

Hestan

TEST REPORT FOR

Hestan Smart Cooking Induction Module HSCIM-1

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.249

Report No.: 101326-8

Date of issue: June 6, 2018



Test Certificate # 803.05

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Hestan
1 Meyer Plaza
Vallejo, CA 94590

Representative: Katie Rieschick
Customer Reference Number: 051618-1

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 101326

May 18, 2018

May 18-22, 2018

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink, reading "Steve Behm", is positioned above a horizontal line.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Canyon Park, Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.11

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Canyon Park Bothell, WA	US0081	SL2-IN-E-1145R	3082C-1	US1022	A-0148

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.249

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.249(a)	Field Strength of Fundamental	NA	Pass
15.249(a)	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
Hestan Smart Cooking Induction Module	Hestan	HSCIM-1	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
DC Power Supply	YescomUSA	DCP305D	NA

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
Hestan Smart Cooking Induction Module	Hestan	HSCIM-1	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
AC/DC Adapter	UpBright	GEO151UB-5025	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Radio Module
Modulation Type(s):	GFSK
Maximum Duty Cycle:	100%
Antenna Type(s) and Gain:	Trace antenna, -10dBi
Antenna Connection Type:	Integral
Nominal Input Voltage:	5.0V nominal (3.6 to 6.0VDC)
Firmware / Software used for Test:	Firmware version cooktop_sdk15_fcc_1.0

FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

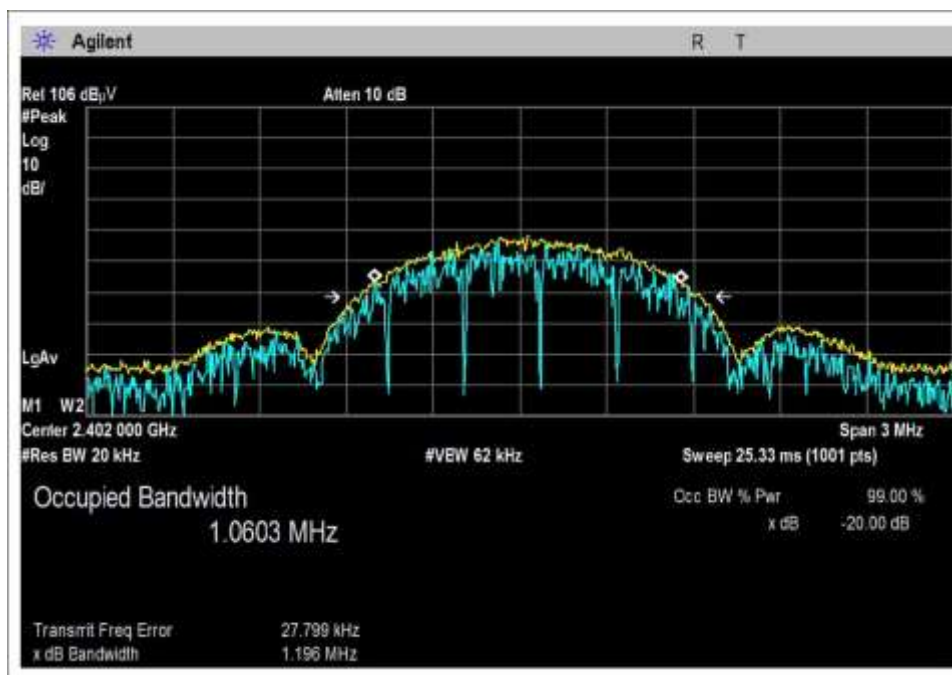
Test Setup/Conditions			
Test Location:	Canyon Park Lab C3	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	5/18/2018
Configuration:	1		
Test Conditions:	The EUT is continuously transmitting modulated data. Low, Mid, and High channels investigated.		

Environmental Conditions			
Temperature (°C)	22-24	Relative Humidity (%):	40-41

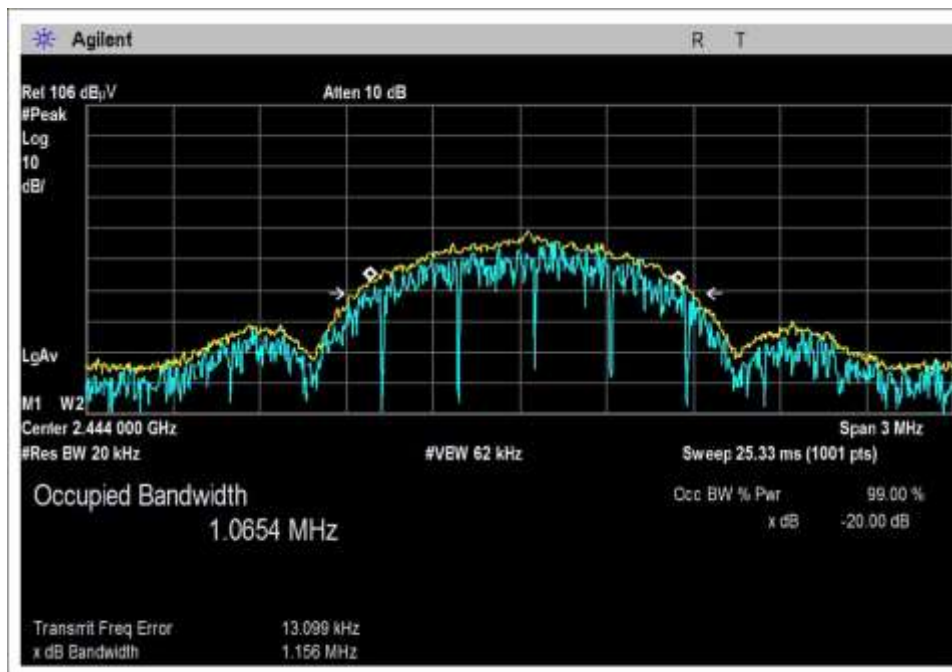
Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02871	Spectrum Analyzer	Agilent	E4440A	1/17/2018	1/17/2020
P05959	Cable	Andrews	Heliast	4/11/2018	4/11/2020
P05544	Cable	Andrews	Heliast	4/12/2018	4/12/2020
03540	Preamp	HP	83017A	5/2/2017	5/2/2019
P06934	Cable	Astrolab	32026-29801-29801-18	3/13/2018	3/13/2020
P07229	Attenuator	Pasternack	PE7004-20	12/1/2017	12/1/2019
01467	Horn Antenna	EMCO	3115	7/21/2017	7/21/2019

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (MHz)	Limit (kHz)	Results
2402	1	GFSK	1.196	None	NA
2444	1	GFSK	1.156	None	NA
2480	1	GFSK	1.207	None	NA

