



Test Report Prepared By:

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EMC testing of the Levven Automation Soulplay FHSS wireless radio in accordance with

FCC Part 15.247, ANSI C63.4: 2014 and ANSI C63.10: 2013 as referenced by FCC DA-00-705 rel. March 30, 2000.

FCC ID: 2AA9N-LASY40

Prepared for:

Levven Automation

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REVISION RECORD

ISSUE	DATE	AUTHOR	REVISIONS
DRAFT 1	2019-01-14	I. Akram	Initial draft submitted for review.
Release 1	2019-02-11	M. Rousseau	Sign off
Release 2	2019-02-15	I. Akram	Combined measurement data in one report and correction in calibration dates, band edge plot heading correction and frequencies.

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1.0 INTRODUCTION

1.1 Scope

The purpose of this report is to present the results of compliance testing performed in accordance with FCC Part 15.247, ANSI C63.4-2014 and ANSI C63.10-2013 to gain FCC Certification Authorization for Low-Power License-Exempt transmitters. All test procedures, limits, criteria, and results described in this report apply only to the Levven Automation Soulplay test sample, referred to herein as the EUT (Equipment Under Test).

The sample has been provided by the customer.

This report does not imply product endorsement by the Electronics Test Centre, A2LA, nor any Canadian Government agency.

1.2 Applicant

This test report has been prepared for Levven Automation, located in Edmonton, Alberta, Canada.

1.3 Test Sample Description

Product Name:	Soulplay		
Frequency Band	2400 – 2483.5 MHz		
EUT Classification	FHSS		
Type of Modulation	FSK (Frequency Shift Keying)		
Frequency Range	2403.5 – 2477.3 MHz		
Antenna Ginseng 1 radio	In-frame, dipole, 5.77 dBi		
Antenna Ginseng 2 radio	PCB trace, Slot Antenna, 4.20dBi		
Detachable/Non Detachable	Non-detachable		
Model# / Serial#	LA-SY40 (with enclosure), s/n N/A		
	LA-SY40 (PCBA), s/n N/A		
Power supply:	120 VAC / 60 Hz		

As provided to ETC (Airdrie) by Levven Automation:

1.4 General Test Conditions and Assumptions

The EUT was set up and exercised using the configurations, modes of operation and arrangements defined in this report only. All inputs and outputs to and from other equipment associated with the EUT were adequately simulated.

Test software provided by the customer was used to program the EUT to transmit continuously. The device operates in FSK modulation and all modes were tested and included in this report. Channel numbers 0, 48 were used as Low, Mid and High Channels respectively.

The channels used for the test are:

Low = channel 1 (2403.5 MHz)

MID = channel 25 (2440.4 MHz)

High. = channel 49 (2477.3 MHz)

The environmental conditions are recorded during each test and are reported in the relevant sections of this document.

1.5 Scope of Testing

Tests were performed in accordance with FCC Part 15.247, ANSI C63.4: 2014, ANSI C63.10: 2013 as referenced in FCC DA 00 705 rel. March 30, 2000.

1.5.1 Test Methodology

Test methods are specified in the Basic Standard as referenced and/or modified by the Product Standard in the part of Section 2 of this report associated with each particular test case.

1.5.2 Variations in Test Methodology

Any variance in methodology or deviation from the reference Standard is documented in the part of Section 2 of this report associated with each particular Test Case.

1.5.3 Test Sample Verification, Configuration & Modifications

EUT setup, configuration, protocols for operation and monitoring of EUT functions, and any modifications performed in order to meet the requirements, are detailed in each Test Case of Section 2 of this report.

1.5.4 Uncertainty of Measurement:

The factors contributing to uncertainty of measurement are identified and calculated in accordance with UKAS (United Kingdom Accreditation Service) document "Lab 34, The Expression of Uncertainty in EMC Testing, Aug 2002." as based on the "ISO Guide to the Expression of Uncertainty in Measurement, 1995."

This uncertainty estimate represents an expended uncertainty expressed at approximately 95% confidence using a coverage factor of k = 2.

Test Method	Uncertainty
Radiated Emissions Level (9 KHz – 1 GHz)	±4.6 dB
Radiated Emissions Level (1 GHz – 26.5 GHz)	±5.31 dB
Conducted Emissions Level (150 KHz – 30 MHz)	±2.7 dB
Uncertainty Conducted Power level	±0.5 dB
Uncertainty Conducted Spurious emission level	±0.6 dB
Uncertainty for Bandwidth test	±1.5 %

2.0 TEST CONCLUSION

STATEMENT OF COMPLIANCE

The customer equipment referred to in this report was found to comply with the requirements, as summarized below.

The EUT was subjected to the following tests. Compliance status is reported as **Compliant** or **Non-compliant**. **N/A** indicates the test was Not Applicable to the EUT.

Note: Maintenance of compliance is the responsibility of the Manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the EUT with respect to the standards detailed in this test report.

The following table summarizes the tests performed in terms of the specification, class or performance criterion applied, and the EUT modification state.

Test Case	Test Type	Specification	Test S	ample	Modifications	Config.	Result
	Gins equency Range = 2 Conducted Tx Pow	2403.5 – 2477.3 –M			equency Range		477.3 –MHz 3dBm (35.2mW)
2.1	AC Conducted Emissions (Tx)	15.207	LA-SY40) (PCBA)	none	see § 2.1	Compliant
2.2	Occupied Bandwidth	15.247(a)(1) 15.247(2)(2)	LA-SY40) (PCBA)	none	see § 2.2	Compliant
2.3	Max Output Power Conducted	15.247(b)	LA-SY40) (PCBA)	none	see § 2.3	Compliant
2.4	Band Edge	15.247(d)	LA-SY40) (PCBA)	none	see § 2.4	Compliant
2.5	Conducted Spurious	15.247(d)	LA-SY40) (PCBA)	none	see § 2.5	Compliant
2.6	Minimum channel separation	15.247(a)(1)	LA-SY40) (PCBA)	none	see § 2.6	Compliant
2.7	Hopping Channels	15.247(a, 1(iii))	LA-SY40) (PCBA)	none	see § 2.7	Compliant
2.8	Average time of Occupancy	15.247(a, 1(iii))	LA-SY40) (PCBA)	none	see § 2.8	Compliant
2.9	EUT Position	ANSI C63.4	LA-SY4 enclo	40 (with sure)	none	see § 2.9	n/a
2.10	Radiated Spurious (Tx Mode)	15.205, 15.209 15.247(d)		40 (with sure)	none	see § 2.11	Compliant
2.11	RF Exposure	15.247(i)	LA-SY40) (PCBA)	none	see § 2.10	Exempt

Refer to the test data for applicable test conditions.

2.1 AC Power Line Conducted Emissions: Transmit Mode

Test Lab: Electronics T	est Centre, Airdrie
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Test Personnel: Bushra Muharram

Date: 2018-12-19 (21.3°C,14.3 % RH)

Standard: FCC Part 15.207 Basic Standard: ANSI C63.10: 2013

EUT: Soulplay

EUT status: Compliant

Comments The conducted emissions produced by a device shall not exceed the limits as specified.

2.1.1 Test Guidance: ANSI C63.10-2013, Clause 6.2

Before any testing is performed, the Ambient (measurement noise floor) is recorded, and a QC check is performed to show that the system is functioning correctly.

Testing starts with a scan, performed under software control. After this is complete, the list of frequencies of interest is generated. These frequencies are then investigated for quasi-peak and average amplitude, as applicable. Emissions measured with a QP detector that fall below the Average limit are deemed to meet both requirements.

2.1.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

2.1.3 Test Equipment

Testing was performed with the following equipment:

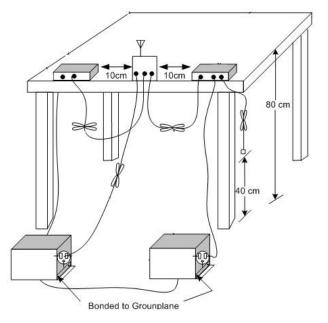
Equipment	Manufacturer	Model #	Asset #	Calibration Date	Calibration Due
EMC Software	UL	Ver. 9.5	ETC-SW- EMC 2.1	N/A	N/A
EMI receiver	Agilent	N9038A	6130	2018-05-02	2019-05-02
LISN	Com-Power	LI-215A	6180	2018-06-06	2020-06-06
Temp/RH logger	Extech	42270	5892	2018-04-13	2019-04-13

2.1.4 Test Sample Verification, Configuration & Modifications

The Soulplay was power up by main. Both radios are transmitting simultaneously in a worse case transmit power during the test.

The EUT met the requirements without modification.

Test setup diagram:



2.1.5 Conducted Emissions Data:

The EUT was evaluated in all transmit/Receive mode.

The emissions data is presented in tabular form, showing the uncorrected spectrum analyzer reading, the correction factors applied, the net result, the value(s) of limit at the frequency measured, and the Delta between the result and the limit.

Freq. Marker	Freq. (MHz)	Raw reading (dBµv)	Det.	LISN Factor (dB/m)	Cable Loss (dB)	Corrected Reading (dBµV)	FCC 15.207 Limit (dBµV)	Delta (dB)	L/N
1	0.15846	35.02	Av	.8	0	35.82	55.54	-19.72	Line
2	0.18571	33.68	Av	.6	.1	34.38	54.23	-19.85	Line
1	0.15876	31.05	Av	.7	0	31.75	55.53	-23.78	Neutral
2	0.68805	29.4	Av	0	0	29.4	46	-16.6	Neutral

Av = Average Detector

Raw Reading in $dB\mu V$ + Antenna Factor in dB/m + Gain/Loss Factor in dB = Corrected Field Strength in $db\mu V/m$.

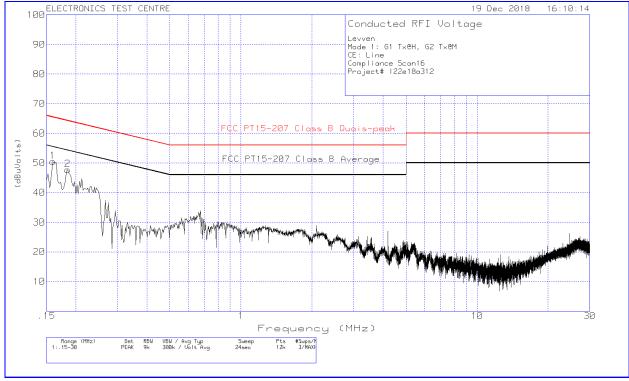
Note: When a preamp is used, the resulting gain is compensated, producing a negative value for the Cable Loss.

Negative values for Delta indicate compliance.

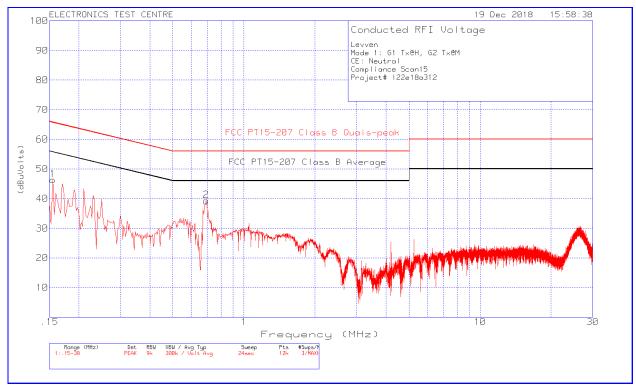
The Ground Bond was measured and found to be 1.1 m Ω .

Note: When a preamp is used, the resulting gain is compensated, producing a negative value for the Cable Loss.

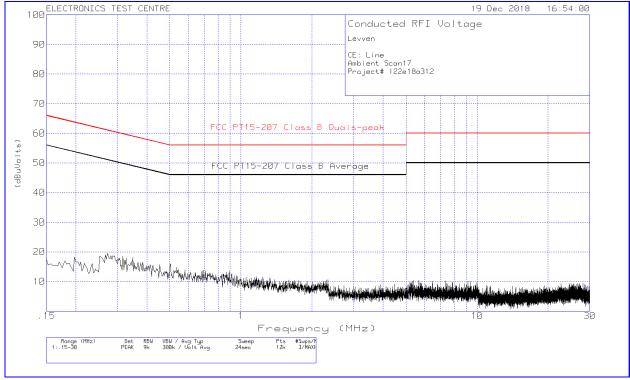




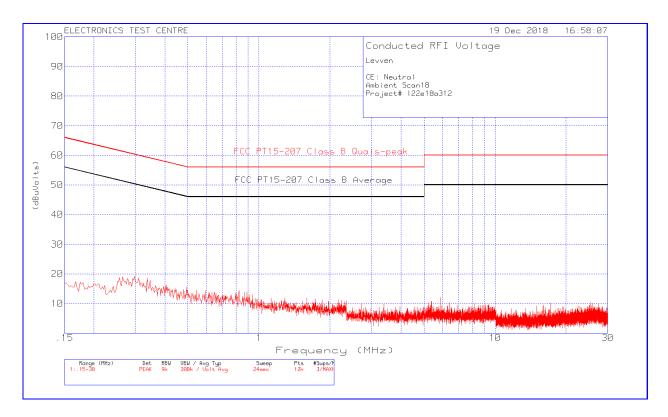
Plot of Conducted Emissions: Neutral (Tx Mode Ginseng1/Ginseng2)



Plot of Test Chamber Ambient: Line



Plot of Test Chamber Ambient: Neutral



2.2 Channel Occupied Bandwidth

Test Lab: Electronics Test Centre, AirdrieEUT: SoulplayTest Personnel: Imran Akram
Bushra MuharramStandard: FCC PART 15.247
Basic Standard: ANSI C63.10-2013Date: 2018-12-14 (20.6°C,14.2 % RH)

EUT status: Compliant

Specification: FCC 15.247 (a, 1)

Criteria: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

2.2.1 Test Guidance: ANSI C63.10-2013, Clause 6.9.2 & 6.9.3 / DA 00-705

This measurement is performed at low, mid and high frequencies, with modulation.

