

Appendix B

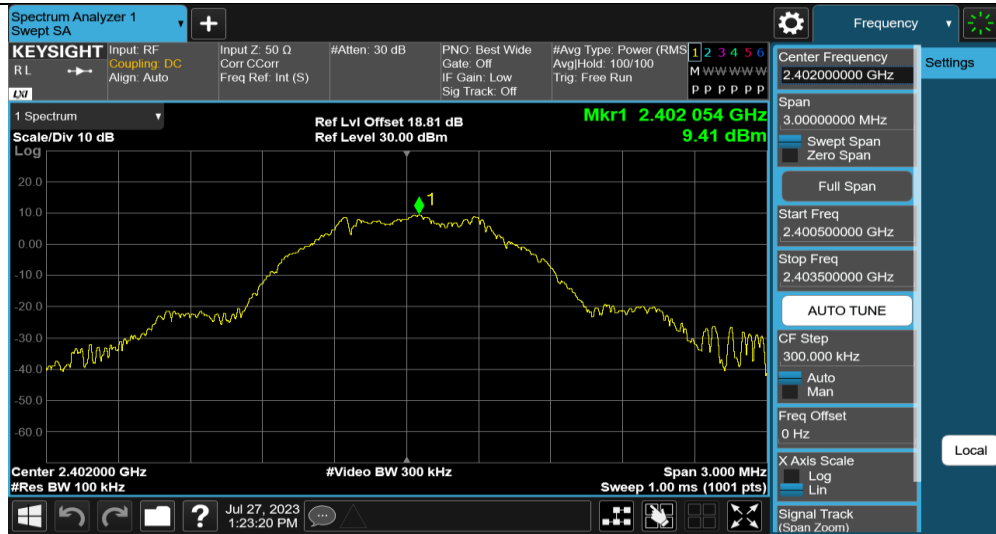
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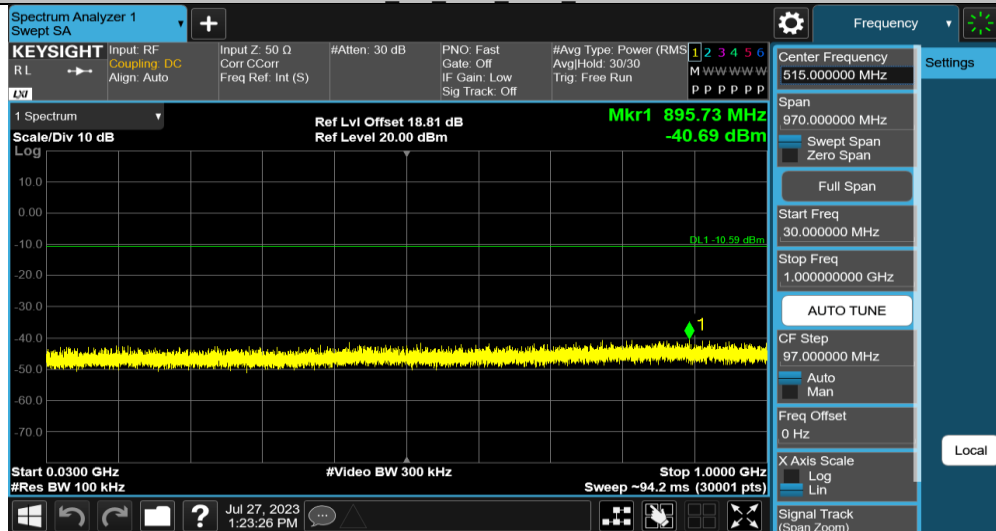


Prüfbericht - Produkte

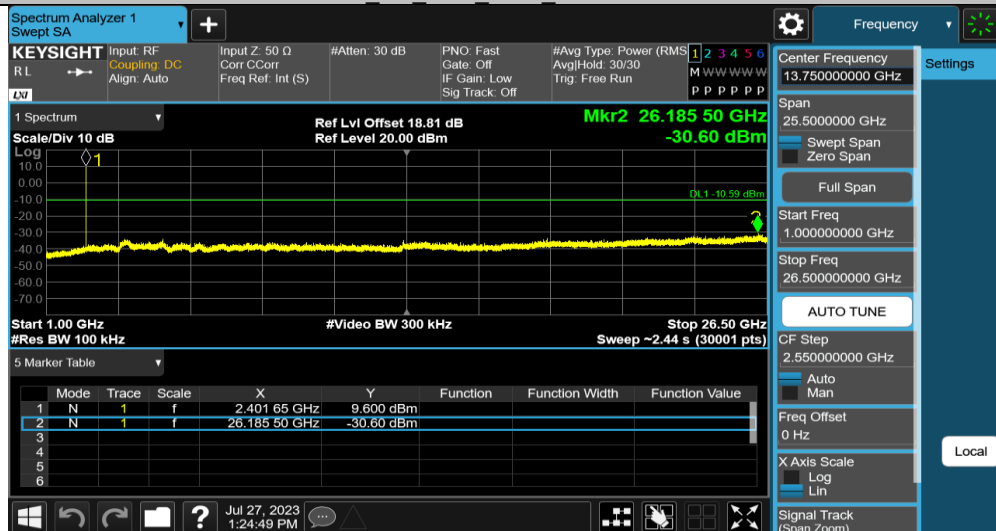
Test Report - Products



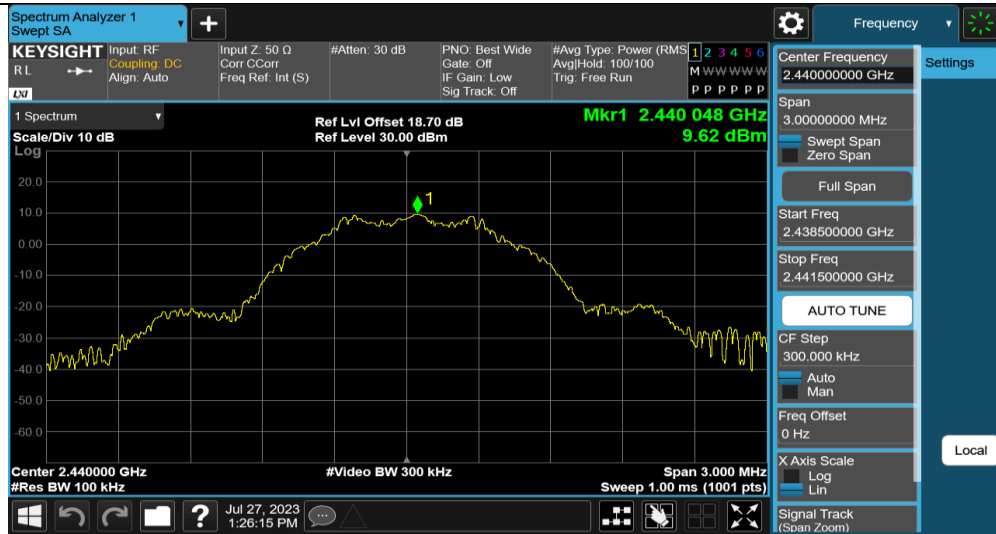
BLE 1M Ant1 2402 30~1000



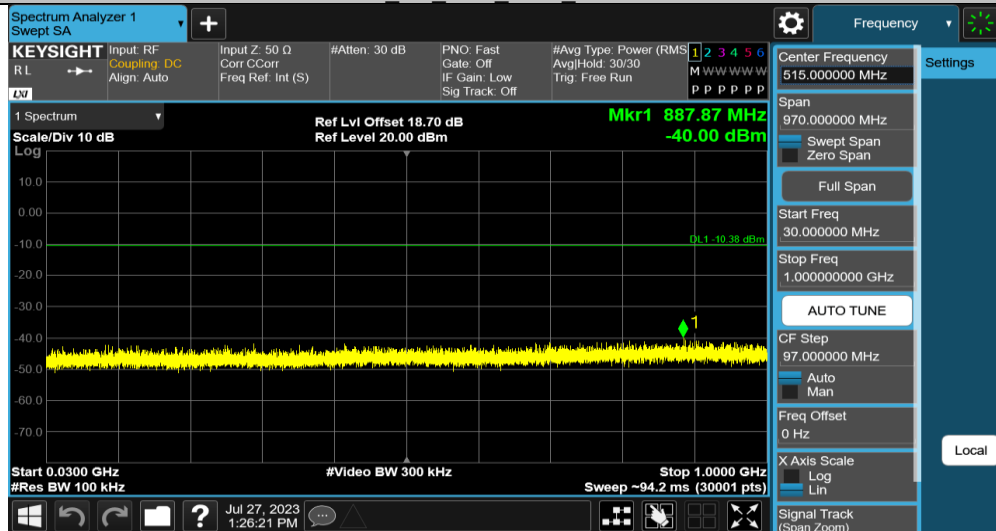
BLE 1M Ant1 2402 1000~26500



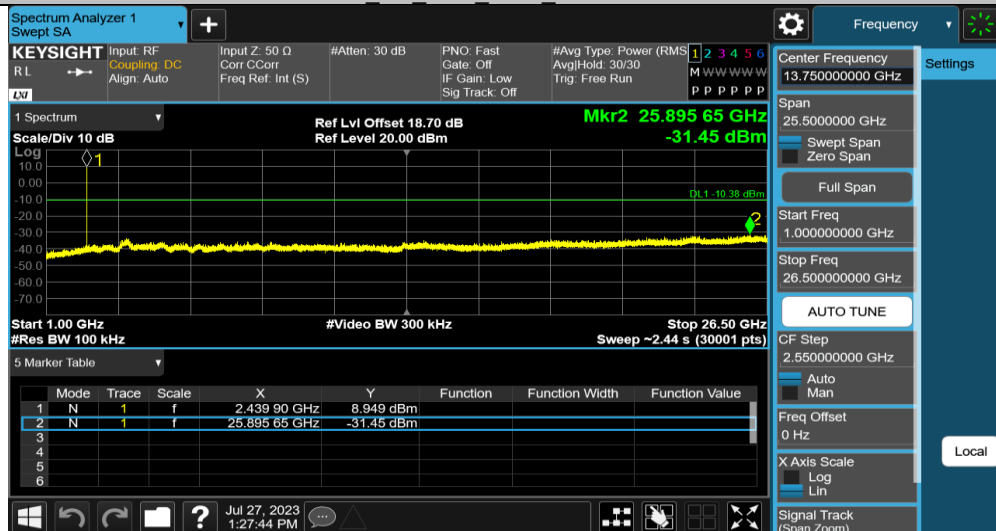
BLE 1M Ant1 2440 0~Reference



BLE 1M Ant1 2440 30~1000



BLE 1M Ant1 2440 1000~26500



BLE 1M Ant1 2480 0~Reference

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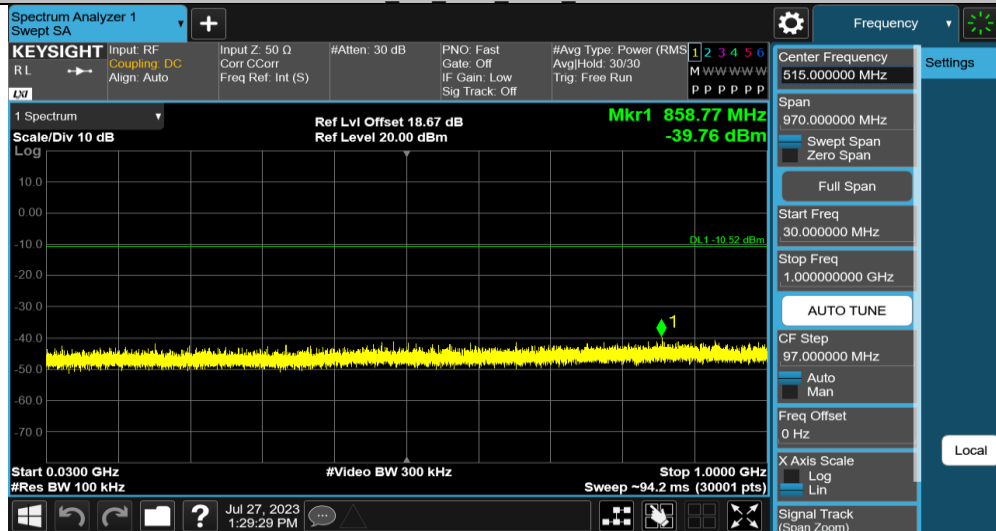


