

Appendix B

CN23CNS7 001

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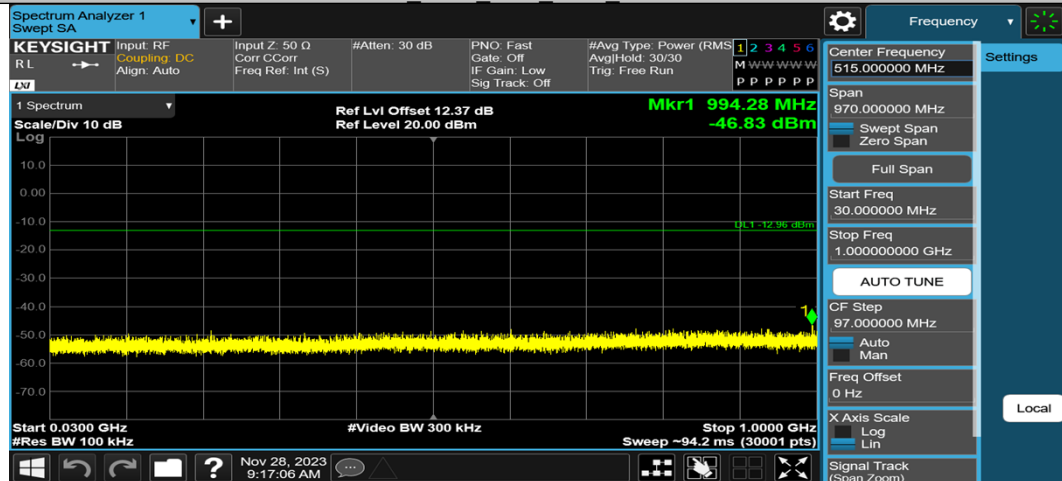
TÜVRheinland®

Prüfbericht - Produkte

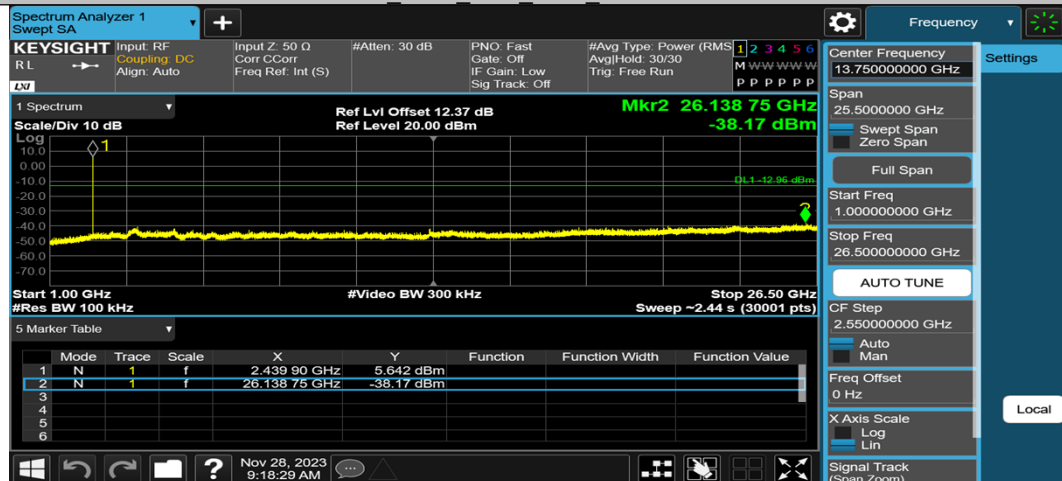
Test Report - Products



BLE 125K Ant1 2440 30~1000



BLE 125K Ant1 2440 1000~26500



BLE 125K Ant1 2480 0~Reference

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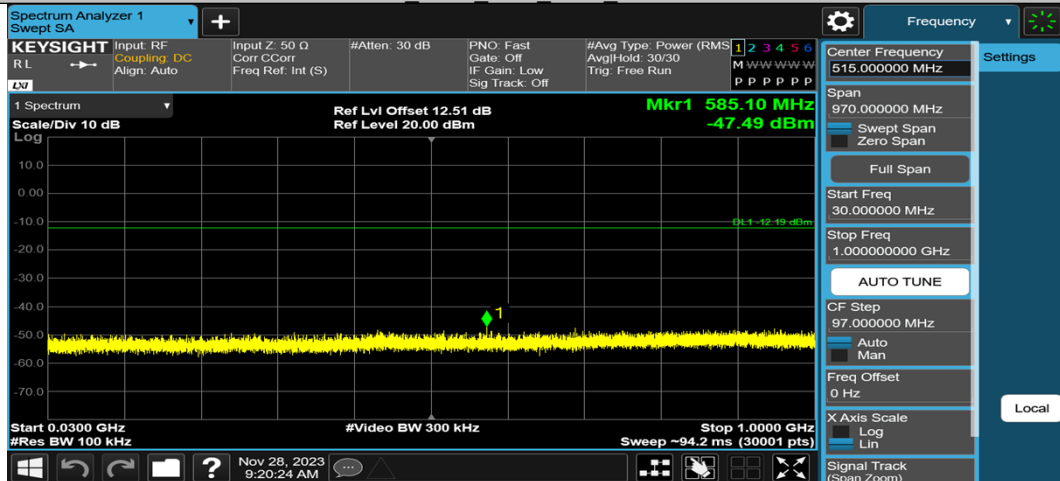
TÜVRheinland®

Prüfbericht - Produkte

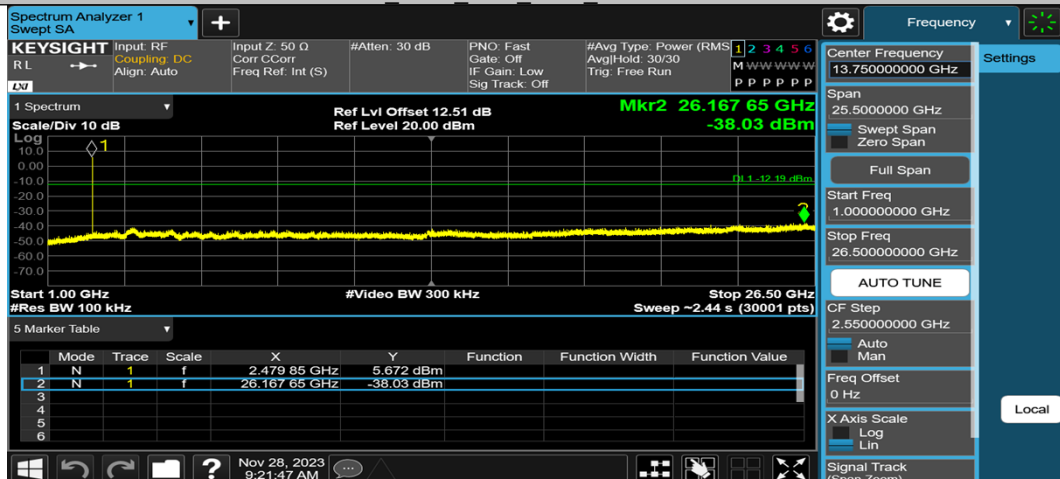
Test Report - Products



BLE 125K Ant1 2480 30~1000



BLE 125K Ant1 2480 1000~26500



BLE_500K



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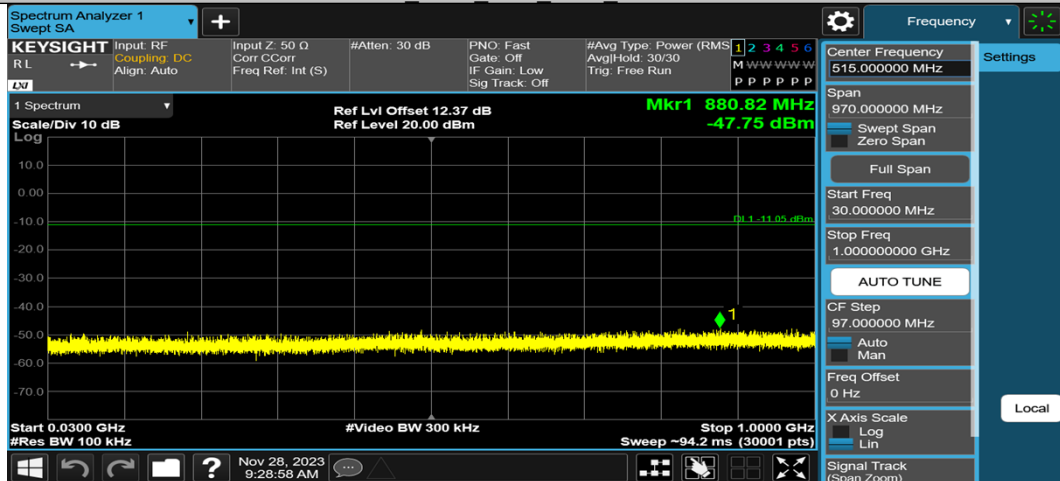
TÜVRheinland®

Prüfbericht - Produkte

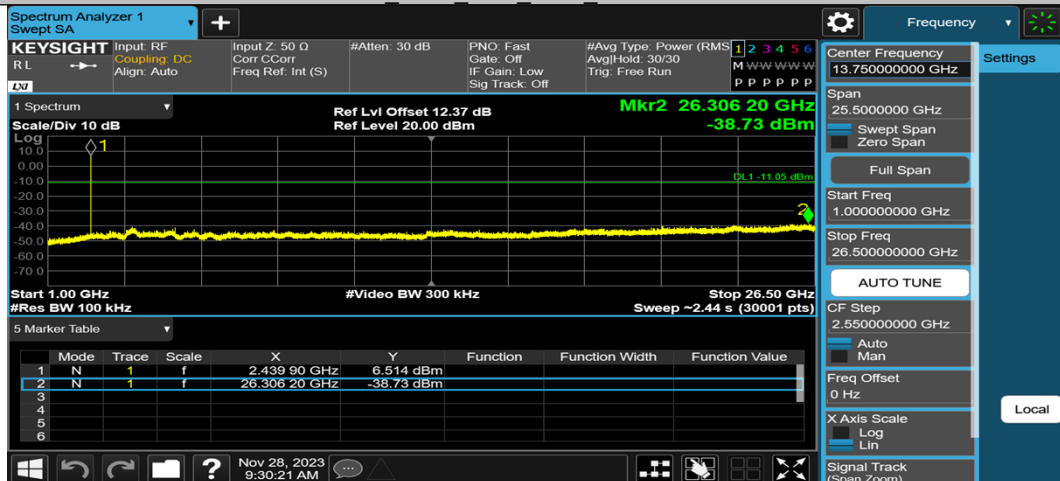
Test Report - Products



BLE 500K Ant1 2440 30~1000



BLE 500K Ant1 2440 1000~26500



BLE 500K Ant1 2480 0~Reference

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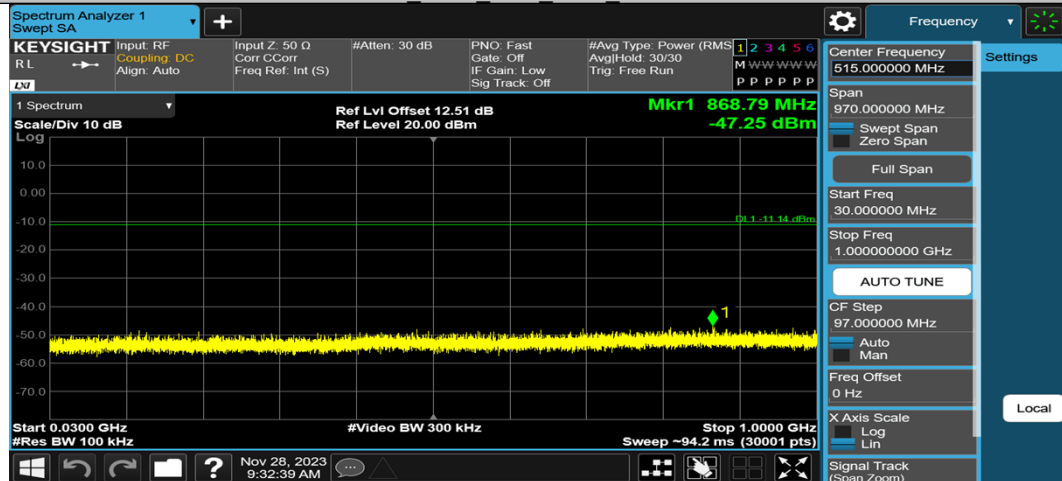
TÜVRheinland®

