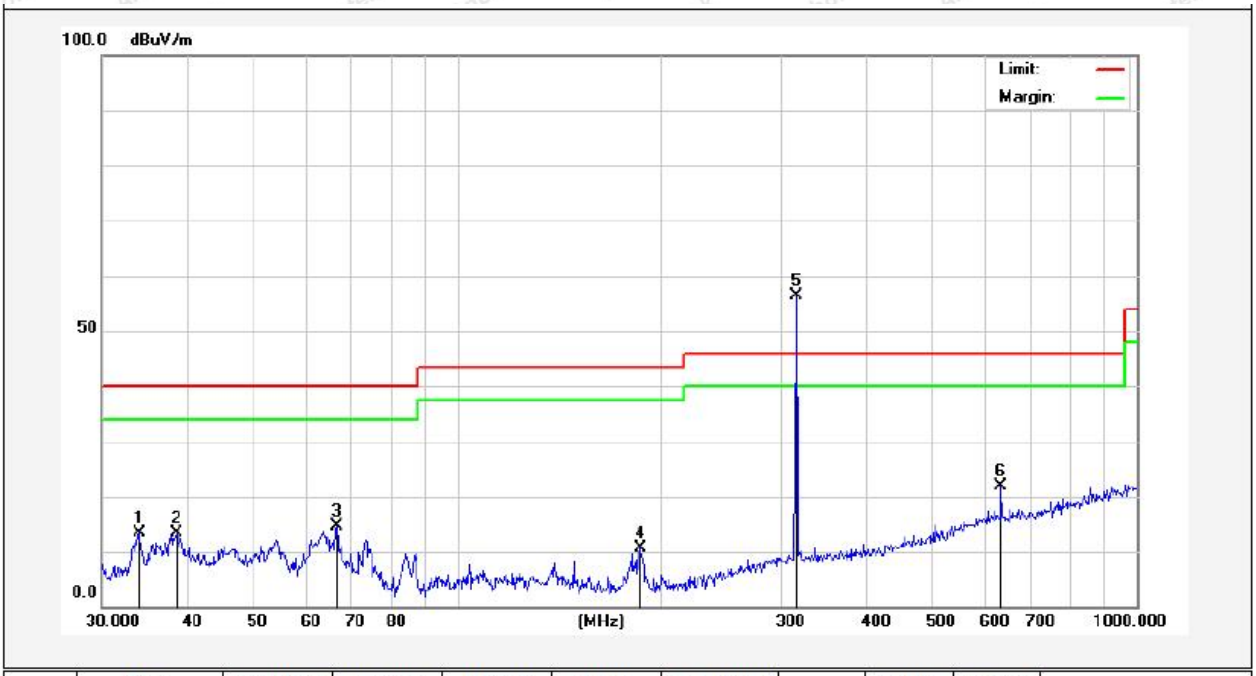
Test Results (30~1000MHz)

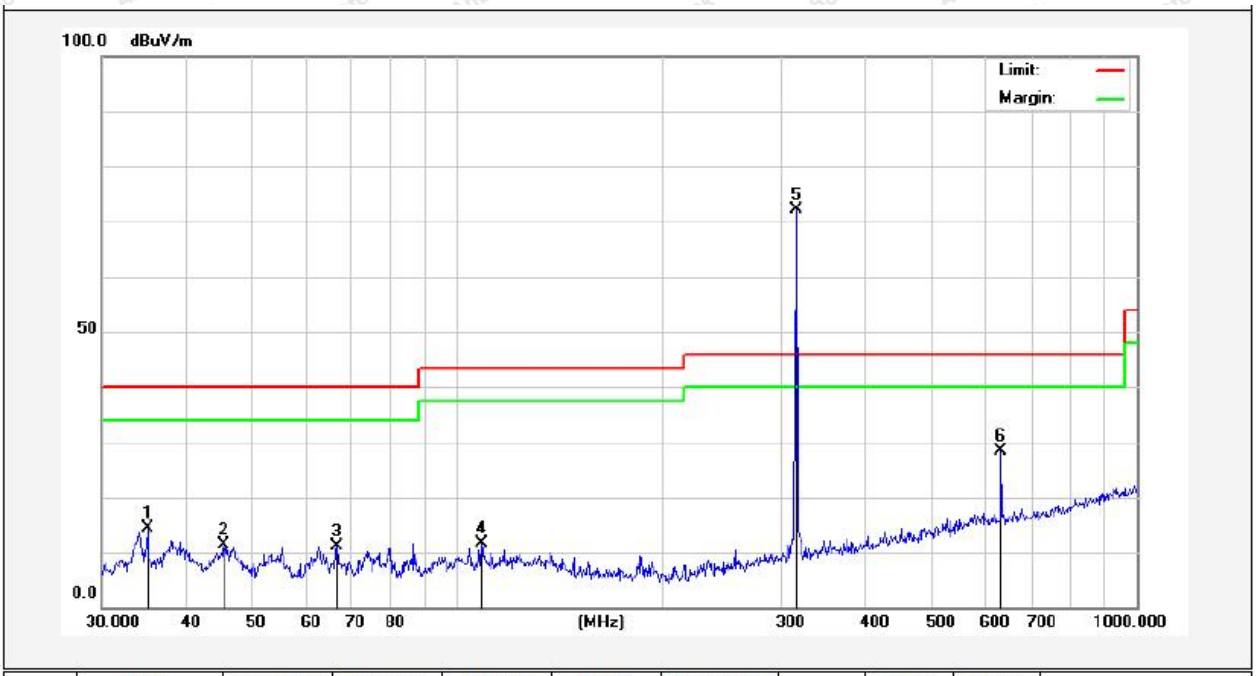
Test Model:	IKEYHD005AL
Test Mode:	315MHz(ASK)
Power Source:	DC 3V battery inside
Polarization:	Vertical
Temp.(℃)/Hum.(%RH):	23.6℃/47%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	34.0365	30.73	-17.31	13.42	40.00	-26.58	QP			
2	38.6160	28.62	-15.28	13.34	40.00	-26.66	QP			
3	66.4989	34.13	-19.51	14.62	40.00	-25.38	QP			
4	185.7882	31.05	-20.32	10.73	43.50	-32.77	QP			
5	315.4808	72.37	-15.87	56.50	/	/	peak			
6	631.6884	32.57	-10.62	21.95	/	/	peak			

