

APPENDIX C

LIST of GRAPHS of EMI MEASUREMENTS

Conducted EMI

- Graph 1: Active Line, 0.145 to 30.5MHz, On with card reader module & Type A card
- Graph 2: Neutral Line, 0.145 to 30.5MHz, On with card reader module & Type A card
- Graph 3: Active Line, 0.145 to 30.5MHz, Tested with resistive dummy load
- Graph 4: Neutral Line, .145 to 30.5MHz, Tested with resistive dummy load

Radiated EMI

- Graph 5: Ambient Emissions, 0.009 to 30MHz, On with card reader module & Type A card
- Graph 6: Carrier, 13.55 to 13.57 MHz, On with card reader module & Type A card
- Graph 7: Vertical Polarisation, 29 to 1000 MHz, On with card reader module & Type A card
- Graph 8: Horizontal Polarisation, 29 to 1000 MHz, On with card reader module & Type A card



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FCC

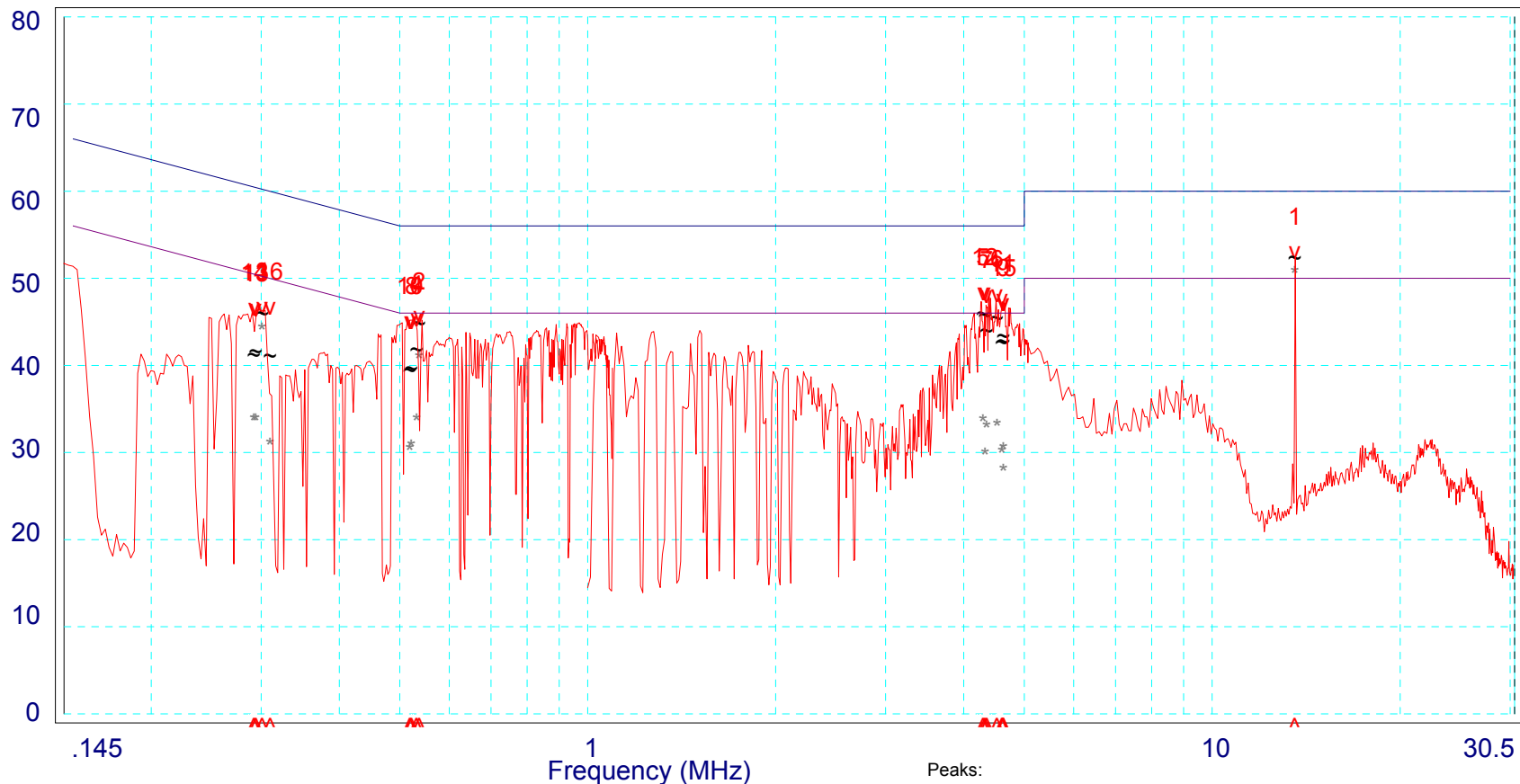
Conducted Emissions (dBuV)

Job No:T50307A

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Test Date: 30-03-2005

GRAPH No. 1



ERG Transit Systems
3V PC Card Type II + with Contactless Reader
Model: MCR500 Part No: 11081
On with card reader module & Type A card (EMCTEST running)

Limits:
FCCN_BQP FCC CLASS B QP CONDUCTED LIMITS (CISPR)
FCCN_BAV FCC CLASS B AV CONDUCTED LIMITS (CISPR)
Legend:
Active Line

Ver 5.5 Build 107
sydney conducted setup
t:L0360405 c1:C0010905 c2:NONE p:NONE a:L0100305
Site ID: Syd Room#2,16/6 Gladstone Rd. Castle Hill, NSW
Test Officer:Joel Mulig

EMC Technologies (Sydney) 3/87 Station Rd, Seven Hills, NSW, 2147, NSW, Australia
Phone +(612) 9624 2777 Fax+(612) 9838 4050

