

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

5.2.Block Diagram of Test Setup



5.3.Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

5.4.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.8:

The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions With peak detector.

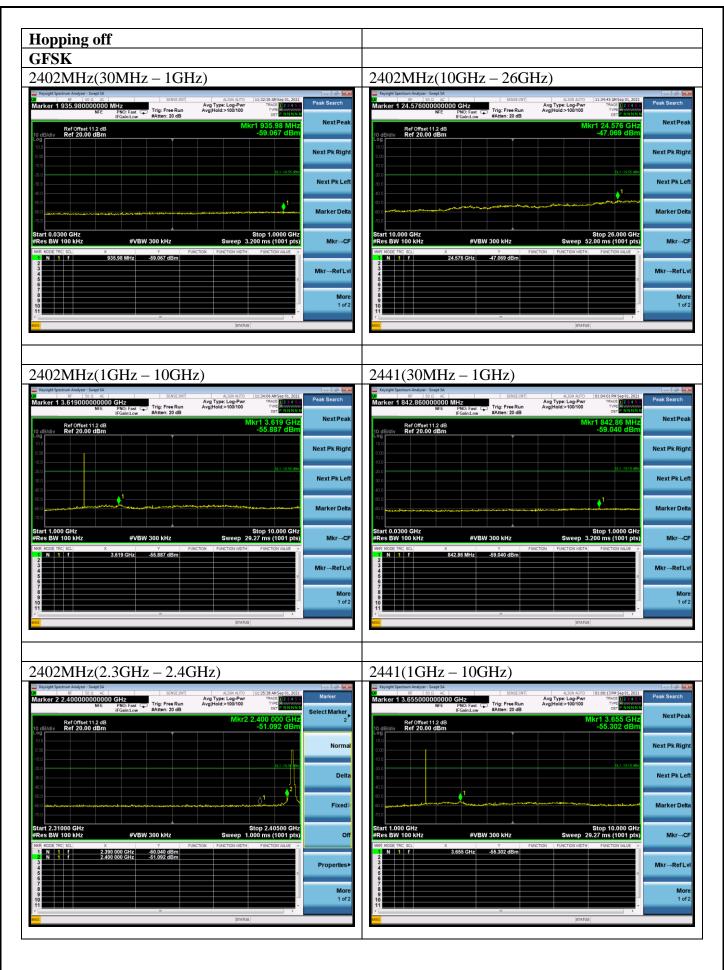
Note: The cable loss and attenuator loss were offset into spectrum analyzer as an amplitude offset.

5.5.Test result

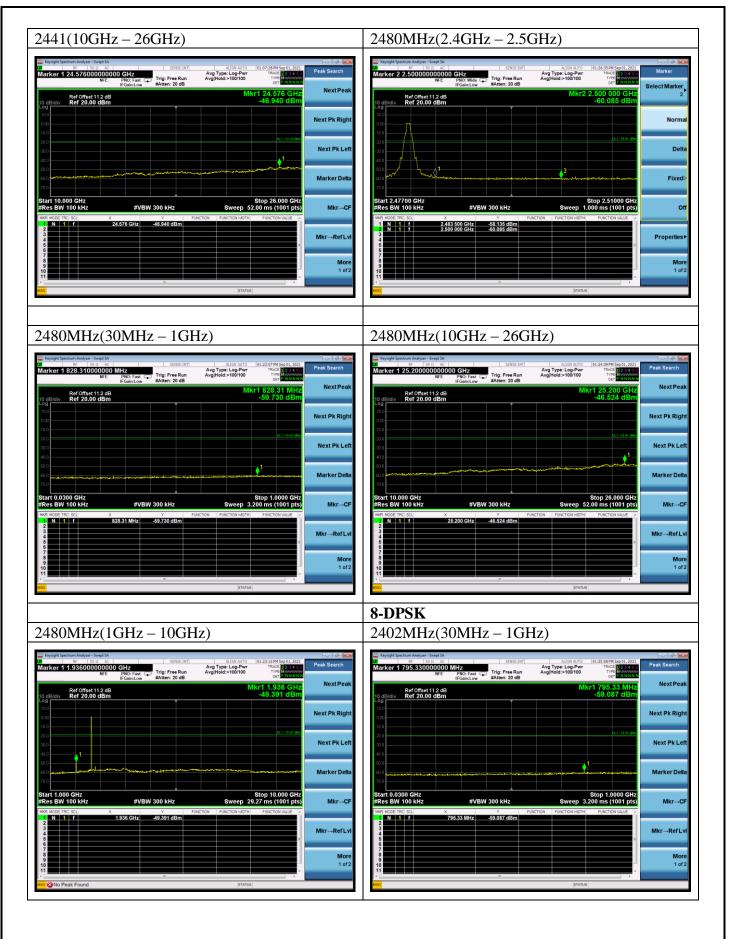
PASS (The testing data was attached in the next pages.)

