

Radiated Emission test (3GHz -18GHz)

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

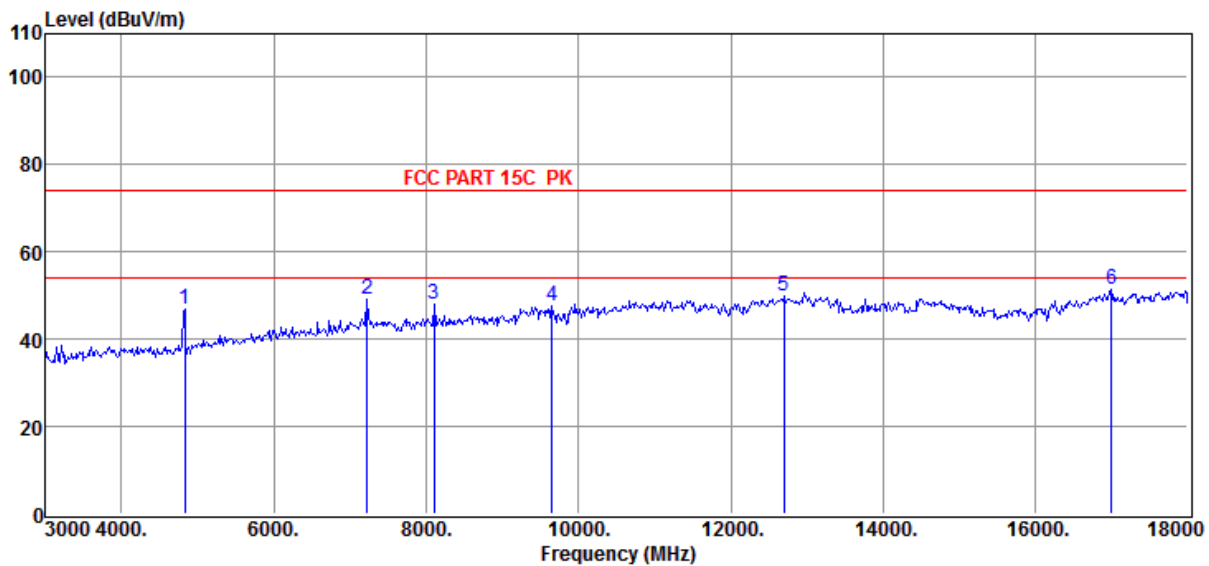
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2412MHz ESP32

Data: 103



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4825.00	46.08	32.55	-31.72	46.91	74.00	-27.09	Peak	HORIZONTAL
2	7222.00	43.07	36.96	-30.98	49.05	74.00	-24.95	Peak	HORIZONTAL
3	8106.00	42.45	37.08	-31.36	48.17	74.00	-25.83	Peak	HORIZONTAL
4	9653.00	39.51	38.09	-30.01	47.59	74.00	-26.41	Peak	HORIZONTAL
5	12696.00	40.16	38.95	-29.08	50.03	74.00	-23.97	Peak	HORIZONTAL
6	16997.00	35.06	42.19	-25.91	51.34	74.00	-22.66	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

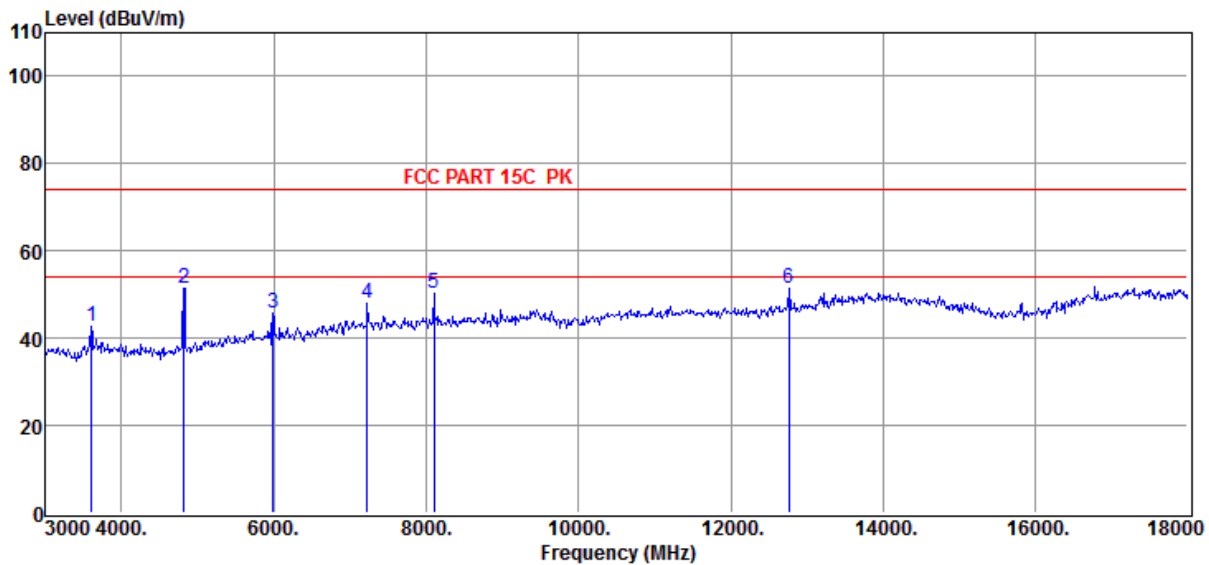
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2412MHz ESP32

Data: 104



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	44.12	30.64	-32.08	42.68	74.00	-31.32	Peak	VERTICAL
2	4815.00	50.74	32.53	-31.72	51.55	74.00	-22.45	Peak	VERTICAL
3	5985.00	42.17	35.26	-31.86	45.57	74.00	-28.43	Peak	VERTICAL
4	7230.00	41.84	36.97	-30.87	47.94	74.00	-26.06	Peak	VERTICAL
5	8100.00	44.60	37.08	-31.38	50.30	74.00	-23.70	Peak	VERTICAL
6	12765.00	41.67	39.08	-29.37	51.38	74.00	-22.62	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

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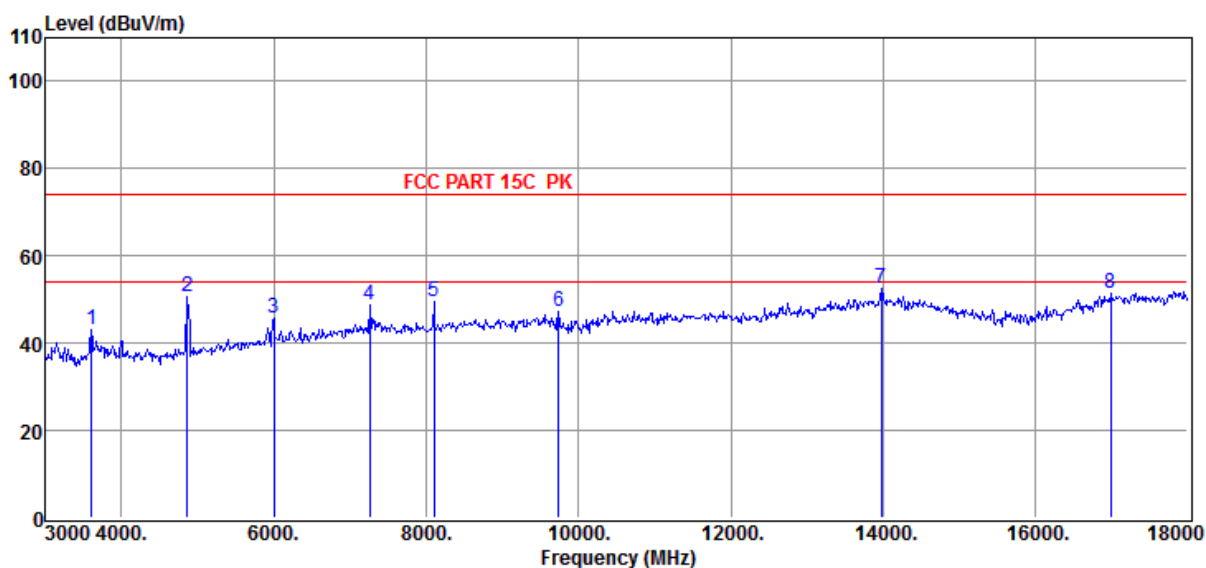
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2437MHz ESP32

Data: 105



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	44.41	30.64	-32.08	42.97	74.00	-31.03	Peak	VERTICAL
2	4860.00	49.65	32.62	-31.72	50.55	74.00	-23.45	Peak	VERTICAL
3	6000.00	42.07	35.30	-31.80	45.57	74.00	-28.43	Peak	VERTICAL
4	7260.00	42.19	37.02	-30.63	48.58	74.00	-25.42	Peak	VERTICAL
5	8100.00	43.70	37.08	-31.38	49.40	74.00	-24.60	Peak	VERTICAL
6	9735.00	39.26	38.14	-30.06	47.34	74.00	-26.66	Peak	VERTICAL
7	13980.00	39.48	41.36	-28.44	52.40	74.00	-21.60	Peak	VERTICAL
8	16995.00	35.11	42.18	-25.93	51.36	74.00	-22.64	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

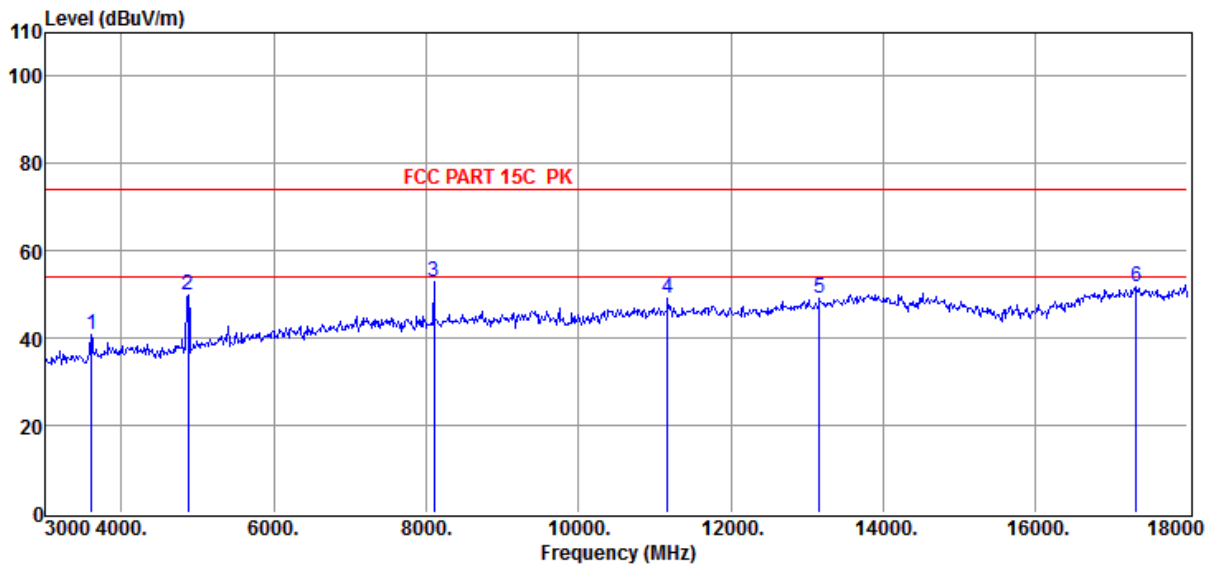
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2437MHz ESP32

Data: 106



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	42.12	30.64	-32.08	40.68	74.00	-33.32	Peak	HORIZONTAL
2	4875.00	49.08	32.65	-31.74	49.99	74.00	-24.01	Peak	HORIZONTAL
3	8100.00	47.16	37.08	-31.38	52.86	74.00	-21.14	Peak	HORIZONTAL
4	11175.00	38.99	38.70	-28.40	49.29	74.00	-24.71	Peak	HORIZONTAL
5	13170.00	38.89	39.81	-29.44	49.26	74.00	-24.74	Peak	HORIZONTAL
6	17325.00	36.06	42.66	-26.89	51.83	74.00	-22.17	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

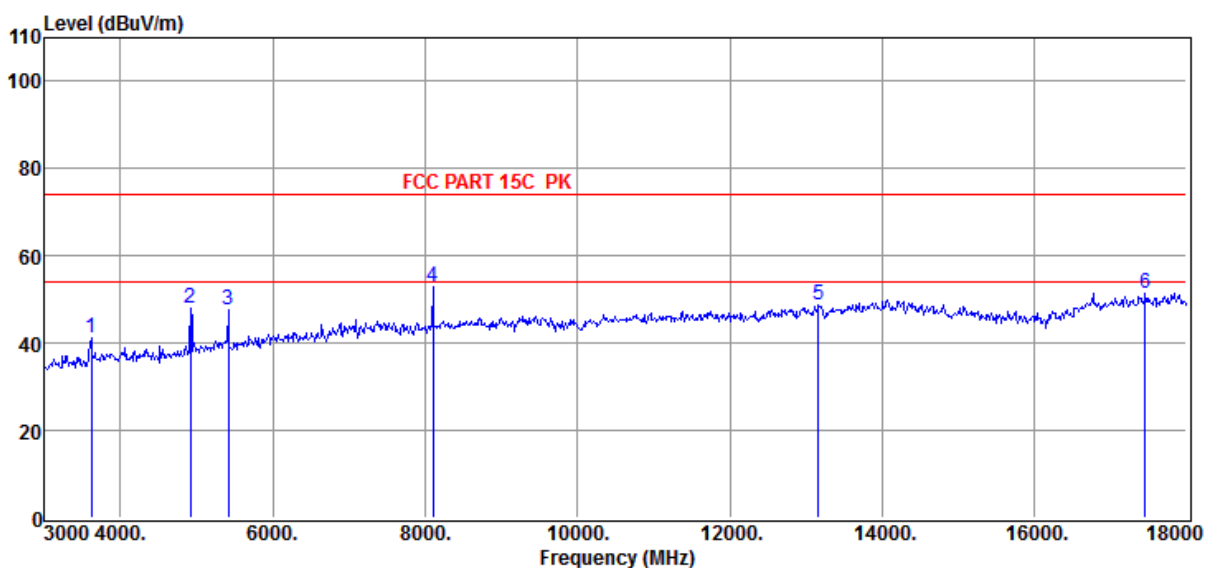
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2462MHz ESP32

Data: 107



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	42.53	30.68	-31.98	41.23	74.00	-32.77	Peak	HORIZONTAL
2	4920.00	46.79	32.74	-31.69	47.84	74.00	-26.16	Peak	HORIZONTAL
3	5415.00	45.42	33.65	-31.57	47.50	74.00	-26.50	Peak	HORIZONTAL
4	8100.00	47.28	37.08	-31.38	52.98	74.00	-21.02	Peak	HORIZONTAL
5	13170.00	38.37	39.81	-29.44	48.74	74.00	-25.26	Peak	HORIZONTAL
6	17460.00	35.63	42.84	-27.25	51.22	74.00	-22.78	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

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Test Site : 10m Chamber

Test Date : 11-29-2023

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EUT : AI Delivery Robot

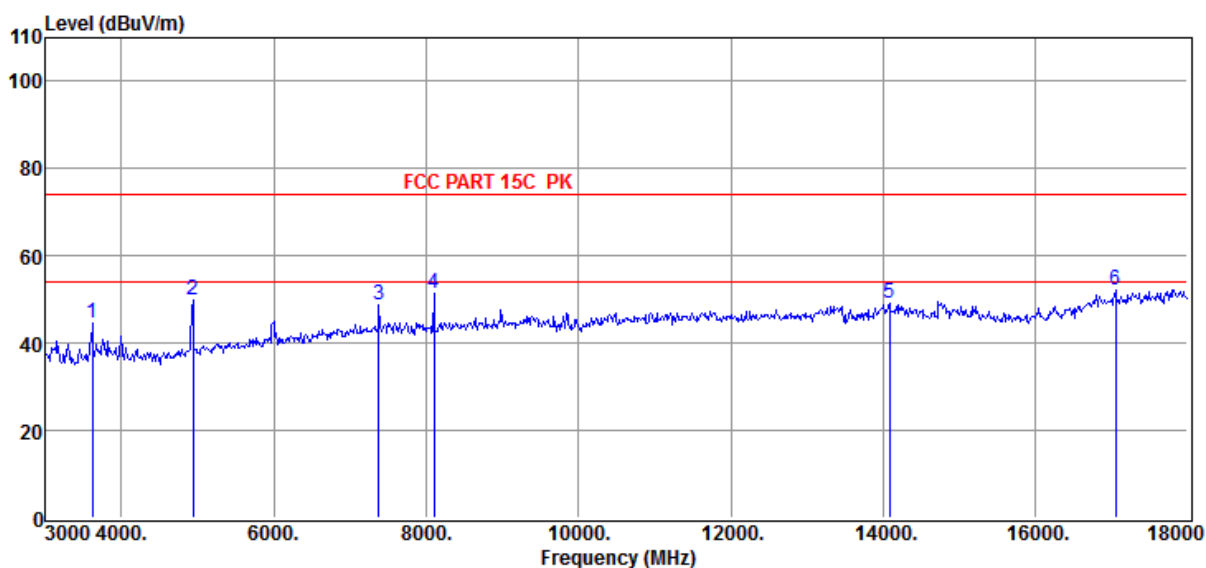
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2462MHz ESP32

Data: 108



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	45.76	30.68	-31.98	44.46	74.00	-29.54	Peak	VERTICAL
2	4935.00	48.66	32.77	-31.64	49.79	74.00	-24.21	Peak	VERTICAL
3	7380.00	42.29	37.21	-30.91	48.59	74.00	-25.41	Peak	VERTICAL
4	8100.00	45.78	37.08	-31.38	51.48	74.00	-22.52	Peak	VERTICAL
5	14085.00	35.91	41.28	-28.22	48.97	74.00	-25.03	Peak	VERTICAL
6	17055.00	36.20	42.28	-26.38	52.10	74.00	-21.90	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

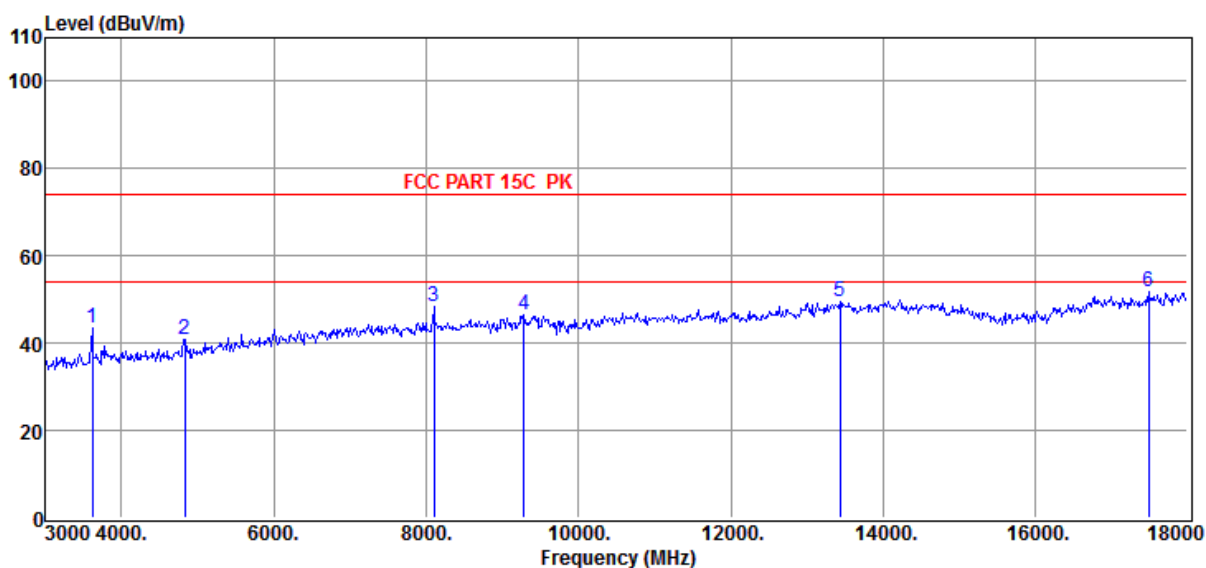
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2412MHz ESP32

Data: 109



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	44.67	30.68	-31.98	43.37	74.00	-30.63	Peak	HORIZONTAL
2	4830.00	40.14	32.56	-31.72	40.98	74.00	-33.02	Peak	HORIZONTAL
3	8100.00	42.58	37.08	-31.38	48.28	74.00	-25.72	Peak	HORIZONTAL
4	9285.00	38.92	37.87	-30.26	46.53	74.00	-27.47	Peak	HORIZONTAL
5	13440.00	38.61	40.29	-29.28	49.62	74.00	-24.38	Peak	HORIZONTAL
6	17490.00	36.15	42.89	-27.29	51.75	74.00	-22.25	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

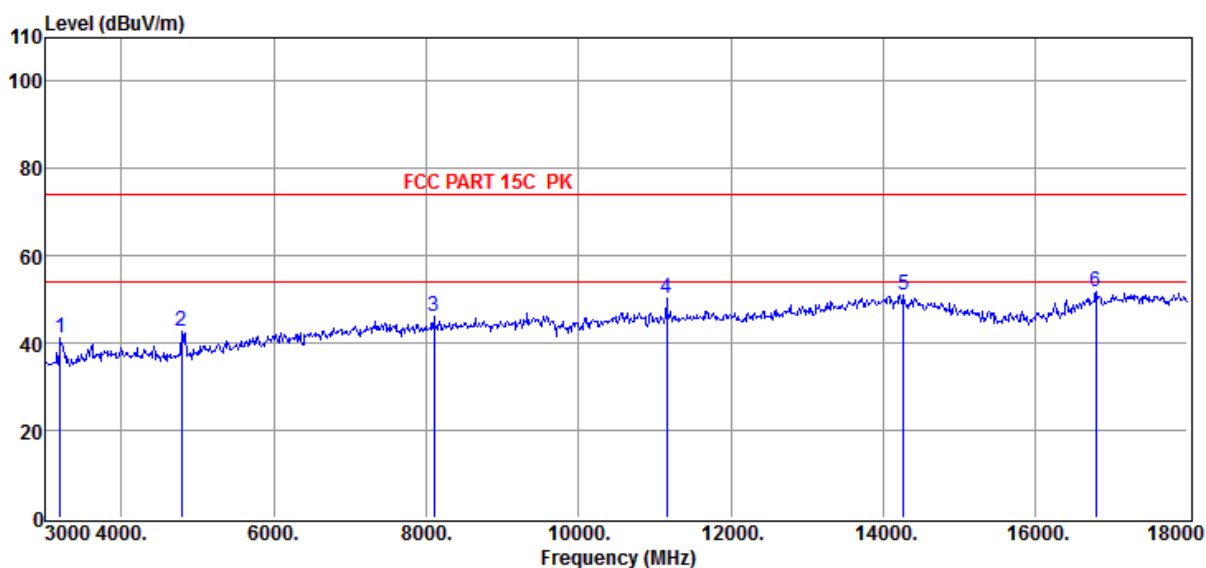
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2412MHz ESP32

Data: 110



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3195.00	43.48	29.67	-32.08	41.07	74.00	-32.93	Peak	VERTICAL
2	4785.00	41.93	32.47	-31.66	42.74	74.00	-31.26	Peak	VERTICAL
3	8100.00	40.40	37.08	-31.38	46.10	74.00	-27.90	Peak	VERTICAL
4	11160.00	40.12	38.70	-28.46	50.36	74.00	-23.64	Peak	VERTICAL
5	14265.00	37.67	41.03	-27.75	50.95	74.00	-23.05	Peak	VERTICAL
6	16800.00	36.46	41.24	-25.80	51.90	74.00	-22.10	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

