MEASUREMENT REPORT

FCC PART 15C / WLAN 802.11b/g/n

FCC ID:	HD5-CT40PL0N
Applicant:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Application Type:	Class II Permissive Change
Product:	Mobile Computer
Model No.:	CT40P-L0N
Brand Name:	Honeywell
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Test Procedure(s):	ANSI C63.10-2013
Test Date:	December 16 ~ 29, 2020

Reviewed By: Jame Yuan

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

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 measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2012RSU042-U1	Rev. 01	Initial Report	12-30-2020	Valid

Note: Model CT40P-L0N has got FCC ID HD5-CT40PL0N, now add new channel 12/13 (20M BW) and 10/11 (40M BW) by software upgrade, so we evaluated all RF testing for new channels in this report.

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1. GENERAL INFORMATION

1.1. Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions

9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions

9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.3. Test Facility

☒	**Test Site – MRT Suzhou Laboratory**	
	Laboratory Location (Suzhou - Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
	Laboratory Location (Suzhou - SIP)	
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China	
	Laboratory Accreditations	
	A2LA: 3628.01	CNAS: L10551
	FCC: CN1166	ISED: CN0001
	VCCI: R-20025, G-20034, C-20020, T-20020	
☐	**Test Site – MRT Shenzhen Laboratory**	
	Laboratory Location (Shenzhen)	
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China	
	Laboratory Accreditations	
	A2LA: 3628.02	CNAS: L10551
	FCC: CN1284	ISED: CN0105
☐	**Test Site – MRT Taiwan Laboratory**	
	Laboratory Location (Taiwan)	
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
	Laboratory Accreditations	
	TAF: L3261-190725	
	FCC: 291082, TW3261	ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Mobile Computer
Model No.	CT40P-L0N
Serial No.	20196B1EBF
Hardware Version	2.0
Software Version	OS.04.001
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth 1# Version	v5.0 dual mode
Bluetooth 2# Version	v5.1 single mode, LE only
NFC Working Frequency	13.56MHz
Accessories	
USB Adapter	Model No.: ADS-12B-06 05010E Input Power: 100 - 240V ~ 50/60Hz, Max. 0.3A Output Power: 5VDC 2.0A
Rechargeable Li-ion Battery	Model No.: CT50-BTSC Capacitance: 4020mAh/15.5Wh Rated Voltage: 3.85V

2.2. Product Specification Subjective to this Report

Frequency Range	802.11b/g/n-HT20: 2412 ~ 2472 MHz 802.11n-HT40: 2422 ~ 2462 MHz
Channel Number	802.11b/g/n-HT20: 13 802.11n-HT40: 9
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM
Antenna Delivery	2*TX + 2*RX
Data Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps

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

2.3. Working Frequencies for this report

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	12	2467 MHz
13	2472 MHz	--	--	--	--

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz

2.4. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Antenna Gain (dBi)	
		Ant 0	Ant 1
FPC Antenna	2.4 ~ 2.5	0.60	2.20

Note 1: SISO mode is only for Ant 0 port.

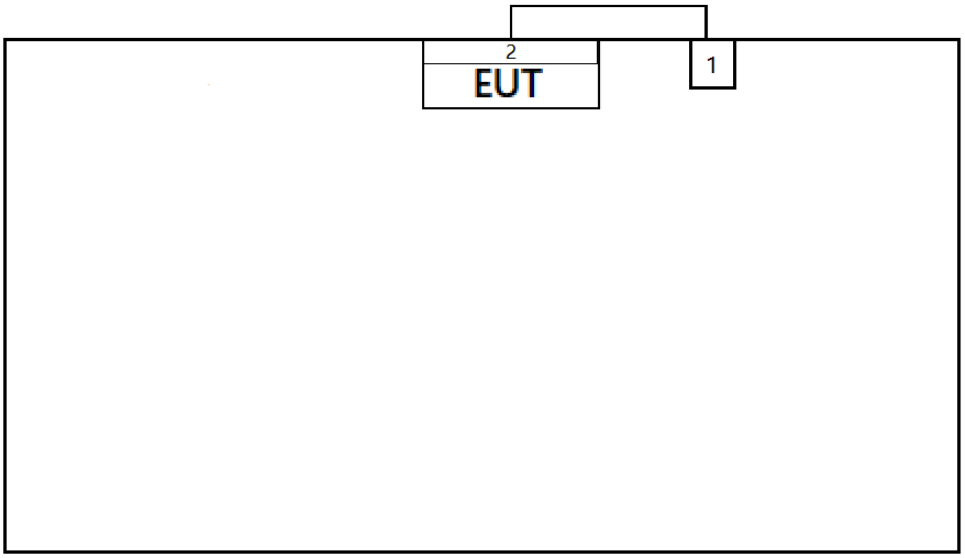
Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

2.5. Test Mode

Test Mode	Mode 1: Transmit by 802.11b (1Mbps)
	Mode 2: Transmit by 802.11g (6Mbps)
	Mode 3: Transmit by 802.11n-HT20 (MCS0)
	Mode 4: Transmit by 802.11n-HT40 (MCS0)

2.6. Description of Test Configuration

The device was tested per the guidance ANSI C63.10: 2013 that was used to reference the appropriate EUT setup for radiated emissions and AC line conducted emission testing.



Product		Manufacturer	Model No.
1	USB Adapter	Shenzhen Honor Electronic Co., Ltd	ADS-12B-06 05010E
2	Snap-on Adapter	Honeywell	CT40-SN

Note 1: The test utility software used during testing was “QRCT”, and the version was 3.0.268.0.

Note 2: Detail power setting refer to operation description.

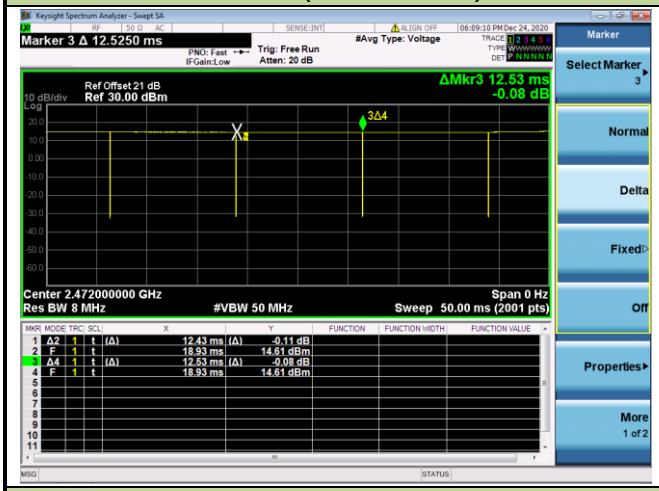
2.7. Duty Cycle

2.4GHz WLAN (DTS) operation is possible in 20MHz 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. 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:

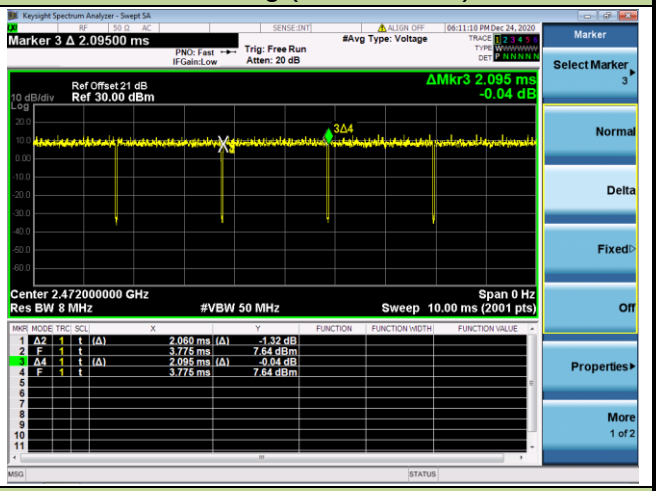
Test Mode	Duty Cycle
802.11b	99.20%
802.11g	98.33%
802.11n-HT20	97.96%
802.11n-HT40	94.66%

Duty Cycle (T = Transmission Duration)