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

Use the following s	Use the following spectrum analyzer settings:					
Span	approximately 2 to 3 times the 20 dB bandwidth, centered on a					
	hopping channel					
RBW	> 1% of the 20 dB bandwidth					
VBW	≥ RBW					
Sweep	auto					
Detector function	peak					
Trace	max hold					
Allow the trace to stabilize. The automated 99% BW function of the spectrum analyzer is						
engaged, 20 dB O	BW is measured with the x dB function.					

2.2.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

2.2.3 Test Equipment

Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-2	1 year	2019-05-2
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

2.2.4 Test Sample Verification, Configuration & Modifications

The EUT was set to transmit continuously on a selected channel with test-specific software. The output was modulated as in normal operation.

The EUT modified to provide the direct access to antenna trace for conducted measurements.

For compliance purposes EUT met requirements without any modification

There is no Deviation and exclusions from test specifications.

Test setup diagrams for Occupied Bandwidth testing:

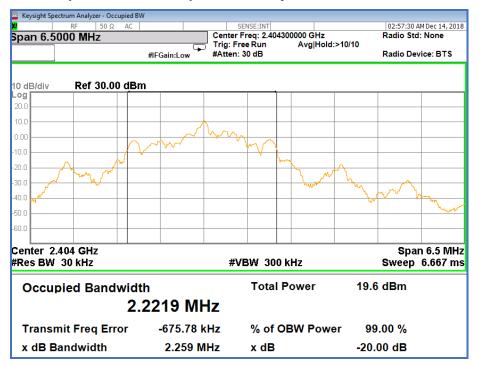
Conducted:



2.2.5 Channel Occupied Bandwidth Data: (Ginseng-1 Radio)

Channel	Freq. [MHz]	20 dB OBW [MHz]	99% OBW [MHz]
Low	2403.5	2.259	2.2219
Mid	2440.4	2.266	2.2296
High	2477.3	2.265	2.2799

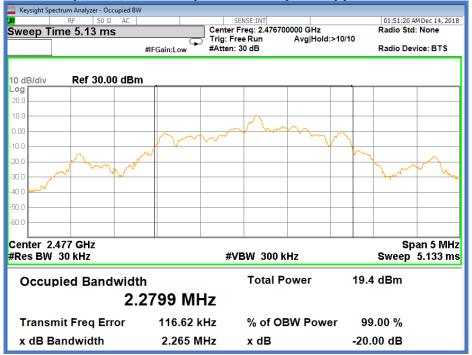
Screen captures from the spectrum analyzer: Low Channel



Keysight Sp	ectrum Analy	zer - Occ	upied BW	1							
LXI	RF	50 Ω	AC			S	ENSE:INT			03:23:21 A	M Dec 14, 2018
Center F	req 2.4	4090	0000	GHz		Center I Trig: Fr	Freq: 2.440900	0000 GHz Avg Hold	->10/10	Radio Std	: None
]			#IFGa	in:Low	#Atten:		Avginoid	.~10/10	Radio Dev	rice: BTS
10 dB/div	Ref	30.00) dBm	<u> </u>							
Log											
20.0											
10.0						Λ					
0.00				~	~ ~		γ				
-10.0				\sim	$\sim \sim \sim$		- W				
-20.0			N					how	Δ		
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	my	1					ų	h		
-30.0	X	-01						1. A A A A A A A A A A A A A A A A A A A	t h	1 mm	$\frown$
-40.0	<del>هر</del>									W - V	- Yannan Ju
-50.0											~
-60.0											
										_	
Center 2 #Res BW						#V	BW 300 k	Hz			n 6.5 MHz 6.667 ms
Occu	Occupied Bandwidth Total Power 19.5 dBm										
2.2296 MHz											
Trans	mit Fre	q Err	or	-4	03.40	кНz	% of OE	BW Powe	er 99	.00 %	
x dB E	Bandwi	dth		2	2.266 N	1Hz	x dB		-20.	00 dB	
Trans	mit Fre	q Err	2.2	229 -4	03.40	kHz	% of OE		er 99	0.00 %	

#### Screen captures from the spectrum analyzer: MID Channel

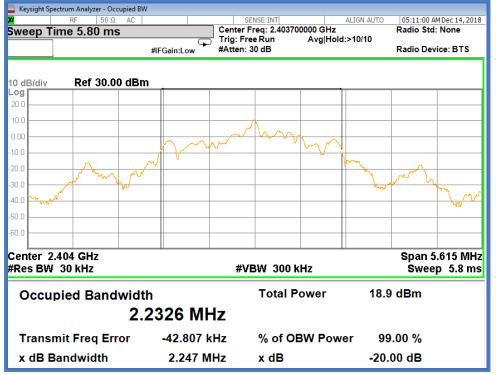
#### Screen captures from the spectrum analyzer: Upper Channel



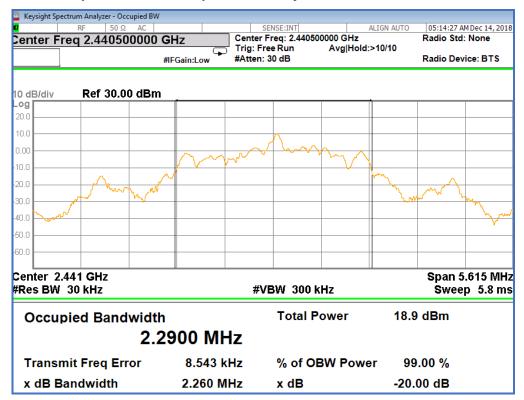
#### 2.2.6 Channel Occupied Bandwidth Data: (Ginseng-2 Radio)

Channel	Freq. [MHz]	20 dB OBW [MHz]	99% OBW [MHz]
Low	2403.5	2.247	2.2326
Mid	2440.4	2.260	2.2900
High	2477.3	2.256	2.2566

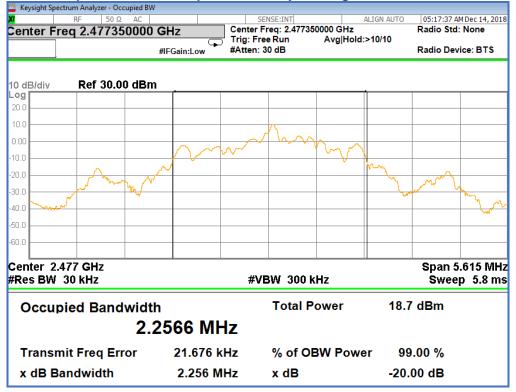
#### Screen captures from the spectrum analyzer: Low Channel



#### Screen captures from the spectrum analyzer: MID Channel



#### Screen captures from the spectrum analyzer: High Channel



# 2.3 Peak Output Power (Conducted)

Test Lab: Electronics Test Centre, Airdrie

Test Personnel: Imran Akram Bushra Muharram

Busilia Mullallalli

EUT: Soulplay

Standard: FCC PART 15.247

Basic Standard: ANSI C63.10: 2013

Date: 2018-12-14 (20.6°C,14.2 % RH)

# **EUT status: Compliant**

# Specification: FCC Part 15.247(b, 1)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

**Criteria:** For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

# 2.3.1 Test Guidance: ANSI C63.10-2013, Clause 11.9.2.2.2, Clause 7.8.5 / DA 00-705

This measurement is performed at low, mid and high frequencies, with modulation.

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

Use the following spectrum analyzer settings:							
Span	approximately 5 times the 20 dB bandwidth, centered on a hopping						
	channel						
RBW	RBW > the 20 dB bandwidth of the emission being measured						
VBW	VBW ≥ RBW						
Sweep	auto						
Detector function	peak						
Trace	max hold						
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.							

# 2.3.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

# 2.3.3 Test Equipment

Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-2	1 year	2019-05-2
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

## 2.3.4 Test Sample Verification, Configuration & Modifications

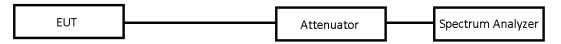
The EUT was set to a selected channel with test-specific software. The output was modulated as in normal operation.

The EUT modified to provide the direct access to antenna trace for conducted measurements.

For compliance purposes EUT met requirements without any modification

#### Test setup diagrams for Peak Power testing:

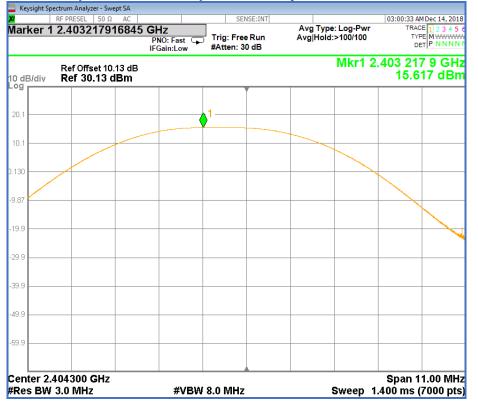
Conducted:



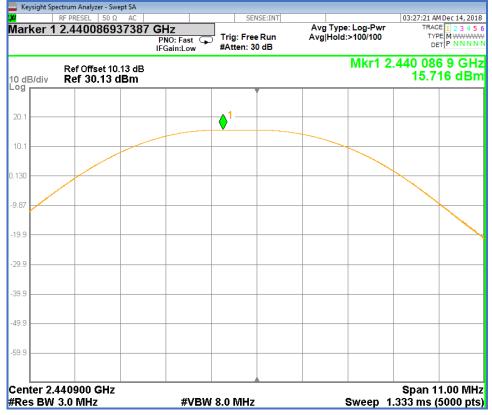
#### 2.3.5 Peak Output Power Data (Ginseng-1 Radio)

Channel	Freq. [MHz]	Output Power measured (dBm)	Output Power Limit (dBm)	Output Power measured (mW)	Output Power Limit (mW)	Result
Low	2403.5	15.617	20.97	36.4502	125	Compliant
Mid	2440.4	15.716	20.97	37.2907	125	Compliant
High	2477.3	15.376	20.97	34.4826	125	Compliant

#### Screen Captures from the spectrum analyzer: Low Channel



#### Screen Captures from the spectrum analyzer: MID Channel



Screen Captures from the spectrum analyzer: High Channel

	•		-	
Keysight Spectrum Analyzer - Swept SA				
RF PRESEL 50 Ω AC		SENSE:INT		01:56:01 AM Dec 14, 2018
Marker 1 2.476403600000	GHz		Avg Type: Log-	
	PNO: Fast 😱	Trig: Free Run	Avg Hold:>100/1	DET P N N N N
	IFGain:Low	#Atten: 30 dB		DEI
			Mka	1 2.476 403 6 GHz
Ref Offset 10.13 dB			ININI ININI	
10 dB/div Ref 30.13 dBm				15.376 dBm
Log		The second secon		
20.1		. 1		
20.1		<b></b>		
		<b>V</b>		
10.1				
10.1				
0.130				
-9.87				
-19.9				
-29.9				
-39.9				
-49.9				
-49.9				
-59,9				
-33.5				
Center 2.476700 GHz				Span 11.40 MHz
#Res BW 3.0 MHz	#VBW :	50 MHz	Swee	p 1.067 ms (2001 pts)
			51100	

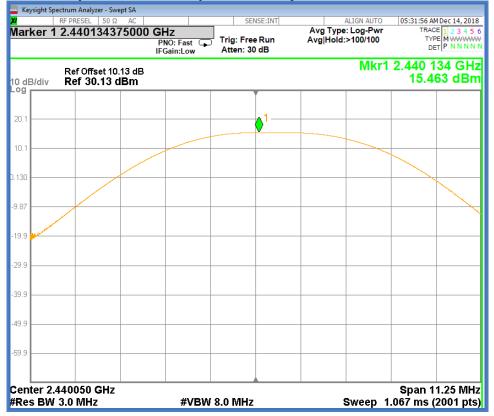
2.3.6	Peak Output Power Data (Ginseng-2 Radio)
-------	------------------------------------------

Channel	Freq. [MHz]	Output Power measured (dBm)	Output Power Limit (dBm)	Output Power measured (mW)	Output Power Limit (mW)	Result
Low	2403.5	15.399	20.97	34.6657	125	Compliant
Mid	2440.4	15.463	20.97	35.1803	125	Compliant
High	2477.3	15.171	20.97	32.8927	125	Compliant

# Screen Captures from the spectrum analyzer: Low Channel

Keysight Sp XI	RF PRESEL 50	Swept SA Ω AC		SENSE:		ALIGN AUTO		M Dec 14, 2018
/larker 1	1 2.403300		<b>iHz</b> PNO: Fast ⊂ <b>→</b> FGain:Low	Trig: Free Ru Atten: 30 dE	un Avgil	Type: Log-Pwr Hold:>100/100	TYP	E 1 2 3 4 5 0 E M WWWW ET P N N N N
0 dB/div	Ref Offset 1 Ref 30.13					Mkr1	2.403 3 15.3	801 GHz 99 dBm
.09								
20.1				1				
10.1								
.130								
3.87								
19.9								
29.9								
39.9								
49.9								
59.9								
enter 2	403250 GH	7					Span 1	1.25 MHz

#### Screen Captures from the spectrum analyzer: MID Channel



#### Screen Captures from the spectrum analyzer: High Channel



## 2.4 Band Edge Attenuation

Test Lab: Electronics Test Centre, Airdrie	EUT: Soulplay
Test Personnel: Imran Akram	Standard: FCC PART 15.247
Bushra Muharram	Basic Standard: ANSI C63.10: 2013

Date: 2018-12-14 (20.6°C,14.2 % RH)

# EUT status: Compliant

#### Specification: FCC Part 15.247(d)

**Criteria:** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.209(a) (see §15.205(c)).

#### 2.4.1 Test Guidance: ANSI C63.10-2013 Clause 11.13.2 & 6.10.4, 6.10.6 / DA 00-705

This measurement is performed at the low and high frequencies, with modulation.