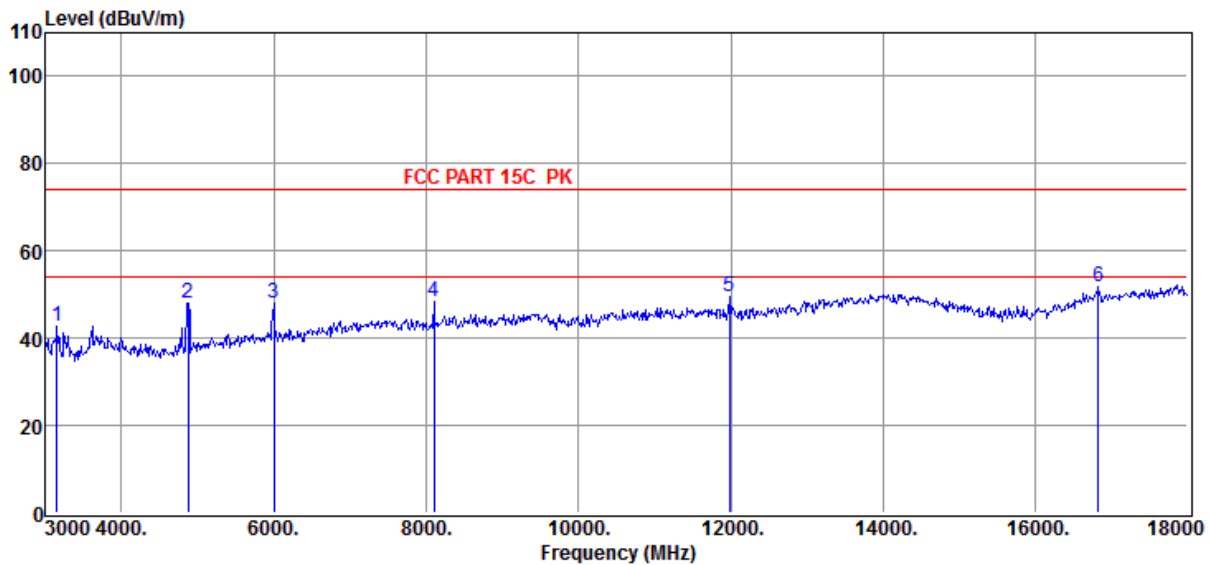
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2437MHz ESP32

Data: 111



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3150.00	45.75	29.56	-32.56	42.75	74.00	-31.25	Peak	VERTICAL
2	4875.00	46.95	32.65	-31.74	47.86	74.00	-26.14	Peak	VERTICAL
3	6000.00	44.51	35.30	-31.80	48.01	74.00	-25.99	Peak	VERTICAL
4	8100.00	42.86	37.08	-31.38	48.56	74.00	-25.44	Peak	VERTICAL
5	11985.00	39.69	38.60	-28.75	49.54	74.00	-24.46	Peak	VERTICAL
6	16830.00	36.60	41.38	-26.11	51.87	74.00	-22.13	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

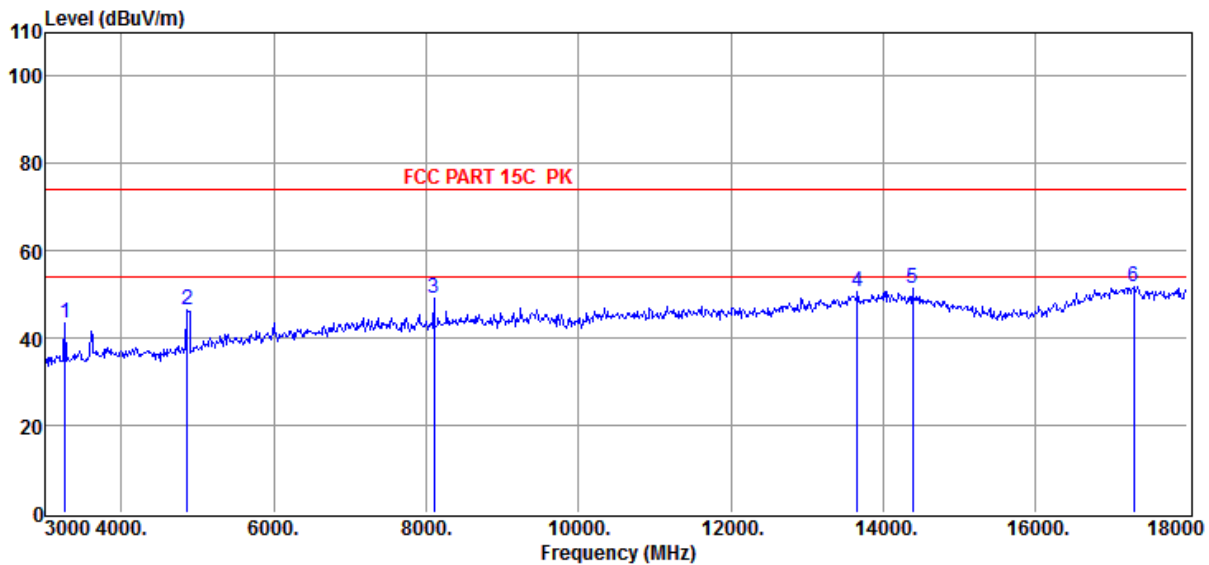
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2437MHz ESP32

Data: 112



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3255.00	45.85	29.81	-32.37	43.29	74.00	-30.71	Peak	HORIZONTAL
2	4860.00	45.77	32.62	-31.72	46.67	74.00	-27.33	Peak	HORIZONTAL
3	8100.00	43.33	37.08	-31.38	49.03	74.00	-24.97	Peak	HORIZONTAL
4	13665.00	38.77	40.73	-28.98	50.52	74.00	-23.48	Peak	HORIZONTAL
5	14385.00	37.78	40.86	-27.18	51.46	74.00	-22.54	Peak	HORIZONTAL
6	17295.00	35.97	42.61	-26.80	51.78	74.00	-22.22	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

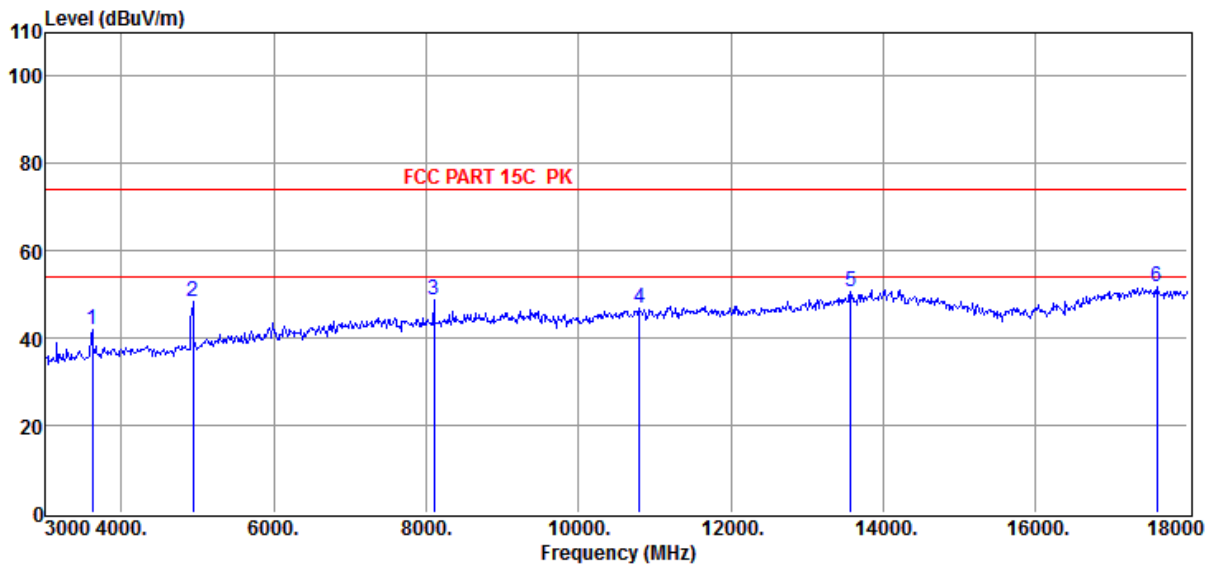
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2462MHz ESP32

Data: 113



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	43.19	30.68	-31.98	41.89	74.00	-32.11	Peak	HORIZONTAL
2	4935.00	47.24	32.77	-31.64	48.37	74.00	-25.63	Peak	HORIZONTAL
3	8100.00	42.95	37.08	-31.38	48.65	74.00	-25.35	Peak	HORIZONTAL
4	10800.00	37.30	38.62	-28.97	46.95	74.00	-27.05	Peak	HORIZONTAL
5	13575.00	39.06	40.55	-29.12	50.49	74.00	-23.51	Peak	HORIZONTAL
6	17595.00	36.29	42.77	-27.34	51.72	74.00	-22.28	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

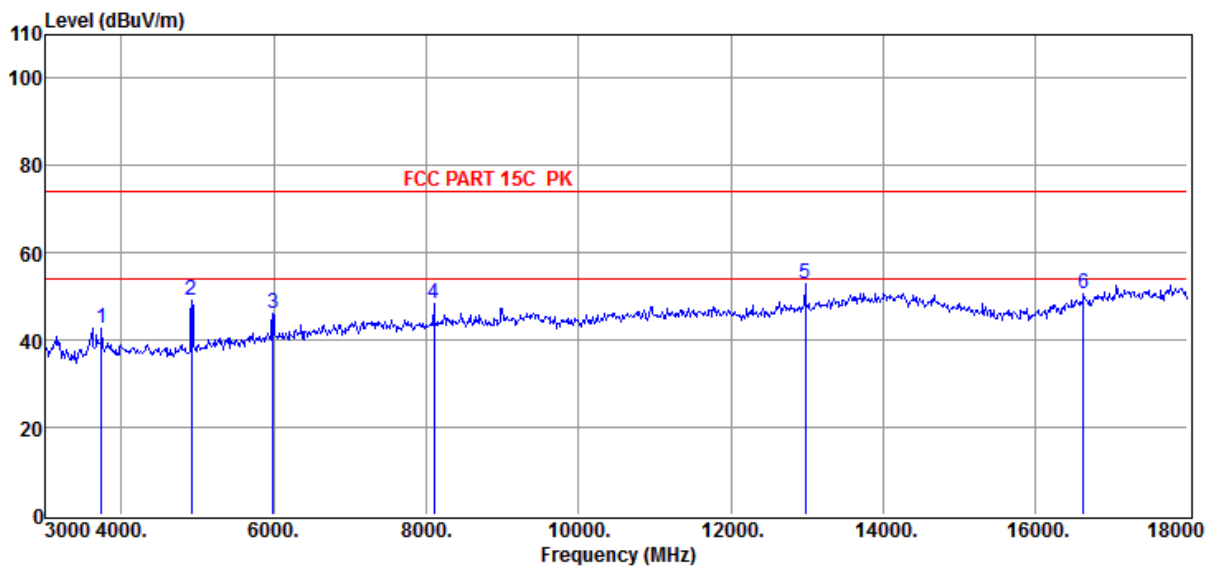
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2462MHz ESP32

Data: 114



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3735.00	44.16	30.96	-32.41	42.71	74.00	-31.29	Peak	VERTICAL
2	4920.00	48.07	32.74	-31.69	49.12	74.00	-24.88	Peak	VERTICAL
3	5985.00	42.77	35.26	-31.86	46.17	74.00	-27.83	Peak	VERTICAL
4	8100.00	42.51	37.08	-31.38	48.21	74.00	-25.79	Peak	VERTICAL
5	12975.00	42.88	39.46	-29.58	52.76	74.00	-21.24	Peak	VERTICAL
6	16635.00	36.55	40.45	-26.37	50.63	74.00	-23.37	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

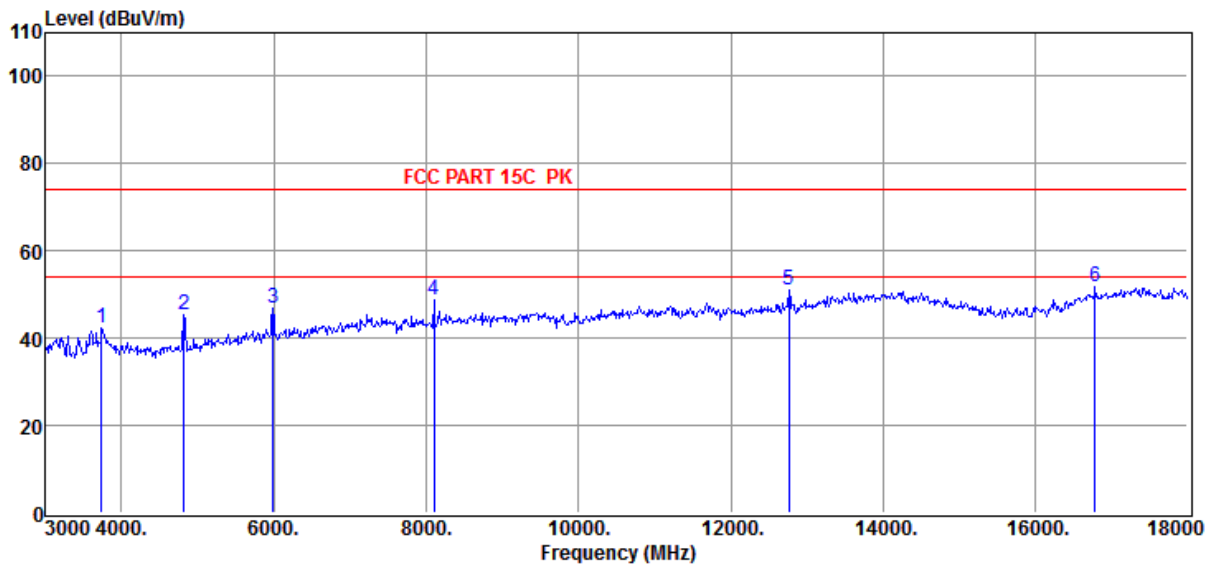
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2412MHz ESP32

Data: 115



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3735.00	43.63	30.96	-32.41	42.18	74.00	-31.82	Peak	VERTICAL
2	4815.00	44.50	32.53	-31.72	45.31	74.00	-28.69	Peak	VERTICAL
3	5985.00	43.43	35.26	-31.86	46.83	74.00	-27.17	Peak	VERTICAL
4	8100.00	42.92	37.08	-31.38	48.62	74.00	-25.38	Peak	VERTICAL
5	12765.00	41.32	39.08	-29.37	51.03	74.00	-22.97	Peak	VERTICAL
6	16785.00	36.57	41.17	-25.91	51.83	74.00	-22.17	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

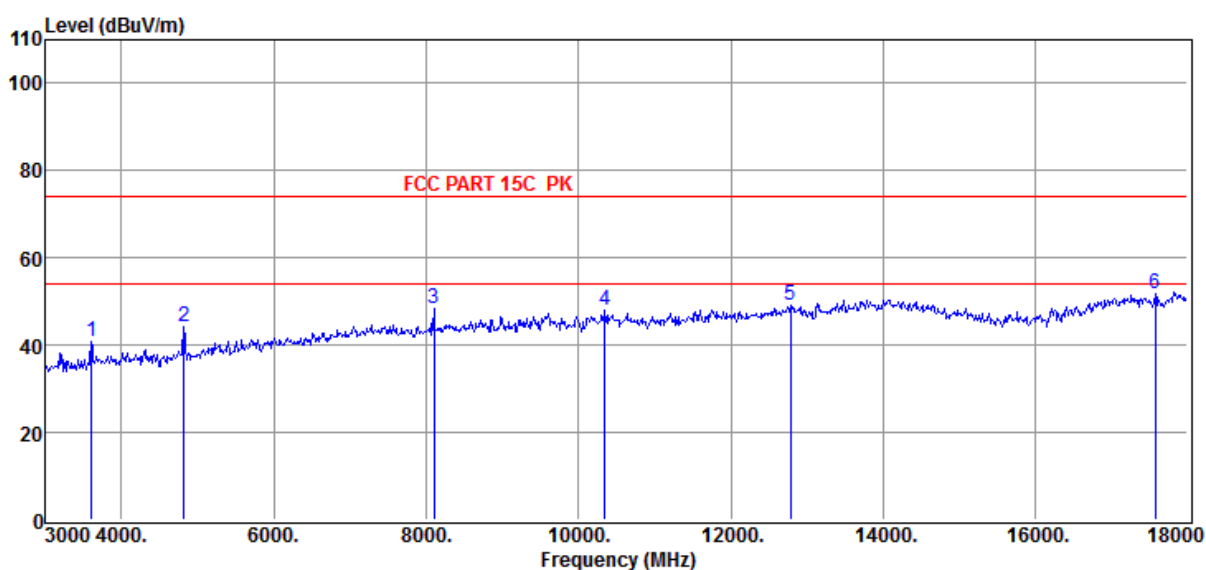
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2412MHz ESP32

Data: 116



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	42.42	30.64	-32.08	40.98	74.00	-33.02	Peak	HORIZONTAL
2	4815.00	43.58	32.53	-31.72	44.39	74.00	-29.61	Peak	HORIZONTAL
3	8100.00	42.82	37.08	-31.38	48.52	74.00	-25.48	Peak	HORIZONTAL
4	10350.00	39.12	38.44	-29.71	47.85	74.00	-26.15	Peak	HORIZONTAL
5	12780.00	39.52	39.10	-29.44	49.18	74.00	-24.82	Peak	HORIZONTAL
6	17580.00	36.44	42.79	-27.33	51.90	74.00	-22.10	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

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Tested By : Novak

EUT : AI Delivery Robot

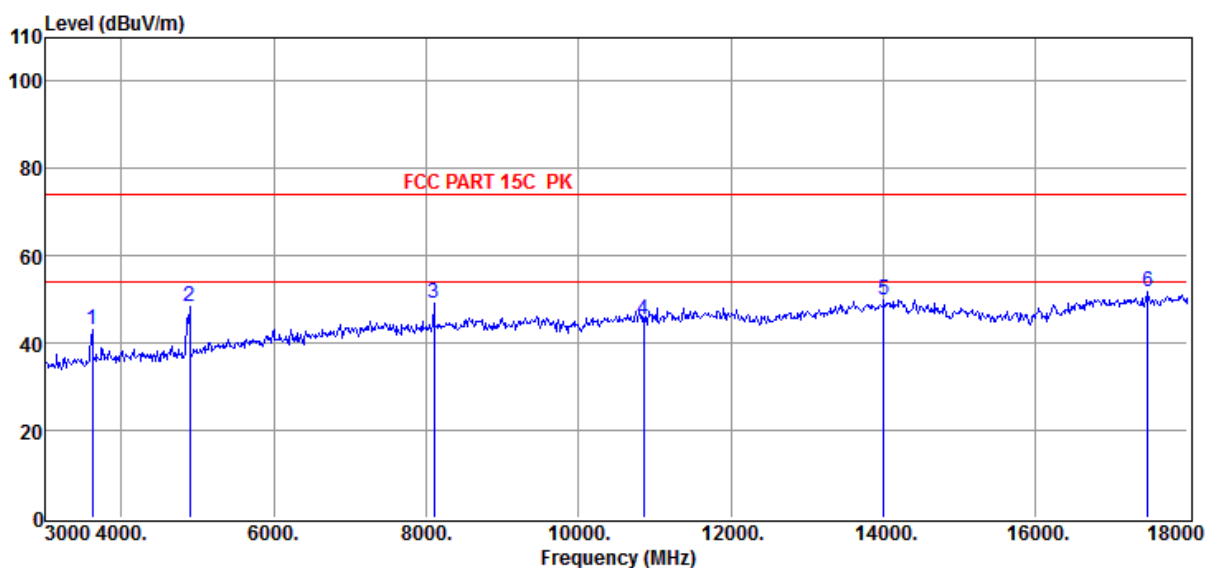
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2437MHz ESP32

Data: 117



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	44.53	30.68	-31.98	43.23	74.00	-30.77	Peak	HORIZONTAL
2	4890.00	47.43	32.68	-31.75	48.36	74.00	-25.64	Peak	HORIZONTAL
3	8100.00	43.45	37.08	-31.38	49.15	74.00	-24.85	Peak	HORIZONTAL
4	10860.00	35.67	38.64	-29.08	45.23	74.00	-28.77	Peak	HORIZONTAL
5	14010.00	36.87	41.39	-28.38	49.88	74.00	-24.12	Peak	HORIZONTAL
6	17475.00	36.26	42.87	-27.27	51.86	74.00	-22.14	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

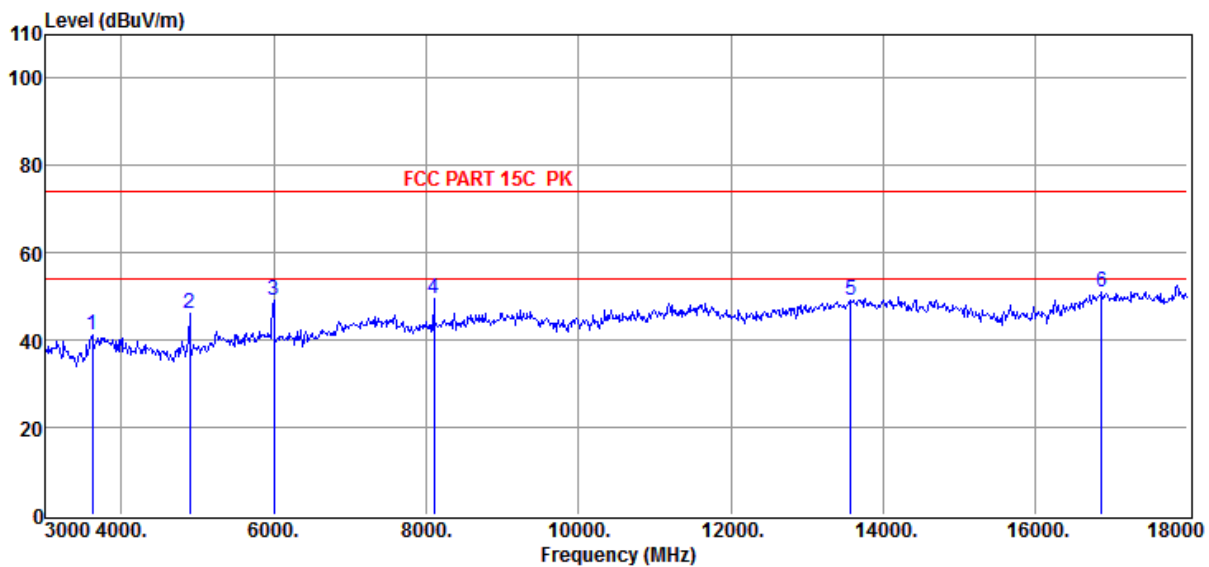
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2437MHz ESP32

Data: 118



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	42.47	30.68	-31.98	41.17	74.00	-32.83	Peak	VERTICAL
2	4890.00	45.34	32.68	-31.75	46.27	74.00	-27.73	Peak	VERTICAL
3	6000.00	45.71	35.30	-31.80	49.21	74.00	-24.79	Peak	VERTICAL
4	8100.00	43.77	37.08	-31.38	49.47	74.00	-24.53	Peak	VERTICAL
5	13575.00	37.86	40.55	-29.12	49.29	74.00	-24.71	Peak	VERTICAL
6	16875.00	35.87	41.60	-26.58	50.89	74.00	-23.11	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

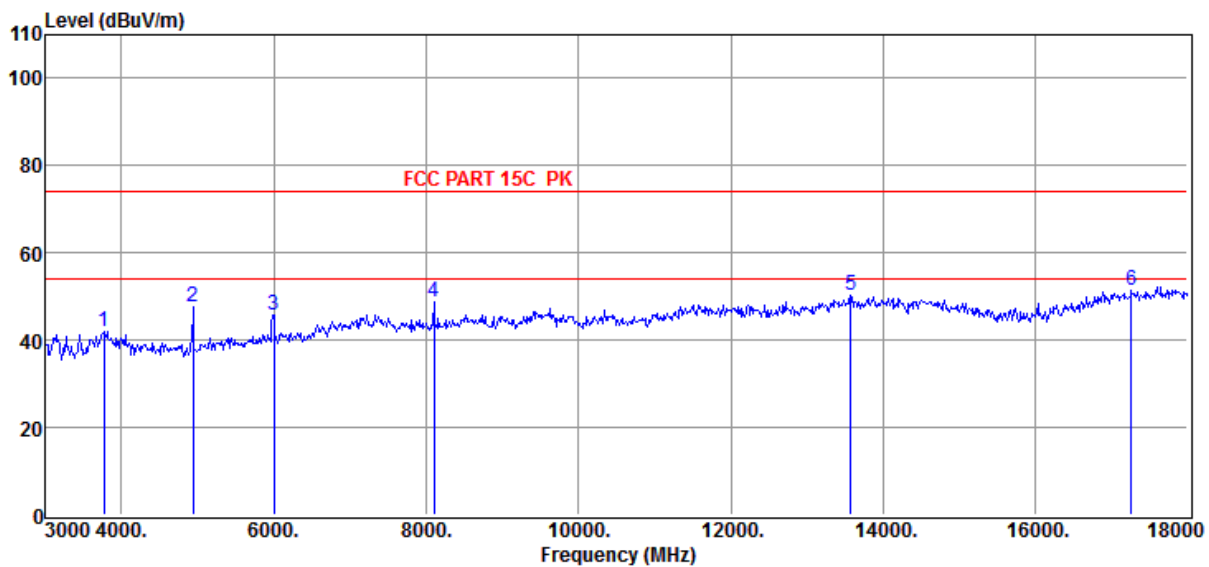
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2462MHz ESP32

Data: 119



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3765.00	43.30	31.04	-32.40	41.94	74.00	-32.06	Peak	VERTICAL
2	4935.00	46.59	32.77	-31.64	47.72	74.00	-26.28	Peak	VERTICAL
3	6000.00	42.40	35.30	-31.80	45.90	74.00	-28.10	Peak	VERTICAL
4	8100.00	43.24	37.08	-31.38	48.94	74.00	-25.06	Peak	VERTICAL
5	13575.00	38.81	40.55	-29.12	50.24	74.00	-23.76	Peak	VERTICAL
6	17265.00	35.68	42.57	-26.84	51.41	74.00	-22.59	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

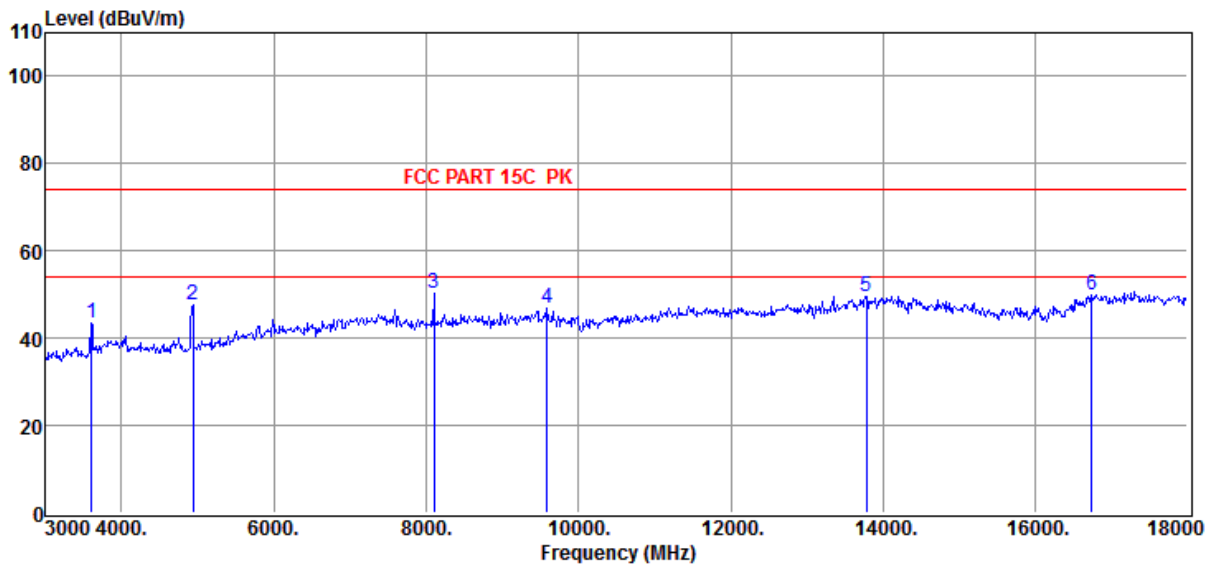
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2462MHz ESP32

Data: 120



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	44.93	30.64	-32.08	43.49	74.00	-30.51	Peak	HORIZONTAL
2	4935.00	46.46	32.77	-31.64	47.59	74.00	-26.41	Peak	HORIZONTAL
3	8100.00	44.47	37.08	-31.38	50.17	74.00	-23.83	Peak	HORIZONTAL
4	9585.00	38.87	38.05	-30.01	46.91	74.00	-27.09	Peak	HORIZONTAL
5	13785.00	37.58	40.97	-28.98	49.57	74.00	-24.43	Peak	HORIZONTAL
6	16740.00	35.08	40.95	-26.25	49.78	74.00	-24.22	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

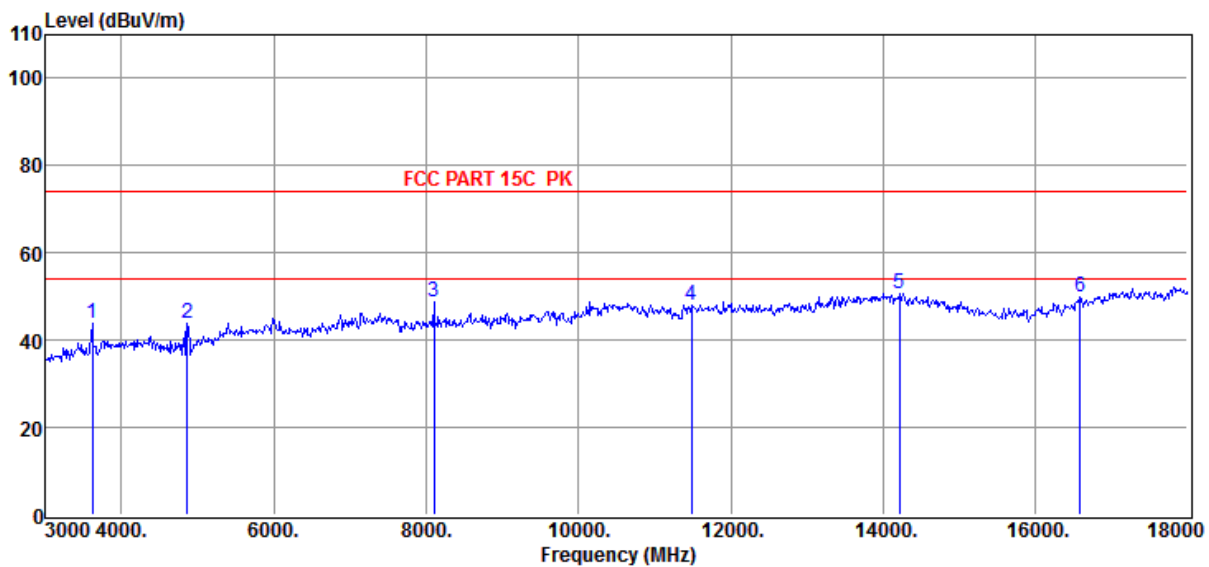
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2422MHz ESP32

Data: 121



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	45.04	30.68	-31.98	43.74	74.00	-30.26	Peak	HORIZONTAL
2	4860.00	42.83	32.62	-31.72	43.73	74.00	-30.27	Peak	HORIZONTAL
3	8100.00	43.25	37.08	-31.38	48.95	74.00	-25.05	Peak	HORIZONTAL
4	11490.00	37.98	38.70	-28.61	48.07	74.00	-25.93	Peak	HORIZONTAL
5	14220.00	36.71	41.09	-27.27	50.53	74.00	-23.47	Peak	HORIZONTAL
6	16590.00	35.89	40.23	-26.32	49.80	74.00	-24.20	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

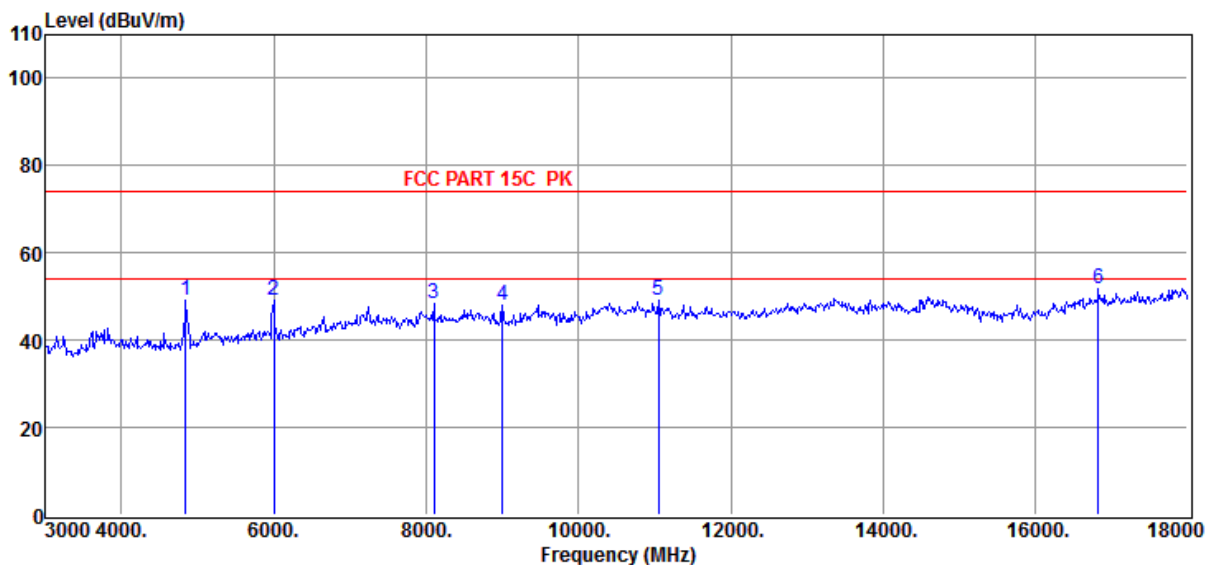
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2422MHz ESP32

Data: 122



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4845.00	48.11	32.59	-31.71	48.99	74.00	-25.01	Peak	VERTICAL
2	6000.00	45.70	35.30	-31.80	49.20	74.00	-24.80	Peak	VERTICAL
3	8100.00	42.72	37.08	-31.38	48.42	74.00	-25.58	Peak	VERTICAL
4	9000.00	40.64	37.70	-30.52	47.82	74.00	-26.18	Peak	VERTICAL
5	11055.00	39.04	38.70	-28.76	48.98	74.00	-25.02	Peak	VERTICAL
6	16830.00	36.60	41.38	-26.11	51.87	74.00	-22.13	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

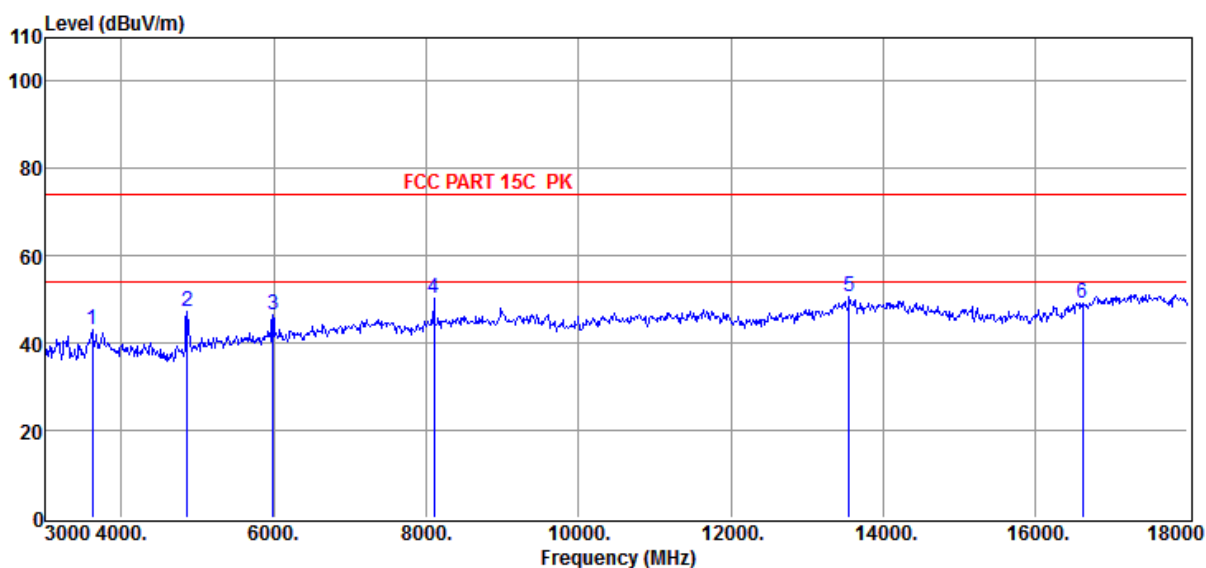
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2437MHz ESP32

Data: 123



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	44.37	30.68	-31.98	43.07	74.00	-30.93	Peak	VERTICAL
2	4860.00	46.42	32.62	-31.72	47.32	74.00	-26.68	Peak	VERTICAL
3	5985.00	43.04	35.26	-31.86	46.44	74.00	-27.56	Peak	VERTICAL
4	8100.00	44.67	37.08	-31.38	50.37	74.00	-23.63	Peak	VERTICAL
5	13560.00	39.07	40.52	-29.11	50.48	74.00	-23.52	Peak	VERTICAL
6	16620.00	35.28	40.38	-26.33	49.33	74.00	-24.67	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

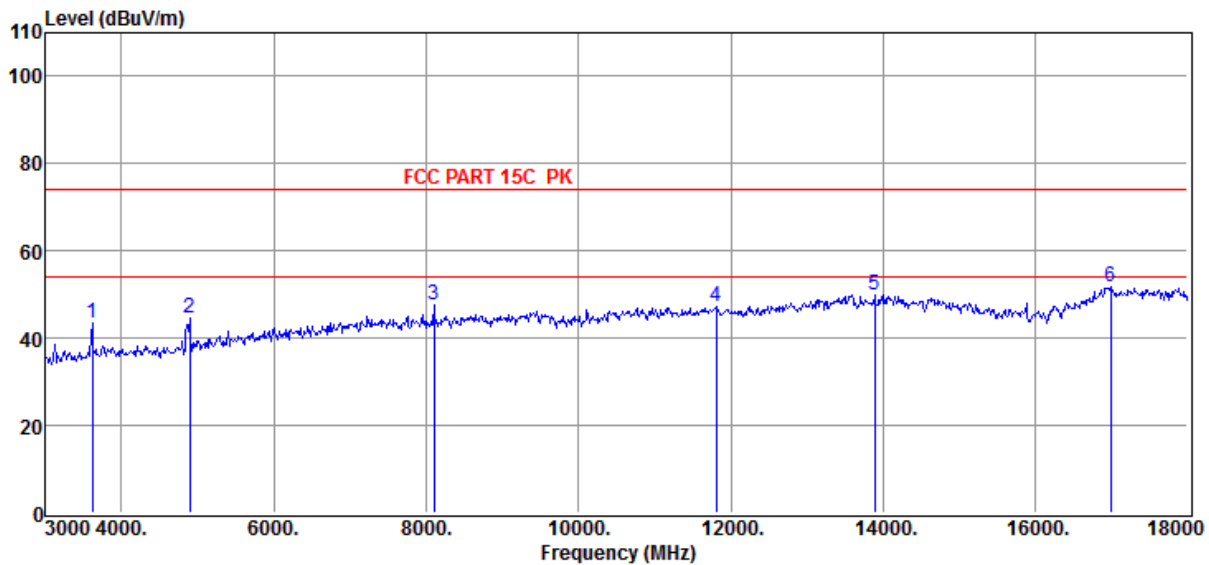
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2437MHz ESP32

Data: 124



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3615.00	44.74	30.68	-31.98	43.44	74.00	-30.56	Peak	HORIZONTAL
2	4890.00	43.69	32.68	-31.75	44.62	74.00	-29.38	Peak	HORIZONTAL
3	8100.00	41.83	37.08	-31.38	47.53	74.00	-26.47	Peak	HORIZONTAL
4	11805.00	37.34	38.64	-28.62	47.36	74.00	-26.64	Peak	HORIZONTAL
5	13890.00	37.55	41.18	-28.66	50.07	74.00	-23.93	Peak	HORIZONTAL
6	16995.00	35.58	42.18	-25.93	51.83	74.00	-22.17	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

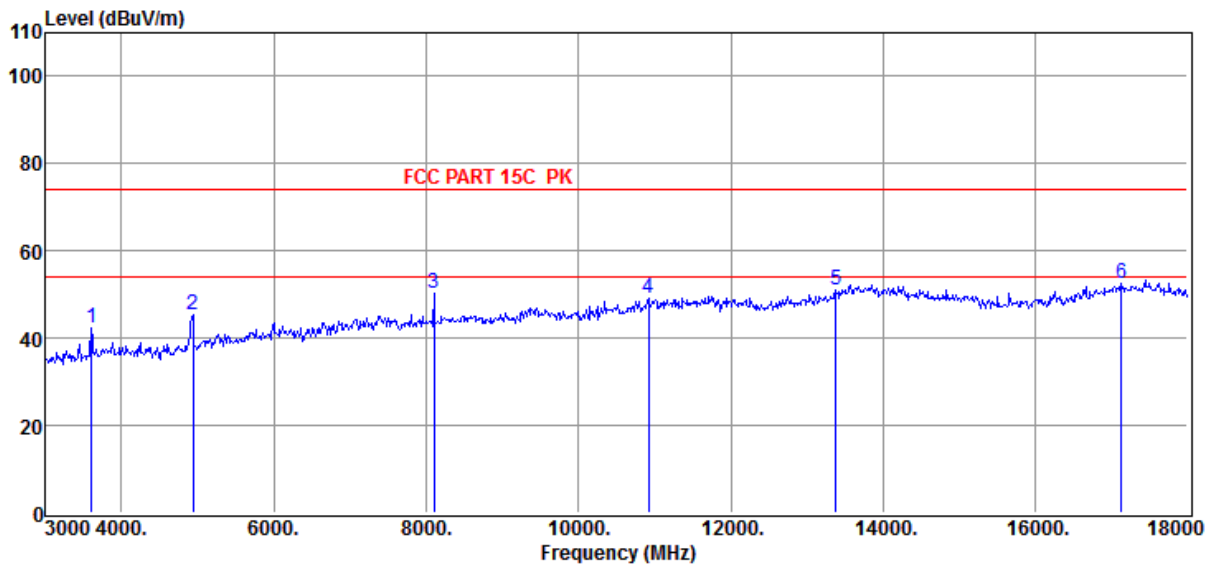
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2452MHz ESP32

Data: 125



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3600.00	43.62	30.64	-32.08	42.18	74.00	-31.82	Peak	HORIZONTAL
2	4935.00	44.19	32.77	-31.64	45.32	74.00	-28.68	Peak	HORIZONTAL
3	8100.00	44.64	37.08	-31.38	50.34	74.00	-23.66	Peak	HORIZONTAL
4	10920.00	39.58	38.67	-29.09	49.16	74.00	-24.84	Peak	HORIZONTAL
5	13380.00	40.06	40.18	-29.37	50.87	74.00	-23.13	Peak	HORIZONTAL
6	17130.00	36.99	42.38	-26.83	52.54	74.00	-21.46	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

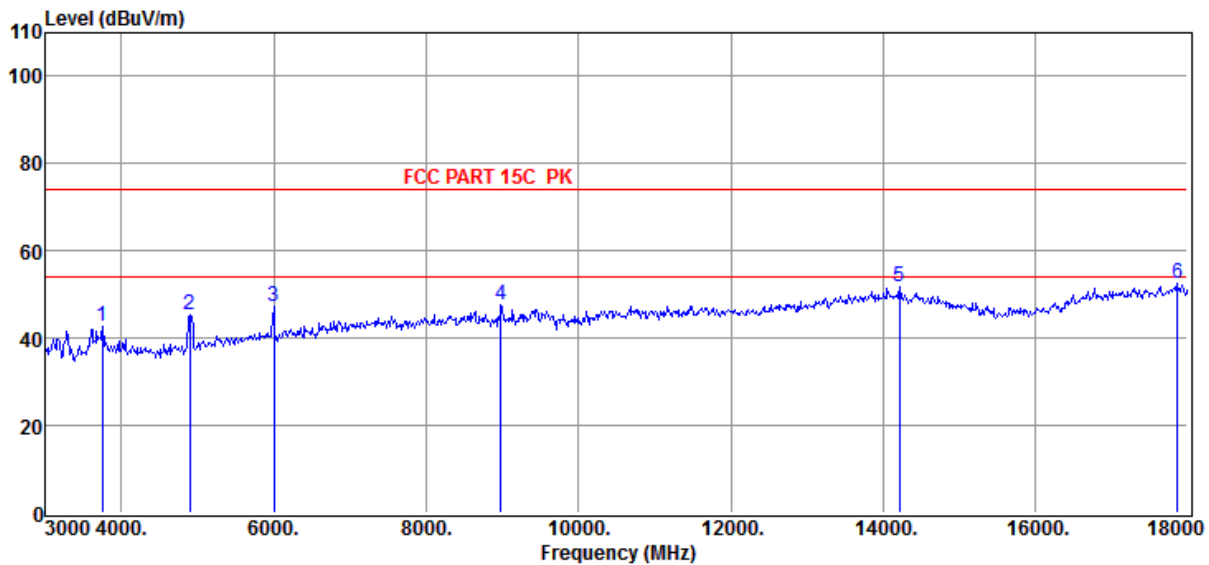
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2452MHz ESP32

Data: 126



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3750.00	44.25	31.00	-32.47	42.78	74.00	-31.22	Peak	VERTICAL
2	4890.00	44.27	32.68	-31.75	45.20	74.00	-28.80	Peak	VERTICAL
3	6000.00	43.72	35.30	-31.80	47.22	74.00	-26.78	Peak	VERTICAL
4	8985.00	40.54	37.69	-30.62	47.61	74.00	-26.39	Peak	VERTICAL
5	14220.00	37.80	41.09	-27.27	51.62	74.00	-22.38	Peak	VERTICAL
6	17865.00	37.19	42.39	-27.11	52.47	74.00	-21.53	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Simultaneous mode:

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-27-2023

Tested By : Novak

EUT : AI Delivery Robot

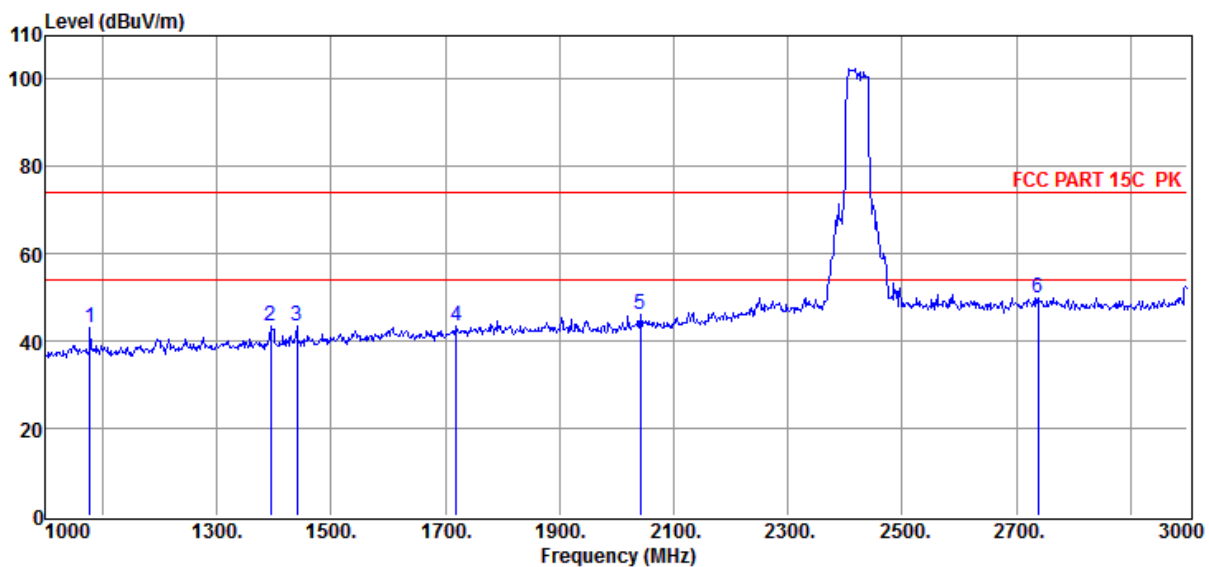
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 2422+ESP32 11B 2412

