



Appendix B

RF Test Data for Zigbee(Conducted Measurement)

Product Name: Spektrum+ Gateway with Ethernet Port SmartHub

Test Model: SPKPL-GTWY-E

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
Supervised by:	Li Huan





B.1 DTS Bandwidth

Test Result

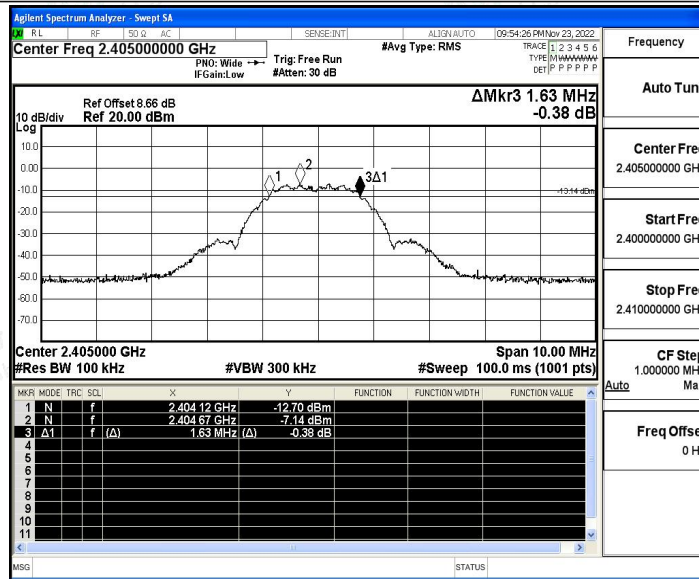
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	1.630	2404.120	2405.750	0.5	PASS
		2440	1.630	2439.110	2440.740	0.5	PASS
		2480	1.630	2479.120	2480.750	0.5	PASS