EUT: Wireless Stereo Headset					
M/N: YY2957					
Test date: 2021-09-01	Pressure: 102.1±1.0 kpa	Humidity: 53.2±3.0%			
Tested by: Lynn	Test site: RF site	Temperature: 22.3±0.6℃			

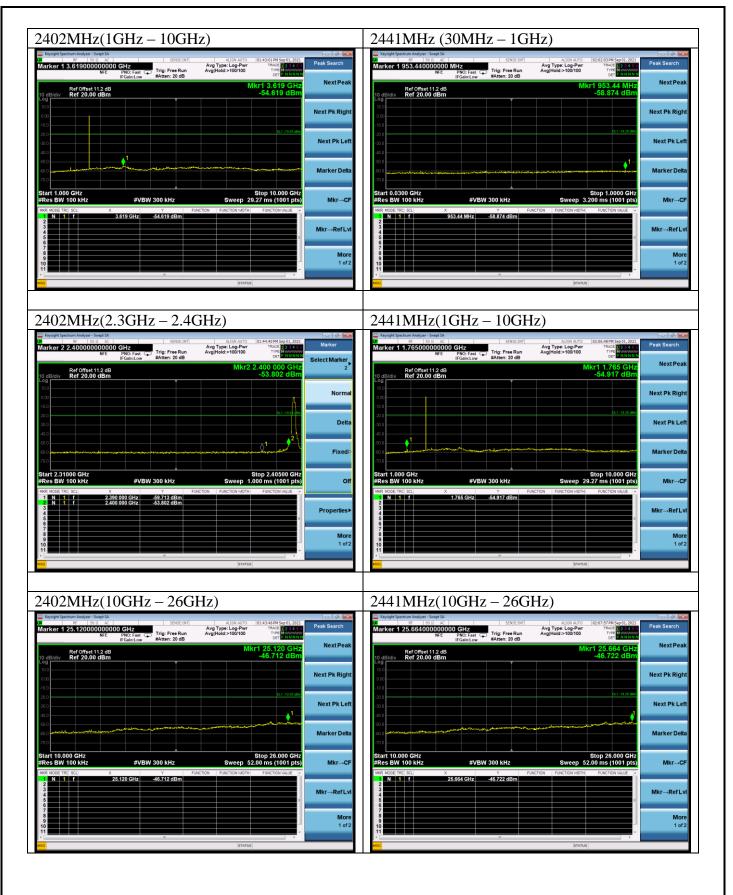




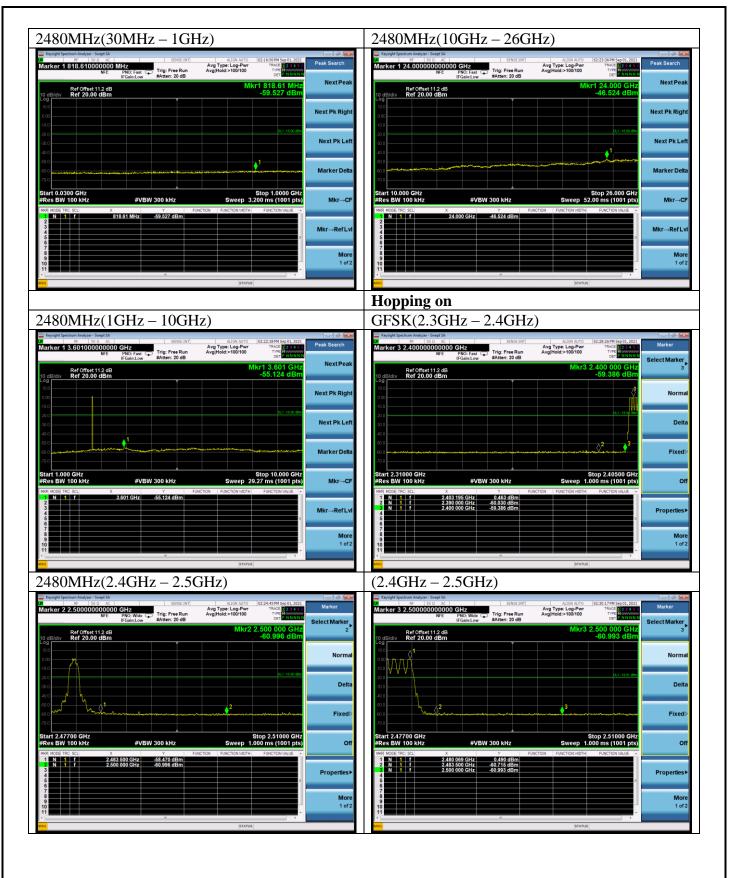




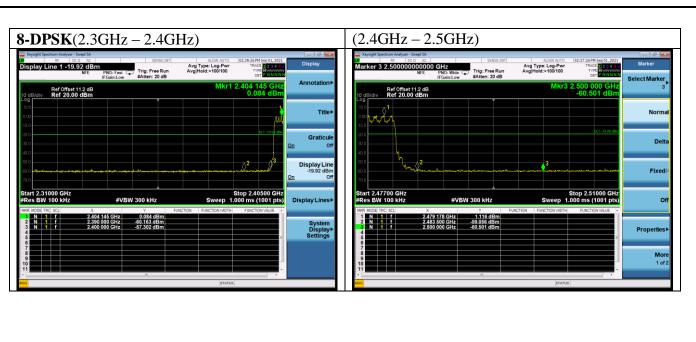














6. 20 dB & 99% BANDWIDTH TEST

6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

6.2.Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.7:

- 1. Connect the antenna port of the EUT to the spectrum analyzer.
