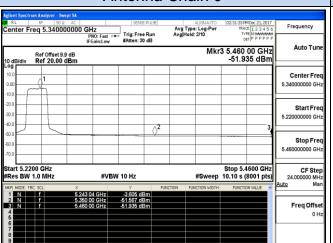
Undesirable emission IEEE 802.11a Antenna Chain 0 Antenna Chain 1 RL FF S02 AC | enter Freq 4.850000000 GHz PN0: Fast FfeeRun IFGeinclow #Atten: 30 dB Avg Type: Log-Pw Avg|Hold: 2/10 Avg Type: Log-Pw Avg|Hold: 2/10 Ref Offset 9.9 dB Ref 20.00 dBm Ref Offset 9.9 dB Ref 20.00 dBm Center Fre Center Free Start Fre Start Free **Stop Fre** 5.200000000 GH Stop Fre CF Step 70.000000 MH: to Mar art 4.5000 GHz Res BW 1.0 MHz Stop 5.2000 GHz #Sweep 10.10 s (8001 pts) Start 4.5000 GHz #Res BW 1.0 MHz Stop 5.2000 GHz #Sweep 10.10 s (8001 pts) CF Step 70.000000 MH: #VBW 3.0 MHz **#VBW 3.0 MHz** 4.500 000 0 GHz 5.150 000 0 GHz 41.794 dBn -40.080 dBn Freq Offse Freq Offse Channel 36 / 5180 MHz - Peak Channel 36 / 5180 MHz - Peak REF SO 2 AC GHZ NTEF Freq 4.850000000 GHZ PRO: Fast HGGaincl ow HAtten: 30 dB Avg Type: Log-Pwr Avg|Hold: 2/10 Avg Type: Log-Pwr Avg|Hold: 2/10 Mkr3 5.150 000 0 GHz -49.761 dBm Mkr3 5.150 000 0 GHz -49.680 dBm Ref Offset 9.9 dB Ref 20.00 dBm Ref Offset 9.9 dB Ref 20.00 dBm Center Fre Center Fre Start Fre Start Fre •3 Stop Free Stop Fred Stop 5.2000 GHz #Sweep 10.10 s (8001 pts) Stop 5.2000 GHz #Sweep 10.10 s (8001 pts rt 4.5000 GHz es BW 1.0 MHz Freq Offse Freq Offse Channel 36 / 5180 MHz - Average Channel 36 / 5180 MHz - Average RL 8F 500 AC | enter Freq 5.340000000 GHz PRO: Fast → PRO: Fast → Frig: Free Run #Fdain.tow #Atten: 30 dB Avg Type: Log-Pwr Avg|Hold: 2/10 Avg Type: Log-Pwr Avg|Hold: 2/10 Auto Tur Mkr3 5.460 00 GHz -42.011 dBm Start Fre Start Free Stop Fre Stop Free CF Step 24.000000 MHz Mar Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) t 5.2200 GHz s BW 1.0 MHz Start 5.2200 GHz CF Ste Freq Offse Freq Offse

