Test Report

Applicant	Cypress Semiconductor
Product	EZ-BT WICED Module
Model	CYBT-333032-02, CYBT-333047-02
Report No.	R1808A0401-R2V1
Issue Date	September 27, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ARIB STD-T66 V3.7**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Peng Tao

Performed by: Peng Tao

Kai Xu

Approved by: Kai Xu

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Summary of measurement results

Number	Summary of measurements of results	Clause	Verdict
1	RF Power Output/Tolerance	Chapter 3.2 (3)	PASS
2	Frequency Error Measurement	Chapter 3.2 (4)	PASS
3	Occupied Bandwidth and Spread-spectrum Bandwidth / Factor	Chapter 3.2 (7)(8)	PASS
4	Unwanted Emission Intensity Measurement	Chapter 3.2 (6)	PASS
5	Limitation of Collateral Emission of Receiver Measurement	Chapter 3.3 (1)	PASS
6	Retention Time	Chapter 3.2 (3)	PASS
Date of Testing: September 7, 2018~ September 17, 2018 and September 27, 2018			

1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

CNAS (accreditation number: L2264)

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

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

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

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City:	Shanghai
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2. General Description of Equipment under Test

Client Information

Applicant	Cypress Semiconductor
Applicant address	198 Champion Ct, San Jose, California 95134,United States
Manufacturer	Cypress Semiconductor
Manufacturer address	198 Champion Ct, San Jose, California 95134,United States

General Information

EUT Description	
Device Type:	Module Device
SN:	/
Hardware Version:	REV1.0
Software Version:	REV1.0
Antenna Type:	The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Dipole Antenna)
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)
Antenna Gain	2.0dBi, 2.2 dBi
Device operating configurations:	
Test Mode:	Bluetooth;
Operating Frequency Range(s)	2402MHz ~ 2480MHz
Test Modulation:	Bluetooth: GFSK, π/4-DQPSK, 8-DPSK
Test Frequency Range(s)	2400MHz to 2483.5MHz
Rate Voltage	3.3V
Extreme Voltage	HV: 3.6V LV: 2.3V

Show compliance with 15.203 antenna requirements:

There are two kinds of configuration for the module:

CYBT-333032-02, it is configured with RF pin to connect external antenna, details is as below:

Manufacture	Part Number	Gain
Antenova	B4844-01	2.2dBi
Pulse	W1030	2.0dBi

CYBT-333047-02, it is configured with RF connector to connect external antenna, details is as below:

Manufacture	Part Number	Gain
Antenova	B4844-01	2.2dBi
Pulse	W1030	2.0dBi

Antenna Type 1: Gain = 2.2 dBi, Antenna Type 2: Gain =2.0 dBi. each one should be applied throughout the compliance test respectively, however, only the test result of larger antenna gain (Antenna Type 1: Gain = 2.2 dBi) will be recorded in this report.

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

ARIB STD-T66 V3.7

4. Test Configuration

For all the test items，an engineering test program installed in notebook was used to make the EUT continuously transmit/receive.

5. Test Case Results

5.1. RF Power Output/Tolerance

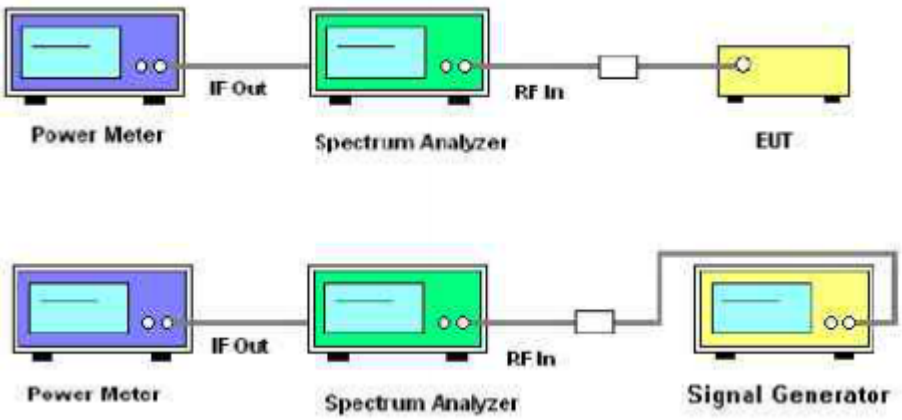
Ambient condition

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

Methods of Measurement

1. A power meter is connected on the IF output port of the spectrum analyzer.
2. Adjust the spectrum analyzer to have the center frequency the same with the measured carrier. RBW=VBW=1MHz, detector mode is positive peak. Turn off the averaging function and use zero span.
3. The calibrating signal power shall be reduced to 0 dBm and it shall be verified that the power meter readign also reduces by 10 dB.
4. Connect the equipment to be measured. Using the following settings of the spectrum analyzer in combination with “max hold” function, find the frequency of highest power output in the power envelope: center frequency equal to operating frequency; RBW & VBW: 1 MHz; detector mode: positive peak; averaging: off; span: 3 times the spectrum width; amplitude: adjust for middle of the instrument’s range. The frequency found shall be recorded.
5. Set the center frequency of the spectrum analyzer to the found frequency and switch to zero span. The power meter indicates the measured power density “E”.
6. Remove the EUT and put the replacing standard signal generator (SSG). Set the standard signal generator (SSG) at same frequency and transmit on, then set SSG output power at Pt to give the equivalent output level of “E”.
7. Calculate antenna power density by the formula below PD = Pt + 10*log(1/x).
x: The duty cycle of the EUT in continuously transmitting mode
Pt: Output power of the SSG

Test Setup



Limits

Item	Limits
Antenna Power Density	≤3mW/MHz (FH form 2427~2470.75MHz)
Antenna Power Error	+20%, -80%(Base on manufacturer declare antenna power density)

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：

Mode	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty cycle	Duty cycle correction Factor (dB)
DH5	1	1	1.00	0.00
2DH5	1	1	1.00	0.00
3DH5	1	1	1.00	0.00

Network Standards	Target Power (mW/MHz)	Output Power (dBm/MHz)			Output Power (mW/MHz)			Low limit (mW/MHz)	Up limit (mW/MHz)
		NV	LV	HV	NV	LV	HV		
DH5	0.145	-9.800	-9.838	-9.891	0.105	0.104	0.103	0.029	0.174
2DH5	0.153	-9.869	-9.916	-9.938	0.103	0.102	0.101	0.031	0.184
3DH5	0.153	-10.215	-10.131	-10.246	0.095	0.097	0.094	0.031	0.184
Note: Low limit=target power*(1-80%); High Limit=target power*(1+20%)									

Network Standards	EIRP (dBm/MHz)			EIRP (mW/MHz)			Conclusion
	NV	LV	HV	NV	LV	HV	
DH5	-7.600	-7.638	-7.691	0.174	0.172	0.170	PASS
2DH5	-7.669	-7.716	-7.738	0.171	0.169	0.168	PASS
3DH5	-8.015	-7.931	-8.046	0.158	0.161	0.157	PASS
Note: 1. EIRP = Output Power + Antenna Gain ((Antenna Gain = 2.2dBi)							

5.2. Frequency Error Measurement

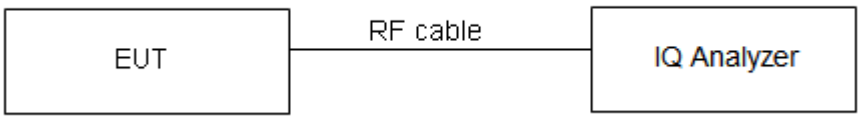
Ambient condition

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

Methods of Measurement

The Frequency Error was measured by the IQ analyzer. The EUT was connected to the IQ analyzer via a known cable loss RF cable. The BT measurement module was selected in the IQ analyzer. The EUT was in continuing transmission mode.

Test Setup



Limits

Tolerance of frequency shall be $\pm 50 \times 10^{-6}$.

Test Results

NV

Network Standards		Carrier frequency (MHz)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)	Conclusion
Bluetooth	DH5	2402	-0.041338	-17.21	±50	PASS
		2441	0.070667	28.95	±50	PASS
		2480	0.035489	14.31	±50	PASS
	2DH5	2402	-0.016526	-6.88	±50	PASS
		2441	-0.033173	-13.59	±50	PASS
		2480	0.005778	2.33	±50	PASS
	3DH5	2402	-0.039465	-16.43	±50	PASS
		2441	0.017600	7.21	±50	PASS
		2480	0.053221	21.46	±50	PASS

LV

Network Standards		Carrier frequency (MHz)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)	Conclusion
Bluetooth	DH5	2402	0.046046	19.17	±50	PASS
		2441	0.048283	19.78	±50	PASS
		2480	0.001215	0.49	±50	PASS
	2DH5	2402	-0.038696	-16.11	±50	PASS
		2441	0.069300	28.39	±50	PASS
		2480	0.012474	5.03	±50	PASS
	3DH5	2402	-0.068937	-28.70	±50	PASS
		2441	0.031098	12.74	±50	PASS
		2480	0.002505	1.01	±50	PASS

HV

Network Standards		Carrier frequency (MHz)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)	Conclusion
Bluetooth	DH5	2402	0.036534	15.21	±50	PASS
		2441	-0.057778	-23.67	±50	PASS
		2480	0.038341	15.46	±50	PASS
	2DH5	2402	-0.038408	-15.99	±50	PASS
		2441	-0.033930	-13.90	±50	PASS
		2480	0.060239	24.29	±50	PASS
	3DH5	2402	0.027119	11.29	±50	PASS
		2441	0.062368	25.55	±50	PASS
		2480	-0.031124	-12.55	±50	PASS

5.3. Occupied Bandwidth and Spread-spectrum Bandwidth / Factor

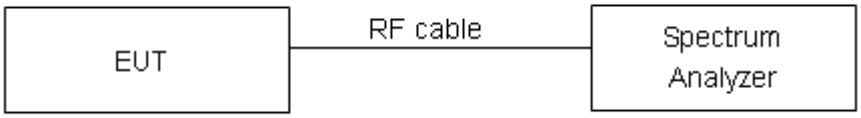
Ambient condition

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

Method of Measurement

The EUT was connected to the spectrum analyzer through a known loss cable. RBW is set to 1MHz, VBW is set to 1MHz on spectrum analyzer. Detector = peak. Trace mode = max hold. Sweep = auto couple. Scanning bandwidth≈85MHz。

Test Setup



Limits

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz or less.
Spread bandwidth (RE: Article 49-20)
In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more.

