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**EMI TEST REPORT  
for  
CERTIFICATION of  
FCC PART 15.225 TRANSMITTER**

**FCC ID:** PDEMEDIOL120

**Manufacturer:** Gemplus Tag Australia Pty Ltd

**Test Sample:** Medio L120 Long Range Reader

**Report Number:** M000840FCC-R  
(Replacement for Report M000840FCC)

**Issue Date:** 17 January 2000

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**EMI TEST REPORT  
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**FCC ID: PDEMEDIOL120**

**EMC Technologies Report Number: M000840FCC-R  
Date: 17 January 2001**

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**EMI TEST REPORT FOR CERTIFICATION  
OF  
FCC PART 15.225 TRANSMITTER**

**Report Number:** M000840FCC-R

**Test Sample:** Long Range Reader

**Model Number:** Medio L120

**Serial Number:** AC0030100162

**Part Number:** HWP100543

**FCC ID:** PDEMEDIOL120

**Manufacturer:** Gemplus Tag Australia

**Tested for:** Gemplus Tag Australia  
First Floor, 99 Frome Street  
Adelaide SA 5000 Australia  
PO Box 99 Rundle Mall, SA 5000 Australia

**Phone:** + 61 8 8223 5802  
**Fax:** + 61 8 8223 3720

**Responsible Party:** Alfio Grasso  
Engineering Manager  
Gemplus Tag Australia

**Equipment Type:** Intentional Radiator, Low Power Transmitter

**Test Standards:** FCC Part 15 Section 225 Intentional Radiators.  
ANSI C63.4-1992  
OET Bulletin No. 63

**Test Dates:** 1<sup>st</sup> to 14<sup>th</sup> September 2000

**Test Officer:** Chieu Huynh

**Attestation:** *I hereby certify that the device(s) described herein were tested as described in this report and that the data included is that which was obtained during such testing.*



**Authorised Signature:**

**Chris Zombolas**  
**EMC Technologies Pty Ltd**



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**EMI TEST REPORT FOR CERTIFICATION  
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FCC PART 15.225 TRANSMITTER**

**Medio L120 Long Range Reader**

## **1.0 SUMMARY of RESULTS**

This report details the results of EMI tests and measurements performed on the Medio L120 Long Range Reader in accordance with the Federal Communications Commission (FCC) regulations as detailed in Title 47 CFR, Part 15 Rules for intentional radiators. All results, and photographs of the EUT are detailed in this report. The EUT complied with requirements for fundamental frequencies and spurious emissions of section 15.225.

Carrier Signal Field Strength:	Complied, margin of 8.2 dB
Out of Band Emissions:	Complied, margin of 2.3* dB
Conducted Emissions:	Complied, margin of 1.0* dB
Frequency Tolerance:	Complied

The measurement procedure was in accordance with ANSI C63.4-1992, and OET Bulletin No. 63. The instrumentation conformed to these requirements.

\* Refer to Section 6.0 Conclusion

## **2.0 GENERAL INFORMATION**

### **2.1 General Description of Test Setup**

<b>Test Sample:</b>	Long Range Reader
<b>Model Number:</b>	Medio L120
<b>Serial Number:</b>	AC003010162
<b>Part Number:</b>	HWP100543
<b>FCC ID:</b>	PDEMEDIOL120
<b>Equipment Type:</b>	Intentional Radiator, Low Power transmitter

### **2.2 Technical Specifications**

Refer to Appendix H for user instructions (manual)

### **2.3 Test sample configurations**

The EUT was connected to HP Vectra PC via a 2m shielded RS232 cable. Monitor, mouse, keyboard and printer were connected to the PC. For the purpose of the test, an SMA-BNC antenna terminal connector was used.

The EUT was configured to continuously transmit during the tests. Testing were performed twice: once with the EUT's small antenna and once with its large antenna. The antennas were oriented to



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maximise the emissions. Initial tests were first performed with the antennas flat on the table. The worst case was found to be with the transmitt antenna in the upright (vertical) position.

## 2.4 Test Sample Functional Description

Refer to Appendix H for user instructions (manual)

## 2.5 Support Equipment

<b>Host PC:</b>	HP Vectra VE
<b>Model:</b>	DTPC-17
<b>Serial No.</b>	SG94072639
<b>Monitor</b>	Lymic (Radiated Tests)
<b>Serial No:</b>	700601117
<b>FCC ID:</b>	I8TKY145V34D
<b>Monitor</b>	View Master 15A (Conducted Tests)
<b>Model:</b>	215ADX
<b>Serial No:</b>	A350FE82216
<b>FCC ID:</b>	IRH215ADX
<b>Keyboard:</b>	Hewlett Packard
<b>Model:</b>	SK-2502C
<b>Serial No:</b>	M990901523
<b>Mouse:</b>	Microsoft
<b>Serial No:</b>	00621183
<b>FCC ID:</b>	C3KKS8
<b>Printer:</b>	DI Conix (Radiated Tests)
<b>Model:</b>	150
<b>Serial:</b>	AB6044883
<b>FCC ID:</b>	E759WG-RBCN150
<b>Printer:</b>	HP Deskjet 829 Cxi (Conducted Tests)
<b>Model:</b>	C4531A
<b>Serial:</b>	SG72K1K110
<b>FCC ID:</b>	B94C4531X

## 2.6 Test Procedure

Radiated emissions measurements were performed in accordance with the procedures of ANSI C63.4-1992. Radiated emission pre-scan tests from 9 kHz to 30 MHz were initially performed in the semi-anechoic chamber at an EUT distance of 3 metres. Final measurements were performed at 10 metres at the OATS. Tests in the range 30 – 1000 MHz were performed at an EUT distance of 10 metres at the OATS. OET Bulletin 63 was used for reference.



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## 2.7 Test Facility

### FCC Registration

Radiated Emission measurements in the ranges 9 kHz – 30 MHz (H-Field) and 30 MHz - 1000 MHz (E-Field) were performed at EMC Technologies open area test site (OATS) situated at Lerderderg Gorge, near the town of Bacchus Marsh, Victoria, Australia. Radiate Emission pre-scanning and conducted emission measurements were performed at EMC Technologies Laboratory in Tullamarine, Victoria Australia.

The above sites have been fully described in a report submitted to the FCC office, and accepted in a letter dated June 24, 1999, **FCC Registration Number 90560**.

**EMC Technologies Pty. Ltd. is also accredited by NATA (National Association of Testing Authorities) for most parts of FCC Part 15. NATA has Mutual Recognition Agreement (MRA) with A2LA and NVLAP.**

## 2.8 Units of Measurements

### Radiated Emissions

Measurements are reported in units of dB relative to one microvolt per metre (dB $\mu$ V/m). The measurement distance was 10 metres from the EUT for both ranges: 30 – 1000 MHz and 9 kHz–30 MHz.

### Conducted Emissions

Measurements are reported in units of dB relative to 1 microVolt. (dB $\mu$ V)

## 2.9 Test Equipment Calibration

All measurement instrumentation and transducers were calibrated in accordance with the applicable standards by an independent NATA registered laboratory such as Agilent Technologies Australia Limited. All equipment calibration is traceable to Australia national standards at the National Measurements Laboratory (NML). The Loop Antenna and reference Dipole antennas were calibrated by NML and the working antennas (biconical, log-periodic) calibrated by the direct comparison method. The complete list of test equipment used for the measurements, including calibration dates and traceability, is contained in Appendix A of this report.

## 2.10 Ambients at OATS

The OATS site is an area of low background ambient signals. No significant broadband ambients are present however commercial radio and TV signals exceed the limit in the AM, HF, FM radio, VHF and UHF television bands. Radiated pre-scan measurements were performed in the semi-anechoic enclosure to check for possible masking of radiated emissions at the frequencies where the OATS ambient signals exceeded the test limit.



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## 3.0 RADIATED EMISSION MEASUREMENTS

### 3.1 Test Procedure

The EUT was set up on the table top at a total height of 80 cm above the ground plane and operated in accordance with section 2 of this report. Investigative tests were first performed with the EUT Loops placed flat on the table and then in the upright (vertical) position. Final measurements were performed with the EUT Loop antenna in the upright position. The EMI Receiver was operated under software control via the PC Controller.

#### 3.1.1 30 – 1000 MHz Range

The 30 MHz to 1000 MHz test frequency range was sub-divided into smaller bands with sufficient frequency resolution to permit reliable display and identification of possible EMI peaks while also permitting fast frequency scan times. The EUT was slowly rotated with the Peak Detector set to Max-Hold. This was performed for two receiver antenna heights. Each significant peak was then investigated and maximised by rotating the turntable and scanning the height of the receiver antenna between 1 to 4 metres with the Quasi-Peak detector ON. The measurement data for each frequency range was automatically corrected by the software for cable losses, antenna factors and preamplifier gain and all data was then stored on disk in sequential data files. This process was performed for both horizontal and vertical receive antenna polarisation.

#### 3.1.2 0.009 – 30 MHz Range

The 0.009 MHz to 30 MHz test frequency range was sub-divided into smaller bands with sufficient frequency resolution to permit reliable display and identification of possible EMI peaks while also permitting fast frequency scan times. The EUT was slowly rotated with the Peak Detector set to Max-Hold. The receive loop antenna was set to 1m above the ground plane with the Quasi-Peak detector ON. The measurement data for each frequency range was automatically corrected by the software for cable losses, antenna factors and preamplifier gain and all data was then stored on disk in sequential data files. The orientation of the receive loop antenna was varied to ensure that the emissions were maximised.

## 3.2 Plotting of Measurement Data for Radiated Emissions

### 3.2.1 30 – 1000 MHz

The stored measurement data was combined to form a single graph which comprised of all the frequency sub-ranges over the range 30 -1000 MHz. The accumulated EMI (EUT ON) was plotted as the Red trace while the Ambient signals (AMBIENT) were plotted as Green trace. The worst case radiated EMI peak measurements (as recorded using the Max-Hold data are presented as the upper or **RED** trace while the respective ambient signals are presented as the lower or **GREEN** trace. Occasionally, an intermittent ambient arose during the EUT ON measurement (RED trace) and could not be captured when the Ambient trace was being stored. The ambient peaks of significant amplitude with respect to the limit are tagged with the "#" symbol while EMI peaks are identified with a numeral. Ambient peaks that were present during the EUT ON measurement (RED trace) and not captured during the AMBIENT measurement were also tagged with the "#" symbol.



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The highest recorded EMI signals are shown on the Peaks List on the bottom right hand side of the graph. For radiated EMI, each numbered peak is listed as a frequency, peak field strength, Quasi-peak field strength, limit, antenna height and the margin relative to the limit in dB. A negative margin is the deviation of the recorded value below the limit. At times, the quasi peak level may appear to be higher than the peak level. This happens because the individual peak is further maximised with the QP detector AFTER the MAX-HOLD trace has been stored. This will be apparent when the peaks list at the foot of the graphs shows the quasi peak level higher than the peak level.

### 3.2.2 0.009 – 30 MHz Range

The stored measurement data was combined to form a single graph which comprised of all the frequency sub-ranges over the range 0.009 -30 MHz. The H-fields were measured at the OATS and the plot shown is from the Semi-Anechoic Chamber pre-scan. The worst case radiated EMI *peak* measurements as recorded using the Max-Hold data are presented as the **RED** trace. The fundamental frequency was measurements were performed at the OATS.

## 3.3 Calculation of Field Strength

The field strength was calculated automatically by the software using all the pre-stored calibration data. The method of calculation is shown below:

$$E = V + AF - G + L$$

Where:

**E** = Radiated Field Strength in dB $\mu$ V/m.

**V** = EMI Receiver Voltage in dB $\mu$ V. (measured value)

**AF** = Antenna Factor in dB(m<sup>-1</sup>). (stored as a data array)

**G** = Preamplifier Gain in dB. (stored as a data array)

**L** = Cable insertion loss in dB. (stored as a data array of  
Insertion Loss versus frequency)

### Example Field Strength Calculation

Assuming a receiver reading of 34.0 dB $\mu$ V is obtained at 90 MHz, the Antenna Factor at that frequency is 9.2 dB. The cable loss is 1.9 dB while the preamplifier gain is 20 dB.

