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EMI TEST REPORT for CERTIFICATION to FCC PART 24(E) – Broadband PCS and FCC PART 22(H) – Cellular Radiotelephone Service

FCC ID: UIB-X3

Test Sample: Autocite Handheld Device
Model: X3
Tested for: Duncan Technologies

Report Number: M060505_Cert_X3

Issue Date: 16th August 2006

EMI TEST REPORT FOR CERTIFICATION
to
FCC PART 24 Subpart E – Broadband PCS and
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Report Number: M060505_Cert_X3

Test Sample: Autocite Handheld Device
Model: X3
Manufacturer: Duncan Technologies
28 Hammond, Suite C
Irvine CA 92618

FCC ID: UIB-X3
Equipment Type: Intentional Radiator

Tested for: Duncan Technologies

Test Standards: FCC Part 24 – Personal Communications Services
Subpart E – Broadband PCS

FCC Part 22 – Public Mobile Services
Subpart H - Cellular Radiotelephone Service

ANSI/TIA/EIA-603
ANSI C63.4 – 2003
OET Bulletin No. 65

Test Dates: 19th June to 28th July 2006

Test Officers:
Chieu Huynh - B.Eng (Hons) Electronics
Jorge Lara

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 Signatory:
Chris Zombolas
Technical Director
EMC Technologies Pty Ltd

EMI TEST REPORT FOR CERTIFICATION
to
FCC PART 24 Subpart E – Broadband PCS and
FCC PART 22 Subpart H - Cellular Radiotelephone Service

1.0 INTRODUCTION

EMI testing was performed on the Autocite Handheld Device, Model: X3. The test results and procedures were performed in accordance with the following Federal Communications Commission (FCC) standards/regulations. The test sample **complied** with the requirements of 47 CFR, Part 24 Subpart E – Broadband PCS and Part 22 Subpart H - Cellular Radiotelephone Service.

1.1 Summary of Results

FCC Part 24 Subpart E Clauses	FCC Part 22 Subpart H Clauses	Test Performed	Result
24.232	22.913	Power Limits	**Complies**
24.235	22.355	Frequency Stability	**Complies**
24.238	22.917	Emission Limits	**Complies**

The measurement procedure used was in accordance with ANSI/TIA/EIA-603, ANSI C63.4-2003 and OET Bulletin No. 65. The instrumentation conformed to the requirements of ANSI C63.2-1996.

1.2 Modifications by EMC Technologies

No modifications were required.

2.0 GENERAL INFORMATION

(Information supplied by the Client)

2.1 Product Details

Test Sample: Autocite Handheld Device
Model: X3
FCC ID: UIB-X3

Manufacturer: Duncan Technologies

Transmitter: GSM/GPRS Radio Modem (850/1900 MHz)
Equipment Type: Intentional Radiator

2.2 Technical Operational Description

Refer to Appendix C – Operation Description.

2.3 Test Configuration

Radiated Measurements: The EUT was configured to communicate continuously to the Rohde & Schwarz Universal Radio Communication Tester and was transmitted continuously during all tests.

Conducted Measurements: The EUT was configured to communicate continuously to the Rohde & Schwarz Universal Radio Communication Tester. A splitter was used between the EUT, the Rohde & Schwarz Digital Radio Tester and the Spectrum analyser. Refer to Appendix B2 for test setup photos.

Testing was performed in the two operating frequency ranges: 824.0 – 849 MHz and 1850 – 1910 MHz. The transmitter continuously transmitted at maximum output power on a low, middle and high frequency channel for each band.

850 MHz band:
Low (824.2 MHz), Middle (836.6 MHz), High (848.8 MHz)

1900 MHz band:
Low (1850.2 MHz), Middle (1880.0 MHz), High (1909.8 MHz)

2.4 Block Diagram

Refer to Appendix D - Block Diagram

2.5 Support Equipment

Rohde & Schwarz Universal Radio Communication Tester, Model: CMU200.

2.6 Test Procedure

Emissions measurements were performed in accordance with the procedures of ANSI/TIA/EIA-603 and ANSI C63.4-2003. Radiated emissions tests were performed at a distance of 3 metres from the EUT. OET Bulletin 65 dated June 2001 was used for reference.

