TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.209
Industry Canada RSS-210 Issue 7
Industry Canada RSS-GEN Issue 2

MANUFACTURER	Destron Fearing 490 Villaume Ave South St Paul MN 55075
EUT DESCRIPTION	RFID reader
EUT NAME	POCKET READER EX
MODEL NUMBER(S) TESTED	POCKET READER EX
SERIAL NUMBER(S) TESTED	L-EXB0012
TEST REPORT NUMBER	WC1007446.1 Rev A
TEST DATE(S)	23 - 25 August 2010

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 Section 15.209 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.

Date: 22 October 2010

Location: Taylors Falls MN
USA

Greg Jakubowski
Senior EMC Technician

Joel T Schneider
Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report No.	**WC1007446.1 Rev A**	Date of issue:	22 October 2010

Manufacturer	Destron Fearing
Address	490 Villaume Ave
	South St Paul MN 55075
Description of Equipment	RFID reader
Name of Equipment	POCKET READER EX
Model No(s) Tested	POCKET READER EX
	.
Serial No(s) Tested	L-EXB0012
Test Result	■ **Compliant** ☐ **Non-compliant**

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.

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	24	10 September 2010	Initial Release
A	24	22 October 2010	Revisions Include: ▪ Page 1 and corresponding TRS: Correcting model number to POCKET READER.EX

TEST REPORT CONTENTS **Page(s)**

EMC TEST REGULATIONS:

The tests were performed according to following regulations:
FCC Part 15, Subpart C, Sections 15.209(a), (f)
IC RSS-210 Issue 7 Section 2.6
IC RSS-Gen Issue 2 Section 4.6.1

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 24°C
Relative Humidity	: 60-65%
Atmospheric pressure	: 99 kPa

POWER SUPPLY UTILIZED

Power supply system : 6 VDC – Also capable of operating with DV-670R AC adapter.

MEASUREMENT UNCERTAINTY

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. This 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. This test system has a measurement uncertainty of ±4.8 dB. The measurement uncertainty values for conducted and radiated emissions meet the requirements as expressed in CISPR 16-4-2. The equipment comprising the test systems is calibrated on an annual basis.

SIGN EXPLANATIONS

☐ - not applicable
■ - applicable

General field strength limits 0.009 – 30 MHz

FCC 15.209(a) – RSS-210 Section 2.6

Measured per ANSI C63.4: 2003

Test summary

The requirements are: ■ - MET ☐ - NOT MET

Test location

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

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE02534	ESHS-20	Rohde & Schwarz	EMI Receiver	837055/003	29-Mar-11
WRLE02517	HFH2-Z2	Polarad	Loop Antenna	879285/036	29-Jul-11

Test limits

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30	30	30

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, *e.g.*, see §§ 15.250, 15.252, 15.255, and 15.509–15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Test Data

Frequency (kHz)	Detector	3 meters dBμV/m	10 meters dBμV/m	30 meters dBμV/m	300 meters dBμV/m (μV/m)	Limit 300 m dBμV/m (μV/m)
134.25	Peak	123	95	63	23* (14.1)	45.0 (178)
134.25	Average	121	93	62	22* (12.6)	25.0 (17.8)
268.5	Peak	73	47	nf	-13* (0.22)	39.0 (89.3)
268.5	Average	69	43	nf	-17* (0.14)	19.0 (8.93)
402.75	Peak	45	nf	nf	-35* (0.017)	35.5 (59.5)
402.75	Average	39	nf	nf	-41* (0.008)	15.5 (5.95)
Frequency (kHz)	Detector	3 meters dBμV/m	10 meters dBμV/m	30 meters dBμV/m (μV/m)		Limit 30 m dBμV/m (μV/m)
537.0	QP	51	nf	11* (3.55)		33.0 (44.6)
671.25	QP	39	nf	-1* (0.89)		31.0 (35.7)
805.5	QP	43	nf	3* (1.41)		29.4 (29.7)

* Extrapolated value using 40 dB per decade fall off

nf = noise floor

No other signals detected up to 30 MHz. Measurements made with 9 kHz RBW. Device rotated through 3 orthogonal axes to determine position of maximum field strength.