The resulting Field Strength is therefore as follows:

$$34.0 + 9.2 + 1.9 - 20 = 25.1 \text{ dBmV/m}$$

## 3.4 Radiated Field Strength Measurement Results

### 9 kHz to 30 MHz Field Strength Measurements at the OATS at 10m

Tx Antenna	Frequency MHz	Peak Level dBmV/m	Limit @ 10m dBmV/m	Result ±dB
Small Antenna	13.56	81.8	90	-8.2
Large Antenna	13.56	79.0	90	-11.0

The measurement uncertainty was 3.7 dB. Refer to graphs 11 and 12 in Appendix G. The out of band emissions between 0.009 – 30MHz were measured at the at the OATS. Refer to graphs 9 and 10 in Appendix G.



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**30 – 1000 MHz Field Strength Emissions – Small EUT Loop Antenna**

Rx Antenna Polarisation	Frequency MHz	Quasi-Peak Level dBmV/m	Limit @ 10m dBmV/m	Result ±dB
Horizontal	171.80	30.4	33.5	- 3.1*
Vertical	78.29	26.2	30.0	- 3.8
Vertical	78.35	23.5	30.0	- 6.5
Vertical	77.01	21.3	30.0	- 8.7
Vertical	705.34	26.9	36.0	- 9.1

\*Notice of this reading should be taken with a measurement uncertainty of 3.7 dB.

Refer to graphs 5, 6 and 11 in Appendix G.

**30-1000 MHz Field Strength Emissions – Large Loop Antenna**

Rx Antenna Polarisation	Frequency MHz	Quasi-Peak Level dBmV/m	Limit @ 10m dBmV/m	Result ±dB
Vertical	56.06	27.7	30.0	- 2.3*
Vertical	32.02	26.8	30.0	- 3.2*
Horizontal	88.00	26.7	30.0	- 3.3*
Vertical	78.29	24.5	30.0	- 5.5
Horizontal	88.05	27.0	33.5	- 6.5

\*Notice of these readings should be taken with a measurement uncertainty of 3.7 dB.

Refer to graphs 7, 8 and 12 in Appendix G

**Summary of Results**

The highest radiated spurious emission was 2.3 dB below the limit at 56.06 MHz for Vertical Polarisation. The fundamental frequency was 8.2 dB below the specified limit at 13.56 MHz for the large Tx Loop.

**4.0 CONDUCTED EMISSIONS RESULTS****4.1 Test Procedure**

The arrangement specified in ANSI C63.4-1992 was adhered to for the conducted EMI measurements. The EUT was placed in the RF screened enclosure and a CISPR EMI Receiver as defined in ANSI C63.2-1987 was used to perform the measurements.

The EMI Receiver was operated under program control using the Max-Hold function and automatic frequency scanning, measurement and data logging techniques. The specified 0.45 MHz to 30 MHz frequency range was sub-divided into sub-ranges to ensure that all short duration peaks were captured.

**4.2 Peak Maximising Procedure**

The various operating modes of the system were investigated. The EUT transmit loop antennas were moved to maximise emissions. For each of the sub-ranges, the EMI receiver was set to continuous scan with the Peak detector set to Max-Hold mode. The Quasi-Peak detector was then invoked to measure the actual Quasi-Peak level of the most significant peaks which were detected.



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### 4.3 Calculation of Voltage Levels

The voltage levels were automatically measured in software and compared to the test limit. The method of calculation was as follows:

$$VEMI = VRx + LBPF$$

Where:

**VEMI** = the Measured EMI voltage in dB $\mu$ V to be compared to the limit.

**VRx** = the Voltage in dB $\mu$ V read directly at the EMI receiver.

**LBPF** = The insertion loss in dB of the cables and the Limiter and Pass Filter.

### 4.4 Plotting of Conducted Emission Measurement Data

The measurement data pertaining to each frequency sub-range were then concatenated to form a single graph of (peak) amplitude versus frequency. This was performed for both Active and Neutral lines and the composite graph was subsequently plotted. A list of the highest relevant peaks and the respective Quasi-Peak values were also plotted on the graph.

### 4.5 Measurement Data-Conducted Emissions

#### Small Antenna

Frequency MHz	Line Act/Neutral	Rx Level dBmV	Corrected Level dBmV	Limit dBmV	Result ± dB
13.56	Neutral	45.7	46.2	48.0	- 1.8 *
13.56	Active	45.8	45.9	48.0	- 2.0
16.00	Active	42.3	42.6	48.0	- 5.4
16.00	Neutral	42.4	42.6	48.0	- 5.4
12.44	Neutral	41.4	41.6	48.0	- 6.4
15.41	Active	39.7	40.6	48.0	- 7.4

\*Notice of this reading should be taken with a measurement uncertainty of 2.0 dB.

The highest conducted emission level was 46.2 dB $\mu$ V at 13.56 MHz. Refer to graphs 1 and 2 in Appendix G.

#### Large Antenna

Frequency MHz	Line Act/Neutral	Rx Level dBmV	Corrected Level dBmV	Limit dBmV	Result ± dB
13.56	Active	46.9	47.0	48.0	- 1.0 *
13.56	Neutral	46.9	46.9	48.0	- 1.1 *
16.00	Active	42.0	42.7	48.0	- 5.3
16.00	Neutral	42.0	42.6	48.0	- 5.4
15.41	Neutral	40.0	40.5	48.0	- 7.5
15.41	Active	40.2	40.5	48.0	- 7.5

\*Notice of these readings should be taken with a measurement uncertainty of 2.0 dB.

The highest conducted emission level was 47.0 dB $\mu$ V at 13.56 MHz. Refer to graphs 3 and 4 in Appendix G.

### 4.6 Results of Conducted Emission Measurement

The EUT complied with the FCC Part 15 Class B limits with a worst case margin of 1.0 dB.



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## 5.0 FREQUENCY TOLERANCE

The frequency tolerance of the carrier signal was within 0.01% of the operating frequency over the temperature variation of -20 degrees C to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at the temperature of 20 degrees C.

The maximum frequency tolerance over the temperature variation of -20 to +50 degrees was 149 Hz for large antenna and 137 Hz for small antenna.

The maximum frequency tolerance for a variation in the primary supply voltage from 85% to 115% was 50 Hz for large antenna and 50 Hz for small antenna.

The EUT complied with the frequency tolerance of the carrier signal with a worst case of 0.0011%

## 6.0 CONCLUSION

The MedioL120 Long Range Reader, FCC ID: PDEMEDIOL120 complied with the requirements of the FCC Parts 2 and 15 Rules for low power transmitter tested in accordance with 15.225. The results were as follows:

Carrier Signal Field Strength:	Complied, worst case margin of 8.2 dB.
Out of Band Emissions:	Complied, worst case margin of 2.3* dB.
Conducted Emissions:	Complied, worst case margin of 1.0* dB.
Frequency Tolerance:	Complied.

The recorded levels of radiated and conducted EMI were within the measurement uncertainty of 3.7 dB and 2.0 dB respectively.



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## APPENDIX A

### MEASUREMENT INSTRUMENTATION DETAILS

EQUIPMENT TYPE	MAKE/MODEL SERIAL NUMBER	LAST CAL. DD/MM/YY	DUe DATE DD/MM/YY	CAL. INTERVAL
EMI RECEIVER	HP8574B CISPR Receiver Sn.3146A01297 including MIL-STD-462 Bandwidths	08/02/00	08/02/01	1 YEAR *2
	HP 8546A Sn. 3549A00290 EMI Receiver	24/08/00	24/08/01	1 YEAR *2
	HP 8593EM s/n 3412A00105	27/03/00	27/03/01	1 YEAR *2
ANTENNAS	EMCO 93110B BICONICAL	08/01/00	08/01/01	1 YEAR *3
	20 - 300MHz Sn. 9804-3094			
	EMCO 3146A LOG PERIODIC	24/02/00	24/02/01	1 YEAR *3
	300 -1000MHz Sn. 9208-1205			
	EMCO 6502 ACTIVE LOOP	02/12/99	02/12/00	1 YEAR *1
	0.009 – 30MHz Sn. 9108-2660			
LISN	EMCO 3825/2 50Ù / 50 iH	20/05/99	20/05/02	3 YEARS *1
	0.009 – 30MHz Sn. 9506-2379			

Note \*1. National Measurements Laboratory calibration.

Note \*2. NATA calibration by Hewlett-Packard (Aust) Ltd

Note \*3. In-house calibration. Refer to Quality Manual.

Note \*4 Calibration not required

### TEST SITES

Shielded Room Test Laboratory	<b>Melbourne</b> 11m x 8m x 4m Chamber-semi-anechoic 8.8m x 5.8m x 3.1m Test Chamber 3.4m x 6.1m x 2.5m Test Chamber 3.4m x 7.3m x 7.5m Test Chamber			*3
Open Area Test Site	<b>Melbourne</b> 3/10 Metre site. 1-4 metre antenna mast. 1.2 metre/400 kg Turntable. (Situated at Lerderderg Gorge, near Bacchus Marsh, Victoria)	31/07/00	31/07/01	1 Year *3



