

TEST RESULT SUMMARY

Limited modular approval for class A devices
FCC Part 15 Subpart C Section 15.207
FCC Part 15 Subpart C Section 15.225
IC RSS-210 Issue 7
IC RSS-Gen Issue 2

MANUFACTURER'S NAME	Datacard Group
NAME OF EQUIPMENT	Card Personalization Equipment
MODEL NUMBER(S) TESTED	SCRDTX
MANUFACTURER'S ADDRESS	11111 Bren Road West Minnetonka MN 55343
TEST REPORT NUMBER	WC707384
TEST DATE(S)	17 May, 02 October, 30 November 2007

According to testing performed at TÜV SÜD America Inc, the above mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Sections 15.207 and 15.225 and Industry Canada RSS-210 Issue 7 and RSS-Gen Issue 2.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

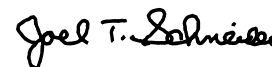
TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Sections 15.207 "Conducted Limits" and 15.225 "Operation within the band 13.110–14.010 MHz" and IC RSS-210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment" and IC RSS-Gen Issue 1 "General Requirements and Information for the Certification of Radiocommunication Equipment".

Date: 06 December 2007

Location: Taylors Falls MN
USA



Greg Jakubowski
Senior EMC Technician



Joel T Schneider
Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Limited modular approval for class A devices

Test Report File No. : **WC707384** Date of issue: 06 December 2007

Model / Serial No(s) Tested : SCRDTX / ---

Product Type : Card Personalization Equipment

Manufacturer : Datacard Group

Address : 11111 Bren Road West
Minnetonka MN 55343

Test Result : **Positive** **Negative**

Test Project Number
References : WC707384

Total pages including
Appendices : 42

TÜV SÜD AMERICA Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.

TÜV SÜD AMERICA Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

D I R E C T O R Y

Documentation			Page(s)
Directory			<u>2</u>
Test Regulations, Environmental conditions, Power supply			<u>3</u>
Test Data and Results:	FCC	IC	
Emissions within the band 13.553–13.567 MHz	15.225(a)	RSS-210, A2.6(a)	<u>4 - 6</u>
Emissions within the bands 13.410–13.553 MHz and 13.567–13.710 MHz	15.225(b)	RSS-210, A2.6(b)	<u>7</u>
Emissions within the bands 13.110–13.410 MHz and 13.710–4.010 MHz	15.225(c)	RSS-210, A2.6(c)	<u>8</u>
General field strength limits 0.009 - 30 MHz	15.209(a)	RSS-210, 2.6	<u>9</u>
Radiated emissions 30 - 1000 MHz	15.209(f)	RSS-210, 2.6	<u>10 - 18</u>
Frequency tolerance	15.225(e)	RSS-210, A2.6(d)	<u>19</u>
Occupied bandwidth	n/a	RSS-Gen, 4.4.1	<u>20</u>
Conducted limits - AC Power Lines	15.207(a)	RSS-Gen, 7.2.2	<u>21 - 24</u>
Test area diagram			<u>25 - 26</u>
Test setup photo(s)			<u>27 - 29</u>
Test Operation Mode, Configuration of the device under test			<u>30</u>
Deviations From Standard, General Remarks, Summary			<u>31</u>
Appendix A			
Constructional Data Form & Block Diagram			<u>32 - 40</u>
Appendix B			
Measurement Protocol			<u>41 - 42</u>

Sign Explanations:

- not applicable
- applicable

EMC TEST REGULATIONS:

The tests were performed according to the following regulations :

- EN 55014-2: 1997 + Amendment A1: 2001 - Category ___
- EN 55024: 1998 + Amendments A1: 2001 + A2: 2003
- EN 60601-1-2: 2001
- EN 61000-6-1: 2001
- EN 61000-6-2: 2001
- EN 61326: 1997 + Amendments A1: 1998 + A2: 2001 + A3: 2003
- EN 61800-3: 1996 + Amendment A11: 2000
- ETS 300 683: 1997
- ETSI EN 301 489-3 V1.4.1: 2002
- EN 300 330-2 V1.1.1 (2001-06)
- FCC Part 15 Subpart C Section 15.207
- FCC Part 15 Subpart C Section 15.225
- IC RSS-210 Issue 7
- IC RSS-Gen Issue 2

ENVIRONMENTAL CONDITIONS IN THE LAB

	<u>Actual</u>
Temperature:	: 15-23 °C
Atmospheric pressure	: 98-99 kPa
Relative Humidity	: 30-45 %

POWER SUPPLY UTILIZED

Power supply system : 5 VDC

Emissions within the band 13.553–13.567 MHz
FCC 15.225(a), IC RSS-210 A2.6(a)

Test summary

The requirements are: ■ - MET □ - NOT MET

The fundamental field strength at 13.56 MHz is 70.8 $\mu\text{V/m}$ at 30 meters. This would be below the lowest in band mask limit of 106 $\mu\text{V/m}$.

Test location

- - Wild River Lab Large Test Site (Open Area Test Site)
- - Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- - 30 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08
2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	08-Jun-08

