Test Report # 316340 A

Equipment Under Test:	MixPre-10T
Test Date(s):	12/13/16, 8/28/17 – 8/30/17 and 9/26/17
Prepared for:	Sound Devices Attn: Kevin Pulvermacher E7556 State Road 23/33 Reedsburg, WI 53959

Report Issued by: Coty Hammerer, EMC Engineer
Signature: Coty Hammerer Date: 10/23/17

Report Reviewed by: Adam Alger, Quality Systems Engineer
Signature: Adam O Alger Date: 10/23/17

Report Constructed by: Coty Hammerer, EMC Engineer
Signature: Coty Hammerer Date: 10/18/17

CONTENTS

Laird Technologies Test Services in Review

The Laird Technologies, Inc. laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:

ACCREDITED
TESTING CERT #1255.01

A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025: 2005 with Electrical (EMC) Scope
A2LA Certificate Number: 1255.01
Scope of accreditation includes all test methods listed herein, unless otherwise noted.

Federal Communications Commission (FCC) – USA

Accredited recognition of two 3 meter Semi-Anechoic Chambers

Accredited Test Firm Registration Number: 953492

Government of Canada

Innovation, Science and Economic Development Canada

ISED Site listing of two 3 meter Semi-Anechoic Chambers based on RSS-GEN – Issue 4
File Number: IC 3088A-2
File Number: IC 3088A-3

1 TEST REPORT SUMMARY

During **12/13/16**, **8/28/17 – 8/30/17 and 9/26/17** the Equipment Under Test (EUT), **MixPre-10T**, as provided by **Sound Devices** was tested to the following requirements:

Requirement	Description	Specification	Method	Compliant
FCC: 15.247 (a)(2) IC: RSS-247 5.2 (1)	Digital Modulation System 6 dB bandwidth	500 kHz	ANSI C63.10	Yes
FCC: 2.1049 IC: RSS-GEN 6.6	Occupied Bandwidth	Reported	ANSI C63.10	Yes
FCC: 15.247 (b)(3) IC: RSS-247 5.4 (4)	Maximum Conducted Output Power	30 dBm	ANSI C63.10	Yes
FCC: 15.247 (e) IC: RSS-247 5.2 (2)	Digital Modulation System Power Spectral Density	8 dBm / 3 kHz	ANSI C63.10	Yes
FCC: 15.247 (d) IC: RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	20 dBc	ANSI C63.10	Yes
FCC: 15.247 (d) IC: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	FCC 15.209 RSS-GEN 8.9	ANSI C63.10	Yes
FCC: 2.1055 (d) IC: RSS-GEN 6.11	Frequency Stability	Reported	ANSI C63.10	Yes
FCC: 15.207 IC: RSS-GEN 8.8	AC Mains Conducted Emissions	FCC 15.207	ANSI C63.10	N/A[1]

Note 1: EUT is battery operated

Notice:

The results relate only to the item tested and described in this report. Any modifications made to the equipment under test after the specified test date(s) may invalidate the data herein.

If the resulting measurement margin is seen to be within the uncertainty value, as listed in this report, the possibility exists that this unit may not meet the required limit specification if subsequently tested.

2 CLIENT INFORMATION

Company Name	Sound Devices
Contact Person	Kevin Pulvermacher
Address	E7556 State Road 23/33 Reedsburg, WI 53959

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	MixPre-10T
Model Number	MixPre-10T
Serial Number	OD01107206000
FCC ID	2AKLX-739M10T
IC ID	22225-739M10T
HVIN	MIXPRE10T
Additional Information	EUT is battery powered with a 7.4 VDC rechargeable battery EUT was tested in 3 orthogonal orientations Bluetooth Low Energy Radio Only

2.2 Product Description

The MixPre-10T is the newest member of the groundbreaking MixPre Series of recorders, mixers, and USB audio interfaces. This lightweight, 10-input/12-track recorder offers world-class sound quality, flexible powering, and built-in, highly accurate timecode generator/reader – perfect for production sound mixers, field recordists and sound designers. The MixPre-10T features eight Sound Devices' Kashmir™ microphone preamps. These high-performance, ultra-low-noise, discrete, Class-A mic preamps were handcrafted by Sound Devices. The Kashmir mic preamps feature a -130dBV noise floor, analog limiters, and new 32-bit A-to-D converters to ensure the highest quality audio recordings that far surpass those of other recorders using simple off-the-shelf, IC-based mic preamps.

2.3 Modifications Incorporated for Compliance

Firmware update was required for the EUT to meet compliance. Firmware: v1.20, Build: 248. The client understands the modifications

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 Additional Information

The EUT is battery powered. The channels are as follows: 2402, 2440, and 2480 MHz which represent low, mid, and high channels. Software Version 2.4.8 was used for testing. The EUT has a touch screen. Navigating through the Bluetooth Low Energy options allows the user to choose channels, transmit or receive (modulated/ non modulated), and the ability to disable the BLE. The memory card on the EUT fills up a little after an hour while recording. Options to format the memory card on the touch screen allow the user to quickly clear the memory and begin recording again. The MixPre-10T includes a MuRata P2ML3599 Type ZS Transceiver module with a chip antenna consisting of a peak gain of 2.7 dBi.

