Pacific Bioscience Laboratories, Inc.
(L'Oreal Beauty Devices)

TEST REPORT FOR

Skin Cleansing System
Model: Mia Smart

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.247
(DTS 2400-2483.5 MHz)

Report No.: 100586-13

Date of issue: March 30, 2018

A2LA ACCREDITED
Certificate # 803.02

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:

Pacific Bioscience Laboratories, Inc.
(L'Oreal Beauty Devices)
17425 NE Union Hill Rd Suite 150
Redmond, WA 98052

Representative: Rajen Shah
Customer Reference Number: 4200501499

REPORT PREPARED BY:

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

Project Number: 100586

DATE OF EQUIPMENT RECEIPT: March 1, 2018
DATE(S) OF TESTING: March 1-8, 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.

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.
110 N. Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.11

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Brea A, CA	US0060	SL2-IN-E-1146R	3082D-1	US1025	A-0147
Brea D, CA	US0060	SL2-IN-E-1146R	3082D-2	US1025	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.247 (DTS)

Test Procedure	Description	Modifications	Results
15.247(a)(2)	6dB Bandwidth	NA	Pass
15.247(b)(3)	Output Power	NA	Pass
15.247(e)	Power Spectral Density	NA	Pass
15.247(d)	RF Conducted Emissions & Band Edge	NA	NA1
15.247(d)	Radiated Emissions & Band Edge	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

NA1 = Not applicable because the EUT does not have an antenna port.

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: Transmit Mode

Equipment Tested:

Device	Manufacturer	Model #	S/N
Skin Cleansing System	Conceived and designed by: Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) of Redmond, WA US / Manufactured by: Jabil Circuit (Guangzhou) Co., LTD. China	Mia Smart	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
AC Adapter	Clarisonic, Phihong, China	PSM03A-050Q-03	
Inductive Charger	Conceived and designed by: Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) of Redmond, WA US / Manufactured by: Jabil Circuit (Guangzhou) Co., LTD. China	Mia Smart Charger	NA
Skin Cleansing System	Conceived and designed by: Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) of Redmond, WA US / Manufactured by: Jabil Circuit (Guangzhou) Co., LTD. China	Mia Smart	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	802.15.1
Operating Frequency Range:	2402-2480MHz
Modulation Type(s):	GFSK
Maximum Duty Cycle:	100%
Number of TX Chains:	1
Antenna Type(s) and Gain:	PCB Trace 1dBi
Beamforming Type:	NA
Antenna Connection Type:	Integral
Nominal Input Voltage:	Battery 2.4Vdc
Firmware / Software used for Test:	Version 0.9

FCC Part 15 Subpart C

15.247(a)(2) 6dB Bandwidth

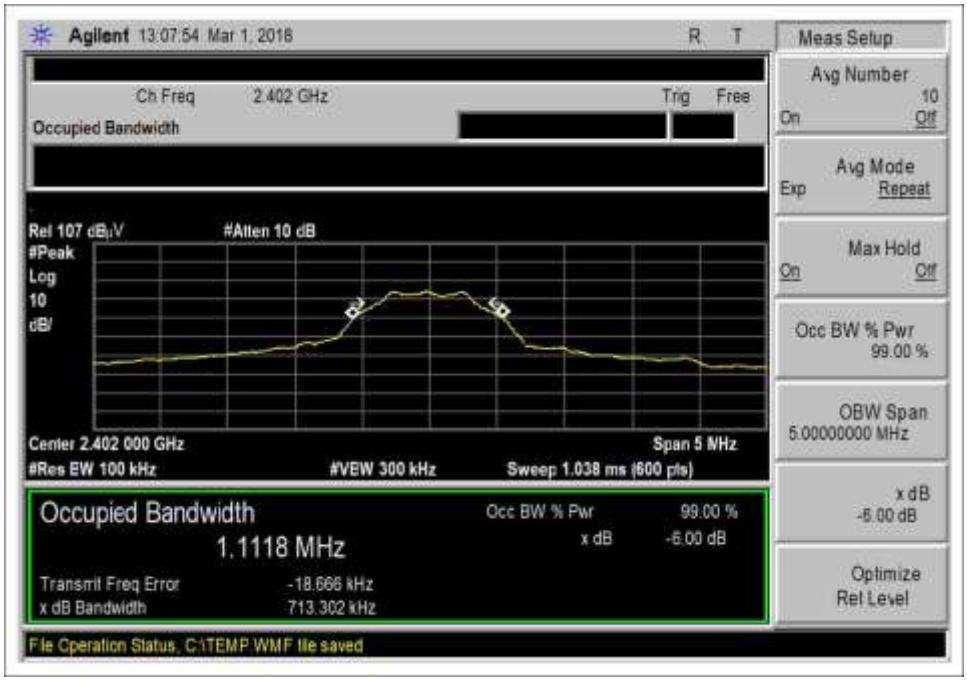
Test Setup / Conditions / Data			
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen
Test Method:	ANSI C63.10 (2013), KDB 558074 V04 (APRIL 5, 2017)	Test Date(s):	3/1/2018
Configuration:	1		
Test Setup:	The EUT is placed on Styrofoam platform. The EUT set to transmit continuously. The EUT is rotated in three orthogonal axis. The EUT is powered by fully charged internal battery. Nominal input voltage: 2.4Vdc Operating frequency: 2402-2480MHz Antenna gain: +1dBi Frequency range: 2400-2483.5MHz RBW=100kHz, VBW=300kHz		

Environmental Conditions			
Temperature (ºC)	19	Relative Humidity (%):	24

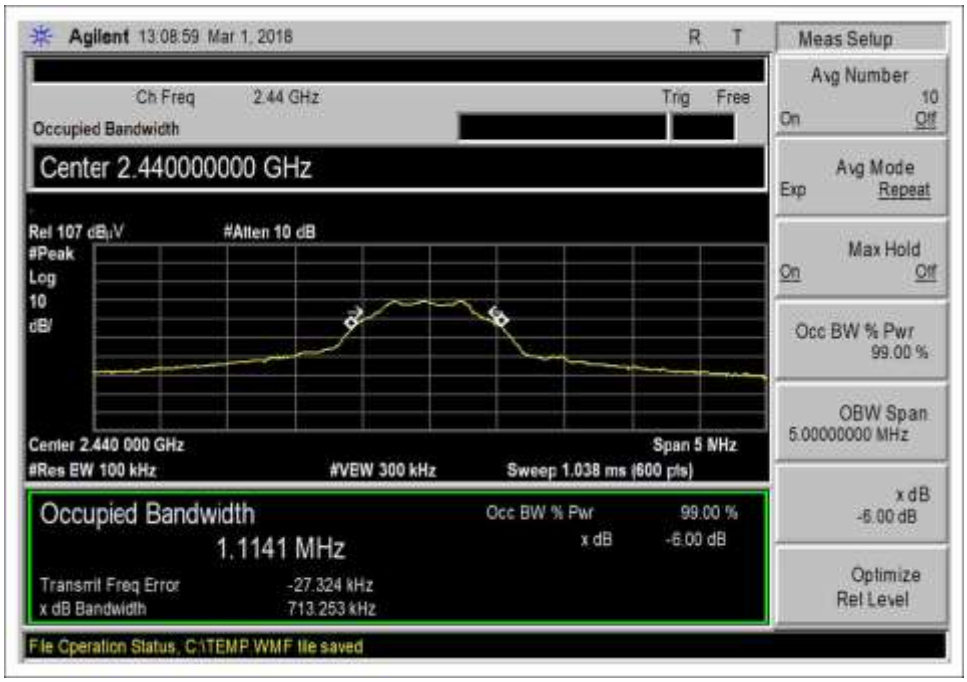
Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
00786	Preamp	HP	83017A	5/9/2016	5/9/2018
02946	Cable	Astrolab Inc.	32022-2-2909K-36TC	12/12/2017	12/12/2019
P06661	Cable	Andrew	LDF1-50	5/6/2016	5/6/2018
01646	Horn Antenna	ETS	3115	3/4/2016	3/4/2018
02672	Spectrum Analyzer	Agilent	E4446A	3/2/2017	3/2/2019

Test Data Summary					
Frequency (MHz)	**Antenna Port**	**Modulation**	**Measured (kHz)**	**Limit (kHz)**	**Results**
2402	NA	GFSK	713.302	≥500	Pass
2440	NA	GFSK	713.253	≥500	Pass
2480	NA	GFSK	715.996	≥500	Pass

