Intertek ETL SEMKO

EMC TEST REPORT

COMPANY: PAXTON ACCESS LTD

PRODUCT: NET2 HANDSFREE
ACCESS CONTROL SYSTEM

REPORT NO. 07024171

WRITTEN BY:	**D A Legge**	
REVIEWED BY:	**D Feasey**	
TEST ENGINEER:	**D A Legge**	

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Opinions and interpretations based on test results are outside our scope of UKAS Accreditation.

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TABLES

GRAPHS

1. JOB DESCRIPTION

Equipment: Net2 Handsfree Access Control System

Equipment Model No(s):

Equipment under Test
Net2 Hands free interface – 477 – 222 – US
Net2 Hands free keyfob - 690 – 222 – US
Net2 Hands free keycard – 690 – 333 – US

Support Equipment
Net2 RS 845 Comms Converter – 455-477-US
Net2 Door ACU – 385-527-US
Exit Button E50 – 356-310-US
Proximity P200 reader - 323-110-US
12V psu -998-241-US
Laptop running Net2 software

Equipment Serial No: None

Phase: Compliance

Customer: Paxton Access Ltd

Test Plan Reference: -

Test Standards: CFR47 Part 15: 207,209 and 249

Test Location: Intertek ETL Semko

Unit D Randalls Way
Leatherhead
Surrey
KT22 7SB

Test Work Started: 5th March 2007

Test Work Completed: 9th March 2007

2. TEST SUMMARY

PRODUCT REFERENCE STANDARDS

ANSI C63.4-2003,

TEST STANDARD	TEST	COMMENT
CFR 47 Part 15:207	Conducted Emissions	Pass-Note
CFR 47 Part 15:209 and 249	Radiated Emissions	Pass

Note: The Conducted Emissions Test results are below the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance with the specification limit.

3. EQUIPMENT UNDER TEST (EUT)

3.1. Description of the EUT

The Net2 Handsfree Access control system testboard is a representation of a single door Paxton Access PC based access control system, known as Net2 Handsfree. The system allows the user to gain access to their premises without the need to present a token to a reader. The system comprises of an active keyfob or Keycard(transponder) which can be carried somewhere on your person and an interface (transceiver) to computer software Net2.

The system was mounted on a wooden board and was tested as received.

3.2. EUT's Modes of Operation

System active, Communicating and standby.

3.3. EUT Configuration Diagram

See photographs in Annex 3

3.4. EUT Support Equipment

The Net2 Handsfree Access control system was monitored for functionality using the client software "Net2". Also used was the RS232/485 comms converter to provide the connection back to the PC/Software

3.5. Cables Associated With the EUT

EUT PORT	TYPE	LENGTH (m)	TERMINATION/LOAD
Net2 ACU	10 core	2	Net2 Handsfree Interface
Reader input	10 Core	2	Net2 Handsfree Interface
Net2 ACU	5 Core	1	RS232 Comms Converter
Laptop	9	3	RS232 Comms Converter
AC Mains	2	1	Net2 ACU

4. CONDUCTED EMISSIONS

4.1. Conducted Emissions Test Method

The testing was performed in accordance with ANSI C63.4-2003.

The test was performed in a screened room using a Line Impedance Stabilising Network (LISN).

4.2. Conducted Emissions Test Results

Any measurements within 10dB below the average and quasi-peak limit lines are measured with the average and quasi-peak detectors respectively. The results for the Net2 Handsfree Access control system testboard and the Keyfob communicating are given in Tables 1 – 2 and Graphs 1 – 2, the results for the Keycard communicating are given in Tables 3 - 4 and Graphs 3 - 4.The test results for the Net2 Handsfree Access control system testboard in standby mode are given in Table 5 and Graph 5.

4.3. Modification Performed During Testing

None

4.4. Conducted Emissions Conclusions

The EUT results are below the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance with the FCC Part 15:207 specification limit.

4.5. Measurement Uncertainty

150kHz to 30MHz $\pm$ 2.9 dB

The measurement uncertainties have been determined at a confidence level of not less than 95%.

Table 1 Conducted Emissions Test Results

Standard: FCC Part 15: 207

Test: Conducted Emissions

Port: Net2Handsfree Interface testboard - Positive Line

Units of measurement:

Frequency: MHz Amplitude: dBμV

Bandwidths: 10kHz

Mode of operation: Active communicating with Keyfob every second

Comment: Monitored for functionality by client Software Net2

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Conducted Emissions

EUT: Net2Air Interface system
Manuf: Paxton Access Controls
Op Cond: 120vac 60Hz
Operator: D A Legge
Test Spec: CFR47-Part15:207
Comment: Handshaking Keyfob
Positive line
Result File: 4171j.dat : Net2Air interface system- Handshaking keyfob - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement: Detectors: X QP / + AV
Meas Time: 2sec
Subranges: 50
Acc Margin: 10 dB

Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.57	40.62	56.00	15.38	L1	gnd
0.61	44.88	56.00	11.12	L1	gnd
0.785	41.43	56.00	14.57	N	gnd
0.83	46.67	56.00	9.33	N	gnd
1.095	44.07	56.00	11.93	N	gnd
1.135	39.03	56.00	16.97	L1	gnd
1.35	40.51	56.00	15.49	N	gnd
1.475	43.17	56.00	12.83	N	gnd
1.705	43.89	56.00	12.11	L1	gnd
1.9	43.05	56.00	12.95	L1	gnd
2.085	45.09	56.00	10.91	N	gnd
2.125	43.65	56.00	12.35	N	gnd
2.71	43.48	56.00	12.52	L1	gnd
4.375	41.65	56.00	14.35	N	gnd
10.875	51.43	60.00	8.57	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.21	47.67	53.21	5.54	N	gnd
0.625	34.69	46.00	11.31	N	gnd
0.85	30.90	46.00	15.10	L1	gnd
10.375	43.94	50.00	6.06	N	gnd
11.125	47.44	50.00	2.56	L1	gnd
11.625	42.48	50.00	7.52	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Final Measurement Results (continued) 08 Mar 2007 14:28

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
12.875	41.44	50.00	8.56	L1	gnd
15.875	40.41	50.00	9.59	L1	gnd
16.625	41.70	50.00	8.30	L1	gnd
19.5	41.80	50.00	8.20	L1	gnd
20.75	44.12	50.00	5.88	L1	gnd
22.0	42.49	50.00	7.51	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Graph 1 Conducted Emissions Test Results

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Conducted Emissions

EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Handshaking Keyfob
	Positive line
Result File:	4171j.dat : Net2Air interface system- Handshaking keyfob - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB

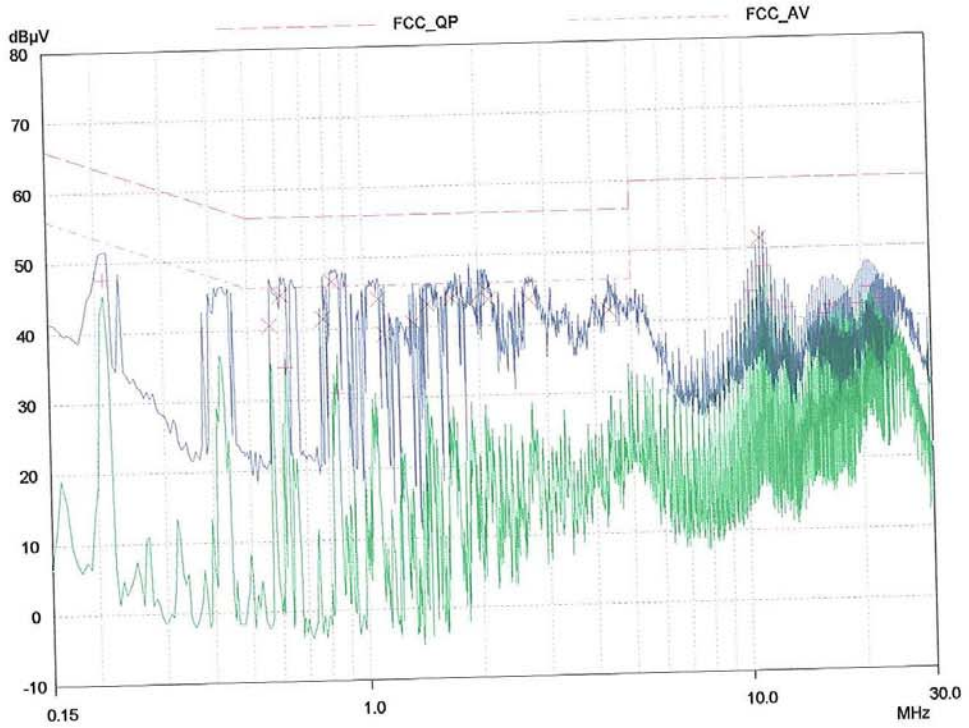

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Table 2 Conducted Emissions Test Results

Standard: FCC Part 15: 207

Test: Conducted Emissions

Port: Net2Handsfree Interface testboard - Neutral line

Units of measurement :

Frequency: MHz Amplitude: dBµV

Bandwidths: 10kHz

Mode of operation: Active – communicating with Keyfob every second

Comment: Monitored for functionality by client Software Net2

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Conducted Emissions

EUT: Net2Air Interface system
Manuf: Paxton Access Controls
Op Cond: 120vac 60Hz
Operator: D A Legge
Test Spec: CFR47-Part15:207
Comment: Handshaking Keyfob
Neutral line
Result File: 4171k.dat : Net2Air interface system- Handshaking keyfob - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies Start	Stop	Step	IF BW	Detector	Receiver Settings M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement: Detectors: X QP / + AV
Meas Time: 2sec
Subranges: 50
Acc Margin: 10 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.205	52.09	63.41	11.32	L1	gnd
0.225	50.33	62.63	12.30	L1	gnd
0.565	41.47	56.00	14.53	N	gnd
0.63	45.62	56.00	10.38	N	gnd
0.675	42.14	56.00	13.86	L1	gnd
0.78	41.52	56.00	14.48	L1	gnd
0.84	46.33	56.00	9.67	N	gnd
0.91	40.46	56.00	15.54	L1	gnd
1.04	45.03	56.00	10.97	N	gnd
1.33	40.71	56.00	15.29	N	gnd
1.45	43.27	56.00	12.73	N	gnd
1.9	42.83	56.00	13.17	L1	gnd
2.085	44.67	56.00	11.33	L1	gnd
2.13	43.47	56.00	12.53	N	gnd
2.7	43.50	56.00	12.50	N	gnd
10.875	51.31	60.00	8.69	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.19	21.05	54.04	32.99	L1	gnd
0.21	47.58	53.21	5.63	L1	gnd
0.41	31.01	47.65	16.64	N	gnd
0.63	33.40	46.00	12.60	L1	gnd
0.83	32.23	46.00	13.77	N	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Final Measurement Results (continued)