Measurement Uncertainty

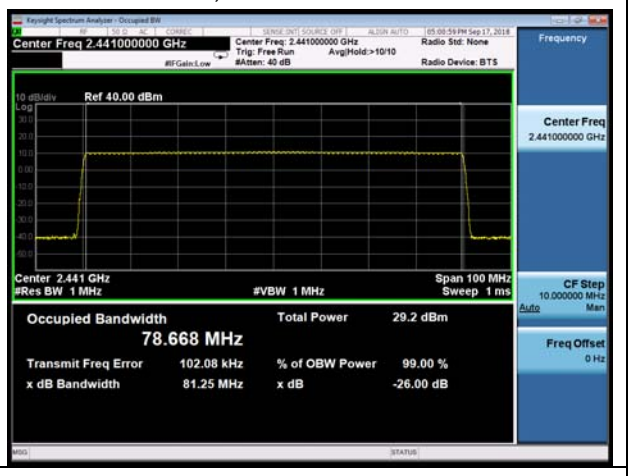
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results

Network Standards	Condition	Data Rate (Mbps)	90% bandwidth (MHz)	99% bandwidth (MHz)	Spreading factor
DH5	LV	1	71.011	78.668	NA
	NV	1	71.048	78.635	
	HV	1	71.050	78.674	
2DH5	LV	2	71.100	78.788	NA
	NV	2	71.151	78.747	
	HV	2	71.121	78.778	
3DH5	LV	3	71.176	78.782	NA
	NV	3	71.247	78.783	
	HV	3	71.257	78.782	

DH5, 90% bandwidth-LV

DH5, 99% bandwidth-LV



DH5, 90% bandwidth-NV

DH5, 99% bandwidth-NV

DH5, 90% bandwidth-HV

DH5, 99% bandwidth-HV

2DH5, 90% bandwidth-LV

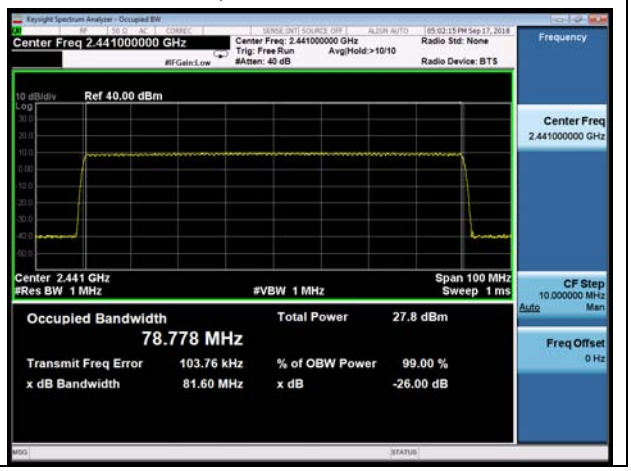
2DH5, 99% bandwidth-LV

2DH5, 90% bandwidth-NV

2DH5, 99% bandwidth-NV

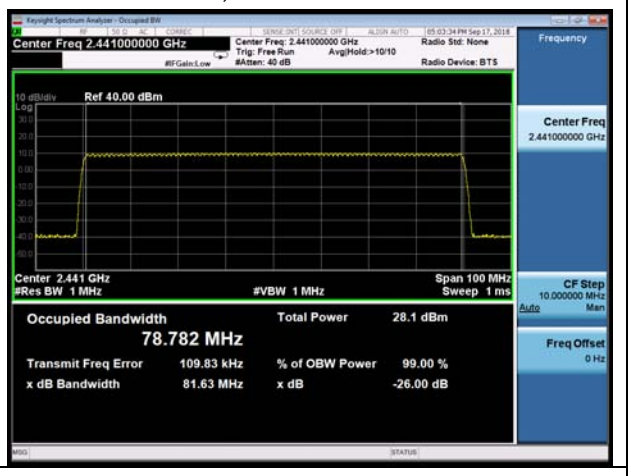
2DH5, 90% bandwidth-HV

2DH5, 99% bandwidth-HV



3DH5, 90% bandwidth-LV

3DH5, 99% bandwidth-LV



3DH5, 90% bandwidth-NV

3DH5, 99% bandwidth-NV

3DH5, 90% bandwidth-HV

3DH5, 99% bandwidth-HV

5.4. Unwanted Emission Intensity Measurement

Ambient condition

Temperature	Relative humidity	Pressure
25°C	50%	101.5kPa

Method of Measurement

These measurements shall only be performed at normal test conditions. In this case measurements need to be performed when operating at the lowest and the highest frequency.

The equipment shall be configured to operate under its worst case situation with respect to output power.

The measurement procedure shall be as follows:

Pre-scan

The test procedure below shall be used to identify potential unwanted emissions of the UUT.

Step 1:

The sensitivity of the spectrum analyser should be such that the noise floor is at least 12 dB below the limits given in tables 1 or 4.

Step 2:

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 1MHz

• Video bandwidth: 1MHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 9 970

NOTE 1: For spectrum analysers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For Frequency Hopping equipment operating in a normal operating (hopping not disabled) mode, the sweep time shall be further increased to capture multiple transmissions on the same hopping frequency in different hopping sequences.

Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.10.2.1.2 and compared to the limits given in tables 1 or 4.

Step 3:

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 1MHz

• Video bandwidth: 1MHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 11 750

NOTE 2: For spectrum analysers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For Frequency Hopping equipment operating in a normal operating (hopping not disabled) mode, the sweep time shall be further increased to capture multiple transmissions on the same hopping frequency in different hopping sequences.
Allow the trace to stabilize. Any emissions identified during the sweeps above that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.10.2.1.2 and compared to the limits given in tables 1 or 4.
Frequency Hopping equipment may generate a block (or several blocks) of spurious emissions anywhere within the spurious domain. If this is the case, only the highest peak of each block of emissions shall be measured using the procedure in clause 5.3.10.2.1.2.

Step 4:

• In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the steps 2 and 3 need to be repeated for each of the active transmit chains (Ach).The limits used to identify emissions during this pre-scan need to be reduced with 10 × log10 (Ach) (number of active transmit chains).

Limit

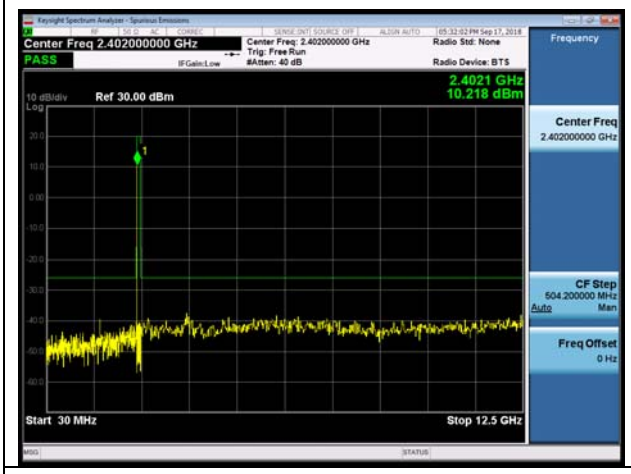
Frequency Range	Limits(μ W/MHz)
30MHz to 2387MHz	2.5μW/MHz=-26dBm
2387MHz to 2400MHz	25μW/MHz=-16dBm
2483.5MHz - 2496.5MHz	25μW/MHz=-16dBm
2496.5MHz - 12.5GHz	2.5μW/MHz=-26dBm

Measurement Uncertainty

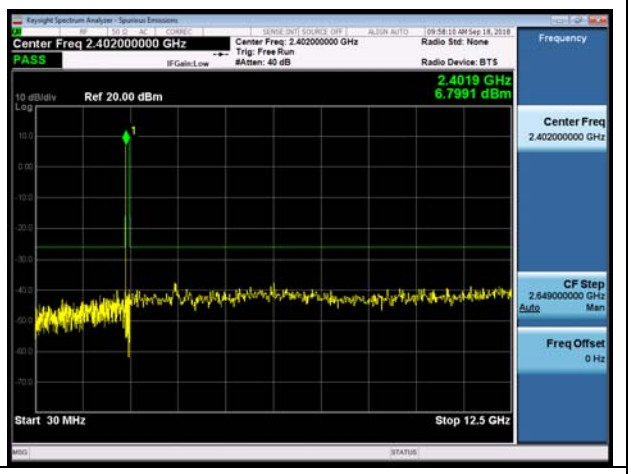
The assessed measurement uncertainty to ensure 95％ confidence level for the normal distribution is with the coverage factor *k* = 1.96, *U*= 3.55 dB.

