ECMG Worldwide Certification Solutions
ECMG Worldwide Certification Solution, Inc.
684 West Maude Avenue Sunnyvale, CA 94085
Tel. (650) 988-0900 Fax (650) 988-6647
www.ecmg-global.com

FCC 15.225 Test Report

On Model Name: Dual Interface (Contact and Contactless) Smart Card Reader
Model Number: CDO920-DI
Trademark: SCM
FCC ID: MBPCDO920-DI14

Prepared for SCM Microsystems

According to FCC Part 15.225

Test Report#:	*SCM-0806-0378SH-FCC ID*
Prepared by:	*Chris Huang*
Reviewed by:	*Harry Zhao*
QC Manager:	*Paul Chen*

Test Report Released by: Paul J. Chen — *Paul Chen*

2008, June 20 — *Date*

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location: *ECMG Worldwide Certification Solution, Inc. (China)*
Building 2, 1298 Lian Xi Road, Pu Dong New Area, Shanghai, P.R. China 201204

Tel: *86-21-51909300*
Fax: *86-21-51909333*

FCC Registration Number: *172634*

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Administrative Data

Test Sample	*: Dual Interface (Contact and Contactless) Smart Card Reader*
Model Number	*: CDO920-DI*
Trade Mark	*:* SCM
Date Tested	*: 2008, June 5th*
Applicant	*: SCM Microsystems 466 Kato Terrace, Fremont, CA 94539*
Telephone	*: 510-249-4881*
Manufacturer	*: SCM Microsystems GmbH Oskar - Messter - Strasse 13D – 85737 Ismaning, Germany*
Telephone	*: 49 89 9595 5000*
Fax	*: 49 89 9595 5555*

EUT Description

SCM Microsystems, Inc. model name CDO920-DI (referred to as the EUT in this report) is a Dual Interface (Contact and Contactless) Smart Card Reader.

Test Summary

This report an application for Certification of a Transmitter operation pursuant to FCC Part 15.225, the product covered by this report is the SCM Model: CDO920-DI. This report is designed to demonstrate the compliance of this device with the requirements outlined in FCC Part 15.225 using the methods in FCC CFR 47 Part 2.

FCC Section	Requirements	Comments	Remark
15.203	The transmitter shall use a transmitting antenna that is an integral part of the device	Compliance	Attachment 1
15.205	Restricted Band of Operation	Compliance	Attachment 2
15.225(a)(b)(c)(d)	Transmitter radiated emissions-Fundamental, Harmonic and Spurious	Compliance	Attachment 3
15.225(e)	Frequency Stability vs Temperature	Compliance	Attachment 4
15.209(a)	Radiated emissions, general requirements	Compliance	Attachment 5
15.207(a)	AC power conducted emissions	Compliance	Attachment 6

Test Mode Justification

The EUT exercise program was used during radiated testing and was designed to exercise the various system components in a manner similar to a typical use.
For emission testing, the unit was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

EUT Exercise Software

The device is programmable and use its own software: "PC Time Clock Server".

Equipment Modification

Any modifications installed previous to testing by SCM Microsystems, Inc. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by ECMG Worldwide Certification Solution, Inc (China) test personnel.

Test System Details

EUT	
Model Name:	**CDO920-DI**
Description:	**Dual Interface (Contact and Contactless) Smart Card Reader**
Manufacturer:	**BMK Professional Electronics GmbH**

Support Equipment

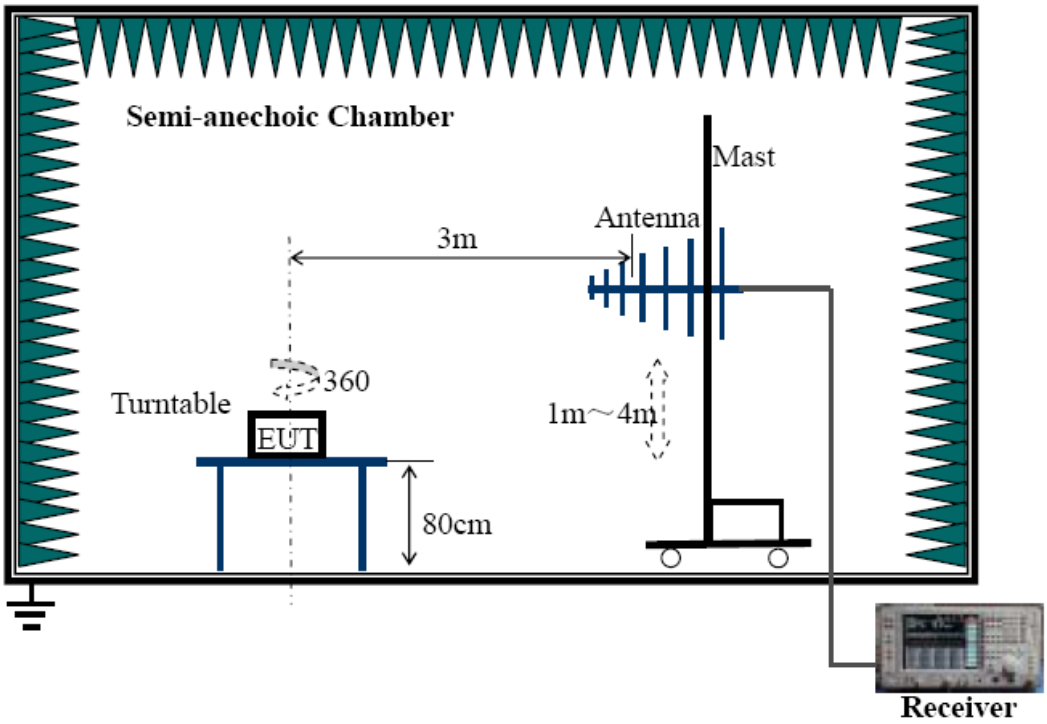
Description	Model Number	Serial Number	Manufacturer	Power Cable Description
PC	OPTIPLEX 330	HBSF92X	DELL	1.8m unshielded
Monitor	E178FPC	CN0WR97964180 7CA7L4C	DELL	1.8m unshielded
Keyboard	L100	CN0RH65665890 7C401F9	DELL	N/A
Mouse	MOC5UO	G1D02BPQ	DELL	N/A
Remote control box	IT-251B	N/A	N/A	N/A
Printer converter	45CV	961217	INTEL LIGENT	N/A

Cable Description

Description	From	To	Length (Meters)	Shielded (Y/N)	Ferrite (Y/N)
DC Cable	Adapter	Reader	1.7m	N	Y*
RJ 45 Cable	EUT	PC	5.0m	N	N
VGA Cable	EUT	PC	1.8m	N	N
Serial Cable	Remote box	PC	1.5m	N	N
Parallel Cable	Converter	PC	0.5m	N	N

* Note 1: There are 2 ferrite cores, one is 5cm to the adapter, while another is 10cm to the DC connector. See the EUT Photos.

Configuration of Tested System



Test Methodology

Radiated emissions testing are performed according to the procedures specified in ANSI C63.4-2003 and FCC Part 15.225.

Frequency Range investigated: ***9 KHz to 30 MHz*** *and* ***30 MHz to 1 GHz***

Measurement setup:

Frequency	*RBW*	*VBW*	*Sweep*	*Detector*	*Distance*	*Antenna polarization*	*Antenna height*
9 KHz – 30 MHz	*9KHz*	*≥RBW*	*Auto*	*Peak*	*3 m*	*Vertical & Horizontal*	*1 m – 4 m*
30 – 1000 MHz	*120 KHz*	*≥RBW*	*Auto*	*Peak*	*3 m*	*Vertical & Horizontal*	*1 m – 4 m*

FCC Part 15.225 Radiated emission limits:

Frequency (MHz)	*Fundamental uV/m*	*Fundamental dBuV/m*	*Measured Distance (meter)*
13.553-13.567	*15,848*	*84*	*30*

** dBuV/m=20 x Log (uV/m)*

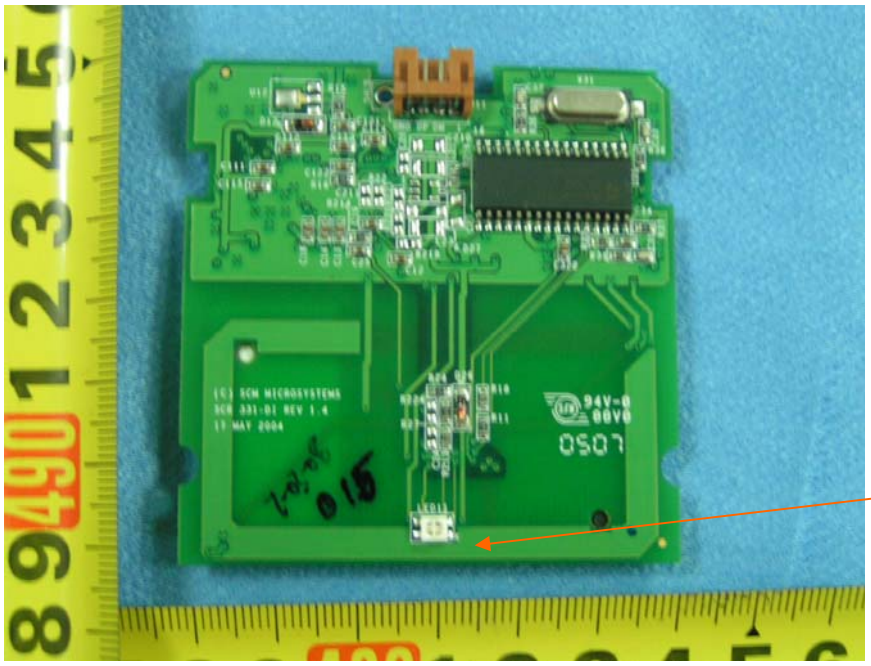
ATTACHMENT 1 - ANTENNA REQUIREMENT

CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.203
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	25°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

SETUP METHOD:	N/A
ANTENNA REQUIREMENT:	An intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.
TEST VOLTAGE:	120V/60Hz
TEST STATUS:	Normal Operation As Usual
RESULTS:	The EUT meets the antenna requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.
M. UNCERTAINTY:	N/A

FCC Section	FCC Rules	Conclusion
15.203	***Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.*** ***The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:*** ● ***The application (or intended use) of the EUT*** ● ***The installation requirements of the EUT*** ● ***The method by which the EUT will be marketed***	***The RF Device used a permanent internal antenna.***

Antenna Location



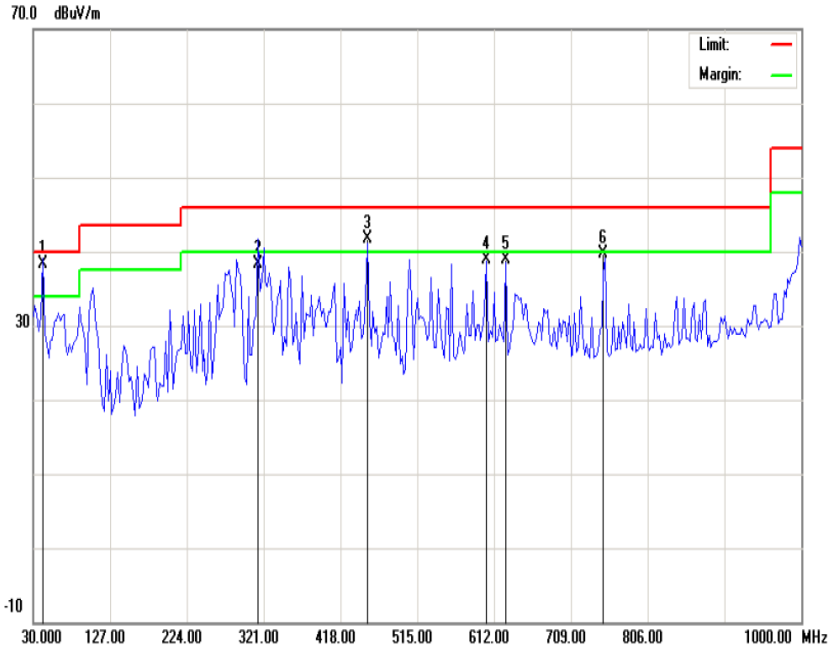
ATTACHMENT 2 - RESTRICTED BAND OF OPERATION

CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.205
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	25°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

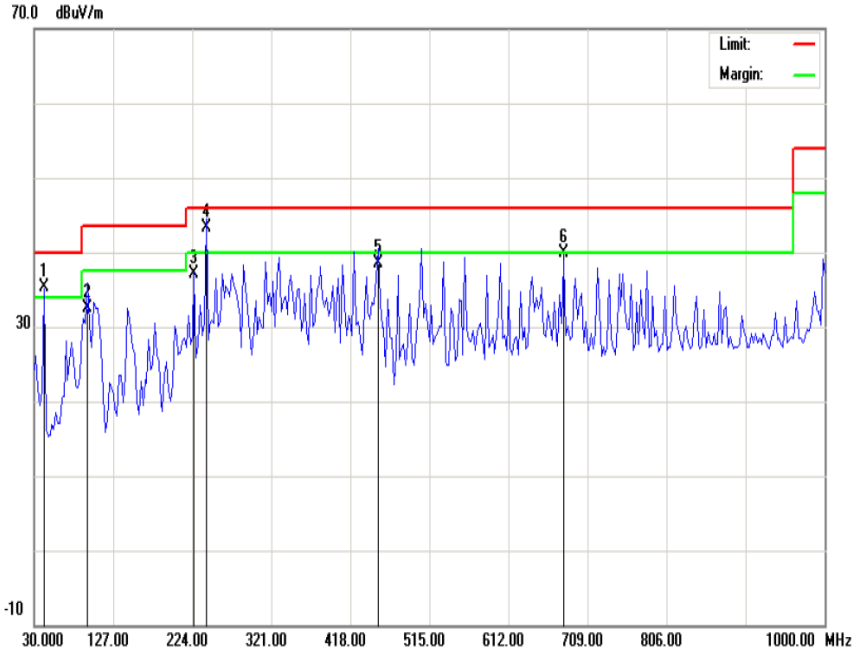
SETUP METHOD:	ANSI C63.4 - 2003
RESTRICTED BANDS OF OPERATION REQUIREMENT:	The only spurious emissions are permitted in any of the frequency bands listed below table of next page.
TESTED RANGE:	30MHz to 1000MHz
TEST VOLTAGE:	120V/60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated
RESULTS:	The EUT meets the restricted bands of operation requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.
M. UNCERTAINTY:	Freq. $\pm$ 2x10^{-7} x Center Freq., Amp $\pm$ 2.6 dB

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6



Horizontal Radiated Emission Plot



Vertical Radiated Emission Plot

ATTACHMENT 3 - Transmitter radiated emissions-Fundamental, Harmonic and Spurious (9k-30MHz)

CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.225(a) (b) (c) (d)
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	25°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

SETUP METHOD:	ANSI C63.4 - 2003
FCC 15.225	(a) The field strength of any emissions within the band 13.553-13.567MHz shall not exceed 15,848 microvolts/meter at 30 meters. (b) Within the band 13.410-13.553MHz and 13.567-13.710MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. (c) Within the band 13.110-13.410MHz and 13.710-14.010MHz, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters. (d)The field strength of any emissions appearing outside of the 13.110-14.010MHz band shall not exceed the general radiated emission limit in 15.209.
TEST PROCEDURE:	The EUT is set up according to the guidelines of ANSI C63.4 for radiated emissions. The length of the antenna was adjusted to the maximum output level. An EMI receiver employing average detector is used for the test. Peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber, and then three significant points were investigated by peak detector and average detector. The frequency investigated is from 13.110MHz to 14.010MHz. The following data lists the significant emission frequencies, measured levels, and the corrected readings against the limits. Explanation of the Correction Factor is given as follows: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain

Continue on to next page…

TESTED RANGE:	9KHz-30MHz
TEST VOLTAGE:	120V/60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated
RESULTS:	The EUT meets the requirements of test reference for Radiated Emissions on vertical polarization by 41.1dB for QP reading at 27.122MHz The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

Limit Description:

Fundamental Frequency	*Field Strength of Fundamental uV/m*	*Field Strength of Fundamental dBuV/m*	*Measured Distance (meter)*
13.553-13.567	*15,848*	*84*	*30*

FCC Part 15.225(a) Radiated emission limits:

Frequency (MHz)	*Fundamental uV/m*	*Fundamental dBuV/m (30 m)*	*Fundamental dBuV/m (3 m)*
13.56	*15,848*	*84*	*104*

Note:dBuV/m=20 x Log (uV/m)
dBuV/m=20 x log (15,848 uV/m) = 84

FCC Part 15.225(b)(c)(d) Field Strength limits:

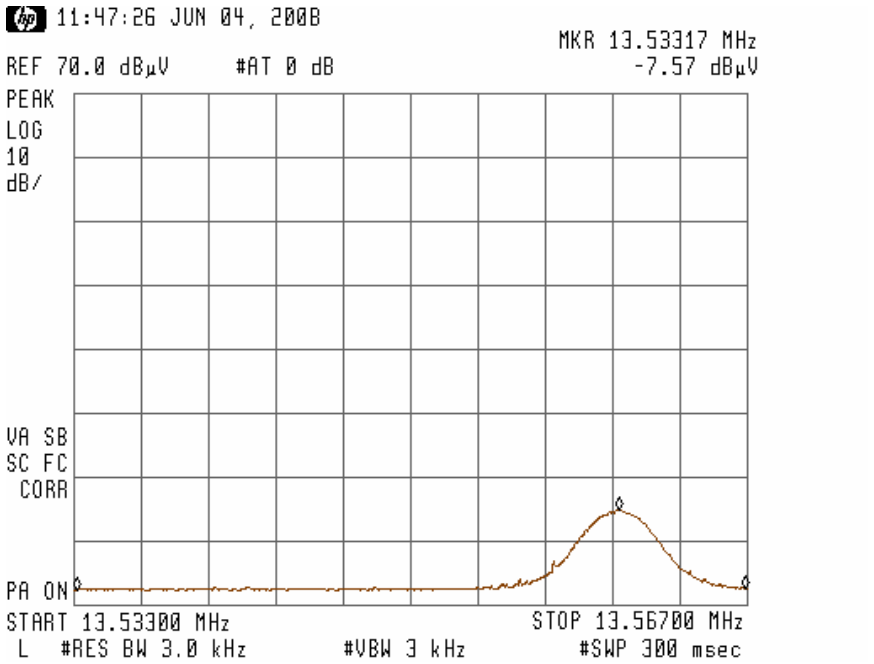
Frequency (MHz)	*Field Strength uV/m (30m)*	*Field Strength dBuV/m (30m)*	*Field Strength dBuV/m (3m)*	*Plot #*
13.410 –13.553	*334*	*50.4*	*70.4*	*In next page.*
13.567 – 13.710	*334*	*50.4*	*70.4*	*In next page*
13.110 – 13.410	*106*	*40.5*	*60.4*	*In next page*
13.710 – 14.010	*106*	*40.5*	*60.4*	*In next page*
Outside of the 13.110 – 14.010	*30*	*29.5*	*49.5*	*In next page*

Note: For test distance other than what is specified, but fulfilling the requirements of section 15.31(f) (1) the field strength is calculated by adding additionally an extrapolation factor of20 dB/decade. The basic equation with a sample calculation is as follows:
DF = Distance Extrapolation Factor in dB
Where DF=20 log(Dt/Ds) = 20 log(3m/30m)= -20 dB
Dt=Test Distance (3m)
Ds=Specified Distance (30m)

Fundamental (13.110MHz-14.010MHz)

Frequency (MHz)	Polarity	Reading (dBuV)	Antenna Factor(dB/m)	Cable Loss(dB)	Corrected Level(3m)(dBuV/m)	Limit(3m) (dBuV/m)	Margin (dB)
13.56	H	5.9	9.5	0.4	15.8	104	-88.2
13.56	V	6.7	9.5	0.4	16.6	104	-87.4

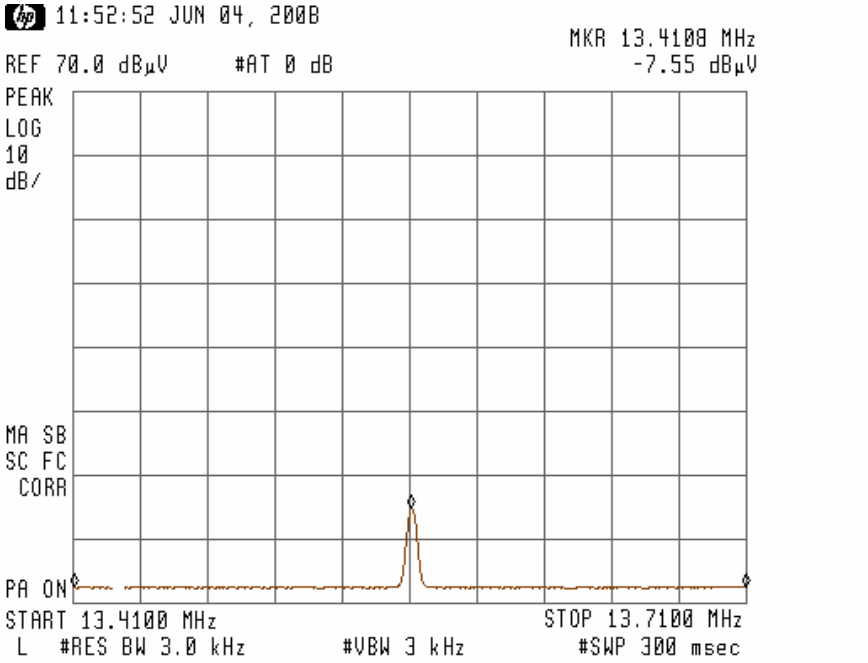
Note: Corrected level =Reading level+ Antenna Factor+ Cable Loss



13.533MHz-13.567MHz Plot

Frequency (MHz)	Reading (dBuV)	Antenna Factor(dB/m)	Cable Loss(dB)	Corrected Level(3m)(dBuV/m)	Limit(3m) (dBuV/m)	Margin (dB)
13.553	-7.6	9.5	0.4	2.3	70.4	-68.1
13.567	-6.8	9.5	0.4	3.1	70.4	-67.3

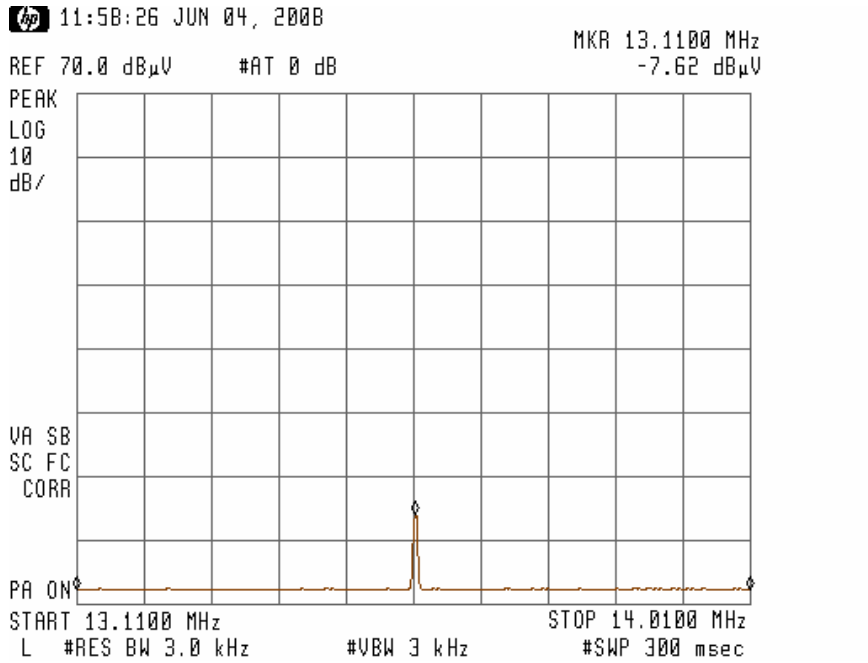
Note: Corrected level =Reading level+ Antenna Factor+ Cable Loss



13.410MHz-13.710MHz Plot

Frequency (MHz)	*Reading (dBuV)*	*Antenna Factor(dB/m)*	*Cable Loss(dB)*	*Corrected Level(3m)(dBuV/m)*	*Limit(3m) (dBuV/m)*	*Margin (dB)*
13.410	*-7.5*	*9.5*	*0.4*	*2.4*	*60.4*	*-58.0*
13.710	*-7.6*	*9.5*	*0.4*	*2.3*	*60.4*	*-58.1*

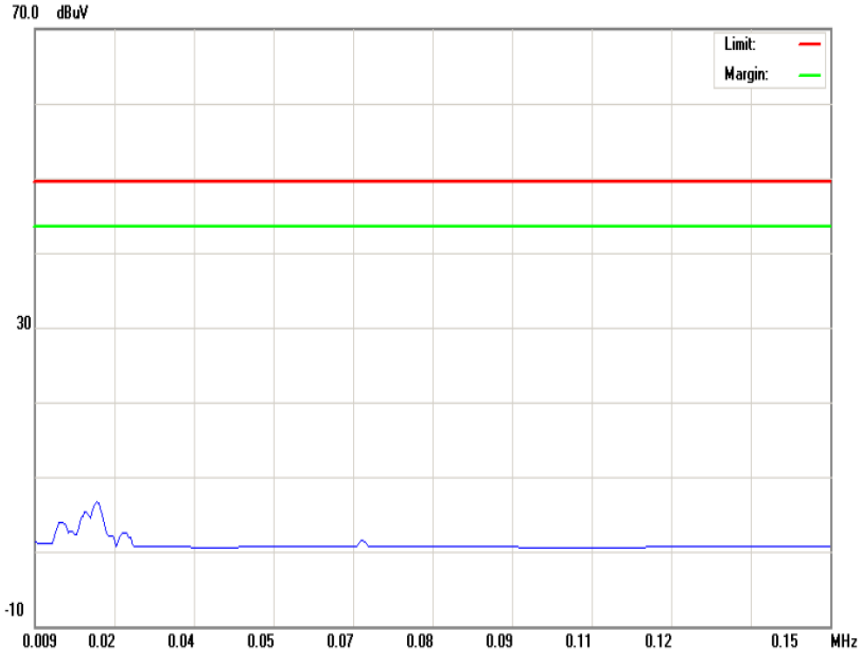
Note: Corrected level =Reading level+ Antenna Factor+ Cable Loss



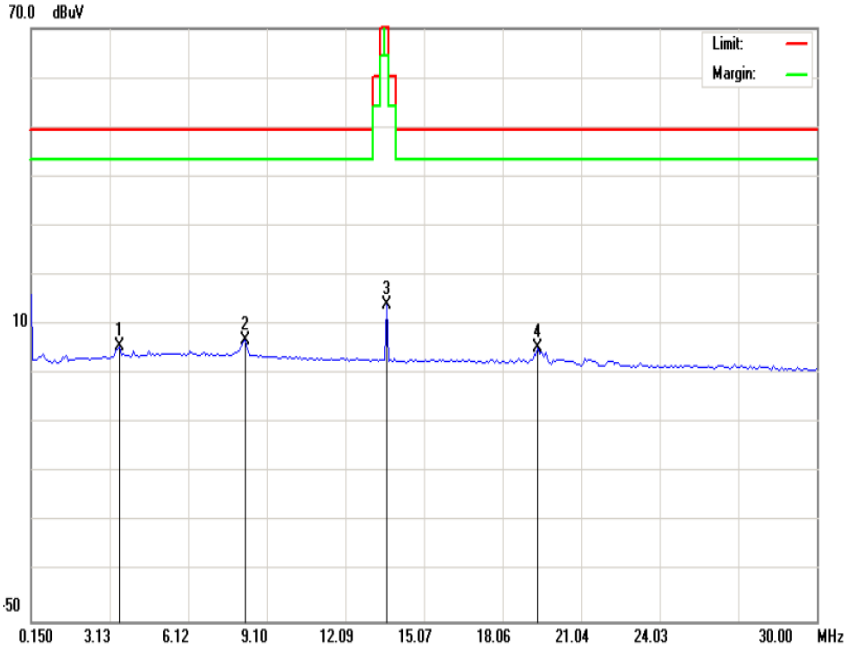
13.110MHz-14.010MHz Plot

Note: There are no other emissions during the frequency band 13.110-13.410MHz and 13.710-14.010MHz.

Spurious (9kHz-30MHz)



9kHz-0.15MHz Plot



0.15kHz-30MHz Plot

Frequency (MHz)	*Polarity*	*Reading (dBuV)*	*Antenna Factor(dB/m)*	*Cable Loss(dB)*	*Corrected Level(3m) (dBuV/m)*	*Limit(3m) (dBuV/m)*	*Margin (dB)*
3.508	H	-4.5	10.2	0.3	6.0	49.5	-43.5
3.508	V	-4.3	10.2	0.3	6.2	49.5	-43.3
8.28	H	-3.8	10.4	0.3	6.9	49.5	-42.6
8.28	V	-3.7	10.4	0.3	7.0	49.5	-42.5
13.6571	H	4.3	9.7	0.5	14.5	49.5	-35.0
13.6571	V	4.2	9.7	0.5	14.4	49.5	-35.1
19.4032	H	-3.7	8.9	0.5	5.5	49.5	-44.0
19.4032	V	-4.2	8.9	0.5	5.0	49.5	-44.5

Note: The readings are peak and average, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used. Corrected level =Reading level+ Antenna Factor+ Cable Loss
Memo: No preamp was used. There are no other emissions during the frequency band.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
Active Loop Antenna	EMCO	6502	2053	11/29/07	11/28/08

SIGNED BY: Cloud Feng _____ **REVIEWED BY:** Hang Zhao _____

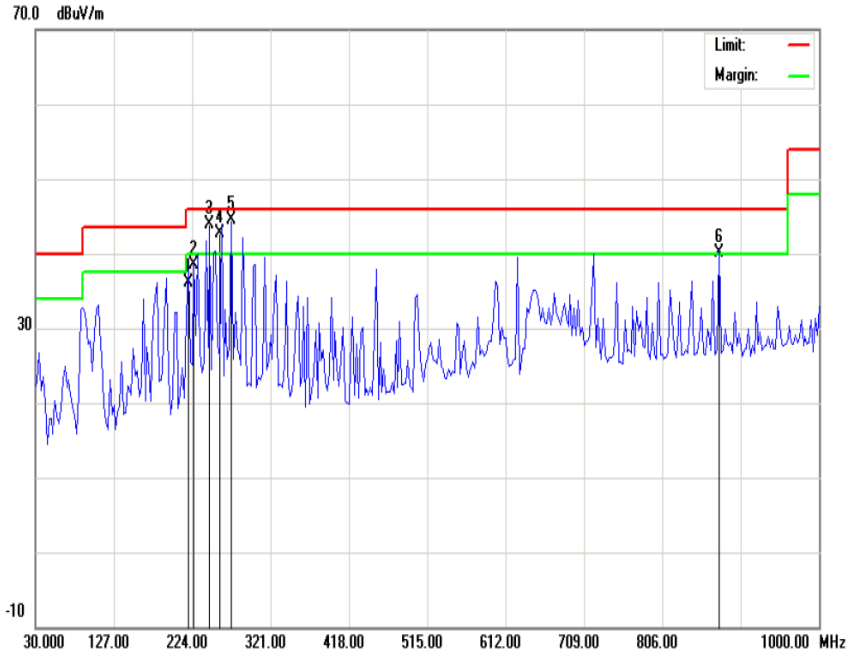
ENGINEER **SENIOR ENGINEER**

ATTACHMENT 4 - General Radiated Emissions

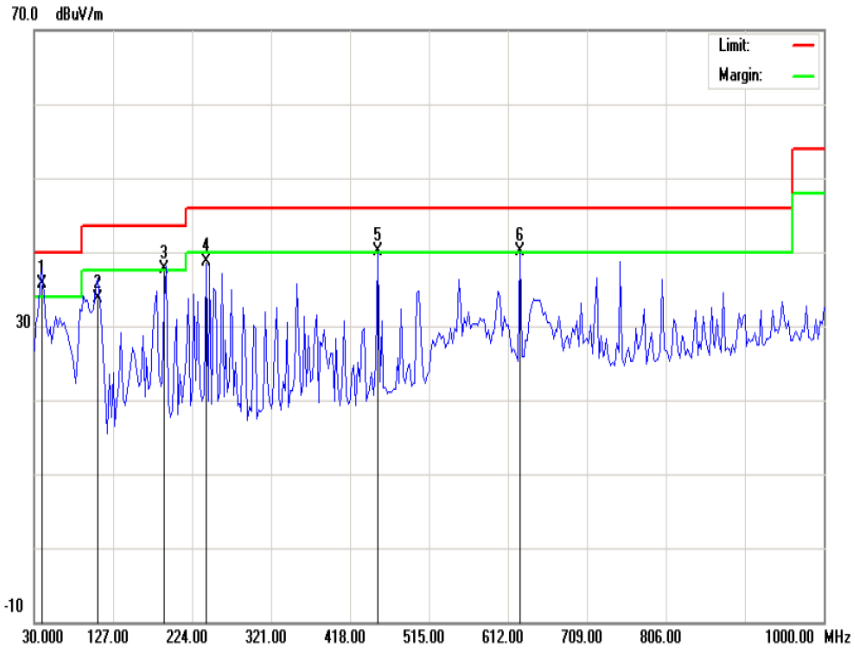
CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.225(d) FCC Part 15.209
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	24°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

SETUP METHOD:	ANSI C63.4 - 2003
TEST PROCEDURE:	The EUT is set up according to the guidelines of ANSI C63.4 for radiated emissions. The length of the antenna was adjusted to the maximum output level. An EMI receiver peak scan is made at the frequency measurement range (pre-scan) in an Anechoic chamber. Signal discrimination is then performed and the significant peaks marked. These peaks are then quasi-peaked for final test at an Open Site Test area. The frequency investigated is from 30MHz to 1GHz. The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor is given as follows: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain
TESTED RANGE:	30MHz to 1,000MHz
TEST VOLTAGE:	120V/60Hz
RESULTS:	The EUT meets the requirements of test reference for Radiated Emissions on horizontal polarization by 1.51 dB at 271.213 MHz. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

Model: CDO920-DI



Horizontal Radiated Emission Plot



Vertical Radiated Emission Plot

30MHz - 1GHz

Horizontal

Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	216.950	13.94	36.06	46.00	-9.94	189	200
2	225.000	14.10	38.42	46.00	-7.58	145	165
3	244.090	14.49	43.81	46.00	-2.19	37	150
4	257.645	14.74	42.77	46.00	-3.23	209	130
5	271.213	14.98	44.49	46.00	-1.51	343	120
6	875.000	24.85	40.11	46.00	-5.89	254	150

Vertical

Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	39.465	14.30	35.66	40.00	-4.34	123	100
2	105.750	10.27	33.79	43.50	-9.71	180	100
3	189.838	13.21	37.75	43.50	-5.75	304	120
4	239.570	14.39	38.79	46.00	-7.21	283	100
5	450.003	18.90	40.06	46.00	-5.94	297	114
6	625.000	21.27	40.18	46.00	-5.82	78	150

Comments: None

Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
Broadband Antenna	Sunol	JB5	A110503	11/29/07	11/28/08

SIGNED BY: _____ **REVIEWED BY:** _____

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ATTACHMENT 5 - Frequency Stability, Section 15.225 (e) & 2.1055

CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.225(e) FCC Part 15.31(e)
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	24°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

TESTED METHOD:	FCC Part 15.225 (e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
TEST PROCEDURE:	Set the environmental temperature chamber to temperature of (-20°C to +50°C) wait the temperature of the chamber to stabilize. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and measure the EUT operating frequency at the start-up, 10 minutes, and 30 minutes after startup.
TEST VOLTAGE:	120V/60Hz
RESULTS:	The EUT meets the reference requirement of Frequency stability under low voltage conditions at operating mode. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

Frequency stability VS Temperature Measurement Data:

Timing	*-20℃*	*-10℃*	*0℃*	*+10℃*	*+20℃*	*+30℃*	*+40℃*	*+50℃*
Start-up	*13.56050*	*13.56048*	*13.56047*	*13.56048*	*13.56050*	*13.56053*	*13.56055*	*13.56056*
10 Min.	*13.56050*	*13.56047*	*13.56048*	*13.56050*	*13.56050*	*13.56053*	*13.56055*	*13.56056*
30 Min.	*13.56048*	*13.56047*	*13.56045*	*13.56051*	*13.56050*	*13.56055*	*13.56056*	*13.56056*

Frequency stability VS Supply Voltage:

Temperature	*102V*	*111V*	*120V*	*129V*	*138V*
20℃	*13.56050*	*13.56050*	*13.56050*	*13.56049*	*13.56050*

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/07	11/28/08
EMI Receiver Display unit	R&S	ESAI-D	825035/005	11/29/07	11/28/08
Temperature Chamber	Dongzhixu	WGD/SJ-215	07-05-15-02	05/16/08	05/15/09

SIGNED BY: Cloud Feng _____ **REVIEWED BY:** Hang Zhao _____

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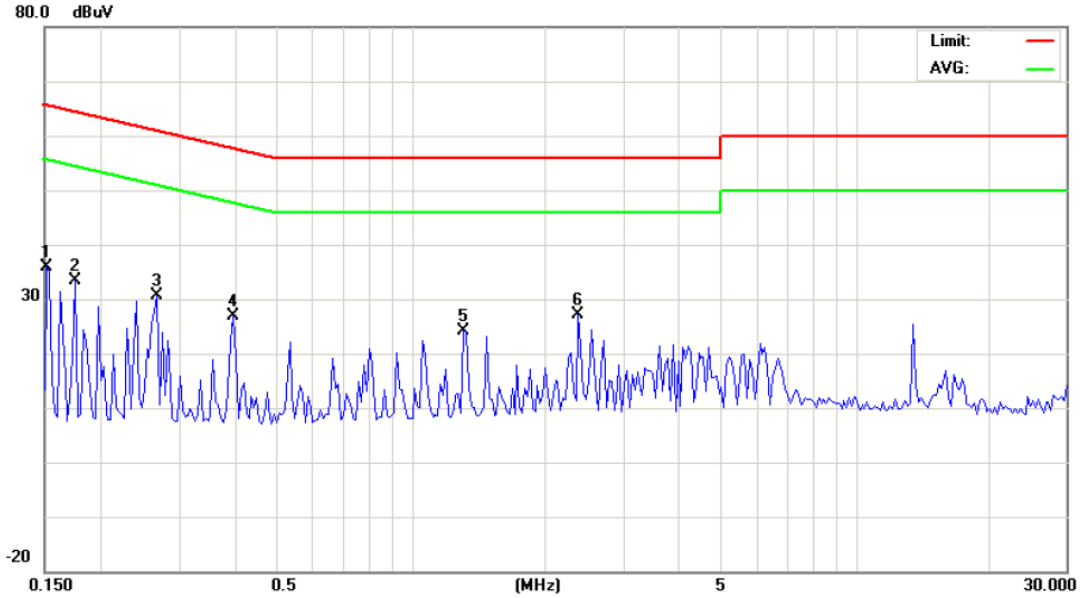
ATTACHMENT 6 - AC Power line Conducted Emission Measurement

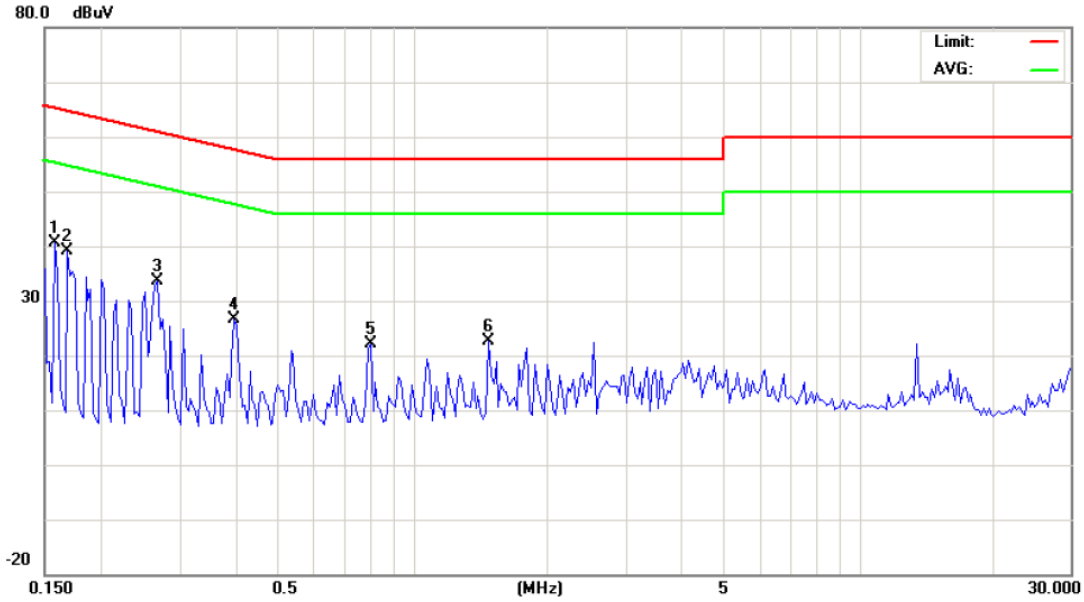
CLIENT:	SCM Microsystems, Inc.	**TEST STANDARD:**	FCC Part 15.207
MODEL NUMBER:	CDO920-DI	**PRODUCT:**	Dual Interface (Contact and Contactless) Smart Card Reader
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	25°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.7 kPa	**GROUNDING:**	No grounding
TESTED BY:	Cloud Feng	**DATE OF TEST:**	2008, June 5

SETUP METHOD:	ANSI C63.4 - 2003
TEST PROCEDURE:	a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface. b. Connect EUT to the power mains through a line impedance stabilization network (LISN) c. The LISN provides 50ohm coupling impedance for the measuring instrument d. Both sides of AC line were checked for maximum conduced interference. e. The frequency range from 150KHz to 30MHz was searched. f. Set the test-receiver system to Peak Detect Function and Specified bandwidth. g. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.
TESTED RANGE:	150kHz-30MHz
TEST VOLTAGE:	120V/60Hz
RESULTS:	The EUT meets the requirements of test reference for Conducted emissions on line L by 24.90 dB for QP reading and 26.59 dB for average reading. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

Model: CDO920-DI



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Line L (Hot Lead)

Signal	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AVE (dB)
1	0.1582	40.65	65.55	-24.90	28.96	55.55	-26.59
2	0.1689	39.01	65.01	-26.00	27.45	55.01	-27.56
3	0.2686	33.55	61.16	-27.61	23.84	61.16	-37.32
4	0.3997	26.51	57.86	-31.35	18.45	47.86	-29.41
5	0.8065	22.01	56.00	-33.39	13.09	46.00	-32.91
6	1.4835	22.68	56.00	-33.32	14.25	46.00	-31.75

Line N (Neutral Lead)

Signal	Frequency (MHZ)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AVE (dB
1	0.1520	35.81	65.88	-30.07	23.54	55.88	-32.34
2	0.1758	33.48	64.68	-31.20	22.46	54.68	-32.22
3	0.2686	30.68	61.16	-30.48	20.88	51.16	-30.28
4	0.3997	26.90	57.86	-30.96	17.46	47.86	-30.40
5	1.3168	24.22	56.00	-31.78	13.20	46.00	-32.80
6	2.3899	27.04	56.00	-28.96	17.89	46.00	-28.11

Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
LISN	R&S	ESH3-Z5	844249/018	12/04/07	12/03/08
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: _____ **REVIEWED BY:** _____

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