HID GLOBAL CORPORATION

CARD PRINTER/ENCODERS OPERATING ON 125KHZ AND 13.56 MHZ

Model: X001900, HDP8500

May 7th 2012
Report No.: SL12022903-HID-004 (47 CFR §15.225, RSS-210)

(This report supersedes NONE)

R&TTE Test Report

To: 47 CFR §15.207, 15.209, 15.225, RS-GEN Issue 3, RSS-210 Issue 8, ICES 003

SIEMIC, INC.
Accessing global markets

CERTIFICATE OF TEST

Date of Issue : **May 7th 2012**

Company Name : **HID Global Corporation**

Product Name/Model : **Card Printer/Encoders operating on 125 KHz and 13.56 MHz**

X001900,HDP8500

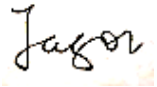
Stipulated Standard : **(1) 47 CFR §15.225: 2011**
(2) RSS-210 Issue 8: 2010

Equipment complied with the specification **[X]**
Equipment did not comply with the specification **[ ]**

The submission documentation to a National Regulatory Body for type approval purposes shall consist of two parts; **Part one : Application Form;**
Part two: Test Report;

Modifications made to the product : None

This Test Report is Issued Under the Authority of:

	
Jason Zhang **Compliance Engineer**	**Leslie Bai** **Engineering Reviewer**

ATTESTATION OF CONFORMITY

Presented To:

HID Global Corporation

15730 Barranca Parkway Irvine, CA 92618 USA

For Product/Model:

Card Printer/Encoders operating on 125KHz and 13.56 MHz
X001900,HDP8500

Was evaluated and confirmed to comply with:

47 CFR15.225: 2011
RSS-210 Issue 8: 2010

Leslie Bai
Director of Certification

SIEMIC, INC.
Accessing global markets

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management through out a project. Our extensive experience with China, Asia Pacific, North America, European, and international compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom , SAR
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom , SAR
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety , SAR
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety, SAR

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
HongKong	OFTA (US002)	RF , Telecom

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CONTENTS

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1 Executive Summary & EUT information

The purpose of this test program was to demonstrate compliance of the HID Global Corporation, Card Printer/Encoders operating on 125KHz and 13.56 MHz, model: X001900,HDP8500, against the current Stipulated Standards. The X001900, HDP8500 have demonstrated compliance with the 47 CFR §15.225: 2011; RSS-210 Issue 8: 2010.

Applicant & EUT Information

Applicant Information

Applicant / Client	**HID Global Corporation** **15370 Barranca Parkway Irvine, CA 92618 , USA**
Manufacturer1	**HID Global Corporation** **15370 Barranca Parkway Irvine, CA 92618 , USA**

EUT Information

EUT Description : The X001900,HDP8500 is HID product.X001900 includes 5 radios modules , which are Ribbon 13.56MHz RFID Radio, Laminator 13.56MHz RFID Radio Module , Two E-card 13.56MHz RFID Radio Module and One E-card 125kHz RFID Radio Module. Specifications for these radios as below.

Ribbon/Laminator 13.56MHz RFID Radio

Type : ISO15693
Carrier Frequency : 13.56MHz +/- 7KHz, 4 cm read/write range
Speed : 26.48Kbps
Data Transmission: 423.75KHz subcarrier , ASK , 100% Manchester bit coding

E-card 13.56MHz RFID Radio

Type : ISO14443
Carrier Frequency : 13.56MHz +/- 7KHz, 10 cm read/write range
Speed : 848kbps(max) , 106kbps(default)
Data Transmission : 847.5kHz subcarrier
Type A : ASK 100% , OOK Manchester bit coding
Type B : ASK 10%, Binary phase shift keying , NRZ bit coding

E-card 125KHz RFID Radio

Type : HID Prox
Carrier Frequency : 125KHz +/- 0.5%
Data Transmission: 112.5KHz&109.375KHz+/- 0.5% subcarrier
FSK, 0% depth , 1.25k bits max bit rate

Model No : X001900,HDP8500

Input Power : 100-240VAC , 50-60Hz,3.5A MAX

Classification Per Stipulated Test Standard : RFID product

Familly Model Difference Comparison Table

Product Specification	X001900	HDP8500
Frequency	Same	Same
Modulation	Same	Same
Power Supply	Same	Same
Connectivity	Same	Same
Electronic Circuit Design	Same	Same
PCB	Same	Same
Component, Cable, Material, Module	Same	Same
Component position, Wiring, Structure	Same	Same
Model, Outlook, Color	Same	Same
Others	Same	Same

2 TECHNICAL DETAILS

Laboratory performing the tests	**SIEMIC Laboratories 2206 Ringwood Ave, San Jose, CA 95131**
Date of EUT received	**Mar 26th, 2012**
Dates of test (from – to)	**April 1st – May 4th, 2012**
Equipment Category	**Printer, RFID product**
Standard applied	**See page 2**

EUT Test Mode Evaluation

EUT Major Function List

Functions	Description
Fn#1	Card printing
Fn#2	Continuous transmitting

EUT Test Mode List

EMC Test Modes	Description	Test Configuration
EMC_TM#1	Use the script command to turn on 13.56MHz Rib & Lam RFID 13.56MHz E-card 5121, 13.56MHz E-card 5121SDI, 125KHz E-card 5125 and make them continue transmitting.	Continues printing& Continues transmitting

RF Test Modes	Description	Test Configuration
RF_Test Mode#1	Software for testing: OmnikeyPwrMgmt	5121 Continuous TX
RF_Test Mode#2	Software for testing: OmnikeyPwrMgmt	5121SDI Continuous TX
RF_Test Mode#3	Software for testing: OmnikeyPwrMgmt	5125 Continuous TX modulated.
RF_Test Mode#4	Software for testing: HostControl_Lite.exe	X001900-Rib RFID TX modulated
RF_Test Mode#5	Software for testing: HostControl_Lite.exe	X001900-Lam RFID TX modulated

Supporting Equipment & Cabling

Supporting equipment used with the EUT

Equipment Description	Model	Serial No.	Manufacturer
PC Laptop	Latitude D600	9444352681	DELL

Details of cables between EUT and Supporting Equipment

Connection Start		Connection Stop		Length / shielding Info	
From	I/O Port	To	I/O Port	Length(m)	Shielding
EUT	USB	Laptop PC	USB	1.5	Unshielded
EUT	RJ45	Laptop PC	RJ45	1.5	Unshielded
Laptop PC	DC-In	AC Power Adapter	DC-OUT	1	Shielding

Test Software Information

Test Item	Software	Description
Radiated & conducted Testing	OmnikeyPwrMgmt & HostControl_Lite.exe	EUT was controlled by script command provided by manufacturer

3 MODIFICATION

Report No.	Report Version	Description	Issue Date

4 TEST SUMMARY

The product was tested in accordance with the following specifications. The Pass / Fail Criteria for the immunity tests were specified in Annex Ciii.

All Testing has been performed according to below product classification:

RFID product

Test Results Summary

Test Standard		Description	Pass / Fail
47 CFR Part 15.225: 2011	RSS 210 Issue 8: 2010		
15.203		Antenna Requirement	Pass
15.207(a)	RSS Gen(7.2.2)	Conducted Emissions Voltage	Pass
15.225(a)	RSS210(A2.6)	Limit in the band of 13.553 – 13.567 MHz	Pass
15.225(b)	RSS210(A2.6)	Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Pass
15.225(c)	RSS210(A2.6)	Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Pass
15.225(d), 15.209	RSS210(A2.6)	Limit outside the band of 13.110 – 14.010 MHz	Pass
15.225(e)	RSS210(A2.6)	Frequency Stability	Pass
	RSS-210(5.9.1)	Occupied Bandwidth	Pass
ANSI C63.4: 2009/ RSS-Gen Issue 3: 2010 PS: All measurement uncertainties are not taken into consideration for all presented test result.			

PS: All Measurement Uncertainty is not taken into consideration for presented test data
Note: Only the worst case model, X001900/HDP8500 was tested and the respective result was presented in this report.

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 AC Line Conducted Emission Test Result TEST RESULT

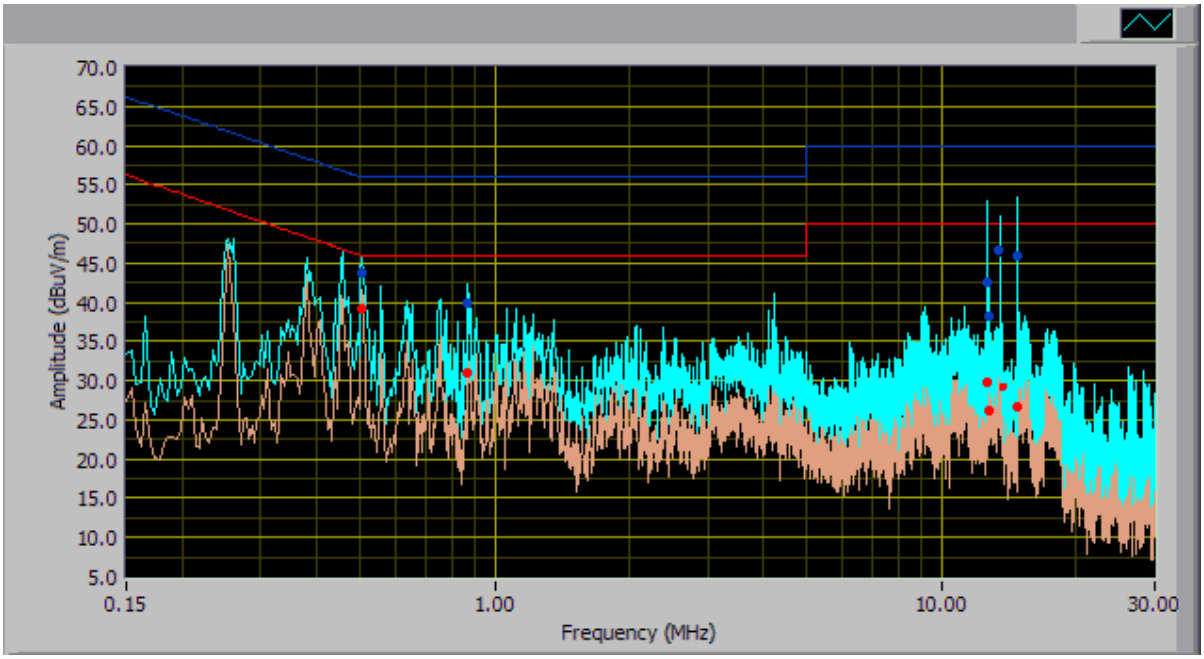
Note:

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
   Conducted Emissions Measurement Uncertainty
3. All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.86dB.
4. Environmental Conditions

Temperature	25ºC
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : April 1st - May 4th 2012
Tested By :Jason Zhang

5.1.1 Test Result Complying For 47 CFR §15.225: 2011 & RSS-210 Issue 8: 2010

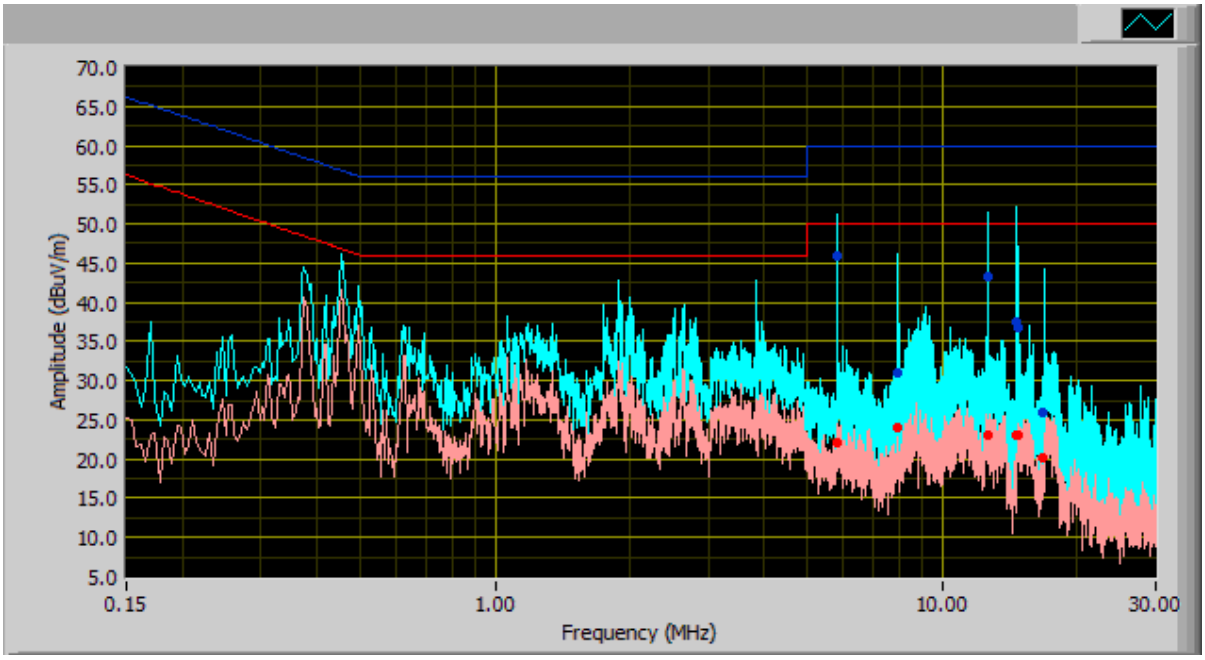


Quasi-Peak Limit

Average Limit

120V, 60Hz, Neutral Line

Frequency (MHz)	QP Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
14.83	46.04	60	Pass	-13.96	26.72	50	Pass	-23.28	Neutral
12.61	42.63	60	Pass	-17.37	29.88	50	Pass	-20.12	Neutral
13.56	46.35	60	Pass	-13.65	29.89	50	Pass	-20.11	Neutral
0.51	43.69	56	Pass	-12.31	39.15	46	Pass	-6.85	Neutral
12.73	38.20	60	Pass	-21.8	26.12	50	Pass	-23.88	Neutral
0.87	39.81	56	Pass	-16.19	31.08	46	Pass	-14.92	Neutral



Quasi-Peak Limit

Average Limit

120V, 60Hz, Phase Line

Frequency (MHz)	QP Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
14.67	37.43	60	Pass	-22.57	22.94	50	Pass	-27.06	Phase
12.60	43.22	60	Pass	-16.78	23.17	50	Pass	-26.83	Phase
5.81	46.00	60	Pass	-14.00	22.04	50	Pass	-27.96	Phase
14.79	36.89	60	Pass	-23.11	23.16	50	Pass	-26.84	Phase
7.93	30.99	60	Pass	-29.01	23.92	50	Pass	-26.08	Phase
16.85	26.07	60	Pass	-33.93	20.24	50	Pass	-29.76	Phase

5.2 Radiated Spurious Emission Test Results

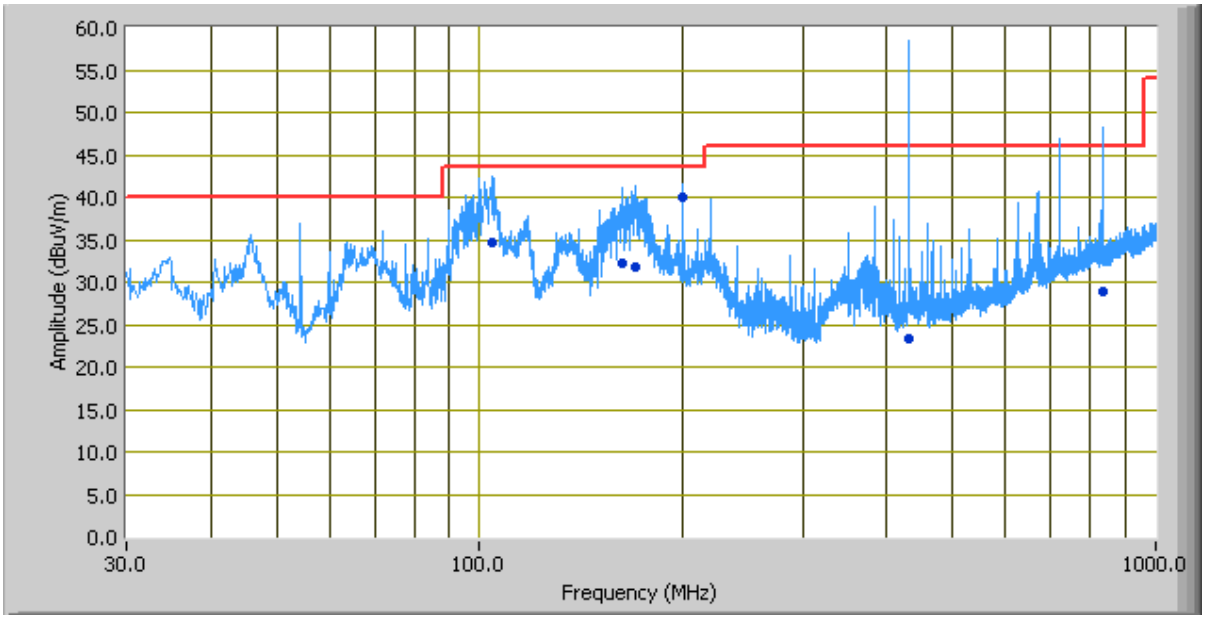
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (QP only @ 3m & 10m) is +5.6dB/-4.5dB (for EUTs < 0.5m X 0.5m X 0.5m).
4. Environmental Conditions