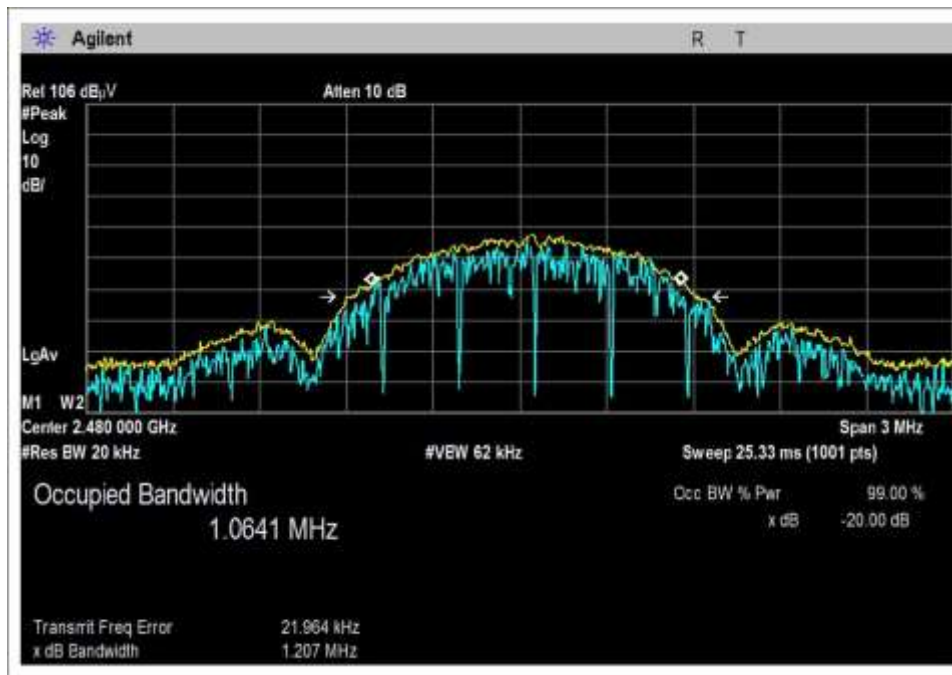
Plots



Low Channel



Middle Channel



High Channel

Test Setup Photo



15.249(a) Field Strength of Fundamental

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation	V _{Minimum} (dBuV/m)	V _{Nominal} (dBuV/m)	V _{Maximum} (dBuV/m)	Max Deviation from V _{Nominal} (dB)
2402	GFSK	92.5	92.5	92.6	0.1
2444	GFSK	92.0	92.0	92.0	0.0
2480	GFSK	89.7	89.7	89.9	0.2

Test performed using operational mode with the highest output power, representing worst case.

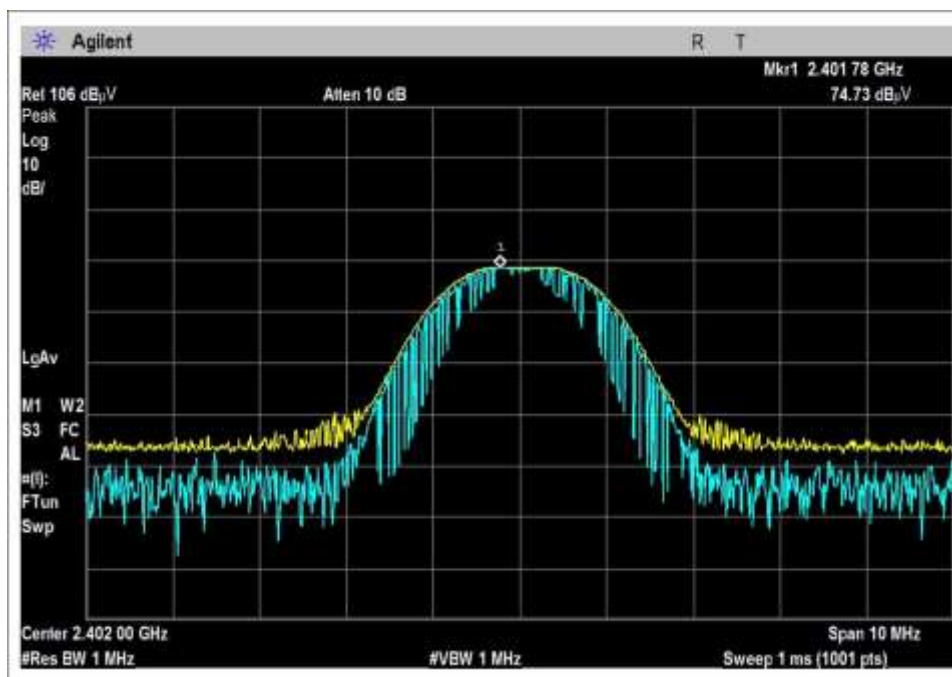
Parameter Definitions:

Measurements performed at input voltage according to manufacturer specification.

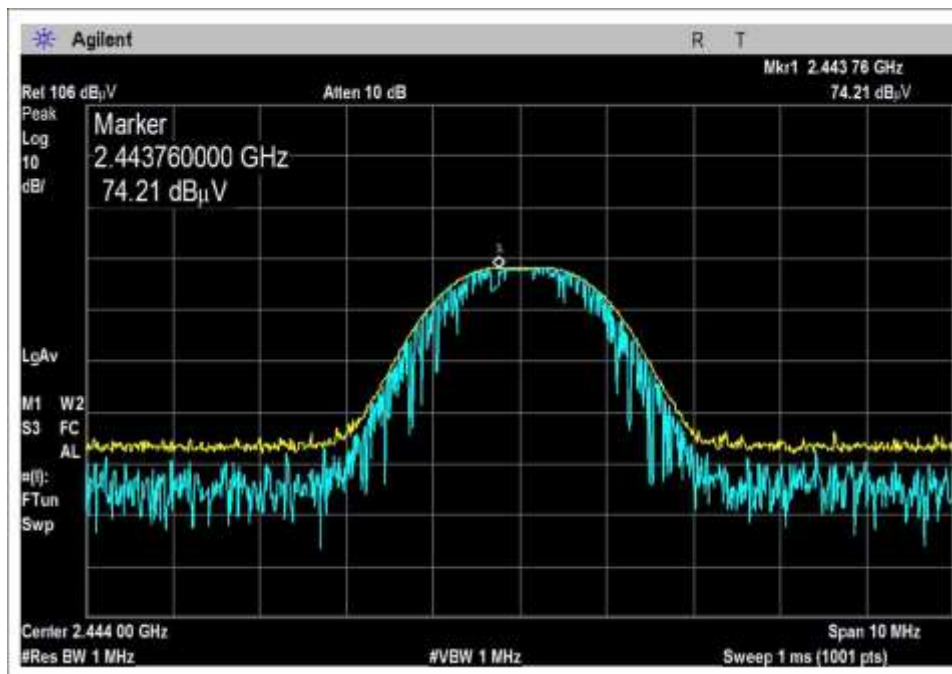
Parameter	Value
V _{Nominal} :	5.0VDC
V _{Minimum} :	3.6VDC
V _{Maximum} :	6.0VDC

Test Data Summary – Radiated Field Strength Measurement					
Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
2402	GFSK	Internal Trace	92.5	≤94	Pass
2444	GFSK	Internal Trace	92.0	≤94	Pass
2480	GFSK	Internal Trace	89.7	≤94	Pass

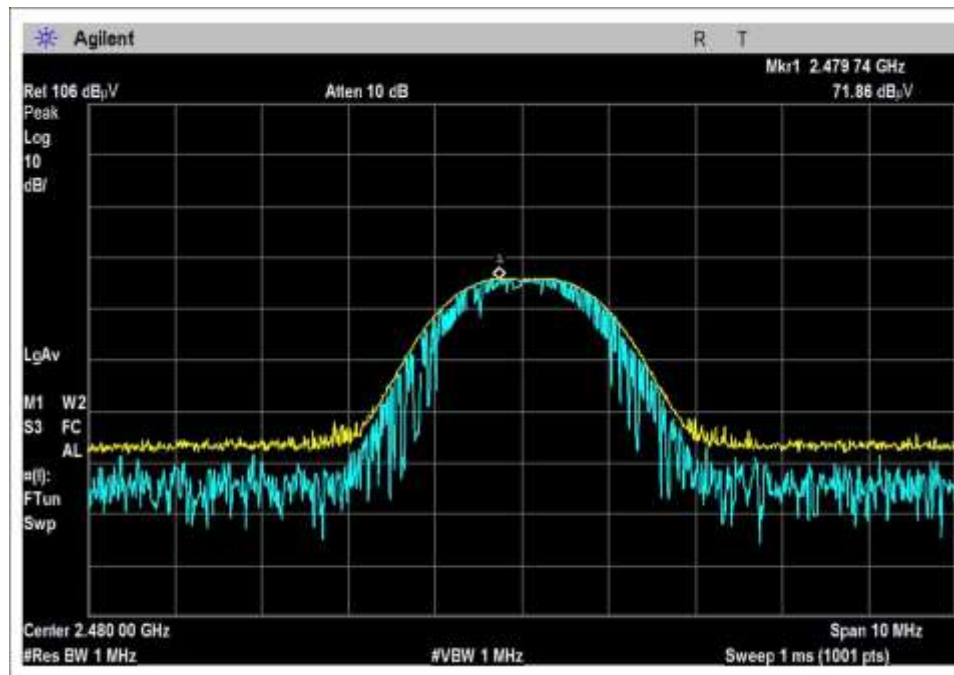
Plots



Low Channel



Middle Channel



High Channel

Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Hestan**
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
 Work Order #: **101326** Date: 5/18-21/2018
 Test Type: **Radiated Scan** Time: 11:17:42
 Tested By: Michael Atkinson Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