3 REFERENCES

Publication	Edition	Date
CFR 47 Part 15.247	-	2017
RSS-247	2	2017
CFR 47 Part 15.209	-	2017
ICES-003	6	2013
ANSI C63.10	-	2017
RSS-GEN	4	2014

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k = 2.

References	Version / Date
CISPR 16-4-1	Ed. 2 (2009-02)
CISPR 16-4-2	Ed. 2 (2011-06)
CISPR 32	Ed. 1 (2012-01)
ANSI C63.23	2012
A2LA P103	February 4, 2016
A2LA P103c	August 10, 2015
ETSI TR 100-028	V1.3.1 (2001-03)

Measurement Type	Configuration	Uncertainty ±
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

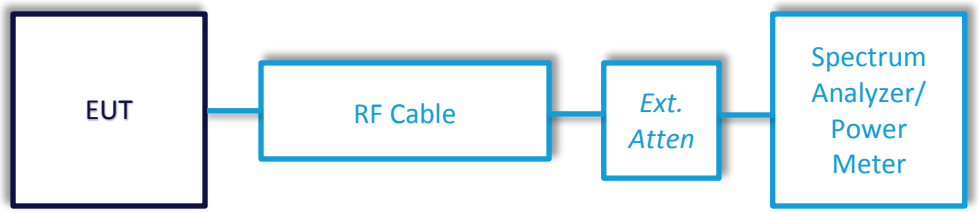
Parameter	ETSI U.C. ±	U.C. ±
Radio Frequency, from F0	$1x10^{-7}$	$0.55x10^{-7}$
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

Block Diagram



5.1.1 Antenna Port Conducted Emissions – DTS Bandwidth

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 (a) (2)/ RSS-247 Section 5.2 (1)
Method	ANSI C63.10 Section 11.8

Limits:

Frequency (MHz)	Limit (MHz)
2402	0.5
2440	0.5
2480	0.5

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 100 kHz, VBW = 300 kHz, Span = 3 MHz
Settings	Peak Detector
EUT	Battery Powered
EUT	Modulated, Continuous Transmit

Instrumentation

LSR a Laird Business

Date: 13-Dec-2016 Test: Conducted Measurements Job #: C-2611

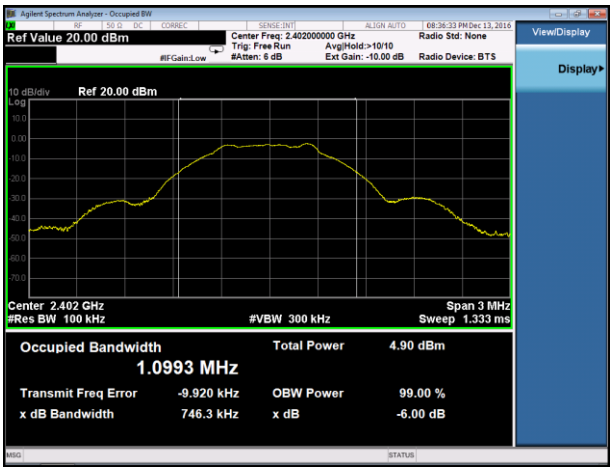
PE: John Johnston Customer: Sound Devices Quote #: 316338

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	44GHz EXA Spectrum Analyzer	Agilent	N9010A	MY53400296	12/19/2015	12/19/2016	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/29/2015	6/29/2017	Active Calibration
3	EE 960088	8GHz MXE Spectrum Analyzer	Agilent	N9038A	MY51210138	2/24/2016	2/23/2017	Active Calibration

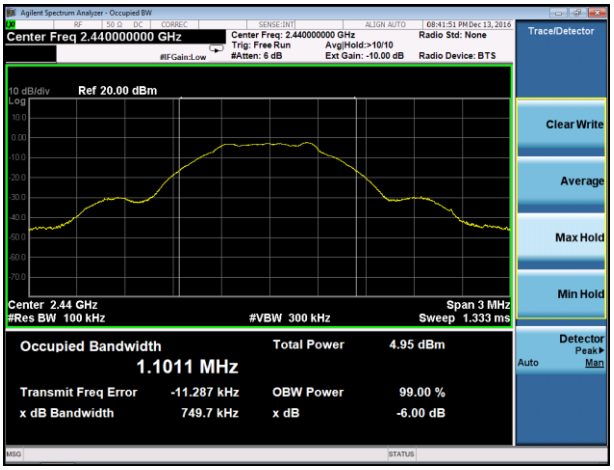
Table

Channel Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Minimum Limit (MHz)
2402	0.746	0.500
2440	0.750	0.500
2480	0.755	0.500

