

Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



Compliance Test Report			FCC PART 90	IC RSS-119				
Test Lab Information	Name	CELLTE	CELLTECH LABS INC.					
rest Lab illiorniation	Address	21-364 L	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada					
Test Site Registration No.(c)	FCC	Accredite	ed Site (ISO 17025:2005 - A2LA Test La	ab Certificate No. 2470.01)				
Test Site Registration No.(s)	IC	3874A-1						
	Name	4RF C	ommunications Ltd.					
Applicant Information	Address	26 Glover St. Wellington 6032 New Zealand						
	FCC	47 CFR Part 2; Part 90						
Standard(s) & Procedure(s)	IC	RSS-119, RSS-Gen.						
	ANSI	TIA/EIA-603-C-2004, C63.4-2003						
Davisa Classification(s)	FCC	Private Land Mobile Radio Services (TNB)						
Device Classification(s)	IC	Land Mobile & Fixed Services in the Frequency Range 27.41-960 MHz (TNB)						
Application Type(s)	FCC/IC	New Cer	tification					
Davice Identifier(s)	FCC ID:	UIPSRN0400025A						
Device Identifier(s)	IC:	6772A-SRN400						
Device Under Test (DUT)	Under Test (DUT)  Aprisa SR 25 KHz, Point-to-Multipoint Transmitter, Scada applications.							

This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Parts 2 and Part 90; Industry Canada RSS-119 Issue 11 and RSS-Gen Issue 3; ANSI TIA/EIA-603-C-2004 and ANSI C63.4-2003.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results and statements contained in this report pertain only to the device(s) evaluated. This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.

Applicant:		4RF Corp. FCC ID:		4RF Corp. FCC ID: UIPSRN0400025A		IC: 6772A-SRN400		<b>**</b> 4DC
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 C
DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4RF	
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### **GENERAL REMARKS**

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### **SUMMARY**

The device under test (DUT) fulfills the general approval requirements as identified in this test report.

### **REVISION LOG**

Revision	Description	Implemented By	Implementation Date
1.0	1st Release	Glen Westwell	6/28/2013

Test Report Prepared By	Date	QA Review By	Date
Glen Westwell	6/28/2013	Mike Meaker	6/28/2013

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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#### **SCOPE**

This report outlines the results collected during RF radiated and conducted measurements of the 4RF Aprisa SR 25kHz point-to-multipoint radio. The measurement results were applied against the applicable requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Part 2 and Part 90; and Industry Canada Radio Standards Specification RSS-119 and RSS-Gen.

#### 1.0 REFERENCES

#### 1.1 Normative References

ANSI/ISO 17025:2005 General Requirements for competence of testing and calibration laboratories

IEEE/ANSI C63.4:2003 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic

Equipment in the Range of 9 kHz to 40 GHz

ANSI/TIA/EIA-603-C:2004 Land Mobile FM or PM Communication Equipment Measurement and Performance Standards

CFR Title 47 Part 2 Code of Federal Regulations

Title 47: Telecommunication

Part 2: Frequency Allocations and Radio Treaty Matters;

General Rules and Regulations

CFR Title 47 Part 90 Code of Federal Regulations

Title 47: Telecommunication

Part 90: Private Land Mobile Radio Services

IC Spectrum Management & Radio Standards Specification

Telecommunications Policy RSS-119 – Land Mobile Fixed Services; 27.41-960 MHz

RSS-Gen - General Requirements and Information for the Certification of

Radiocommunication Equipment

### 2.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria are the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

#### 3.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC as an accredited test facility and Industry Canada under File Number IC 3874A-1.

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:	UT Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>	
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### 4.0 GENERAL INFORMATION

### **DUT Description & Specifications**

Device Description	Aprisa SR 25	kHz Point-to-Multipoint Digital Radio		
Test Sample Serial No.	T/A Sample -	Identical Prototype		
Device Identifier(s)	FCC ID:	UIPSRN0400025A		
	IC ID:	6772A-SRN400		
Model number(s)	** FCC single port = APSR-N400-025-SO-12-FCA FCC dual port = APSR-N400-025-DO-12-FCA  IC single port = APSR-N400-025-SO-12-ICA IC dual port = APSR-N400-025-DO-12-ICA			
Transmit Frequency Range	UHF 400 – 470 MHz (25 KHz Channels)			
Rated TX Power	+37.0dBm			
Modulation	4-CPFSK			
Spectral Efficiency	19,200 bits per second / 25 KHz or 4800 bits per second / 6.25 kHz			
Antenna	Maximum antenna gain = 15dBi.			
Emission Designator	20K0D7W (99	9% = 13.68 kHz, ABW = 20 kHz)		
DUT Power Source	Nominal 13.8	Vdc		
Type of Equipment	Fixed. Licensed Nor	n-Broadcast Station Transmitter (TNB)		
Deviation(s) from standard/procedure	None			
Modification of DUT	None			
Test Exercise	The DUT was	s placed in continuous transmit mode.		
Applicable Standards	FCC Part 90,	IC RSS-119		

### **DUT Function & Test Statements**

Spectrum Efficient Technologies Part 90.203(j)(5).

This device complies with the spectrum efficiency requirement of this rule part.

It uses 4-CPFSK modulation and operates at 9600 symbols per second or 19,200 bits per second / 25 KHz channel, which also meets the minimum data rate of 4800 bits per 6.25 kHz channel bandwidth.

A manufacturer's attestation exhibit has been submitted with this filing.

This device has no voice frequency capability. It uses digital modulation only. Therefore no voice frequency test requirements have been reported.

\*\*This device comes in two electrically identical variants. One with a single combined TX/RX port and one with separate RX and TX ports. A manufacturer's attestation exhibit has been submitted with this filing.