Channel 48 / 5240 MHz - Peak

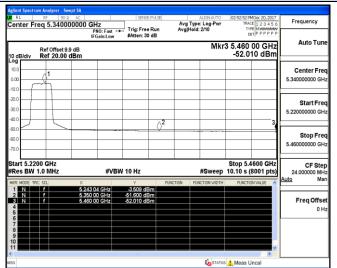
Channel 48 / 5240 MHz - Peak

IEEE 802.11a

Antenna Chain 0



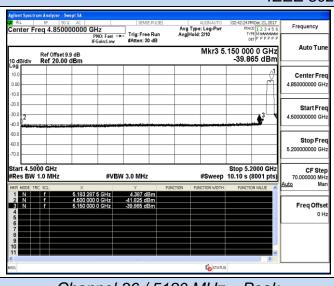
Antenna Chain 1

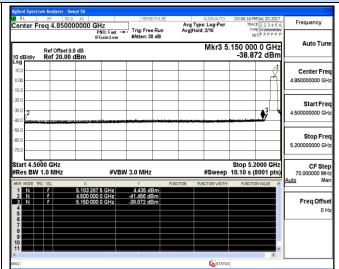


Channel 48 / 5240 MHz - Average

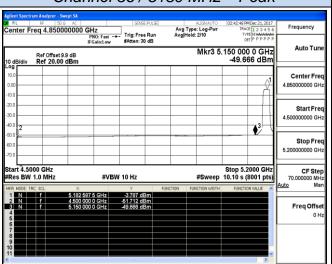
Channel 48 / 5240 MHz – Average

IEEE 802.11n HT20

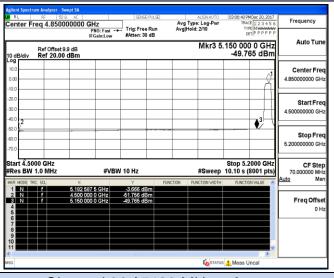




Channel 36 / 5180 MHz – Peak



Channel 36 / 5180 MHz - Peak



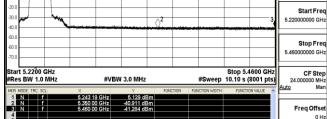
Channel 36 / 5180 MHz – Average

Channel 36 / 5180 MHz – Average

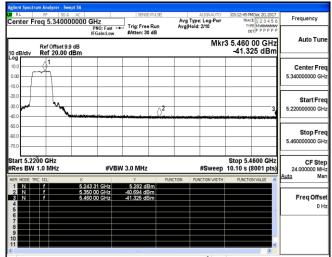
IEEE 802.11n HT20

Antenna Chain 0

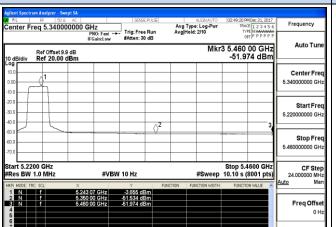
| SPACE | SPAC



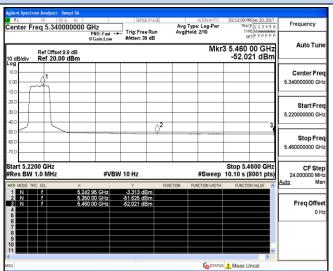
Antenna Chain 1



Channel 48 / 5240 MHz – Peak



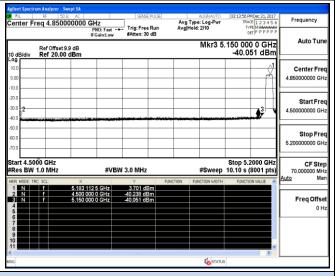
Channel 48 / 5240 MHz - Peak

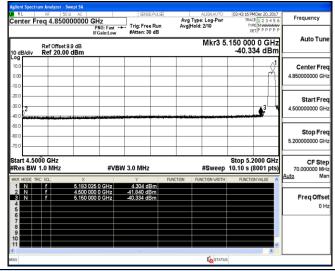


Channel 48 / 5240 MHz - Average

Channel 48 / 5240 MHz - Average

IEEE 802.11ac VHT20

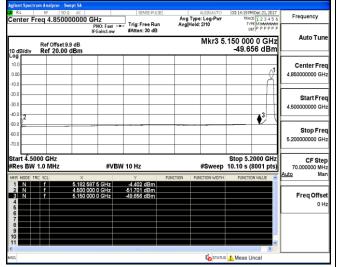




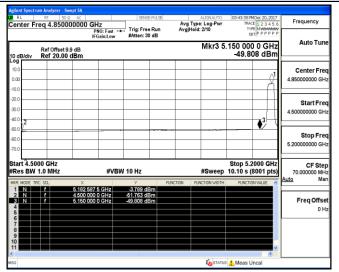
Channel 36 / 5180 MHz – Peak C

Channel 36 / 5180 MHz - Peak

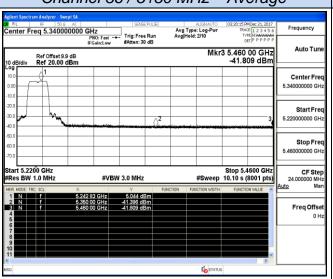
Undesirable emission IEEE 802.11ac VHT20 Antenna Chain 0