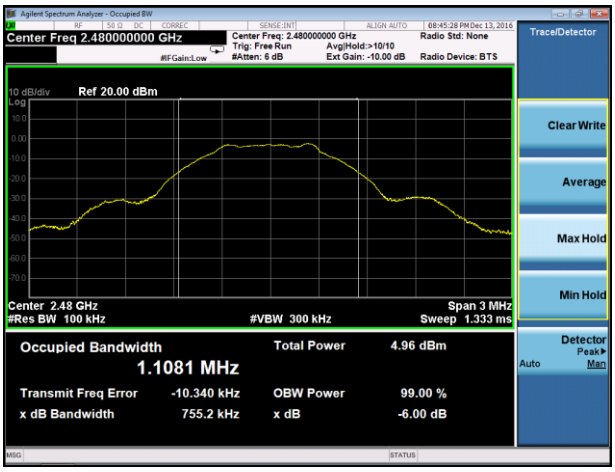
Plots



2402 MHz



2440 MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 6 dB
Ext Gain: -10.00 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.333 ms
Occupied Bandwidth
1.1081 MHz
Total Power
4.96 dBm
Transmit Freq Error
-10.340 kHz
OBW Power
99.00 %
x dB Bandwidth
755.2 kHz
x dB
-6.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

2480 MHz

5.1.2 Antenna Port Conducted Emissions – 99% Bandwidth

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 (a) (2)/ RSS-247 Section 5.2 (1)
Method	ANSI C63.10 Section 6.9.3

Limits:

N/A

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 30 kHz, VBW = 91 kHz, Span = 3 MHz
Settings	Peak Detector
EUT	Battery Powered
EUT	Modulated, Continuous Transmit

Instrumentation

LSR
a Laird Business

Date: 13-Dec-2016 Test: Conducted Measurements Job #: C-2611

PE: John Johnston Customer: Sound Devices Quote #: 316338

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/29/2016	11/1/2017	Active Calibration
3	EE 960088	EMI Receiver	Agilent	N9038A	MY51210138	3/2/2017	3/2/2018	Active Calibration

Table

Channel Frequency (MHz)	99% OBW (MHz)
2402	1.09
2440	1.09
2480	1.10

Plots

2402 MHz

2440 MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 6 dB
Ext Gain: -10.00 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 2.44 GHz
#Res BW 30 kHz
#VBW 91 kHz
Span 3 MHz
Sweep 4 ms
Occupied Bandwidth
1.0924 MHz
Total Power
5.02 dBm
Transmit Freq Error
-7.223 kHz
OBW Power
99.00 %
x dB Bandwidth
684.8 kHz
x dB
-6.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

2480 MHz

5.1.3 Antenna Port Conducted Emissions – Maximum Peak Output Power

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 (b) (3)/ RSS-247 Section 5.4(3)
Method	ANSI C63.10 Section 11.9

Limits:

Frequency (MHz)	Limit (dBm)
2402	30
2440	30
2480	30

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 1MHz, VBW = 3 MHz, Span = 3 MHz
Settings	Peak Detector
EUT	Battery Powered
EUT	Modulated, Continuous Transmit

Instrumentation

LSR a Laird Business

Date: 13-Dec-2016 Test: Conducted Measurements Job #: C-2611

PE: John Johnston Customer: Sound Devices Quote #: 316338

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	44GHz EXA Spectrum Analyzer	Agilent	N9010A	MY53400296	12/19/2015	12/19/2016	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	EE 960088	8GHz MXE Spectrum Analyzer	Agilent	N9038A	MY51210138	2/24/2016	2/23/2017	Active Calibration

Table

Channel Frequency (MHz)	Max Peak Conducted Output Power (dBm)	Power Limit (dBm)	Power Margin (dB)
2402	-1.64	30.00	31.64
2440	-1.58	30.00	31.58
2480	-1.67	30.00	31.67

Plots

2402 MHz

2440 MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479712040401 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -10.00 dB
09:02:23 PM Dec 13, 2016
Mkr1 2.479 712 0 GHz
-1.666 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

2480 MHz

5.1.4 Antenna Port Conducted Emissions – PSD

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 (e)/ RSS-247 Section 5.2(2)
Method	ANSI C63.10 Section 11.10.2

Limits:

Frequency (MHz)	Limit (dBm) in 100 kHz BW
2402	8
2440	8
2480	8

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 100 kHz, VBW = 300 kHz, Span = 1.14 MHz
Settings	Peak Detector
EUT	Battery Powered
EUT	Modulated, Continuous Transmit

Instrumentation

LSR a Laird Business

Date: 13-Dec-2016 Test: Conducted Measurements Job #: C-2611

PE: John Johnston Customer: Sound Devices Quote #: 316338

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/29/2016	11/1/2017	Active Calibration
3	EE 960088	EMI Receiver	Agilent	N9038A	MY51210138	3/2/2017	3/2/2018	Active Calibration

