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EMC COMPLIANCE REPORT

In accordance with
EUROPEAN DIRECTIVE 95/54/EC 1995

MEGAPULSE PTY LTD

48V MEGAPULSE MKII BATTERY CONDITIONER

REPORT TL4498B

JULY 2004



Certificate of Compliance

RFI Industries Test Report: TL4498B
Issue Date: July 2004

Test Sample: 48V Megapulse MKII Battery Conditioner
Model No: Not Specified
Serial No: J4803051000

Client Details: Mr. Ross Naddei,
Megapulse Pty Ltd,
11 Fortuna Court,
Eaton's Hill,
Queensland, 3153

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Test Specification: European Directive 95/54/EC 1995
Annexe VII Broadband radiated emissions measurements.
Annexe VIII Narrowband radiated emissions measurements.

Summary: Broadband radiated emissions measurements **Complied**
Narrowband radiated emissions measurements **Complied**

Test Date(s): 30th of June 2004

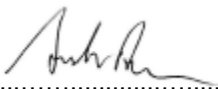
**Test House:
(Issued by)** R.F.I. Industries Pty. Limited,
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52 Holloway Drive,
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The 48V Megapulse MKII Battery Conditioner, complied with the Electromagnetic Radiated Emissions From Electrical/Electronic Sub Assemblies requirements of the European Directive 95/54/EC 1995, Annexe VII Broadband radiated emissions measurements and Annexe VIII Narrowband radiated emissions measurements.



Jeremy Poynter
(Test Officer)



Andrew Burden
(EMC Engineering Manager)

28-07-04

Date

**EMC COMPLIANCE REPORT
FOR
MEGAPULSE PTY LTD****1. INTRODUCTION**

Electromagnetic radiation emission measurements were performed on the 48V Megapulse MKII Battery Conditioner, in accordance with the requirements of the European Directive 95/54/EC 1995.

2. SUMMARY OF RESULTS

Worst-case emissions are tabled as follows:

Test	Configuration	Delta Limit
Electromagnetic radiation	Horizontal/Vertical	Peak Emissions >10dB below limit

3. TEST SAMPLE, MODIFICATIONS AND CONFIGURATION**3.1 Test Sample**

The product, as supplied by the client, is described as follows:

48V Megapulse MKII Battery Conditioner.
Model No: Not specified
Serial No: J4803051000

This product shall be referred to as EUT.

3.2 Modifications

No modifications were performed on the above sample.

3.3 Configuration

The EUT was tested in nominal operating mode. All measurements were performed at 48VDC supply voltage via 300mm leads from four 12VDC automotive batteries in series. Battery interconnecting lead lengths was kept to a minimum.

(Refer to Appendix B for battery configuration photo)

4. TEST FACILITY AND EQUIPMENT**4.1 Test Facility**

Electromagnetic radiation pre-scan emission measurements were performed at RFI Industries EMC Laboratories, located at 52 Holloway Drive Bayswater, Victoria, Australia.

Compliance Electromagnetic radiation emission measurements were performed at an Open Area Test Site, located at 290 Majors Line road Tooborac, near Heathcote, 100km north of Melbourne, Victoria, Australia.

4.2 Test Equipment

Refer to Appendix A for the measurement instrument list.

5. REFERENCE STANDARDS

European Directive 95/54/EC 1995

Electromagnetic Radiated Emissions From Electrical/Electronic Sub Assemblies
Annexe VII Broadband radiated emissions measurements and
Annexe VIII Narrowband radiated emissions measurements.

6. ELECTROMAGNETIC RADIATION DISTURBANCE

6.1 Test Procedure

Electromagnetic radiation emissions were measured 1 metre away from the EUT at the Open Area Test Site.

The EUT was raised to a height of 1.5 metres above the ground reference plane.

For both horizontal and vertical antenna polarisations, the peak detector was set to MAX-HOLD and the range selected continuously scanned. The antenna height was fixed to a height of 1.5 metres and EUT wiring loom turned side on for worst-case emission arrangement.

Plots of the accumulated measurement data for both horizontal and vertical antenna polarisations, including all transducer correction factors were produced.

(Refer to photographs in Appendix B for views of the test configurations)

6.2 Test Results

Electromagnetic radiation emissions were below the specified limit for quasi-peak measurements.

Tabled below are results of the quasi peak measurements, performed at spot frequencies where the peak emission was close to, or exceeded the applicable limit line.