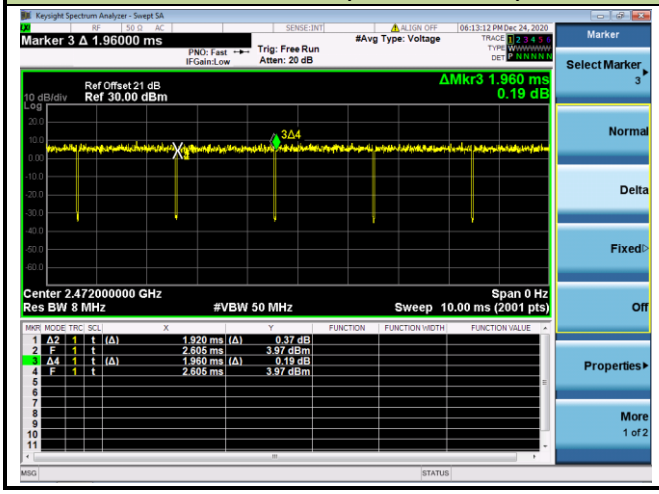
802.11b (T = 12.43ms)



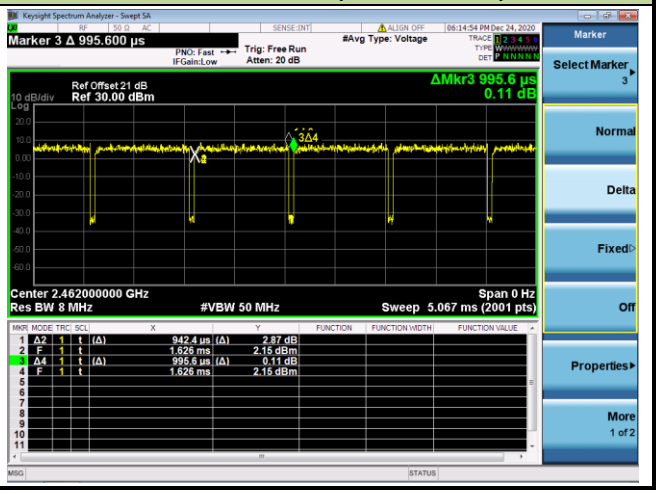
802.11g (T = 2.060ms)



802.11n-HT20 (T = 1.920ms)



802.11n-HT40 (T = 942.4us)



2.8. EMI Suppression Device(s)/Modifications

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

2.9. Test Environment Condition

Ambient Temperature	15°C ~ 35°C
Relative Humidity	20%RH ~ 75%RH

3. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (WZ-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2021/07/26
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Conducted Emission (SIP-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06621	1 year	2021/12/03

Radiated Emission (WZ-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/08/08
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/09/27
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission (WZ-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Keysight	N9038A	MRTSUE06125	1 year	2021/07/02
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2021/05/26
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2021/10/25
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermal Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2021/12/08
Anechoic Chamber	RIKEN	Chamber-WZ-AC2	MRTSUE06213	1 year	2021/04/30

Radiated Emission (SIP-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06645	1 year	2021/08/30
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2021/08/30
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2021/11/09
Thermal Hygrometer	testo	608-H1	MRTSUE06620	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2021/12/24

Radiated Emission (SIP-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
MXA Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2021/09/26
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06646	1 year	2021/08/30
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06648	1 year	2021/11/26
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06599	1 year	2021/11/26
Preamplifier	EMCI	EMC051845SE	MRTSUE06644	1 year	2021/11/09
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2021/10/21
Thermal Hygrometer	testo	608-H1	MRTSUE06624	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2021/12/24

Radiated Emission (SIP-AC3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06647	1 year	2021/08/08
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2021/09/13
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06598	1 year	2021/11/26
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2021/01/16
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2021/01/16
Thermal Hygrometer	testo	608-H1	MRTSUE06622	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2021/12/24

Conducted Test Equipment (WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2021/01/08
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/22
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/08/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/08/08
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2021/09/26
Attenuator	MVE	20dB	MRTSUE06547	1 year	2021/05/20
Attenuator	MVE	6dB	MRTSUE06532	1 year	2021/05/20
Attenuator	MVE	10dB	MRTSUE06540	1 year	2021/05/20
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/10/21
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2021/07/26

Conducted Test Equipment (SIP-SR5)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
USB wideband power sensor	Agilent	U2021XA	MRTSUE06595	1 year	2021/09/26
USB wideband power sensor	Agilent	U2021XA	MRTSUE06596	1 year	2021/09/26
Attenuator	MVE	20dB	MRTSUE06547	1 year	2021/05/20
Attenuator	MVE	6dB	MRTSUE06532	1 year	2021/05/20
Attenuator	MVE	10dB	MRTSUE06540	1 year	2021/05/20
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Temperature Chamber	BAOYT	BYG-408CS	MRTSUE06847	1 year	2021/03/31
Thermal Hygrometer	testo	622	MRTSUE06629	1 year	2021/11/25

Software	Version	Function
EMI Software	V3	EMI Test Software

4. 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
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

5. TEST RESULT

5.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	6dB Bandwidth	≥ 500kHz	Conducted	Pass	Section 5.2
15.247(b)(3)	Output Power	≤ 1Watt		Pass	Section 5.3
15.247(e)	Power Spectral Density	≤ 8dBm / 3kHz		Pass	Section 5.4
15.247(d)	Band Edge / Out-of-Band Emissions	≥ 20dBc (Peak)		Pass	Section 5.5
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 5.6 & 5.7
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 5.8

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 of the system to connect the EUT to the analyzer at all frequencies of interest.
2) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.

5.2. 6dB Bandwidth Measurement

5.2.1.Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

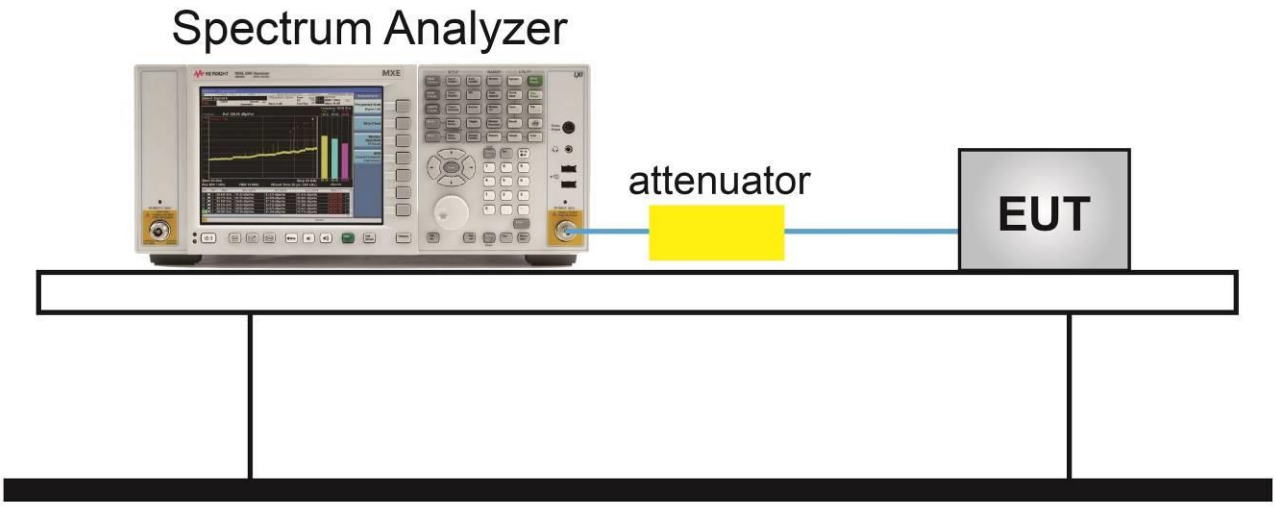
5.2.2.Test Procedure used

ANSI C63.10-2013 - Section 11.8

5.2.3.Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace was allowed to stabilize

5.2.4.Test Setup



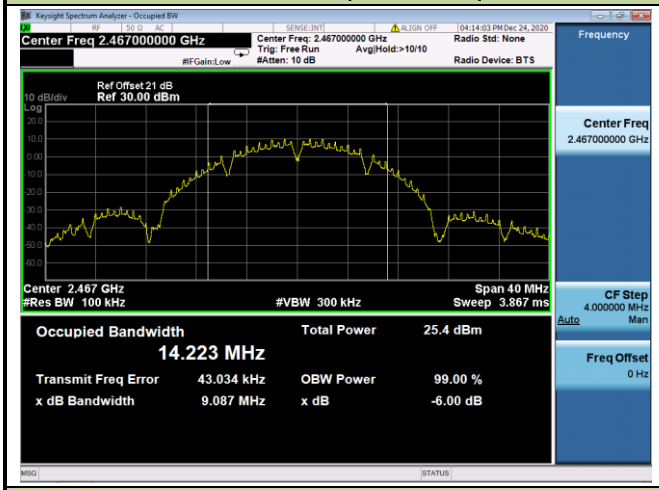
5.2.5.Test Result

Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/24
Test Mode	SISO Mode - ANT 0		