Test Results

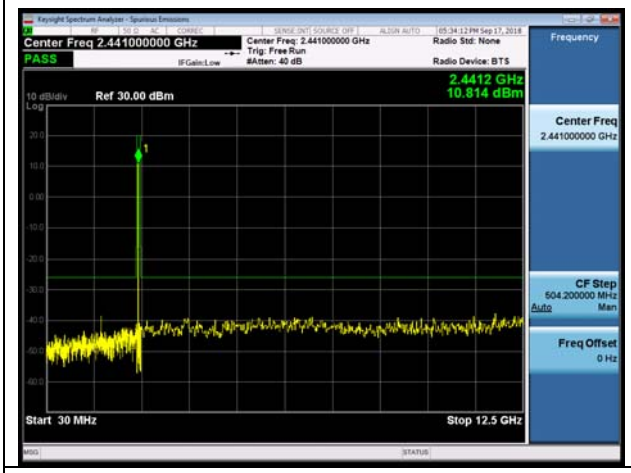
DH5 LV CH0 30MHz to 12.75GHz



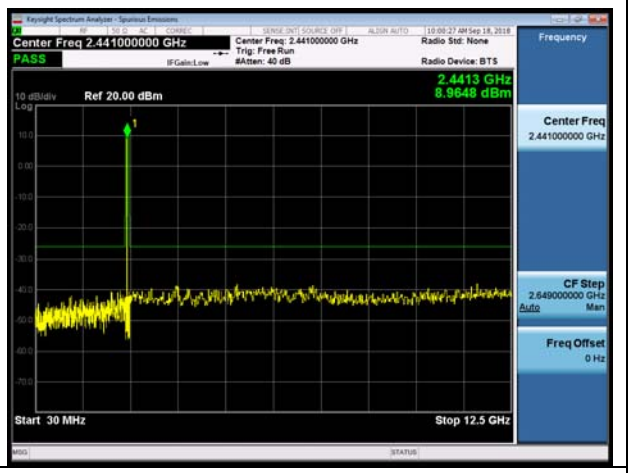
2DH5 LV CH0 30MHz to 12.75GHz



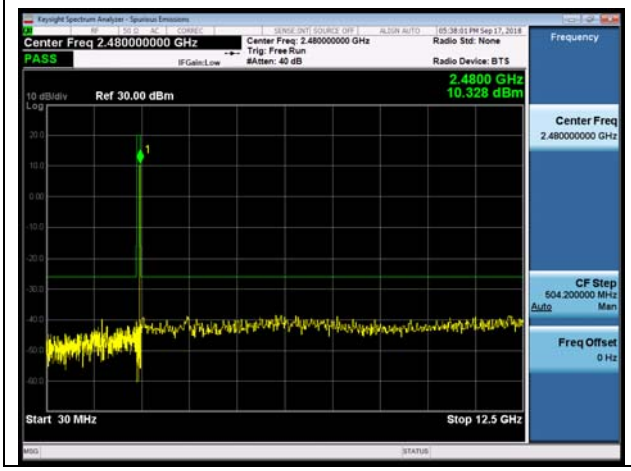
DH5 LV CH39 30MHz to 12.75GHz



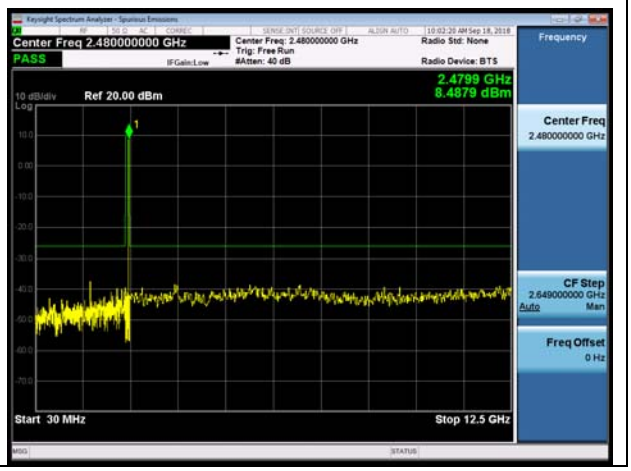
2DH5 LV CH39 30MHz to 12.75GHz



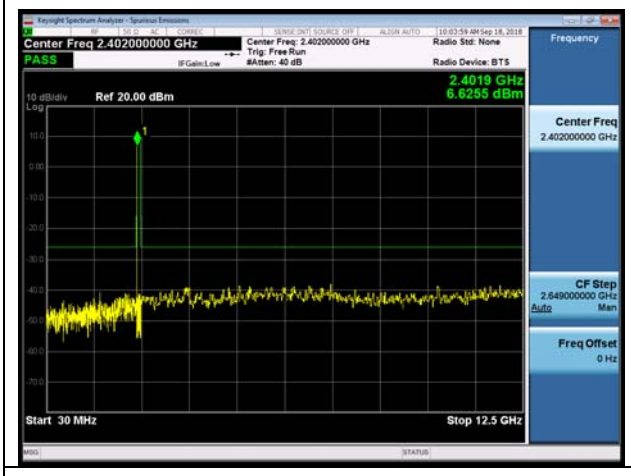
DH5 LV CH78 30MHz to 12.75GHz



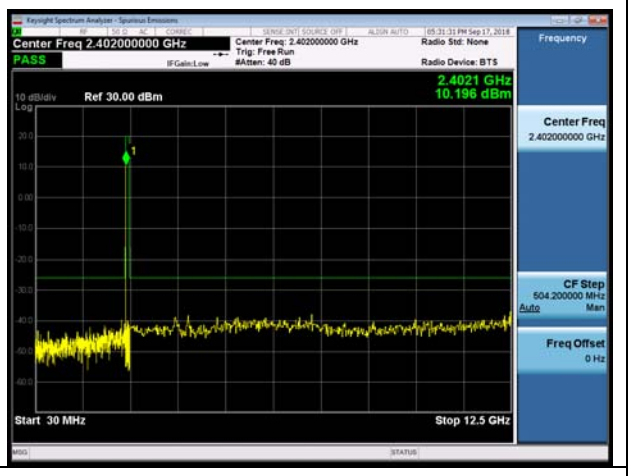
2DH5 LV CH78 30MHz to 12.75GHz



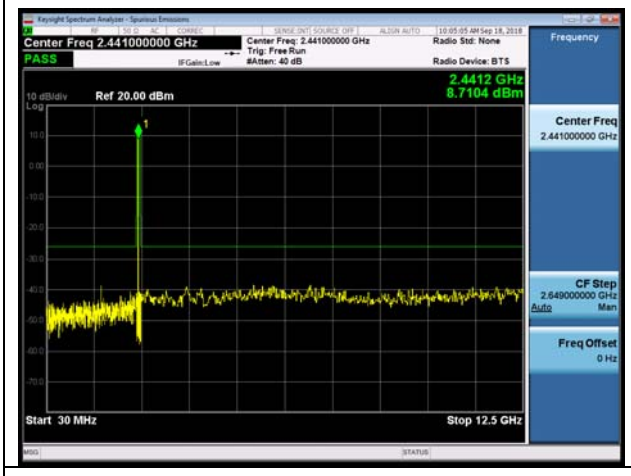
3DH5 LV CH0 30MHz to 12.75GHz



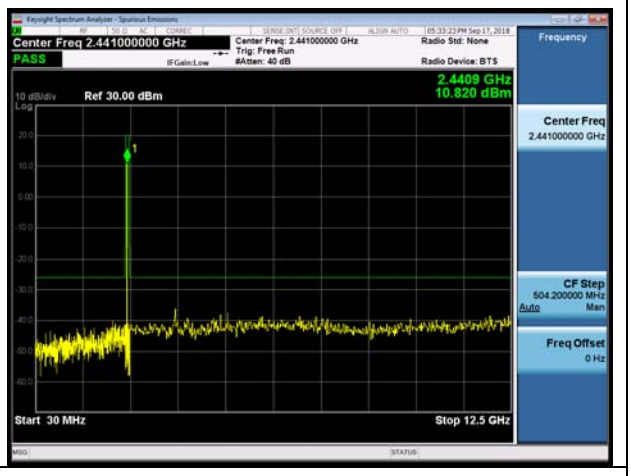
DH5 NV CH0 30MHz to 12.75GHz



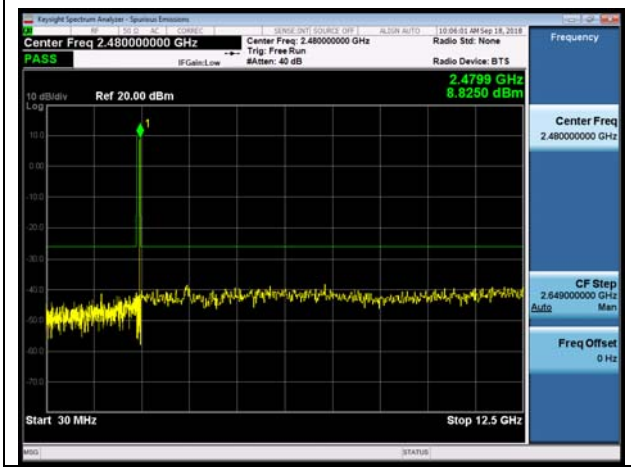
3DH5 LV CH39 30MHz to 12.75GHz



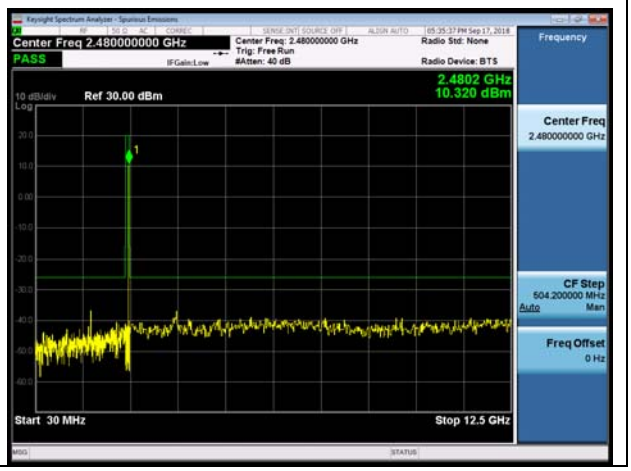
DH5 NV CH39 30MHz to 12.75GHz



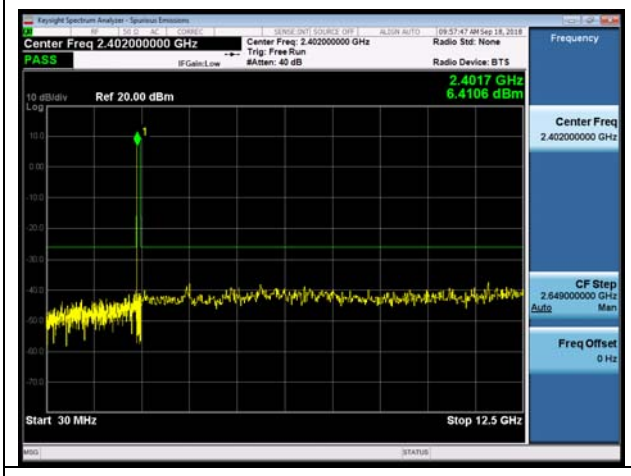
3DH5 LV CH78 30MHz to 12.75GHz



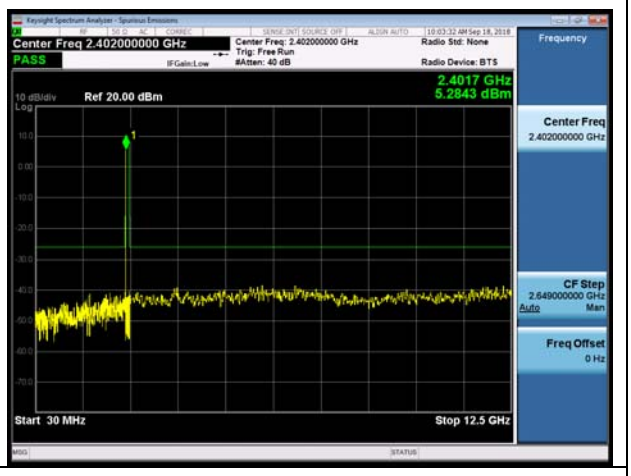
DH5 NV CH78 30MHz to 12.75GHz



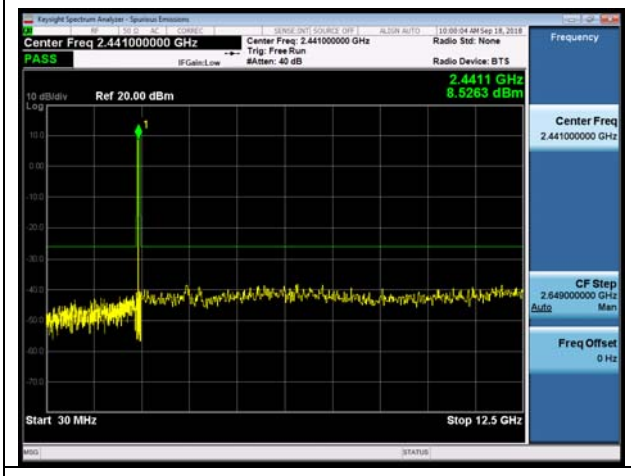
2DH5 NV CH0 30MHz to 12.75GHz



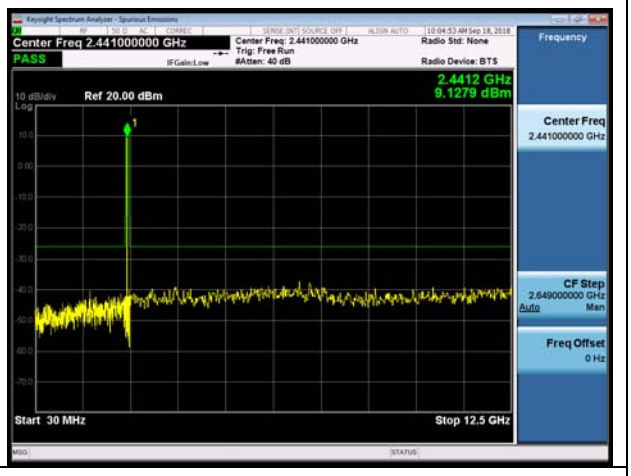
3DH5 NV CH0 30MHz to 12.75GHz



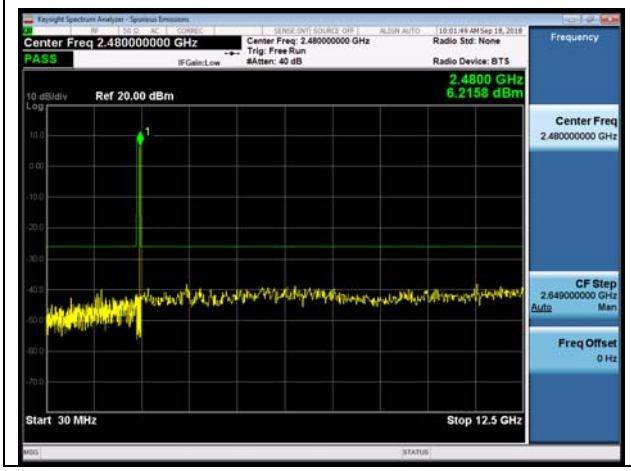
2DH5 NV CH39 30MHz to 12.75GHz



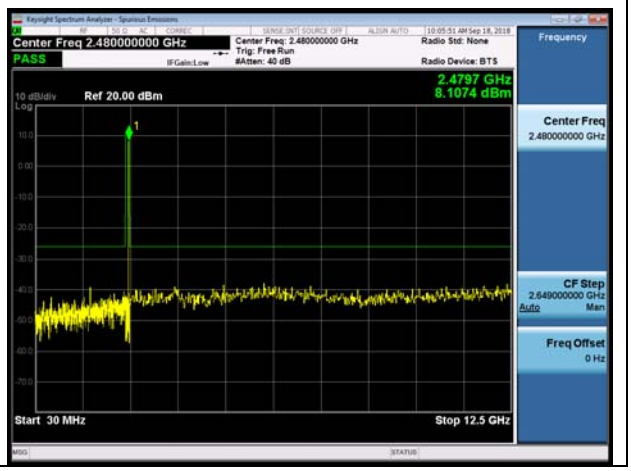
3DH5 NV CH39 30MHz to 12.75GHz



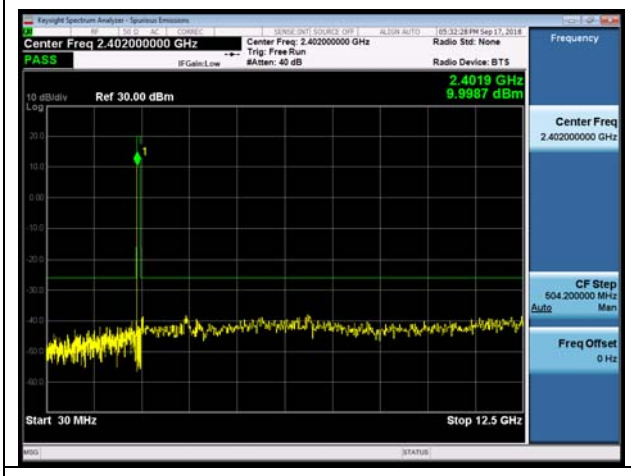
2DH5 NV CH78 30MHz to 12.75GHz



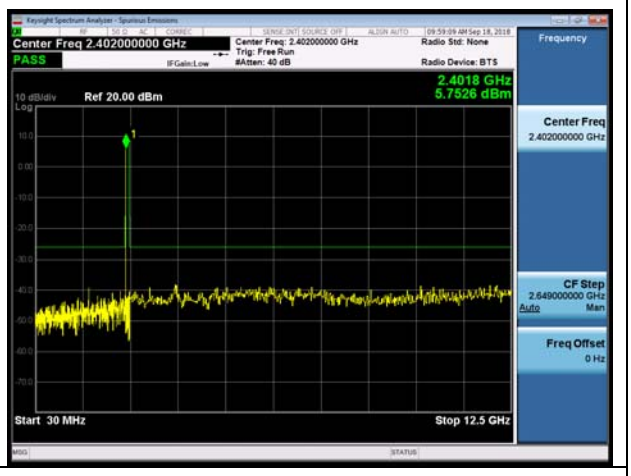
3DH5 NV CH78 30MHz to 12.75GHz



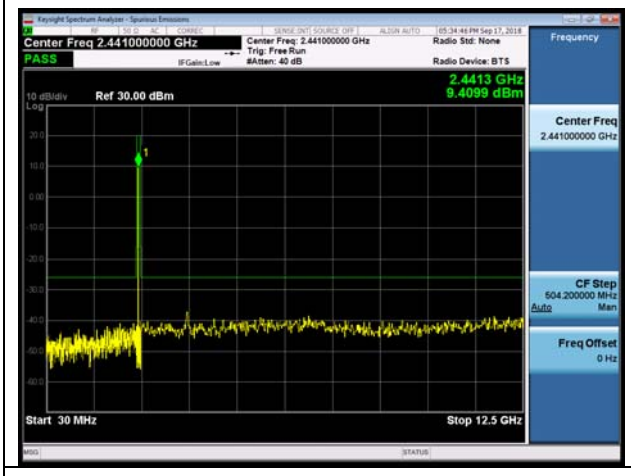
DH5 HV CH0 30MHz to 12.75GHz



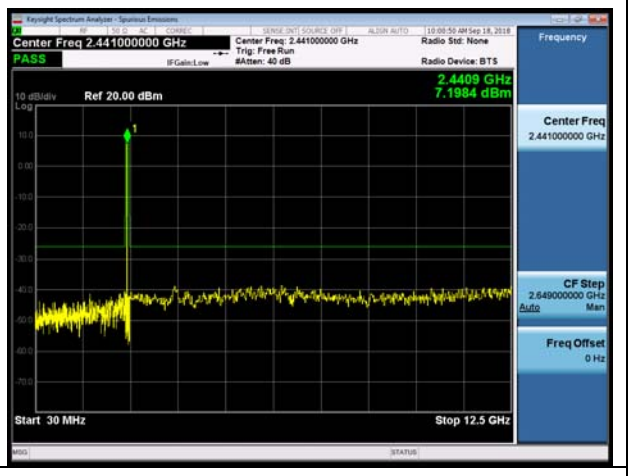
2DH5 HV CH0 30MHz to 12.75GHz



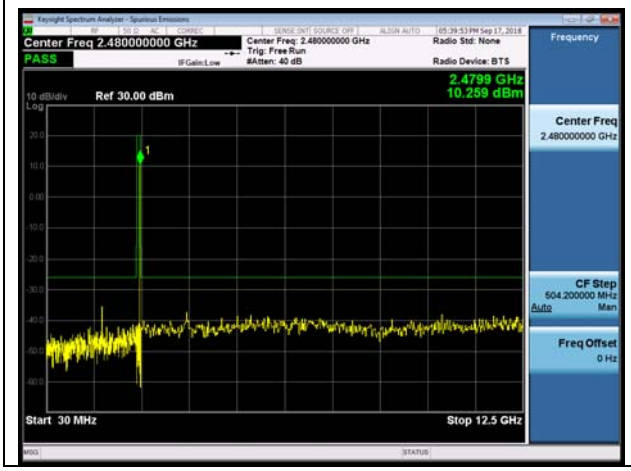
DH5 HV CH39 30MHz to 12.75GHz



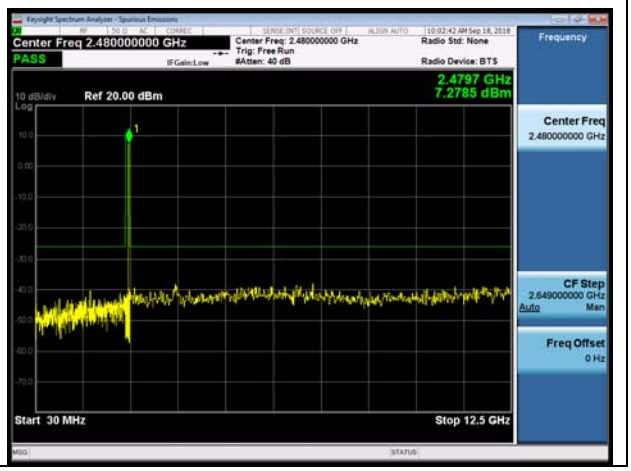
2DH5 HV CH39 30MHz to 12.75GHz



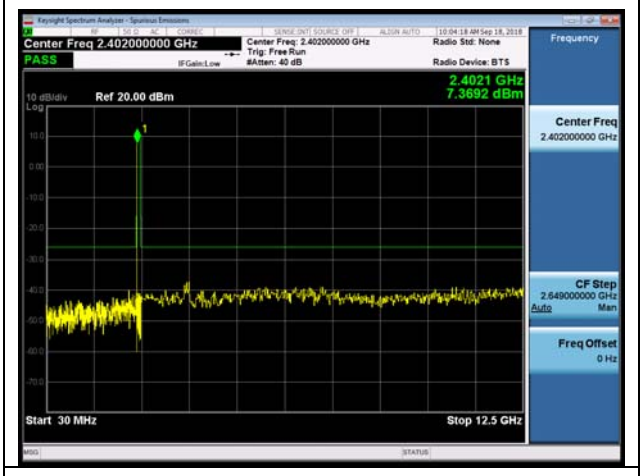
DH5 HV CH78 30MHz to 12.75GHz



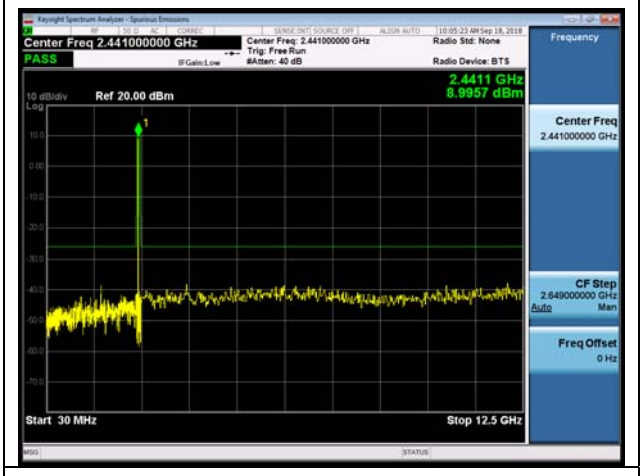
2DH5 HV CH78 30MHz to 12.75GHz



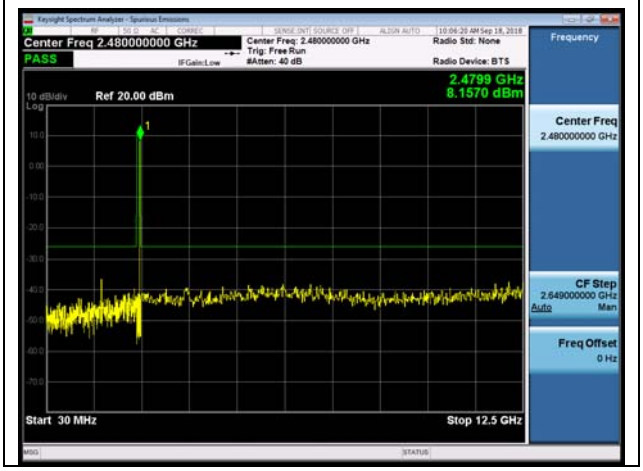
3DH5 HV CH0 30MHz to 12.75GHz



3DH5 HV CH39 30MHz to 12.75GHz



