TEST RESULT SUMMARY

FCC PART 15 SUBPART C
Section 15.225
FCC PART 15 SUBPART C
Section 15.207 Conducted Emission Requirements

MANUFACTURER'S NAME	DataCard Group
NAME OF EQUIPMENT	Card Printer / laminator
MODEL NUMBER	**SP75**
MANUFACTURER'S ADDRESS	11111 Bren Road West Minnetonka MN 55343
TEST REPORT NUMBER	WC405505 RevA
TEST DATE	30 November & 17 December 2004, 02 February 2005

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15 Subpart C, Sections 15.207 and 15.225.

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 Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15 Subpart C, Sections 15.207 and 15.225.

Date: 18 March 2005

Location: Taylors Falls MN USA	G. S. Jakubowski Tested By	T.K. Swanson Reviewed By

Not Transferable

EMC EMISSION - T E S T R E P O R T

Test Report File No.	:	**WC405505 RevA**	Date of issue:	18 March 2005

Model / Serial No.	:	**SP75 / M00035**
Product Name	:	Card Printer / laminator
Applicant	:	DataCard Group
Manufacturer	:	DataCard Group
License holder	:	DataCard Group
Address	:	11111 Bren Road West
	:	Minnetonka MN 55343
Test Result	:	■ **Positive** ☐ **Negative**
Test Project Number Reference(s)	:	**WC405505 RevA**
Total pages including Appendices		34

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service 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 Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service 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 or any agency of the US government.

TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	33	31 January 2005	Initial Release
A	34	18 March 2005	Revisions include: Changed fundamental frequency from 13.56 to 13.5615 MHz on pages 10 and A3.

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D I R E C T O R Y - EMISSIONS

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

☐ - EN 50081-1 / 1991

☐ - EN 55011 / 1991 ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - EN 55013 / 1990

☐ - EN 55014 / 1987 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55014 / A2:1990

☐ - EN 55014 / 1993 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55015 / 1987

☐ - EN 55015 / A1:1990

☐ - EN 55015 / 1993

☐ - EN 55022 / 1987 ☐ - Class A ☐ - Class B

☐ - EN 55022 / 1994 ☐ - Class A ☐ - Class B

☐ - BS

☐ - VCCI ☐ - Class A ☐ - Class B

■ - FCC Part 15 Subpart C Section 15.225

■ - FCC Part 15 Subpart C Section 15.207 Conducted Emission Requirements

☐ - FCC Part 15 Subpart B ☐ - Class A ☐ - Class B

☐ - CISPR 11 (1990) ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - CISPR 22 (1993) ☐ - Class A ☐ - Class B

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Environmental conditions in the lab:

	Actual
Temperature	: 22 °C
Relative Humidity	: 23 %
Atmospheric pressure	: 99.0 kPa
Power supply system	: 60 Hz – 110 VAC – 1 Phase

Sign Explanations:

☐ - not applicable
■ - applicable

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Emissions Test Conditions: CONDUCTED EMISSIONS [FCC 15.207]

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE*) measurements were performed at the following test location:

☐ - Test not applicable

☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Oakwood Lab (Open Area Test Site)
☐ - Wild River Lab Screen Room
☐ - New Brighton Lab Shielded Room

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2416	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1437	Code B 05-Jan-06
■ -	3989	3816/2	ETS Lindgren	50 Ω LISN	00035358	Code B 27-May-05
■ -	2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	14-Feb-05

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

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: RADIATED EMISSIONS [FCC 15.225 (a),(b) 10 kHz - 30 MHz]

The *RADIATED EMISSIONS (MAGNETIC FIELD*) measurements were performed at the following test location:

☐ - Test not applicable

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

at a test distance of :

☐ - 0.3 meters
☐ - 1 meter
■ - 3 meter
■ - 10 meters
■ - 30 meters

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	27-Apr-05
■ -	2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	14-Feb-05

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

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

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Emissions Test Conditions: RADIATED EMISSIONS [FCC 15.225 (b) Electric Field 30 - 1000 MHz]

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location:

☐ - Test not applicable

☐ - Wild River Lab Large Test Site (Open Area Test Site)
■ - Wild River Lab Small Test Site (Open Area Test Site) – NSA measurements made 8-04, due 8-06.
☐ - Oakwood Lab (Open Area Test Site)

at a test distance of :

☐ - 3 meters
■ - 10 meters
☐ - 30 meters

Test equipment used :

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	30-Mar-05
■-	2690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Jan-05
■ -	2673	85662A	Hewlett-Packard	Analyzer Display	2152A03687	28-Jan-05
■	2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	10-May-05
■ -	2668	8447D	Electro-Mechanics (EMCO)	Preamplifier	1937A02209	Code B 16-Mar-05

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

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location:

■ - Test not applicable

☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Oakwood Lab (Open Area Test Site)
☐ - Wild River Lab Screen Room
☐ - New Brighton Lab Shielded Room

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Emissions Test Conditions: RADIATED EMISSIONS Electric Field 1 to 100 GHz

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 100 GHz were performed in a horizontal and vertical polarization at the following test location:

■ - Test not applicable

☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Oakwood Lab (Open Area Test Site)
☐ - Wild River Lab Screen Room

at a test distance of:

☐ - 1 meters
☐ - 3 meters
☐ - 10 meters

Emissions Test Conditions: FREQUENCY TOLERANCE OF THE CARRIER SIGNAL [FCC 15.225 (c)]

The *FREQUENCY TOLERANCE* measurements were performed at the following test location:

☐ - Test not applicable

☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Oakwood Lab (Open Area Test Site)
☐ - Wild River Lab Screen Room
■ - Specialty Labs

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	8591E	Hewlett-Packard	Spectrum Analyzer	3501A03603	25-Oct-04
■-	901	Emco	Near Field Probe	7405-901	N/A
■-	Model FRP-381B	Blue M	Temperature Chamber	FRP-173	N/A
■-	HH23	Omega	Microprocessor Thermometer	SPL-900-194	01-Jun-05

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

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Equipment Under Test (EUT) Test Operation Mode - Emission tests :

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

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal Operating Mode

■ - 1. SP75 testing all options including contacted and contactless smartcard option and magnetic stripe option, this includes SP75 printing full color images, encoding data on the magnetic stripe and reading smartcards.
2. Gemplus driver utility used for testing smartcard options, TCPIP ping test to test ethernet port, color printjob with magnetic stripe data for testing color engine and magnetic stripe feature, RFID system.

Configuration of the device under test:

■ - See Constructional Data Form in Appendix B - Page B2

☐ - See Product Information Form in Appendix B - beginning on Page B3

The following peripheral devices and interface cables were connected during the measurement:

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

■ - unshielded power cable

■ - unshielded cables

■ - shielded cables MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

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Emission Test Results:

FCC 15.207 - Conducted emissions 150 kHz - 30 MHz

The requirements are ■ - MET ☐ - NOT MET

Minimum margin of compliance 3 dB at 165.0 kHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: _____

FCC 15.225 (a)(b) - Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are ■ - MET ☐ - NOT MET

Minimum limit margin for fundamental 44 dB at 13.5615 MHz

Minimum limit margin for spurious/harmonics >10 dB at _____ kHz

Remarks: The fundamental was measured to be 36 dBuV/m (44.67 microvolts/meter) in Quasi-Peak mode at 30 meters. The limit is 80 dBuV/m (10000 microvolts/meter) at 30 meters. No spurious emissions or other harmonics were detected within 10 dB of the 30 uV/m limit. For band edge compliance the carrier is below the spurious limit from 13.110 MHz to 14.010 MHz (see page A5).

FCC 15.225 (b) - Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are ■ - MET ☐ - NOT MET

Minimum margin of compliance >10 dB at _____ MHz

Minimum limit margin for spurious _____ dB at _____ MHz

Remarks: Testing done up to 1000 MHz due to oscillator frequency of card printer (non-RF device) RF ID is contained in. This report only addresses emissions from RF ID. No emissions detected above the noise level of the measuring system.

Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are ☐ - MET ☐ - NOT MET ■ - N/A

Remarks: _____

Equivalent Radiated emissions 1 GHz - 100 GHz

The requirements are ☐ - MET ☐ - NOT MET ■ - N/A

Remarks: _____

FCC 15.225 (c) - Frequency Tolerance of the Carrier Signal

The requirements are ■ - MET ☐ - NOT MET

Remarks: Limit is ±0. 01% of 13.5615 MHz, or ±1.3561 kHz, so allowed band is 13.559644 MHz to 13.562356 MHz. Frequency remains at 13.5615 MHz from –20 to 50 degrees C and 102 to 138 VAC.

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DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

The radiated measurements from 10 kHz to 30 MHz are made in quasi-peak detection, except for the levels noted between 110-490 kHz, which are made in average detection.

SUMMARY:

The requirements according to the technical regulations are

■ - met

☐ - **not** met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

☐ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 30 November 2004

Testing End Date: 07 February 2005

- TÜV PRODUCT SERVICE INC -

Thomas K. Swanson

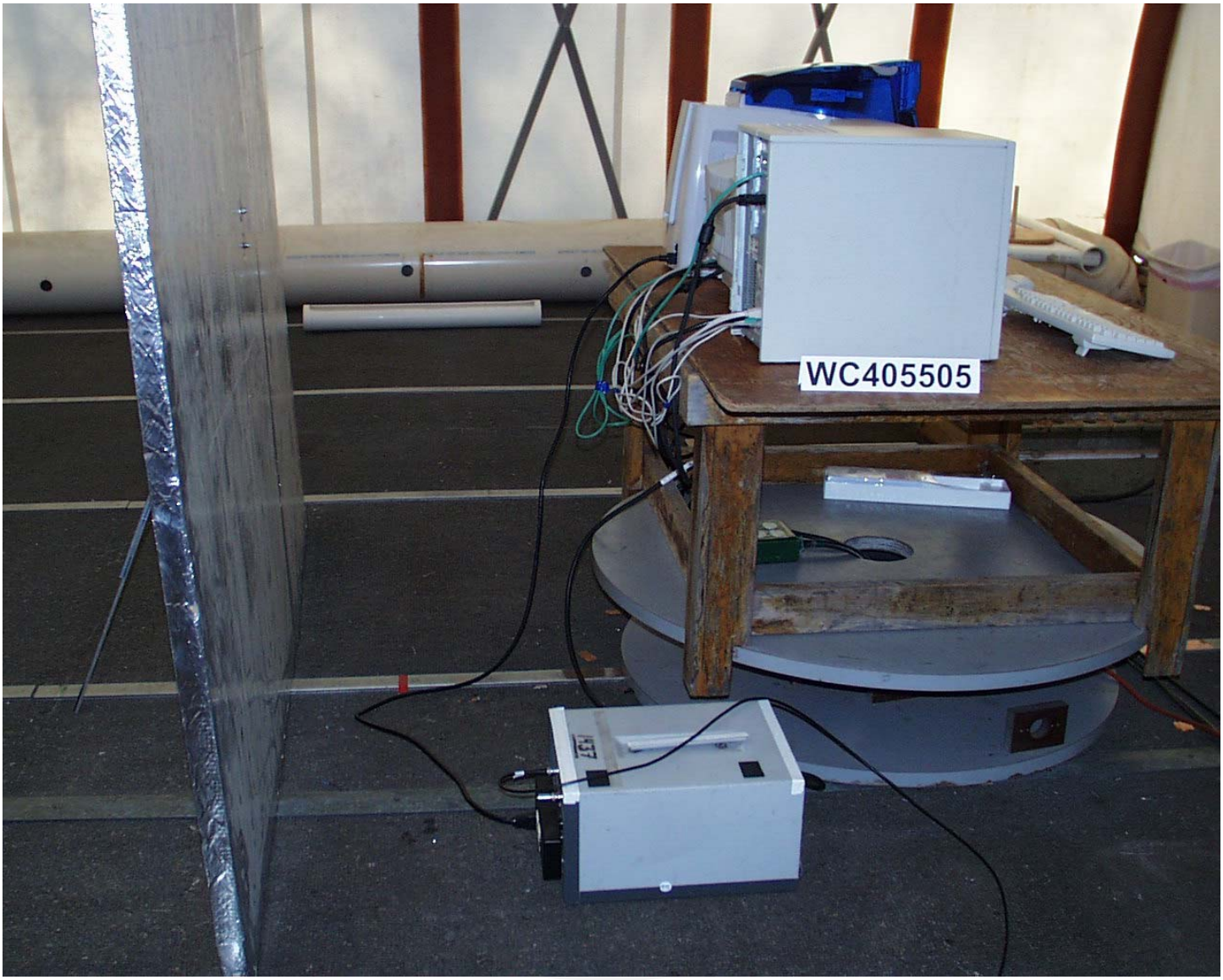
T. K. Swanson
Reviewed By

G S Jakubowski

Tested By:
G. S. Jakubowski

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

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



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

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

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

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

Test-setup photo(s):
Radiated emission 10 kHz - 30 MHz

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Appendix A

Test Data Sheets

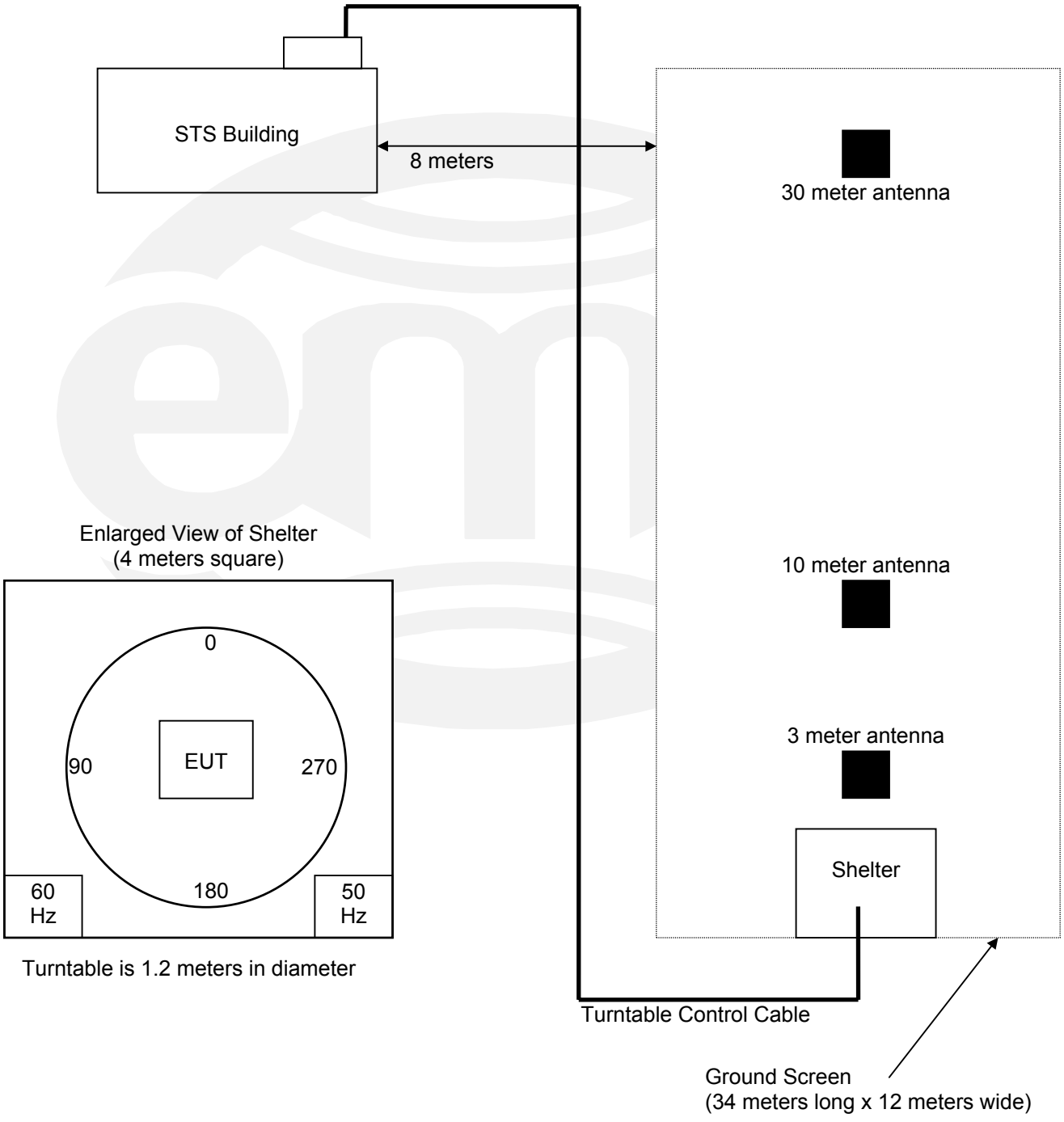