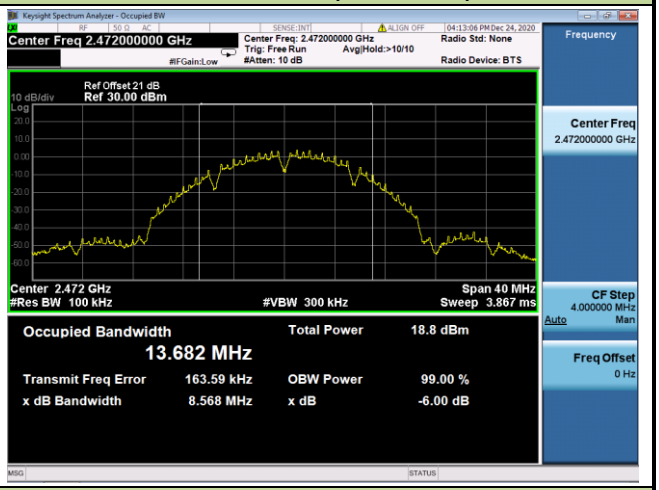
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.11b	1Mbps	12	2467	9.09	≥ 0.5	Pass
802.11b	1Mbps	13	2472	8.57	≥ 0.5	Pass
802.11g	6Mbps	12	2467	16.37	≥ 0.5	Pass
802.11g	6Mbps	13	2472	16.07	≥ 0.5	Pass
802.11n-HT20	MCS0	12	2467	17.61	≥ 0.5	Pass
802.11n-HT20	MCS0	13	2472	16.81	≥ 0.5	Pass
802.11n-HT40	MCS0	10	2457	36.35	≥ 0.5	Pass
802.11n-HT40	MCS0	11	2462	35.79	≥ 0.5	Pass

802.11b

Channel 12 (2467MHz)

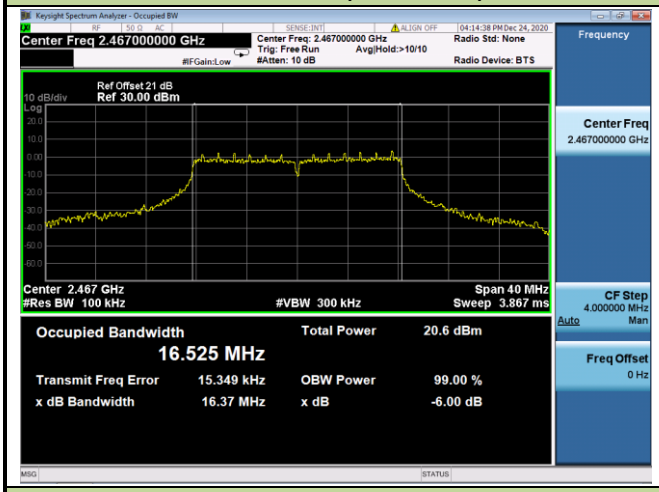


Channel 13 (2472MHz)

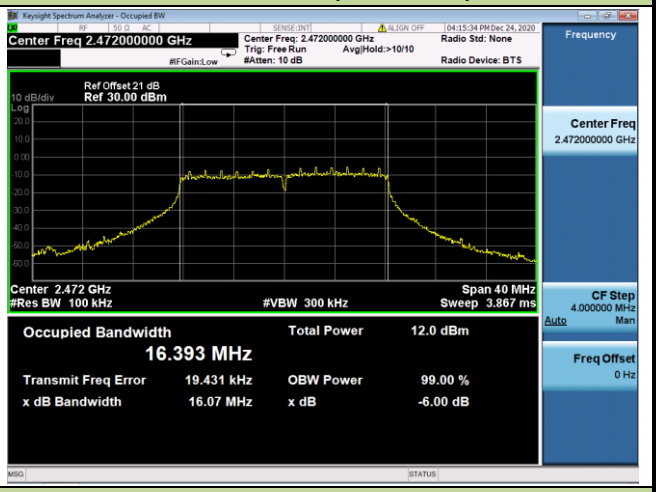


802.11g

Channel 12 (2467MHz)

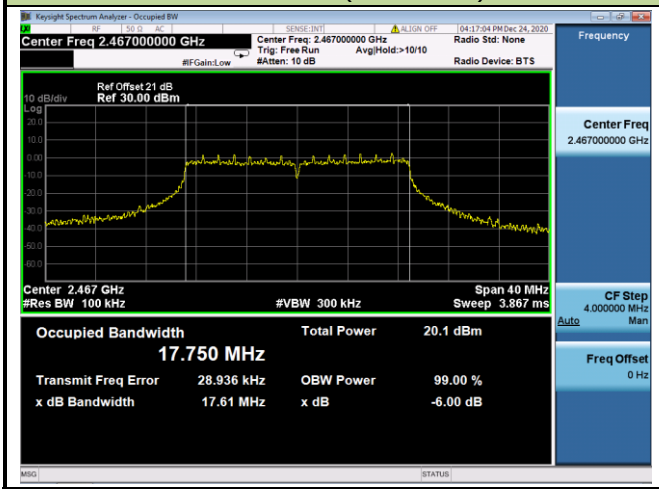


Channel 13 (2472MHz)

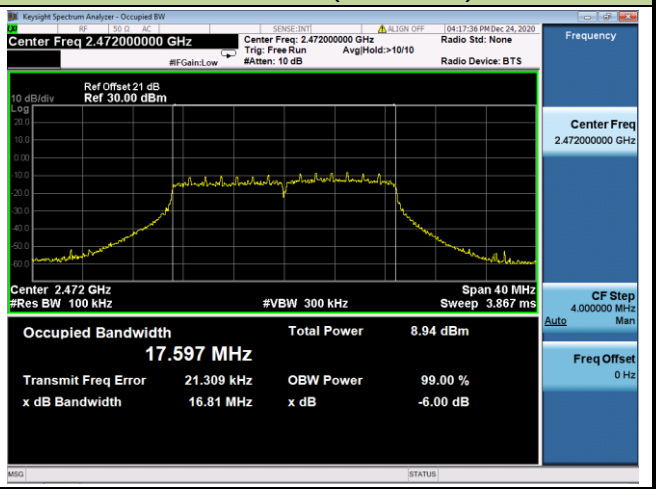


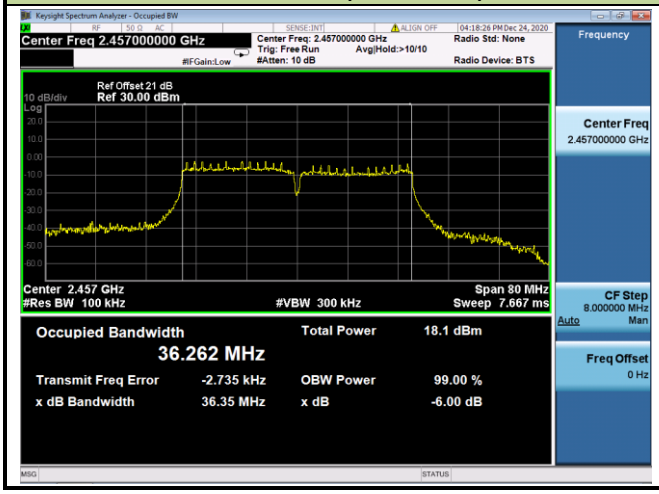
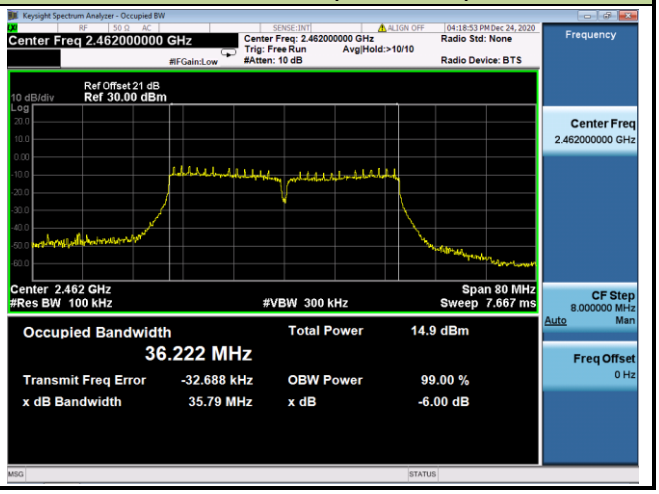
802.11n-HT20

Channel 12 (2467MHz)



Channel 13 (2472MHz)



802.11n-HT40	
Channel 10 (2457MHz)	Channel 11 (2462MHz)
	

5.3. Output Power Measurement

5.3.1.Test Limit

The maximum conducted output power shall not exceed 1 Watt (30dBm).

5.3.2.Test Procedure Used

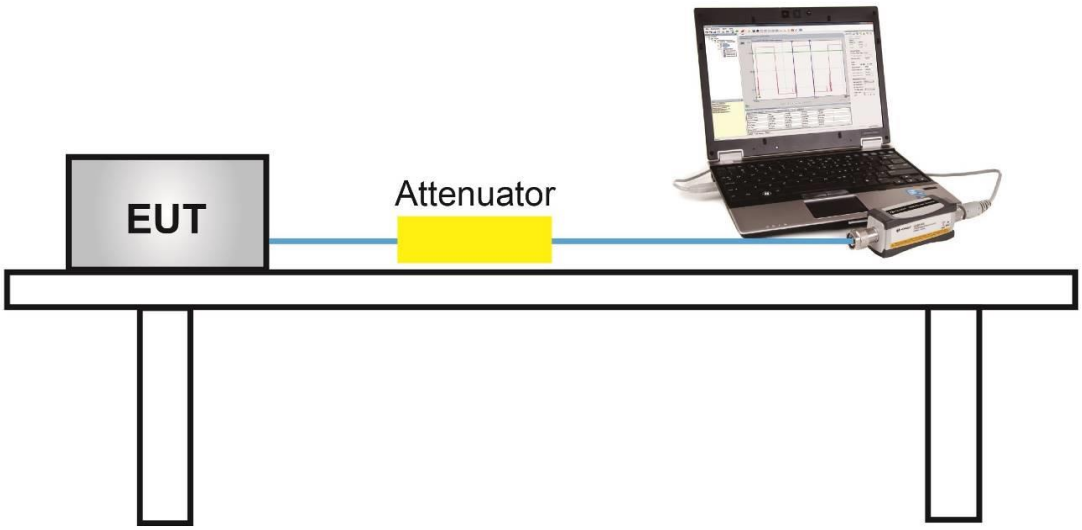
ANSI C63.10-2013 - Section 11.9.2.3.2

5.3.3.Test Setting

Method AVGPM-G (Measurement using a gated RF average-reading power meter)

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

5.3.4.Test Setup



5.3.5.Test Result

Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/24~2020/12/29
Test Mode	SISO Mode - ANT 0		

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
11b	1Mbps	12	2467	17.49	≤ 30.00	Pass
11b	1Mbps	13	2472	11.93	≤ 30.00	Pass
11g	6Mbps	12	2467	13.82	≤ 30.00	Pass
11g	6Mbps	13	2472	4.99	≤ 30.00	Pass
11n-HT20	MCS0	12	2467	13.38	≤ 30.00	Pass
11n-HT20	MCS0	13	2472	2.04	≤ 30.00	Pass
11n-HT40	MCS0	10	2457	10.98	≤ 30.00	Pass
11n-HT40	MCS0	11	2462	7.99	≤ 30.00	Pass

Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/24
Test Mode	MIMO Mode		

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	ANT 0 Average Power (dBm)	ANT 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11n-HT20	MCS0	12	2467	13.35	12.88	16.13	≤ 30.00	Pass
11n-HT20	MCS0	13	2472	1.38	0.58	4.01	≤ 30.00	Pass
11n-HT40	MCS0	10	2457	10.39	10.08	13.25	≤ 30.00	Pass
11n-HT40	MCS0	11	2462	6.96	6.26	9.63	≤ 30.00	Pass

Note: Total Average Power (dBm) = $10*\log\{10^{(\text{ANT 0 Average Power }/10)} + 10^{(\text{ANT 1 Average Power }/10)}\}$ (dBm).

5.4. Power Spectral Density Measurement

5.4.1.Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

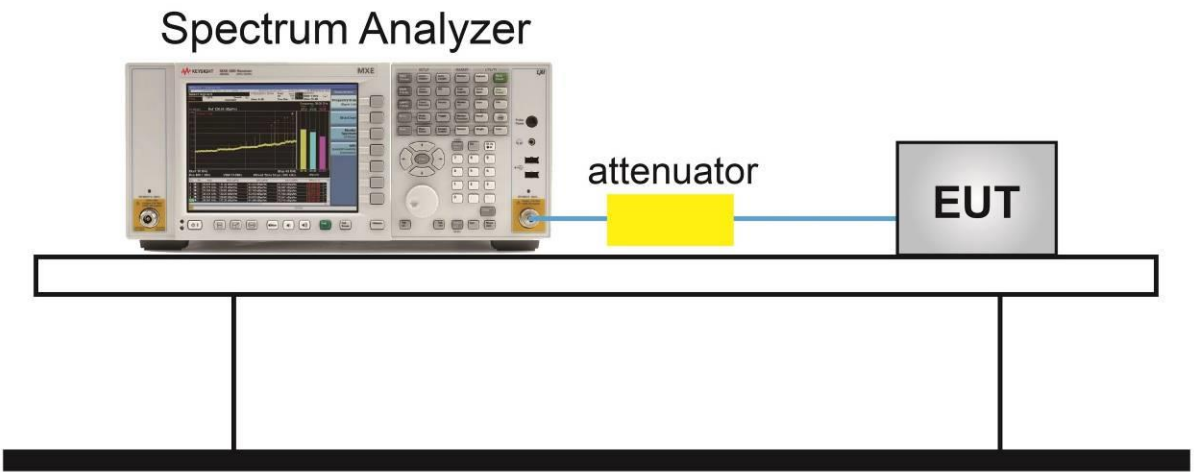
5.4.2.Test Procedure Used

ANSI C63.10-2013 - Section 11.10.3 & 11.10.5

5.4.3.Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the OBW
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = RMS
6. Employ trace averaging (rms) mode over a minimum of 100 traces.
7. Sweep time = auto couple
8. Trace mode = max hold
9. Trace was allowed to stabilize

5.4.4.Test Setup



5.4.5.Test Result

Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/28
Test Mode	SISO Mode - ANT 0		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PKPSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
11b	1Mbps	12	2467	-9.32	≤ 8.00	Pass
11b	1Mbps	13	2472	-13.77	≤ 8.00	Pass
11g	6Mbps	12	2467	-14.66	≤ 8.00	Pass
11g	6Mbps	13	2472	-22.81	≤ 8.00	Pass
11n-HT20	MCS0	12	2467	-14.47	≤ 8.00	Pass
11n-HT20	MCS0	13	2472	-25.82	≤ 8.00	Pass
11n-HT40	MCS0	10	2457	-19.54	≤ 8.00	Pass
11n-HT40	MCS0	11	2462	-22.22	≤ 8.00	Pass

Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	TR3	Test Date	2020/12/23 ~ 2020/12/24
Test Mode	MIMO Mode		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AVGPSD (dBm / 10kHz)		Duty Cycle (%)	Total AVGPSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
				ANT 0	ANT 1				
11n-HT20	MCS0	12	2467	-15.97	-17.27	97.96	-13.47	≤ 8.00	Pass
11n-HT20	MCS0	13	2472	-27.52	-26.62	97.96	-23.95	≤ 8.00	Pass
11n-HT40	MCS0	10	2457	-21.57	-20.56	94.66	-17.79	≤ 8.00	Pass
11n-HT40	MCS0	11	2462	-24.91	-23.96	94.66	-21.16	≤ 8.00	Pass

Note:

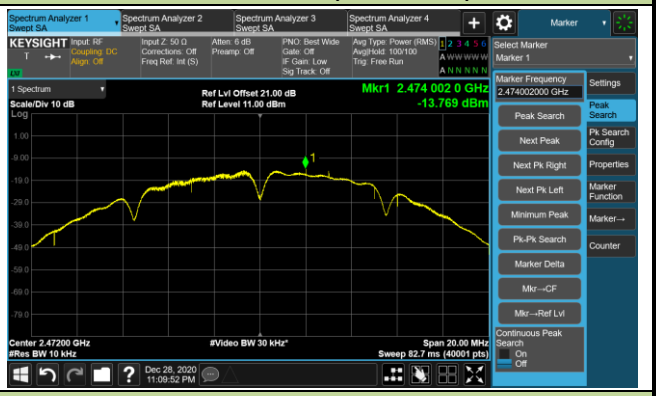
When EUT duty cycle > 98%, Final AVGPSD (dBm / 10kHz) = $10*\log\{^{10(\text{Ant 0 AVGPSD}/10)}+^{10(\text{Ant 1 AVGPSD}/10)}\}$.