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

Use the following s	Use the following spectrum analyzer settings:						
Span	wide enough to capture the peak level of the emission operating o						
	the channel closest to the bandedge, as well as any modulation						
	products which fall outside of the authorized band of operation.						
RBW	> 1% of the span						
VBW	≥ RBW						
Sweep	auto						
Detector function	peak						
Trace	max hold						
Tracemax holdAllow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the specified limit. Now, using the same instrument settings, enable the hopping function of the EUT and Follow the same procedure listed above.							

#### 2.4.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

## 2.4.3 Test Equipment

Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-2	1 year	2019-05-2
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

## 2.4.4 Test Sample Verification, Configuration & Modifications

The EUT was set to transmit continuously on a selected channel with test-specific software. The output was modulated as in normal operation. The EUT met the requirements without modification.

## Test setup diagrams for Band Edge Attenuation testing:

#### Conducted:



# 2.4.5 Band Edge Data (Ginseng-1 Radio)

Modulation	Channel	Attenuation at Band Edge	Attenuation Limit at Band Edge		
	2403.5 MHz	39.591 dBc	20 dBc		
(Non – Hopping)	2477.3 MHz	53.423 dBc	20 dBc		
(Hopping)	2403.5 MHz	46.176 dBc	20 dBc		
(Hopping)	2477.3 MHz	48.654 dBc	20 dBc		

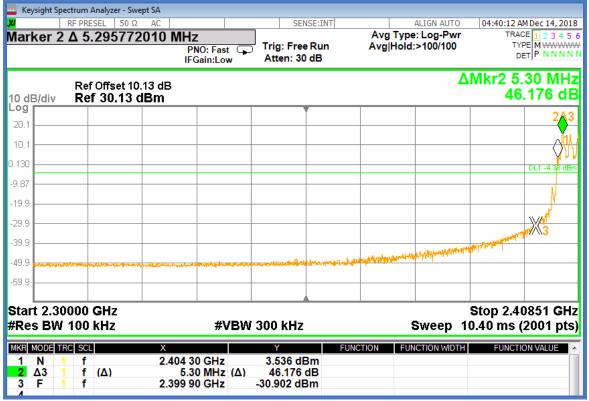
# Screen Capture from the spectrum analyzer: Lower Band Edge (Non Hopping)

arker 2 Δ 4.2052	72182 MHz PNO: Fast IFGain:Lov		Avg Type: Log-Pwr Avg Hold:>100/100	03:08:46 AM Dec 14, 20 TRACE 1 2 3 4 5 TYPE M WWW DET P N N N
Ref Offset 0 dB/div Ref 30.1			Δ	Mkr2 4.205 MH 39.591 d
- <b>°</b> g 20.1				<u></u> 2∆:
10.1				X
130				
				DL1 -4.38 dE
.87				
9.9				3
9.9				
9.9 <b></b>		and the state of the	tana ang ang ang ang ang ang ang ang ang	
19.9				
59.9				
tart 2.30000 GHz Res BW 1.0 MHz	#\	/BW 3.0 MHz	Sweep	Stop 2.40980 GH 1.400 ms (7000 pt
IKR MODE TRC SCL	X 2.404 105 GHz	Y FU 15.536 dBm	UNCTION FUNCTION WIDT	H FUNCTION VALUE
<b>2</b> Δ3 1 f (Δ)	4.205 MHz	(Δ) 39.591 dB		
2 Δ3 1 f (Δ) 3 F 1 f	4.205 MHz 2.399 900 GHz	(Δ) 39.591 dB -24.055 dBm		

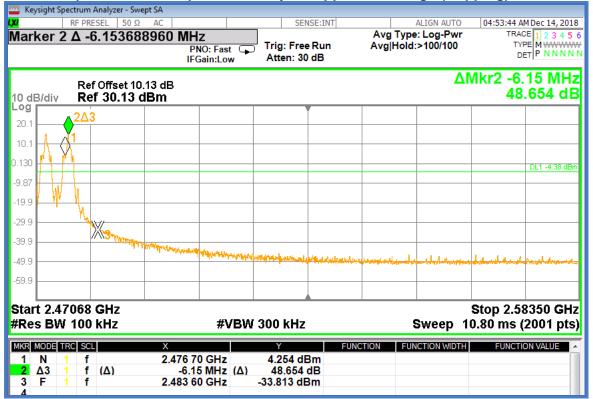
# Screen Capture from the spectrum analyzer: Upper Band Edge (Non Hopping)

v Marker (	RF PRESEL 50 ⊆ 2 -6.304000	000 MHz	PNO: Fast 🕞 FGain:Low	SENSE:IN Trig: Free Run #Atten: 30 dB	Avg T	ype: Log-Pwr old:>100/100	TYPE	Dec 14, 2018
10 dB/div	Ref Offset 1 Ref 30.13					ΔМ	kr2 -6.30 53.	04 MHz 413 dE
20.1	<mark>2∆3</mark>							
10.1	×							
).130								DL1 -4.62 dBr
9.87								
19.9		n						
29.9								
39.9					Mara - 1. J. M. Maran,			
49.9								
59.9								
	7600 GHz V 1.0 MHz		#VBW	3.0 MHz		Sweep 1	Stop 2.50 .067 ms (2	
MKR MODE 1 Ν 2 Δ3 3 F	TRC SCL 1 f 1 f (Δ) 1 f	× 2.476 4 -6.3 2.483 6	04 MHz (Δ)	Y 15.271 dBm 53.413 dB -38.099 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO	N VALUE

#### Screen Capture from the spectrum analyzer: Lower Band Edge (Hopping)



#### Screen Capture from the spectrum analyzer Upper Band Edge (Hopping)



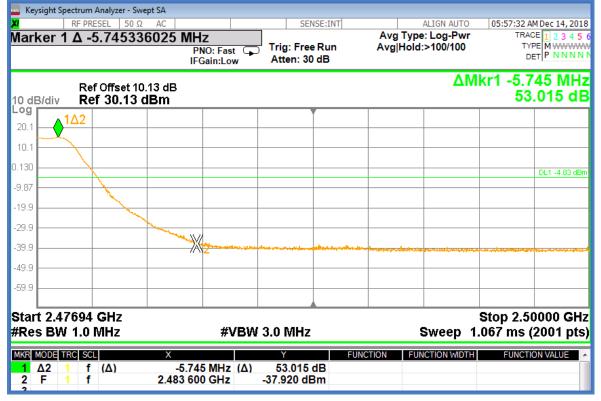
# 2.4.6 Band Edge Data (Ginseng-2 Radio)

Modulation	Channel	Attenuation at Band Edge	Attenuation Limit at Band Edge	
	2403.5 MHz	39.354 dBc	20 dBc	
(Non-Hopping)	2477.3 MHz	53.015 dBc	20 dBc	
(Hopping)	2403.5 MHz	50.418 dBc	20 dBc	
(Hopping)	2477.3 MHz	49.040 dBc	20 dBc	

## Screen Capture from the spectrum analyzer: Lower Band Edge (Non Hopping)

Keysight Speed	ctrum Analyzer - Swo	ept SA						
	RF PRESEL 50 Ω			SENSE:I		ALIGN AUTO		MDec 14, 2018
Marker 1	Δ 4.291088	F	<b>IZ</b> PNO: Fast ⊂ <b>⊾</b> FGain:Low	Trig: Free Ru Atten: 30 dB		Type: Log-Pw Hold:>100/100	TY	CE 1 2 3 4 5 6 PE M WWWW ET P N N N N
10 dB/div	Ref Offset 10 Ref 30.13 (						ΔMkr1 4. 39	.29 MHz .354 dB
20.1				The second se				<mark>1∆</mark> 2
10.1								A
0.130								DL1 4.60 dBm
-9.87								DET #4.60 (Dhi
-19.9								
-29.9								×2
-39.9		a balanta a sural-lares	-			January and roland line	and the second second	/ 
-49.9								
-59.9								
Start 2.30 #Res BW			#VBW	3.0 MHz		Sweep	Stop 2.4 1.067 ms (	0848 GHz (2001 pts)
MKR MODE TR		x		Y	FUNCTION	FUNCTION WIDT	H FUNCTI	ON VALUE
1 Δ2 1 2 F 1	f (Δ) f		29 MHz (Δ) 90 GHz	39.354 dB -23.991 dBm				

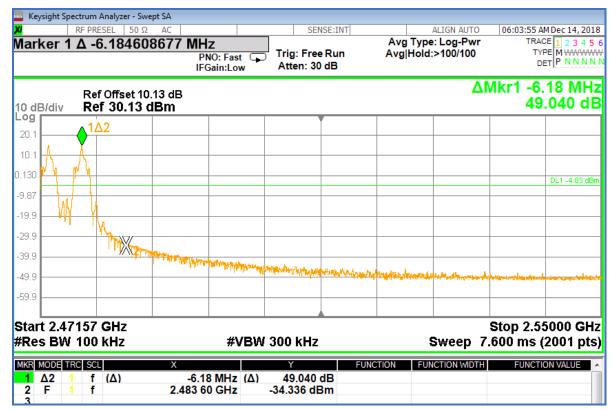
#### Screen Capture from the spectrum analyzer: Upper Band Edge (Non Hopping)



#### Screen Capture from the spectrum analyzer: Lower Band Edge (Hopping)

X	Spectrum Analyzer - S RF PRESEL 50 1 Δ 5.26737	Ω AC 21477 MH	Z NO: Fast G	SENSE:I Trig: Free Ru Atten: 30 dB	Avg	ALIGN AUTO Type: Log-Pwr Iold:>100/100	TRA TY	M Dec 14, 2018 CE 1 2 3 4 5 PE M WWWW ET P N N N N
10 dB/div	Ref Offset 1 Ref 30.13	0.13 dB	Gam.LOw	71110111 00 42			∆Mkr1 5 50	.27 MH .418 dE
20.1								1/2
10.1								
0.130								111
-9.87								DL1 -4.60 dBn
-19.9								N
-29.9								
-39.9							A REAL PROPERTY.	₫Ж2
-49.9	An ideal distantin Andre Baarde	aller and storic first an estimate	Problem Bulleting Product		with a shad a shall be seen	the state of the s	MARY .	
-59.9								
	30000 GHz W 100 kHz		#VBW	300 kHz		Sweep	Stop 2.4 10.40 ms (	0848 GH: (2001 pts
MKR MODE		×		Y	FUNCTION	FUNCTION WIDT	H FUNCTI	ON VALUE
1 Δ2 2 F	1 f (Δ) 1 f	5.2 2.399 9	27 MHz (Δ) 0 GHz	50.418 dB -35.694 dBm				

#### Screen Capture from the spectrum analyzer: Upper Band Edge (Hopping)



#### 2.5 Conducted Harmonic and Spurious Emissions

Test Lab: Electronics Test Centre, Airdrie Test Personnel: Imran Akram Bushra Muharram Date: 2018-12-14 (20.6°C,14.2 % RH)	EUT: Soulplay Standard: FCC PART 15.247 Basic Standard: ANSI C63.4-2014
EUT status	s: Compliant

# Specification: FCC Part 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

#### 2.5.1 Test Guidance: ANSI C63.10-2013, Clause 6.7

This measurement is performed at the low, mid and high frequencies, with modulation. The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

Use the following spectrum analyzer settings:						
Span	Wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.					
RBW	100 kHz					
VBW	≥ RBW					
Sweep	auto					
Detector function	peak					
Trace	max hold					
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.						

#### 2.5.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

#### 2.5.3 Test Equipment

Testing was performed with the following equipment:

#### 2.5.4 Test Sample Verification, Configuration & Modifications

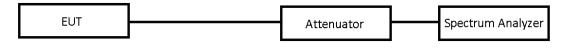
Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-02	1 year	2019-05-02
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
2.4GHz Notch Filter	Micro-Tronics	BRM 50702	-	2018-01-15	1 year	2019-01-15
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

The EUT was set to a selected channel with test-specific software. The output was modulated as in normal operation.

The EUT met the requirements without modification.

The EUT modified to provide the direct access to antenna trace for conducted measurements.