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## APPENDIX B1

### PHOTOGRAPHS OF TEST SETUP

#### Radiated Emissions Test-Setup: Small Antenna



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## APPENDIX B2

### PHOTOGRAPHS OF TEST SETUP

#### Radiated Emissions Test-Setup: Large Antenna



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## APPENDIX B3

### PHOTOGRAPHS OF TEST SAMPLE

Conducted Emissions Test-Setup: Small Antenna



Conducted Emissions Test-Setup: Large Antenna

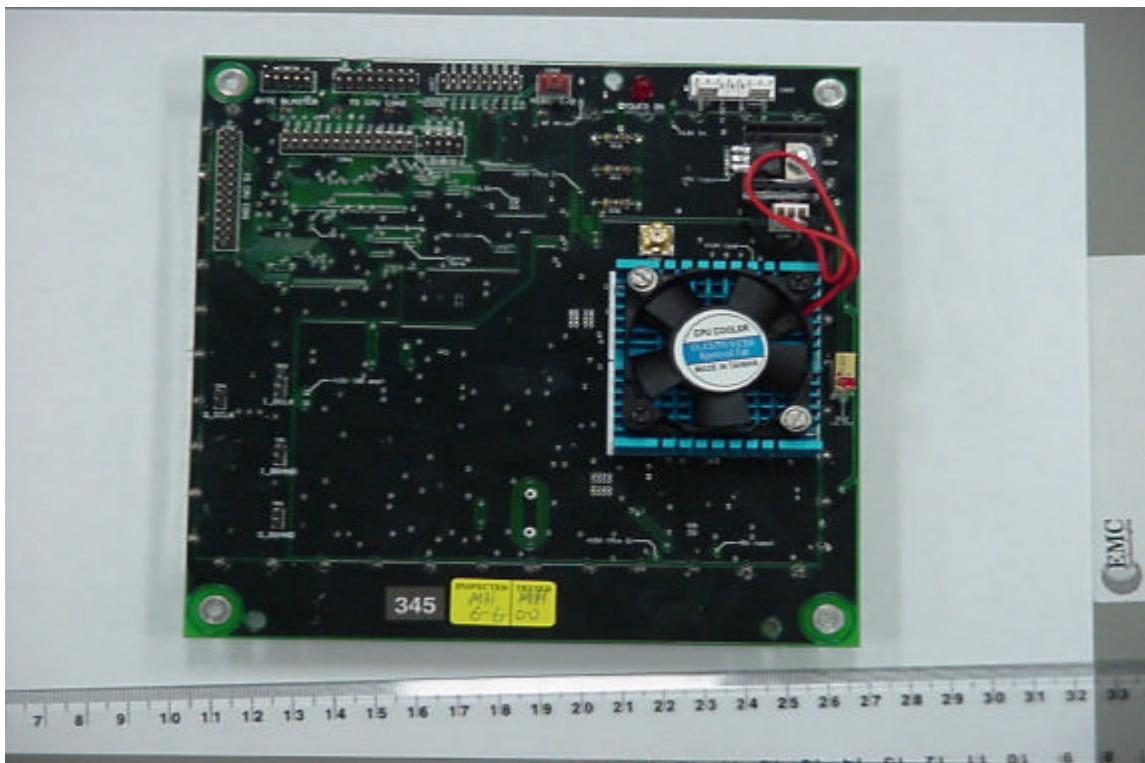
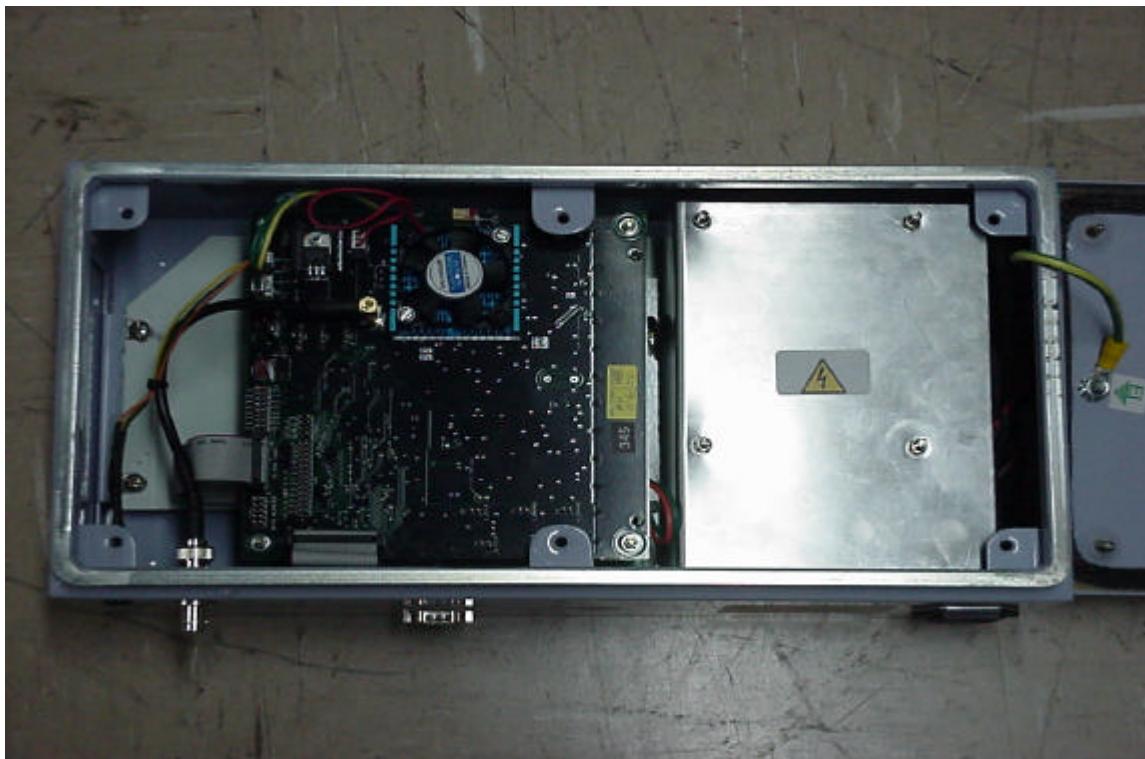


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## APPENDIX B4

### PHOTOGRAPHS OF TEST SAMPLE

#### Internal Photos

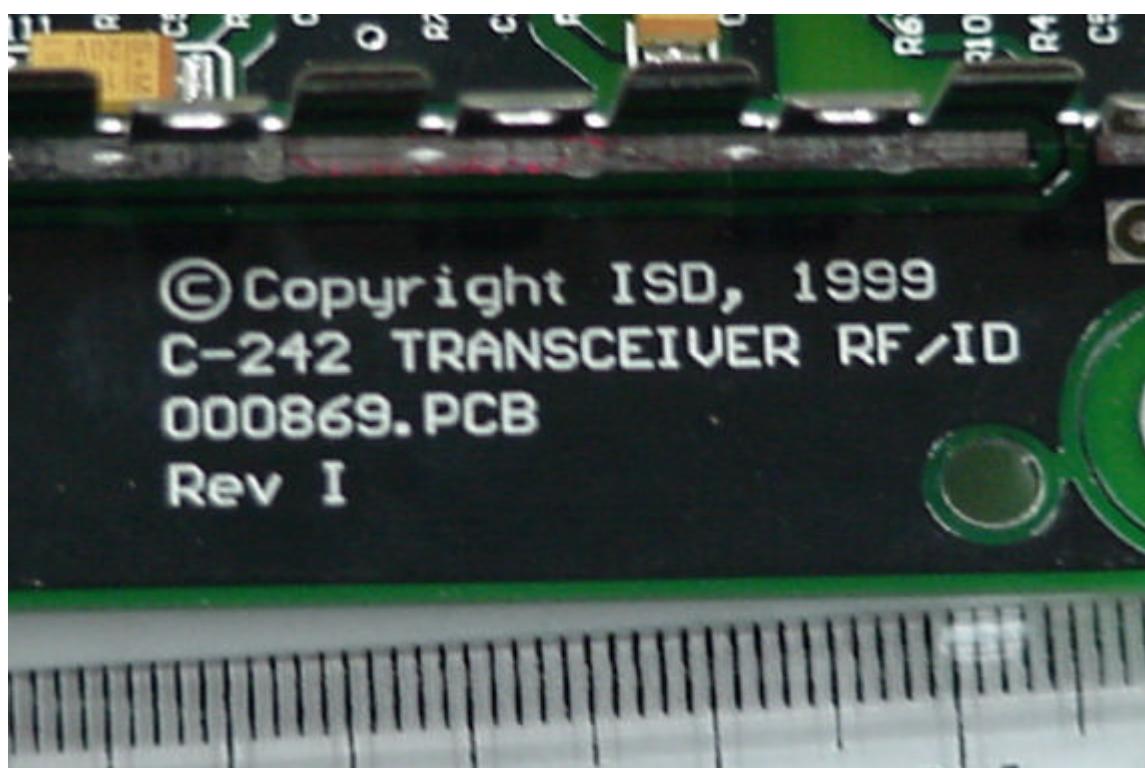
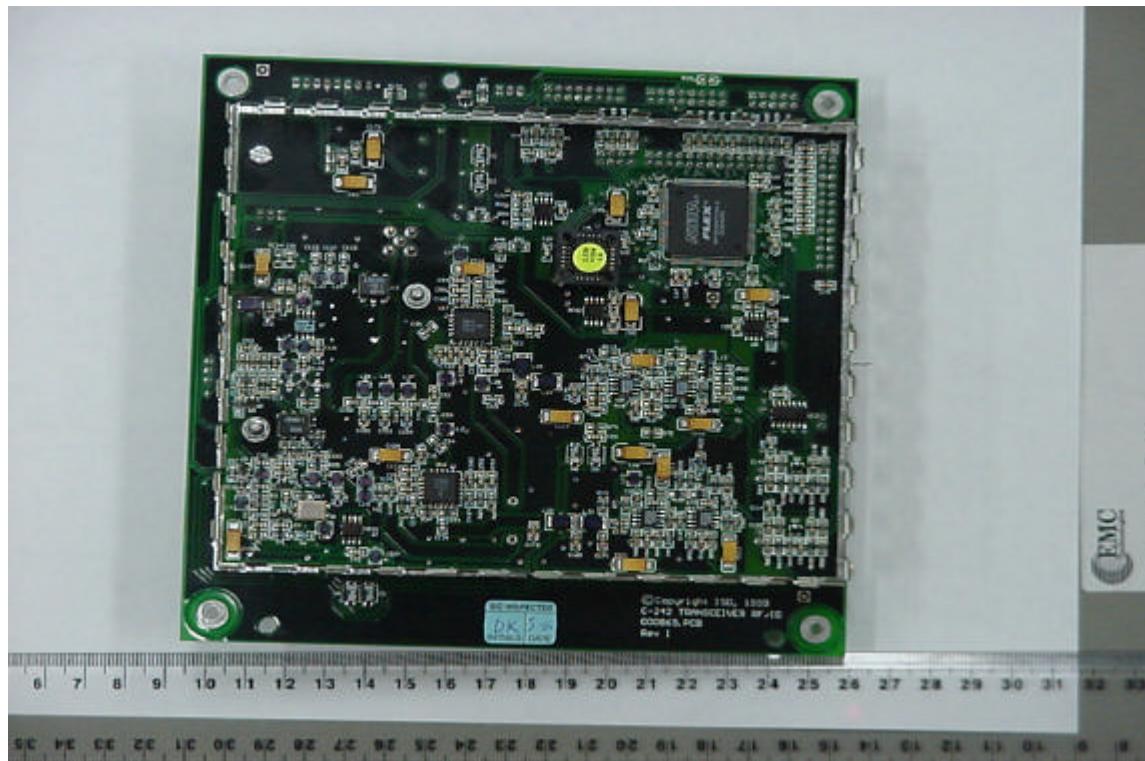


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## APPENDIX B5

### PHOTOGRAPHS OF TEST SAMPLE

#### Internal Photos

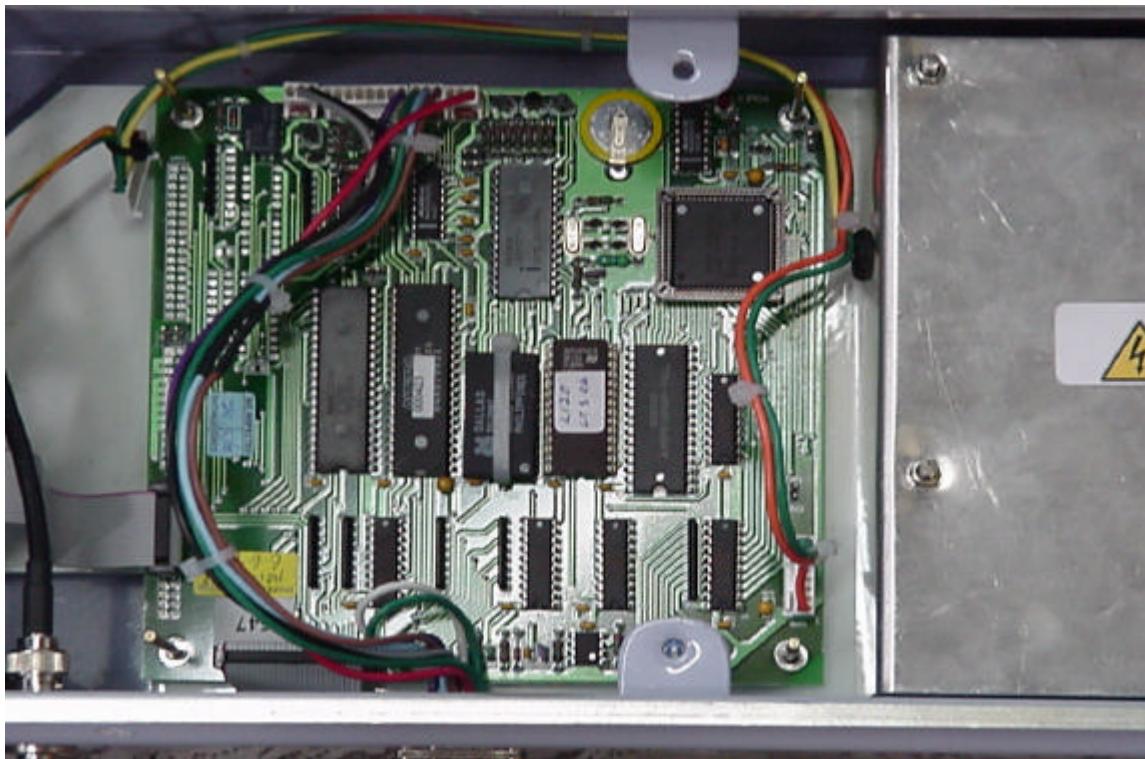
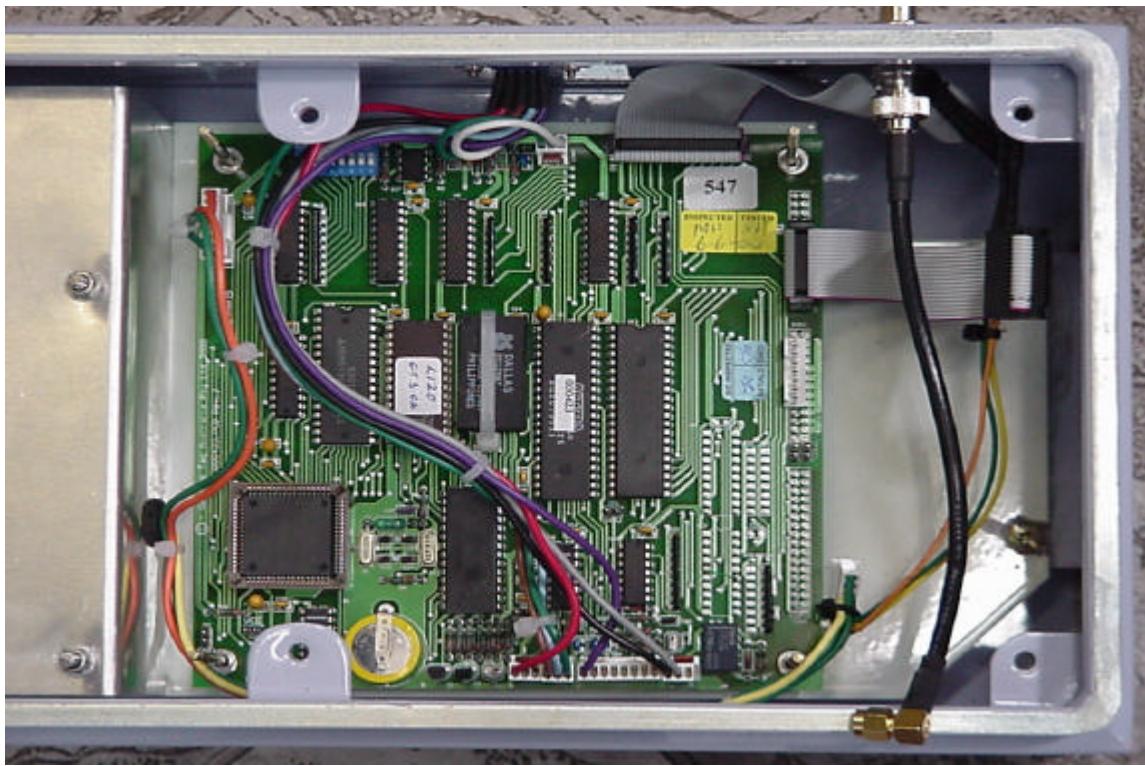