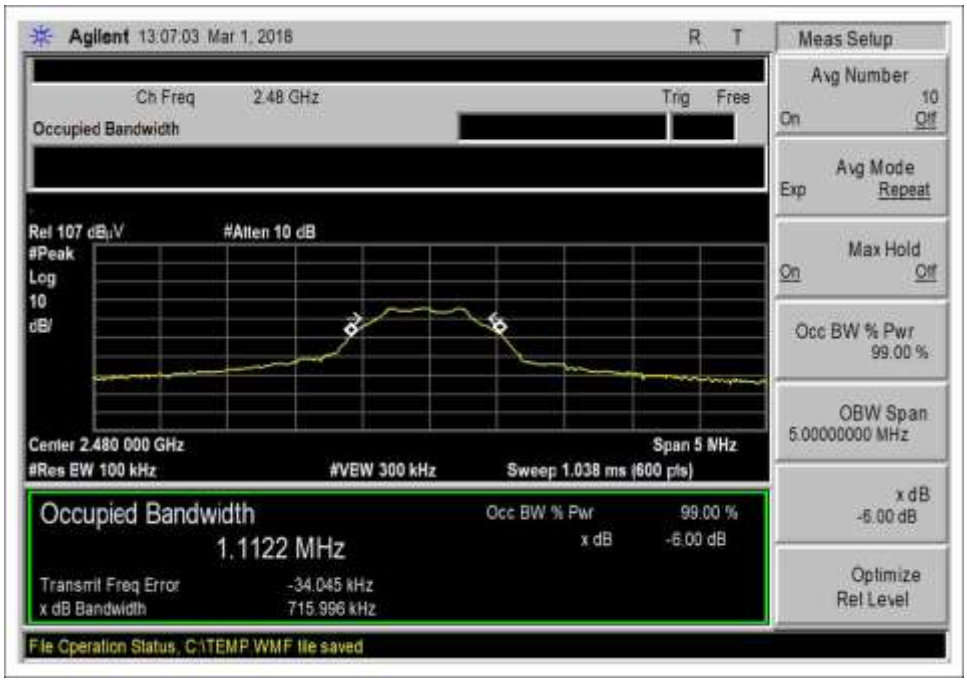
Plots



2402MHz



2440MHz


Agilent 13:07.03 Mar 1, 2018
R T
Meas Setup
Avg Number
10
On Off
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Avg Mode
Exp Repeat
Ref 107 dBµV
#Atten 10 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
5.00000000 MHz
Center 2.480 000 GHz
Span 5 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.038 ms (600 pts)
x dB
-6.00 dB
Occupied Bandwidth
1.1122 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Optimize
Ref Level
Transmit Freq Error -34.045 kHz
x dB Bandwidth 715.996 kHz
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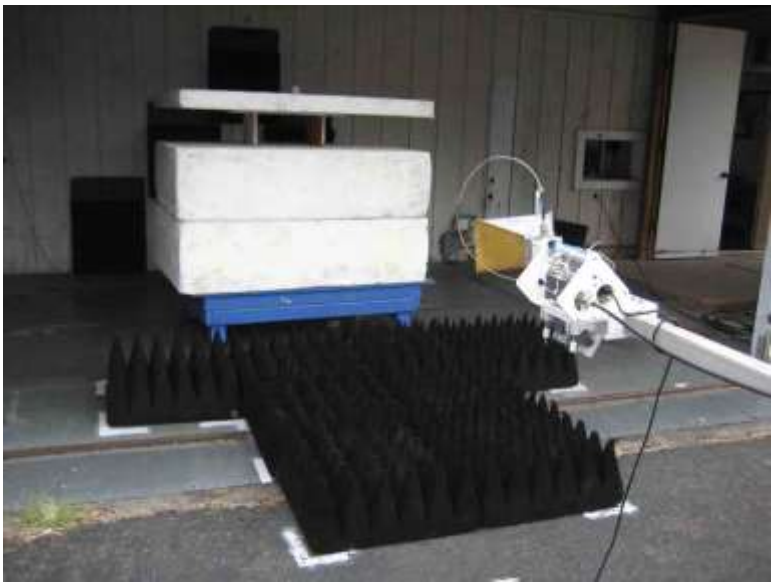
2480MHz

Test Setup Photos



Above 1GHz, Front view, Cone placement

Above 1GHz, Back view

X Axis

Y Axis

Z Axis

15.247(b)(3) Output Power

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation	$V_{Minimum}$ (dBm)	$V_{Nominal}$ (dBm)	$V_{Maximum}$ (dBm)	Max Deviation from $V_{Nominal}$ (dB)
2402	GFSK	NA	NA	NA	NA
2440	GFSK	NA	NA	NA	NA
2480	GFSK	NA	NA	NA	NA

Test performed using operational mode with the highest output power, representing worst case.
NA: Power output tests were performed using a fresh battery.

Parameter Definitions:

Measurements performed at input voltage according to manufacturer specification.

Parameter	Value
$V_{Nominal}$:	2.4Vdc
$V_{Minimum}$:	NA
$V_{Maximum}$:	NA

NA: Power output tests were performed using a fresh battery.

Test Data Summary - Voltage Variations

This equipment is battery powered and the manufacturer declares the equipment cannot operate while charging.
Power output tests were performed using a fresh battery.

Power Output Test Data Summary - Radiated Measurement						
Measurement Option: RBW > DTS Bandwidth						
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Field Strength (dBuV/m @3m)	EIRP Calculated (dBm)	EIRP Limit (dBm)	Results
2402	GFSK	PCB Trace/1dBi	96.8	1.6	≤ 36	Pass
2440	GFSK	PCB Trace/1dBi	95.1	-0.1	≤ 36	Pass
2480	GFSK	PCB Trace/1dBi	92.6	-2.6	≤ 36	Pass

For fixed point-to-point antennas, the limit is calculated in accordance with 15.247(c)(1):

$$Limit = 30 - Roundup\left(\frac{G-6}{3}\right)$$

For directional beamforming antennas, the limit is calculated in accordance with 15.247(c)(2) and KDB 662911.

Conducted RF output power calculated in accordance with ANSI C63.10.

$$P(W) = \frac{(E \cdot d)^2}{30\,G}$$

Or equivalently, in logarithmic form:

$$P(dBm) = E(dBuV/m) + 20LOG(d) - G\ - 104.77$$

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.247(b) Power Output (2400-2483.5 MHz DTS)**		
Work Order #:	**100586**	Date:	3/7/2018
Test Type:	**Maximized Emissions**	Time:	13:33:28
Tested By:	Don Nguyen	Sequence#:	0
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

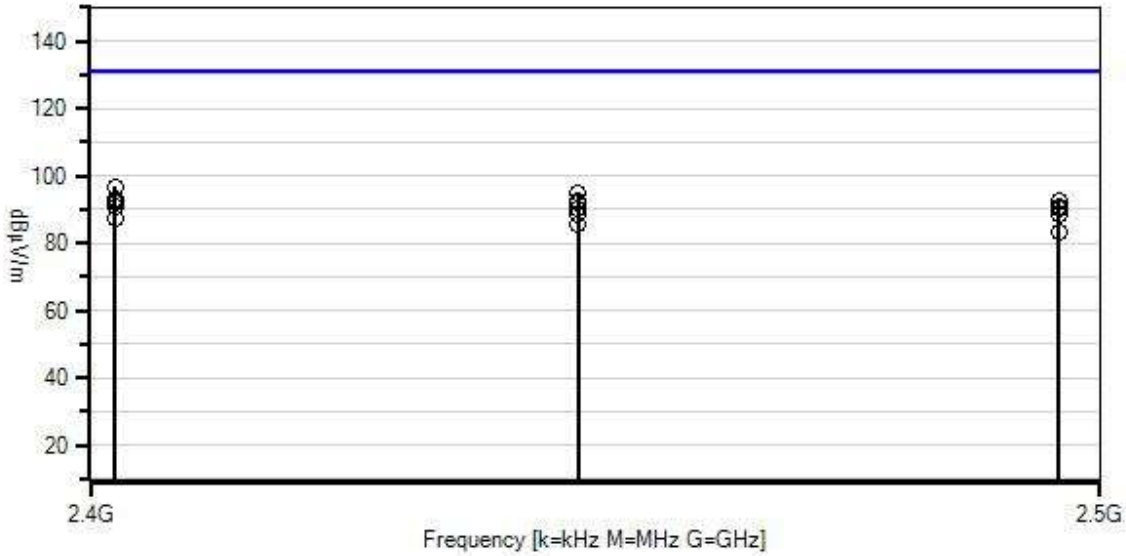
Test Conditions / Notes:

The EUT is placed on Styrofoam platform. The EUT set to transmit continuously.
The EUT is rotated in three orthogonal axes. Data represents worst case orientation.
The EUT is powered by fully charged internal battery. Nominal input voltage: 2.4Vdc
Operating frequency: 2402-2480MHz
Antenna gain: +1dBi

Frequency range: 2400-2483.5MHz
RBW=2MHz, VBW=6MHz

Test Method: ANSI C63.10 (2013), KDB 558074 V04 (APRIL 5, 2017)
Temperature: 21°C
Relative Humidity: 23%
Pressure: 100kPa
Site A

Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) WO#: 100586 Sequence#: 0 Date: 3/7/2018
15.247(b) Power Output (2400-2483.5 MHz DTS) Test Distance: 3 Meters Vert



Readings
QP Readings
Ambient
1 - 15.247(b) Power Output (2400-2483.5 MHz DTS)
Peak Readings
Average Readings
Software Version: 5.03.11

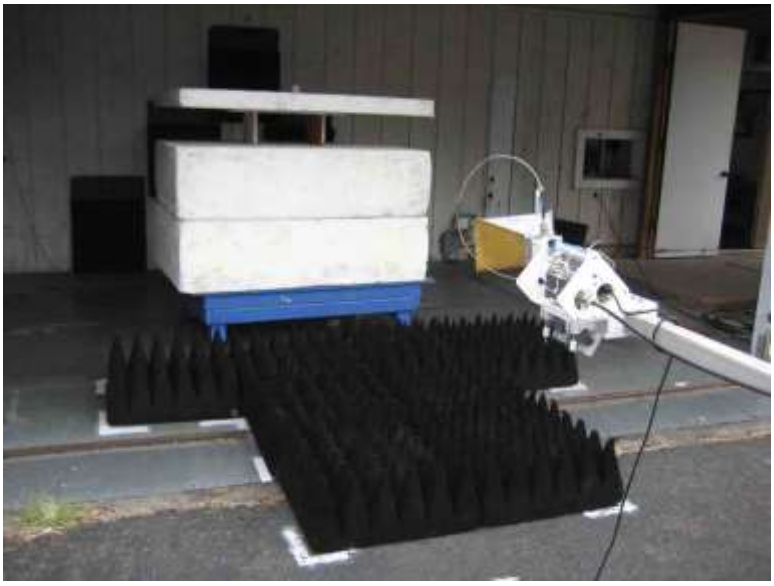
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00786	Preamp	83017A	5/9/2016	5/9/2018
T2	AN02946	Cable	32022-2-2909K-36TC	12/12/2017	12/12/2019
T3	ANP06661	Cable	LDF1-50	5/6/2016	5/6/2018
T4	AN00849	Horn Antenna	3115	3/6/2018	3/6/2020
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2402.000M	101.0	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	96.8	131.2 X axis	-34.4	Horiz
2	2440.020M	99.5	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	95.1	131.2 X axis	-36.1	Horiz
3	2402.000M	97.3	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	93.1	131.2 Y axis	-38.1	Vert
4	2480.020M	96.9	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	92.6	131.2 Y axis	-38.6	Horiz
5	2440.020M	96.9	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	92.5	131.2 Y axis	-38.7	Horiz
6	2402.000M	96.6	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	92.4	131.2 Z axis	-38.8	Horiz
7	2440.020M	96.5	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	92.1	131.2 Y axis	-39.1	Vert
8	2402.000M	95.9	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	91.7	131.2 Y axis	-39.5	Horiz
9	2402.000M	95.0	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	90.8	131.2 Z axis	-40.4	Vert
10	2480.020M	95.0	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	90.7	131.2 Y axis	-40.5	Vert
11	2480.020M	94.9	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	90.6	131.2 Z axis	-40.6	Horiz
12	2440.020M	94.6	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	90.2	131.2 Z axis	-41.0	Vert
13	2480.020M	94.4	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	90.1	131.2 X axis	-41.1	Horiz
14	2480.020M	92.6	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	88.3	131.2 Z axis	-42.9	Vert
15	2440.020M	92.7	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	88.3	131.2 Z axis	-42.9	Horiz
16	2402.000M	91.8	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	87.6	131.2 X axis	-43.6	Vert
17	2440.020M	90.1	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	85.7	131.2 X axis	-45.5	Vert
18	2480.020M	87.5	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	83.2	131.2 X axis	-48.0	Vert