When EUT duty cycle < 98%, Final AVGPSD (dBm / 10kHz) = $10*\log\{^{10(\text{Ant 0 AVGPSD}/10)}+^{10(\text{Ant 1 AVGPSD}/10)}\}$ + 10*log(1/Duty cycle).

SISO Mode - 802.11b

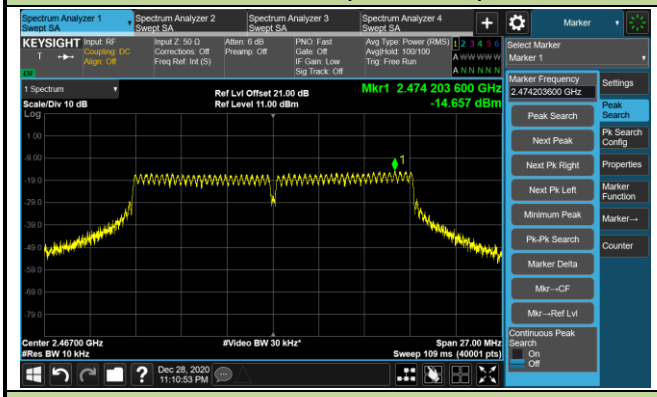
Channel 12 (2467MHz)

Channel 13 (2472MHz)

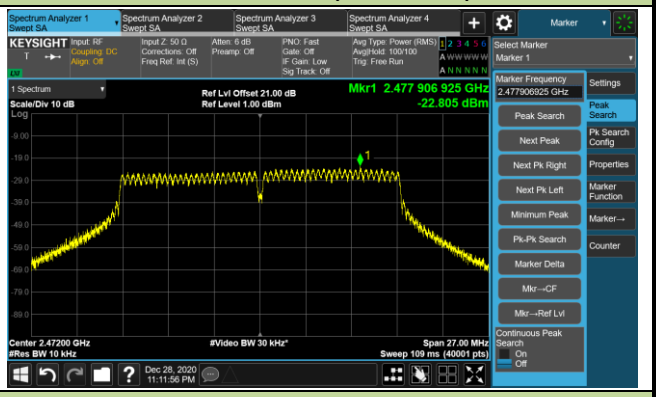


SISO Mode - 802.11g

Channel 12 (2467MHz)

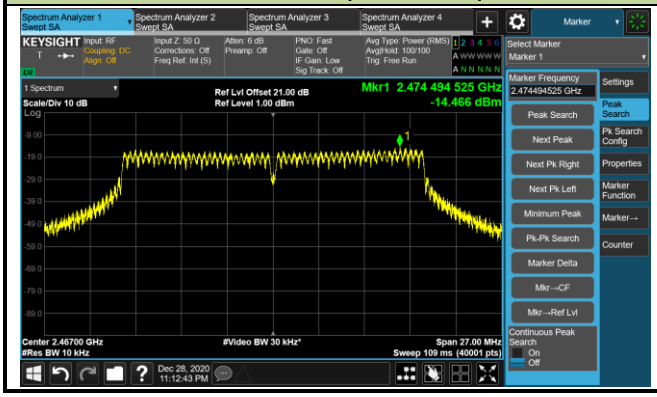


Channel 13 (2472MHz)

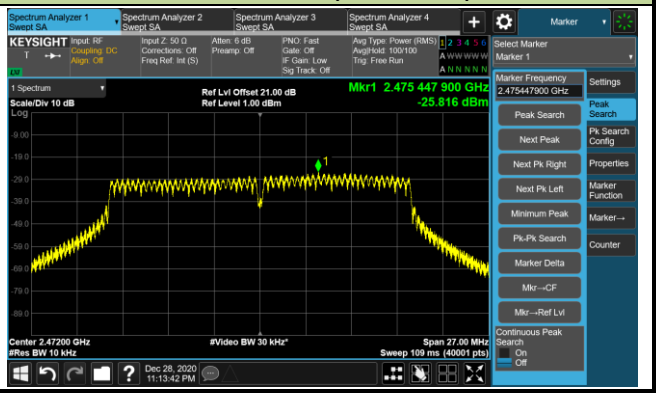


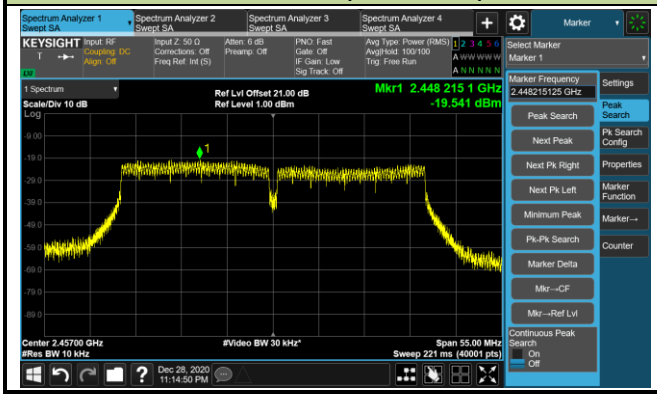
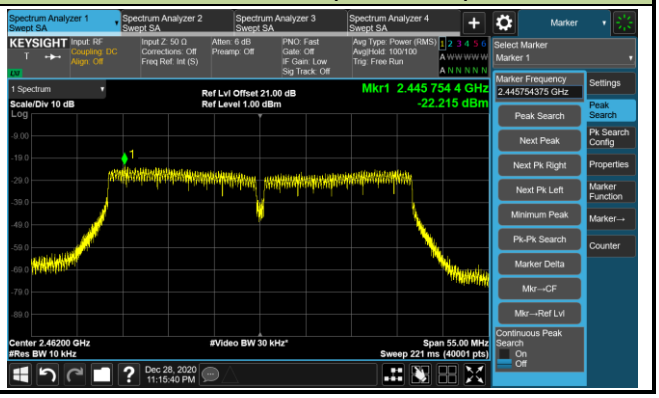
SISO Mode - 802.11n-HT20 - PKPSD

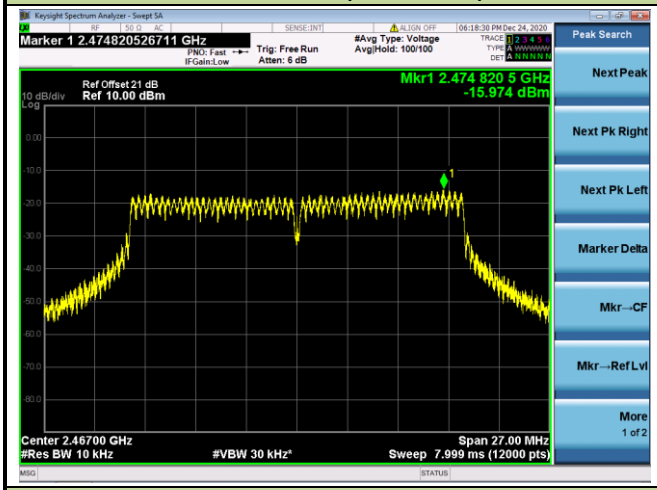
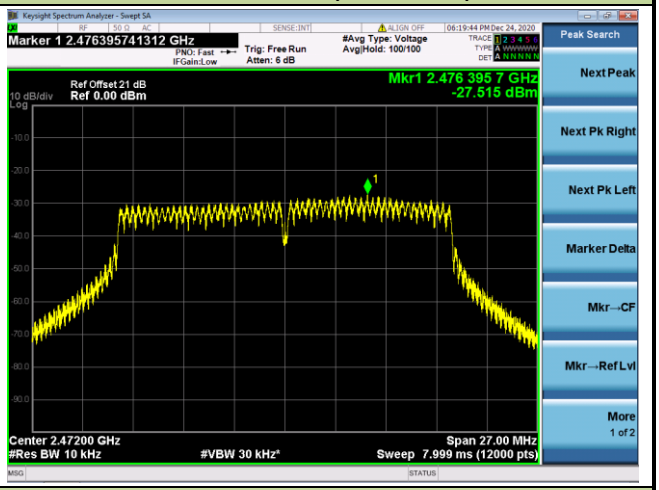
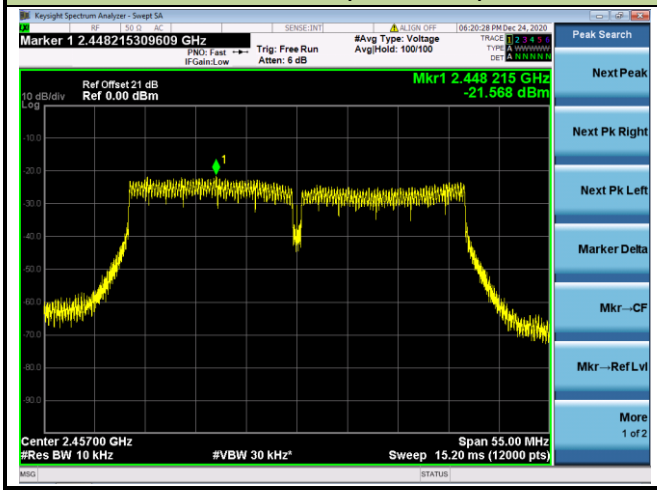
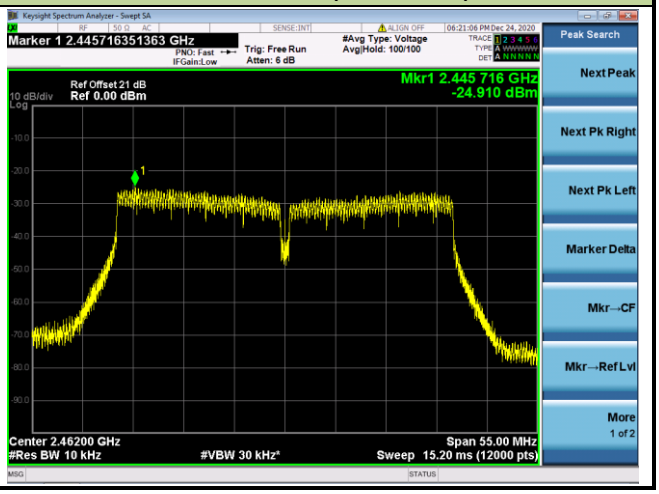
Channel 12 (2467MHz)

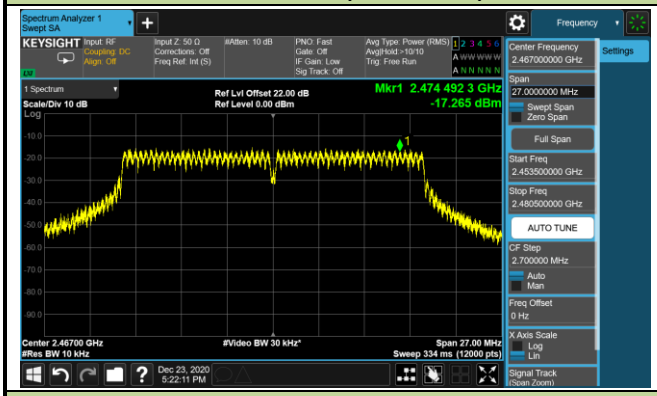
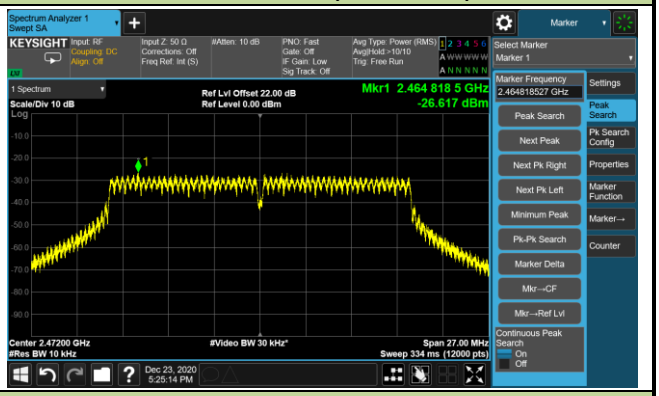
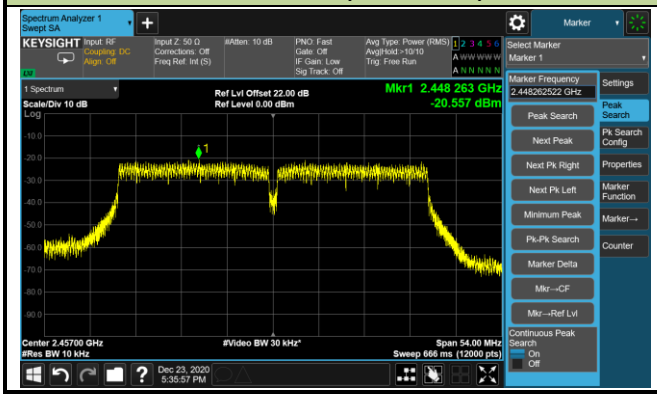
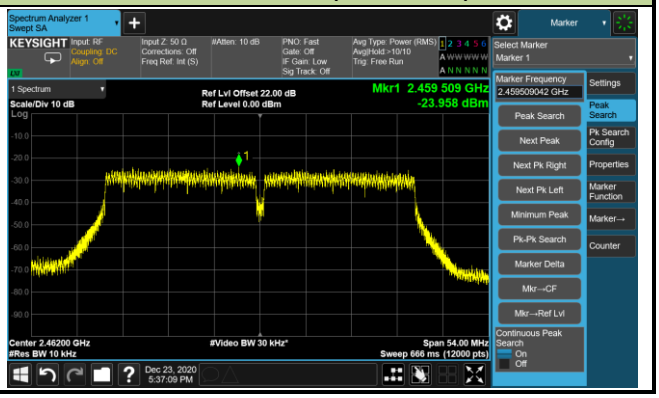


Channel 13 (2472MHz)



SISO Mode - 802.11n-HT40	
Channel 10 (2457MHz)	Channel 11 (2462MHz)
	

MIMO Mode Ant 0 - 802.11n-HT20	
Channel 12 (2467MHz)	Channel 13 (2472MHz)
	
MIMO Mode Ant 0 - 802.11n-HT40	
Channel 10 (2457MHz)	Channel 11 (2462MHz)
	

MIMO Mode Ant 1 - 802.11n-HT20	
Channel 12 (2467MHz)	Channel 13 (2472MHz)
	
MIMO Mode Ant 1 - 802.11n-HT40	
Channel 10 (2457MHz)	Channel 11 (2462MHz)
	

5.5. Conducted Band Edge and Out-of-Band Emissions

5.5.1.Test Limit

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

5.5.2.Test Procedure Used

ANSI C63.10-2013 - Section 11.11

5.5.3.Test Settitng

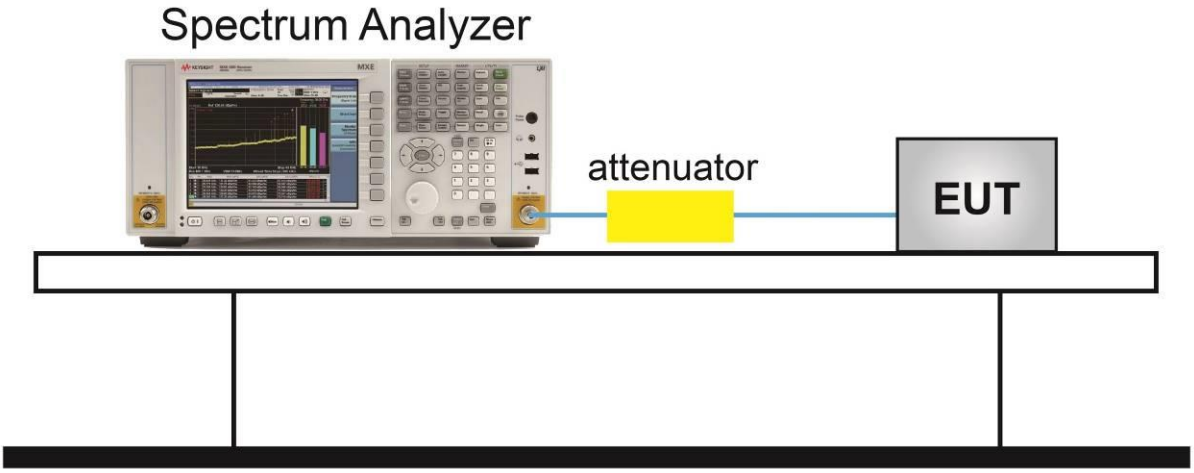
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW ≥ 3 x RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