Data: 151



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	1078.00	49.80	27.46	-34.28	42.98	74.00	-31.02	Peak	HORIZONTAL
2	1394.00	47.64	29.48	-33.61	43.51	74.00	-30.49	Peak	HORIZONTAL
3	1440.00	46.93	29.90	-33.50	43.33	74.00	-30.67	Peak	HORIZONTAL
4	1720.00	45.40	31.22	-32.98	43.64	74.00	-30.36	Peak	HORIZONTAL
5	2042.00	44.93	33.39	-32.38	45.94	74.00	-28.06	Peak	HORIZONTAL
6	2738.00	43.60	37.26	-30.78	50.08	74.00	-23.92	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

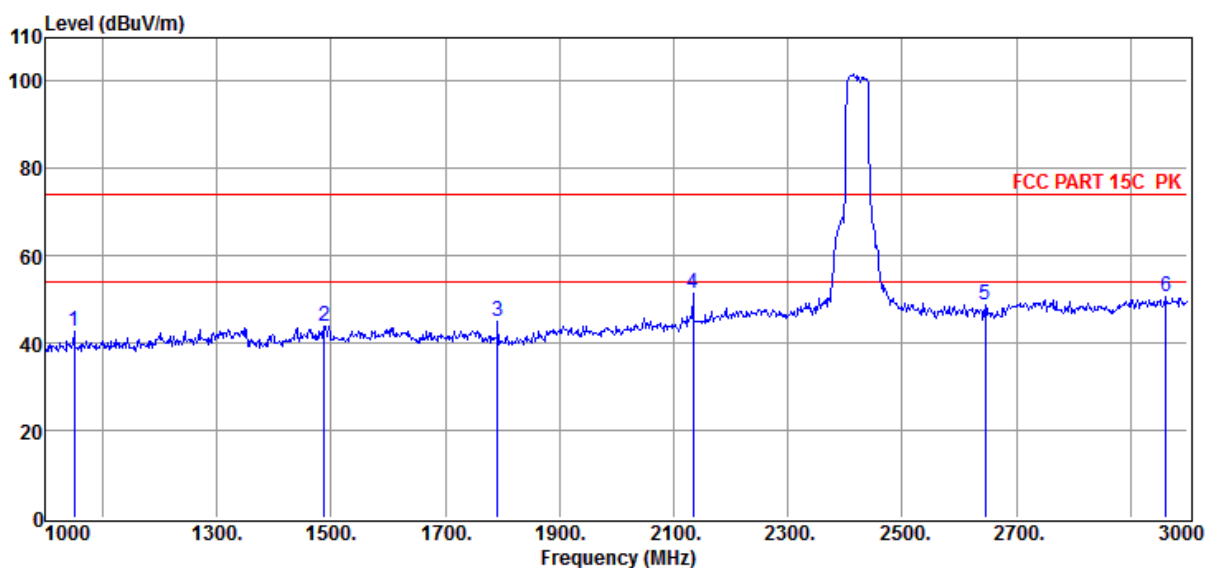
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 2422+ESP32 11B 2412

Data: 152



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	1050.00	49.70	27.40	-34.32	42.78	74.00	-31.22	Peak	VERTICAL
2	1488.00	46.91	30.38	-33.46	43.83	74.00	-30.17	Peak	VERTICAL
3	1792.00	46.23	31.65	-32.83	45.05	74.00	-28.95	Peak	VERTICAL
4	2134.00	50.43	33.17	-32.23	51.37	74.00	-22.63	Peak	VERTICAL
5	2646.00	43.46	36.63	-31.28	48.81	74.00	-25.19	Peak	VERTICAL
6	2962.00	43.54	37.54	-30.48	50.60	74.00	-23.40	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

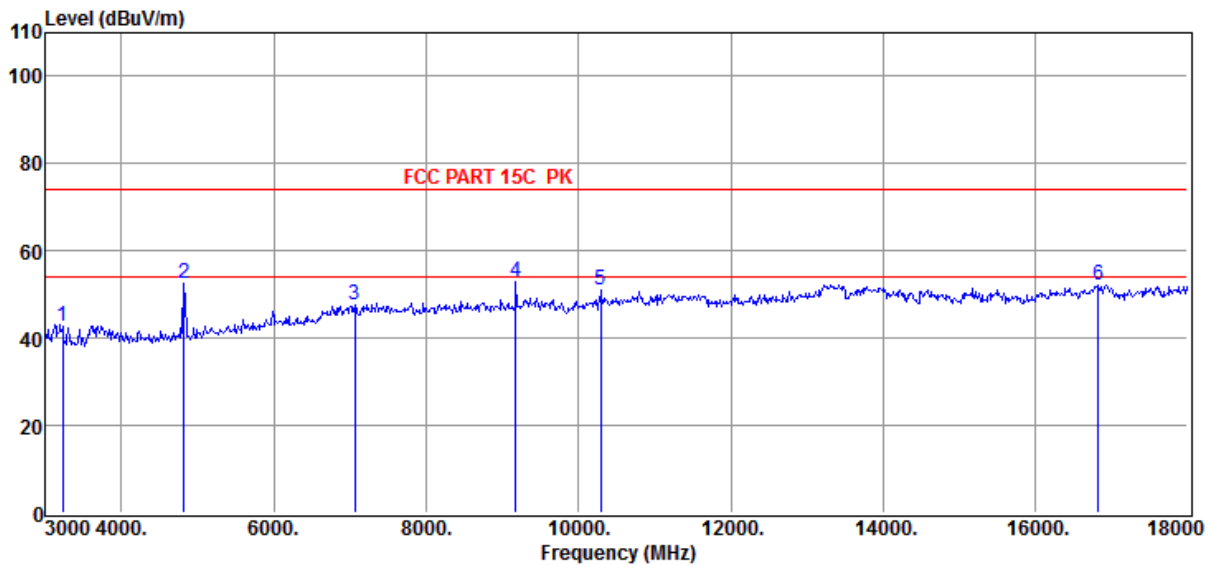
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 2422+ESP32 11B 2412

Data: 101



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3225.00	45.30	29.74	-32.18	42.86	74.00	-31.14	Peak	VERTICAL
2	4815.00	51.68	32.53	-31.72	52.49	74.00	-21.51	Peak	VERTICAL
3	7065.00	41.50	36.70	-30.66	47.54	74.00	-26.46	Peak	VERTICAL
4	9180.00	45.82	37.81	-30.57	53.06	74.00	-20.94	Peak	VERTICAL
5	10290.00	42.32	38.42	-29.85	50.89	74.00	-23.11	Peak	VERTICAL
6	16830.00	36.90	41.38	-26.11	52.17	74.00	-21.83	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 11-29-2023

Tested By : Novak

EUT : AI Delivery Robot

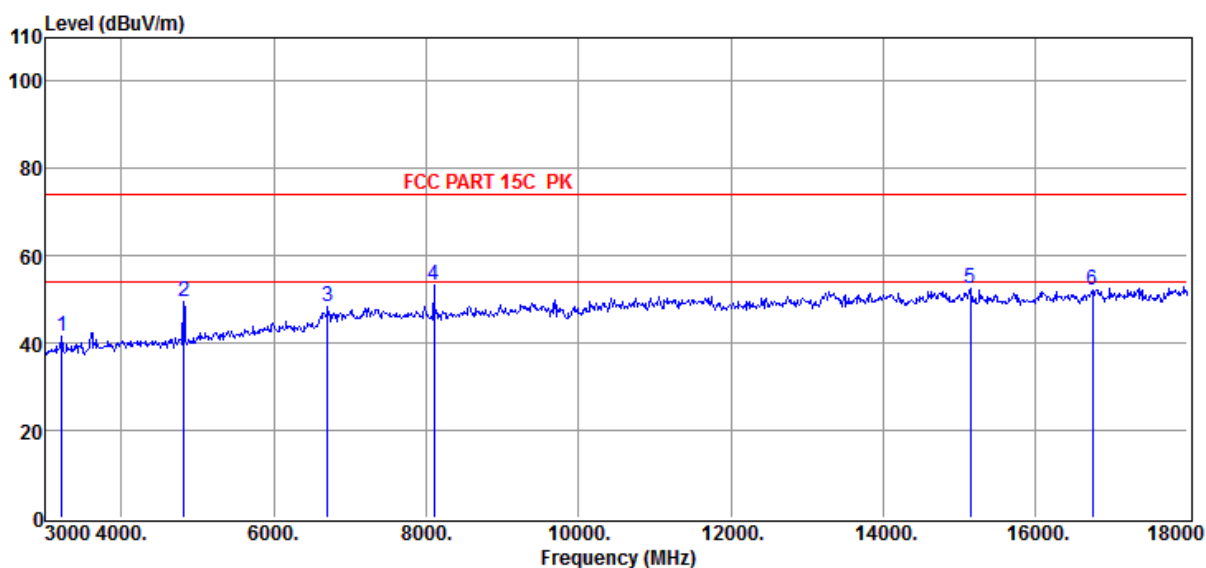
Model Number : OS-R-DR02-A

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 2422+ESP32 11B 2412

Data: 102



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3210.00	43.93	29.70	-32.09	41.54	74.00	-32.46	Peak	HORIZONTAL
2	4815.00	48.87	32.53	-31.72	49.68	74.00	-24.32	Peak	HORIZONTAL
3	6705.00	43.70	36.13	-31.49	48.34	74.00	-25.66	Peak	HORIZONTAL
4	8100.00	47.55	37.08	-31.38	53.25	74.00	-20.75	Peak	HORIZONTAL
5	15150.00	40.91	38.76	-27.07	52.60	74.00	-21.40	Peak	HORIZONTAL
6	16755.00	37.27	41.02	-26.14	52.15	74.00	-21.85	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup

Same as section 4.1

9.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

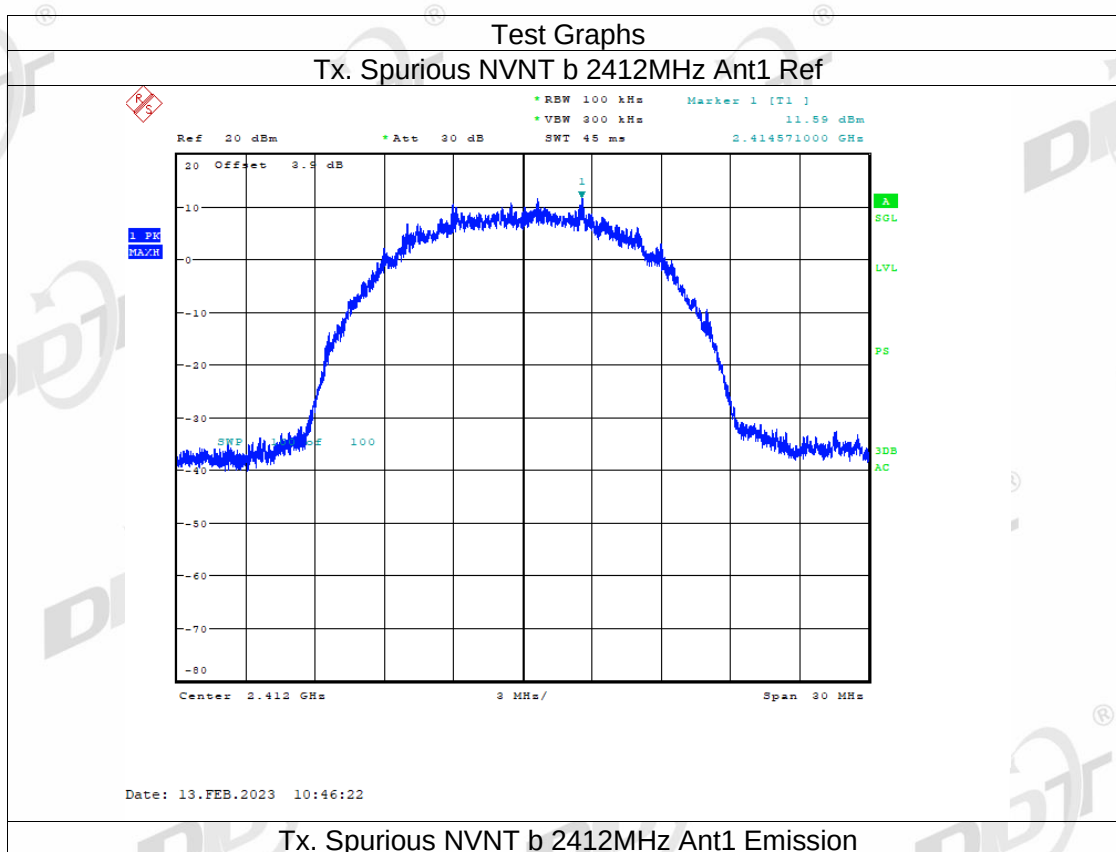
RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span}/\text{RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

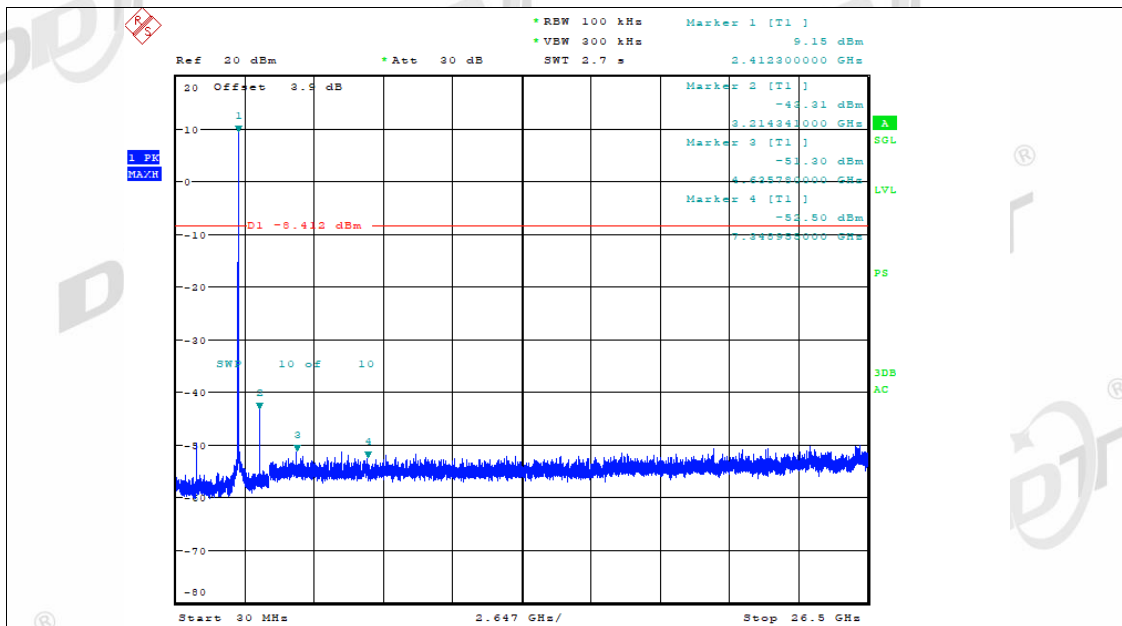
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

9.4. Test result

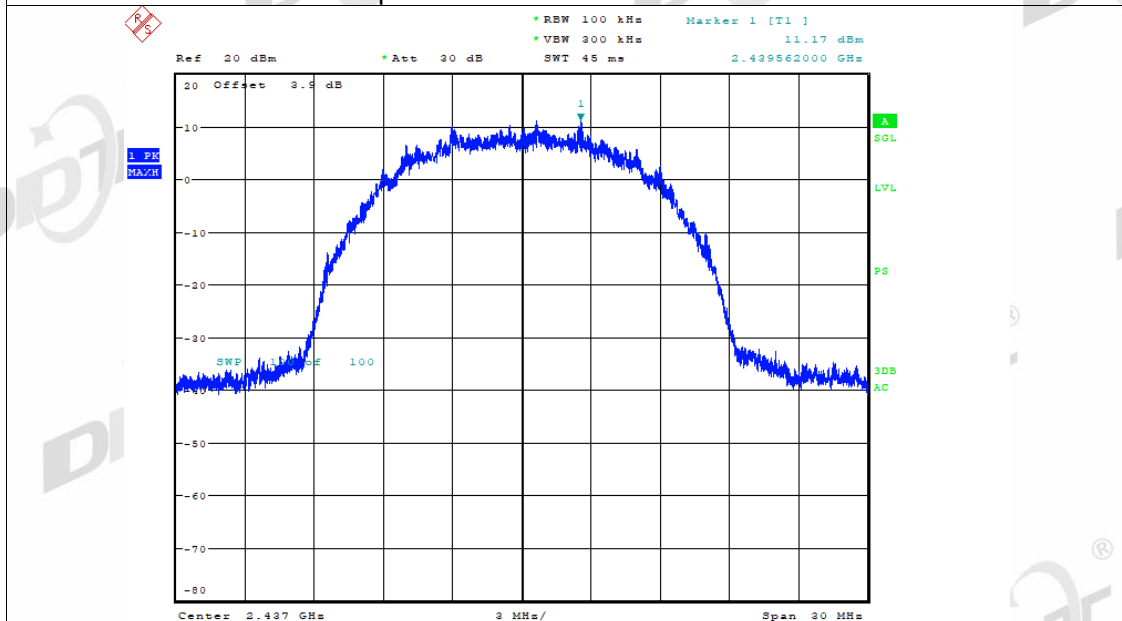
EUT Set Mode	CH or Frequency	Ant1 Result (dBm)	EUT Set Mode	CH or Frequency	Ant1 Result Result (dBm)
11b	CH1	Pass	11n HT 20	CH1	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH11	Pass
11g	CH1	Pass	11n HT 40	CH3	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH9	Pass

