Intentional Radiator Test Report

Test Standards:
FCC Part 15.225 (Subpart C – Intentional Radiators)
Industry Canada RSS-210, Issue 8

Prepared For:
Identiv Group, Inc.
1900B Carnegie Ave,
Santa Ana, CA 92705
USA

Product Name :
Contactless RFID Smartcard Reader

Model Name :
CLOUD 3701F

Application Purpose : Original

Prepared by:

EMCE Engineering, Inc.
44366 S. Grimmer Blvd.
Fremont, CA 94538
USA

Revision History

Rev.	Issue Date	Description
0	5/10/2014	Initial Issue

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1.0 GENERAL INFORMATION

Test Laboratory:	EMCE Engineering 44366 S. Grimmer Blvd. Fremont, CA 94538 USA Tel: 510-490-4307, Fax: 510-490-3441 bob@universalcompliance.com
	FCC registration number : 743299
	Test Site : FCC : US5291, IC : 3324A
Applicant Name :	Identiv Group, Inc. 1900B Carnegie Ave Santa Ana, CA 92705 Tel: 510-933-3300
	Contact Person: Calai Bhoopathi
Application Purpose :	Original
EUT Description	RFID
Product Name	Contactless RFID Smartcard Reader
Model Name :	CLOUD 3701F
Applied Standards :	47 CFR §15.207, 15.209, 15.225: 2010 & Canadian Standards RSS-GEN Issue 3, RSS-210 Issue 8
FCC ID :	MBPCLOUD 3701F-001
IC :	N/A
RF Operating Frequency (ies)	13.56MHz
Modulation	ASK
Emission Designator	N/A
Receipt of EUT :	4/20/14
Date of Testing :	4/30/14 – 5/5/14
Date of Report :	5/10/14

The tests listed in this report have been completed to demonstrated compliance to the CFR 47 Section 15.225, as well as Industry Canada Radio Standard RSS-210, Issue 8.

Contents approved:

Name: Bob Cole
Title: President

2.0 EUT AND ACCESSORY INFORMATION

EUT	
Model name:	*CLOUD 3701F*
Description:	*Contactless RFID Smartcard Reader*
Manufacturer:	*Identiv Group, Inc.*

Support Equipment				
Description	*Model Number*	*Serial Number*	*Manufacturer*	*Power Cable Description*
Netbook PC	*Acer Aspire*	*NUSH6AA0012410 25337600*	*Acer*	*Unshielded / 1.5 Meter*

Cable Description				
From	*To*	*Length (Meters)*	*Shielded (Y/N)*	*Ferrite Loaded (Y/N)*
EUT	*Netbook*	*0.5*	*Y*	*N*

3.0 SUMMARY OF TEST RESULTS

Test Standard		Description	Pass / Fail
47 CFR Part 15.225: 2010	RSS 210 Issue 8		
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	N/A
ANSI C63.4: 2009/ RSS-Gen Issue 3 PS: All measurement uncertainties are not taken into consideration for all presented test result.			

PASS The EUT passed that particular test.
FAIL The EUT failed that particular test.
008 Not Applicable due to product type.

4.0 MODIFICATIONS

There were no modifications.

5.0 TEST RESULTS

5.1 Antenna Requirement

Requirement(s): 47 CFR §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.
b) Antenna must use a unique type of connector to attach to the device.
c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

1) The RFID antenna is integral to the main board permanently to the device which meets the requirement (See Internal Photographs submitted as another Exhibit).