Temperature	21.8°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date: April 1st - May 4th , 2012
Tested by: Jason Zhang

Results: PASS

Test Result Complying For 47 CFR §15.225: 2011 & RSS-210 Issue 8: 2010

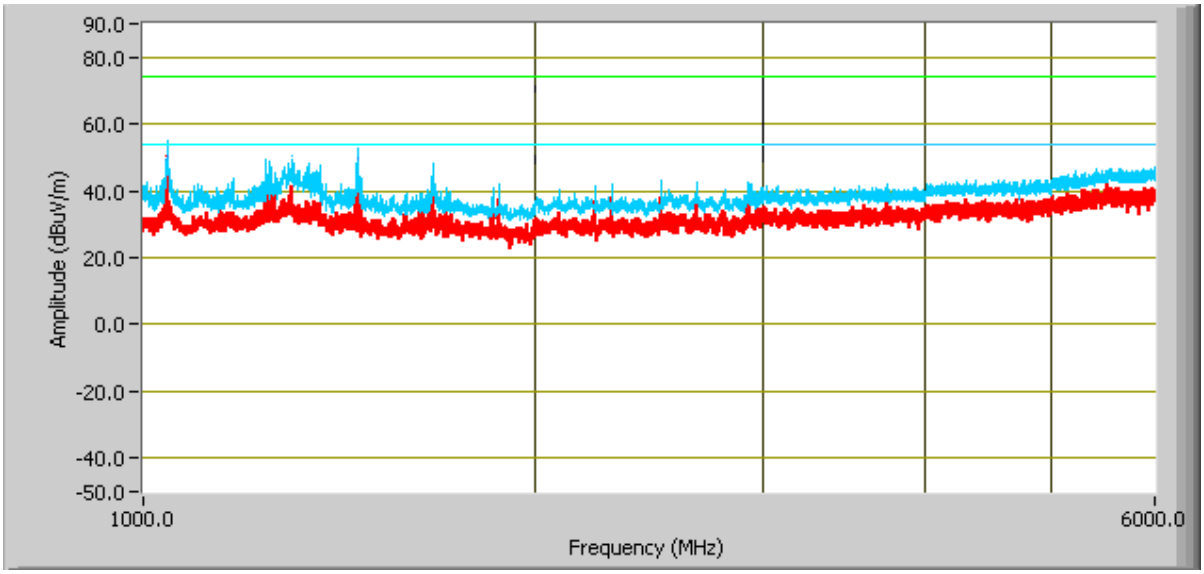


Limit

30MHz ~1000MHz

Frequency	Corrected Amplitude	Turntable position	Polarity	Antenna height	Class B Limit	Margin	Measure Detector
(MHz)	@ 3m	(deg)		(cm)	(dBμV/m)	(dB)	
104.54	34.58	88.00	V	106.00	43.52	-8.94	QP
162.60	32.15	324.00	V	139.00	43.52	-11.37	QP
169.73	31.83	349.00	V	129.00	43.52	-11.69	QP
200.00	39.90	299.00	H	116.00	43.52	-3.62	QP
432.00	39.76	360.00	V	100.00	46.00	-6.24	QP
834.77	28.81	154.00	H	230.00	46.00	-17.19	QP

Above 1GHz Radiated Emission Test Result



Note 1: Upper plot is a pre-scan test plot performed in 3 meters SAC.

1GHz-6GHz (120V, 60Hz)

Frequency (GHz)	Final FS @ 3m (dBuV)	Direction (degree)	Height (m)	Polarity (H/V)	Antenna Loss (dB)	Cable Loss (dB)	Amplifier (dB)	Limit @ 3m (dBuV)	Delta (dB)	Detector (pk/avg)
1.044	54.96	180	1.5	H	24.80	1.82	31.99	74	-24.41	Peak
1.044	46.99	360	1.0	H	24.80	1.82	31.99	54	-12.38	Ave
1.301	50.76	78	1.0	H	24.80	1.82	31.99	74	-28.61	Peak
1.301	41.27	78	1.4	H	24.80	1.82	31.99	54	-18.10	Ave
1.461	53.43	280	1.2	H	24.80	1.82	31.99	74	-25.94	Peak
1.461	47.29	78	1.4	H	24.80	1.82	31.99	54	-12.08	Ave
1.044	48.02	62	1.3	V	24.80	1.82	31.99	74	-31.35	Peak
1.044	37.16	78	1.4	V	24.80	1.82	31.99	54	-22.21	Ave
1.301	48.71	190	1.1	V	24.80	1.82	31.99	74	-30.66	Peak
1.301	39.00	271	1.7	V	24.80	1.82	31.99	54	-20.37	Ave
1.461	52.41	190	1.1	V	24.80	1.82	31.99	74	-26.96	Peak
1.461	44.76	271	1.7	V	24.80	1.82	31.99	54	-14.61	Ave

5.3 Radiated Emission < 30MHz (9kHz - 30MHz, H-Field)

Requirement(s): 47 CFR §15.225 & RSS-210 (A2.6) & RSS-310 (3.7)

Procedures: **For < 30MHz,** Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the centre of the loop. The measuring bandwidth was set to 10 kHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT.)

The limit is converted from microvolt/meter to decibel microvolt/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude (dBµV/m) + ACF (dB) + Cable Loss(dB) – Distance Correction Factor

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, is +/- 6dB.
4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : April 1st - May 4th 2012
Tested By : Jason Zhang

Results: Pass

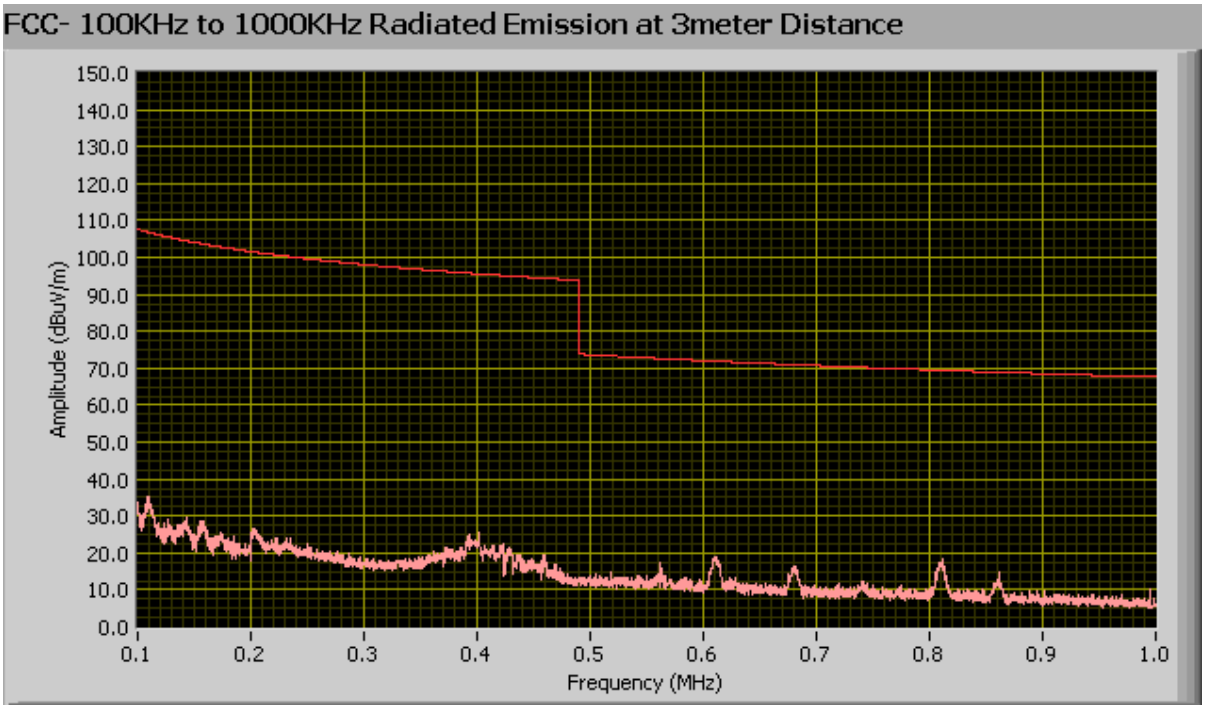
Note : Different modes were verified , only the worse case was recorded which was with all radios on.