#### Test setup diagram for Conducted Spurious Emissions testing:



# 2.5.5 Conducted Emissions Data: (Ginseng-1 Radio)



			#Res BW 3.0 MHz	#VBW 8.0 MHz	Sweep 1.400 ms (7000 p	ots			
Keysight Spectrum Analyzer - Swept SA				🔤 Key	sight Spectrum Analyzer - Swep	ot SA			
RF PRESEL 50 Ω 🛕 DC	SENSE		03:18:21 AM Dec 14, 2018	<u>×/</u>	RF PRESEL 50 Ω		SENSE:INT		03:12:03 AM Dec 14, 2
ker 1 409.625925 kHz	PNO: Fast C Trig: Free R		-Pwr TRACE 1 2 3 4 5 6 100 TYPE M WWWW DET P N N N N	Mark	er 1 627.061552	PNO: Fast	Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TYPE M WWW
	IFGain:Low #Atten: 30 c	βB				IFGain:Low	#Atten: 30 dB		DET P N N N
Ref Offset 10.13 dE	3		Mkr1 410 kHz		Ref Offset 10.	13 dB		N	1kr1 627.06 MI
B/div Ref 30.13 dBm			-51.956 dBm	10 dE Log	Idiv Ref 30.13 d	Bm			-48.440 dB
1				20.1			Ť		
1				10.1					
-			DL1 -4.38 dBm	0.130					DL1 -4.38
7				-9.87					
9				-19.9					
9				-29.9					
9 1				-39.9				1	
9				-49.9		and the second	the data and the data and the second state of the second state of the second state of the second state of the s		
9	1	and the second	a de 1996 del mande - este de la compacta da dida	-59.9					
And	and the second secon								
art 0.38 MHz	49 (DW) 00 LUL-	0	Stop 30.00 MHz		0.0300 GHz				Stop 1.0000 GI
tes BW 9.1 kHz	#VBW 30 kHz	Swee	ep 339.9 ms (5000 pts)	#Res	8W 100 kHz	#VBW	300 kHz	Sweep	93.11 ms (9700 p
R MODE TRC SCL X	Y	FUNCTION FUNCTION	WIDTH FUNCTION VALUE		ODE TRC SCL	X		JNCTION FUNCTION WIDT	H FUNCTION VALUE
R MODE TRC SCL X	¥ 410 kHz -51.956 dBn		WIDTH FUNCTION VALUE	1	N 1 f	x 627.06 MHz	Y Fl -48.440 dBm	UNCTION FUNCTION WIDT	H FUNCTION VALUE
R MODE TRC SCL X	¥ 410 kHz -51.956 dBn	n		1	N 1 f	pt SA	-48.440 dBm	JNCTION FUNCTION WIDT	
R MODE TRC SCL X N 1 f Keysight Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC	410 kHz -51.956 dBn	n E:INT Avg Type: Log	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 1 2 3 4 5 6	Left Left Xi	N 1 f	pt SA AC	-48.440 dBm	Avg Type: Log-Pwr	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4
R MODE TRC SCL X N 1 f Keysight Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC	410 kHz -51.956 dBn 55885 12 GHz Trig: Free I PNO: Fast D Trig: Free I	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 1 2 3 4 5 6	Left Left Xi	N 1 f sight Spectrum Analyzer - Swep RF PRESEL 50 Ω	AC	-48.440 dBm		03:15:44 AM Dec 14, 20
Keysight Spectrum Analyzer - Swept SA RF PRESEL 50 0 AC rrker 1 2.40365398669	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDec 14, 2018 g-Pwr TRACE 12 3 4 5 ( 1/100 TYPE MUNAWAWA DET P N N N N	Left Left Xi	N 1 f sight Spectrum Analyzer - Sweg RF PRESEL 50 Ω Ker 1 16.0693112	AC 87419 GHz PNO: Fast IFGain:Low	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWWW DET P N N N
Koyde TRG ScL X N 1 f Keydeht Spectrum Analyzer - Swept SA I RF PRESEL SO 0 AC Irker 1 2.40365398669 Ref Offset 10.13 dE	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 12 3 4 5 6 y/100 Tryreg Maxwaw Det P NNNN Mkr1 2.403 7 GHz	und Kep Mari	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14,20 TRACE 1 2 3 4 TYPE M WAWA DET P N N N r1 16.069 3 GF
RM009         FIGE         SQL         X           N         1         f         Keysight Spectrum Analyzer - Swept SA         RF PRESEL         50.0         AC           arker         1         2.40365398669         AC         AC <td>410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30</td> <td>n Avg Type: Loç Run Avg Hold:&gt;100</td> <td>03:13:55 AMDec 14, 2018 g-Pwr TRACE 12 3 4 5 ( 1/100 TYPE MUNAWAWA DET P N N N N</td> <td>Left Left Xi</td> <td>N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω ker 1 16.0693112 Ref Offset 10.</td> <td>AC AC A</td> <td>-48.440 dBm</td> <td>Avg Type: Log-Pwr Avg Hold:&gt;100/100</td> <td>03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 1 TYPE M WWWW</td>	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDec 14, 2018 g-Pwr TRACE 12 3 4 5 ( 1/100 TYPE MUNAWAWA DET P N N N N	Left Left Xi	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 1 TYPE M WWWW
MODE         TRG         Scl.         X           N         1         f         f           Keysight Spectrum Analyzer - Swept SA         Ref Perfect         50 0         Ac           arker         1         2.40365398669         Ac         Ac           arker         1         2.40365398669         Ac         Ac           GB/div         Ref Offset 10.13 dE         Ac         Ac         Ac	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 12 3 4 5 6 y/100 Tryreg Maxwaw Det P NNNN Mkr1 2.403 7 GHz	Mari 10 di	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 1 TYPE M WWW DET P N N N r1 16.069 3 GH
Red by TAGE         Sect.         X           N         1         f         f           Keysight Spectrum Analyzer - Swept SA         Swept SA         Swept SA           arker 1         2.40365398669         G         Acrker 10.13 dE           dB/div         Ref Offset 10.13 dB         S         1	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 12 3 4 5 6 y/100 Tryreg Maxwaw Det P NNNN Mkr1 2.403 7 GHz	10 di Log	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 1 TYPE M WWW DET P N N N r1 16.069 3 GH
R MODE TRG Scl         x           N         1         f           Keysight Spectrum Analyzer - Swept SA RF PRESEL         50 0         AC           arker         1         2.40365398669         AC           dB/div         Ref Offset 10.13 dB         B         1           11         1         1         1         1	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AM Dec 14, 2018 g-Pwr TRACE 12 3 4 5 6 y/100 Tryreg Maxwaw Det P NNNN Mkr1 2.403 7 GHz	10 di 20.1	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
GI MODE TRG SEL X N 1 f Koysight Spectrum Analyzer - Swept SA RF PRESEL ISO 0 AC arker 1 2.40365398669 Ref Offset 10.13 dE	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	10 dt 20 11 10 11 10 11	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AM Dec 14, 20 TRACE 1 2 3 4 1 TYPE M WWW DET P N N N r1 16.069 3 GH
Repetition         Repetit	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	20 1 2 6 2 6 2 0 1 10.1 0.130 -9.87	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
Repetting         Ref         Sector         All         F           Kysight         1         f         F         Sector         Sector <td>410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30</td> <td>n Avg Type: Loç Run Avg Hold:&gt;100</td> <td>03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t</td> <td>20 1 20 1 10.130 -9.87 -19.9</td> <td>N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.</td> <td>AC AC A</td> <td>-48.440 dBm</td> <td>Avg Type: Log-Pwr Avg Hold:&gt;100/100</td> <td>03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA</td>	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	20 1 20 1 10.130 -9.87 -19.9	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
Representation         Ref         Offset         10.13         dE           Ref         Ref         30.13         dBm         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         39         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30         30 <t< td=""><td>410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30</td><td>n Avg Type: Loç Run Avg Hold:&gt;100</td><td>03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t</td><td>Logi 20.1 0.130 .997 -19.9 -29.9</td><td>N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.</td><td>AC AC A</td><td>-48.440 dBm</td><td>Avg Type: Log-Pwr Avg Hold:&gt;100/100</td><td>03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA</td></t<>	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	Logi 20.1 0.130 .997 -19.9 -29.9	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
R MODE         TRG         ScL         X           N         1         f         X           Keysight Spectrum Analyzer - Swept SA         Ref Offset 10.13 dE         Ref Offset 10.13 dE           dB/div         Ref Offset 10.13 dE         Ref Offset 10.13 dE         Ref Offset 10.13 dE           dB/div         Ref Offset 10.13 dE         Ref Offset 10.13 dE         Ref Offset 10.13 dE           11         1         1         1         1         1           13         1         1         1         1         1           19         1         1         1         1         1         1           19         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	10 df 20 f 20 1 10.1 0.130 -9.87 -19.9 -29.9 -39.9	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
MODE         TAGE         SCL         X           N         1         f         X           Keysightspectrum Analyzer - Swept SA         Represent So 0         Ac           arker         1         2.40365398669         X           arker         1         2.40365398669         X           dB/div         Ref Offset 10.13 dB         X         X           11         1         1         1         1           10         1         1         1         1           10         1         1         1         1           10         1         1         1         1           11         1         1         1         1           12         1         1         1         1           13         1         1         1         1           14         1         1         1         1           15         1         1         1         1           16         1         1         1         1           17         1         1         1         1           18         1         1         1         1  <	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	Logi 20.1 0.130 .997 -19.9 -29.9	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
MODE         TAGE         SCL         X           N         1         f         X           Keysightspectrum Analyzer - Swept SA         Represent So 0         Ac           arker         1         2.40365398669         X           arker         1         2.40365398669         X           dB/div         Ref Offset 10.13 dB         X         X           11         1         1         1         1           10         1         1         1         1           10         1         1         1         1           10         1         1         1         1           11         1         1         1         1           12         1         1         1         1           13         1         1         1         1           14         1         1         1         1           15         1         1         1         1           16         1         1         1         1           17         1         1         1         1           18         1         1         1         1  <	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14: 2018 Per Tree 12:3:45 K tree 12:3:45 K t	10 df 20 f 20 1 10.1 0.130 -9.87 -19.9 -29.9 -39.9	N 1 f sight Spectrum Analyzer - Swej RF PRESEL 50 Ω Ker 1 16.0693112 Ref Offset 10.	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []::34 TRACE []:34 TRACE []:34 TRA
MODE         TRC         ScL         x           N         1         f         x           Keysight Spectrum Analyzer - Swept SA Re PERENT 50 0 Ac         arker 1         x           arker 1         2.40365398669         arker 10.13 dE           dB/div         Ref Offset 10.13 dE         arker 30.13 dBm           9	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	n Avg Type: Loç Run Avg Hold:>100	03:13:55 AMDer 14:2018 3-Perr Trace 12:2:3:5 Der P NNNN Mkr1 2:403 7 GHz 14:921 dBm 0L1-4:38 obs	10 df 20 f 20 f 10 df 20 f 10.11 0.130 .9.87 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .9.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9 .0.9	N 1 f  ightSpectrum Analyzer - Swe	AC A	-48.440 dBm	Avg Type: Log-Pwr Avg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE [] 3 41 TRACE [] 3 41 TYPE
R MODE         TRC         Scl.         X           N         1         f         Keysight Spectrum Analyzer-Swept SA           R P PRESEL         50 0         Ac           arker         1         2.40365398669           B         Ref Offset 10.13 dE           B         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1.1         1           1	410 kHz -51.956 dBn 2 GHz PNO: Fast IFGain:Low #Atten: 30	Avg Type: Loc Avg Type: Loc Avg Hold:>100 dB	03:13:55 AMDec 14, 2018 g-Pwr TRACE [1:23:45 c TVCE] PNNNM Mkr1 2:403 7 GHz 14.921 dBm 011:43:055 011:43:055 011:43:055 011:43:055	10 df 20.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1	N 1 f sight Spectrum Analyzer - Swe	AC A	-48.440 dBm  SENSE1NT   Trig: Free Run #Atten: 30 dB	Arg Type: Log-Pwr Arg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []: 34 TRACE []: 34 TOPE [
MODE         TAC         Scl.         x           N         1         f         x           Keysight Spectrum Analyzer - Swept SA         x         x           Intervention         RF PRESEL         SO 0         AC           Intervention         Ref Offset 10.13 dB         dB/div         Ref Offset 10.13 dB           Intervention         Ref 0         So 1.13 dB         BD           Intervention         Intervention         Intervention         Intervention           Intervention         Intervention         Interventinterven	410 kHz -51.956 dBn 2 GHz PRO: Fast PRO: Fast Fasin.Low 30 3 4 4 4 10 kHz 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5	Avg Type: Loc Avg Type: Loc Avg Hold:>100 dB	03:13:55 AM Dec 14, 2018           g-Pwr         TRACE         12.3:4.5 ( TYPE)           Mkr1 2:.403 7 GHz         14.921 dBm           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050           0:1:4:3:050         0:1:4:3:050	10 df 20.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1	N 1 f  ightSpectrum Analyzer - Swe	AC A	-48.440 dBm	Arg Type: Log-Pwr Arg Hold:>100/100	03:15:44 AMDec 14, 20 TRACE []: 34 TRACE [

	24.690955	000000	PNO: Fast G	Trig: Free Ru #Atten: 30 dB	n Avgil	Type: Log-Pwr Iold:>100/100	TYPE MWW DET PNN
dB/div	Ref 30.13	dBm				Mkr	1 24.691 0 G -26.546 dl
0.1							
0.1							
30							DL1-4.6
87							021 443
9.9							
9.9		an shallan		to prove and the second	and the second se	No. of Concession, Name	المحديدية مارسان والمتحافظ ومقارفتهم
9.9							
9.9							
9.9							
	000 GHz 1.0 MHz		#VBV	N 3.0 MHz		Sweep 1	Stop 25.000 ( 7.73 ms (7000