Prüfbericht - Produkte

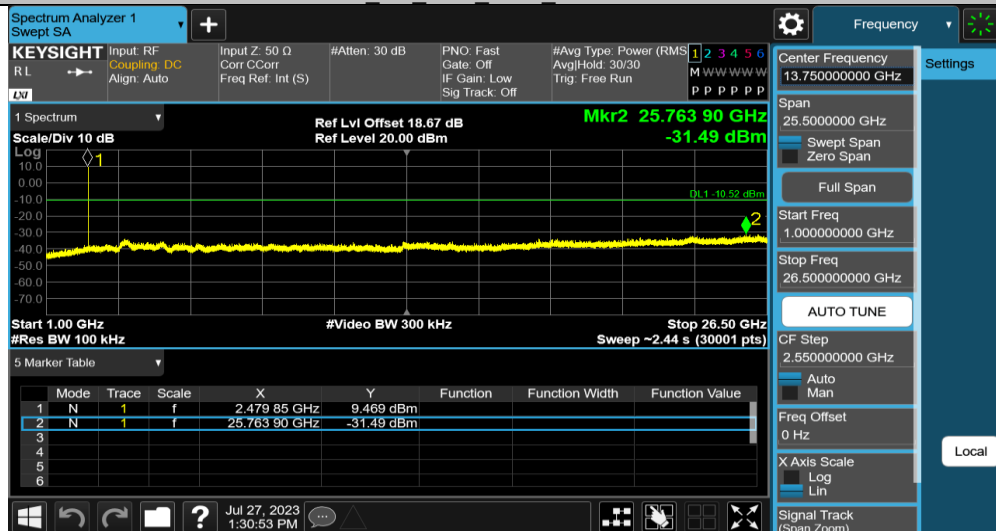
Test Report - Products



BLE 1M Ant1 2480 30~1000



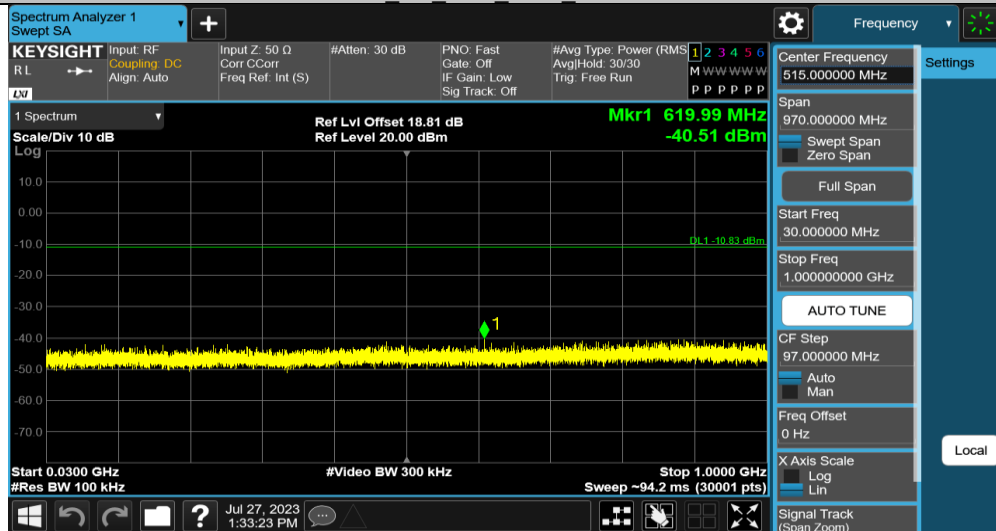
BLE 1M Ant1 2480 1000~26500



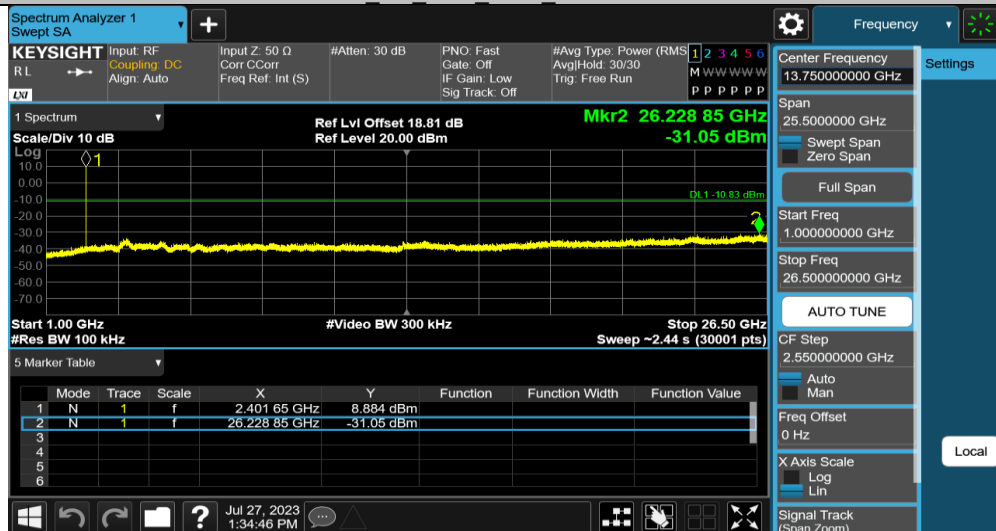
BLE 2M Ant1 2402 0~Reference



BLE 2M Ant1 2402 30~1000



BLE 2M Ant1 2402 1000~26500



BLE 2M Ant1 2440 0~Reference

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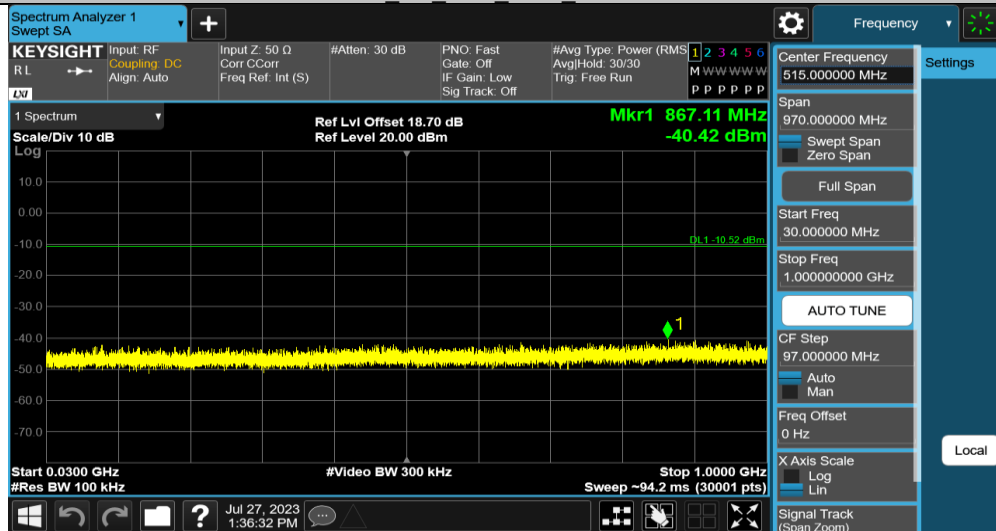