5.2 Conducted Emissions Voltage

Requirement(s): 47 CFR §15.207

Requirement:

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Procedures:

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. "Ave" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of measurement at a confidence level of approximately 95% (in the case where distributions normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) ±3.5dB.
4. Environmental Conditions

Temperature	24ºC
Relative Humidity	45%
Atmospheric Pressure	1010mbar

Test Date : 4/30/2014

Tested By : Bob Cole

Results: Pass

FCC Part 15.207 Line Conducted Emissions
120V / 60 Hz - Line 1
150kHz – 30 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **Identiv Group, Inc.**
Specification: **EN55022 B COND [QP]**
Work Order #: **4036** Date: 4/30/2014
Test Type: **Conducted Emissions** Time: 12:22:51 PM
Equipment: **RFID USB Smartcard Reader** Sequence#: 3
Manufacturer: Identive Group, Inc. Tested By: Bob Cole
Model: CLOUD 3701F 120V 60Hz
S/N: 006

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
EMCO 3810-2 LISN	4576	02/20/2014	02/20/2016	007
HP Transient Limiter	3107A02941	05/01/2013	04/01/2015	006
HP 8566B Spectrum Analyzer	3014A06947	03/02/2013	03/02/2015	598
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2016	610

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
RFID USB Smartcard Reader*	Identive Group, Inc.	CLOUD 3701F	006

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop PC	Acer	Aspire One725-0687	NUSH6AA001241025337600

Test Conditions / Notes:

Quasi-Peak measurements meet Average Limits

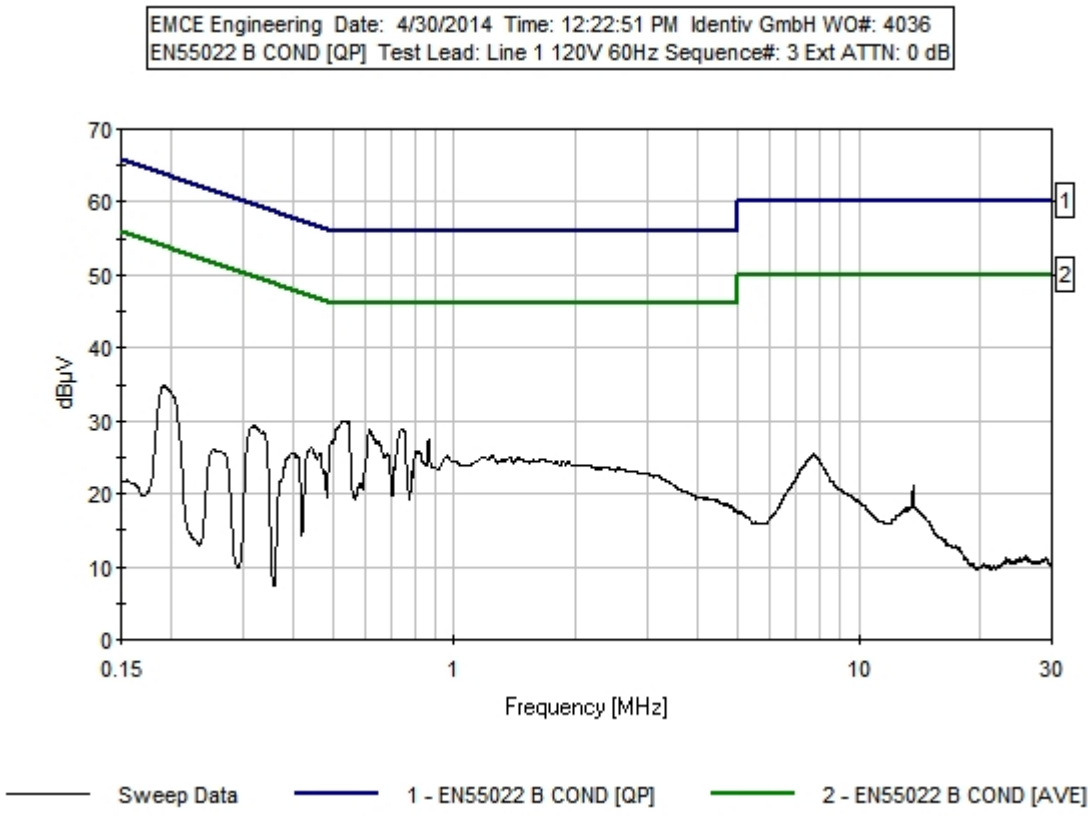
Transducer Legend:

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Line 1

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	528.871k	30.0					+0.0	30.0	56.0	-26.0	Line
2	737.578k	28.9					+0.0	28.9	56.0	-27.1	Line

3	616.135k	28.7	+0.0	28.7	56.0	-27.3	Line
4	863.383k	27.4	+0.0	27.4	56.0	-28.6	Line
5	192.178k	34.9	+0.0	34.9	63.9	-29.0	Line
6	813.206k	25.9	+0.0	25.9	56.0	-30.1	Line



FCC Part 15.207 Line Conducted Emissions
120V / 60 Hz - Line 2
150kHz – 30 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **Identiv Group, Inc.**
Specification: **EN55022 B COND [QP]**
Work Order #: **4036** Date: 4/30/2014
Test Type: **Conducted Emissions** Time: 12:37:09 PM
Equipment: **RFID USB Smartcard Reader** Sequence#: 4
Manufacturer: Identive Group, Inc. Tested By: Bob Cole
Model: CLOUD 3701F 120V 60Hz
S/N: 006

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
EMCO 3810-2 LISN	4576	02/20/2014	02/20/2016	007
HP Transient Limiter	3107A02941	05/01/2013	04/01/2015	006
HP 8566B Spectrum Analyzer	3014A06947	03/02/2013	03/02/2015	598
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2016	610

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
RFID USB Smartcard Reader*	Identive Group, Inc.	CLOUD 3701F	006

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop PC	Acer	Aspire One725-0687	NUSH6AA001241025337600

Test Conditions / Notes:

Quasi-Peak measurements meet Average Limits

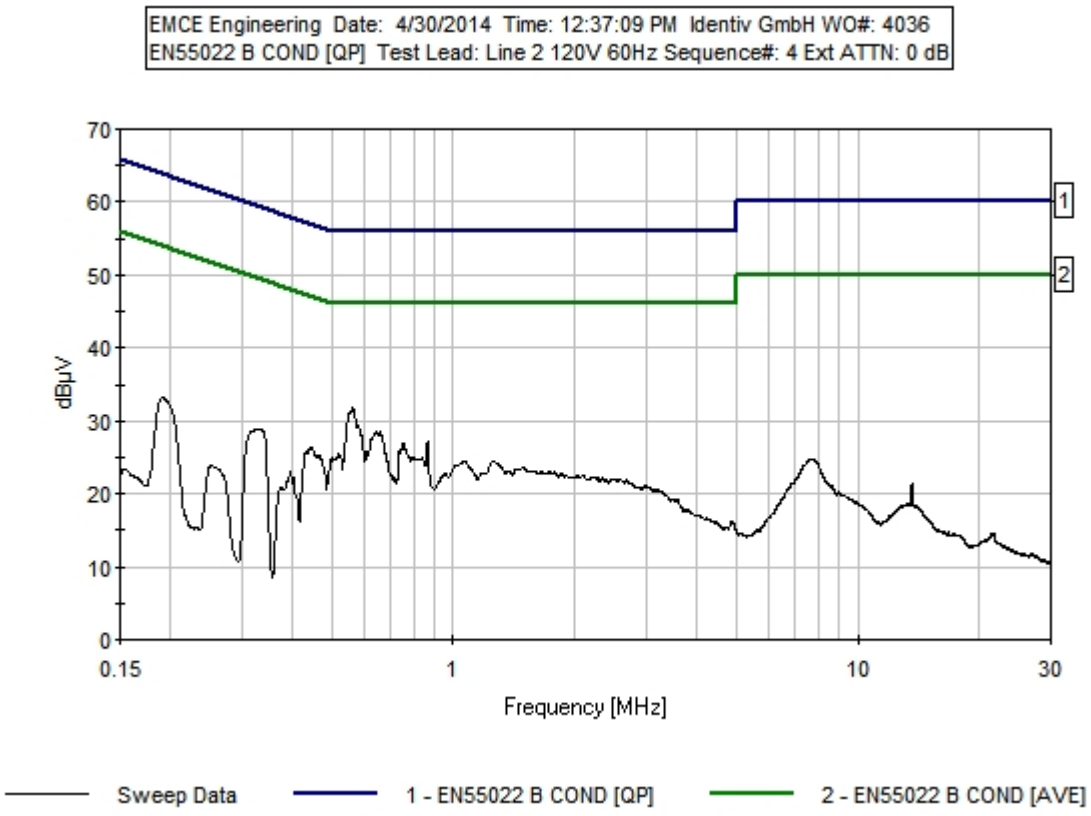
Transducer Legend:

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Line 2

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	563.050k	31.8					+0.0	31.8	56.0	-24.2	Line
2	661.222k	28.6					+0.0	28.6	56.0	-27.4	Line
3	862.656k	27.2					+0.0	27.2	56.0	-28.8	Line

4	750.667k	26.9	+0.0	26.9	56.0	-29.1	Line
5	330.346k	28.9	+0.0	28.9	59.4	-30.5	Line
6	518.690k	25.4	+0.0	25.4	56.0	-30.6	Line



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	24ºC
Relative Humidity	45%
Atmospheric Pressure	1010mbar

Test Date : 5/01/2014

Tested By : Bob Cole

Results: Pass

FCC Part 15.209 Radiated Emissions
9 kHz – 30 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **Identive, Inc.**
Specification: **15.209 9k-30M FCC Limits II**
Work Order #: **4036** Date: 5/1/2014
Test Type: **Radiated Scan** Time: 11:32:52 AM
Equipment: **RFID USB Smartcard Reader** Sequence#: 6
Manufacturer: Identive Group, Inc. Tested By: Bob Cole
Model: CLOUD 3701F
S/N: 006

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
RFID USB Smartcard Reader*	Identive Group, Inc.	CLOUD 3701F	006

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop PC	Acer	Aspire One725-0687	NUSH6AA001241025337600

Test Conditions / Notes:

Transducer Legend:

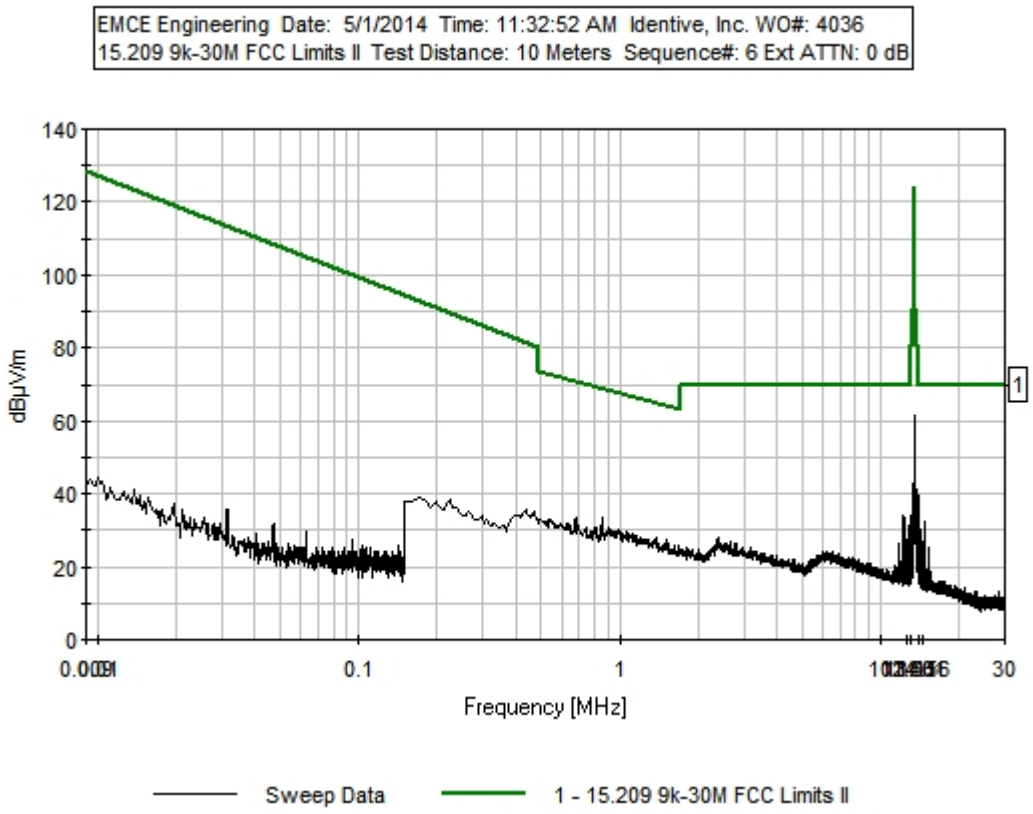
T1=8447 Pre-Amp Asset 377	T2=25' LMR #001
T3=LP-105 Loop Antenna	

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.338M	40.1	+27.3	+0.1	+19.8		+10.0	42.7	80.5	-37.8	Paral
2	13.771M	39.0	+27.3	+0.1	+19.5		+10.0	41.3	80.5	-39.2	Paral
3	13.970M	37.4	+27.3	+0.1	+19.4		+10.0	39.6	80.5	-40.9	Paral
4	13.654M	42.1	+27.3	+0.1	+19.6		+10.0	44.5	90.5	-46.0	Paral
5	13.456M	41.0	+27.3	+0.1	+19.7		+10.0	43.5	90.5	-47.0	Paral
6	13.609M	40.4	+27.3	+0.1	+19.6		+10.0	42.8	90.5	-47.7	Paral

7	13.699M	38.6	+27.3	+0.1	+19.6	+10.0	41.0	90.5	-49.5	Paral
8	13.636M	37.8	+27.3	+0.1	+19.6	+10.0	40.2	90.5	-50.3	Paral
9	13.483M	36.8	+27.3	+0.1	+19.7	+10.0	39.3	90.5	-51.2	Paral
10	13.555M	59.0	+27.3	+0.1	+19.7	+10.0	61.5	124.0	-62.5	Paral



5.4 Radiated Emissions > 30 MHz (30MHz – 1 GHz, E-Field)

Requirement(s): 47 CFR §15.209; 47 CFR §15.225(d) & RSS-210 (A2.6)

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 10 meter away from the measuring antenna. The Log periodic antenna was positioned 1 meter above the ground from the centre of the antenna. The measuring bandwidth was set to 120 kHz. (Note: During testing the receive antenna was raise from 1~4 meters 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	24°C
Relative Humidity	45%
Atmospheric Pressure	1010mbar

Test Date : 4/30/2014

Tested By : Bob Cole

Results: Pass

FCC Part 15B Radiated Emissions
30 MHz – 1 GHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **Identive, Inc.**
Specification: **EN55022B RADIATED**
Work Order #: **4036** Date: 4/30/2014
Test Type: **Radiated Scan** Time: 15:37:57
Equipment: **RFID USB Smartcard Reader** Sequence#: 7
Manufacturer: Identive Group, Inc. Tested By: Bob Cole
Model: CLOUD 3701F
S/N: 006

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
RFID USB Smartcard Reader*	Identive Group, Inc.	CLOUD 3701F	006

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop PC	Acer	Aspire One725-0687	NUSH6AA001241025337600

Test Conditions / Notes:

Transducer Legend:

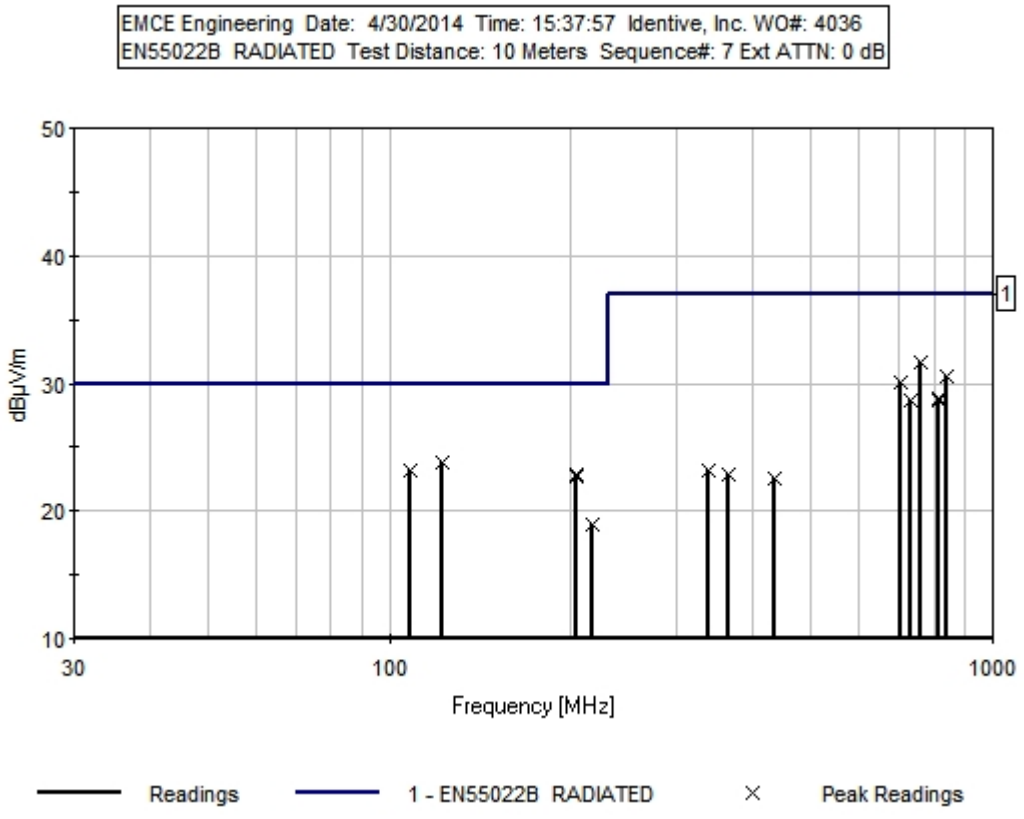
T1=100' LMR 900 Rad Cable 12-2013	T2=8447 Pre-Amp Asset 377
T3=EMCO 3142 BiConiLog S/N: 9808-1306	

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	759.348M	36.1	+1.5	+27.1	+21.2		+0.0	31.7	37.0	-5.3	Vert 202
2	122.028M	40.2	-0.1	+26.7	+10.4		+0.0 36	23.8	30.0	-6.2	Vert 137
3	840.708M	33.7	+1.6	+27.0	+22.2		+0.0	30.5	37.0	-6.5	Vert 223
4	108.480M	39.6	+0.0	+26.8	+10.4		+0.0 36	23.2	30.0	-6.8	Vert 100
5	705.107M	34.3	+1.4	+27.1	+21.5		+0.0	30.1	37.0	-6.9	Horiz 321
6	203.400M	38.9	+0.2	+26.9	+10.6		+0.0	22.8	30.0	-7.2	Horiz 280

7	203.388M	38.8	+0.2	+26.9	+10.6	+0.0	22.7	30.0	-7.3	Vert 218
8	813.588M	32.7	+1.5	+27.0	+21.7	+0.0	28.9	37.0	-8.1	Vert 144
9	813.594M	32.5	+1.5	+27.0	+21.7	+0.0	28.7	37.0	-8.3	Horiz 280
10	732.235M	33.6	+1.4	+27.1	+20.7	+0.0	28.6	37.0	-8.4	Horiz 280
11	216.960M	34.9	+0.2	+26.9	+10.8	+0.0	19.0	30.0	-11.0	Horiz 220
12	339.000M	36.5	+0.5	+27.0	+13.1	+0.0	23.1	37.0	-13.9	Horiz 155
13	366.120M	35.5	+0.6	+26.9	+13.7	+0.0	22.9	37.0	-14.1	Horiz 308
14	433.918M	33.1	+0.8	+26.9	+15.6	+0.0	22.6	37.0	-14.4	Horiz 227



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 13.5589 MHz = 1355 Hz

Environmental Conditions		
	Temperature	24°C
	Relative Humidity	45%
	Atmospheric Pressure	1010mbar

Test Date : 4/30/2014

Tested By : Bob Cole

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.

Reference Frequency: 13.559975 MHz

Temperature (ºC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.559888	87	<0.01	Pass
40	13.559895	80	<0.01	Pass
30	13.559858	117	<0.01	Pass
20	Reference (13.559975 MHz)			
10	13.559871	104	<0.01	Pass
0	13.559901	74	<0.01	Pass
-10	13.559870	105	<0.01	Pass
-20	13.559844	131	<0.01	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: 13.559975 MHz at 20°C at 5VDC

Measured Voltage ±15% of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
4.25	13.559992	17	<0.01	Pass
5.75	13.559994	19	<0.01	Pass

5.6 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	24°C
Relative Humidity	45%
Atmospheric Pressure	1010mbar

Test Date : 4/30/2014

Tested By : Bob Cole

Test Requirement:

13.56MHz
(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.

Peak Output Power
Per CFR 47, Section 15.225 and RSS-210 Issue 8 A2.6

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **Identive, Inc.**
Specification: **RFID FCC Mask 10 Meter**
Work Order #: **4036** Date: 4/30/2014
Test Type: **Radiated Scan** Time: 12:14:32 PM
Equipment: **RFID USB Smartcard Reader** Sequence#: 3
Manufacturer: Identive Group, Inc. Tested By: Bob Cole
Model: CLOUD 3701F
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
RFID USB Smartcard Reader*	Identive Group, Inc.	CLOUD 3701F	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop PC	Acer	Aspire One725-0687	NUSH6AA001241025337600

Test Conditions / Notes:

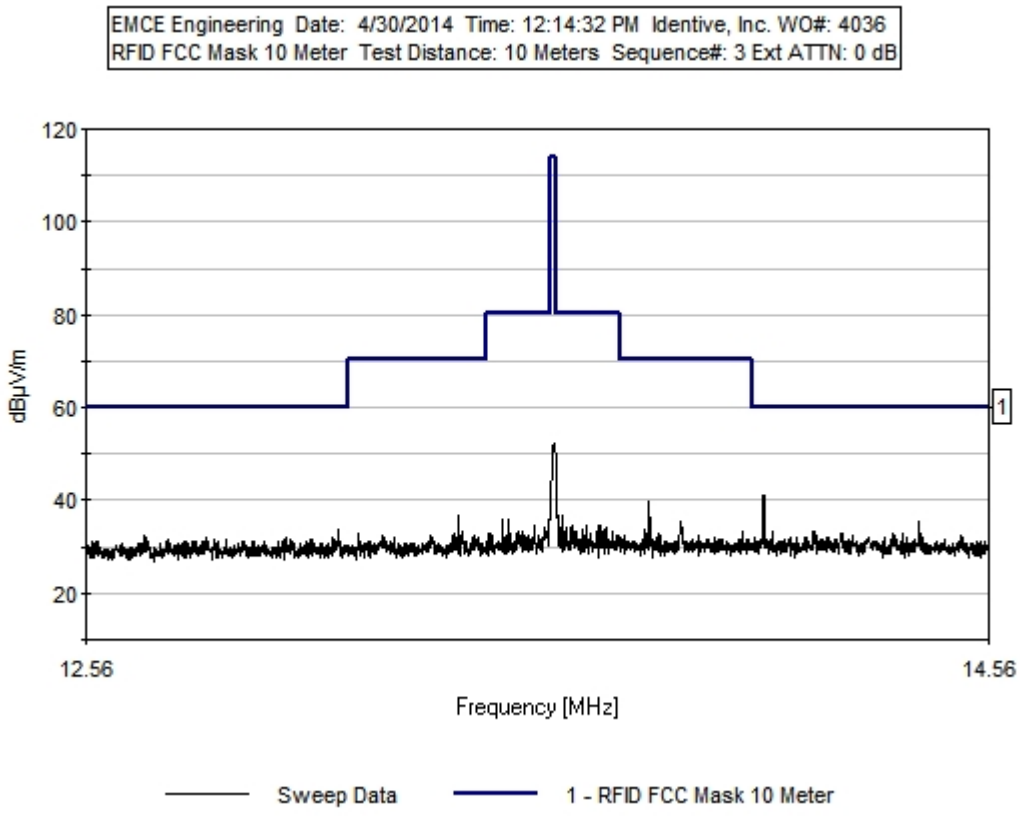
Transducer Legend:

T1=100' LMR 900 Rad Cable 12-2013 T2=8447 Pre-Amp Asset 377
T3=LP-105 Loop Factors

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	14.033M	28.9	+0.2	+27.3	+39.4		+0.0	41.2	60.0	-18.8	Vert
2	14.395M	23.2	+0.2	+27.3	+39.2		+0.0	35.3	60.0	-24.7	Vert
3	13.088M	20.8	+0.2	+27.3	+40.0		+0.0	33.7	60.0	-26.3	Vert
4	14.148M	21.2	+0.2	+27.3	+39.3		+0.0	33.4	60.0	-26.6	Vert
5	14.055M	20.9	+0.2	+27.3	+39.4		+0.0	33.2	60.0	-26.8	Vert
6	14.215M	20.7	+0.2	+27.3	+39.3		+0.0	32.9	60.0	-27.1	Vert



Frequency (MHz)	Corrected Amplitude Reading (dBuV/m @ 3M)
13.558	39.9

5.7 Occupied Bandwidth

Requirement(s): RSS-210 (5.9.1)

Procedures: Occupied Bandwidth was measured according to RSS-210 (5.9.1). Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz.

Environmental Conditions	Temperature	24°C
	Relative Humidity	45%
	Atmospheric Pressure	1010mbar

Test Date :

Tested By :

Results:

Frequency	Occupied Bandwidth (99%)

N/A – No Industry Canada Application

6.0 TEST EQUIPMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer Hewlett-Packard	8566B	3014A06947	5/2/12	5/2/14
Quasi-Peak Adapter Hewlett-Packard	85650A	3145A01673	5/2/13	5/2/15
EMI Analyzer System Hewlett-Packard	8593EM	3497A5703	5/17/12	5/17/14
Signal Analyzer Rohde-Schwarz	FSV7	1321.3008K7	3/10/14	3/10/16
HP 84125 EMI Measurement System	84125B	US36432003	5/1 /13	5/1/15
Pre-Amplifier(100KHz-1.3GHz) Hewlett-Packard	8447D	2443A03587	5/1/13	5/1/15
LISN(9KHz-30MHz) EMCO	3810-2	9807-1988	5/17/12	5/17/14
LISN(9KHz-30MHz) EMCO	3810-2	4576	5/17/12	5/17/14
BiConiLog Antenna Sunol Sciences	JB6	1090	8/14/12	8/14/14
Loop Antenna Empire Devices	LP105	000114	1/15/14	1/15/16
Webber Temperature Chamber	WE4-100-200	3-60-32	8/15/13	8/15/15
RF Signal Cable Murata	25’ LMR	N/A	5/10 /13	5/10 /15
RF Signal Cable EMCE	100’ LMR	N/A	5/1 /13	5/1 /15