FCC PART 15, SUBPART B and C
TEST REPORT

for

WIRELESS TEMP SENSOR

MODEL: S1-LXRFTS

Prepared for

VENSTAR, INC.
9250 OWENSMOUTH AVE.
CHATSWORTH, CALIFORNIA 91311

Prepared by:_____

ALEX BENITEZ

Approved by:_____

KYLE FUJIMOTO

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

DATE: JULY 22, 2009

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	17	2	2	2	10	30	**63**

TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos • Test Setup Diagrams • Radiated and Conducted Emissions Photos • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Test Site – 3 Meters

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 or any other agency of the U.S. Government.

Device Tested:	Wireless Temp Sensor Model: S1-LXRFTS S/N: N/A
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified in order to meet the specifications.
Manufacturer:	Venstar, Inc. 9250 Owensmouth Ave. Chatsworth, California 91311
Test Dates:	July 1 and 2, 2009
Test Specifications:	EMI requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249
Test Procedure:	ANSI C63.4: 2003
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	The EUT operates on battery power and cannot be plugged into the AC public mains. Thus, this test was not performed.
2	Radiated RF Emissions 10 kHz – 9300 MHz (Transmitter Portion)	Complies with the limits of CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249 Highest reading in relation to spec limit: 91.83 dBuV/m @ 920.4 MHz (*Uc =1.85 dB)
3	Radiated RF Emissions 10 kHz – 9300 MHz (Digital and Receiver Portion)	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Wireless Temp Sensor, Model: S1-LXRFTS. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. 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, 15.207, 15.209, and 15.249.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

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

Venstar, Inc.

Corey McTigue	Engineering Manager

Compatible Electronics Inc.

Alex Benitez	Test Technician
Kyle Fujimoto	Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

2.5 Disposition of the Test Sample

The test sample has not yet been returned as of the date of this report.

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
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
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
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The Wireless Temp Sensor, Model: S1-LXRFTS (EUT) was tested as a stand alond unit in three orthogonal axis. During the test, the EUT was continuously sending to and receiving a signal from the thermostat RF module.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

There were no external cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
WIRELESS TEMP SENSOR (EUT)	VENSTAR, INC.	S1-LXRFTS	N/A	MUH-RFTS
THERMOSTAT RF MODULE	VENSTAR, INC.	S1-LXRFM	N/A	MUH-RFM

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	August 22, 2008	Aug. 22, 2009
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	August 22, 2008	Aug. 22, 2009
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	August 22, 2008	Aug. 22, 2009
EMI Receiver	Rohde & Schwarz	ESIB40	100194	September 17, 2008	Sept. 17, 2010
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Biconical Antenna	Com Power	AB-900	15250	February 23, 2009	Feb. 23, 2010
Log Periodic Antenna	Com Power	AL-100	16060	June 15, 2009	June 15, 2010
Preamplifier	Com-Power	PA-102	1017	January 12, 2009	Jan. 12, 2010
Loop Antenna	Com-Power	AL-130	17089	September 29, 2008	Sept. 29, 2009
Horn Antenna	Com-Power	AH-118	071175	June 27, 2008	June 27, 2010
Microwave Preamplifier	Com Power	PA-122	181921	March 12, 2009	March 12, 2010
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A

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 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT operates on battery power and cannot be plugged into the AC public mains. Thus, this test was not performed.

7.1.2 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-102 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 and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the EMI Receiver to keep the amplitude reading calibrated.

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 9.3 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: 2003. 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 by the Radiated Emission Manual Test software. 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.

Radiated Emissions (Spurious and Harmonics) Test (con't)

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 10 meter test distance from 10 kHz to 30 MHz, and at a 3 meter test distance from 30 MHz to 9.3 GHz to obtain the final test data.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249.

8. CONCLUSIONS

The Wireless Temp Sensor Model: S1-LXRFTS meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249.