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 C
DUT Type:	e: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4</b> KF	
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<u>Section</u>	Description of Test	Procedure Reference	<u>Limit Reference</u>	Result
5	RF Output Power	ANSI/TIA/EIA-603-C	§2.1046, §90.205	Pass
6	Spurious Emissions at the antenna terminals (Conducted)	ANSI/TIA/EIA-603-C	§2.1051, 90.210	Pass
7	Occupied Bandwidth and Emission Mask	ANSI/TIA/EIA-603-C	§2.1049, §90.210	Pass
8	Radiated Spurious Emissions	ANSI C63.4-2003	§2.1053, §90.210	Pass
10	Frequency Stability	ANSI/TIA/EIA-603-C	§2.1055, §90.213	Pass
<u>Section</u>	Description of Test	Procedure Reference	<u>Limit Reference</u>	Result
Section 5	Description of Test  Transmitter Output Power	Procedure Reference RSS-Gen 4.8	RSS-119, 5.4	Result Pass
5	Transmitter Output Power Spurious Emissions at the	RSS-Gen 4.8	RSS-119, 5.4	Pass
5	Transmitter Output Power  Spurious Emissions at the antenna terminals (Conducted)  Occupied Bandwidth	RSS-Gen 4.8 RSS-Gen 4.9	RSS-119, 5.4 RSS-119, 5.8	Pass Pass

Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>10</b> 4DC
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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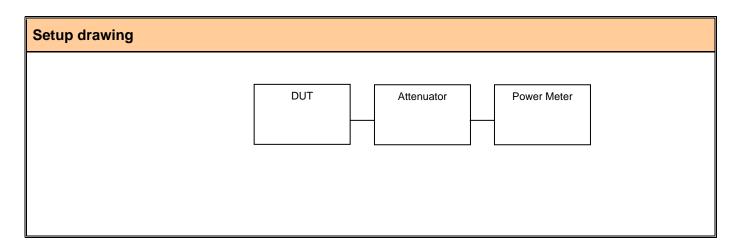
# 5.0 <u>RF OUTPUT POWER MEASUREMENT</u>

References				
Normative Reference Standard	FCC CFR 47 §2.1046, §90.205; IC RSS-119, 5.4			
Procedure Reference	The RF output power measurements were performed in accordance with ANSI TIA/EIA Standard 603.			

Limits						
FCC CFR 47 §90.279	ERP relative to Effective Antenna Height (EAH), 90.279.					
RSS-119, 5.4	The output power shall be within ±1.0 dB of the manufacturers rated power.					

Environmental conditions				
Temperature	25 +/- 5 °C			
Humidity	40 +/- 10 %			
Barometric Pressure	101 +/- 3 kPa			

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00007	Gigatronics	8652A	Power Meter	03-May-14
00014	Gigatronics	80701A	Power Sensor	03-May-14



Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 4DC
DUT Type:	P-to-Mp Transmitter			DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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### **Test results: Complies**

Measured Frequency	Conducted Output Power	Rated Output Power
(MHz)	(dBm)	(dBm)
406.11250	36.8	37.0
429.98750	36.7	37.0
450.01250	36.6	37.0
469.98750	36.6	37.0

### Sign-off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Glen Westwell Lab Manager Celltech Labs Inc.

6/28/2013

Date

Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:	P-to-Mp Transmitter			DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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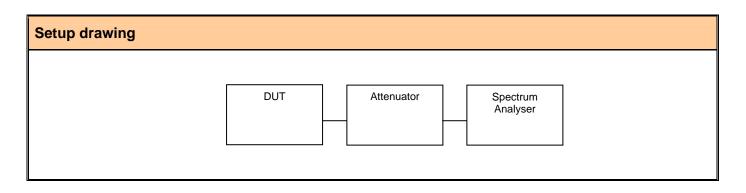
# 6.0 SPURIOUS EMISSIONS AT THE ANTENNA TERMINAL

References				
Normative Reference Standard	FCC CFR 47 §2.1051, §90.210; IC RSS-119, 5.8			
Procedure Reference	The spurious emissions measurements at the antenna terminal were performed in accordance with ANSI TIA/EIA Standard 603.			
	The emission search was performed across all required ranges. The worst case performance has been presented.			

Limits	
FCC CFR 47 §90.210	43 + 10 Log (Po) = 43 + 10 Log
RSS119, Para. 5.8	43 + 10 Log (Po) = 43 + 10 Log

Environmental conditions				
Temperature	25 +/- 5 °C			
Humidity	40 +/- 10 %			
Barometric Pressure	101 +/- 3 kPa			

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00051	HP	8566B	Spectrum Analyzer RF Section	10-May-2014
00047	HP	85685A	RF Preselector	10-May-2014
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-2015