Test limit

15848 $\mu\text{V/m}$ at 30 meters

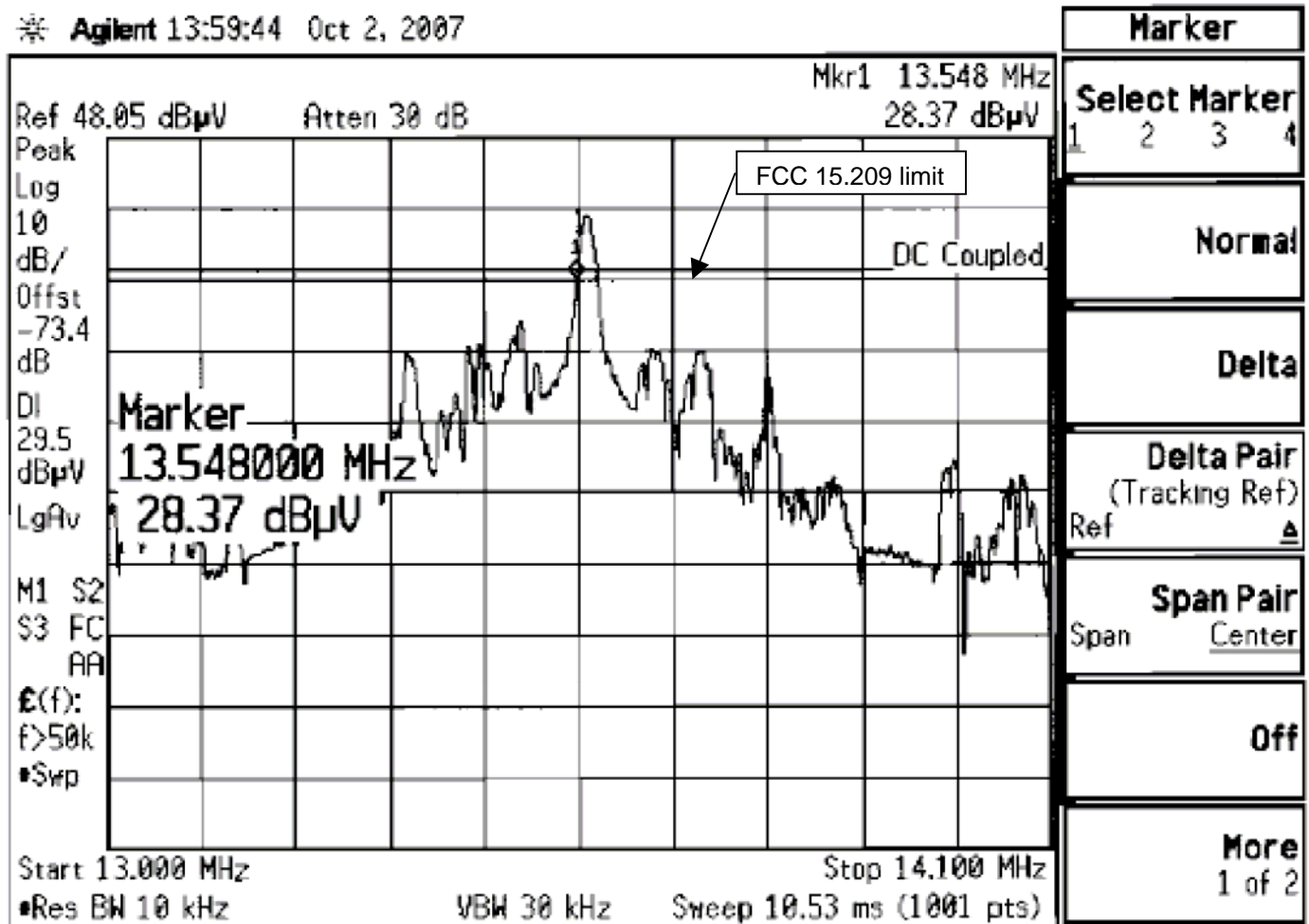
Test data, Quasi-Peak, 30 meters

Frequency (MHz)	$\mu\text{V/m}$
13.56	70.8

see plots on following pages

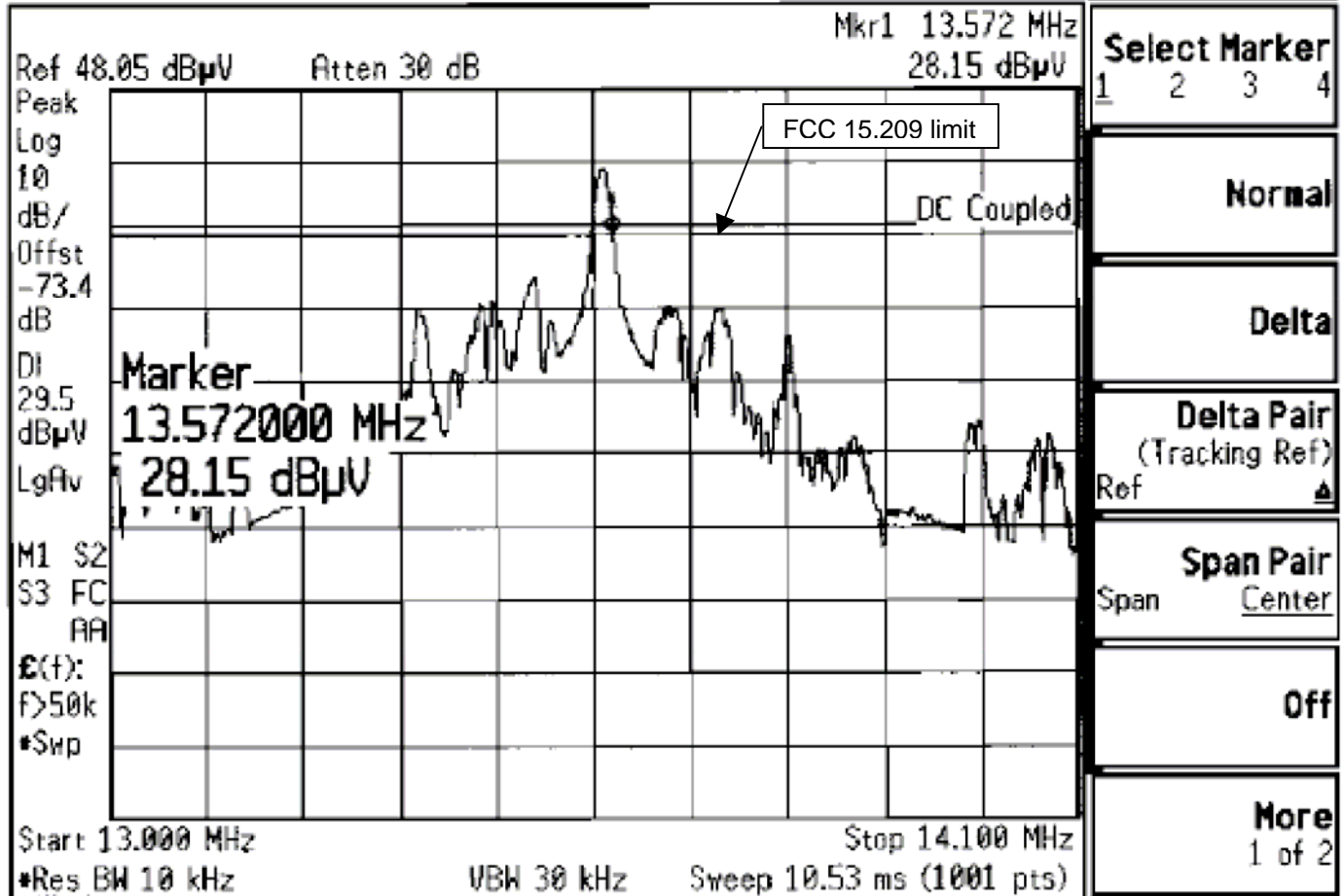
Band edge spurious emission mask, low end
 Offset used to convert Y scale from dB μ V to dB μ V/m at 30 meters

Agilent 13:59:44 Oct 2, 2007



Band edge spurious emission mask, high end
 Offset used to convert Y scale from dB μ V to dB μ V/m at 30 meters

Agilent 14:00:57 Oct 2, 2007



Emissions within the bands 13.410–13.553 MHz and 13.567–13.710 MHz
FCC 15.225(b), IC RSS-210, A2.6(b)

Test summary

The requirements are: - MET - NOT MET
Minimum margin of compliance > 10 dB below the limit

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 0.3 meters
- 1 meters
- 3 meters
- 10 meters
- 30 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08
2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	08-Jun-08

Test limit

334 μ V/m at 30 meters

Test data

No significant emissions detected

Emissions within the bands 13.110-13.410 MHz and 13.710-14.010MHz
FCC 15.225(c), IC RSS-210 A2.6(c)

Test summary

The requirements are: - MET - NOT MET
 Minimum margin of compliance > 10 dB below the limit

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 0.3 meters
- 1 meters
- 3 meters
- 10 meters
- 30 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08
2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	08-Jun-08

Test limit

106 μ V/m at 30 meters

Test data

No significant emissions detected

General field strength limits 0.009 – 30 MHz (outside the band 13.110-14.010 MHz)
FCC 15.209(a), FCC 15.209(c), IC RSS-210 A2.6(d)

Test summary

The requirements are: - MET - NOT MET

Maximum spurious emission is -25 dBuV/m at 27.12 MHz at 30 meters (extrapolated)

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 0.3 meters

- 1 meters

- 3 meters

- 10 meters

- 30 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08
2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	08-Jun-08

Test limits

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 13.110	30	30
14.010 - 30	30	30

Spurious Test data, Quasi peak, $\mu\text{V}/\text{m}$

Frequency (MHz)	distance 0.3 m	1 m	3 m	10 m	30 m
27.12	7413	56.2	nf	nf	0.056

* Extrapolated values using 40 dB per decade roll off

nf Noise floor

Radiated Emissions 30 - 1000 MHz

FCC 15.209(f), IC RSS-210 2.6

Test summary

The requirements are: - MET - NOT MET

Minimum margin of compliance is 5 dB at 40.674 MHz

Per section 15.33, the limit used above the 10th harmonic and outside the restricted bands of section 15.205 is the class A limit of section 15.109

15.209 up to 135.6 MHz and in restricted bands, Class A up to 1 GHz due to 29.5 MHz oscillator and Datacard assertion only going to be used in Class A devices

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 3 meters

- 10 meters

Test Equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
3202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	10-May-08
3847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B
3294	8566B	Hewlett-Packard	Spectrum Analyzer	2349A03098	16-May-08
3295	85662A	Hewlett-Packard	Analyzer Display	2349A06144	16-May-08
2681	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00562	23-Mar-08

Cal Code B = Calibration verification performed internally.

Test limits

Within restricted bands

Frequency (MHz)	Field strength (dB μ V/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Outside restricted bands, extrapolated to 3 meters

Frequency (MHz)	Field strength (dB μ V/m)
30-88	49
88-216	53.5
216-960	56.4
Above 960	59.5

Test data

see following pages

RADIATED EMISSIONS



Test Report #: WC707384 Run 1 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %
 EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat Page: 1 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.209, FCC A outside restr bnds, 3M	DELTA2 FCC-A <1GHz 3m
13.56 MHz harmonics						
40.674 MHz	46.08 Qp	0.48 / 17.14 / 29.56 / 0.0	34.14	V / 1.00 / 0	-5.86	-14.96
67.794 MHz	45.75 Qp	0.79 / 10.08 / 29.32 / 0.0	27.3	V / 1.00 / 0	-12.7	-21.8
108.474 MHz	35.7 Qp	0.96 / 9.12 / 29.5 / 0.0	16.29	V / 1.00 / 0	-27.21	-37.21
122.034 MHz	41.8 Qp	1.0 / 9.11 / 29.5 / 0.0	22.41	V / 1.00 / 0	-21.09	-31.09
135.594 MHz	42.45 Qp	1.05 / 8.26 / 29.5 / 0.0	22.26	V / 1.00 / 0	-21.24	-31.24
149.154 MHz	40.15 Qp	1.1 / 9.62 / 29.4 / 0.0	21.47	V / 1.00 / 0	-32.03	-32.03
162.714 MHz	48.15 Qp	1.21 / 8.99 / 29.4 / 0.0	28.95	V / 1.00 / 0	-14.55	-24.55
176.274 MHz	51.8 Qp	1.27 / 9.92 / 29.45 / 0.0	33.53	V / 1.00 / 0	-19.97	-19.97
189.834 MHz	60.8 Qp	1.32 / 10.85 / 29.56 / 0.0	43.41	V / 1.00 / 0	-10.09	-10.09
203.394 MHz	61.9 Qp	1.37 / 11.03 / 29.66 / 0.0	44.64	V / 1.00 / 0	-8.86	-8.86
216.954 MHz	60.25 Qp	1.41 / 11.15 / 29.7 / 0.0	43.11	V / 1.00 / 0	-13.29	-13.29
230.514 MHz	45.75 Qp	1.44 / 11.64 / 29.62 / 0.0	29.21	V / 1.00 / 0	-27.19	-27.19
230.514 MHz	45.8 Qp	1.44 / 11.64 / 29.62 / 0.0	29.26	V / 1.00 / 0	-27.14	-27.14
244.074 MHz	42.4 Qp	1.47 / 12.13 / 29.5 / 0.0	26.49	V / 1.00 / 0	-19.51	-29.91
257.634 MHz	35.55 Qp	1.5 / 12.61 / 29.5 / 0.0	20.16	V / 1.00 / 0	-25.84	-36.24
271.194 MHz	30.6 Qp	1.56 / 12.63 / 29.65 / 0.0	15.14	V / 1.00 / 0	-30.86	-41.26
284.754 MHz	33.6 Qp	1.63 / 13.0 / 29.79 / 0.0	18.44	V / 1.00 / 0	-27.56	-37.96
298.314 MHz	35.0 Qp	1.7 / 13.37 / 29.89 / 0.0	20.18	V / 1.00 / 0	-36.22	-36.22
311.874 MHz	29.2 Qp	1.76 / 13.74 / 29.82 / 0.0	14.88	V / 1.00 / 0	-41.52	-41.52
325.434 MHz	31.65 Qp	1.82 / 14.11 / 29.72 / 0.0	17.86	V / 1.00 / 0	-28.14	-38.54
338.994 MHz	32.95 Qp	1.88 / 14.48 / 29.6 / 0.0	19.71	V / 1.00 / 0	-36.69	-36.69
Other spurious						
137.709 MHz	40.1 Qp	1.06 / 8.47 / 29.5 / 0.0	20.13	V / 1.00 / 0	-23.37	-33.37
147.117 MHz	35.16 Qp	1.09 / 9.41 / 29.41 / 0.0	16.26	V / 1.00 / 0	-37.24	-37.24

