

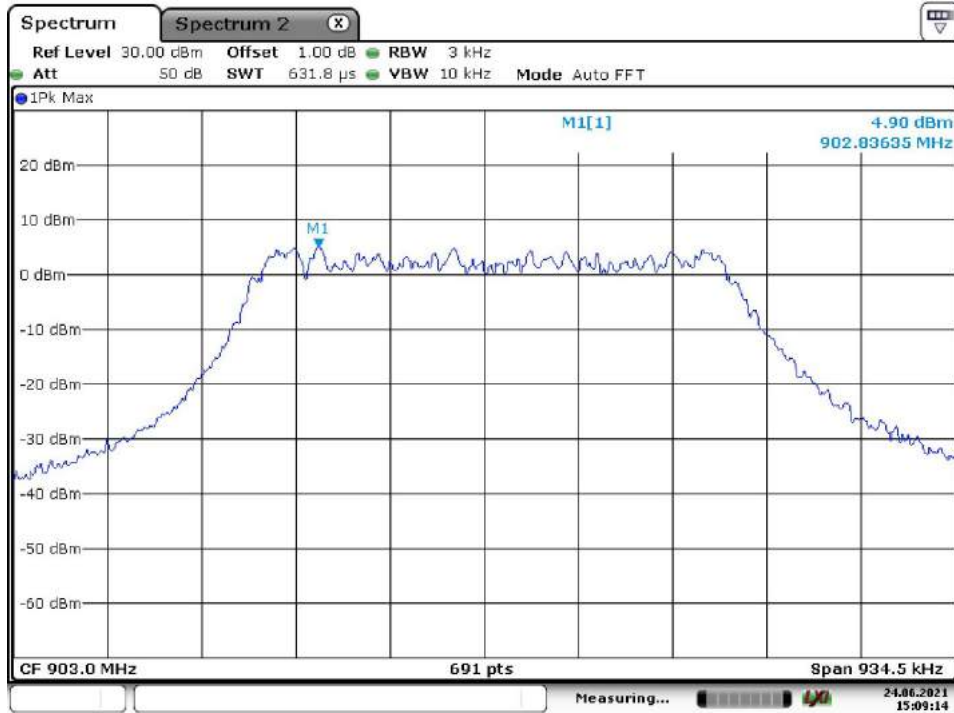
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Appendix B.1: Conducted Power Spectral Density