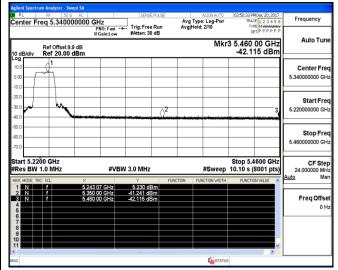
Antenna Chain 1



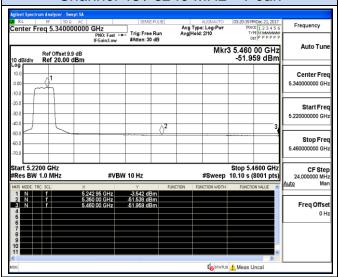
Channel 36 / 5180 MHz – Average



Channel 36 / 5180 MHz – Average

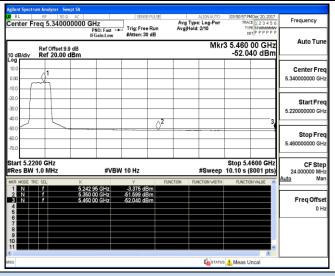


Channel 48 / 5240 MHz - Peak



Channel 48 / 5240 MHz – Average

Channel 48 / 5240 MHz - Peak

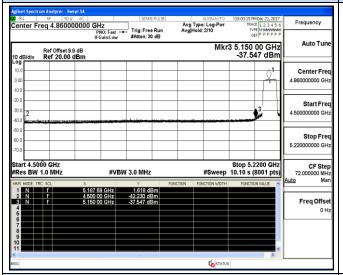


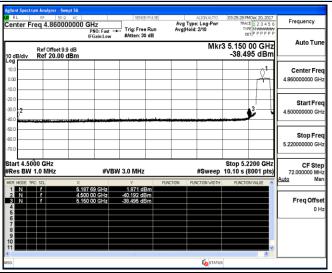
Channel 48 / 5240 MHz - Average

IEEE 802.11n HT40

Antenna Chain 0

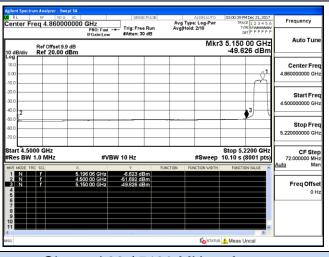
Antenna Chain 1

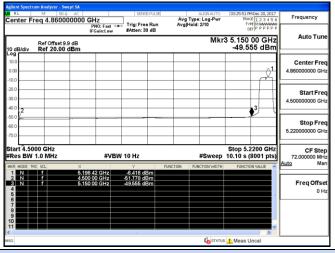




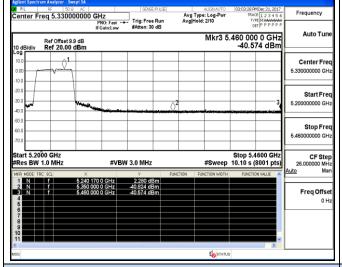
Channel 38 / 5190 MHz - Peak

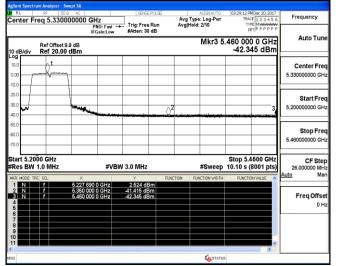
Channel 38 / 5190 MHz - Peak





Channel 38 / 5190 MHz – Average Channel 38 / 5190 MHz – Average



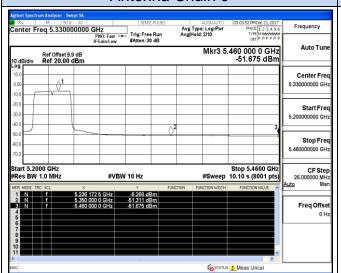


Channel 46 / 5230 MHz - Peak

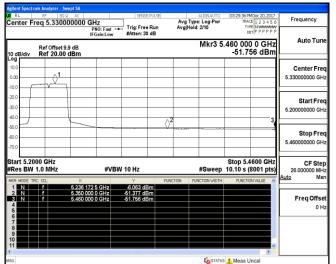
Channel 46 / 5230 MHz - Peak

IEEE 802.11n HT40

Antenna Chain 0



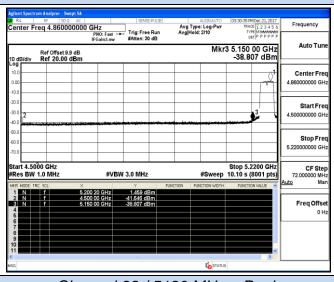
Antenna Chain 1

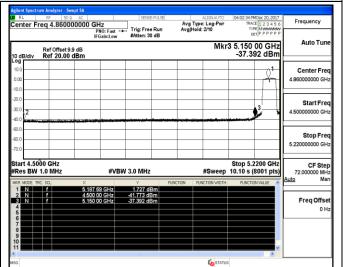


Channel 46 / 5230 MHz - Average

Channel 46 / 5230 MHz - Average

IEEE 802.11ac VHT40



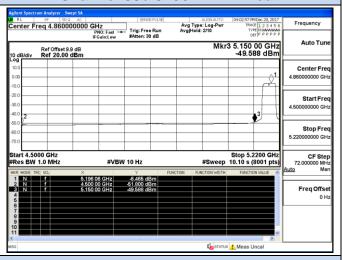


Channel 38 / 5190 MHz – Peak

Avg Type: Log-Pw Avg|Hold: 2/10 Mkr3 5.150 00 GHz -49.625 dBm Center Fre Start Fre Stop Fre CF Stej 72.000000 MH

Channel 38 / 5190 MHz - Average

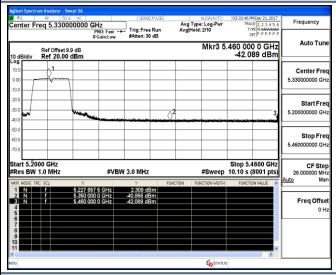
Channel 38 / 5190 MHz – Peak

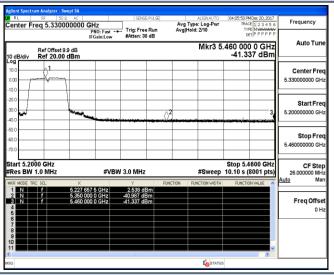


Channel 38 / 5190 MHz – Average

Antenna Chain 0

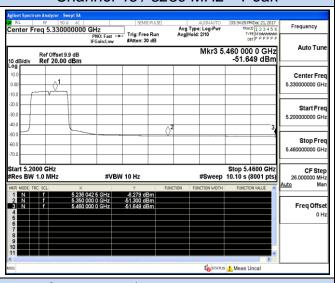
IEEE 802.11ac VHT40 Antenna Chain 1

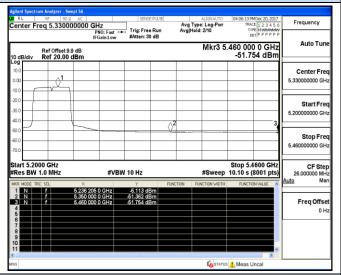




Channel 46 / 5230 MHz - Peak

Channel 46 / 5230 MHz - Peak

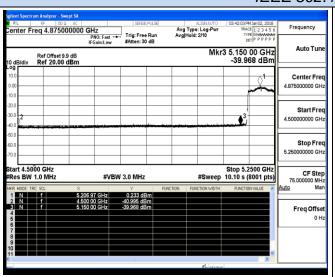


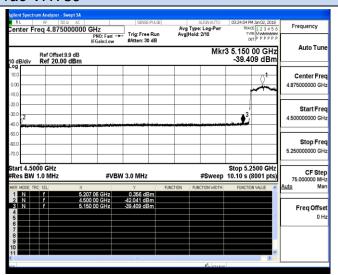


Channel 46 / 5230 MHz - Average

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 RL RF 50.2 AC enter Freq 4.875000000 GHz PNO: Fast → Fraint.ow #Atten: 30 dB Avg Type: Log-Pw Avg|Hold: 2/10 Avg Type: Log-Pwi Avg|Hold: 2/10 Mkr3 5.150 00 GHz -50.043 dBm Mkr3 5.150 00 GHz -49.972 dBm Center Fre Center Free Start Fre Start Free h my Stop Free Stop Free art 4.5000 GHz es BW 1.0 MHz Start 4.5000 GHz #Res BW 1.0 MHz Stop 5.2500 GHz #Sweep 10.10 s (8001 pts) Stop 5.2500 GHz #Sweep 10.10 s (8001 pts CF Step 75.000000 MHz o Man CF Step 75.000000 MHz o Man #VBW 10 Hz #VBW 10 Hz -25.343 dBm -51.761 dBm -50.043 dBm -25,350 dBm -51,652 dBm -49,972 dBm Freq Offse Freq Offse Channel 42 / 5210 MHz – Average Channel 42 / 5210 MHz – Average RL RF S0 2 AC | Inter Freq 5.315000000 GHz PN0: Fast → IFGain.t ow #Atten: 30 dB Avg Type: Log-Pw Avg|Hold: 2/10 Frequency Frequency Avg Type: Log-Pv Avg|Hold: 2/10 Auto Tun Auto Tur Mkr3 5.460 00 GHz -41.645 dBm Mkr3 5.460 00 GHz -41.426 dBm Ref Offset 9.9 dB Ref 20.00 dBn Center Fre Center Free Start Fre Start Free Stop Free Stop Free art 5.1700 GHz tes BW 1.0 MHz Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) tart 5.1700 GHz Res BW 1.0 MHz CF Step 29.000000 MHz to Man CF Step 29.000000 MHz o Man #VBW 3.0 MHz #VBW 3.0 MHz -41.056 dBn -41.426 dBn Freq Offse Freq Offse Channel 42 / 5210 MHz - Peak Channel 42 / 5210 MHz – Peak er Freq 5.315000000 GHz PNO: Fast → IFCaint.tow #Atten: 30 dB RL RF S0.2 AC | enter Freq 5.315000000 GHz PN0: Fast → | | FGdint.low | #Atten: 30 dB Avg Type: Log-Pu Avg|Hold: 2/10 Avg Type: Log-Pwi AvalHold: 2/10 Auto Tun Auto Tun Mkr3 5.460 00 GHz -51.264 dBm Mkr3 5.460 00 GHz -51.253 dBm Center Fre Center Fre Start Fre Start Fre Stop Fred Stop Fred Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) t 5.1700 GHz s BW 1.0 MHz rt 5.1700 GHz es BW 1.0 MHz Stop 5.4600 GHz #Sweep 10.10 s (8001 pts) CF Step 29.000000 MH CF Step 29.000000 MHz #VBW 10 Hz #VBW 10 Hz Freq Offse Freq Offse

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

-----THE END OF REPORT-----