2.7 Test Facility

2.7.1 General

Measurements were performed at EMC Technologies open area test site (OATS) situated at Lerderderg Gorge, near the township of Bacchus Marsh in Victoria, Australia. and EMC Technologies' laboratory in Tullamarine, Victoria Australia.

The above sites have been accepted for testing by the Federal Communications Commission (FCC), **FCC Registration Number 90560**.

EMC Technologies open area test site (OATS) has also been accepted by Industry Canada for the performance of radiated measurements in accordance with RSS 212, Issue 1 (Provisional).
Industry Canada File Number, IC 4161.

2.7.2 NATA Accreditation

EMC Technologies is accredited in Australia to test to the following standards by the National Association of Testing Authorities (NATA).

"FCC Part 15 unintentional and intentional emitters in the frequency range 9kHz to 18 GHz excluding TV receivers (15.117 and 15.119), TV interface devices (15.115), cable ready consumer electronic equipment (15.118), cable locating equipment (15.213) and unlicensed national information infrastructure devices (Sub part E)."

The current full scope of accreditation can be found on the NATA website: www.nata.asn.au
It also includes a large number of emissions, immunity, SAR, EMR and Safety standards.

NATA is the Australian national laboratory accreditation body and has accredited EMC Technologies to operate to the IEC/ISO17025 requirements. A major requirement for accreditation is the assessment of the company and its personnel as being technically competent in testing to the standards. This requires fully documented test procedures, continued calibration of all equipment to the National Standard at the National Measurements Laboratory (NML) and an internal quality system to ISO 9002. NATA has mutual recognition agreements with the National Voluntary Laboratory Accreditation Program (NVLAP) and the American Association for Laboratory Accreditation (A^2LA).

2.8 Units of Measurements

2.8.1 Conducted Emissions

Measurements are reported in units of dB relative to one microvolt. (dBμV).

2.8.2 Radiated Emissions

Measurements are reported in units of dB relative to one microvolt per metre (dBμV/m).

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) Pty Ltd or the National Measurement Laboratory (NML). All equipment calibration is traceable to Australia national standards at the National Measurements Laboratory. The reference antenna calibration was performed by NML and the working antennas (biconical and log-periodic) calibrated by the NATA approved procedures. The complete list of test equipment used for the measurements, including calibration dates and traceability is contained in Appendix A.

2.10 Ambients at OATS

The Open Area Test Site (OATS) 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 FM radio, VHF and UHF television bands. Radiated prescan measurements were performed in the shielded enclosure to check for possible radiated emissions at the frequencies where the OATS ambient signals exceeded the test limit.

RESULTS

3.0 PEAK POWER OUTPUT MEASUREMENTS

Testing was performed in accordance with the requirements of FCC Part 24.232(b), FCC Part 22.913.

Measurements were performed while the transmitter continuously transmitted.

The transmitter output was connected to the spectrum analyser via a calibrated power divider in peak hold mode.

The resolution bandwidth of 1 MHz and the video bandwidth of 1 MHz were utilised.

Limits:
FCC Part 24.232(b) EIRP = Peak Conducted Power in dBm + Antenna gain in dBi
FCC Part 22.913 ERP = EIRP – 2.15 dB
The antenna gain is 1 dBi (unity gain).

3.1 FCC Part 22.913 (850 MHz)

Channel	Frequency MHz	Peak Power Measured dBm	EIRP Measured dBm	ERP Measured dBm	ERP Measured Watts	ERP Limit Watts
Low	824.2	31.2	32.2	30.05	1.0116	7.0
Middle	836.6	31.3	32.3	30.15	1.0352	7.0
High	848.8	31.6	32.6	30.45	1.1092	7.0

Refer to Appendix K1 for power plots.

3.2 FCC Part 24.232(b) (1900 MHz)

Channel	Frequency MHz	Peak Power Measured dBm	EIRP Measured dBm	EIRP Measured Watts	EIRP Limit Watts
Low	1850.2	29.1	30.1	1.0233	2.0
Middle	1880	29.0	30.0	1.000	2.0
High	1909.8	28.7	29.7	0.9333	2.0

Refer to Appendix K2 for power plots.

Variation by +/- 15% of the supply voltage in accordance with Section 15.31(e), did not vary the output power observed.

A substitution measurement was used to check the output power measured. The transmitter was replaced with the signal generator. The signal generator output level was increased until the same level on the spectrum analyser was observed. The measurement observed is the signal generator output level in dBm and corrected with the cable loss and the attenuation used. The results were within ±1.4 dB of the reported levels above.

4.0 OUT of BAND EMISSIONS (Spurious and Harmonics)

4.1 Test Procedure

Measurements were made at the open area test site. The EUT was set up on the table top (placed on turntable) of total height 80 cm above the ground plane, and operated as described in section 2 of this report. The EMI Receiver was operated under software control via the PC Controller through the IEEE.488 Interface Bus Card Adaptor. The 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 antenna heights. When an emission was located, it was positively identified and its maximum level found by rotating the automated turntable, and by varying the antenna height. Each significant peak was investigated with the Quasi-Peak/Average Detectors. The software for cable losses automatically corrected the measurement data for each frequency range, 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 antenna polarisations.

4.2 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 dBµV/m.
V = EMI Receiver Voltage in dBµV. (measured value)
AF = Antenna Factor in dB(m^{-1}). (stored as a data array)
G = Preamplifier Gain in dB. (stored as a data array)
L = Cable loss in dB. (stored as a data array of Insertion Loss versus frequency)

- **Example Field Strength Calculation**

Assuming a receiver reading of 34.0 dBµV 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 dBµV/m

The Field Strength result is converted into dBm.

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (1000 MHz – 18000 MHz) ± 4.1 dB
  (30 MHz – 1000 MHz) ± 3.7 dB

4.3 Radiated Emissions Results

Testing was performed in accordance with the requirements of FCC Part 24.238 and FCC Part 22.917(a).

As per 24.238(a) – The limits of any emissions outside the frequency band shall be attenuated by at least 43 + 10log(P) dB, where P is the measured transmitter output power.

4.3.1 Frequency Band: 1 – 20 GHz

Calibrated EMCO 3115, EMCO 3116 and ETS Standard Horn antennas were used for measurements between 1 to 20 GHz.

The resolution bandwidth of 1 MHz and the video bandwidth of 1 MHz were utilised

All measurements above 1 GHz were initially made over a distance of 3 metres. This was decreased to 1.0 metre as the emission levels from the device were very low.

4.3.1.1 850 MHz

Testing was performed while transmitter continuously transmitted on a low (824.2 MHz), middle (836.6 MHz) and high (848.8 MHz) frequency channel. Harmonics related to the transmitter are reported below.

Low Channel – 824.2 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
824.20	Fundamental	3	-	-
1648.4	Vertical/Horizontal	-52	-13	Pass
2472.6	Vertical/Horizontal	-49	-13	Pass
3296.8	Vertical/Horizontal	-45	-13	Pass
4121.0	Vertical/Horizontal	-48	-13	Pass
4945.2	Vertical/Horizontal	Low	-13	Pass
5769.4	Vertical/Horizontal	-42	-13	Pass
6593.6	Vertical/Horizontal	-35	-13	Pass
7417.8	Vertical/Horizontal	-43	-13	Pass
8242.0	Vertical/Horizontal	-40	-13	Pass

Middle Channel – 836.6 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
836.6	Fundamental	3.5	-	-
1673.2	Vertical/Horizontal	-54	-13	Pass
2509.8	Vertical/Horizontal	-49	-13	Pass
3346.4	Vertical/Horizontal	-44	-13	Pass
4183.0	Vertical/Horizontal	-49	-13	Pass
5019.6	Vertical/Horizontal	Low	-13	Pass
5856.2	Vertical/Horizontal	-41	-13	Pass
6692.8	Vertical/Horizontal	-36	-13	Pass
7529.4	Vertical/Horizontal	-41	-13	Pass
8366.0	Vertical/Horizontal	-40	-13	Pass

High Channel – 848.8 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
848.8	Fundamental	2.5	-	-
1697.6	Vertical/Horizontal	-54	-13	Pass
2546.4	Vertical/Horizontal	-50	-13	Pass
3395.2	Vertical/Horizontal	-45	-13	Pass
4244	Vertical/Horizontal	-49	-13	Pass
5092.8	Vertical/Horizontal	Low	-13	Pass
5941.6	Vertical/Horizontal	-40	-13	Pass
6790.4	Vertical/Horizontal	-37	-13	Pass
7639.2	Vertical/Horizontal	-39	-13	Pass
8488	Vertical/Horizontal	-40	-13	Pass

Harmonics were recorded within 22 dB of the FCC limits. The measurement uncertainty for radiated emissions in this band was ± 4.1 dB.

A substitution measurement was used to check the harmonics measured. The transmitter was replaced with a horn antenna that was connected to the signal generator. The signal generator output level was increased until the same level on the spectrum analyser was observed. The measurement observed is the signal generator output level in dBm less any loss/gain due to the coax cable and the antenna. The results were lower than the reported levels above.

Result: Complies

4.3.1.2 1900 MHz

Testing was performed while transmitter continuously transmitted on a low (1850.2 MHz), middle (1880 MHz) and high (1909.8 MHz) frequency channel. Harmonics related to the transmitter are reported below.

Low Channel – 1850.2 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
1850.2	Fundamental	-5.5	-	-
3700.4	Vertical/Horizontal	-29	-13	Pass
5550.6	Vertical/Horizontal	-30	-13	Pass
7400.8	Vertical/Horizontal	-29	-13	Pass
9251.0	Vertical/Horizontal	-38	-13	Pass
11101.2	Vertical/Horizontal	-40	-13	Pass
12951.4	Vertical/Horizontal	-37	-13	Pass
14801.6	Vertical/Horizontal	-43	-13	Pass
16651.8	Vertical/Horizontal	-44	-13	Pass
18502	Vertical/Horizontal	low	-13	Pass

Middle Channel – 1880 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
1880	Fundamental	-5	-	-
3760	Vertical/Horizontal	-30	-13	Pass
5640	Vertical/Horizontal	-29	-13	Pass
7520	Vertical/Horizontal	-26	-13	Pass
9400	Vertical/Horizontal	-41	-13	Pass
11280	Vertical/Horizontal	-36	-13	Pass
13160	Vertical/Horizontal	-35	-13	Pass
15040	Vertical/Horizontal	-42	-13	Pass
16920	Vertical/Horizontal	-45	-13	Pass
18800	Vertical/Horizontal	low	-13	Pass

High Channel – 1909.8 MHz

Frequency MHz	Antenna Polarization	Level dBm	Limit dBm	Result
1909.8	Fundamental	-2	-	-
3819.6	Vertical/Horizontal	-29	-13	Pass
5729.4	Vertical/Horizontal	-25	-13	Pass
7639.2	Vertical/Horizontal	-38	-13	Pass
9549.0	Vertical/Horizontal	-37	-13	Pass
11458.8	Vertical/Horizontal	-40	-13	Pass
13368.6	Vertical/Horizontal	-37	-13	Pass
15278.4	Vertical/Horizontal	-43	-13	Pass
17188.2	Vertical/Horizontal	-46	-13	Pass
19098	Vertical/Horizontal	low	-13	Pass

Harmonics were recorded within 12 dB of the FCC limits. The measurement uncertainty for radiated emissions in this band was ± 4.1 dB.

A substitution measurement was used to check the harmonics measured. The transmitter was replaced with a horn antenna that was connected to the signal generator. The signal generator output level was increased until the same level on the spectrum analyser was observed. The measurement observed is the signal generator output level in dBm less any loss/gain due to the coax cable and the antenna. The results were lower than the reported levels above.

Result: Complies

4.3.2 Frequency Band: 30 - 1000 MHz

A calibrated Biconical antenna was used for measurements between 30 MHz to 232 MHz and a calibrated Logperiodic antenna used for measurements between 230 MHz to 1000 MHz.

Testing was performed at 3m distance. The resolution bandwidth of 1 MHz and the video bandwidth of 1 MHz were utilised.

No spurious emissions were recorded within 30 dB of the FCC limit (the limit is -13dBm). The measurement uncertainty in this band was ± 3.7 dB. Refer to Appendix L (graphs 3 to 6) for plots.

Result: Complies.