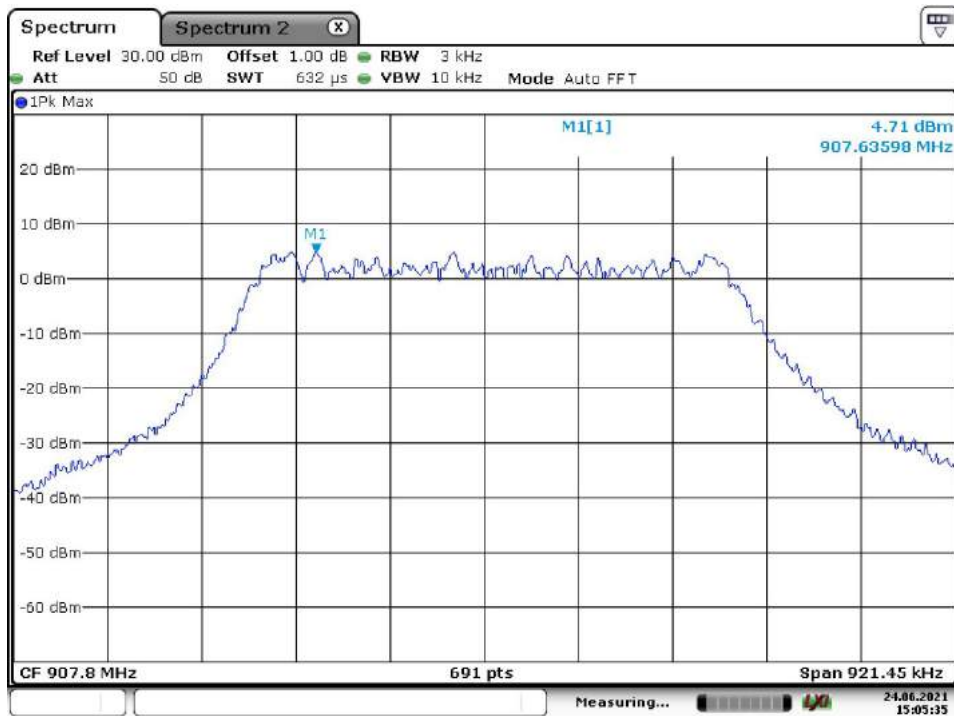
Lora DTS

Low Channel



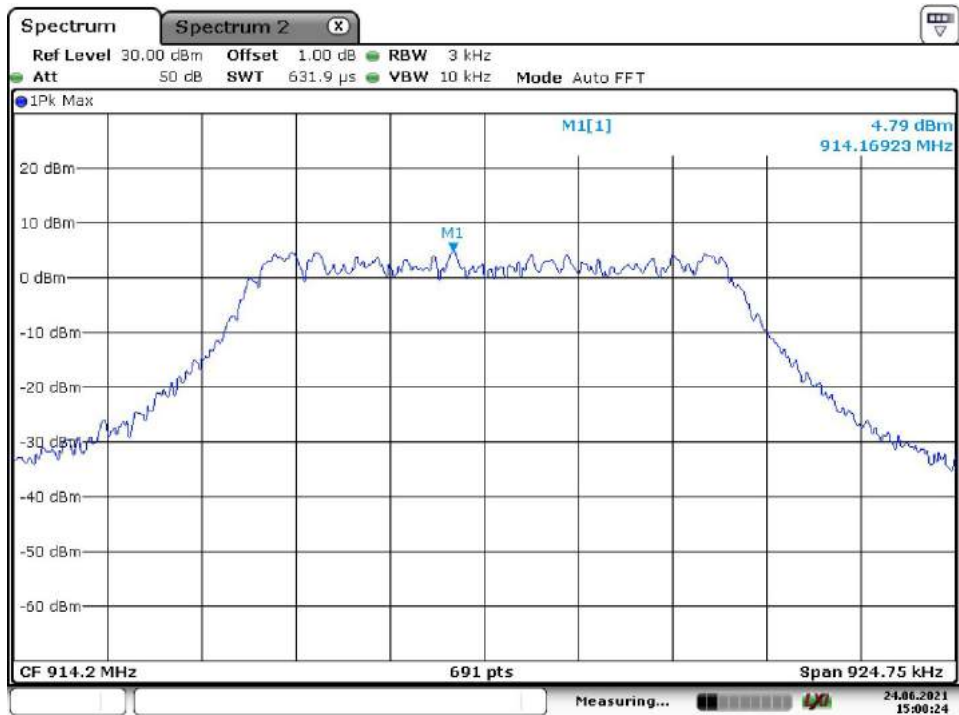
Date: 24.JUN.2021 15:09:14

Middle Channel



Date: 24.JUN.2021 15:09:35

High Channel

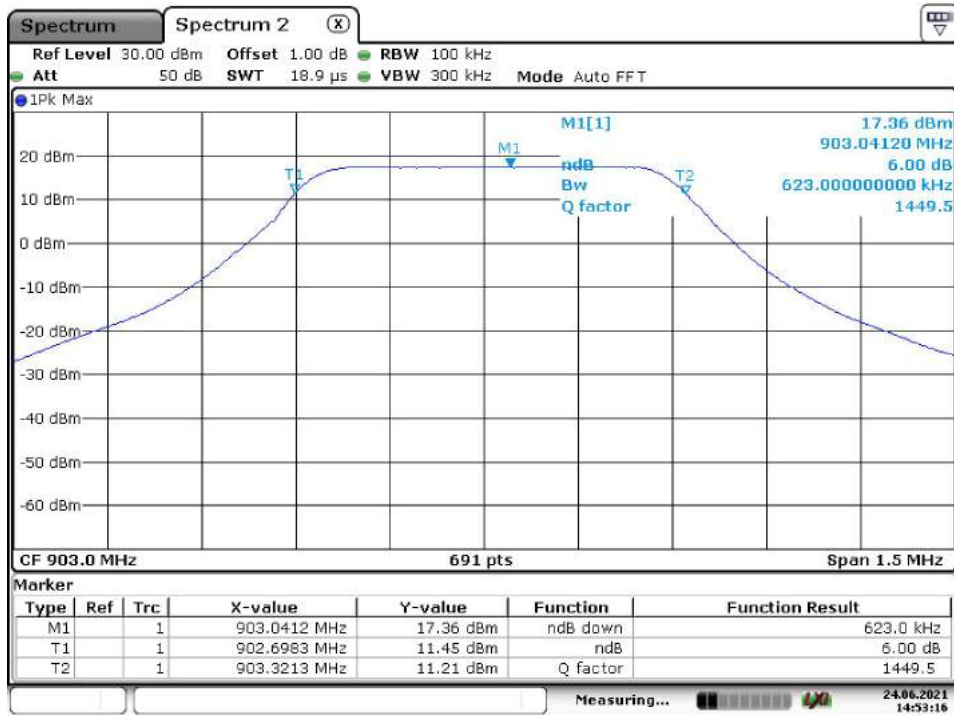


Date: 24.JUN.2021 15:00:24

Appendix B.2: 6dB Bandwidth

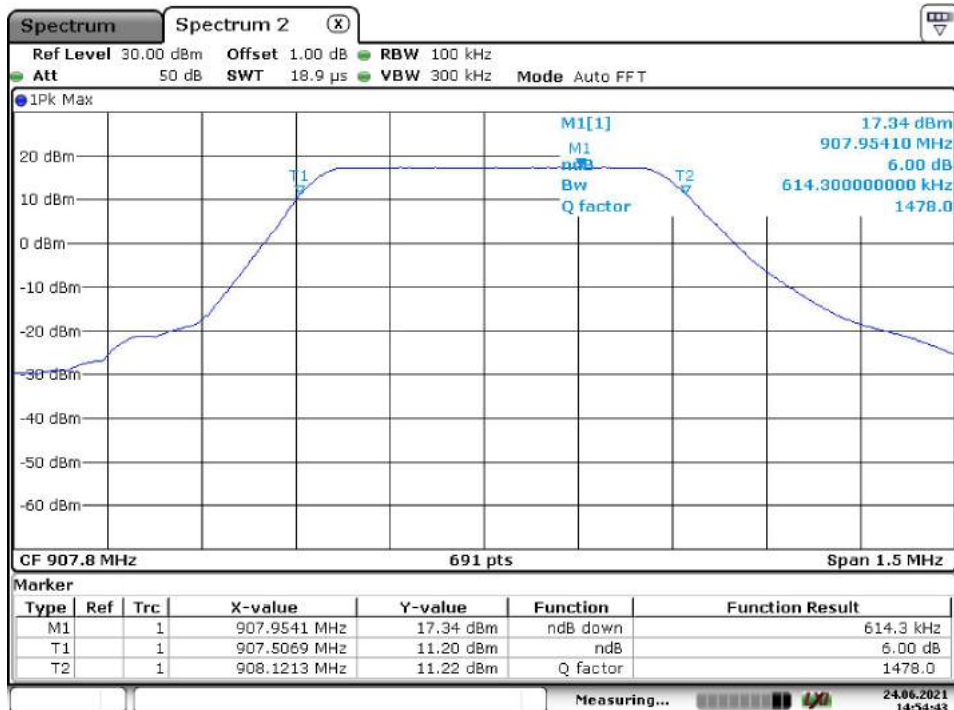
Lora DTS

Low Channel



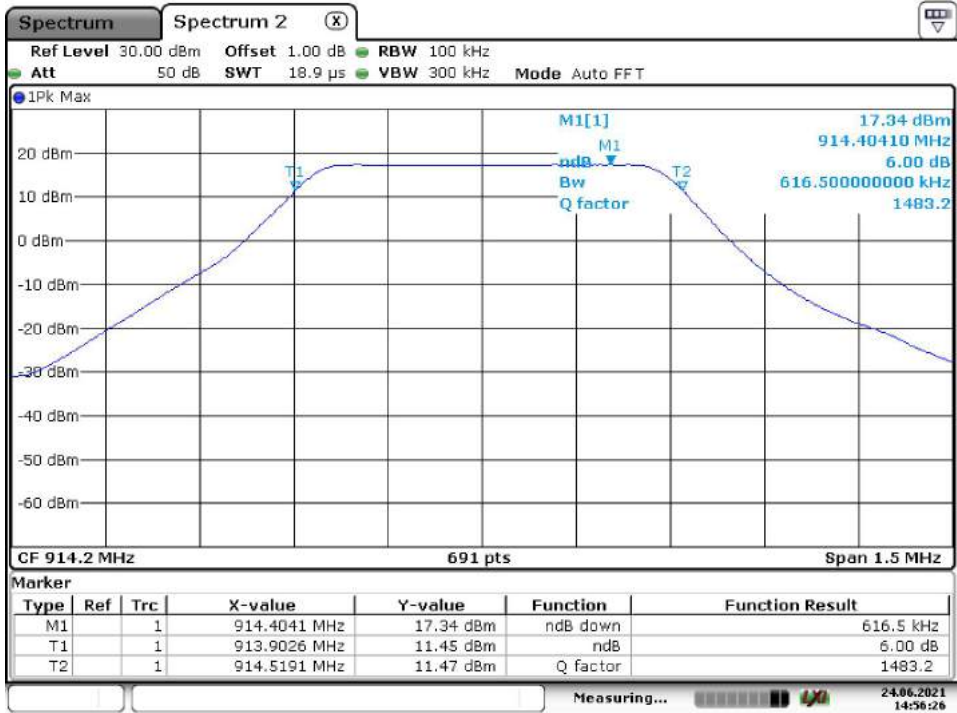
Date: 24.JUN.2021 14:53:15

Middle Channel



Date: 24.JUN.2021 14:54:43

High Channel

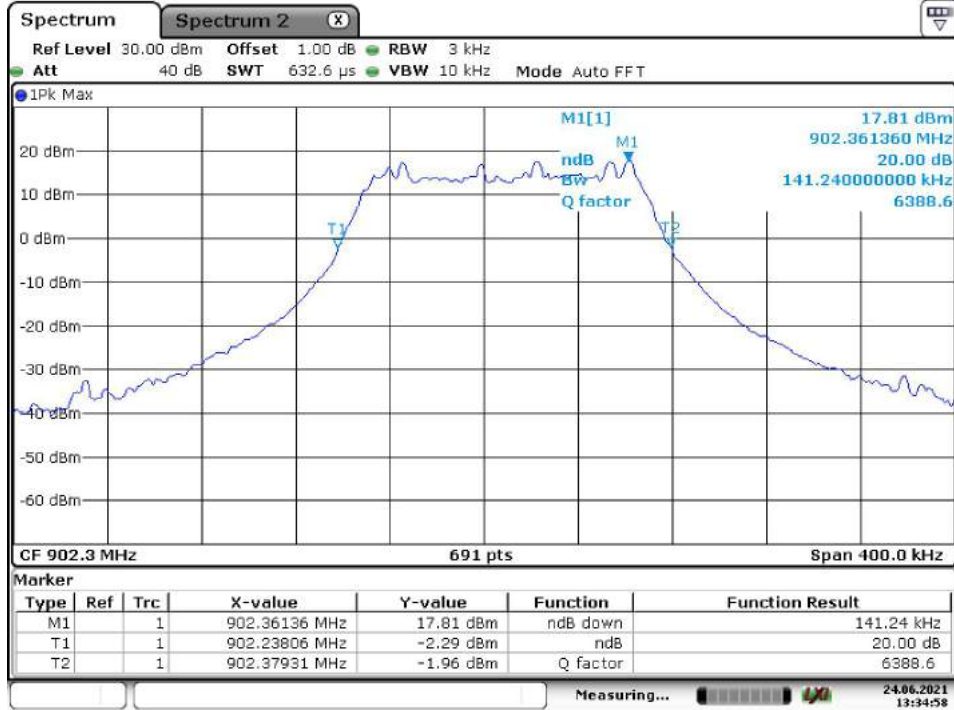


Date: 24.JUN.2021 14:56:26

Appendix B.3: 20dB Bandwidth

Lora FHSS

Low Channel



Date: 24.JUN.2021 13:34:59

Middle Channel



Date: 24.JUN.2021 13:37:06

High Channel



Date: 24.JUN.2021 13:38:04

Appendix B.4: 99% Bandwidth

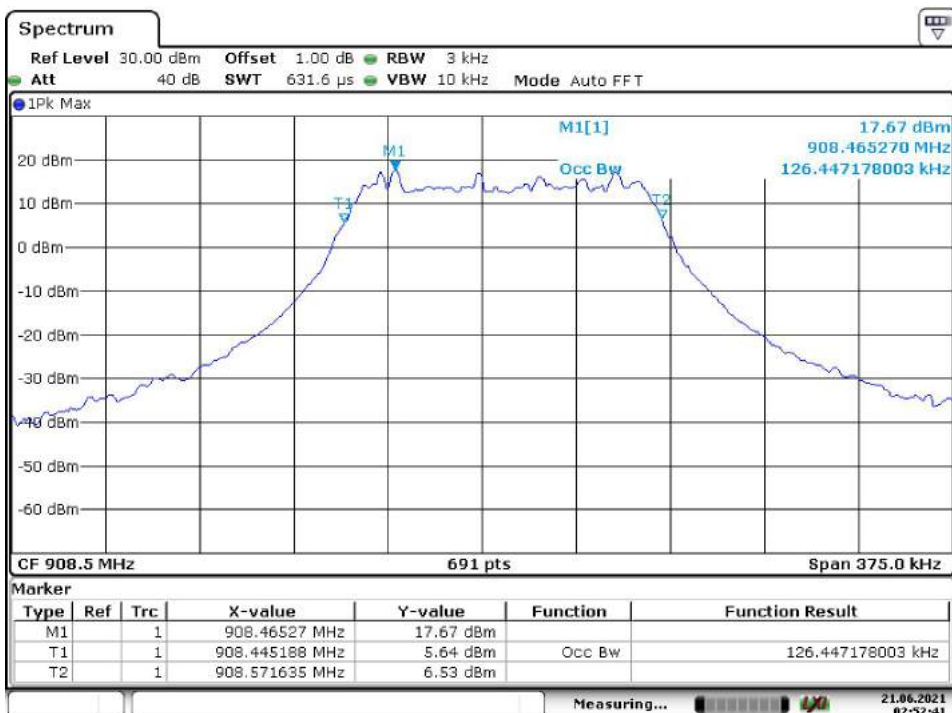
Lora FHSS

Low Channel



Date: 21.JUN.2021 02:42:47

Middle Channel



Date: 21.JUN.2021 02:52:42

High Channel



Date: 21.JUN.2021 02:56:50

Lora DTS

Low Channel



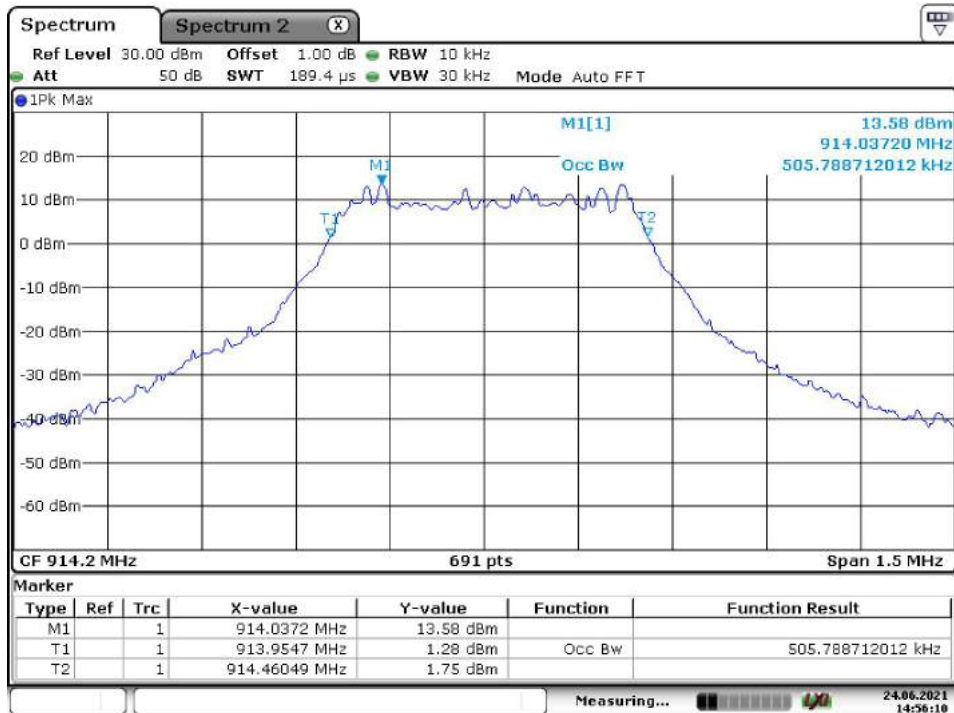
Date: 24.JUN.2021 14:53:08

Middle Channel



Date: 24.JUN.2021 14:55:08

High Channel



Date: 24.JUN.2021 14:56:10

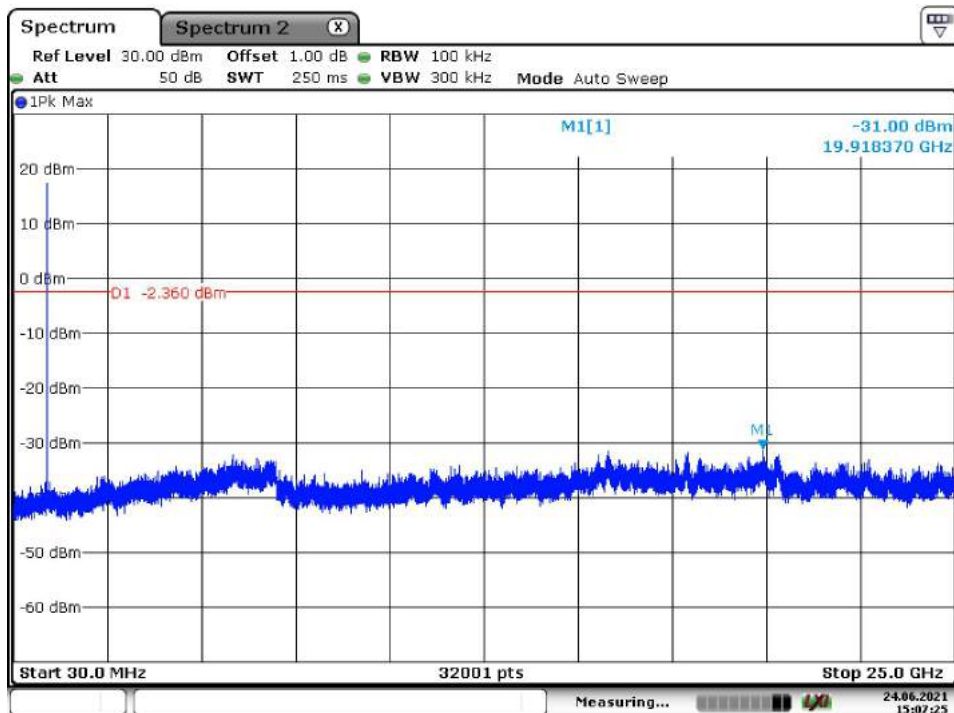
Appendix B.5: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Lora DTS

