MEASUREMENT REPORT

FCC PART 15.407 WLAN 802.11a/n/ac

FCC ID:	Q9DAPEX037457
APPLICANT:	Hewlett Packard Enterprise Company
Application Type:	Class III Permissive Change
Product:	ACCESS POINT
Model No.:	APEX0374, APEX0375, APEX0377
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part15 Subpart E (Section 15.407)
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01
Test Date:	August 01 ~ November 25, 2017

Reviewed By : Paddy Chen
(Paddy Chen)

Approved By : Chenz Ker
(Chenz Ker)

ilac-MRA

TAF
Testing Laboratory
3261

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurementreport and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported hereinrelate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1710TW0108-U7	Rev. 01	Initial Report	11-26-2017	Valid

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Description Page

§2.1033General Information

Applicant:	Hewlett Packard Enterprise Company
Applicant Address:	3000 Hanover St. Palo Alto, CA 94304, USA
Manufacturer:	Hewlett Packard Enterprise Company
Manufacturer Address:	3000 Hanover St. Palo Alto, CA 94304, USA
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
FCC Registration No.:	153292
FCC Rule Part(s):	Part15 Subpart E (Section 15.407)
Model No.:	APEX0374, APEX0375, APEX0377
FCC ID:	Q9DAPEX037457
Test Device Serial No.:	APEX0374 (Conducted Sample S/N: CNDNK7Z002, Radiated Sample S/N: CNDNK7Z001)
	APEX0375 (Conducted Sample S/N: CNDJK8001T, Radiated Sample S/N: CNDJK8001L)
	APEX0377 (Conducted Sample S/N: CNDJK8001J, Radiated Sample S/N: CNDNK81002)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- **MRT facility is a FCC registered (Reg. No. 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.**
- **MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (TAF) under the American Association for Laboratory Accreditation Program (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.**

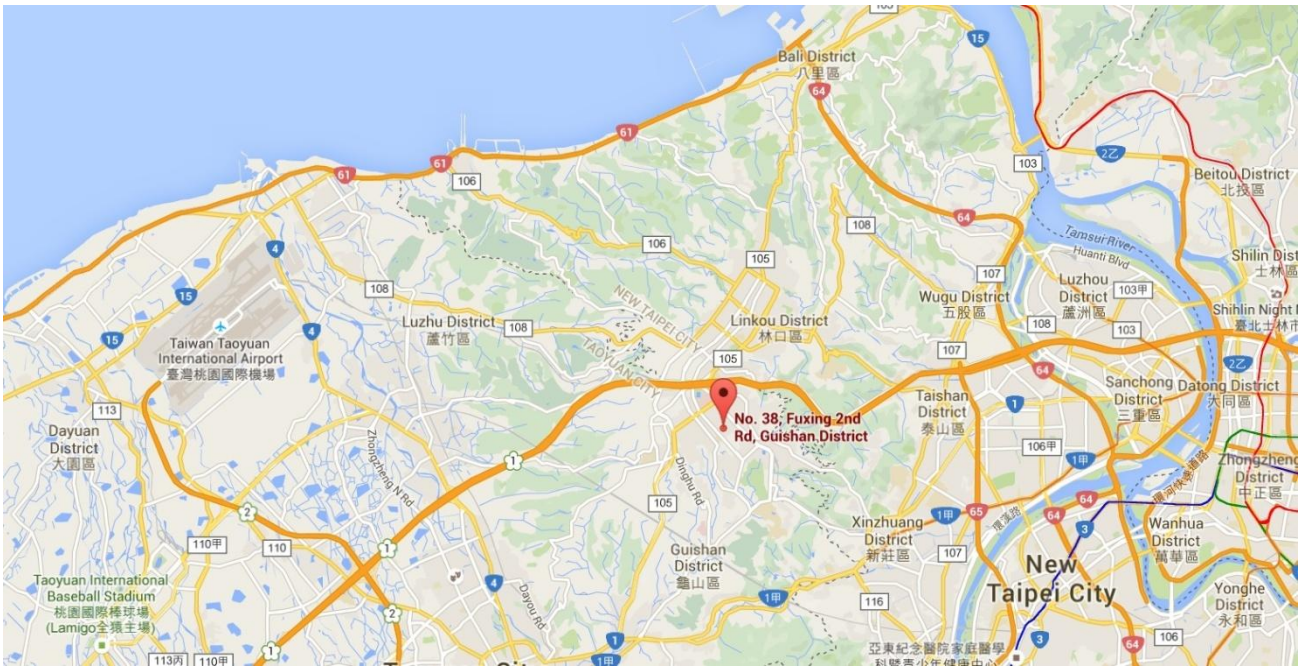
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices includingintentional and/or unintentional radiators for compliance with the technical rules and regulations of the FederalCommunications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	ACCESS POINT
Model No.	APEX0374, APEX0375, APEX0377
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac
Bluetooth Specification:	v4.0 single mode
Software Version:	R660.1.1.0.3.005
Operating Temperature:	-40 ~ 65 °C
Power Type:	POE input or AC adapter input
Operating Environment:	Outdoor Use

Note 1: The difference between three models is that the EUT use different antenna and appearance, other hardware and software are the same. Each model has its own power parameter value.
Note 2: The applicant provide one POE adapter (Manufacturer: MICROSEMI & Model: PD-9001GR/AT/AC) for approval testing, it is not for sale.

2.2. Product Specification Subjective to this Report

Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80/ac-VHT80+80 (Non-contiguous): 5290MHz, 5530MHz, 5610MHz, 5690MHz For 802.11ac-VHT80+80 (Contiguous): 5210MHz + 5290MHz, 5530MHz + 5610MHz
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.2Mbps

Note: For other features of this EUT, test report will be issued separately.

2.3. Working Frequencies for this report

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260 MHz	56	5280 MHz	60	5300 MHz
64	5320 MHz	100	5500 MHz	104	5520 MHz
108	5540 MHz	112	5560 MHz	116	5580 MHz
120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz
144	5720 MHz	--	--	--	--

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz	102	5510 MHz
110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz	142	5710 MHz	--	--

802.11ac-VHT80/ac-VHT80+80 (Non-contiguous)

Channel	Frequency	Channel	Frequency	Channel	Frequency
58	5290 MHz	106	5530 MHz	122	5610 MHz
138	5690 MHz	--	--	--	--

Note: For 802.11ac-VHT80+80 mode, Ant 0 & Ant 1 ports work on one frequency of the above table, Ant 2 & Ant 3 ports work on another frequency of the above table. E.g. channel 58 + 138 group, channel 58 will transmit by Ant 0+1 ports and channel 138 will transmit by Ant 2+3 ports. Only channel 122 and channel 5690 can't transmit simultaneously.

802.11 ac-VHT80+80 (Contiguous)

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	--	--
106	5530 MHz	122	5610 MHz	--	--

Note: For example, Ant 0 & 1 ports operate on one 80MHz channel 42, while Ant 2 & 3 ports operate on the adjacent 80MHz channel 58.

2.4. Description of Available Antennas

For Model No.: APEX0374

Antenna No.	Polarization	Frequency Band (GHz)	Model No.	Max Peak Gain (dBi)	30 Degree Antenna Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
							For Power	For PSD
Wi-Fi External Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)								
1 (Note 3)	**Omni**	**2.4**	**ANT-2x2-2005**	**5.0**	**N/A**	**0.0**	**5.0**	**5.00**
2 (Note 3)	**Omni**	**5**	**ANT-2x2-5005**	**5.0**	**0**	**3.0**	**5.0**	**8.01**
3 (Note 3)	**Directional**	**2.4**	**ANT-2x2-2314**	**14.0**	**N/A**	**0.0**	**14.0**	**14.0**
4 (Note 3)	Directional	5	ANT-3x3-5712	11.5	1.5	3.0	11.5	14.51
5 (Note 3)	Directional	5	ANT-4x4-5314	14.0	6.0	3.0	14.0	17.01
6 (Note 3)	**Directional**	**5**	**MT-484052/NVH**	**16.0**	**3.0**	**3.0**	**16.0**	**19.01**
7 (Note 3)	Directional	2.4	ANT-3x3-D608	7.5	N/A	3.0	7.5	10.51
		5		7.5	4.5	3.0	7.5	10.51
8 (Note 3)	Directional	2.4	ANT-3x3-D100	5.0	N/A	3.0	5.0	8.01
		5		5.0	4.0	3.0	5.0	8.01
Bluetooth Internal Antenna								
PCB		2.4	N/A	3.0	N/A			

For Model No.: APEX0375

Polarization	Frequency Band (GHz)	Max Peak Gain (dBi)	30 Degree Antenna Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)						
Directional (Note 3)	2.4	4.0	N/A	0.0	4.0	4.00
Directional (Note 3)	5	4.6	-4.0	3.0	4.6	7.61
Bluetooth Internal Antenna						
PCB	2.4	4.5	N/A			