100KHz ~ 1MHz

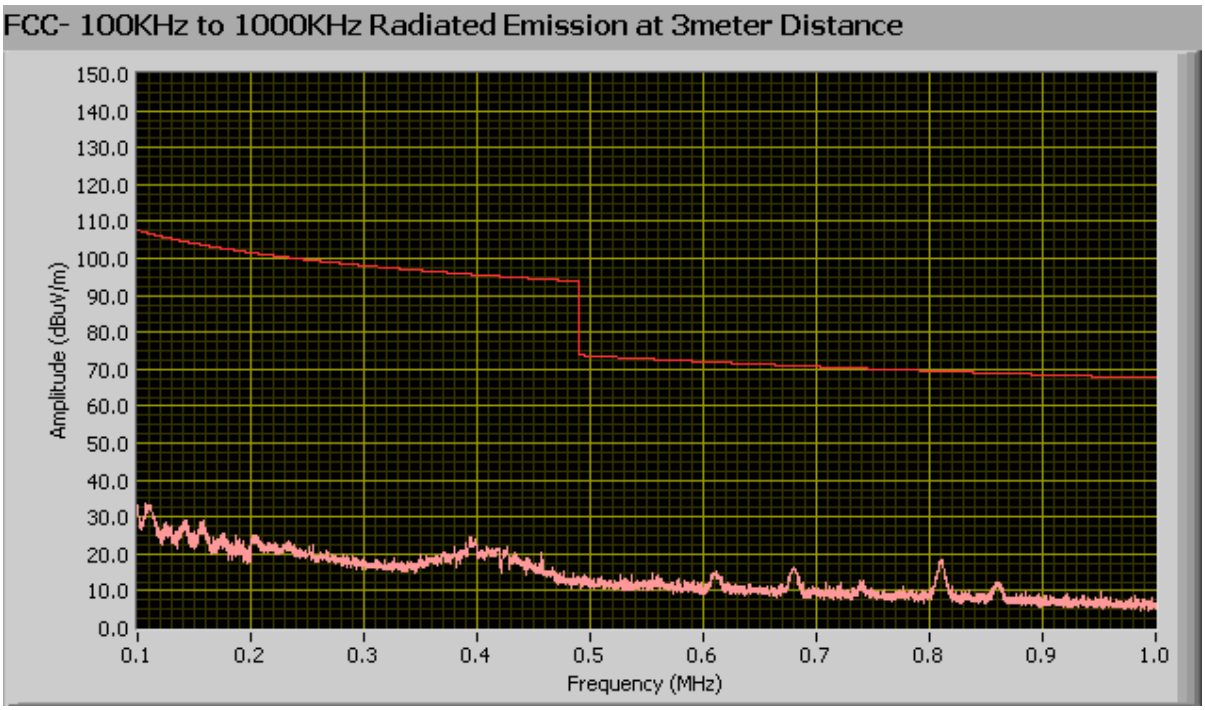
Model:X001900-5121 RFID reader

Loop Antenna at 0 degree

General Emission Limit @ 3 Meter



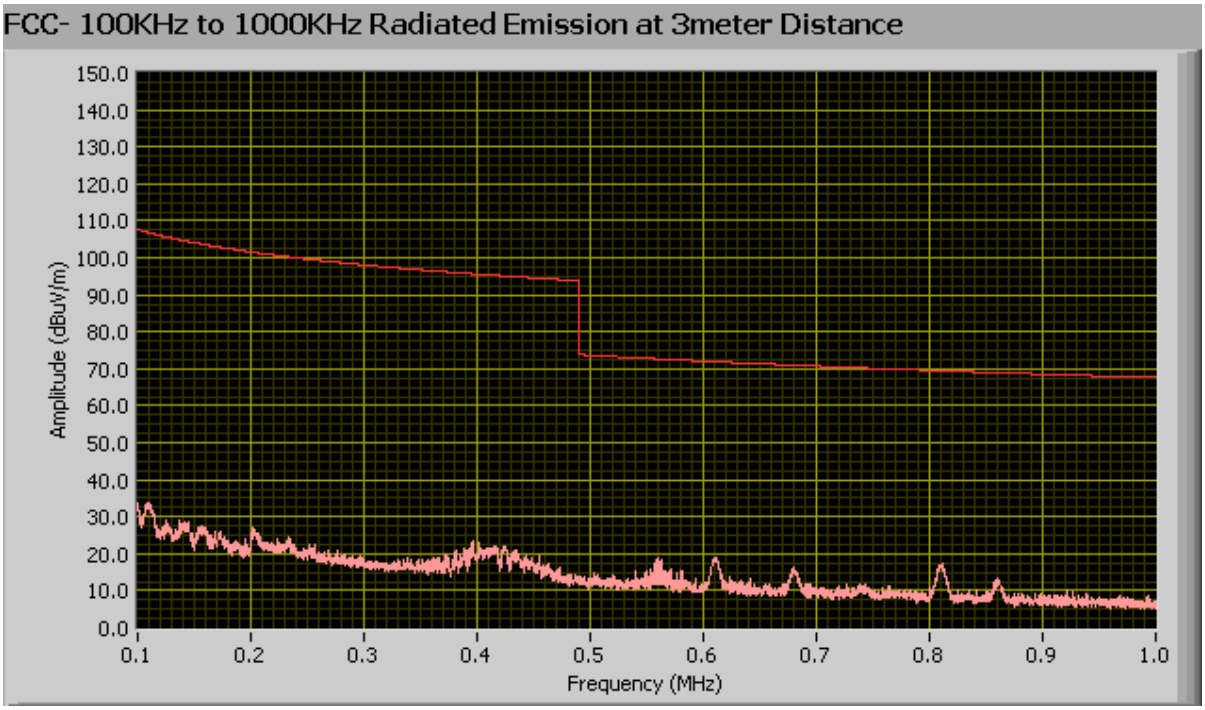
Loop Antenna at 90 degree



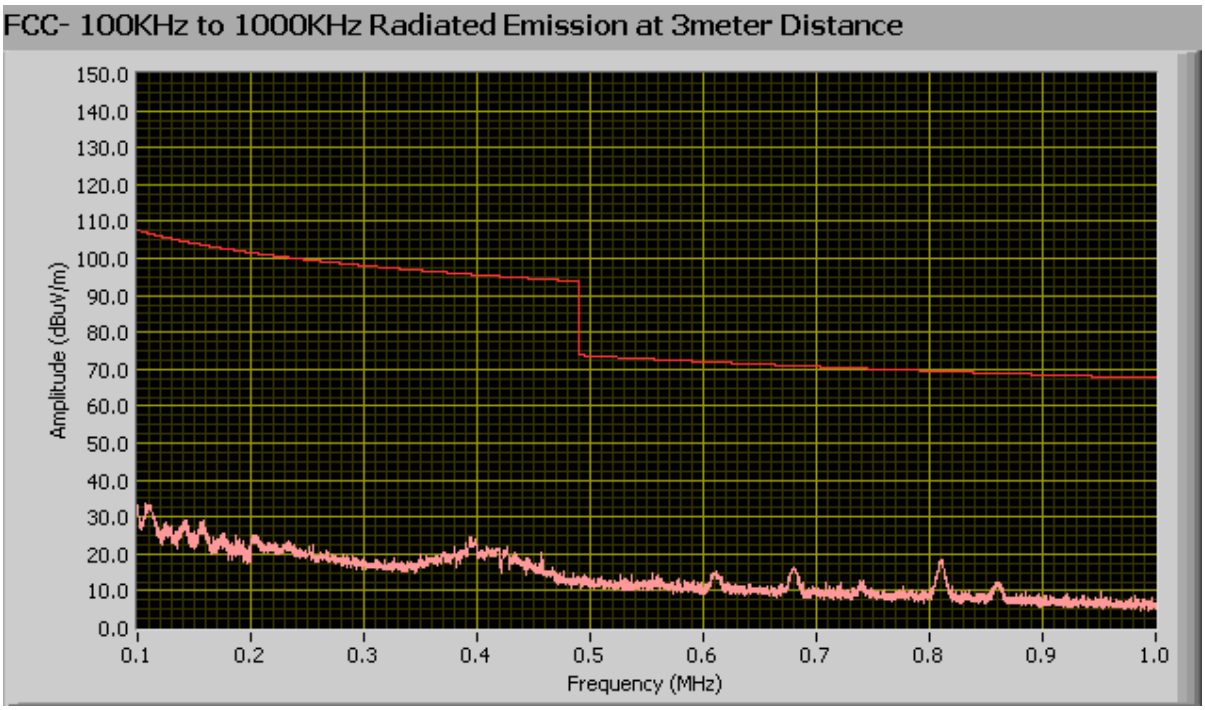
Model:X001900-5121SDI RFID reader

Loop Antenna at 0 degree

General Emission Limit @ 3 Meter



Loop Antenna at 90 degree

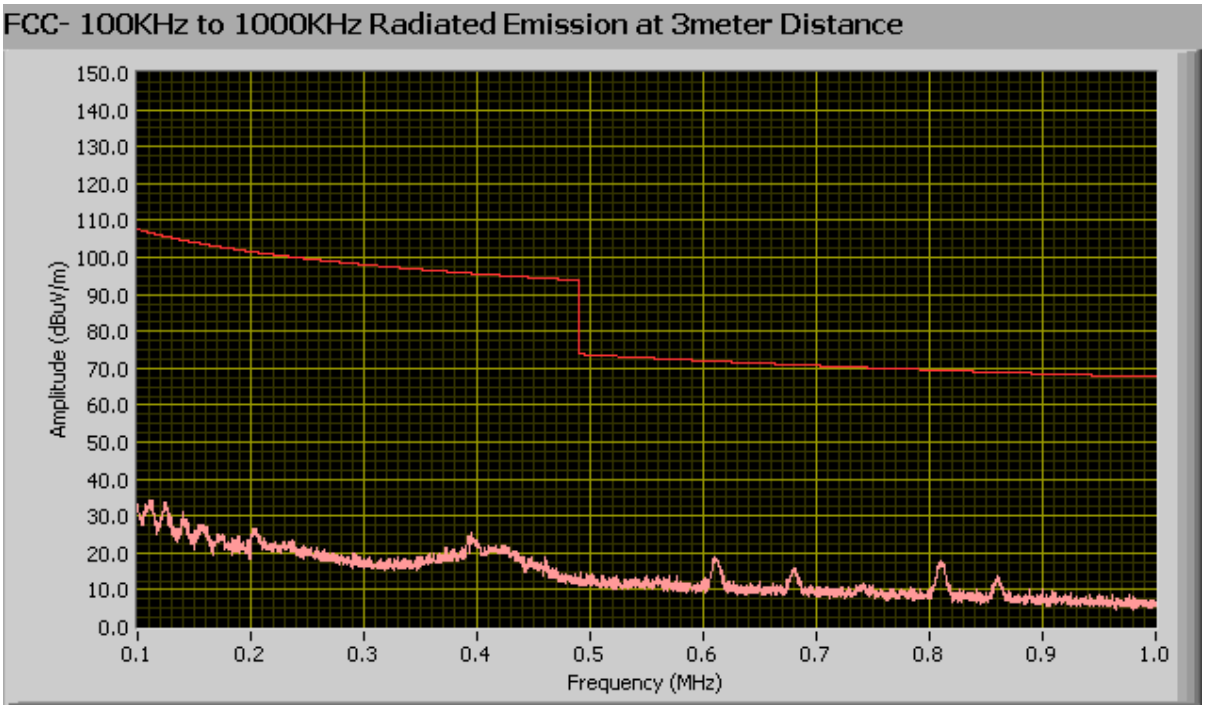


Model:X001900-5125 RFID reader(125KHz)

