

Compliance Testing Report

FCC Title 47 Part 15

Subparts A & B (Class B) & C

Client:	Emotiv Systems Pty Ltd
Address:	Suite 217/10, NIC Building, Australian Technology Park 4 Cornwallis Street, Eveleigh NSW 2015, Australia
Report Number:	0702EMOEPOC(Dongle)_FCC15
Date of Testing:	11 th November to 3 rd December 2009
File Number:	EMOT091013

Equipment Name:	Emotiv EPOC USB Dongle
Equipment Model Number:	Not Supplied
Equipment Serial Number:	Not Supplied
Equipment FCC ID:	XUE-USBD01
Equipment Description:	USB Dongle for Wireless EEG Headset System

Result: COMPLIES (refer to page 5)

Tested by: Richard Turner



Approved by: Colin Gan



Date of Issue: 02 Jul 2010

AUSTEST (NSW) FCC REGISTRATION NUMBER 90455

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Report Revision History:

Date	Report Number	Changes
19 Mar 2010	0319EMOEPOC(Dongle)_FCC15	Original Report.
02 Jul 2010	0702EMOEPOC(Dongle)_FCC15	FCC Label revision only.

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1 TEST SUMMARY

Austest makes no claim regarding the consistency of production versions of the EUT.

The results in this report apply only to the tested EUT described in Section 3 of this report.

FCC Section	Test	Result	Notes
FCC Part 15, Subpart B – Unintentional Radiators			
15.107	Conducted Limits	COMPLIES	
15.109	Radiated Emission Limits	COMPLIES	
FCC Part 15, Subpart C – Intentional Radiators			
15.203	Antenna Requirement	COMPLIES	
15.205	Restricted Bands of Operation	COMPLIES	
15.207	Conducted Limits	COMPLIES	
15.209	Radiated Emission Limits, General Requirements	COMPLIES	(i),(ii)
15.215	Additional Provisions to the General Radiated Limitations	COMPLIES	
15.249	Operation within the Bands 902-928MHz, 2400-2483.5MHz, 5725-5875MHz, and 24.0-24.25GHz	COMPLIES	

Notes (applicable only if referenced in “Notes” column of above summary table):

- (i) EUT complies (the measurement results were below the applicable limits), but some emissions were within the range of measurement uncertainty of the limits.
- (ii) EUT complies (when modified as described in Section 2 of this report).
- (iii) There were deviations from the applied standard as described in Section 5.2 of this report.

2 MODIFICATIONS

In order to ensure operation is maintained within the 2400 to 2483.5MHz band, channel selection was restricted from CH4 to CH79.

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3 EQUIPMENT UNDER TEST (EUT) DESCRIPTION

EUT Name:	Emotiv EPOC USB dongle
EUT Description:	USB dongle for wireless EEG headset system
EUT Model:	Not Supplied
EUT Serial Number:	Not Supplied
EUT FCC ID:	XUE-USBD01
Manufacturer:	Emotiv Systems
Power Supply & Rating:	5VDC provided by the host PC USB port
Highest Clock/Operating Frequency:	40MHz
Transmit Frequency Range:	2404 to 2479MHz
Transmit Power:	0dBm
Modulation Technique:	GFSK
Number of Channels:	76
Antenna Specifications:	Integral Antenna

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4 EUT TEST SETUP & CONFIGURATION

Refer to the photographs in APPENDIX C – EUT TEST SETUP PHOTOGRAPHS for the EUT test setup and physical configuration.

Details of supporting equipment and cables used are listed as follows:

4.1 Supporting Equipment

Equipment	Brand & Model
Desktop PC	DELL Inspiron 5455
LCD Monitor	Samsung 743N
Keyboard	DELL SK-8165
Mouse	DELL OXN967
EPOC Headset	Emotiv EPOC
AC adaptor	UNIFIVE UN305-0505

The EUT is connected to a USB port on the desktop PC.

Communication is established with the EPOC headset to ensure transmission on the selected frequency.

The AC adaptor is only used to charge the headset internal battery. Whilst under charge the headset is unable to transmit.

4.2 Cables

Connection / Port	Connecting Cable	Source / Load
EUT USB port	2m shielded USB cable, bundled	PC USB port
PC USB port	1.8m shielded USB cable, bundled	Permanently fitted to the DELL mouse
PC USB port	1.9m shielded USB cable, bundled	Permanently fitted to the DELL keyboard
PC monitor port	1.4m shielded HDB15 cable, bundled	Samsung LCD monitor
Monitor mains supply connection	2.8m unshielded 3 core IEC mains lead	115VAC AMN (associated equipment)
PC mains supply connection	1.7m unshielded 3 core IEC mains lead	115VAC AMN (EUT)

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4.3 Transmitter Test Channels

The transmitter test channels per Section 15.31(m) were:

Channel	Transmitter Frequency (MHz)
Low	2404
Mid	2442
High	2479

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5 TEST SPECIFICATIONS

5.1 Accreditations & Listings

Austest Laboratories has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Test Site Criteria (ANSI C63.4-2003) by the FCC Laboratory Division for Certification testing under Parts 15 or 18 of the FCC Rules.

Austest Laboratories (NSW)'s Yarramalong test facilities are listed with the FCC under Registration Number 90455.

5.2 Deviations from Standards and/or Accreditations

None.

5.3 Test Facility

Testing was performed in New South Wales at Austest Laboratories (NSW)'s Yarramalong test facilities located at 46 Glenola Farm Lane in Yarramalong Valley, New South Wales, Australia.

Radiated emission testing is performed at an Open Area Test Site (OATS), where some ambient signals may exceed the continuous disturbance limit. The possibility of missing an emission during testing is removed by use of pre-scans, performed in a shielded enclosure, prior to the final OATS measurements.

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5.4 Test Equipment

Test Equipment	Brand & Model	Cal. Due Date
EMI Receiver	HP 8574B	23 Feb 2010
Spectrum Analyser	HP 8593E	09 Oct 2010
Biconical Array Antenna	EM6912	13 Jan 2010
Log-Periodic Array Antenna	EM6950	08 Jan 2010
DRG Horn Antenna	AH Systems SAS-571	29 Dec 2011
Loop Antenna	EM-6876	09 Sep 2010
Pre-Amplifier (25MHz-1GHz)	HP 8447E	24 Feb 2010
Pre-Amplifier (1GHz-25GHz)	RE 218A	12 Oct 2010
Pre-Amplifier (4GHz- 25GHz)	RE 518A	12 Oct 2010
LISN/AMN	Compower LI-200	25 Feb 2010
10dB attenuator	Microlab	10 Jan 2010
AC Source	Chroma 6512	-

5.5 Measurement Uncertainties

The following uncertainties are for a 95% level of confidence, based on a coverage factor, k=2.

Test	Measurement Uncertainty
Conducted Emissions (Austest NSW)	±2.6dB
Radiated Emissions (Austest NSW)	±4.7dB

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6 FCC Part 15B, Section 15.107 - CONDUCTED LIMITS

Test Date:	11 Nov 2009	Temperature:	24°C
Test Officer:	RT	Humidity:	66%
Test Location:	Austest Laboratories (NSW)		

6.1 EUT Test Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply.
- b. No communication established with the EPOC headset.

6.2 Test Method

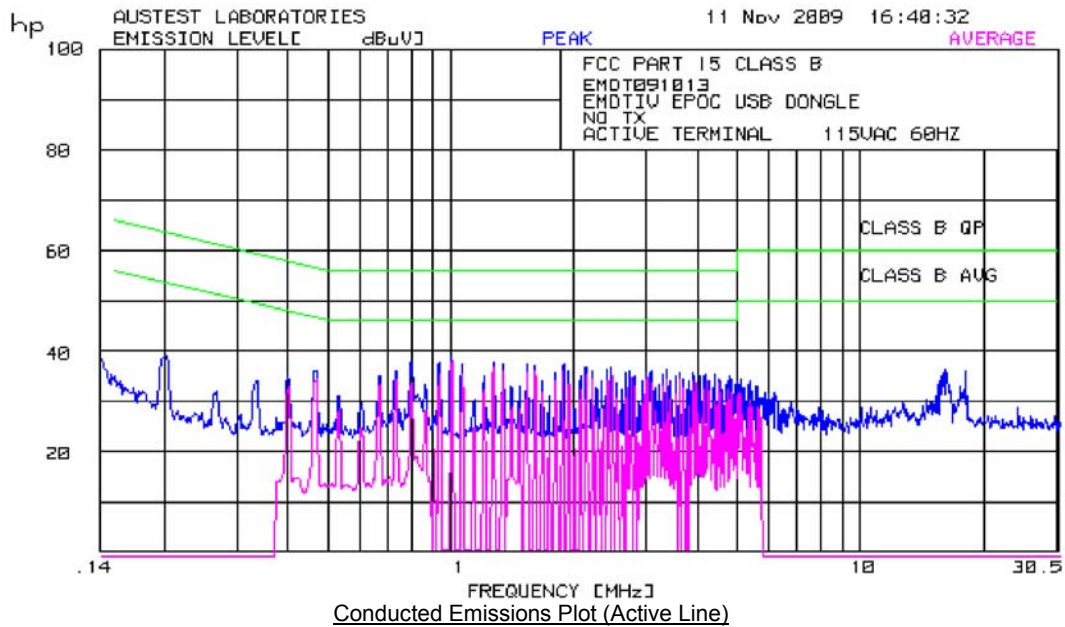
- a. Measurements are performed in accordance with ANSI C63.4-2003.
- b. Set the EMI Receiver BW to 9kHz for the test.
- c. Set up the EUT on a non-conductive table, 0.8m above a conductive ground plane, with the rear of the whole EUT setup 0.4m away from a conductive vertical reference plane (in electrical contact with the ground plane), and 0.8m away from any other conductive surface.
- d. The EUT power is supplied through the EUT LISN, while the supporting equipment power is supplied through the supporting equipment LISN. Both LISNs are grounded to the ground plane and kept 0.8m away from the EUT test setup.
- e. Maintain the power cable length between the EUT and the EUT LISN between 0.8m to 1m. Bundle any excess power cable lengths together in the centre of the cable to form a bundle 30cm to 40cm long.
- f. Drape all interconnection cables the table edge and keep them at least 40cm above the ground plane. Bundle any excess cables in the centre of the cable to form a bundle 30cm to 40cm long.
- g. Conducted emission measurements are made on both Active and Neutral lines of the EUT.