9.5. Original test data

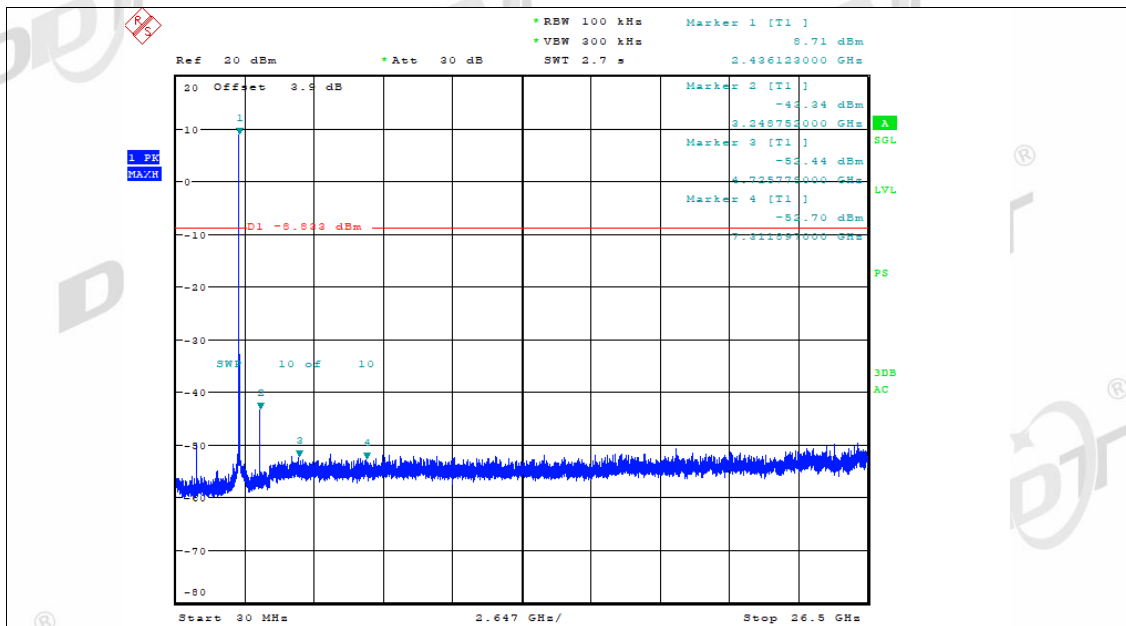




Tx. Spurious NVNT b 2437MHz Ant1 Ref

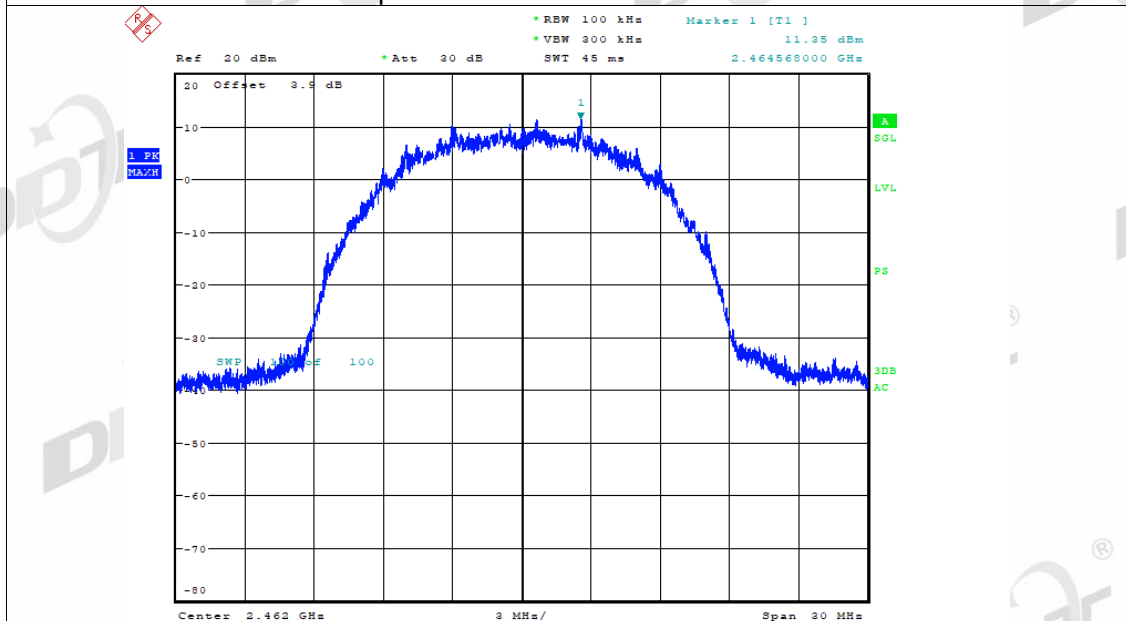


Tx. Spurious NVNT b 2437MHz Ant1 Emission



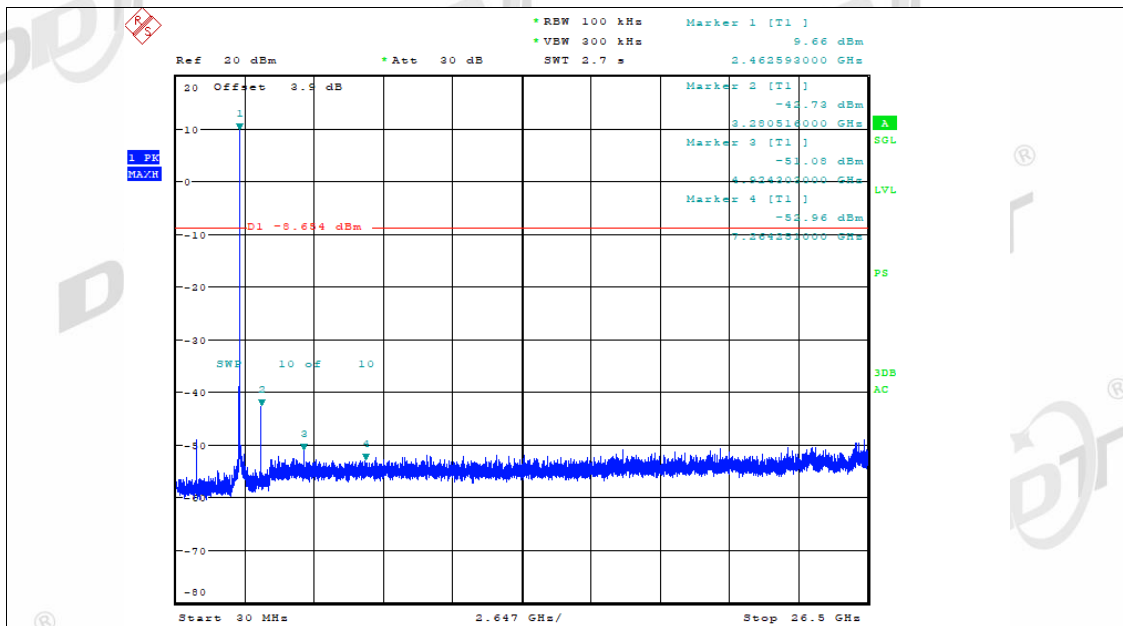
Date: 13.FEB.2023 10:56:33

Tx. Spurious NVNT b 2462MHz Ant1 Ref



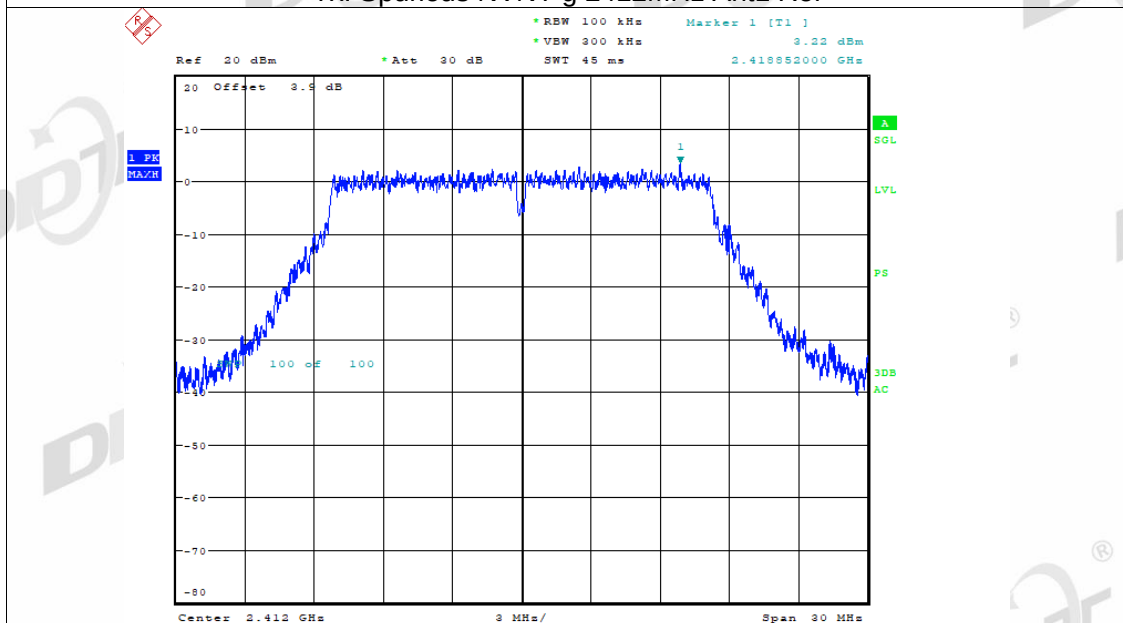
Date: 13.FEB.2023 11:02:29

Tx. Spurious NVNT b 2462MHz Ant1 Emission



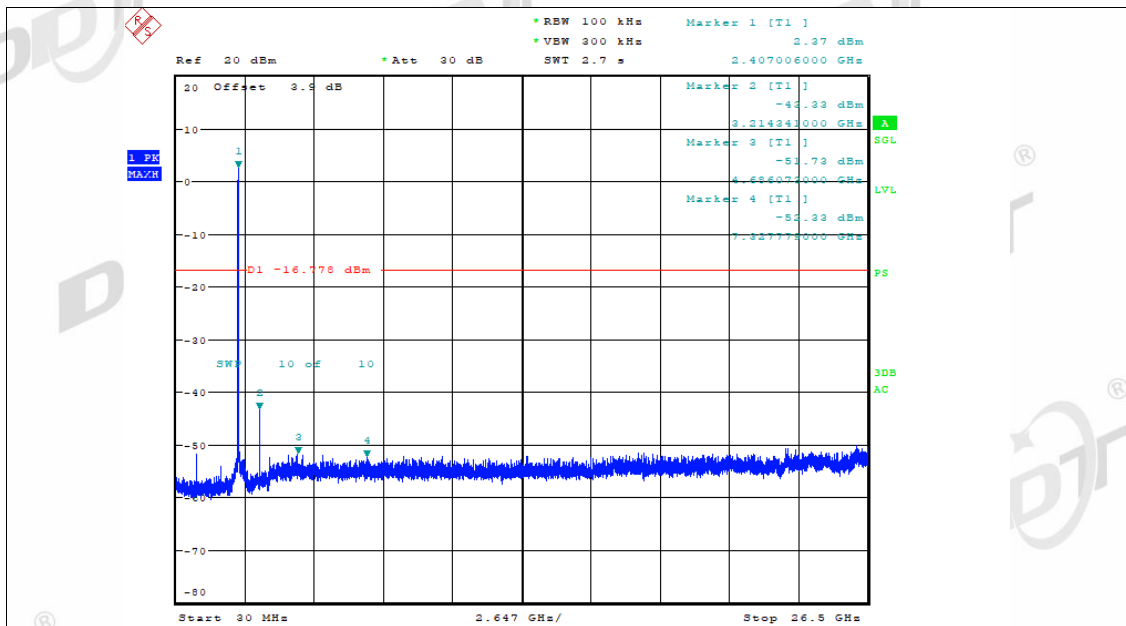
Date: 13.FEB.2023 11:03:03

Tx. Spurious NVNT g 2412MHz Ant1 Ref



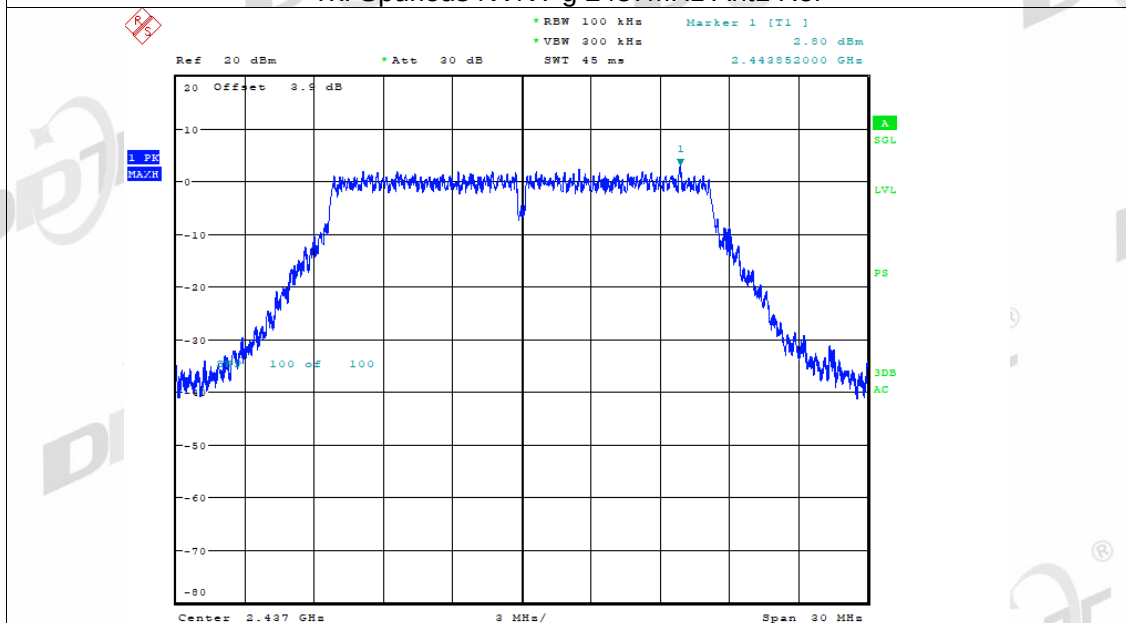
Date: 13.FEB.2023 10:25:22

Tx. Spurious NVNT g 2412MHz Ant1 Emission



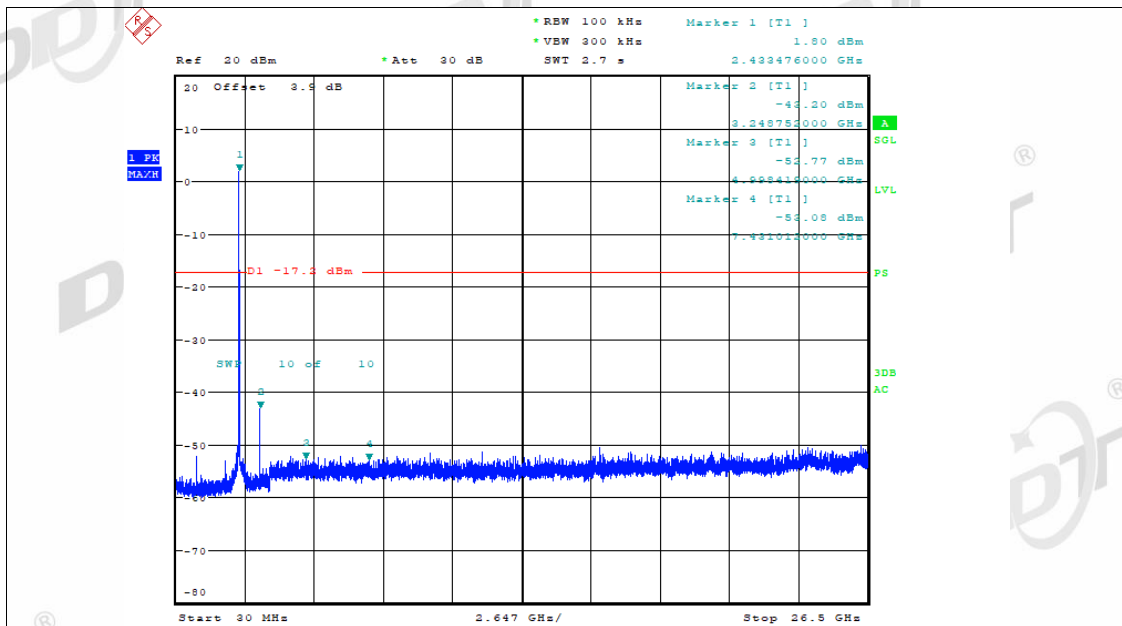
Date: 13.FEB.2023 10:25:55

Tx. Spurious NVNT g 2437MHz Ant1 Ref



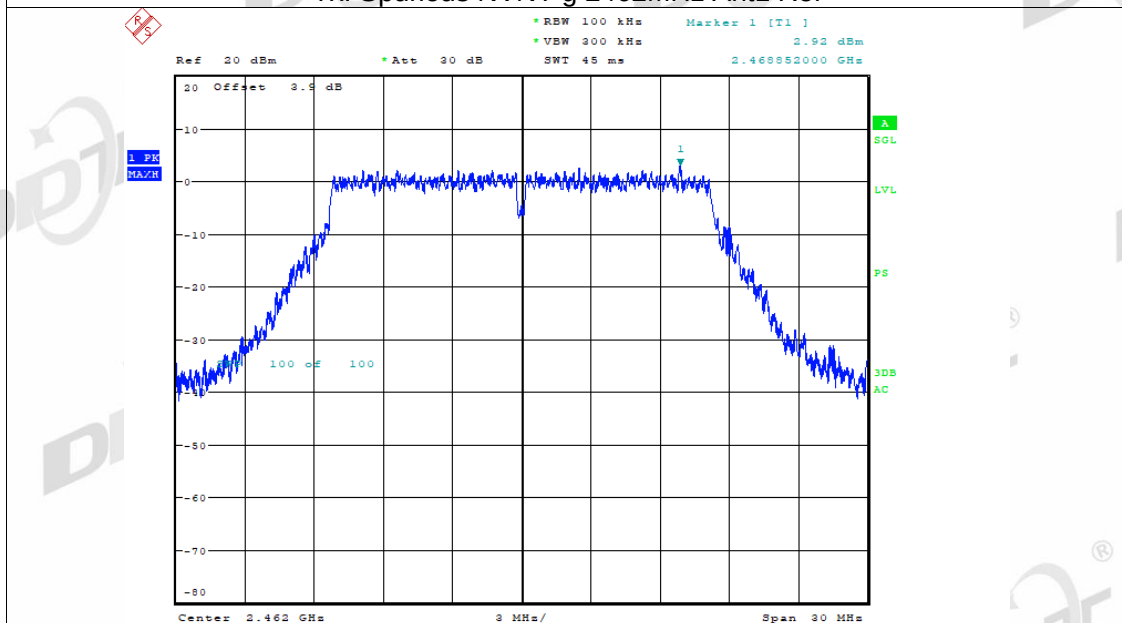
Date: 13.FEB.2023 10:33:19

Tx. Spurious NVNT g 2437MHz Ant1 Emission



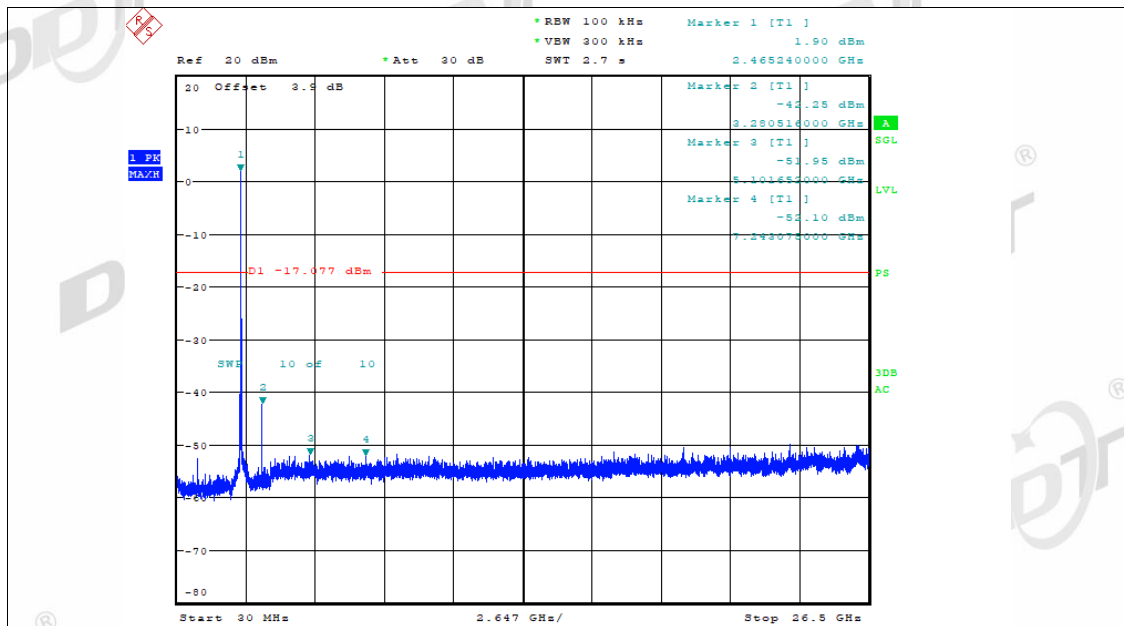
Date: 13.FEB.2023 10:33:52

Tx. Spurious NVNT g 2462MHz Ant1 Ref



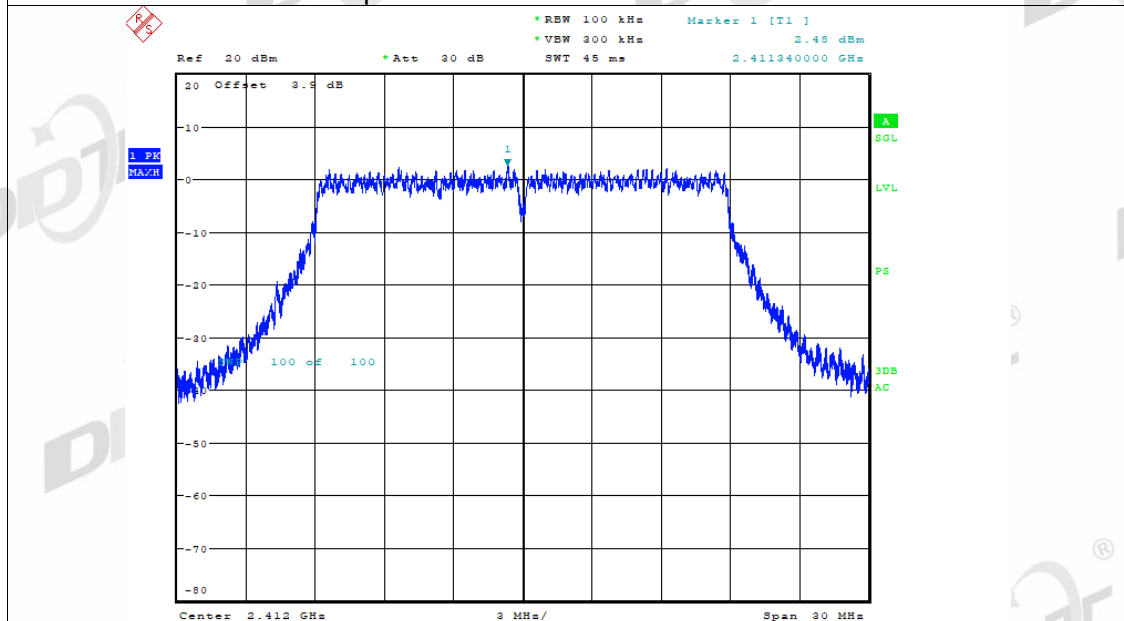
Date: 13.FEB.2023 10:40:29

Tx. Spurious NVNT g 2462MHz Ant1 Emission



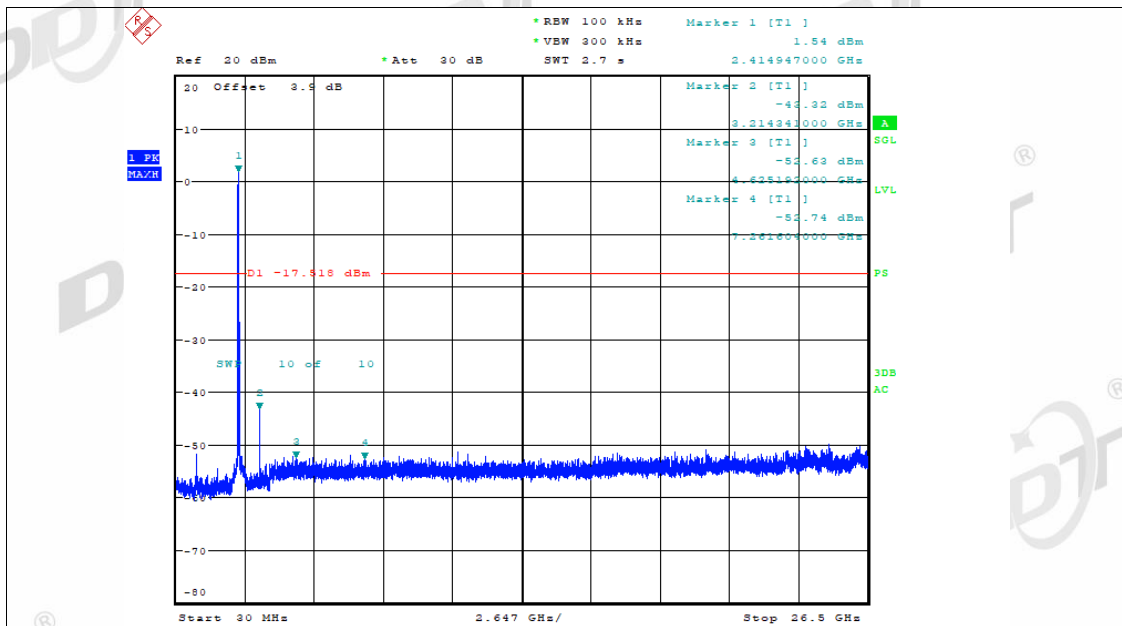
Date: 13.FEB.2023 10:41:03

Tx. Spurious NVNT n20 2412MHz Ant1 Ref



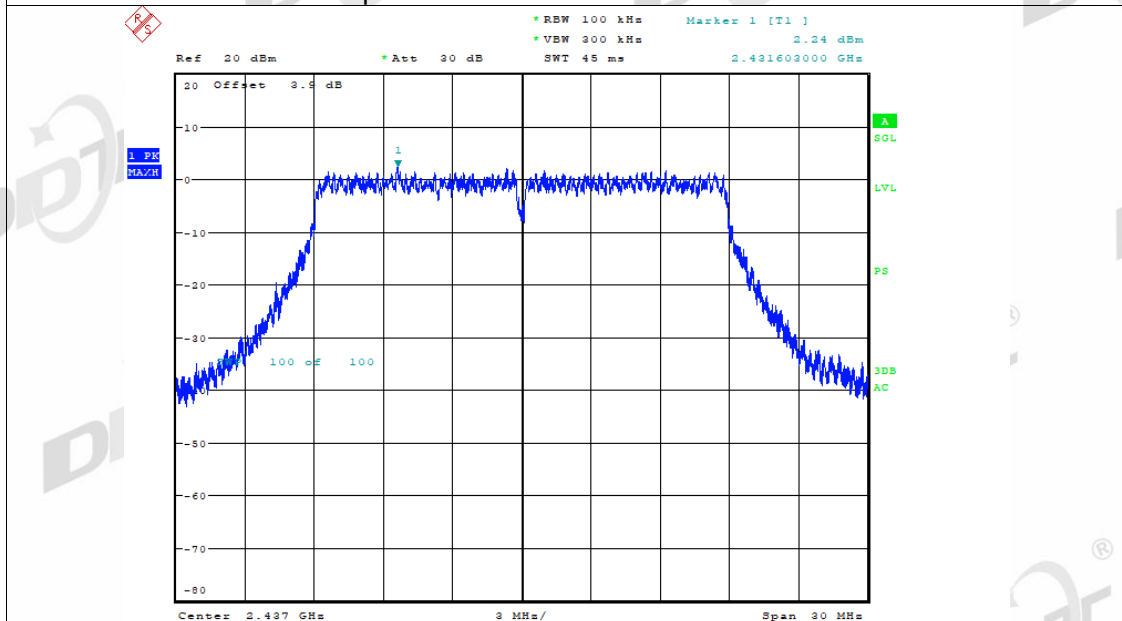
Date: 13.FEB.2023 10:06:06

Tx. Spurious NVNT n20 2412MHz Ant1 Emission



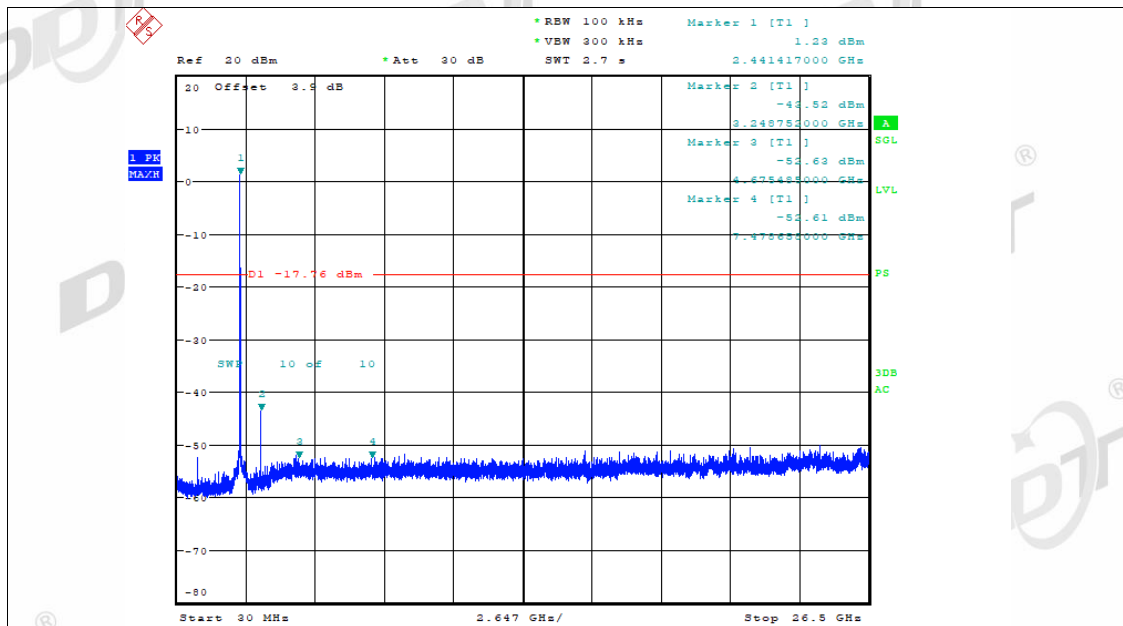
Date: 13.FEB.2023 10:06:40