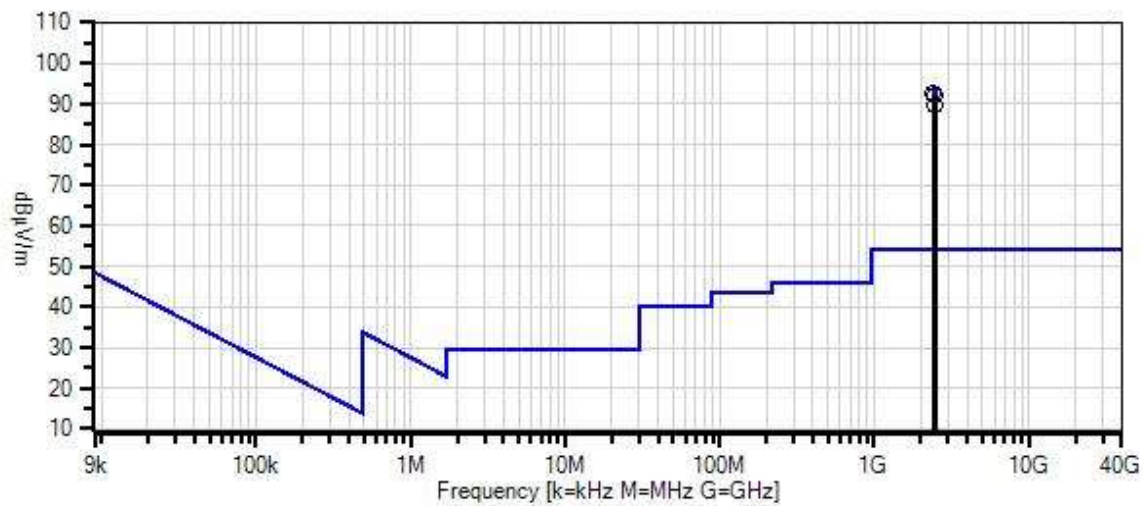
Temperature: 22-24°C
 Humidity: 40-41%
 Pressure: 102.0-102.2kPa

 Frequency Range: 2402-2480
 Frequency tested: 2402, 2444, 2480MHz
 Firmware power setting: -4

 Test Location: Canyon Park Lab C3
 Test Method: ANSI C63.10 (2013)

 Duty Cycle: 100%
 Test Mode: Continuously transmitting
 Test Setup: The EUT is a module, connected to DC power from power supply remotely located outside of chamber.
 The EUT is on a test table 1.5m high.
 X, Y, and Z EUT axes investigated, as well as both horizontal and vertical measurement antenna polarities, only worst case reported.

Hestan W/O#: 101326 Sequence#: 1 Date: 5/21/2018
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Horiz



- Readings
- Peak Readings
- × QP Readings
- * Average Readings
- ▼ Ambient
- Software Version: 5.03.11
- 1 - 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T1	ANP05959	Cable	Heliac	4/11/2018	4/11/2020
T2	ANP05544	Cable	Heliac	4/12/2018	4/12/2020
T3	AN03540	Preamp	83017A	5/2/2017	5/2/2019
T4	ANP06934	Cable	32026-29801-29801-18	3/13/2018	3/13/2020
T5	ANP07229	Attenuator	PE7004-20	12/1/2017	12/1/2019
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/21/2017	7/21/2019

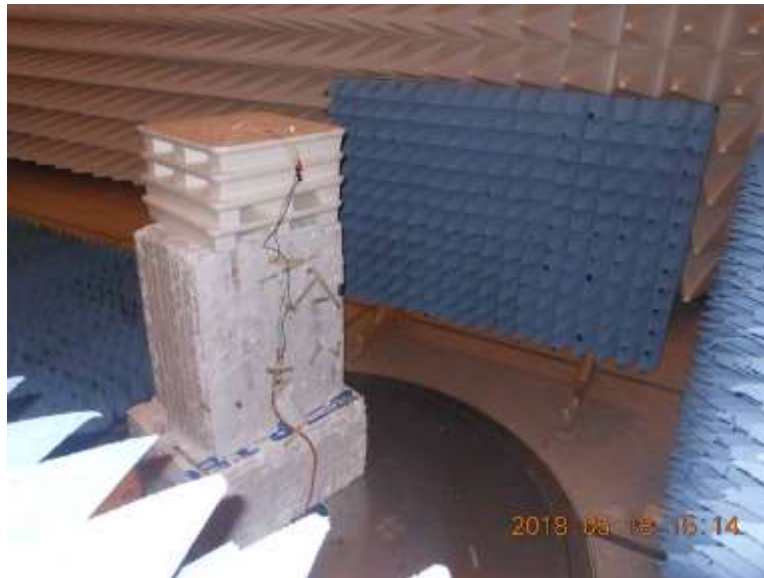
Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	2401.780M	74.7	+1.0 +20.1	+2.2 +28.1	-34.0	+0.4	+0.0	92.5	94.0 X	-1.5	Horiz
2	2443.780M	74.2	+1.0 +20.1	+2.2 +28.1	-34.0	+0.4	+0.0	92.0	94.0 X	-2.0	Horiz
3	2479.740M	71.9	+1.0 +20.1	+2.2 +28.1	-34.0	+0.4	+0.0	89.7	94.0 X	-4.3	Horiz

Test Setup Photos



Above 1GHz Cone placement



X Axis



Y Axis



Z Axis

15.249(a) Radiated Emissions and Band Edge

Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Hestan**
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
 Work Order #: **101326** Date: 5/22/2018
 Test Type: **Radiated Scan** Time: 14:36:10
 Tested By: Michael Atkinson Sequence#: 3
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

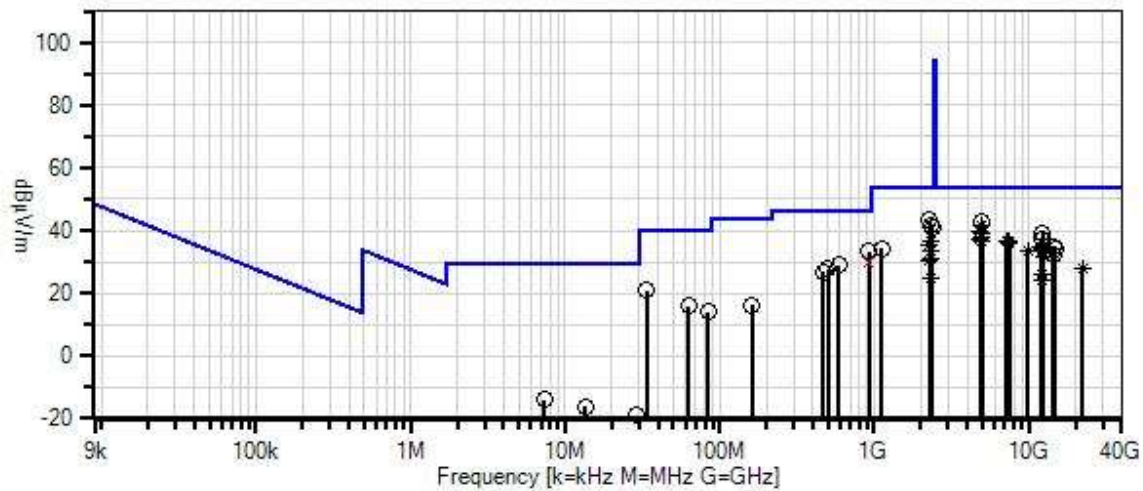
Temperature: 22-24°C
 Humidity: 40-41%
 Pressure: 102.0-102.2kPa

 Frequency Range: 0.09-24800MHz
 Frequency tested: 2402, 2444, 2480MHz
 Firmware power setting: -4

 Test Location: Canyon Park Lab C3
 Test Method: ANSI C63.10 (2013)

 Duty Cycle: 100%
 Test Mode: Continuously transmitting
 Test Setup: The EUT is a module, connected to DC power from power supply remotely located outside of chamber. X, Y, and Z EUT axes investigated, only worst case reported.
 Below 30MHz there were 3 orthogonal polarities investigated, above 30MHz horizontal and vertical antenna polarities investigated, only worst case reported.