Low Channel



Date: 24.JUN.2021 15:06:42

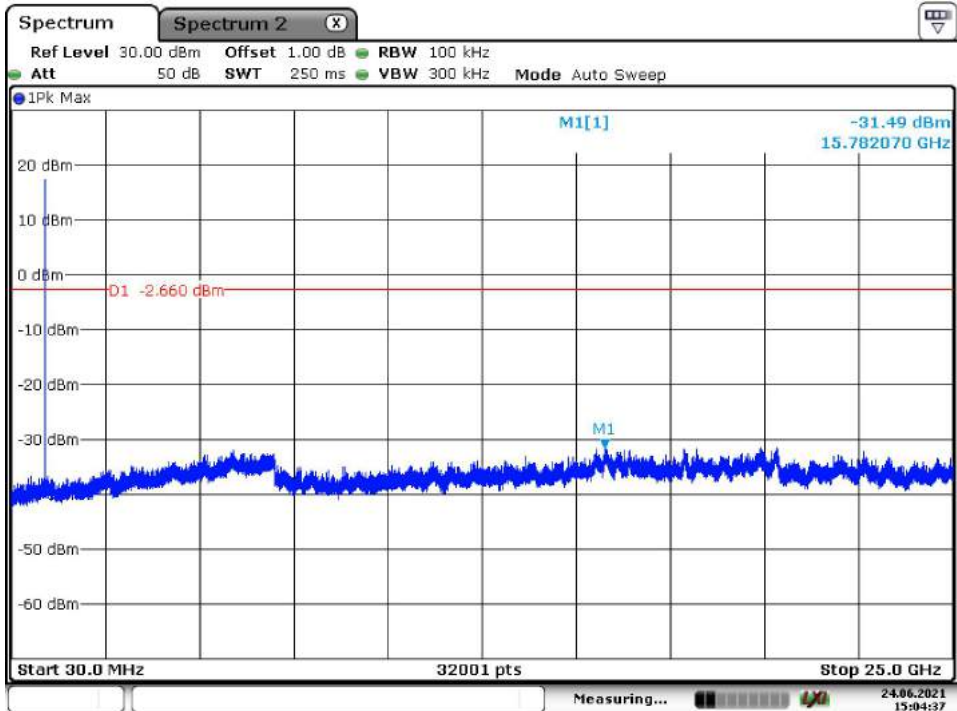


Date: 24.JUN.2021 15:07:25

Middle Channel



Date: 24.JUN.2021 15:02:23

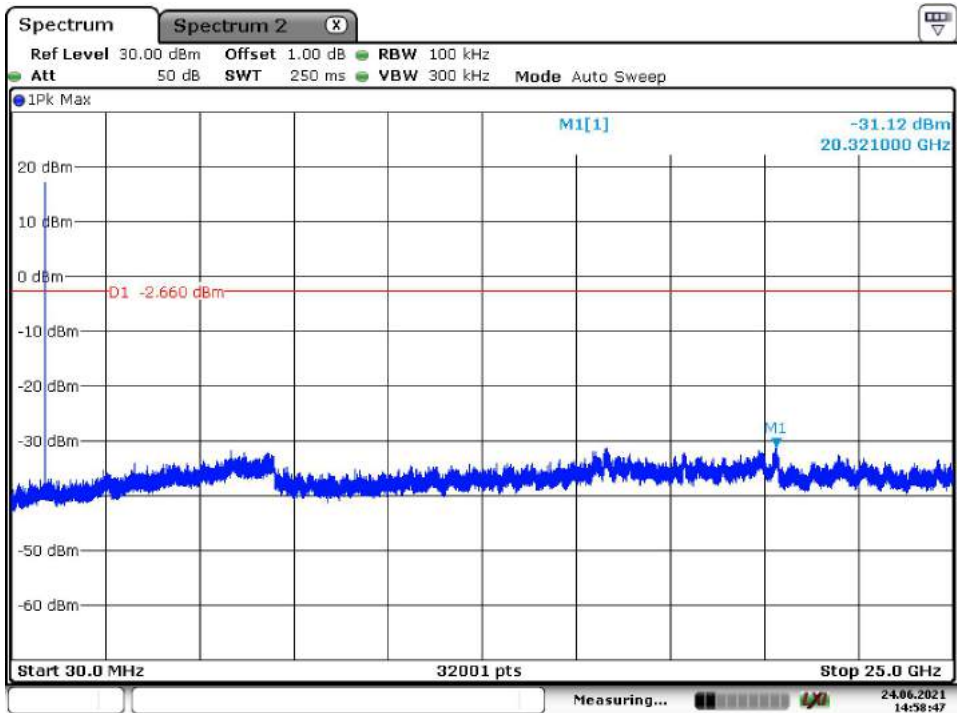


Date: 24.JUN.2021 15:04:37

High Channel



Date: 24.JUN.2021 14:57:07

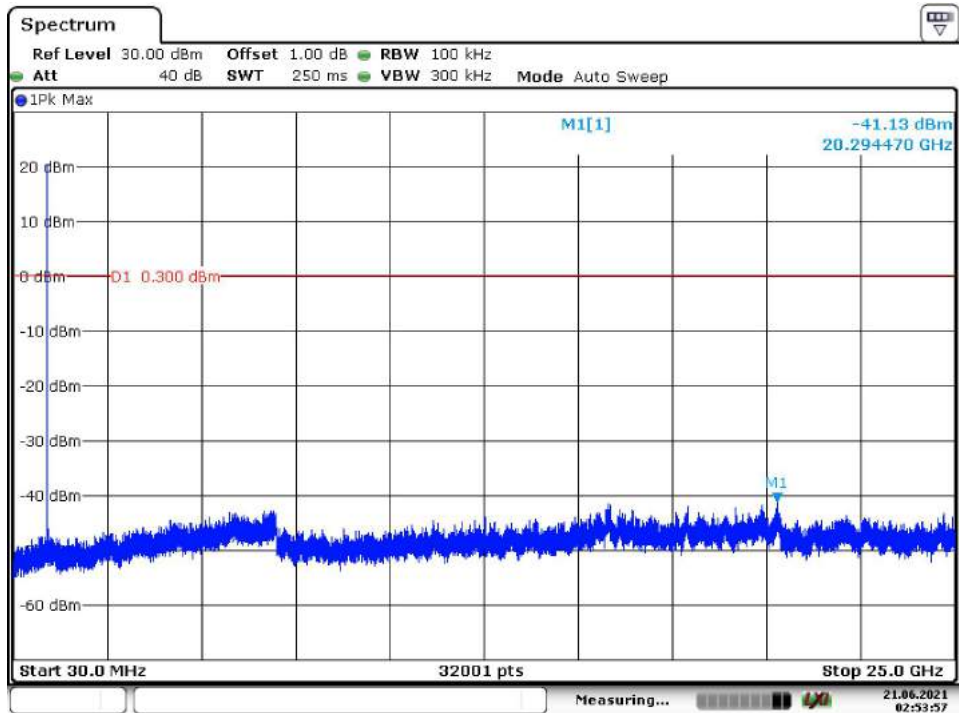


Date: 24.JUN.2021 14:58:48

Middle Channel



Date: 21.JUN.2021 02:51:16

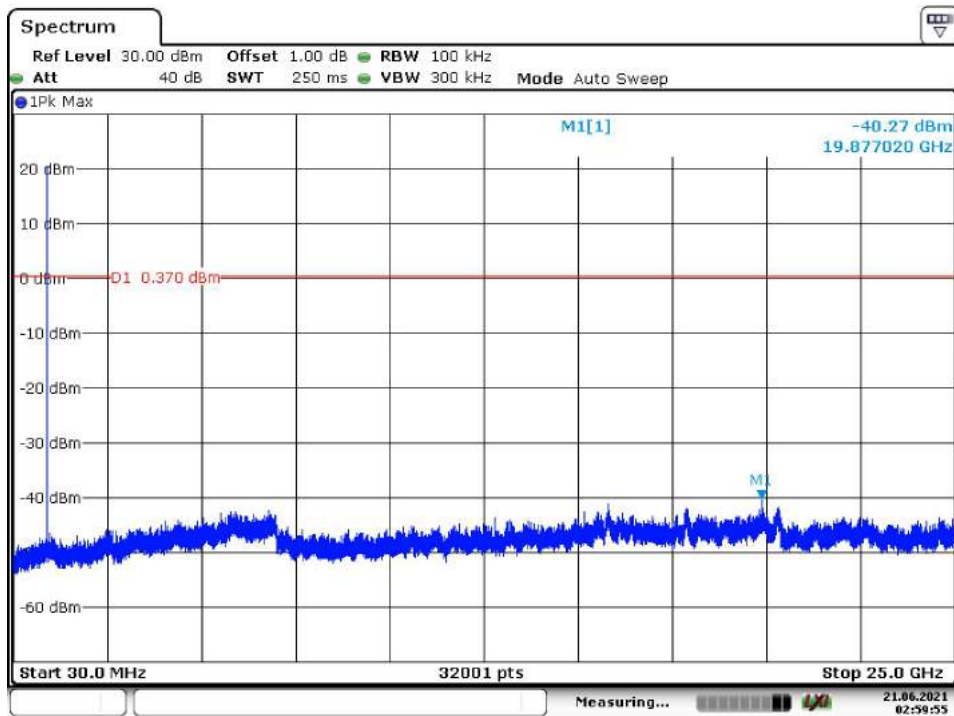


Date: 21.JUN.2021 02:53:58

High Channel

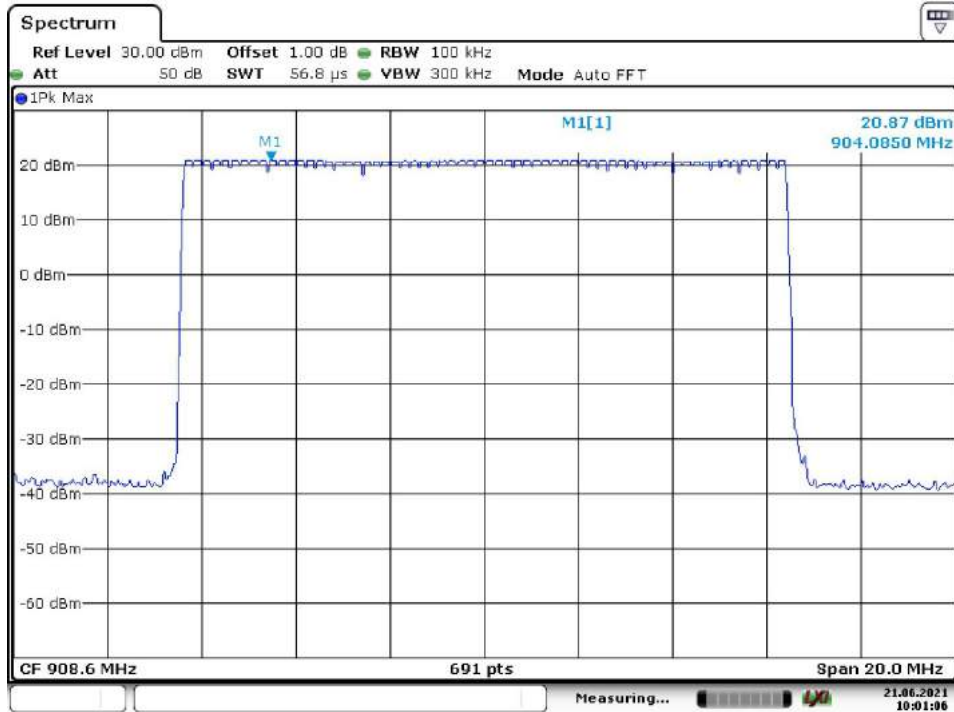


Date: 21.JUN.2021 02:55:36

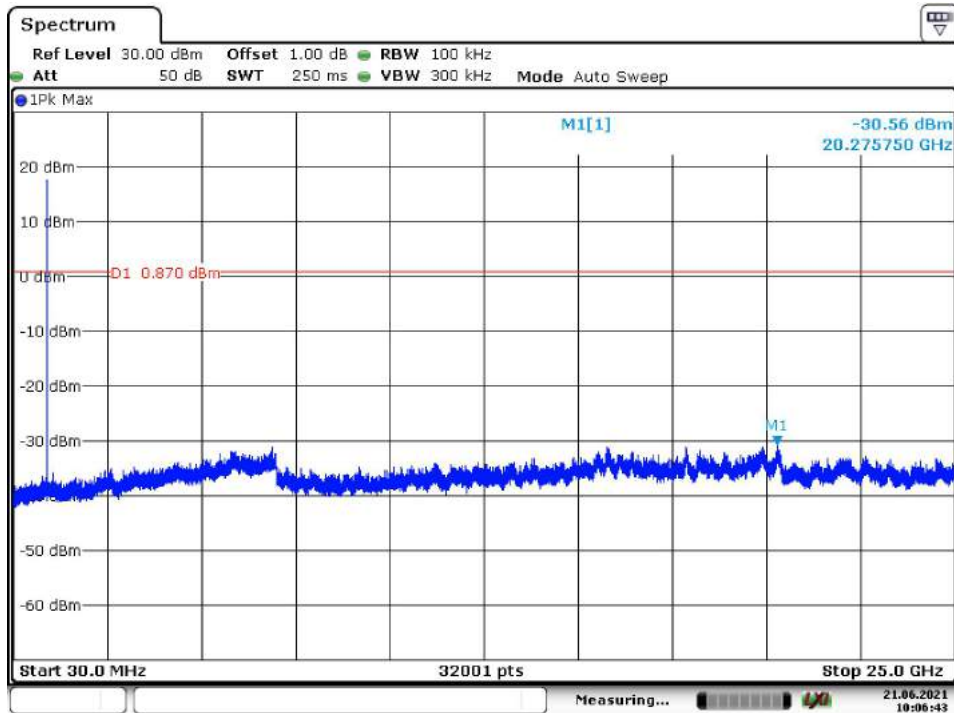


Date: 21.JUN.2021 02:59:56

Lora FHSS, hopping



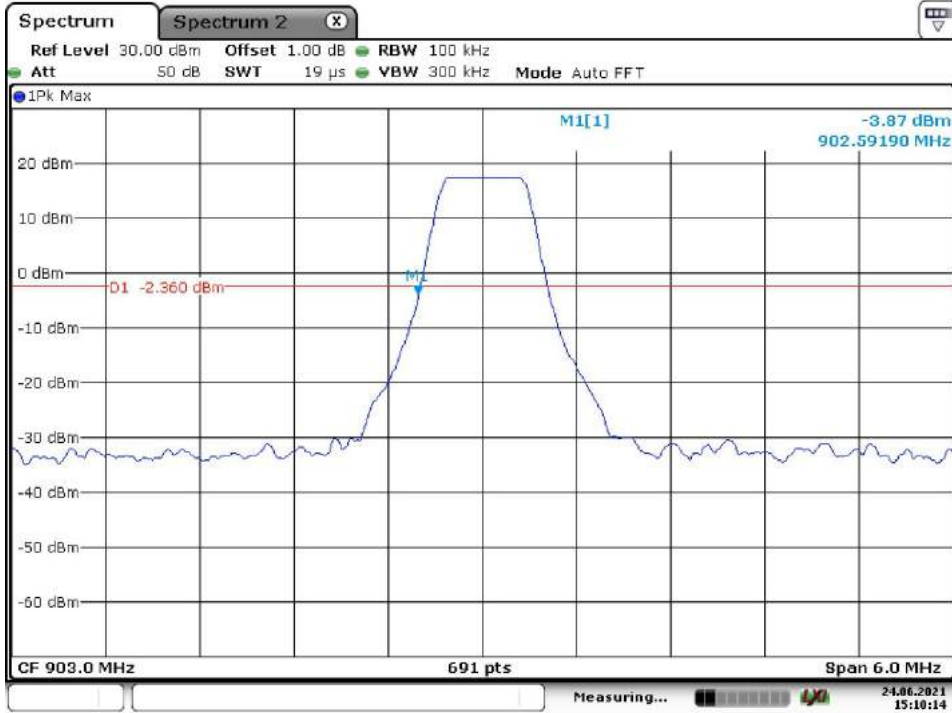
Date: 21.JUN.2021 10:01:07



Date: 21.JUN.2021 10:06:43

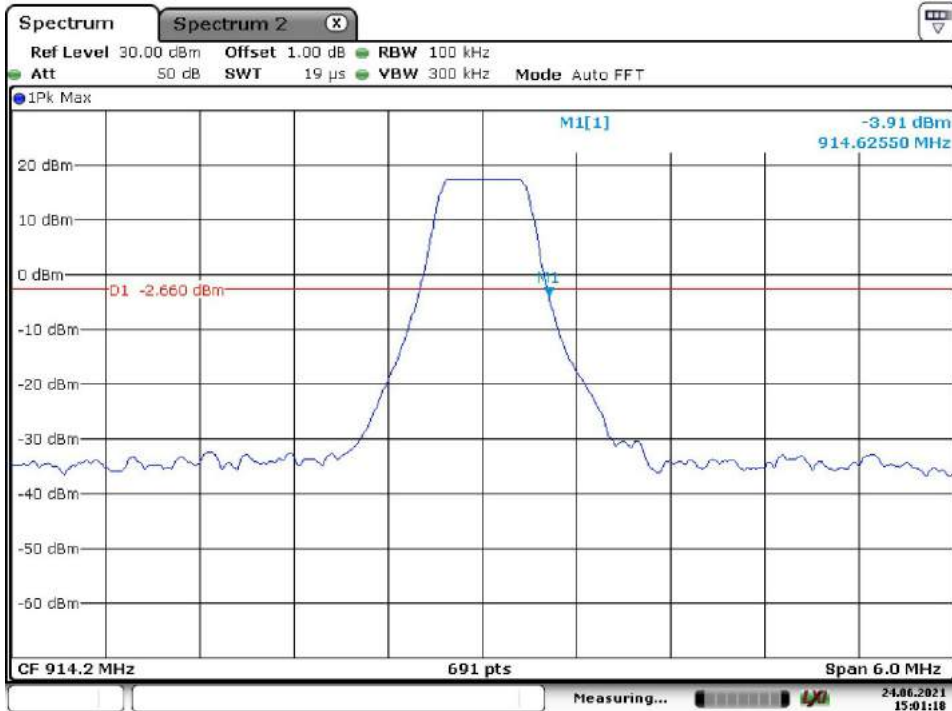
Lora DTS, Band Edge

Low Channel



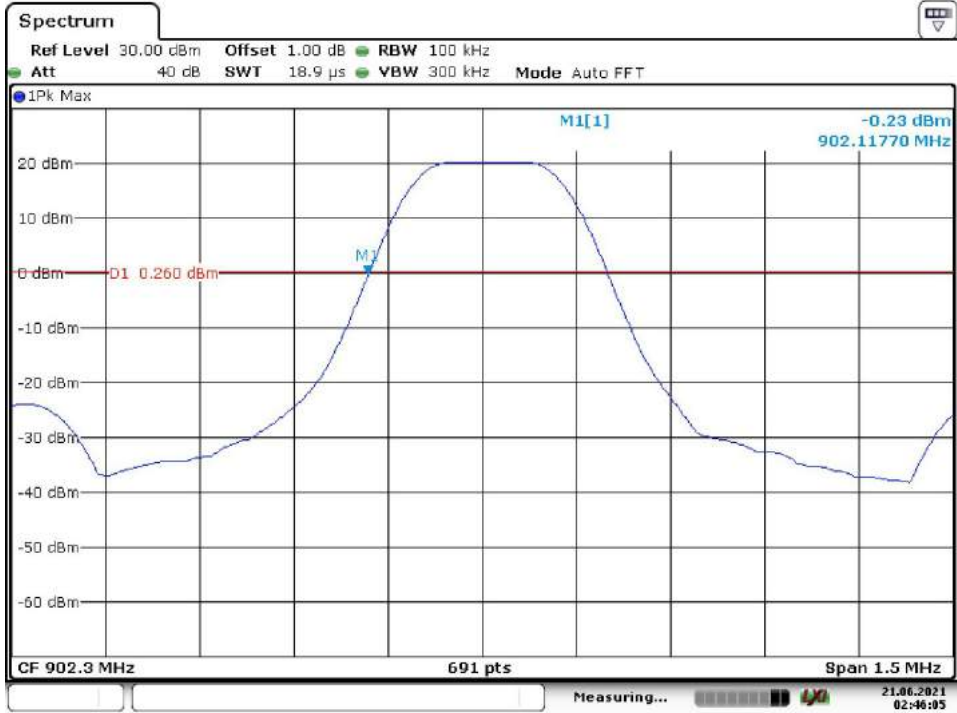
Date: 24.JUN.2021 15:10:15

High Channel



Date: 24.JUN.2021 15:01:18

Lora FHSS, No hopping, Band Edge
Low Channel



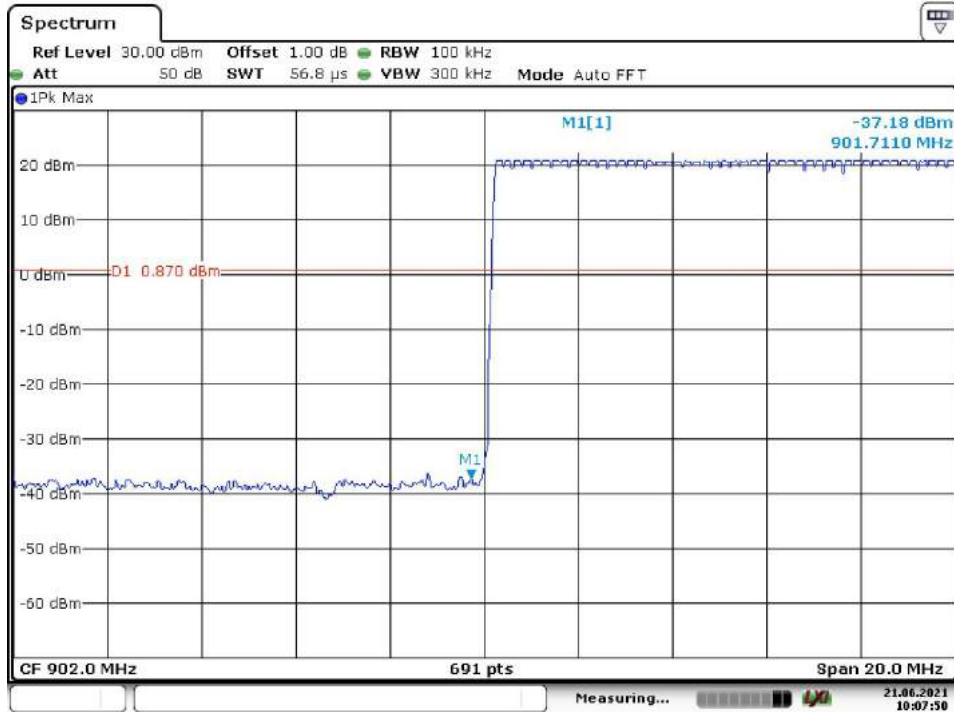
Date: 21.JUN.2021 02:46:06

High Channel

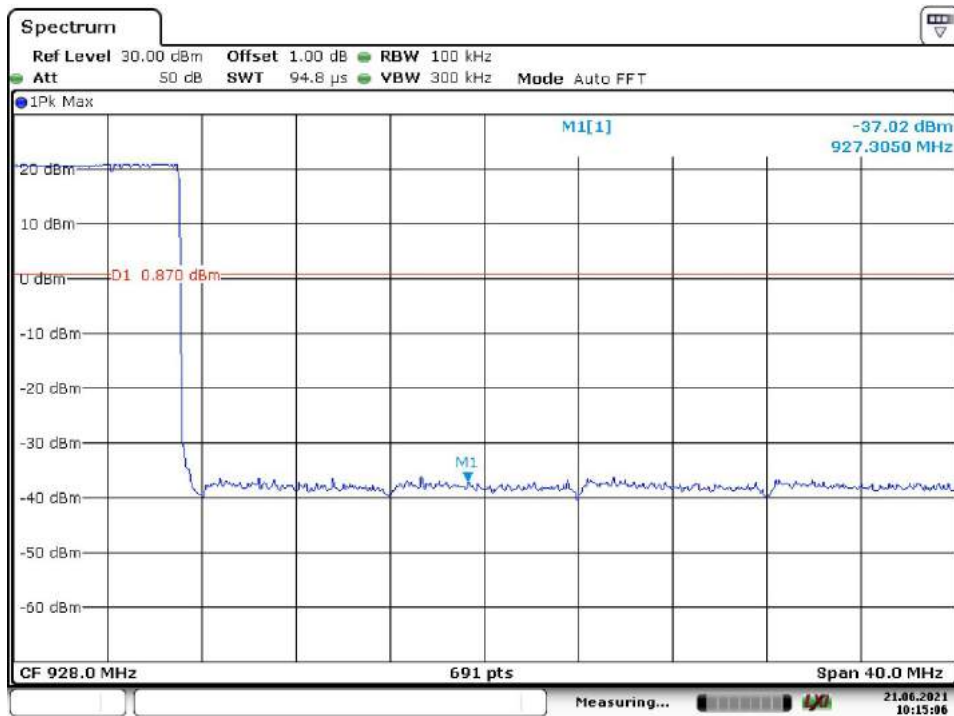


Date: 21.JUN.2021 02:59:02

Lora FHSS, hopping, Band Edge



Date: 21.JUN.2021 10:07:50

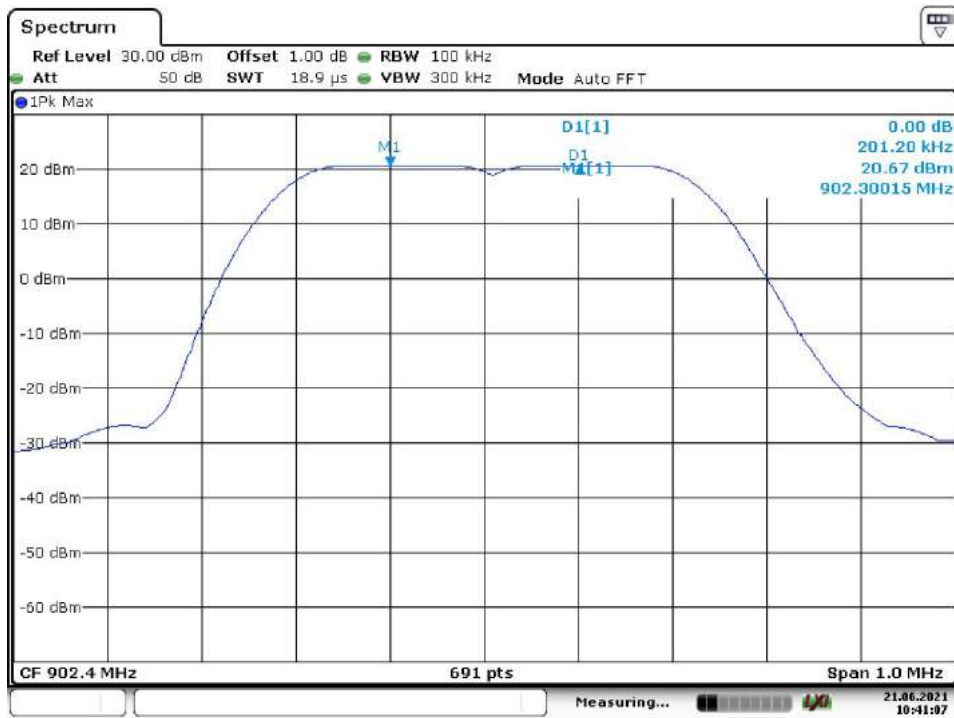


Date: 21.JUN.2021 10:15:06

Appendix B.6: Carrier Frequency Separation

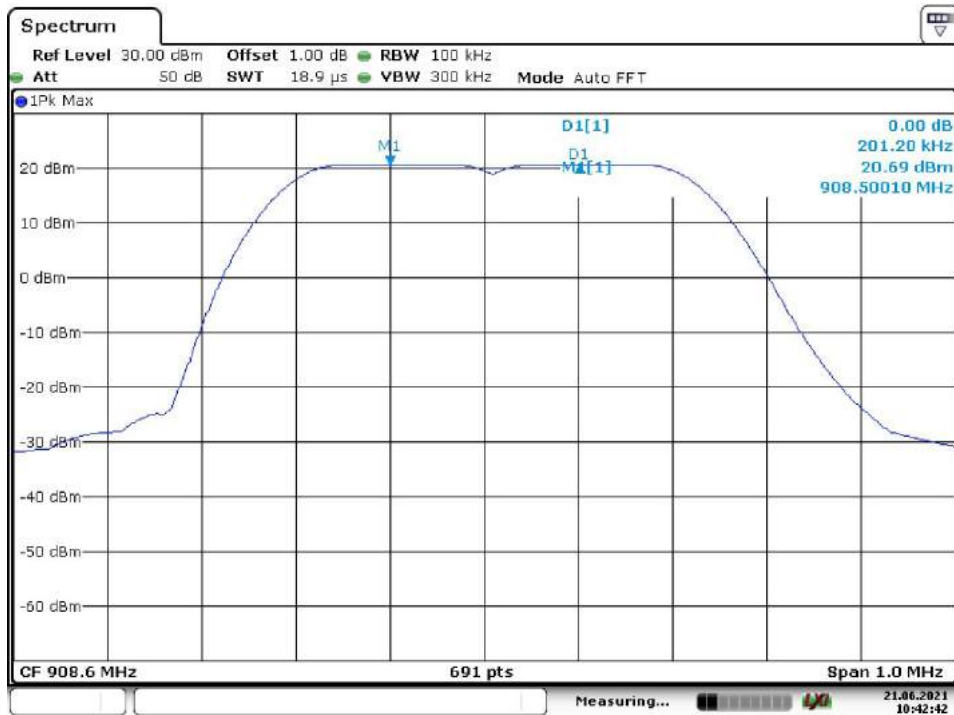
Lora FHSS

Low Channel



Date: 21.JUN.2021 10:41:07

Middle Channel



Date: 21.JUN.2021 10:42:42

High Channel



Date: 21.JUN.2021 10:45:09

Note 1: Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

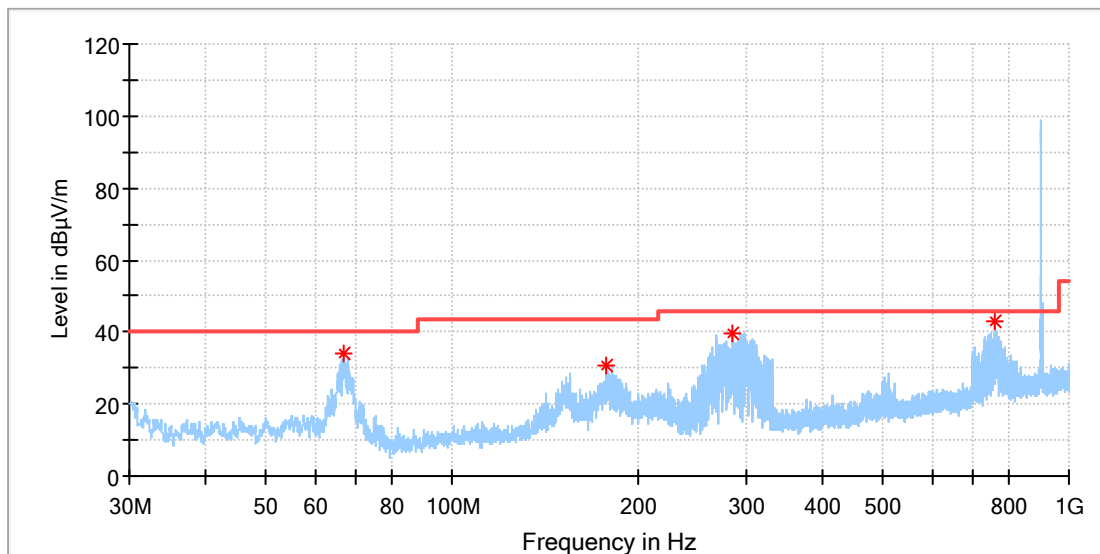
Appendix B.7: Test Results of Radiated Spurious Emissions

Lora DTS

30MHz - 1GHz

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_903MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

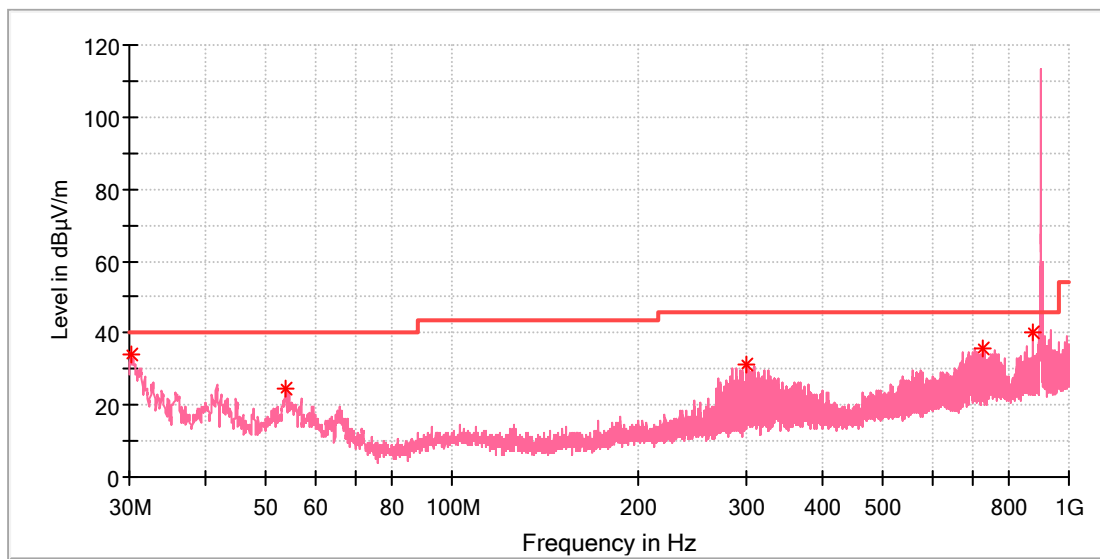


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.811500	34.18	40.00	5.82	100.0	H	0.0	-20.7
177.925000	30.77	43.50	12.73	100.0	H	346.0	-20.7
284.237000	39.70	46.00	6.30	100.0	H	198.0	-16.6
759.779500	42.80	46.00	3.20	100.0	H	256.0	-7.0

