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Testing of

# **Electromagnetic Emissions**

per

USA:	CFR Title 47, Part 2.1091;2.1093	(Exposure)
USA:	CFR Title 47, Part 15.519	(Emissions)
Canada:	ISED RSS-220	(Emissions)
Canada:	ISED RSS-102	(Exposure)

are herein reported for

# Lear Corporation SAT

Test Report No.: 20170330-RPTWAC0100056Ar2 Copyright (c) 2017

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Results of testing completed on (or before) March 30, 2017 are as follows.

**Emissions:** The transmitter intentional emissions **COMPLY** with the regulatory limit(s) by no less than 1.0 dB. Transmit chain spurious or harmonic emissions **COMPLY** by no less than 4.7 dB.

# **Revision History**

Rev. No.	Date	Details	Revised By
r0	March 31, 2017	Initial Release.	J. Brunett
r1	April 23, 2017	Include Plots of GPS Restricted Band Data.	J. Brunett
r2	May 28, 2017	Include Additional Plots.	J. Brunett

## Contents

Re	evisio	on History	2
Tε	able o	of Contents	2
1	<b>Test</b> 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8	<b>Report Scope and Limitations</b> Laboratory Authorization         Report Retention         Subcontracted Testing         Limitation of Results         Copyright         Endorsements         Test Location         Traceability and Equipment Used	4 4 4 4 4 4 5 5
2	<b>Test</b> 2.1	t <b>Specifications and Procedures</b> Test Specification and General Procedures	<b>6</b> 6
3	<b>Con</b> 3.1	figuration and Identification of the Equipment Under TestDescription and Declarations3.1.1EUT Configuration3.1.2Modes of Operation3.1.3Variants3.1.4Test Samples3.1.5Functional Exerciser3.1.6Modifications Made3.1.7Production Intent3.1.8Declared Exemptions and Additional Product Notes	7 7 7 8 8 8 8 8
4	Emi 4.1 4.2 4.3		13 14 15 16

### 5 Measurement Uncertainty

# List of Tables

1	Test Site List	5
2	Equipment List.	5
3	EUT Declarations.	7
4	Fundamental Emission Pulsed Operation.	
5	Fundamental Emission Bandwidth.	13
6	Fundamental Emission Field Strength.	14
$\overline{7}$	Electromagnetic Field Exposure.	15
8	Transmit Chain Spurious Emissions.	16
8	Transmit Chain Spurious Emissions.	16
9	Measurement Uncertainty	20

# List of Figures

1	Photos of EUT.	7
2	EUT Test Configuration Diagram.	8
3	Radiated Emissions Diagram of the EUT.	9
4	Radiated Emissions Test Setup Photograph(s)	.0
5	Fundamental Emission Pulsed Operation.	.2
6	Fundamental Emission Bandwidth.	.3
7	Fundamental Emission Example Plots 1	.4
8	Transmit Chain Spurious Emissions Pre-Scan Plots.	.7
8	Transmit Chain Spurious Emissions Pre-Scan Plots.	.8
8	Transmit Chain Spurious Emissions Pre-Scan Plots.	.9

### 1 Test Report Scope and Limitations

#### 1.1 Laboratory Authorization

Test Facility description and attenuation characteristics are on file with the FCC Laboratory, Columbia, Maryland (FCC Reg. No: 688478) and with ISED Canada, Ottawa, ON (File Ref. No: IC8719A-1 and IC22227-1).

#### **1.2 Report Retention**

For equipment verified to comply with the regulations herein, the manufacturer is obliged to retain this report with the product records for the life of the product, and no less than ten years. A copy of this Report will remain on file with this laboratory until March 2027.

#### 1.3 Subcontracted Testing

This report does not contain data produced under subcontract.

#### 1.4 Limitation of Results

The test results contained in this report relate only to the item(s) tested. Any electrical or mechanical modification made to the test item subsequent to the test date shall invalidate the data presented in this report. Any electrical or mechanical modification made to the test item subsequent to this test date shall require reevaluation.

#### 1.5 Copyright

This report shall not be reproduced, except in full, without the written approval of Willow Run (WR) Test Labs, Inc..

#### **1.6** Endorsements

This report shall not be used to claim product endorsement by any accrediting, regulatory, or governmental agency.

#### 1.7 Test Location

The EUT was fully tested by **Willow Run (WR) Test Labs, Inc.**, 7117 Fieldcrest Dr., Brighton, Michigan 48116 USA. Table 1 lists all sites employed herein. Specific test sites utilized are also listed in the test results sections of this report.

Table 1: Test Site List.			
Description	Location	Quality Num.	
OATS (3 meter)	8501 Beck Rd. Bldg 2227, Belleville MI 48111	OATSA	

#### 1.8 Traceability and Equipment Used

Pertinent test equipment used for measurements at this facility is listed in Table 2. The quality system employed at Willow Run (WR) Test Labs, Inc. has been established to ensure all equipment has a clearly identifiable classification, calibration expiry date, and that all calibrations are traceable to the SI through NIST, other recognized national laboratories, accepted fundamental or natural physical constants, ratio type of calibration, or by comparison to consensus standards.

#### Table 2: Equipment List.

Description	Manufacturer/Model	$\mathbf{SN}$	Quality Num.	Last Cal By / Date Due
Spectrum Analyzer	Rohde & Schwarz / FSV30	101660	RSFSV30001	RS / May-2018
Spectrum Analyzer	Rohde & Schwarz / FSV4	101222	RSFSV4001	RS / Mar-2018
Spectrum Analyzer	Agilent / 7504A	MY45111009	SPAHWPK101	Techmaster / Nov-2017
Biconical	EMCO / 93110B	9802-3039	BICEMCO01	Lib. Labs / Aug-2017
Log Periodic Antenna	EMCO / 3146	9305-3614	LOGEMCO01	Lib. Labs / Aug-2017
Quad Ridge Horn	ETS Lind. / 3164-04	00066988	HRNQR316401	Lib. Labs / Aug-2017
Quad Ridge Horn	Singer / A6100	C35200	HQR2TO18S01	Lib. Labs / Aug-2017
K-Band Horn	JEF / NRL Std.	001	HRNK01	WRTL / Jul-2017
Harmonic Mixer	Hewlett Packard / 11970A	MY3003A1226	5 MIX26TO4001	Keysight / Mar-2019
Ka-Band Horn	JEF / NRL Std.	001	HRNKA001	WRTL / Jul-2017

### 2 Test Specifications and Procedures

#### 2.1 Test Specification and General Procedures

The ultimate goal of Lear Corporation is to demonstrate that the Equipment Under Test (EUT) complies with the Rules and/or Directives below. Detailed in this report are the results of testing the Lear Corporation SAT for compliance to:

Country/Region	Rules or Directive	Referenced Section(s)
United States	Code of Federal Regulations	CFR Title 47, Part 15.519
Canada	ISED Canada	ISED RSS-220

It has been determined that the equipment under test is subject to the rules and directives above at the date of this testing. In conjunction with these rules and directives, the following specifications and procedures are followed herein to demonstrate compliance (in whole or in part) with these regulations.