Hestan WO#: 101326 Sequence#: 3 Date: 5/22/2018
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Ground Para



- Readings
 - Peak Readings
 - × QP Readings
 - * Average Readings
 - ▼ Ambient
- Software Version: 5.03.11
- 1 - 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T2	ANP05959	Cable	Heliac	4/11/2018	4/11/2020
T3	ANP05544	Cable	Heliac	4/12/2018	4/12/2020
T4	AN03540	Preamp	83017A	5/2/2017	5/2/2019
T5	ANP06934	Cable	32026-29801-29801-18	3/13/2018	3/13/2020
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/21/2017	7/21/2019
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	3/30/2017	3/30/2019
T8	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/7/2016	10/7/2018
T9	ANP06678	Cable	32026-29801-29801-144	3/13/2018	3/13/2020
T10	ANP06503	Cable	32026-29801-29801-36	3/13/2018	3/13/2020
T11	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T12	ANP05305	Cable	ETSI-50T	10/24/2017	10/24/2019
T13	AN02307	Preamp	8447D	1/15/2018	1/15/2020
T14	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T15	ANP06123	Attenuator	18N-6	5/5/2017	5/5/2019
T16	AN03628	Biconilog Antenna	3142E	6/7/2017	6/7/2019
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	2278.430M	45.8	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0	-34.1 +0.0	+0.0	43.3	54.0	-10.7	Horiz
									X		
2	4960.000M	38.2	+0.0 +0.7 +0.0 +0.0 +0.0	+1.2 +32.5 +0.0 +0.0	+3.7 +0.0 +0.0 +0.0	-33.2 +0.0	+0.0	43.1	54.0	-10.9	Horiz
									Y		

3	2350.000M	44.2	+0.0	+1.0	+2.1	-34.1	+0.0	41.7	54.0	-12.3	Horiz
			+0.4	+28.1	+0.0	+0.0		X			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
4	4888.045M	36.5	+0.0	+1.2	+3.7	-33.2	+0.0	41.4	54.0	-12.6	Vert
	Ave		+0.8	+32.4	+0.0	+0.0		Y			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	4888.000M	40.2	+0.0	+1.2	+3.7	-33.2	+0.0	45.1	54.0	-8.9	Vert
			+0.8	+32.4	+0.0	+0.0		Y			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
6	920.500M	26.1	+0.0	+0.6	+0.0	+0.0	+0.0	33.4	46.0	-12.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+1.6					
			-27.3	+2.0	+5.9	+24.5					
			+0.0								
7	2386.000M	43.5	+0.0	+1.0	+2.2	-34.0	+0.0	41.2	54.0	-12.8	Horiz
			+0.4	+28.1	+0.0	+0.0		Z			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
8	4804.241M	35.1	+0.0	+1.1	+3.7	-33.2	+0.0	39.9	54.0	-14.1	Vert
	Ave		+0.9	+32.3	+0.0	+0.0		Y			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
9	12216.000	44.1	+0.0	+2.1	+6.3	+0.0	+0.0	39.3	54.0	-14.7	Horiz
	M		+0.0	+0.0	-13.2	+0.0					
			+0.0	+0.0	+0.0	+0.0		X			
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
10	4960.000M	34.0	+0.0	+1.2	+3.7	-33.2	+0.0	38.9	54.0	-15.1	Vert
	Ave		+0.7	+32.5	+0.0	+0.0		Y			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	4960.000M	40.6	+0.0	+1.2	+3.7	-33.2	+0.0	45.5	54.0	-8.5	Vert
			+0.7	+32.5	+0.0	+0.0		Y			
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

12	4888.143M Ave	33.0	+0.0 +0.8 +0.0 +0.0 +0.0	+1.2 +32.4 +0.0 +0.0 +0.0	+3.7 +0.0 +0.0 +0.0 +0.0	-33.2 +0.0 +0.0 +0.0 +0.0	+0.0	37.9 X	54.0	-16.1	Horiz
^	4888.143M	39.2	+0.0 +0.0 +3.8 +0.0 +0.0	+0.0 +0.0 +1.6 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	44.6 X	54.0	-9.4	Horiz
14	920.500M QP	22.5	+0.0 +0.0 +0.0 -27.3 +0.0	+0.6 +0.0 +0.0 +2.0 +0.0	+0.0 +0.0 +0.0 +5.9 +0.0	+0.0 +0.0 +1.6 +24.5 +0.0	+0.0	29.8	46.0	-16.2	Vert
15	12011.620 M	42.4	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	37.4 X	54.0	-16.6	Horiz
16	4804.075M Ave	32.3	+0.0 +0.9 +0.0 +0.0 +0.0	+1.1 +32.3 +0.0 +0.0 +0.0	+3.7 +0.0 +0.0 +0.0 +0.0	-33.2 +0.0 +0.0 +0.0 +0.0	+0.0	37.1 X	54.0	-16.9	Horiz
^	4804.075M	40.8	+0.0 +0.0 +3.7 +0.0 +0.0	+0.0 +0.0 +1.5 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	46.0 X	54.0	-8.0	Horiz
18	588.700M	27.8	+0.0 +0.0 +0.0 -28.2 +0.0	+0.5 +0.0 +0.0 +1.5 +0.0	+0.0 +0.0 +0.0 +5.9 +0.0	+0.0 +0.0 +1.3 +20.3 +0.0	+0.0	29.1	46.0	-16.9	Vert
19	2351.989M Ave	39.2	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	36.7 Y	54.0	-17.3	Vert
20	4960.352M Ave	31.6	+0.0 +0.7 +0.0 +0.0 +0.0	+1.2 +32.5 +0.0 +0.0 +0.0	+3.7 +0.0 +0.0 +0.0 +0.0	-33.2 +0.0 +0.0 +0.0 +0.0	+0.0	36.5 X	54.0	-17.5	Horiz

