

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room		
Date	April 4, 2023	April 20, 2023	May 26, 2023
Temperature / Humidity	21 deg. C / 30 % RH	27 deg. C / 46 % RH	25 deg. C / 39 % RH
Engineer	Shiro Kobayashi	Kouki Yamada	Shiro Kobayashi
Mode	Tx		

11b

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
				[dBm]	[mW]	[dBm]	[mW]
2412	0.25	2.29	9.90	12.44	17.54	12.44	17.54
2437	0.33	2.30	9.91	12.54	17.95	12.54	17.95
2462	0.36	2.32	9.91	12.59	18.16	12.59	18.16

11g

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
				[dBm]	[mW]	[dBm]	[mW]
2412	0.93	2.29	9.90	13.12	20.51	13.12	20.51
2437	0.80	2.30	9.91	13.01	20.00	13.01	20.00
2462	0.89	2.32	9.91	13.12	20.51	13.12	20.51

11n-20

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
				[dBm]	[mW]	[dBm]	[mW]
2412	0.96	2.29	9.90	13.15	20.65	13.15	20.65
2437	0.85	2.30	9.91	13.06	20.23	13.06	20.23
2462	0.93	2.32	9.91	13.16	20.70	13.16	20.70

11ax-20(OFDM)

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
				[dBm]	[mW]	[dBm]	[mW]
2412	1.08	2.29	9.90	13.27	21.23	13.27	21.23
2437	1.04	2.30	9.91	13.25	21.13	13.25	21.13
2462	1.05	2.32	9.91	13.28	21.28	13.28	21.28

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power average) = Result (Time average)

*This measurement was performed with using the gate function of power meter.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 27, 2023
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11ax-20, RU Type: 26-tone RU

Average power

Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
					[dBm]	[mW]	[dBm]	[mW]
2412	0	-5.34	2.29	9.90	6.85	4.84	6.85	4.84
	4	-5.50	2.29	9.90	6.69	4.67	6.69	4.67
	8	-4.91	2.29	9.90	7.28	5.35	7.28	5.35
2437	0	-5.18	2.31	9.91	7.04	5.06	7.04	5.06
	4	-5.44	2.31	9.91	6.78	4.76	6.78	4.76
	8	-4.98	2.31	9.91	7.24	5.30	7.24	5.30
2462	0	-5.11	2.32	9.91	7.12	5.15	7.12	5.15
	4	-5.50	2.32	9.91	6.73	4.71	6.73	4.71
	8	-5.06	2.32	9.91	7.17	5.21	7.17	5.21

11ax-20, RU Type: 52-tone RU

Average power

Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
					[dBm]	[mW]	[dBm]	[mW]
2412	37	-2.61	2.29	9.90	9.58	9.08	9.58	9.08
	38	-2.72	2.29	9.90	9.47	8.85	9.47	8.85
	40	-2.21	2.29	9.90	9.98	9.95	9.98	9.95
2437	37	-2.32	2.31	9.91	9.90	9.77	9.90	9.77
	38	-2.50	2.31	9.91	9.72	9.38	9.72	9.38
	40	-2.15	2.31	9.91	10.07	10.16	10.07	10.16
2462	37	-2.32	2.32	9.91	9.91	9.79	9.91	9.79
	38	-2.51	2.32	9.91	9.72	9.38	9.72	9.38
	40	-2.26	2.32	9.91	9.97	9.93	9.97	9.93

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power average) = Result (Time average)

*This measurement was performed with using the gate function of power meter.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 27, 2023
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11ax-20, RU Type: 106-tone RU

Average power

Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
					[dBm]	[mW]	[dBm]	[mW]
2412	53	0.62	2.29	9.90	12.81	19.10	12.81	19.10
	54	0.92	2.29	9.90	13.11	20.46	13.11	20.46
2437	53	0.71	2.31	9.91	12.93	19.63	12.93	19.63
	54	0.88	2.31	9.91	13.10	20.42	13.10	20.42
2462	53	0.84	2.32	9.91	13.07	20.28	13.07	20.28
	54	0.96	2.32	9.91	13.19	20.84	13.19	20.84

11ax-20, RU Type: 242-tone RU

Average power

Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Result (Burst power average)	
					[dBm]	[mW]	[dBm]	[mW]
2412	61	0.96	2.29	9.90	13.15	20.65	13.15	20.65
2437	61	0.97	2.31	9.91	13.19	20.84	13.19	20.84
2462	61	1.02	2.32	9.91	13.25	21.13	13.25	21.13

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power average) = Result (Time average)

*This measurement was performed with using the gate function of power meter.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 7, 2023
Temperature / Humidity	24 deg. C / 49 % RH
Engineer	Hiromasa Sato
Mode	Tx

BT LE 1 M-PHY

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-9.08	2.30	9.64	2.86	1.93	1.77	4.63	2.90
2440	-9.40	2.31	9.64	2.55	1.80	1.77	4.32	2.70
2480	-9.28	2.33	9.64	2.69	1.86	1.77	4.46	2.79

BT LE 2 M-PHY

Average power

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-11.89	2.30	9.64	0.05	1.01	4.28	4.33	2.71
2440	-12.21	2.31	9.64	-0.26	0.94	4.28	4.02	2.52
2480	-12.08	2.33	9.64	-0.11	0.97	4.28	4.17	2.61

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power average) = Result (Time average) + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 4, 2023
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11b 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	0.02	
2	0.11	
5.5	0.24	
11	0.25	*

*: Worst Rate

11g 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	0.72	
9	0.72	
12	0.67	
18	0.79	
24	0.93	*
36	0.91	
48	0.92	
54	0.88	

*: Worst Rate

Sample Calculation:

All comparisons were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 4, 2023
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11n-20		2412 MHz	
G.I.	MCS	Reading [dBm]	Remark
800 ns	0	0.89	
	1	0.85	
	2	0.93	
	3	0.90	
	4	0.90	
	5	0.91	
	6	0.89	
	7	0.88	
400 ns	0	0.93	
	1	0.91	
	2	0.96	*
	3	0.95	
	4	0.93	
	5	0.93	
	6	0.90	
	7	0.89	

*: Worst Rate

Sample Calculation:

All comparisons were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 4, 2023
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11ax-20(OFDM)		2412 MHz	
G.I.	MCS	Reading	Remark
		[dBm]	
3200 ns	0	0.67	
	1	0.68	
	2	0.71	
	3	0.71	
	4	1.06	
	5	1.05	
	6	1.05	
	7	1.03	
	8	0.92	
	9	0.93	
	10	0.90	
	11	0.96	
1600 ns	0	0.71	
	1	0.68	
	2	0.71	
	3	0.68	
	4	1.08	*
	5	1.01	
	6	1.05	
	7	1.04	
	8	0.95	
	9	0.97	
	10	0.90	
	11	0.92	

