



# **TEST REPORT**

Applicant:	Autel Robotics Co., Ltd
Address:	601,701,801,901, Block B1, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong, 518055, China
Product Name:	EVO Max 4T, EVO Max 4N, EVO Max 4T XE, EVO Max 4T Pro
FCC ID:	2AGNTMDX600958C
Standard(s):	47 CFR Part 15, Subpart E(15.407) ANSI C63.10-2013 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Report Number: 2402A23350E-RF-00C

Report Date: 2025/2/18

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).

Peopo Yun

Reviewed By: Pedro Yun Title: Project Engineer

Gonin Xn

Approved By: Gavin Xu Title: RF Supervisor

**Bay Area Compliance Laboratories Corp. (Dongguan)** No.12, Pulong East 1<sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China

> Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

Note: The information marked  $\blacktriangle$  is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report cannot be reproduced except in full, without prior written approval of the Company. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0. This report may contain data that are not covered by the accreditation scope and shall be marked with  $\bigstar$ . This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government. Each test item follows the test standard(s) without deviation.

# CONTENTS

DOCUMENT REVISION HISTORY	
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)······	
1.2 ACCESSORY INFORMATION ······	5
1.3 ANTENNA INFORMATION DETAIL	6
1.4 EQUIPMENT MODIFICATIONS ······	
2. SUMMARY OF TEST RESULTS	7
3. DESCRIPTION OF TEST CONFIGURATION	3
3.1 OPERATION FREQUENCY DETAIL ······	8
3.2 EUT OPERATION CONDITION ······10	D
3.3 SUPPORT EQUIPMENT LIST AND DETAILS ······ 10	D
3.4 SUPPORT CABLE LIST AND DETAILS	
3.5 BLOCK DIAGRAM OF TEST SETUP 11	1
3.6 TEST FACILITY	2
3.7 Measurement Uncertainty ····· 12	2
4. REQUIREMENTS AND TEST PROCEDURES 13	3
4.1 AC LINE CONDUCTED EMISSIONS 13	3
4.1.1 Applicable Standard 12   4.1.2 EUT Setup 14   4.1.3 EMI Test Receiver Setup 14   4.1.4 Test Procedure 12   4.1.5 Corrected Amplitude & Margin Calculation 12   4.1.6 Test Result 12   4.2 RADIATION SPURIOUS EMISSIONS 10	4 5 5 5
4.2.1 Applicable Standard104.2.2 EUT Setup114.2.3 EMI Test Receiver & Spectrum Analyzer Setup194.2.4 Test Procedure194.2.5 Corrected Result & Margin Calculation204.2.6 Test Result204.3 EMISSION BANDWIDTH21	9 9 0 0
4.3.1 Applicable Standard ······2	1
4.3.2 EUT Setup 2   4.3.3 Test Procedure 2	1
4.4.4 Test Result 22 4.4 MAXIMUM CONDUCTED OUTPUT POWER 22	
4.4.1 Applicable Standard 2:   4.4.2 EUT Setup 2:   4.4.3 Test Procedure 2:   4.4.4 Test Result 2:   4.5 MAXIMUM POWER SPECTRAL DENSITY 2:	3 3 3 3

4.5.1 Applicable Standard 24   4.5.2 EUT Setup 24   4.5.3 Test Procedure 24   4.5.4 Test Result 25	
4.5.4 Test Result 25 4.6 DUTY CYCLE 26	
4.6.1 EUT Setup 26   4.6.2 Test Procedure 26   4.6.3 Judgment 26   4.7 ANTENNA REQUIREMENT 27	
4.7.1 Applicable Standard 27   4.7.2 Judgment 27	
5. Test DATA AND RESULTS ······ 28	
5.1 AC LINE CONDUCTED EMISSIONS ······ 28	
5.2 RADIATION SPURIOUS EMISSIONS ······ 29	
5.3 EMISSION BANDWIDTH ······60	
5.4 MAXIMUM CONDUCTED OUTPUT POWER ······ 70	
5.5 POWER SPECTRAL DENSITY ····································	
5.6 DUTY CYCLE	
EXHIBIT A - EUT PHOTOGRAPHS ······ 83	
EXHIBIT B - TEST SETUP PHOTOGRAPHS ······ 84	

# **DOCUMENT REVISION HISTORY**

Revision Number Report Number		Description of Revision	Date of Revision
1.0	2402A23350E-RF-00C	Original Report	2025/2/18

# **1. GENERAL INFORMATION**

# **1.1 Product Description for Equipment under Test (EUT)**

1 1			
EUT Name: EVO Max 4T, EVO Max 4N, EVO Max 4T XE, EVO Max 4T Pro			
EUT Model:	MDX		
	5150-5250 MHz band:		
	SRD 1.4MHz:5154-5246 MHz		
	SRD 10MHz: 5157-5243MHz		
Onoration Fraguenau	SRD 20MHz: 5167-5233MHz		
<b>Operation Frequency:</b>	5725-5850 MHz band		
	SRD 1.4MHz: 5728-5847 MHz		
	SRD 10MHz: 5733-5842 MHz		
	SRD 20MHz: 5738-5839 MHz		
Maximum Average Conducted	5150-5250MHz:20.11 dBm		
Output Power:	5725-5850MHz:24.95 dBm		
Modulation Type:	OFDM(QPSK ,16QAM)		
Rated Input Voltage:	DC 14.76V from battery or DC 14.88V from battery		
Carial Normakana	22WN8-1(For RF Conducted Test)		
Serial Number:	2WN8-2(For Radiated Spurious Emissions Test)		
EUT Received Date: 2024/12/28			
EUT Received Status: Good			
Note:			
The device can install difference Gimbal camera, test was only performed with Gimbal camera 3#(4T).			

# **1.2 Accessory Information**

Accessory Description	Manufacturer	Model	Parameters
Adapter	Shenzhen Esun Power Technology Co.,Ltd	MDX120W	Input:100-240Vac,50/60Hz,3.0A Output:Main:17Vdc.7.06A; USB-C:5.0V,3.0A;9.0V,3.0A;12.0V,2.5A Total Output Power:120.02W Max
Battery 1#	Xiamen Ampace Technology Limited	ABX40	DC 14.88V
Battery 2#	Xiamen Ampace Technology Limited	ABX41	DC 14.76V
Battery 3#	Xiamen Ampace Technology Limited	MDX_8070_1488	DC 14.88V

Note: Per 15B report, Powered by Battery 2# was the worst, so only performed it.

1.3 Antenna	Information	Detail 🛦
-------------	-------------	----------

Antenna	Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Chain 0		EDG		5150-5250MHz	-1.6dBi
(Tx&Rx)		FPC	50	5725-5850MHz	1.6dBi
Chain 1	Dongguan YiJia	EDC	50	5150-5250MHz	0.7dBi
(Tx&Rx)	Electronics	FPC	50	5725-5850MHz	1.7dBi
Chain 2	Communcication	EDC	50	5150-5250MHz	3.0dBi
Only Rx	Technology Co.,Ltd	FPC	50	5725-5850MHz	3.9dBi
Chain 3		EDC	50	5150-5250MHz	4.2dBi
Only Rx		FPC	50	5725-5850MHz	3.3dBi
Per KDB 662911 D01 Multiple Transmitter Output v02r01:   For power measurements:   CDD Mode:   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \le 4$ directional gain=0.7dBi +0dB =0.7dBi for 5150-5250MHz   directional gain=1.7dBi +0dB =1.7dBi for 5725-5850MHz   For power spectral density (PSD) measurements:   Array Gain = 10 log( $N_{ANT}/N_{SS}$ ) dB.   directional gain=0.7dBi +3dB =3.7dBi for 5150-5250MHz   directional gain=1.7dBi +3dB =3.7dBi for 5150-5250MHz   The design of compliance with §15.203:   Unit uses a permanently attached antenna.   Unit uses a unique coupling to the intentional radiator.   Unit was professionally installed, and installer shall be responsible for verifying that the correct					

# **1.4 Equipment Modifications**

No modifications are made to the EUT during all test items.

# 2. SUMMARY OF TEST RESULTS

channel was tested.

Standard(s) Section	Test Items	Result		
§15.207(a)	AC line conducted emissions	Not Applicable		
FCC§15.205& §15.209 &§15.407(b)	Radiation Spurious Emissions	Compliant		
FCC§15.407(a) (e)	Emission Bandwidth	Compliant		
FCC§15.407(a)	Maximum Conducted Output Power	Compliant		
FCC§15.407 (a)	Power Spectral Density	Compliant		
§15.203	Antenna Requirement	Compliant		
Note 1: Not Applicable, the device was powered by battery when operating.				
Note 2: For Radiated Spurious Emissions 9kHz~1GHz and 18~40GHz, the maximum output power mode and				

# **3. DESCRIPTION OF TEST CONFIGURATION**

# **3.1 Operation Frequency Detail**

#### For SRD-5.2GHz band: 1.4MHz Bandwidth Mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5154	48	5201
2	5155	49	5202
3	5156		
		92	5245
46	5199	93	5246
47	5200	/	/

## **10MHz Bandwidth Mode:**

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5157	45	5201
2	5158	46	5202
3	5159		
		86	5242
43	5199	87	5243
44	5200	/	/

## 20MHz Bandwidth Mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5167	35	5201
2	5168	36	5202
3	5169		
		66	5232
33	5199	67	5233
34	5200	/	/

# For SRD-5.8GHz band:

# 1.4MHz Bandwidth Mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5728	61	5788
2	5729	62	5789
3	5730		
	•••	•••	
59	5786	119	5846
60	5787	120	5847

# **10MHz Bandwidth Mode:**

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5733	56	5788
2	5734	57	5789
3	5735		
54	5786	109	5841
55	5787	110	5842

# 20MHz Bandwidth Mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5738	52	5789
2	5739	53	5790
3	5740		
50	5787	101	5838
51	5788	102	5839

Note: The above frequencies in bold were performed the test.

