TESTING
No. L2264

Part 15C

TEST REPORT

Product Name	WIFI/BT Combo wireless module
Model	M26H002
Brand Name	FOXCONN
FCC ID	MCLM26H002
Client	Hon Hai Precision Ind. Co.,Ltd.

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Product Name	WIFI/BT Combo wireless module	**Model**	M26H002
FCC ID	MCLM26H002	**Report No.**	RXA1301-0014RF01R2
Client	Hon Hai Precision Ind. Co.,Ltd.		
Manufacturer	Hon Hai Precision Ind. Co.,Ltd.		
Reference Standard(s)	**FCC CFR47 Part 15C (2013)** Radio Frequency Devices **15.205** Restricted bands of operation; **15.207** Conducted limits; **15.209** Radiated emission limits; general requirements; **15.247** Operation within the bands 902-928 MHz,2400-2483.5 MHz, and 5725-5850MHz. **ANSI C63.4** Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40GHz. (2009) **DA00-705** Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System.(2000)		
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 3 of this test report are below limits specified in the relevant standards. General Judgment: **Pass** (Stamp) **Date of issue: February 21st, 2013**		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中 Director **Revised by** 唐凯 RF Manager **Performed by** RF Engineer

TABLE OF CONTENT

1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing laboratory

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Yang Weizhong
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company:	Hon Hai Precision Ind. Co.,Ltd.
Address:	5F-1, 5 Hsin-An Road, Hsinchu Science-Based Industrial Park
City:	/
Postal Code:	/
Country:	/

1.4. Manufacturer Information

Company:	Hon Hai Precision Ind. Co.,Ltd.
Address:	5F-1, 5 Hsin-An Road, Hsinchu Science-Based Industrial Park
City:	/
Postal Code:	/
Country:	/

1.5. Information of EUT

General information

Name of EUT:	WIFI/BT Combo wireless module		
IMEI:	A41731673970		
Hardware Version:	v.015		
Software Version:	MFG-8787-WIFI-SD-BT-SD-WIN-X86-1.2.7.33-14.0.11.p74		
Antenna Information:	Type	External Antenna	
	Antenna 1 Part NO.	MSA-3411-25GC1-A1-W550MU	
	Antenna 2 Part NO.	MSA-3411-25GC1-A1-W550MM	
	Cable Length	550mm	
	Antenna 1 Max Gain	4.0dBi	
	Antenna 2 Max Gain	3.6dBi	
Device Operating Configurations:			
Test Mode	Basic Rate	Enhanced Data Rate(EDR)	
Modulation Type:	Frequency Hopping Spread Spectrum (FHSS)		
	GFSK	π/4-DQPSK	8DPSK
Packet Type:(Maximum Payload)	DH5	2DH5	3DH5
Max. Conducted Power	6.00 dBm		
Operating Frequency Range(s)	2400 ~ 2483.5 MHz		

Equipment under Test (EUT) is WIFI/BT Combo wireless module with external antenna. The EUT supports Bluetooth and WIFI function.

The EUT consist of two types of Bluetooth antennas. The Part NO of antenna 1 is MSA-3411-25GC1-A1-W550MU, The Part NO of antenna 2 is MSA-3411-25GC1-A1-W550MM.

The gain of antenna 1 is bigger than antenna 2. The radiation test cases were all tested for antenna 1, then the worst emission was found and this mode was tested for antenna 2.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test performed from January 25, 2013 to February 1, 2013.

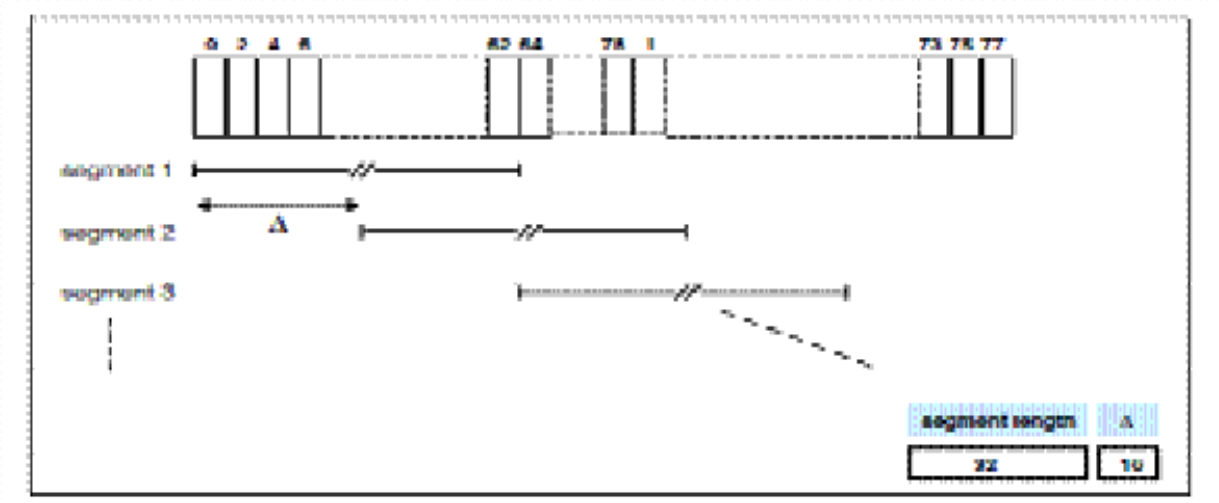
2. Information about the FHSS characteristics

2.1. Pseudorandom Frequency Hopping Sequence

Frequency Hopping Systems. A spread spectrum system in which the carrier is modulated with the coded information in a conventional manner causing a conventional spreading of the RF energy about the frequency carrier. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence. The wide RF bandwidth needed by such a system is not required by spreading of the RF energy about the carrier but rather to accommodate the range of frequencies to which the carrier frequency can hop. The test of a frequency hopping system is that the near term distribution of hops appears random, the long term distribution appears evenly distributed over the hop set, and sequential hops are randomly distributed in both direction and magnitude of change in the hop set.

The selection scheme chooses a segment of 32 hop frequencies spanning about 64 MHz and visits these hops in a pseudo-random order. Next, a different 32-hop segment is chosen, etc. In the page, master page response, slave page response, page scan, inquiry, inquiry response and inquiry scan hopping sequences, the same 32-hop segment is used all the time (the segment is selected by the address; different devices will have different paging segments).

When the basic channel hopping sequence is selected, the output constitutes a pseudo-random sequence that slides through the 79 hops. The principle is depicted in the figure below.



Hop selection scheme in CONNECTION state.

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45, etc.

Each frequency used equally on the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

2.2. Equal Hopping Frequency Use

All Bluetooth units participating in the Pico net are time and hop-synchronized to the channel. Each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

2.3. System Receiver Input Bandwidth

Each channel bandwidth is 1MHz. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

3. Test Information

3.1. Test Mode

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

EUT is stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded. Then this mode was measured in the following mode.

Test Modes		
Band	Radiated Test Cases	Conducted Test Cases
BT	DH5 GFSK(Channel 0/39/78) 3DH5 8DPSK(Channel 0/39/78)	DH5 GFSK(Channel 0/39/78) 2DH5 π/4-DQPSK(Channel 0/39/78) 3DH5 8DPSK(Channel 0/39/78)

Note: It is chosen the maximum RF output power of basic rata and EDR mode of Bluetooth for RSE and CSE to test.

3.2. Summary of test results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Peak Power Output -Conducted	15.247(b)(1)	PASS
2	Occupied Bandwidth (20dB)	15.247(a)(1)	PASS
3	Frequency Separation	15.247(a)(1)	PASS
4	Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	PASS
5	Band Edge Compliance	15.247(d)	PASS
6	Spurious Radiated Emissions in the restricted band	15.247(d),15.205,15.209	PASS
7	Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
8	Spurious RF Conducted Emissions	15.247(d)	PASS
9	Radiates Emission	15.247(d),15.205,15.209	PASS
10	AC Power Line Conducted Emission	15.207	PASS

3.3. Peak Power Output –Conducted

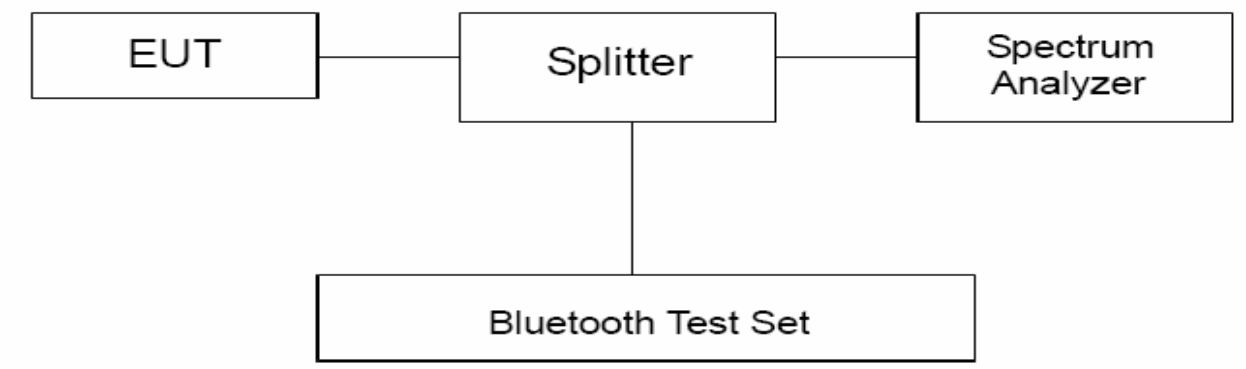
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, the EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The EUT is controlled by the Bluetooth test set to ensure max power transmission with proper modulation. The peak detector is used. RBW is set to 2 MHz; VBW is set to 6 MHz. These measurements have been tested at following channels: 0, 39, and 78.

Test Setup



Limits

Rule Part 15.247 (b) (1)specifies that " For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts."

Peak Output Power	≤ 0.125W (21dBm)

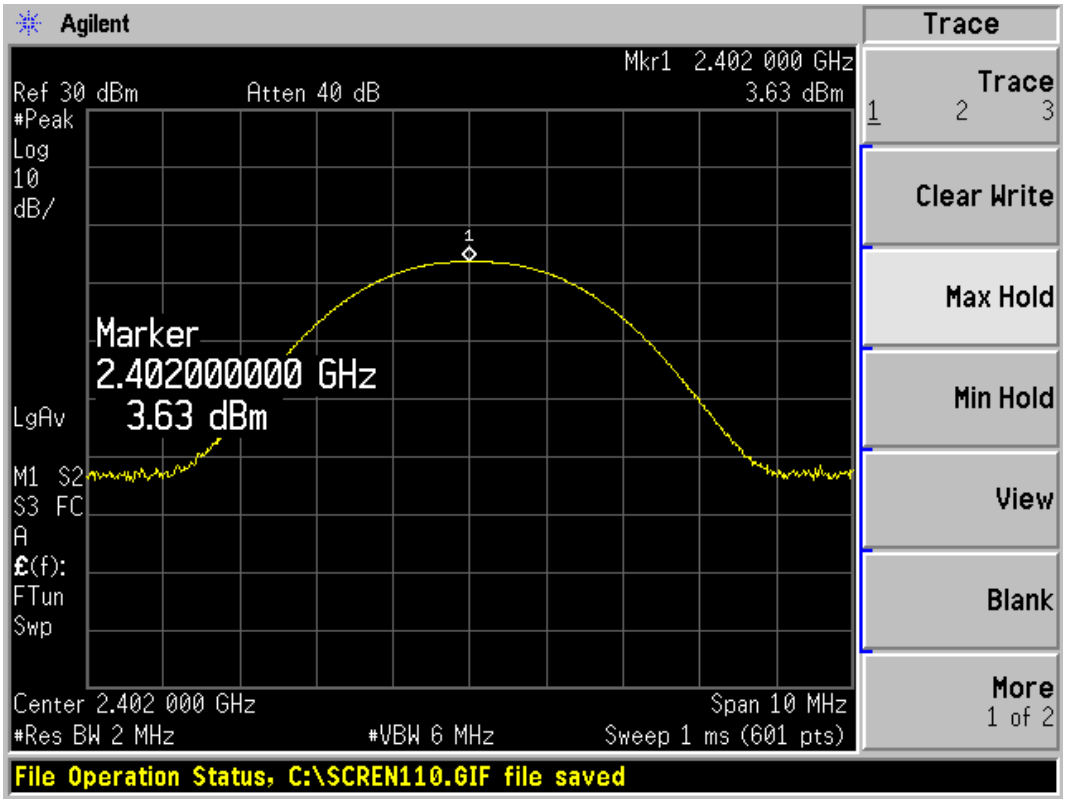
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

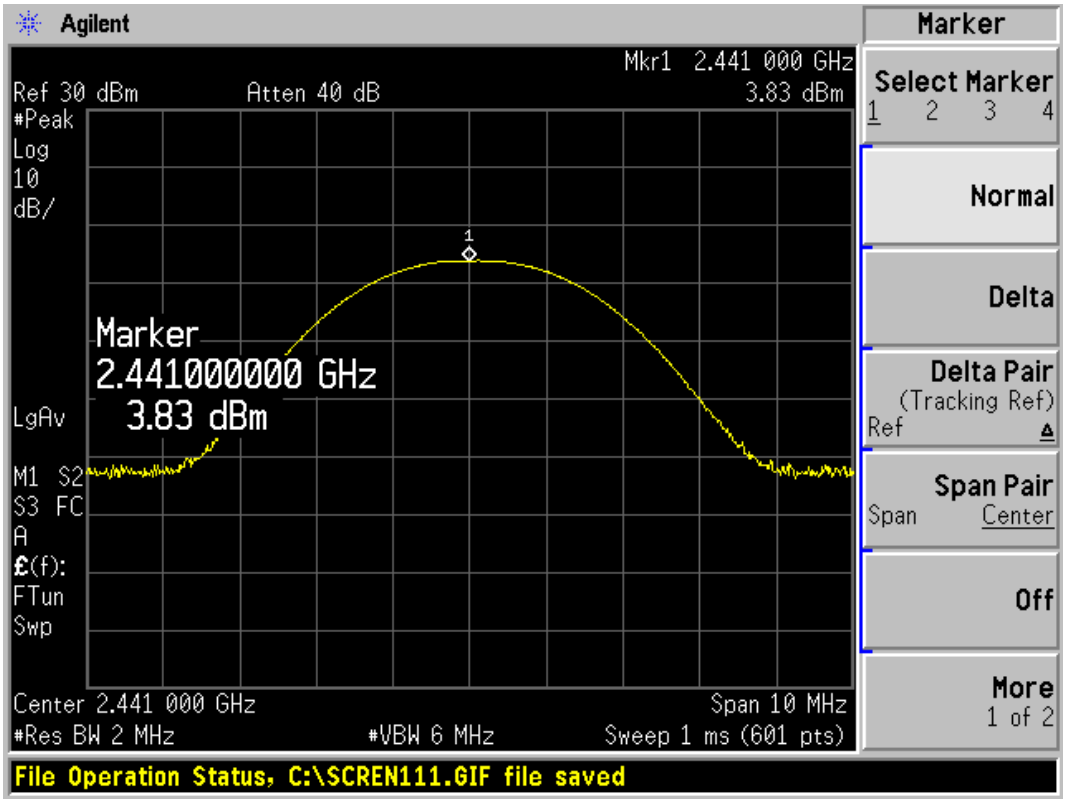
Test Results

Channel	Frequency (MHz)	Peak Output Power (dBm)			Conclusion
		DH5	2DH5	3DH5	
0	2402	3.63	5.79	5.57	PASS
39	2441	3.83	5.99	5.77	PASS
78	2480	4.06	6.00	5.69	PASS

DH5

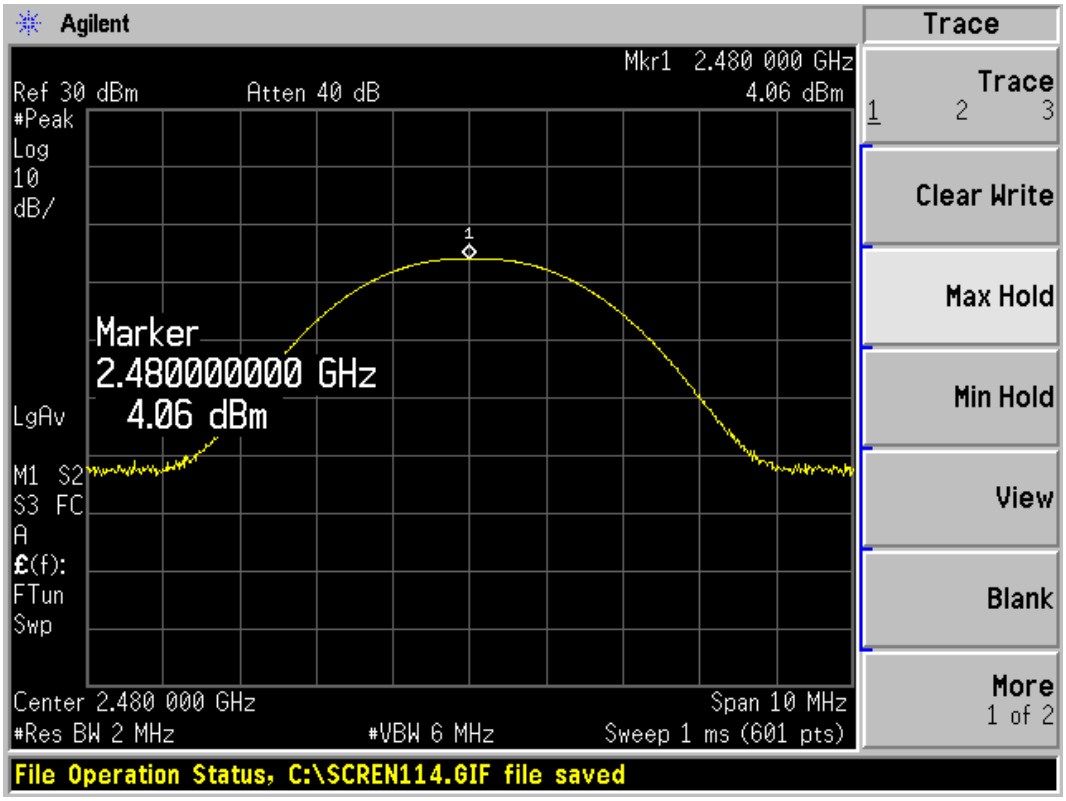


Carrier frequency (MHz): 2402
Channel No.:0



Carrier frequency (MHz): 2441

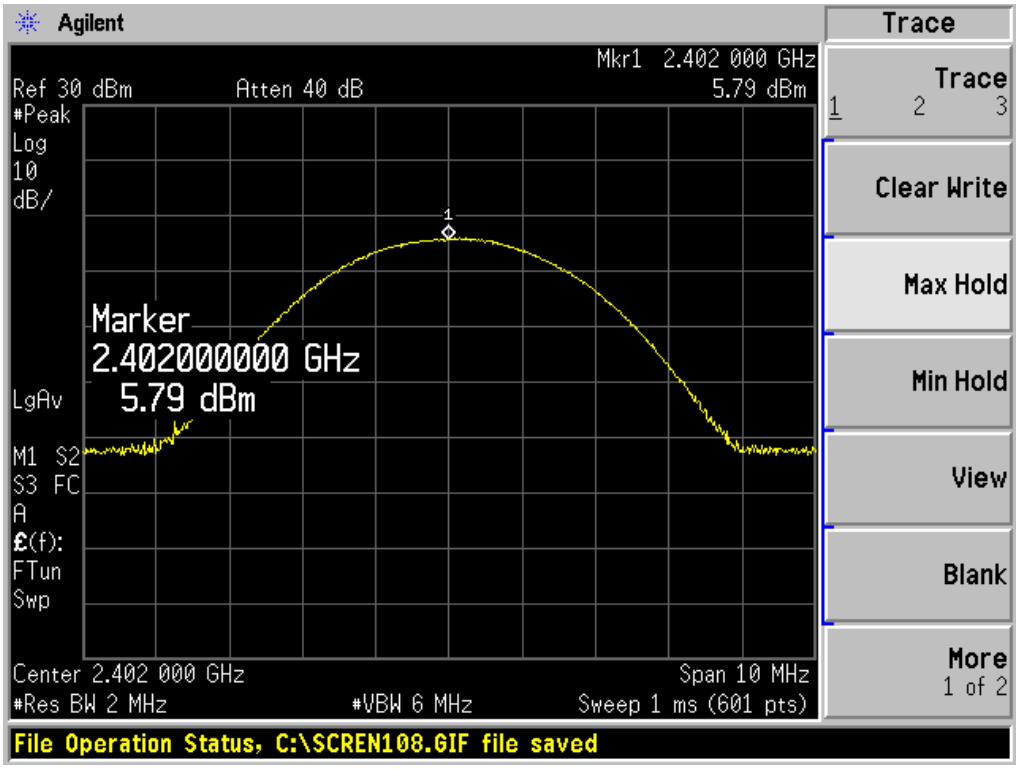
Channel No.:39



Carrier frequency (MHz): 2480

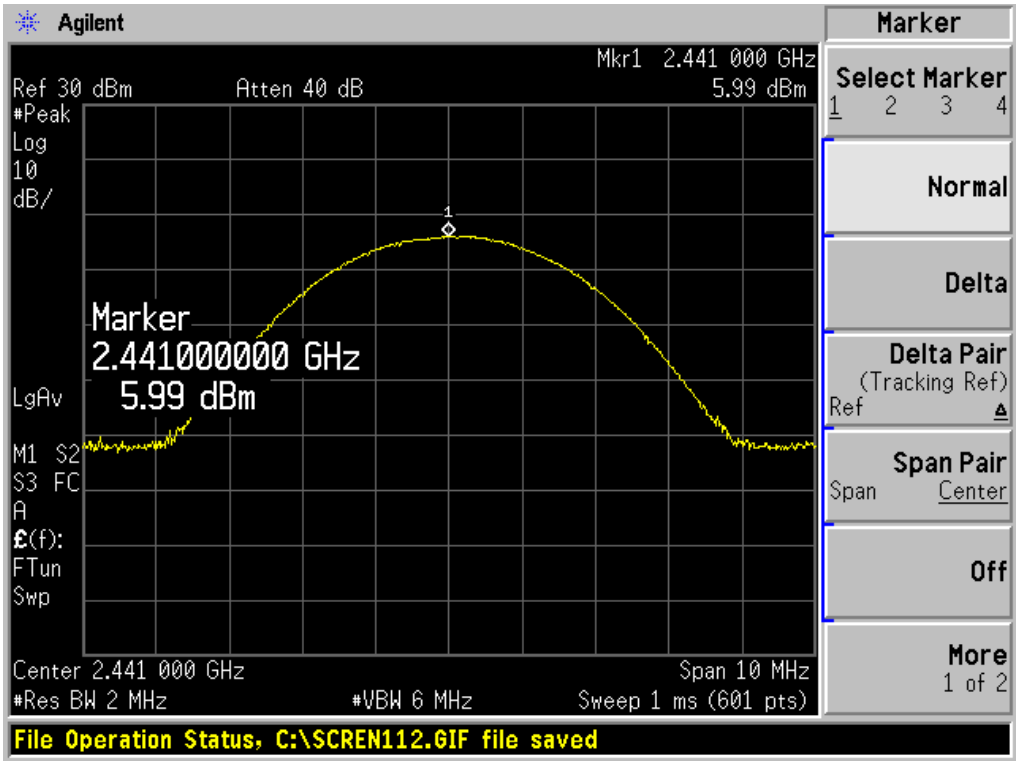
Channel No.:78

2DH5



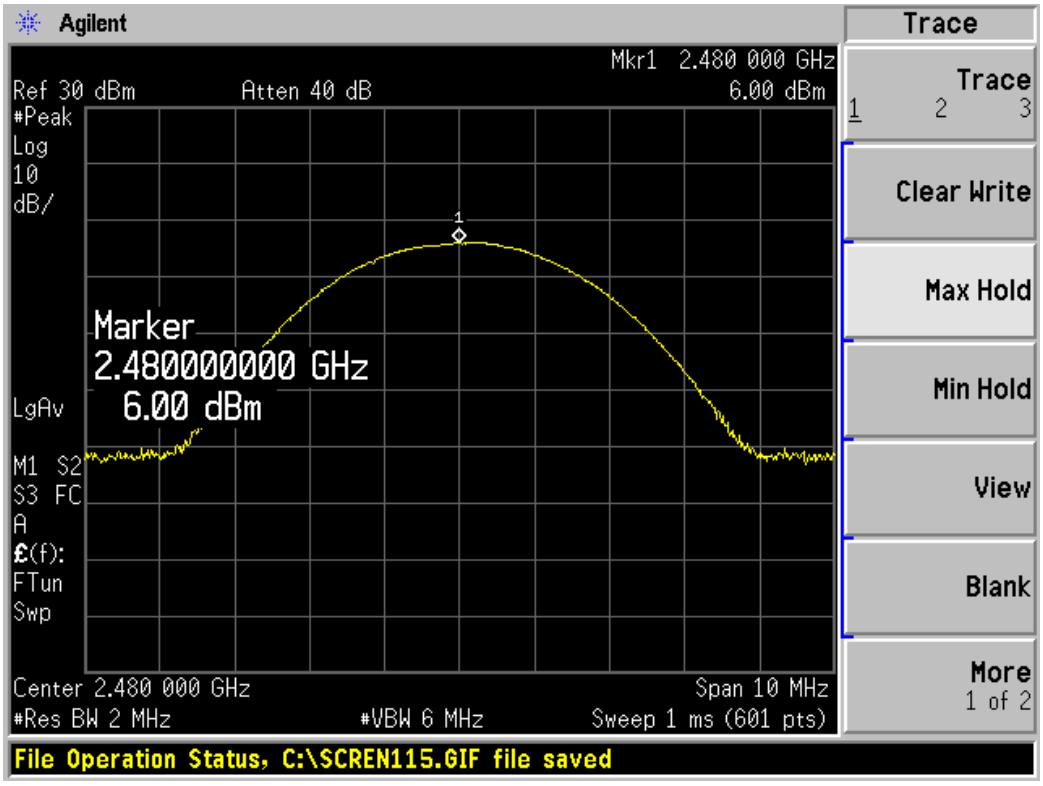
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

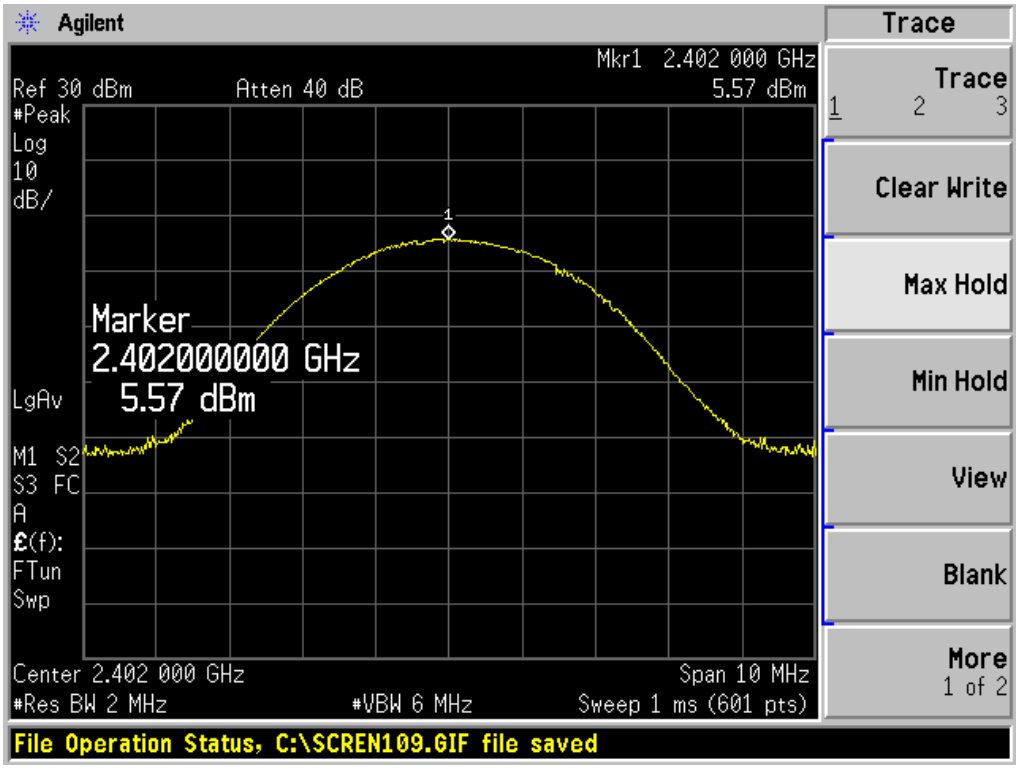
Channel No.:39



Carrier frequency (MHz): 2480

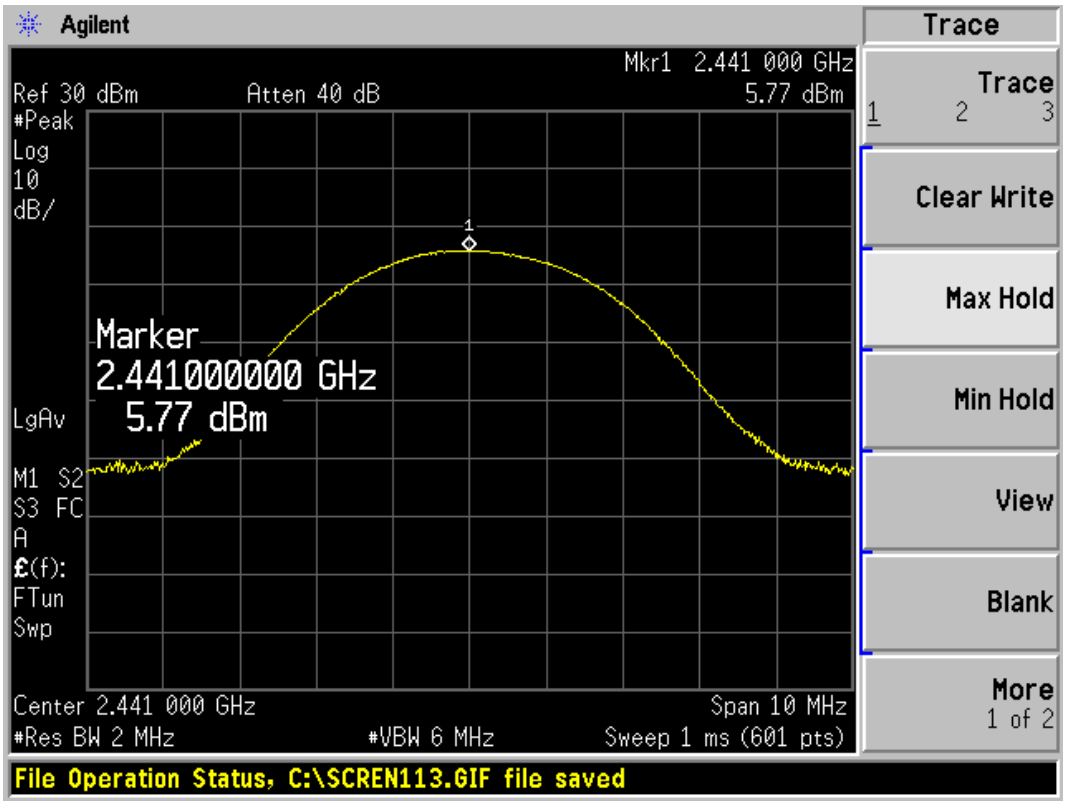
Channel No.:78

3DH5

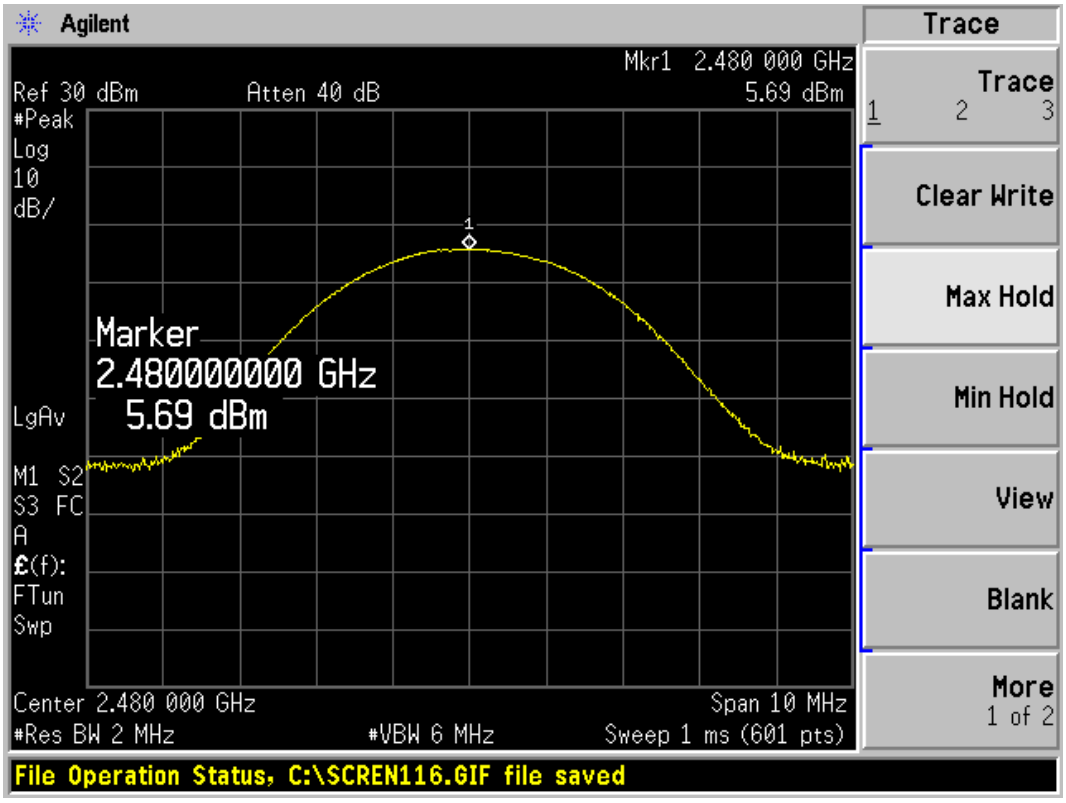


Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441
Channel No.:39



Carrier frequency (MHz): 2480
Channel No.:78

3.4. Occupied Bandwidth (20dB)

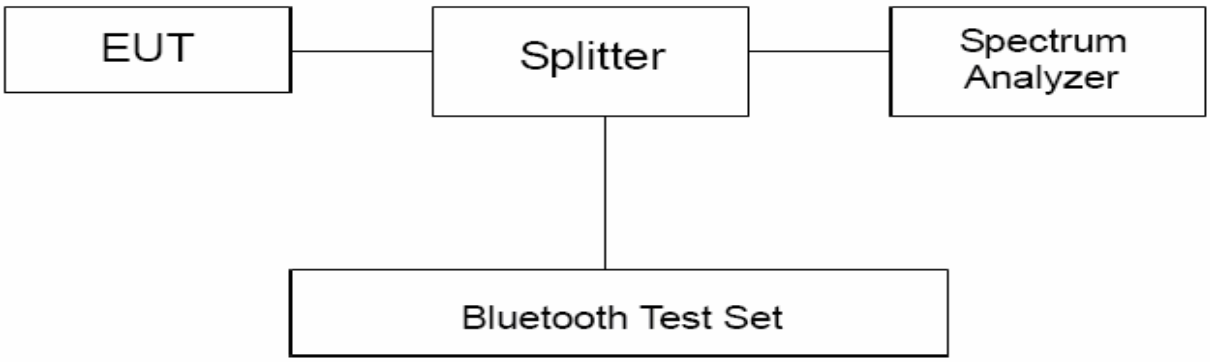
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 20 kHz and VBW is set to 60 kHz on spectrum analyzer. -20dB occupied bandwidths are recorded.

