## FCC PART 15, SUBPART B and C TEST REPORT

for

**TRANSMITTER** 

MODEL: 84-941-XX

Prepared for

SHURflo, LLC 5900 KATELLA AVENUE CYPRESS, CALIFORNIA 90630

Prepared by: Yomen /

IAMES ROSS

Approved by: Apple Fajimsto

KYLE FUJIMOTO

COMPATIBLE ELECTRONICS INC. 114 OLINDA DRIVE BREA, CALIFORNIA 92823 (714) 579-0500

DATE: NOVEMBER 22, 2005

	REPORT		APPENDICES			TOTAL	
	BODY	A	В	С	D	E	
PAGES	15	2	2	2	12	16	49

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### GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: Transmitter

Model: 84-941-XX

S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was modified in order to meet the specifications. Please see the list located in

Appendix B.

Manufacturer: SHURflo, LLC

5900 Katella Avenue Cypress, California 90630

Test Date: November 22, 2005
Test Specifications: EMI requirements

CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.209, and 15.231

Test Procedure: ANSI C63.4

Test Deviations: The test procedure was not deviated from during the testing.

### SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	This test was not performed because the EUT operates on batteries only and cannot be plugged into the AC public mains.
2	Radiated RF Emissions, 10 kHz – 4340 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.
3	-20 dB Bandwidth of the Fundamental	Complies with the limits of Subpart C, sections 15.231 [e].

Report Number: **B50310A1 FCC Part 15 Subpart B** and **FCC Section 15.231** Test Report

Transmitter Model: 84-941-XX

## 1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Transmitter Model: 84-941-XX. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.



## 2. ADMINISTRATIVE DATA

## 2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

## 2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

## 2.3 Cognizant Personnel

SHURflo, LLC

Bernard Perkins Project Engineer
Quang Truong Electrical Engineer

Compatible Electronics, Inc.

James Ross Test Engineer Kyle Fujimoto Test Engineer

## 2.4 Date Test Sample was Received

The test sample was received prior to its qualification testing on November 22, 2005.

## 2.5 Disposition of the Test Sample

The test sample has not been returned to SHURflo, LLC as of November 22, 2005.

### 2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF Radio Frequency

EMI Electromagnetic Interference EUT Equipment Under Test

P/N Part Number S/N Serial Number HP Hewlett Packard

ITE Information Technology Equipment

CML Corrected Meter Limit

LISN Line Impedance Stabilization Network

PCB Printed Circuit Board

TX Transmit RX Receive





## 3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
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





### 4. DESCRIPTION OF TEST CONFIGURATION

## 4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Transmitter Model: 84-941-XX (EUT) was tested as a stand-alone unit and tested in three orthogonal axis. The EUT was continuously transmitting.

The antenna is a trace on the PCB of the EUT.

After the transmitter is activated, the transmission will cease operation within 5 seconds after activation.

The final radiated data was taken in the mode described above. Please see Appendix E for the data sheets.









#### 4.1.1 **Cable Construction and Termination**

There were no external cables connected to the EUT.







FCC Part 15 Subpart B and FCC Section 15.231 Test Report

Transmitter

Model: 84-941-XX

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

## 5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
TRANSMITTER (EUT)	SHURflo, LLC	84-941-XX	N/A	TLC-84941XX





# 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Radiate Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	June 10, 2005	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22279	June 10, 2005	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	June 11, 2005	1 Year
Preamplifier	Com Power	PA-103	1582	February 3, 2005	1 Year
Microwave Preamplifier	Com-Power	PA-122	181917	March 3, 2005	1 Year
Loop Antenna	Com-Power	AL-130	17089	September 3, 2004	2 Year
Biconical Antenna	Com Power	AB-900	15250	March 11, 2005	1 Year
Log Periodic Antenna	Com Power	AL-100	16247	August 22, 2005	1 Year
Horn Antenna	Com Power	AH-118	10073	July 27, 2004	2 Year
Antenna Mast	Com-Power	AM-100	N/A	N/A	N/A
Turntable	Com-Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A





FCC Part 15 Subpart B and FCC Section 15.231 Test Report

Transmitter

Model: 84-941-XX

## 6. TEST SITE DESCRIPTION

## **6.1** Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

## 6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.





## 7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

## 7.1 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-103 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer and EMI Receiver record the highest measured reading over all the sweeps.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 4.34 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.



FCC Part 15 Subpart B and FCC Section 15.231 Test Report

Transmitter

Model: 84-941-XX

### Radiated Emissions (Spurious and Harmonics) Test (continued)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data. The final qualification data sheets are located in Appendix E.

#### **Test Results:**

The EUT complies with the limits of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.205, 15.209 and 15.231 for radiated emissions.

#### 7.2 Bandwidth of the Fundamental

The -20 dB bandwidth was checked to see that it was within 0.25% of the fundamental frequency for the EUT. Photographs of the -20 dB bandwidth are located in Appendix E.

#### **Test Results:**

The EUT complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231 [c].



FCC Part 15 Subpart B and FCC Section 15.231 Test Report

Transmitter

Model: 84-941-XX

## 8. CONCLUSIONS

The Transmitter, Model: 84-941-XX meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.







## **APPENDIX A**

# LABORATORY RECOGNITIONS





# LABORATORY RECOGNITIONS

### Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

## Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)





## APPENDIX B

# **MODIFICATIONS TO THE EUT**





# MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.231 or FCC Class B specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

### Modifications:

- A 6pF capacitor (Reference C5) has been removed from the circuit.
- A reference 6pF capacitor (Reference C6) remains between the output of the transmitter and ground.





## **APPENDIX C**

# ADDITIONAL MODELS COVERED UNDER THIS REPORT





# ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Transmitter Model: 84-941-XX S/N: N/A

There were no additional models covered under this report.





## APPENDIX D

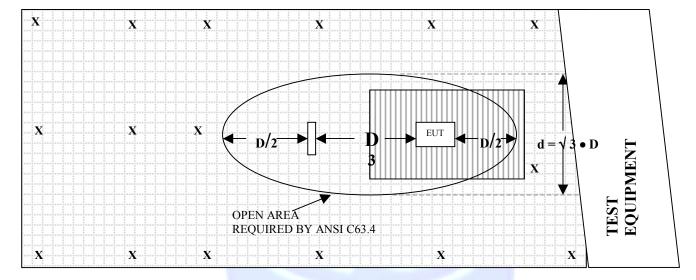
DIAGRAMS, CHARTS, AND PHOTOS





## FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED TEST SITE

## **OPEN LAND > 15 METERS**



## **OPEN LAND > 15 METERS**

**OPEN LAND > 15 METERS** 

X = GROUND RODS = GROUND SCREEN

D = TEST DISTANCE (meters) = WOOD COVER





# COM-POWER AL-130

# **LOOP ANTENNA**

S/N: 17089

# CALIBRATION DATE: SEPTEMBER 3, 2004

FREQUENCY	MAGNETIC	ELECTRIC
(MHz)	(dB/m)	(dB/m)
0.009	-40.8	10.7
0.01	-40.9	10.6
0.02	-41.8	9.7
0.05	-42.0	9.5
0.07	-41.5	10.0
0.1	-41.7	9.8
0.2	-44.1	7.4
0.3	-41.6	9.9
0.5	-41.5	10.0
0.7	-41.4	10.1
1	-41.0	10.5
2	-40.6	10.9
3	-40.8	10.7
4	-41.0	10.5
5	-40.4	11.1
10	-40.7	10.8
15	-41.6	9.9
20	-41.3	10.2
25	-43.0	8.5
30	-42.6	8.9





# **COM-POWER AB-900**

# **BICONICAL ANTENNA**

S/N: 15250

CALIBRATION DATE: MARCH 11, 2005

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
30	10.90	120	13.10
35	10.90	125	12.40
40	10.90	140	11.90
45	10.30	150	11.80
50	11.40	160	13.30
60	10.40	175	15.40
70	7.40	180	14.60
80	6.20	200	15.70
90	8.20	250	16.50
100	10.10	300	19.20





# **COM-POWER AL-100**

# LOG PERIODIC ANTENNA

S/N: 16247

CALIBRATION DATE: AUGUST 22, 2005

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
300	12.70	700	19.72
400	13.19	800	20.59
500	14.99	900	21.10
600	15.95	1000	24.35



COM POWER AH-118

# HORN ANTENNA

S/N: 10073

CALIBRATION DATE: JULY 27, 2004

EDECHENCY	EACTOR	EDEOMENON	EA CEOP		
FREQUENCY	FACTOR	FREQUENCY	FACTOR		
(GHz)	(dB)	(GHz)	(dB)		
1.0	25.3	10.0	39.8		
1.5	28.3	10.5	38.6		
2.0	31.5	11.0	38.5		
2.5	31.2	11.5	40.4		
3.0	30.4	12.0	42.0		
3.5	30.5	12.5	41.7		
4.0	30.9	13.0	41.9		
4.5	32.0	13.5	43.7		
5.0	34.1	14.0	45.5		
5.5	33.7	14.5	45.8		
6.0	34.2	15.0	40.5		
6.5	35.1	15.5	41.8		
7.0	37.1	16.0	41.5		
7.5	40.4	16.5	40.2		
8.0	39.8	17.0	43.3		
8.5	38.4	17.5	46.6		
9.0	37.5	18.0	47.1		
9.5	42.4				





# **COM-POWER PA-103**

# **PREAMPLIFIER**

S/N: 1582

CALIBRATION DATE: FEBRUARY 3, 2005

FREQUENCY	FACTOR	FREQUENCY	FACTOR		
(MHz)	(dB)	(MHz)	(dB)		
30	33.2	300	33.0		
40	33.0	350	32.8		
50	33.1	400	32.8		
60	33.0	450	32.8		
70	33.2	500	32.5		
80	33.2	550	32.5		
90	33.1	600	32.4		
100	33.2	650	32.4		
125	33.1	700	32.3		
150	33.0	750	32.2		
175	33.0	800	32.2		
200	33.0	850	32.4		
225	33.0	900	31.8		
250	33.0	950	32.3		
275	32.9	1000	32.0		





# **COM-POWER PA-122**

# MICROWAVE PREAMPLIFIER

S/N: 181917

CALIBRATION DATE: MARCH 3, 2005

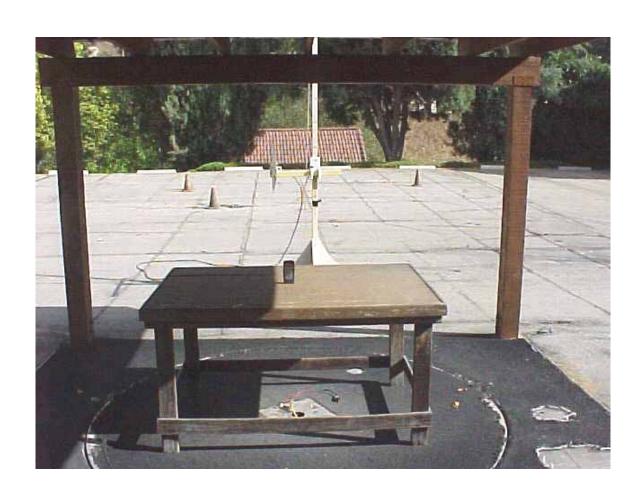
FREQUENCY	FACTOR	FREQUENCY	FACTOR		
(GHz)	(dB)	(GHz)	(dB)		
1.00	34.780	6.00	35.568		
1.25	34.443	6.50	34.984		
1.50	33.921	7.00	33.916		
1.75	33.862	7.50	33.463		
2.00	33.646	8.00	33.932		
2.25	33.784	8.50	34.828		
2.50	33.892	9.00	36.153		
2.75	33.886	9.50	36.797		
3.00	33.921	10.00	36.822		
3.25	33.943	11.00	33.815		
3.50	34.076	12.00	33.733		
3.75	34.232	13.00	34.807		
4.00	34.464	14.00	34.121		
4.25	34.613	15.00	33.122		
4.50	34.929	16.00	34.286		
4.75	35.164	17.00	34.358		
5.00	35.321	18.00	33.767		
5.50	35.366				





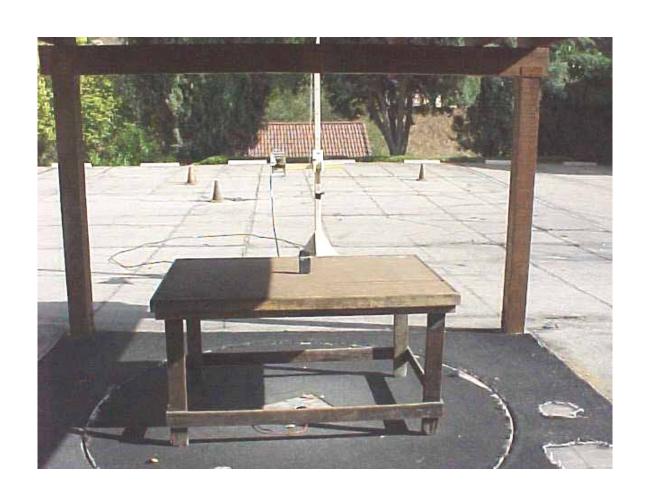
## **FRONT VIEW**

SHURFIO, LLC
TRANSMITTER
MODEL: 84-941-XX
FCC SUBPART B AND C – RADIATED EMISSIONS – 10 kHz to 1 GHz – 11-22-05



## **REAR VIEW**

SHURFIO, LLC
TRANSMITTER
MODEL: 84-941-XX
FCC SUBPART B AND C – RADIATED EMISSIONS – 10 kHz to 1 GHz – 11-22-05



## **FRONT VIEW**

SHURFIO, LLC TRANSMITTER MODEL: 84-941-XX

FCC SUBPART B AND C - RADIATED EMISSIONS - 1 GHz to 4.34 GHz - 11-22-05



## **REAR VIEW**

SHURFIO, LLC TRANSMITTER MODEL: 84-941-XX

FCC SUBPART B AND C - RADIATED EMISSIONS - 1 GHz to 4.34 GHz - 11-22-05

Report Number: **B50310A1 FCC Part 15 Subpart B** and **FCC Section 15.231** Test Report

Transmitter Model: 84-941-XX

**APPENDIX E** 

**DATA SHEETS** 





# RADIATED EMISSIONS

**DATA SHEETS** 



# **RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)**

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)	Antenna			EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.		Azimuth (dagrass)		Channel	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
							Chamie			` /						Comments
434.0000	51.6	32.2 A	V	1.0	180	X		13.9	5.6	0.0	0.0	0.0	51.7	-29.1	80.8	
434.0000	69.1	49.7 A	V	1.2	250	Y		13.9	5.6	0.0	0.0	0.0	69.2	-11.6	80.8	
434.0000	58.6	39.2 A	V	2.0	0	Z		13.9	5.6	0.0	0.0	0.0	58.7	-22.1	80.8	
434.0000	71.2	51.8 A	Н	1.0	270	X		13.9	5.6	0.0	0.0	0.0	71.3	-9.5	80.8	
434.0000	59.6	40.2 A	Н	1.0	90	Y		13.9	5.6	0.0	0.0	0.0	59.7	-21.1	80.8	
434.0000	68.6	49.2 A	Н	1.0	265	Z		13.9	5.6	0.0	0.0	0.0	68.7	-12.1	80.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak Reading	Average (A)	Antenna Polar.	Antenna	EUT Azimuth	EUT Axis	EUT Tx	Antenna Factor	Cable Loss	Amplifier Gain	Distance Factor	Mixer Factor	*Corrected Reading	Delta **	Spec Limit	
MHz	(dBuV)	or Quasi- Peak (QP)		_				(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	Comments
868.0000	56.7	37.3 A	V	1.2	180	X		20.9	6.7	32.2	0.0	0.0	32.8	-28.0	60.8	
868.0000	60.8	41.4 A	V	1.0	180	Y		20.9	6.7	32.2	0.0	0.0	36.9	-23.9	60.8	
868.0000	66.3	46.9 A	V	1.3	350	Z		20.9	6.7	32.2	0.0	0.0	42.4	-18.4	60.8	
868.0000	62.4	43.0 A	Н	1.0	315	X		20.9	6.7	32.2	0.0	0.0	38.5	-22.3	60.8	
868.0000	60.4	41.0 A	Н	1.0	90	Y		20.9	6.7	32.2	0.0	0.0	36.5	-24.3	60.8	
868.0000	61.7	42.3 A	Н	1.0	85	Z		20.9	6.7	32.2	0.0	0.0	37.8	-23.0	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

PAGE 2 of PAGE 10

<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Averag			Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected		Spec	
MHz	Reading (dBuV)	or Qu Peak (			0	Azimuth (degrees)		Tx Channel	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
1302.0000	63.8	44.4	A	V	2.4	90	X	LOW	27.3	2.8	34.3	0.0	0.0	40.1	-13.9	54.0	Comments
1302.0000	74.4	55.0	A	V	2.0	170	Y	LOW	27.3	2.8	34.3	0.0	0.0	50.7	-3.3	54.0	
1302.0000	72.3	52.9	A	V	1.3	0	Z	LOW	27.3	2.8	34.3	0.0	0.0	48.6	-5.4	54.0	
1302.0000	73.8	54.4	A	Н	1.0	170	X	LOW	27.3	2.8	34.3	0.0	0.0	50.1	-3.9	54.0	
1302.0000	67.9			Н	1.4	90	Y	LOW	27.3	2.8	34.3	0.0	0.0	44.2	-9.8	54.0	
		48.5	<u>A</u>													1	
1302.0000	68.7	49.3	Α	Н	1.1	190	Z	LOW	27.3	2.8	34.3	0.0	0.0	45.0	-9.0	54.0	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)		Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.	0	Azimuth		Tx Channel	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
1736.0000	61.6	42.2 A	V	2.2	90	X	LOW	29.9	3.8	33.9	0.0	0.0	42.0	-18.8	60.8	Comments
	1															
1736.0000	60.6	41.2 A	V	2.0	350	Y	LOW	29.9	3.8	33.9	0.0	0.0	41.0	-19.8	60.8	
1736.0000	65.3	45.9 A	V	1.2	180	Z	LOW	29.9	3.8	33.9	0.0	0.0	45.7	-15.1	60.8	
1736.0000	57.4	38.0 A	Н	1.2	350	X	LOW	29.9	3.8	33.9	0.0	0.0	37.8	-23.0	60.8	
1736.0000	58.0	38.6 A	Н	1.5	90	Y	LOW	29.9	3.8	33.9	0.0	0.0	38.4	-22.4	60.8	
1736.0000	51.2	31.8 A	Н	1.9	270	Z	LOW	29.9	3.8	33.9	0.0	0.0	31.6	-29.2	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)		Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.	0	Azimuth	Axis	Tx Channel	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
			V	1.3	45	X	LOW	31.4	4.0		0.0	0.0	45.2	-15.6		Comments
2170.0000	62.9	43.5 A						<b></b>		33.7					60.8	
2170.0000	62.9	43.5 A	V	1.3	170	Y	LOW	31.4	4.0	33.7	0.0	0.0	45.2	-15.6	60.8	
2170.0000	67.6	48.2 A	V	1.7	185	Z	LOW	31.4	4.0	33.7	0.0	0.0	49.9	-10.9	60.8	
2170.0000	72.1	52.7 A	Н	1.4	0	X	LOW	31.4	4.0	33.7	0.0	0.0	54.4	-6.4	60.8	
2170.0000	69.4	50.0 A	Н	1.9	270	Y	LOW	31.4	4.0	33.7	0.0	0.0	51.7	-9.1	60.8	
2170.0000	60.2	40.8 A	Н	2.2	90	Z	LOW	31.4	4.0	33.7	0.0	0.0	42.5	-18.3	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak Reading	Average (A) or Quasi-	Antenna Polar.	Antenna Height	EUT Azimuth	EUT Axis	EUT Tx	Antenna Factor	Cable Loss	Amplifier Gain	Distance Factor	Mixer Factor	*Corrected Reading	Delta **	Spec Limit	
MHz	(dBuV)	Peak (QP)						(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	Comments
2604.0000	54.5	35.1 A	V	1.0	190	X	LOW	31.0	4.6	33.9	0.0	0.0	36.8	-24.0	60.8	
2604.0000	56.8	37.4 A	V	1.3	260	Y	LOW	31.0	4.6	33.9	0.0	0.0	39.1	-21.7	60.8	
2604.0000	56.1	36.7 A	V	1.9	355	Z	LOW	31.0	4.6	33.9	0.0	0.0	38.4	-22.4	60.8	
2604.0000	61.2	41.8 A	Н	2.0	270	X	LOW	31.0	4.6	33.9	0.0	0.0	43.5	-17.3	60.8	
2604.0000	60.4	41.0 A	Н	1.9	90	Y	LOW	31.0	4.6	33.9	0.0	0.0	42.7	-18.1	60.8	
2604.0000	56.8	37.4 A	Н	2.0	180	Z	LOW	31.0	4.6	33.9	0.0	0.0	39.1	-21.7	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)		Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi-	Polar.	0	Azimuth	Axis	Tx	Factor	Loss	Gain	Factor	Factor (dB)	Reading	** (dB)	Limit	Comments
	/	Peak (QP)						(dB)	(dB)	(dB)	(dB)		(dBuV/m)		(dBuV/m)	Comments
3038.0000	42.1	22.7 A	V	1.8	275	X	LOW	30.4	5.3	33.9	0.0	0.0	24.5	-36.3	60.8	
3038.0000	54.9	35.5 A	V	1.5	225	Y	LOW	30.4	5.3	33.9	0.0	0.0	37.3	-23.5	60.8	
3038.0000	52.0	32.6 A	V	1.0	195	Z	LOW	30.4	5.3	33.9	0.0	0.0	34.4	-26.4	60.8	
3038.0000	42.4	23.0 A	Н	1.5	90	X	LOW	30.4	5.3	33.9	0.0	0.0	24.8	-36.0	60.8	
3038.0000	53.5	34.1 A	Н	1.0	90	Y	LOW	30.4	5.3	33.9	0.0	0.0	35.9	-24.9	60.8	
3038.0000	50.4	31.0 A	Н	1.0	90	Z	LOW	30.4	5.3	33.9	0.0	0.0	32.8	-28.0	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)		Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.	0	Azimuth	Axis (X V Z)	Tx Channel	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
3472.0000	60.0	40.6 A	V	1.4	180	X	LOW	30.5	6.3	34.1	0.0	0.0	43.3	-17.5	60.8	Comments
								<b></b>								
3472.0000	62.9	43.5 A	V	1.2	200	Y	LOW	30.5	6.3	34.1	0.0	0.0	46.2	-14.6	60.8	
3472.0000	60.2	40.8 A	V	1.3	100	Z	LOW	30.5	6.3	34.1	0.0	0.0	43.5	-17.3	60.8	
3472.0000	61.6	42.2 A	Н	2.0	90	X	LOW	30.5	6.3	34.1	0.0	0.0	44.9	-15.9	60.8	
3472.0000	67.5	48.1 A	Н	1.3	270	Y	LOW	30.5	6.3	34.1	0.0	0.0	50.8	-10.0	60.8	
3472.0000	58.1	38.7 A	Н	2.0	340	Z	LOW	30.5	6.3	34.1	0.0	0.0	41.4	-19.4	60.8	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)		Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.	0	Azimuth		Tx	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
										` ′			, , , , , , , , , , , , , , , , , , ,			Comments
3906.0000	48.4	29.0 A	V	1.0	225	X	LOW	30.8	6.3	34.4	0.0	0.0	31.8	-22.2	54.0	
3906.0000	50.0	30.6 A	V	1.0	180	Y	LOW	30.8	6.3	34.4	0.0	0.0	33.4	-20.6	54.0	
3906.0000	54.4	35.0 A	V	1.0	225	Z	LOW	30.8	6.3	34.4	0.0	0.0	37.8	-16.2	54.0	
3906.0000	56.3	36.9 A	Н	1.0	225	X	LOW	30.8	6.3	34.4	0.0	0.0	39.7	-14.3	54.0	
3906.0000	59.2	39.8 A	Н	1.5	135	Y	LOW	30.8	6.3	34.4	0.0	0.0	42.6	-11.4	54.0	
3906.0000	57.0	37.6 A	Н	1.3	90	Z	LOW	30.8	6.3	34.4	0.0	0.0	40.4	-13.6	54.0	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING

COMPANY	SHURflo, LLC	DATE	11/22/05	
EUT	Transmitter	DUTY CYCLE	10.7	%
MODEL	89-941-XX	PEAK TO AVG	-19.4123244	dB
S/N	N/A	TEST DIST.	3	Meters
TEST ENGINEER	Kyle Fujimoto	LAB	A	

Frequency	Peak	Average (A)	, ,	Antenna		EUT	EUT	Antenna	Cable	Amplifier		Mixer	*Corrected	Delta	Spec	
MHz	Reading (dBuV)	or Quasi- Peak (QP)	Polar.		Azimuth	Axis	Tx	Factor (dB)	Loss (dB)	Gain (dB)	Factor (dB)	Factor (dB)	Reading (dBuV/m)	** (dB)	Limit (dBuV/m)	Comments
				1.0		X		` /	7.1	` ′	0.0	0.0			54.0	Comments
4340.0000	46.3	26.9 A			180		LOW	31.7		34.7			30.9	-23.1		
4340.0000	51.9	32.5 A	V	1.0	225	Y	LOW	31.7	7.1	34.7	0.0	0.0	36.5	-17.5	54.0	
4340.0000	49.9	30.5 A	V	1.0	180	Z	LOW	31.7	7.1	34.7	0.0	0.0	34.5	-19.5	54.0	
4340.0000	51.3	31.9 A	Н	1.0	180	X	LOW	31.7	7.1	34.7	0.0	0.0	35.9	-18.1	54.0	
4340.0000	57.0	37.6 A	Н	1.0	180	Y	LOW	31.7	7.1	34.7	0.0	0.0	41.6	-12.4	54.0	
4340.0000	48.6	29.2 A	Н	1.0	225	Z	LOW	31.7	7.1	34.7	0.0	0.0	33.2	-20.8	54.0	

<sup>\*</sup> CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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<sup>\*\*</sup> DELTA = SPEC LIMIT - CORRECTED READING



Test Location : Compatible Electronics Page: 1/1

: SHURflo Customer Date: 11/22/2005 : SHURflo Manufacturer Ti me: 17:31:30

Eut name Transmitter Lab: A

Model : 84-941-XX Test Distance: 3.0 Meters

Serial # : N/A Specification : FCC B

Distance correction factor (20 \* log(test/spec) 0.00

: Spurious Emissions Test Frequency Range: 10 kHz to 4340 MHz Test Mode

Note(s): Excludes the Transmitter's Fundamental and Harmonics

Polarization(s): Vertical and Horizontal Test Engineer: Kyle Fujimoto

Pol Freq Rdng Cabl e Ant Amp Cor' d Li mi t Delta gai n loss factor rdg = R= L R-L

MHz dBuV dB dBuV dB dBdBdBuV/m

No spurious emissions found within the test frequency range



Report Number: B50310A1

FCC Part 15 Subpart B and FCC Section 15.231 Test Report

Transmitter

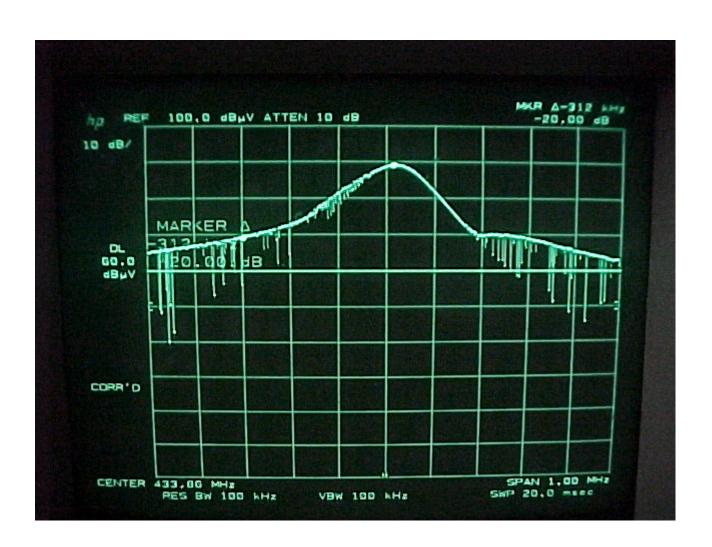
Transmitter Model: 84-941-XX

-20 dB BANDWIDTH

**PHOTOGRAPHS** 



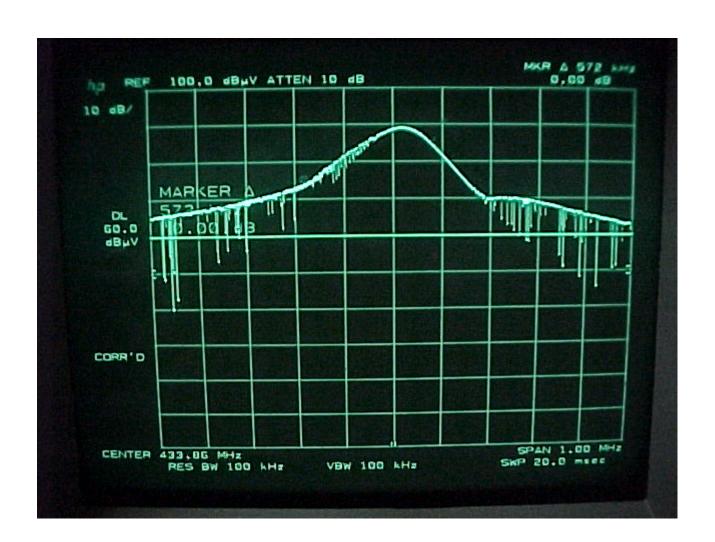
Transmitter Model: 84-941-XX



## PHOTOGRAPH OF THE -20 dB BANDWIDTH 1 OF 2



Transmitter Model: 84-941-XX



## PHOTOGRAPH OF THE -20 dB BANDWIDTH 2 OF 2