Note: For the unintentional radiator and receiver portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

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

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 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.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Wireless Temp Sensor
Model: S1-LXRFTS
S/N: N/A

ALSO APPROVED UNDER THIS REPORT:

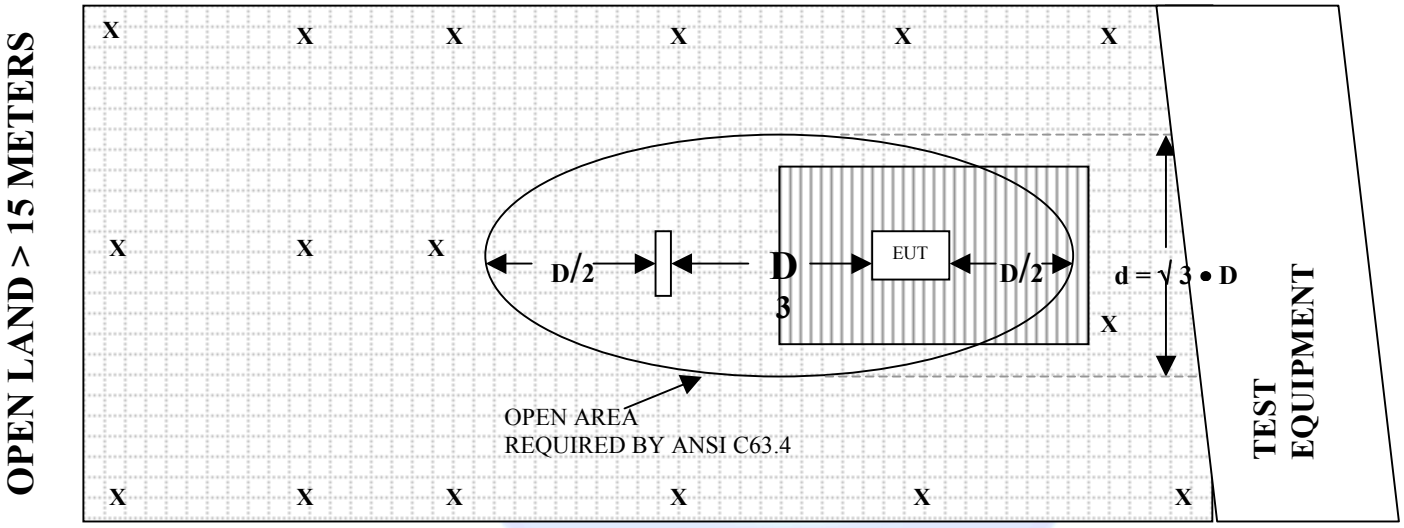
There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X	= GROUND RODS
D	= TEST DISTANCE (meters)
	= GROUND SCREEN
	= WOOD COVER

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: FEBRUARY 23, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.0	100	11.1
35	11.1	120	13.6
40	10.2	140	12.4
45	11.2	160	12.9
50	11.6	180	16.5
60	9.1	200	17.0
70	8.4	250	16.3
80	6.2	275	18.2
90	8.5	300	17.9

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16060

CALIBRATION DATE: JUNE 15, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	14.2	700	20.1
400	15.9	800	21.2
500	17.1	900	21.3
600	18.8	1000	22.3

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.5	10.0	39.4
1.5	25.4	10.5	39.7
2.0	28.3	11.0	39.0
2.5	28.9	11.5	40.0
3.0	29.7	12.0	39.7
3.5	30.8	12.5	41.7
4.0	31.4	13.0	42.7
4.5	32.6	13.5	41.2
5.0	33.7	14.0	41.6
5.5	34.4	14.5	43.2
6.0	34.7	15.0	42.3
6.5	35.4	15.5	39.3
7.0	37.0	16.0	41.7
7.5	37.4	16.5	39.6
8.0	37.6	17.0	43.0
8.5	37.6	17.5	47.1
9.0	38.5	18.0	46.2
9.5	38.6		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 12, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	39.0	300	38.8
40	39.0	350	38.8
50	38.8	400	38.7
60	38.7	450	38.6
70	38.8	500	38.3
80	38.8	550	38.9
90	39.1	600	38.4
100	39.1	650	38.8
125	38.9	700	38.4
150	38.9	750	38.5
175	38.9	800	38.3
200	38.8	850	38.4
225	39.0	900	38.1
250	38.9	950	37.4
275	38.8	1000	38.1

COM-POWER PA-122

PREAMPLIFIER

S/N: 181921

CALIBRATION DATE: MARCH 12, 2009

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	36.46	10.0	35.06
1.5	35.36	10.5	34.82
2.0	34.76	11.0	33.12
2.5	34.94	11.5	34.33
3.0	34.59	12.0	34.75
3.5	34.55	12.5	33.94
4.0	34.25	13.0	35.50
4.5	33.89	13.5	34.89
5.0	34.22	14.0	36.56
5.5	34.81	14.5	36.06
6.0	35.74	15.0	36.67
6.5	36.51	15.5	36.84
7.0	36.66	16.0	34.31
7.5	35.72	16.5	35.11
8.0	33.28	17.0	35.35
8.5	33.11	17.5	34.11
9.0	34.71	18.0	33.88
9.5	35.50	18.5	32.20

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: SEPTEMBER 29, 2008

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.57	9.93
0.01	-42.06	9.44
0.02	-42.43	9.07
0.05	-42.50	9.00
0.07	-42.10	9.40
0.1	-42.03	9.47
0.2	-44.50	7.00
0.3	-41.93	9.57
0.5	-41.90	9.60
0.7	-41.73	9.77
1	-41.23	10.27
2	-40.90	10.60
3	-41.20	10.30
4	-41.30	10.20
5	-40.70	10.80
10	-41.10	10.40
15	-42.17	9.33
20	-42.00	9.50
25	-42.20	9.30
30	-43.10	8.40

FRONT VIEW

VENSTAR, INC.
WIRELESS TEMP SENSOR
MODEL: S1-LXRFTS
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

VENSTAR, INC.
WIRELESS TEMP SENSOR
MODEL: S1-LXRFTS
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISISONS

DATA SHEETS

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	89.69	V	94	-4.31	Peak	1	125	
1818.8	44.99	V	54	-9.01	Peak	1.25	225	
2728.2	40.4	V	54	-13.6	Peak	1.25	135	
3637.6	44.53	V	54	-9.47	Peak	1.35	150	
4547	45.35	V	54	-8.65	Peak	1.58	150	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	93.86	H	94	-0.14	Peak	1.25	180	
909.4	91.71	H	94	-2.29	QP	1.25	180	
1818.8	48.85	H	54	-5.15	Peak	1.25	225	
2728.2	42.75	H	54	-11.25	Peak	1.25	135	
3637.6	40.45	H	54	-13.55	Peak	1.35	150	
4547	42.96	H	54	-11.04	Peak	1.58	150	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	93.01	V	94	-0.99	Peak	1.25	180	
909.4	91.51	V	94	-2.49	QP	1.25	180	
1818.8	53.46	V	74	-20.54	Peak	1.35	150	
1818.8	51.76	V	54	-2.24	Avg	1.35	150	
2728.2	48.94	V	54	-5.06	Peak	1.35	150	
3637.6	44.81	V	54	-9.19	Peak	1.56	175	
4547	47.28	V	54	-6.72	Peak	1.99	180	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	91.39	H	94	-2.61	Peak	1.25	180	
1818.8	45.39	H	54	-8.61	Peak	1.35	225	
2728.2	45.07	H	54	-8.93	Peak	1.69	135	
3637.6	39.34	H	54	-14.66	Peak	1.76	150	
4547	43.93	H	54	-10.07	Peak	2.05	1.55	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	92.29	V	94	-1.71	Peak	1	135	
1818.8	53.05	V	74	-20.95	Peak	1.35	150	
1818.8	49.71	V	54	-4.29	Avg	1.35	150	
2728.2	49.71	V	74	-24.29	Peak	1.35	150	
2728.2	46.31	V	54	-7.69	Avg	1.35	150	
3637.6	44.84	V	54	-9.16	Peak	1.29	135	
4547	47.11	V	54	-6.89	Peak	1.58	155	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC 15.249
Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
909.4	91.39	H	94	-2.61	Peak	1.25	150	
1818.8	52.06	H	74	-21.94	Peak	1.35	150	
1818.8	49.63	H	54	-4.37	Avg	1.35	150	
2728.2	43.81	H	74	-30.19	Peak	1.68	125	
3637.6	44.64	H	54	-9.36	Peak	1.35	150	
4547	45.93	H	54	-8.07	Peak	1.56	180	
5456.4								**No Emission Detected**
6365.8								**No Emission Detected**
7275.2								**No Emission Detected**
8184.6								**No Emission Detected**
9094								**No Emission Detected**

FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Labs: B and D
Tested By: Kyle Fujimoto

Receive Mode - Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Receive Mode
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.249 and FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 9.3 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	84.94	V	94	-9.06	Peak	1	90	
1828.4	42.57	V	54	-11.43	Peak	1.25	180	
2742.6	47.36	V	54	-6.64	Peak	1.35	135	
3656.8	43.56	V	54	-10.44	Peak	1.58	150	
4571	43.91	V	74	-30.09	Peak	1.36	185	
5485.2		V	54	-54	Avg			**No Emission Detected**
6399.4		V	54	-54	Avg			**No Emission Detected**
7313.6		V	54	-54	Avg			**No Emission Detected**
8227.8		V	74	-74	Peak			**No Emission Detected**
9142		V	54	-54	Avg			**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	95.34	H	94	1.34	Peak	1	90	
914.2	91.19	H	94	-2.81	QP	1	90	
1828.4	48.14	H	54	-5.86	Peak	1.35	135	
2742.6	43.84	H	54	-10.16	Peak	1.69	150	
3656.8	44.69	H	54	-9.31	Peak	1.85	175	
4571	45.78	H	54	-8.22	Peak	1.96	185	
5485.2								**No Emission Detected**
6399.4								**No Emission Detected**
7313.6								**No Emission Detected**
8227.8								**No Emission Detected**
9142								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	91.74	V	94	-2.26	Peak	1.25	180	
1828.4	51.18	V	54	-2.82	Peak	1.35	150	
1828.4	47.11	V	54	-6.89	Avg	1.35	150	
2742.6	45.95	V	54	-8.05	Peak	1.25	150	
3656.8	44.64	V	54	-9.36	Peak	1.35	180	
4571	46.64	V	54	-7.36	Peak	1.59	175	
5485.2								**No Emission Detected**
6399.4								**No Emission Detected**
7313.6								**No Emission Detected**
8227.8								**No Emission Detected**
9142								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	90.84	H	94	-3.16	Peak	1.25	180	
1828.4	49.27	H	54	-4.73	Peak	1.35	160	
2742.6	46.25	H	54	-7.75	Peak	1.95	180	
3656.8	43.88	H	54	-10.12	Peak	2.05	158	
4571	42.69	H	54	-11.31	Peak	1.35	150	
5485.2								**No Emission Detected**
6399.4								**No Emission Detected**
7313.6								**No Emission Detected**
8227.8								**No Emission Detected**
9142								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	90.74	V	94	-3.26	Peak	1.35	135	
1828.4	49.04	V	54	-4.96	Peak	1.35	160	
2742.6	44.68	V	54	-9.32	Peak	1.95	180	
3656.8	44.27	V	54	-9.73	Peak	2.05	158	
4571	46.49	V	54	-7.51	Peak	1.35	150	
5485.2								**No Emission Detected**
6399.4								**No Emission Detected**
7313.6								**No Emission Detected**
8227.8								**No Emission Detected**
9142								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.2	90.64	H	94	-3.36	Peak	1.35	150	
1828.4	45.79	H	54	-8.21	Peak	1.56	175	
2742.6	42.38	H	54	-11.62	Peak	1.95	155	
3656.8	44.61	H	54	-9.39	Peak	2.05	135	
4571	48.33	H	54	-5.67	Peak	1.69	150	
5485.2								**No Emission Detected**
6399.4								**No Emission Detected**
7313.6								**No Emission Detected**
8227.8								**No Emission Detected**
9142								**No Emission Detected**

FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Labs: B and D
Tested By: Kyle Fujimoto

Receive Mode - Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Receive Mode
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.249 and FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 9.3 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	86.93	V	94	-7.07	Peak	1.53	150	
1840.8	44.44	V	54	-9.56	Peak	1.36	175	
2761.2	41.46	V	54	-12.54	Peak	1.38	250	
3681.6	44.01	V	54	-9.99	Peak	1.69	315	
4602	45.92	V	54	-8.08	Peak	1.85	275	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