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## APPENDIX B6

### PHOTOGRAPHS OF TEST SAMPLE

#### Internal Photos



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**APPENDIX C**  
**TEST SAMPLE SCHEMATICS**

**SUBMITTED AS ATTACHMENT**



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**APPENDIX D**

**TEST SAMPLE PCB LAYOUTS**

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**APPENDIX E**  
**TEST SAMPLE PCB OVERLAYS**

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**APPENDIX F****FCC ID LABELLING****SUBMITTED AS ATTACHMENT**

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**APPENDIX G****GRAPHS OF EMI MEASUREMENTS****CONDUCTED EMI      0.45 - 30 MHz**

<b>Graph 1</b>	Active Line	Small Antenna
<b>Graph 2</b>	Neutral Line	Small Antenna
<b>Graph 3</b>	Active Line	Large Antenna
<b>Graph 4</b>	Neutral Line	Large Antenna

**RADIATED EMI      30 - 1000 MHz**

<b>Graph 5:</b>	Vertical Polarisation	Small Antenna
<b>Graph 6:</b>	Horizontal Polarisation	Small Antenna
<b>Graph 7:</b>	Vertical Polarisation	Large Antenna
<b>Graph 8:</b>	Horizontal Polarisation	Large Antenna

**OUT of BAND EMISSIONS at the CARRIER SIGNAL FREQUENCY**

<b>Graph 9:</b>	Small Antenna (13.52 – 13.6 MHz)
<b>Graph 10:</b>	Large Antenna (13.52 – 13.6 MHz)

**RADIATED EMI      0.009 - 30 MHz (LOOP ANTENNA)**

<b>Graph 11:</b>	Small Antenna
<b>Graph 12:</b>	Large Antenna



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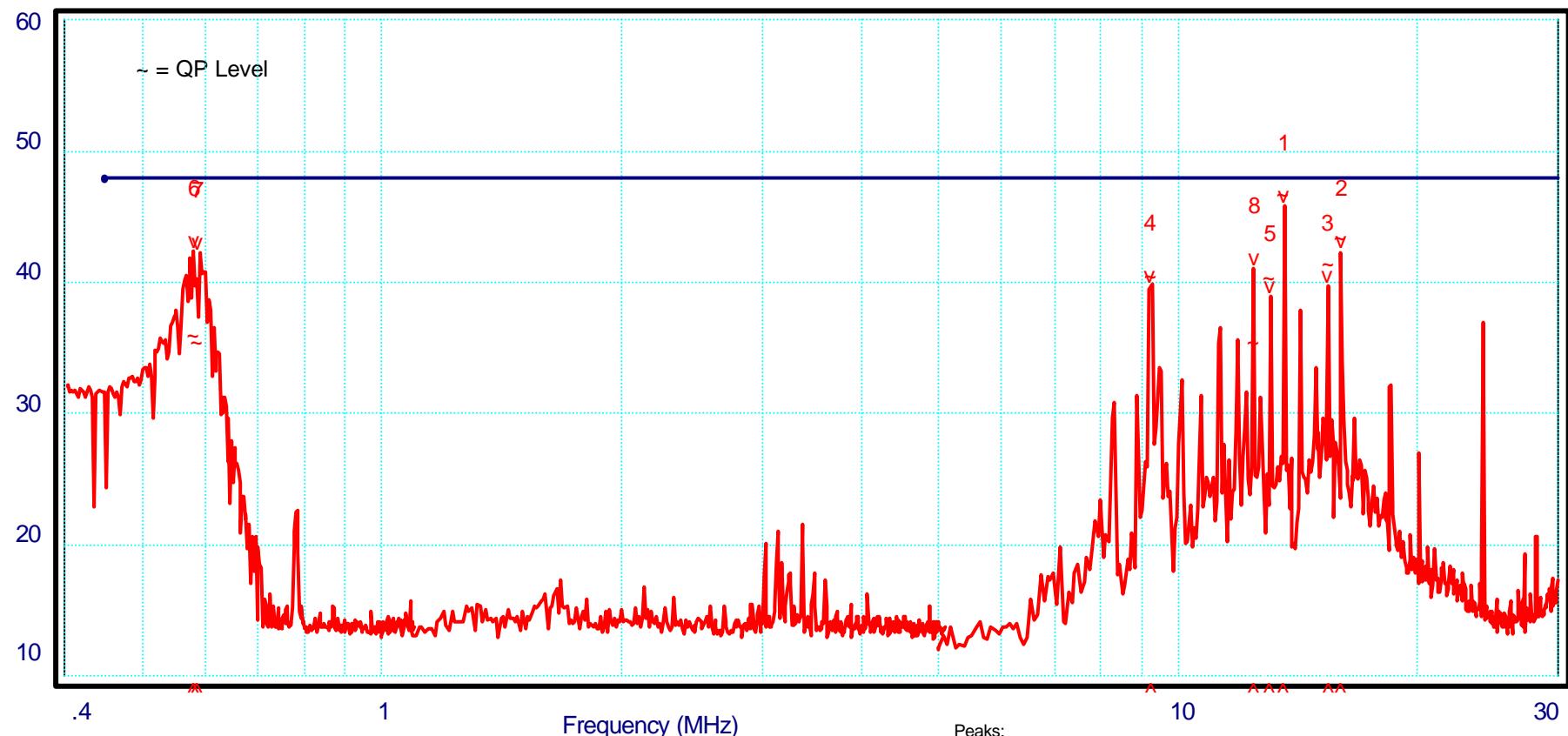
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Conducted Emissions dBuV Peak

Project No: M000840

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Test Date: 14-9-2000

GRAPH No. 1



GEMPLUS TAG AUSTRALIA PTY. LTD.

Small Antenna

Limits:  
 FCC\_BQP FCC CLASS B CONDUCTED QP LIMITS

Peaks:

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCC_BQP (dBuV)	dL1 (dB)	Av Val (dBuV)	dL2 (dB)
1	13.56	45.8	45.9	48.0	-2.1		
2	16.00	42.3	42.6	48.0	-5.4		
3	15.41	39.7	40.6	48.0	-7.4		
4	9.22	39.7	39.7	48.0	-8.3		
5	13.04	38.9	39.6	48.0	-8.4		
6	.58	42.3	35.2	48.0	-12.8		
7	.59	42.2	34.7	48.0	-13.3		
8	12.45	41.1	34.7	48.0	-13.3		

Legend:

— Active Line

Equipment: HP8574B TST 99B  
 Transducers: C190997 L0150502 NOPREAMP  
 Site ID: Melb Room#3  
 Test Officer: Chieu Huynh

Source:

analdata 106107120

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

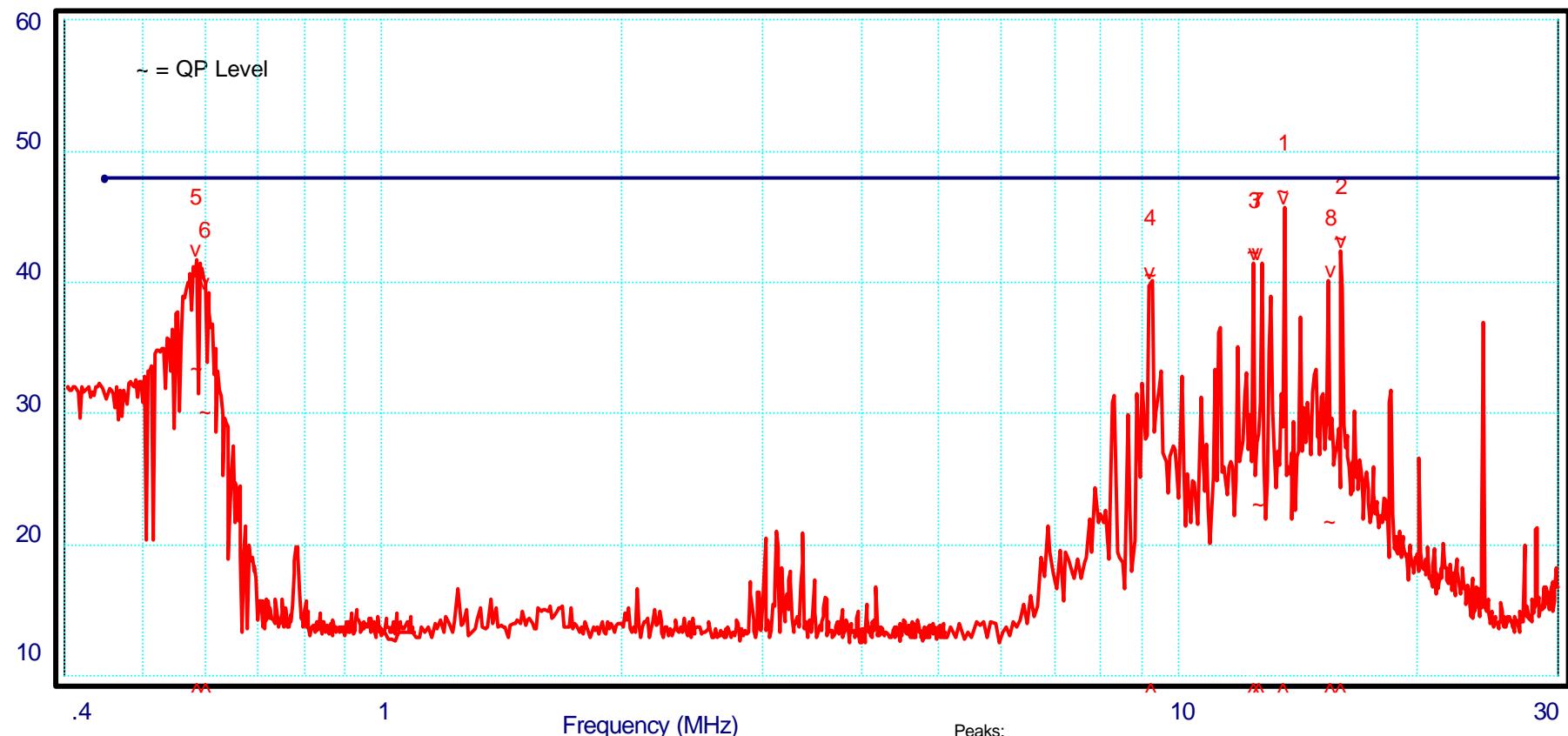
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Conducted Emissions dBuV Peak

Project No:M000840

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Test Date: 14-9-2000

GRAPH No. 2



GEMPLUS TAG AUSTRALIA PTY. LTD.