- 2. Let the EUT transmit at Low/ Mid/ High channel with test software.
- 3. Setting of SA is following as: RBW: 30kHz / VBW: 100kHz

Sweep Mode: Continuous sweep Detect mode: Positive peak Trace mode: Max hold.

4. Use the occupied bandwidth function of the SA measure the 20dB bandwidth directly.



6.4.Test Results

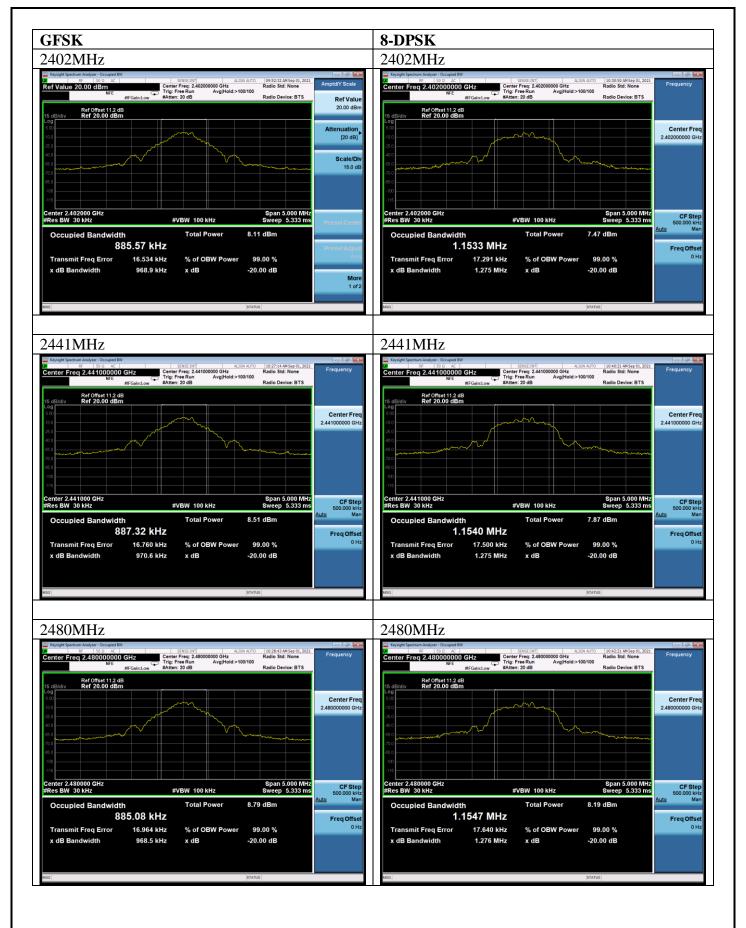
EUT: Wireless Stereo Headset					
M/N: YY2957					
Test date: 2021-09-01	Pressure: 102.1 ±1.0 kpa	Humidity: 53.2±3.0%			
Tested by: Lynn	Test site: RF site	Temperature: 22.3±0.6℃			