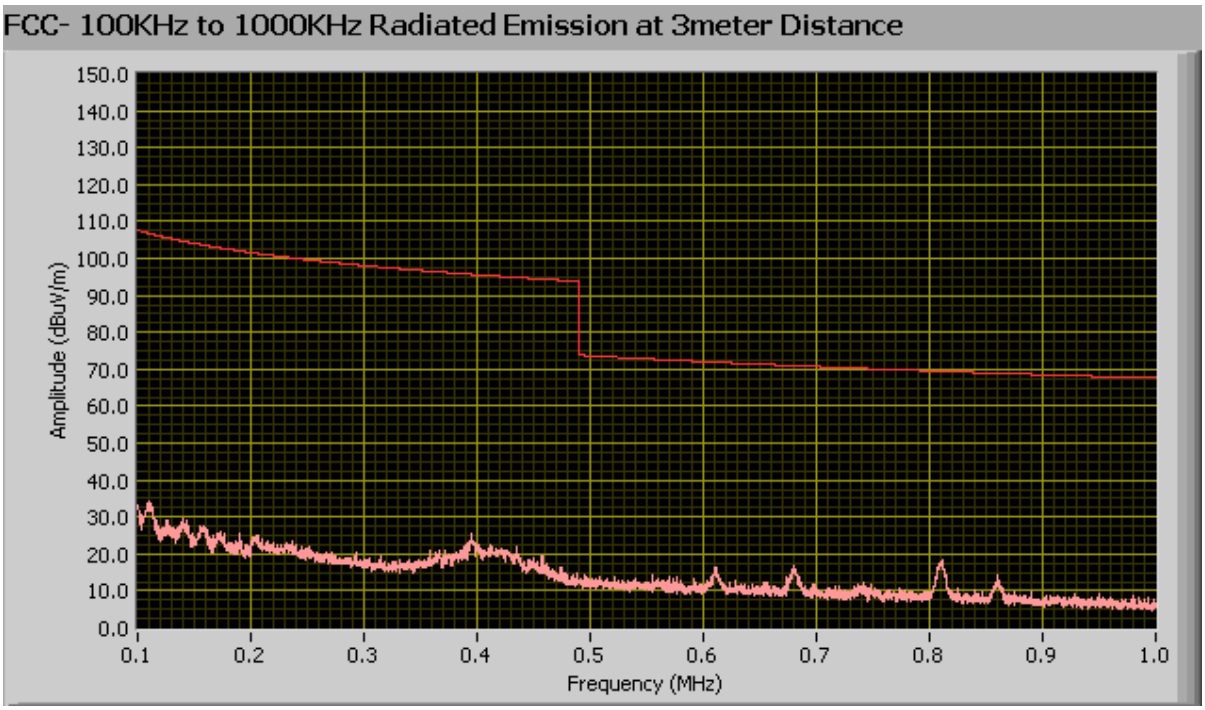
100KHz ~ 1MHz

Loop Antenna at 0 degree

General Emission Limit @ 3 Meter



Loop Antenna at 90 degree

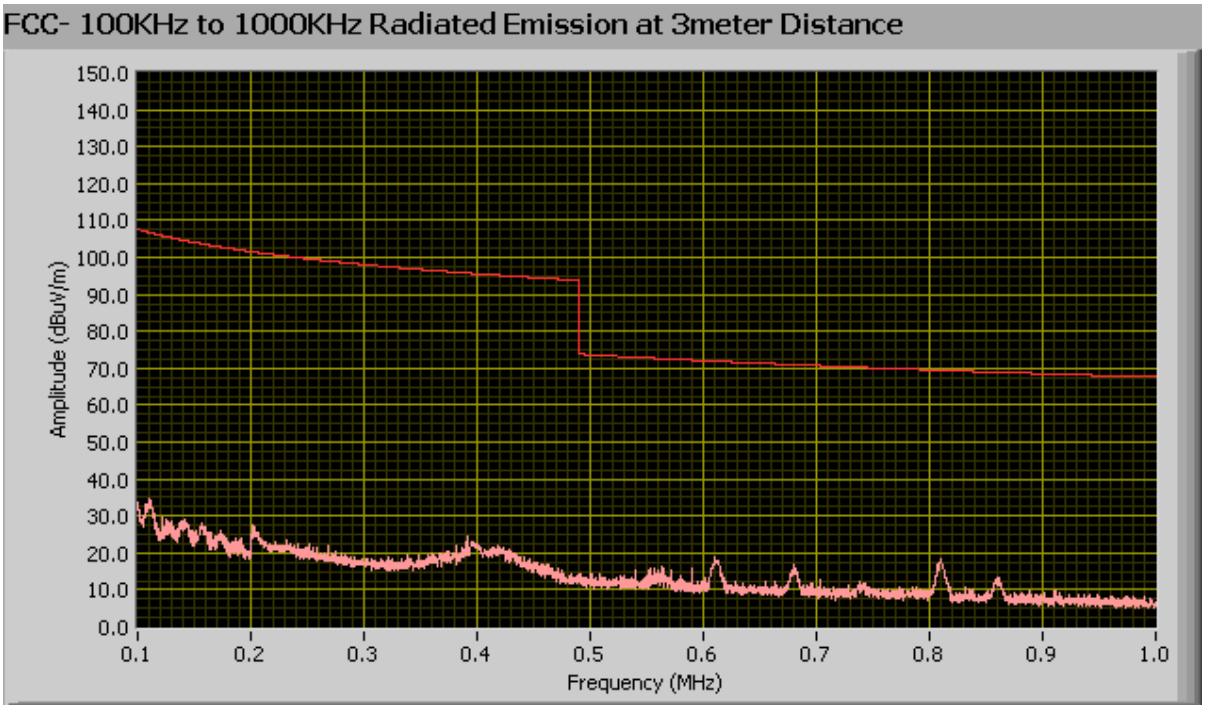


Model:X001900-Lam RFID reader

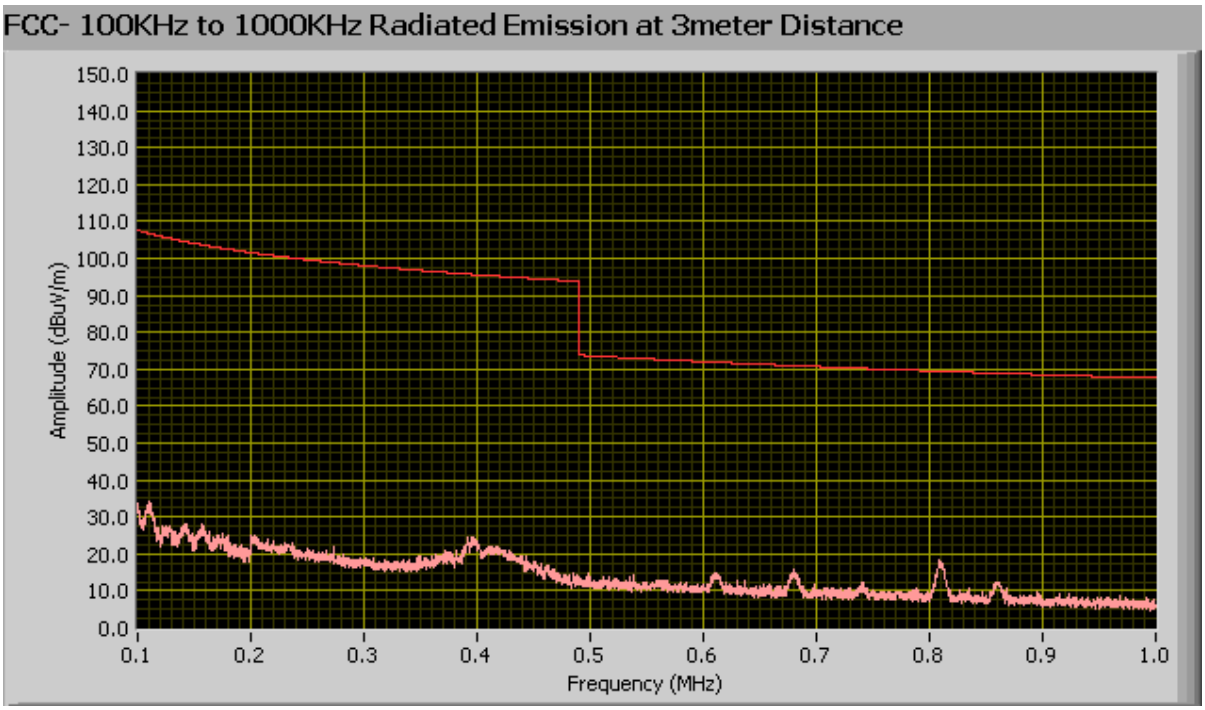
100KHz ~ 1MHz

Loop Antenna at 0 degree

General Emission Limit @ 3 Meter



Loop Antenna at 90 degree

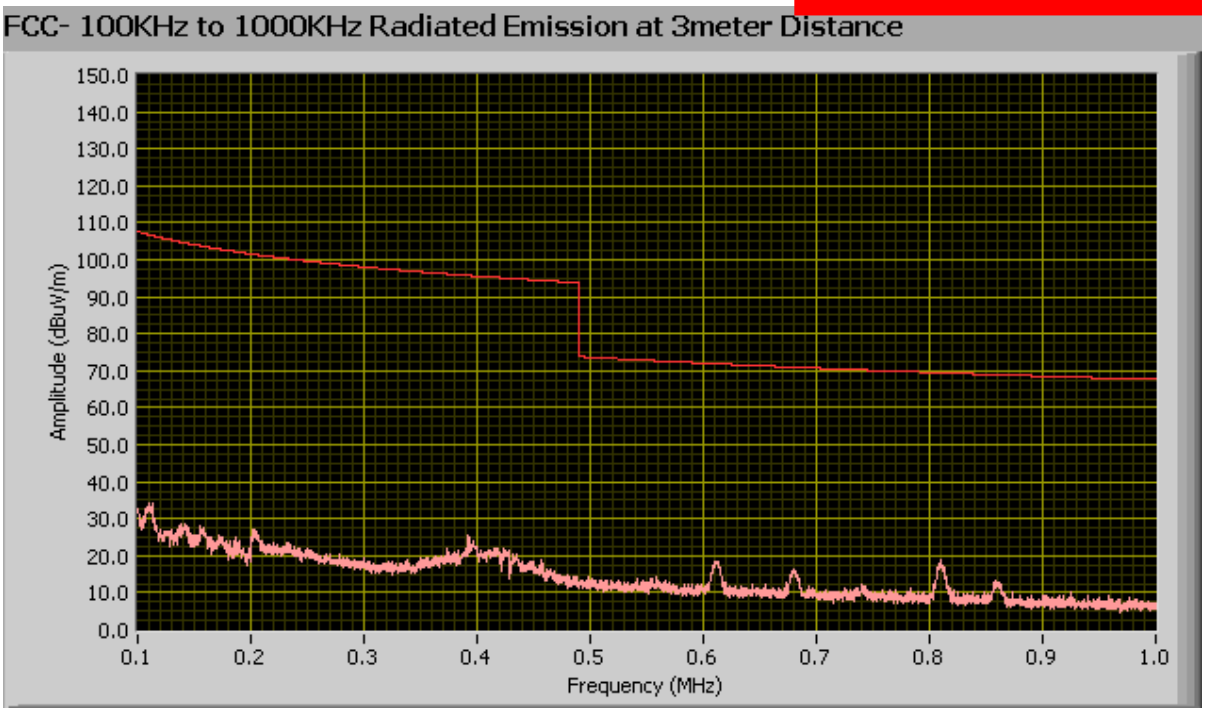


Model:X001900-Rib RFID reader

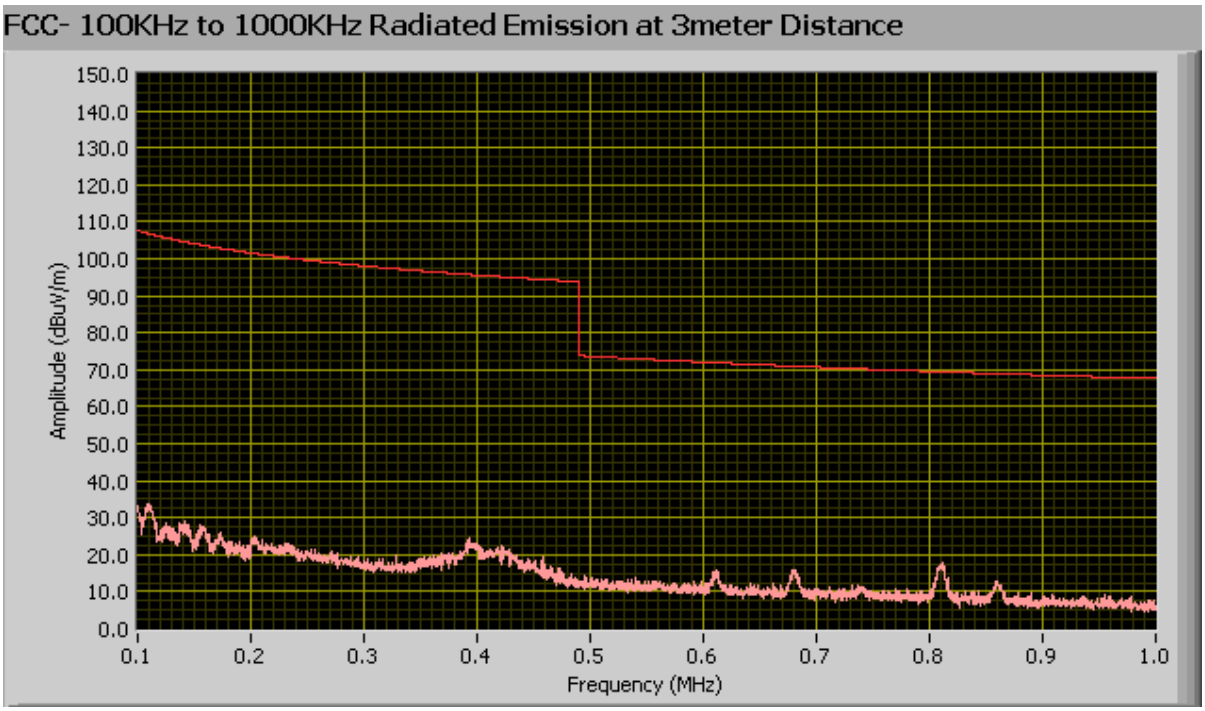
100KHz ~ 1MHz

Loop Antenna at 0 degree

General Emission Limit @ 3 Meter



Loop Antenna at 90 degree

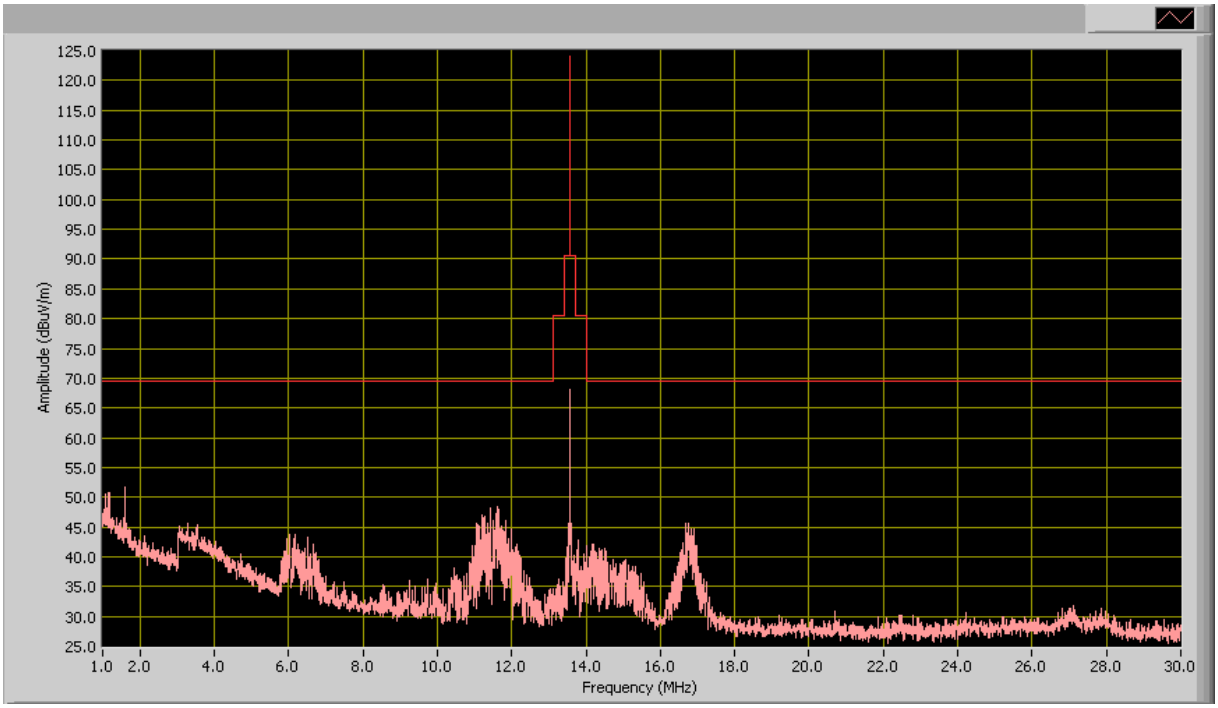


Model:X001900-5121 RFID reader

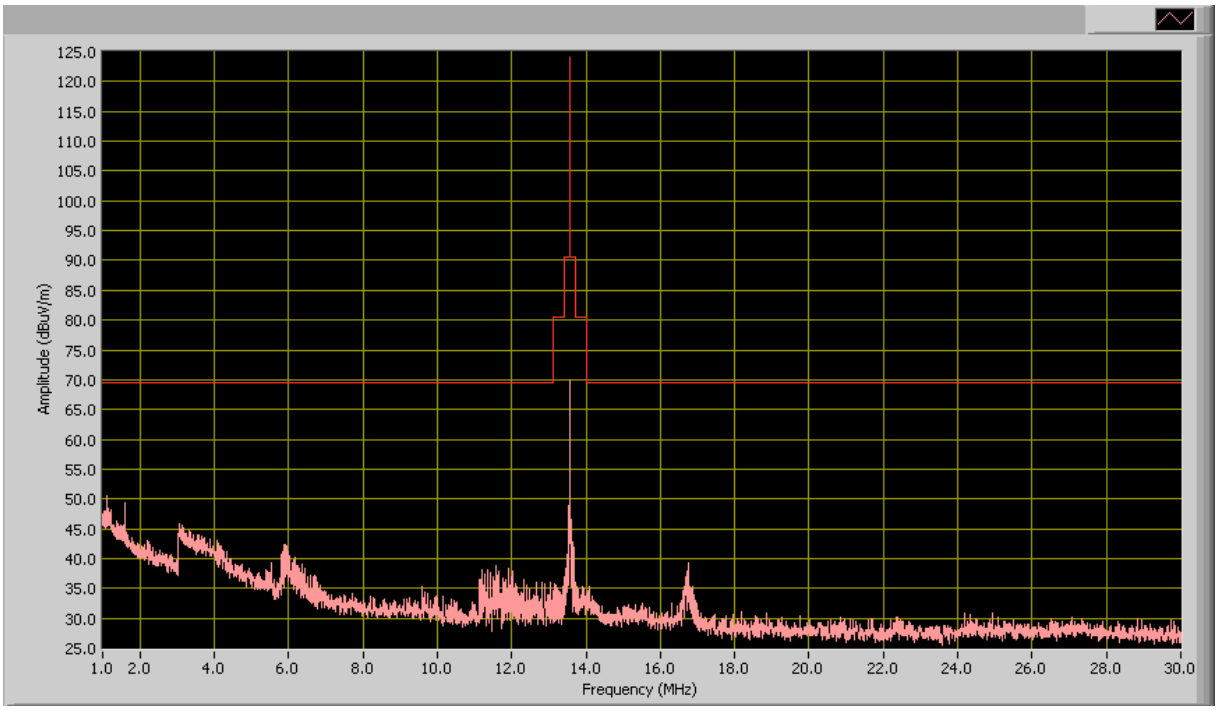
1MHz ~ 30MHz

General Emission Limit @ 3 meter

Loop Antenna at 0 degree



Loop Antenna at 90 degree

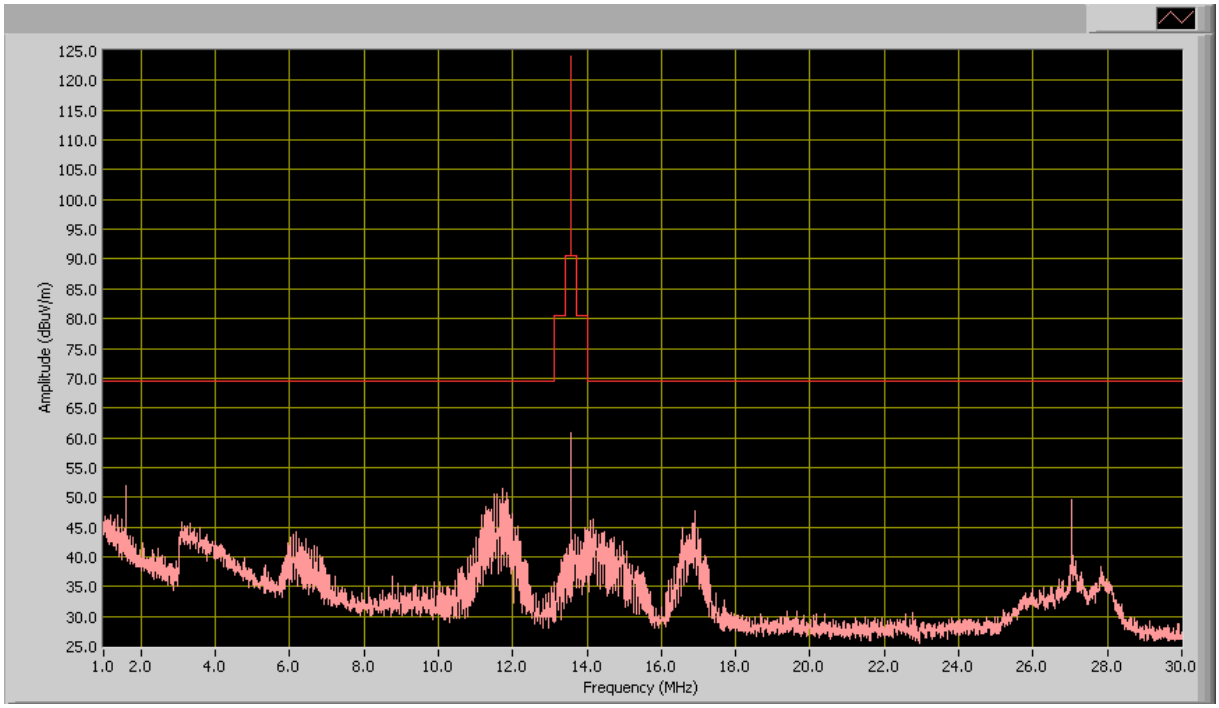


Model:X001900-5121SDI RFID reader

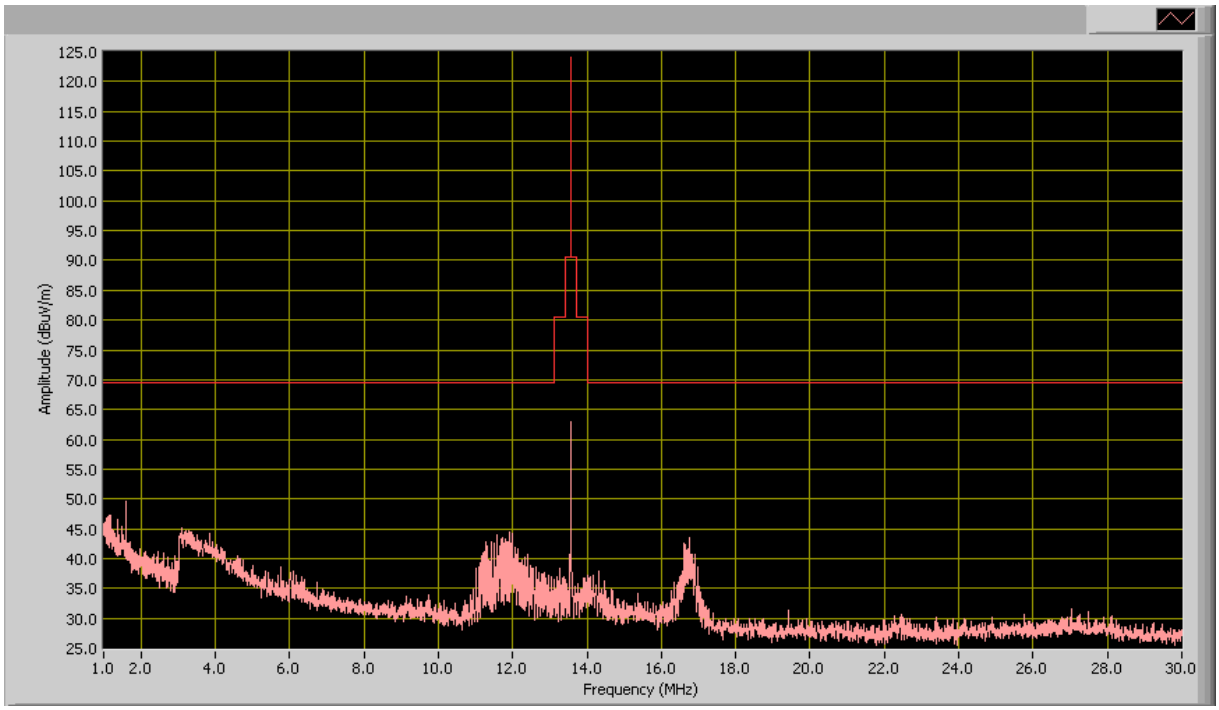
1MHz ~ 30MHz

