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 :
uTrust Scramblepad TS

Model Name :
DS47L-SSP-TS

Application Purpose : Original

Prepared by:

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

Revision History

Rev.	Issue Date	Description
0	3/26/2015	Initial Issue

TABLE OF CONTENTS

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 Smartcard Reader
Product Name	UTrust Scramblepad TS
Model Name :	DS47L-SSP-TS
Applied Standards :	47 CFR §15.207, 15.209, 15.225: 2010 & Canadian Standards RSS-GEN Issue 3, RSS-210 Issue 8
FCC ID :	FCC ID: MBPSPTS-01
IC :	IC: 7485-SPTSR1
RF Operating Frequency (ies)	13.56MHz, 125 kHz
Modulation	ASK
Emission Designator	64K1K1D, 1K47K1D
Receipt of EUT :	1/5/2015
Date of Testing :	1/5/2015 - 1/12/2015
Date of Report :	3/26/2015

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:	*DS47L-SSP-TS*
Product Name:	*uTrust Scramblepad TS*
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	Pass
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.
N/A 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 : 1/12/2015

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: **FCC 15_209 COND [AVE]**
Work Order #: **4096** Date: 1/12/2015
Test Type: **Conducted Emissions** Time: 14:01:33
Equipment: **Physical Access Reader** Sequence#: 1
Manufacturer: Identiv Tested By: Mashood Danmole
Model: DS47L-SSP-TS 120V 60Hz
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV7-B160 Signal Analyzer	101468	01/28/2014	01/28/2017	N/A
Emco 3816/2 LISN	9808-1089	07/10/2014	07/10/2015	0059
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

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

Function	Manufacturer	Model #	S/N
Phisical Access Reader*	Identiv	DS47L-SSP-TS	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
System Controller Box	Identiv	HIRSCH Mx Controller	N/A

Test Conditions / Notes:

Transducer Legend:

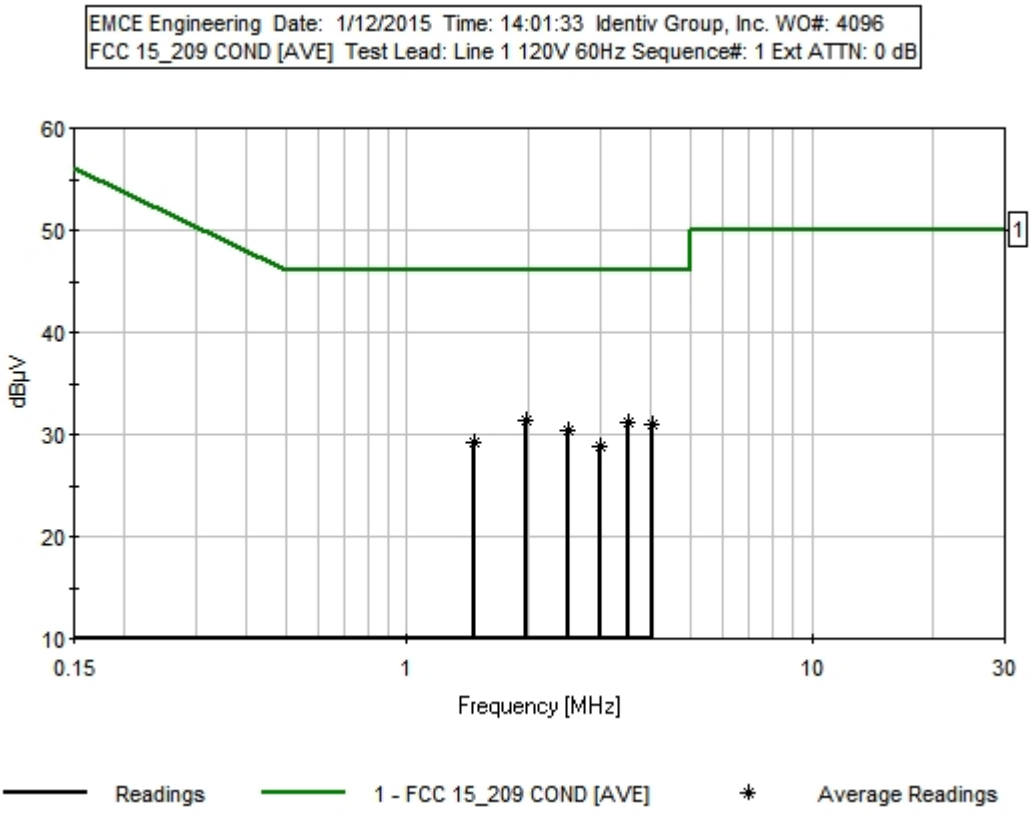
T1=EMCO 3810-2 LISN S/N 9807-1988	T2=25' LMR #001

Ext Attn: 0 dB

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1 Ave	1.977M	30.7	+0.6	+0.1			+0.0	31.4	46.0	-14.6	Line
^	1.977M	46.6	+0.6	+0.1			+0.0	47.3	46.0	+1.3	Line
3 Ave	3.528M	30.4	+0.6	+0.1			+0.0	31.1	46.0	-14.9	Line
^	3.528M	49.7	+0.6	+0.1			+0.0	50.4	46.0	+4.4	Line