21	7439.459M Ave	27.8	+0.0 +0.5 +0.0 +0.0 +0.0	+1.5 +36.8 +0.0 +0.0 +0.0	+4.2 +0.0 +0.0 +0.0 +0.0	-34.4 +0.0 +0.0 +0.0 +0.0	+0.0	36.4 X	54.0	-17.6	Horiz
^	7439.380M	39.1	+0.0 +0.5 +0.0 +0.0 +0.0	+1.5 +36.8 +0.0 +0.0 +0.0	+4.2 +0.0 +0.0 +0.0 +0.0	-34.4 +0.0 +0.0 +0.0 +0.0	+0.0	47.7 X	54.0	-6.3	Horiz
23	7206.657M Ave	28.4	+0.0 +0.5 +0.0 +0.0 +0.0	+1.4 +36.2 +0.0 +0.0 +0.0	+3.8 +0.0 +0.0 +0.0 +0.0	-33.9 +0.0 +0.0 +0.0 +0.0	+0.0	36.4 X	54.0	-17.6	Horiz
^	7206.700M	38.9	+0.0 +0.5 +0.0 +0.0 +0.0	+1.4 +36.2 +0.0 +0.0 +0.0	+3.8 +0.0 +0.0 +0.0 +0.0	-33.9 +0.0 +0.0 +0.0 +0.0	+0.0	46.9 X	54.0	-7.1	Horiz
25	498.500M	28.4	+0.0 +0.0 +0.0 -28.1 +0.0	+0.4 +0.0 +0.0 +1.3 +5.9	+0.0 +0.0 +0.0 +18.6 +18.6	+0.0 +0.0 +1.2 +18.6 +18.6	+0.0	27.7	46.0	-18.3	Horiz
26	7332.246M Ave	27.3	+0.0 +0.5 +0.0 +0.0 +0.0	+1.5 +36.5 +0.0 +0.0 +0.0	+4.0 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	35.7 X	54.0	-18.3	Horiz
^	7332.340M	38.2	+0.0 +0.5 +0.0 +0.0 +0.0	+1.5 +36.5 +0.0 +0.0 +0.0	+4.0 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	46.6 X	54.0	-7.4	Horiz
28	2273.946M Ave	37.6	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	35.1 Y	54.0	-18.9	Vert
29	33.900M	28.4	+0.0 +0.0 +0.0 -28.0 +0.0	+0.1 +0.0 +0.0 +0.3 +5.9	+0.0 +0.0 +0.0 +13.8 +13.8	+0.0 +0.0 +0.3 +13.8 +13.8	+0.0	20.8	40.0	-19.2	Horiz
30	463.600M	28.1	+0.0 +0.0 +0.0 -28.0 +0.0	+0.4 +0.0 +0.0 +1.3 +5.9	+0.0 +0.0 +0.0 +17.9 +17.9	+0.0 +0.0 +1.1 +17.9 +17.9	+0.0	26.7	46.0	-19.3	Vert

31	12008.980 M Ave	39.5	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	34.5	54.0	-19.5	Vert
^	12008.960 M	40.5	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	35.5	54.0	-18.5	Vert
33	14410.700 M	40.1	+0.0 +0.0 +0.0 +0.0 +0.0	+2.7 +0.0 +0.0 +0.0 +0.0	+6.3 -14.6 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	34.5	54.0	-19.5	Horiz
34	1117.000M	44.1	+0.0 +0.3 +0.0 +0.0 +0.0	+0.6 +24.3 +0.0 +0.0 +0.0	+1.4 +0.0 +0.0 +0.0 +0.0	-36.3 +0.0 +0.0 +0.0 +0.0	+0.0	34.4	54.0	-19.6	Horiz
35	14881.080 M	39.3	+0.0 +0.0 +0.0 +0.0 +0.0	+2.6 +0.0 +0.0 +0.0 +0.0	+6.7 -14.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	34.4	54.0	-19.6	Horiz
36	12218.894 M Ave	38.7	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.3 -13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	33.9	54.0	-20.1	Horiz
37	2352.027M Ave	36.2	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	33.7	54.0	-20.3	Horiz
38	12008.877 M Ave	38.5	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	33.5	54.0	-20.5	Horiz
39	9919.440M Ave	21.6	+0.0 +0.9 +0.0 +0.0 +0.0	+1.9 +37.7 +0.0 +0.0 +0.0	+4.9 +0.0 +0.0 +0.0 +0.0	-33.7 +0.0 +0.0 +0.0 +0.0	+0.0	33.3	54.0	-20.7	Horiz
^	9919.440M	32.6	+0.0 +0.9 +0.0 +0.0 +0.0	+1.9 +37.7 +0.0 +0.0 +0.0	+4.9 +0.0 +0.0 +0.0 +0.0	-33.7 +0.0 +0.0 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Horiz

41	14413.520 M	37.7	+0.0 +0.0 +0.0 +0.0 +0.0	+2.7 +0.0 +0.0 +0.0 +0.0	+6.3 -14.6 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	32.1	54.0	-21.9	Horiz
									X		
42	12398.960 M Ave	36.6	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.4 -13.4 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	31.7	54.0	-22.3	Horiz
									X		
^	12398.940 M	38.8	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.4 -13.4 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	33.9	54.0	-20.1	Horiz
									X		
44	2316.039M Ave	33.6	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	31.1	54.0	-22.9	Vert
									Y		
45	2274.069M Ave	32.7	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	30.2	54.0	-23.8	Horiz
									X		
46	63.000M	30.1	+0.0 +0.0 +0.0 -27.9 +0.0	+0.1 +0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +0.0 +5.9 +6.9	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	15.9	40.0	-24.1	Vert
47	22352.000 M Ave	27.5	+0.0 +0.0 +8.9 +0.0 +0.0	+0.0 +0.0 +4.4 +0.0 +0.0	+0.0 +0.0 +1.8 +0.0 +0.0	+0.0 -14.5 +0.0 +0.0 +0.0	+0.0	28.1	54.0	-25.9	Horiz
									X		
^	22352.000 M	44.3	+0.0 +0.0 +8.9 +0.0 +0.0	+0.0 +0.0 +4.4 +0.0 +0.0	+0.0 +0.0 +1.8 +0.0 +0.0	+0.0 -14.5 +0.0 +0.0 +0.0	+0.0	44.9	54.0	-9.1	Horiz
									X		
49	84.300M	28.1	+0.0 +0.0 +0.0 -27.8 +0.0	+0.2 +0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +0.0 +5.9 +6.6	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	14.0	40.0	-26.0	Vert
50	161.900M	26.4	+0.0 +0.0 +0.0 -27.5 +0.0	+0.3 +0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +0.0 +5.9 +9.8	+0.0 +0.0 +0.6 +0.0 +0.0	+0.0	16.2	43.5	-27.3	Vert