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
10.375	43.81	50.00	6.19	L1	gnd
10.875	47.70	50.00	2.30	L1	gnd
11.625	42.29	50.00	7.71	L1	gnd
12.875	41.46	50.00	8.54	L1	gnd
16.875	41.43	50.00	8.57	L1	gnd
19.5	41.35	50.00	8.65	L1	gnd
21.25	43.13	50.00	6.87	L1	gnd
22.25	41.00	50.00	9.00	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Graph 2 Conducted Emissions Test Results

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Conducted Emissions

EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Handshaking Keyfob
	Neutral line
Result File:	4171k.dat : Net2Air interface system- Handshaking keyfob - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB

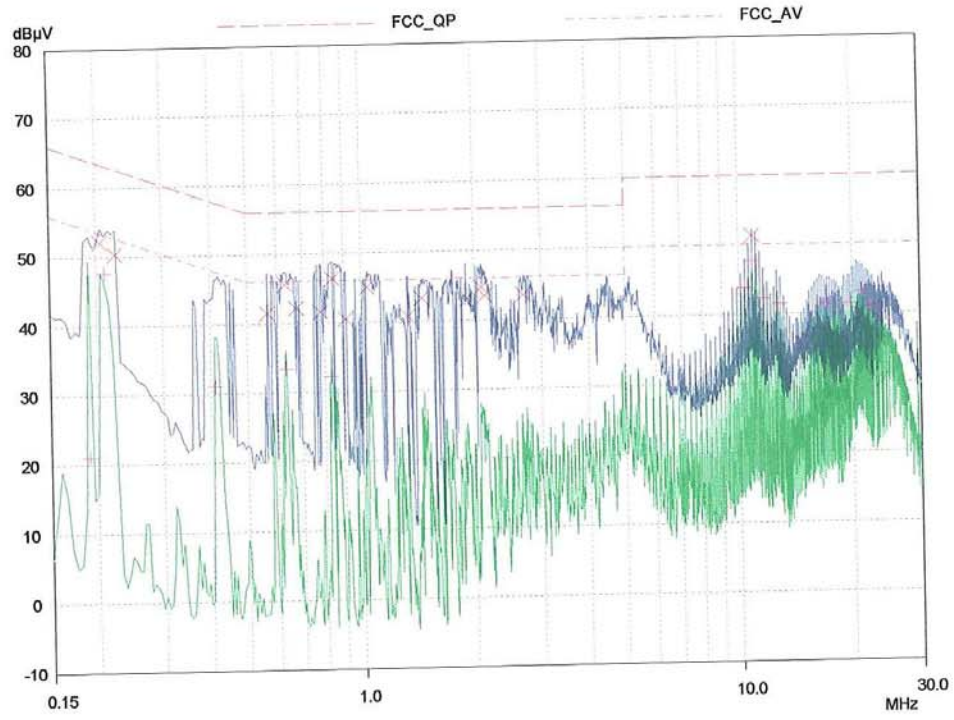

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Table 3 Conducted Emissions Test Results

Standard: FCC Part 15: 207

Test: Conducted Emissions

Port: Net2Handsfree Interface testboard - Positive Line

Units of measurement:

Frequency: MHz Amplitude: dBμV

Bandwidths: 10kHz

Mode of operation: Active communicating with Keycard every second

Comment: Monitored for functionality by client Software Net2

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Conducted Emissions

EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Handshaking Keycard
	Positive line
Result File:	4171l.dat : Net2Air interface system- Handshaking keycard - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies Start	Stop	Step	IF BW	Detector	Receiver Settings M-Time	Atten
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:

Detectors:	X QP / + AV
Meas Time:	2sec
Subranges:	50
Acc Margin:	10 dB

Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.575	41.97	56.00	14.03	L1	gnd
0.61	44.78	56.00	11.22	L1	gnd
0.665	42.64	56.00	13.36	N	gnd
0.815	45.26	56.00	10.74	L1	gnd
0.85	45.95	56.00	10.05	N	gnd
1.095	44.07	56.00	11.93	N	gnd
1.13	40.69	56.00	15.31	L1	gnd
1.71	43.75	56.00	12.25	N	gnd
1.81	37.73	56.00	18.27	N	gnd
2.075	44.63	56.00	11.37	N	gnd
2.745	42.25	56.00	13.75	L1	gnd
4.375	39.94	56.00	16.06	L1	gnd
10.875	51.45	60.00	8.55	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.21	46.97	53.21	6.24	N	gnd
0.62	32.06	46.00	13.94	N	gnd
10.375	43.99	50.00	6.01	N	gnd
10.875	47.89	50.00	2.11	L1	gnd
11.625	42.49	50.00	7.51	L1	gnd
12.875	41.46	50.00	8.54	L1	gnd
17.125	41.83	50.00	8.17	L1	gnd
17.875	41.33	50.00	8.67	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Final Measurement Results (continued)

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
20.5	43.93	50.00	6.07	L1	gnd
22.0	42.53	50.00	7.47	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

Graph 3 Conducted Emissions Test Results

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Conducted Emissions

EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Handshaking Keycard
	Positive line
Result File:	4171l.dat : Net2Air interface system- Handshaking keycard - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB

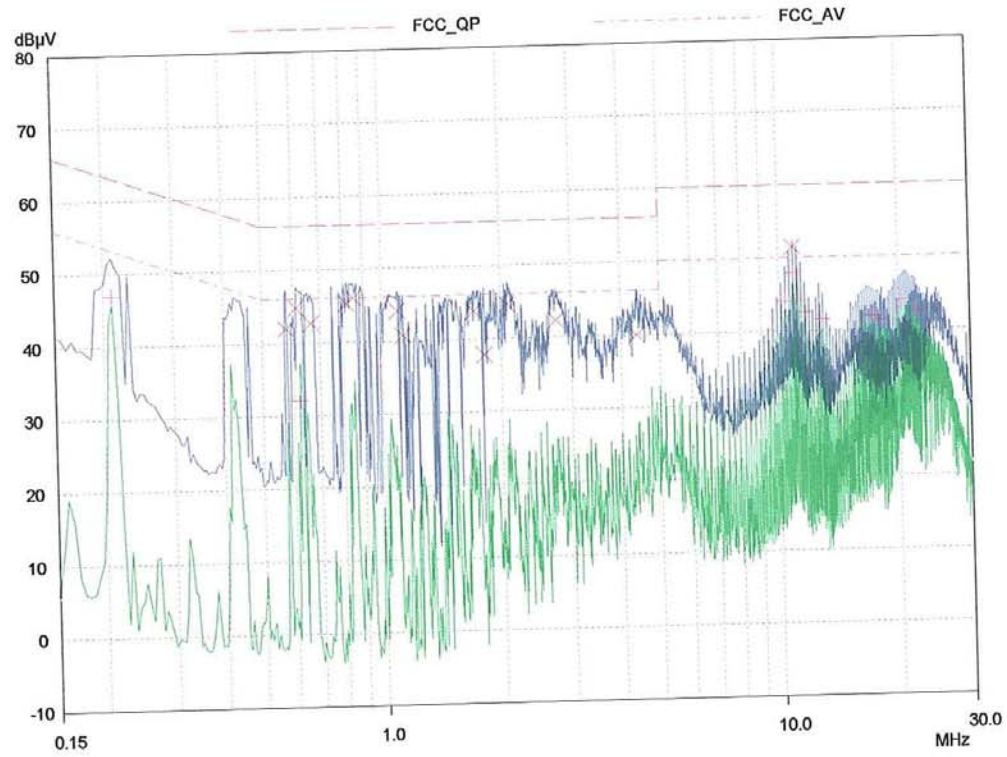

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Table 4 Conducted Emissions Test Results

Standard: FCC Part 15: 207

Test: Conducted Emissions

Port: Net2Handsfree Interface testboard - Neutral Line

Units of measurement:

Frequency: MHz Amplitude: dBμV

Bandwidths: 10kHz

Mode of operation: Active communicating with Keycard every second

Comment: Monitored for functionality by client Software Net2

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Conducted Emissions

EUT: Net2Air Interface system
Manuf: Paxton Access Controls
Op Cond: 120vac 60Hz
Operator: D A Legge
Test Spec: CFR47-Part15:207
Comment: Handshaking Keycard
Neutral line
Result File: 4171m.dat : Net2Air interface system- Handshaking keycard - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies Start	Stop	Step	Receiver Settings IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement: Detectors: X QP / + AV
Meas Time: 2sec
Subranges: 50
Acc Margin: 10 dB

Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.225	50.63	62.63	12.00	N	gnd
0.455	40.52	56.78	16.26	N	gnd
0.565	39.60	56.00	16.40	L1	gnd
0.62	45.04	56.00	10.96	N	gnd
0.8	40.72	56.00	15.28	L1	gnd
0.85	45.99	56.00	10.01	N	gnd
1.07	44.81	56.00	11.19	L1	gnd
1.125	41.70	56.00	14.30	N	gnd
1.345	40.71	56.00	15.29	L1	gnd
1.75	42.91	56.00	13.09	L1	gnd
2.085	44.37	56.00	11.63	L1	gnd
2.125	43.30	56.00	12.70	N	gnd
4.57	36.83	56.00	19.17	N	gnd
10.875	51.31	60.00	8.69	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.21	46.93	53.21	6.28	L1	gnd
0.615	29.07	46.00	16.93	L1	gnd
10.375	43.84	50.00	6.16	L1	gnd
10.875	47.71	50.00	2.29	L1	gnd
12.625	42.08	50.00	7.92	L1	gnd
12.875	41.35	50.00	8.65	L1	gnd
16.625	41.30	50.00	8.70	L1	gnd
18.125	40.29	50.00	9.71	L1	gnd
20.7	16.73	50.00	33.27	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

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Final Measurement Results (continued)

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Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
21.95	17.15	50.00	32.85	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

Graph 4 Conducted Emissions Test Results

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Conducted Emissions

EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Handshaking Keycard
	Neutral line
Result File:	4171m.dat : Net2Air interface system- Handshaking keycard - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB

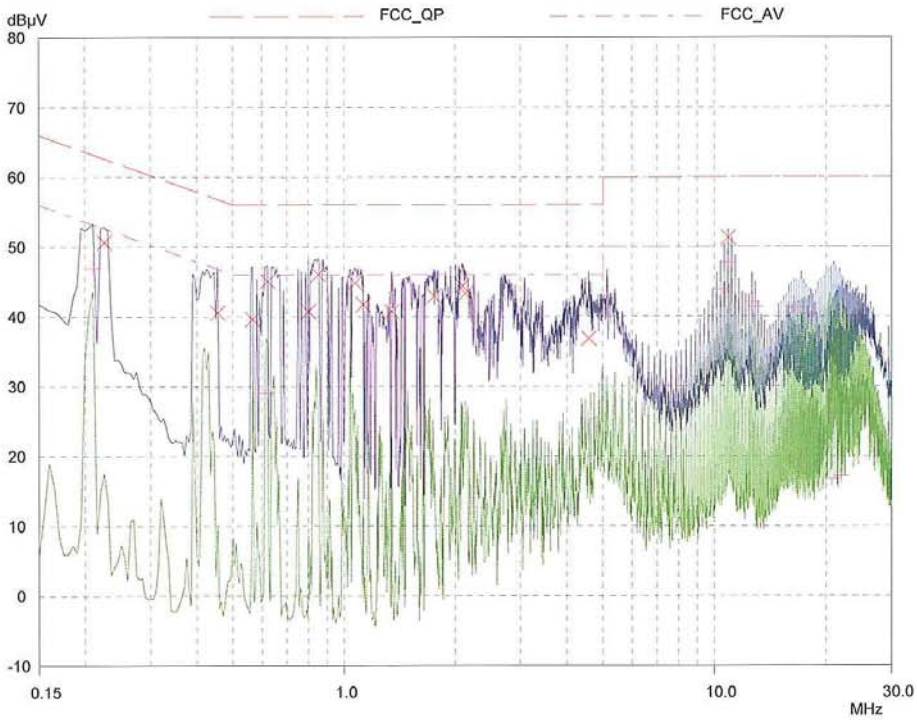

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Table 5 Conducted Emissions Test Results

Standard: FCC Part 15: 207

Test: Conducted Emissions

Port: Net2Handsfree Interface testboard - Positive and Neutral Lines

Units of measurement:

Frequency: MHz Amplitude: dBµV

Bandwidths: 10kHz

Mode of operation: Net2Handsfree interface system testboard – Standby mode

Comment: Monitored for functionality by client Software Net2

07024171 08 Mar 2007 16:00

Conducted Emissions

EUT: Net2Air Interface system
Manuf: Paxton Access Controls
Op Cond: 120vac 60Hz
Operator: D A Legge
Test Spec: CFR47-Part15:207
Comment: Standby mode
Positive and Neutral lines
Result File: 4171n.dat : Net2Air interface system- Standby Mode - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement: Detectors: X QP / + AV
Meas Time: 2sec
Subranges: 50
Acc Margin: 10 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.61	45.78	56.00	10.22	N	gnd
0.815	46.25	56.00	9.75	N	gnd
0.85	45.30	56.00	10.70	N	gnd
1.05	44.05	56.00	11.95	N	gnd
1.66	44.03	56.00	11.97	L1	gnd
1.735	41.85	56.00	14.15	N	gnd
2.075	45.89	56.00	10.11	N	gnd
2.7	44.14	56.00	11.86	L1	gnd
10.875	51.39	60.00	8.61	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.205	48.97	53.41	4.44	N	gnd
0.21	48.32	53.21	4.89	N	gnd
0.415	39.19	47.55	8.36	N	gnd
0.62	38.14	46.00	7.86	N	gnd
0.83	37.76	46.00	8.24	N	gnd
10.375	43.93	50.00	6.07	N	gnd
10.875	47.82	50.00	2.18	N	gnd
11.625	42.61	50.00	7.39	L1	gnd
12.875	41.51	50.00	8.49	N	gnd
15.875	40.46	50.00	9.54	L1	gnd
17.125	41.85	50.00	8.15	L1	gnd
19.5	41.93	50.00	8.07	L1	gnd
20.5	43.99	50.00	6.01	L1	gnd
22.25	41.87	50.00	8.13	L1	gnd

* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

PAGE 2

Graph 5 Conducted Emissions Test Results

07024171 08 Mar 2007 16:00

Conducted Emissions

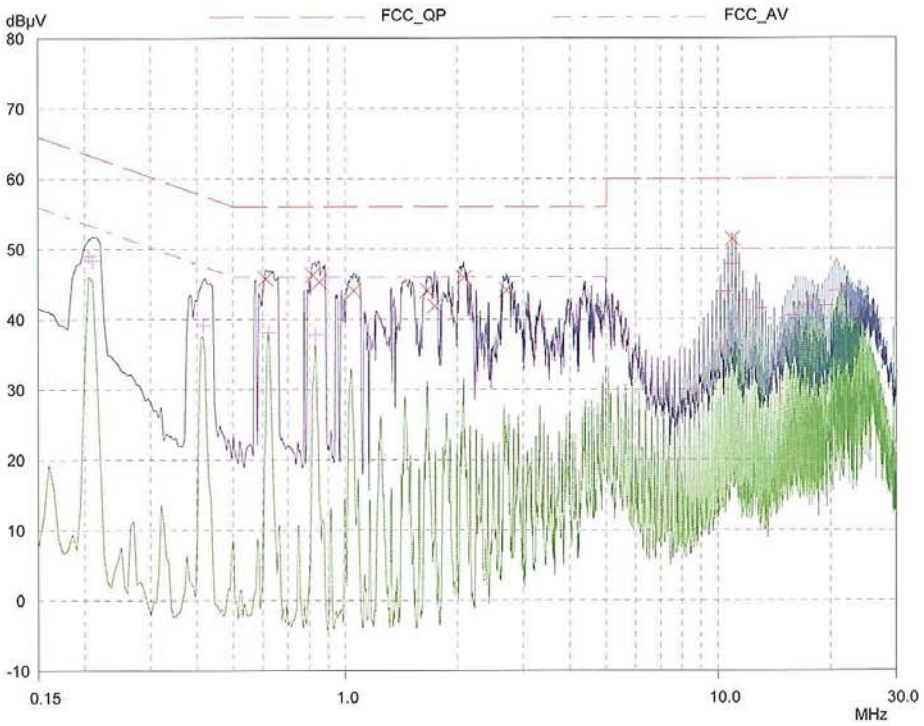
EUT:	Net2Air Interface system
Manuf:	Paxton Access Controls
Op Cond:	120vac 60Hz
Operator:	D A Legge
Test Spec:	CFR47-Part15:207
Comment:	Standby mode
	Positive and Neutral lines
Result File:	4171n.dat : Net2Air interface system- Standby Mode - FCC Pt 15:207

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	21	9kHz	30MHz	8157
	22	9kHz	30MHz	LISN7473

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB



PAGE 1

5. RADIATED EMISSIONS

5.1. Radiated Emissions Test Method

The testing was performed in accordance with ANSI C63.4-2003.

The testing was carried out in a fully lined anechoic chamber, with the limit line at 10m distance for adjusted for a 3m test site.The limit line was also lowered by 6dB to give worst case conditions(the test site being fixed and unable to maximise signal levels).

The Intentional radiated field strengths are tabulated in Table 6 and the 6dB bandwidths in table 7. The plots are shown in Annex 1

5.2. Unintentional Radiated Emissions Test Results

The radiated emissions from 30 to 1000MHz were measured using a quasi-peak detector. Measurements above 1000MHz were measured using average and peak detectors.
The results for the frequency range 30 to 1000MHz for Net2Handsfree interface system communicating with the Keyfob are given in Table 8 and Graph 6 and for the keycard communicating, Table 9 and Graph 7. The test results for the Net2Handsfree interface system in standby mode are given in Table 10 and Graph 8.

The results for frequencies above 1000MHz are tabulated and shown in Table 11.

5.3. Modifications Performed During Testing

None.

5.4. Radiated Emissions Conclusions

The intentional radiated field strengths complied with CFR47 Part15:249.

The non intentional radiated emissions complied with CFR47 Part15:209 for the Net2Handsfree Access control system communicating with the Keyfob.

The non intentional radiated emissions complied with CFR47 Part15:209 for the Net2Handsfree Access control system communicating with the keycard.

5.5. Measurement Uncertainty

30MHz to 1000MHz ±3.3dB

The measurement uncertainties have been determined at a confidence level of not less than 95%.

5.6. Radiated Field Strength

Table 6 Intentional Radiated Field strengths – 3m

Peak Detector

Exciter	Polarity	Analyser dBµV	ACF dB	Cables dB	PeakTotal dBµV/m	Peak Limit dBµV/m
Keyfob	V	55.0	28.5	2.0	85.5	114.0
Keyfob	H	52.0	28.5	2.0	82.5	114.0
Keycard	V	57.1	28.5	2.0	87.6	114.0
Keycard	H	42.8	28.5	2.0	73.3	114.0

Note: ACF = Antenna correction dB

Average Detector

Exciter	Polarity	Analyser dBµV	ACF dB	Cables dB	Average Total dBµV/m	Average Limit dBµV/m
Keyfob	V	54.0	28.5	2.0	84.5	94.0
Keyfob	H	50.0	28.5	2.0	80.5	94.0
Keycard	V	55.5	28.5	2.0	86.0	94.0
Keycard	H	50.8	28.5	2.0	81.3	94.0

Analyser dBµv + ACF + Cables - dBµv/m @ 3m

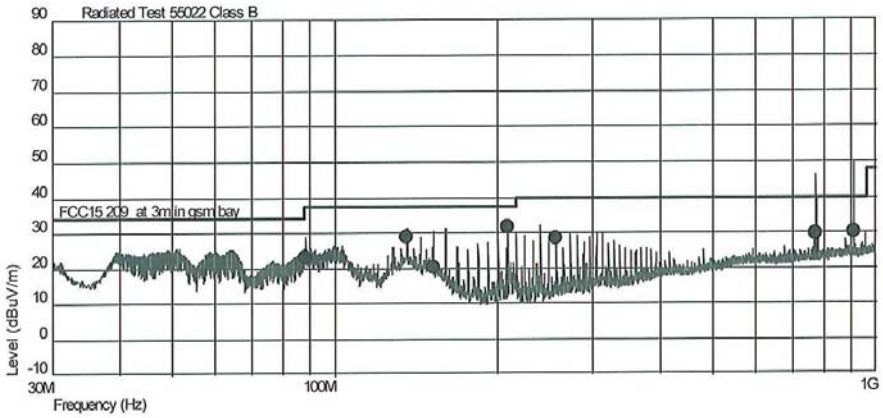
Table 7 - Graph 6 Non Intentional Radiated Emissions Test Results Keyfob