and

Test Setup Drawing(s)

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Small Test Site (STS)



TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

FCC Part 15.225 Magnetic Field Radiated Emissions 10 kHz to 30 MHz							
Customer Name: DataCard							
EUT: SP75							
Test Report # WC405505							
Test Date: 30 November 2004							
	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dBuV/m	margin
MHz	0.3 m	1 m	3 m	10 m	30 m	30 m Limit	dB
0.009						80	
0.49						80	
0.49						80	
1.705						80	
1.705						80	
13.5615			**59**	**47**	**36**	**80**	**44**
30						80	
Quasi-Peak							
All Levels are measured - No extrapolations							
No further harmonics or spurious emisison detected 10 kHz to 30 MHz							
Noise Floor level at 13.56 MHz is 8 dBuV/m							

Datacard SP 75
17 December 2004

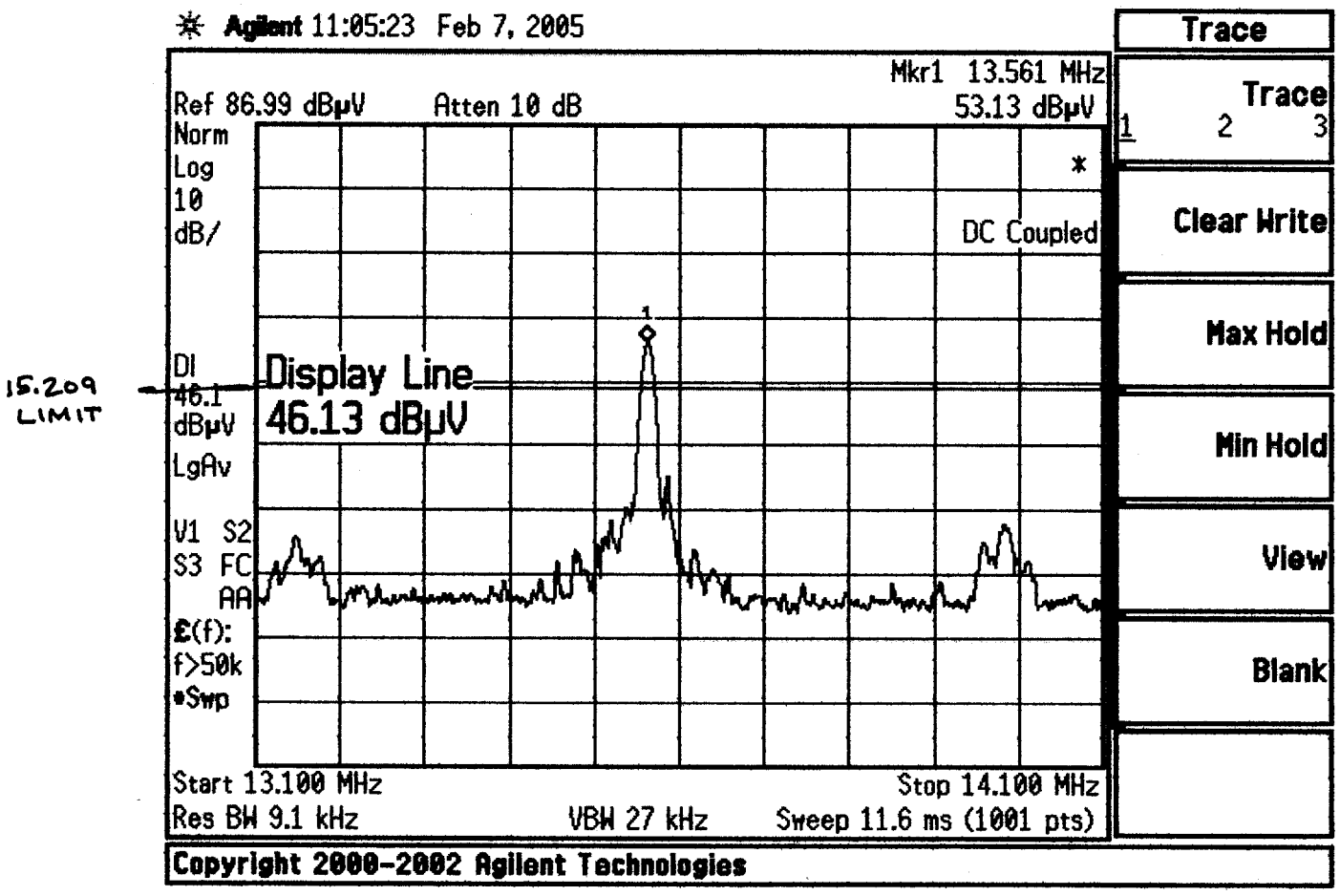
Temperature testing by JTS at Specialty Lab

Test Equipment List:

Blue M Model FRP-381B Temperature Chamber, s/n FRP-173.
Omega HH23 Microprocessor Thermometer, #SPL-900-194, cal due 6/01/05
Agilent spectrum analyzer, TUV #3367
EMCO 7405-901 loop probe

Allowed deviation is ±0.01%, or 1.356 kHz

-20 degrees C	13.5615 MHz
-10 degrees C	13.5615 MHz
0 degrees C	13.5615 MHz
+10 degrees C	13.5615 MHz
+20 degrees C	13.5615 MHz
+30 degrees C	13.5615 MHz
+40 degrees C	13.5615 MHz
+50 degrees C	13.5615 MHz
102 VAC	13.5615 MHz
138 VAC	13.5615 MHz


Agilent 11:05:23 Feb 7, 2005
Trace
Mkr1 13.561 MHz
Ref 86.99 dBµV
Atten 10 dB
53.13 dBµV
Norm
Log
10
dB/
DC Coupled
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
Dl
46.1
dBµV
Display Line
46.13 dBµV
LgAv
V1 S2
S3 FC
AA
£(f):
f>50k
*Swp
15.209
LIMIT
Start 13.100 MHz
Stop 14.100 MHz
Res BW 9.1 kHz
VBW 27 kHz
Sweep 11.6 ms (1001 pts)
Copyright 2000-2002 Agilent Technologies

Band Edge

CONDUCTED EMISSIONS

Test Report #:	WC405505 Run 2	Test Area:	STS		
EUT Model #:	SP75	Date:	11/30/2004		
EUT Serial #:	M00035	EUT Power:	110VAC / 60Hz	Temperature:	22.0 °C
Test Method:	EN55022 A			Air Pressure:	99.0 kPa
Customer:	DataCard			Rel. Humidity:	23.0 %
EUT Description:	Card Printer / Laminator				
Notes:					
Data File Name:	5505.dat			Page:	1 of 4

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
110 VAC / 60 Hz						
165.0 kHz	44.97 Qp	0.2 / 2.7 / 0.0 / 0.0	47.87	L1	-17.34	n/a
165.0 kHz	38.98 Av	0.2 / 2.7 / 0.0 / 0.0	41.88	L1	n/a	-13.33
220.0 kHz	40.8 Qp	0.2 / 1.9 / 0.0 / 0.0	42.9	L1	-19.92	n/a
220.0 kHz	32.92 Av	0.2 / 1.9 / 0.0 / 0.0	35.02	L1	n/a	-17.8
440.0 kHz	39.22 Qp	0.3 / 0.9 / 0.0 / 0.0	40.42	L1	-16.64	n/a
440.0 kHz	36.38 Av	0.3 / 0.9 / 0.0 / 0.0	37.58	L1	n/a	-9.48
480.0 kHz	37.22 Qp	0.3 / 0.8 / 0.0 / 0.0	38.32	L1	-18.02	n/a
480.0 kHz	28.55 Av	0.3 / 0.8 / 0.0 / 0.0	29.65	L1	n/a	-16.69
17.535 MHz	16.44 Qp	2.47 / 0.69 / 0.0 / 0.0	19.6	L1	-40.4	n/a
17.535 MHz	12.2 Av	2.47 / 0.69 / 0.0 / 0.0	15.36	L1	n/a	-34.64
165.0 kHz	45.05 Qp	0.2 / 2.7 / 0.0 / 0.0	47.95	N	-17.26	n/a
165.0 kHz	41.05 Av	0.2 / 2.7 / 0.0 / 0.0	43.95	N	n/a	-11.26
220.0 kHz	42.27 Qp	0.2 / 1.9 / 0.0 / 0.0	44.37	N	-18.45	n/a
220.0 kHz	33.49 Av	0.2 / 1.9 / 0.0 / 0.0	35.59	N	n/a	-17.23
440.0 kHz	38.15 Qp	0.3 / 0.9 / 0.0 / 0.0	39.35	N	-17.71	n/a
440.0 kHz	34.95 Av	0.3 / 0.9 / 0.0 / 0.0	36.15	N	n/a	-10.91
480.0 kHz	35.08 Qp	0.3 / 0.8 / 0.0 / 0.0	36.18	N	-20.16	n/a
480.0 kHz	27.38 Av	0.3 / 0.8 / 0.0 / 0.0	28.48	N	n/a	-17.86
17.535 MHz	9.64 Qp	2.47 / 0.69 / 0.0 / 0.0	12.8	N	-47.2	n/a
17.535 MHz	11.76 Av	2.47 / 0.69 / 0.0 / 0.0	14.92	N	n/a	-35.08
230 VAC / 50 Hz						
165.0 kHz	49.57 Qp	0.2 / 2.7 / 0.0 / 0.0	52.47	L1	-12.74	n/a