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FCC

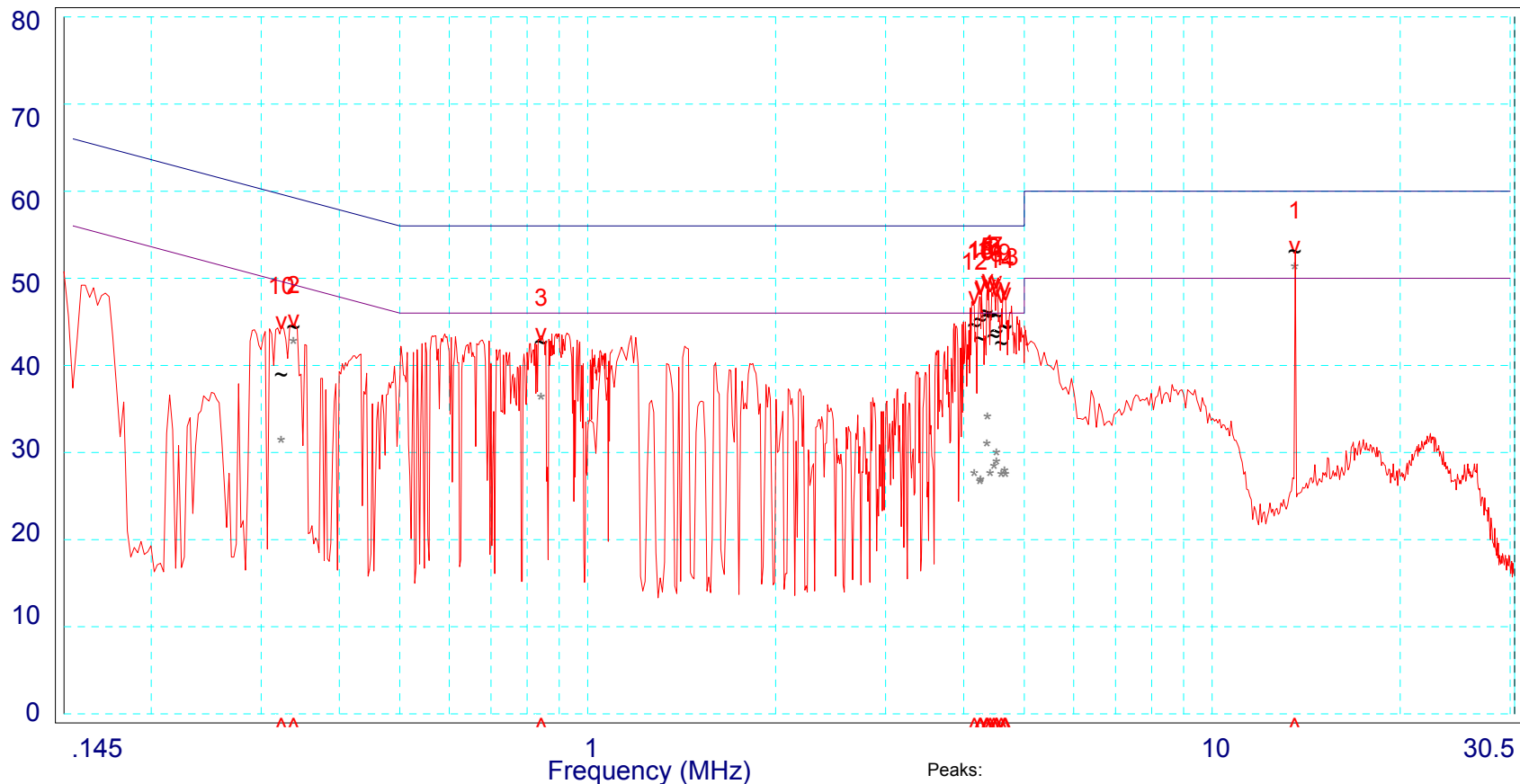
Conducted Emissions (dBuV)

Job No:T50307A

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Test Date: 30-03-2005

GRAPH No. 2



ERG Transit Systems
3V PC Card Type II + with Contactless Reader
Model: MCR500 Part No: 11081
On with card reader module & Type A card (EMCTEST running)

Limits:
FCCN_BQP FCC CLASS B QP CONDUCTED LIMITS (CISPR)
FCCN_BAV FCC CLASS B AV CONDUCTED LIMITS (CISPR)

Legend:
— Neutral Line

Ver 5.5 Build 107
sydney conducted setup
t:L0360405 c1:C0010905 c2:NONE p:NONE a:L0100305

Site ID: Syd Room#2, 16/6 Gladstone Rd. Castle Hill, NSW
Test Officer: Joel Mulig

Source:
T50307c 4 5 6

EMC Technologies (Sydney) 3/87 Station Rd, Seven Hills, NSW, 2147, NSW, Australia
Phone +(612) 9624 2777 Fax+(612) 9838 4050

Peaks:

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCCN_BQPdL1 (dBuV)	(dB)	Av Val (dBuV)	FCCN_BAVdL2 (dBuV)	(dB)
1	13.56	53.4	52.6	60.0	-7.4	50.3	50.0	.3
2	0.338	44.8	43.9	59.3	-15.3	41.7	49.3	-7.6
3	0.842	43.3	42.1	56.0	-13.9	35.4	46.0	-10.6
4	4.369	49.5	45.2	56.0	-10.8	33.1	46.0	-12.9
5	4.356	49.3	45.7	56.0	-10.3	30.0	46.0	-16.0
6	4.516	48.4	43.4	56.0	-12.6	29.0	46.0	-17.0
7	4.516	49.3	45.3	56.0	-10.7	27.9	46.0	-18.1
8	4.474	49.1	42.9	56.0	-13.2	27.4	46.0	-18.6
9	4.654	48.5	44.0	56.0	-12.0	26.9	46.0	-19.1
10	0.323	44.6	38.4	59.6	-21.2	30.4	49.6	-19.2
11	4.413	48.9	45.3	56.0	-10.7	26.6	46.0	-19.4
12	4.160	47.5	44.1	56.0	-11.9	26.6	46.0	-19.4
13	4.667	48.0	44.0	56.0	-12.0	26.5	46.0	-19.5
14	4.595	47.6	42.0	56.0	-14.0	26.5	46.0	-19.5
15	4.260	48.8	42.6	56.0	-13.4	25.9	46.0	-20.1
16	4.249	48.6	44.8	56.0	-11.2	25.7	46.0	-20.3