Frequency (MHz)	Peak Emission (dBmV/m)	Result Quasi-peak (dBmV/m)	Limit Quasi-peak (dBmV/m)	Delta limit (dB)
Emissions > 10dB below the limit				

Table 1: Vertical (Refer to graph 1 Appendix C)

Frequency (MHz)	Peak Emission (dBmV/m)	Result Quasi-peak (dBmV/m)	Limit Quasi-peak (dBmV/m)	Delta limit (dB)
Emissions > 10dB below the limit				

Table 2: Horizontal (Refer to graph 2 Appendix C)

Notice should be taken of the measurement uncertainty of:

- ± 5.54dB at 30 to 300MHz
- ± 6.25dB at 300 to 1000MHz

Climatic Conditions	
Room Temperature:	9.1°C
Humidity:	80%

7. CONCLUSION

The 48V Megapulse MKII Battery Conditioner complied with the Electromagnetic Radiation Emission Requirements of European Directive 95/54/EC 1995.

APPENDIX A

TEST EQUIPMENT

(Electromagnetic Radiation Emission Measurements)

INV	EQUIPMENT	Make	Model No	Serial No	Calibration		Equip Used
					Date	Type	
81	Spectrum Analyser	Hewlett Packard	HP8593A	3009A00398	Sep. 04	E	◆
555	Spectrum Analyser	Hewlett Packard	HP8591E	3230A00565	Sep. 04	E	
17	EMI Receiver	Electro Metrics	EMC-30 MKIV	350	Dec. 05	E	◆
359	Transient Limiter	Hewlett Packard	HP11947A	3107A01833	On Use	I	
312	Pre Amplifier	Amplifier Research	LN1000	16565	Jan. 05	I	◆
313	Pre Amplifier	Amplifier Research	LN1000	16566	Dec. 05	I	
355	High Pass Filter	Solar Electronics	7801-100	947214	On Use	I	
43	LISN	EMCO	3825/2R	1179	Jan. 05	E	
47	LISN	EMCO	3850/2	9105 1005	Sep. 04	E	
48	LISN	EMCO	3850/2	9105 1006	Feb. 04	E	
525	Signal Generator	Hewlett Packard	HP8648A	3642U01815	On Use	I	
66	Power Splitter	Hewlett Packard	11667A	A16126	On Use	I	◆
163	Biconical Antenna	Electro Metrics	BIA-30C	3110	Jul. 04	I	◆
187	Log Periodic Antenna	EMCO	3146	2630	Sep. 04	I	◆

V: Verification of operation against an internal reference
I: Internal calibration against a NATA traceable standard
E: External calibration by a NATA endorsed facility
O: External calibration by an International facility

APPENDIX B

PHOTOGRAPHS

Photograph No.	Photograph Description
1	Electromagnetic Radiated Emission Test Configuration.
2	Electromagnetic Radiated Emission Test Configuration Close Up.
3	Battery Configuration.
4	Interconnecting Lead Close Up.
5	EUT Close Up Front View.
6	EUT Close Up Rear View.
7	EUT Close Up Internal View. (Image can not be shown due to patent protection)



Photo 1. Electromagnetic Radiated Emission Test Configuration.



Photo 2. Electromagnetic Radiated Emission Test Configuration Close Up.



Photo 3. Battery Configuration.