Test Setup Photos



Above 1GHz, Front view, Cone placement

Above 1GHz, Back view

X Axis

Y Axis

Z Axis

15.247(e) Power Spectral Density

PSD Test Data Summary - Radiated Measurement						
Measurement Method: PKPSD						
Frequency (MHz)	**Modulation**	**Ant. Type / Gain (dBi)**	**Field Strength (dBuV/m @3m)**	**EIRP Calculated (dBm/3kHz)**	**EIRP Limit (dBm/3kHz)**	**Results**
2402	GFSK	PCB Trace/ 1dBi	82.5	-12.7	≤14	Pass
2440	GFSK	PCB Trace/ 1dBi	80.5	-14.7	≤14	Pass
2480	GFSK	PCB Trace/ 1dBi	78.3	-16.9	≤14	Pass

Conducted RF output power calculated in accordance with ANSI C63.10.

$$P(W) = \frac{(E \cdot d)^2}{30\ G}$$

Or equivalently, in logarithmic form:

$$P(dBm) = E(dBuV/m) + 20LOG(d) - G\ - 104.77$$

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)**		
Work Order #:	**100586**	Date:	3/7/2018
Test Type:	**Maximized Emissions**	Time:	14:31:43
Tested By:	Don Nguyen	Sequence#:	1
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

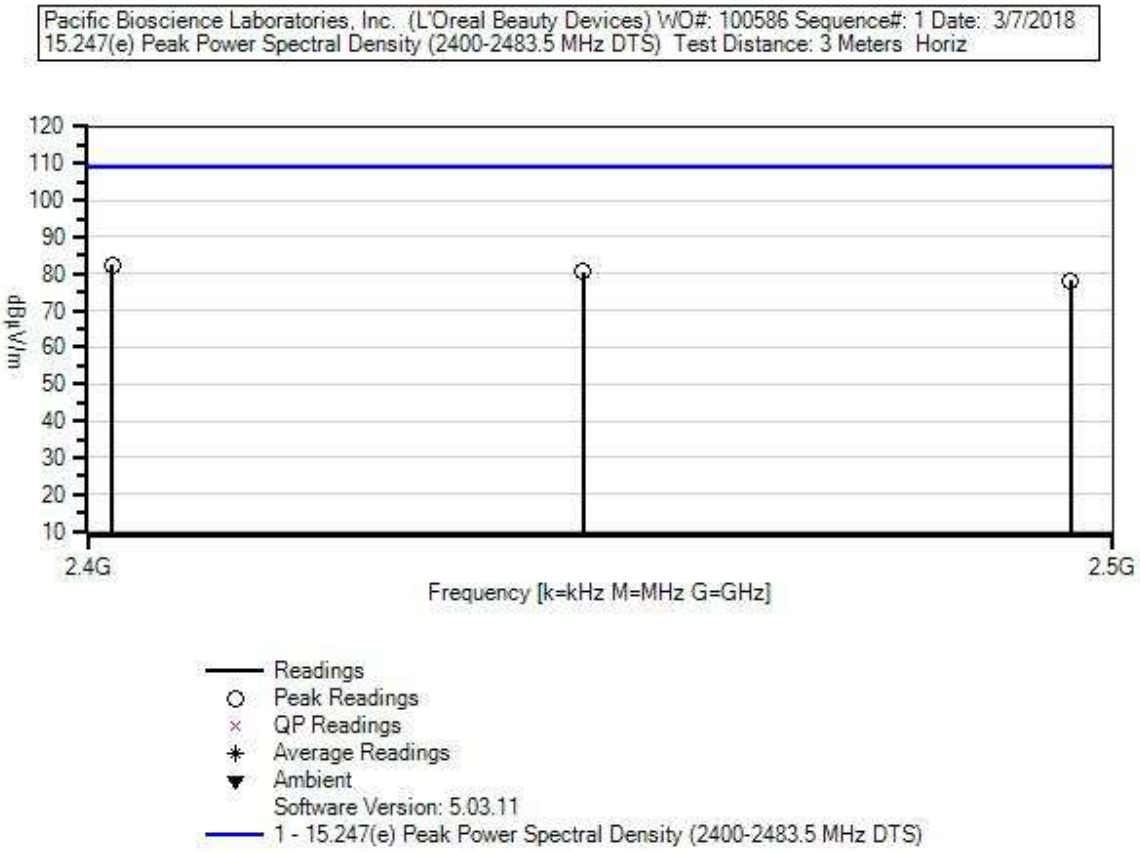
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on Styrofoam platform. The EUT set to transmit continuously. The EUT is rotated in three orthogonal axes. Data represents worst case orientation.
The EUT is powered by fully charged internal battery. Nominal input voltage: 2.4Vdc
Operating frequency: 2402-2480MHz
Antenna gain: +1dBi
Frequency range: 2400-2483.5MHz
RBW=3kHz, VBW=9kHz

Test Method: ANSI C63.10 (2013), KDB 558074 V04 (APRIL 5, 2017)
Temperature: 21°C
Relative Humidity: 23%
Pressure: 100kPa
Site A



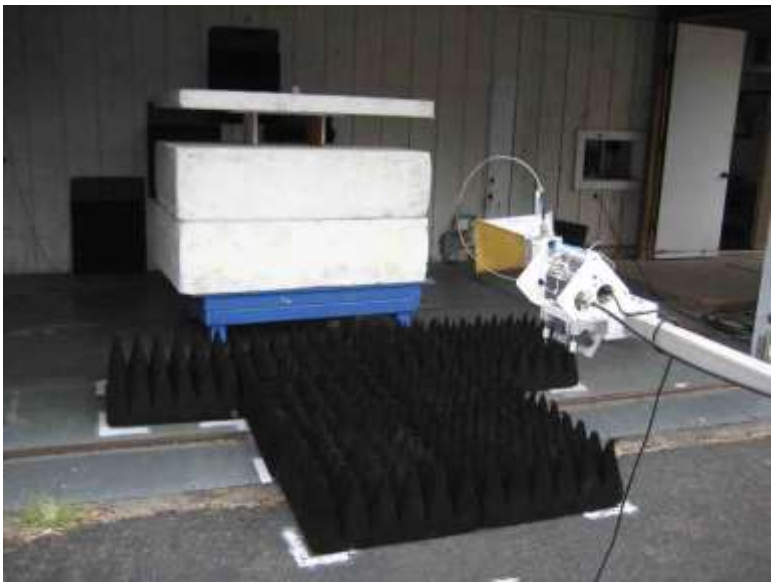
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00786	Preamp	83017A	5/9/2016	5/9/2018
T2	AN02946	Cable	32022-2-2909K-36TC	12/12/2017	12/12/2019
T3	ANP06661	Cable	LDF1-50	5/6/2016	5/6/2018
T4	AN00849	Horn Antenna	3115	3/6/2018	3/6/2020
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2401.976M	86.7	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	82.5	109.2	-26.7	Horiz
2	2439.971M	84.9	-38.1 +0.0	+1.3	+4.0	+28.4	+0.0	80.5	109.2	-28.7	Horiz
3	2479.962M	82.6	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	78.3	109.2	-30.9	Horiz

Test Setup Photos



Above 1GHz, Front view, Cone placement

Above 1GHz, Back view

X Axis

Y Axis

Z Axis

15.247(d) Radiated Emissions & Band Edge

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**100586**	Date:	3/8/2018
Test Type:	**Maximized Emissions**	Time:	14:21:19
Tested By:	Don Nguyen	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			

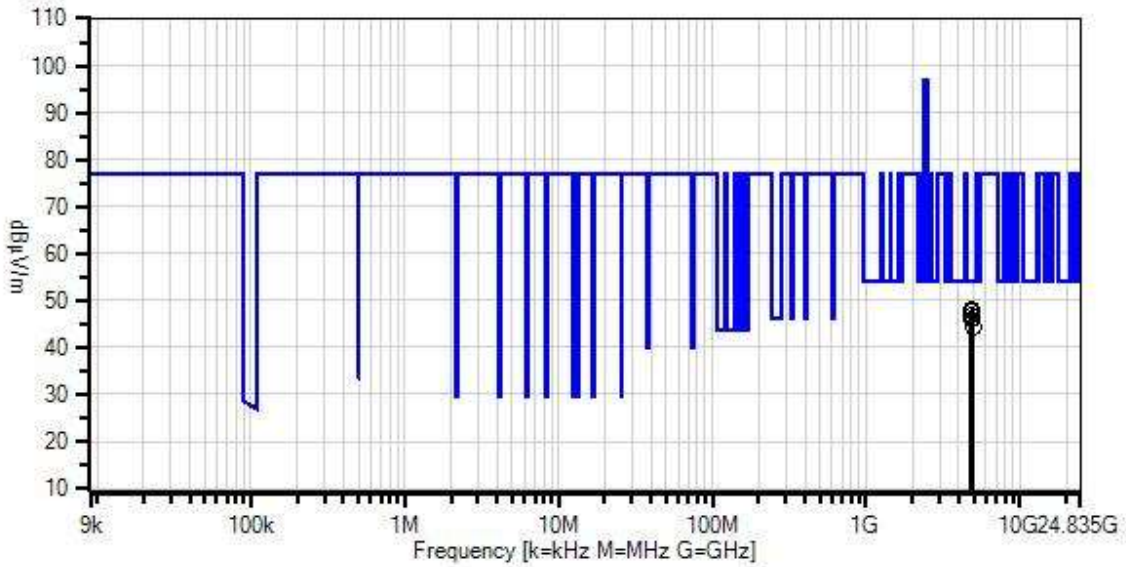
Test Conditions / Notes:

