

	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01

Compliance Test Report		FCC PART 90	IC RSS-119
Test Lab Information	Name	CELLTECH LABS INC.	
	Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada	
Test Site Registration No.(s)	FCC	Accredited Site (ISO 17025:2005 - A2LA Test Lab Certificate No. 2470.01)	
	IC	3874A-1	
Applicant Information	Name	4RF Communications Ltd.	
	Address	26 Glover St. Wellington 6032 New Zealand	
Standard(s) & Procedure(s)	FCC	47 CFR Part 2; Part 90	
	IC	RSS-119, RSS-Gen.	
	ANSI	TIA/EIA-603-C-2004, C63.4-2003	
Device Classification(s)	FCC	Private Land Mobile Radio Services (TNB)	
	IC	Land Mobile & Fixed Services in the Frequency Range 27.41-960 MHz (TNB)	
Application Type(s)	FCC/IC	New Certification	
Device Identifier(s)	FCC ID:	UIPSRN0400025A	
	IC:	6772A-SRN400	
Device Under Test (DUT)	Aprisa SR 25 KHz, Point-to-Multipoint Transmitter, Scada applications.		
<p>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.</p> <p>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.</p> <p>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.</p>			
Test Report Approved By		Glen Westwell	Lab Manager Celltech Labs Inc.

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	Report Issue Date:	6/28/2013	
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Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

GENERAL REMARKS

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


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:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

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% = 13.68 kHz, ABW = 20 kHz)	
DUT Power Source	Nominal 13.8Vdc	
Type of Equipment	Fixed. Licensed Non-Broadcast Station Transmitter (TNB)	
Deviation(s) from standard/procedure	None	
Modification of DUT	None	
Test Exercise	The DUT was 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:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Section	Description of Test	Procedure Reference	Limit Reference	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
Section	Description of Test	Procedure Reference	Limit Reference	Result
5	Transmitter Output Power	RSS-Gen 4.8	RSS-119, 5.4	Pass
6	Spurious Emissions at the antenna terminals (Conducted)	RSS-Gen 4.9	RSS-119, 5.8	Pass
7	Occupied Bandwidth and Emission Mask	RSS-Gen 4.6.1	RSS-119, 5.5	Pass
8	Radiated Spurious Emissions	ANSI C63.4-2003	RSS-119, 5.8	Pass
10	Frequency Stability	RSS-Gen 4.7	RSS-119, 5.3	Pass

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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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	
					Test Lab Certificate No. 2470.01

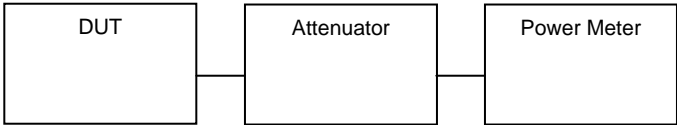
5.0 RF OUTPUT POWER MEASUREMENT


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

Setup drawing
 <pre> graph LR DUT[DUT] --- Attenuator[Attenuator] --- PowerMeter[Power Meter] </pre>

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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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 Lab Certificate No. 2470.01

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	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

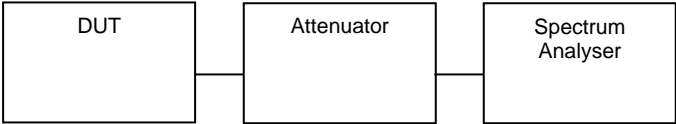
6.0 SPURIOUS EMISSIONS AT THE ANTENNA TERMINAL


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




Limits	
FCC CFR 47 §90.210	$43 + 10 \text{ Log (Po)} = 43 + 10 \text{ Log}$
RSS119, Para. 5.8	$43 + 10 \text{ Log (Po)} = 43 + 10 \text{ Log}$

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

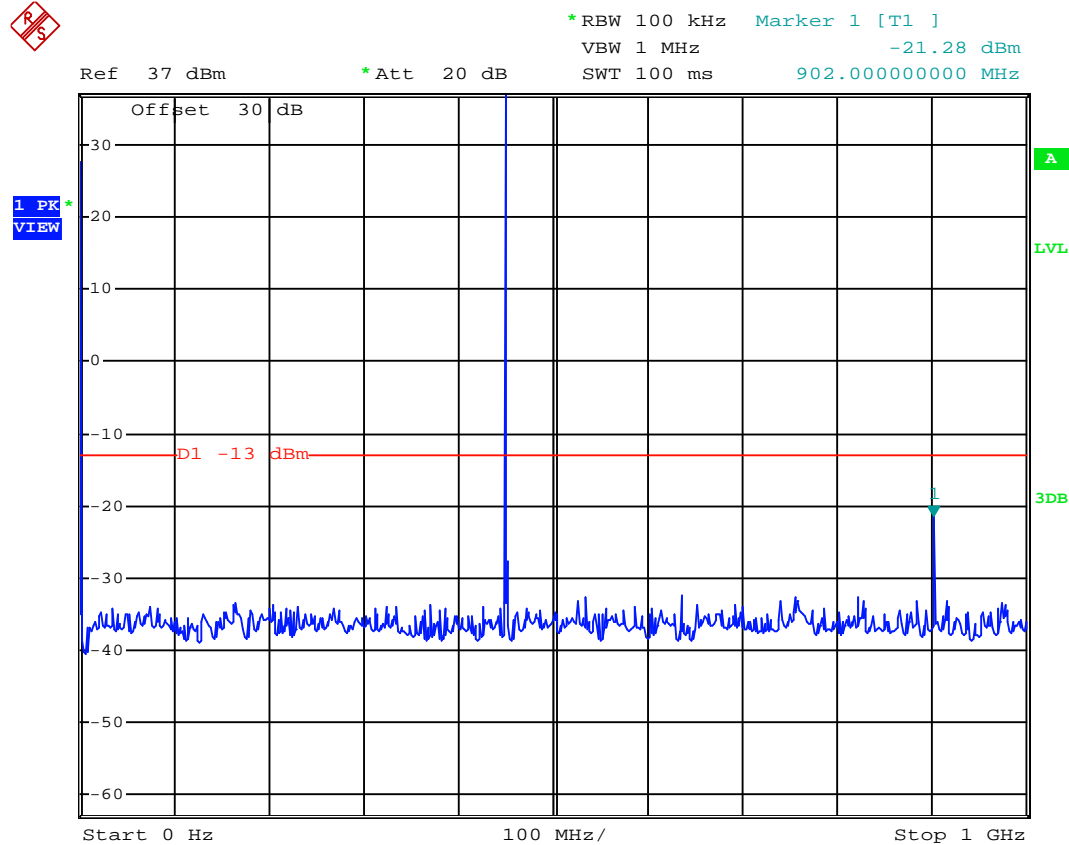
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00051	HP	8566B	Spectrum Analyzer RF Section	10-May-2014
00047	HP	85685A	RF Preselector	10-May-2014
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-2015

Setup drawing
 <pre> graph LR DUT[DUT] --- Attenuator[Attenuator] --- SpectrumAnalyser[Spectrum Analyser] </pre>


Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Test results: Complies



Date: 26.APR.2013 13:53:44

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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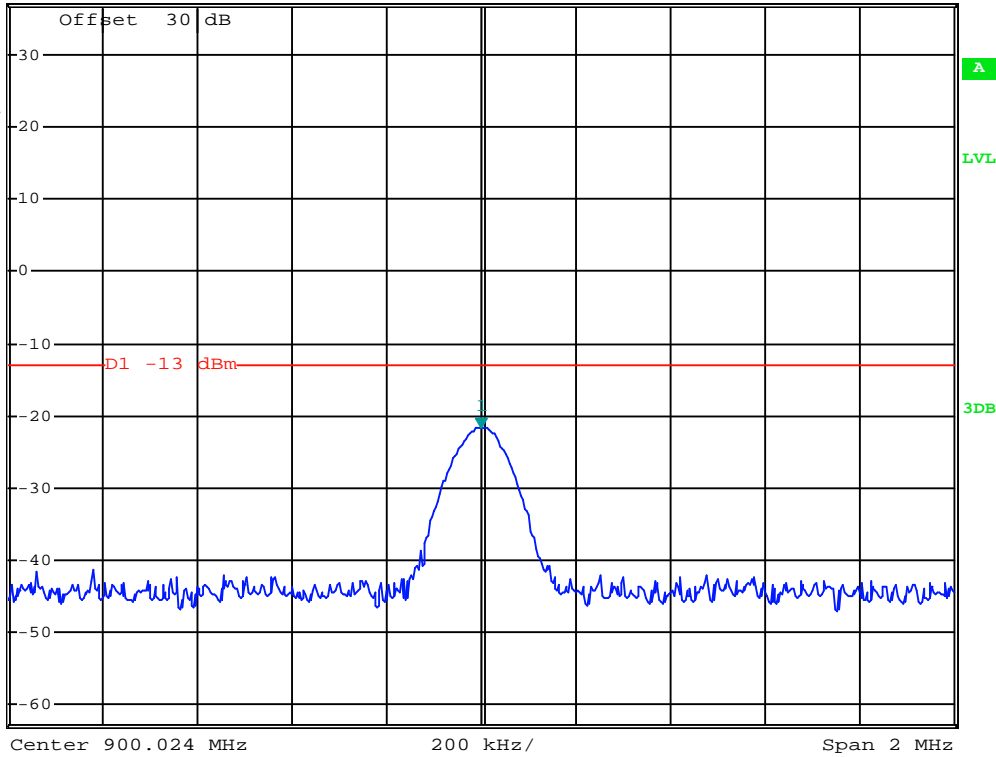


*RBW 100 kHz Marker 1 [T1]
 VBW 1 MHz -21.67 dBm
 SWT 2.5 ms 900.02400000 MHz

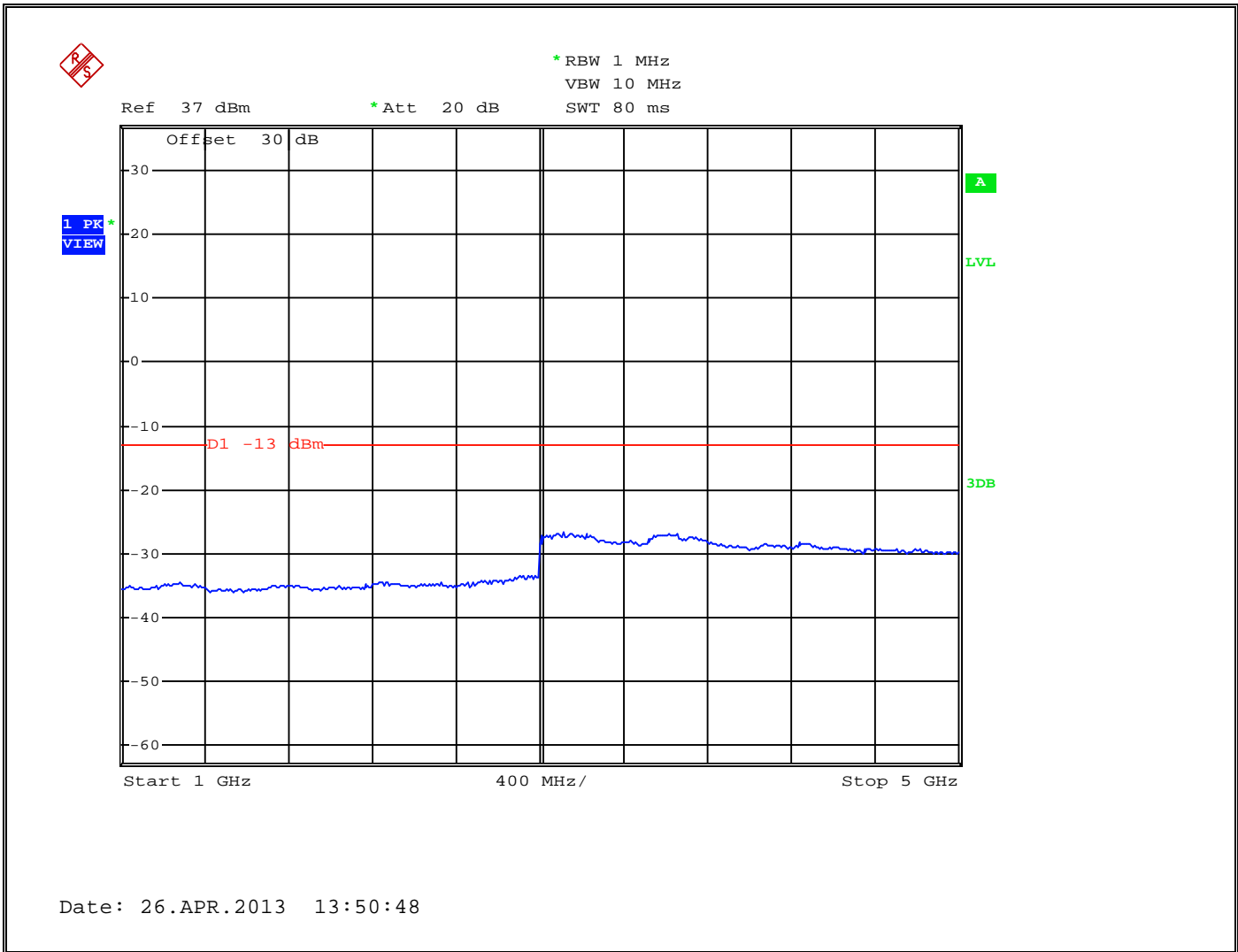
Ref 37 dBm




*Att 20 dB

1 RM
 VIEW



Date: 26.APR.2013 13:55:51



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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 Lab Certificate No. 2470.01

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	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

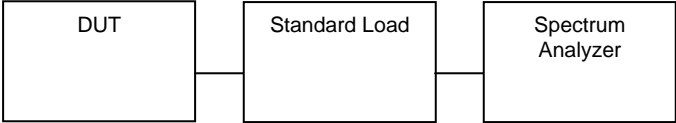
7.0 OCCUPIED BANDWIDTH AND EMISSION MASK


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	
§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

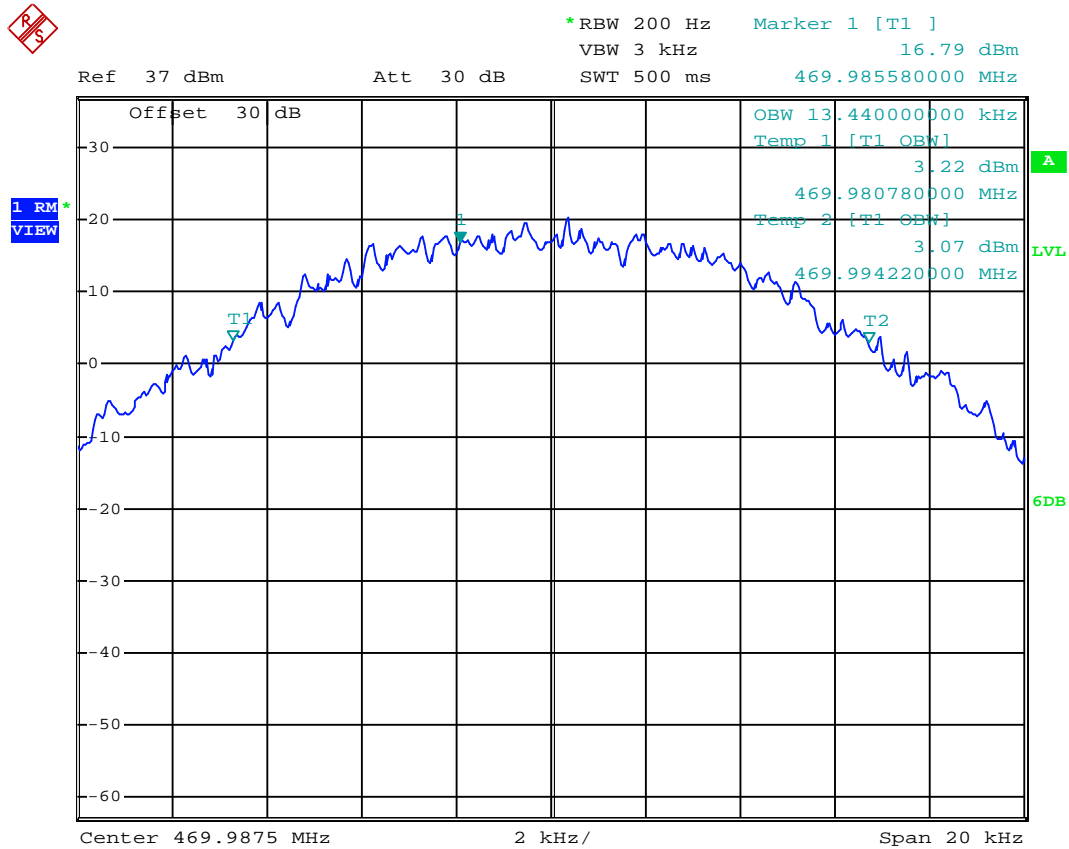
Equipment list				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00241	R&S	FSU 40	Spectrum Analyzer	09-Apr-2015

Setup drawing	
 <pre> graph LR DUT[DUT] --- SL[Standard Load] SL --- SA[Spectrum Analyzer] </pre>	

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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7.1 Test results - OBW

99% Occupied Bandwidth = 13.44 kHz



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

Test results Cont.

99% Occupied Bandwidth = 13.68Hz

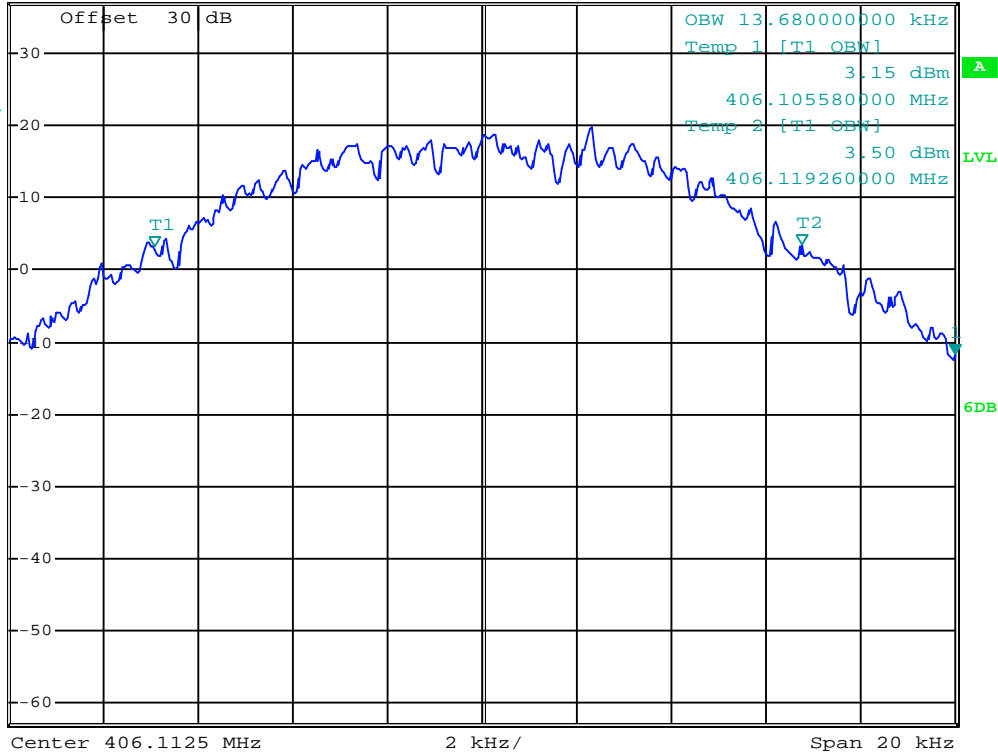


*RBW 200 Hz Marker 1 [T1]
VBW 3 kHz -11.72 dBm
SWT 500 ms 406.122500000 MHz

Ref 37 dBm

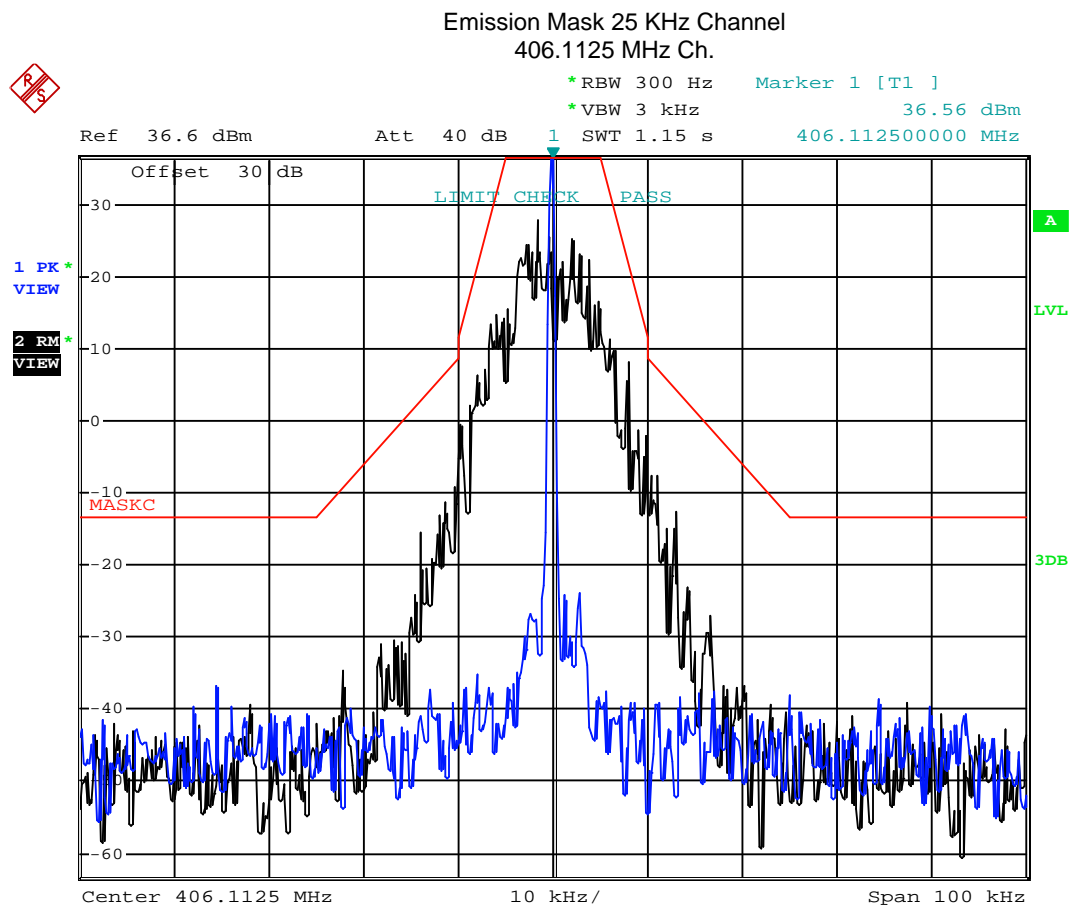
Att 30 dB

1 RM
VIEW



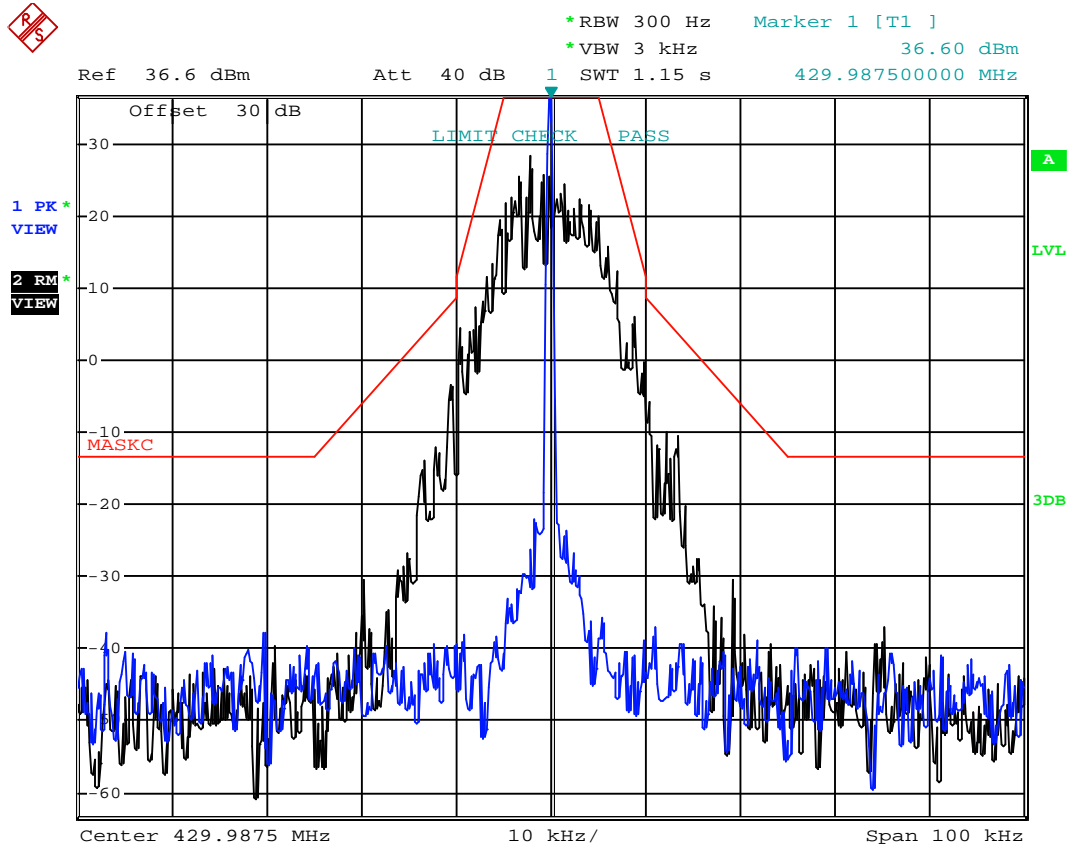
Date: 26.APR.2013 13:38:00

7.2 Test results – Spectrum Mask C: Complies

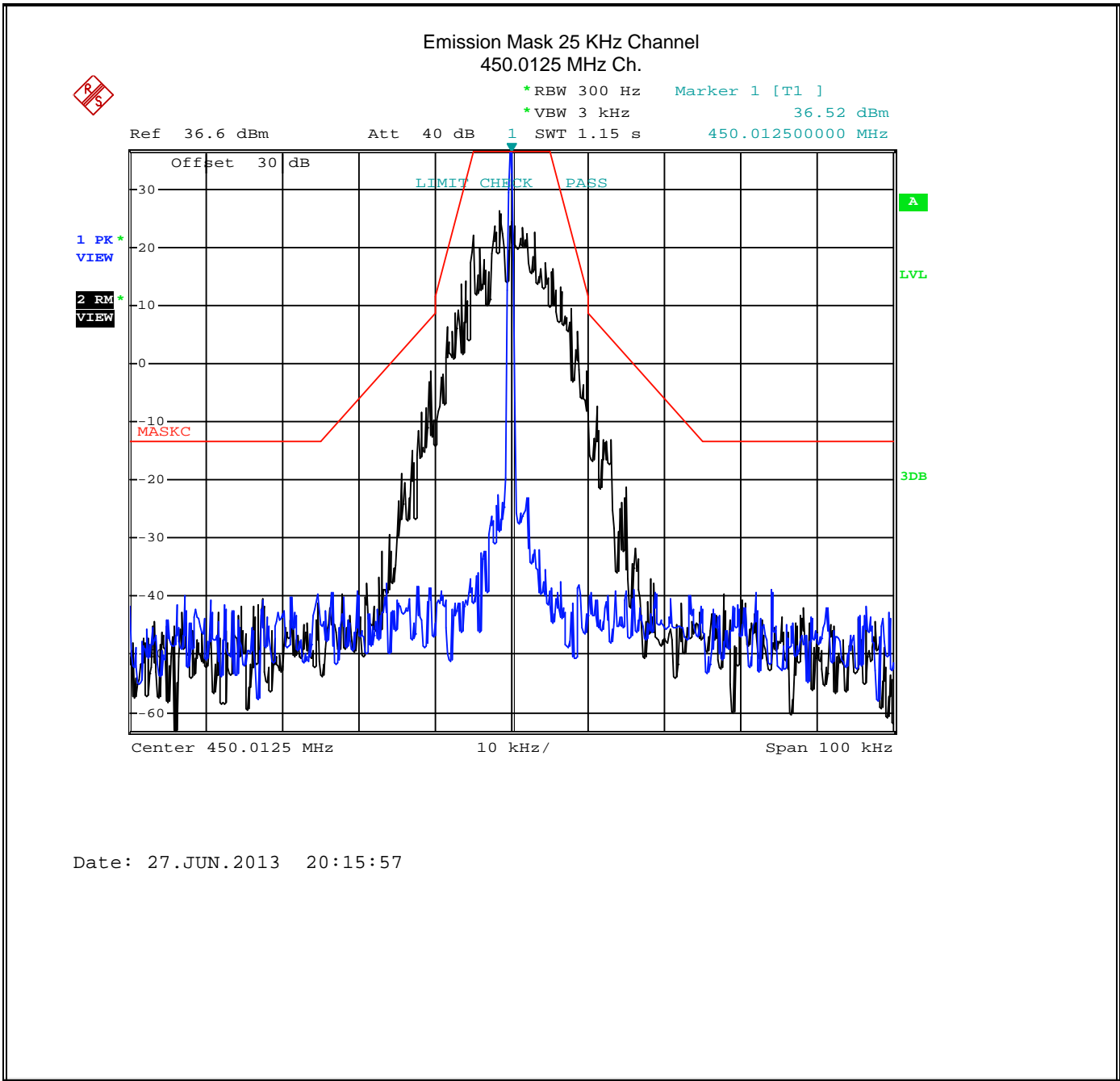


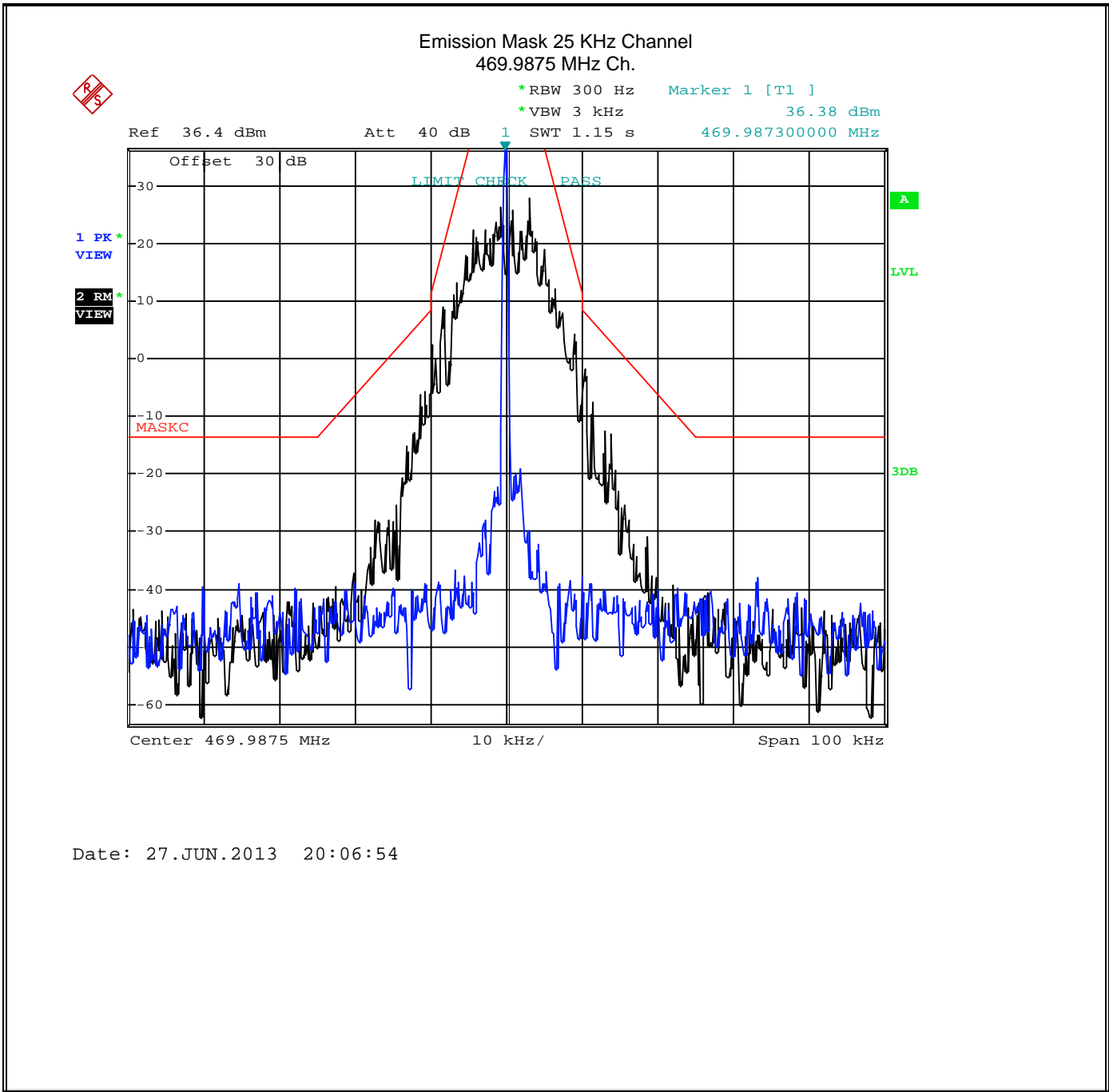
Date: 27.JUN.2013 19:59:27

Emission Mask 25 KHz Channel
429.9875 MHz Ch.

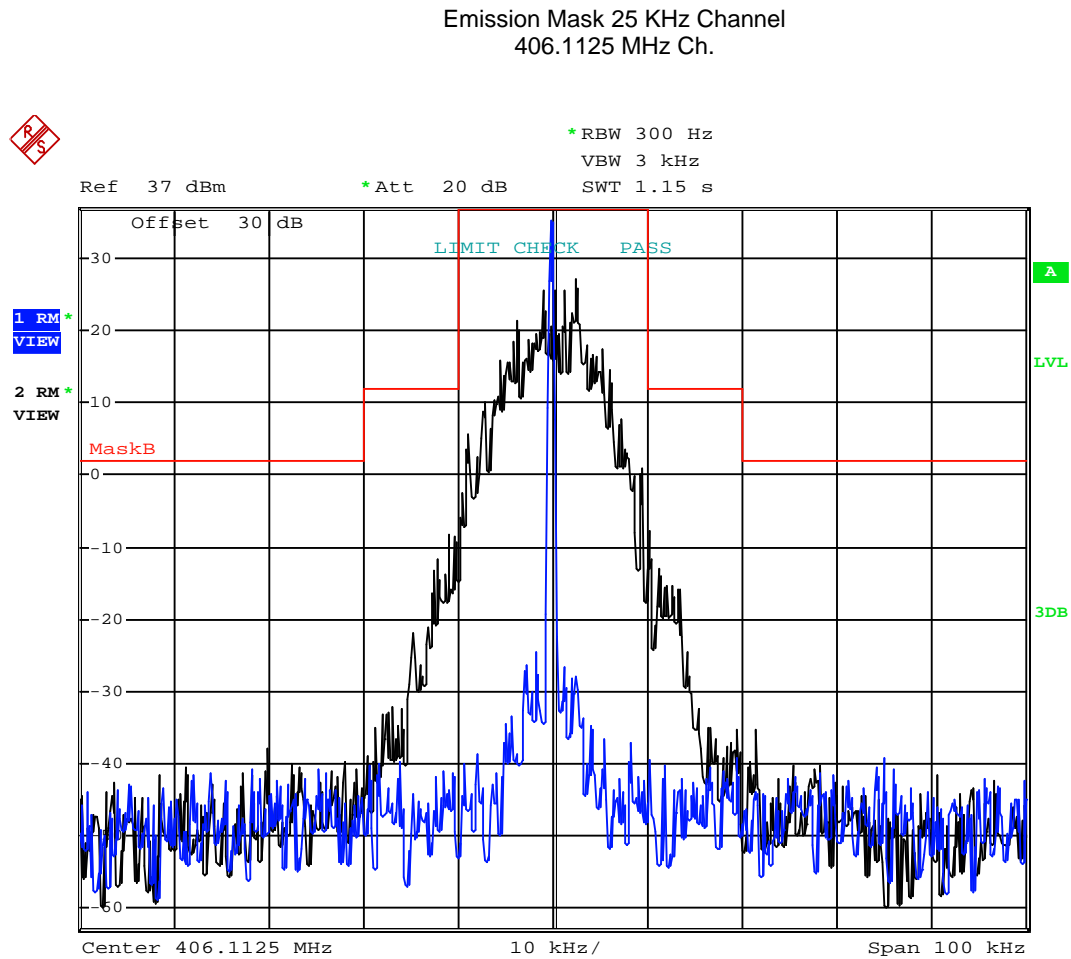


Date: 27.JUN.2013 19:52:03



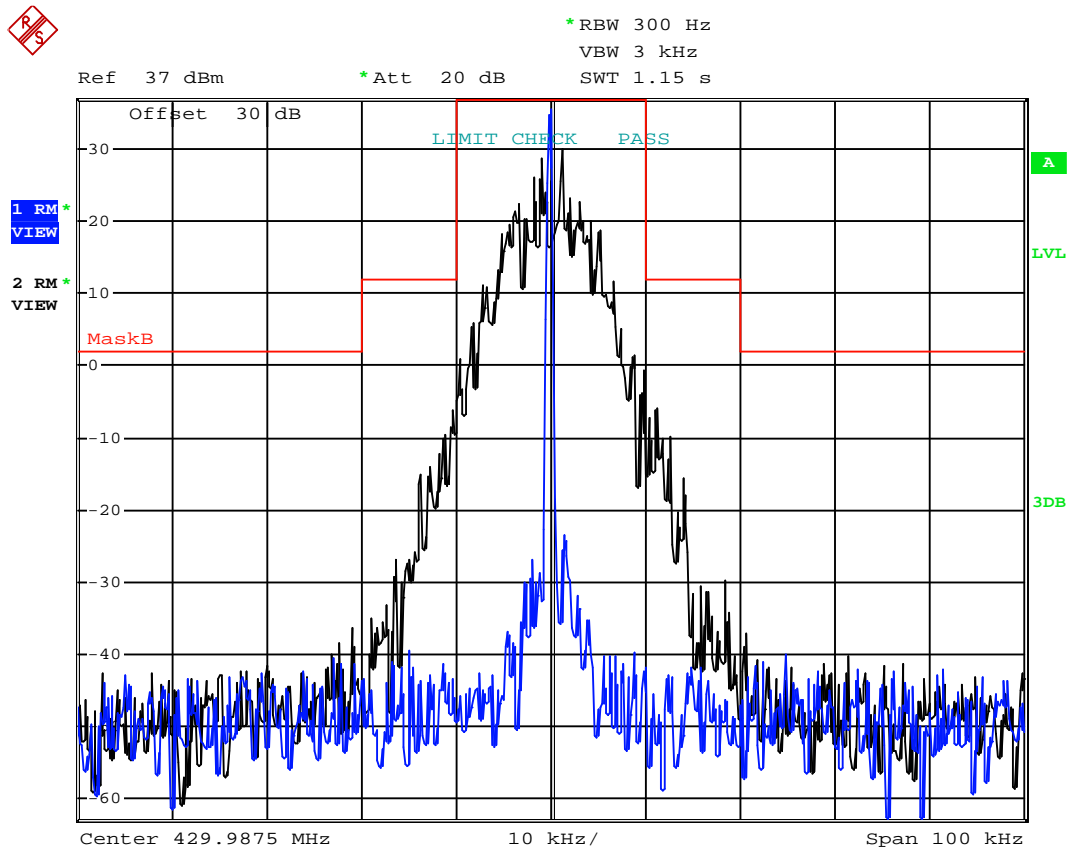


7.3 Test results – Spectrum Mask B: Complies



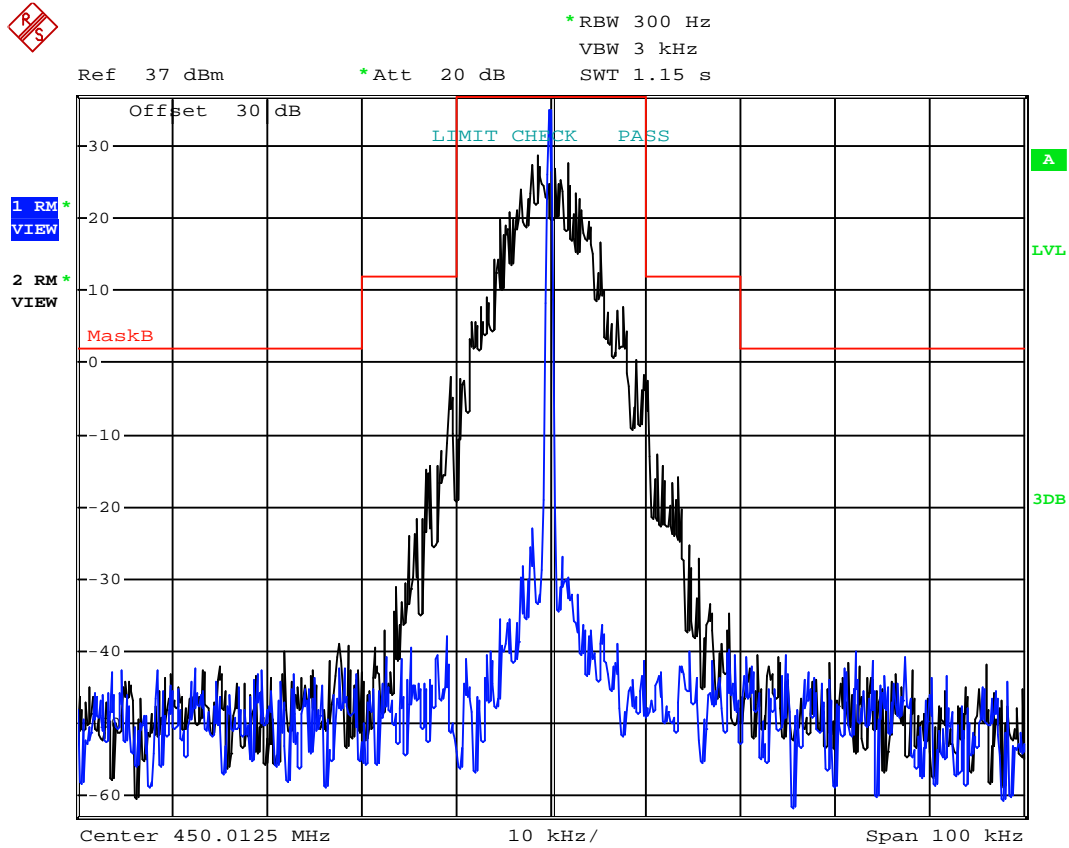
Date: 26.APR.2013 17:37:01

Emission Mask 25 KHz Channel
429.9875 MHz Ch.



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

Emission Mask 25 KHz Channel
450.0125 MHz Ch.



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

Emission Mask 25 KHz Channel
469.9875 MHz Ch.



*RBW 300 Hz

VBW 3 kHz

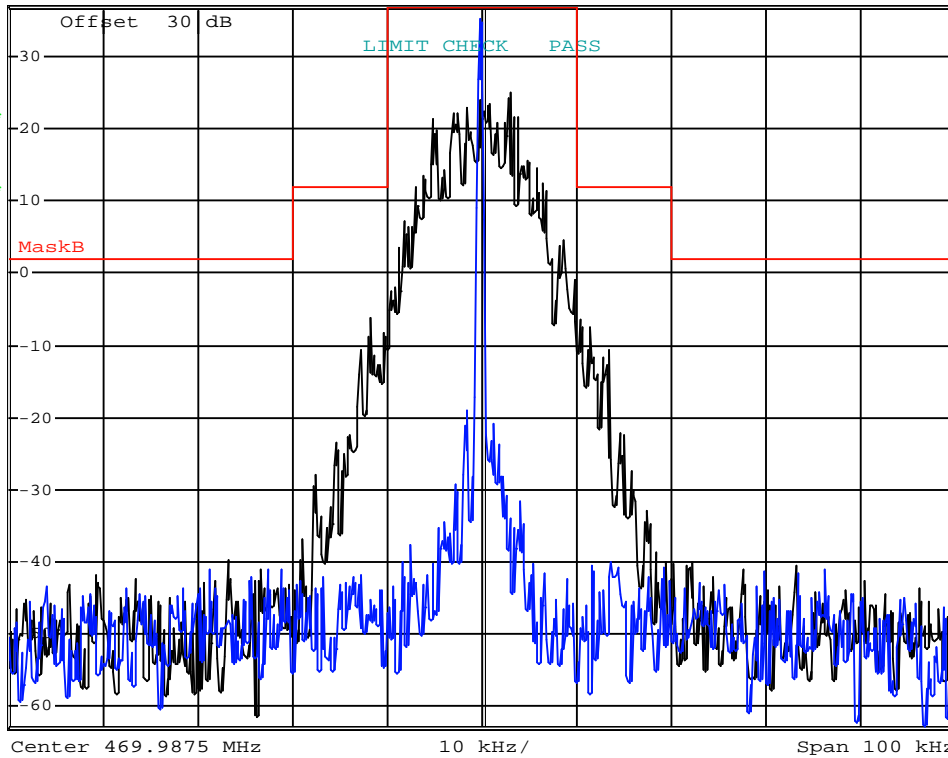
Ref 37 dBm

*Att 20 dB



SWT 1.15 s

1 RM
VIEW

2 RM
VIEW



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

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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

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	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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Normative Reference Standard	FCC CFR 47 §2.1053; 90.210; IC RSS-119, RSS-GEN
-------------------------------------	---

- The transmitter spurious emissions were measured in accordance with ANSI/TIA-603-C.
- The spectrum was searched from the lowest frequency generated in the DUT up to the 10th harmonic of the fundamental frequency.
- The DUT was characterized on 3 orthogonal axis.
- Detected emissions are reported.

§90.210. RSS-119.

Emissions must be at least $43 + 10 \log_{10}(P)$ dB below the mean power output of the transmitter.

Temperature

25 +/- 5 °C

Humidity



40 +/- 10 %

Barometric Pressure

101 +/- 3 kPa

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.

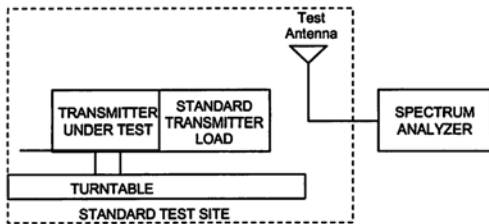
	Test Report Serial No.:	250613-T1223-E-900	Report Issue Date:	6/28/2013	
	Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

Measurement equipment setup

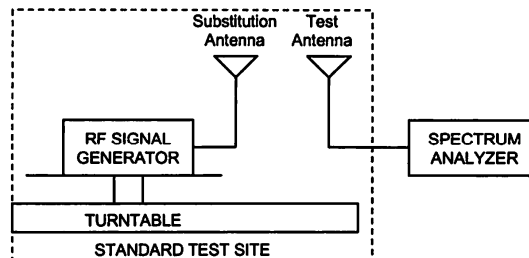
MEASUREMENT EQUIPMENT CONNECTIONS	For the field strength measurements, the measurement equipment was connected as shown in D.6. For the final substitutions, the DUT was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated. Worst case performance is presented.		
	Frequency Range	RX Antenna	TX Antenna
	30 MHz - 1GHz	Bilog	Dipole
	1 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn
MEASUREMENT EQUIPMENT SETTINGS	Measurement Settings.		
	RBW	VBW	Detector
	MHz	MHz	
	100 kHz < 1GHz 1 MHz >1 GHz	300 kHz < 1 GHz 3 MHz> 1 GHz	Peak


Setup drawing(s)



A.



B.



Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01

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	H	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	H	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	H	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 10th 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:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01


9.0 RADIATED SPURIOUS EMISSIONS


References	
Normative Reference Standard	FCC CFR 47 §15.209; IC RSS-210, RSS-GEN
Procedure Reference(s)	<p>The procedure used was ANSI C63.4-2003. The frequency was scanned from the lowest radio frequency generated to the 10th 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.</p> <p>RSS-Gen 4.9</p>

Limits												
§15.209 RSS-Gen 6.1												
		<table><tr><th>Frequency (MHz)</th><th>Limits</th></tr><tr><td>30-88</td><td>40.0 dBuV/m measured @ 3 meters</td></tr><tr><td>80-216</td><td>43.5 dBuV/m measured @ 3 meters</td></tr><tr><td>216-960</td><td>46.0 dBuV/m measured @ 3 meters</td></tr><tr><td>Above 960</td><td>54.0 dBuV/m measured @ 3 meters</td></tr></table>	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
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											

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:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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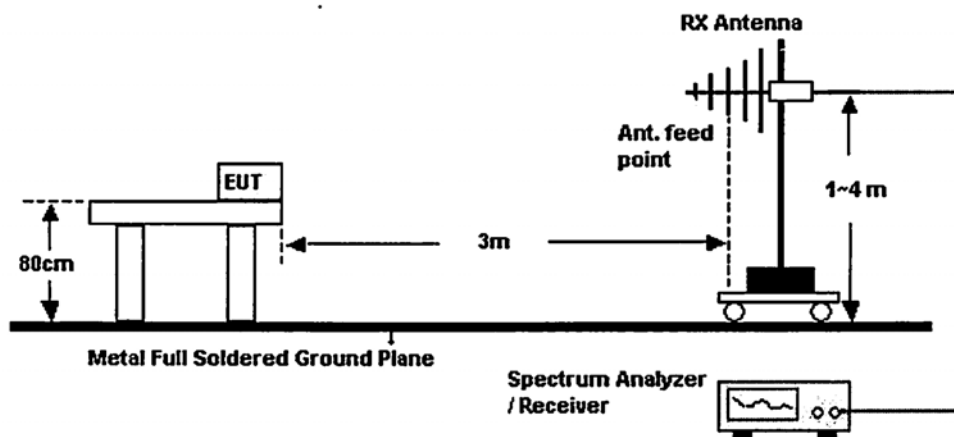
	Test Report Serial No.:	250613-T1223-E-900	Report Issue Date:	6/28/2013	
	Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01


Measurement equipment setup


MEASUREMENT EQUIPMENT CONNECTIONS	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.		
	Frequency Range	RX Antenna	TX Antenna
	9kHz – 30Mhz	Active Loop	N/a
	30 MHz - 1GHz	Bilog	N/a
	1 GHz - 18 GHz	ETS 3115 Horn	N/a
MEASUREMENT EQUIPMENT SETTINGS	For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:		
	Measurement	RBW	VBW
		kHz	kHz
	< 30 MHz	10	100
	< 1 GHz	100	300
	> 1 GHz	1000	3000
	<ul style="list-style-type: none"> The spectrum was searched from the lowest radio frequency generated by the EUT to the 10th harmonic of the fundamental. All detected emissions are reported. The DUT was characterized on 3 orthogonal axis, worst case config. Reported. 		

Setup drawing(s)

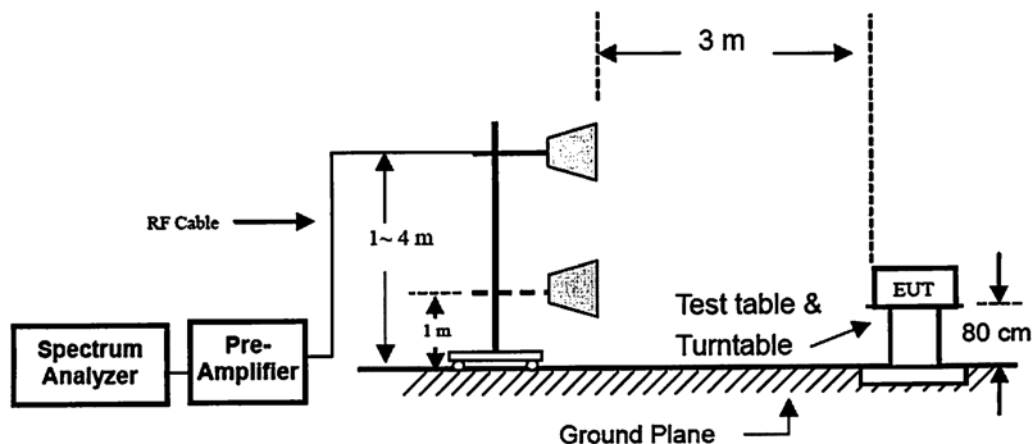
30 MHz – 1 GHz



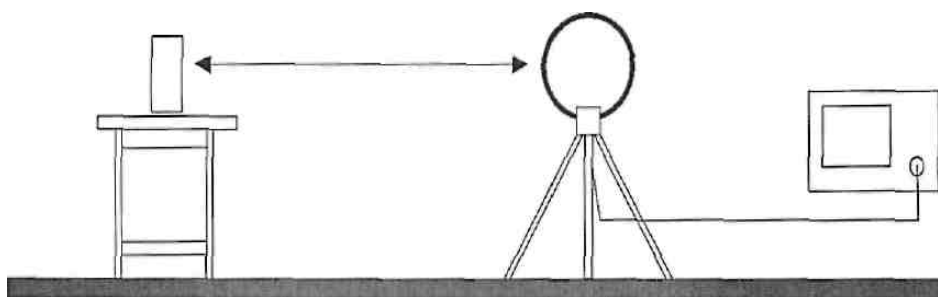
Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01



Measurement Frequency above 1GHz



Active Loop Ant. <30 MHz



Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01

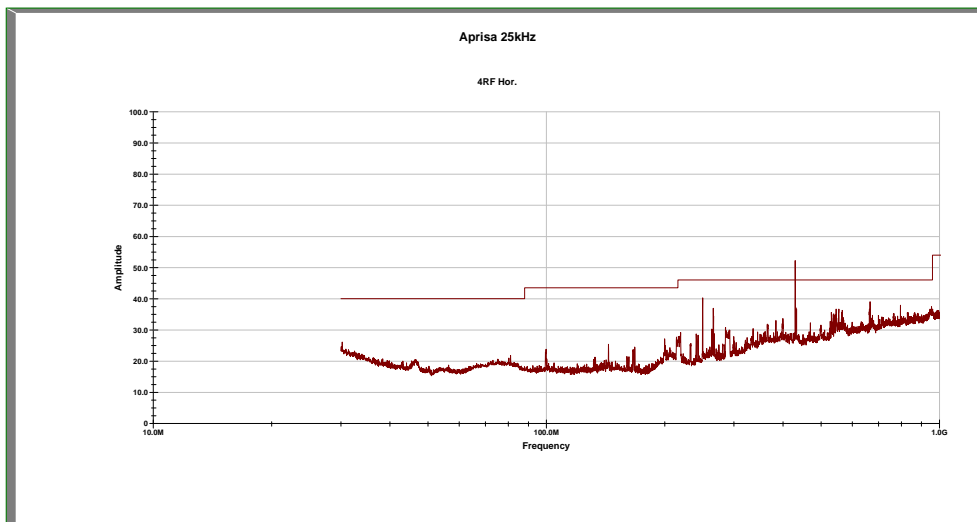
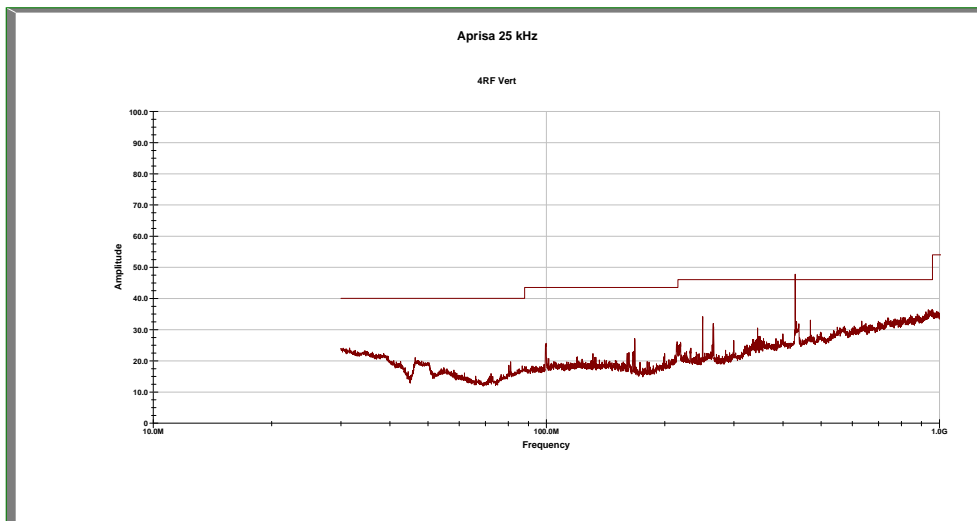
Test Data


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 10th 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.



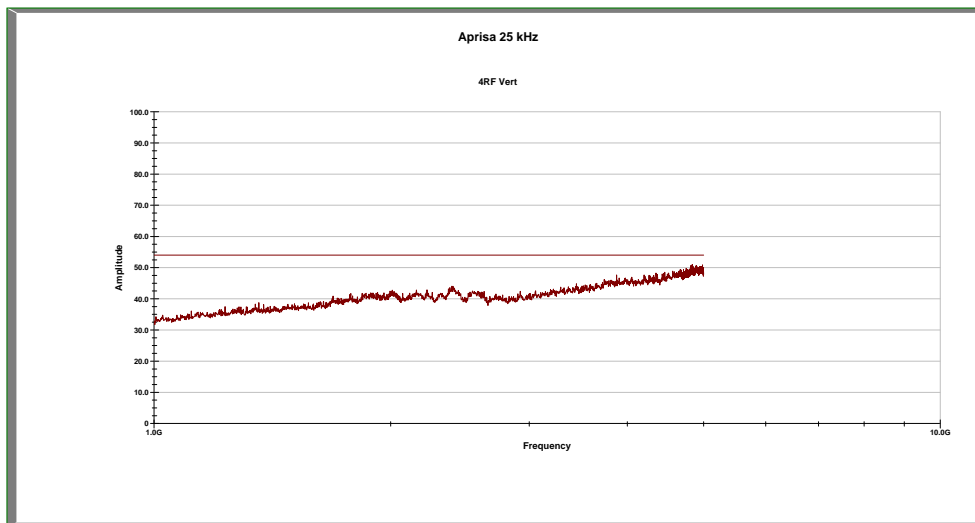
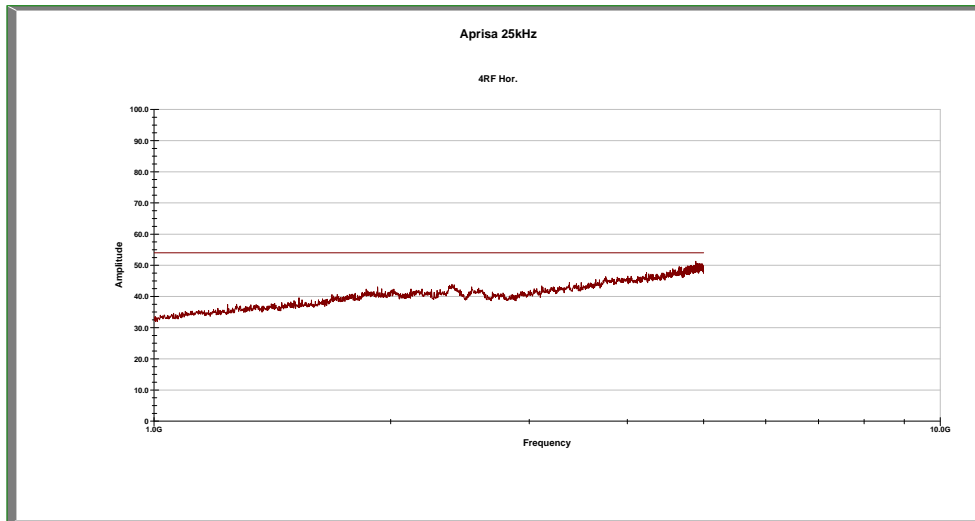
Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	Report Issue Date:	6/28/2013	
	Measurement Date(s):	May 2-June 25, 2013	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	
					Test Lab Certificate No. 2470.01


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	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01

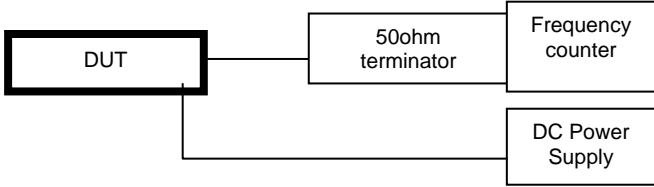
10.0 FREQUENCY STABILITY


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

Setup drawing	
 <pre> graph LR DUT[DUT] --- Terminator[50ohm terminator] Terminator --- Counter[Frequency counter] DUT --- PWS[DC Power Supply] </pre>	

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	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	
					Test Lab Certificate No. 2470.01

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.

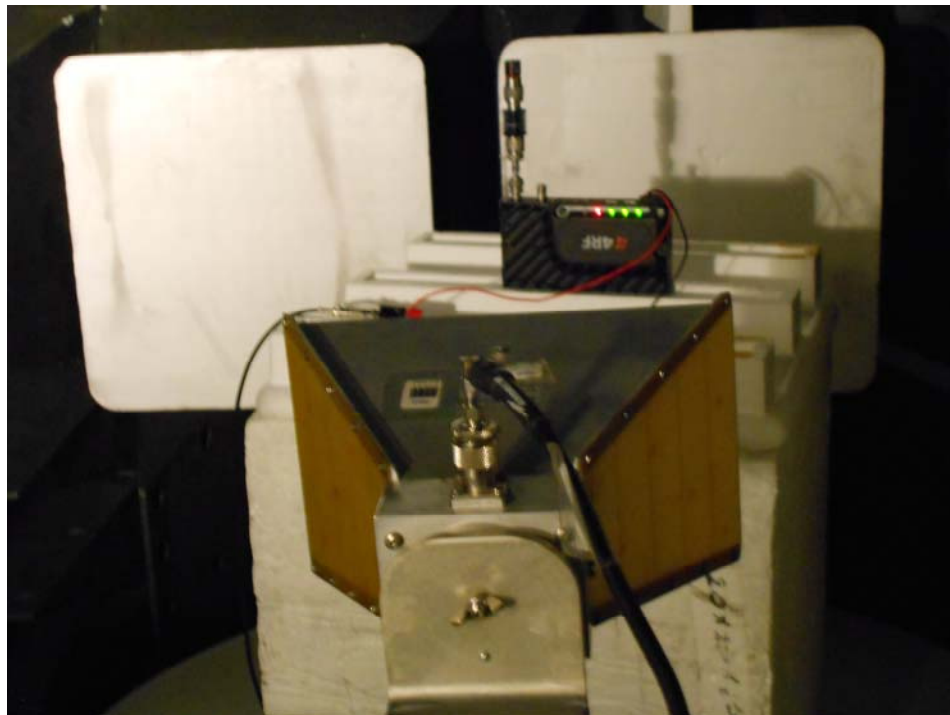
6/28/2013


Date



Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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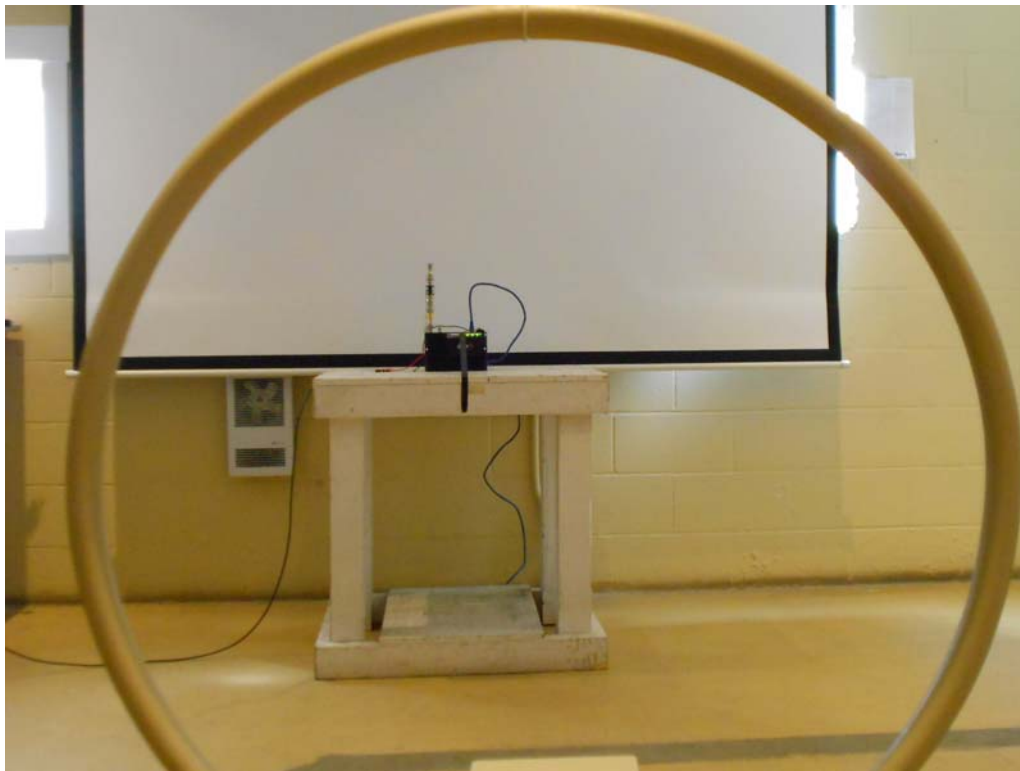
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	Measurement Date(s):	May 2-June 25, 2013	Report Revision No.:	Revision 1.0	
	FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01


11.0 TEST SET-UP PHOTO'S





Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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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	
					Test Lab Certificate No. 2470.01





Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	Test Report Serial No.:	250613-T1223-E-900	Report Issue Date:	6/28/2013	
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	FCC Rule Part(s):	47 CFR §2, §90	FCC Test Firm Reg. No.:	Accredited	
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					Test Lab Certificate No. 2470.01



Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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	IC Standard(s):	RSS-119, RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

END OF DOCUMENT

Applicant:	4RF Corp.	FCC ID:	UIPSRN0400025A	IC:	6772A-SRN400	
DUT Type:	P-to-Mp Transmitter	DUT	Aprisa SR25 kHz	Freq.:	400-470 MHz	
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