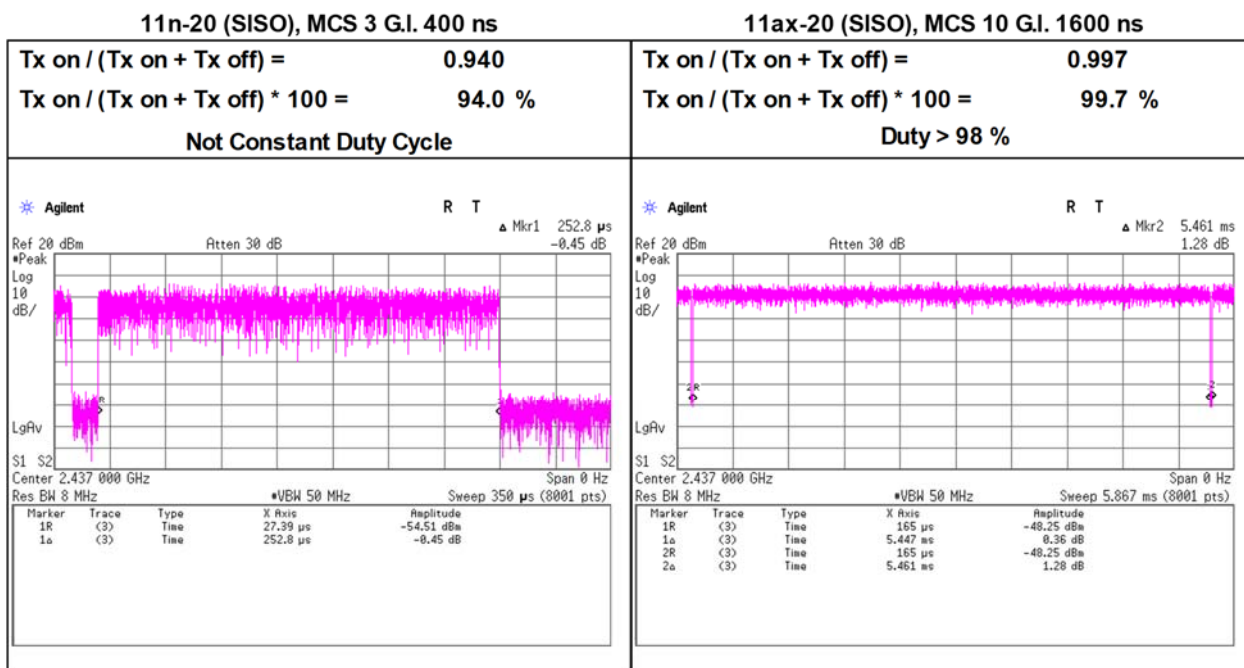
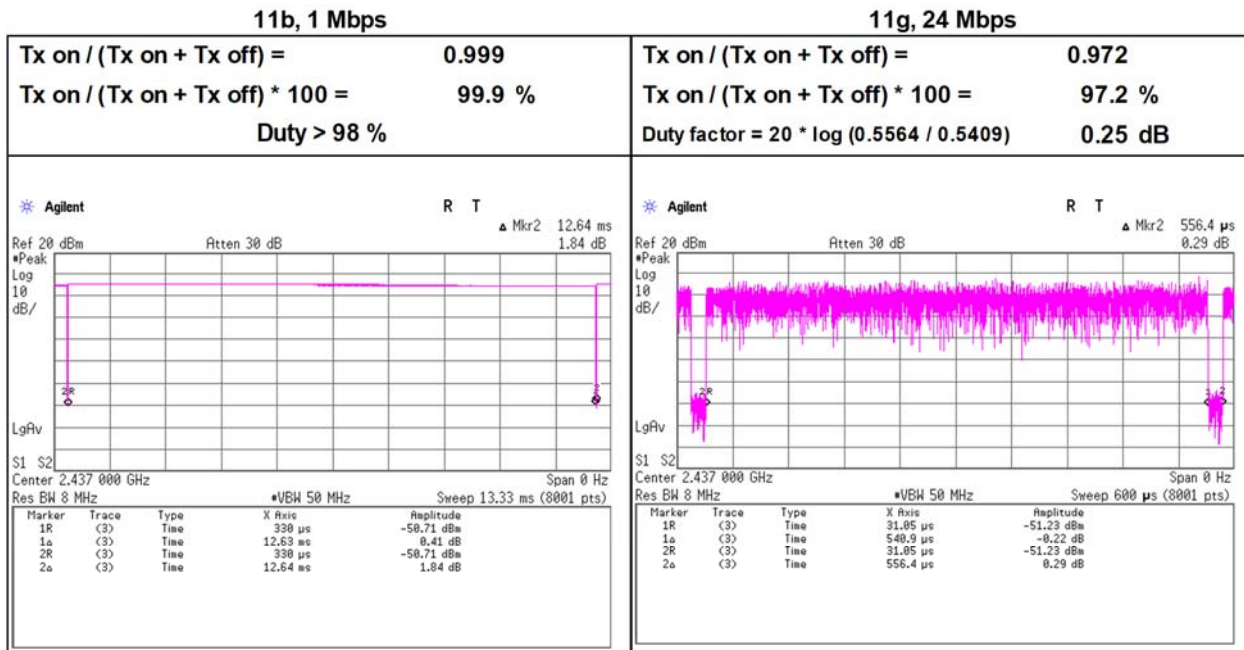
*: Worst Rate

Sample Calculation:

All comparisons were carried out on same frequency and measurement factors.