The EUT is placed on Styrofoam platform. The EUT set to transmit continuously. The EUT is rotated in three orthogonal axes. Data represents worst case orientation.
The EUT is powered by fully charged internal battery. Nominal input voltage: 2.4Vdc
Operating frequency: 2402-2480MHz
Antenna gain: +1dBi

Frequency range: 9kHz-25GHz
9kHz to 150kHz RBW=0.2kHz, VBW=0.6kHz.
150kHz to 30MHz RBW=9kHz, VBW=27kHz.
30-1000MHz, RBW=120kHz, VBW=360kHz
1000-25000MHz, RBW=1MHz, VBW=3MHz (restricted band)
RBW=100kHz, VBW=300kHz (-20dBc limit)

Test Method: ANSI C63.10 (2013), KDB 558074 V04 (APRIL 5, 2017)
Temperature: 21°C
Relative Humidity: 23%
Pressure: 100kPa
Site A

Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) WO#: 100586 Sequence#: 3 Date: 3/8/2018
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert



Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.11

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00786	Preamp	83017A	5/9/2016	5/9/2018
T2	AN02946	Cable	32022-2-2909K-36TC	12/12/2017	12/12/2019
T3	ANP06661	Cable	LDF1-50	5/6/2016	5/6/2018
T4	AN00849	Horn Antenna	3115	3/6/2018	3/6/2020
	AN03385	High Pass Filter	11SH10-3000/T10000-O/O	6/2/2017	6/2/2019
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
	AN00309	Preamp	8447D	2/19/2018	2/19/2020
	AN01995	Biconilog Antenna	CBL6111C	5/10/2016	5/10/2018
	ANP05275	Attenuator	1W	5/5/2016	5/5/2018
	ANP05050	Cable	RG223/U	1/20/2017	1/20/2019
	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/7/2016	12/7/2018
	AN00314	Loop Antenna	6502	5/20/2016	5/20/2018
	AN03367	Horn Antenna-ANSI C63.5 Calibration	62-GH-62-25.	8/24/2017	8/24/2019
	AN01413	Horn Antenna	84125-80008	10/7/2016	10/7/2018

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

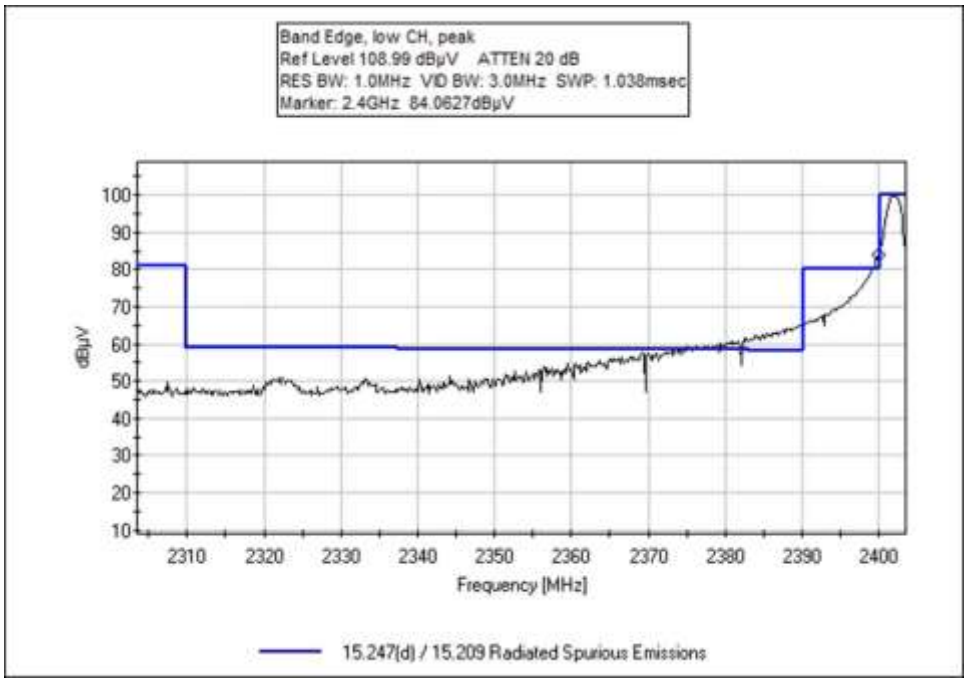
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4880.000M	44.6	-37.7	+1.8	+5.9	+33.5	+0.0	48.1	54.0	-5.9	Horiz
2	4804.370M	44.5	-37.6	+1.8	+5.8	+33.2	+0.0	47.7	54.0	-6.3	Horiz
3	4880.000M	43.5	-37.7	+1.8	+5.9	+33.5	+0.0	47.0	54.0	-7.0	Vert
4	4803.870M	42.8	-37.6	+1.8	+5.8	+33.2	+0.0	46.0	54.0	-8.0	Vert
5	4960.000M	40.9	-37.6	+1.8	+5.9	+33.5	+0.0	44.5	54.0	-9.5	Vert
6	4960.000M	40.9	-37.6	+1.8	+5.9	+33.5	+0.0	44.5	54.0	-9.5	Horiz

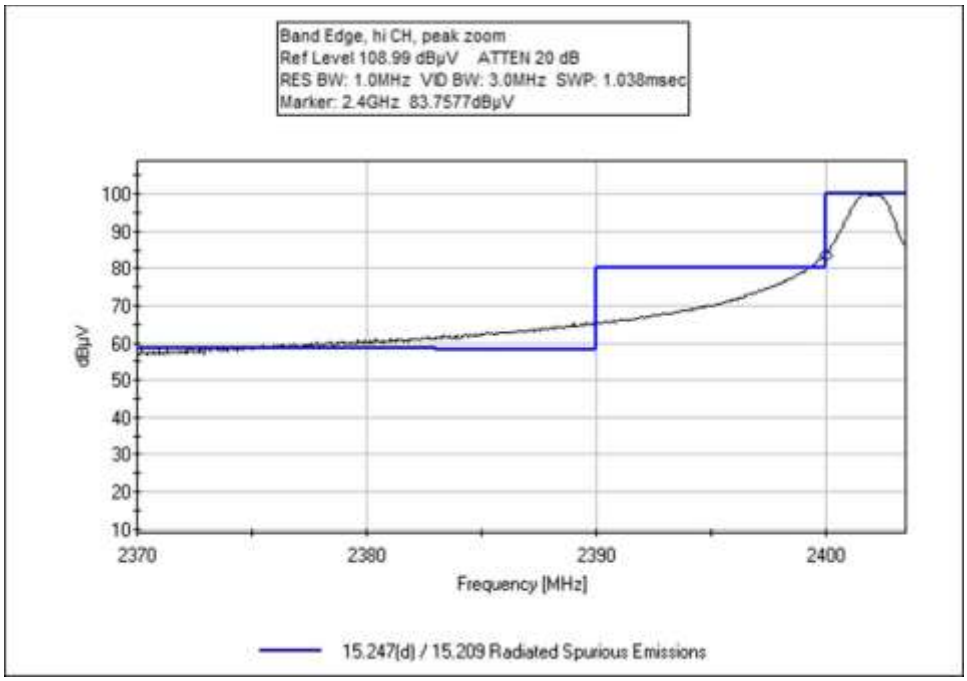
Band Edge

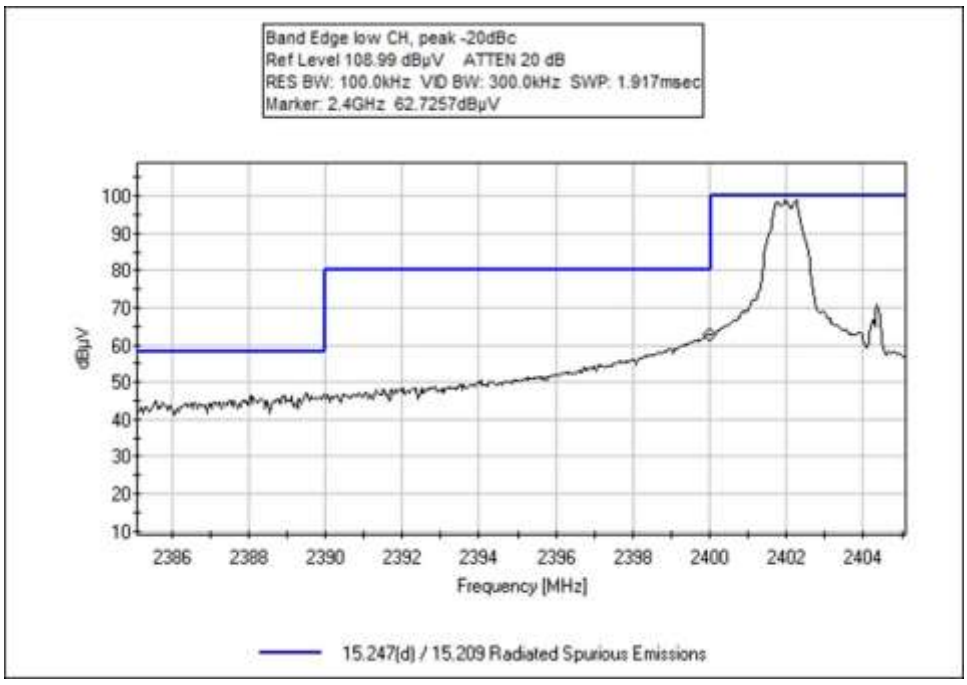
Band Edge Summary					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
2390.0	GFSK	NA	32.1*	<54.0	Pass
2400.0	GFSK	NA	58.5	<76.8	Pass
2483.5	GFSK	NA	28.5*	<54.0	Pass

