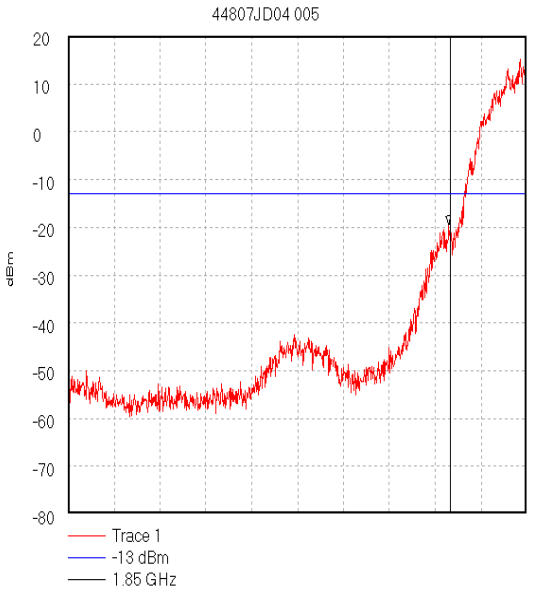
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1849.996	-19.51	-13.0	6.51	Complied

Top Band Edge

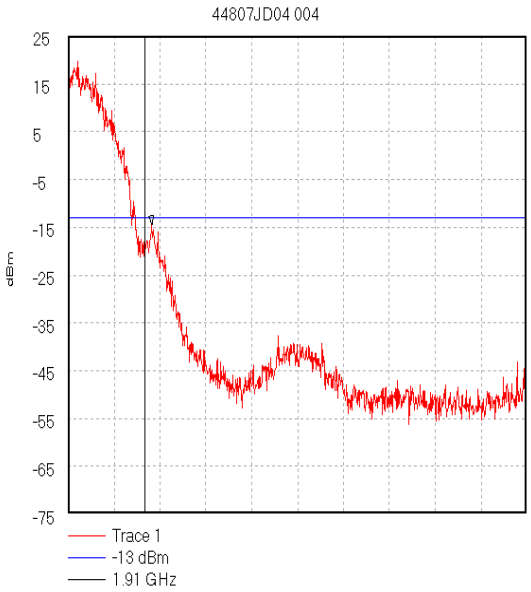
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910.019	-14.51	-13.0	-1.51	Complied

Bottom Channel



Start 1.849 GHz; Stop 1.8502 GHz
Ref 20 dBm; Ref Offset 25.2 dB; 10 dB/div
RBW 3.0 kHz; VBW 10.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.849996 GHz, -19.51 dBm
Display Line: -13 dBm;
29/07/2003 14:57:35

Top Channel



Start 1.9098 GHz; Stop 1.911 GHz
Ref 25 dBm; Ref Offset 25.2 dB; 10 dB/div
RBW 3.0 kHz; VBW 10.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.910019 GHz, -14.51 dBm
Display Line: -13 dBm;
29/07/2003 14:55:15

8.10. Transmitter Conducted Out of Band Emissions: Section 24.238

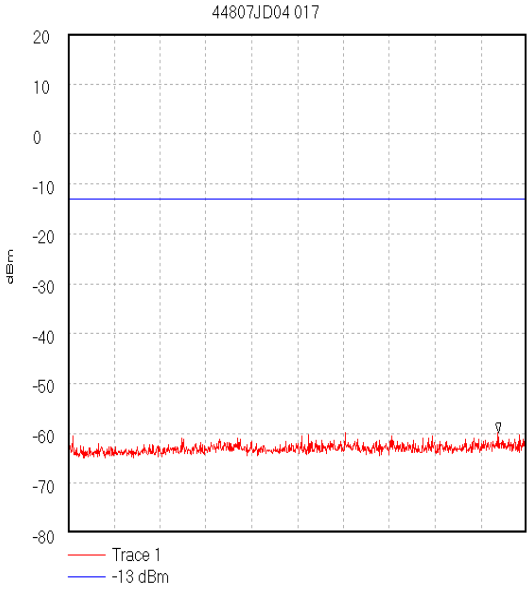
8.10.1. The EUT was configured as for conducted emission measurements as described in Section 9 of this report.

Results:

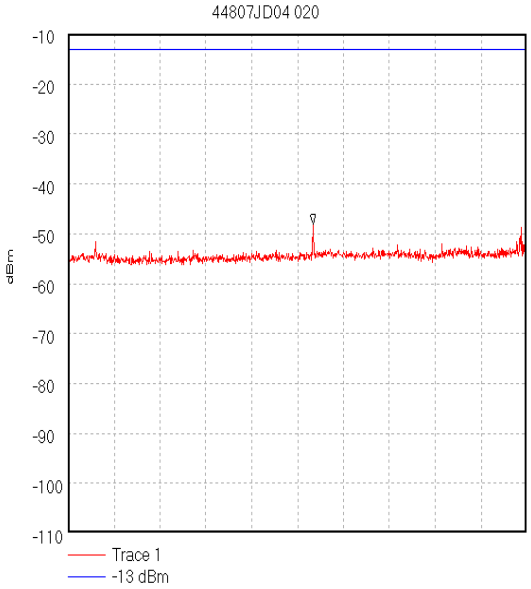
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3700.405	-31.0	-13.0	18.00	Complied
3759.644	-30.1	-13.0	17.1	Complied
3819.705	-34.8	-13.0	21.8	Complied

Test Of: Danger Inc.
Tina PDA
To: FCC Part 15 and 24

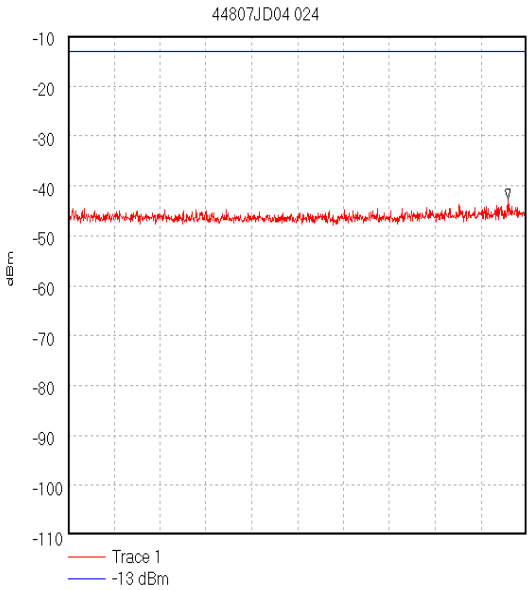
Transmitter Conducted Out of Band Emissions – Middle Channel