Prüfbericht - Produkte

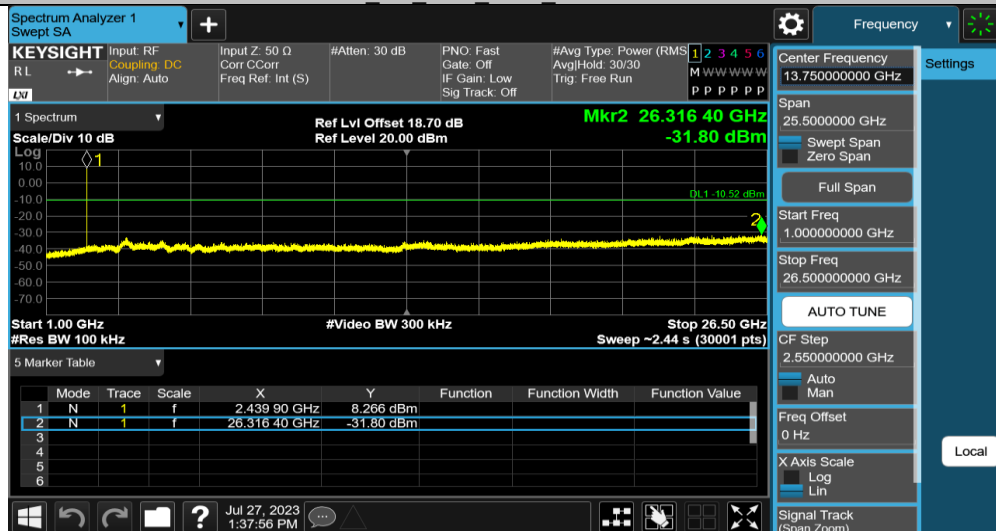
Test Report - Products



BLE 2M Ant1 2440 30~1000



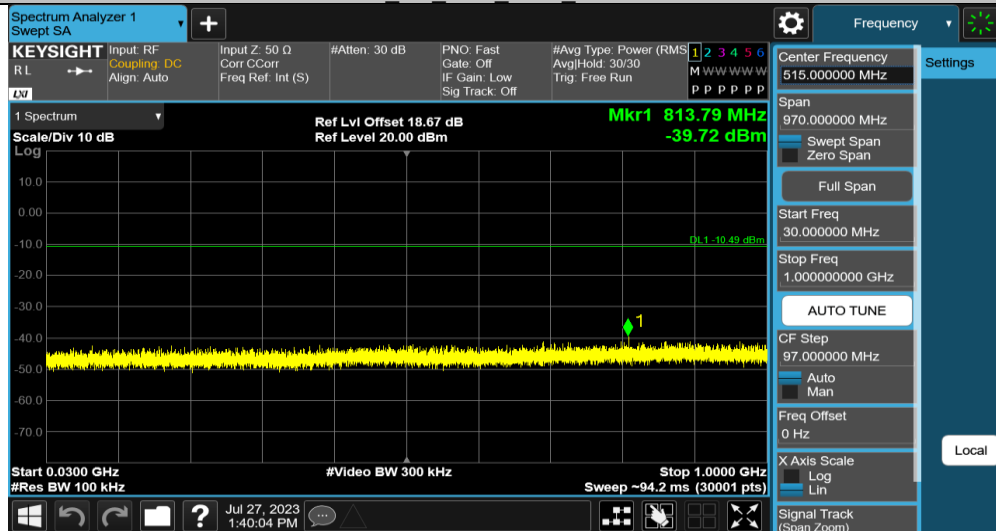
BLE 2M Ant1 2440 1000~26500



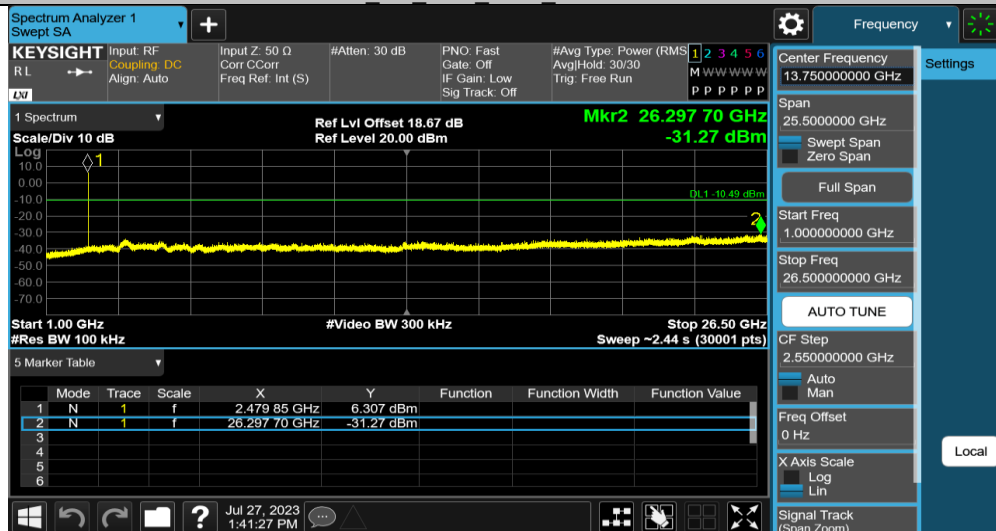
BLE 2M Ant1 2480 0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500



BLE_500K_Ant1_2402_0~Reference

Appendix B

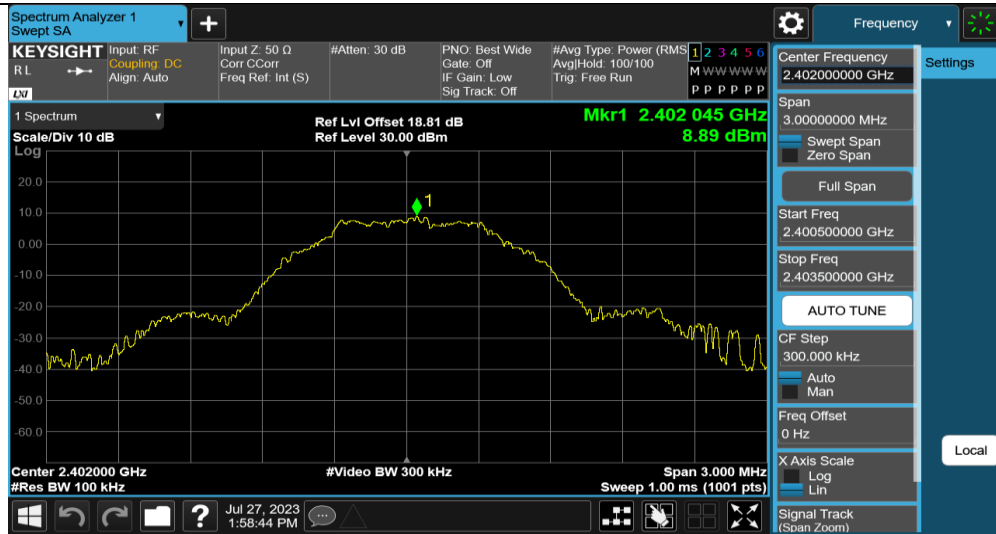
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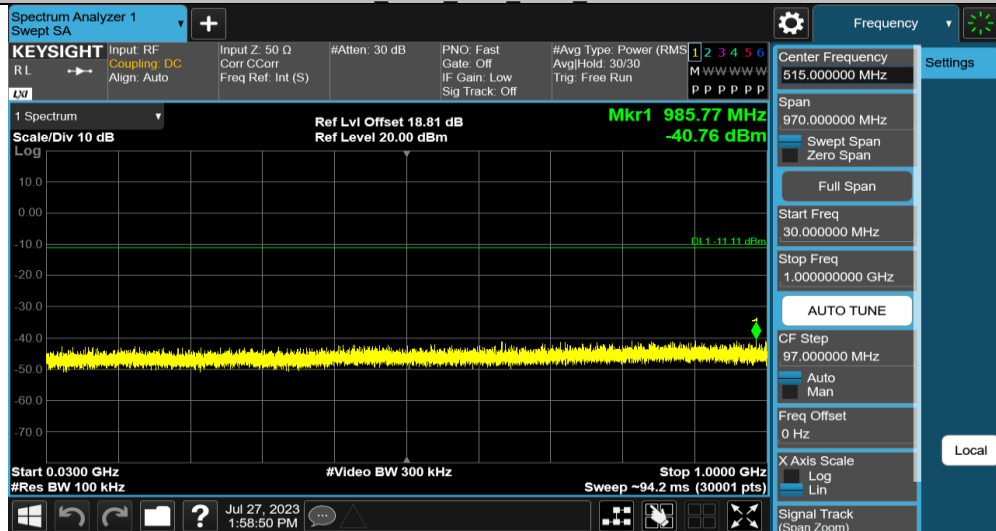


Prüfbericht - Produkte

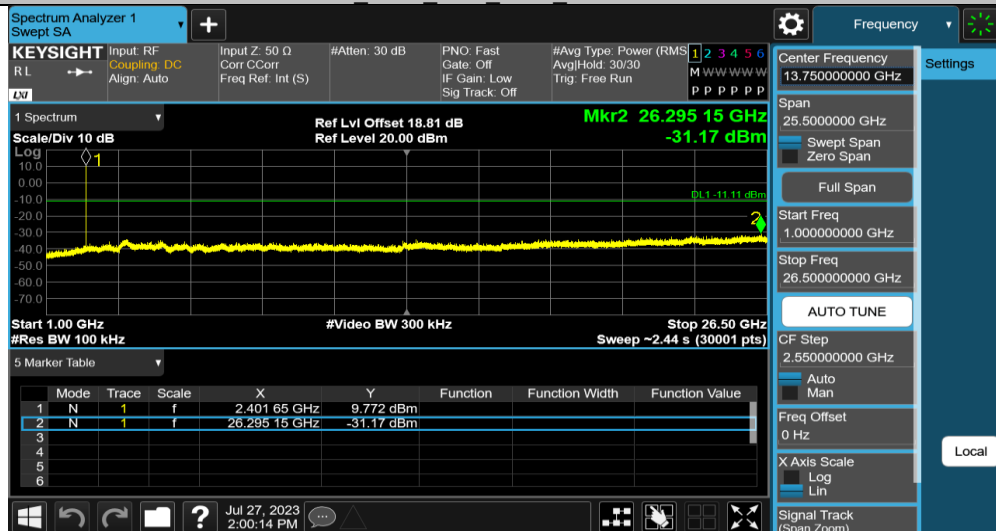
Test Report - Products



BLE_500K_Ant1_2402_30-1000



BLE_500K_Ant1_2402_1000-26500



BLE_500K_Ant1_2440_0-Reference

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Prüfbericht - Produkte

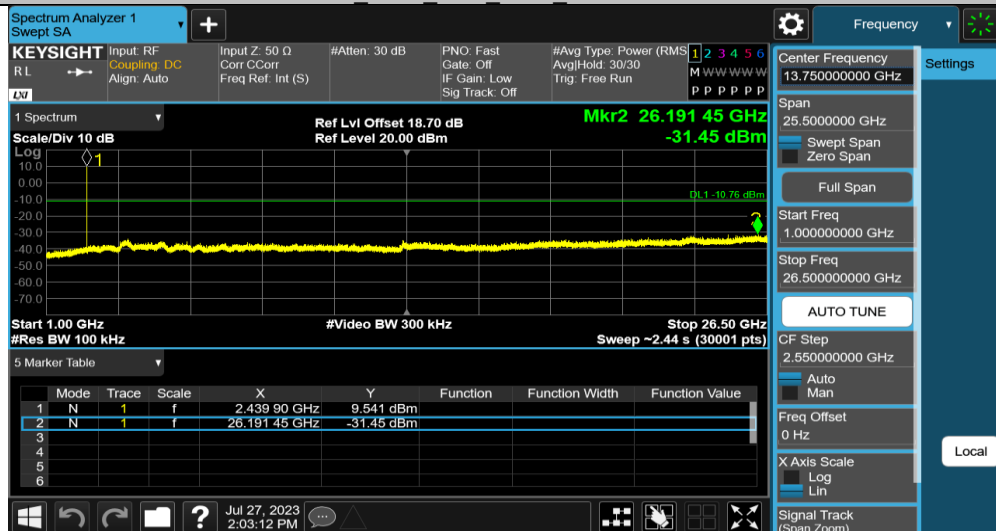
Test Report - Products



BLE_500K_Ant1_2440_30-1000



BLE_500K_Ant1_2440_1000-26500



BLE_500K_Ant1_2480_0-Reference

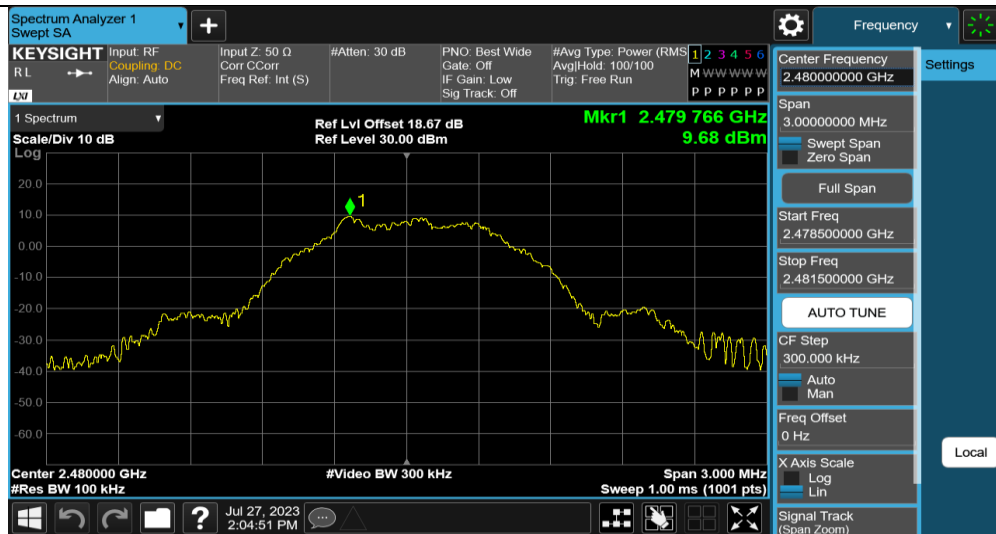
Appendix B

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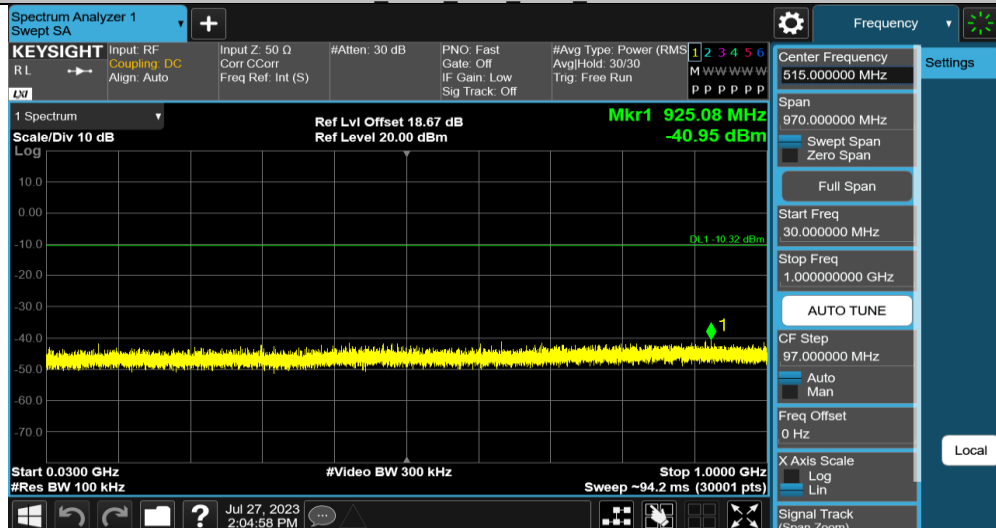
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Prüfbericht - Produkte