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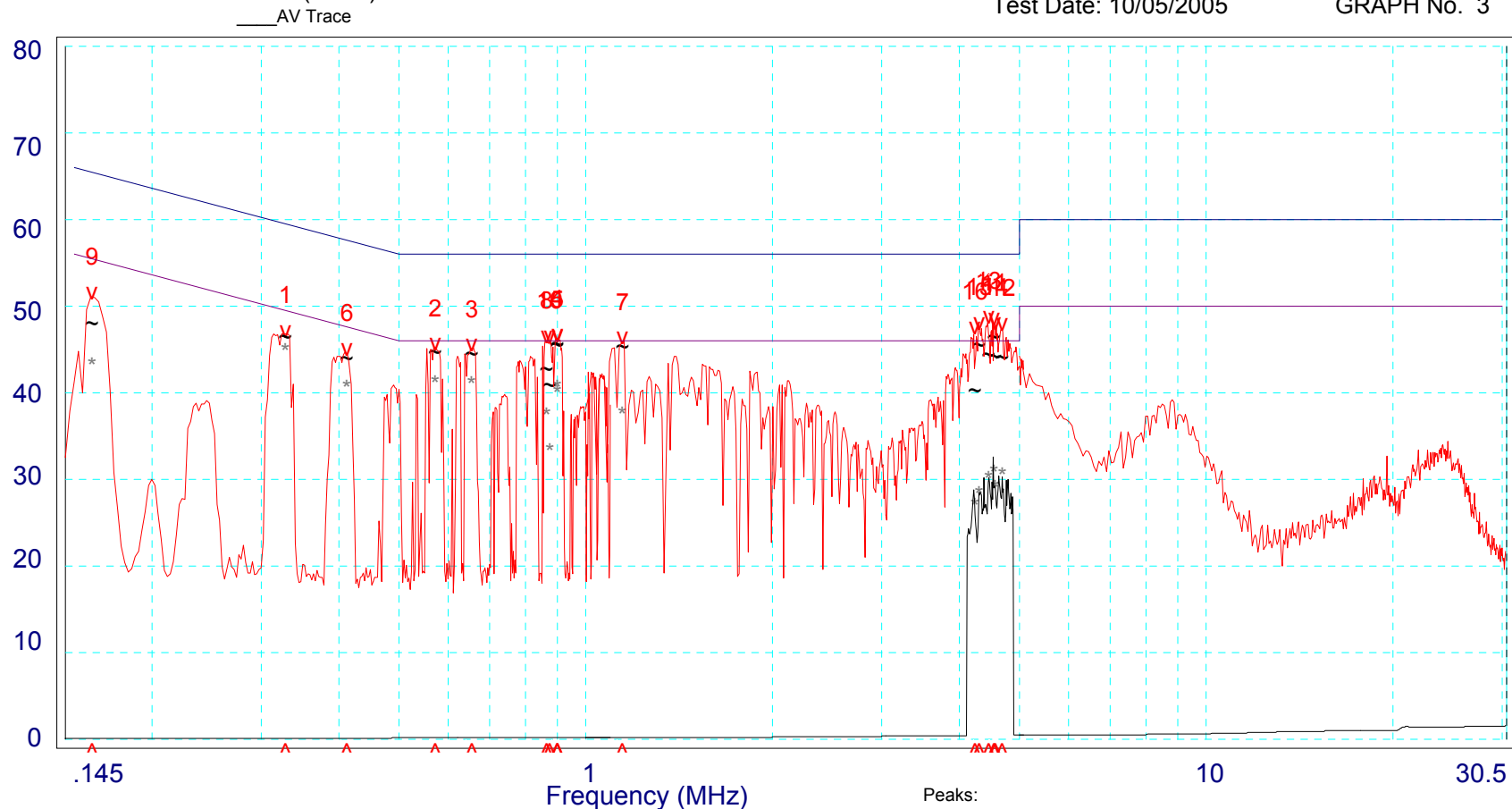
Conducted Emissions (dBuV)

Job No:T50307A

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Test Date: 10/05/2005

GRAPH No. 3



ERG

Contactless Reader with Type A Card

Model: MCR500 Part No: 11081

Tested with resistive dummy load

Limits:

FCCN_BQP FCC CLASS B QP CONDUCTED LIMITS (CISPR)

FCCN_BAV FCC CLASS B AV CONDUCTED LIMITS (CISPR)

Legend:

Active Line

Ver 5.5 Build 107

Source:

t:L0110306 c1:C0010905 c2:NONE p:NONE a:L0030705

T50307c 31 32 33

Site ID: Syd Room#2,3/87 Station Rd, Seven Hills, NSW

Test Officer:Joel Mulig

EMC Technologies (Sydney) 3/87 Station Rd, Seven Hills, NSW, 2147, NSW, Australia
Phone +(612) 9624 2777 Fax+(612) 9838 4050

Peaks:

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCCN_BQP (dBuV)	L1 (dB)	Av Val (dBuV)	FCCN_BAV (dBuV)	L2 (dB)
1	0.328	46.8	46.0	59.5	-13.5	44.2	49.5	-5.3
2	0.572	45.3	44.3	56.0	-11.7	40.5	46.0	-5.5
3	0.655	45.2	44.0	56.0	-12.0	40.4	46.0	-5.6
4	0.900	46.4	45.1	56.0	-10.9	40.0	46.0	-6.0
5	0.900	46.3	45.1	56.0	-10.9	39.4	46.0	-6.6
6	0.412	44.7	43.5	57.6	-14.1	40.0	47.6	-7.6
7	1.146	46.1	44.9	56.0	-11.1	36.9	46.0	-9.1
8	0.865	46.2	42.3	56.0	-13.7	36.8	46.0	-9.2
9	0.160	51.3	47.5	65.5	-18.0	42.6	55.5	-12.9
10	0.875	46.2	40.4	56.0	-15.6	32.7	46.0	-13.3
11	4.551	48.2	46.0	56.0	-10.1	30.2	46.0	-15.8
12	4.693	47.6	43.6	56.0	-12.4	29.9	46.0	-16.1
13	4.461	48.4	43.9	56.0	-12.1	29.5	46.0	-16.5
14	4.571	47.7	43.7	56.0	-12.3	28.4	46.0	-17.6
15	4.306	47.8	45.0	56.0	-11.0	27.7	46.0	-18.3
16	4.238	47.2	39.8	56.0	-16.2	26.4	46.0	-19.6

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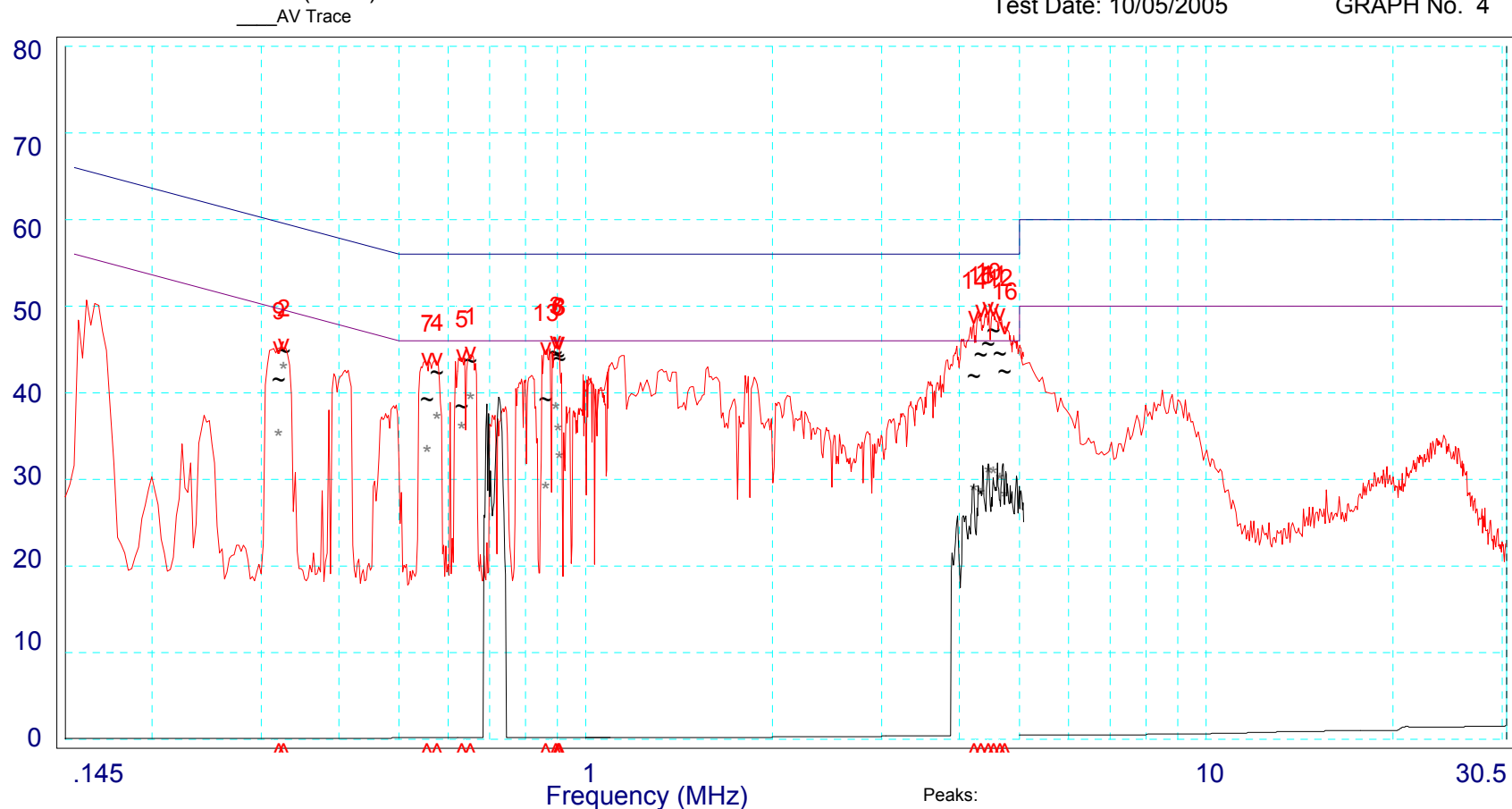
Conducted Emissions (dBuV)

Job No:T50307

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Test Date: 10/05/2005

GRAPH No. 4



ERG Transit Systems
Contactless Reader with Type A Card
Model: MCR500 Part No: 11081
Tested with resistive dummy load

Limits:
FCCN_BQP FCC CLASS B QP CONDUCTED LIMITS (CISPR)
FCCN_BAV FCC CLASS B AV CONDUCTED LIMITS (CISPR)