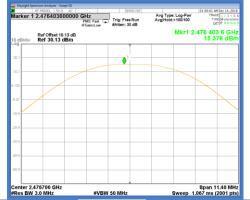
#### **MID Channel**



Keysight Spectrum Analyzer - Swept SA				🔤 Keysig	ht Spectrum Analyzer						
RF PRESEL 50 Ω 🔥 DC		Aver Terrer Law Down	03:42:49 AM Dec 14, 2018	<u>×</u>	RF PRESEL 5			SENSE:INT		e: Log-Pwr	03:35:22 AM Dec 14, 201 TRACE 1 2 3 4 5
/larker 1 385.925185 kH	PNO: Fast Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWWW	Marke	r 1 608.859	676255 MHz	IO: East	rig: Free Run	Avg Hold	:>100/100	TYPE MWWWW DET P NNNN
	IFGain:Low #Atten: 30 dB		DET P NNNNN			IFG	Gain:Low #	Atten: 30 dB			DETIPINININ
D-605			Mkr1 386 kHz		Baf Offer	t 10.13 dB				М	kr1 608.86 MH;
Ref Offset 10.13 dl 10 dB/div Ref 30.13 dBm			-51.223 dBm	10 dB/c							-48.355 dBn
-og				Log							
20.1				20.1							
10.1				10.1							
0.130				0.130 -							
			DL1 -4.28 dBm								DL1 -4.28 dBn
.9.87				-9.87							
-19.9				-19.9							
-29.9				-29.9							
-39.9 4				-39.9					1		
49.9				-49.9					<b>V</b>		
					and the second distance in the local distance			and the second se			and the second
-59.9	فالجامة الشانية وأحداد وسيادهم والمعارية والمحدية والجاعية وسيبط والمتعاد	ور والدار المالية والمار ومواردة والماردة والمردة	المقعة وفقادته إعامه ووادها والطاران	-59.9							
Start 0.38 MHz			Stop 30.00 MHz	Start (	.0300 GHz						Stop 1.0000 GHz
#Res BW 9.1 kHz	#VBW 30 kHz	Sween 3	39.9 ms (5000 pts)		3W 100 kHz		#VBW 30	0 kH7		Sween 9	13.11 ms (9700 pts
		•	, ,							•	· ·
MKR MODE TRC SCL X	386 kHz -51.223 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE		DE TRC SCL	X 609.94	6 MHz -48	Y El 3.355 dBm	JNCTION FUN	NCTION WIDTH	FUNCTION VALUE
Keysight Spectrum Analyzer - Swept SA					ight Spectrum Analyze		-40	5.505 UBIII			
Keysight spectrum Analyzer - Swept SK			03:37:42 AM Dec 14, 2018	×.	RF PRESEL			SENSE:INT			03:39:48 AM Dec 14, 2018
Marker 1 2.4405554059		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 (	Mark	er 1 16.6549	950330022			Avg Type	: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWWW
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hold:>100/100	DET P N N N N			P		Trig: Free Run Atten: 30 dB	Avg Hold:	>100/100	DET P NNN1
	ir Gain.Low mitterin co up	N/L	(r1 2.440 6 GHz				Guilleon			Micer	1 16.655 0 GHz
Ref Offset 10.13 d		IVIP	14.960 dBm			et 10.13 dB				INIKI	-31.195 dBm
10 dB/div Ref 30.13 dBm	1		14.900 0.611	10 dB Log r	div Ref 30.	.13 dBm					-51.185 UBII
20.1	ĬĬ			20.1							
				10.1							
10.1											
0.130			DL1 -4.28 dBm	0.130							DL1 -4.28 dBm
-9.87				-9.87							
-19.9				-19.9							
-29.9				-29.9							<b>⊘'</b>
				-39.9							المادور والماجة والتلاجة والمرجع
-39.9											
-49.9				-49.9							
-59.9				-69.9							
								k			
Start 1.000 GHz		_	Stop 3.600 GHz		3.600 GHz		41/D14/ 0	0 MU-	•		Stop 18.000 GHz
#Res BW 100 kHz	#VBW 300 kHz	Sweep 24	9.6 ms (26000 pts)	#Res	BW 1.0 MHz		#VBW 3.	UIVIHZ	SI	weep 37.	.00 ms (15000 pts)
MKR MODE TRC SCL	×	UNCTION FUNCTION WIDTH	FUNCTION VALUE	MKR M	ODE TRC SCL	x		Y FL	INCTION FUN	ICTION WIDTH	FUNCTION VALUE
	^ I	incrion roncholi mon	TONGTION VALUE								
	2.440 6 GHz 14.960 dBm	one non a rone non mon	TORCHOR PALOE	1		16.655	0 GHz -3	1.195 dBm			

Keysight Spectrum Analyzer - Swept SA 02:41:47 AM Dec 14, 2018 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P N N N N Varker 1 24.686955279326 GHz PN0: Fast IFGainLow #Atten: 30 dB Avg Type: Log-Pwr Avg|Hold:>100/100 Mkr1 24.687 0 GHz -27.171 dBm Ref 30.13 dBm 10 dB/div Log ¢ 29. 39.9 -49. 59. Start 18.000 GHz #Res BW 1.0 MHz Stop 25.000 GHz Sweep 17.73 ms (7000 pts) #VBW 3.0 MHz MKR MODE TRC SCL FUNCTION FUN -27.171 dBm 24.687 0 GHz

#### **High Channel**



ght Spectrum Analyzer - Swept SA RF PRESEL 50 Ω Δ DC		SENSE:INT			02:26:58 AM Dec 14, 20		1 0	RF PRESEL 50 S			CD	NSE:INT			02:14:27 AM E
5000			Avg Type: L	Log-Pwr	TRACE 1 2 3 4	R		t 10.13 dB					Avg Type:	Log-Pwr	TRACE
		g: Free Run tten: 30 dB	Avg Hold:>1	100/100	DET P N N N					PNO: Fast G	Trig: Fre		Avg Hold:>	100/100	TYPE DET
Ref Offset 10.13 d	B			Mkr1 2	476 857 GH dB			Ref Offset 1	0.13 dB	-Gam:Low	WALLER .			Mk	r1 290.9 -51.63
<ul> <li>Ref 30.13 dBm</li> </ul>	I				ub	10 L0	dB/div	Ref 30.13	dBm						-51.65
						2	- 1								
						1	.1								
					DL1 -4.62 d	0.1	30								
						-9	37								
						-1	.9								
							·								
						-2									
						-3	.9		1	1			+ +		
						-4	.9		- <u>-</u>				وأربيه فالمتناسية الأري		
						5	9								
and the second	الاحلام بالدوجات والموطات سيالي عاقه	للأوبيه فأعاب والأواهرية		California (States	and the part of the second second	ľ						1			
.38 MHz					Stop 30.00 Mi	Si	art 0.030	00 GHz							Stop 1.00
SW 9.1 kHz	#VBW 3.0	MHz	Sv	weep 329	9.3 ms (5000 pt	#1	les BW	100 kHz		#VB۱	N 300 kHz	<u>.</u>	S	weep 93	.11 ms (9)
			INCTION FUNCT		FUNCTION VALUE		R MODE TRO		×		Y	EU	INCTION FUNC	TION WIDTH	FUNCTION
1 <b>f</b> It Spectrum Analyzer - Swept SA	2.476 9 GHz	dBm	INCTION FUNCT				N 1 Keysight Spec	f ctrum Analyzer - Sv	wept SA	0.9 MHz	-51.637 d	_			02:23:11 AM
1 <b>f</b> t Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC	B5 GHz		Avg Type: L Avg Hold:>1	Log-Pwr	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N		N 1 Keysight Spec	f ctrum Analyzer - Sv RF PRESEL 50 S	wept SA Ω AC	D.9 MHz	SE	NSE:INT	Avg Type: Avg Hold:>	Log-Pwr •100/100	02:23:11 AM 0 TRACE TYPE DET
1 f t Spectrum Analyzer - Swept SA RE PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N 1 2.476 9 GH	a Marina Pr	N 1 Keysight Spec	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET
t Spectrum Analyzer - Swept SA RF PRESEL   50 Ω AC T 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N	11 11 11	N 1 Keysight Spec	f ctrum Analyzer - Sv RF PRESEL 50 § 000	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET
t Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC r 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N 1 2.476 9 GH	n M Pi 1L	N 1 Keysight Spec	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET
1 f t Spectrum Analyzer - Swept SA RE PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N 1 2.476 9 GH		N 1 Keysight Spec	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET
1 f t Spectrum Analyzer - Swept SA RE PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N 1 2.476 9 GH	10 10 11 12 11 11 11 11	Keysight Spee bints 15 dB/div g 0.1 1 −−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1 f tSpectrum Analyzer - Swept SA RF PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 20 TRACE 1 2 3 4 TYPE M WWW DET P N N N 1 2.476 9 GH	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	dB/div 9	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET
1 f Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Keysight Spee bints 15 dB/div g 0.1 1 −−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1 f Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	2 2 1 1 2 3 9 9 9 9 9	dB/div 9	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1 f tSpectrum Analyzer - Swept SA RF PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	11 11 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	dB/div 9 1.1 20 30 37	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1     f       Spectrum Analyzer - Swept SA RF PRESEL     50 Ω       1     2.47685680218       Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	2 1 1 0. - - - - - - - - - - - - - - - - - -	dB/div 9 0.1 1 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1 f t Spectrum Analyzer - Swept SA RE PRESEL 50 Ω AC 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	A A A A A A A A A A A A A A A A A A A	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1     f       Spectrum Analyzer - Swept SA RF PRESEL     50 Ω       1     2.47685680218       Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	dB/div 9 0.1 1 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1     f       Spectrum Analyzer - Swept SA RF PRESEL     50 Ω       1     2.47685680218       Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100	02:19:38 AM Dec 14, 22 TRACE 12 3 4 TYPE M WWW DET P NNN 1 2.476 9 GH 14.543 dB	9 2 1 1 0 3 3 4 4 4 4 4 4 4 4	A A A A A A A A A A A A A A A A A A A	f trum Analyzer - Sk RF PRESEL 50 9 000 Ref Offset 1	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	100/100	TRACE TYPE DET 1 2.476
1 f 1 f 1 PR-PRESL 50 0 AC 1 2.47685680216 Ref Offset 10.13 d W Ref 30.13 dBm	B5 GHz PNO: Fast IFGain:Low	dBm SENSE:INT	Avg Type: L	Log-Pwr 100/100 Mkr1	02:19:38 MM Dec 14, 22 TRACE [] = 3.4 YPGE [] = 3.4 YPGE [] = 3.4 PGE [] = 3.4 PG	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N         1           Keysight Spece         1           Dints         15           dB/div         9           9         1           1         1           10         1           11         1           13         1           13         1           14         1           15         1           16         1           17         1           18         1           19         1           19         1           19         1           19         1         1           19         1         1         1           19         10         10         10         10           19         10         10         10         10         10           19         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10 <th10< th=""> <th10< th="">         10</th10<></th10<>	f trum Analyzer - S pr PRESEL   So f 000 Ref Offset 1 Ref 30.13	wept SA Ω AC I II 0.13 dB	PNO: Fast	SE Trig: Fre	NSE:INT	Avg Type:	-100/100 Mkr	TRACE TYPE DET 1 2.476
1 f tspectrum Analyzer - Swept SA	B FRO: Fast T IFGain.Low B	dBm sense:int g: Free Run tten: 30 dB	Avg Type: L Avg Hold:>1	Log-Pwr 100/100 Mkr1	02:19:38 AMDec 14, 22 TRACE []:3:34 TYPE    WINN DET    WINN 12:476 9 GH 14:543 dB 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824	10 11 10 10 10 10 10 10 10 10 10 10 10 1	N         1           Keysight Spect         1           oints         15           dB/div         9           9         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           102         1         1           103         1         1         1           103         1         1         1         1           103 <td>f tum Aalyzer - 5 er PRESEL   50 e 0000 Ref Offset 1 Ref 30.13 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>wept SA Ω AC I II 0.13 dB</td> <td>PNO: Fast C FGain:Low</td> <td>► Trig: Fre #Atten: i</td> <td>e Run 30 dB</td> <td>Avg Type: Avg Hold:&gt;</td> <td>100/100 Mkr</td> <td>TRACE TYPE DET 1 2.476</td>	f tum Aalyzer - 5 er PRESEL   50 e 0000 Ref Offset 1 Ref 30.13 0 0 0 0 0 0 0 0 0 0 0 0 0	wept SA Ω AC I II 0.13 dB	PNO: Fast C FGain:Low	► Trig: Fre #Atten: i	e Run 30 dB	Avg Type: Avg Hold:>	100/100 Mkr	TRACE TYPE DET 1 2.476
t Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC r 1 2.47685680218 Ref Offset 10.13 dl	B5 GHz PNO: Fast IFGain:Low	dBm sense:int g: Free Run tten: 30 dB	Avg Type: L Avg Hold:>1	Log-Pwr 100/100 Mkr1	02:19:38 MM Dec 14, 22 TRACE [] = 3.4 YPGE [] = 3.4 YPGE [] = 3.4 PGE [] = 3.4 PG	10 11 10 10 10 10 10 10 10 10 10 10 10 1	N         1           Keysight Spect         1           oints         15           dB/div         9           9         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           102         1         1           103         1         1         1           103         1         1         1         1           103 <td>f trum Analyzer - S pr PRESEL   So f 000 Ref Offset 1 Ref 30.13</td> <td>wept SA Ω AC I II 0.13 dB</td> <td>PNO: Fast C FGain:Low</td> <td>SE Trig: Fre</td> <td>e Run 30 dB</td> <td>Avg Type: Avg Hold:&gt;</td> <td>100/100 Mkr</td> <td>TRACE TYPE DET 1 2.476</td>	f trum Analyzer - S pr PRESEL   So f 000 Ref Offset 1 Ref 30.13	wept SA Ω AC I II 0.13 dB	PNO: Fast C FGain:Low	SE Trig: Fre	e Run 30 dB	Avg Type: Avg Hold:>	100/100 Mkr	TRACE TYPE DET 1 2.476
1 f 1 spectrum Analyzer - Sweet SA	B B H Santow #VBW 30	dBm sense:int g: Free Run teen: 30 dB	Avg Type: L Avg Hold:>1	Log-Pwr 100/100 Mkr1	02:19:38 AMDec 14, 22 TRACE []:3:34 TYPE    WINN DET    WINN 12:476 9 GH 14:543 dB 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824 06:1:4824	<b>1</b> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N         1           Keysight Spect         1           oints         15           dB/div         9           9         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           101         1           102         1         1           103         1         1         1           103         1         1         1         1           103 <td>f tum Analyzer 50 ep PRESEL 50 0 000 Ref Offset 1 Ref 30.13 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>wept SA α AC  </td> <td>PNO: Fast C FGain:Low</td> <td>► Trig: Fre #Atten: i</td> <td>en en e</td> <td>Avg Type: Avg Hold:&gt;</td> <td>/100/100 Mkr</td> <td>TRACE TYPE DET 1 2.476</td>	f tum Analyzer 50 ep PRESEL 50 0 000 Ref Offset 1 Ref 30.13 0 0 0 0 0 0 0 0 0 0 0 0 0	wept SA α AC	PNO: Fast C FGain:Low	► Trig: Fre #Atten: i	en e	Avg Type: Avg Hold:>	/100/100 Mkr	TRACE TYPE DET 1 2.476