General Emission Limit @ 3 meter

Loop Antenna at 0 degree



Loop Antenna at 90 degree

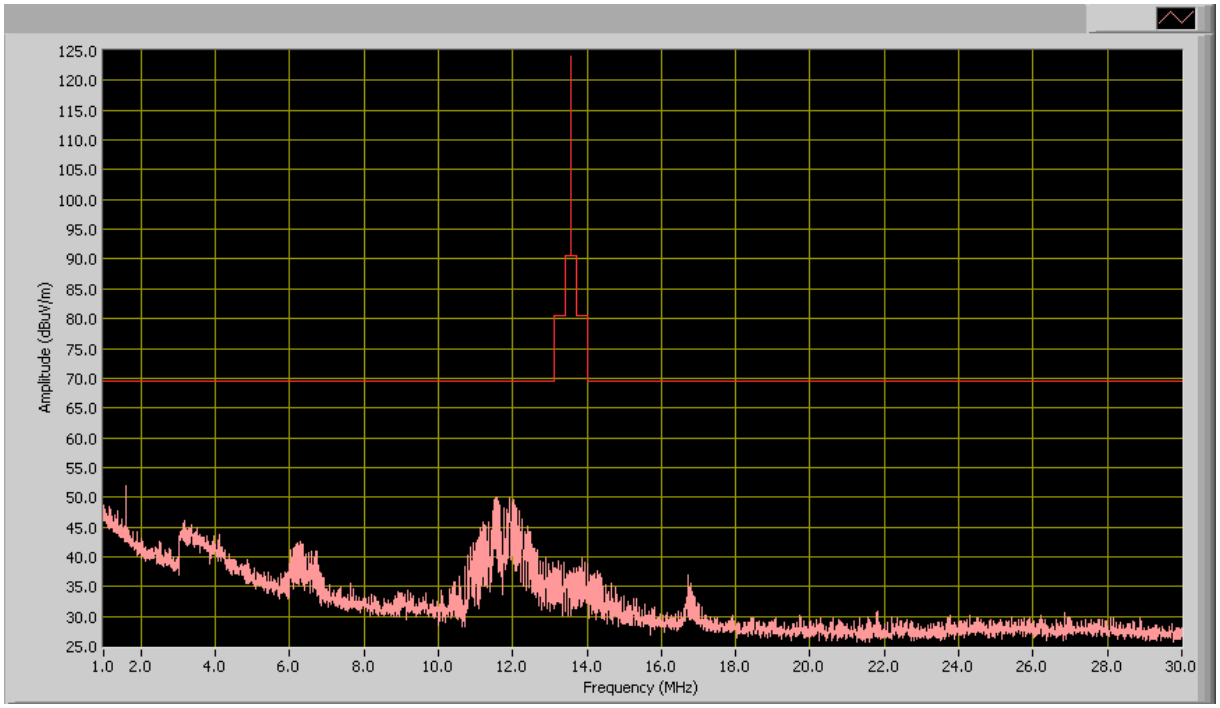


Model:X001900-5125 RFID reader

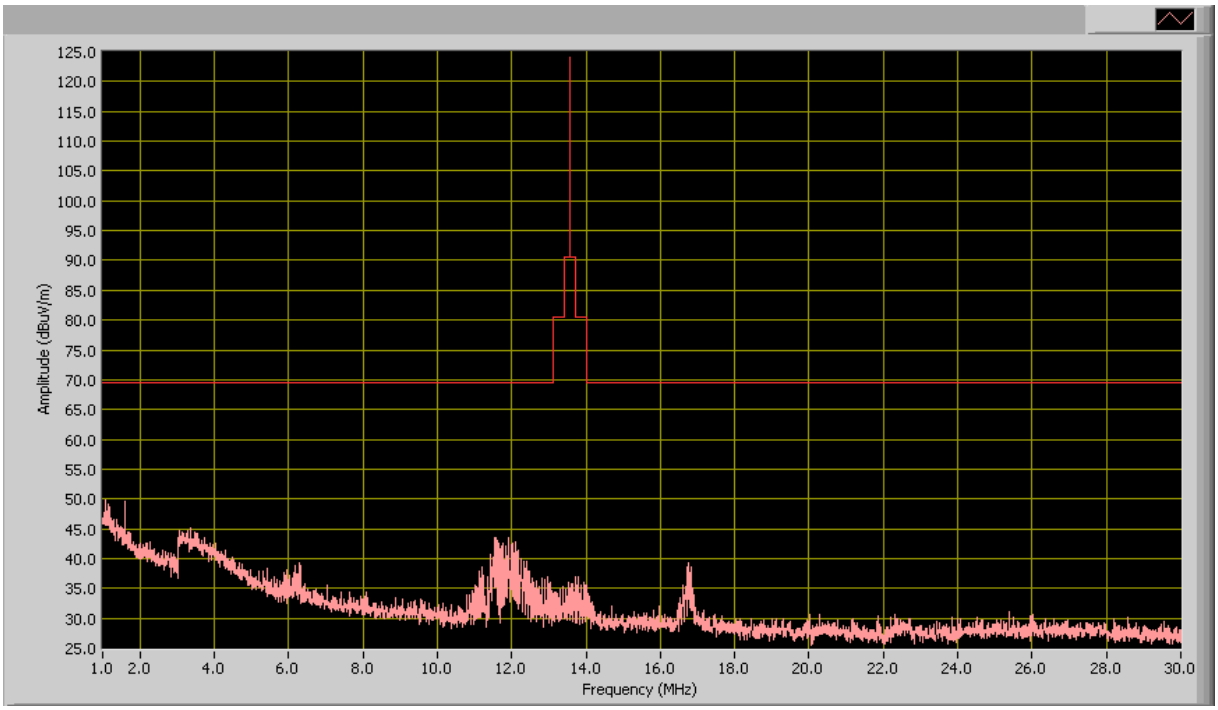
1MHz ~ 30MHz

General Emission Limit @ 3 meter

Loop Antenna at 0 degree



Loop Antenna at 90 degree

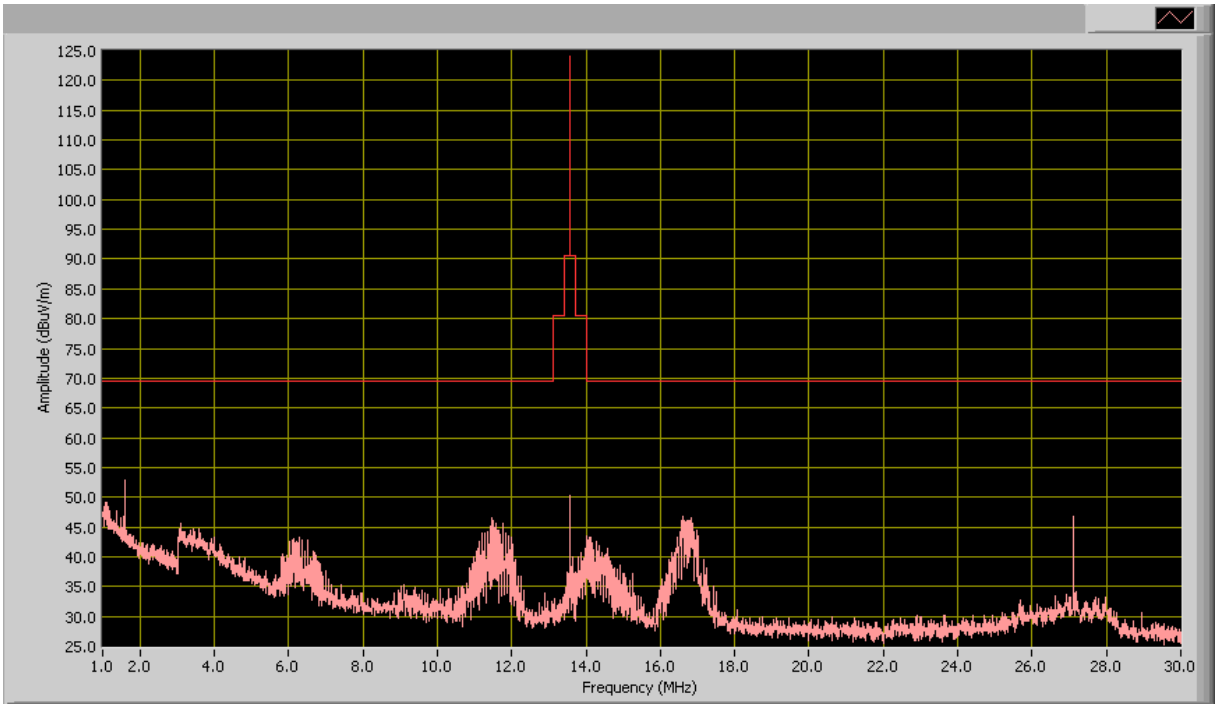


Model:X001900-Lam RFID reader

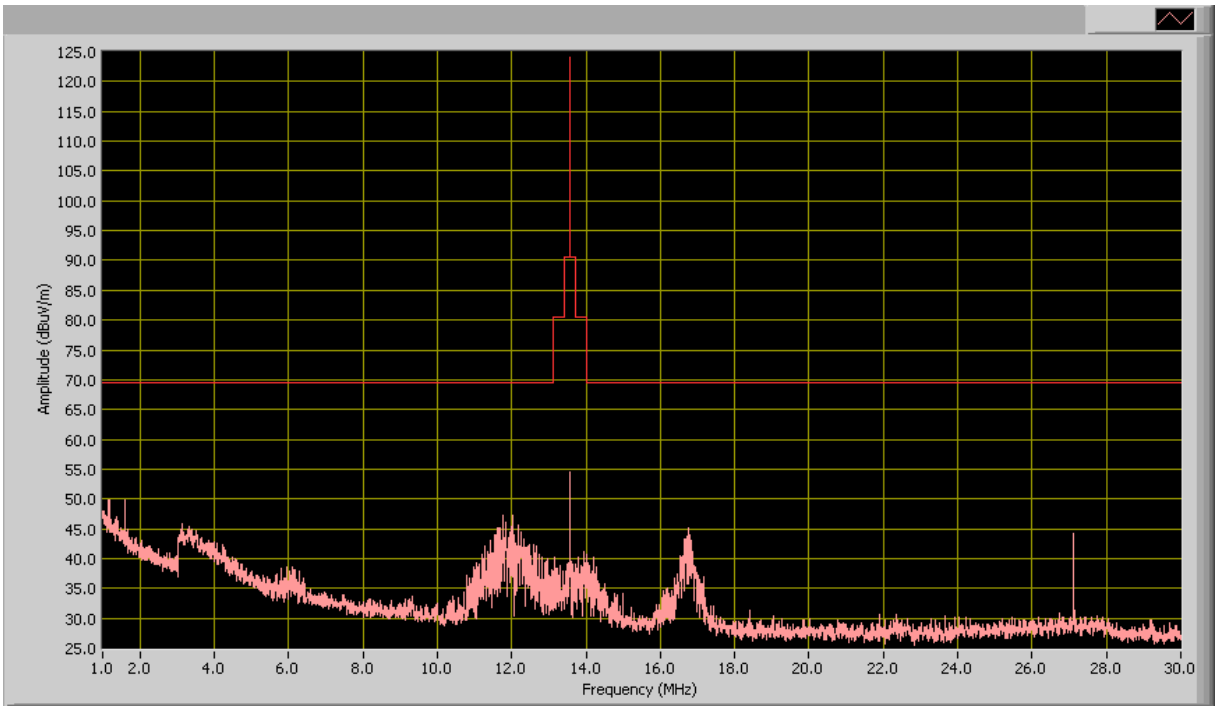
1MHz ~ 30MHz

Loop Antenna at 0 degree

General Emission Limit @ 3 meter



Loop Antenna at 90 degree

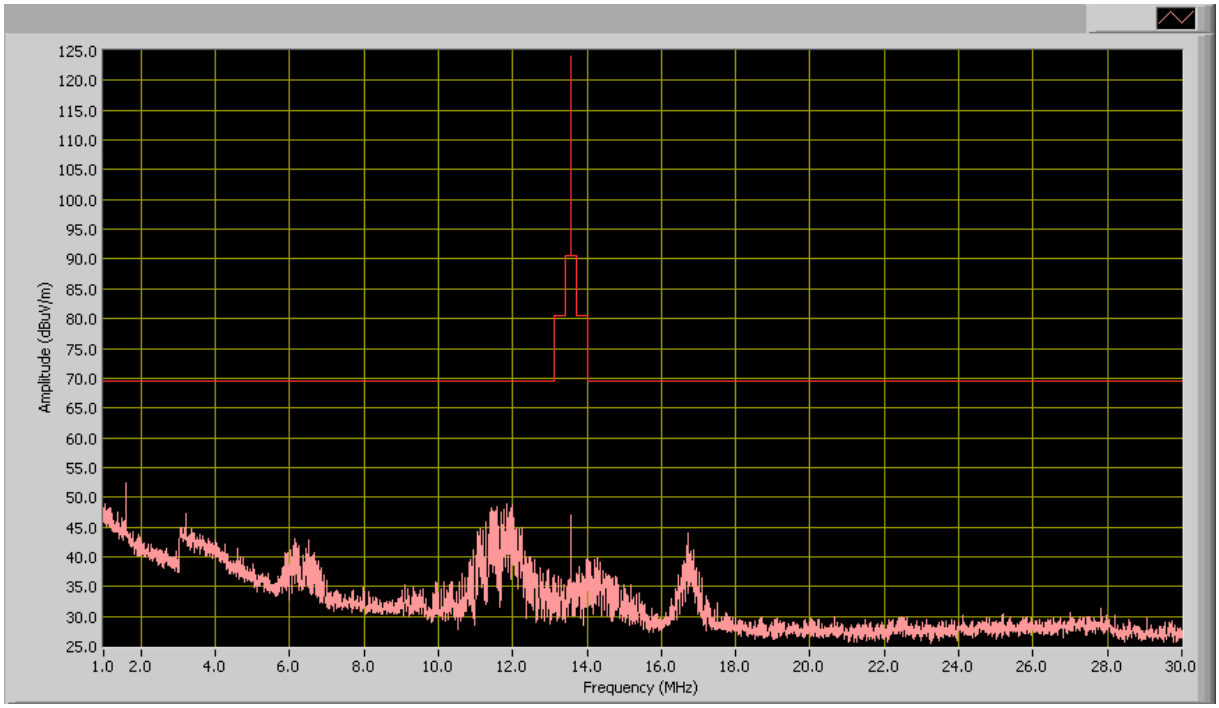


Model:X001900-Rib RFID reader

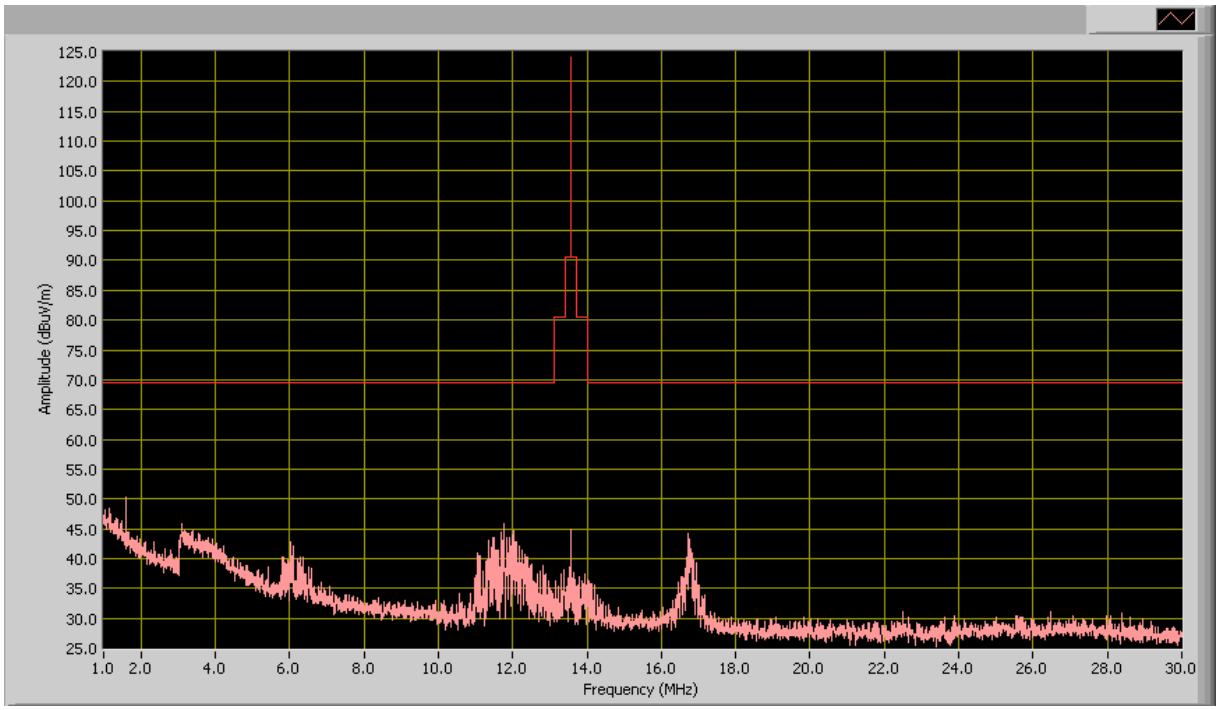
1MHz ~ 30MHz

General Emission Limit @ 3 meter

Loop Antenna at 0 degree



Loop Antenna at 90 degree



5.4 Fundamental Field Strength Test Result

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, is +/- 6dB.
4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : April 1st - May 4th 2012
Tested By : Jason Zhang