Legend:
— Neutral Line

Ver 5.5 Build 107

Source:

t:L0110306 c1:C0010905 c2:NONE p:NONE a:L0030705
Site ID: Syd Room#2,3/87 Station Rd, Seven Hills, NSW
Test Officer:Joel Mulig

\T50307c 22 23 24

EMC Technologies (Sydney) 3/87 Station Rd, Seven Hills, NSW, 2147, NSW, Australia
Phone +(612) 9624 2777 Fax+(612) 9838 4050

Peaks:

No	Freq (MHz)	Peak (dBuV)	Qp Val (dBuV)	FCCN_BQPdL1 (dBuV)	(dB)	Av Val (dBuV)	FCCN_BAVdL2 (dBuV)	(dB)
1	0.652	44.3	43.2	56.0	-12.8	38.6	46.0	-7.4
2	0.326	45.3	44.3	59.6	-15.2	42.1	49.6	-7.5
3	0.895	45.5	44.2	56.0	-11.8	37.4	46.0	-8.6
4	0.576	43.6	41.9	56.0	-14.2	36.3	46.0	-9.7
5	0.631	44.0	37.9	56.0	-18.1	35.2	46.0	-10.8
6	0.903	45.4	43.8	56.0	-12.2	34.9	46.0	-11.1
7	0.555	43.6	38.8	56.0	-17.2	32.5	46.0	-13.5
8	0.907	45.5	43.4	56.0	-12.6	31.7	46.0	-14.3
9	0.320	45.0	41.1	59.7	-18.6	34.3	49.7	-15.4
10	4.455	49.5	45.2	56.0	-10.8	30.1	46.0	-15.9
11	4.544	49.3	46.8	56.0	-9.2	30.0	46.0	-16.0
12	4.651	48.8	44.0	56.0	-12.0	29.3	46.0	-16.7
13	0.862	44.8	38.8	56.0	-17.2	28.2	46.0	-17.8
14	4.226	48.5	41.5	56.0	-14.5	28.0	46.0	-18.0
15	4.336	49.2	43.9	56.0	-12.1	27.5	46.0	-18.5
16	4.734	47.2	42.0	56.0	-14.0	27.3	46.0	-18.7

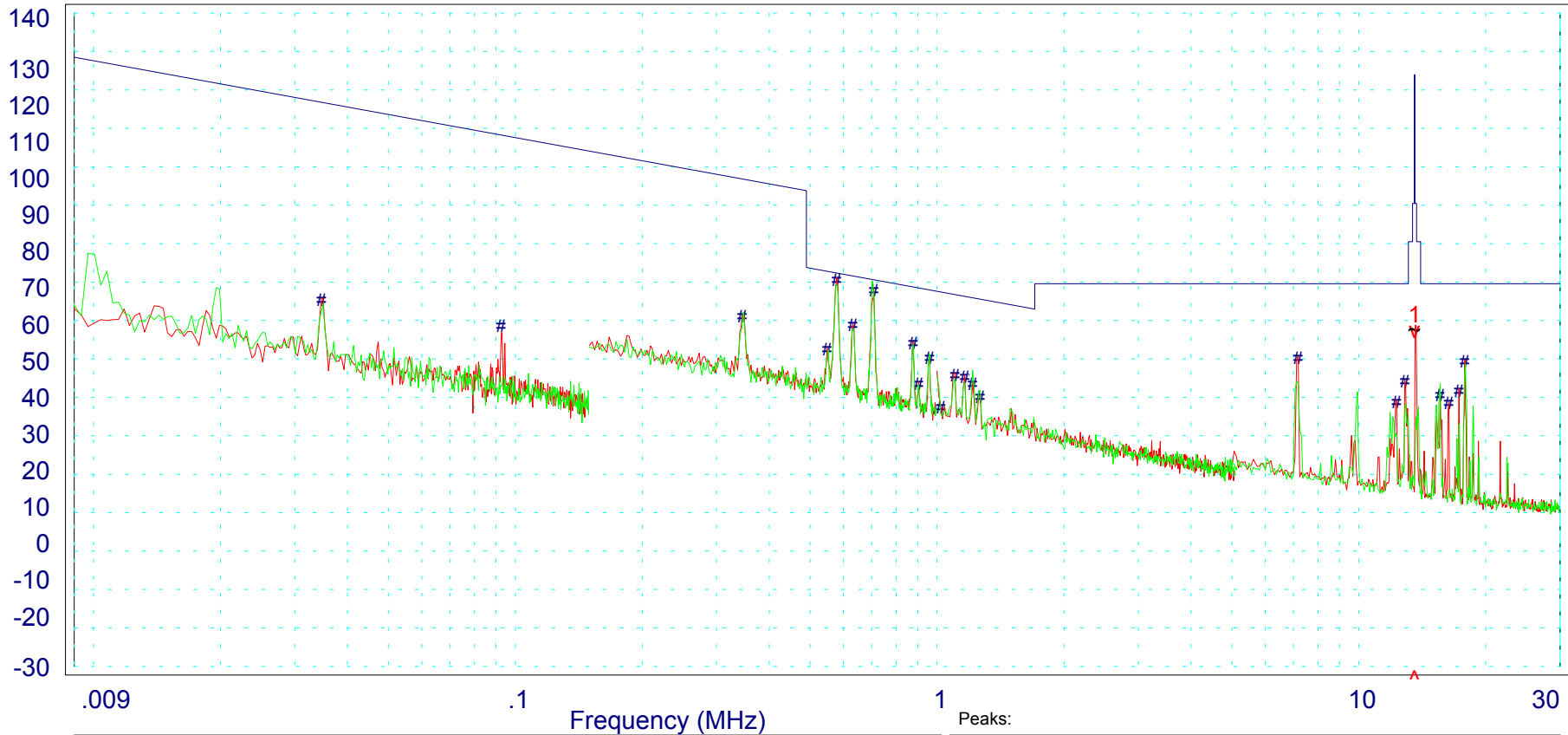
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FCC
Radiated Emissions (dBUV/m)
= Ambient