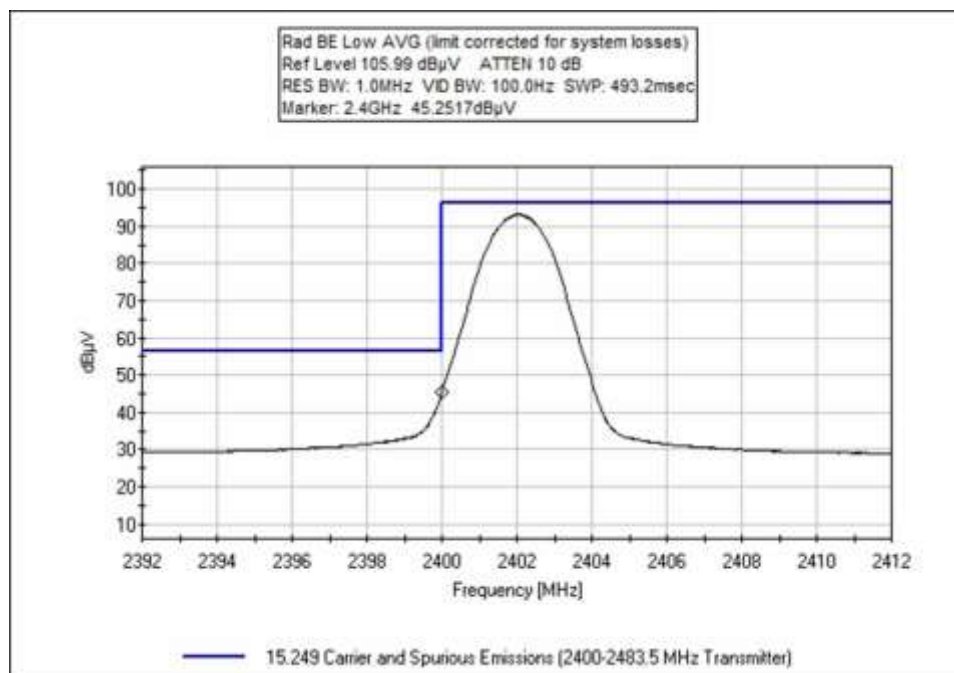
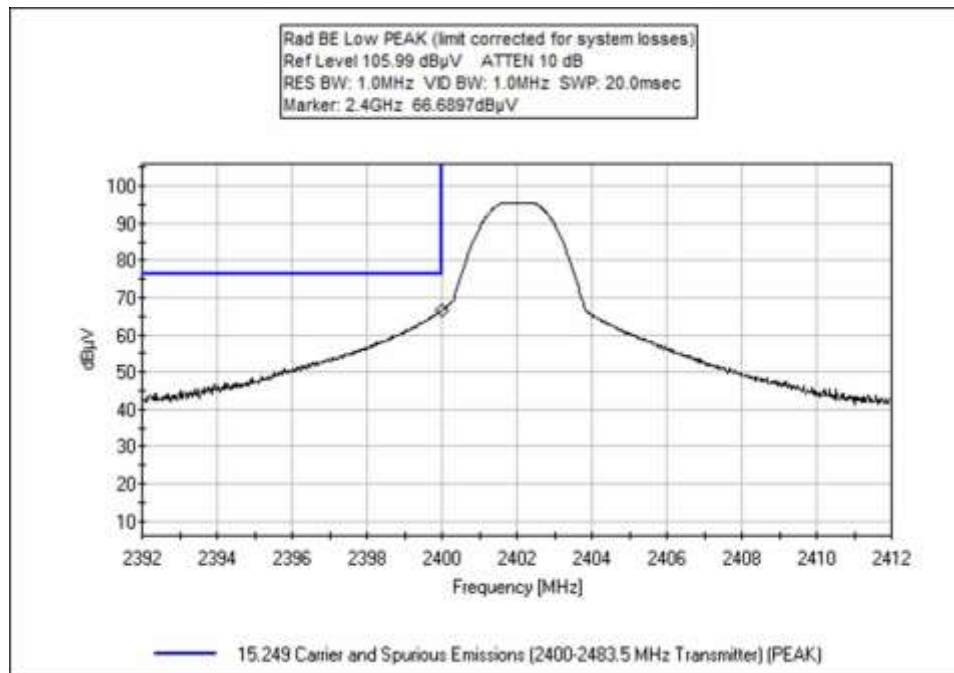
51	12008.983 M Ave	31.3	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	26.3	54.0	-27.7	Horiz
									Y		
^	12008.900 M	39.3	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.2 -13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	34.3	54.0	-19.7	Horiz
									Y		
53	2353.559M Ave	27.4	+0.0 +0.4 +0.0 +0.0 +0.0	+1.0 +28.1 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	-34.1 +0.0 +0.0 +0.0 +0.0	+0.0	24.9	54.0	-29.1	Horiz
									X		
54	12220.060 M Ave	28.8	+0.0 +0.0 +0.0 +0.0 +0.0	+2.1 +0.0 +0.0 +0.0 +0.0	+6.3 -13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0	24.0	54.0	-30.0	Horiz
									X		
55	7.297M	16.4	+0.0 +0.0 +0.0 +0.0 +9.4	+0.1 +0.0 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	-40.0	-14.0	29.5	-43.5	Para
56	13.505M	14.5	+0.0 +0.0 +0.0 +0.0 +9.1	+0.0 +0.0 +0.0 +0.0 +0.0	+0.2 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	-40.0	-16.2	29.5	-45.7	Groun
57	29.190M	15.0	+0.0 +0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.0 +0.0	+0.2 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0 +0.0	-40.0	-18.9	29.5	-48.4	Perp

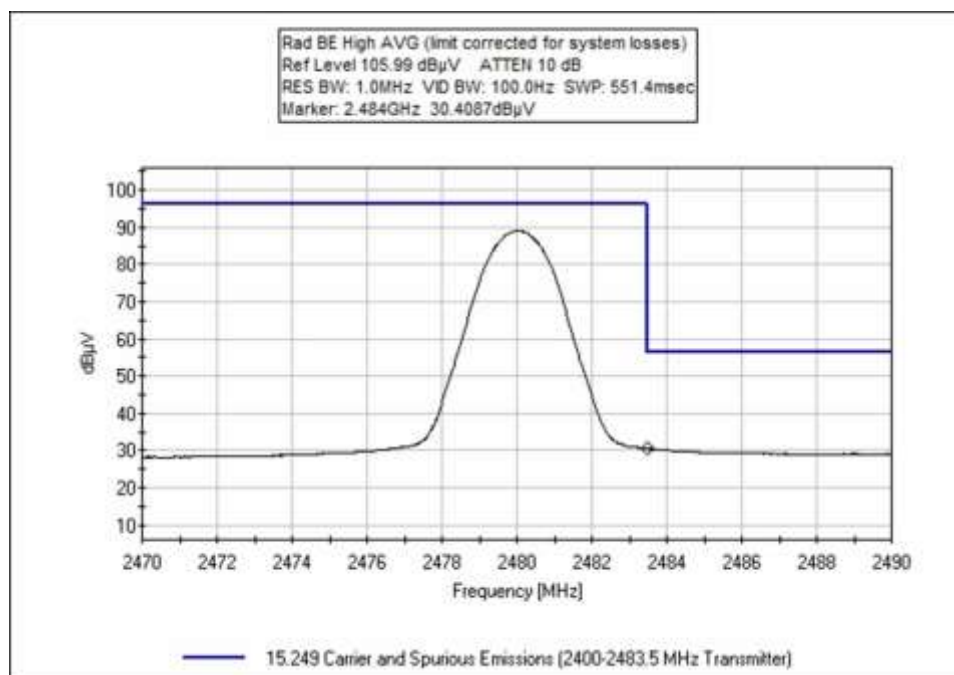
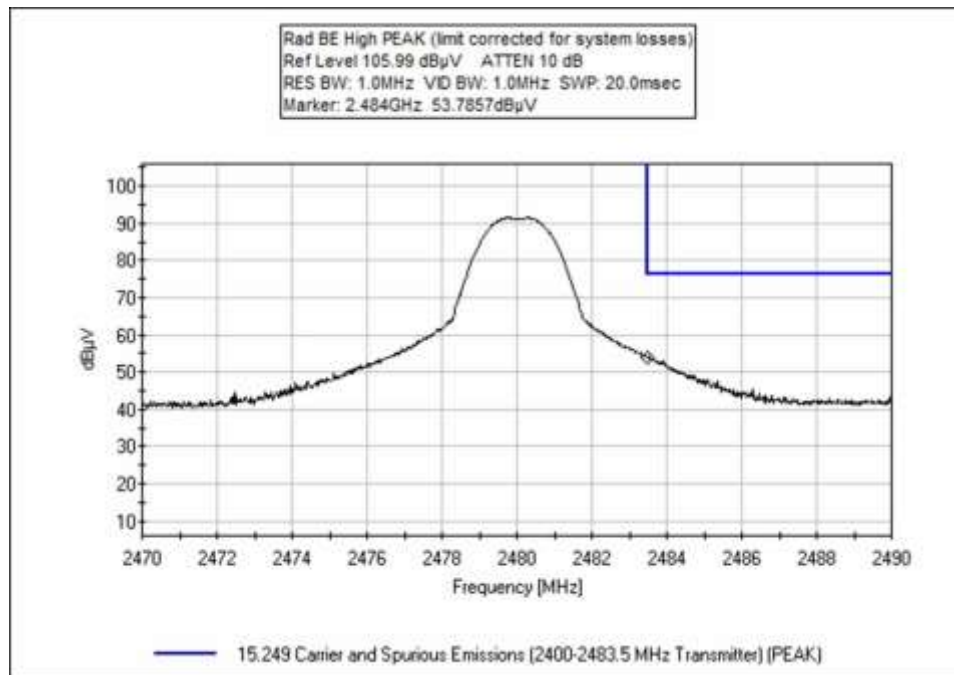
Band Edge