Small Antenna

Limits:  
 FCC\_BQP FCC CLASS B CONDUCTED QP LIMITS

Legend:

— Neutral Line

Equipment: HP8574B TST 99B  
 Transducers: C190997 L0150502 NOPREAMP  
 Site ID: Melb Room#3  
 Test Officer: Chieu Huynh

Source:

analdata 109111119

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCC_BQP (dBuV)	dL1 (dB)	Av Val (dBuV)	dL2 (dB)
1	13.56	45.7	46.2	48.0	-1.8		
2	16.00	42.4	42.6	48.0	-5.4		
3	12.44	41.4	41.6	48.0	-6.4		
4	9.22	40.0	39.9	48.0	-8.1		
5	.58	41.7	32.7	48.0	-15.3		
6	.60	39.1	29.4	48.0	-18.6		
7	12.60	41.4	22.4	48.0	-25.6		
8	15.55	40.1	21.0	48.0	-27.0		

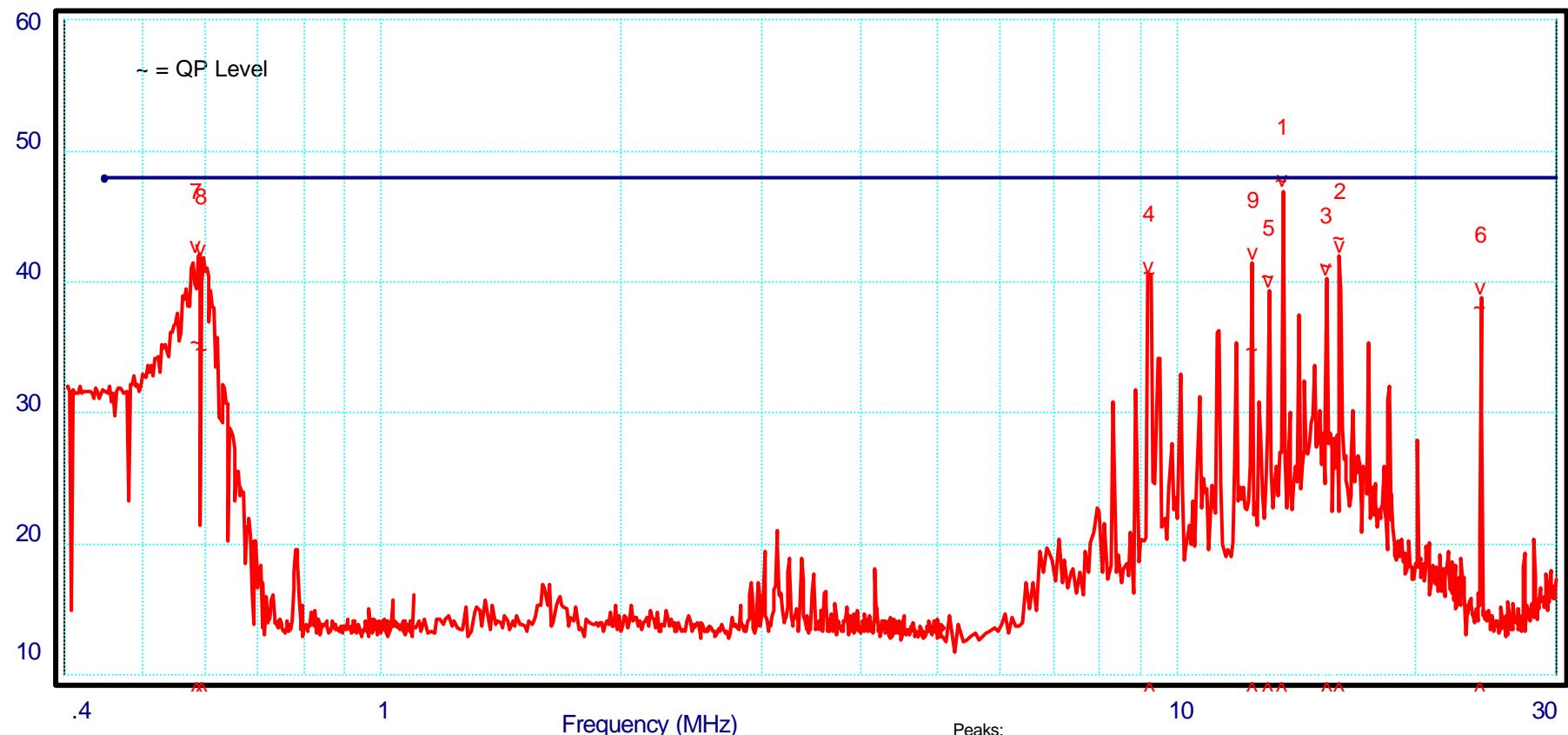
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Conducted Emissions dBuV Peak

Project No: M000840

Test Date: 14-9-2000

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GRAPH No. 3



GEMPLUS TAG AUSTRALIA PTY. LTD.

Large Antenna

Limits:  
 FCC\_BQP FCC CLASS B CONDUCTED QP LIMITS

Legend:

— Active Line

Equipment: HP8574B TST 99B  
 Transducers: C190997 L0150502 NOPREAMP  
 Site ID: Melb Room#3  
 Test Officer: Chieu Huynh

Source:

analdata 116117121

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCC_BQP (dBuV)	dL1 (dB)	Av Val (dBuV)	dL2 (dB)
1	13.56	46.9	47.0	48.0	-1.0		
2	16.00	42.0	42.7	48.0	-5.3		
3	15.41	40.2	40.5	48.0	-7.5		
4	9.22	40.4	40.0	48.0	-8.0		
5	13.04	39.3	39.7	48.0	-8.3		
6	24.05	38.7	37.3	48.0	-10.7		
7	.59	42.0	34.7	48.0	-13.3		
8	.59	41.7	34.2	48.0	-13.8		
9	12.45	41.4	34.1	48.0	-13.9		

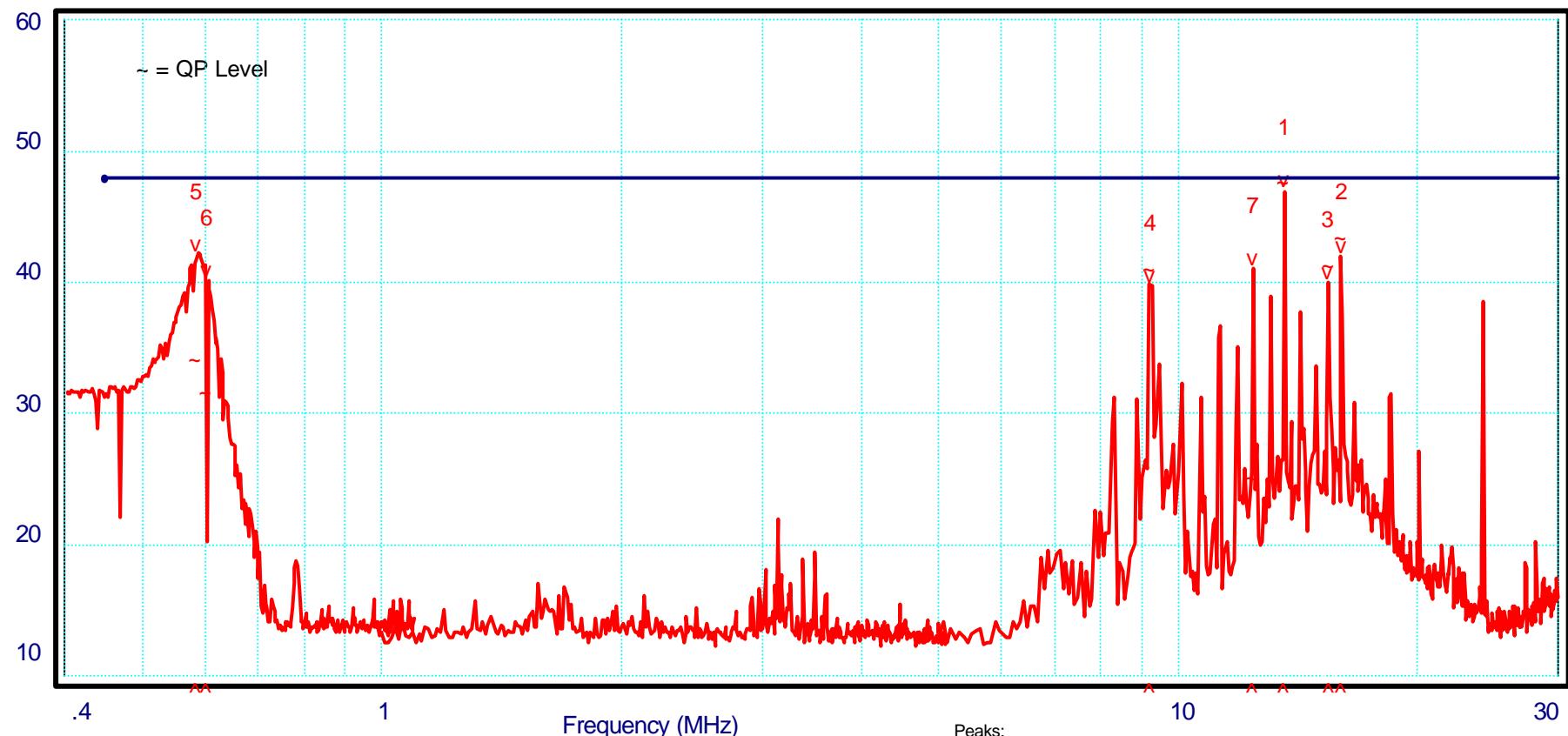
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Conducted Emissions dBuV Peak

Project No: M000840

Test Date: 14-9-2000

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GRAPH No. 4



GEMPLUS TAG AUSTRALIA PTY. LTD.