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_903MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

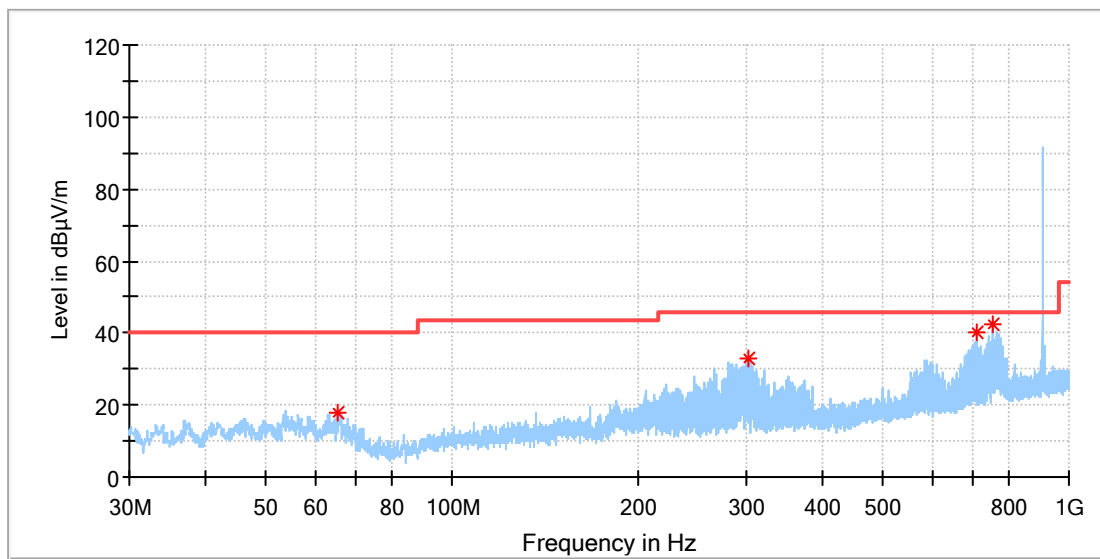


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.194000	34.09	40.00	5.91	100.0	V	298.0	-23.0
53.668000	24.67	40.00	15.33	100.0	V	0.0	-18.4
300.484500	31.42	46.00	14.58	100.0	V	169.0	-16.3
725.441500	35.65	46.00	10.35	100.0	V	28.0	-7.6
871.232500	39.98	46.00	6.02	100.0	V	28.0	-5.2

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

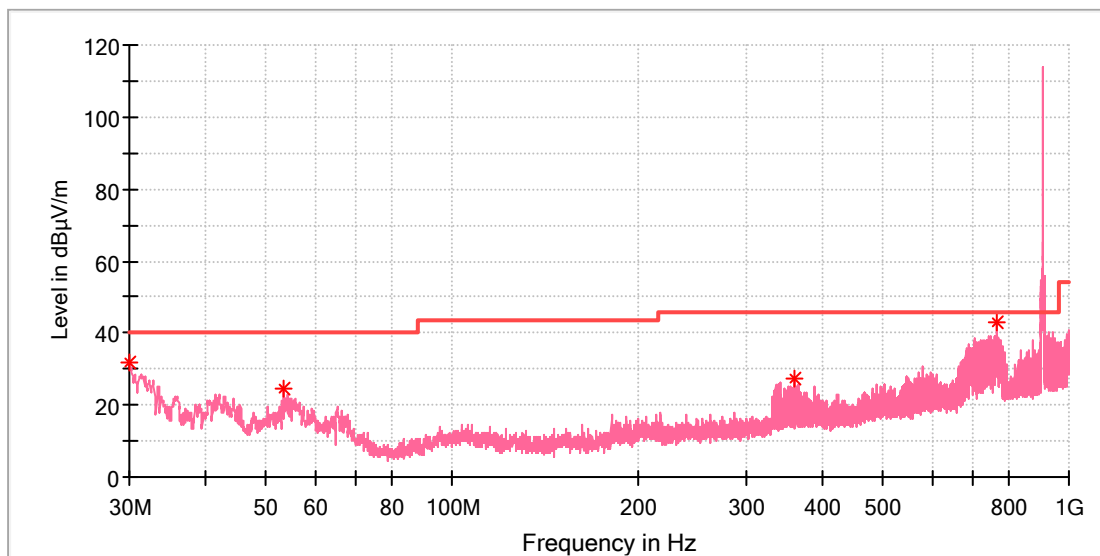


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
65.502000	18.01	40.00	21.99	100.0	H	330.0	-20.2
301.842500	33.14	46.00	12.86	100.0	H	0.0	-16.2
708.515000	40.41	46.00	5.59	100.0	H	83.0	-7.9
752.892500	42.27	46.00	3.73	100.0	H	252.0	-7.1

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

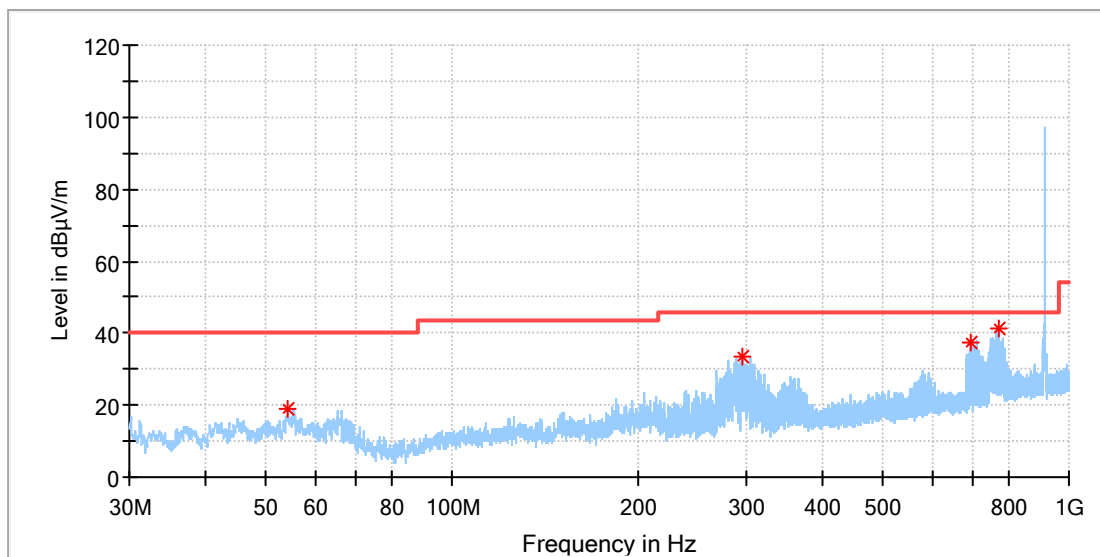


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.097000	31.54	40.00	8.46	100.0	V	341.0	-23.0
53.280000	24.74	40.00	15.26	100.0	V	257.0	-18.4
359.994000	27.61	46.00	18.39	100.0	V	0.0	-14.6
764.581000	42.77	46.00	3.23	100.0	V	144.0	-6.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

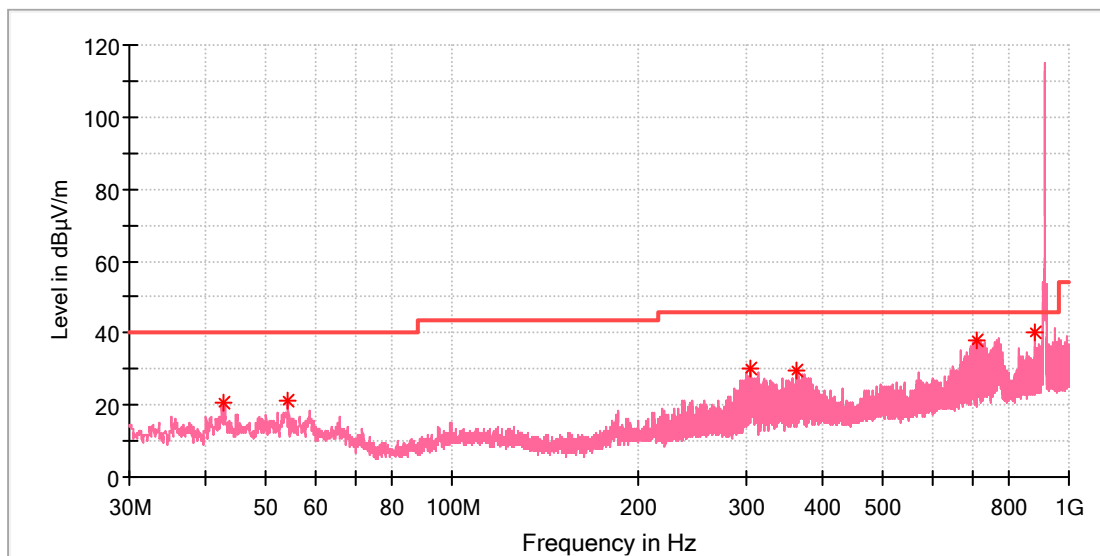


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
54.298500	19.23	40.00	20.77	100.0	H	341.0	-18.4
295.198000	33.61	46.00	12.39	100.0	H	266.0	-16.4
694.595500	37.58	46.00	8.42	100.0	H	198.0	-8.1
771.322500	41.58	46.00	4.42	100.0	H	198.0	-6.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



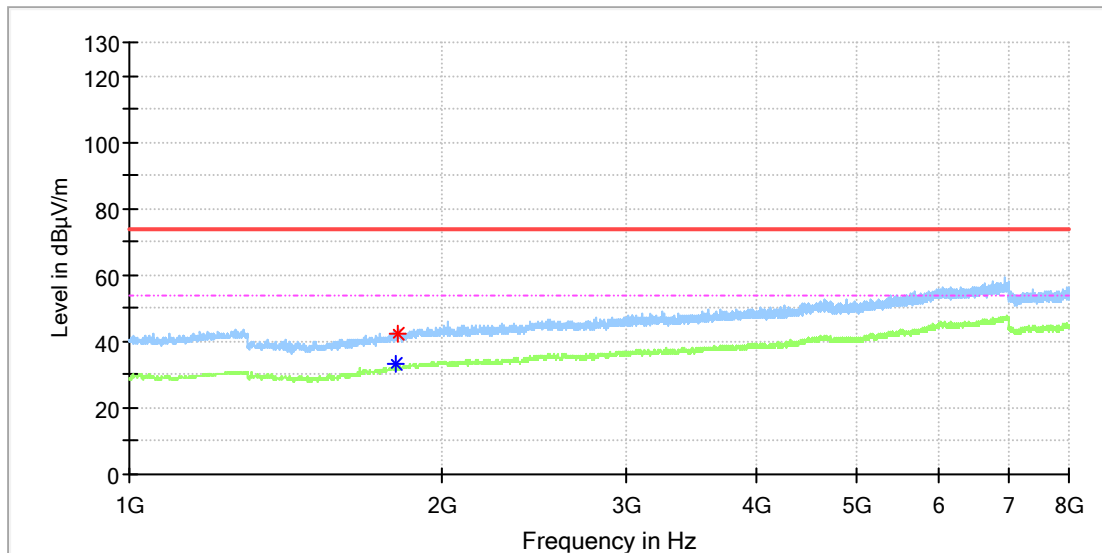
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.755500	20.81	40.00	19.19	100.0	V	0.0	-19.4
54.250000	21.36	40.00	18.64	100.0	V	87.0	-18.4
305.480000	30.19	46.00	15.81	100.0	V	216.0	-16.1
363.049500	29.62	46.00	16.38	100.0	V	216.0	-14.6
711.182500	38.13	46.00	7.87	100.0	V	174.0	-7.8
882.290500	40.19	46.00	5.81	100.0	V	0.0	-5.1

1GHz - 10GHz

EUT Information

EUT Name: WisDuo LPWAN Module
 Model: RAK3172
 Test Mode: DTS_500k_903MHz
 Test Voltage: DC 5V from USB
 Remark: Temp 23 Humi:45%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