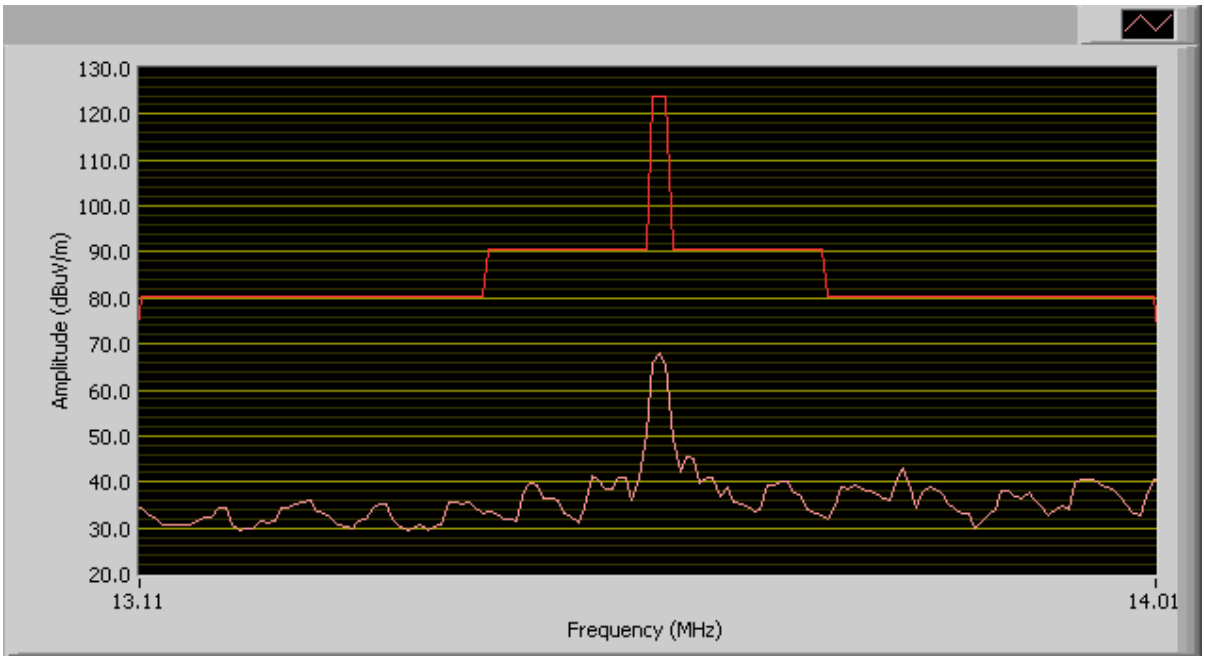
Test Requirement:

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Test Plot for X001900-5121 E-card 13.56MHz RFID Radio Reader Module

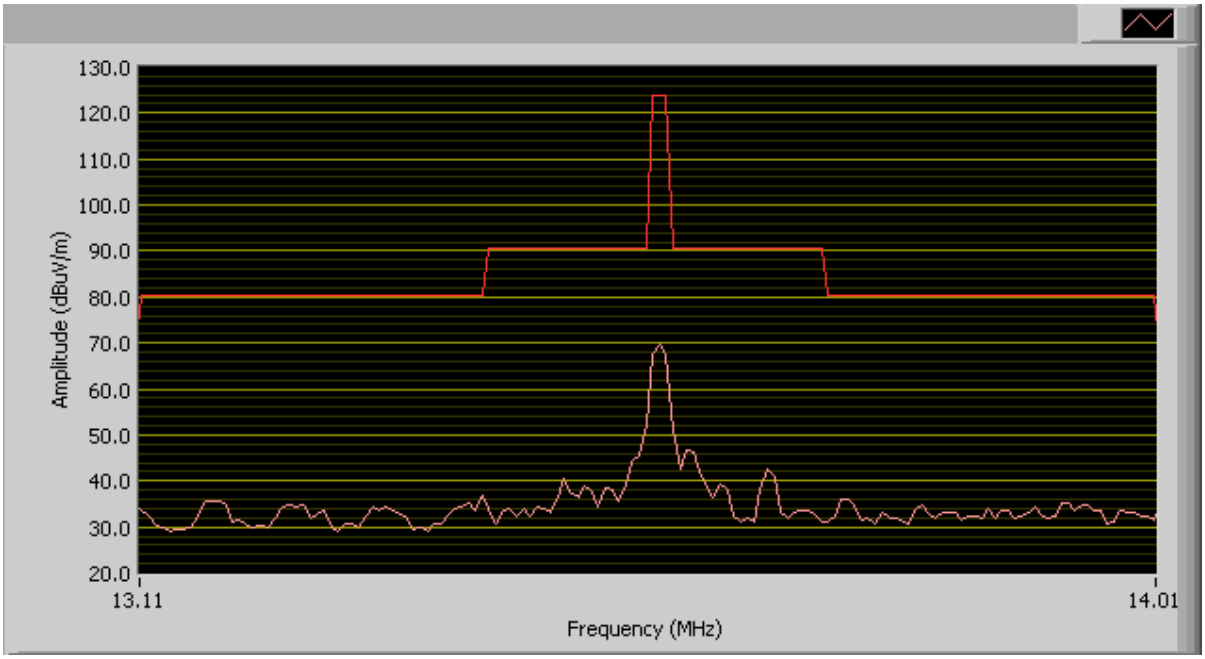
Loop Antenna at 0 degree

General Emission Limit @ 3 meter



Frequency(MHz)	Amplitude(dBuV/m)
13.563	67.98

Loop Antenna at 90 degree

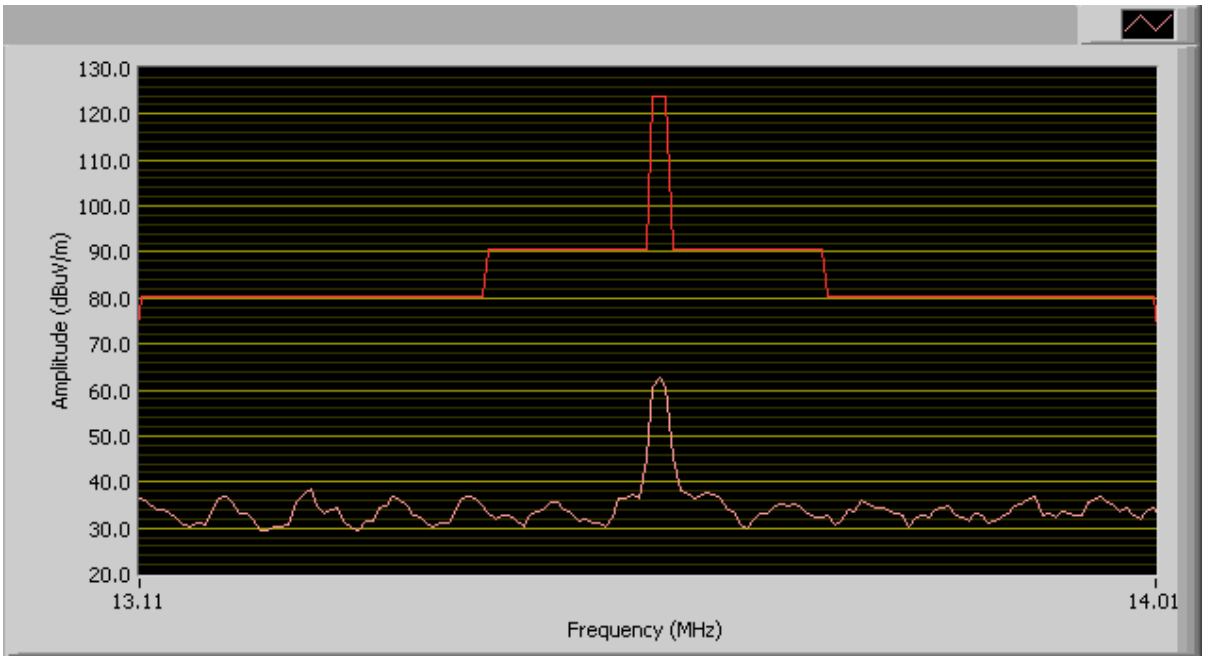


Frequency(MHz)	Amplitude(dBuV/m)
13.563	69.85

Test Plot for X001900-5121SDI E-card 13.56MHz RFID Radio Reader Module

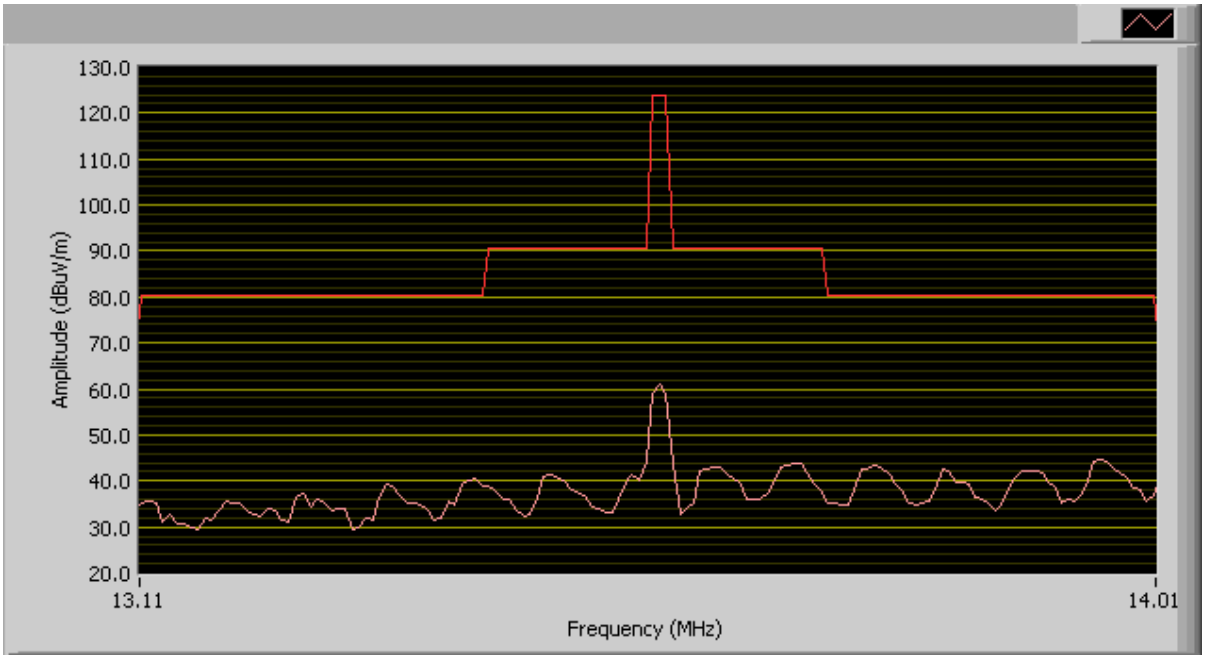
Loop Antenna at 0 degree

General Emission Limit @ 3 meter



Frequency(MHz)	Amplitude(dBuV/m)
13.563	62.85

Loop Antenna at 90 degree



Frequency(MHz)	Amplitude(dBuV/m)
13.563	60.95

For X001900-5125 E-card 125KHz RFID Radio Reader Module

125KHz ------ The fundamental field strength should not exceed general spurious emission requirement.

Loop Antenna at 0 degree

Frequency	Measure	Ant. Height	Factor	Amplitude @ 3m	Limits @ 3m	Margin
(MHz)	(Avg/QP)	(m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)
0.125	Peak	1.00	64.76	35.65	105.67	-70.02

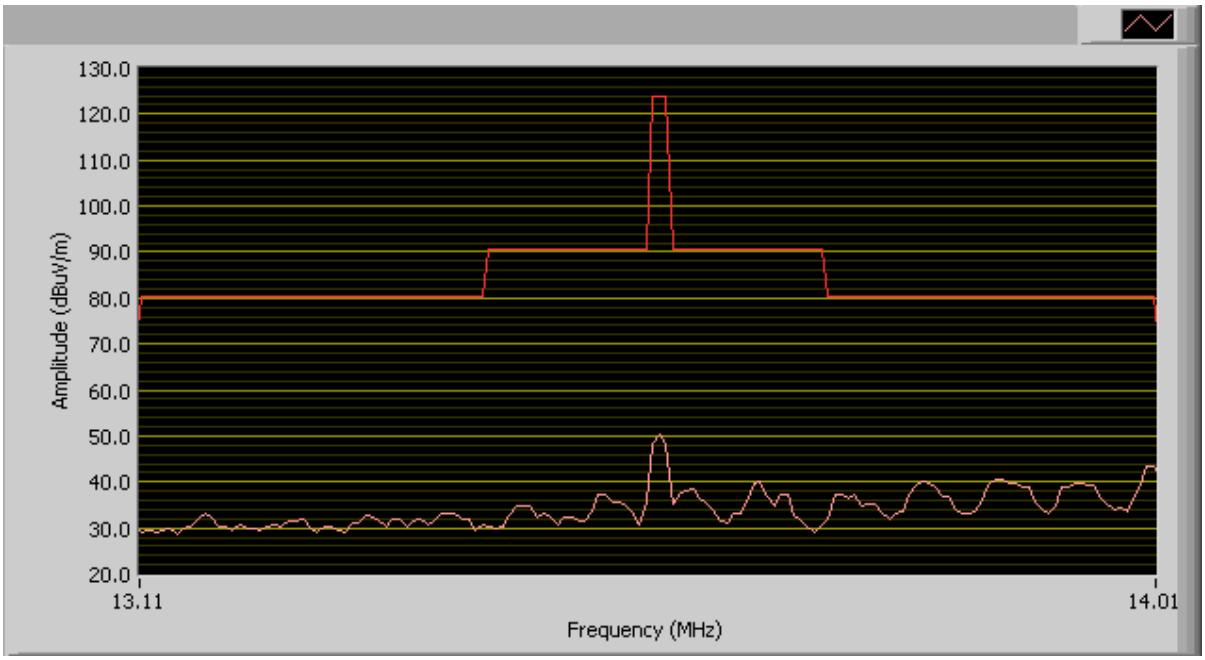
Loop Antenna at 90 degree

Frequency	Measure	Ant. Height	Factor	Amplitude @ 3m	Limits @ 3m	Margin
(MHz)	(Avg/QP)	(m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)
0.125	Peak	1.00	64.76	34.67	105.67	-71