Intertek-Lhd - Final Report – Handshaking Keyfob

Job Number	07024171
Customer	Paxton Glass
Model	Netair2 interface
Engineer	D A Legge
Standard	CFR47 Part 15:209

Peak Result 31

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)



Peak Result 0

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)
88.44 M	22.96	1.10	--	355.00	37.50	-14.54		QP	120.0 k
135.9 M	28.73	1.10	--	120.00	37.50	-8.77		QP	120.0 k
151.74 M	20.22	1.10	--	175.00	37.50	-17.28		QP	120.0 k
208.02 M	31.75	1.10	--	335.00	37.50	-5.75		QP	120.0 k
255.96 M	28.59	1.10	--	120.00	40.00	-11.41		QP	120.0 k
773.64 M	29.50	1.10	|	190.00	40.00	-10.50		QP	120.0 k
908.16 M	30.02	1.10	|	305.00	40.00	-9.98		QP	120.0 k

Table 8 and Graph 7 Non Intentional Radiated Emissions Test Results

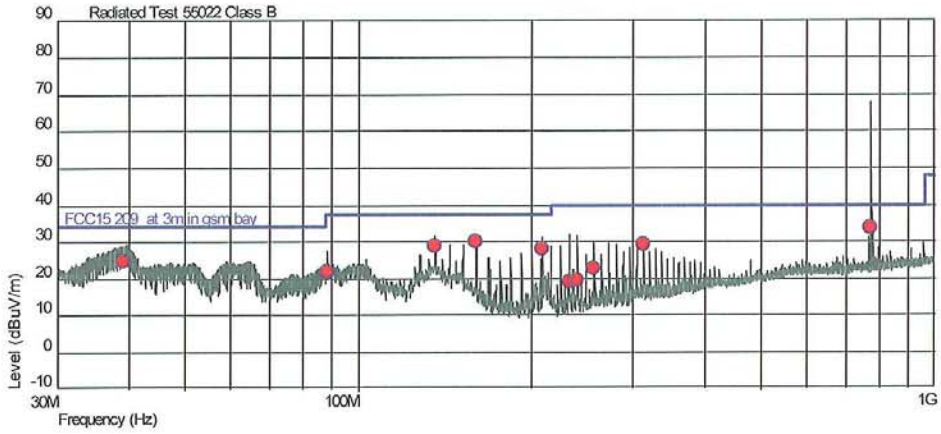
Keycard

Intertek-Lhd – Final Report – Handshaking Keycard

Job Number	07024171
Customer	Paxton Access
Model	Net2air interface with Keycard
Engineer	D A Legge
Standard	CFR47 Part 15::209

Peak Result 31

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)



Peak Result 0

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)
39.0 M	24.80	1.10	--	125.00	34.00	-9.20		QP	120.0 k
88.44 M	22.02	1.10	--	195.00	37.50	-15.48		QP	120.0 k
135.9 M	28.79	1.10	--	120.00	37.50	-8.71		QP	120.0 k
160.02 M	29.97	1.10	--	175.00	37.50	-7.53		QP	120.0 k
207.96 M	27.83	1.10	--	345.00	37.50	-9.67		QP	120.0 k
232.74 M	19.12	1.10	--	145.00	40.00	-20.88		QP	120.0 k
239.76 M	19.50	1.10	|	205.00	40.00	-20.50		QP	120.0 k
255.9 M	22.82	1.10	--	40.00	40.00	-17.18		QP	120.0 k
312.0 M	29.16	1.10	--	255.00	40.00	-10.84		QP	120.0 k
774.66 M	33.55	1.10	|	30.00	40.00	-6.45		QP	120.0 k

Table 9 and Graph 8 Radiated Emissions Test Results

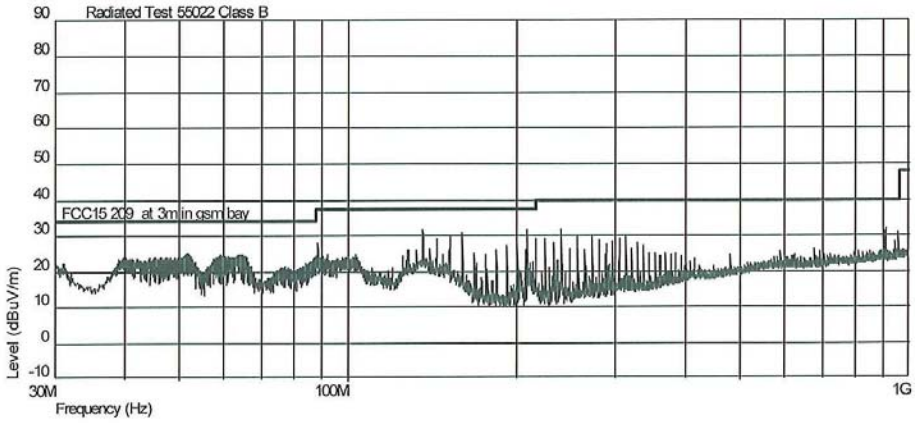
Standby mode

Intertek-Lhd – Prescan Report – Net2air interface system in standby mode

Job Number	07024171
Customer	Paxton Glass
Model	Net2air Interface system
Engineer	D A Legge
Standard	CFR47 Part15:209

Peak Result 31

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)



Peak Result 0

Frequency(Hz)	Level(dBuV/m)	Height(m)	Polar	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	Comment	Detector	RBW(Hz)

Table 10 Radiated Emissions Test Result 1 to 24GHz

Keyfob Communicating with Net2Handsfree system

Frequency GHz	Analyser dBµV	Antenna dB	Cables dB	Preamp dB	Total dBµV/m	Limit dBµV/m	Detector
1 – 2.4	< 31.0	26.1	1.6	29.0	< 29.7	54.0	Average
1 – 2.4	< 36.0	26.1	1.6	29.0	< 34.7	74.0	Peak
2 – 4	< 27.0	30.5	2.4	28.0	< 31.9	54.0	Average
2 - 4	< 35.0	30.5	2.4	28.0	< 39.9	74.0	Peak
4.8	40.9	27.5	3.2	29.0	42.6	54.0	Average
5.59	33.6	27.5	3.46	28.0	32.96	54.0	Average
7.23	35.0	28.7	3.9	29.5	38.1	54.0	Average
4.8	45.7	27.5	3.2	29.0	47.4	74.0	Peak
5.59	42.0	27.5	3.46	28.0	44.6	74.0	Peak
7.23	45.19	28.7	3.9	29.5	48.3	74.0	Peak
8 - 12	< 31.0	33.4	4.5	27.0	< 41.9	54.0	Average
12 - 18	< 32.0	31.7	6.8	27.3	< 43.2	54.0	Average
18 - 24	< 30.0	33.8	9.2	26.0	< 47.0	54.0	Average
8 – 12	< 41.0	33.4	4.5	27.0	< 51.9	74.0	Peak
12 – 18	< 41.0	31.7	6.8	27.3	< 52.2	74.0	Peak
18 - 24	< 40.0	32.8	8.2	28.0	< 53.0	74.0	Peak

Note: < equates to measuring system noise

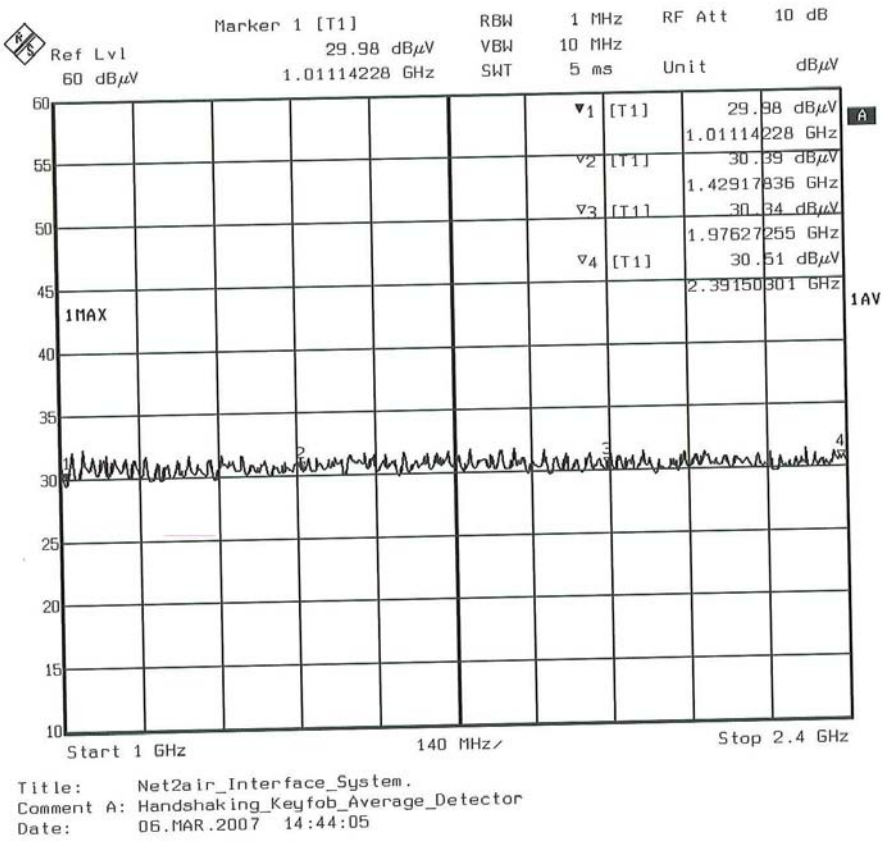
Keycard communicating with Net2Handsfree system

Frequency GHz	Analyser dBµV	Antenna dB	Cables dB	Preamp dB	Total dBµV/m	Limit dBµV/m	Detector
1 – 2.4	< 31.0	26.1	1.6	29.0	< 29.7	54.0	Average
1 – 2.4	< 36.0	26.1	1.6	29.0	< 34.7	74.0	Peak
2 – 4	< 27.0	30.5	2.4	28.0	< 31.9	54.0	Average
2 - 4	< 35.0	30.5	2.4	28.0	< 39.9	74.0	Peak
4.8	< 28.2	27.5	3.2	29.0	< 29.9	54.0	Average
5.59	< 29.0	27.5	3.46	28.0	< 31.96	54.0	Average
7.23	< 31.0	28.7	3.9	29.5	< 34.1	54.0	Average
4.8	44.1	27.5	3.2	29.0	45.8	74.0	Peak
5.59	< 40.0	27.5	3.46	28.0	< 42.96	74.0	Peak
7.23	< 42.0	28.7	3.9	29.5	< 45.1	74.0	Peak
8 - 12	< 31.0	33.4	4.5	27.0	< 41.9	54.0	Average
12 - 18	< 32.0	31.7	6.8	27.3	< 43.2	54.0	Average
18 - 24	< 30.0	33.8	9.2	26.0	< 47.0	54.0	Average
8 – 12	< 41.0	33.4	4.5	27.0	< 51.9	74.0	Peak
12 – 18	< 41.0	31.7	6.8	27.3	< 52.2	74.0	Peak
18 - 24	< 40.0	32.8	8.2	28.0	< 53.0	74.0	Peak