Band Edge Summary

Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
2400 (PEAK)	GFSK	Internal Trace	64.4	<74	Pass
2400 (AVG)	GFSK	Internal Trace	42.8	<54	Pass
2483.5 (PEAK)	GFSK	Internal Trace	51.5	<74	Pass
2483.5 (AVG)	GFSK	Internal Trace	28.1	<54	Pass

Band Edge Plots





Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Hestan**
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
 Work Order #: **101326** Date: 5/22/2018
 Test Type: **Radiated Scan** Time: 09:25:51
 Tested By: Michael Atkinson Sequence#: 2
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 22-24°C
 Humidity: 40-41%
 Pressure: 102.0-102.2kPa

 Frequency Range: Band Edge
 Frequency tested: 2402, 2444, 2480MHz
 Firmware power setting: -4

 Test Location: Bothell Lab C3
 Test Method: ANSI C63.10 (2013)

 Duty Cycle: 100%
 Test Mode: Continuously transmitting
 Test Setup: The EUT is a module, connected to DC power from power supply remotely located outside of chamber.
 The EUT is on a test table 1.5m high.
 X, Y, and Z EUT axes investigated, as well as both horizontal and vertical measurement antenna polarities, only worst case reported.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T2	ANP05959	Cable	Heliac	4/11/2018	4/11/2020
T3	ANP05544	Cable	Heliac	4/12/2018	4/12/2020
T4	AN03540	Preamp	83017A	5/2/2017	5/2/2019
T5	ANP06934	Cable	32026-29801-29801-18	3/13/2018	3/13/2020
T6	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/21/2017	7/21/2019

Measurement Data:

Reading listed by margin.

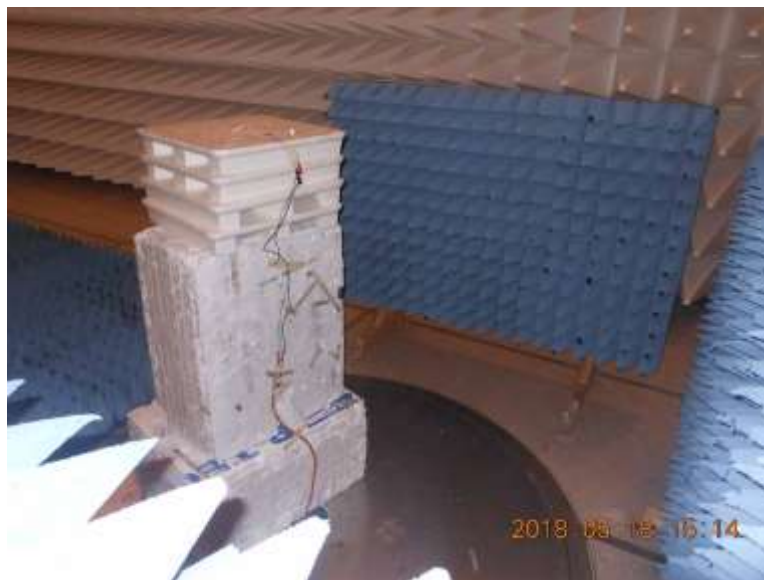
Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	2400.000M	45.1	+0.0	+1.0	+2.2	-34.0	+0.0	42.8	54.0	-11.2	Horiz
	Ave		+0.4	+28.1					X		
^	2400.000M	66.7	+0.0	+1.0	+2.2	-34.0	+0.0	64.4	74.0	-9.6	Horiz
			+0.4	+28.1					X		
3	2483.500M	30.4	+0.0	+1.0	+2.2	-34.0	+0.0	28.1	54.0	-25.9	Horiz
	Ave		+0.4	+28.1					X		
^	2483.500M	53.8	+0.0	+1.0	+2.2	-34.0	+0.0	51.5	74.0	-22.5	Horiz
			+0.4	+28.1					X		

Test Setup Photos



Below 1GHz



Above 1GHz Cone placement



X Axis



Y Axis



Z Axis

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Hestan**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **101326** Date: 5/22/2018
 Test Type: **Conducted Emissions** Time: 14:59:34
 Tested By: Michael Atkinson Sequence#: 5
 Software: EMITest 5.03.11 115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

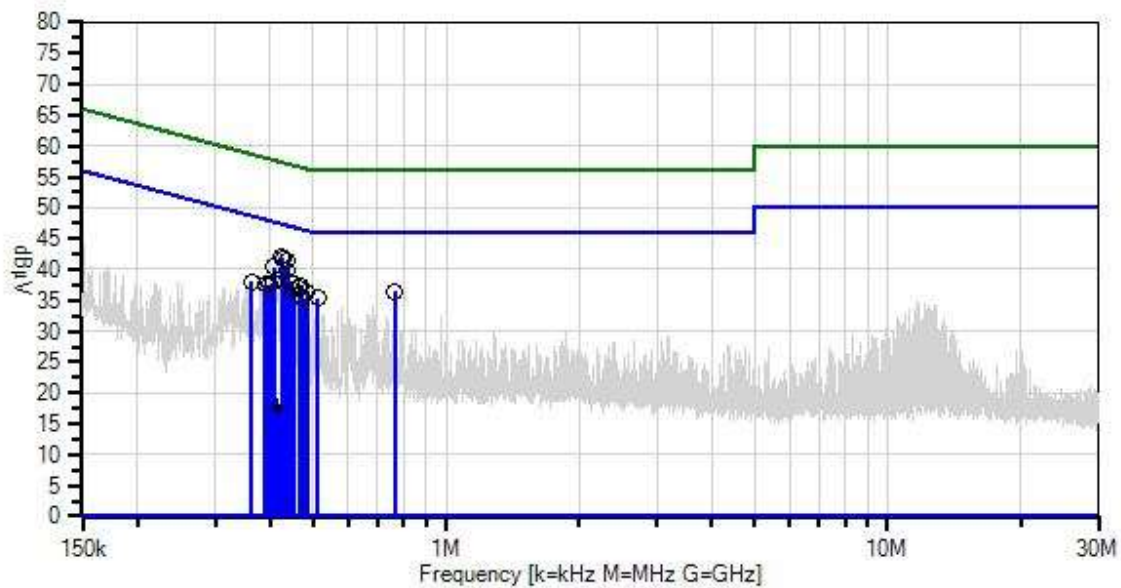
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

Temperature: 22-24°C Humidity: 40-41% Pressure: 102.0-102.2kPa Frequency Range: 0.15-30MHz Frequency tested: 2402, 2444, 2480MHz Firmware power setting: -4 Test Location: Bothell Lab C3 Test Method: ANSI C63.10 (2013) Duty Cycle: 100% Test Mode: Continuously transmitting Test Setup: The EUT is a module, connected to AC/DC adapter. The EUT is continuously transmitting modulated data.
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Hestan W/O#: 101326 Sequence#: 5 Date: 5/22/2018
15.207 AC Mains - Average Test Lead: 115VAC 60Hz Line



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/15/2018	1/15/2020
T2	ANP05959	Cable	Helix	4/11/2018	4/11/2020
T3	ANP05544	Cable	Helix	4/12/2018	4/12/2020
T4	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
T5	AN01311	50uH LISN-Line1 (L)	3816/2	3/16/2018	3/16/2020
	AN01311	50uH LISN-Line2 (N)	3816/2	3/16/2018	3/16/2020

Measurement Data:

Reading listed by margin.