Prüfbericht - Produkte

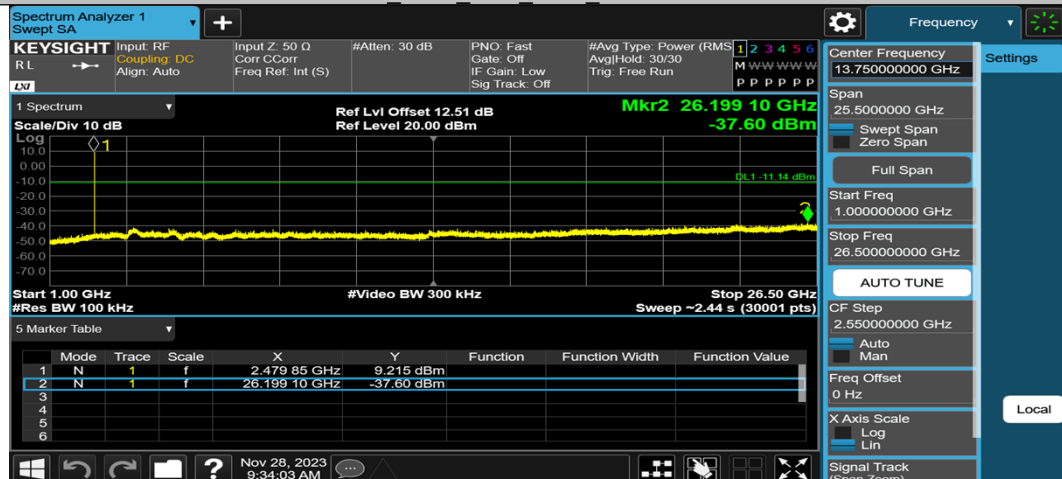
Test Report - Products



BLE 500K Ant1 2480 30~1000



BLE 500K Ant1 2480 1000~26500



Appendix B

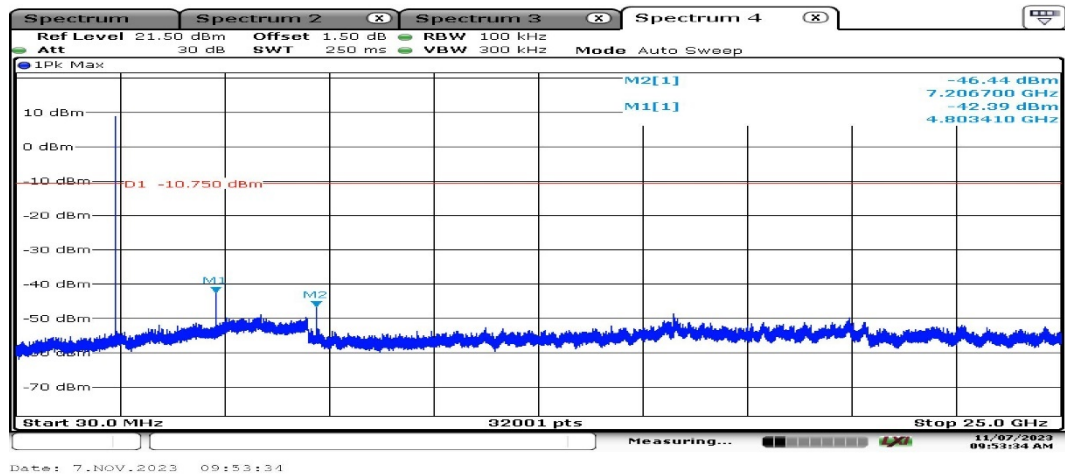
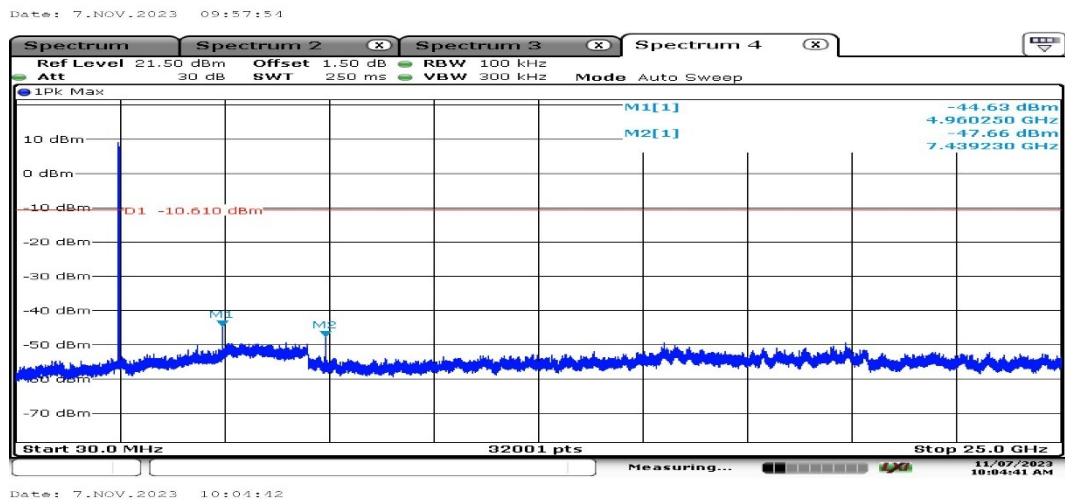
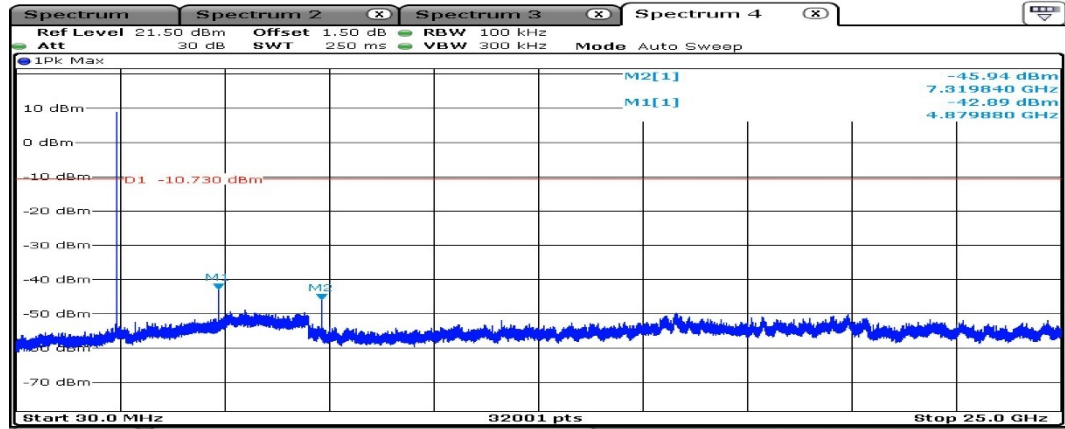
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Prüfbericht - Produkte

Test Report - Products

BLE_1M



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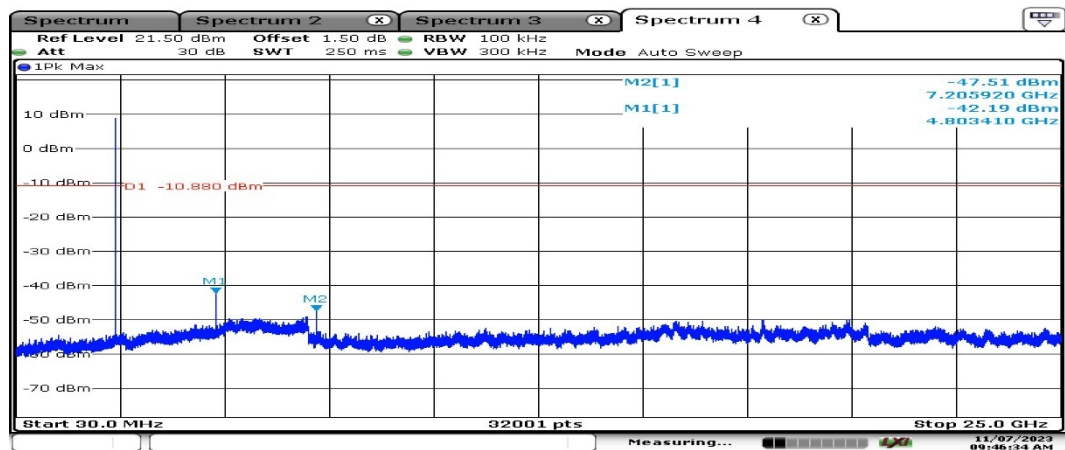
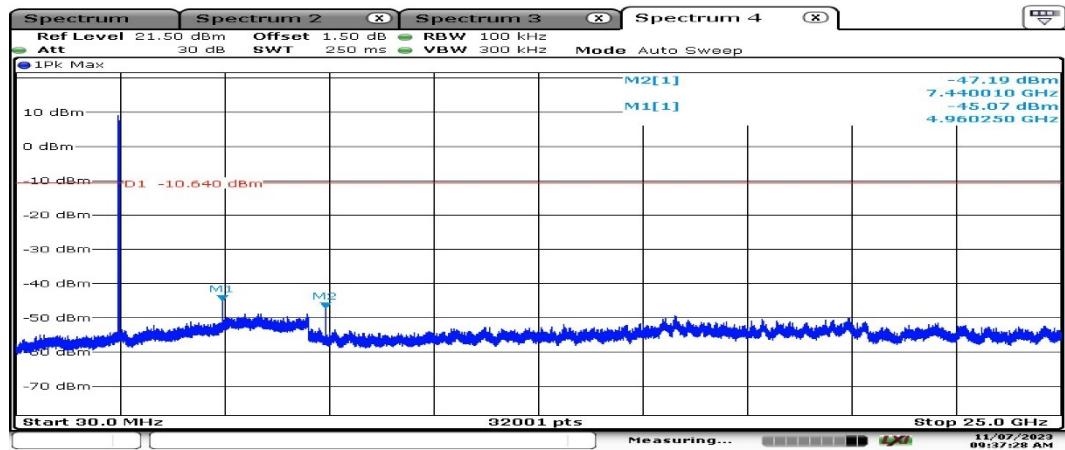
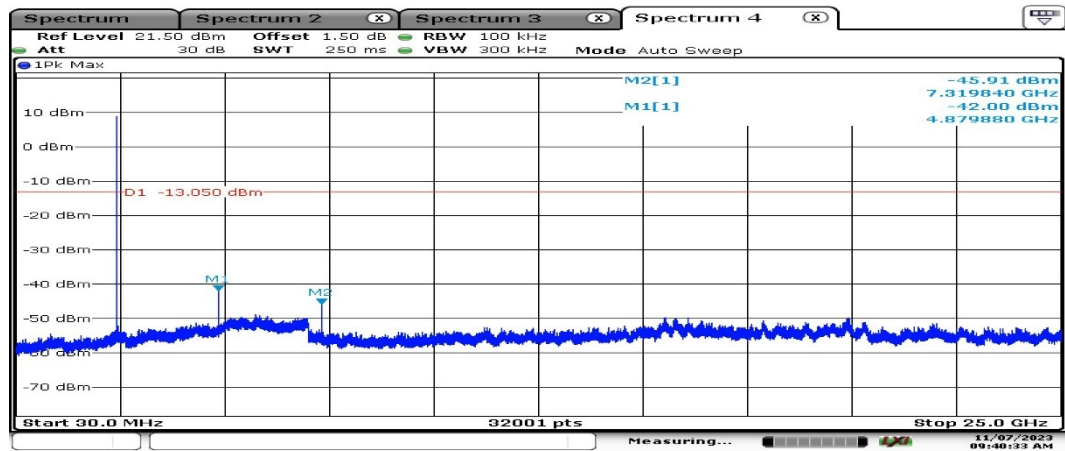
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Prüfbericht - Produkte