X-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	93.83	H	94	-0.17	Peak	1.35	165	
920.4	89.05	H	94	-4.95	QP	1.35	165	
1840.8	47.77	H	54	-6.23	Peak	1.65	315	
2761.2	41.79	H	54	-12.21	Peak	1.75	225	
3681.6	43.63	H	54	-10.37	Peak	1.62	175	
4602	45.77	H	54	-8.23	Peak	1.63	150	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC 15.249
Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	91.83	V	94	-2.17	Peak	1.26	160	
1840.8	51.08	V	54	-2.92	Peak	1.35	150	
1840.8	49.8	V	54	-4.2	Avg	1.35	150	
2761.2	41.55	V	54	-12.45	Peak	1.36	175	
3681.6	43.58	V	54	-10.42	Peak	1.52	150	
4602	47.42	V	54	-6.58	Peak	1.36	178	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Y-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	89.03	H	94	-4.97	Peak	1.68	150	
1840.8	45.63	H	54	-8.37	Peak	1.35	150	
2761.2	40.82	H	54	-13.18	Peak	1.59	180	
3681.6	44.58	H	54	-9.42	Peak	1.75	150	
4602	46.69	H	54	-7.31	Peak	1.58	181	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	91.58	V	94	-2.42	Peak	1.56	150	
1840.8	50.04	V	54	-3.96	Peak	1.35	150	
2761.2	40.88	V	54	-13.12	Peak	1.24	175	
3681.6	43.97	V	54	-10.03	Peak	1.36	195	
4602	46.83	V	54	-7.17	Peak	1.59	205	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Lab: B
Tested By: Kyle Fujimoto

Z-Axis - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
920.4	94.32	H	94	0.32	Peak	1.25	135	
920.4	89.97	H	94	-4.03	QP	1.25	135	
1840.8	47.06	H	54	-6.94	Peak	1.36	152	
2761.2	39.17	H	54	-14.83	Peak	1.45	150	
3681.6	42.95	H	54	-11.05	Peak	1.52	225	
4602	47.89	H	54	-6.11	Peak	1.35	150	
5522.4								**No Emission Detected**
6442.8								**No Emission Detected**
7363.2								**No Emission Detected**
8283.6								**No Emission Detected**
9204								**No Emission Detected**

FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Receive Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Receive Mode
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X and Y Axis

FCC 15.249 and FCC Class B

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

Date: 07/01/09
Labs: B and D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 9.3 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X and Y Axis

COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics
Customer : Venstar, Inc.
Manufacturer : Venstar, Inc.
Eut name : Wireless Temp Sensor
Model : S1-LXRFTS
Serial # : N/A
Specification : FCC Class B

Page : 1/1
Date : 7/02/2009
Time : 13:17:01
Lab : D
Test Distance : 3.0 Meters

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

Test Mode : Tested By: Kyle Fujimoto
Horizontal and Vertical Polarization
10 kHz - 1000 MHz Range
Transceiver Mode

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1H	49.700	41.70	0.70	11.58	38.81	15.17	40.00	-24.83
2V	63.310	45.60	0.73	8.86	38.73	16.46	40.00	-23.54
3V	114.530	39.50	1.06	12.96	38.98	14.54	43.50	-28.96
4H	114.530	41.90	1.06	12.96	38.98	16.94	43.50	-26.56
5V	126.670	39.20	1.11	13.18	38.90	14.59	43.50	-28.91
6H	221.650	48.00	1.67	16.68	38.97	27.38	46.00	-18.62
7H	237.660	35.70	1.70	16.46	38.95	14.91	46.00	-31.09
8V	250.630	35.70	1.70	16.35	38.90	14.86	46.00	-31.14
9H	274.700	36.50	1.80	18.18	38.80	17.68	46.00	-28.32
10V	305.261	47.30	1.93	14.30	38.80	24.74	46.00	-21.26
11V	359.534	34.10	2.24	15.27	38.78	12.83	46.00	-33.17
12H	449.620	34.50	2.50	16.53	38.60	14.93	46.00	-31.07
13H	529.020	42.40	2.82	17.63	38.66	24.19	46.00	-21.81
14H	549.620	11.10	2.90	17.98	38.90	-6.91	46.00	-52.91
15V	685.215	43.90	3.24	19.92	38.52	28.55	46.00	-17.45
16H	799.620	35.40	3.60	21.20	38.30	21.89	46.00	-24.11

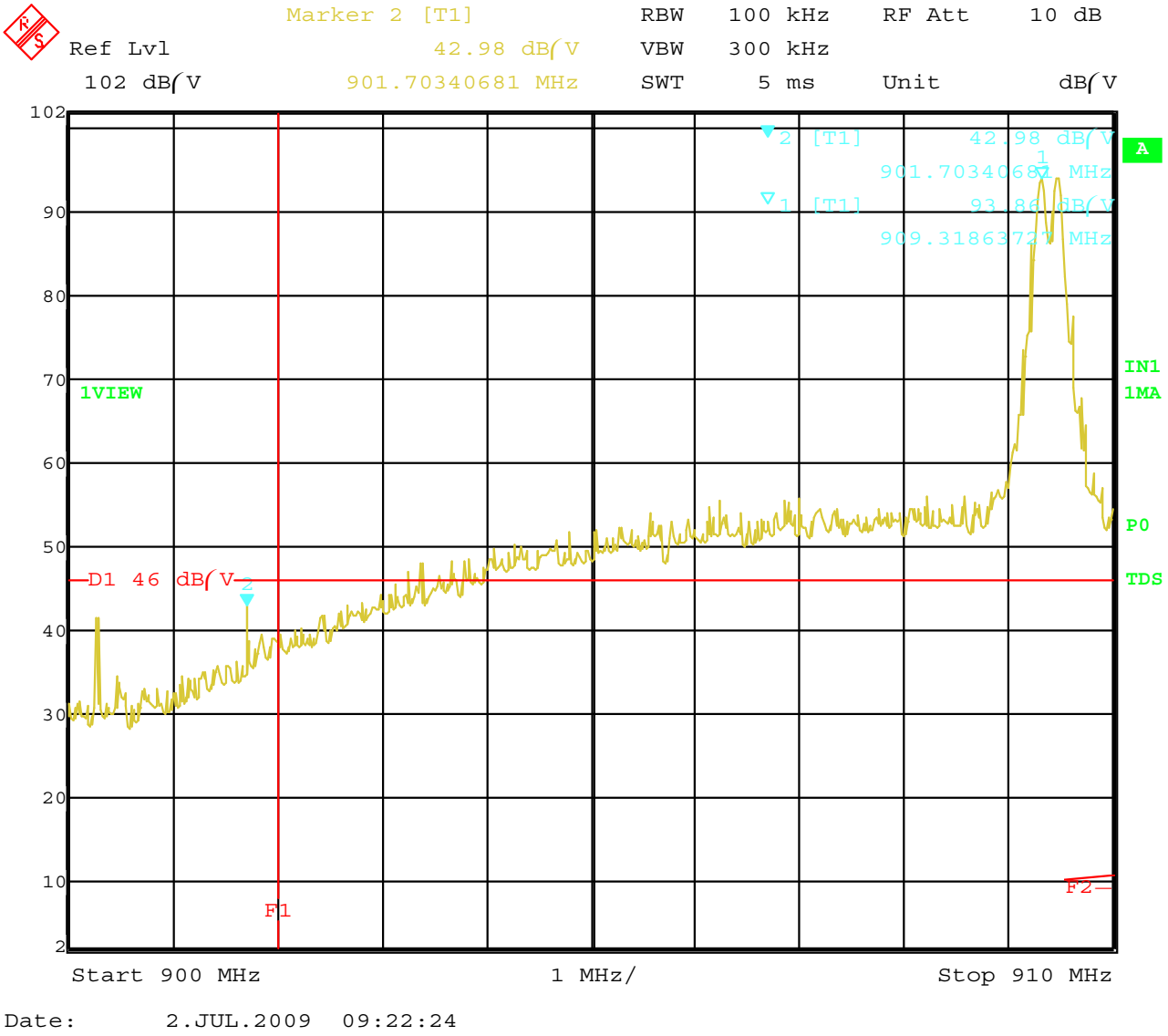
FCC 15.249

Venstar, Inc.
Wireless Temp Sensor
Model: S1-LXRFTS

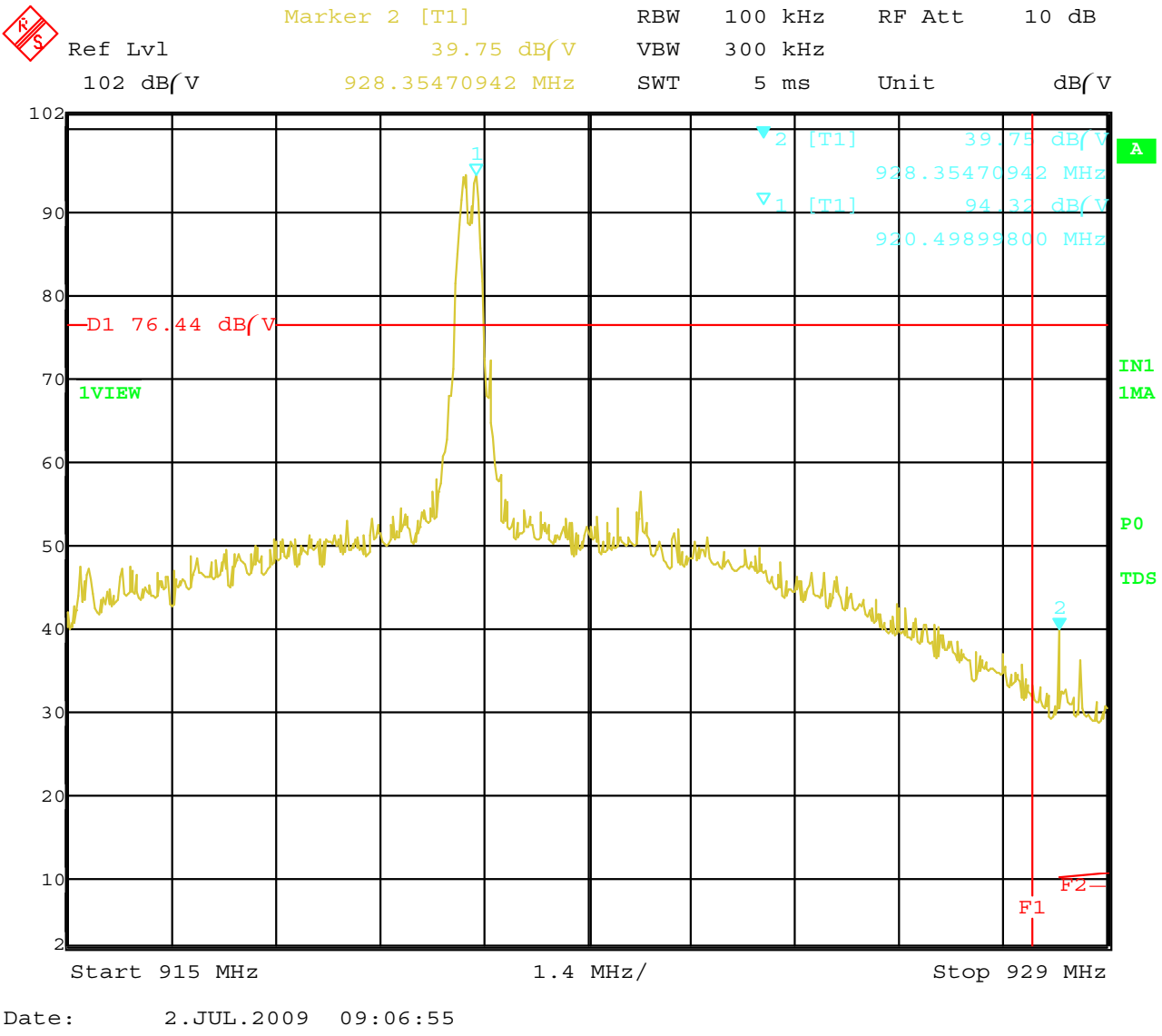
Date: 07/02/09
Lab: B
Tested By: Kyle Fujimoto

Band Edges (Worst Case)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
901.71	42.98	H	46	-4.31	Peak	1.25	180	Band Edge (Worst Case)
								Low Channel - X-Axis
928.35	39.75	H	46	-6.25	Peak	1.25	135	Band Edge (Worst Case)
								High Channel - Z-Axis



Band Edge – Low Channel – Horizontal Polarization – X-Axis (Worst Case)



Band Edge – High Channel – Horizontal Polarization – Z-Axis (Worst Case)