



Test report No. : 4790038917B-US-R1-V0
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Issued date : 2022/1/13
FCC ID : RYK-WUBT239ACND

RADIO TEST REPORT

Product : 802.11ac/a/b/g/n 2T2R Wi-Fi + Bluetooth 5.0 USB Dongle

Model Name : WUBT-239ACN(BT) Dongle

FCC ID : RYK-WUBT239ACND

Test Regulation : FCC 47 CFR Part 15 Subpart E (Section 15.407)

Received Date : 2021/8/5

Test Date : 2021/8/9 ~ 2021/10/25

Issued Date : 2022/1/13

Applicant : SparkLAN Communications, Inc.
8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City
11493, Taiwan (R.O.C.)

Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd.,
Zhudong Township, Hsinchu County, Taiwan



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REVISION HISTORY

Original Test Report No.: 4790038917B-US-R1-V0

[illegible]

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1. Attestation of Test Results

APPLICANT: SparkLAN Communications, Inc.
8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493,
Taiwan (R.O.C.)

MANUFACTURER: SparkLAN Communications, Inc.
8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493,
Taiwan (R.O.C.)

EUT DESCRIPTION: 802.11ac/a/b/g/n 2T2R Wi-Fi + Bluetooth 5.0 USB Dongle

BRAND: SparkLAN

MODEL: WUBT-239ACN(BT) Dongle

SAMPLE STAGE: Engineering Verification Test sample

DATE of TESTED: 2021/8/9 ~ 2021/10/25

APPLICABLE STANDARDS	
STANDARD	Test Results
FCC 47 CFR PART 15 Subpart E (Section 15.407)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu
Project Handler

Date : 2022/1/13

Approved and Authorized By:

Waternil Guan
Engineer

Date : 2022/1/13

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2. Summary of Test Results

Summary of Test Results		
FCC Clause	Test Items	Result
15.407(e)	6dB Bandwidth	Note 1
15.403(i)	26dB Bandwidth	Note 1
2.1049	Occupied Bandwidth	Note 1
15.407(a)(1/2/3)	Conducted Output Power	PASS
15.407(a)(1/2/3)	Power Spectral Density	Note 1
15.407(g)	Frequency Stability	Note 1
15.407(b) (1/2/3/4(i/ii)/9)	Radiated Emissions and Band Edge Measurement	PASS
15.407(b)(9)	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS
15.407(h)	Dynamic Frequency Selection	Note 2

Note:

1. This prepared for FCC Spot Check Verification Report, the test items and spot-check test data are decided by applicant's engineering judgment, for more details please refer to the note 1 and 2 of section 6.1.
2. The "Dynamic Frequency Selection measurement" was recorded in Report No.: 4790038917B-US-R2-V0.

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3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB 789033 D02 General UNII Test Procedure New Rules v02r01, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

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5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	± 3.1 dB
RF Conducted	9 kHz - 40GHz	± 1.9 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	± 1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	± 5.4 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	± 4.7 dB

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6. Equipment under Test

6.1. Description of EUT

Product	802.11ac/a/b/g/n 2T2R Wi-Fi + Bluetooth 5.0 USB Dongle	
Brand Name	SparkLAN	
Model Name	WUBT-239ACN(BT) Dongle	
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5720 MHz, 5745 ~ 5825 MHz	
Modulation	256QAM, 64QAM, 16QAM, QPSK, BPSK	
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to MCS15 802.11ac: up to MCS9	
Number of Channel	5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
	5260 ~ 5320 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
	5500 ~ 5720 MHz	12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		6 for 802.11n (HT40), 802.11ac (VHT40)
		3 for 802.11ac (VHT80)
	5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
Maximum Output Power	5180 ~ 5240 MHz: 16.65 dBm 5260 ~ 5320 MHz: 17.80 dBm 5500 ~ 5720 MHz: 17.35 dBm 5745 ~ 5825 MHz: 16.95 dBm	
Normal Voltage	5Vdc	
Sample ID	Conducted Test: 4197850 Radiated Test: 4197853	

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Note:

1. This spot check report was issued based on the re-used report with report number 4790038917A-US-R1-V0 / FCC ID: RYK-WUBT239ACNBT. The technical construction which included circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction are as same as the original device (Model: WUBT-239ACN(BT) [MU]), the differences are add outer case and use PCB antenna only. Therefore, only the output power and worst case of the emission was performed and recorded in this report.
2. The spot check verification data was following the table, and just shows the worst case of the radiated spurious and band edge emission.

Band	Test Item	Test Limit	Original Model			Spot Check Model			Deviation
			WUBT-239ACN(BT) [MU]			WUBT-239ACN(BT) Dongle			
			FCC ID: RYK-WUBT239ACNBT			FCC ID: RYK-WUBT239ACND			
			Mode	Channel	Test Result	Mode	Channel	Test Result	
UNII WLAN 5GHz	Band Edge	54 dBuV/m	11a	5300 MHz	44.34 dBuV/m	11a	5180 MHz	44.59 dBuV/m	0.25 dB
	RSE	68.2 dBuV/m	11a	5240 MHz	51.04 dBuV/m	11a	5240 MHz	50.97 dBuV/m	-0.07 dB
	Band Edge	54 dBuV/m	11ac20	5240 MHz	43.96 dBuV/m	11ac20	5240 MHz	44.04 dBuV/m	0.08 dB
	RSE	68.2 dBuV/m	11ac20	5220 MHz	49.77 dBuV/m	11ac20	5220 MHz	49.92 dBuV/m	0.15 dB
	Band Edge	54 dBuV/m	11ac40	5190 MHz	44.04 dBuV/m	11ac40	5190 MHz	44.64 dBuV/m	0.6 dB
	RSE	68.2 dBuV/m	11ac40	5230 MHz	49.92 dBuV/m	11ac40	5230 MHz	49.81 dBuV/m	-0.11 dB
	Band Edge	54 dBuV/m	11ac80	5210 MHz	43.95 dBuV/m	11ac80	5210 MHz	44.33 dBuV/m	0.38 dB
	RSE	68.2 dBuV/m	11ac80	5210 MHz	49.51 dBuV/m	11ac80	5210 MHz	49.46 dBuV/m	-0.05 dB

Comparison of two models, all test results are under FCC Technical Limit.

3. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx,Rx Function
802.11a	2TX,2RX
802.11n (HT20)	2TX,2RX
802.11n (HT40)	2TX,2RX
802.11ac (VHT20)	2TX,2RX
802.11ac (VHT40)	2TX,2RX
802.11ac (VHT80)	2TX,2RX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40 and tune up powers of 802.11n mode for HT20 / HT40 are same as 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report.

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

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6.2. Channel List

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

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FOR 5500 ~ 5720MHz

12 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

6 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	138	5690MHz
122	5610MHz	-	-

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	-	-

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

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6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	23~26°C/ 60~65%RH	5Vdc	2021/08/09~ 2021/10/25	Mike Cai
Radiated Spurious Emission	966-2	23~26°C/ 60~65%RH	5Vdc	2021/09/06~ 2021/10/22	Patrick Kuan/ Mike Cai
AC power Line Conducted Emission	SR1	23~26°C/ 60~65%RH	5Vdc	2021/10/07~ 2021/10/08	Mike Cai

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)	Remark
1	Chain (0)	SparkLAN	N/A	PCB	2.4GHz: 0.7 5GHz: 4.24	Ant L
	Chain (1)	SparkLAN	N/A	PCB	2.4GHz: 0.25 5GHz: 3.83	Ant R

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

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6.5. Test Mode Applicability and Tested Channel Detail

- For AC power line conducted emissions, the pre-scan has been determined by AC power 120Vac/60Hz (worst case).
- The fundamental of the EUT with PCB Antenna was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that Y-Z plane was worst-case. Therefore, all final radiated testing was performed with the EUT in Y-Z plane.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions (Above 1GHz)	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ac20			36 to 48	36, 44, 48	MCS0
	802.11ac40			38 to 46	38, 46	MCS0
	802.11ac80			42	42	MCS0
	802.11a	5260-5320		52 to 64	52, 60, 64	6Mbps
	802.11ac20			52 to 64	52, 60, 64	MCS0
	802.11ac40			54 to 62	54, 62	MCS0
	802.11ac80			58	58	MCS0
	802.11a	5500-5720		100 to 144	100, 116, 140, 144	6Mbps
	802.11ac20			100 to 144	100, 116, 140, 144	MCS0
	802.11ac40			102 to 142	102, 110, 134,142	MCS0
	802.11ac80			106, 122,138	106, 122, 138	MCS0
	802.11a	5745-5825		149 to 165	149, 157, 165	6Mbps
	802.11ac20			149 to 165	149, 157, 165	MCS0
	802.11ac40			151 to 159	151, 159	MCS0
	802.11ac80			155	155	MCS0
Radiated Emissions (Below 1GHz)	802.11ac20	5745-5825	OFDM	149 to 165	149	MCS0
AC Power Line Conducted Emission	802.11ac20	5745-5825	OFDM	149 to 165	149	MCS0

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Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Conducted Output Power	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ac20			36 to 48	36, 44, 48	MCS0
	802.11ac40			38 to 46	38, 46	MCS0
	802.11ac80			42	42	MCS0
	802.11a	5260-5320		52 to 64	52, 60, 64	6Mbps
	802.11ac20			52 to 64	52, 60, 64	MCS0
	802.11ac40			54 to 62	54, 62	MCS0
	802.11ac80			58	58	MCS0
	802.11a	5500-5720		100 to 144	100, 116, 140, 144	6Mbps
	802.11ac20			100 to 144	100, 116, 140, 144	MCS0
	802.11ac40			102 to 142	102, 110, 134,142	MCS0
	802.11ac80			106, 122,138	106, 122, 138	MCS0
	802.11a	5745-5825		149 to 165	149, 157, 165	6Mbps
	802.11ac20			149 to 165	149, 157, 165	MCS0
	802.11ac40			151 to 159	151, 159	MCS0
	802.11ac80			155	155	MCS0

Simultaneously transmission condition:

Condition	Technology	
1	WLAN (2.4GHz), Chain0	Bluetooth, Chain1
2	WLAN (5GHz), Chain0	Bluetooth Chain1