Tx. Spurious NVNT n20 2437MHz Ant1 Ref



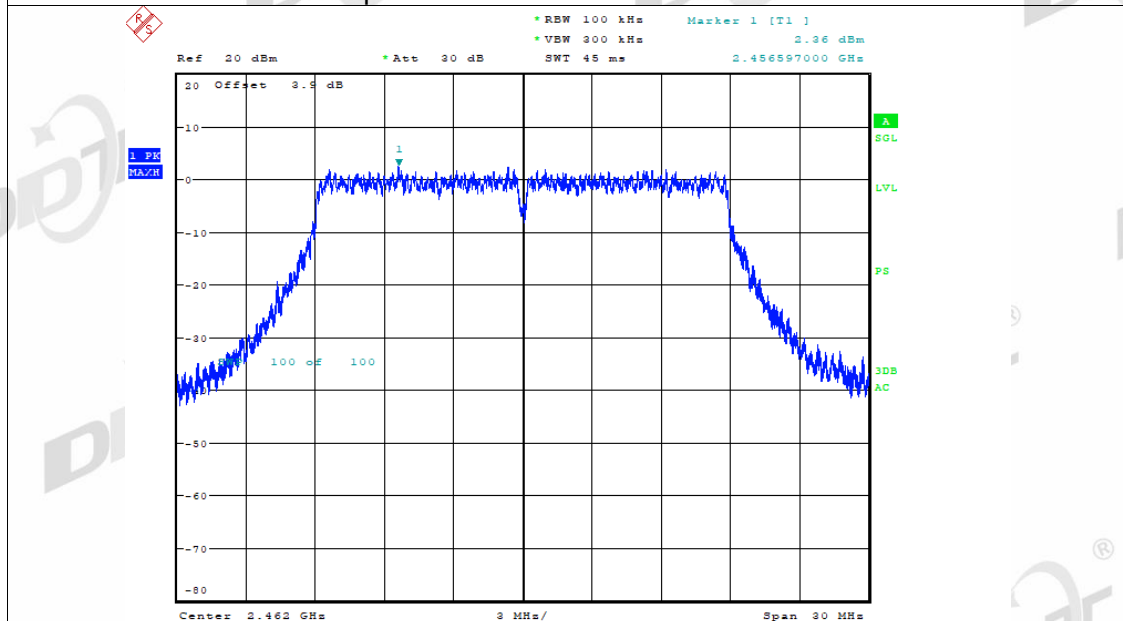
Date: 13.FEB.2023 10:10:03

Tx. Spurious NVNT n20 2437MHz Ant1 Emission



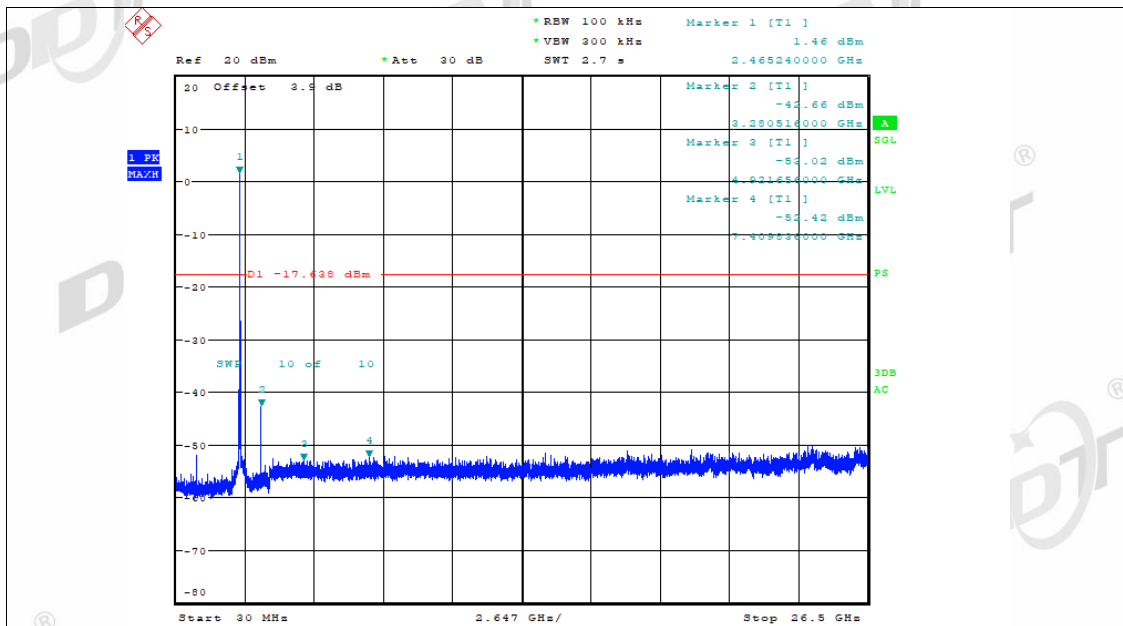
Date: 13.FEB.2023 10:10:36

Tx. Spurious NVNT n20 2462MHz Ant1 Ref



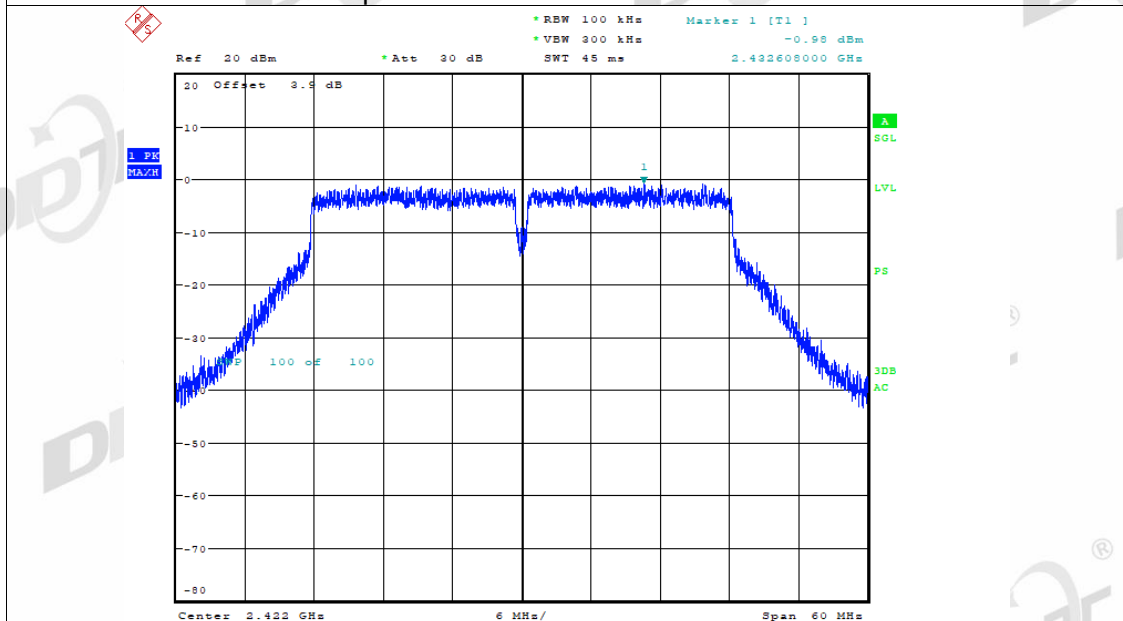
Date: 13.FEB.2023 10:18:35

Tx. Spurious NVNT n20 2462MHz Ant1 Emission



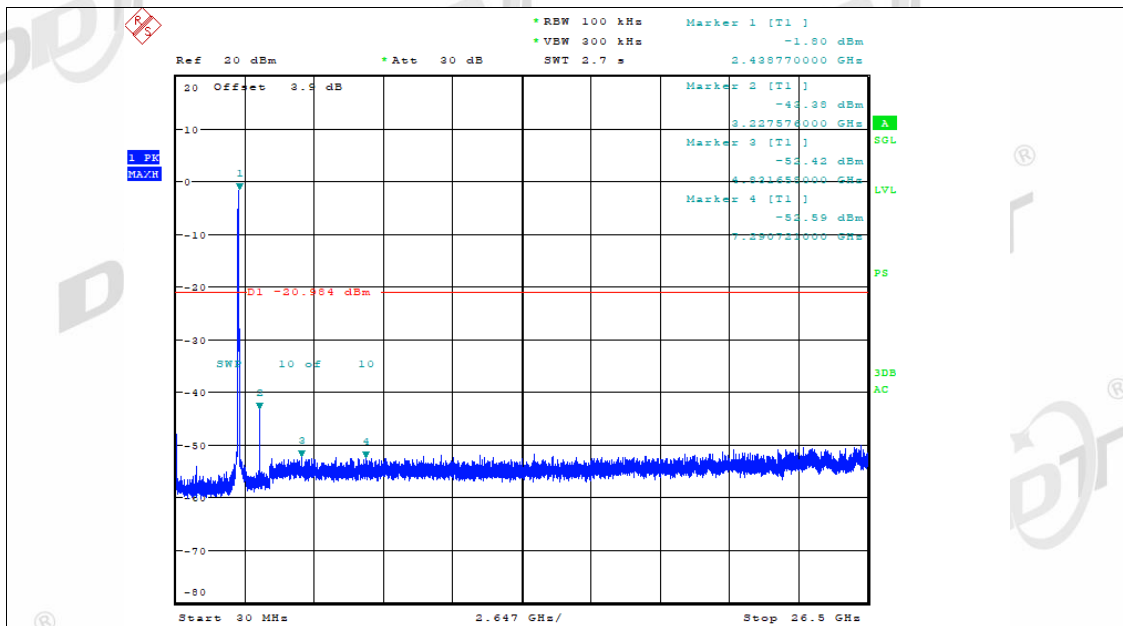
Date: 13.FEB.2023 10:19:08

Tx. Spurious NVNT n40 2422MHz Ant1 Ref



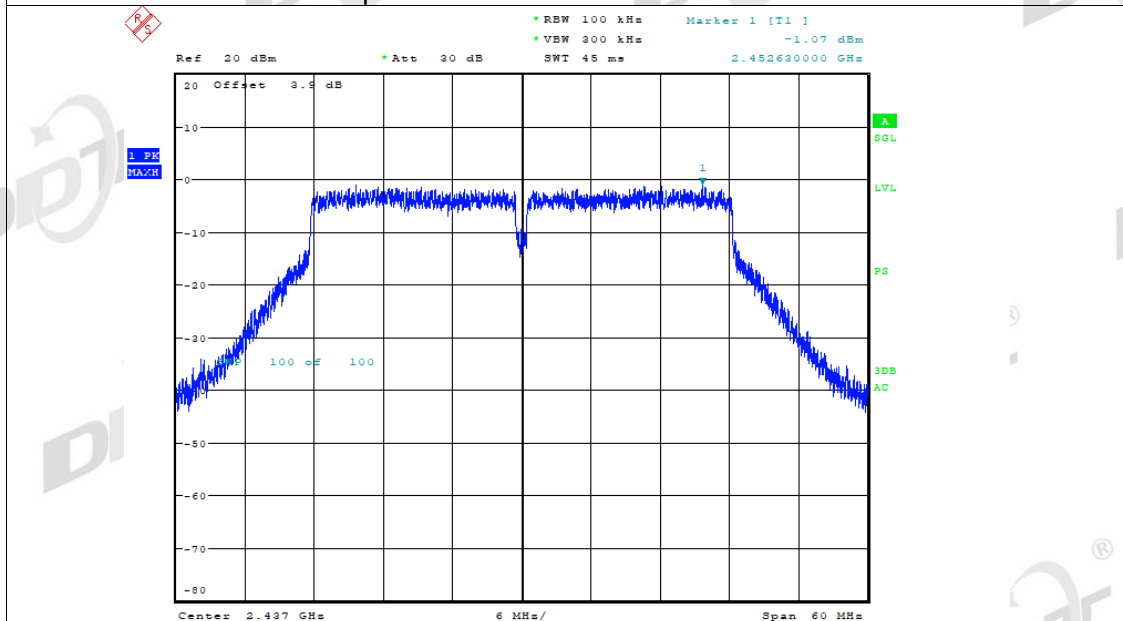
Date: 13.FEB.2023 09:52:53

Tx. Spurious NVNT n40 2422MHz Ant1 Emission



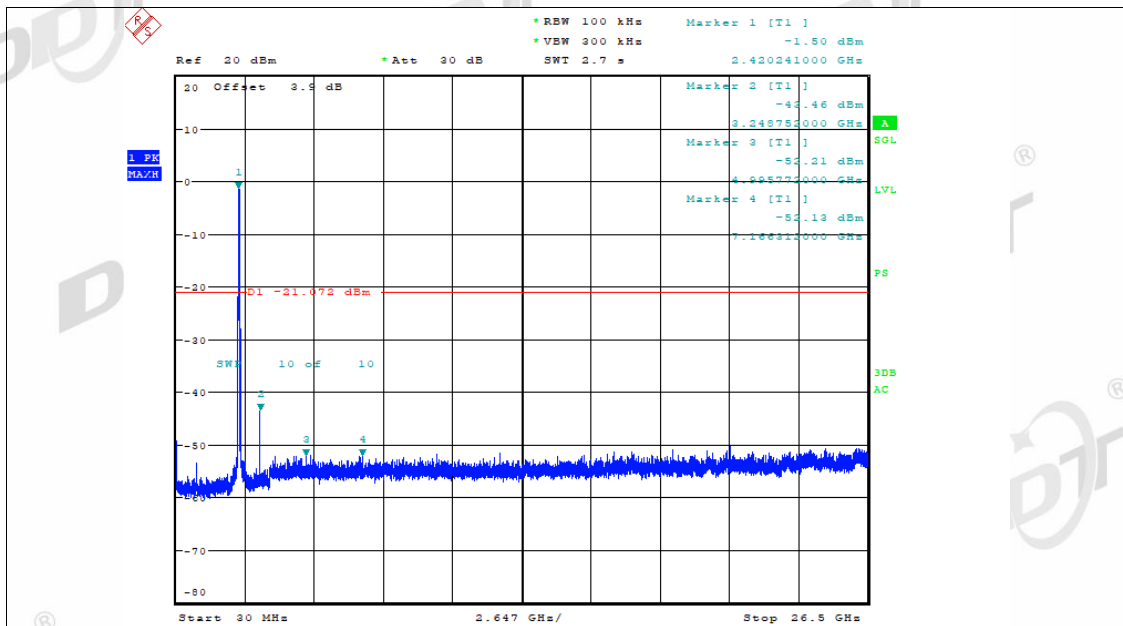
Date: 13.FEB.2023 09:53:27

Tx. Spurious NVNT n40 2437MHz Ant1 Ref



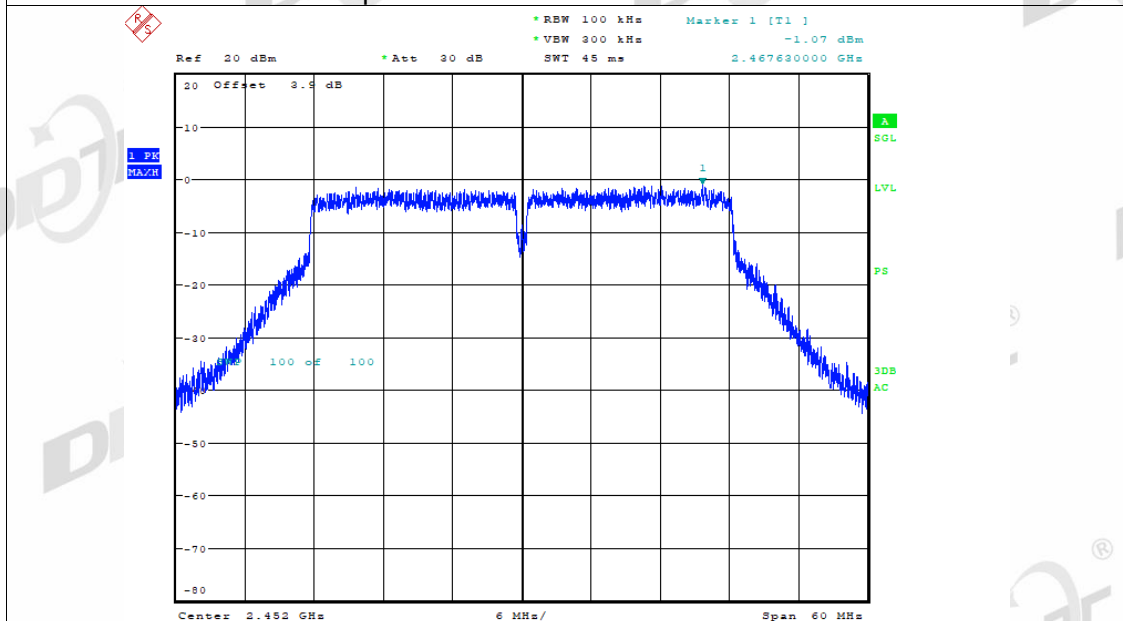
Date: 13.FEB.2023 09:56:39

Tx. Spurious NVNT n40 2437MHz Ant1 Emission



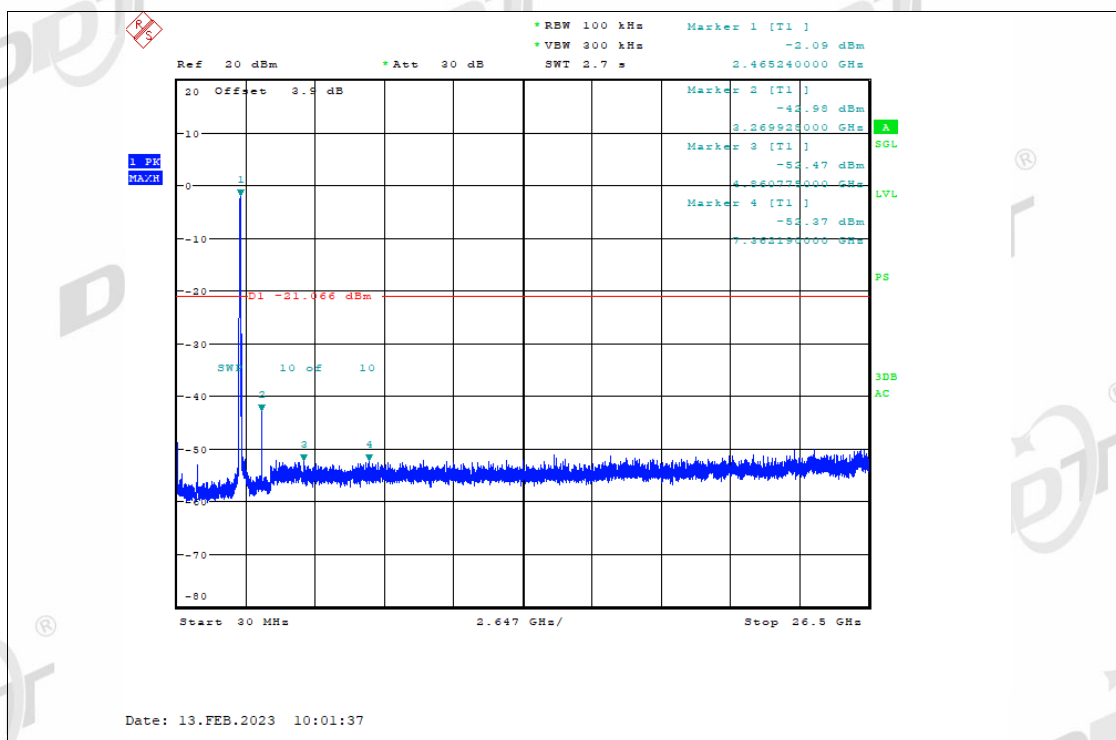
Date: 13.FEB.2023 09:57:12

Tx. Spurious NVNT n40 2452MHz Ant1 Ref



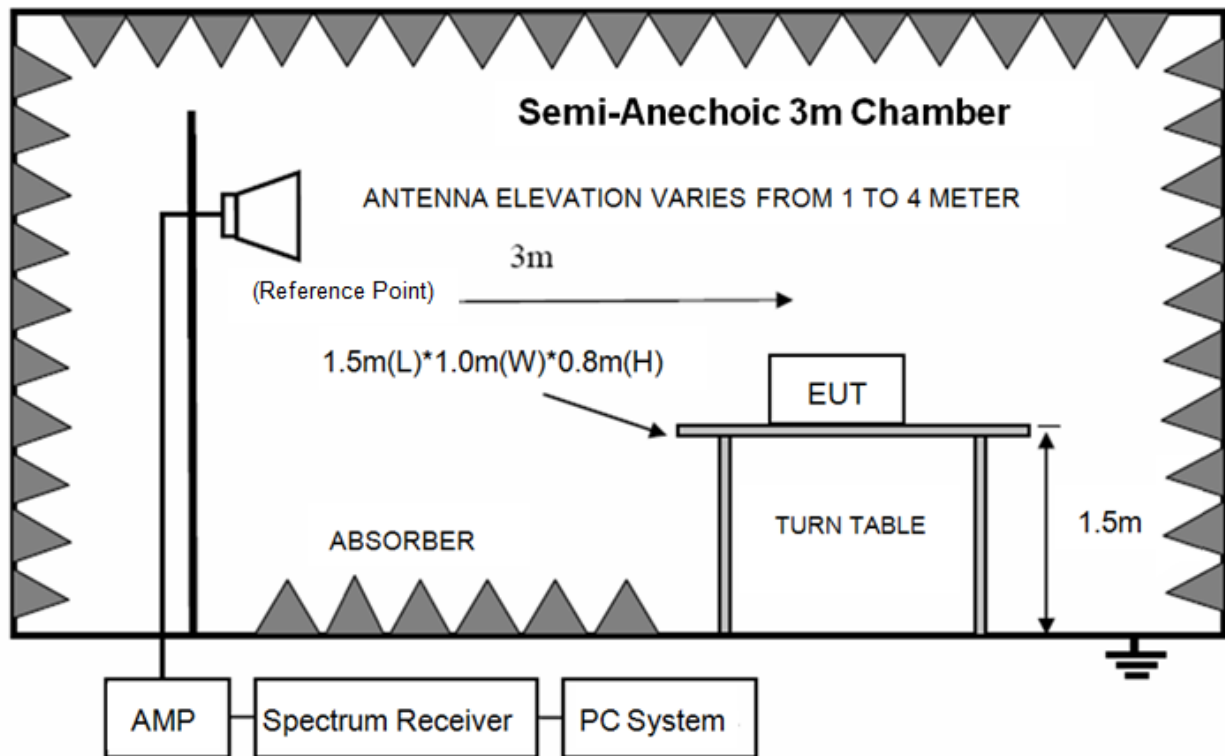
Date: 13.FEB.2023 10:01:03

Tx. Spurious NVNT n40 2452MHz Ant1 Emission



10. Radiated Band Edge Compliance

10.1. Block diagram of test setup



10.2. Limit

All restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400 MHz to 2483.5 MHz shall be at least 20dB below the fundamental emissions or comply with RSS-Gen Issue 3 clause 7.2.5 (Same as FCC 15.209) limits.