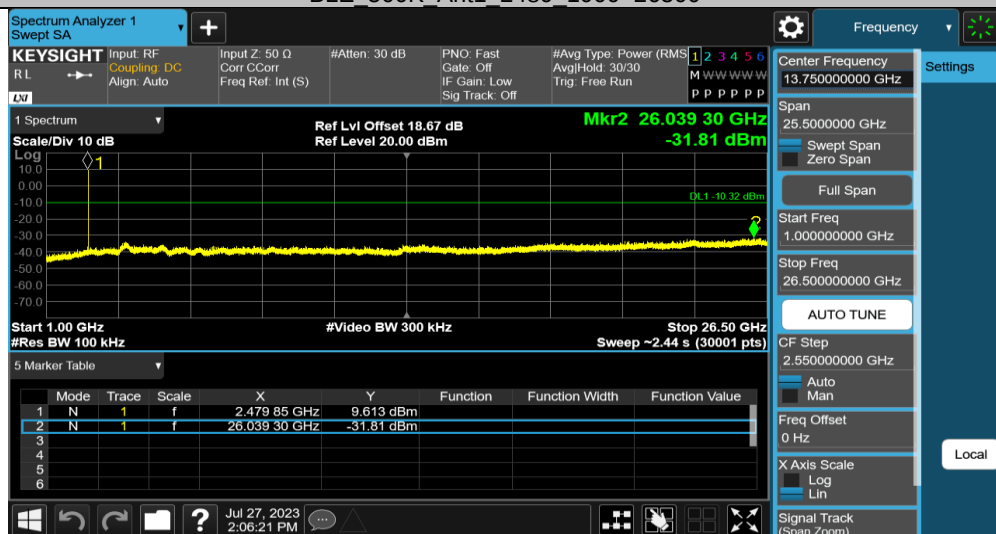
Test Report - Products



BLE 500K Ant1 2480 30-1000



BLE 500K Ant1 2480 1000-26500



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Prüfbericht - Produkte

Test Report - Products

Band Edge

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_125K	Ant1	Low	2402	6.389	-39.25	≤-13.61	PASS
		High	2480	9.164	-44.24	≤-10.84	PASS
BLE_1M	Ant1	Low	2402	9.421	-42.87	≤-10.58	PASS
		High	2480	9.206	-44.08	≤-10.79	PASS
BLE_2M	Ant1	Low	2402	9.28	-23.25	≤-10.72	PASS
		High	2480	9.096	-42.71	≤-10.9	PASS
BLE_500K	Ant1	Low	2402	8.941	-42.97	≤-11.06	PASS
		High	2480	9.091	-44.05	≤-10.91	PASS

Test Graphs



Appendix B

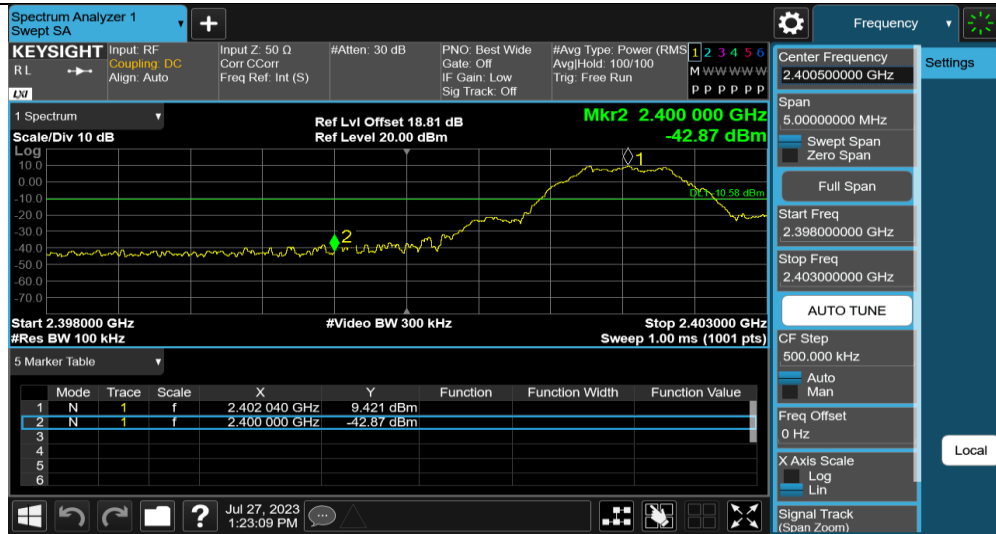
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Prüfbericht - Produkte

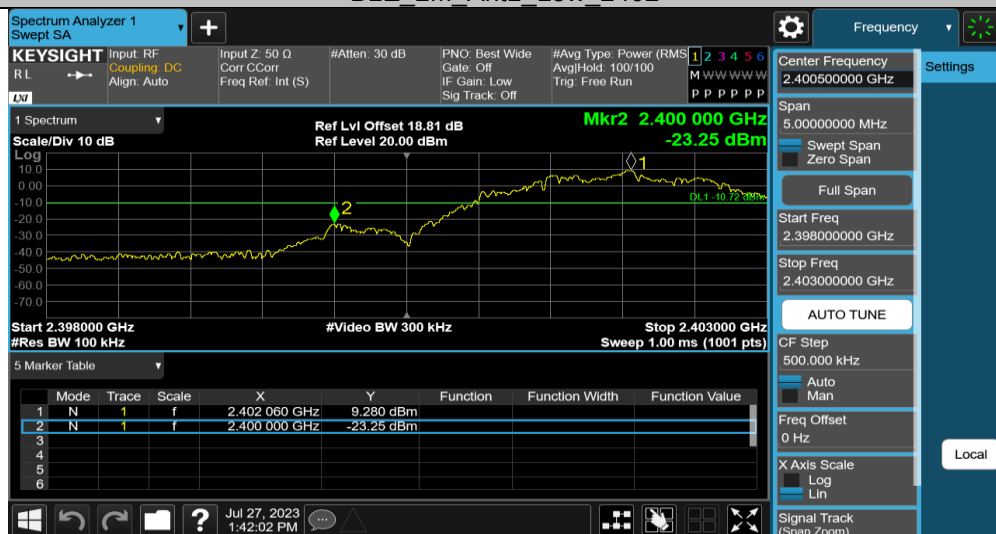
Test Report - Products



BLE 1M Ant1 High 2480



BLE 2M Ant1 Low 2402



BLE 2M Ant1 High 2480

Appendix B

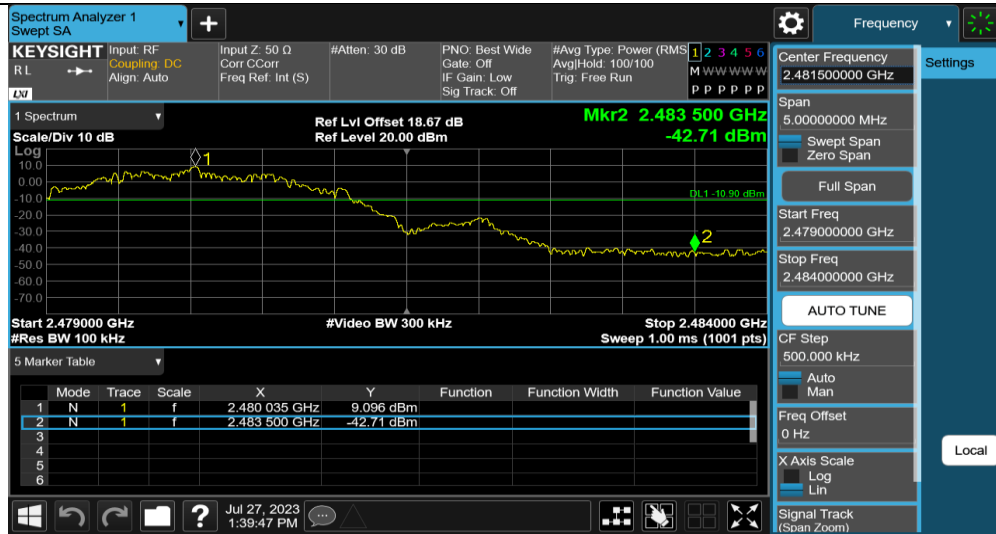
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Prüfbericht - Produkte

Test Report - Products



BLE 500K Ant1 Low 2402



BLE 500K Ant1 High 2480



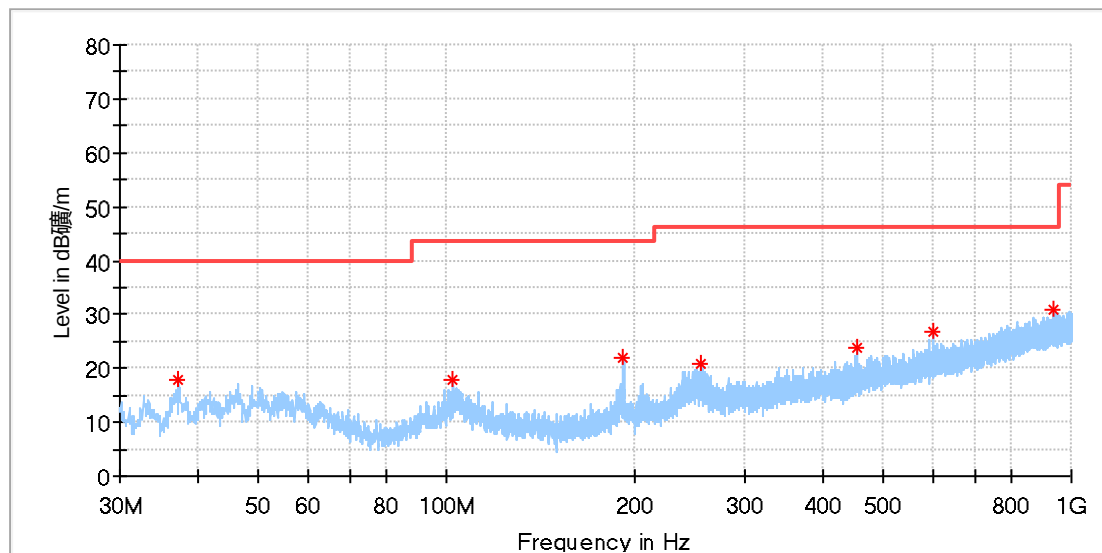
APPENDIX B.5: RADIATED SPURIOUS EMISSIONS