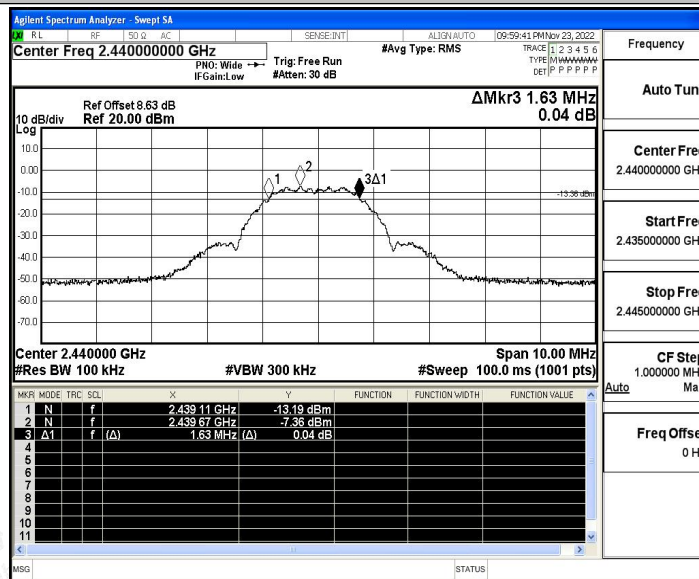


Test Graphs

ZIGB_Ant1_2405

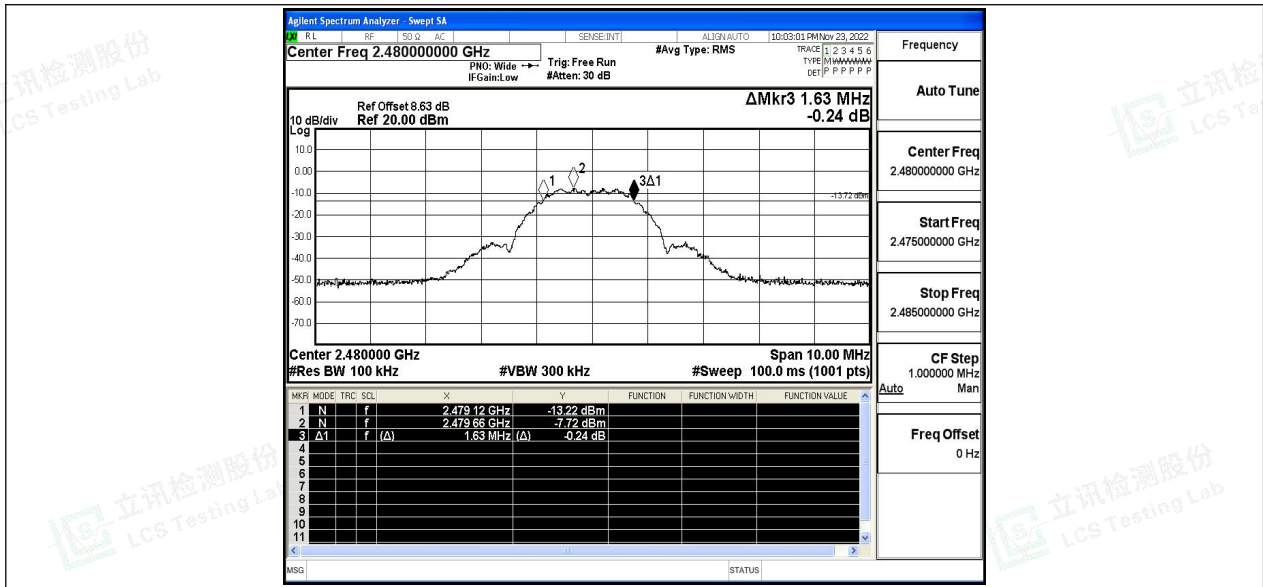


ZIGB_Ant1_2440



ZIGB_Ant1_2480







B.2 Maximum conducted output power

Test Result

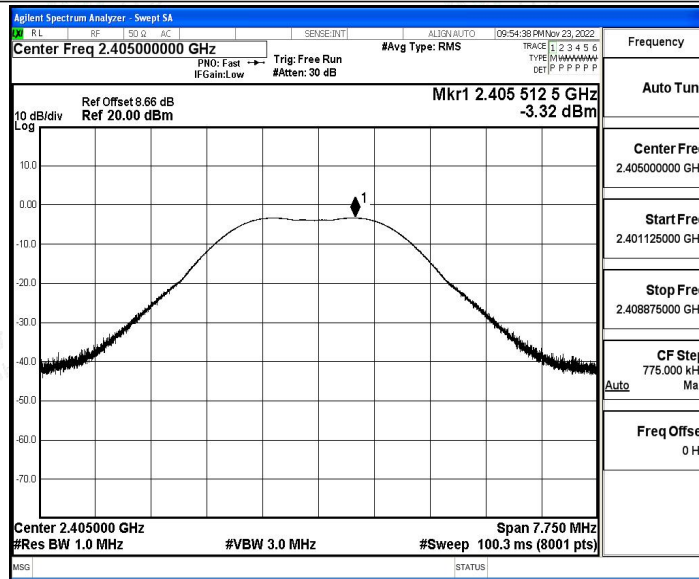
TestMode	Antenna	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	-3.32	≤30	PASS
		2440	-3.53	≤30	PASS
		2480	-3.87	≤30	PASS