3DH5 HV CH78 30MHz to 12.75GHz



5.5. Limitation of Collateral Emission of Receiver Measurement

Ambient condition

Temperature	Relative humidity	Pressure
25°C	50%	101.5kPa

Method of Measurement

These measurements shall only be performed at normal test conditions and Testing shall be performed when the equipment is in a receive-only mode. The test procedure below shall be used to identify potential unwanted emissions of the UUT.

The measurement shall be performed at the lowest and the highest channel on which the equipment can operate. These frequencies shall be recorded .The following test procedure applies:

Step 1:

The sensitivity of the spectrum analyser should be such that the noise floor is at least 12 dB below the limits given in tables 2 or 5.

Step 2:

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 100 kHz
• Video bandwidth: 100 kHz
• Detector mode: Peak
• Trace Mode: Max Hold
• Sweep Points: ≥ 9 970
• Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5.

Step 3:

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 1 MHz
• Video bandwidth: 1 MHz
• Detector mode: Peak
• Trace Mode: Max Hold
• Sweep Points: ≥ 11 750
• Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above that fall within the 6dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5. Frequency Hopping equipment may generate a block (or several blocks) of spurious emissions anywhere within the spurious domain. If this is the case, only the highest peak of each block of emissions shall be measured using the procedure in clause 5.3.11.2.1.2.

Step 4:

• In case of conducted measurements on smart antenna systems (equipment with multiple receive chains), the steps 2 and 3 need to be repeated for each of the active receive chains (Ach).The limits used to identify emissions during this pre-scan need to be reduced with 10 × log10 (Ach)(number of active receive chains).

Limit

Frequency Range	Limits(dBm)
30MHz to 1GHz	< - 54 dBm(4nW)
1GHz to 12.75GHz	< - 47 dBm(4nW)

Measurement Uncertainty

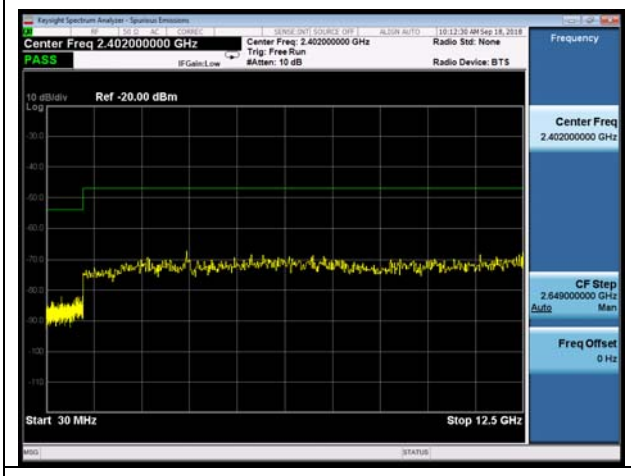
Conducted

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

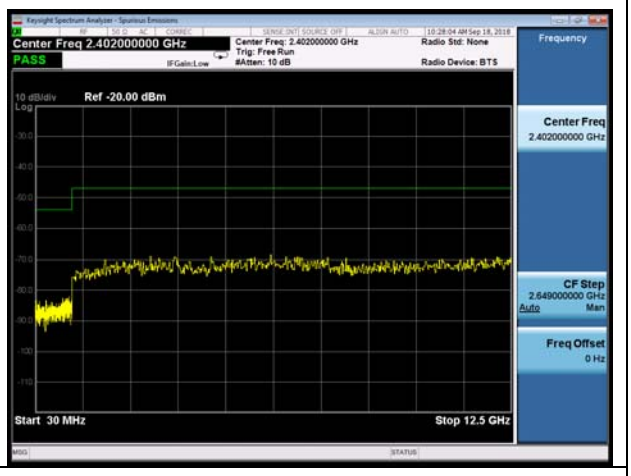
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

Test Results

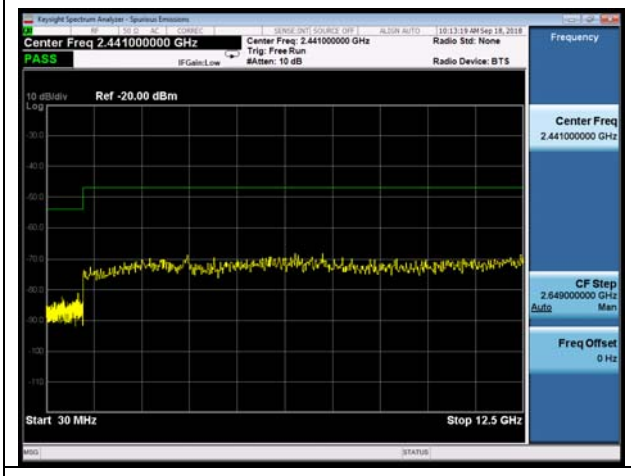
DH5 LV CH0 30MHz to 12.75GHz



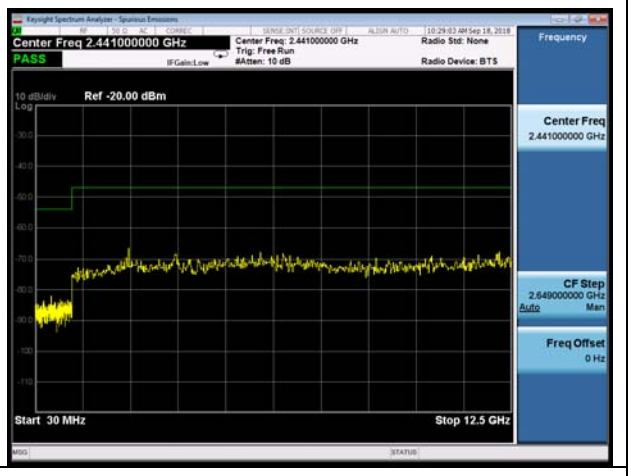
2DH5 LV CH0 30MHz to 12.75GHz



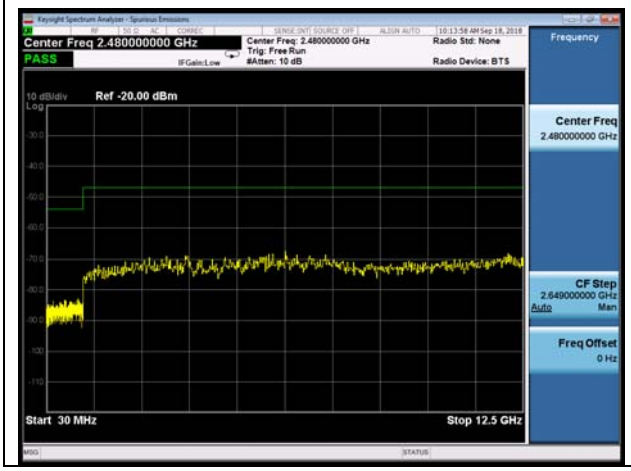
DH5 LV CH39 30MHz to 12.75GHz



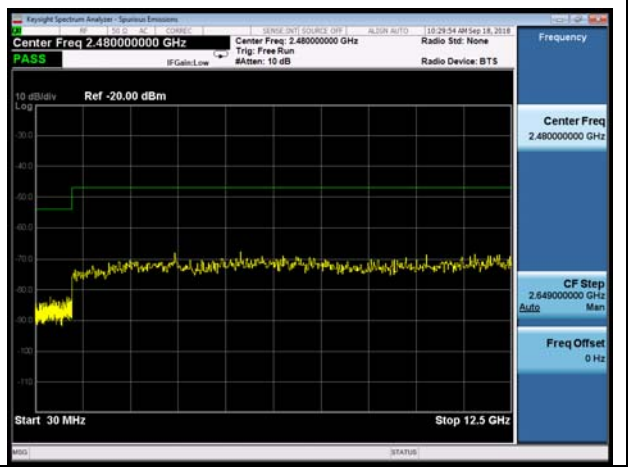
2DH5 LV CH39 30MHz to 12.75GHz



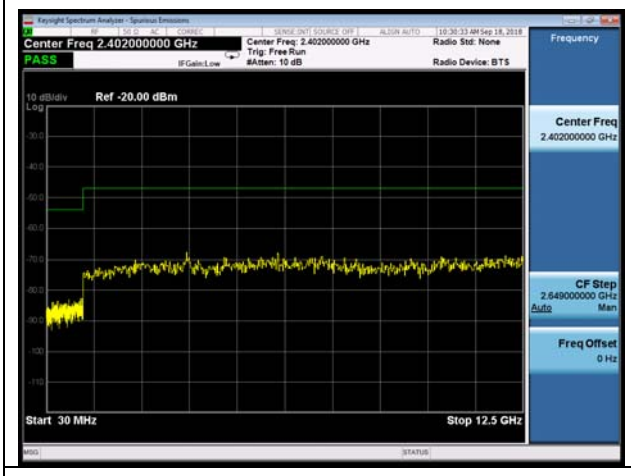
DH5 LV CH78 30MHz to 12.75GHz



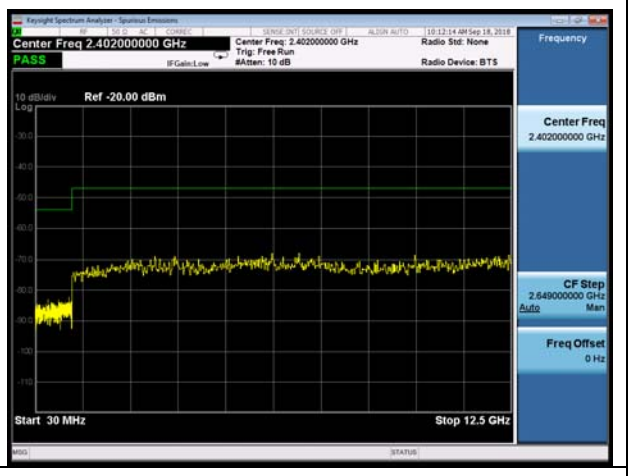
2DH5 LV CH78 30MHz to 12.75GHz



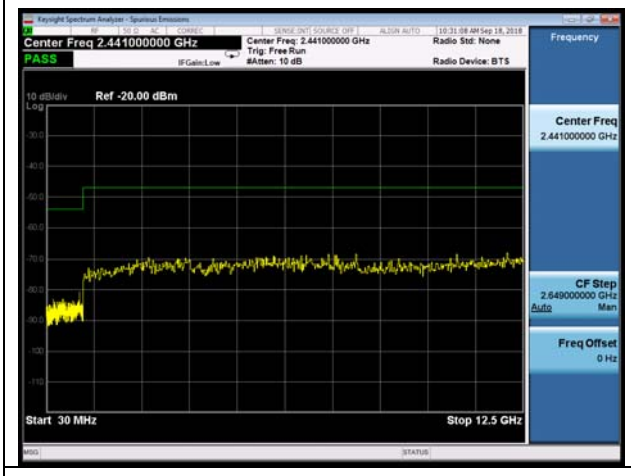
3DH5 LV CH0 30MHz to 12.75GHz



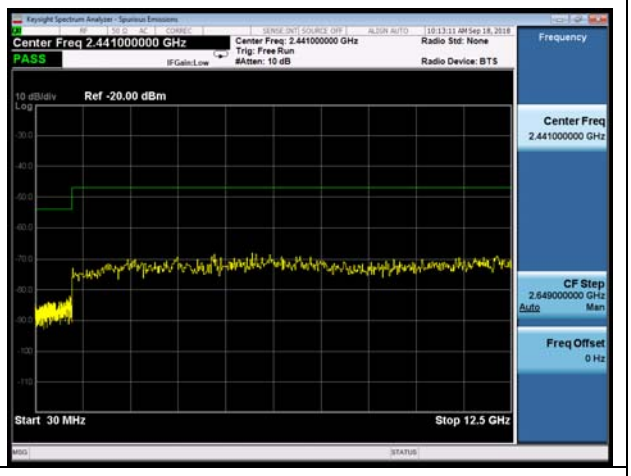
DH5 NV CH0 30MHz to 12.75GHz



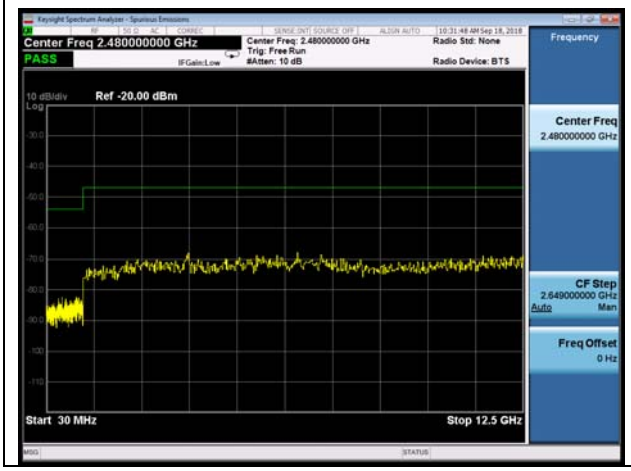
3DH5 LV CH39 30MHz to 12.75GHz



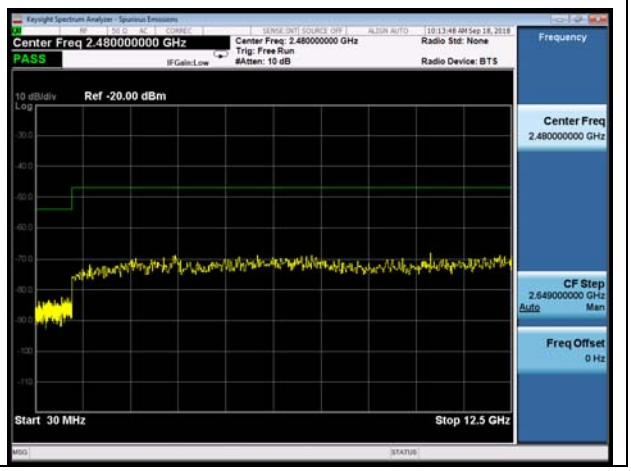
DH5 NV CH39 30MHz to 12.75GHz



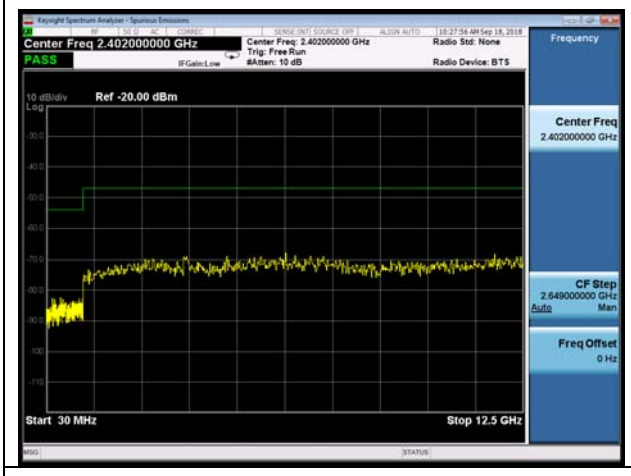
3DH5 LV CH78 30MHz to 12.75GHz



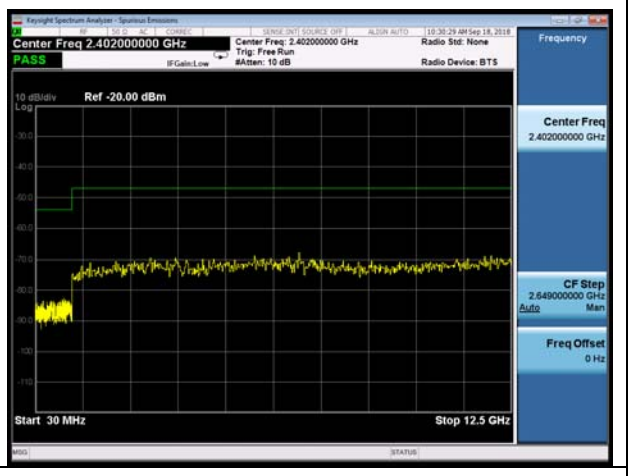
DH5 NV CH78 30MHz to 12.75GHz



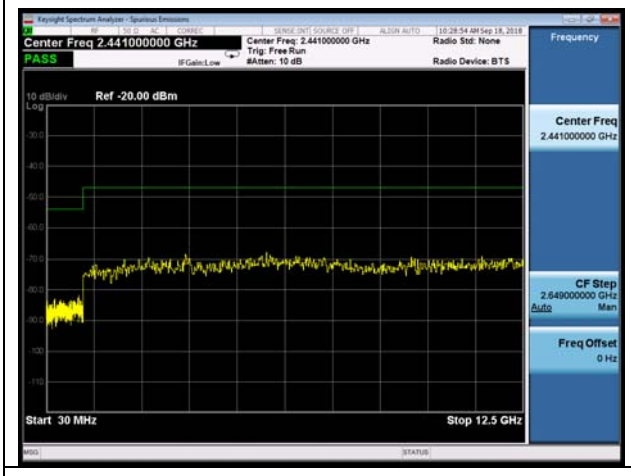
2DH5 NV CH0 30MHz to 12.75GHz



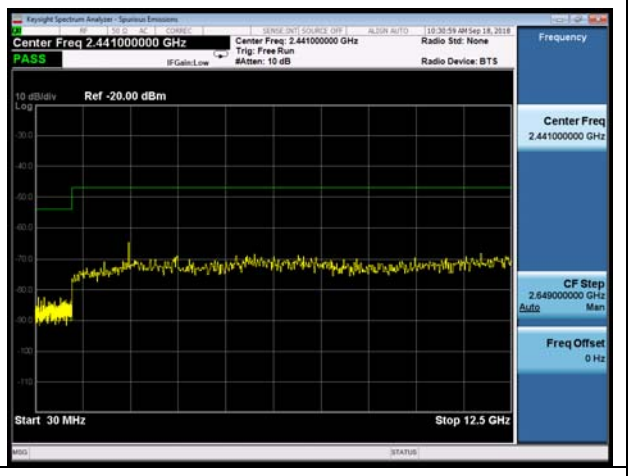
3DH5 NV CH0 30MHz to 12.75GHz



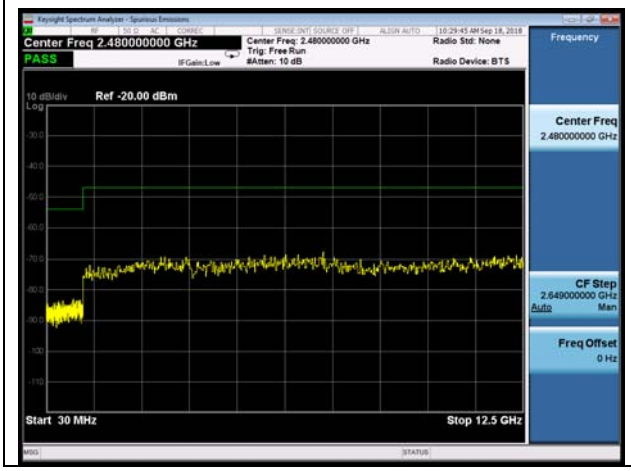
2DH5 NV CH39 30MHz to 12.75GHz



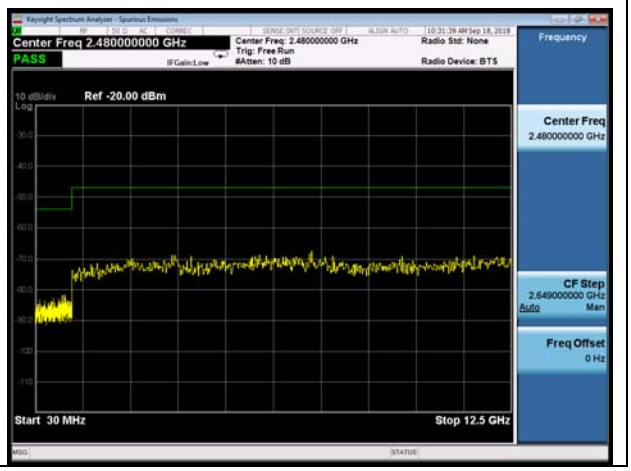
3DH5 NV CH39 30MHz to 12.75GHz



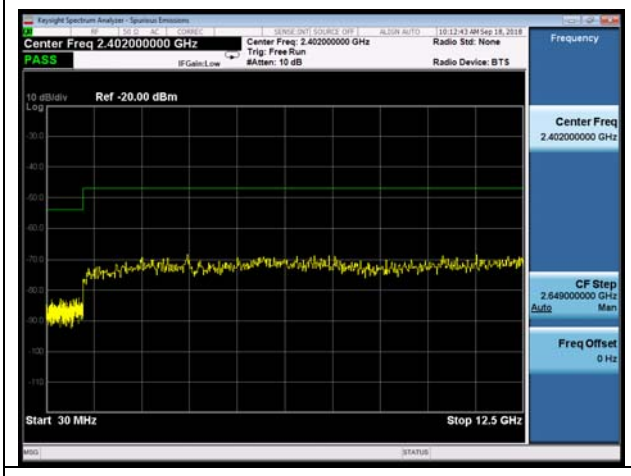
2DH5 NV CH78 30MHz to 12.75GHz



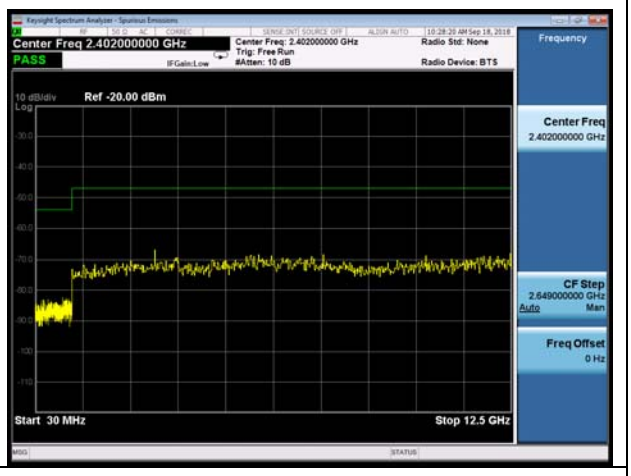
3DH5 NV CH78 30MHz to 12.75GHz



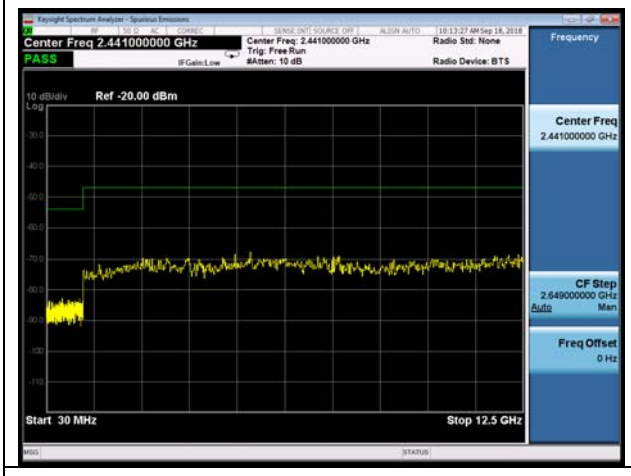
DH5 HV CH0 30MHz to 12.75GHz



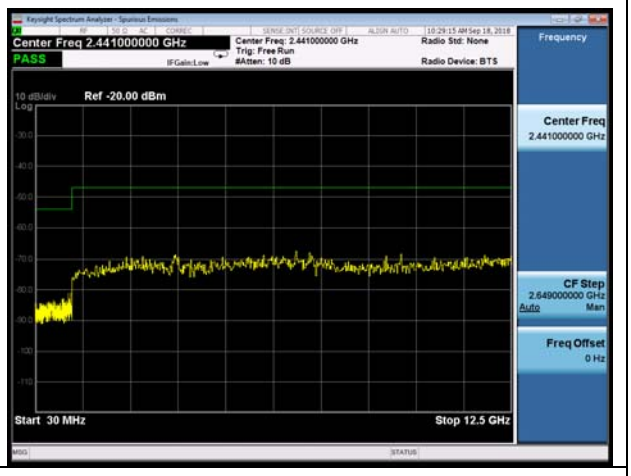
2DH5 HV CH0 30MHz to 12.75GHz



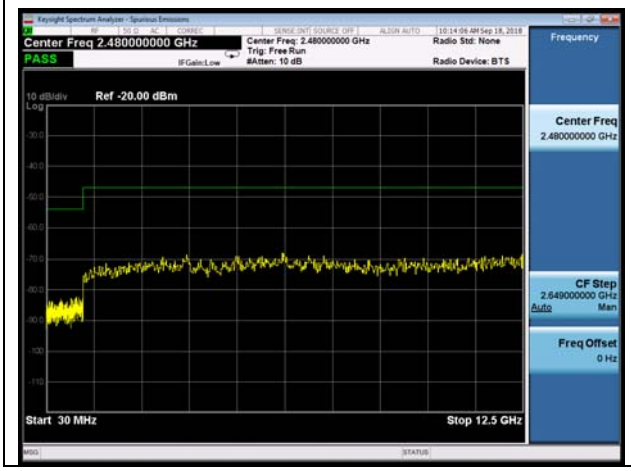
DH5 HV CH39 30MHz to 12.75GHz



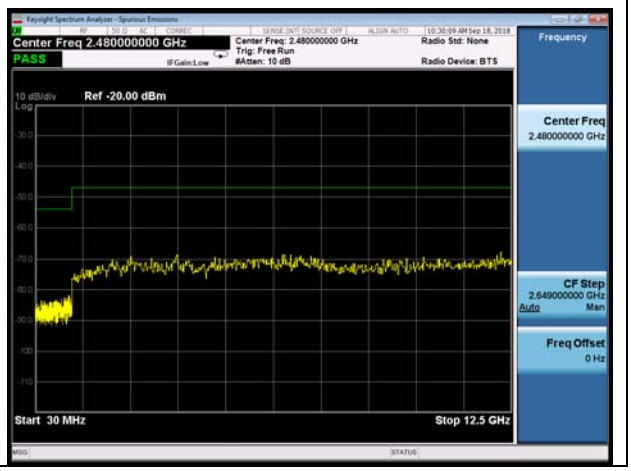
2DH5 HV CH39 30MHz to 12.75GHz



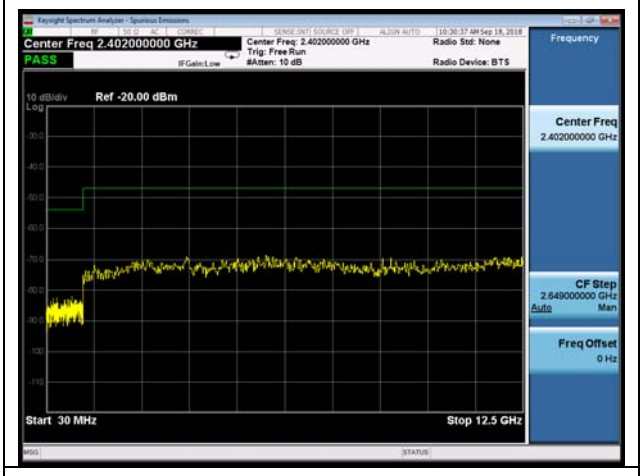
DH5 HV CH78 30MHz to 12.75GHz



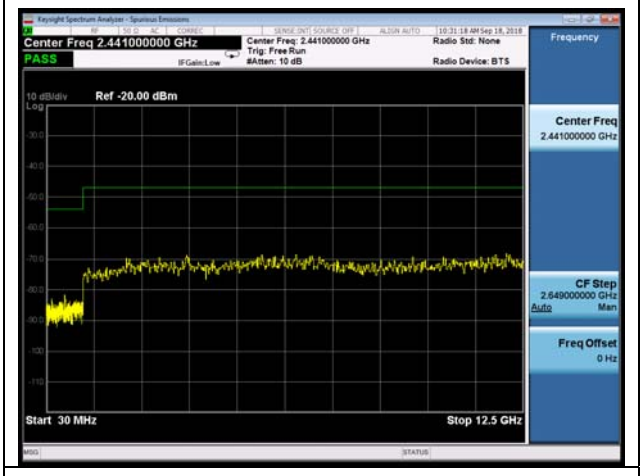
2DH5 HV CH78 30MHz to 12.75GHz



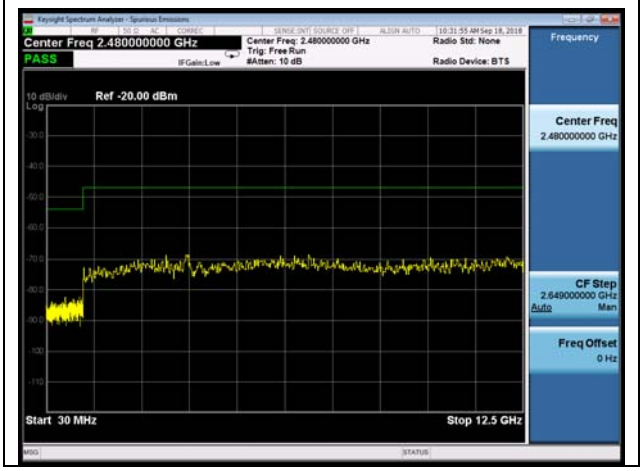
3DH5 HV CH0 30MHz to 12.75GHz



3DH5 HV CH39 30MHz to 12.75GHz



3DH5 HV CH78 30MHz to 12.75GHz



5.6. Retention Time

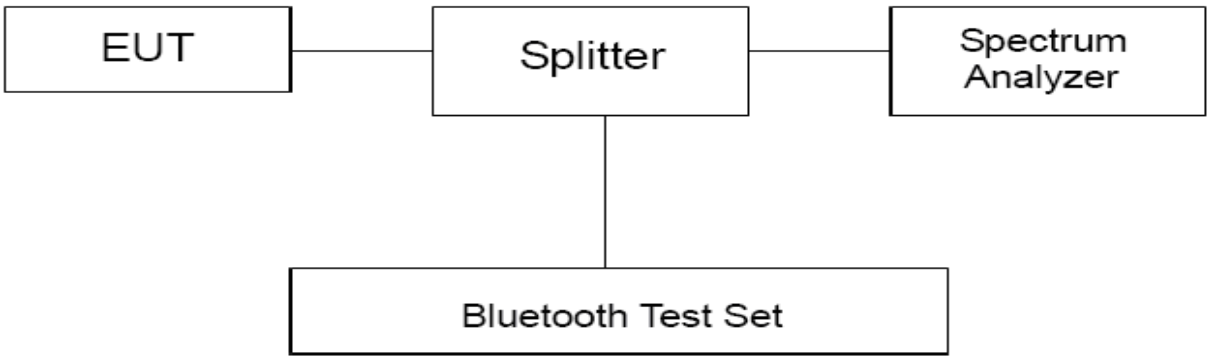
Ambient condition

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 1MHz on spectrum analyzer. The Retention time is calculated by:
Retention time=Scanning times * Pulse time length /1000

Test Setup



Limits

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.”

Retention time	≤0.4s

Measurement Uncertainty

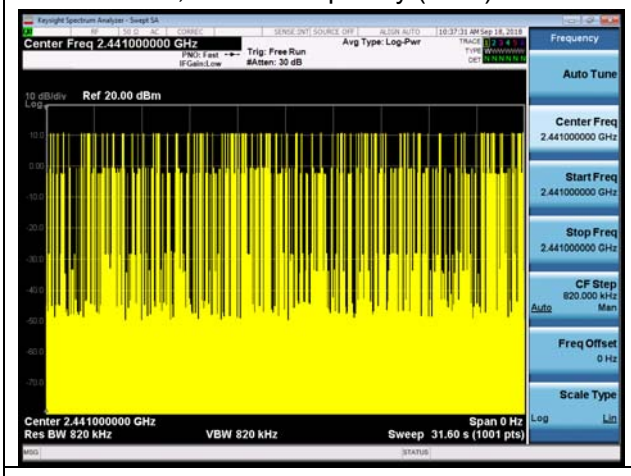
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2.

Requirements	**Uncertainty**					
Retention time	DH5	*U*=0.70ms	2DH5	*U*=0.70ms	3DH5	*U*=0.70ms

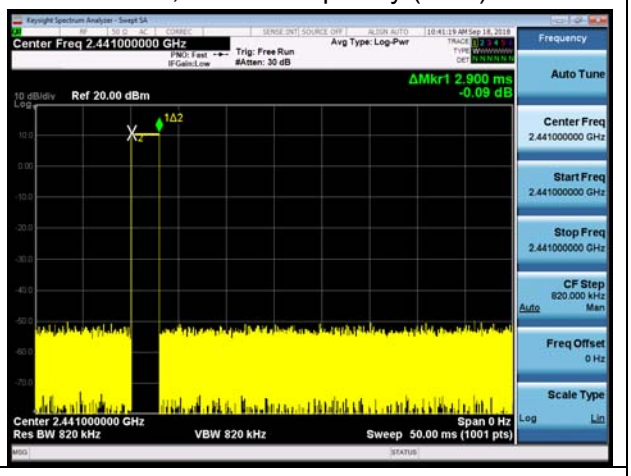
Test Results:

Packet type	Carrier frequency (MHz)	Scanning times N	Pulse time length t (ms)	Retention time (s)	Limit (s)	Conclusion
DH5	2441	85	2.90	0.25	< 0.4s	PASS
2DH5	2441	83	2.90	0.24	< 0.4s	PASS
3DH5	2441	74	2.90	0.21	< 0.4s	PASS
Note: Retention time =Scanning times * Pulse time length /1000						

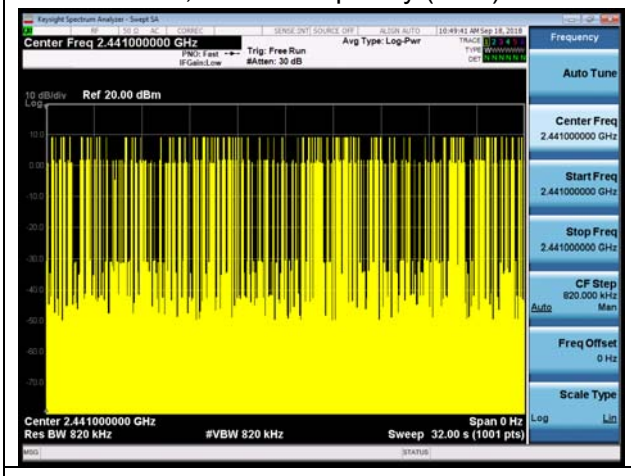
DH5 CH39, Carrier frequency (MHz): 2441-N



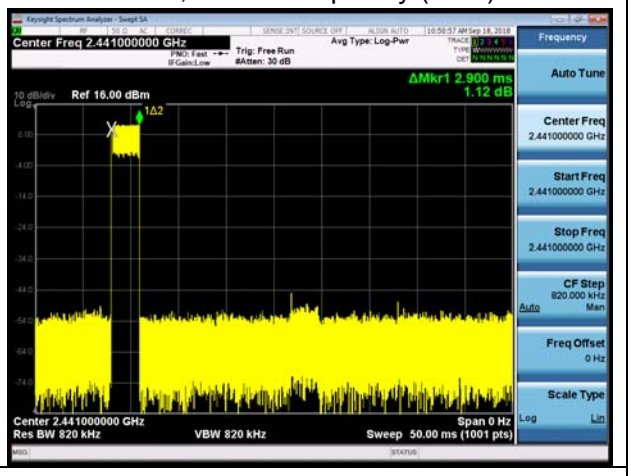
DH5 CH39, Carrier frequency (MHz): 2441-t



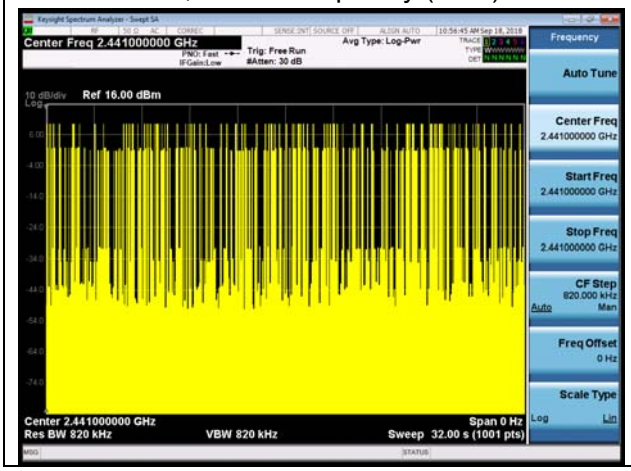
2DH5 CH39, Carrier frequency (MHz): 2441-N



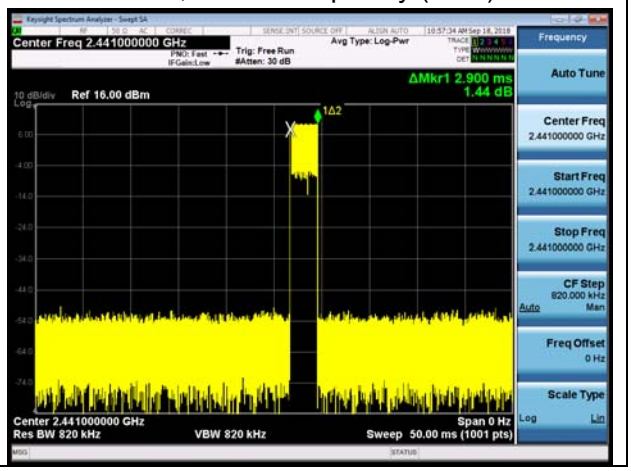
2DH5 CH39, Carrier frequency (MHz): 2441-t



3DH5 CH39, Carrier frequency (MHz): 2441-N



3DH5 CH39, Carrier frequency (MHz): 2441-t



6. Main Test Instrument

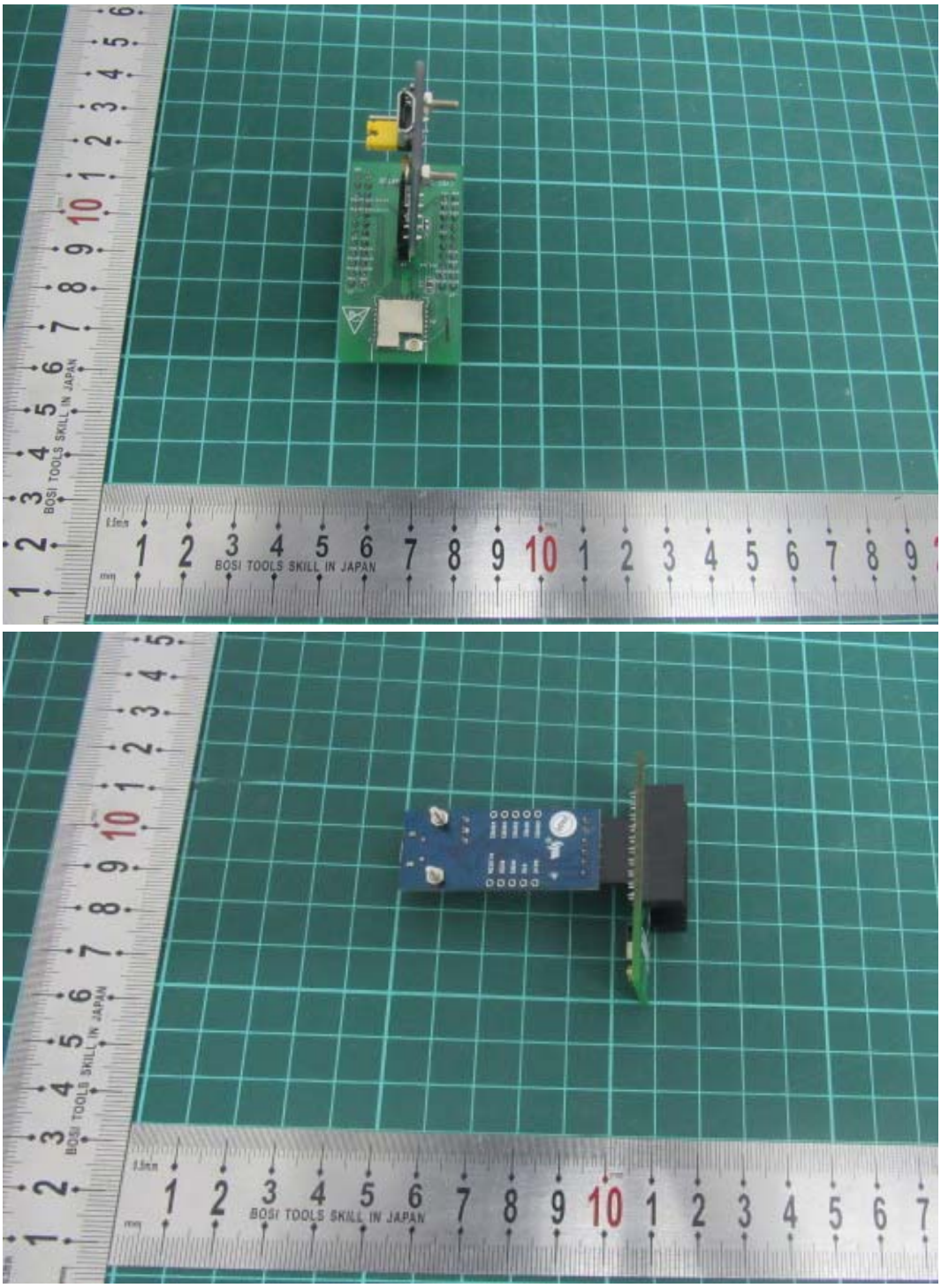
Table 1: List of Main Instruments

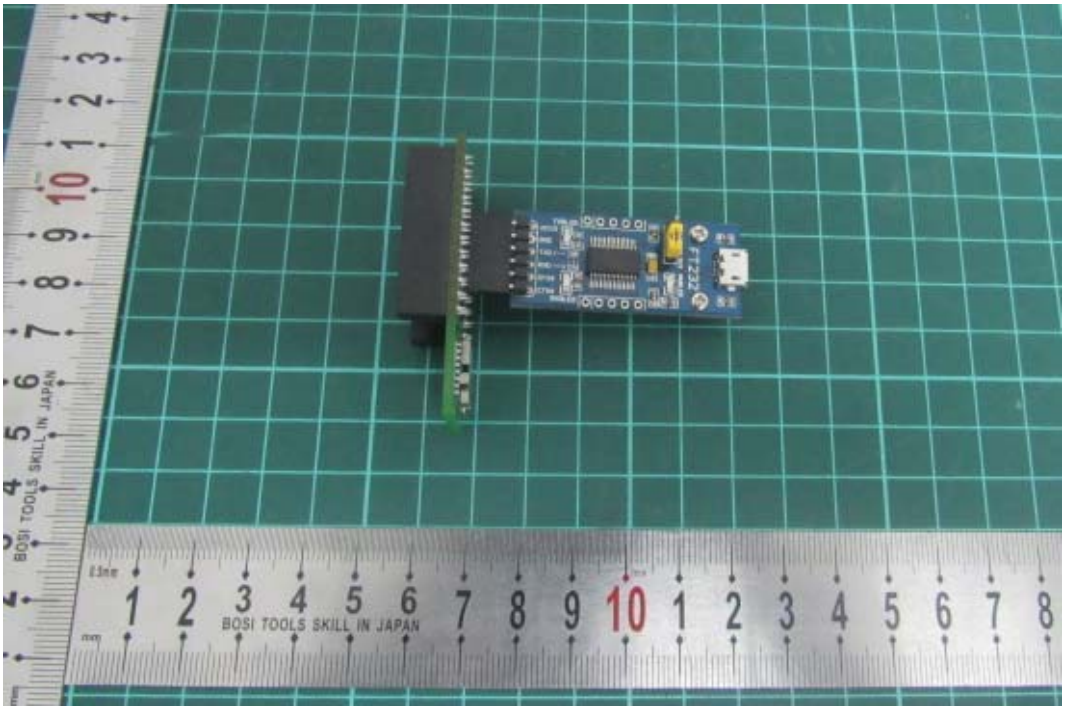
Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
Spectrum Analyzer	FSV30	R&S	100815	2017-12-17	2018-12-16
Climate Chamber	PT-30B	Re Ce	20101891	2015-07-18	2020-07-17
Spectrum Analyzer	N9020A	Agilent	MY54420163	2017-12-17	2018-12-16
Power Meter	NRP2	R&S	1144.1374K02 -104306-EX	2017-12-17	2018-12-16
Power Sensor	NRP-Z21	R&S	102437	2017-12-17	2018-12-16
DC Power Supply	GW Instek	GPS-3030D	GEP882653	2017-05-21	2018-05-20
IQ Analyzer	IQ2010	LITE POINT	IQP08510	2018-05-20	2019-05-19
Notebook	DELL	E450	PE-OH1XWX/ PF-O1P5FC	/	/
Double Ridged Waveguide Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05

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

ANNEX A: EUT Appearance and Test Setup

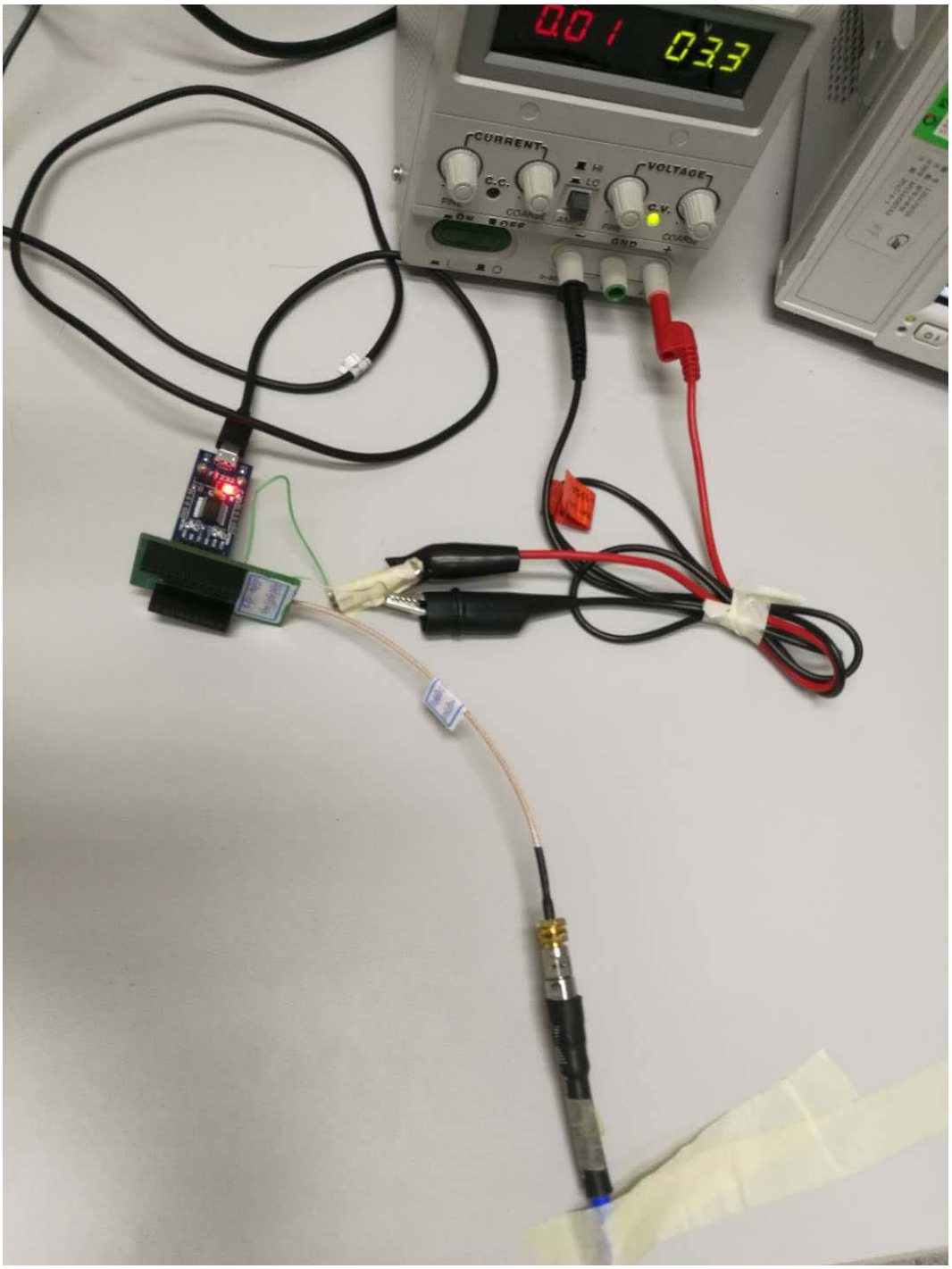
A.1 EUT Appearance





Picture 1 Constituents of EUT

A.2 Test Setup



Picture 2 Test Setup