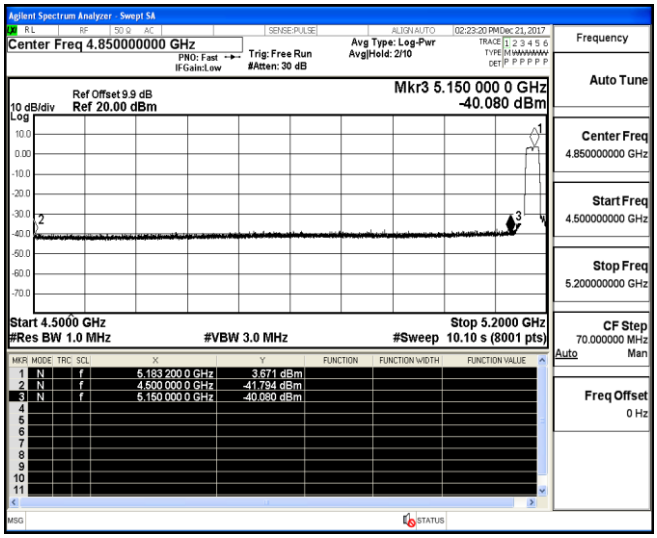
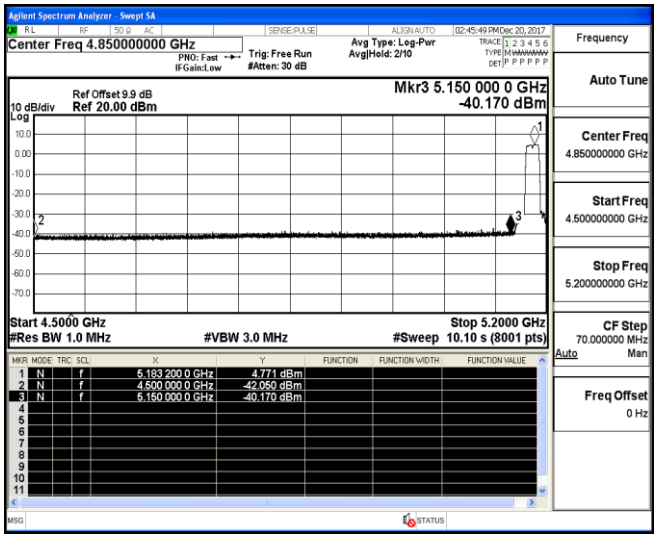
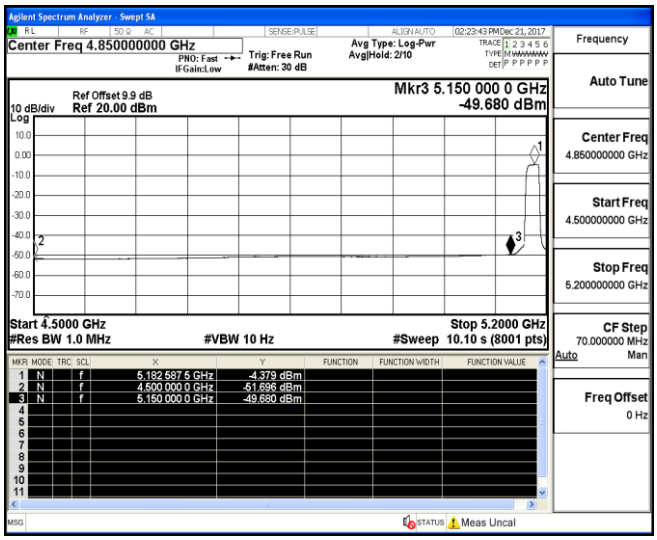
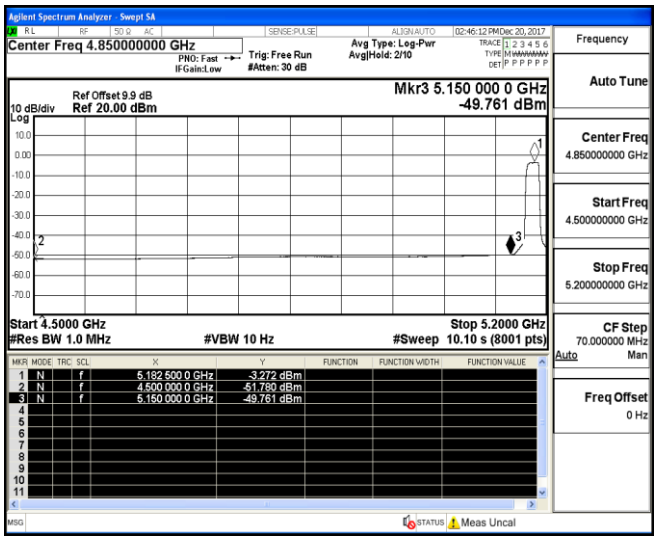
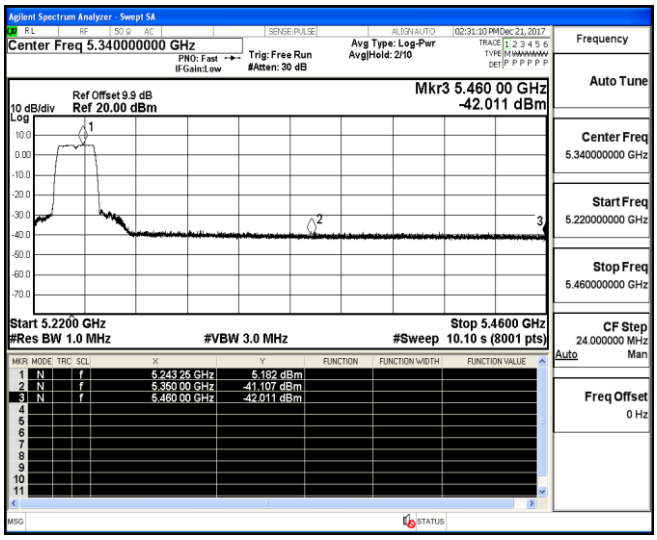
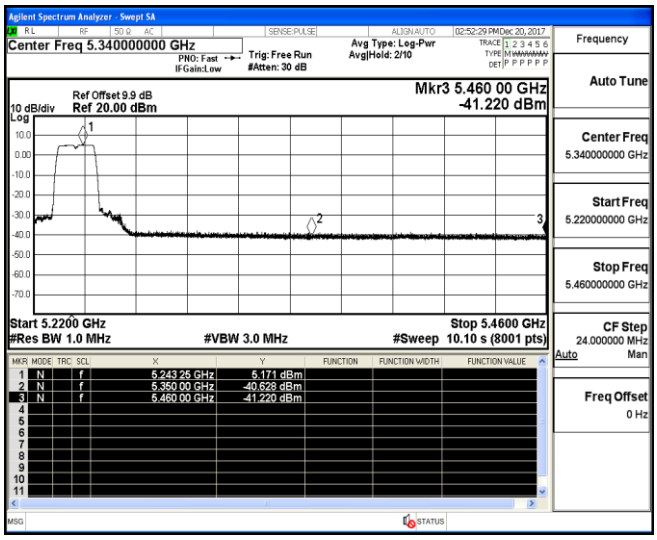
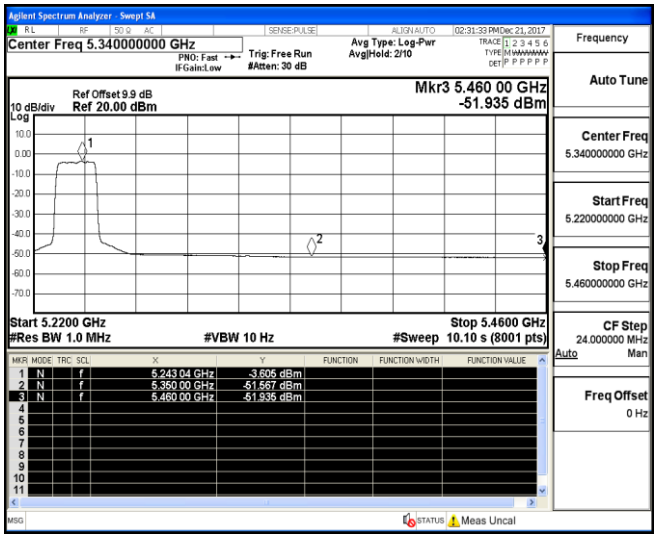
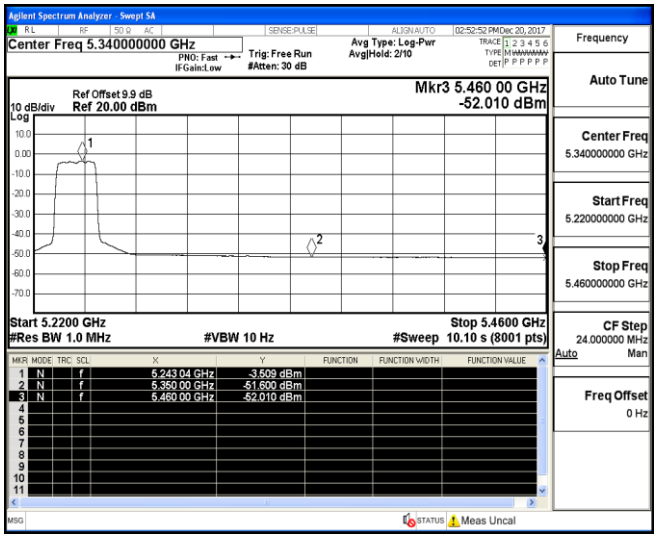
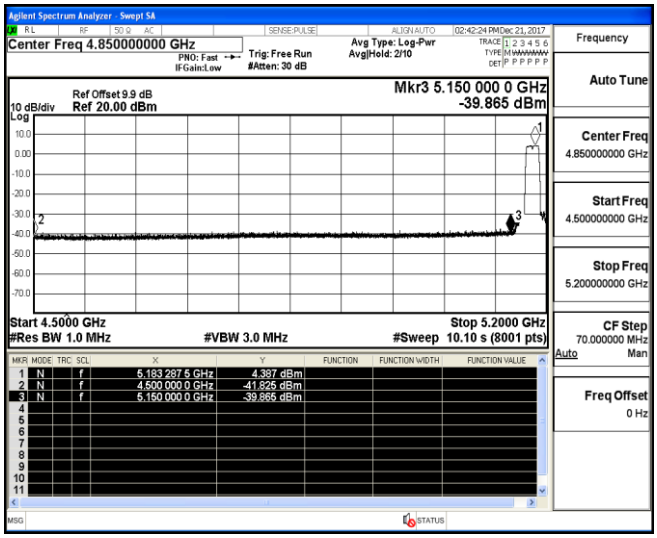
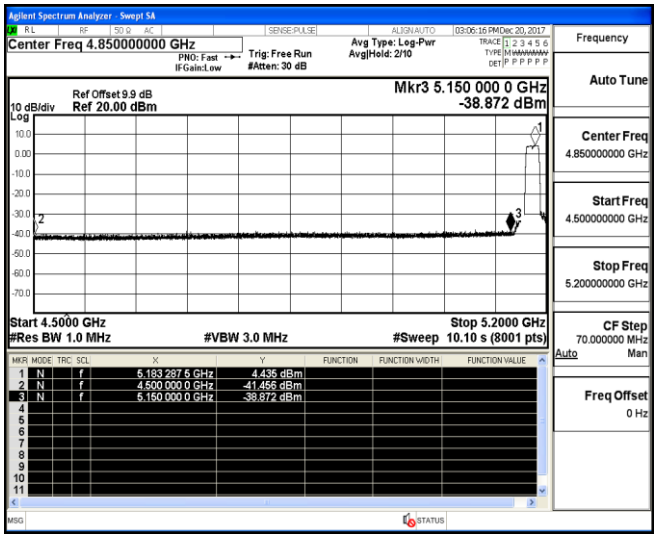
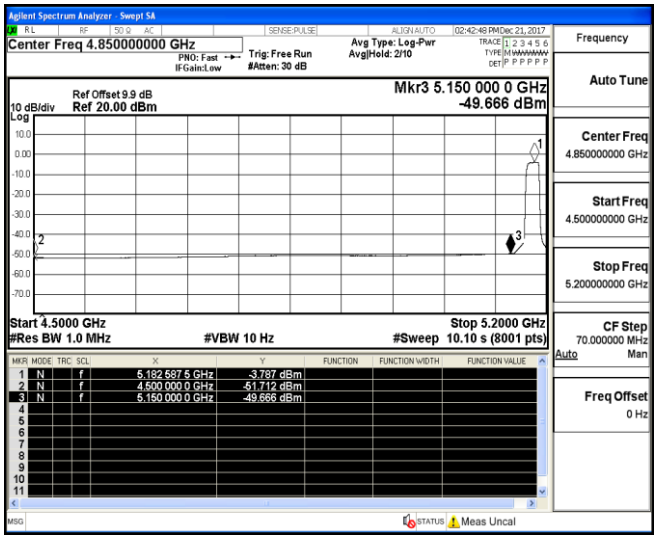
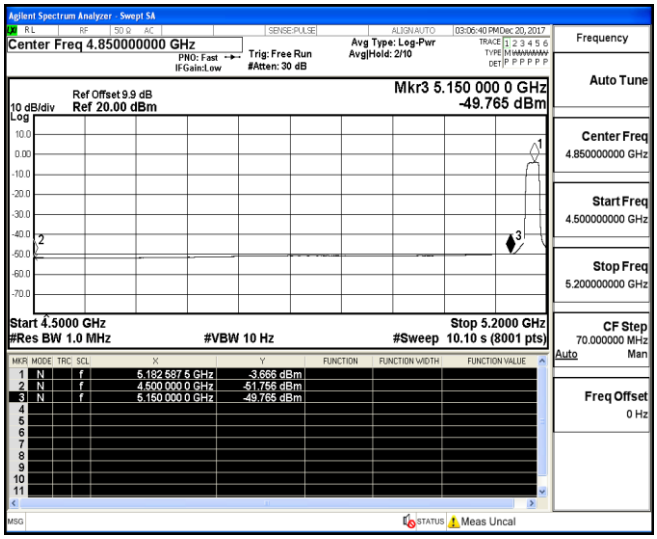
Undesirable emission	
IEEE 802.11a	
Antenna Chain 0	Antenna Chain 1
	