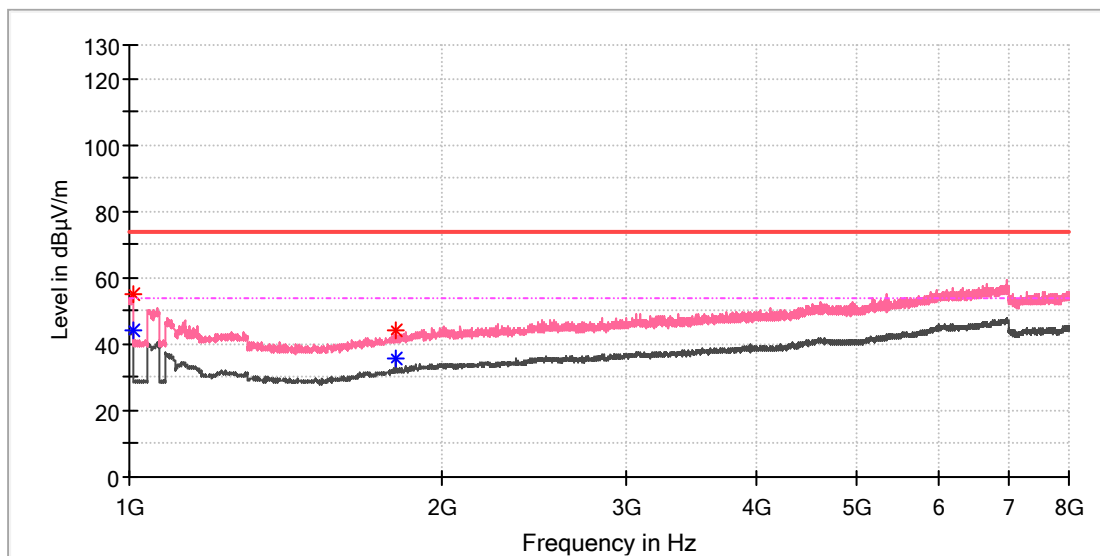


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1805.850000	---	33.11	54.00	20.89	100.0	H	198.0	4.8
1807.525000	42.35	---	74.00	31.65	100.0	H	26.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_903MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

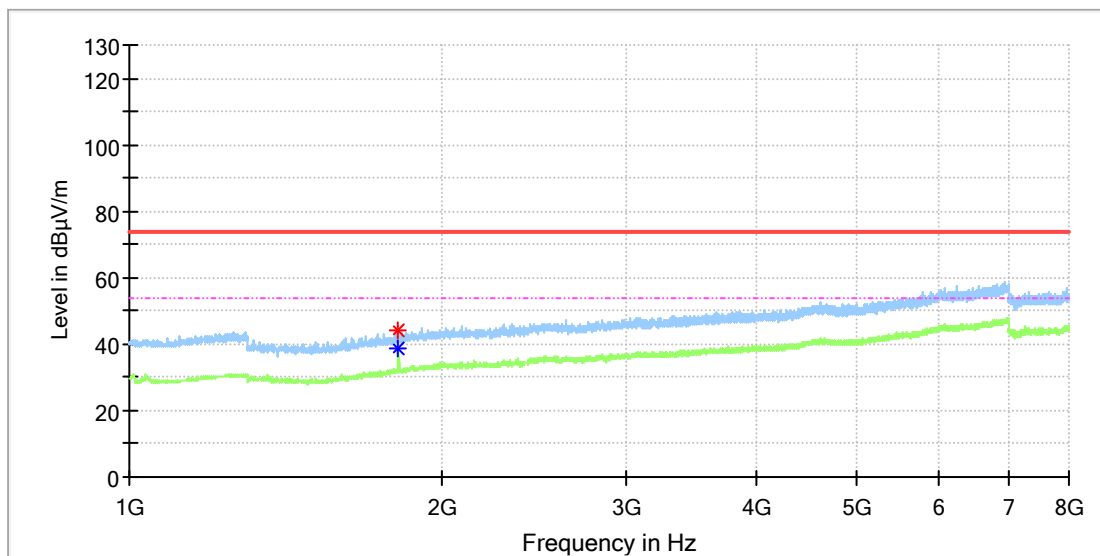


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1007.000000	---	44.01	54.00	9.99	100.0	V	194.0	-0.1
1008.000000	54.88	---	74.00	19.12	100.0	V	194.0	-0.1
1805.850000	---	35.51	54.00	18.49	100.0	V	220.0	4.8
1806.687500	43.89	---	74.00	30.11	100.0	V	220.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

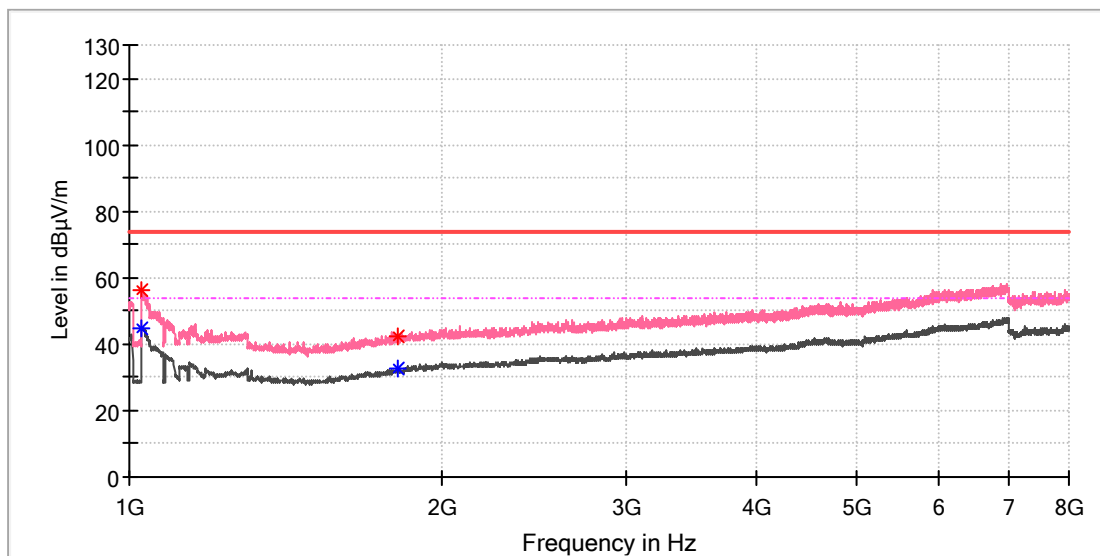


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1814.225000	44.40	---	74.00	29.60	100.0	H	323.0	4.8
1815.062500	---	38.79	54.00	15.21	100.0	H	323.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

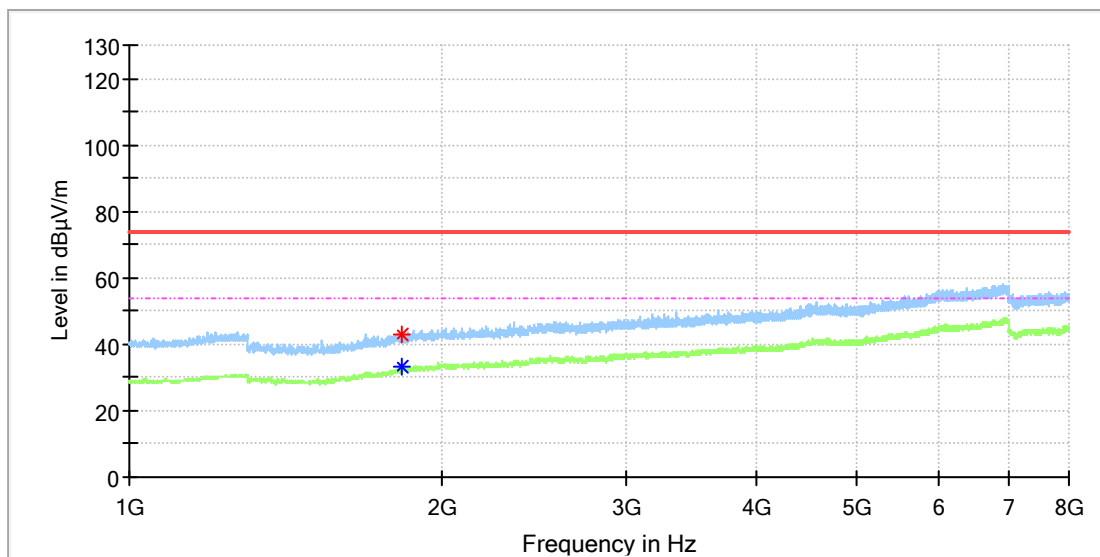


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1028.500000	---	44.88	54.00	9.12	100.0	V	12.0	-0.2
1028.500000	56.00	---	74.00	18.00	100.0	V	12.0	-0.2
1814.225000	---	32.52	54.00	21.48	100.0	V	224.0	4.8
1815.062500	42.33	---	74.00	31.67	100.0	V	278.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

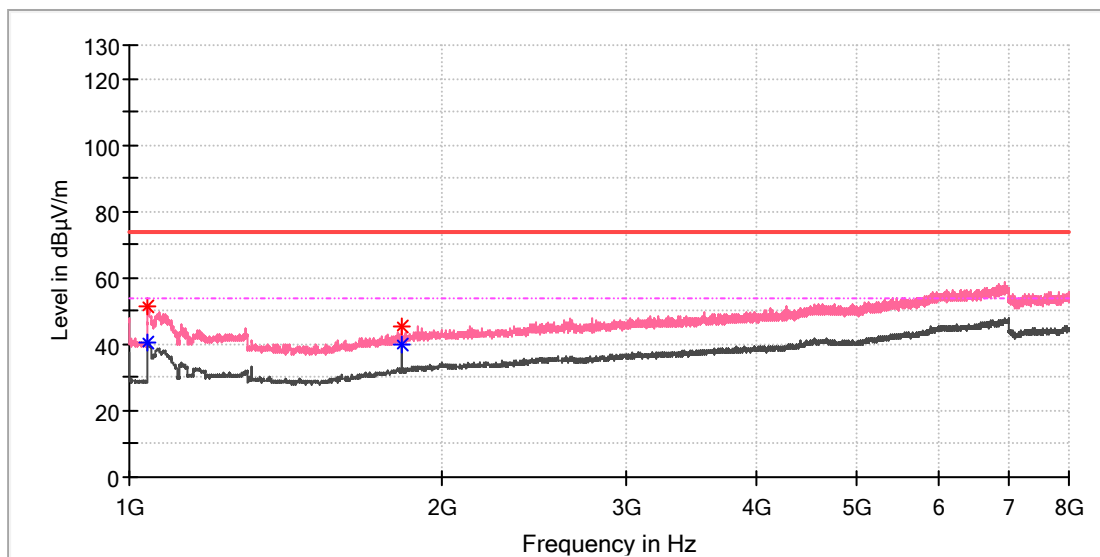


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1826.787500	42.90	---	74.00	31.10	100.0	H	269.0	4.9
1828.462500	---	33.46	54.00	20.54	100.0	H	191.0	4.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

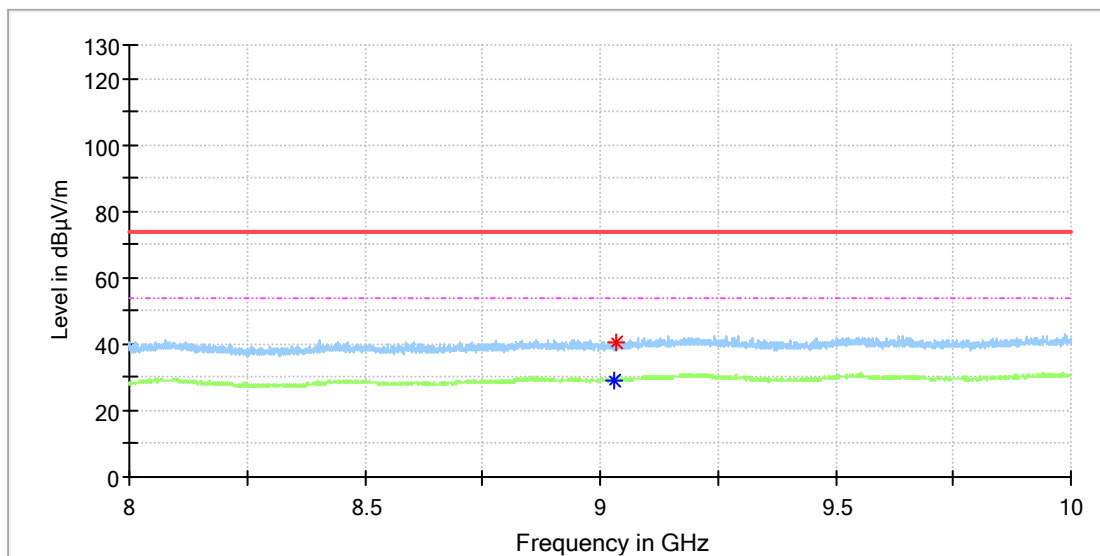


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1042.000000	---	40.72	54.00	13.28	100.0	V	0.0	-0.2
1042.500000	51.44	---	74.00	22.56	100.0	V	0.0	-0.2
1828.462500	---	39.64	54.00	14.36	100.0	V	106.0	4.9
1828.462500	45.30	---	74.00	28.70	100.0	V	106.0	4.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_903MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

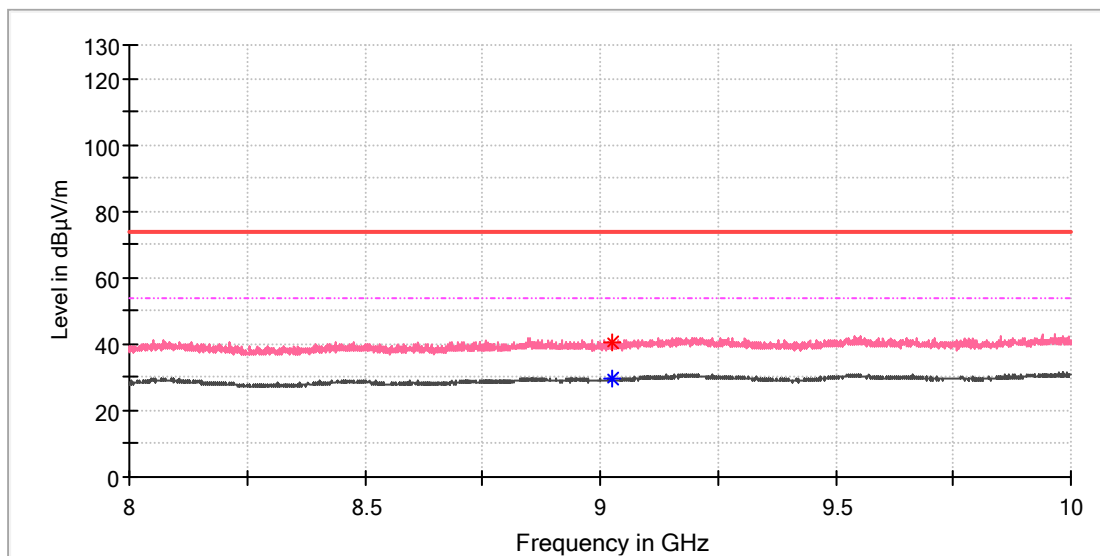


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9029.500000	---	29.22	54.00	24.78	100.0	H	74.0	8.9
9033.500000	40.24	---	74.00	33.76	100.0	H	277.0	8.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_903MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

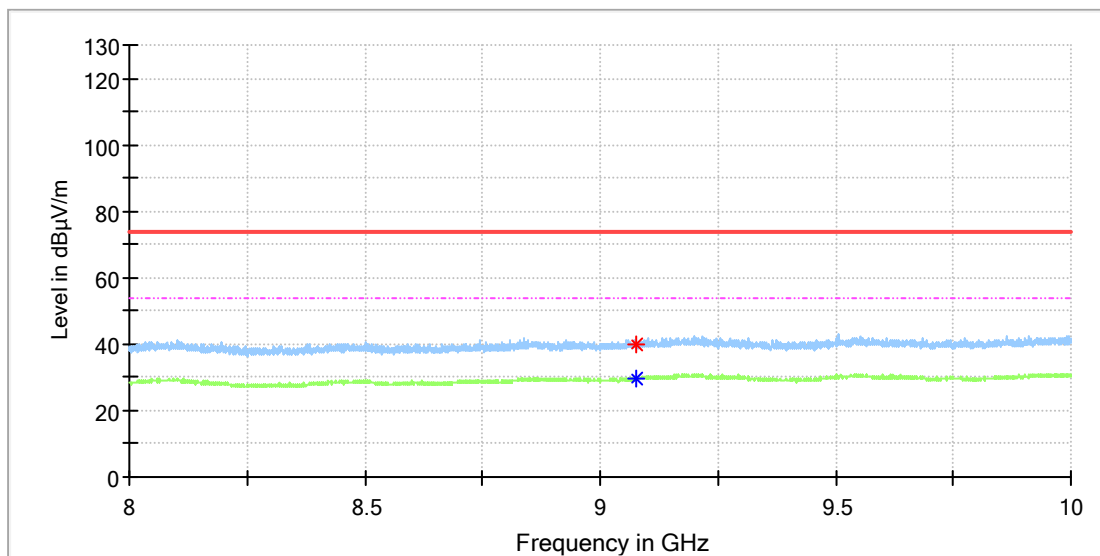


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9025.000000	40.66	---	74.00	33.34	100.0	V	17.0	8.9
9027.000000	---	29.42	54.00	24.58	100.0	V	221.0	8.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