5.5.4.Test Setup



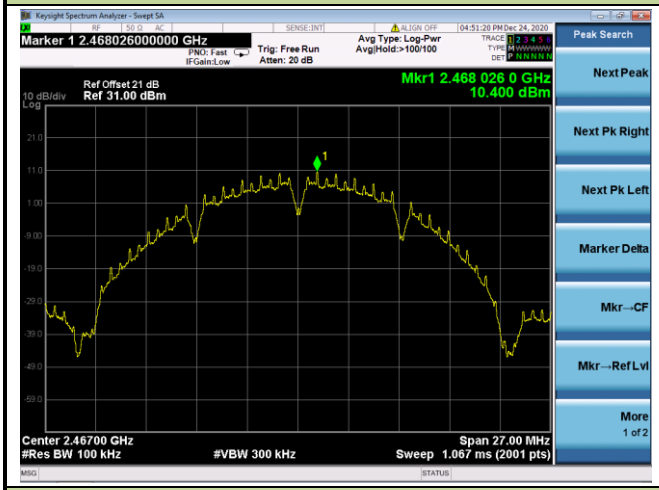
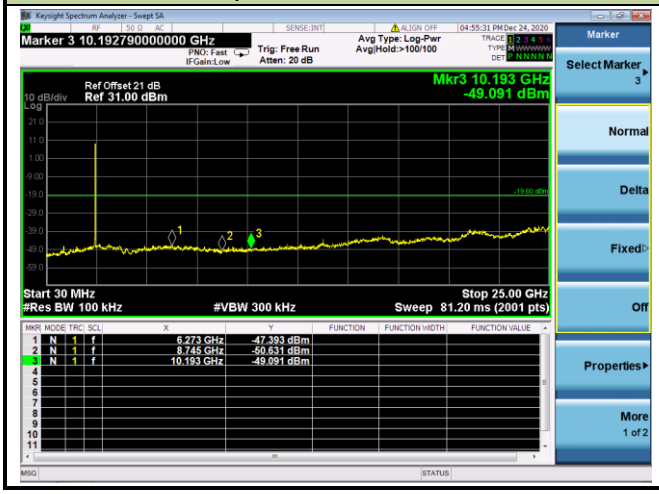
5.5.5.Test Result

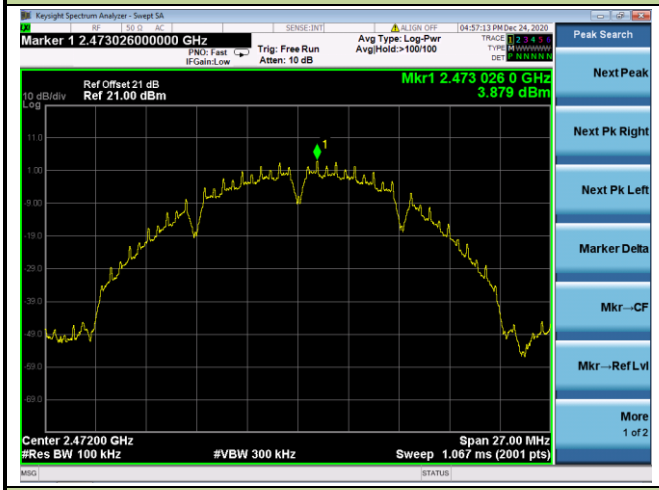
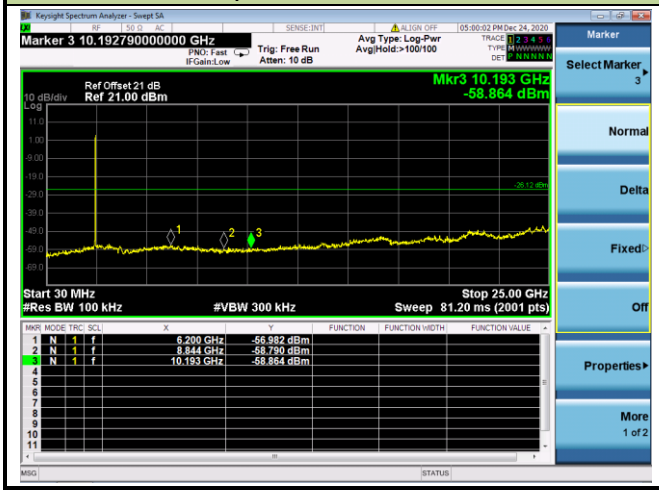
Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/24
Test Mode	SISO Mode		

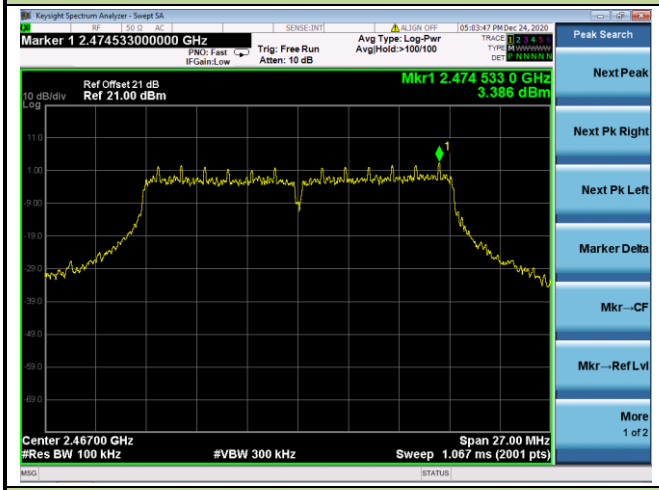
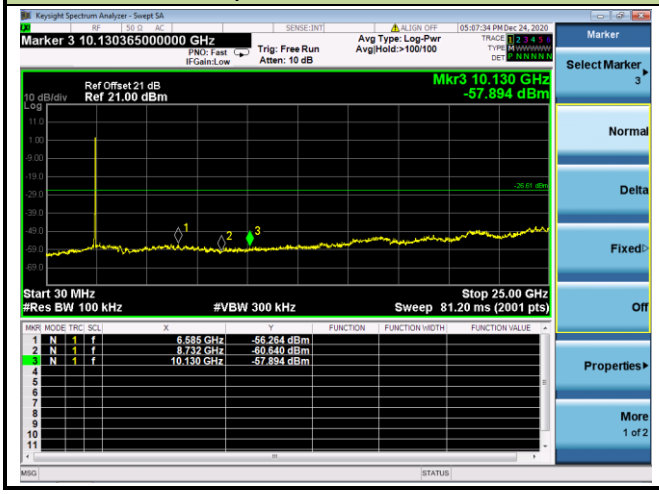
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit	Result
802.11b	1Mbps	12	2467	30dBc	Pass
802.11b	1Mbps	13	2472	30dBc	Pass
802.11g	6Mbps	12	2467	30dBc	Pass
802.11g	6Mbps	13	2472	30dBc	Pass
802.11n-HT20	MCS0	12	2467	30dBc	Pass
802.11n-HT20	MCS0	13	2472	30dBc	Pass
802.11n-HT40	MCS0	10	2457	30dBc	Pass
802.11n-HT40	MCS0	11	2462	30dBc	Pass

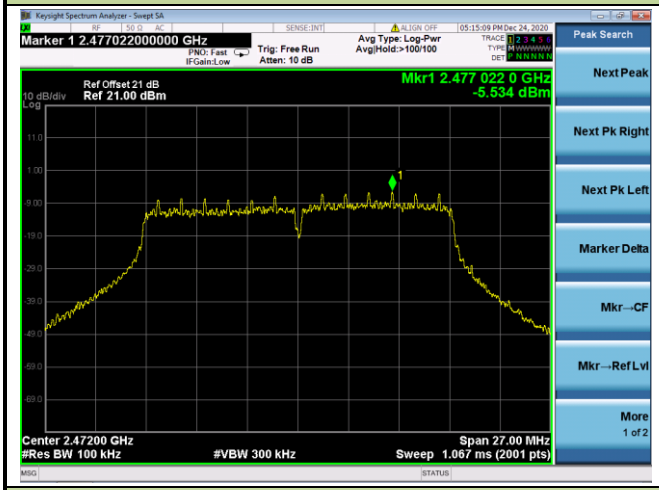
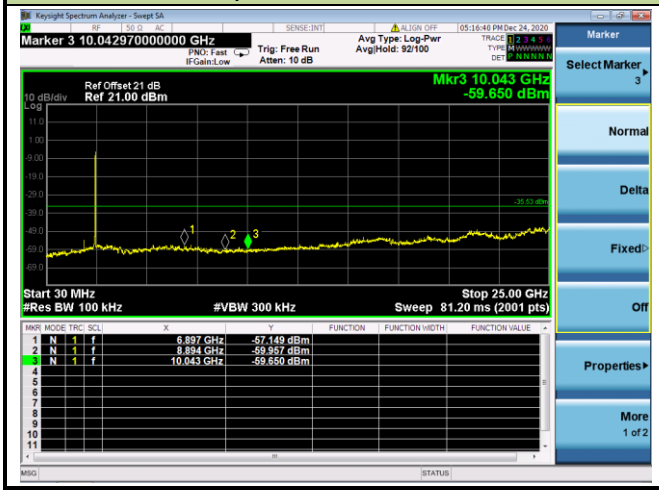
Product	Mobile Computer	Test Engineer	Amy Zhang
Test Site	WZ-TR3	Test Date	2020/12/23 ~ 2020/12/24
Test Mode	MIMO Mode		