Test Mode	Frequency (MHz)	20dB bandwidth (kHz)	Limit (kHz)
GFSK	2402	968.9	N/A
	2441	970.6	N/A
	2480	968.5	N/A
8-DPSK	2402	1275	N/A
	2441	1275	N/A
	2480	1276	N/A
Conclusion: P.	ASS	·	

Test Mode	Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)
	2402	885.57	N/A
GFSK	2441	887.32	N/A
	2480	885.08	N/A
	2402	1153.3	N/A
8-DPSK	2441	1154.0	N/A
	2480	1154.7	N/A

Conclusion: PASS







7. CARRIER FREQUENCY SEPARATION TEST

7.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

7.2.Limit

Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

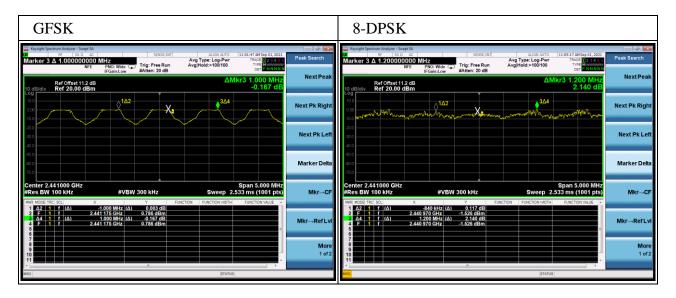
7.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.2:

- 1. Connect the antenna port of the EUT to the Spectrum analyzer.
- 2. Let the EUT transmit at Low/ Mid/ High channel.
- 3. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz.Span: 3MHz
- 4. Use the mark Delta function of the SA measure out the channel separation.

7.4. Test Results.

EUT: Wireless Stereo Headset						
M/N: YY2957						
Test date: 2021-09-01						
Tested by: Lynn		Test site: RF site		Temperature: 22.3±0.6°C		
Test Mode	Channe	el separation	Limit(kHz	2)	Conclusion	
GFSK	1.0MHz		647.067		PASS	
8-DPSK	1.0MHz		850.667		PASS	





8. NUMBER OF HOPPING FREQUENCY TEST

8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

8.2.Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

8.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.3:

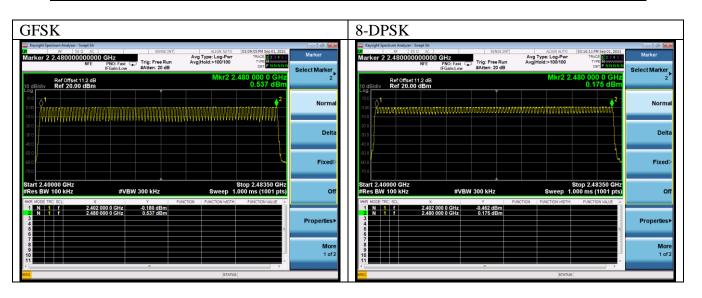
- 1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
- 2. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz Start frequency: 2390MHz Stop frequency: 2483.5MHz

And waiting for the hopping trace until stability, count out the number of the hopping.

8.4.Test Results

EUT: Wireless Stereo Headset					
M/N: YY2957	M/N: YY2957				
Test date: 2021-09-01	Pressure: 102.1±1.0 kpa	Humidity: 53.2±3.0%			
Tested by: Lynn	Test site: RF site	Temperature: 22.3±0.6℃			

Test Mode	Number of channel	Limit	Conclusion
GFSK	79	>=15	PASS
8-DPSK	79	>=15	PASS





9. DWELL TIME

9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

9.2.Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.4:

- 1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
- 2. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz

Sweep Mode: Single

Detect mode: Positive peak

Trace mode: Auto

Span: 0Hz

Sweep time: 5s and big enough to measure one hopping signal

3. Use below formula calculate the Dwell time

Dwell time=Hopping number per second*0.4*channel number*Pulse bandwidth per hopping.

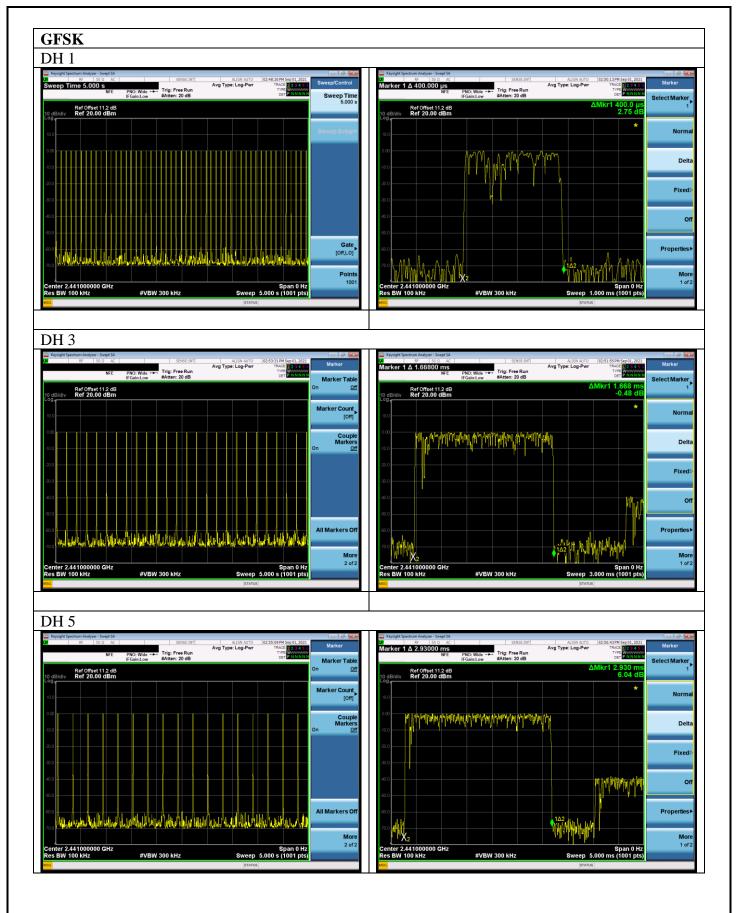
9.4.Test Results

EUT: Wireless Stereo Headset							
M/N: YY2957							
Test date: 2021-09-01	Pressure: 102.1 ±1.0 kpa	Humidity: 53.2±3.0%					
Tested by: Lynn	Test site: RF site	Temperature: 22.3 ±0.6 °C					

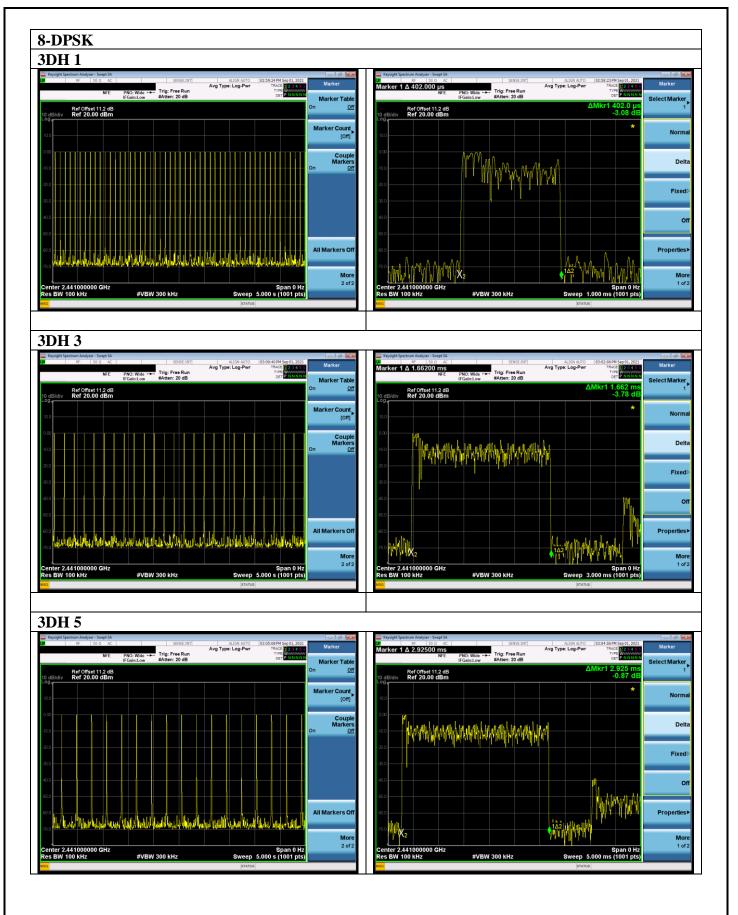
Mod	le	dwell time	Limit	Conclusion
	DH1	51 hops/5s*0.4*79chanels* 0.400 ms =128.928ms	≦400ms	PASS
GFSK	DH3	26 hops/5s*0.4*79chanels* 1.668 ms =274.086ms	≦400ms	PASS
	DH5	17 hops/5s*0.4*79chanels* 2.930 ms =314.799ms	≦400ms	PASS
	3-DH1	51 hops/5s*0.4*79chanels* 0.402 ms =129.573ms	≦400ms	PASS
8-DPSK	3-DH3	26 hops/5s*0.4*79chanels* 1.662 ms =273.100ms	≦400ms	PASS
	3-DH5	17 hops/5s*0.4*79chanels* 2.925 ms =314.262ms	≤400ms	PASS

Note: All the lower levels were signaled from receiver and should not be considered in here.











10.MAXIMUM PEAK OUTPUT POWER TEST

10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	Power meter	Anritsu	ML2487A	6K00002472	Apr.07,21	1Year
3.	Power sensor	Anritsu	MA2491A	033005	Apr.06,21	1Year
4.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
5.	RF Cable	HUBER+SUHN ER	SUCOFLE X-106	505238/6	Apr.07,21	1 Year

10.2.Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt.

10.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.5:

Connected the EUT's antenna port to Power Sensor, and use power meter to test peak output power directly.

10.4.Test Results

EUT: Wireless Stereo Headset						
M/N: YY2957						
Test date: 2021-09-01	Pressure: 102.1±1.0 kpa	Humidity: 53.2±3.0%				
Tested by: Lynn	Test site: RF site	Temperature: 22.3±0.6°C				

Test Mode	Frequency	Peak output Power (dBm)	Limit (dBm)							
	2402	0.570	21							
GFSK	2441	0.933	21							
	2480	1.277	21							
	2402	0.646	21							
8-DPSK	2441	1.008	21							
	2480	1.328	21							
Conclusion:	Conclusion: PASS									



11.BAND EDGE COMPLIANCE TEST

11.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1Year
2.	Amplifier	Agilent	8449B	3008A02495	Apr.07,21	1 Year
3.	Horn Antenna	ETC	MCTD 1209	DRH15F03006	Jul.26,21	1 Year
4.	RF Cable	HUBER+SUHNER	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

11.2.Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

11.3.Test Produce

Use the test method descried in ANSI C63.10 clause 7.8.6:

For upper band emissions that are up to two bandwidths(2MHz) away (2483.5MHz to 2485.5MHz) from the band-edge use below produce:

- 1. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 100KHz and with a video bandwidth 300KHz. Record the peak levels of the fundamental emission and the relevant band-edge emission, Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement, it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.
- 2. Subtract the delta measured in step (1) from the maximum field strengths measured in clause 4. The resultant field strengths are then used to determine band-edge compliance as required by Section 15.205

For emissions above two bandwidths away from the band-edge use below produce:

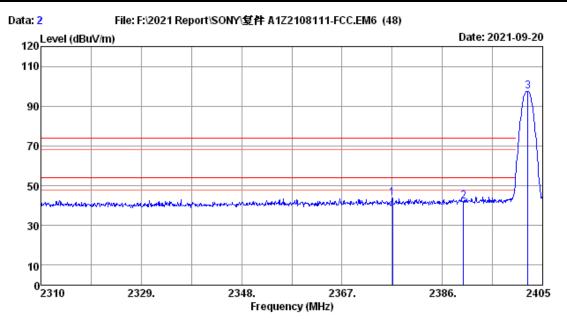
- 1. The EUT is placed on a insulating material (up to 12mm thick) worked at highest radiated power.
- 2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:
 - (a) PEAK: RBW=1MHz; VBW=3MHz, PK detector, Sweep=AUTO
 - (b) This is pulse Modulation device a duty cycle factor was used to calculate average level based measured peak level.