# **3.2 EUT Operation Condition**

The system was configured for testing in Engineering Mode, which was provided by the manufacturer. The EUT configuration is below:

EUT Exe	ercise Software:	RRTL6.0.0_VC	OM		
The software was provi provided by the manufa		rer. The maximum	n power was confi	gured as below, t	hat was
	Test	Test		Power Le	vel Setting
<b>Test Modes</b>	Channels	Frequency (MHz)	Data rate	Chain 0	Chain 1
5150-5250 MHz Band(	(QPSK):				
	Lowest	5154	120kbps	95	100
1.4M	Middle	5201	120kbps	95	100
	Highest	5246	120kbps	95	100
	Lowest	5157	19Mbps	65	70
10M	Middle	5201	19Mbps	65	70
	Highest	5243	19Mbps	65	70
	Lowest	5167	38Mbps	55	70
20M	Middle	5201	38Mbps	55	70
	Highest	5233	38Mbps	60	70
5725-5850 MHz Band(	QPSK):		·		
	Lowest	5728	120kbps	35	35
1.4M	Middle	5789	120kbps	35	35
	Highest	5847	120kbps	35	35
	Lowest	5733	19Mbps	35	35
10M	Middle	5789	19Mbps	35	35
	Highest	5842	19Mbps	35	35
	Lowest	5738	38Mbps	35	35
20M	Middle	5790	38Mbps	35	35
	Highest	5839	38Mbps	35	35

1. The above are the worst-case data rates, which are determined for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations.

2. The device supports SISO in all BW modes, and MIMO 2TX in all BW modes, per pretest, 2TX mode was the worst mode and reported for all BW modes.

# 3.3 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

# 3.4 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	То
/	/	/	/	/	/

#### Report No.: 2402A23350E-RF-00C

# 3.5 Block Diagram of Test Setup

Radiated Spurious Emission:

	EUT	Non-Conductive Table 80/150 cm above Ground Plane	A I.U Meter
<	1.5 Meter		

# **3.6 Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 829273, the FCC Designation No. : CN5044.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

# **3.7 Measurement Uncertainty**

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
	9kHz~30MHz: 3.3dB, 30MHz~200MHz: 4.55 dB, 200MHz~1GHz:
Unwanted Emissions, radiated	5.92 dB, 1GHz~6GHz: 4.98 dB, 6GHz~18GHz: 5.89 dB,
	18GHz~26.5GHz:5.47 dB, 26.5GHz~40GHz:5.63 dB
Unwanted Emissions, conducted	±2.47 dB
Temperature	±1°C
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 0.4\%$
Duty Cycle	1%
AC Power Lines Conducted Emission	3.11 dB (150 kHz to 30 MHz)

# 4. REQUIREMENTS AND TEST PROCEDURES

# 4.1 AC Line Conducted Emissions

## 4.1.1 Applicable Standard

## FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBµV)	
Frequency of emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

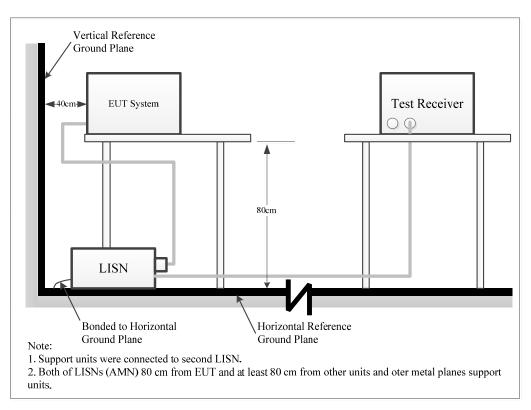
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000  $\mu$ V within the frequency band 535-1705 kHz, as measured using a 50  $\mu$ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

# 4.1.2 EUT Setup



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

# 4.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

#### 4.1.4 Test Procedure

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

## 4.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = attenuation caused by cable loss + voltage division factor of AMN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

#### 4.1.6 Test Result

Please refer to section 5.1.

# 4.2 Radiation Spurious Emissions

#### 4.2.1 Applicable Standard

FCC §15.407 (b);

*Undesirable emission limits.* Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.

(4) For transmitters operating solely in the 5.725-5.850 GHz band:

(i) All emissions shall be limited to a level of  $_{-}$  27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2018.

(8) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(9) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.

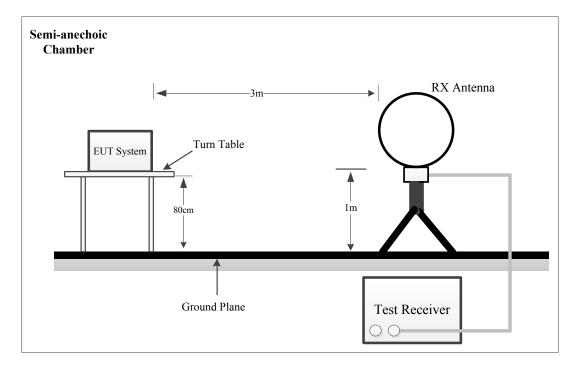
(10) The provisions of § 15.205 apply to intentional radiators operating under this section.

(11) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

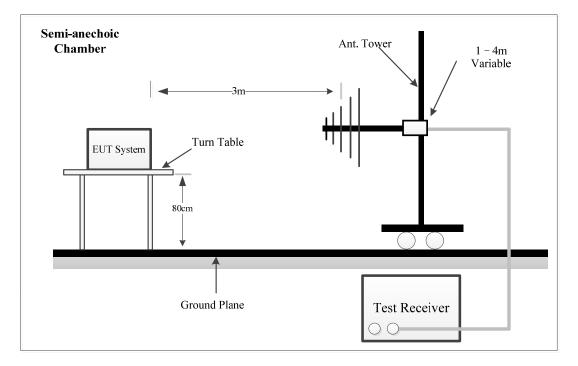
(c) The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

# 4.2.2 EUT Setup

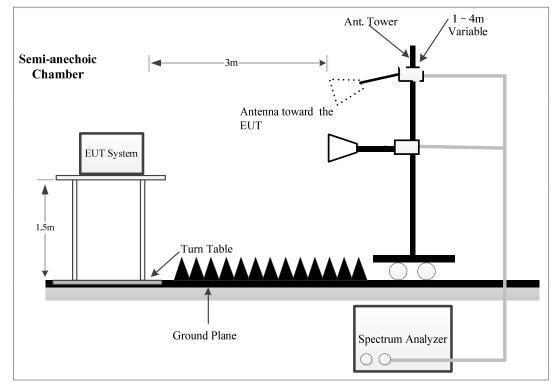
# 9kHz~30MHz:



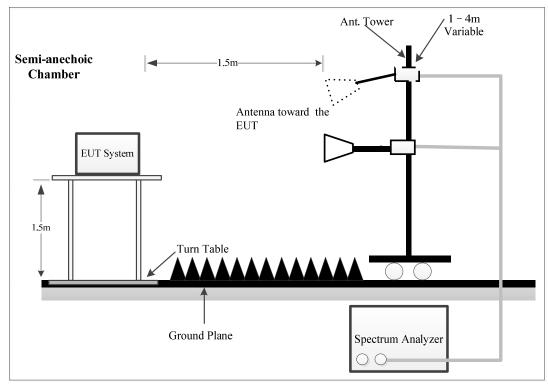
# 30MHz~1GHz:



## 1-26.5GHz:



# 26.5-40GHz:



The radiated emission tests were performed in the semi-anechoic chamber, using the setup accordance with the ANSI C63.10-2013. The specification used was FCC 15.209, FCC 15.407limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

For 9kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

## 4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

9kHz-1000MHz:

Frequency Range	Measurement	RBW	Video B/W	IF B/W	Detector
9 kHz – 150 kHz	QP/AV	300Hz	1 kHz	200 Hz	QP/AV
150 kHz – 30 MHz	QP/AV	10 kHz	30 kHz	9 kHz	QP/AV
20MIL 1000 MIL	РК	100 kHz	300 kHz	/	PK
30MHz – 1000 MHz	QP	/	/	120kHz	QP

1GHz-40GHz:

Measurement	Detector	Duty cycle	RBW	Video B/W	
РК	PK	Any	1MHz	3 MHz	
Ave.	РК	>98%	1MHz	5kHz	
	ГК	<98%	1MHz	$\geq 1/T$ , not less than 5kHz	

Final measurement for emission identified during the pre-scan:

Measurement	Detector	Duty cycle	RBW	Video B/W
РК	PK	Any	1MHz	3 MHz
Ave.	РК	>98%	1MHz	10 Hz
		<98%	1MHz	≥1/T

Note: T is minimum transmission duration

#### 4.2.4 Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz-1 GHz except 9 – 90 kHz, 110 – 490 kHz, employing an average detector, peak and Average detection modes for frequencies above 1 GHz.

If the maximized peak measured value is under the QP/Average limit by more than 6dB, then it is unnecessary to perform an QP/Average measurement.

If the maximized peak measured value is under the average limit, then it is unnecessary to perform an QP measurement.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as:  $E [dB\mu V/m] = EIRP[dBm] + 95.2$ , for d = 3 meters.

If the maximized peak measured value is under the QP limit by more than 6dB, then it is unnecessary to perform an QP measurement.

All emissions under the average limit and under the noise floor have not recorded in the report.

For Radiated 26.5-40GHz test, which was performed at 1.5 m distance, according to C63.10, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m

Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.0 dB

## 4.2.5 Corrected Result & Margin Calculation

The basic equation except 26.5-40GHz test is as follows:

Factor = Antenna Factor + Cable Loss-Amplifier Gain

For Radiated 26.5-40GHz test: Factor = Antenna Factor + Cable Loss- Distance extrapolation Factor

Result = Reading + Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

#### 4.2.6 Test Result

Please refer to section 5.2.

# 4.3 Emission Bandwidth

# 4.3.1 Applicable Standard

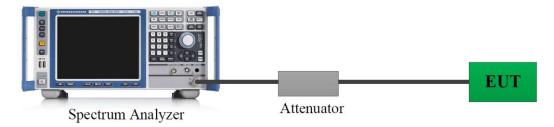
## FCC §15.407 (a),(h)

(h)(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

## FCC §15.407 (e)

Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

# 4.3.2 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer. The insert loss of this RF cable/attenuator was offset into the setting of test equipment.

# 4.3.3 Test Procedure

# 26dB Emission Bandwidth:

According to ANSI C63.10-2013 Section 12.4.1

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = peak.

d) Trace mode = max hold

e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

# 6 dB emission bandwidth:

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

a) Set RBW = 100 kHz.

- b) Set the video bandwidth (VBW)  $\geq$  3 RBW.
- c) Detector = Peak.

d) Trace mode = max hold.

- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative

#### Bay Area Compliance Laboratories Corp. (Dongguan)

to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

#### 99% Occupied Bandwidth:

According to ANSI C63.10-2013 Section 12.4.2&6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

#### 4.4.4 Test Result

Please refer to section 5.3.

# 4.4 Maximum Conducted Output Power

#### 4.4.1 Applicable Standard

#### FCC §15.407(a) (1)(i)

For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

#### FCC §15.407(a) (3)(i)

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

#### 4.4.2 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer. The insert loss of this RF cable/attenuator was offset into the setting of test equipment.

#### 4.4.3 Test Procedure

According to ANSI C63.10-2013 Section 12.3.3.1

Method PM-G is measurement using a gated RF average power meter.

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

#### 4.4.4 Test Result

Please refer to section 5.4.

# 4.5 Maximum Power Spectral Density

#### 4.5.1 Applicable Standard

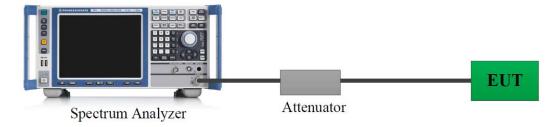
#### FCC §15.407(a) (1)(i)

For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

## FCC §15.407(a) (3)(i)

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

## 4.5.2 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer. The insert loss of this RF cable/attenuator was offset into the setting of test equipment.

#### 4.5.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

#### Duty cycle $\geq$ 98%

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-1 should be applied.

#### Duty cycle <98%, duty cycle variations are less than $\pm 2\%$

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-2 should be applied.

# Duty cycle <98%, duty cycle variations exceed $\pm 2\%$

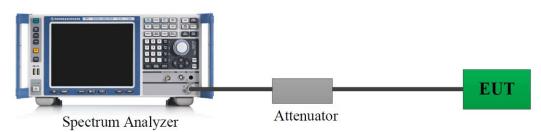
KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-3 should be applied.

# 4.5.4 Test Result

Please refer to section 5.5.

# 4.6 Duty Cycle

# 4.6.1 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer. The insert loss of this RF cable/attenuator was offset into the setting of test equipment.

## 4.6.2 Test Procedure

According to ANSI C63.10-2013 Section 12.2

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:

1) Set the center frequency of the instrument to the center frequency of the transmission.

2) Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value.

3) Set VBW  $\geq$  RBW. Set detector = peak or average.

4) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if  $T \le 16.7$  µs.)

# 4.6.3 Judgment

Report Only. Please refer to section 5.6.

# 4.7 Antenna Requirement

## 4.7.1 Applicable Standard

#### FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

#### 4.7.2 Judgment

Compliant. Please refer to the Antenna Information detail in Section 1.3.

# 5. Test DATA AND RESULTS

# 5.1 AC Line Conducted Emissions

Not Applicable, the device was powered by battery when operating.

# **5.2 Radiation Spurious Emissions**

# 1) 9kHz - 1GHz

Serial Number:	2WN8-2	Test Date:	2025/1/13
Test Site:	Chamber10m	Test Mode:	Transmitting
Tester:	Leesin Xiang	Test Result:	Pass

Environmental Conditions:								
Temperature: (°C)	19.4	Relative Humidity: (%)	38	ATM Pressure: (kPa)	101.8			

#### **Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/25	2026/10/24
Sunol Sciences	Hybrid Antenna	JB3	A060611-1	2023/9/6	2026/9/5
Narda	Coaxial Attenuator	779-6dB	04269	2023/9/6	2026/9/5
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-04	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2024/7/1	2025/6/30
Sonoma	Amplifier	310N	185914	2024/8/26	2025/8/25
R&S	EMI Test Receiver	ESCI	100224	2024/8/26	2025/8/25
Audix	Test Software	E3	191218 V9	N/A	N/A

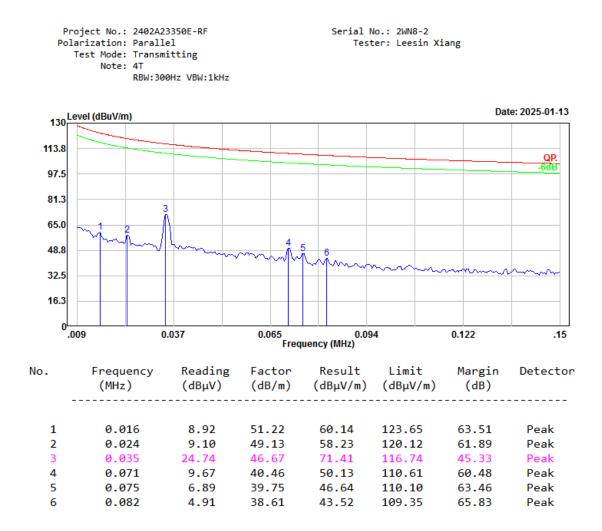
\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

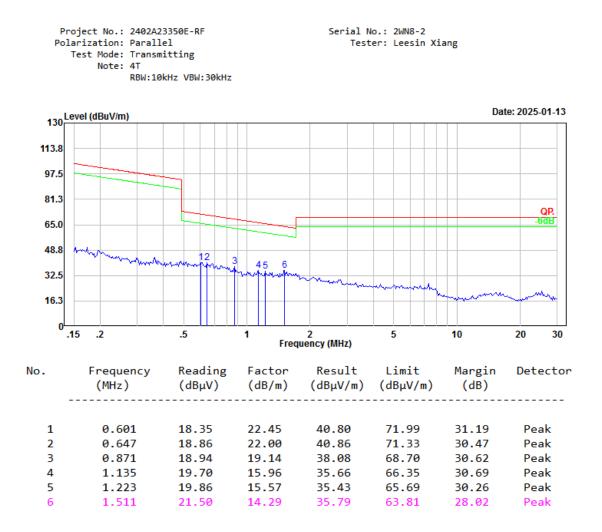
## Test Data:

Please refer to the below table and plots.

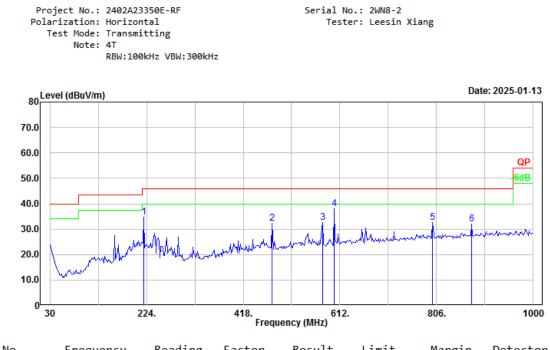
#### 9kHz~30MHz(20MHz mode 5738MHz was tested):

Three antenna orientations (parallel, perpendicular, and ground-parallel) was measured, the worst orientations was below:



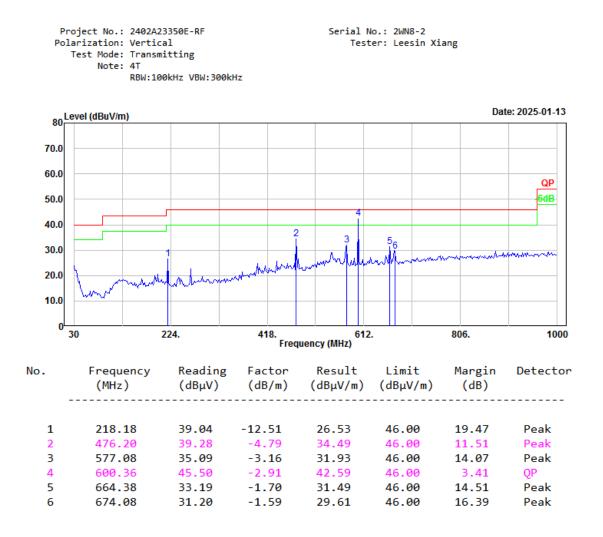


# 30MHz-1GHz(20MHz mode 5738MHz was tested):



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	218.18	47.25	-12.51	34.74	46.00	11.26	Peak
2	476.20	37.06	-4.79	32.27	46.00	13.73	Peak
3	577.08	35.69	-3.16	32.53	46.00	13.47	Peak
4	600.36	40.80	-2.91	37.89	46.00	8.11	Peak
5	798.24	32.09	0.43	32.52	46.00	13.48	Peak
6	875.84	30.96	1.16	32.12	46.00	13.88	Peak

Bay Area Compliance Laboratories Corp. (Dongguan)



# 2) 1-40GHz:

Serial Number:	2WN8-2	Test Date:	2025/1/20-2025/1/22
Test Site:	Chamber B	Test Mode:	Transmitting
Tester:	Leo Xiao, Colin Yang	Test Result:	Pass

#### **Environmental Conditions:**

Temperature: (°C)	19.9-20.3	Relative Humidity: (%)	30-35	ATM Pressure: (kPa)	101-101.2
----------------------	-----------	------------------------------	-------	------------------------	-----------

#### **Test Equipment List and Details:**

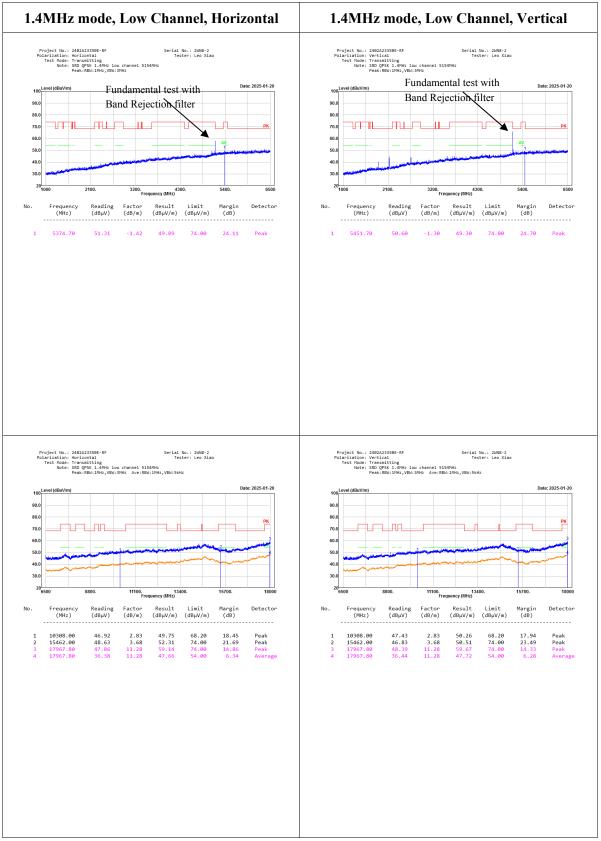
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	000 527 35	2023/9/7	2026/9/6
Xinhang Macrowave	Coaxial Cable	XH750A-N/J- SMA/J-10M	20231117004 #0001	2024/11/17	2025/11/16
AH	Preamplifier	PAM-0118P	469	2024/4/15	2025/4/14
Audix	Test Software	E3	191218 V9	N/A	N/A
R&S	Spectrum Analyzer	FSV40	101944	2024/9/6	2025/9/5
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2023/2/22	2026/2/21
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J- 2.92/J-6M-A	20231208001 #0001	2024/12/9	2025/12/8
AH	Preamplifier	PAM-1840VH	191	2024/9/5	2025/9/4
Decentest	Multiplex Switch Test Control Set & Filter Switch Unit	DT7220SCU & DT7220FCU	DC79902 & DC79905	2024/8/27	2025/8/26