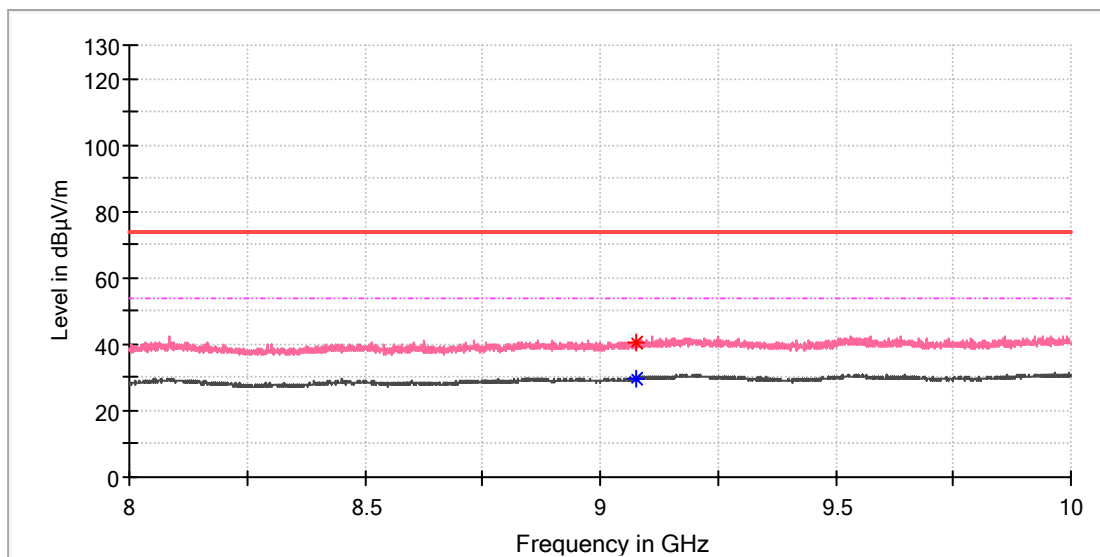


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9077.000000	40.19	---	74.00	33.81	100.0	H	9.0	9.4
9078.500000	---	29.89	54.00	24.11	100.0	H	54.0	9.4

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_907.8MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

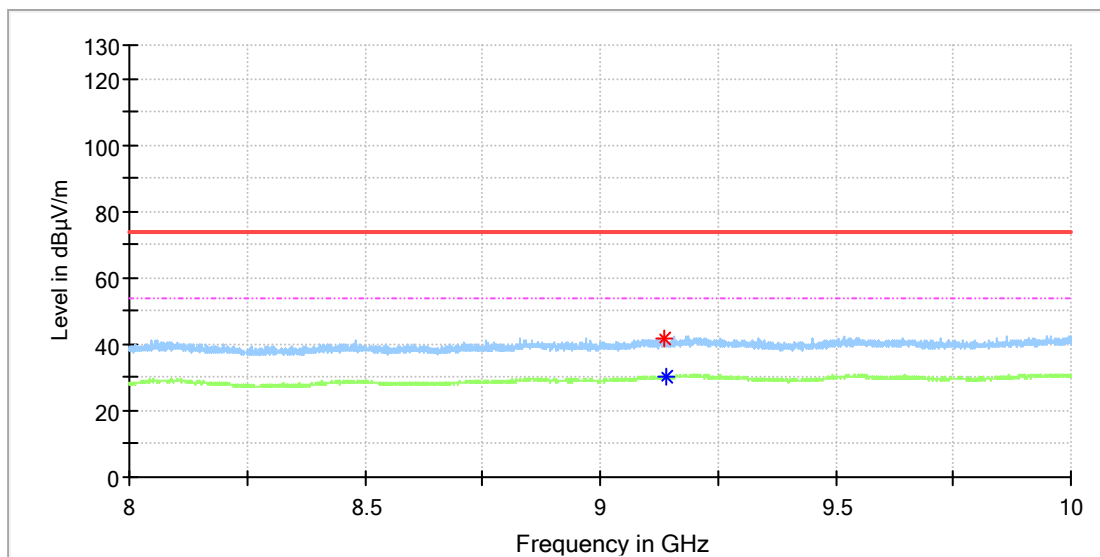


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9075.000000	40.44	---	74.00	33.56	100.0	V	346.0	9.4
9075.000000	---	29.78	54.00	24.22	100.0	V	346.0	9.4

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

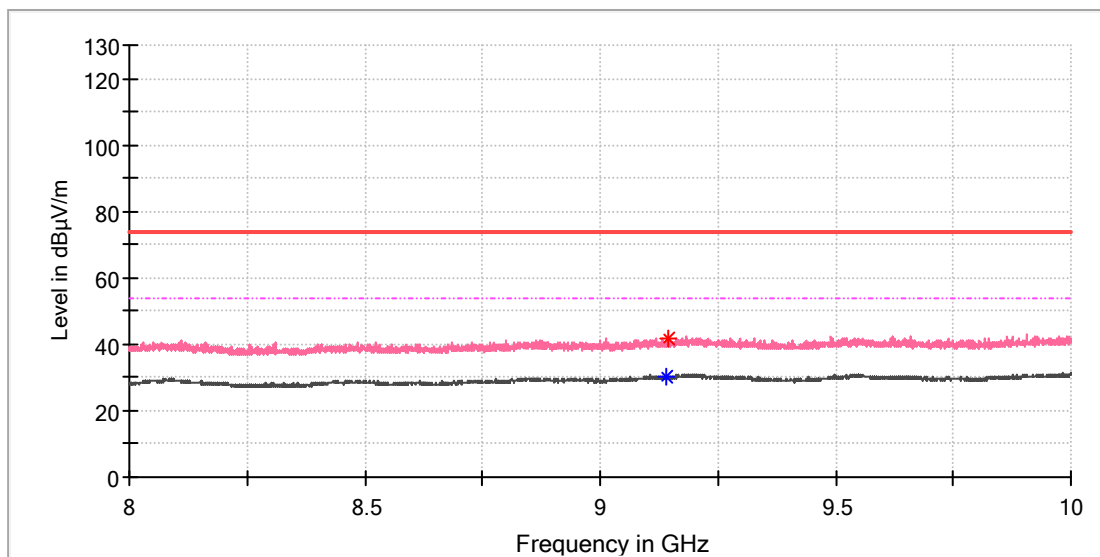


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9136.500000	41.76	---	74.00	32.24	100.0	H	349.0	10.0
9139.500000	---	30.07	54.00	23.93	100.0	H	279.0	10.0

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	DTS_500k_914.2MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

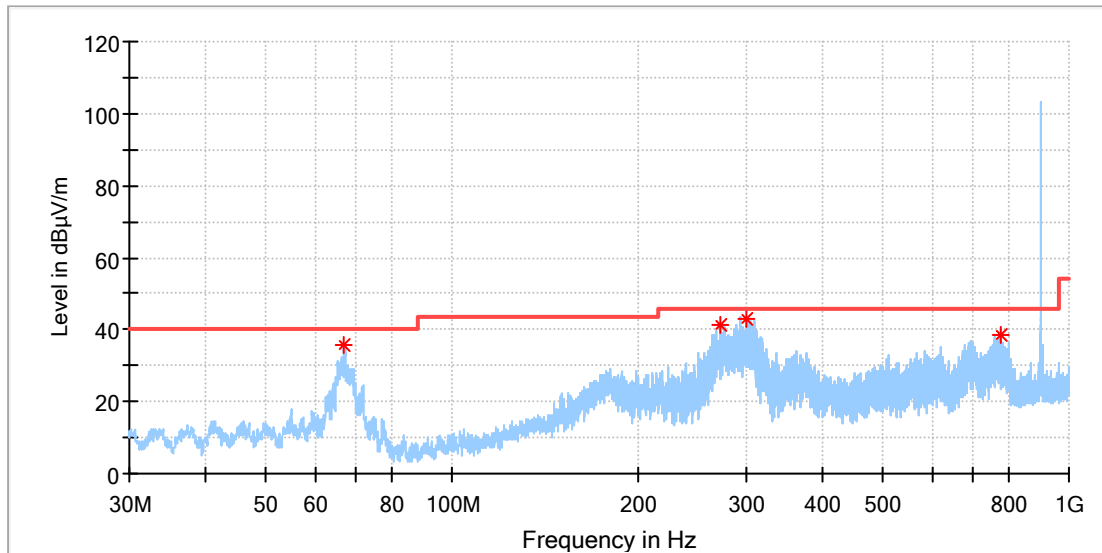
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9142.500000	---	30.31	54.00	23.69	100.0	V	104.0	10.1
9143.000000	41.81	---	74.00	32.19	100.0	V	67.0	10.1

Lora FHSS

30MHz - 1GHz

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

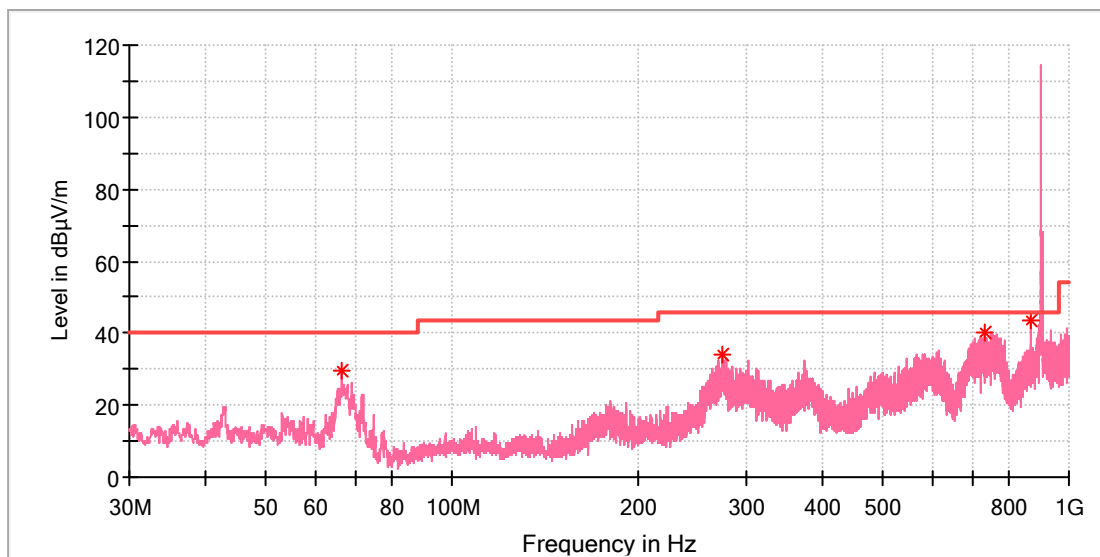


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.908500	35.88	40.00	4.12	100.0	H	0.0	-20.7
272.403000	41.30	46.00	4.70	100.0	H	299.0	-16.9
300.824000	42.85	46.00	3.15	100.0	H	299.0	-16.3
777.385000	38.31	46.00	7.69	100.0	H	273.0	-6.7

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

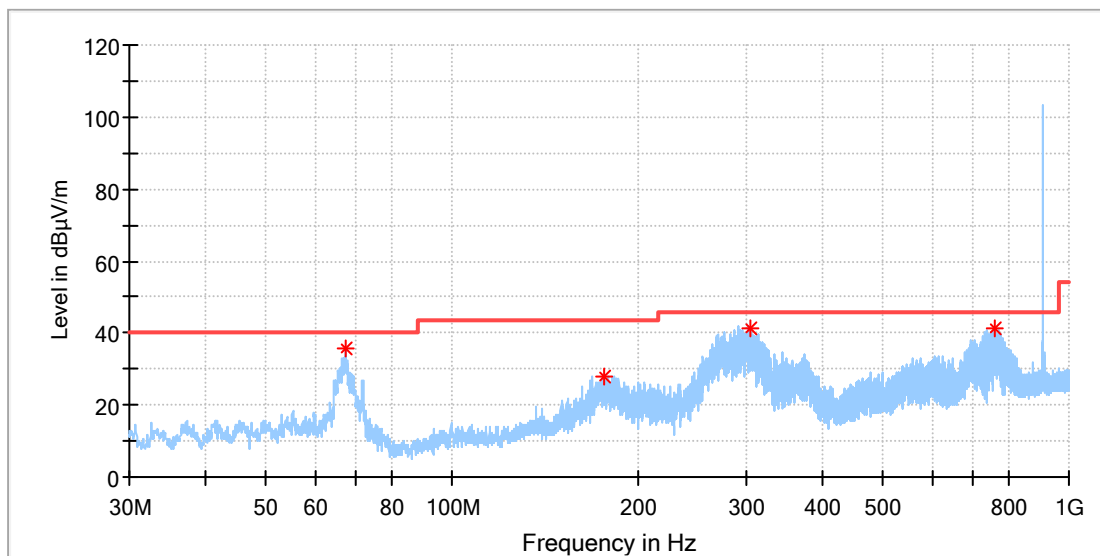


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.229500	29.83	40.00	10.17	100.0	V	274.0	-20.5
273.567000	34.28	46.00	11.72	100.0	V	60.0	-16.9
732.280000	40.43	46.00	5.57	100.0	V	123.0	-7.5
870.311000	43.64	46.00	2.36	100.0	V	75.0	-5.2

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

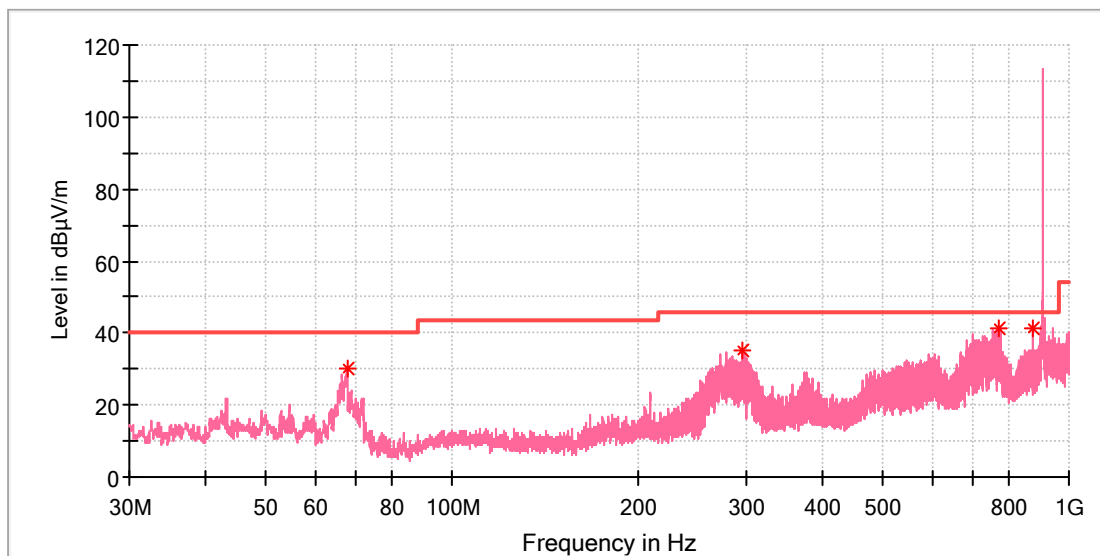


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
67.345000	35.52	40.00	4.48	100.0	H	0.0	-20.9
175.985000	27.91	43.50	15.59	100.0	H	95.0	-20.8
304.995000	41.36	46.00	4.64	100.0	H	213.0	-16.1
759.100500	41.53	46.00	4.47	100.0	H	213.0	-7.0

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

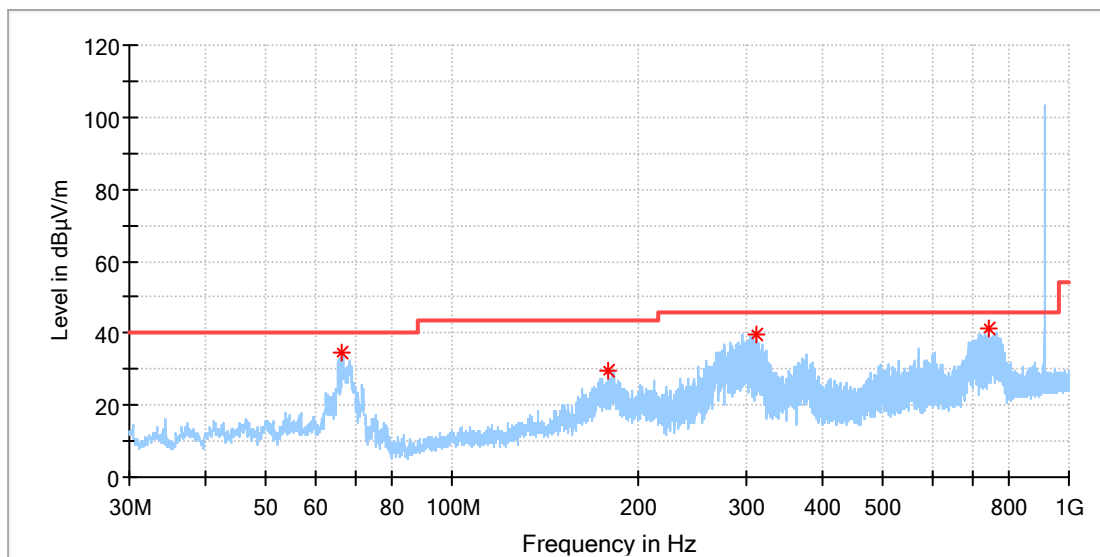


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
67.539000	29.87	40.00	10.13	100.0	V	283.0	-21.0
295.974000	35.43	46.00	10.57	100.0	V	274.0	-16.4
770.158500	41.24	46.00	4.76	100.0	V	274.0	-6.8
876.567500	41.21	46.00	4.79	100.0	V	158.0	-5.2