Table

Channel Frequency (MHz)	Peak PSD in 100 kHz RBW (dBm)	PSD Limit (dBm)	PSD Margin (dBm)
2402	-2.44	8.00	10.44
2440	-2.41	8.00	10.41
2480	-2.51	8.00	10.51

Plots

2402 MHz

2440 MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.480228824627 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -10.00 dB
09:06:33 PM Dec 13, 2016
Mkr1 2.480 228 82 GHz
-2.505 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 2.4800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.140 MHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

2480 MHz

5.1.5 Antenna Port Conducted Emissions – TX Spurious in 100 kHz BW

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 (d)/ RSS-247 Section 5.5
Method	ANSI C63.10 Section 11.11

Limits:

Frequency (MHz)	Limit (dBc)
2402	≥ 20
2440	≥ 20
2480	≥ 20

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 100 kHz, VBW = 300 kHz
Settings	Peak Detector
EUT	Battery Powered
EUT	Modulated, Continuous Transmit
Notes	1) Reference level plots were taken at the transmitted frequency and used to determine the 20 dBc limit line 2) Reference levels were determined by using the PSD values 3) All emissions greater than 20 dB below limit
Example Calculation	At 2402 MHz, PSD level was -2.437 dBm with a RBW of 100 kHz. Since the RBW was 100 kHz the PSD value can be used as the reference value. Therefore, -2.437dBm - 20 dBc = -22.44 dBm which serves as the Limit for Tx Spurious plots/ measurements

Instrumentation

LSR
a Laird Business

Date : 13-Dec-2016 Test : Conducted Measurements Job # : C-2611

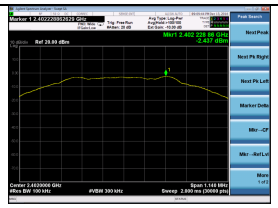
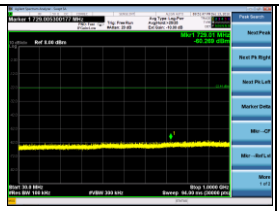
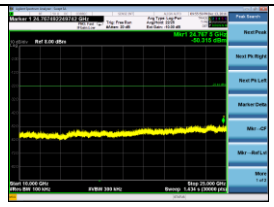
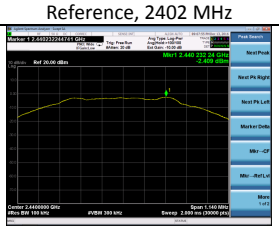
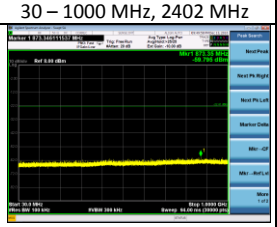
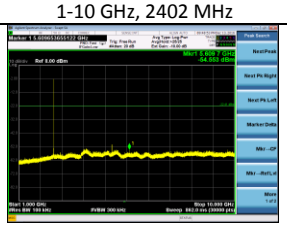
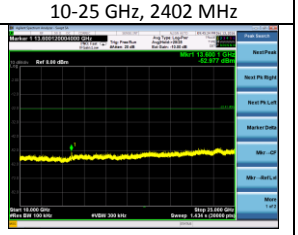
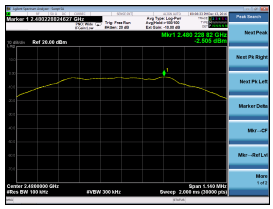
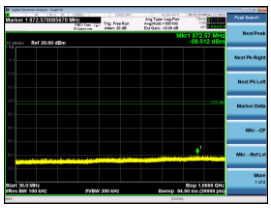
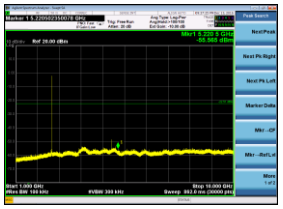
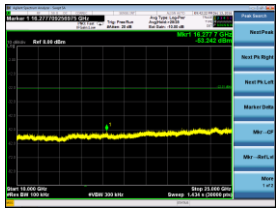
PE: John Johnston Customer : Sound Devices Quote #: 316338

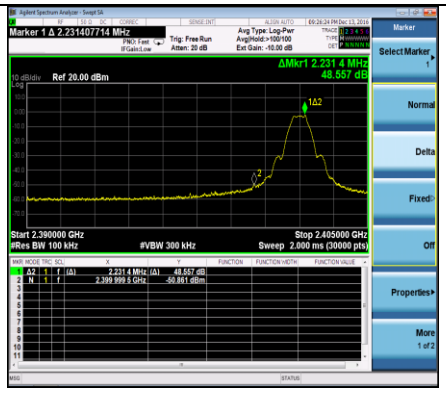
No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	44GHz EXA Spectrum Analyzer	Agilent	N9010A	MY53400296	12/19/2015	12/19/2016	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/29/2015	6/25/2017	Active Calibration
3	EE 960088	8GHz MXE Spectrum Analyzer	Agilent	N9038A	MY51210138	2/24/2016	2/23/2017	Active Calibration