11.4.Test Results

Pass (The testing data was attached in the next pages.)

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.





Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

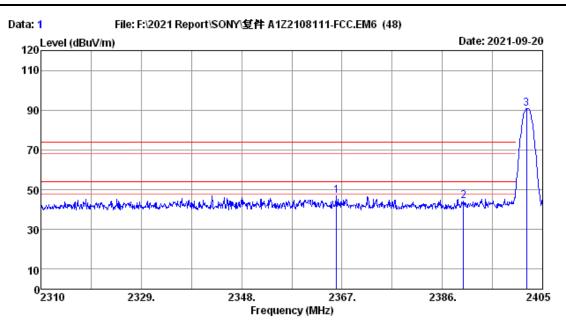
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 GFSK 2402MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
_	2376.60 2390.00	27.86 27.89	1.64 1.65	49.54 47.70	35.24 35.24	43.80 42.00	74.00 74.00	30.20 32.00	Peak Peak
3	2402.25	27.89	1.66	102.99	35.24	97.30			Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

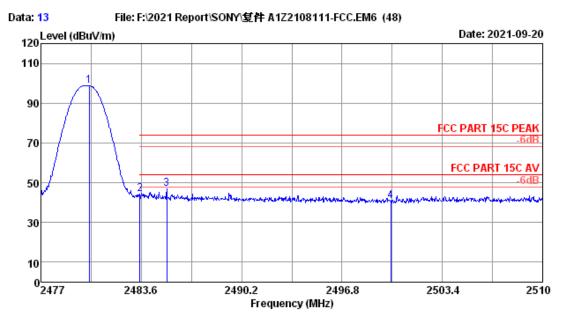
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 GFSK 2402MHz Tx

		Ant.	Cable		Amp	Emission			
No.	Freq.		Loss	Reading		Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2365.96	27.82	1.64	52.91	35.24	47.13	74.00	26.87	Peak
2	2390.00	27.89	1.65	50.00	35.24	44.30	74.00	29.70	Peak
3	2401.96	27.89	1.66	96.31	35.24	90.62			Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

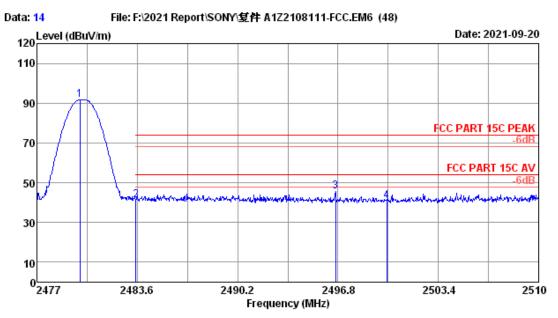
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 GFSK 2480MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.17	28.07	1.69	104.20	35.25	98.71			Peak
2	2483.50	28.07	1.69	49.65	35.25	44.16	74.00	29.84	Peak
3	2485.28	28.07	1.69	52.24	35.25	46.75	74.00	27.25	Peak
4	2500.00	28.10	1.70	46.16	35.25	40.71	74.00	33.29	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

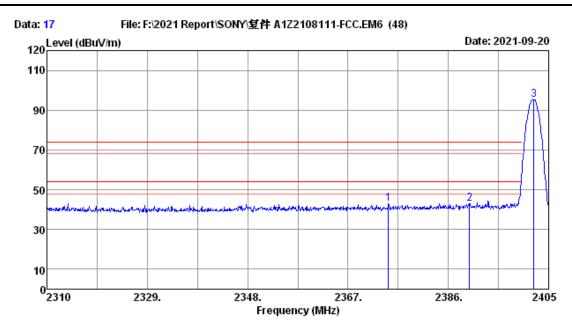
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 GFSK 2480MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
	0.450 0.4	00.00	4 60	07.40	05 05	01 64			D 1-
Τ.	2479.84	28.07	1.69	97.13	35.25	91.64			Peak
2	2483.50	28.07	1.69	46.81	35.25	41.32	74.00	32.68	Peak
3	2496.64	28.10	1.70	50.95	35.25	45.50	74.00	28.50	Peak
4	2500.00	28.10	1.70	46.38	35.25	40.93	74.00	33.07	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