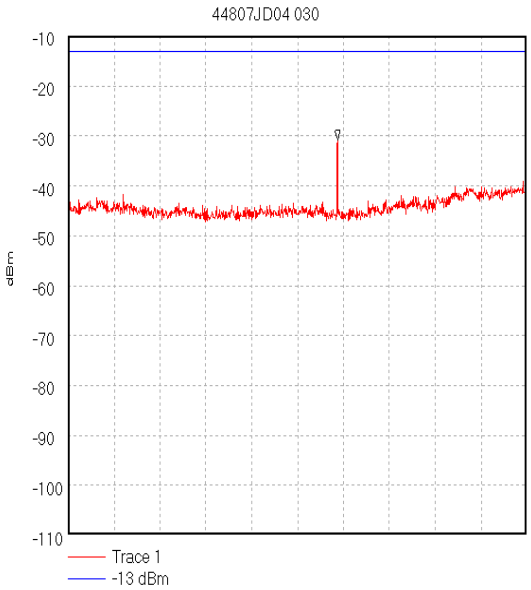
Start 9.0 kHz; Stop 1.0 GHz
Ref 20 dBm; Ref Offset 27.5 dB; 10 dB/div
RBW 10.0 kHz; VBW 10.0 kHz; Att 15 dB; Swp 30.0 S
Peak 937.778 MHz, -59.86 dBm
Display Line: -13 dBm;
30/07/2003 14:24:30



Start 1.0 GHz; Stop 1.85 GHz
Ref -10 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.454 GHz, -48.01 dBm
Display Line: -13 dBm;
30/07/2003 14:29:32



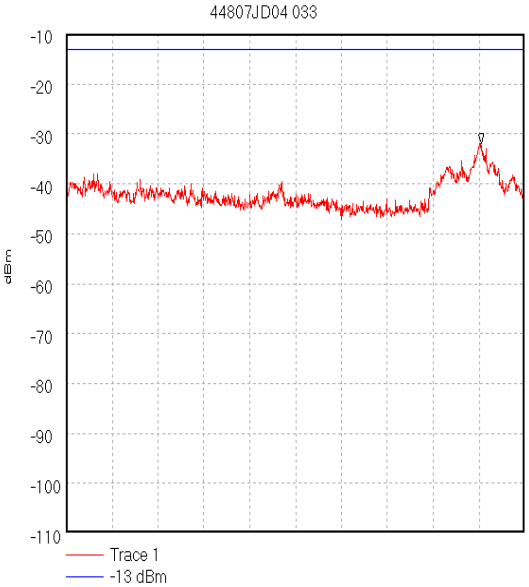
Start 1.91 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 1.9963 GHz, -42.65 dBm
Display Line: -13 dBm;
30/07/2003 14:37:30



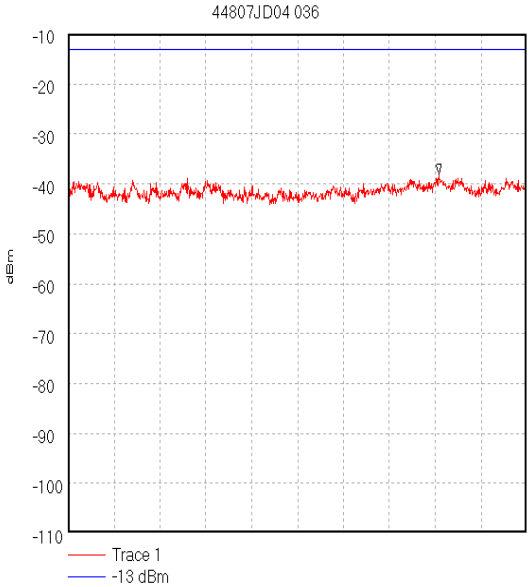
Start 2.0 GHz; Stop 5.0 GHz
Ref -10 dBm; Ref Offset 29.4 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 20.0 mS
Peak 3.763333 GHz, -30.79 dBm
Display Line: -13 dBm;
30/07/2003 15:25:05

Test Of: Danger Inc.
Tina PDA
To: FCC Part 15 and 24

Transmitter Conducted Out of Band Emissions – Middle Channel (Continued)



Start 5.0 GHz; Stop 15.0 GHz
Ref -10 dBm; Ref Offset 34.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 40.0 mS
Peak 14.044444 GHz, -31.94 dBm
Display Line: -13 dBm;
30/07/2003 15:36:38



Start 15.0 GHz; Stop 20.0 GHz
Ref -10 dBm; Ref Offset 43.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 19.044444 GHz, -38.03 dBm
Display Line: -13 dBm;
30/07/2003 15:39:39

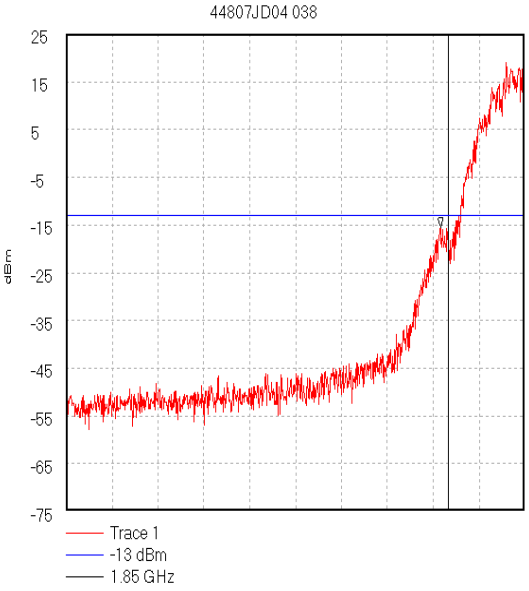
8.11. Transmitter Conducted Emissions (Block Edges): Section 24.238