Table

N/A – No emissions within 20 dB of limit

Plots

			
Reference, 2402 MHz	30 – 1000 MHz, 2402 MHz	1-10 GHz, 2402 MHz	10-25 GHz, 2402 MHz
			
Reference, 2440 MHz	30 – 1000 MHz, 2440 MHz	1-10 GHz, 2440 MHz	10-25 GHz, 2440 MHz
			
Reference, 2480 MHz	30 – 1000 MHz, 2480 MHz	1-10 GHz, 2480 MHz	10-25 GHz, 2480 MHz

	
Lower Band Edge, 2.31 – 3.39 GHz	Upper Band Edge, 2.483.5 – 2.5 GHz

5.1.6 Antenna Port Conducted Emissions – Frequency Stability

Operator	John Johnston
QA	Aidi Zainal
Test Date	12/13/16
Location	Conducted Measurement Area
Temp. / R.H.	68-75 F/ 30-60 %
Requirement	CFR 47 Part 15.247 2.10.5.5
Method	ANSI C63.10 Section 6.8.2

Limits:

N/A

Test Parameters

Frequency	2402, 2440, and 2480 MHz
Settings	RBW= 100 kHz, VBW = 300 kHz, Span = 500 kHz
Settings	Peak Detector
EUT	3.3 VDC Nominal, ±15%
EUT	Unmodulated, Continuous Transmit
Notes	Frequency Counter Function used on Spectrum Analyzer

Instrumentation

LSR a Laird Business

Date: 13-Dec-2016 Test: Conducted Measurements Job #: C-2611

PE: John Johnston Customer: Sound Devices Quote #: 316338

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	44GHz EXA Spectrum Analyzer	Agilent	N9010A	MY53400296	12/19/2015	12/19/2016	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	EE 960088	8GHz MXE Spectrum Analyzer	Agilent	N9038A	MY51210138	2/24/2016	2/23/2017	Active Calibration

Table

Frequency Stability f = 2402 MHz			
Supply Voltage	Frequency (Hz)	Measured Frequency (Hz)	Deviation (Hz)
2.55	2402000000	2401985007	14993
3	2402000000	2401985067	14933
3.45	2402000000	2401985393	14607

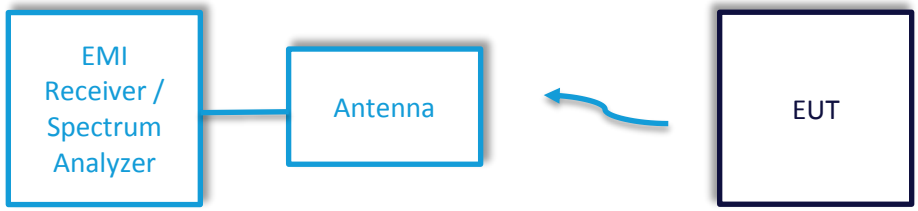
Frequency Stability f = 2440 MHz			
Supply Voltage	Frequency (Hz)	Measured Frequency (Hz)	Deviation (Hz)
2.55	2440000000	2439984829	15171
3	2440000000	2439984837	15163
3.45	2440000000	2439984823	15177

Frequency Stability f = 2480 MHz			
Supply Voltage	Frequency (Hz)	Measured Frequency (Hz)	Deviation (Hz)
2.55	2480000000	2479984426	15574
3	2480000000	2479984472	15528
3.45	2480000000	2479984585	15415

5.2 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBµV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBµV/m) Margin (dB) = Limit (dBµV/m) - Corrected Reading (dBµV/m) Example at 4000 MHz: Reading = 40 dBµV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBµV/m Average Limit = 20 log (500) = 54 dBµV/m Margin = 54 dBµV/m - 50.8 dBµV/m = 3.2 dB

Block Diagram



5.2.1 Radiated – Radiated Emissions

Operator	Coty Hammerer & Aidi Zainal
QA	Aidi Zainal/ Coty Hammerer
Test Date	8/28/17 – 8/30/17 & 8/26/17
Location	Chamber 3
Temp. / R.H.	71 F/ 55%
Requirement	CFR 47 part 15.209 CFR 47 part 15.205 RSS-GEN section 6.13
Method	ANSI C63.10 Sections 6.6 and 6.5

Limits:

Frequency (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
>960	500	54	3

Test Parameters

Frequency	30 – 25 GHz
Distance	3 meters
Settings	RBW=1 MHz, VBW=3 MHz for > 1 GHz RBW= 120 kHz, VBW= 1.2 MHz for < 1 GHz
EUT	Battery Power
EUT	Modulated, Continuous Transmit
Notes	Average measurements were performed with a 10 Hz VBW determined by the following equation [1/ (minimum transmitter on time] as specified in ANSI C63.10 section 4.1.4.2.3 f).