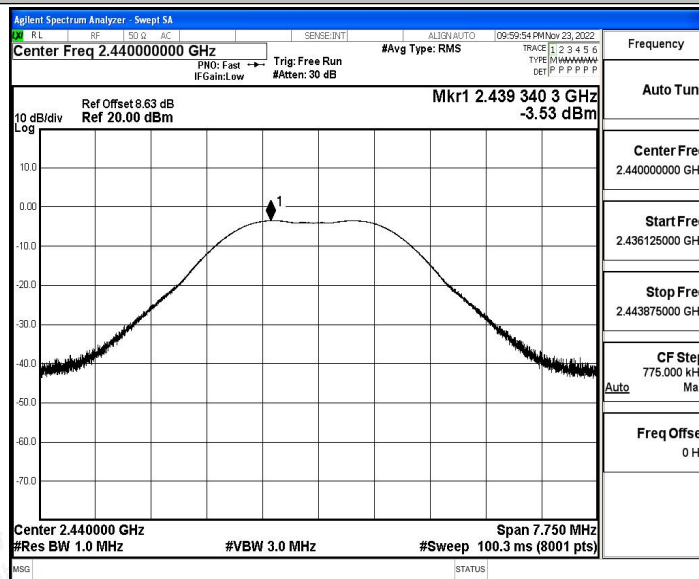


Test Graphs

ZIGB_Ant1_2405

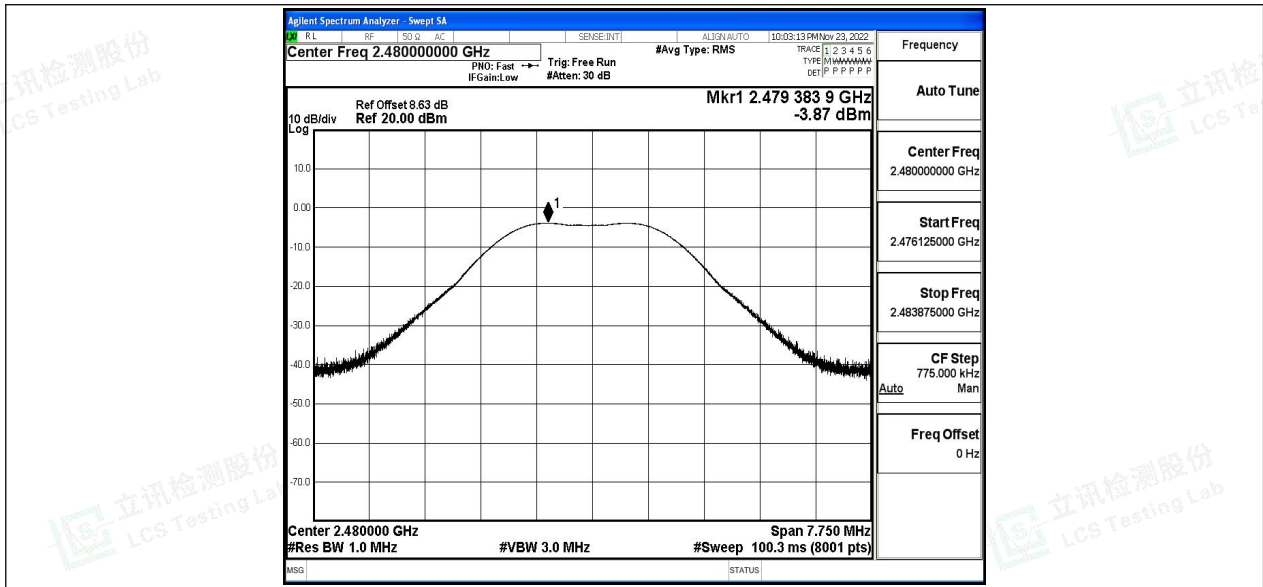


ZIGB_Ant1_2440



ZIGB_Ant1_2480







B.3 Maximum power spectral density

Test Result

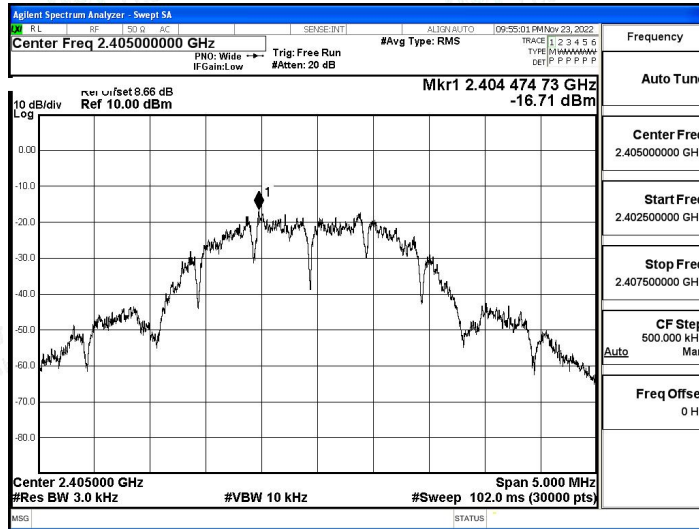
TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
ZIGB	Ant1	2405	-16.71	≤8.00	PASS
		2440	-16.19	≤8.00	PASS
		2480	-16.6	≤8.00	PASS