Test Results (30~1000MHz)

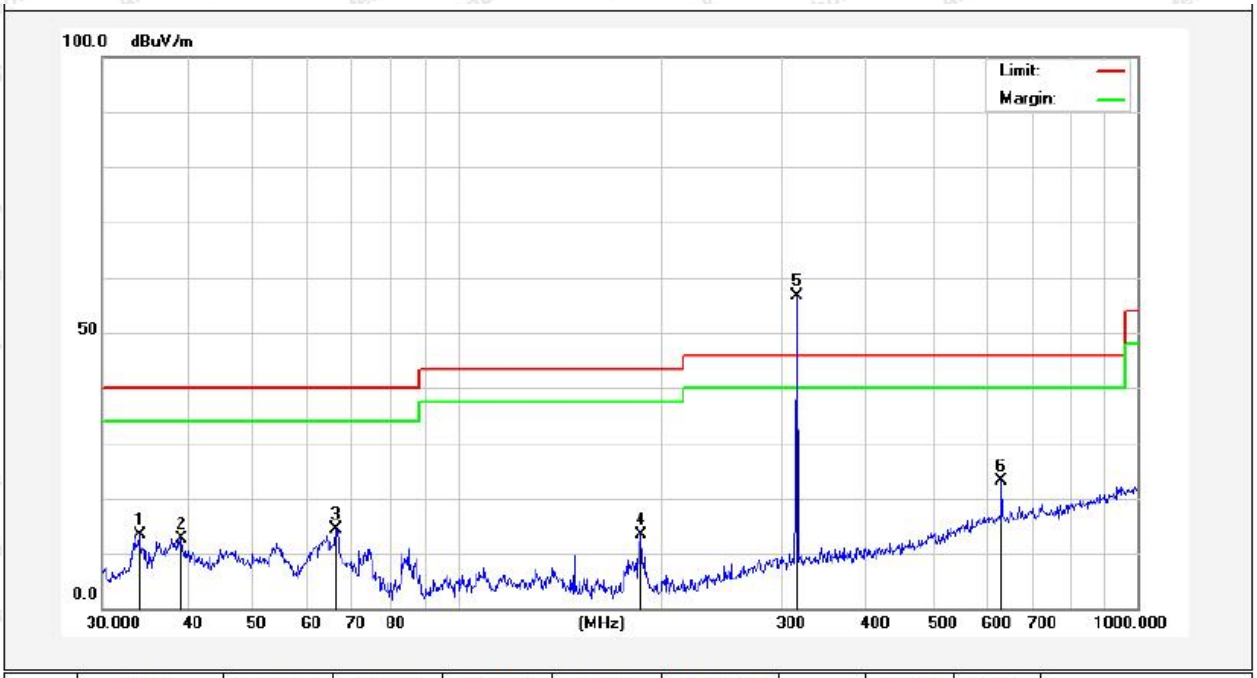
Test Model:	IKEYHD005AL
Test Mode:	315MHz(FSK)
Power Source:	DC 3V battery inside
Polarization:	Horizontal
Temp.(℃)/Hum.(%RH):	23.6℃/47%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	35.0048	32.90	-18.45	14.45	40.00	-25.55	QP			
2	45.3755	26.52	-15.25	11.27	40.00	-28.73	QP			
3	66.4989	31.39	-20.20	11.19	40.00	-28.81	QP			
4	108.6470	34.55	-22.94	11.61	43.50	-31.89	QP			
5	315.4808	88.83	-16.80	72.03	/	/	peak			
6	631.6884	39.04	-10.62	28.42	/	/	peak			

Test Results (30~1000MHz)

Test Model:	IKEYHD005AL
Test Mode:	315MHz(FSK)
Power Source:	DC 3V battery inside
Polarization:	Vertical
Temp.(℃)/Hum.(%RH):	23.6℃/47%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	34.0365	30.60	-17.31	13.29	40.00	-26.71	QP			
2	39.2991	27.67	-14.92	12.75	40.00	-27.25	QP			
3	66.2662	33.98	-19.49	14.49	40.00	-25.51	QP			
4	186.4409	33.66	-20.30	13.36	43.50	-30.14	QP			
5	315.4808	72.61	-15.87	56.74	/	/	peak			
6	631.6884	33.75	-10.62	23.13	/	/	peak			

Remark:

1. Results = Reading + Factor

Test Results (Fundamental)

315MHz(ASK)

Mode	Freq. (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor(dB)	Duty cycle Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det. Mode
TX Mode	315.4808	H	88.55	-16.8	-	71.75	95.62	PK
	315.4808	H	88.55	-16.8	-5.95	65.80	75.62	AV
	315.4808	V	72.37	-15.87	-	56.5	95.62	PK
	315.4808	V	72.37	-15.87	-5.95	50.55	75.62	AV

Remark:

1. Result = Reading + Factor+ Duty cycle Factor
2. Pulse Desensitization Correction Factor
3. AV=PEAK +Duty Cycle Factor

Mode	Freq. (MHz)	Pulse Width (ms)	2/Pulse Width(kHz)
TX Mode	315(ASK)	0.42	4.762

RBW(1000kHz)＞ 2/Pulse Width

Therefore PDCF is not needed.

