TEST REPORT

Application No.:	SHEM1805004270CR
FCC ID	SVC-PF2I
IC	152C-PF2I
Applicant:	Lenbrook Industries Limited
Address of Applicant:	633 Granite Court, Pickering, Ontario, Canada L1W 3K1
Manufacturer:	Lenbrook Industries Limited
Address of Manufacturer:	633 Granite Court, Pickering, Ontario, Canada L1W 3K1
Factory:	HANSONG(NANJING) TECHNOLOGY LTD.
Address of Factory:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China.
Equipment Under Test (EUT):	
EUT Name:	Protable Wireless Music Streaming Speaker
Model No.:	Pulse Flex 2i
Trade mark:	Bluesound
Standard(s) :	47 CFR Part 15, Subpart C 15.247 RSS-247 Issue 2, February 2017 RSS-Gen Issue 5, April 2018
Date of Receipt:	2018-05-31
Date of Test:	2018-08-31 to 2018-09-02
Date of Issue:	2018-12-14
Test Result:	**Pass***

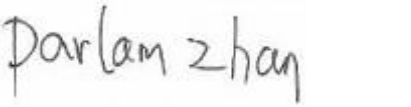
* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center EMC Laboratory
NO.588 West Jindu Road,Songjiang District,Shanghai,China 201612
中国·上海·松江区金都西路588号 邮编: 201612
t(86-21)61915666 f(86-21)61915678 www.sgsgroup.com.cn
t(86-21)61915666 f(86-21)61915678 e sgs.china@sgs.com

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2018-12-14	/

Authorized for issue by:				
				
		Vincent Zhu / Project Engineer		
				
		Parlam Zhan /Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**FCC Requirement**	**IC Requirement**	**Method**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	RSS-Gen Section 6.8	N/A	Customer Declaration
Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence	47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)	RSS-247 Section 5.1(a)	N/A	Pass

Radio Spectrum Matter Part				
Item	**FCC Requirement**	**IC Requirement**	**Method**	**Result**
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207	RSS-Gen Section 8.8	ANSI C63.10 (2013) Section 6.2	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247(b)(1)	RSS-247 Section 5.4(b)	ANSI C63.10 (2013) Section 7.8.5	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.247(a)(1)	RSS-247 Section 5.1(a)	ANSI C63.10 (2013) Section 7.8.7	Pass
Carrier Frequencies Separation	47 CFR Part 15, Subpart C 15.247a(1)	RSS-247 Section 5.1(b)	ANSI C63.10 (2013) Section 7.8.2	Pass
Hopping Channel Number	47 CFR Part 15, Subpart C 15.247a(1)(iii)	RSS-247 Section 5.1(d)	ANSI C63.10 (2013) Section 7.8.3	Pass
Dwell Time	47 CFR Part 15, Subpart C 15.247a(1)(iii)	RSS-247 Section 5.1(d)	ANSI C63.10 (2013) Section 7.8.4	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Section 5.5	ANSI C63.10 (2013) Section 7.8.6	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Section 5.5	ANSI C63.10 (2013) Section 7.8.8	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.205 & 15.209	Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.10.5	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.205 & 15.209	Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass
99% Bandwidth	-	RSS-Gen Section 6.6	ANSI C63.10 Section 6.9.3	Pass
Frequency Stability	-	RSS-Gen Section 8.11	RSS-Gen Section 6.11	Pass

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	AC 100-240V~50/60Hz
Test voltage:	AC 120V 60Hz
Cable:	AC Cable 180cm
Antenna Gain	2 dBi
Antenna Type	Integral Antenna
Channel Spacing	1MHz
Modulation Type	GFSK, π/4DQPSK, 8DPSK
Number of Channels	79
Operation Frequency	2402MHz to 2480MHz
Spectrum Spread Technology	Frequency Hopping Spread Spectrum(FHSS)

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	ThinkPad X100e	/

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.4dB (30MHz-1GHz)
		4.6dB (1GHz-18GHz)
		5.2dB (Above 18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• NVLAP (Certificate No. 201034-0)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

• FCC –Designation Number: CN5033

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

• Industry Canada (IC) – IC Assigned Code: 8617A

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Conducted Emission at AC Power Line					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2018-08-13	2019-08-12
Signal Generator	R&S	SMR20	SHEM006-1	2018-08-13	2019-08-12
Signal Generator	Agilent	N5182A	SHEM182-1	2018-08-13	2019-08-12
Communication Tester	R&S	CMW270	SHEM183-1	2018-08-13	2019-08-12
Switcher	Tonscend	JS0806	SHEM184-1	2018-08-13	2019-08-12
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2018-08-13	2019-08-12
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2018-08-13	2019-08-12
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01~RF04	/	2017-12-26	2018-12-25
Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9KHz-2GHz)	CLAVIIO	BDLNA-0001	SHEM164-1	2018-08-13	2019-08-12
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118	SHEM050-2	2018-08-13	2019-08-12
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Signal Generator	R&S	SMR40	SHEM058-1	2018-08-13	2019-08-12
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(c)

RSS-Gen Section 6.8

6.1.2 Conclusion

Standard Requirement:

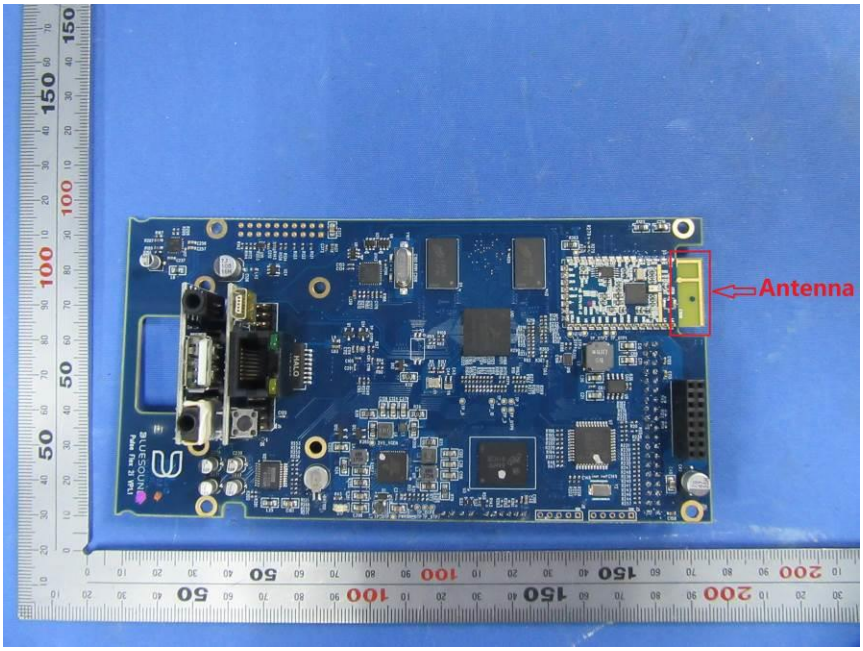
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is Integral antenna and no consideration of replacement. The best case gain of the antenna is 2dBi.



6.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

RSS-247 Section 5.1(a)

6.2.2 Conclusion

Standard Requirement:

The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. 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.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Compliance for section 15.247(a)(1):

According to Technical Specification, the pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

> Number of shift register stages: 9

> Length of pseudo-random sequence: 29 -1 = 511 bits

> Longest sequence of zeros: 8 (non-inverted signal)

Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

Each frequency used equally on the average by each transmitter.

According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.

Compliance for section 15.247(g):

According to Technical Specification, the system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the Bluetooth system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

Compliance for section 15.247(h):

According to Technical specification, the system incorporates with an adaptive system to detect other user within the spectrum band s

7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207
RSS-Gen Section 8.8

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		

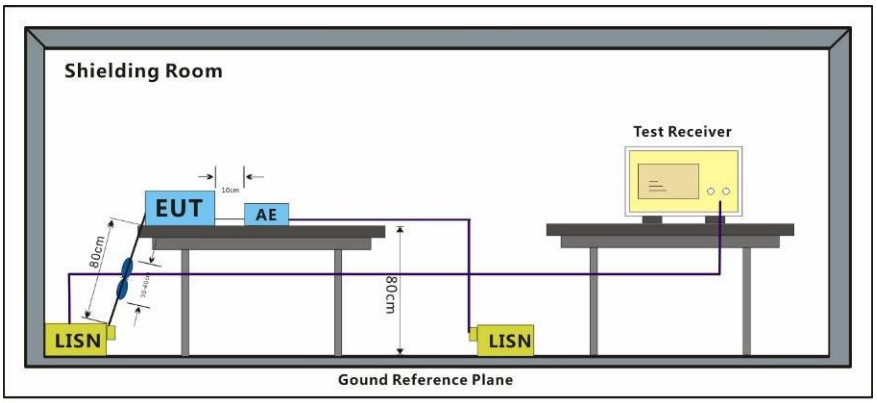
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

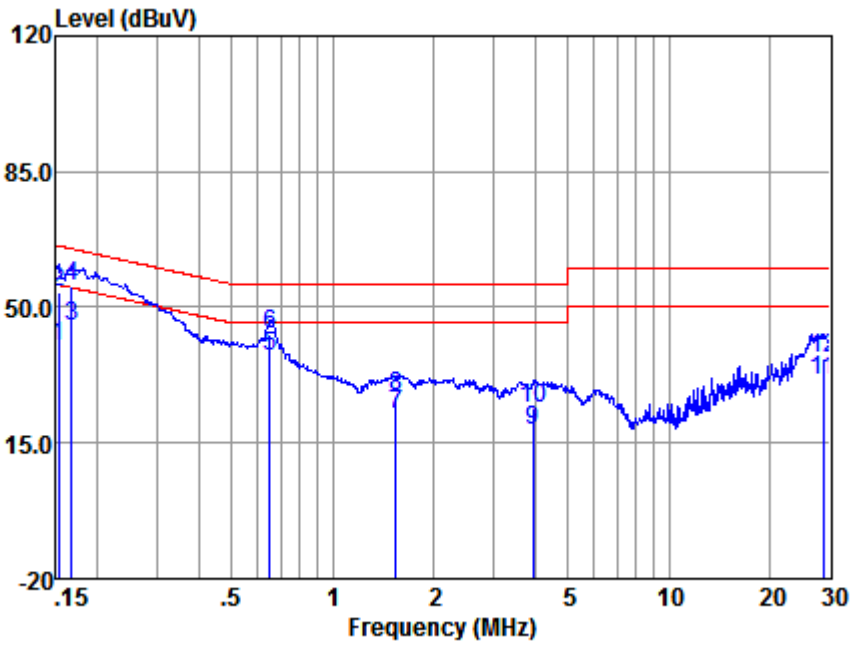
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

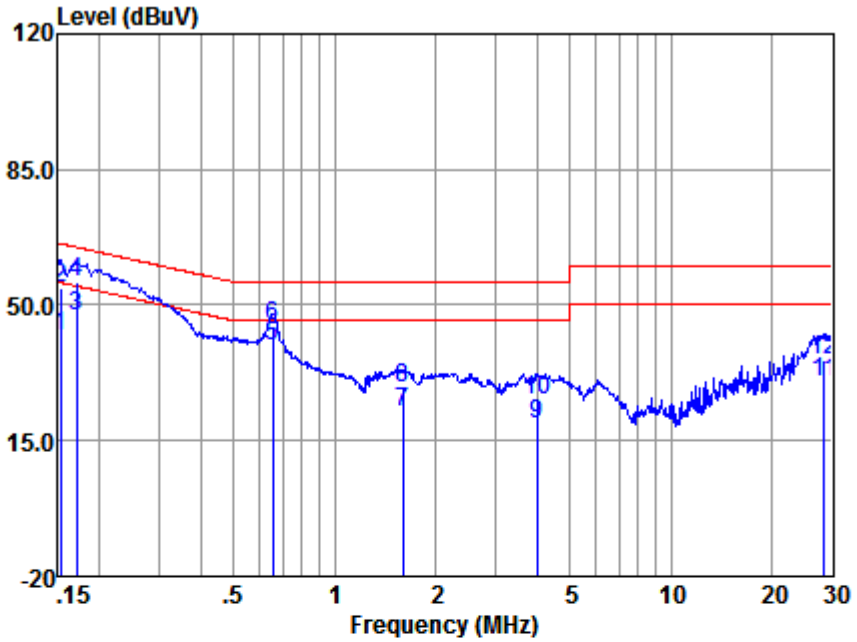
Remark: LISN=Read Level+ Cable Loss+ LISN Factor



LISN : LINE

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	29.90	0.19	9.82	39.91	55.87	-15.96	Average
2	0.15	43.61	0.19	9.82	53.62	65.87	-12.25	QP
3	0.17	35.22	0.18	9.83	45.23	55.08	-9.85	Average
4	0.17	45.19	0.18	9.83	55.20	65.08	-9.88	QP
5	0.65	27.56	0.18	9.83	37.57	46.00	-8.43	Average
6	0.65	33.02	0.18	9.83	43.03	56.00	-12.97	QP
7	1.54	12.05	0.23	9.88	22.16	46.00	-23.84	Average
8	1.54	16.98	0.23	9.88	27.09	56.00	-28.91	QP
9	3.94	7.80	0.36	9.89	18.05	46.00	-27.95	Average
10	3.94	13.70	0.36	9.89	23.95	56.00	-32.05	QP
11	28.75	18.73	2.12	10.33	31.18	50.00	-18.82	Average
12	28.75	24.25	2.12	10.33	36.70	60.00	-23.30	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss



LISN : NEUTRAL

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	32.07	0.19	9.82	42.08	55.87	-13.79	Average
2	0.15	44.34	0.19	9.82	54.35	65.87	-11.52	QP
3	0.17	37.17	0.18	9.83	47.18	54.94	-7.76	Average
4	0.17	46.08	0.18	9.83	56.09	64.94	-8.85	QP
5	0.65	29.26	0.18	9.83	39.27	46.00	-6.73	Average
6	0.65	34.42	0.18	9.83	44.43	56.00	-11.57	QP
7	1.59	12.42	0.23	9.89	22.54	46.00	-23.46	Average
8	1.59	18.64	0.23	9.89	28.76	56.00	-27.24	QP
9	4.01	9.02	0.36	9.89	19.27	46.00	-26.73	Average
10	4.01	15.29	0.36	9.89	25.54	56.00	-30.46	QP
11	28.60	17.79	2.11	10.26	30.16	50.00	-19.84	Average
12	28.60	23.52	2.11	10.26	35.89	60.00	-24.11	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

7.2 Frequency Stability

Test Requirement RSS-Gen Section 8.11

Test Method: RSS-Gen Section 6.11

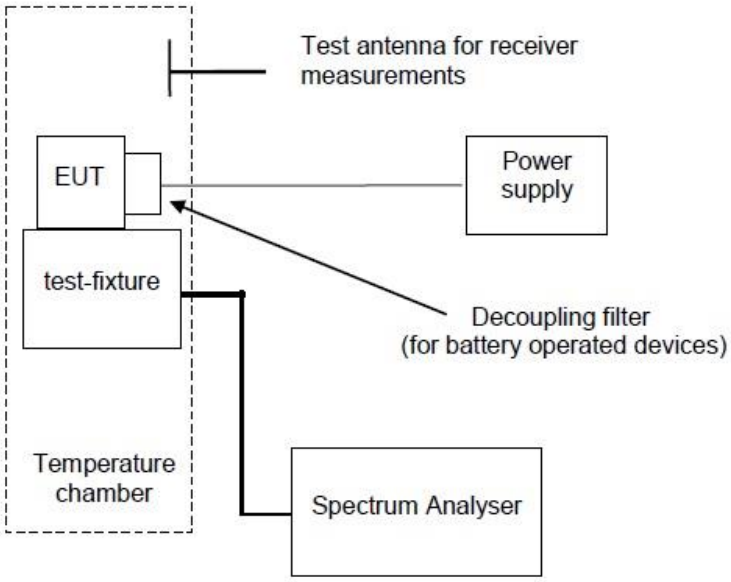
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode TX mode_Keep the EUT in continuously transmitting mode with unmodulated carrier frequency.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

Test Conditions		Test Result		
Voltage	Temp (℃)	2402	2441	2480
Normal	Extreme (-20)	2402.008	2441.008	2480.006
	Extreme (+20)	2402.006	2441.009	2480.008
	Extreme (+50)	2402.010	2441.006	2480.008
Extreme (+15%)	Normal (20)	2402.008	2441.010	2480.006
Extreme (-15%)		2402.010	2441.010	2480.009

7.3 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(1)
RSS-247 Section 5.4(b)

Test Method: ANSI C63.10 (2013) Section 7.8.5

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

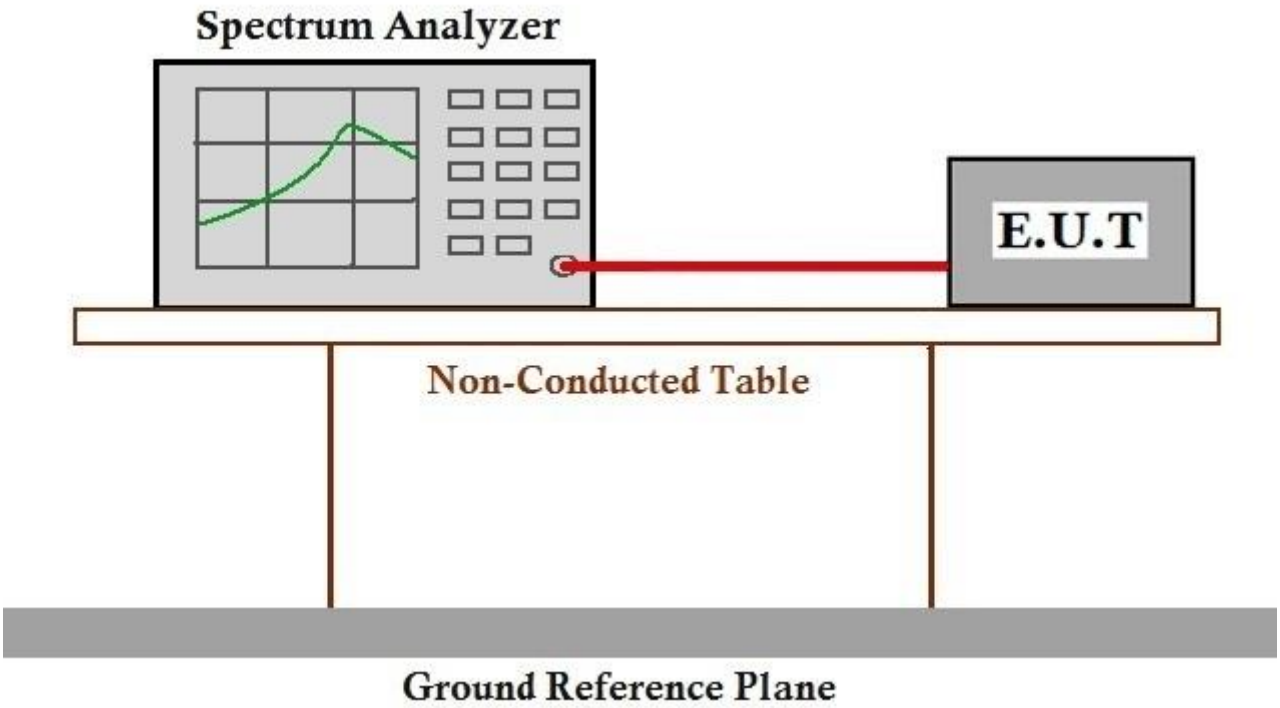
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.4 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247(a)(1)
RSS-247 Section 5.1(a)

Test Method: ANSI C63.10 (2013) Section 7.8.7

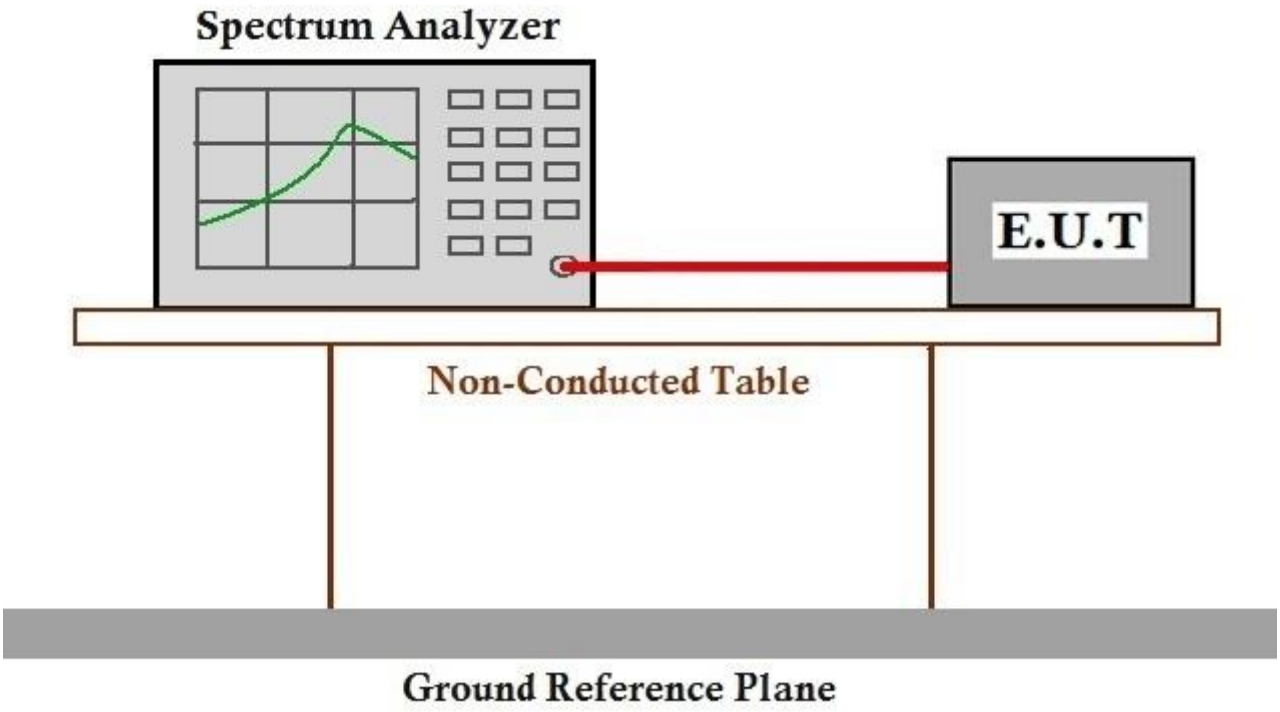
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.5 Carrier Frequencies Separation

Test Requirement	47 CFR Part 15, Subpart C 15.247a(1) RSS-247 Section 5.1(b)
Test Method:	ANSI C63.10 (2013) Section 7.8.2
Limit:	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W

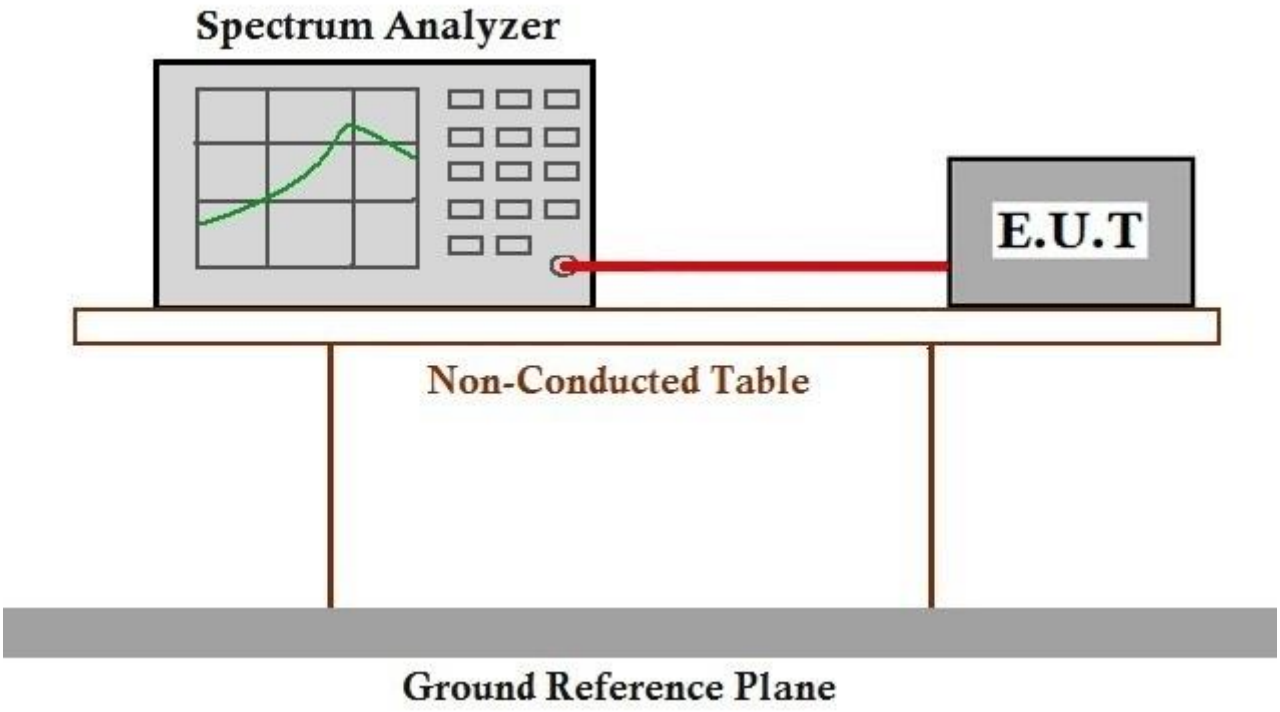
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.6 Hopping Channel Number

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)
RSS-247 Section 5.1(d)

Test Method: ANSI C63.10 (2013) Section 7.8.3

Limit:

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

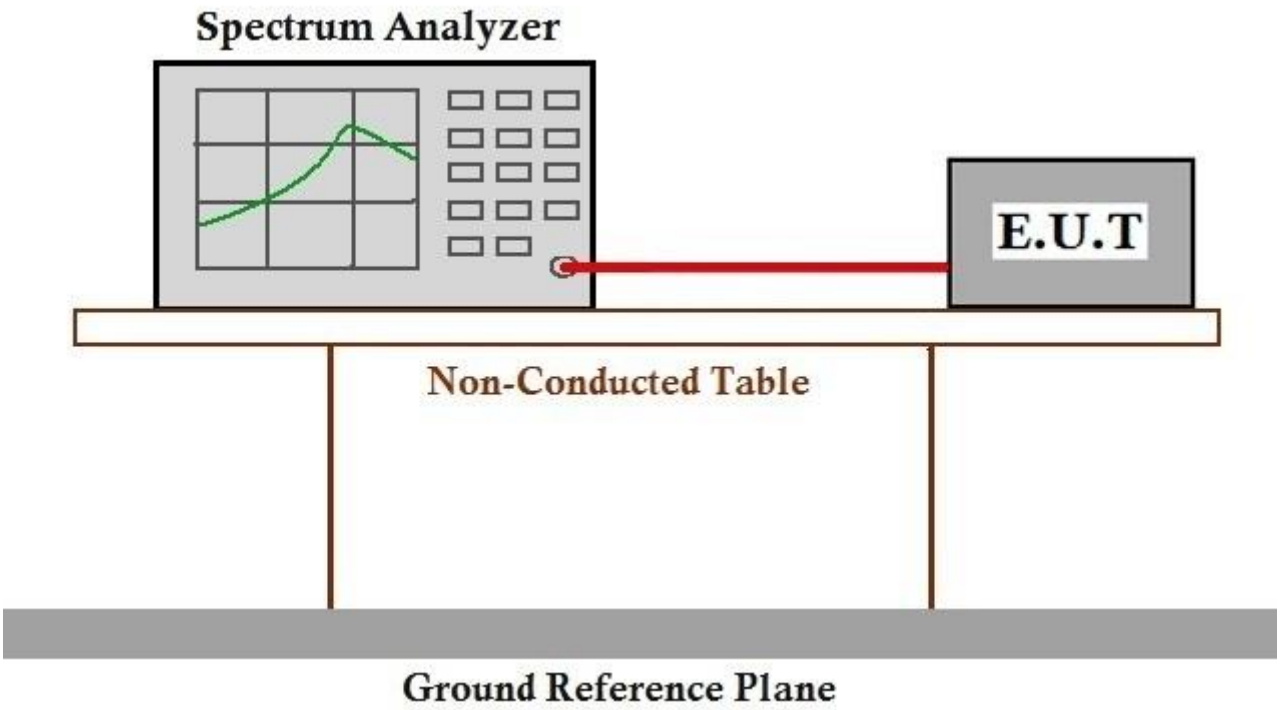
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.7 Dwell Time

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)
RSS-247 Section 5.1(d)

Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

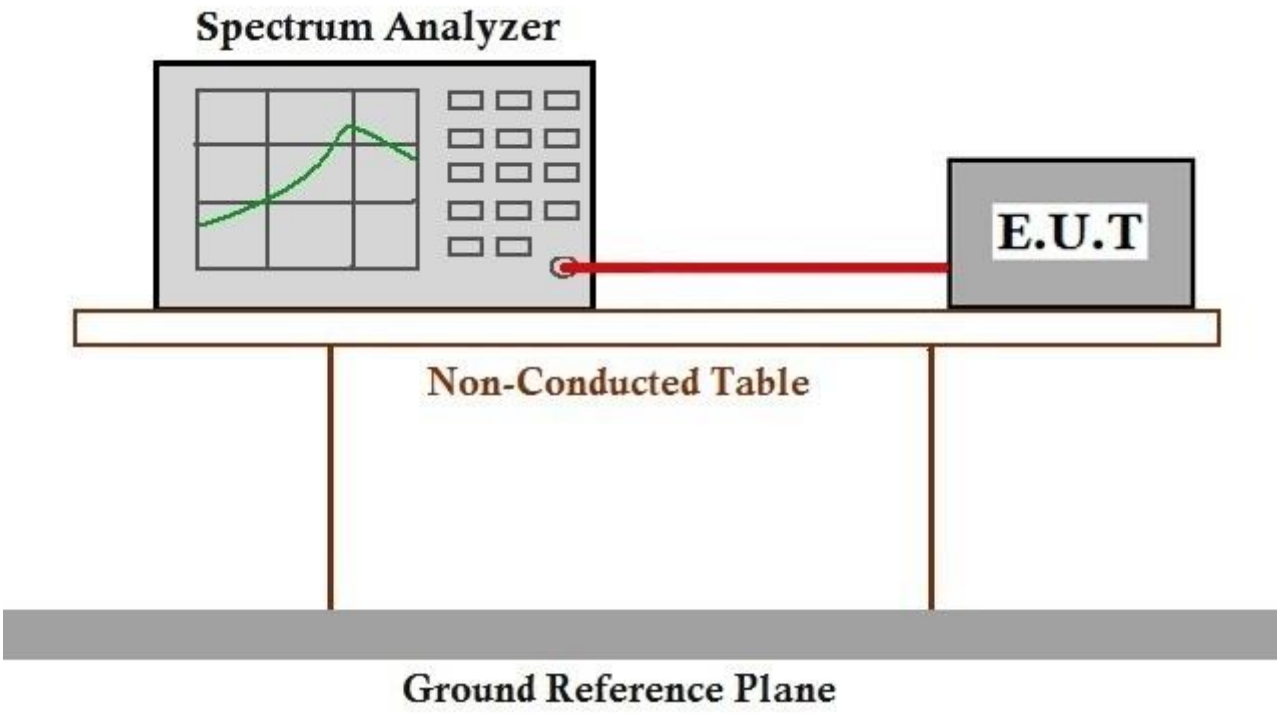
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.7.2 Test Setup Diagram



7.7.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.8 Conducted Band Edges Measurement

Test Requirement	47 CFR Part 15, Subpart C 15.247(d) RSS-247 Section 5.5
Test Method:	ANSI C63.10 (2013) Section 7.8.6
Limit:	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)

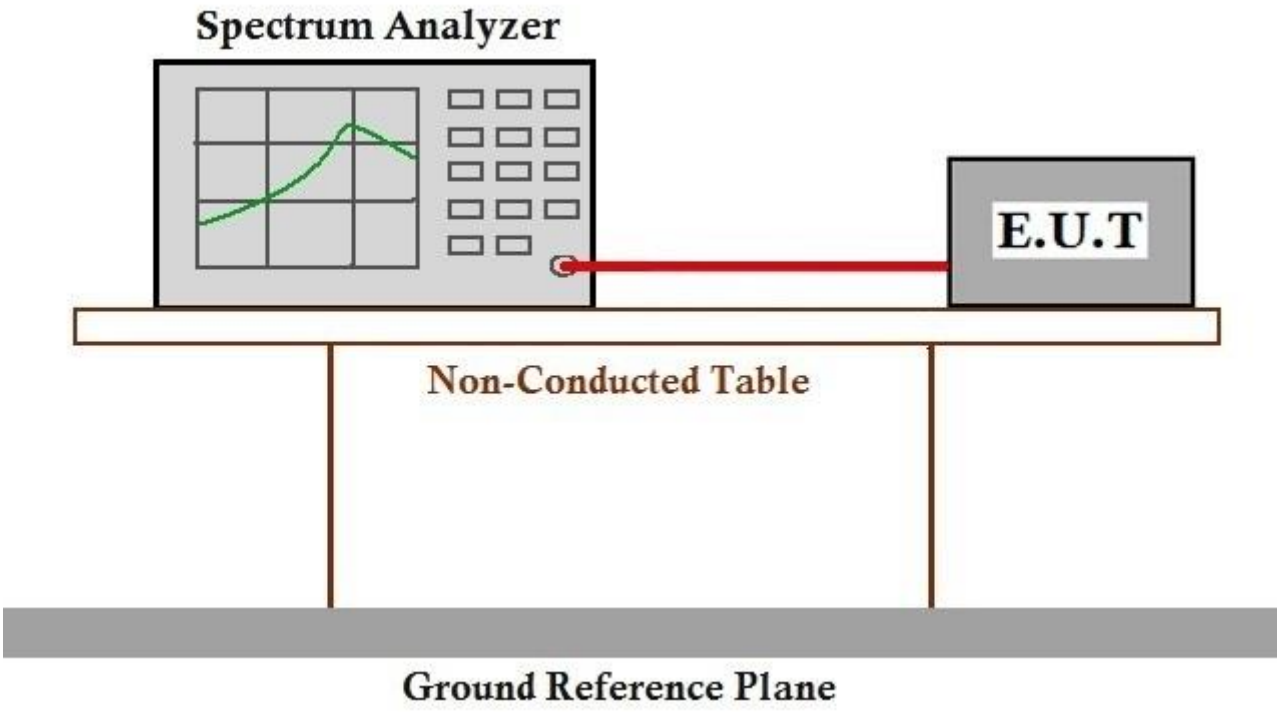
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.9 Conducted Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.247(d) RSS-247 Section 5.5
Test Method:	ANSI C63.10 (2013) Section 7.8.8
Limit:	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)

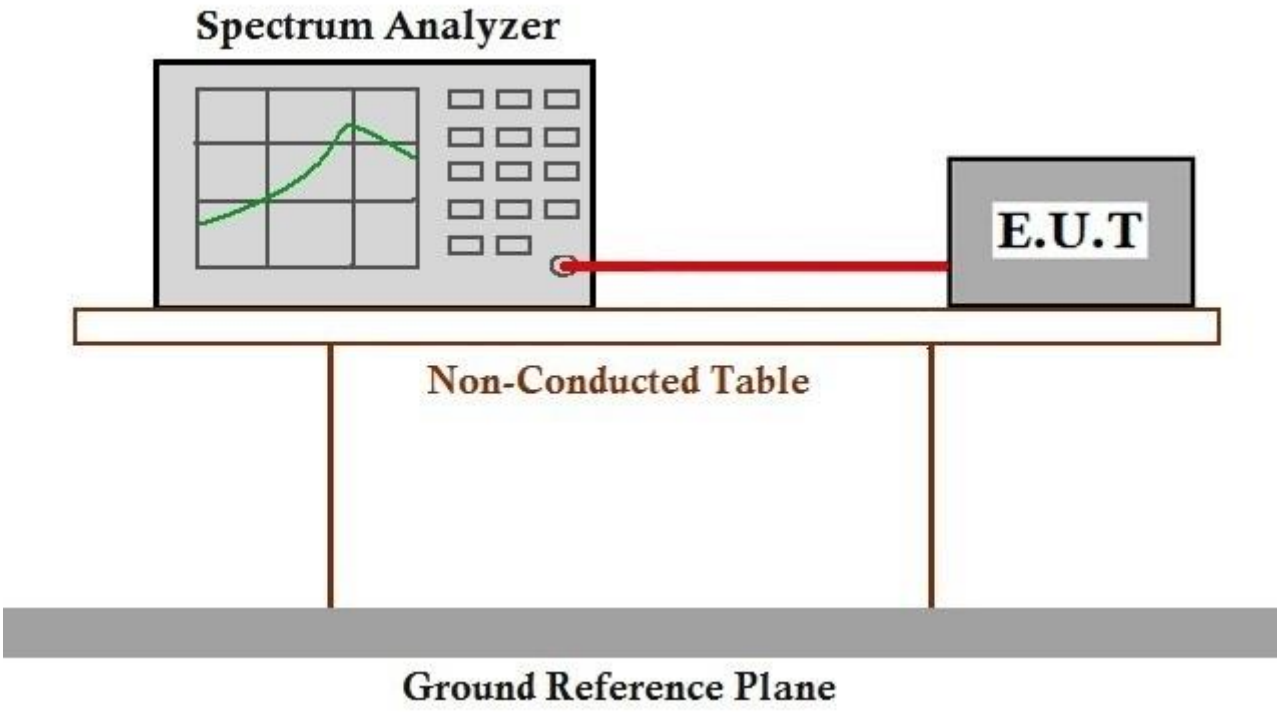
7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.9.2 Test Setup Diagram



7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

7.10 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Section 3.3 & RSS-Gen Section 8.9

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

Frequency(MHz)	Field strength(microvolts/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
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

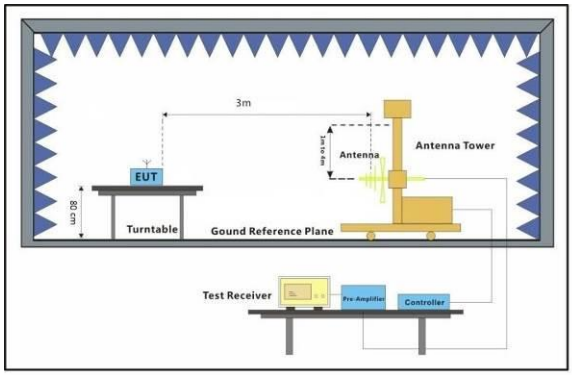
7.10.1 E.U.T. Operation

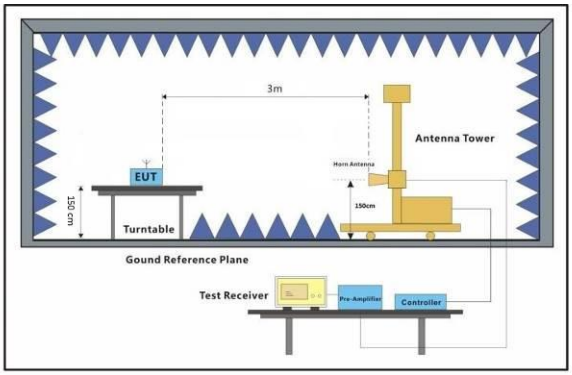
Operating Environment:

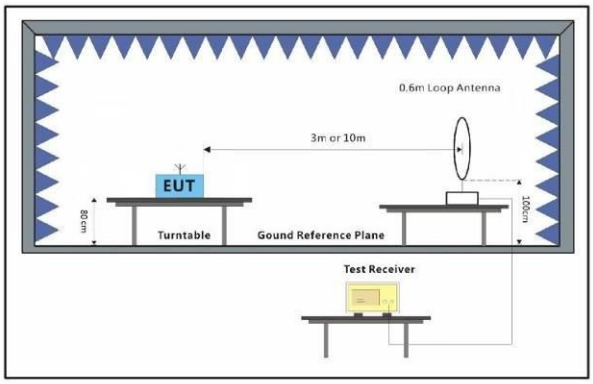
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.10.2 Test Setup Diagram







7.10.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

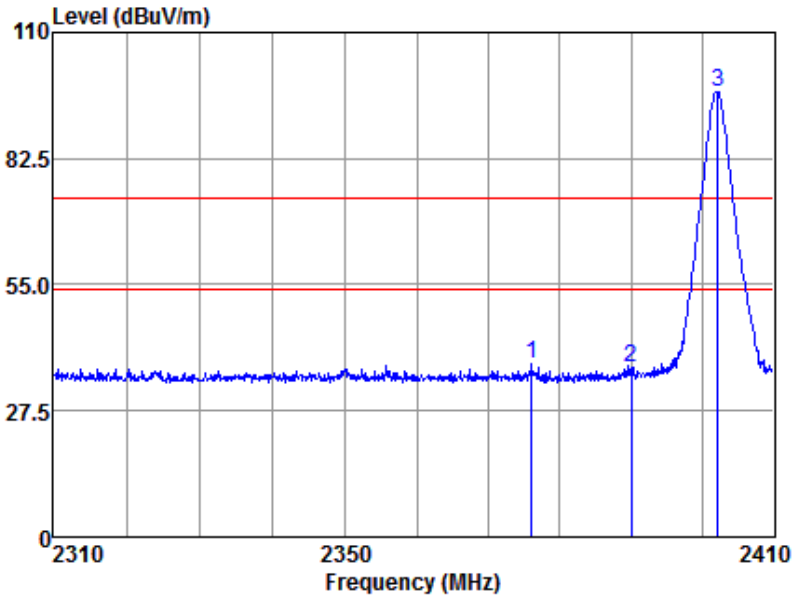
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low

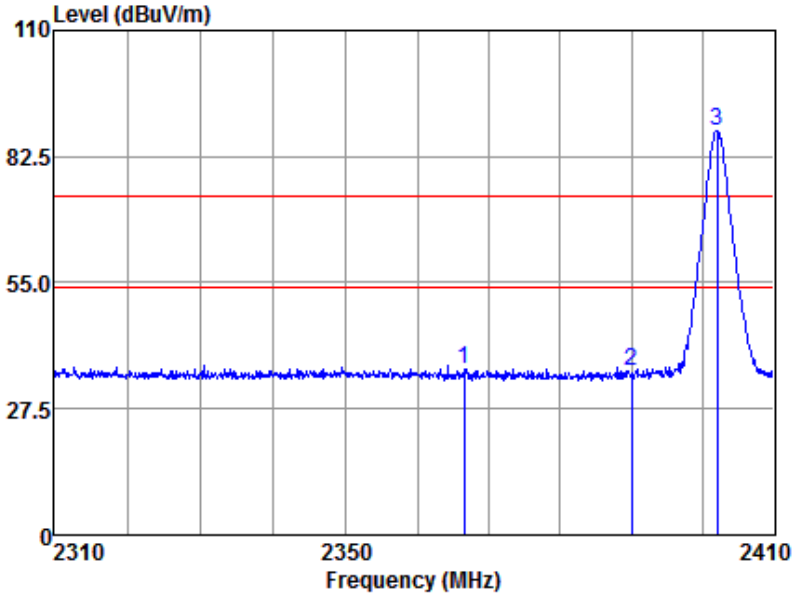


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2376.03	42.50	26.01	6.45	37.36	37.60	74.00	-36.40	Peak
2390.00	41.93	26.03	6.47	37.36	37.07	74.00	-36.93	Peak
2402.25	101.95	26.05	6.50	37.35	97.15	74.00	23.15	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:Low

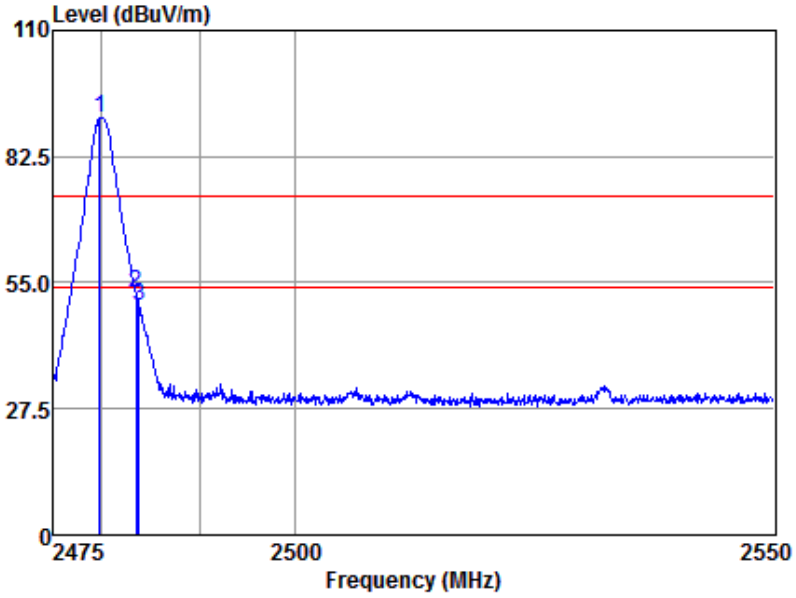


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2366.48	40.92	26.00	6.42	37.36	35.98	74.00	-38.02	Peak
2390.00	40.60	26.03	6.47	37.36	35.74	74.00	-38.26	Peak
2402.15	92.92	26.05	6.50	37.35	88.12	74.00	14.12	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:High

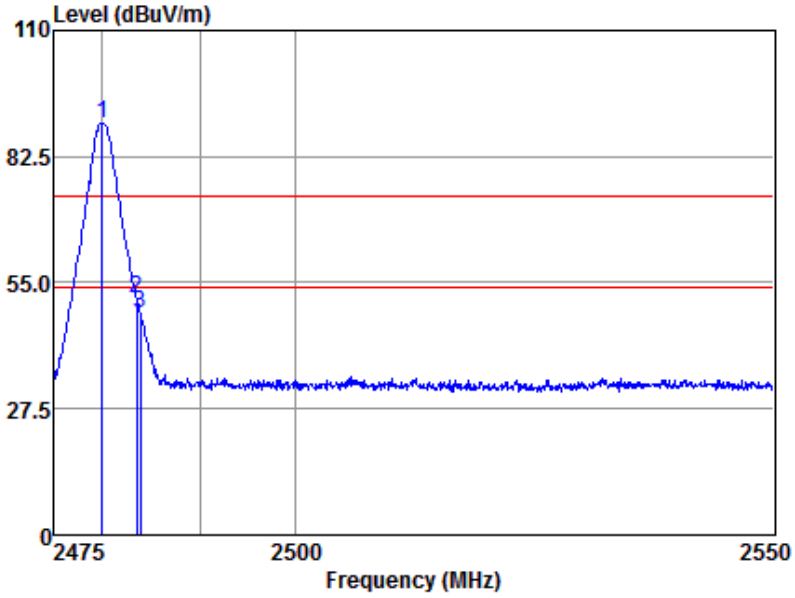


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.81	95.49	26.17	6.74	37.49	90.91	74.00	16.91	Peak
2483.50	57.37	26.18	6.80	37.51	52.84	74.00	-21.16	Peak
2483.81	54.28	26.18	6.80	37.51	49.75	74.00	-24.25	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:High

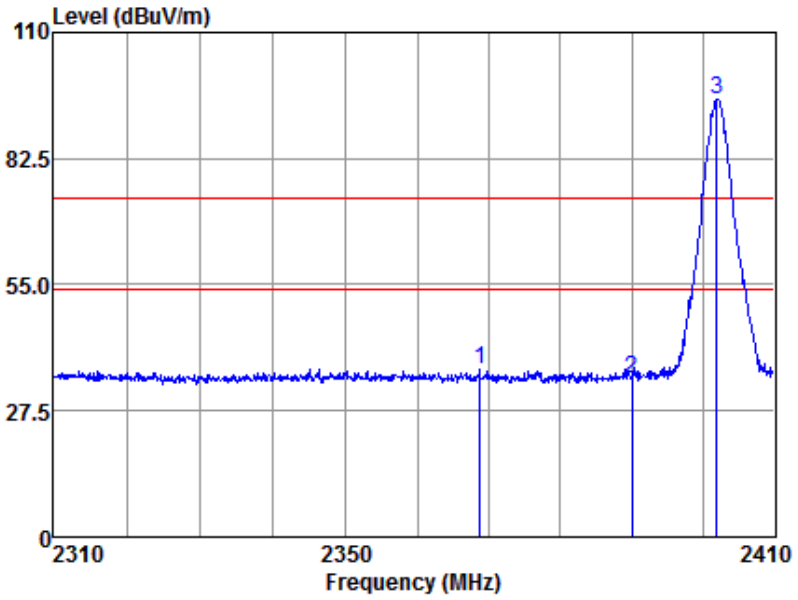


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.96	94.34	26.17	6.74	37.49	89.76	74.00	15.76	Peak
2483.50	56.10	26.18	6.80	37.51	51.57	74.00	-22.43	Peak
2483.88	53.03	26.18	6.80	37.51	48.50	74.00	-25.50	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:π/4 DQPSK; ; Channel:Low

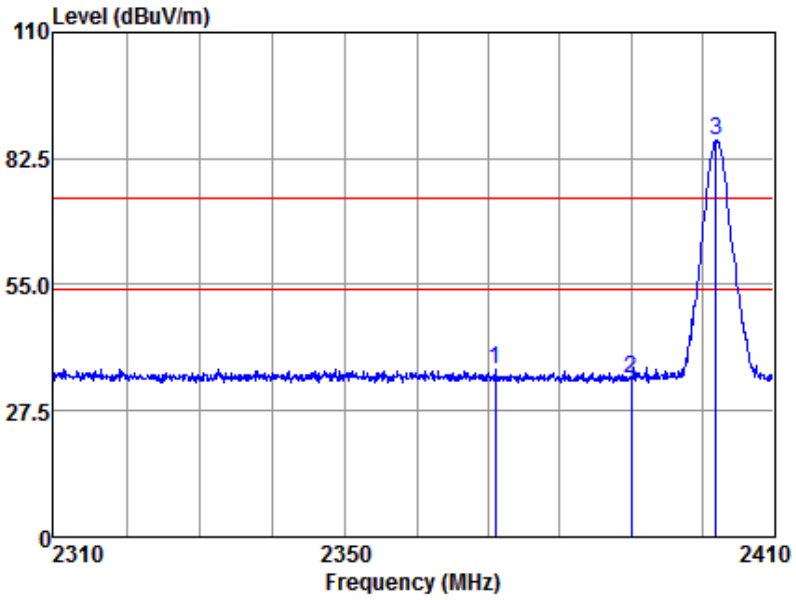


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2368.69	41.49	26.00	6.45	37.36	36.58	74.00	-37.42	Peak
2390.00	39.48	26.03	6.47	37.36	34.62	74.00	-39.38	Peak
2401.95	100.15	26.05	6.50	37.35	95.35	74.00	21.35	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:π/4 DQPSK; ; Channel:Low

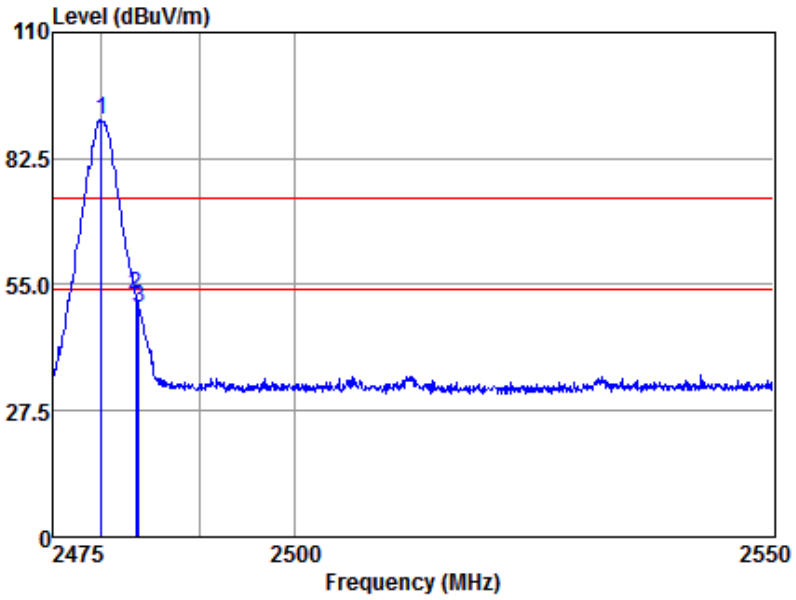


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2371.00	41.59	26.01	6.45	37.36	36.69	74.00	-37.31	Peak
2390.00	39.53	26.03	6.47	37.36	34.67	74.00	-39.33	Peak
2401.95	91.17	26.05	6.50	37.35	86.37	74.00	12.37	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:π/4 DQPSK; ; Channel:High

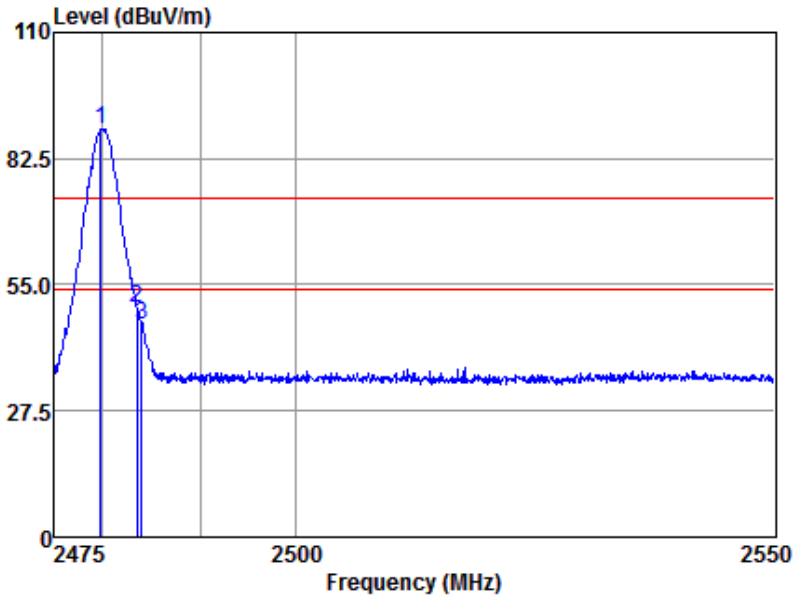


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.96	95.46	26.17	6.74	37.49	90.88	74.00	16.88	Peak
2483.50	57.21	26.18	6.80	37.51	52.68	74.00	-21.32	Peak
2483.81	54.56	26.18	6.80	37.51	50.03	74.00	-23.97	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:π/4 DQPSK; ; Channel:High

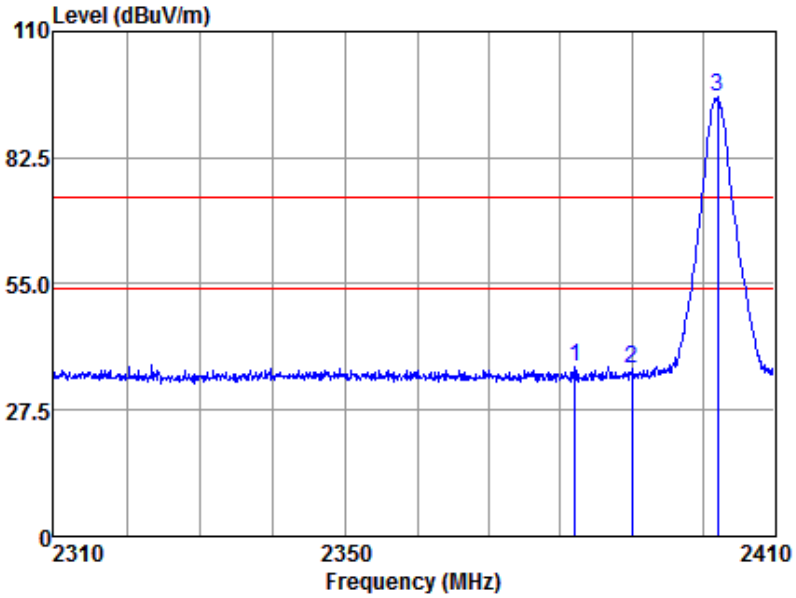


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.81	93.51	26.17	6.74	37.49	88.93	74.00	14.93	Peak
2483.50	54.61	26.18	6.80	37.51	50.08	74.00	-23.92	Peak
2483.96	50.71	26.18	6.80	37.51	46.18	74.00	-27.82	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:8DPSK; ; Channel:Low

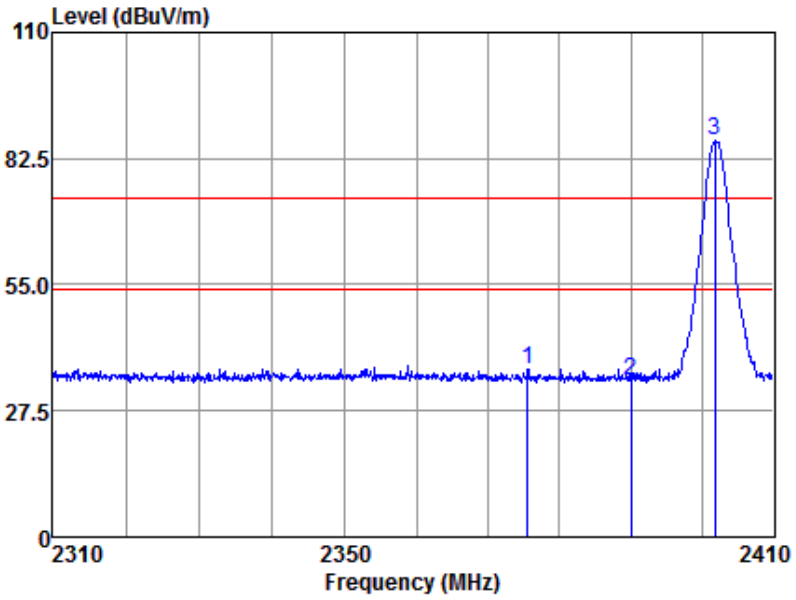


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2381.98	41.92	26.02	6.45	37.36	37.03	74.00	-36.97	Peak
2390.00	41.27	26.03	6.47	37.36	36.41	74.00	-37.59	Peak
2402.15	100.40	26.05	6.50	37.35	95.60	74.00	21.60	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:8DPSK; ; Channel:Low

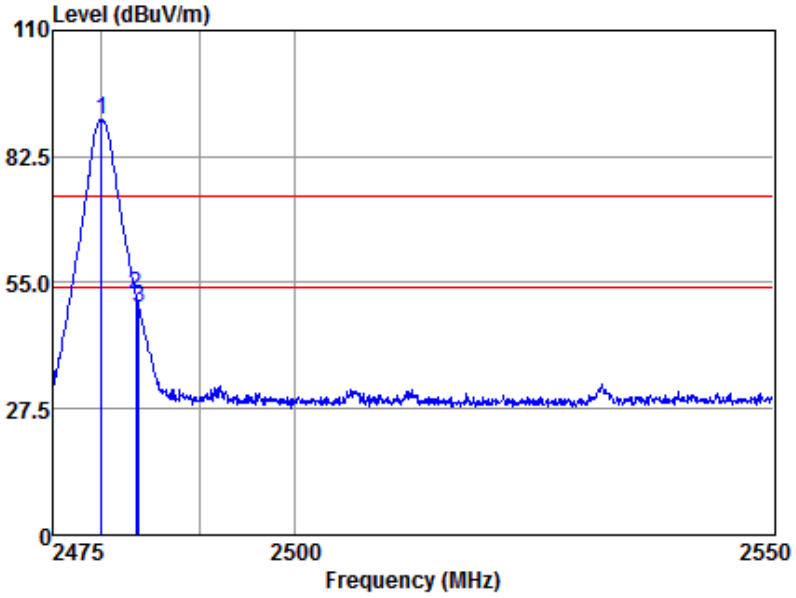


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2375.52	41.53	26.01	6.45	37.36	36.63	74.00	-37.37	Peak
2390.00	39.12	26.03	6.47	37.36	34.26	74.00	-39.74	Peak
2401.84	91.29	26.05	6.50	37.35	86.49	74.00	12.49	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Horizontal; Modulation:8DPSK; ; Channel:High

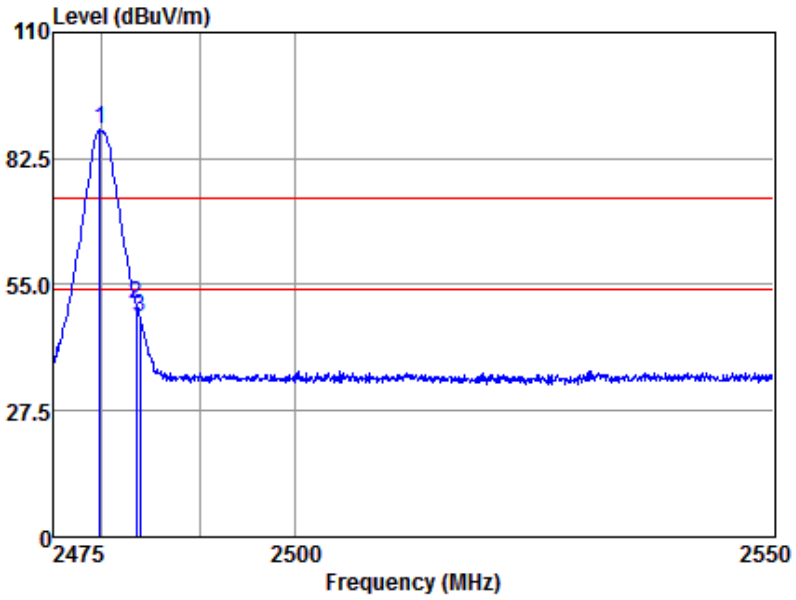


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.96	95.06	26.17	6.74	37.49	90.48	74.00	16.48	Peak
2483.50	57.04	26.18	6.80	37.51	52.51	74.00	-21.49	Peak
2483.81	54.01	26.18	6.80	37.51	49.48	74.00	-24.52	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical; Modulation:8DPSK; ; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2479.81	93.30	26.17	6.74	37.49	88.72	74.00	14.72	Peak
2483.50	55.30	26.18	6.80	37.51	50.77	74.00	-23.23	Peak
2483.88	52.49	26.18	6.80	37.51	47.96	74.00	-26.04	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.11 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Section 3.3 & RSS-Gen Section 8.9

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Limit:

Frequency(MHz)	Field strength(microvolts/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
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

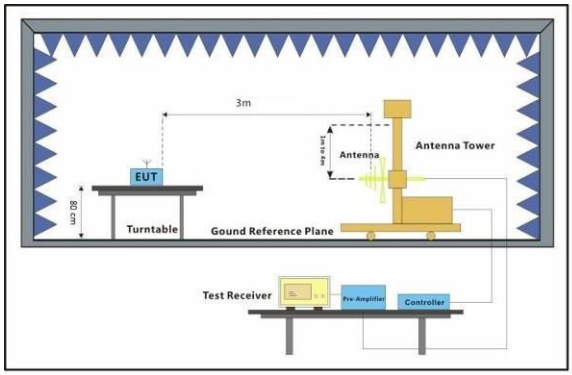
7.11.1 E.U.T. Operation

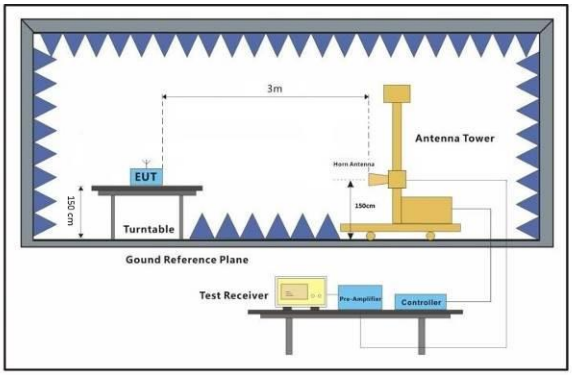
Operating Environment:

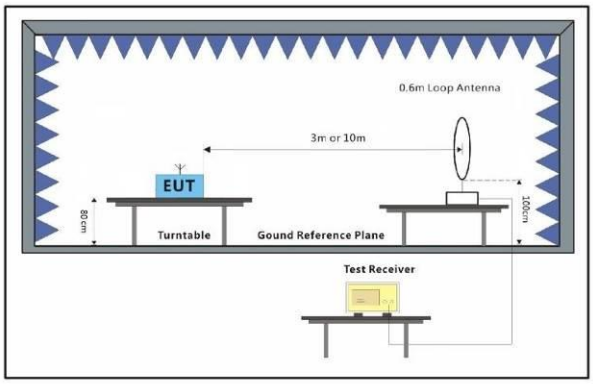
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.11.2 Test Setup Diagram







7.11.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

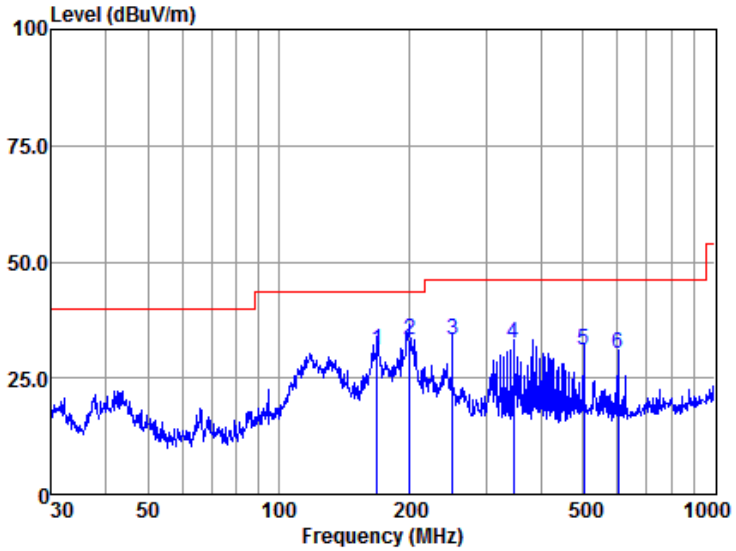
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown

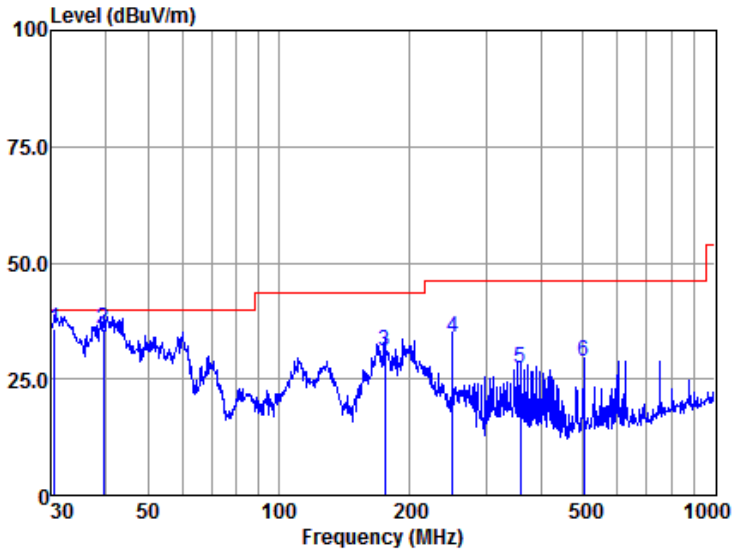
Below 1GHz



Antenna Polarity :HORIZONTAL
EUT/Project :4272CR
Test mode :d

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	167.82	60.97	11.93	0.65	42.58	30.97	43.50	-12.53	QP
2	199.99	65.79	9.40	0.69	42.52	33.36	43.50	-10.14	QP
3	250.30	63.46	11.50	0.77	42.46	33.27	46.00	-12.73	QP
4	346.81	59.49	14.15	0.92	42.25	32.31	46.00	-13.69	QP
5	501.18	54.88	17.24	1.18	42.14	31.16	46.00	-14.84	QP
6	601.43	51.52	19.42	1.38	42.19	30.13	46.00	-15.87	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



Antenna Polarity :VERTICAL
EUT/Project :4272CR
Test mode :d

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	30.53	62.98	15.36	0.18	42.60	35.92	40.00	-4.08	QP
2	39.58	62.02	16.26	0.22	42.62	35.88	40.00	-4.12	QP
3	175.04	61.05	11.75	0.66	42.56	30.90	43.50	-12.60	QP
4	250.30	64.24	11.50	0.77	42.46	34.05	46.00	-11.95	QP
5	359.19	54.22	14.38	0.93	42.21	27.32	46.00	-18.68	QP
6	501.18	52.34	17.24	1.18	42.14	28.62	46.00	-17.38	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Above 1GHz

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	39.88	6.18	46.06	54	-7.94	peak
7206	36.12	10.63	46.75	54	-7.25	peak
9608	33.88	14.38	48.26	54	-5.74	peak

Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	36.83	6.18	43.01	54	-10.99	peak
7206	35.46	10.63	46.09	54	-7.91	peak
9608	33.80	14.38	48.18	54	-5.82	peak

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	34.97	7.00	41.97	54	-12.03	peak
7323	38.81	11.13	49.94	54	-4.06	peak
9764	33.05	14.36	47.41	54	-6.59	peak

Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	35.42	7.00	42.42	54	-11.58	peak
7323	35.65	11.13	46.78	54	-7.22	peak
9764	30.77	14.36	45.13	54	-8.87	peak

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	38.42	7.49	45.91	54	-8.09	peak
7440	36.18	11.65	47.83	54	-6.17	peak
9920	31.31	14.40	45.71	54	-8.29	peak

Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	34.95	7.49	42.44	54	-11.56	peak
7440	33.86	11.65	45.51	54	-8.49	peak
9920	31.00	14.40	45.40	54	-8.60	peak

Mode:a; Polarization:Horizontal; Modulation:π/4 DQPSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	39.63	6.18	45.81	54	-8.19	peak
7206	37.28	10.63	47.91	54	-6.09	peak
9608	30.16	14.38	44.54	54	-9.46	peak

Mode:a; Polarization:Vertical; Modulation:π/4 DQPSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	33.62	6.18	39.80	54	-14.20	peak
7206	33.13	10.63	43.76	54	-10.24	peak
9608	32.28	14.38	46.66	54	-7.34	peak

Mode:a; Polarization:Horizontal; Modulation:π/4 DQPSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	38.64	7.00	45.64	54	-8.36	peak
7323	37.36	11.13	48.49	54	-5.51	peak
9764	33.31	14.36	47.67	54	-6.33	peak

Mode:a; Polarization:Vertical; Modulation:π/4 DQPSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	36.41	7.00	43.41	54	-10.59	peak
7323	35.08	11.13	46.21	54	-7.79	peak
9764	34.44	14.36	48.80	54	-5.20	peak

Mode:a; Polarization:Horizontal; Modulation:π/4 DQPSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	34.32	7.49	41.81	54	-12.19	peak
7440	33.83	11.65	45.48	54	-8.52	peak
9920	33.96	14.40	48.36	54	-5.64	peak

Mode:a; Polarization:Vertical; Modulation:π/4 DQPSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	35.65	7.49	43.14	54	-10.86	peak
7440	35.59	11.65	47.24	54	-6.76	peak
9920	32.61	14.40	47.01	54	-6.99	peak

Mode:a; Polarization:Horizontal; Modulation:8DPSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	38.22	6.18	44.40	54	-9.60	peak
7206	36.10	10.63	46.73	54	-7.27	peak
9608	33.02	14.38	47.40	54	-6.60	peak

Mode:a; Polarization:Vertical; Modulation:8DPSK; ; Channel:Low

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4804	32.83	6.18	39.01	54	-14.99	peak
7206	33.94	10.63	44.57	54	-9.43	peak
9608	32.12	14.38	46.50	54	-7.50	peak

Mode:a; Polarization:Horizontal; Modulation:8DPSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	38.79	7.00	45.79	54	-8.21	peak
7323	36.88	11.13	48.01	54	-5.99	peak
9764	34.46	14.36	48.82	54	-5.18	peak

Mode:a; Polarization:Vertical; Modulation:8DPSK; ; Channel:middle

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4882	38.35	7.00	45.35	54	-8.65	peak
7323	36.66	11.13	47.79	54	-6.21	peak
9764	32.77	14.36	47.13	54	-6.87	peak

Mode:a; Polarization:Horizontal; Modulation:8DPSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	36.91	7.49	44.40	54	-9.60	peak
7440	36.34	11.65	47.99	54	-6.01	peak
9920	32.51	14.40	46.91	54	-7.09	peak

Mode:a; Polarization:Vertical; Modulation:8DPSK; ; Channel:High

Frequency	RX_R	Factor	Emission	Limit	Over Limit	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4960	37.23	7.49	44.72	54	-9.28	peak
7440	35.12	11.65	46.77	54	-7.23	peak
9920	31.23	14.40	45.63	54	-8.37	peak

7.12 99% Bandwidth

Test Requirement RSS-Gen Section 6.6

Test Method: ANSI C63.10 Section 6.9.3

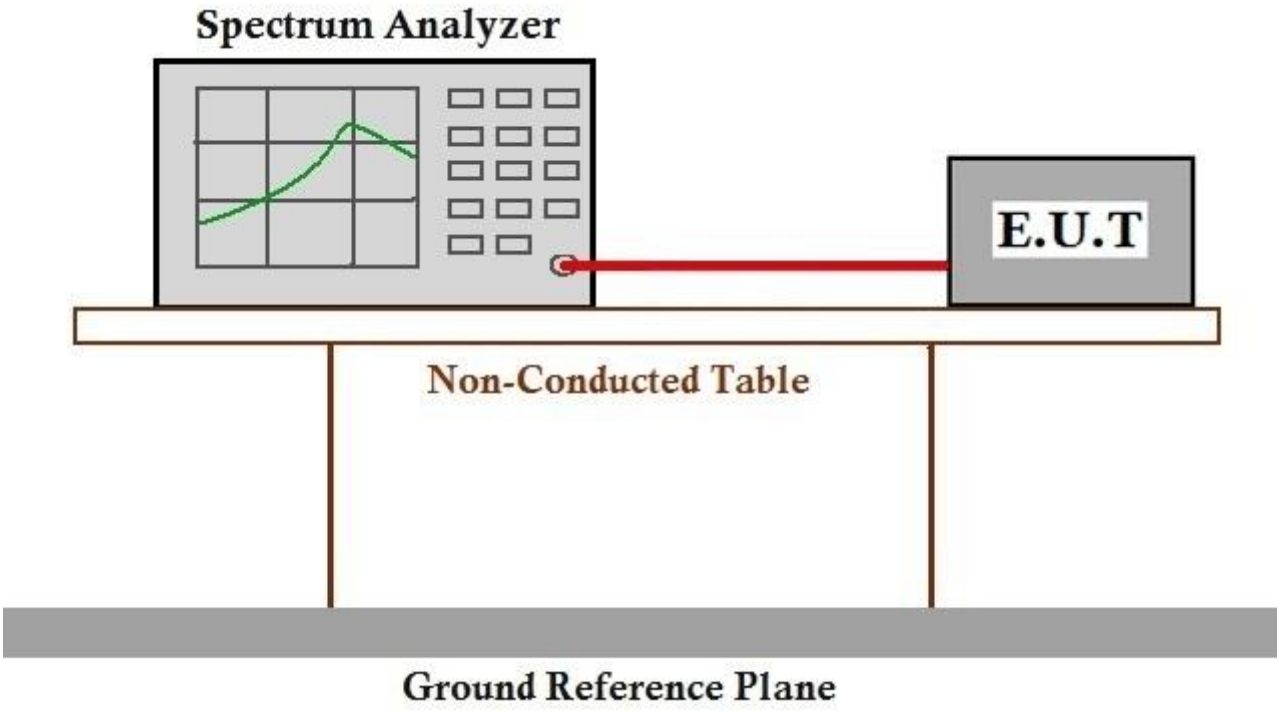
7.12.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Engineering Mode_Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

7.12.2 Test Setup Diagram



7.12.3 Measurement Procedure and Data

The detailed test data see: Appendix A SHEM180500427001

8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

9 EUT Constructional Details

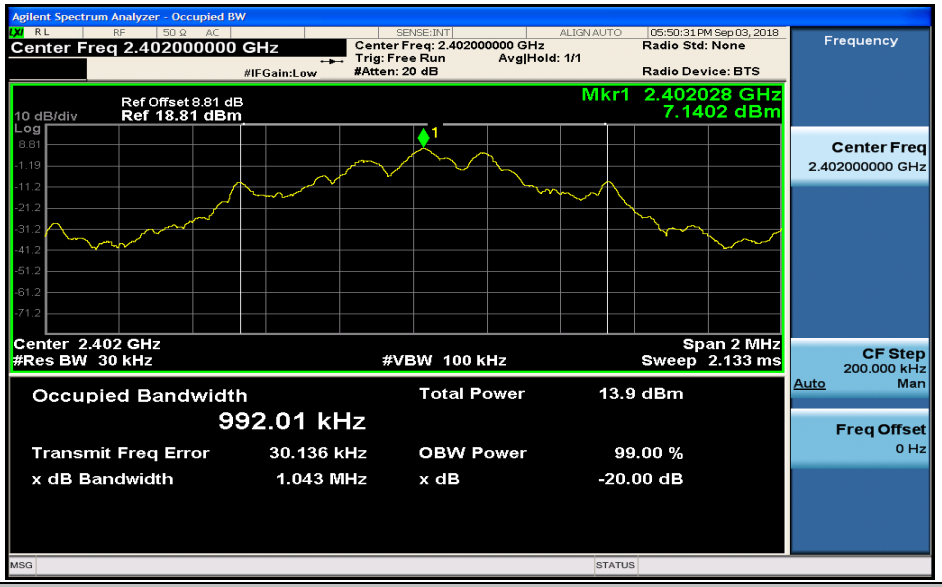
Refer to the < External Photos > & < Internal Photos >.

Appendix A for SHEM180500427001

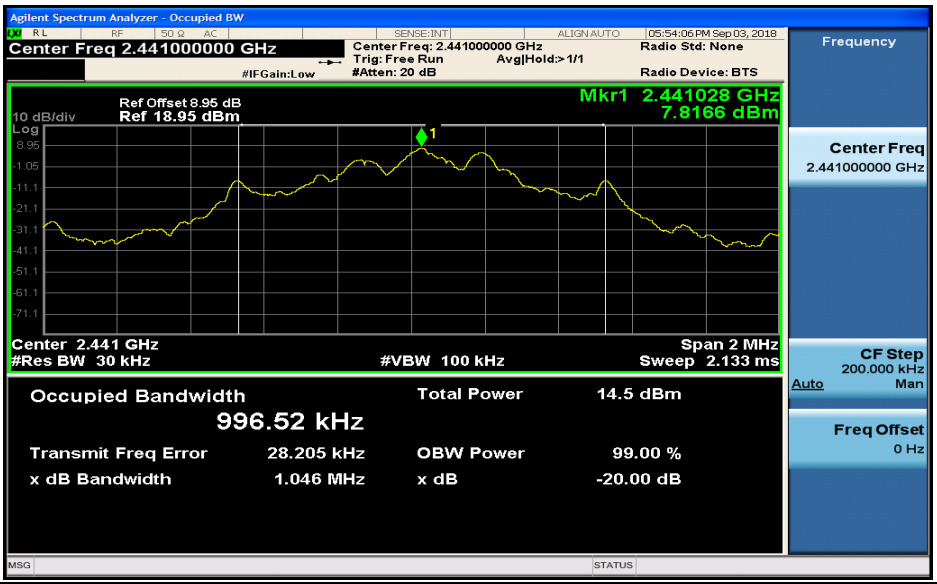
1.20 dB Bandwidth

Test Mode	Test Channel	EBW[MHz]	Limit[MHz]	Verdict
DH5	2402	1.04	---	PASS
DH5	2441	1.05	---	PASS
DH5	2480	1.05	---	PASS
2DH5	2402	1.16	---	PASS
2DH5	2441	1.16	---	PASS
2DH5	2480	1.16	---	PASS
3DH5	2402	1.17	---	PASS
3DH5	2441	1.17	---	PASS
3DH5	2480	1.17	---	PASS

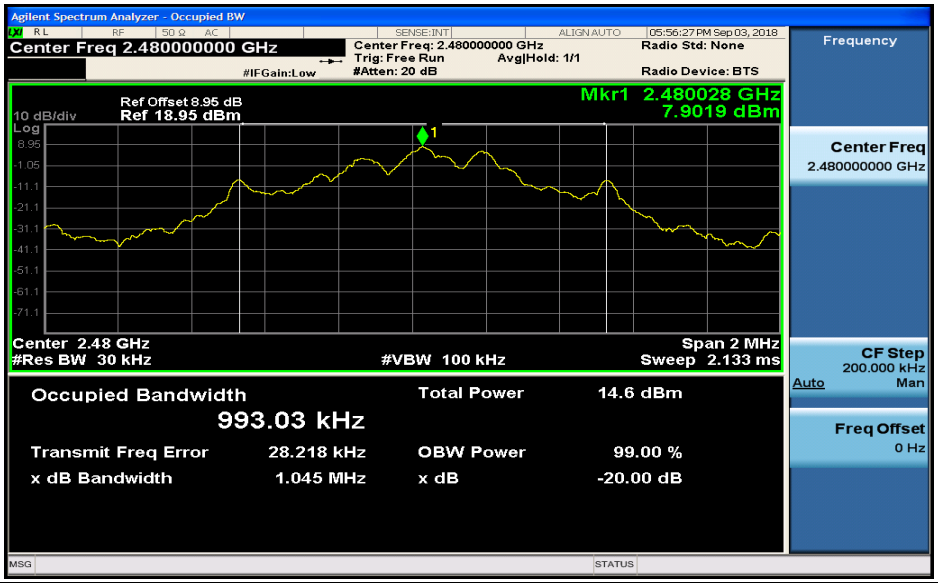
20 dB Bandwidth_DH5_2402



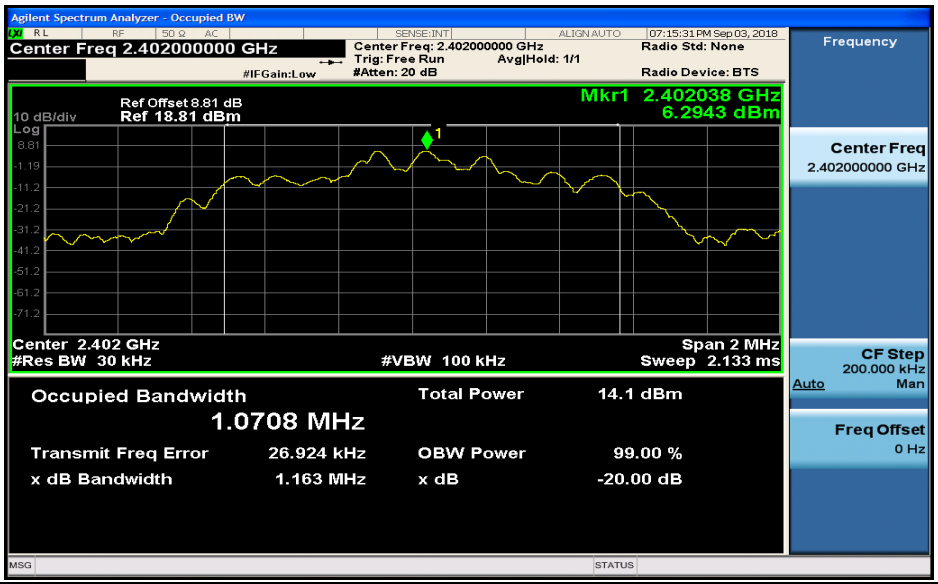
20 dB Bandwidth_DH5_2441



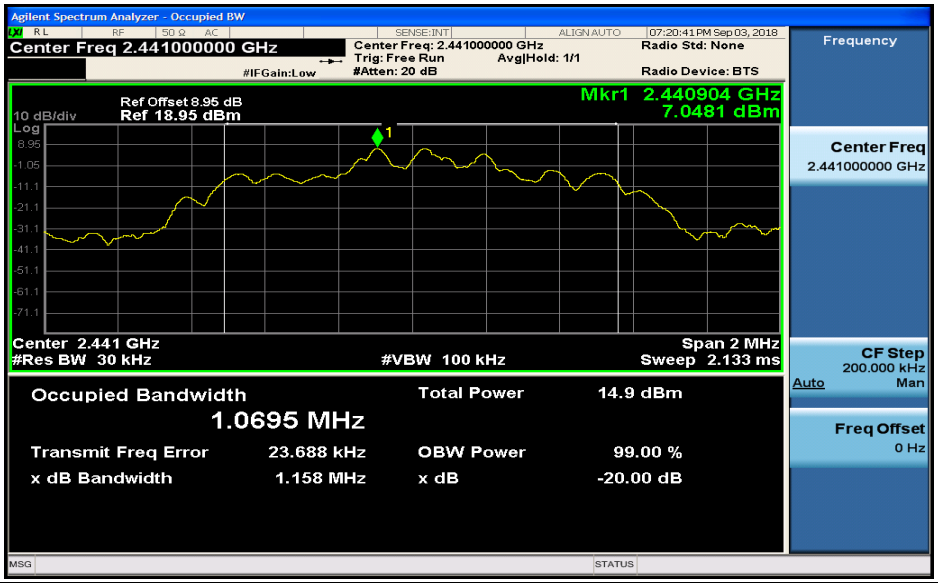
20 dB Bandwidth_DH5_2480



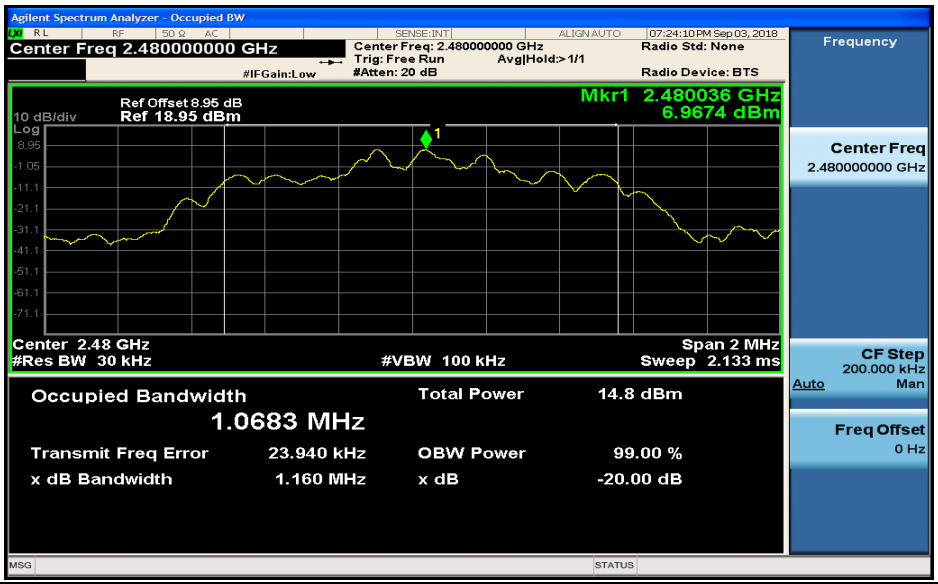
20 dB Bandwidth_2DH5_2402



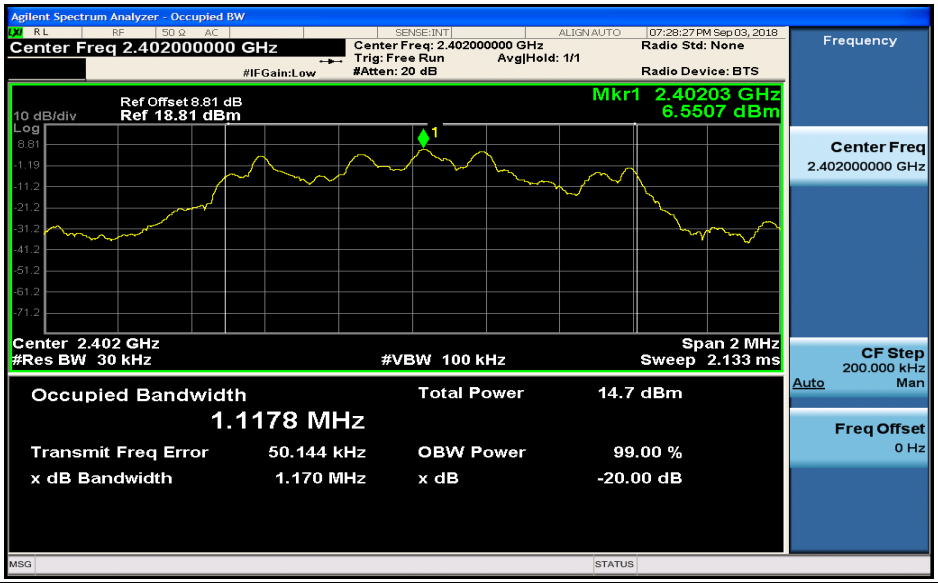
20 dB Bandwidth_2DH5_2441



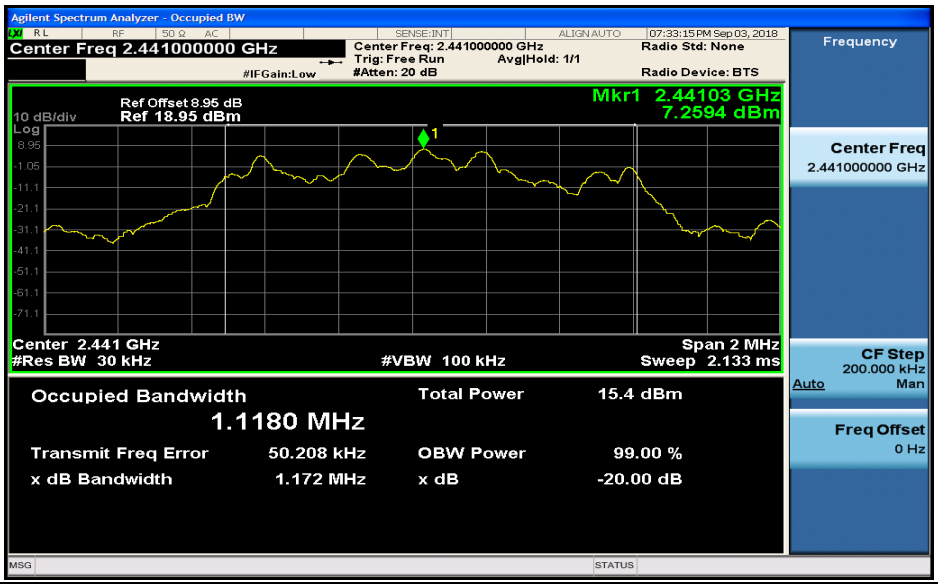
20 dB Bandwidth_2DH5_2480



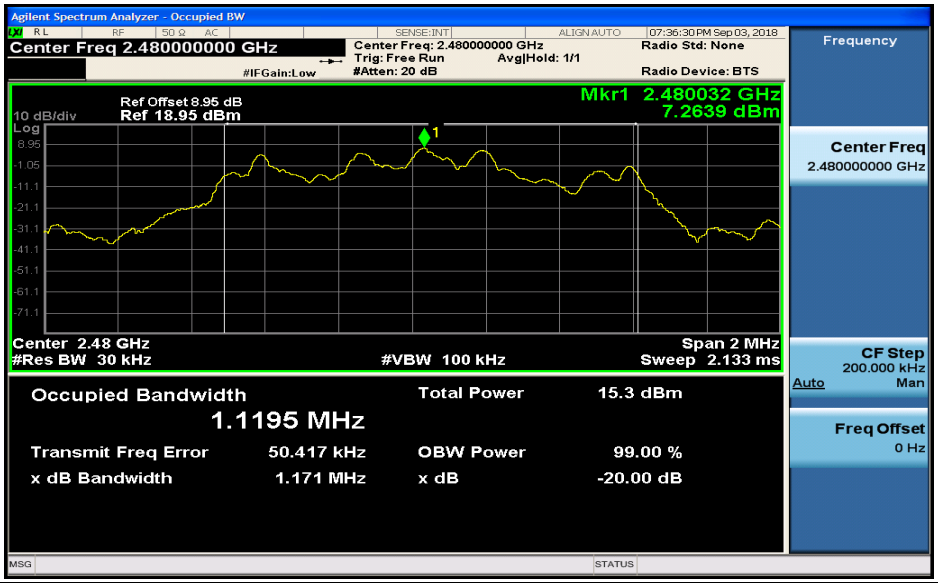
20 dB Bandwidth_3DH5_2402



20 dB Bandwidth_3DH5_2441



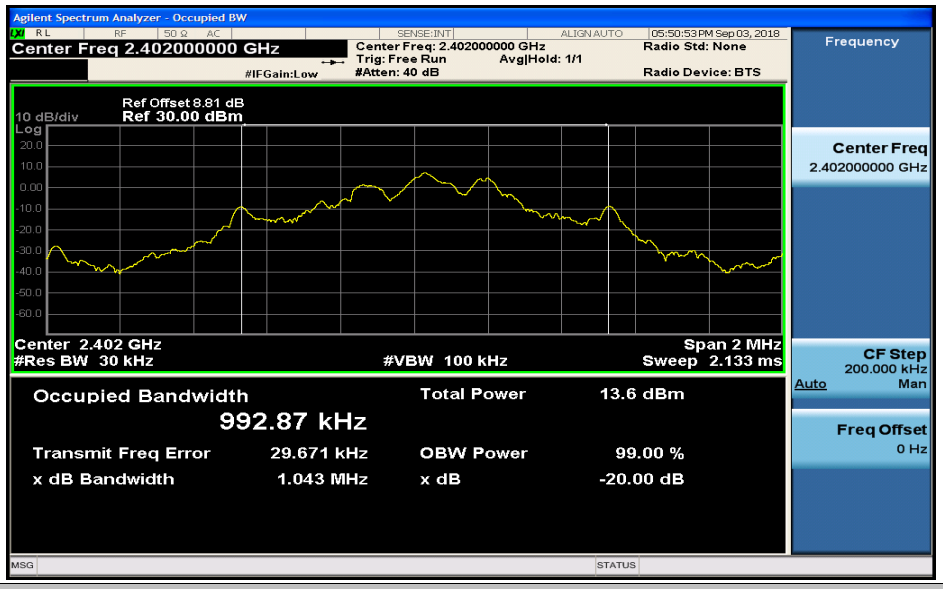
20 dB Bandwidth_3DH5_2480


Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
07:36:30 PM Sep 03, 2018
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 8.95 dB
10 dB/div
Ref 18.95 dBm
Log
Mkr1 2.480032 GHz
7.2639 dBm
8.95
-1.05
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2 MHz
Sweep 2.133 ms
CF Step
200.000 kHz
Auto
Man
Occupied Bandwidth
1.1195 MHz
Total Power
15.3 dBm
Transmit Freq Error
50.417 kHz
OBW Power
99.00 %
x dB Bandwidth
1.171 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

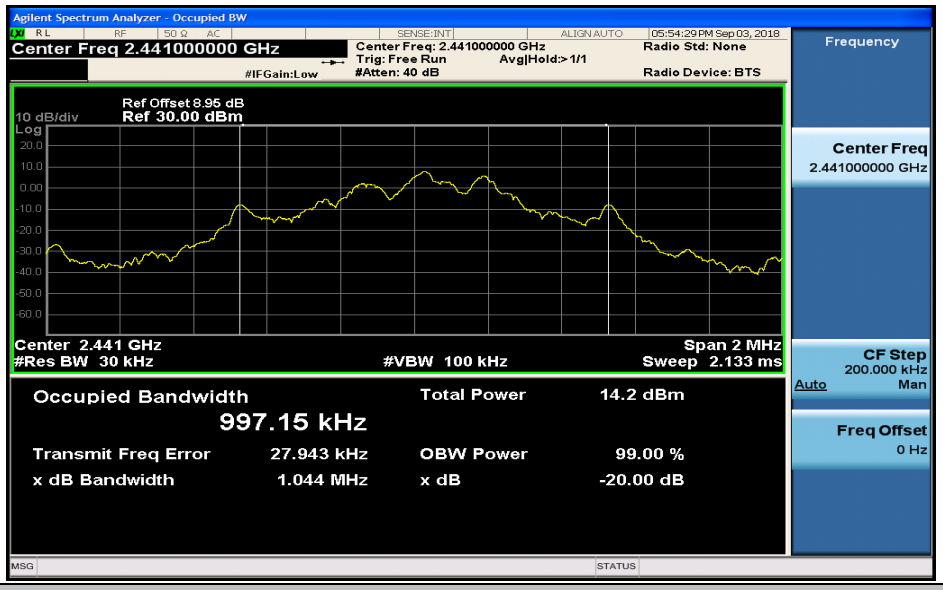
2.Occupied Bandwidth

Test Mode	Test Channel	OBW[MHz]	Limit[MHz]	Verdict
DH5	2402	0.99	---	PASS
DH5	2441	1.00	---	PASS
DH5	2480	0.99	---	PASS
2DH5	2402	1.07	---	PASS
2DH5	2441	1.07	---	PASS
2DH5	2480	1.07	---	PASS
3DH5	2402	1.12	---	PASS
3DH5	2441	1.11	---	PASS
3DH5	2480	1.12	---	PASS

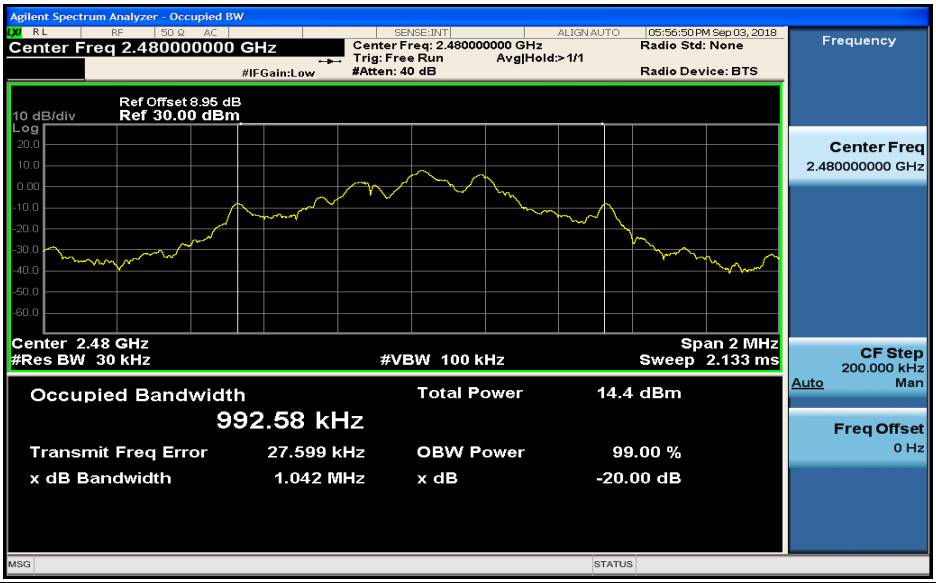
Occupied Bandwidth_DH5_2402



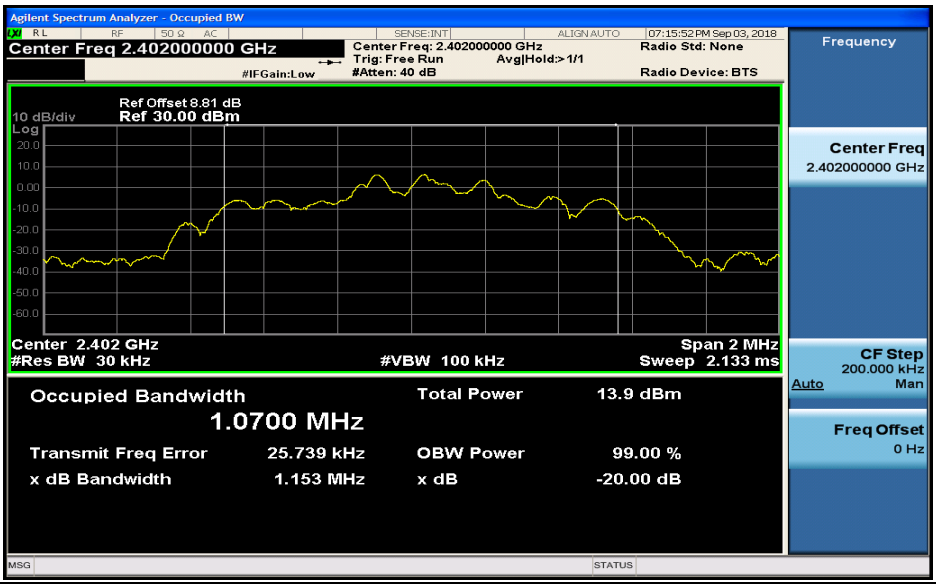
Occupied Bandwidth_DH5_2441



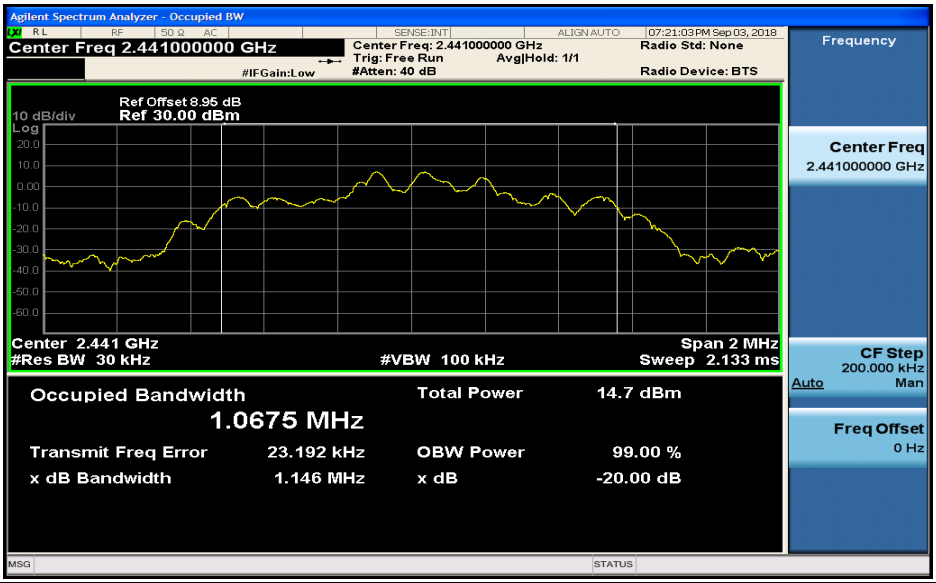
Occupied Bandwidth_DH5_2480



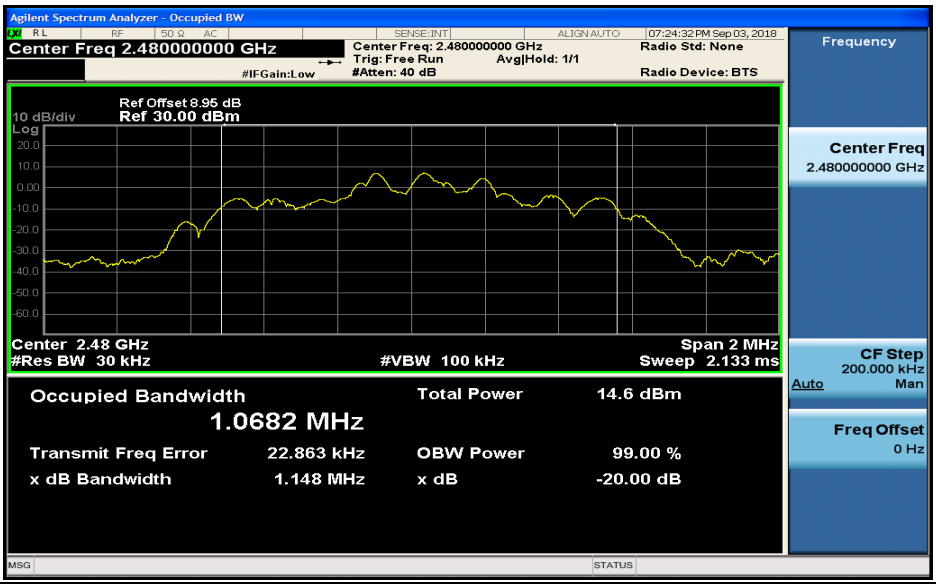
Occupied Bandwidth_2DH5_2402



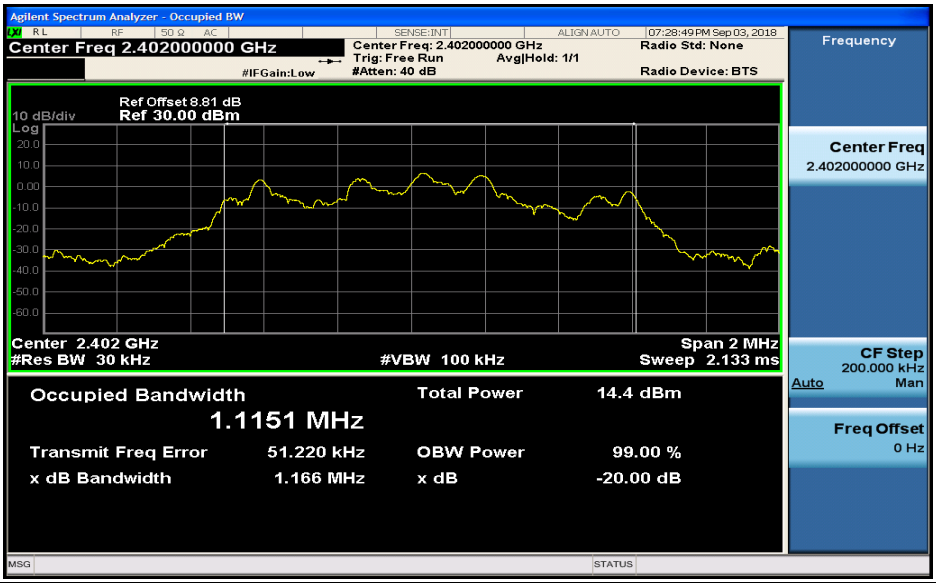
Occupied Bandwidth_2DH5_2441



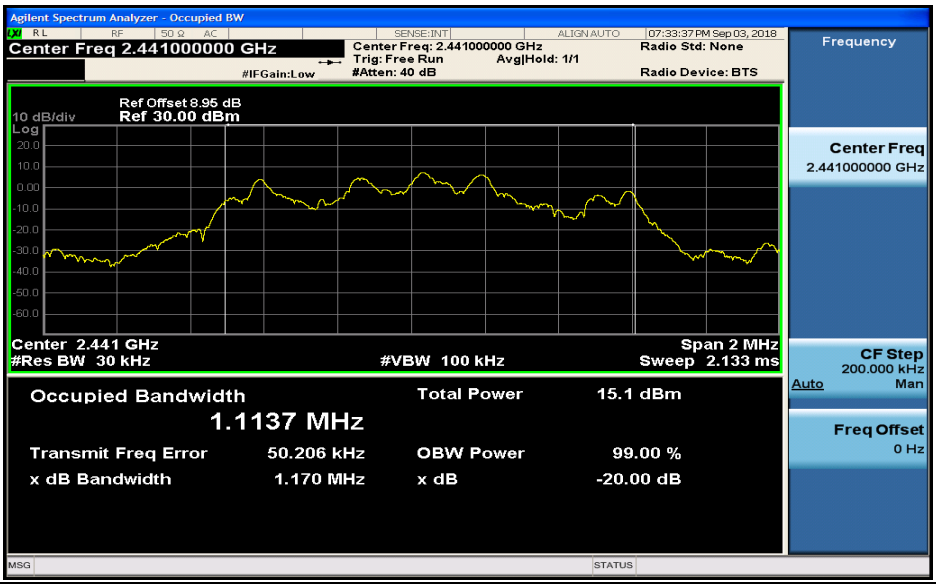
Occupied Bandwidth_2DH5_2480



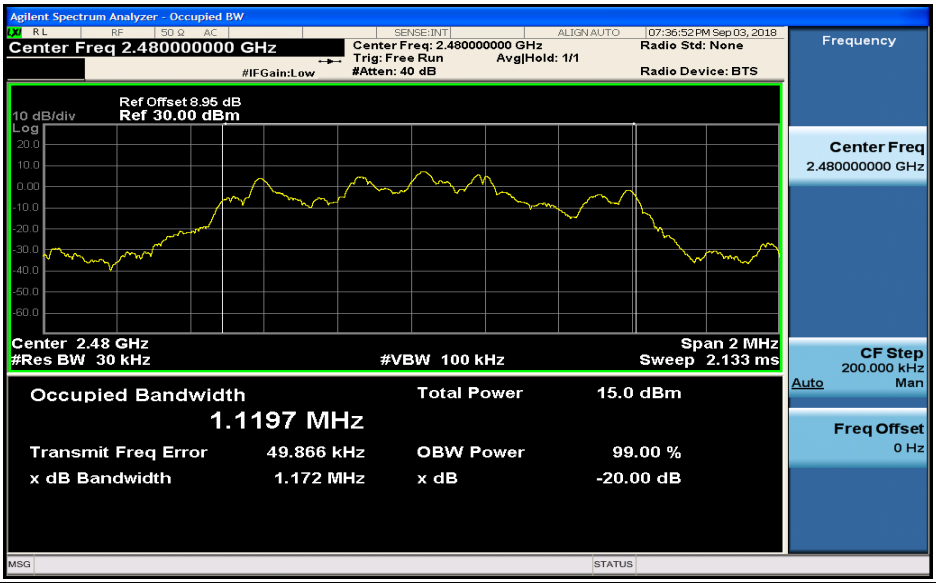
Occupied Bandwidth_3DH5_2402



Occupied Bandwidth_3DH5_2441

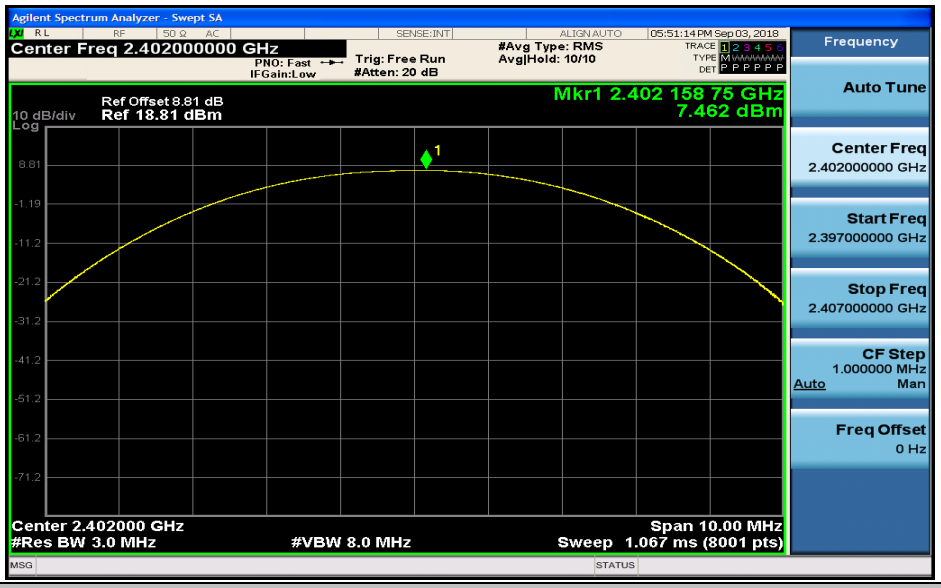


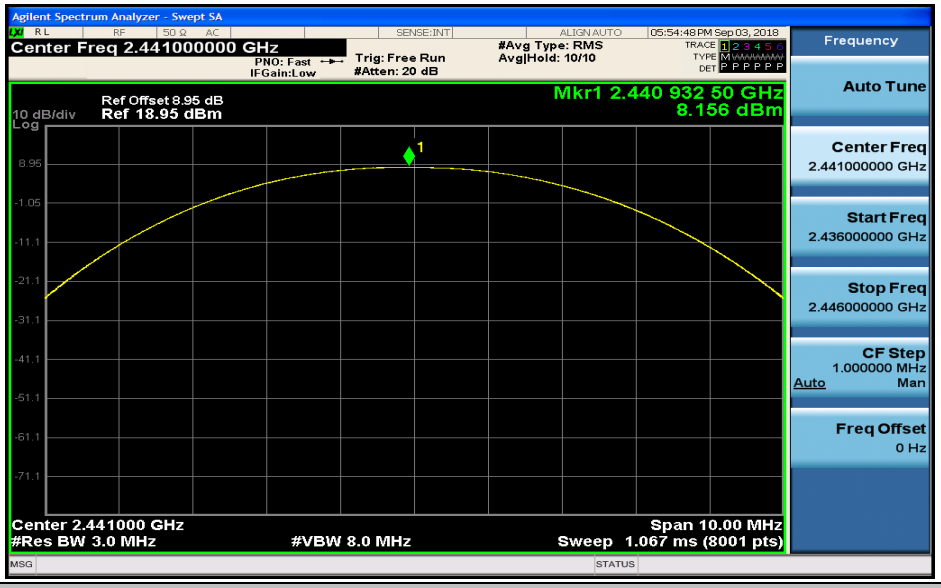
Occupied Bandwidth_3DH5_2480


Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
07:36:52 PM Sep 03, 2018
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 8.95 dB
10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2 MHz
Sweep 2.133 ms
CF Step
200.000 kHz
Auto
Man
Occupied Bandwidth
1.1197 MHz
Total Power
15.0 dBm
Transmit Freq Error
49.866 kHz
OBW Power
99.00 %
x dB Bandwidth
1.172 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

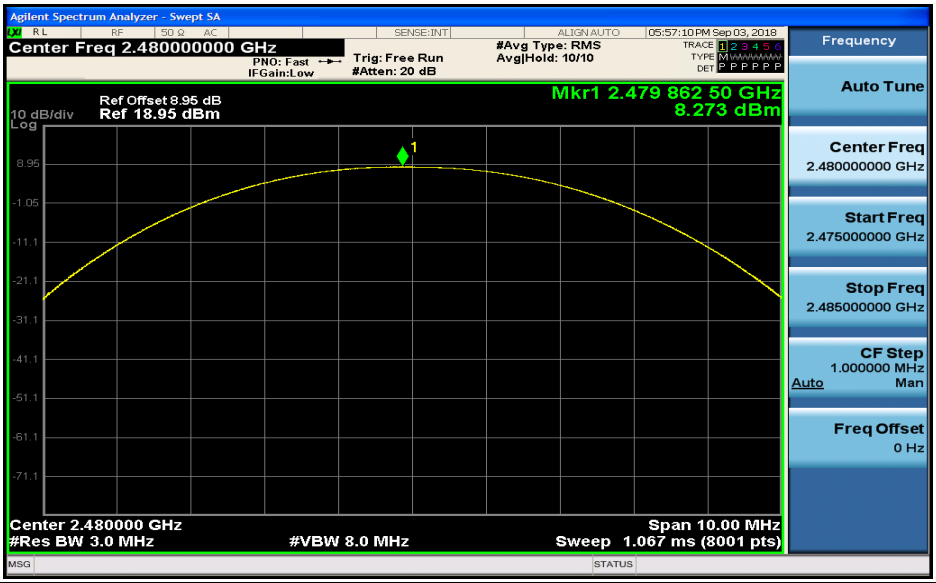
3.Conducted Peak Output Power

Test Mode	Test Channel	Power[dBm]	Limit[dBm]	Verdict
DH5	2402	7.46	20.96	PASS
DH5	2441	8.16	20.96	PASS
DH5	2480	8.27	20.96	PASS
2DH5	2402	7.37	20.96	PASS
2DH5	2441	8.04	20.96	PASS
2DH5	2480	8.09	20.96	PASS
3DH5	2402	7.57	20.96	PASS
3DH5	2441	8.25	20.96	PASS
3DH5	2480	8.32	20.96	PASS

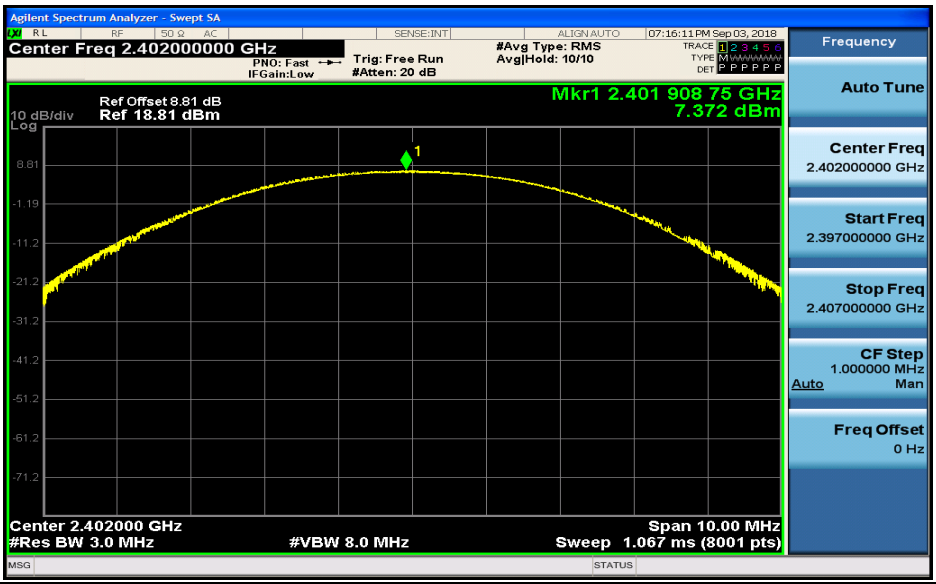
Conducted Peak Output Power_DH5_2402


Conducted Peak Output Power_DH5_2441


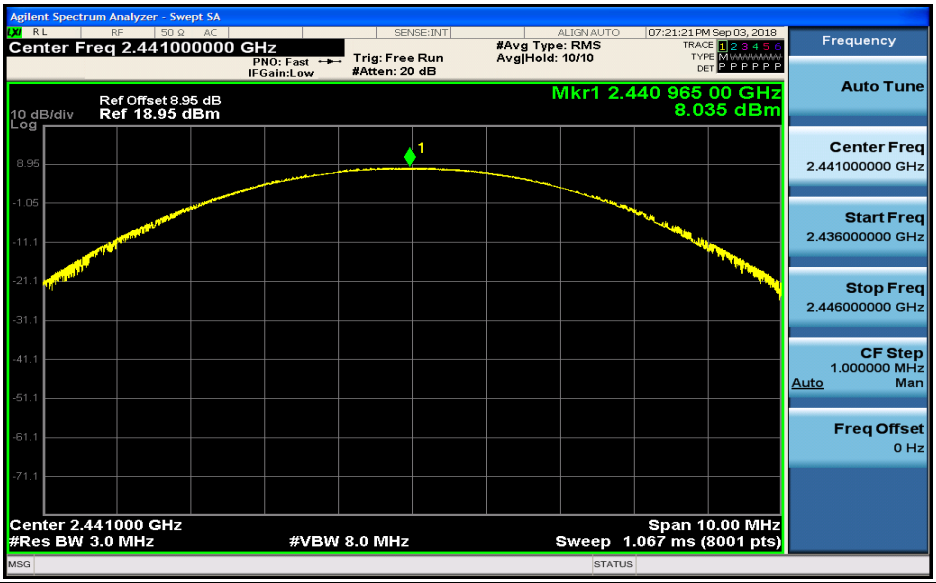
Conducted Peak Output Power_DH5_2480



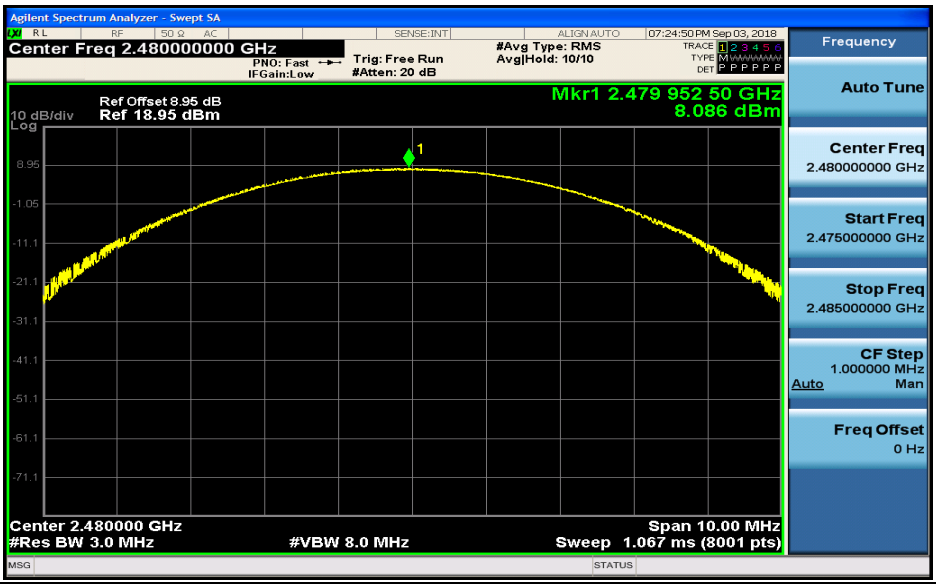
Conducted Peak Output Power_2DH5_2402



Conducted Peak Output Power_2DH5_2441

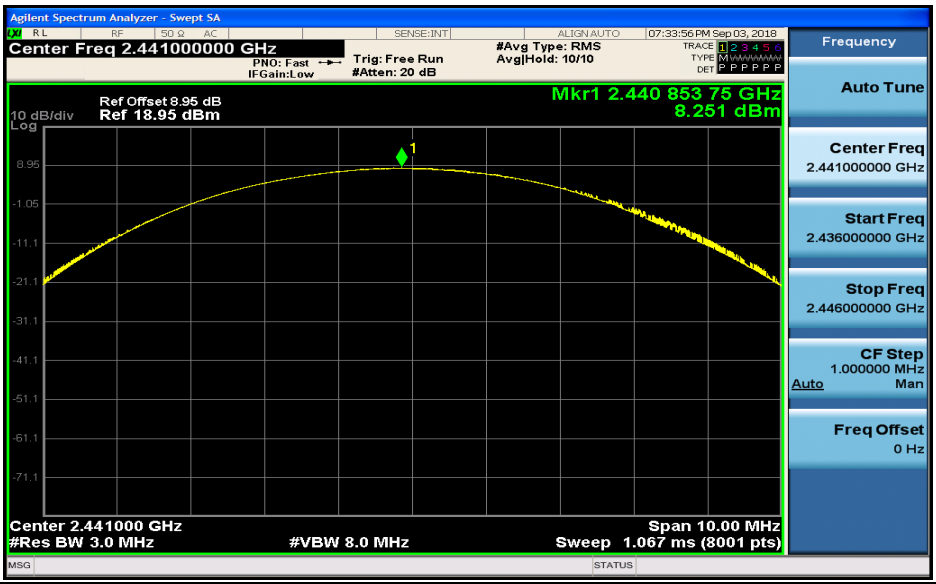


Conducted Peak Output Power_2DH5_2480

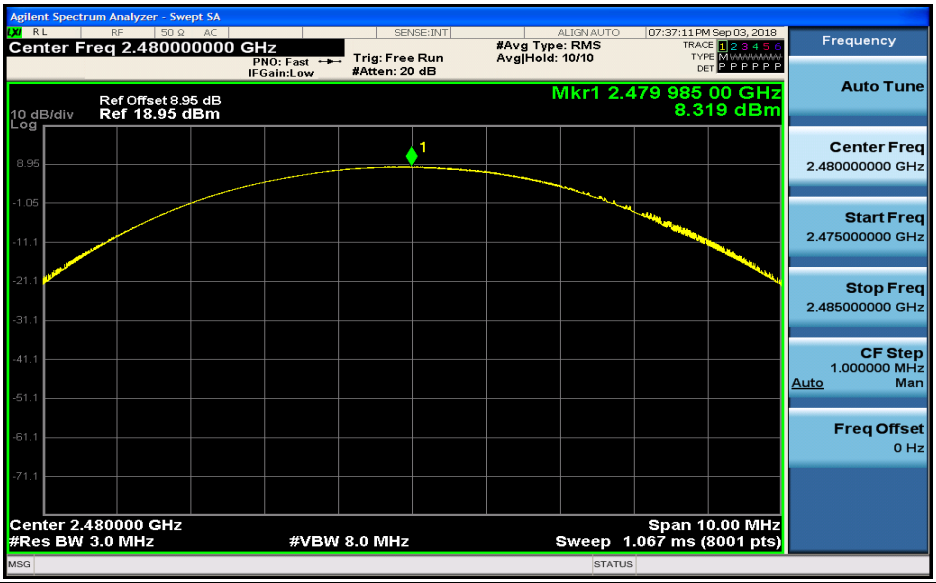


Conducted Peak Output Power_3DH5_2402

Conducted Peak Output Power_3DH5_2441



Conducted Peak Output Power_3DH5_2480

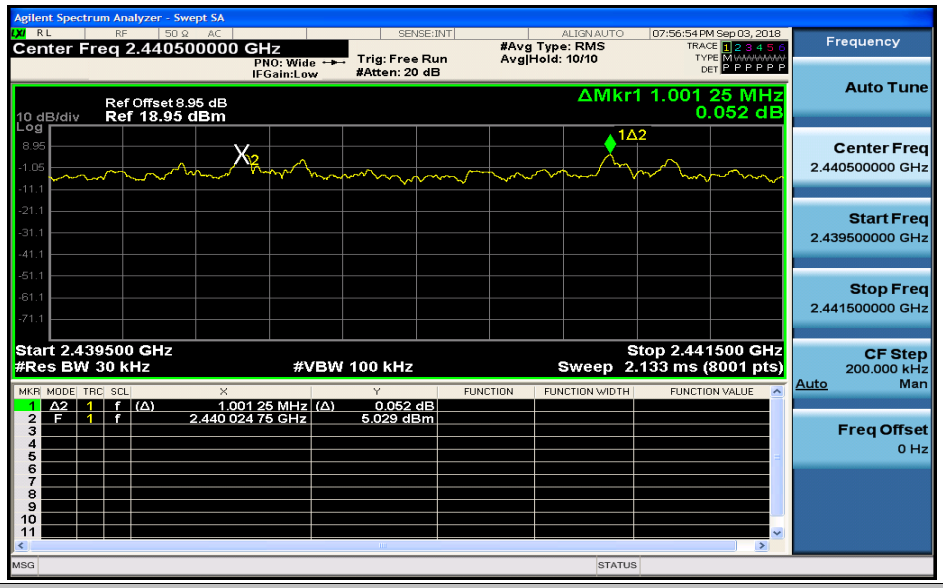

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
07:37:11 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Log
Ref 18.95 dBm
Mkr1 2.479 985 00 GHz
8.319 dBm
8.95
-1.05
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 10.00 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.475000000 GHz
Stop Freq
2.485000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

4.Carrier Frequency Separation

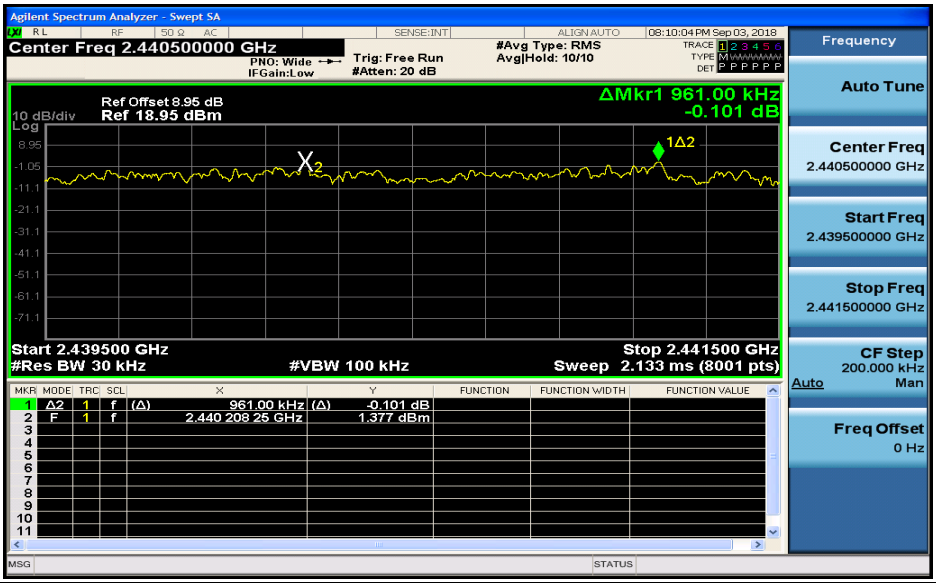
Test Mode	Test Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	2441	0.99	0.697	PASS
2DH5	2441	1.00	0.772	PASS
3DH5	2441	0.96	0.781	PASS

Carrier Frequency Separation_DH5_2441

Carrier Frequency Separation_2DH5_2441

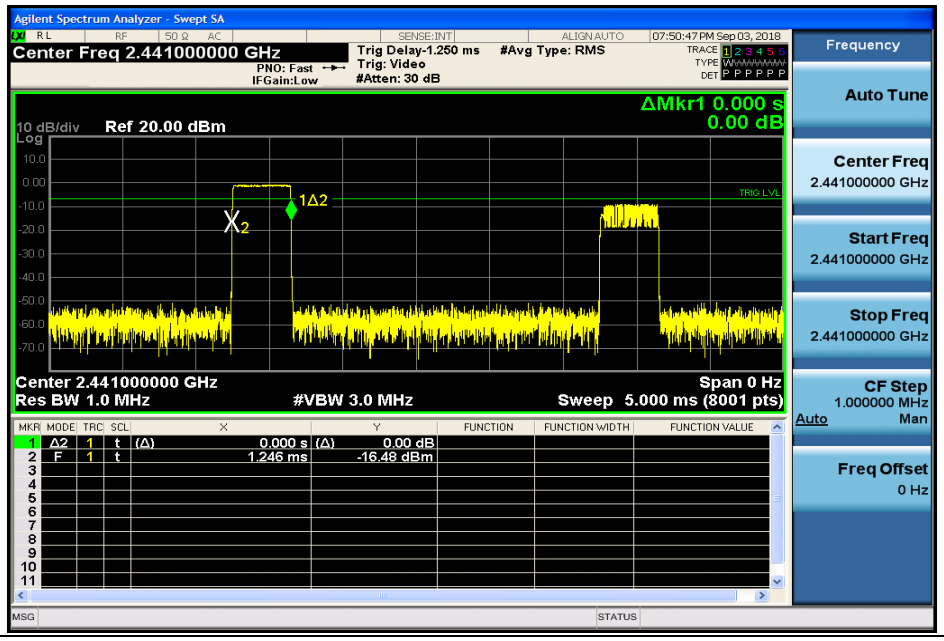
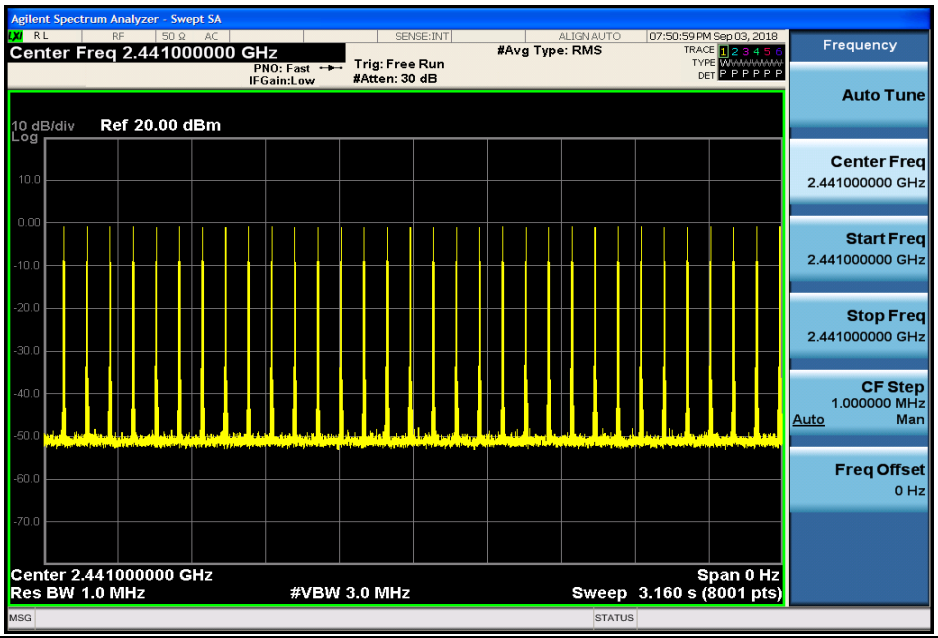


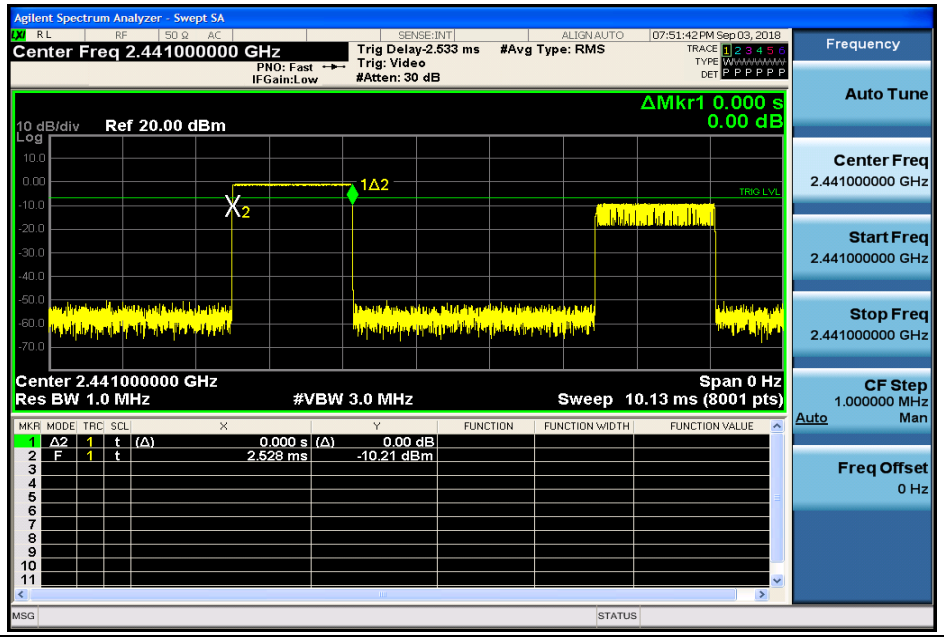
Carrier Frequency Separation_3DH5_2441

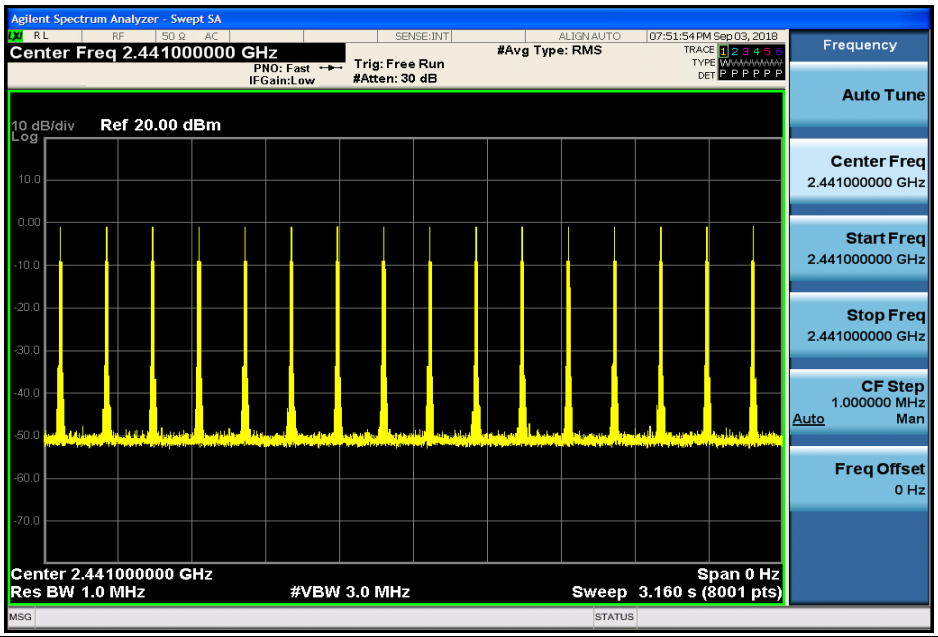

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.440500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
08:10:04 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Log
Ref 18.95 dBm
ΔMkr1 961.00 kHz
-0.101 dB
Start 2.439500 GHz
#Res BW 30 kHz
#VBW 100 kHz
Stop 2.441500 GHz
Sweep 2.133 ms (8001 pts)
1 Δ2 (Δ) 961.00 kHz (Δ) -0.101 dB
2 F 1 f 2.440 208 25 GHz 1.377 dBm
Frequency
Auto Tune
Center Freq
2.440500000 GHz
Start Freq
2.439500000 GHz
Stop Freq
2.441500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

5.Dwell Time

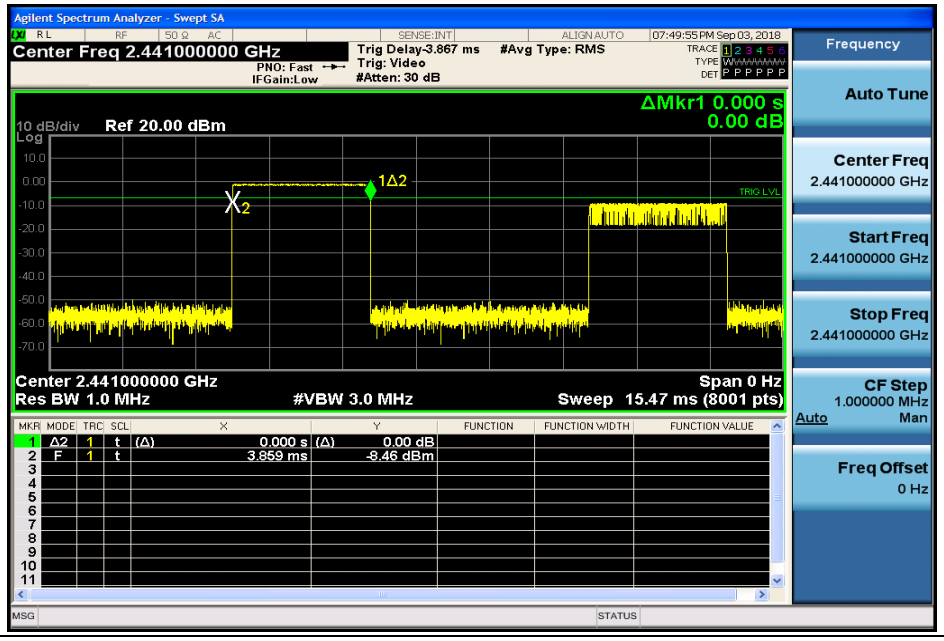
Test Mode	Test Channel	Burst Width[ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit[s]	Verdict
DH1	2441	0.40	310	0.13	0.4	PASS
DH3	2441	1.66	160	0.27	0.4	PASS
DH5	2441	2.90	110	0.32	0.4	PASS
2DH1	2441	0.41	310	0.13	0.4	PASS
2DH3	2441	1.66	160	0.27	0.4	PASS
2DH5	2441	1.71	160	0.27	0.4	PASS
3DH1	2441	0.41	310	0.13	0.4	PASS
3DH3	2441	1.66	160	0.27	0.4	PASS
3DH5	2441	2.91	110	0.32	0.4	PASS

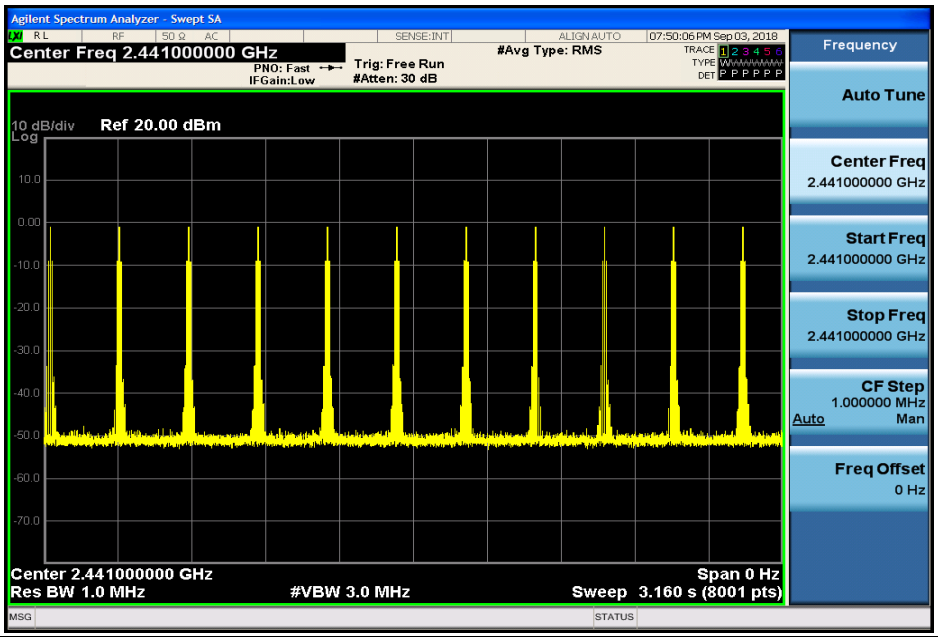
Dwell Time_DH1_2441


Dwell Time_DH3_2441



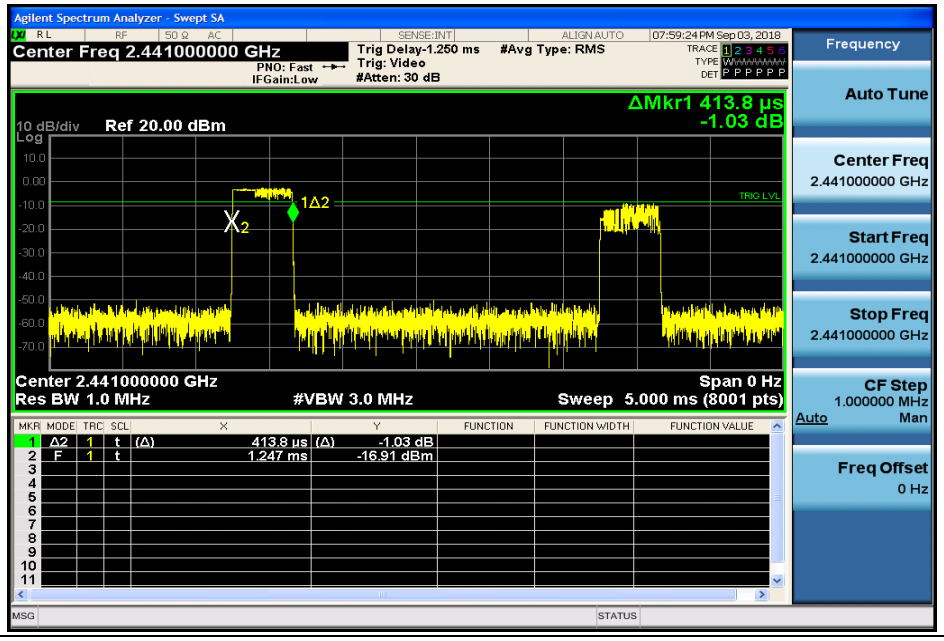


Dwell Time_DH5_2441

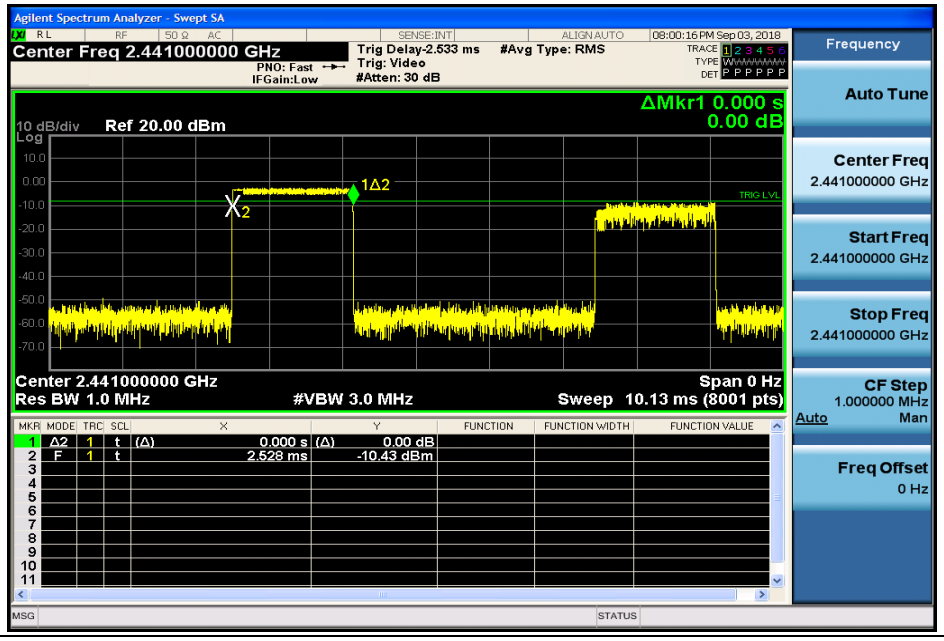


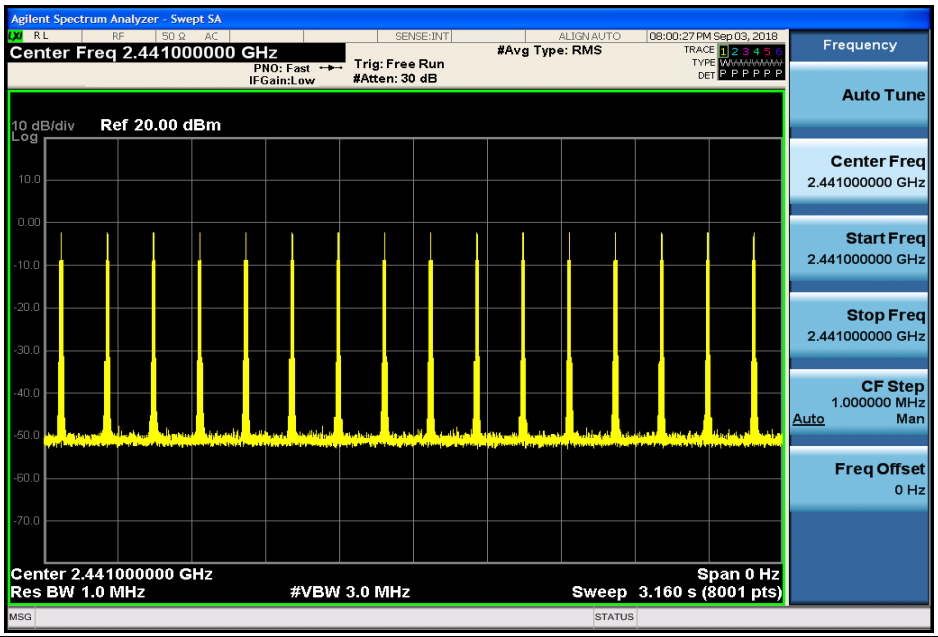


Dwell Time_2DH1_2441

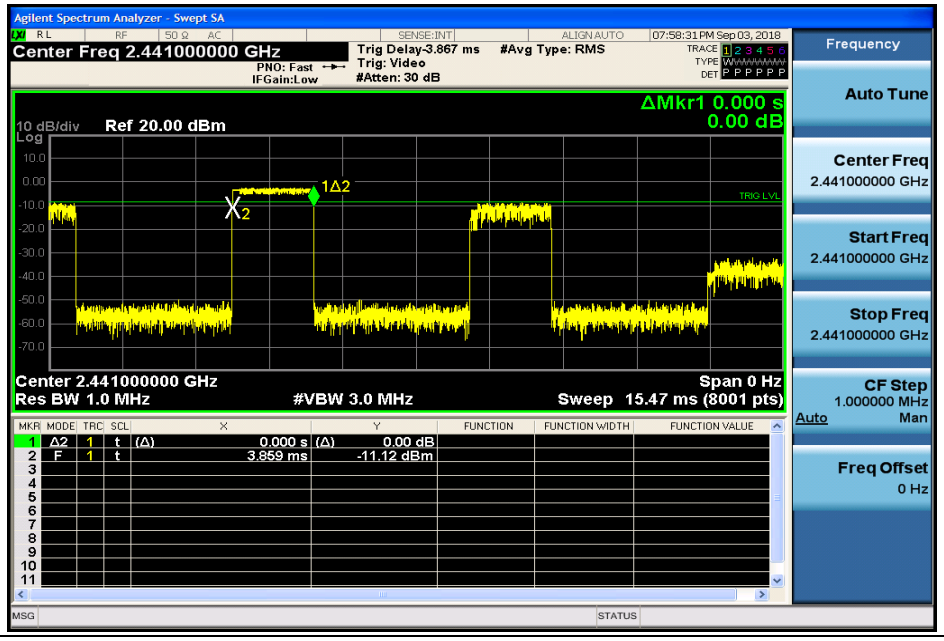


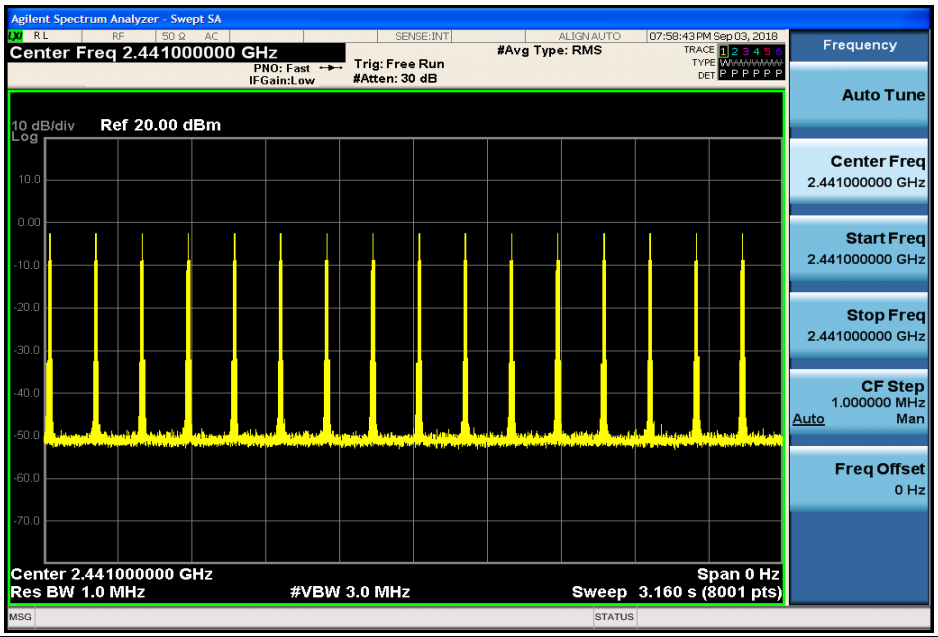
Dwell Time_2DH3_2441



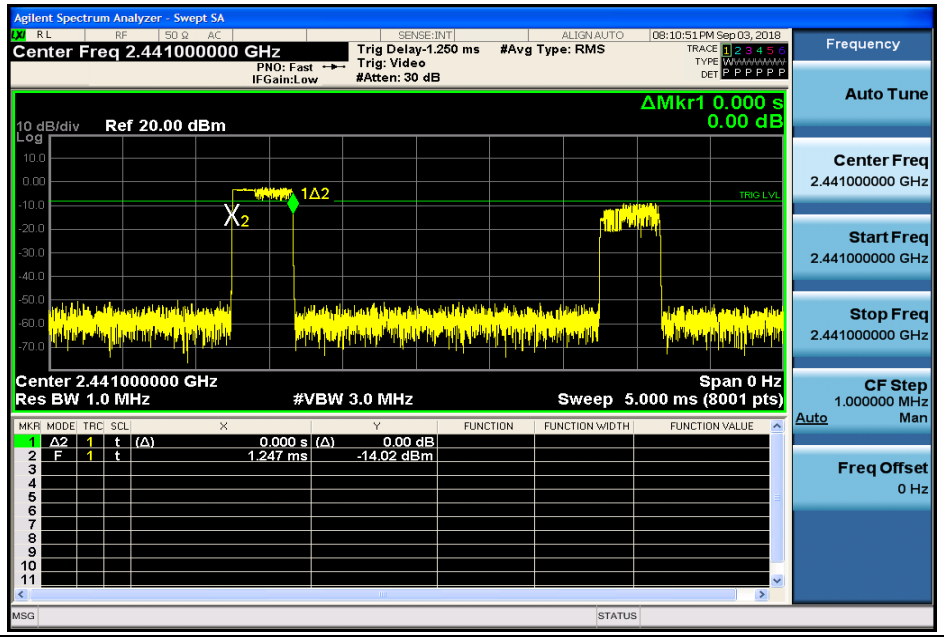


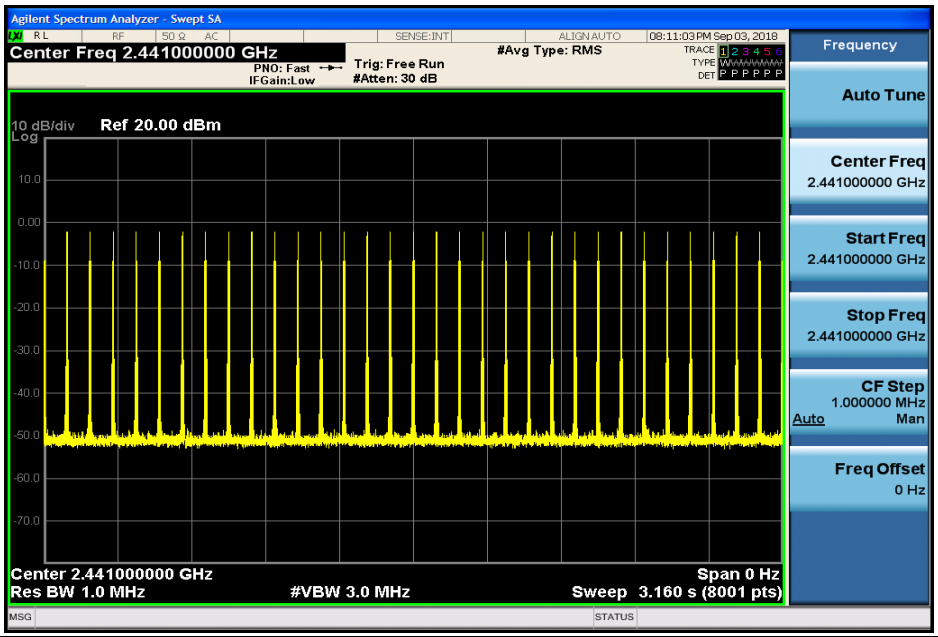
Dwell Time_2DH5_2441



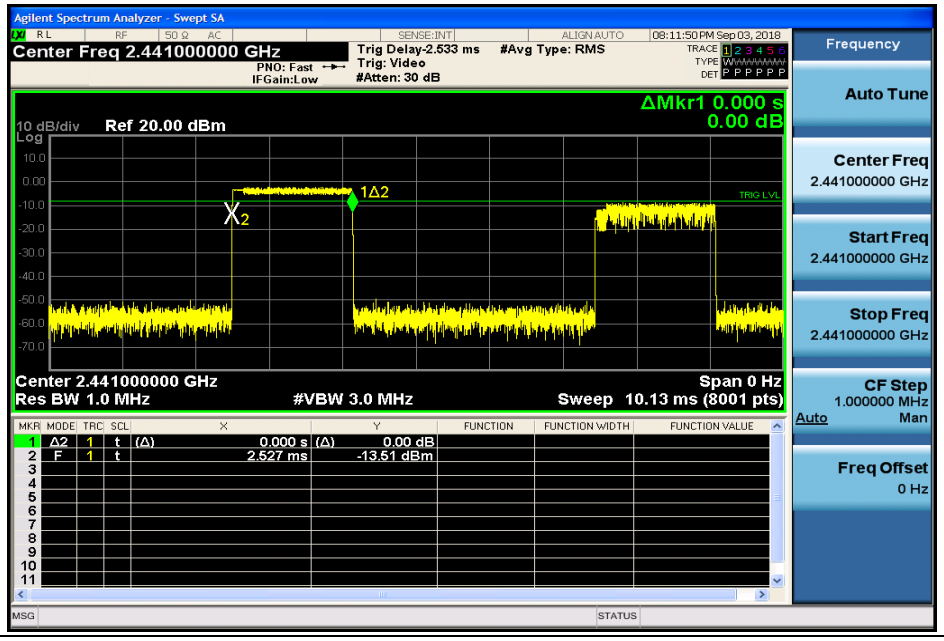


Dwell Time_3DH1_2441

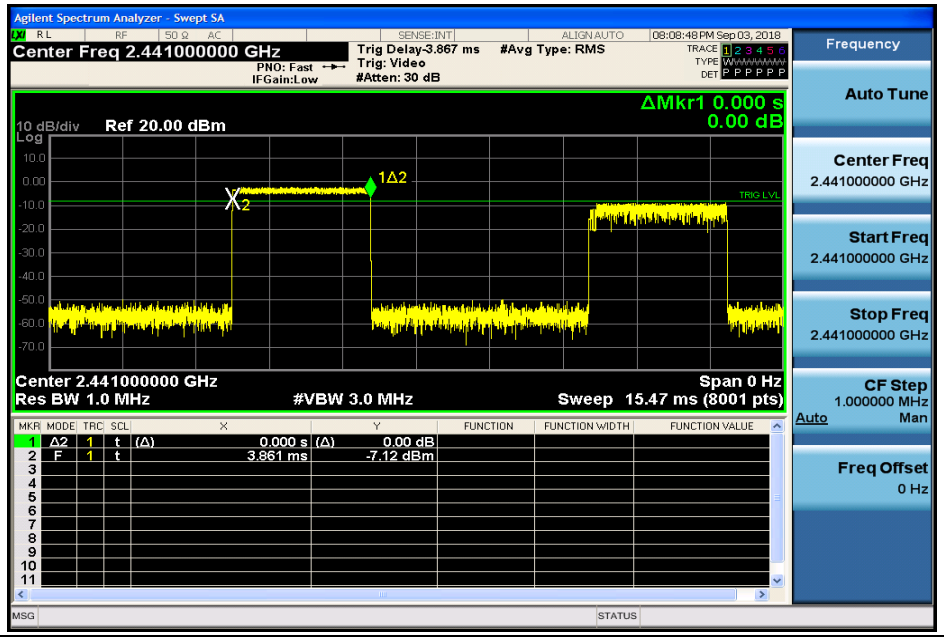


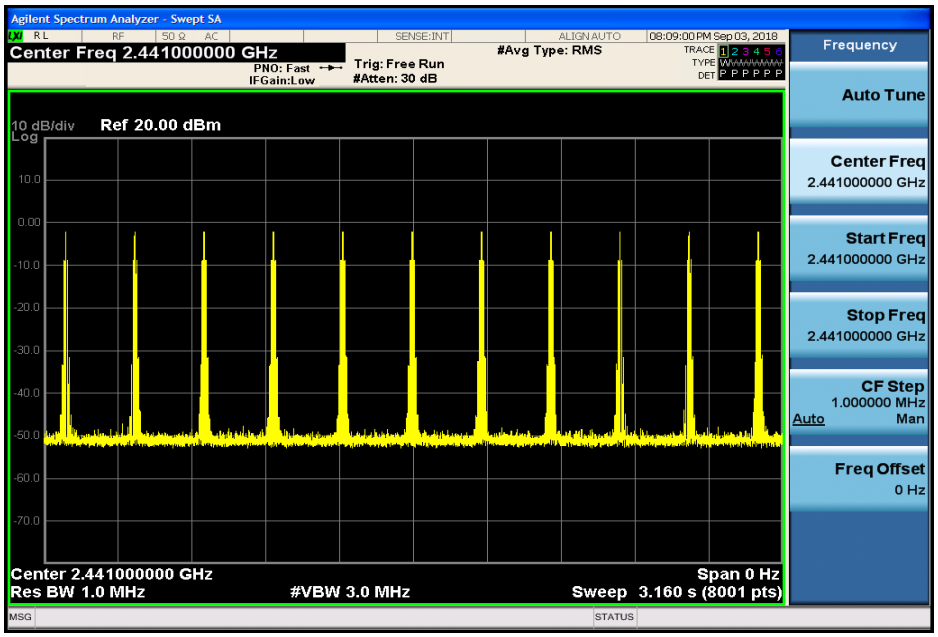


Dwell Time_3DH3_2441



Dwell Time_3DH5_2441

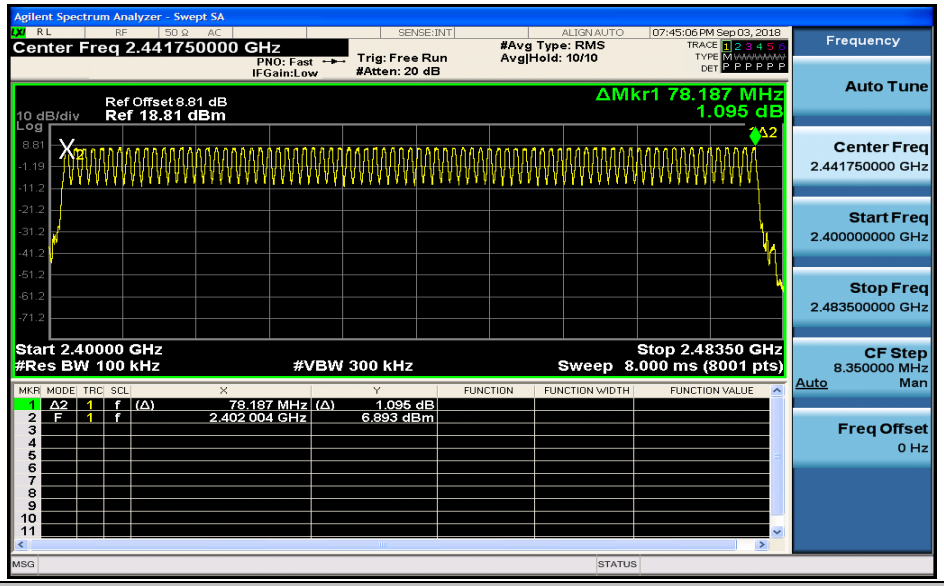

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-3.867 ms
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
08:08:48 PM Sep 03, 2018
ΔMkr1 0.000 s
0.00 dB
10 dB/div
Log
Ref 20.00 dBm
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 15.47 ms (8001 pts)
1 Δ2 1 t (Δ) 0.000 s (Δ) 0.00 dB
2 F 1 t 3.861 ms -7.12 dBm
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
08:09:00 PM Sep 03, 2018
10 dB/div
Log
Ref 20.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.160 s (8001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

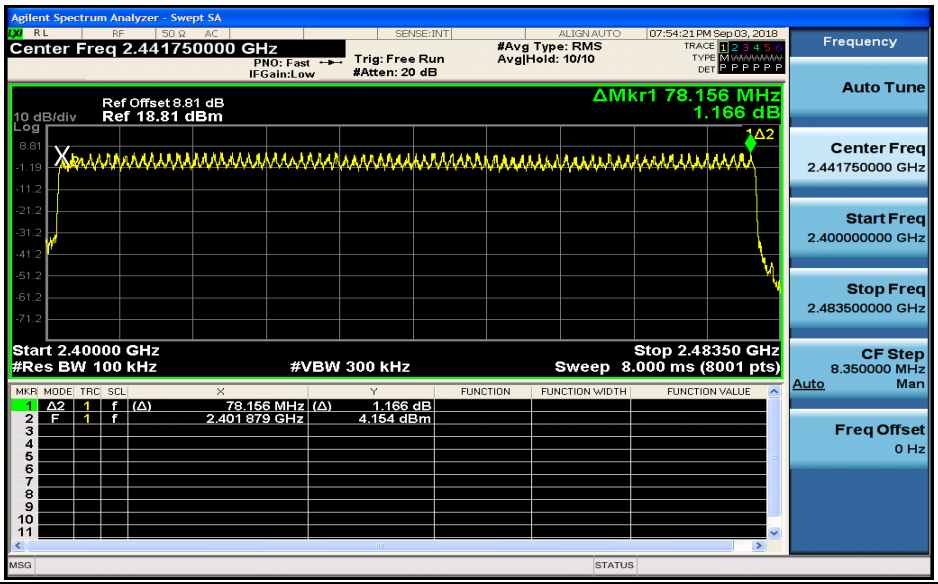
6.Hopping Channel Number

Test Mode	Number of Hopping Channel[N]	Limit[N]	Verdict
DH5	79	>=15	PASS
2DH5	79	>=15	PASS
3DH5	79	>=15	PASS

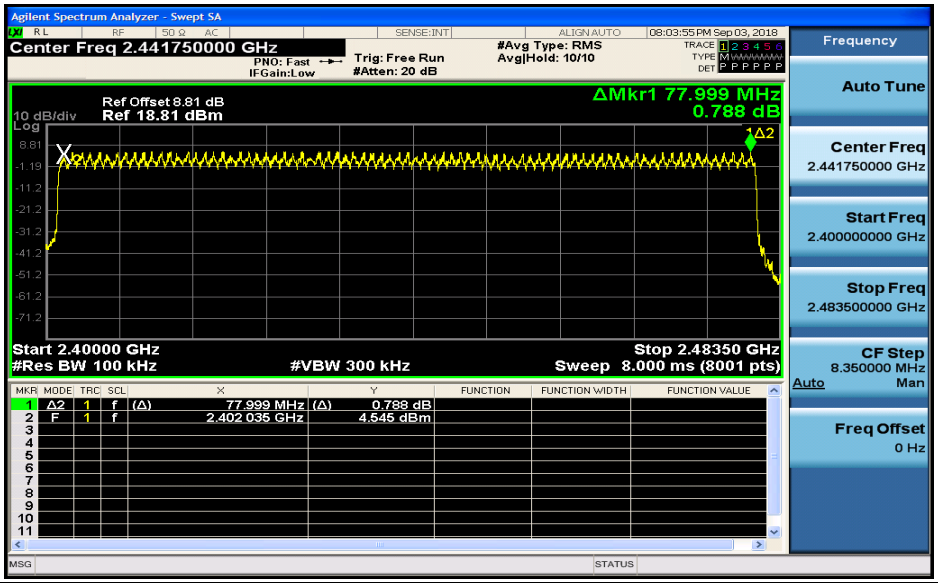
Hopping Channel Number_DH5



Hopping Channel Number_2DH5



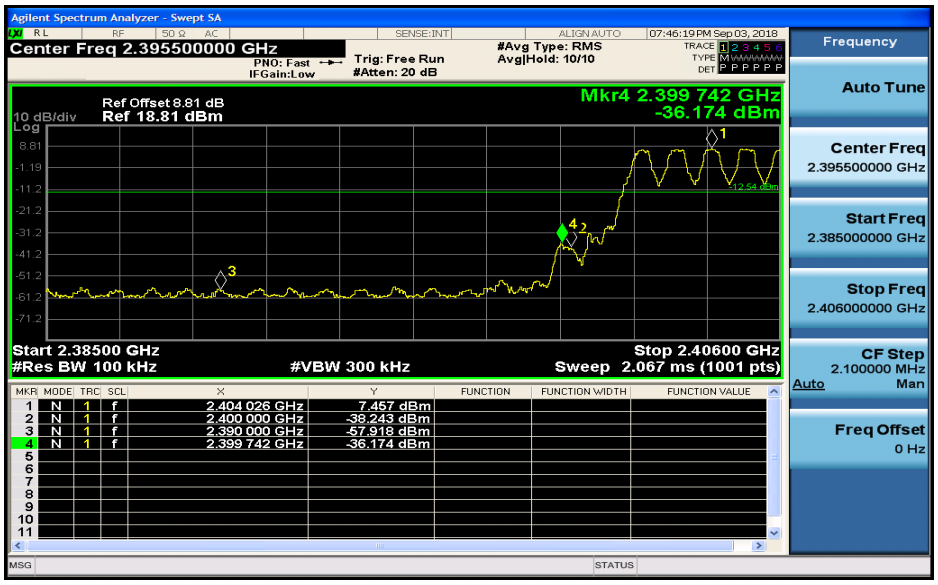
Hopping Channel Number_3DH5


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
08:03:55 PM Sep 03, 2018
Ref Offset 8.81 dB
10 dB/div
Log
Ref 18.81 dBm
ΔMkr1 77.999 MHz
0.788 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 Δ2 1 f (Δ) 77.999 MHz (Δ) 0.788 dB
2 F 1 f 2.402 035 GHz 4.545 dBm
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

7.Band-edge for RF Conducted Emissions

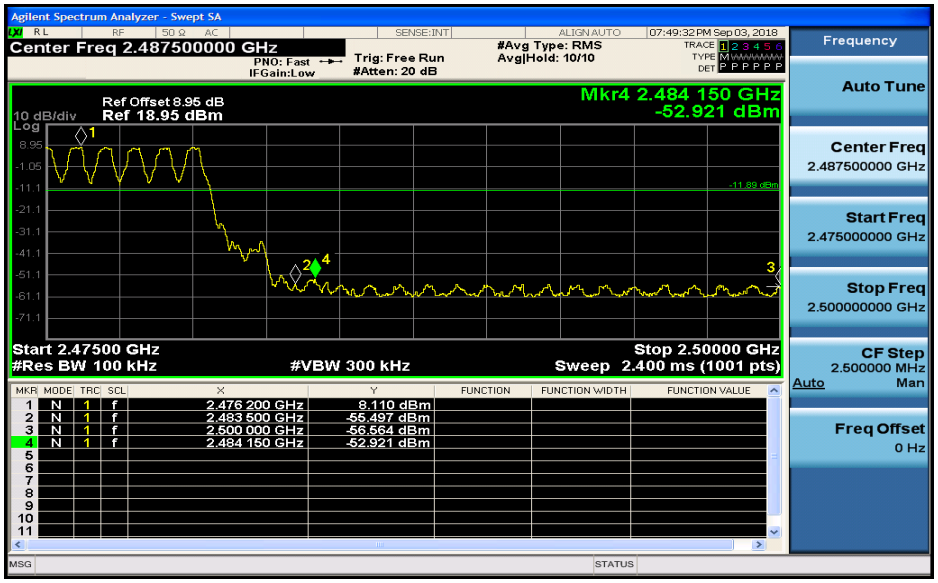
Test Mode	Test Channel	Hopping	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit[dBm]	Verdict
DH5	2402	On	7.46	-36.17	-12.54	PASS
DH5	2402	Off	7.34	-34.51	-12.66	PASS
DH5	2480	On	8.11	-52.92	-11.89	PASS
DH5	2480	Off	8.09	-49.70	-11.91	PASS
2DH5	2402	On	5.46	-33.96	-14.54	PASS
2DH5	2402	Off	6.80	-35.17	-13.20	PASS
2DH5	2480	On	5.57	-56.57	-14.43	PASS
2DH5	2480	Off	7.50	-51.40	-12.50	PASS
3DH5	2402	On	5.49	-35.06	-14.51	PASS
3DH5	2402	Off	7.10	-35.46	-12.90	PASS
3DH5	2480	On	5.62	-53.18	-14.38	PASS
3DH5	2480	Off	7.85	-48.66	-12.15	PASS

Band-edge for RF Conducted Emissions_DH5_2402_Hopping On



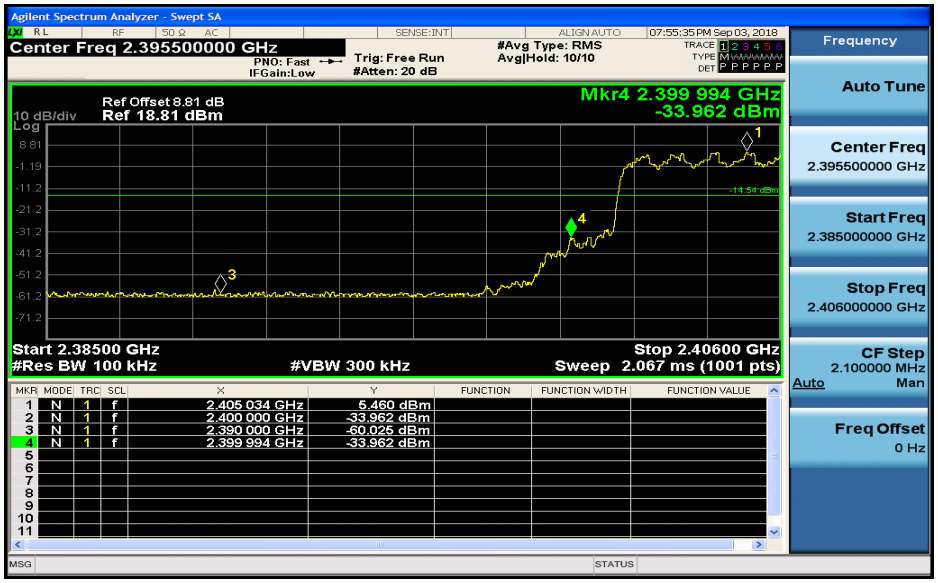
Band-edge for RF Conducted Emissions_DH5_2402_Hopping Off

Band-edge for RF Conducted Emissions_DH5_2480_Hopping On



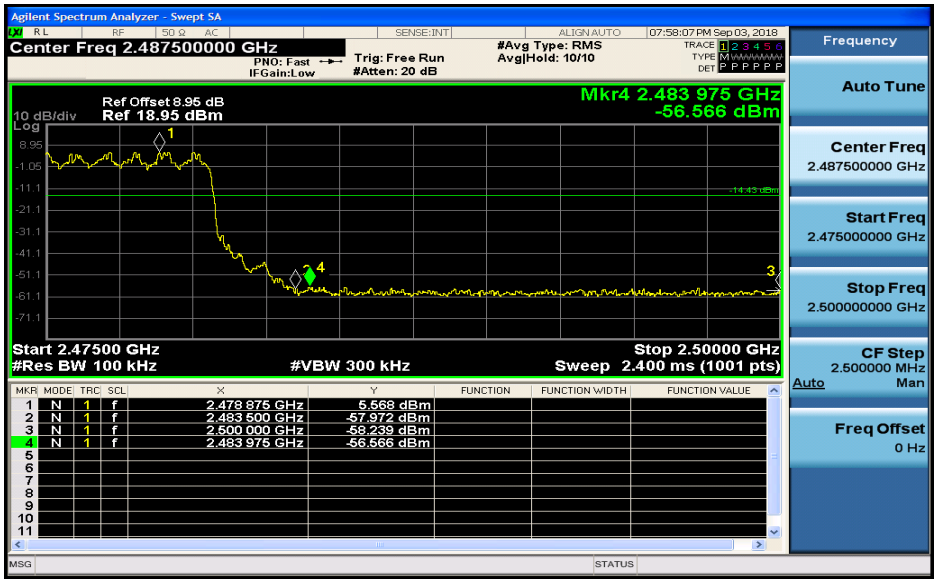
Band-edge for RF Conducted Emissions_DH5_2480_Hopping Off

Band-edge for RF Conducted Emissions_2DH5_2402_Hopping On



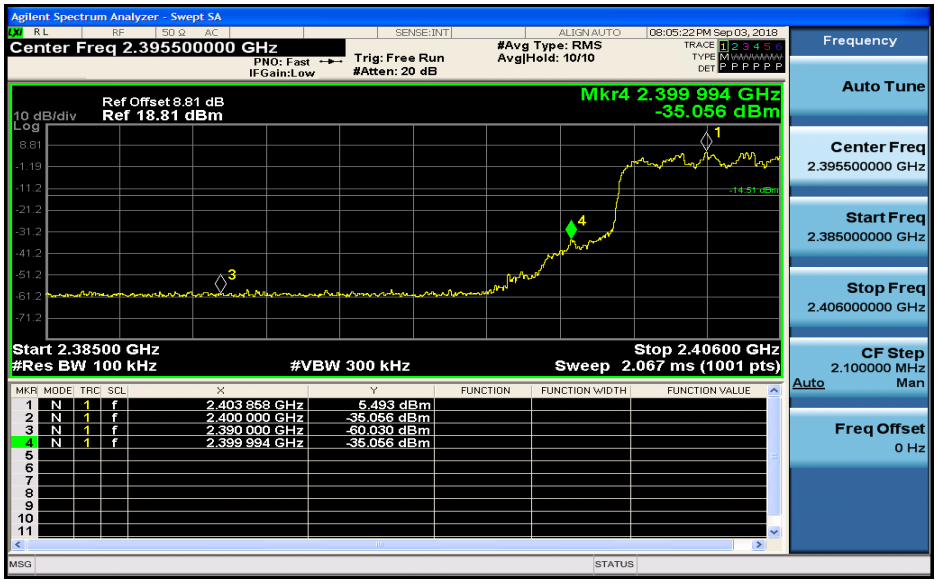
Band-edge for RF Conducted Emissions_2DH5_2402_Hopping Off

Band-edge for RF Conducted Emissions_2DH5_2480_Hopping On



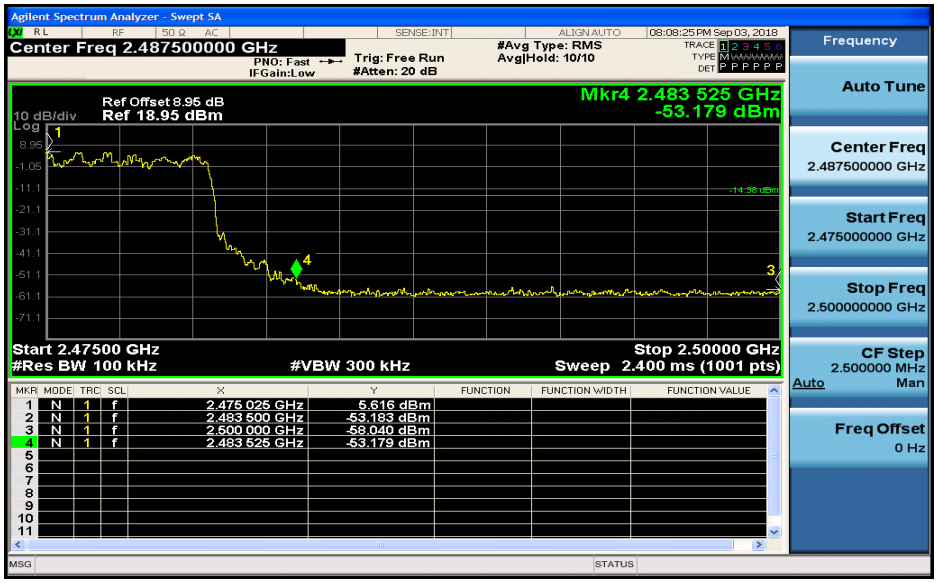
Band-edge for RF Conducted Emissions_2DH5_2480_Hopping Off

Band-edge for RF Conducted Emissions_3DH5_2402_Hopping On



Band-edge for RF Conducted Emissions_3DH5_2402_Hopping Off

Band-edge for RF Conducted Emissions_3DH5_2480_Hopping On

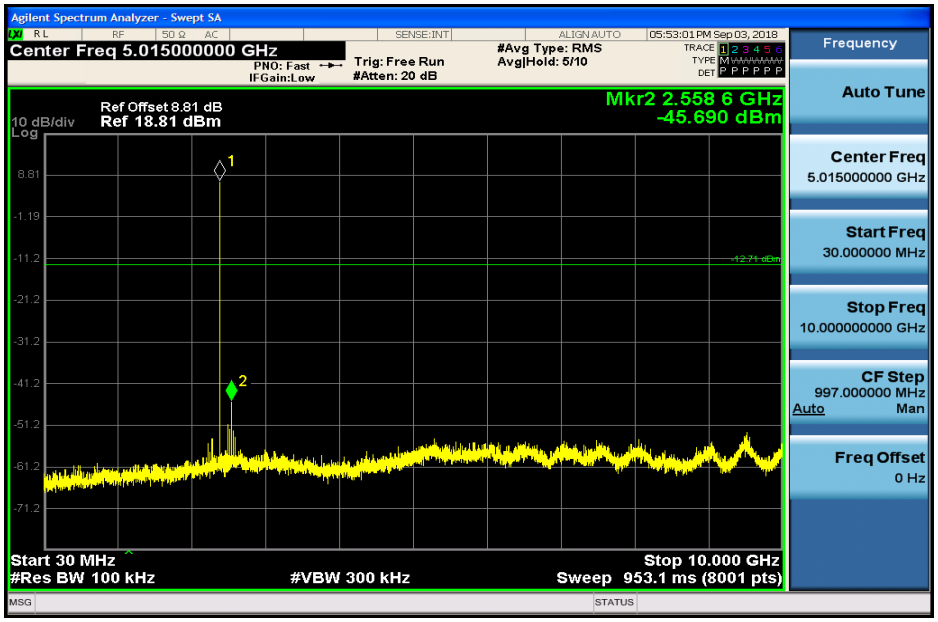


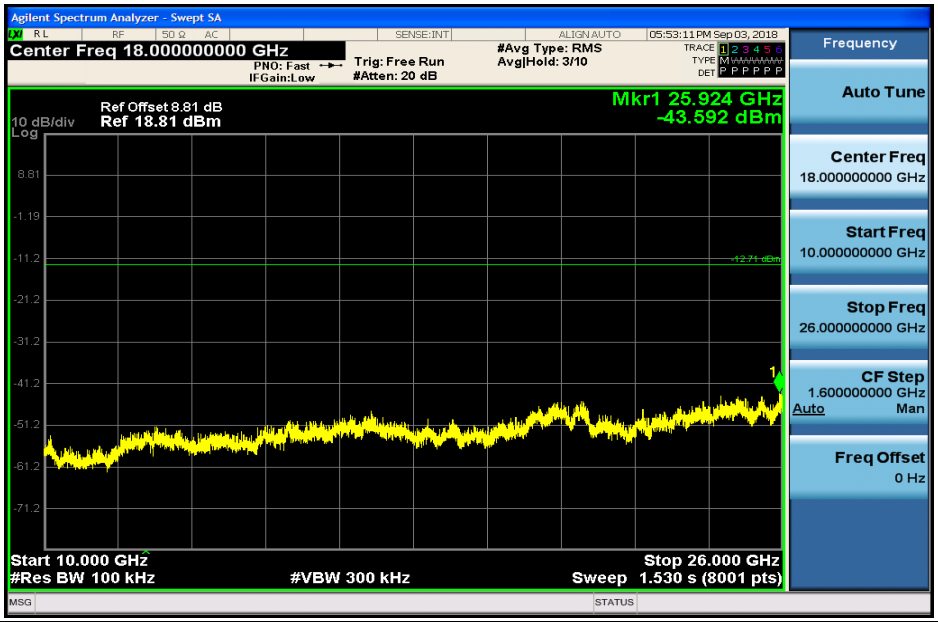
Band-edge for RF Conducted Emissions_3DH5_2480_Hopping Off

8.RF Conducted Spurious Emissions

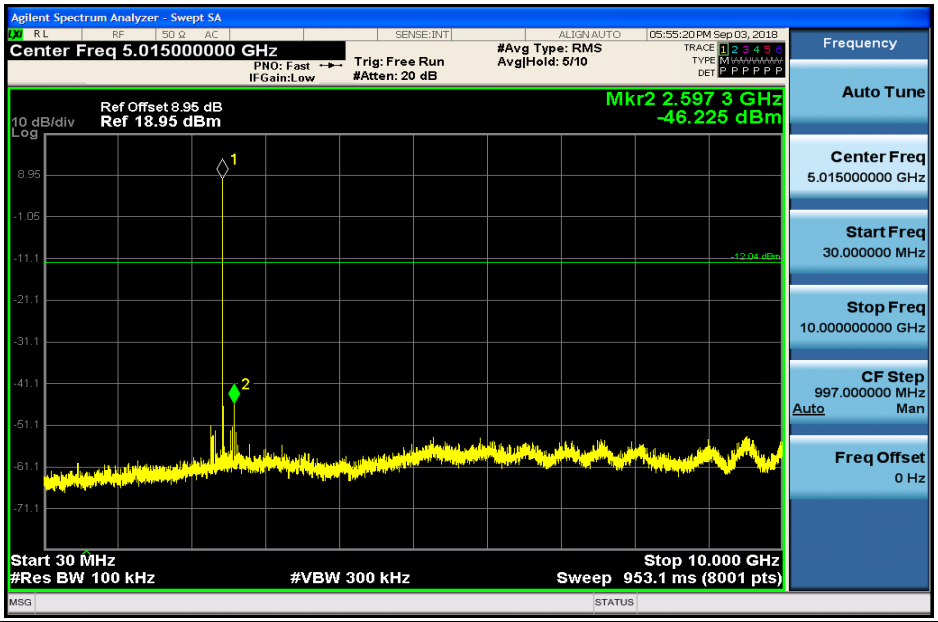
Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
DH5	2402	30	10000	100	300	7.29	-45.69	<-12.71	PASS
DH5	2402	10000	26000	100	300	7.286	-43.59	<-12.71	PASS
DH5	2441	30	10000	100	300	7.97	-46.23	<-12.04	PASS
DH5	2441	10000	26000	100	300	7.965	-44.30	<-12.04	PASS
DH5	2480	30	10000	100	300	7.94	-47.75	<-12.06	PASS
DH5	2480	10000	26000	100	300	7.941	-43.69	<-12.06	PASS
2DH5	2402	30	10000	100	300	6.70	-47.75	<-13.30	PASS
2DH5	2402	10000	26000	100	300	6.7	-44.23	<-13.30	PASS
2DH5	2441	30	10000	100	300	7.43	-47.98	<-12.57	PASS
2DH5	2441	10000	26000	100	300	7.429	-43.54	<-12.57	PASS
2DH5	2480	30	10000	100	300	7.39	-48.92	<-12.61	PASS
2DH5	2480	10000	26000	100	300	7.39	-43.93	<-12.61	PASS
3DH5	2402	30	10000	100	300	7.06	-49.84	<-12.95	PASS
3DH5	2402	10000	26000	100	300	7.055	-43.73	<-12.95	PASS
3DH5	2441	30	10000	100	300	7.74	-49.91	<-12.26	PASS
3DH5	2441	10000	26000	100	300	7.742	-43.76	<-12.26	PASS
3DH5	2480	30	10000	100	300	7.82	-48.66	<-12.18	PASS
3DH5	2480	10000	26000	100	300	7.821	-43.71	<-12.18	PASS

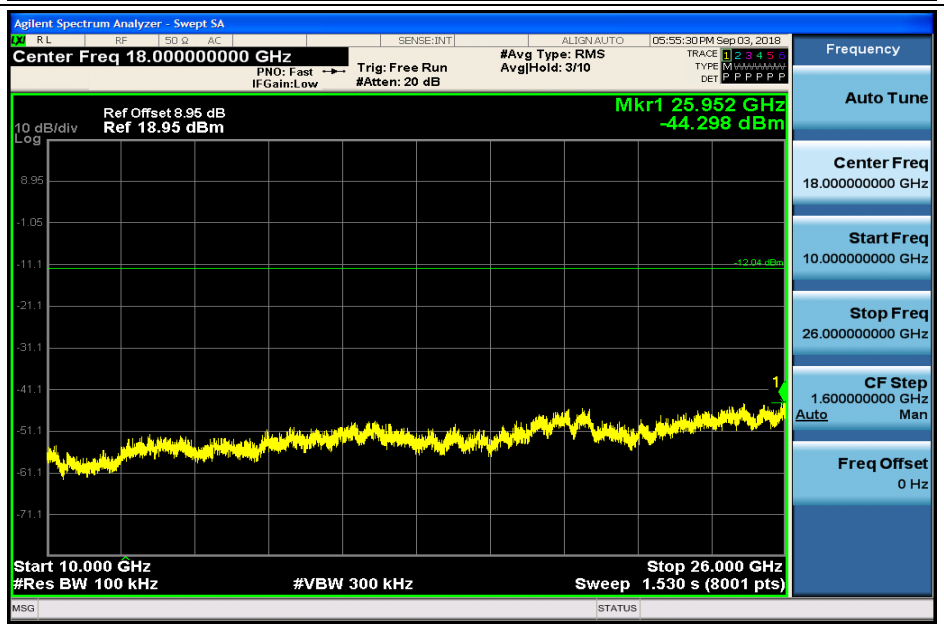
RF Conducted Spurious Emissions_DH5_2402





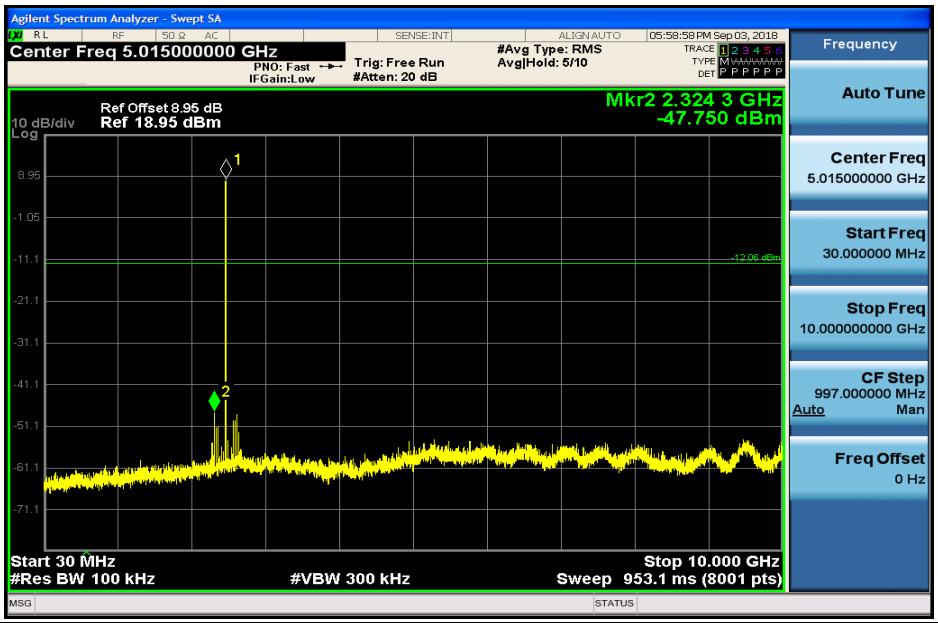
RF Conducted Spurious Emissions_DH5_2441

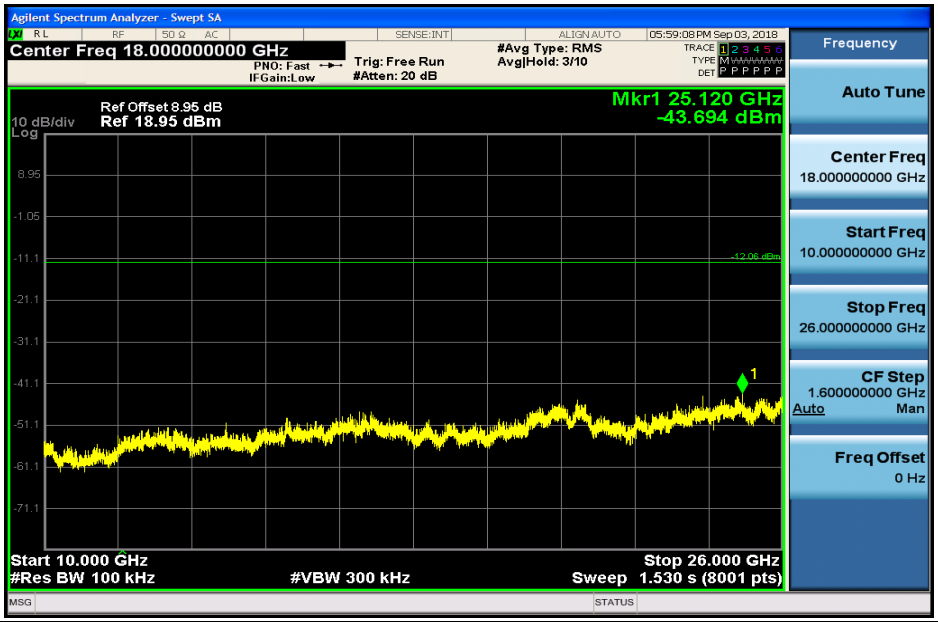




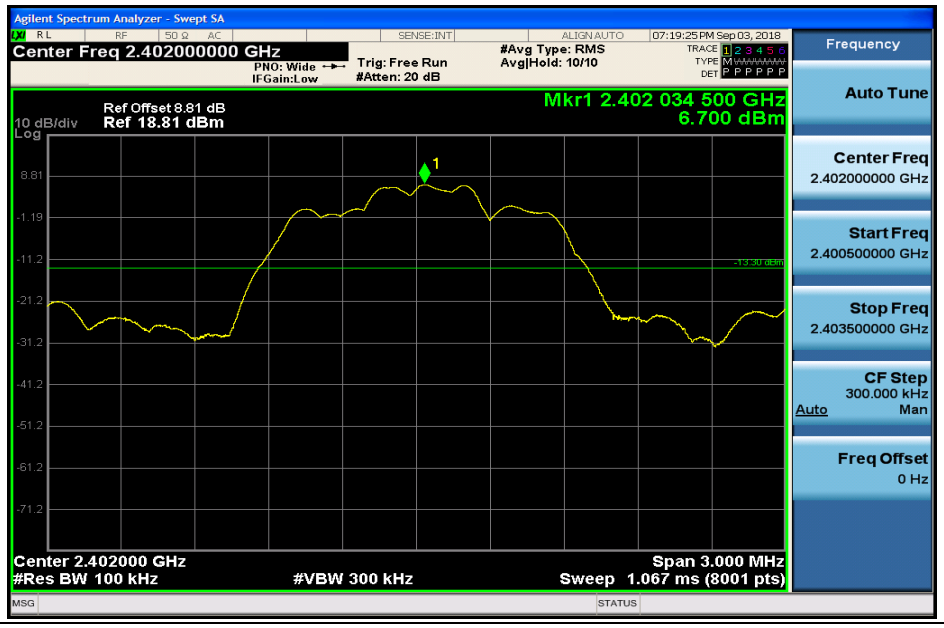
RF Conducted Spurious Emissions_DH5_2480

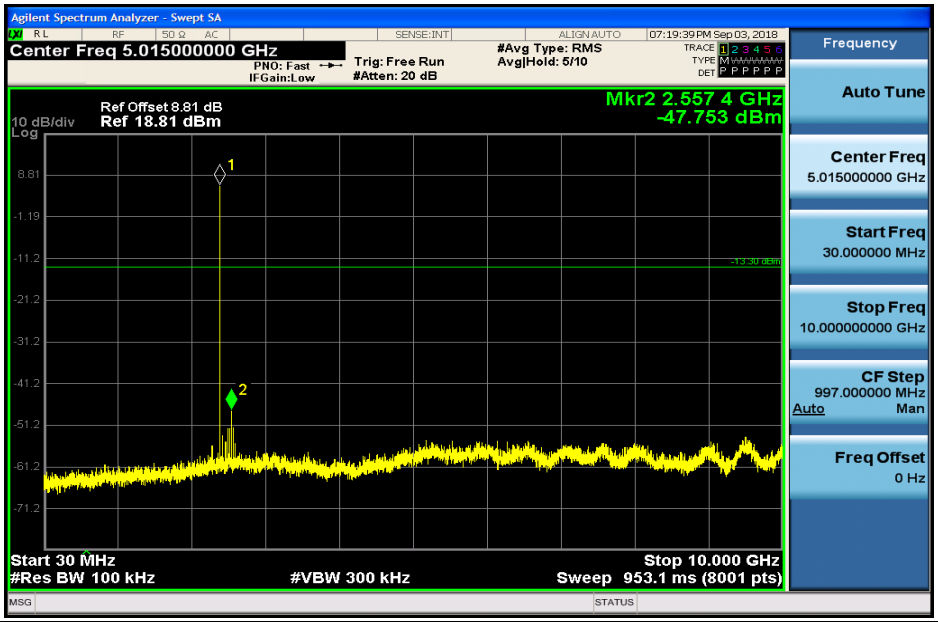

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
05:58:43 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Ref 18.95 dBm
Log
Mkr1 2.480 199 500 GHz
7.941 dBm
-12.06 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

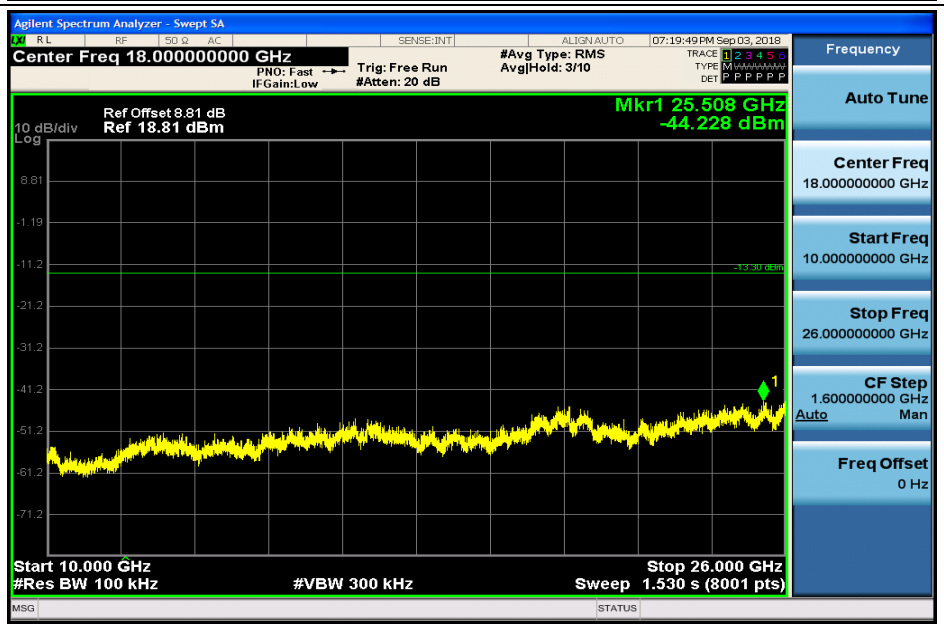

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 5/10
05:58:58 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Ref 18.95 dBm
Log
Mkr2 2.324 3 GHz
-47.750 dBm
-12.06 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 953.1 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
10.000000000 GHz
CF Step
997.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS



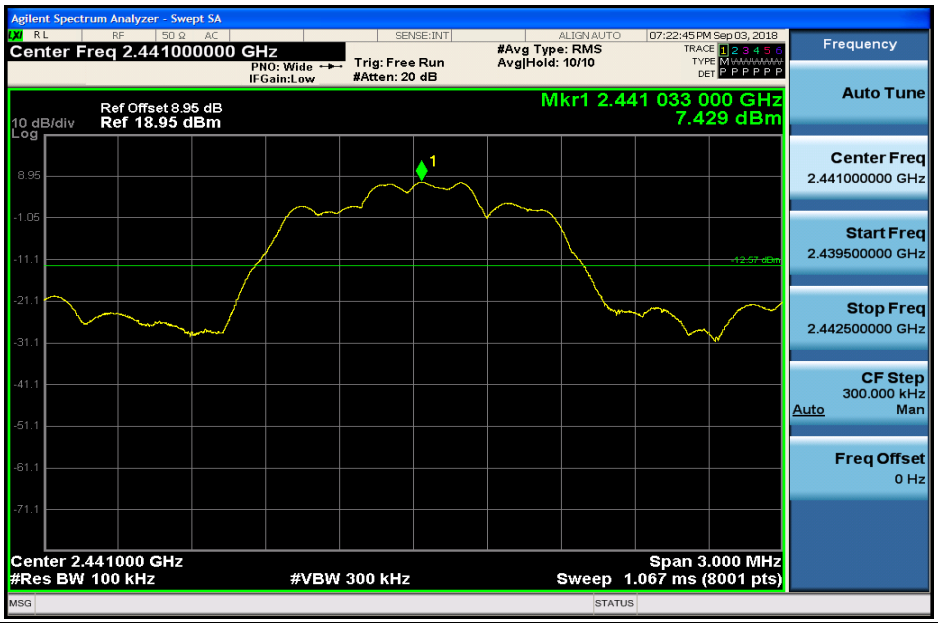
RF Conducted Spurious Emissions_2DH5_2402

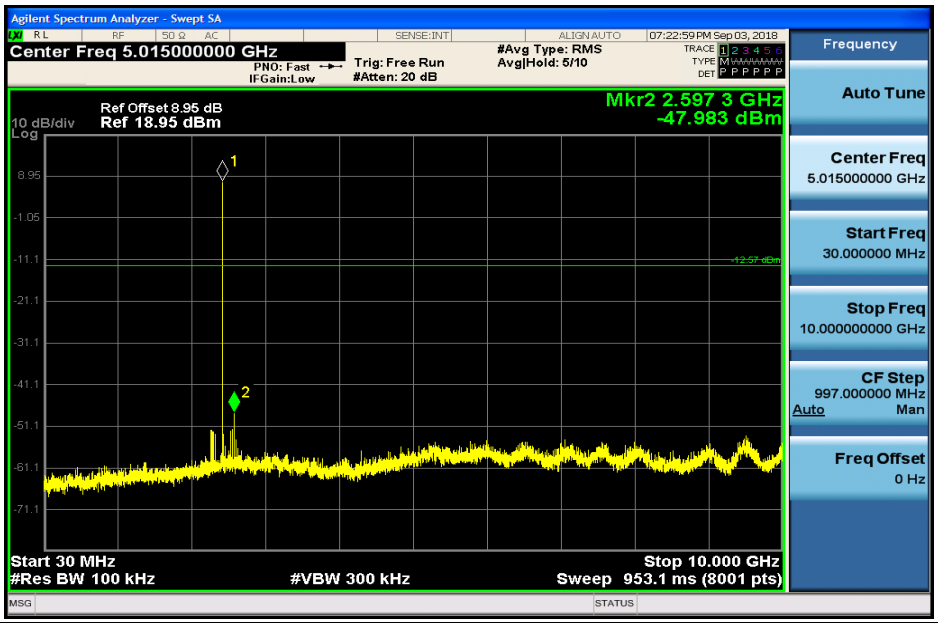


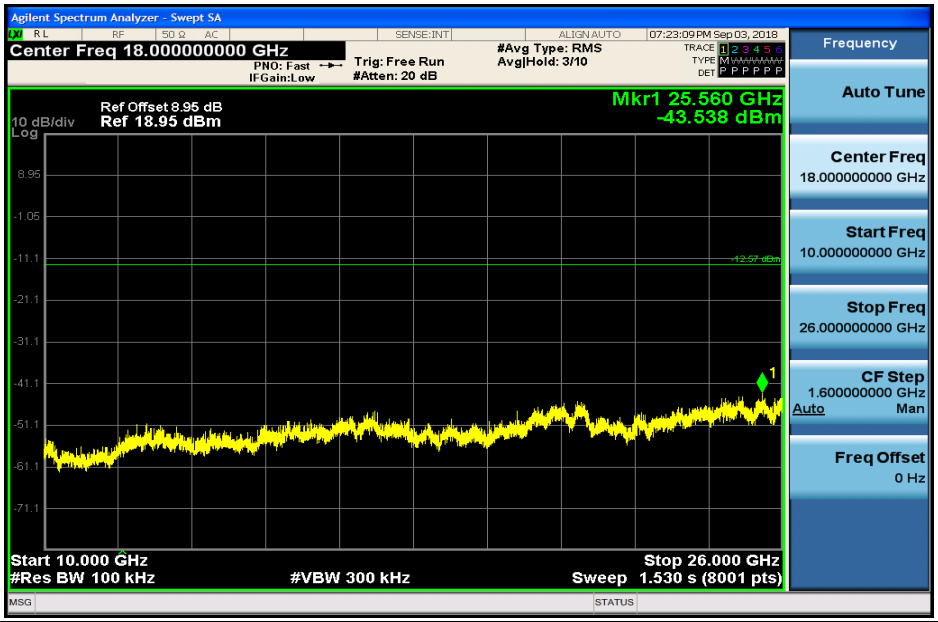




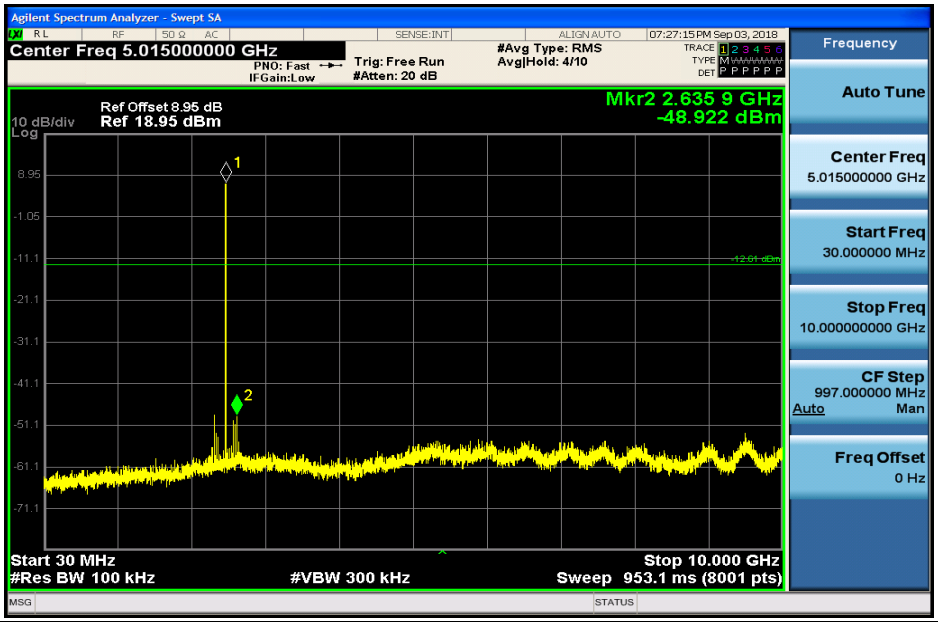
RF Conducted Spurious Emissions_2DH5_2441

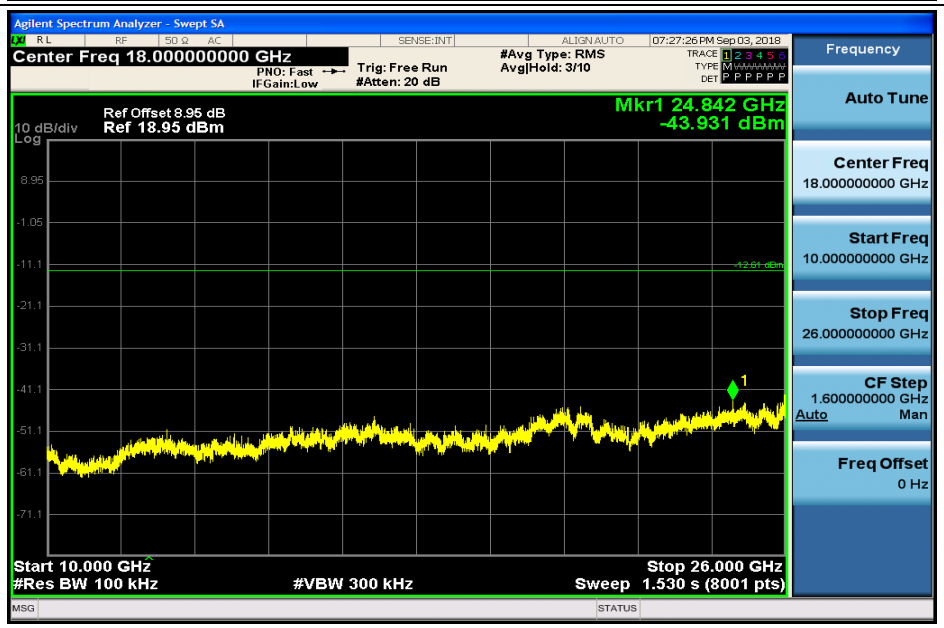

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
07:22:45 PM Sep 03, 2018
Frequency
Auto Tune
Ref Offset 8.95 dB
10 dB/div
Log
Ref 18.95 dBm
Mkr1 2.441 033 000 GHz
7.429 dBm
Center Freq
2.441000000 GHz
Start Freq
2.439500000 GHz
Stop Freq
2.442500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.441000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 5/10
07:22:59 PM Sep 03, 2018
Frequency
Auto Tune
Ref Offset 8.95 dB
10 dB/div
Log
Ref 18.95 dBm
Mkr2 2.597 3 GHz
-47.983 dBm
Center Freq
5.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
10.000000000 GHz
CF Step
997.000000 MHz
Auto
Man
Freq Offset
0 Hz
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 953.1 ms (8001 pts)
MSG
STATUS

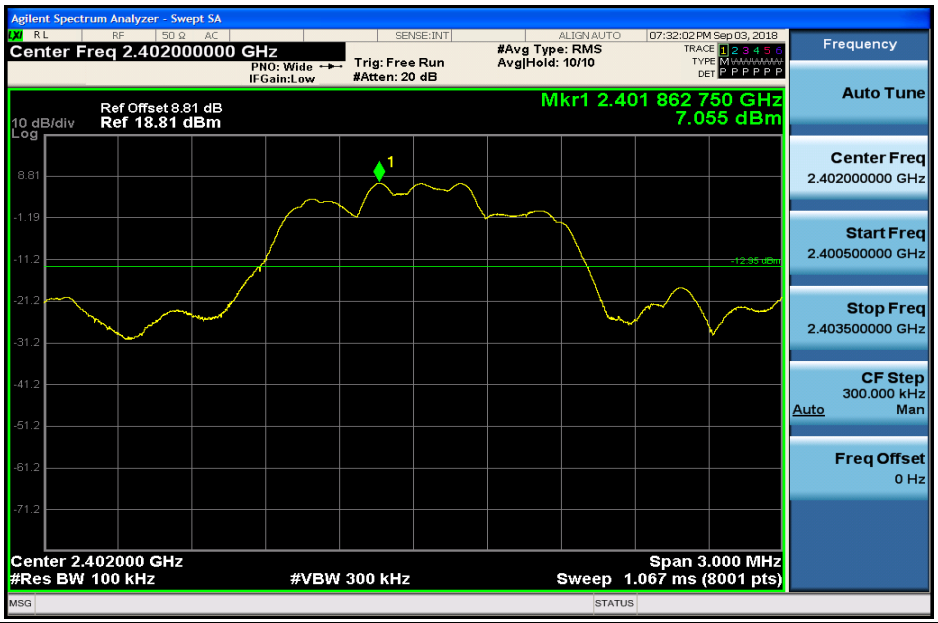


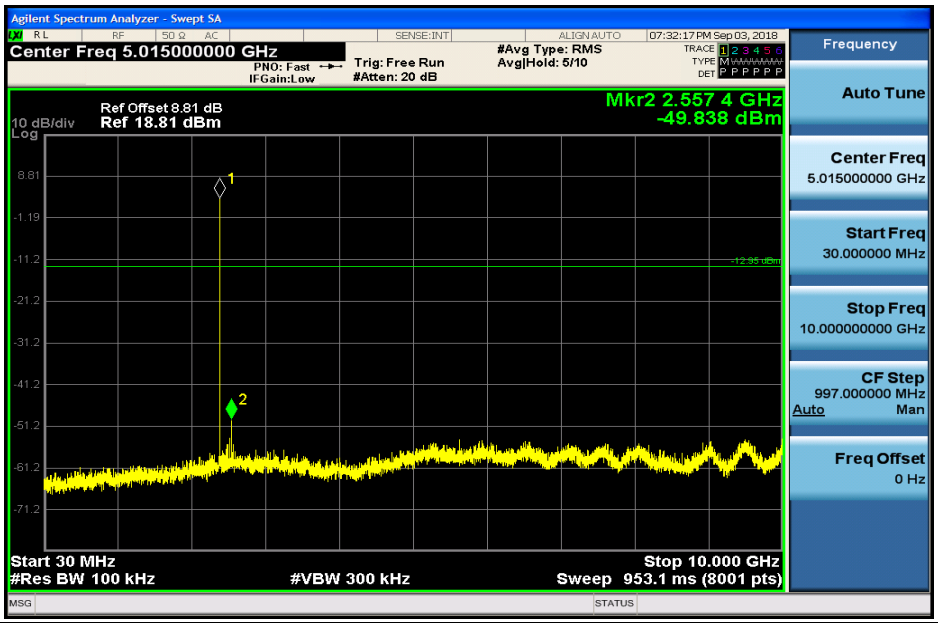
RF Conducted Spurious Emissions_2DH5_2480

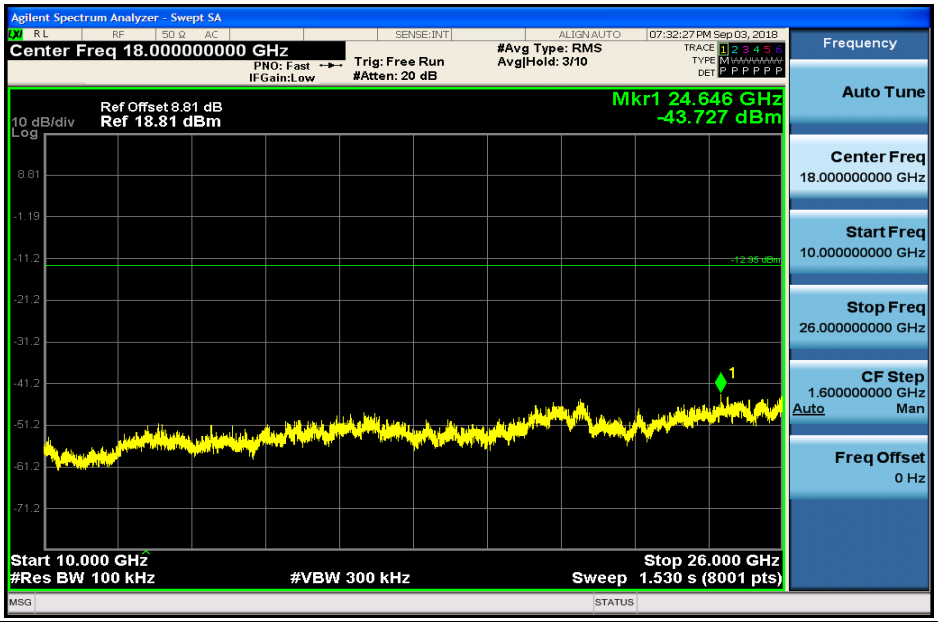




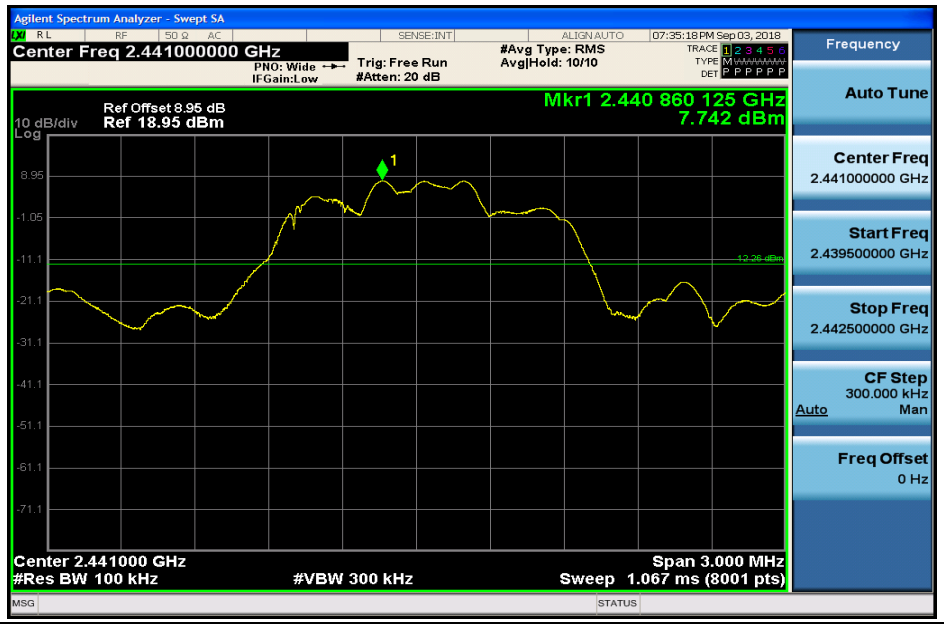
RF Conducted Spurious Emissions_3DH5_2402

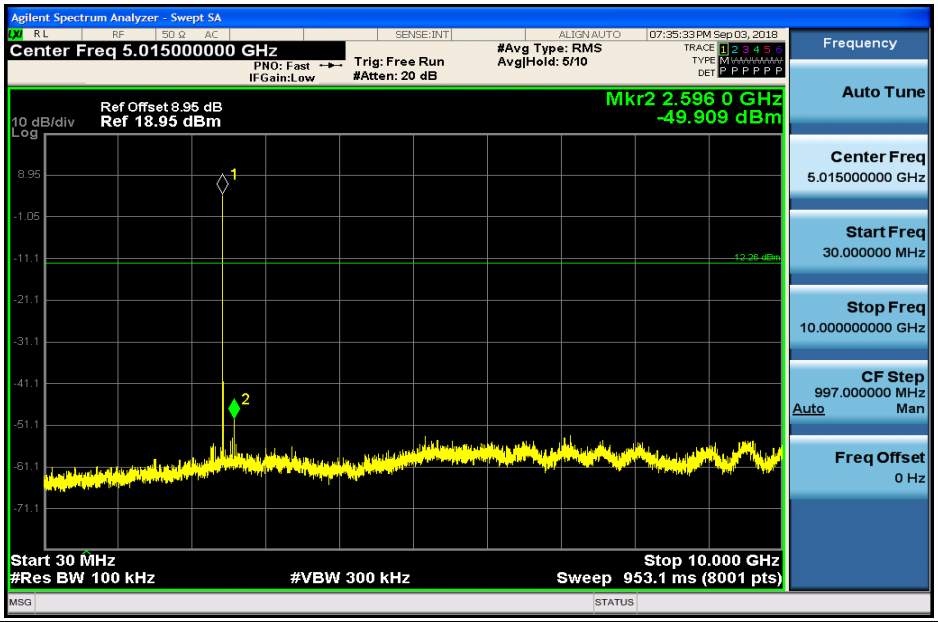

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
07:32:02 PM Sep 03, 2018
Frequency
Auto Tune
Ref Offset 8.81 dB
10 dB/div
Log
Ref 18.81 dBm
Mkr1 2.401 862 750 GHz
7.055 dBm
Center Freq
2.402000000 GHz
Start Freq
2.400500000 GHz
Stop Freq
2.403500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.402000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS

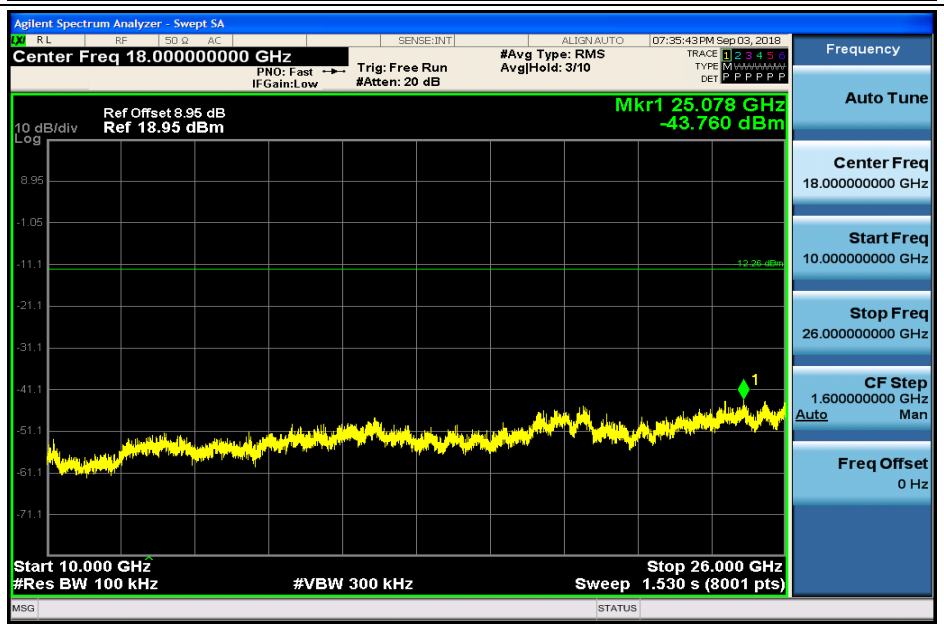

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 5/10
07:32:17 PM Sep 03, 2018
Frequency
Auto Tune
Ref Offset 8.81 dB
10 dB/div
Log
Ref 18.81 dBm
Mkr2 2.557 4 GHz
-49.838 dBm
Center Freq
5.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
10.000000000 GHz
CF Step
997.000000 MHz
Auto
Man
Freq Offset
0 Hz
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 953.1 ms (8001 pts)
MSG
STATUS



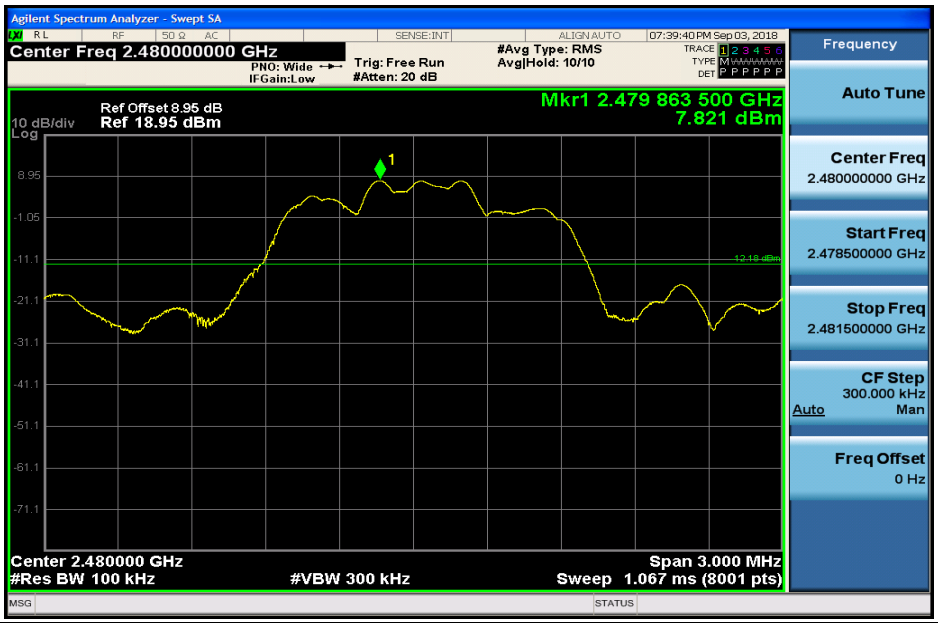
RF Conducted Spurious Emissions_3DH5_2441

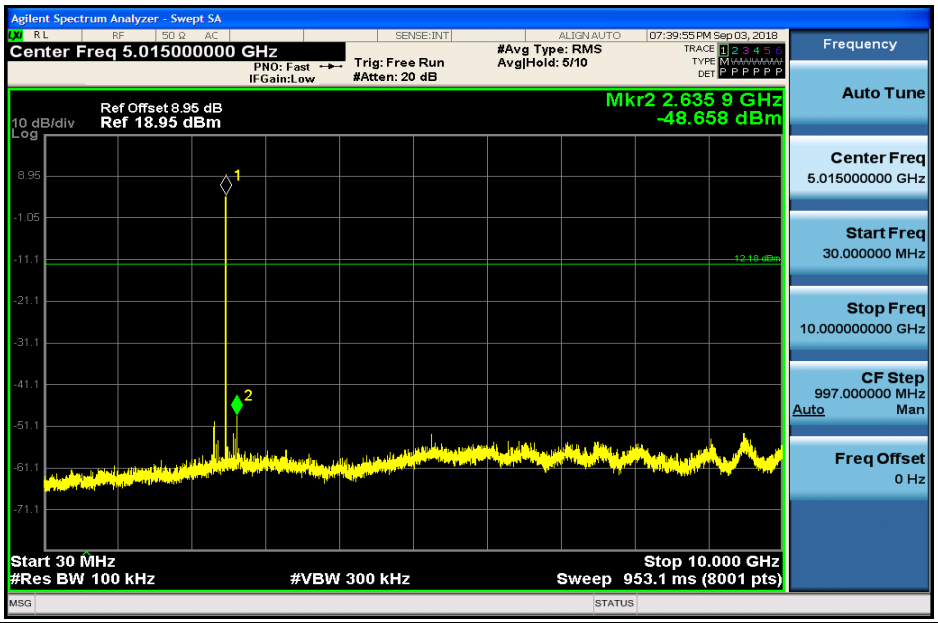


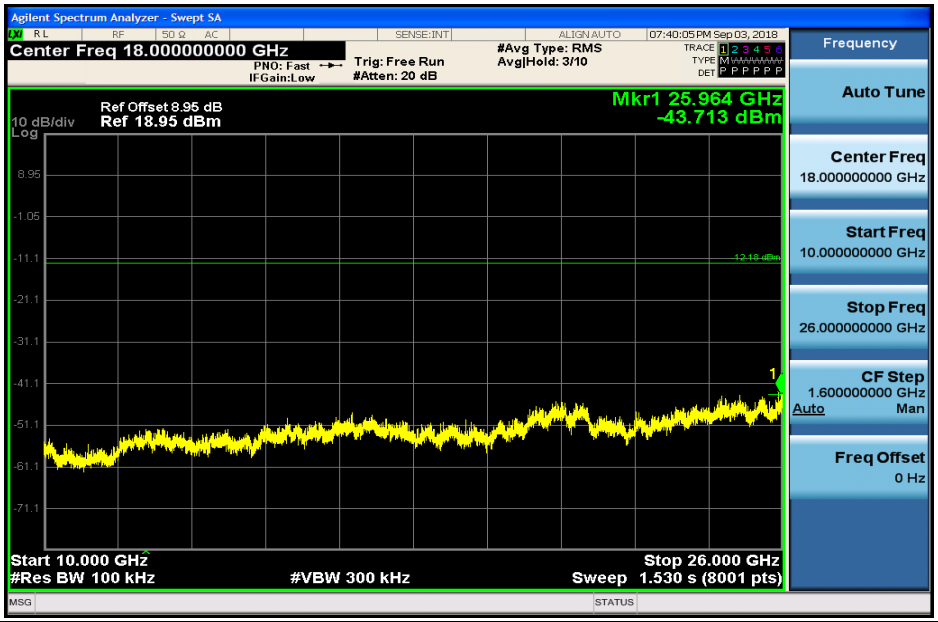




RF Conducted Spurious Emissions_3DH5_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
07:39:40 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Ref 18.95 dBm
Log
Mkr1 2.479 863 500 GHz
7.821 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 5/10
07:39:55 PM Sep 03, 2018
Ref Offset 8.95 dB
10 dB/div
Ref 18.95 dBm
Log
Mkr2 2.635 9 GHz
-48.658 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 953.1 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
10.000000000 GHz
CF Step
997.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS



- End of the Report -