ANSI C63.4:2014	"Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" $$
ANSI C63.10:2013 (USA)	"American National Standard of Procedures for Compliance Testing of Unli- censed Wireless Devices"
CFR 47 2.1091/1093	"447498 D01 General RF Exposure Guidance v06: RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices"
ISED Canada	"The Measurement of Occupied Bandwidth"
ISED Canada RSS-102	"Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)"
ISED Canada SPR-002	"Supplementary Procedure for Assessing Compliance with RSS-102 Nerve Stimulation Exposure Limits."

## 3 Configuration and Identification of the Equipment Under Test

#### **3.1** Description and Declarations

The equipment under test is an automotive UWB Transceiver. The EUT is approximately  $4 \ge 4 \ge 1.5$  cm in dimension, and is depicted in Figure 1. It is powered by 13.4 VDC vehicle power system. In use, this device is permanently installed in a motor vehicle. Table 3 outlines provider declared EUT specifications.

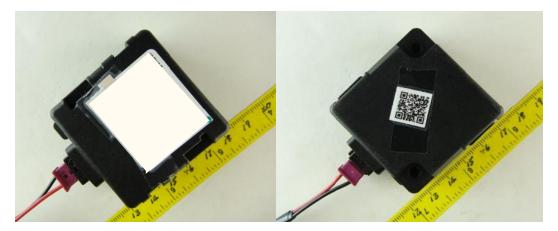


Figure 1: Photos of EUT.

General Declarations			
Equipment Type:	UWB Transceiver	Country of Origin:	Spain
Nominal Supply:	13.4 VDC	Oper. Temp Range:	$-40^{\circ}$ C to $+85^{\circ}$ C
Frequency Range:	3615 - 4337  MHz	Antenna Dimension:	$3 \mathrm{~cm}$
Antenna Type:	Integral	Antenna Gain:	Integral
Number of Channels:	1	Channel Spacing:	Not Applicable
Alignment Range:	Not Declared	Type of Modulation:	$\operatorname{PPM}$
United States			
FCC ID Number:	KOBJXU18A	Classification:	UWB
Canada			
IC Number:	9591 A IVI110 A	Classification:	Ultra-Wideband (UWB) De-
IC Inumber:	3521A-JXU18A	Classification:	vice

#### 3.1.1 EUT Configuration

Concerl Declarations

The EUT is configured for testing as depicted in Figure 2.

#### 3.1.2 Modes of Operation

There is only a single mode of operation for this device, as a UWB transceiver used to triangulate position of a paired keyfob. In normal operation the EUT will only send a single PPM UWB frame as an acknowledgement response to a paired UWB keyfob. When paired in normal operation, only two UWB acknowledgements transmissions occur spaced approximately 20 ms apart due to remote manual activate inquiry by the keyfob

#### 3.1.3 Variants

There is only a single variant of the EUT, as tested.

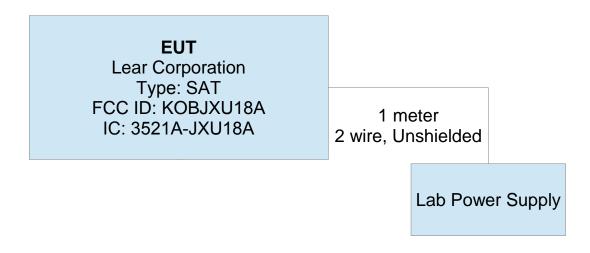


Figure 2: EUT Test Configuration Diagram.

#### 3.1.4 Test Samples

Two samples of the EUT were provided for testing. One normal operating sample paired with a corresponding UWB keyfob for encoding testing, and one software modified sample that transmitted repeatedly at a higher than normal rate (once every 10 ms) when power is applied.

#### 3.1.5 Functional Exerciser

EUT functionality was verified by observation of transmitted signal.

#### 3.1.6 Modifications Made

There were no modifications made to the EUT by this laboratory.

#### 3.1.7 Production Intent

The EUT appears to be a production ready sample.

#### 3.1.8 Declared Exemptions and Additional Product Notes

The EUT is permanently installed in a transportation vehicle. As such, digital emissions are exempt from US and Canadian digital emissions regulations (per FCC 15.103(a) and IC correspondence on ICES-003).

#### 4 Emissions

#### 4.1 General Test Procedures

#### 4.1.1 Radiated Test Setup and Procedures

Radiated electromagnetic emissions from the EUT are first pre-scanned in our shielded anechoic chamber or GTEM test cell. Spectrum and modulation characteristics of all emissions are recorded. Instrumentation, including spectrum analyzers and other test equipment as detailed in Section 1.7 are employed. After pre-scan, emission measurements are made on the test site of record. If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in relevant test standards are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed if the resulting emissions appear to be worst-case in such a configuration. See Figure 3. All intentionally radiating elements that are not fixed-mounted in use are placed on the test table lying flat, on their side, and on their end (3-axes) and the resulting worst case emissions are recorded. If the EUT is fixed-mounted in use, measurements are made with the device oriented in the manner consistent with installation and then emissions are recorded.

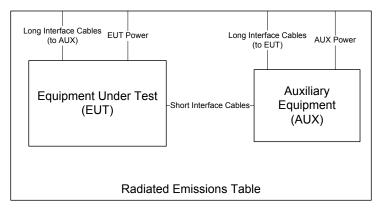


Figure 3: Radiated Emissions Diagram of the EUT.

If the EUT exhibits spurious emissions due to internal receiver circuitry, such emissions are measured with an appropriate carrier signal applied. For devices with intentional emissions below 30 MHz, a shielded loop antenna is used. It is placed at a 1 meter receive height. Emissions between 30 MHz and 1 GHz are measured using tuned dipoles and/or calibrated broadband antennas. For both horizontal and vertical polarizations, the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected. The EUT is then rotated through  $360^{\circ}$  in azimuth until the highest emission is detected. The test antenna is then raised and lowered one last time from 1 to 4 m and the worst case value is recorded. Emissions above 1 GHz are characterized using standard gain horn or broadband ridge-horn antennas on our OATS with a  $4 \times 5$  m rectangle of H-4 absorber placed over the ground screen covering the OATS ground screen. Care is taken to ensure that test receiver resolution and video bandwidths meet the regulatory requirements, and that the emission bandwidth of the EUT is not reduced. Photographs of the test setup employed are depicted in Figure 4.