4. Duty Cycle Factor

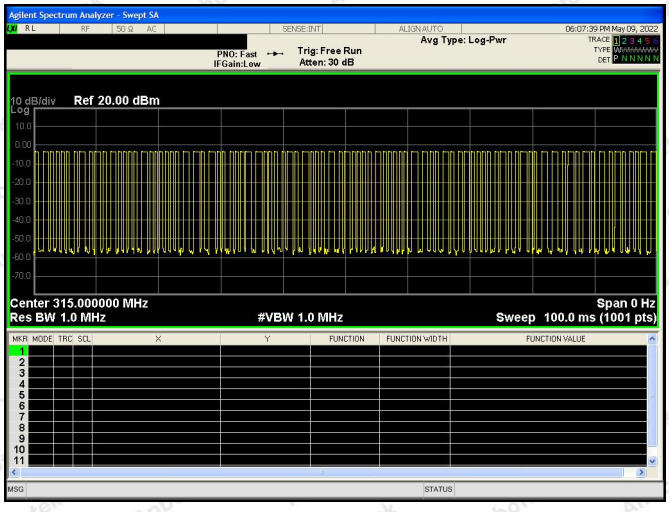
Mode	Freq. (MHz)	T on1 (ms)	N1	T on2 (ms)	N2	T on(ms)	T period (ms)	Duty Cycle	Duty Cycle Factor
TX Mode	315(ASK)	0.42	62	0.84	29	50.400	100	50.40%	-5.95

T on=T on1*N1 + T on2*N2

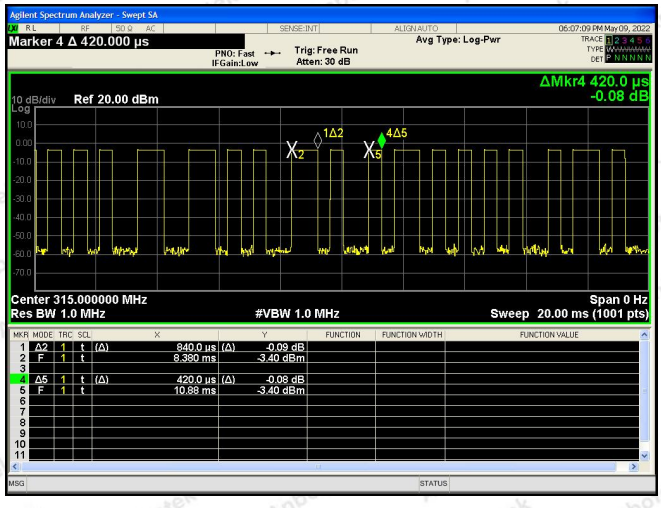
Duty Cycle=T on/T period

Duty Cycle Factor =20*lg(Duty Cycle)

315MHz(ASK)-T period



315MHz(ASK)-T on1&T on2



Test Results (Harmonics Emissions+Radiated Emissions from 1G-4G)

315MHz(ASK)

Frequency (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor (dB)	Duty cycle Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det Mode
631.6884	H	40	-10.62	-	29.38	75.62	PK
631.6884	H	40	-10.62	-5.95	23.43	55.62	AV
631.6884	V	32.57	-10.62	-	21.95	75.62	PK
631.6884	V	32.57	-10.62	-5.95	16.00	55.62	AV
945.4399	H	26.38	-5.69	-	20.69	74	PK
945.4399	H	26.38	-5.69	-5.95	14.74	54	AV
945.4399	V	26.41	-5.69	-	20.72	74	PK
945.4399	V	26.41	-5.69	-5.95	14.77	54	AV

Remark:

1. Result = Reading + Factor + Duty cycle Factor

Test Results (Fundamental)

315MHz(FSK)

Mode	Freq. (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor(dB)	Results (dBuV/m)	Limits (dBuV/m)	Det. Mode
TX Mode	315.4808	H	88.83	-16.8	72.03	95.62	PK
	315.4808	H	86.35	-16.8	69.55	75.62	AV
	315.4808	V	72.61	-15.87	56.74	95.62	PK
	315.4808	V	70.96	-15.87	55.09	75.62	AV

Remark:

1. Result = Reading + Factor
2. Pulse Desensitization Correction Factor

Mode	Freq. (MHz)	Pulse Width (ms)	2/Pulse Width(kHz)
TX Mode	315(FSK)	100	0.020

RBW(1000kHz)＞ 2/Pulse Width

Therefore PDCF is not needed.

4. Duty Cycle Factor

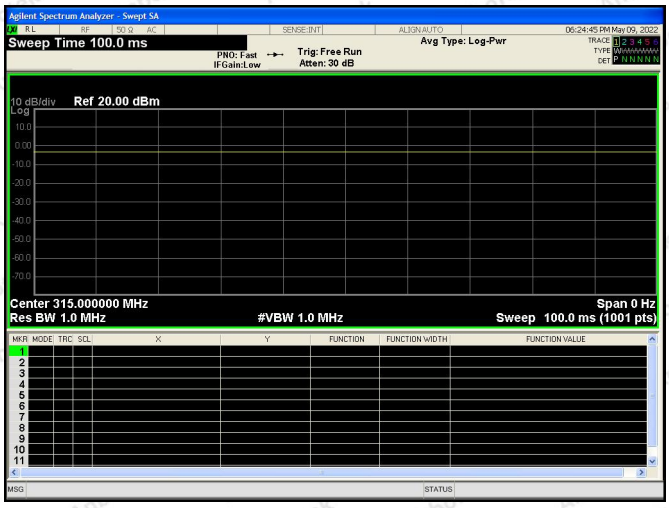
Mode	Freq. (MHz)	T on1 (ms)	N1	T on(ms)	T period (ms)	Duty Cycle
TX Mode	315(FSK)	100	1	100.000	100	100.00%

T on=T on1*N

Duty Cycle=T on/T period

Duty Cycle Factor =20*lg(Duty Cycle)

315MHz(FSK)-T on



Test Results (Harmonics Emissions+Radiated Emissions from 1G-4G)

315MHz(FSK)

Frequency (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det Mode
631.6884	H	39.04	-10.62	28.42	75.62	PK
631.6884	H	37.91	-10.62	27.29	55.62	AV
631.6884	V	33.75	-10.62	23.13	75.62	PK
631.6884	V	31.55	-10.62	20.93	55.62	AV
945.4399	H	26.96	-5.69	21.27	74	PK
945.4399	H	24.76	-5.69	19.07	54	AV
945.4399	V	26.47	-5.69	20.78	74	PK
945.4399	V	24.49	-5.69	18.8	54	AV

Remark:

1. Result = Reading + Factor

Test Results (Fundamental)

434MHz(ASK)

Mode	Freq. (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor(dB)	Duty cycle Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det. Mode
TX Mode	434.0651	H	91.31	-15.7	-	75.61	100.83	PK
	434.0651	H	91.31	-15.7	-6.06	69.55	80.83	AV
	434.0651	V	76.07	-13.93	-	62.14	100.83	PK
	434.0651	V	76.07	-13.93	-6.06	56.08	80.83	AV

Remark:

1. Result = Reading + Factor+ Duty cycle Factor
2. Pulse Desensitization Correction Factor
3. AV=PEAK +Duty Cycle Factor

Mode	Freq. (MHz)	Pulse Width (ms)	2/Pulse Width(kHz)
TX Mode	434(ASK)	0.42	4.762

RBW(1000kHz)＞ 2/Pulse Width

Therefore PDCF is not needed.