Test Report - Products

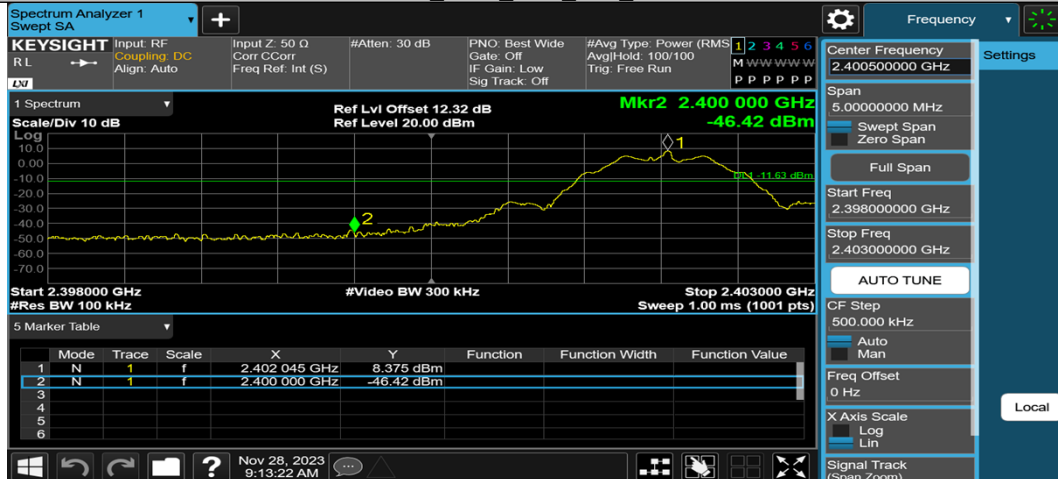
BLE_2M



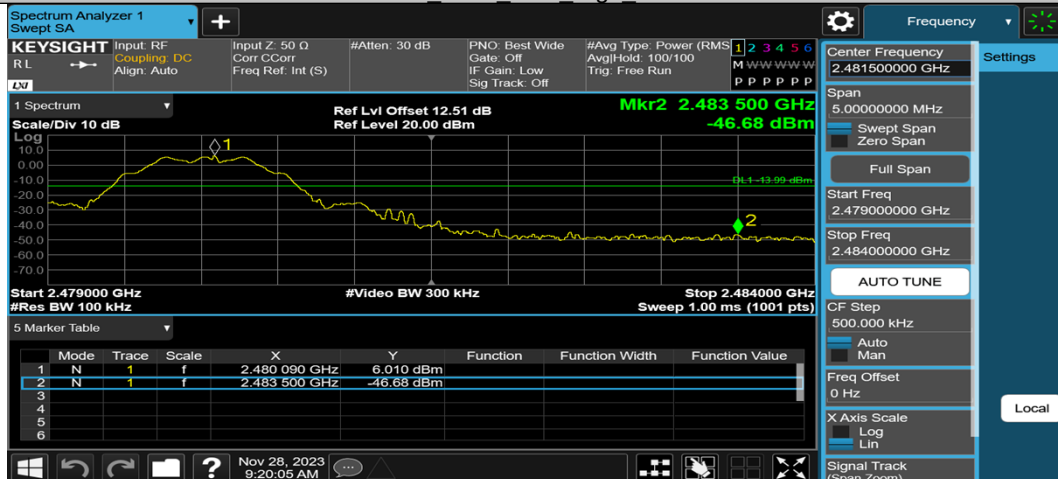
Band Edge

BLE_125K

BLE_125K_Ant1_Low_2402

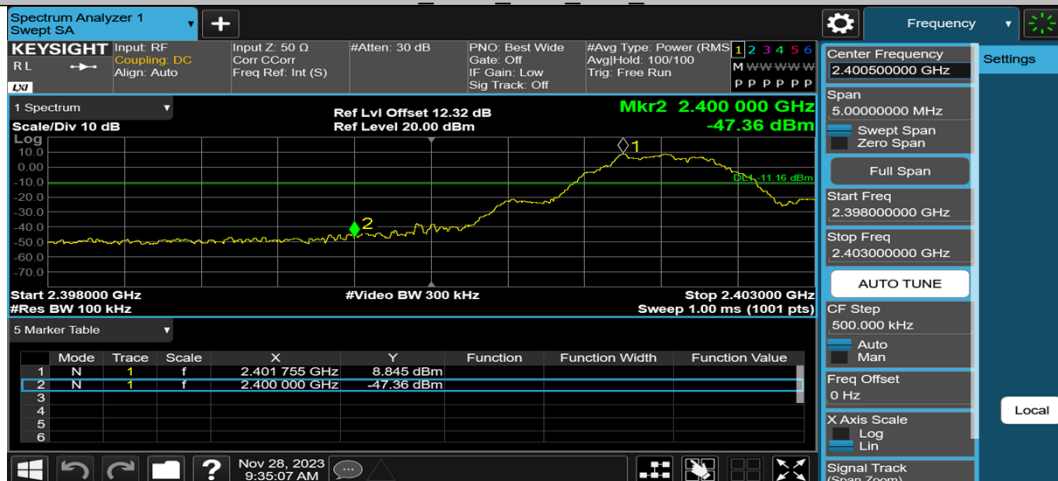


BLE_125K_Ant1_High_2480



BLE_500K

BLE_500K_Ant1_Low_2402



BLE_500K_Ant1_High_2480

Appendix B

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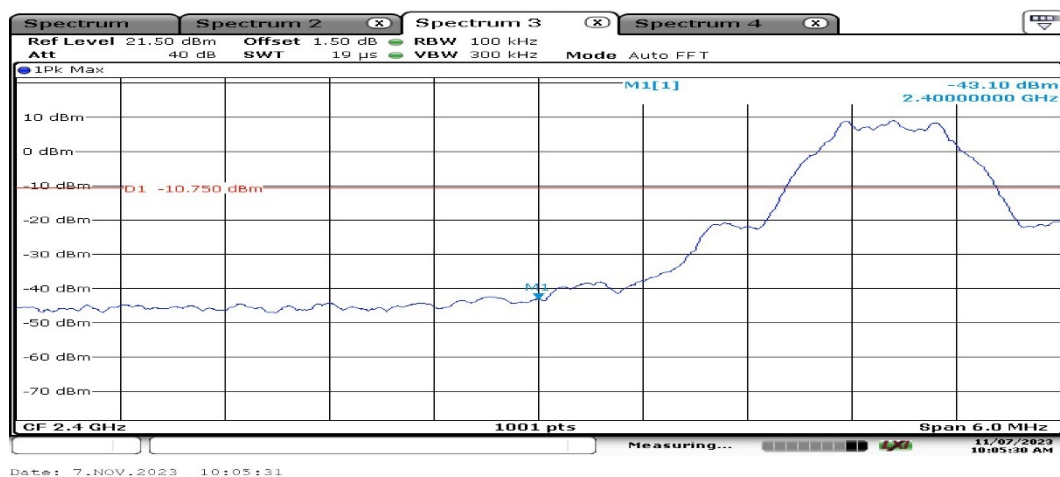
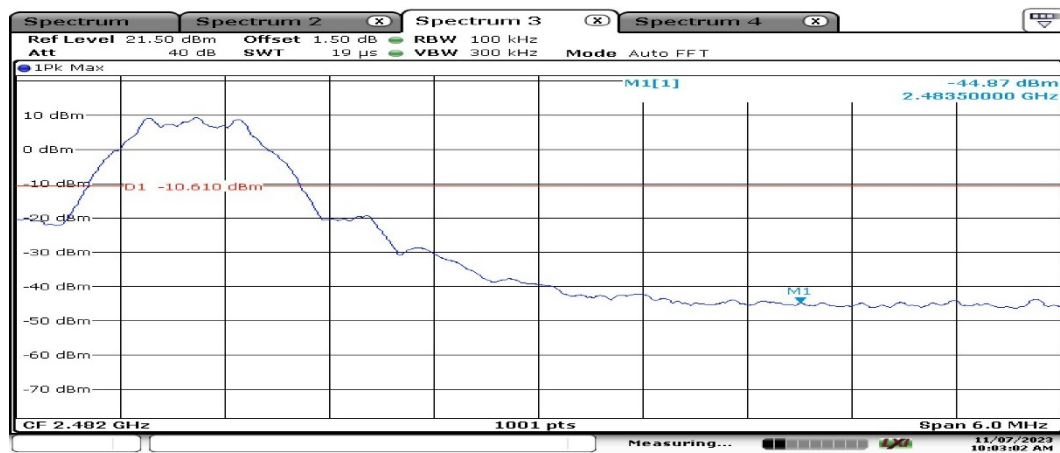
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Prüfbericht - Produkte