Test Setup



Limits

No specific occupied bandwidth requirements in part 15.247(a) (1).

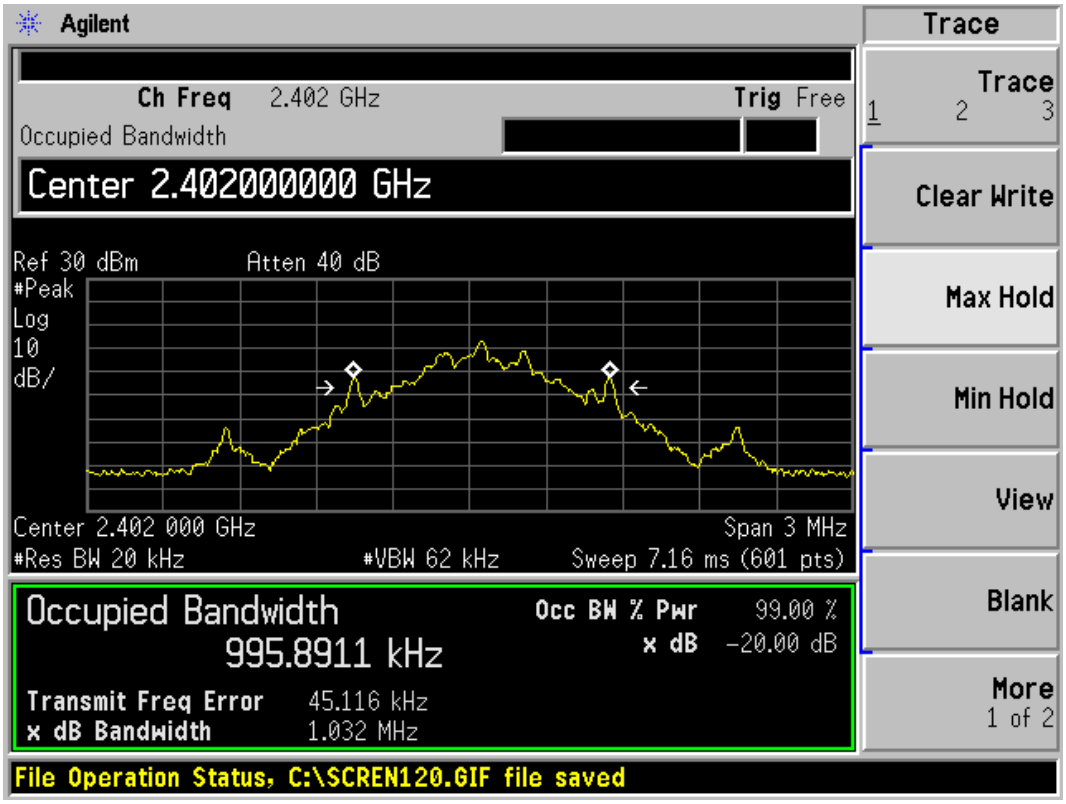
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results

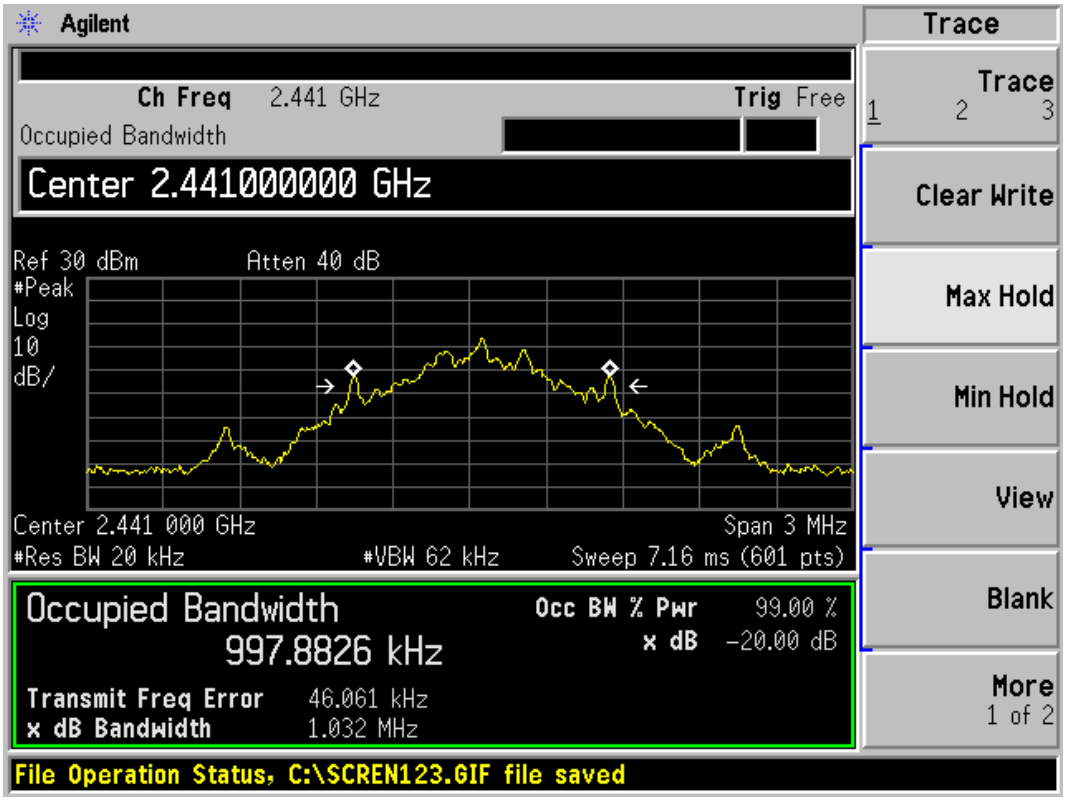
DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1032
39	2441	1032
78	2480	1033



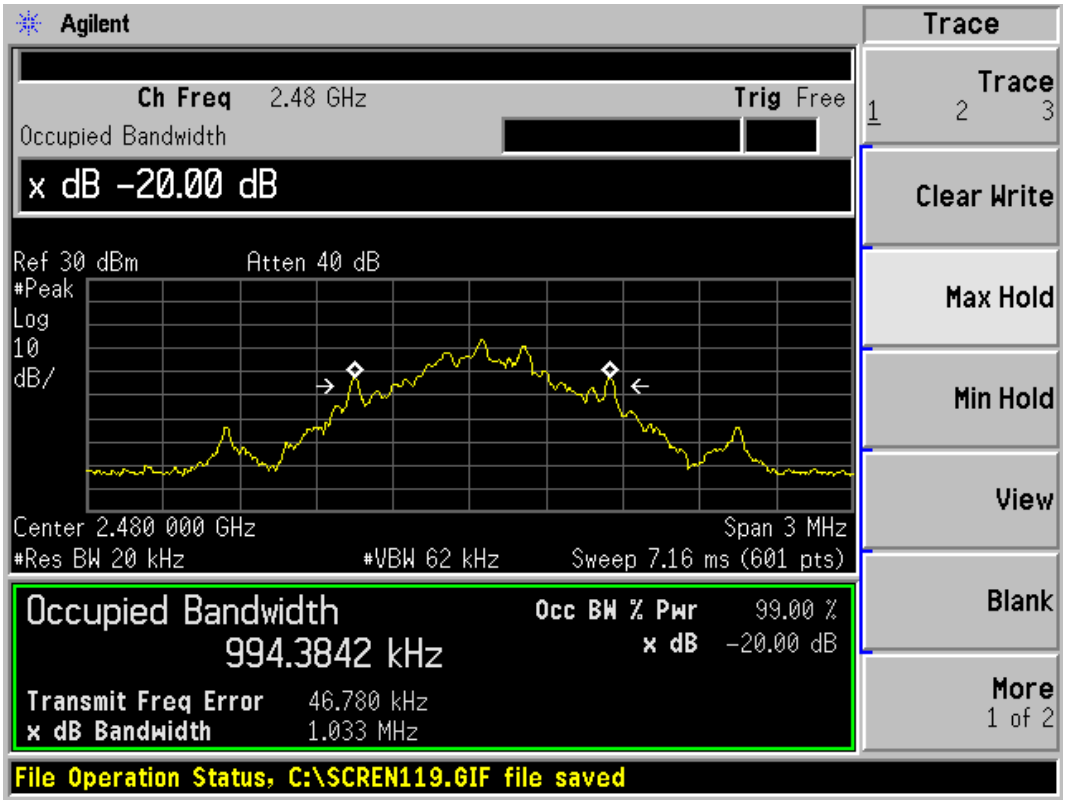
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39

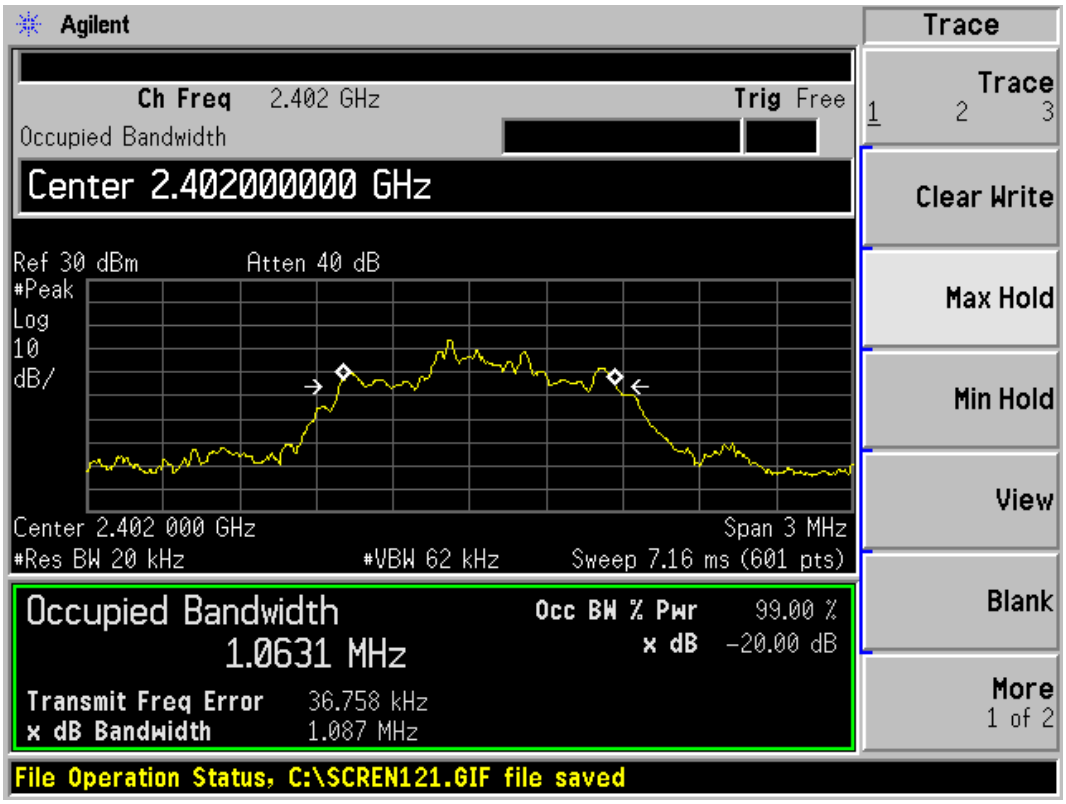


Carrier frequency (MHz): 2480

Channel No.:78

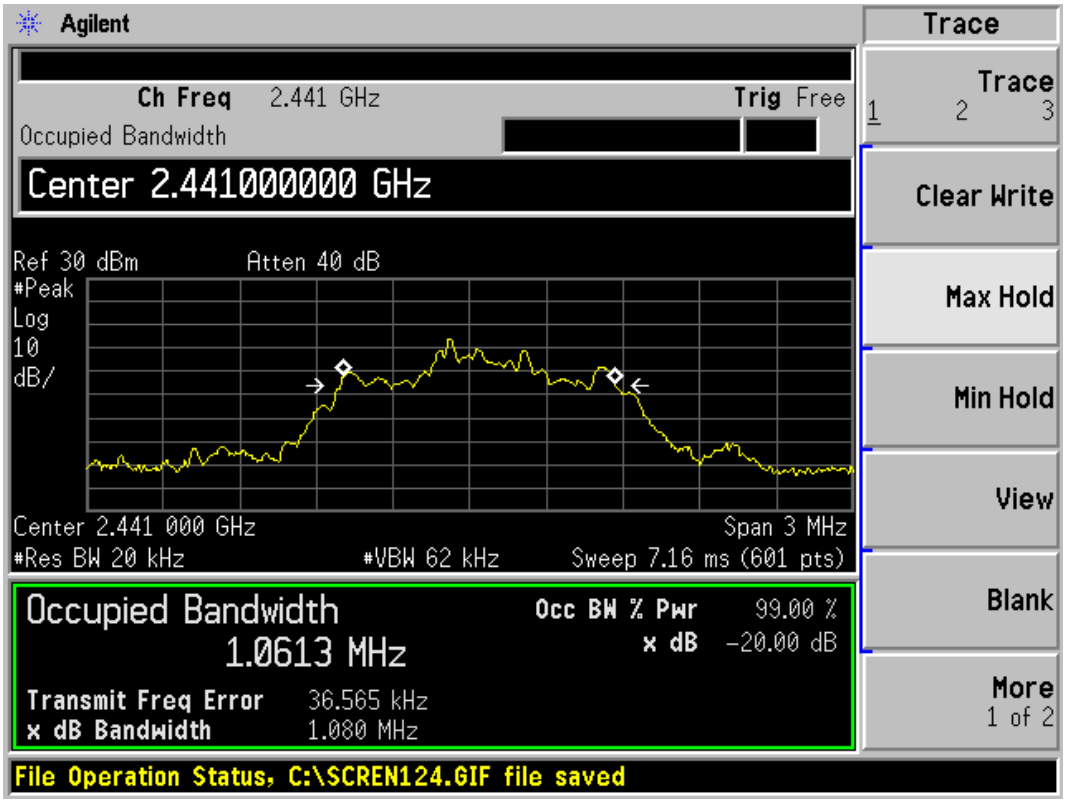
2DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1087
39	2441	1080
78	2480	1089



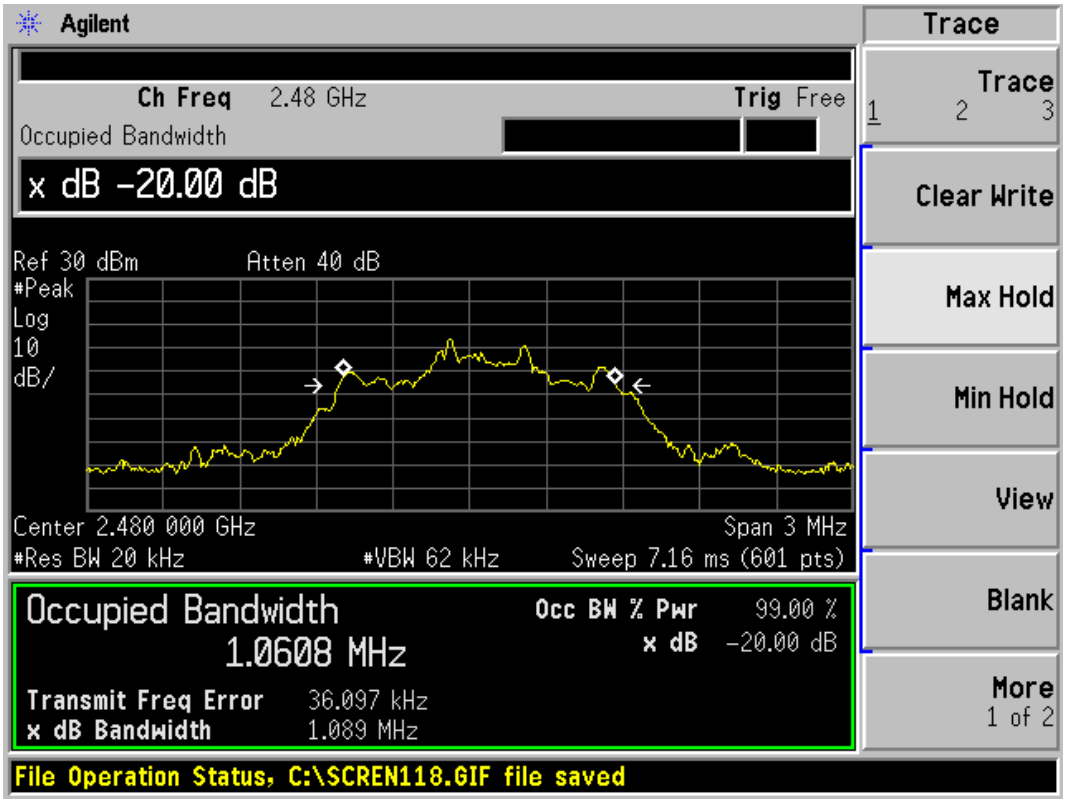
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39

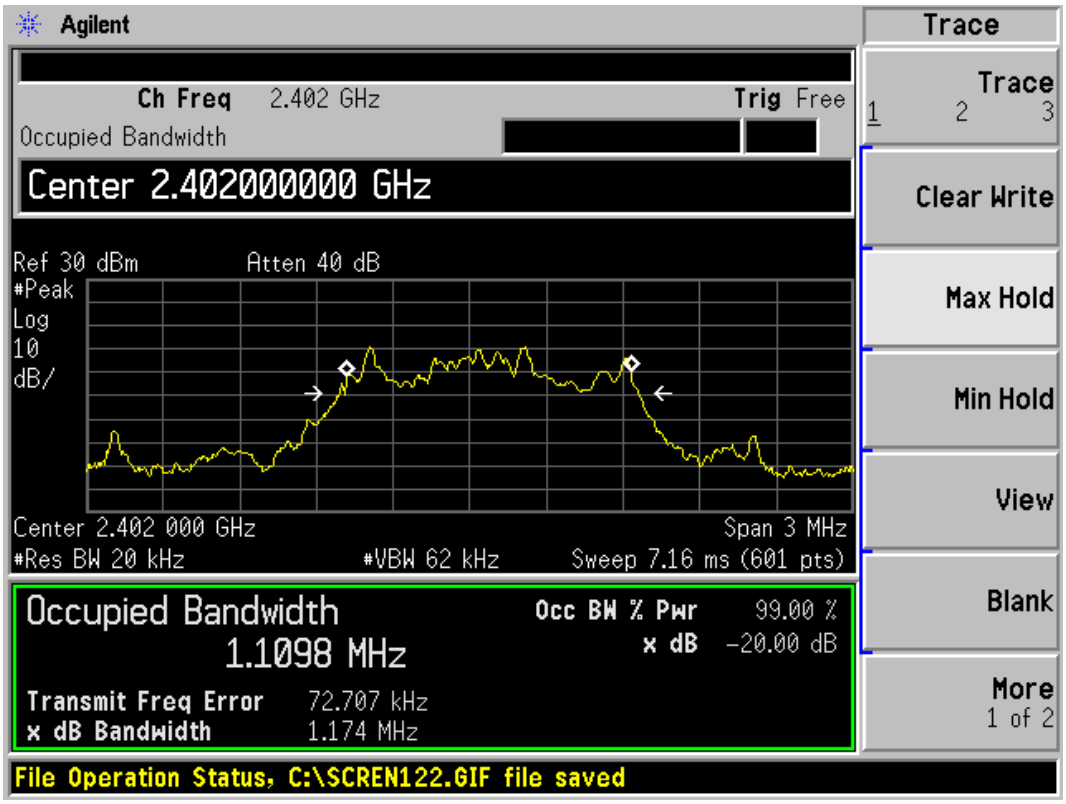


Carrier frequency (MHz): 2480

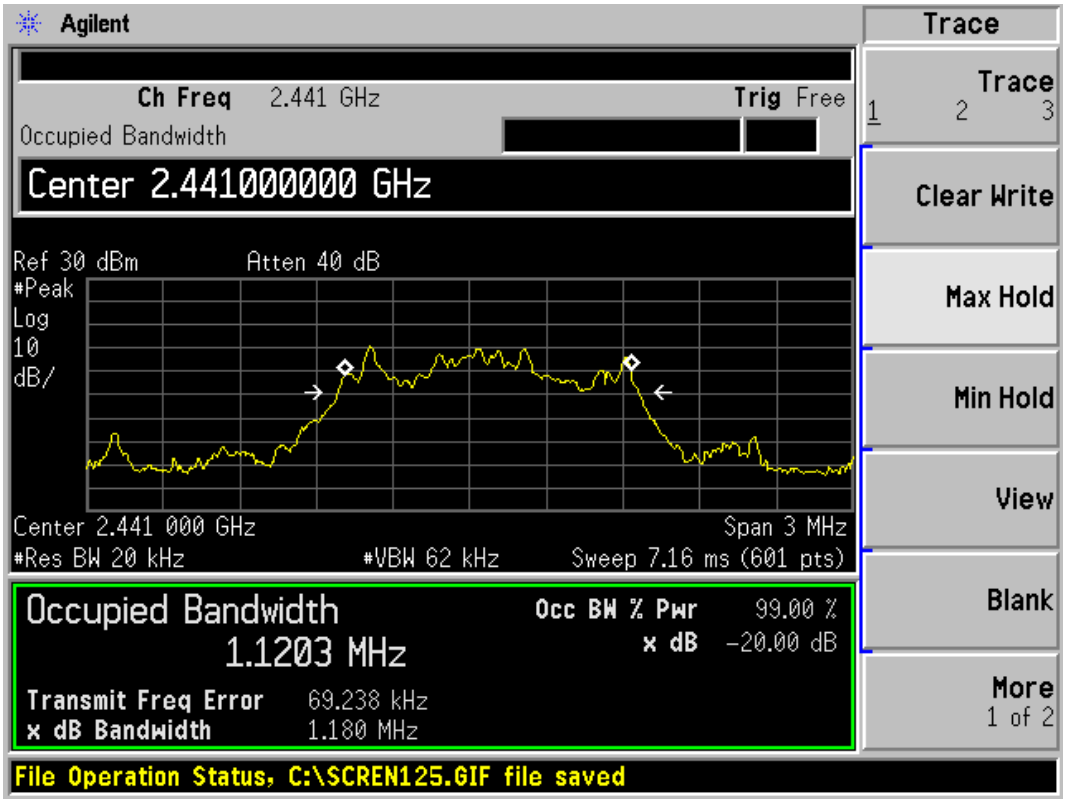
Channel No.:78

3DH5

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
0	2402	1174
39	2441	1180
78	2480	1180

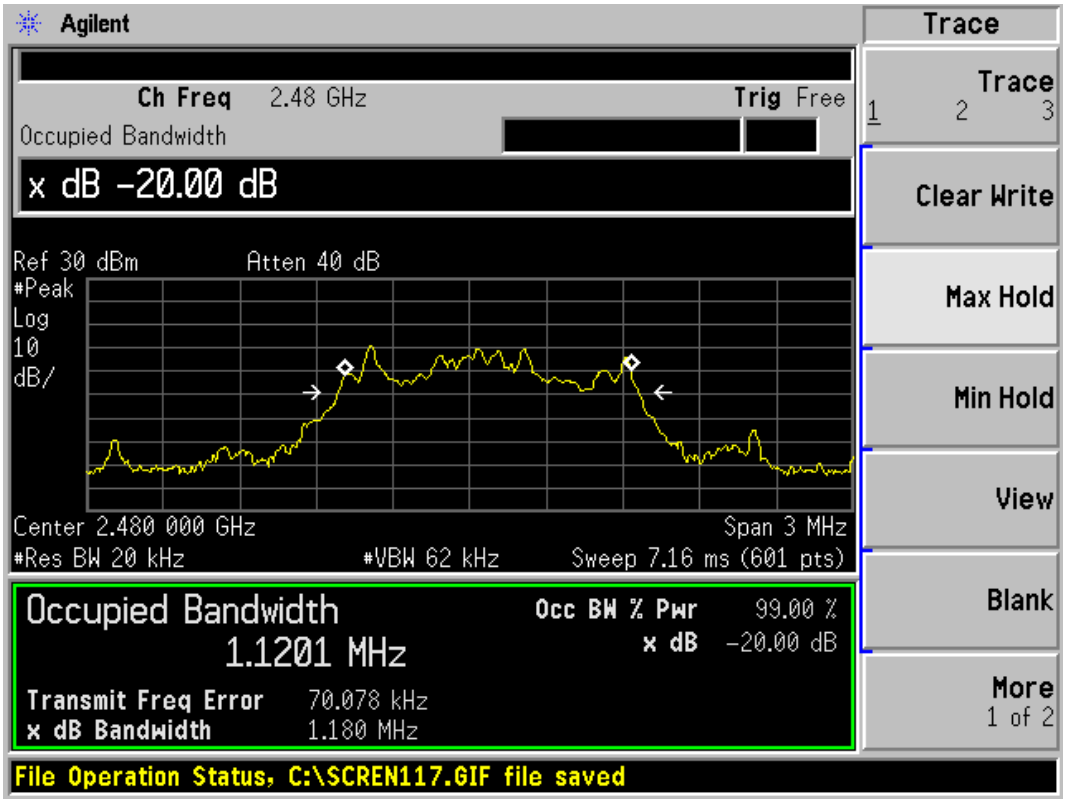


Carrier frequency (MHz): 2402
Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

3.5. Frequency Separation

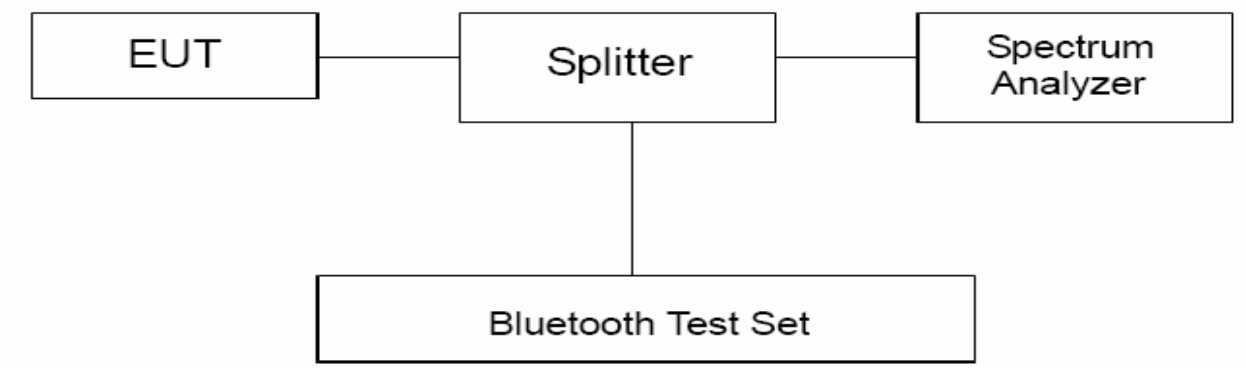
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 300 kHz and VBW is set to 3MHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

Rule Part 15.247(a)(1)specifies that “Frequency hopping systems 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, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. ”

Note: The value of two-thirds of 20 dB bandwidth is always greater than 25 kHz.

Measurement Uncertainty

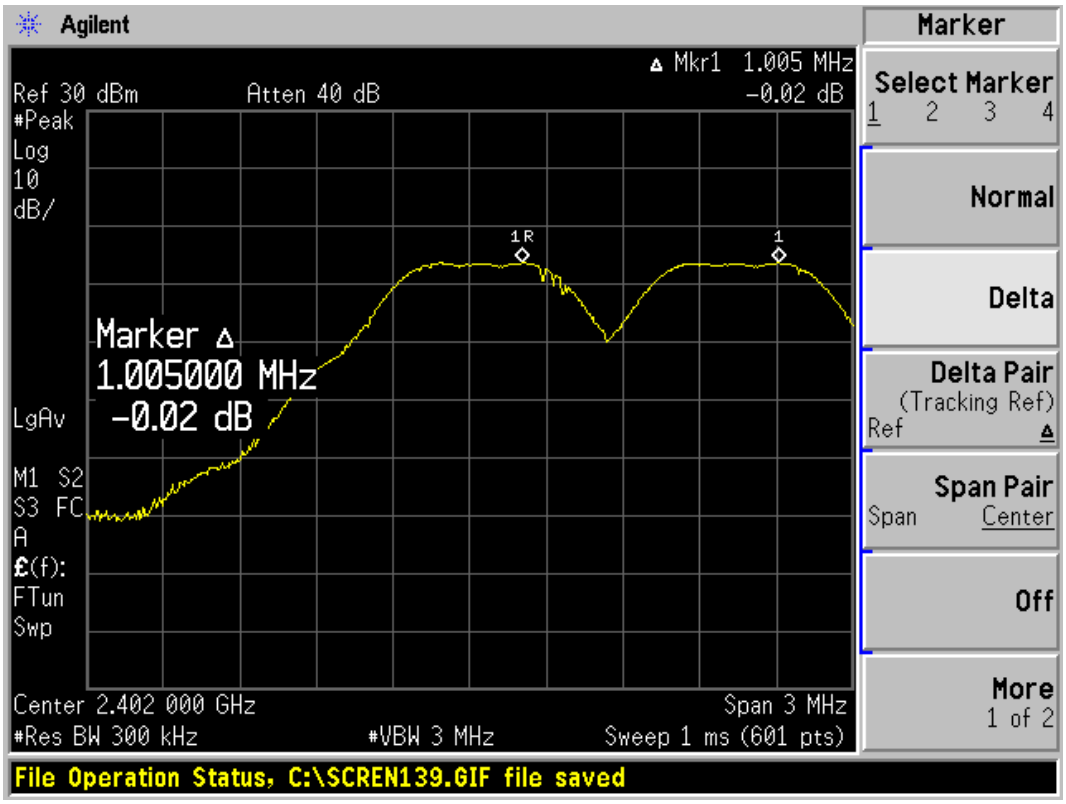
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results:

DH5

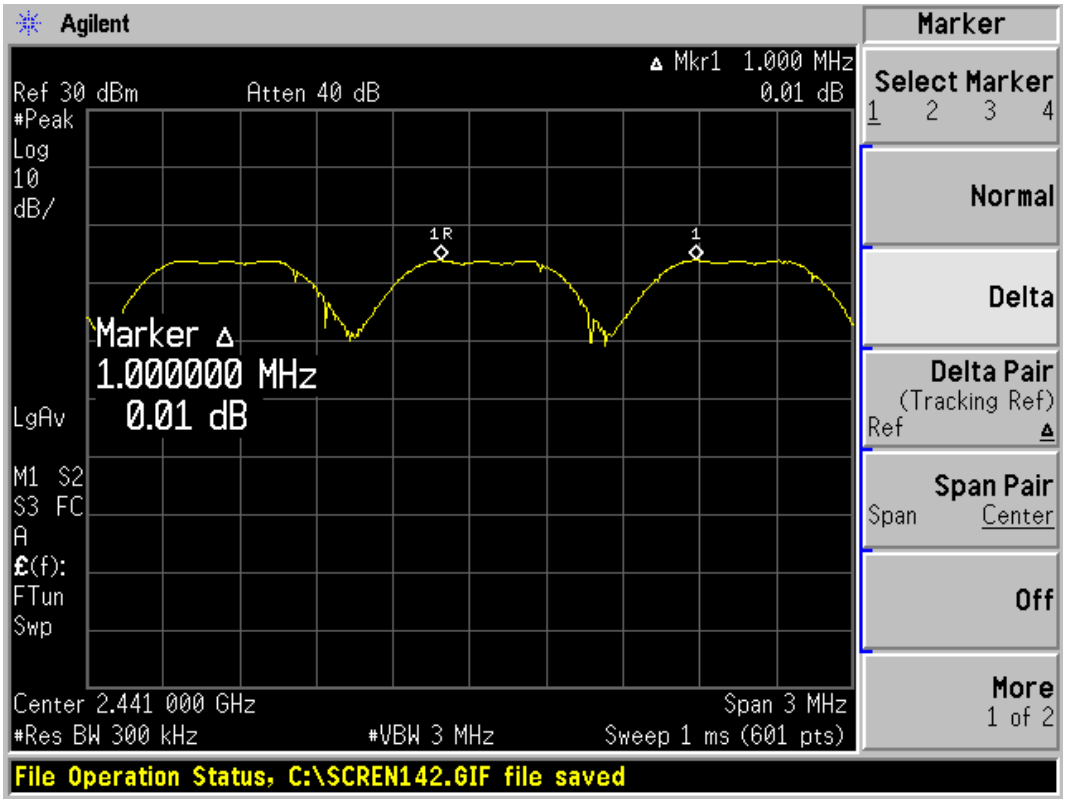
Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2402	1005	1032	688	PASS
2441	1000	1032	688	PASS
2480	1005	1033	688.67	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



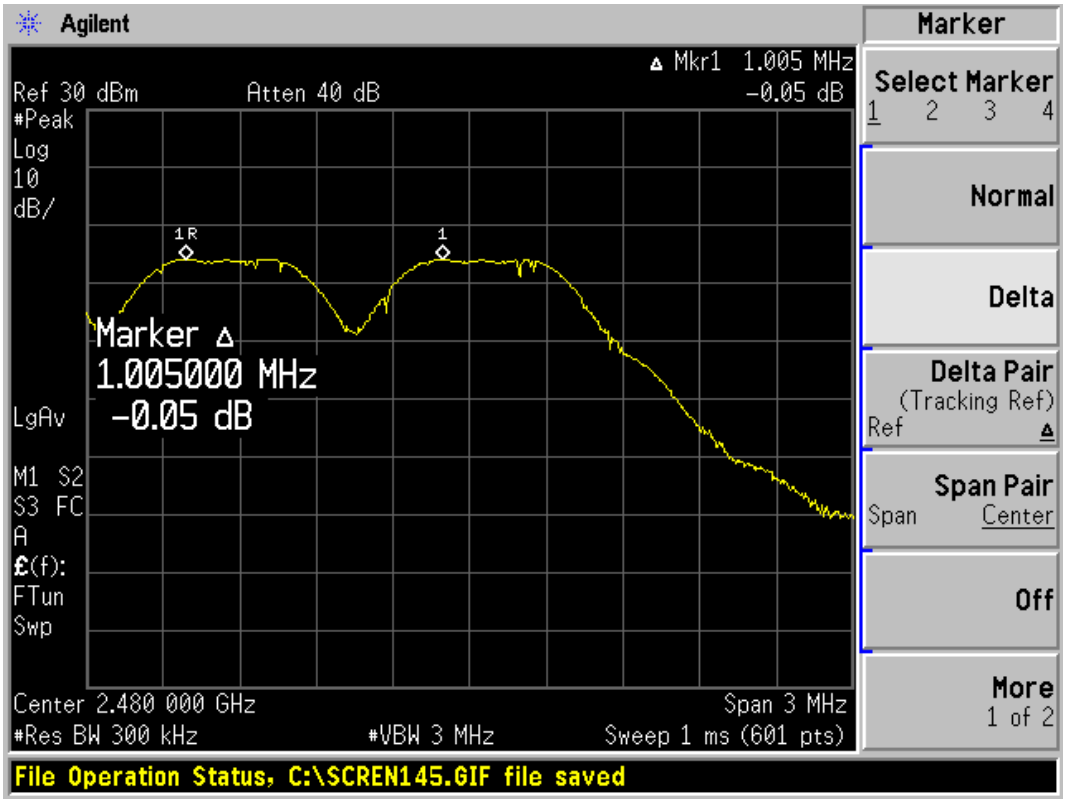
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



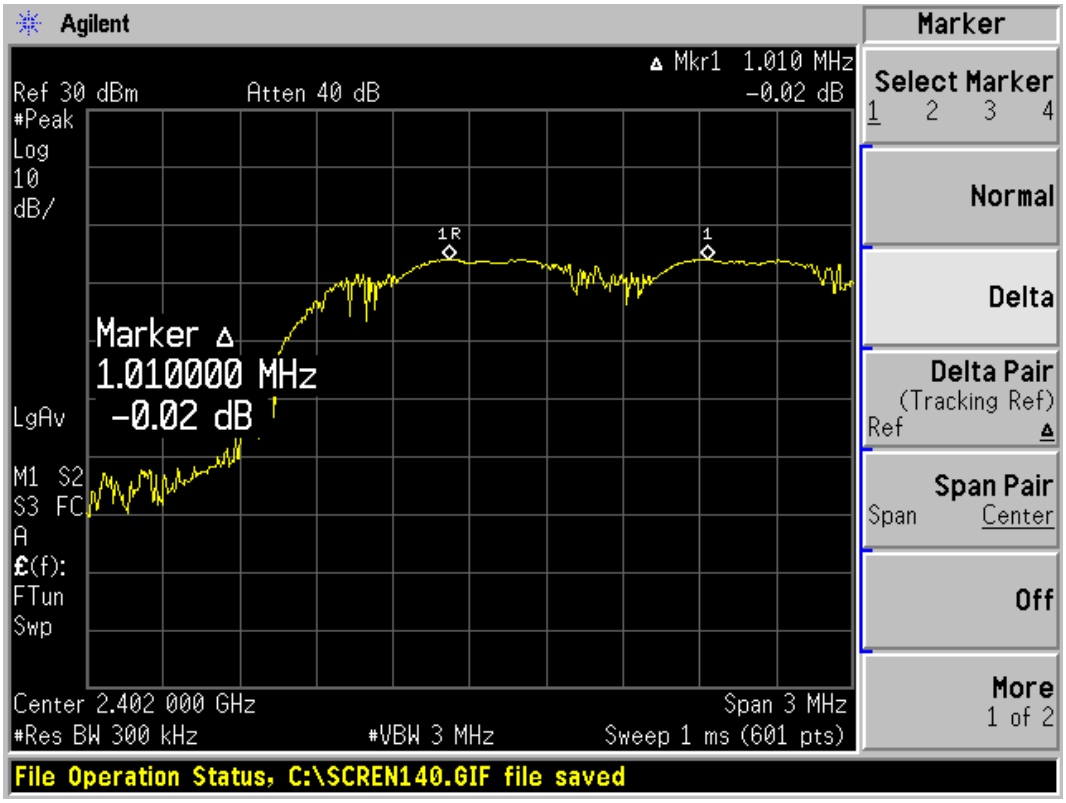
Carrier frequency (MHz): 2480

Channel No.:78

2DH5

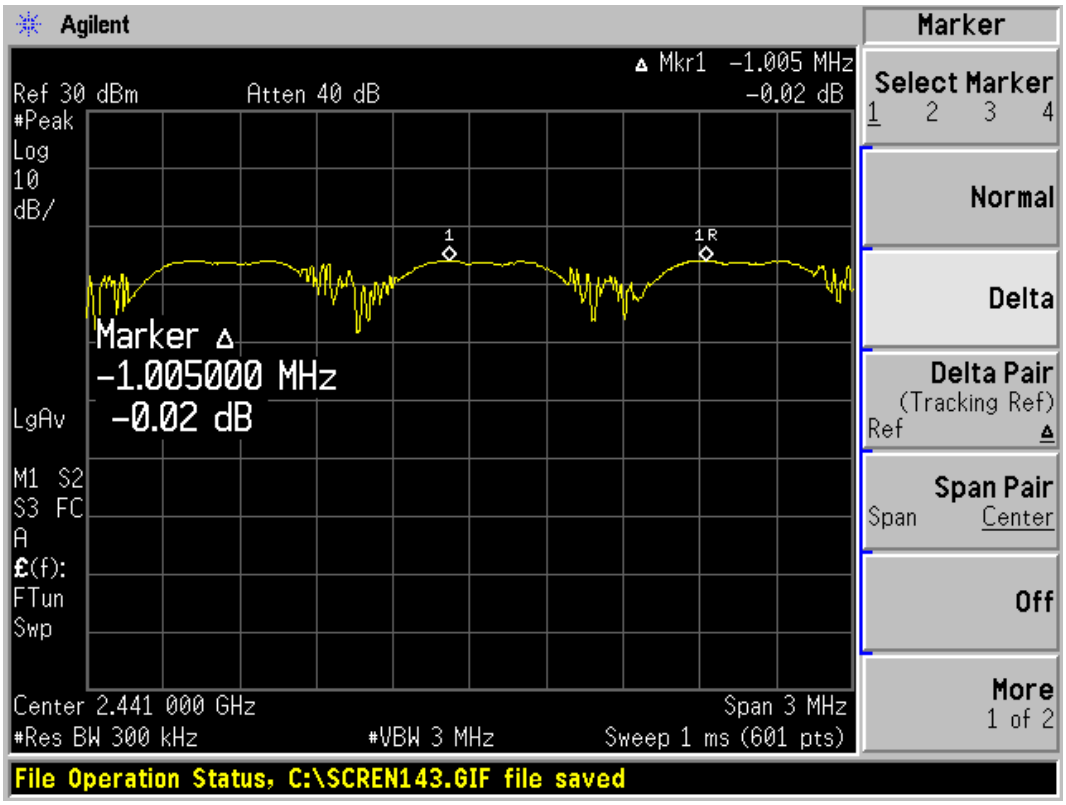
Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2402	1010	1087	724.67	PASS
2441	1005	1080	720	PASS
2480	1005	1089	726	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



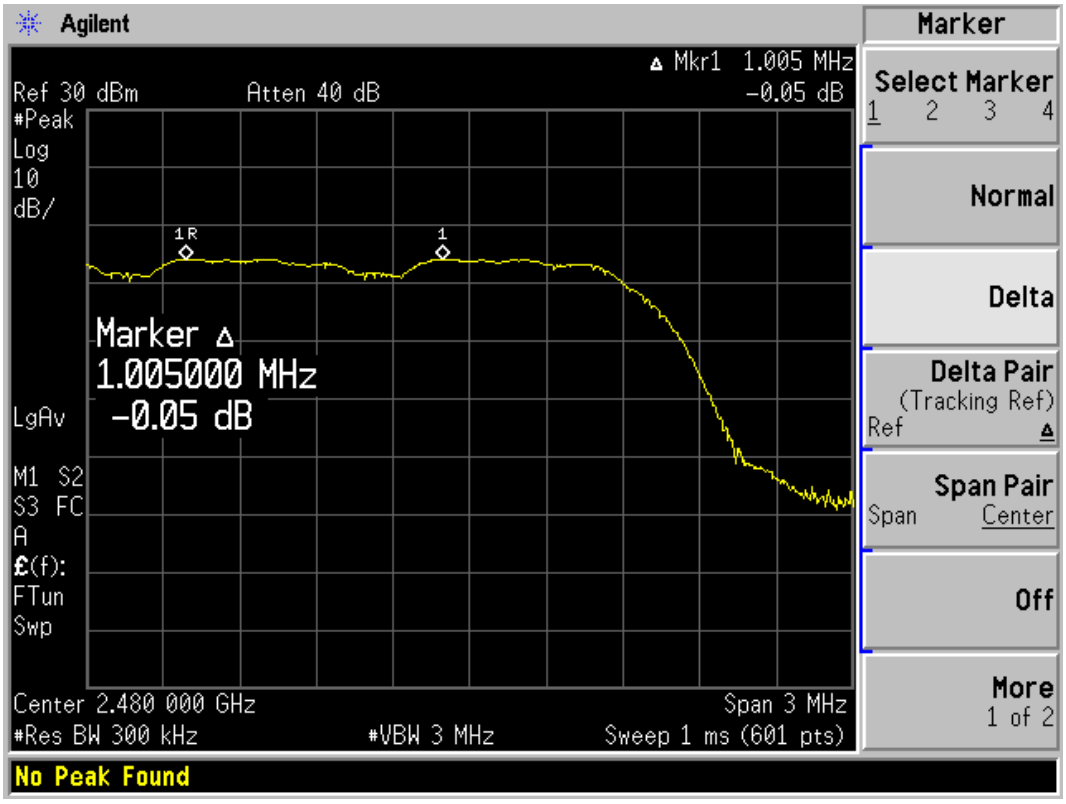
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



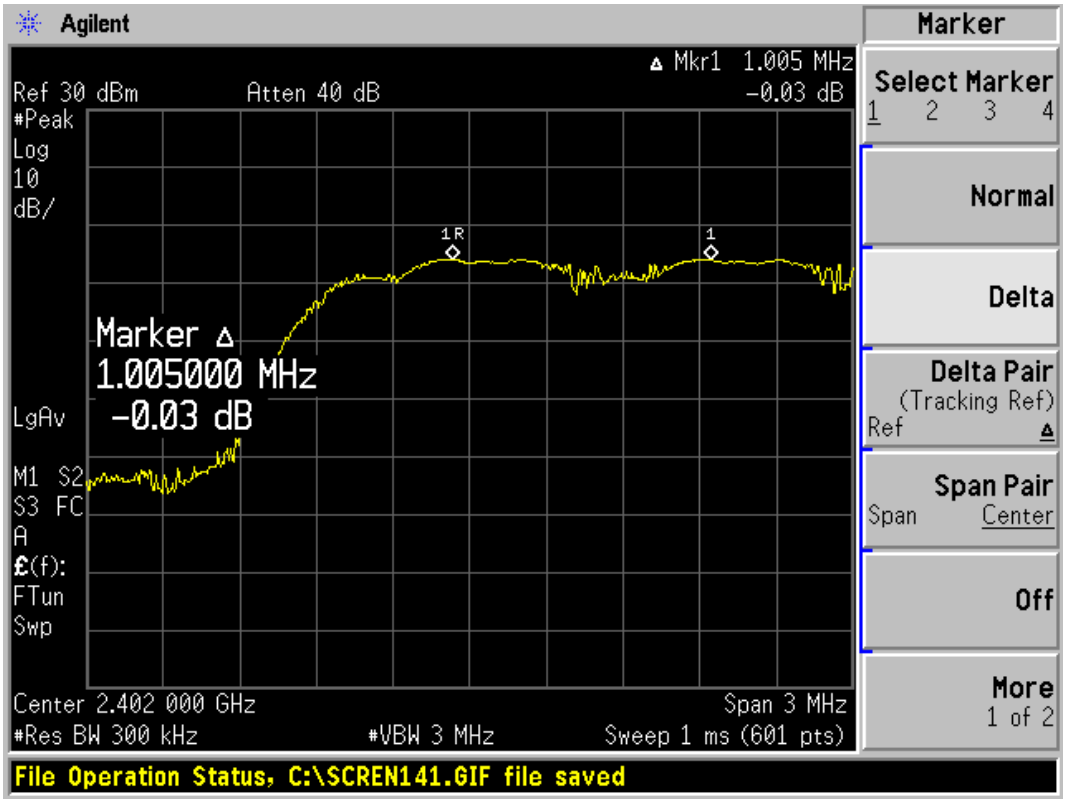
Carrier frequency (MHz): 2480

Channel No.:78

3DH5

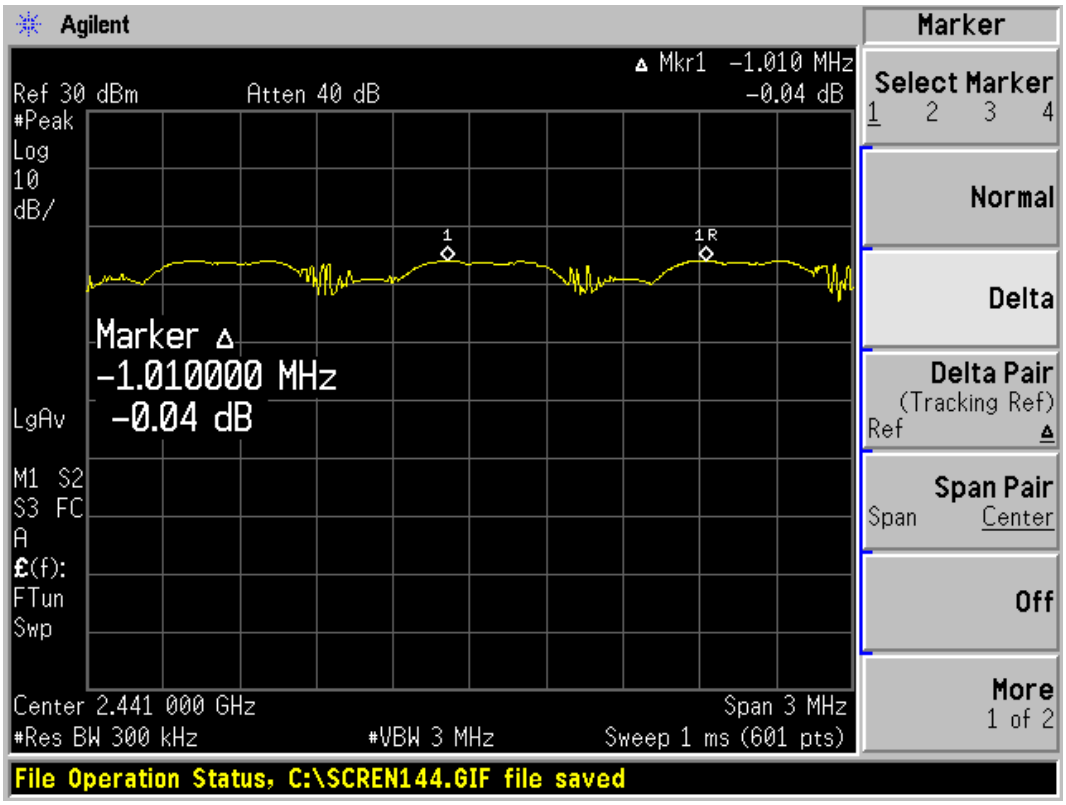
Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth (kHz)	Limit(kHz)	Conclusion
2402	1005	1174	782.67	PASS
2441	1010	1180	786.67	PASS
2480	1010	1180	786.67	PASS

Note: The limit is two-thirds of 20 dB bandwidth.



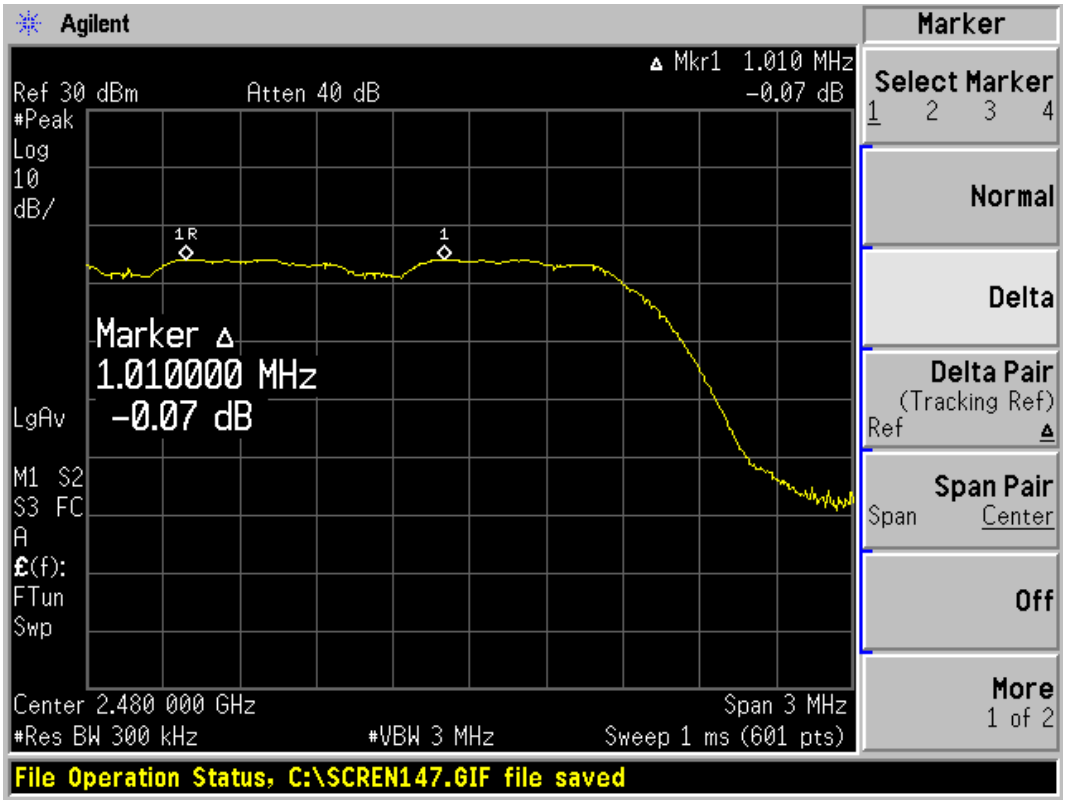
Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2441

Channel No.:39



Carrier frequency (MHz): 2480

Channel No.:78

3.6. Time of Occupancy (Dwell Time)

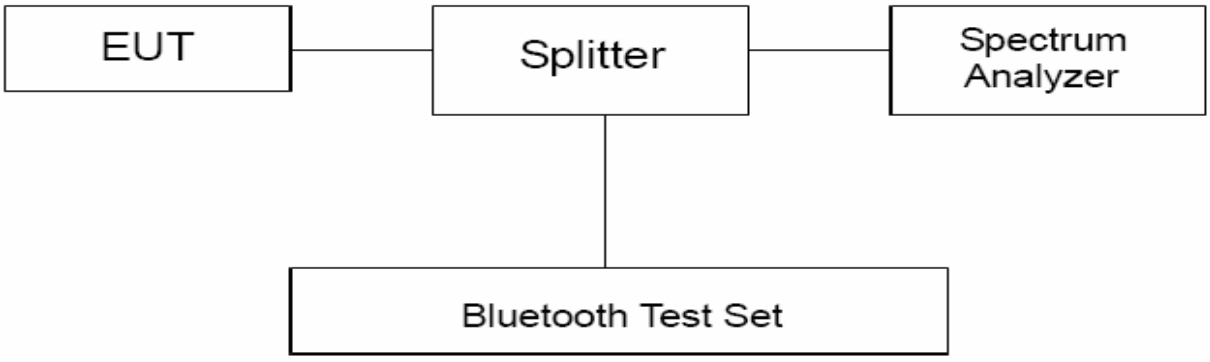
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 3MHz on spectrum analyzer .The time slot length is measured of three different packet types, which are available in the Bluetooth technology. Those are DH1, DH3 and DH5 packets. The dwell time is calculated by:
Dwell time = time slot length * hop rate * 0.4s with:
- hop rate=1600 * 1/s for DH1 packet =1600
- hop rate=1600/3 * 1/s for DH3 packet =533.33
- hop rate=1600/5 * 1/s for DH5 packet =320

Test Setup



Limits

Rule Part 22.913(a) specifies that " Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed..”

Dwell time	≤ 400ms

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2.

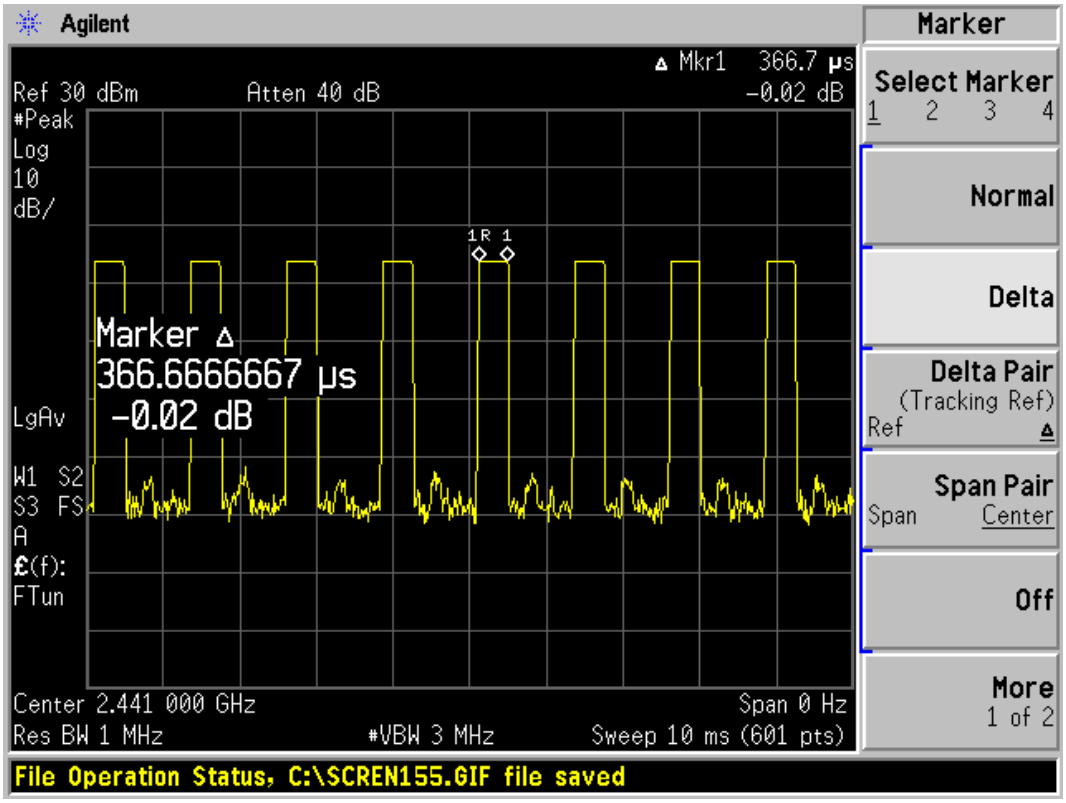
Requirements	Uncertainty	
Dwell Time	DH1	U= 0.64ms
	DH3	U= 0.80ms
	DH5	U= 0.70ms

Test Results:

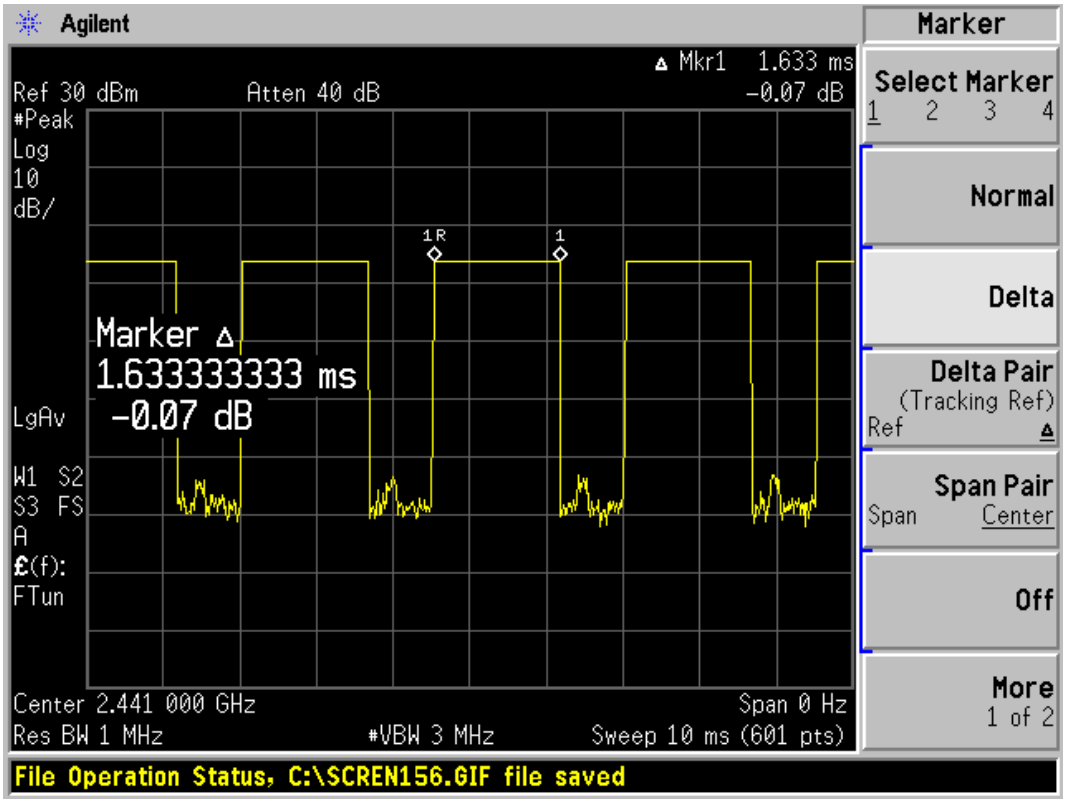
CH 39

Packet type	hop rate (1/s)	Time slot length(ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH1	1600	0.367	234.88	400	PASS
DH3	533.33	1.633	348.37	400	PASS
DH5	320	2.883	369.02	400	PASS
2DH1	1600	0.350	224.00	400	PASS
2DH3	533.33	1.600	341.33	400	PASS
2DH5	320	2.833	362.62	400	PASS
3DH1	1600	0.350	224.00	400	PASS
3DH3	533.33	1.617	344.96	400	PASS
3DH5	320	2.867	366.98	400	PASS

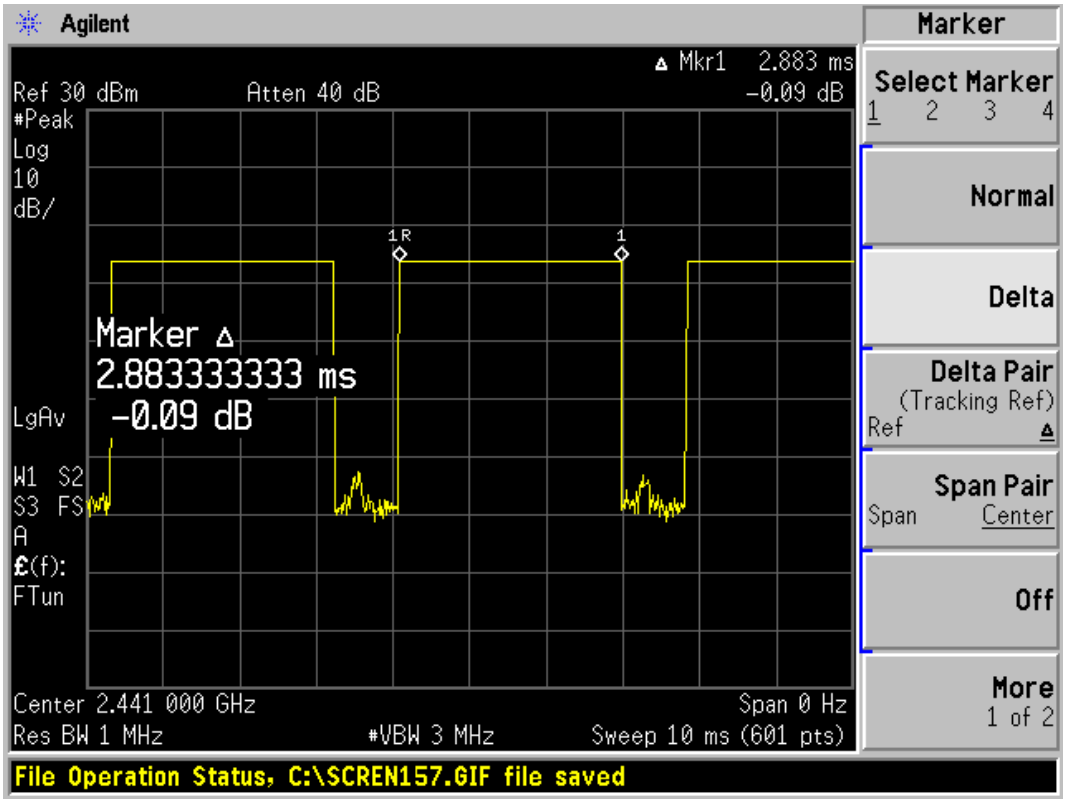
Note: Dwell time = time slot length * hop rate * 0.4s



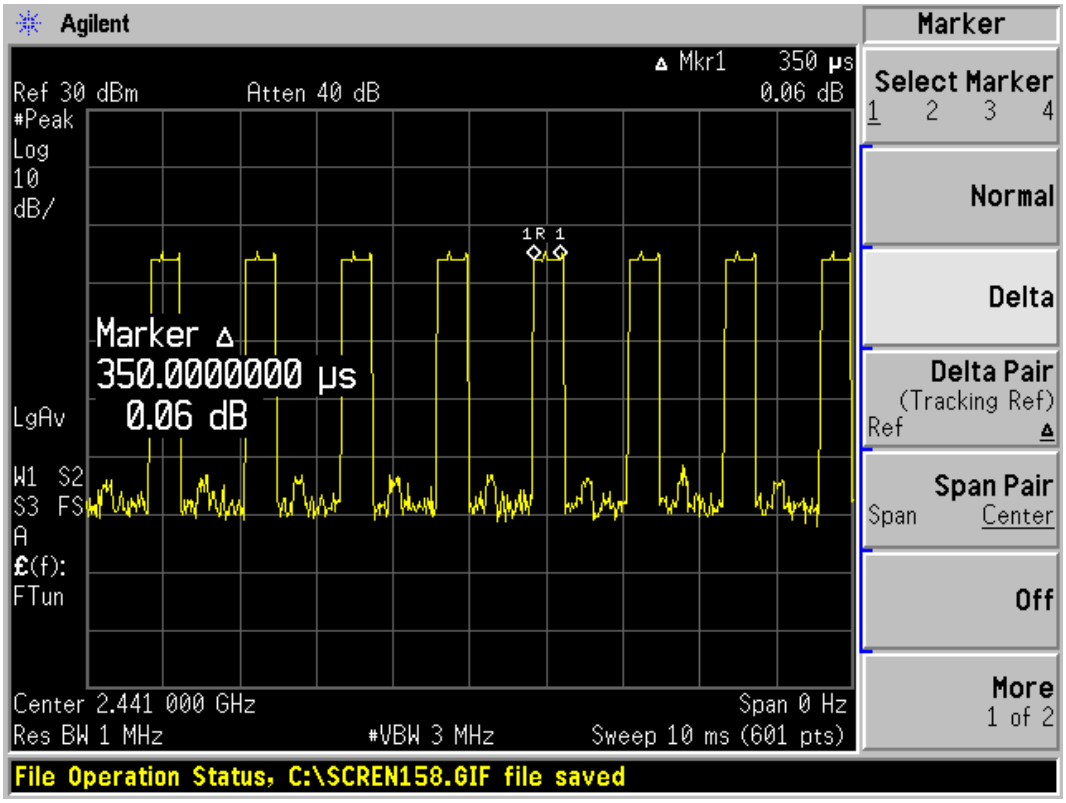
Carrier frequency (MHz): 2441, DH1



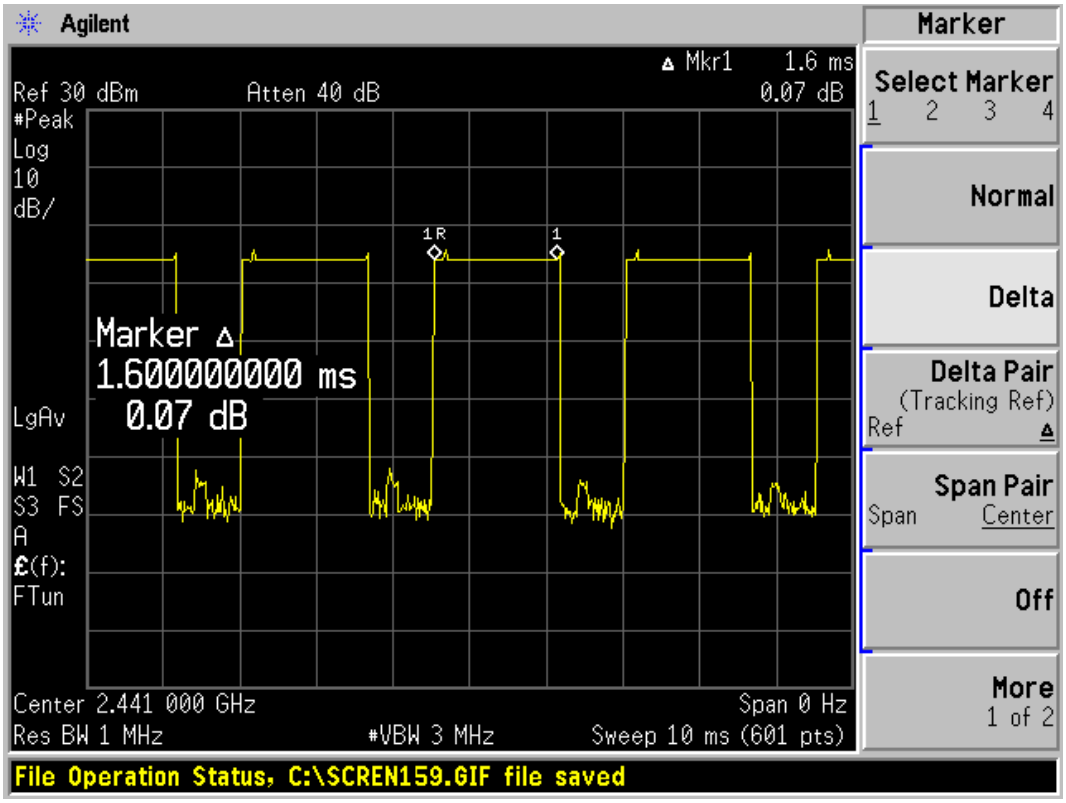
Carrier frequency (MHz): 2441, DH3



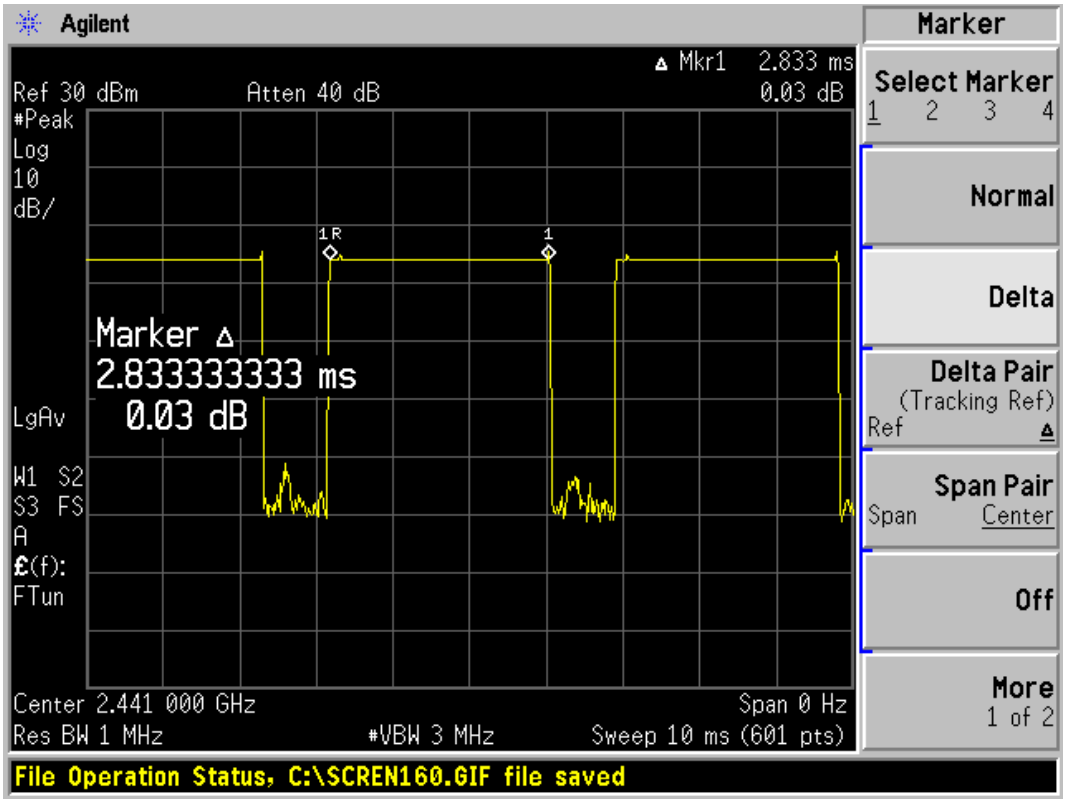
Carrier frequency (MHz): 2441, DH5



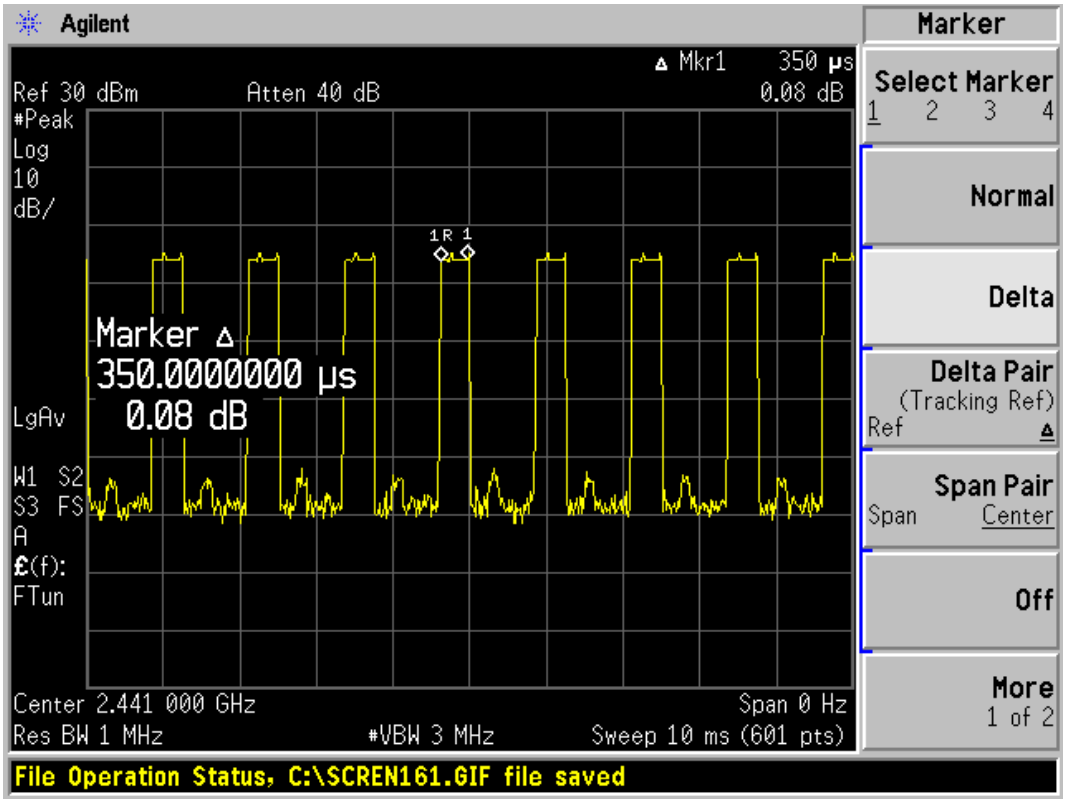
Carrier frequency (MHz): 2441, 2DH1



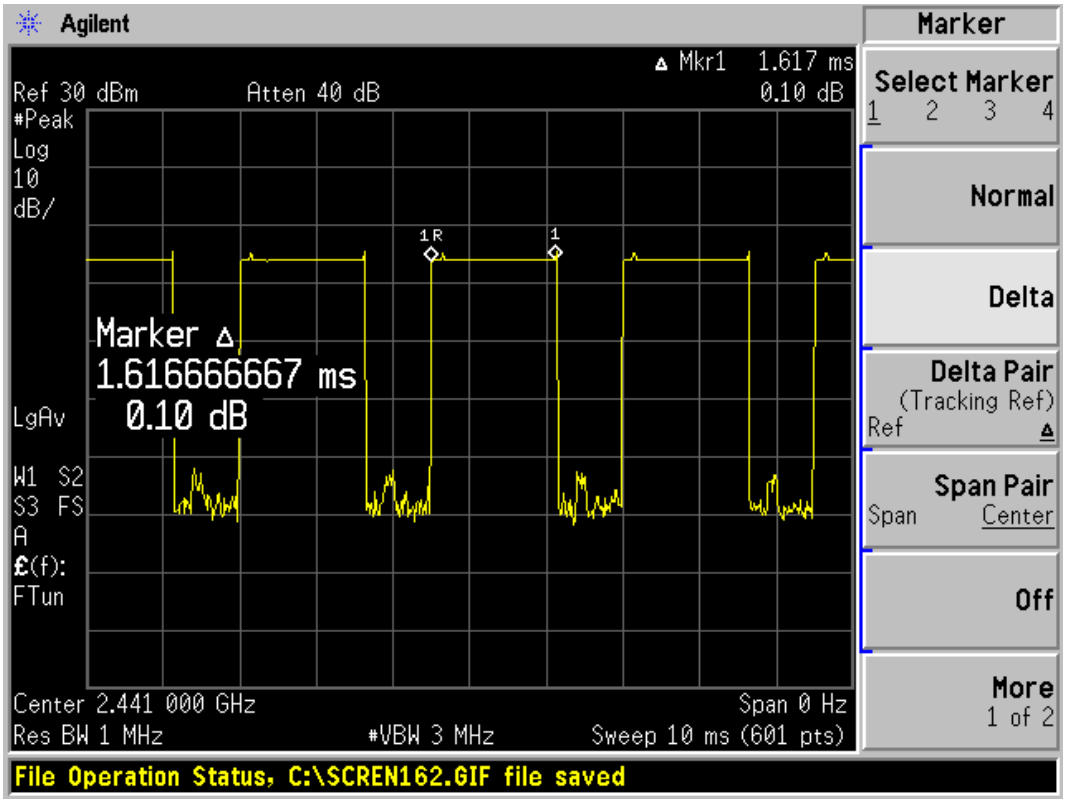
Carrier frequency (MHz): 2441, 2DH3



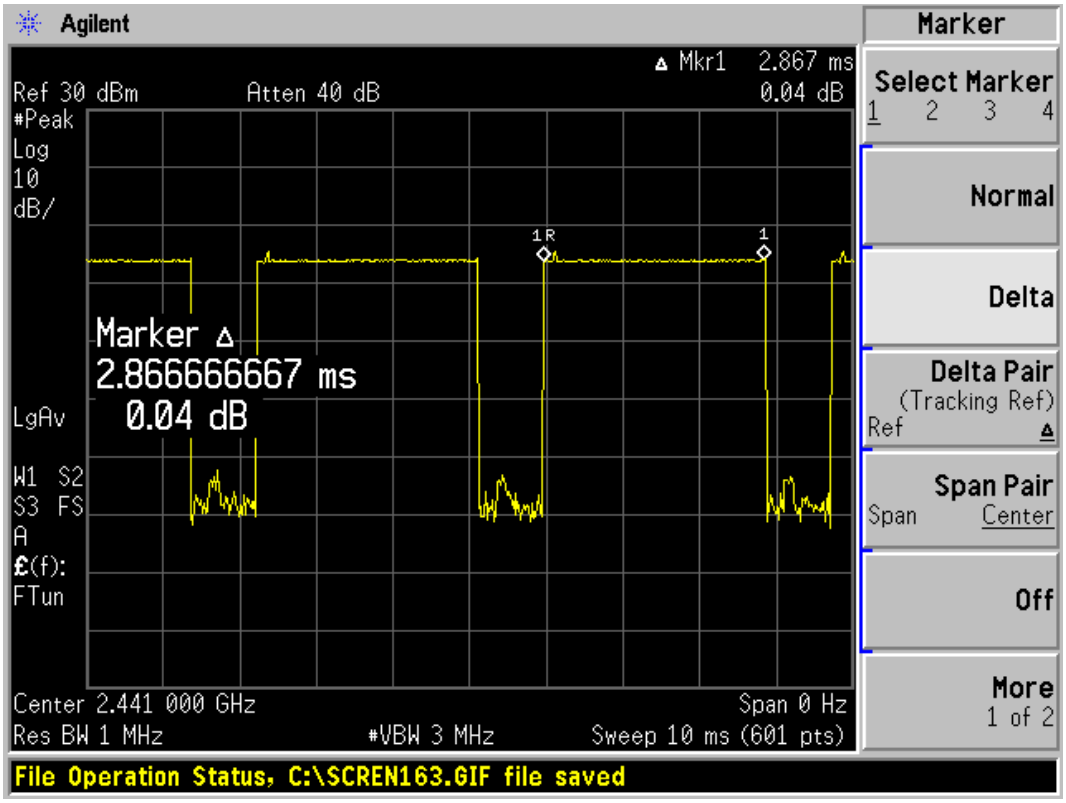
Carrier frequency (MHz): 2441, 2DH5



Carrier frequency (MHz): 2441, 3DH1



Carrier frequency (MHz): 2441, 3DH3



Carrier frequency (MHz): 2441, 3DH5

3.7. Band Edge Compliance

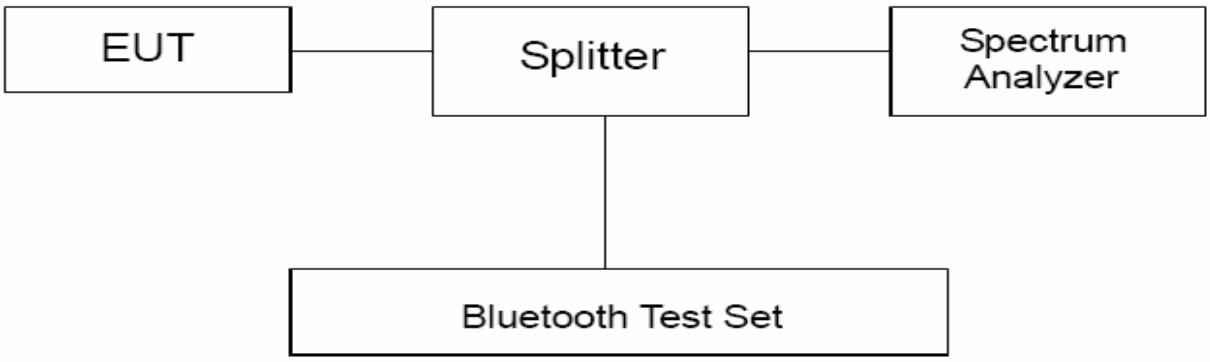
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The lowest and highest channels were measured. The peak detector is used. RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. EUT test for Hopping On mode and Hopping Off mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

Limit	≥20 dB

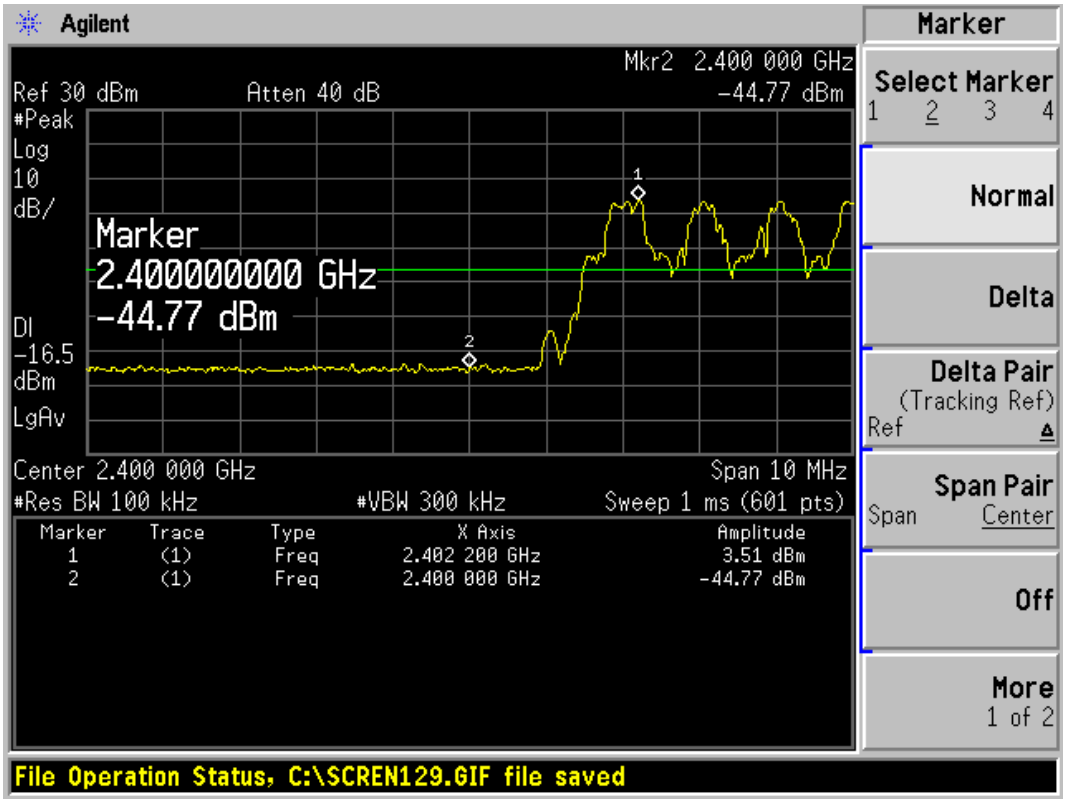
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

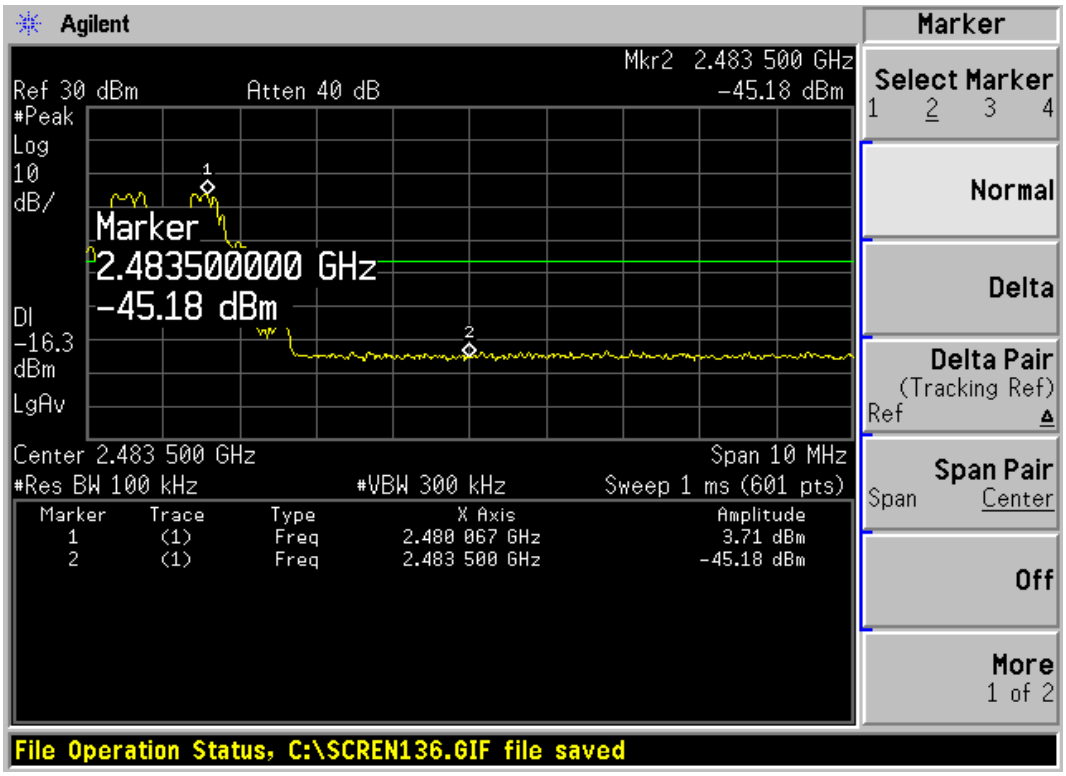
Test Results: PASS

Hopping On-DH5-



Carrier frequency (MHz): 2402

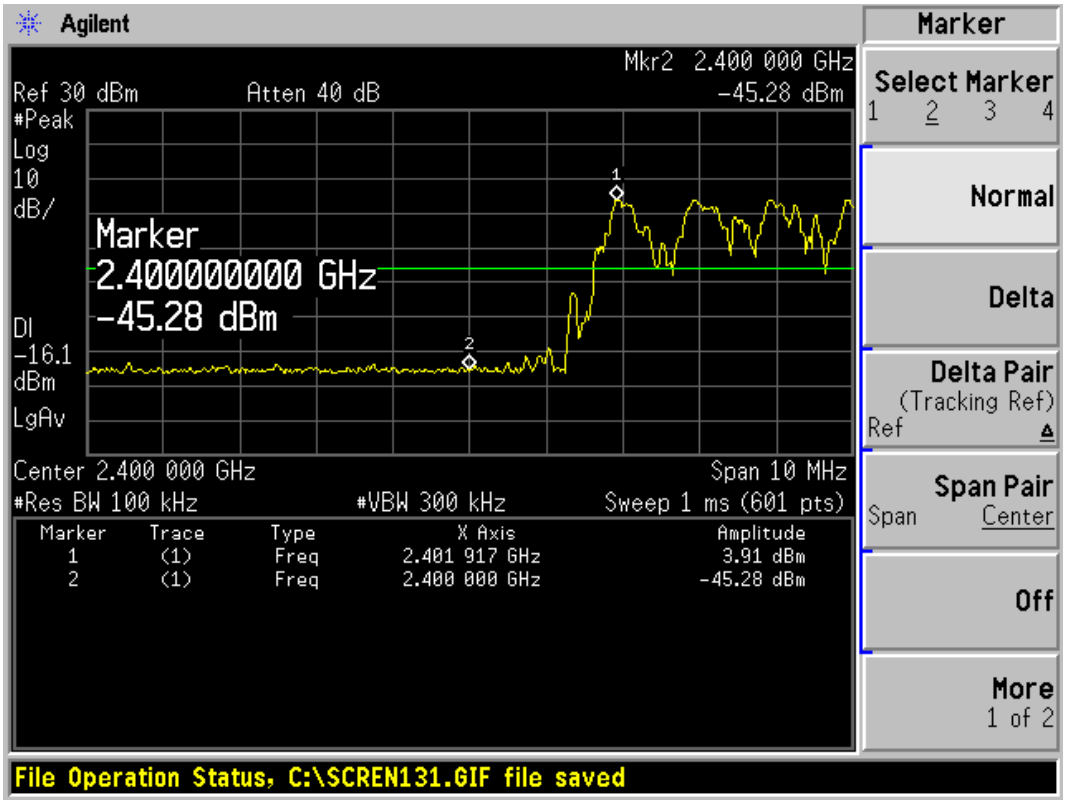
Channel No.:0



Carrier frequency (MHz): 2480

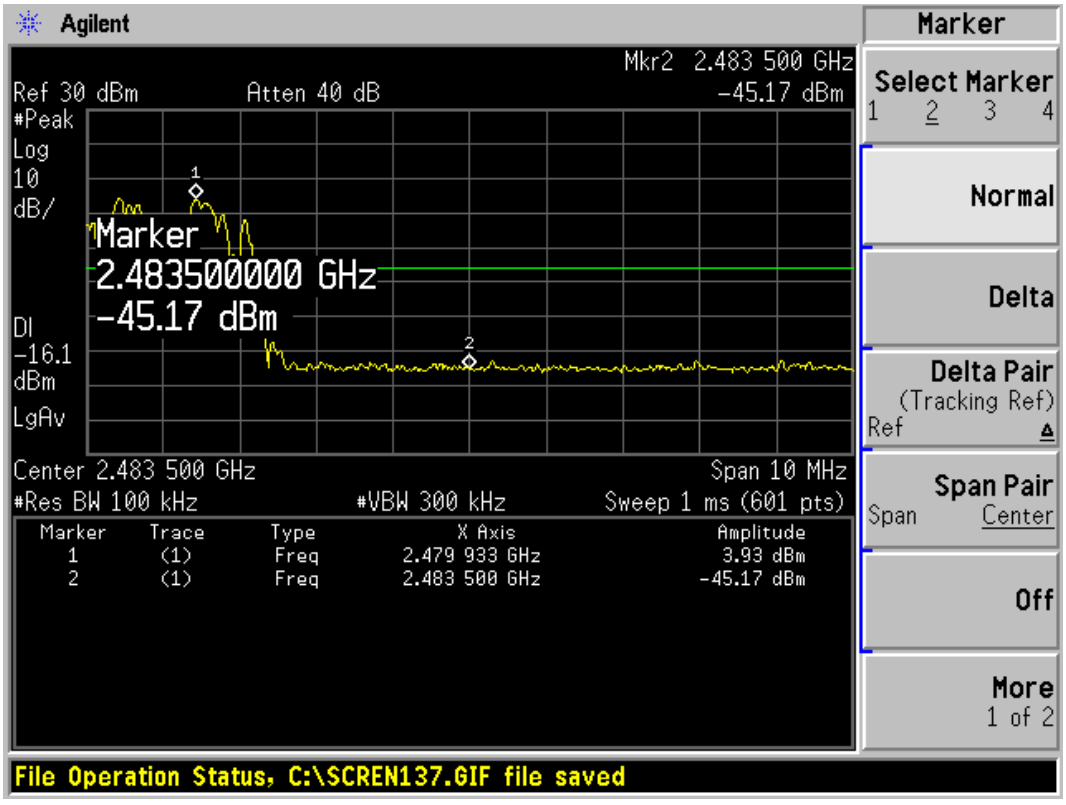
Channel No.:78

Hopping On-2DH5



Carrier frequency (MHz): 2402

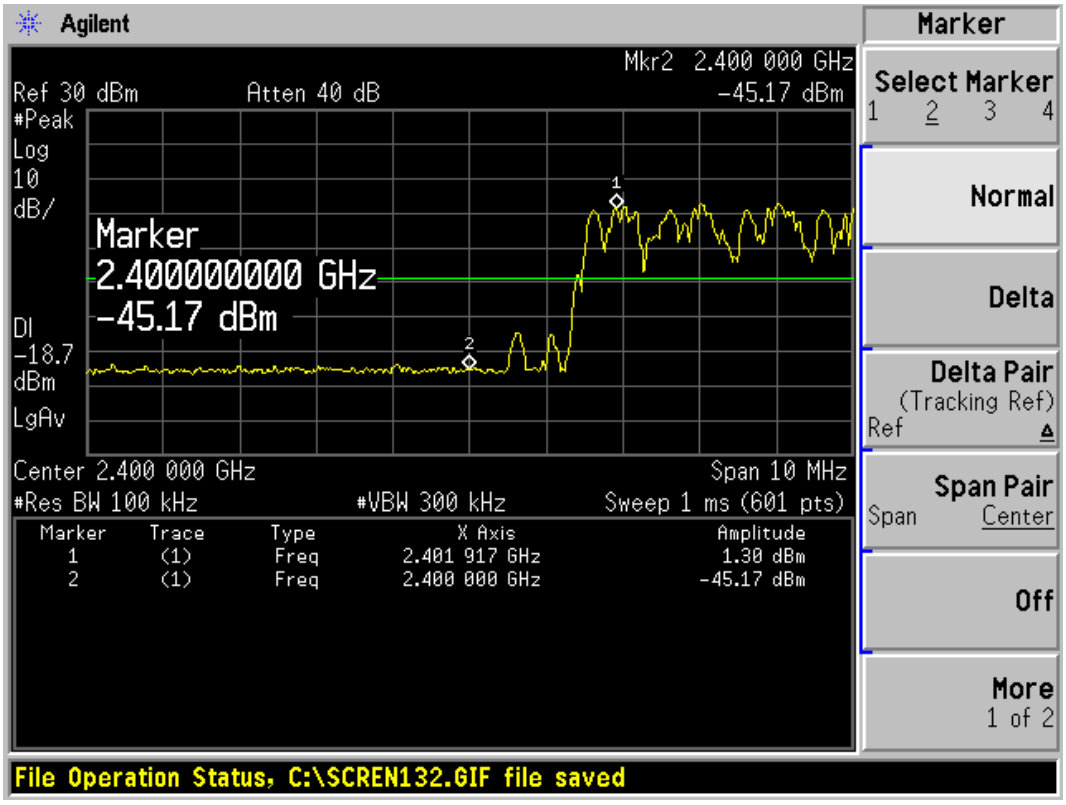
Channel No.:0



Carrier frequency (MHz): 2480

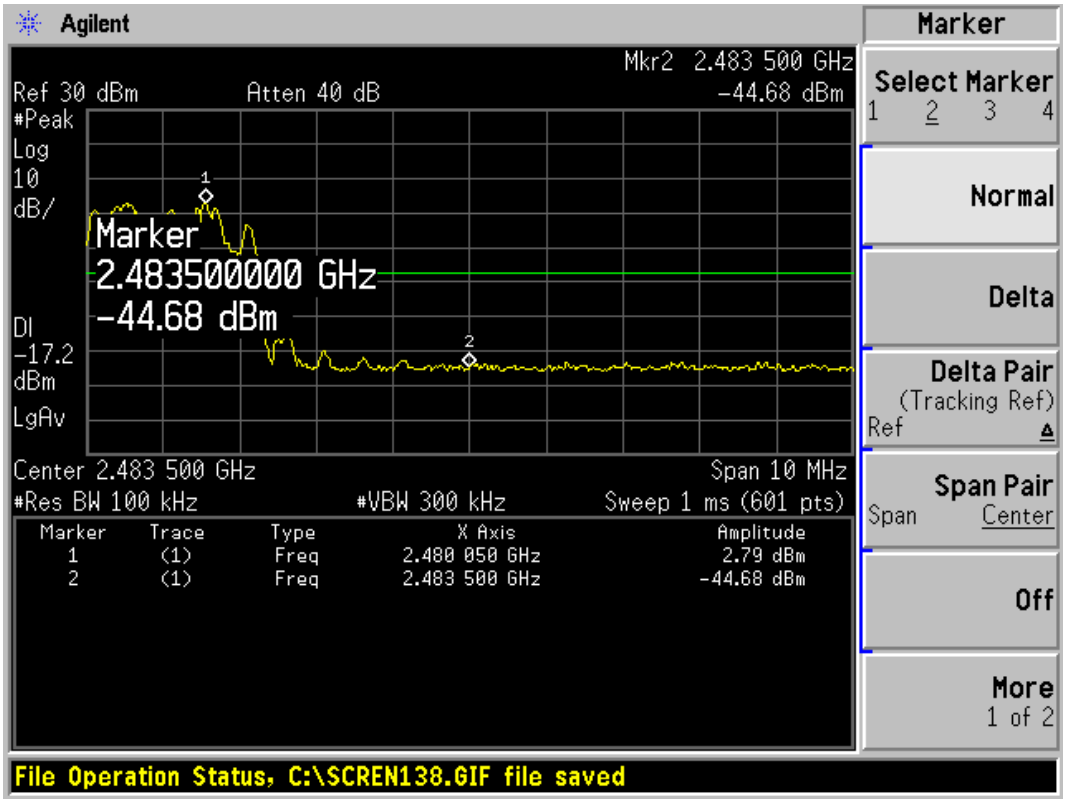
Channel No.:78

Hopping On-3DH5



Carrier frequency (MHz): 2402

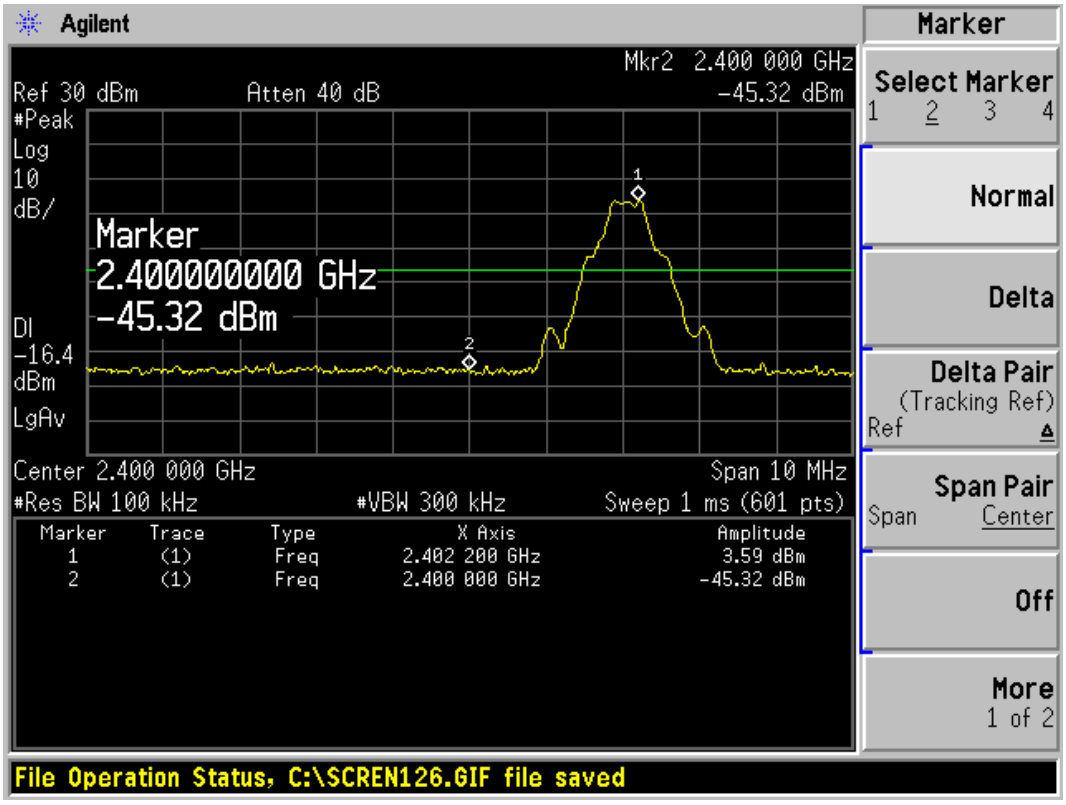
Channel No.:0



Carrier frequency (MHz): 2480

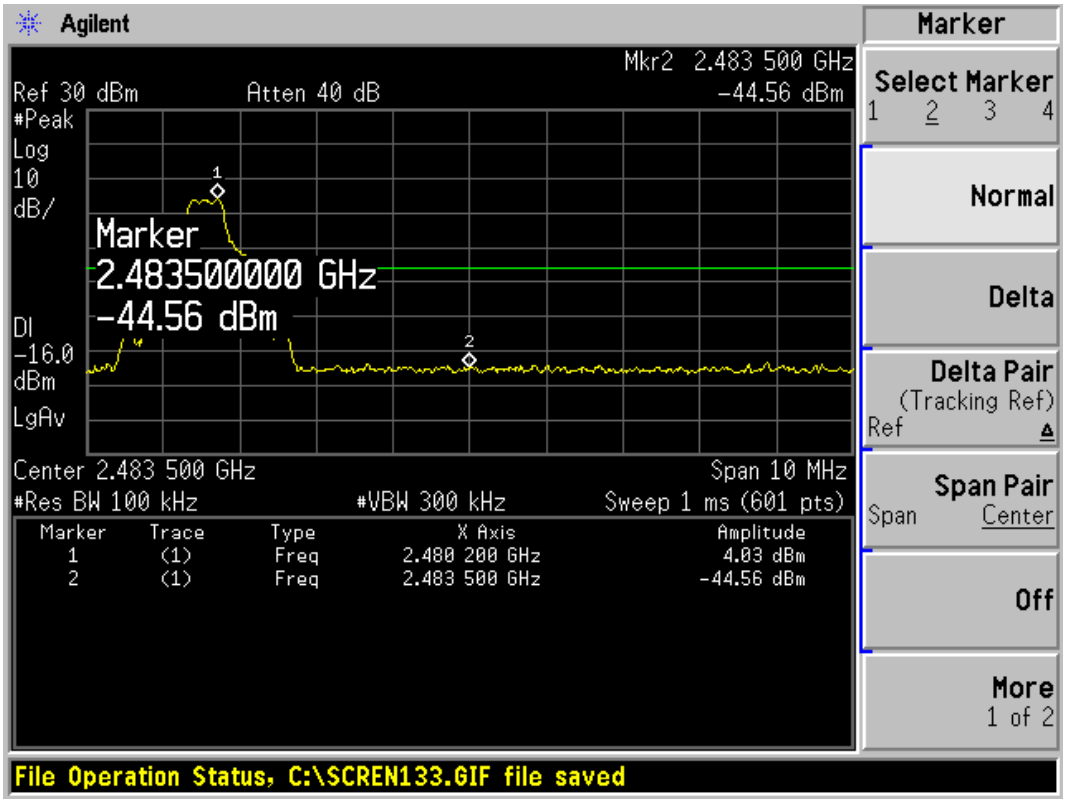
Channel No.:78

Hopping Off-DH5-



Carrier frequency (MHz): 2402

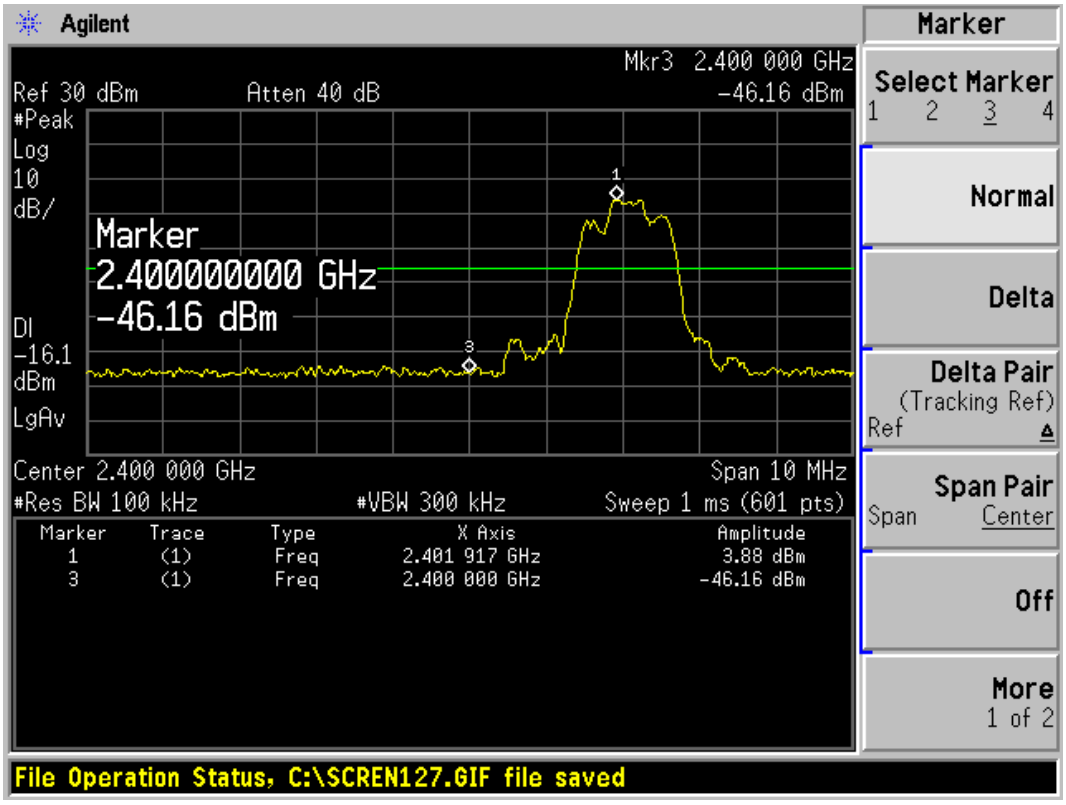
Channel No.:0



Carrier frequency (MHz): 2480

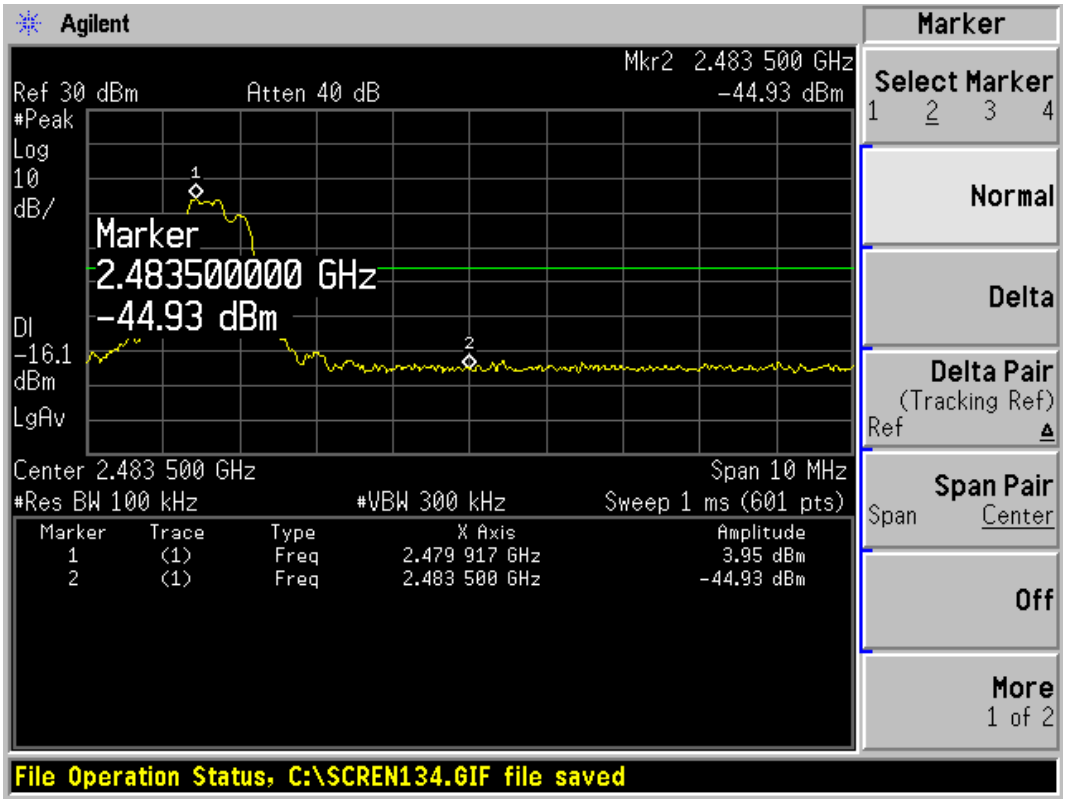
Channel No.:78

Hopping Off-2DH5



Carrier frequency (MHz): 2402

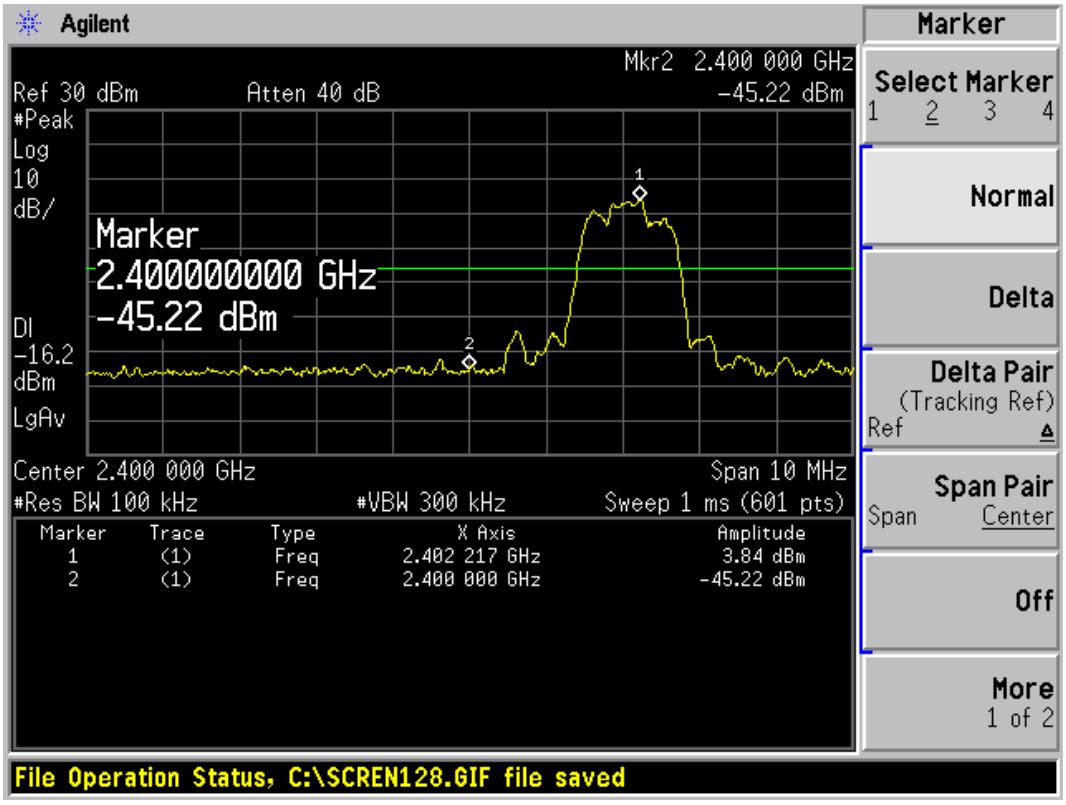
Channel No.:0



Carrier frequency (MHz): 2480

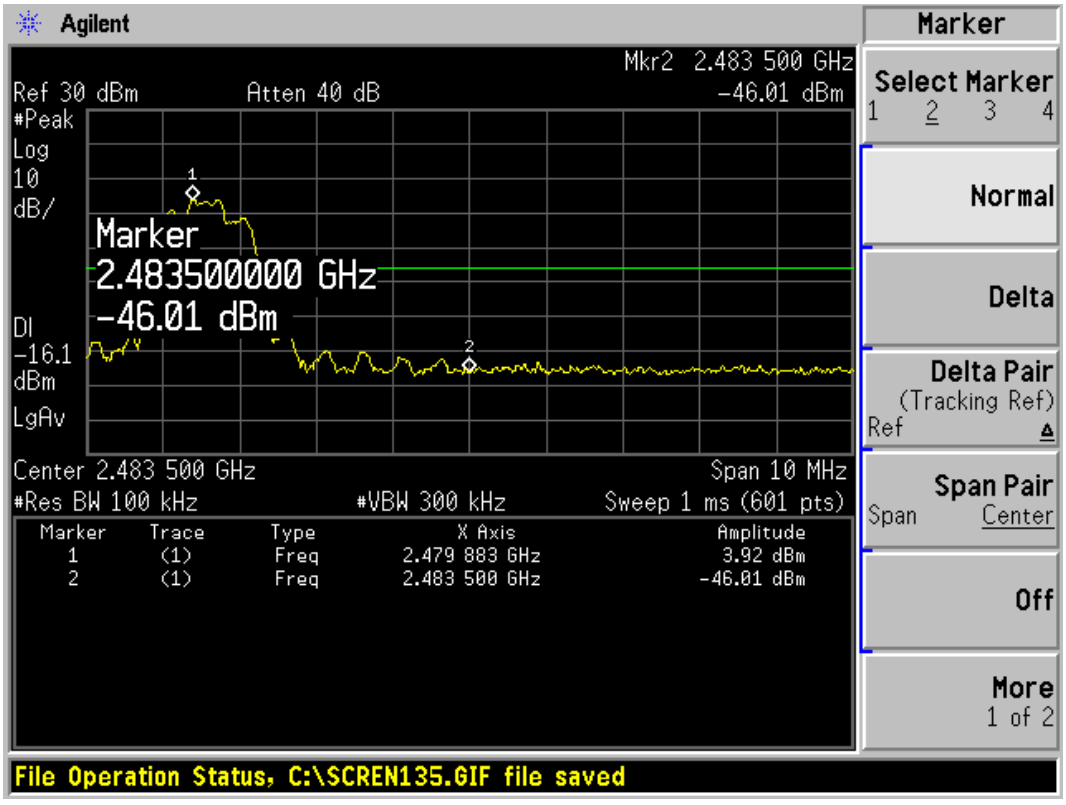
Channel No.:78

Hopping Off-3DH5



Carrier frequency (MHz): 2402

Channel No.:0



Carrier frequency (MHz): 2480

Channel No.:78

3.8. Spurious Radiated Emissions in the Restricted Band

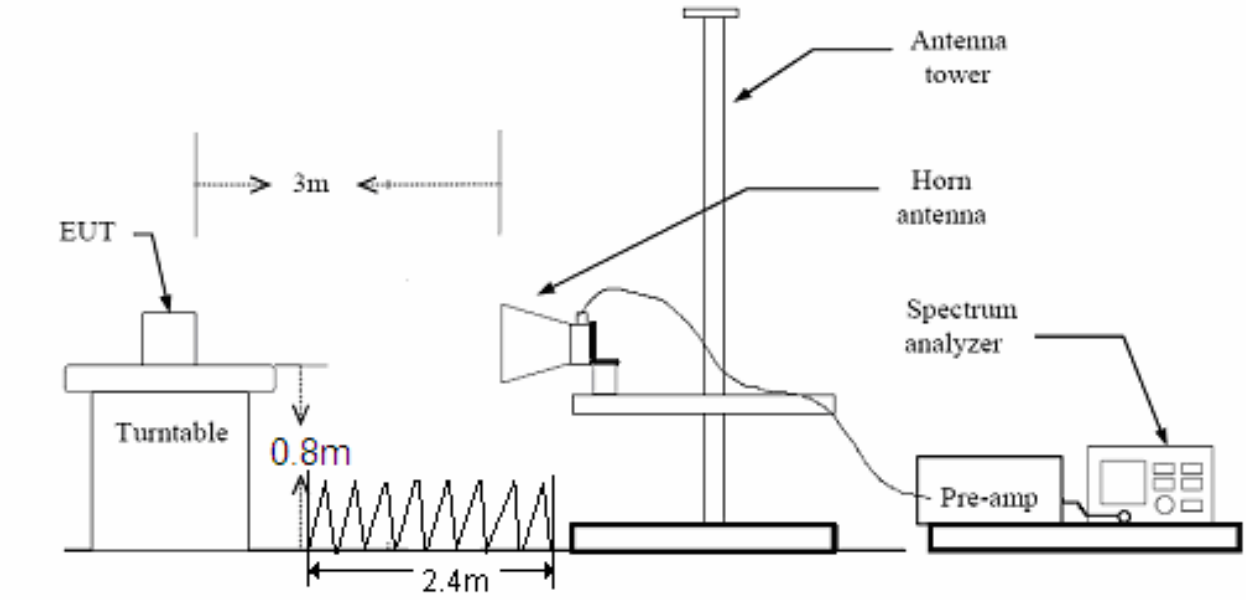
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.
Set the spectrum analyzer in the following:
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit.
If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak- average correction factor, derived form the appropriate duty cycle calculation.
This setting method can refer to **DA00-705.**

The test is in transmitting mode. The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis) and docking mode. The worst emission was found in stand-up position (Y axis) and the worst case was recorded.

Test setup



Note: Area side: 2.4m X 3.6m

Limits

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	[2]
13.36 - 13.41			

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 3.55 dB.

Test Results:

BT ANTENNA 1 Test Results:

Channel.	Fre. (MHz)	PK Value (dBuV/m)	AV Value (dBuV/m)	Limit (dBuV/m)		Margin (dB)		Reading value (dBuV/m)	Correct Factor (dB)	Antenna Height (m)	Table Angle (Degree)
				PK	AV	PK	AV				
DH5-Ch0	2389.905	55.366	24.5639	74	54	18.634	1.01	60.666	-5.3	1.01	90
DH5-Ch78	2483.269	57.868	27.0659	74	54	16.132	1.02	62.368	-4.5	1.02	270
3DH5-Ch0	2393.775	45.963	15.12064	74	54	28.037	1.01	51.263	-5.3	1.01	90
3DH5-Ch78	2482.994	62.380	31.53764	74	54	11.620	1.03	66.88	-4.5	1.03	180

Note: 1. The other emission levels were very low against the limit.

2. Margin value = Emission level – Limit value.

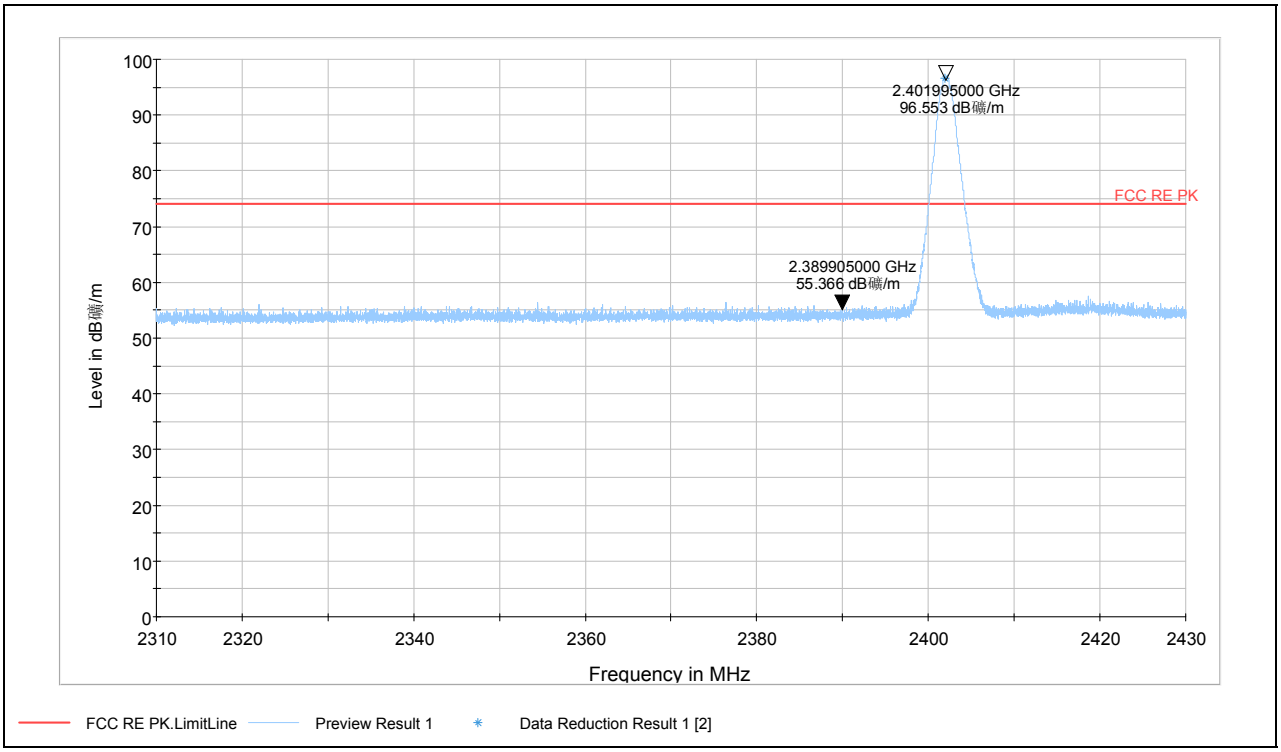
3. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel.
Based upon Bluetooth theory the transmitter is on 0.625 *5 per 296.25 ms per channel.
Therefore the duty cycle correlation factor be equal to 20log(2.8333/100)=-30.8021dB for DH5, 20log(2.87/100)=-30.8424dB for 3DH5.

4. Average value = Peak value + 20log(duty cycle)

5. The other emission levels were very low against the limit.

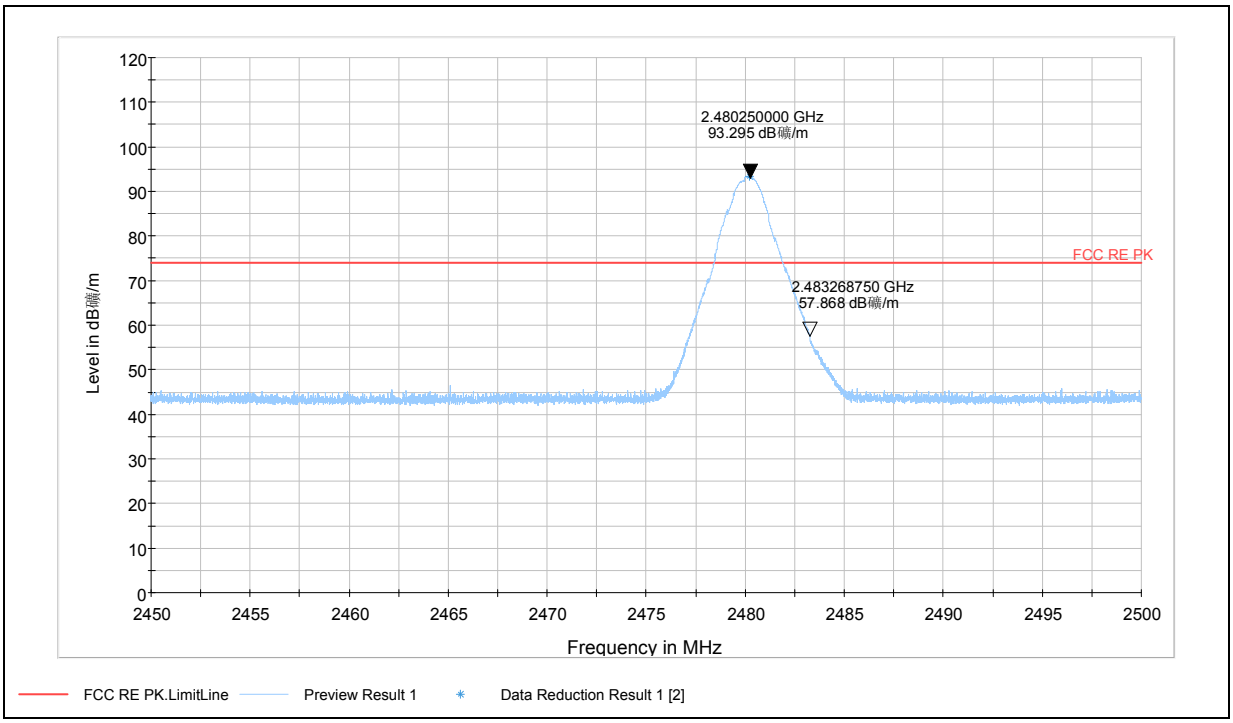
6. PK value= Reading Value+ Correct Factor

DH5- Channel 0



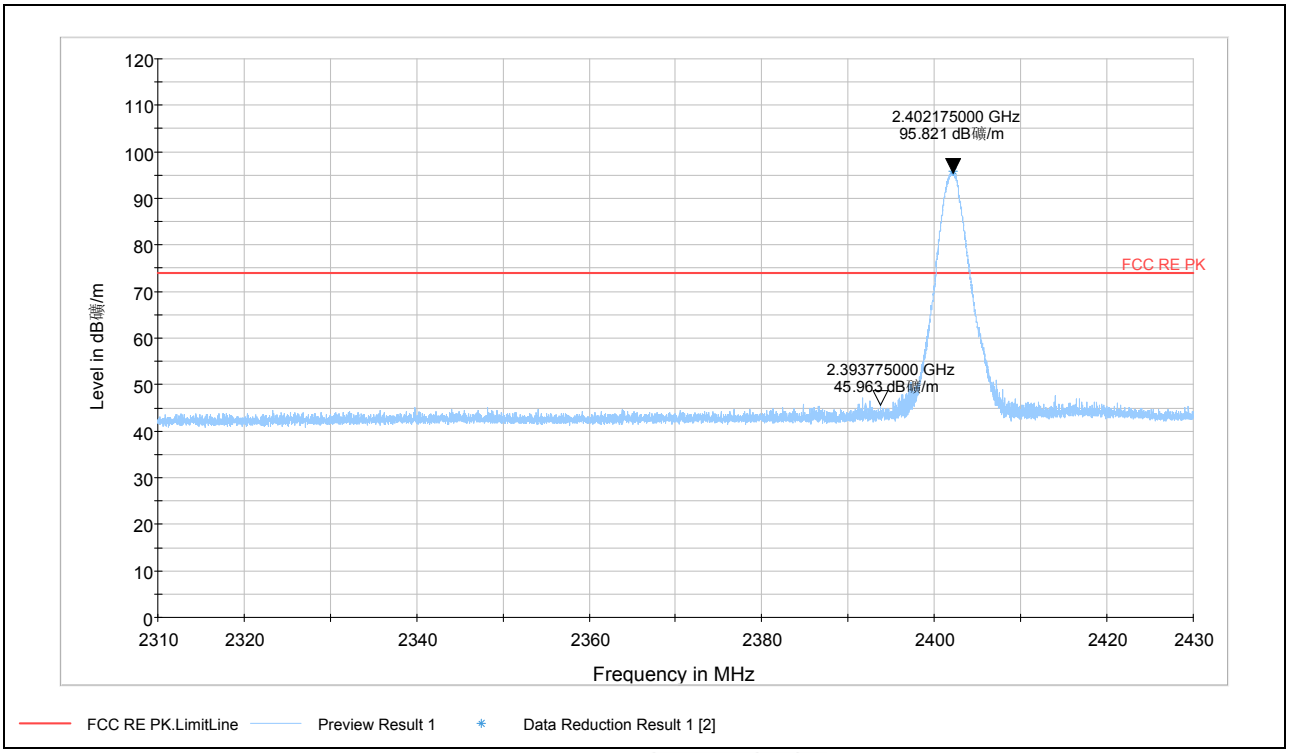
Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

DH5- Channel 78



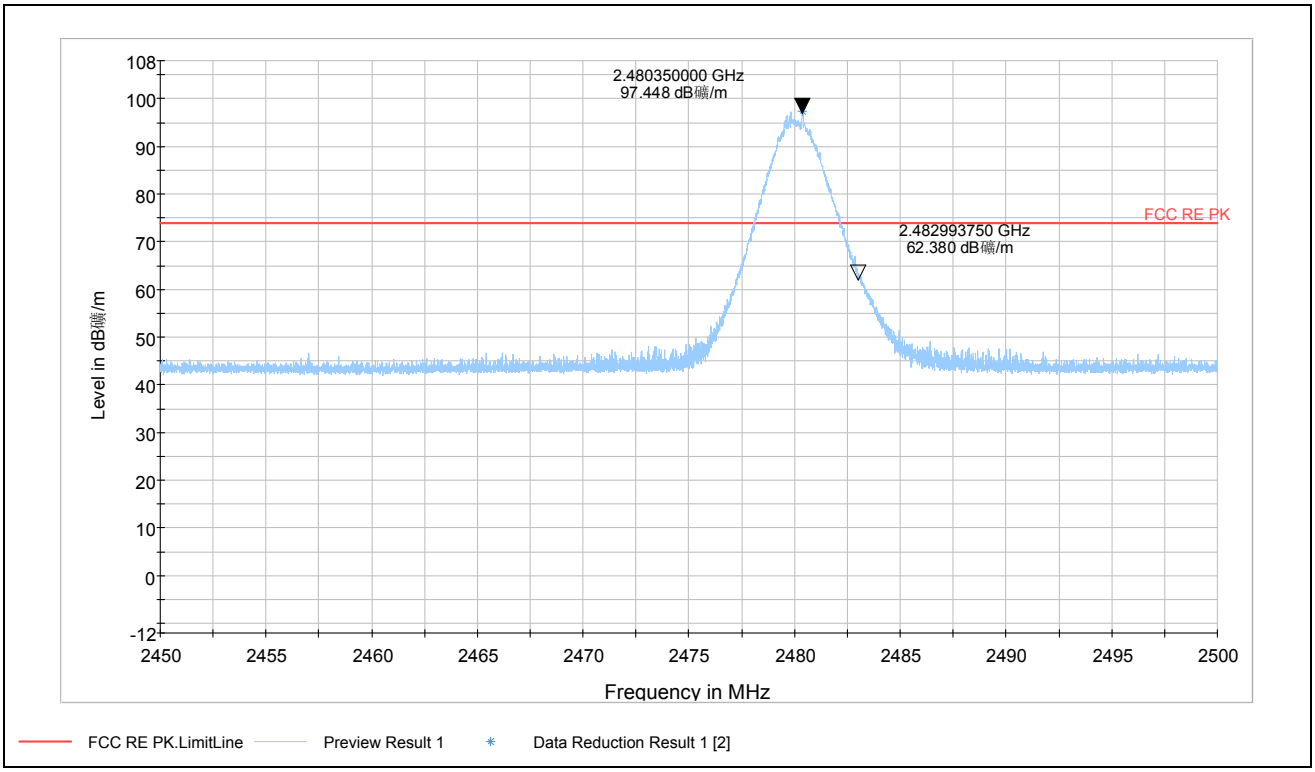
Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

3DH5- Channel 0



Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

3DH5- Channel 78



Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

BT ANTENNA 2 Test Results:

Channel.	Fre. (MHz)	PK Value (dBuV/m)	AV Value (dBuV/m)	Limit (dBuV/m)		Margin (dB)		Reading value (dBuV/m)	Correct Factor (dB)	Antenna Height (m)	Table Angle (Degree)
				PK	AV	PK	AV				
3DH5-Ch0	2384.775	45.8	14.956	74	54	28.2	39.042	51.1	-5.3	1.01	0
3DH5-Ch78	2483.51875	57.8	26.958	74	54	16.2	27.042	62.3	-4.5	1.01	180

Note: 1. The other emission levels were very low against the limit.

2. Margin value = Emission level – Limit value.

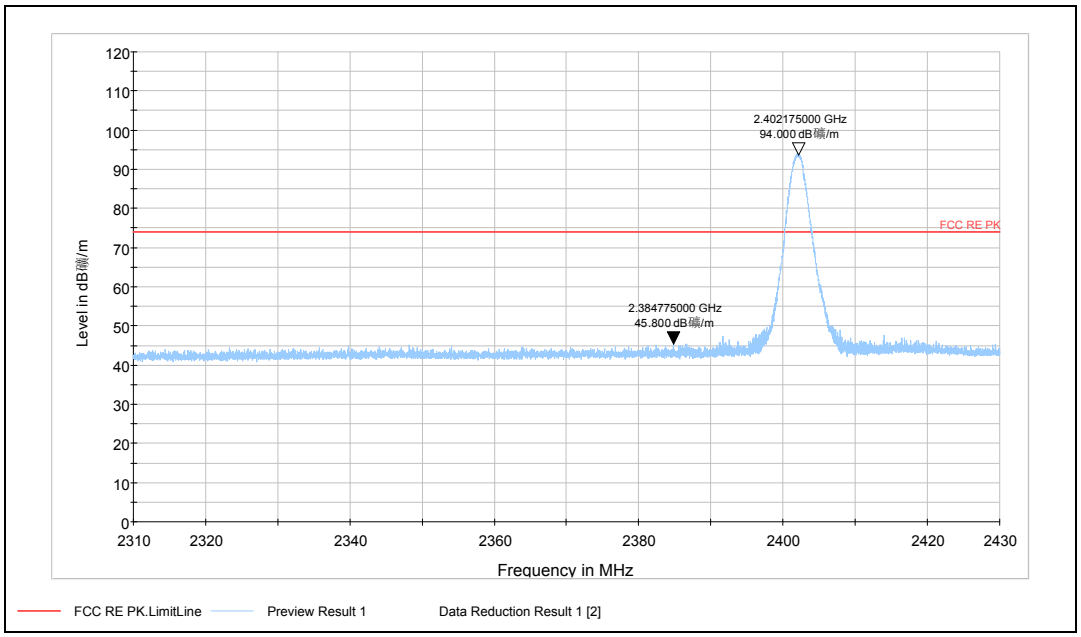
3. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel .
Based upon Bluetooth theory the transmitter is on 0.625 *5 per 296.25 ms per channel .
Therefore the duty cycle correlation factor be equal to 20log(2.8333/100)=-30.8021dB for DH5, 20log(2.87/100)=-30.8424dB for 3DH5.

4. Average value = peak reading + 20log(duty cycle)

5. The other emission levels were very low against the limit.

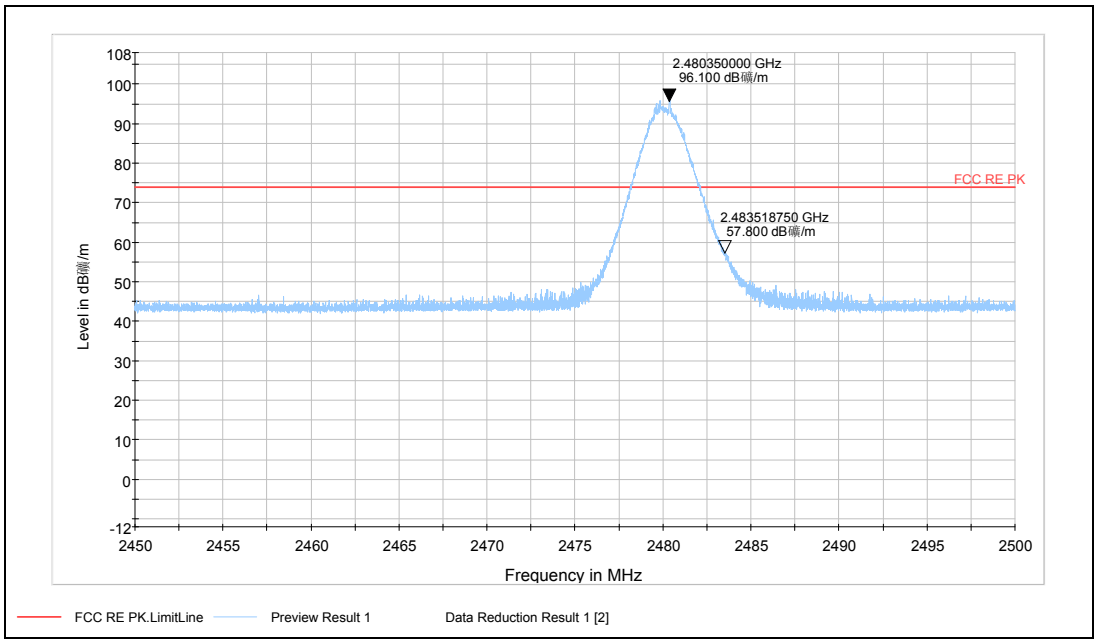
6. PK value= Reading Value+ Correct Factor

3DH5- Channel 0



Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

3DH5- Channel 78



Note: The signal beyond the limit is carrier, a font (Level in dBµV/m) in the test plot = (level in dBuV/m)

3.9. Number of hopping Frequency

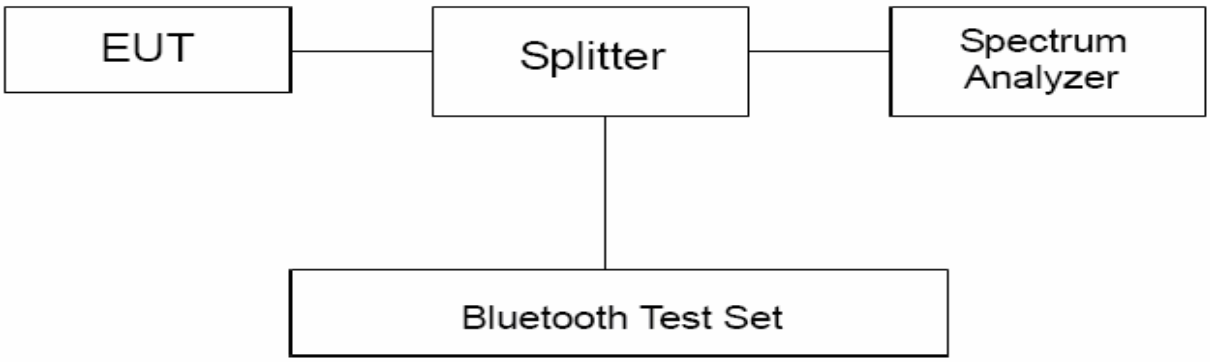
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1 MHz and VBW is set to 3 MHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

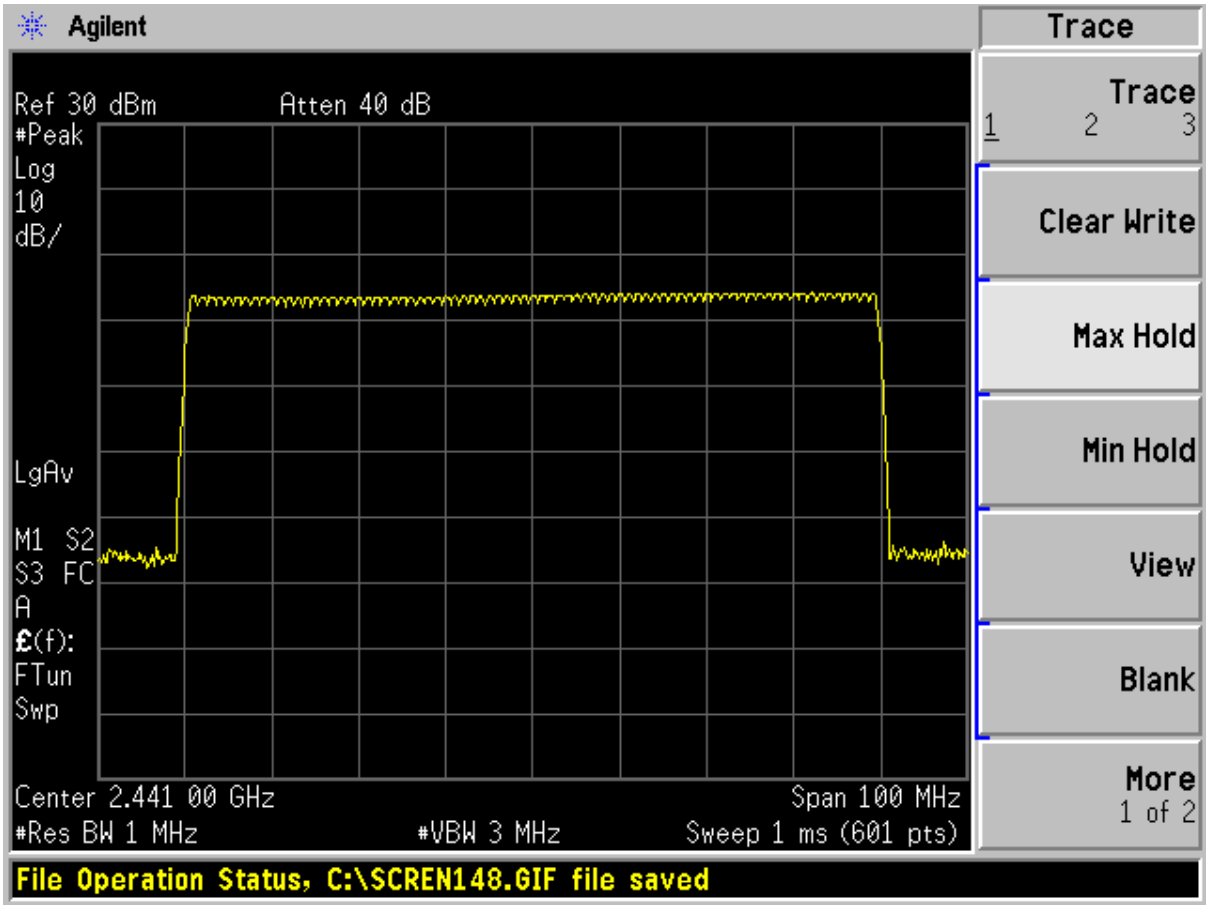
Rule Part 15.247(a) (1) (iii) specifies that" Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels..".

Limits	≥ 15 channels

Test Results:

DH5

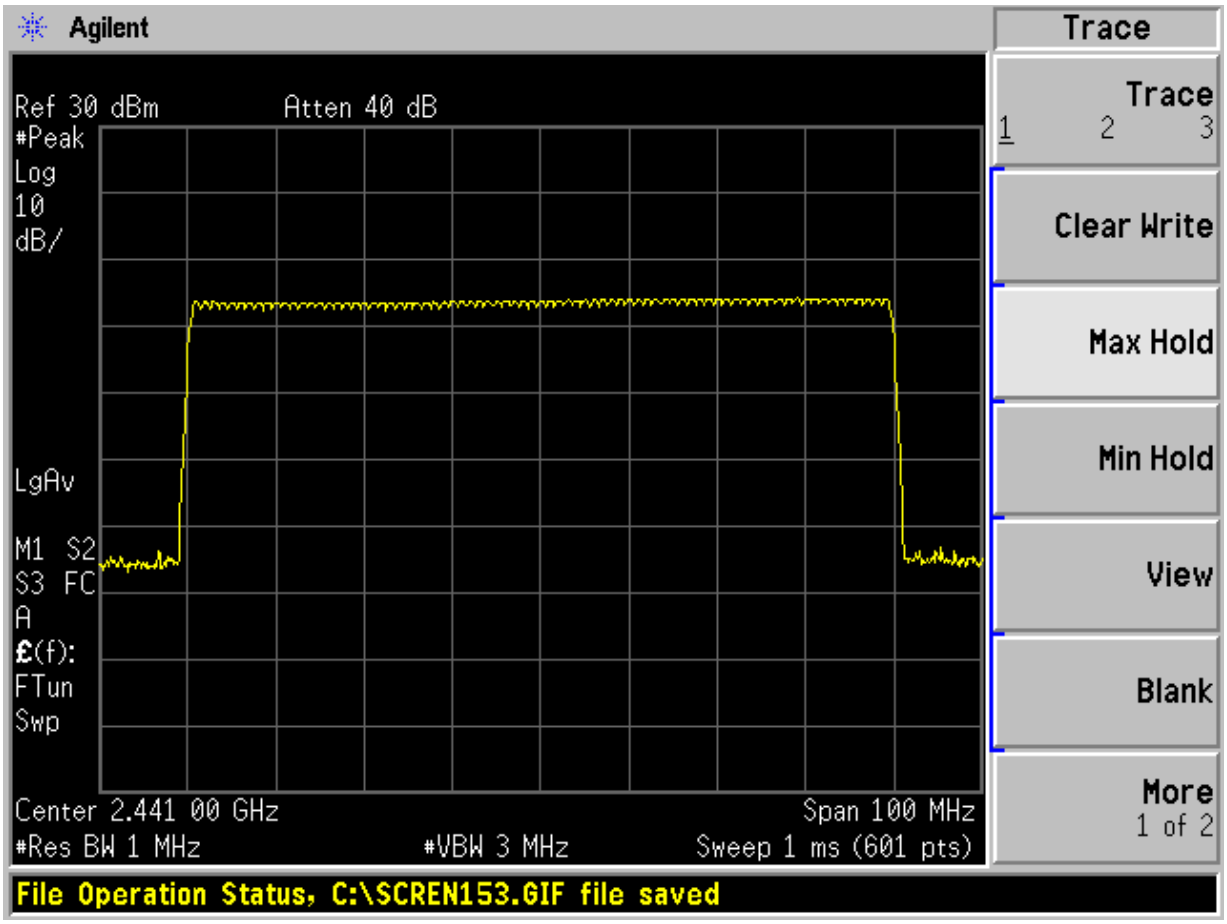
Number of hopping channels	conclusion
79	PASS



2400 MHz –2483.5 MHz

2DH5

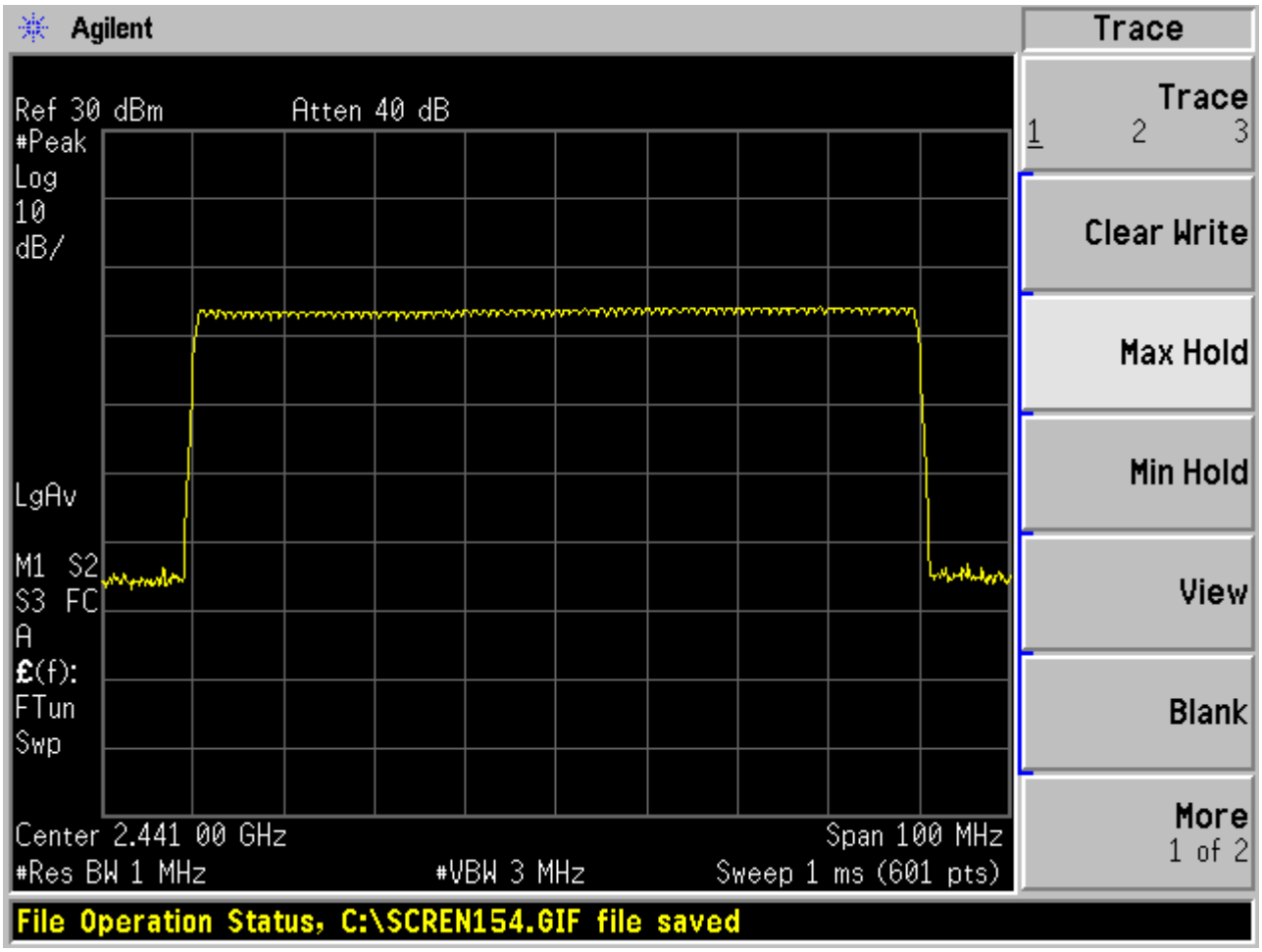
Number of hopping channels	conclusion
79	PASS



2400 MHz –2483.5 MHz

3DH5

Number of hopping channels	conclusion
79	PASS



2400 MHz –2483.5 MHz

3.10. Spurious RF Conducted Emissions

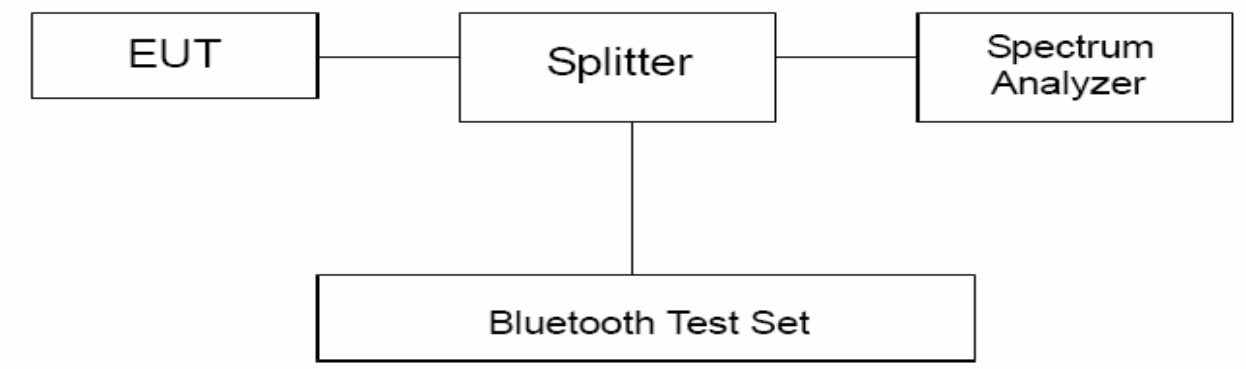
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.
The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.”

Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
DH5	2402	3.63	⩽-16.37
	2441	3.83	⩽-16.17
	2480	4.06	⩽-15.94
EDR	2402	5.79	⩽-14.21
	2441	5.99	⩽-14.01
	2480	6.00	⩽-14.00

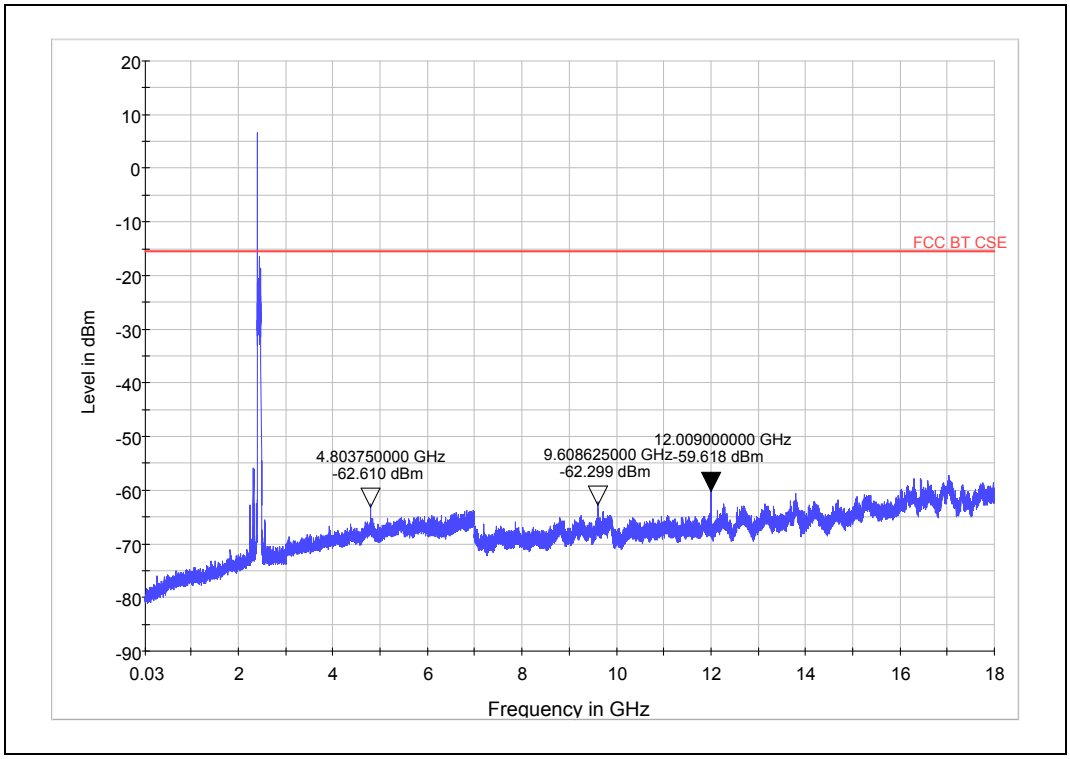
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

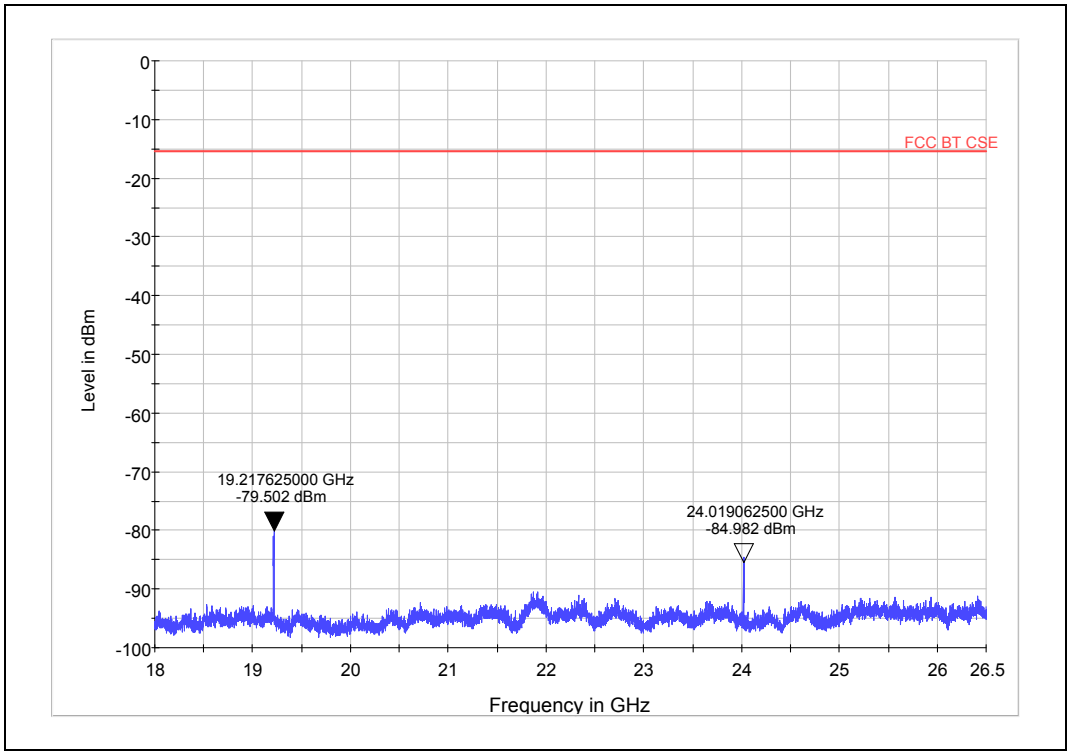
Test Results:

DH5-CH0：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2402

Spurious RF conducted emissions from 30MHz to 18GHz

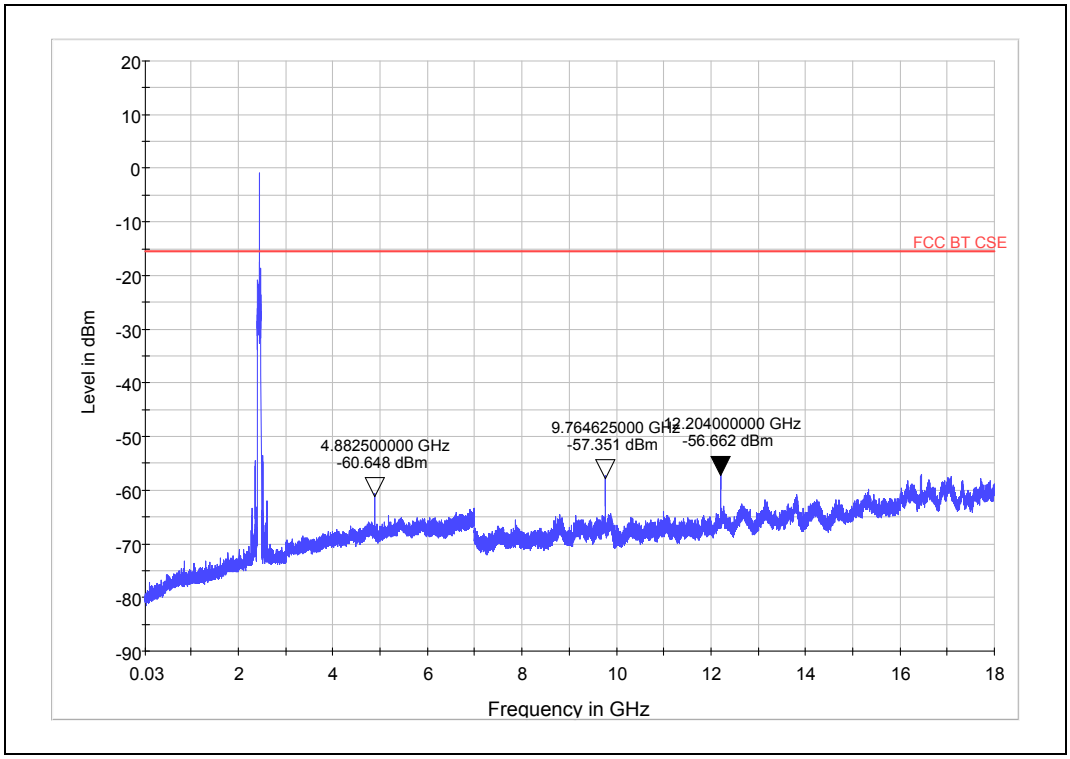


Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.0 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4804	-62.610	-16.37
3	7206	Nf	-16.37
4	9609	-62.299	-16.37
5	12009	-59.618	-16.37
6	14412	Nf	-16.37
7	16814	Nf	-16.37
8	19218	-79.502	-16.37
9	21618	Nf	-16.37
10	24019	-84.982	-16.37
Nf: noise floor			

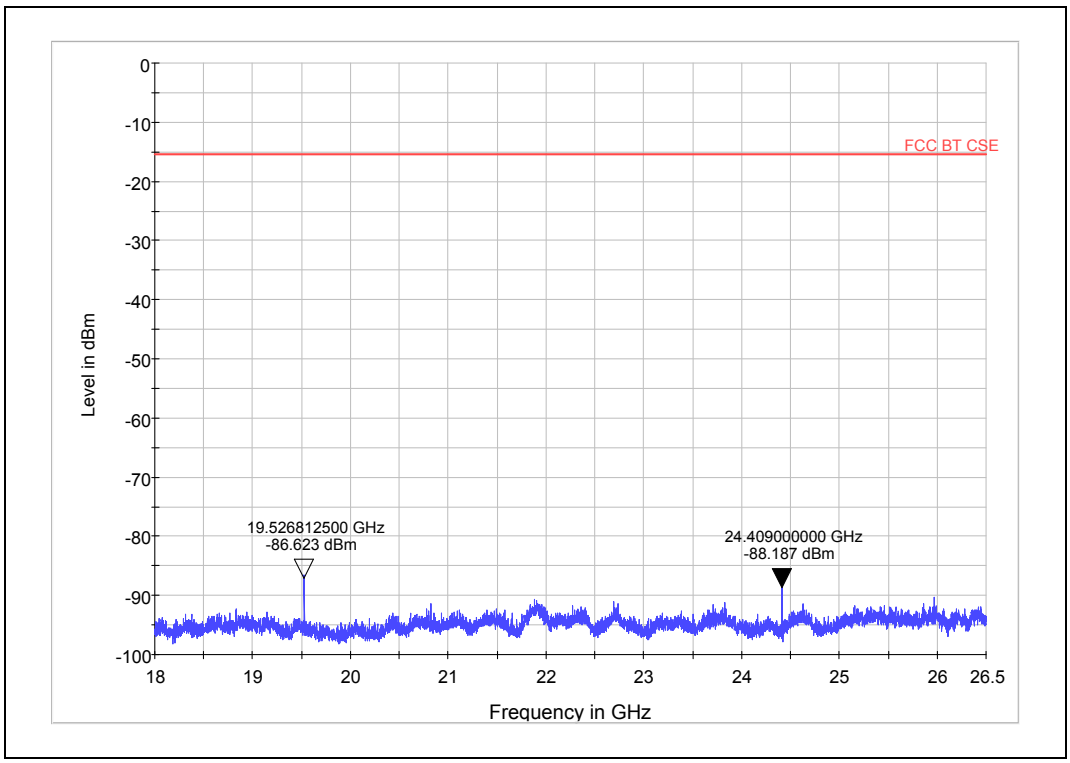
Note: The other Spurious RF conducted emissions level is no more than noise floor.

DH5-CH39：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2441

Spurious RF conducted emissions from 30MHz to 18GHz

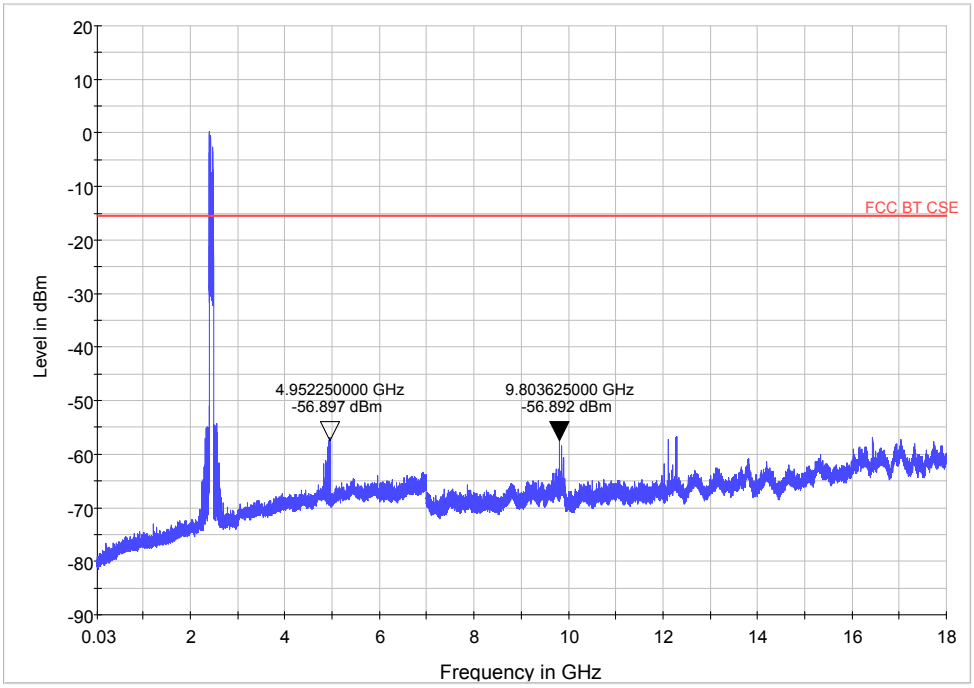


Spurious RF conducted emissions from 18GHz to 26.5GHz

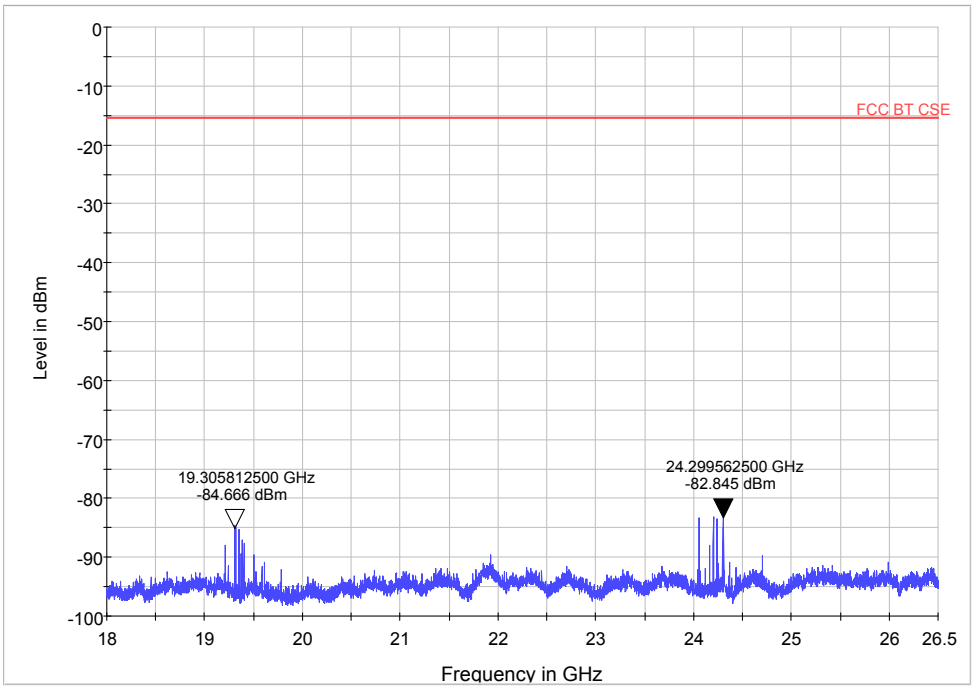
Harmonic	TX ch.39 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4883	-60.648	-16.17
3	7323	Nf	-16.17
4	9765	-57.351	-16.17
5	12204	-56.662	-16.17
6	14646	Nf	-16.17
7	17087	Nf	-16.17
8	19527	-86.623	-16.17
9	21969	Nf	-16.17
10	24409	-88.187	-16.17
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

DH5-CH78：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2480
Spurious RF conducted emissions from 30MHz to 18GHz

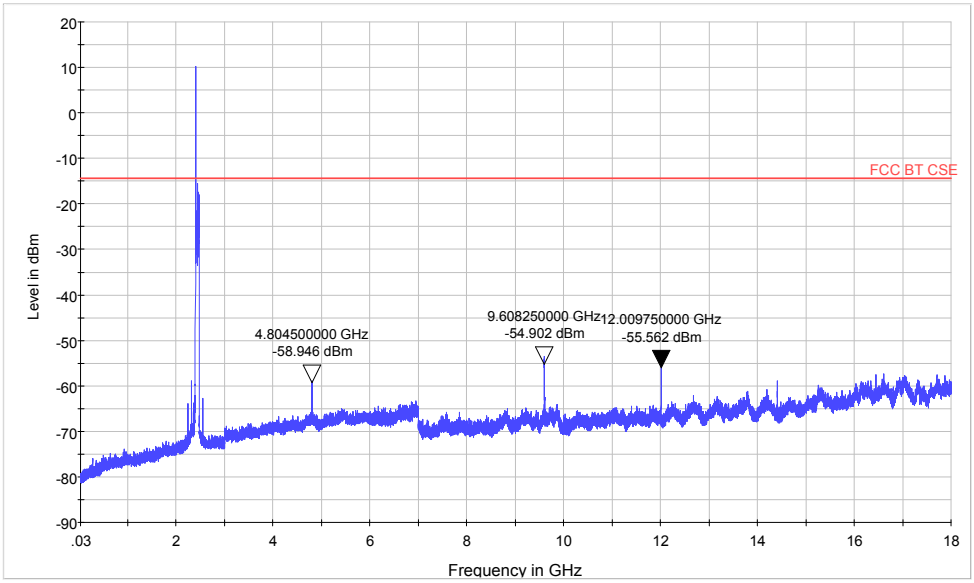


Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.78 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4952	-56.897	-15.94
3	7440	Nf	-15.94
4	9804	-56.892	-15.94
5	12400	Nf	-15.94
6	14880	Nf	-15.94
7	17360	Nf	-15.94
8	19306	-84.666	-15.94
9	22320	Nf	-15.94
10	24300	-82.845	-15.94
Nf: noise floor			

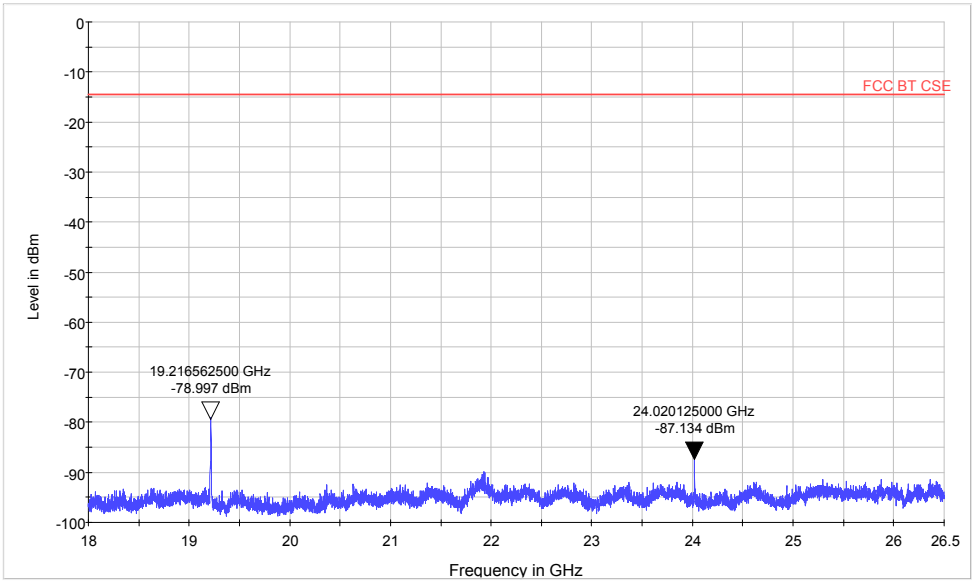
Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH0：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2402

Spurious RF conducted emissions from 30MHz to 18GHz

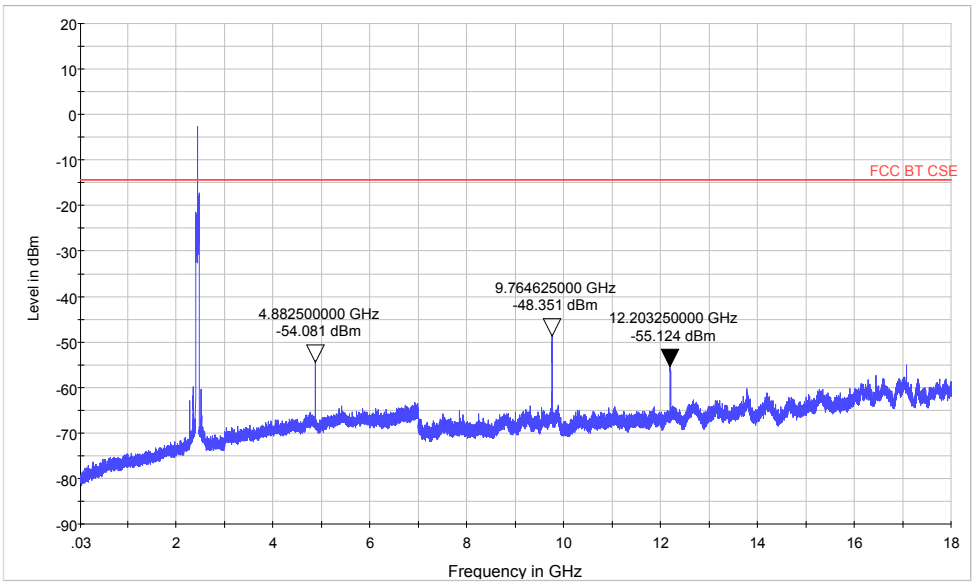


Spurious RF conducted emissions from 18GHz to 26.5GHz

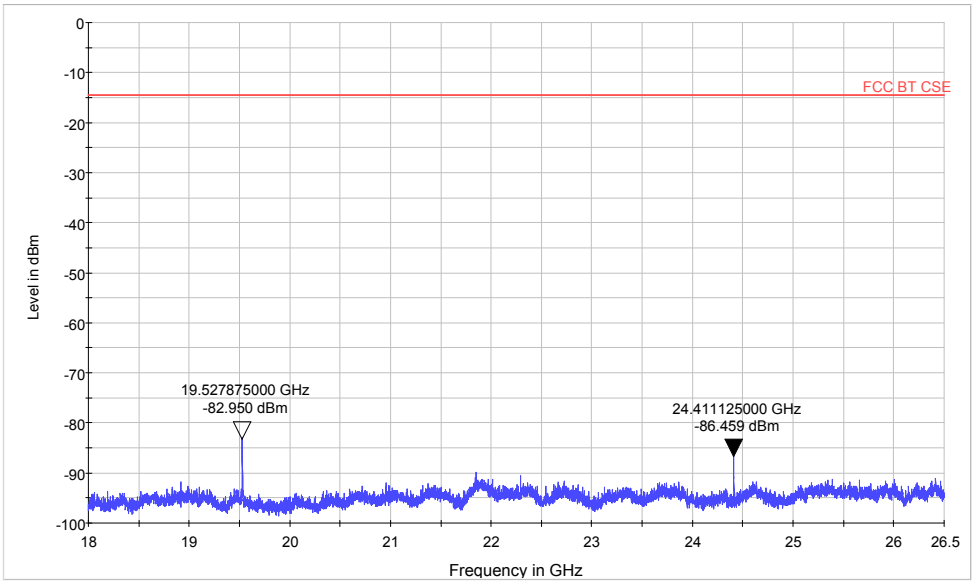
Harmonic	TX ch.0 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4805	-58.946	-14.21
3	7206	Nf	-14.21
4	9608	-54.902	-14.21
5	12010	-55.562	-14.21
6	14412	Nf	-14.21
7	16814	Nf	-14.21
8	19217	-78.997	-14.21
9	21618	Nf	-14.21
10	24020	-87.134	-14.21
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH39：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2441
Spurious RF conducted emissions from 30MHz to 18GHz

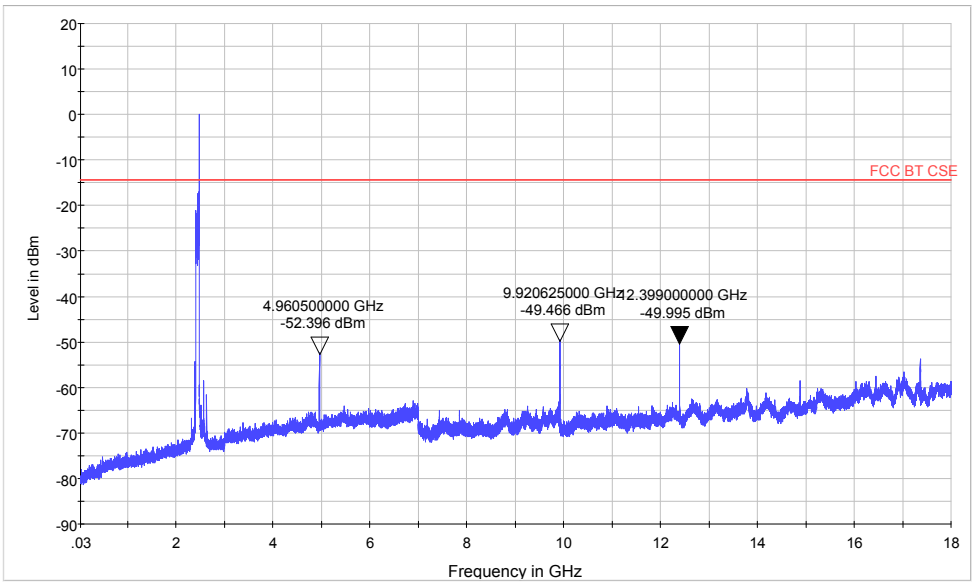


Spurious RF conducted emissions from 18GHz to 26.5GHz

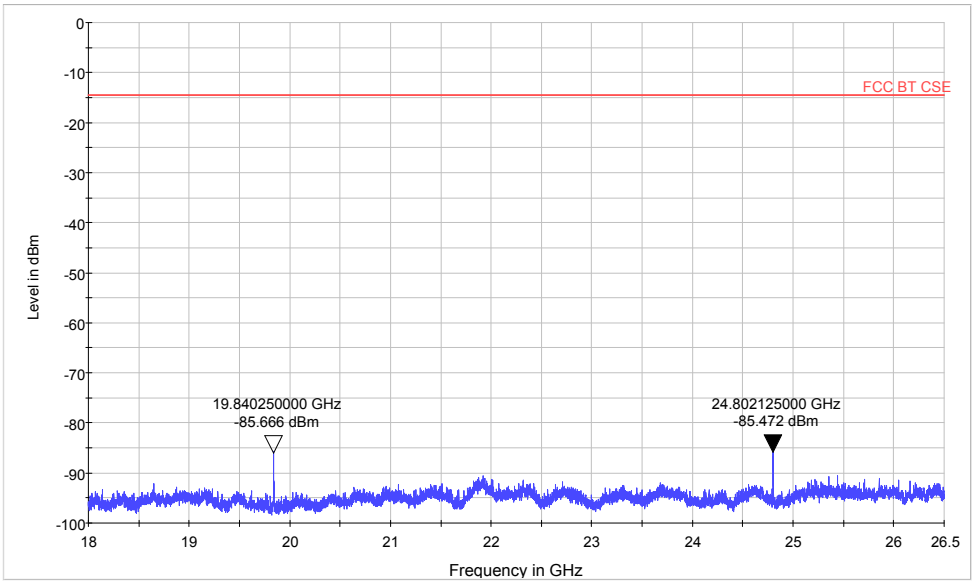
Harmonic	TX ch.39 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4883	-54.081	-14.01
3	7323	Nf	-14.01
4	9765	-48.351	-14.01
5	12203	-55.124	-14.01
6	14646	Nf	-14.01
7	17087	Nf	-14.01
8	19528	-82.950	-14.01
9	21969	Nf	-14.01
10	24411	-86.459	-14.01
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

EDR-CH78：



Note: The signal beyond the limit is carrier. Carrier frequency (MHz): 2480
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.78 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4961	-52.396	-14.00
3	7440	Nf	-14.00
4	9921	-49.466	-14.00
5	12399	-49.995	-14.00
6	14880	Nf	-14.00
7	17360	Nf	-14.00
8	19840	-85.666	-14.00
9	22320	Nf	-14.00
10	24802	-85.472	-14.00
Nf: noise floor			

Note: The other Spurious RF conducted emissions level is no more than noise floor.

3.11. Radiates Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	102.5kPa

Method of Measurement

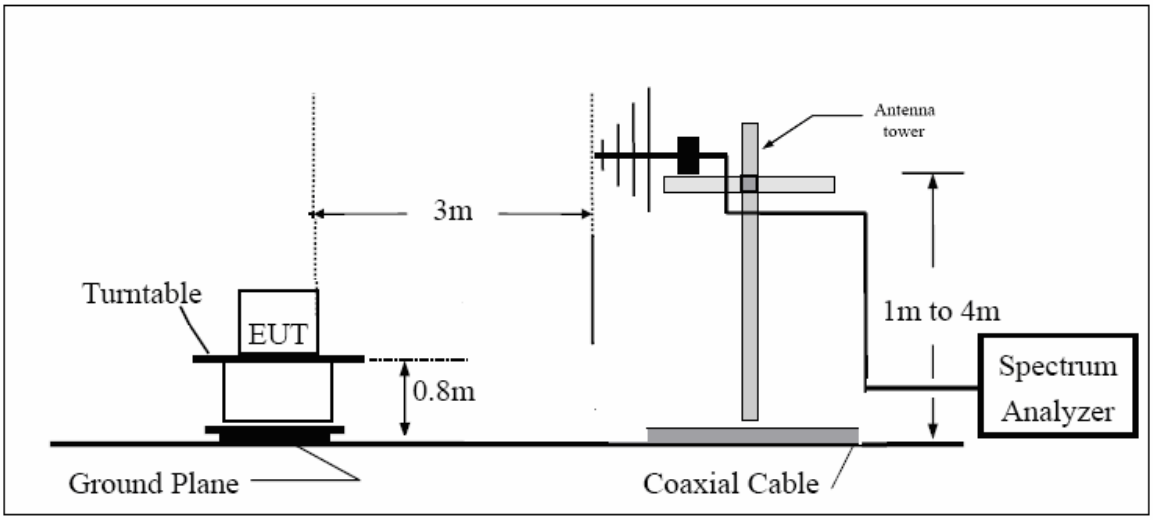
The test set-up was made in accordance to the general provisions of ANSI C63.4-2009.The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.
Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier. The height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.
Set the spectrum analyzer in the following:
Below 1GHz (detector: Peak and Quasi-Peak)
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz(detector: Peak):
(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded. Then this mode was measured in the following mode: EUT with cradle and EUT without cradle. The worst emission was found in EUT with cradle mode and the worst case was recorded.

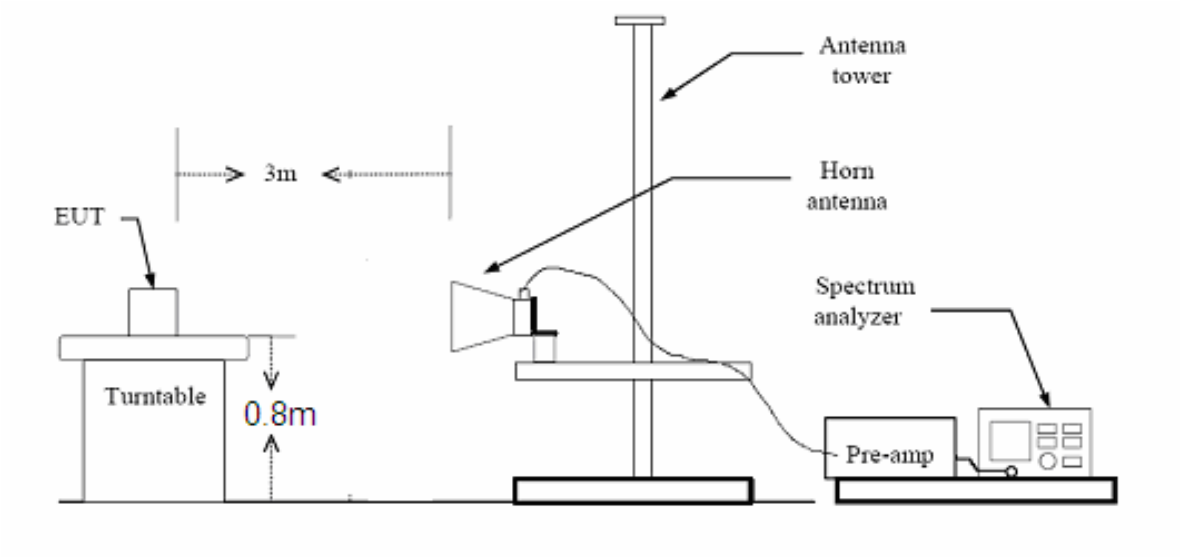
The test is in transmitting mode.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Limits

Rule Part 15.247(d) specifies that “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)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

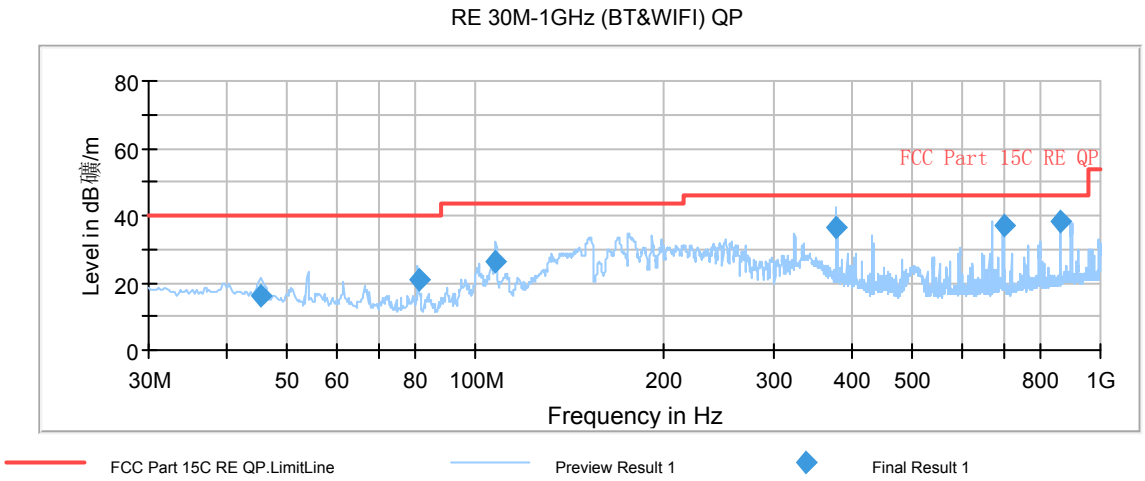
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

Test result

DH5-Channel 39



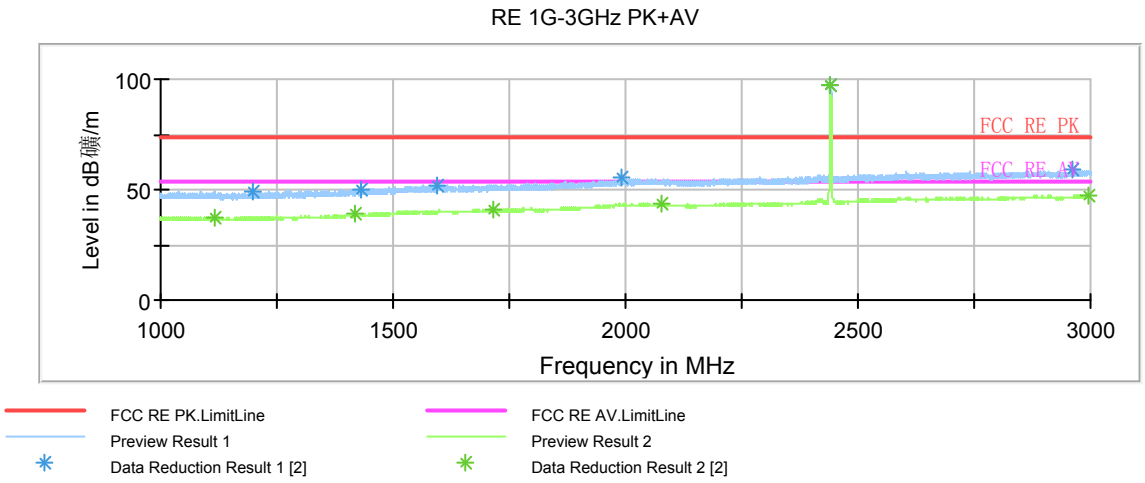
Note: a font (Level in dBµV/m) in the test plot = (level in dBuv/m)
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
45.420000	16.0	100.0	V	20.0	40.7	-24.7	24.0	40.0
81.145000	21.0	125.0	V	97.0	52.7	-31.7	19.0	40.0
107.902500	26.4	100.0	V	267.0	54.9	-28.5	17.1	43.5
377.602500	36.2	100.0	H	285.0	61.5	-25.3	9.8	46.0
699.402500	36.8	120.0	H	52.0	56	-19.2	9.2	46.0
863.980000	38.5	100.0	H	31.0	55.3	-16.8	7.5	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak



Radiates Emission from 1GHz to 3GHz

Note: The signal beyond the limit is carrier. a font (Level in dB礦/m) in the test plot = (level in dBuv/m)

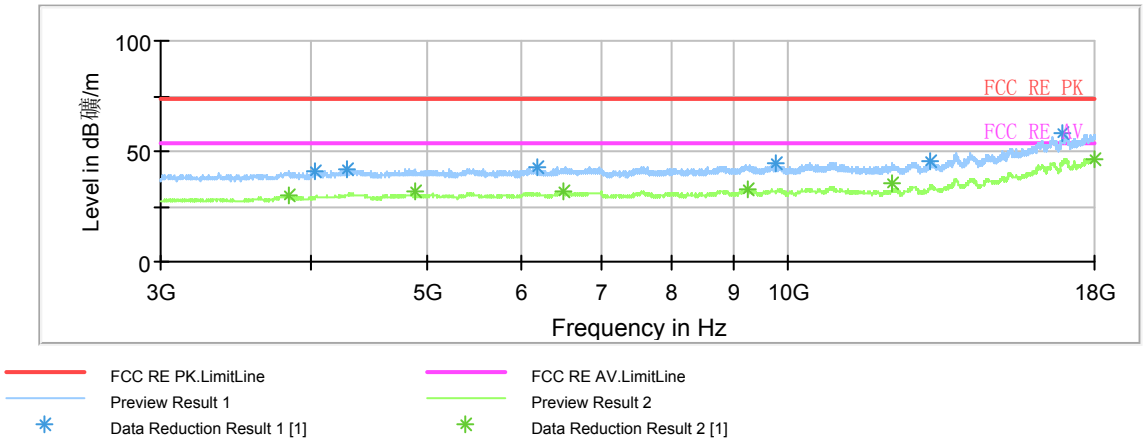
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1117.750000	46.2	100.0	H	131.0	48.4	-2.2
1417.000000	47.4	100.0	V	0.0	48.5	-1.1
1714.000000	50.4	100.0	H	194.0	49.1	1.3
2077.500000	54.0	100.0	H	35.0	50.1	3.9
2441.250000	97.5	100.0	V	18.0	92.3	5.2
2996.500000	57.9	100.0	H	289.0	49.7	8.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1198.500000	36.8	100.0	V	194.0	39	-2.2
1431.250000	38.1	100.0	V	298.0	38.9	-0.8
1594.750000	39.7	100.0	H	233.0	38.9	0.8
1989.250000	42.7	100.0	V	0.0	39.2	3.5
2441.250000	97.1	100.0	V	18.0	91.9	5.2
2963.250000	46.8	100.0	V	129.0	38.9	7.9

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
2. Average = Reading value + Correction factor

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Note: a font (Level in dB磺/m)in the test plot =(level in dBuv/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3841.875000	39.4	100.0	V	0.0	39.6	-0.2
4880.625000	41.5	100.0	H	0.0	39.6	1.9
6498.750000	41.1	100.0	V	211.0	36.5	4.6
9240.000000	42.0	100.0	V	0.0	33.2	8.8
12206.250000	44.3	100.0	H	46.0	33.7	10.6
17986.875000	56.7	100.0	H	255.0	33.2	23.5

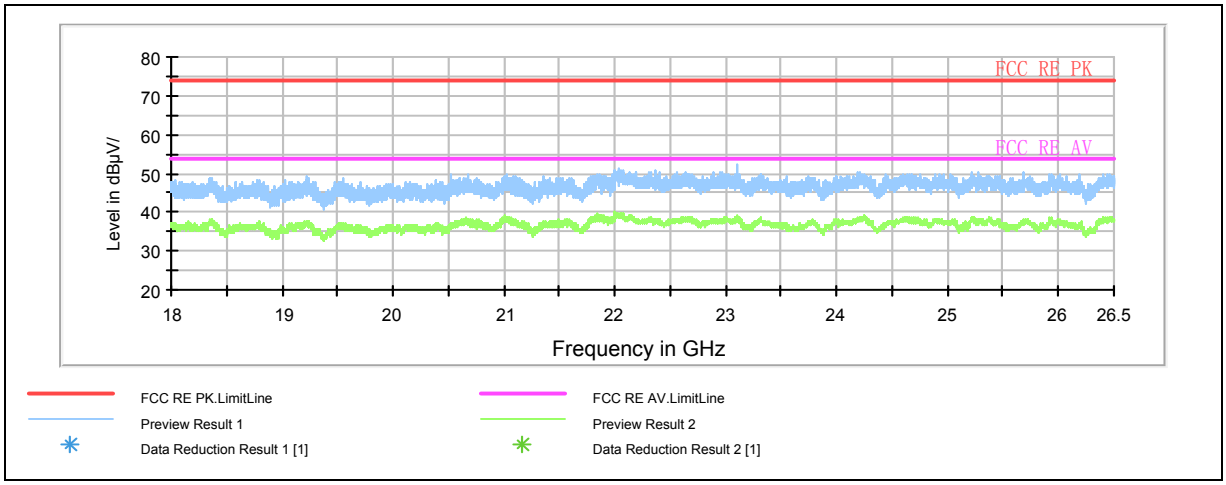
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
4040.625000	29.0	100.0	H	46.0	29.3	-0.3
4297.500000	29.6	100.0	H	111.0	28.1	1.5
6174.375000	30.4	100.0	V	187.0	26.4	4.0
9785.625000	31.5	100.0	H	133.0	22.3	9.2
13149.375000	34.0	100.0	H	25.0	21.3	12.7
16942.500000	45.2	100.0	V	119.0	24.0	21.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

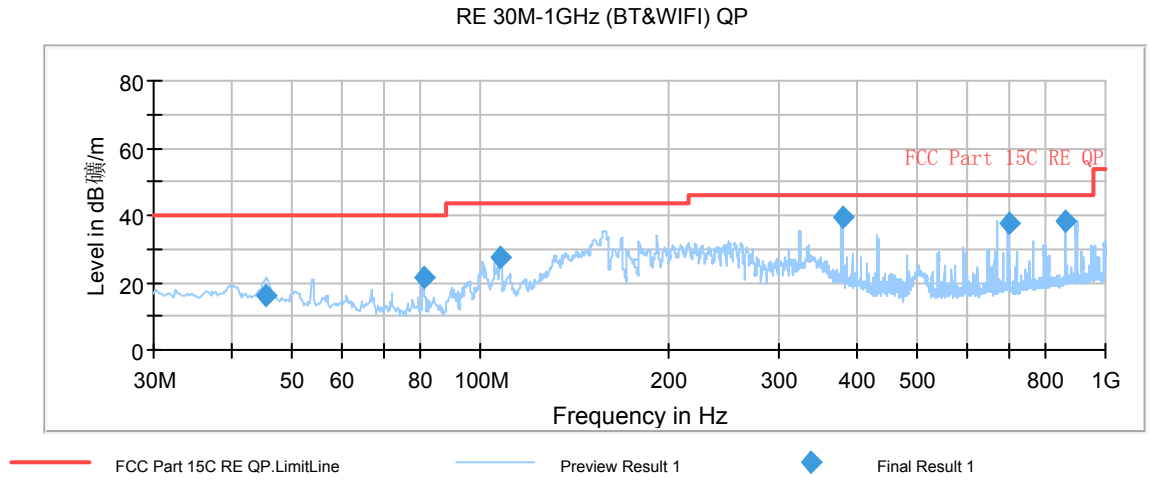
2. Average = Reading value + Correction factor



Radiates Emission from 18GHz to 26.5GHz

Note: a font (Level in dB磁/m)in the test plot =(level in dBuv/m)

3DH5-Channel 39



Radiates Emission from 30MHz to 1GHz

Note: a font (Level in dBµV/m)in the test plot =(level in dBuv/m)

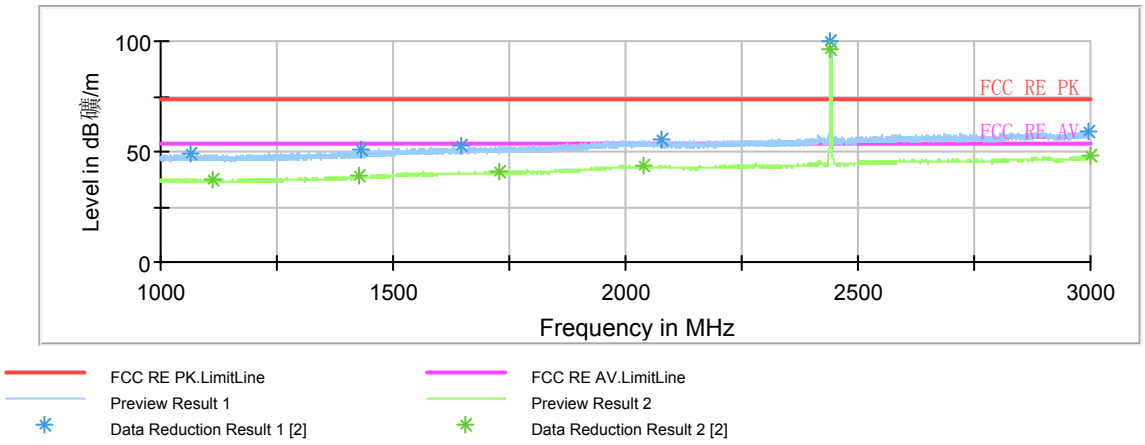
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
45.520000	21.6	100.0	V	0.0	46.3	-24.7	18.4	40.0
80.925000	24.2	100.0	V	68.0	56.0	-31.8	15.8	40.0
108.085000	30.6	100.0	H	48.0	59.1	-28.5	12.9	43.5
378.957500	40.8	100.0	V	0.0	66.1	-25.3	5.2	46.0
699.542500	38.8	100.0	H	48.0	58.0	-19.2	7.2	46.0
864.200000	38.0	100.0	H	28.0	54.8	-16.8	8.0	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

RE 1G-3GHz PK+AV



Radiates Emission from 1GHz to 3GHz

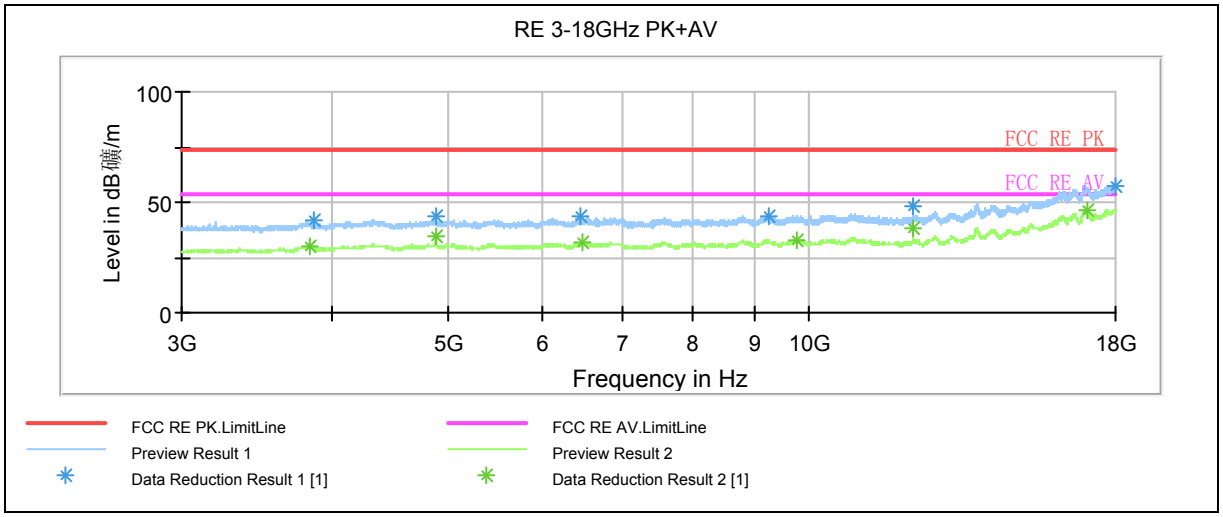
Note: The signal beyond the limit is carrier. a font (Level in dBµV/m)in the test plot =(level in dBuv/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1113.500000	46.9	100.0	H	105.0	49.2	-2.3
1428.000000	48.8	100.0	V	251.0	49.7	-0.9
1728.000000	49.5	100.0	V	343.0	48.5	1.0
2037.500000	53.2	100.0	H	81.0	49.5	3.7
2441.000000	99.3	100.0	V	46.0	94.1	5.2
2998.500000	57.4	100.0	V	198.0	49.2	8.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1063.000000	36.5	100.0	H	0.0	38.8	-2.3
1429.500000	38.2	100.0	V	198.0	39.1	-0.9
1647.000000	39.7	100.0	H	201.0	38.8	0.9
2079.000000	42.9	100.0	V	284.0	38.9	4.0
2441.000000	95.7	100.0	H	15.0	90.5	5.2
2996.500000	47.2	100.0	V	358.0	39.0	8.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
2. Average= Reading value + Correction factor



Radiates Emission from 3GHz to 18GHz

Note: a font (Level in dB磭/m)in the test plot =(level in dBuv/m)

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3860.625000	42.0	100.0	H	2.0	42.4	-0.4
4880.625000	43.5	100.0	H	0.0	41.6	1.9
6448.125000	43.4	100.0	V	35.0	38.9	4.5
9271.875000	43.8	100.0	H	99.0	35.2	8.6
12204.375000	48.0	100.0	H	45.0	37.4	10.6
17979.375000	57.7	100.0	H	109.0	34.3	23.4

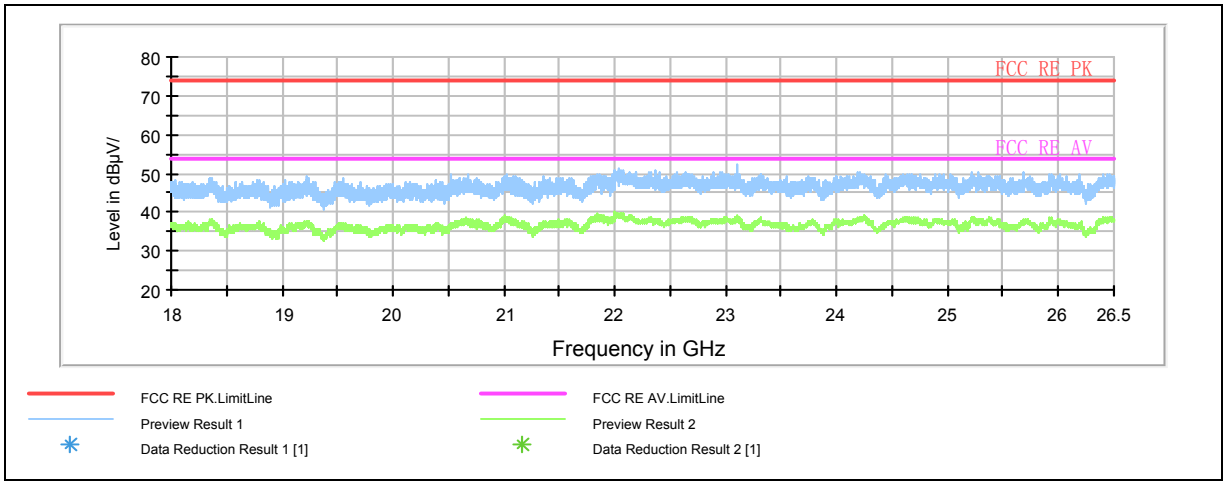
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3838.125000	30.0	100.0	H	0.0	30.2	-0.2
4880.625000	34.9	100.0	H	0.0	33	1.9
6465.000000	31.7	100.0	V	356.0	27	4.7
9765.000000	32.9	100.0	V	238.0	24	8.9
12206.250000	38.1	100.0	V	35.0	27.5	10.6
17025.000000	46.6	100.0	V	216.0	24.9	21.7

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

2. Average= Reading value + Correction factor



Note: a font (Level in dBµV/m)in the test plot =(level in dBuv/m)

Radiates Emission from 18GHz to 26.5GHz

3.12. Conducted Emission

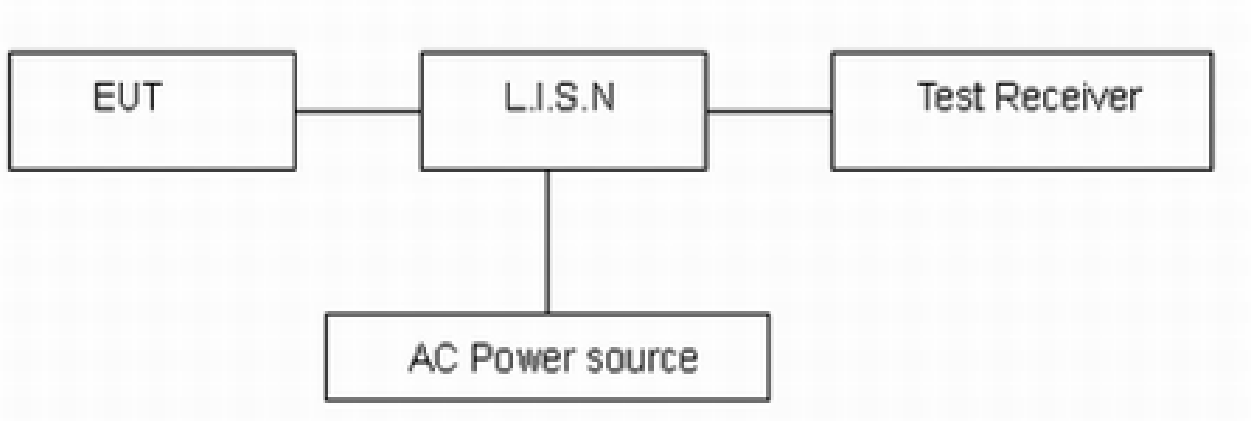
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2009. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz.The measurement result should include both L line and N line.
The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage from 220V/50Hz to 110V/60Hz.

Limits

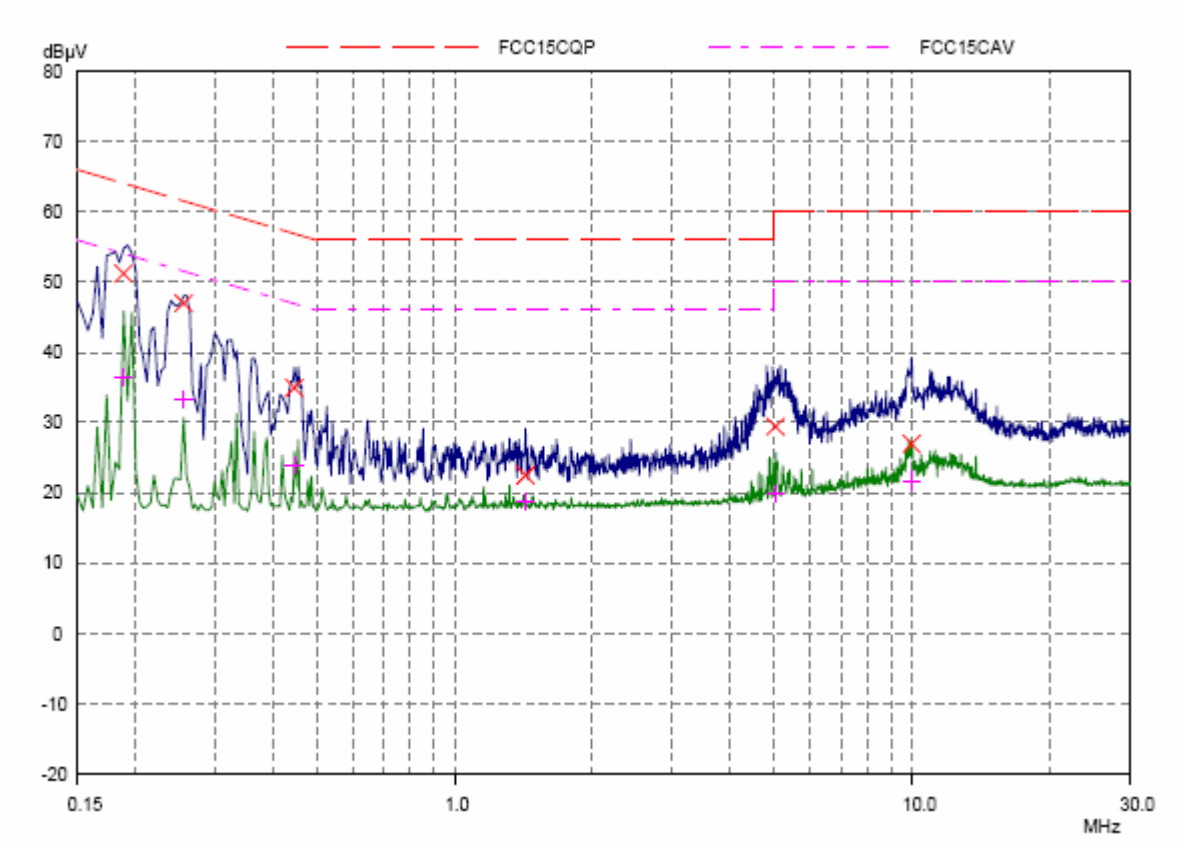
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.69 dB.

Test Results:

Basic Rate-CH39

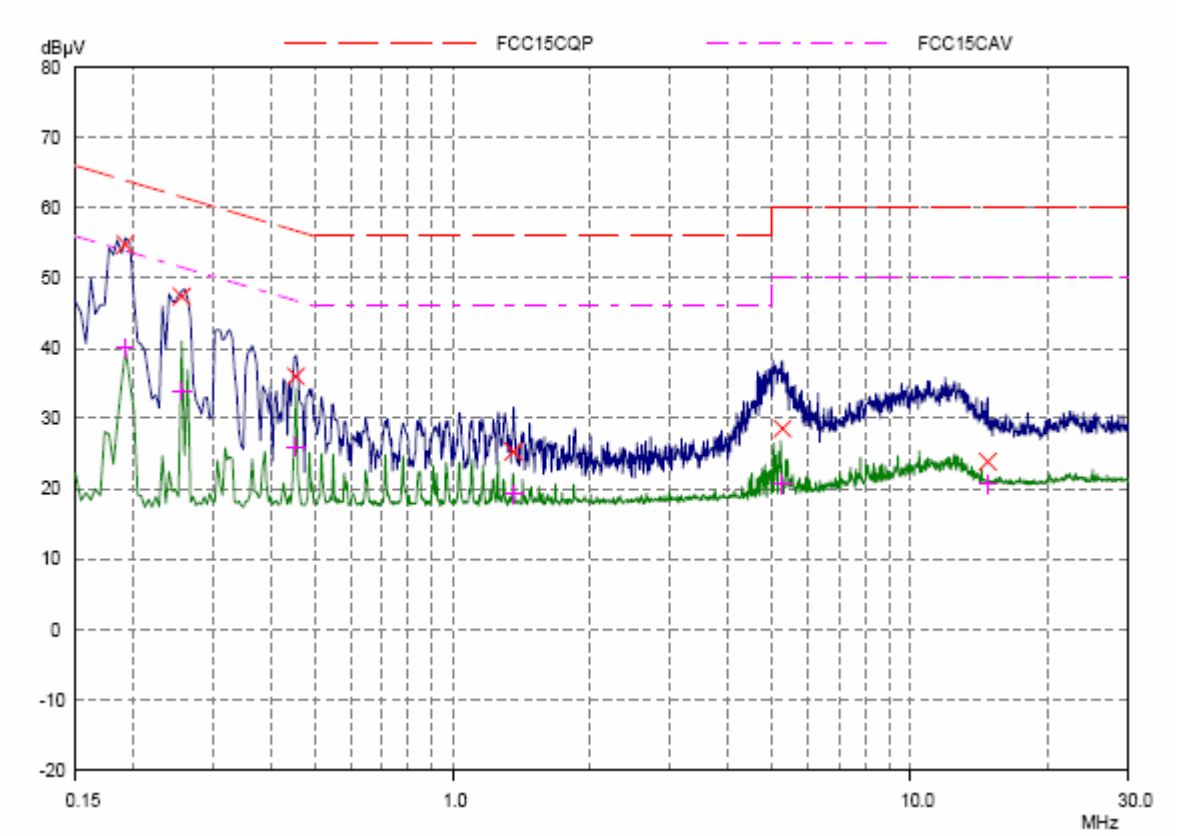


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.18906	51.22	64.08	12.86	L1	gnd
0.25546	46.98	61.58	14.60	L1	gnd
0.44687	34.95	56.93	21.98	L1	gnd
1.42734	22.46	56.00	33.54	L1	gnd
5.03281	29.39	60.00	30.61	L1	gnd
9.98203	26.95	60.00	33.05	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.18906	36.42	54.08	17.66	L1	gnd
0.25546	33.23	51.58	18.35	L1	gnd
0.44687	23.94	46.93	22.99	L1	gnd
1.42734	18.68	46.00	27.32	L1	gnd
5.03281	19.89	50.00	30.11	L1	gnd
9.98203	21.71	50.00	28.29	L1	gnd

L Line



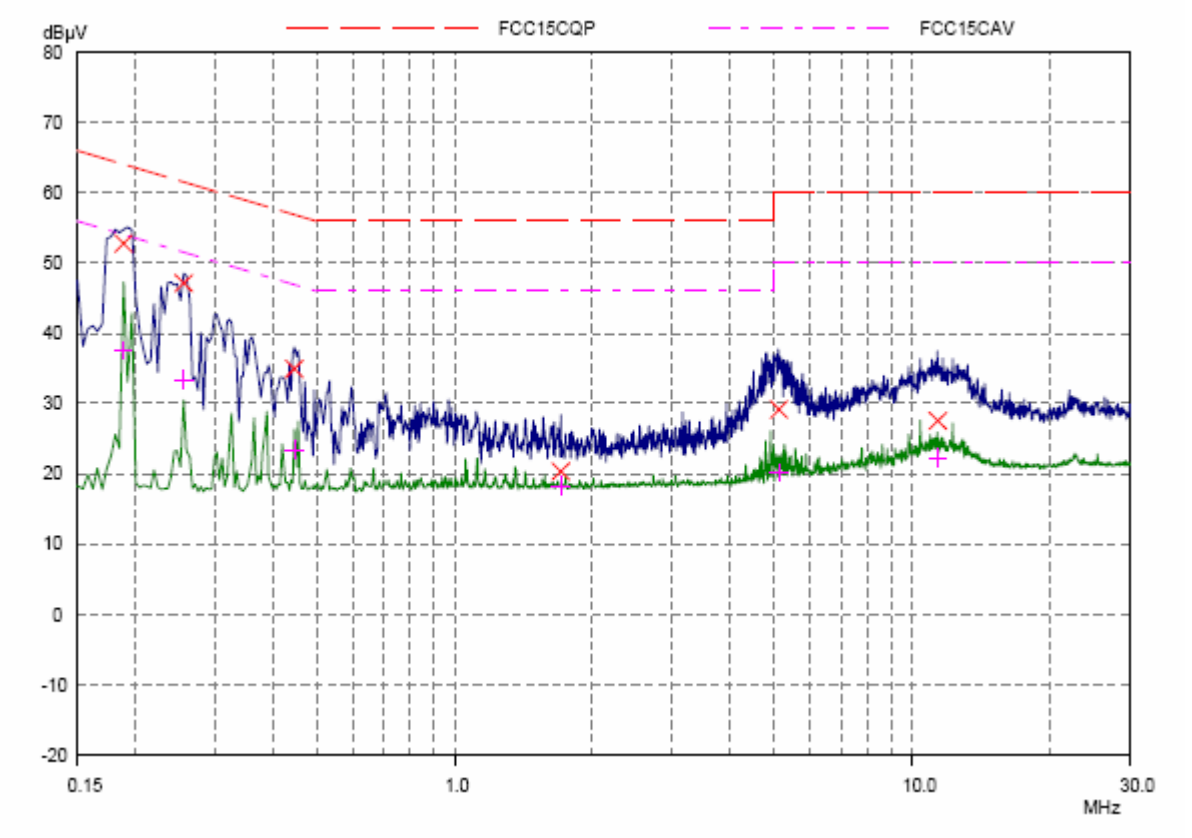
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.19296	54.78	63.91	9.13	N	gnd
0.25546	47.38	61.58	14.20	N	gnd
0.45468	35.99	56.79	20.80	N	gnd
1.36093	25.27	56.00	30.73	N	gnd
5.25156	28.56	60.00	31.44	N	gnd
14.76328	23.87	60.00	36.13	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.19296	40.02	53.91	13.89	N	gnd
0.25546	33.91	51.58	17.67	N	gnd
0.45468	26.00	46.79	20.79	N	gnd
1.36093	19.27	46.00	26.73	N	gnd
5.25156	20.56	50.00	29.44	N	gnd
14.76328	20.66	50.00	29.34	N	gnd

N Line

Conducted Emission from 150 KHz to 30 MHz

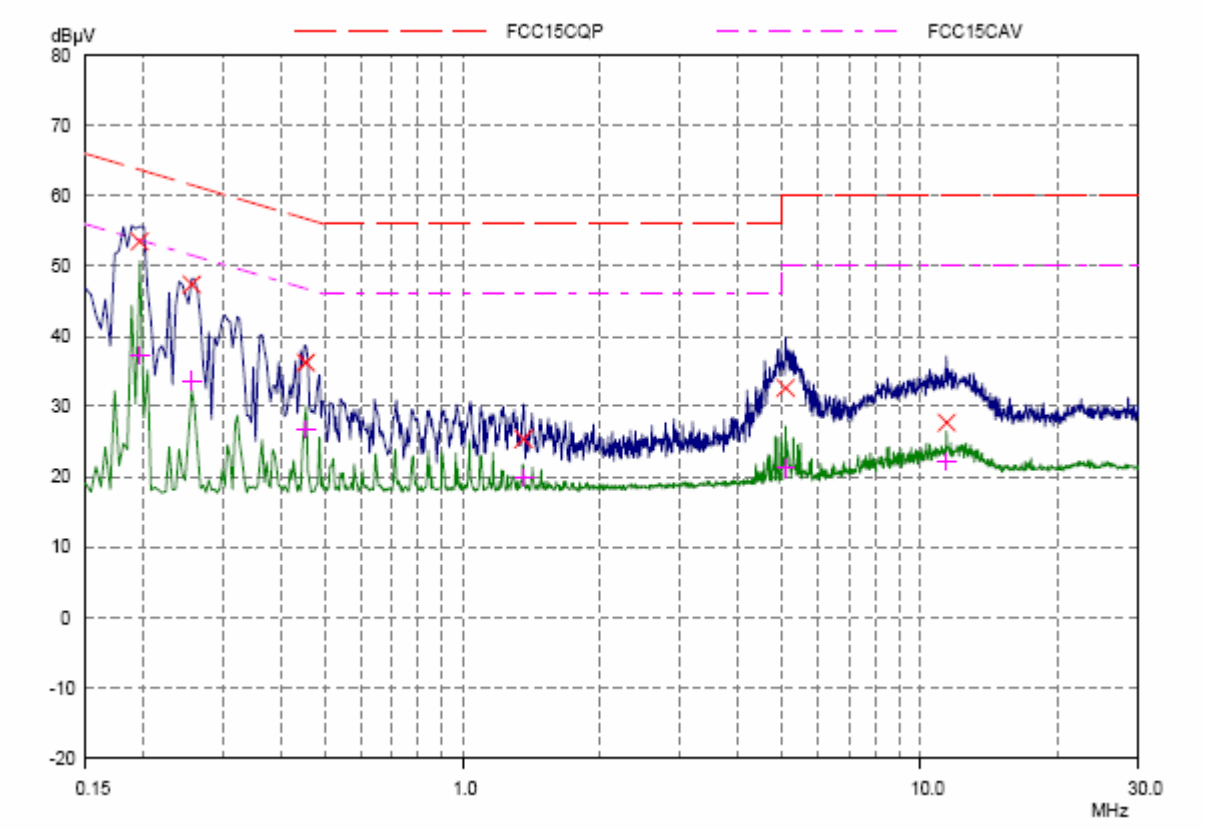


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.18906	52.80	64.08	11.28	L1	gnd
0.25546	47.14	61.58	14.44	L1	gnd
0.44687	34.95	56.93	21.98	L1	gnd
1.70859	20.33	56.00	35.67	L1	gnd
5.11484	29.14	60.00	30.86	L1	gnd
11.38046	27.52	60.00	32.48	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.18906	37.56	54.08	16.52	L1	gnd
0.25546	33.36	51.58	18.22	L1	gnd
0.44687	23.35	46.93	23.58	L1	gnd
1.70859	18.27	46.00	27.73	L1	gnd
5.11484	20.15	50.00	29.85	L1	gnd
11.38046	22.27	50.00	27.73	L1	gnd

L Line



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.19687	53.51	63.74	10.23	N	gnd
0.25546	47.36	61.58	14.22	N	gnd
0.45468	36.21	56.79	20.58	N	gnd
1.36093	25.37	56.00	30.63	N	gnd
5.0914	32.64	60.00	27.36	N	gnd
11.43125	27.70	60.00	32.30	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.19687	37.36	53.74	16.38	N	gnd
0.25546	33.73	51.58	17.85	N	gnd
0.45468	26.72	46.79	20.07	N	gnd
1.36093	19.84	46.00	26.16	N	gnd
5.0914	21.22	50.00	28.78	N	gnd
11.43125	22.20	50.00	27.80	N	gnd

N Line

Conducted Emission from 150 KHz to 30 MHz

4. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	BT Base Station Simulator	CBT	R&S	100271	2012-06-30	One year
02	EMI Test Receiver	ESCS30	R&S	100138	2013-01-15	One year
03	LISN	ENV216	R&S	101171	2010-04-16	Three years
04	EMI Test Receiver	ESCI	R&S	100948	2012-06-30	One year
05	TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2010-06-20	Three years
06	Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2012-07-02	Three years
07	PSG Analog Signal Generator	E8257D	Agilent	MY49281101	2012-06-30	One year
08	ESG Vector Signal Generator	E4438C	Agilent	MY49070900	2012-06-30	One year
09	Spectrum Analyzer	E4445A	Agilent	MY46181146	2012-06-30	One year
10	Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
11	MOB COMMS DC SUPPLY	66319D	Agilent	MY43004105	2012-06-30	One year
12	Power Sensor	E9304A	Agilent	MY50220022	2012-06-30	One year
13	Power Meter	E4418B	Agilent	MY50000623	2012-06-30	One year
14	Vibration table	ESS-050-120	dongling	D1007126	2010-08-23	Three years
15	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2012-06-30	One year

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