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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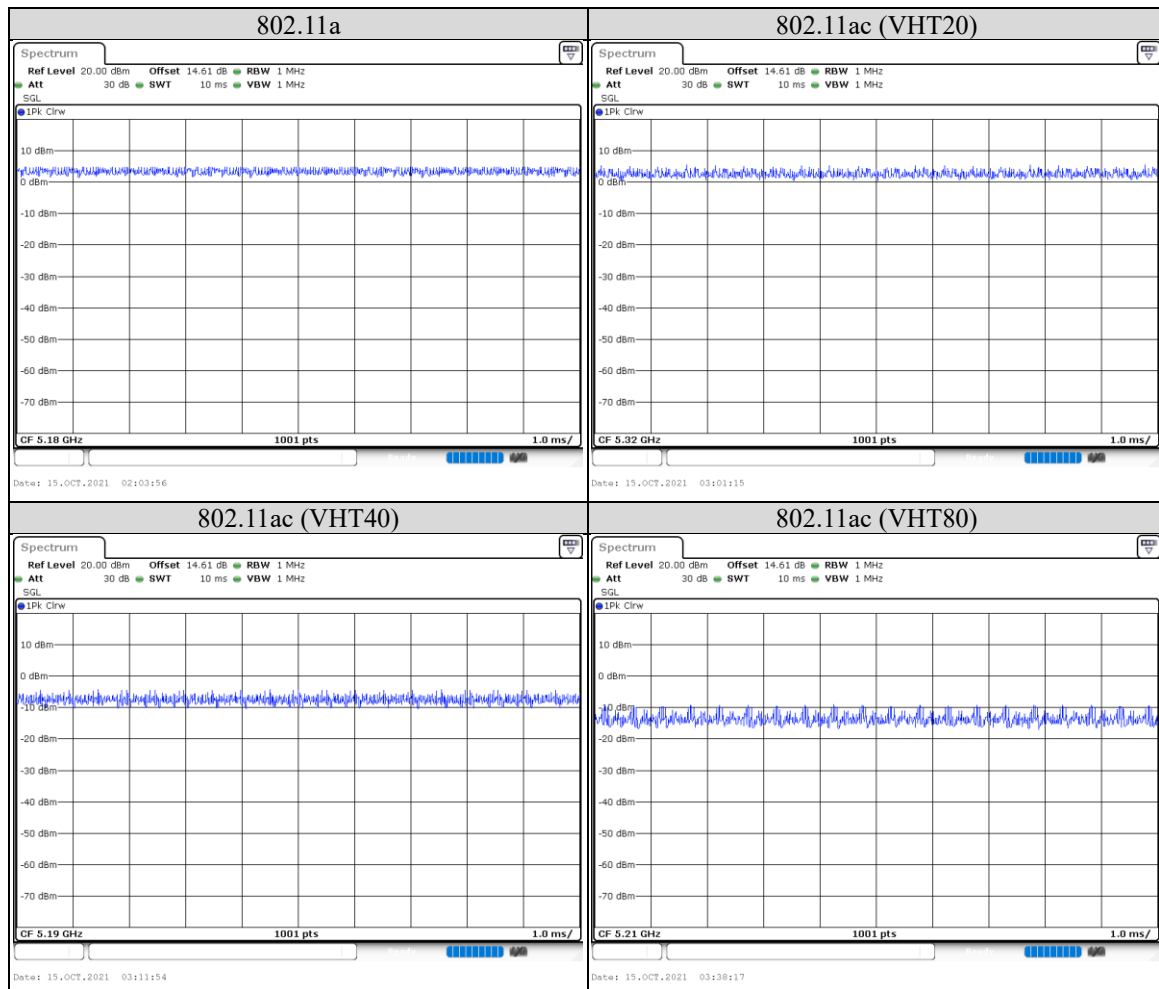
6.6. Duty cycle

802.11a: Duty cycle = $1/1 = 100\%$, duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11ac(VHT20): Duty cycle = $1/1 = 100\%$, duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11ac(VHT40): Duty cycle = $1/1 = 100\%$, duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11ac(VHT80): Duty cycle = $1/1 = 100\%$, duty cycle of test signal is $\geq 98\%$, duty factor is not required.





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7. Test Equipment

Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2020/11/11	2021/11/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2020/12/11	2021/12/10
Loop Antenna	ETS lindgren	6502	00213440	2020/12/25	2021/12/24
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2021/1/13	2022/1/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2020/12/30	2021/12/29
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2020/12/30	2021/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2021/6/8	2022/6/7
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2021/2/3	2022/2/2
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2021/5/19	2022/5/18
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/1/22	2022/1/21
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/1/22	2022/1/21

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Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2020/11/6	2021/11/5
Pulse Power Sensor	Anritsu	MA2411B	1531202	2020/12/21	2021/12/20
Power Meter	Anritsu	ML2495A	1645002	2020/12/21	2021/12/20
Temperature & Humidity Test Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA1701-010	2021/3/22	2022/3/21
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2020/11/17	2021/11/16
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2021/8/30	2022/8/29
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2021/8/26	2022/8/25
Cables	TITAN	CFD200	T0732ACFD20 020A300-1	2021/3/2	2022/3/1

UL Software		
Description	Name	Version
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF Conducted Test Tools	ver 2.4.0.620b
AC power Line Conducted Emission	EZ_EMG	UL-3A1.2

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8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	Lenovo	T460	PC0FWU5Y	Provide by lab

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	USB Cable	fujiei	Z08145	1	Provide by lab

Test Setup

Controlled using a bespoke application (RTL8822CU MP Diagnostic Program 0.0001.1020.2018) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

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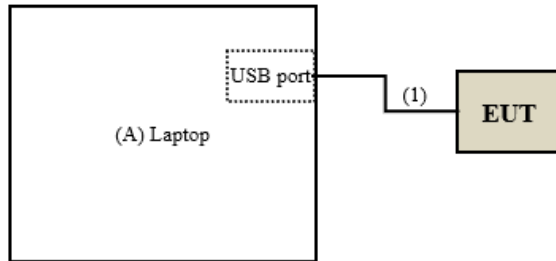
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Setup Diagram for Radiated Spurious Emission Test



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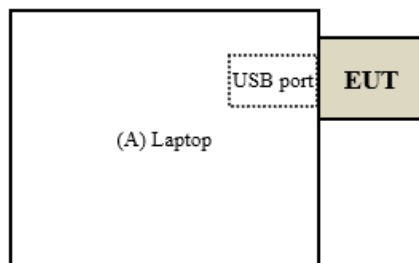
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Setup Diagram for AC Power Line Conducted Emission Test



Under Table

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9. Test Results

9.1. Conducted output power

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
		Fixed point-to-point Access Point	1 Watt (30 dBm) If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$
		Indoor Access Point	1 Watt (30 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	√	Client device	250mW (24 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-3	√		For Point-to-multipoint systems (P2M): 1 Watt (30 dBm). If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ For Point-to-point systems (P2P): 1 Watt (30 dBm)

Note:

- P_{Out} = maximum conducted output power in dBm,
- G_{TX} = the maximum transmitting antenna directional gain in dBi.
- B is the 26 dB emission bandwidth in megahertz
- Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ant}]$ dBi.
 N_{ant} : Number of Transmit Antennas
 $G1, G2, \dots, Gn$: Gain of Individual Antennas
- Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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Test Procedure

For Average Power Measurement

Test method PM-G

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test method SA-1

For 802.11ac (VHT80)

- a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- b. Set sweep trigger*.
- c. Set RBW = 1 MHz.
- d. Set VBW $\geq$ 3 MHz
- e. Number of points in sweep $\geq$ 2 Span / RBW.
- f. Sweep time $\leq$ (number of points in sweep) * T
- g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- h. Detector = RMS.
- i. Trace mode = max hold.
- j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

* If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq$ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”

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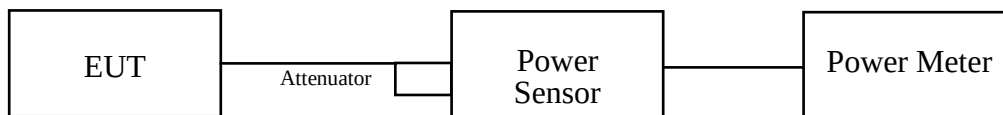
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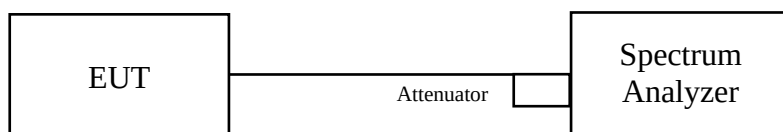


Test Setup

For Average Power Measurement



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

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Test Data

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	13.86	12.85	43.551	16.39	23.98	PASS
44	5220	13.42	12.72	40.644	16.09	23.98	PASS
48	5240	13.82	12.71	42.756	16.31	23.98	PASS
52	5260	13.44	14.80	52.24	17.18	23.66	PASS
60	5300	13.52	14.71	52.119	17.17	23.68	PASS
64	5320	13.90	14.71	54.075	17.33	23.67	PASS
100	5500	11.84	15.51	50.816	17.06	23.65	PASS
116	5580	11.75	15.58	51.05	17.08	23.66	PASS
140	5700	11.81	15.47	50.35	17.02	23.66	PASS
144 (U-NII-2c Band)	5720	10.67	14.34	38.815	15.89	22.53	PASS
144 (U-NII-3 Band)	5720	5.31	9.03	11.402	10.57	30	PASS
149	5745	12.58	14.57	46.774	16.70	30	PASS
157	5785	12.90	14.77	49.545	16.95	30	PASS
165	5825	12.67	14.77	48.529	16.86	30	PASS

Note: The directional gain = 4.24 dBi < 6 dBi, so the power limit shall not be reduced.

For Reference only – Straddle Channels Total Power

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
144	5720	11.78	15.46	50.234	17.01

Note: The total power was calculated through formula and record the value for reference only.

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802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	13.86	12.88	43.752	16.41	23.98	PASS
44	5220	13.74	12.83	42.855	16.32	23.98	PASS
48	5240	14.30	12.57	44.978	16.53	23.98	PASS
52	5260	14.45	14.49	55.976	17.48	23.91	PASS
60	5300	14.61	14.83	59.293	17.73	23.91	PASS
64	5320	12.42	14.09	43.152	16.35	23.91	PASS
100	5500	11.63	15.57	50.582	17.04	23.9	PASS
116	5580	11.78	15.75	52.602	17.21	23.92	PASS
140	5700	11.69	15.69	51.88	17.15	23.95	PASS
144 (U-NII-2c Band)	5720	10.71	14.43	39.537	15.97	22.72	PASS
144 (U-NII-3 Band)	5720	5.75	9.50	12.677	11.03	30	PASS
149	5745	12.48	14.84	48.195	16.83	30	PASS
157	5785	12.96	14.55	48.306	16.84	30	PASS
165	5825	12.43	14.51	45.709	16.60	30	PASS

Note: The directional gain = 4.24 dBi < 6 dBi, so the power limit shall not be reduced.

For Reference only – Straddle Channels Total Power

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
144	5720	11.91	15.64	52.119	17.17

Note: The total power was calculated through formula and record the value for reference only.

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802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	9.57	11.19	22.233	13.47	23.98	PASS
46	5230	13.72	13.55	46.238	16.65	23.98	PASS
54	5270	13.71	15.66	60.256	17.80	23.98	PASS
62	5310	9.93	10.90	22.131	13.45	23.98	PASS
102	5510	9.47	10.76	20.749	13.17	23.98	PASS
110	5550	11.66	15.99	54.325	17.35	23.98	PASS
134	5670	11.45	16.00	53.827	17.31	23.98	PASS
142 (U-NII-2c Band)	5710	11.24	14.95	44.566	16.49	23.98	PASS
142 (U-NII-3 Band)	5710	3.41	7.21	7.464	8.73	30	PASS
151	5755	12.36	14.48	45.29	16.56	30	PASS
159	5795	12.80	14.65	48.195	16.83	30	PASS

Note: The directional gain = 4.24 dBi < 6 dBi, so the power limit shall not be reduced.

For Reference only – Straddle Channels Total Power

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
142	5710	11.90	15.63	52	17.16

Note: The total power was calculated through formula and record the value for reference only.

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802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	7.33	9.08	13.49	11.30	23.98	PASS
58	5290	7.29	8.95	13.213	11.21	23.98	PASS
106	5530	10.72	11.45	25.763	14.11	23.98	PASS
122	5610	12.56	15.53	53.703	17.30	23.98	PASS
138 (U-NII-2c Band)	5690	11.12	14.48	41.02	16.13	23.98	PASS
138 (U-NII-3 Band)	5690	6.30	9.87	13.964	11.45	30	PASS
155	5775	12.61	14.76	48.195	16.83	30	PASS

Note: The directional gain = 4.24 dBi < 6 dBi, so the power limit shall not be reduced.

For Reference only – Straddle Channels Total Power

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
138	5690	12.36	15.77	54.954	17.40

Note: The total power was calculated through formula and record the value for reference only.

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9.2. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

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Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
*1 beyond 75 MHz or more above of the band edge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

Note:

The following formula is used to convert the effective isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

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Test Procedures

[For 9 kHz ~ 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

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Note:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
802.11a	1MHz	10Hz
802.11ac (VHT20)		10Hz
802.11ac (VHT40)		10Hz
802.11ac (VHT80)		10Hz

Note: Refer to section 6.6 for duty cycle.

- All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported.
- Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
- Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
- Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
- Test data of Notation "@" = Fundamental Frequency
- Test data of Notation "*" = Only required peak limit or the peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

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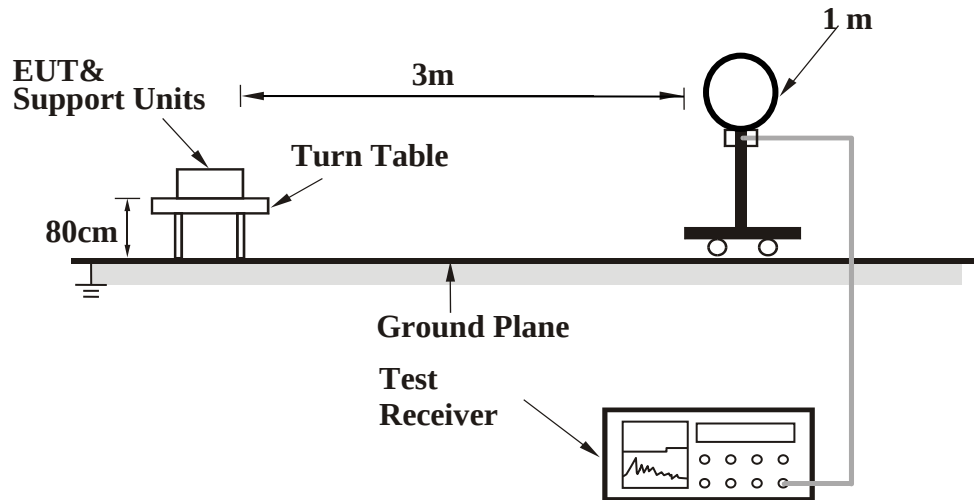
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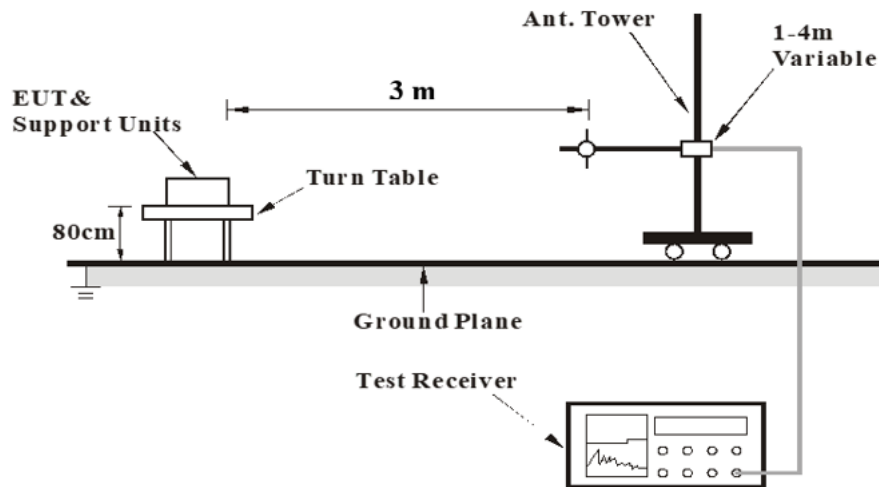


Test Setup

<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



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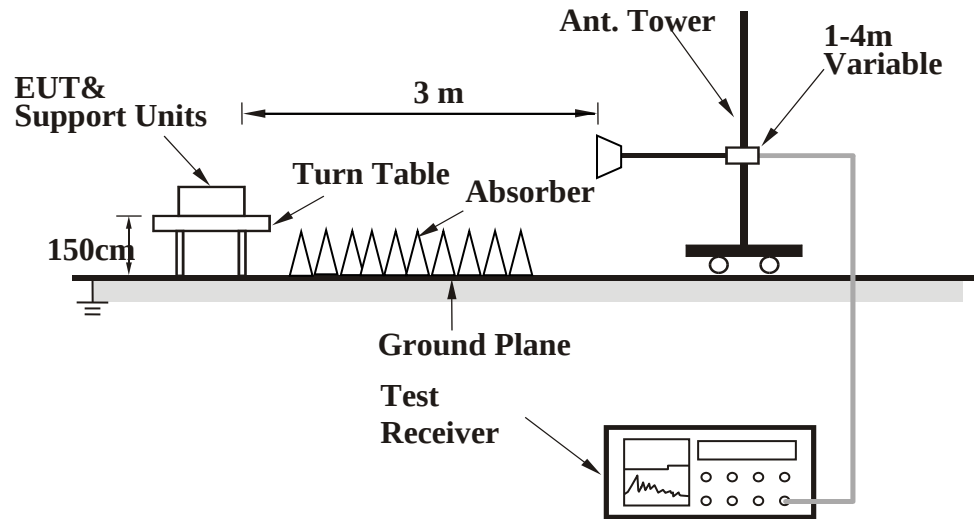
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<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

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FCC ID : RYK-WUBT239ACND

Test Data

Above 1G

Mode	802.11a	Channel	36
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5069.3	42.06	13.37	55.43	74	-18.57	PK
		5107.8	30.17	13.45	43.62	54	-10.38	AVG
	@	5180	88.53	13.4	101.93	N/A	N/A	PK
	@	5180	81.22	13.4	94.62	N/A	N/A	AVG
		10360	31.92	17.39	49.31	68.2	-18.89	PK
Vertical		5056	36.95	13.32	50.27	74	-23.73	PK
		5100.1	32.93	13.46	46.39	54	-7.61	AVG
	@	5180	88.78	13.4	102.18	N/A	N/A	PK
	@	5180	87.76	13.4	101.16	N/A	N/A	AVG
		10360	31.24	17.39	48.63	68.2	-19.57	PK

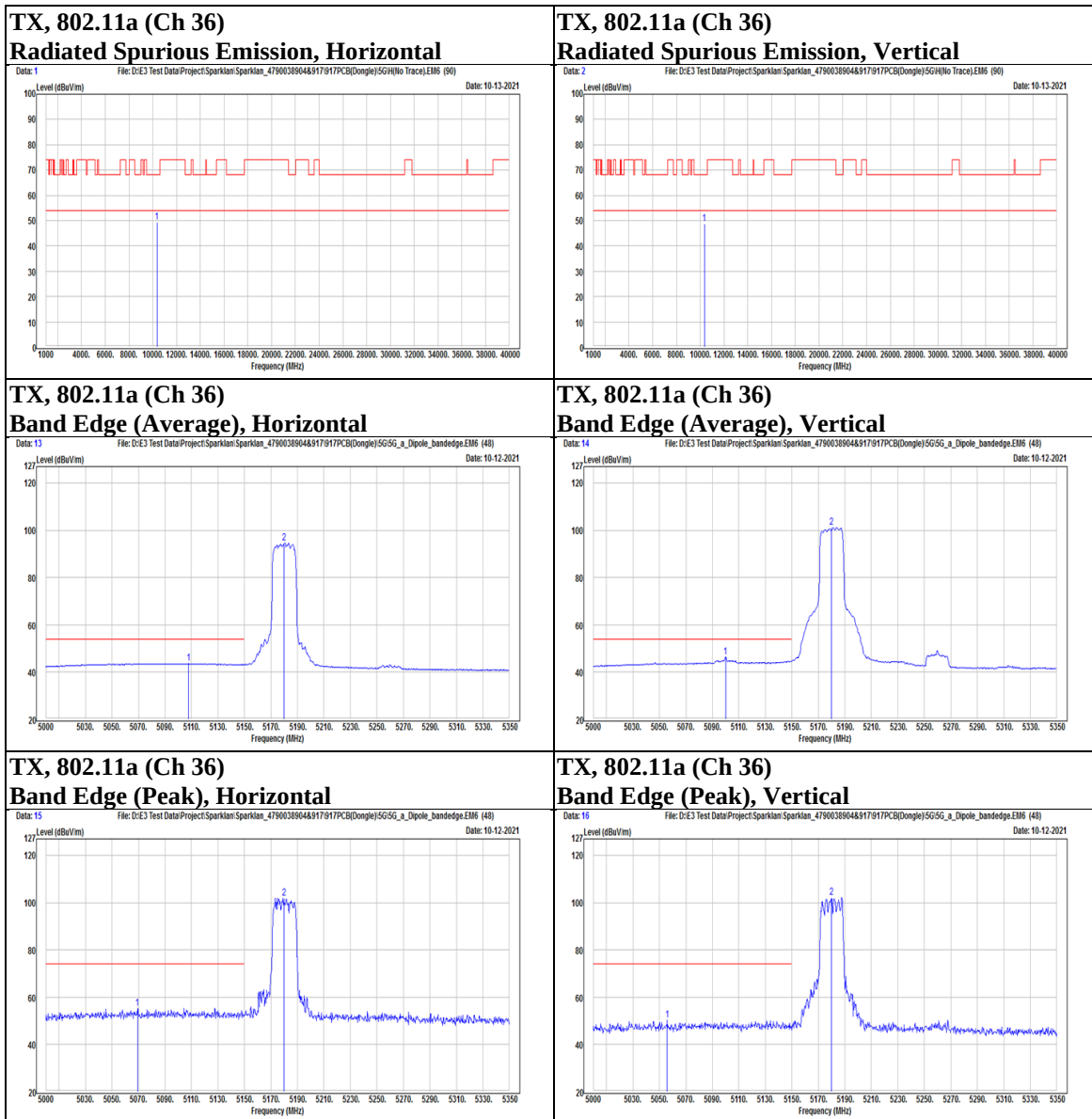
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Mode	802.11a	Channel	44
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5097.65	30.25	13.46	43.71	54	-10.29	AVG
		5108.85	42.26	13.45	55.71	74	-18.29	PK
	@	5220	91.58	13.33	104.91	N/A	N/A	PK
	@	5220	82.64	13.33	95.97	N/A	N/A	AVG
		10440	31.06	17.63	48.69	68.2	-19.51	PK
Vertical		5098.7	30.3	13.46	43.76	54	-10.24	AVG
		5143.5	36.86	13.43	50.29	74	-23.71	PK
	@	5220	90.46	13.33	103.79	N/A	N/A	PK
	@	5220	87.2	13.33	100.53	N/A	N/A	AVG
		10440	31.95	17.63	49.58	68.2	-18.62	PK

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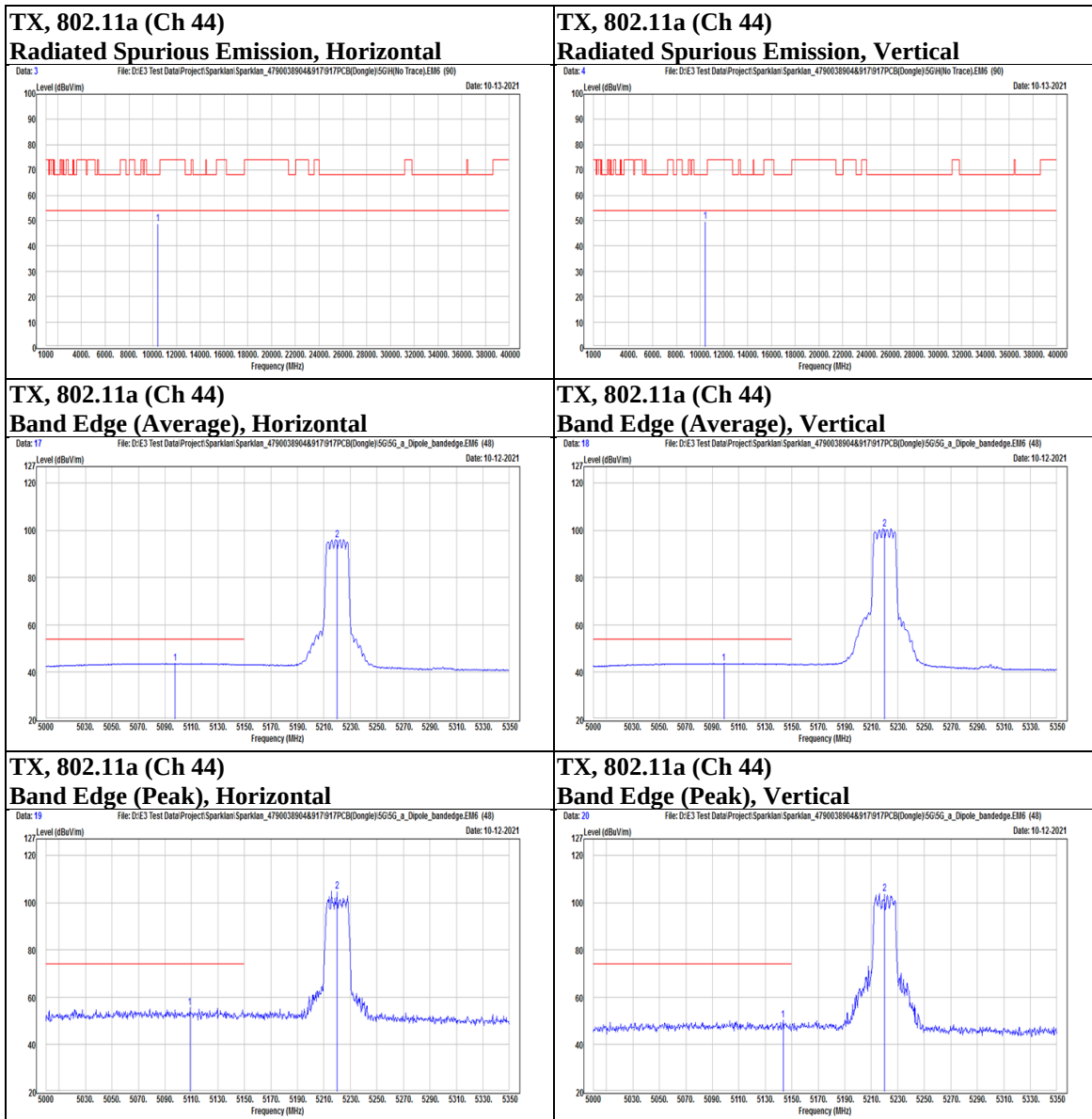
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Mode	802.11a	Channel	48
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5102.2	30.29	13.46	43.75	54	-10.25	AVG
		5105.7	41.68	13.46	55.14	74	-18.86	PK
	@	5240	89.62	13.27	102.89	N/A	N/A	PK
	@	5240	83.09	13.27	96.36	N/A	N/A	AVG
		10480	33.28	17.69	50.97	68.2	-17.23	PK
Vertical		5119.35	38.18	13.45	51.63	74	-22.37	PK
		5133.35	30.51	13.43	43.94	54	-10.06	AVG
	@	5240	89.8	13.27	103.07	N/A	N/A	PK
	@	5240	87.34	13.27	100.61	N/A	N/A	AVG
		10480	31.35	17.69	49.04	68.2	-19.16	PK

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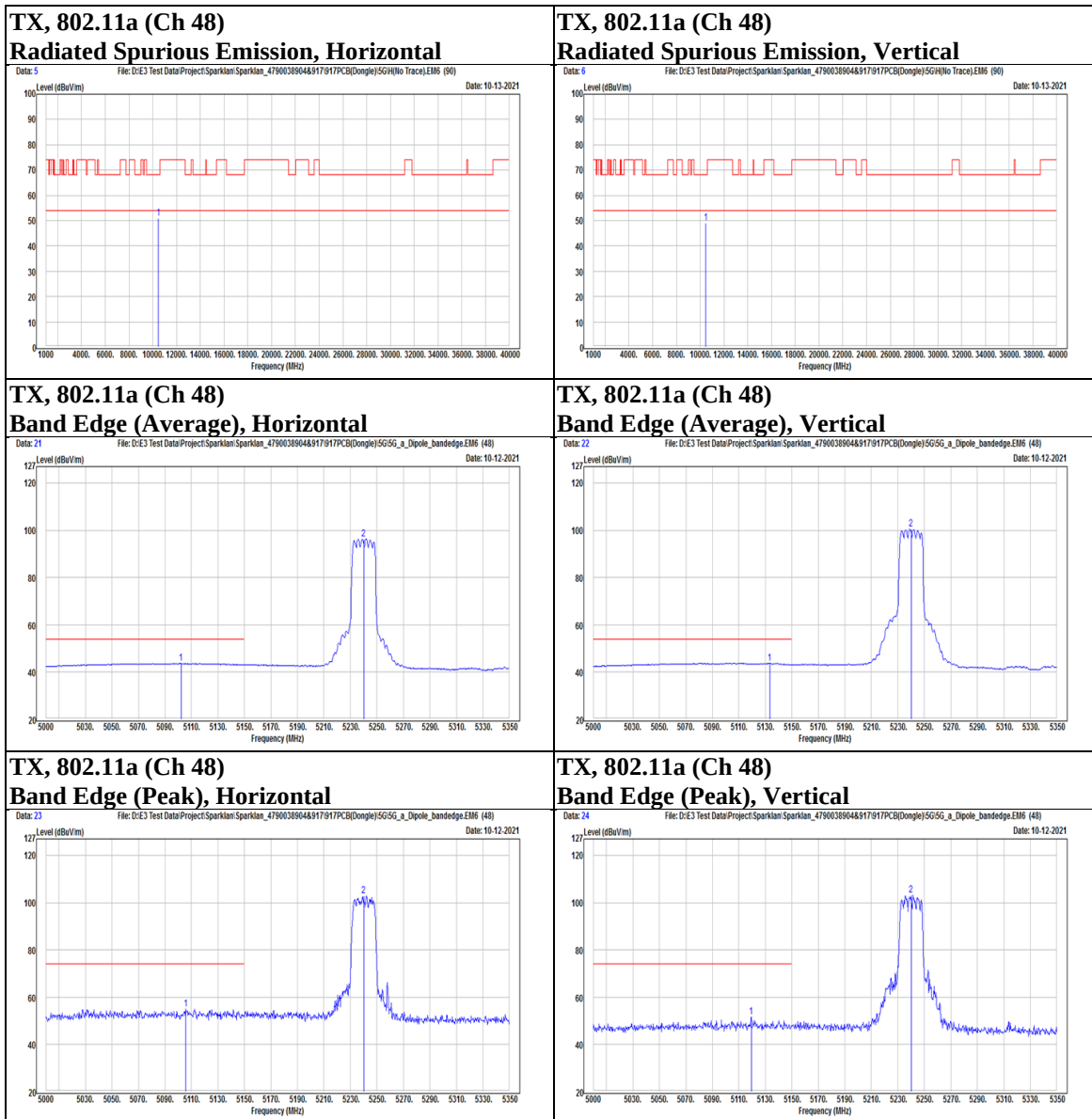
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Mode	802.11a	Channel	52
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	@	5260	89.71	13.24	102.95	N/A	N/A	PK
	@	5260	82.15	13.24	95.39	N/A	N/A	AVG
		5366.7	29.19	13.31	42.5	54	-11.5	AVG
		5433.6	40.22	13.59	53.81	74	-20.19	PK
		10520	30.9	17.73	48.63	68.2	-19.57	PK
Vertical	@	5260	94.9	13.24	108.14	N/A	N/A	PK
	@	5260	87.05	13.24	100.29	N/A	N/A	AVG
		5366.4	30.03	13.31	43.34	54	-10.66	AVG
		5404.2	40.53	13.45	53.98	74	-20.02	PK
		10520	31.34	17.73	49.07	68.2	-19.13	PK

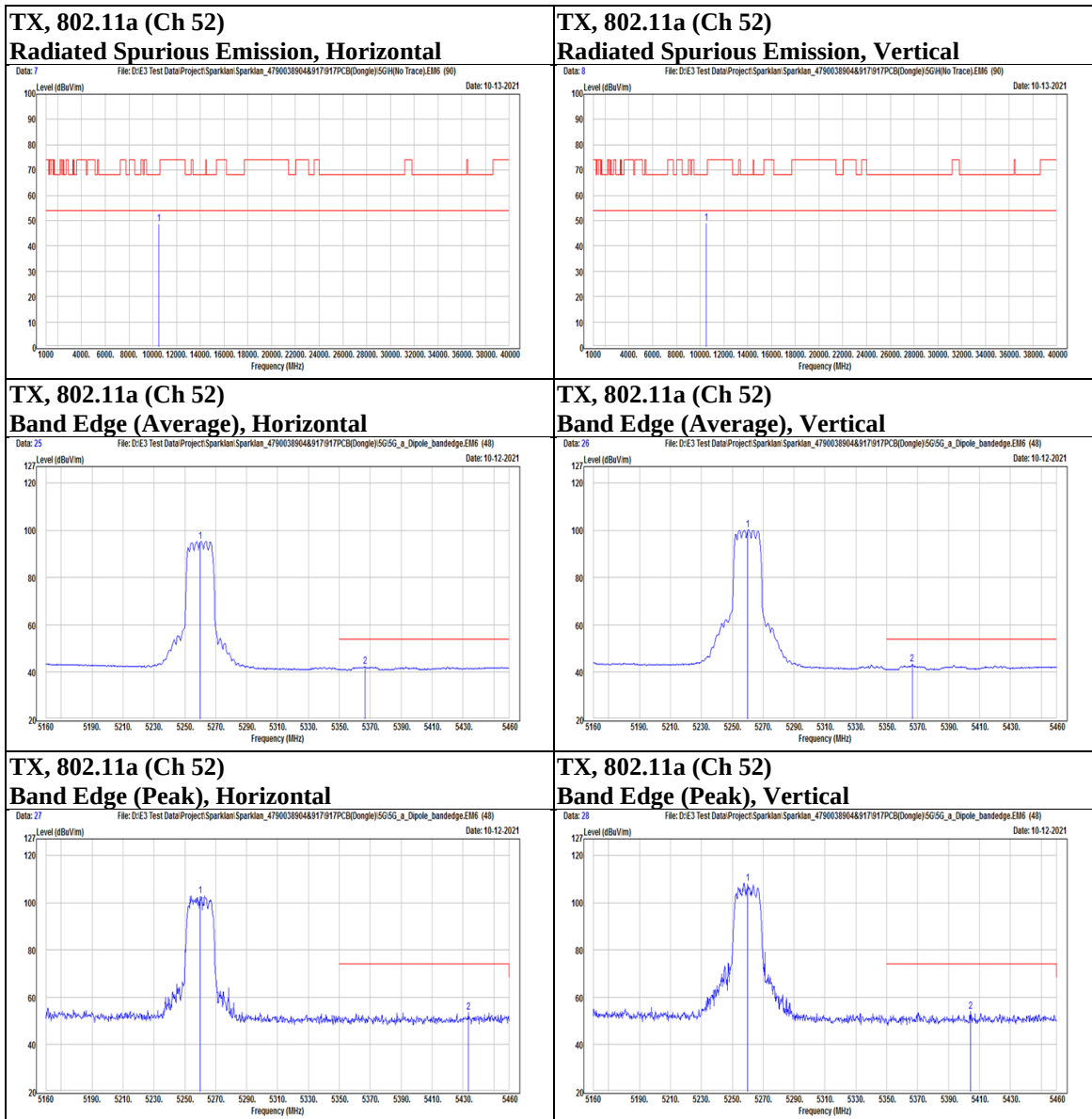
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Mode	802.11a	Channel	60
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	@	5300	91.97	13.21	105.18	N/A	N/A	PK
	@	5300	83.2	13.21	96.41	N/A	N/A	AVG
		5456.1	39.29	13.69	52.98	74	-21.02	PK
		5460	29.41	13.7	43.11	54	-10.89	AVG
		10600	31.78	17.73	49.51	68.2	-18.69	PK
Vertical	@	5300	94.73	13.21	107.94	N/A	N/A	PK
	@	5300	86.48	13.21	99.69	N/A	N/A	AVG
		5455.8	30.9	13.69	44.59	54	-9.41	AVG
		5457.6	40.88	13.7	54.58	74	-19.42	PK
		10600	30.75	17.73	48.48	68.2	-19.72	PK

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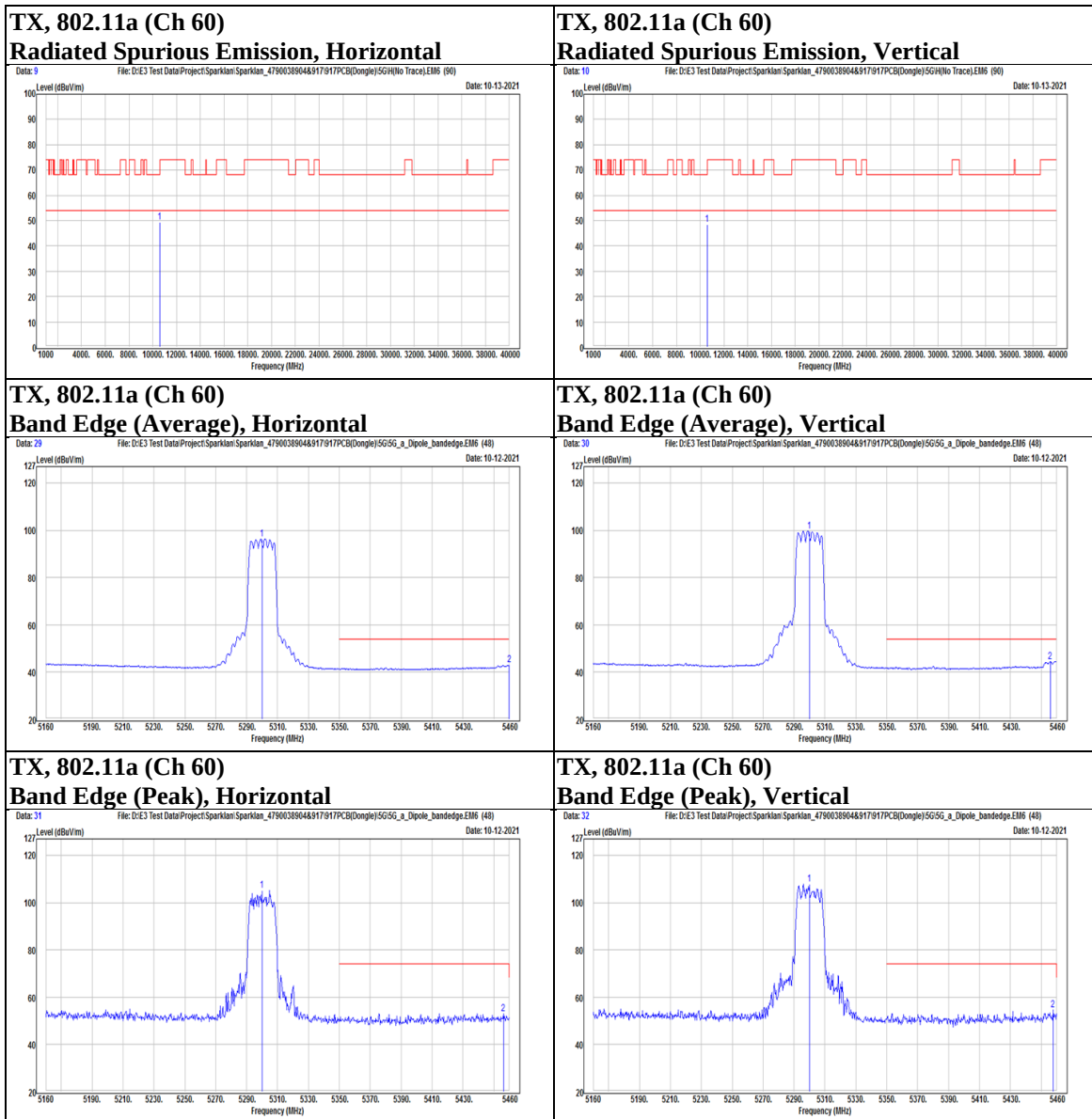
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Mode	802.11a	Channel	64
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	@	5320	90.39	13.23	103.62	N/A	N/A	PK
	@	5320	81.85	13.23	95.08	N/A	N/A	AVG
		5350.2	28.89	13.26	42.15	54	-11.85	AVG
		5442.3	40.22	13.64	53.86	74	-20.14	PK
	*	10640	31.69	17.82	49.51	74	-24.49	PK
Vertical	@	5320	92.41	13.23	105.64	N/A	N/A	PK
	@	5320	84.71	13.23	97.94	N/A	N/A	AVG
		5350.8	50	13.26	63.26	74	-10.74	PK
		5352.3	29.69	13.26	42.95	54	-11.05	AVG
	*	10640	31.53	17.82	49.35	74	-24.65	PK

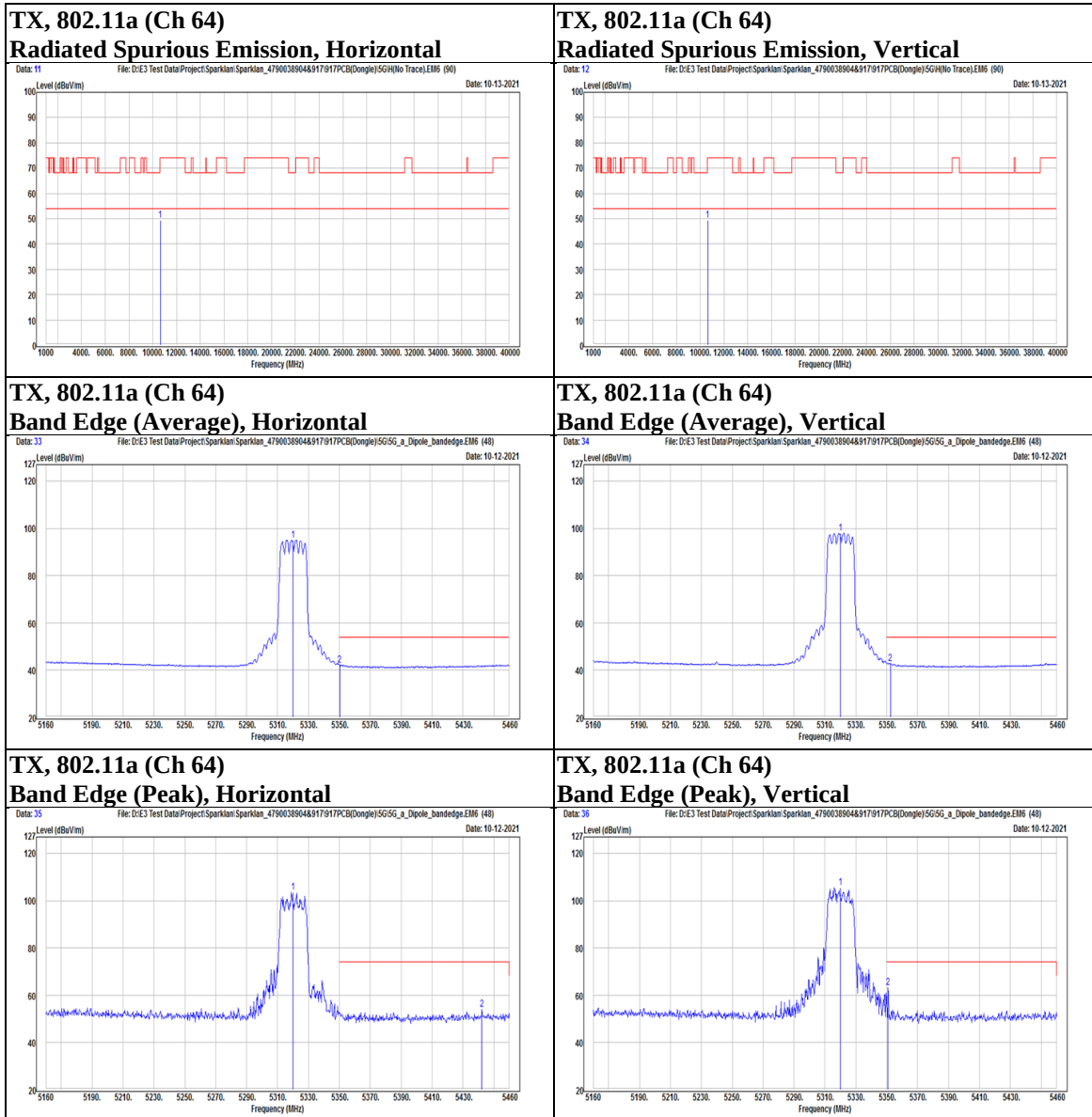
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Mode	802.11a	Channel	100
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5452.85	39.42	13.68	53.1	74	-20.9	PK
		5452.85	29.8	13.68	43.48	54	-10.52	AVG
		5469.3	41.81	13.74	55.55	68.2	-12.65	PK
	@	5500	90.65	13.83	104.48	N/A	N/A	PK
	@	5500	80.5	13.83	94.33	N/A	N/A	AVG
	*	11000	30.78	18.28	49.06	74	-24.94	PK
Vertical		5459.85	41.82	13.7	55.52	74	-18.48	PK
		5459.85	31.1	13.7	44.8	54	-9.2	AVG
		5468.95	45.31	13.74	59.05	68.2	-9.15	PK
	@	5500	95.24	13.83	109.07	N/A	N/A	PK
	@	5500	85.3	13.83	99.13	N/A	N/A	AVG
	*	11000	31.54	18.28	49.82	74	-24.18	PK

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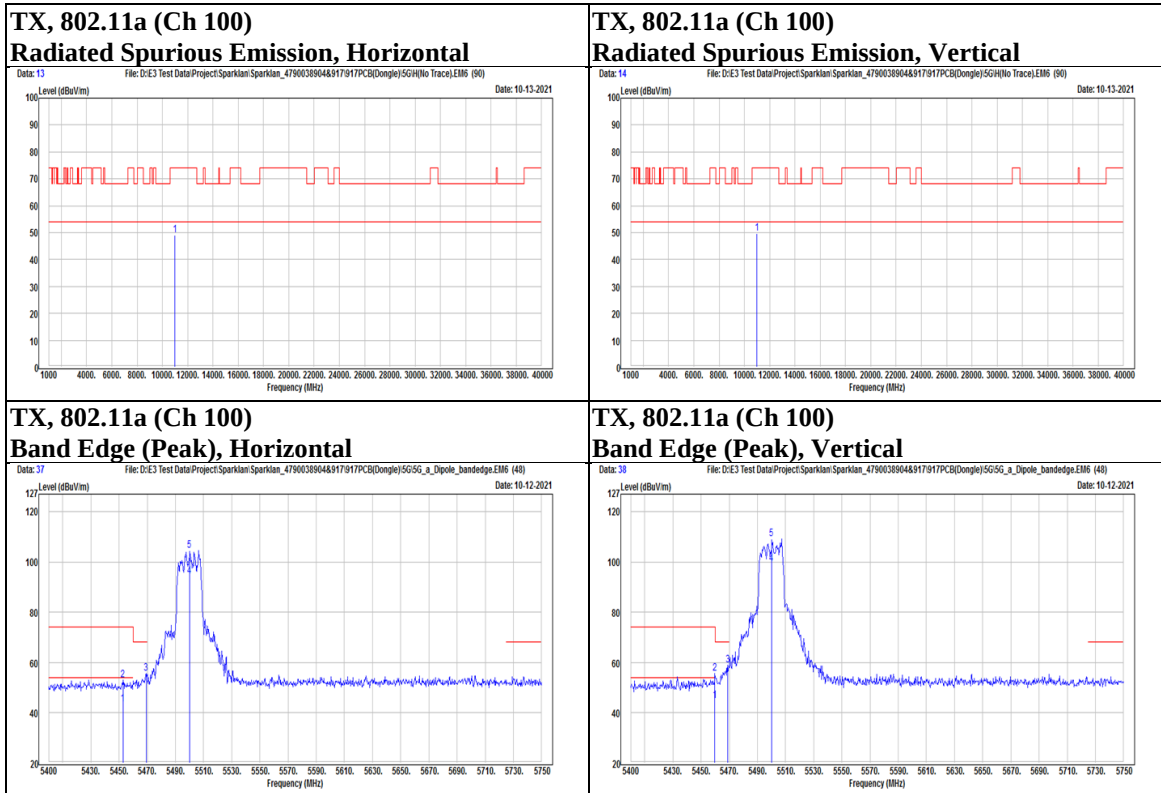
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Mode	802.11a	Channel	116
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5433.6	39.28	13.59	52.87	74	-21.13	PK
		5433.6	28.1	13.59	41.69	54	-12.31	AVG
		5460.2	38.58	13.7	52.28	68.2	-15.92	PK
	@	5580	91.75	13.98	105.73	N/A	N/A	PK
	@	5580	81.2	13.98	95.18	N/A	N/A	AVG
		5733.9	41.02	14.23	55.25	68.2	-12.95	PK
	*	11160	31.7	18.32	50.02	74	-23.98	PK
Vertical		5439.55	39.7	13.63	53.33	74	-20.67	PK
		5439.55	28.39	13.63	42.02	54	-11.98	AVG
		5463.7	39.92	13.72	53.64	68.2	-14.56	PK
	@	5580	96.07	13.98	110.05	N/A	N/A	PK
	@	5580	86.7	13.98	100.68	N/A	N/A	AVG
		5737.75	41.19	14.24	55.43	68.2	-12.77	PK
	*	11160	30.58	18.32	48.9	74	-25.1	PK

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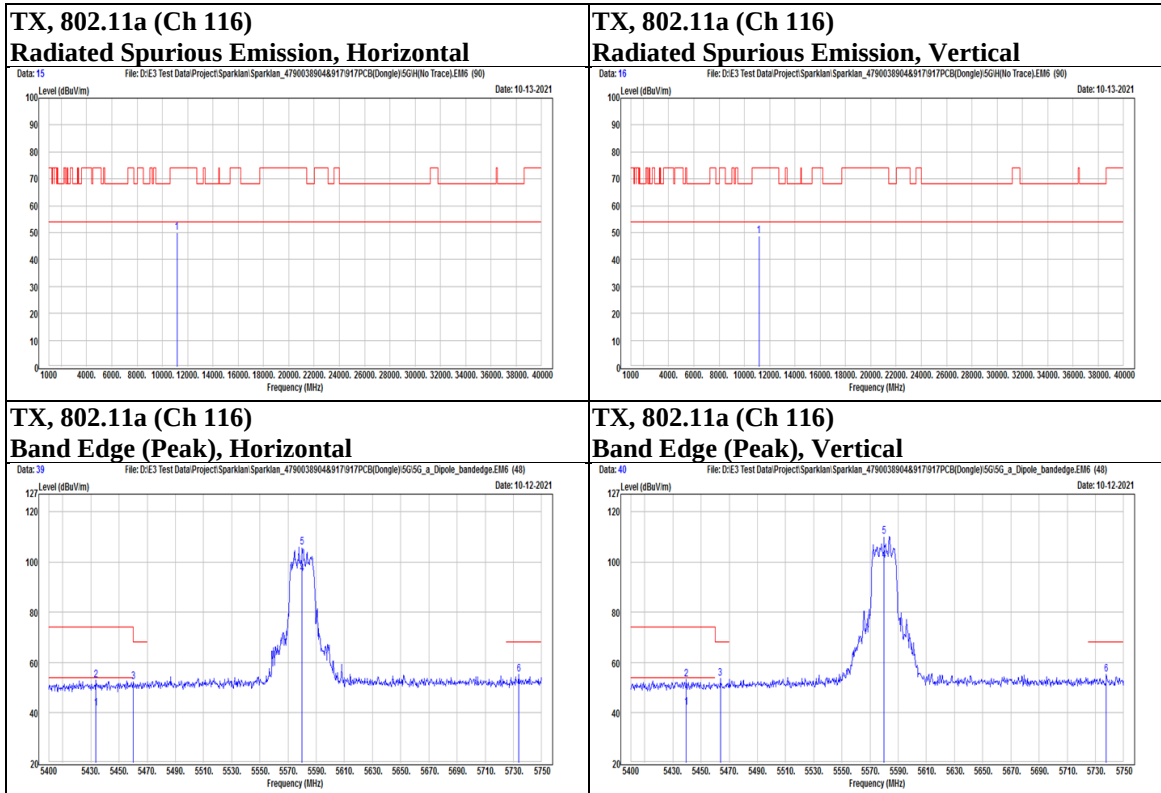
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Mode	802.11a	Channel	140
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	@	5700	90	14.05	104.05	N/A	N/A	PK
	@	5700	79.5	14.05	93.55	N/A	N/A	AVG
		5732.5	42.19	14.22	56.41	68.2	-11.79	PK
	*	11400	30.96	18.74	49.7	74	-24.3	PK
Vertical	@	5700	93.88	14.05	107.93	N/A	N/A	PK
	@	5700	83.1	14.05	97.15	N/A	N/A	AVG
		5725.5	42.3	14.18	56.48	68.2	-11.72	PK
	*	11400	30.3	18.74	49.04	74	-24.96	PK

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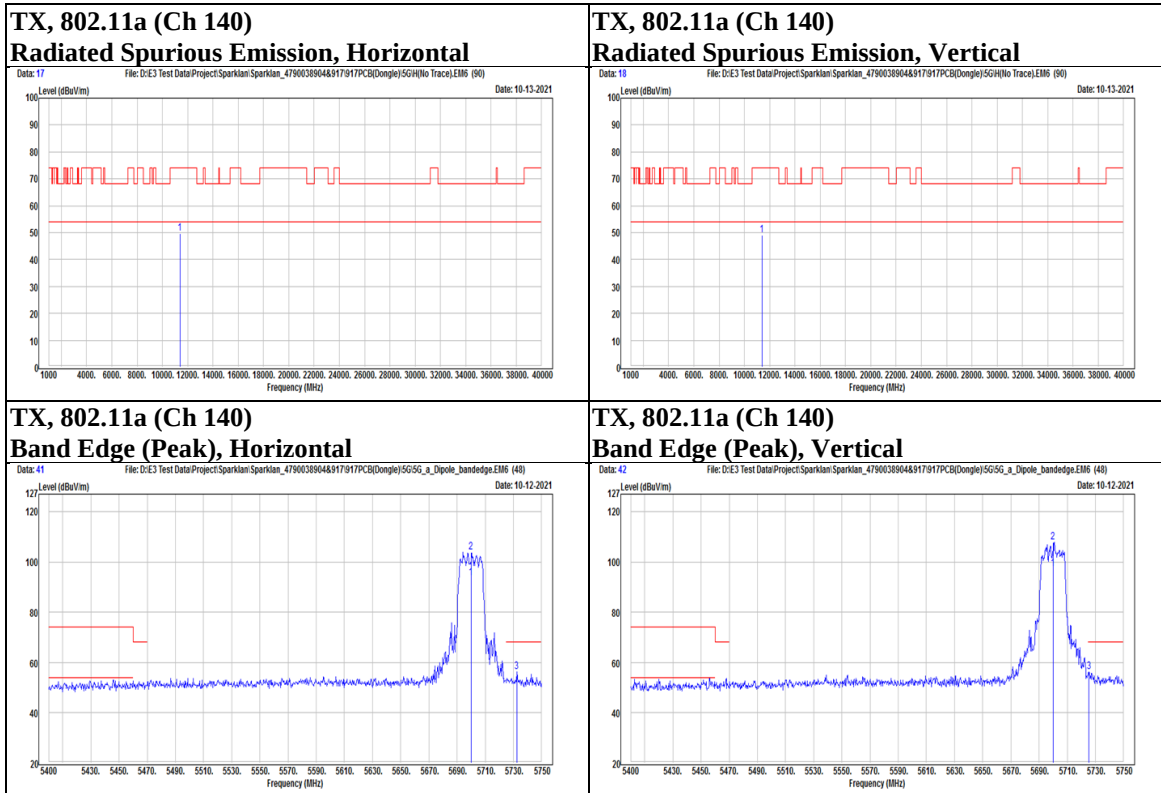
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Mode	802.11a	Channel	144
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	*	11440	30.32	18.86	49.18	74	-24.82	PK
Vertical	*	11440	30.81	18.86	49.67	74	-24.33	PK

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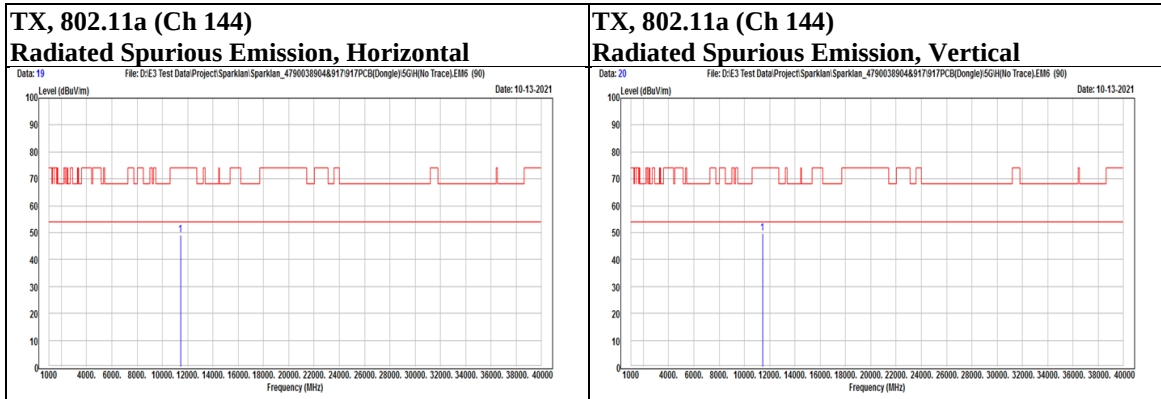
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Mode	802.11a	Channel	149
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5588.5	40.25	14.01	54.26	68.2	-13.94	PK
		5696.5	41.61	14.05	55.66	102.62	-46.96	PK
	@	5745	93.47	14.28	107.75	N/A	N/A	PK
	*	11490	31.74	19.02	50.76	74	-23.24	PK
Vertical		5616.5	40.4	14.03	54.43	68.2	-13.77	PK
		5697	42.23	14.05	56.28	102.99	-46.71	PK
	@	5745	97.51	14.28	111.79	N/A	N/A	PK
	*	11490	30.34	19.02	49.36	74	-24.64	PK

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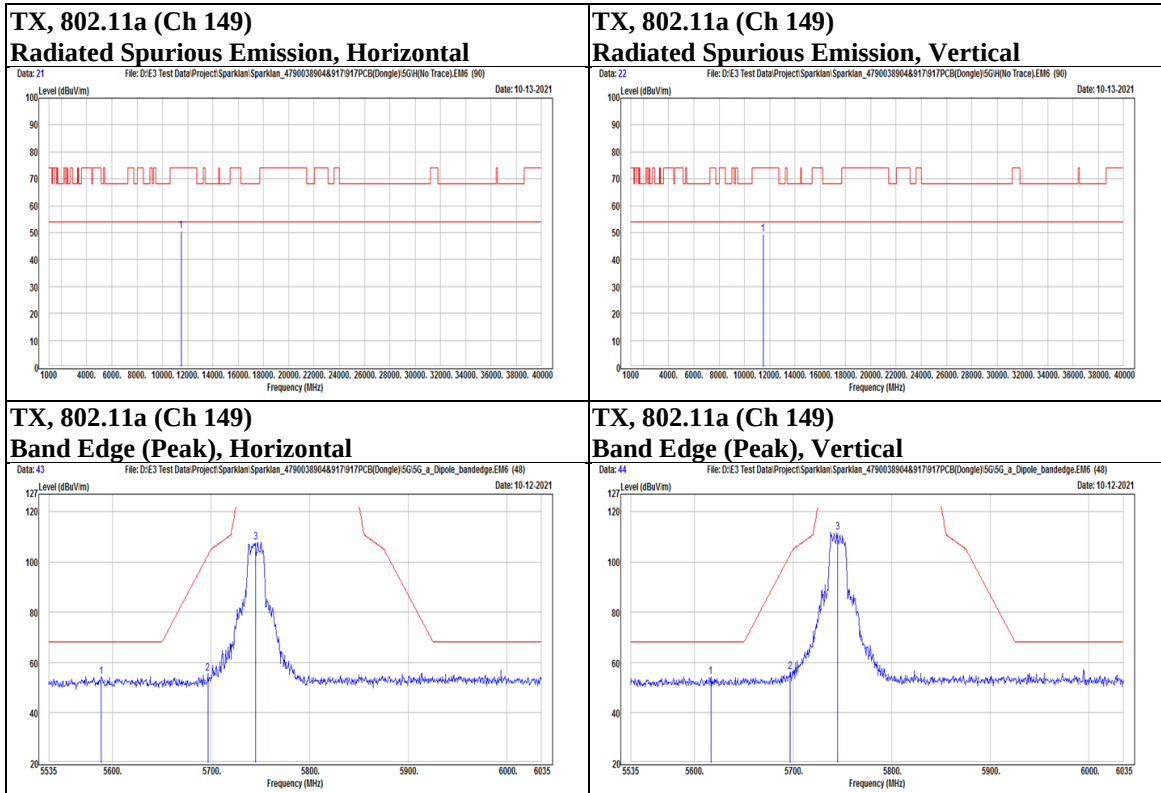
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Mode	802.11a	Channel	157
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5550.5	40.65	13.89	54.54	68.2	-13.66	PK
		5697	41.15	14.05	55.2	102.99	-47.79	PK
	@	5785	94.68	14.48	109.16	N/A	N/A	PK
		5910	40.83	14.97	55.8	79.27	-23.47	PK
		5941.5	40.96	15.01	55.97	68.2	-12.23	PK
	*	11570	30.37	18.88	49.25	74	-24.75	PK
Vertical		5620.5	41.6	14.02	55.62	68.2	-12.58	PK
		5662	41.04	14.01	55.05	77.11	-22.06	PK
	@	5785	97.67	14.48	112.15	N/A	N/A	PK
		5924.5	41.53	14.99	56.52	68.57	-12.05	PK
		5945.5	41.95	15.01	56.96	68.2	-11.24	PK
	*	11570	31.16	18.88	50.04	74	-23.96	PK

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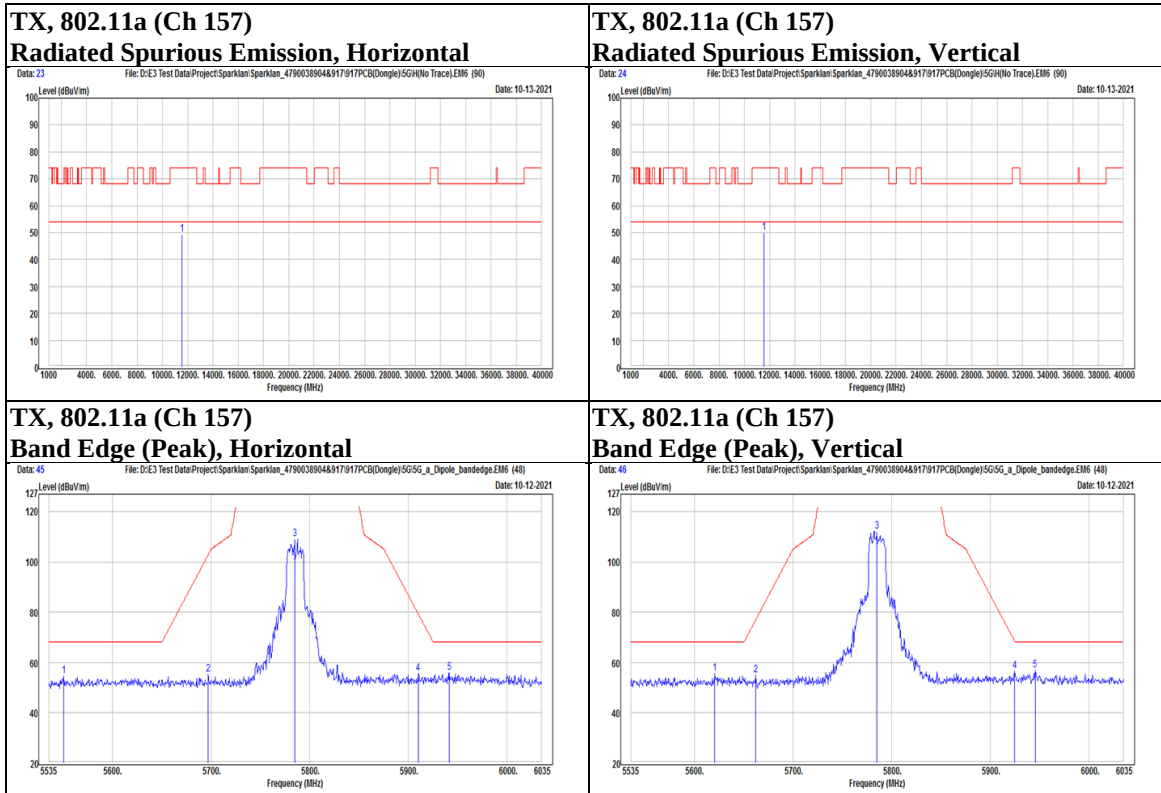
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Mode	802.11a	Channel	165
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	@	5825	92.56	14.69	107.25	N/A	N/A	PK
		5924.5	40.2	14.99	55.19	68.57	-13.38	PK
		6002.5	41.92	15.17	57.09	68.2	-11.11	PK
	*	11650	30.32	18.63	48.95	74	-25.05	PK
Vertical	@	5825	95.87	14.69	110.56	N/A	N/A	PK
		5896.5	40.07	14.96	55.03	89.25	-34.22	PK
		5980	40.01	15.11	55.12	68.2	-13.08	PK
	*	11650	30.46	18.63	49.09	74	-24.91	PK

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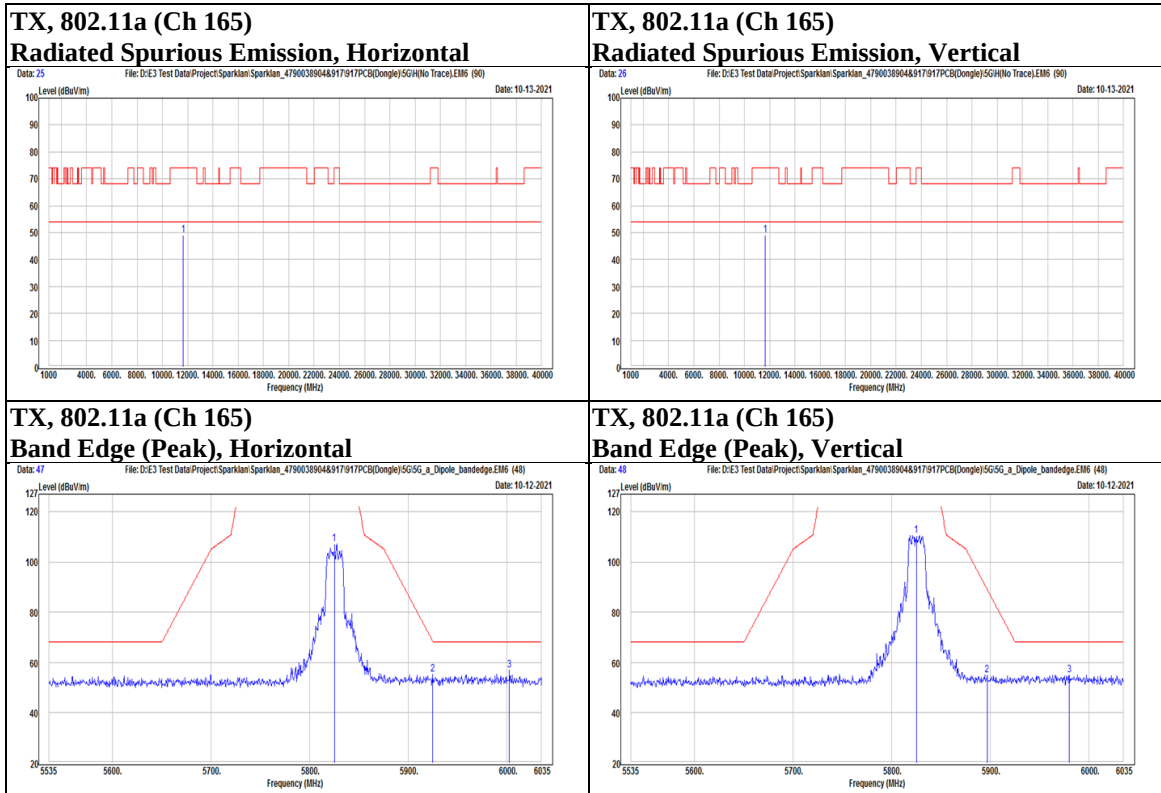
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Mode	802.11ac(VHT20)	Channel	36
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5089.25	42.83	13.44	56.27	74	-17.73	PK
		5100.1	30.33	13.46	43.79	54	-10.21	AVG
	@	5180	88.49	13.4	101.89	N/A	N/A	PK
	@	5180	80.88	13.4	94.28	N/A	N/A	AVG
		10360	31.52	17.39	48.91	68.2	-19.29	PK
Vertical		5135.8	37.95	13.44	51.39	74	-22.61	PK
		5149.8	31.58	13.43	45.01	54	-8.99	AVG
	@	5180	89.63	13.4	103.03	N/A	N/A	PK
	@	5180	87.44	13.4	100.84	N/A	N/A	AVG
		10360	31.34	17.39	48.73	68.2	-19.47	PK

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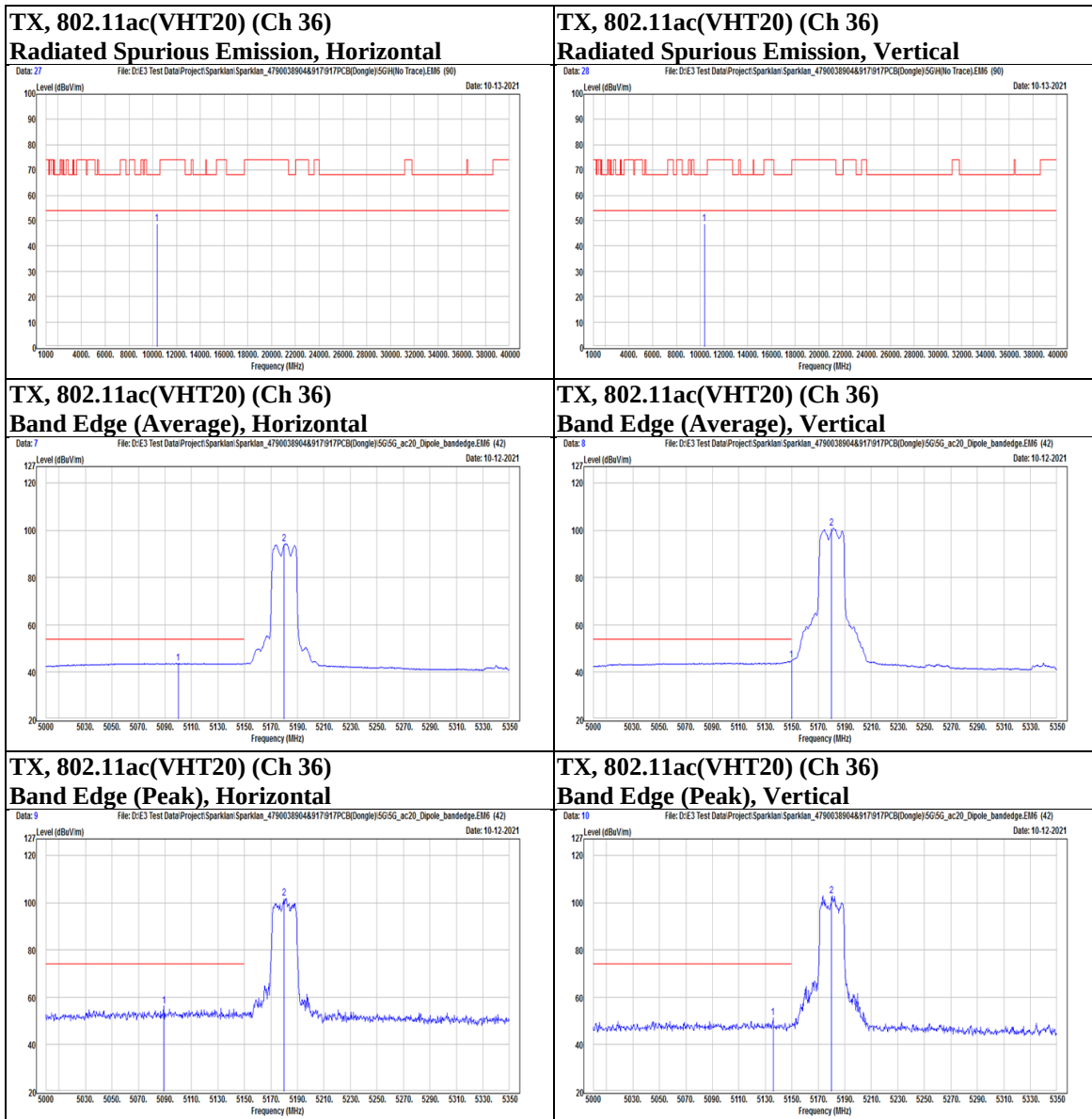
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Mode	802.11ac(VHT20)	Channel	44
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5087.5	30.32	13.42	43.74	54	-10.26	AVG
		5130.2	42.36	13.44	55.8	74	-18.2	PK
	@	5220	89.39	13.33	102.72	N/A	N/A	PK
	@	5220	82.04	13.33	95.37	N/A	N/A	AVG
		10440	32.29	17.63	49.92	68.2	-18.28	PK
Vertical		5102.2	30.38	13.46	43.84	54	-10.16	AVG
		5127.75	37.16	13.43	50.59	74	-23.41	PK
	@	5220	89.15	13.33	102.48	N/A	N/A	PK
	@	5220	87.47	13.33	100.8	N/A	N/A	AVG
		10440	31.89	17.63	49.52	68.2	-18.68	PK

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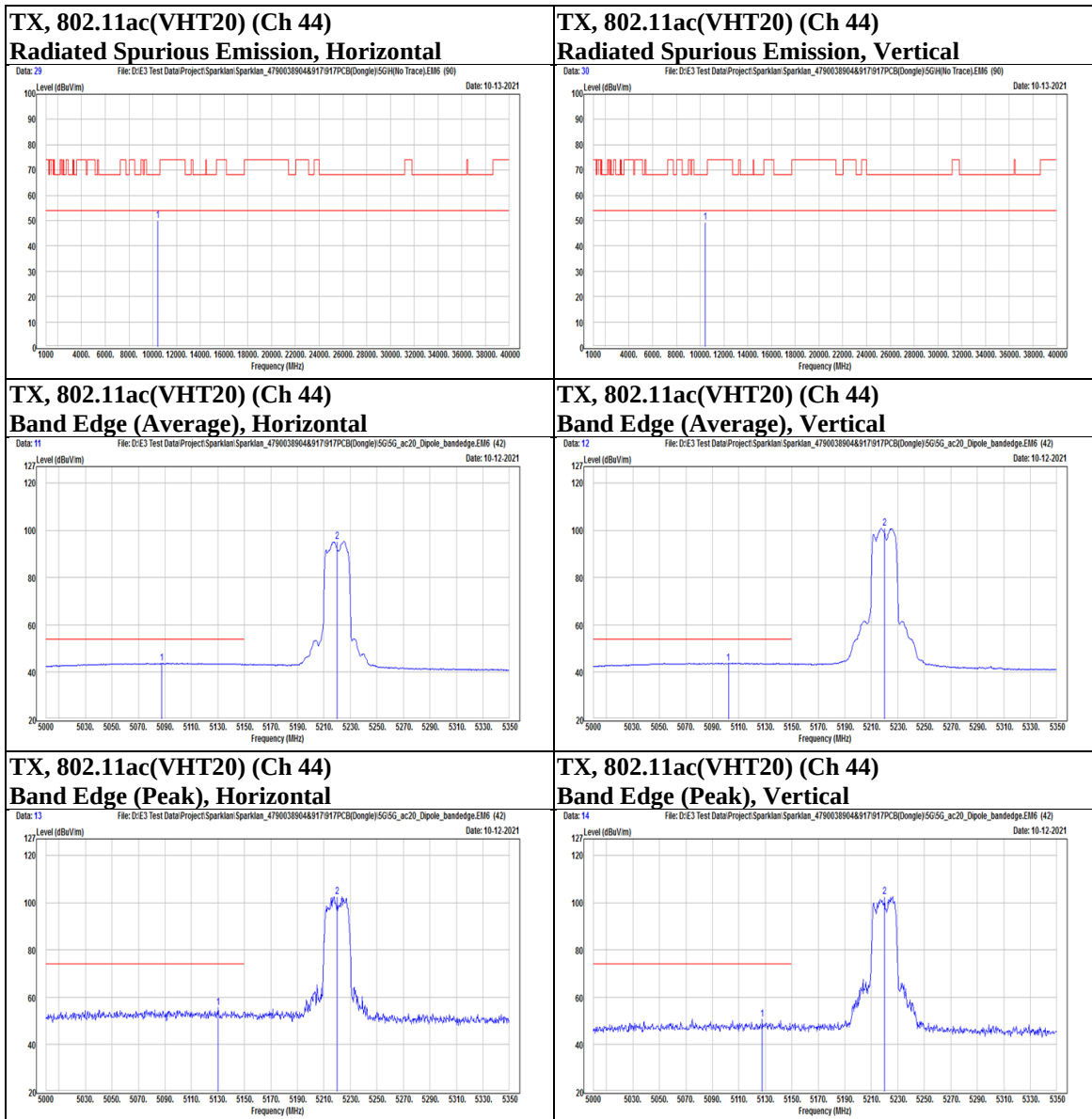
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Mode	802.11ac(VHT20)	Channel	48
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Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal		5080.15	42.72	13.4	56.12	74	-17.88	PK
		5113.05	30.37	13.45	43.82	54	-10.18	AVG
	@	5240	90.04	13.27	103.31	N/A	N/A	PK
	@	5240	82.37	13.27	95.64	N/A	N/A	AVG
		10480	31.46	17.69	49.15	68.2	-19.05	PK
Vertical		5034.65	36.85	13.13	49.98	74	-24.02	PK
		5106.75	30.58	13.46	44.04	54	-9.96	AVG
	@	5240	89.91	13.27	103.18	N/A	N/A	PK
	@	5240	87.66	13.27	100.93	N/A	N/A	AVG
		10480	31.71	17.69	49.4	68.2	-18.8	PK

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