Note: < Equates to measuring system noise

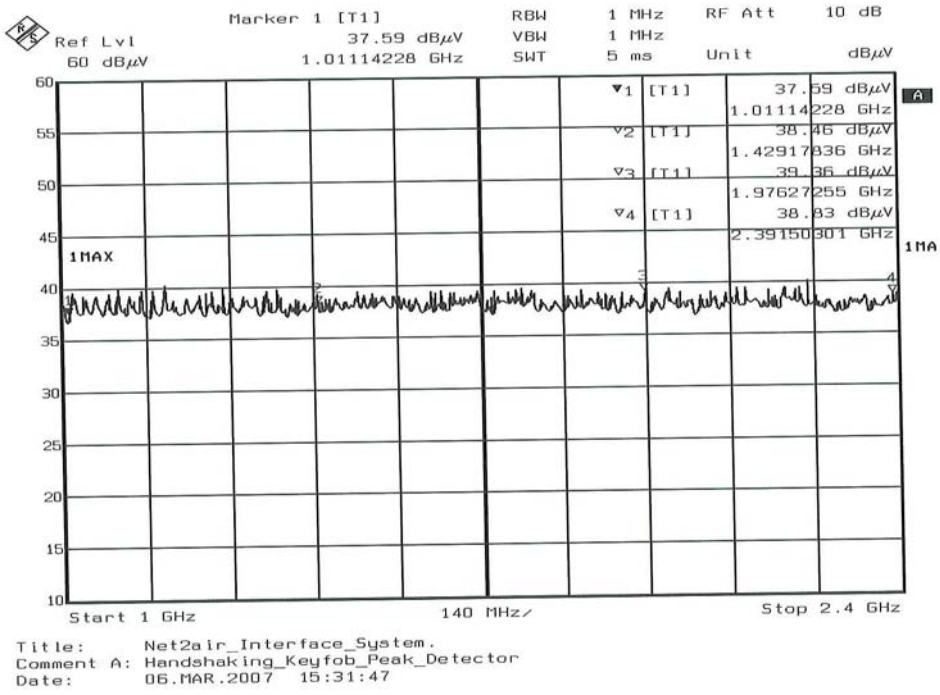
5.7. Restricted Frequency Band Emissions

Keyfob 1 – 2.4GHz – Average Detector

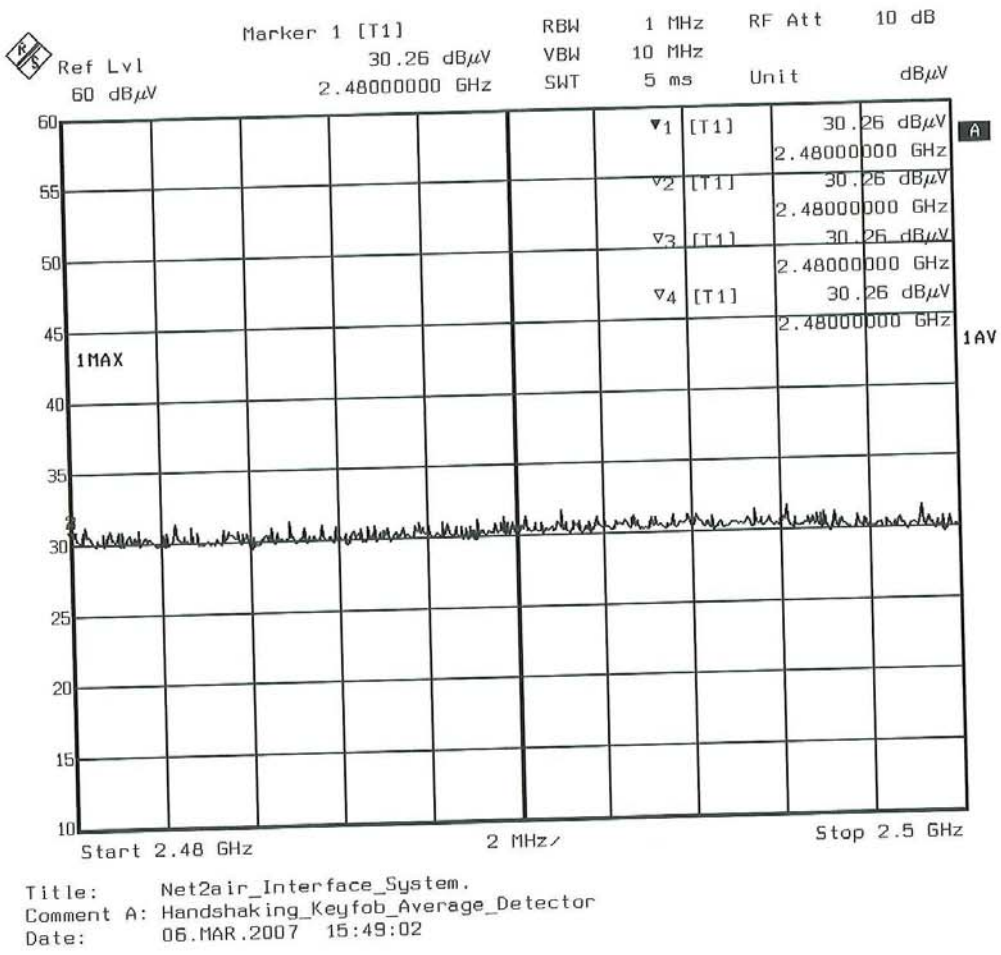


Title: Net2air_Interface_System.
Comment A: Handshaking_Keyfob_Average_Detector
Date: 06.MAR.2007 14:44:05