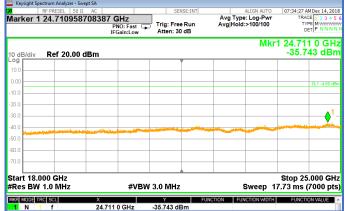
		FGain:Low		 М	kr1 24.62	29 9 GH 535 dB
10 dB/div Ref 3	0.13 dBm		· · · · · · · · · · · · · · · · · · ·		-20.3	<b>J35 UB</b>
20.1				 		
10.1				 		
1.130					_	DL1 -4.62 d
9.87						
19.9						1
29.9		the stars		and a second		
39.9	Production designs of the Products of					
49.9				 		
59.9						
Start 18.000 GHz #Res BW 1.0 MH			3.0 MHz		Stop 2 17.73 ms	5.000 GH

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# 2.5.6 Conducted Emissions Data: (Ginseng-2 Radio)







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#### MID Channel



www.common.com/sectrum Analyzer - Swept SA			w Keysight Spectrum Analyzer - Sw		
RF PRESEL 50 Ω 🛕 DC	SENSE:INT	ALIGN AUTO 06:31:11 AM Dec 14, 20:	KV RF PRESEL 50 Ω		ALIGN AUTO 06:33:20 AM Dec 14, 201
Marker 1 380.000000 kHz	PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB	Avg Type: Log-Pwr Avg Hold:>100/100 DET P N N N	Marker 1 625.36137	7462 MHz PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB	Avg Type: Log-Pwr TRACE 1 2 3 4 5 Avg Hold:>100/100 TYPE M WWW DET P N N N
Ref Offset 10.13 dB	IFGail.LOW Attent to db	Mkr1 380 kH -52.237 dBr	Ref Offset 10	0.13 dB	Mkr1 625.36 MH -48.897 dBr
10 dB/div Ref 30.13 dBm		-52.257 051	10 dB/div Ref 30.13	dBm	-40.037 UDI
20.1	Ť		20.1		
10.1			10.1		
0.130		DL1 -4 55 dE	0.130		DL1 -4.55 dE
-9.87			-9.87		
			-19.9		
-19.9					
-29.9			-29.9		
-39.9			-39.9		<b>_</b> 1
-49.9			-49.9		
			-59.9		
-59.9	مودن بالمحافظ بمدار ومعالية والمعالية والمحافظ والمحافظ ومعالية والمحافظ	فأنتاح وارتدار والمسبوق والمامة أوداكم ومتراجعا أحفائهما ومادحون والتراجع والمسالية	-09.9		
Start 0.38 MHz	· · · · · · · · · · · · · · · · · · ·	Stop 30.00 MH	Start 0.0300 GHz		Stop 1.0000 GH
#Res BW 9.1 kHz	#VBW 30 kHz	Sweep 339.9 ms (5000 pt	#Res BW 100 kHz	#VBW 300 kHz	Sweep 93.11 ms (9700 pts
	# <b>1</b> 211 00 MIL				· · · ·
MKR MODE TRC SCL X	380 kHz -52.237 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE	MKR MODE TRC SCL	625.36 MHz -48.897 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE
<mark>1</mark> N 1 f	380 KHZ -52.237 dBm			620.00 MHZ -48.897 dBm	
Keysight Spectrum Analyzer - Swept SA			Keysight Spectrum Analyzer - Swe		
X RF PRESEL 50 Ω AC	SENSE:INT	ALIGN AUTO 06:35:54 AMDec 14, 20 Avg Type: Log-Pwr TRACE 1 2 3 4 5	₩ RF PRESEL 50 Ω Marker 1 16.0664310		ALIGN AUTO 06:40:02 AM Dec 14, 20 Avg Type: Log-Pwr TRACE 1 2 3 4
Marker 1 2.440555405977	PNO: Fast Trig: Free Run	AvalHold:>100/100 TYPE MWWW	Marker 1 10.0004310	PNO: Fast ( Trig: Free Run	Avg Hold:>100/100 TVPE MWWW DET P N N N
	IFGain:Low Atten: 30 dB	DET P NNNI		IFGain:Low Atten: 30 dB	DETIPINN
Ref Offset 10.13 dB		Mkr1 2.440 6 GH	Ref Offset 10		Mkr1 16.066 4 GI
10 dB/div Ref 30.13 dBm		14.598 dBr	10 dB/div Ref 30.13 d		-30.833 dB
Log			Log		
20.1		1	20.1		
10.1			10.1		
0.130			0.130		
		DL1 -4.55 dE			DL1 -4.55 o
-9.87			-9.87		
-19.9			-19.9		
-29.9			-29.9		• • • • • • • • • • • • • • • • •
-39.9			-39.9	and the second sec	and the second
-49.9			-49.9		
-59.9			-59.9		
		Stop 3.600 GH	Start 3.600 GHz		
	#VBW 300 kHz	Stop 3.600 GH Sweep 249.6 ms (26000 pt	Start 3.600 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	
Start 1.000 GHz #Res BW 100 kHz			#Res BW 1.0 MHz		Stop 18.000 GF Sweep 37.00 ms (15000 pt FUNCTION FUNCTION VALUE
#Res BW 100 kHz		Sweep 249.6 ms (26000 pt			Sweep 37.00 ms (15000 pt

Marker 1	24.676953		GHz PNO: Fast G	Trig: Free Run Atten: 30 dB		ype: Log-Pwr old:>100/100	TY	CE 1 2 3 4 5 PE M WWW ET P N N N
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70.0								
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MKR MODE TR	RC SCL	x	7 0 GHz	-36,486 dBm	FUNCTION	FUNCTION WIDTH	FUNCT	ON VALUE

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## **High Channel**



RF PRESEL 50 Ω ▲ DC	SENSI	E:INT AL					
er 1 403.700740 kHz			IGN AUTO 06:50:32 AM Dec 14, 2018 Log-Pwr TRACE 1 2 3 4 5				06:48:11 AM Dec
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				Log	The second secon		
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				0.130			
			DL1 -4.83 dBm				DL1
				-9.87			
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	and a second						<b>0</b> 4 4 0 0 0 0
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BW 9.1 KHZ	#VBW 30 kHz	51	weep 339.9 ms (5000 pts	) #Res BW 100 kHz	#VBW 300 kHz	Sweep 9	3.11 ms (970
N 1 F	404 kHz -52.265 dBn		TION WIDTH FUNCTION VALUE	MKR MODE TRC SCL 1 N 1 f	X Y 616.16 MHz -48.959 dBm		
I 1 f ght Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC	GHz	n AL	IGN AUTO 06:44:51 AM Dec 14, 2018 Log-Pwr TRACE 112:3 4 5 1 100/100 TYPE M WAAWA	1 N 1 f 	616.16 MHz -48.959 dBm ept SA AC SENSE:IN 594240 GHz	Avg Type: Log-Pwr	TRACE 1
1 f ight Spectrum Analyzer - Swept SA RF PRESEL 50 Ω AC	SENSI	n AL Avg Type: I Run Avg Hold:>	IGN AUTO 06:44:51 AM Dec 14, 2018 Log-Pwr TRACE 2 3 4 5 100/100 TVPE MWWWW DET P N N N N	1 N 1 f Keysight Spectrum Analyzer-Sw Marker 1 16.703913:	616.16 MHz -48.959 dBm ept SA AC SENSE:IN	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE TYPE M DET P
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ht Spectrum Analyzer - Swept SA RF PRESEL 50 Q AC er 1 2.477356821416 Ref Offset 10.13 dB	GHz PNO: Fast	n AL Avg Type: I Run Avg Hold:>	IGN АЛТО Log-Pwr 100/100 Mkr1 2.477 4 GHz 14.424 dBm	I         I         f           Image: Constraint of the state of th	616.16 MHz 48.969 dBm ept5A AC 58NSE:IN 594240 GHZ PRO: Fast Atten: 30 dB 113 dB	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 TYPE M DET P 1 16.703 9 -31.919
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L 1 f pht Spectrum Analyzer - Swept SA re P PPESES er 1 2.477356821416 Ref Offset 10.13 dB div Ref 30.13 dBm 1.000 GHz	SENSI SCHZ PRO: Fest IFGain:Low Trig: Free F Atten: 30 d	n Avg Type: tun Avg Type: B Avg Hoid>	IGN АЛТО Log-Purr 100/100 MKr1 2.477 4 GHz 14.424 dBm Dt.1-483 dBm	I         I         f           Image: Spectrum Analyzer - Sm Image: Spectrum Analyzer -	616.16 MHz 48.969 dBm ept5A AC 58NSE:IN 594240 GHZ PRO: Fast Atten: 30 dB 113 dB	Avg Type: Log-Pwr Avg Hold>100/100	TRACE [] TOPE[] DET]P 1 16.703 9 -31.919 DE1 DE1 DE1 DE1 Stop 18.00 .00 ms (1500

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#### 2.6 Channel Separation

Test Lab: Electronics Test Centre, Airdrie

Test Personnel: Imran Akram

EUT: Soulplay

Bushra Muharram

Standard: FCC Part 15.247

Date: 2018-12-14 (20.6°C,14.2% RH)

Basic Standard: ANSI C63.10: 2013

# **EUT status: Compliant**

## Specification: FCC Part 15.247(a, 1)

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

#### 2.6.1 Test Guidance: ANSI 63.10 Clause 7.8.2/FCC DA 00-705

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:				
Span	wide enough to capture the peaks of two adjacent channels.			
RBW	≥ 1% of the span			
VBW	≥RBW			
Sweep	auto			
Detector function	peak			
Trace	max hold			
Allow the trace to stabilize. Use the marker-delta function to determine the separation				
between the peaks of the adjacent channels.				

#### 2.6.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

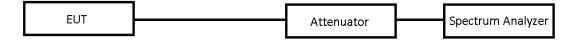
#### 2.6.3 Test Equipment

Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-02	1 year	2019-05-02
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

#### 2.6.4 Test Sample Verification, Configuration & Modifications

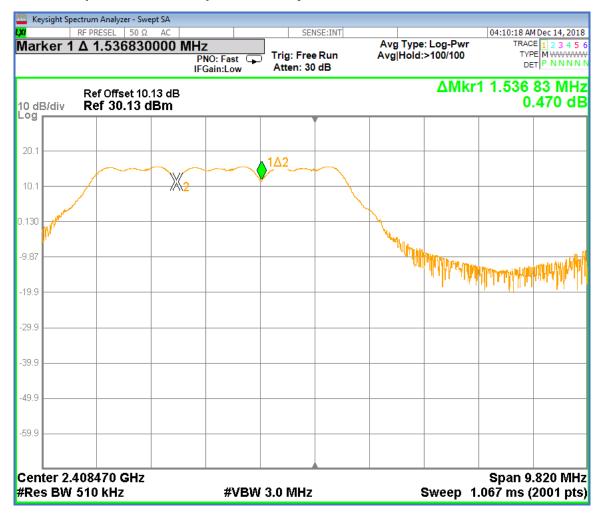
#### EUT configuration for Channel Separation testing:



#### 2.6.5 Channel Separation Data: (Ginseng-1 Radio)

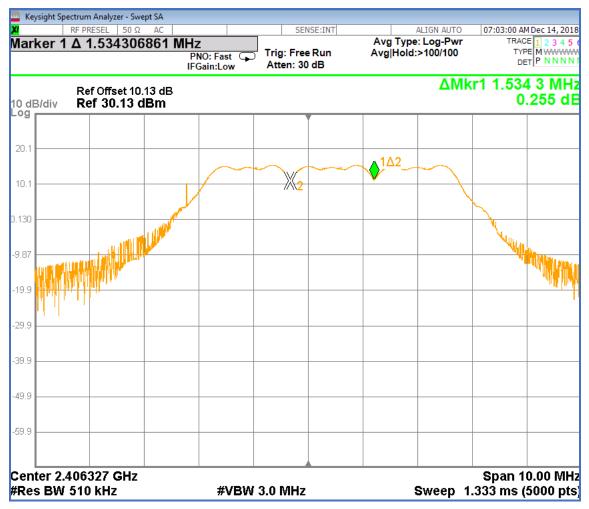
Compliant: The channel separation measured for this device is 1.53683 MHz

#### Screen Captures from the spectrum analyzer:



#### 2.6.6 Channel Separation Data: (Ginseng-2 Radio)

Compliant: The channel separation measured for this device is 1.5343 MHz



#### Screen Captures from the spectrum analyzer:

#### 2.7 Number of Hopping Channels

Date: 2018-12-14 (20.6°C,14.2 % RH)	Number of Channels: 15	
Bushra Muharram	Basic Standard: ANSI C63.10: 2013	
Test Personnel: Imran Akram	Standard: FCC Part 15.247	
Test Lab: Electronics Test Centre, Airdrie	EUTSoulplay	

# **EUT status: Compliant**

#### Specification: FCC Part 15.247 [a, 1(iii)]

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

#### 2.7.1 Test Guidance: ANSI 63.10 Clauses 7.8.3 / FCC DA-00-0705A1

This measurement is performed with the EUT transmitter frequency hopping function active.

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span	the frequency band of operation			
RBW	≥ 1% of the span			
VBW	≥RBW			
Sweep	auto			
Detector function	peak			
Trace	max hold			
Allow the trace to stabilize.				

#### 2.7.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

#### 2.7.3 Test Equipment

Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-02	1 year	2019-05-02
Temp/Humidity	Extech	42270	5892	2018-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

### 2.7.4 Test Sample Verification, Configuration & Modifications

The EUT was operating normally.

The EUT met the requirements without modification.

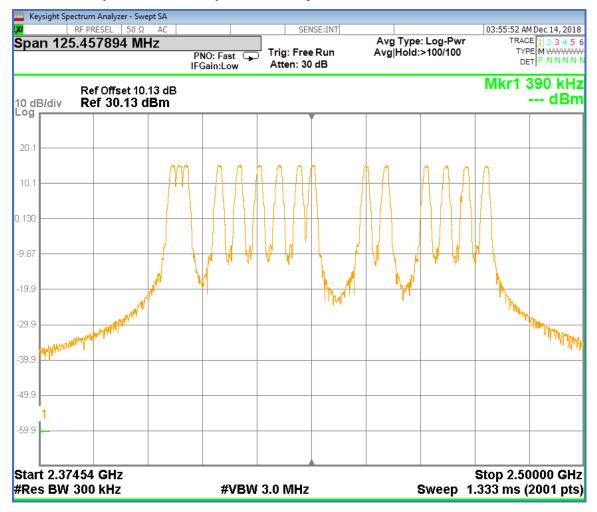
#### EUT configuration for Radiated Emissions testing:



#### 2.7.5 Hopping Channel Data: (Ginseng-1 Radio)

#### There are 15 hopping channels

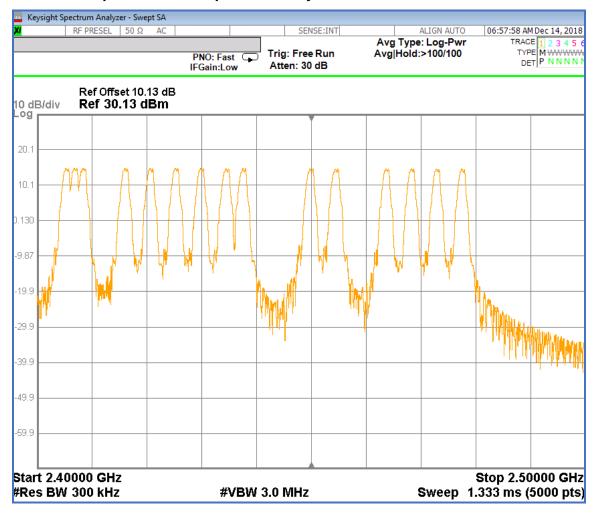
#### Screen Capture from the spectrum analyzer:



#### 2.7.6 Hopping Channel Data: (Ginseng-2 Radio)

#### There are 15 hopping channels

#### Screen Capture from the spectrum analyzer:



#### 2.8 Time of Occupancy (Dwell Time)

Test Lab: Electronics Test Centre, Airdrie

Test Personnel: Imran Akram **Bushra Muharram**  **EUT: Soulplay** 

Standard: FCC PART 15.247

Date: 2018-12-14 (20.6°C,14.2% RH)

Basic Standard: ANSI C63.10: 20013

# **EUT status: Compliant**

### Specification: FCC Part 15.247 [a, 1(iii)]

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

#### Test Guidance: ANSI 63.10 Clause 7.8.4 / FCC DA-00-0705 2.8.1

This measurement is performed with the EUT frequency hopping function active.

The RF output of EUT with an antenna connector is fed to the input of the spectrum analyzer through appropriate attenuation. The loss from the cable and the attenuator were added on the analyzer as gain offset setting there by allowing direct measurements, without the need for any further corrections.

The EUT must have its hopping function enabled. Use the following spectrum analyzer				
settings:				
Span	zero span, centered on a hopping channel			
RBW	The RBW shall be $\leq$ Channel spacing and where possible RBW			
	should be set >> 1/T, where T is the expected dwell time per channel			
VBW	≥RBW			
Sweep	as necessary to capture the entire dwell time per hopping channel			
Detector function	peak			
Trace	max hold			
Allow the trace to stabilize. If possible, use the marker-delta function to determine the				

II possible, use the marker-delta function dwell time.

#### 2.8.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

#### 2.8.3 Test Equipment

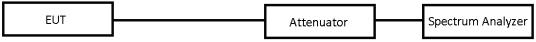
Testing was performed with the following equipment:

Equipment	Manufacturer	Model #	Asset #	Cal. Date	Interval	Cal. Due
EMI receiver	Agilent	N9038A	6130	2018-05-02	1 year	2019-05-02
Temp/Humidity	Extech	42270	5892	2019-04-13	1 year	2019-04-13
Attenuator	FairView Microwave	SA18N5WA-10	6886	2018-11-23	1 year	2019-11-23
DC Blocker	MCL	BLK-89-S+	-	2018-01-15	1 year	2019-01-15
CE Cable (50cm length)	Huber+Suhner	Enviroflex 400	-	2018-01-15	1 year	2019-01-15

#### 2.8.4 Test Sample Verification, Configuration & Modifications

The EUT was operating in normal mode. The EUT met the requirements without modification.

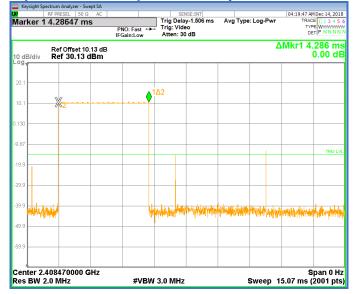
## EUT configuration for Dwell Time testing:



#### 2.8.5 Dwell Time Data: (Ginseng-1 Radio)

Pulse Width (ms)	Number of Pulses	Total Dwell Time (ms)	Measuring Period (.4s x # of hop CH)	Limit (sec)
4.286	73	312.878	6 Sec	.4 (400ms)

#### Screen Capture from the spectrum analyzer: Pulse Width



#### Screen Capture from the spectrum analyzer: Period - 6 Sec



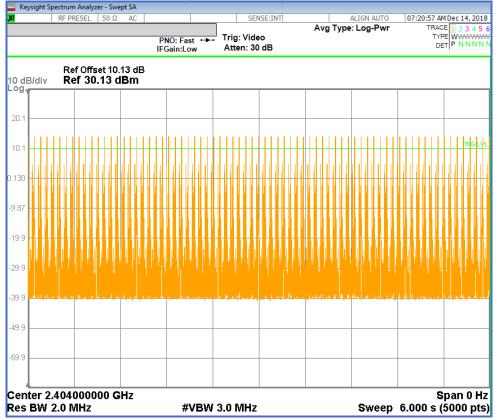
## 2.8.6 Dwell Time Data (Ginseng-2 Radio)

Pulse Width (ms)	Number of Pulses		Measuring Period (.4s x # of hop CH)	Limit (sec)
4.281	73	312.513	6 Sec	.4 (400ms)

#### Screen Capture from the spectrum analyzer: Pulse Width



#### Screen Capture from the spectrum analyzer: Period - 6 Sec



#### 2.9 EUT Positioning Assessment

Test Lab: Electronics Test Centre, Airdrie	EUT: Soulplay
Test Personnel:	Standard: FCC PART 15.247

Basic Standard: ANSI C63.4-2014

Date:

# N/A - Fixed Wall Mount

**Comments:** EUT will be oriented in one fix position.

#### Specification: ANSI C63.4-2014, Clause 6.3.2.1

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs (see Figure 6, Figure 7, and Figure 9). For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

#### 2.10 Radiated Spurious Emissions (Ginseng1 & Ginseng2 Tx Mode)

Test Lab: Electronics Test Centre, Airdrie **EUT: Soulplay** 

**Test Personnel: Imran Akram** 

**Bushra Muharram** 

Standard: FCC PART 15.247

Date: 2018-12-11/13/14/18 (20.6°C,14.2 % RH)

Basic Standard: ANSI C63.10-2013

**EUT status: Compliant** 

#### Specification: FCC PART 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

MHz	MHz	MHz	MHz	MHz	GHz	GHz
0.0900000 –	8.2910000 -	16.804250 -	162.01250 -	1660.0000 -	3.6000000 -	14.470000 –
0.1100000	8.2940000	16.804750	167.17000	1710.0000	4.4000000	14.500000
0.4950000 -	8.3620000 -	25.500000 -	167.72000 -	1718.8000 –	4.5000000 –	15.350000 –
0.5050000	8.3660000	25.670000	173.20000 -	1722.2000	5.1500000	16.200000
2.1735000 -	8.3762500 -	37.500000 -	240.00000 -	2200.0000 –	5.3500000 –	17.700000 –
2.1905000	8.3867500	38.250000	285.00000	2300.0000	5.4600000	21.400000
4.1250000 -	8.4142500 -	73.000000 -	322.00000 -	2310.0000 –	7.2500000 –	22.010000 -
4.1280000	8.4147500	74.600000	335.40000	2390.0000	7.7500000	23.120000
4.1772500 -	12.290000 -	74.800000 -	399.90000 -	2483.5000 -	8.0250000 -	23.600000 –
4.1777500	12.293000	75.200000	410.00000	2500.0000	8.5000000	24.000000
4.2072500 -	12.519750 -	108.00000 -	608.00000 -	2655.0000 -	9.0000000 -	31.200000 –
4.2077500	12.520250	121.94000 **	614.00000	2900.0000	9.2000000	31.800000
5.6770000 -	12.576750 -	123.00000 -	960.00000 –	32600000 -	9.3000000 –	36.430000 -
5.6830000	12.577250	138.00000 **	1240.0000 ****	3267.0000	9.5000000	36.500000
6.2150000 -	13.360000 -	149.90000 -	1300.0000 –	3332.0000 –	10.600000 -	Above
6.2180000	13.410000	150.05000	1427.0000 ****	3339.0000	12.700000	38.600000
6.2677500 -	16.420000 -	156.52475-	1435.0000 –	3345.8000 –	13.250000 –	
6.2682500	16.423000	156.52525	1626.5000	3358.0000	13.400000	
6.3117500 - 6.3122500	16.694750 - 16.695250	156.70000 - 156.90000	1645.5000 – 1646.5000	3500.0000 – 3600.0000 <b>****</b>		

#### **Restricted Bands of Operation:**

#### 2.10.1 Test Guidance: ANSI C63.10-2013, Clause 13.4.2

From 9 kHz to 150 kHz (resolution bandwidth of 200 Hz) and from 150 kHz to 30 MHz (resolution bandwidth 9 kHz) measurements are performed with a loop antenna (as per KDB 460108).

From 30 MHz to 1000 MHz, measurements are performed with a broadband biconilog antenna and a resolution bandwidth of 120 kHz.

Above 1000 MHz, measurements are performed with a DRG Horn antenna or a Standard Gain horn, and a resolution bandwidth of 1 MHz The EUT is raised to 150 cm above the ground plane, and the area between the EUT and the antenna mast is covered with RF absorbent material.

The scan is performed at discrete increments of turntable azimuth and antenna height, which are selected in accordance with the applicable standard in order to assure capture of frequencies of interest. Optimization is performed based on the scan data.

Frequencies having peak emissions within 10dB of the limits are optimized. The EUT is rotated in azimuth over 360 degrees and the direction of maximum emission is noted.

Antenna height is varied from 1 - 4 meters at this azimuth to obtain the maximum emission. Then the maximum level is measured with the appropriate detector and recorded. Up to 1 GHz, measurements are performed with a Quasi-Peak detector. Above 1 GHz, measurements are recorded with Peak and/or Average detectors, as applicable.

#### 2.10.2 Deviations From The Standard:

There were no deviations from the EUT setup or methodology specified in the standard.

2.10.3	Test	Equipment
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Testing was performed with the following equipment:

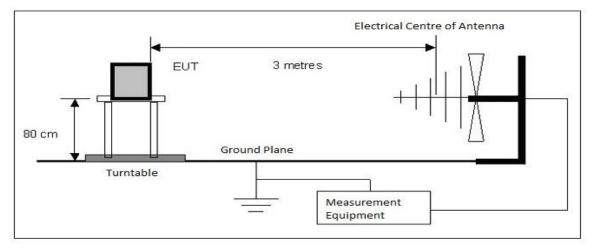
Equipment	Manufacturer	Model #	Asset #	Calibration Date	Interval	Calibration Due
EMC Software	UL	Ver. 9.5	ETC-SW- EMC 2.1	N/A		
EMI receiver	Agilent	N9038A	6130	2018-05-02	1yr	2019-05-02
Loop Antenna	EMCO	6502	10868	2017-03-29	2yr	2019-03-29
Biconilog Antenna	ARA	LPB-2520/A	4318	2018-09-19	2yr	2020-09-19
DRG Horn	EMCO	3115	19357	2018-09-12	2yr	2020-09-12
Standard Horn	QuinStar Technology Inc.	QWH-KPRS00	6163	2018-09-13	2yr	2020-09-13
Humidity/Temp Logger	Extech Ins. Corp.	42270	5892	2018-04-13	1yr	2019-04-13
Low Noise Amplifier (1 – 18 GHz)	MITEQ	JS43-01001800- 21-5P	4354	2018-01-03	1 yr	2019-01-03
Low Noise Amplifier (18 – 26 GHz)	MITEQ	JS44-01002650- 33-3P	6163	2018-01-03	1 yr	2019-01-03
Pre-Amplifier (30 – 1300 MHz)	hp	8447D	9291	2018-01-03	1yr	2019-01-03
RE Cable below 1GHz	3600-KPA-		4419	2018-01-03	1 yr	2019-01-03
RE Cable Above 1 GHz	A.H. System Inc.	SAC-26G-8.23	6187	2018-01-03	1yr	2019-01-03

## 2.10.4 Test Sample Verification, Configuration & Modifications

The EUT was set to a selected channel with test-specific software. The output was modulated as in normal operation.

The EUT met the requirements without modification.

### Test setup diagram for Radiated Spurious Emissions testing (below 1GHz):



Above 1GHz, the EUT is raised using a low permittivity material (polystyrene) to a height of 1.5m.

#### 2.10.5 Radiated Emissions Data:

The emissions data are presented in tabular form, showing turntable azimuth, antenna height and polarization, the uncorrected spectrum analyzer reading, the correction factors applied, the net result, the value of the limit at the frequency investigated, and the Delta between the result and the limit.

# Meter Reading in dB $\mu$ V + Antenna Factor in dB/m + Gain/Loss Factor in dB = Corrected Field Strength in db $\mu$ V/m.

#### Delta = Field Strength - Limit

Notes:

- When a preamp is used, the resulting gain is compensated, producing a negative value for the Cable Loss.
- Measurements reported are the result of adjusting the turntable azimuth and antenna height to obtain the maximum EUT emission. This may produce a different reading than the plot trace. The plot is a Peak Hold function obtained at discrete increments of height and azimuth, while the reported measurement is obtained with the appropriate Quasi Peak or Average detector after the height and azimuth have been adjusted for maximum emission.
- Preliminary scans were performed for all channels in Transmit modes. The MID band channel 2441 MHz for Ginseng Radio 2 and upper channel 2477 MHz for Ginseng Radio 1 were selected as the worst-case condition for detailed examination. Both radio Ginseng1 and Ginseng2 are transmitting simultaneously.
- In Transmit mode, the EUT was assessed up to 25.0 GHz.

Test Sample: Soulplay FCC ID: 2AA9N-LASY40

#### FCC Part 15.247 ANSI C63.4-2014 ANSI C63.10-2013

#### Negative values for Delta indicate compliance.

Freq. Marker	Freq. [GHz]	Raw reading [dBµv]	Det	Antenna Factor [dB/m]	Pre amp Gain [dB]	Corrected Reading [dBµv/m]	FCC 15.209 Limit [dBµv/m]	Delta [dB]	Azimuth [Deg]	Height [cm]	Polarization
1	*4.8814	56.05	РК	33	-31.7	57.35	74	-16.65	80	325	Horizontal
1	*4.8814	49.91	Av	33	-31.7	51.21	54	-2.79	80	325	Horizontal
2	*4.9543	53.93	PK	33.2	-31.6	55.53	74	-18.47	298	348	Horizontal
2	*4.9543	47.46	Av	33.2	-31.6	49.06	54	-4.94	298	348	Horizontal
3	*7.3213	42.97	PK	36.4	-27.8	51.57	74	-22.43	79	382	Horizontal
3	*7.3213	36.33	Av	36.4	-27.8	44.93	54	-9.07	79	382	Horizontal
4	*7.4278	38.94	PK	36.5	-28.1	47.34	74	-26.66	293	385	Horizontal
4	*7.4278	30.52	Av	36.5	-28.1	38.92	54	-15.08	293	385	Horizontal
5	9.7632	43.94	PK	37.9	-26.9	54.94	74	-19.06	98	307	Horizontal
5	9.7632	35.14	Av	37.9	-26.9	46.14	54	-7.86	98	307	Horizontal
6	9.909	41.27	PK	38	-26.6	52.67	74	-21.33	200	192	Horizontal
6	9.909	32.37	Av	38	-26.6	43.77	54	-10.23	200	192	Horizontal
7	*12.2041	40.02	PK	39.3	-25.2	54.12	74	-19.88	313	183	Horizontal
7	*12.2041	32.17	Av	39.3	-25.2	46.27	54	-7.73	313	183	Horizontal
8	*4.8814	54.2	PK	33	-31.7	55.5	74	-18.5	297	232	Vertical
8	*4.8814	47.81	Av	33	-31.7	49.11	54	-4.89	297	232	Vertical
9	*4.9543	53.38	PK	33.2	-31.6	54.98	74	-19.02	133	114	Vertical
9	*4.9543	46.91	Av	33.2	-31.6	48.51	54	-5.49	133	114	Vertical
10	*7.3223	48.57	PK	36.4	-27.8	57.17	74	-16.83	109	102	Vertical
10	*7.3223	43.57	Av	36.4	-27.8	52.17	54	-1.83	109	102	Vertical
11	*7.4307	44.01	PK	36.5	-28.1	52.41	74	-21.59	344	216	Vertical
11	*7.4307	35.21	Av	36.5	-28.1	43.61	54	-10.37	344	216	Vertical
12	9.7632	41.63	PK	37.9	-26.9	52.63	74	-21.37	265	222	Vertical
12	9.7632	32.29	Av	37.9	-26.9	43.29	54	-10.71	265	222	Vertical
13	9.909	41.11	PK	38	-26.6	52.51	74	-21.49	266	309	Vertical
13	9.909	32.42	Av	38	-26.6	43.82	54	-10.18	266	309	Vertical
14	*12.2041	35.3	PK	39.3	-25.2	49.4	74	-24.6	148	180	Vertical
14	*12.2041	25.62	Av	39.3	-25.2	39.72	54	-14.28	148	180	Vertical

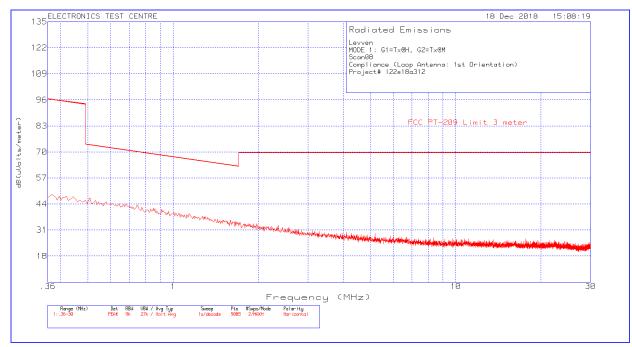
* Restricted Band

**PK - Peak detector** 

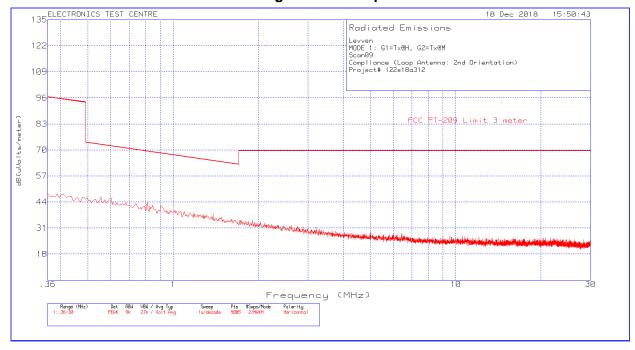
Av - Average detector

#### FCC Part 15.247 ANSI C63.4-2014 ANSI C63.10-2013

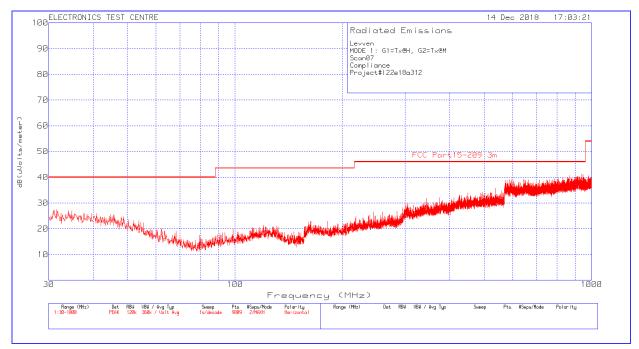
#### Plot of Radiated Emissions: Measuring Antenna Parallel



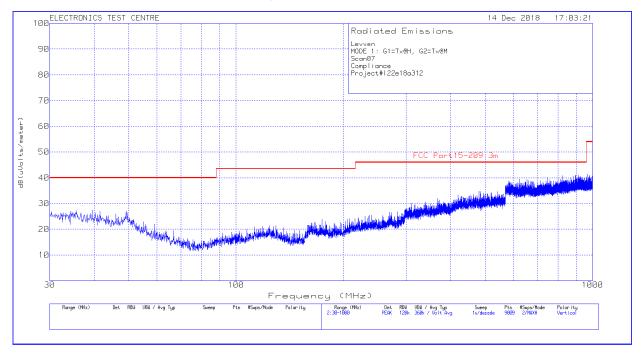
#### Plot of Radiated Emissions: Measuring Antenna Perpendicular



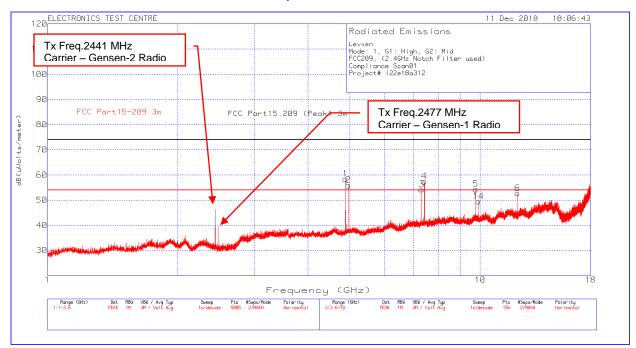
#### Plot of Radiated Emissions: Horizontal polarization



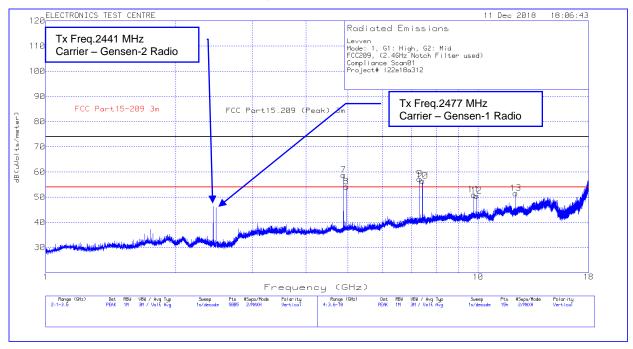
#### Plot of Radiated Emissions: Vertical polarization



#### Plot of Radiated Emissions: Horizontal polarization



#### Plot of Radiated Emissions: Vertical polarization



#### Plot of Radiated Emissions: Horizontal polarization

100 ELECTRONICS TE	EST CENTRE	13 Dec 2018 18:02:55
90		Radiated Emissions Levven MOD1_G1 = Tx0H, G2 = Tx0MID
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70		
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#### Plot of Radiated Emissions: Vertical polarization

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30	nik den kinder konstruktion for til state som	
30	Range (SHz) Det RSU USU / Avg Tup Sveep	2 Frequency (GHz)

### 2.11 RF Exposure

Test Lab: Electronics Test Centre, Airdrie	EUT: Soulplay
Test Personnel:	Standard: FCC PART 15.247
Date:	

# EUT status: Exempt

Compliant: RF exposure assessment to be provided in a separate Exhibit.

## 3.0 TEST FACILITY

#### 3.1 Location

The Soulplay was tested for emissions at the Electronics Test Centre laboratory located in Airdrie, Alberta, Canada. The Radio Frequency Anechoic Chamber (RFAC), identified as Chamber 1, has a usable working space measuring 10.6 m long x 7.3 m wide x 6.5 m high.

Measurements taken at this site are accepted by Industry Canada as evidence of conformity per registration file # 2046A. This site is also listed with the FCC under Registration Number CA2046.

The floor, walls and ceiling consist of annealed steel panels. The walls and ceiling are covered with ferrite tile, augmented by RF absorbant foam material on the end wall nearest the turntable, and on the adjacent walls and the ceiling. The chamber floor supports a 15 cm high internal floor, constructed of annealed steel panels, that forms the ground plane, and is bonded to the chamber walls.

The 3-m diameter turntable is flush-mounted with the floor. A sub-floor cable-way is provided to route cables between the turntable pit and EUT support equipment located in the Control Room. Cables reach the EUT through an opening in the centre of the turntable.

Test instrumentation and EUT support equipment is located in the Control Room, consisting of two shielded vestibules joined together at the side of the main room. Cables are routed through bulkhead panels between the rooms and the test chamber as required. Power feeds are routed into the main room and vestibules through line filters providing at least 100 dB of attenuation between 10 kHz and 10 GHz.

Either floor mounted or table-top equipment can be tested at this facility.

#### 3.2 Grounding Plan

The Soulplay was placed at the center of the test chamber turntable on top of an 80-cm high polystyrene foam table. The EUT was grounded according to Levven Automation specifications.

#### 3.3 Power Supply

All EUT power was supplied by filtered 120VAC / 60Hz main.

# **End of Document**

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