Where regulations allow for direct measurement of field strength, power values (dBm) measured on the test receiver / analyzer are converted to  $dB\mu V/m$  at the regulatory distance, using

$$E_{dist} = 107 + P_R + K_A - K_G + K_E - C_F$$

where  $P_R$  is the power recorded on spectrum analyzer, in dBm,  $K_A$  is the test antenna factor in dB/m,  $K_G$  is the combined pre-amplifier gain and cable loss in dB,  $K_E$  is duty correction factor (when applicable) in dB, and  $C_F$  is a distance conversion (employed only if limits are specified at alternate distance) in dB. This field strength value is then compared with the regulatory limit. If effective isotropic radiated power (EIRP) is computed, it is computed as

$$EIRP(dBm) = E_{3m}(dB\mu V/m) - 95.2.$$

When presenting data at each frequency, the highest measured emission under all possible EUT orientations (3-axes) is reported.

When microwave measurements are made at a range different than the regulatory distance or made at closerange to improve receiver sensitivity, the reading is corrected back to the regulatory distance. This is done using a 20 dB/decade field behavior as dictated by the test procedures. When measurements are made in the near-field, the near-field/far-field boundary (N/F) is reported. It is computed as

$$N/F = 2D^2/\lambda$$

where D is the maximum dimension of the transmitter or receive antenna, and  $\lambda$  is the wavelength at the measurement frequency. Typically for high frequency measurements the receive antenna is connected to test receiver / analyzer through an external mixer. In this case, cable loss, IF amplifier gain, and mixer conversion losses are corrected for in the data table, or directly in the spectrum analyzer.



Figure 4: Radiated Emissions Test Setup Photograph(s).

#### 4.1.2 Conducted Emissions Test Setup and Procedures

#### 4.1.3 Power Supply Variation

Tests at extreme supply voltages are made if required by the the procedures specified in the test standard, and results of this testing are detailed in this report.

#### 4.1.4 Thermal Variation

Tests at extreme temperatures were not performed for this device.

#### 4.2 Intentional Emissions

#### 4.2.1 Fundamental Emission Pulsed Operation

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Duty cycle is measured using the maximum possible receiver IFBW for the purpose of computing RF exposure compliance and documenting the encoding employed by the EUT. The test equipment employed includes RSFSV30001, HRNQR316401.

**Measurement Results** The details and results of testing the EUT are summarized in Table 4. Plots showing the measurements made to obtain these values are provided in Figure 5.

Table 4: Fundamental Emission Pulsed Operation.

Frequency Range	Det	IFBW	VBW	Test Date:	23-Mar-17
f > 1 000 MHz	Pk	28 MHz	28 MHz	Test Engineer:	Joseph Brunett
				EUT	Normal Operating
				Meas. Distance:	60 cm

	Pulsed Operation / Duty Cycle												
Transmit Mode	Symbol Rate	Data Rate*	Voltage	Oper. Freq	Min. Cycle Time	On-Time	Worst Case Duty Cycle	Field Strength Duty Correction**	Exposure Duty Correction***				
	(Msym/s)	(Mbps)	(V)	(MHz)	(ms)	(ms)	(%)	(dB)	(dB)				
PPM (Normal)	-	-	13.4	3993.6	20.80	0.32	1.548	36.2	18.1				

\*\* E-field duty cycle correction (due to burst-modulated carrier) computed as 20\*Log(On-Time/ Min Cycle-Time). This duty is not applied in demonstrating compliance with the regulations.

\*\*\* Worst-case Exposure duty cycle correction (due to burst-modulated carrier) computed as 10\*Log(On-Time/ Min Cycle-Time). Overestimate due to finite transmission length of only two frames in the actual paired use system.

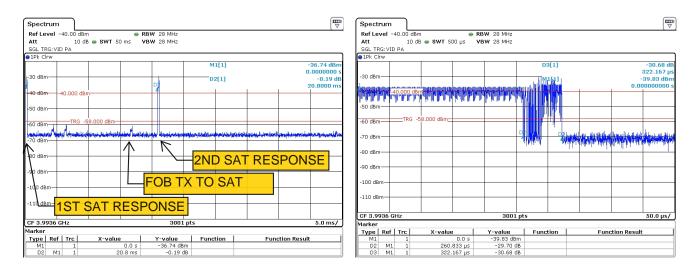


Figure 5: Fundamental Emission Pulsed Operation.

#### 4.2.2 Fundamental Emission Bandwidth

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Emission bandwidth (EBW) of the EUT is measured following the UWB measurement procedures in ANSI C63.10:2013/RSS-220. The test equipment employed includes RSFSV30001, HRNQR316401.

**Measurement Results** The details and results of testing the EUT are summarized in Table 5. Plots showing the measurements made to obtain these values are provided in Figure 6.

	quency Range 1 000 MHz	Pk 1 MHz 3 MHz 1 GHz				Test Date: t Engineer: EUT s. Distance:		23-Mar-17 Joseph Brunett Normal Operating 60 cm					
						Occupie	d Bandwidth						
Transmit Mode	Symbol Rate	Data Rate	Voltage	Oper. Freq	99% OBW	10 dB EBW	10 dB EBW Limit	fL	fL Limit	fH	fH Limit	fmax	Pass/Fail
I ransmit Mode	(Msym/s)	(Mbps)	(V)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	
Normal PPM	-	-	13.4	3993.6	799.7	721.4	500.0	3615.4	3100.0	4336.8	10600.0	3837.7	Pass



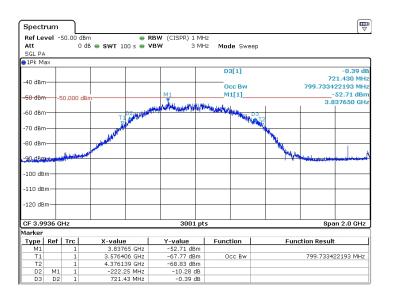


Figure 6: Fundamental Emission Bandwidth.

#### 4.2.3 Fundamental Emission Field Strength

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. The fundamental emission is measured at the regulatory distance on our OATS following the UWB measurement procedures in ANSI C63.10:2013/RSS-220. The test equipment employed includes RSFSV30001, HRNQR316401.

Measurement Results The details and results of testing the EUT are summarized in Table 6.

Table 6: Fundamental Emission Field Strength.

	Free	uency R	ange		Det			IF R	andwi	dth	,	Video	Band	width								т	est Date	22-Mar-17
		1 000 M	0		Pk/RMS				MHz	uui			3 MH										Engineer:	
	1.2	1 000 ML	112		I KIKIND				WILL				5 10111	-								Test I	EUT	
																							Mode	
																						M	Distance	
																						wieas.	Distance	: 3m
																								FCC/I
	RX	BW	Frequen	cy Band	Anter	nna + C	Cable**	*			Power			orrecti		E-Fiel	d @ DR			E	IRP**			
	IFBW	VBW	Start	Stop	Quality	Pol.	Dim.	Ka	Kg	Pk	RMS	MR	DR	N/F	CF	Pk	RMS	Pk	RMS	50 MHz Pk Lim	FCC RMS Lim.	ISED RMS Lim.	Pass	
#	(MHz)	(MHz)	MHz	MHz	Number	H/V	cm	dB/m	dB	dB	uV/m	m	m	m	dB	dB	uV/m	dł	3m	dBm	dBm	dBm	dB	Comments
1	- PEAK	Power (F	k Detector,	1 GHz Spa	n, 1001 Freq Samp	les, 1 s	sec swee	ep, Max-	-Held)															
2	28	28.0	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3			3.0	3.0	1.2	0.0	85.3								
3	50	50.0	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3				3.0	1.2	0.0			-4.9		.0			4.9	max all
4																								
5	- RMS I	Power (RN	IS Detector.	1 GHz Sp	an, 1001 Freq Samp	ples, 1	sec swe	ep, Max	(Held)													· · · · ·		
6	20	13.4	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3			3.0	3.0	1.2	0.0	1	52.9		-42.3		-41.3	-41.3****	1.0	max all
7																								
-	E	nv.	Frequen	cy Band	Anter	nna + C	Cable**	*	-	Rx.	Power	Ra	inge C	orrecti	ion*	E-Fiel	d@DR			E	RP**			
	Temp.	Volt.	Start	Stop	Quality	Pol.	Dim.	Ka	Kg	Pk	RMS	MR	DR	N/F	CF	Pk	RMS	Pk	RMS	50 MHz Pk Lim	FCC RMS Lim.	ISED RMS Lim.	Pass	
#	(C)	(V)	MHz	MHz	Number	H/V	cm	dB/m		dB	uV/m	m	m	m	dB	dB	uV/m	dł	3m	dBm	dBm	dBm	dB	Comments
11	20	11.4	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3			3.0	3.0	1.2	0.0	85.4								
12	20	13.4	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3			3.0	3.0	1.2	0.0	85.3								
13	20	15.4	3837.0	3837.0	HRNQR316401	H/V	22.0	40.1	17.3			_	3.0	1.2	0.0	85.3								
14																								
15																								
-		uted aceu	ming a 20 d	B/decade F	Decay Pate DP is t	he rem	ulatory	Decired	Pange	maar	uraman	L dieta	nce	MD ie	Maasi	rement P	ange which	ie radu	cad from	n DR to achieve nec	Accory SND	· · · · · · · · · · · · · · · · · · ·		

\*\* EIRP is computed from field strength at 3 meter distance.

\*\*\* Dimension of antenna is taken to be larger of the test antenna and the EUT antenna; EUT antenna is 3cm in dimension

\*\*\*\* ISED Correspondence regarding this product was granted use at proposed avg power rating under RSS-220 Hand-Held Regulations. See correspondence included in this application.

Equipment Used: RSFSV30001

EIRP Peak (50 MHz) = EIRP Pk (28 MHz) + 20 Log10(50 Mhz / 28 MHz)

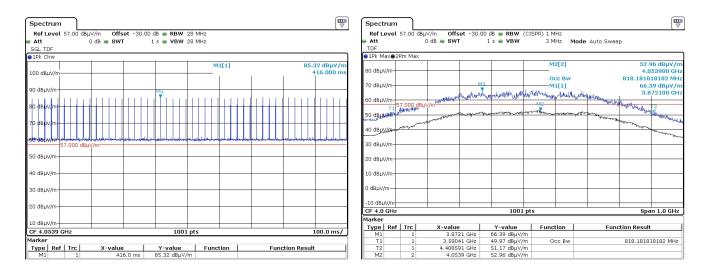


Figure 7: Fundamental Emission Example Plots

#### 4.2.4 Exposure and Potential Health Hazard

To demonstrate compliance with with regulations that place limitations on human electromagnetic field exposure for both the general public and for workers, we compute EIRP from measured emission data. These levels are compared with limits placed by the directives and recommendations detailed in Section 2.1. Table 7 details the results of these computations.

#### Table 7: Electromagnetic Field Exposure.

USA REF: 1.1310, 2.1091/1093, 447498 D01 General RF Exposure Guidance v06 IC REF: RSS-102 Issue 5, Safety Code 6	Test Date: Test Engineer:	22-Mar-17 Joseph Brunett
fin. Sep. Distance: <5 mm (Portable)	EUT: EUT Mode:	LEAR SAT LEAR SAT
	Meas. Distance:	3m

	Frequen	cy Band	E-Field	EIRP	H-Field	Ca	nada ISED RSS-102 MPE			USA FCC 1.1310 MPE	
Mode	Start	Stop	@ 3m (Avg)	(Avg)	@ MSP (Avg)	SC6 Limit @ MSP	SC6 Limit @ MSP	MPE Ratio	SAR Threshold	SAR Threshold	Worst Case MPE Ratio
	MHz	MHz	dBuV/m	mW	dBuA/m	dBuV/m	dBuA/m			Limit	
Other											
	Frequen	cy Band	Pk EIRP + Duty	E-Field	Pwr Density	EIRP + Duty	EIRP			Minimum	
Mode	Start	Stop	(RMS)	@20cm (RMS)	@20cm (RMS)*	(RMS)	Exemption Limit @ MSP	MPE Ratio	SAR Threshold	1g / 10g SAR Threshold	MPE Ratio
	MHz	MHz	dBm	dBuV/m	mW/cm2	mW	mW			Limit	
UWB	3615.40	4336.83	-23.0	95.8	0.00000	0.00505	1.5	0.00337	0.00020	3	0.00007
		ATIOS IS > 1, T	HEN THE EUT M	UST UNDERGO S	AR TESTING PER	FCC AND ISED (IC)	MPE RATIO Total (<1):			MPE RATIO Total (<1):	
REGUL	ATIONS.						REQUIRES SAR TESTING	No		REQUIRES SAR TESTING	No

\* EIRP (mW) = S (mW/cm^2) x 4 x PI x 20cm^2

#### 4.3 Unintentional Emissions

#### 4.3.1**Transmit Chain Spurious Emissions**

Test Setup & Procedure The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Spurious radiated emissions measurements are made following the UWB measurement procedures in ANSI C63.10:2013/RSS-220 up to 40 GHz. The test equipment employed includes RSFSV30001, BICEMCO01, LOGEMCO01, HRNQR316401, HQR2TO18S01, HRNK01, HRNKA01.

#### Measurement Results The details and results of testing the EUT are summarized in Table 8.

#### Table 8(a): Transmit Chain Spurious Emissions.

		y Range		Det				andwie					lwidth								1	Fest Date	: 22-Mar-17
F	< 960	) MHz		Pk/QPk			12	20 kHz			3	00 kH	z								Test	Engineer	: Joseph Brunett
F	> 960	) MHz		RMS Detector: 1 C	GHz Sp	oan / 10	01 Freq	Sample	es; 1 s	ec swee	ep/GH	Iz Spa	n (i.e.	1ms R	MS integrat	ion time per bi	n); Max	Held				EUT	: LEAR SAT
				Pk Detector: 1 GH	z Span	/ 1001	Freq Sa	mples;	1 sec	sweep/	GHz S	Span	(i.e. 11	ns RM	S integratio	n time per bin)	; Max H	eld				Mode	: 10ms Rep Pulses
																					Meas.	Distance	: As Noted
																							FCC/IC
	Env.	Freque	ncy Band	Anter	ına + C	Cable**	*		Rx.	Power	Ra	inge C	orrecti	on*	E-Field	@ DR****				E-Fiel	d Limit		
Tem	o. Vo	lt. Start	Stop	Quality	Pol.	Dim.	Ka	Kg	Pk	RMS	MR	DR	N/F	CF	Pk	Qpk				Pk	Qpk	Pass	
# (C)	) (v	) MHz	MHz	Number	H/V	cm	dB/m	dB	dB	uV/m	m	m	m	dB	dE	uV/m				dBu	iV/m	dB	Comments
1 20	13.	.4 30.0	88.0	BICEMCO01	H/V	22.0	16.9	35.0			3.0	3.0	0.0	0.0	31.2						40.0	8.8	background
2 20	13.	.4 88.0	216.0	BICEMC001	H/V	22.0	16.9	35.0			3.0	3.0	0.1	0.0	34.7						43.5	8.8	background
3 20	13.	.4 216.0	960.0	LOGEMCO01	H/V	22.0	20.1	29.9			3.0	3.0	0.3	0.0	38.1						46.0	7.9	background
,	Env.	Freque	ncy Band	Anter	ına + C	able**	*		Rx.	Power	Ra	inge C	orrecti	on*	E-Field	@ DR****			E	IRP**			
Tem	. Vo	lt. Start	Stop	Quality	Pol.	Dim.	Ka	Kg	Pk	RMS	MR	DR	N/F	CF	Pk	Qpk	Pk	RMS	1MHz Pk Lim	FCC RMS Lim.	ISED RMS Lim.	Pass	
# (C)	) (V	) MHz	MHz	Number	H/V	cm	dB/m	dB	dB	uV/m	m	m	m	dB	dE	uV/m	dE	Bm	dBm	dBm	dBm	dB	Comments
4 GPS	Restr	icted Band E	nissions																				
5 20	13.	.4 1164.0	1240.0	HRNQR316401	H/V	22.0	25.2	-0.4			0.6	3.0	0.4	14.0	-3.2		-98.4			-85.3	-85.3	13.1	max all, noise
5 20	13.	.4 1559.0	1610.0	HRNQR316401	H/V	22.0	21.9	-0.4			0.6	3.0	0.5	14.0	-0.8		-96.0			-85.3	-85.3	10.7	max all, noise
,																							
8 Harn	onic /	Spurious UV	/B Emission	s																			
9 20	13.	.4 960.0	1610.0	HRNQR316401	H/V	22.0	27.6	19.3			0.6	3.0	0.5	14.0	19.3	10.1	-75.9	-85.1	-34.0	-75.3	-75.3	9.8	max all, noise
0 20	13.	4 1610.0	1990.0	HRNQR316401	H/V	22.0	21.7	19.1			0.6	3.0	0.6	14.0	24.5	14.4	-70.7	-80.8	-34.0	-63.3	-70.0	10.8	max all, noise
1 20	13.	.4 1990.0	3100.0	HRNQR316401	H/V	22.0	20.6	18.2			0.6	3.0	1.0	14.0	30.6	20.4	-64.6	-74.8	-34.0	-61.3	-70.0	4.8	max all, noise
2 20	13.	.4 3100.0	3615.0	HRNQR316401	H/V	22.0	27.4	18.0			0.6	3.0	1.2	14.0	54.9	42.9	-40.3	-52.3	-34.0	-41.3	-41.3****	6.3	max all
3 20	13.	.4 4337.0	4750.0	HRNQR316401	H/V	22.0	52.5	17.3			0.6	3.0	1.5	14.0	54.9	42.9	-40.3	-52.3	-34.0	-41.3	-41.3****	6.3	max all
4 20	13.	.4 4750.0	10600.0	HQR2TO18S01	H/V	15.0	35.3	29.1			0.6	3.0	1.6	14.0	23.2	13.5	-72.0	-81.7	-34.0	-41.3	-41.3	38.0	max all, noise
5 20	13.	.4 10600.0	18000.0	HQR2TO18S01	H/V	15.0	34.3	23.5			0.6	3.0	2.7	14.0	25.2	14.0	-70.0	-81.2	-34.0	-61.3	-61.3	19.9	max all, noise
6 20	13.	.4 18000.0	26500.0	HRNK001	H/V	10.2	33.7	36.5			0.3	3.0	1.8	20.0	33.7	24.1	-61.5	-71.1	-34.0	-61.3	-61.3	9.8	max all, noise
7 20	13.	.4 26500.0	40000.0	HRNKA001	H/V	9.2	37.2	12.5	39	28	0.2	3.0	2.3	23.5	40.2	29.2	-55.0	-66.0	-34.0	-61.3	-61.3	4.7	max all, noise
8																							

CF is computed assuming a 20 dB/decade Decay Rate. DR is the regulatory Desired Range measurement distance. MR is Measurement Range, which is reduced from DR to achieve necessary SNR

\*\* EIRP is computed from field strength at 3 meter distance.

\*\*\* Dimension of antenna is taken to be larger of the test antenna and the EUT antenna; EUT antenna is 3cm in dimension

\*\*\*\* ISED Correspondence regarding this particular product permitted use at proposed power rating under RSS-220 Hand-Held Regulations. See correspondence included in this application.

Equipment Used: RSFSV30001, SAHWPK101, MIX26TO4001

	_	GPS I	REST	PICTE		ND F	MICC	IONS		
Spectrun	n ]	0151	KEST1	KIC II			avii 55	IONS		Spectrum
	57.00 dBµ∿			RBW 1 kHz						Ref Level 57
Att PA TDF	0	dB SWT	32.2 ms	VBW 1 kHz	Mode Au	uto FFT				Att PA TDF
PA TUP										PA TOP
CT & Man			1	1	м	1[1]		-3.1	L7 dBu∀/m	
50 dBuV/m-									96160 GHz	50 dBuV/m
00 0001,111										oo abpiini
40 dBuV/m-										40 dBµV/m-
io appijin										io apprim
30 dBuV/m-										30 dBµV/m-
oo appijin										oo abpiini
20 dBuV/m-										20 dBuV/m-
20 00000										20 dbpv/m
10 dBµV/m-										10 dBuV/m
10 0000/11										To apply in
0 dBuV/m-			M1							0 dBuV/m
		and the second sec	<b>T</b>	and some		and the subscript		la staatio da da ta	da ba co ki co a	Protect and states
-10 dBµV/m	they are the state of the	an algo through the	and the second strained.	na / Han Han In Anna	niai/4400m344/	Alaine Shift of a near the	el an investigent of the second	and an address for	enter anter anter anter	-10 dBµV/m
-10 ubµv/m										-10 ubpv/iii
-20 dBµV/m										-20 dBµV/m
-20 ubµv/m										-20 ubpv/m
00.40.11/										00.40.47
-30 dBµV/m										-30 dBµV/m
10.10.11/										10 10 11
-40 dBµV/m									1 0 1 0 1 -	-40 dBµV/m
Start 1.16	4 GHZ			3001	pts			Stop	1.24 GHz	Start 1.559 (

#### Table 8(b): Transmit Chain Spurious Emissions.

Spectrum										
Ref Level 57	.00 dBµV,	/m			RBW 1 kHz					
Att	0	dB	SWT	22.8 ms	VBW 1 kHz	Mode Au	uto FFT			
PA TDF										
⊖1Pk Max									-	
						M	1[1]		-0.3	75 dBµV/m
50 dBµV/m									1.60	24630 GHz
00 0001111										
40 dBµV/m										
30 dBµV/m										
00 00001,										
20 dBµV/m					-					
10 dBµV/m										
									M1	
0 dBµV/m Manadatana analara	متنابيته			Second States	the set of the set of	an unit the sector	bed has to solve	d setter a bluer dat	and a relation of a	and the second
A REAL PROPERTY OF THE PARTY OF T	ward with the second		Annual	and handered	and a fear of the second s	furine and the first of the	And the second second		and a second	
-10 dBµV/m					_					
-20 dBµV/m										
-30 dBµV/m										
-40 dBµV/m										
Start 1.559 G	Hz				300	1 pts			Stop	1.61 GHz

Spectrum	INDOOR PRE-SO	CAN SPURIOU	JS	Spectrum			
Ref Level 44.00 de Att TDF	BµV/m Offset -33.00 dB ● RBW (C 0 dB ● SWT 641 ms ● VBW	CISPR) 1 MHz 3 MHz Mode Auto	Sweep	Ref Level 44.00 d Att TDF		B B RBW (CISPR) 1 MHz s B VBW 3 MHz Mode	Auto Sweep
●1Pk Max●2Rm Max				● 1Pk Max●2Rm Max			
		M2[2]	9.88 dBµV/m			M1[1]	29.08 dBµV/m
40 dBµV/m			1.595500 GHz	40 dBµV/m-			2.684500 GHz
		M1[1]	21.44 dBµV/m			M2[2]	17.64 dBµV/m
35 dBµV/m-			1.530600 GHz	35 dBµV/m			2.686500 GHz
00 00011				00 000			
30 dBµV/m				30 dBµV/m			M1
30 00µv/m				30 00µv/m			بهله باستلابات المالي
25 dBµV/m				25 d0.0//m			1 Marchelley asher Hatty of an and and and
23 ubpv/m			MI	23 ubµv/m	1. 1	alligence relevant and the house of school of the second	All strates as
00 40.00/m				Aller Hall bourstall and the	When and the happened to be a stand to be a strand	seen alberraich an State of the	
20 ubµv/m	www.millionalineduration	ale reported to all and a second and a	Craller Man a come and	V20Perepty/meters			1012
Hilsold yundersold results	when with the the same we all the same and the						Annound
15 dBµV/m-				15 dBµV/m		and a second and a second and a second as a se	
			Ma				
10 dBµV/m				-10 UBUV/m			
5 dBµV/m				5 dBµV/m			
0 dBµV/m	+ + +		<u> </u>	0 dBµV/m	+ +		
-5 dBµV/m-+TH -30.8	828 dBµV/m			-5 dBµV/m-+TH -30.	828 dBµV/m		
Start 960.0 MHz	641 pt	ts	Stop 1.6 GHz	Start 1.6 GHz		1101 pts	Stop 2.7 GHz
Marker				Marker			
Type Ref Trc	X-value Y-value	Function	Function Result	Type Ref Trc	X-value	Y-value Function	Function Result
M1 1	1.5306 GHz 21.44 dBµV/m			M1 1		29.08 dBµV/m	
M2 2	1.5955 GHz 9.88 dBµV/m			M2 2	2.6865 GHz	17.64 dBµV/m	
			_				_
Spectrum Ref Level 35.00 dE Att PA TDF	BµV/m Offset -32.00 dB ● RBW (C 0 dB ● SWT 1.1 s ● VBW	CISPR) 1 MHz 3 MHz <b>Mode</b> Auto	Sweep	Spectrum Ref Level 53.00 d Att PA TDF		IB <b>● RBW</b> (CISPR) 1 MHz s <b>● VBW</b> 3 MHz <b>Mode</b>	Auto Sweep
Ref Level 35.00 de Att PA TDF				Ref Level 53.00 d Att PA TDF			-
Ref Level 35.00 dB		3 MHz Mode Auto	Sweep	RefLevel 53.00 d		s e VBW 3 MHz Mode	Auto Sweep
Att PA TDF PA TDF			( ∆ ) Sweep 18.36 dBµV/m	Ref Level 53.00 d Att PA TDF			Auto Sweep
Ref Level 35.00 de Att PA TDF		3 MHz Mode Auto	Sweep	Ref Level 53.00 d Att PA TDF PK Maxe2Rm Max		s • VBW 3 MHz Mode	Auto Sweep
Att PA TDF PA TDF		3 MHz Mode Auto	[ ∆ ] Sweep 18.36 dBµV/m 3.596500 gH≵	Ref Level 53.00 d Att PA TDF PK Maxe2Rm Max		s e VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.303500 GHz
Att PA TDF PA TDF		3 MHz Mode Auto	[▲] Sweep 18.36 dBµV/m 3.596500 gHz 32.22 dBµs, Mi	Ref Level 53.00 d Att PA TOF PIPk Max@2Rm Max 60 dBµV/m 11 55 dBµV/m Vm 4 db 53.000 dl	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.303500 GHz 36.63 dBµV/m
Ref Level 35.00 de ● Att PA TDF ● 1Pk Max●2Rm Max 30 dBµV/m		3 MHz Mode Auto	[▲] Sweep 18.36 dBµV/m 3.596500 gHz 32.22 dBµs, Mi	Ref Level 53.00 d Att PA TOF PIPk Max@2Rm Max 60 dBµV/m 11 55 dBµV/m Vm 4 db 53.000 dl	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 4.300500 GHz
Ref Level 35.00 db           Att           PA TDF           1Pk Max 2Rm Max           30 dBµV/m           25 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	∑ Sweep 19:36 d8µV/m 3.596500 6/4 3.59250 6/4 3.59250 6/2	Ref Level 53.00 d Att PA TOF PIPk Max@2Rm Max 60 dBµV/m 11 55 dBµV/m Vm 4 db 53.000 dl	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 4.300500 GHz
Ref Level 35.00 db           Att           PA TDF           1Pk Max 2Rm Max           30 dBµV/m           25 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto	∑ Sweep 19:36 d8µV/m 3.596500 6/4 3.59250 6/4 3.59250 6/2	Ref Level 53.00 d Att PA TOF 1Pk Max@2Rm Max 60 dBµV/m 50 dBµV/m 50 dBµV/m 40 50 dBµV/m 50 dBµV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 4.300500 GHz
Ref Level 35.00 dt           Att           PA TDF           1Pk Max 2Rm Max           30 dBµV/m           25 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	∑ Sweep 19:36 d8µV/m 3.596500 6/4 3.59250 6/4 3.59250 6/2	Ref Level 53.00 d Att PA TOF PIPk Max@2Rm Max 60 dBµV/m 11 55 dBµV/m Vm 4 db 53.000 dl	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TOF           ● 1Pk Max●2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	∑ Sweep 19:36 d8µV/m 3.596500 6/4 3.59250 6/4 3.59250 6/2	Ref Level 53.00 d PA TOP PA TOP PA TA PA TOP PA TO	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level         35.00 db           Att         PA ToF           91 ToF         120 dbµV/m           20 dbµV/m         20 dbµV/m           20 dbµV/m         15 dbµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d Att PA TOF 1Pk Max@2Rm Max 60 dBµV/m 50 dBµV/m 50 dBµV/m 40 50 dBµV/m 50 dBµV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 dl           Att           PA TDF           ● 1Pk Max●2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           20 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	∑ Sweep 19:36 d8µV/m 3.596500 6/4 3.59250 6/4 3.59250 6/2	Ref Level 53.00 d PA TOP IPk Maxe 2Rm Max 60 dBuV/m 1 5 dBuV/m 45 dBuV/m 45 dBuV/m 45 dBuV/m 20 dBuV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level         35.00 df           Att         PA TOF           PA TOF         IPk Max         Rm Max           30 dBµV/m         25 dBµV/m         20 dBµV/m           20 dBµV/m         15 dBµV/m         10 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOP PA TOP PA TA PA TOP PA TO	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level         35.00 db           Att         PA ToF           IPk Max@22Rm Max         30 dbµV/m           25 dbµV/m         20 dbµV/m           20 dbµV/m         15 dbµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level \$3.00 d           PA TOP           PA TOP           ● 1Pk Max@2Rm Max           © 0 Bu/Vm           \$10           \$5 dBu/Vm           \$45 dBu/Vm           \$40 dBu/Vm           \$35 dBu/Vm	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA ToF           ● IPk Max● 2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           15 dBµV/m           5 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOP IPk Maxe 2Rm Max 60 dBuV/m 1 5 dBuV/m 45 dBuV/m 45 dBuV/m 45 dBuV/m 20 dBuV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level         35.00 df           Att         PA TOF           PA TOF         IPk Max         Rm Max           30 dBµV/m         25 dBµV/m         20 dBµV/m           20 dBµV/m         15 dBµV/m         10 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOF PA TOF 19k Maxe 28m Max 60 dBuV/m 50 dBuV/m 45 dBuV/m 35 dBuV/m 30 dBuV/m 30 dBuV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TDF           PIX br           30 dBµV/m           25 dBµV/m           20 dBµV/m           15 dBµV/m           10 dBµV/m           0 dBµV/m           0 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level \$3.00 d           PA TOP           PA TOP           ● 1Pk Max@2Rm Max           © 0 Bu/Vm           \$10           \$5 dBu/Vm           \$45 dBu/Vm           \$40 dBu/Vm           \$35 dBu/Vm	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA ToF           ● IPk Max● 2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           15 dBµV/m           5 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d           Atto           PA TOP           IPK Maxe 2Rm Max           60 dBµV/m           11           50 dBµV/m           40 dBµV/m           35 d5µV/m           30 dBµV/m           25 d5µV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TDF           ● 1Pk Max●2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           10 dBµV/m           0 dBµV/m           5 dBµV/m           5 dBµV/m           5 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOF PA TOF 19k Maxe 28m Max 60 dBuV/m 50 dBuV/m 45 dBuV/m 35 dBuV/m 30 dBuV/m 30 dBuV/m	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TOF           PIX Max● ZRm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           15 dBµV/m           10 dBµV/m           0 dBµV/m           0 dBµV/m	0 db • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d           PA TOP           PA TOP           IPK Maxe 2Rm Max           60 dBu/Vm           50 dBu/Vm           45 dBu/Vm           35 dSu/Vm           30 dBu/Vm           25 dSu/Vm	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TDF           ● 1Pk Max●2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           15 dBµV/m           0 dBµV/m           5 dBµV/m           -5 dBµV/m           -10 dBµV/m	0 d8 • SWT 1.1 5 • VBW	3 MHz Mode Auto M2[2] M1[1]	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOP PA	0 db • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 4.300500 GHz
Ref Level 35.00 df           PA TOF           PA TOF           10k Max           25 dBµV/m           20 dBµV/m           20 dBµV/m           10 dBµV/m           5 dBµV/m           -10 dBµV/m           -10 dBµV/m	0 dB • SWT 1.1 s • VBW	3 MHz Mode Auto	Sweep  19.36 dBµV/m 3.596500 GH 3.59250 GH 3.59250 GC	Ref Level 53.00 d           PA TOF           PA TOF           Ink Maxe 2Rm Max           60 dbu//m           11           50 dbu//m           40 dbu//m           30 dbu//m           30 dbu//m           20 dbu//m           20 dbu//m           20 dbu//m           11           50 dbu//m           40 dbu//m           20 dbu//m           20 dbu//m           15 dbu//m	0 dB • SWT 1.1	s         VBW         3 MHz         Mode	Auto Sweep
Ref Level 35.00 df           Att           PA TDF           ● 1Pk Max●2Rm Max           30 dBµV/m           25 dBµV/m           20 dBµV/m           10 dBµV/m           0 dBµV/m           -5 dBµV/m           -10 dBµV/m           -10 dBµV/m           Start 2.7 GHz	0 d8 • SWT 1.1 5 • VBW	3 MHz Mode Auto	IB.36 dBµV/m           3.596500 Grit           3.59550 Grit           3.59250 Grit           3.59250 Grit           Junit           Junit	Ref Level 53.00 d PA TOP ● 19k Max@2Rm Max 60 dBµV/m 41 50 dBµV/m 50 dBµV/m 45 dBµV/m 35 dBµV/m 25 dBµV/m 25 dBµV/m 15 dBµV/m 15 dBµV/m 26 dBµV/m 27 d	0 db • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep 55.31 dBµV/m 4.300500 GHz 36.63 dBµV/m 4.300500 GHz
Ref Level 35.00 df           Att           PA TOF           PATOF           10 dBµV/m           25 dBµV/m           20 dBµV/m           10 dBµV/m           5 dBµV/m           -10 dBµV/m	0 dB • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1] M00 M1	Sweep 18.36 dBµV/m 3.596500 GH 3.59250 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.5	Ref Level 53.00 d           PA TOP           PA TOP           IPK Maxe 2Rm Max           60 dBµV/m           11           50 dBµV/m           40 dBµV/m           30 dBµV/m           25 dBµV/m           26 dBµV/m           20 dBµV/m           20 dBµV/m           15 dBµV/m           20 dBµV/m           15 dBµV/m           15 dBµV/m           20 dBµV/m           21 dBµV/m           22 dBµV/m           20 dBµV/m           21 dBµV/m           22 dBµV/m           23 dBµV/m           24 dBµV/m           25 dBµV/m	0 db • SWT 1.1	s e VBW 3 MHz Mode	Auto Sweep
Ref Level 35.00 df           Att           PA TDF           PA TDF           Oldbu/m           25 dBµV/m           20 dBµV/m           20 dBµV/m           10 dBµV/m           5 dBµV/m           5 dBµV/m           6 dBµV/m           5 dBµV/m           6 dBµV/m           5 dBµV/m           6 dBµV/m           5 dBµV/m           6 dBµV/m           5 dBµV/m           5 dBµV/m           5 dBµV/m           5 dBµV/m           5 dBµV/m           6 dBµV/m           710 dBµV/m           10 dBµV/m           10 dBµV/m           10 dBµV/m	0 dB • SWT 1.1 5 • VBW	3 MHz Mode Auto M2[2] 	Sweep  19.36 dBµV/m 3.596500 GH 3.59250 GH 3.59250 GC	Ref Level \$3.00 d           Att           PA TOF           ● 19k Max@2Rm Max           © 0 dbuV/m           \$1           \$5 dbuV/m           \$0 dbuV/m           \$3 dbuV/m           <	0 dB • SWT 1.1	s • VBW 3 MHz Mode	Auto Sweep
Ref Level 35.00 df           Att           PA TOF           PATOF           10 dBµV/m           25 dBµV/m           20 dBµV/m           10 dBµV/m           5 dBµV/m           -10 dBµV/m	0 dB • SWT 1.1 s • VBW	3 MHz Mode Auto M2[2] M1[1] M1[1] M1[1] M1[1] M2[2] M1[1] M2[2] M1[1] M2[2]	Sweep 18.36 dBµV/m 3.596500 GH 3.59250 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.592500 GH 3.5	Ref Level 53.00 d           PA TOP           PA TOP           IPK Maxe 2Rm Max           60 dBµV/m           11           50 dBµV/m           40 dBµV/m           30 dBµV/m           25 dBµV/m           26 dBµV/m           20 dBµV/m           20 dBµV/m           15 dBµV/m           20 dBµV/m           15 dBµV/m           15 dBµV/m           20 dBµV/m           21 dBµV/m           22 dBµV/m           20 dBµV/m           21 dBµV/m           22 dBµV/m           23 dBµV/m           24 dBµV/m           25 dBµV/m	0 dB @ SWT 1.1	s e VBW 3 MHz Mode	Auto Sweep

Figure 8(a): Transmit Chain Spurious Emissions Pre-Scan Plots.

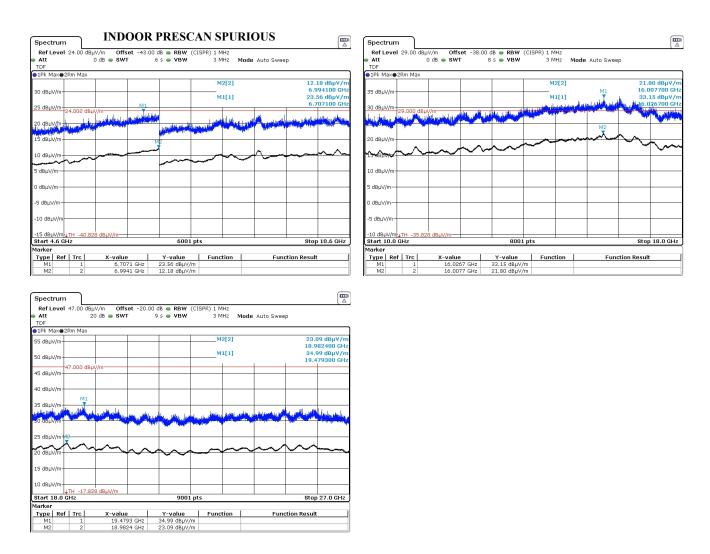
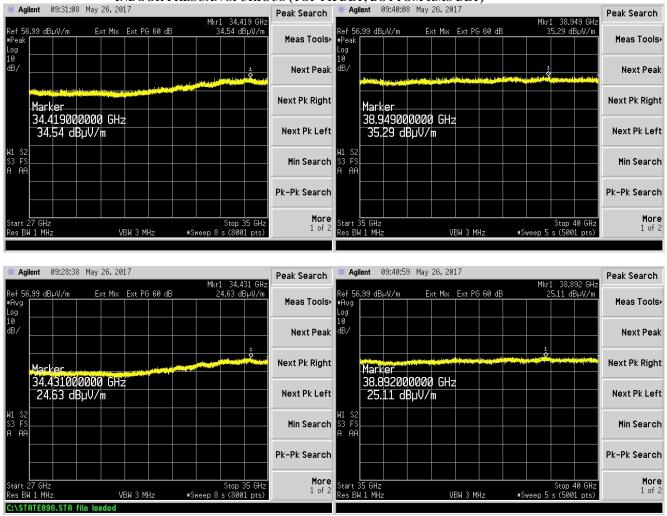


Figure 8(b): Transmit Chain Spurious Emissions Pre-Scan Plots.



#### INDOOR PRESCAN SPURIOUS (TOP PK DET, BOTTOM RMS DET)

Figure 8(c): Transmit Chain Spurious Emissions Pre-Scan Plots.

### 5 Measurement Uncertainty

The maximum values of measurement uncertainty for the laboratory test equipment and facilities associated with each test are given in the table below. This uncertainty is computed for a 95.45% confidence level based on a coverage factor of k = 2.

Table 9: Measurement Uncertainty.

Measured Parameter	${\bf Measurement} ~ {\bf Uncertainty}^{\dagger}$
Radio Frequency	$\pm (f_{Mkr}/10^7 + RBW/10 + (SPN/(PTS - 1))/2 + 1 \text{ Hz})$
Conducted Emm. Amplitude	$\pm 1.8\mathrm{dB}$
Radiated Emm. Amplitude $(30 - 200 \text{ MHz})$	$\pm 2.7\mathrm{dB}$
Radiated Emm. Amplitude $(200 - 1000 \text{ MHz})$	$\pm 2.5\mathrm{dB}$
Radiated Emm. Amplitude $(f > 1000 \text{ MHz})$	$\pm 3.7\mathrm{dB}$
DC and Low Frequency Voltages	$\pm 2\%$
Temperature	$\pm 0.5^{\circ}\mathrm{C}$
Humidity	$\pm 5\%$

<sup>†</sup>Ref: CISPR 16-4-2:2011+A1:2014