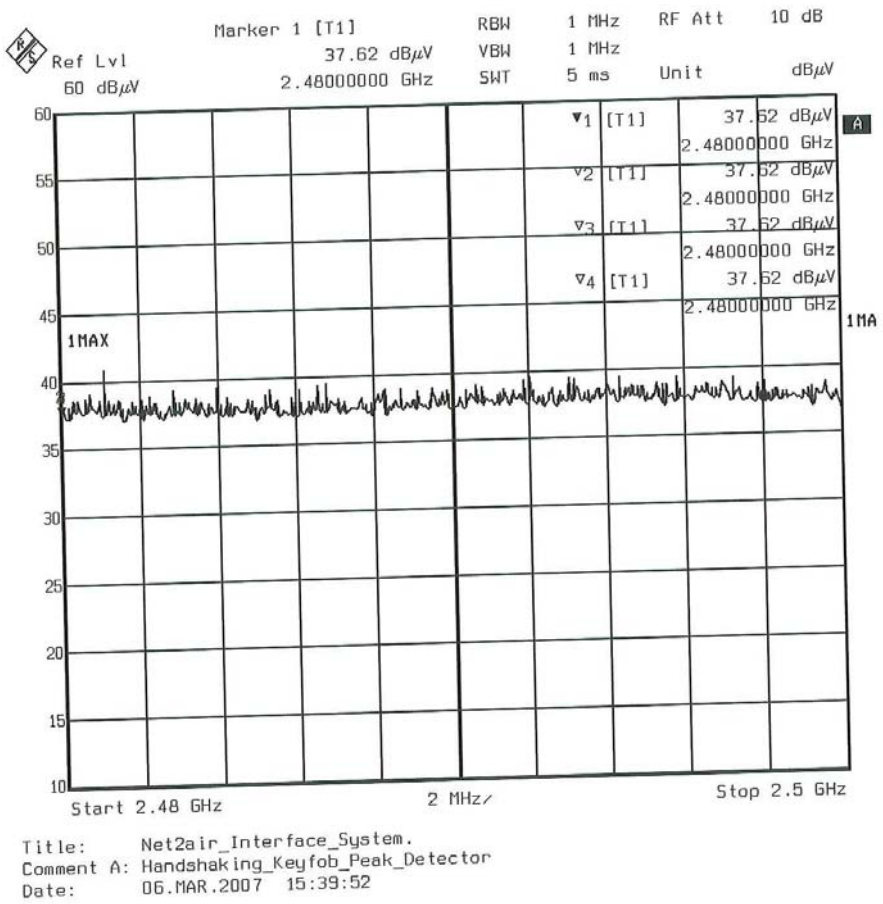
Keyfob 1 – 2.4GHz – Peak Detector



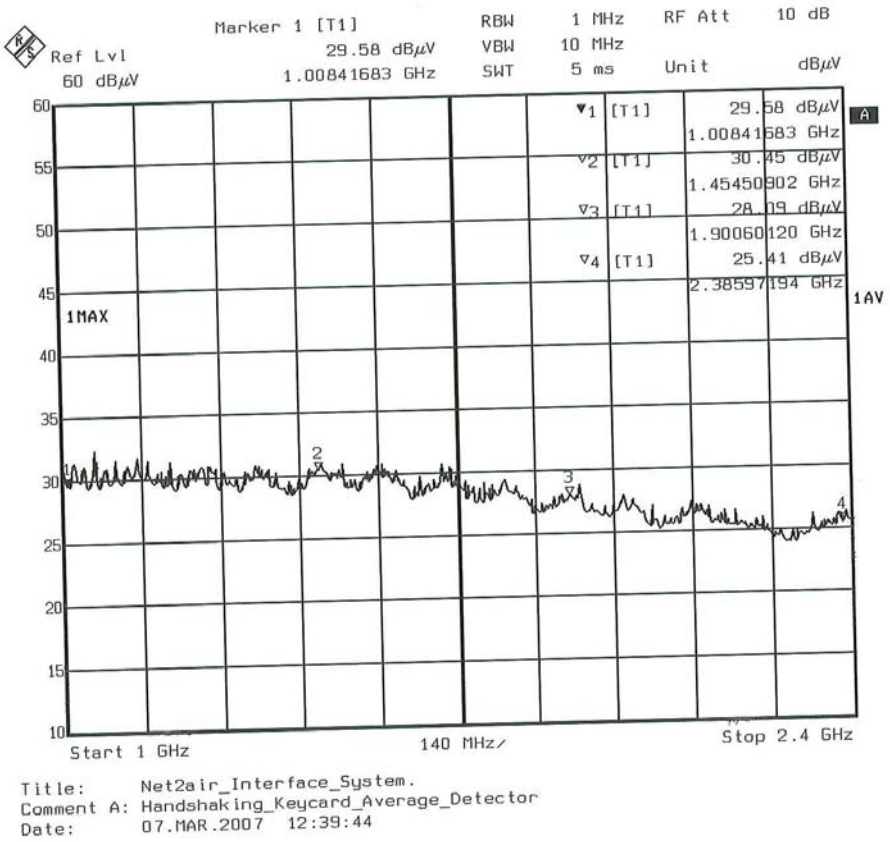
Keyfob 2.48 – 2.5GHz - Average Detector



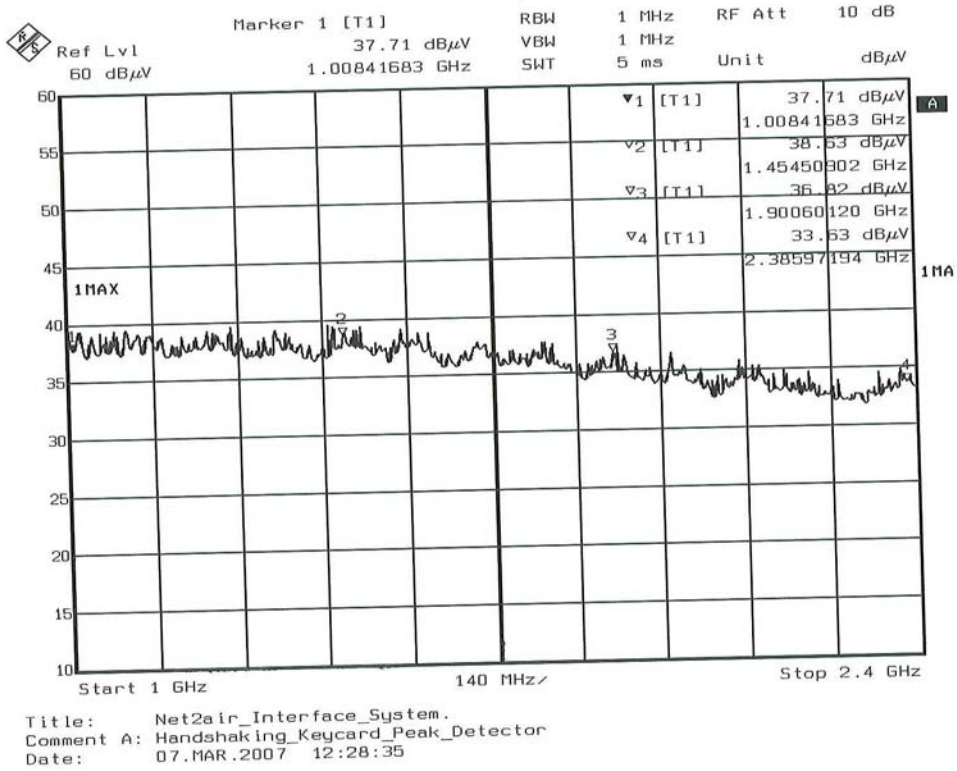
Keyfob 1 – 2.4GHz – Peak Detector



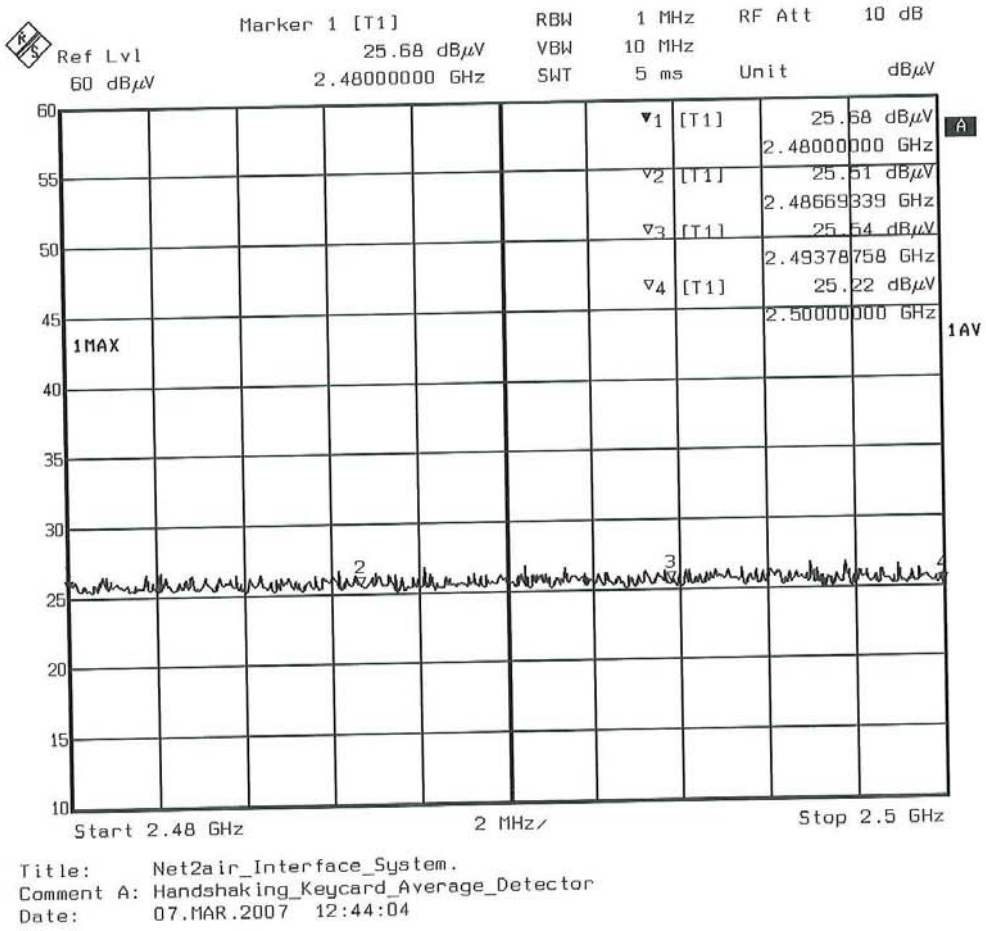
Key card 1 – 2.4GHz – Average Detector



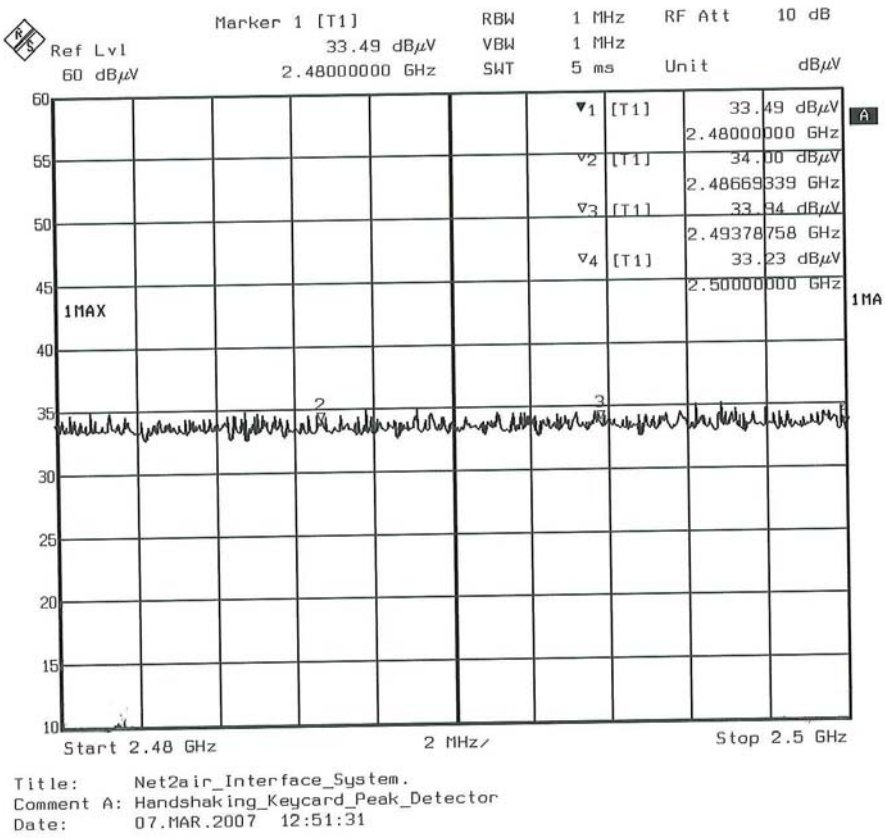
Key card 1 – 2.4GHz Peak Detector



Keycard 2.48 -2.5GHz – Average Detector

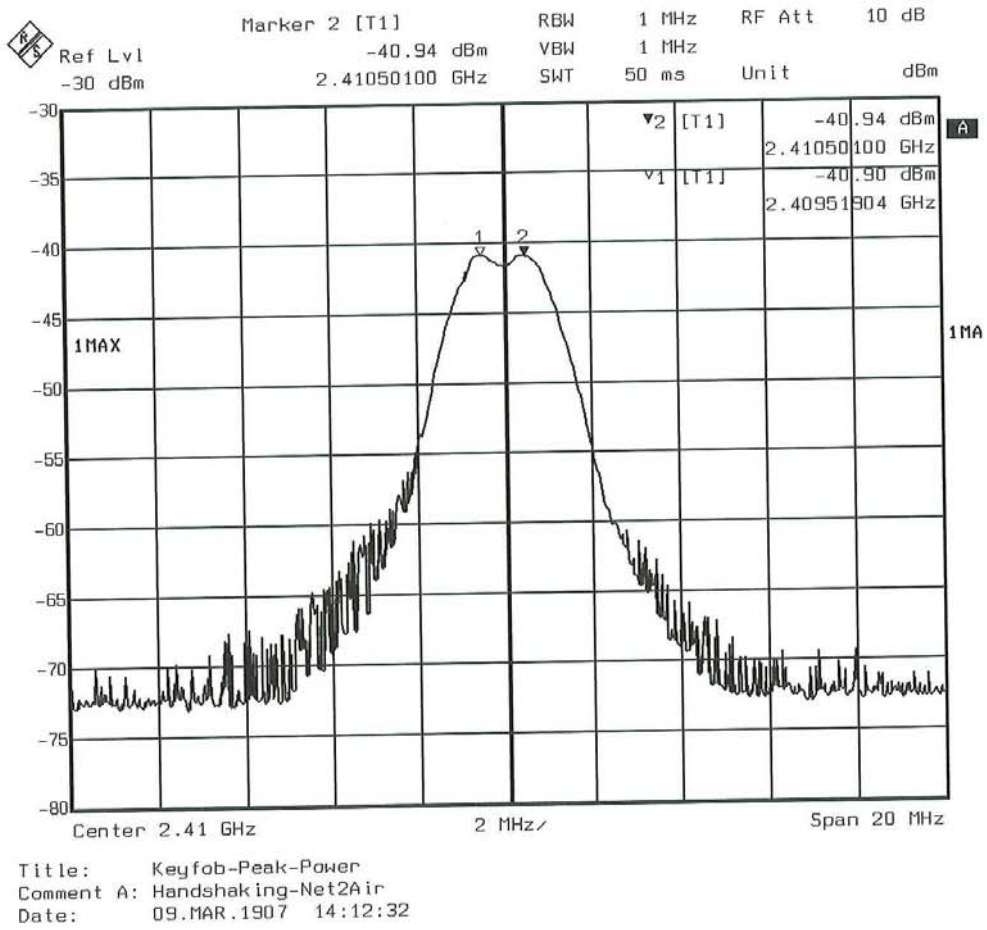


Keycard 2.48 2.5GHz Peak Detector

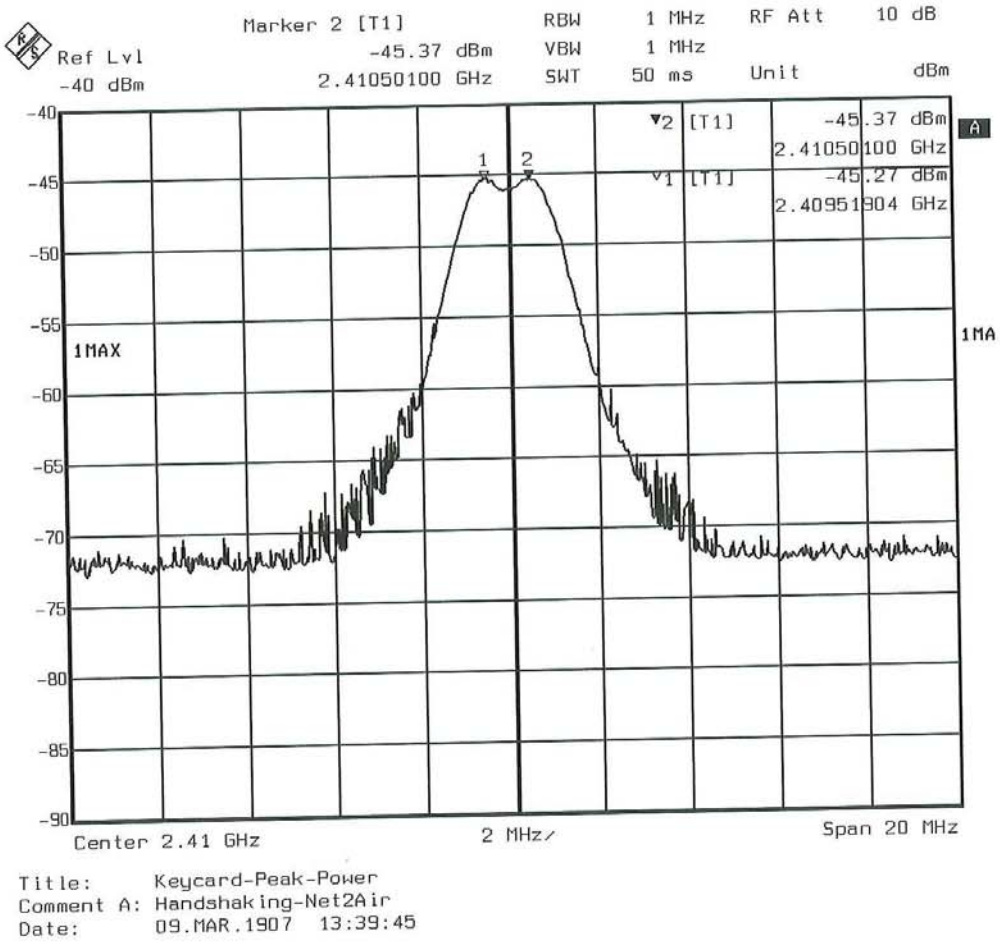


ANNEX 1

Peak Power Plots - Keyfob

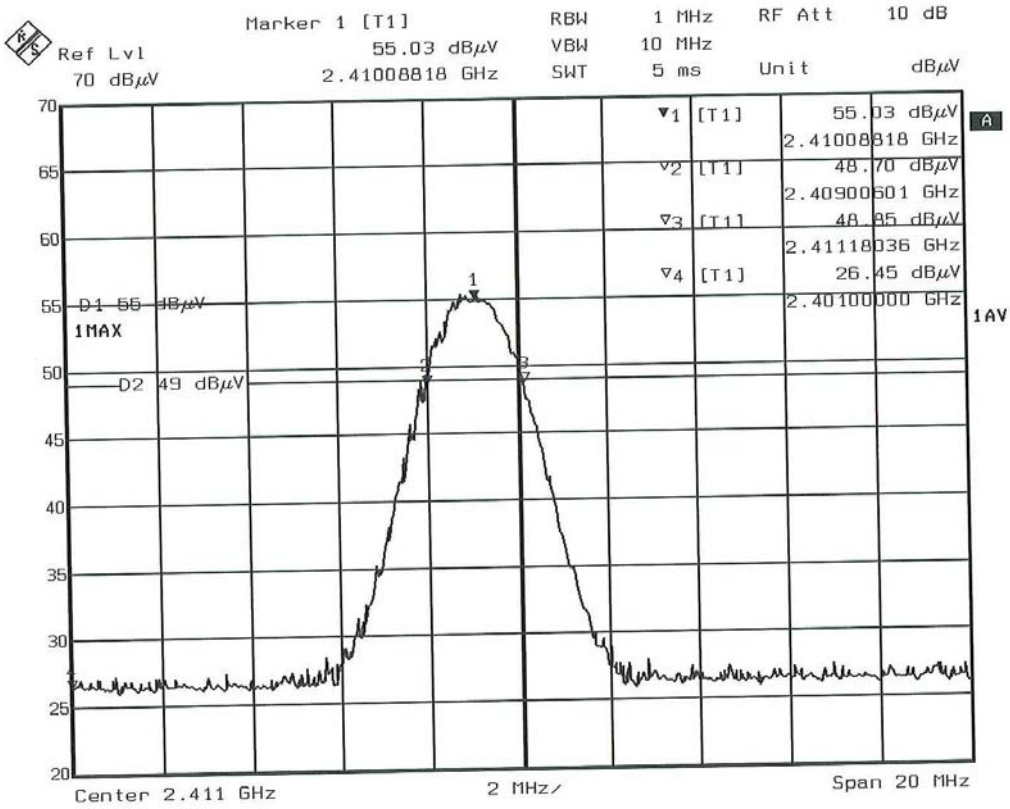


Peak Power Plot - Keycard