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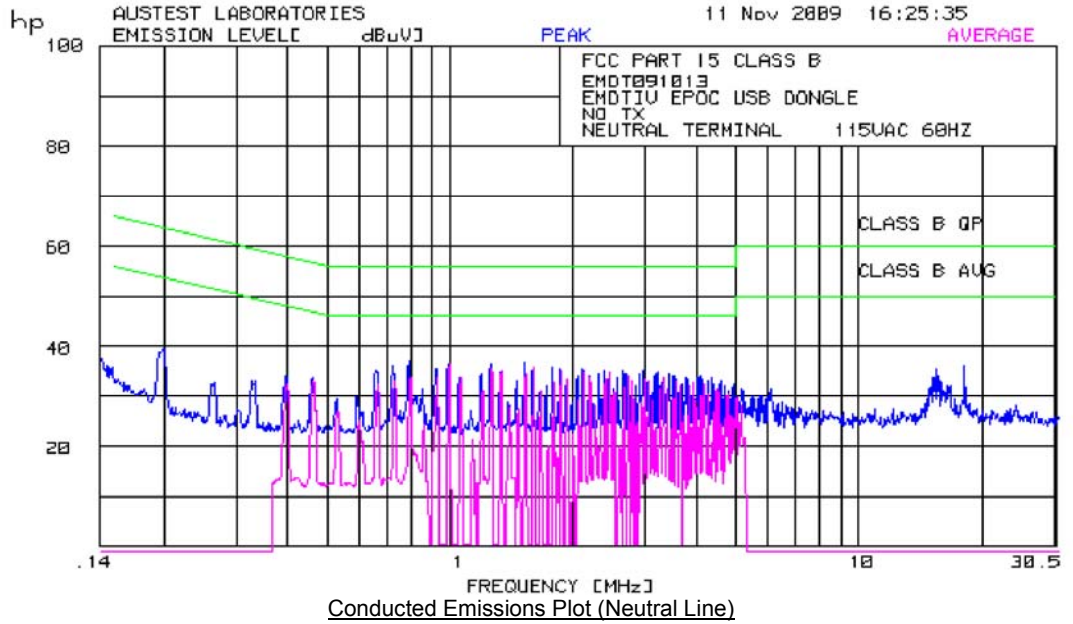
6.3 Test Results

The 6 worst-case results are:

Terminal	Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Pass Margin (dB)	AV Level (dBµV)	AV Limit (dBµV)	AV Pass Margin (dB)
Active	1.01	-	56.0	>-10.0	38.0	46.0	-8.0
Active	1.27	-	56.0	>-10.0	36.7	46.0	-9.3
Neutral	1.00	-	56.0	>-10.0	36.3	46.0	-9.7
Active	1.60	-	56.0	>-10.0	36.2	46.0	-9.8
Active	1.87	-	56.0	>-10.0	36.1	46.0	-9.9
Active	1.34	-	56.0	>-10.0	35.9	46.0	-10.1



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7 FCC Part 15B, Section 15.109 - RADIATED EMISSION LIMITS

Test Date:	17 Nov 2009	Temperature:	23°C
Test Officer:	RT	Humidity:	54%
Test Location:	Austest Laboratories (NSW)		

7.1 EUT Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply.
- b. No communication established with the EPOC headset.

7.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.4-2003.
- b. Set the measuring receiver BW settings to:
 - i. 120kHz (30MHz to 1GHz) EMI Receiver BW.
- c. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
- d. To maximise emissions, rotate the EUT through 360° and adjust the measuring antenna height between 1m to 4m in the following antenna orientations:
 - i. Biconical and Log-Periodic antennas (30MHz to 1GHz) - Both vertical and horizontal polarizations.
- e. Measure the maximised emission and repeat the above for all measurement frequencies.
- f. Highest frequency used in the device, disregarding the intentional 2.4GHz transmission, was 40MHz. In accordance with section 15.33 (b) (1) the upper frequency of measurement is 1GHz.
- g. The EUT was placed horizontally on the test table.
- h. Unintentional radiated disturbances were measured with both the EPOC headset and USB dongle on the test table. The headset was under charge, using the supplied AC adaptor and therefore transmission was inhibited. To minimise disturbances after test setup the LCD monitor was switched off.

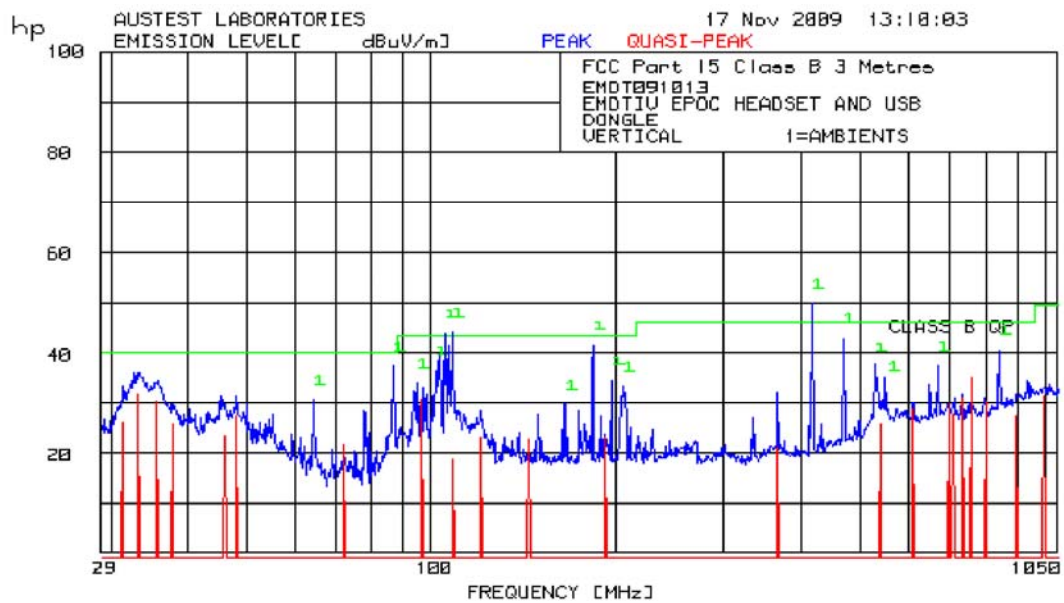
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7.3 Test Results