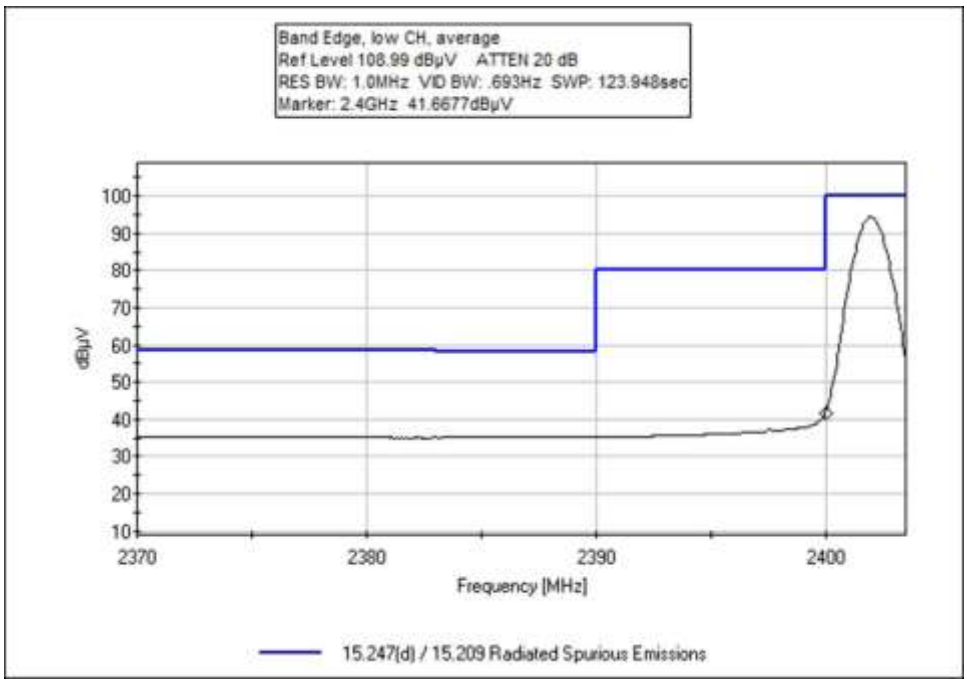
NA: Integral antenna
*Average detector

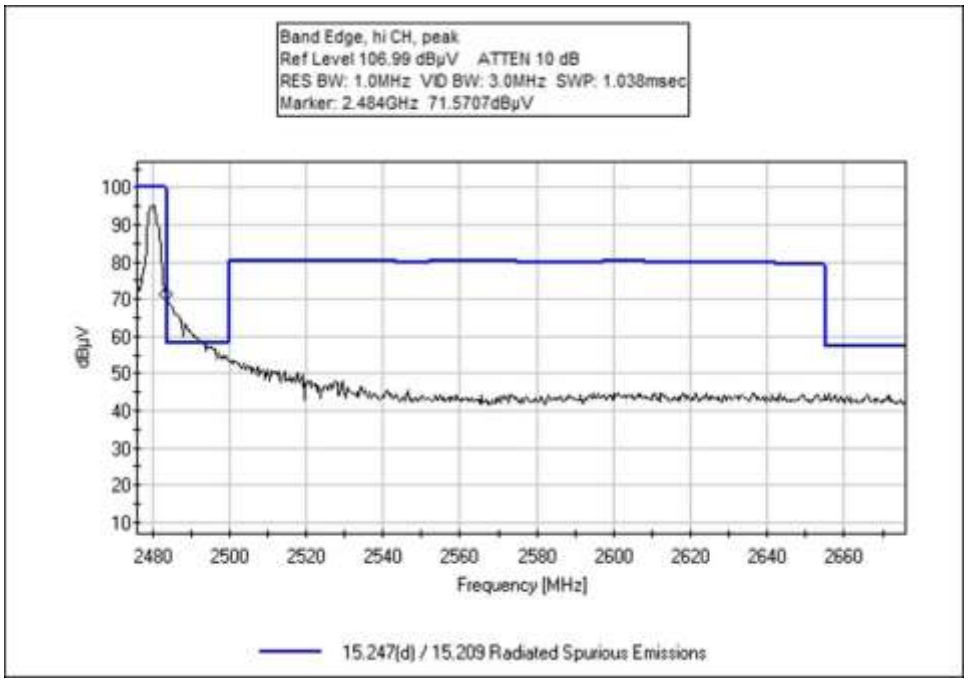
Band Edge Plots

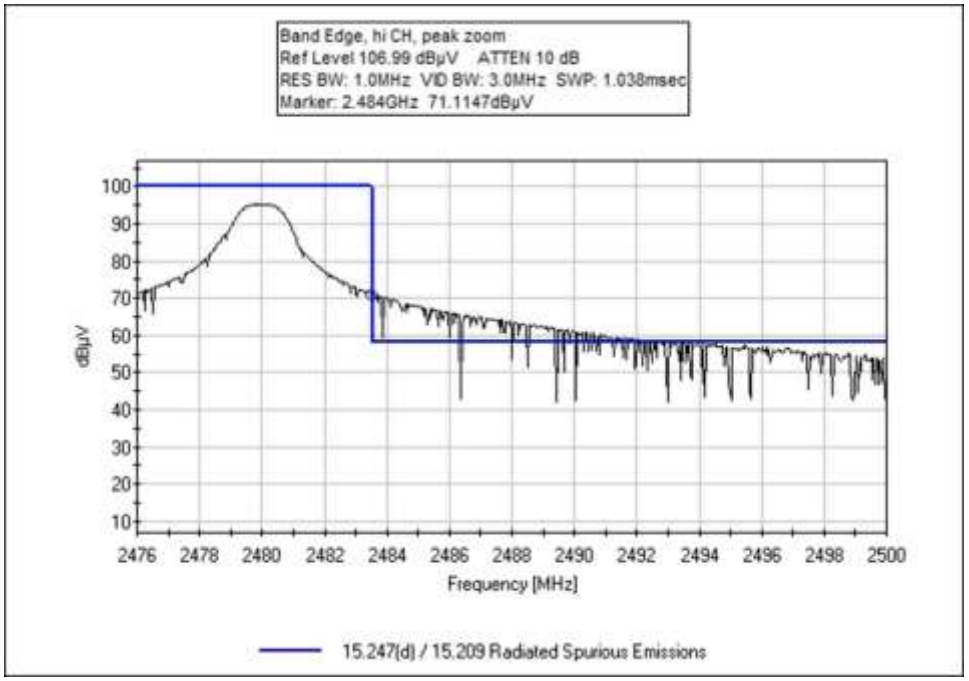


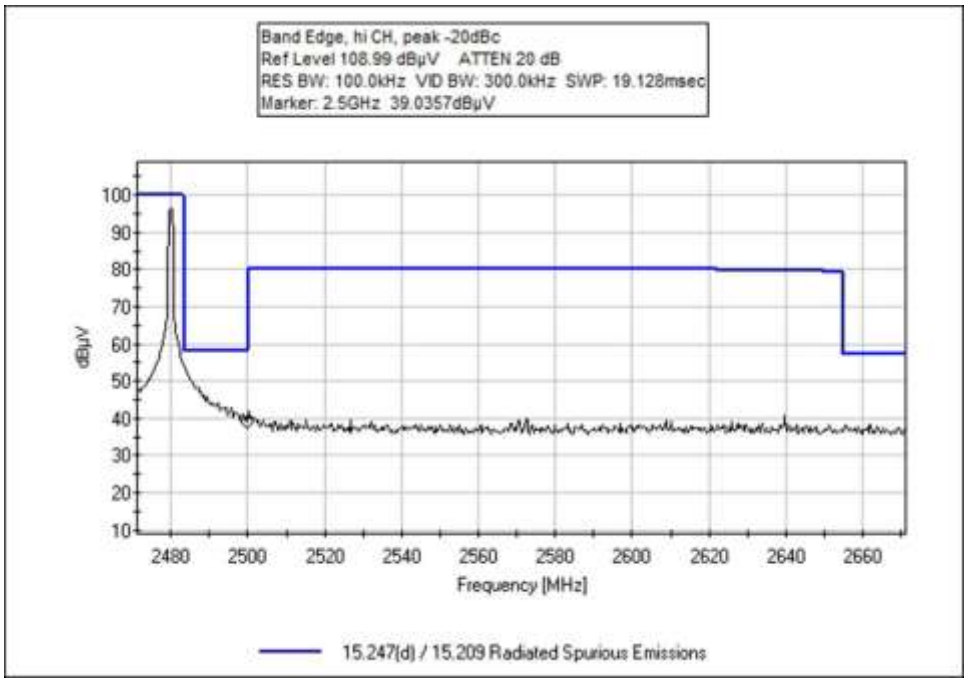


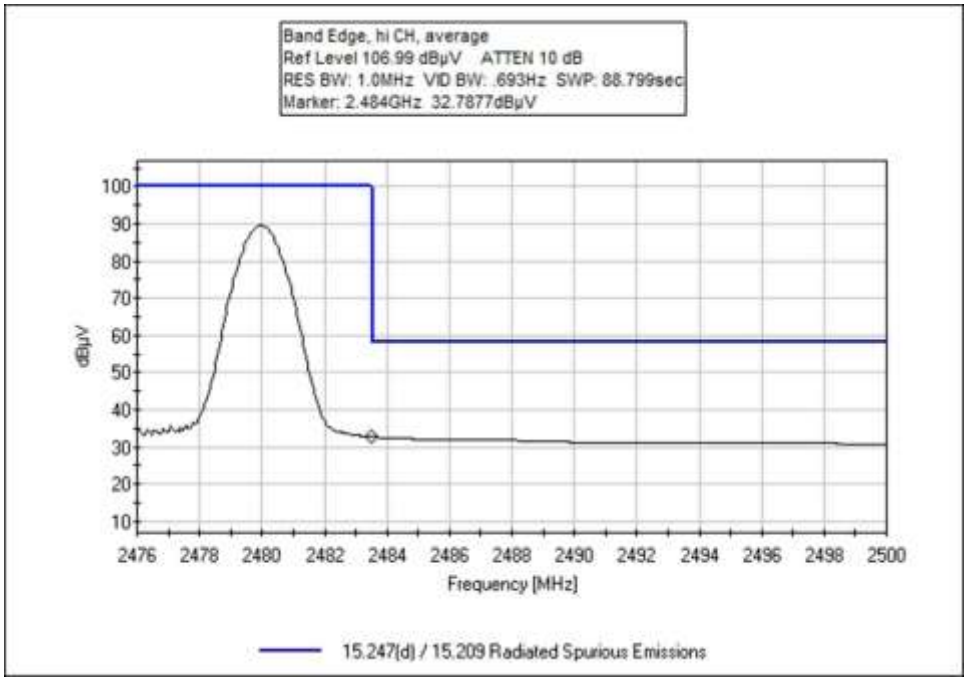

Band Edge low CH, peak -20dBc
Ref Level 108.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 1.917msec
Marker: 2.4GHz 62.7257dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