Job No:T50307A

Test Date: 09-03-05

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GRAPH No. 5



ERG Transit Systems Limited
3V PC Card Type II+ with Contactless Reader
Model: MCR500 PartNo: 11081
On with card reader module & Type A card (EMCTEST running)

Limits:
FCC_loop_3mFcc Pt15 Subpart C Section 15.209(a) 3Metre Limits

Legend:
— Ambients
— Emissions

Source:
T50307r1 6 7 8 9
T50307r1 10 11 12 13

Ver 5.5 Build 70
Colo Radiated Test Setup Active Loop
t:A0081204E c1:C0201105 c2:NONE p:NONE a:NONE
Site ID: OATS#1,1247 Upper Colo Rd. Colo, NSW
Test Officer: Bruce Holdsworth

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9260
Sydney---- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

Peaks:					
No	Freq (MHz)	Peak (dBUV)	Qp Val	FCC_loop_3dL1 (dBUV)	3dL1 (dB)
1	13.56	58.8	58.8	124.0	-65.2

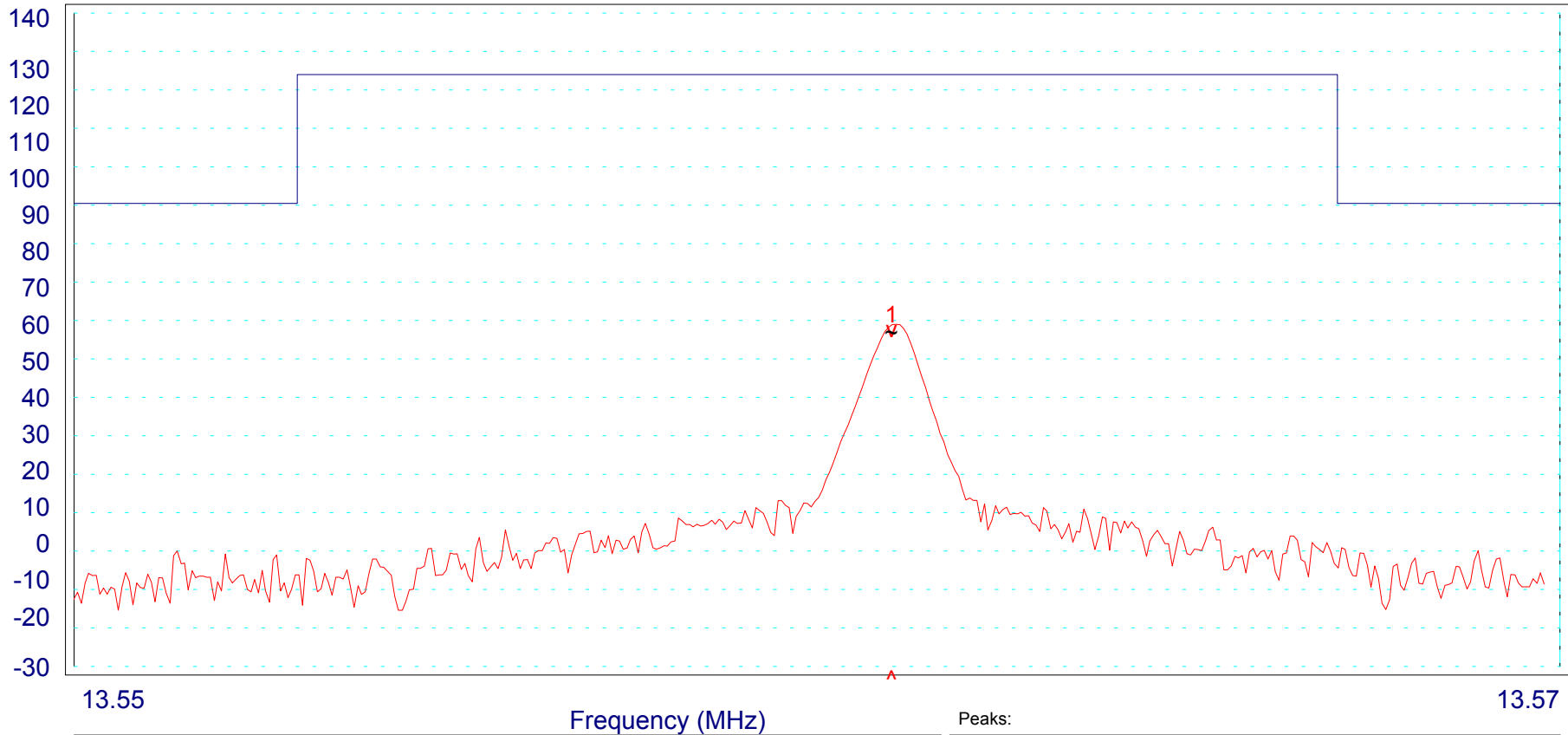
EMC Technologies Pty. Ltd. - Global Product Certification

FCC
Radiated Emissions (dBuV/m)
= Ambient

Job No:T50307A

Test Date: 09-03-05

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GRAPH No. 6



ERG Transit Systems Limited
3V PC Card Type II+ with Contactless Reader
Model: MCR500 PartNo: 11081
On with card reader module & Type A card (EMCTEST running)

Limits:
FCC_loop_3mFcc Pt15 Subpart C Section 15.209(a) 3Metre Limits

Legend:
Carrier

Ver 5.5 Build 70
Colo Radiated Test Setup Active Loop
t:A0081204E c1:C0201105 c2:NONE p:NONE a:NONE
Site ID: OATS#1,1247 Upper Colo Rd. Colo, NSW
Test Officer: Bruce Holdsworth