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

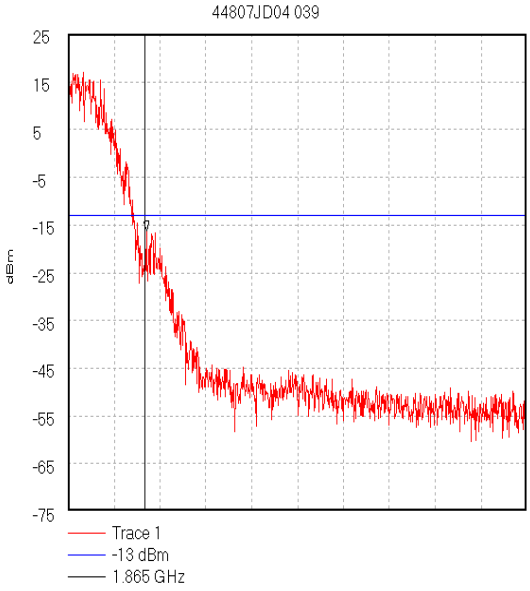
Results:

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.980	-15.47	-13.0	2.47	Complied
1865.005	-16.16	-13.0	3.16	Complied
1864.997	-16.72	-13.0	3.72	Complied
1870.019	-15.52	-13.0	2.52	Complied
1869.999	-15.42	-13.0	2.42	Complied
1885.001	-15.32	-13.0	2.32	Complied
1884.976	-16.74	-13.0	3.74	Complied
1890.024	-15.60	-13.0	2.60	Complied
1889.983	-16.49	-13.0	3.49	Complied
1895.020	-15.22	-13.0	2.22	Complied
1894.981	-16.97	-13.0	3.97	Complied
1910.017	-15.90	-13.0	2.90	Complied

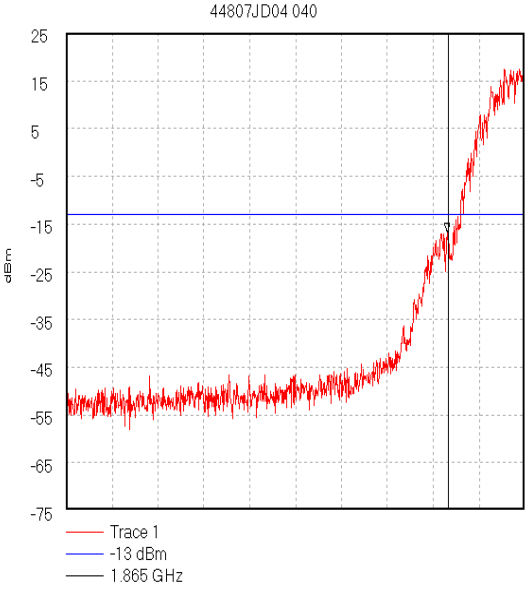
Transmitter Conducted Emissions (Block Edges)



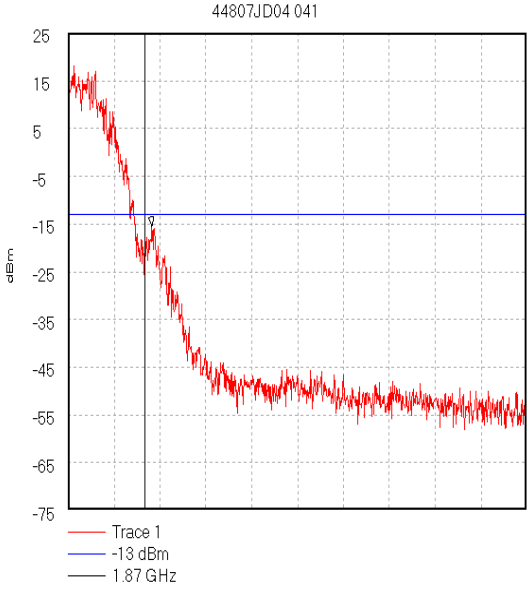
Start 1.849 GHz; Stop 1.8502 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.84998 GHz, -15.47 dBm
Display Line: -13 dBm;
30/07/2003 16:07:37



Start 1.8648 GHz; Stop 1.866 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.865005 GHz, -16.16 dBm
Display Line: -13 dBm;
30/07/2003 16:33:24



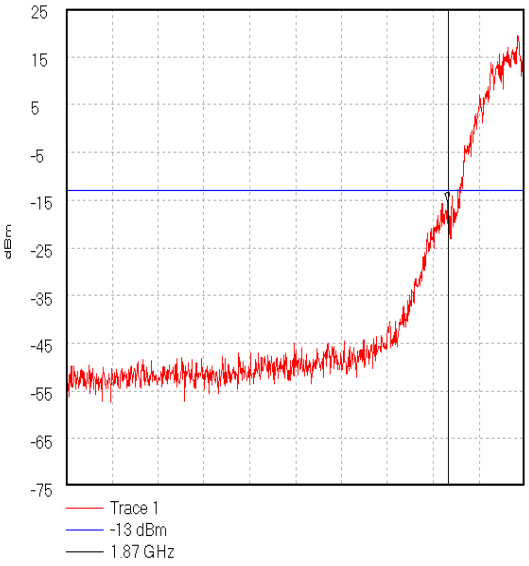
Start 1.864 GHz; Stop 1.8652 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.864997 GHz, -16.72 dBm
Display Line: -13 dBm;
30/07/2003 16:35:48



Start 1.8698 GHz; Stop 1.871 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.870019 GHz, -15.52 dBm
Display Line: -13 dBm;
30/07/2003 16:37:18

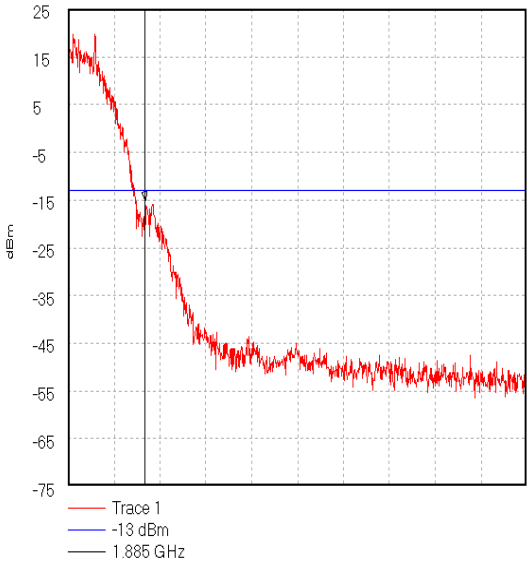
Transmitter Conducted Emissions (Block Edges) (Continued)