Note:

- 1) This testing was carried out on different modulations, but only the worst case was presented in this report.
- 2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

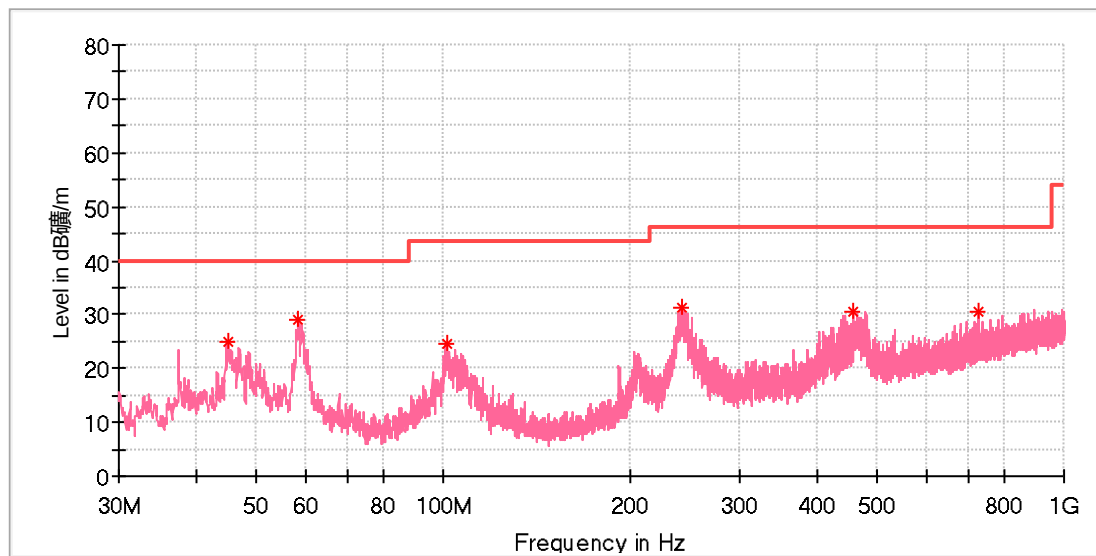
30 MHz to 1GHz

EUT Name:	I/O Module
Model:	IQ5-IO-8DI-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168435417/A003516465-012
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

**Critical Freqs**

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.226500	17.88	40.00	22.12	100.0	H	90.0	-21.1
102.459000	17.71	43.50	25.79	100.0	H	69.0	-18.9
191.990000	22.05	43.50	21.45	100.0	H	276.0	-19.4
254.749000	20.83	46.00	25.17	100.0	H	212.0	-17.2
454.617500	23.76	46.00	22.24	100.0	H	120.0	-12.8
599.341500	26.74	46.00	19.26	100.0	H	127.0	-9.9
935.058500	31.05	46.00	14.95	100.0	H	127.0	-4.6

EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



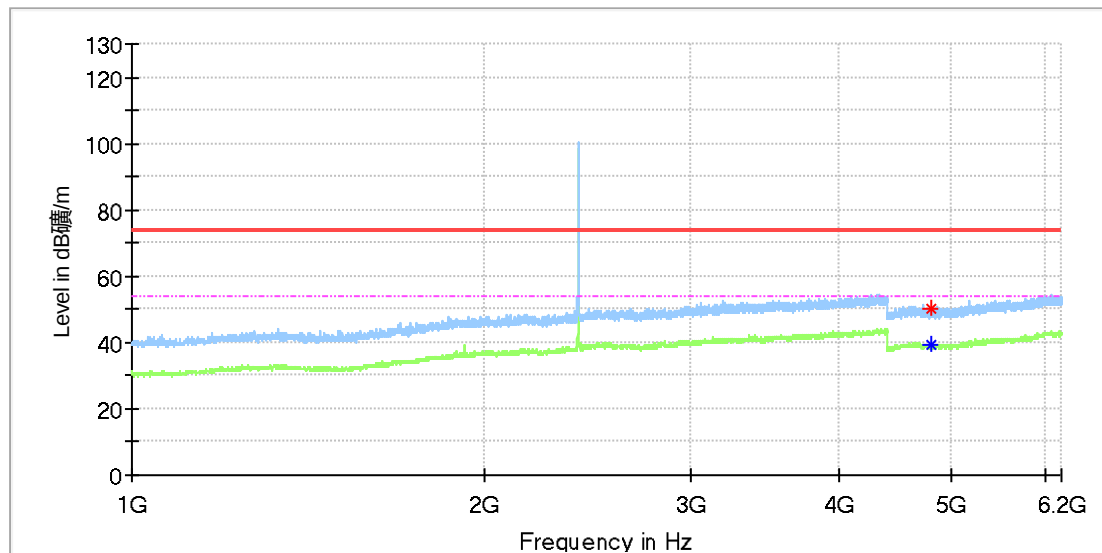
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.938000	24.82	40.00	15.18	100.0	V	66.0	-18.8
58.324000	28.93	40.00	11.07	100.0	V	86.0	-18.8
101.101000	24.51	43.50	18.99	100.0	V	79.0	-18.9
242.672500	31.16	46.00	14.84	100.0	V	47.0	-17.7
458.061000	30.40	46.00	15.60	100.0	V	142.0	-12.7
729.564000	30.33	46.00	15.67	100.0	V	114.0	-7.5

1GHz-18GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

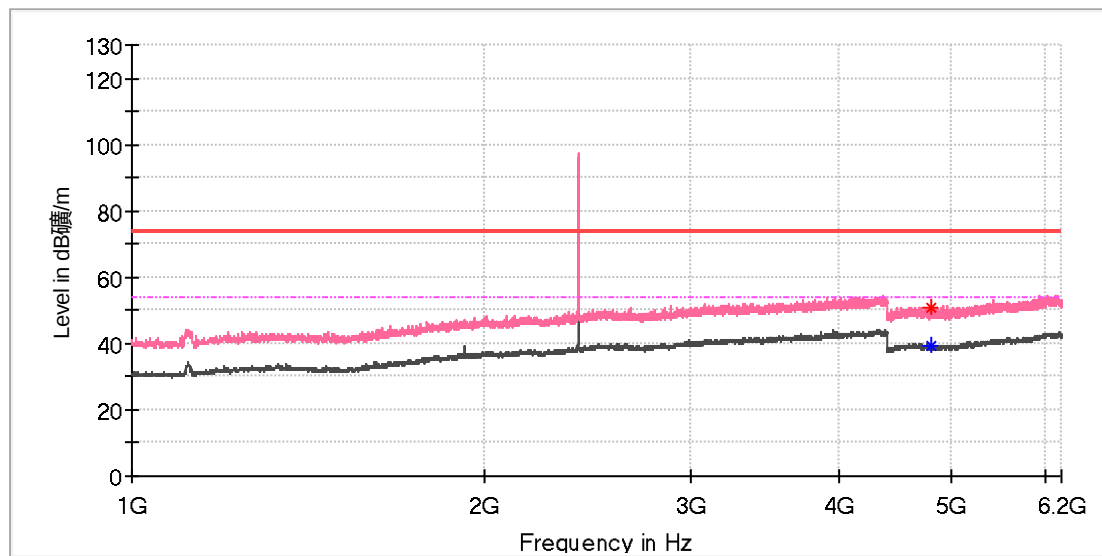
EUT Name:	I/O Module
Model:	IQ5-IO-8DI-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168435417/A003516465-012
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4806.500000	---	39.53	54.00	14.47	150.0	H	180.0	11.8
4808.000000	50.05	---	74.00	23.95	150.0	H	299.0	11.8

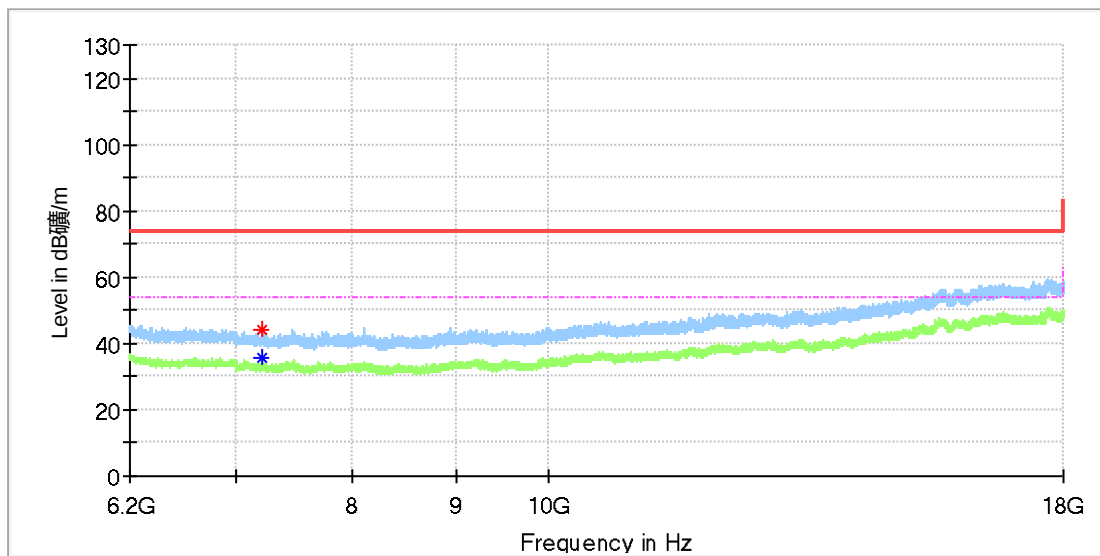
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 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.500000	---	39.45	54.00	14.55	150.0	V	356.0	11.8
4809.500000	50.49	---	74.00	23.51	150.0	V	257.0	11.8