4. Duty Cycle Factor

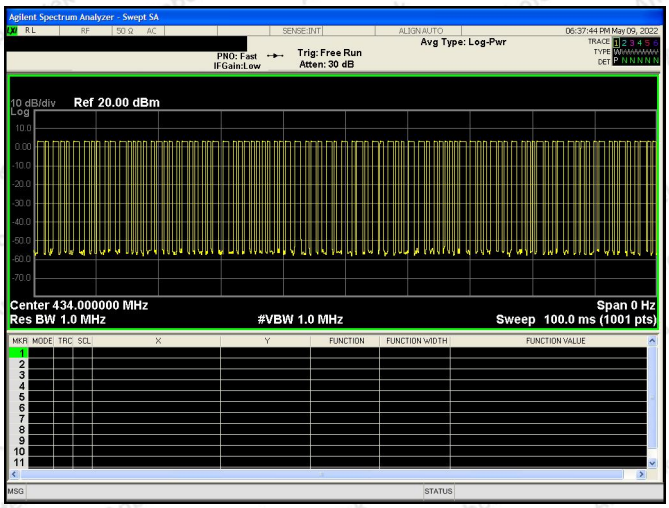
Mode	Freq. (MHz)	T on1 (ms)	N1	T on2 (ms)	N2	T on(ms)	T period (ms)	Duty Cycle	Duty Cycle Factor
TX Mode	434(ASK)	0.42	58	0.82	31	49.780	100	49.78%	-6.06

T on=T on1*1 + T on2*N2

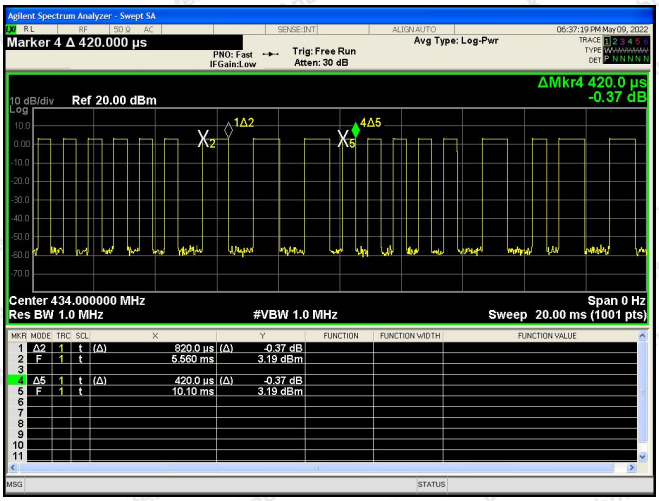
Duty Cycle=T on/T period

Duty Cycle Factor =20*lg(Duty Cycle)

434MHz(ASK)-T period



434MHz(ASK)-T on1&T on2



Test Results (Harmonics Emissions+Radiated Emissions from 1G-4G)

434MHz(ASK)

Frequency (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor (dB)	Duty cycle Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det Mode
869.1302	H	36.79	-7.00	-	29.79	80.83	PK
869.1302	H	36.79	-7.00	-6.06	23.73	60.83	AV
869.1302	V	27.63	-7.00	-	20.63	80.83	PK
869.1302	V	27.63	-7.00	-6.06	14.57	60.83	AV
1302.1953	H	35.84	1.36	-	37.20	74	PK
1302.1953	H	35.84	1.36	-6.06	31.14	54	AV
1302.1953	V	32.26	1.36	-	33.62	74	PK
1302.1953	V	32.26	1.36	-6.06	27.56	54	AV

Remark:

1. Result = Reading + Factor + Duty cycle Factor

Test Results (Fundamental)

434MHz(FSK)

Mode	Freq. (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor(dB)	Results (dBuV/m)	Limits (dBuV/m)	Det. Mode
	434.0651	H	94.33	-15.7	78.63	100.83	PK
	434.0651	H	92.74	-15.7	77.04	80.83	AV
	434.065	V	78.23	-13.93	64.3	100.83	PK
TX Mode	434.065	V	76.57	-13.93	62.64	80.83	AV

Remark:

1. Result = Reading + Factor
2. Pulse Desensitization Correction Factor

Mode	Freq. (MHz)	Pulse Width (ms)	2/Pulse Width(kHz)
TX Mode	434(FSK)	100	0.020

RBW(1000kHz)＞ 2/Pulse Width

Therefore PDCF is not needed.

4. Duty Cycle Factor

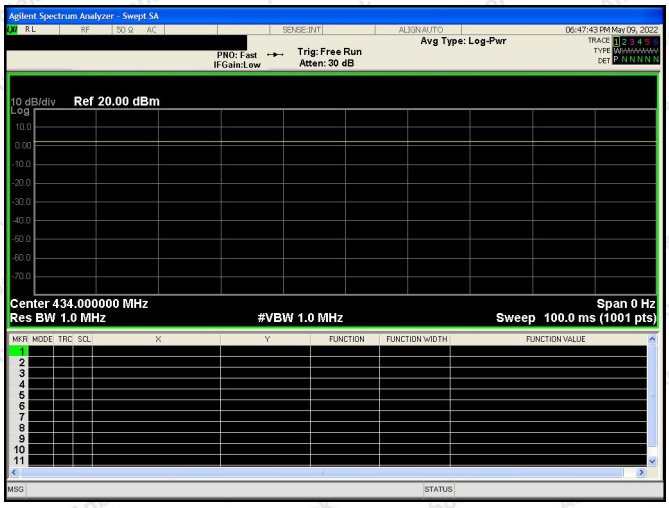
Mode	Freq. (MHz)	T on1 (ms)	N1	T on(ms)	T period (ms)	Duty Cycle
TX Mode	434(FSK)	100	1	100.000	100	100.00%