Band Edge, low CH, average
Ref Level 108.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: .693Hz SWP: 123.948sec
Marker: 2.4GHz 41.6677dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


Band Edge, hi CH, peak
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.038msec
Marker: 2.484GHz 71.5707dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


Band Edge, hi CH, peak zoom
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.038msec
Marker: 2.484GHz 71.1147dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


Band Edge, hi CH, peak -20dBc
Ref Level 108.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 19.128msec
Marker: 2.5GHz 39.0357dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


Band Edge, hi CH, average
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: .693Hz SWP: 88.799sec
Marker: 2.484GHz 32.7877dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**100586**	Date:	3/7/2018
Test Type:	**Maximized Emissions**	Time:	15:25:58
Tested By:	Don Nguyen	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:

The EUT is placed on Styrofoam platform. The EUT set to transmit continuously.
The EUT is rotated in three orthogonal axes. Data represents worst case orientation.
The EUT is powered by fully charged internal battery. Nominal input voltage: 2.4Vdc
Operating frequency: 2402-2480MHz
Antenna gain: +1dBi

Frequency range: 2400-2483.5MHz
RBW=1MHz, VBW=3MHz (restricted band)
RBW=100kHz, VBW=300kHz (-20dBc limit)

Test Method: ANSI C63.10 (2013)
Temperature: 21°C
Relative Humidity: 21%
Pressure: 100kPa
Site A

Test Equipment:

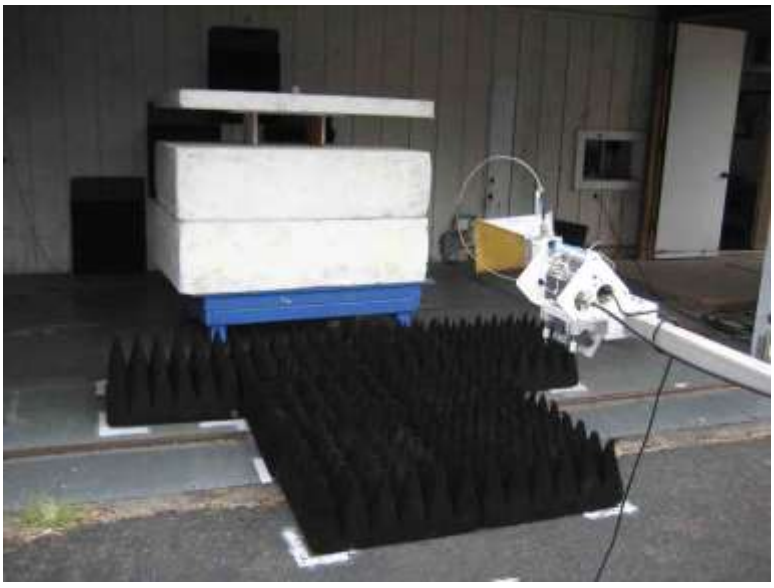
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00786	Preamp	83017A	5/9/2016	5/9/2018
T2	AN02946	Cable	32022-2-2909K-36TC	12/12/2017	12/12/2019
T3	ANP06661	Cable	LDF1-50	5/6/2016	5/6/2018
T4	AN00849	Horn Antenna	3115	3/6/2018	3/6/2020
T5	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2400.000M	62.7	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	58.5	76.8	-18.3	Horiz
2	2390.000M Ave	36.3	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	32.1	54.0	-21.9	Horiz
^	2390.000M	65.2	-38.1 +0.0	+1.3	+4.0	+28.6	+0.0	61.0	54.0	+7.0	Horiz
4	2483.500M Ave	32.8	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	28.5	54.0	-25.5	Horiz
^	2483.500M	71.6	-38.0 +0.0	+1.3	+4.0	+28.4	+0.0	67.3	54.0	+13.3	Horiz

Test Setup Photos

Below 1GHz



Above 1GHz, Front view, Cone placement

Above 1GHz, Back view

X Axis

Y Axis

Z Axis

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**100586**	Date:	3/1/2018
Test Type:	**Conducted Emissions**	Time:	12:50:02
Tested By:	Don Nguyen	Sequence#:	0
Software:	EMITest 5.03.11		110V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

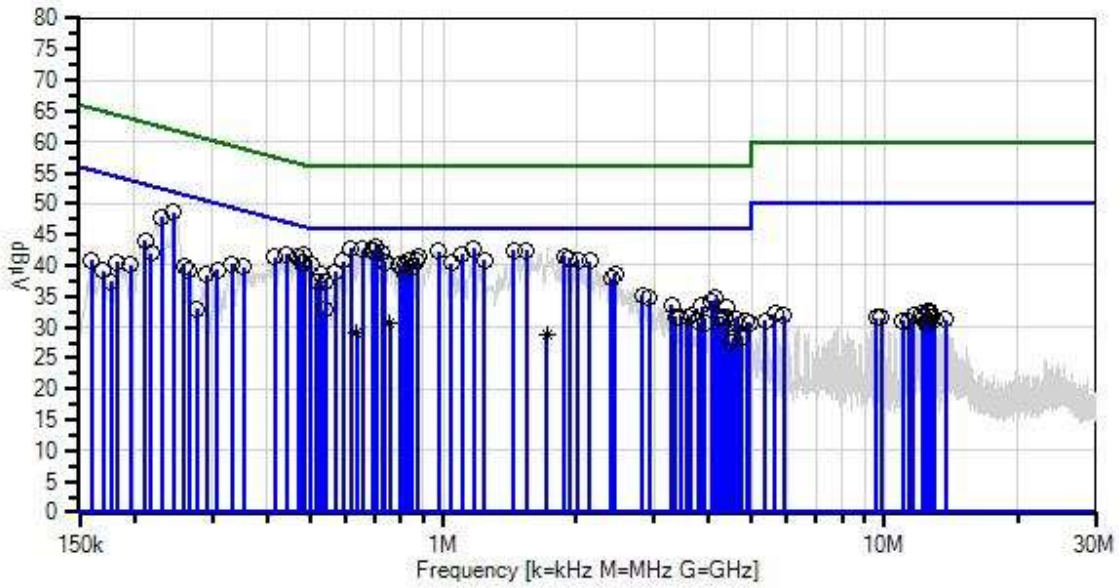
Test Conditions / Notes:

The EUT is placed in a charging cradle. The cradle is connected to a support USB charger.
The EUT is in charging mode.

Frequency range: 150kHz-30MHz
RBW=VBW=9kHz

Test Method: ANSI C63.10 (2013)
Temperature: 23°C
Relative Humidity: 31%
Pressure: 100kPa
Site D

Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) WO#: 100586 Sequence#: 0 Date: 3/1/2018
15.207 AC Mains - Average Test Lead: 110V 60Hz L1-Line



Sweep Data
× QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP01910	Cable	RG-142	10/25/2017	10/25/2019
T2	AN00847.1	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2018
	AN00847.1	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2018
	AN02869	Spectrum Analyzer	E4440A	8/1/2017	8/1/2018
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019
T4	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
T5	ANP06986	Cable-Line L1(dB)	1.34m-extcord	2/16/2018	2/16/2020
	ANP06986	Cable-Neutral L2(dB)	1.34m-extcord	2/16/2018	2/16/2020

Measurement Data: Reading listed by margin. Test Lead: L1-Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	707.038k	37.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	43.0	46.0	-3.0	L1-Li
2	618.319k	36.7	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.7	46.0	-3.3	L1-Li
3	1.171M	36.7	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	42.7	46.0	-3.3	L1-Li
4	244.535k	42.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	48.6	51.9	-3.3	L1-Li
5	656.134k	36.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.6	46.0	-3.4	L1-Li
6	689.585k	36.5	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.5	46.0	-3.5	L1-Li
7	1.447M	36.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	42.5	46.0	-3.5	L1-Li
8	1.545M	36.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	42.5	46.0	-3.5	L1-Li
9	698.312k	36.3	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.3	46.0	-3.7	L1-Li
10	975.017k	36.3	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	42.3	46.0	-3.7	L1-Li
11	728.127k	36.2	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	42.1	46.0	-3.9	L1-Li
12	1.103M	35.8	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	41.8	46.0	-4.2	L1-Li
13	230.718k	41.9	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	47.9	52.4	-4.5	L1-Li
14	1.885M	35.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	41.5	46.0	-4.5	L1-Li
15	877.205k	35.4	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	41.3	46.0	-4.7	L1-Li
16	484.513k	35.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	41.6	46.3	-4.7	L1-Li
17	1.932M	35.2	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	41.2	46.0	-4.8	L1-Li