Test Lead: Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V	dB μ V	dB	Ant
1	425.156k	32.2	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	41.9	47.3	-5.4	Line
2	427.292k	32.1	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	41.8	47.3	-5.5	Line
3	438.555k	31.7	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	41.5	47.1	-5.6	Line
4	408.423k	30.7	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	40.4	47.7	-7.3	Line
5	434.321k	30.1	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	39.9	47.2	-7.3	Line
6	443.090k	28.2	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	38.0	47.0	-9.0	Line
7	469.398k	27.5	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	37.2	46.5	-9.3	Line
8	763.954k	26.8	+0.2 +0.3	+0.1	+0.0	+9.1	+0.0	36.5	46.0	-9.5	Line
9	464.257k	27.3	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	37.0	46.6	-9.6	Line
10	405.752k	28.1	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	37.8	47.7	-9.9	Line
11	483.307k	26.7	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	36.4	46.3	-9.9	Line
12	451.255k	27.1	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	36.8	46.9	-10.1	Line
13	397.920k	27.9	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	37.6	47.9	-10.3	Line

14	389.375k	27.8	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	37.5	48.1	-10.6	Line
15	363.207k	28.2	+0.1 +0.6	+0.0	+0.0	+9.1	+0.0	38.0	48.7	-10.7	Line
16	512.941k	25.6	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	35.3	46.0	-10.7	Line
17	474.841k	25.6	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	35.3	46.4	-11.1	Line
18	415.366k	8.0	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	17.7	47.5	-29.8	Line
	Ave										
^	415.365k	33.5	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	43.2	47.5	-4.3	Line
^	417.857k	32.5	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	42.2	47.5	-5.3	Line
^	412.517k	30.4	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	40.1	47.6	-7.5	Line



Test Location: CKC Laboratories • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
Customer: **Hestan**
Specification: **15.207 AC Mains - Average**
Work Order #: **101326** Date: 5/22/2018
Test Type: **Conducted Emissions** Time: 15:41:44
Tested By: Michael Atkinson Sequence#: 6
Software: EMITest 5.03.11 115VAC 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

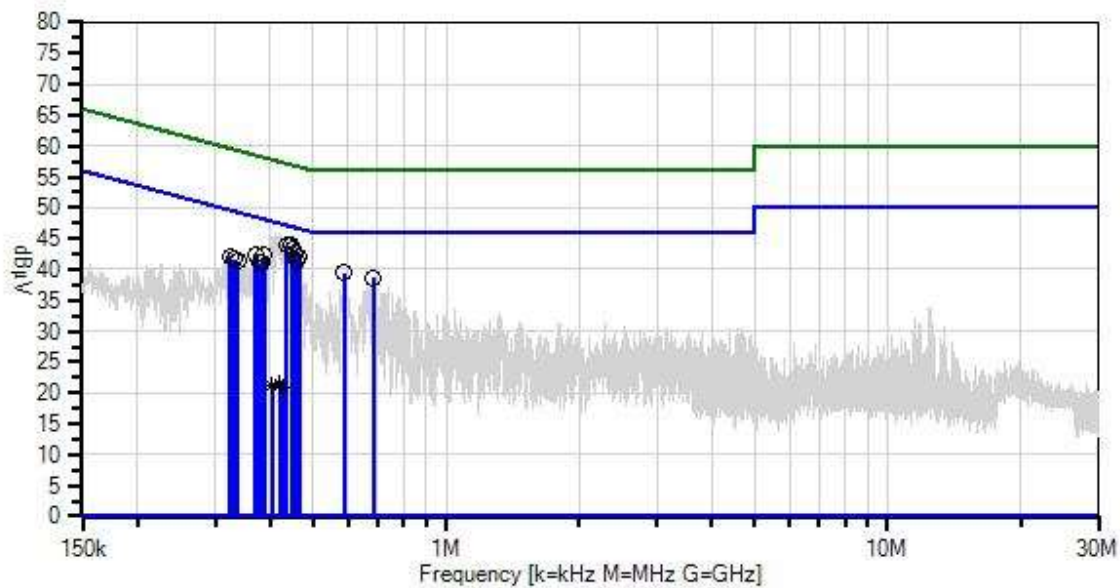
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

Test Conditions / Notes:

Temperature: 22-24°C Humidity: 40-41% Pressure: 102.0-102.2kPa Frequency Range: 0.15-30MHz Frequency tested: 2402, 2444, 2480MHz Firmware power setting: -4 Test Location: Bothell Lab C3 Test Method: ANSI C63.10 (2013) Duty Cycle: 100% Test Mode: Continuously transmitting Test Setup: The EUT is a module, connected to AC/DC adapter. The EUT is continuously transmitting modulated data.
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Hestan W/O#: 101326 Sequence#: 6 Date: 5/22/2018
15.207 AC Mains - Average Test Lead: 115VAC 60Hz Return



— Sweep Data	— Readings	○ Peak Readings
x QP Readings	* Average Readings	▼ Ambient
Software Version: 5.03.11	— 1 - 15.207 AC Mains - Average	— 2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02871	Spectrum Analyzer	E4440A	2/24/2017	2/24/2019
T1	AN02611	High Pass Filter	HE9615-150K-50-720B	1/15/2018	1/15/2020
T2	ANP05959	Cable	Helix	4/11/2018	4/11/2020
T3	ANP05544	Cable	Helix	4/12/2018	4/12/2020
T4	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
	AN01311	50uH LISN-Line1 (L)	3816/2	3/16/2018	3/16/2020
T5	AN01311	50uH LISN-Line2 (N)	3816/2	3/16/2018	3/16/2020

Measurement Data:

Reading listed by margin.

Test Lead: Return

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V	dB μ V	dB	Ant
1	446.114k	34.0	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	43.8	46.9	-3.1	Retur
2	435.833k	34.1	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	43.9	47.1	-3.2	Retur
3	449.743k	33.4	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	43.2	46.9	-3.7	Retur
4	456.698k	33.1	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	42.8	46.8	-4.0	Retur
5	465.769k	32.6	+0.1 +0.4	+0.0	+0.0	+9.1	+0.0	42.2	46.6	-4.4	Retur
6	459.117k	31.7	+0.1 +0.4	+0.0	+0.0	+9.1	+0.0	41.3	46.7	-5.4	Retur
7	386.883k	32.6	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	42.3	48.1	-5.8	Retur
8	370.684k	32.7	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	42.4	48.5	-6.1	Retur
9	586.722k	29.7	+0.2 +0.4	+0.0	+0.0	+9.1	+0.0	39.4	46.0	-6.6	Retur
10	377.982k	31.4	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	41.1	48.3	-7.2	Retur
11	380.830k	31.4	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	41.1	48.3	-7.2	Retur
12	323.510k	32.4	+0.1 +0.6	+0.0	+0.0	+9.1	+0.0	42.2	49.6	-7.4	Retur
13	684.391k	29.0	+0.2 +0.3	+0.0	+0.0	+9.1	+0.0	38.6	46.0	-7.4	Retur

14	331.165k	31.9	+0.1 +0.6	+0.0	+0.0	+9.1	+0.0	41.7	49.4	-7.7	Retur
15	338.107k	31.5	+0.1 +0.6	+0.0	+0.0	+9.1	+0.0	41.3	49.2	-7.9	Retur
16	419.994k Ave	11.9	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	21.6	47.4	-25.8	Retur
^	419.993k	36.2	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	45.9	47.4	-1.5	Retur
18	425.512k Ave	11.1	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	20.8	47.3	-26.5	Retur
^	423.376k	35.4	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	45.1	47.4	-2.3	Retur
^	425.512k	35.3	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	45.0	47.3	-2.3	Retur
^	430.496k	35.0	+0.2 +0.5	+0.0	+0.0	+9.1	+0.0	44.8	47.2	-2.4	Retur
22	404.151k Ave	11.5	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	21.2	47.8	-26.6	Retur
^	404.150k	35.8	+0.1 +0.5	+0.0	+0.0	+9.1	+0.0	45.5	47.8	-2.3	Retur

Test Setup Photo



SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	($\text{dB}\mu\text{V}$)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	($\text{dB}\mu\text{V}/\text{m}$)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.