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

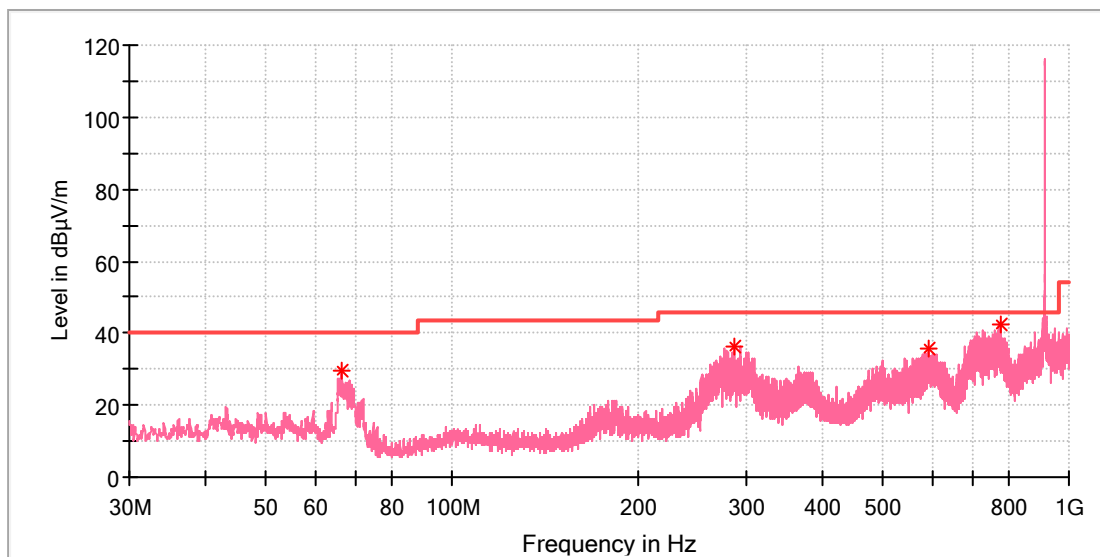


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.423500	34.77	40.00	5.23	100.0	H	5.0	-20.6
179.089000	29.77	43.50	13.73	100.0	H	126.0	-20.6
310.912000	39.42	46.00	6.58	100.0	H	22.0	-15.9
742.077000	41.33	46.00	4.67	100.0	H	260.0	-7.3

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



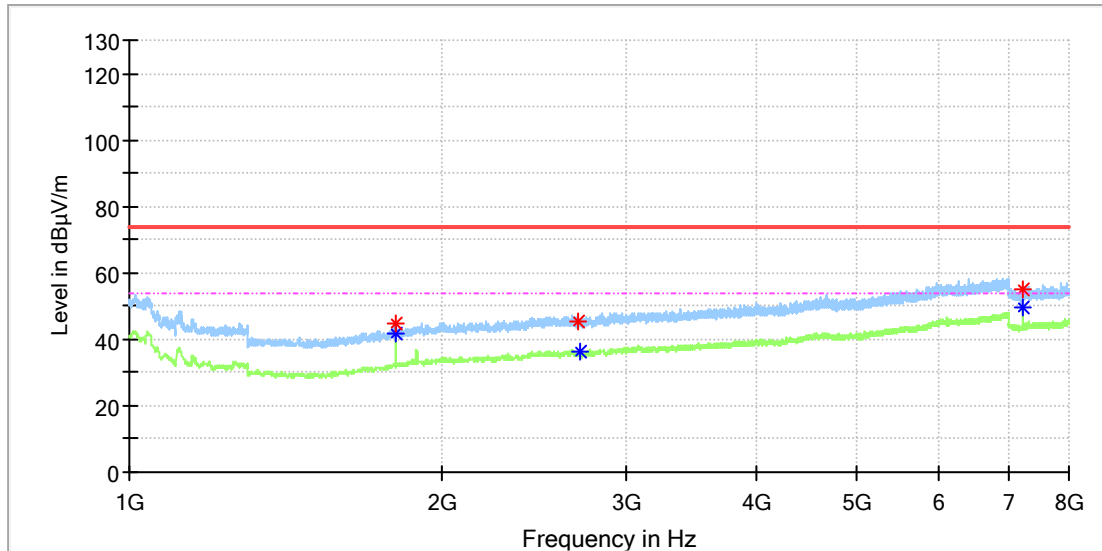
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.229500	29.42	40.00	10.58	100.0	V	271.0	-20.5
286.322500	36.56	46.00	9.44	100.0	V	271.0	-16.6
594.249000	35.81	46.00	10.19	100.0	V	70.0	-10.0
776.609000	42.66	46.00	3.34	100.0	V	271.0	-6.7

1GHz - 10GHz

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

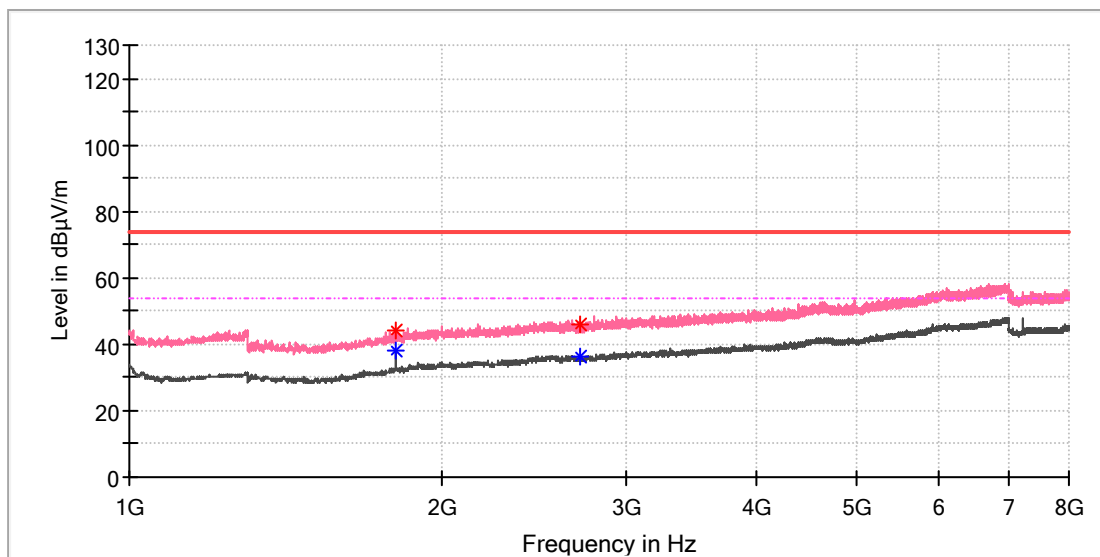


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1804.175000	---	41.43	54.00	12.57	100.0	H	4.0	4.7
1804.175000	44.96	---	74.00	29.04	100.0	H	4.0	4.7
2702.812500	45.46	---	74.00	28.54	100.0	H	105.0	7.5
2706.162500	---	36.06	54.00	17.94	100.0	H	93.0	7.5
7218.612500	54.79	---	74.00	19.21	100.0	H	278.0	17.9
7218.612500	---	49.59	54.00	4.41	100.0	H	278.0	17.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

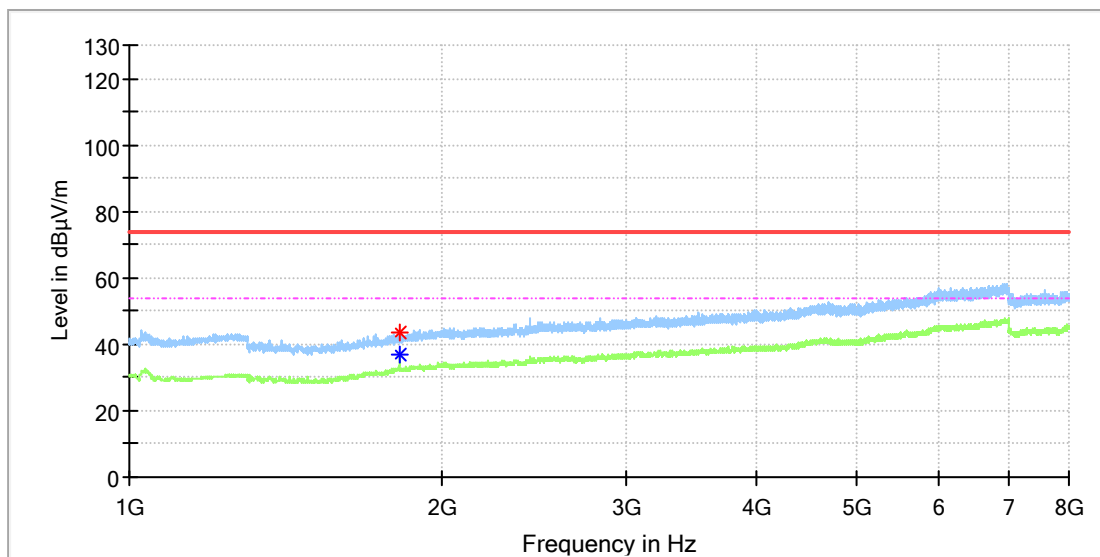


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1804.175000	44.20	---	74.00	29.80	100.0	V	127.0	4.7
1804.175000	---	37.83	54.00	16.17	100.0	V	127.0	4.7
2706.162500	---	36.25	54.00	17.75	100.0	V	3.0	7.5
2707.000000	46.11	---	74.00	27.89	100.0	V	42.0	7.6

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

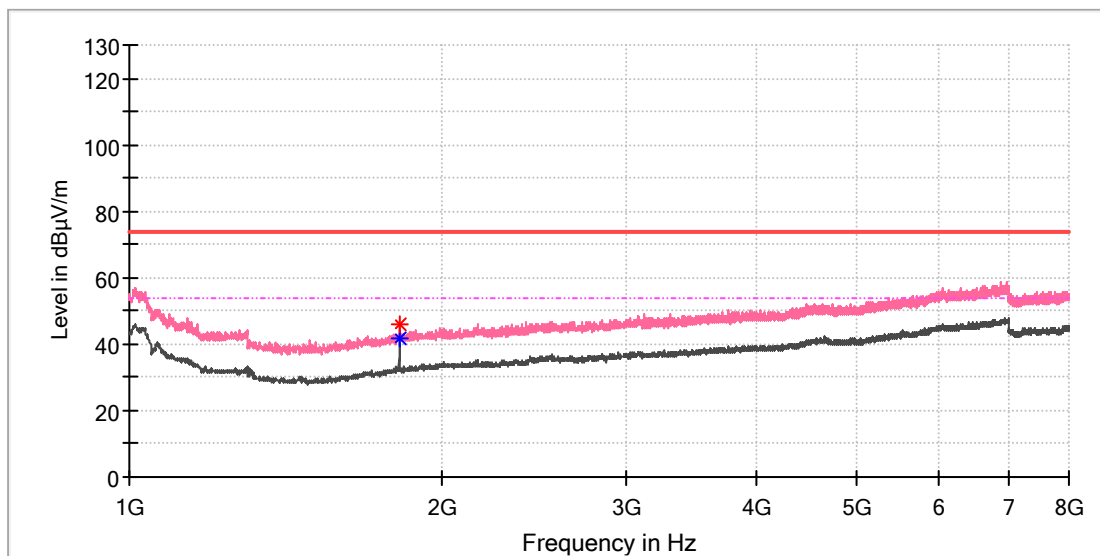


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1816.737500	43.55	---	74.00	30.45	100.0	H	128.0	4.8
1816.737500	---	36.93	54.00	17.07	100.0	H	128.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

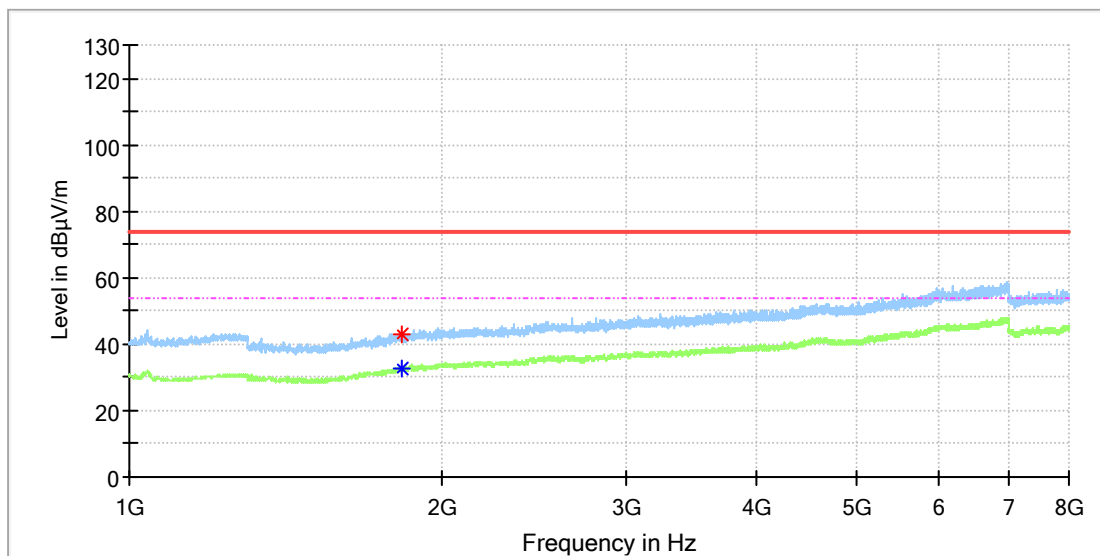


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1816.737500	45.87	---	74.00	28.13	100.0	V	148.0	4.8
1816.737500	---	41.76	54.00	12.24	100.0	V	148.0	4.8

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

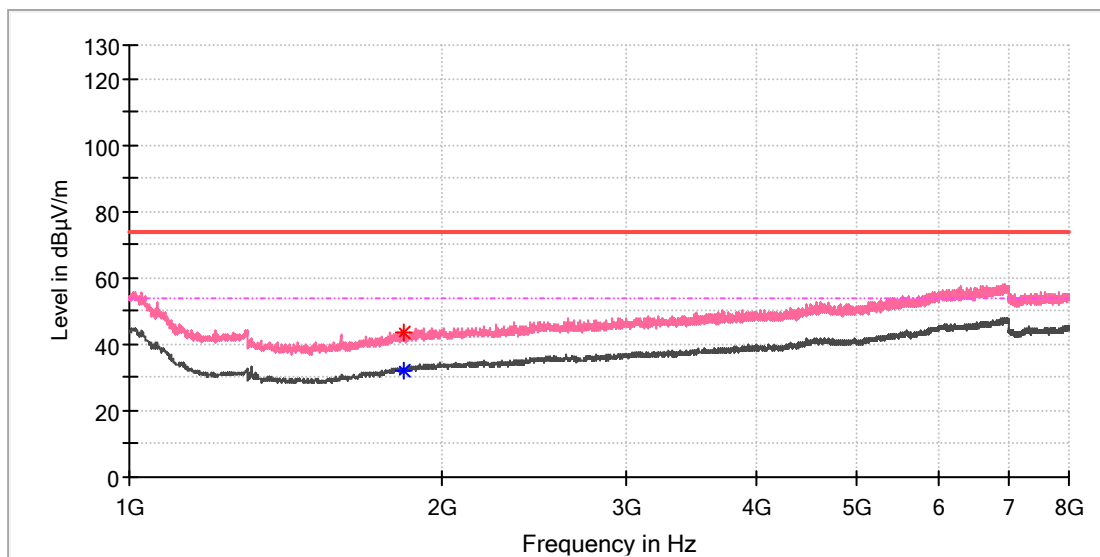


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1825.112500	---	32.80	54.00	21.20	100.0	H	10.0	4.9
1828.462500	42.88	---	74.00	31.12	100.0	H	68.0	4.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

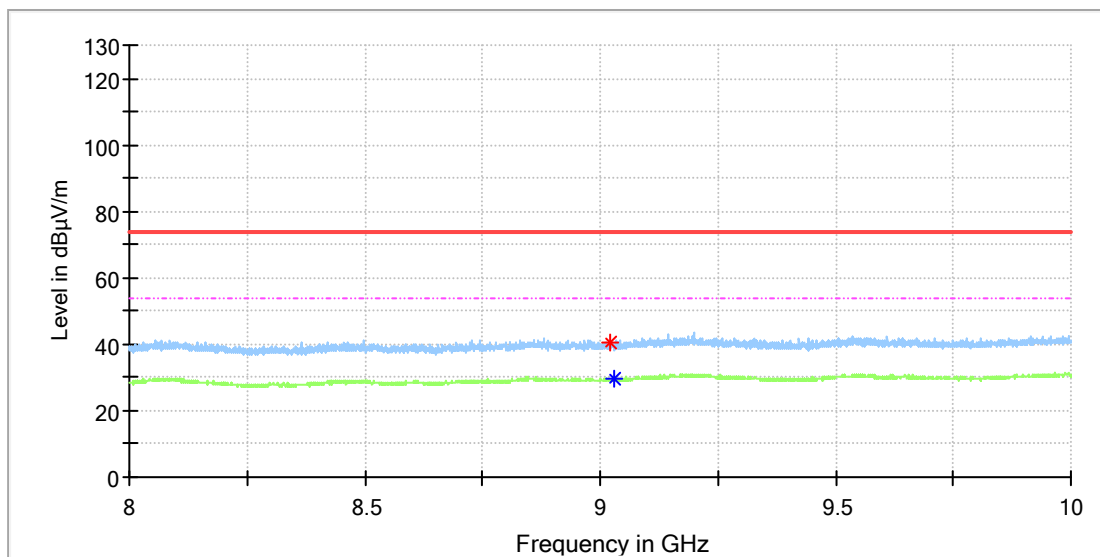


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1831.812500	43.66	---	74.00	30.34	100.0	V	232.0	4.9
1831.812500	---	32.31	54.00	21.69	100.0	V	232.0	4.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