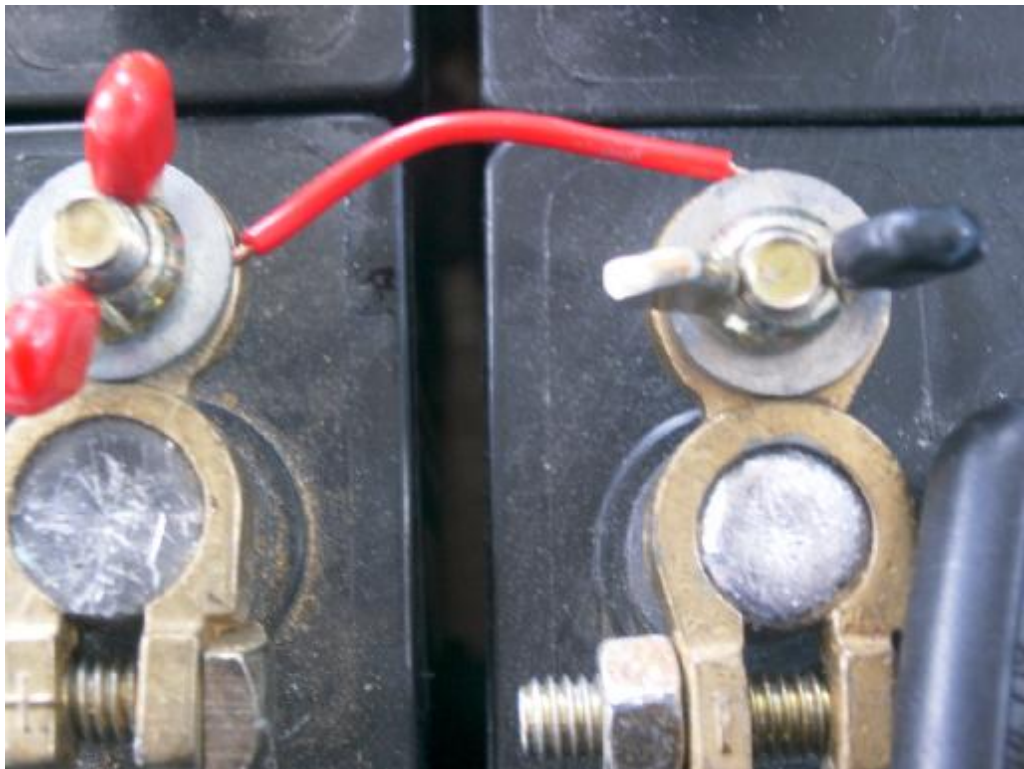


Photo 4. Interconnecting Lead Close Up.



Photo 5. EUT Close Up Front View.



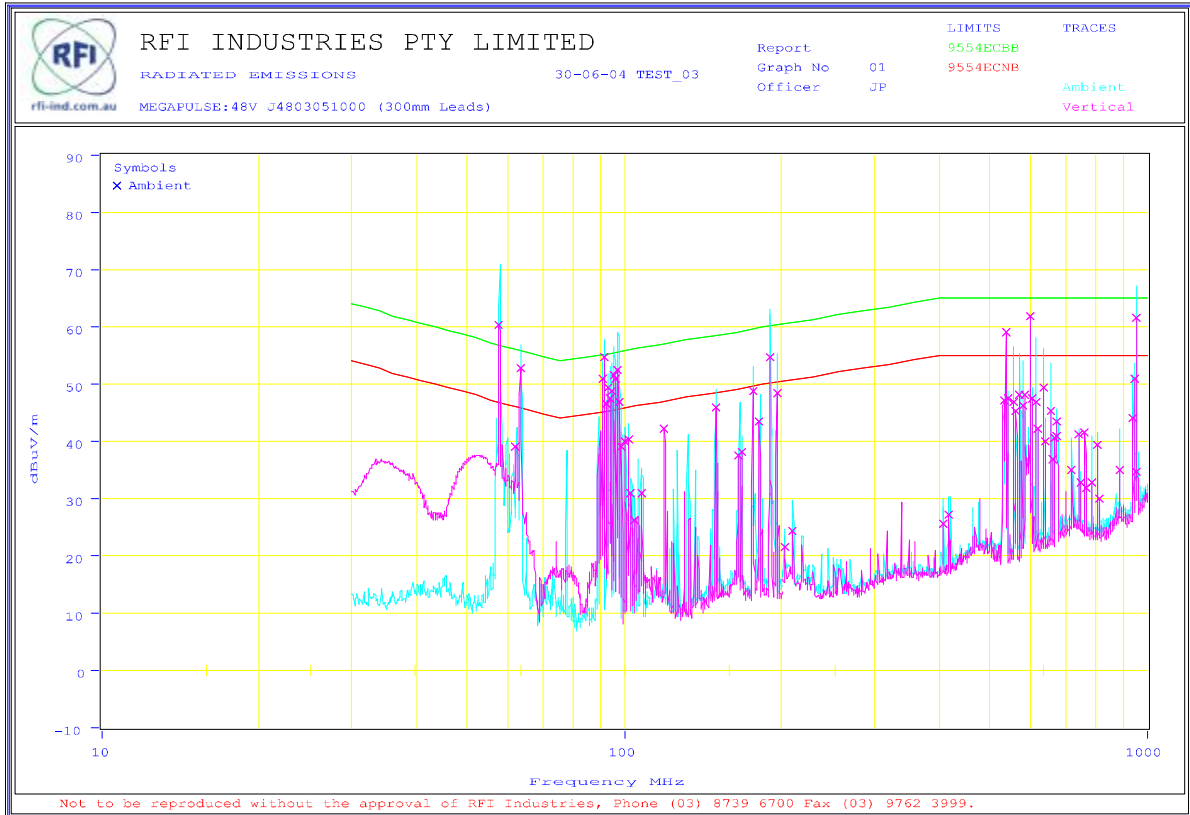
Photo 6. EUT Close Up Rear View.