Burst rate confirmation

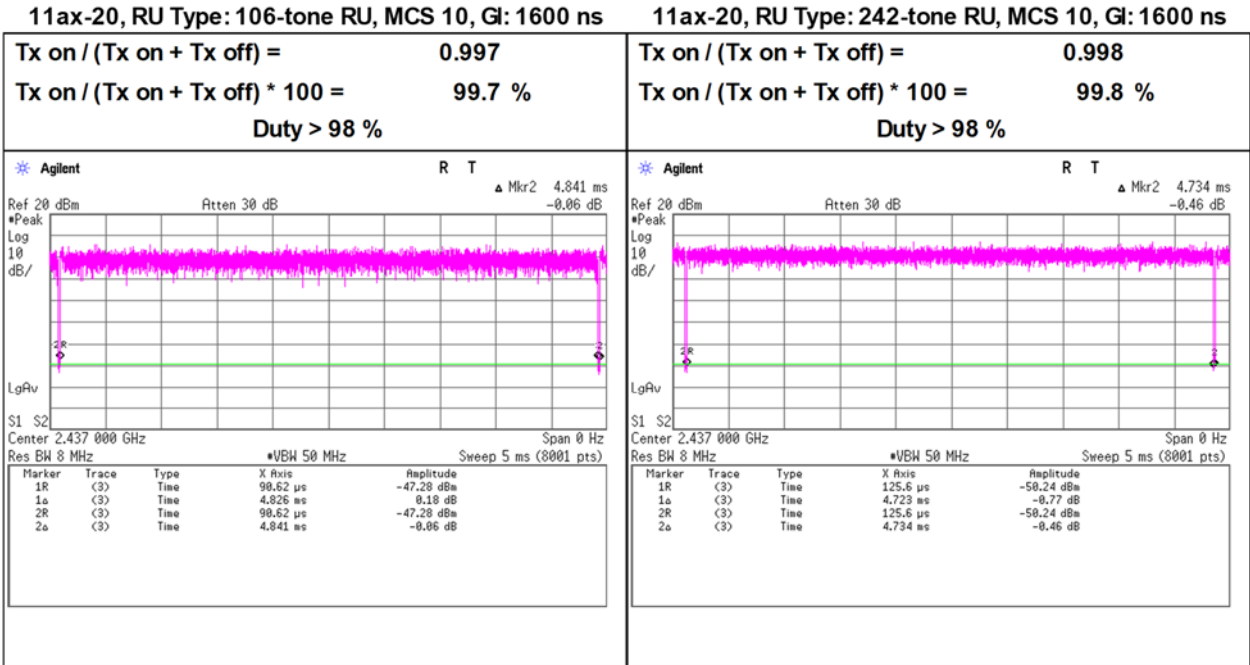
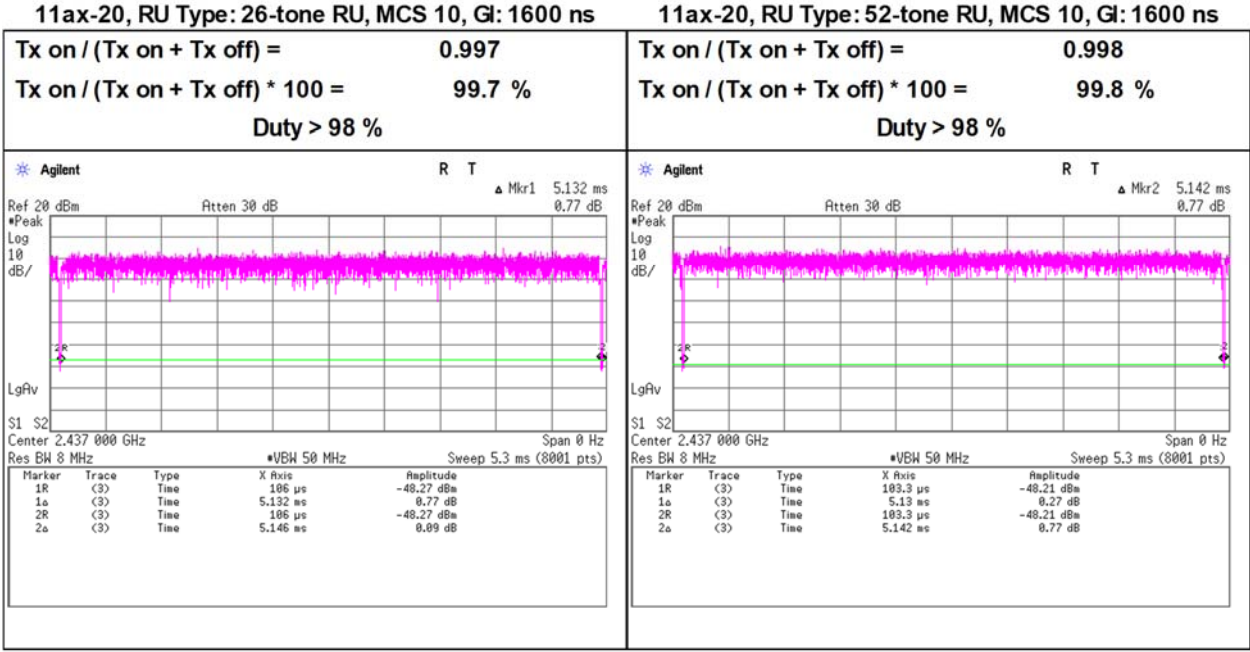
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	April 20, 2023	May 26, 2023
Temperature / Humidity	27 deg. C / 46 % RH	25 deg. C / 39 % RH
Engineer	Kouki Yamada	Shiro Kobayashi
Mode	Tx	



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

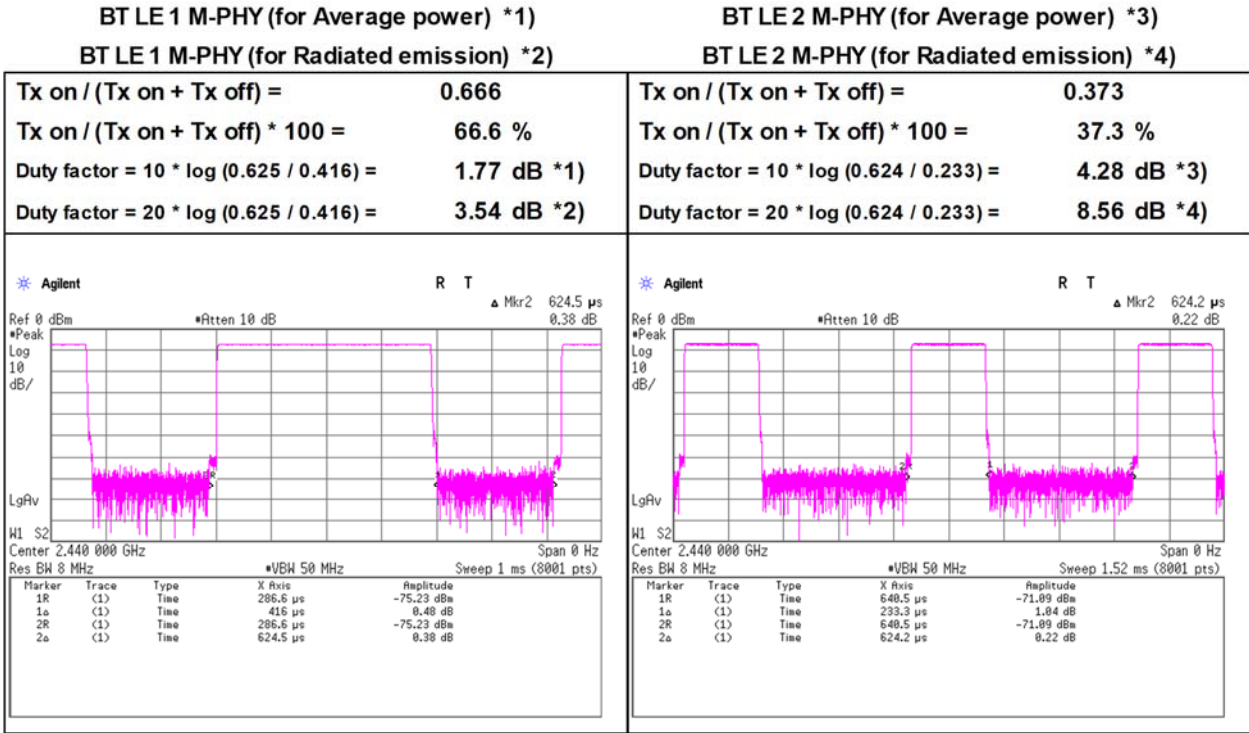
Test place Shonan EMC Lab. No.5 Shielded Room
Date May 25, 2023
Temperature / Humidity 25 deg. C / 33 % RH
Engineer Shiro Kobayashi
Mode Tx



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

Test place Shonan EMC Lab. No.5 Shielded Room
 Date April 7, 2023
 Temperature / Humidity 24 deg. C / 49 % RH
 Engineer Hiromasa Sato
 Mode Tx



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	April 20, 2023	May 26, 2023
Temperature / Humidity	27 deg. C / 46 % RH	25 deg. C / 39 % RH
Engineer	Kouki Yamada	Shiro Kobayashi
Mode	Tx	

11b

Frequency [MHz]	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	2411.105	-23.32	2.29	9.90	-11.13	8.00	19.13
2437	2436.227	-23.80	2.30	9.91	-11.59	8.00	19.59
2462	2461.400	-22.99	2.32	9.91	-10.76	8.00	18.76

11g

Frequency [MHz]	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	2418.221	-24.67	2.29	9.90	-12.48	8.00	20.48
2437	2431.668	-24.97	2.30	9.91	-12.76	8.00	20.76
2462	2456.668	-24.89	2.32	9.91	-12.66	8.00	20.66

11n-20

Frequency [MHz]	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	2416.384	-25.30	2.29	9.90	-13.11	8.00	21.11
2437	2430.734	-25.21	2.30	9.91	-13.00	8.00	21.00
2462	2455.734	-24.69	2.32	9.91	-12.46	8.00	20.46