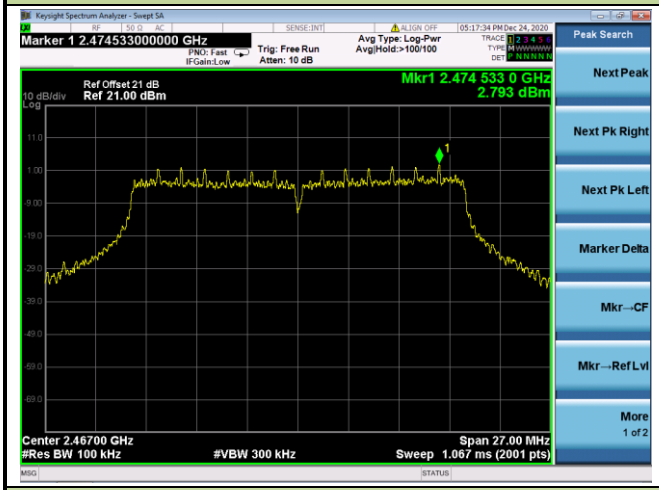
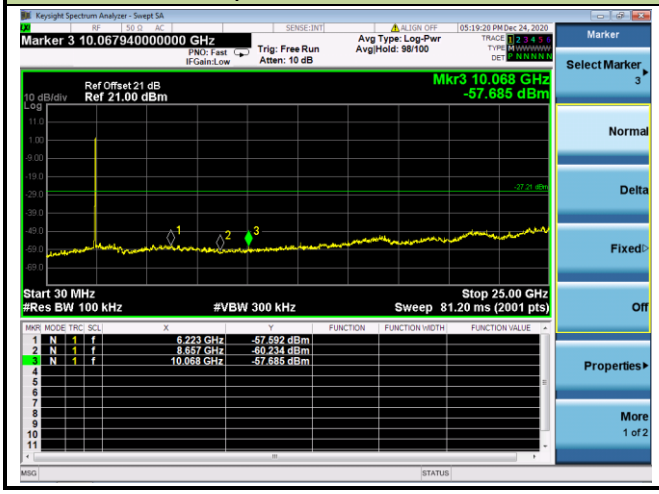
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit	Result
802.11n-HT20	MCS0	12	2467	30dBc	Pass
802.11n-HT20	MCS0	13	2472	30dBc	Pass
802.11n-HT40	MCS0	10	2457	30dBc	Pass
802.11n-HT40	MCS0	11	2462	30dBc	Pass

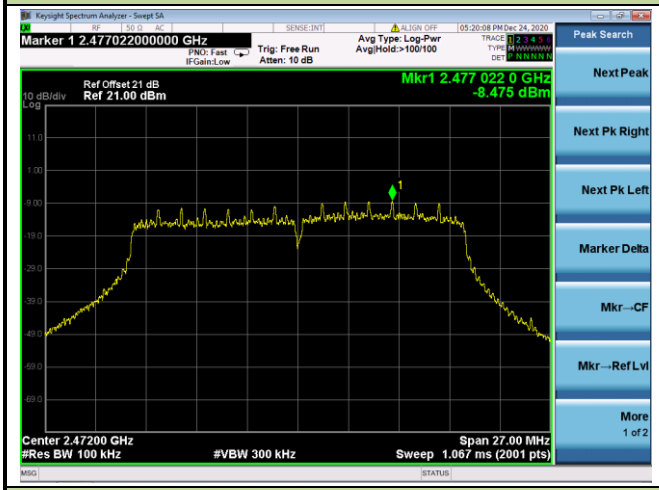
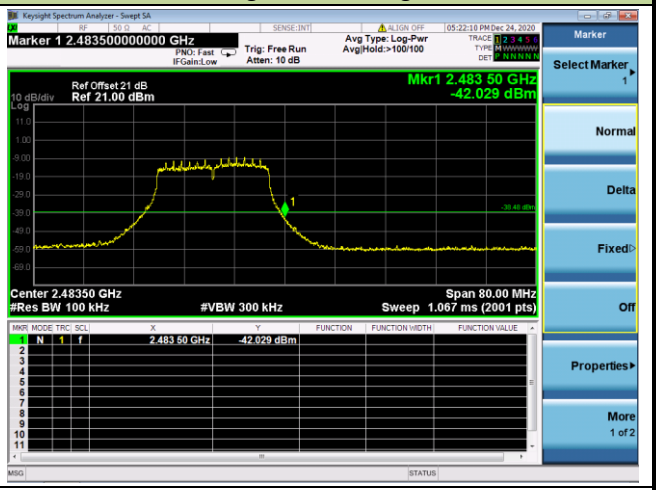
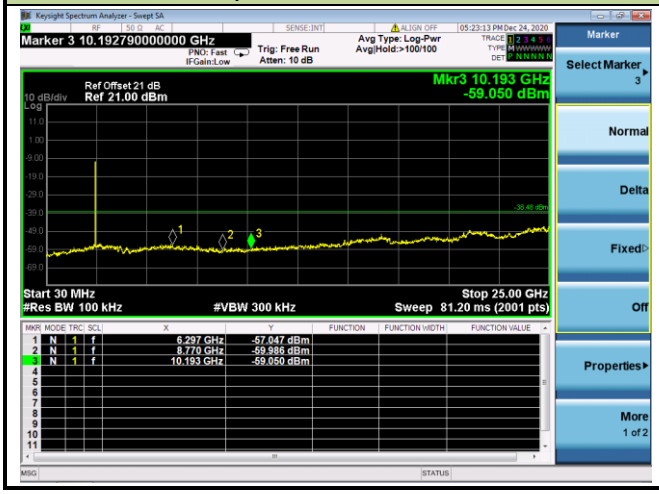
SISO Mode - 802.11b Channel 12 (2467MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

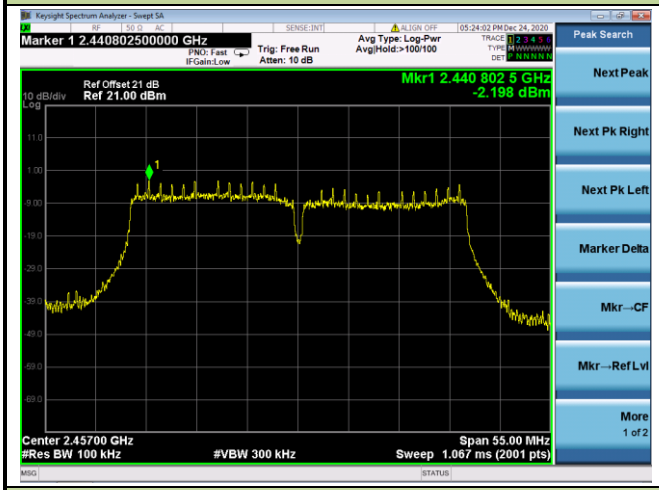
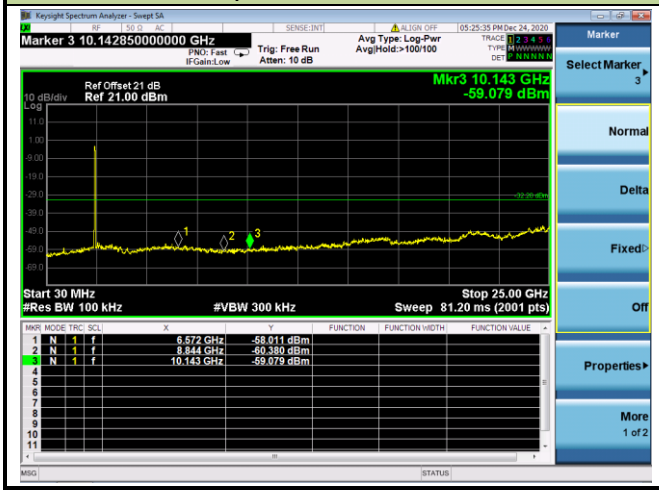
SISO Mode - 802.11b Channel 13 (2472MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

SISO Mode - 802.11g Channel 12 (2467MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

SISO Mode - 802.11g Channel 13 (2472MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

SISO Mode - 802.11n-HT20 Channel 12 (2467MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

SISO Mode - 802.11n-HT20 Channel 13 (2472MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

SISO Mode - 802.11n-HT40 Channel 10 (2457MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission