Amber Helm Development L.C.

92723 Michigan Hwy-152 Sister Lakes, Michigan 49047 USA Tel: 888-847-8027 LRFOBC-WR2235TXB Issued: April 18, 2023

EMC Test Report

regarding

USA: CFR Title 47, Part 15.519 (Emissions) Canada: ISED RSS-220 i1+A1 (Emissions)

for



FOBU3

Category: UWB Transceiver

Judgments: Part 15.519, ISED RSS-220 Compliant Testing Completed: April 17, 2023



Prepared for:

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A copy of this report will remain on file until May 2033.

Revision History

Rev. No.	Date	Details	Revised By		
r0	April 18, 2023	Initial Release.	J. Brunett		
r1	May 28, 2023	Typo corrections.	J. Brunett		
r2	September 14, 2023	Added Spur Plots	J. Brunett		

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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: US5348 and US5356) and with ISED Canada, Ottawa, ON (File Ref. No: 3161A and 24249). Amber Helm Development L.C. holds accreditation under NVLAP Lab Code 200129-0.

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 May 2033.

1.3 Subcontracted Testing

This report does not contain data produced under subcontract.

1.4 Test Data

This test report contains data included within the laboratory's scope of accreditation. Any data in this report that is not covered under the laboratory's scope is clearly identified.

1.5 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.

1.6 Copyright

This report shall not be reproduced, except in full, without the written approval of Amber Helm Development L.C.

1.7 Endorsements

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

1.8 Test Location

The EUT was fully tested by **Amber Helm Development L.C.**, headquartered at 92723 Michigan Hwy-152, Sister Lakes, Michigan 49047 USA. Table 1 lists all sites employed herein. Specific test sites utilized are also listed in the test results sections of this report where needed.

Table 1: Test Site List.							
Description	Location	Quality Num.					
OATS (3 meter)	3615 E Grand River Rd., Williamston, Michigan 48895	OATSC					

1.9 Traceability and Equipment Used

Pertinent test equipment used for measurements at this facility is listed in Table 2. The quality system employed at Amber Helm Development L.C. 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.	Cal/Ver By / Date Due
Spectrum Analyzer	R & S / FSV30	101660	RSFSV3001	RS / Apr-2024
EMI Receiver	R & S / ESW26	101313	RSESW2601	RS / October-2023
Biconical	EMCO / 93110B	9802-3039	BICEMCO01	Keysight / Aug-2025
Log Periodic Antenna	EMCO / 3146	9305-3614	LOGEMCO01	Keysight / Aug-2025
BNC-BNC Coax	WRTL / RG58/U	001	CAB001-BLACK	AHD / Sept-2023
3.5-3.5MM Coax	PhaseFlex / PhaseFlex	001	CAB015-PURP	AHD / Sept-2023
Harmonic Mixer	Hewlett Packard / 11970A	MY3003A1226	MIX26TO4001	AHD / Mar-2025
K-Band Horn	JEF / NRL Std.	001	HRNK01	AHD / Jul-2024
Ka-Band Horn	JEF / NRL Std.	001	HRNKA001	AHD / Jul-2024
Quad Ridge Horn	Singer / A6100	C35200	HQR1TO18S01	Keysight / Aug-2024

2 Test Specifications and Procedures

2.1 Test Specification and General Procedures

The 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 FOBU3 for compliance to:

Country/Region	Rules or Directive	Referenced Section(s)
United States Canada	Code of Federal Regulations ISED Canada	CFR Title 47, Part 15.519 ISED RSS-220 $i1+A1$

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	"American National Standard of Procedures for Compliance Testing of Unli- censed Wireless Devices"
TP0102RA	"AHD Internal Document TP0102 - Radiated Emissions Test Procedure"
ICES-003; Issue 7 (2020)	"Information Technology Equipment (ITE) - Limits and methods of measurement"

Date: April 18, 2023

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 $7 \ge 4 \ge 1.5$ cm in dimension, and is depicted in Figure 1. It is powered by 3 VDC Lithium cell battery. In use, this device is hand held Table 3 outlines provider declared EUT specifications.



Figure 1: Photos of EUT.

Table 3:	EUT	Declarations	•
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General Declarations Equipment Type: UWB Transceiver **Country of Origin:** China Nominal Supply: 3 VDC **Oper.** Temp Range: -30° C to $+60^{\circ}$ C 3615 - 4337 MHzFrequency Range: Antenna Dimension: 3 cmAntenna Type: Integral Antenna Gain: Not Declared Number of Channels: 1 **Channel Spacing:** Not Applicable Alignment Range: Not Declared Type of Modulation: PPM United States FCC ID Number: KOBJXF23A **Classification**: 15FCanada IC Number: 3521A-JXF23A Hand Held Ultra-Wideband (UWB) Device **Classification:**

3.1.1 EUT Configuration

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



Figure 2: EUT Test Configuration Diagram.

3.1.2 Modes of Operation

There are two principle modes of operation for this device. The first mode (UWB-MODE) is that of a UWB transceiver used to estimate distance from a paired Vehicular mounted satellite device (SAT). In normal operation the EUT, when triggered by an LF command from the vehicle, sends two PPM UWB frames spaced approximately 10 ms apart to a SAT in the vehicle. The SAT on the vehicle in turn responds with an acknowledgement (ACK). Once the ACK is received, the EUT transmits 3 more UWB messages to the SAT which may result in another ACK from the SAT. This message exchange allows for distance estimation calculations. The second mode (UHF-MODE) is that of a manually or automatically actuated UHF RKE transmitter which is addressed in a second test report (AHD Rpt No.: LRFOBC-WR2235TXA).

3.1.3 Variants

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

3.1.4 Test Samples

Two samples of the EUT were provided for testing, including a normal operating sample (paired with a corresponding UWB Satellite) (SN: 1265) and a sample (SN: 1174) with modified SW that transmits repeatedly at a higher than normal rate (once every 10 ms) when power is applied.

3.1.5 Functional Exerciser

EUT normal operating functionality was verified by toggling the door handle switch on the auxiliary switch box provided with the system. Upon switch toggle the RFA LF would trigger UHF and UWB transmissions from the paired EUT (SK CTO) keyfob which in turn would cause the UWB Satellite to transmit UWB frames in response. Upon proper authentication the LED on the switch box would illuminate demonstrating proper system functionality for all radio components.

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

None.

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 screen room. Spectrum and modulation characteristics of all emissions are recorded. Instrumentation, including spectrum analyzers and other test equipment as detailed in Section 1.8 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. If the EUT exhibits spurious emissions due to internal receiver circuitry, such emissions are measured with an appropriate carrier signal applied.



Figure 3: Radiated Emissions Diagram of the EUT.

For devices with intentional emissions below 30 MHz, a shielded loop antenna and/or E-field and H-Field broadband probes are used depending on the regulation. Shielded loops are placed at a 1 meter receive height at the desired measurement distance. For exposure in this band, 10cm diameter single-axis broadband probes meeting the requirements of ISED SPR-002 section 5.2 are employed. Measurements are repeated and summed over three axes, and the entire frequency range is measured with and without the EUT transmitting.

Emissions between 30 MHz and 1 GHz are measured using 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° 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 or broadband ridge-horn antennas on our OATS with a 4×5 m rectangle of ECCOSORB absorber covering the OATS ground screen and a 1.5m table height. 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 λ 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 analyzer.



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

4.1.2 Conducted Emissions Test Setup and Procedures

The EUT is not subject to measurement of power line conducted emissions as it is powered solely by its internal battery.

4.1.3 Power Supply Variation

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

In the case the EUT is designed for operation from a battery power source, the extreme test voltages are evaluated over the range specified in the test standard; no less than $\pm 10\%$ of the nominal battery voltage declared by the manufacturer. For all battery operated equipment, worst case intentional and spurious emissions are re-checked employing a new (fully charged) battery.

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 reported for all relevant modes of operation. The test equipment employed includes RSFSV30001, HQR1TO18S01.

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.								
10-Apr-23	Frequency Range Det IFBW VBW Test Date:								
J. Nantz	Test Engineer:	10 MHz	10 MHz	Pk	f > 1 000 MHz				
Normal Operating	EUT								
60 cm	Meas. Distance:								

	Pulsed Operation / Duty Cycle										
R0	Transmit Mode	Voltage	Oper. Freq	Min. Cycle Time	Total Off- Time/s	EN 302-065 Total Off-Time/s Limit	Mean Off-Time Limit	On-Time	EN 302-065 On- Time LDC Limit	Exposure Duty Correction	
		(V)	(MHz)	(ms)	(ms)	(ms)	(ms)	(ms)	(ms)	(dB)	
R1	PPM (Normal)	3.0	3996.0 31.50 998.46			950.00	38.00	1.54	5.00	13.1	
#	C1	C2	C3	C4	C5	C6	C7	C8	С9	C10	
(ROW) (COLUMN) NOTE:											
	R0 C5 Total Off-time/sec is equal to 1000ms – duration of the five frames observed due to a single manual activation per second (maximum possible repetition rate of system unlock response time observed by test laboratory > 1 sec).								cond (maximum		
	R0 C8 Maximum five-frame on-time measured.										
	Worst-case Exposure duty cycle correction (due to burst-modulated carrier) computed as 10*Log(On-Time/ Min Cycle-Time).								le-Time).		
	R0 C10 Overestimate due to finite transmission length of only five 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 with the device placed in the test mode(s) with the shortest available frame length and minimum frame spacing. The 20 dB EBW is measured as the max-held peak-detected signal when the IF bandwidth is greater than or equal to 1% of the receiver span. For complex modulations other than ASK and FSK, the 99% emission bandwidth per IC test procedures has a different result, and is also reported. The test equipment employed includes RSFSV30001, HQR1TO18S01.

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.

Table 5: Fundamental Emission Bandwidth.

Frequency Range f>1 000 MHz				Det Pk	IFBW 1 MHz	VBW 1 MHz	Span 1 GHz		Tes	Test Date: t Engineer: EUT s. Distance:		21-Fe Joseph I Normal C 60 e	b-23 Brunett Operating cm	
							Occupi	ed Bandwidth						
R0	Tananit Mada	Symbol Rate	Data Rate	Voltage	Oper. Freq	99% OBW	10 dB OBW	OBW Minimum Limit	fL	fL Limit	fH	fH Limit	fmax	Pass/Fail
	I ransmit Wode	(Msym/s)	(Mbps)	(V)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	
R1	Normal PPM	-	-	3.0	3994.0	751.2	614.4	500.0	3723.6	3100.0	4338.0	4800.0	3994.0	Pass
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14
	(ROW)	(COLUMN)	NOTE											

ROW) (COLUMN) NOTE: R0 C7 Measure

C7 Measured according to ANSI C63.10-2013, section 10.1



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. Fundamental emissions are measured at the regulatory distance on our OATS. The test equipment employed includes RSFSV30001, HQR1TO18S01.

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

Table 6(a): Fundamental Emission Field Strength.

																EUT !	Modes:	al	UWB	continu	ously n	nodulate	d at hig	gher tha	n norm	al perio	dic rate	, max fi	rame width.
																		a2	UWB	Normal	Operat	ing Mo	de – Ac	tuated	by dete	ction of	LF into	errogati	on.
									Tes	t Date:		02/27/2	3					a3											
								1	est En	gineer:	Jos	eph Bru	inett					a4											
	Freq	uency			Site				EUT		Te	st Ante	enna	Cable		Rec	eiver			Fie	ld Stre	ngth @	DR			EUT	EIRP		Details
	Start	Stop	Temp.	MR	DR	N/F	CF				Pol.	Dim.	Ka	Kg	Rx P	ower	Band	width		Pk			RMS		P	'k	RM	ΛS	l .
R0								Mode	Volt.	Dim					Pk	RMS	RBW	VBW	Meas.	Li	mit	Meas.	Lir	nit	Meas.	Limit	Meas.	Limit	I
								see												USA	CAN		USA	CAN					Pass/Fail
	MHz	MHz	(C)		m		dB	table	(V)	cm	H/V	cm	dB/m	dB	dBu	ıV/m	M	Hz			dBu	V/m				dI	3m		dB
R1	SE	ΓUP:			DATS	A		LEA	AR SK	CTO	HRI	NQR31	6401			RSFS	V30001		NOTE	S: Max	all oric	ntation	s of EU	T and b	oth Tes	st Antei	ına Pola	rizatior	15
R2	Peak Pe	ower - No	Key																										
R3	3994.0	3994.0	-2.0	3.0	3.0	1.3	0.0	al	3.0	1.5	H/V	22.0	33.6	-0.4			28.00	28.00	89.9										
R4	3994.0	3994.0	-2.0	3.0	3.0	1.3	0.0	al	3.0	1.5	H/V	22.0	33.6	-0.4			50.00	50.00	94.9						3	.0			0.3
R5	Peak Pe	ower - Wi	ith Key	r																									
R6	3997.0	3997.0	-2.0	3.0	3.0	1.3	0.0	al	3.0	1.5	H/V	22.0	33.6	-0.4			28.00	28.00	88.4										
R7	3997.0	3997.0	-2.0	3.0	3.0	1.3	0.0	al	3.0	1.5	H/V	22.0	33.6	-0.4			50.00	50.00	93.4						-1.8	.0			1.8
R8																													
R10	PSD - N	lo Key																											
R11	3994.0	3994.0	-2.0	3.0	3.0	1.3	0.0	al	2.1	1.5	H/V	22.0	33.6	-0.4			1.00	3.00	68.7			53.2					-42.0	-41.3	0.7
R12	3994.0	3994.0	-2.0	3.0	3.0	1.3	0.0	al	3.0	1.5	H/V	22.0	33.6	-0.4			1.00	3.00	68.8			53.2					-42.0	-41.3	0.7
R13	3994.0	3994.0	-2.0	3.0	3.0	1.3	0.0	al	3.3	1.5	H/V	22.0	33.6	-0.4			1.00	3.00	68.8			53.2					-42.0	-41.3	0.7
R14																													
R15																													
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C28	C29	C31
(F	ROW)	(COLU	JMN)	NOT	E:																								
	R0	C	4	MR	is Me	asuren	nent Ra	ange, v	vhich i	s reduc	ed froi	n DR	to achie	eve neces	sary S	NR.													
	R0	C	5	DR i	s the	regulat	tory D	esired l	Range	measu	rement	distan	ce.																
	R0	C	6	N/F	is Nea	ar-Fiel	d / Far	-Field	distanc	e com	puted f	or may	of EU	T Anten	na Dim	ension	(C10)	and T	est Ant	tenna d	limens	ion (Cl	2), wh	ere ap	plicabl	e.			

 R0
 C7
 CF is computed using a 20 dB/decade Decay Rate.

 R0
 C19
 When E-field or EIRP is reported directly from Spectrum Analyzer, Antenna Factors and Cable losses are included directly in SA settings and Pr is not reported.

R0 C19,C22 PEAK and RMS Power measured with 1 GHz Span, 1001 Freq Samples, 1 sec sweep, Max-Held. Peak then measured in zero span using 28MHz RBW/VBW

R4/R7 C25 Peak in 50 MHz BW computed from (R2;C19) using 20*log10(50MHz / 28MHz)

 R0
 C29
 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. RMS Limits of -41.3 dBm/MHz are applicable as EUT employs LDC mitigation according to EN 302 065-3 v2.1.1, section 4.5.3. Exterior limits do not apply to trigger before transmit

 R0
 C29
 vehicular systems in alignment with Decision (EU) 2019/785 of 14 May 2019, Annex 3

Table 6(b): Fundamental Emission Field Strength.



4.3Unintentional Emissions

Transmit Chain Spurious Emissions 4.3.1

The results for the measurement of transmit chain spurious emissions at the nominal voltage and temperature are provided in Table 7.

								Ta	bie	1	a):	11	rai	ISH	110	Una	m spi	iriou	s En	lissions.				
	Freq F <	uency I < 960 N > 960 N	Range IHz IHz		Det Pk/QPk RMS Detector: 1.0	iHz Sn	an / 100	IF B 1	andw 20 kH Sample	idth z es: 1 se	c sweer	Video : : /GHz	Ban 300 kl	dwidtl Iz (i.e. 1	n ms RM	S integrat	ion time per bi	n): Max H	ald.			Test	Fest Date: Engineer: EUT:	27-Mar-23 Joseph Brunett LEAR SK CTO
	-				Pk Detector: 1 GH	z Snan	/ 1001	Frea Sar	nnles	1 sec s	ween/G	H _Z Si	oan (i	e Im	RMS	integratio	n time ner bin)	· Max Held	1				Mode:	10ms Ren Pulses
	GNS	S Rest	ricted		Pk Detector start/st	top free	quencie	s per stat	tndard	, 1kHz	RBW /	3 kH2	zVBW	. May	c Held	integratio	i tine per onij	, wax new	1			Meas.	Distance:	As Noted
																								FCC/IC
	Er	ıv.	Freque	ncy Band	An	tenna +	Cable			Rx.	Power	R	ange	Correc	tion	E-I	ield @ DR				E-Fiel	d Limit		
R0	Temp.	Volt.	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		dBuV/m				dBu	V/m	dB	Comments
R1	20	3.0	30.0	88.0	BICEMCO01	H/V	22.0	16.9	35.0			3.0	3.0	0.0	0.0	30.9						40.0	9.1	background
R2	20	3.0	88.0	216.0	BICEMCO01	H/V	22.0	16.9	35.0			3.0	3.0	0.1	0.0	34.7						43.5	8.8	background
R3	20	3.0	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
	Er	ıv.	Freque	ncy Band	An	tenna +	Cable			Rx.	Power	R	ange	Correc	tion	E-H	ield @ DR			E	IRP	_		
R4	Temp.	Volt.	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		dBuV/m		iBm	dBm	dBm	dBm	dB	Comments
R5	GPS F	Restricte	ed Band Em	nissions																				
R6	20	3.0	1164.0	1240.0	HQR1TO18S01	H/V	22.0	25.2	-0.4			0.6	3.0	0.4	14.0	-11.8		-107.0	1		-85.3	-85.3	21.7	max all
R7	20	3.0	1559.0	1610.0	HQR1TO18S01	H/V	22.0	21.9	-0.4			0.6	3.0	0.5	14.0	2.3		-92.9			-85.3	-85.3	7.6	max all
R8																								
R9	Harmo	nic / Sp	ourious UW	B Emission:	5																			
R10	20	3.0	960.0	1610.0	HQR1TO18S01	H/V	22.0	27.6	19.3			0.6	3.0	0.5	14.0	10.4	2.8	-84.8	-92.4	-34.0	-75.3	-75.3	17.1	max all
R11	20	3.0	1610.0	1990.0	HQR1TO18S01	H/V	22.0	21.7	19.1			0.6	3.0	0.6	14.0	16.5	9.2	-78.7	-86.0	-34.0	-63.3	-70.0	16.0	max all
R12	20	3.0	1990.0	3100.0	HQR1TO18S01	H/V	22.0	20.6	18.2			0.6	3.0	1.0	14.0	19.4	12.9	-75.8	-82.3	-34.0	-61.3	-70.0	12.3	max all
R13	20	3.0	3100.0	3615.0	HQR1TO18S01	H/V	22.0	27.4	18.0			0.6	3.0	1.2	14.0	29.2	15.3	-66.0	-79.9	-34.0	-41.3	-41.3	32.0	max all
R14	20	3.0	4337.0	4750.0	HQR1TO18S01	H/V	22.0	52.5	17.3			0.6	3.0	1.5	14.0	41.0	26.8	-54.2	-68.4	-34.0	-41.3	-41.3	20.2	max all
R15	20	3.0	4750.0	10600.0	HQR1TO18S01	H/V	15.0	35.3	29.1			0.6	3.0	1.6	14.0	25.7	14.0	-69.5	-81.2	-34.0	-41.3	-41.3	35.5	max all, noise
R16	20	3.0	10600.0	18000.0	HQR1TO18S01	H/V	15.0	34.3	23.5			0.2	3.0	2.7	26.0	10.7	-1.2	-84.5	-96.4	-34.0	-61.3	-61.3	35.1	max all, noise
R17	20	3.0	18000.0	26500.0	HRNK001	H/V	10.2	33.7	36.5			0.1	3.0	1.8	32.0	12.5	0.5	-82.7	-94.7	-34.0	-61.3	-61.3	33.4	max all, noise
R18	20	3.0	26500.0	40000.0	HRNKA001	H/V	9.2	36.1	0.0	-101	-102	0.1	3.0	2.3	35.6	6.5	5.5	-88.7	-89.7	-34.0	-61.3	-61.3	28.4	max all, noise
R19																								
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24
(R	OW)	(CC	DLUMN)	NOTE:																				
R)/R4		C15	CF is com	puted assuming a 20) dB/de	cade D	ecay Rat	te. DF	t is the	regulate	ory Do	esired	Range	measu	rement di	stance. MR is	Measurem	ent Range,	which is reduced fro	om DR to achieve n	ecessary SNR.		
	R4	С	18/C19	EIRP is co	mputed from field s	trength	n at 3 m	eter dista	ance.															
R)/R4		C7	Dimensior	n of antenna is taken	to be l	larger o	f the test	anten	na and	the EU	Г ante	nna; l	EUT ar	ntenna	s 1.5cm in	dimension.							
R1	3/R14		C22	ISED Con	espondence regardi	ng this	particu	lar produ	act per	mitted	use at p	ropos	ed po	wer rat	ing un	ler RSS-2	20 Hand-Held	Regulation	s. See cor	respondence include	d in this application	L.		
Rl	-R17	С	10/C11	When E-fi	eld or EIRP is repor	ted dir	ectly fro	om Spec	trum /	Analyze	er, Ante	nna F	actors	and C	able lo	ses are in	cluded directly	in SA sett	ings and P	is not reported.				
R)/R4		C23	Values rep	orted are the maxim	um ov	er all or	rientation	ns and	polariz	zations.	Repo	rted va	alues a	re the 1	naximum	radiated power	r or backgr	ound noise	whichever is highe	r.			

Table 7(a): Transmit Chain Spurious Emissions

Radiated Digital Spurious 4.3.2

The results for the measurement of digital spurious emissions are not reported herein as all digital emissions were greater than 20 dB below the regulatory limit. Radiation from digital components was measured to 1 GHz, or to five times the maximum digital component operating frequency, whichever is greater.

Table 7(b): Transmit Chain Spurious Emissions.