4.3.3 Frequency Band: 0.009 - 30 MHz

A calibrated Loop antenna was used. Testing was performed at 3m distance. The resolution bandwidth of 1 MHz and the video bandwidth of 1 MHz were utilised.

No spurious emissions were recorded within 30 dB of the FCC limit (the limit is -13dBm). The measurement uncertainty in this band was ± 3.7 dB.

Result: Complies.

4.4 Band Edge Measurements

Testing was performed in accordance with the requirements of FCC Part 24.238 and FCC Part 22.917(a).

4.4.1 850 MHz

Refer to Appendix H1 for Band Edge plots

NB: D1 is the limit line – "any emissions outside the frequency band shall be attenuated by at least 43 + 10log(P) dB"

Result: Complies.

4.4.2 1900 MHz

Refer to Appendix H2 for Band Edge plots

NB: D1 is the limit line – "any emissions outside the frequency band shall be attenuated by at least 43 + 10log(P) dB"

Result: Complies.

4.5 Antenna Conducted RF Measurements (9 kHz to 10th Harmonic)

Testing was performed in accordance with the requirements of FCC Part 24.238 and FCC Part 22.917(a).

Measurements were performed while the transmitter continuously transmitted.

The transmitter output was connected to the spectrum analyser in peak hold mode.

The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised.

Testing was performed in the two operating frequency ranges. The transmitter continuously transmitted at highest output power on a low, middle and high frequency channel for each range. The transmitter also tested at low output power for each range.

4.5.1 850 MHz

Refer to Appendix J1 for antenna conducted RF plots. Harmonics or spurious emissions were below the FCC limits (the limit is -13dBm).

Result: Complies.

4.5.2 1900 MHz

Refer to Appendix J2 for antenna conducted RF plots. Harmonics or spurious emissions were below the FCC limits (the limit is -13dBm).

Result: Complies.

5.0 CONDUCTED EMISSION MEASUREMENTS

5.1 Test Procedure

The arrangement specified in ANSI/TIA/EIA-603 and ANSI C63.4-2003 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 C63.2-1996 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 0.15 MHz to 30 MHz frequency range was sub-divided into sub-ranges to ensure that all short duration peaks were captured.

5.2 Peak Maximising Procedure

The various operating modes of the system were investigated. 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 and the Average detector were then invoked to measure the actual Quasi-Peak and Average level of the most significant peaks, which were detected.

5.3 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 dBµV to be compared to the limit.
VRx = the Voltage in dBµV read directly at the EMI receiver.
LBPF = the loss in dB of the cables and the Limiter and Pass Filter.

5.4 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 were subsequently plotted. A list of the highest relevant peaks and the respective Quasi-Peak and Average values were also plotted on the graph.

5.5 Results of Conducted Emission Measurements (AC Mains Ports)

The worst case conducted EMI complied with both quasi peak and average limits by margins of > 10 dB. The measurement uncertainty was ± 2.0 dB. Refer to Appendix L (graphs 1 & 2) for plots.

Result: Complies

6.0 FREQUENCY STABILITY

Testing was performed in accordance with the requirements of FCC Part 24.235 and FCC Part 22.355.

To ensure that the fundamental emission stays within authorized frequency block, testing was performed while the transmitter continuously transmitted on a low and high frequency channel of band 850 MHz and 1900 MHz

Measurements were performed while the transmitter continuously transmitted.

The transmitter output was connected to the spectrum analyser in peak hold mode.

The measurements were performed with the temperature from -30 to +50 ˚C. The transmitter frequency was recorded every 10˚C step and the results are reported.

Low Channel – 824.2 MHz

Temperature (˚C)	Frequency MHz	Frequency Error Hz	Frequency Error ppm	Limits ppm
-30	824.199012	988	1.199	2.5
-20	824.199020	980	1.189	2.5
-10	824.199001	999	1.212	2.5
0	824.198984	1016	1.233	2.5
+10	824.199007	993	1.205	2.5
+20 (Battery Full)	824.199039	951	1.154	2.5
+20 (End Point)	824.199076	924	1.121	2.5
+30	824.199033	967	1.173	2.5
+40	824.199053	947	1.149	2.5
+50	824.199082	918	1.114	2.5