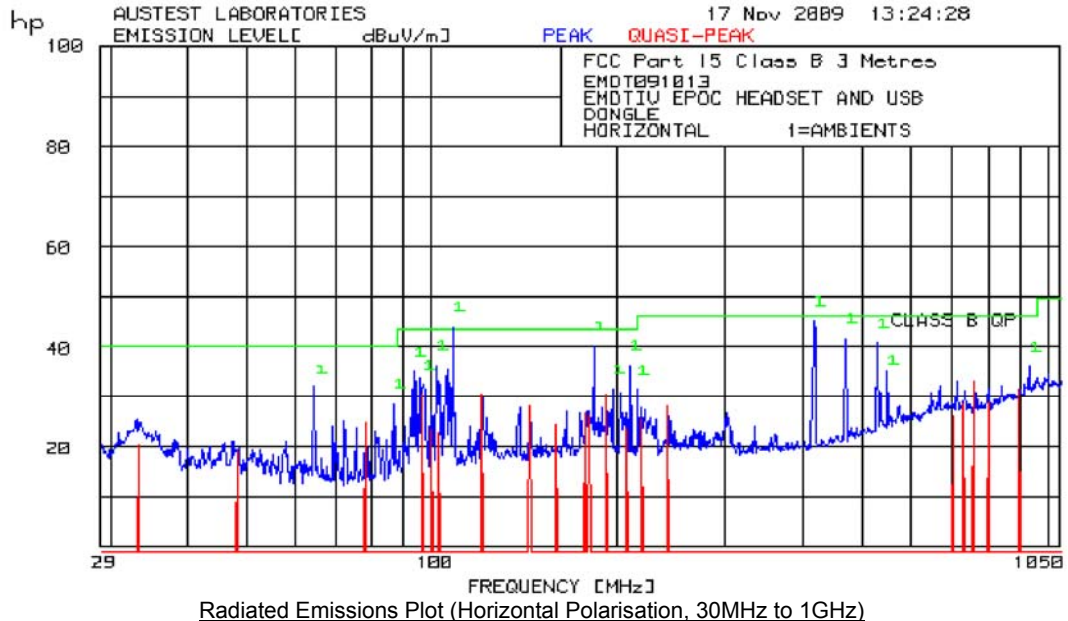
7.3.1 30MHz to 1000MHz

- a. The highest measured disturbance level was 38µV/m (31.7dBµV/m) at 33.2MHz.
- b. Disturbance was broadband and occurred when the headset was under charge.
- c. The 6 worst-case results are:

Frequency (MHz)	QP Level @ 3m (dBµV/m)	Antenna Pol	QP Limit @ 3m (dBµV/m)	QP Pass Margin (dB)
33.2	31.7	Vertical	40.0	-8.3
35.7	30.2	Vertical	40.0	-9.8
758.9	35.2	Vertical	46.0	-10.8
96.2	30.8	Vertical	43.5	-12.7
48.1	27.2	Vertical	40.0	-12.8
758.9	33.1	Horizontal	46.0	-12.9



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8 FCC Part 15C, Section 15.203 – ANTENNA REQUIREMENT

The EUT complies with the requirement of this Section since it is “designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device”, as the antenna is an integral antenna.

9 FCC Part 15C, Section 15.205 – RESTRICTED BANDS OF OPERATION

The EUT complies with the requirements of this Section since it does not operate within the listed Restricted Bands of Operation. The EUT operates in the frequency range 2404 to 2479MHz.

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10 FCC Part 15C, Section 15.207 - CONDUCTED LIMITS

Test Date:	11 Nov 2009	Temperature:	24°C
Test Officer:	RT	Humidity:	66%
Test Location:	Austest Laboratories (NSW)		

10.1 EUT Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply.
- b. RF communication established with the EPOC headset.

10.2 Test Method

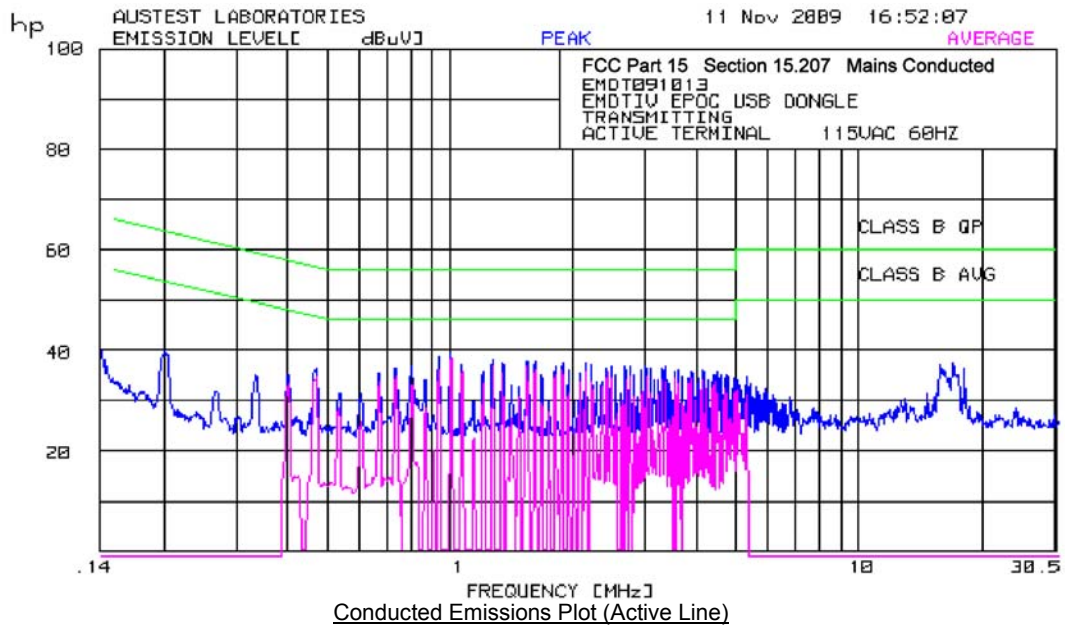
- a. Measurements are performed in accordance with ANSI C63.4-2003.
- b. Set the EMI Receiver BW to 9kHz for the test.
- c. Set up the EUT on a non-conductive table, 0.8m above a conductive ground plane, with the rear of the whole EUT setup 0.4m away from a conductive vertical reference plane (in electrical contact with the ground plane), and 0.8m away from any other conductive surface.
- d. The EUT power is supplied through the EUT LISN, while the supporting equipment power is supplied through the supporting equipment LISN. Both LISNs are grounded to the ground plane and kept 0.8m away from the EUT test setup.
- e. Maintain the power cable length between the EUT and the EUT LISN between 0.8m to 1m. Bundle any excess power cable lengths together in the centre of the cable to form a bundle 30cm to 40cm long.
- f. Drape all interconnection cables the table edge and keep them at least 40cm above the ground plane. Bundle any excess cables in the centre of the cable to form a bundle 30cm to 40cm long.
- g. Communication was established with the EPOC headset. The headset was positioned away from the test area.
- h. Conducted emission measurements are made on both Active and Neutral lines of the EUT.

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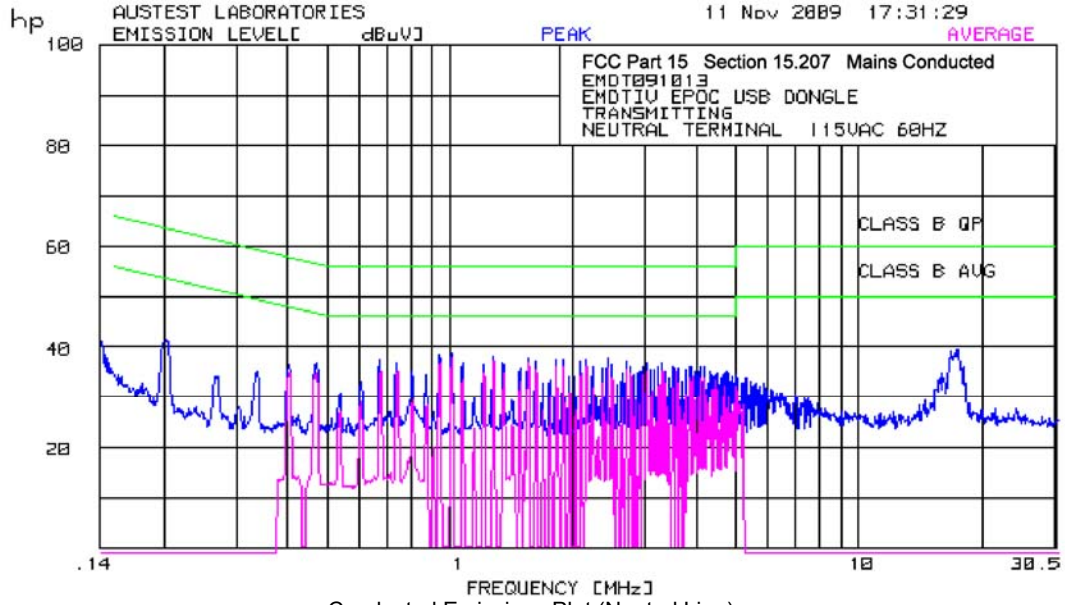
10.3 Test Results

- a. Disturbances were unaffected by RF channel selection. Final measurement made using CH42.
- b. The 6 worst-case results are:

Terminal	Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Pass Margin (dB)	AV Level (dBµV)	AV Limit (dBµV)	AV Pass Margin (dB)
Active	1.01	-	56.0	>-10.0	38.4	46.0	-7.6
Neutral	1.01	-	56.0	>-10.0	37.9	46.0	-8.1
Neutral	1.28	-	56.0	>-10.0	37.2	46.0	-8.8
Active	1.28	-	56.0	>-10.0	36.9	46.0	-9.1
Neutral	1.55	-	56.0	>-10.0	36.8	46.0	-9.2
Neutral	0.94	-	56.0	>-10.0	36.6	46.0	-9.4



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11 FCC Part 15C, Section 15.209 - RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS

Test Date:	25 Nov to 3 Dec 2009	Temperature:	23°C
Test Officer:	RT	Humidity:	54%
Test Location:	Austest Laboratories (NSW)		

11.1 EUT Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply.
- b. RF communication established with the EPOC headset.