TX Spurious

| MultiView | Receiver
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 | ectrum | | | | | | ~
 | MultiView | Receiver
 | 🖾 Spec | trum 🗍 | 820 | | | | | ~
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--|--|---|--|------------------------------|----------------|---------------------
---|--|
| Ref Level 52. | 00 dBµV/m Of
10 dB = SV
 | Hiset -40 dB =
 | RBW 1 MHz | Mode Auto Swe | ven. | | F | requency 1 2 | 850000 GHz
 | Ref Level 52 | 2.00 dBµV/m (
10 dB = 5
 | Offset -40 dB ● F
SWI 380 ms ■ V | RBW 1 MHz | Mode Auto Swe | ven. | | | requency 1.8 | 000000 GHz
 |
| Input
Preamp TDF Inpu | 1 AC PS
 | On On
 | Notch Off | 2" "20200318-AH | D-CABO18WHITE | -10M-20GH7 2* | "AHD-GTEM-PRI | ESCAN2021" | 050000 0112
 | Input
Preamp TDF In | 1 AC F
 | S On M | Notch Off
TE-10M-20GHZ | *20200318-AH | D-CABO18WHIT | E-10M-20GH7 3 | " "AHD-GTEM-PE | ESCAN2021" | 000000 0112
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 | 10 0 001011
 | | , | | torr to orning to | | 1Pk Vic | w • 2Rm View
 | 1 Frequency S | Sweep
 | | LE TOULEOOLE | , | | | | • 1Pk Vie | w • 2Rm View
 |
| 50 dBµV/m- |
 |
 | | | | | | M1[1] | 10.38 dBpV/m
 | 50 dBµV/m |
 | | | | | | | M2[2] | 9.20 dBµV/m
 |
| |
 |
 | | | | | | M2[2] | 2.81 dBµV/m
 | |
 | | | | | | | M1[1] | 16.50 dBµV/m
 |
| 40 dBµV/m |
 |
 | | | | | | | 1.574600 GHz
 | 40 dBµV/m |
 | | | | | | | | 1.919700 GHz
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| MultiView | Receiver
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 | MultiView | Receiver
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| Ref Level 52. | Receiver
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 | RBW 1 MHz | × | | | | | ▽
 | MultiView
Ref Level 62 | Receiver
 | Diffset -40 dB = F | trum | MHz | | | | | ▽
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| MultiView 8
Ref Level 52.1
Att
Input | Receiver 00 dBµV/m Of 10 dB ● SV 1 AC PS
 | Spe
Hset -40 dB •
WT 1.11 s •
S On
 | RBW 1 MHz
VBW 3 MHz
Notch Off | Mode Auto Swee | р | | F | requency 2.5 | v
450000 GHz
 | MultiView
Ref Level 62
Att
Input | Receiver
 | Spec Diffset -40 dB SWT 542 ms SWT 542 ms | trum (
RBW (CISPR)
VBW (
Notch | 1 MHz
3 MHz Mode / | luto Sweep | | | requency 3.3 | 710000 GHz
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| MultiView
Ref Level 52.0
Att
Input
Preamp TDF Input | Receiver OddBµV/m Of 10 dB = SV 1 AC PS ut1 "20200318-A
 | Spe
Fiset -40 dB •
WT 1.11 s •
S On
WD-CAB018WH
 | RBW 1 MHz
VBW 3 MHz
Notch Off
IITE-10M-20GH2 | Mode Auto Swee | *P
D-CAB01SWHITE | -10M-20GHZ_2" | F | requency 2.5 | v
450000 GHz
 | MultiView
Ref Level 62
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Input
TDF Input "20 | Receiver
 | Spec Offset -40 dB F SWT 542 ms N >S On M >S018WHITE-10M-3 AB018WHITE-10M-3 AB018WHITE-10M-3 | trum (
RBW (CISPR)
VBW :
Notch
20GHZ","20200 | 1 MHz
3 MHz Mode /
Off
318-AHD-CAB0 | Auto Sweep
18WHITE-10M-2 | 0GHZ_2","2023 | 0412-AHD-S BAY | requency 3.3 | 710000 GHz
 |
| MultiView 8
Ref Level 52.0
Att
Input
Preamp TDF Input
Infraguency St
St dBµA/m | Receiver
00 dBµV/m Of
10 dB = Sv
1 AC PS
ut1 "20200318-A
wccp | Spe
Ifset -40 dB •
WT 1.11s •
S On
A+D-CAB018WH | RBW 1 MHz
VBW 3 MHz
Notch Off
ITE-10M-20GH2 | Mode Auto Swee
2","20200318-AH | P
D-CABO1SWHITE | -10M-20GHZ_2" | F
,/'AHD-GTEM-PRI | requency 2.5 | ✓ ✓ 450000 GHz // • 28m View 19.44 dBpV/m | MultiView
Ref Level 62
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TDF Input1 "20
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60 dBµN/m | Receiver
2.00 dBµV/m 0
10 dB = 5
1 AC F
1200318-AHD-CA | Spec System | ctrum (
RBW (CISPR)
VBW
Notch
20GHZ","20200 | 1 MHz
3 MHz Mode /
Off
318-AHD-CAB0 | Auto Sweep
18WHITE-10M-2 | 0GHZ_2","2023 | 0412-AHD-S BAY | Trequency 3.3 | |
| MultiView G
Ref Level 52.0
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Input
Preamp TDF Input
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So dBut//m- | Receiver
00 dBµV/m Of
10 dB = Sy
1 AC PS
ut1 "20200318-A
weep | Spe
ffset -40 dB •
WT 1.11s •
S On
WD-CAB018WH | RBW 1 MHz
VBW 3 MHz
Notch Off
IITE-10M-20GH2 | Mode Auto Swee | ep
D-CABO1SWHITE | -10M-20GHZ_2" | F
,"AHD-GTEM-PRI | requency 2.5 | v 450000 GHz w/ • 2Rm View 19.44 dBpV/m 2.265300 GHz | MultiView
Ref Level 62
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Input
TDF Input1 "20
Infrequencys
60 dBµv/m | Receiver | Spec Spec SwT 542 ms | RBW (CISPR)
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20GHZ","20200 | 1 MHz
3 MHz Mode /
Off
318-AHD-CAB0 | Auto Sweep
18WHITE-10M-2 | 0GHZ_2","2023 | 0412-AHD-S BAY | TREQUENCY 3.3
ID HRN'
ID HRN'
ID HRN' | 710000 GHz
29.18 dBpV/m
3.634500 GHz |
| MultiView C
Ref Level 52.0
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Preamp TDF Input
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50 dBµ//m- | Receiver 00 dBµV/m Of 10 dB SV 1 AC PS utl "20200318-A Weep
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ffset -40 dB •
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VBW 3 MHz
Notch Off
ITE-10M-20GH2 | Mode Auto Swee | PD-CABO18WHITE | -10M-20GHZ_2" | F
,''AHD-GTEM-PRI | requency 2.5
ESCAN2021"
EIP& WE
M1[1]
M2[2] | ✓
✓ ✓ ✓ ✓ ✓ ✓ ✓ | MultiView
Ref Level 62
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50 dBµ/m | Receiver
200 dBµV/m 0
10 dB = 5
1 AC F
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WCCP
 | Spec | RBW (CISPR)
VBW
Notch
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3 MHz Mode /
Off
318-AHD-CAB0 | Auto Sweep
18WHITE-10M-2 | 0GHZ_2","2023 | 0412-AHD-S BAY | Trequency 3.3
D HRN'
M1[1]
M2[2] | ▼
710000 GHz
29.18 dBpV/m
3.634500 GHz
15.33 dBpV/m
3.632500 GHz
 |
| MultiView C
Ref Level 52.
Att
Input
Preemp TDF Inpu
Frequency SS
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40 dBµV/m | Receiver 00 dBµV/m Of 10 dB SV 1 AC PS utl "20200318-A WCCP
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ffset - 40 dB -
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 | RBW 1 MHz
VBW 3 MHz
Notch Off
(TE-10M-20GH2 | Mode Auto Swee | sp
D-CAB018WHITE | -10M-20GHZ_2" | F.,"AHD-GTEM-PRI | requency 2.5
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19:44 dBµV/m
2.265300 GHz
12:94 dBµV/m
2.265300 GHz
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Ref Level 62
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50 dBµ//m | Receiver
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1 AC F
1200318-AHD-C4
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2.00 dBµ//m (
10 dB = 5
1 AC F
1200318-AHD-CA
WCCD | Spec Spec Spec System S | trum (i
RBW (CISPR)
VBW
Notch
20GHZ","20200 | I MHz
MHz Mode /
Off
318-AHD-CABO | Juto Sweep | 10GHZ_2","2023 | 0412-AHD-S BAY | M1[1]
M2[2] | ▼
710000 GHz
29.18 dBµV/m
3.634500 GHz
15.33 dBµV/m
3.637500 GHz |
| MultiView C
Ref Level 52.0
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Preamp TDF Input
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40 dbp///m | Receiver
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VBW 3 MHz
Notch Off
(ITE-10M-20GH2 | Mode Auto Swee 7","20200318-AH | ep
D-CABO18WHITE | -10M-20GHZ_2" | F
,//AHDGTEM-PRI | requency 2.5 | v 450000 GHz w 228m V(ew 19,44 dB/V/m 2.265300 GHz 2.265300 GHz
 | MultiView Ref Level 62 Att Input TDF Input! TDF Input! S0 dBµV/m 40 dBµV/m 30 dBµV/m | Receiver
.00 dBµ//m (0
10 dB = \$
1AC F
200318-AHD-CA
WCCD
 | Spect -40 d8 = F 95 Cn = F 95 Cn = F 96018WHTE-10M-2 | trum (i
RBW (CISPR)
VBW
Notch
20GHZ","20200 | I MHz
MHz Mode /
Off
318-AHD-CAB0 | Juto Sweep | 0GHZ_2',"2023 | 0412-AHD-S BAY | irequency 3.3 D HRN' 100 HRN' M1[1] 100 HRN' M2[2] 100 HRN' | v 710000 GHz 29.18 dBµ/m 3.634500 GHz 3.634500 GHz 3.637500 GHz
 |
MultiView Composition Ref Level 52.1 Att Input Frequency 50 0 dbµ//m 50 dbµ//m 40 dbµ//m 30 dbµ//m 20 dbµ//m 20 dbµ//m	Receiver 00 dBµV/m Of 10 dB = \$5% 1 AC PS utt *20200318-P weep	Spe See S	RBW 1 MHz VBW 3 MHz Notch Off (ITE-10M-20GH)	Mode Auto Swee	ep D-CABO1SWHITE	-10M-20GHZ_2"	F	requency 2.5 ISCAN-2021* ISCA	v 450000 GHz 19.44 dBµV/m 2.265300 GHz 12.94 dBµV/m 2.265300 GHz	MultiView Ref Level 62 * Att Input 1DF Input 50 dBy//m 40 dBy//m 30 dBy//m	Receiver .00 dBµ//m (0 10 dB = \$ 1AC F 200318-AHD-CA WCCD	Spect Sec	trum (ERRW (CISPR) WeW Notch 20GHZ","2020C	1 MHz Off 318-AHD-CAB0	Auto Sweep	00GHZ_2*,*2023	0412-AHD-S BAY	TREQUENCY 3.3 D HRN' TREAT	v 710000 GHz 29.18 dBµV/m 3.634500 GHz 15.33 dBµV/m 3.637500 GHz M1 M1
MultiView Ref Level 52.1 Att Input Input Presemp TDF lepp 50 dBµ//m 40 dBµ//m 20 dBµ//m	Receiver 10 dBµV/m Of 10 dB = \$5% 1 AC PS utt "20200318-A weep	Spe Spe See S	RBW 1MHz VBW 3MHz Notch Of ITE-10M-20GH2	Mode Auto Swee **,*20200318-AH	ep D-CABO ISWHITE	-10M-20GHZ_2*	F ,"AHD-GTEM-PRI	requency 2.5 ESCAN2021* IPX WE M2[2]	V 450000 GHz 19.44 dBpV/m 12.265300 GHz 2.265300 GHz	MultiView Ref Level 62 Att Input TOP Input 50 dBµ//m 40 dBµ//m 30 dBµ//m	Receiver 10 dB + 5 10 10 dB + 5 10 10 dB + 5 10 10 10 10 10 10	Spec	trum (RBW (CISPR) We Notch 20GH2","2020C	I MH2 MH2 Mode / Off 318-AHD-CABO	2410 Sweep 1890-17E-10M-2	0GHZ_2*,*2023	0412-AHD-S BAY	inequency 3.3 D HRN' IPRV/E MI[1] IPRV/E M2[2] IPRV/E	v 28m Viaw 29.18 dBµV/m 3.634500 GHz 15.33 dBµV/m 3.637500 GHz Mi Mi Mi Mi Mi Mi
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MultiView Ref Level 52.1 Imput Presemp TDF Ipput Incourses 30 dBµV/m 40 dBµV/m 20 dBµV/m 20 dBµV/m 10 dBµV/m 10 dBµV/m	Receiver 00 dBµV/m Of 10 dB = \$\$ 1 AC PS 1 A	Spe Spe Spe See Son S	RBW 1 MHz VBW 3 MHz VBW 3 MHz Notch Off ITE-10M-20GH2	Mode Auto Swee	sp D-CABO I SWHITE	-10M-20GHZ_2*	F ,"AHD-GTEM-PRI	requency 2.5 55CAN-2021* 1123 1224 11[1] 1224 12	450000 GHz 9.44 dbpV/m 19.44 dbpV/m 2.265300 GHz 2.265300 GHz	MultiView Ref Level 62 Att Trput Toput 50 db//m	Receiver 10 dB = 1	Spec	Etrum (CISPR) New (CISPR) Netch 20GHZ","2020C	I MHE 3 MHE Off Off 1318-AHD-CABO	uto Sweep	0.GHZ_2*,*2023	0412-AHD-S BAY	Trequency 3.3 D HRN* IDP V/c M1[1] M2[2] M2[2]	v 224m Vicew 29.13 dBµVm 3.634500 GHz 15.33.dBµVm 3.637500 GHz 41 41 41 41 41 41 41 41 41 41
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,"AHD-GTEM-FRI | requency 2.5 |
 | MultiView Ref Level 62 Att ToP Input *20 In requerters 5 50 db//m 40 db//m 90 db//m 10 db//m 10 db//m 0 db//m | Receiver 10 dB µ//m (10 dB µ//m (10 dB = ½ 1 AC (1 1 AC (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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0412-AHD-S BAY | requency 3.3 D HN' MI[1] M2[2] | v
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Multiview Ref Level S2.1 Att Input Pream DTF Ico 50 dBµ/m 40 dBµ//m 0 dBµ/m 0 dBµ/m -10 dBµ/m	Receiver 00 dB/V/m Of 10 dB 97 1 AC PS 1 AC PS VCD PS VCD PS VCD PS VCD PS	X Spe Iffect -40 dB = W1 V1 1.11:0 O V1 0.000 (BWH) O M1 Spe V1 Spe V1 Spe V1 Spe V1 Spe Spe Spe	REVUIN I MH2 REV 1 MH2 VEW 3 MH2 HE210H-20CH2 HE210H-20CH2	Mode Auto Swee V: "20200318-044	sp D-CABO I SWHITE	-104-206HZ_2*	F	requency 2.5 SCAL-2021 112207 MT[1] MZ[2]	v 450000 GHz v 2 20m Vice 19.44 dByV/m 2.265300 GHz 2.265300 GHz 4.265300 GHz 4.265300 GHz	MultiView Ref Level 62 Input TDF Input 50 dBu//m 40 dBu//m 30 dBu//m 10 dBu//m 10 dBu//m 0 dBu//m	Receiver 10 dB = i 2003 18 - 410 - Cl 2003	Spectra 40 dB * f	Etrum (ERBW (CISPR) VBW (SISPR) 2004/2 200000	MH2 MH2 MH2 MH2 MH2 Mode # MH2 MH2 MH2 MH2 MH2 MH2 MH2 MH2 MH2 MH2	iuto Sweep	0GHZ_2*,*2023		inequency 3.3 D H9/* 100000 M1[1] 100000 M2[2] 1 V//W/V 1	v 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Multiview Ref Level 52.1 Att page 10 ⁴ (more 32) Bigging 10 ⁴ (more 32) 50 dBµ//m 20 dBµ//m 20 dBµ//m 0 dBµ//m 0 dBµ//m 0 dBµ//m 0 dBµ//m	Receiver 00 dBu/ym Of 10 dB ym 10 dB ym 11 dD ym 12 dB ym 14 ym dm 10 dB ym 11 dB ym 11 dB ym 12 dB dB 12 dB dB 13 dB dB 14 dB dB 14 dB dB 14 dB dB <td< td=""><td>Image: Add to the second sec</td><td>SCTUM RBW 1 MH2 VBW 3 MH2 NRTH 00H2 NTC 10H-20CH2</td><td></td><td>P</td><td>-10/1-2004/Z_2*</td><td>F AND-GTEM-PRI</td><td>requency 2.5 SCAN-2021* 104 VIE VIE[1] V2[2]</td><td>20000 GHz 2014 48000 2014 48000 2014 48000 2014 48000 2014 48000 2014 2014 48000 2014 20</td><td>Multiview Ref Level 62 Throut Toput Toput S0 dBu//m 60 dBu//m 90 dBu//m</td><td>Receiver Receiver 10 dB/W/m 10 de 10 de</td><td>Spect</td><td>Etrum (EFR) BRBW (CISPR) VBW Vorth 200Hz/202000</td><td>MH2 MH2 M</td><td>Lito Sweep</td><td>000HZ_27,2023</td><td></td><td>requency 3.3 D H91' 102 VI 111 V2[2]</td><td>v 710000 GHz 2018 dig/w 3.634500 GHz 1.533 dig/w 3.637500 GHz 1.533 dig/w 4.533 dig/w 4.</td></td<>	Image: Add to the second sec	SCTUM RBW 1 MH2 VBW 3 MH2 NRTH 00H2 NTC 10H-20CH2		P	-10/1-2004/Z_2*	F AND-GTEM-PRI	requency 2.5 SCAN-2021* 104 VIE VIE[1] V2[2]	20000 GHz 2014 48000 2014 48000 2014 48000 2014 48000 2014 48000 2014 2014 48000 2014 20	Multiview Ref Level 62 Throut Toput Toput S0 dBu//m 60 dBu//m 90 dBu//m	Receiver Receiver 10 dB/W/m 10 de	Spect	Etrum (EFR) BRBW (CISPR) VBW Vorth 200Hz/202000	MH2 M	Lito Sweep	000HZ_27,2023		requency 3.3 D H91' 102 VI 111 V2[2]	v 710000 GHz 2018 dig/w 3.634500 GHz 1.533 dig/w 3.637500 GHz 1.533 dig/w 4.533 dig/w 4.
MultiView Image: Comparison of the second seco	Receiver 00 dBy/m Of 10 dB est 10 dB est 10 dB est	Milett Specification Iffect -40.48 - W1 1.12 - Interfect - - M1 - - M2 - -	Setrum	Image: Auto Sweet Image: Auto Sweet	92 O-CABO1SWHITE	-104-20642_2*	F	requency 2.5 (500-2021) 102-876 11[1] 122-876 11[1] 122-876 11[1] 122-876 11[1] 122-876 122	v 450000 GHz 44-64 digit/m 12-46 digit/m 12-6500 GHz 12-94 digit/m 12-6500 GHz 12-94 digit/m 12-6500 GHz	MultiView Ratework Ratework Topot Topot Topot Topot So digit/m Go digit/m 40 digit/m Go digit/m 50 digit/m Go digit/m 10 digit/m Go digit/m 20 digit/m Go digit/m 20 digit/m Go digit/m -10 digit/m -10 digit/m	Receiver	Specific data	trum (ERBW (CISPK) BBW (CISPK) BBW BBW BBW BBW BBW BBW BBW BBW BBW BB	E MH2 MH2 MH2 MODE # 318-AHD-CA80	Lito Sweep	000H2_2*,*2023		requency 3.3 D HRY 104 We M1(1) 104 We M2[2]	v 7710000 GHz 19 18 080/7m 3.634500 GHz 15.33 080/7m 3.635500 GHz 10 10 10 10 10 10 10 10 10 10
MultiView Ref Level 52: valt 100 <th>Receiver 00 dBu/ym Of 10 dB exp Stac 10 dB ex</th> <th>(Inter-od-B) (Inter-od-B) (</th> <th>SCTUM</th> <th></th> <th></th> <th>-1041-200942_2*</th> <th>F</th> <th>requency 2.5 SCAN-2021* 10K VIC M2[2]</th> <th></th> <th>Hult/View Anti-Livie 2 ext Top Top Top</th> <th>Receiver 100 dBµU/m = C 10 AC = 1 2003 BA-APD CA Weep</th> <th>Special data</th> <th>trum (CISPR) Rew (CISPR) Notah 2005H2","20200</th> <th>Mark Mode 2 Mark Mode 2 Mark Starto-Cabo</th> <th>Luto Sweep</th> <th>00HZ_2", 2023</th> <th>1</th> <th>requency 3.3 D1HN* 152 Ver N111 152 Ver N2[2] 152 Ver</th> <th>710000 GHz 710000 GHz 710000 GHz 710 GHz 710</th>	Receiver 00 dBu/ym Of 10 dB exp Stac 10 dB ex	(Inter-od-B) (SCTUM			-1041-200942_2*	F	requency 2.5 SCAN-2021* 10K VIC M2[2]		Hult/View Anti-Livie 2 ext Top Top Top	Receiver 100 dBµU/m = C 10 AC = 1 2003 BA-APD CA Weep	Special data	trum (CISPR) Rew (CISPR) Notah 2005H2","20200	Mark Mode 2 Mark Mode 2 Mark Starto-Cabo	Luto Sweep	00HZ_2", 2023	1	requency 3.3 D1HN* 152 Ver N111 152 Ver N2[2] 152 Ver	710000 GHz 710000 GHz 710000 GHz 710
MultiView Ref Level 52: • Att • Att • Att • Att • Deserver	Receiver 00 dBU/m Of 10 dB est/m Of 10 dB est	Milet Odd Specific VI 1.11:5 0.0 0.0 VI 1.0:5 0.0 0	SCTUM			-104-20042_2*	F	requency 2.5 SCAN-2021* 126270 M1(2) M2(2)		MultiView Get Level 52 * Att Trput * Description 10 display/m 50 display/m 50 display/m 20 display/m 20 display/m 0 display/m 0 display/m 0 display/m -10 display/m -20 display/m -30 display/m	Receiver	Specific and the second	Etrum @ RBW (CISFR) WBW Socket, "200000	Mode 2 Mode 3	Luto Sweep	000HZ_2*, 2023	100412-AHD-S BAY	requency 3.3 D H4X* M1(1) M2(2) WWWWWWWW	v 7710000 GHz 3.0318 GM/V 3.0318 GM/V 3.0318 GM/V 4.0333 GM/V 4.0
MultiView Ref Level 52: • Att • Parane • Bar	Receiver 00 dBu/m Of 10 dB exp/m Of 10 dB exp Soft variation Soft variation Soft variation Soft variation Soft variation Soft	Milet Spectra Iffset -0.43 - So On - - So On - - - Milet -	sctrum			-104-20042_2*	F (APD-GTEM-RM	requency 2.5		HultiView Ref Level 52 e Att Top top Top top 10 10 11 12 12 13 14 15 15 16 12 12 12 14 15 15 16 17 18 19 10 12 14 15 15 16 17 18 19 19 10 10 11 12 12 13 14 15 15 16 17 18 19 10 10 10 10 </td <td>Receiver</td> <td>Specific Constraints of the second se</td> <td>trum @ the we (cise) Notch 2005H2 (200000</td> <td>MAL MAL M</td> <td>NUTO SWEEP</td> <td>00H2_2*,*2023</td> <td></td> <td>requency 3.3 D H9/* (11[1] 102(2) (12[2]) (12[</td> <td>2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</td>	Receiver	Specific Constraints of the second se	trum @ the we (cise) Notch 2005H2 (200000	MAL M	NUTO SWEEP	00H2_2*,*2023		requency 3.3 D H9/* (11[1] 102(2) (12[2]) (12[2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
MultiView Ref Level 52: • Anti • Anti • Presentor • Description	Receiver 00 dBu//m Of 10 dB = 5% 10 dB = 5% vit 1 = 20 B PS vit 1 = 20 D PS	(2) Spy (2) Sp (2) S	Setrum					requency 2.5 SCAN-2021 11(1) 122 07 122 122 07 122 07 120 07 100 07 100 07 100 07 100 07 100 0000000000		HultiView Bel Level 52 * Att Tradition * Of the state	Receiver	Specific Total Specific Specif	trum () RBW (CISPR) Notch Notch 200Hz / 20000	R I Mite Off NHI Mode II Mite Not NHI Mode NHI NHI NHI NHI NHI NHI NHI NHI	2410 Sweep 18WHTE-104-2	00HZ_27,2023		requency 3.3 D H9Y H1[1] 10000 H2[2] H2[] H2[2 7710000 GHz 29.18 480/Vm 29.18 480/Vm 29.18 480/Vm 3.637500 414 15.33 480/Vm 78 16 3.637500 414 16 3.637500 414 16 3.637500 414 16 3.637500 414 16 3.637500 414 16 3.637500 414 16 16 16 16 16 16 16 16 16 16 16 16 16
Public/lew Ref Level 52: Imput Imput Present TDF Pro Present TDF Present TDF Pro Present TDF PresentTDF Present TDF Present TDF Present TDF PresentTDF Pres	Receiver 00 dBu/m Of 10 dB 5% State 10 dB 5%<	Image Spectra Inset = 40, dB = S On S On M1	SCTUM		sp O-CAROISWHITE	- 104-20542_2*	, APD-GTEM-FPI	requency 2.5		HultiView Get Level 52 * Att Trput * Other Comparison 16 control (1/2) 16 control (1/2) 10 diput/m 20 diput/m -20 diput/m -20 diput/m -20 diput/m -30 diput/m -20 diput/m	Receiver 10 dB v 1 AC F 1 A	Special Specia	trum € BBW (CISPR) Notch 200H27 20000	R)	Suto Sweep	00H2_2**2023		Parentee (1997)	2 710000 GHz 29.3640/m 15.33.4640/m 3.637500 GHz 3.637500 GHz 3.637500 GHz 3.642 GHz esuit
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Table 7(c): Transmit Chain Spurious Emissions.

TX Spurious (Continued)

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| Ref Level 52
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 | tode Auto Sween | Frequency 5 400
 | Ref Lev | /el 52.00 dBμV/m C
10 dB = S | Offset -50 dB = RBW (CISP
WI 46 s = VBW | R) 1 MHz
3 MHz Mode Auto
 | Sweep | Frequency \$ | B 3000000 GHz |
| Input
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 | | inequency 5.400
 | Input | 1 AC P | S On Notch | Off
 | with the societ of length | on toop toppositive | 5.5000000 0112 |
| 1 Frequency S
 | Sweep | 018WHITE-10M-203H2 , 20200318-AHD

 | -CABUTEWHITE-TOM-20GHZ_2 , SINGER QK TO | 18k View /
 | 2Rm View 1 Freque | ncy Sweep | B016WHITE-10M-200H2 , 2 | J200318-ARD-CAB0189
 | VHITE-IUM-200HZ_2 , SINGER | QK 1000-18000MH2 | Pk Max • 2Rm Max |
| 50 dBµV/m
 | |

 | | M2[2] 10
 | 0.75 dBpV/m 50 dBpV/m | | |
 | | M1[1] | 25.73 dBµV/m |
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 | .222100 GHz | | |
 | | Matal | 10.323600 GHz |
| 40 dBpv/m-
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 | | 5.
 | 222100 GHz | | |
 | | (12[2] | 10.352600 GHz |
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 | 30 dBi (V/m | | |
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| 4.8 GHz
 | | 1201 pts

 | 120.0 MHz/ |
 | 6.0 GHz 6.0 GHz | | 460 | 1 pts
 | 460.0 MHz/ | | 10.6 GHz |
| 2 Marker Tabl
 | le |

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 | 2 Marker | Table | | •
 | | | |
| Type Ref
 | f Trc | X-Value Y-Value
5.2221 GHz 20.55 dB

 | ue Function | Function Resu
 | ult Type | Ref Trc | X-Value
10.3236 GHz | Y-Value
25.73 dBuV/m
 | Function | Functio | on Result |
| M2
 | 2 | 5.2221 GHz 10.75 dB

 | µV∕m |
 | M2 | 2 | 10.3526 GHz | 14.00 dBµV/m
 | | | |
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 | Measuring 🗰 💷 🛤 🗯 | 14.04.2023 Ref Level
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18:57:14 | RBW |
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| MultiView
 | Receiver | Spectrum

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 | V MultiVi | ew 🗟 Receiver | Spectrum |
 | | | ~ |
| Ref Level 38
 | Receiver Receiver 0 dBµV/m 10 dB = SW | Spectrum X ffset -60 dB RBW (CISPR) 1 MHz VT 2.4 s VBW 3 MHz

 | Node Auto Sweep | Frequency 11.800
 | MultiVi RefLev Att | ew ↔ Receiver
vel 32.00 dBµV/m 0
10 dB = S | Spectrum
Sfset -66 dB = RBW (CISF
WT 5 s = VBW | R) 1 MHz
3 MHz Mode Auto
 | Sweep | Frequency 1 | 5.5000000 GHz |
| MultiView
Ref Level 38
Att
Input
TDF Input1 "20
 | Receiver Alternative | Spectrum Spectrum Spectrum Solution
 | fode Auto Sweep | Frequency 11.800
 | WultiVi Ref Lev Att Input TDF Input | ew : Receiver
vel 32.00 dBµV/m G
10 dB = S
1 AC P
t1 "20200318-AHD-CA
 | Spectrum Spectrum Solution | R) 1 MHz
3 MHz Mode Auto
Off
0200318-AHD-CAB018V | Sweep
VHITE-10M-20GHZ_2","202304 | Frequency 1: | 5.5000000 GHz
 |
| MultiView
Ref Level 38
Att
Input
TDF Input1 *20
 | Receiver
3.00 dBµV/m Off
10 dB = SW
1 AC PS
0200318-AHD-CABO
SWCEP | Spectrum Sectrum ifset -60 dB = RBW (CISFR) 1 MHz VT 2.4.5 VBW S On Notch Off 0018WHITE-10M-20GHZ","20200318-AHD Off

 | Node Auto Sweep
>-CAB018WHITE-10M-20GHZ_2","20230414-AH | Frequency 11.800
 | Multivi Ref Lee Att Input ZRm Mox De Input Extended | ew Receiver
rel 32.00 dBpV/m C
10 dB = S
1AC P
t1 "20200318-AHD-CA
Hey Sweep | Spectrum Offset -66 dB = RBW (CISF WY 5 s = VBW S 'S On Notch B018WHITE-10M-20GHZ","24 | R) 1 MHz
3 MHz Mode Auto
Off
0200318-AHD-CAB018V
 | Sweep
VHITE-10M-20GHZ_2*,*202304 | Frequency 1. | 5.5000000 GHz |
| MultiView
Ref Level 38
Att
Input
TDF Input 120
 | Receiver
3.00 dBµV/m Off
10 dB = SW
1.4C PS
0200318-AHD-CAB4
SWCEP | Spectrum Sector ffset -60 dB = RBW (CISPR) 1 MHz MHz VI 2.4 s = VBW 3 MHz S On Notch Off Io18WHITE-10M-2024HZ,"20200318-AHD MHz

 | 4ode Auto Sweep
>-CAB018WHITE-10M-20GHZ_2","20230414-AH | Frequency 11.800 ID-X BAND-HRN* 11.800 M2[2] 1
 | v MultiVi 000000 GHz Ref Let
Input 22km Mox
124 dByV/m
\$375600 GHz 1 FreqUe
30 dbyV/m | ew :: Receiver
rel 32.00 dBµV/m Q
10 dB = S
1 AC P
t1 *20200318-AHD-CA
mcy Swcep | Spectrum Spectrum Sffset-66 dB = RBW (CISF WT 5 s VBW S On Notch B018WHITE-10M-20GHZ","20 | (R) 1 MHz
3 MHz Mode Auto
Off
0200318-AHD-CAB0189
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WHITE-10M-20GHZ_2*,*202304 | Frequency 1. | 5.5000000 GHz
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 | Aode Auto Sweep
CA8018WHITE-10M-20GHZ_2*,*20230414-AH | Frequency 11.800
ID-X BAND-HRN'
M2[2] -1

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1.4C P
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M2[2] | v 5.5000000 GHz 4: Max: e2km Max 8:63:dBjv/m 17.969500 GHz 3.07:dBjv/m 17.989500 GHz |
| MultiView
Ref Level 38
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 | Node Auto Sweep
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vel 3: 00 d8µV/m C
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may SWGCP
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 | tode Auto Sweep
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FL 1*20200318-AHD-CA | Spectrum Offset-66 dB = RBW (CISF WT 5 = VBW S0 ISWHITE-10H-200Hct,"20 UDISWHITE-10H-200Hct,"20 UDISWHITE-10HCT,"20 UDIS | (X) (| Sweep
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M2[2]
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17.989500 GHz
13.07.dBµV/m
17.989500 GHz |
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C48019WHTE-10M-200HZ_2*, 20230414-4H
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-CABO J8WHTE-1004-200HZ_2*,20230414-AH
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 | tode Auto Sweep | Frequency 11.800 O-X DNO-HEN' 150 Max M2[2] 1-2 M1 [1] 12 M2 1-2 M3 12 M4 12 M3 12 M4 12 M4 12 M4 12
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Multiview Ref Level 38 * Att Import 100 Import 100 100 400	Receiver Receiver Receiver Receiver Robert	Spectrum Spectrum Sector Spectrum Sector Spectrum Sector Spectrum Sector Spectrum Sector Spectrum Sector Spectrum Spect	tode Auto Sweep >C2401894-ETE-1004-200407_2*20230414-AH 	Frequency 11.800 D-X DAVD -HEN' 100 MOX M2[2] -1 M1[1] 11 100 100 MOX 11 10 <th></th> <th>ew Receiver rel 32.00 dgu/m 0 10 dg e s 10 dg</th> <th>Spectrum Intert-Go db = RBW (1053 S On Notch S On N</th> <th>(1) (1) (1) (2) (1) (2) (</th> <th>Sweep VHTE-104-200HZ 21,"202304</th> <th>Frequency 31 14440-040 EMD-FR0* 111 M1[1] 111 M2[2] 111</th> <th>5,500000 GHz</th>		ew Receiver rel 32.00 dgu/m 0 10 dg e s 10 dg	Spectrum Intert-Go db = RBW (1053 S On Notch S On N	(1) (1) (1) (2) (1) (2) (Sweep VHTE-104-200HZ 21,"202304	Frequency 31 14440-040 EMD-FR0* 111 M1[1] 111 M2[2] 111	5,500000 GHz
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MultiView Ref Level 3% eff input TDF Input 7 30 dbu/m 20 dbu/m -10 dbp/m -10 dbp/m -20 dbu/m -30 dbu/m -30 dbu/m -30 dbu/m -30 dbu/m -50 dbu/m	Receiver Construction	Spectrum Section	tode Auto Sweep C480.19WHTE-10M-200HZ_2*, 20230414-4H 1 <	Frequency 11.800 0-X EARO-HER! 12 M2[2] 14 M1[1] 12 M1[1] 12 XAD/POINT 2 XAD/POINT 2 XAD/POINT 2 XAD/POINT 2 XAD/POINT 2 XAD/POINT 2	Comparing the second seco	ew Receiver rel 32.00 day/m of 10 db * 8 3.40 rel 100003140 rel 10000340 rel 10000340 rel 100000340 rel 10000000 rel 10000000 rel 1	Spectrum Spectrum Spectr	(1) (Sweep WHTE-100-2004Z.21,202304 Utubing of the state Utubing of the state	Frequency 11 14-40-0-/u DAD-H2W Aft(1) Aft(2) Aft(2	5.500000 GHz 5.445 - 547 MS - 0.03 dBy/m - 0.03 dBy/m
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Multiview Ref Level 38 Att Improved 12011 Incertainty 30 dipt/m 30 dipt/m 10 dipt/m -0 dipt/m	Receiver 10 of the year 10 o	Spectrum E Inset:-60.08 PRW (CSRR) Mrs. 12:41 = VW 3 Mrz. 0:10WHTE:-10M-SOCIET_20000019:4445	tode Auto Sweep LC280189WETE-1004-200HZ_2*120230414-AH	Frequency 11.800 O-X DAVO-HEN'	Image: system Image: system 000000 GHz Ref Let system 000000 GHz Ref Let system 000000 GHz System 0100000 GHz System 0100000 GHz System 0100000 GHz System 01000000 GHz System 0100000000000000000000000000000000000	ew Receiver rel 32.00 day/m of 10 db * S 1 AC * 1	Spectrum Sheat of the RRW (GSF) So the RRW (GSF) So Notch So Construct to the Construction of the Construc	(1) (Sweep wette 100-20047, 21, 202304 dentities, august 21, 21, 21, 21, 21, 21, 21, 21, 21, 21,	Frequency 11 14-APD-KU BAND-HON M1(1) M2(2) M3(1) M3(2) M3(1) M3(2) M3(2	5.500000 GHz
Multiv/ew Ref Level 38 Att Jopan Jopan Jogan Jopan Jopan Jopan Jopan Jopan <t< th=""><td>Receiver Construction Construction Construction Construction Construction Construction Construction</td><td>Spectrum Spectrum Sector Software So</td><td>tode Auto Sweep</td><td>Frequency 11.800 G-X EWO-HEXT DF Max M2 [2] 7 M1 [1] 17 M1 [1] 17</td><td>Comparison of the second second</td><td>ew Receiver rel 32.00 gJ/m d = 8 10 d = 8 1</td><td>Spectrum Spectrum Spectrum Spec</td><td>Comparison of the second second</td><td>Swep wette-104-20042.2*,*202304 uteretee.2*,*202304 uteretee.2*,*2</td><td>Frequency 11 14-AD-D-KD-BAD-BAD All (1) All (1)</td><td>5.500000 GHz</td></t<>	Receiver Construction Construction Construction Construction Construction Construction Construction	Spectrum Spectrum Sector Software So	tode Auto Sweep	Frequency 11.800 G-X EWO-HEXT DF Max M2 [2] 7 M1 [1] 17	Comparison of the second	ew Receiver rel 32.00 gJ/m d = 8 10 d = 8 1	Spectrum Spectrum Spec	Comparison of the second	Swep wette-104-20042.2*,*202304 uteretee.2*,*202304 uteretee.2*,*2	Frequency 11 14-AD-D-KD-BAD-BAD All (1)	5.500000 GHz
Multiview Ref Level 38 Att Interpretent Interpret <	Receiver Oddywardiad a started calls action of the started call between of the started calls action of the st	Spectrum E Mat 6.04 = RUW (CSRR) Mrs. 3 Mrz. 17 - 24 = 8 WW (CSRR) Mrs. 3 Mrz. 0010WHTE: 10M-00047 (20000) 8 -440 3 Mrz. 010WHTE: 10M-00047 (20000) 8 -440	tode Auto Sweep	Frequency 11.800 0-x DAPO-HEN'	viature Multivity 00000 GHz Ref to 21 0.20200 GHz Ref to 21 0.20200 GHz Sector Most 10 Sector Most Sector Most 11 Sector Most Sector Most 12 Sector Most Sector Most 13 Sector Most Sector Most	ew Receiver rel 32.00 db//m 0 10df = S 1/AC 5 112 20000314/00 - CA 1/AC 110 1/AC 5 1/AC 110 1/AC 1/AC 5 111 1/AC 1/AC 5 111 1/AC 1/AC 1/AC	Spectrum Sitest of the RRW (CBS) Sitest of t		Sweep wette 1004-2004/Z, 21, 20230-4 used and a second sec	Frequency 11 14-MD-NU BMD-HW M(1) M(2) Function Func	5.500000 GHz 5.63 dBy/ 17.06550 GHz 17.06550 GHz 17.08550 GHz 18.0 GHz 18.0 GHz 18.0 GHz

Table 7(d): Transmit Chain Spurious Emissions.



TX Spurious (Continued)



Anntsu MS2760A-0070 SN: 1705006 SW Package: V2019.9. Options: Date/Time: 17 Apr 2023 13:58 Eastern Davight Time GPS: --

Anritsu MS2760A-0070 SN: 1705006 SW Package: V2019.9.1 Options: Date/Time: 17 Apr 2023 14:14 Eastern Daylight Time GPS: ----



Table 7(e): Transmit Chain Spurious Emissions.

5 Measurement Uncertainty and Accreditation Documents

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 8: 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	$\pm 1.9\mathrm{dB}$
Radiated Emm. Amplitude $(f < 30 \text{ MHz})$	$\pm 3.1\mathrm{dB}$
Radiated Emm. Amplitude $(30 - 200 \text{ MHz})$	$\pm 4.0\mathrm{dB}$
Radiated Emm. Amplitude $(200 - 1000 \text{ MHz})$	$\pm 5.2\mathrm{dB}$
Radiated Emm. Amplitude $(f > 1000 \text{ MHz})$	$\pm 3.7\mathrm{dB}$
Radiated Emm. Amplitude $(f < 30 \text{ MHz})$ Radiated Emm. Amplitude $(30 - 200 \text{ MHz})$ Radiated Emm. Amplitude $(200 - 1000 \text{ MHz})$ Radiated Emm. Amplitude $(f > 1000 \text{ MHz})$	$\pm 3.1 dB$ $\pm 4.0 dB$ $\pm 5.2 dB$ $\pm 3.7 dB$

[†]Ref: CISPR 16-4-2:2011+A1:2014

United States Department of Commerce National Institute of Standards and Technology	Gordon Helm EMC-002401-NE AMARCE RAJIN/TED ENGINER
NVLAP LAB CODE: 200129-0	PPPVVV I
AHD (Amber Helm Development, L.C.) Sister Lakes, MI	
is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:	Joseph Brunett
Electromagnetic Compatibility & Telecommunications	EMIC-002790-NE
This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025-2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated aduanary 2009).	MARIE
2023-06-20 through 2024-06-30 Effective Dates For the National Voluntary Laboratory Accreditation Program	RATIFIED ENGINE

Figure 7: Accreditation Documents