Photo 7. EUT Close Up Internal View. (Image can not be shown due to patent protection)

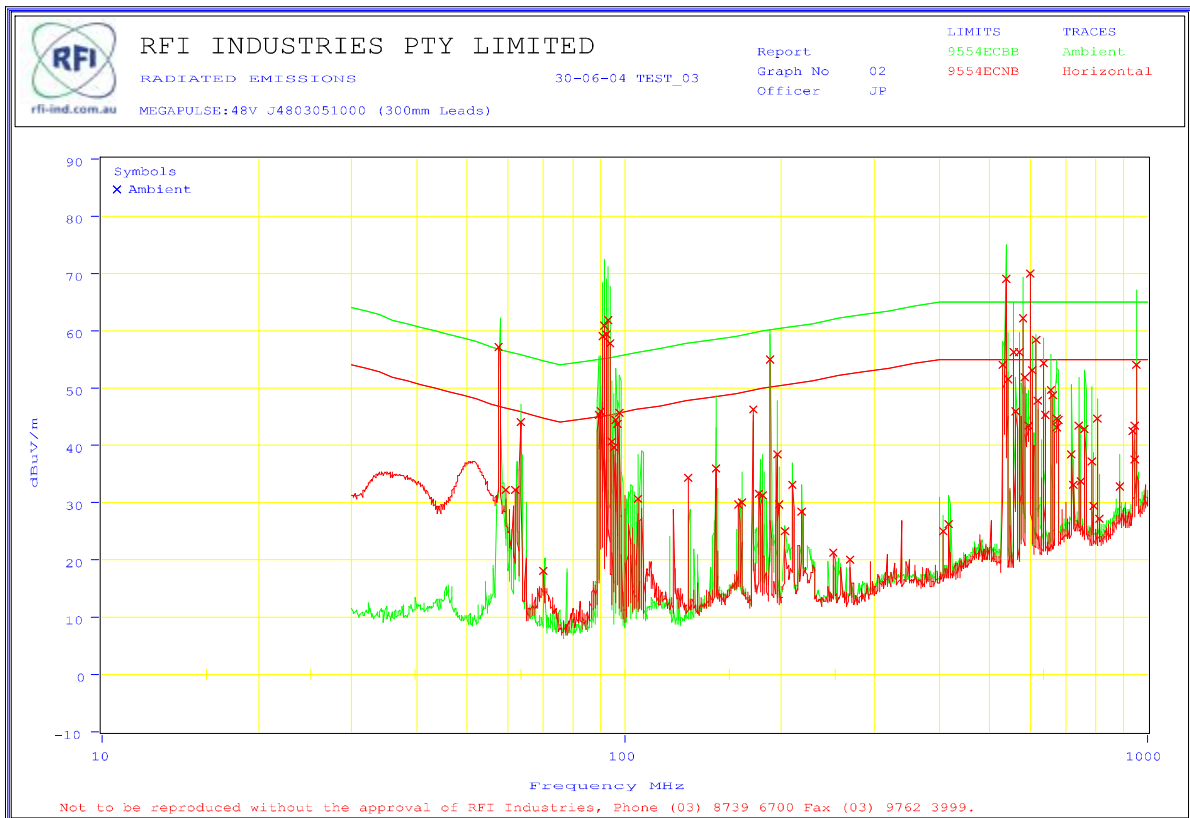
APPENDIX C

ELECTROMAGNETIC RADIATION EMISSION MEASUREMENTS GRAPHS

Graph No.	Graph Description
1	Vertical Antenna Polarization
2	Horizontal Antenna Polarization



Graph 1 – Vertical Antenna Polarisation.



Graph 2 – Horizontal Antenna Polarisation.