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9260
Sydney---- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

Peaks:					
No	Freq (MHz)	Peak (dBuV)	Qp Val	FCC_loop_3dL1 (dBuV)	3dL1 (dB)
1	13.56	59.0	58.1	124.0	-65.9

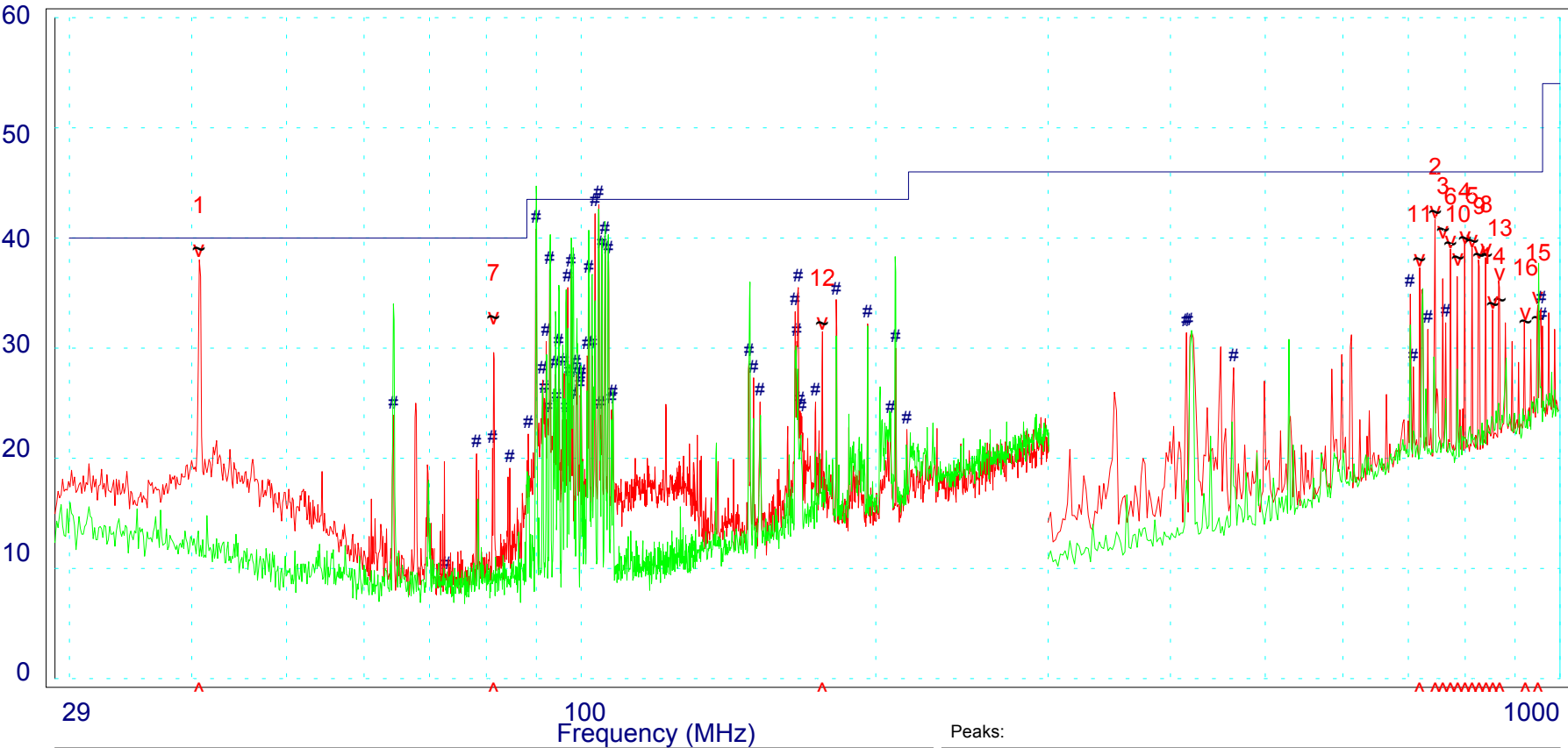
EMC Technologies Pty. Ltd. - Global Product Certification

FCC
Radiated Emissions (dBuV/m)
= Ambient

Job No:T50307A

Test Date: 09-03-05

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GRAPH No. 7



ERG Transit Systems Limited
3V PC Card Type II+ with Contactless Reader
Model: MCR500 PartNo: 11081
On with card reader module & Type A card (EMCTEST running)

Limits:
FCC-B3 FCC CLASS B RAD 3M LIMITS

Legend:
— Vertical Ambients
— Vertical Emissions

Ver 5.5 Build 70
Colo Radiated Test Setup
t:A0690206 c1:C0201105 c2:NONE p:A0961105 a:NONE
Site ID: OATS#1,1247 Upper Colo Rd. Colo, NSW
Test Officer: Bruce Holdsworth

Source:
V Amb0403 1 2 3 4 5 11
T50307r3 1 2 3 4 5 11

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9260
Sydney---- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

Peaks:					
No	Freq (MHz)	Peak (dBuV/m)	Qp Val	FCC-B3 (dBuV/m)	dL1 (dB)
1	40.68	38.2	38.2	40.0	-1.8
2	745.87	41.7	41.5	46.0	-4.5
3	759.42	39.9	39.9	46.0	-6.1
4	800.11	39.4	39.1	46.0	-6.9
5	813.66	39.1	38.9	46.0	-7.1
6	772.97	39.0	38.7	46.0	-7.3
7	81.36	32.0	32.0	40.0	-8.0
8	840.80	38.3	37.6	46.0	-8.4
9	827.23	38.1	37.6	46.0	-8.4
10	786.55	37.4	37.4	46.0	-8.6
11	718.75	37.3	37.2	46.0	-8.8
12	176.30	31.6	31.4	43.5	-12.1
13	867.91	36.1	33.6	46.0	-12.4
14	854.37	33.5	33.2	46.0	-12.8
15	949.27	33.9	31.9	46.0	-14.1
16	922.18	32.5	31.6	46.0	-14.4