10.3. Test procedure

Same with clause 8.3 except change investigated frequency range.

Remark: All restriction band have been tested, and shown in report.

10.4. Test result

Pass. (See below detailed test result)

Note: All modes were test and the worst case was record in this report.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

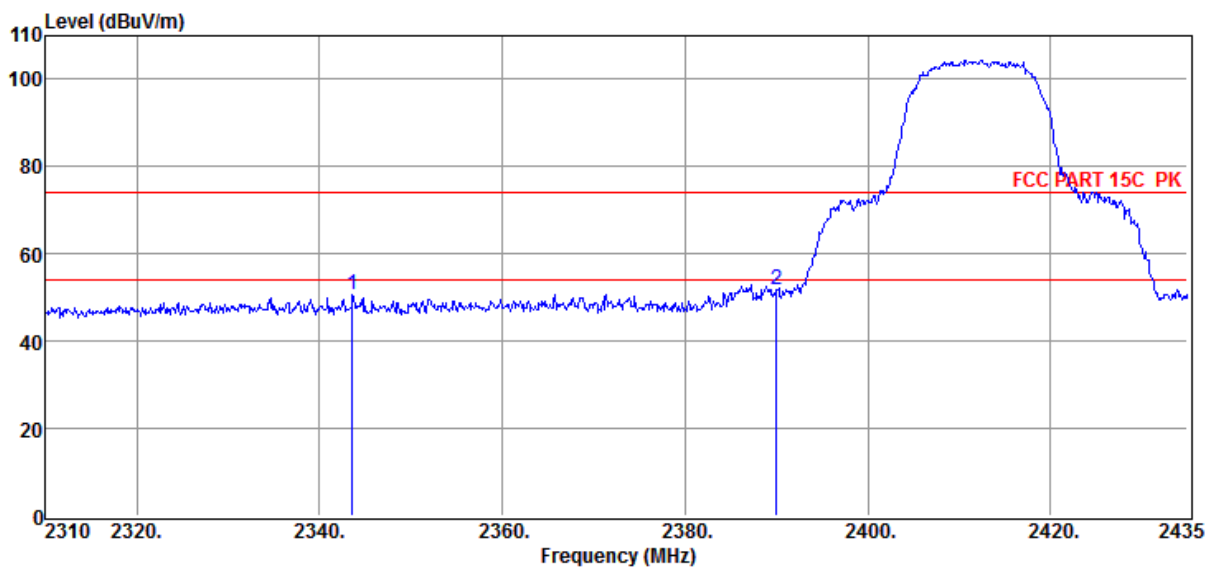
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2412MHz ESP32

Data: 219



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2343.63	47.49	34.51	-31.49	50.51	74.00	-23.49	Peak	HORIZONTAL
2	2390.00	48.53	35.00	-31.70	51.83	74.00	-22.17	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

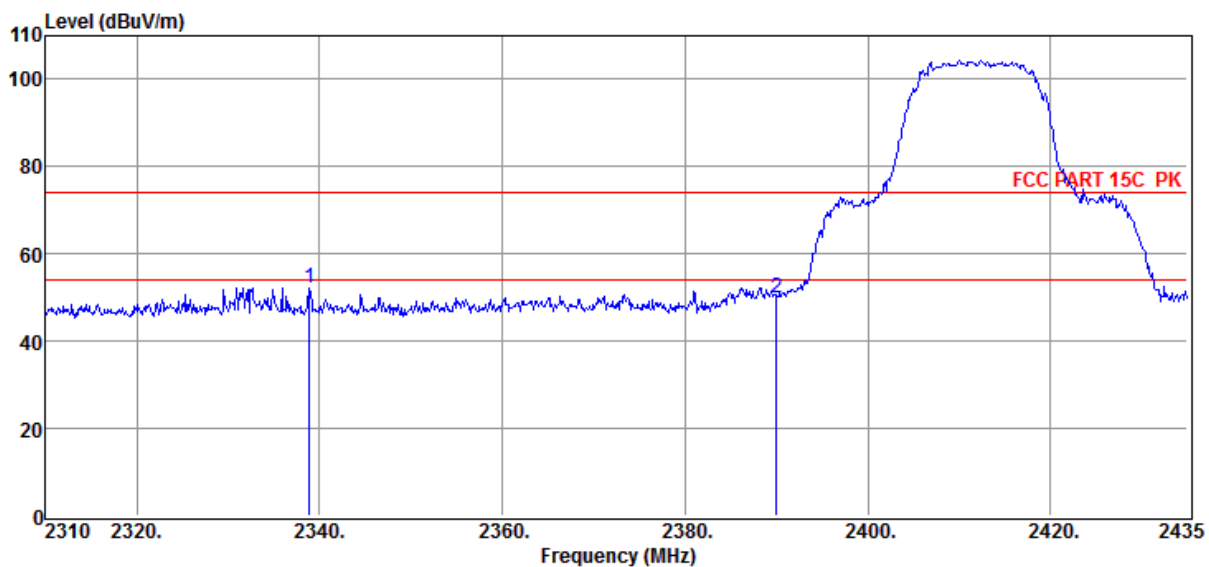
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2412MHz ESP32

Data: 220



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2338.88	49.43	34.44	-31.54	52.33	74.00	-21.67	Peak	VERTICAL
2	2390.00	46.78	35.00	-31.70	50.08	74.00	-23.92	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

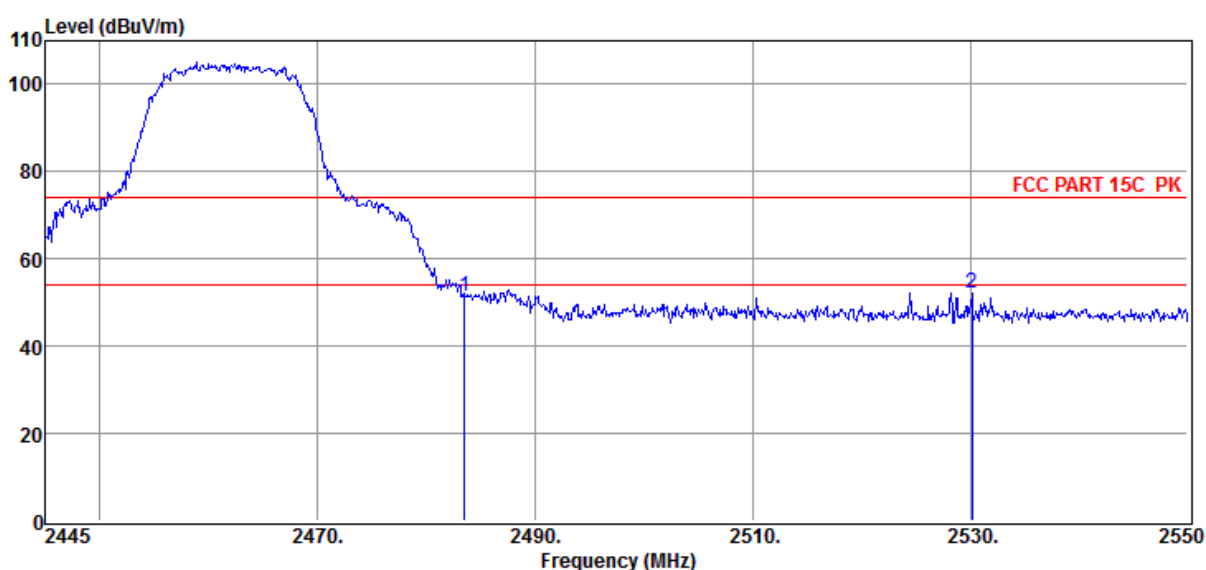
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2462MHz ESP32

Data: 221



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.86	35.10	-31.58	51.38	74.00	-22.62	Peak	VERTICAL
2	2530.16	47.90	35.68	-31.35	52.23	74.00	-21.77	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

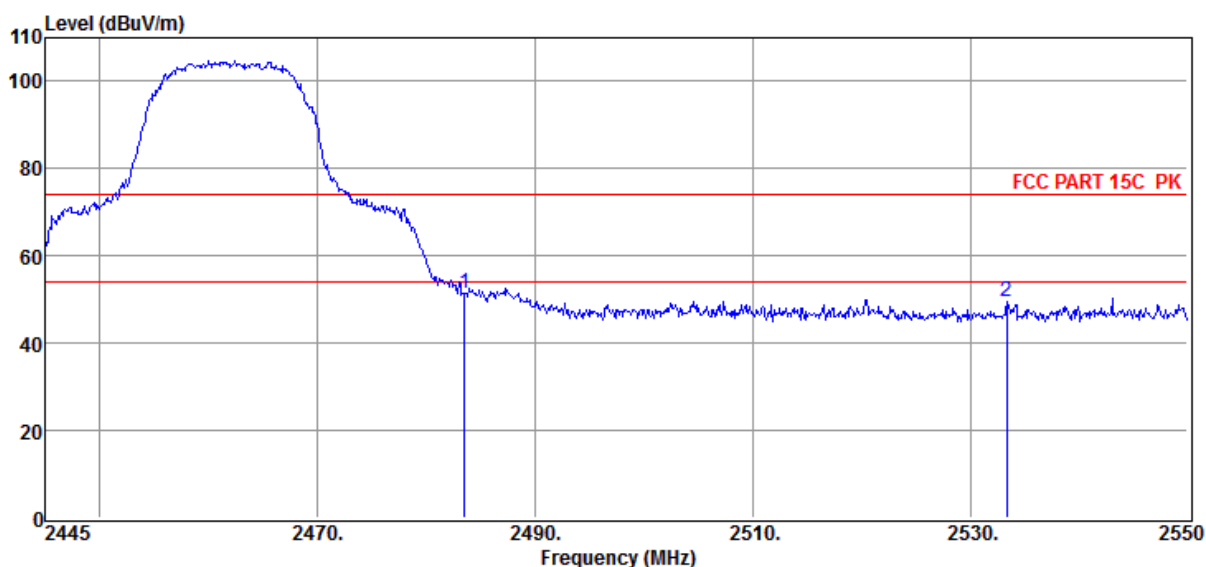
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B 1M 2462MHz ESP32

Data: 222



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.79	35.10	-31.58	51.31	74.00	-22.69	Peak	HORIZONTAL
2	2533.41	45.30	35.73	-31.33	49.70	74.00	-24.30	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

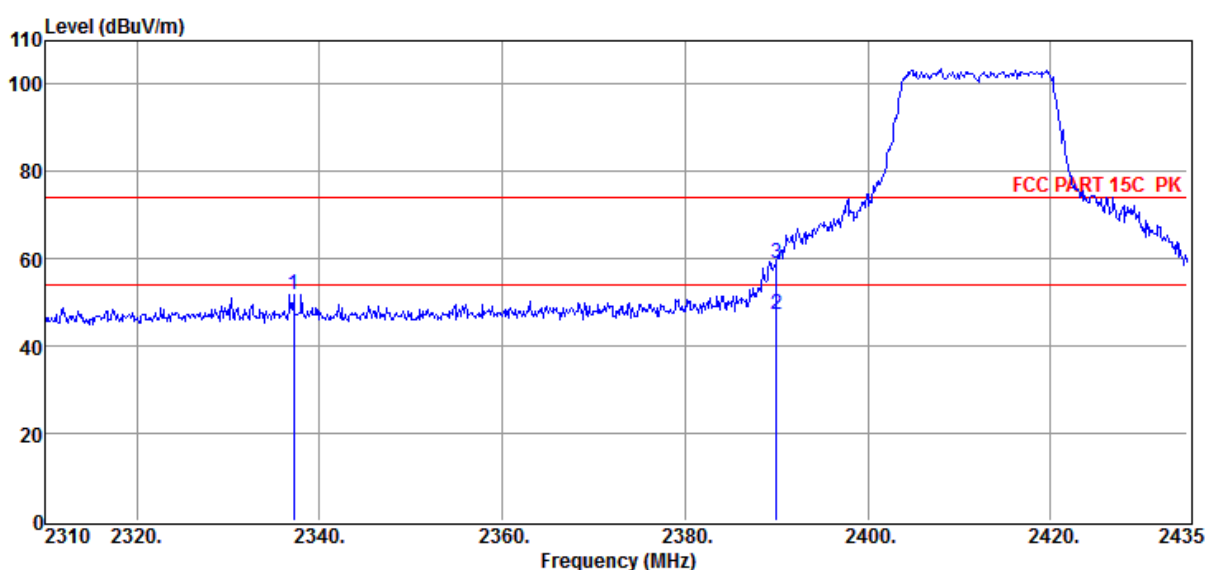
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2412MHz ESP32

Data: 223



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2337.13	49.04	34.42	-31.56	51.90	74.00	-22.10	Peak	VERTICAL
2	2390.00	44.13	35.00	-31.70	47.43	54.00	-6.57	Average	VERTICAL
3	2390.00	55.75	35.00	-31.70	59.05	74.00	-14.95	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

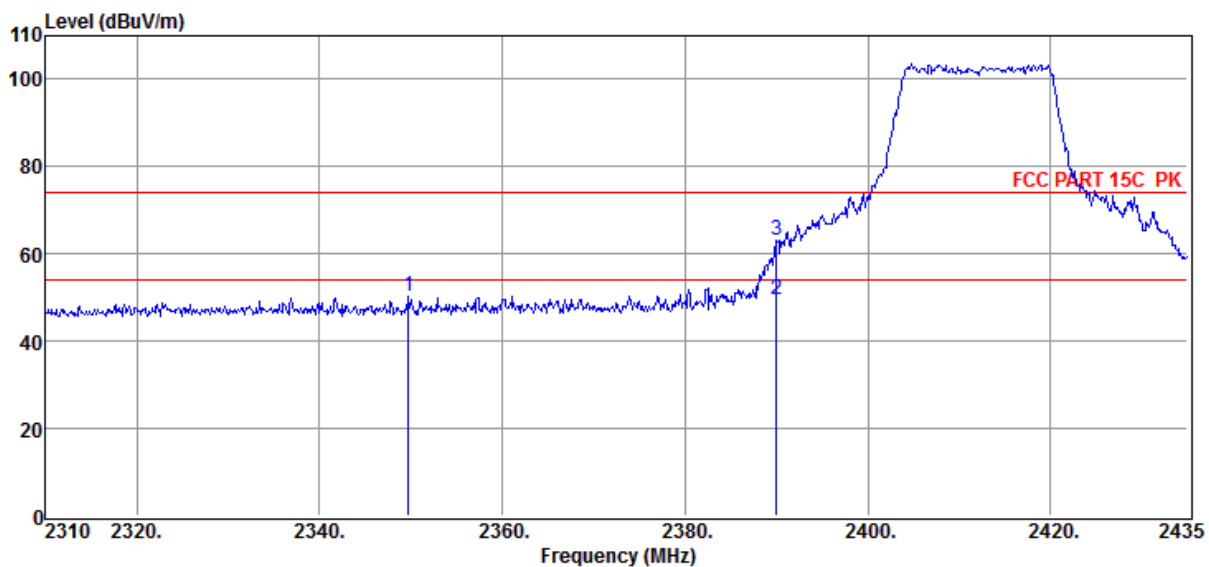
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2412MHz ESP32

Data: 224



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2349.75	47.23	34.60	-31.41	50.42	74.00	-23.58	Peak	HORIZONTAL
2	2390.00	46.25	35.00	-31.70	49.55	54.00	-4.45	Average	HORIZONTAL
3	2390.00	59.78	35.00	-31.70	63.08	74.00	-10.92	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

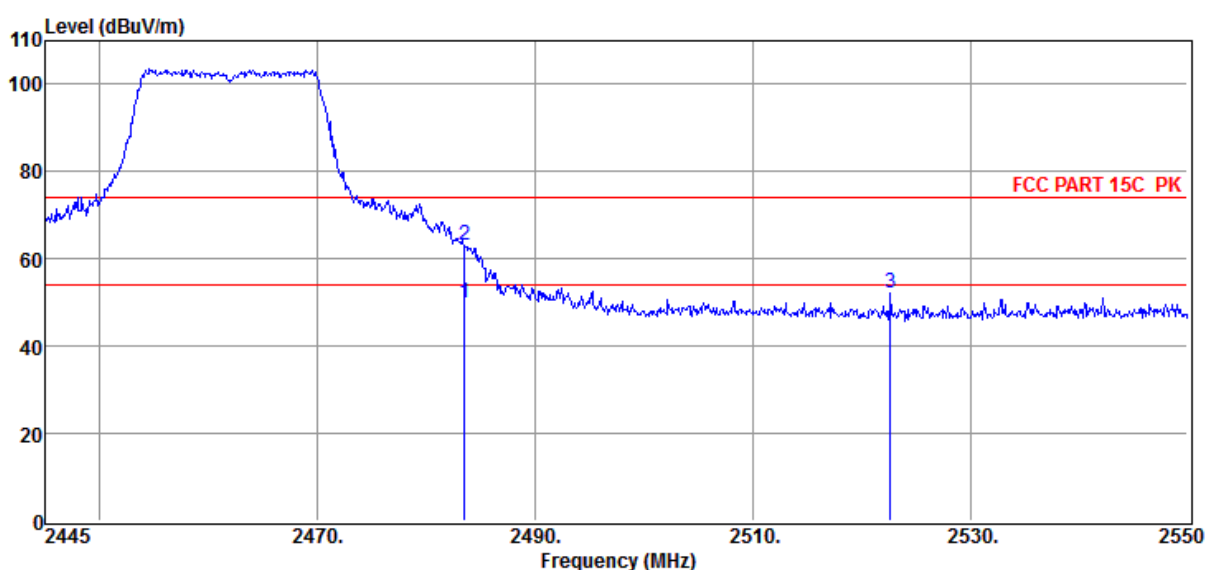
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2462MHz ESP32

Data: 225



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.25	35.10	-31.58	49.77	54.00	-4.23	Average	VERTICAL
2	2483.50	59.52	35.10	-31.58	63.04	74.00	-10.96	Peak	VERTICAL
3	2522.70	47.93	35.56	-31.40	52.09	74.00	-21.91	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

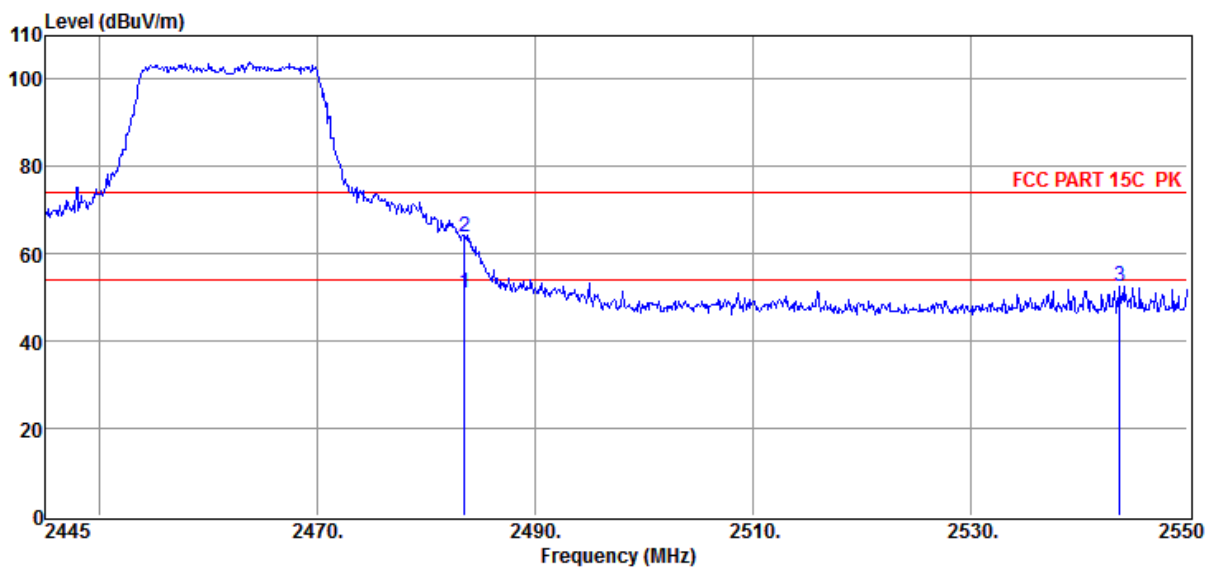
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G 6M 2462MHz ESP32

Data: 226



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.35	35.10	-31.58	50.87	54.00	-3.13	Average	HORIZONTAL
2	2483.50	60.21	35.10	-31.58	63.73	74.00	-10.27	Peak	HORIZONTAL
3	2543.81	48.08	35.90	-31.25	52.73	74.00	-21.27	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

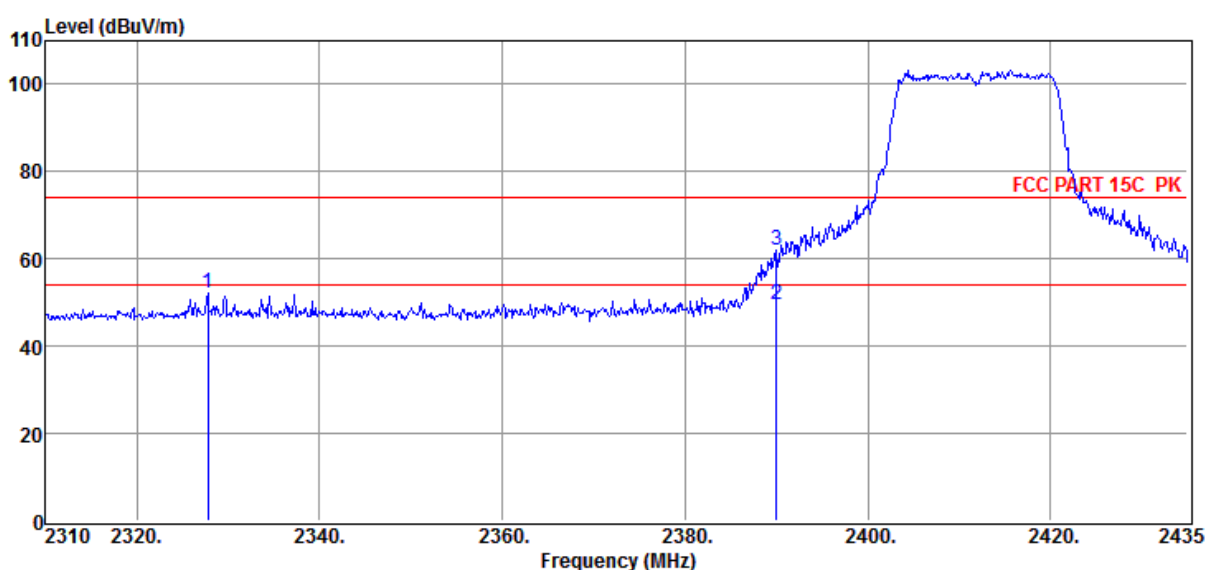
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2412MHz ESP32

Data: 227



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2327.75	49.53	34.29	-31.67	52.15	74.00	-21.85	Peak	HORIZONTAL
2	2390.00	46.28	35.00	-31.70	49.58	54.00	-4.42	Average	HORIZONTAL
3	2390.00	58.88	35.00	-31.70	62.18	74.00	-11.82	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

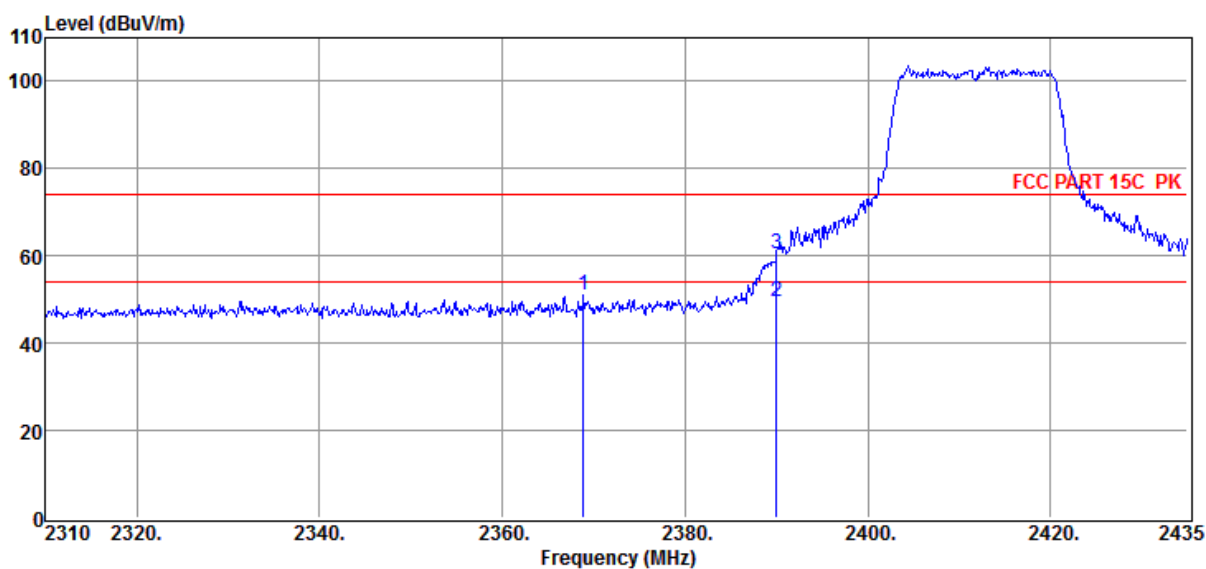
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2412MHz ESP32

Data: 228



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2368.88	47.78	34.79	-31.55	51.02	74.00	-22.98	Peak	VERTICAL
2	2390.00	46.16	35.00	-31.70	49.46	54.00	-4.54	Average	VERTICAL
3	2390.00	57.20	35.00	-31.70	60.50	74.00	-13.50	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

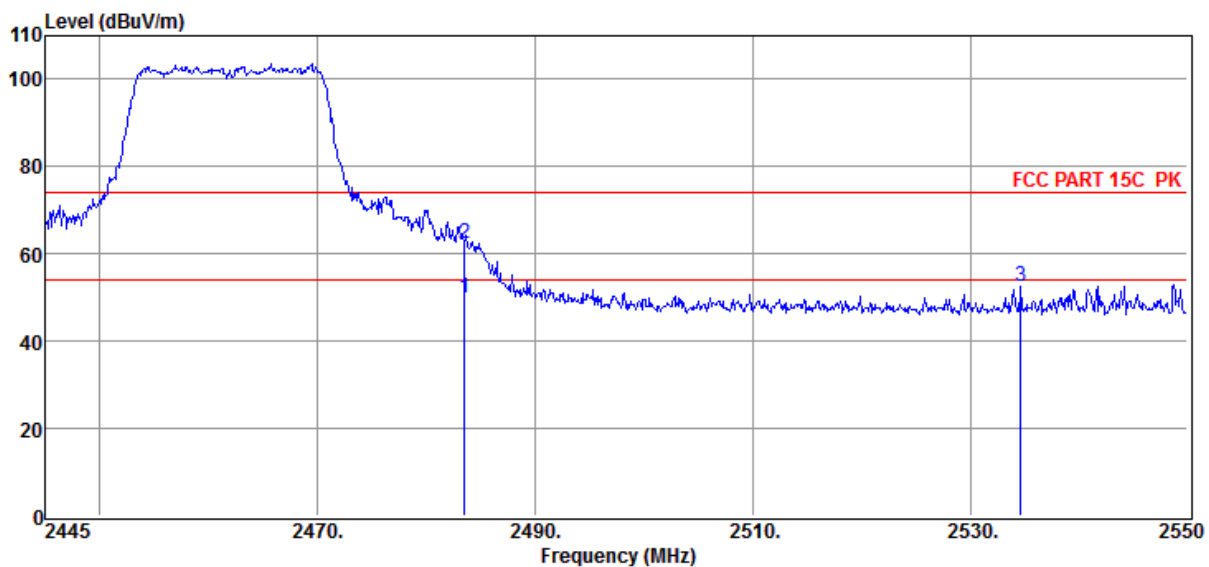
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2462MHz ESP32

Data: 229



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.21	35.10	-31.58	49.73	54.00	-4.27	Average	HORIZONTAL
2	2483.50	58.82	35.10	-31.58	62.34	74.00	-11.66	Peak	HORIZONTAL
3	2534.67	48.05	35.75	-31.32	52.48	74.00	-21.52	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

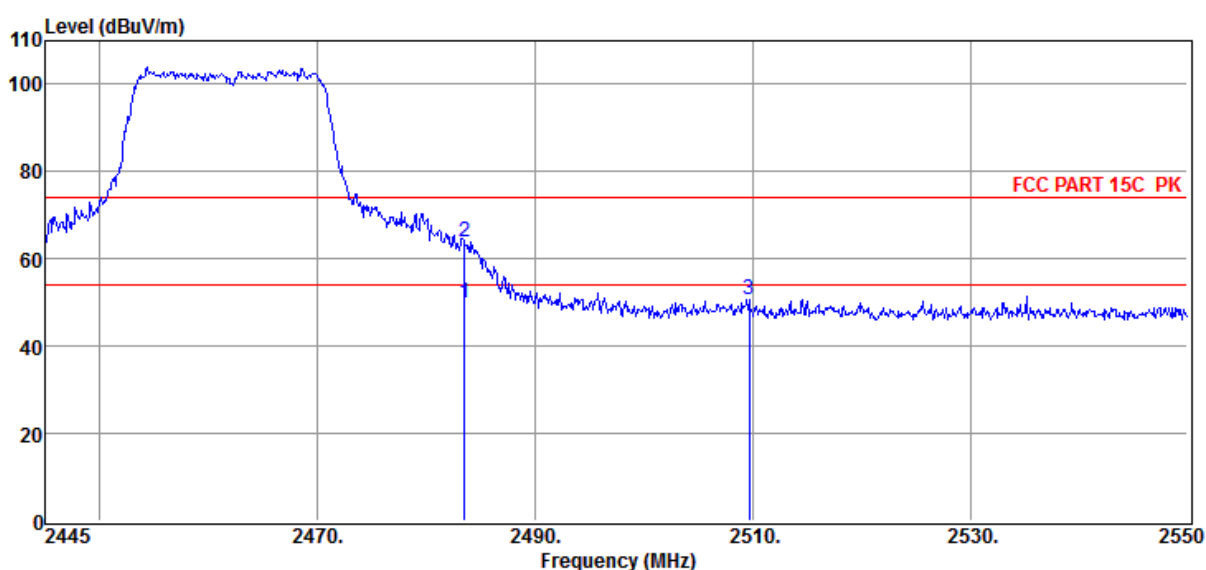
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS0 2462MHz ESP32

Data: 230



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.56	35.10	-31.58	50.08	54.00	-3.92	Average	VERTICAL
2	2483.50	60.53	35.10	-31.58	64.05	74.00	-9.95	Peak	VERTICAL
3	2509.68	46.76	35.35	-31.49	50.62	74.00	-23.38	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

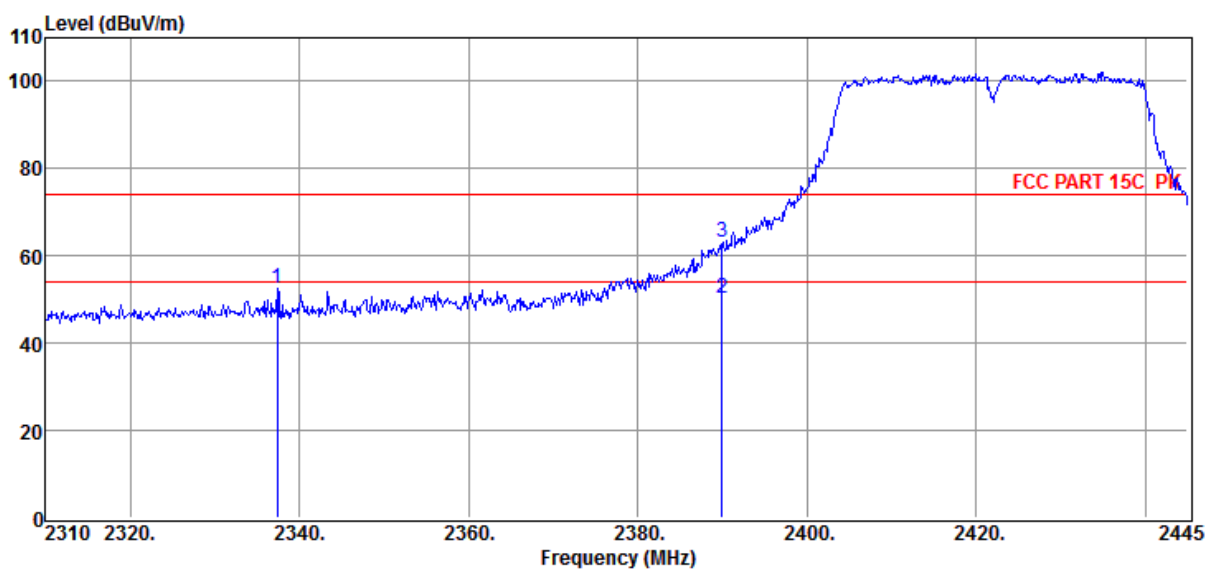
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2422MHz ESP32

Data: 231



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2337.41	49.72	34.42	-31.56	52.58	74.00	-21.42	Peak	VERTICAL
2	2390.00	46.84	35.00	-31.70	50.14	54.00	-3.86	Average	VERTICAL
3	2390.00	59.79	35.00	-31.70	63.09	74.00	-10.91	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

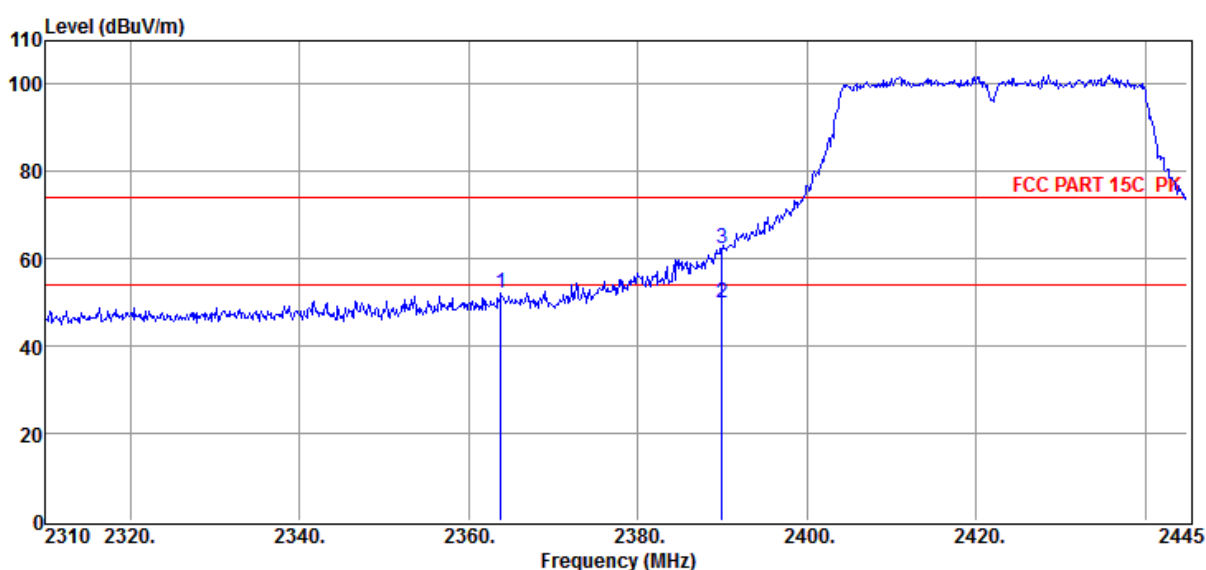
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2422MHz ESP32

Data: 232



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2363.87	49.10	34.74	-31.51	52.33	74.00	-21.67	Peak	HORIZONTAL
2	2390.00	46.52	35.00	-31.70	49.82	54.00	-4.18	Average	HORIZONTAL
3	2390.00	59.23	35.00	-31.70	62.53	74.00	-11.47	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

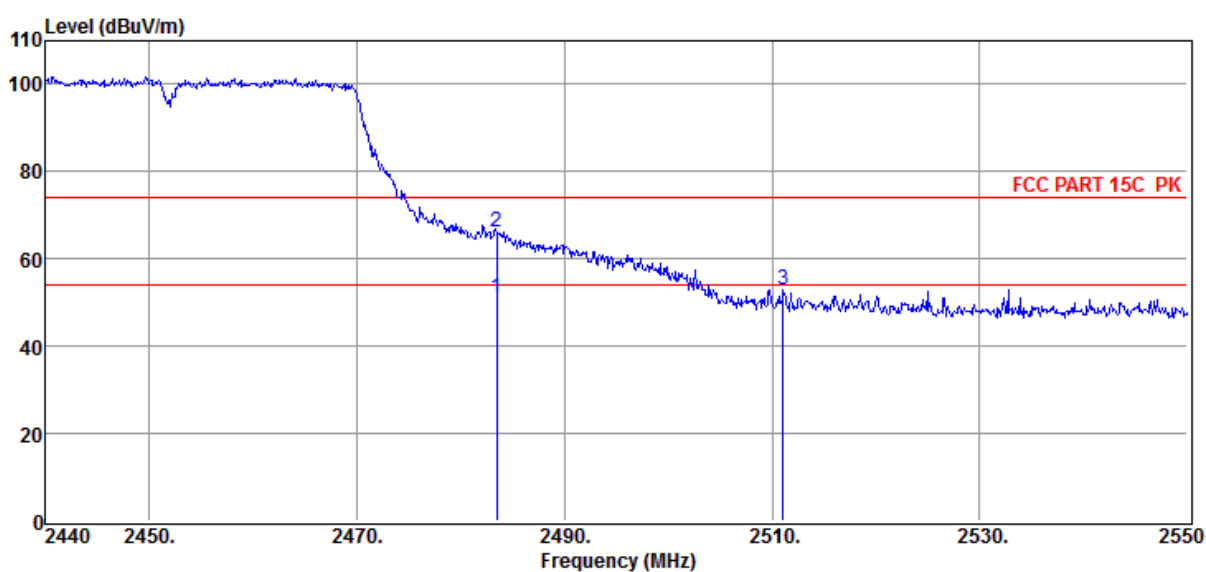
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2452MHz ESP32

Data: 233



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.36	35.10	-31.58	50.88	54.00	-3.12	Average	VERTICAL
2	2483.50	62.63	35.10	-31.58	66.15	74.00	-7.85	Peak	VERTICAL
3	2511.06	49.03	35.38	-31.48	52.93	74.00	-21.07	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 02-25-2023

Tested By : Sunny

EUT : AI Delivery Robot

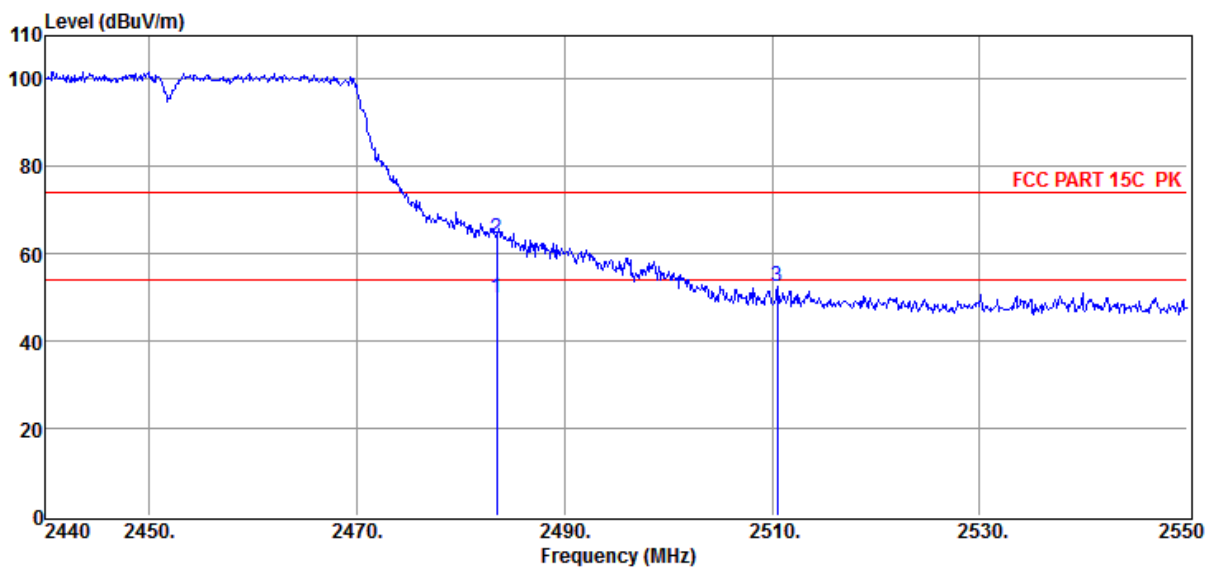
Model Number : OS-R-DR02

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS0 2452MHz ESP32

Data: 234



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.37	35.10	-31.58	49.89	54.00	-4.11	Average	HORIZONTAL
2	2483.50	59.83	35.10	-31.58	63.35	74.00	-10.65	Peak	HORIZONTAL
3	2510.51	48.60	35.37	-31.49	52.48	74.00	-21.52	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

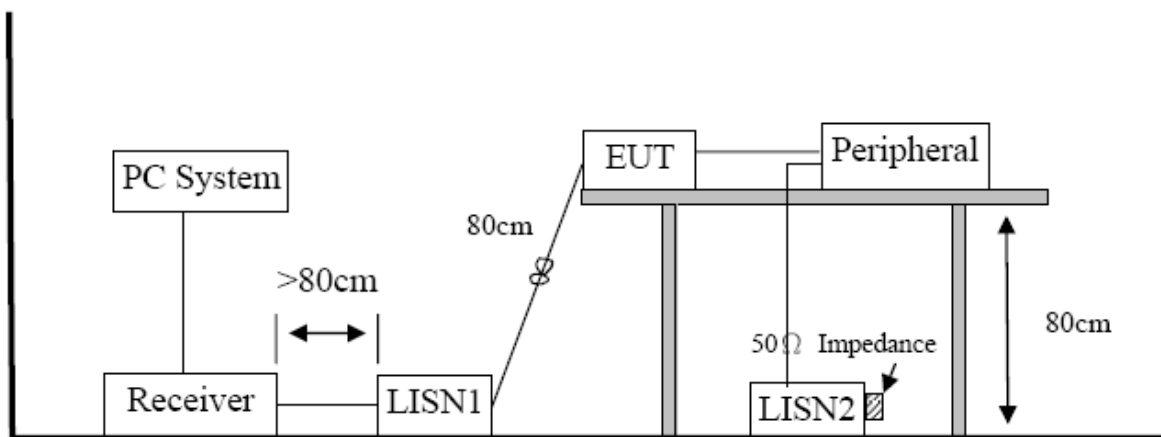
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level - Limit.

11. Power Line Conducted Emission

11.1. Block diagram of test setup



11.2. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

11.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

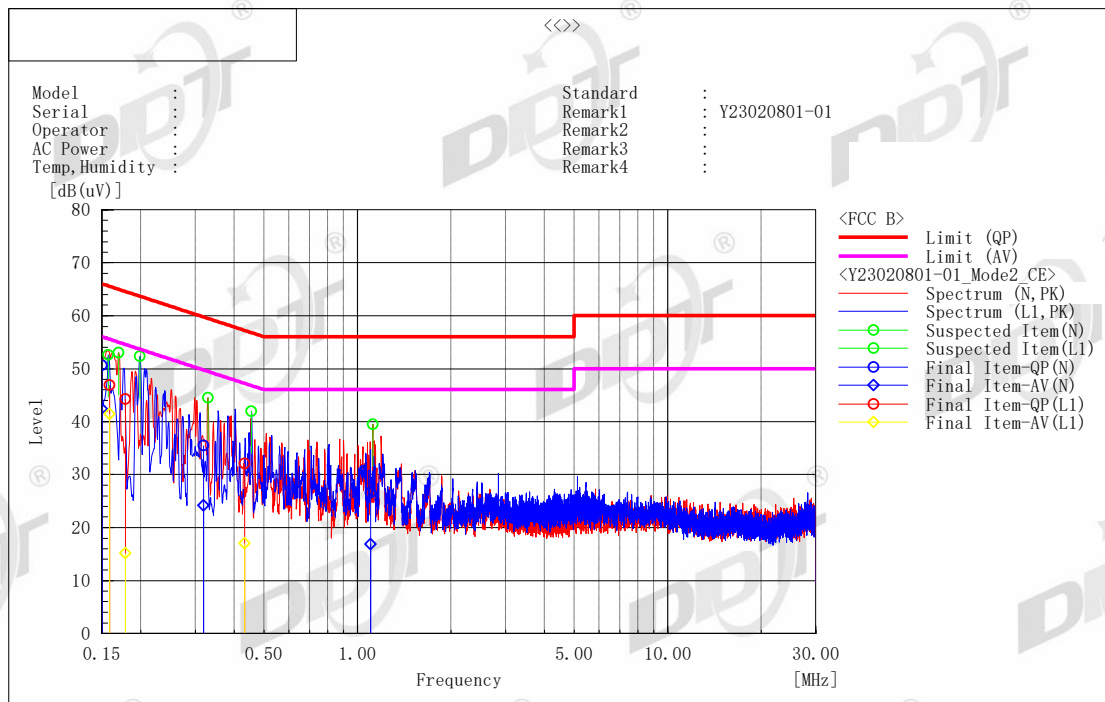
11.4. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at all mode, only the worst case was recorded in this report.

Test Data:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.1502	40.9	32.7	9.7	50.6	42.4	66.0	56.0	15.4	13.6	
2	0.31847	25.8	14.5	9.7	35.5	24.2	59.7	49.7	24.2	25.5	
3	1.10251	16.8	7.2	9.7	26.5	16.9	56.0	46.0	29.5	29.1	

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.17838	34.5	5.3	9.8	44.3	15.1	64.6	54.6	20.3	39.5	
2	0.43215	22.3	7.3	9.8	32.1	17.1	57.2	47.2	25.1	30.1	
3	0.15906	37.1	31.6	9.8	46.9	41.4	65.5	55.5	18.6	14.1	

Note1) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor

Note2) Line = Polarity of input power (Live or Neutral)

N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity,

Note3) Factor = LISN Insertion Loss + Cable Loss

Note4) Margin = Limit – Level (Quasi-Peak and/or C/Average)

Note5) C/Average : Abbreviation of CISPR Average

12. Antenna Requirements

12.1. Limit

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2. Result

The antenna used for this product is Chip antenna and no antenna other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 2 dBi.

13. Photos of the EUT

Please find the photos of EUT in APPENDIXES.

END OF REPORT