

# Test Report

FCC ID: 2AORG-KCDBT181

Date of issue: Jan. 17, 2018

Report Number:	MTi180117E053
Sample Description:	Bluetooth audio transmitter
Model(s):	KCDBT181, BWA18AV003
Applicant:	Dongguan Kechenda Electronic Technology Co., Ltd
Address:	kechenda Industrial Zone, No.2, Guliao 2Rd, Tangxia Town, Dongguan, Guangdong, China
Date of Test:	Jan. 05, 2018 to Jan. 17, 2018

Shenzhen Microtest Co., Ltd.  
<http://www.mtitest.com>

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<b>TEST RESULT CERTIFICATION</b>	
<b>Applicant's name</b> .....	<b>Dongguan Kechenda Electronic Technology Co., Ltd</b>
Address .....	kechenda Industrial Zone, No.2, Guliao 2Rd, Tangxia Town, Dongguan, Guangdong, China
<b>Manufacture's Name</b> .....	<b>Dongguan Kechenda Electronic Technology Co., Ltd</b>
Address .....	kechenda Industrial Zone, No.2, Guliao 2Rd, Tangxia Town, Dongguan, Guangdong, China
Product name .....	Bluetooth audio transmitter
Model and/or type reference	: KCDBT181
Serial Model .....	BWA18AV003
<b>Standards</b> .....	FCC Part 15.247
Test procedure.....	ANSI C63.10:2013

*This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.*

Tested by:



Demi Mu

Jan. 17, 2018


Reviewed by:



Smith Chen

Jan. 17, 2018

Approved by:



Tom Xue

Jan. 17, 2018

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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

<b>FCC Part15 (15.247) , Subpart C</b>			
Standard Section	Test Item	Judgment	Remark
15.203/15.247(c)	Antenna Requirement	PASS	
15.207	Conducted Emission	PASS	
15.247(b)(1)	Conducted Peak Output Power	PASS	
15.247(a)(1)	20dB Occupied Bandwidth	PASS	
15.247(a)(1)	Carrier Frequencies Separation	PASS	
15.247(a)(1)	Hopping Channel Number	PASS	
15.247(a)(1)	Dwell Time	PASS	
15.205/15.209	Spurious Emission	PASS	
15.247(d)	Band Edge	PASS	

NOTE:

(1) "N/A" is not applicable in this test report

### 1.1 TEST FACILITY

Shenzhen Microtest Co., Ltd  
 Add.: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China  
 FCC Registration No.: 448573

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  · where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** · providing a level of confidence of approximately **95 %** .

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth audio transmitter	
Trade Name	N/A	
Model Name	KCDBT181	
Serial Model	BWA18AV003	
Model Difference	The wireless module used in the product is the same, but the model is named differently.	
Product Description	The EUT is a Bluetooth audio transmitter	
	Operation Frequency:	2402-2480MHz
	Modulation Type:	GFSK, $\pi/4$ -DQPSK
	Bit Rate of Transmitter	1 Mbps、 2 Mbps
	Number Of Channel	79 CH
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	-5.584 dBm
	Antenna Type:	PCB antenna
	Antenna Gain (dBi)	-0.68 dBi
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.	
Battery	DC 3.7V by battery	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466

11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		
Remark: Channel 0, 39 & 78 selected for GFSK, $\pi/4$ -DQPSK and 8DPSK.					

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	KCDBT181	PCB antenna	/	-0.68	PCB Antenna



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	GFSK CKCDBT181/CH40/CH79
Mode 2	$\pi/4$ -DQPSK CKCDBT181/CH40/CH79
Mode 3	Link Mode

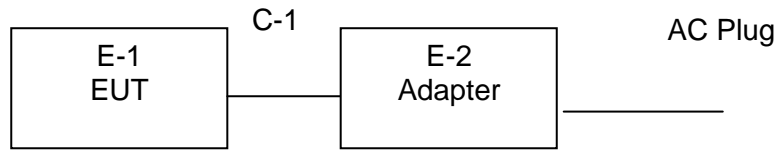
For Conducted Emission	
Final Test Mode	Description
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	GFSK CKCDBT181/CH40/CH79
Mode 2	$\pi/4$ -DQPSK CKCDBT181/CH40/CH79

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Bluetooth audio transmitter	ACIL	KCDBT181	N/A	EUT
E-2	Adapter	N/A	HW-050100E01	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

For RF conducted test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Universal Radio Communication Tester	Rohde&schwarz	CMU200	114587	2018/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2018/11/4
Dc Power Supply	GW	GPR-6030D	/	2018/11/4
Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2018/11/14
Broadband TRILOG Antenna	Schwarabeck	VULB9163	9163-872	2018/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1145	2018/11/14
Amplifier	HP	8447D	3113A06150	2018/11/4
Amplifier	Agilent	8449B	3008A02400	2018/7/4
Test Receiver	Schwarabeck	ESPI7	100314	2018/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2018/11/4
Signal Generator	R&S	SMT 06	832080/007	2018/11/4
Broadband TRILOG Antenna	Schwarabeck	VULB9163	9163-872	2018/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1145	2018/11/14
Amplifier	HP	8447D	3113A06150	2018/11/4
Amplifier	Agilent	8449B	3008A02400	2018/7/4
Test Receiver	Schwarabeck	ESPI	100314	2018/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2018/11/4
LISN	R&S	ENV216	1001131	2018/9/25
Test Cable	United Microwave	57793	1m	2018/12/05
Test Cable	United Microwave	A30A30-5006	10m	2018/12/05

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

Frequency (MHz)	Limit	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Note:

(1) Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

#### 1.1.1 Test method

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN is at least 80 cm from nearest part of EUT chassis.
5. The resolution bandwidth of EMI test receiver is set at 9kHz.

#### 1.1.2 Test Result

Not application because of the EUT is power by battery.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

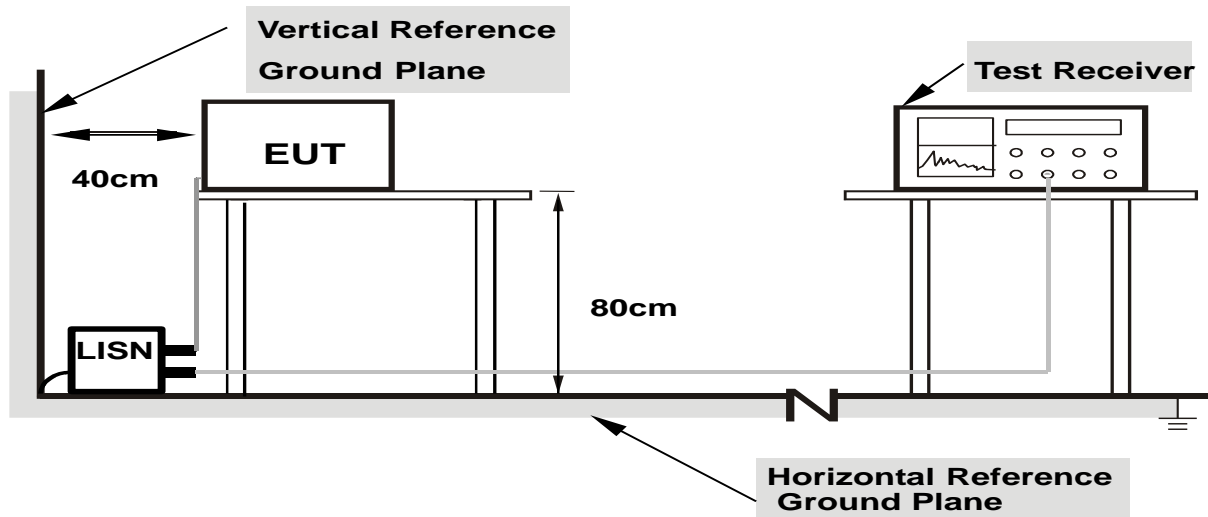
### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



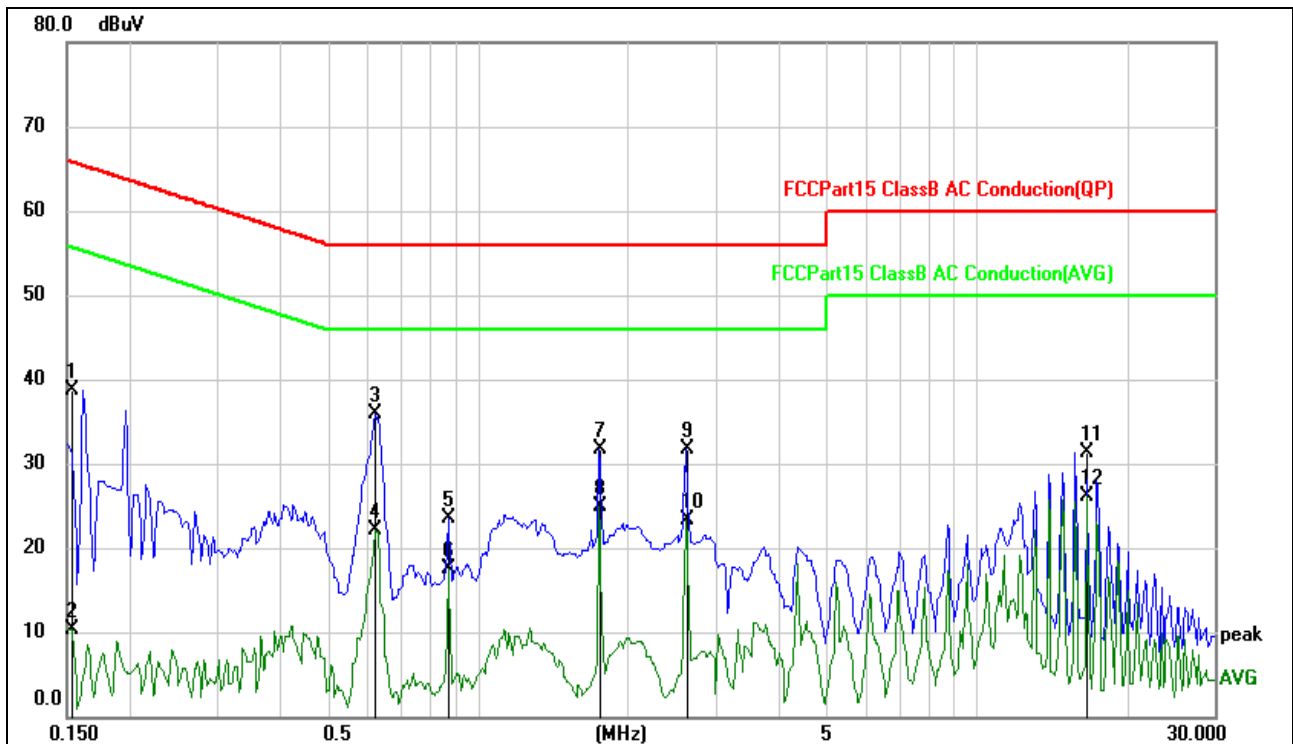
- Note: 1. Support units were connected to second LISN.**  
**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

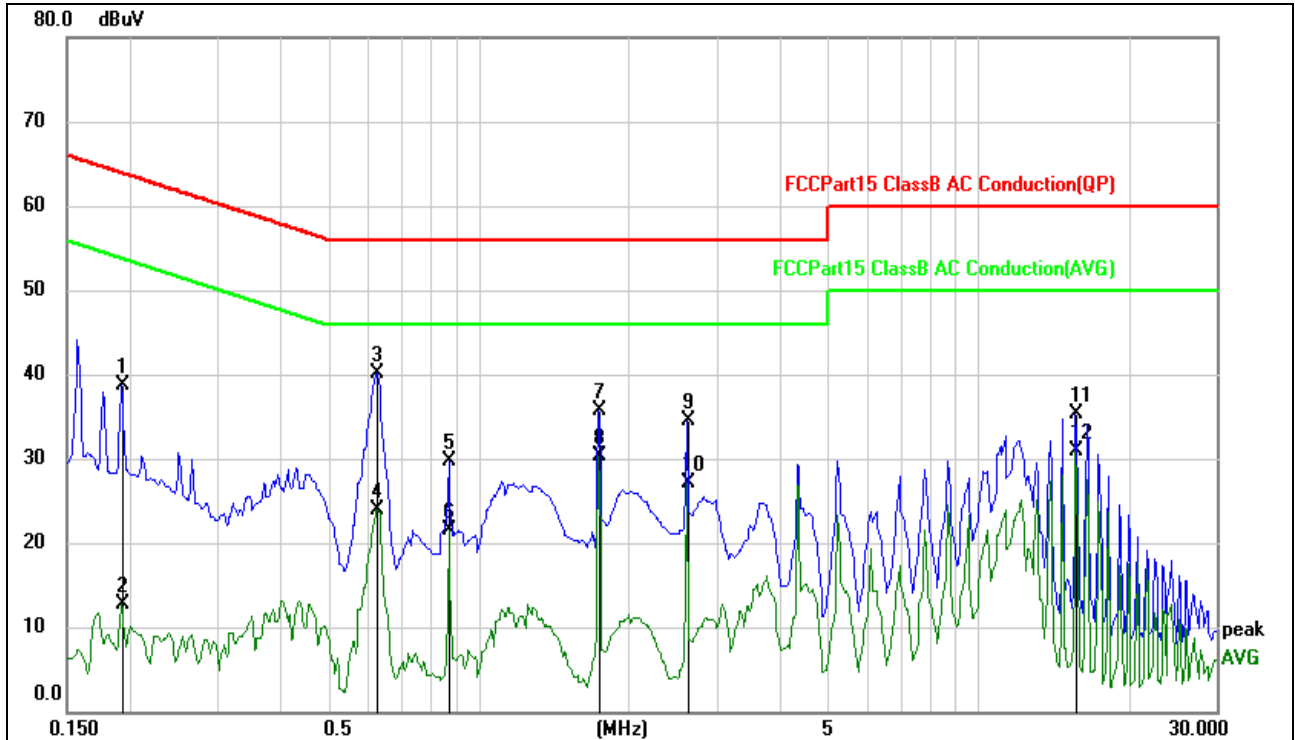
**3.1.6 TEST RESULTS**

EUT :	Bluetooth audio transmitter	Model Name. :	KCDBT181
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 3



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.1539	38.64	0.02	38.66	65.79	-27.13	QP
2	0.1539	10.22	0.02	10.24	55.79	-45.55	AVG
3	0.6227	35.88	0.02	35.90	56.00	-20.10	QP
4	0.6227	22.16	0.02	22.18	46.00	-23.82	AVG
5	0.8727	23.44	0.02	23.46	56.00	-32.54	QP
6	0.8727	17.58	0.02	17.60	46.00	-28.40	AVG
7	1.7477	31.74	0.02	31.76	56.00	-24.24	QP
8	1.7477	24.80	0.02	24.82	46.00	-21.18	AVG
9	2.6187	31.63	0.03	31.66	56.00	-24.34	QP
10	2.6187	23.27	0.03	23.30	46.00	-22.70	AVG
11	16.5898	31.12	0.09	31.21	60.00	-28.79	QP
12	16.5898	26.02	0.09	26.11	50.00	-23.89	AVG

EUT :	Bluetooth audio transmitter	Model Name. :	KCDBT181
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 3



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.1930	38.62	0.02	38.64	63.91	-25.27	QP
2	0.1930	12.76	0.02	12.78	53.91	-41.13	AVG
3	0.6266	40.13	0.02	40.15	56.00	-15.85	QP
4	0.6266	23.83	0.02	23.85	46.00	-22.15	AVG
5	0.8727	29.64	0.02	29.66	56.00	-26.34	QP
6	0.8727	21.55	0.02	21.57	46.00	-24.43	AVG
7	1.7398	35.62	0.02	35.64	56.00	-20.36	QP
8	1.7398	30.26	0.02	30.28	46.00	-15.72	AVG
9	2.6109	34.54	0.03	34.57	56.00	-21.43	QP
10	2.6109	26.98	0.03	27.01	46.00	-18.99	AVG
11	15.6875	35.26	0.09	35.35	60.00	-24.65	QP
12	15.6875	30.72	0.09	30.81	50.00	-19.19	AVG



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micровolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### 3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

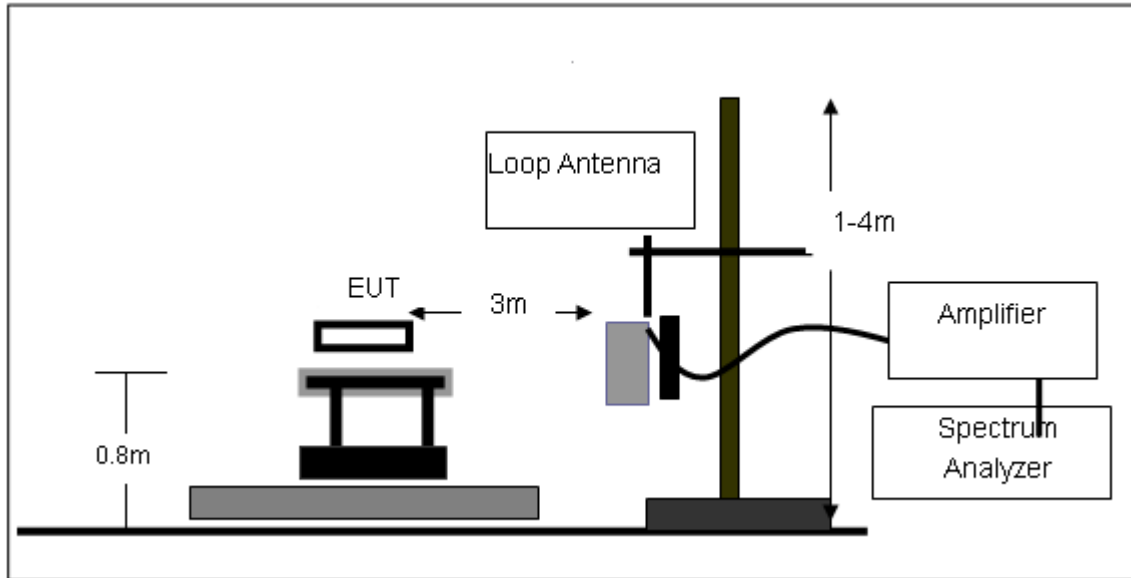
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### **3.2.3 DEVIATION FROM TEST STANDARD**

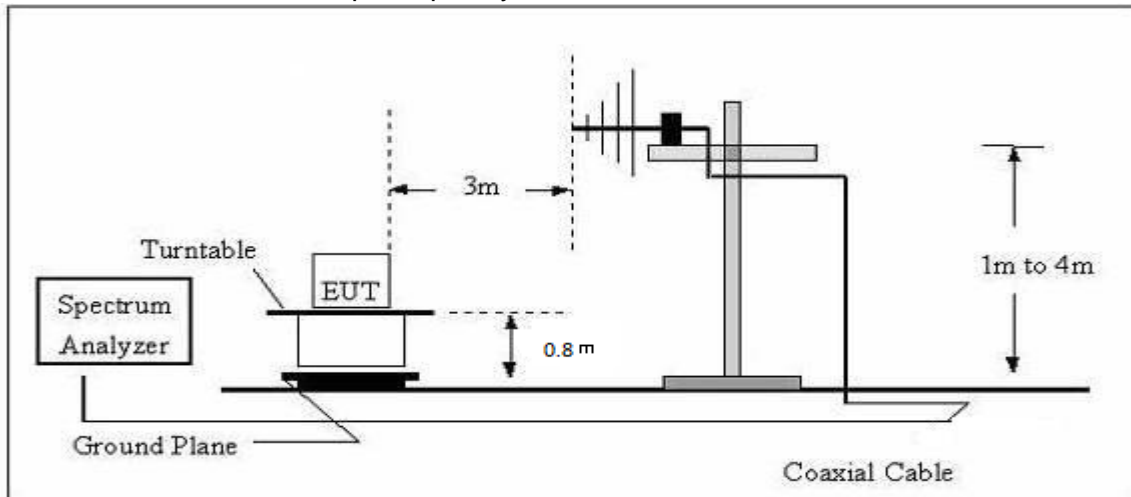
No deviation

### 3.2.4 TEST SETUP

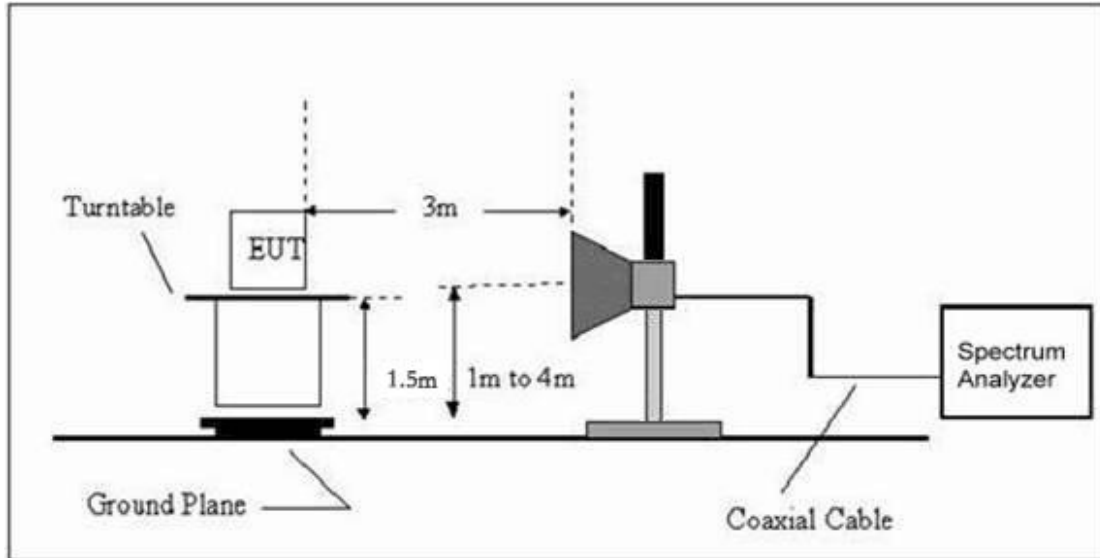
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)**

EUT:	Bluetooth audio transmitter	Model Name. :	KCDBT181
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V from Adapter AC 120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

**NOTE:**

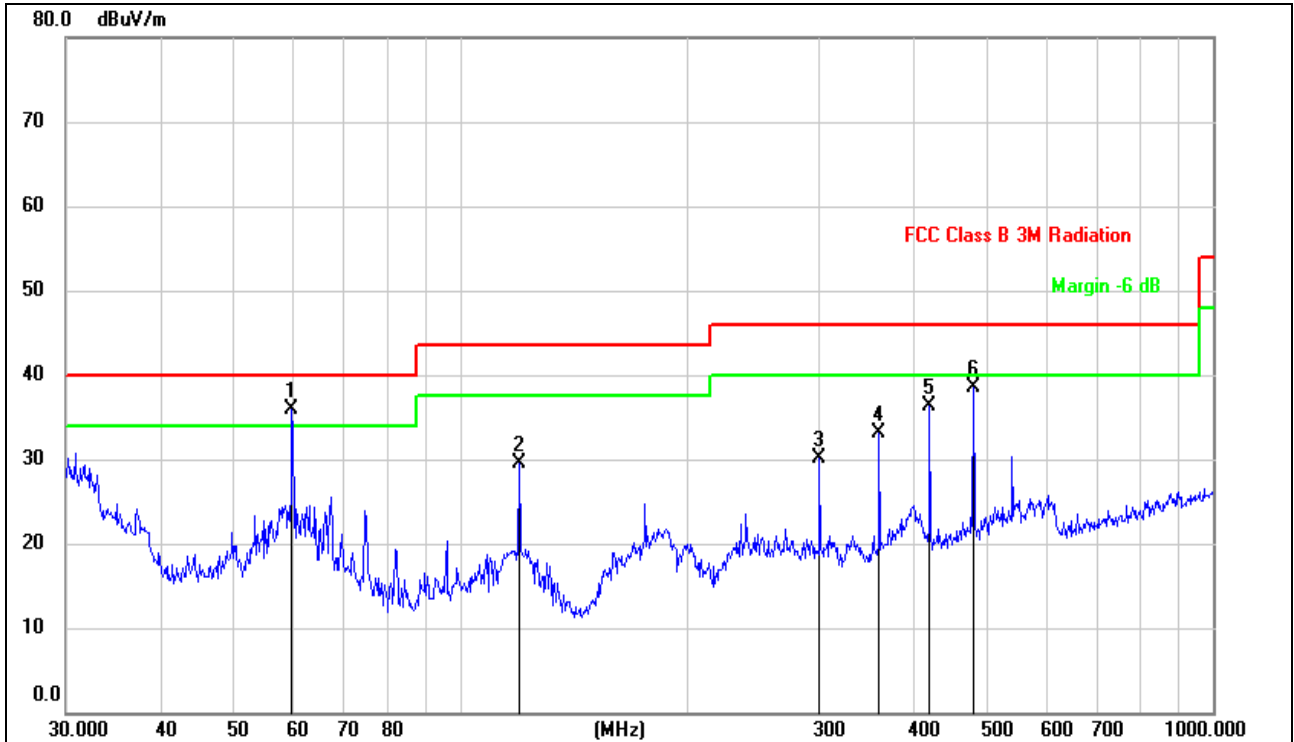
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log(\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

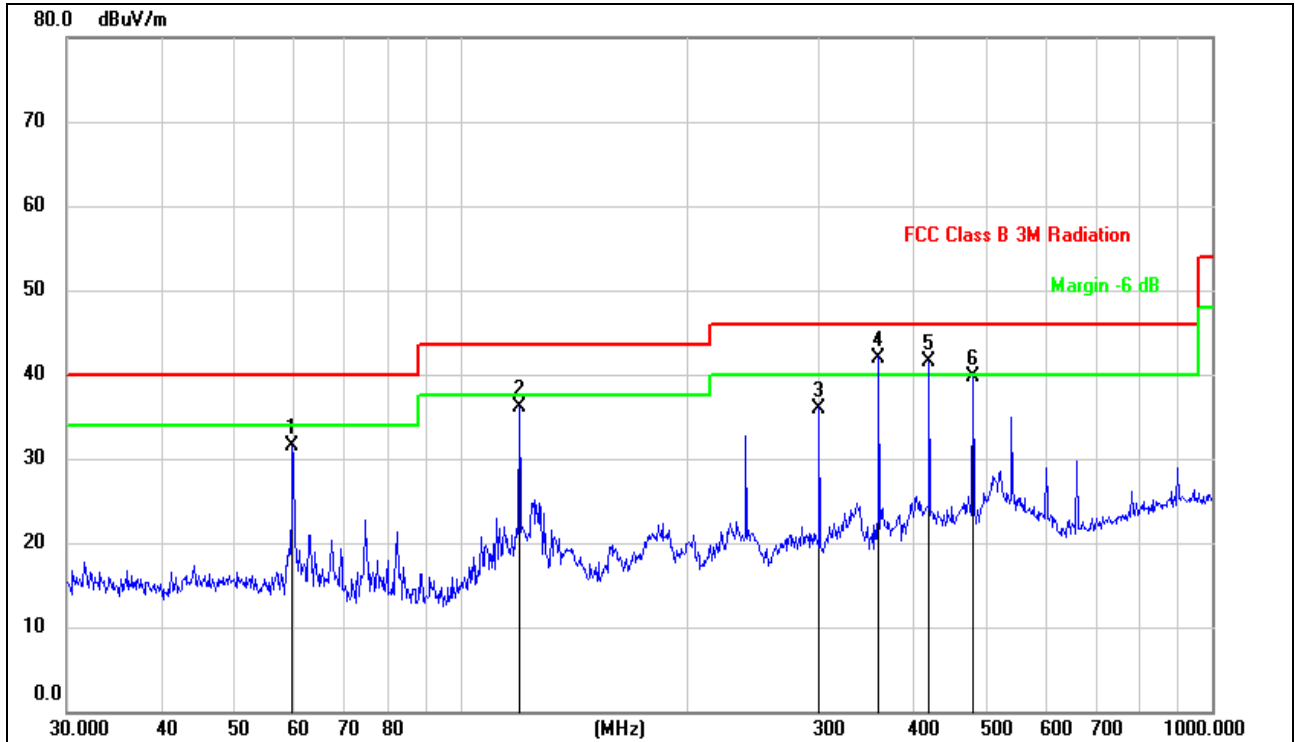
**3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)**

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V from Adapter AC 120V/60Hz
Test Mode :	TX		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	59.8588	47.05	-11.15	35.90	40.00	-4.10	QP
2	119.8556	41.57	-12.07	29.50	43.50	-14.00	QP
3	300.3672	37.85	-7.65	30.20	46.00	-15.80	QP
4	360.4476	40.47	-7.37	33.10	46.00	-12.90	QP
5	420.5803	42.54	-6.24	36.30	46.00	-9.70	QP
6	480.5276	43.86	-5.36	38.50	46.00	-7.50	QP

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V from Adapter AC 120V/60Hz
Test Mode :	RX		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	59.8588	42.65	-11.15	31.50	40.00	-8.50	QP
2	119.8556	49.15	-13.05	36.10	43.50	-7.40	QP
3	300.3672	44.61	-8.61	36.00	46.00	-10.00	QP
4	360.4476	49.37	-7.37	42.00	46.00	-4.00	QP
5	420.5803	47.74	-6.24	41.50	46.00	-4.50	QP
6	480.5276	45.06	-5.36	39.70	46.00	-6.30	QP

**3.2.8 TEST RESULTS (1G-25GHZ)**

**GFSK,  
Normal Voltage**

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
<b>Low Channel (2402 MHz)</b>							
Vertical	4805.00	55.11	-3.64	58.75	74.00	-15.25	Pk
Vertical	4805.00	43.74	-3.64	47.38	54.00	-6.62	AV
Vertical	7206.68	50.26	-0.95	51.21	74.00	-22.79	Pk
Vertical	7206.68	43.07	-0.95	44.02	54.00	-9.98	AV
Horizontal	4804.17	53.71	-3.64	57.35	74.00	-16.65	Pk
Horizontal	4804.17	43.46	-3.64	47.10	54.00	-6.90	AV
Horizontal	7206.83	51.72	-0.95	52.67	74.00	-21.33	Pk
Horizontal	7206.83	43.97	-0.95	44.92	54.00	-9.08	AV
<b>Mid Channel (2441 MHz)</b>							
Vertical	4882.44	54.87	-3.68	58.55	74.00	-15.45	Pk
Vertical	4882.44	43.98	-3.68	47.66	54.00	-6.34	AV
Vertical	7323.92	54.25	-0.82	55.07	74.00	-18.93	Pk
Vertical	7323.92	43.52	-0.82	44.34	54.00	-9.66	AV
Horizontal	4882.56	53.84	-3.68	57.52	74.00	-16.48	Pk
Horizontal	4882.56	41.50	-3.68	45.18	54.00	-8.82	AV
Horizontal	7323.41	51.60	-0.82	52.42	74.00	-21.58	Pk
Horizontal	7323.41	43.53	-0.82	44.35	54.00	-9.65	AV
<b>High Channel (2480 MHz)</b>							
Vertical	4960.30	57.94	-3.59	61.53	74.00	-12.47	Pk
Vertical	4960.30	43.26	-3.59	46.85	54.00	-7.15	AV
Vertical	7440.77	50.10	-0.68	50.78	74.00	-23.22	Pk
Vertical	7440.77	43.17	-0.68	43.85	54.00	-10.15	AV
Horizontal	4960.80	51.23	-3.59	54.82	74.00	-19.18	Pk
Horizontal	4960.80	42.32	-3.59	45.91	54.00	-8.09	AV
Horizontal	7440.66	49.23	-0.68	49.91	74.00	-24.09	Pk
Horizontal	7440.66	43.83	-0.68	44.51	54.00	-9.49	AV



**π/4-DQPSK**  
**Normal Voltage**

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
<b>operation frequency:2402</b>							
V	4804.88	56.54	-3.64	60.18	74	-13.82	Pk
V	4804.88	43.68	-3.64	47.32	54	-6.68	AV
H	4804.41	53.91	-3.64	57.55	74	-16.45	Pk
H	4804.41	41.74	-3.64	45.38	54	-8.62	AV
<b>operation frequency:2441</b>							
V	4882.87	56.94	-3.68	60.62	74	-13.38	Pk
V	4882.87	43.40	-3.68	47.08	54	-6.92	AV
H	4882.04	51.56	-3.68	55.24	74	-18.76	Pk
H	4882.04	40.61	-3.68	44.29	54	-9.71	AV
<b>operation frequency:2480</b>							
V	4960.26	53.97	-3.59	57.56	74	-16.44	pk
V	4960.26	43.23	-3.59	46.82	54	-7.18	AV
H	4960.72	53.06	-3.59	56.65	74	-17.35	pk
H	4960.72	40.97	-3.59	44.56	54	-9.44	pk
<b>Remark:</b>							
Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit							

Note: The PK value is less than the AV value, AV value is not required  
Factor added by measurement software automatically.

**3.3 BAND EDGE(RADIATED)**

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
<b>GFSK</b>							
2390	52.42	-12.78	39.64	74	-34.36	peak	Vertical
2390	51.35	-12.78	38.57	74	-35.43	peak	Horizontal
2400	53.62	-11.39	42.23	74	-31.77	peak	Vertical
2400	53.27	-11.39	41.88	74	-32.12	peak	Horizontal
2483.5	54.70	-13.78	40.92	74	-33.08	peak	Vertical
2483.5	54.49	-13.78	40.71	74	-33.29	peak	Horizontal
<b>π/4-DQPSK</b>							
2390	50.95	-13.06	37.89	74	-36.11	peak	Vertical
2390	52.83	-13.06	39.77	74	-34.23	peak	Horizontal
2400	51.39	-12.14	39.25	74	-34.75	peak	Vertical
2400	51.86	-12.14	39.72	74	-34.28	peak	Horizontal
2483.5	51.22	-12.78	38.44	74	-35.56	peak	Vertical
2483.5	52.19	-12.78	39.41	74	-34.59	peak	Horizontal

NOTE: The PK value is less than the AV value, AV value is not required.

**BAND EDGE(RADIATED)(HOPPING MODE)**

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type	Comment
<b>GFSK</b>							
2390	54.06	-12.78	41.28	74	-32.72	peak	Vertical
2390	51.73	-12.78	38.95	74	-35.05	peak	Horizontal
2400	51.62	-13.67	37.95	74	-36.05	peak	Vertical
2400	52.39	-13.67	38.72	74	-35.28	peak	Horizontal
2483.5	51.93	-15.78	36.15	74	-37.85	peak	Vertical
2483.5	51.43	-15.78	35.65	74	-38.35	peak	Horizontal
<b><math>\pi/4</math>-DQPSK</b>							
2390	51.52	-13.06	38.46	74	-35.54	peak	Vertical
2390	51.34	-13.06	38.28	74	-35.72	peak	Horizontal
2400	51.59	-13.67	37.92	74	-36.08	peak	Vertical
2400	52.44	-13.67	38.77	74	-35.23	peak	Horizontal
2483.5	50.17	-12.78	37.39	74	-36.61	peak	Vertical
2483.5	54.31	-12.78	41.53	74	-32.47	peak	Horizontal

NOTE: The PK value is less than the AV value, AV value is not required.

#### 4. 20DB OCCUPIED CHANNEL BANDWIDTH

##### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247a(1)	20dB bandwidth	/	2400-2483.5	PASS

##### 4.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
Bandwidth: RBW=10 kHz, VBW=30 kHz, detector= Peak

##### 4.1.2 DEVIATION FROM STANDARD

No deviation.

##### 4.1.3 TEST SETUP



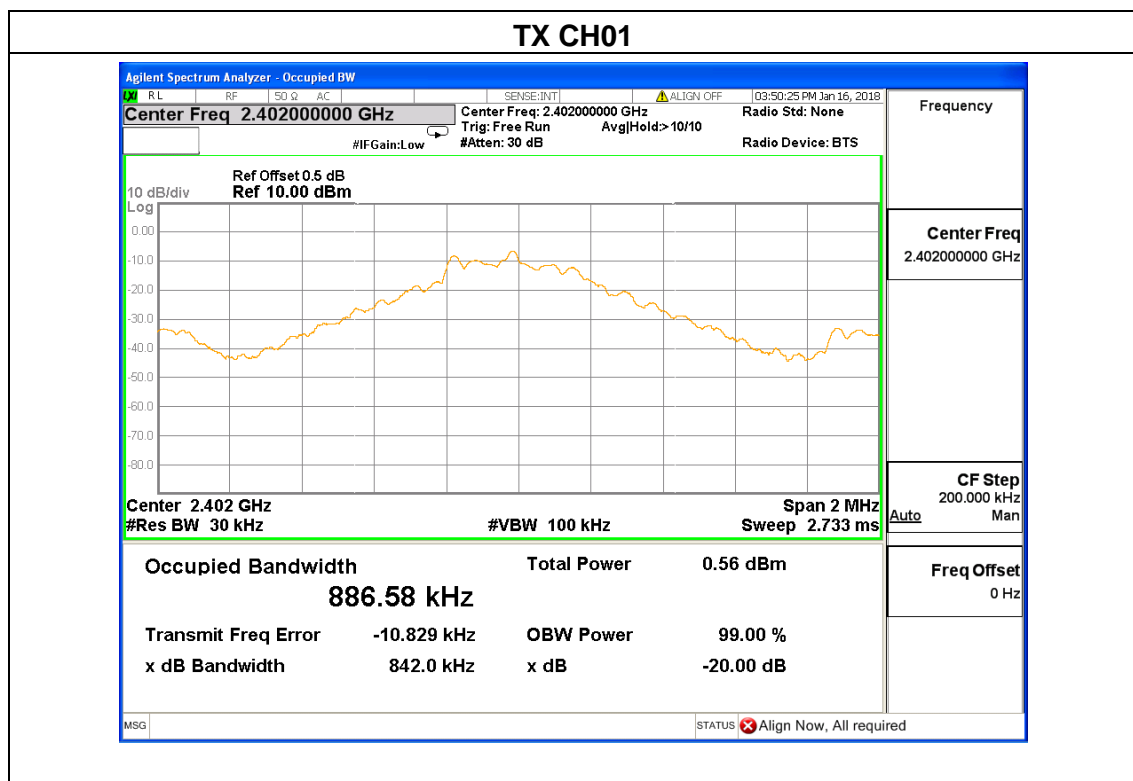
##### 4.1.4 EUT OPERATION CONDITIONS

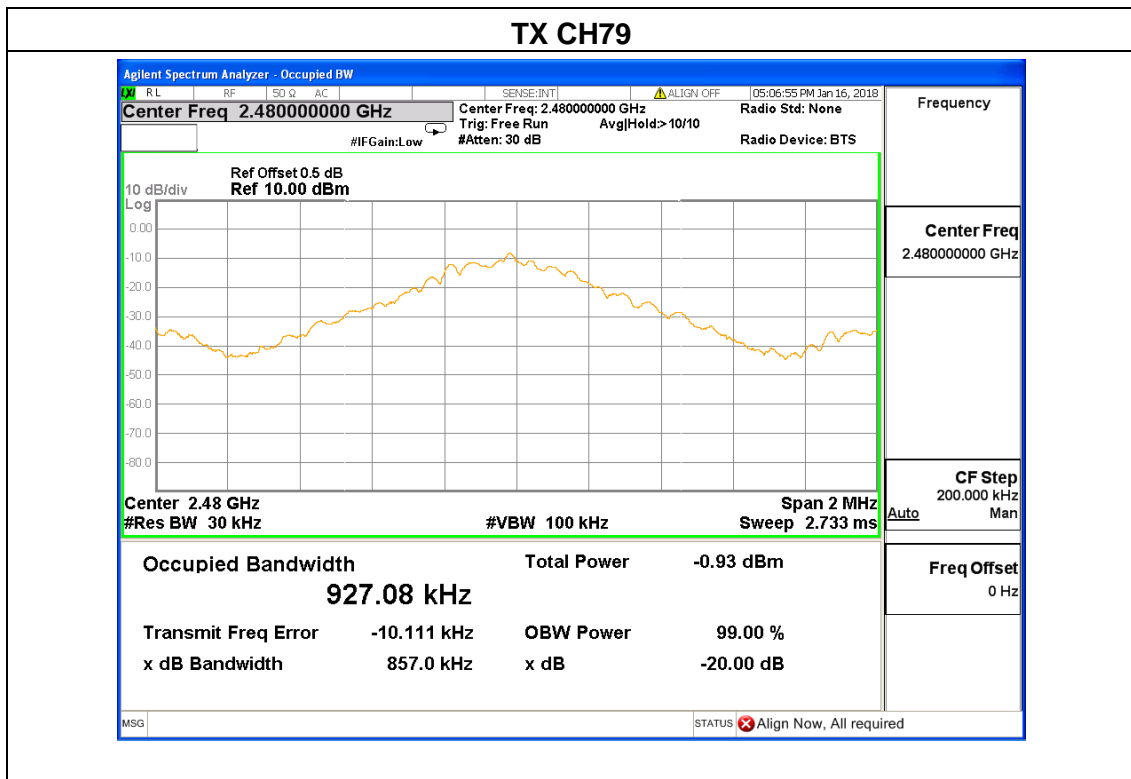
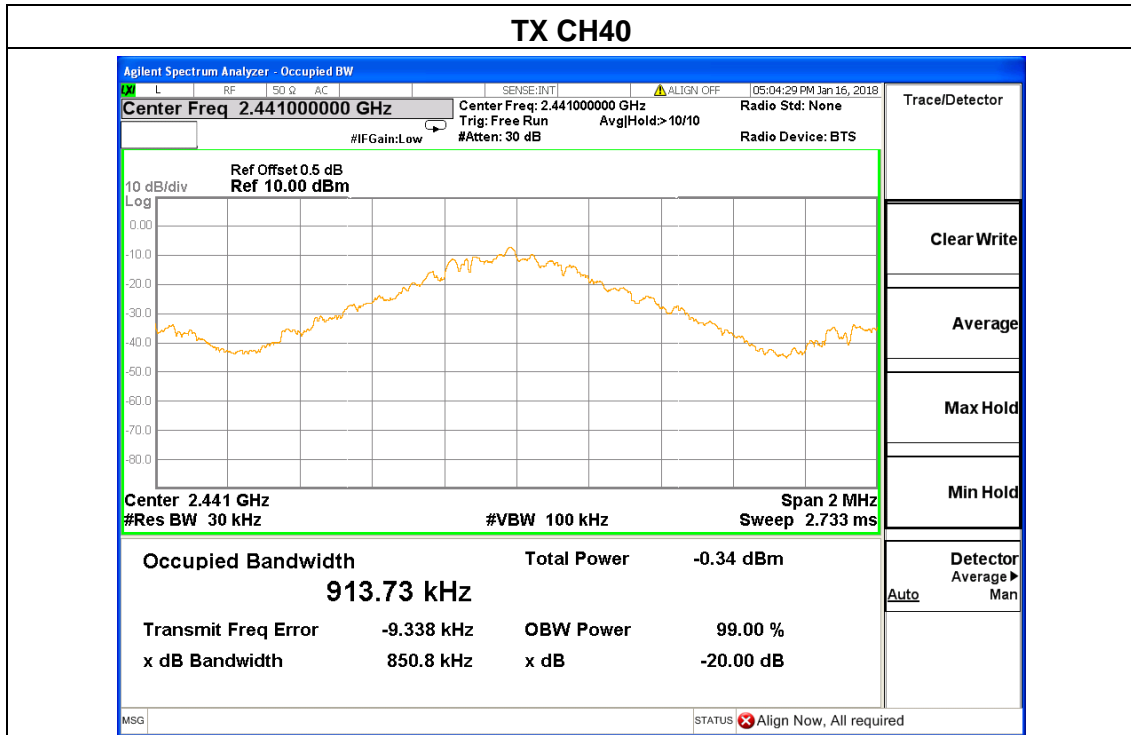
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

**4.1.5 TEST RESULTS**

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	GFSK Mode /CH00, CH39, CH78		

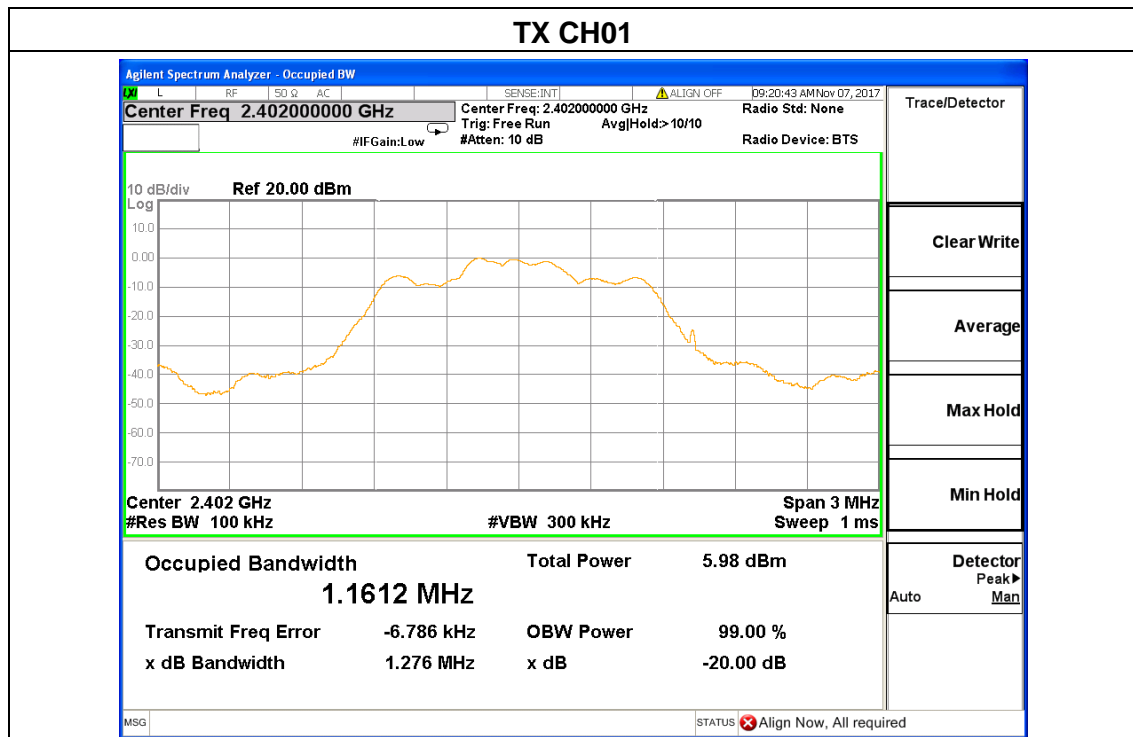
Frequency	20dB Bandwidth (MHz)	Limit	Result
2402 MHz	0.842	/	PASS
2441 MHz	0.851	/	PASS
2480 MHz	0.857	/	PASS

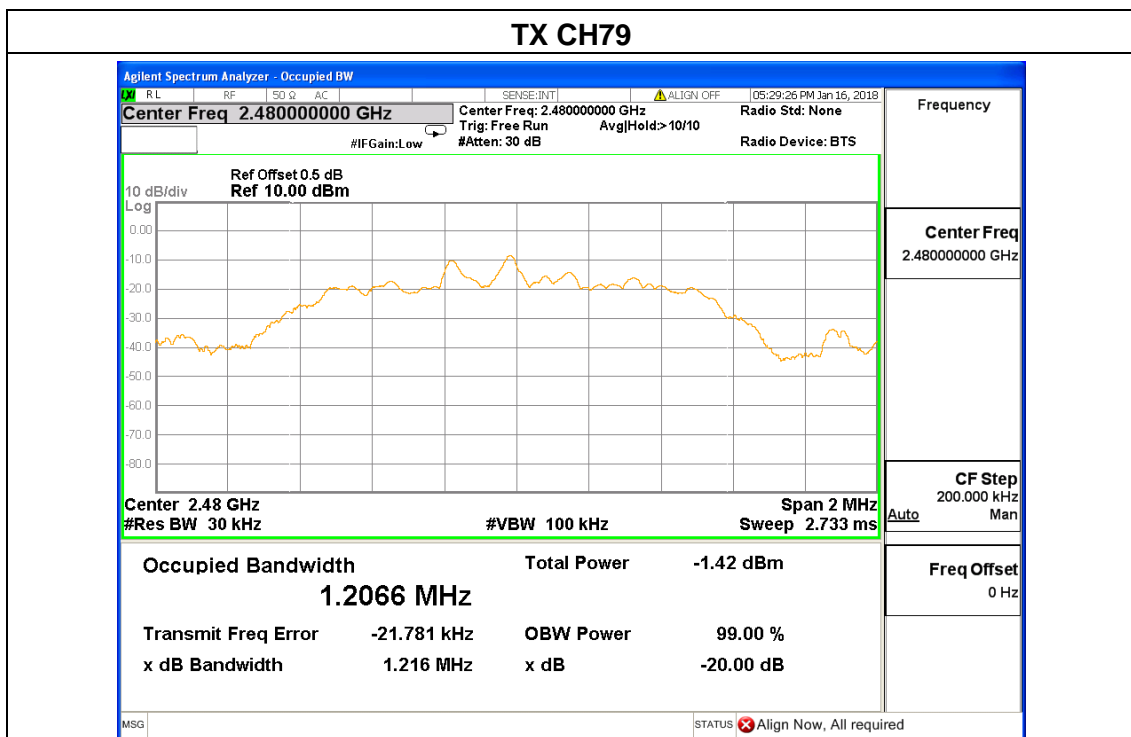
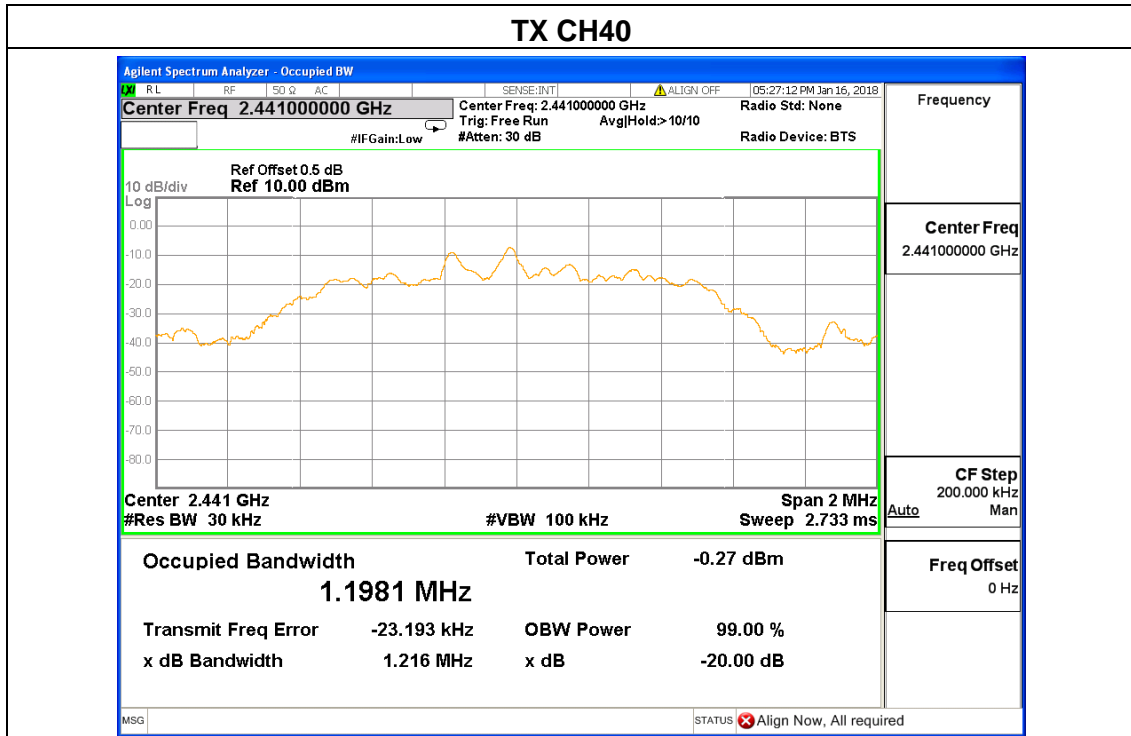




EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	π/4-DQPSK, Mode /CH00, CH39, CH78		

Frequency	20dB Bandwidth (MHz)	Limit	Result
2402 MHz	1.276	/	PASS
2441 MHz	1.216	/	PASS
2480 MHz	1.216	/	PASS







## 5. CARRIER FREQUENCY SEPARATION TEST

### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)	Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth (Which is greater)	2400-2483.5	PASS

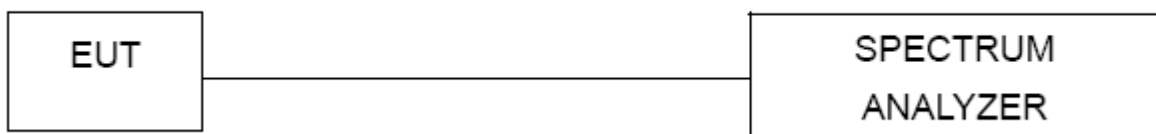
#### 5.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
RBW=100 kHz, VBW=300 kHz, detector= Peak, Sweep Time =auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

#### 5.1.3 TEST SETUP



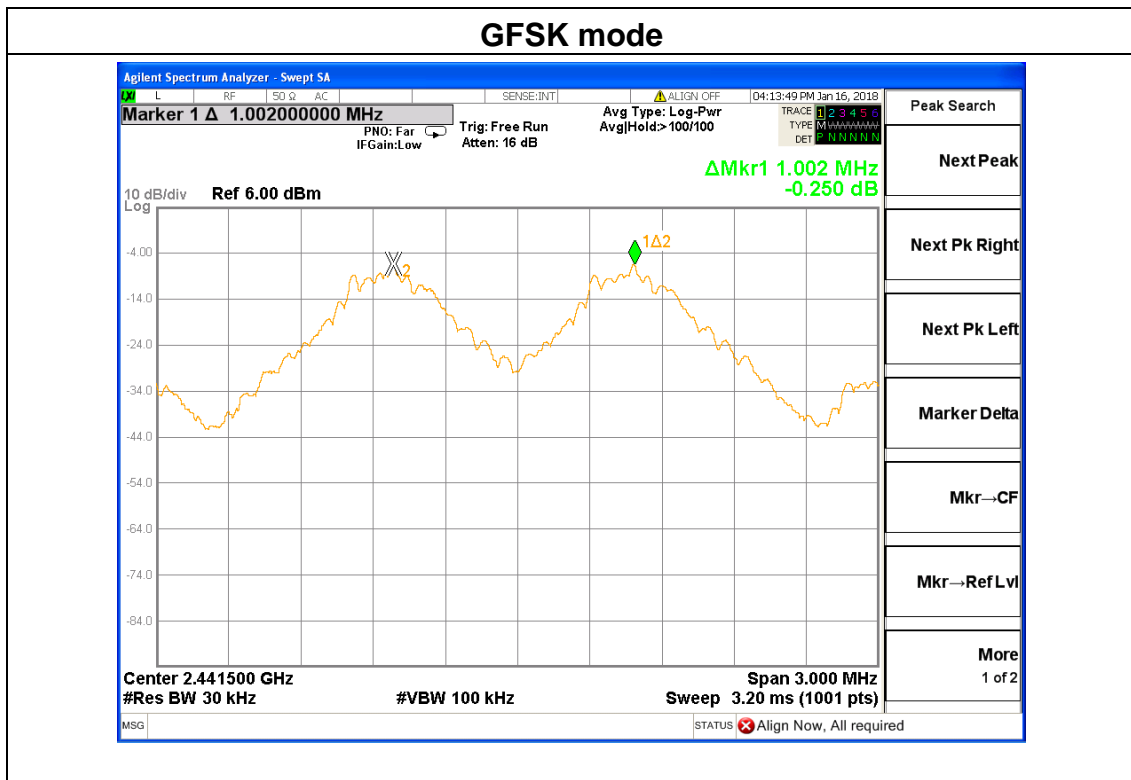
#### 5.1.4 EUT OPERATION CONDITIONS

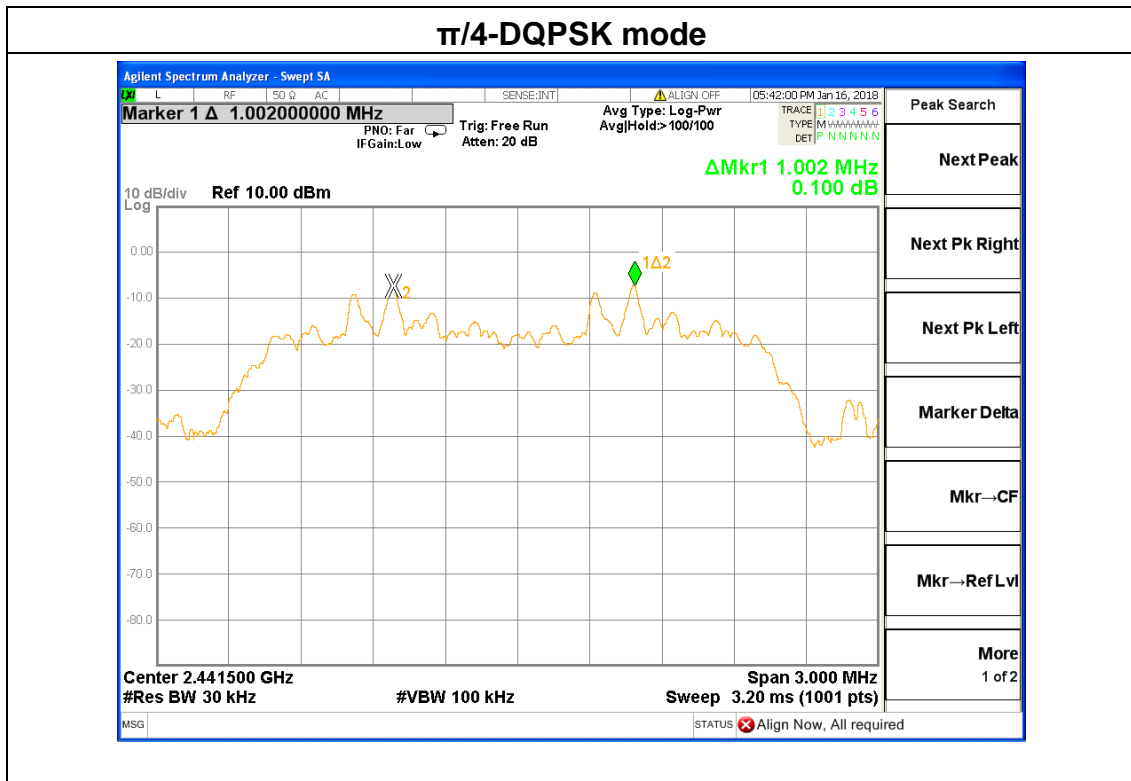
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**5.1.5 TEST RESULTS**

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	GFSK Mode /CH00, CH39		

Mode	Channel	Frequency (MHz)	Test Result (KHz)	Limit (kHz)	Result
GFSK	Middle	2441	1002	668	Pass
$\pi/4$ -DQPSK	Middle	2441	1002	668	Pass





## 6. NUMBER OF HOPPING CHANNEL

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(a)	Number of Hopping Channel	>15 channels	2400-2483.5	PASS

#### 6.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 kHz, VBW=300 kHz, Detector=Peak, Sweep time= Auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



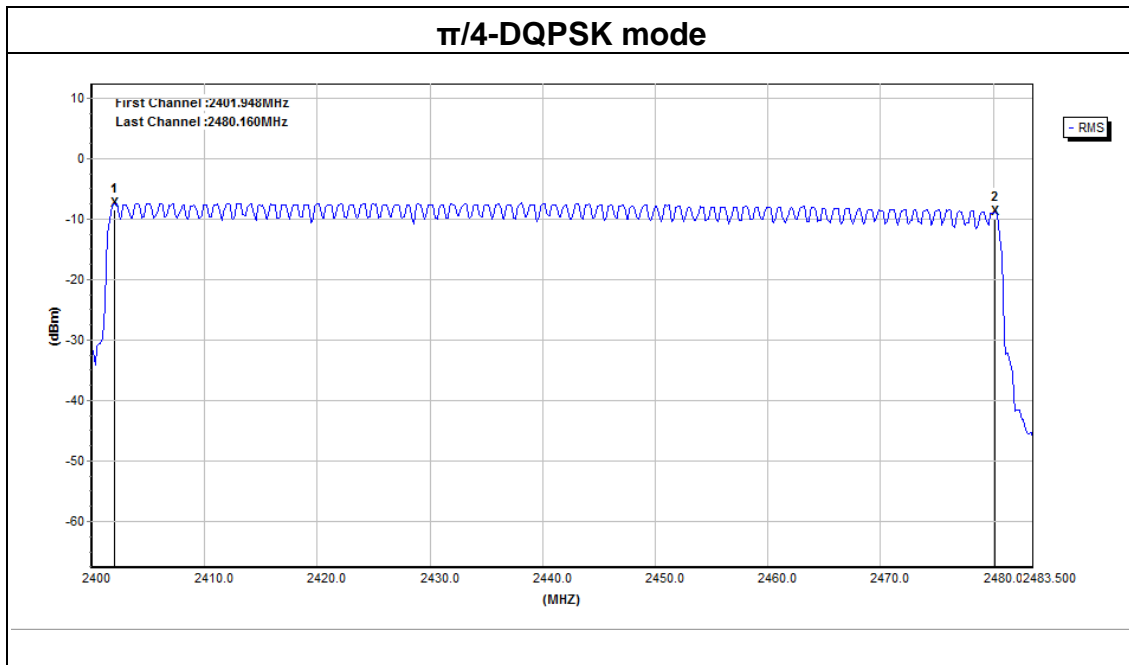
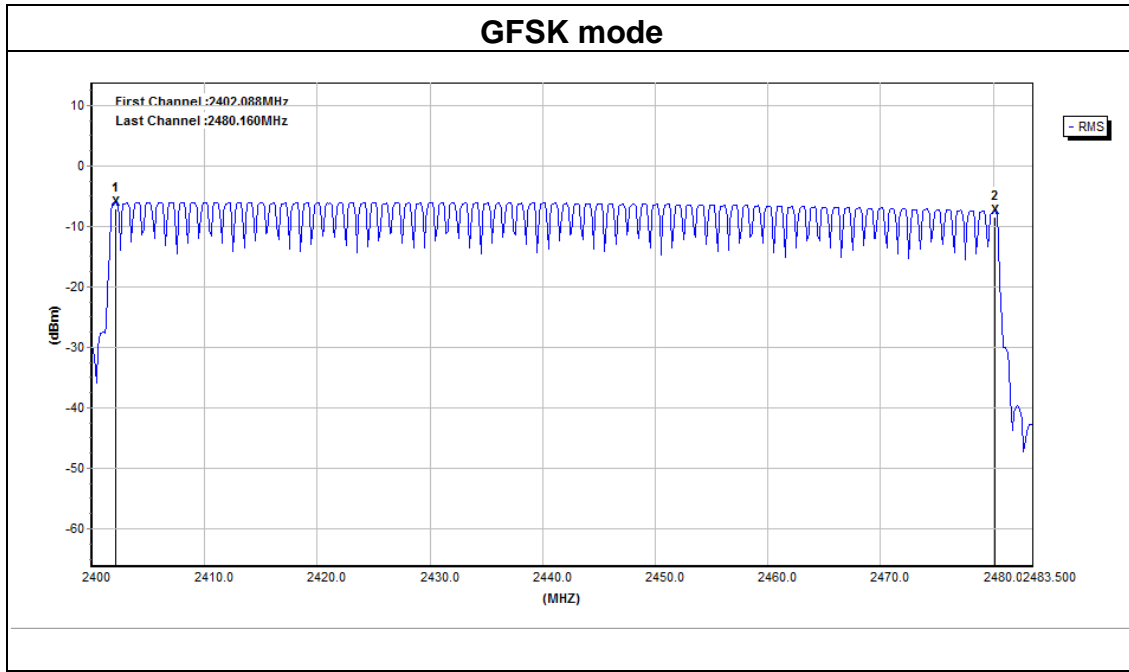
#### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 6.1.5 TEST RESULTS

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	GFSK, $\pi/4$ -DQPSK,Mode / CH00, CH39		

Mode	Quantity of Hopping Channel	Limit	Judgment
GFSK, $\pi/4$ -DQPSK	79	>15	PASS



## 7. DWELL TIME

### 7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(a)	Dwell time	0.4 sec	2400-2483.5	PASS

#### 7.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.
- (9) The EUT was set to the Hopping Mode for Dwell Time Test

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

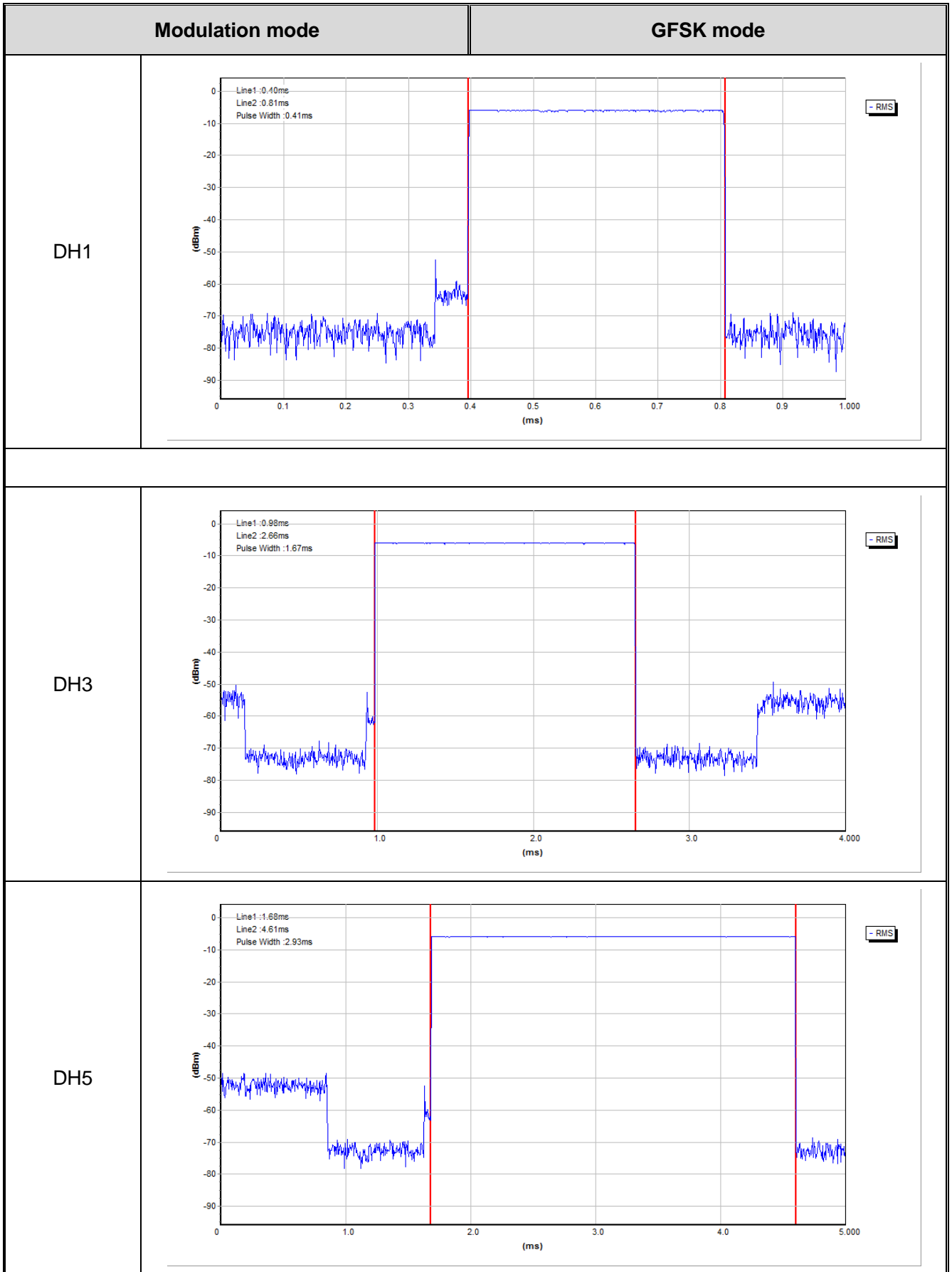
**7.1.5 TEST RESULTS**

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	GFSK, π/4-DQPSK,/ CH00, CH39		

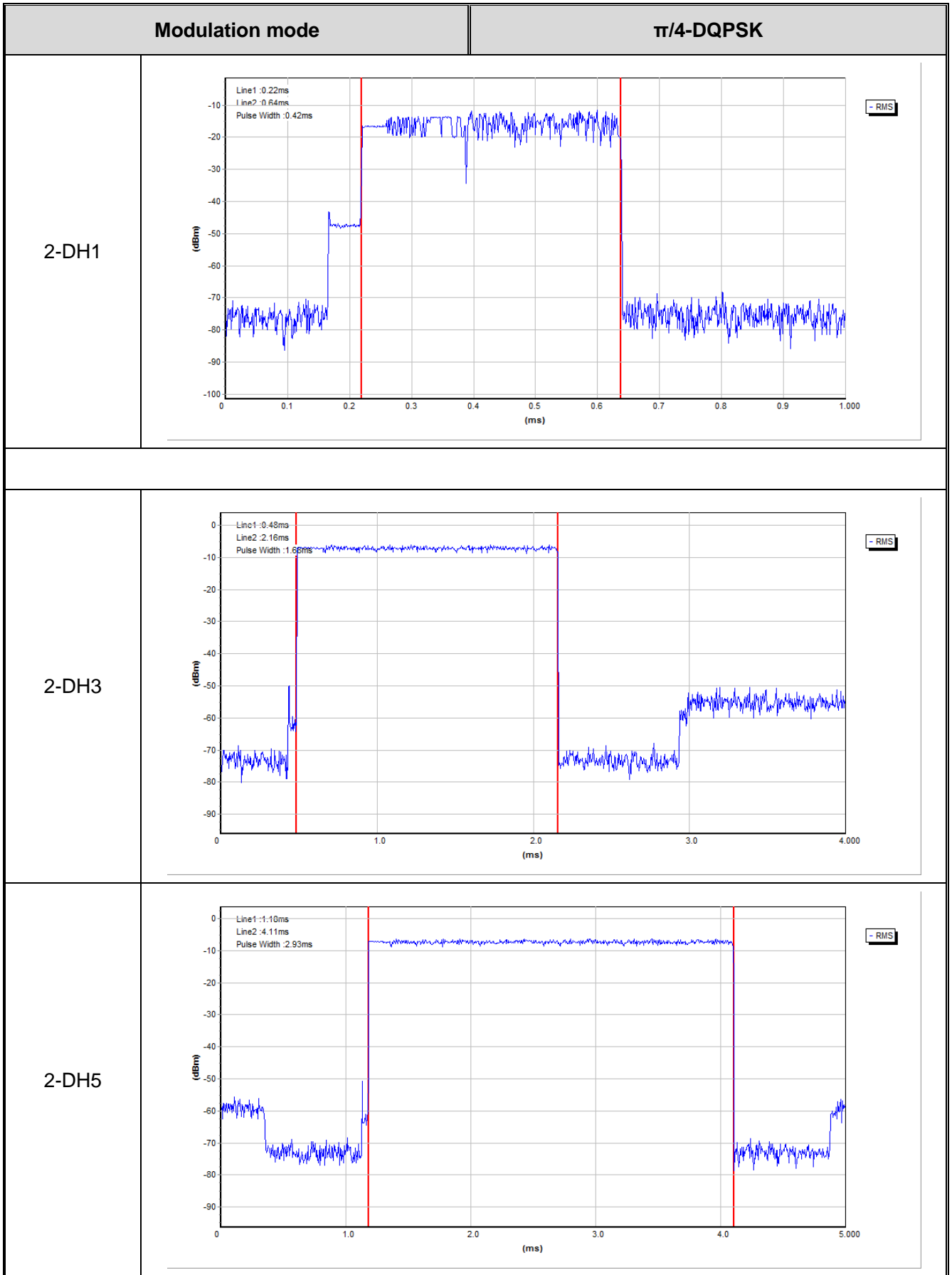
For GFSK, π/4-DQPSK and 8DPSK:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (ms)	Limit (s)	Conclusion
GFSK	DH1	2441	0.41	131.20	<0.4	PASS
	DH3	2441	1.67	267.20	<0.4	PASS
	DH5	2441	2.93	312.53	<0.4	PASS
π/4 DQPSK	2DH1	2441	0.42	134.40	<0.4	PASS
	2DH3	2441	1.66	265.60	<0.4	PASS
	2DH5	2441	2.93	312.53	<0.4	PASS
Note: 1 A period time = 0.4 (s) * 79 = 31.6(s) 2 DH1 time slot = Pulse Duration * (1600/(2*79)) * A period time DH3 time slot = Pulse Duration * (1600/(4*79)) * A period time DH5 time slot = Pulse Duration * (1600/(6*79)) * A period time						







**8. PEAK OUTPUT POWER TEST**

**8.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm)	2400-2483.5	PASS

**8.1.1 TEST PROCEDURE**

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
 RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤ 1 MHz)  
 RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz)
- (3) The EUT was set to continuously transmitting in the max power during the test.

**8.1.2 DEVIATION FROM STANDARD**

No deviation.

**8.1.3 TEST SETUP**



**8.1.4 EUT OPERATION CONDITIONS**

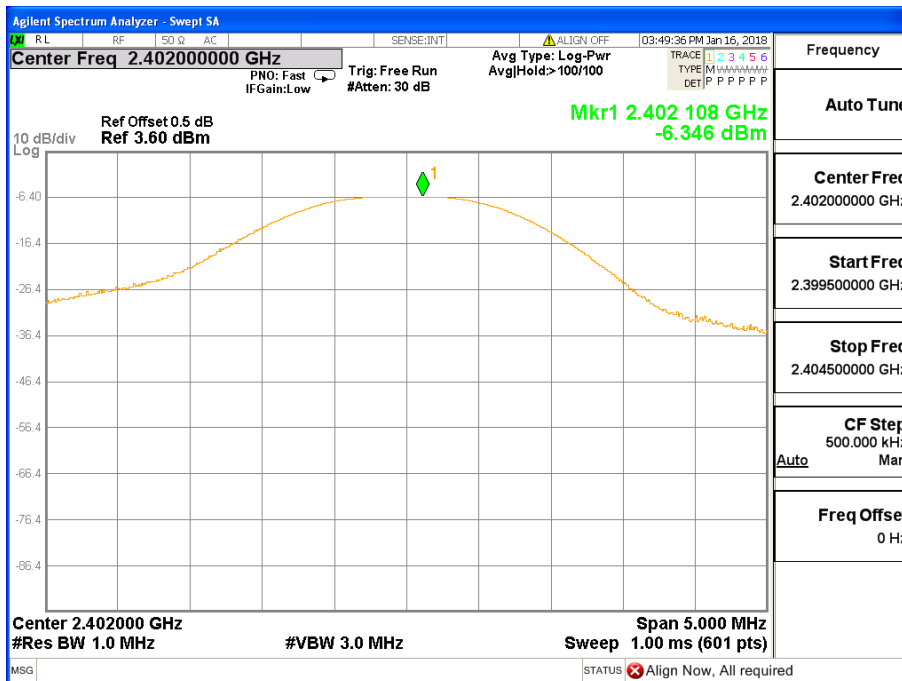
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**8.1.5 TEST RESULTS**

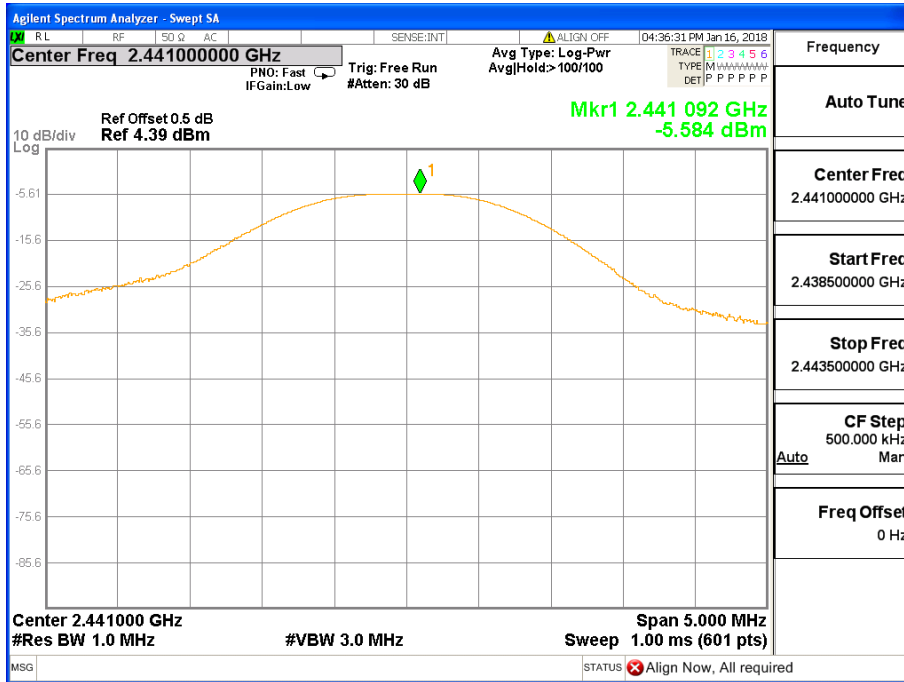
EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from USB Port
Test Mode :	GFSK, $\pi/4$ -DQPSK, Mode / CH00, CH39		

TX GFSK Mode			
Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH01	2402	-6.346	30
CH40	2441	-5.584	30
CH79	2480	-7.149	30
TX $\pi/4$ -DQPSK Mode			
CH01	2402	-6.911	30
CH40	2441	-6.027	30
CH79	2480	-7.181	30

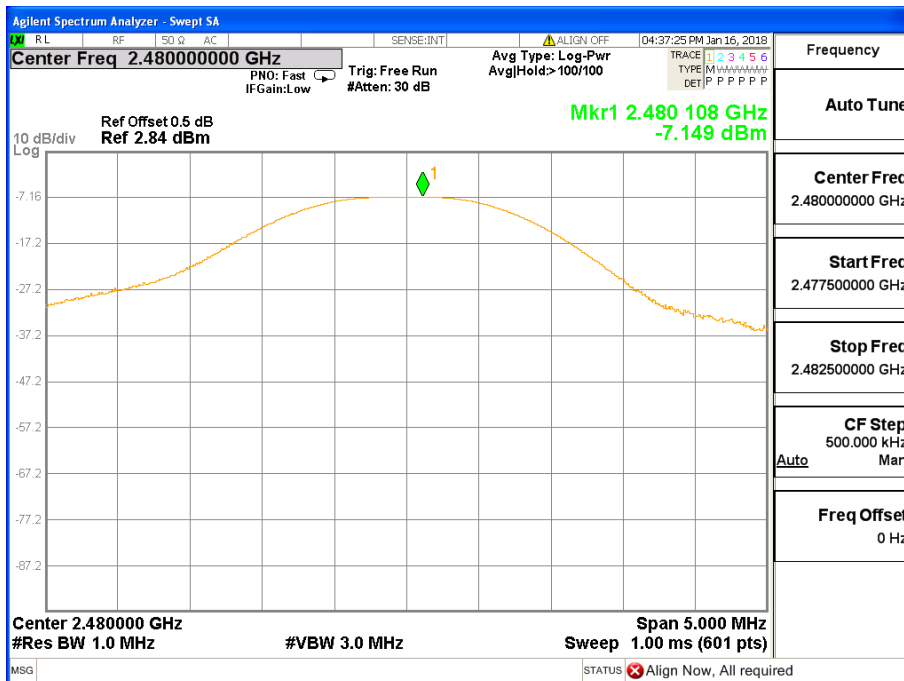
**GFSK 2402MHz**



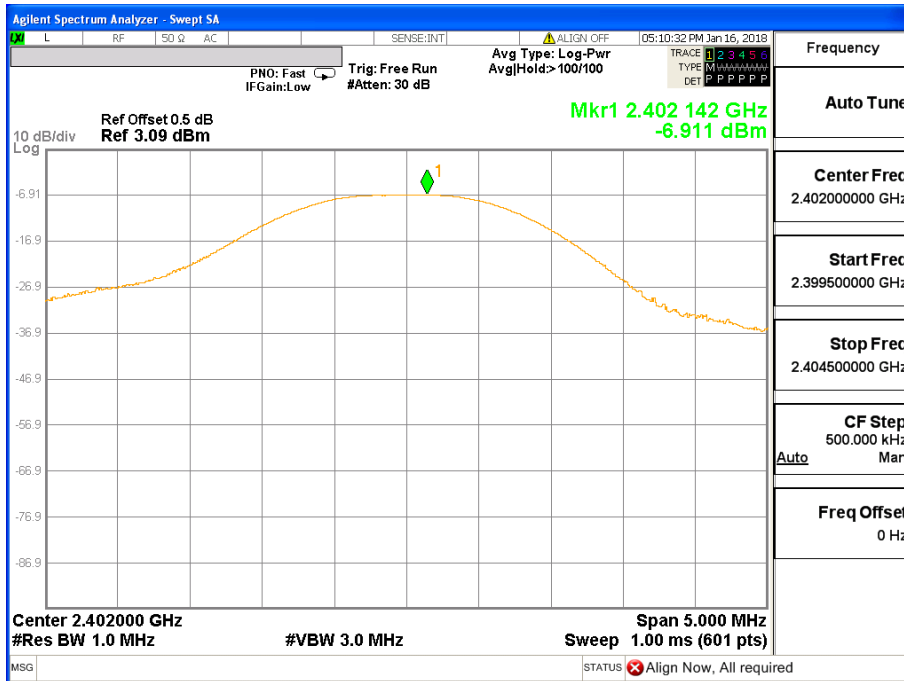
**GFSK 2441MHz**



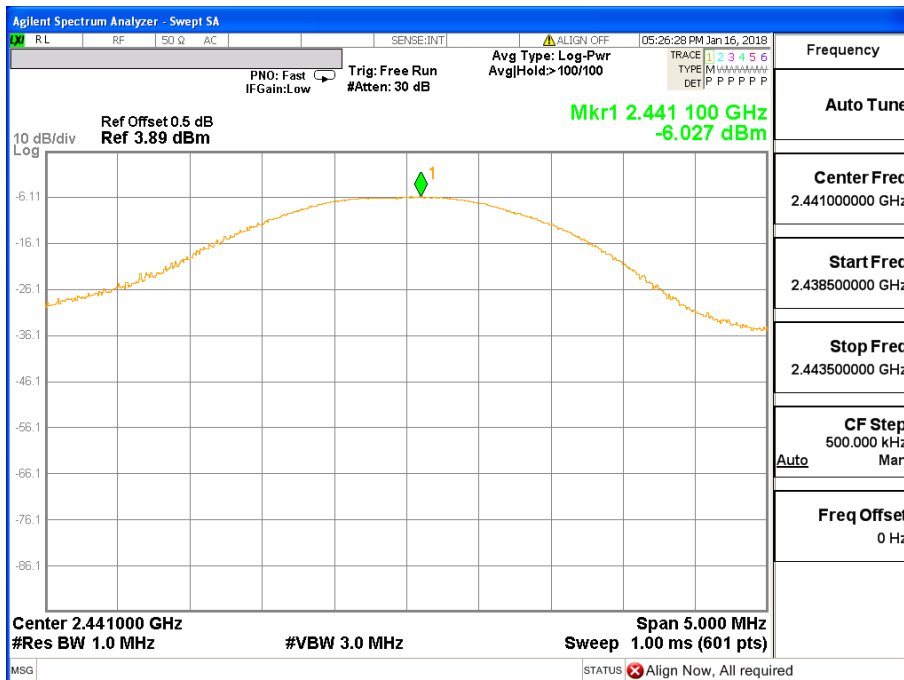
**GFSK 2480MHz**



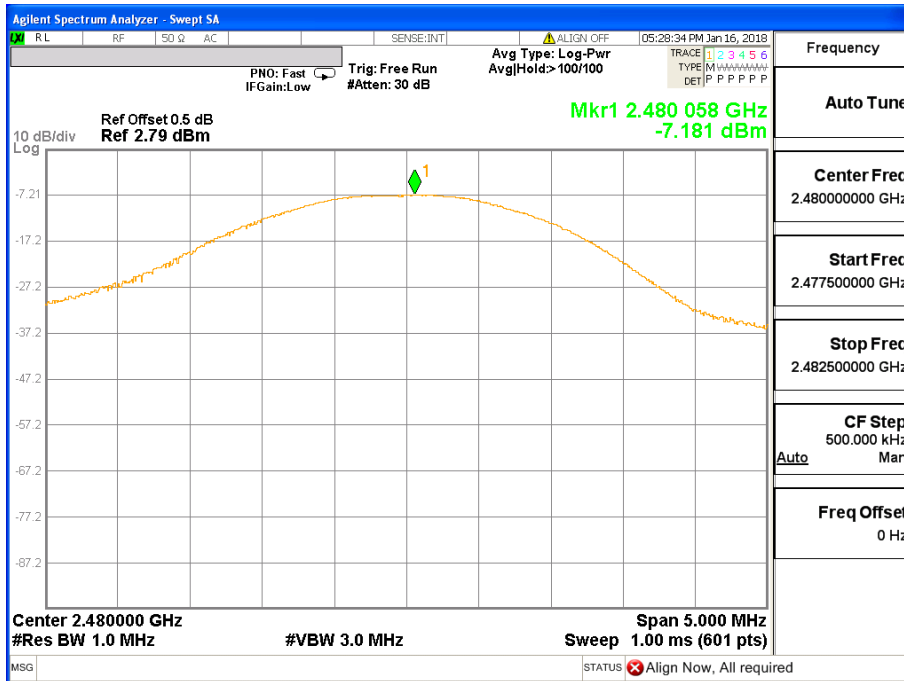
**$\pi$  /4-DQPSK 2402**



**$\pi$  /4-DQPSK 2441**



**$\pi$  /4-DQPSK 2480**



### **8.1.6. 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE APPLICABLE STANDARD**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### **TEST PROCEDURE**

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

### **8.1.7 DEVIATION FROM STANDARD**

No deviation.

### **8.1.8 TEST SETUP**



### **8.1.9 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

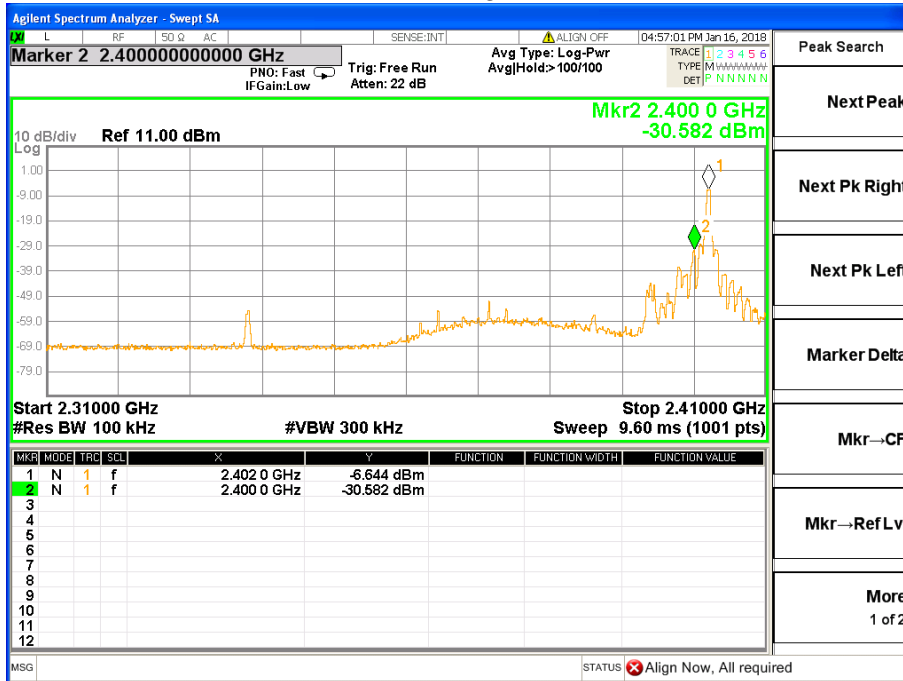
**8.1.10 TEST RESULTS**

EUT :	Bluetooth audio transmitter	Model Name :	KCDBT181
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from USB Port

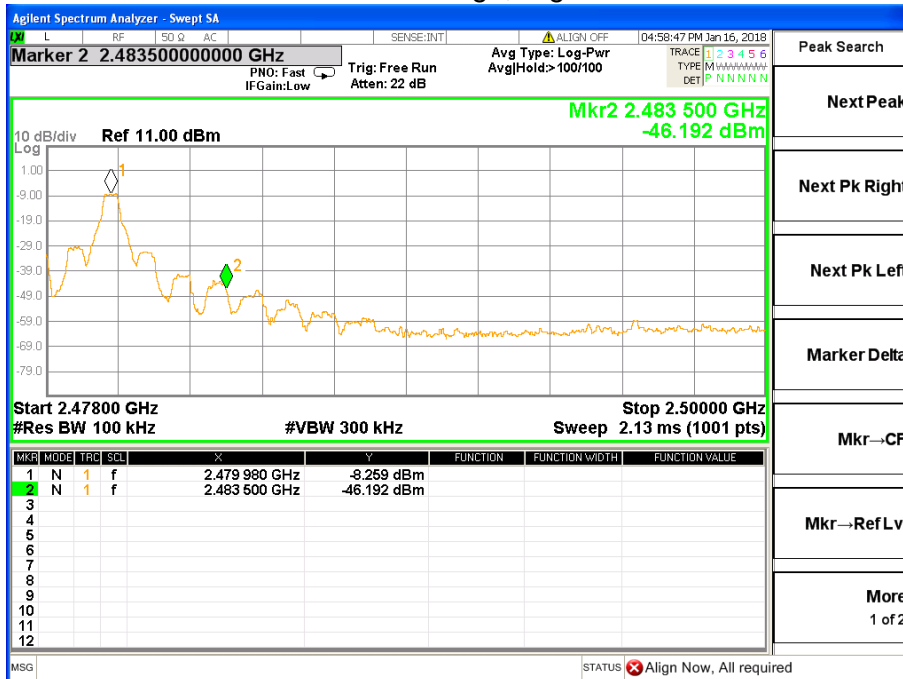
Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
GFSK mode			
Left-band	24.582	20	Pass
Right-band	38.192	20	Pass
$\pi/4$ -DQPSK mode			
Left-band	24.225	20	Pass
Right-band	37.780	20	Pass



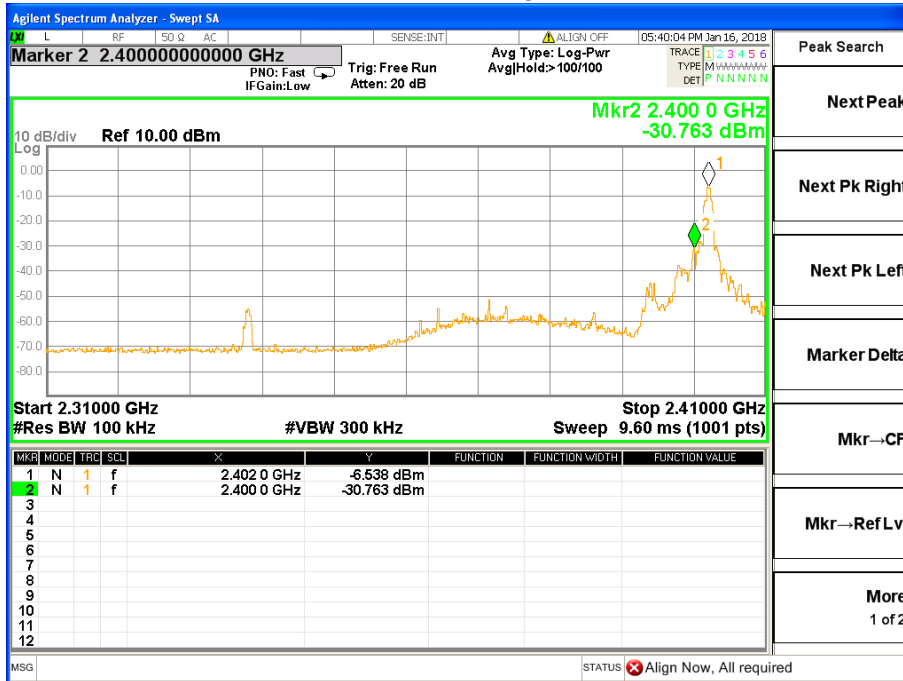
GFSK: Band Edge, Left Side



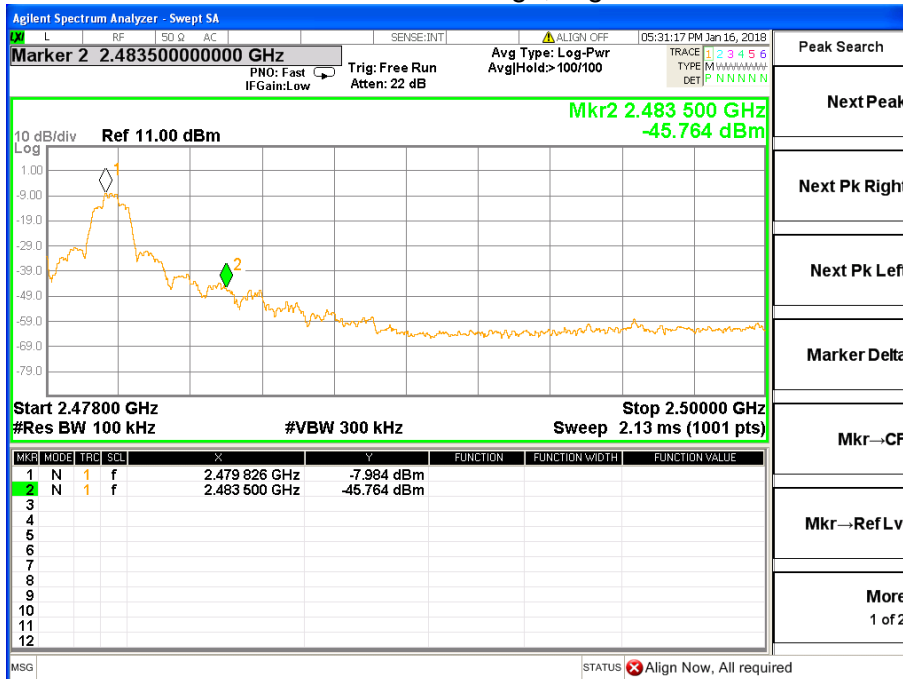
GFSK: Band Edge, Right Side



$\pi/4$ -DQPSK: Band Edge, Left Side



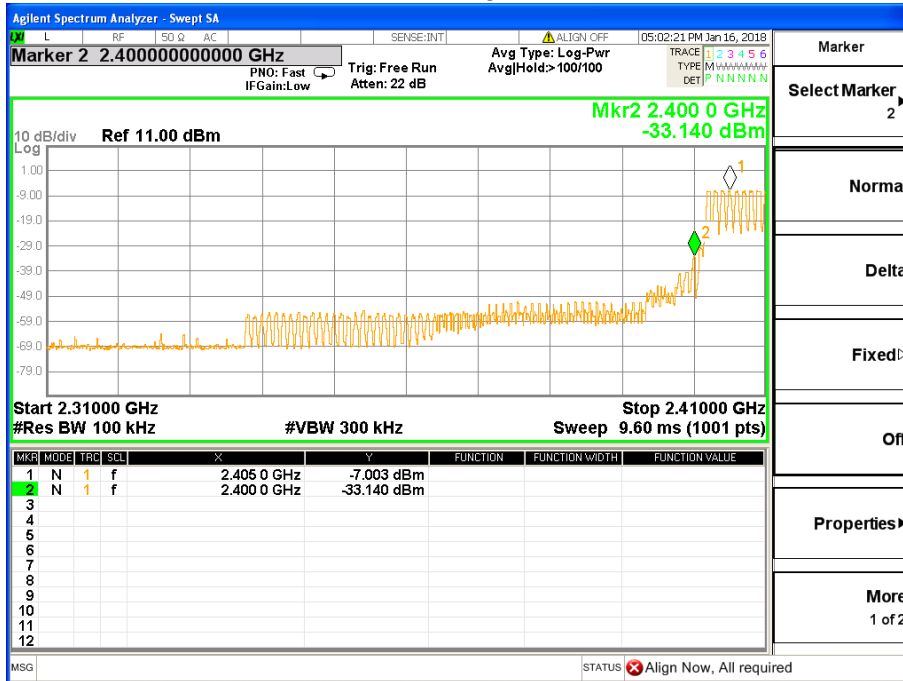
$\pi/4$ -DQPSK: Band Edge, Right Side



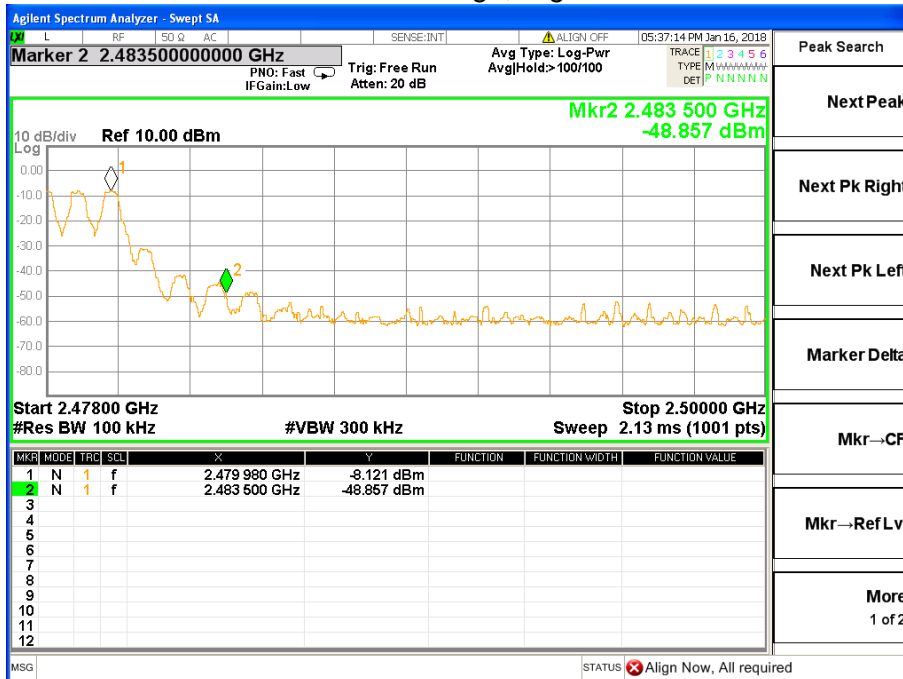
**Hopping Mode**

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
GFSK mode			
Left-band	26.137	20	Pass
Right-band	40.736	20	Pass
$\pi/4$ -DQPSK mode			
Left-band	27.211	20	Pass
Right-band	39.085	20	Pass

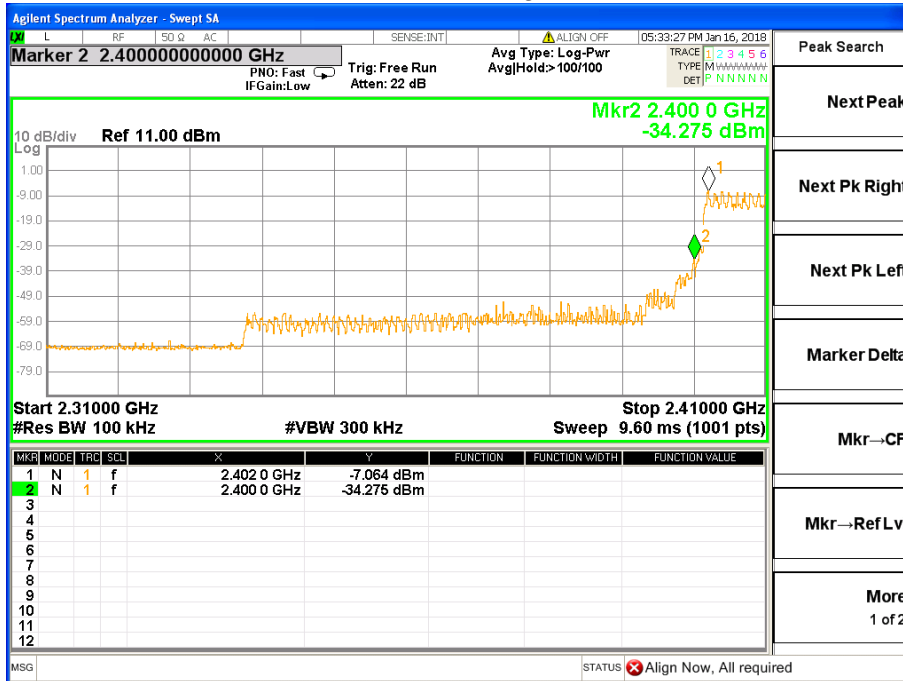
GFSK: Band Edge, Left Side



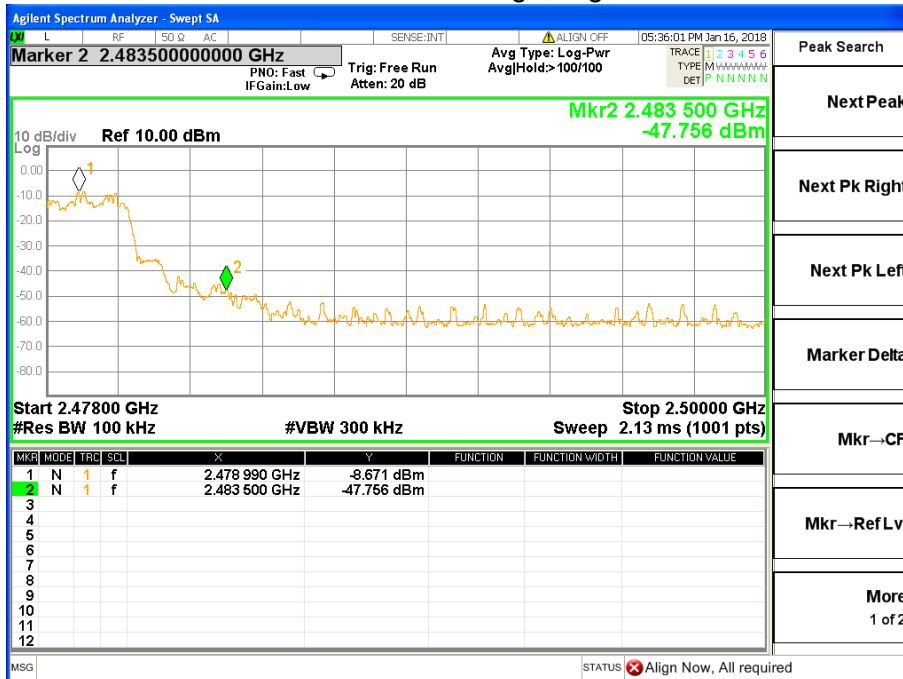
GFSK: Band Edge, Right Side



$\pi/4$ -DQPSK: Band Edge, Left Side



$\pi/4$ -DQPSK: Band Edge, Right Side



## **9. ANTENNA REQUIREMENT**

### **9.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 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.

### **9.2 EUT ANTENNA**

The EUT antenna is PCB antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

**----END OF REPORT----**