Channel 36 / 5180 MHz – Peak	Channel 36 / 5180 MHz – Peak
	
Channel 36 / 5180 MHz – Average	Channel 36 / 5180 MHz – Average
	
Channel 48 / 5240 MHz – Peak	Channel 48 / 5240 MHz – Peak

Undesirable emission

IEEE 802.11a

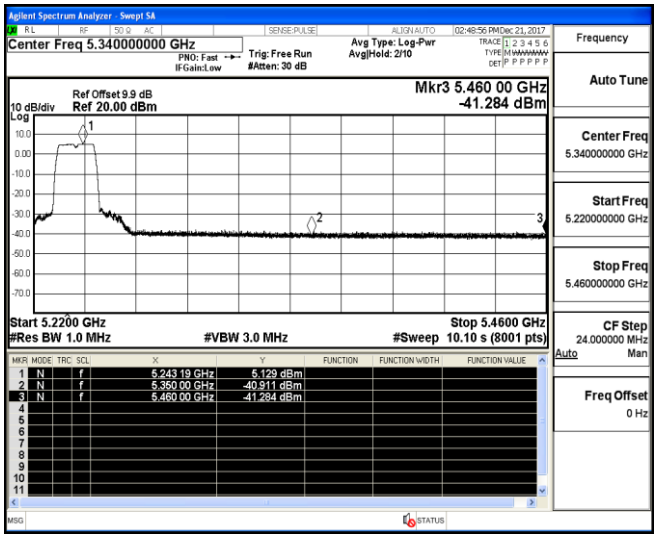
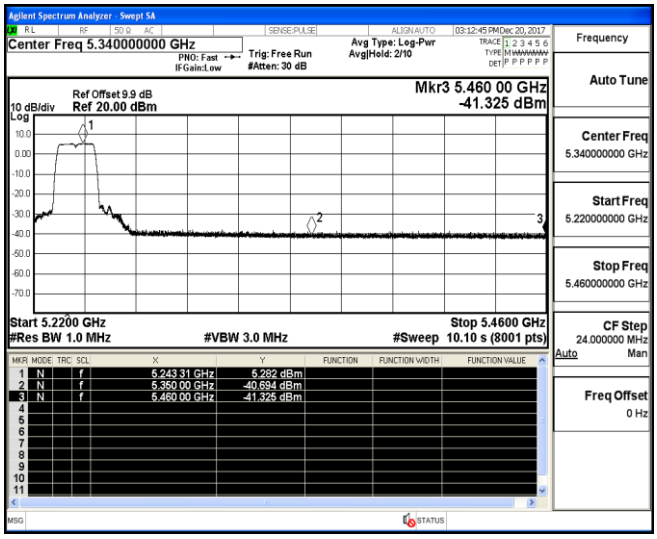
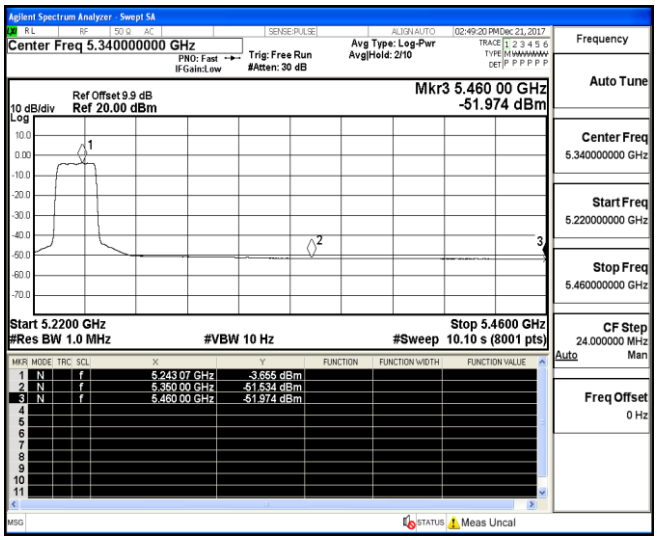
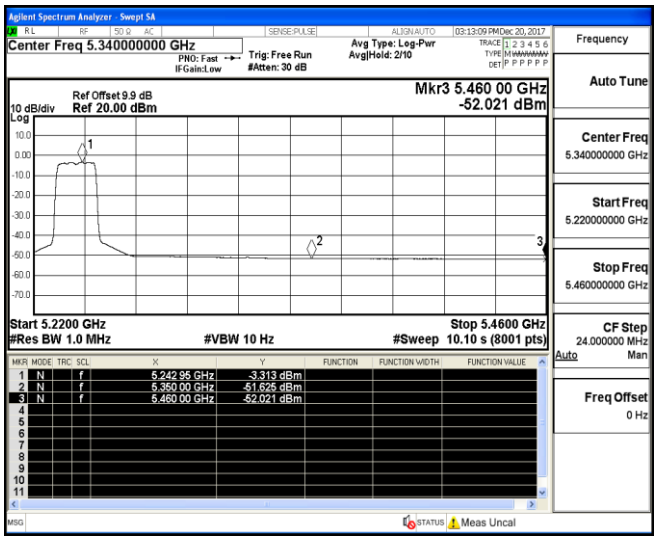
Antenna Chain 0	Antenna Chain 1
	
Channel 48 / 5240 MHz – Average	Channel 48 / 5240 MHz – Average

IEEE 802.11n HT20

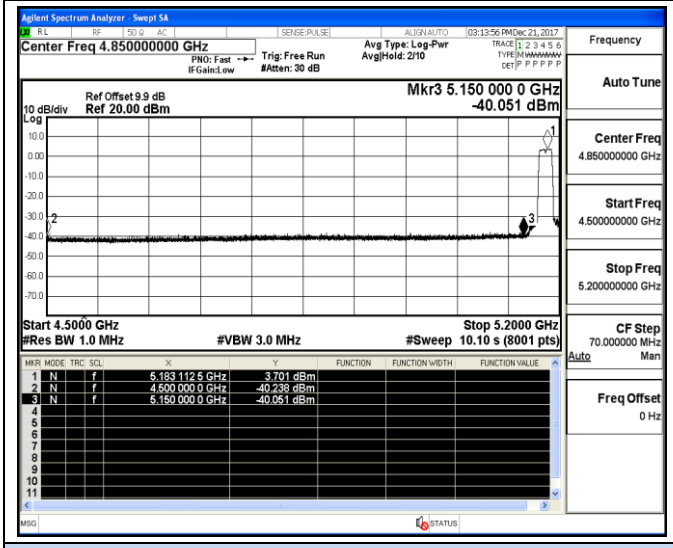
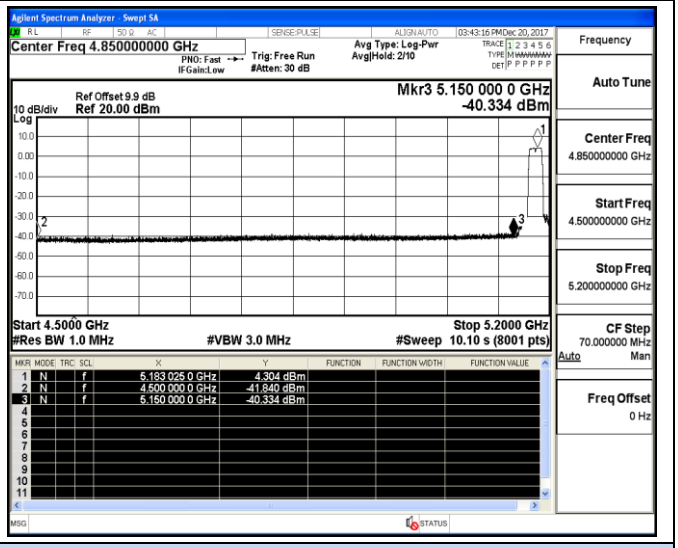
	
Channel 36 / 5180 MHz – Peak	Channel 36 / 5180 MHz – Peak
	
Channel 36 / 5180 MHz – Average	Channel 36 / 5180 MHz – Average

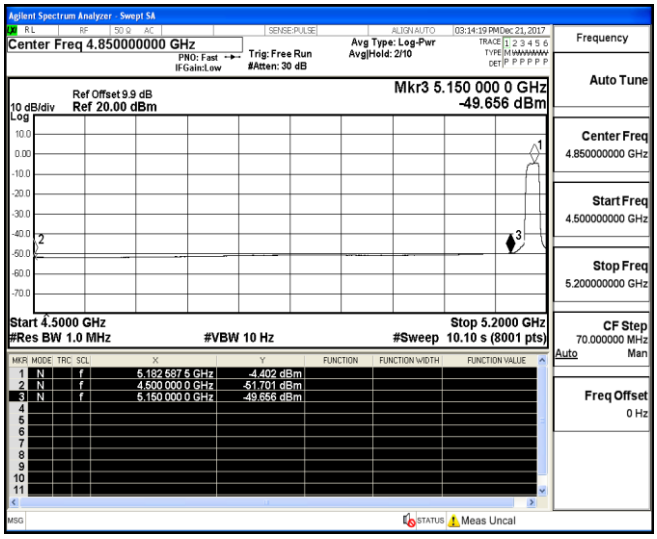
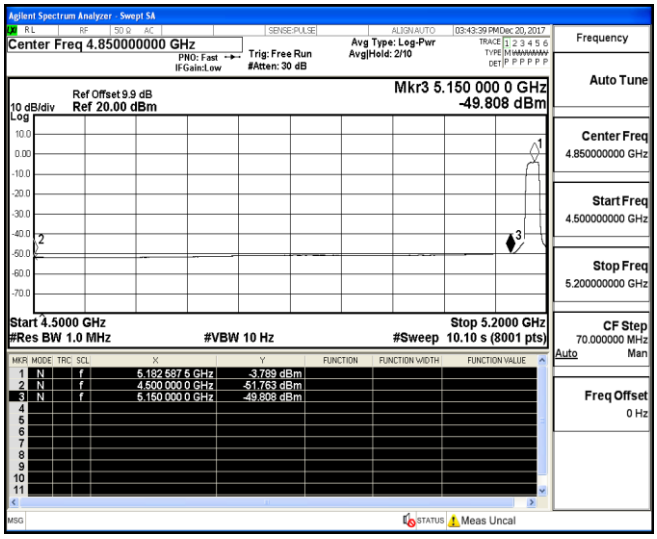
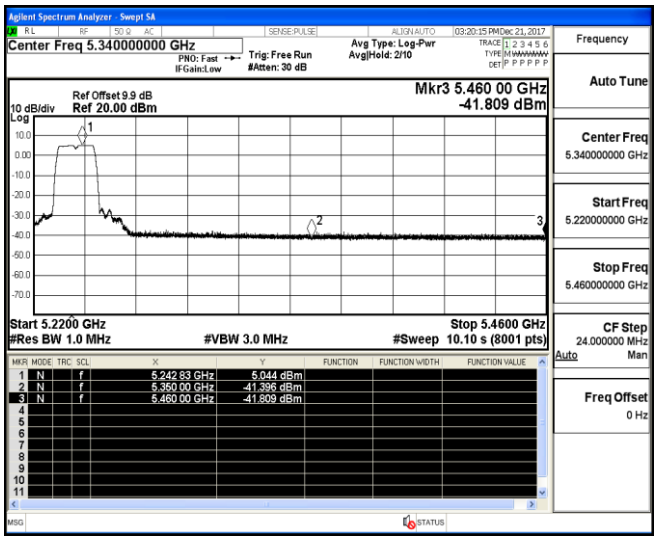
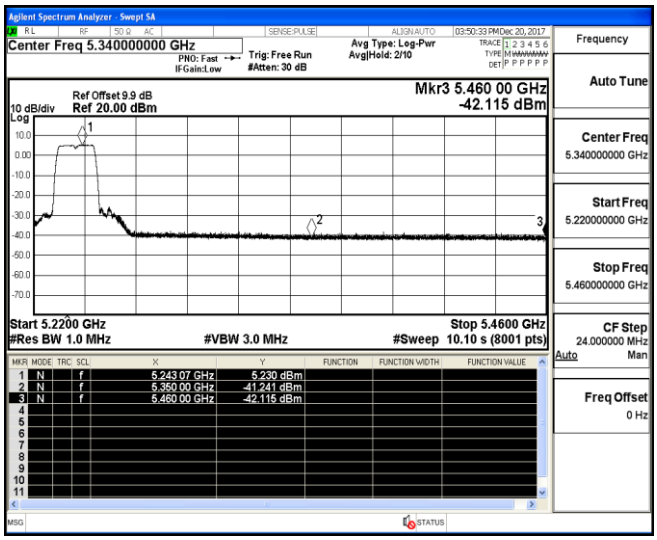
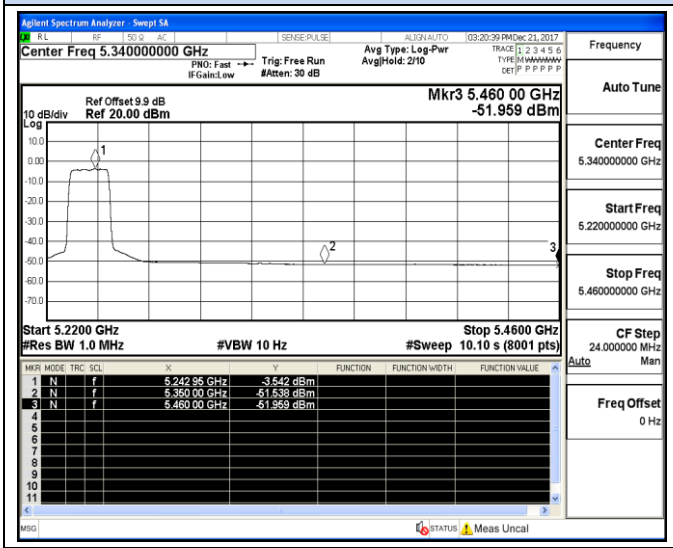
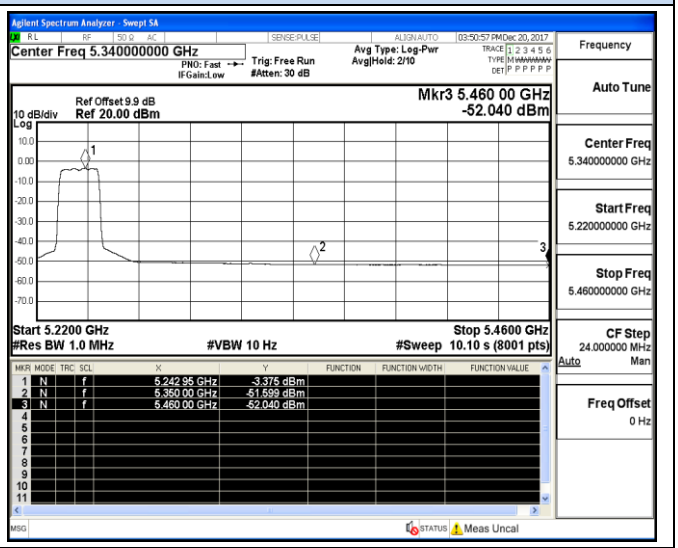
Undesirable emission

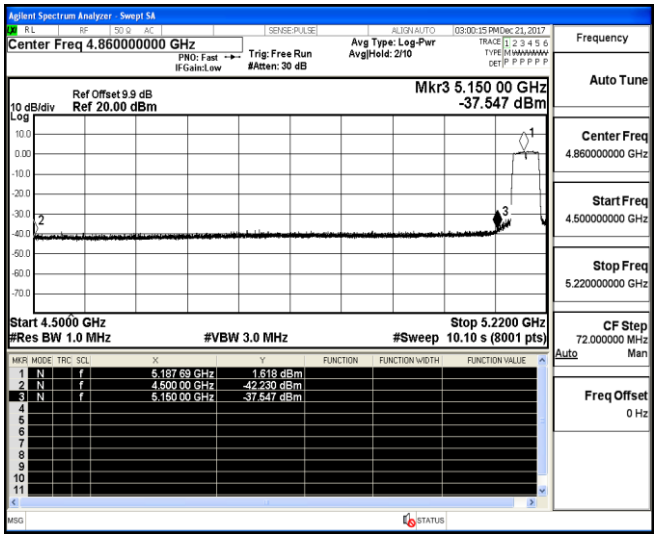
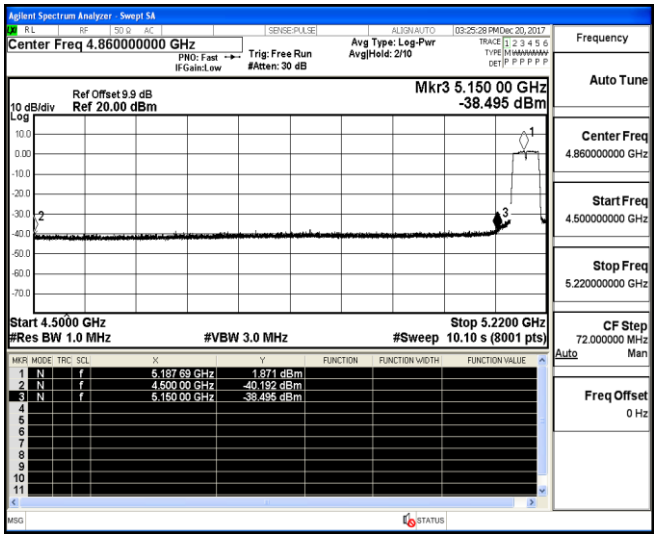
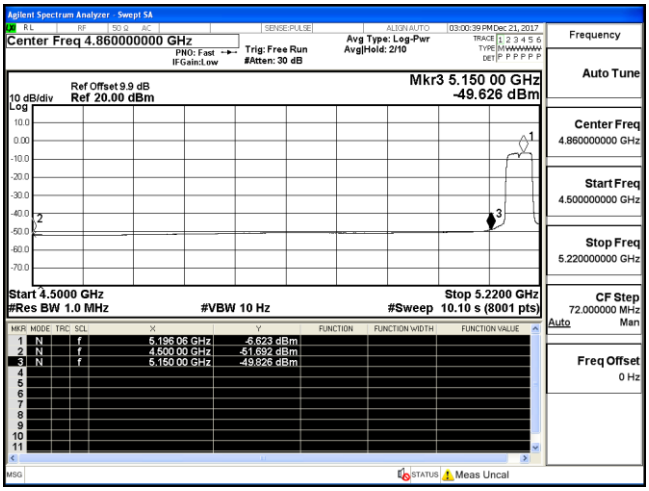
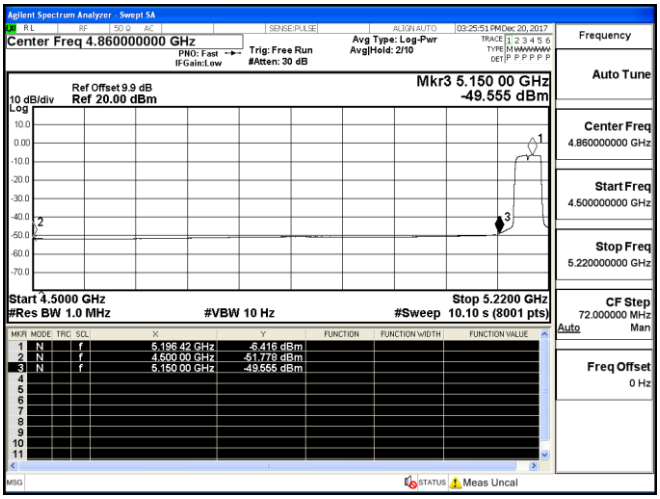
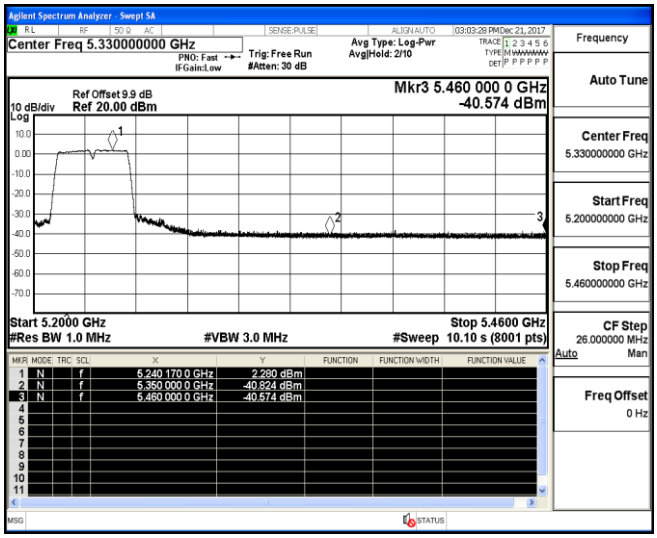
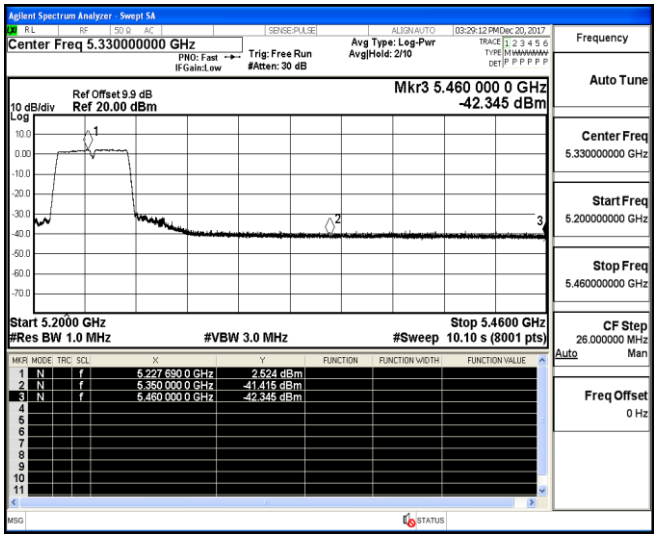
IEEE 802.11n HT20

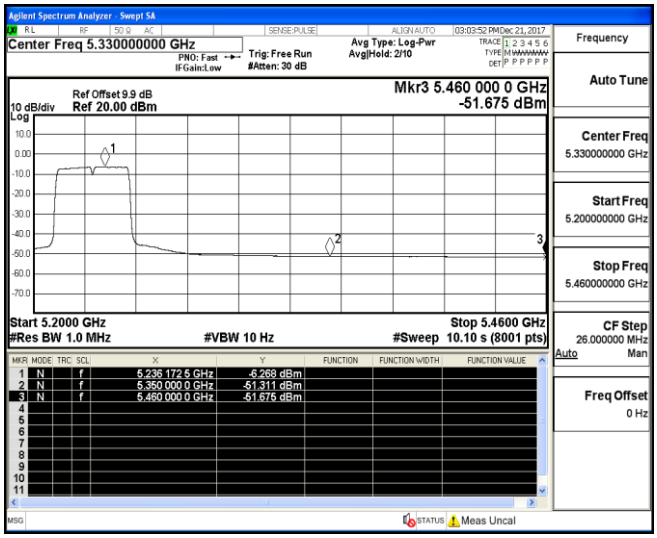
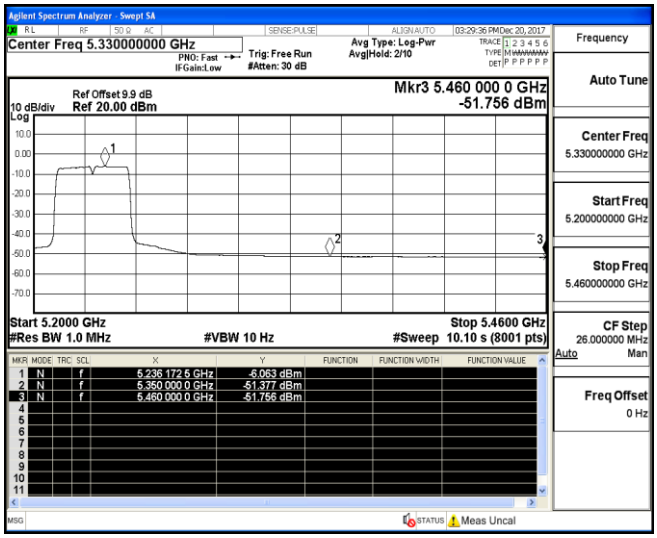
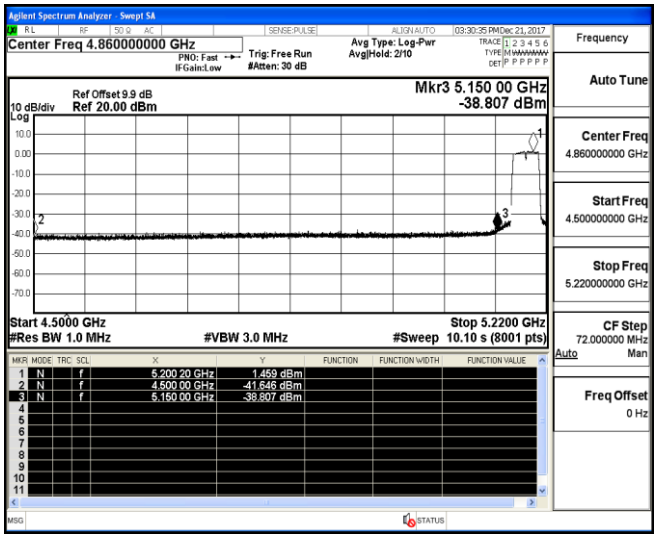
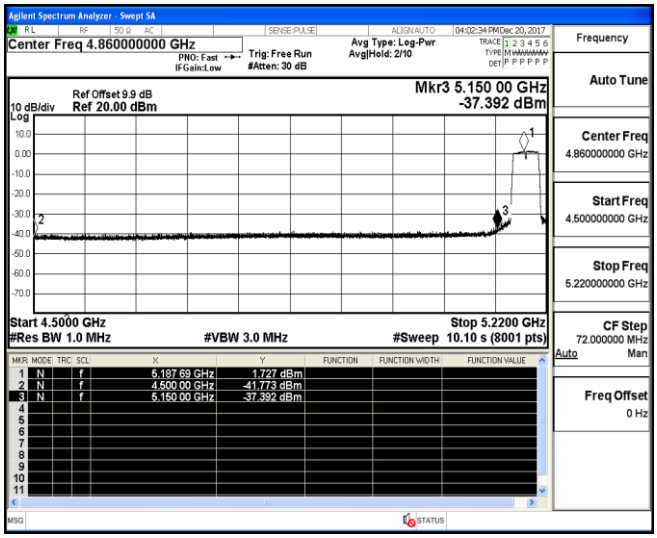
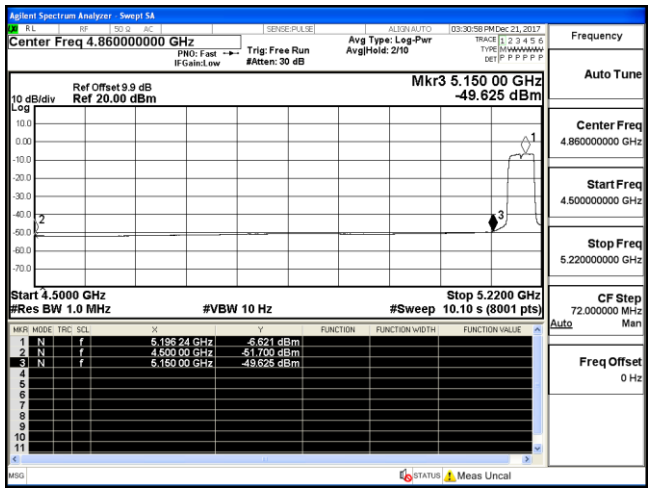
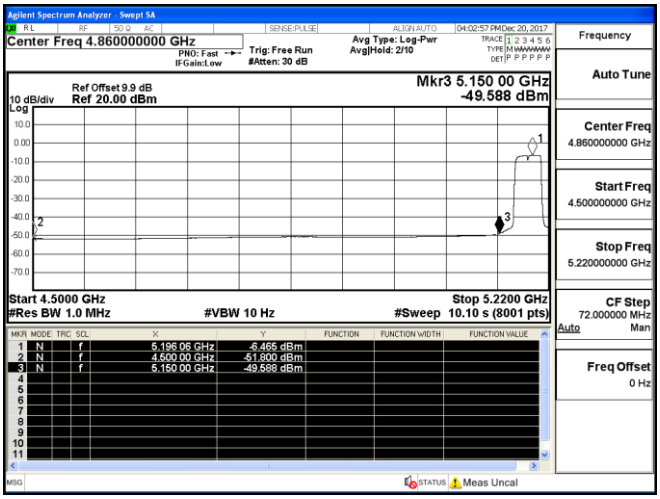
Antenna Chain 0	Antenna Chain 1
	
Channel 48 / 5240 MHz – Peak	Channel 48 / 5240 MHz – Peak
	
Channel 48 / 5240 MHz – Average	Channel 48 / 5240 MHz – Average

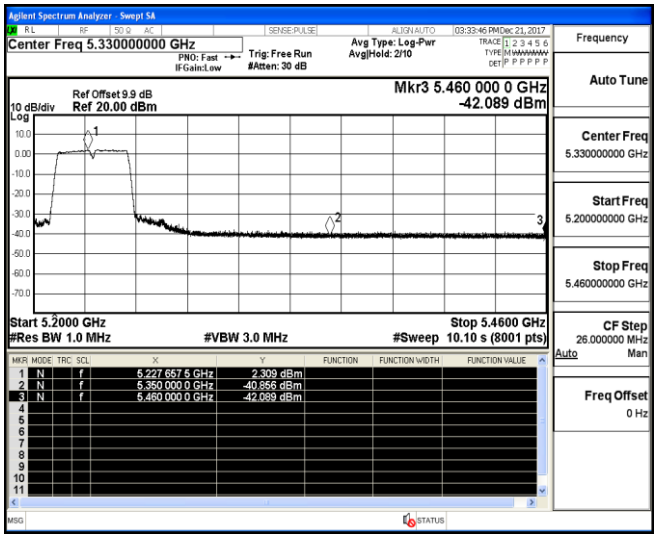
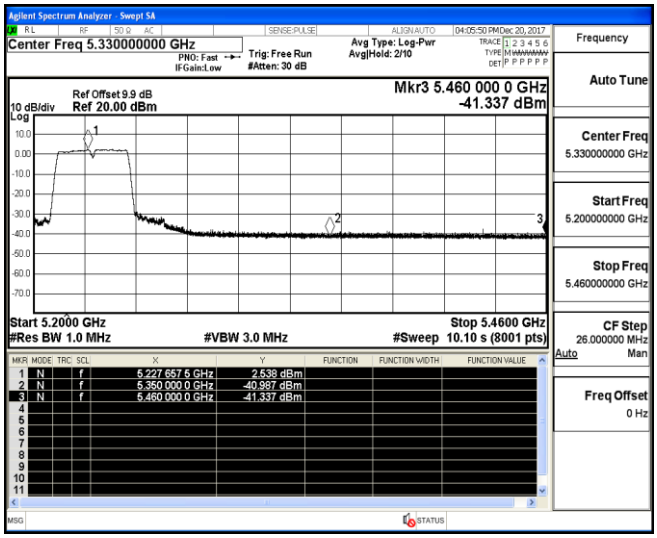
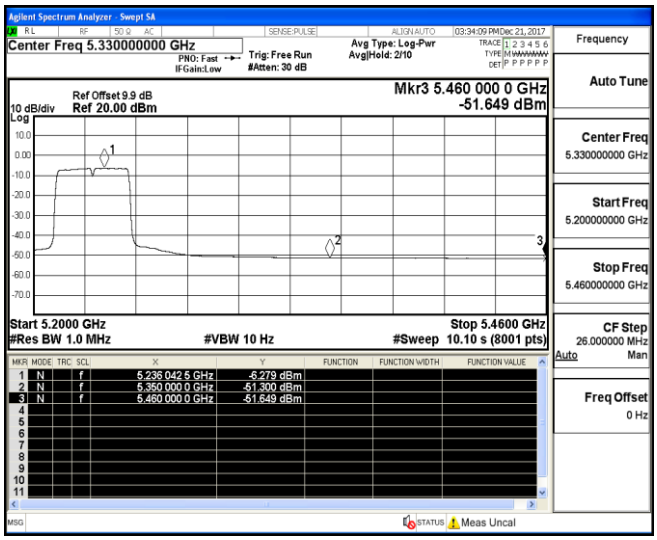
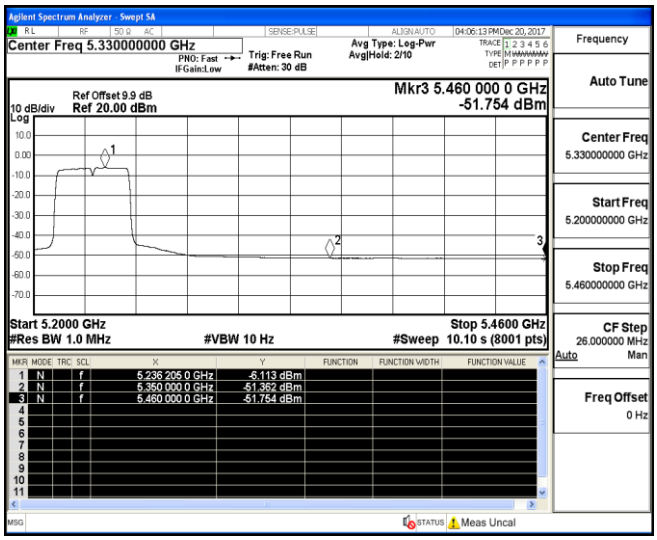
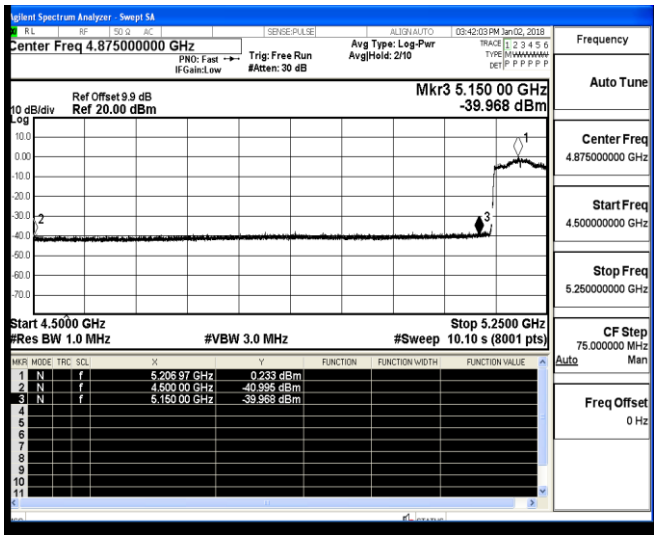
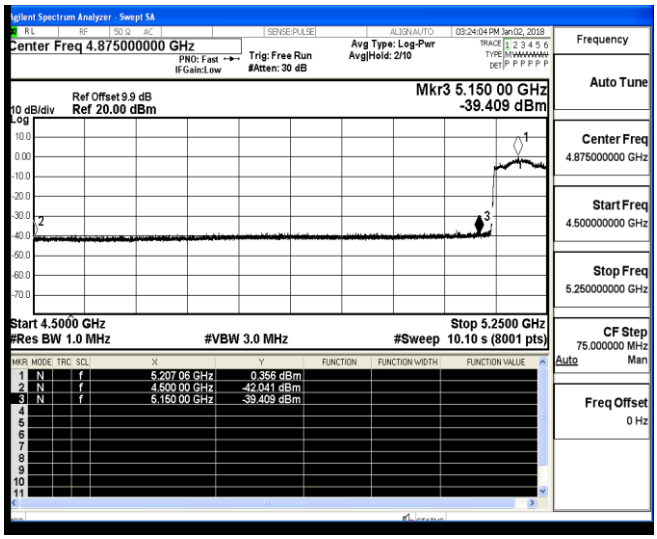
IEEE 802.11ac VHT20

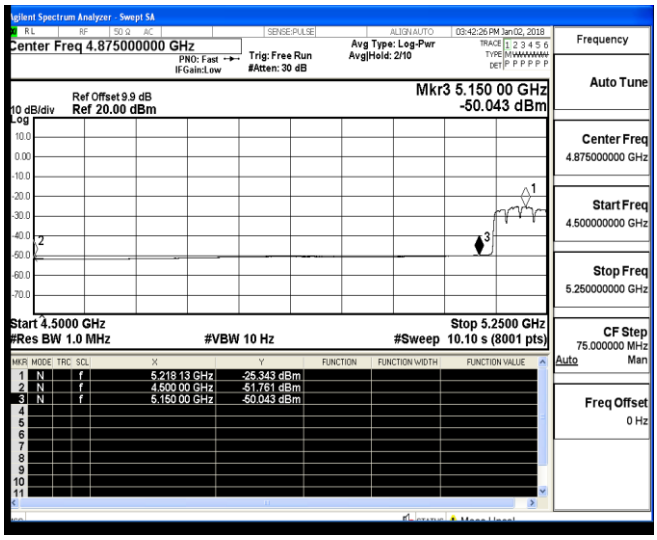
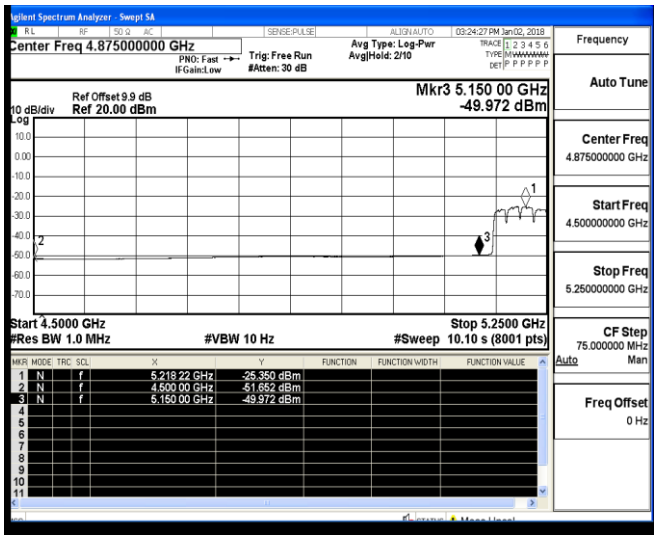
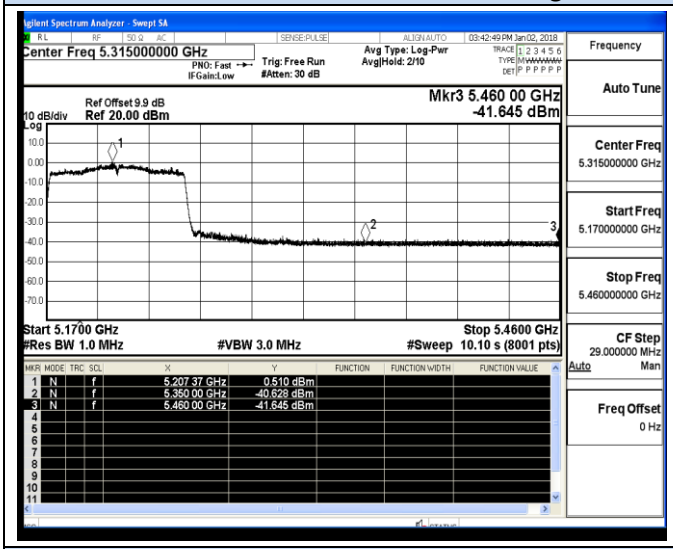
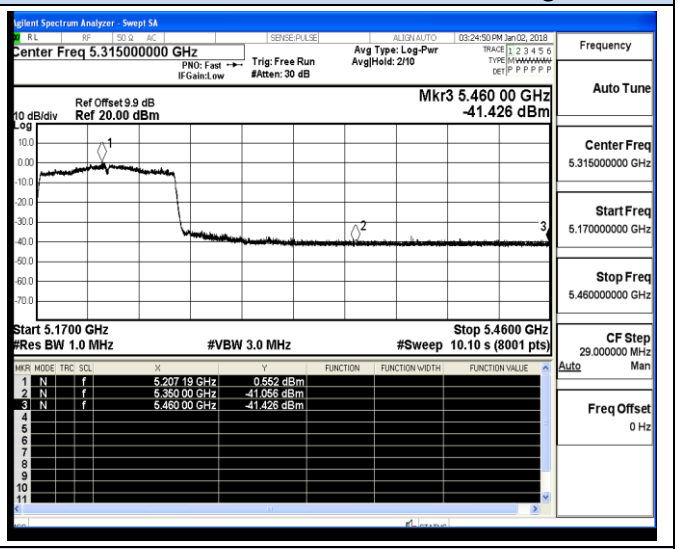
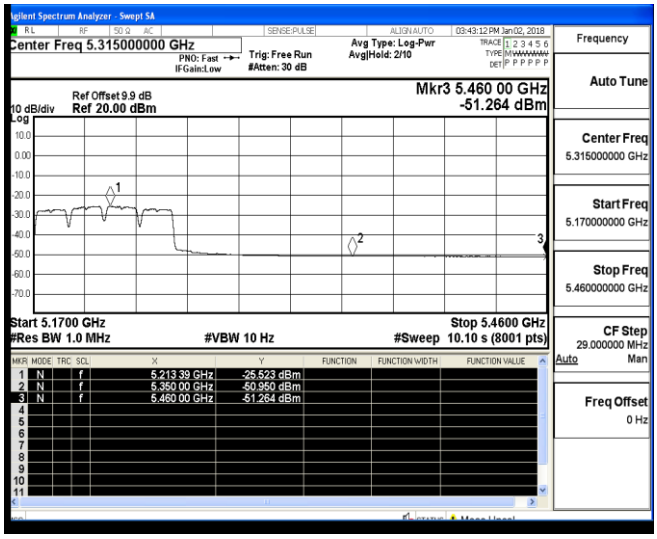
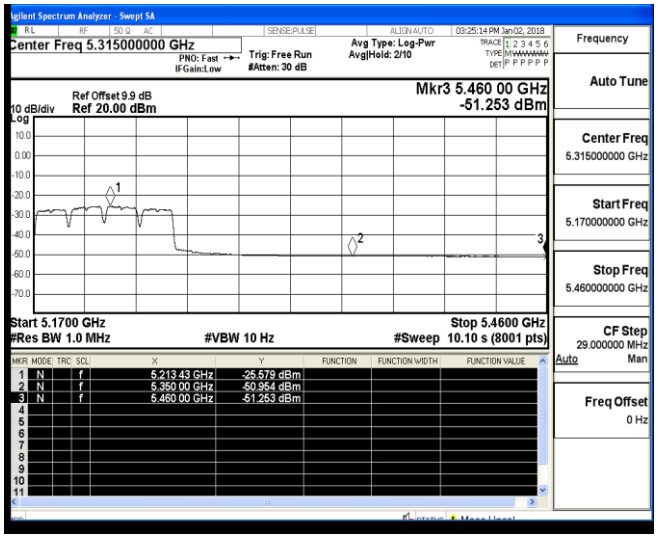
	