5	4.056M Ave	30.3	+0.6	+0.1	+0.0	31.0	46.0	-15.0	Line
^	4.056M	49.6	+0.6	+0.1	+0.0	50.3	46.0	+4.3	Line
7	2.496M Ave	29.6	+0.6	+0.1	+0.0	30.3	46.0	-15.7	Line
^	2.496M	46.4	+0.6	+0.1	+0.0	47.1	46.0	+1.1	Line
9	1.457M Ave	28.6	+0.5	+0.1	+0.0	29.2	46.0	-16.8	Line
^	1.457M	47.1	+0.5	+0.1	+0.0	47.7	46.0	+1.7	Line
11	2.998M Ave	28.2	+0.6	+0.1	+0.0	28.9	46.0	-17.1	Line
^	2.999M	48.3	+0.6	+0.1	+0.0	49.0	46.0	+3.0	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: **FCC 15_209 COND [AVE]**
Work Order #: **4096** Date: 1/12/2015
Test Type: **Conducted Emissions** Time: 14:08:57
Equipment: **Phisical Access Reader** Sequence#: 2
Manufacturer: Identiv Tested By: Mashood Danmole
Model: DS47L-SSP-TS 120V 60Hz
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV7-B160 Signal Analyzer	101468	01/28/2014	01/28/2017	N/A
Emco 3816/2 LISN	9808-1089	07/10/2014	07/10/2015	0059
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

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

Function	Manufacturer	Model #	S/N
Phisical Access Reader*	Identiv	DS47L-SSP-TS	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
System Controller Box	Identiv	HIRSCH Mx Controller	N/A

Test Conditions / Notes:

Transducer Legend:

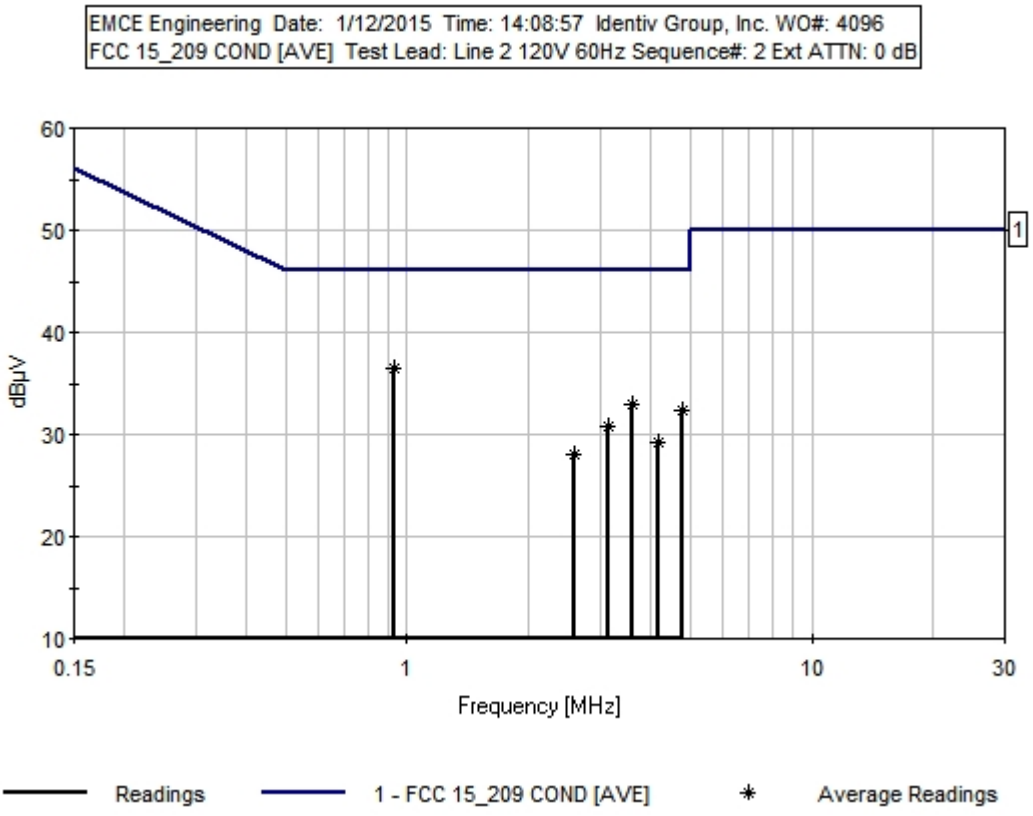
T1=EMCO 3810-2 LISN S/N 9807-1988	T2=25' LMR #001

Ext Attn: 0 dB

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1 Ave	928.340k	35.8	+0.5	+0.1			+0.0	36.4	46.0	-9.6	Line
^	928.340k	46.4	+0.5	+0.1			+0.0	47.0	46.0	+1.0	Line
3 Ave	3.621M	32.2	+0.6	+0.1			+0.0	32.9	46.0	-13.1	Line
^	3.621M	48.5	+0.6	+0.1			+0.0	49.2	46.0	+3.2	Line
5 Ave	4.772M	31.7	+0.6	+0.1			+0.0	32.4	46.0	-13.6	Line

^	4.772M	47.4	+0.6	+0.1	+0.0	48.1	46.0	+2.1	Line
7	3.127M Ave	30.0	+0.6	+0.1	+0.0	30.7	46.0	-15.3	Line
^	3.127M	48.5	+0.6	+0.1	+0.0	49.2	46.0	+3.2	Line
9	4.158M Ave	28.6	+0.6	+0.1	+0.0	29.3	46.0	-16.7	Line
^	4.158M	47.8	+0.6	+0.1	+0.0	48.5	46.0	+2.5	Line
11	2.599M Ave	27.3	+0.6	+0.1	+0.0	28.0	46.0	-18.0	Line
^	2.599M	46.9	+0.6	+0.1	+0.0	47.6	46.0	+1.6	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 : 1/7/2015

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: **Identiv**
Specification: **15.209 9k-30M FCC Limits II**
Work Order #: **4097** Date: 1/7/2015
Test Type: **Radiated Scan** Time: 12:30:07 PM
Equipment: **Physical Access Pad** Sequence#: 1
Manufacturer: Identiv Tested By: Mashood Danmole
Model: DS47L-SSP-TS
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV7-B160 Signal Analyzer	101468	01/28/2014	01/28/2017	N/A
HP 8447D PreAmp	2443A03587	05/01/2014	05/01/2015	008
Empire Devices Loop Antenna	N/A	05/07/2014	05/07/2015	114
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

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

Function	Manufacturer	Model #	S/N
Physical Access Pad*	Identiv	DS47L-SSP-TS	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
System Controller Box	Identiv	HIRSCH Mx Controller	N/A

Test Conditions / Notes:

Transducer Legend:

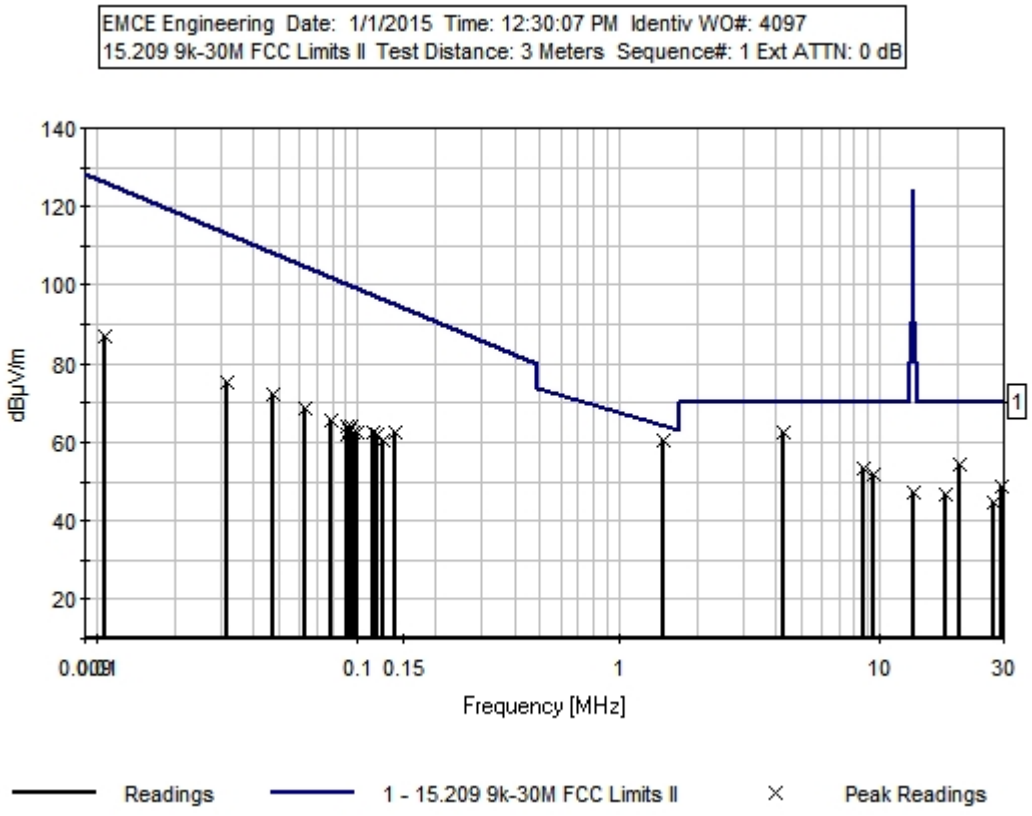
T1=8447 Pre-Amp Asset 377	T2=25' LMR #001
T3=LP-105 Loop Antenna	T4=dBuA - dBuV Conversion

Ext Attn: 0 dB

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	10.805k	21.9	+28.0	+0.0	+41.8	+51.5	+0.0	87.2	126.3	-39.1	X (ho
2	31.456k	10.2	+27.9	+0.0	+41.4	+51.5	+0.0	75.2	113.3	-38.1	X (ho
3	47.095k	7.2	+27.8	+0.0	+41.2	+51.5	+0.0	72.1	108.4	-36.3	X (ho

4	62.935k	3.9	+27.8	+0.0	+41.0	+51.5	+0.0	68.6	104.9	-36.3	X (ho
5	78.574k	0.9	+27.8	+0.0	+41.0	+51.5	+0.0	65.6	102.2	-36.6	X (ho
6	90.388k	-0.4	+27.8	+0.0	+40.9	+51.5	+0.0	64.2	100.5	-36.3	X (ho
7	91.090k	-2.7	+27.8	+0.0	+40.9	+51.5	+0.0	61.9	100.4	-38.5	X (ho
8	93.196k	-1.8	+27.8	+0.0	+40.9	+51.5	+0.0	62.8	100.1	-37.3	X (ho
9	94.249k	-0.7	+27.8	+0.0	+40.9	+51.5	+0.0	63.9	100.0	-36.1	X (ho
10	96.544k	-2.4	+27.7	+0.0	+40.9	+51.5	+0.0	62.3	99.7	-37.4	X (ho
11	98.893k	-2.4	+27.7	+0.0	+40.9	+51.5	+0.0	62.3	99.4	-37.1	X (ho
12	114.750k	-2.0	+27.7	+0.0	+40.8	+51.5	+0.0	62.6	97.6	-35.0	X (ho
13	117.875k	-2.6	+27.7	+0.0	+40.8	+51.5	+0.0	62.0	97.3	-35.3	X (ho
14	125.750k	-4.1	+27.7	+0.0	+40.8	+51.5	+0.0	60.5	97.1	-36.6	X (ho
15	138.500k	-1.8	+27.7	+0.0	+40.7	+51.5	+0.0	62.7	95.3	-32.6	X (ho
16	1.493M	7.3	+27.4	+0.0	+29.3	+51.5	+0.0	60.7	64.1	-3.4	X (ho
17	4.289M	13.9	+27.3	+0.0	+24.6	+51.5	+0.0	62.7	70.0	-7.3	X (ho
18	8.710M	5.7	+27.4	+0.0	+23.6	+51.5	+0.0	53.4	70.0	-16.6	X (ho
19	9.522M	5.1	+27.4	+0.0	+22.8	+51.5	+0.0	52.0	70.0	-18.0	X (ho
20	13.555M	3.2	+27.3	+0.0	+19.7	+51.5	+0.0	47.1	90.5	-43.4	X (ho
21	17.967M	5.0	+27.2	+0.0	+17.3	+51.5	+0.0	46.6	70.0	-23.4	X (ho
22	20.331M	13.7	+27.2	+0.0	+16.2	+51.5	+0.0	54.2	70.0	-15.8	X (ho
23	27.323M	6.5	+27.0	+0.0	+13.6	+51.5	+0.0	44.6	70.0	-25.4	X (ho
24	29.576M	11.5	+27.0	+0.0	+12.8	+51.5	+0.0	48.8	70.0	-21.2	X (ho


EMCE Engineering Date: 1/1/2015 Time: 12:30:07 PM Identiv WO#: 4097
15.209 9k-30M FCC Limits II Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB
140
120
100
80
60
40
20
dBµV/m
0.1
0.15
1
10
30
Frequency [MHz]
1
Readings
1 - 15.209 9k-30M FCC Limits II
Peak Readings

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 : 1/6/2015

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: **Identiv**
Specification: **FCC 15.209 30-1000 10M**
Work Order #: **4097** Date: 1/6/2015
Test Type: **Radiated Scan** Time: 12:24:01
Equipment: **Phisycal Access Pad** Sequence#: 3
Manufacturer: Identiv Tested By: Mashood Danmole
Model: DS47L-SSP-TS
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV7-B160 Signal Analyzer	101468	01/28/2014	01/28/2017	N/A
HP 8447D PreAmp	2443A03587	05/01/2014	05/01/2015	008
Sunol Sciences JB6 Antenna	1090	02/12/2014	02/12/2016	701
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

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

Function	Manufacturer	Model #	S/N
Phisycal Access Pad*	Identiv	DS47L-SSP-TS	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
System Controller Box	Identiv	HIRSCH Mx Controller	N/A

Test Conditions / Notes:

Transducer Legend:

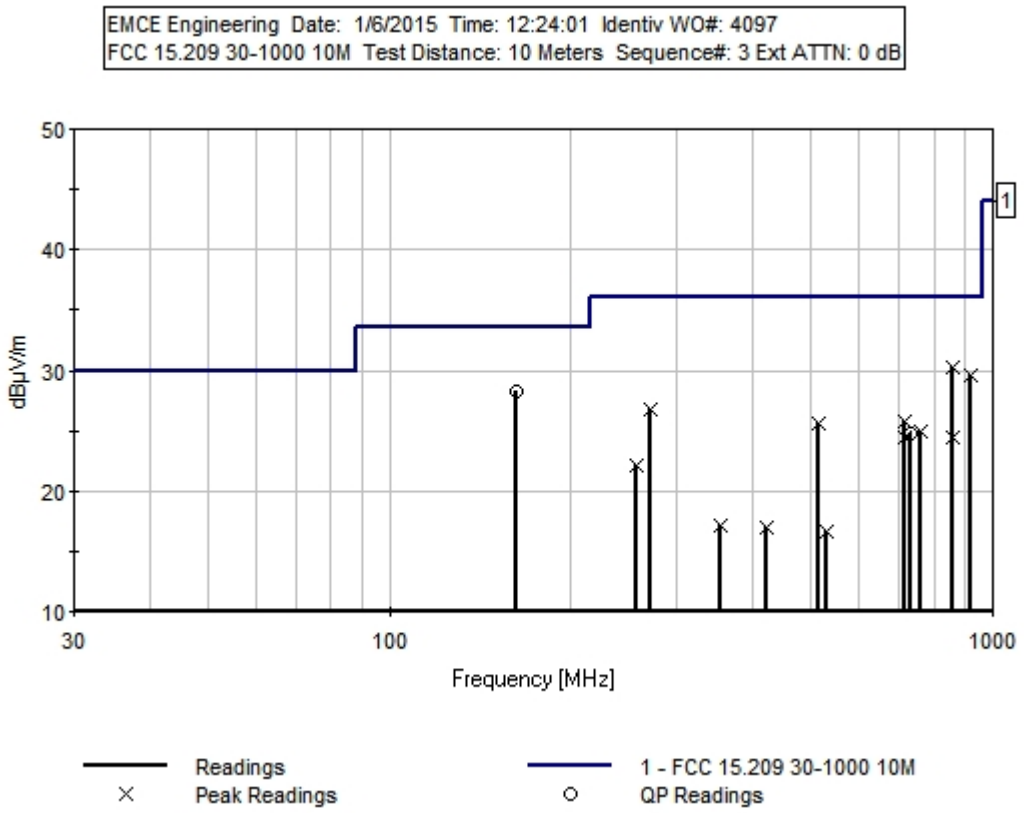
T1=Sunol JB6 S/N A42610	T2=8447 Pre-Amp Asset 377
T3=100' LMR 900 Rad Cable 12-2013	

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	162.720M QP	42.8	+12.2	+26.7	+0.0		+0.0 120	28.3	33.5	-5.2	Vert 100
2	856.116M	33.7	+21.9	+27.0	+1.7		+0.0 130	30.3	36.0	-5.7	Vert 397
3	922.080M	32.4	+22.3	+26.9	+1.8		+0.0 147	29.6	36.0	-6.4	Vert 190
4	271.200M	40.2	+13.3	+27.0	+0.3		+0.0 245	26.8	36.0	-9.2	Vert 100

5	712.158M	31.0	+20.4	+27.1	+1.4	+0.0 88	25.7	36.0	-10.3	Vert 309
6	514.966M	33.5	+18.1	+26.9	+0.9	+0.0 194	25.6	36.0	-10.4	Horiz 311
7	759.574M	29.9	+20.7	+27.1	+1.5	+0.0 116	25.0	36.0	-11.0	Vert 219
8	732.240M QP	29.9	+20.6	+27.1	+1.4	+0.0 209	24.8	36.0	-11.2	Vert 173
9	715.564M	29.7	+20.4	+27.1	+1.4	+0.0 240	24.4	36.0	-11.6	Horiz 265
10	856.811M	27.8	+21.9	+27.0	+1.7	+0.0 214	24.4	36.0	-11.6	Horiz 325
11	257.640M	36.8	+12.0	+27.0	+0.3	+0.0 270	22.1	36.0	-13.9	Horiz 250
12	352.560M	29.1	+14.5	+27.0	+0.6	+0.0 189	17.2	36.0	-18.8	Horiz 175
13	420.360M	27.0	+16.1	+26.9	+0.7	+0.0 310	16.9	36.0	-19.1	Horiz 229
14	528.840M	24.4	+18.1	+26.9	+1.0	+0.0 133	16.6	36.0	-19.4	Horiz 229



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 : 1/8/2015

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	13.560101	121	<0.01	Pass
40	13.560077	97	<0.01	Pass
30	13.559997	17	<0.01	Pass
20	Reference (13.559980 MHz)			
10	13.559931	49	<0.01	Pass
0	13.559909	71	<0.01	Pass
-10	13.559883	97	<0.01	Pass
-20	13.559864	126	<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	13.559985	15	<0.01	Pass
5.75	13.559991	9	<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 : 1/12/2015

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: **Identiv**
Specification: **RFID FCC Mask 10 Meter**
Work Order #: **4097** Date: 1/12/2015
Test Type: **Radiated Scan** Time: 11:21:42 PM
Equipment: **Physical Access Pad** Sequence#: 10
Manufacturer: Identiv Tested By: Mashood Danmole
Model: DS47L-SSP-TS
S/N: N/A

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV7-B160 Signal Analyzer	101468	01/28/2014	01/28/2017	N/A
HP 8447D PreAmp	2443A03587	05/01/2014	05/01/2015	008
Empire Devices Loop Antenna	N/A	05/07/2014	05/07/2015	114
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

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

Function	Manufacturer	Model #	S/N
Physical Access Pad*	Identiv	DS47L-SSP-TS	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
System Controller Box	Identiv	HIRSCH Mx Controller	N/A

Test Conditions / Notes:

Transducer Legend:

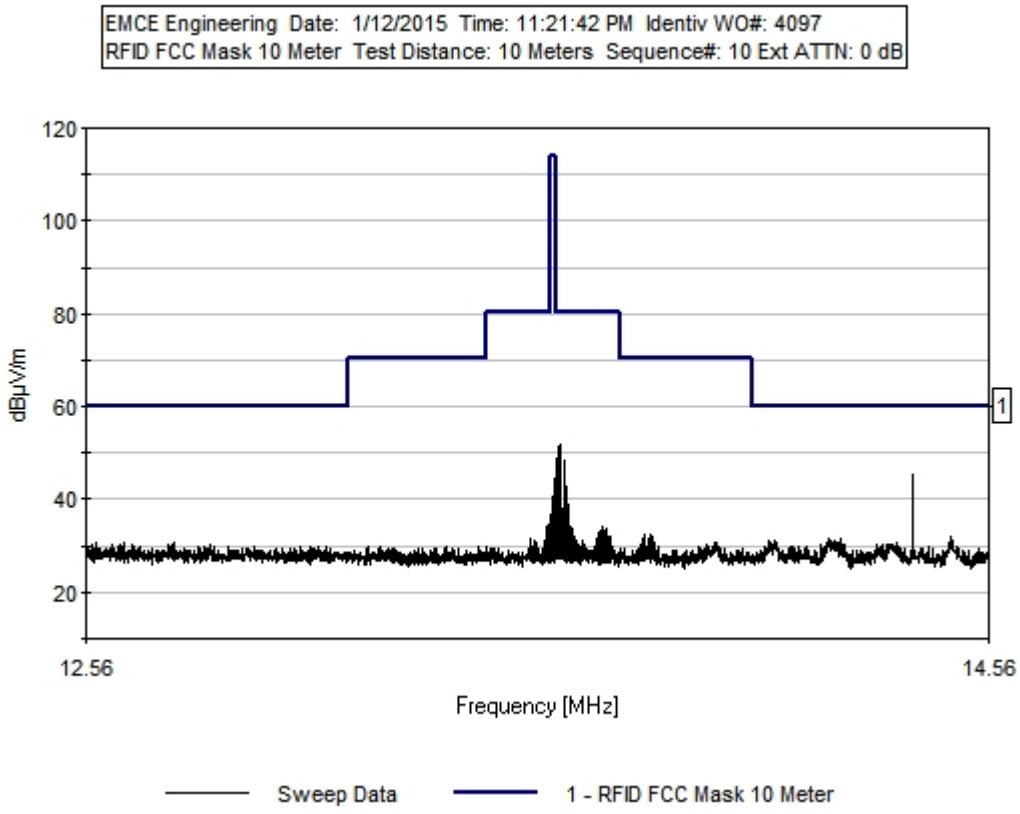
T1=8447 Pre-Amp Asset 377	T2=25' LMR #001
T3=LP-105 Loop Factors	

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	14.380M	33.3	+27.3	+0.0	+39.2		+0.0 186	45.2	60.0	-14.8	X (ho 244
2	14.469M	20.0	+27.3	+0.0	+39.1		+0.0 186	31.8	60.0	-28.2	X (ho 244
3	13.575M	39.5	+27.3	+0.0	+39.7		+0.0 186	51.9	80.5	-28.6	X (ho 244

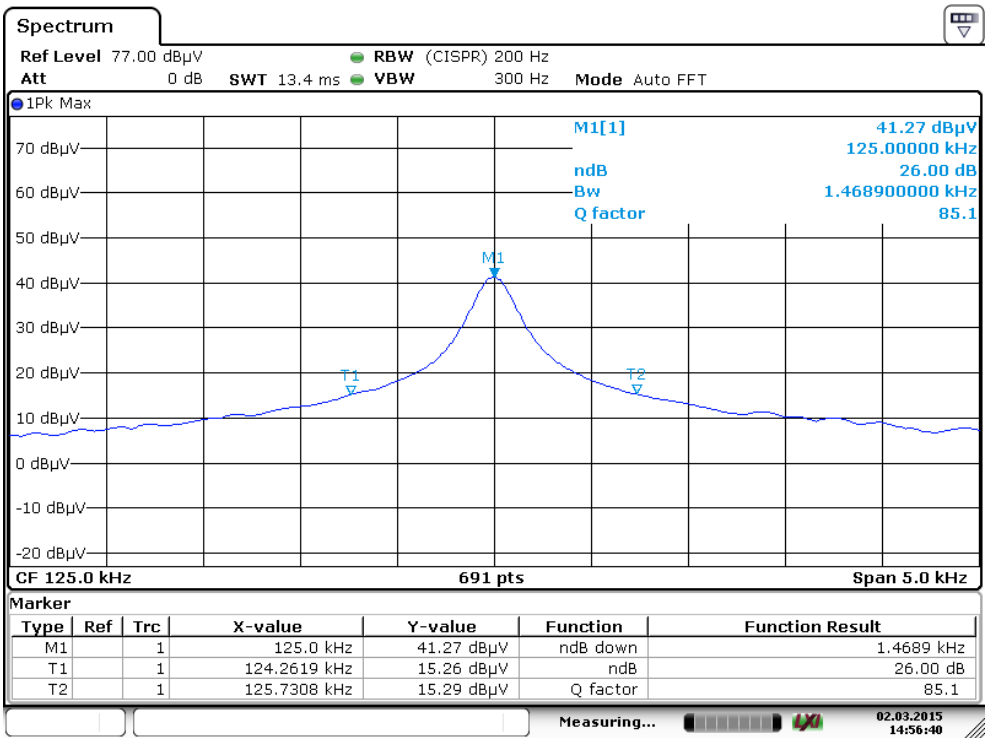
4	14.184M	19.4	+27.3	+0.0	+39.3	+0.0 186	31.4	60.0	-28.6	X (ho 244
5	14.211M	19.4	+27.3	+0.0	+39.3	+0.0 186	31.4	60.0	-28.6	X (ho 244
6	14.060M	19.0	+27.3	+0.0	+39.4	+0.0 186	31.1	60.0	-28.9	X (ho 244



13.56 MHz Peak Power

Frequency (MHz)	Corrected Amplitude Reading (dBuV/m @ 10M)
13.558	51.8

125 kHz Peak Power / Occupied Bandwidth



125 kHz Peak Power

Frequency	Corrected Amplitude Reading (dBuV/m @ 3M)
125 kHz	41.27

5.7 Occupied Bandwidth

Requirement(s): RSS-210 (5.9.1)

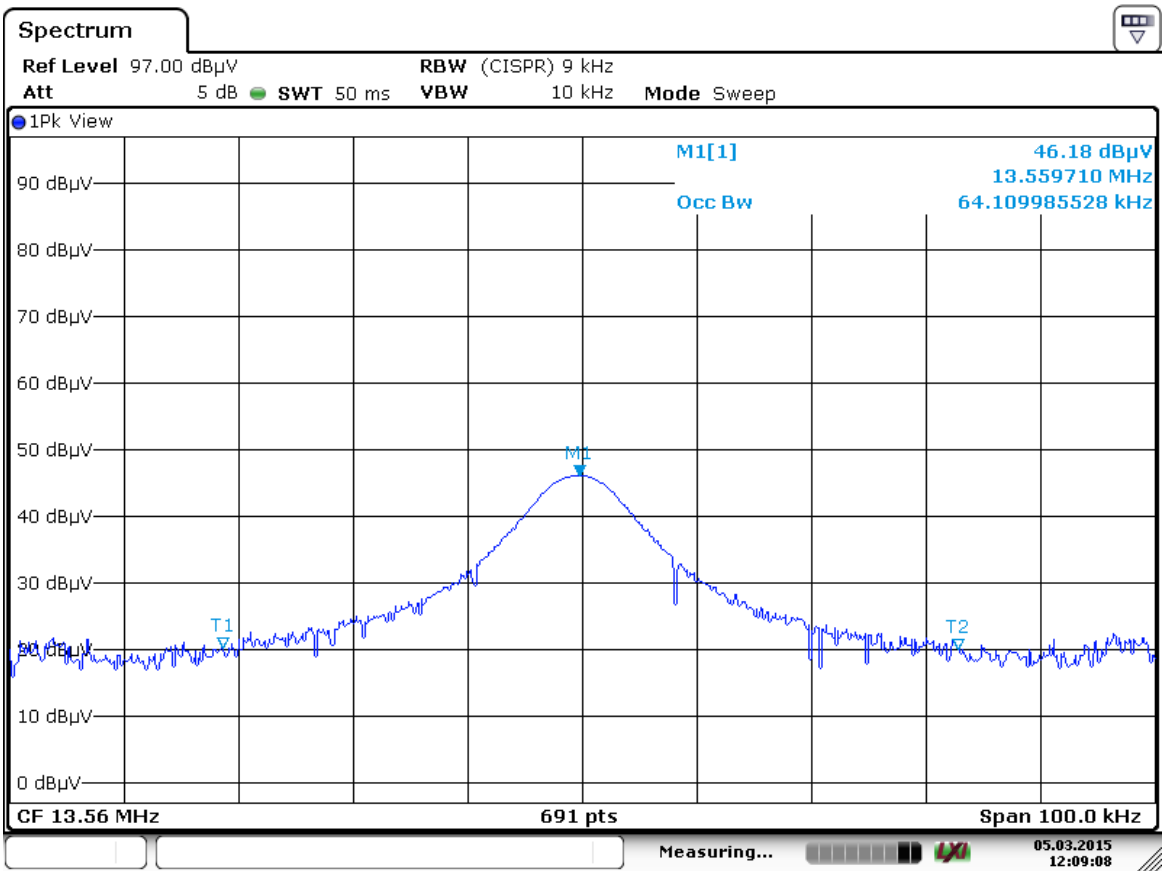
Procedures: Occupied Bandwidth was measured according to RSS-210 (5.9.1). Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz.

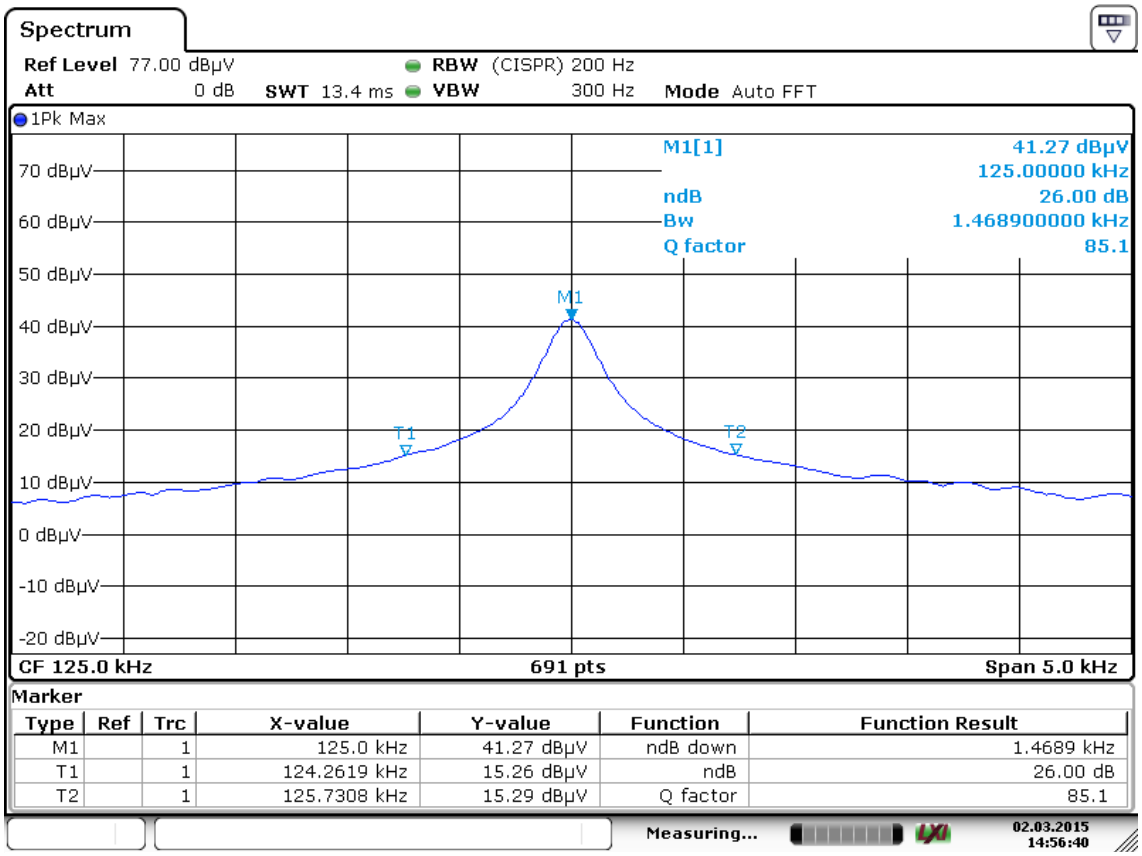
Environmental Conditions	Temperature	24°C
	Relative Humidity	45%
	Atmospheric Pressure	1010mbar

Test Date : 1/12/2015

Tested By : Bob Cole

Results: Pass





Frequency	Occupied Bandwidth (99%)
13.56 MHz	64.1099 kHz
125 kHz	1.4689 kHz

6.0 TEST EQUIPMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer Hewlett-Packard	8566B	3014A06947	5/2/14	5/2/16
Quasi-Peak Adapter Hewlett-Packard	85650A	3145A01673	5/2/14	5/2/16
EMI Analyzer System Hewlett-Packard	8593EM	3497A5703	5/17/14	5/17/16
Signal Analyzer Rohde-Schwarz	FSV7	101468	1/28/14	1/28/17
HP 84125 EMI Measurement System	84125B	US36432003	5/1 /13	5/1/15
Pre-Amplifier(100KHz-1.3GHz) Hewlett-Packard	8447D	2443A03587	5/1/14	5/1/16
LISN(9KHz-30MHz) EMCO	3816-2	9807-1988	7/10/14	7/10/15
LISN(9KHz-30MHz) EMCO	3816-2	4576	7/1014	7/10/15
BiConiLog Antenna Sunol Sciences	JB6	1090	8/14/14	8/14/16
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