For Model No.: APEX0377

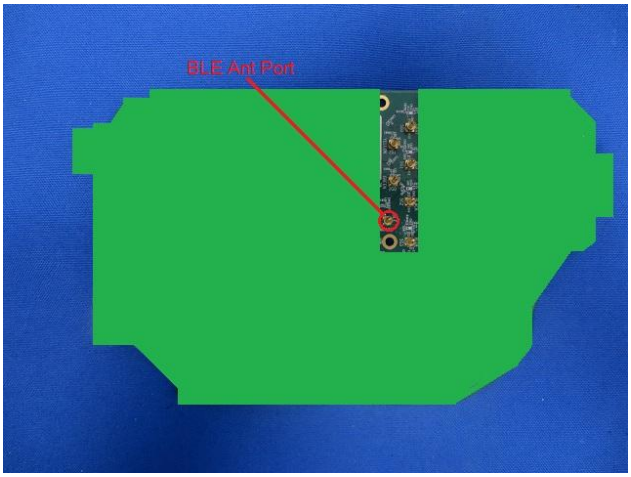
Polarization	Frequency Band (GHz)	Max Peak Gain (dBi)	30 Degree Antenna Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)						
Directional (Note 3)	2.4	6.4	N/A	0.0	6.4	6.40
Directional (Note 3)	5	6.3	6.3	3.0	6.3	9.31
Bluetooth Internal Antenna						
PCB	2.4	6.7	N/A			

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.
   If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
   - For power spectral density (PSD) measurements on all devices,
     Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for $N_{ANT} \leq 4$;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a/b/g.
   Directional gain = G_{ANT} + BF Gain, BF Gain was declared by the applicant.
3. These antennas have Cross-Polarized design, the detail see the antenna specification.
4. For Model No.: APEX0374, we selected the max peak gain antenna of each type to perform RF testing. (Omni antenna 1# and 2#, Directional antenna 3# and 6#)

2.5. Description of Antenna RF Port

<table>
<tr><td colspan="7">Antenna RF Port</td></tr>
<tr><td>--</td><td colspan="2">2.4GHz RF Port</td><td colspan="4">5GHz RF Port</td></tr>
<tr><td>Software Control Port</td><td>Ant 0</td><td>Ant 1</td><td>Ant 0</td><td>Ant 1</td><td>Ant 2</td><td>Ant 3</td></tr>
<tr><td colspan="7">APEX0374</td></tr>
<tr><td colspan="7"> 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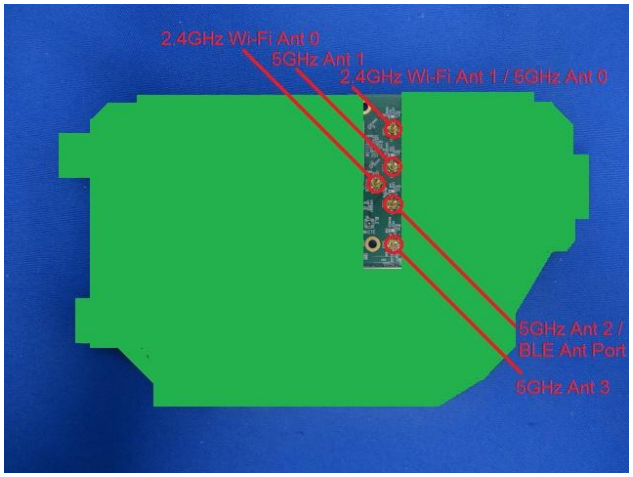
<tr><td colspan="4">APEX0375</td><td colspan="3">APEX0377</td></tr>
<tr><td colspan="4"> 
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2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11a (6Mbps)
	Mode 2: Transmit by 802.11n-HT20 (MCS0)
	Mode 3: Transmit by 802.11n-HT40 (MCS0)
	Mode 4: Transmit by 802.11ac-VHT20 (MCS0)
	Mode 5: Transmit by 802.11ac-VHT40 (MCS0)
	Mode 6: Transmit by 802.11ac-VHT80 (MCS0)
	Mode 7: Transmit by 802.11ac-VHT80+80 Non-contiguous (MCS0)
	Mode 8: Transmit by 802.11ac-VHT80+80 Contiguous (MCS0)

5GHz Test Mode	Ant 0 + 1 + 2 + 3	
	CDD	Beam-Forming
802.11a	√	×
802.11n-HT20	√	√
802.11n-HT40	√	√
802.11ac-VHT20	√	√
802.11ac-VHT40	√	√
802.11ac-VHT80	√	√
802.11ac-VHT80+80 (Non-Contiguous)	√	√
802.11ac-VHT80+80 (Contiguous)	√	×

2.7. Description of Test Software

The test utility software used during testing was“QCARCT”, and the version was “v3.0.174.0”.

Power Parameter Value for APEX0374 / Omni Antenna (ANT-2x2-5005):

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11a	52	5260	14.0	--
	60	5300	13.5	--
	64	5320	13.5	--
	100	5500	13.0	--
	120	5600	13.0	--
	140	5700	13.5	--
	144	5720	13.5	--
802.11n-HT20	52	5260	14.5	14.5
	60	5300	14.5	14.5
	64	5320	14.5	14.5
	100	5500	14.0	14.0
	120	5600	14.0	14.0
	140	5700	14.5	14.5
	144	5720	14.5	14.5
802.11n-HT40	62	5310	17.0	15.5
	102	5510	16.0	15.0
	118	5590	16.0	15.0
	134	5670	16.5	15.0
	142	5710	16.5	15.0
802.11ac-VHT20	52	5260	14.5	14.5
	60	5300	14.5	14.5
	64	5320	14.5	14.5
	100	5500	14.0	14.0
	120	5600	14.0	14.0
	140	5700	14.5	14.5
	144	5720	14.5	14.5

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11ac-VHT40	54	5270	17.0	15.5
	62	5310	17.0	15.5
	102	5510	16.0	16.0
	118	5590	16.0	16.0
	134	5670	16.5	15.0
	142	5710	16.5	15.5
802.11ac-VHT80	58	5290	18.0	15.5
	106	5530	18.0	15.0
	122	5610	18.0	15.0
	138	5690	18.0	15.0
802.11ac-VHT80+80 Contiguous	42	5210	17.0	--
	58	5290		
	106	5530	17.0	--
	122	5610		

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value for CDD & Beam-Forming Mode	
			Ant 0 + 1 / Ant 0 + 1 + 2 + 3	Ant 2 + 3 / Ant 0 + 1 + 2 + 3
Non-contiguous 80+80 MHz mode fall within different UNII band				
802.11ac-VHT80+80	58	5290	21.0	--
	58	5290	--	20.5
	106	5530	20.5	--
	106	5530	--	20.5
	122	5610	20.5	--
	122	5610	--	20.0
	138	5690	20.5	--
	138	5690	--	20.0
Non-contiguous 80+80 MHz mode fall within same UNII band				
802.11ac-VHT80+80	106	5530	17.5	--
	138	5690	--	17.5
	106	5530	--	17.5
	138	5690	17.5	--

Power Parameter Value for APEX0374 / Directional Antenna (MT-484052/NVH):

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11a	52	5260	4.0	--
	60	5300	4.0	--
	64	5320	4.0	--
	100	5500	3.0	--
	120	5600	3.0	--
	140	5700	3.0	--
	144	5720	3.0	--
802.11n-HT20	52	5260	4.0	4.0
	60	5300	4.0	4.0
	64	5320	4.0	4.0
	100	5500	3.5	3.5
	120	5600	3.0	3.0
	140	5700	3.5	3.5
	144	5720	3.5	3.5
802.11n-HT40	54	5270	6.5	5.0
	62	5310	6.5	5.0
	102	5510	5.5	5.0
	118	5590	5.5	5.0
	134	5670	5.5	5.0
	142	5710	5.5	5.0
802.11ac-VHT20	52	5260	4.0	4.0
	60	5300	4.0	4.0
	64	5320	4.0	4.0
	100	5500	3.5	3.5
	120	5600	3.5	3.5
	140	5700	3.5	3.5
	144	5720	3.5	3.5

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11ac-VHT40	54	5270	6.5	4.5
	62	5310	6.5	4.5
	102	5510	5.5	4.0
	118	5590	5.5	4.0
	134	5670	5.5	4.0
	142	5710	5.5	4.0
802.11ac-VHT80	58	5290	7.5	4.0
	106	5530	7.5	4.0
	122	5610	7.5	4.0
	138	5690	7.0	4.0
802.11ac-VHT80+80 Contiguous	42	5210	10.0	--
	58	5290		
	106	5530	7.0	--
	122	5610		

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value for CDD & Beam-Forming Mode	
			Ant 0 + 1 / Ant 0 + 1 + 2 + 3	Ant 2 + 3 / Ant 0 + 1 + 2 + 3
Non-contiguous 80+80 MHz mode fall within different UNII band				
802.11ac-VHT80+80	58	5290	10.5	--
	58	5290	--	10.5
	106	5530	10.5	--
	106	5530	--	10.5
	122	5610	10.5	--
	122	5610	--	10.5
	138	5690	10.5	--
	138	5690	--	10.5
Non-contiguous 80+80 MHz mode fall within same UNII band				
802.11ac-VHT80+80	106	5530	7.5	--
	138	5690	--	7.5
	106	5530	--	7.5
	138	5690	7.5	--

Power Parameter Value for APEX0375:

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11a	52	5260	12.5	--
	60	5300	12.5	--
	64	5320	12.5	--
	100	5500	11.5	--
	120	5600	12.0	--
	140	5700	12.0	--
	144	5720	12.0	--
802.11n-HT20	52	5260	12.5	12.5
	60	5300	12.5	12.5
	64	5320	13.0	13.0
	100	5500	12.0	12.0
	120	5600	12.5	12.5
	140	5700	13.0	13.0
	144	5720	13.0	13.0
802.11n-HT40	54	5270	15.0	14.5
	62	5310	15.0	14.5
	102	5510	14.5	14.5
	118	5590	14.5	14.5
	134	5670	15.0	14.0
	142	5710	15.0	14.0
802.11ac-VHT20	52	5260	12.5	12.5
	60	5300	12.5	12.5
	64	5320	13.0	13.0
	100	5500	12.0	12.0
	120	5600	12.5	12.5
	140	5700	13.0	13.0
	144	5720	13.0	13.0

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11ac-VHT40	54	5270	15.0	14.5
	62	5310	15.0	14.5
	102	5510	14.5	14.5
	118	5590	14.5	14.0
	134	5670	15.0	14.0
	142	5710	15.0	14.0
802.11ac-VHT80	58	5290	16.0	14.0
	106	5530	15.5	14.0
	122	5610	15.5	14.0
	138	5690	15.5	14.0
802.11ac-VHT80+80 Contiguous	42	5210	19.0	--
	58	5290		
	106	5530	15.5	--
	122	5610		

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value for CDD & Beam-Forming Mode	
			Ant 0 + 1 / Ant 0 + 1 + 2 + 3	Ant 2 + 3 / Ant 0 + 1 + 2 + 3
Non-contiguous 80+80 MHz mode fall within different UNII band				
802.11ac-VHT80+80	58	5290	19.0	--
	58	5290	--	19.0
	106	5530	19.0	--
	106	5530	--	19.0
	122	5610	19.5	--
	122	5610	--	19.0
	138	5690	19.5	--
	138	5690	--	19.5
Non-contiguous 80+80 MHz mode fall within same UNII band				
802.11ac-VHT80+80	106	5530	16.0	--
	138	5690	--	16.0
	106	5530	--	16.5
	138	5690	16.5	--

Power Parameter Value for APEX0377:

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11a	52	5260	11.0	--
	60	5300	11.0	--
	64	5320	11.0	--
	100	5500	10.5	--
	120	5600	10.0	--
	140	5700	10.0	--
	144	5720	10.5	--
802.11 n-HT20	48	5240	9.0	6.0
	52	5260	11.5	11.5
	60	5300	11.5	11.5
	64	5320	11.5	11.5
	100	5500	11.0	11.0
	120	5600	10.5	10.5
	140	5700	10.5	10.5
	144	5720	10.5	10.5
802.11n-HT40	54	5270	13.5	12.5
	62	5310	13.5	12.5
	102	5510	13.0	12.0
	118	5590	13.0	12.0
	134	5670	13.0	12.0
	142	5710	12.5	12.5
802.11ac-VHT20	52	5260	11.5	11.5
	60	5300	11.5	11.5
	64	5320	11.5	11.5
	100	5500	11.0	11.0
	120	5600	10.5	10.5
	140	5700	10.5	10.5
	144	5720	10.5	10.5

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	
			CDD Mode	Beam-Forming Mode
802.11ac-VHT40	54	5270	13.5	12.5
	62	5310	13.5	12.5
	102	5510	13.0	12.0
	118	5590	12.5	12.0
	134	5670	12.5	12.0
	142	5710	12.5	12.0
802.11ac-VHT80	58	5290	15.5	12.5
	106	5530	15.0	12.0
	122	5610	15.0	12.0
	138	5690	15.0	12.0
802.11ac-VHT80+80 Contiguous	42	5210	11.0	--
	58	5290		
	106	5530	15.5	--
	122	5610		

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value for CDD & Beam-Forming Mode	
			Ant 0 + 1 / Ant 0 + 1 + 2 + 3	Ant 2 + 3 / Ant 0 + 1 + 2 + 3
Non-contiguous 80+80 MHz mode fall within different UNII band				
802.11ac-VHT80+80	58	5290	18.5	--
	58	5290	--	19.0
	106	5530	18.0	--
	106	5530	--	18.5
	122	5610	18.0	--
	122	5610	--	18.5
	138	5690	18.0	--
	138	5690	--	18.5
Non-contiguous 80+80 MHz mode fall within same UNII band				
802.11ac-VHT80+80	106	5530	15.5	--
	138	5690	--	15.5
	106	5530	--	15.5
	138	5690	15.5	--

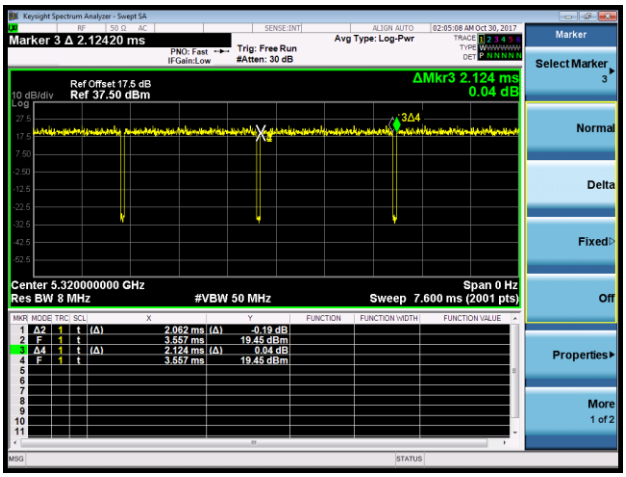
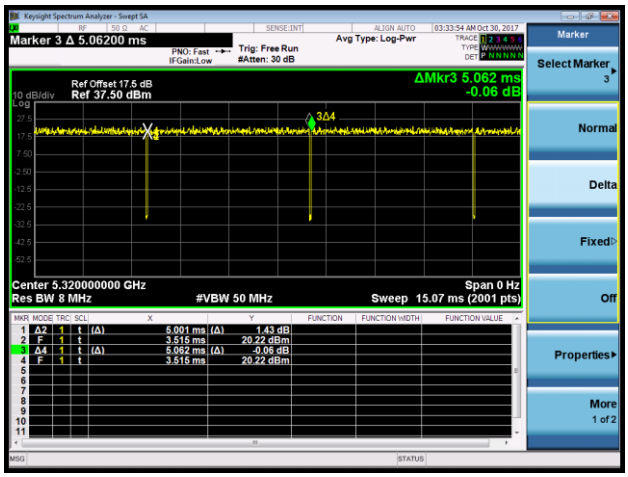
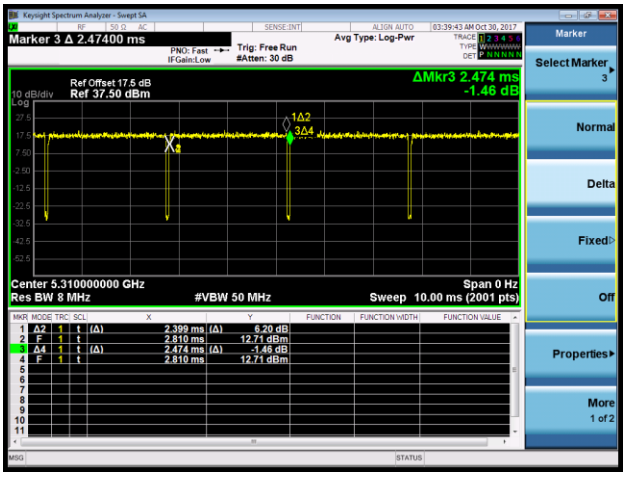
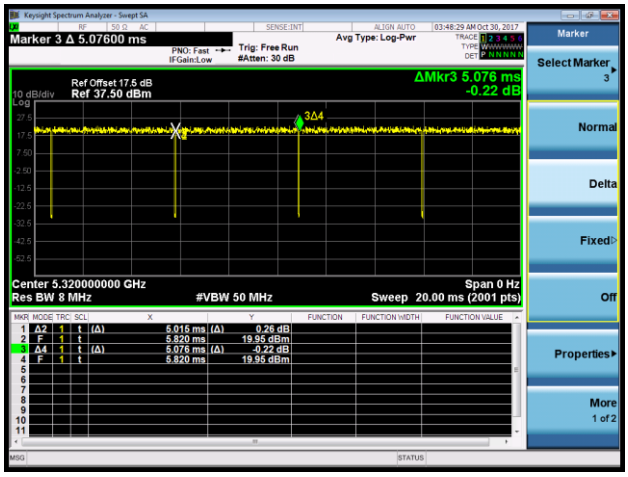
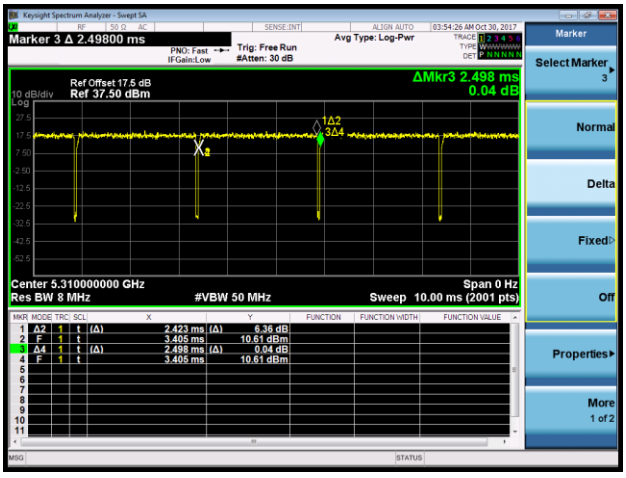
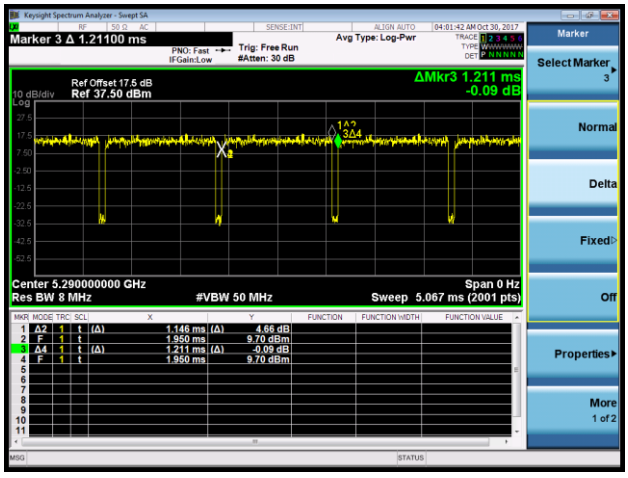
2.8. Device Capabilities

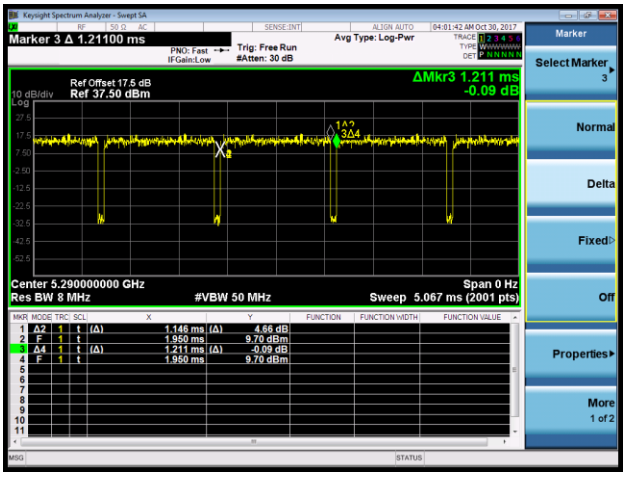
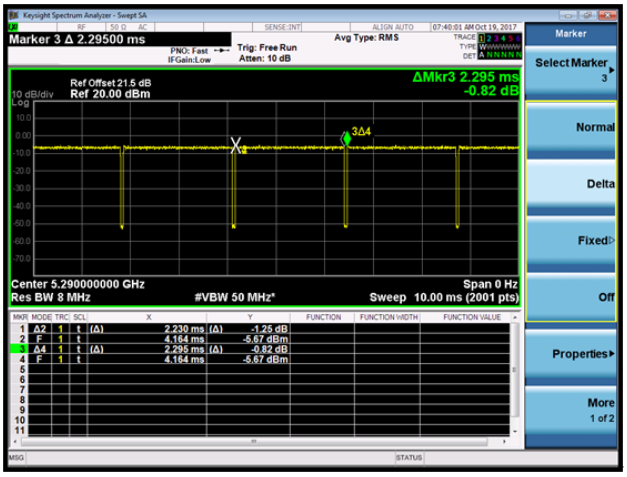
This device contains the following capabilities:

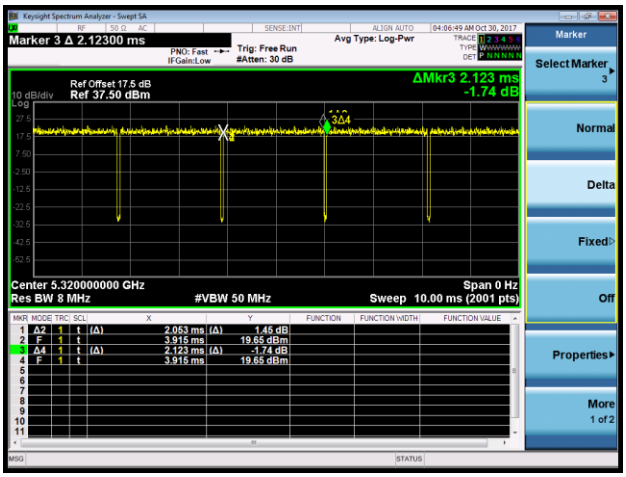
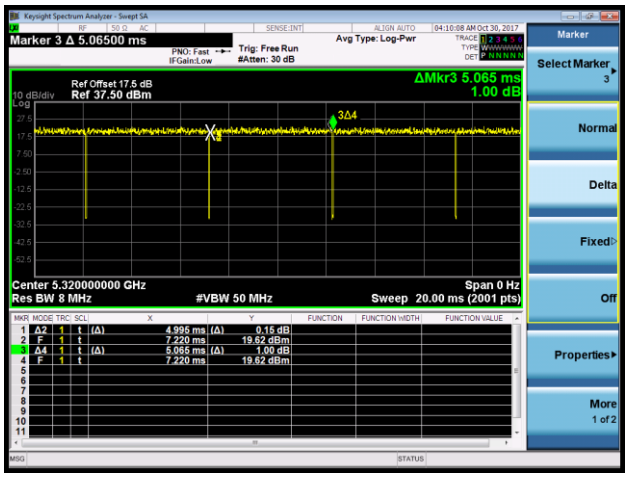
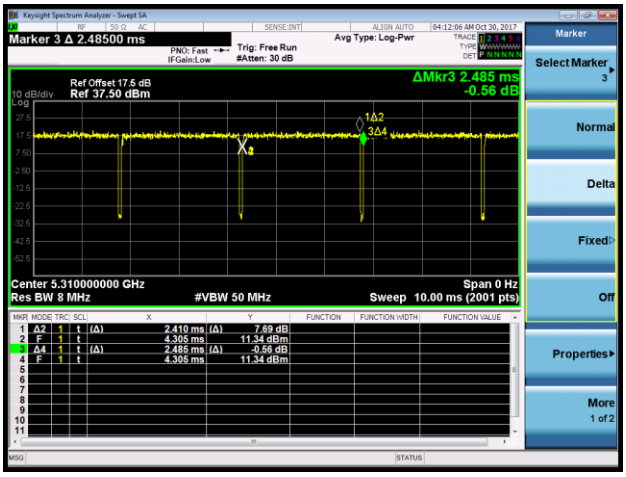
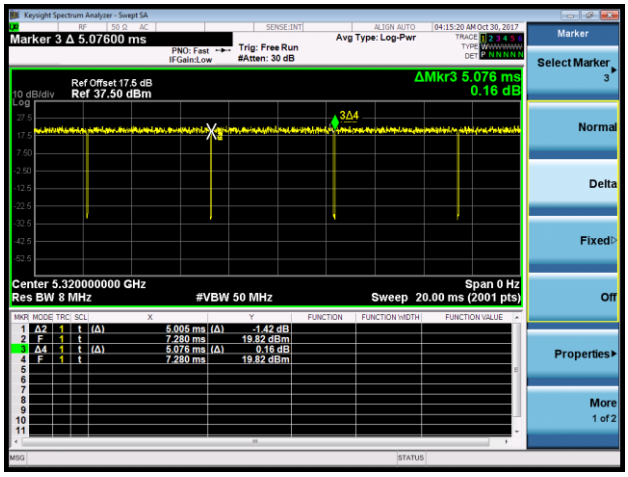
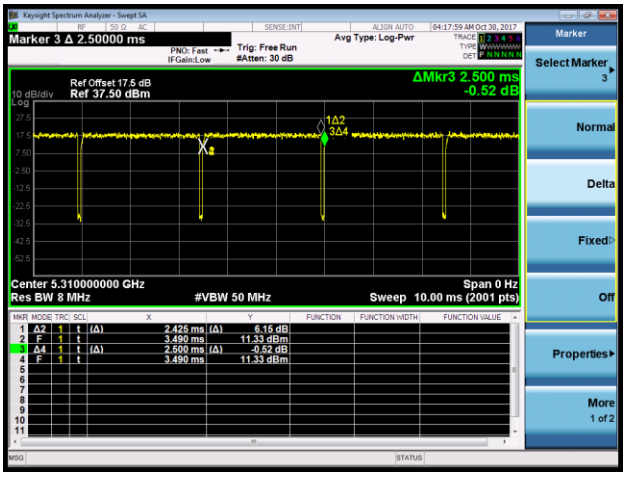
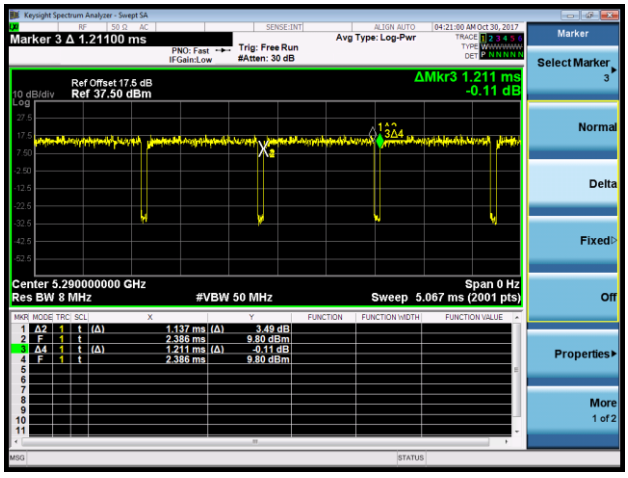
802.11a/b/g/n/ac Wi-Fi & Bluetooth v4.0 single mode

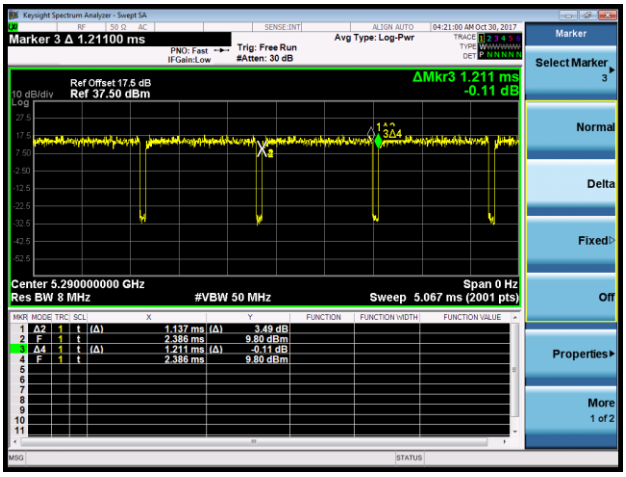
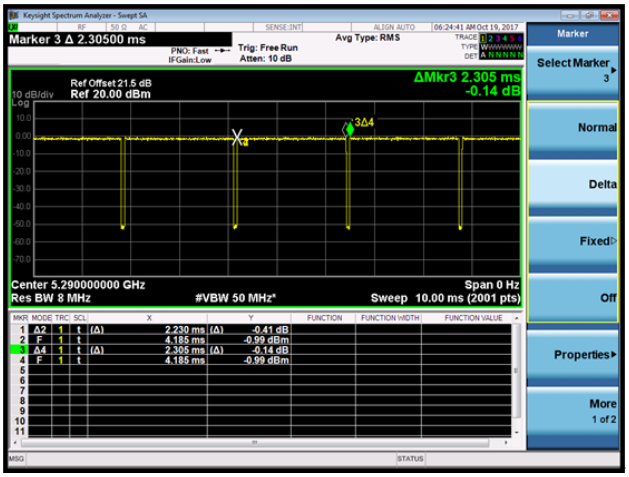
Note: 5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v02r01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

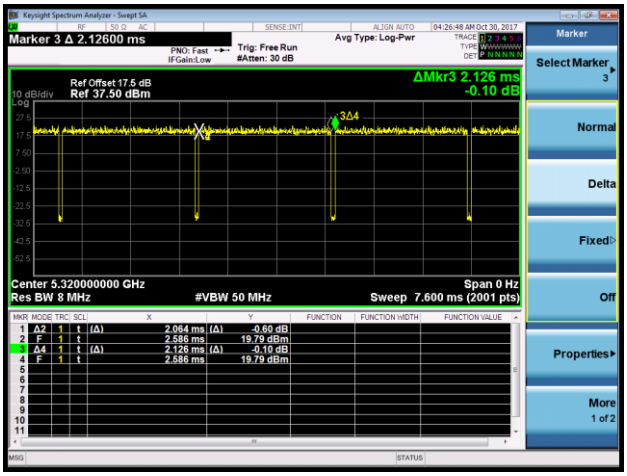
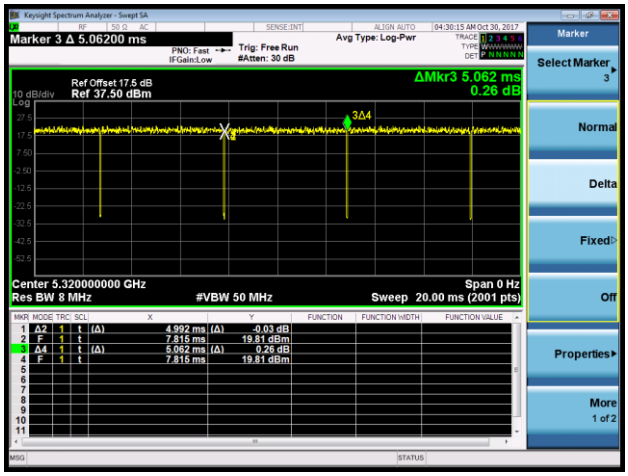
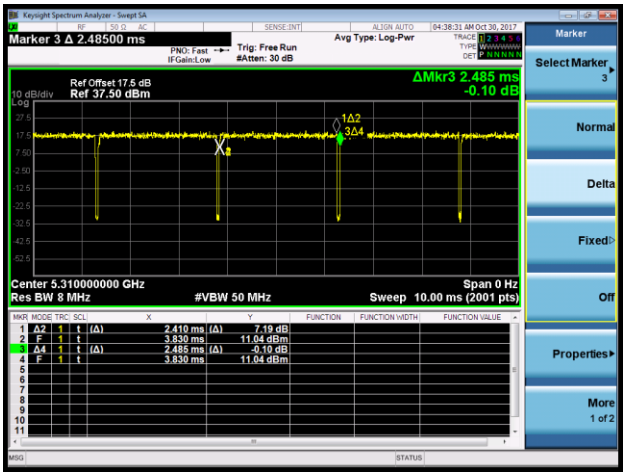
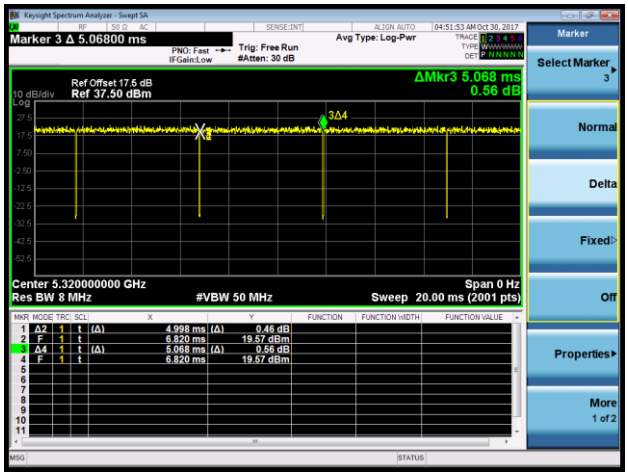
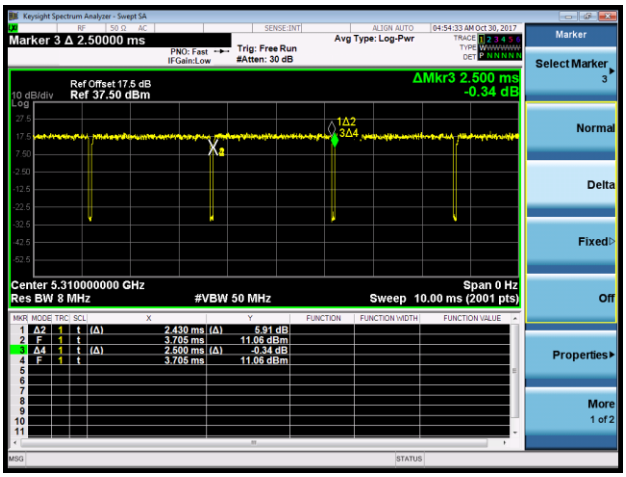
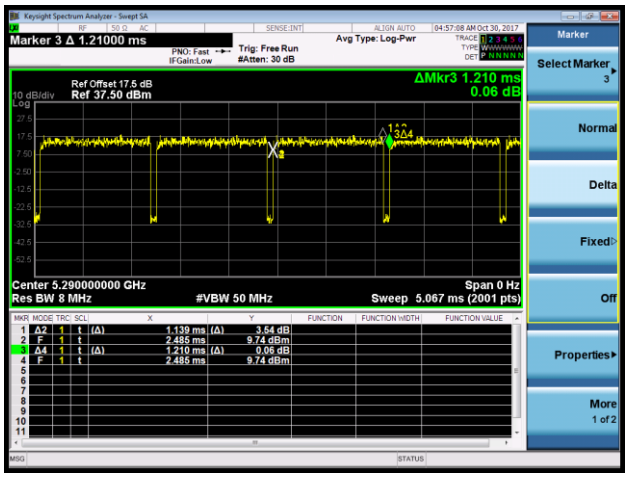
Model No.	Test Mode	Duty Cycle
APEX0374	802.11a	97.08 %
	802.11n-HT20	98.80 %
	802.11n-HT40	96.95 %
	802.11ac-VHT20	98.80 %
	802.11ac-VHT40	96.98 %
	802.11ac-VHT80	94.67 %
	802.11ac-VHT80+80 (Non-contiguous)	94.67 %
	802.11ac-VHT80+80 (Contiguous)	97.17 %
APEX0375	802.11a	96.71 %
	802.11n-HT20	98.61 %
	802.11n-HT40	96.98 %
	802.11ac-VHT20	98.61 %
	802.11ac-VHT40	96.99 %
	802.11ac-VHT80	93.86 %
	802.11ac-VHT80+80 (Non-contiguous)	93.86 %
	802.11ac-VHT80+80 (Contiguous)	96.75 %
APEX0377	802.11a	97.08 %
	802.11n-HT20	98.61 %
	802.11n-HT40	96.97 %
	802.11ac-VHT20	98.61 %
	802.11ac-VHT40	97.18 %
	802.11ac-VHT80	94.11 %
	802.11ac-VHT80+80 (Non-contiguous)	94.11 %
	802.11ac-VHT80+80 (Contiguous)	96.54 %

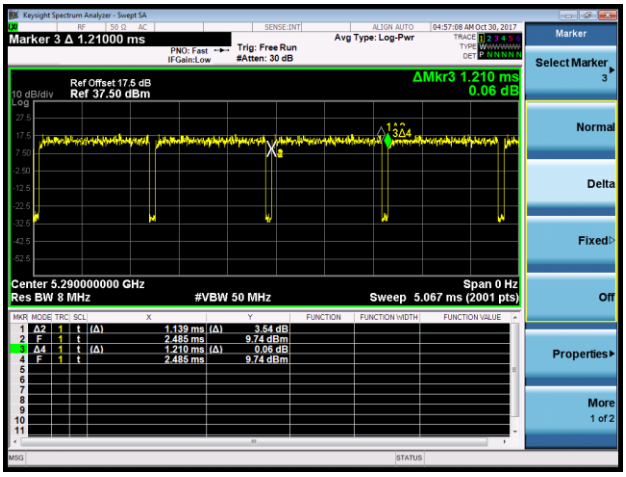
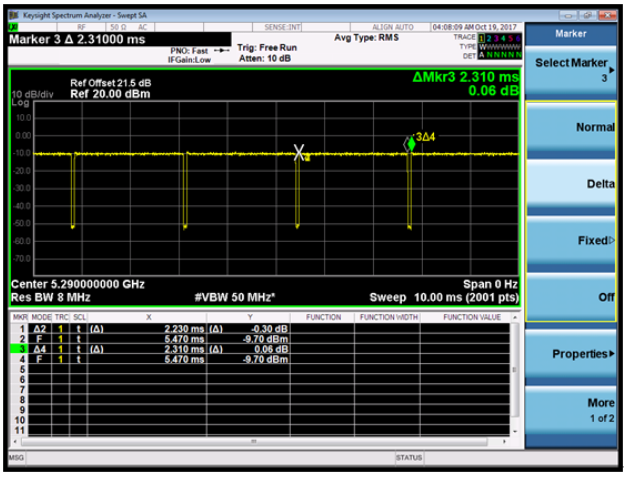
Duty Cycle - APEX0374 (T = Transmission Duration)	
802.11a (T = 2.062ms)	802.11n-HT20 (T = 5.001ms)
	
802.11n-HT40 (T = 2.399ms)	802.11ac-VHT20 (T = 5.015ms)
	
802.11ac-VHT40 (T = 2.423ms)	802.11ac-VHT80 (T = 1.146ms)
	

Duty Cycle - APEX0374 (T = Transmission Duration)	
802.11ac-VHT80+80 (T = 1.146ms) (Non-contiguous)	802.11ac-VHT80+80 (T = 2.230ms) (Contiguous)
	

Duty Cycle - APEX0375 (T = Transmission Duration)	
802.11a (T = 2.053ms)	802.11n-HT20 (T = 4.995ms)
	
802.11n-HT40 (T = 2.410ms)	802.11ac-VHT20 (T = 5.005ms)
	
802.11ac-VHT40 (T = 2.425ms)	802.11ac-VHT80 (T = 1.137ms)
	

Duty Cycle - APEX0375 (T = Transmission Duration)	
802.11ac-VHT80+80 (T = 1.137ms) (Non-contiguous)	802.11ac-VHT80+80 (T = 2.230ms) (Contiguous)
	

Duty Cycle - APEX0377 (T = Transmission Duration)	
802.11a (T = 2.064ms)	802.11n-HT20 (T = 4.992ms)
	
802.11n-HT40 (T = 2.410ms)	802.11ac-VHT20 (T = 4.998ms)
	
802.11ac-VHT40 (T = 2.430ms)	802.11ac-VHT80 (T = 1.139ms)
	

Duty Cycle - APEX0377 (T = Transmission Duration)	
802.11ac-VHT80+80 (T = 1.139ms) (Non-contiguous)	802.11ac-VHT80+80 (T = 2.230ms) (Contiguous)
	

2.9. Test Configuration

The **ACCESS POINT**was tested per the guidance of KDB 789033 D02v02r01.ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testingand AC line conducted testing.

2.10. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.11. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphletsupplied to the user and be readily visible to the purchaser at the time of purchase. However, when the deviceis so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label andlabel location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed WirelessDevices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in themeasurement of the **ACCESS POINT.**

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remotecontrolled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated tomaximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by theresponsible party can be used with the device. The use of a permanently attached antenna or of an antennathat uses a unique coupling to the intentional radiator shall be considered sufficient to comply with theprovisions of this section.”

Conclusion:

The product is defined as the professional installation of equipment by the manufacturer, there is no necessary to comply with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2018/03/17
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2018/03/23
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2018/03/23
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2018/03/02
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2018/03/16
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2018/04/06
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2018/04/06
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2018/04/06
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2018/04/06
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2018/04/06
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2018/04/06
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2018/07/10
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2018/03/18
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2018/03/18
Programmable Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2018/05/11
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Software	**Version**	**Function**
e3	V 8.3.5	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 40GHz: 4.76dB
Output Power - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

7. TEST RESULT

7.1. Summary

Product Name: **ACCESS POINT**

FCC ID: **Q9DAPEX037457**

FCC Classification: **Unlicensed National Information Infrastructure (UNII)**

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section7.2
15.407(a)(2)	Maximum Conducted Output Power	≤ 24 dBm		Pass	Section 7.3
15.407(h)(1)	Transmit Power Control	≤ 24 dBm		Pass	Section 7.4
15.407(a)(2), (5)	Peak Power Spectral Density	≤ 11 dBm/MHz		Pass	Section 7.5
15.407(g)	Frequency Stability	N/A		Pass	Section 7.6
15.407(b)(2), (3), (5)	Undesirable Emissions	≤ -27dBm/MHz EIRP	Radiated	Pass	Section 7.7 & 7.8
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits(Restricted Bands andRadiated Emission Limits)	Emissions in restrictedbands must meet theradiated limits detailed in15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.9

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer.The correction table was used to account for the losses of the cables and attenuators used as part ofthe system to connect the EUT to the analyzer at all frequencies of interest.
2) Test Items “26dB Bandwidth” & “99% Bandwidth” & “6dB Bandwidth” have been assessed MIMO transmission, and showed the worst test data in this report.

7.2. 26dB Bandwidth Measurement

7.2.1.Test Limit

N/A

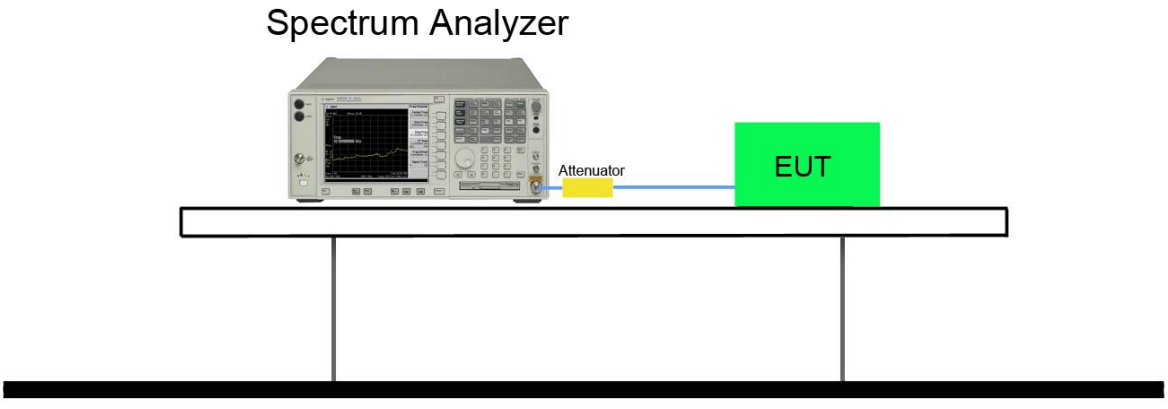
7.2.2.Test Procedure Used

KDB 789033 D02v02r01 - Section C.1

7.2.3.Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3×RBW.
4. Detector = Peak.
5. Trace mode = max hold.

7.2.4.Test Setup



7.2.5.Test Result

For APEX0374, refer to Annex D clause 1;

For APEX0375, refer to Annex E clause 1;

For APEX0377, refer to Annex F clause 1.

7.3. Output Power Measurement

7.3.1.Test Limit

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

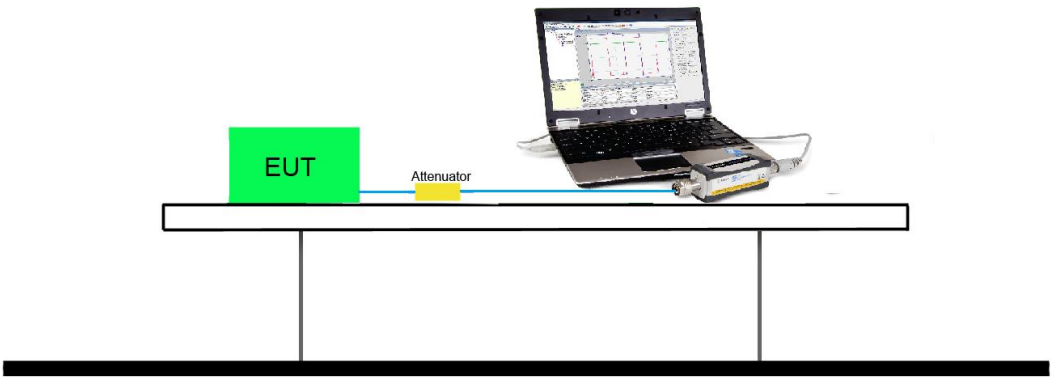
7.3.2.Test Procedure Used

KDB 789033 D02v02r01 - Section E) 3) b) Method PM-G

7.3.3.Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.3.4.Test Setup



7.3.5.Test Result

For APEX0374, refer to Annex D clause 2;

For APEX0375, refer to Annex E clause 2;

For APEX0377, refer to Annex F clause 2.

7.4. Transmit Power Control

7.4.1.Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

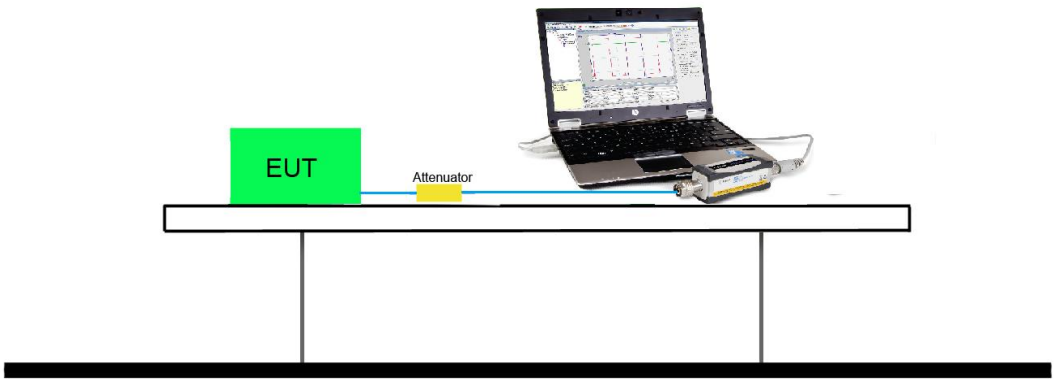
7.4.2.Test Procedure Used

KDB 789033 D02v01- Section E) 3) b) Method PM-G

7.4.3.Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.4.4.Test Setup



7.4.5.Test Result

For APEX0374, refer to Annex D clause 3;

For APEX0375, refer to Annex E clause 3;

For APEX0377, refer to Annex F clause 3.

7.5. Power Spectral Density Measurement

7.5.1.Test Limit

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

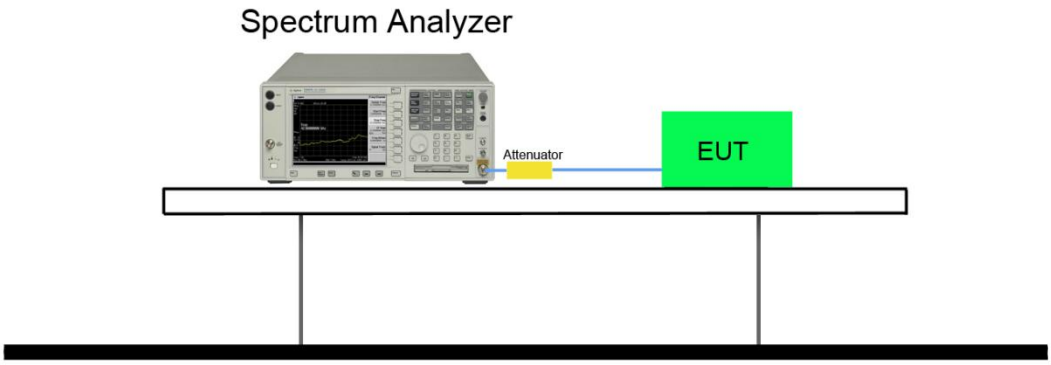
7.5.2.Test Procedure Used

KDB 789033 D02v02r01 - SectionF

7.5.3.Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 6.99 dB to the measured result.

7.5.4.Test Setup



7.5.5.Test Result

For APEX0374, refer to Annex D clause 4;

For APEX0375, refer to Annex E clause 4;

For APEX0377, refer to Annex F clause 4.

7.6. Frequency Stability Measurement

7.6.1.Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ±20 ppm maximum for the 5GHz band (IEEE 802.11 specification).

7.6.2.Test Procedure Used

Frequency Stability Under Temperature Variations:

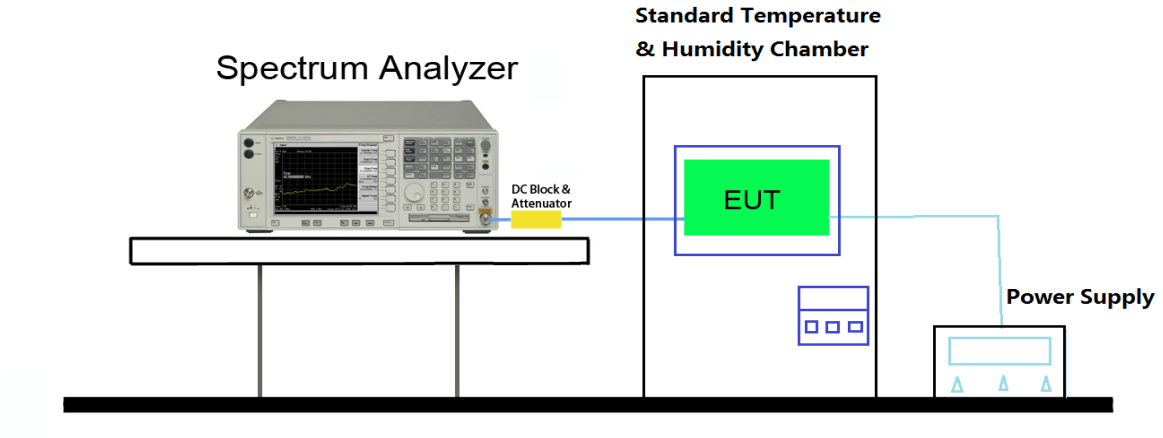
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, recordthe maximum frequency change.

7.6.3.Test Setup



7.6.4.Test Result

For APEX0374, refer to Annex D clause 5;

For APEX0375, refer to Annex E clause 5;

For APEX0377, refer to Annex F clause 5.

7.7. Radiated Spurious Emission Measurement

7.7.1.Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.7.2.Test Procedure Used

KDB 789033 D02v02r01 - Section G

7.7.3.Test Setting

Quasi-Peak& Average Measurements below30MHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 200Hz for 9kHz to 150kHz frequency; RBW = 9kHz for 0.15MHz to 30MHz frequency
4. Detector = CISPR quasi-peak or power average (Average)
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120 kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

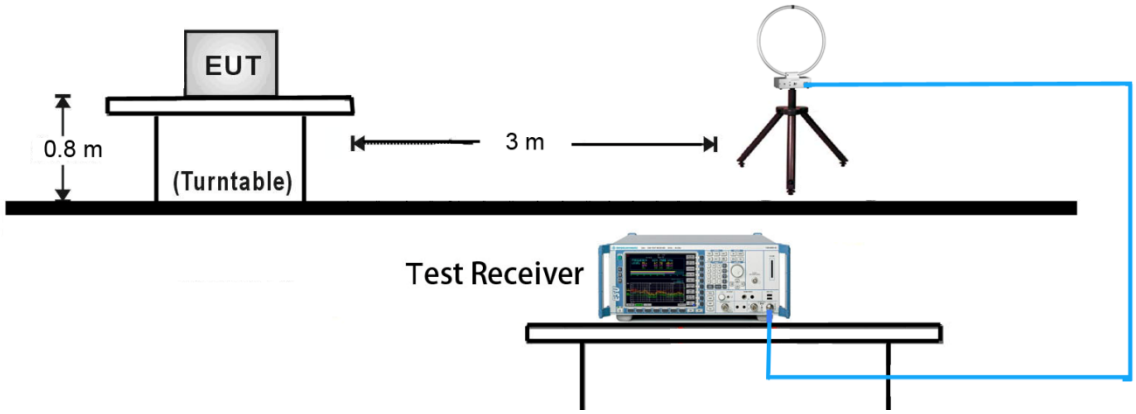
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

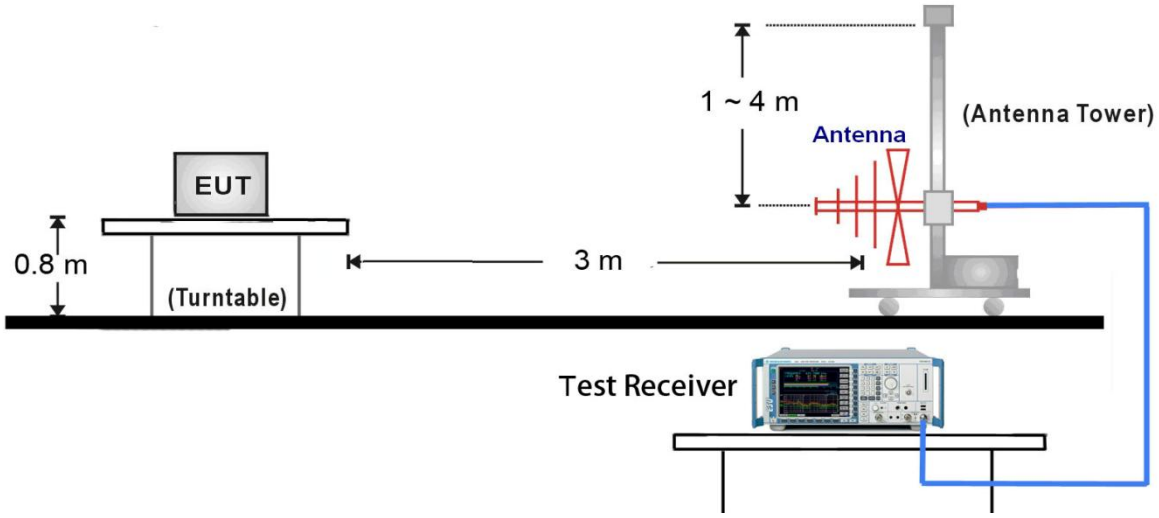
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW ≤ RBW/100 (i.e., 10 kHz) but not less than 10 Hz. If the EUT duty cycle is < 98%, set VBW ≥ 1/T.
4. Detector = Peak
5. Sweep time = auto
6. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

7.7.4.Test Setup

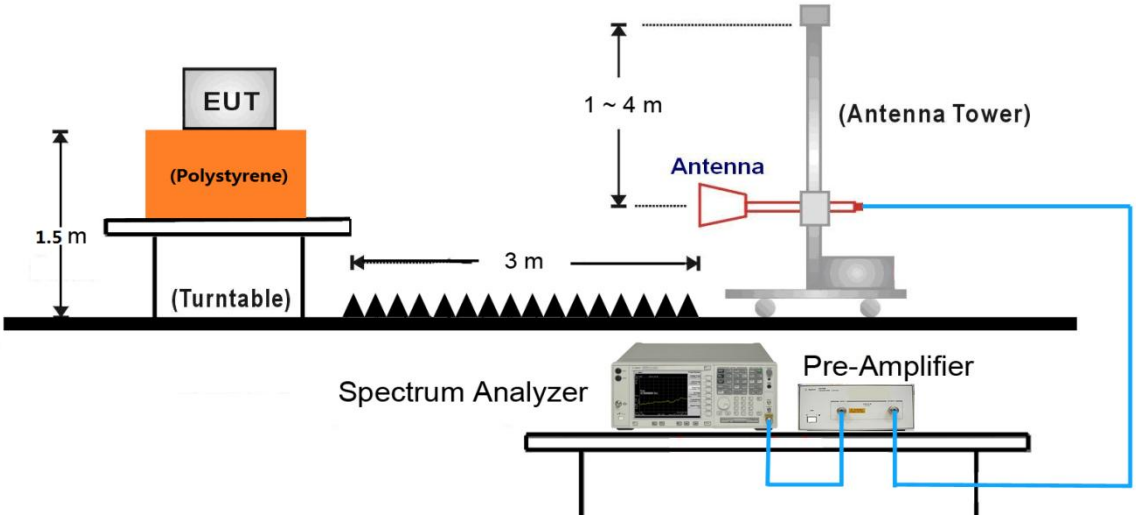
9kHz ~30MHz Test Setup:



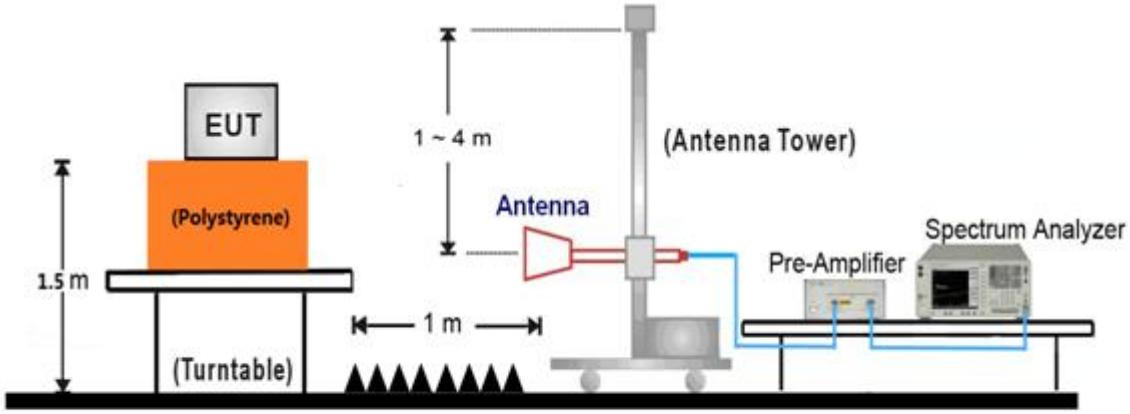
30MHz ~ 1GHz Test Setup:



1GHz ~18GHz Test Setup:



18GHz ~40GHz Test Setup:



7.7.5.Test Result

For APEX0374, refer to Annex D clause 6;

For APEX0375, refer to Annex E clause 6;

For APEX0377, refer to Annex F clause 6.

7.8. Radiated Restricted Band Edge Measurement

7.8.1.Test Limit

For 15.205 Requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (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	8.25 - 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 - 156.525	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	--	--	--

For 15.407(b) Requirement:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Refer to KDB 789033 D02v02r01 G)2)c), as specified in § 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in § 15.407(b)(4)). However, an out-of-band emission that complies with both the peak and average limits of § 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.8.2.Test Procedure Used

KDB 789033 D02v02r01 – Section G

7.8.3.Test Setting

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

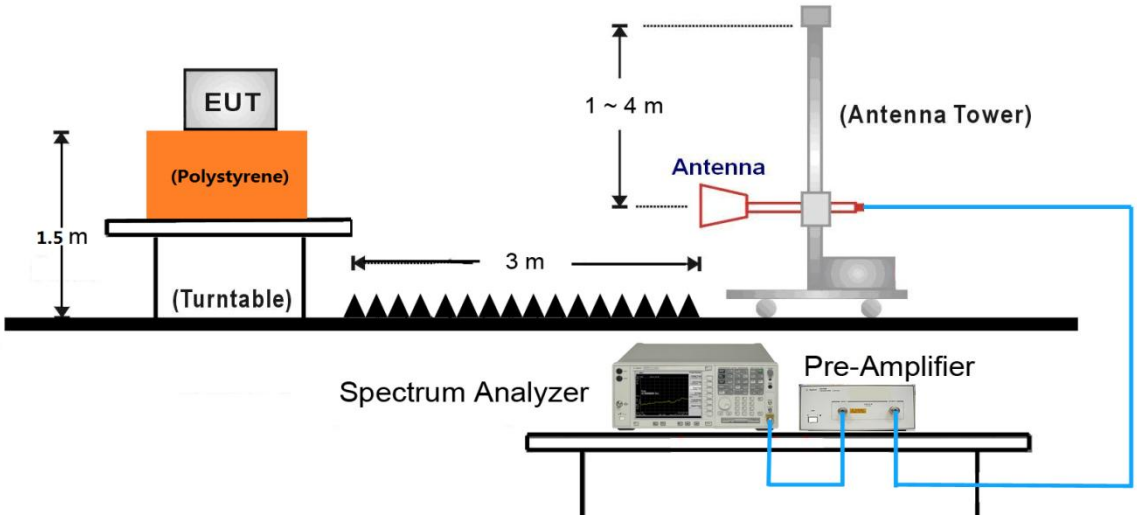
3. VBW If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW ≤ RBW/100 (i.e., 10 kHz) but not less than 10 Hz. If the EUT duty cycle is < 98%, set VBW ≥ 1/T.

4. Detector = Peak

5. Sweep time = auto

6. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

7.8.4.Test Setup



7.8.5.Test Result

For APEX0374, refer to Annex D clause 7;

For APEX0375, refer to Annex E clause 7;

For APEX0377, refer to Annex F clause 7.

7.9. AC Conducted Emissions Measurement

7.9.1. Test Limit

FCC Part 15.207 Limits		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

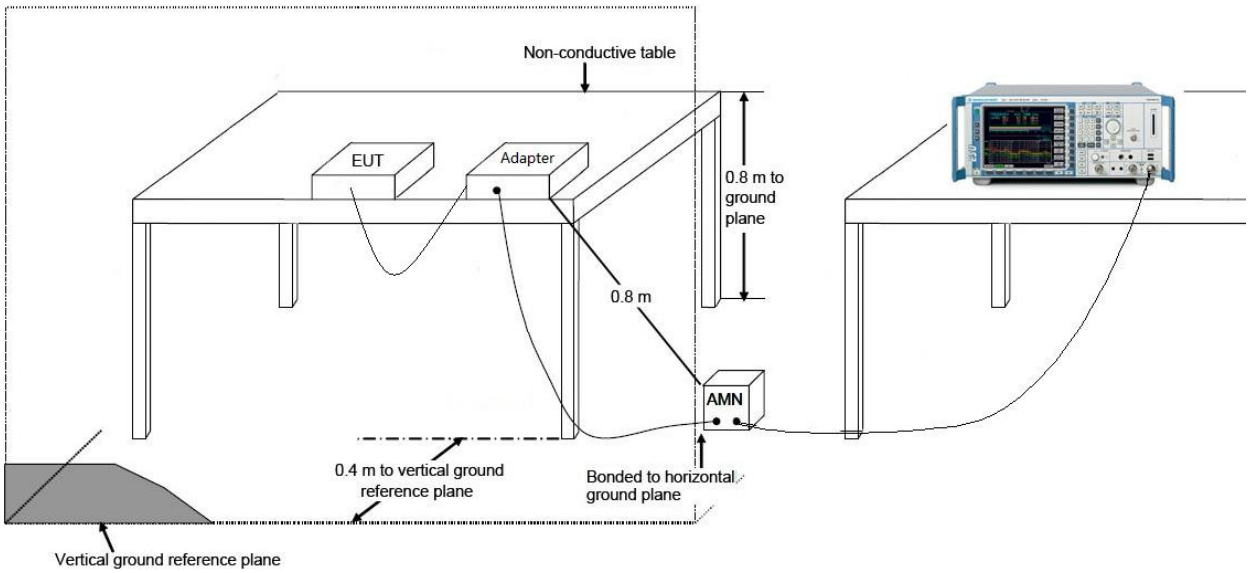
7.9.2. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB 789033 for compliance to FCC 47CFR 15.247 requirements.The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

7.9.3. Test Setup



7.9.4.Test Result

For APEX0374, refer to Annex D clause 8;

For APEX0375, refer to Annex E clause 8;

For APEX0377, refer to Annex F clause 8.

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **ACCESS POINT** is in compliance with Part 15E of the FCC Rules.

The End