Instrumentation

Laird
Smart Technology. Delivered.

Date : 30-Aug-2017 Test : Transmitter Radiated Emissions Job : C-2613

PE : Coty Hammerer Customer : Sound Devices Quote : 316340

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	AA 960081	Double Ridge Horn Antenna	EMCO	3115	6907	3/17/2017	3/17/2018	Active Calibration
2	EE 960088	EMI Receiver	Agilent	N9038A	MY51210138	3/2/2017	3/2/2018	Active Calibration
3	AA 960174	Small Horn Antenna	ETS Lindgren	3116C-PA	00206880	5/1/2017	5/1/2018	Active Calibration
4	AA 960176	Cable - low loss 6m	A.H. Systems, Inc.	SAC-26G-6	395	5/15/2017	5/15/2018	Active Verification
5	EE 960159	Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	462101702	4/13/2017	4/13/2018	Active Calibration
6	AA 960128	Biconical Antenna	ETS Lindgren	3110B	00062899	4/13/2017	4/13/2018	Active Calibration
7	AA 960078	Log Periodic Antenna	EMCO	93146	9701-4855	4/17/2017	4/17/2018	Active Calibration
	AA 960153	High Pas Filter 2.4 GHz	KWM	HPF-L-14186	7272-04	5/9/2017	5/2/2018	Active Calibration
8	EE 960085	EMI Receiver	Agilent	N9038A	MY51210148	5/12/2017	5/12/2018	Active Calibration

Tested By: Coty Hammerer Quality Assurance: Aidi Zainal

Tables

Frequency (MHz)	Height (m)	Azimuth (degree)	QP Measurement (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Ant. Polarization	EUT Orientation
849.59	100.00	133.60	44.60	46.00	1.40	Vertical	Vertical
907.00	100.00	124.00	39.70	46.00	6.30	Vertical	Vertical
499.21	100.00	172.00	43.10	46.00	2.90	Vertical	Vertical
479.23	100.00	350.40	44.30	46.00	1.70	Horizontal	Vertical
499.21	100.00	163.00	43.60	46.00	2.40	Horizontal	Vertical
319.45	100.00	170.00	40.60	46.00	5.40	Horizontal	Vertical
499.21	100.00	124.90	43.80	46.00	2.20	Horizontal	Flat
516.06	100.00	233.00	44.00	46.00	2.00	Horizontal	Flat
849.83	100.00	27.90	43.00	46.00	3.00	Horizontal	Flat
849.95	113.00	314.50	43.90	46.00	2.10	Vertical	Flat
904.78	113.00	240.20	43.12	46.00	2.88	Vertical	Flat
516.12	100.00	195.00	42.00	46.00	4.00	Vertical	Flat
719.93	167.00	349.80	41.55	46.00	4.45	Vertical	Flat
499.21	102.00	76.70	41.90	46.00	4.10	Vertical	Flat
850.00	100.00	268.70	41.23	46.00	4.77	Vertical	Side
499.18	100.00	50.00	44.60	46.00	1.40	Vertical	Side
499.17	100.00	127.90	42.70	46.00	3.30	Horizontal	Side
850.00	100.00	235.80	41.36	46.00	4.64	Horizontal	Side
614.40	100.00	11.40	42.00	46.00	4.00	Horizontal	Side
720.00	100.00	154.60	41.22	46.00	4.78	Horizontal	Side
135.16	285.00	177.00	37.47	43.50	6.03	Vertical	Vertical

15.209 Radiated Emissions < 1 GHz

Peak Frequency (MHz)	Peak Measurement (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Avg Frequency (MHz)	Avg Measurement (dBµV/m)	Avg Limit (dBµV/m)	Avg Margin (dB)
2367.92	55.23	74.00	18.77	2390.00	42.47	54.00	11.53
2491.04	54.65	74.00	19.35	2486.44	42.53	54.00	11.47