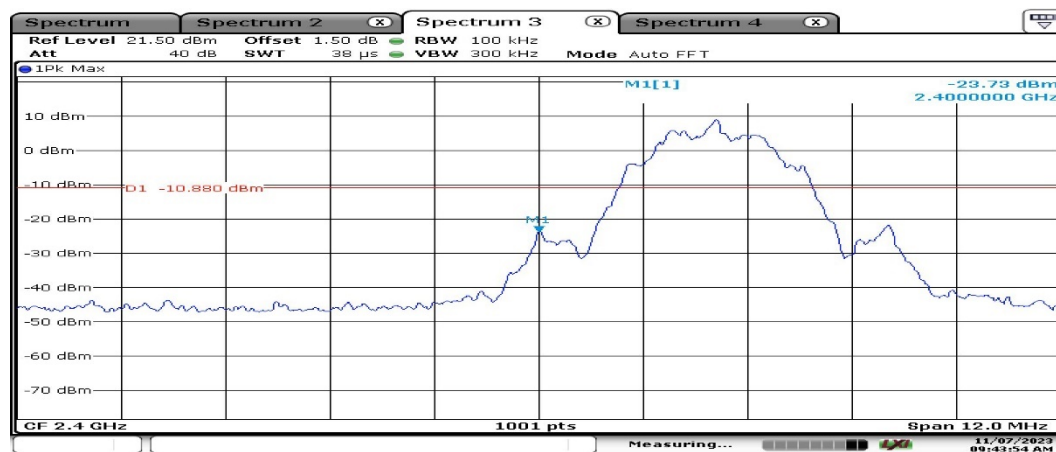
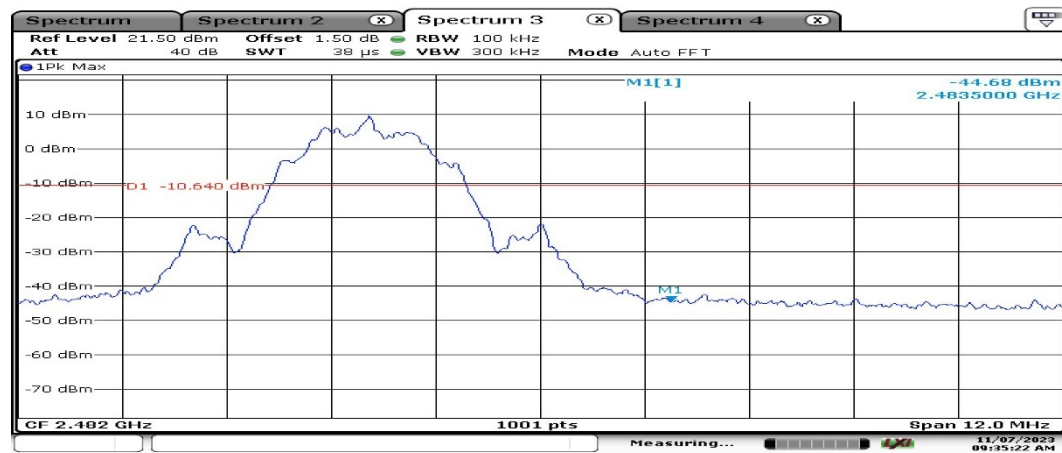
Test Report - Products



BLE_1M



BLE_2M



APPENDIX B.5: RADIATED SPURIOUS EMISSIONS

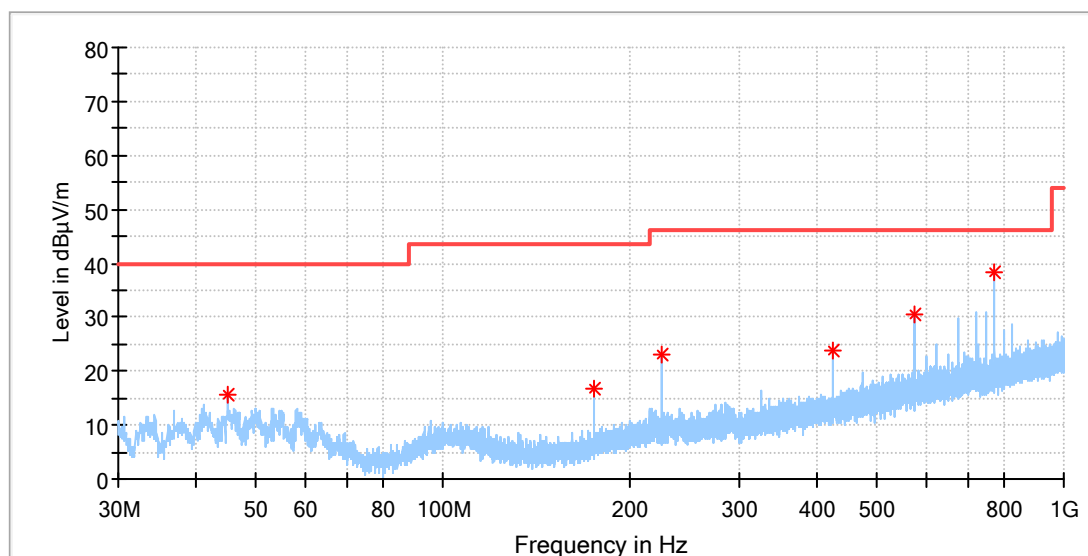
Note:

- 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 Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

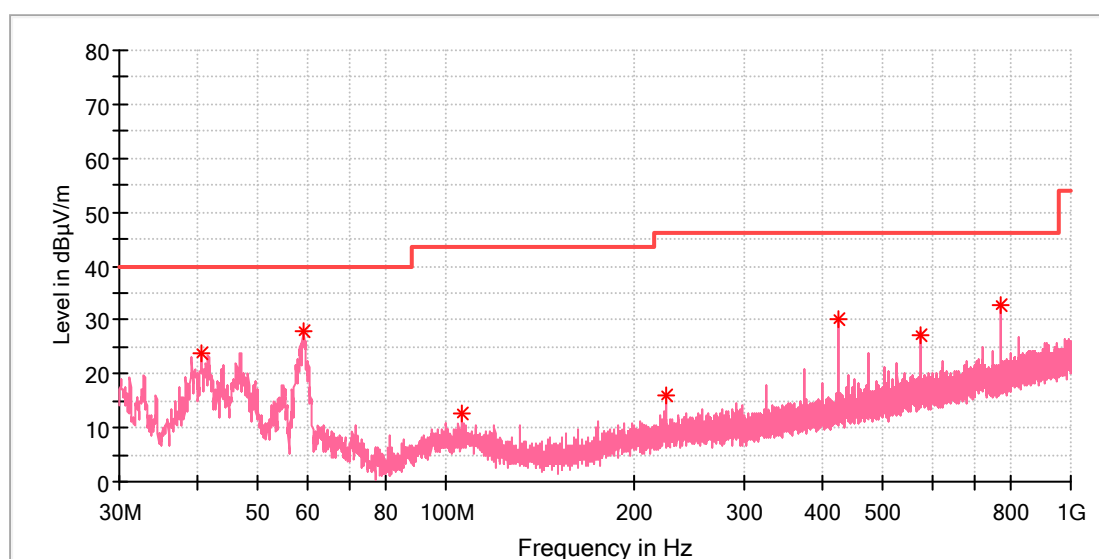


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.997692	15.47	40.00	24.53	100.0	H	310.0	-19.2
175.015000	16.62	43.50	26.88	100.0	H	23.0	-21.3
225.007308	23.04	46.00	22.96	100.0	H	13.0	-18.7
425.013846	23.88	46.00	22.12	100.0	H	39.0	-13.7
575.065385	30.51	46.00	15.49	100.0	H	64.0	-10.7
775.034615	38.31	46.00	7.69	100.0	H	347.0	-7.2

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

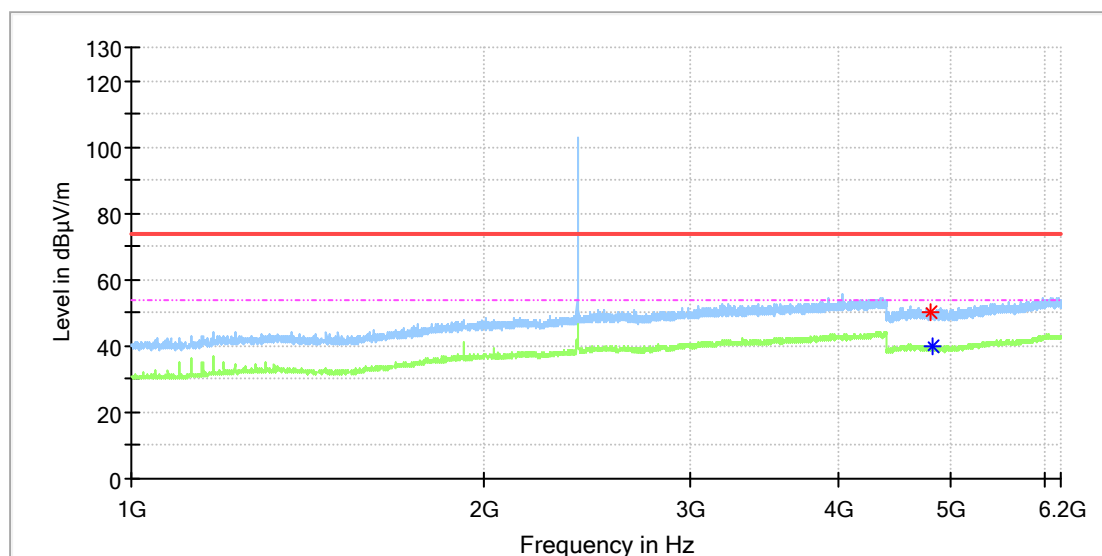
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.595385	23.86	40.00	16.14	100.0	V	266.0	-20.3
58.988077	27.79	40.00	12.21	100.0	V	36.0	-19.2
106.256923	12.57	43.50	30.93	100.0	V	201.0	-19.2
225.007308	15.88	46.00	30.12	100.0	V	152.0	-18.7
425.013846	30.18	46.00	15.82	100.0	V	0.0	-13.7
575.065385	27.30	46.00	18.70	100.0	V	59.0	-10.7
775.034615	32.73	46.00	13.27	100.0	V	120.0	-7.2

1GHz-18GHz

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

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

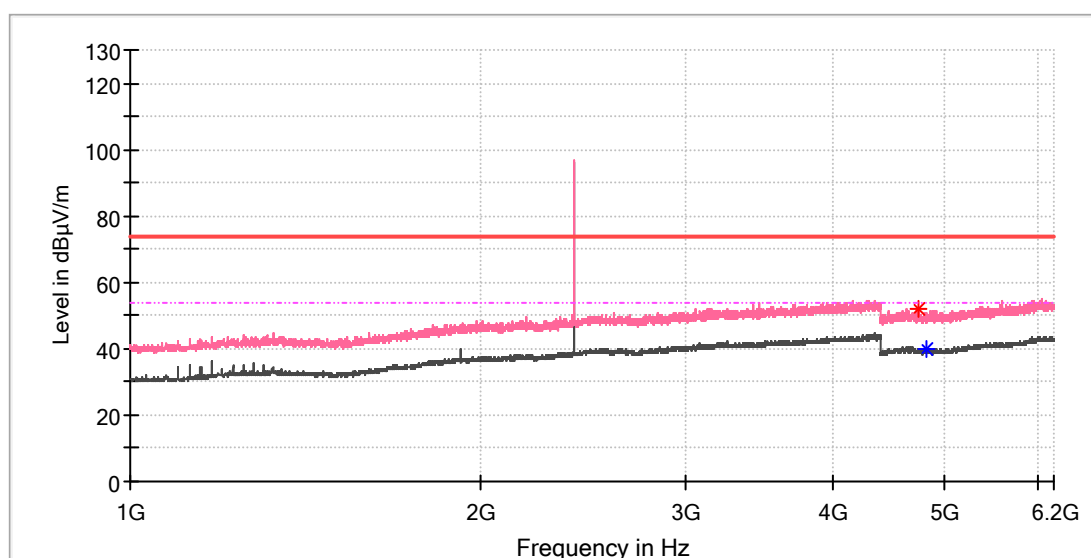


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4807.000000	50.28	---	74.00	23.72	150.0	H	228.0	11.8
4819.000000	---	39.71	54.00	14.29	150.0	H	350.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