General field strength limits 30 – 1000 MHz

FCC 15.209(a) – RSS-210 Section 2.6

Measured per ANSI C63.4: 2003

Test summary

The requirements are: ■ - MET ☐ - NOT MET

Test location

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

Test equipment used:

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
OWLE03202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	28-May-11
OWLE02682	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	03-Feb-11
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10
WRLE10616	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	QA0746005	Code B 23-Oct-10

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 and is calibrated according to internal procedure. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB RBW and quasi-peak detection.

Test limits

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
960 - 1000	500	3

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector.

Test Data

No other signals detected in this range in transmit or standby modes.

Occupied Bandwidth
RSS-Gen 4.6.1

Test summary
The requirements are: ■ - MET ☐ - NOT MET ☐ - NOT APPLICABLE
Test was performed in accordance with the article “The Measurement of Occupied Bandwidth” by Industry Canada’s certification bureau.

Occupied Bandwidth = 81 Hz

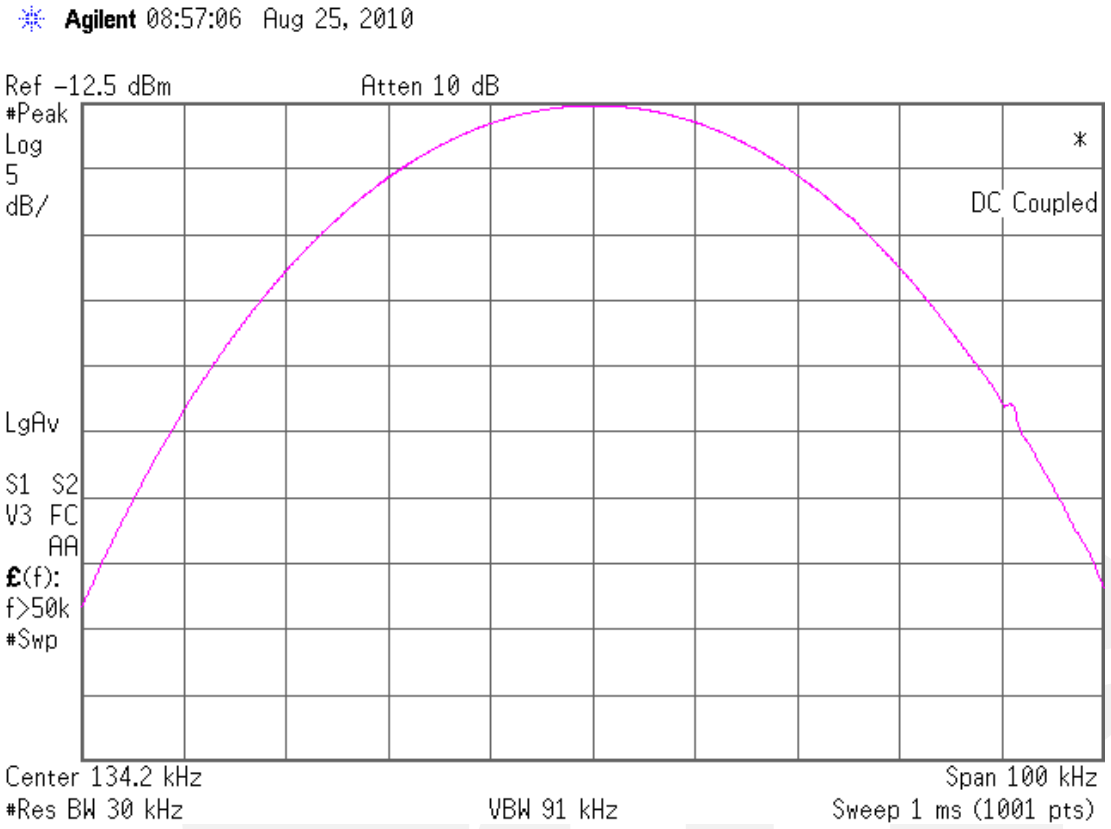
Test location
Wild River Lab Large Test Site (Open Area Test Site)

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
WRLE02517	HFH2-Z2	Polarad	Loop Antenna	879285/036	29-Jul-11
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	09-Aug-11

Test limit
Not Applicable

Test Data
See following pages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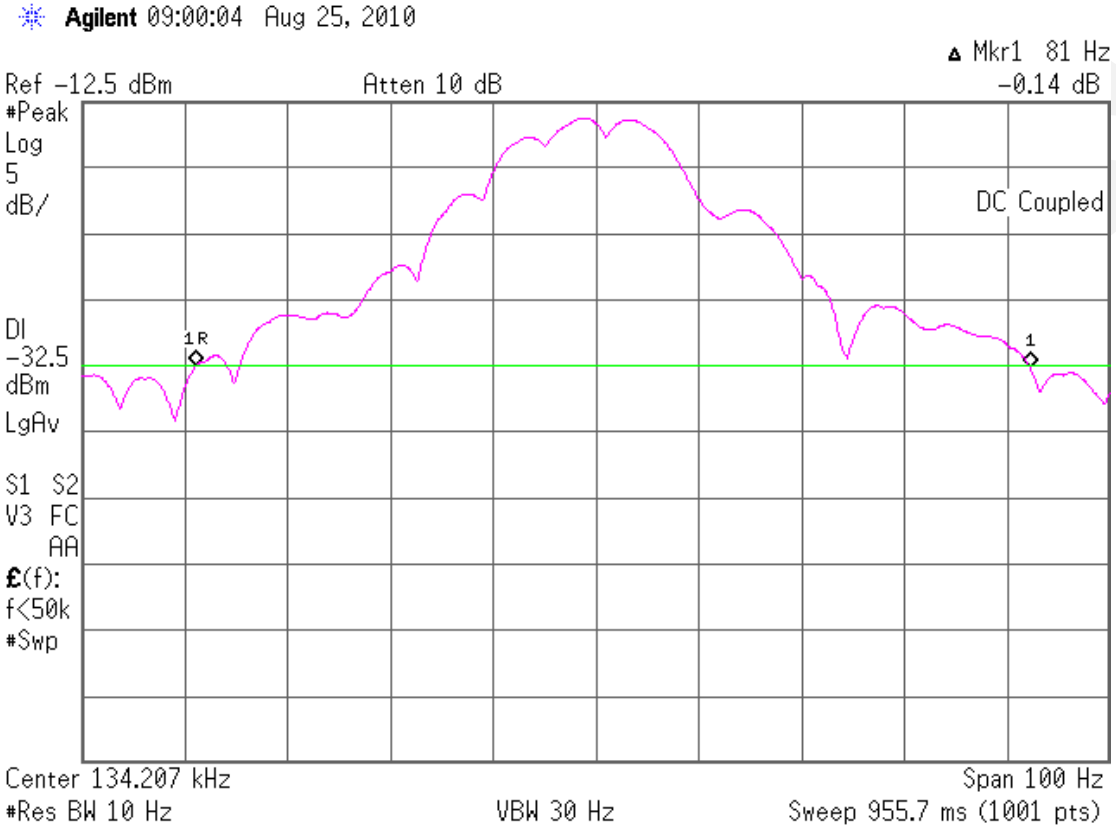
Atten 10 dB
#Peak
Log
5
dB/
DC Coupled
LgAv
S1 S2
V3 FC
AA
£(f):
f>50k
#Swp
Center 134.2 kHz
Span 100 kHz
#Res BW 30 kHz
VBW 91 kHz
Sweep 1 ms (1001 pts)