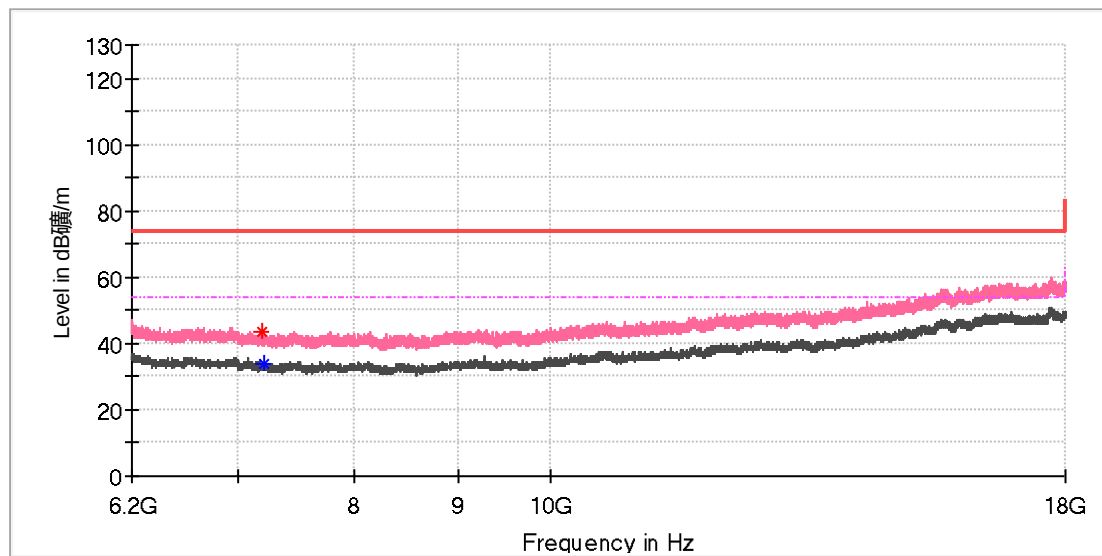
EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7206.441667	44.02	---	74.00	29.98	150.0	H	200.0	8.8
7206.441667	---	35.40	54.00	18.60	150.0	H	200.0	8.8

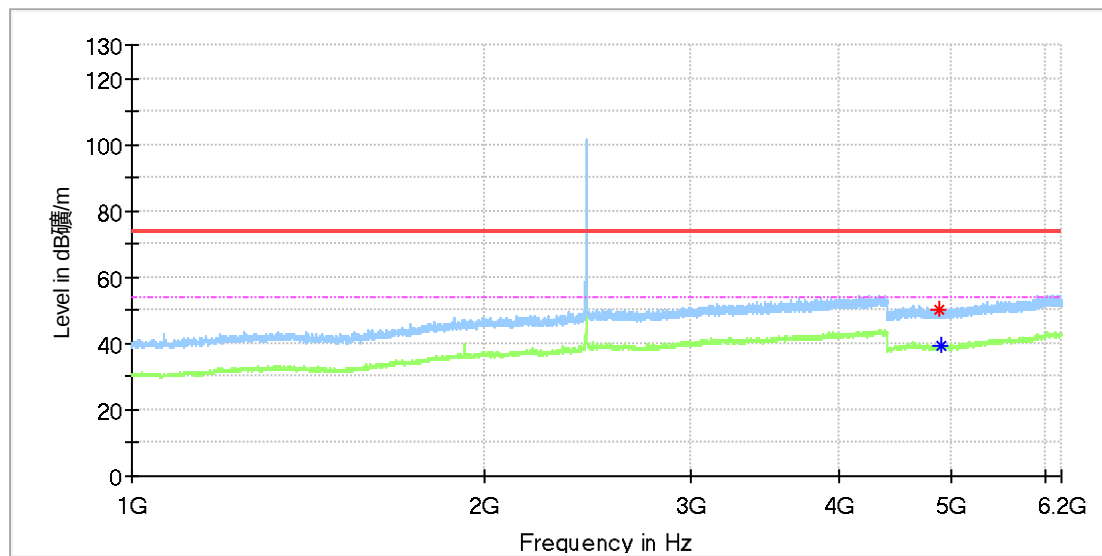
EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7199.558333	43.32	---	74.00	30.68	150.0	V	85.0	8.8
7204.966667	---	34.10	54.00	19.90	150.0	V	50.0	8.8

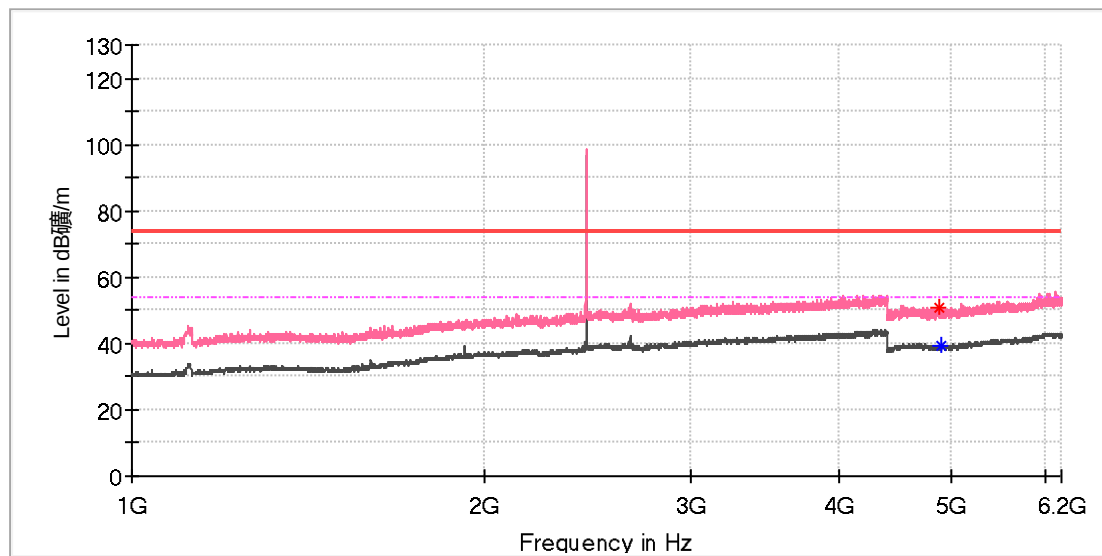
EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4869.500000	50.02	---	74.00	23.98	150.0	H	115.0	11.8
4898.000000	---	39.33	54.00	14.67	150.0	H	214.0	11.8

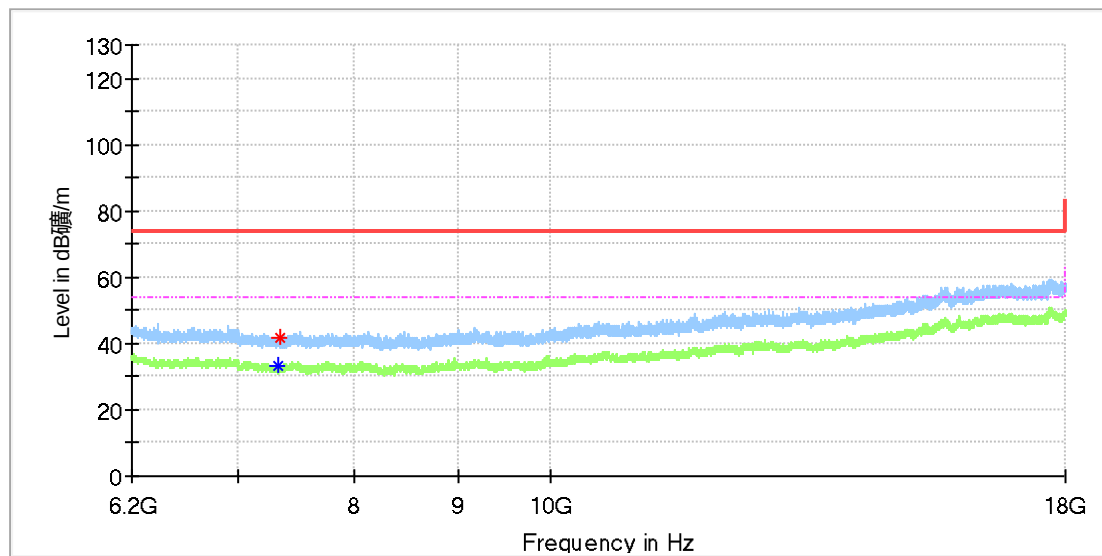
EUT Name: I/O Module
Model: IQ5-IO-8DI-B
Test Mode: BLE 1M_Mid channel
Order No/Sample No: 168435417/A003516465-012
Test Voltage:: 120V/60Hz
Remark: Temp 24 Humi:50%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4876.500000	50.93	---	74.00	23.07	150.0	V	338.0	11.8
4898.000000	---	39.38	54.00	14.62	150.0	V	84.0	11.8

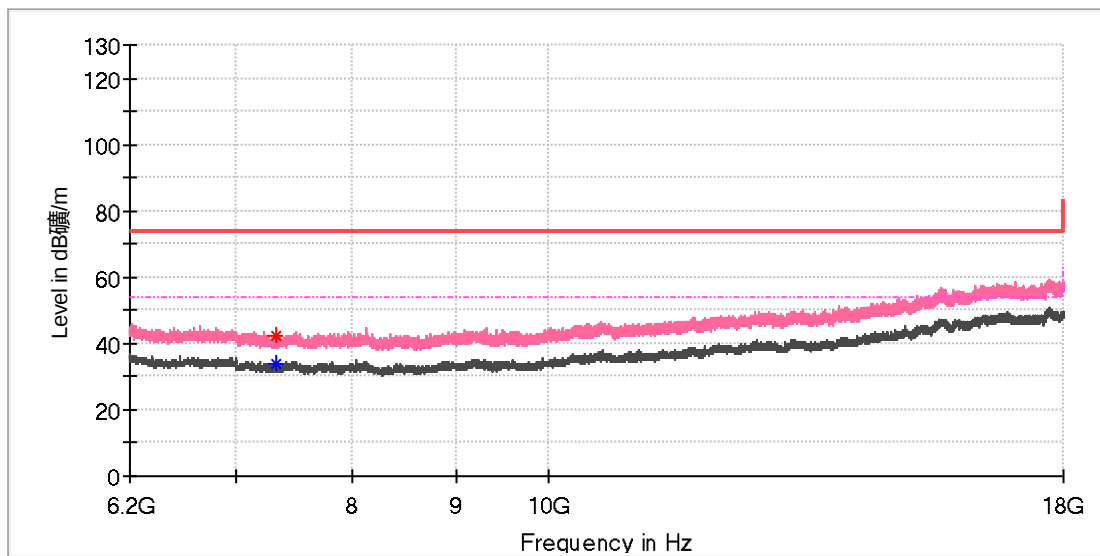
EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	---	33.47	54.00	20.53	150.0	H	47.0	8.2
7348.533333	41.69	---	74.00	32.31	150.0	H	275.0	8.1

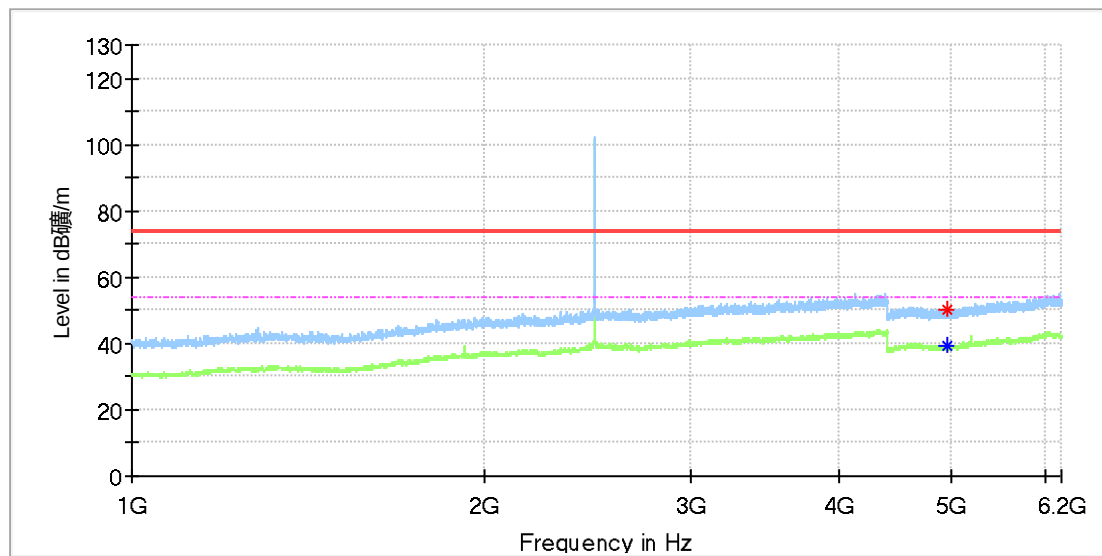
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 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7320.508333	---	34.11	54.00	19.89	150.0	V	357.0	8.2
7326.900000	42.12	---	74.00	31.88	150.0	V	59.0	8.1

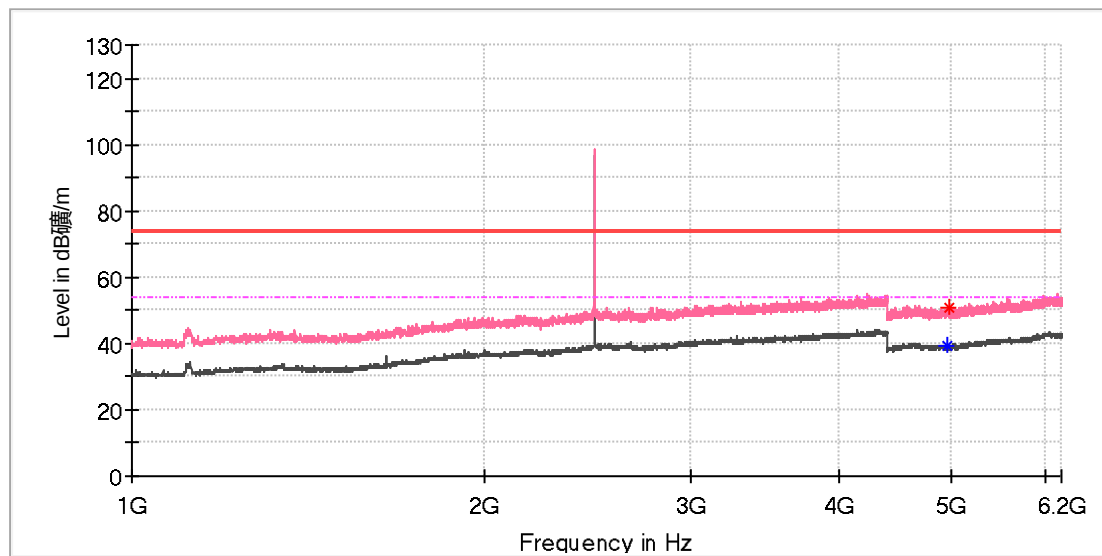
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 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4954.500000	50.12	---	74.00	23.88	150.0	H	186.0	11.8
4958.000000	---	39.57	54.00	14.43	150.0	H	303.0	11.8

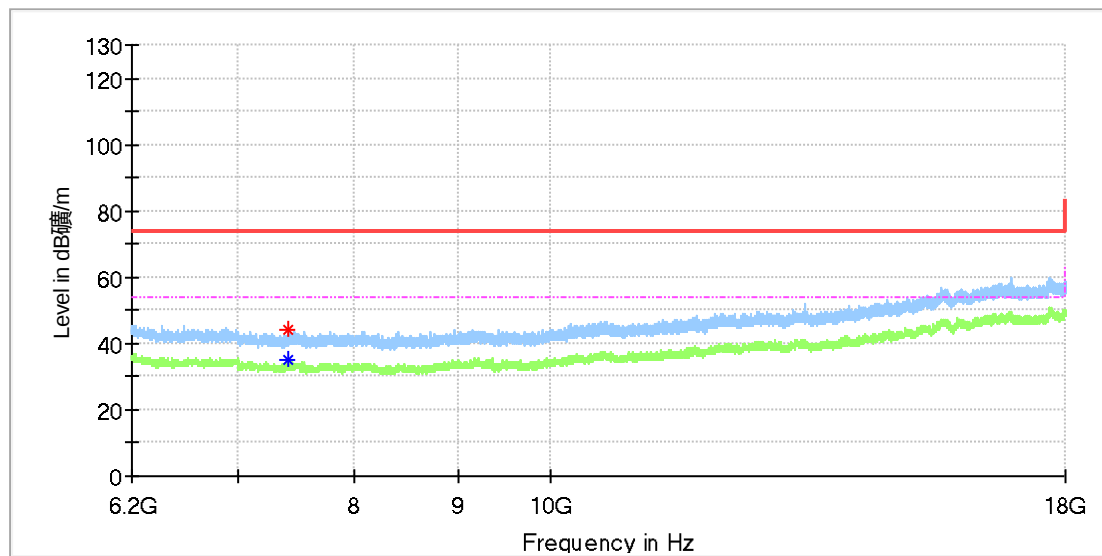
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 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4951.500000	---	39.34	54.00	14.66	150.0	V	298.0	11.8
4972.000000	50.60	---	74.00	23.40	150.0	V	109.0	11.8

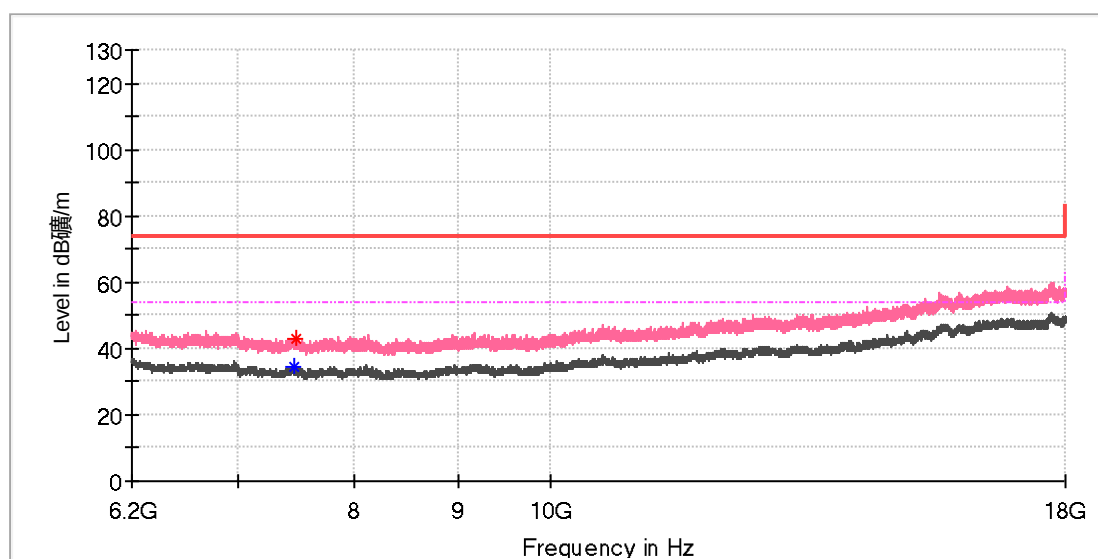
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 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7404.583333	---	34.92	54.00	19.08	150.0	H	0.0	8.3
7407.041667	43.94	---	74.00	30.06	150.0	H	276.0	8.3

EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

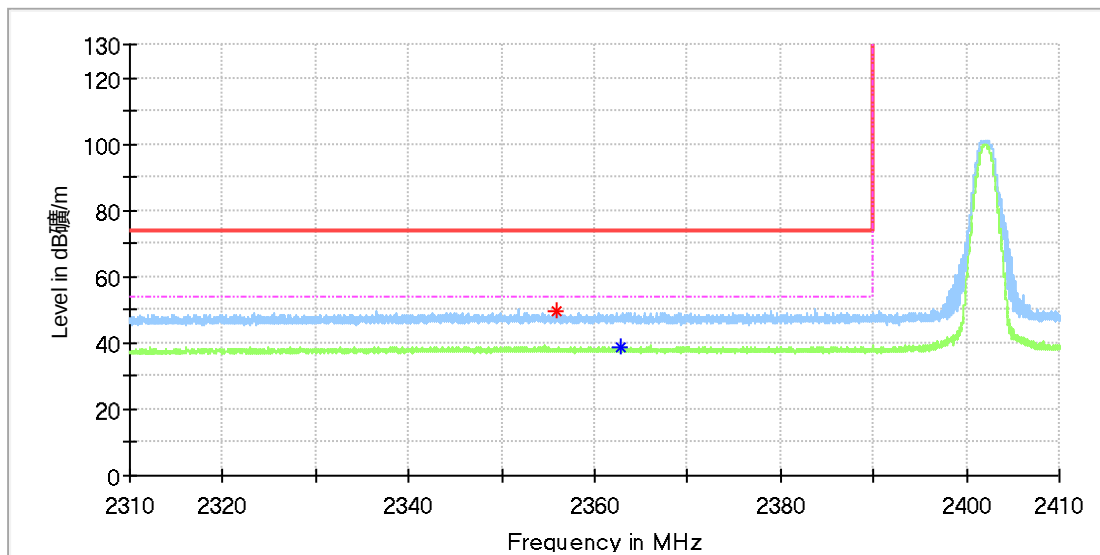


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7465.550000	---	34.52	54.00	19.48	150.0	V	72.0	8.6
7472.925000	42.96	---	74.00	31.04	150.0	V	72.0	8.6

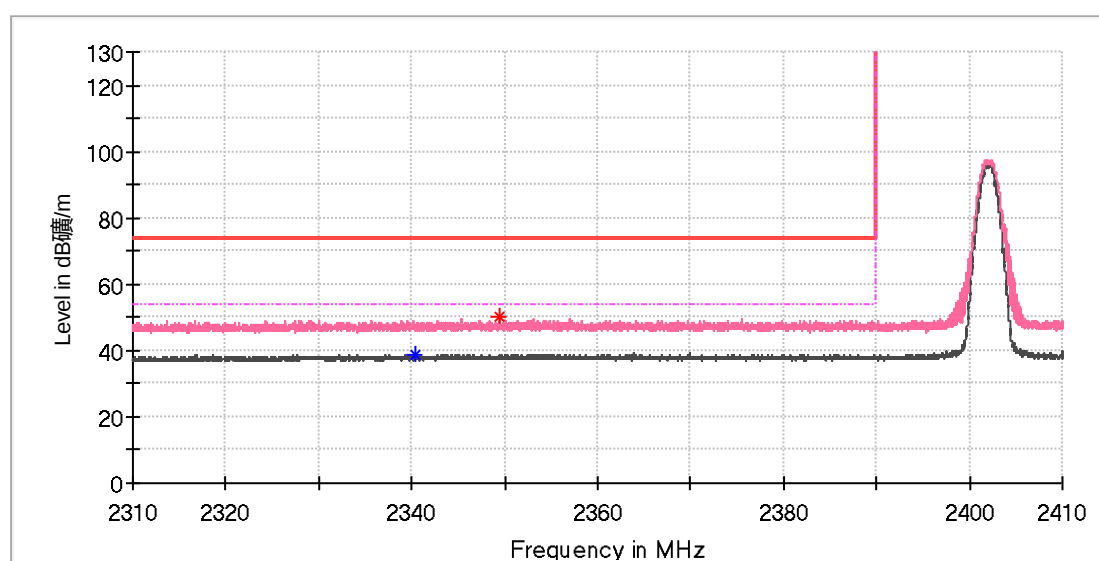
APPENDIX B.6: RADIATED EMISSIONS IN RESTRICTED BANDS

EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2355.867647	49.49	---	74.00	24.51	150.0	H	17.0	6.9
2362.867647	---	38.49	54.00	15.51	150.0	H	1.0	6.9

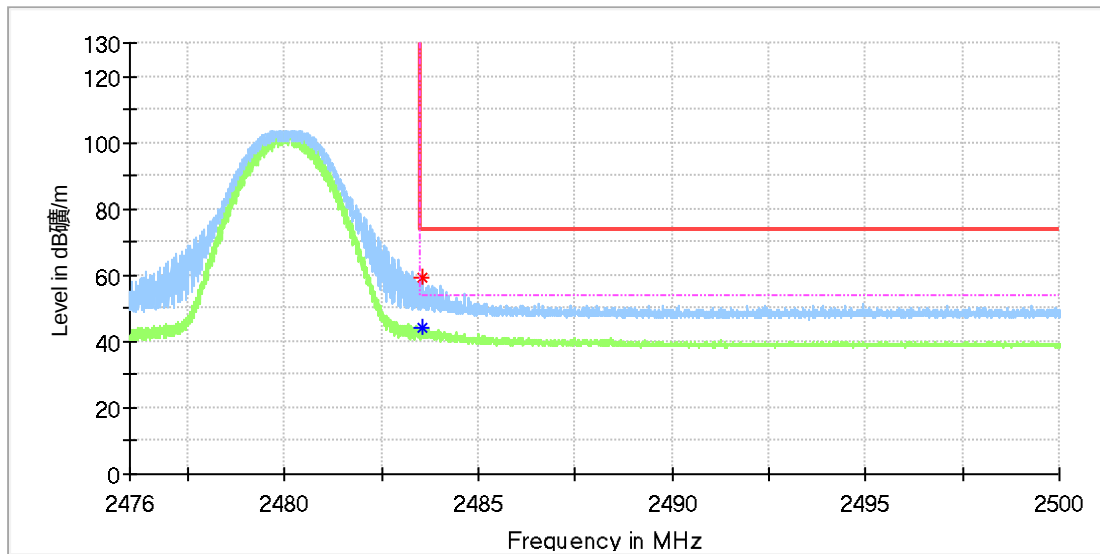
EUT Name:	I/O Module
Model:	IQ5-IO-8DI-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168435417/A003516465-012
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2340.294118	---	38.50	54.00	15.50	150.0	V	328.0	6.8
2349.455882	50.17	---	74.00	23.83	150.0	V	306.0	6.9

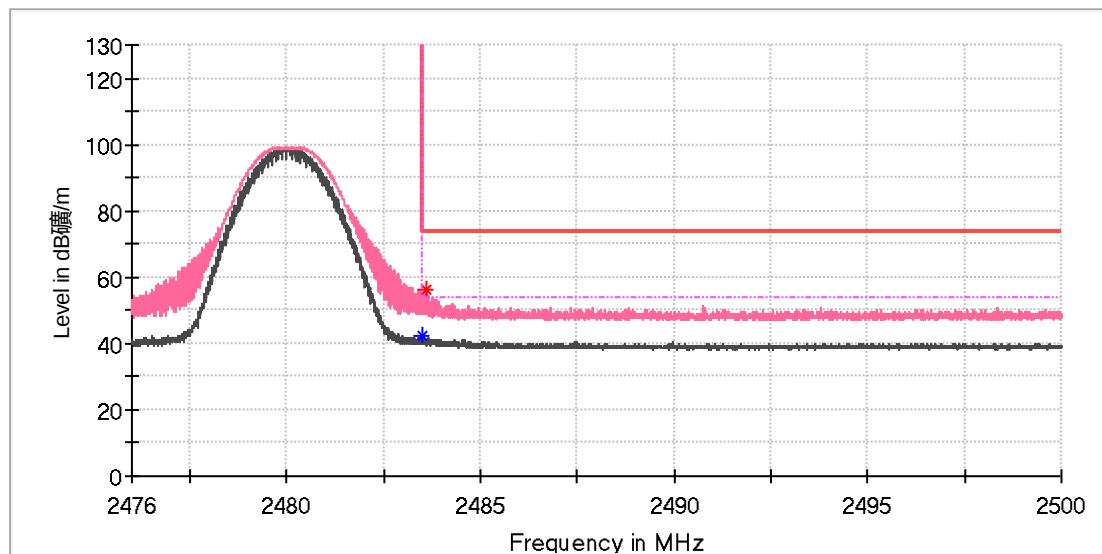
EUT Name:	I/O Module
Model:	IQ5-IO-8DI-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168435417/A003516465-012
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.556471	---	44.37	54.00	9.63	150.0	H	331.0	7.4
2483.567059	59.04	---	74.00	14.96	150.0	H	331.0	7.4

EUT Name: I/O Module
 Model: IQ5-IO-8DI-B
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168435417/A003516465-012
 Test Voltage:: 120V/60Hz
 Remark: Temp 24 Humi:50%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



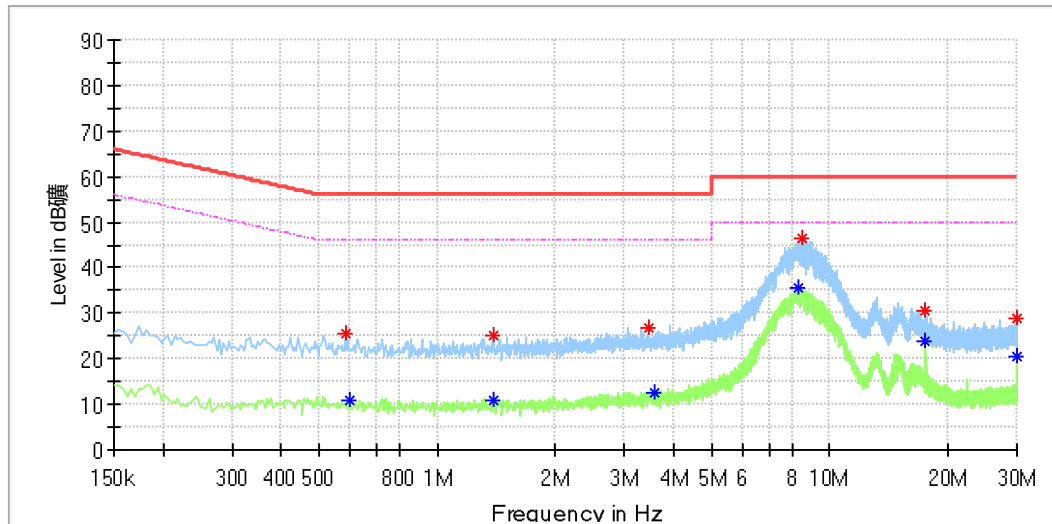
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.521177	---	42.14	54.00	11.86	150.0	V	314.0	7.4
2483.612941	56.20	---	74.00	17.80	150.0	V	306.0	7.4

APPENDIX B.7: CONDUCTED EMISSION ON AC MAINS

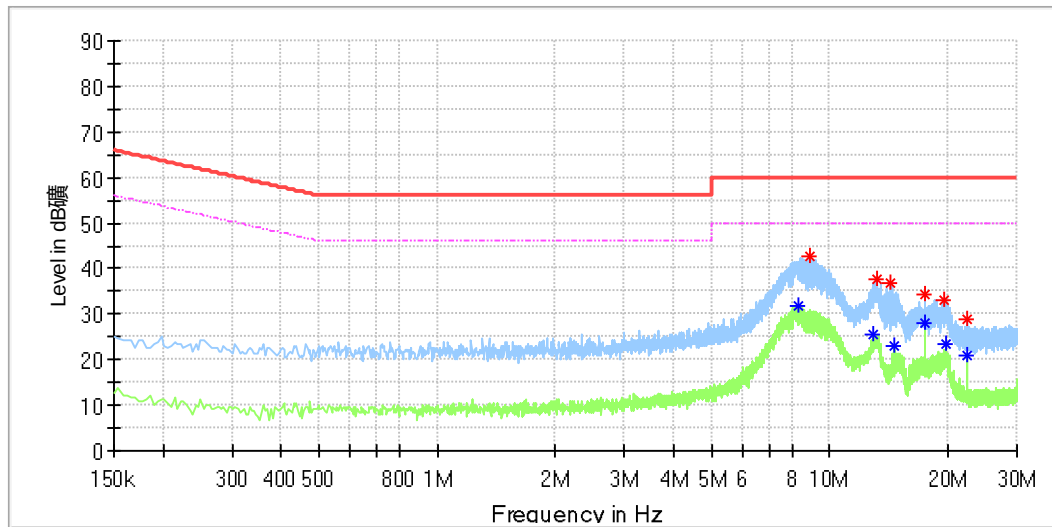
Normal Working with Bluetooth connected

EUT Name: I/O Module
 Order Number: 168435417(P01048896)
 Model: IQ5-IO-8DI-B
 Test Mode: On, Normal working with BLE connected
 Test Voltage: AC 120V60Hz
 Test Standard: FCC Part 15C
 Test By:/Review By: Charlie Zha / Gary Chen
 Tem./Hum./Pressure: 23.2°C/50.6%/101kPa
 Remark: SR1

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.582000	25.58	---	56.00	30.42	L1	10.0
0.598000	---	10.97	46.00	35.03	L1	10.0
1.390000	25.07	---	56.00	30.93	L1	10.1
1.398000	---	10.94	46.00	35.06	L1	10.1
3.458000	26.92	---	56.00	29.08	L1	10.2
3.562000	---	12.74	46.00	33.26	L1	10.2
8.350000	---	35.65	50.00	14.35	L1	10.3
8.534000	46.43	---	60.00	13.57	L1	10.3
17.574000	30.65	---	60.00	29.35	L1	10.4
17.574000	---	23.97	50.00	26.03	L1	10.4
30.000000	---	20.44	50.00	29.56	L1	10.4
30.000000	28.87	---	60.00	31.13	L1	10.4

EUT Name: I/O Module
 Order Number: 168435417(P01048896)
 Model: IQ5-IO-8DI-B
 Test Mode: On, Normal working with BLE connected
 Test Voltage: AC 120V60Hz
 Test Standard: FCC Part 15C
 Test By:/Review By: Charlie Zha / Gary Chen
 Tem./Hum./Pressure: 23.2°C/50.6%/101kPa
 Remark: SR1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
8.354000	---	31.93	50.00	18.07	N	10.0
8.942000	42.86	---	60.00	17.14	N	10.0
12.890000	---	25.74	50.00	24.26	N	10.1
13.218000	37.55	---	60.00	22.45	N	10.1
14.346000	36.78	---	60.00	23.22	N	10.1
14.674000	---	22.85	50.00	27.15	N	10.1
17.562000	34.44	---	60.00	25.56	N	10.2
17.566000	---	28.08	50.00	21.92	N	10.2
19.586000	33.03	---	60.00	26.97	N	10.2
19.710000	---	23.31	50.00	26.69	N	10.2
22.502000	---	20.83	50.00	29.17	N	10.3
22.502000	28.68	---	60.00	31.32	N	10.3