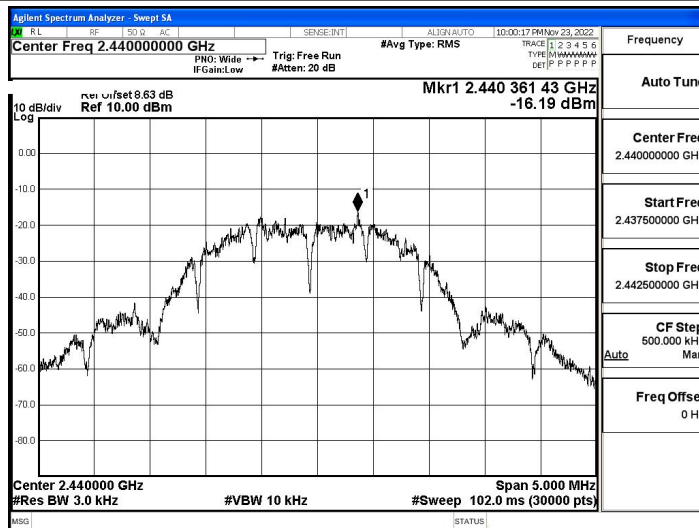


Test Graphs

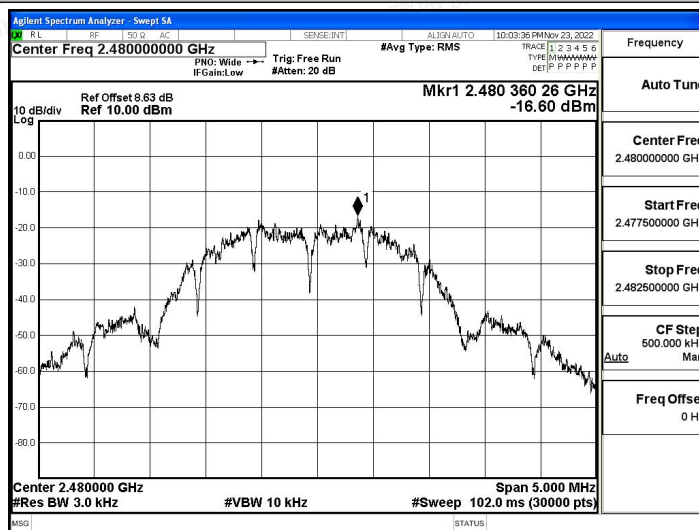
ZIGB_Ant1_2405



ZIGB_Ant1_2440



ZIGB_Ant1_2480





B.4 Band edge measurements

Test Result

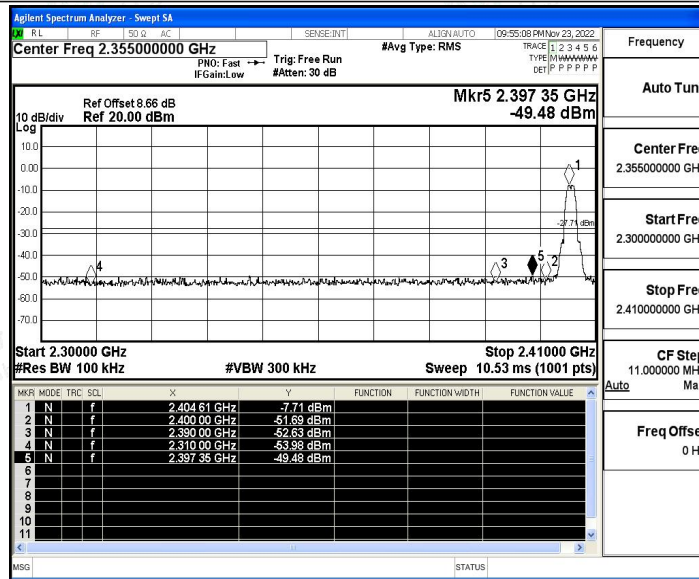
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	Low	2405	-7.71	-49.48	≤-27.71	PASS
		High	2480	-8.36	-48.79	≤-28.36	PASS