Tested by: G Jakubowski

Printed | Signature

Reviewed by: TKS

Printed | Signature

CONDUCTED EMISSIONS

Test Report #:	WC405505 Run 2	Test Area:	STS		
EUT Model #:	SP75	Date:	11/30/2004		
EUT Serial #:	M00035	EUT Power:	110VAC / 60Hz	Temperature:	22.0 °C
Test Method:	EN55022 A			Air Pressure:	99.0 kPa
Customer:	DataCard			Rel. Humidity:	23.0 %
EUT Description:	Card Printer / Laminator				
Notes:					
Data File Name:	5505.dat			Page:	2 of 4

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
165.0 kHz	44.59 Av	0.2 / 2.7 / 0.0 / 0.0	47.49	L1	n/a	-7.72
205.0 kHz	43.61 Qp	0.2 / 1.98 / 0.0 / 0.0	45.79	L1	-17.62	n/a
205.0 kHz	12.68 Av	0.2 / 1.98 / 0.0 / 0.0	14.86	L1	n/a	-38.55
310.0 kHz	35.64 Qp	0.3 / 1.45 / 0.0 / 0.0	37.39	L1	-22.58	n/a
310.0 kHz	25.92 Av	0.3 / 1.45 / 0.0 / 0.0	27.67	L1	n/a	-22.3
440.0 kHz	37.44 Qp	0.3 / 0.9 / 0.0 / 0.0	38.64	L1	-18.42	n/a
440.0 kHz	27.76 Av	0.3 / 0.9 / 0.0 / 0.0	28.96	L1	n/a	-18.1
27.125 MHz	15.24 Qp	3.1 / 0.93 / 0.0 / 0.0	19.27	L1	-40.73	n/a
27.125 MHz	27.04 Av	3.1 / 0.93 / 0.0 / 0.0	31.07	L1	n/a	-18.93
165.0 kHz	52.73 Qp	0.2 / 2.7 / 0.0 / 0.0	55.63	L2	-9.58	n/a
165.0 kHz	48.62 Av	0.2 / 2.7 / 0.0 / 0.0	51.52	L2	n/a	-3.69
205.0 kHz	45.36 Qp	0.2 / 1.98 / 0.0 / 0.0	47.54	L2	-15.87	n/a
205.0 kHz	44.25 Av	0.2 / 1.98 / 0.0 / 0.0	46.43	L2	n/a	-6.98
310.0 kHz	41.32 Qp	0.3 / 1.45 / 0.0 / 0.0	43.07	L2	-16.9	n/a
310.0 kHz	25.78 Av	0.3 / 1.45 / 0.0 / 0.0	27.53	L2	n/a	-22.44
440.0 kHz	36.06 Qp	0.3 / 0.9 / 0.0 / 0.0	37.26	L2	-19.8	n/a
440.0 kHz	36.84 Av	0.3 / 0.9 / 0.0 / 0.0	38.04	L2	n/a	-9.02
27.125 MHz	15.1 Qp	3.1 / 0.93 / 0.0 / 0.0	19.13	L2	-40.87	n/a
27.125 MHz	10.12 Av	3.1 / 0.93 / 0.0 / 0.0	14.15	L2	n/a	-35.85

Tested by: G Jakubowski

Printed

Signature

Reviewed by: TKS

Printed

Signature

CONDUCTED EMISSIONS

Test Report #:	WC405505 Run 2	Test Area:	STS		
EUT Model #:	SP75	Date:	11/30/2004		
EUT Serial #:	M00035	EUT Power:	110VAC / 60Hz	Temperature:	22.0 °C
Test Method:	EN55022 A			Air Pressure:	99.0 kPa
Customer:	DataCard			Rel. Humidity:	23.0 %
EUT Description:	Card Printer / Laminator				
Notes:					
Data File Name:	5505.dat			Page:	3 of 4

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
165.0 kHz	52.73 Qp	0.2 / 2.7 / 0.0 / 0.0	55.63	L2	-9.58
205.0 kHz	45.36 Qp	0.2 / 1.98 / 0.0 / 0.0	47.54	L2	-15.87
440.0 kHz	39.22 Qp	0.3 / 0.9 / 0.0 / 0.0	40.42	L1	-16.64
310.0 kHz	41.32 Qp	0.3 / 1.45 / 0.0 / 0.0	43.07	L2	-16.9
480.0 kHz	37.22 Qp	0.3 / 0.8 / 0.0 / 0.0	38.32	L1	-18.02
220.0 kHz	42.27 Qp	0.2 / 1.9 / 0.0 / 0.0	44.37	N	-18.45
17.535 MHz	16.44 Qp	2.47 / 0.69 / 0.0 / 0.0	19.6	L1	-40.4
27.125 MHz	15.24 Qp	3.1 / 0.93 / 0.0 / 0.0	19.27	L1	-40.73

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
165.0 kHz	48.62 Av	0.2 / 2.7 / 0.0 / 0.0	51.52	L2	-3.69
205.0 kHz	44.25 Av	0.2 / 1.98 / 0.0 / 0.0	46.43	L2	-6.98
440.0 kHz	36.84 Av	0.3 / 0.9 / 0.0 / 0.0	38.04	L2	-9.02
480.0 kHz	28.55 Av	0.3 / 0.8 / 0.0 / 0.0	29.65	L1	-16.69
220.0 kHz	33.49 Av	0.2 / 1.9 / 0.0 / 0.0	35.59	N	-17.23
27.125 MHz	27.04 Av	3.1 / 0.93 / 0.0 / 0.0	31.07	L1	-18.93
310.0 kHz	25.92 Av	0.3 / 1.45 / 0.0 / 0.0	27.67	L1	-22.3
17.535 MHz	12.2 Av	2.47 / 0.69 / 0.0 / 0.0	15.36	L1	-34.64

Tested by: G Jakubowski

Printed | Signature

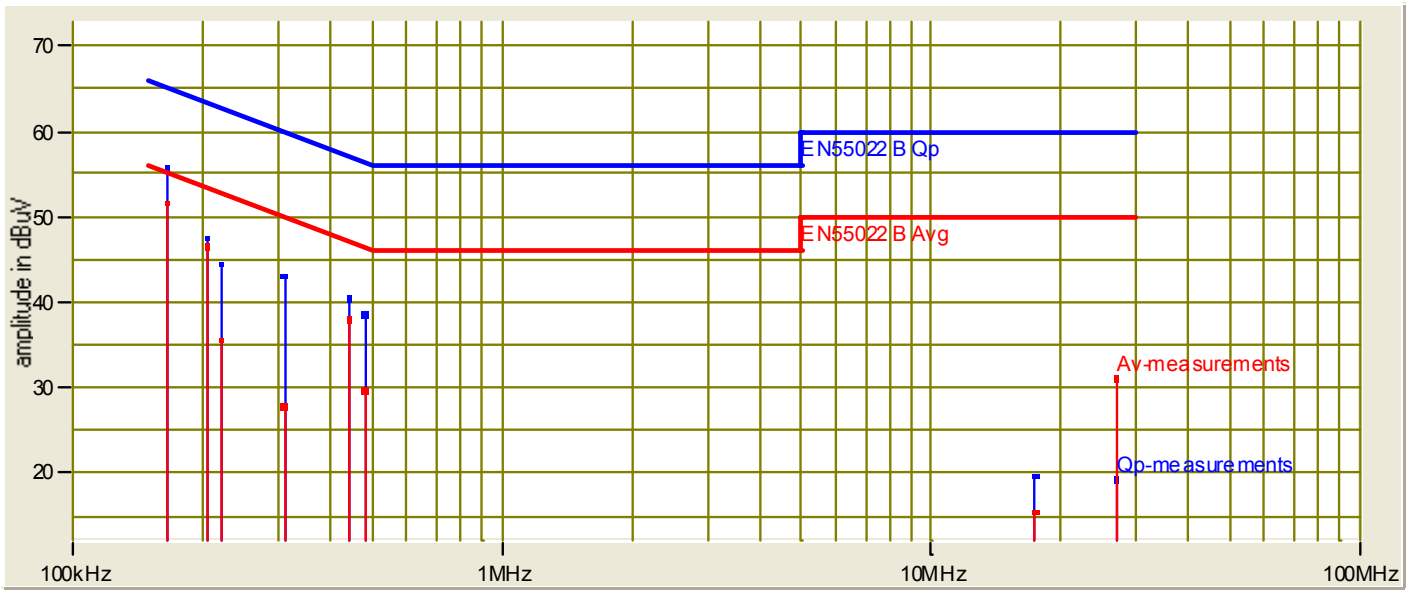
Reviewed by: TKS

Printed | Signature

CONDUCTED EMISSIONS

Test Report #:	WC405505 Run 2	Test Area:	STS		
EUT Model #:	SP75	Date:	11/30/2004		
EUT Serial #:	M00035	EUT Power:	110VAC / 60Hz	Temperature:	22.0 °C
Test Method:	EN55022 A			Air Pressure:	99.0 kPa
Customer:	DataCard			Rel. Humidity:	23.0 %
EUT Description:	Card Printer / Laminator				
Notes:					
Data File Name:	5505.dat			Page:	4 of 4

Graph:



Tested by: G Jakubowski

Printed _____ Signature _____

Reviewed by: TKS

Printed _____ Signature _____

RADIATED EMISSIONS

Test Report #:	WC405505 Run 1	Test Area:	STS		
EUT Model #:	SP75	Date:	11/30/2004		
EUT Serial #:	M00035	EUT Power:	110VAC / 60Hz	Temperature:	22.0 °C
Test Method:	EN55022 B			Air Pressure:	99.0 kPa
Customer:	DataCard			Rel. Humidity:	23.0 %
EUT Description:	Card Printer / Laminator				
Notes:					
Data File Name:	5505.dat			Page:	1 of 1

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN 55022 B 10m	DELTA2
No Emissions detected that are related to RFID						
End of Scan 30 to 1000 MHz						

Tested by: G Jakubowski

Printed

Signature

Reviewed by: TKS

Printed

Signature

Appendix B

Constructional Data Form

and/or

Product Information Form(s)

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

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 West		
	Minnetonka, MN 55343		
Contact:	Steve Fitzsimmons	Position:	Electrical Engineer
Phone:	952 988 1838	Fax:	952 988 2658
E-mail Address:	Steve_fitzsimmons@datacard.com		

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

EUT Description	Card Printer / laminator		
EUT Name	SP75		
Model No.:	SP75	Serial No.:	M00035
Product Options:	Magstripe, Smartcard, Supplies RFID, Graphics		
Configurations to be tested:	Printing full color card, encoding magentic stripe, operating SCR-331-DI smart card reader		

Test Objective

☒	EMC Directive 89/336/EEC (EMC)	☒	FCC:	Class	☒	A	☐	B	Part	15b, c
	Std: EN55022:1998	☒	VCCI:	Class	☒	A	☐	B		
☐	Machinery Directive 89/392/EEC (EMC	☒	BCIQ:	Class	☒	A	☐	B		
	Std:	☒	Canada:	Class	☒	A	☐	B		
☐	Medical Device Directive 93/42/EEC (EMC)	☒	Australia:	Class	☒	A	☐	B		
	Std:	☒	Other:	RTTE Directive EN301 489-3: 2000 EN 300-330-2						
☐	Vehicle Directive 72/245/EEC (EMC) Std:									
☐	FDA Reviewers Guidance for Premarket Notification Submissions (EMC)									

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

TÜV Product Service Certification Requested

☐ Attestation of Conformity (AoC) ☐ International EMC Mark (IEM)
☐ Certificate of Conformity (CoC) ☒ Compliance Document

Protection Class (N/A for vehicles) ☒ Class I ☐ Class II ☐ Class III

(Press **F1** when field is selected to show additional information on Protection Class.)

EUT Specifications and Requirements

Length: 23" Width: 10" Height: 21" Weight: 20 lbs.

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: 100-230 (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 5.4 A Current (Amps/phase(nominal)): 2.5A

Other

Other Special Requirements

Typical Installation and/or Operating Environment

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

EUT Power Cable

☐ Permanent OR ☒ Removable Length (in meters): 2
☐ Shielded OR ☒ Unshielded
☐ Not Applicable

Form

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*	☐	☒	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
USB	☐	☒	2	☒	☐	Foil	None	USB A-B	USB spec 1.1	2	☒	☐
RS232	☐	☒	1	☒	☐	Foil	None	Dsub9	None	2	☒	☐
10baseT	☐	☒	1	☐	☒	10baseT	none	RJ45	Magnetics	2	☒	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
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	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

EUT Software.

Revision Level: 6.8.0-1.3

Description: Pre production firmware, fully capable of running all sub systems.

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. SP75 testing all options including contacted and contactless smartcard option and magnetic stripe option, this includes SP75 printing full color images, encoding data on the magnetic stripe and reading smartcards
2. Gemplus driver utility used for testing smartcard options, TCPIP ping test to test ethernet port, color printjob with magnetic stripe data for testing color engine and magnetic stripe feature, RFID system
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 #
SP75	SP75C2H1NETSC 347L2	M00035	

Form

EMC Test Plan and Constructional Data Form

TÜV PRODUCT SERVICE

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

Description	*Model #*	*Serial #*	*FCC ID #*
Desktop PC	SSE2500MT64	SFST0072121	E186194
Keyboard	EO3601QUS201-C	J014405380	E139948JZ
Monitor	VCDTS21378-2M	E783732785	GSS15015
Mouse	ECM-S3902	1487209	EW4ECM-S3902

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
4MHz	Fund.	Printer control board	Oscillator for system clock generation
13.56MHz	Fund.	(1 for each supply antenna)	RFID communication clock
4MHz	12MHz	Printer control board	TPH logic control
4MHz	48MHz	Printer control board	system clock
48MHz	Fund	Laminator control board	system clock

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Protran	UP07231240	3 per system	☒ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*

Form

EMC Test Plan and Constructional Data Form

PRODUCT SERVICE

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

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

(PLEASE INSERT "**ELECTRONIC SIGNATURE**" BELOW IF POSSIBLE)

Authorization Signatures

Customer authorization to perform tests according to this test plan.	Date
Steve Fitzsimmons	11/22/04
Test Plan/CDF Prepared By (please print)	Date
Reviewed by TÜV Product Service Associate	Date

Appendix C

MEASUREMENT PROTOCOL FOR FCC

GENERAL INFORMATION

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ±4.8 dB. The equipment comprising the test systems are 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 it's 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, expressed in dBμV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC limit.

To convert between dBμV and μV, the following conversions apply:

dBμV = 20(log μV)

μV = Inverse log(dBμV/20)

RADIATED EMISSIONS

The final level, expressed in dBμV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBμV), adding the antenna correction factor and cable loss factor (Factor dB) to it, then subtracting the preamp gain. This result then has the FCC limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment A.

Example:

FREQ (MHz)	LEVEL (dBuV)		CABLE/ANT/PREAMP (dB)		(dB)	FINAL (dBuV/m)		POL/HGT/AZ (m)	(deg)		DELTA1 FCC B
60.80	42.5Qp	+	1.2	+	10.9 - 25.5 =	29.1		V 1.0	0.0	-	-10.9

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DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-2001 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

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 and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/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. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 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. Intentional radiators are rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

In the frequency range of 9 kHz to 30 MHz, measurements are made with quasi-peak or average detection with a loop antenna. The antenna is positioned 1 meter above the ground plane and rotated about its vertical axis for maximum response at each azimuth about the EUT. The antenna is also positioned horizontally at the specified distances.

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