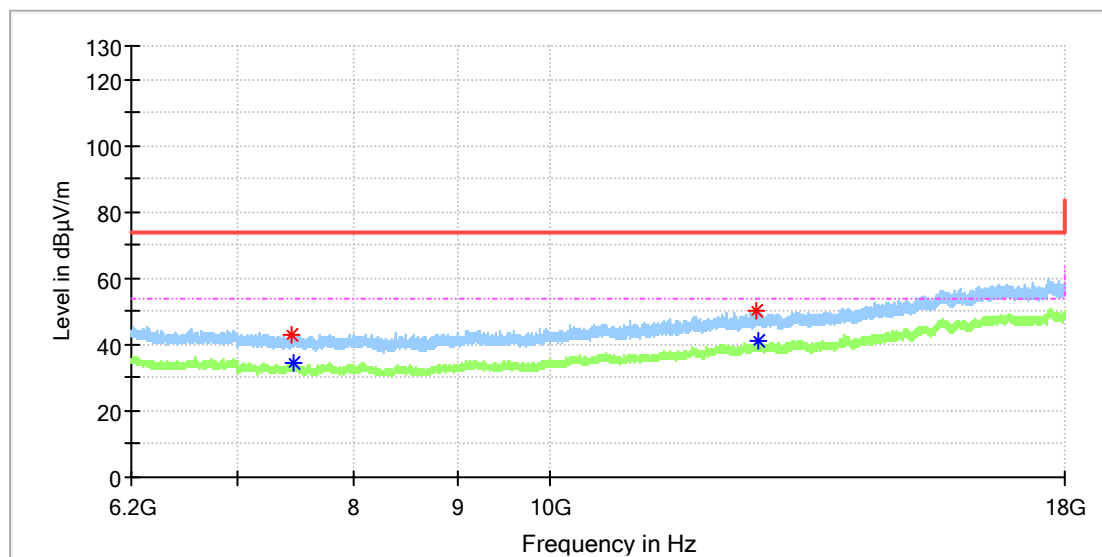


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4745.500000	52.06	---	74.00	21.94	150.0	V	262.0	11.9
4814.000000	---	39.93	54.00	14.07	150.0	V	237.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No./Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

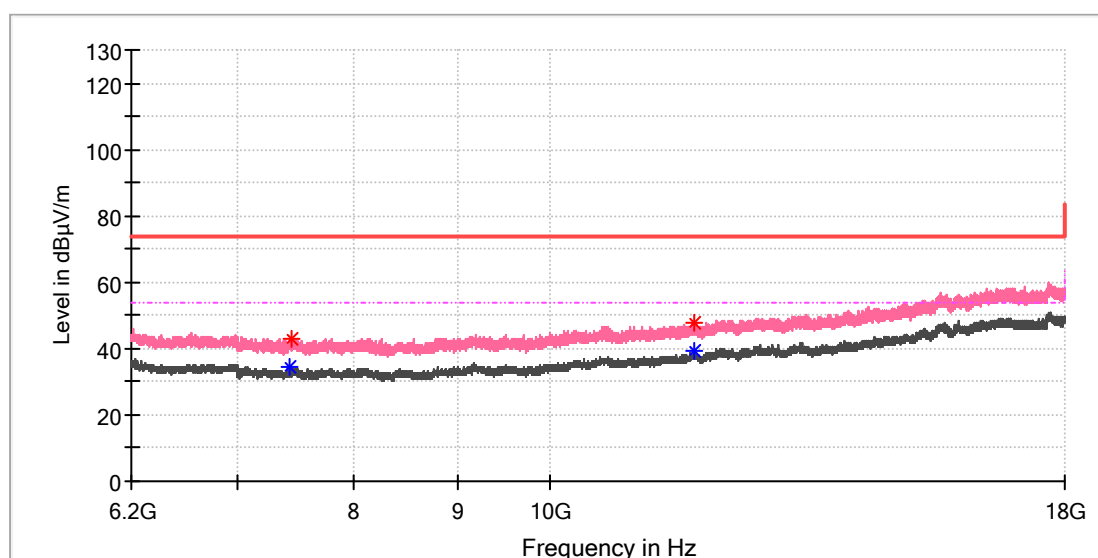


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7451.783333	42.68	---	74.00	31.32	150.0	H	353.0	8.5
7456.700000	---	34.43	54.00	19.57	150.0	H	182.0	8.5
12658.041667	50.30	---	74.00	23.70	150.0	H	209.0	15.0
12687.541667	---	40.83	54.00	13.17	150.0	H	18.0	15.1

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

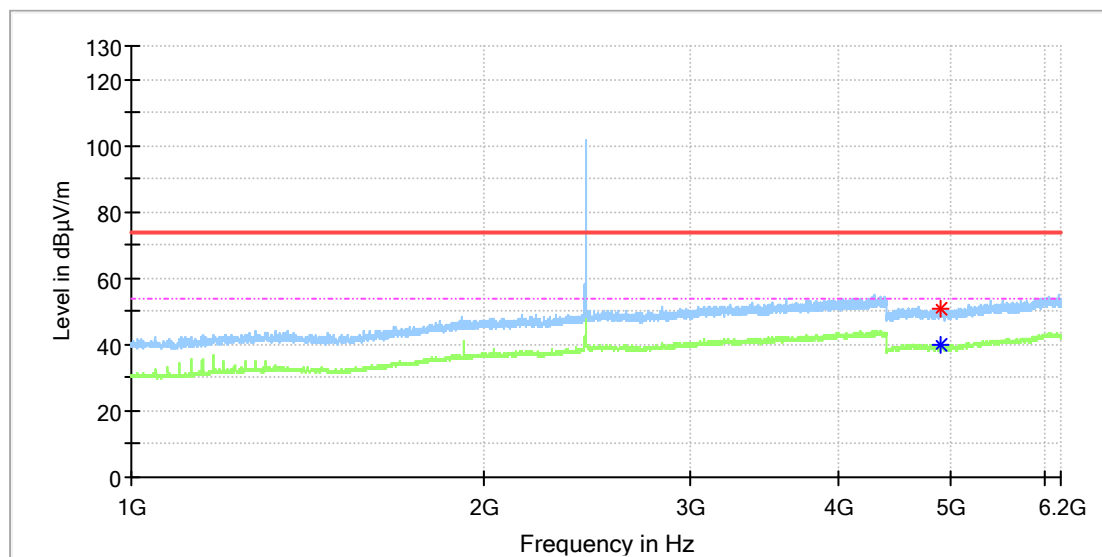


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7430.150000	---	34.20	54.00	19.80	150.0	V	352.0	8.4
7450.800000	42.79	---	74.00	31.21	150.0	V	133.0	8.5
11788.775000	---	39.34	54.00	14.66	150.0	V	121.0	13.4
11790.741667	47.90	---	74.00	26.10	150.0	V	0.0	13.4

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

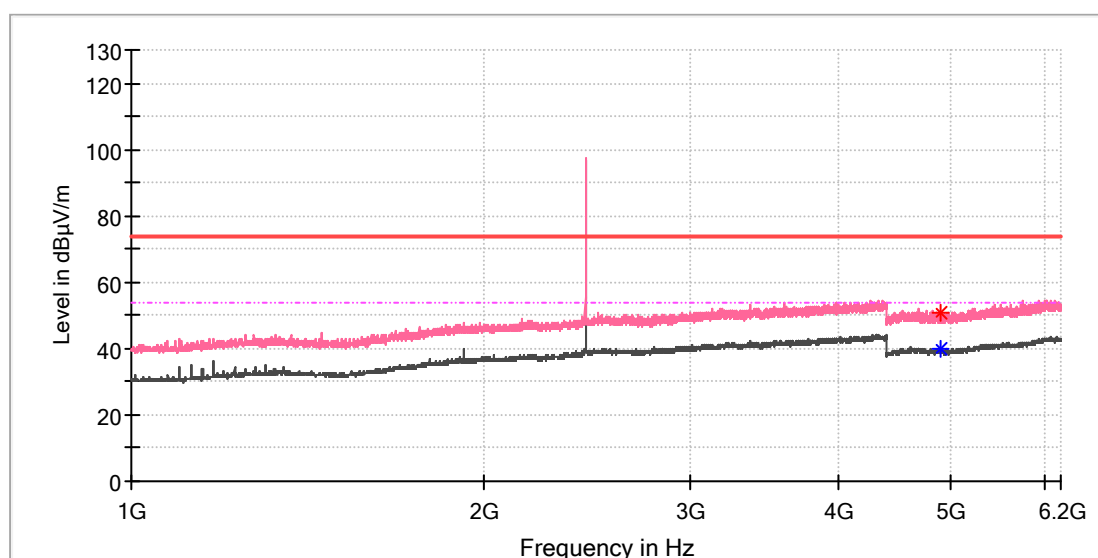


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4892.000000	---	39.61	54.00	14.39	150.0	H	168.0	11.8
4892.500000	50.80	---	74.00	23.20	150.0	H	111.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

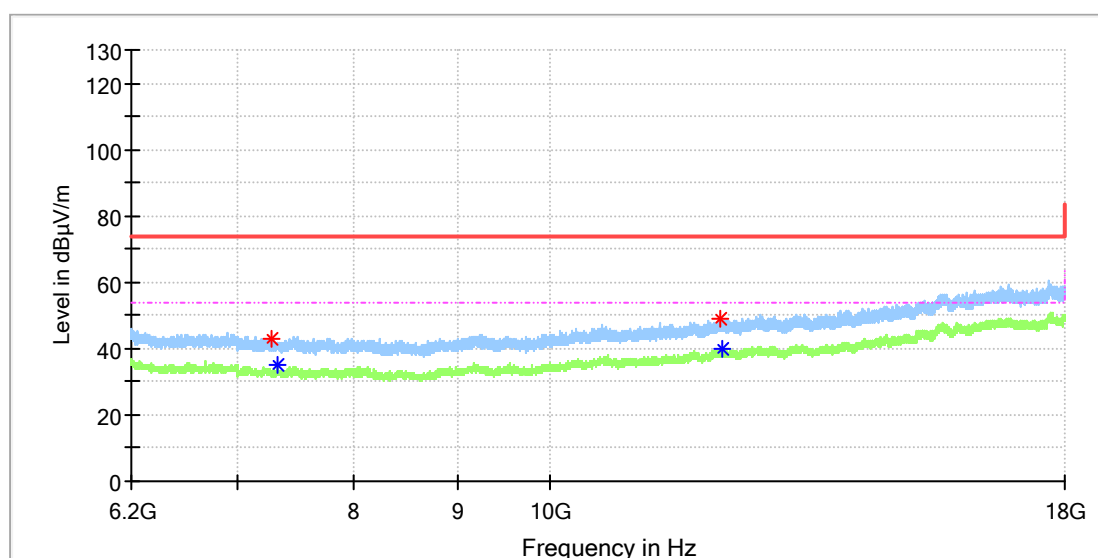


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4891.000000	50.83	---	74.00	23.17	150.0	V	34.0	11.8
4901.000000	---	39.87	54.00	14.13	150.0	V	318.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

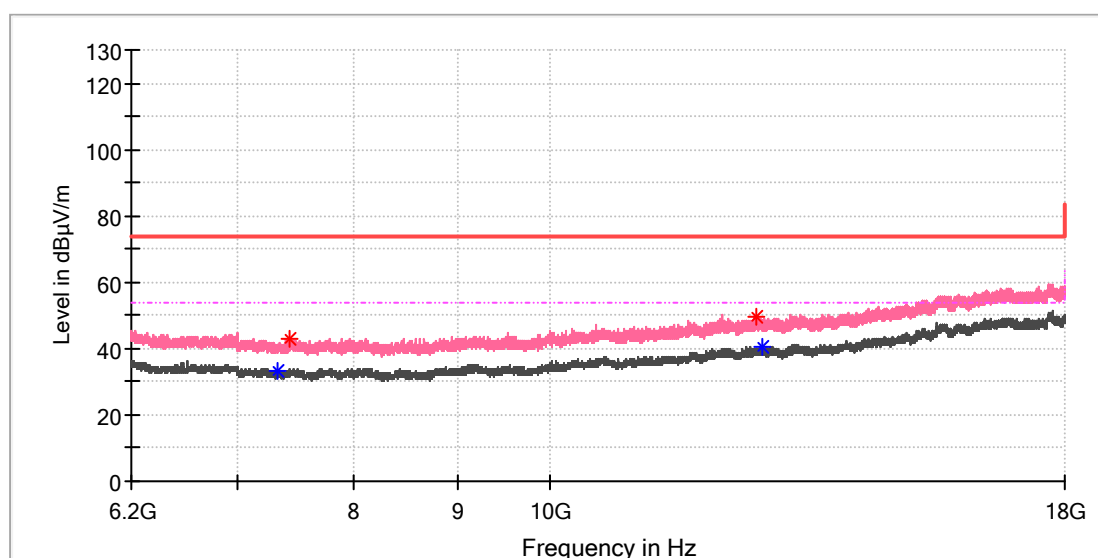


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7269.866667	42.96	---	74.00	31.04	150.0	H	266.0	8.5
7320.508333	---	35.14	54.00	18.86	150.0	H	206.0	8.2
12131.958333	48.91	---	74.00	25.09	150.0	H	132.0	14.3
12169.816667	---	39.91	54.00	14.09	150.0	H	69.0	14.5

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Mid channel
Order No./Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

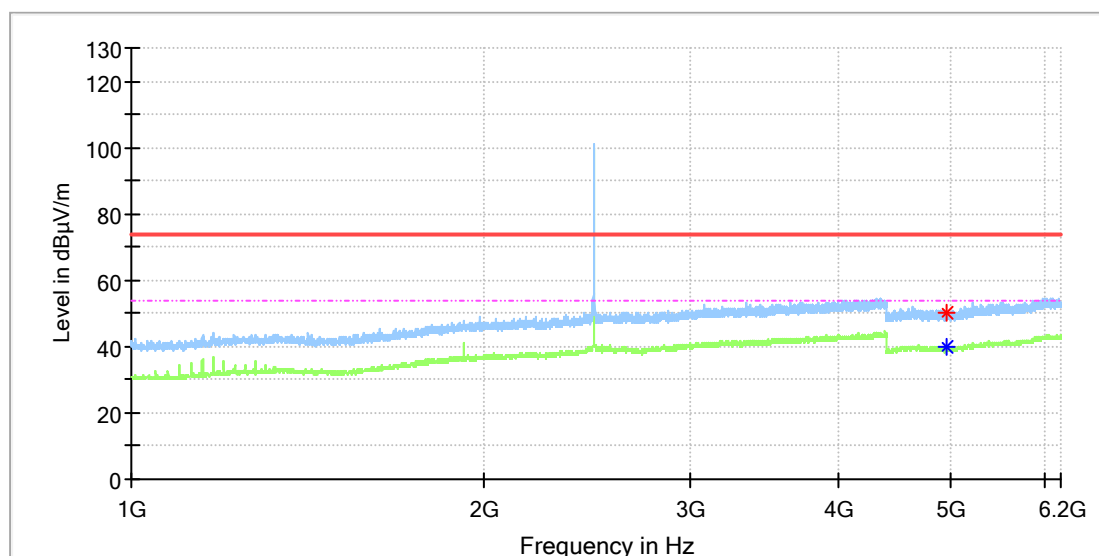


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7324.441667	---	33.45	54.00	20.55	150.0	V	275.0	8.2
7434.575000	43.08	---	74.00	30.92	150.0	V	311.0	8.4
12653.125000	49.85	---	74.00	24.15	150.0	V	240.0	15.0
12732.775000	---	40.47	54.00	13.53	150.0	V	204.0	15.2

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

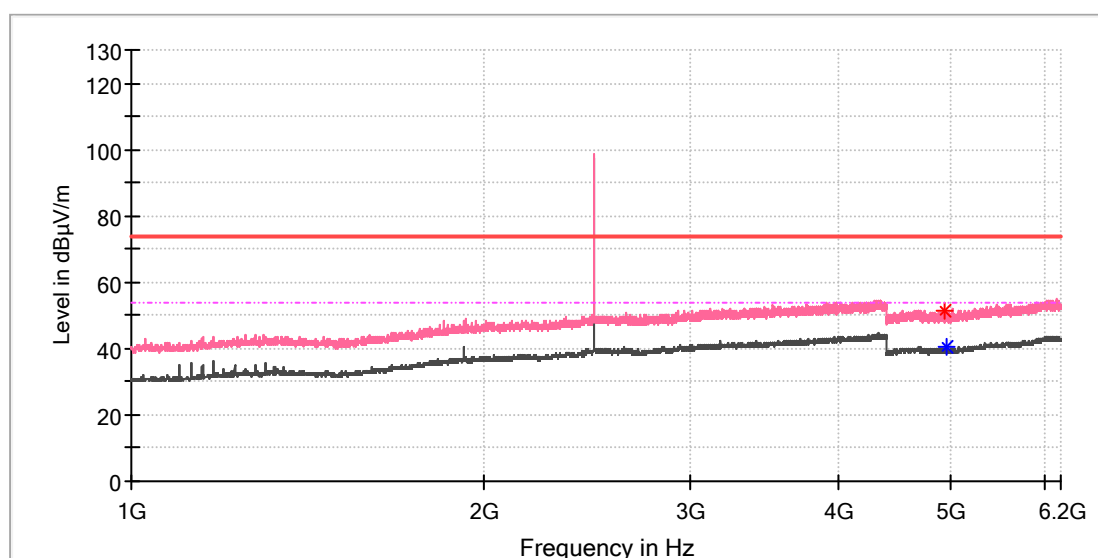


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4951.500000	50.46	---	74.00	23.54	150.0	H	179.0	11.8
4957.000000	---	39.74	54.00	14.26	150.0	H	261.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

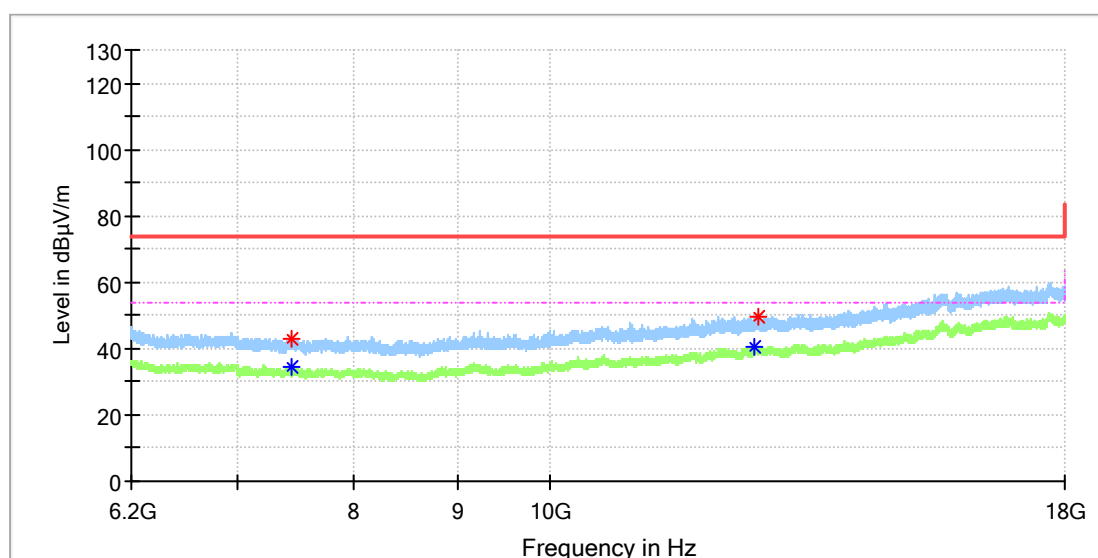


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4926.500000	51.24	---	74.00	22.76	150.0	V	352.0	11.8
4956.000000	---	40.30	54.00	13.70	150.0	V	51.0	11.8

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

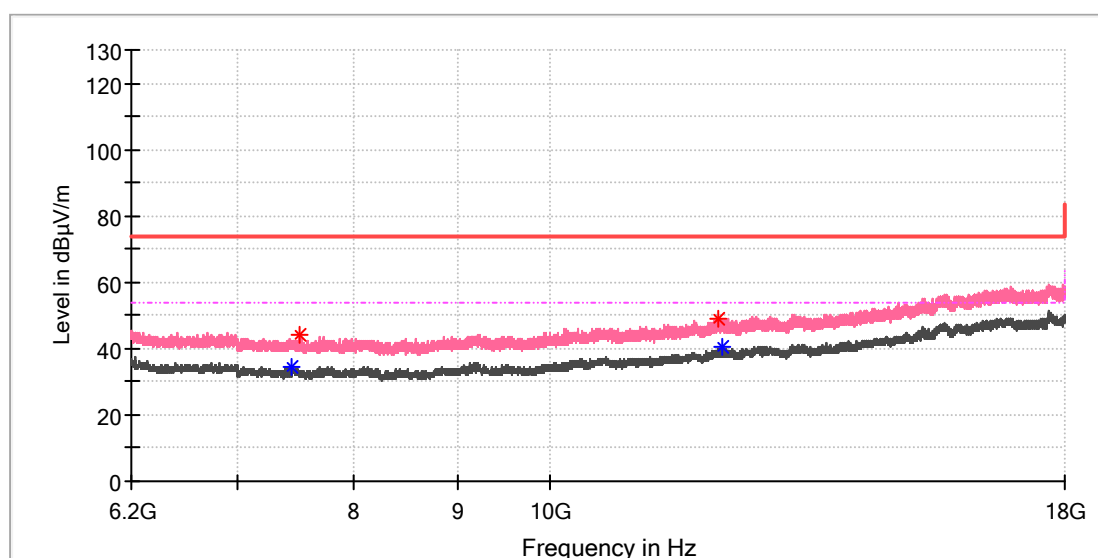


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7447.358333	42.65	---	74.00	31.35	150.0	H	19.0	8.5
7451.291667	---	34.32	54.00	19.68	150.0	H	56.0	8.5
12633.950000	---	40.23	54.00	13.77	150.0	H	71.0	15.0
12686.558333	49.84	---	74.00	24.16	150.0	H	44.0	15.1

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

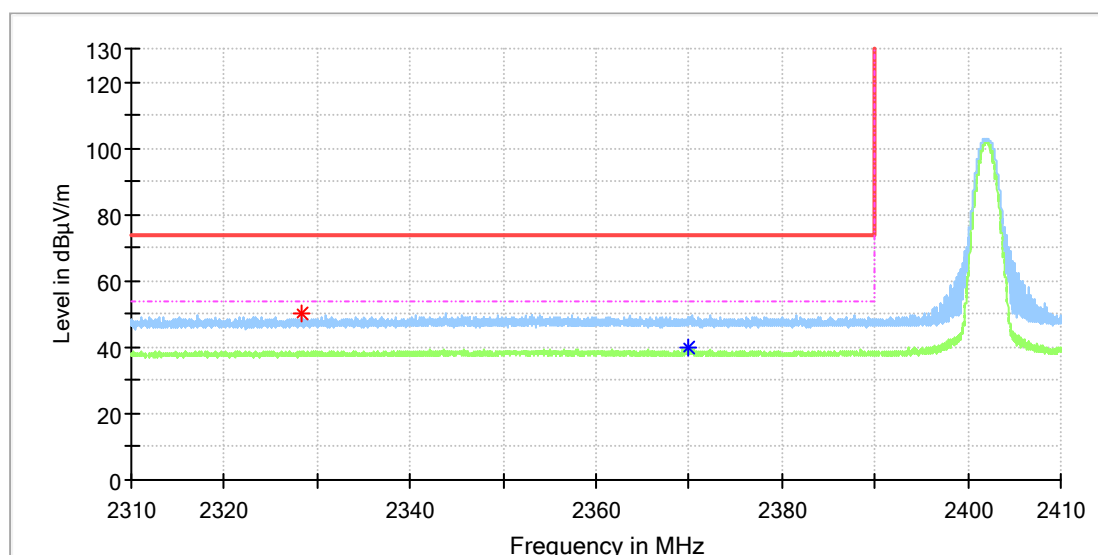
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7450.308333	---	34.34	54.00	19.66	150.0	V	0.0	8.5
7508.325000	43.90	---	74.00	30.10	150.0	V	341.0	8.7
12110.816667	49.11	---	74.00	24.89	150.0	V	233.0	14.2
12181.616667	---	40.57	54.00	13.43	150.0	V	341.0	14.6

APPENDIX B.6: RADIATED EMISSIONS IN RESTRICTED BANDS

BLE_1M

EUT Information

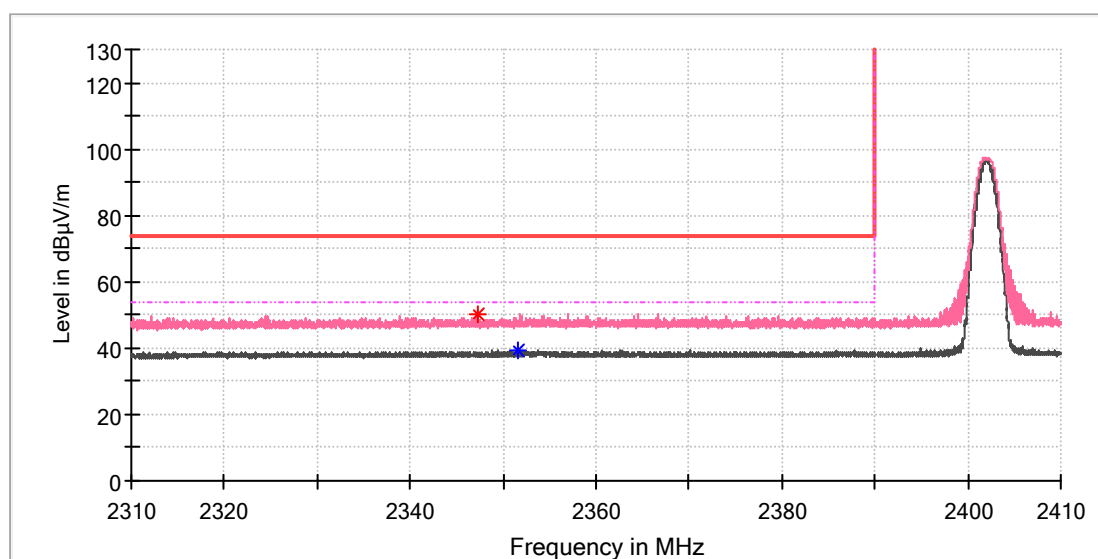
EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2328.367647	50.15	---	74.00	23.85	150.0	H	266.0	6.7
2369.838235	---	40.16	54.00	13.84	150.0	H	260.0	6.9

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

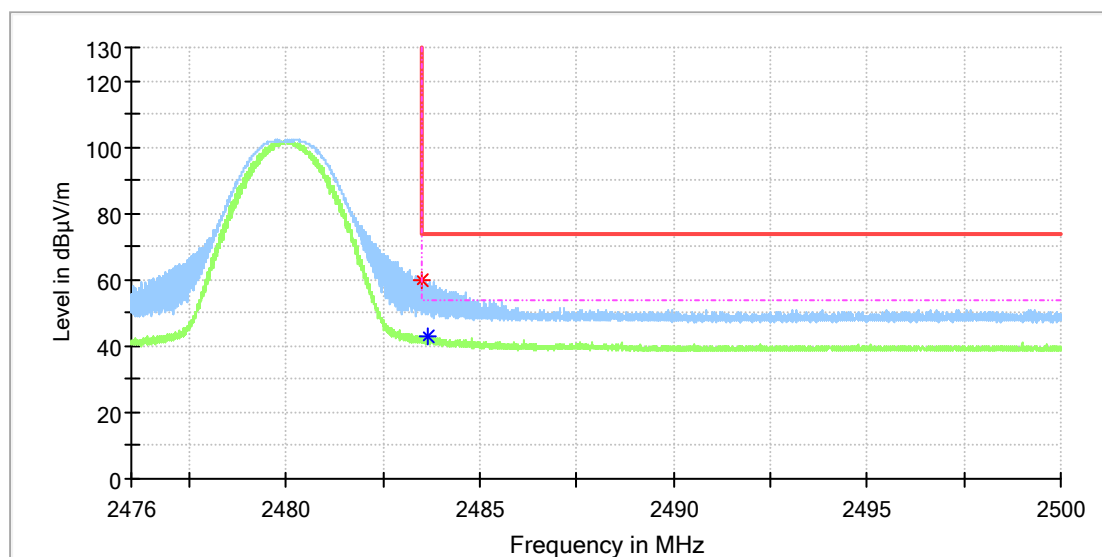


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2347.323530	50.42	---	74.00	23.58	150.0	V	84.0	6.9
2351.602941	---	39.36	54.00	14.64	150.0	V	50.0	6.9

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

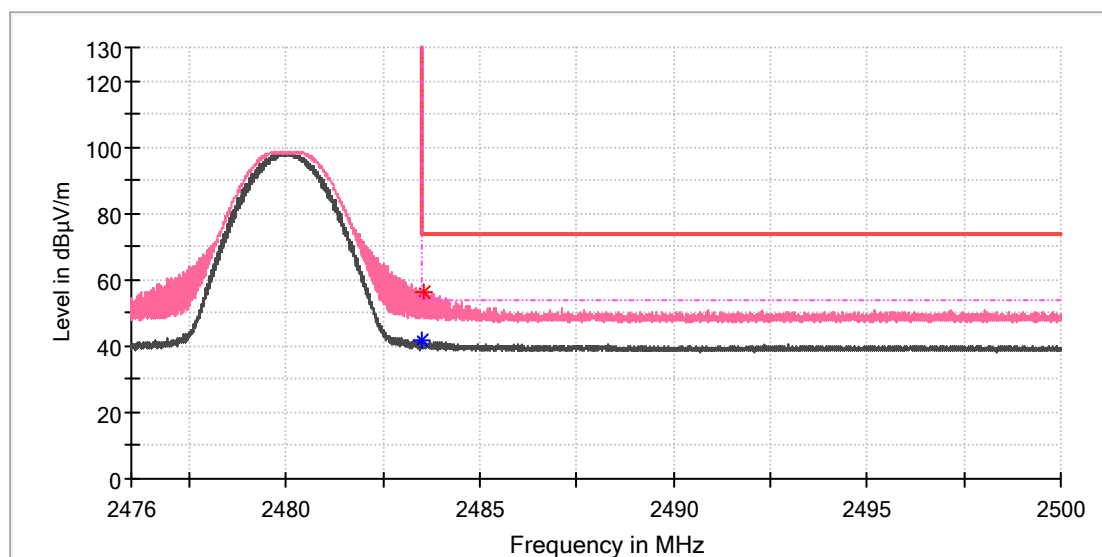


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.524706	59.83	---	74.00	14.17	150.0	H	240.0	7.4
2483.665882	---	43.21	54.00	10.79	150.0	H	254.0	7.4

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



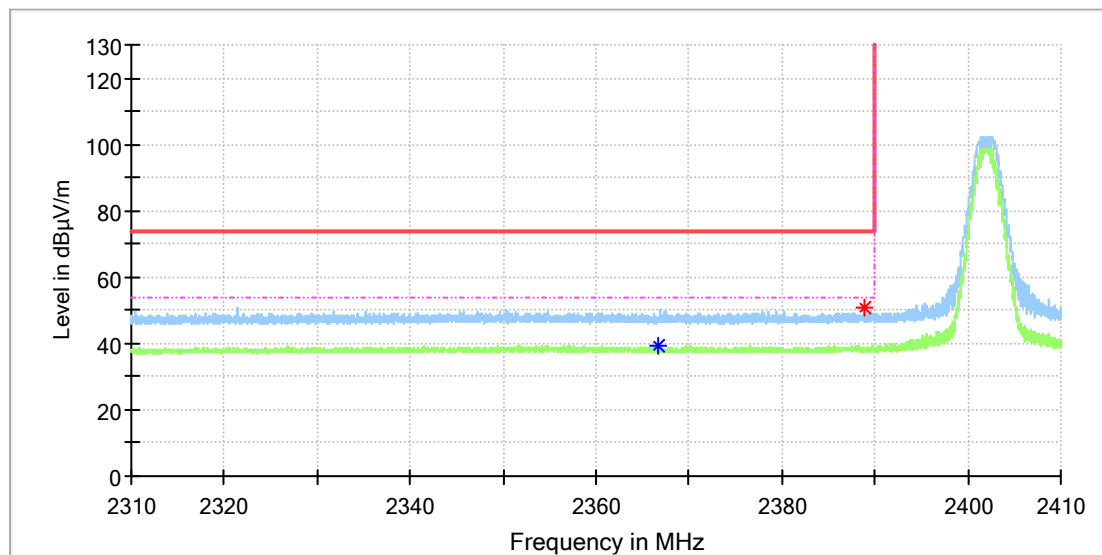
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.521177	---	41.63	54.00	12.37	150.0	V	137.0	7.4
2483.545882	56.26	---	74.00	17.74	150.0	V	143.0	7.4

BLE_2M

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

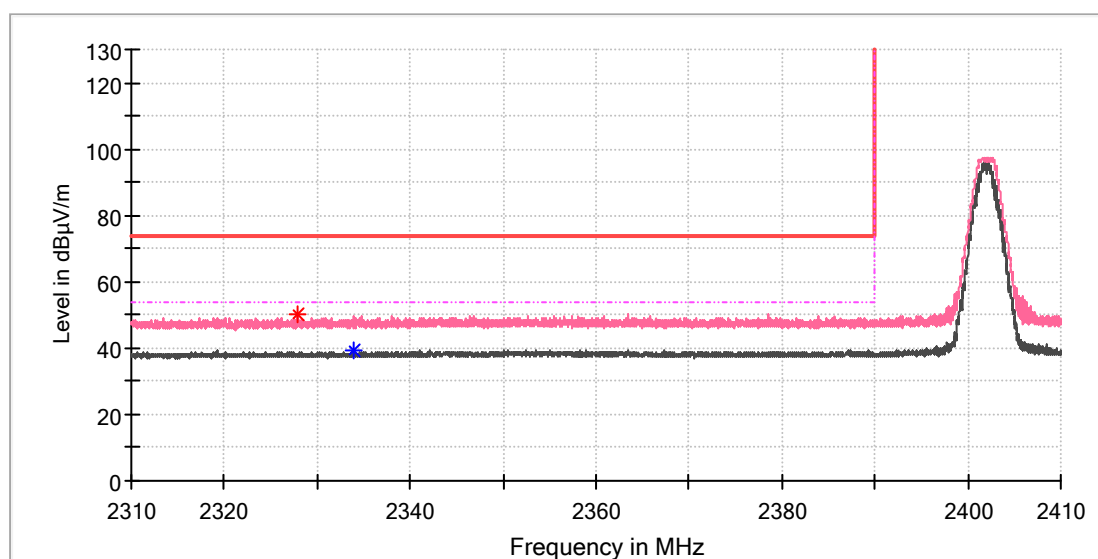


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2366.779412	---	39.43	54.00	14.57	150.0	H	0.0	6.9
2388.911765	50.94	---	74.00	23.06	150.0	H	257.0	7.0

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

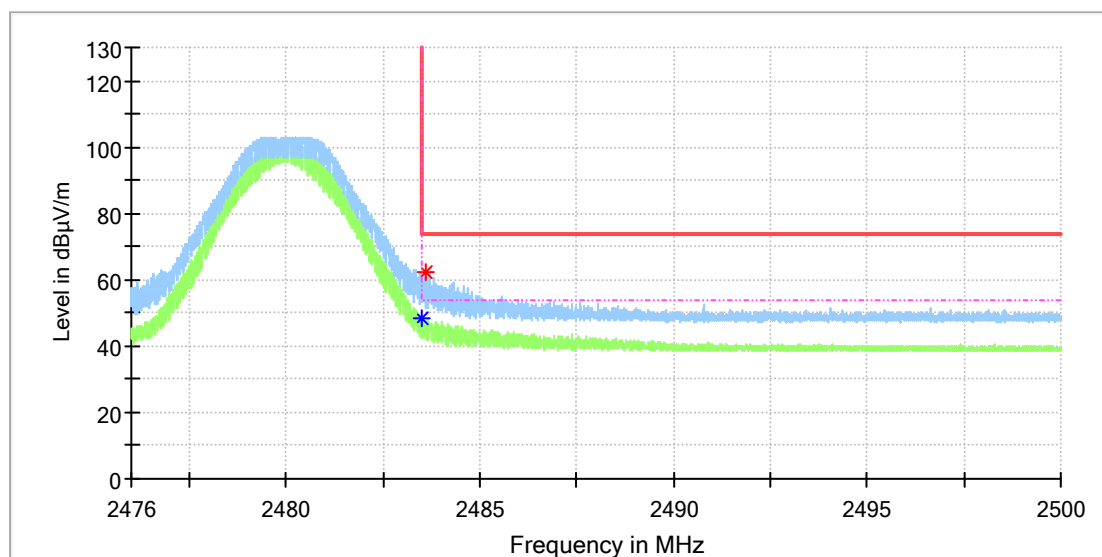


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2327.941177	50.11	---	74.00	23.89	150.0	V	117.0	6.7
2333.867647	---	39.21	54.00	14.80	150.0	V	89.0	6.7

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 2M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

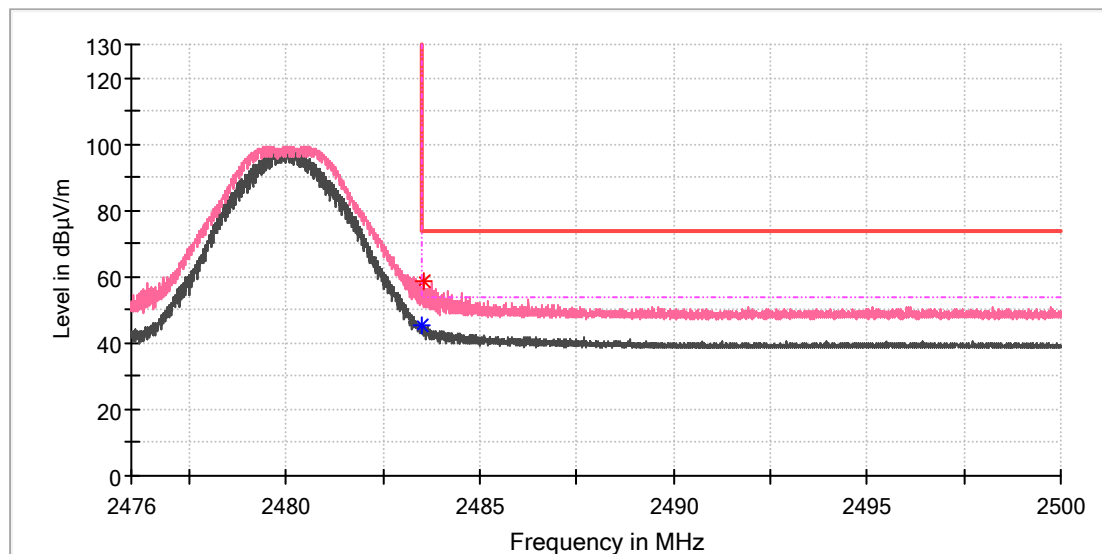


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	48.37	54.00	5.63	150.0	H	252.0	7.4
2483.577647	62.06	---	74.00	11.94	150.0	H	330.0	7.4

EUT Information

EUT Name:	I/O Module
Model:	IQ5-IO-8DOS-HOA-B
Test Mode:	BLE 2M_High channel
Order No/Sample No:	168449710/A003584092-002
Test Voltage::	AC 24V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

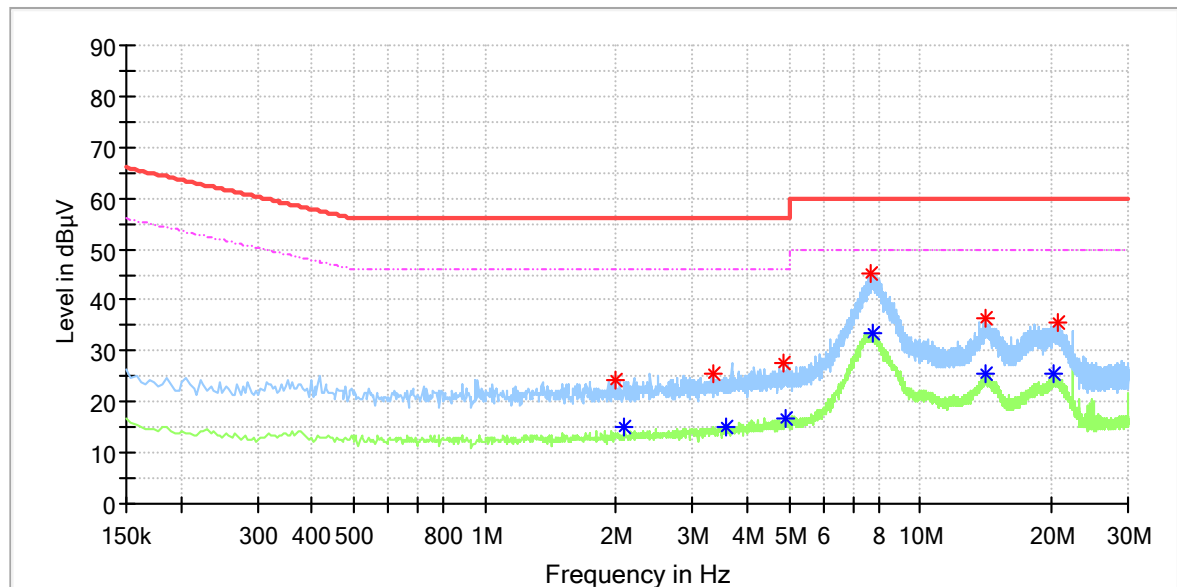


Critical Freqs

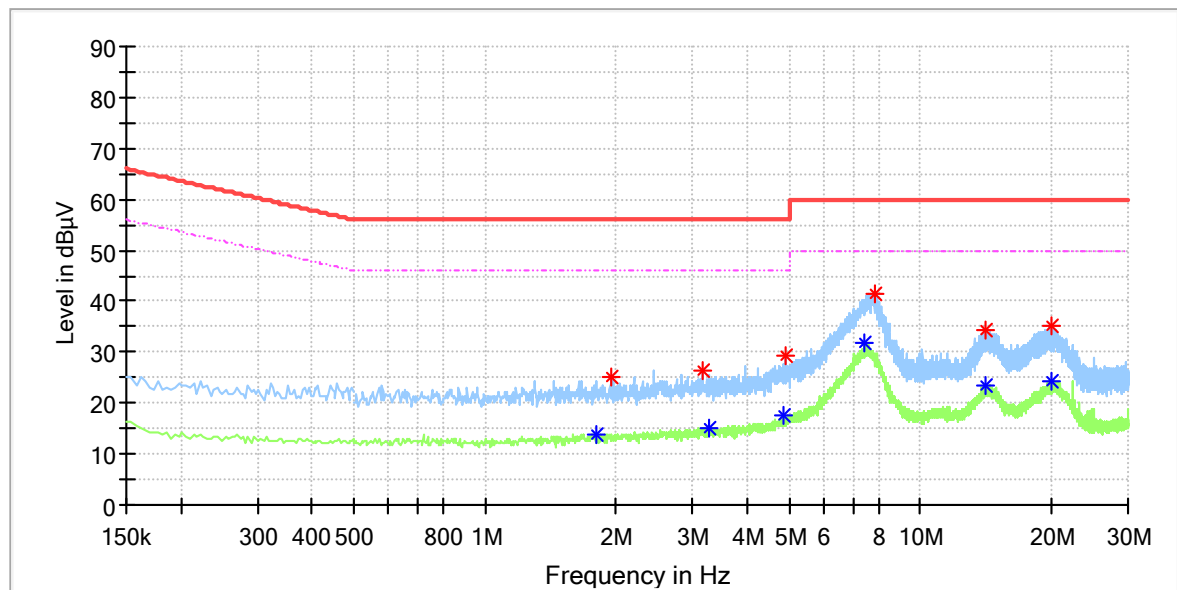
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.524706	---	45.32	54.00	8.68	150.0	V	138.0	7.4
2483.528235	58.68	---	74.00	15.32	150.0	V	138.0	7.4

APPENDIX B.7: CONDUCTED EMISSION ON AC MAINS

Normal Working with Bluetooth connected

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
1.992000	24.48	---	56.00	31.52	L1	9.8
2.096000	---	15.16	46.00	30.84	L1	9.9
3.360000	25.69	---	56.00	30.31	L1	10.0
3.568000	---	15.04	46.00	30.96	L1	10.0
4.872000	27.60	---	56.00	28.40	L1	10.0
4.908000	---	16.64	46.00	29.36	L1	10.0
7.696000	45.31	---	60.00	14.69	L1	9.9
7.736000	---	33.68	50.00	16.32	L1	9.9
14.060000	36.35	---	60.00	23.65	L1	10.1
14.196000	---	25.33	50.00	24.67	L1	10.1
20.336000	---	25.35	50.00	24.65	L1	10.5
20.608000	35.54	---	60.00	24.46	L1	10.5



Critical Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
1.808000	---	14.00	46.00	32.00	N	9.9
1.952000	24.97	---	56.00	31.03	N	9.9
3.164000	26.47	---	56.00	29.53	N	10.0
3.280000	---	15.19	46.00	30.81	N	10.0
4.836000	---	17.56	46.00	28.44	N	10.0
4.896000	29.29	---	56.00	26.71	N	10.0
7.452000	---	31.64	50.00	18.36	N	9.9
7.844000	41.57	---	60.00	18.43	N	10.0
14.132000	---	23.62	50.00	26.38	N	10.1
14.176000	34.39	---	60.00	25.61	N	10.1
20.108000	35.31	---	60.00	24.69	N	10.4
20.116000	---	24.42	50.00	25.58	N	10.4