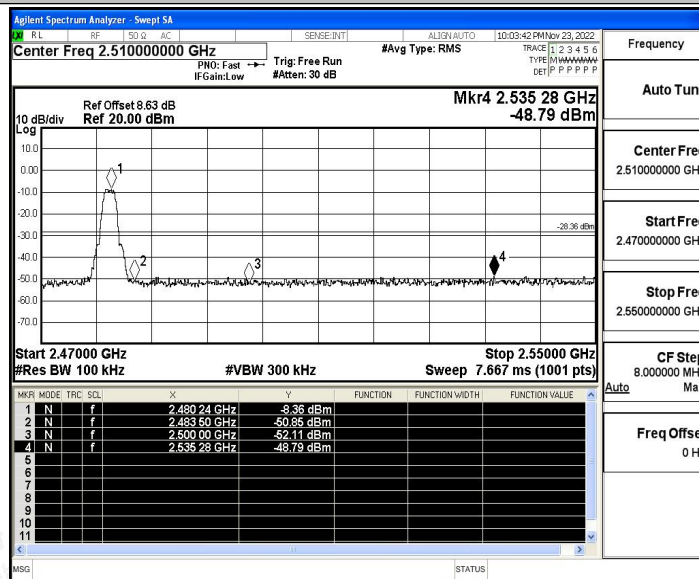


Test Graphs

ZIGB_Ant1_Low_2405



ZIGB_Ant1_High_2480





B.5 Conducted Spurious Emission

Test Result

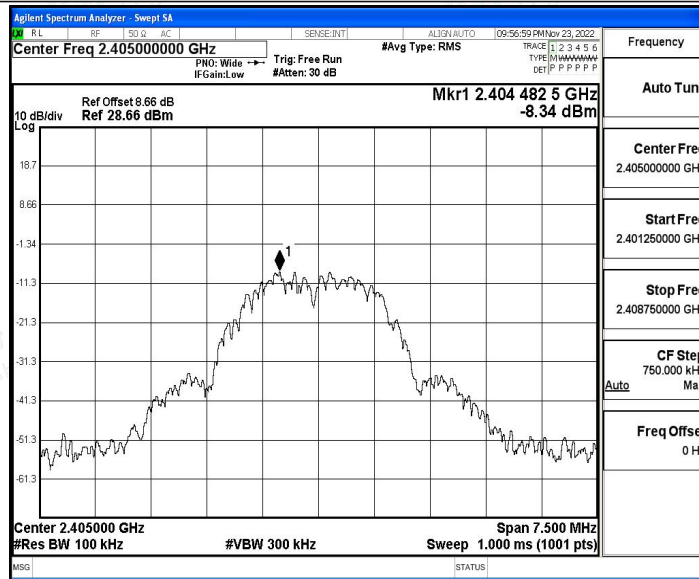
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	Reference	-8.34	-8.34	---	PASS
			30~1000	-8.34	-59.13	≤-28.34	PASS
			1000~26500	-8.34	-45.83	≤-28.34	PASS
		2440	Reference	-9.24	-9.24	---	PASS
			30~1000	-9.24	-48.06	≤-29.24	PASS
			1000~26500	-9.24	-46.09	≤-29.24	PASS
		2480	Reference	-8.38	-8.38	---	PASS
			30~1000	-8.38	-60.32	≤-28.38	PASS
			1000~26500	-8.38	-46.32	≤-28.38	PASS