11ax-20(OFDm)

Frequency [MHz]	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	2421.128	-25.70	2.29	9.90	-13.51	8.00	21.51
2437	2444.259	-25.19	2.30	9.91	-12.98	8.00	20.98
2462	2471.392	-25.91	2.32	9.91	-13.68	8.00	21.68

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	May 25, 2023
Temperature / Humidity	25 deg. C / 33 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11ax-20, RU Type: 26-tone RU

Frequency [MHz]	RU Index	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	0	2403.486	-22.89	2.29	9.90	-10.70	8.00	18.70
	4	2410.900	-21.78	2.29	9.90	-9.59	8.00	17.59
	8	2419.653	-21.95	2.29	9.90	-9.76	8.00	17.76
2437	0	2428.486	-22.05	2.31	9.91	-9.83	8.00	17.83
	4	2435.900	-22.55	2.31	9.91	-10.33	8.00	18.33
	8	2444.653	-21.92	2.31	9.91	-9.70	8.00	17.70
2462	0	2453.486	-22.54	2.32	9.91	-10.31	8.00	18.31
	4	2460.900	-21.87	2.32	9.91	-9.64	8.00	17.64
	8	2470.443	-22.32	2.32	9.91	-10.09	8.00	18.09

11ax-20, RU Type: 52-tone RU

Frequency [MHz]	RU Index	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	37	2404.729	-21.95	2.29	9.90	-9.76	8.00	17.76
	38	2407.169	-21.71	2.29	9.90	-9.52	8.00	17.52
	40	2418.170	-21.53	2.29	9.90	-9.34	8.00	17.34
2437	37	2429.729	-22.12	2.31	9.91	-9.90	8.00	17.90
	38	2434.202	-21.77	2.31	9.91	-9.55	8.00	17.55
	40	2443.170	-21.72	2.31	9.91	-9.50	8.00	17.50
2462	37	2454.729	-21.81	2.32	9.91	-9.58	8.00	17.58
	38	2458.795	-22.27	2.32	9.91	-10.04	8.00	18.04
	40	2468.170	-21.63	2.32	9.91	-9.40	8.00	17.40

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	May 25, 2023
Temperature / Humidity	25 deg. C / 33 % RH
Engineer	Shiro Kobayashi
Mode	Tx

11ax-20, RU Type: 106-tone RU

Frequency [MHz]	RU Index	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	53	2408.412	-20.86	2.29	9.90	-8.67	8.00	16.67
	54	2419.964	-20.94	2.29	9.90	-8.75	8.00	16.75
2437	53	2433.412	-20.76	2.31	9.91	-8.54	8.00	16.54
	54	2446.064	-20.90	2.31	9.91	-8.68	8.00	16.68
2462	53	2454.347	-20.70	2.32	9.91	-8.47	8.00	16.47
	54	2469.964	-21.04	2.32	9.91	-8.81	8.00	16.81

11ax-20, RU Type: 242-tone RU

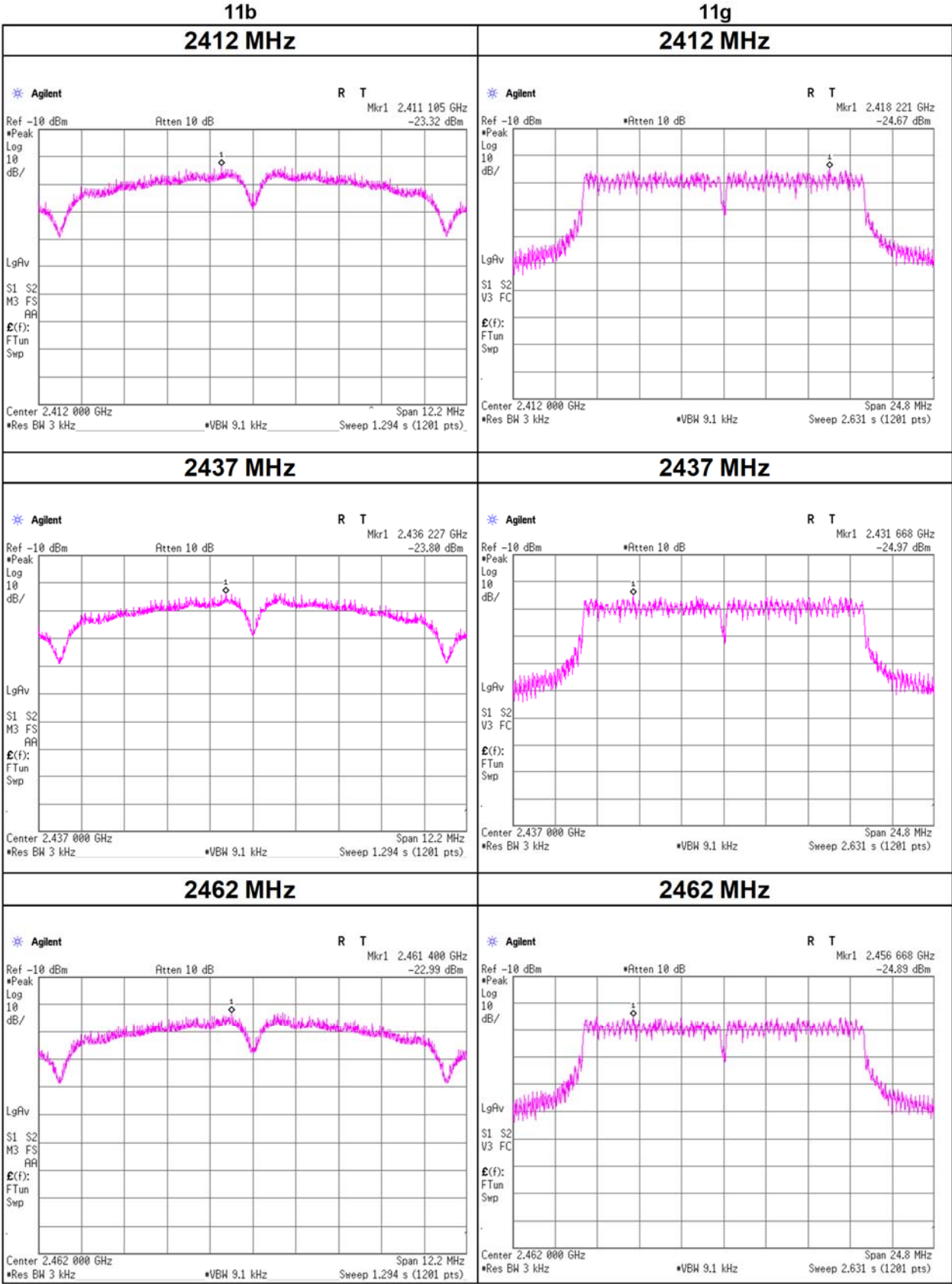
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2412	61	2411.474	-24.90	2.29	9.90	-12.71	8.00	20.71
2437	61	2441.138	-24.91	2.31	9.91	-12.69	8.00	20.69
2462	61	2453.964	-24.72	2.32	9.91	-12.49	8.00	20.49

Sample Calculation:

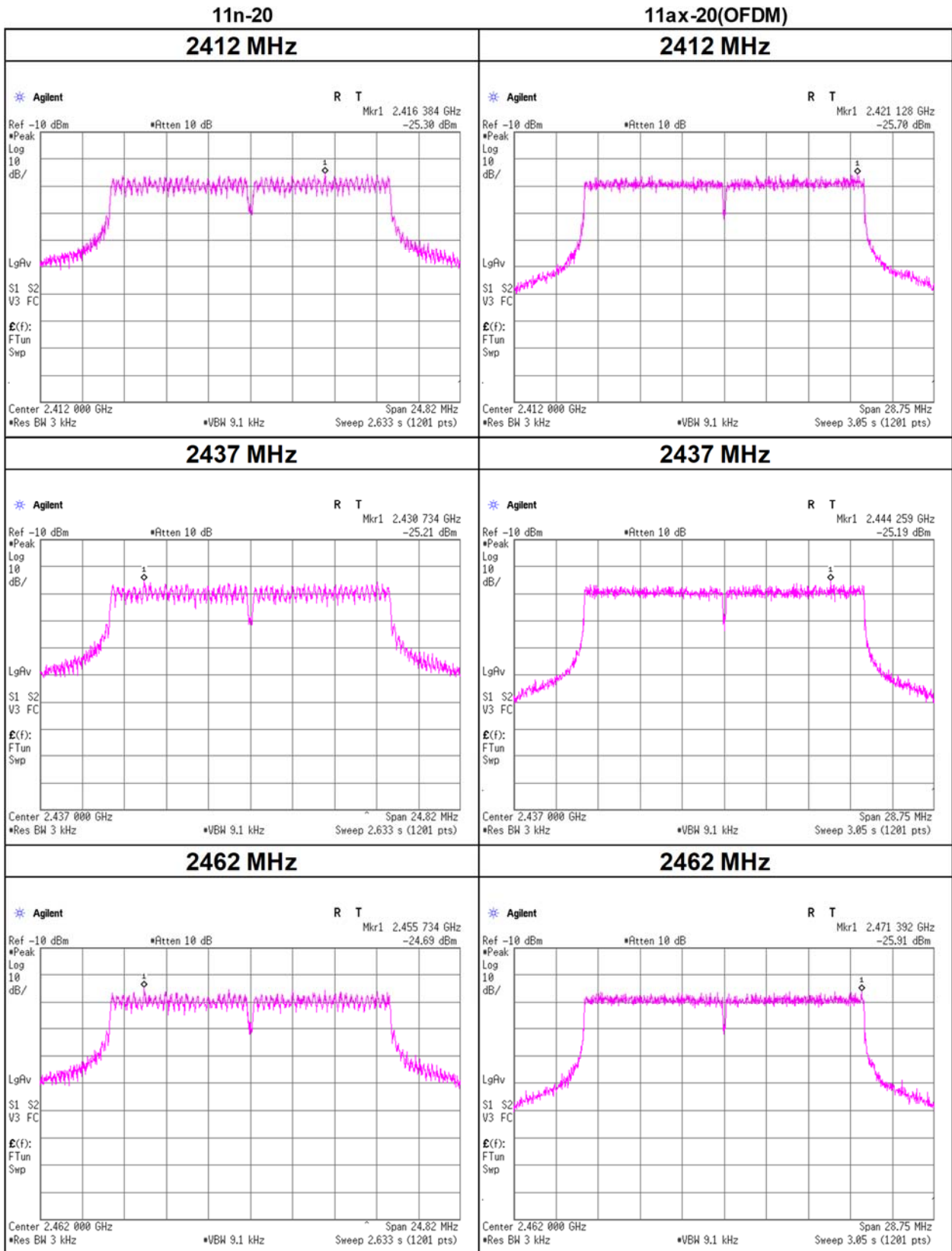
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Power Density

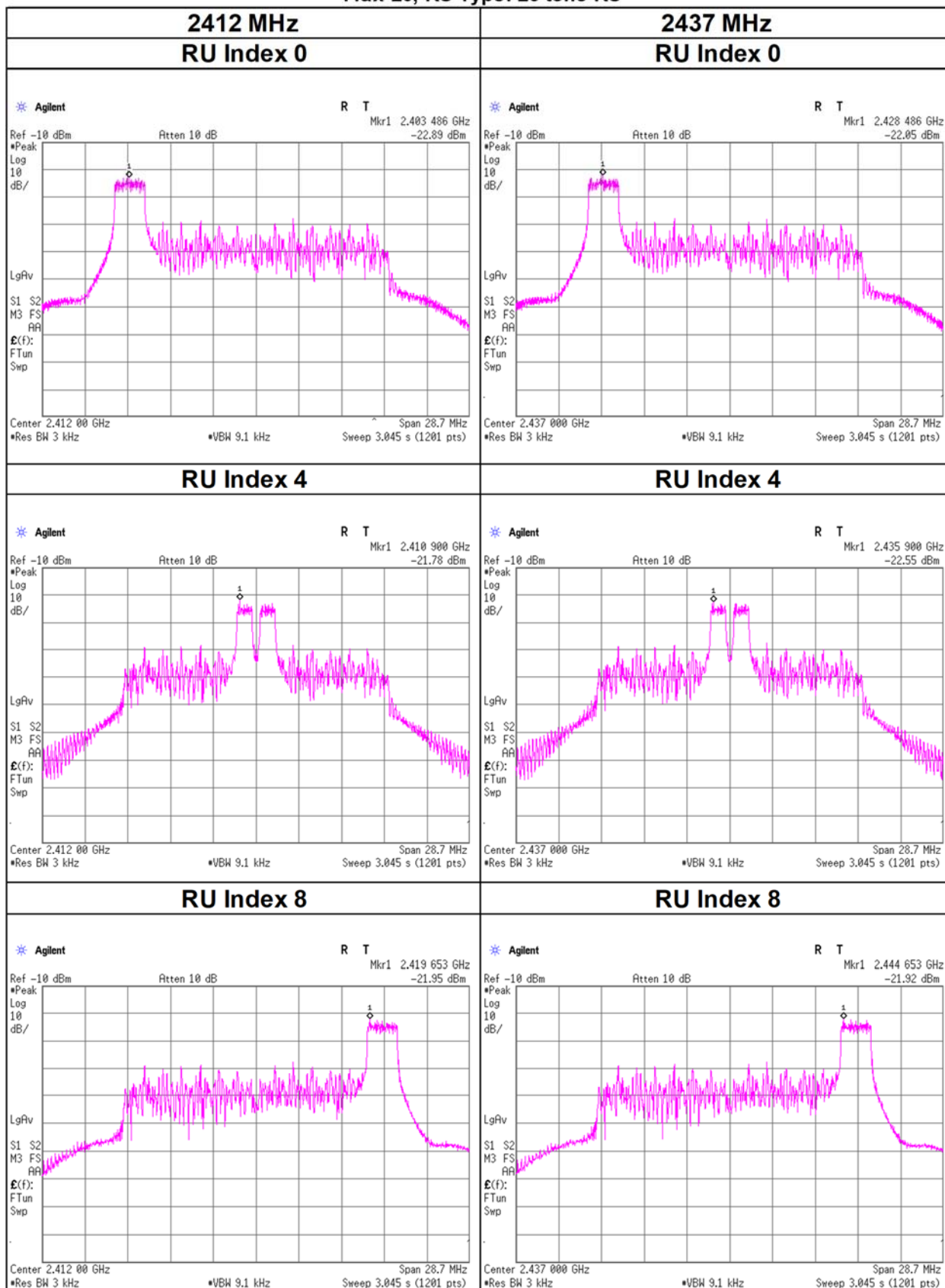


Power Density



Power Density

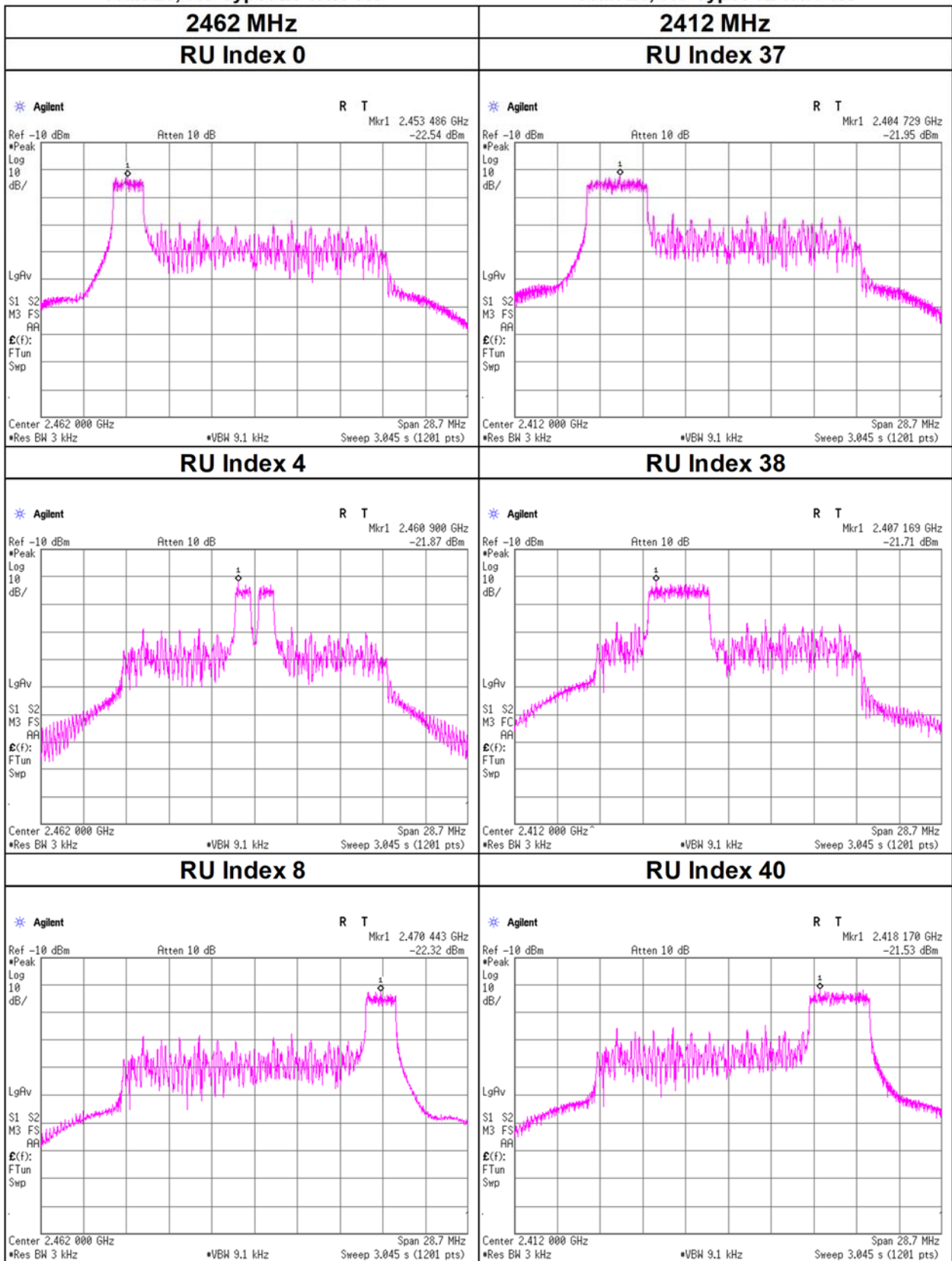
11ax-20, RU Type: 26-tone RU



Power Density

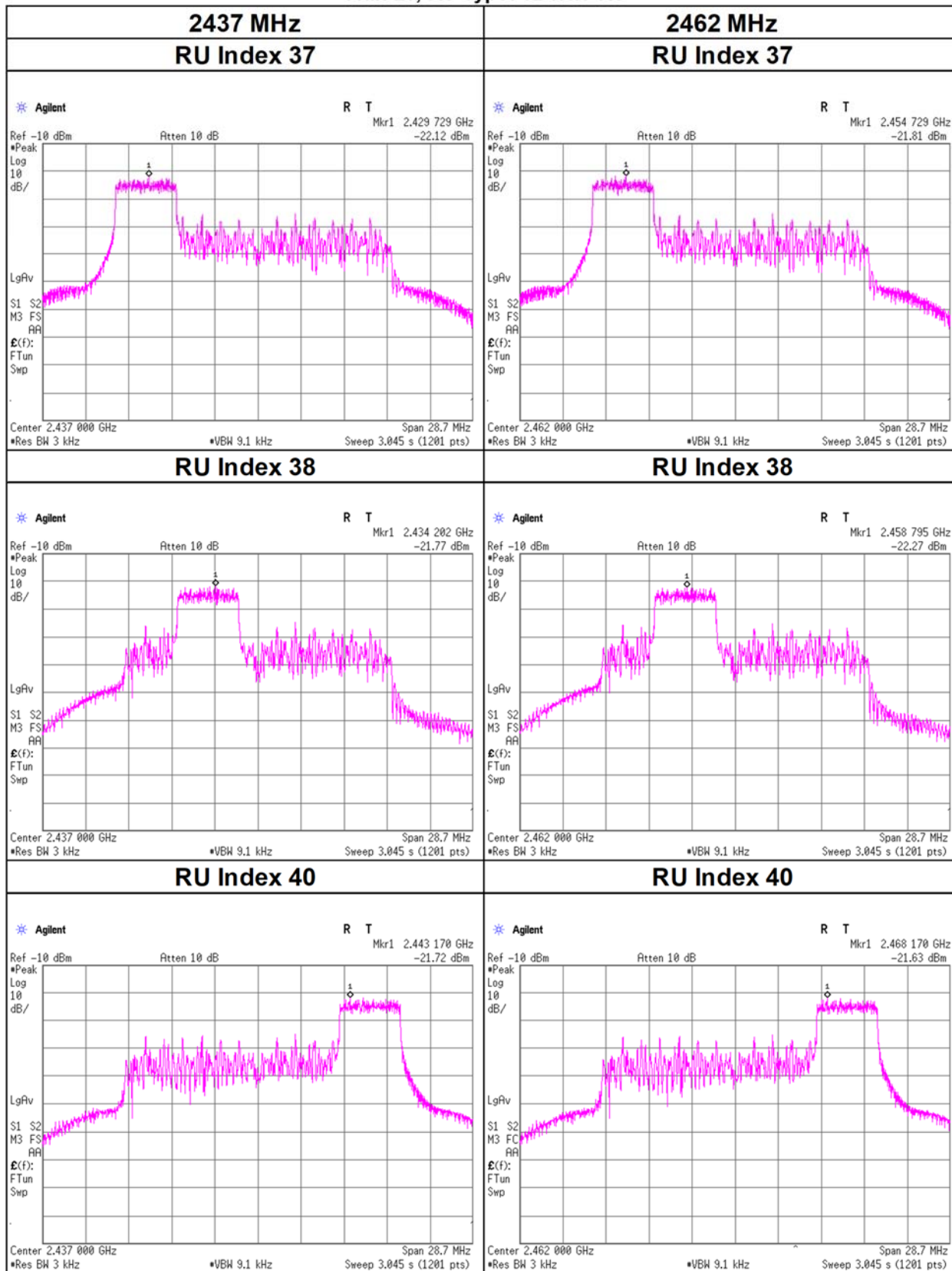
11ax-20, RU Type: 26-tone RU

11ax-20, RU Type: 52-tone RU



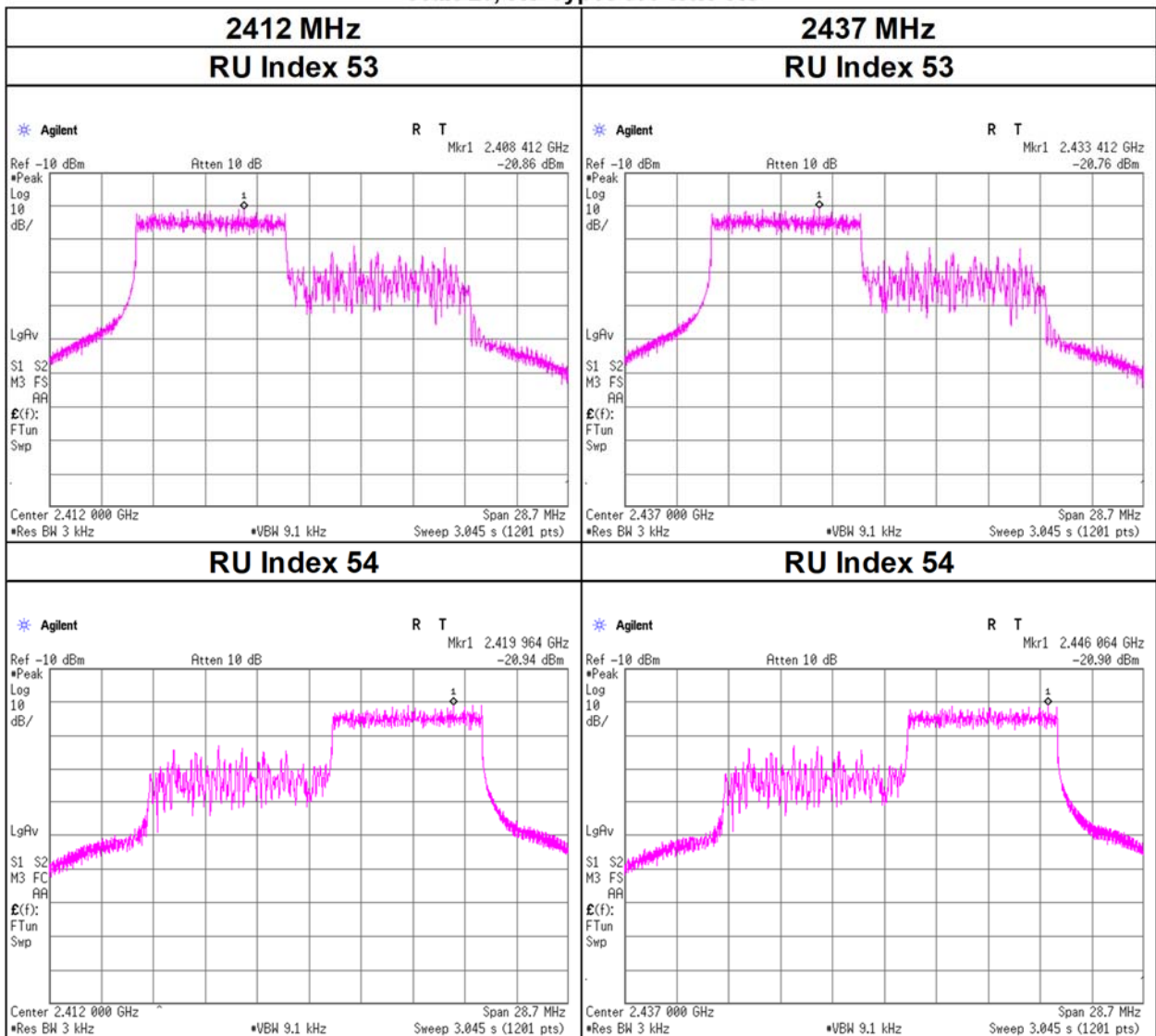
Power Density

11ax-20, RU Type: 52-tone RU



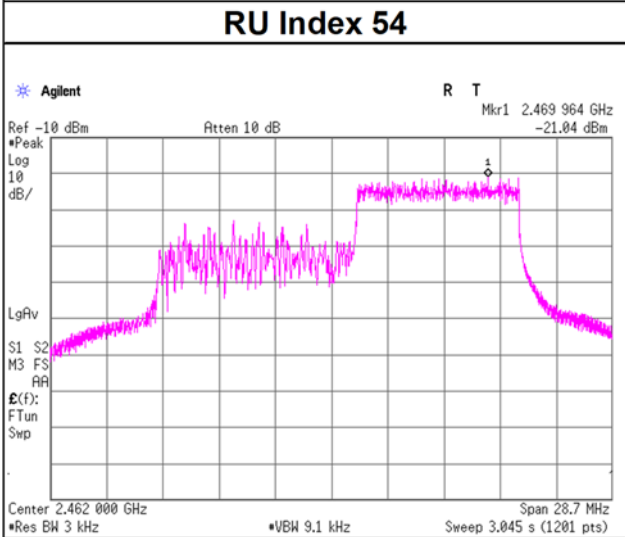
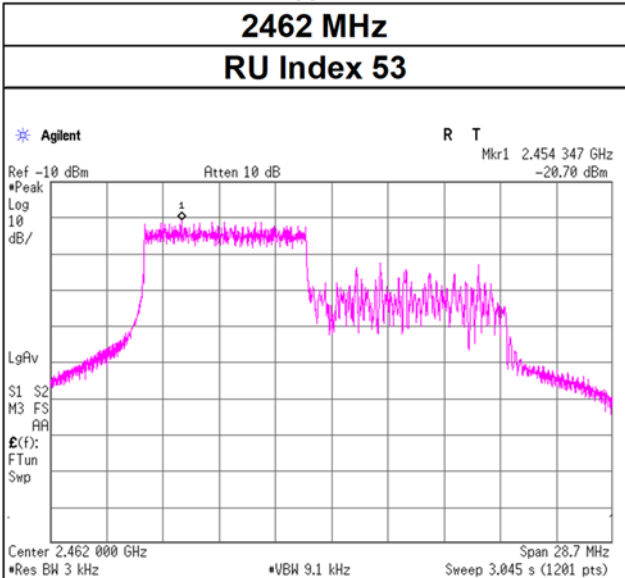
Power Density

11ax-20, RU Type: 106-tone RU



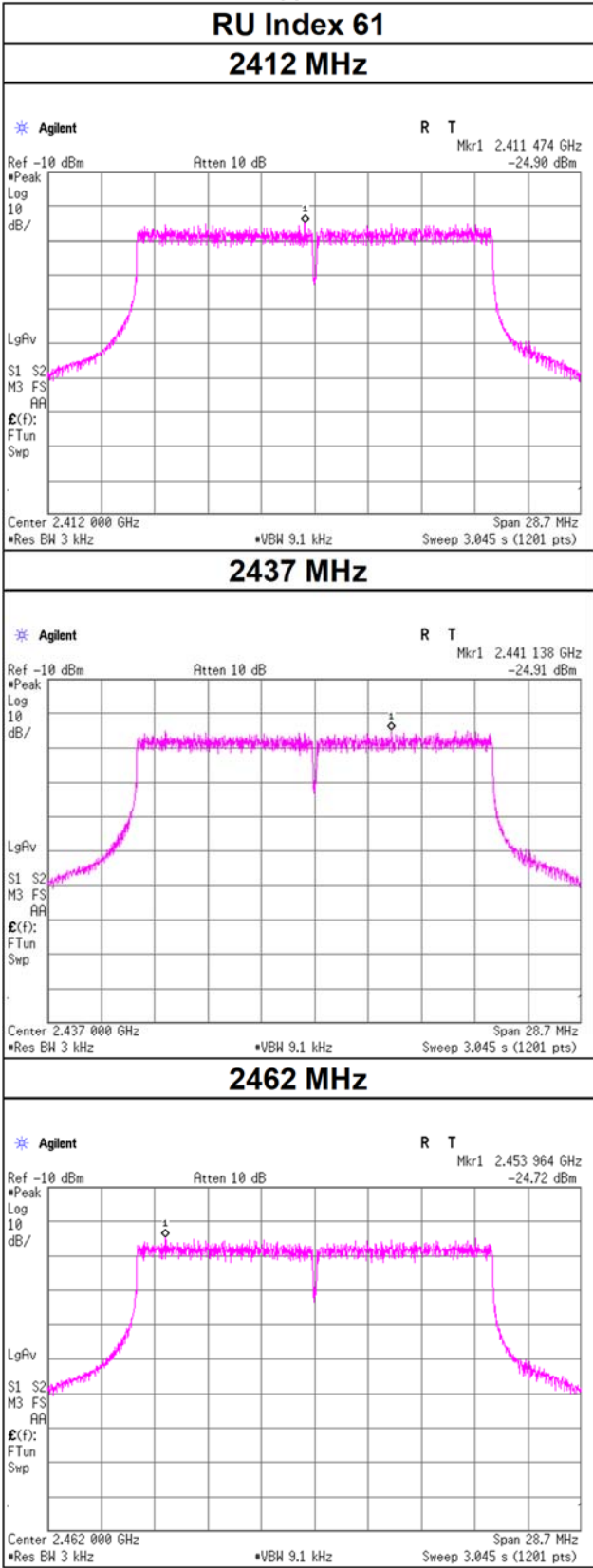
Power Density

11ax-20, RU Type: 106-tone RU

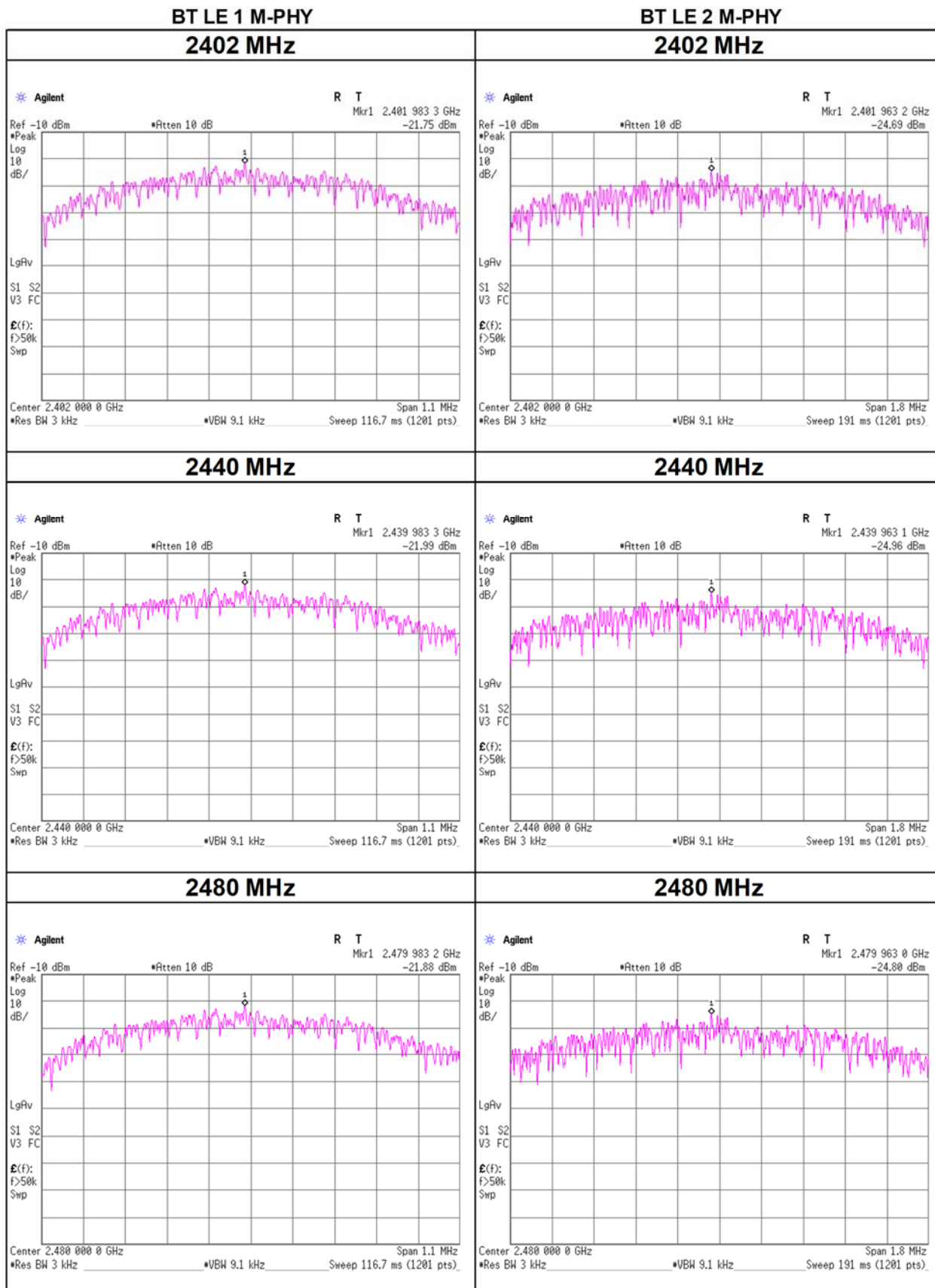


Power Density

11ax-20, RU Type: 242-tone RU



Power Density



APPENDIX 2: Test Instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	145111	Digital Tester	SANWA	PC500	7019232	2022/09/20	12
AT	145132	Attenuator	Weinschel Corp.	54A-10	W5692	2022/10/20	12
AT	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2023/03/01	12
AT	145801	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250152	2022/08/04	12
AT	146062	Terminator	Hirose Electric	HRM-TMP-05(40)	-	-	-
AT	151609	Attenuator	Weinschel Corp.	54A-10	81601	2023/03/02	12
AT	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2022/11/08	12
AT	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2022/11/08	12
AT	169912	Power sensor	Keysight Technologies Inc	N1923A	MY57290005	2022/11/08	12
AT	179106	Coaxial Cable	Junkosha	MWX241-01000KMSKMS/B	1901Q061-R	2023/04/12	12
AT	179107	Coaxial Cable	Junkosha	MWX241-01000KMSKMS/B	1901Q062-R	2023/04/12	12
AT	191845	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2022/08/08	12

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:

AT: Antenna Terminal Conducted test