18	836.481k	35.0	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.9	46.0	-5.1	L1-Li
19	470.696k	35.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	41.4	46.5	-5.1	L1-Li
20	2.021M	34.9	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	40.9	46.0	-5.1	L1-Li
21	1.239M	34.9	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	40.9	46.0	-5.1	L1-Li
22	442.335k	35.9	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	41.8	47.0	-5.2	L1-Li
23	592.867k	34.7	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.7	46.0	-5.3	L1-Li
24	872.841k	34.8	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.7	46.0	-5.3	L1-Li
25	2.149M	34.7	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	40.7	46.0	-5.3	L1-Li
26	739.035k	34.6	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.5	46.0	-5.5	L1-Li
27	1.043M	34.4	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	40.4	46.0	-5.6	L1-Li
28	480.877k	34.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.6	46.3	-5.7	L1-Li
29	501.966k	34.3	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.3	46.0	-5.7	L1-Li
30	796.485k	34.2	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.1	46.0	-5.9	L1-Li
31	477.241k	34.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.4	46.4	-6.0	L1-Li
32	818.301k	34.1	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.0	46.0	-6.0	L1-Li
33	416.156k	35.5	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	41.4	47.5	-6.1	L1-Li
34	851.025k	33.9	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.8	46.0	-6.2	L1-Li
35	811.029k	33.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.2	46.0	-6.8	L1-Li
36	571.051k	33.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	39.0	46.0	-7.0	L1-Li
37	526.691k	32.7	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	38.7	46.0	-7.3	L1-Li
38	2.446M	32.7	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	38.7	46.0	-7.3	L1-Li
39	2.408M	31.8	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.8	46.0	-8.2	L1-Li
40	542.690k	31.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	37.4	46.0	-8.6	L1-Li
41	517.965k	31.3	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	37.3	46.0	-8.7	L1-Li
42	353.616k	33.9	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.8	48.9	-9.1	L1-Li
43	211.084k	38.1	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	44.1	53.2	-9.1	L1-Li

44	332.527k	34.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	40.2	49.4	-9.2	L1-Li
45	307.802k	33.4	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.3	50.0	-10.7	L1-Li
46	217.629k	36.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.0	52.9	-10.9	L1-Li
47	2.821M	29.0	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	35.1	46.0	-10.9	L1-Li
48	4.131M	28.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	34.7	46.0	-11.3	L1-Li
49	2.936M	28.6	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	34.7	46.0	-11.3	L1-Li
50	259.079k	34.0	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.9	51.5	-11.6	L1-Li
51	4.062M	27.9	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	34.2	46.0	-11.8	L1-Li
52	266.351k	33.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	39.2	51.2	-12.0	L1-Li
53	291.076k	32.6	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	38.5	50.5	-12.0	L1-Li
54	3.301M	27.4	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	33.6	46.0	-12.4	L1-Li
55	3.850M	27.1	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	33.4	46.0	-12.6	L1-Li
56	4.403M	26.8	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	33.1	46.0	-12.9	L1-Li
57	538.327k	26.8	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	32.8	46.0	-13.2	L1-Li
58	182.723k	34.5	+0.1 +0.0	+0.0	+0.3	+5.7	+0.0	40.6	54.4	-13.8	L1-Li
59	195.812k	34.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.0	53.8	-13.8	L1-Li
60	3.650M	25.6	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.8	46.0	-14.2	L1-Li
61	3.361M	25.5	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.7	46.0	-14.3	L1-Li
62	3.446M	25.5	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.7	46.0	-14.3	L1-Li
63	4.339M	25.3	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	31.6	46.0	-14.4	L1-Li
64	3.578M	25.3	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.5	46.0	-14.5	L1-Li
65	4.199M	25.2	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	31.5	46.0	-14.5	L1-Li
66	160.179k	34.6	+0.1 +0.0	+0.0	+0.5	+5.7	+0.0	40.9	55.5	-14.6	L1-Li
67	4.611M	25.0	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	31.4	46.0	-14.6	L1-Li
68	3.786M	24.6	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.9	46.0	-15.1	L1-Li
69	4.883M	24.5	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	30.9	46.0	-15.1	L1-Li

70	4.956M	24.4	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	30.8	46.0	-15.2	L1-Li
71	3.922M	24.3	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.6	46.0	-15.4	L1-Li
72	756.489k Ave	24.7	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	30.6	46.0	-15.4	L1-Li
^	756.488k	37.6	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	43.5	46.0	-2.5	L1-Li
74	4.675M	24.1	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	30.5	46.0	-15.5	L1-Li
75	4.267M	24.1	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.4	46.0	-15.6	L1-Li
76	169.633k	32.9	+0.1 +0.0	+0.0	+0.4	+5.7	+0.0	39.1	55.0	-15.9	L1-Li
77	635.773k Ave	23.1	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	29.1	46.0	-16.9	L1-Li
^	635.772k	37.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	43.4	46.0	-2.6	L1-Li
79	176.905k	31.3	+0.1 +0.0	+0.0	+0.3	+5.7	+0.0	37.4	54.6	-17.2	L1-Li
80	1.719M Ave	22.8	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	28.8	46.0	-17.2	L1-Li
^	1.719M	37.1	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	43.1	46.0	-2.9	L1-Li
82	12.598M	25.4	+0.3 +1.0	+0.1	+0.1	+5.8	+0.0	32.7	50.0	-17.3	L1-Li
83	12.454M	25.4	+0.3 +0.9	+0.1	+0.1	+5.8	+0.0	32.6	50.0	-17.4	L1-Li
84	4.751M	22.1	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	28.5	46.0	-17.5	L1-Li
85	4.547M	21.9	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	28.3	46.0	-17.7	L1-Li
86	12.184M	25.2	+0.3 +0.9	+0.1	+0.1	+5.7	+0.0	32.3	50.0	-17.7	L1-Li
87	12.661M	24.9	+0.3 +1.0	+0.1	+0.1	+5.8	+0.0	32.2	50.0	-17.8	L1-Li
88	5.643M	25.8	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	32.2	50.0	-17.8	L1-Li
89	276.532k	27.0	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	32.9	50.9	-18.0	L1-Li
90	11.625M	24.9	+0.3 +0.9	+0.1	+0.1	+5.7	+0.0	32.0	50.0	-18.0	L1-Li
91	5.923M	25.5	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	31.9	50.0	-18.1	L1-Li
92	12.734M	24.3	+0.3 +1.0	+0.1	+0.1	+5.8	+0.0	31.6	50.0	-18.4	L1-Li
93	9.842M	24.7	+0.2 +0.7	+0.2	+0.1	+5.7	+0.0	31.6	50.0	-18.4	L1-Li
94	4.471M	21.3	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	27.6	46.0	-18.4	L1-Li
95	9.562M	24.6	+0.2 +0.7	+0.2	+0.1	+5.7	+0.0	31.5	50.0	-18.5	L1-Li

96	12.247M	24.4	+0.3 +0.9	+0.1	+0.1	+5.7	+0.0	31.5	50.0	-18.5	L1-Li
97	13.013M	24.1	+0.3 +1.0	+0.1	+0.1	+5.8	+0.0	31.4	50.0	-18.6	L1-Li
98	13.761M	23.9	+0.3 +1.1	+0.1	+0.1	+5.8	+0.0	31.3	50.0	-18.7	L1-Li
99	11.013M	23.9	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	31.0	50.0	-19.0	L1-Li
100	5.373M	24.6	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	31.0	50.0	-19.0	L1-Li
101	11.355M	23.9	+0.3 +0.8	+0.1	+0.1	+5.7	+0.0	30.9	50.0	-19.1	L1-Li
102	12.526M	23.5	+0.3 +1.0	+0.1	+0.1	+5.8	+0.0	30.8	50.0	-19.2	L1-Li
103	12.391M	23.5	+0.3 +0.9	+0.1	+0.1	+5.8	+0.0	30.7	50.0	-19.3	L1-Li

Test Location:	CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices)**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**100586**	Date:	3/1/2018
Test Type:	**Conducted Emissions**	Time:	12:50:44 PM
Tested By:	Don Nguyen	Sequence#:	1
Software:	EMITest 5.03.11		110V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

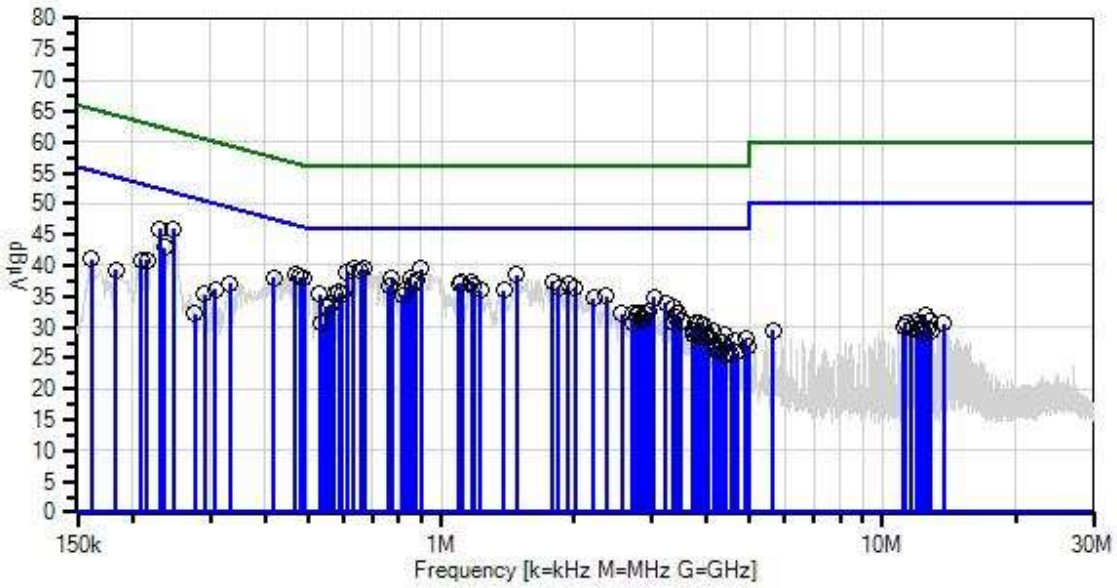
Test Conditions / Notes:

The EUT is placed in a charging cradle. The cradle is connected to a support USB charger.
The EUT is in charging mode.