T on=T on1*N1

Duty Cycle=T on/T period

Duty Cycle Factor =20*lg(Duty Cycle)

434MHz(FSK)-T on



Test Results (Harmonics Emissions+Radiated Emissions from 1G-4G)

434MHz(FSK)

Frequency (MHz)	Antenna Pol.	Reading (dBuV/m)	Factor (dB)	Results (dBuV/m)	Limits (dBuV/m)	Det Mode
869.1302	H	37.34	-7.00	30.34	80.83	PK
869.1302	H	35.62	-7.00	28.62	60.83	AV
869.1302	V	27.69	-7.00	20.69	80.83	PK
869.1302	V	25.94	-7.00	18.94	60.83	AV
1301.76	H	35.11	1.36	36.47	74	PK
1301.76	H	33.43	1.36	34.79	54	AV
1301.76	V	36.84	1.36	38.2	74	PK
1301.76	V	34.57	1.36	35.93	54	AV

Remark:

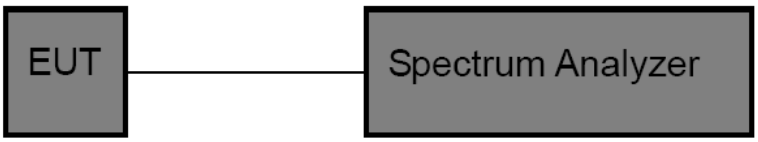
1. Result = Reading + Factor

5. 20DB Occupy Bandwidth Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.231 (c)
Test Limit	According to FCC Part 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.

5.2. Test Setup



5.3. Test Procedure

1. Place the EUT on the table and set it in the continuously transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
   RBW = 1% to 5% of the OBW, VBW≥3*RBW,
   Span= 2*OBW~5*OBW
   Detector= Peak
   Trace mode= Max hold.
   Sweep- auto couple.
4. Mark the peak frequency and –20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

5.4. Test Data

Test Item	:	20dB Bandwidth	Test Mode	:	Continuously transmitting
Test Voltage	:	DC 3V battery inside	Temperature	:	22.7℃
Test Result	:	PASS	Humidity	:	55%RH

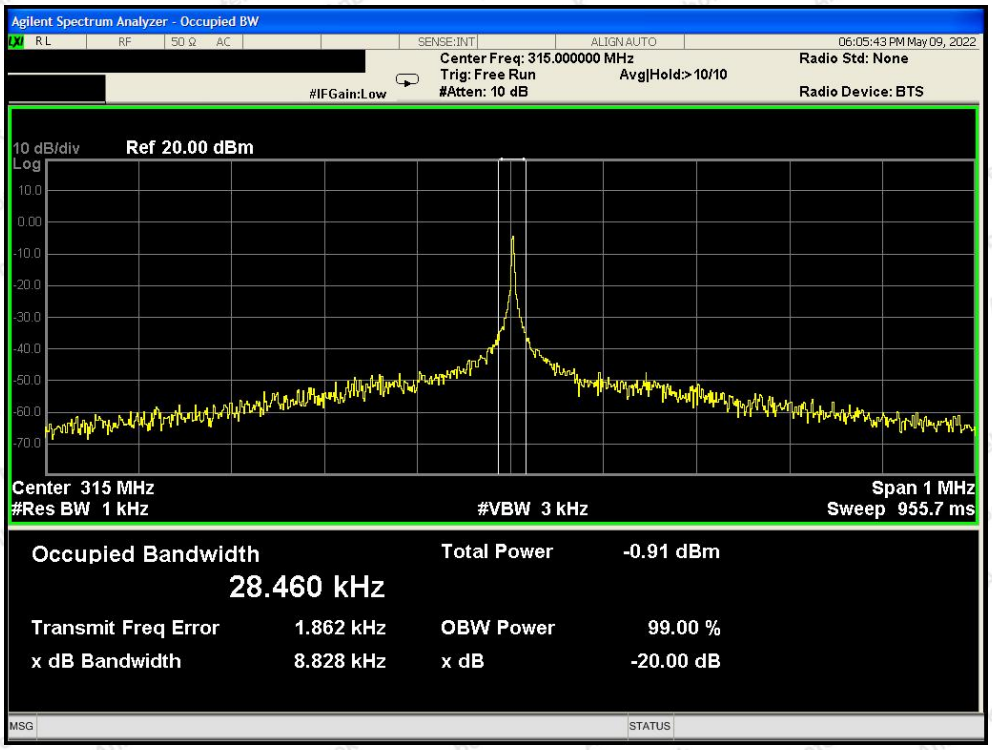
Mode	Freq. (MHz)	Modulation Type	20DB Bandwidth (kHz)	Limit (kHz)	Results
TX Mode	315	ASK	8.828	⩽787.5	PASS
TX Mode	315	FSK	68.63	⩽787.5	PASS
TX Mode	434	ASK	8.806	⩽1084.8	PASS
TX Mode	434	FSK	70.18	⩽1084.8	PASS

Note: Limit=0.0025*Freq.

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com
Hotline 400-003-0500 www.anbotek.com

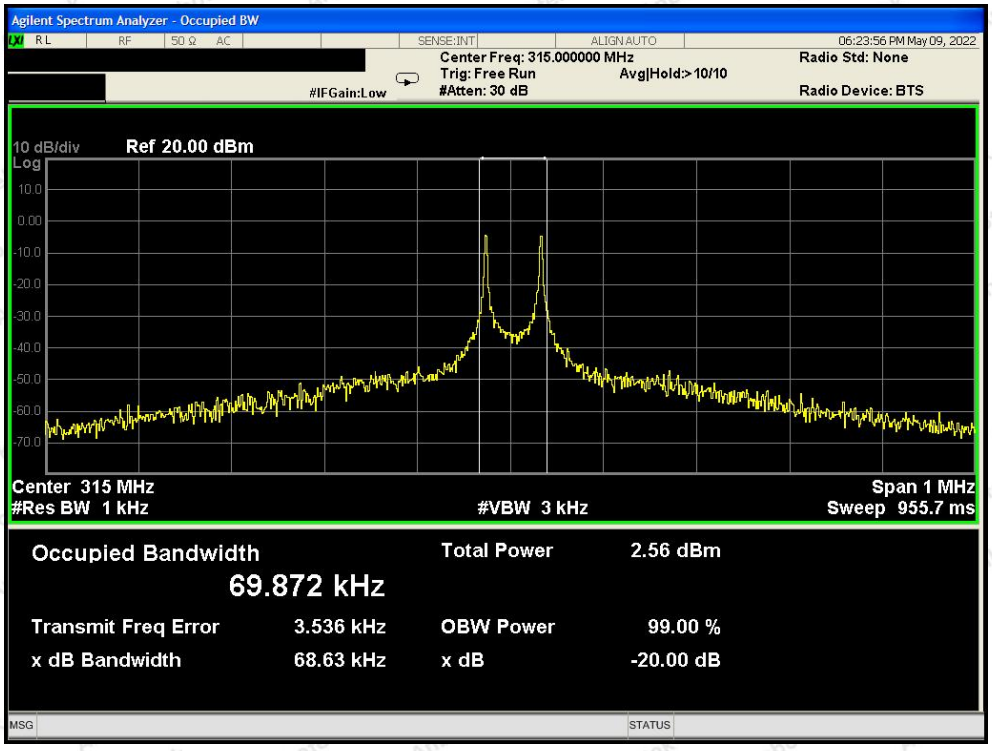
315 MHz(ASK)

Plot of 20DB Bandwidth



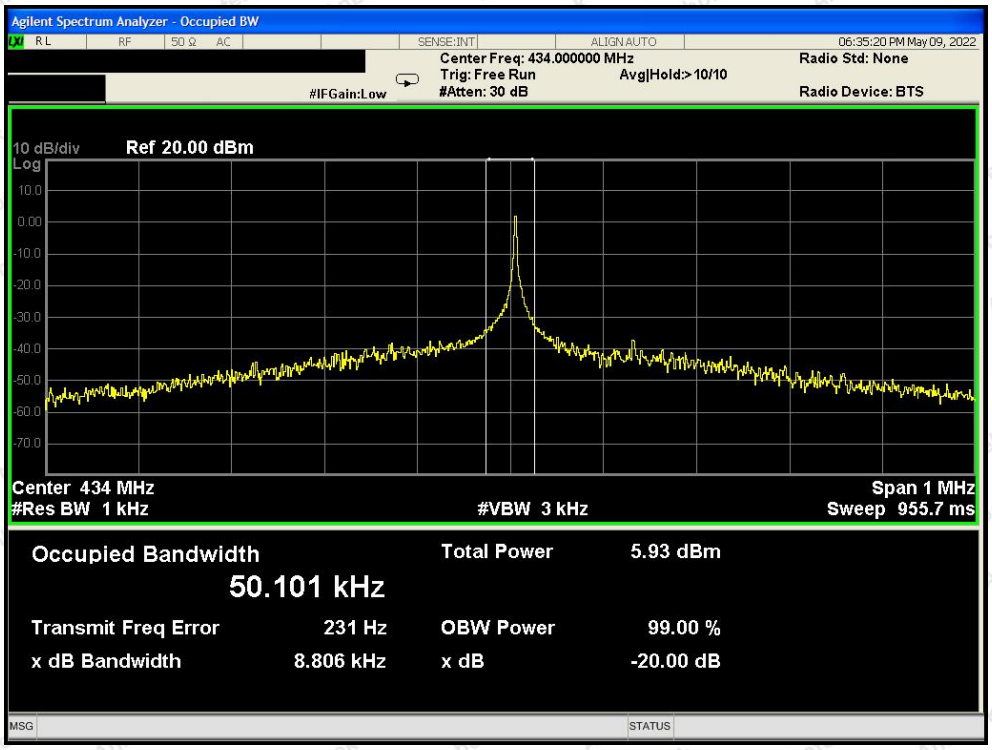
315 MHz(FSK)

Plot of 20DB Bandwidth



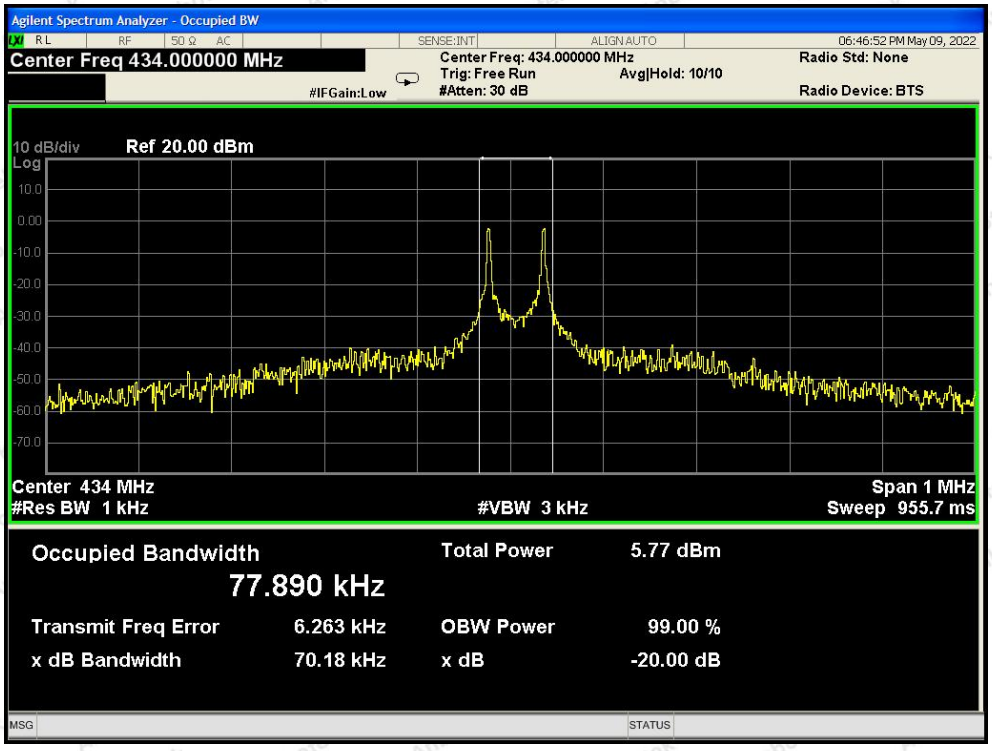
434 MHz(ASK)

Plot of 20DB Bandwidth



434 MHz(FSK)

Plot of 20DB Bandwidth

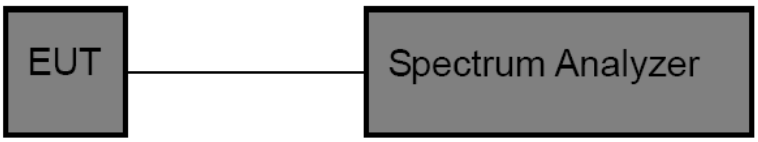


6. Dwell Time Test

6.1. Test Standard and Limit

Test Standard	FCC Part 15.231(a)(1)
Test Limit	According to FCC Part 15.231(a)(1), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released

6.2. Test Setup



6.3. Test Procedure

1. Place the EUT on the table and set it in continuously transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as
   RBW=1000kHz, VBW= 1000 kHz, Span= 0Hz, Sweep Time= 20 Seconds.
3. Record the Delta mark time.

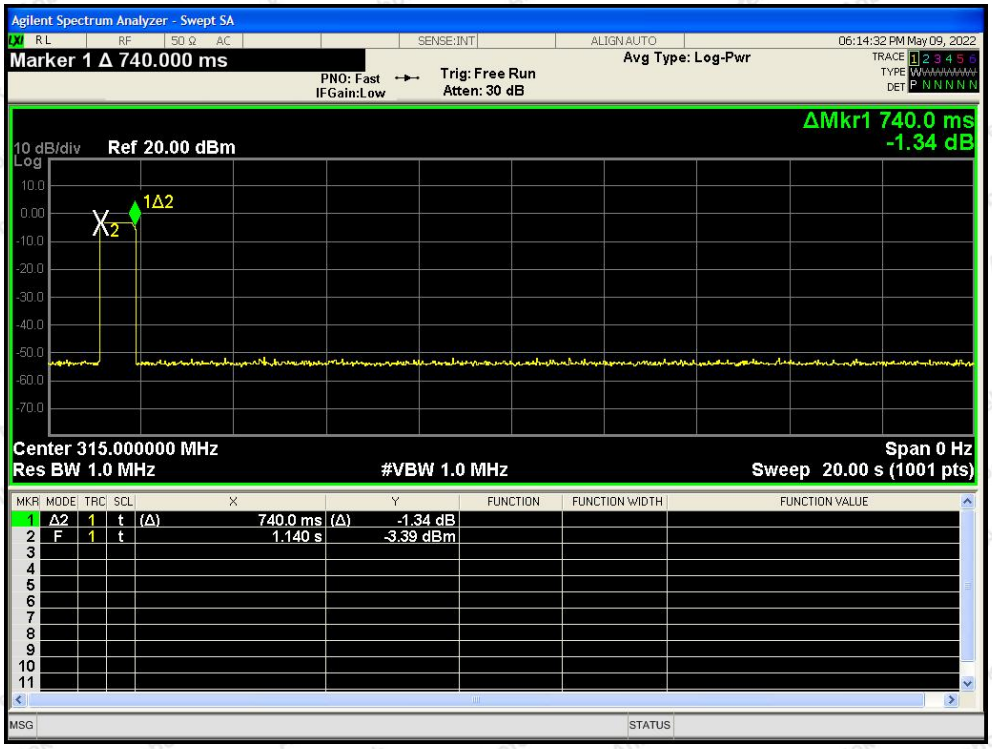
6.4. Test Data

Test Item	:	Dwell Time	Test Mode	:	Continuously transmitting
Test Voltage	:	DC 3V battery inside	Temperature	:	22.7℃
Test Result	:	PASS	Humidity	:	55%RH

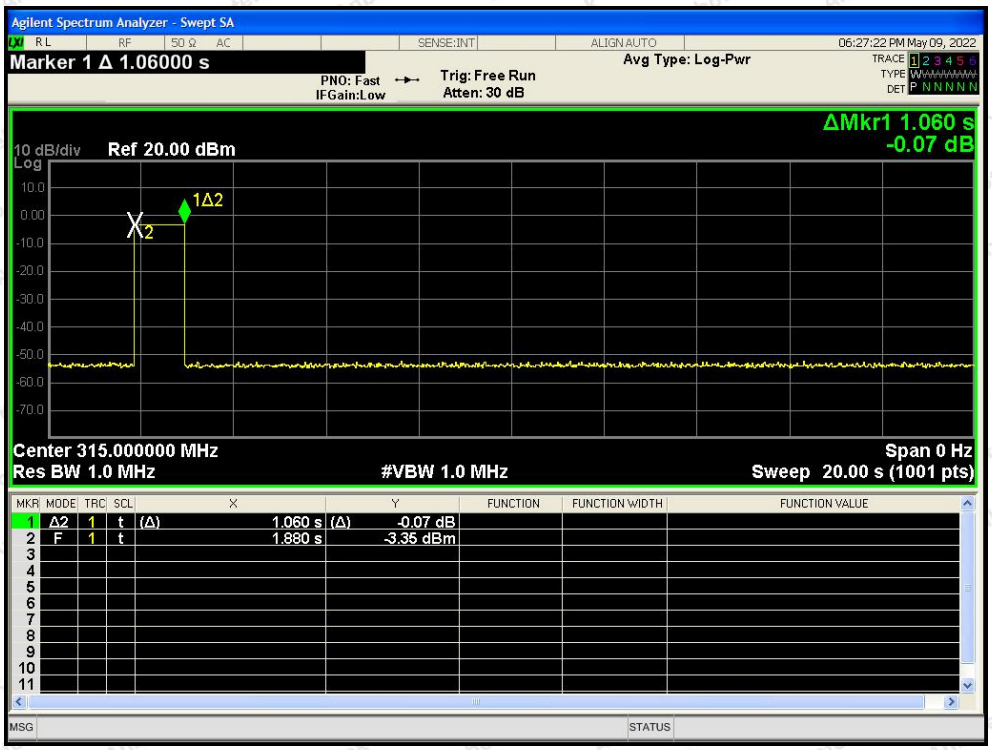
Mode	Freq. (MHz)	Modulation Type	Transmitting time(s)	Limit(s)	Results
TX Mode	315	ASK	0.74	≤5	PASS
TX Mode	315	FSK	1.06	≤5	PASS
TX Mode	434	ASK	1.04	≤5	PASS
TX Mode	434	FSK	1.08	≤5	PASS

Please refer the following plot.

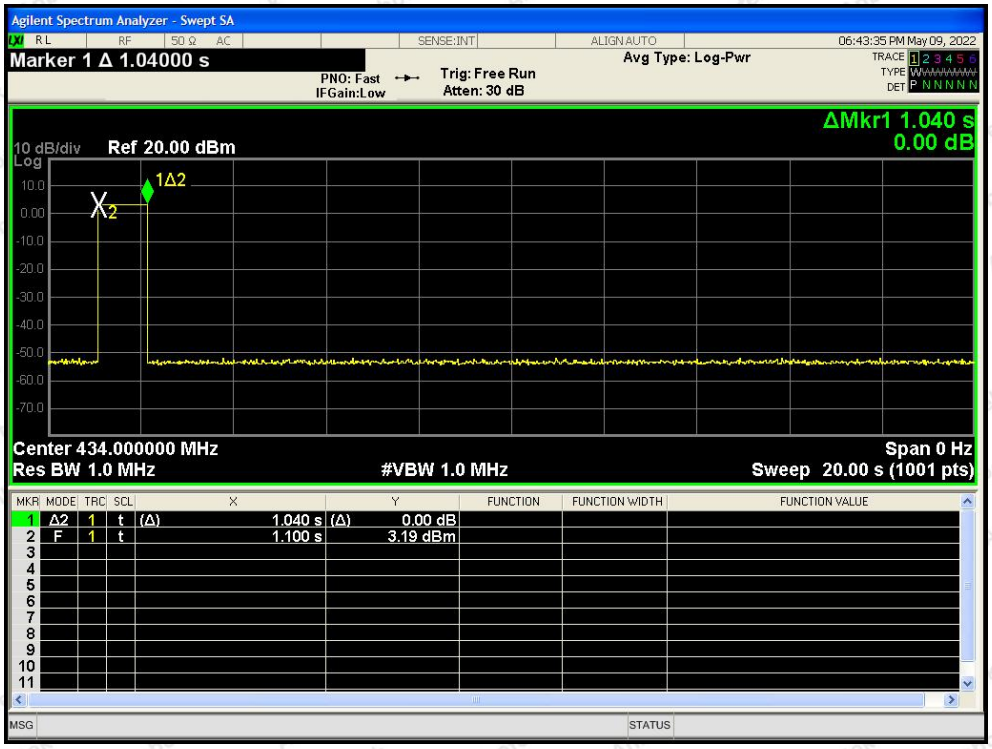
315 MHz(ASK)



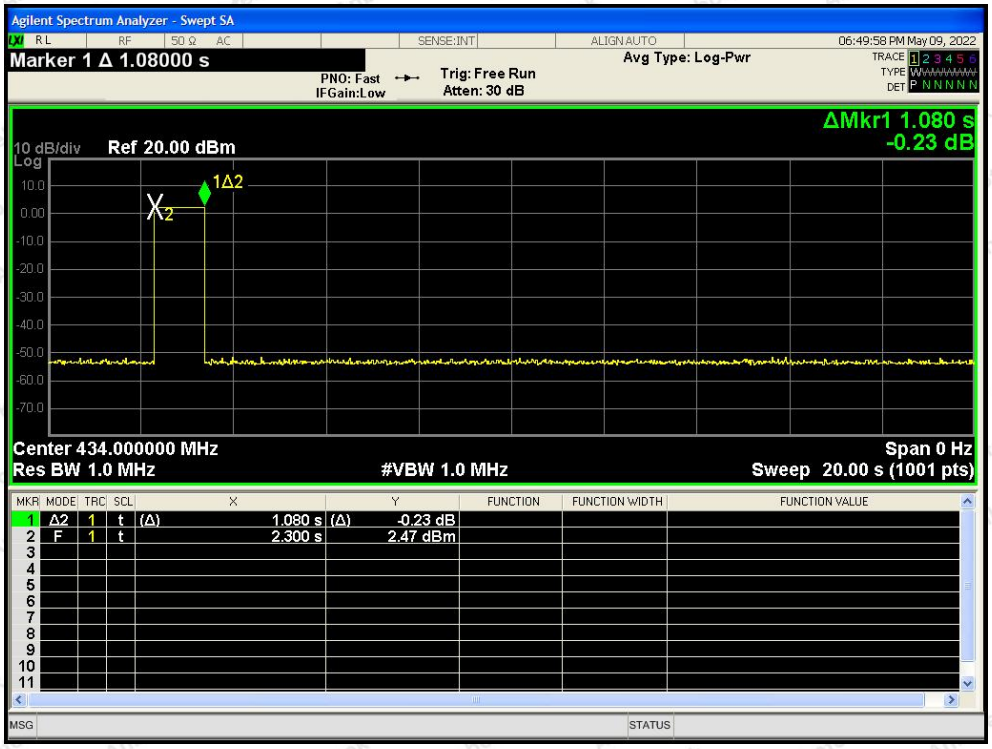
315 MHz(FSK)



434 MHz(ASK)



434 MHz(FSK)



7. Antenna Requirement

7.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	1) 15.203 requirement: 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. Antenna requirement must meet at least one of the following: 1) Antenna must be permanently attached to device. 2) The antenna must use a unique type of connector to attach to the device. 3) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.

7.2. Antenna Connected Construction

The antenna is a PCB antenna which permanently attached, and the best case gain of the antenna is -1dBi. It complies with the standard requirement.