11.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.4-2003.
- b. Set the measuring receiver BW settings to:
 - i. 9kHz (150kHz to 30MHz) EMI Receiver BW.
 - ii. 120kHz (30MHz to 1GHz) EMI Receiver BW.
 - iii. 1MHz (above 1GHz) RBW, 3MHz VBW, using a Spectrum Analyser for Peak measurements.
 - iv. 1MHz (above 1GHz) RBW, 10Hz VBW, using a Spectrum Analyser for Average measurements.
- c. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
- d. To maximise emissions, rotate the EUT through 360° and adjust the measuring antenna height between 1m to 4m in the following antenna orientations:
 - i. Loop antenna (150kHz to 30MHz) – Coaxial and coplanar orientations.
 - ii. Biconical and Log-Periodic antennas (30MHz to 1GHz) - Both vertical and horizontal polarizations.
 - iii. Horn antenna (above 1GHz) - Both vertical and horizontal polarizations.
- e. Measure the maximised emission and repeat the above for all measurement frequencies.
- f. The client advised that the lowest frequency utilised by the intentional radiator was 16MHz. Measurement was made from 150kHz to 25GHz (10th harmonic).
- g. The EUT was placed horizontally on the test table.
- h. Communication was established with the EPOC headset. The headset was placed away from the test area. To minimise disturbances after test setup the LCD monitor was switched off.

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11.3 Test Results

11.3.1 150kHz to 30MHz

All measured disturbances were greater than 10dB below the limits.

11.3.2 30MHz to 1000MHz

- a. The highest measured quasi-peak peak level was 89µV/m (39.0dBµV/m) at 48.0MHz.
- b. Disturbance was not dependent upon channel selection. Final measurement using CH42.
- c. The disturbance was measured with the dongle connected to the host PC USB port by a shielded USB cable. Disturbance was seen to drop in level by 17dB when connected directly into the USB port, not using the cable. Disturbance was only present when RF communication with the headset was established.
- d. Unintentional disturbances from the PC were disregarded.

Frequency (MHz)	QP Level @ 3m (dBµV/m)	Antenna Pol	QP Limit @ 3m (dBµV/m)	QP Pass Margin (dB)
48.0	39.0	Vertical	40.0	-1.0*
48.0	31.3	Horizontal	40.0	-8.7

*Result was within the laboratory's measurement uncertainty.

11.3.3 1GHz to 25GHz

- a. The highest measured peak level was 4.3mV/m (72.6dBµV/m) at 2400.0MHz using CH4.
- b. The highest measured average level was 70µV/m (36.9dBµV/m) at 2483.5MHz using CH79.
- c. Field strength measurements were made at a 1 meter or 3 meter distance. Measurements made at a 1 meter distance were extrapolated to a 3 meter distance using an extrapolation factor of 20dB/decade as specified in section 15.31 (f) (1).
- d. Average measurements were only made when peak levels exceeded the average limit of 500µV/m.

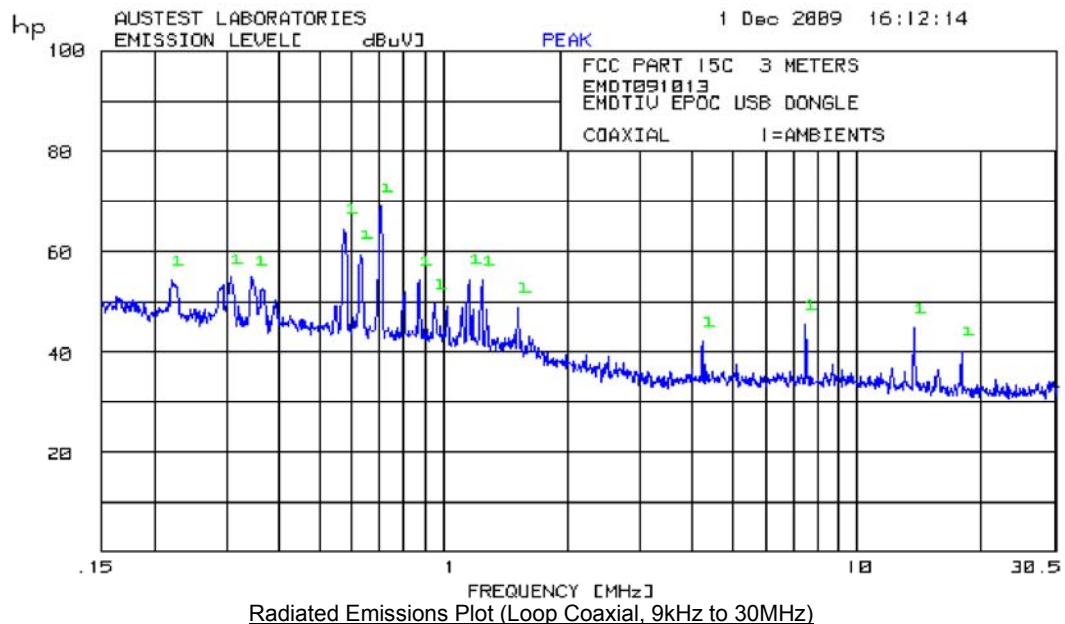
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e. The worse case results are:

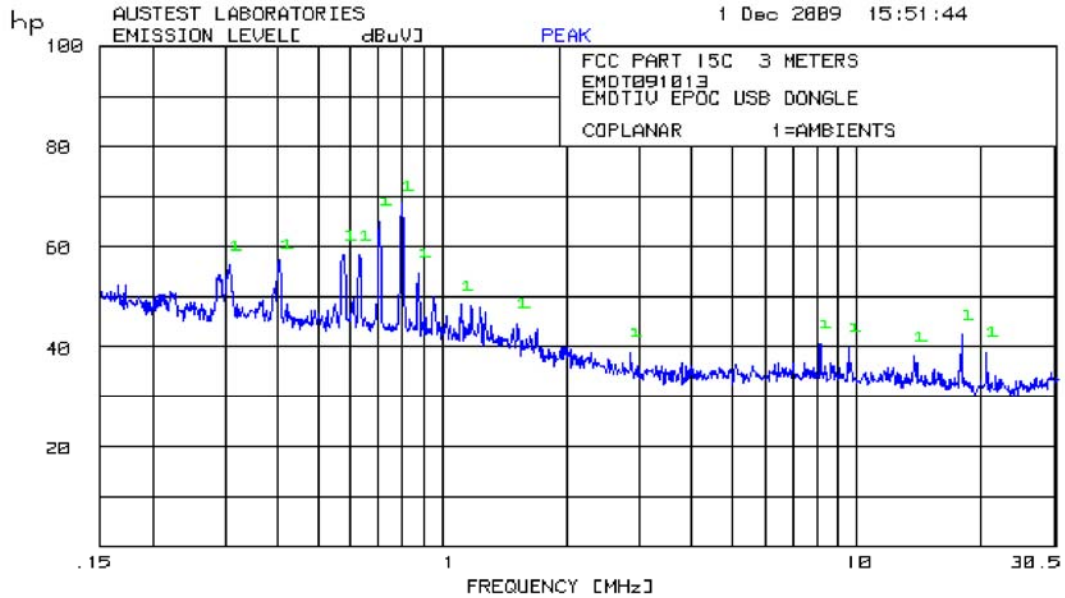
Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Pk Pass Margin (dB)
2400.0 (CH4)	72.6	Vertical	74.0	-1.4*
2483.5 (CH79)	71.2	Vertical	74.0	-2.8*
2400.0 (CH4)	70.4	Horizontal	74.0	-3.6*
2483.5 (CH79)	70.2	Horizontal	74.0	-3.8*
7438.0 (CH79)	56.2	Vertical	74.0	-17.8
7437.0 (CH79)	55.3	Horizontal	74.0	-18.7
7211.0 (CH4)	54.1	Vertical	74.0	-19.9
7211.0 (CH4)	52.7	Horizontal	74.0	-21.3

Frequency (GHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
2483.5 (CH79)	36.9	Vertical	54.0	-17.1
2483.5 (CH79)	36.9	Horizontal	54.0	-17.1
2400.0 (CH4)	36.7	Vertical	54.0	-17.3
2400.0 (CH4)	36.6	Horizontal	54.0	-17.4
7438.0 (CH79)	30.0	Vertical	54.0	-24.0
7437.0 (CH79)	30.0	Horizontal	54.0	-24.0
7211.0 (CH4)	29.3	Vertical	54.0	-24.7

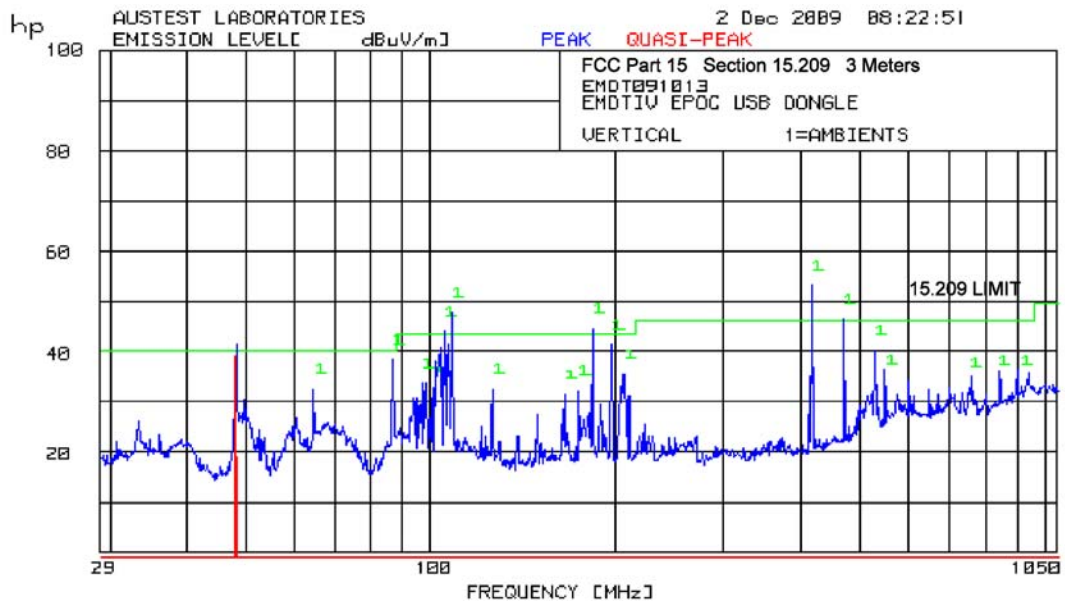
*Results were within the laboratory's measurement uncertainty.



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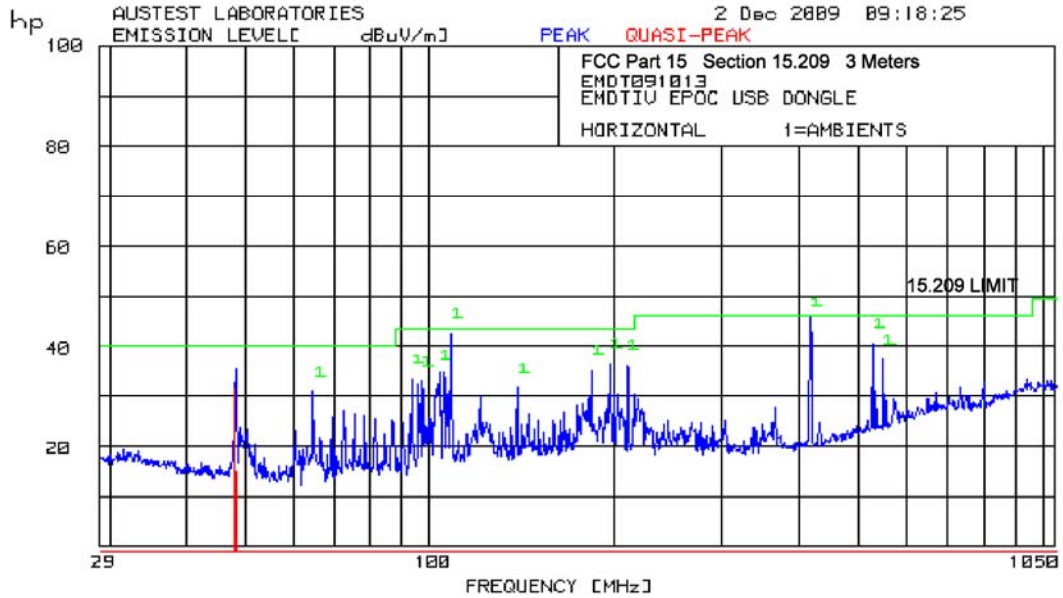


Radiated Emissions Plot (Loop Coplanar, 9kHz to 30MHz)

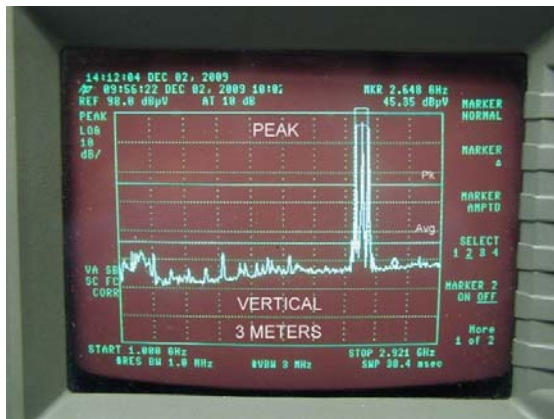


Radiated Emissions Plot (Vertical Polarisation, 30MHz to 1GHz)

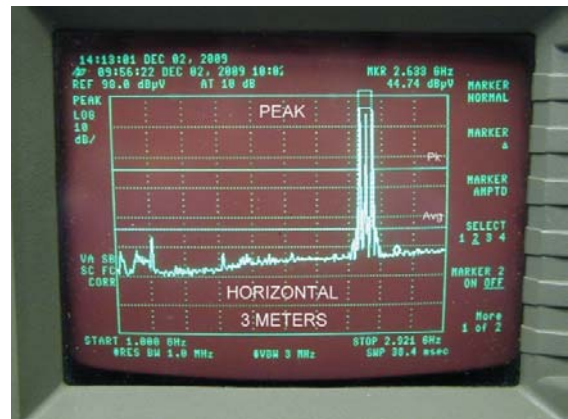
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Radiated Emissions Plot (Horizontal Polarisation, 30MHz to 1GHz)

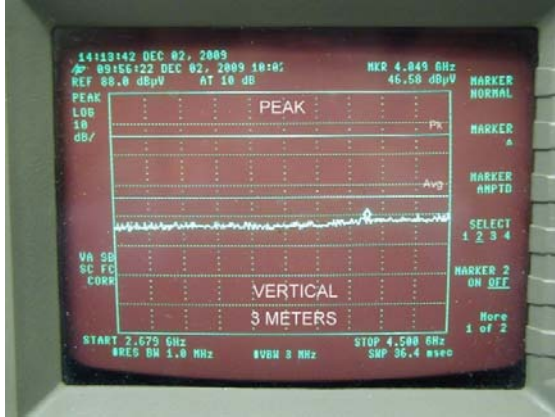


Radiated Emissions Plot (V-Pol, 1GHz-2.92GHz)



Radiated Emissions Plot (H-Pol, 1GHz-2.92GHz)

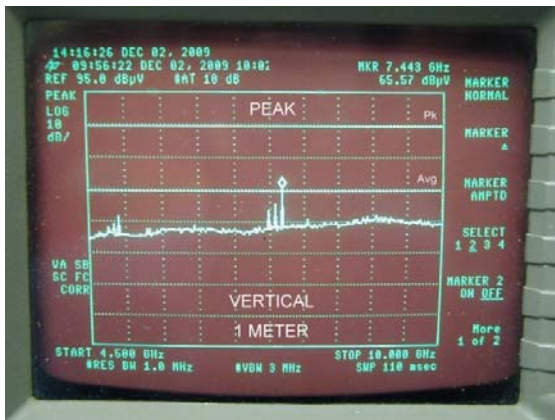
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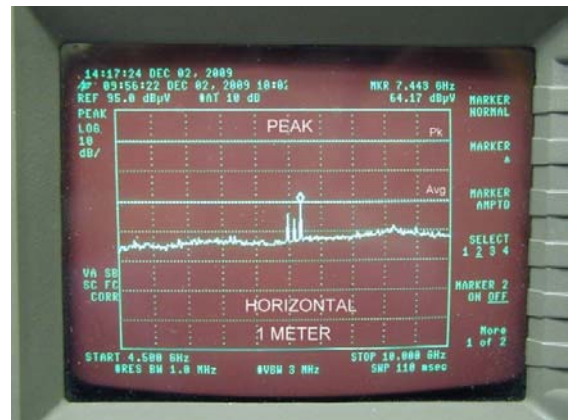
Radiated Emissions Plot (V-Pol, 2.68GHz-4.5GHz)



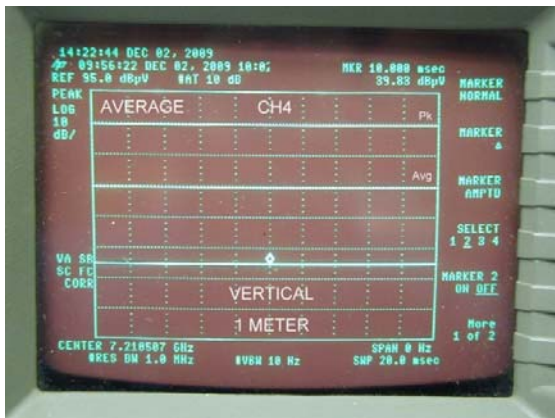
Radiated Emissions Plot (H-Pol, 2.68GHz-4.5GHz)



Radiated Emissions Plot (V-Pol, 4.5GHz-10GHz)



Radiated Emissions Plot (H-Pol, 4.5GHz-10GHz)

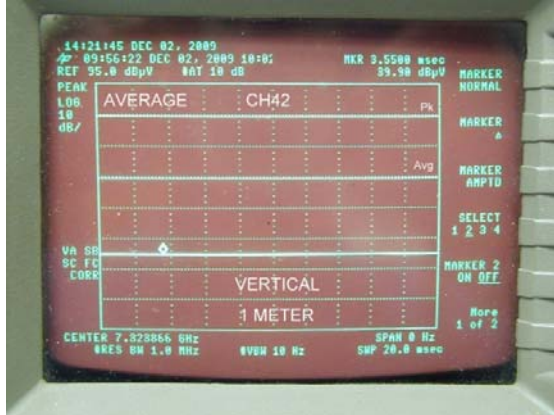


Radiated Emissions Plot (CH4 3rd Har, V-Pol, Average)

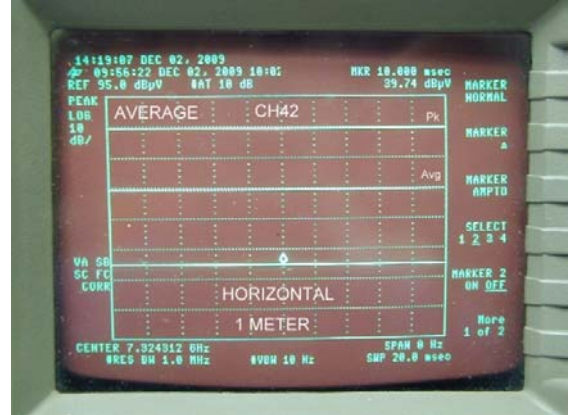


Radiated Emissions Plot (CH4 3rd Har, H-Pol, Average)

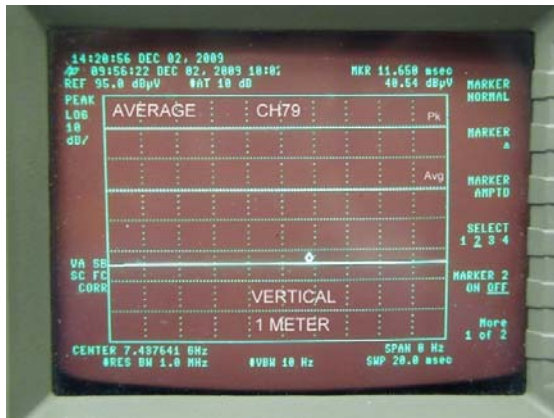
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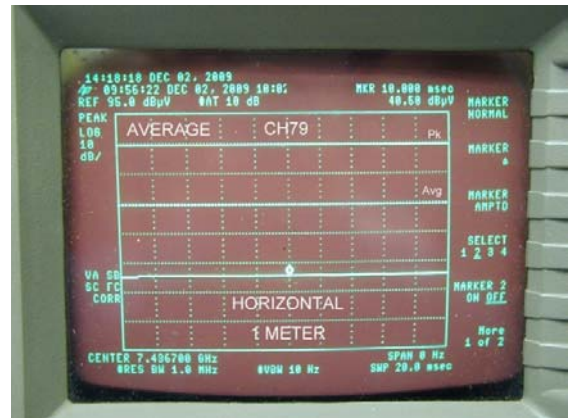
Radiated Emissions Plot (CH42 3rd Har, V-Pol, Average)



Radiated Emissions Plot (CH42 3rd Har, H-Pol, Average)



Radiated Emissions Plot (CH79 3rd Har, V-Pol, Average)



Radiated Emissions Plot (CH79 3rd Har, H-Pol, Average)

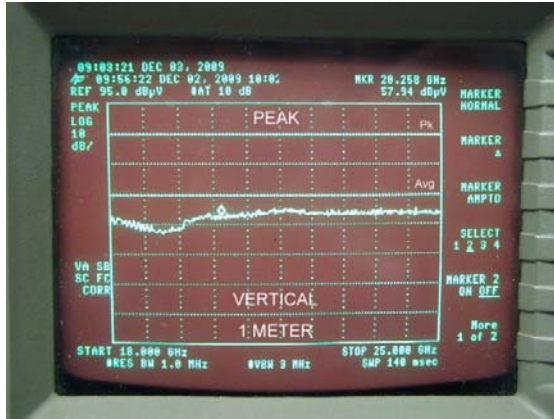


Radiated Emissions Plot (V-Pol, 10GHz-18GHz)

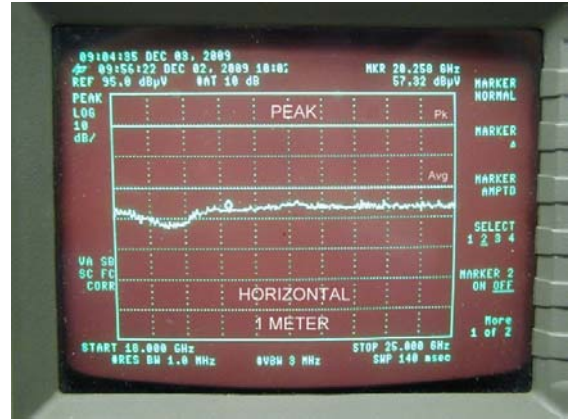


Radiated Emissions Plot (H-Pol, 10GHz-18GHz)

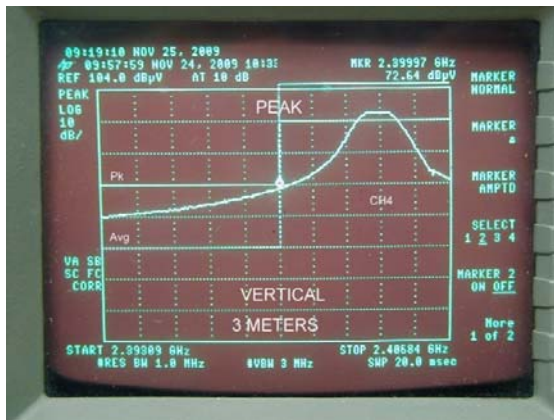
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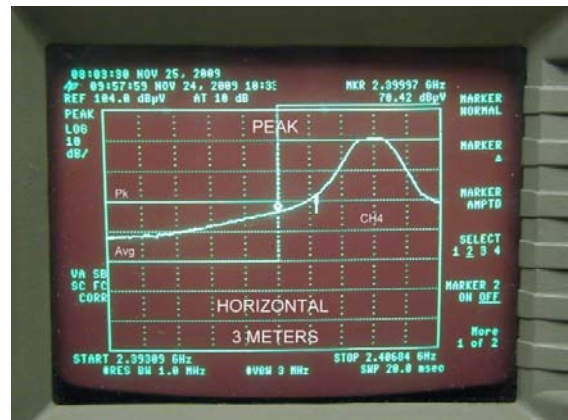
Radiated Emissions Plot (V-Pol, 18GHz-25GHz)



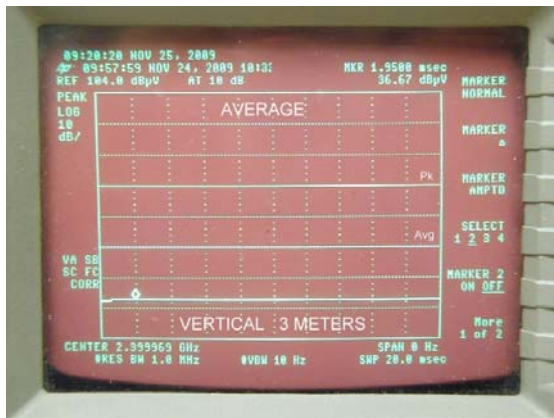
Radiated Emissions Plot (H-Pol, 18GHz-25GHz)



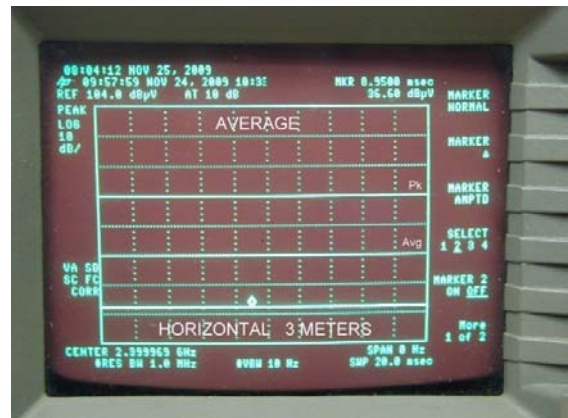
Radiated Emissions Plot (CH4, V-Pol, Peak)



Radiated Emissions Plot (CH4, H-Pol, Peak)

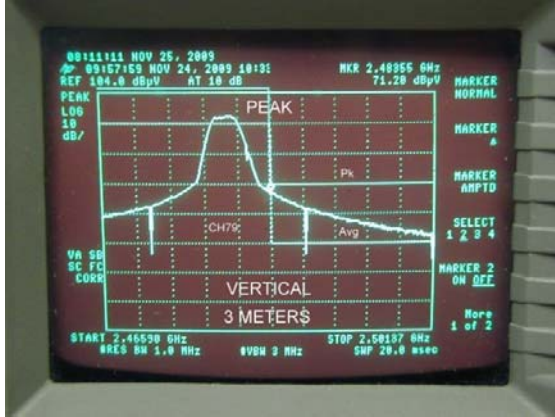


Radiated Emissions Plot (CH4, V-Pol, Average)



Radiated Emissions Plot (CH4, H-Pol, Average)

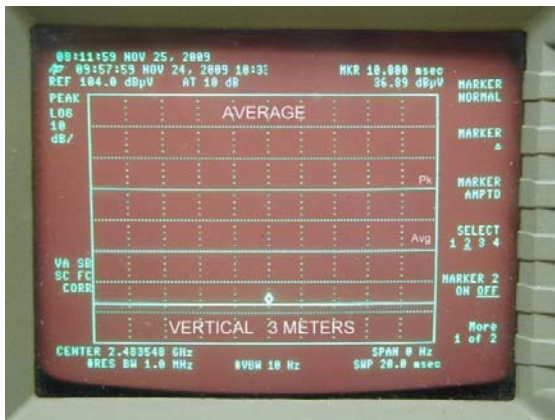
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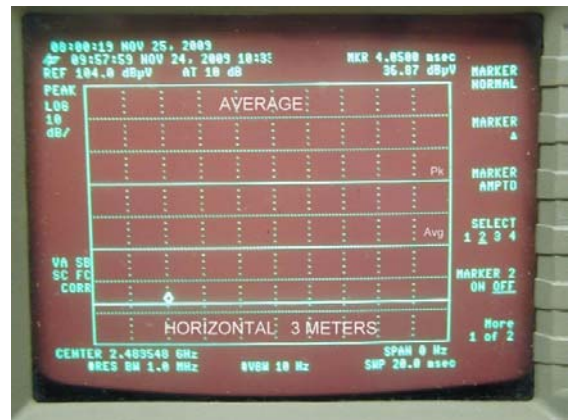
Radiated Emissions Plot (CH79, V-Pol, Peak)



Radiated Emissions Plot (CH79, H-Pol, Peak)



Radiated Emissions Plot (CH79, V-Pol, Average)



Radiated Emissions Plot (CH79, H-Pol, Average)

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12 FCC Part 15C, Section 15.215 – ADDITIONAL PROVISIONS TO THE GENERAL RADIATED LIMITATIONS

The EUT complies with the requirements of this Section as shown by the test results of this report.

Test Date:	25 Nov 2009	Temperature:	23°C
Test Officer:	RT	Humidity:	72%
Test Location:	Austest Laboratories (NSW)		

12.1 EUT Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply.
- b. RF communication established with the EPOC headset.

12.2 Test Method

- a. Set the spectrum analyser to capture Peak power, which in this case was achieved using a RBW of 100kHz RBW, and a VBW of 300kHz.
- b. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
- c. To maximise the emission, rotate the EUT through 360° and adjust the measuring antenna height between 1m to 4m in both vertical and horizontal antenna polarizations.
- d. Mark the peak frequency level and note the -20dB lower frequency of the Low Channel and the upper frequency of the High Channel to ensure that they are within the permitted operating frequency band.
- e. The EUT was placed horizontally on the test table.
- f. Communication was established with the EPOC headset. The headset was placed away from the test area.

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13 FCC Part 15C, Section 15.249 – OPERATION WITHIN THE BANDS 902-928MHz, 2400-2483.5MHz, 5725-5850MHz, AND 24.0-24.25GHz

13.1 Field Strength at 3m (Fundamental & Harmonics) – Section 15.249(a), (c) & (e)

Test Date:	25 Nov 2009	Temperature:	23°C
Test Officer:	RT	Humidity:	72%
Test Location:	Austest Laboratories (NSW)		

13.1.1 EUT Operating Mode

- a. EUT power supply voltage – Host PC connected to the 115VAC 60Hz mains supply
- b. RF communication established with the EPOC headset.

13.1.2 Test Method

- a. Measurements are performed in accordance with ANSI C63.4-2003.
- b. Set the measuring receiver to Peak detection and the BW settings to:
 - i. 1MHz (above 1GHz) RBW, 1MHz or more VBW, using a Spectrum Analyser for Peak measurements.
 - ii. 1MHz (above 1GHz) RBW, 10Hz VBW, using a Spectrum Analyser for Average measurements.
- c. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
- d. To maximise emissions, rotate the EUT through 360° and adjust the measuring antenna height between 1m to 4m in the following antenna orientations:
 - i. Horn antenna (above 1GHz) - Both vertical and horizontal polarizations.
- e. Measure the maximised emission and repeat the above for all measurement frequencies.
- f. The EUT was placed horizontally on the test table.
- g. Communication was established with the EPOC headset. The headset was placed away from the test area.

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13.1.3 Test Results

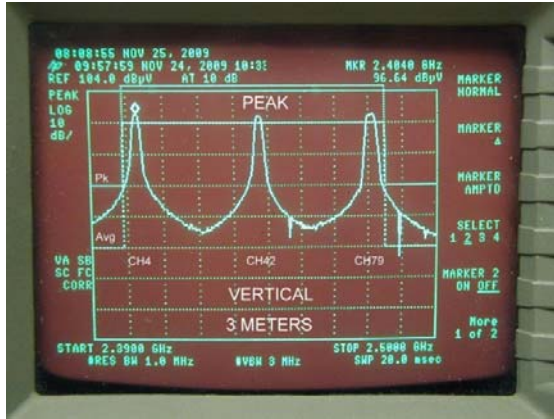
13.1.3.1 *Fundamental Frequencies*

- a. The highest measured peak level was 77mV/m (97.7dBµV/m) at 2404MHz using CH4.
- b. The highest measured average level was 92µV/m (39.3dBµV/m) at 2479MHz using CH79.
- c. The measured field strength of the fundamental frequencies at a 3 meter distance is shown below.
- d. Average measurements were only made when peak levels exceeded the average limit of 50mV/m.
- e. Mains voltage was varied between 85% and 115% of 115VAC. No significant change of level at the fundamental frequencies was noted.

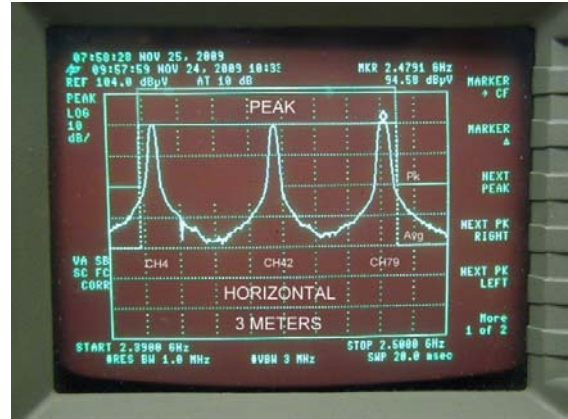
Frequency (MHz)	Ant. Pol.	Measured Peak Field Strength @ 3m		Peak Field Strength Limit @ 3m		Pass Margin (dB)
		(dBµV/m)	(mV/m)	(dBµV/m)	(mV/m)	
2404.0 (CH4)	Vertical	97.7	77	114.0	500	-16.3
2479.0 (CH79)	Vertical	96.4	66	114.0	500	-17.6
2442.0 (CH42)	Vertical	95.9	62	114.0	500	-18.1
2404.0 (CH4)	Horizontal	94.6	54	114.0	500	-19.4
2442.0 (CH42)	Horizontal	94.4	52	114.0	500	-19.6
2479.0 (CH79)	Horizontal	94.4	52	114.0	500	-19.6

Frequency (MHz)	Ant. Pol.	Measured Average Field Strength @ 3m		Average Field Strength Limit @ 3m		Pass Margin (dB)
		(dBµV/m)	(µV/m)	(dBµV/m)	(mV/m)	
2479.0 (CH79)	Vertical	39.3	92	94.0	50	-54.7
2442.0 (CH42)	Horizontal	38.6	85	94.0	50	-55.4
2479.0 (CH79)	Horizontal	38.5	84	94.0	50	-55.5
2404.0 (CH4)	Vertical	38.4	83	94.0	50	-55.6
2404.0 (CH4)	Horizontal	38.4	83	94.0	50	-55.6
2442.0 (CH42)	Vertical	38.4	83	94.0	50	-55.6

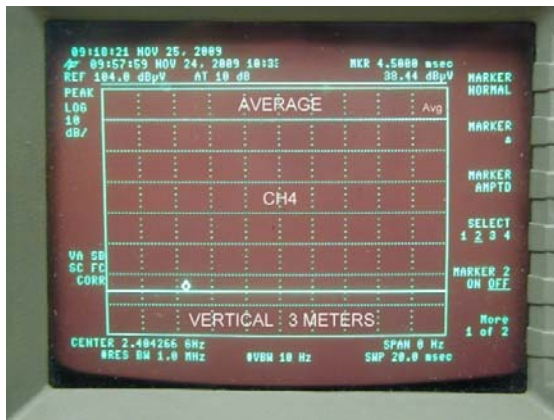
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Field Strength Plot (V Pol, Peak)



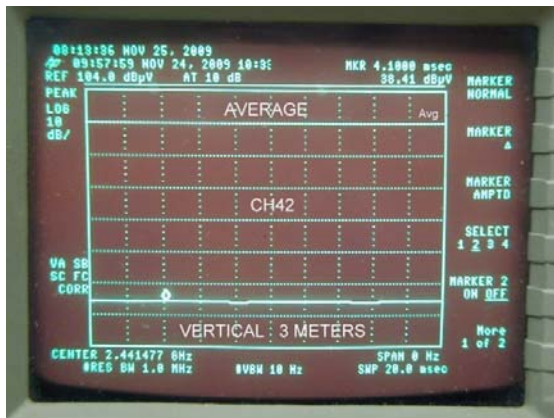
Field Strength Plot (H Pol, Peak)



Field Strength Plot (CH4, V Pol, Average)



Field Strength Plot (CH4, H Pol, Average)

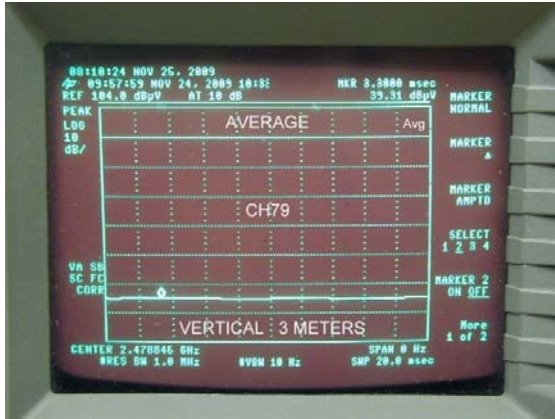


Field Strength Plot (CH42, V Pol, Average)



Field Strength Plot (CH42, H Pol, Average)

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Field Strength Plot (CH79, V Pol, Average)



Field Strength Plot (CH79, H Pol, Average)

13.1.3.2 Harmonics

All measured harmonic levels were below the limits specified in FCC Part 15, Sections 15.209 and 15.249. For details, please refer to Clause 11 of this report.

13.2 Emissions Radiated Outside the Specified Frequency Bands – Section 15.249(d)

All emissions outside the specified frequency bands were below the radiated emission limits specified in FCC Part 15, Section 15.209.

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APPENDIX A – PHOTOGRAPHIC RECORD OF EUT



EUT Top



EUT Bottom

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EUT Main PCB (Top Side)



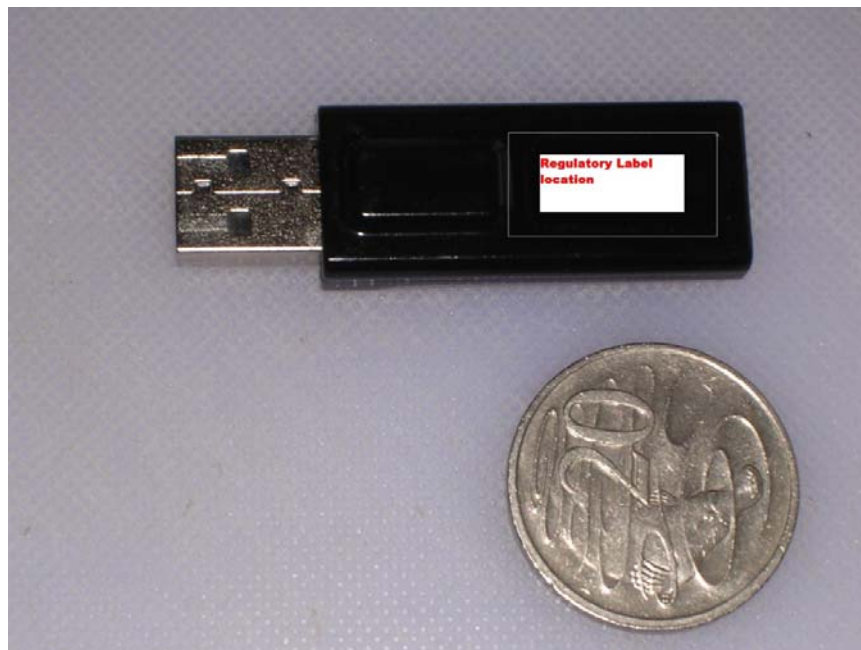
EUT Main PCB (Bottom Side)

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APPENDIX B – FCC LABEL & LOCATION



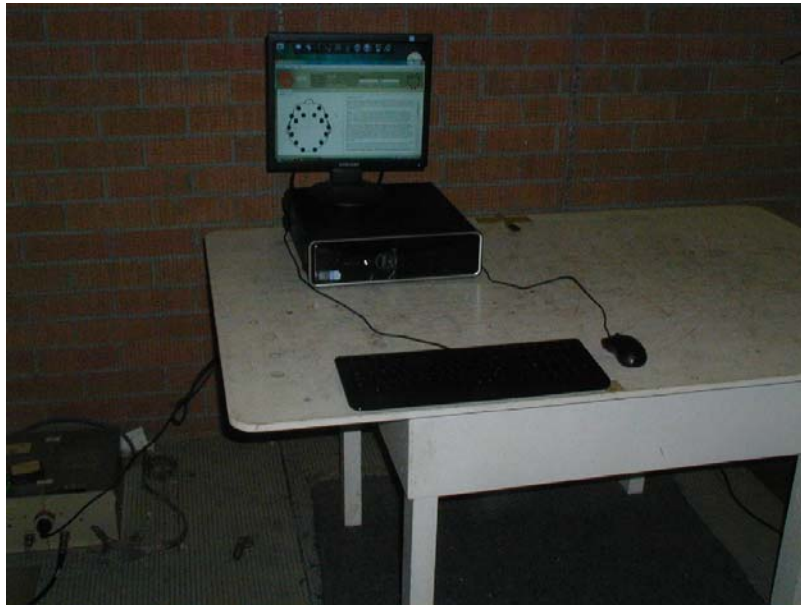
FCC Label



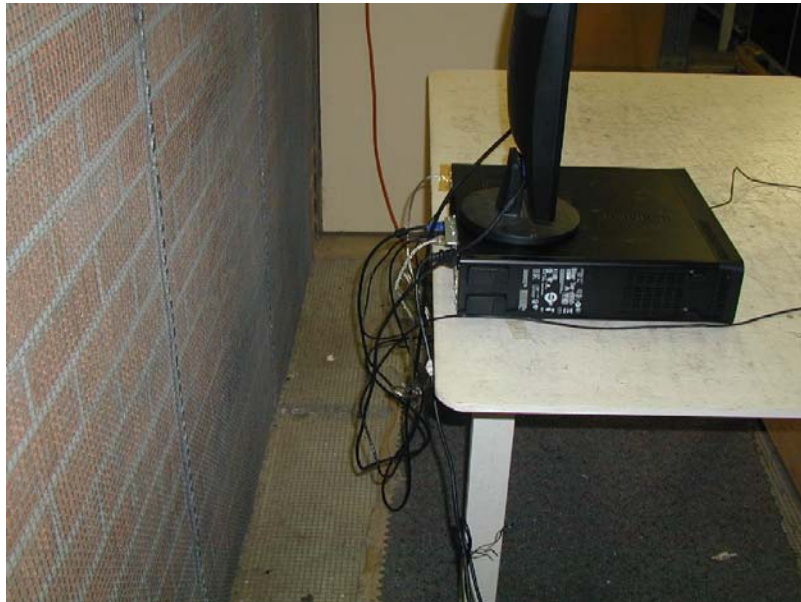
FCC Label Location on EUT

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APPENDIX C – EUT TEST SETUP PHOTOGRAPHS



Conducted Disturbance Test Setup (Front View)



Conducted Disturbance Test Setup (Side View)

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FCC Part 15B Radiated Disturbance Test Setup (Front View – EUT Charging Mode)



FCC Part 15B Radiated Disturbance Test Setup (Rear View – EUT Charging Mode)

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FCC Part 15C Radiated Disturbance Test Setup (Front View – EUT Transmit Mode)



FCC Part 15C Radiated Disturbance Test Setup (Rear View – EUT Transmit Mode)

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