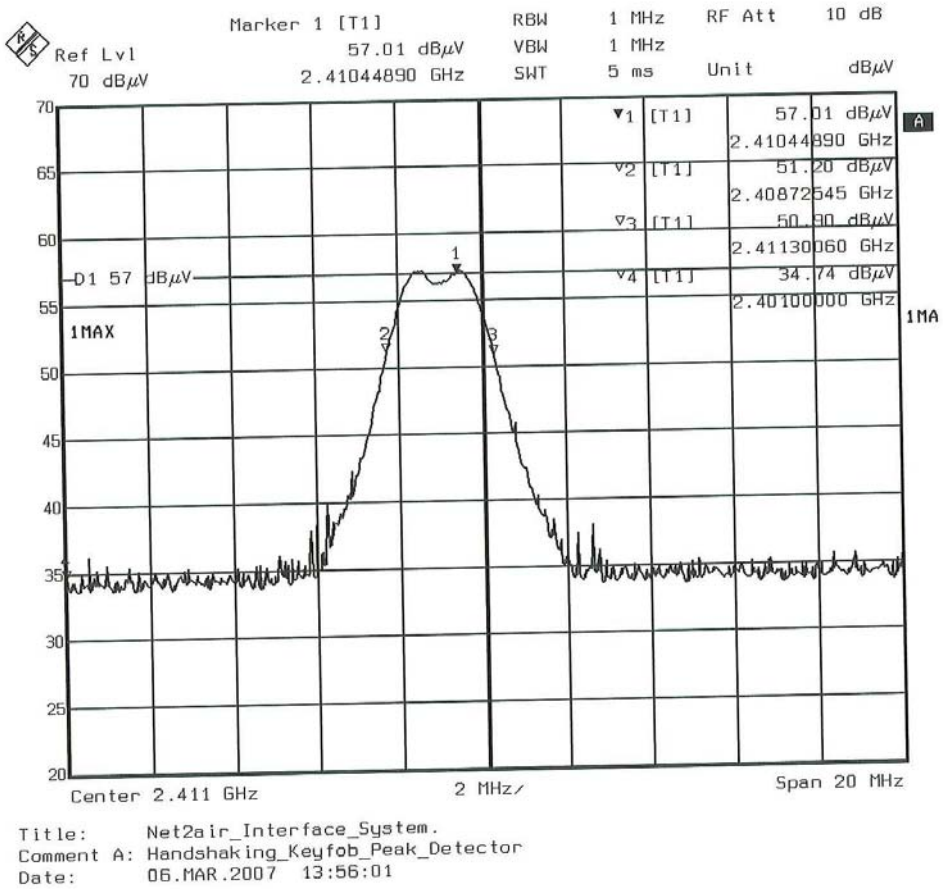


ANNEX 2 – 6dBandwidths

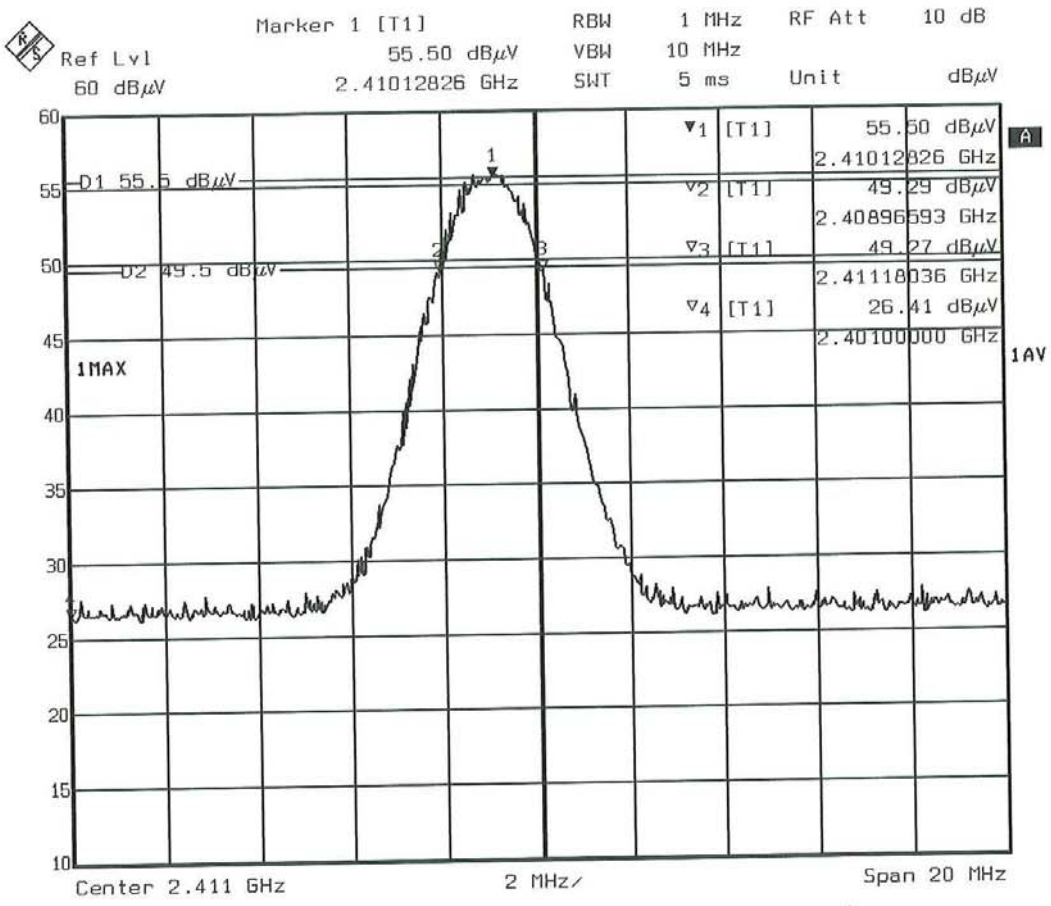
Keyfob – Average Detector



Keyfob –Peak Detector



Keycard – Average Detector



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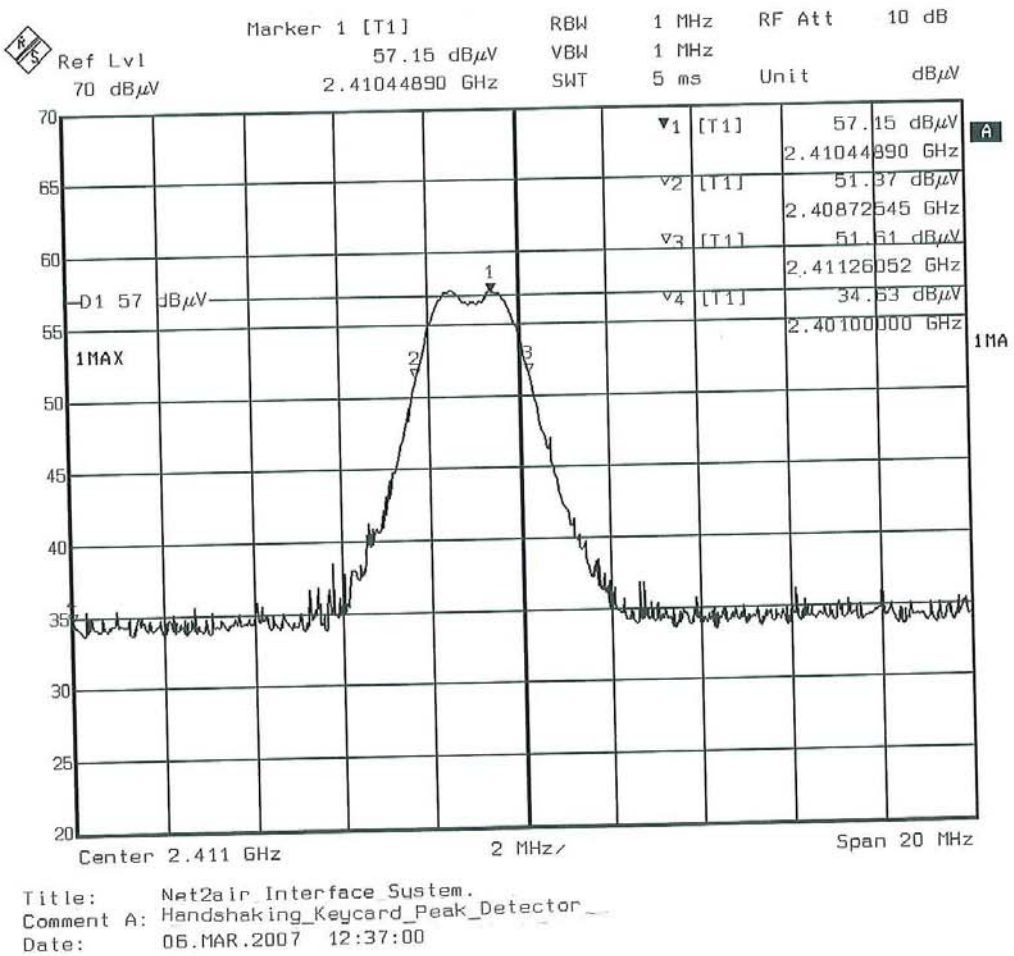
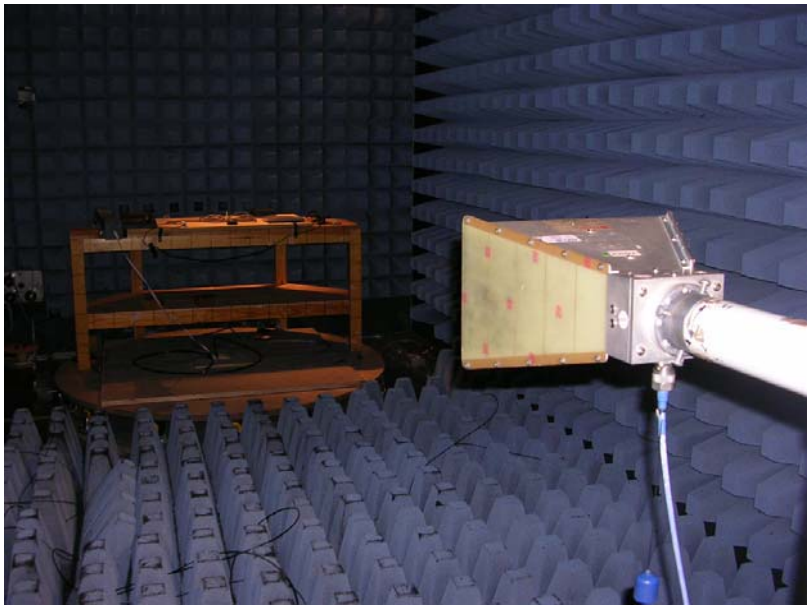
Comment A: Handshaking_Keycard_Average_Detector
Date: 06.MAR.2007 12:09:56

Keycard – Peak Detector



Annex 3
Test Set ups

Radiated Emissions

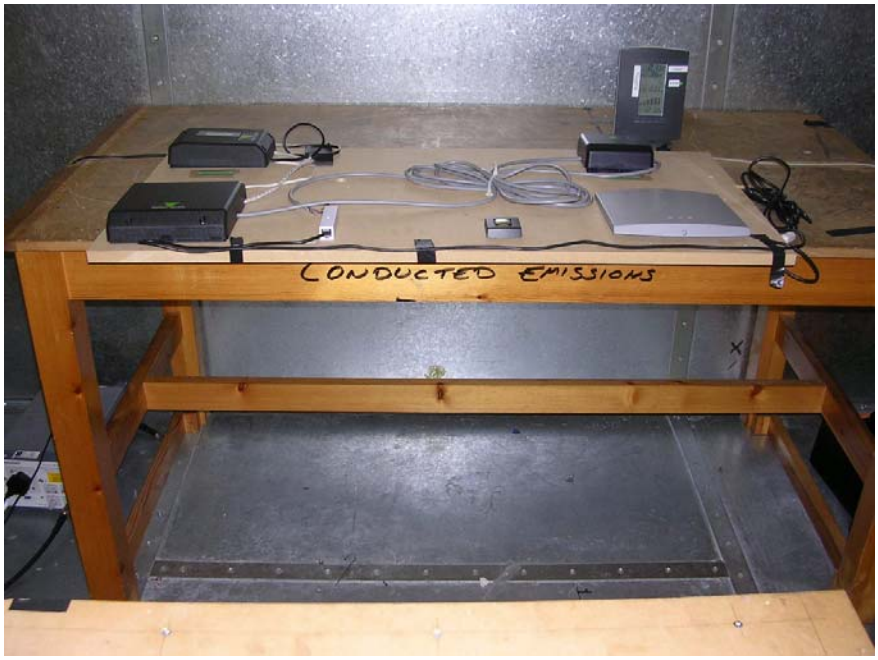


Radiated Emissions

Keyfob Field Strength

Keycard Field Strengths

Conducted Emissions



Conducted Emissions

6. TEST EQUIPMENT

Equipment	Type	ID
Rohde & Schwarz FSEK	Analyser	1088
Rohde & Schwarz ESHS10	Receiver	7463
Rohde & Schwarz ESHS10	Receiver	4761
Rohde & Schwarz ESHS-Z5	Lisn	7473
Chase Antenna	Bilog	
2m N to N	Cable	8157
2m N to N	Cable	7258
3m N to N	Cable	7529
4m N to N	Cable	7177
2m K to K	Cable	7532
3m Kto K	Cable	7531
Emco Horn Antenna	1 to 18GHz	7512
Emco Horn Antenna	4 to 8GHz	7617
Emco Horn Antenna	8 to 12GHz	7614
Scientific Atlanta	12 to 18GHz	7615
Scientific Atlanta	18 to 26GHz	7513
ERA Wideband Amplifier	1 to 18GHz	7534
GSM A	Environment	7286
Test Bay 5	Environment	7404
High Accuracy THP	Environment Monitor	7519
High Accuracy THP	Environment Monitor	7516
Continuous Power International	115Vac 60Hz Generator	7497