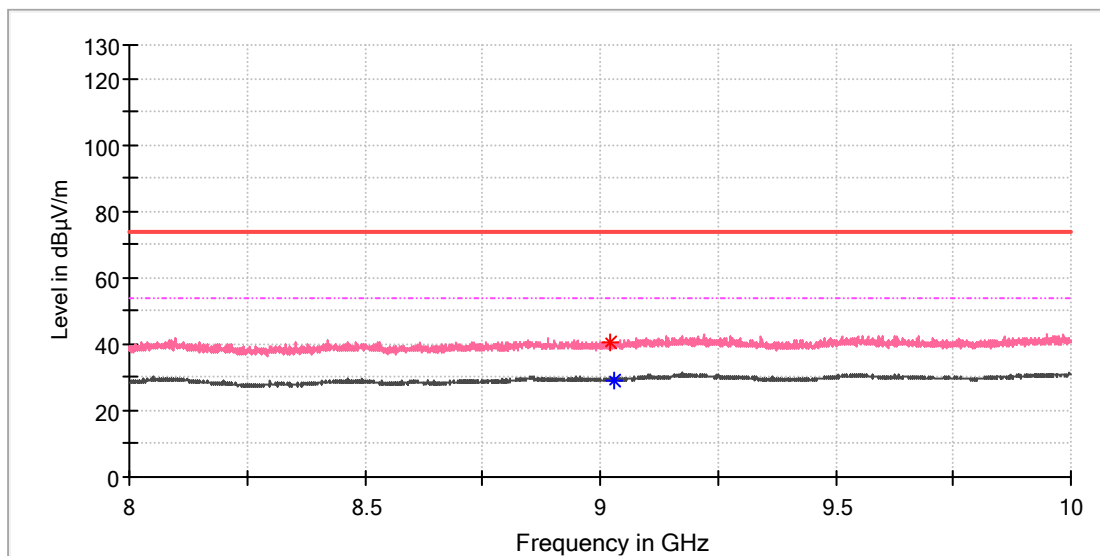


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9022.000000	40.35	---	74.00	33.65	100.0	H	188.0	8.9
9028.500000	---	29.43	54.00	24.57	100.0	H	254.0	8.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_902.3MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

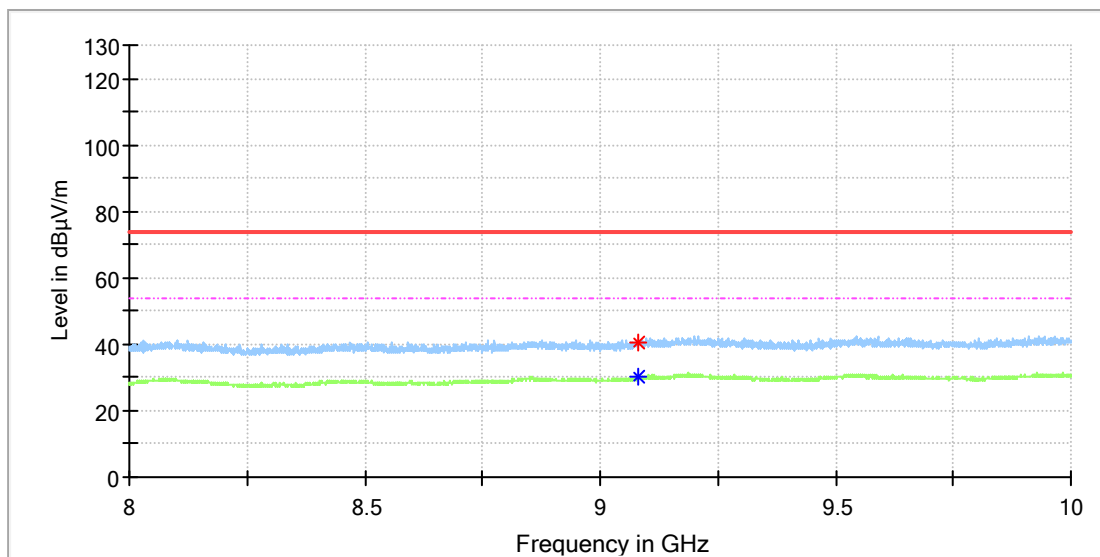


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9023.000000	40.28	---	74.00	33.72	100.0	V	225.0	8.9
9029.500000	---	29.30	54.00	24.70	100.0	V	271.0	8.9

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

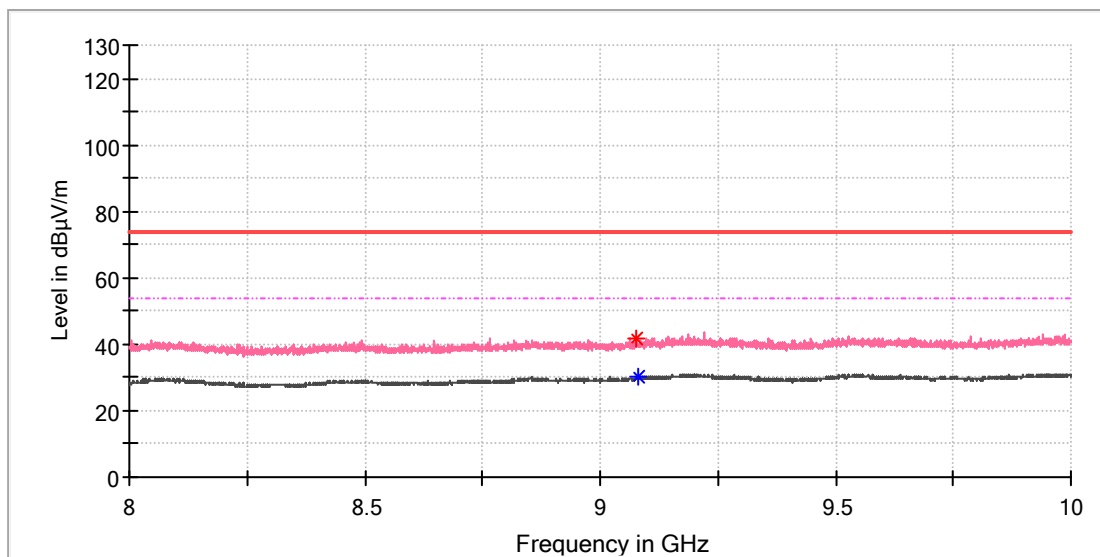


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9079.500000	40.77	---	74.00	33.23	100.0	H	146.0	9.4
9081.000000	---	30.02	54.00	23.98	100.0	H	154.0	9.5

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_908.5MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

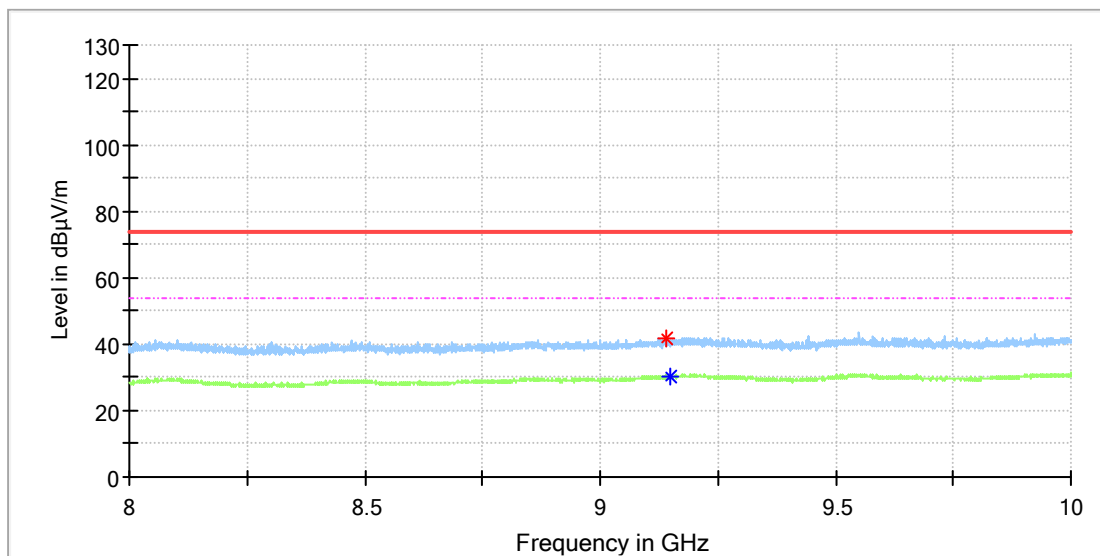


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9077.500000	41.45	---	74.00	32.55	100.0	V	100.0	9.4
9082.500000	---	30.00	54.00	24.00	100.0	V	356.0	9.5

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

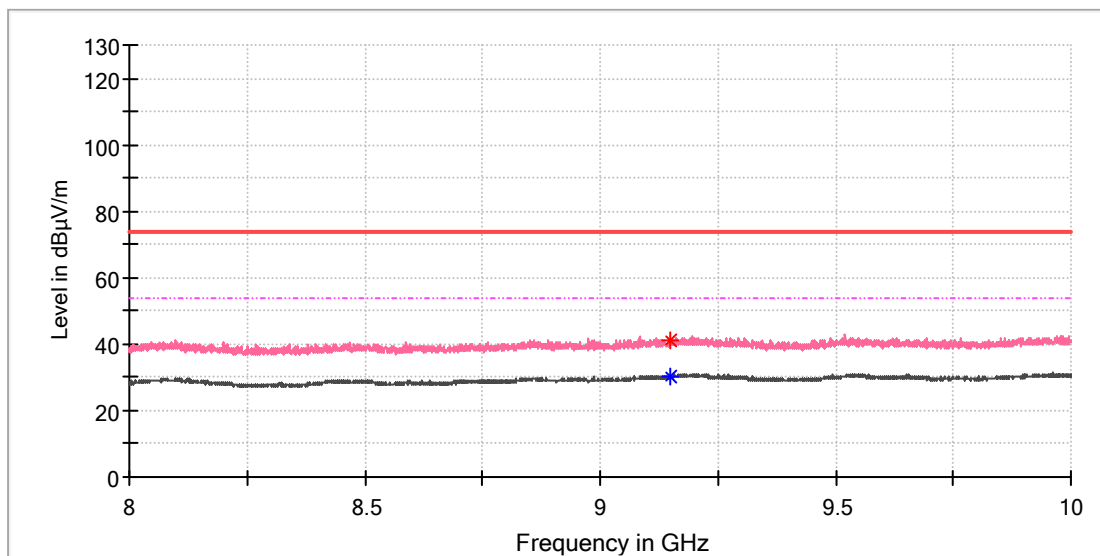


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9140.500000	41.75	---	74.00	32.25	100.0	H	17.0	10.0
9148.500000	---	30.27	54.00	23.73	100.0	H	294.0	10.1

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Mode:	Lora_125k_914.9MHz
Test Voltage::	DC 5V from USB
Remark:	Temp 24 Humi:47%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



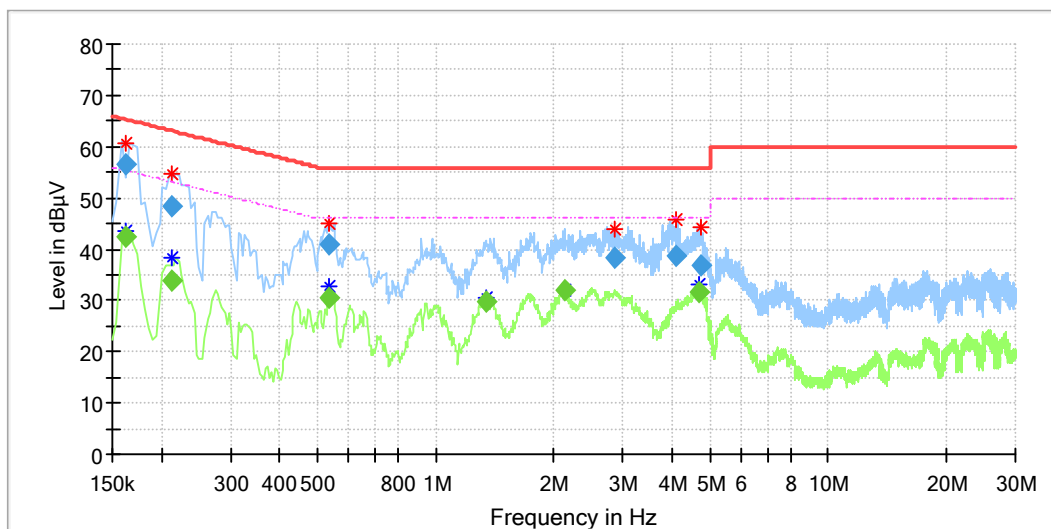
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9147.000000	41.21	---	74.00	32.79	100.0	V	207.0	10.1
9150.500000	---	30.47	54.00	23.53	100.0	V	44.0	10.1

Appendix B.8: Test Results of Conducted Emission on AC Mains

EUT Information

EUT Name: WisDuo LPWAN Module
 Model: RAK3172
 Test Voltage: AC 120V/60Hz
 Test By: Ouyang Wang
 Review By: Gary Chen
 Remark: SR2

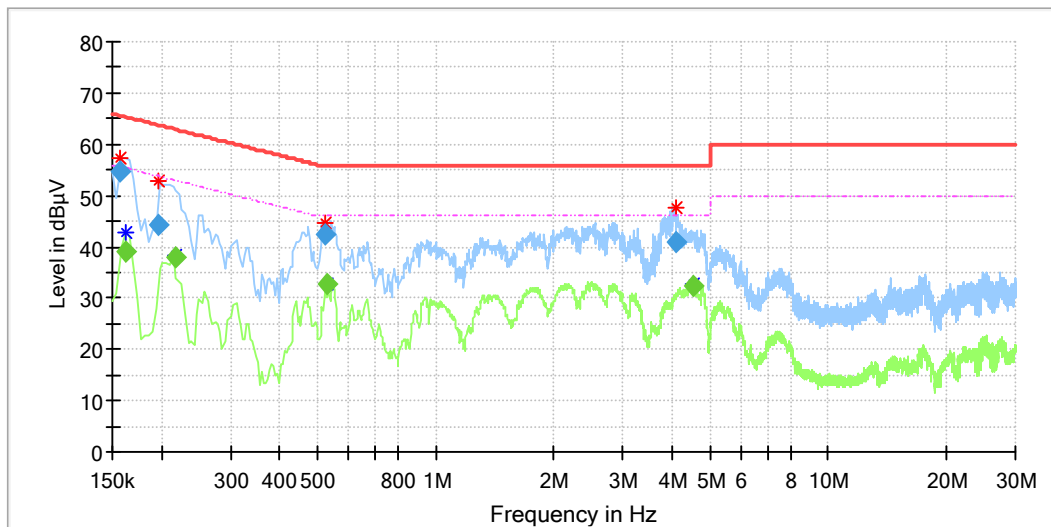


Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.161500	---	42.31	55.39	13.08	200.0	9.000	L1	9.9
0.161500	56.56	---	65.39	8.83	200.0	9.000	L1	9.9
0.213500	---	33.76	53.07	19.30	200.0	9.000	L1	9.9
0.213500	48.29	---	63.07	14.78	200.0	9.000	L1	9.9
0.533500	40.81	---	56.00	15.19	200.0	9.000	L1	10.0
0.537500	---	30.46	46.00	15.54	200.0	9.000	L1	10.0
1.349500	---	29.85	46.00	16.15	200.0	9.000	L1	10.1
2.137500	---	32.01	46.00	13.99	200.0	9.000	L1	10.1
2.866500	38.32	---	56.00	17.68	200.0	9.000	L1	10.2
4.117500	38.84	---	56.00	17.16	200.0	9.000	L1	10.2
4.713500	---	31.67	46.00	14.33	200.0	9.000	L1	10.2
4.753500	37.00	---	56.00	19.00	200.0	9.000	L1	10.2

EUT Information

EUT Name:	WisDuo LPWAN Module
Model:	RAK3172
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	SR2



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.157500	54.64	---	65.60	10.95	200.0	9.000	N	9.8
0.161500	---	39.19	55.39	16.19	200.0	9.000	N	9.8
0.197500	44.23	---	63.72	19.48	200.0	9.000	N	9.8
0.218500	---	37.77	52.88	15.10	200.0	9.000	N	9.8
0.525500	42.41	---	56.00	13.59	200.0	9.000	N	9.8
0.529500	---	32.81	46.00	13.19	200.0	9.000	N	9.8
4.101500	40.85	---	56.00	15.15	200.0	9.000	N	9.9
4.537500	---	32.20	46.00	13.80	200.0	9.000	N	9.9