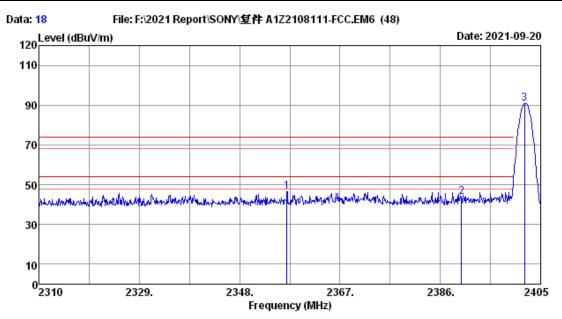
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 8DPSK 2402MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2374.70	27.86	1.64	48.85	35.24	43.11	74.00	30.89	Peak
2	2390.00	27.89	1.65	48.52	35.24	42.82	74.00	31.18	Peak
3	2402.25	27.89	1.66	100.95	35.24	95.26			Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Site no. : 3m Chamber Data no. : 18
Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

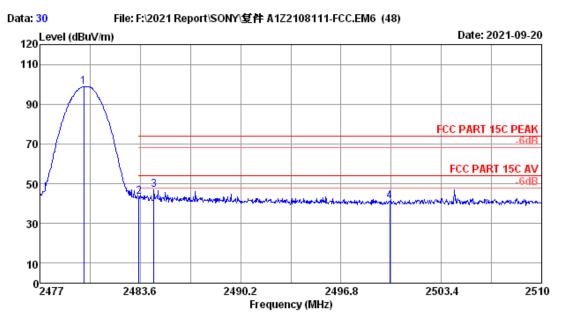
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 8DPSK 2402MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
_	2356.93 2390.00		1.64 1.65	52.25 49.41	35.24 35.24	46.47 43.71	74.00 74.00	27.53 30.29	Peak Peak
_	2401.96		1.66	96.43	35.24	90.74			Peak Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

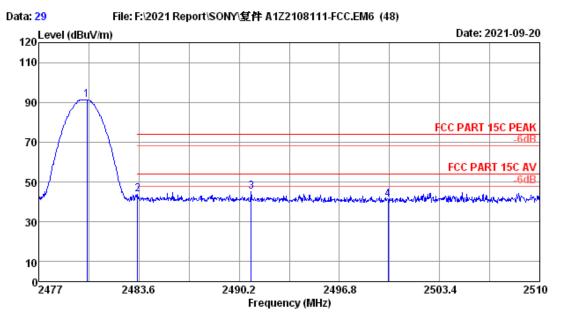
Env. / Ins. : 23.8*C/53.5% Engineer : Lynn

Test Mode : BT3.0 8DPSK 2480MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.87	28.07	1.69	104.31	35.25	98.82			Peak
2	2483.50	28.07	1.69	48.71	35.25	43.22	74.00	30.78	Peak
3	2484.49	28.07	1.69	52.27	35.25	46.78	74.00	27.22	Peak
4	2500.00	28.10	1.70	46.65	35.25	41.20	74.00	32.80	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.





Site no. : 3m Chamber Data no. : 29
Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 23.8 * C / 53.5 * Engineer : Lynn

Test Mode : BT3.0 8DPSK 2480MHz Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)		Limits (dBuV/m)	Margin (dB)	Remark
1	2480.17	28.07	1.69	96.84	35.25	91.35			Peak
2	2483.50	28.07	1.69	49.39	35.25	43.90	74.00	30.10	Peak
3	2490.99	28.10	1.69	50.64	35.25	45.18	74.00	28.82	Peak
4	2500.00	28.10	1.70	46.44	35.25	40.99	74.00	33.01	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.

^{2.} The emission levels that are 20dB below the official limit are not reported.



12. ANTENNA REQUIREMENT

12.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2. Antenna Connected Construction

The antennas used for this product are Chip Antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 2.28dBi.



13.DEVIATION TO TEST	SPECIFI	CATIONS
[NONE]		
	THE END	