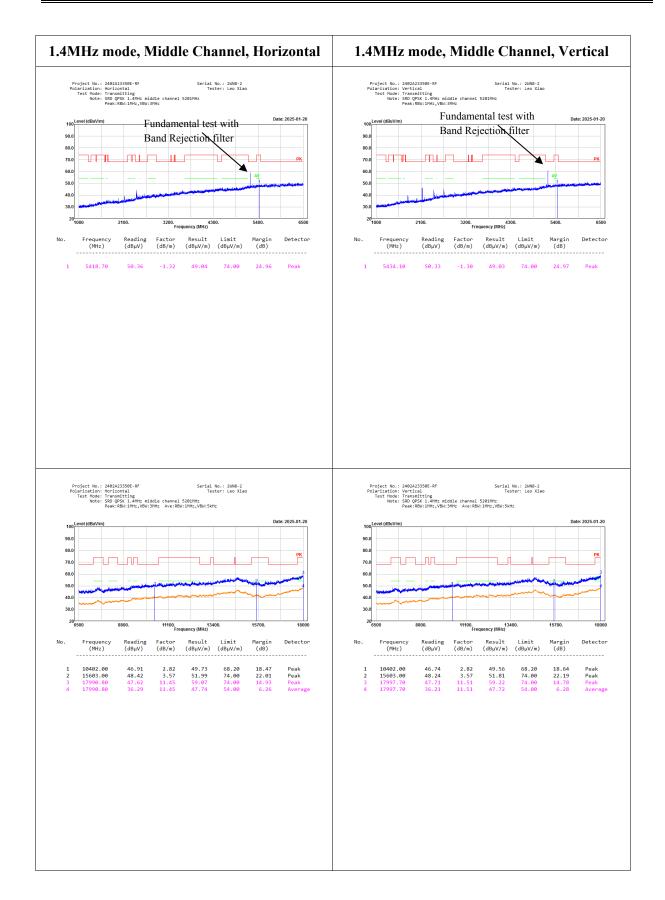
\* Statement of Traceability: Bay Area Compliance Laboratories Corp.(Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

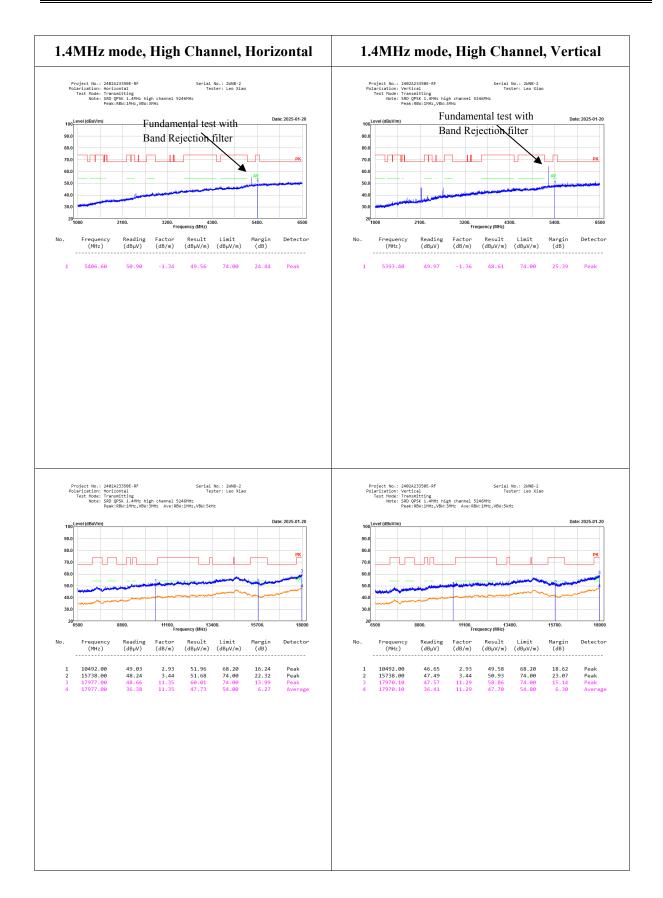
## Test Data:

Please refer to the below table and plots.

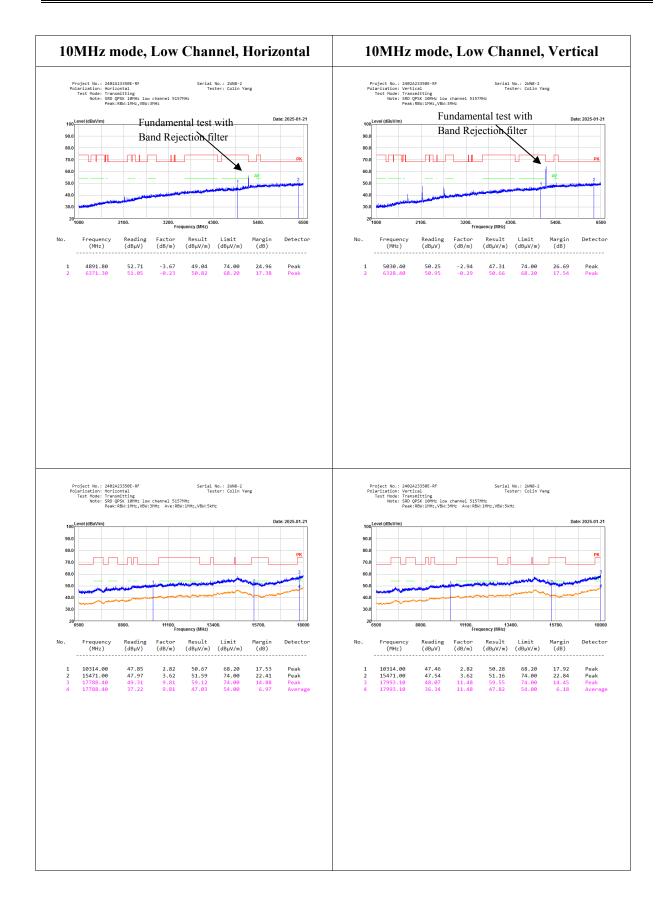
#### 1-18GHz: 5150-5250MHz:



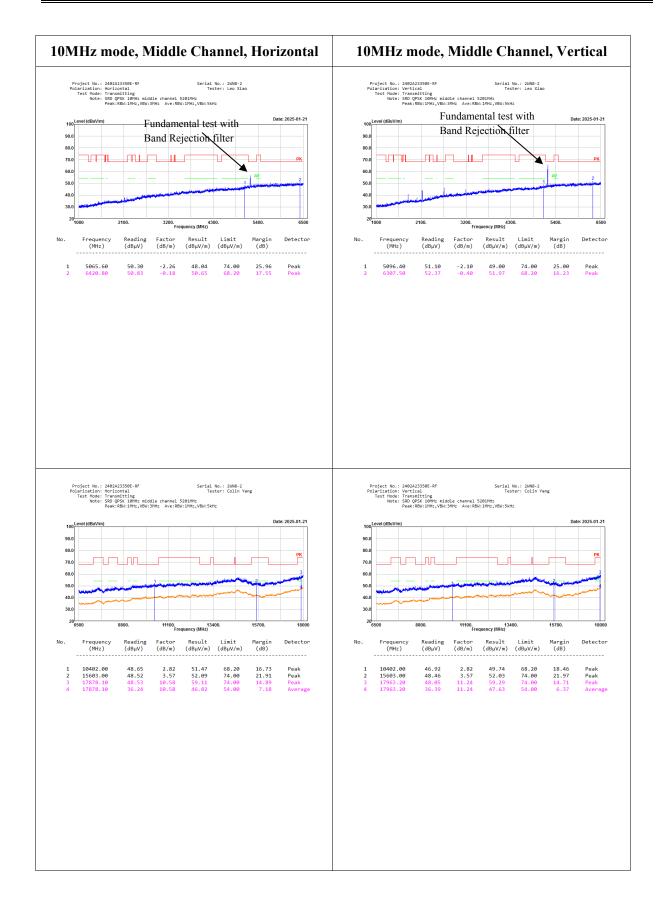




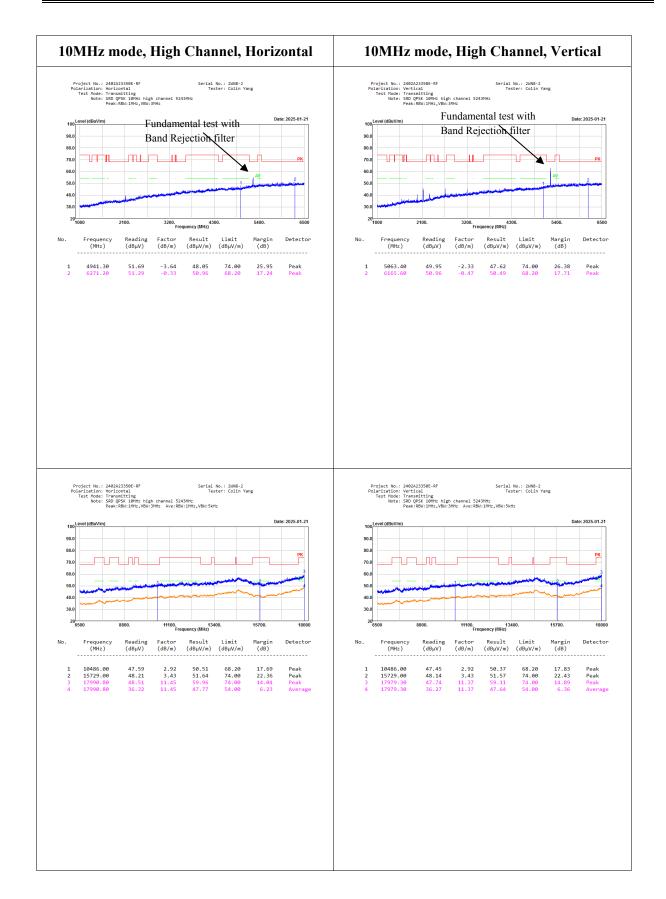
Page 37 of 84



Page 38 of 84

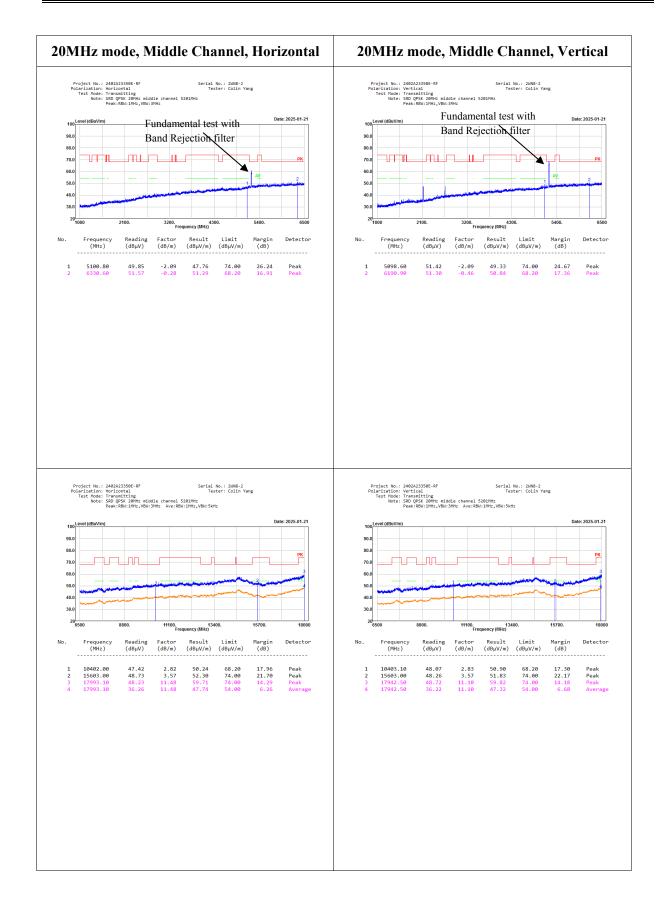


Page 39 of 84

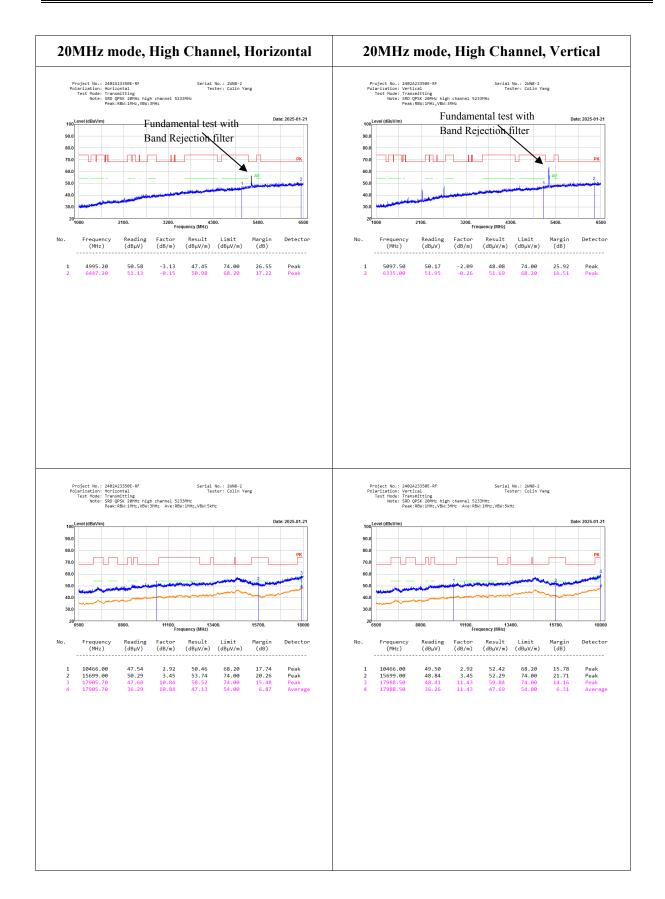




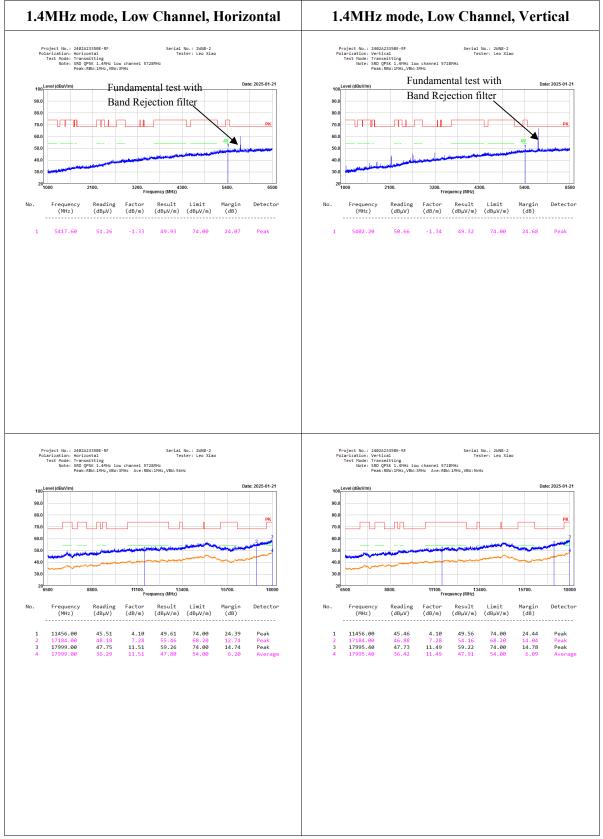
Page 41 of 84

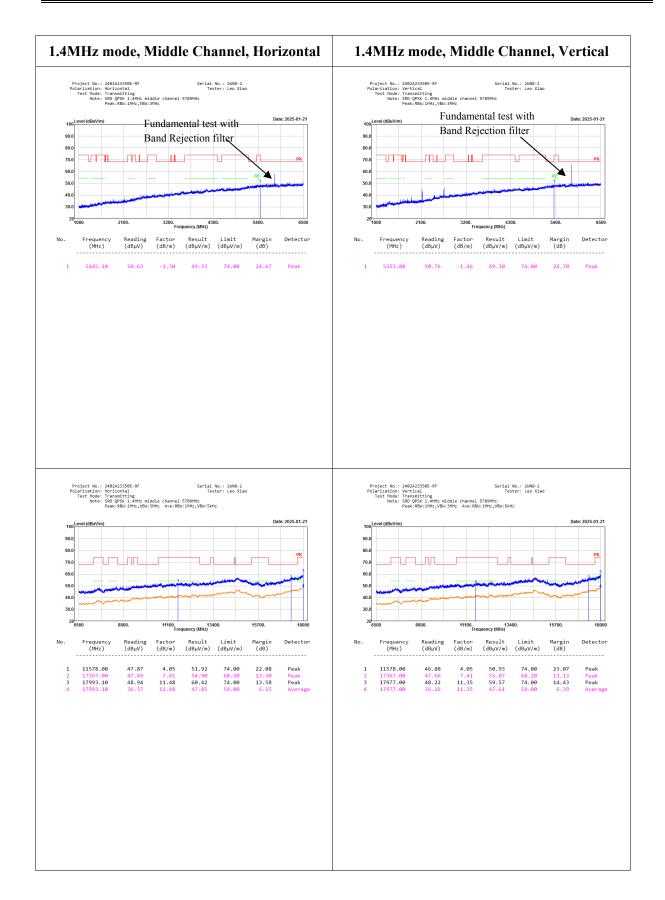


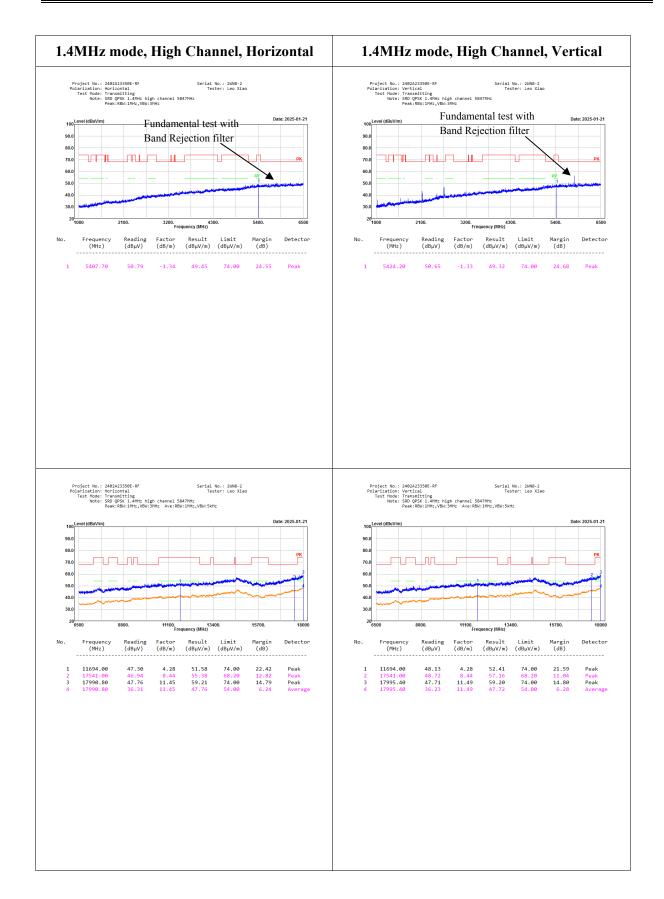
Page 42 of 84



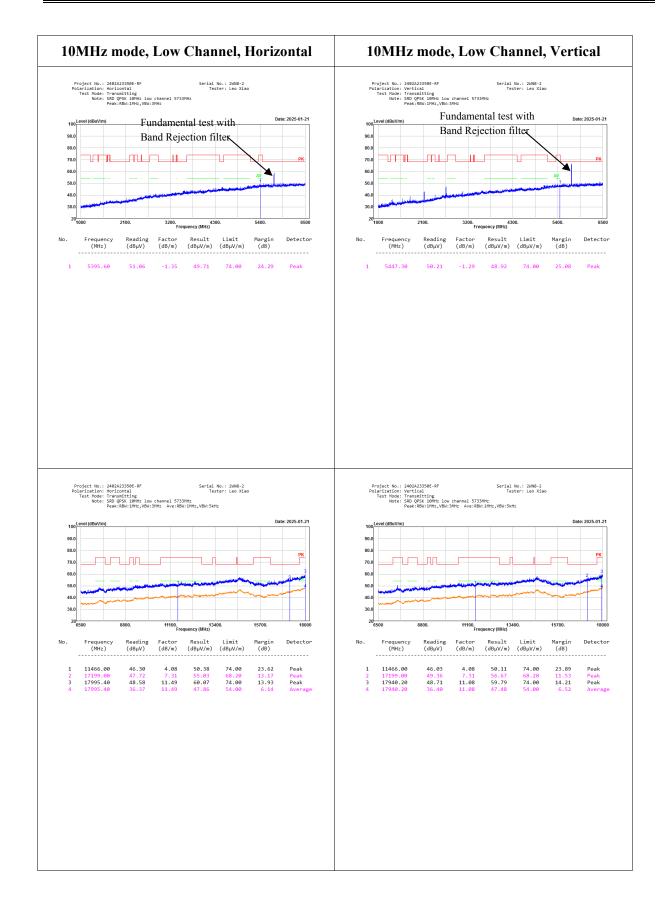
### 5725-5850MHz:



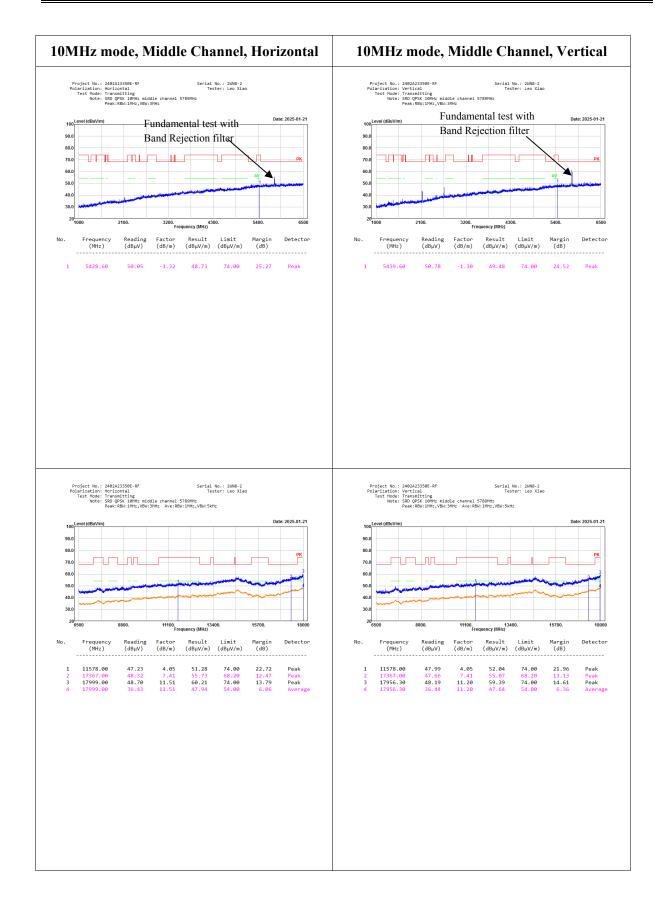




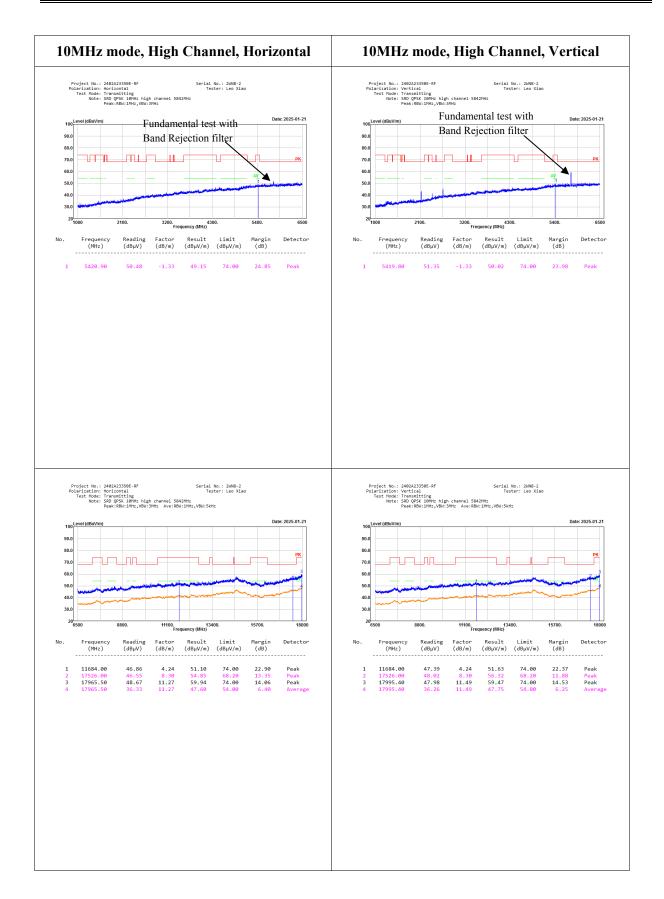
Page 46 of 84

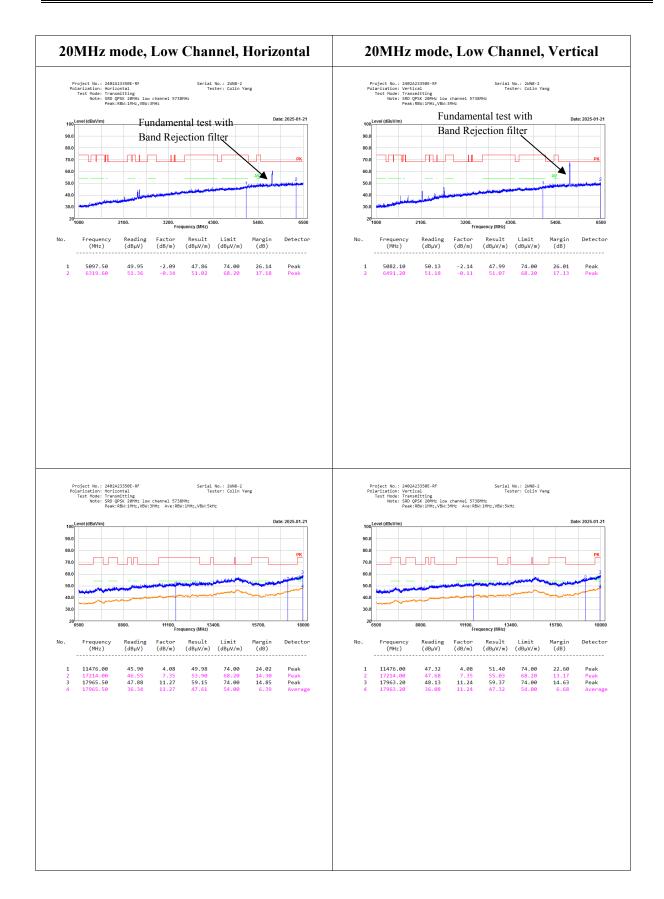


Page 47 of 84

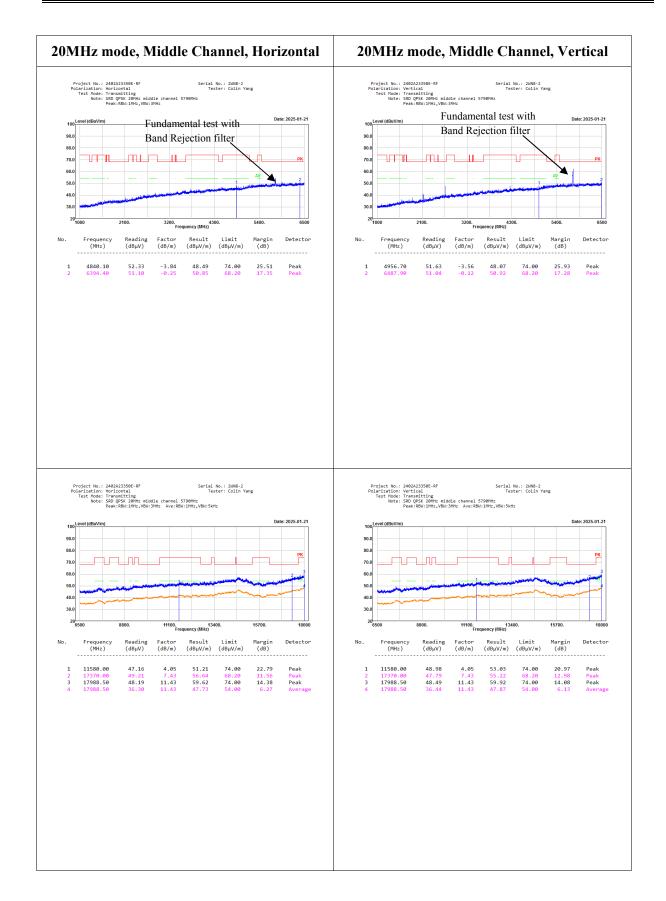


Page 48 of 84





Page 50 of 84



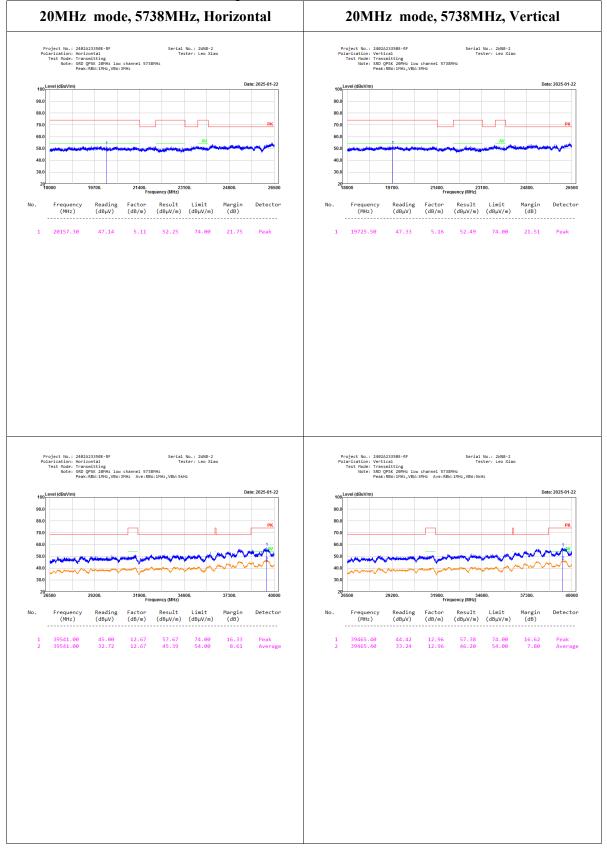
Page 51 of 84



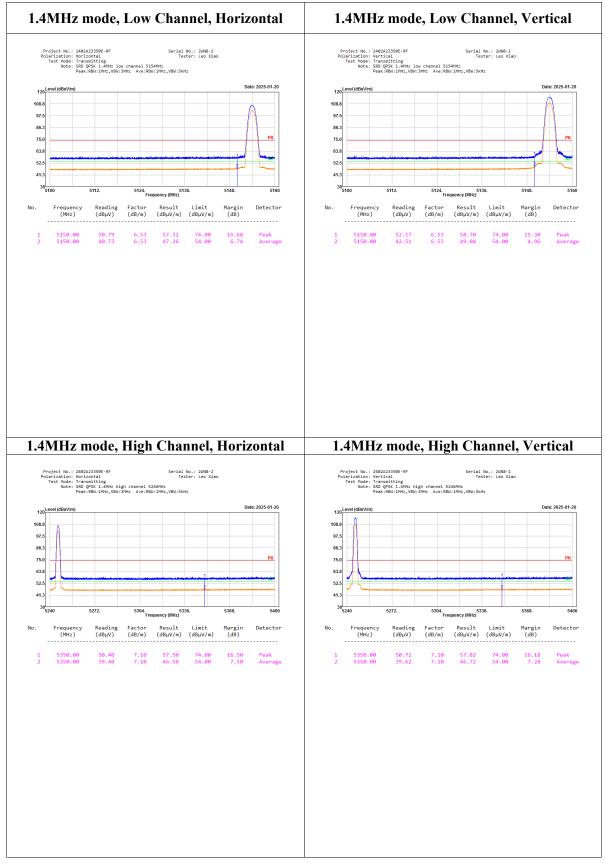
Page 52 of 84

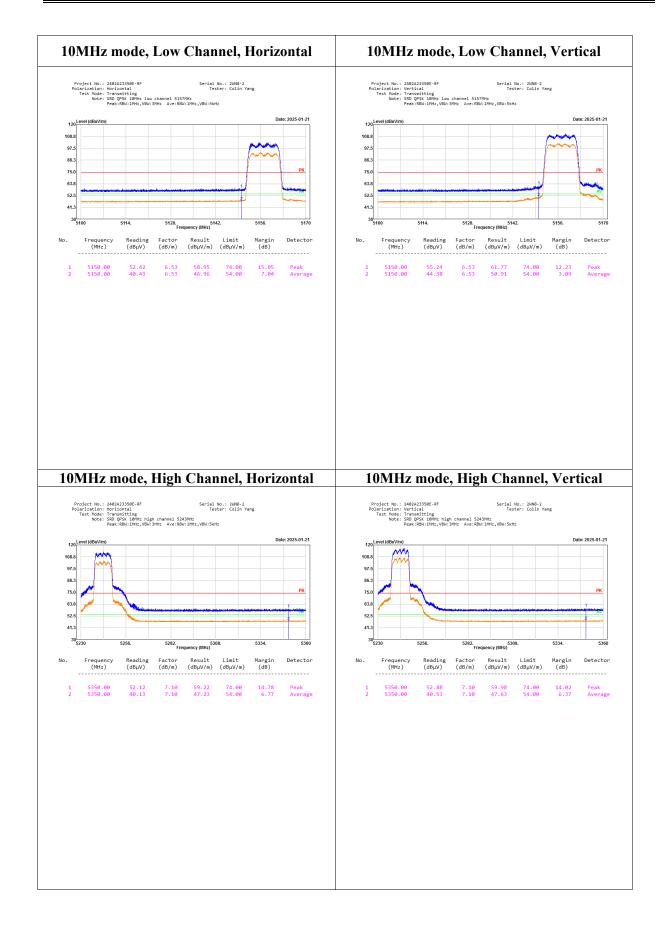
### 18-40GHz:

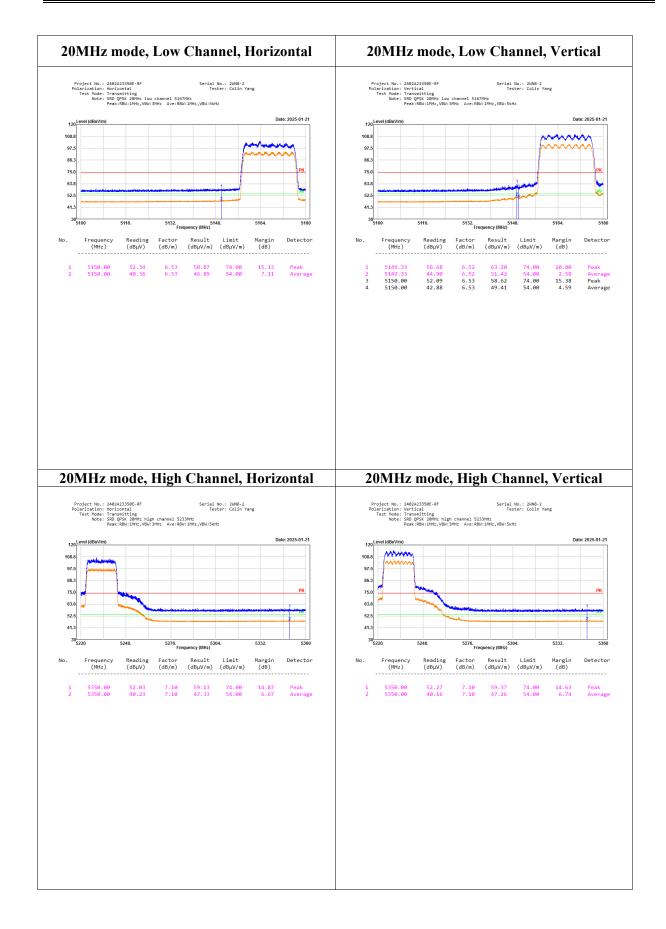
No Emission was detected in the range 18-40GHz,test was performed on the mode and channel which with the maximum power.



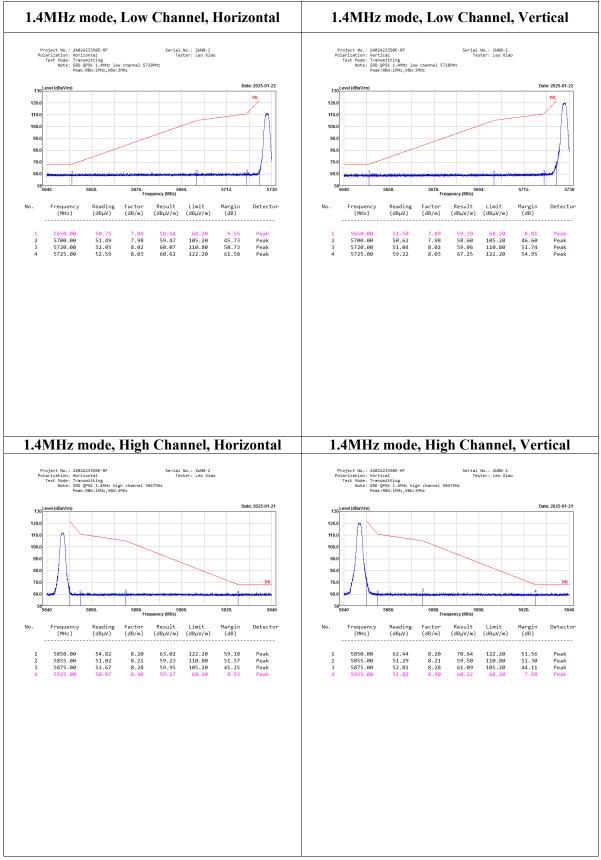
# Bandedge: 5150-5250MHz:

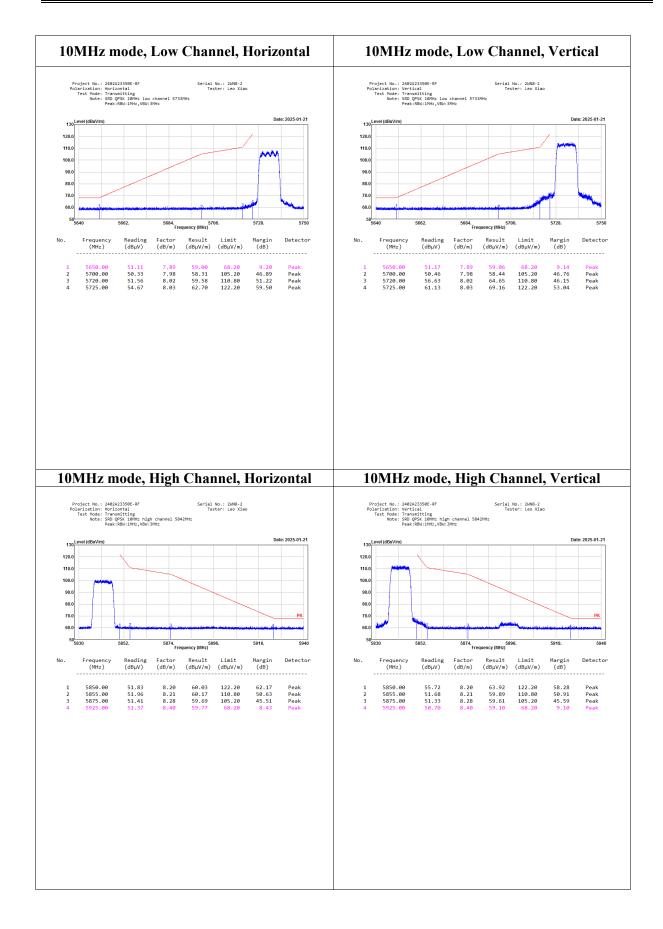


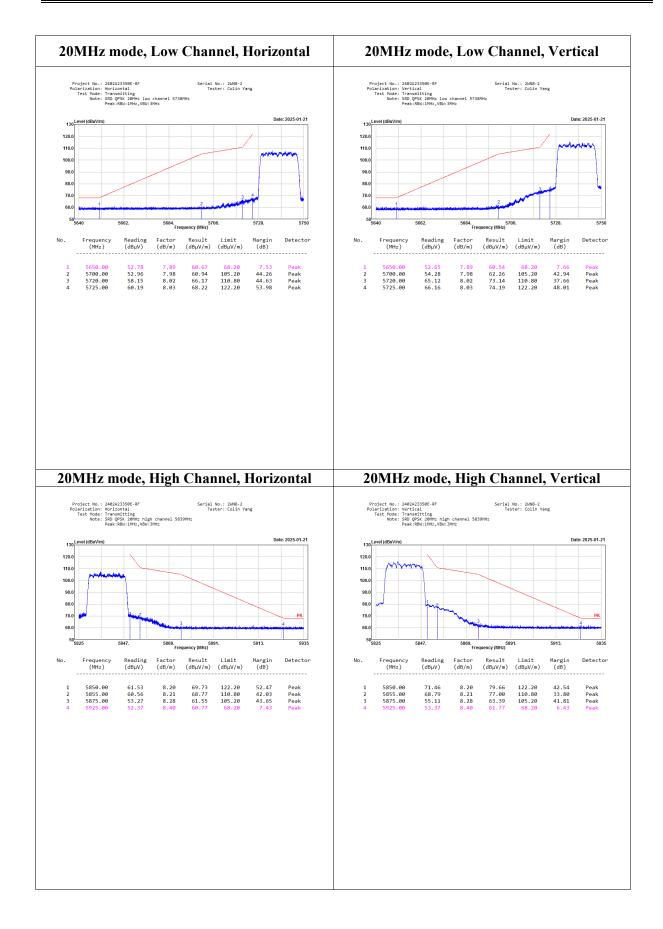




### 5725-5850MHz:







### 5.3 Emission Bandwidth

Serial No.:	2WN8-1	Test Date:	2025/1/23
Test Site:	RF	Test Mode:	Transmitting
Tester:	Jojo Zhou	Test Result:	Pass

### **Environmental Conditions:**

Temperature: (°C): 24.8	Relative Humidity: (%)	48	ATM Pressure: (kPa)	101.1
----------------------------	------------------------------	----	------------------------	-------

### **Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101461	2024/9/5	2025/9/4
Eastsheep	Coaxial Attenuator	5W-N-JK- 6G-10dB	F-08- EM503	2024/6/7	2025/6/6

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

2000 Emission Danuwium			
Test Modes	Test Frequency (MHz)	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1.4M	5154	1.233	1.094
	5201	1.250	1.094
	5246	1.250	1.094
10M	5157	9.580	8.944
	5201	9.580	8.944
	5243	9.580	8.944
	5167	19.392	18.003
20M	5201	19.334	18.003
	5233	19.334	18.003

### Test Data: 26dB Emission Bandwidth

Note: Test only was performed at Chain 0.

The 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth.

### 6dB Emission Bandwidth 5725-5850MHz

Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
	5728	1.133	1.107
1.4M	5789	1.133	1.111
	5847	1.155	1.142
	5733	9.001	8.944
10M	5789	9.001	8.944
	5842	9.001	8.944
	5738	18.061	17.945
20M	5790	18.061	17.945
	5839	18.061	17.945

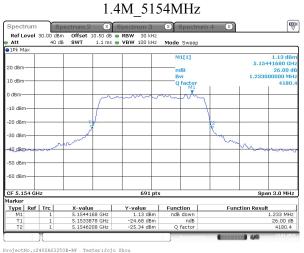
Note:

6dB Emission Bandwidth Limit:  $\geq 0.5$  MHz

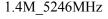
Test only was performed at Chain 0.

The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

### 26dB Bandwidth:



Date: 23.JAN.2025 09:19:09

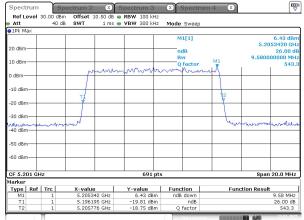


Bm Offset 10.50 dB dB SWT 1.1 ms	RBW 30 kHz VBW 100 kHz	Mode Sweep		
dB SWI 1.1 ms	VBW 100 kHz	Mode Sweep		
		M1[1]		2.67 dBn
				5.24641680 GH
		ndB		26.00 di
		Bw		1.250400000 MH
		Q faqtar	1	4195.
	marche	ma at		
			1	
			N I	
TI			12	
2			2	
and a second			- m	n.
				manon
	-		-	
			-	
	691 pts			Span 3.0 MHz
X-value	Y-value	Function	Fund	tion Result
5.2464168 GHz	2.67 dBm	ndB down		1.2504 MHz
5.2453792 GHz	-22.92 dBm	ndB		26.00 dB
				4195.9
	5.2453792 GHz	5.2453792 GHz -22.92 dBm	5.2453792 GHz -22.92 dBm ndB	

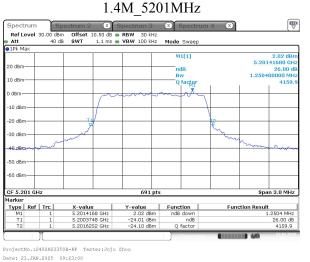
ProjectNo.:2402A23350E-RF Tester:Jojo Zhou

#### Date: 23.JAN.2025 09:27:09

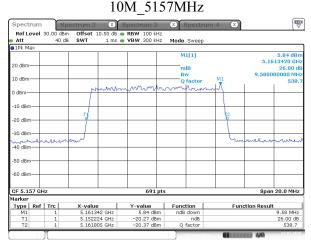
### 10M 5201MHz



ProjectNo.:2402A23350B-RF Tester:Jojo Zhou Date: 23.JAN.2025 09:34:43

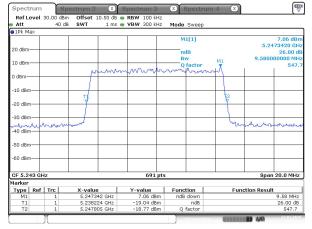




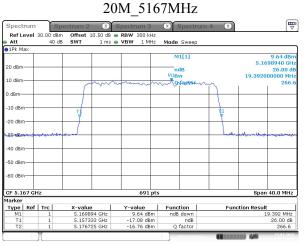


ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 09:31:13

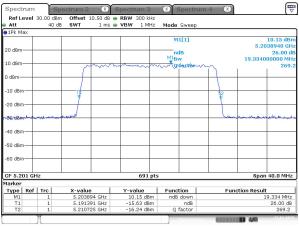
#### 10M 5243MHz



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 09:37:21

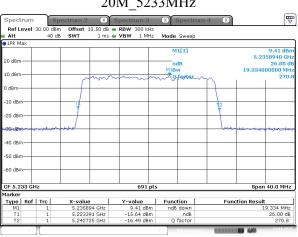


20M\_5201MHz



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou

Date: 23.JAN.2025 09:51:34



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou

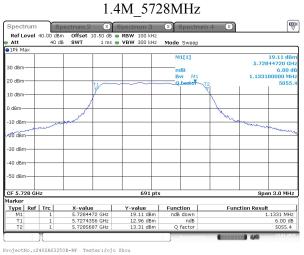
Date: 23.JAN.2025 10:25:56

## 20M\_5233MHz

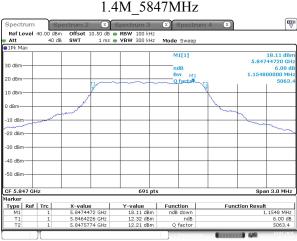
Report No.: 2402A23350E-RF-00C

ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 10:15:41

### 6dB Bandwidth:



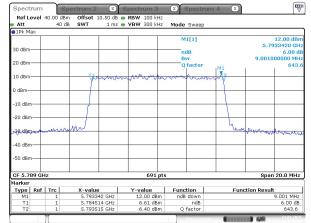
ProjectNo.:2402A23350E-RF Tester:Jojo Date: 23.JAN.2025 10:31:29



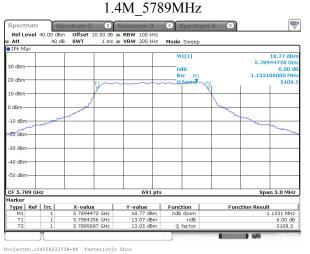
ProjectNo.:2402A23350E-RF Tester:Jojo Zhou

Date: 23.JAN.2025 10:43:04

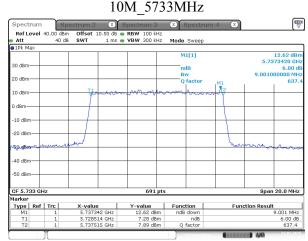
### $10M_5789MHz$



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 11:08:06

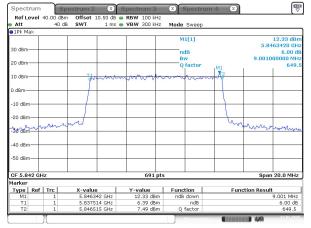


Date: 23.JAN.2025 10:34:45



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 11:05:07

#### 10M 5842MHz



ProjectNo.:2402A23350E-RF Tester:Jojo Zhou Date: 23.JAN.2025 11:19:14