Agilent 09:00:04 Aug 25, 2010
Δ Mkr1 81 Hz
-0.14 dB
Ref -12.5 dBm
Atten 10 dB
#Peak
Log
5
dB/
DC Coupled
Dl
-32.5
dBm
LgAv
S1 S2
V3 FC
AA
£(f):
f<50k
#Swp
1R
1
Center 134.207 kHz
Span 100 Hz
#Res BW 10 Hz
VBW 30 Hz
Sweep 955.7 ms (1001 pts)

AC power line conducted emission limits 0.15 - 30 MHz

FCC 15.207 – RSS-Gen Section 7.2.2

Measured per ANSI C63.4: 2003

Test summary

The requirements are: ■ - MET ☐ - NOT APPLICABLE

Test location

Wild River Lab Shield Room

Test equipment used:

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE02534	ESHS-20	Rohde & Schwarz	EMI Receiver	837055/003	29-Mar-11
WRLE03990	3816/2	EMCO	LISN	35359	02-Aug-11

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure. Measurements between 150 kHz and 30 MHz are made with 9 kHz/6 dB RBW and quasi-peak and average detection.

Test limits

Frequency (MHz)	dBµV QP	dBµV AV
0.15 – 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Test Data

Measurement summary for limit1: FCC 15.207 B Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 FCC 15.207 B Qp
268.4 kHz	38.44 Qp	0.02 / 0.04 / 0.0 / 0.0	38.5	L1	-22.66
536.54 kHz	28.19 Qp	0.05 / 0.04 / 0.0 / 0.0	28.28	L1	-27.72
805.0 kHz	23.38 Qp	0.07 / 0.04 / 0.0 / 0.0	23.49	L1	-32.51
1.073 MHz	22.0 Qp	0.1 / 0.04 / 0.0 / 0.0	22.14	L1	-33.86
3.892 MHz	14.89 Qp	0.16 / 0.08 / 0.0 / 0.0	15.13	N	-40.87
16.735 MHz	12.12 Qp	0.32 / 0.33 / 0.0 / 0.0	12.78	L1	-47.22
170.99 kHz	9.95 Qp	0.02 / 0.05 / 0.0 / 0.0	10.01	L1	-54.9

Measurement summary for limit2: FCC 15.207 B Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA2 FCC 15.207 B Avg
268.4 kHz	36.91 Av	0.02 / 0.04 / 0.0 / 0.0	36.97	L1	-14.19
536.54 kHz	26.67 Av	0.05 / 0.04 / 0.0 / 0.0	26.76	L1	-19.24
805.0 kHz	22.09 Av	0.07 / 0.04 / 0.0 / 0.0	22.2	N	-23.8
1.073 MHz	20.3 Av	0.1 / 0.04 / 0.0 / 0.0	20.44	L1	-25.56
3.892 MHz	13.11 Av	0.16 / 0.08 / 0.0 / 0.0	13.35	N	-32.65
16.735 MHz	6.01 Av	0.32 / 0.33 / 0.0 / 0.0	6.67	L1	-43.33
170.99 kHz	-6.5 Av	0.02 / 0.05 / 0.0 / 0.0	-6.44	L1	-61.35

Test-setup photo(s):
Radiated emissions

Test-setup photo(s):
Radiated emissions

Test-setup photo(s):
Conducted emissions

Equipment Under Test (EUT) Test Operation Mode:

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

☐ - Standby

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal operating mode

■ - See EMC Test Plan and Constructional Data Form in appendix A

Configuration of the device under test:

■ - See EMC Test Plan and Constructional Data Form in appendix A

☐ - See Product Information Form in Appendix B

GENERAL REMARKS:

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:	23 August 2010
Condition of EUT:	Normal
Testing Start Date:	23 August 2010
Testing End Date:	25 August 2010

TÜV SÜD AMERICA INC

Greg Jakubowski	Joel T Schneider
Senior EMC Technician	Senior EMC Engineer

Appendix A

EMC Test Plan and Constructional Data Form

Form

EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
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:	Destron Fearing		
Address:	490 Villaume Ave		
	South St. Paul		
	55075		
Contact:	Daniel Johnson	Position:	Product Engineer
Phone:	651-552-6586	Fax:	651-455-0413
E-mail Address:	DJOHNSON@DESTRONFEARING.COM		

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

EUT Description	RFID Reader		
EUT Name	POCKET EX		
Model No.:	POCKET EX	Serial No.:	L-EXB0012
Product Options:	none		
Configurations to be tested:	HandHeld stand alone		

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)*

Modifications since last test:	None
Modifications made during test:	None

Test Objective(s): ***Please indicate the tests to be performed, entering the applicable standard(s) where noted.***

- ☐ EMC Directive 2004/108/EC (EMC) Std: _____
- ☐ Machinery Directive 89/392/EEC (EMC) Std: _____
- ☐ Medical Device Directive 93/42/EEC (EMC) Std: _____
- ☐ Vehicle Directive: ☐ 2001/3/EC (EMC) ☐ 2004/104/EC (EMC)
  ☐ Other Vehicle Std: _____
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

- ☒ FCC: Class ☐ A ☒ B Part 15
- ☐ VCCI: Class ☐ A ☐ B
- ☐ BSMI: Class ☐ A ☐ B (Separate Report)
- ☒ Canada: Class ☐ A ☒ B
- ☐ Australia: Class ☐ A ☐ B
- ☒ Other: EN

Third Party Certification, if applicable (*Signature on Page 6 Required)

- ☐ Attestation of Conformity (AoC)*
- ☐ Statement of Compliance (previously CoC)*
- 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.)
- ☒ FCC / TCB Certification
- ☐ E-Mark Certification
- ☐ EMC Certification (used with Octagon Mark)*
- ☐ Compliance Document*
- ☒ Industry Canada / FCB Certification
- ☐ Taiwan Certification

EMC Test Plan and Constructional Data Form

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 SÜD America 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: 11.0 in Width: 5.0 in Height: 1.3 in Weight: 1.18 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: 6 VDC (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.)

Industrial Factory

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

Type	Analog	Digital	During Test: Active	During Test: Passive	Qty	Shielding: Yes	Shielding: No	Shielding: Type	Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
EXAMPLE: *RS232*	☐	☒	☒	☐	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
RS232	☐	☒	☒	☐	1	☒	☐			9 PIN D-SUB		2	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
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	☐	☐	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: Rev A

Description: Read RFID tag IDs

Equipment Under Test (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. Stand alone Battery operated

2.

3.

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

Description	Model #	Serial #	FCC ID #

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) This information is required for FCC & Taiwan testing.

Description	*Model #*	*Serial #*	*FCC ID #*

Oscillator Frequencies

Manufacturer	*Frequency*	*Derived Frequency*	*Component # / Location*	*Description of Use*
	4.294 MHz	134.2KHz	X1	DRIVE CIRCUIT

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
	DV-670R	NA	☐ Switched-mode: (Frequency) DC ☐ Linear ☒ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*

EMC Test Plan and Constructional Data Form

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 ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

Daniel Johnson	08-23-10
Customer authorization to perform tests according to this test plan.	Date
Daniel Johnson	08-23-10
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.

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.

Radiated Emissions

For radiated emissions from 9 kHz to 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. A receiver with peak/average detection and 9 kHz RBW, and quasi-peak detection, was used as specified by the test requirement. Intentional radiators are rotated through 3 orthogonal axes to determine the test position for maximum emissions. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. The test antenna was 3 meters from the EUT. The EUT was rotated 360 degrees, and the test antenna was adjusted from 1-4 meters in height with vertical and horizontal polarization to maximize the emission levels.

Test Equipment

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