High Channel – 848.8 MHz

Temperature (˚C)	Frequency MHz	Frequency Error Hz	Frequency Error ppm	Limits ppm
-30	848.798951	1049	1.236	2.5
-20	848.799004	996	1.173	2.5
-10	848.799036	964	1.136	2.5
0	848.799030	970	1.143	2.5
+10	848.799072	928	1.093	2.5
+20 (Battery Full)	848.799039	961	1.132	2.5
+20 (End Point)	848.799111	889	1.047	2.5
+30	848.799085	915	1.078	2.5
+40	848.799048	952	1.122	2.5
+50	848.799066	934	1.100	2.5

The frequency was found to stay within the authorized frequency block 824 – 849 MHz.

Result: Complies

Low Channel – 1850.2 MHz

Temperature (˚C)	Frequency MHz	Frequency Error Hz	Frequency Error ppm	Limits ppm
-30	1850.199057	943	0.510	2.5
-20	1850.199009	991	0.536	2.5
-10	1850.199032	968	0.523	2.5
0	1850.198938	1062	0.574	2.5
+10	1850.199055	945	0.511	2.5
+20 (Battery Full)	1850.199081	919	0.497	2.5
+20 (End Point)	1850.199024	976	0.528	2.5
+30	1850.199059	941	0.509	2.5
+40	1850.198982	1018	0.550	2.5
+50	1850.199064	936	0.506	2.5

High Channel – 1909.8 MHz

Temperature (˚C)	Frequency MHz	Frequency Error Hz	Frequency Error ppm	Limits ppm
-30	1909.798944	1056	0.553	2.5
-20	1909.799002	998	0.523	2.5
-10	1909.799087	913	0.478	2.5
0	1909.799063	937	0.491	2.5
+10	1909.799015	985	0.516	2.5
+20 (Battery Full)	1909.799076	924	0.484	2.5
+20 (End Point)	1909.799080	920	0.482	2.5
+30	1909.799009	991	0.519	2.5
+40	1909.798995	1005	0.526	2.5
+50	1909.799028	972	0.509	2.5

The frequency was found to stay within the authorized frequency block 1850 – 1910 MHz.

Result: Complies.

7.0 CHANNEL BANDWIDTH

Testing was performed in the two operating frequency ranges: 824.0 – 849.0 MHz and 1850 – 1910 MHz. The transmitter continuously transmitted at maximum output power on a low, middle and high frequency channel for each band.

7.1 850 MHz

The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised

Channel	Frequency MHz	Bandwidth kHz	26 dB Bandwidth Plots
Low	824.2	340.7	Appendix I1
Middle	836.6	336.7	Appendix I1
High	848.8	338.7	Appendix I1

7.2 1900 MHz

The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised

Channel	Frequency MHz	Bandwidth kHz	26 dB Bandwidth Plots
Low	1850.2	332.7	Appendix I2
Middle	1880	332.7	Appendix I2
High	1909.8	332.7	Appendix I2

8.0 RADIO FREQUENCY EXPOSURE (HAZARD) INFORMATION

The Personal Communications Services operating in the 824 – 849 MHz and 1850 - 1910 MHz bands are required to be operated in a manner that ensures that the public is not exposed to RF energy levels in accordance with CFR 47, Section 1.1307(b)(1).

In accordance with this section and also section 2.1091 this device has been defined as a portable device and SAR testing was performed in accordance with OET Bulletin 65 and reported under EMC Technologies M060507. The highest SAR value of 1.09 mW/g complies with the FCC human exposure requirements of 47 CFR 2.1093 (d).

Results: Complies

9.0 COMPLIANCE STATEMENT

The Autocite Handheld Device, Model: X3, tested on behalf of Duncan Technologies, **complies** with the requirements of 47 CFR, Part 24 Subpart E – Broadband PCS and Part 22 Subpart H - Cellular Radiotelephone Service.

Results were as follows:

FCC Part 24 Subpart E Clauses	FCC Part 22 Subpart H Clauses	Test Performed	Result
24.232	22.913	Power Limits	**Complies**
24.235	22.355	Frequency Stability	**Complies**
24.238	22.917	Emission Limits	**Complies**

Note: Refer to M060507 (FCC SAR Report) for details of SAR Compliance.

TEST REPORT APPENDICES

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