TEST REPORT

of

FCC Part 15 Subpart C

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

Product :	**Aristotle Hub**
Brand:	**MATTEL**
Model:	**FMT67**
Model Difference:	**N/A**
FCC ID:	**PU5FMT67**
FCC Rule Part:	**§15.247, Cat: DSS**
Applicant:	**Wistron Corporation**
Address:	**21F., No. 88, Sec. 1, HsinTai 5th Rd., Hsichih Dist, New Taipei City 221**

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:
No. 120, Lane 180, Hsin Ho Rd.
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-16LR332FCDSS**
Issue Date :**2017/01/05**

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.
This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.
This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.

VERIFICATION OF COMPLIANCE

Applicant:	Wistron Corporation
Product Description:	Aristotle Hub
Brand Name:	MATTEL
Model No.:	FMT67
Model Difference:	N/A
FCC ID:	PU5FMT67
Date of test:	2016/12/08 ~ 2017/01/04
Date of EUT Received:	2016/12/08

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 ***Dion Chang / Engineer***	***Date:***	2017/01/05
Prepared By:	Gigi Yeh ***Gigi Yeh / Specialist***	***Date:***	2017/01/05
Approved By:	Vincent Su ***Vincent Su / Technical Manager***	***Date:***	2017/01/05

Version

Version No.	Date	Description
00	2017/01/05	Initial creation of document

Uncertainty of Measurement

Description Of Test	Uncertainty
Conducted Emission (AC power line)	2.586 dB
Field Strength of Spurious Radiation	<=30MHz: 2.96dB 30-1GHz: 4.22 dB 1-40 GHz: 4.08 dB
Conducted Power	2.412 GHz: 1.30 dB 5.805 GHz: 1.55 dB
Power Density	2.412 GHz:1.30 dB 5.805 GHz: 1.67 dB
Frequency	0.0032%
Time	0.01%
DC Voltage	1%

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1. GENERAL INFORMATION

1.1. Product Description

General:

Product Name	Aristotle Hub	
Brand Name	MATTEL	
Model Name	FMT67	
Model Difference	N/A	
HDMI Port:	One	
Micro sd card	One	
Power Supply	12Vdc from AC adapter	
	Adapter:	Model No.: WA-30J12FU

WLAN: 1TX/1RX

Wi-Fi	Frequency Range (MHz)	Channels	Peak / Average Power	Modulation Technology
802.11b	2412 – 2462	11	18.00dBm (PK)	DSSS
802.11g	2412 – 2462	11	21.00dBm (PK)	OFDM
802.11n	HT20 2412 – 2462	11	20.00dBm (PK)	
Modulation type		CCK, DQPSK, DBPSK for DSSS 256QAM.64QAM. 16QAM, QPSK, BPSK for OFDM		
Antenna Designation		Chip Antenna 4.9 dBi		
Tune up power		+/- 1 dB		

Bluetooth: 1TX/1RX

Frequency Range:	2402– 2480MHz	
Bluetooth Version:	BT2.1+BT3.0	BT BLE 4.0+ 4.1
Channel number:	79 channels	40 channels
Modulation type	GFSK + π/4DQPSK + 8DPSK	GFSK
Transmit Power:	11.00 dBm Peak	1.00 dBm Peak
Tune up power	+/- 1 dB	
Dwell Time:	<= 0.4s	N/A
Antenna Designation:	Chip Antenna 4.9dBi	

Zigbee: 1TX/1RX

Frequency Range(MHz)	2405-2480MHz
Modulation type	OQPSK
Channel Number	16
Antenna Designation:	Chip Antenna 3.6 dBi

The EUT is compliance with IEEE 802.11 b/g/n, BT2.1+3.0 and BT4.0+ 4.1 Standard.

This test report applies for Bluetooth EDR V2.1 +3.0 transmitter.

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: PU5FMT67** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2014, 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 . FCC Registration Number is: 872200; Designation Number is: TW1036, Canada Registration Number: 4067B-4.

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 operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

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 5 and 7 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 m/1.5m(Frequency above 1GHz) 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 according to the requirements in Section 6 and 11 of ANSI C63.10: 2013.

2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed channel)

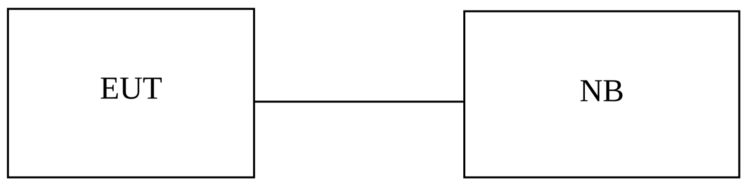


Table 1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	NB	HP	440i	N/A	N/A	No- Shielding

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/EIRP	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 & 99% Power 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)、mid (2441MHz) and high (2480MHz) with each modulation were chosen for full testing.

The worst case EDR 3M mode was reported for Radiated Emission.

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	09/08/2016	09/07/2017
LISN 18	ROHDE & SCHWARZ	ENV216	101424	02/11/2016	02/10/2017
LISN 19	ROHDE & SCHWARZ	ENV216	101425	03/12/2016	03/11/2017
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

5.3. EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2009.
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.

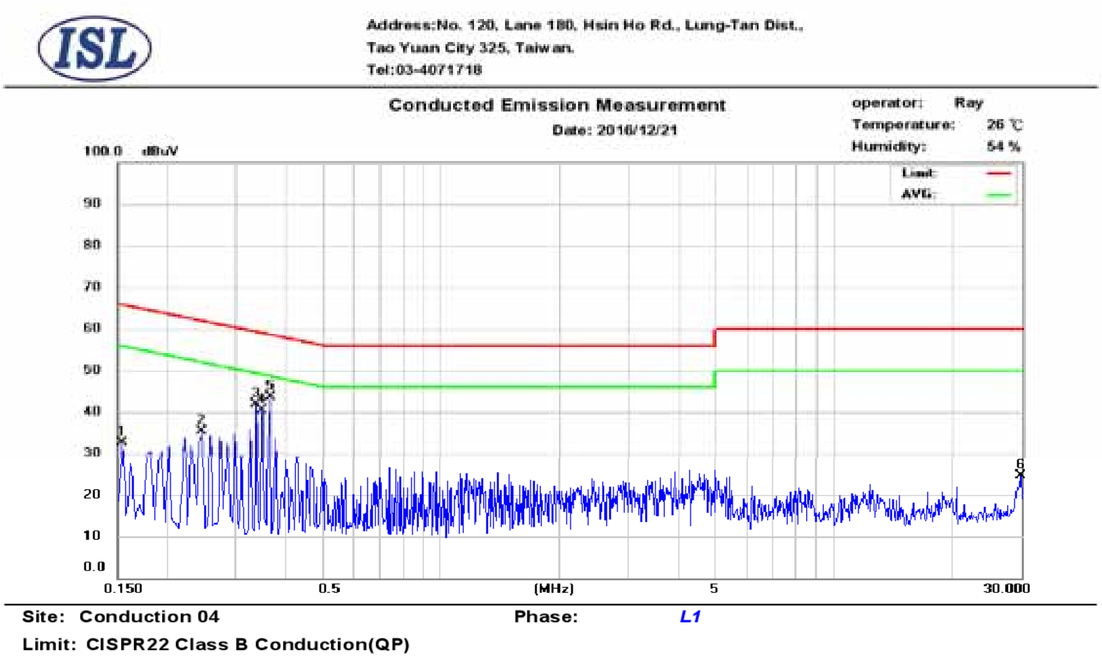
5.5. Measurement Result:

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:	2016/12/21



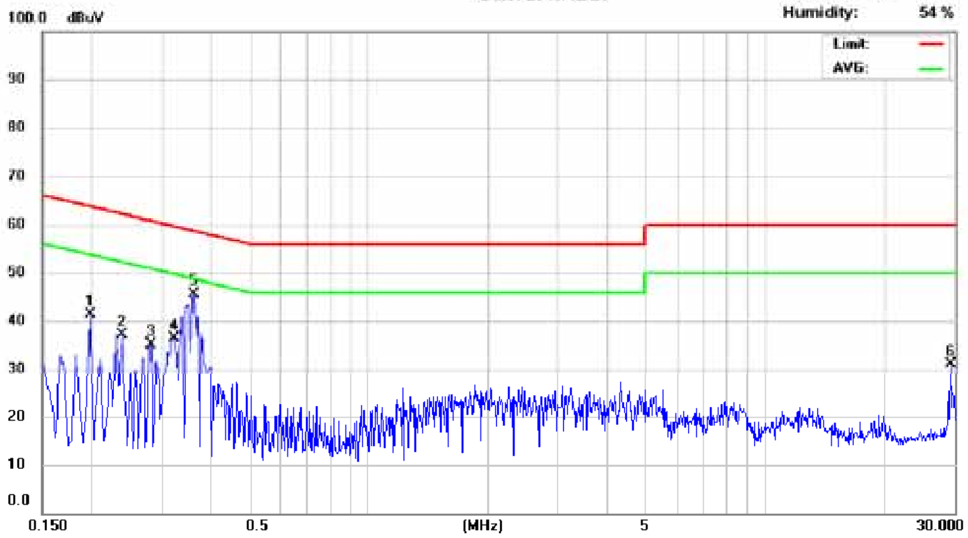
No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.154	24.23	2.03	9.69	33.92	65.78	-31.86	11.72	55.78	-44.06
2	0.246	21.51	0.87	9.69	31.20	61.89	-30.69	10.56	51.89	-41.33
3	0.338	26.91	3.86	9.69	36.60	59.25	-22.65	13.55	49.25	-35.70
4	0.350	29.28	5.06	9.69	38.97	58.96	-19.99	14.75	48.96	-34.21
5	0.366	28.07	4.53	9.69	37.76	58.59	-20.83	14.22	48.59	-34.37
6	29.878	7.63	0.12	10.14	17.77	60.00	-42.23	10.26	50.00	-39.74

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718

Conducted Emission Measurement

Date: 2016/12/21

operator: Ray
Temperature: 26 ℃
Humidity: 54 %



Site: Conduction 04 Phase: *N*

Limit: CISPR22 Class B Conduction(QP)

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	0.198	21.58	1.02	9.68	31.26	63.69	-32.43	10.70	53.69	-42.99
2	0.238	22.65	1.38	9.68	32.33	62.17	-29.84	11.06	52.17	-41.11
3	0.282	19.66	0.23	9.69	29.35	60.76	-31.41	9.92	50.76	-40.84
4	0.322	21.93	1.77	9.68	31.61	59.66	-28.05	11.45	49.66	-38.21
5	0.362	31.52	7.12	9.68	41.20	58.68	-17.48	16.80	48.68	-31.88
6	29.294	9.95	-0.51	10.30	20.25	60.00	-39.75	9.79	50.00	-40.21

6. PEAK OUTPUT POWER MEASUREMENT

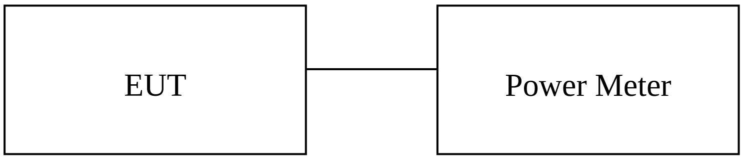
6.1. Standard Applicable:

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
Power Sensor 06	DARE	RPR3006W	13I00030SNO33	11/03/2016	11/02/2017
Power Sensor 07	DARE	RPR3006W	13I00030SNO34	11/03/2016	11/02/2017
Temperature Chamber	KSON	THS-B4H100	2287	06/28/2016	06/27/2017
DC Power supply	ABM	8185D	N/A	10/06/2016	10/05/2017
AC Power supply	EXTECH	CFC105W	NA	12/25/2016	12/24/2017
Attenuator	Woken	Watt-65m3502	11051601	NA	NA
Splitter	MCLI	PS4-199	12465	12/26/2015	12/25/2017
Spectrum analyzer	keysight	N9010A	MY56070257	05/31/2016	05/30/2017
Spectrum analyzer	R&S	FSP40	100143	08/07/2016	08/06/2017
Test Sofware	DARE	Radimation Ver:2013.1.23	NA	NA	NA

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	10.05	0.00	10.05	0.01012	1
Mid	10.61	0.00	10.61	0.01151	1
High	7.76	0.00	7.76	0.00597	1

EDR 2M Mode

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	11.03	0.00	11.03	0.01268	0.125
Mid	11.43	0.00	11.43	0.01390	0.125
High	8.67	0.00	8.67	0.00736	0.125

EDR 3M Mode

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	11.21	0.00	11.21	0.01321	0.125
Mid	11.65	0.00	11.65	0.01462	0.125
High	8.87	0.00	8.87	0.00771	0.125

Offset: 1dB

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	11/14/2016	11/13/2017
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
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	06/17/2015	06/16/2017
Bilog Antenna30-1G	Schaffner	CBL 6112D	37873	07/22/2016	07/21/2017
Horn antenna1-18G	ETS	3117	00066665	07/22/2016	07/21/2017
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	03/09/2016	03/08/2017
Preamplifier1-18G	MITEQ	AFS44-001018 00-25-10P-44	1329256	07/27/2016	07/26/2017
Preamplifier1-26G	EM	EM01M26G	NA	03/10/2016	03/09/2017
Preamplifier26-40G	MITEQ	JS-26004000-2 7-5A	818471	07/23/2015	07/22/2017
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	11/25/2016	11/24/2017
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/02/2016	10/01/2017
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&3742 1/2	11/03/2015	11/02/2017
2.4G Filter	Micro-Tronics	Brm50702	76	12/25/2016	12/24/2017
Test Software	Audix	E3 Ver:6.12023	N/A	N/A	N/A
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

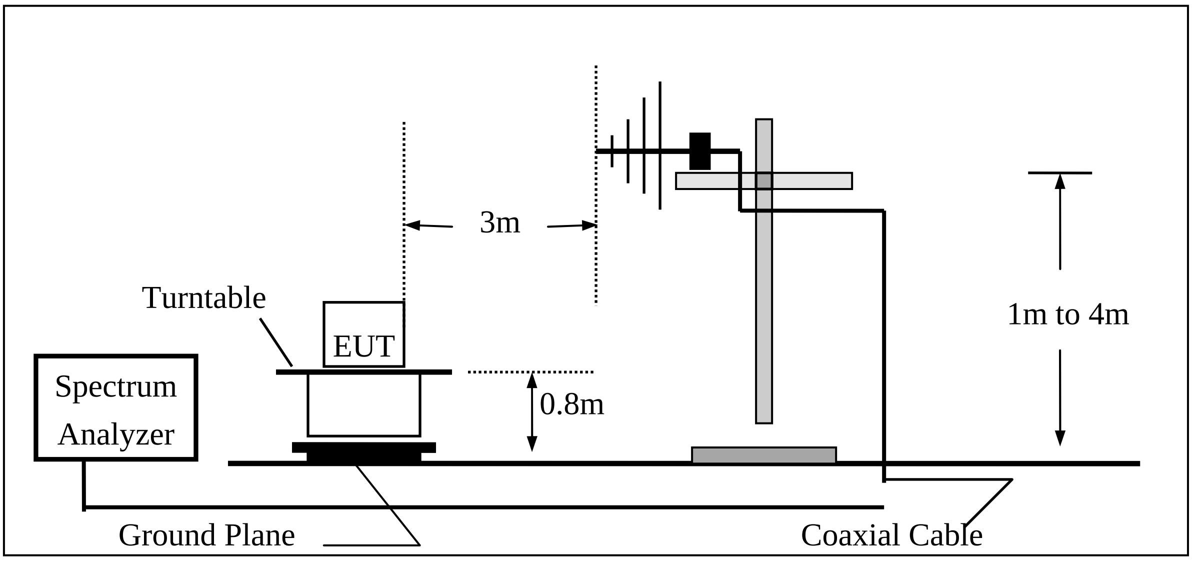
7.3. Test SET-UP:

7.3.1. Conducted Emission at antenna port:

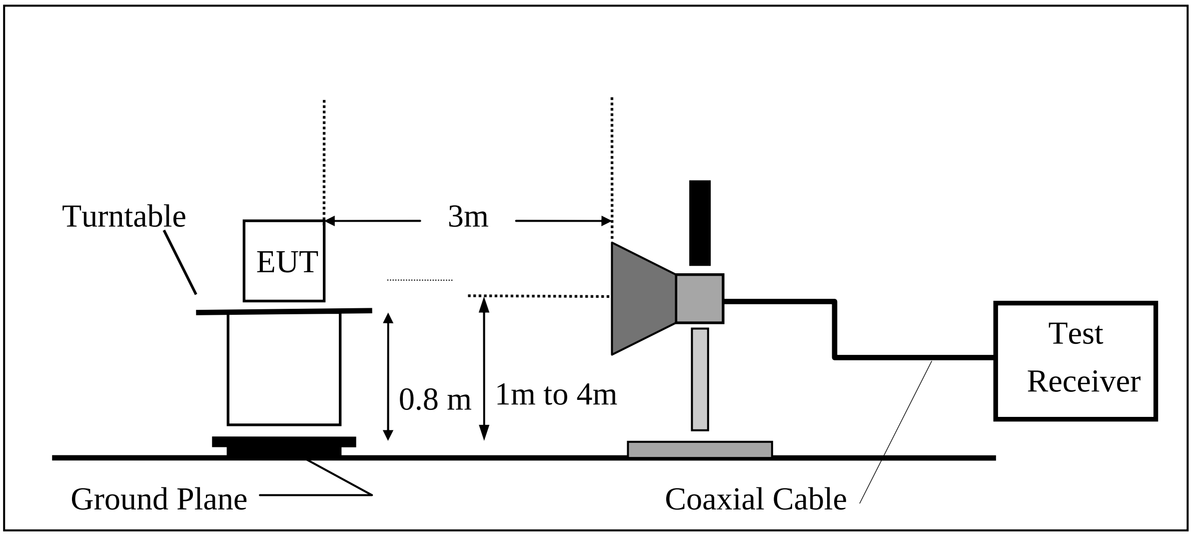
Refer to section 6.3 for details.

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

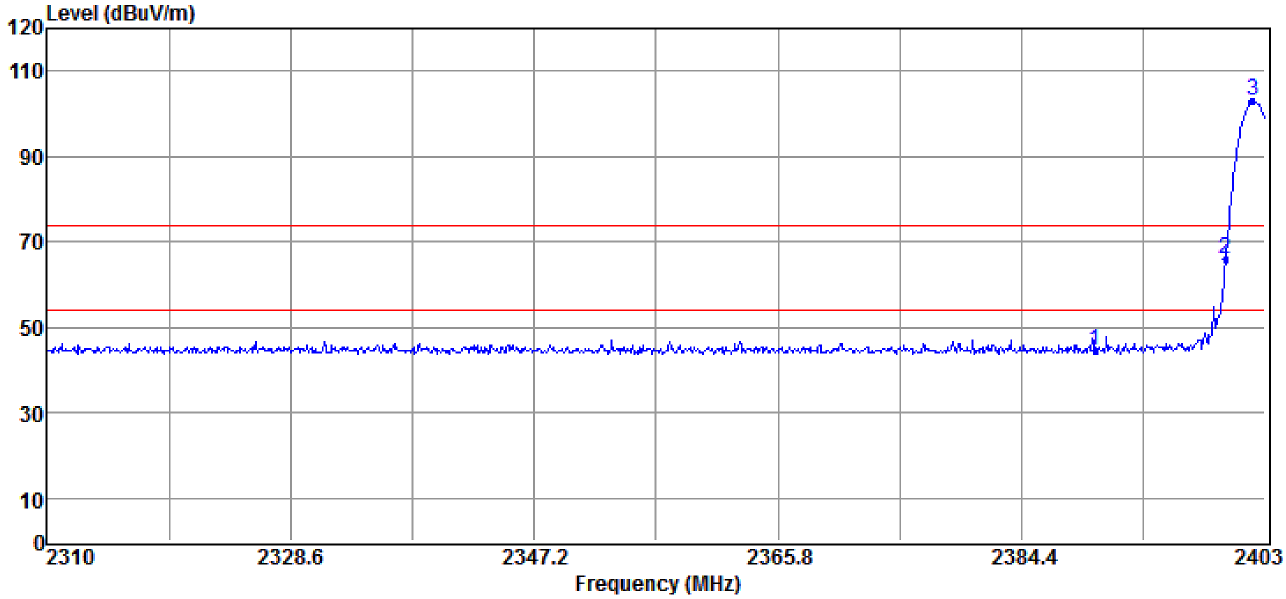
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

7.6. Measurement Result:

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

Radiated Emission: (The worst case :EDR 3M mode)

Operation Mode	TX CH Low	Test Date	2016/12/21
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %



No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	47.48	-3.15	44.33	74.00	-29.67	Peak	VERTICAL
2	2400.00	69.10	-3.16	65.94	83.29	-17.35	Peak	VERTICAL
3	2402.07	106.45	-3.16	103.29	F	---	Peak	VERTICAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

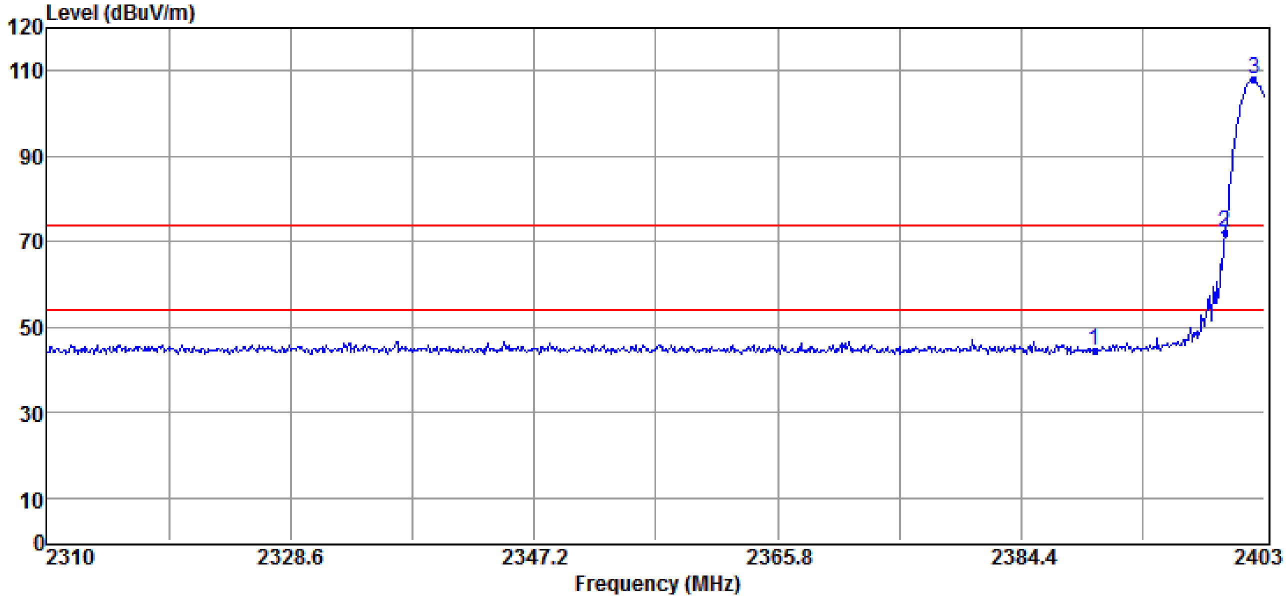
3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: “F” denotes fundamental frequency



No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	47.70	-3.15	44.55	74.00	-29.45	Peak	HORIZONTAL
2	2400.00	75.26	-3.16	72.10	88.10	-16.00	Peak	HORIZONTAL
3	2402.16	111.26	-3.16	108.10	F	---	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

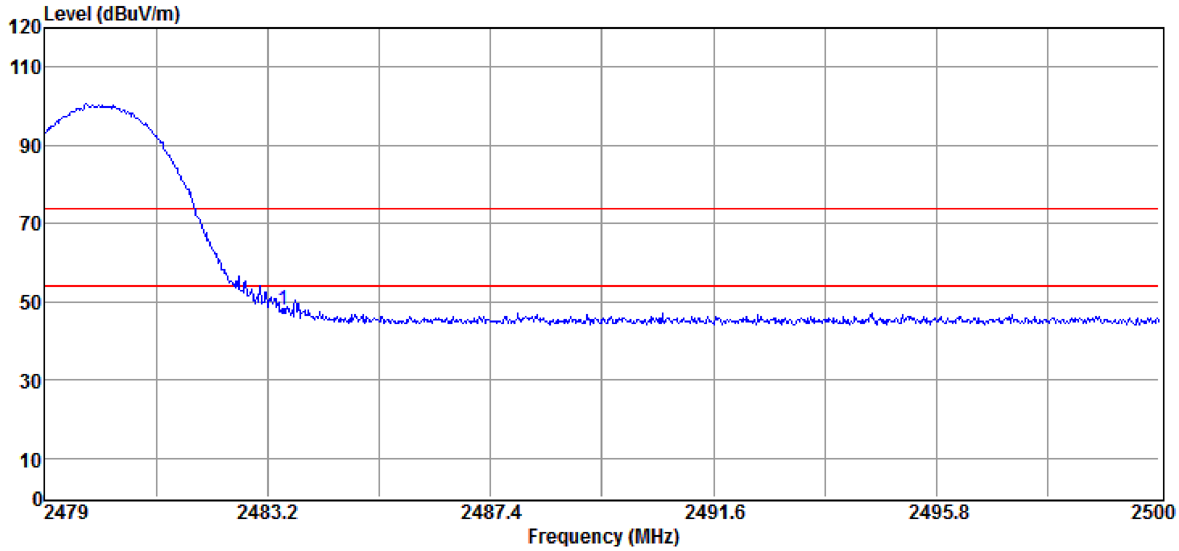
4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: “F” denotes fundamental frequency

Operation Mode	TX CH High	Test Date	2016/12/21
Fundamental Frequency	2480 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %



No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	50.75	-3.11	47.64	74.00	-26.36	Peak	VERTICAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

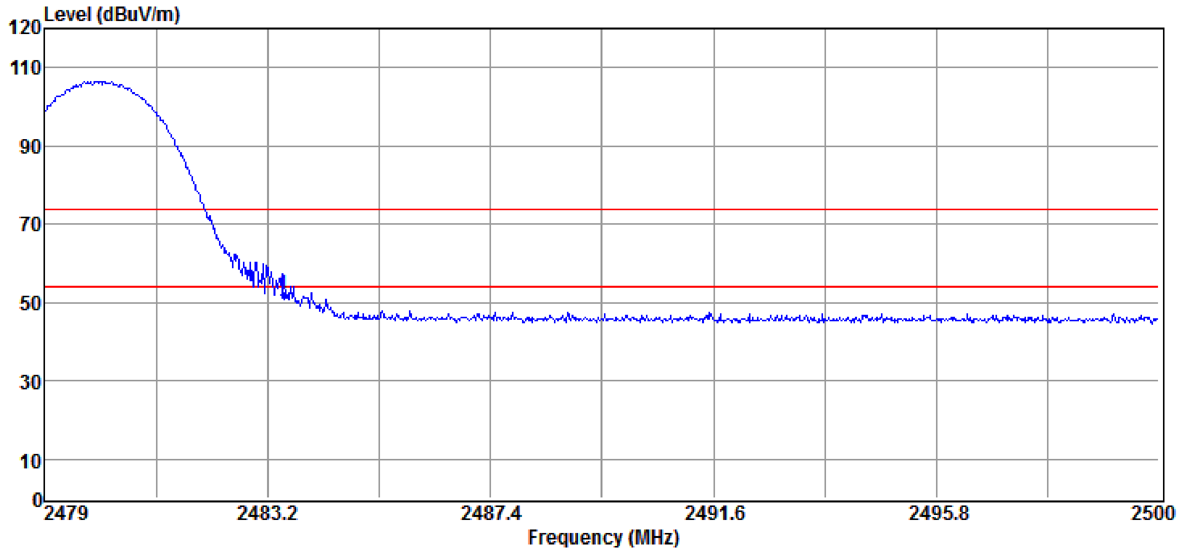
3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: “F” denotes fundamental frequency



No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	55.23	-3.11	52.12	74.00	-21.88	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: “F” denotes fundamental frequency

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: EDR 3M Mode)

Operation Mode	TX CH Low	Test Date	2016/12/21
Fundamental Frequency	2402MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	60.07	37.34	-6.02	31.32	40.00	-8.68	Peak	VERTICAL
2	153.19	30.55	-4.95	25.60	43.50	-17.90	Peak	VERTICAL
3	243.40	40.66	-6.02	34.64	46.00	-11.36	Peak	VERTICAL
4	336.52	30.85	-3.29	27.56	46.00	-18.44	Peak	VERTICAL
5	513.06	29.54	-0.36	29.18	46.00	-16.82	Peak	VERTICAL
6	760.41	29.51	3.97	33.48	46.00	-12.52	Peak	VERTICAL
1	60.07	35.96	-6.02	29.94	40.00	-10.06	Peak	HORIZONTAL
2	165.80	39.95	-4.98	34.97	43.50	-8.53	Peak	HORIZONTAL
3	244.37	44.04	-6.00	38.04	46.00	-7.96	Peak	HORIZONTAL
4	362.71	35.17	-2.94	32.23	46.00	-13.77	Peak	HORIZONTAL
5	514.03	33.22	-0.32	32.90	46.00	-13.10	Peak	HORIZONTAL
6	833.16	30.23	5.07	35.30	46.00	-10.70	Peak	HORIZONTAL

Remark:

1. Emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
2. Measuring frequencies from the lowest internal frequency to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.
4. Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/12/21
Fundamental Frequency	2441MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	60.07	37.35	-6.02	31.33	40.00	-8.67	Peak	VERTICAL
2	246.31	41.20	-5.96	35.24	46.00	-10.76	Peak	VERTICAL
3	336.52	31.88	-3.29	28.59	46.00	-17.41	Peak	VERTICAL
4	518.88	29.51	-0.20	29.31	46.00	-16.69	Peak	VERTICAL
5	705.12	29.51	2.81	32.32	46.00	-13.68	Peak	VERTICAL
6	870.02	28.61	5.43	34.04	46.00	-11.96	Peak	VERTICAL
1	60.07	36.39	-6.02	30.37	40.00	-9.63	Peak	HORIZONTAL
2	150.28	34.53	-5.06	29.47	43.50	-14.03	Peak	HORIZONTAL
3	246.31	38.96	-5.96	33.00	46.00	-13.00	Peak	HORIZONTAL
4	311.30	34.51	-3.78	30.73	46.00	-15.27	Peak	HORIZONTAL
5	514.03	30.38	-0.32	30.06	46.00	-15.94	Peak	HORIZONTAL
6	833.16	29.79	5.07	34.86	46.00	-11.14	Peak	HORIZONTAL

Remark:

1. Emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
2. Measuring frequencies from the lowest internal frequency to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.
4. Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	2016/12/21
Fundamental Frequency	2480MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	60.07	37.45	-6.02	31.43	40.00	-8.57	Peak	VERTICAL
2	240.49	40.49	-6.10	34.39	46.00	-11.61	Peak	VERTICAL
3	336.52	30.64	-3.29	27.35	46.00	-18.65	Peak	VERTICAL
4	499.48	30.54	-0.75	29.79	46.00	-16.21	Peak	VERTICAL
5	739.07	28.75	3.51	32.26	46.00	-13.74	Peak	VERTICAL
6	938.89	28.76	6.76	35.52	46.00	-10.48	Peak	VERTICAL
1	60.07	35.83	-6.02	29.81	40.00	-10.19	Peak	HORIZONTAL
2	153.19	36.10	-4.95	31.15	43.50	-12.35	Peak	HORIZONTAL
3	246.31	40.44	-5.96	34.48	46.00	-11.52	Peak	HORIZONTAL
4	311.30	34.63	-3.78	30.85	46.00	-15.15	Peak	HORIZONTAL
5	479.11	30.68	-0.83	29.85	46.00	-16.15	Peak	HORIZONTAL
6	630.43	28.76	1.83	30.59	46.00	-15.41	Peak	HORIZONTAL

Remark:

1. Emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
2. Measuring frequencies from the lowest internal frequency to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.
4. Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	2016/12/21
Fundamental Frequency	2402 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1609.00	48.55	-7.16	41.39	74.00	-32.61	Peak	VERTICAL
2	4804.00	32.77	3.23	36.00	74.00	-38.00	Peak	VERTICAL
1	1609.00	51.71	-7.16	44.55	74.00	-29.45	Peak	HORIZONTAL
2	4804.00	32.60	3.23	35.83	74.00	-38.17	Peak	HORIZONTAL

Remark:

1. Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
3. “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.
4. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
6. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/12/21
Fundamental Frequency	2441 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1994.00	39.59	-5.39	34.20	74.00	-39.80	Peak	VERTICAL
2	4882.00	32.39	3.41	35.80	74.00	-38.20	Peak	VERTICAL
1	4960.00	33.41	3.60	37.01	74.00	-36.99	Peak	HORIZONTAL
2	6243.00	35.64	6.41	42.05	74.00	-31.95	Peak	HORIZONTAL

Remark:

1. Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
3. “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.
4. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
6. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	2016/12/21
Fundamental Frequency	2480 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1497.00	45.73	-7.33	38.40	74.00	-35.60	Peak	VERTICAL
2	4960.00	33.30	3.60	36.90	74.00	-37.10	Peak	VERTICAL
1	1609.00	43.48	-7.16	36.32	74.00	-37.68	Peak	HORIZONTAL
2	4882.00	32.85	3.41	36.26	74.00	-37.74	Peak	HORIZONTAL

Remark:

1. Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
3. “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.
4. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
6. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

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:

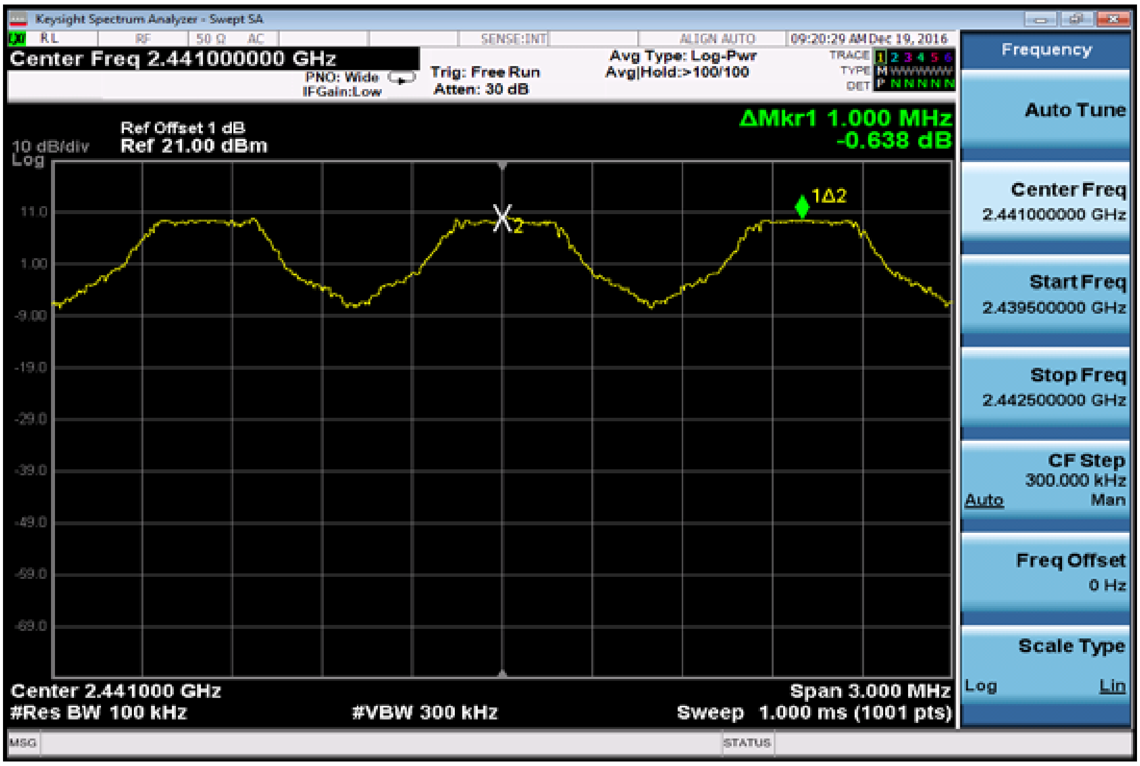
Channel separation (MHz)	Limit	Result
1	>=25KHz or 2/3 times 20dB bandwidth	PASS

Note: Refer to next page for plots.

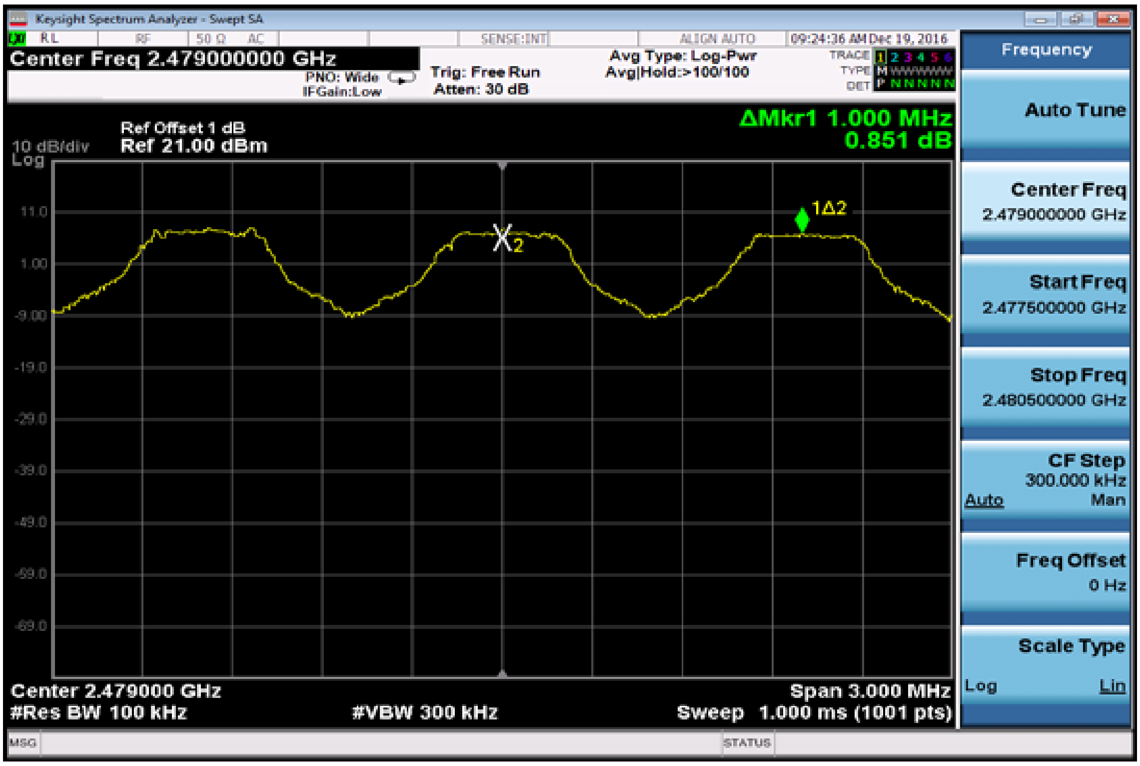
Frequency Separation Test Data

Low

Mid



High


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.479000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:24:36 AM Dec 19, 2016
Ref Offset 1 dB
10 dB/div
Log
Ref 21.00 dBm
ΔMkr1 1.000 MHz
0.851 dB
11.0
1.00
-9.00
-19.0
-29.0
-39.0
-49.0
-59.0
-69.0
Center 2.479000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.479000000 GHz
Start Freq
2.477500000 GHz
Stop Freq
2.480500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

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.

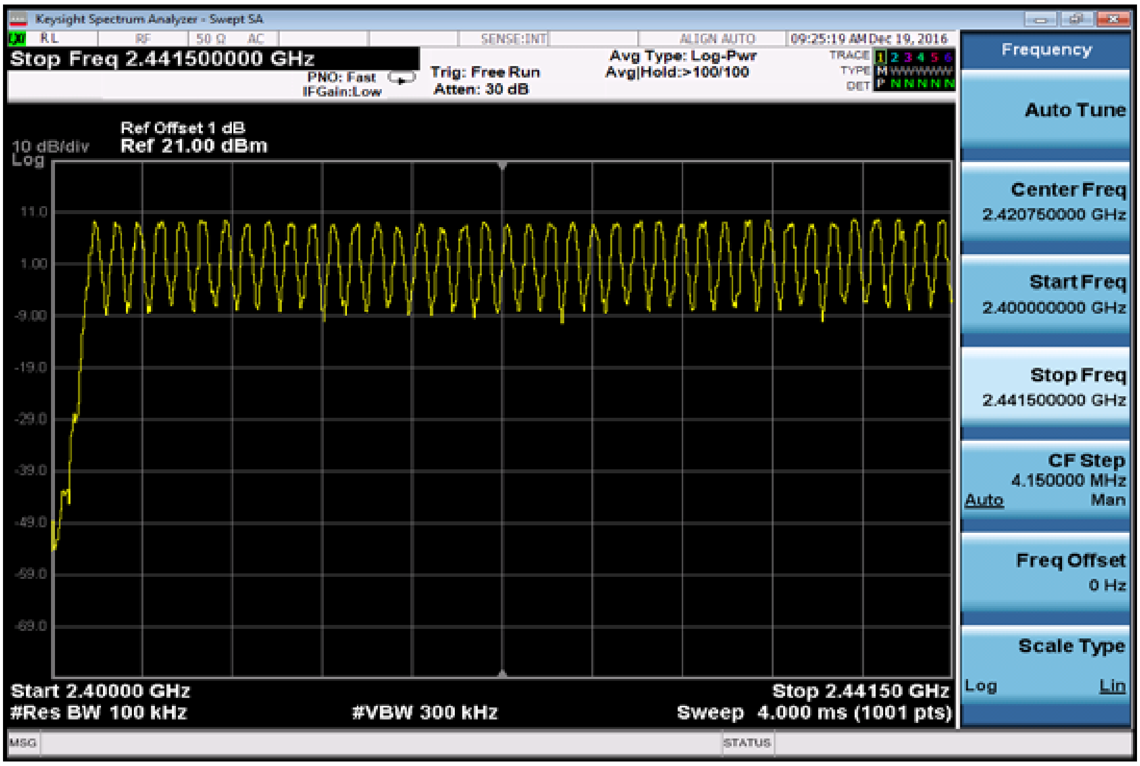
10.5. Measurement Result:

Test Result : 79 Channel > 15 Channel

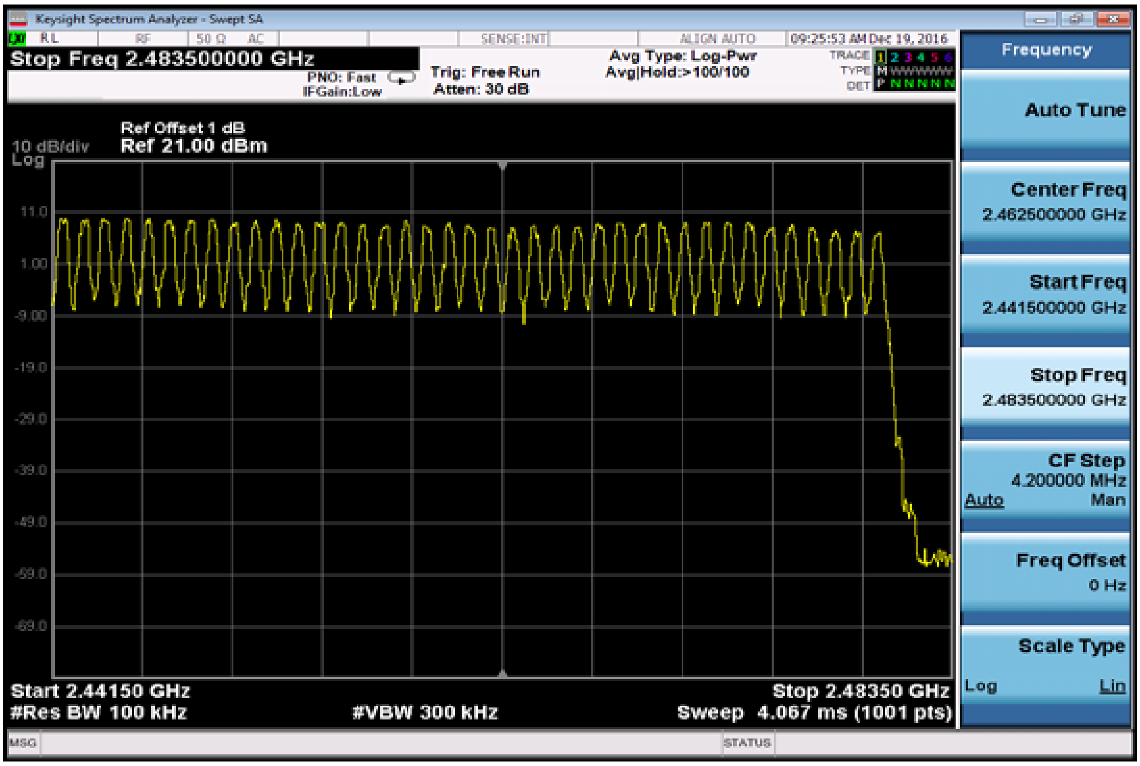
Note: Refer to next page for plots.

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:

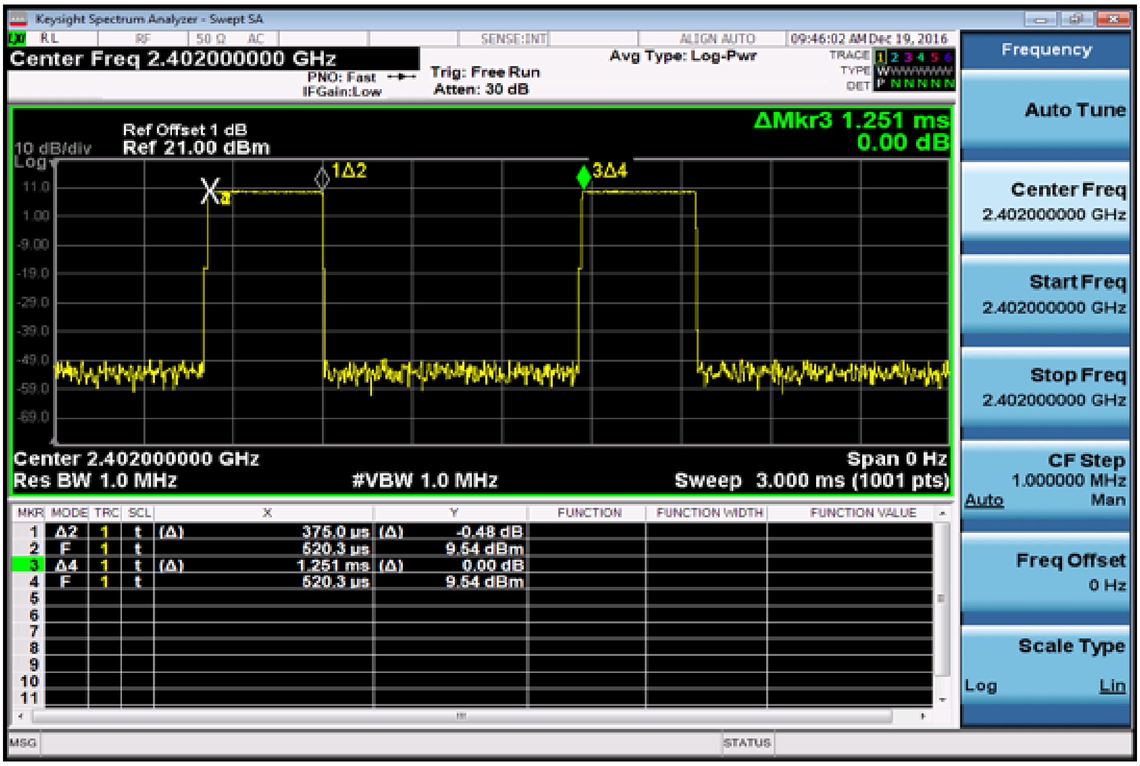
A period time = 0.4 (ms) * 79 = 31.6 (s)

CH Low	DH1 time slot	=	0.375 (ms)	* (1600/2/79) * 31.6 =	120.00	(ms)
	DH3 time slot	=	1.630 (ms)	* (1600/4/79) * 31.6 =	260.80	(ms)
	DH5 time slot	=	2.880 (ms)	* (1600/6/79) * 31.6 =	307.20	(ms)
CH Mid	DH1 time slot	=	0.381 (ms)	* (1600/2/79) * 31.6 =	121.92	(ms)
	DH3 time slot	=	1.620 (ms)	* (1600/4/79) * 31.6 =	259.20	(ms)
	DH5 time slot	=	2.880 (ms)	* (1600/6/79) * 31.6 =	307.20	(ms)
CH High	DH1 time slot	=	0.381 (ms)	* (1600/2/79) * 31.6 =	121.92	(ms)
	DH3 time slot	=	1.630 (ms)	* (1600/4/79) * 31.6 =	260.80	(ms)
	DH5 time slot	=	2.880 (ms)	* (1600/6/79) * 31.6 =	307.20	(ms)

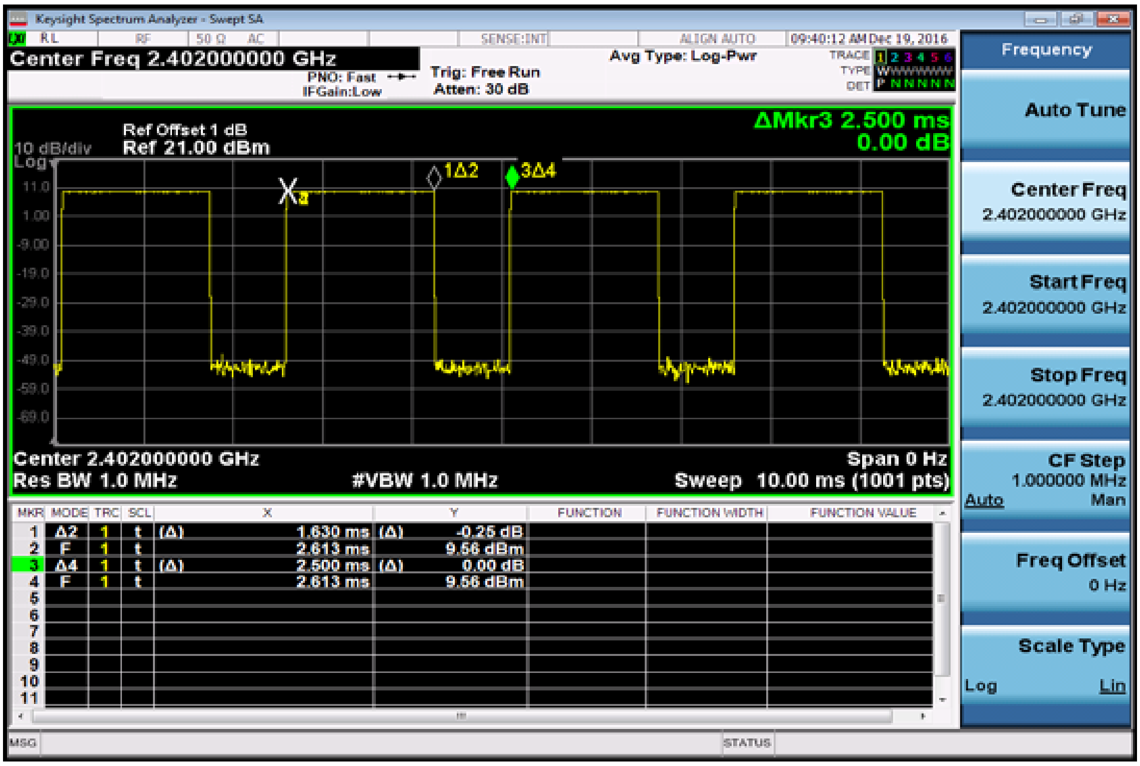
Note: Refer to next page for plots.

Low Channel

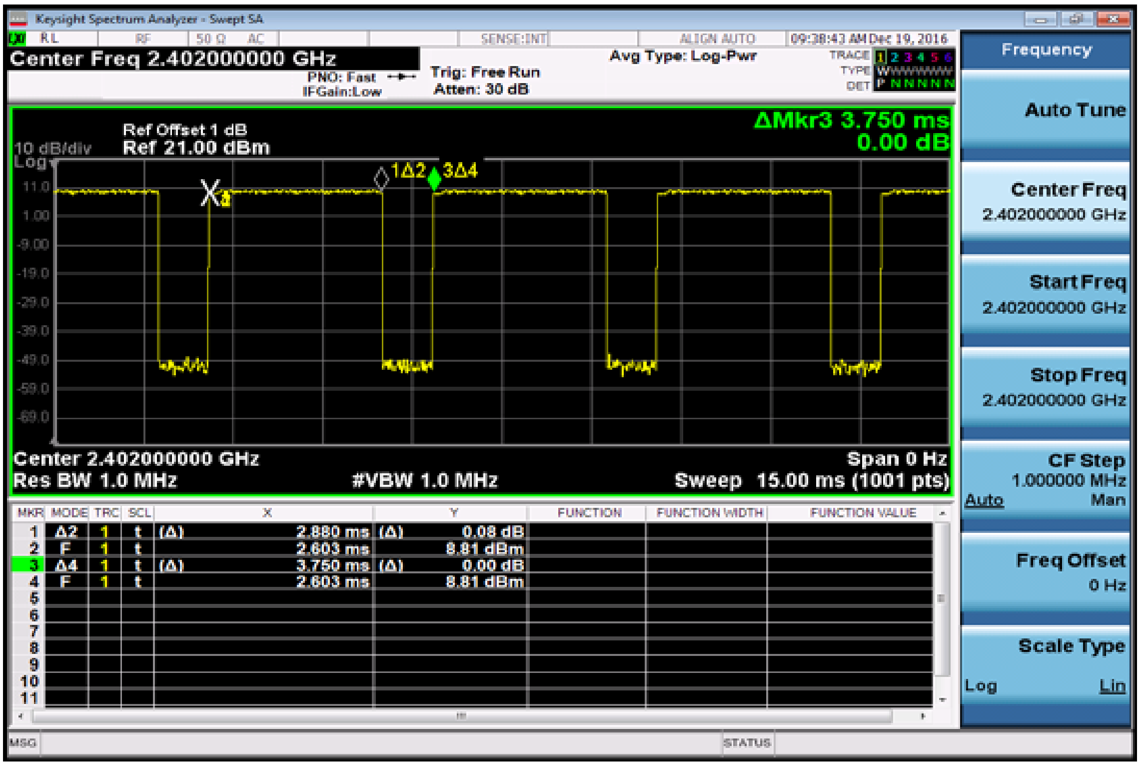
DH1



DH3

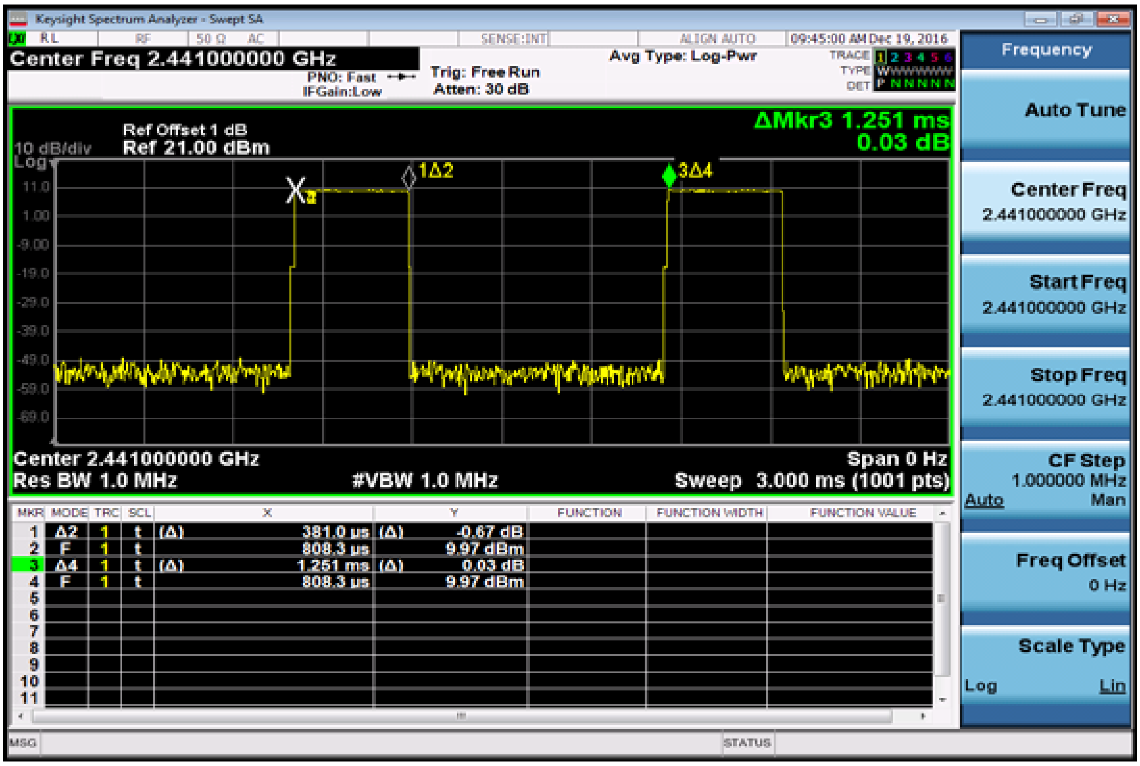


DH5

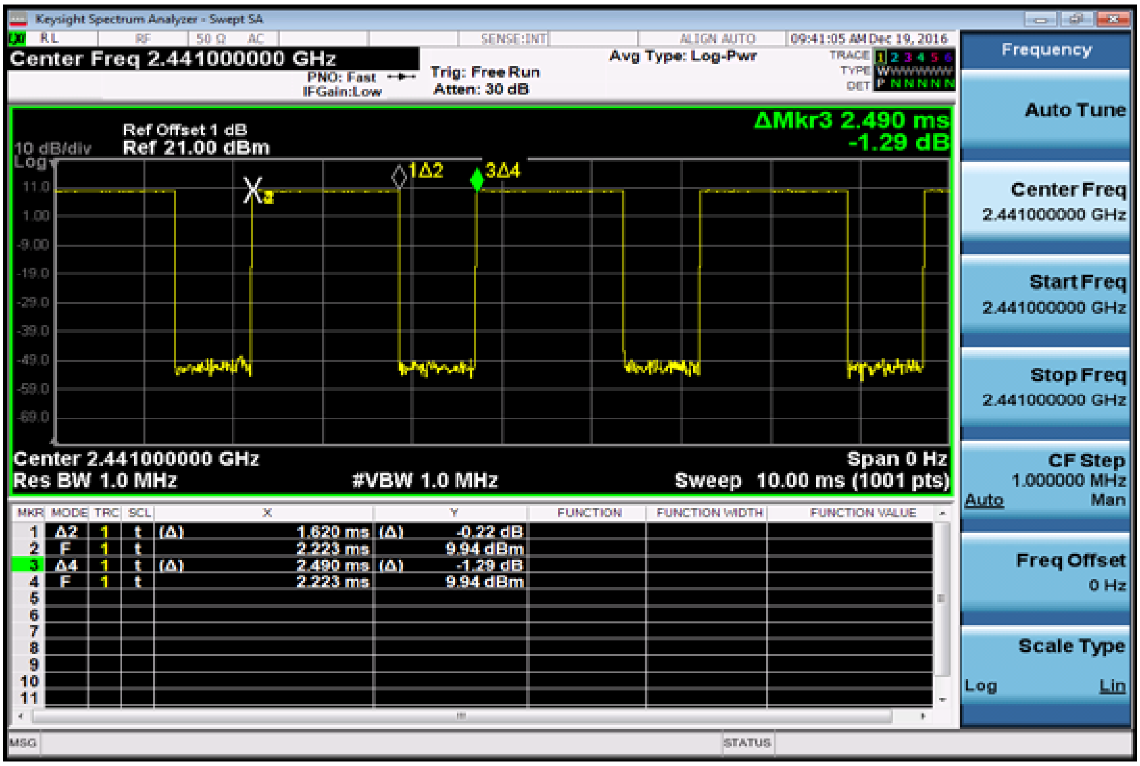


Mid Channel

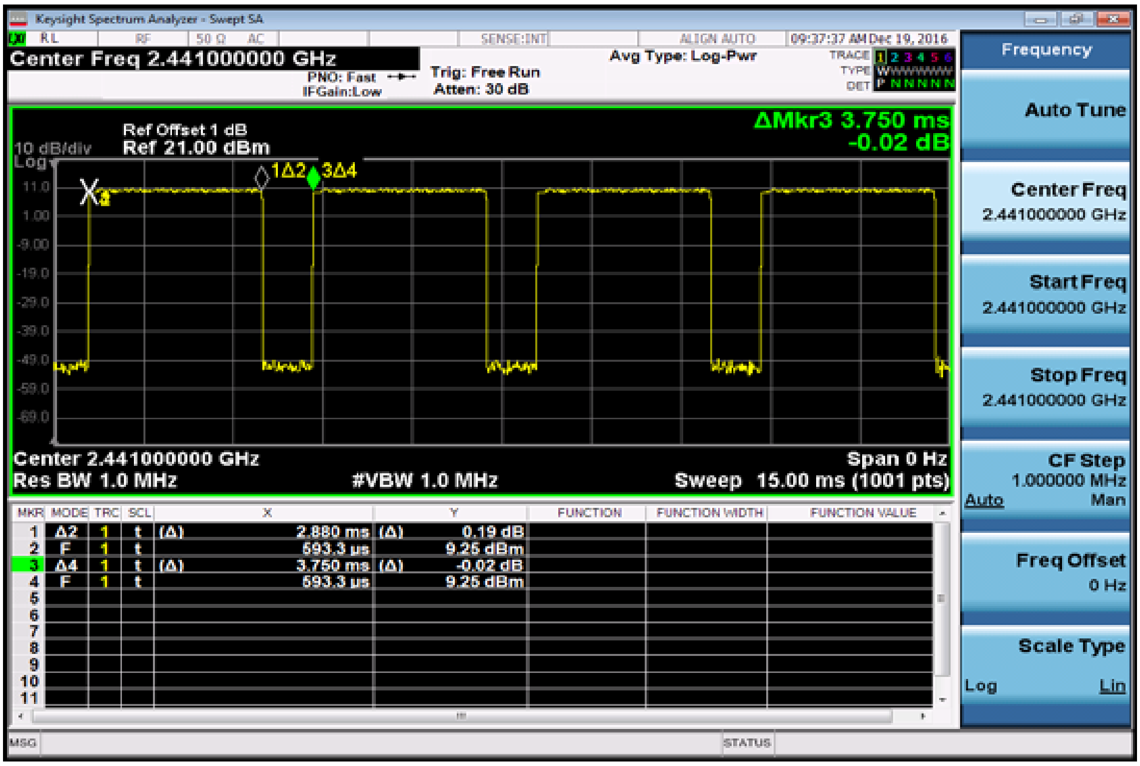
DH1



DH3

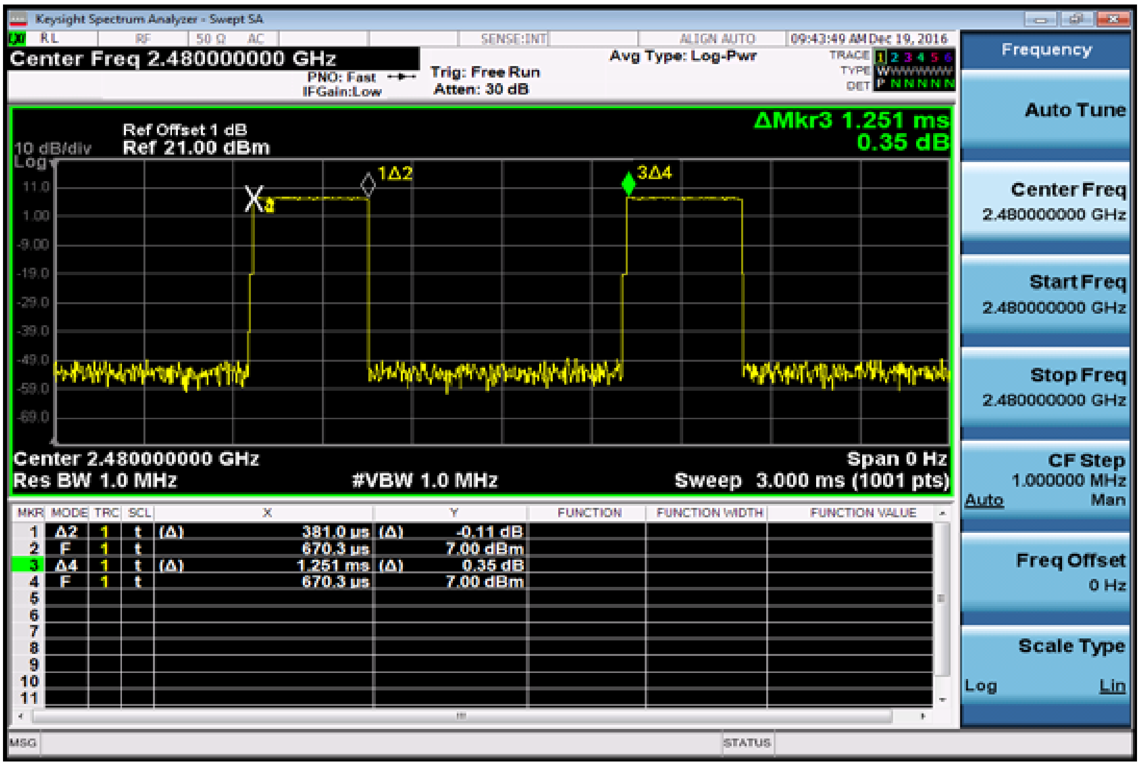

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
09:41:05 AM Dec 19, 2016
Ref Offset 1 dB
10 dB/div Ref 21.00 dBm
ΔMkr3 2.490 ms
-1.29 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (1001 pts)
1 Δ2 1 t (Δ) 1.620 ms (Δ) -0.22 dB
2 F 1 t 2.223 ms 9.94 dBm
3 Δ4 1 t (Δ) 2.490 ms (Δ) -1.29 dB
4 F 1 t 2.223 ms 9.94 dBm
Frequency
Auto Tune
Center Freq 2.441000000 GHz
Start Freq 2.441000000 GHz
Stop Freq 2.441000000 GHz
CF Step 1.000000 MHz
Freq Offset 0 Hz
Scale Type

DH5

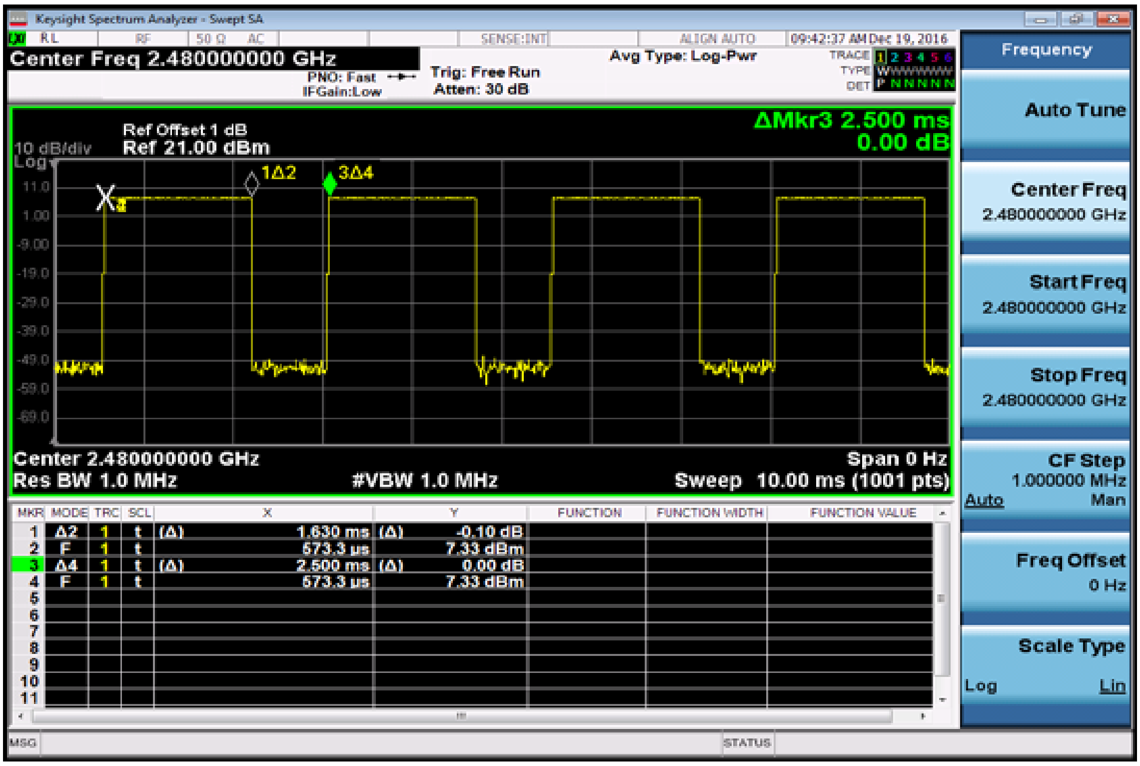

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
09:37:37 AM Dec 19, 2016
Ref Offset 1 dB
10 dB/div Ref 21.00 dBm
ΔMkr3 3.750 ms
-0.02 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 15.00 ms (1001 pts)
1 Δ2 1 t (Δ) 2.880 ms (Δ) 0.19 dB
2 F 1 t 593.3 µs 9.25 dBm
3 Δ4 1 t (Δ) 3.750 ms (Δ) -0.02 dB
4 F 1 t 593.3 µs 9.25 dBm
Frequency
Auto Tune
Center Freq 2.441000000 GHz
Start Freq 2.441000000 GHz
Stop Freq 2.441000000 GHz
CF Step 1.000000 MHz
Freq Offset 0 Hz
Scale Type

High Channel

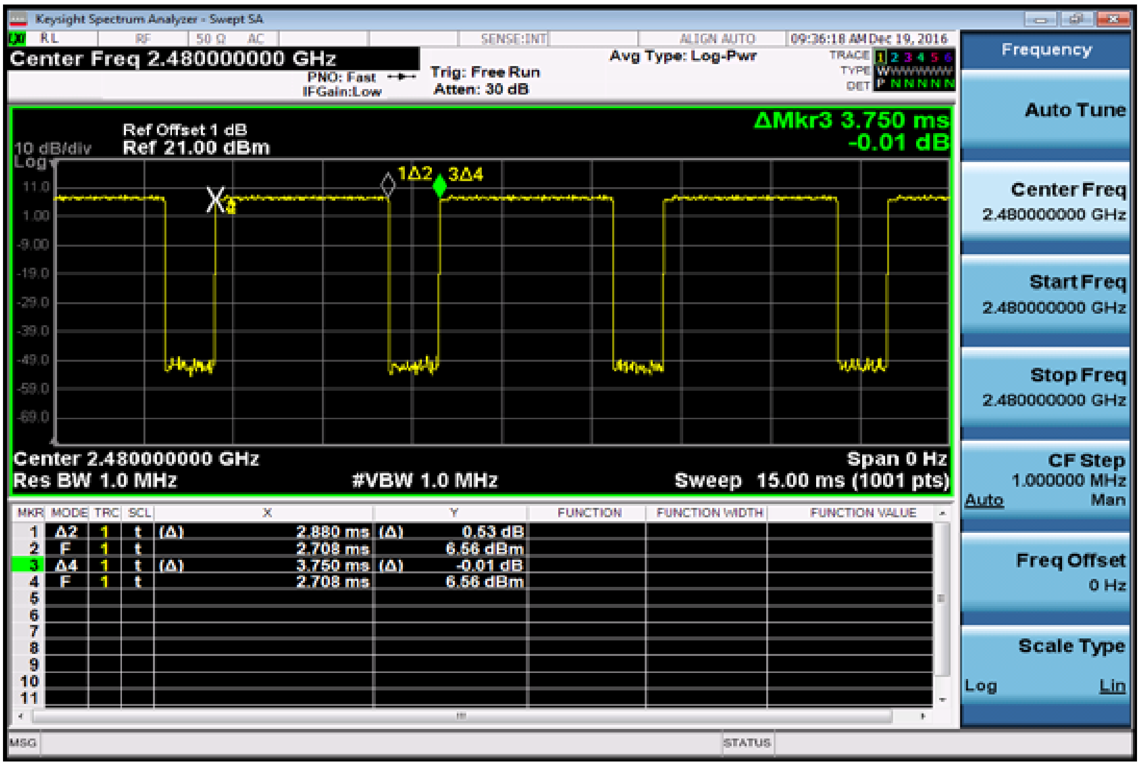
DH1



DH3



DH5


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
09:36:18 AM Dec 19, 2016
Ref Offset 1 dB
10 dB/div Ref 21.00 dBm
ΔMkr3 3.750 ms
-0.01 dB
Center 2.480000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 1.0 MHz
Sweep 15.00 ms (1001 pts)
1 Δ2 1 t (Δ) 2.880 ms (Δ) 0.53 dB
2 F 1 t 2.708 ms 6.56 dBm
3 Δ4 1 t (Δ) 3.750 ms (Δ) -0.01 dB
4 F 1 t 2.708 ms 6.56 dBm
Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.480000000 GHz
Stop Freq 2.480000000 GHz
CF Step 1.000000 MHz
Freq Offset 0 Hz
Scale Type
Log Lin

12. 20dB Bandwidth Bandwidth

12.1. Standard Applicable:

According to §15.247(a)(1)

(2) FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the -20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

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 (MHz)
Low	0.919
Mid	0.919
High	0.920

EDR 2M Mode

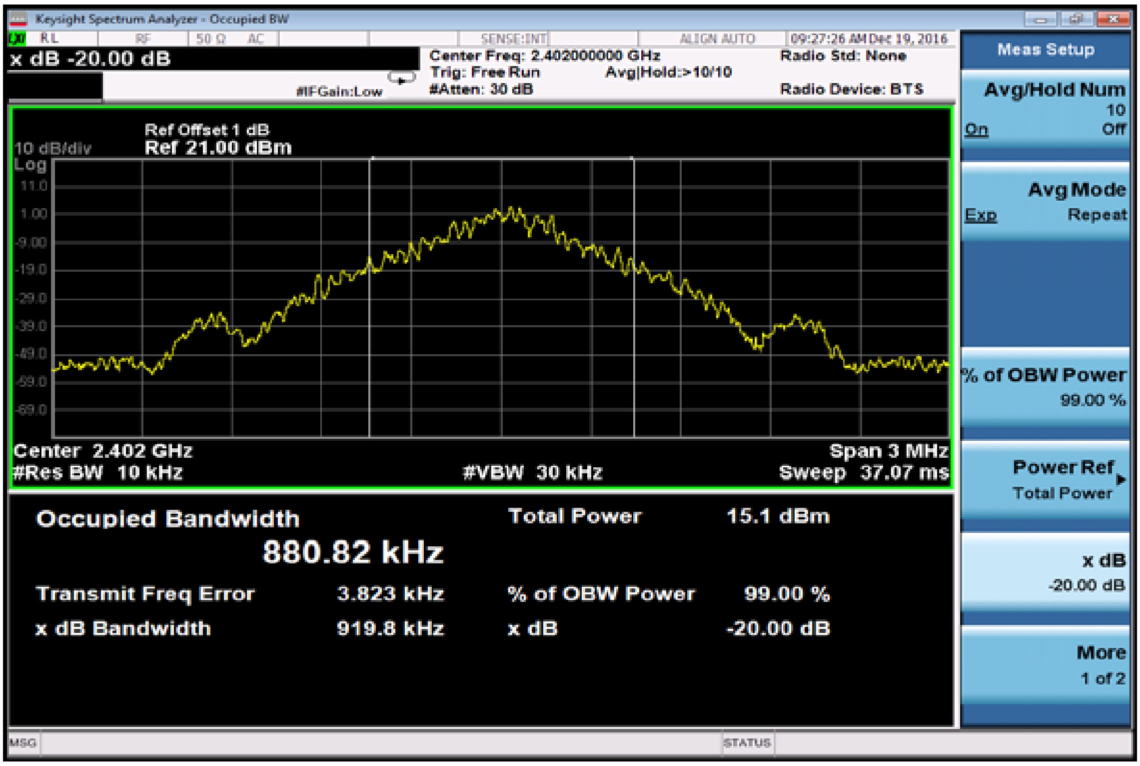
CH	20dB Bandwidth (MHz)	2/3* 20dB Bandwidth (MHz)
Lower	1.282	0.855
Mid	1.279	0.853
Higher	1.281	0.854

EDR 3M Mode

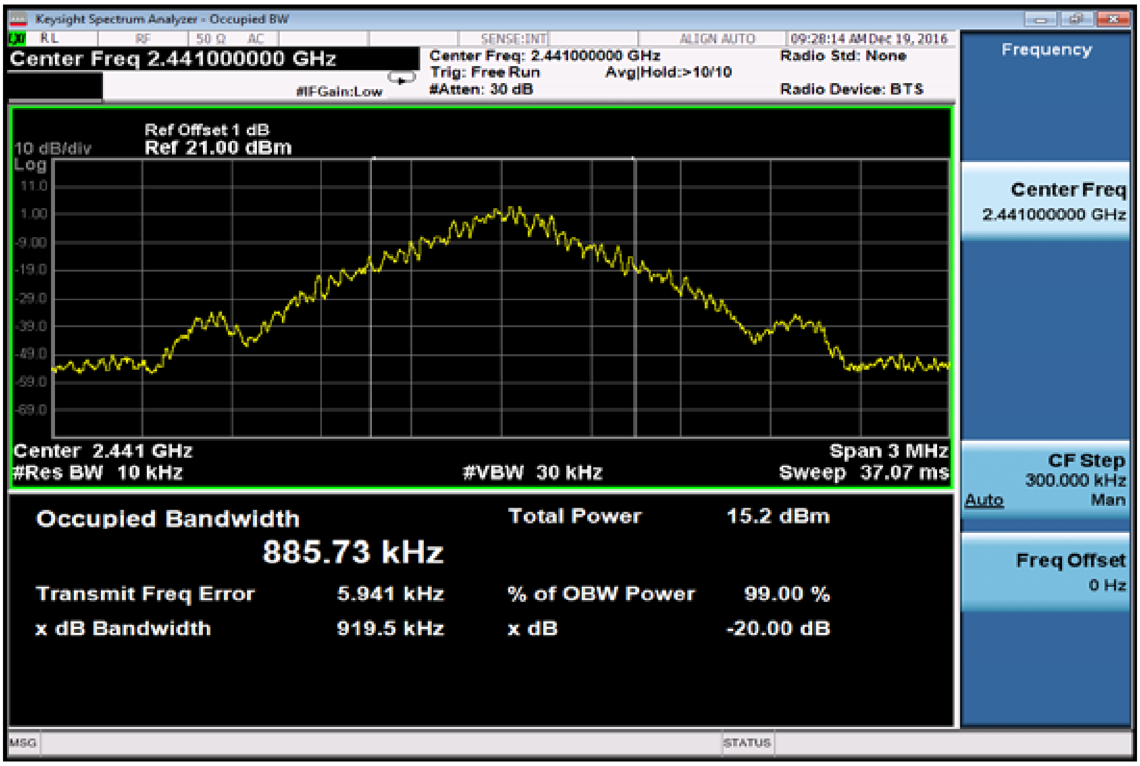
CH	20dB Bandwidth (MHz)	2/3* 20dB Bandwidth (MHz)
Lower	1.288	0.859
Mid	1.287	0.858
Higher	1.302	0.868

Note: Refer to next page for plots.

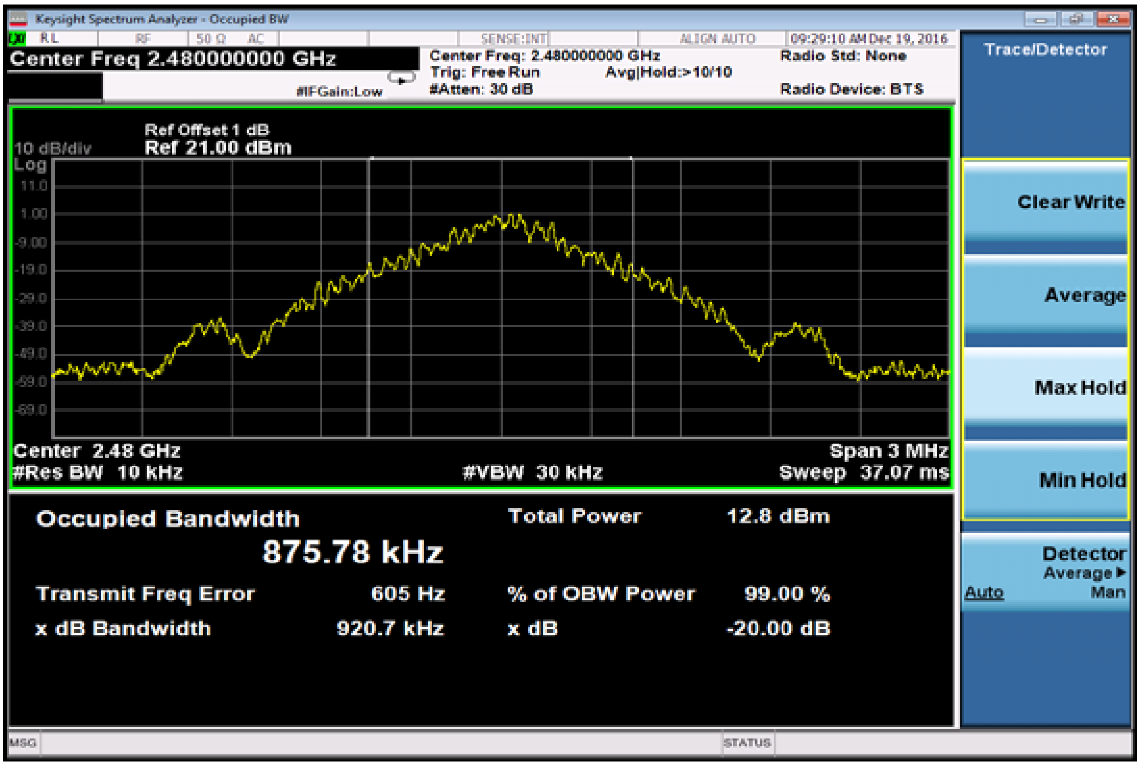
BDR Mode
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid

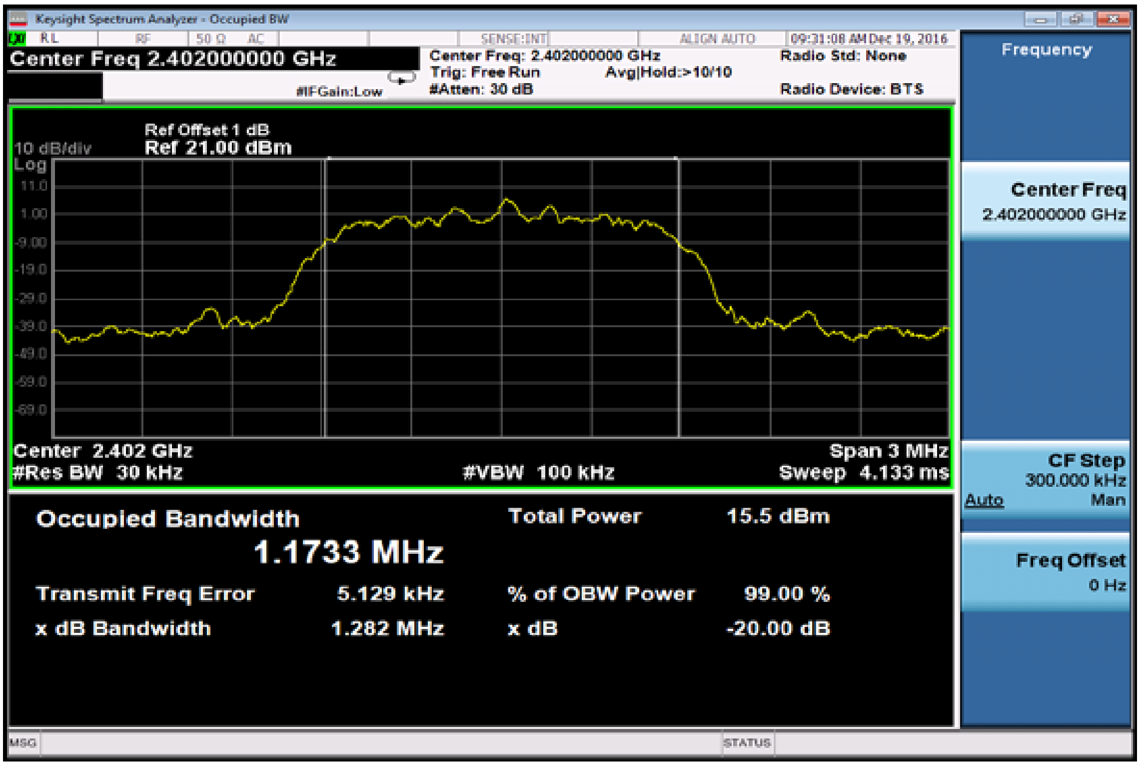


20dB Bandwidth Test Data CH-High

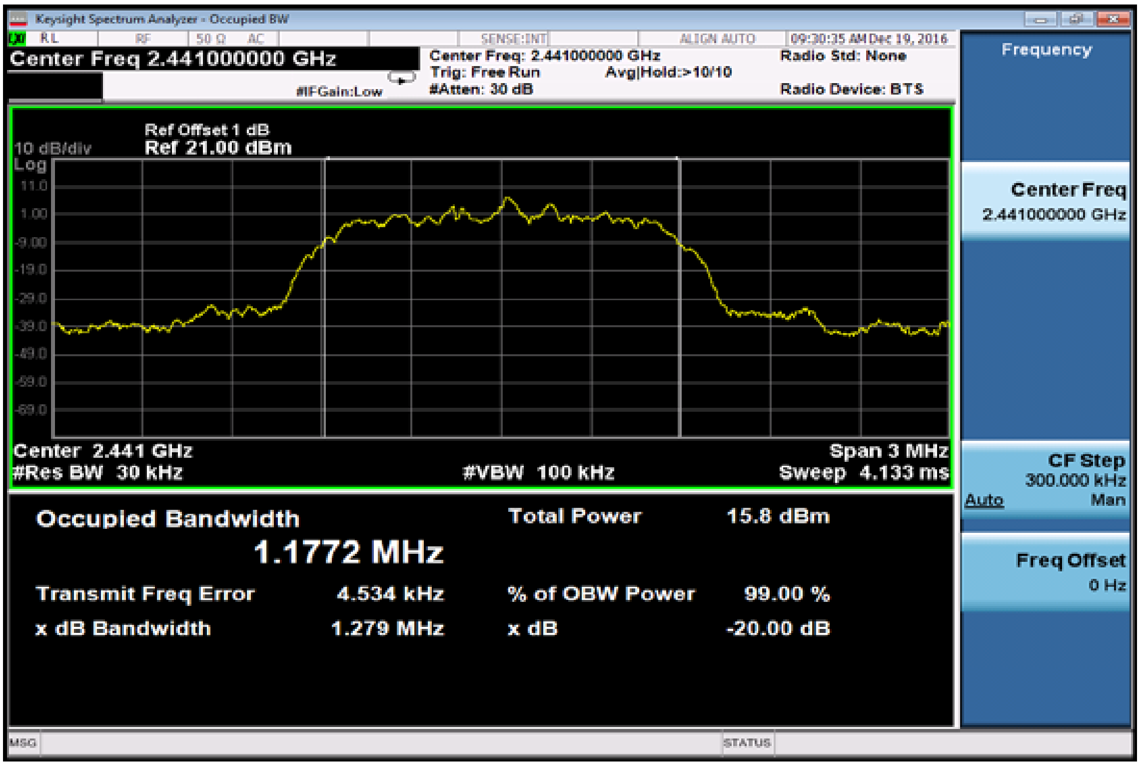


EDR 2M Mode

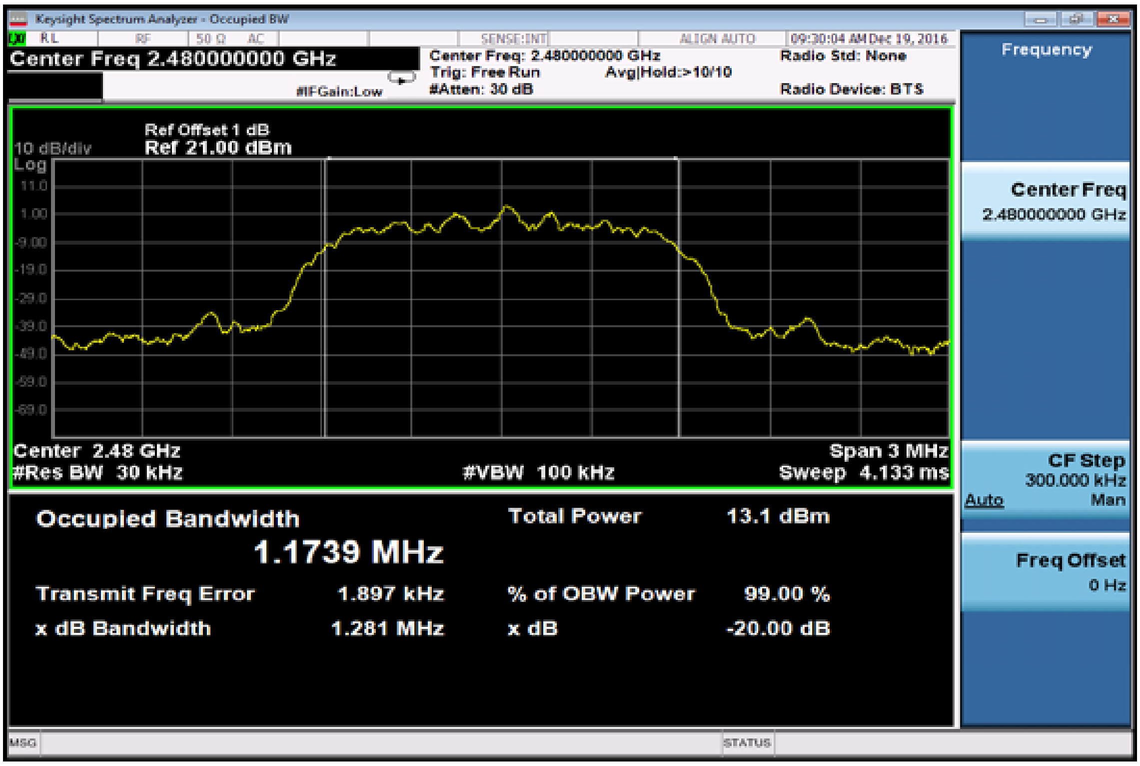
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid

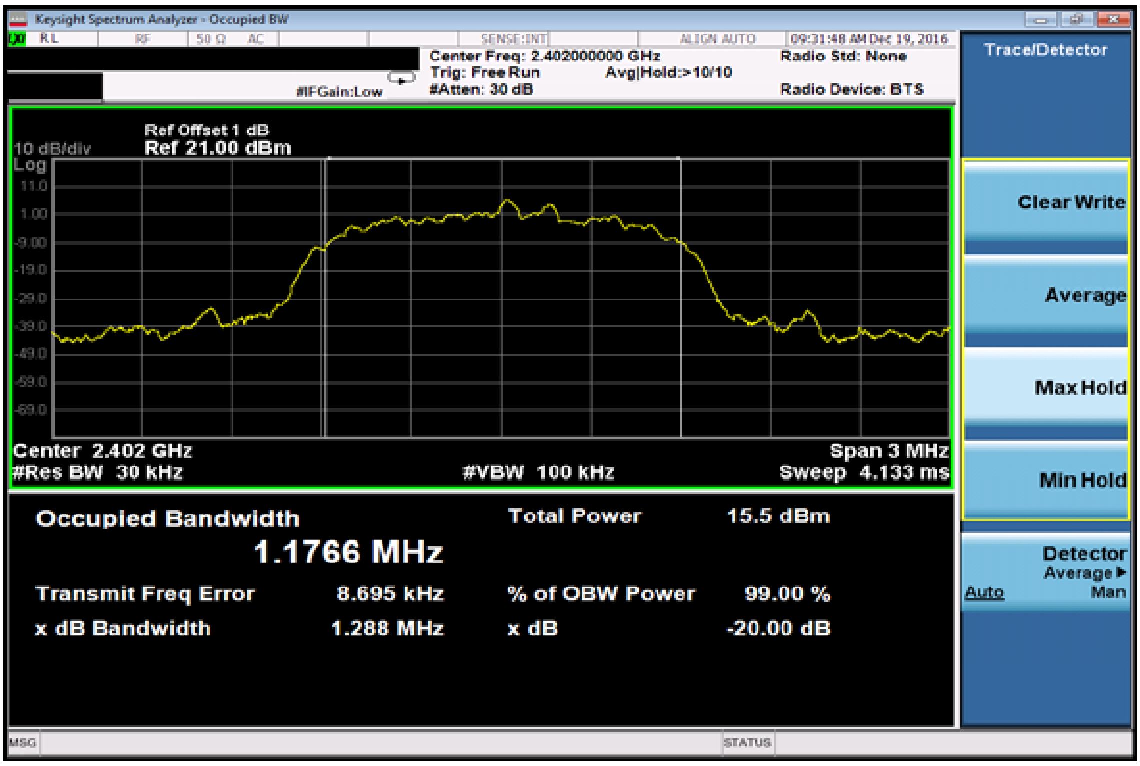


20dB Bandwidth Test Data CH-High

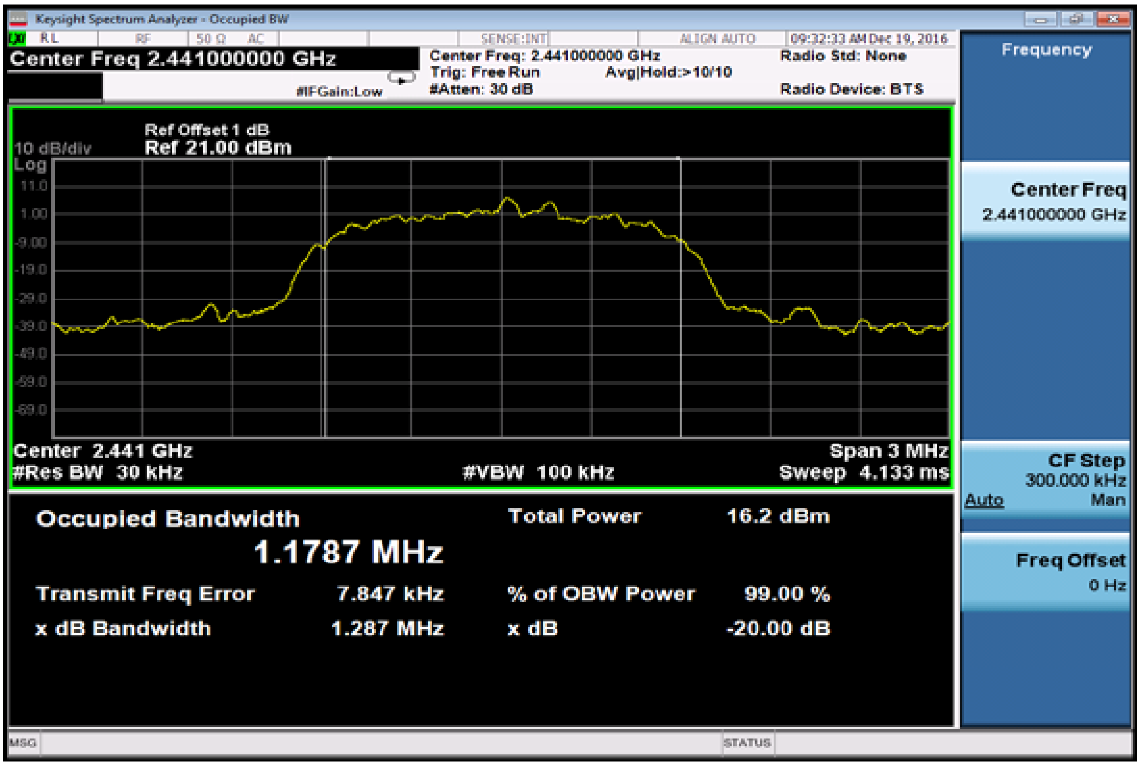


EDR 3M Mode

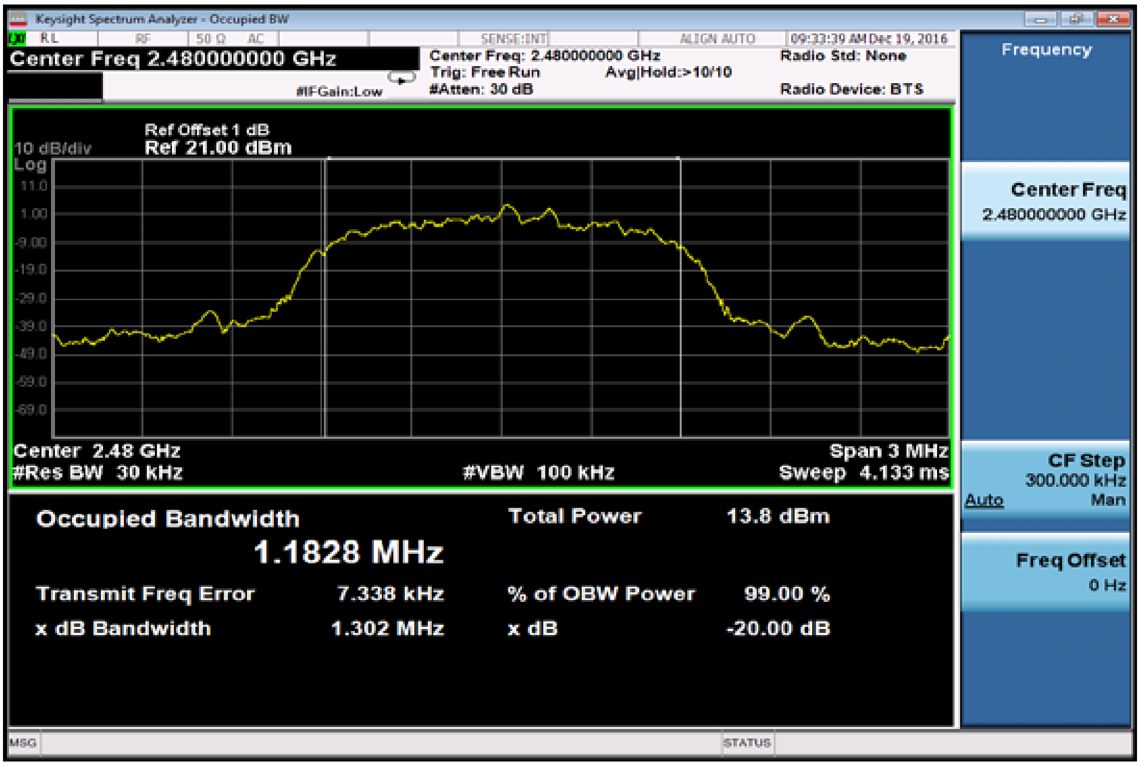
20dB Bandwidth Test Data CH-Low



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.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

13.2. Antenna Connected Construction:

The directional gains of antenna used for transmitting is 4.9dBi, and the antenna type is chip antenna which is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.