Channel 36 / 5180 MHz – Peak	Channel 36 / 5180 MHz – Peak

Undesirable emission	
IEEE 802.11ac VHT20	
Antenna Chain 0	Antenna Chain 1
	
Channel 36 / 5180 MHz – Average	Channel 36 / 5180 MHz – Average
	
Channel 48 / 5240 MHz – Peak	Channel 48 / 5240 MHz – Peak
	
Channel 48 / 5240 MHz – Average	Channel 48 / 5240 MHz – Average

Undesirable emission	
IEEE 802.11n HT40	
Antenna Chain 0	Antenna Chain 1
	
Channel 38 / 5190 MHz – Peak	Channel 38 / 5190 MHz – Peak
	
Channel 38 / 5190 MHz – Average	Channel 38 / 5190 MHz – Average
	
Channel 46 / 5230 MHz – Peak	Channel 46 / 5230 MHz – Peak

Undesirable emission	
IEEE 802.11n HT40	
Antenna Chain 0	Antenna Chain 1
	
Channel 46 / 5230 MHz – Average	Channel 46 / 5230 MHz – Average
IEEE 802.11ac VHT40	
	
Channel 38 / 5190 MHz – Peak	Channel 38 / 5190 MHz – Peak
	
Channel 38 / 5190 MHz – Average	Channel 38 / 5190 MHz – Average

Undesirable emission	
IEEE 802.11ac VHT40	
Antenna Chain 0	Antenna Chain 1
	
Channel 46 / 5230 MHz – Peak	Channel 46 / 5230 MHz – Peak
	
Channel 46 / 5230 MHz – Average	Channel 46 / 5230 MHz – Average
IEEE 802.11ac VHT80	
	

Channel 42 / 5210 MHz – Peak	Channel 42 / 5210 MHz – Peak
Undesirable emission	
IEEE 802.11ac VHT80	
Antenna Chain 0	Antenna Chain 1
	
Channel 42 / 5210 MHz – Average	Channel 42 / 5210 MHz – Average
	
Channel 42 / 5210 MHz – Peak	Channel 42 / 5210 MHz – Peak
	
Channel 42 / 5210 MHz – Average	Channel 42 / 5210 MHz – Average

5.8. Antenna Requirements

5.8.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited
And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.8.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 2.0dBi, and the antenna is an internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.8.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Conducted power refers ANSI C63.10:2013 Output power test procedure for UNII devices.

Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep Time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For 5G WLAN devices, the IEEE 802.11a mode is used.

Limits

FCC	ISED
Antenna Gain	
6 dBi	

Antenna Chain 0

T_{nom}	V_{nom}	Lowest Channel 5180 MHz	Middle Channel 5220 MHz	Highest Channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		12.75	13.40	14.15
Radiated power [dBm] Measured with OFDM modulation		14.60	15.12	15.83
Gain [dBi] Calculated		1. 85	1. 72	1. 68
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

Antenna Chain 1

T_{nom}	V_{nom}	Lowest Channel 5180 MHz	Middle Channel 5220 MHz	Highest Channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		13.80	13.72	14.20
Radiated power [dBm] Measured with OFDM modulation		15.67	15.61	15.92
Gain [dBi] Calculated		1.87	1.79	1.72
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2017-06-17	2018-06-16
2	Power Sensor	R&S	NRV-Z81	100458	2017-06-17	2018-06-16
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-17	2018-06-16
4	EPM Series Power Meter	Agilent	E4419B	MY45104493	2017-06-17	2018-06-16
5	E-SERIES AVG POWER SENSOR	Agilent	E9301H	MY41495234	2017-06-17	2018-06-16
6	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-18	2018-11-17
7	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2017-06-17	2018-06-16
8	SPECTRUM ANALYZER	R&S	FSP	100503	2017-06-17	2018-06-16
9	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-17	2018-06-16
10	Positioning Controller	MF	MF-7082	/	2017-06-17	2018-06-16
11	EMI Test Software	AUDIX	E3	N/A	2017-06-17	2018-06-16
12	EMI Test Receiver	ROHDE & SCHWARZ	ESR 7	101181	2017-06-17	2018-06-16
13	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-18	2018-11-17
14	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2017-06-23	2018-06-22
15	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-05-02	2018-05-01
16	Horn Antenna	EMCO	3115	6741	2017-06-23	2018-06-22
17	Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	2017-06-10	2018-06-09
18	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-17	2018-06-16
19	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-17	2018-06-16
20	TEST RECEIVER	R&S	ESCI	101142	2017-06-17	2018-06-16
21	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-17	2018-06-16
22	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-003 2	2017-06-17	2018-06-16
23	Artificial Mains	R&S	ENV216	101288	2017-06-17	2018-06-16

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