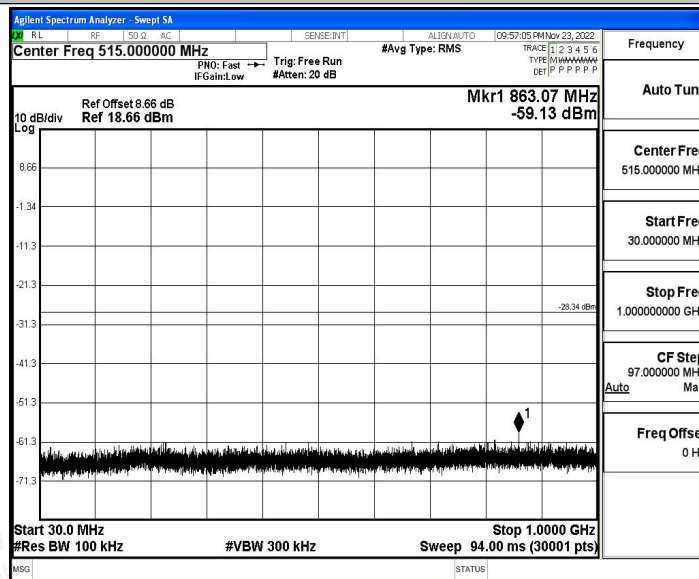


Test Graphs

ZIGB_Ant1_2405_0~Reference

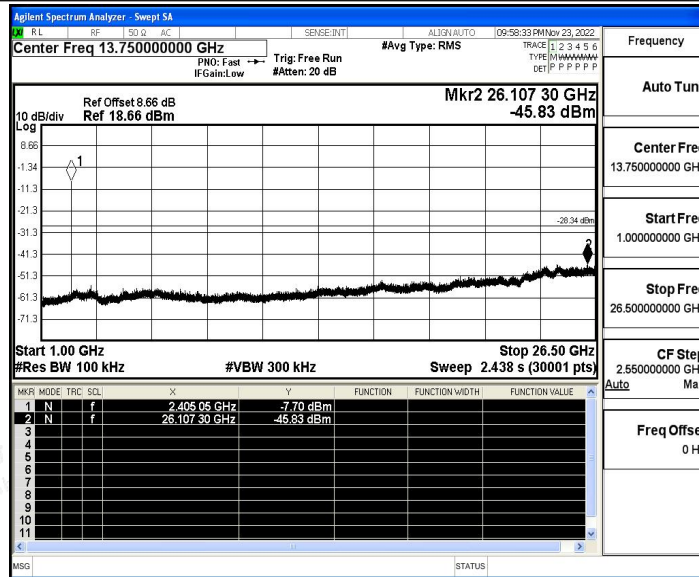


ZIGB_Ant1_2405_30~1000

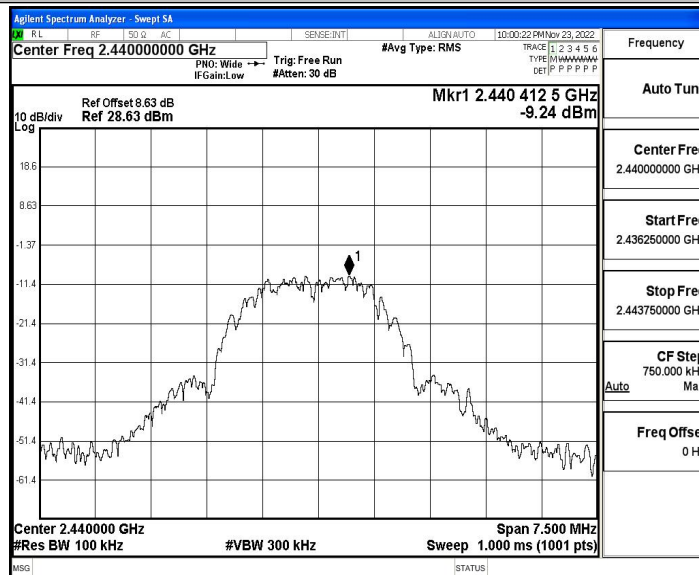


ZIGB_Ant1_2405_1000~26500



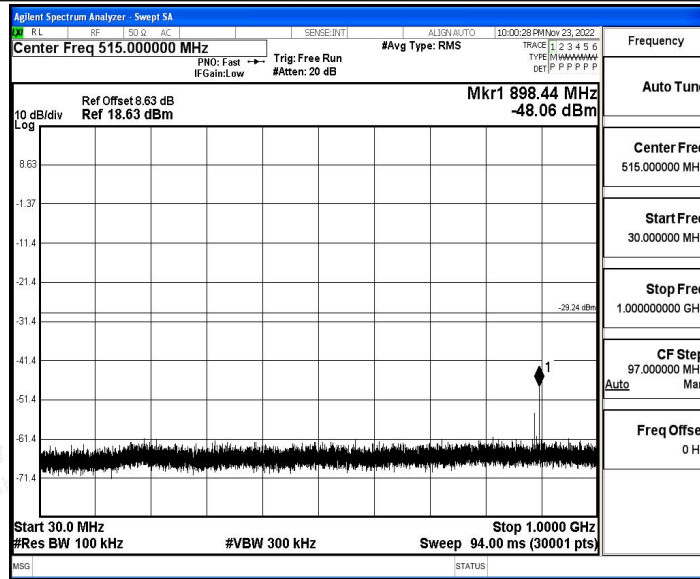


ZIGB_Ant1_2440_0~Reference

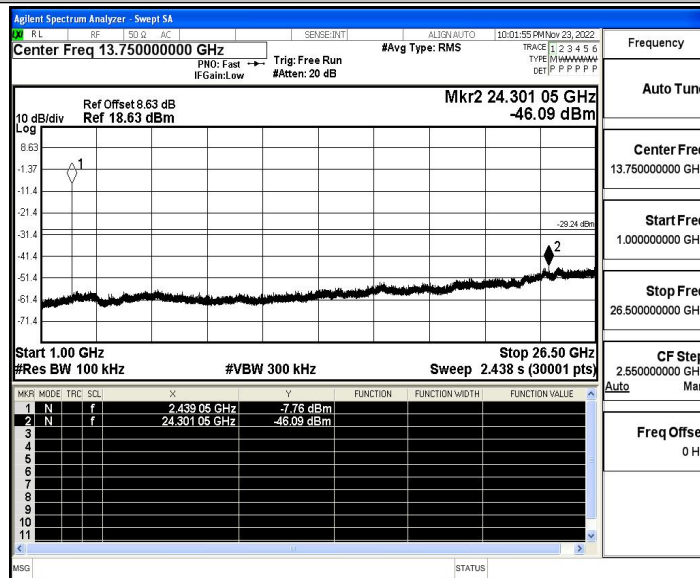


ZIGB_Ant1_2440_30~1000



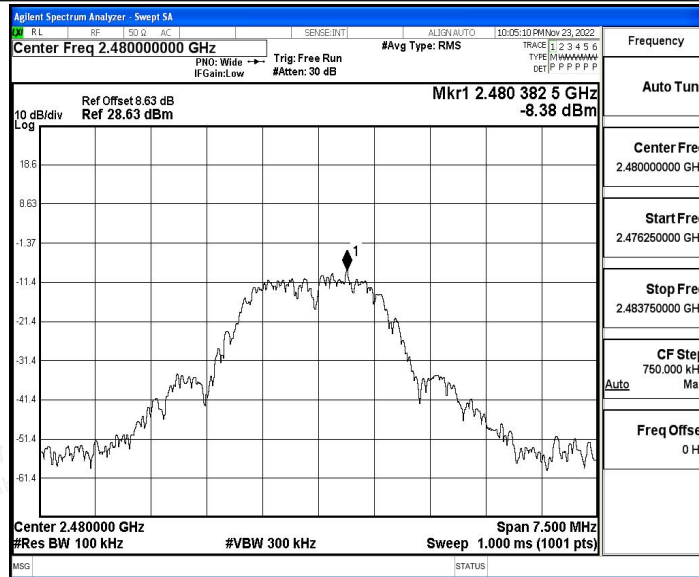


ZIGB_Ant1_2440_1000~26500

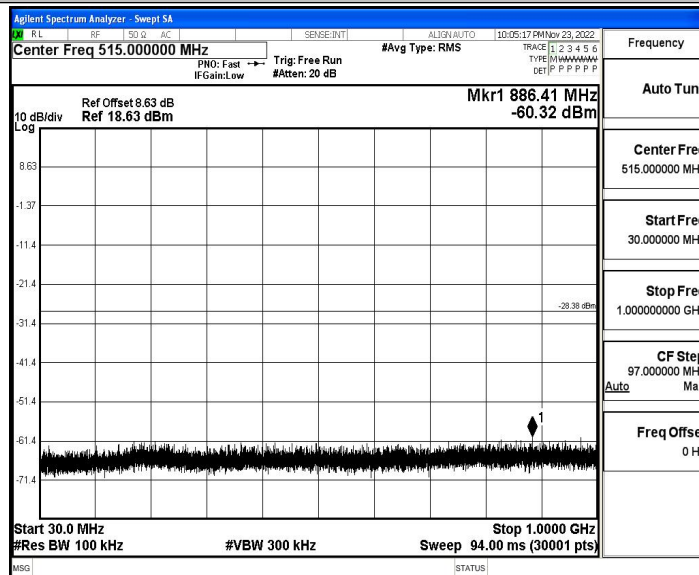


ZIGB_Ant1_2480_0~Reference



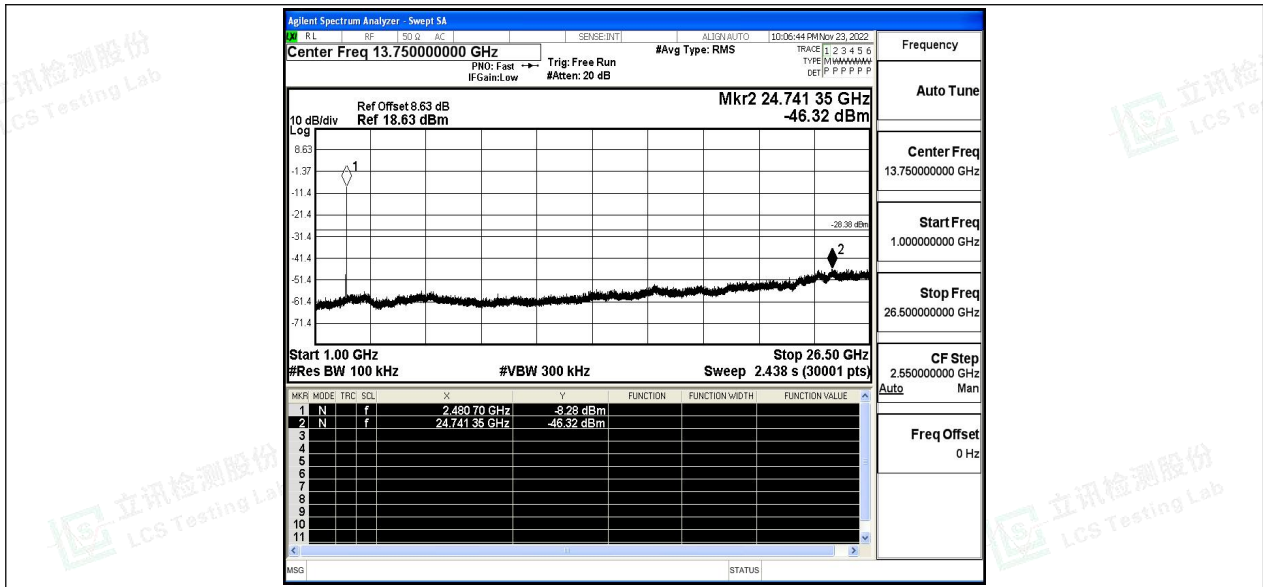


ZIGB_Ant1_2480_30~1000



ZIGB_Ant1_2480_1000~26500







B.6 Duty Cycle

Test Result

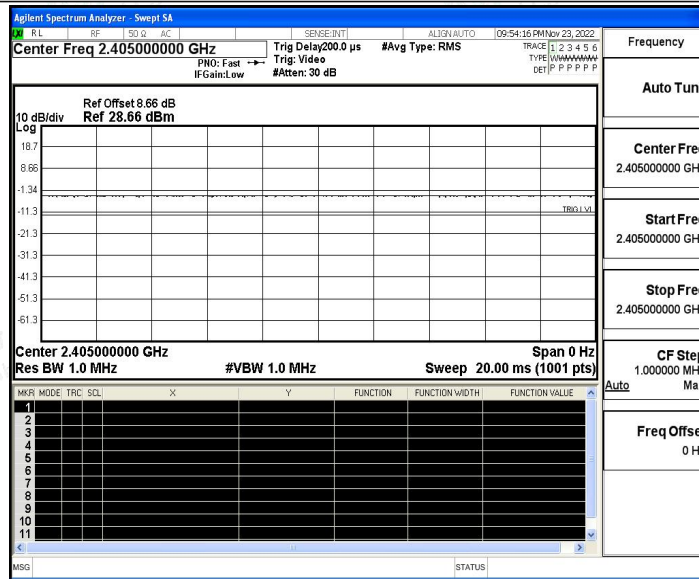
TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor	1/T
ZIGB	Ant1	2405	20.00	20.00	100.00	0.00	1
		2440	20.00	20.00	100.00	0.00	1
		2480	20.00	20.00	100.00	0.00	1



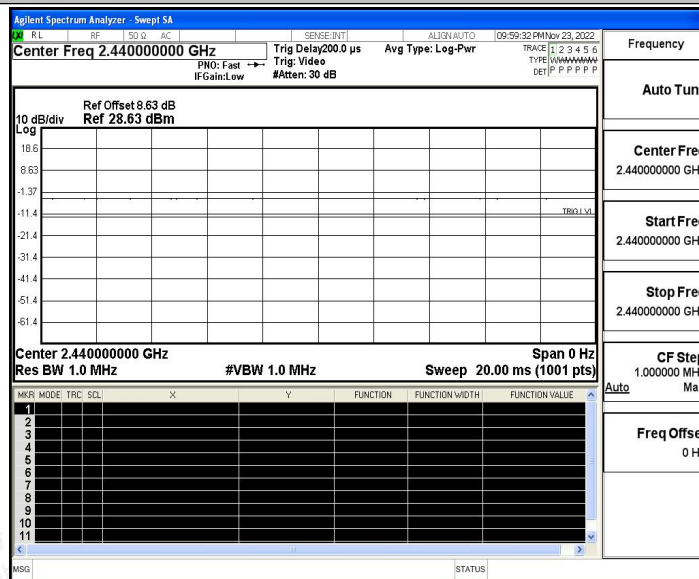


Test Graphs

ZIGB_Ant1_2405

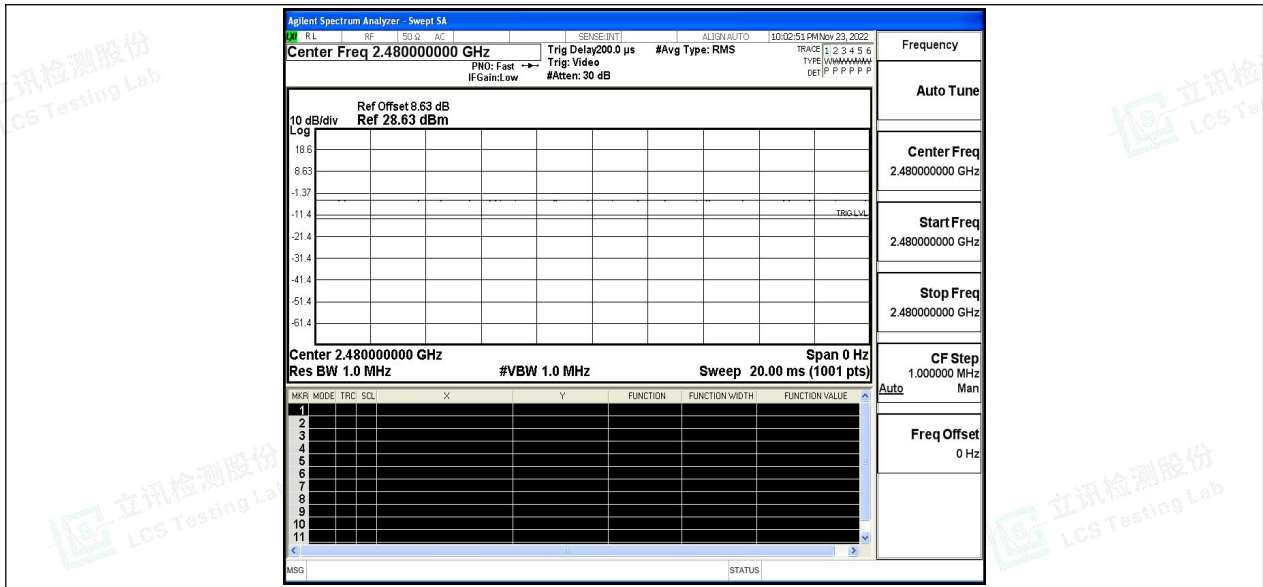


ZIGB_Ant1_2440



ZIGB_Ant1_2480







B.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq.[MHz]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	Low	2405	AV	2310.000	-48.64	≤-41.20	PASS
				AV	2388.660	-48.26	≤-41.20	PASS
				AV	2390.000	-48.28	≤-41.20	PASS
				Peak	2310.000	-44.43	≤-21.20	PASS
				Peak	2367.980	-38.08	≤-21.20	PASS
				Peak	2390.000	-44.84	≤-21.20	PASS
		High	2480	AV	2483.500	-45.82	≤-41.20	PASS
				AV	2483.520	-45.81	≤-41.20	PASS
				AV	2500.000	-47.73	≤-41.20	PASS
				Peak	2483.500	-40.67	≤-21.20	PASS
				Peak	2483.680	-38.52	≤-21.20	PASS
				Peak	2500.000	-42.82	≤-21.20	PASS

Note:

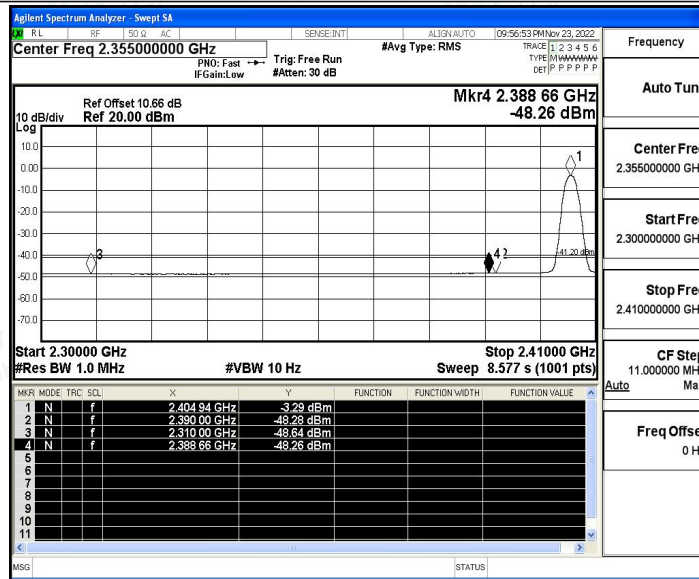
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



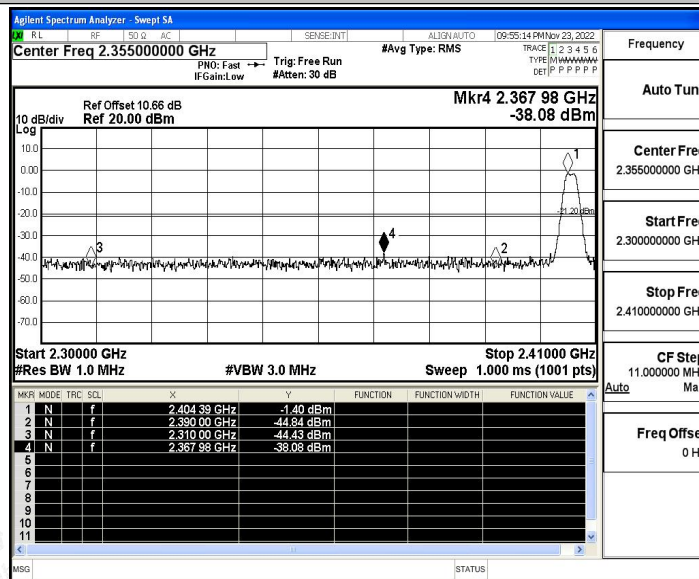


Test Graphs

ZIGB_Ant1_Low_2405_AV

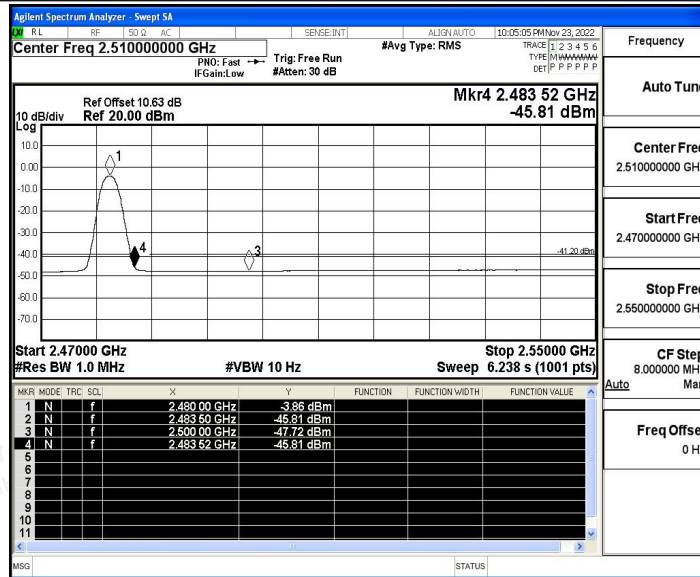


ZIGB_Ant1_Low_2405_Peak



ZIGB_Ant1_High_2480_AV





ZIGB_Ant1_High_2480_Peak