44807JD04 042



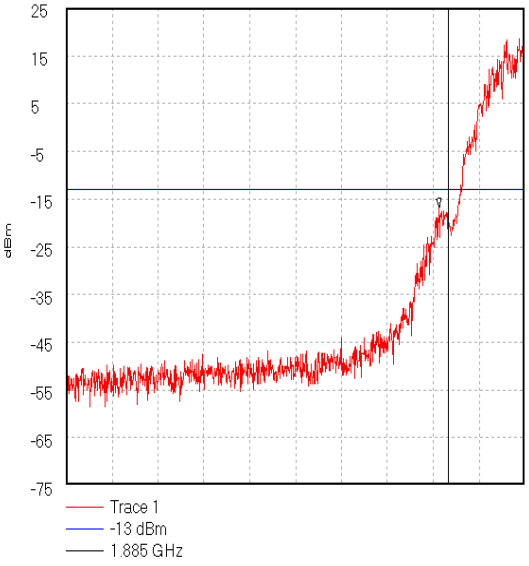
Start 1.869 GHz; Stop 1.8702 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.869999 GHz, -15.42 dBm
Display Line: -13 dBm;
30/07/2003 16:39:45

44807JD04 043



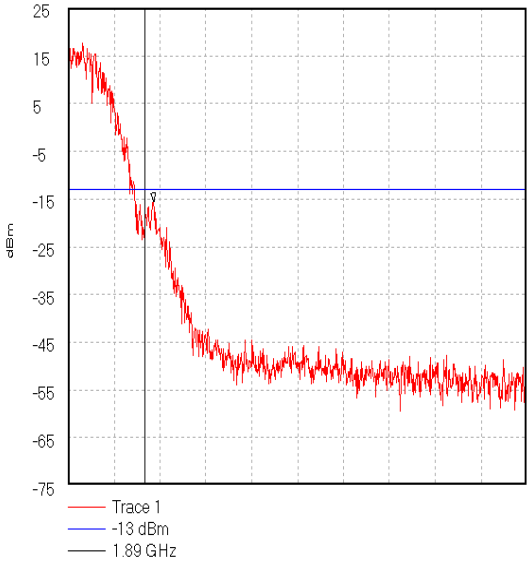
Start 1.8848 GHz; Stop 1.886 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.885001 GHz, -15.32 dBm
Display Line: -13 dBm;
30/07/2003 16:41:56

44807JD04 044



Start 1.884 GHz; Stop 1.8852 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.884976 GHz, -16.74 dBm
Display Line: -13 dBm;
30/07/2003 16:44:12

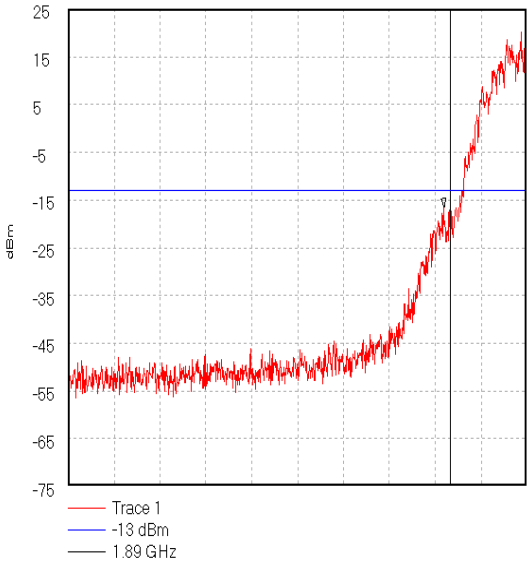
44807JD04 045



Start 1.8898 GHz; Stop 1.891 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.890024 GHz, -15.6 dBm
Display Line: -13 dBm;
30/07/2003 16:45:38

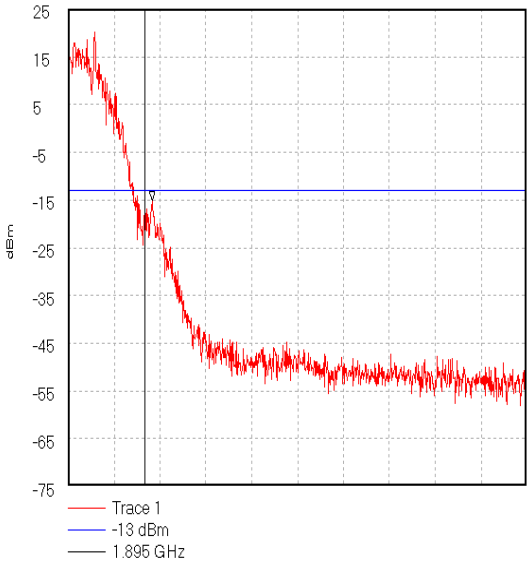
Transmitter Conducted Emissions (Block Edges) (Continued)

44807JD04 046



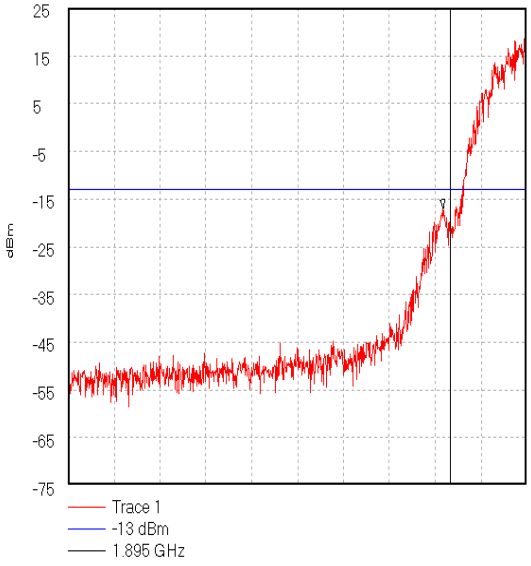
Start 1.889 GHz; Stop 1.8902 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.889983 GHz, -16.49 dBm
Display Line: -13 dBm;
30/07/2003 16:47:02

44807JD04 047



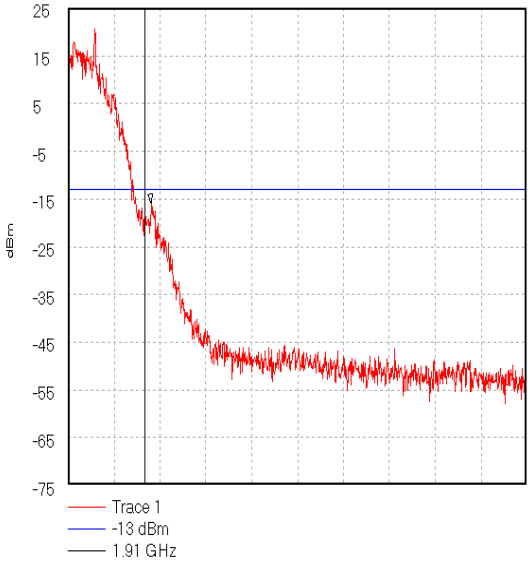
Start 1.8948 GHz; Stop 1.896 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.89502 GHz, -15.22 dBm
Display Line: -13 dBm;
30/07/2003 16:50:48

44807JD04 048



Start 1.894 GHz; Stop 1.8952 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.894981 GHz, -16.97 dBm
Display Line: -13 dBm;
30/07/2003 16:52:31

44807JD04 049



Start 1.9098 GHz; Stop 1.911 GHz
Ref 25 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 3.0 kHz; VBW 3.0 kHz; Att 10 dB; Swp 400.0 mS
Marker 1.910017 GHz, -15.9 dBm
Display Line: -13 dBm;
30/07/2003 16:54:00

8.12. Transmitter Conducted Emissions (Band Edge Integration): Section 24.238

8.12.1. The EUT was configured as for conducted emissions measurements as described in Appendix 2 of this report.

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

Results: Adjacent 1MHz channels

1st 1MHz block immediately outside adjacent frequency block.

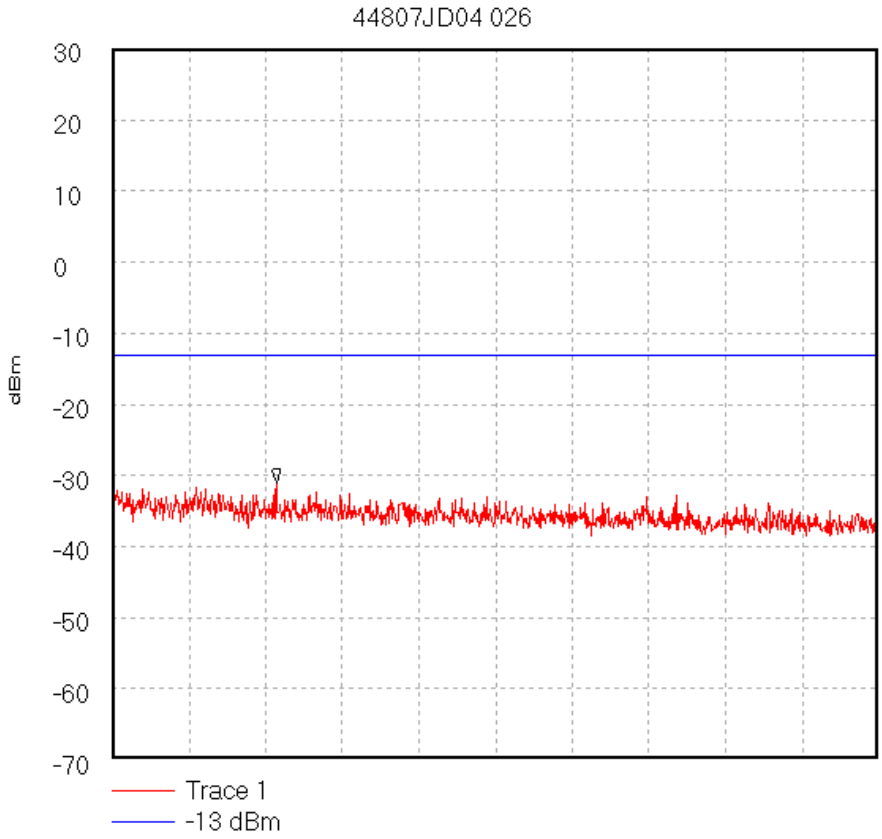
First Band: 1.911 to 1.912 MHz

100kHz Strip Number	Peak Power (nW/100kHz)	100kHz Strip Number	Peak Power (nW/100kHz)
1	641.211	6	420.728
2	653.132	7	481.792
3	790.681	8	528.447
4	561.049	9	418.794
5	484.173	10	319.890
Total Peak Power:		5299.897 nW/MHz	

Band (MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	-22.8	13.0	-9.8	Complied

Test Of: **Danger Inc.**
Tina PDA
To: **FCC Part 15 and 24**

First Band: 1.911 to 1.912 MHz



Start 1.911 GHz; Stop 1.912 GHz
Ref 30 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 15 dB; Swp 20.0 mS
Peak 1.911214 GHz, -31.02 dBm
Display Line: -13 dBm;
30/07/2003 14:48:25

Transmitter Conducted Emissions (Band Edge Integration) (Continued)

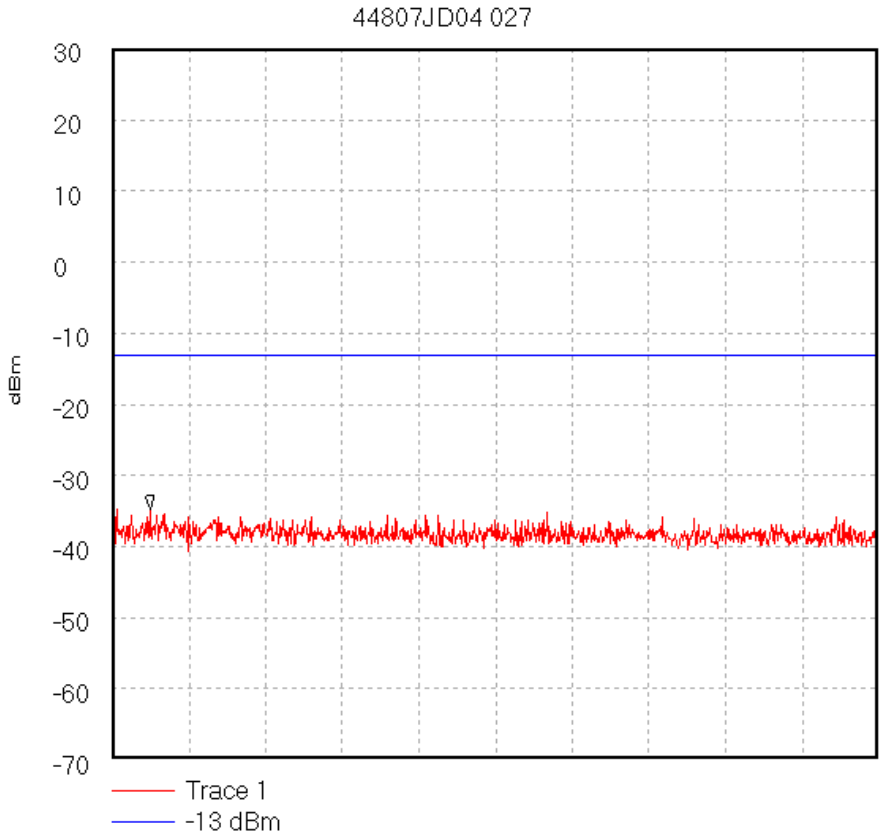
2nd 1MHz block immediately outside adjacent frequency block.

First Band: 1.912 to 1.913 MHz

100kHz Strip Number	Peak Power (nW/100kHz)	100kHz Strip Number	Peak Power (nW/100kHz)
1	331.132	6	297.852
2	261.819	7	233.346
3	254.684	8	254.684
4	269.774	9	202.769
5	274.790	10	255.859
Total Peak Power:		2636.709 nW/MHz	

Band (MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1912 to 1913	25.8	13.0	12.8	Complied

Second Band: 1.912 to 1.913 MHz



Start 1.912 GHz; Stop 1.913 GHz
Ref 30 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 15 dB; Swp 20.0 mS
Peak 1.912049 GHz, -34.8 dBm
Display Line: -13 dBm;
30/07/2003 14:53:50

Transmitter Conducted Emissions (Band Edge Integration) (Continued)

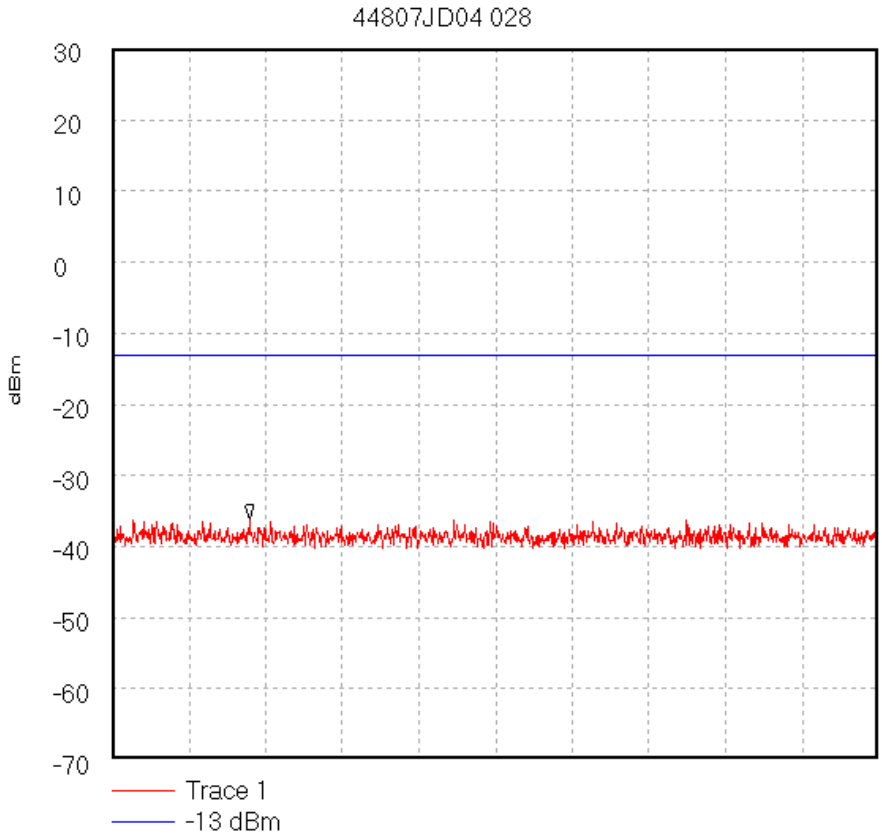
3rd 1MHz block immediately outside adjacent frequency block.

First Band: 1.913 to 1.914 MHz

100kHz Strip Number	Peak Power (nW/100kHz)	100kHz Strip Number	Peak Power (nW/100kHz)
1	223.872	6	194.536
2	239.883	7	226.465
3	222.331	8	238.781
4	202.769	9	213.797
5	233.346	10	198.153
Total Peak Power:		2193.933 nW/MHz	

Band (MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1913 to 1914	26.6	13.0	13.6	Complied

Third Band: 1.913 to 1.914 MHz



Start 1.913 GHz; Stop 1.914 GHz
Ref 30 dBm; Ref Offset 28.0 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 15 dB; Swp 20.0 mS
Peak 1.913179 GHz, -36.2 dBm
Display Line: -13 dBm;
30/07/2003 14:57:04

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 – 2001 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 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 6dB or greater PAD. 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.

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 Deg C.

Measurements were also performed at voltage extremes between the declared nominal supply voltage and at the declared endpoint voltage.

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 using the GSM test set described in Appendix 1.

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 none 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. If the EUT was not fitted with an antenna port as standard, the client made a temporary antenna port available.

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 EUT is a PCS phone, no modulation input port was available. A call was thus setup 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 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 FSEB user manual for this measurement, i.e., RBW <= 1/20 of occupied bandwidth. A value of 3kHz 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.

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.

During the swept measurements (and also during subsequent final measurements on single frequencies) 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.

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. Conducted Emissions Measurements:

The test was performed in a laboratory environment.

Spurious emission measurements at the Antenna port were performed from the lowest declared frequency to 10 times the highest EUT fundamental frequency as shown in section 2.5 of this report.

A measuring receiver was connected to the antenna port of the EUT via a suitable cable and RF Attenuator. The total loss of both the cable and the attenuator were measured and entered as a reference level offset into the measuring receiver to correct for the losses.

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 as such, the limit line presented on the accompanying plots is set to –13dBm.

The frequency band described above was investigated with the transmitter operating at full power on the top, bottom and middle channels. Any spurious observed were then recorded and 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 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 to be 3 kHz

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

The test equipment settings for conducted antenna port measurements were as follows:

Receiver Function	**Settings**
Detector Type:	Peak
Mode:	Max Hold
Bandwidth:	1 MHz >1GHz
Bandwidth:	10 kHz <1GHz
Amplitude Range:	100 dB
Step Size:	Continuous sweep
Sweep Time:	Coupled

The resolution bandwidth used for measurements in the 1 MHz blocks either side of the declared operating frequency block were set as described in the procedure above.

9.6. Transmitter 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 10 times the highest fundamental frequency stated in section 2.5 of this report. 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 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 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 6dB or greater PAD. 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

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 as such, 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.

All measurements were performed using broadband Horn antennas.

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 to be 3 kHz

9.7. 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 5 times the highest clock frequency stated in section 2.5 of this report 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 – 2001 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.

Receiver Radiated Emissions (Continued)

The final field strength was determined as the indicated level in dBuV plus cable loss and antenna factor.

The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements Below 1GHz	Final Measurements Above 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

10. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30.0 MHz	95%	+/- 3.25 dB
Carrier Output Power	Not applicable	95%	+/- 0.46 dB
Conducted Emissions	0.009 kHz to 26 GHz	95%	+/- 1.2 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	30.0 MHz to 1000.0 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1.0 GHz to 26.0 GHz	95%	+/- 1.78 dB
Spectral Power Density	Not applicable	95%	+/- 1.2 dB

10.5. The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
A027	Horn Antenna	Eaton	9188-2	301
A028	Horn Antenna	Eaton	91888-2	304
A031	2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	557
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002
A1037	Chase Bilog Antenna	Chase EMC Ltd	CBL6112B	2413
A1071	Double Ridged Guide Antenna	EMCO	3115	9811-5625
A1077	3020A	Narda	3020A	40140
A1255	Power supply	Farnell	11E302BT	000263
A1318	Narda Termination 20W AVG	Narda	374BNM	0006
A197	Site 2 Controller SC144	Unknown	SC144	150720
A200	Weinschel 100 W 20 dB Attenuator	Weinschel	WA48-20	385
A240	6 dB Attenuator	Schaffner	6806-17-B	NONE
A253	WG 12 Microwave Horn	Flann Microwave	12240-20	128
A254	WG 14 Microwave Horn	Flann Microwave	14240-20	139
A255	WG 16 Microwave Horn	Flann Microwave	16240-20	519
A259	Bilog Antenna	Chase	CBL6111	1513
A276	OATS Positioning Controller	Rohde & Schwarz	HCC	
A392	3 dB attenuator (9)	Suhner	6803.17.B	None
A430	WG 18 horn	Flann	18240-20	425
A435	WG 22 horn	Flann	22240-20	400
C1065	Rosenberger	Rosenberger	UFA210-1-7872	0985
C1080	Rosenberger Cable 3m	Rosenberger	FA210A1030 M5050	28464-1
C1081	Rosenberger Cable 2m	Rosenberger	FA210A1020 M5050	28463-2
C1082	Rosenberger Cable 2m	Rosenberger	FA210A1020 M5050	28463-1
C151	Cable	Rosenberger	UFA210A-1-1181-70x70	None
C160	Cables	Rosenberger	UFA210A-1-1181-70x70	None
C202	Rosenberger cable	Rosenberger	UFA 210A-1-1180-70X70	1543

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
C341	Cable	Andrews	None	None
C453	Cable	Rosenberger	RG142XX-001-RFIB	C453-10081998
C457	Cable	Rosenberger	RG142XX-002-RFIB	C457-10081998
C461	Cable	Rosenberger	UFA210A-1-1182-704704	98H0305
C468	N-Type Coaxial Cable	Rosenberger	UFA210A-1-3937-504504	98L0440
C564	C564-N-2	Rosenberger	UFA 210A-1-0787-70x70	96L0226
E009	Environmental Chamber	Thermotron Corporation	S-8-E Mini Max	25-2407-0
G013	SMHU Signal Generator	Rohde & Schwarz	SMHU	894 055/003
G085	Generator	Hewlett Packard	83650L	3614A00104
M003	Spectrum Monitor	Rohde & Schwarz	EZM	883 580/008
M023	ESVP Receiver	Rohde & Schwarz	ESVP	872 991/027
M028	FSB Spectrum Analyser	Rohde & Schwarz	FSB	860 001/009 (RF), 860 161/007 (Display)
M069	ESMI Spectrum Analyser / Receiver	Rohde & Schwarz	ESMI	829 808/007 (DU) / 827 063/008 (RU)
M088	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:835862/018 RU:835387/006
M105	Fluke 77 DVM	Fluke	77	963580770
M1093	Will tek	Will tek	4202S	0513018
M1101	Hewlett Packard	Hewlett Packard	8922M	3933U04329
M1102	Hewlett Packard	Hewlett Packard	83220E	3842U05665
M115	Temperature/Humidity Meter	RS Components	212-146	None
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016
M133	Temperature/Humidity/ Pressure Meter	RS Components	None	None
M141	Power Meter	Boonton	4220	33402BE
M150	Power Sensor	Boonton	51072	28473

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
M173	Turntable Controller	R.H.Electrical Services	RH351	3510020
M208	Thermo/hygro meter	RS Components Ltd	RS212-124	M208-RS212-124
M281	Power Meter	Hewlett Packard	E4418A (EPM441A)	GB37170210-01
S201	Site 1	RFI	1	
S212	Site 12	RFI	12	
S503	Antenna Mast	EMCO	1051-25	9205 1670

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\44807JD04\EMICON	Test configuration for measurement of conducted emissions
DRG\44807JD04\EMIRAD	Test configuration for measurement of radiated emissions

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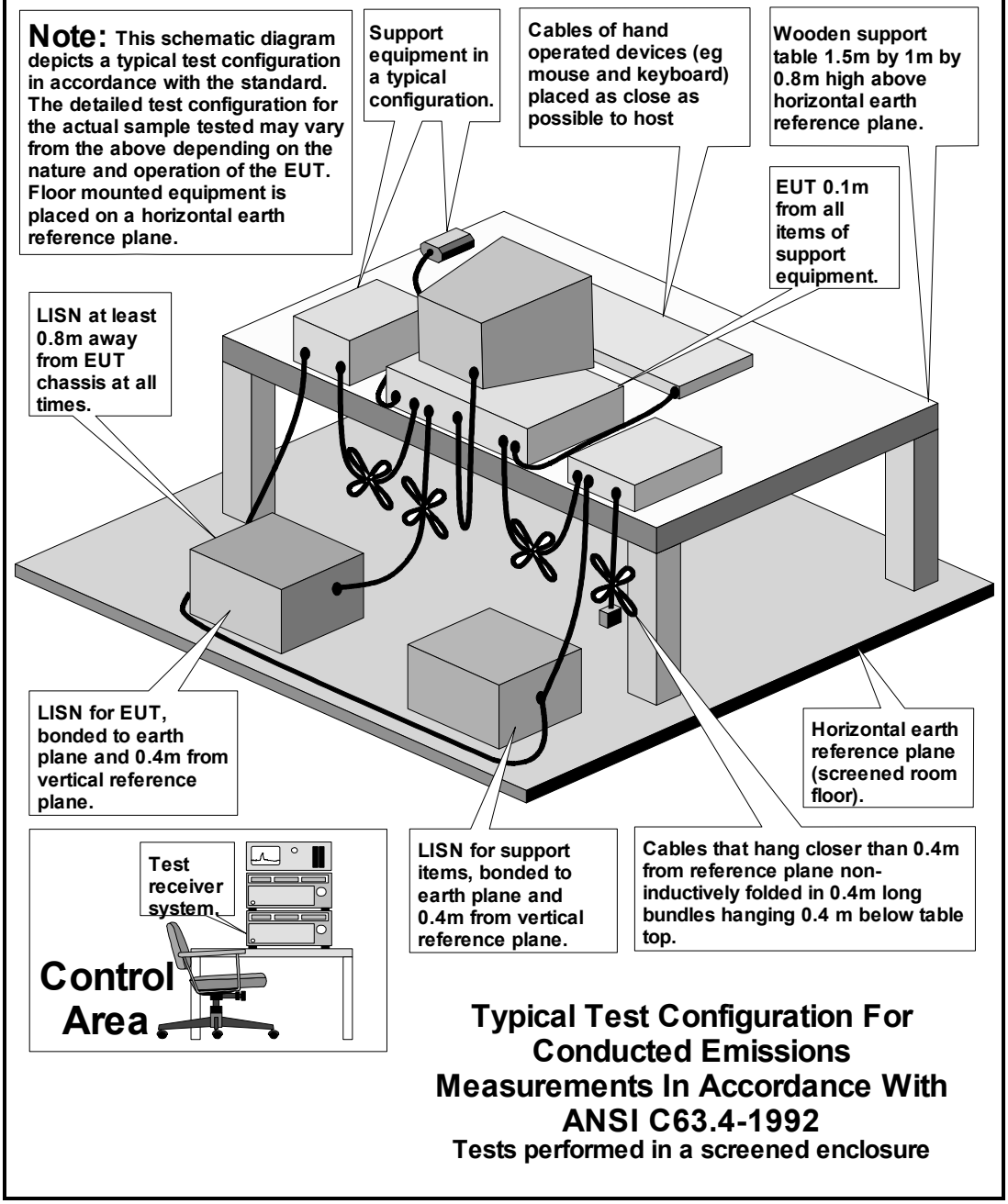
DRG\44807JD04\EMICON

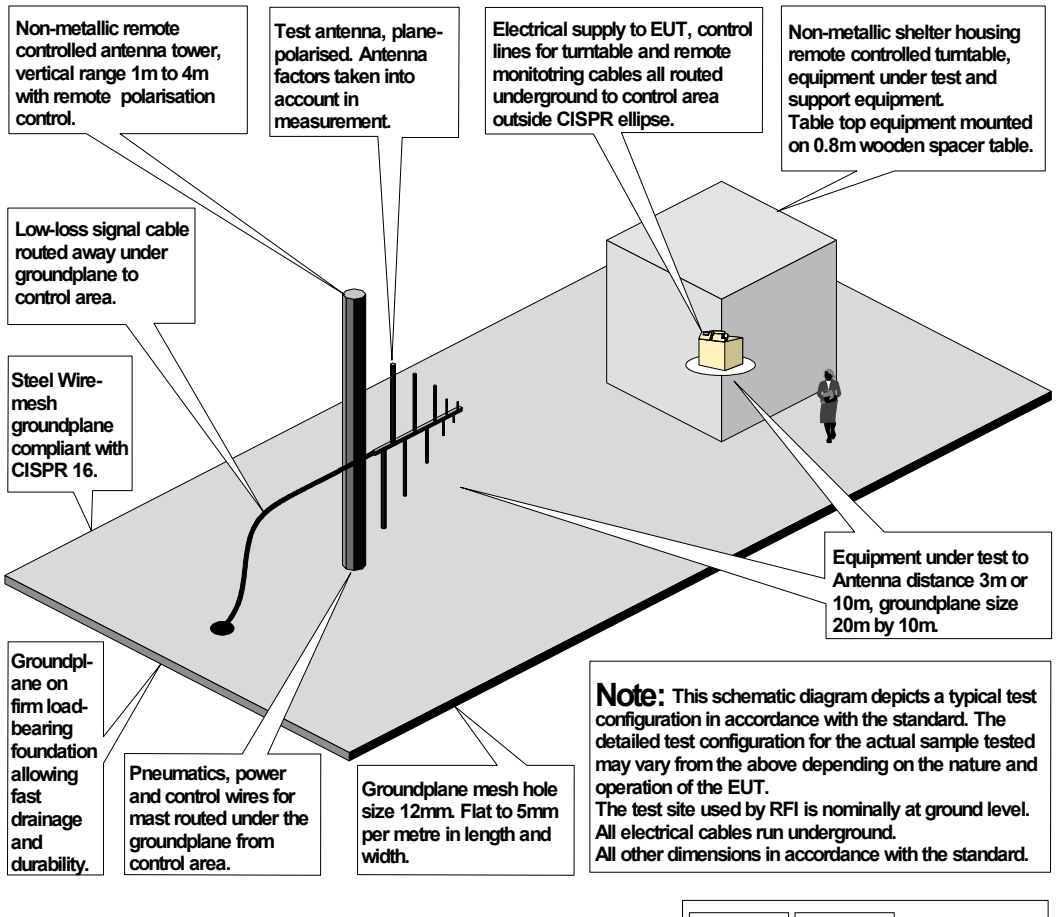


Typical Test Configuration For Conducted Emissions Measurements In Accordance With ANSI C63.4-1992

Tests performed in a screened enclosure

Test Of: Danger Inc.
Tina PDA
To: FCC Part 15 and 24

DRG\44807JD04\EMIRAD



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

Test Configuration For Radiated Emissions Measurements

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

Groundplane Earthed

Control room outside CISPR ellipse