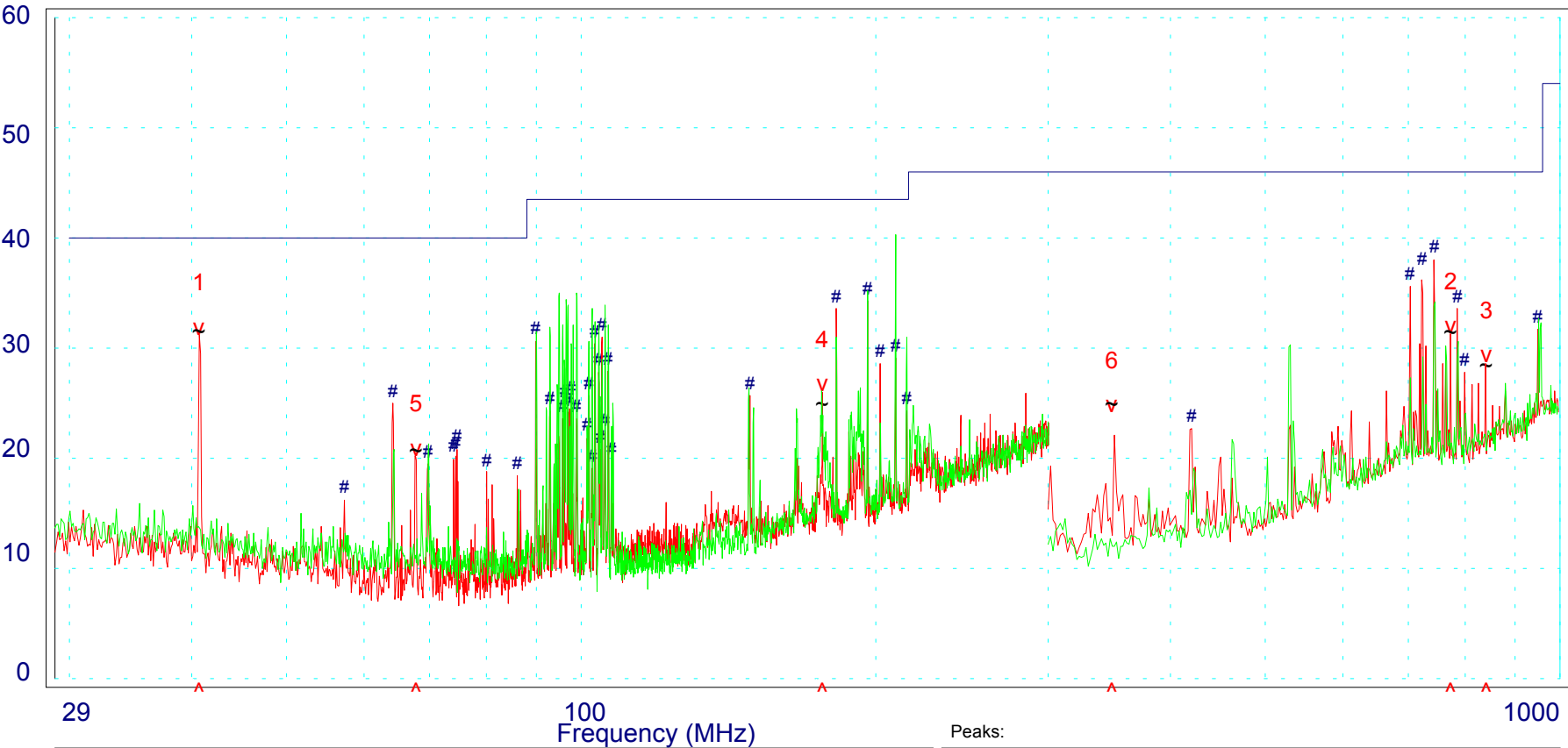
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FCC
Radiated Emissions (dBUV/m)
= Ambient

Job No:T50307A

Test Date: 09-03-05

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GRAPH No. 8



ERG Transit Systems Limited
3V PC Card Type II+ with Contactless Reader
Model: MCR500 PartNo: 11081
On with card reader module & Type A card (EMCTEST running)

Limits: FCC-B3 FCC CLASS B RAD 3M LIMITS

Legend:
Horizontal Ambients
Horizontal Emissions

Ver 5.5 Build 70
Colo Radiated Test Setup
t:A0690206 c1:C0201105 c2:NONE p:A0961105 a:NONE
Site ID: OATS#1,1247 Upper Colo Rd. Colo, NSW
Test Officer: Bruce Holdsworth

Melbourne- 57 Assembly Drv Tullamarine, 3043, Vic, Australia Ph+(613) 9335 3333 Fax+(613) 9338 9260
Sydney---- 16,6 Gladstone Rd Castle Hill, 2154, NSW, Australia Ph+(612) 9899 4599 Fax+(612) 9899 4019

Peaks:					
No	Freq (MHz)	Peak (dBUV/m)	Qp Val	FCC-B3 (dBUV/m)	dL1 (dB)
1	40.68	31.1	30.7	40.0	-9.3
2	772.99	31.3	30.6	46.0	-15.4
3	840.79	28.6	27.6	46.0	-18.4
4	176.29	26.0	24.1	43.5	-19.4
5	67.80	20.1	19.9	40.0	-20.1
6	348.36	24.1	24.1	46.0	-21.9