Frequency range: 150kHz-30MHz
RBW=VBW=9kHz

Test Method: ANSI C63.10 (2013)
Temperature: 23°C
Relative Humidity: 31%
Pressure: 100kPa
Site D

Pacific Bioscience Laboratories, Inc. (L'Oreal Beauty Devices) WO#: 100586 Sequence#: 1 Date: 3/1/2018
15.207 AC Mains - Average Test Lead: 110V 60Hz L2-Neutral



Sweep Data
× QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP01910	Cable	RG-142	10/25/2017	10/25/2019
	AN00847.1	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2018
T2	AN00847.1	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2018
	AN02869	Spectrum Analyzer	E4440A	8/1/2017	8/1/2018
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019
T4	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
	ANP06986	Cable-Line L1(dB)	1.34m-extcord	2/16/2018	2/16/2020
T5	ANP06986	Cable-Neutral L2(dB)	1.34m-extcord	2/16/2018	2/16/2020

Measurement Data: Reading listed by margin. Test Lead: L2-Neutral

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	247.445k	40.1	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	46.0	51.8	-5.8	L2-Ne
2	635.046k	33.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	39.6	46.0	-6.4	L2-Ne
3	230.719k	39.9	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	45.9	52.4	-6.5	L2-Ne
4	898.468k	33.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	39.5	46.0	-6.5	L2-Ne
5	669.952k	33.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	39.4	46.0	-6.6	L2-Ne
6	658.316k	33.3	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	39.3	46.0	-6.7	L2-Ne
7	611.775k	33.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	39.0	46.0	-7.0	L2-Ne
8	1.485M	32.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	38.5	46.0	-7.5	L2-Ne
9	772.488k	32.2	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	38.1	46.0	-7.9	L2-Ne
10	851.753k	32.0	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	38.0	46.0	-8.0	L2-Ne
11	466.334k	32.5	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	38.5	46.6	-8.1	L2-Ne
12	479.424k	32.2	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	38.2	46.3	-8.1	L2-Ne
13	490.332k	32.0	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	38.0	46.2	-8.2	L2-Ne
14	876.478k	31.6	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.6	46.0	-8.4	L2-Ne
15	1.175M	31.4	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.4	46.0	-8.6	L2-Ne
16	1.792M	31.4	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.4	46.0	-8.6	L2-Ne
17	1.115M	31.3	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.3	46.0	-8.7	L2-Ne

18	1.098M	31.1	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	37.1	46.0	-8.9	L2-Ne
19	861.934k	30.9	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.9	46.0	-9.1	L2-Ne
20	1.945M	30.9	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.9	46.0	-9.1	L2-Ne
21	236.537k	36.9	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	42.9	52.2	-9.3	L2-Ne
22	1.188M	30.7	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.7	46.0	-9.3	L2-Ne
23	761.580k	30.7	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	36.6	46.0	-9.4	L2-Ne
24	417.611k	32.1	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	38.0	47.5	-9.5	L2-Ne
25	2.013M	30.5	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.5	46.0	-9.5	L2-Ne
26	1.847M	30.3	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.3	46.0	-9.7	L2-Ne
27	830.664k	30.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	36.2	46.0	-9.8	L2-Ne
28	1.226M	30.0	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.0	46.0	-10.0	L2-Ne
29	1.388M	30.0	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	36.0	46.0	-10.0	L2-Ne
30	588.505k	29.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	35.6	46.0	-10.4	L2-Ne
31	529.601k	29.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	35.4	46.0	-10.6	L2-Ne
32	572.506k	29.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	35.4	46.0	-10.6	L2-Ne
33	597.958k	29.4	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	35.4	46.0	-10.6	L2-Ne
34	820.483k	29.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	35.2	46.0	-10.8	L2-Ne
35	816.120k	29.1	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	35.0	46.0	-11.0	L2-Ne
36	2.370M	28.9	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	35.0	46.0	-11.0	L2-Ne
37	3.029M	28.7	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	34.8	46.0	-11.2	L2-Ne
38	2.213M	28.7	+0.1 +0.1	+0.0	+0.1	+5.7	+0.0	34.7	46.0	-11.3	L2-Ne
39	3.233M	27.8	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	33.9	46.0	-12.1	L2-Ne
40	216.175k	34.8	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.8	53.0	-12.2	L2-Ne
41	562.325k	27.8	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	33.8	46.0	-12.2	L2-Ne
42	208.903k	34.8	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	40.8	53.2	-12.4	L2-Ne
43	331.801k	31.1	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	37.0	49.4	-12.4	L2-Ne

44	549.963k	27.3	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	33.3	46.0	-12.7	L2-Ne
45	3.369M	27.1	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	33.3	46.0	-12.7	L2-Ne
46	2.957M	26.4	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.5	46.0	-13.5	L2-Ne
47	2.816M	26.3	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.4	46.0	-13.6	L2-Ne
48	2.727M	26.2	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.3	46.0	-13.7	L2-Ne
49	2.561M	26.1	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.2	46.0	-13.8	L2-Ne
50	3.433M	25.9	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	32.1	46.0	-13.9	L2-Ne
51	308.530k	30.2	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	36.1	50.0	-13.9	L2-Ne
52	2.893M	26.0	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.1	46.0	-13.9	L2-Ne
53	2.778M	25.9	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	32.0	46.0	-14.0	L2-Ne
54	161.635k	34.8	+0.1 +0.0	+0.0	+0.5	+5.7	+0.0	41.1	55.4	-14.3	L2-Ne
55	3.420M	25.5	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.7	46.0	-14.3	L2-Ne
56	2.842M	25.2	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	31.3	46.0	-14.7	L2-Ne
57	2.876M	25.2	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	31.3	46.0	-14.7	L2-Ne
58	3.493M	24.9	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	31.1	46.0	-14.9	L2-Ne
59	183.451k	33.2	+0.1 +0.0	+0.0	+0.3	+5.7	+0.0	39.3	54.3	-15.0	L2-Ne
60	291.077k	29.5	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	35.4	50.5	-15.1	L2-Ne
61	3.361M	24.6	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	30.8	46.0	-15.2	L2-Ne
62	2.710M	24.6	+0.1 +0.1	+0.1	+0.1	+5.7	+0.0	30.7	46.0	-15.3	L2-Ne
63	3.786M	24.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.7	46.0	-15.3	L2-Ne
64	3.854M	24.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.7	46.0	-15.3	L2-Ne
65	536.146k	24.6	+0.1 +0.0	+0.0	+0.2	+5.7	+0.0	30.6	46.0	-15.4	L2-Ne
66	3.922M	24.0	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	30.3	46.0	-15.7	L2-Ne
67	3.714M	23.2	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	29.4	46.0	-16.6	L2-Ne
68	4.131M	23.0	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	29.3	46.0	-16.7	L2-Ne
69	3.731M	22.7	+0.1 +0.2	+0.1	+0.1	+5.7	+0.0	28.9	46.0	-17.1	L2-Ne

70	3.744M	22.6	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.9	46.0	-17.1	L2-Ne
71	4.020M	22.6	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.9	46.0	-17.1	L2-Ne
72	3.824M	22.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.7	46.0	-17.3	L2-Ne
73	4.403M	22.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.7	46.0	-17.3	L2-Ne
74	3.901M	22.3	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.6	46.0	-17.4	L2-Ne
75	3.973M	22.1	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	28.4	46.0	-17.6	L2-Ne
76	4.888M	21.7	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	28.1	46.0	-17.9	L2-Ne
77	4.148M	21.6	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	27.9	46.0	-18.1	L2-Ne
78	4.611M	21.4	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	27.8	46.0	-18.2	L2-Ne
79	12.454M	24.6	+0.3 +0.8	+0.2	+0.1	+5.8	+0.0	31.8	50.0	-18.2	L2-Ne
80	4.335M	21.2	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	27.5	46.0	-18.5	L2-Ne
81	276.533k	26.3	+0.1 +0.0	+0.0	+0.1	+5.7	+0.0	32.2	50.9	-18.7	L2-Ne
82	11.905M	24.0	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	31.1	50.0	-18.9	L2-Ne
83	4.960M	20.5	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	26.9	46.0	-19.1	L2-Ne
84	12.734M	23.6	+0.3 +0.9	+0.2	+0.1	+5.8	+0.0	30.9	50.0	-19.1	L2-Ne
85	4.228M	20.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	26.7	46.0	-19.3	L2-Ne
86	11.283M	23.6	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	30.7	50.0	-19.3	L2-Ne
87	13.770M	23.2	+0.3 +1.0	+0.2	+0.1	+5.8	+0.0	30.6	50.0	-19.4	L2-Ne
88	4.271M	20.1	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	26.4	46.0	-19.6	L2-Ne
89	11.977M	23.2	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	30.3	50.0	-19.7	L2-Ne
90	4.160M	19.9	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	26.2	46.0	-19.8	L2-Ne
91	11.148M	22.9	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	30.0	50.0	-20.0	L2-Ne
92	4.683M	19.5	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	25.9	46.0	-20.1	L2-Ne
93	11.634M	22.7	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	29.8	50.0	-20.2	L2-Ne
94	12.661M	22.5	+0.3 +0.9	+0.2	+0.1	+5.8	+0.0	29.8	50.0	-20.2	L2-Ne
95	4.386M	19.4	+0.2 +0.2	+0.1	+0.1	+5.7	+0.0	25.7	46.0	-20.3	L2-Ne

96	4.539M	19.1	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	25.5	46.0	-20.5	L2-Ne
97	5.643M	23.1	+0.2 +0.3	+0.1	+0.1	+5.7	+0.0	29.5	50.0	-20.5	L2-Ne
98	12.869M	22.1	+0.3 +0.9	+0.2	+0.1	+5.8	+0.0	29.4	50.0	-20.6	L2-Ne
99	12.175M	22.2	+0.3 +0.8	+0.2	+0.1	+5.7	+0.0	29.3	50.0	-20.7	L2-Ne
100	12.391M	22.0	+0.3 +0.8	+0.2	+0.1	+5.8	+0.0	29.2	50.0	-20.8	L2-Ne

Test Setup Photos

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 dBµV/m, the spectrum analyzer reading in dBµV 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	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/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.