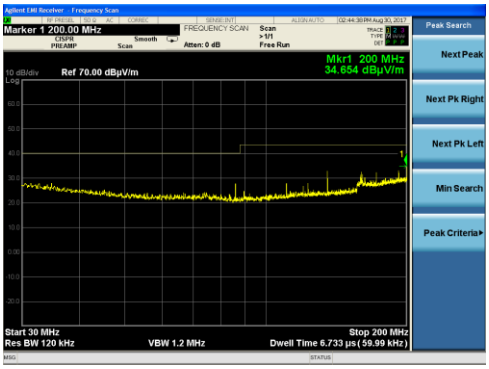
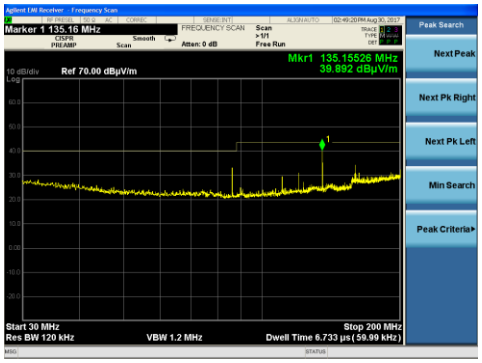
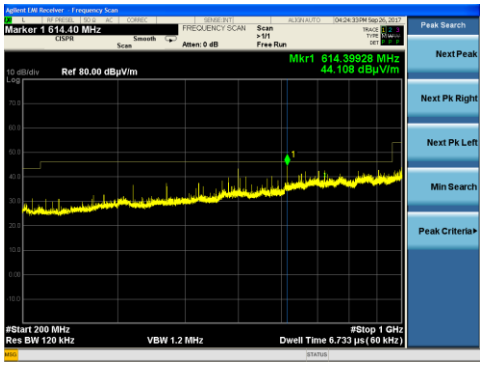
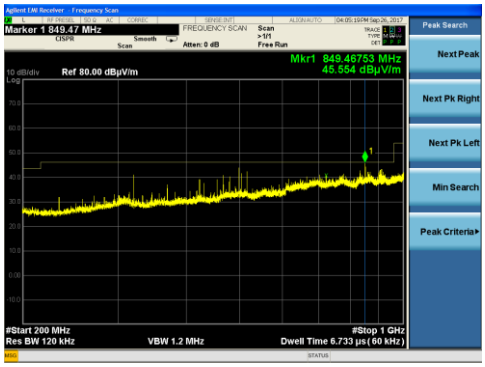
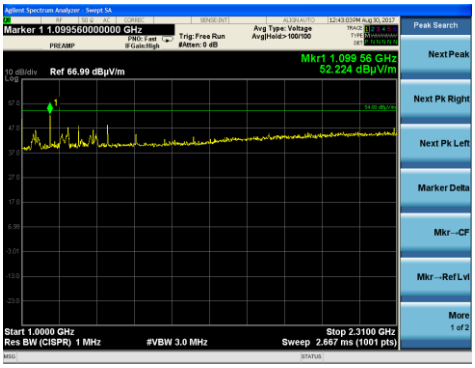
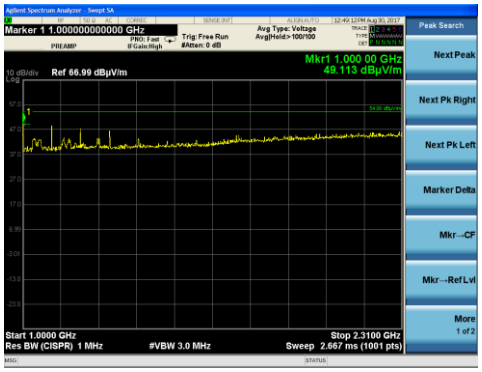
15.205 Restricted Band Emissions – Band Edges