Tested by: Greg Jakubowski

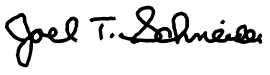
 Printed



 Signature

Reviewed by: J. T. Schneider

 Printed



 Signature

RADIATED EMISSIONS



Test Report #: WC707384 Run 1 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %
 EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat

Page: 2 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.209, FCC A outside restr bnds, 3M	DELTA2 FCC-A <1GHz 3m
166.731 MHz	38.65 Qp	1.23 / 9.26 / 29.4 / 0.0	19.74	V / 1.00 / 0	-23.76	-33.76
176.541 MHz	38.05 Qp	1.27 / 9.93 / 29.46 / 0.0	19.8	V / 1.00 / 0	-33.7	-33.7
196.149 MHz	44.6 Qp	1.35 / 11.18 / 29.61 / 0.0	27.51	V / 1.00 / 0	-25.99	-25.99
205.961 MHz	53.75 Qp	1.38 / 10.98 / 29.68 / 0.0	36.43	V / 1.00 / 0	-17.07	-17.07
215.765 MHz	42.65 Qp	1.41 / 11.11 / 29.7 / 0.0	25.47	V / 1.00 / 0	-28.03	-28.03
225.569 MHz	37.75 Qp	1.43 / 11.46 / 29.68 / 0.0	20.96	V / 1.00 / 0	-35.44	-35.44
235.379 MHz	35.4 Qp	1.45 / 11.81 / 29.56 / 0.0	19.11	V / 1.00 / 0	-37.29	-37.29
257.638 MHz	34.95 Qp	1.5 / 12.61 / 29.5 / 0.0	19.56	V / 1.00 / 0	-26.44	-36.84
287.992 MHz	34.55 Qp	1.65 / 13.09 / 29.82 / 0.0	19.46	V / 1.00 / 0	-36.94	-36.94
271.194 MHz	35.0 Qp	1.56 / 12.63 / 29.65 / 0.0	19.54	V / 1.00 / 90	-26.46	-36.86
298.314 MHz	35.35 Qp	1.7 / 13.37 / 29.89 / 0.0	20.53	V / 1.00 / 90	-35.87	-35.87
67.794 MHz	46.3 Qp	0.79 / 10.08 / 29.32 / 0.0	27.85	V / 1.00 / 180	-12.15	-21.25
108.474 MHz	36.95 Qp	0.96 / 9.12 / 29.5 / 0.0	17.54	V / 1.00 / 180	-25.96	-35.96
215.765 MHz	43.25 Qp	1.41 / 11.11 / 29.7 / 0.0	26.07	V / 1.00 / 180	-27.43	-27.43
216.954 MHz	61.55 Qp	1.41 / 11.15 / 29.7 / 0.0	44.41	V / 1.00 / 180	-11.99	-11.99
244.074 MHz	42.95 Qp	1.47 / 12.13 / 29.5 / 0.0	27.04	V / 1.00 / 180	-18.96	-29.36
271.194 MHz	35.55 Qp	1.56 / 12.63 / 29.65 / 0.0	20.09	V / 1.00 / 180	-25.91	-36.31
287.992 MHz	35.85 Qp	1.65 / 13.09 / 29.82 / 0.0	20.76	V / 1.00 / 180	-35.64	-35.64
311.874 MHz	34.85 Qp	1.76 / 13.74 / 29.82 / 0.0	20.53	V / 1.00 / 180	-35.87	-35.87
325.434 MHz	33.15 Qp	1.82 / 14.11 / 29.72 / 0.0	19.36	V / 1.00 / 180	-26.64	-37.04
108.474 MHz	37.7 Qp	0.96 / 9.12 / 29.5 / 0.0	18.29	H / 3.00 / 270	-25.21	-35.21
162.714 MHz	50.6 Qp	1.21 / 8.99 / 29.4 / 0.0	31.4	H / 3.00 / 270	-12.1	-22.1
284.754 MHz	33.8 Qp	1.63 / 13.0 / 29.79 / 0.0	18.64	H / 3.00 / 270	-27.36	-37.76

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS



America

Test Report #: WC707384 Run 1 Test Area: LTS

EUT Model #: SCRDTX Date: 11/30/2007

EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C

Test Method: FCC 15.225 Air Pressure: 99.0 kPa

Customer: Datacard Rel. Humidity: 30.0 %

EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat Page: 3 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.209, FCC A outside restr bnds, 3M	DELTA2 FCC-A <1GHz 3m
287.992 MHz	37.05 Qp	1.65 / 13.09 / 29.82 / 0.0	21.96	H / 3.00 / 270	-34.44	-34.44
298.314 MHz	39.3 Qp	1.7 / 13.37 / 29.89 / 0.0	24.48	H / 3.00 / 270	-31.92	-31.92
311.874 MHz	37.3 Qp	1.76 / 13.74 / 29.82 / 0.0	22.98	H / 3.00 / 270	-33.42	-33.42
287.992 MHz	38.35 Qp	1.65 / 13.09 / 29.82 / 0.0	23.26	H / 3.00 / 180	-33.14	-33.14
108.474 MHz	39.25 Qp	0.96 / 9.12 / 29.5 / 0.0	19.84	H / 3.00 / 90	-23.66	-33.66
122.034 MHz	45.15 Qp	1.0 / 9.11 / 29.5 / 0.0	25.76	H / 3.00 / 90	-17.74	-27.74
149.154 MHz	41.15 Qp	1.1 / 9.62 / 29.4 / 0.0	22.47	H / 3.00 / 90	-31.03	-31.03
162.714 MHz	53.45 Qp	1.21 / 8.99 / 29.4 / 0.0	34.25	H / 3.00 / 90	-9.25	-19.25
287.992 MHz	38.6 Qp	1.65 / 13.09 / 29.82 / 0.0	23.51	H / 3.00 / 90	-32.89	-32.89
Maximized						
40.674 MHz	45.81 Qp	0.48 / 17.14 / 29.56 / 0.0	33.87	V / 1.00 / 0	-6.13	-15.23
203.394 MHz	63.48 Qp	1.37 / 11.03 / 29.66 / 0.0	46.22	V / 1.00 / 0	-7.28	-7.28
End scan 30 to 1000 MHz						

Tested by: Greg Jakubowski

Printed

Greg Jakubowski

Signature

Reviewed by: J. T. Schneider

Printed

Joel T. Schneider

Signature

RADIATED EMISSIONS



Test Report #: WC707384 Run 1 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %
 EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat

Page: 4 of 8

Measurement summary for limit1: 15.209, FCC A outside restr bnds, 3M (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.209, FCC A outside restr bnds, 3M
40.674 MHz	46.08 Qp	0.48 / 17.14 / 29.56 / 0.0	34.14	V / 1.00 / 0	-5.86
203.394 MHz	63.48 Qp	1.37 / 11.03 / 29.66 / 0.0	46.22	V / 1.00 / 0	-7.28
162.714 MHz	53.45 Qp	1.21 / 8.99 / 29.4 / 0.0	34.25	H / 3.00 / 90	-9.25
189.834 MHz	60.8 Qp	1.32 / 10.85 / 29.56 / 0.0	43.41	V / 1.00 / 0	-10.09
216.954 MHz	61.55 Qp	1.41 / 11.15 / 29.7 / 0.0	44.41	V / 1.00 / 180	-11.99
67.794 MHz	46.3 Qp	0.79 / 10.08 / 29.32 / 0.0	27.85	V / 1.00 / 180	-12.15
205.961 MHz	53.75 Qp	1.38 / 10.98 / 29.68 / 0.0	36.43	V / 1.00 / 0	-17.07
122.034 MHz	45.15 Qp	1.0 / 9.11 / 29.5 / 0.0	25.76	H / 3.00 / 90	-17.74
244.074 MHz	42.95 Qp	1.47 / 12.13 / 29.5 / 0.0	27.04	V / 1.00 / 180	-18.96
176.274 MHz	51.8 Qp	1.27 / 9.92 / 29.45 / 0.0	33.53	V / 1.00 / 0	-19.97
135.594 MHz	42.45 Qp	1.05 / 8.26 / 29.5 / 0.0	22.26	V / 1.00 / 0	-21.24
137.709 MHz	40.1 Qp	1.06 / 8.47 / 29.5 / 0.0	20.13	V / 1.00 / 0	-23.37
108.474 MHz	39.25 Qp	0.96 / 9.12 / 29.5 / 0.0	19.84	H / 3.00 / 90	-23.66
166.731 MHz	38.65 Qp	1.23 / 9.26 / 29.4 / 0.0	19.74	V / 1.00 / 0	-23.76
257.634 MHz	35.55 Qp	1.5 / 12.61 / 29.5 / 0.0	20.16	V / 1.00 / 0	-25.84
271.194 MHz	35.55 Qp	1.56 / 12.63 / 29.65 / 0.0	20.09	V / 1.00 / 180	-25.91
196.149 MHz	44.6 Qp	1.35 / 11.18 / 29.61 / 0.0	27.51	V / 1.00 / 0	-25.99
325.434 MHz	33.15 Qp	1.82 / 14.11 / 29.72 / 0.0	19.36	V / 1.00 / 180	-26.64
230.514 MHz	45.8 Qp	1.44 / 11.64 / 29.62 / 0.0	29.26	V / 1.00 / 0	-27.14
284.754 MHz	33.8 Qp	1.63 / 13.0 / 29.79 / 0.0	18.64	H / 3.00 / 270	-27.36
215.765 MHz	43.25 Qp	1.41 / 11.11 / 29.7 / 0.0	26.07	V / 1.00 / 180	-27.43
149.154 MHz	41.15 Qp	1.1 / 9.62 / 29.4 / 0.0	22.47	H / 3.00 / 90	-31.03
298.314 MHz	39.3 Qp	1.7 / 13.37 / 29.89 / 0.0	24.48	H / 3.00 / 270	-31.92
287.992 MHz	38.6 Qp	1.65 / 13.09 / 29.82 / 0.0	23.51	H / 3.00 / 90	-32.89

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS



America

Test Report #: WC707384 Run 1 Test Area: LTS

EUT Model #: SCRDTX Date: 11/30/2007

EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C

Test Method: FCC 15.225 Air Pressure: 99.0 kPa

Customer: Datacard Rel. Humidity: 30.0 %

EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat

Page: 5 of 8

Measurement summary for limit1: 15.209, FCC A outside restr bnds, 3M (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.209, FCC A outside restr bnds, 3M
311.874 MHz	37.3 Qp	1.76 / 13.74 / 29.82 / 0.0	22.98	H / 3.00 / 270	-33.42
176.541 MHz	38.05 Qp	1.27 / 9.93 / 29.46 / 0.0	19.8	V / 1.00 / 0	-33.7
225.569 MHz	37.75 Qp	1.43 / 11.46 / 29.68 / 0.0	20.96	V / 1.00 / 0	-35.44
338.994 MHz	32.95 Qp	1.88 / 14.48 / 29.6 / 0.0	19.71	V / 1.00 / 0	-36.69
147.117 MHz	35.16 Qp	1.09 / 9.41 / 29.41 / 0.0	16.26	V / 1.00 / 0	-37.24
235.379 MHz	35.4 Qp	1.45 / 11.81 / 29.56 / 0.0	19.11	V / 1.00 / 0	-37.29

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS



Test Report #: WC707384 Run 1 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %
 EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat

Page: 6 of 8

Measurement summary for limit2: FCC-A <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC-A <1GHz 3m
203.394 MHz	63.48 Qp	1.37 / 11.03 / 29.66 / 0.0	46.22	V / 1.00 / 0	-7.28
189.834 MHz	60.8 Qp	1.32 / 10.85 / 29.56 / 0.0	43.41	V / 1.00 / 0	-10.09
216.954 MHz	61.55 Qp	1.41 / 11.15 / 29.7 / 0.0	44.41	V / 1.00 / 180	-11.99
40.674 MHz	46.08 Qp	0.48 / 17.14 / 29.56 / 0.0	34.14	V / 1.00 / 0	-14.96
205.961 MHz	53.75 Qp	1.38 / 10.98 / 29.68 / 0.0	36.43	V / 1.00 / 0	-17.07
162.714 MHz	53.45 Qp	1.21 / 8.99 / 29.4 / 0.0	34.25	H / 3.00 / 90	-19.25
176.274 MHz	51.8 Qp	1.27 / 9.92 / 29.45 / 0.0	33.53	V / 1.00 / 0	-19.97
67.794 MHz	46.3 Qp	0.79 / 10.08 / 29.32 / 0.0	27.85	V / 1.00 / 180	-21.25
196.149 MHz	44.6 Qp	1.35 / 11.18 / 29.61 / 0.0	27.51	V / 1.00 / 0	-25.99
230.514 MHz	45.8 Qp	1.44 / 11.64 / 29.62 / 0.0	29.26	V / 1.00 / 0	-27.14
215.765 MHz	43.25 Qp	1.41 / 11.11 / 29.7 / 0.0	26.07	V / 1.00 / 180	-27.43
122.034 MHz	45.15 Qp	1.0 / 9.11 / 29.5 / 0.0	25.76	H / 3.00 / 90	-27.74
244.074 MHz	42.95 Qp	1.47 / 12.13 / 29.5 / 0.0	27.04	V / 1.00 / 180	-29.36
149.154 MHz	41.15 Qp	1.1 / 9.62 / 29.4 / 0.0	22.47	H / 3.00 / 90	-31.03
135.594 MHz	42.45 Qp	1.05 / 8.26 / 29.5 / 0.0	22.26	V / 1.00 / 0	-31.24
298.314 MHz	39.3 Qp	1.7 / 13.37 / 29.89 / 0.0	24.48	H / 3.00 / 270	-31.92
287.992 MHz	38.6 Qp	1.65 / 13.09 / 29.82 / 0.0	23.51	H / 3.00 / 90	-32.89
137.709 MHz	40.1 Qp	1.06 / 8.47 / 29.5 / 0.0	20.13	V / 1.00 / 0	-33.37
311.874 MHz	37.3 Qp	1.76 / 13.74 / 29.82 / 0.0	22.98	H / 3.00 / 270	-33.42
108.474 MHz	39.25 Qp	0.96 / 9.12 / 29.5 / 0.0	19.84	H / 3.00 / 90	-33.66
176.541 MHz	38.05 Qp	1.27 / 9.93 / 29.46 / 0.0	19.8	V / 1.00 / 0	-33.7
166.731 MHz	38.65 Qp	1.23 / 9.26 / 29.4 / 0.0	19.74	V / 1.00 / 0	-33.76
225.569 MHz	37.75 Qp	1.43 / 11.46 / 29.68 / 0.0	20.96	V / 1.00 / 0	-35.44

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS



America

Test Report #: WC707384 Run 1 Test Area: LTS

EUT Model #: SCRDTX Date: 11/30/2007

EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C

Test Method: FCC 15.225 Air Pressure: 99.0 kPa

Customer: Datacard Rel. Humidity: 30.0 %

EUT Description: Card Personalization Equipment

Notes: _____

Data File Name: 7384.dat

Page: 7 of 8

Measurement summary for limit2: FCC-A <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC-A <1GHz 3m
257.634 MHz	35.55 Qp	1.5 / 12.61 / 29.5 / 0.0	20.16	V / 1.00 / 0	-36.24
271.194 MHz	35.55 Qp	1.56 / 12.63 / 29.65 / 0.0	20.09	V / 1.00 / 180	-36.31
338.994 MHz	32.95 Qp	1.88 / 14.48 / 29.6 / 0.0	19.71	V / 1.00 / 0	-36.69
325.434 MHz	33.15 Qp	1.82 / 14.11 / 29.72 / 0.0	19.36	V / 1.00 / 180	-37.04
147.117 MHz	35.16 Qp	1.09 / 9.41 / 29.41 / 0.0	16.26	V / 1.00 / 0	-37.24
235.379 MHz	35.4 Qp	1.45 / 11.81 / 29.56 / 0.0	19.11	V / 1.00 / 0	-37.29
284.754 MHz	33.8 Qp	1.63 / 13.0 / 29.79 / 0.0	18.64	H / 3.00 / 270	-37.76

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS



America

Test Report #: WC707384 Run 1 Test Area: LTS
EUT Model #: SCRDTX Date: 11/30/2007
EUT Serial #: 88 EUT Power: 5VDC Temperature: 23.0 °C
Test Method: FCC 15.225 Air Pressure: 99.0 kPa
Customer: Datacard Rel. Humidity: 30.0 %

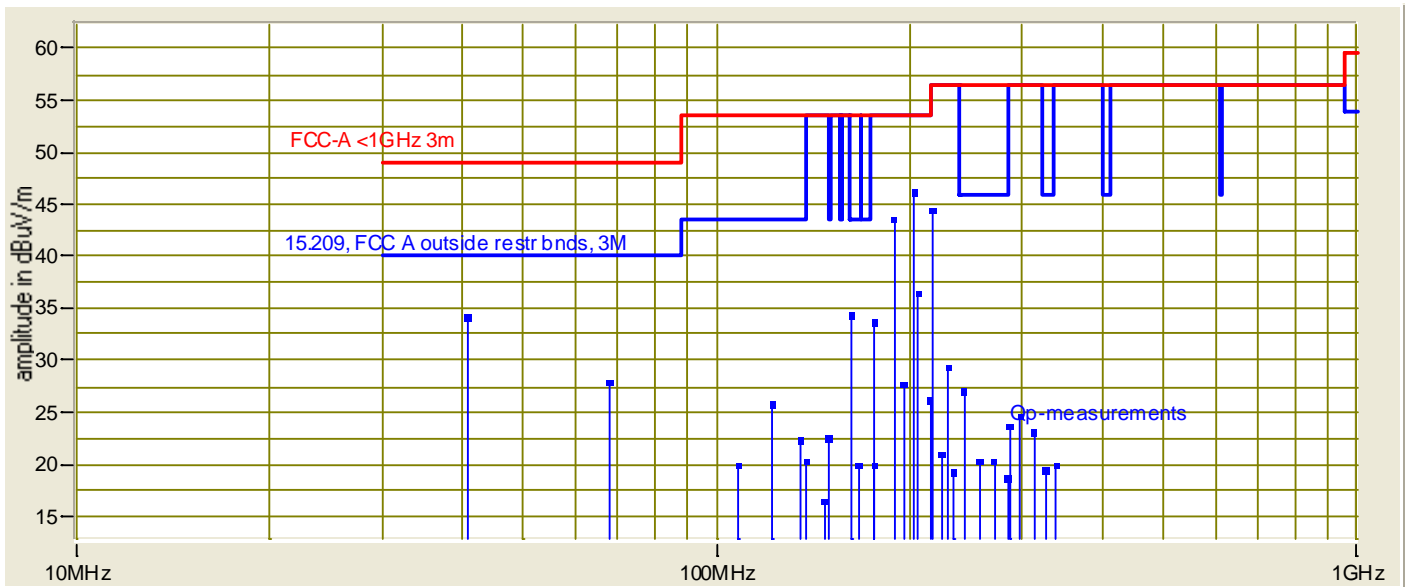
EUT Description: Card Personalization Equipment

Notes:

Data File Name: 7384.dat

Page: 8 of 8

Graph:



Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

Frequency tolerance

FCC 15.225(e), IC RSS-210 A2.6(d)

Test summary

The requirements are: - MET - NOT MET

The frequency tolerance of the carrier signal is maintained within $\pm 0.01\%$ of the operating frequency, 13.56 MHz.

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
 - Wild River Lab Small Test Site (Open Area Test Site)
 - New Brighton Lab

Test distance

- 3 meters
 - 10 meters
 - Near field probe

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
10435	E4440A	Agilent	Spectrum Analyzer		27 Feb 08
2435	LP-105A	Singer	Near field loop probe		Code Y
2241	SM-8C	Thermotron	Minimax temp chamber		15 Aug 08
2721	79	Fluke	Multimeter		14 Feb 08

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limits

$\pm 0.01\%$ of the operating frequency

Test data

Temperature (degrees C)	Frequency (MHz)
-20	13.55982
-10	13.55982
0	13.55986
10	13.55986
20	13.55986
30	13.55986
40	13.55984
50	13.55984

Supply voltage (% nominal)	Frequency (MHz)
85	13.55982
115	13.55984

Occupied bandwidth

RSS-Gen 4.4.1

Test summary

The requirements are: - MET - NOT MET
 Occupied bandwidth = 5.02 kHz

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- New Brighton Lab

Test equipment

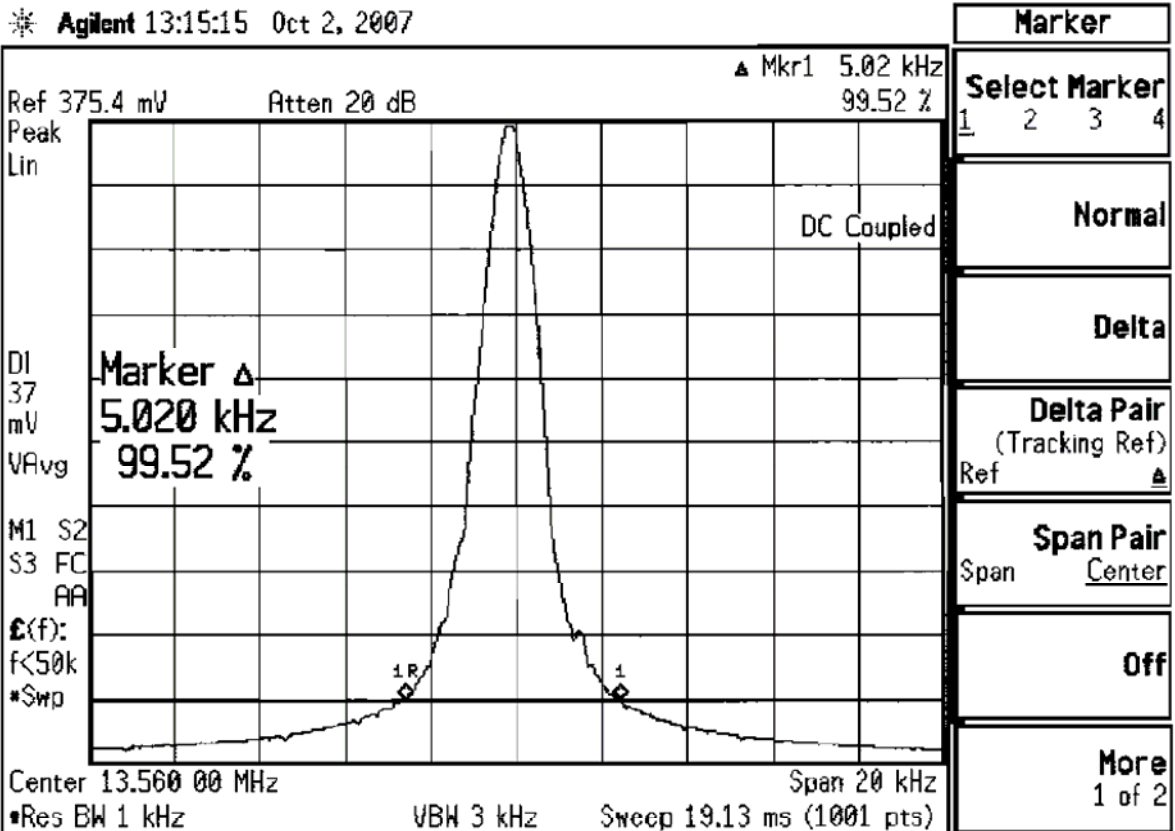
TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
10435	E4440A	Agilent	Spectrum Analyzer		27 Feb 08
2435	LP-105A	Singer	Near field loop probe		Code Y

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limit

No limit specified

Test data



Conducted Emissions - AC Power Lines

FCC 15.207(a), IC RSS-Gen 7.2.2

Test summary

The requirements are: - MET - NOT MET

Class A device. Testing performed on a generic AC to DC supply. Module will get its DC voltage from a host unit. Minimum margin of compliance is 1 dB at 13.56 MHz

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

Test Equipment (tested 27 February 2007)

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2417	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1439	Code B
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08

Cal Code B = Calibration verification performed internally.

Test limits

Frequency (MHz)	Quasi Peak dB μ V/m	Average dB μ V/m
0.15 - 0.5	79	66
.0.5 - 30	73	60

Test data

See following pages

CONDUCTED EMISSIONS



America

Test Report #: WC707384 Run 2 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: _____ EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %

EUT Description: Card Personalization Equipment

Data File Name: 7384.dat

Page: 2 of 3

Measurement summary for limit1: EN55022 B Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp
13.56 MHz	48.95 Qp	0.87 / 0.03 / 0.0 / 0.0	49.85	N	-10.15
160.0 kHz	46.69 Qp	0.12 / 0.1 / 0.0 / 0.0	46.91	L1	-18.55
200.0 kHz	39.21 Qp	0.13 / 0.1 / 0.0 / 0.0	39.44	N	-24.17
455.0 kHz	31.01 Qp	0.19 / 0.19 / 0.0 / 0.0	31.39	L1	-25.39
230.0 kHz	35.53 Qp	0.14 / 0.09 / 0.0 / 0.0	35.76	L1	-26.69
12.135 MHz	22.39 Qp	0.83 / 0.06 / 0.0 / 0.0	23.28	N	-36.72

Measurement summary for limit2: EN55022 B Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA2 EN55022 B Avg
13.56 MHz	47.41 Av	0.87 / 0.03 / 0.0 / 0.0	48.31	N	-1.69
455.0 kHz	29.73 Av	0.19 / 0.19 / 0.0 / 0.0	30.11	L1	-16.67
160.0 kHz	30.0 Av	0.12 / 0.1 / 0.0 / 0.0	30.22	L1	-25.24
230.0 kHz	23.89 Av	0.14 / 0.09 / 0.0 / 0.0	24.12	N	-28.33
200.0 kHz	23.71 Av	0.13 / 0.1 / 0.0 / 0.0	23.94	N	-29.67
12.135 MHz	17.06 Av	0.83 / 0.06 / 0.0 / 0.0	17.95	N	-32.05

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

CONDUCTED EMISSIONS



America

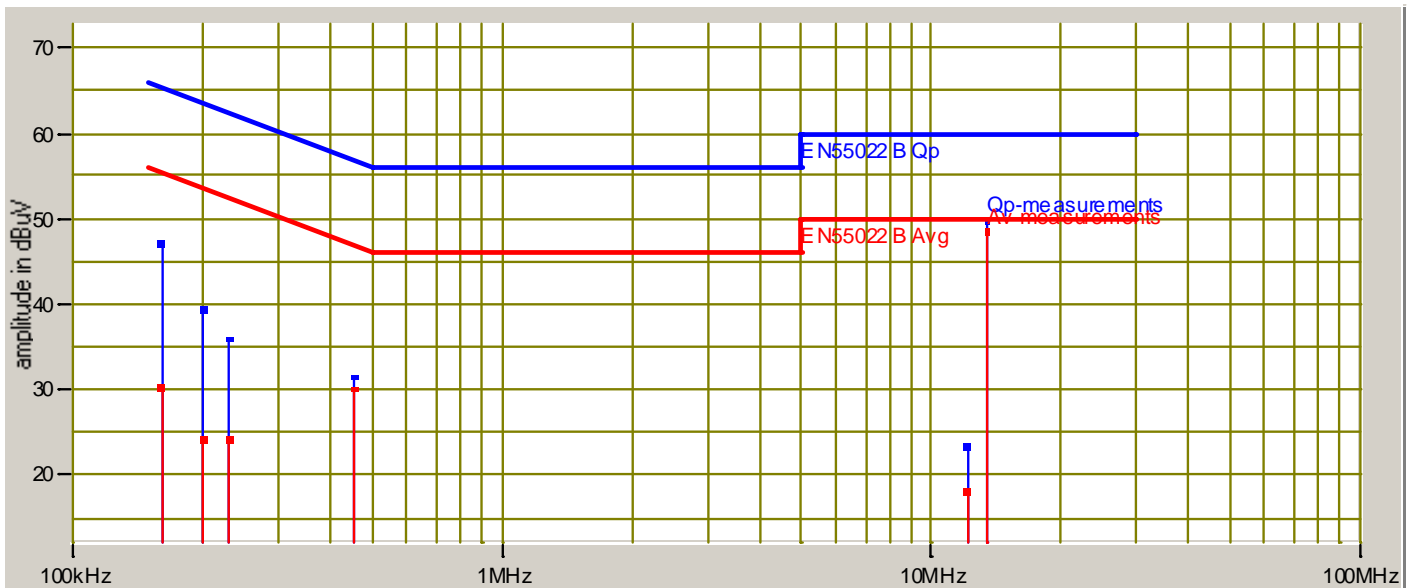
Test Report #: WC707384 Run 2 Test Area: LTS
 EUT Model #: SCRDTX Date: 11/30/2007
 EUT Serial #: _____ EUT Power: 5VDC Temperature: 23.0 °C
 Test Method: FCC 15.225 Air Pressure: 99.0 kPa
 Customer: Datacard Rel. Humidity: 30.0 %

EUT Description: Card Personalization Equipment

Data File Name: 7384.dat

Page: 3 of 3

Graph:



Tested by: Greg Jakubowski

 Printed

Greg Jakubowski

 Signature

Reviewed by: J. T. Schneider

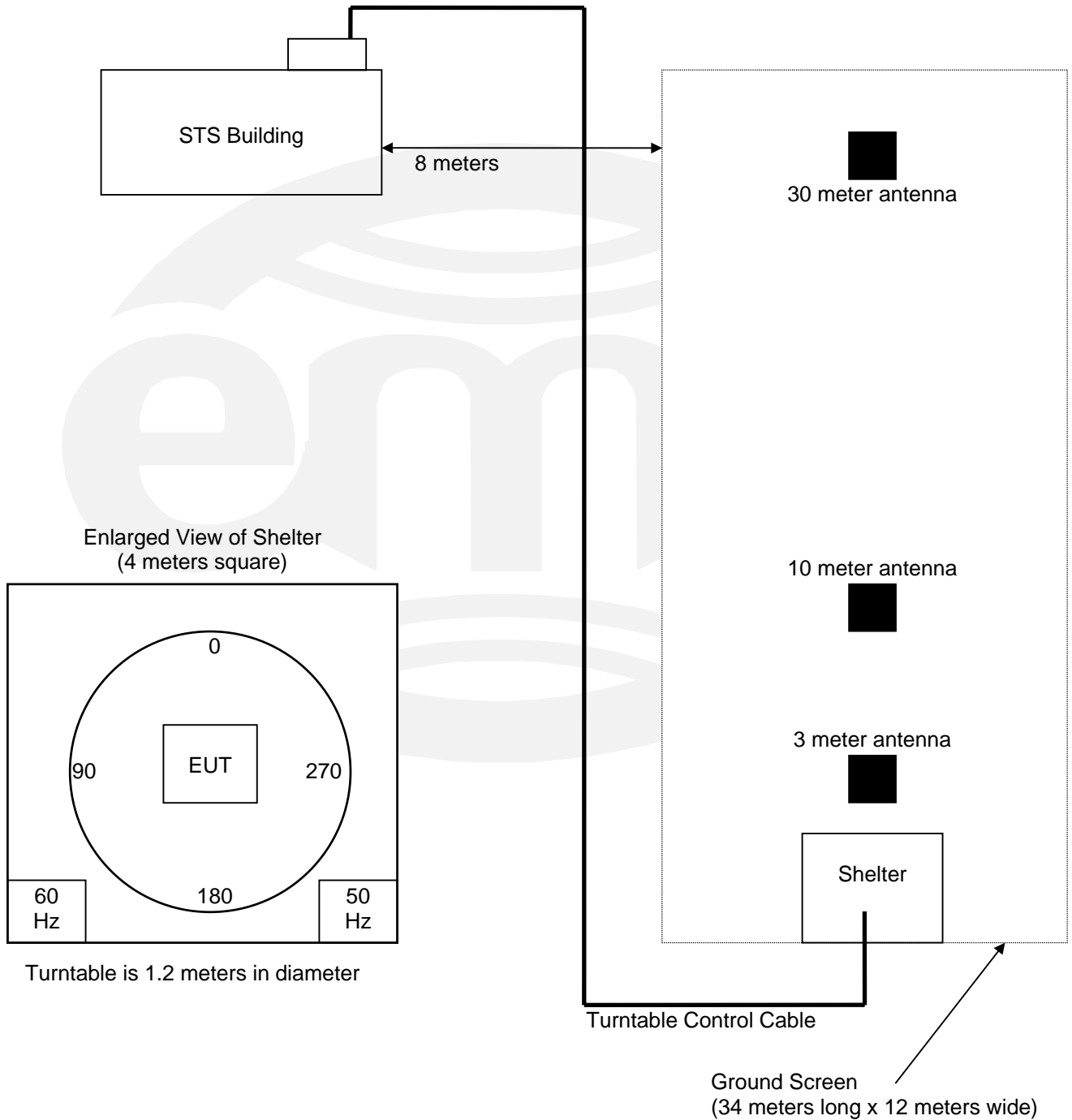
 Printed

Joel T. Schneider

 Signature

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Small Test Site (STS)

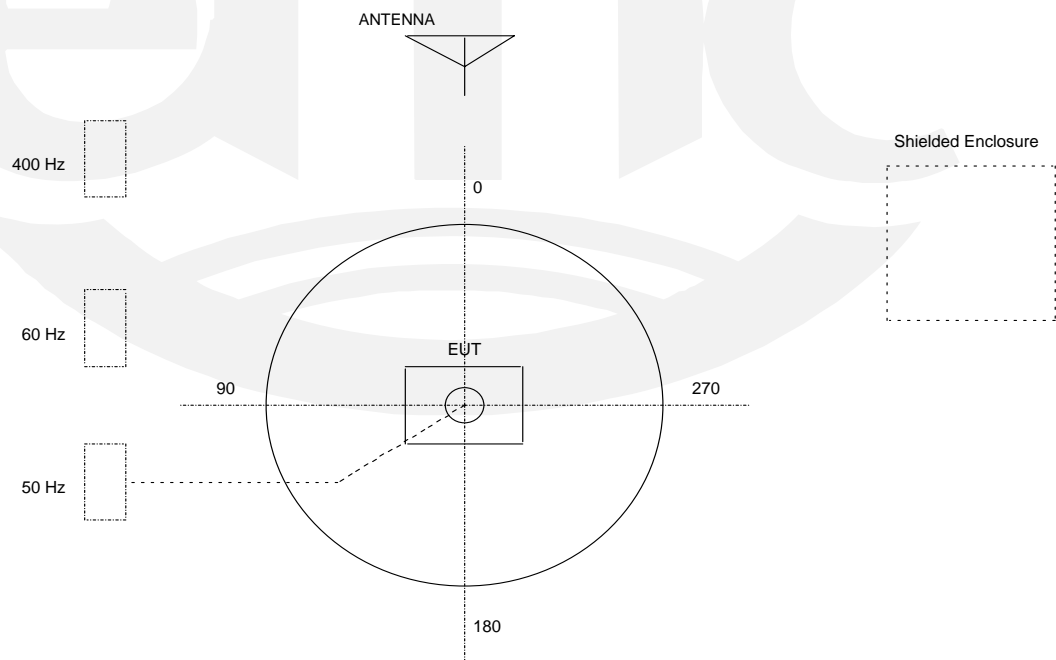


TEST SETUP FOR EMISSIONS TESTING

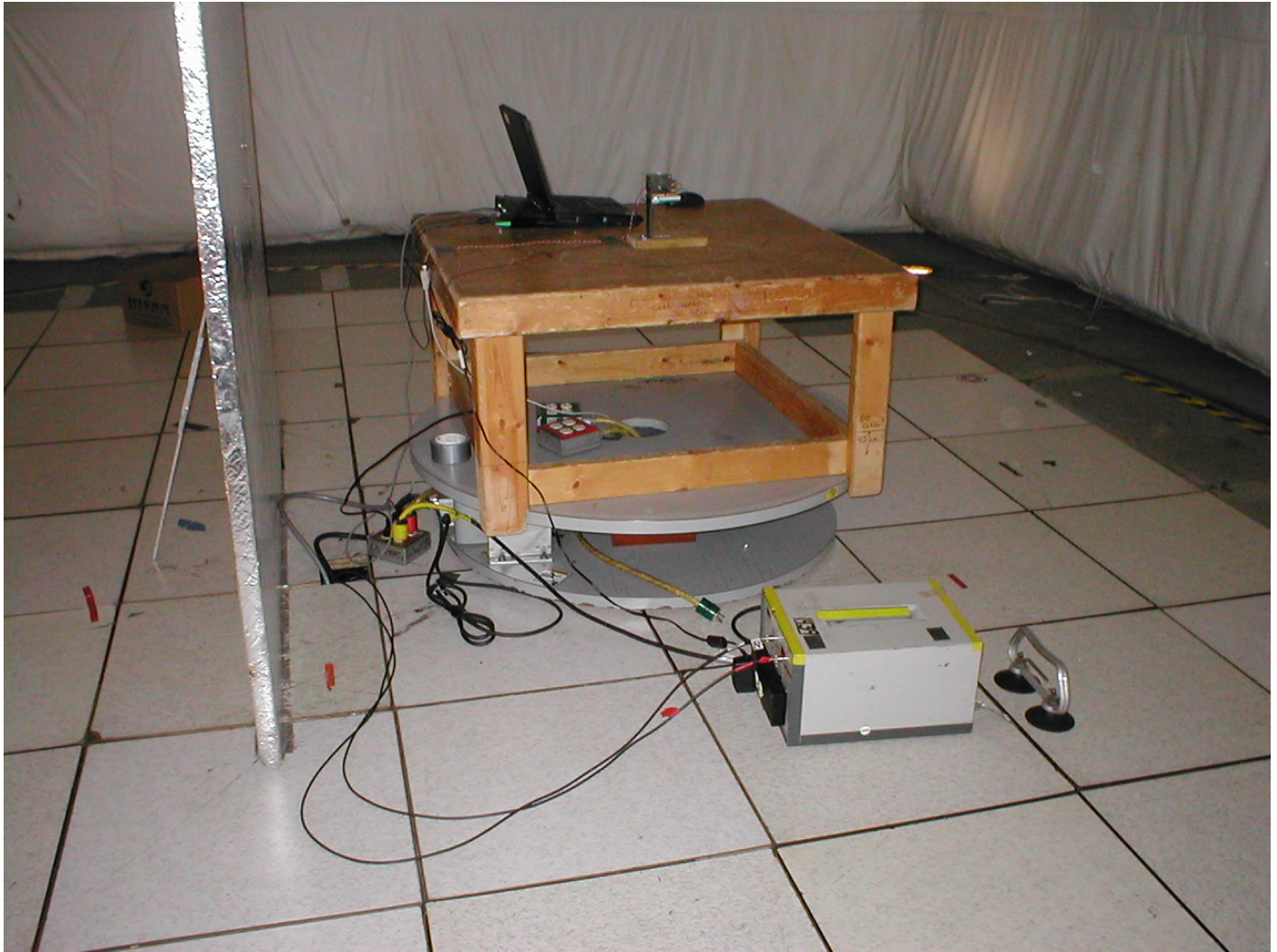
WILD RIVER LAB Large Test Site

Notes:

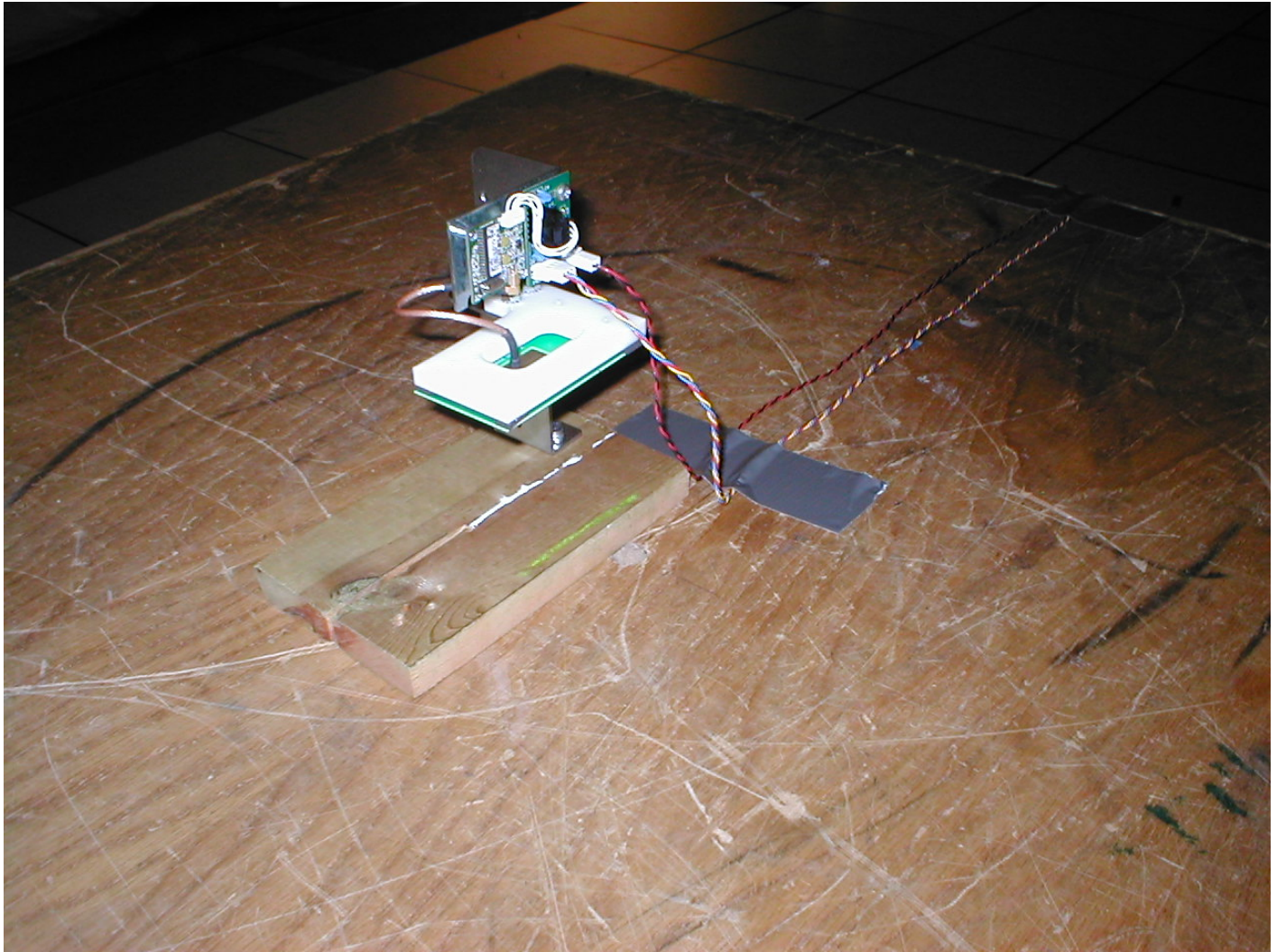
1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



Test-setup photo(s):
Conducted Emissions 150 kHz - 30 MHz



Test-setup photo(s):
Radiated Emissions 30 - 1000 MHz



Test-setup photo(s):
Radiated Emissions 30 - 1000 MHz



Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during testing :

- Standby
 - Test program (H - Pattern)
 - Test program (color bar)
 - Test program (customer specific)
 - Practice operation
 - Normal operating mode
 - Transmit mode
-

Configuration of the device under test:

- See Appendix A
- See Product Information Form(s) in Appendix B

DEVIATIONS FROM STANDARD:

None

GENERAL REMARKS:

None

Modifications required to pass:

- None
- As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

- None
- As indicated in the Test Plan
-

SUMMARY:

The requirements according to the technical regulations are

- met and the device under test does fulfill the general approval requirements.
- **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 17 May 2007

Condition of EUT: Normal

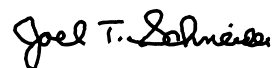
Testing Start Date: 17 May 2007

Testing End Date: 30 November 2007

TÜV SÜD AMERICA INC



Greg Jakubowski
Senior EMC Technician



Joel T Schneider
Senior EMC Engineer

Appendix A

Constructional Data Form



EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE.

Applicant -- NOTE: This information will be input into your test report as shown below.
Press the F1 key at any time to get HELP for the current field selected.

Company: Datacard Group
 Address: 11111 Bren Road W.
Minnetonka, MN 55343
 Contact: Stan Dorr/Mike Greschner Position: Electrical Engineer/Agency Eng
 Phone: 952 988 2927/952-988-1840 Fax: _____
 E-mail Address: Stanley_Dorr@datacard.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description Card Personalization Equipment
 EUT Name SCRDTX
 Model No.: _____ Serial No.: 88
 Product Options: _____
 Configurations to be tested: PWA Transmitter Device, PWA Antenna, Cable to connect the two PWA's

Test Objective

- | | |
|--|---|
| <input checked="" type="checkbox"/> EMC Directive 89/336/EEC (EMC) | <input checked="" type="checkbox"/> FCC: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B Part <u>15b C</u> |
| Std: <u>EN55022:1994</u> | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC) | <input checked="" type="checkbox"/> BCIQ: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| Std: _____ | <input checked="" type="checkbox"/> Canada: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC) | <input checked="" type="checkbox"/> Australia: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| Std: _____ | <input checked="" type="checkbox"/> Other: <u>RTTE 301-489-1 & EST1300-330</u> |
| <input type="checkbox"/> Vehicle Directive 72/245/EEC (EMC) | |
| Std: _____ | |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC) | |

EMC Test Plan and Constructional Data Form

TÜV Product Service Certification Requested

- | | |
|--|---|
| <input type="checkbox"/> Attestation of Conformity (AoC) | <input type="checkbox"/> International EMC Mark (IEM) |
| <input type="checkbox"/> Certificate of Conformity (CoC) | <input type="checkbox"/> Compliance Document |
| Protection Class (N/A for vehicles) | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
- (Press **F1** when field is selected to show additional information on Protection Class.)

Attendance

Test will be: Attended by the customer Unattended by the customer

Failure - Complete this section if testing will not be attended by the customer.

- If a failure occurs, TÜV Product Service should:
- Call contact listed above, if not available then stop testing. (After hrs phone): _____
 - Continue testing to complete test series.
 - Continue testing to define corrective action.
 - Stop testing.

EUT Specifications and Requirements

Length: _____ Width: _____ Height: _____ Weight: _____

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 5Vdc (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: _____

Current (Amps/phase(max)): _____ Current (Amps/phase(nominal)): _____

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Office Environment

EMC Test Plan and Constructional Data Form



EUT Power Cable

Permanent OR Removable Length (in meters): _____
 Shielded OR Unshielded
 Not Applicable

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables												
Interface			Shielding									
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
EXAMPLE: RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Drive to Antenna	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		Twisted Triple No Shield				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>

EMC Test Plan and Constructional Data Form



EUT Software.

Revision Level:

Description:

EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Transmit Mode

- 2.

- 3.

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #
PWA Transmitter			
PWA Antenna			
Cable			

EMC Test Plan and Constructional Data Form



Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)			
<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>

Oscillator Frequencies			
<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
13.56 Mhz 29.5 Mhz		Micro Prox - (contactless smart card)	Processor - contactless RF oscillator

Power Supply			
<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

Power Line Filters		
<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>

EMC Test Plan and Constructional Data Form



Critical EMI Components (Capacitors, ferrites, etc.)				
<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

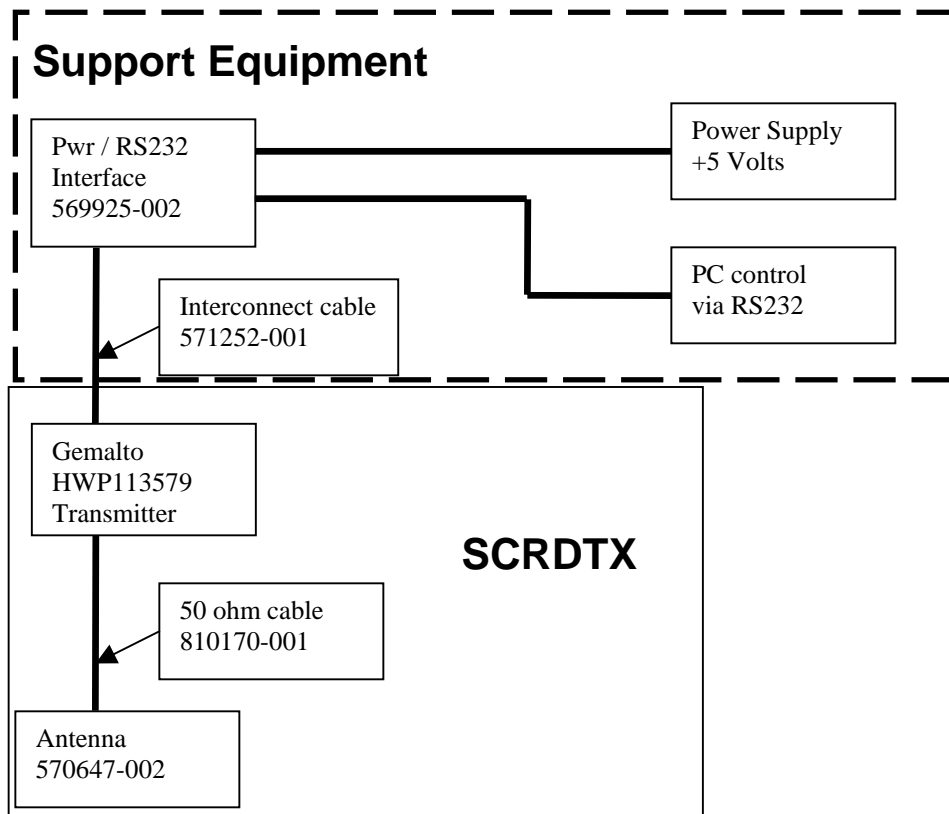
Authorization Signatures

Mike Greschner	10-19-07
_____	_____
Customer authorization to perform tests according to this test plan.	Date
Stan Dorr	
_____	_____
Test Plan/CDF Prepared By (please print)	Date
_____	_____
Reviewed by TÜV Product Service Associate	Date



EMC Block Diagram Form

System Configuration Block Diagram -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



Authorization Signatures

Customer authorization to perform tests according to this test plan.

Date

Test Plan/CDF Prepared By (please print)

Date

Appendix B

Measurement Protocol



MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emission testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

The final level, in $\text{dB}\mu\text{V}$, equals the EMI receiver level plus the cable loss and LISN factor.

Radiated Emissions

The final level, in $\text{dB}\mu\text{V}/\text{m}$, equals the reading from the spectrum analyzer (Level $\text{dB}\mu\text{V}$), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A. Intentional radiators are rotated through 3 orthogonal axes to determine the test position yielding the maximum emission levels.

Below 30 MHz, a calibrated loop antenna was positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. For certain applications, the loop antenna may also need to be positioned horizontally at the specified distance from the EUT. The center of the loop was 1 m above the ground.

Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Tabletop equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.

Example:

FREQ (MHz)	LEVEL ($\text{dB}\mu\text{V}$)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL ($\text{dB}\mu\text{V}/\text{m}$)	POL/HGT/AZ (m) (deg)	DELTA1
60.80	42.5Qp +	1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.