Large Antenna

Limits:  
 FCC\_BQP FCC CLASS B CONDUCTED QP LIMITS

Legend:

— Neutral Line

Equipment: HP8574B TST 99B  
 Transducers: C190997 L0150502 NOPREAMP  
 Site ID: Melb Room#3  
 Test Officer: Chieu Huynh

Source:

analdata 113114122

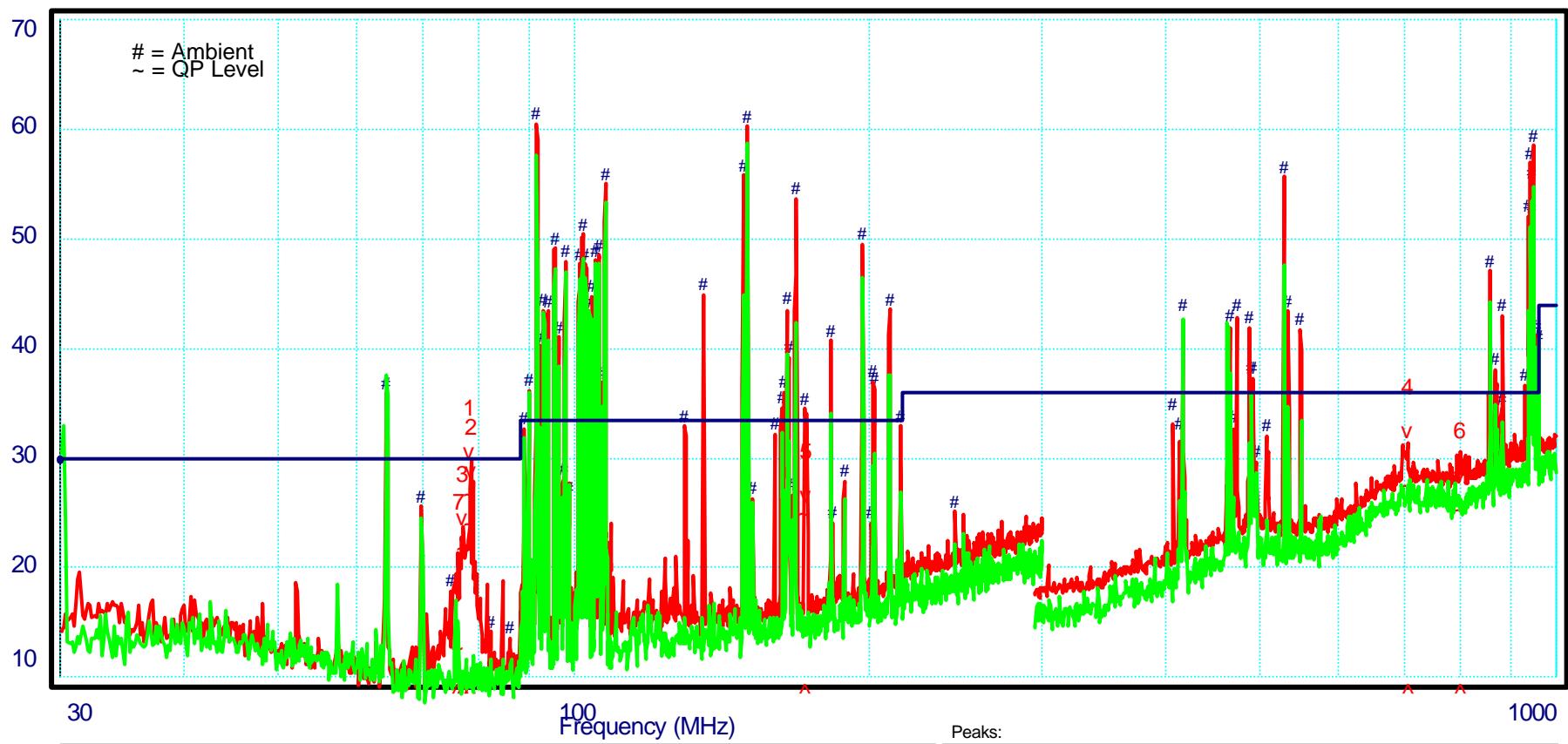
Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

EMC Technologies Pty. Ltd. - Global Product Certification  
FCC Class B Project No:M000840  
Electric Field Strength dBuV/m Peak

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Test Date: 1-9-2000

### GRAPH No. 5



GEMPLUS TAG AUSTRALIA PTY. LTD.

## Small Antenna

Limits: FCCB-10 FCC CLASS B RAD 10M LIMITS

Legend:

Equipment: HP8546A TST 99B  
Transducers: LCABLE a1100201 A1360100 NOPREAMP  
Site ID: Lederderg OATS1  
Test Officer: Chieu Huynh

Source: analdata 34 35 36 37 30 31  
spcldata 22 24 26 27 22 23

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9200  
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

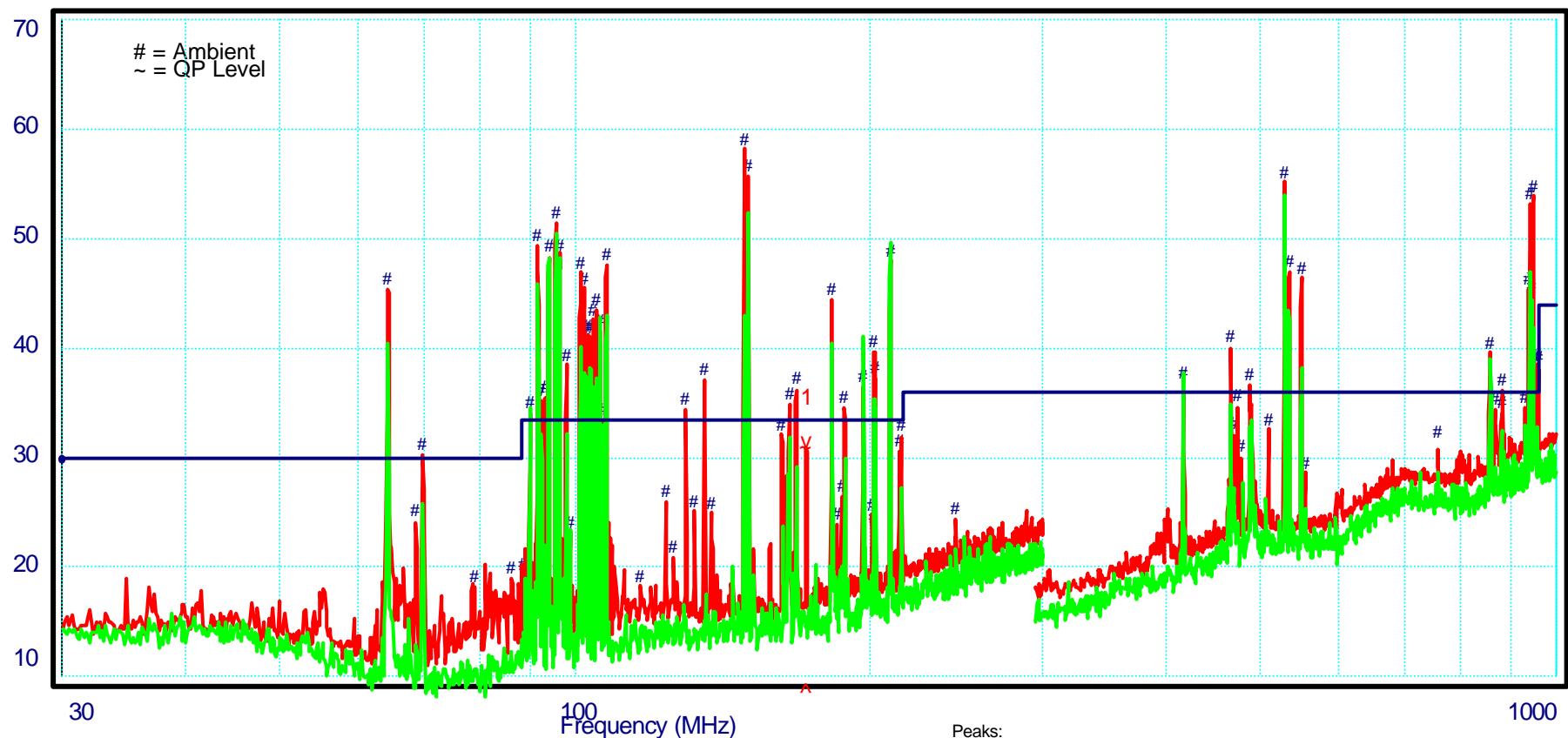
No	Freq (MHz)	Peak (dBuV/m)	Qp	Val	FCCB-10 (dBuV/m)	dL1 (dB)
1	78.29	30.0	26.2	30.0	-3.8	
2	78.35	28.3	23.5	30.0	-6.5	
3	77.01	23.9	21.3	30.0	-8.7	
4	705.34	31.9	26.9	36.0	-9.1	
5	171.81	26.0	24.4	33.5	-9.1	
6	797.73	27.8	24.8	36.0	-11.2	
7	76.24	21.3	12.1	30.0	-17.9	

EMC Technologies Pty. Ltd. - Global Product Certification  
FCC Class B Project No:M000840  
Electric Field Strength dBuV/m Peak

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Test Date: 1-9-2000

## GRAPH No. 6



GEMPLUS TAG AUSTRALIA PTY. LTD.

## Small Antenna

Limits:  
FCCB-10 FCC CLASS B RAD 10M LIMITS

Legend:

- Horizontal Ambients
- Horizontal Emissions

Equipment: HP8546A TST 99B  
Transducers: LCABLE a1100201 A1360100 NOPREAMP  
Site ID: Lederderg OATS1  
Test Officer: Chieu Huynh

Source: analdata

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9200  
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

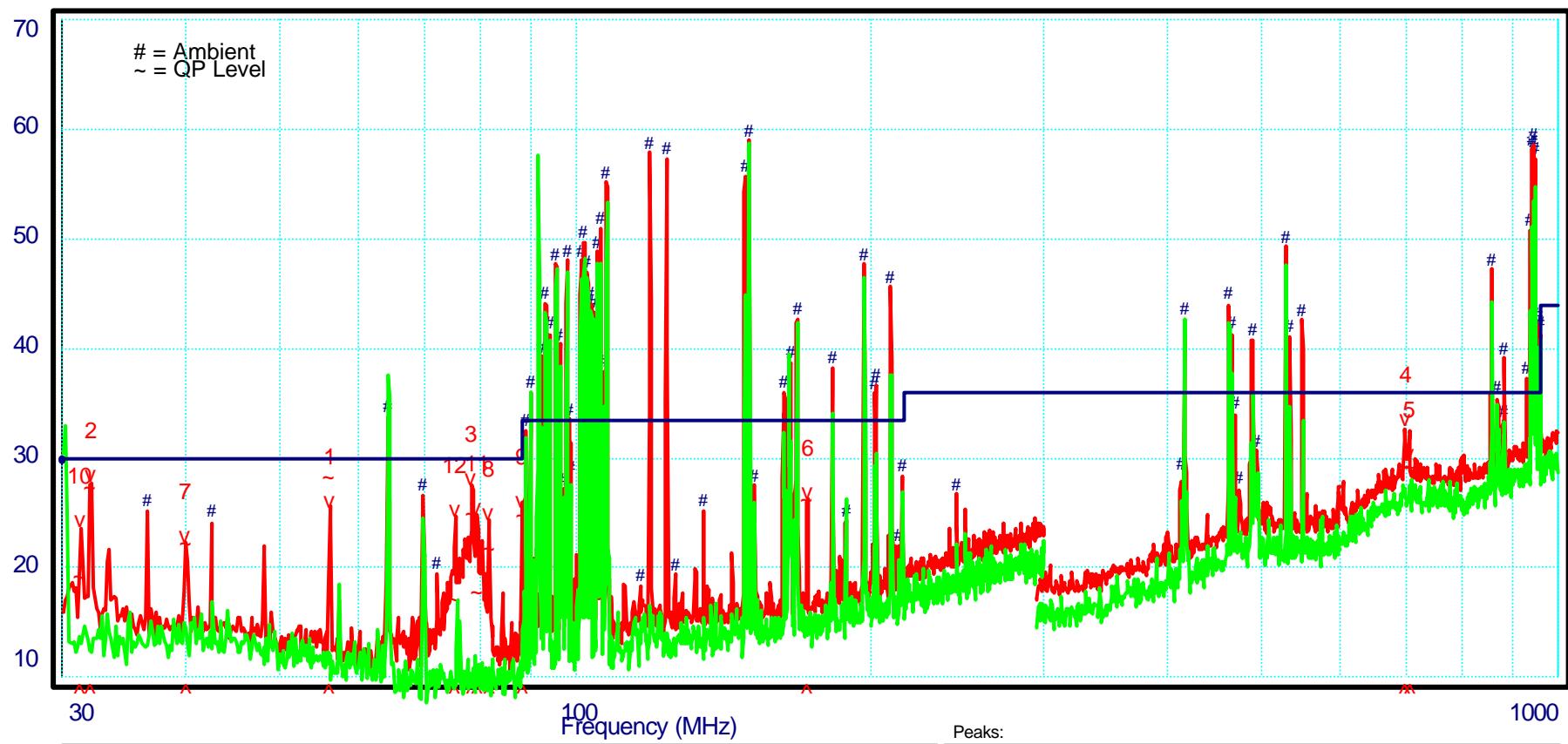
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Electric Field Strength dBuV/m Peak

Project No: M000840

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Test Date: 8-9-2000

GRAPH No. 7



Peaks:

No	Freq (MHz)	Peak (dBuV/m)	Qp Val	FCCB-10 (dBuV/m)	dL1 (dB)
1	56.06	25.6	27.7	30.0	-2.3
2	32.02	27.9	26.8	30.0	-3.2
3	78.29	27.5	24.5	30.0	-5.5
4	699.21	33.0	28.7	36.0	-7.3
5	706.15	29.8	28.7	36.0	-7.3
6	171.80	26.3	25.7	33.5	-7.8
7	40.03	22.4	21.7	30.0	-8.3
8	81.43	24.4	21.3	30.0	-8.7
9	88.04	25.6	24.3	33.5	-9.2
10	31.26	23.8	18.7	30.0	-11.3
11	79.14	24.9	17.3	30.0	-12.7
12	75.17	24.7	16.6	30.0	-13.4

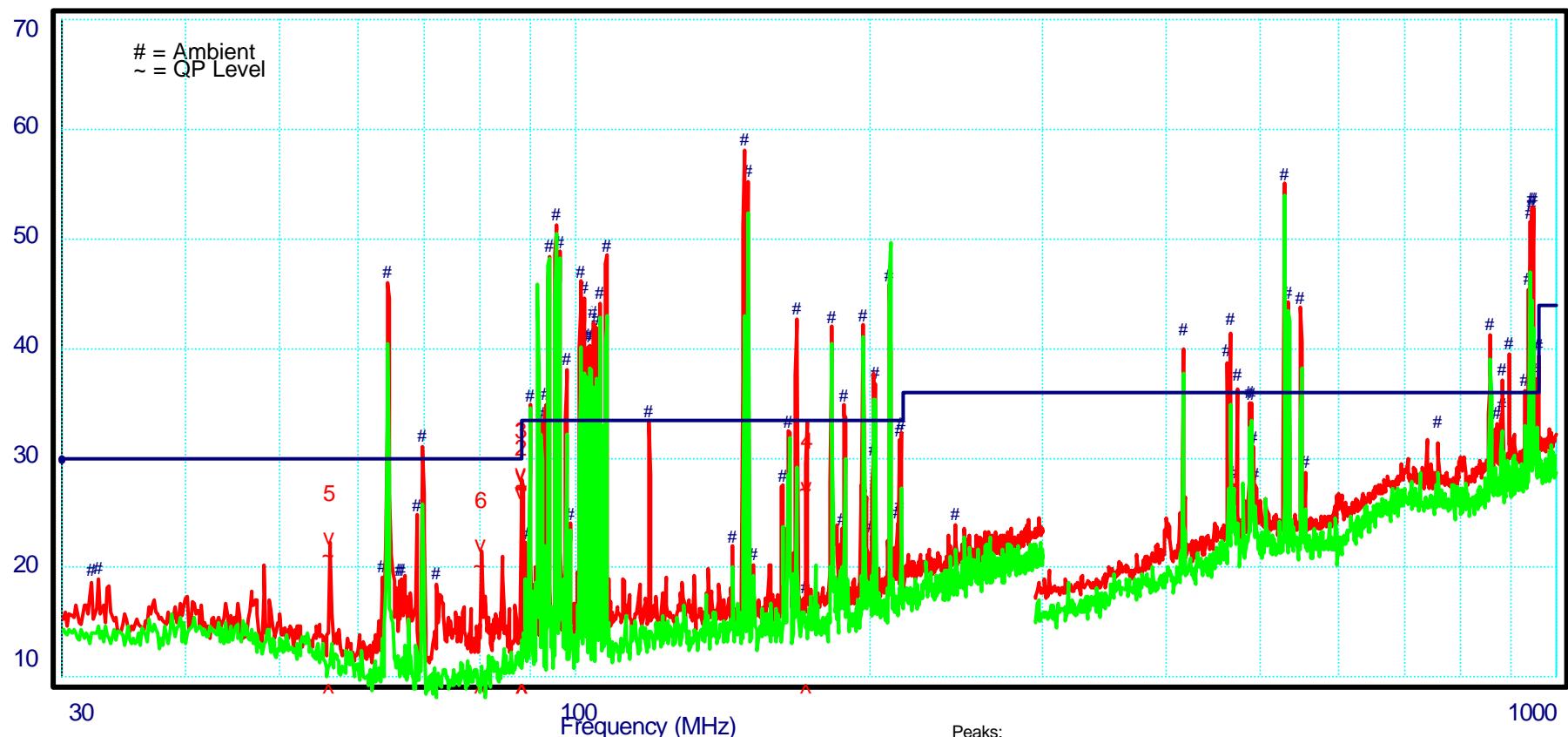
GEMPLUS TAG AUSTRALIA PTY. LTD.		Large Antenna							
Limits:		Legend:							
FCCB-10 FCC CLASS B RAD 10M LIMITS		Vertical Ambients							
		Vertical Emissions							
Equipment: HP8546A TST 99B		Source:							
Transducers: LCABLE a110201 A1360100 NOPREAMP		analdata		34 35 36 37 30 31					
Site ID: Lederderg OATS1		analdata		43 44 45 46 53 54					
Test Officer: Chieu Huynh									
Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230									
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010									

EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Project No:M000840  
 Electric Field Strength dBuV/m Peak

Test Date: 8-9-2000

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GRAPH No. 8



GEMPLUS TAG AUSTRALIA PTY. LTD.

Large Antenna

Limits:  
 FCCB-10 FCC CLASS B RAD 10M LIMITS

Legend:  
 Horizontal Ambients  
 Horizontal Emissions

Equipment: HP8546A TST 99B  
 Transducers: LCABLE a1100201 A1360100 NOPREAMP  
 Site ID: Lerderderg OATS1  
 Test Officer: Chieu Huynh

Source:  
 analdata  
 analdata

38 39 40 41 32 33  
 47 48 49 50 51 52

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

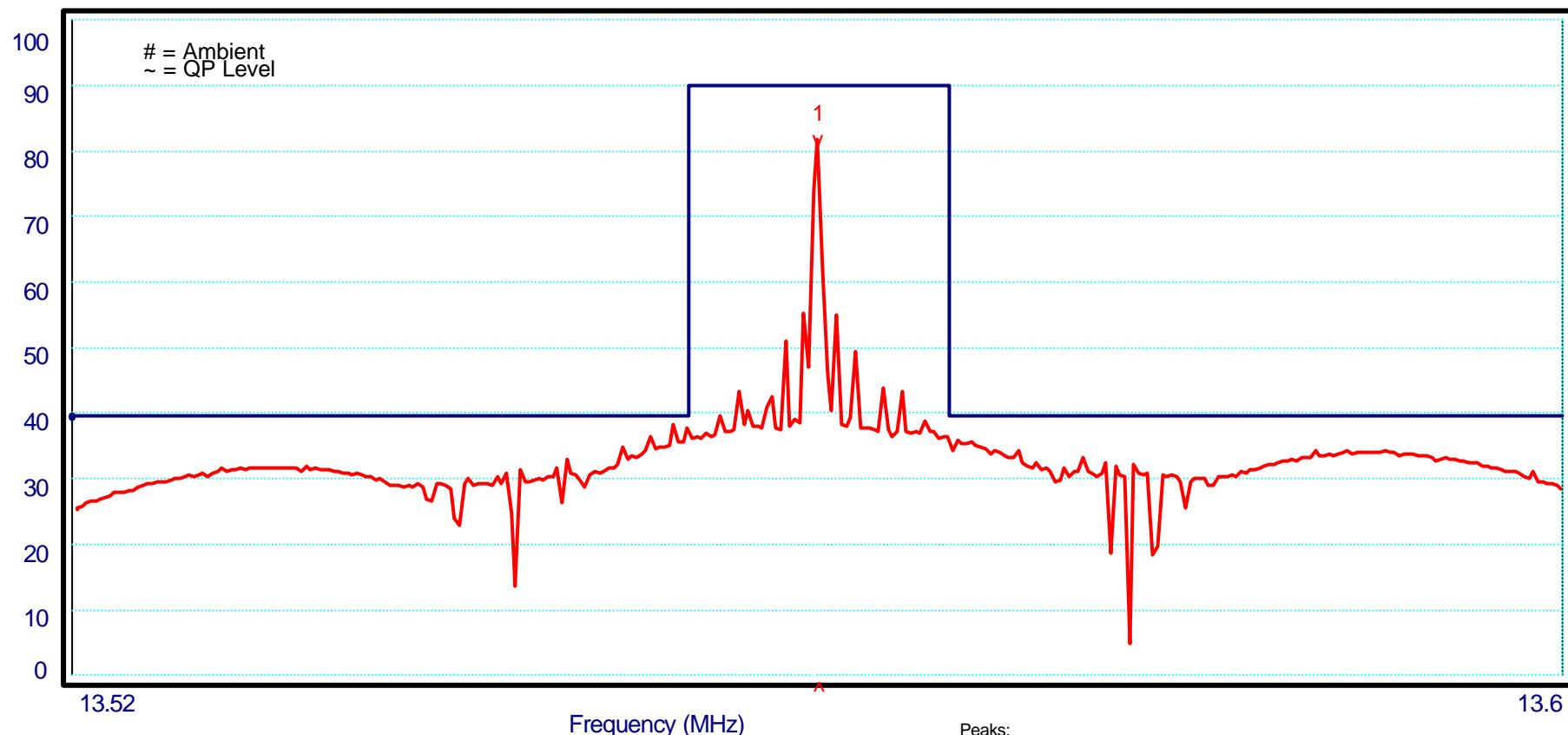
EMC Technologies Pty. Ltd. - Global Product Certification  
FCC Class B  
Electric Field Strength dBuV/m Peak

Project No:M000840

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Test Date: 1-9-2000

GRAPH No. 9



GEMPLUS TAG AUSTRALIA PTY. LTD.

Out of Band Emissions for 13.56 MHz - Using Loop Antenna  
Small Antenna

Limits:  
FCC15225 FCC PART 15.225 10mtr TX LMTS FOR 13.5 MHz

Legend:

— EUT on

Equipment: HP8546A TST 99B  
Transducers: LCABLE 6502\_e NOPREAMP  
Site ID: Lerderderg OATS1  
Test Officer: Chieu Huynh

Source:

analdata 40

No	Freq (MHz)	Peak (dBuV/m)	Qp Val	FCC15225 (dBuV/m)	dL1 (dB)
1	13.56	82.0	81.8	90.0	-8.2

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9200  
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

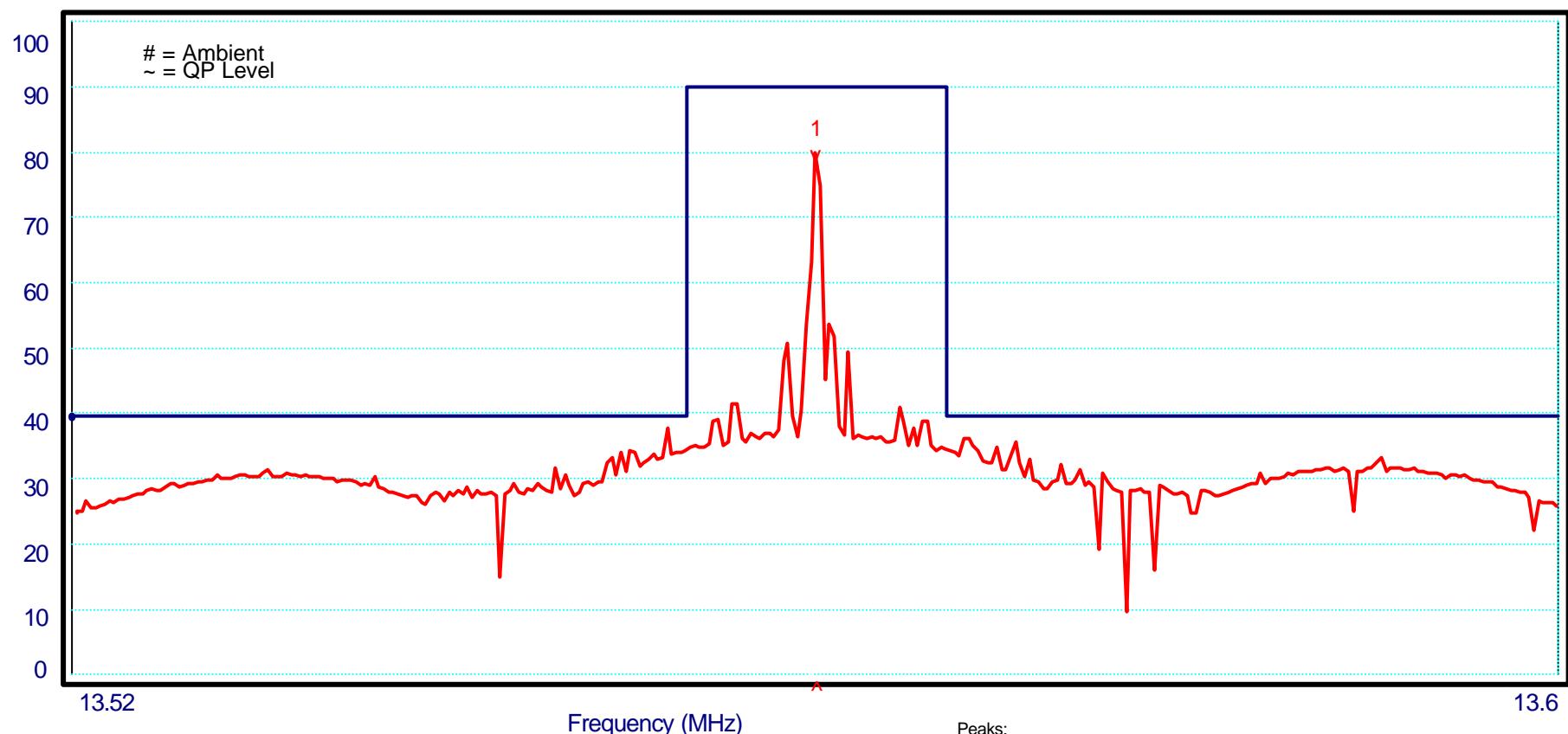
EMC Technologies Pty. Ltd. - Global Product Certification  
FCC Class B  
Electric Field Strength dBuV/m Peak

Project No:M000840

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Test Date: 1-9-2000

GRAPH No. 10



GEMPLUS TAG AUSTRALIA PTY. LTD.

Out of Band Emissions for 13.56 MHz - Using Loop Antenna  
Large Antenna

Limits:  
FCC15225 FCC PART 15.225 10mtr TX LMTS FOR 13.5 MHz

Legend:

— EUT on

Equipment: HP8546A TST 99B  
Transducers: LCABLE 6502\_e NOPREAMP  
Site ID: Lerderderg OATS1  
Test Officer: Chieu Huynh

Source:

analdata 58

No	Freq (MHz)	Peak (dBuV/m)	Qp Val	FCC15225 (dBuV/m)	dL1
1	13.56	80.0	79.0	90.0	-11.0

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9200  
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

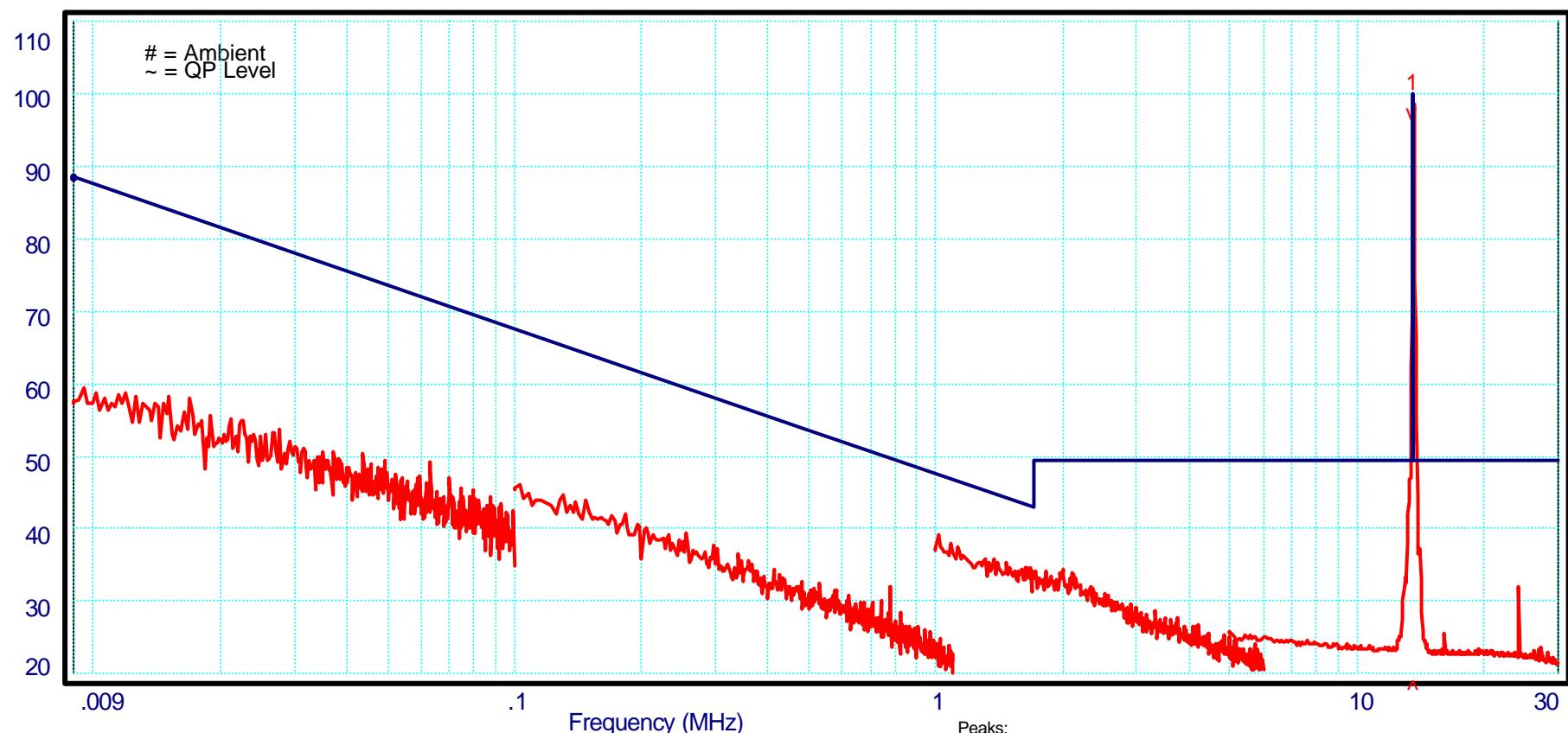
EMC Technologies Pty. Ltd. - Global Product Certification  
 FCC Class B  
 Electric Field Strength dBuV/m Peak

Project No:M000840

Test Date: 9-9-2000

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GRAPH No. 11



GEMPLUS TAG AUSTRALIA PTY. LTD.

Out of Band Emissions - Using Loop Antenna  
 Small Antenna

Limits:  
 FCC225SP FCC PART 15.225 3mtr Tx & out of band LMTS FOR 13.5 MHz

Legend:

— EUT on

Equipment: HP8546A TST 99B  
 Transducers: C151C162 6502\_E NOPREAMP  
 Site ID: Melb Room#4  
 Test Officer: Chieu Huynh

Source:

analdata 85 87 88 89

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
 Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

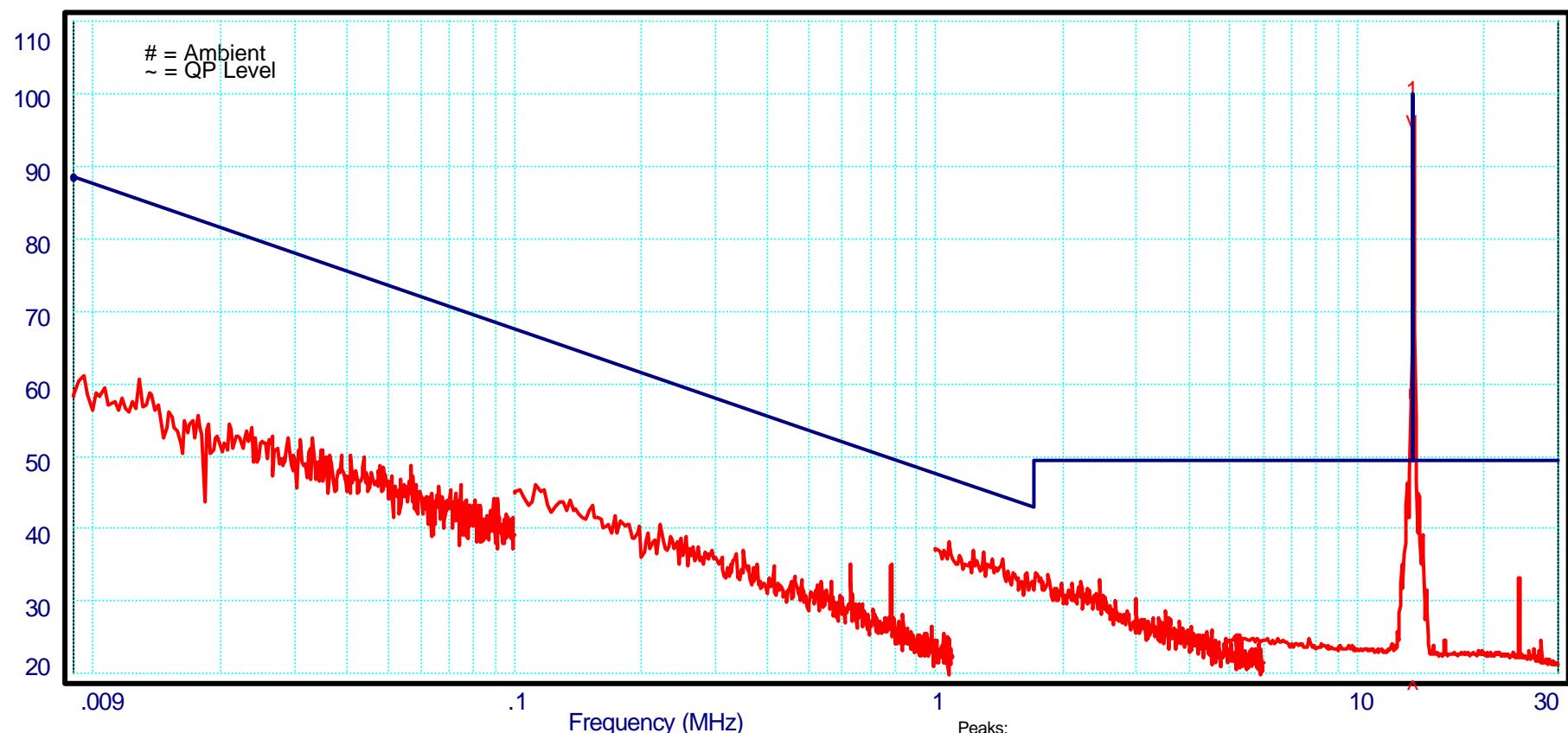
EMC Technologies Pty. Ltd. - Global Product Certification  
FCC Class B  
Electric Field Strength dBuV/m Peak

Project No:M000840

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Test Date: 9-9-2000

GRAPH No. 12



GEMPLUS TAG AUSTRALIA PTY. LTD.

Out of Band Emissions - Using Loop Antenna  
Large Antenna

Limits:  
FCC225SP FCC PART 15.225 3mtr Tx & out of band LMTS FOR 13.5 MHz

Legend:

— EUT on

Equipment: HP8546A TST 99B  
Transducers: C151C162 6502\_e NOPREAMP  
Site ID: Melb Room#4  
Test Officer: Chieu Huynh

Source:

analdata 70 78 72 73

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9230  
Sydney--- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4010

**APPENDIX H**

**USER INSTRUCTIONS (Manual)**

**SUBMITTED AS ATTACHMENTS 1 AND 2**



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