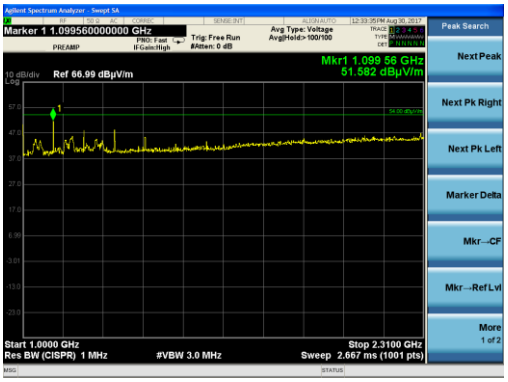
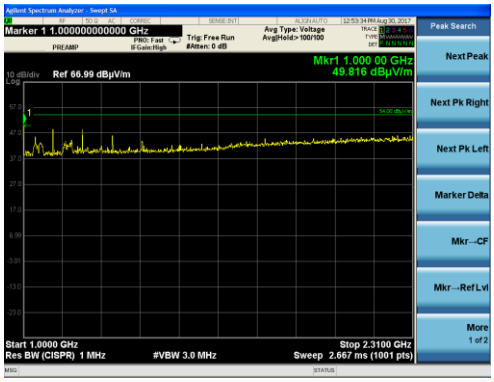
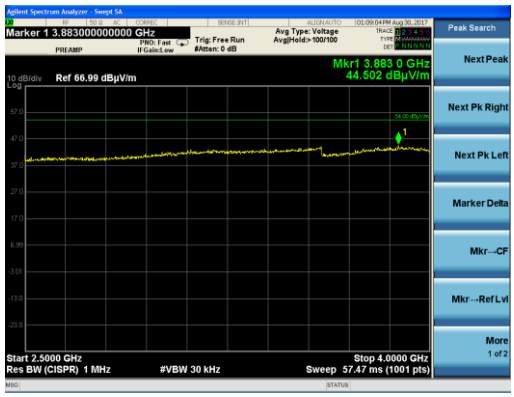
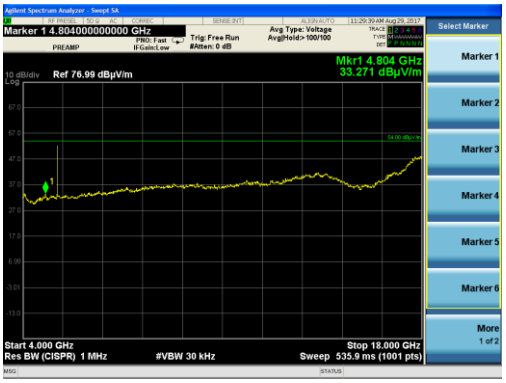
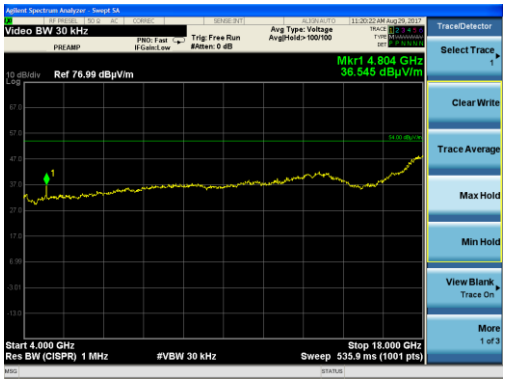
Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBµV/m)	Avg Reading (dBµV/m)	Avg Limit (dBµV/m)	Average Margin (dB)	Antenna Polarity	EUT Orientation
4804	1.37	0.00	42.00	33.13	54.00	20.87	Vertical	Flat
4880	1.17	0.00	42.10	32.83	54.00	21.17	Vertical	Flat
4960	1.08	119.20	41.30	30.36	54.00	23.64	Horizontal	Side
4960	1.00	358.00	41.00	30.45	54.00	23.55	Vertical	Flat
19519	1.00	0.00	44.93	34.12	54.00	19.88	Vertical	Flat

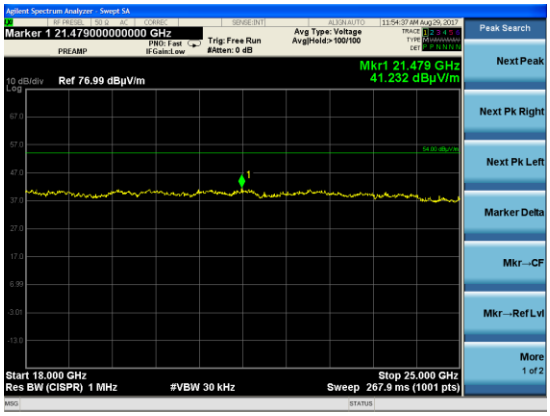
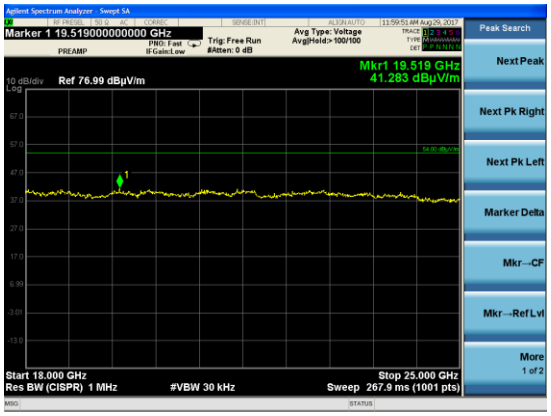
15.205 Restricted Band Emissions – Transmitter Harmonics

Plots – Worst Case

Note: These plots show the Quasi-Peak Limit for Measurements < 1 GHz and the Average Limit for Measurements > 1 GHz while using Peak Trace Data.

	
Horizontal, 30-200 MHz	Vertical, 30-200 MHz
	
Horizontal, 200-1000 MHz	Vertical, 200-1000 MHz
	
Horizontal, 1-2.31 GHz, Radio Not Powered	Vertical, 1-2.31 GHz, Radio Not Powered

	
Horizontal, 1-2.31 GHz	Vertical, 1-2.31 GHz
	
Horizontal 2.5 – 4 GHz, Reduced VBW	Vertical 2.5 – 4 GHz, Reduced VBW
	
Horizontal, 4-18 GHz, Reduced VBW **Note:** Emissions in 5 GHz range is not EUT related	Vertical, 4-18 GHz, Reduced VBW

	
Horizontal, 18-25 GHz, Reduced VBW	Vertical, 18-25 GHz, Reduced VBW

6 REVISION HISTORY

Version	Date	Notes	Person
V0	10/22/17	Initial Draft	Coty Hammerer
V1	10/23/17	Revisions/ More Information Added	Coty Hammerer

END OF REPORT