TEST REPORT

of

FCC Part 15 Subpart C

Full Modular Approval

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product :	**Bluetooth module**
Brand:	**N/A**
Model:	**MBC005; BTD1**
Model Difference:	**For market segmentation**
FCC ID:	**2AJFZ-MBC005**
FCC Rule Part:	**§15.247, Cat: DSS**
Applicant:	**X-Media Tech, Inc**
Address:	**519 Marine View Ave Ste G-H Belmont CA 94002 USA**

Test Performed by:
International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;
*Address:
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Report No.: **ISL-16LR208FCDSS**
Issue Date : **2016/08/18**

Testing laboratory
0997

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.
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VERIFICATION OF COMPLIANCE

Applicant:	X-Media Tech, Inc
Product Description:	Bluetooth module
Brand Name:	N/A
Model No.:	MBC005; BTD1
Model Difference:	FOR MARKET SEGMENTATION
FCC ID:	2AJFZ-MBC005
Date of test:	2016/07/27 ~ 2016/08/16
Date of EUT Received:	2016/07/27

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Dino Chen	***Date:***	2016/08/18
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Prepared By:	Gigi yeh	***Date:***	2016/08/18
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	Vincent Su / Technical Manager		

Version

Version No.	Date	Description
00	2016/08/17	Initial creation of document

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1. GENERAL INFORMATION

1.1. Product Description

Product Name	Bluetooth module
Brand Name	N/A
Model Name	MBC005; BTD1
Model Difference	FOR MARKET SEGMENTATION
Input port	One provided for data link and power input
AUX Port	One provided for audio in
Power Supply	5Vdc

Bluetooth:

Bluetooth Version	V3.0 + EDR (GFSK + π /4 DQPSK + 8DPSK)
Frequency Range	2402 – 2480MHz
Channel number	79 channels
Modulation type	Frequency Hopping Spread Spectrum (FHSS)
Rated Power	4.0 dBm (Peak)
Tune-Up Power	1dB
Dwell Time	<= 0.4s
Antenna Designation	Printing Antenna, 2.75dBi

The EUT is compliance with Bluetooth EDR V3.0 Standard.

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AJFZ-MBC005** filing to comply with Section 15.247 of the FCC Part 15C, Subpart C Rules.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC Public Notice DA 00-705

1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was tested with a test program to fix the TX/RX frequency that was for the purpose of the measurements. For more information please see test data and APPENDIX 1 for set-up photographs.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7, 13 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8/1.5 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.10: 2013.

2.4. Configuration of Tested System

Fig. 2-1 Radiated/Conducted Emission Configuration

Radiated

Conduction:

Table 1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	NB	HP	440	N/A	Non-shield	Non-shield
2	24" LCD Monitor	DELL	U2412Mb	N/A	shielded / 1.8M	Non-shield / 1.8M
3	Portable Computer	DELL	PP05L	N/A	N/A	Non-shielded /1.8M
4	USB mouse	DELL	MO56UC	G17009ZJ	Shielded /1.8M	N/A
5	Printer	LEXMARK	Z43	4101002	Shielded /1.8M	Non-shielded /1.8M
6	Speaker/ microphone	HTC	RC-E160	N/A	Non-shield /1.4M	N/A
7	Modem	ACEEX	DM 1414	N/A	Shielded /1.8M	Non-shielded /1.8M
8	Speaker	M.CRAFTSMAN	BT0214091023	N/A	Non-shield /0.1M	N/A
9	Smart phone	HTC	PL99110	N/A	N/A	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power line Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(d)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(c)	TX Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(ii)	Time of Occupancy	Compliant
§15.247(a)(1)	20dB Bandwidth	Compliant
§15.203, §15.247(c)	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low (2402MHz)

5. AC POWER LINE CONDUCTED EMISSION TEST

5.1. Standard Applicable:

According to §15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

5.2. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Conduction 04-3 Cable	WOKEN	CFD 300-NL	Conduction 04 -3	07/27/2016	07/26/2017
EMI Receiver 17	Rohde & Schwarz	ESCI 7	100887	09/08/2015	09/07/2016
LISN 18	ROHDE & SCHWARZ	ENV216	101424	02/11/2016	02/10/2017
LISN 19	ROHDE & SCHWARZ	ENV216	101425	03/12/2016	03/11/2017

5.3. EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10-2013
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

5.4. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

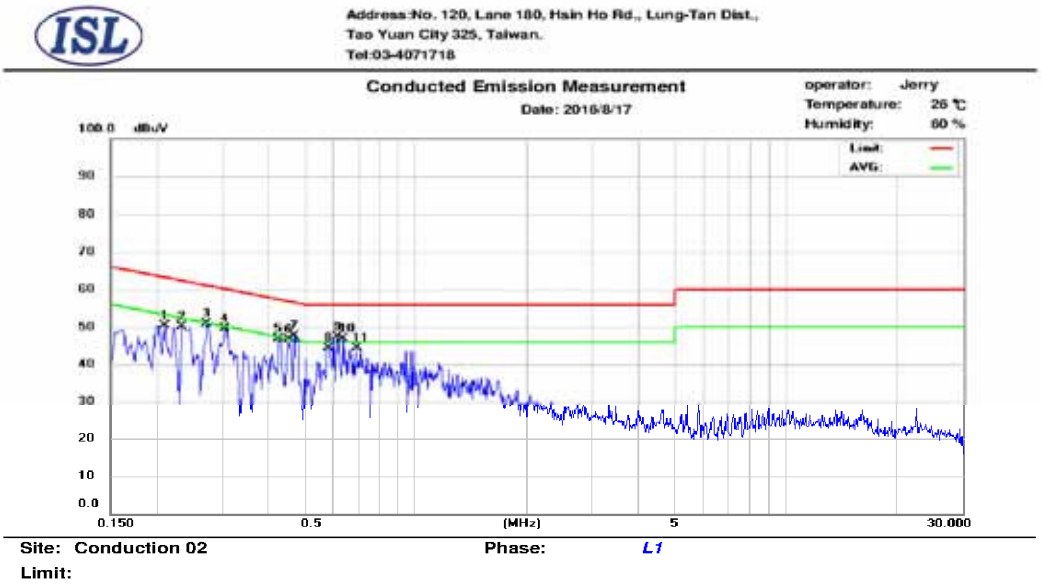
5.5. Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2016/08/17
Test By:	Dino		



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.210	37.09	27.34	9.65	46.74	63.21	-16.47	36.99	53.21	-16.22
2	0.234	38.61	26.83	9.65	48.26	62.31	-14.05	36.48	52.31	-15.83
3	0.274	38.48	36.57	9.65	48.13	61.00	-12.87	46.22	51.00	-4.78
4	0.306	38.62	37.69	9.65	48.27	60.08	-11.81	47.34	50.08	-2.74
5	0.426	35.59	20.04	9.66	45.25	57.33	-12.08	29.70	47.33	-17.63
6	0.454	33.22	17.36	9.66	42.88	56.80	-13.92	27.02	46.80	-19.78
7	0.470	35.27	19.56	9.66	44.93	56.51	-11.58	29.22	46.51	-17.29
8	0.582	33.91	31.67	9.67	43.58	56.00	-12.42	41.34	46.00	-4.66
9	0.614	32.67	30.08	9.67	42.34	56.00	-13.66	39.75	46.00	-6.25
10	0.638	33.99	18.46	9.67	43.66	56.00	-12.34	28.13	46.00	-17.87
11	0.690	31.15	17.09	9.67	40.82	56.00	-15.18	26.76	46.00	-19.24

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6. PEAK OUTPUT POWER MEASUREMENT

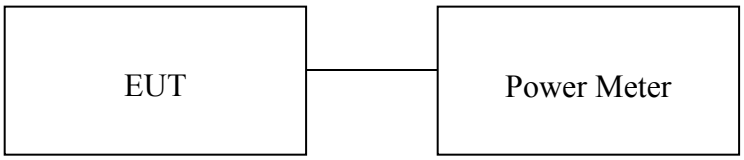
6.1. Standard Applicable:

According to §15.247(b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: 0.125 Watts.

6.2. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter 05	Anritsu	ML2495A	1116010	07/28/2016	07/27/2017
Power Sensor 05	Anritsu	MA2411B	34NKF50	07/28/2016	07/27/2017
DC Power supply	ABM	8185D	N/A	09/05/2015	09/04/2016
AC Power supply	EXTECH	CFC105W	NA	12/26/2015	12/25/2016
Splitter	MCLI	PS4-199	12465	12/26/2015	12/25/2017
Spectrum analyzer	Agilent	N9030A	MY51360021	10/02/2015	10/01/2016

6.3. .Test Set-up:



6.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

6.5. Measurement Result:

BDR Mode

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	4.89	0.0	4.89	0.00371	1
Mid	4.78	0.0	4.78	0.00361	1
High	4.75	0.0	4.75	0.00359	1

EDR 2M Mode

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	4.14	0.0	4.14	0.00312	0.125
Mid	3.94	0.0	3.94	0.00298	0.125
High	3.54	0.0	3.54	0.00272	0.125

EDR 3M Mode

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	4.11	0.0	4.11	0.00310	0.125
Mid	4.03	0.0	4.03	0.00304	0.125
High	3.62	0.0	3.62	0.00277	0.125

Offset Cable loss 0.8dB

7. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

7.1. Standard Applicable:

According to §15.247(d), in any 100 KHz 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, 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 in15.209(a).

7.2. Measurement Equipment Used:

7.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

7.2.2. Radiated emission:

Chamber 14(966)					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer 21(26.5GHz)	Agilent	N9010A	MY49060537	07/29/2016	07/28/2017
Spectrum Analyzer 20(6.5GHz)	Agilent	E4443A	MY48250315	05/20/2016	05/19/2017
Spectrum Analyzer 22(43GHz)	R&S	FSU43	100143	05/22/2016	05/21/2017
Dipole antenna	SCHWARZBECK	VHAP,30-300	919	12/28/2015	12/27/2017
Dipole antenna	SCHWARZBECK	UHAP,300-1000	1195	12/28/2015	12/27/2017
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	06/17/2015	06/16/2017
Bilog Antenna30-1G	SCHWARZBECK	VULB9168	644	03/02/2016	03/01/2017
Horn antenna1-18G	ETS	3117	00066665	11/30/2015	11/29/2016
Horn antenna26-40G(05)	Com-power	AH-640	100A	01/21/2015	01/20/2017
Horn antenna18-26G(04)	Com-power	AH-826	081001	07/24/2015	07/23/2017
Preamplifier9-1000M	HP	8447D	NA	03/11/2016	03/10/2017
Preamplifier1-18G	MITEQ	AFS44-00101800-25-10P-44	1329256	07/27/2016	07/26/2017
Preamplifier1-26G	EM	EM01M26G	NA	03/10/2016	03/09/2017
Preamplifier26-40G	MITEQ	JS-26004000-27-5A	818471	07/23/2015	07/22/2017
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	11/25/2015	11/24/2016
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/02/2015	10/01/2016
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&37421/2	11/03/2015	11/02/2017
Signal Generator	R&S	SMU200A	102330	03/28/2016	03/27/2017
Signal Generator	Anritsu	MG3692A	20311	11/04/2015	11/03/2016
2.4G Filter	Micro-Tronics	Brm50702	76	12/26/2015	12/25/2016

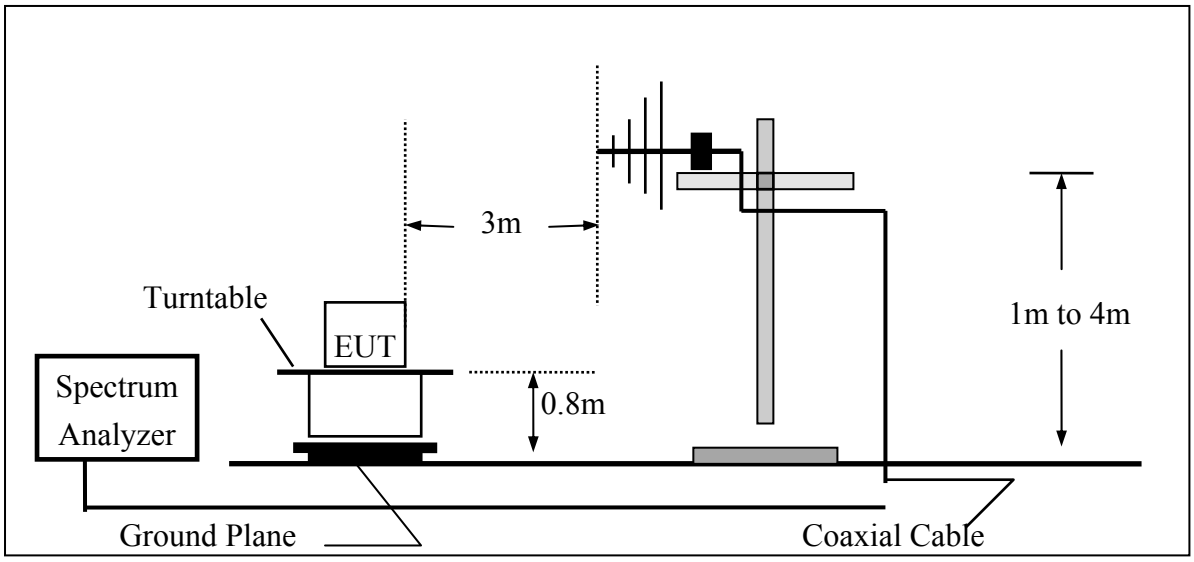
7.3. Test SET-UP:

7.3.1. Conducted Emission at antenna port:

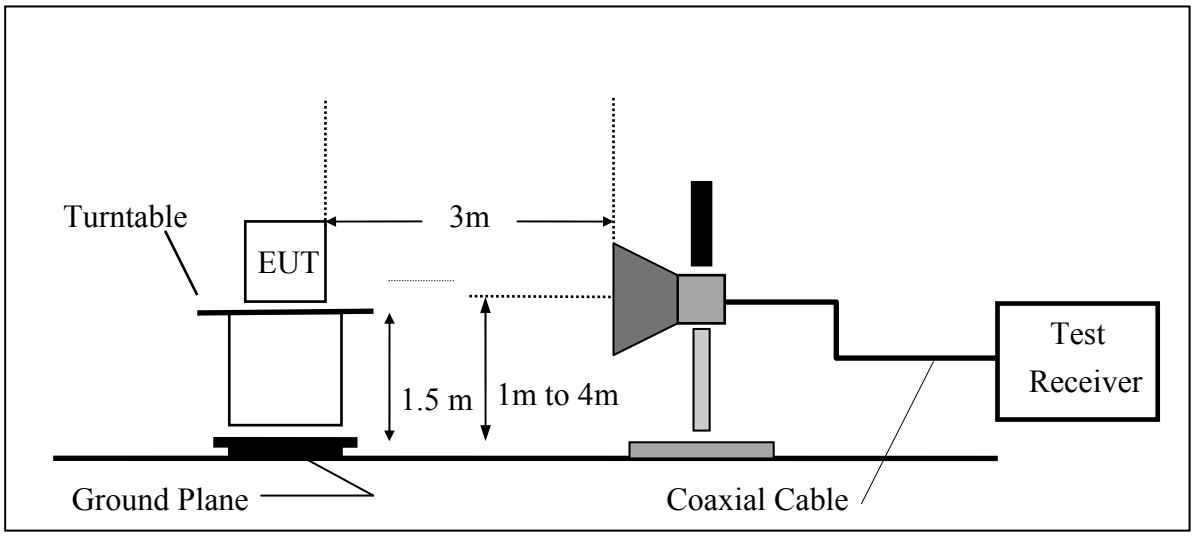
Refer to section 6.3 for details.

7.3.2. Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



7.4. Measurement Procedure:

1. Place the EUT on the table and set it in 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 center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

7.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

7.6. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Bandedge Mode

Radiated Emission: (BDR mode)

Operation Mode	TX CH Low	Test Date	2016/08/04
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25		

Radiated Emission (EDR 2M mode):

Operation Mode	TX CH Low	Test Date	2016/08/04
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25		

Radiated Emission (EDR 3M mode):

Operation Mode	TX CH Low	Test Date	2016/08/04
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25		

8. SPURIOUS EMISSION TEST

8.1. Standard Applicable:

According to §15.247(d), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

8.2. Measurement Equipment Used:

8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2. Radiated emission:

Refer to section 7.2 for details.

8.3. Test SET-UP:

8.3.1. Conducted Emission at antenna port:

Refer to section 6.3 for details.

8.3.2. Radiated emission:

Refer to section 7.3 for details.

8.4. Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measured were complete.

8.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

8.6. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Radiated Spurious Emission Measurement Result: (below 1GHz) (Worst case: BDR Mode)

Operation Mode	TX CH Low	Test Date	2016/08/04
Fundamental Frequency	2402MHz	Test By	Dino
Temperature	25		

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/08/04
Fundamental Frequency	2441MHz	Test By	Dino
Temperature	25		

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	2016/08/04
Fundamental Frequency	2480MHz	Test By	Dino
Temperature	25		

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	2016/08/04
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25		

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/08/04
Fundamental Frequency	2441 MHz	Test By	Dino
Temperature	25		

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	2016/08/04
Fundamental Frequency	2480 MHz	Test By	Dino
Temperature	25		

9. FREQUENCY SEPARATION

9.1. Standard Applicable:

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 20dB bandwidth of the hopping channel, whichever is greater.

9.2. Measurement Equipment Used:

Refer to section 6.2 for details.

9.3. Test Set-up:

Refer to section 6.3 for details.

9.4. Measurement Procedure:

1. Place the EUT on the table and set it in 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 center frequency of spectrum analyzer = middle of hopping channel .
4. Set the spectrum analyzer as RBW,VBW=100KHz, Adjust Span to 3.0 MHz, Sweep = auto.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

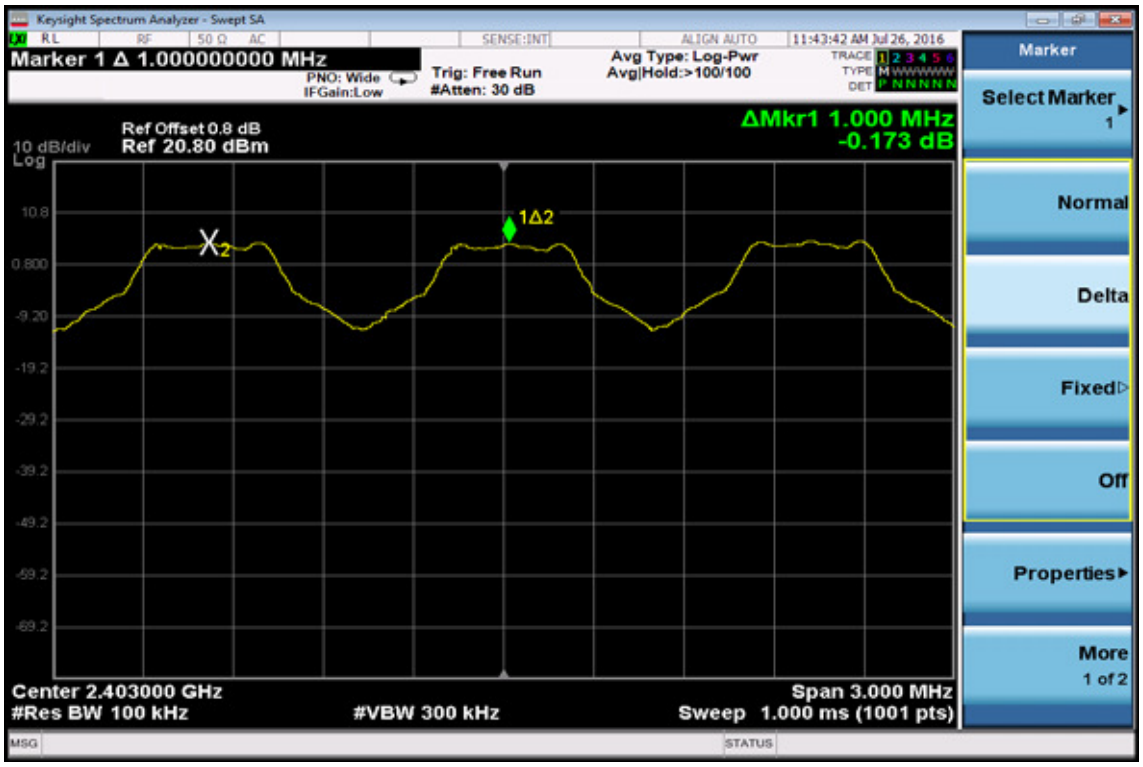
9.5. Measurement Result:

Channel separation (MHz)	Limit	Result
1	>=25KHz or 2/3 times 20dB bandwidth	PASS

Note: Refer to next page for plots.

Frequency Separation Test Data

Low



Mid

High

Keysight Spectrum Analyzer - Swept SA
Marker 1 Δ 1.000000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:12:22 PM Jul 26, 2016
Ref Offset 0.8 dB
10 dB/div
Ref 20.80 dBm
Log
ΔMkr1 1.000 MHz
-0.049 dB
1Δ2
Center 2.479000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

10. NUMBER OF HOPPING FREQUENCY

10.1. Standard Applicable:

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

10.2. Measurement Equipment Used:

Refer to section 6.2 for details.

10.3. Test Set-up:

Refer to section 6.3 for details.

10.4. Measurement Procedure:

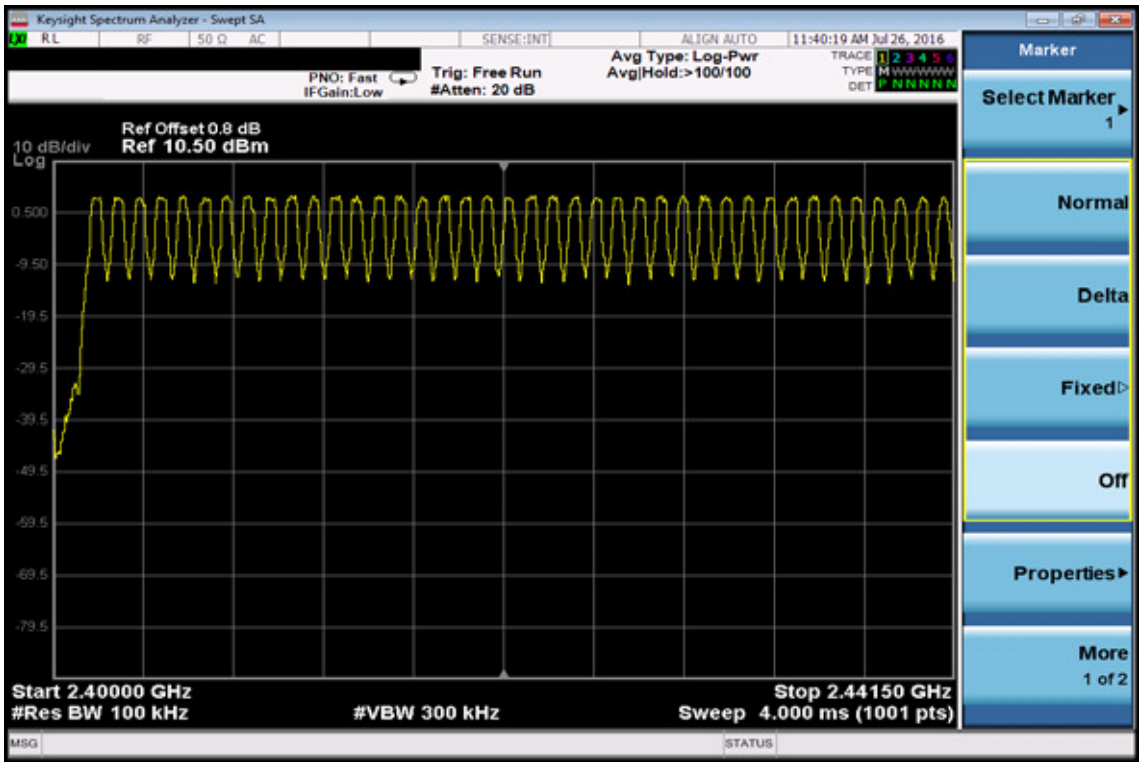
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Start=2400MHz, Stop = 2441MHz and Start=2441MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW=300KHz, VBW=1MHz
5. Max hold, view and count how many channel in the band.

10.5. Measurement Result:

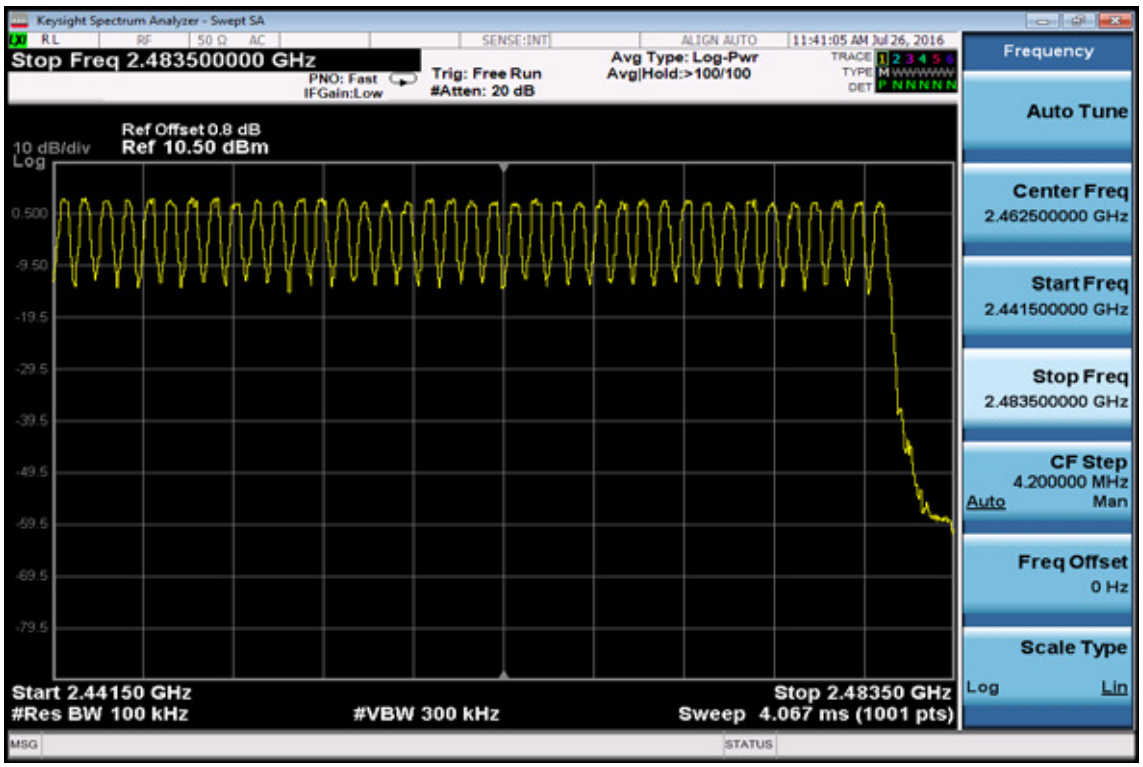
Test Result : 79 Channel > 15 Channel

Note: Refer to next page for plots.

Channel Number
2.4 GHz – 2.441GHz



2.441 GHz – 2.4835GHz



11. TIME OF OCCUPANCY (DWELL TIME)

11.1. Standard Applicable:

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

11.2. Measurement Equipment Used:

Refer to section 6.2 for details.

11.3. Test Set-up:

Refer to section 6.3 for details.

11.4. Measurement Procedure:

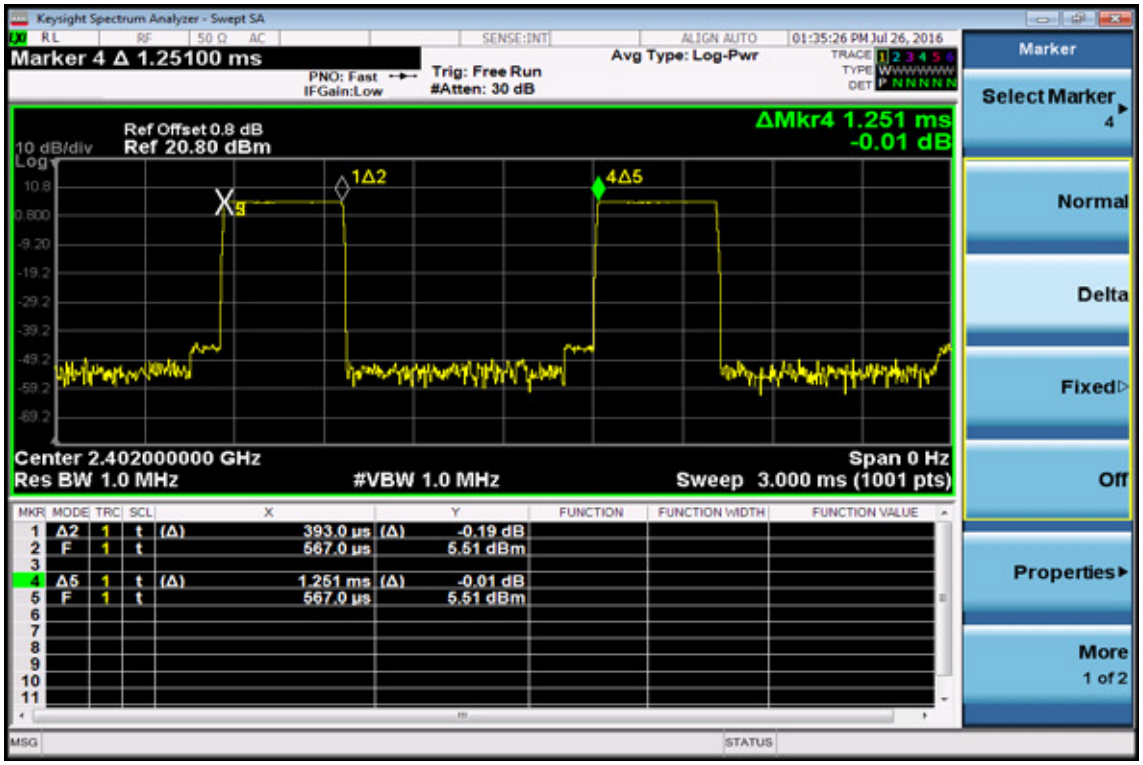
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW / VBW =1MHz, Span = 0Hz , Adjust Sweep = 2.5ms.
5. Repeat above procedures until all frequency measured were complete.

11.5. Measurement Result:

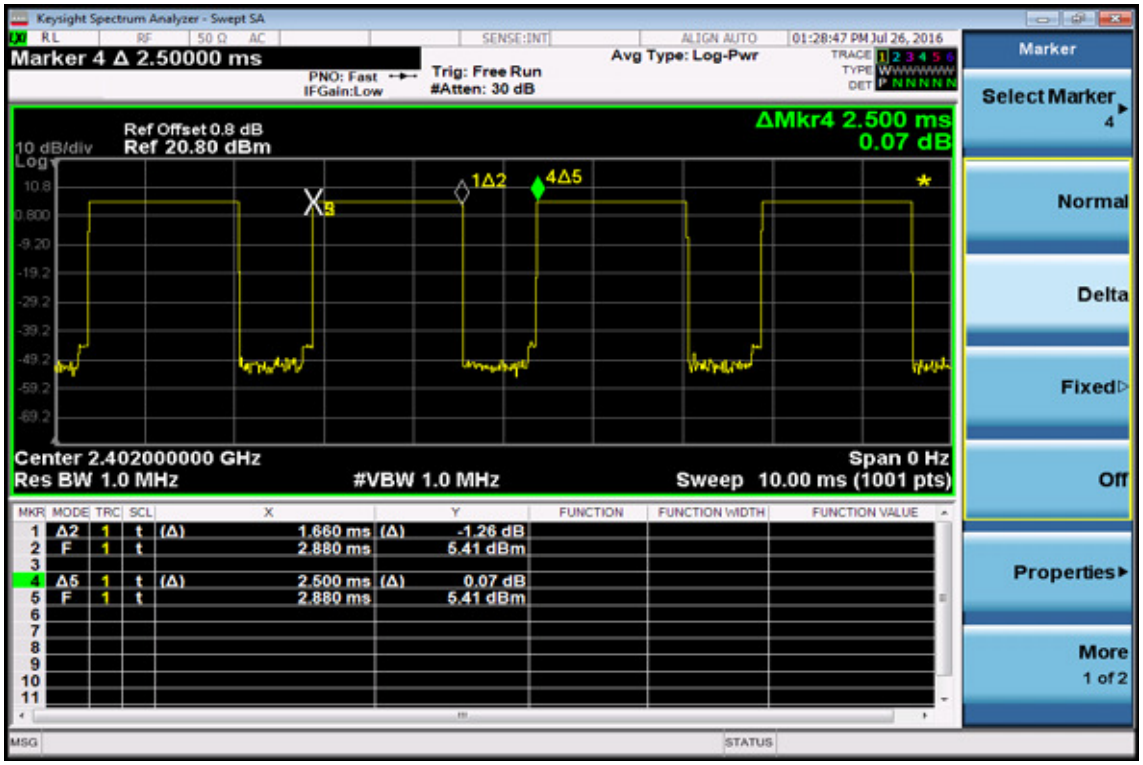
A period time = 0.4 (ms) * 79 = 31.6 (s)

Low Channel

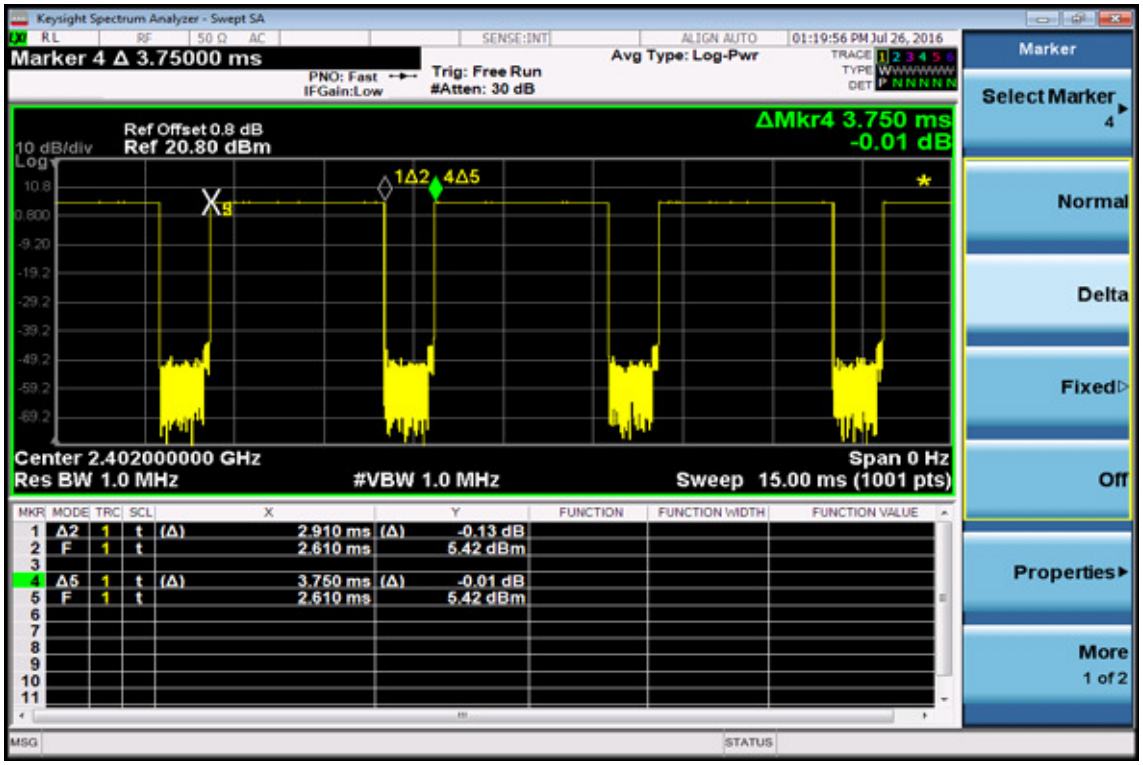
DH1



DH3

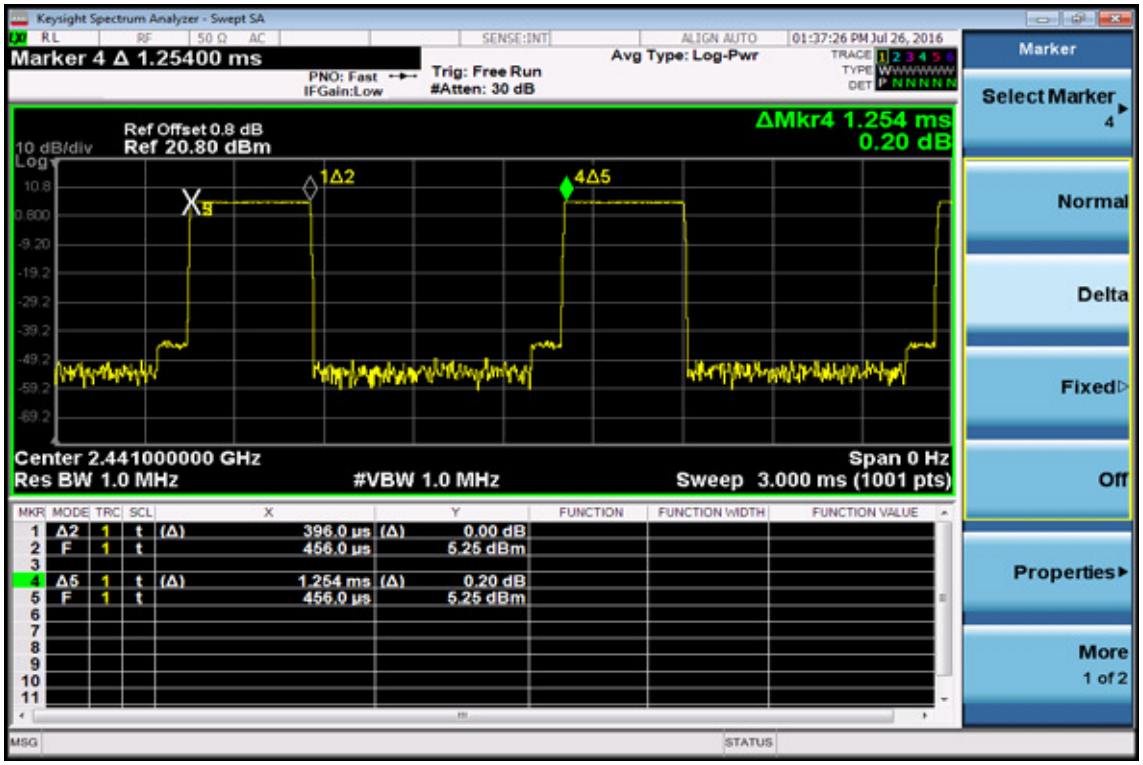


DH5

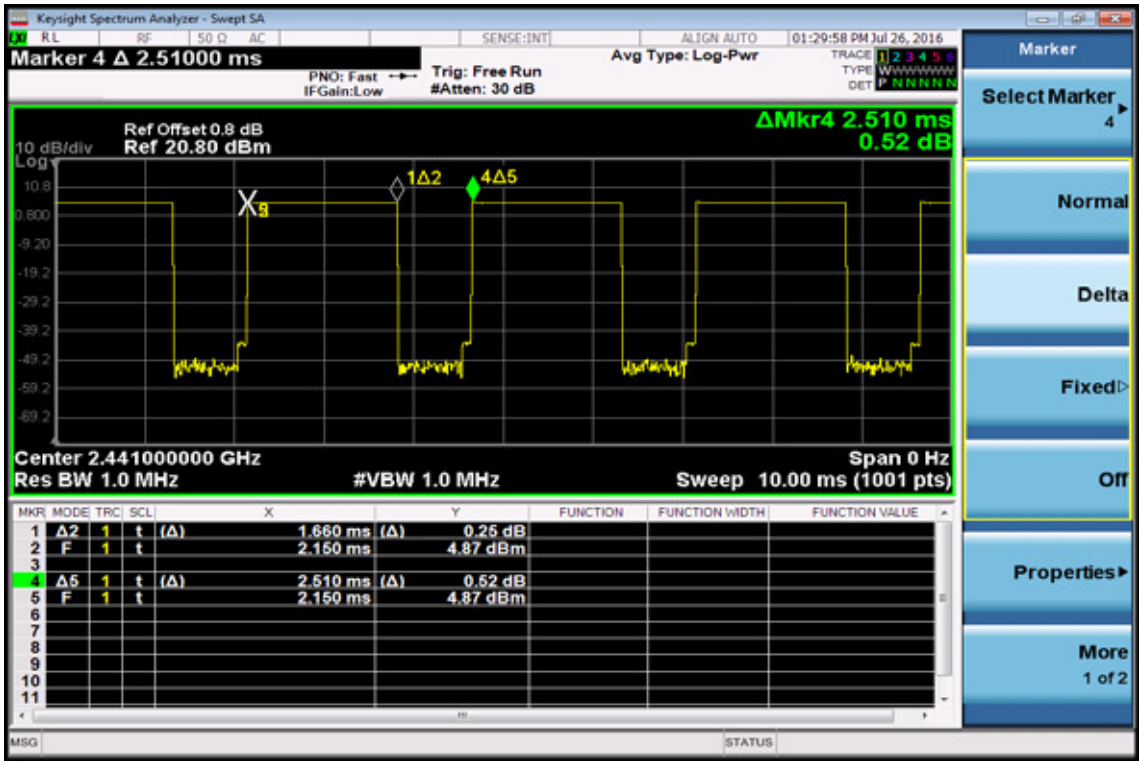


Mid Channel

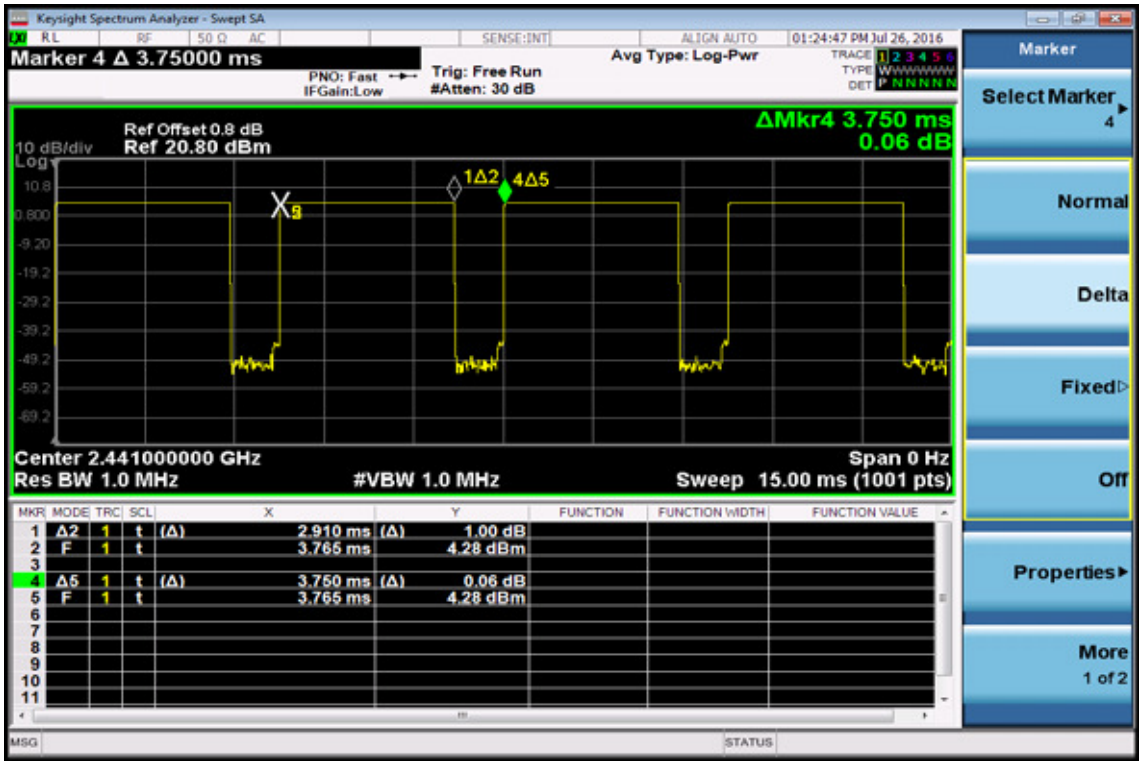
DH1



DH3


Keysight Spectrum Analyzer - Swept SA
Marker 4 Δ 2.51000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
01:29:58 PM Jul 26, 2016
Ref Offset 0.8 dB
10 dB/div
Ref 20.80 dBm
ΔMkr4 2.510 ms
0.52 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (1001 pts)
1 Δ2 1 t (Δ) 1.660 ms (Δ) 0.25 dB
2 F 1 t 2.150 ms 4.87 dBm
4 Δ5 1 t (Δ) 2.510 ms (Δ) 0.52 dB
5 F 1 t 2.150 ms 4.87 dBm
Marker
Select Marker 4
Normal
Delta
Fixed
Off
Properties
More 1 of 2

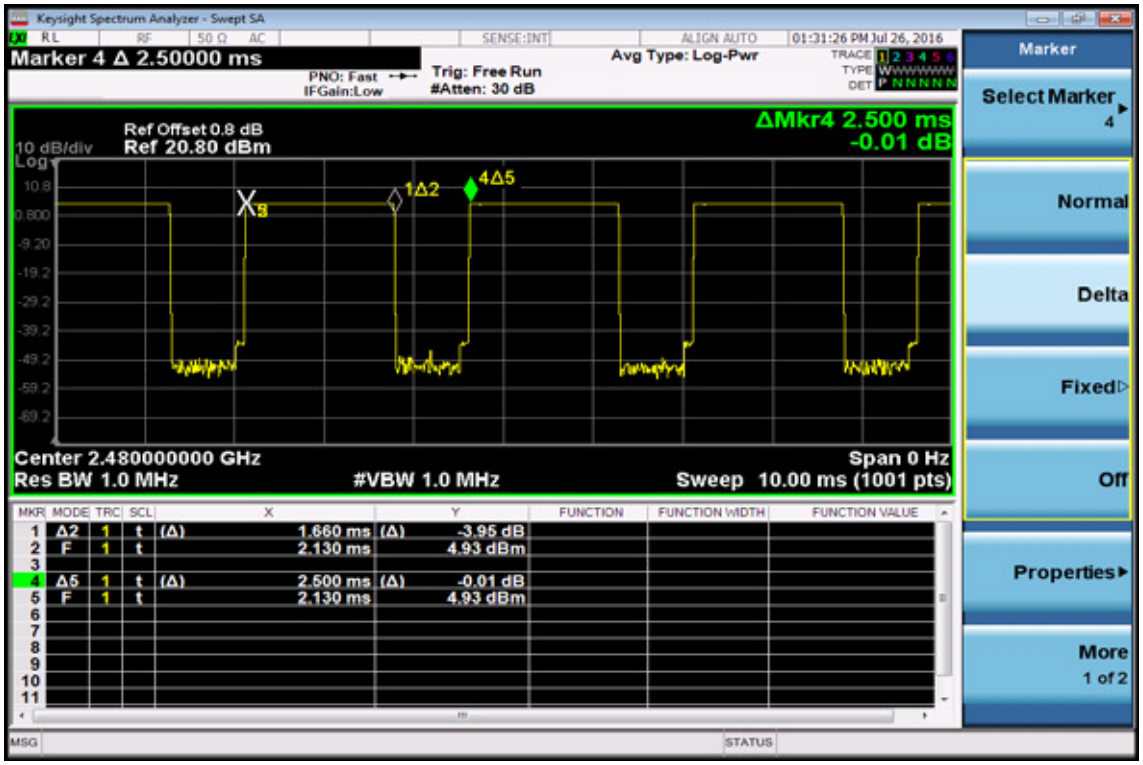
DH5


Keysight Spectrum Analyzer - Swept SA
Marker 4 Δ 3.75000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
01:24:47 PM Jul 26, 2016
Ref Offset 0.8 dB
10 dB/div
Ref 20.80 dBm
ΔMkr4 3.750 ms
0.06 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 15.00 ms (1001 pts)
1 Δ2 1 t (Δ) 2.910 ms (Δ) 1.00 dB
2 F 1 t 3.765 ms 4.28 dBm
4 Δ5 1 t (Δ) 3.750 ms (Δ) 0.06 dB
5 F 1 t 3.765 ms 4.28 dBm
Marker
Select Marker 4
Normal
Delta
Fixed
Off
Properties
More 1 of 2

High Channel

DH1

DH3



DH5

Keysight Spectrum Analyzer - Swept SA
Marker 4 Δ 3.75000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
01:26:17 PM Jul 26, 2016
Ref Offset 0.8 dB
10 dB/div
Ref 20.80 dBm
ΔMkr4 3.750 ms
0.01 dB
Center 2.480000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 15.00 ms (1001 pts)
1 Δ2 F 1 t (Δ) 2.910 ms (Δ) -0.12 dB
2 F 1 t 2.340 ms 5.04 dBm
4 Δ5 1 t (Δ) 3.750 ms (Δ) 0.01 dB
5 F 1 t 2.340 ms 5.04 dBm
Marker
Select Marker 4
Normal
Delta
Fixed
Off
Properties
More 1 of 2

12. 20dB Bandwidth

12.1. Standard Applicable:

According to §15.247(a)(1), for frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

12.2. Measurement Equipment Used:

Refer to section 6.2 for details.

12.3. Test Set-up:

Refer to section 6.3 for details.

12.4. Measurement Procedure:

1. Place the EUT on the table and set it in 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=10KHz (1 % of Bandwidth.), Span= 3MHz, Sweep=auto
4. Mark the peak frequency and –20dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

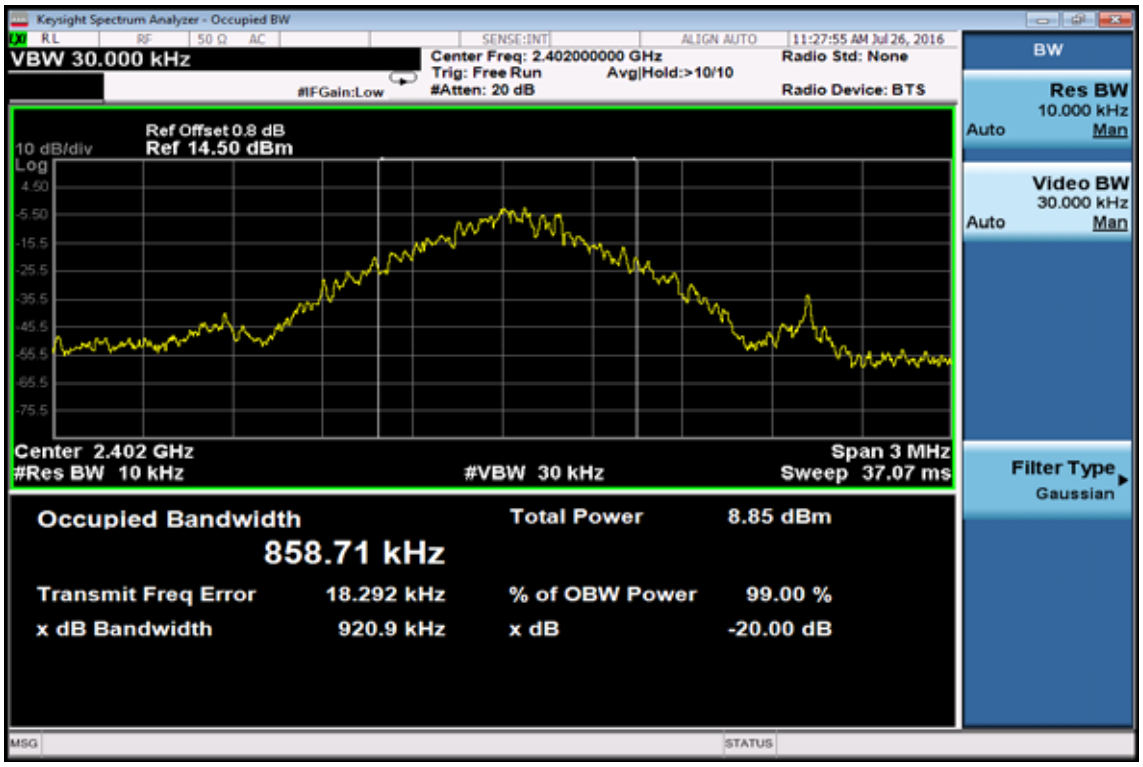
12.5. Measurement Result:

BDR Mode

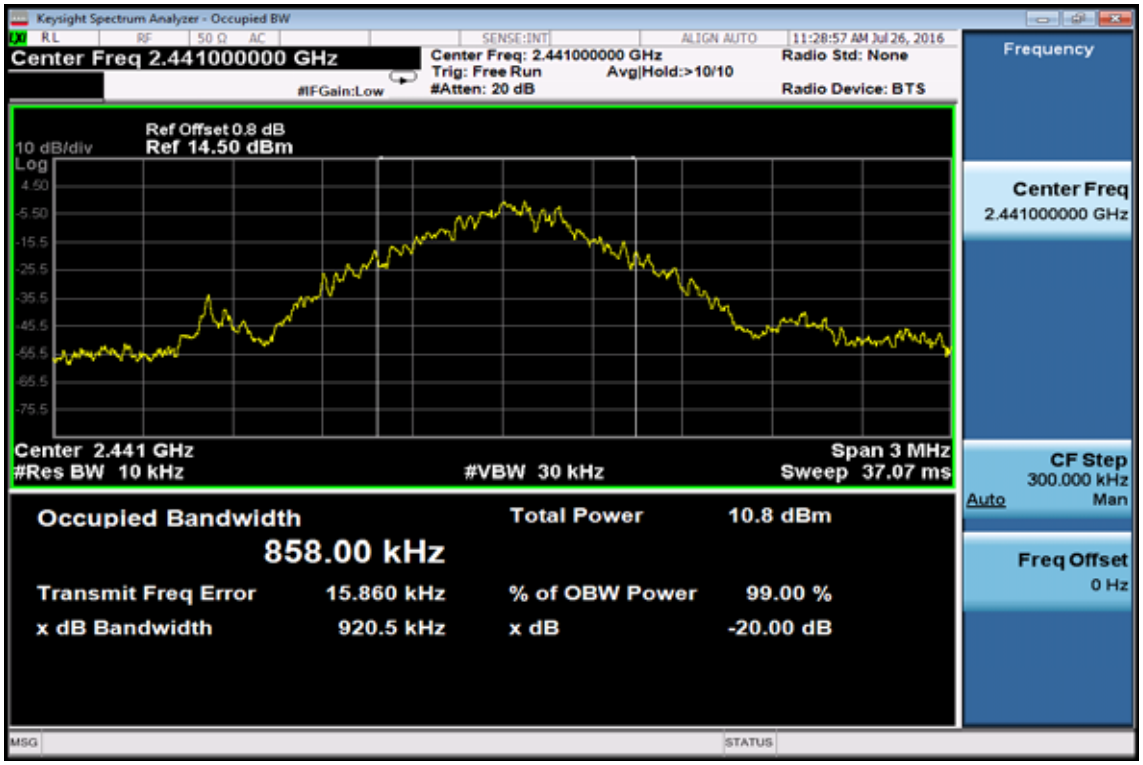
CH	20dB Bandwidth

BDR Mode

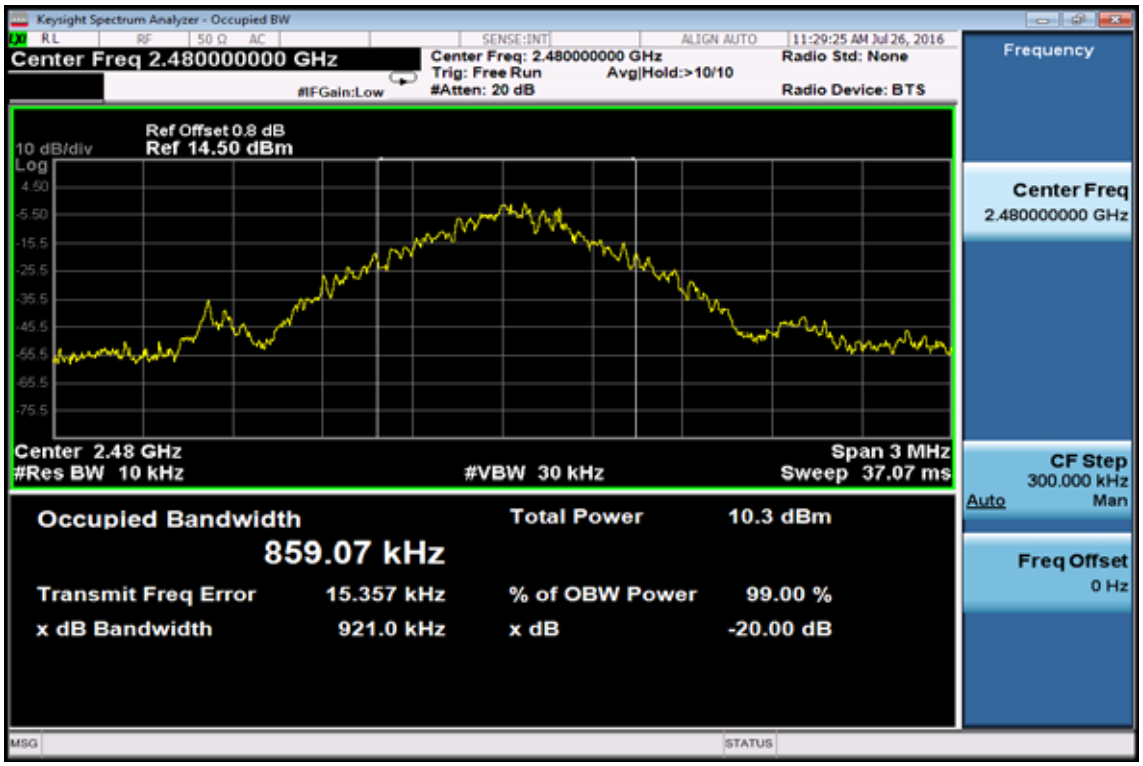
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid

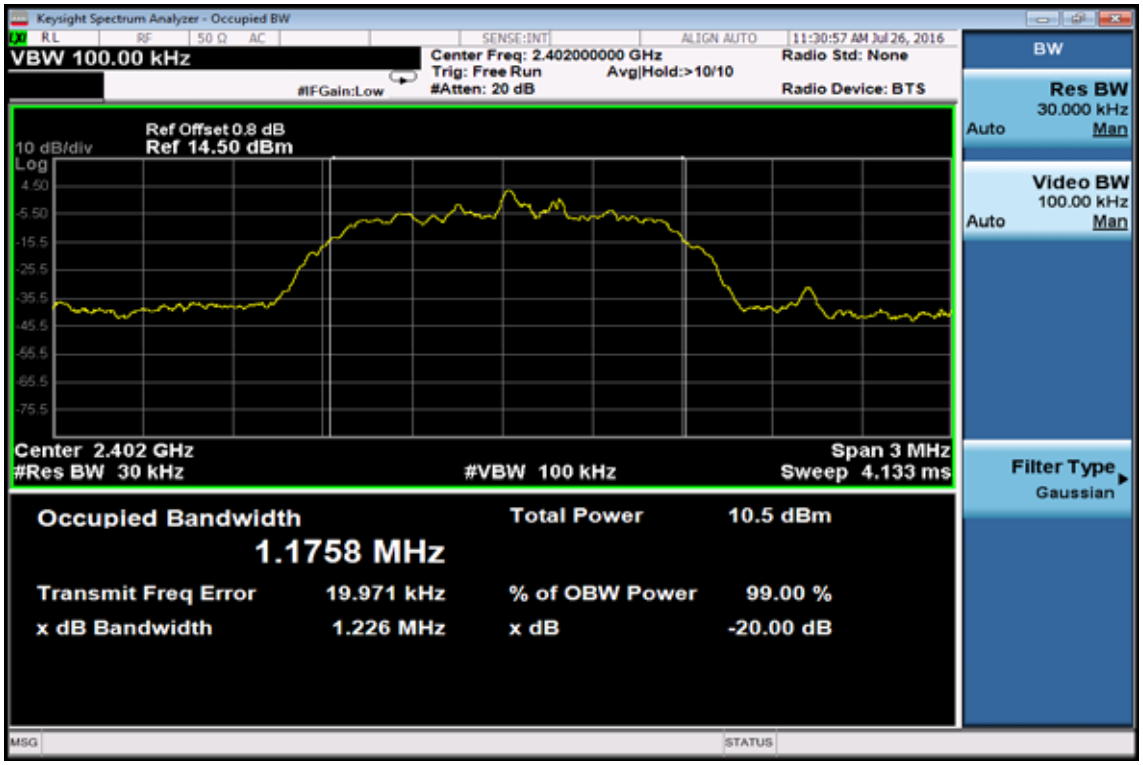


20dB Bandwidth Test Data CH-High

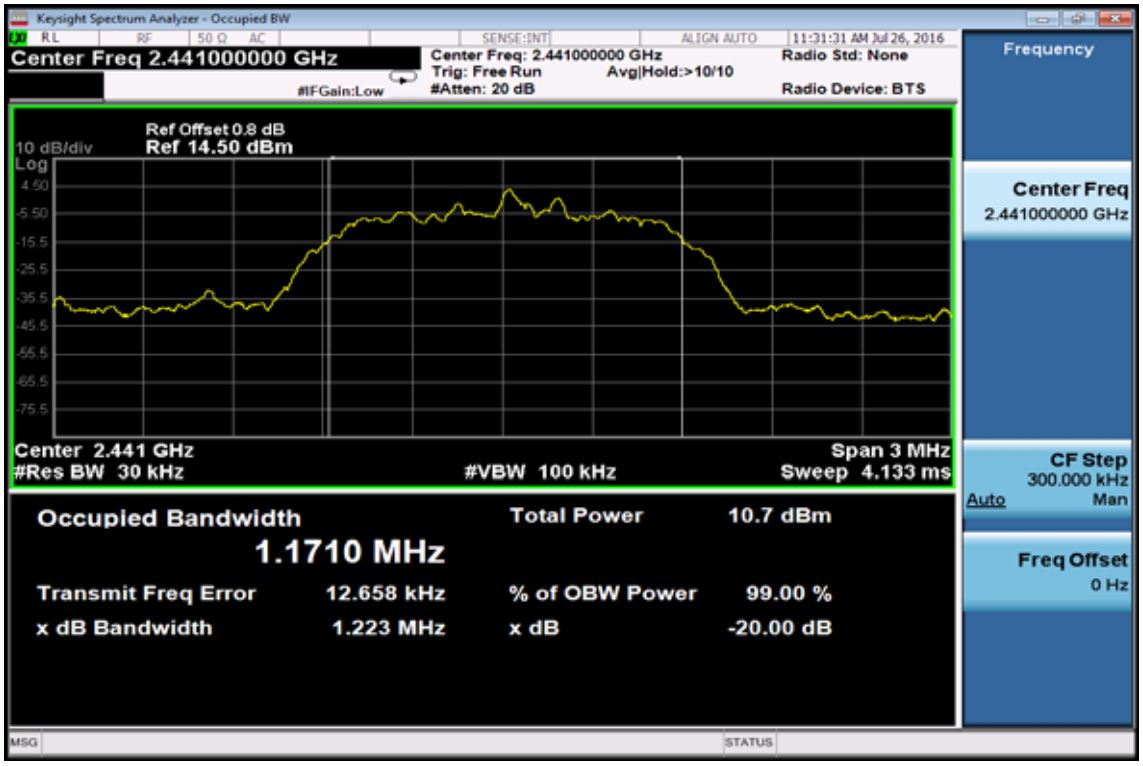


EDR 2M Mode

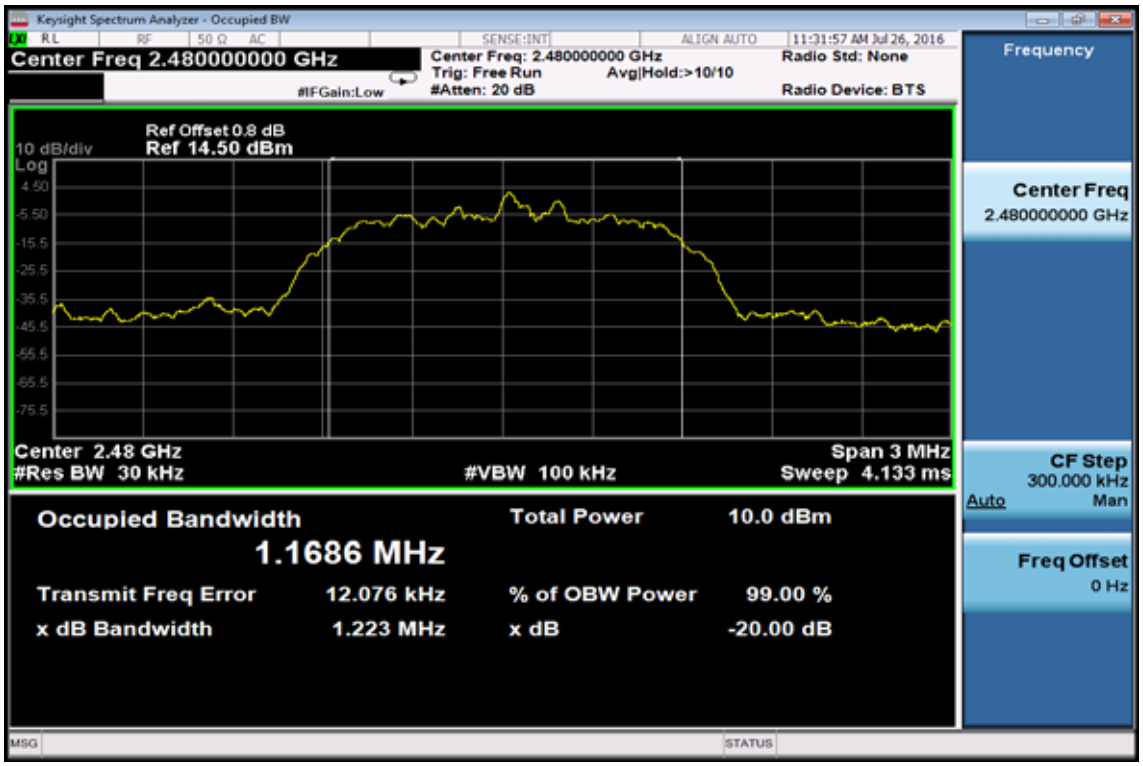
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid

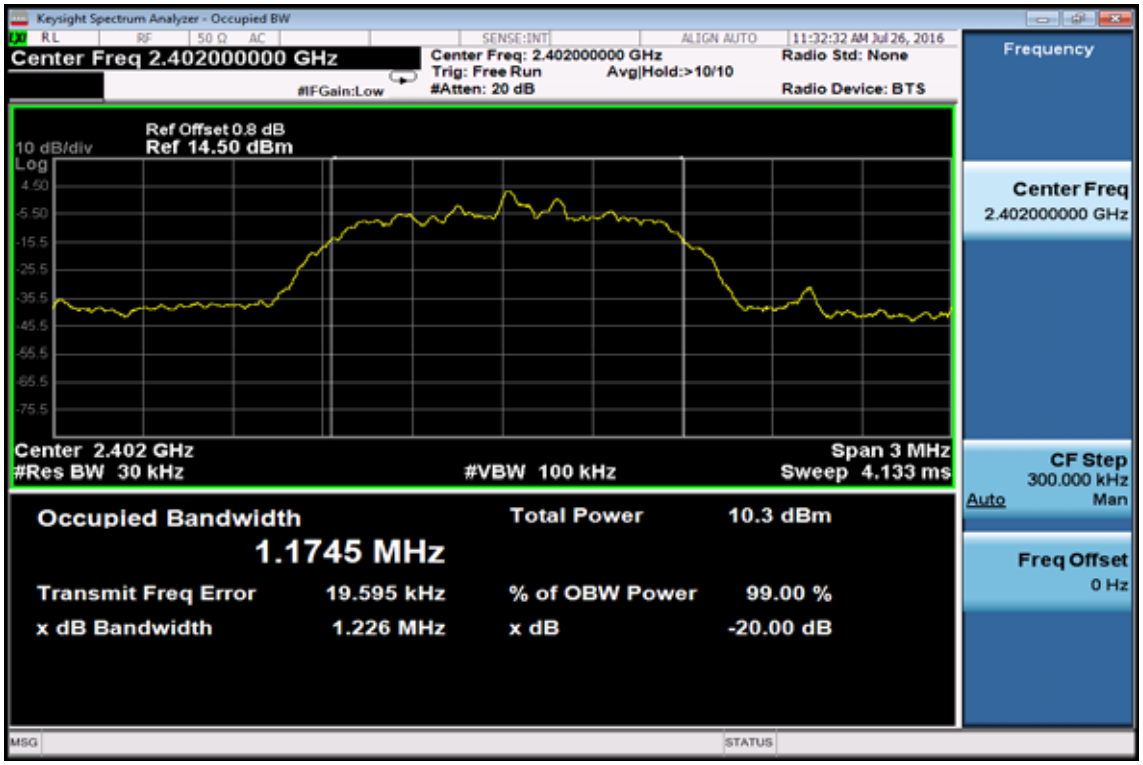


20dB Bandwidth Test Data CH-High

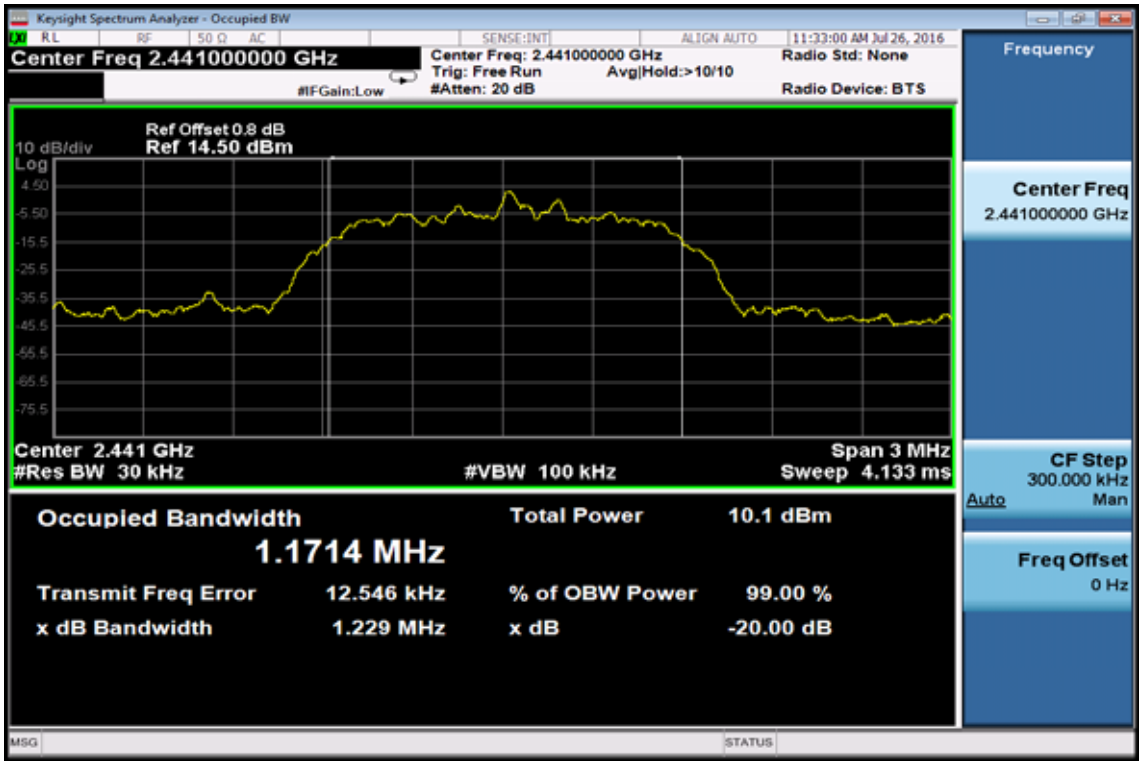


EDR 3M Mode

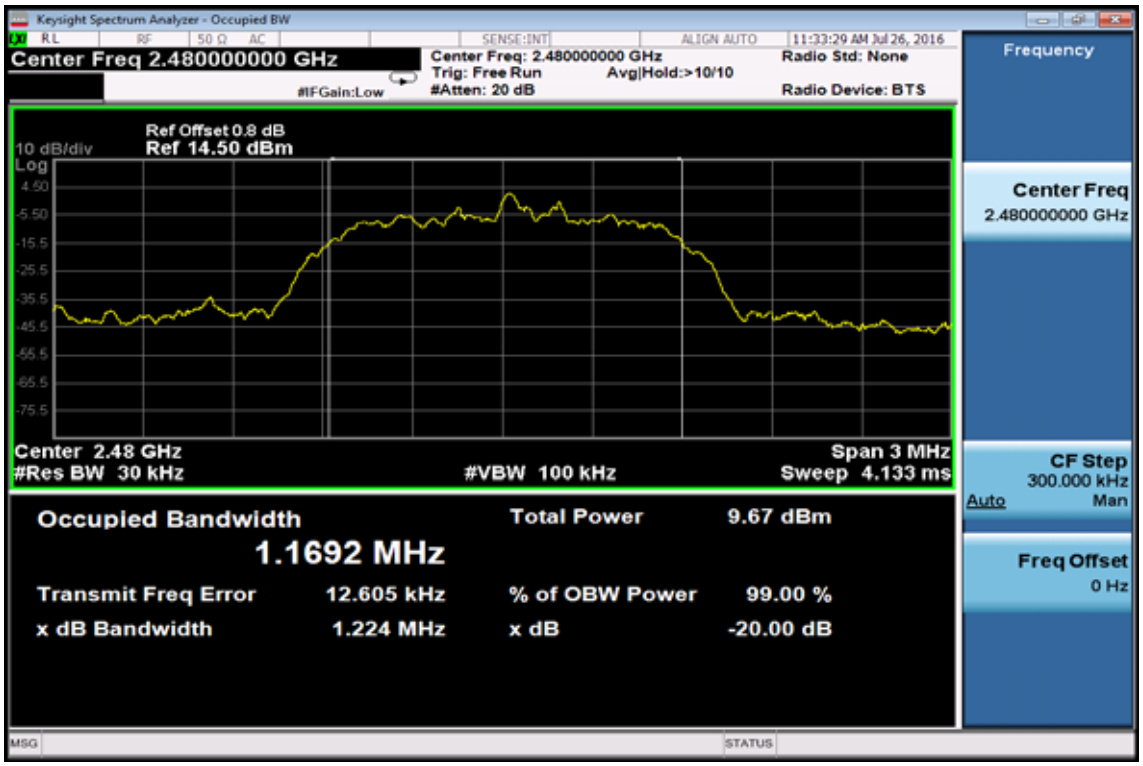
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



20dB Bandwidth Test Data CH-High



13. ANTENNA REQUIREMENT

13.1. Standard Applicable:

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

And according to §15.247(c), 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 6 dBi.

13.2. Antenna Connected Construction:

The directional gains of BT antenna used for transmitting is 2.75dBi, and the antenna type is PCB antenna which is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.