Test Plot for X001900-Laminator RFID 13.56MHz Radio Module

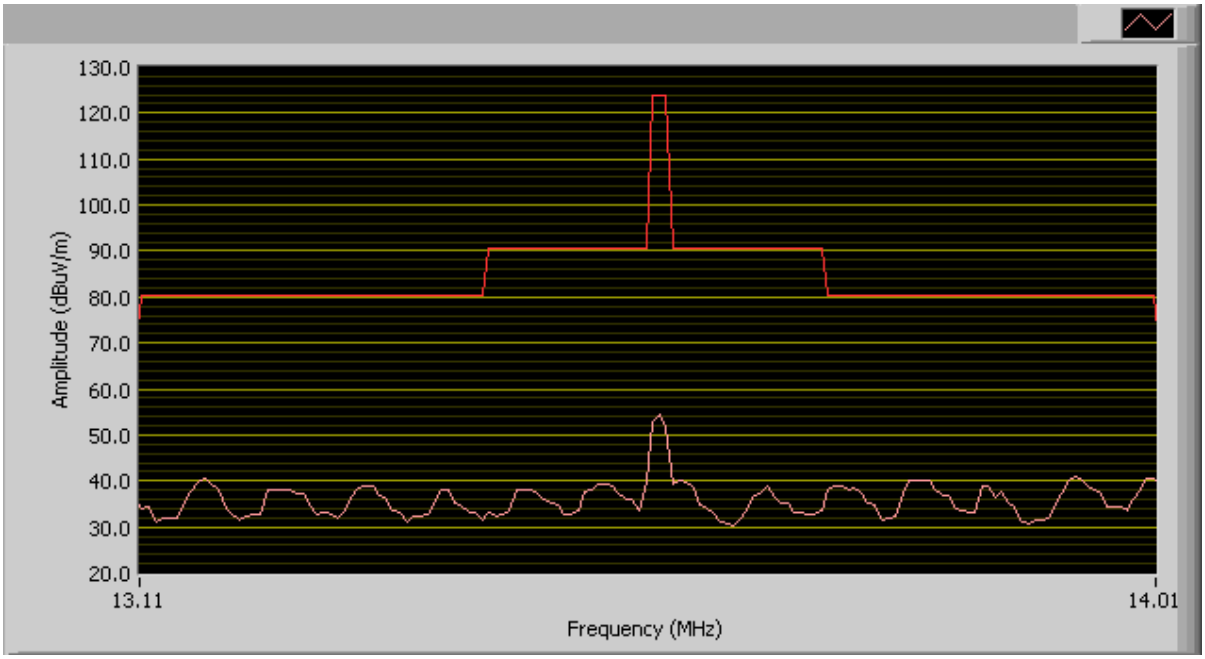
Loop Antenna at 0 degree

General Emission Limit @ 3 meter



Frequency(MHz)	Amplitude(dBuV/m)
13.563	50.34

Loop Antenna at 90 degree

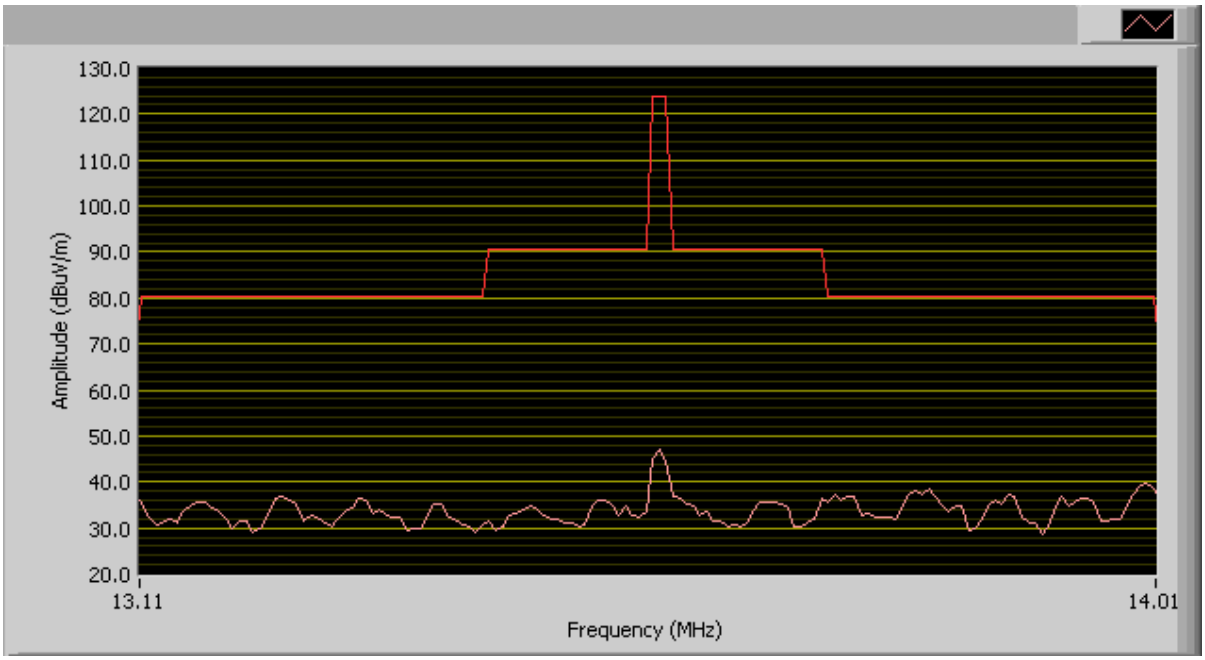


Frequency(MHz)	Amplitude(dBuV/m)
13.563	54.59

Test Plot for X001900-Ribbon RFID 13.56MHz Radio Module

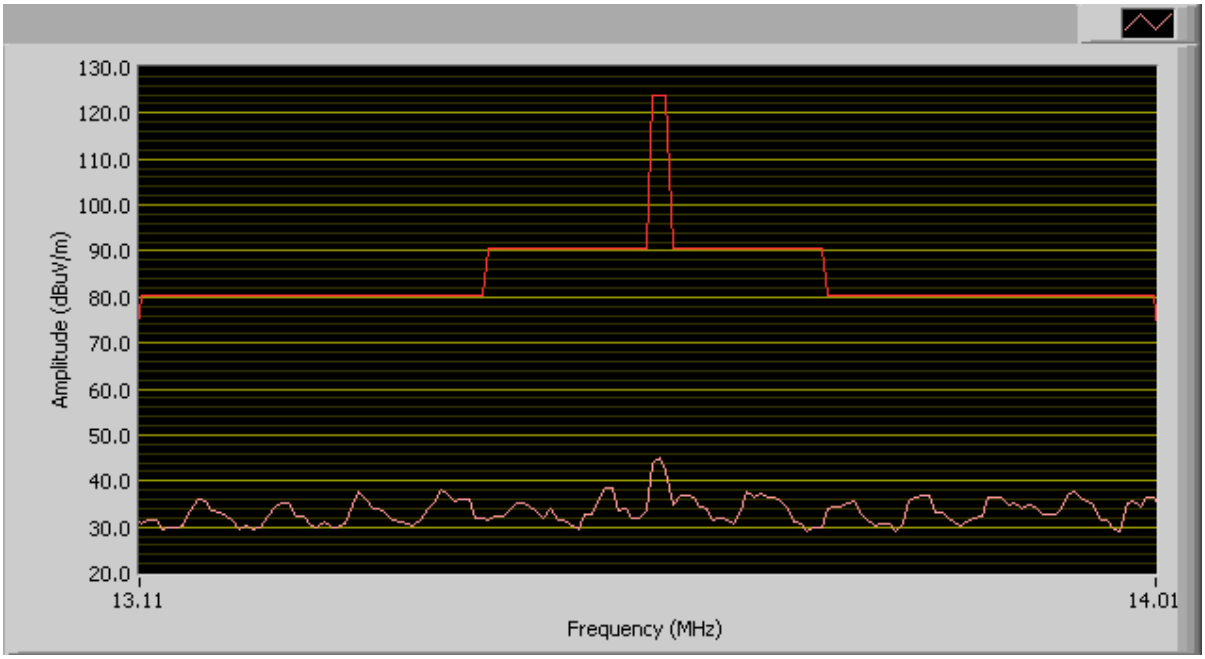
Loop Antenna at 0 degree

General Emission Limit @ 3 meter



Frequency(MHz)	Amplitude(dBuV/m)
13.563	46.99

Loop Antenna at 90 degree



Frequency(MHz)	Amplitude(dBuV/m)
13.563	44.99

5.5 Frequency Stability

Requirement(s): 47 CFR §15.225(e) & RSS-210 (A2.6)

Procedures: Frequency Stability was measured according to 47 CFR §2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.

Limit: ±0.01% of 13.56 MHz = 1356 Hz, ±0.01% of 125 kHz = 125 Hz

Environmental Conditions	Temperature	23°C
	Relative Humidity	50%
	Atmospheric Pressure	1019mbar

Test Date : April 1st -May 4th 2012
Tested By : Jason Zhang

Results: Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01% of the operating frequency over a temperature variation of -20ºC to +50ºC at normal supply voltage.

Test Result for X001900-5121 E-card 13.56MHz RFID Radio Reader Module

Reference Frequency: 13.56076MHz at -20°C and +50ºC

Temperature (ºC)	voltage (V)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	120VAC	13.56071	-0.05	1.356KHz	Pass
40	120VAC	13.56076	0.00	1.356KHz	Pass
30	120VAC	13.56080	0.04	1.356KHz	Pass
20	120VAC	13.56076(Reference Frequency)			
10	120VAC	13.56078	0.02	1.356KHz	Pass
0	120VAC	13.56078	0.02	1.356KHz	Pass
-10	120VAC	13.56076	0.00	1.356KHz	Pass
-20	120VAC	13.56080	0.04	1.356KHz	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Carrier Frequency: 13.56076MHz at 20°C at 120VAC

Measured Voltage ±15% of nominal (AC)	Temperature (ºC)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
120	20.0	13.56076(Reference Frequency)			
102	20.0	13.56073	-0.03	1.356KHz	Pass
138	20.0	13.56078	0.02	1.356KHz	Pass

Test Result for X001900-5121SDI E-card 13.56MHz RFID Radio Reader Module

Reference Frequency: 13.56078MHz at -20°C and +50ºC

Temperature (ºC)	voltage (V)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	120VAC	13.56072	-0.06	1.356KHz	Pass
40	120VAC	13.56071	-0.07	1.356KHz	Pass
30	120VAC	13.56078	0.00	1.356KHz	Pass
20	120VAC	13.56078(Reference Frequency)			
10	120VAC	13.56074	-0.04	1.356KHz	Pass
0	120VAC	13.56075	-0.03	1.356KHz	Pass
-10	120VAC	13.56078	0.00	1.356KHz	Pass
-20	120VAC	13.56077	-0.01	1.356KHz	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Carrier Frequency: 13.56076MHz at 20°C at 120VAC

Measured Voltage ±15% of nominal (AC)	Temperature (ºC)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
120	20.0	13.56078(Reference Frequency)			
102	20.0	13.56073	-0.05	1.356KHz	Pass
138	20.0	13.56079	0.01	1.356KHz	Pass

Test Result for X001900-Laminator E-card 13.56MHz RFID Radio Reader Module

Reference Frequency: 13.56067MHz at -20°C and +50ºC

Temperature (ºC)	voltage (V)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	120VAC	13.56070	0.03	1.356KHz	Pass
40	120VAC	13.56066	-0.01	1.356KHz	Pass
30	120VAC	13.56067	0.00	1.356KHz	Pass
20	120VAC	13.56067(Reference Frequency)			
10	120VAC	13.56066	-0.01	1.356KHz	Pass
0	120VAC	13.56071	0.04	1.356KHz	Pass
-10	120VAC	13.56071	0.04	1.356KHz	Pass
-20	120VAC	13.56070	0.03	1.356KHz	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Carrier Frequency: 13.56076MHz at 20°C at 120VAC

Measured Voltage ±15% of nominal (AC)	Temperature (ºC)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
120	20.0	13.56067(Reference Frequency)			
102	20.0	13.56066	-0.01	1.356KHz	Pass
138	20.0	13.56067	0.00	1.356KHz	Pass

Test Result for X001900-Ribbon E-card 13.56MHz RFID Radio Reader Module

Reference Frequency: 13.56070MHz at -20°C and +50ºC

Temperature (ºC)	voltage (V)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	120VAC	13.56070	0.00	1.356KHz	Pass
40	120VAC	13.56068	-0.02	1.356KHz	Pass
30	120VAC	13.56067	-0.03	1.356KHz	Pass
20	120VAC	13.56070(Reference Frequency)			
10	120VAC	13.56068	-0.02	1.356KHz	Pass
0	120VAC	13.56073	0.03	1.356KHz	Pass
-10	120VAC	13.56075	0.05	1.356KHz	Pass
-20	120VAC	13.56073	0.03	1.356KHz	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Carrier Frequency: 13.56076MHz at 20°C at 120VAC

Measured Voltage ±15% of nominal (AC)	Temperature (ºC)	Measured Freq. (MHz)	Freq. Drift (KHz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
120	20.0	13.56070(Reference Frequency)			
102	20.0	13.56066	-0.04	1.356KHz	Pass
138	20.0	13.56071	0.01	1.356KHz	Pass

Test Result for X001900-5125 E-card 125KHz RFID Radio Reader Module

Reference Frequency: 125.025KHz at -20°C and +50ºC

Temperature (ºC)	voltage (V)	Measured Freq. (KHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	120VAC	124.955	-70	125Hz	Pass
40	120VAC	124.960	-65	125Hz	Pass
30	120VAC	124.977	-48	125Hz	Pass
20	120VAC	125.025(Reference Frequency)			
10	120VAC	124.976	-49	125Hz	Pass
0	120VAC	124.950	-75	125Hz	Pass
-10	120VAC	124.959	-66	125Hz	Pass
-20	120VAC	124.949	-76	125Hz	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within ± 0.01%, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20ºC environmental temperature.

Carrier Frequency: 13.56076MHz at 20°C at 120VAC

Measured Voltage ±15% of nominal (AC)	Temperature (ºC)	Measured Freq. (KHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
120	20.0	125.025(Reference Frequency)			
102	20.0	125.010	-15	125Hz	Pass
138	20.0	125.020	-5	125Hz	Pass

5.6 Occupied Bandwidth

Requirement(s): RSS Gen (4.3)

Procedures: Occupied Bandwidth was measured according to RSS Gen (4.3). Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz.

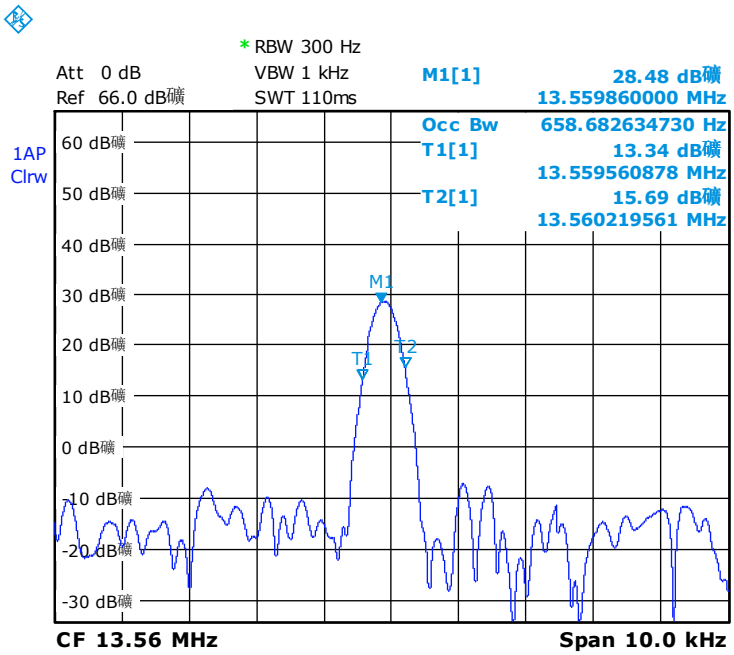
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, is +/- 6dB.
4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : April 1st -May 4th 2010
Tested By : Jason Zhang

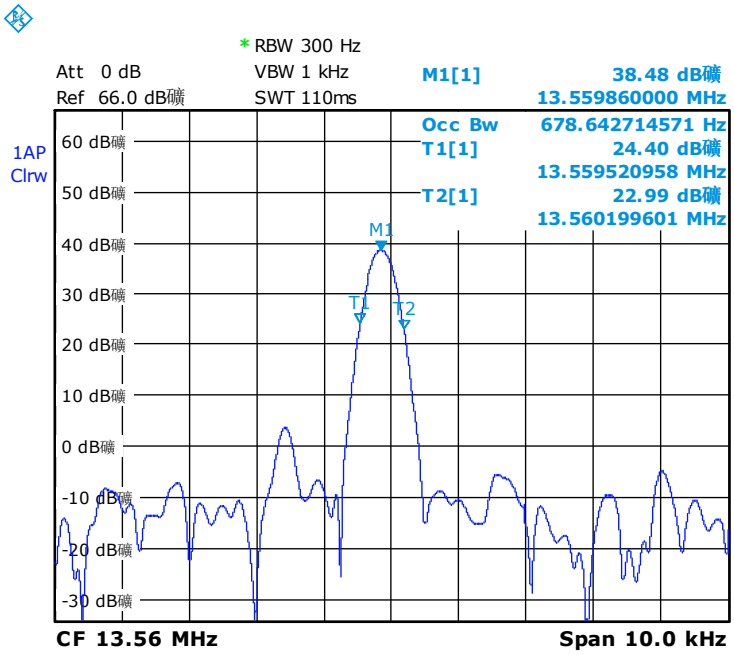
Results: Pass

Plots: X001900-5121 (E-card 13.56MHz RFID Radio Reader Module)



