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## ENGINEERING TEST REPORT # 314318 B

### LSR Job #: C-2052

RF Exposure Compliance of:

ColorTouch

Test Date(s):

November 14<sup>th</sup>, December 1<sup>st</sup>-4<sup>th</sup>, 2014

Prepared For:

Venstar USA

Attn: Steve Dushane

9250 Owensmouth Avenue

Chatsworth, CA 91311

**This Test Report is issued under the Authority of:** Shane D. Rismeyer, EMC Engineer

Signature:

Date: 1/27/15

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Prepared For: Venstar	Name: ColorTouch
Report: RF314318 B FCC RF	Model: TERM-500
LSR: C-2052	Serial: Eng Sample

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## LSR, LLC in Review

As an EMC Testing Laboratory, our Accreditation and Assessments are recognized through the following:

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TESTING CERT #1255.01

A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025: 2005 with Electrical (EMC) Scope of Accreditation  
A2LA Certificate Number: 1255.01

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Federal Communications Commission (FCC) – USA

Listing of 3 Meter Semi-Anechoic Chamber based on Title 47 CFR – Part 2.948  
FCC Registration Number: 90756

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Industry Canada

On file, 3 Meter Semi-Anechoic Chamber based on RSS-212 – Issue 1  
File Number: IC 3088-A  
On file, 3 and 10 Meter OATS based on RSS-212 – Issue 1  
File Number: IC 3088

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U. S. Conformity Assessment Body (CAB) Validation

Validated by the European Commission as a U. S. Competent Body operating under the U. S./EU, Mutual Recognition Agreement (MRA) operating under the European Union Electromagnetic Compatibility – Council Directive 2004/108/EC (formerly 89/336/EEC, Article 10.2).  
Date of Validation: January 16, 2001

Validated by the European Commission as a U.S. Notified Body operating under the U.S. /EU, Mutual Recognition Agreement (MRA) operating under the European Union Telecommunication Equipment – Council Directive 99/5/EC, Annex V.  
Date of Validation: November 20, 2002  
Notified Body Identification Number: 1243

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## 1.0 Conformance Summary

The EUT was found to MEET the 5mm minimum test separation distance threshold for SAR test exclusion per FCC §2.1091(mobile) using methods of FCC KDB 447498 D01 General RF Exposure Guidance v05r02 as a standalone device.

## 2.0 SAR Test Exclusion Threshold

SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 20$  cm

1-g SAR test exclusion threshold equation:

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] * \sqrt{f(\text{GHz})} \leq 3.0$$

10-g SAR test exclusion threshold equation:

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] * \sqrt{f(\text{GHz})} \leq 7.5$$

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### 3.0 Client Information

<b>Manufacturer Name:</b>	Venstar
<b>Address:</b>	9250 Owensmouth Ave.
<b>Contact Person:</b>	Steve Dushane

### 3.1 Equipment Under Test (EUT) Information

*The following information has been supplied by the applicant.*

<b>Product Name:</b>	ColorTouch
<b>Model Number:</b>	THERM-500
<b>Serial Number:</b>	Eng Sample
<b>FCC ID</b>	MUH-SKYPORT2

### 3.2 Product Description

Color Touch thermostat is a controller used with HVAC system to regulate temperature and/or humidity. This thermostat incorporates an on-board Wi-Fi transceiver, which allows the user to observe temperature and humidity information using a remote device.

### 3.3 Modifications Incorporated In the EUT for Compliance Purposes

None noted at time of test

### 3.4 Deviations & Exclusions from Test Specifications

None noted at time of test

### 3.5 Additional Information

Low Channel 1(2412 MHz), Middle Channel 6 (2437 MHz), High Channel 11 (2462 MHz). EUT programmed for continuous transmit or receive on selectable channel and data rate (modulation) using the touchscreen interface.

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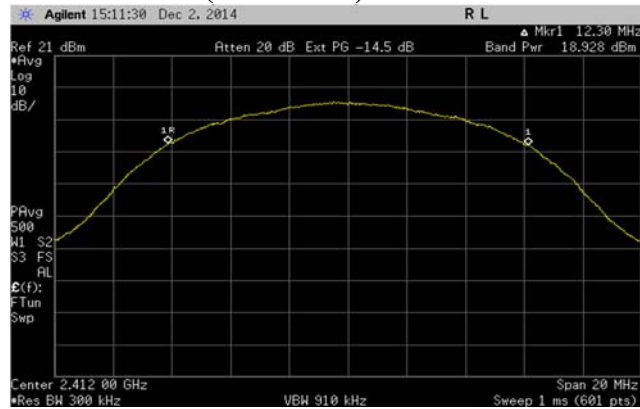
## 4.0 RF Conducted Measurement Data

Table

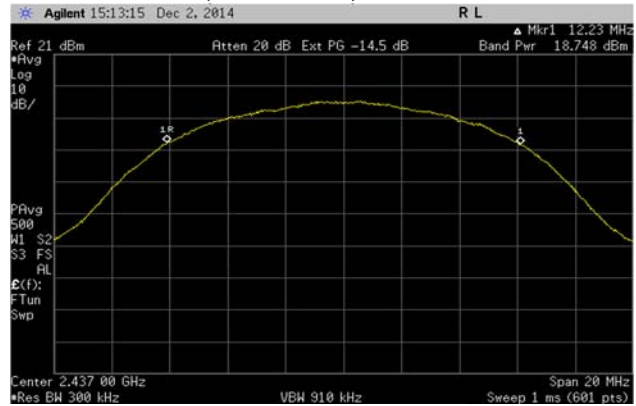
Frequency (MHz)	Power (dBm)
2412	18.93
2437	18.75
2462	18.55

### Plots

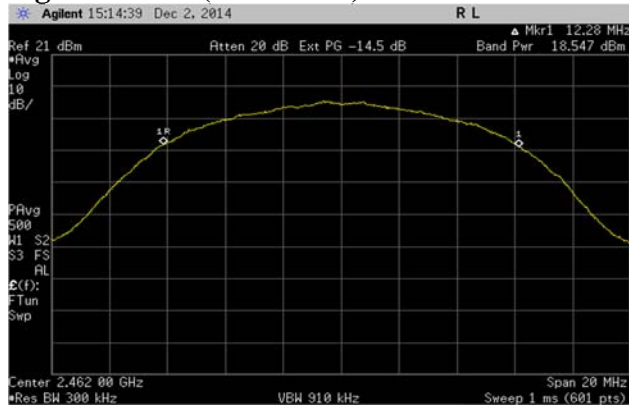
#### Low Channel (2402 MHz)



#### Mid Channel (2437 MHz)



## High Channel (2462 MHz)



### 5.0 SAR Test Exclusion Calculation

[Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10]  
mW at > 1500 MHz and ≤ 6 GHz

Test separation distance = 190mm

Frequency in GHz = 2.45 GHz

Limits

1g limit (3)

10g limit (7.5)

Max channel power

1g limit = 95.8 mW

10g limit = 239.6 mW

1g SAR

$95.8 + (190\text{mm} - 50\text{mm}) \cdot 10 \text{ mW} = 1495.8 \text{ mW}$

**78 mW < 1496 mW**

10g SAR

$239.6 + (190\text{mm} - 50\text{mm}) \cdot 10 \text{ mW} = 1639.6 \text{ mW}$

**78 mW < 1640 mW**

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## 6.0 MPE Calculation

Note: Antenna gain over ground plane.

### Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density  
P = power input to the antenna  
G = power gain of the antenna in the direction of interest relative to an isotropic radiator  
R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	18.93	(dBm)
Maximum peak output power at antenna input terminal:	78.163	(mW)
Antenna gain(typical):	3	(dBi)
Maximum antenna gain:	1.995	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	0.031026	(mW/cm <sup>2</sup> )
Maximum allowable antenna gain:	18.1	(dBi)
Margin of Compliance at 20 cm =	15.1	dB

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