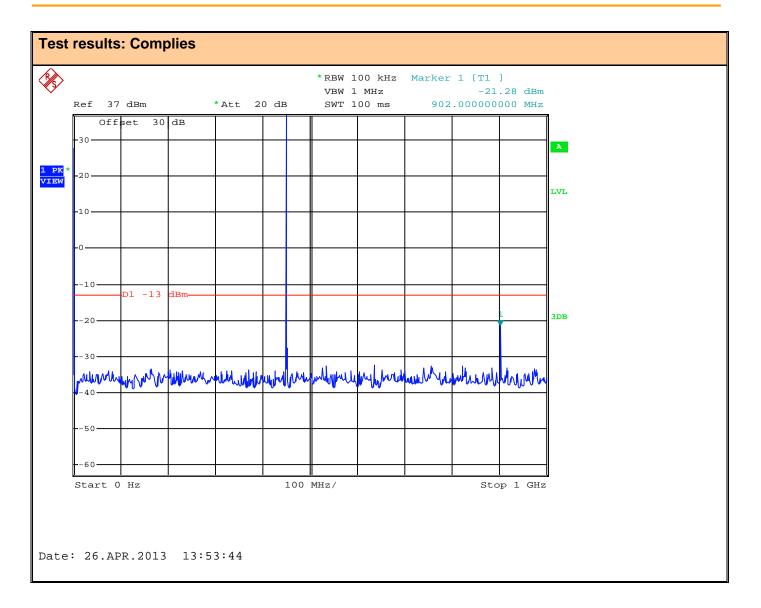


Applicant:	4RF Corp. FG		FCC ID:	UIPSRN0400025A		IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:	JT Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>	
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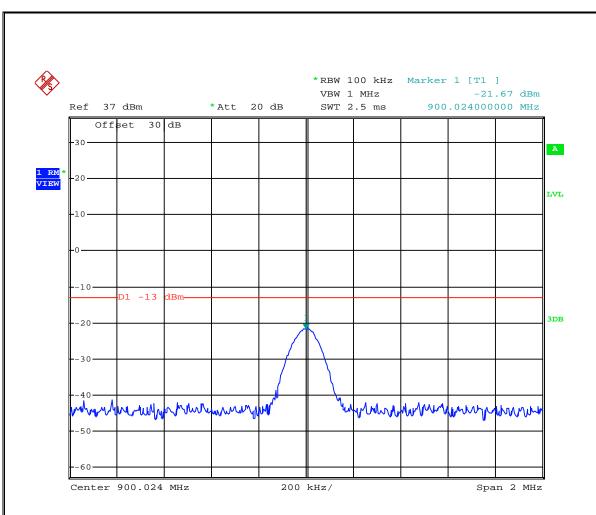


Applicant:	4RF Corp. FCC		FCC ID:	UIPSRN0400025A		IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:	T Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>	
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
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IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1





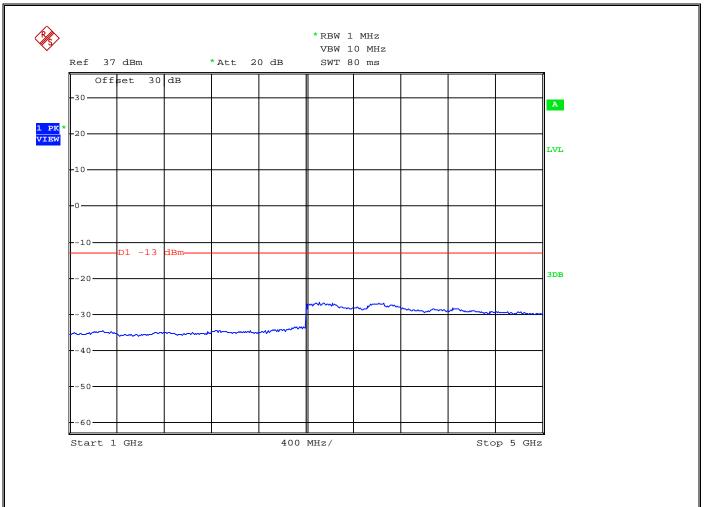
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Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 5
DUT Type:	pe: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	eq.: 400-470 MHz	4KF	
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Date: 26.APR.2013 13:50:48

Applicant:		4RF Corp. FCC ID:		4RF Corp. FCC ID: UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 40 5
DUT Type:	: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.: 400-470 MHz	4KF		
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# Sign-off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Glen Westwell. Lab Manager Celltech Labs Inc.

6/28/2013

Date

Applicant:	4RF Corp. FCC I		4RF Corp. FCC ID: UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:	T Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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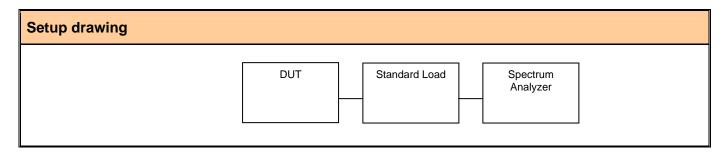
# 7.0 OCCUPIED BANDWIDTH AND EMISSION MASK

References					
Normative Reference Standard FCC CFR 47 §2.1049, §90.210 RSS-119, 5.8					
Procedure Reference / Description	Occupied bandwidth was performed by connecting the output of the DUT to the input of a spectrum analyzer.				

Limits	Limits					
§90.210	Mask C.					
RSS-119	The nominal authorized channel bandwidth : Channel spacing = 25kHz, ABW = 20kHz					

Environmental conditions				
Temperature	25 +/- 5 °C			
Humidity	40 +/- 10 %			
Barometric Pressure	101 +/- 3 kPa			

Equipment list							
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE			
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-2015			



Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	400
DUT Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	4KF		
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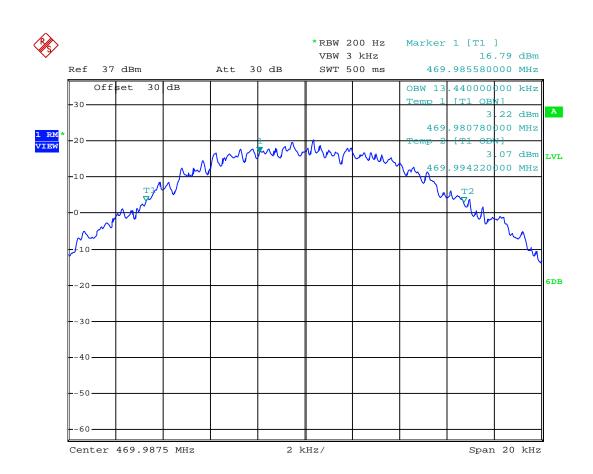


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### 7.1 Test results - OBW

### 99% Occupied Bandwidth = 13.44 kHz



Date: 26.APR.2013 13:35:32

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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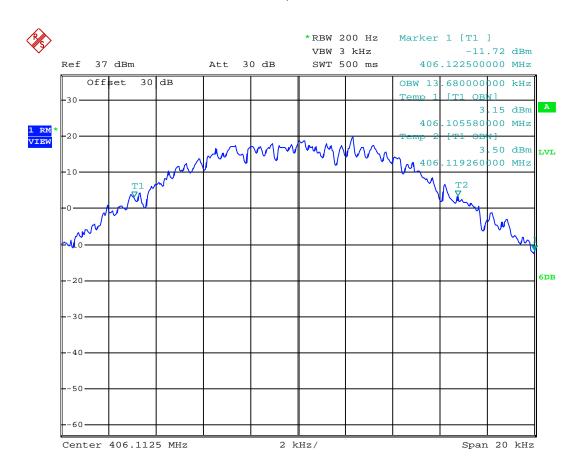


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### **Test results Cont.**





Date: 26.APR.2013 13:38:00

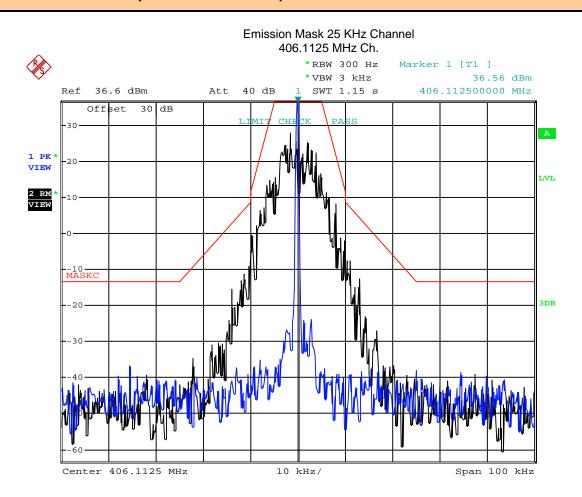
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



### 7.2 Test results – Spectrum Mask C: Complies



Date: 27.JUN.2013 19:59:27

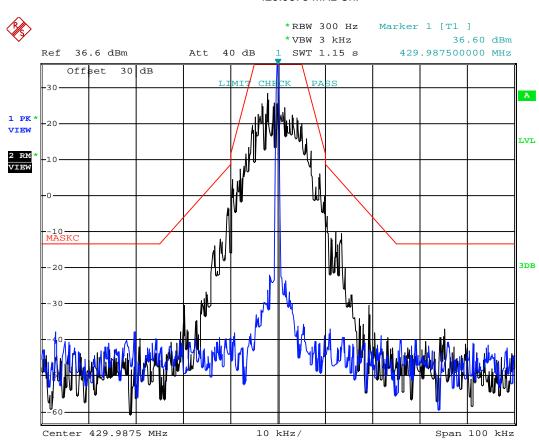
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# Emission Mask 25 KHz Channel 429.9875 MHz Ch.



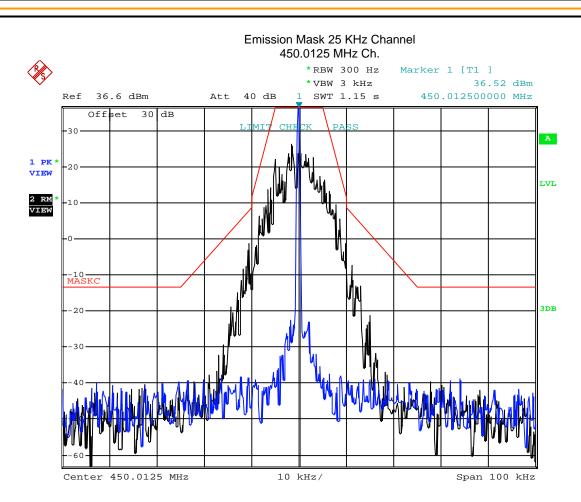
Date: 27.JUN.2013 19:52:03

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1





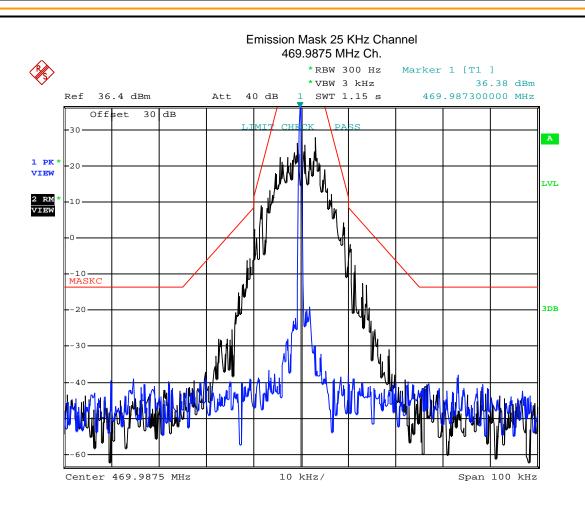
Date: 27.JUN.2013 20:15:57

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1





Date: 27.JUN.2013 20:06:54

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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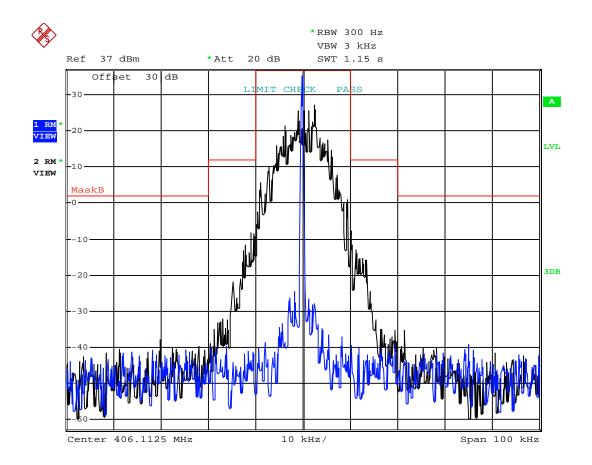


Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



### 7.3 Test results - Spectrum Mask B: Complies

# Emission Mask 25 KHz Channel 406.1125 MHz Ch.



Date: 26.APR.2013 17:37:01

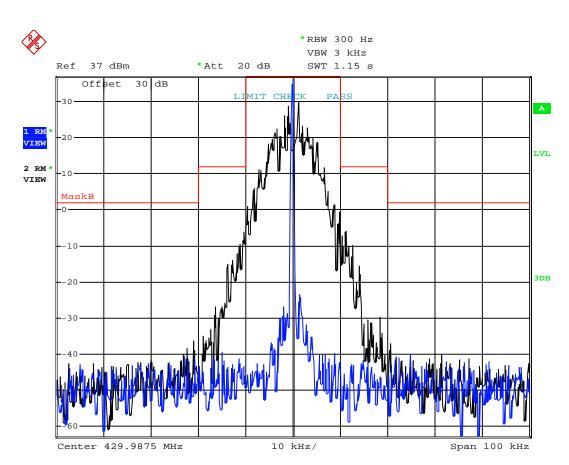
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 5
DUT Type:	Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	4RF	
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T (5 (6 : 1N	050040 T4000 E 000	5 (1 5)	0/00/0040
Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# Emission Mask 25 KHz Channel 429.9875 MHz Ch.



Date: 26.APR.2013 17:38:56

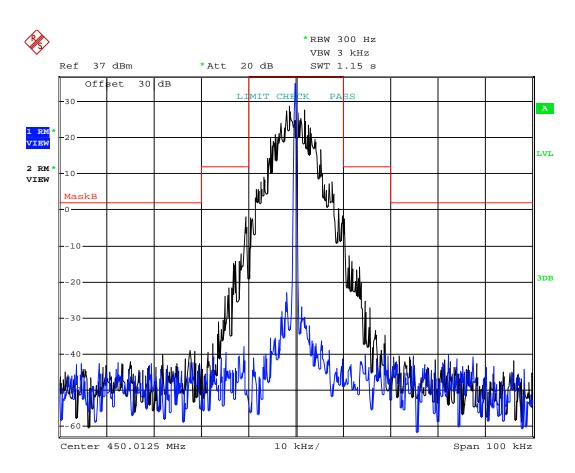
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 5
DUT Type:	UT Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	4KF	
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# Emission Mask 25 KHz Channel 450.0125 MHz Ch.



Date: 26.APR.2013 17:32:13

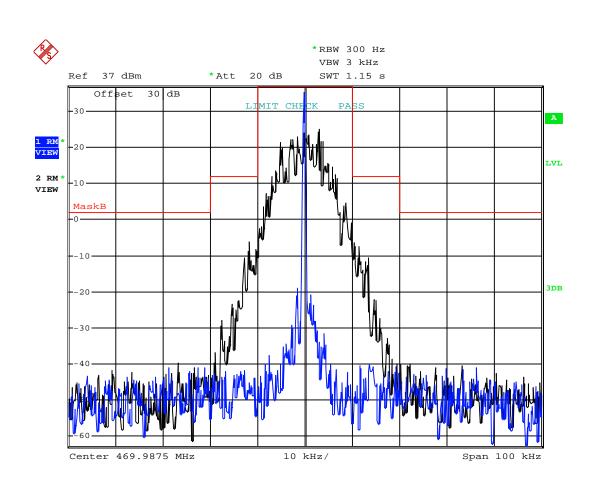
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 40 5
DUT Type:	T Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	4KF	
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# Emission Mask 25 KHz Channel 469.9875 MHz Ch.



Date: 26.APR.2013 17:34:50

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:	DUT Type: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	4KF	
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# Sign-off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Glen Westwell. Lab Manager Celltech Labs Inc.

6/28/2013

Date

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:	DUT Type: P-to-Mp Transmitter		DUT	DUT Aprisa SR25 kHz		400-470 MHz	4KF	
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# 8.0 RADIATED SPURIOUS EMISSIONS - TX (SIGNAL SUBSTITUTION)

References								
Normative Reference Standard	FCC CFR 47 §2.1053; 90.210;IC RSS-119, RSS-GEN							
Measurement Reporting	<ul> <li>The transmitter spurious emissions were measured in accordance with ANSI/TIA-603-C.</li> <li>The spectrum was searched from the lowest frequency generated in the DUT up to the 10<sup>th</sup> harmonic of the fundamental frequency.</li> <li>The DUT was characterized on 3 orthogonal axis.</li> <li>Detected emissions are reported.</li> </ul>							

Limits	
§90.210, RSS-119,	Emissions must be at least 43 + 10 log <sub>10</sub> (P) dB below the mean power output of the transmitter.

<b>Environmental conditions</b>	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

Equipment list				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-15
00050	Chase	CBL-6111A	Bilog Antenna	07-May-14
00055	EMCO	3121C	Dipole Antenna	07-Mat-14
00034	EMCO	3115	Horn Ant.	06-Dec-14
00035	EMCO	3115	Horn Ant.	06-Dec-14
00239	Miteq	JS4-00102600	LNA	COU
00006	R&S	SMR 20	Signal Generator (10MHz-40GHz)	1-May-14
00007	Gigatronics	8652A	Power Meter	03-May-14
00014	Gigatronics	80701A	Power Sensor	03-May-14

Note: COU = cal on use.

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



Peak

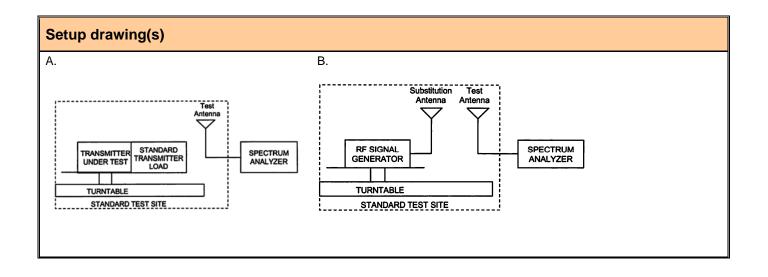
#### Measurement equipment setup For the field strength measurements, the measurement equipment was connected as shown in D.6. For the final substitutions, the DUT was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated. Worst case **MEASUREMENT** performance is presented. **EQUIPMENT** Frequency Range RX Antenna TX Antenna CONNECTIONS 30 MHz - 1GHz Dipole Bilog 1 GHz - 18 GHz ETS 3115 Horn ETS 3115 Horn Measurement Settings. **MEASUREMENT RBW VBW** Detector **EQUIPMENT** MHz MHz **SETTINGS**

300 kHz < 1 GHz

3 MHz> 1 GHz

100 kHz < 1GHz

1 MHz >1 GHz



Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



## Radiated Emissions: Signal Substitution (Fig. A&B)

TX: 429.9875 MHz	Ant. Polarity	Emission Level	Substitution Level	Antenna Gain (+)	Cable loss (+)	Amp Gain (-)	Corrected Pwr Level	Limit	Margin
(MHz)		(dBuV)	(dB)	(+dBi)	(dB)	(dB)	(dBm)	(dBm)	(dB)
859.975	V	55.0	-46.5	1.88 (dBd)	12.1	29.9	-62.4	-13.0	49.4
859.975	Н	54.0	-47.3	1.88 (dBd)	12.1	29,9	-63.2	-13.0	50.2
1289.9625	V	50.82	-49.4	6.9	13.8	30.2	-58.9	-13.0	45.9
1289.9625	Н	46.3	-54.3	6.9	13.8	30.2	-63.8	-13.0	50.8
2149.9375	V	50.1	-43.5	9.1	17.4	28.8	-45.8	-13.0	32.8
2149.9375	Н	52.3	-41.1	9.1	17.4	28.8	-43.4	-13.0	30.4

### Test results:

#### Complies.

- · All detected emissions are reported.
- The worst case emission is 2149.9375 MHz at -43.4dBm.
- The spectrum was searched from the lowest frequency generated in the DUT up to the 10<sup>th</sup> harmonic of the fundamental frequency.
- The DUT was characterized on 3 orthogonal axis.

### Sign-off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Glen Westwell Lab Manager Celltech Labs Inc.

6/28/2013

Date

Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	400
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



# 9.0 RADIATED SPURIOUS EMISSIONS

References	
Normative Reference Standard	FCC CFR 47 §15.209; IC RSS-210, RSS-GEN
Procedure Reference(s)	The procedure used was ANSI C63.4-2003. The frequency was scanned from the lowest radio frequency generated to the 10 <sup>th</sup> harmonic of the fundamental. Detected emissions were maximized by rotating the table 360 degrees, to produce the maximum signal strength. The DUT was characterized on three (3) orthogonal planes. Worst case data has been recorded.
	RSS-Gen 4.9

Frequency (MHz)	Limits
30-88	40.0 dBuv/m measured @ 3 meters
80-216	43.5 dBuv/m measured @ 3 meters
216-960	46.0 dBuv/m measured @ 3 meters
Above 960	54.0 dBuv/m measured @ 3 meters
	30-88 80-216 216-960

Environmental conditions				
Temperature	25 +/- 5 °C			
Humidity	40 +/- 10 %			
Barometric Pressure	101 +/- 3 kPa			

Equipment list								
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE				
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-15				
00072	EMCO	2075	Mini-mast	n/a				
00073	EMCO	2080	Turn Table	n/a				
00071	EMCO	2090	Multi-Device Controller	n/a				
00030	HP	83017A	Microwave system amplifier	n/a				
00050	Chase	CBL-6111A	Bilog Antenna	03 May14				
00034	ETS	3115	Double Ridged Guide Horn	06 Dec 14				
00085	EMCO	6502	Active Loop Antenna	03 Jun 15				

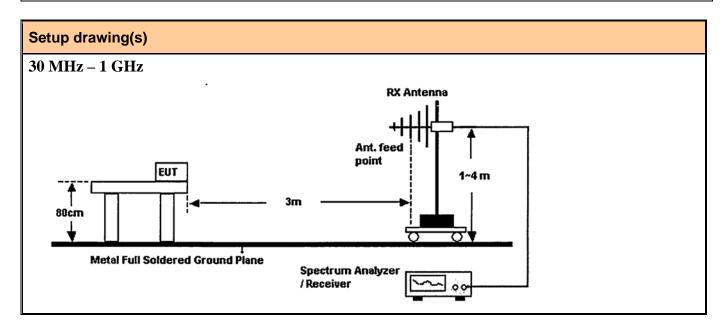
Applicant:		4RF Corp.	FCC ID:	UIPSR	N0400025A	IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
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IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



Measurement	equipment setup						
MEASUREMENT	For the field strength measurements, the measurement equipment was connected as shown in E.6. Various antenna types may be required to cover the applicable frequency range tested. The ranges in which each antenna was used are shown below.						
EQUIPMENT	Frequency I	Range	RX Antenna	TX Antenna			
CONNECTIONS	9kHz – 30	Mhz	Active Loop	N/a			
	30 MHz - 1	GHz	Bilog	N/a			
	1 GHz - 18	GHz	ETS 3115 Horn	N/a			
	For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:						
	Measurement	RBW	VBW	Detector			
	Measurement	kHz	kHz	Detector			
	< 30 MHz	10	100	Peak			
MEASUREMENT EQUIPMENT	< 1 GHz	100	300	Peak			
SETTINGS	> 1 GHz	1000	3000	Peak			
	The spectrum was searched from the lowest radio frequency generated by the EUT to the 10 <sup>th</sup> harmonic of the fundamental.  All detected emissions are reported.  The DUT was characterized on 3 orthogonal axis, worst case config. Reported.						

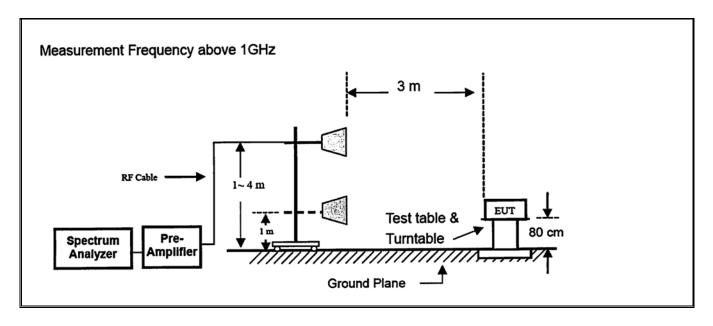


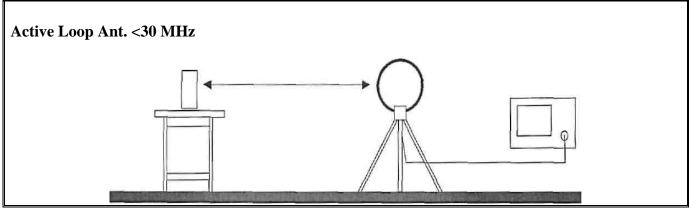
Applicant:		4RF Corp. FCC ID:		UIPSR	N0400025A	IC:	6772A-SRN400	<b>"</b> 4DC
DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF	
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Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1







Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>**</b> 4DC
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1

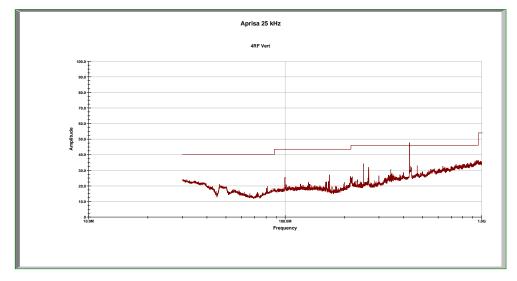


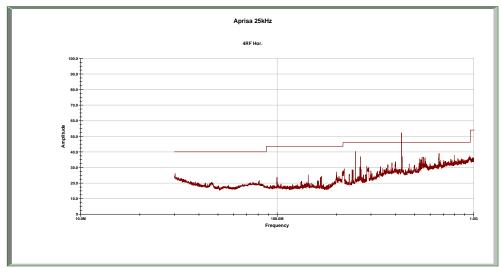
Test Data	
Normative Reference Standard	FCC CFR 47 §15.209; IC RSS-210, RSS-GEN

## Radiated Spurious Emissions.

30MHz – 1GHz Search

- Peak detector used
- The spectrum was searched from the lowest frequency generated in the DUT up to the 10<sup>th</sup> harmonic of the fundamental frequency.
- The DUT was characterized on 3 orthogonal axis.
- Detected emissions are reported.
- Highest peak emission displayed is the carrier at 429.9875 MHz.





Applicant:		4RF Corp. FCC ID:		FCC ID: UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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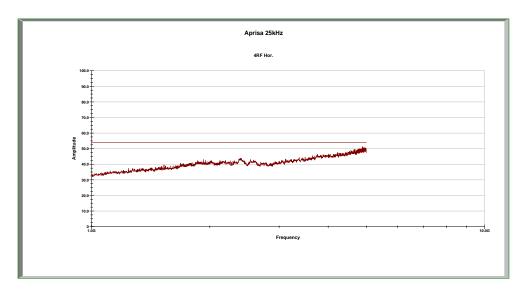
Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1

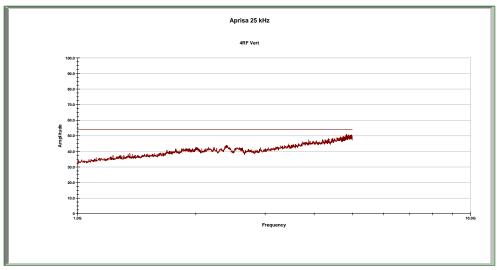


# Radiated Spurious Emissions Cont.

# 1GHz – 5GHz Search

- Peak detector Used
- Emissions were measured at 1m and corrected with a 9.54dB correction factor.





Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>10</b> 4DC
DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF	
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Test Report Serial No.:	250613-T1223-E-90O	Report Issue Date:	6/28/2013
Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited
IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1



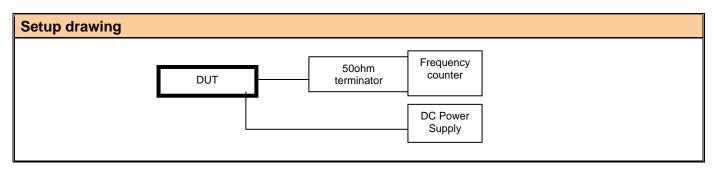
# 10.0 FREQUENCY STABILITY

References				
Normative Reference Standard	FCC CFR 47 §2.1055, §90.213; IC RSS-119			
Procedure Reference / Description	§2.1055(a)(2) The frequency stability shall be measured with variation of ambient temperature as follows: (1) From -40° to +70° centigrade.			

Limits	
§90.213 & RSS-119	90.213 - 421-512 MHz, 2.5ppm, RSS-119 - 406.1-430 MHz & 450-470 MHz, 2.5ppm

Environmental conditions				
Temperature	25 +/- 5 °C			
Humidity	40 +/- 10 %			
Barometric Pressure	101 +/- 3 kPa			

Equipment list							
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE			
na	ESPEC	ECT-2	Heater/Refrigerator	na			
0003	HP	53181A	Frequency Counter	02-May-14			
na	HP	E3611A	DC Power Supply	na			
00234	VWR	na	Temperature Humidity Monitor	20-July-14			



Applicant:	4RF Corp.		FCC ID:	UIPSRN0400025A		IC:	6772A-SRN400	<b>4</b> 4 D C
DUT Type:		P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>
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# **Test results: Complies**

Temperature (degrees C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Frequency tolerance (ppm)
-40	429 987 500	429 987 171	329	0.765
-30	429 987 500	429 987 100	400	0.93
-20	429 987 500	429 987 076	424	0.986
-10	429 987 500	429 987 070	430	0.1
0	429 987 500	429 987 124	76	0.874
10	429 987 500	429 987 307	193	0.449
20 -end point	429 987 500	429 987 380	120	0.279
20	429 987 500	429 987 381	119	0.277
20 +end point	429 987 500	429 987 381	119	0.277
30	429 987 500	429 987 372	128	0.298
40	429 987 500	429 987 301	199	0.463
50	429 987 500	429 987 266	234	0.544
60	429 987 500	429 987 209	291	0.677
70	429 987 500	429 987 169	331	0.77

# Sign-off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Glen Westwell Lab Manager Celltech Labs Inc.

Di Wand

6/28/2013

Date

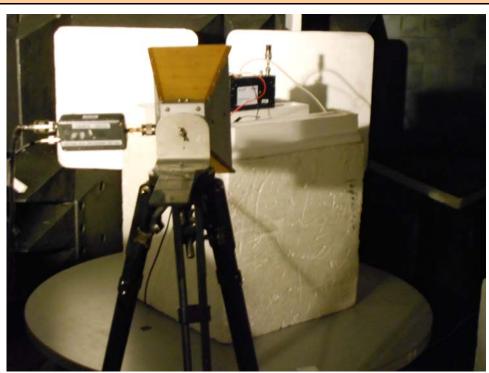
Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b> 4DC
DUT Type:	e: P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>	
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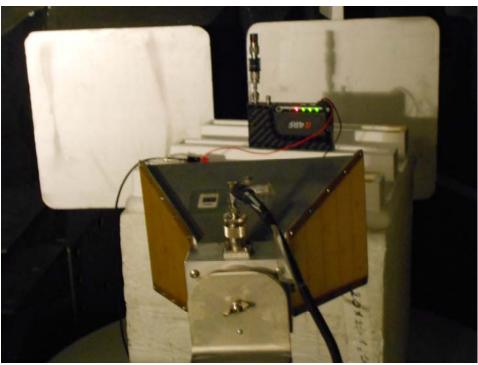


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# 11.0 TEST SET-UP PHOTO'S



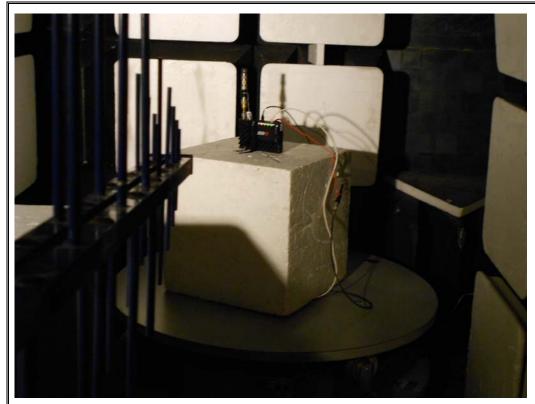


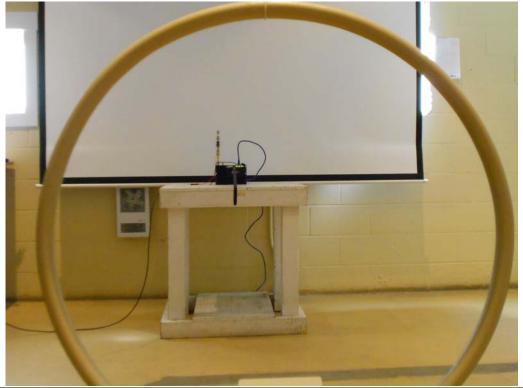
Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>"</b> 4DC
DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>	
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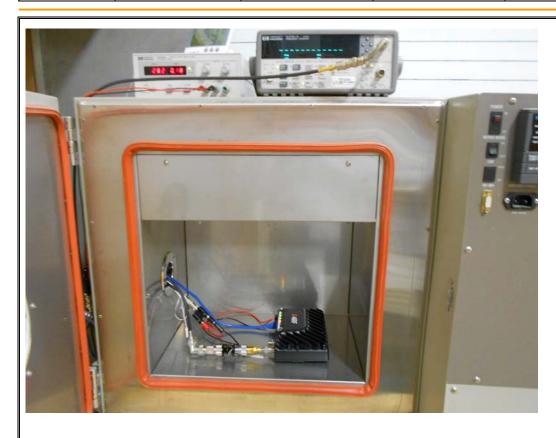


Applicant:		4RF Corp. FCC ID:		UIPSRN0400025A		IC:	6772A-SRN400	<b>40</b>	
DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	·· 4KF		
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# END OF DOCUMENT

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DUT Type:	P-to-Mp Transmitter		DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	<b>4KF</b>		
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