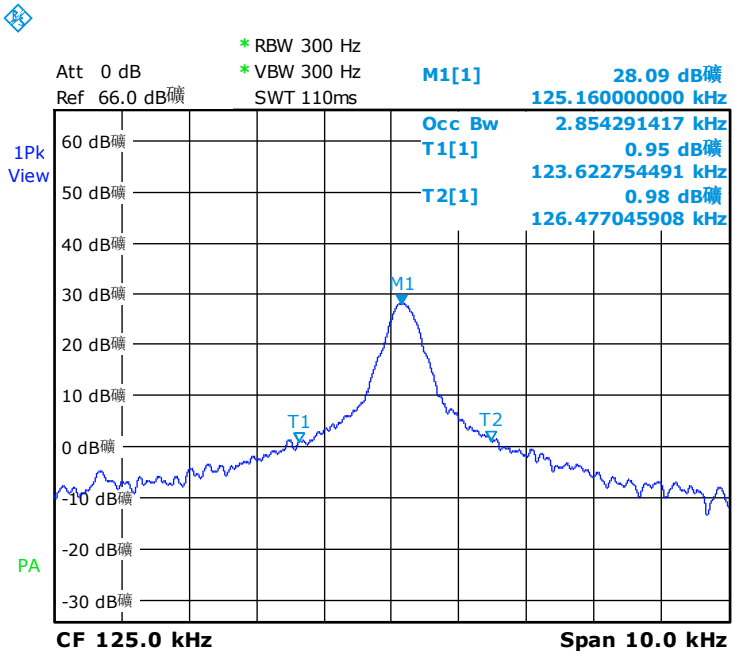
Date: 2.MAY.2012 17:00:27

Plots: X001900-5121SDI (E-card 13.56MHz RFID Radio Reader Module)



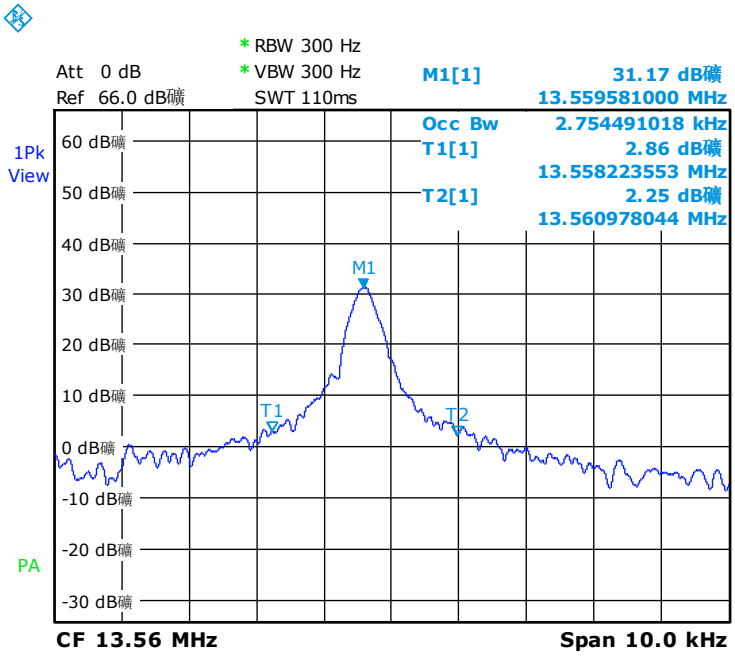
Date: 2.MAY.2012 17:02:29

Plots: X001900-5125 (E-card 125KHz RFID Radio Reader Module)



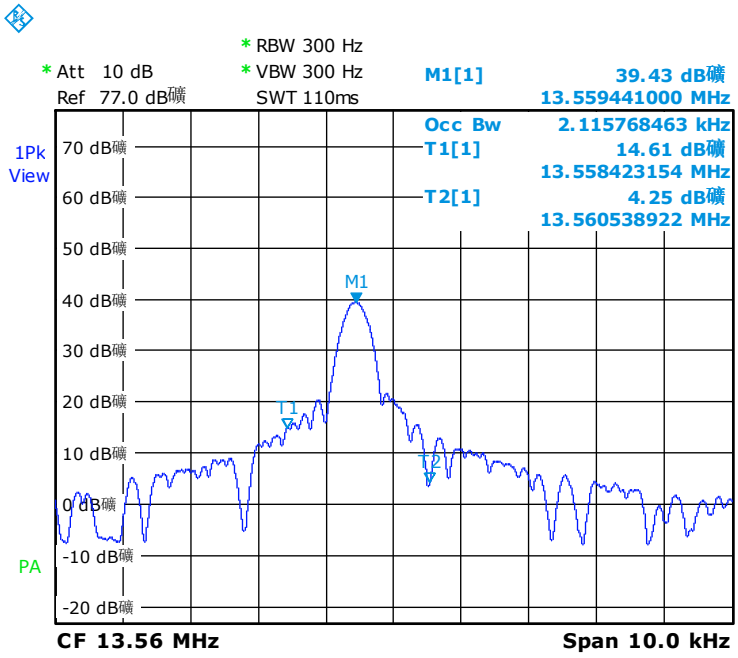
Date: 2.MAY.2012 17:22:14

Plots: X001900-Ribbon (E-card 13.56MHz RFID Radio Reader Module)



Date: 2.MAY.2012 17:10:53

Plots: X001900-Laminator (E-card 13.56MHz RFID Radio Reader Module)



Date: 4.MAY.2012 17:42:45

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Serial #	Calibration Date	Calibration Due	Calibrate Cycle
CONDUCTED EMISSIONS					
R & S Receiver	ESIB 40	100179	05/19/2011	05/19/2012	1year
R&S LISN	ESH2-Z5	861741/013	05/18/2011	05/18/2012	1year
CHASE LISN	MN2050B	1018	05/18/2011	05/18/2012	1year
Sekonic Hygro Hermograph	ST-50	HE01-000092	06/04/2011	06/04/2012	1year
Radiated Emissions					
R & S Receiver	ESIB 40	100179	05/19/2011	05/19/2012	1year
Sunol Sciences, Inc. antenna (30MHz~2GHz)	JB1	A030702	06/01/2011	06/01/2012	1year
3 Meters SAC	3M	N/A	10/13/2011	10/13/2012	1year
10 Meters OATS	10M	N/A	06/17/2011	06/17/2012	1year
Sekonic Hygro Hermograph	ST-50	HE01-000092	06/04/2011	06/04/2012	1year
Test Equity Environment Chamber	1007H	61201	06/01/2011	06/01/2012	1year
Passive Loop Antenna (10kHz-30MHz)	6512	49120	08/31/2011	08/31/2012	1year
Electrostatic Discharge Immunity					
HAEFELY ESD Tester	PESD1600	H 907726	05/19/2011	05/19/2012	1year
RF Radiated Immunity					
High Power Solid State Amplifier (80MHz~1000MHz)	CMC150	M631-0408	Functional verification		
Medium Power Solid State Amplifier (0.8~4.2GHz)	S41-25	M629-0408	Functional verification		
Synthesized Signal Generator (0.1 - 6000 MHz)	8665B-008	3744A01304	05/17/2011	05/17/2012	1year
ETS Bilog Antenna	3141	1203	Functional verification		
Double Ridged Waveguide Horn Antenna (1-18GHz)	3115	10SL0060	Functional verification		
Electrical Fast Transient/Burst Immunity					
EMCPRO-PLUS Immunity Test System	EMCPRO PLUS	0802203	05/19/2011	05/19/2012	1year
Surge Immunity					
EMCPRO-PLUS Immunity Test System	EMCPRO PLUS	0802203	05/19/2011	05/19/2012	1year
Conducted Disturbance Immunity					
IFI Power Amplifier (80~1000MHz)	CMC150	M631-0408	Functional verification		
HP Signal Generator	8564E	3626A00557	05/17/2011	05/17/2012	1year
FISCHER BCI Injection Probe	F-120-3B	FISCHER BCI Injection Probe	05/17/2011	05/17/2012	1year
COM-POWER CDN	CDN M3-25	COM-POWER CDN	05/18/2011	05/18/2012	1year
COM-POWER CDN	CDN M2-25	COM-POWER CDN	05/18/2011	05/18/2012	1year
Voltage Dips Immunity					
EMCPRO-PLUS Immunity Test System	EMCPRO PLUS	0802203	05/19/2011	05/19/2012	1year

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.

2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.

3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.

4. All other supporting equipments were powered separately from another main supply.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.

2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.

3. High peaks, relative to the limit line, were then selected.

4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 KHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.

5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Sample Calculation Example

At 20 MHz limit = 250 μV = 47.96 dBμV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 1GHz (for FCC tests, until the 5th harmonic for operating frequencies ≥ 108MHz), was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred; clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table as shown in Annex B.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.

2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:

   a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b. The EUT was then rotated to the direction that gave the maximum emission.
   c. Finally, the antenna height was adjusted to the height that gave the maximum emission.

3. A Quasi-peak measurement was then made for that frequency point.

4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

5. The frequency range covered was from 30MHz to 1GHz (for FCC tests, until the 5th harmonic for operating frequencies ≥ 108MHz), using the Biconical antenna for frequencies from 30MHz to 230MHz, Log-periodical antenna for frequencies from 230MHz to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz limit = 200 μV/m = 46.00 dBμV/m

Log-periodic antenna factor & cable loss at 300 MHz = 18.50 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV/m
(Calibrated level including antenna factors & cable losses)

Therefore, Q-P margin = 46.00 – 40.00 = 6.00 i.e. **6 dB below limit**

Annex B EUT PHOTOGRAPHS

Annex B.i. Photograph 1: EUT External Photo

Please see attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

TEST SETUP

Please see attachment

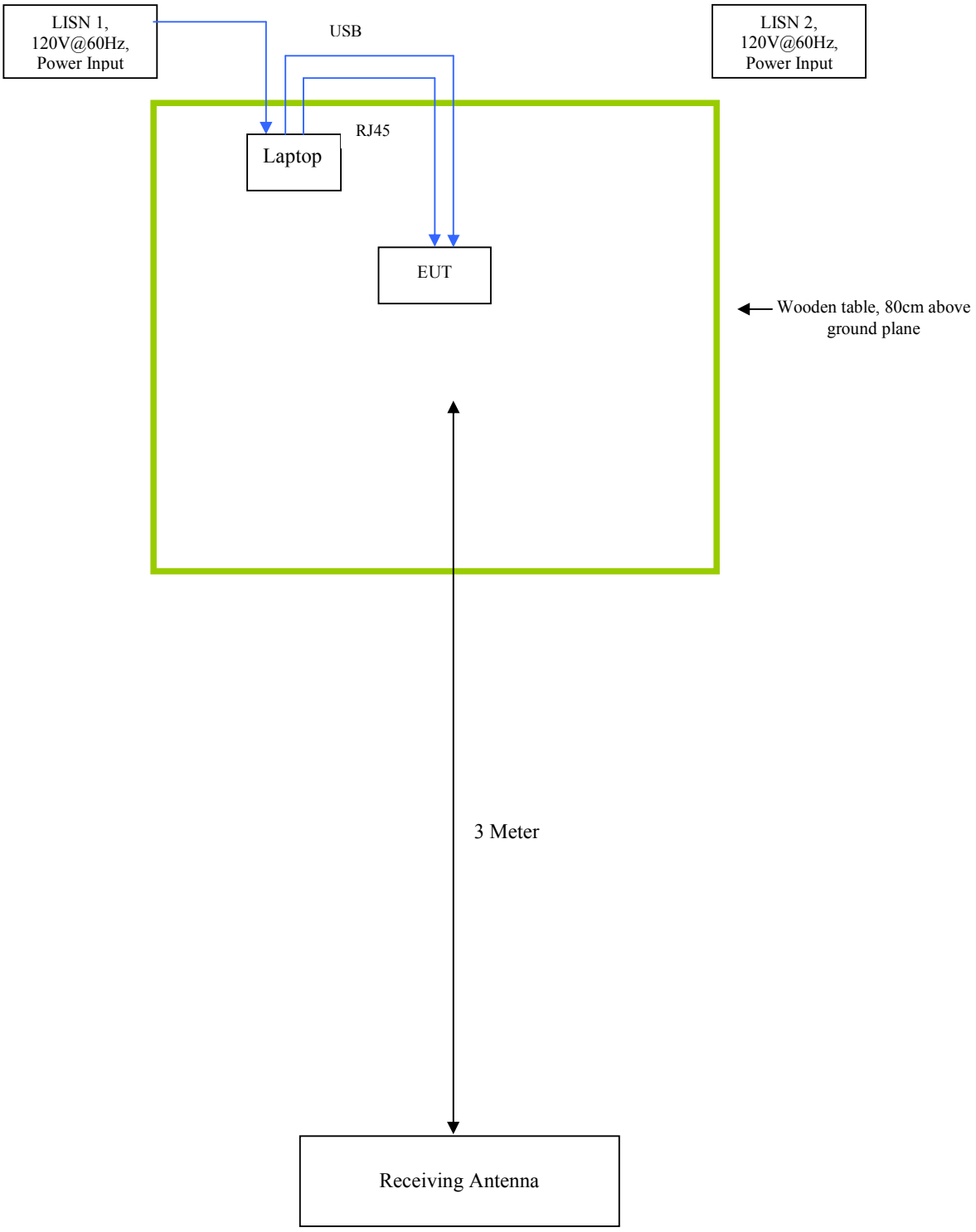
TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

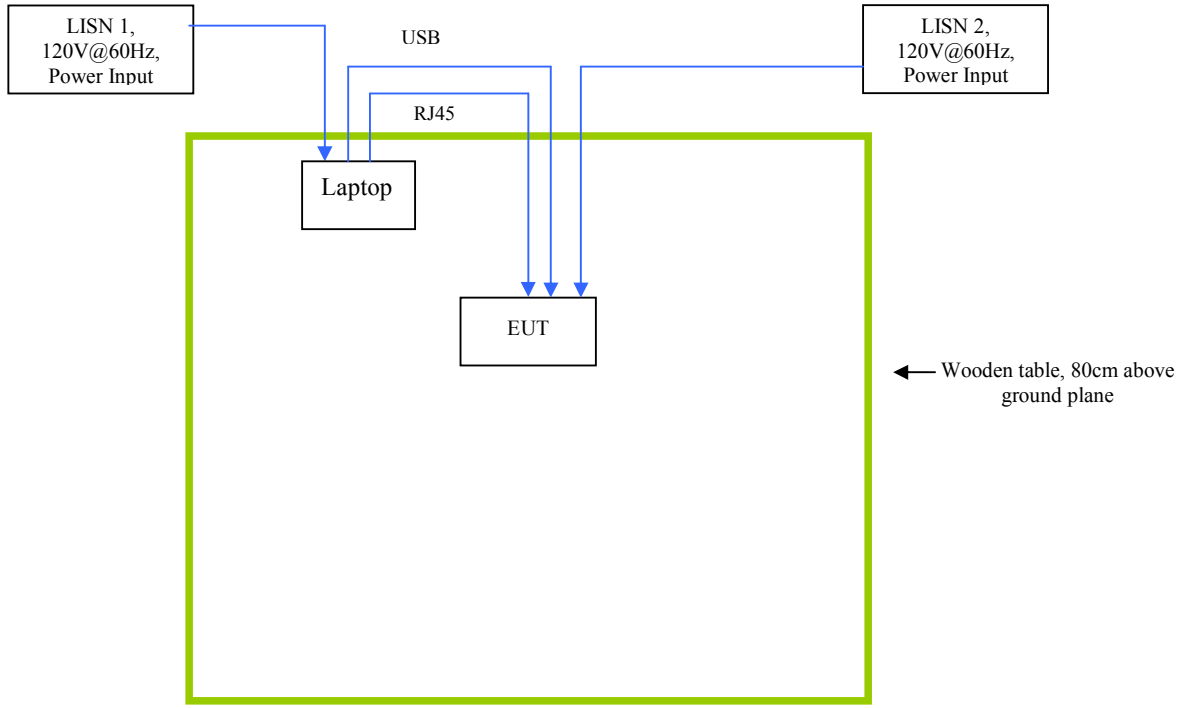
The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
PC Laptop / DELL	Latitude D600	USB Cable & RJ45 Cable < 3 meter (From PC to EUT)

Block Configuration Diagram for Radiated Emission



Block Configuration Diagram for Conducted Emission



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting controlled via usb connection to PC Laptop using test program.
Others Testing	The EUT was continuously transmitting controlled via usb connection to PC Laptop using test program.

Annex C.iii. PASS / FAIL CRITERIA & MONITORING METHODS

For compliance to the immunity requirements of the Directive, the EUT must comply with the correct Performance Criteria (Continuous, Transient phenomena) stipulated in the relevant standard.

Performance Criteria A (Continuous phenomena) – the equipment should continue as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment id used as intended.

Performance Criteria B (Transient phenomena) – After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level mat be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or store data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment id used as intended.

Please refer to the standard for the full Performance Criteria description.

Annex D USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment