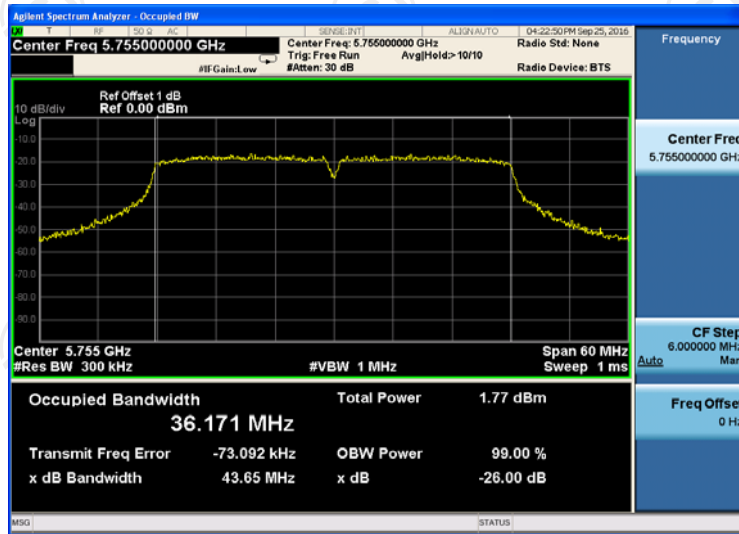
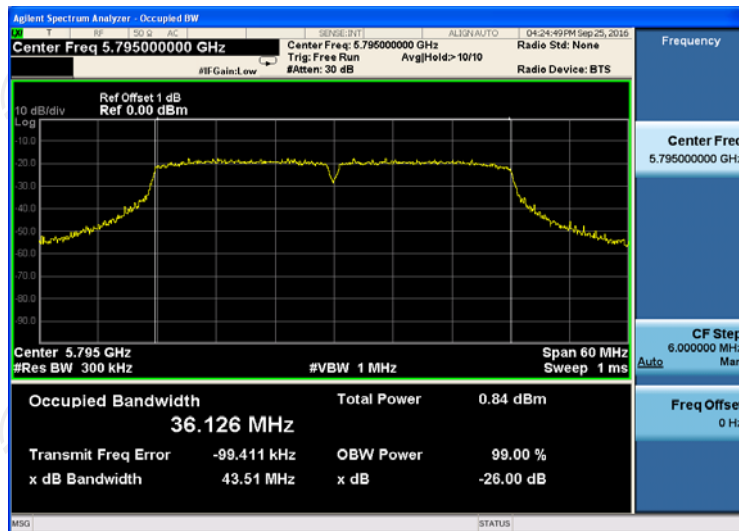


11n(HT40)

CH151




CH159



## 6.6. Power Spectral Density

### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 E Section 15.407 (a)
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section F
<b>Limit:</b>	$\leq 17.00\text{dBm/MHz}$ for Band I 5150MHz-5250MHz $\leq 11.00\text{dBm/MHz}$ for Band II 5250MHz-5350MHz $\leq 11.00\text{dBm/MHz}$ for Band III 5450MHz-5725MHz $\leq 30.00\text{dBm/500KHz}$ for Band IV 5725MHz-5850MHz The e.i,r,p spectral density for Band I 5150MHz – 5250 MHz should not exceed 10dBm/MHz
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW $\geq 3 \times$ RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level. 4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.
<b>Test Result:</b>	PASS

### 6.6.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug 12, 2017
RF cable	TCT	RE-06	N/A	Aug 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug 12, 2017

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.6.3. Test data

6.6.4.

Configuration Band I (5150 - 5250 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Power Spectral Density			Limit (dBm/MHz)	Result
		Ant0	Ant1	Total		
11n(HT20)	CH36	-4.851	-6.395	-2.54	17	PASS
11n(HT20)	CH44	-4.958	-6.286	-2.56	17	PASS
11n(HT20)	CH48	-4.631	-5.870	-2.20	17	PASS
11n(HT40)	CH38	-9.334	-9.723	-6.51	17	PASS
11n(HT40)	CH46	-7.932	-8.183	-5.05	17	PASS

Note: 1. All antennas have the same gain.  $G_{ANT}=2dBi$ ,  $Array\ Gain=10\log(N_{ANT}/N_{SS})=3.01dBi$

$Directional\ Gain=G_{ANT} + Array\ Gain=5.01dBi$ ,  $5.01dBi < 6dBi$  so limit=17dBm/MHz

2. The total PSD method used the sum spectra maxima across the outputs.

Configuration Band IV (5725 - 5850 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Power Spectral Density			Limit (dBm/500kHz)	Result
		Ant0	Ant1	Total		
11n(HT20)	CH149	-8.872	-9.167	-6.01	30	PASS
11n(HT20)	CH157	-9.010	-8.297	-5.63	30	PASS
11n(HT20)	CH161	-8.016	-7.175	-4.56	30	PASS
11n(HT40)	CH151	-13.849	-13.864	-10.85	30	PASS
11n(HT40)	CH159	-12.216	-11.263	-8.70	30	PASS

Note: 1. All antennas have the same gain.  $G_{ANT}=2dBi$ ,  $Array\ Gain=10\log(N_{ANT}/N_{SS})=3.01dBi$

$Directional\ Gain=G_{ANT} + Array\ Gain=5.01dBi$ ,  $5.01dBi < 6dBi$  so limit=30dBm/MHz

2. The total PSD method used the sum spectra maxima across the outputs.

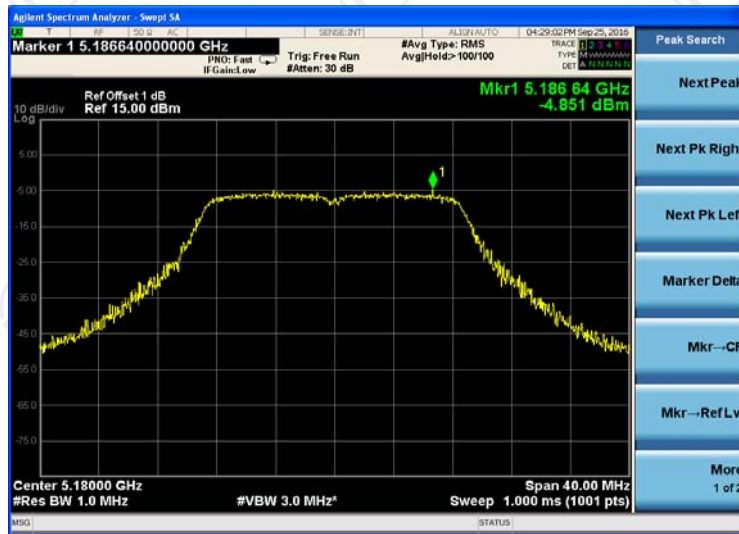
Test plots as follows:

ANT 0

Band I (5150 – 5250 MHz)

11n(HT20)

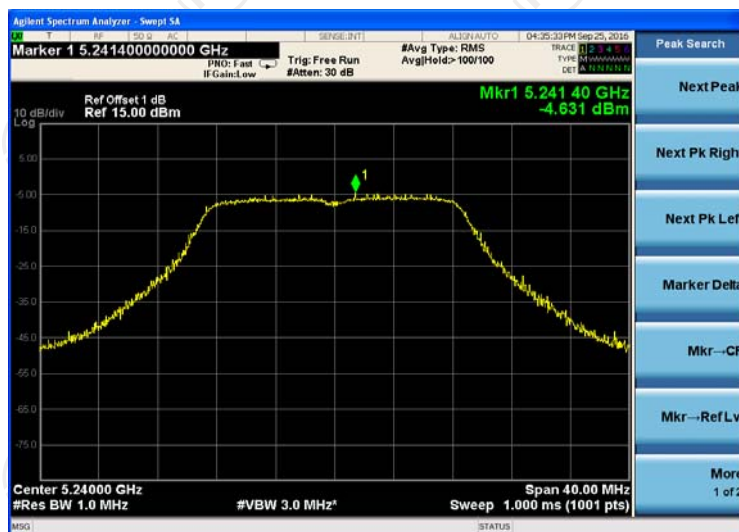
CH36



CH44



CH48

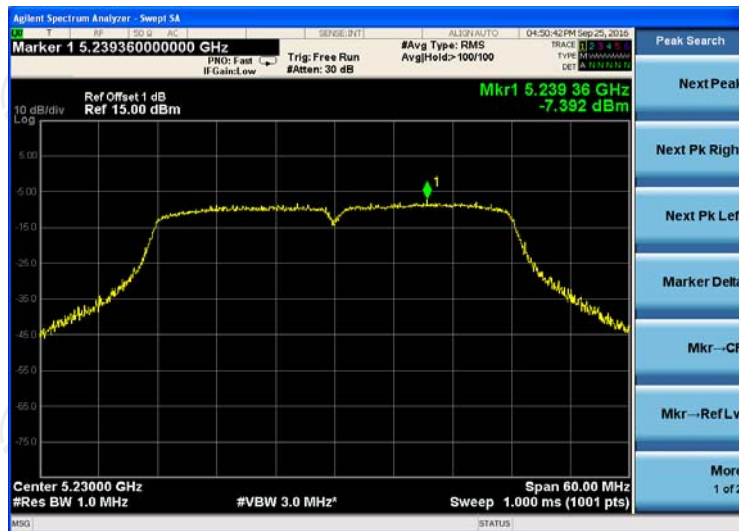


11n(HT40)

CH38



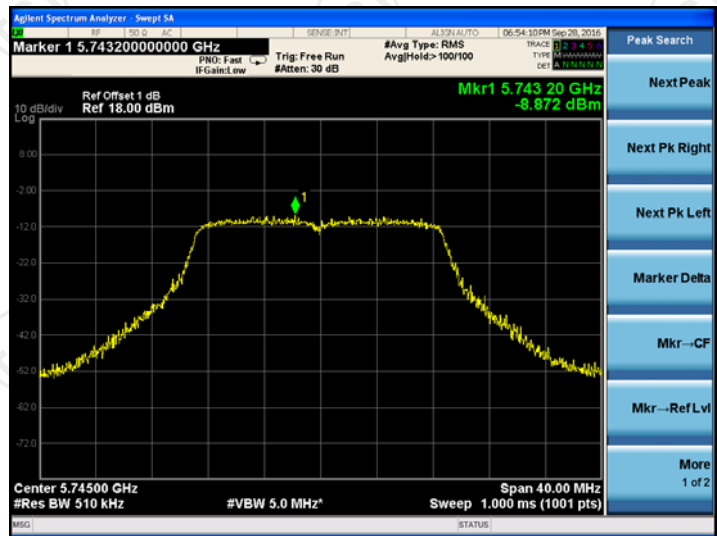
CH46



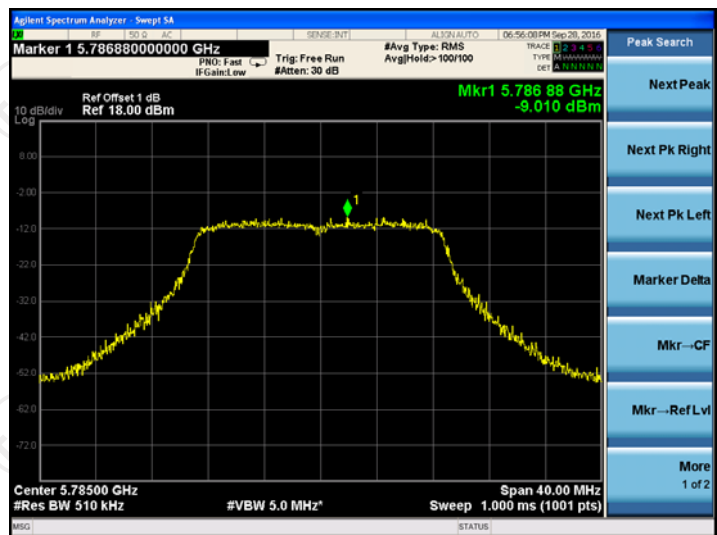
Band IV (5725 – 5850 MHz)

11n(HT20)

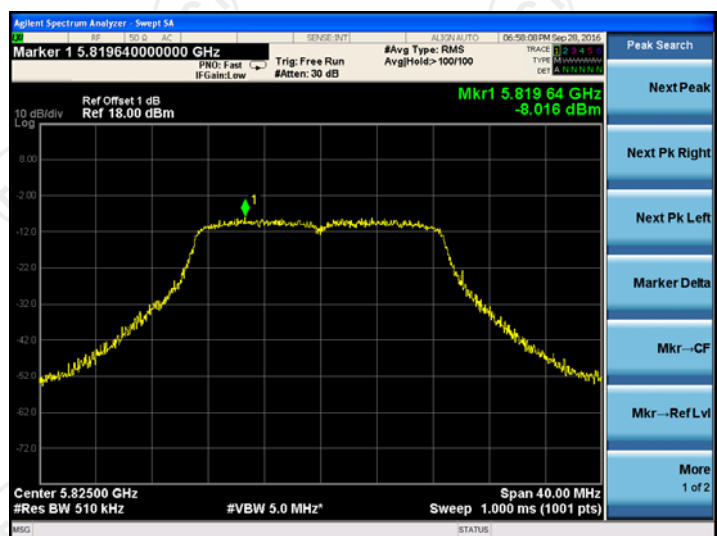
CH149



CH157



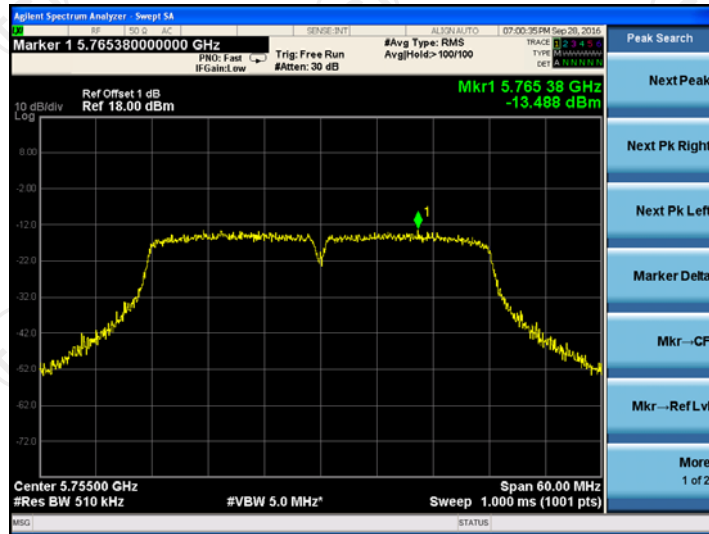
CH161



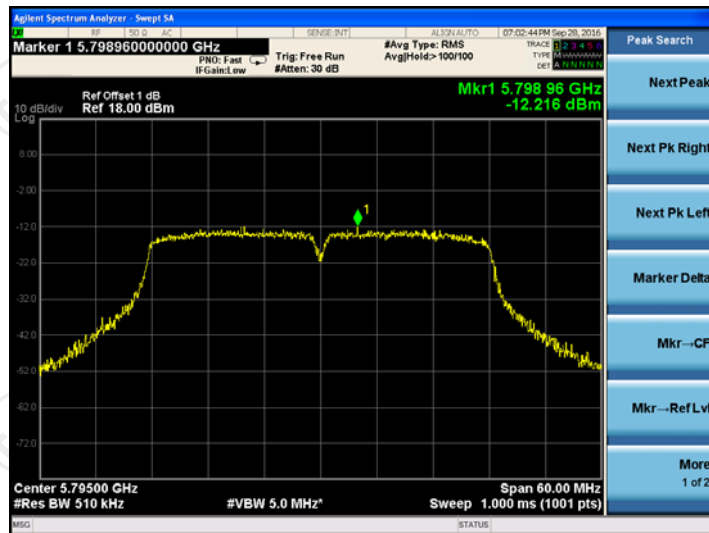


11n(HT40)

CH151



CH159



ANT 1

Band I (5150 – 5250 MHz)

11n(HT20)

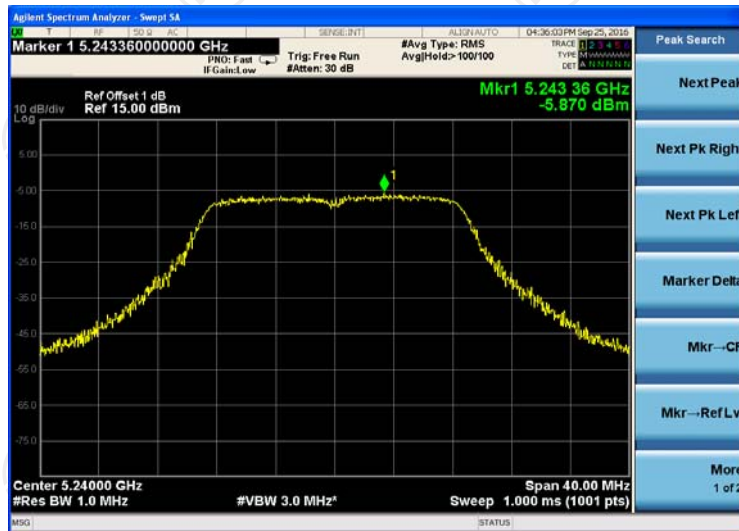
CH36



CH44



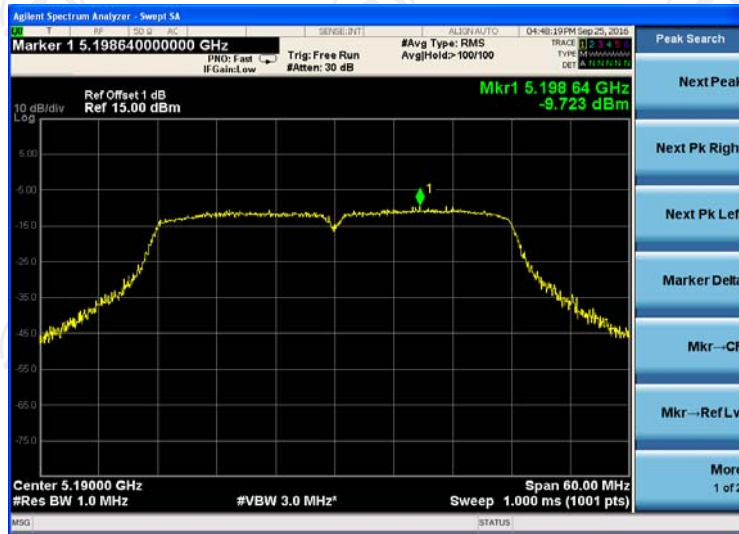
CH48



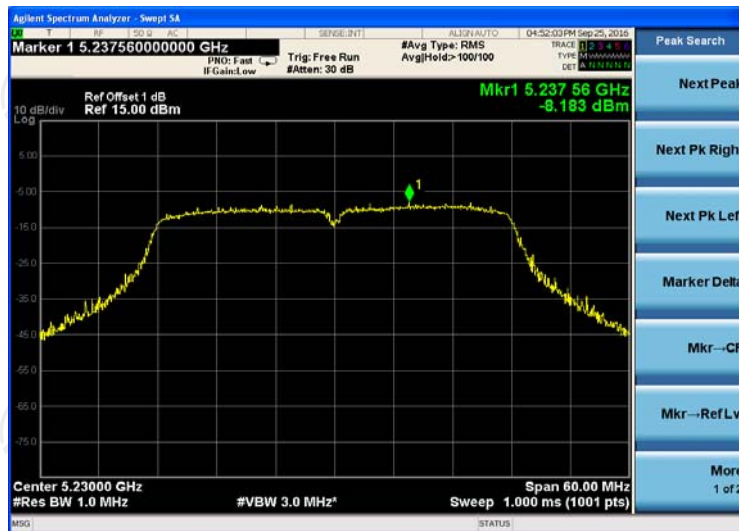


11n(HT40)

CH38

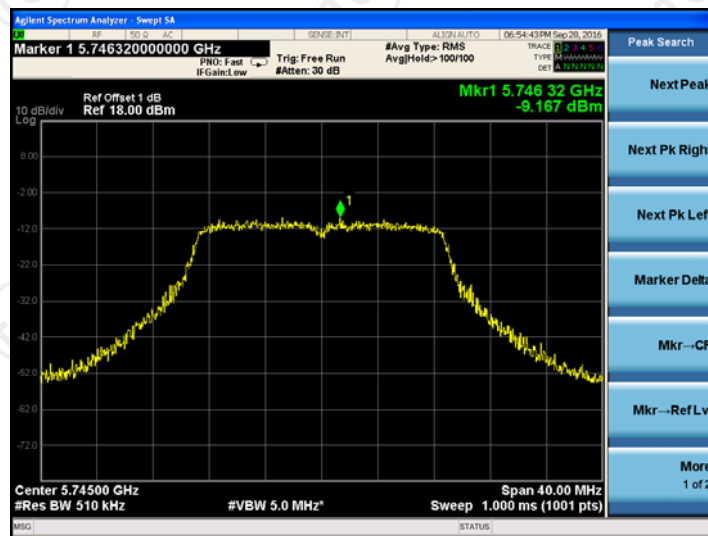


CH46

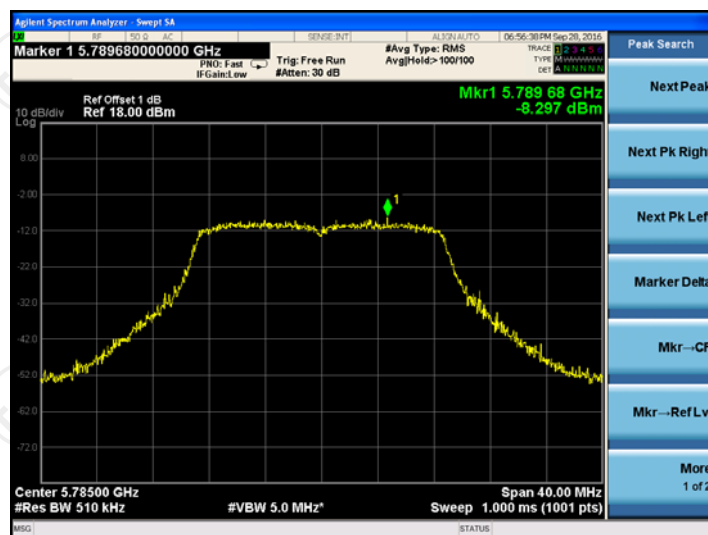


Band IV (5725 – 5850 MHz)  
11n(HT20)

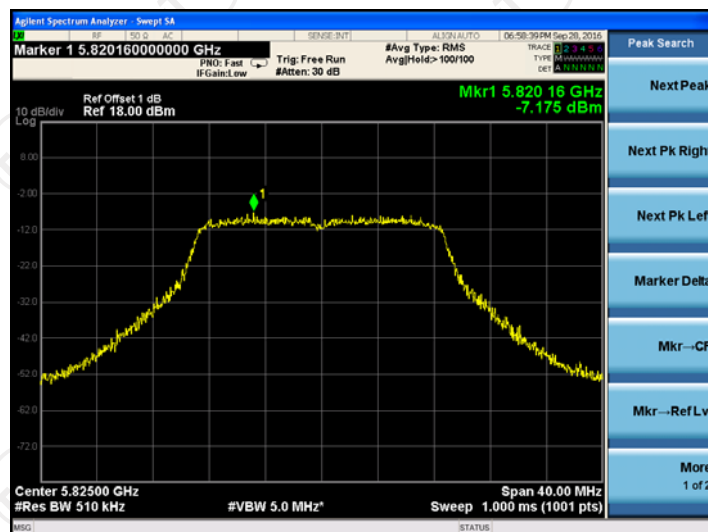
CH149



CH157

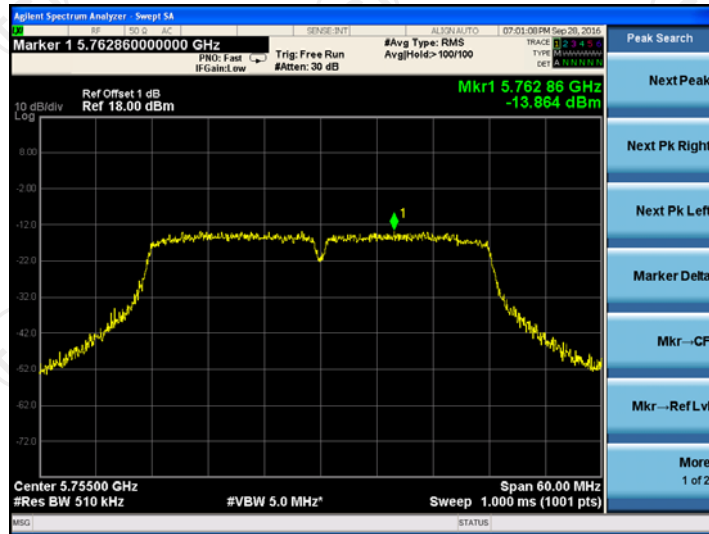


CH161

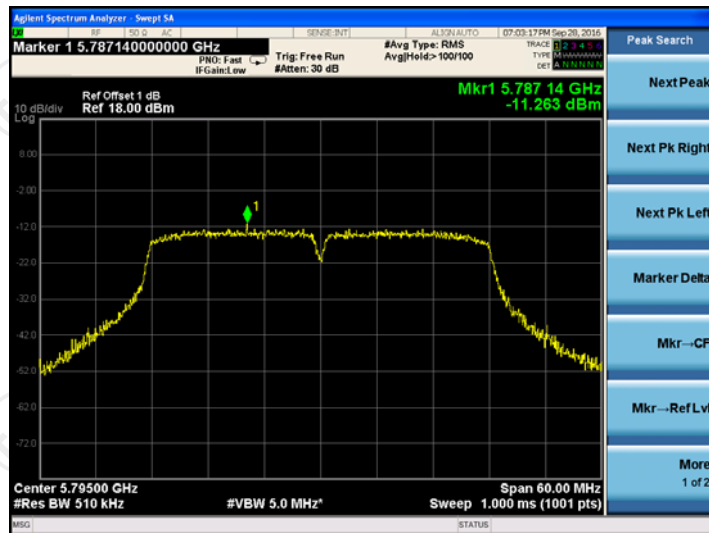


11n(HT40)

CH151

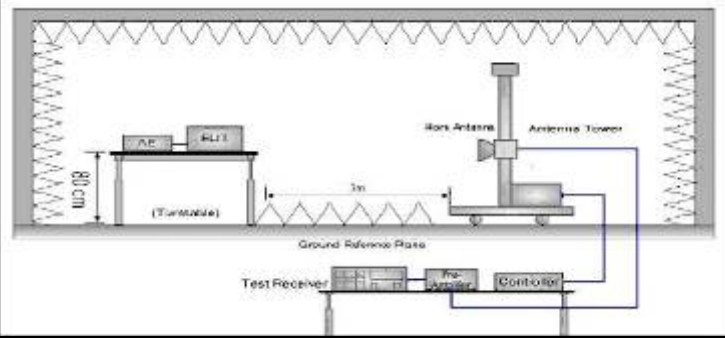


CH159



## 6.7. Band edge

### 6.7.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15E Section 15.407
<b>Test Method:</b>	ANSI C63.10 2013
<b>Limit:</b>	For band I&II&III: $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -27\text{dBm}$ For band IV(5715-5725MHz&5850-5860MHz): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 78.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -17\text{dBm}$ ; For band IV(other un-restricted band): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -27\text{dBm}$
<b>Test Setup:</b>	 <p>The diagram illustrates the test setup. An EUT (Under Test) is placed on a rotating table (Tumble) at a height of 0.8 meters. The table is rotated 360 degrees. The EUT is positioned 3 meters away from an interference-receiving antenna mounted on a variable-height antenna tower. The antenna height is varied from 1 meter to 4 meters above the ground. A ground reference plane is shown. The test receiver system includes a Test Receiver, Pre-Amplifier, and Controller.</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak,</li> </ol>

	quasipeak or average method as specified and then reported in a data sheet.
<b>Test Result:</b>	PASS

**6.7.2. Test Instruments**

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESPI Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHW ARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHW ARZ	FSP40	100056	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable	TCT	RE-High-04	N/A	Aug. 11, 2017
Antenna Mast	CCS	CC-A-4M	N/A	Aug. 11, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



**6.7.3. Test Data**

802.11n HT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m)t (Avg)	Over	Ant. Pol. H/V
Band I	Lowest	5150	43.02	5.82	48.84	68.2	54	-5.16	H
		5150	40.65	5.82	46.47	68.2	54	-7.53	V
	Highest	5350	42.79	6.52	49.31	68.2	54	-4.69	H
		5350	41.23	6.52	47.75	68.2	54	-6.25	V
Band IV	Lowest	5725	44.32	8.21	52.53	78.2	54	-1.47	H
		5725	41.83	8.21	50.04	78.2	54	-3.96	V
	Highest	5850	43.79	8.87	52.66	78.2	54	-1.34	H
		5850	41.68	8.87	50.55	78.2	54	-3.45	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

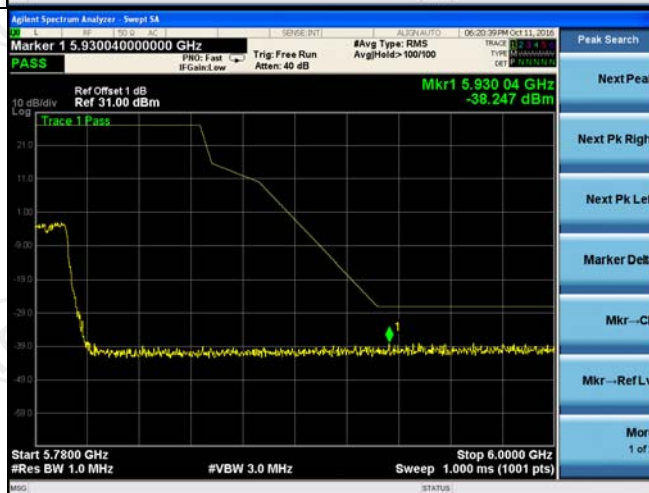
802.11n HT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m)t (Avg)	Over	Ant. Pol. H/V
Band I	Lowest	5150	44.76	5.82	50.58	68.2	54	-3.42	H
		5150	38.35	5.82	44.17	68.2	54	-9.83	V
	Highest	5350	42.81	6.52	49.33	68.2	54	-4.67	H
		5350	41.56	6.52	48.08	68.2	54	-5.92	V
Band IV	Lowest	5725	44.35	8.21	52.56	78.2	54	-1.44	H
		5725	43.08	8.21	51.29	78.2	54	-2.71	V
	Highest	5850	42.95	8.87	51.82	78.2	54	-2.18	H
		5850	41.64	8.87	50.51	78.2	54	-3.49	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

### Band IV Band-edge for RF Conducted Emissions

802.11n  
HT20 / LCH

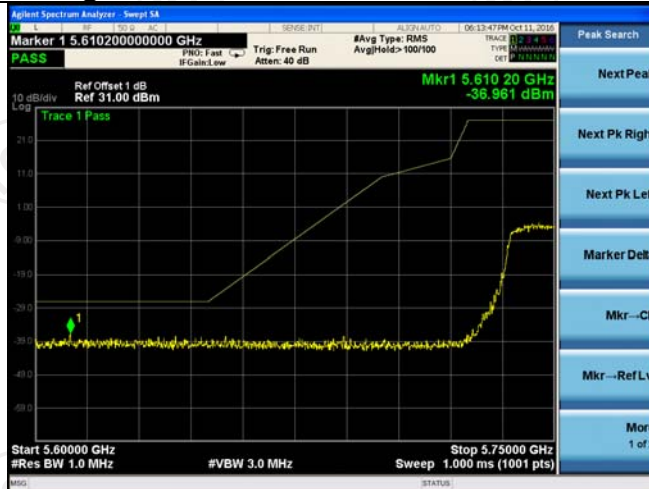


802.11n  
HT20 / HCH



### Band IV Band-edge for RF Conducted Emissions

802.11n  
HT40 / LCH



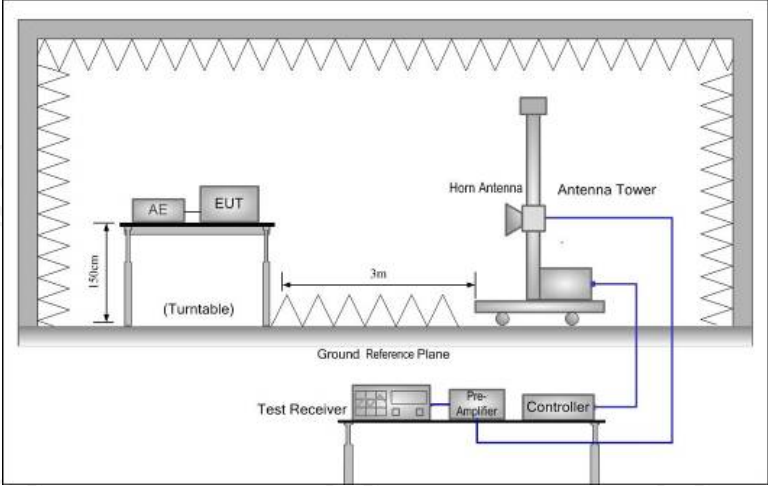
802.11n  
HT40 / HCH



## 6.8. Spurious Emission

### 6.8.1. Restrict Bands Measurement

#### 6.8.1.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205				
<b>Test Method:</b>	KDB 789033 D02 v01r03				
<b>Frequency Range:</b>	Band I & II: 4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz Band III & IV: 5.35 GHz to 5.46 GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Operation mode:</b>	Transmitting mode with modulation				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
<b>Limit:</b>	Frequency	Limit (dBuV/m @3m)	Remark		
	Above 1GHz	74	Peak Value		
		54	Average Value		
<b>Test setup:</b>	<p>Above 1GHz</p> 				
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>The testing follows FCC KDB Publication No. 789033 D02 General UNII Test Procedures New Rules v01r03. Section G) Unwanted emissions measurement.</li> <li>For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the</li> </ol>				

interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:

Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;

(2) Set RBW=100 kHz for  $f < 1$  GHz;  $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold;

(3) Set RBW = 1 MHz,  $VBW = 3$  MHz for  $f > 1$  GHz for peak measurement.

For average measurement:  $VBW = 10$  Hz, when duty cycle is no less than 98 percent.  $VBW \geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

(4) A 5.8GHz high -PASS filter is used during radiated emissions above 1GHz measurement.

Test results:	PASS
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6.8.1.1 Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESPI Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHW ARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHW ARZ	FSP40	100056	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable	TCT	RE-High-04	N/A	Aug. 11, 2017
Antenna Mast	CCS	CC-A-4M	N/A	Aug. 12, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



**6.8.1.2 Test Data**

**Restrict band around fundamental**

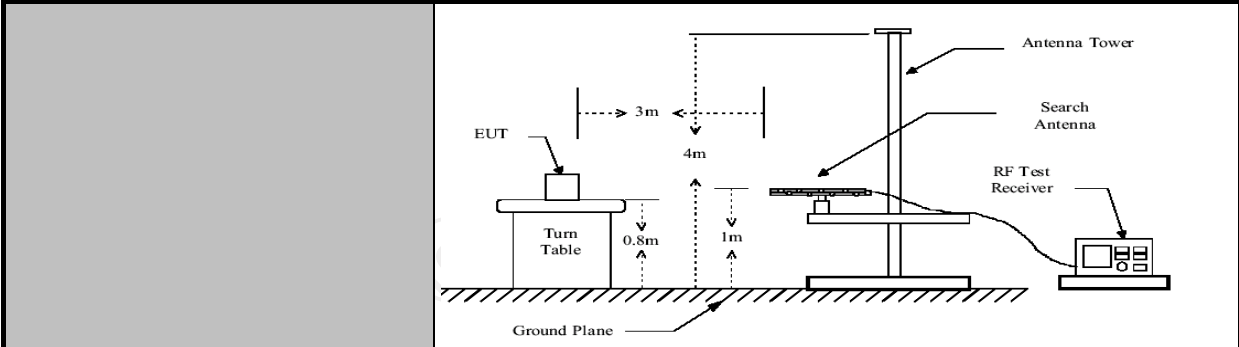
11n (HT20) CH36: 5180MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (dBUV)	Correction Factor (Db/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (Db)
					Peak (Db $\mu$ V/m)	AV (Db $\mu$ V/m)			
5142.20	H	52.36	---	0.55	52.91	---	74	54	-1.09
5150.00	H	51.88	---	0.66	52.54	---	74	54	-1.46
5183.20	H	48.76	---	0.86	49.62	---	74	54	-4.38
5150.00	H	49.38	---	0.66	50.04	---	74	54	-3.96
5187.19	H	48.51	---	0.85	49.36	---	74	54	-4.64
5142.65	V	49.82	---	0.55	50.37	---	74	54	-3.63
5150.03	V	51.37	---	0.66	52.03	---	74	54	-1.97
5183.29	V	48.29	---	0.58	48.87	---	74	54	-5.13
5150.00	V	49.43	---	0.66	50.09	---	74	54	-3.91
5187.28	V	50.16	---	0.57	50.73	---	74	54	-3.27
11n (HT20) CH64: 5320MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (Db $\mu$ V)	Correction Factor (Db/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (Db)
					Peak (Db $\mu$ V/m)	AV (Db $\mu$ V/m)			
5314.55	H	51.25	---	0.99	52.24	---	74	54	-1.76
5360.00	H	49.32	---	0.85	50.17	---	74	54	-3.83
5323.00	V	51.08	---	0.99	52.07	---	74	54	-1.93
5360.00	V	50.63	---	0.85	51.48	---	74	54	-2.52
11n(HT20) CH100: 5500MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (dBUV)	Correction Factor (dB/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (dB)
					Peak (dBUV/m)	AV (dBUV/m)			
5416.24	H	48.38	---	0.99	49.37	---	74	54	-4.63
5460	H	49.23	---	0.89	50.12	---	74	54	-3.88
5503.76	H	48.57	---	0.85	49.42	---	74	54	-4.58
5416.24	V	50.65	---	0.99	51.64	---	74	54	-2.36
5460	V	51.29	---	0.89	52.18	---	74	54	-1.82
5503.20	V	50.72	---	0.99	51.71	---	74	54	-2.29
11n(HT40) CH38: 5190MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (dBUV)	Correction Factor (dB/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (dB)
					Peak (dBUV/m)	AV (dBUV/m)			
5135.98	H	50.12	---	0.57	50.69	---	74	54	-3.31
5207.33	H	53.45	---	0.86	54.31	---	74	54	0.31
5135.98	V	51.37	---	0.57	51.94	---	74	54	-2.06
5207.33	V	40.65	---	0.85	50.55	---	74	54	-3.45
11n(HT40) CH62: 5310MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (dBUV)	Correction Factor (dB/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (dB)
					Peak (dBUV/m)	AV (dBUV/m)			
5303.66	H	48.83	---	0.99	49.82	---	74	54	-4.18
5360.00	H	49.35	---	0.85	50.2	---	74	54	-3.8
5306.66	V	50.35	---	0.99	51.34	---	74	54	-2.66
5360.00	V	41.48	---	0.85	50.77	---	74	54	-3.23
11n(HT40) CH102: 5510MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (Db $\mu$ V)	AV reading (dBUV)	Correction Factor (dB/m)	Emission Level		Peak limit (Db $\mu$ V/m)	AV limit (Db $\mu$ V/m)	Margin (dB)
					Peak (dBUV/m)	AV (dBUV/m)			
5417.98	H	51.48	---	0.81	52.29	---	74	54	-1.71
5460	H	52.13	---	0.93	53.06	---	74	54	-0.94

5503.60	H	49.27	---	0.82	50.09	---	74	54	-3.91
5417.98	V	51.32	---	0.81	52.13	---	74	54	-1.87
5460	V	50.46	---	0.93	51.39	---	74	54	-2.61
5503.60	V	51.48	---	0.81	52.29	---	74	54	-1.71

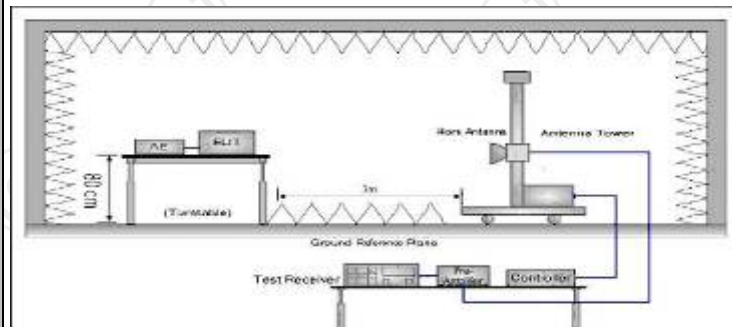
**6.8.2. Unwanted Emissions out of the Restricted Bands**

**6.8.2.1. Test Specification**

<b>Test Requirement:</b>	FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205				
<b>Test Method:</b>	KDB 789033 D02 v01r03				
<b>Frequency Range:</b>	9kHz to 40GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Operation mode:</b>	Transmitting mode with modulation				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
<b>Limit:</b>	Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,				
	Frequency	Field Strength (microvolts/meter)	Measurement 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		
	Frequency	Limit (dBuV/m @3m)	Detector		
Above 1G	74.0	Peak			
	54.0	Average			
<b>Test setup:</b>	For radiated emissions below 30MHz				
	<p>The diagram illustrates the test setup for radiated emissions below 30MHz. It shows an Equipment Under Test (EUT) placed on a turn table. A distance of 3m is maintained between the EUT and the antenna. The antenna is positioned above a ground plane. The antenna is connected to a receiver, which is also connected to a pre-amplifier and a computer. The computer is used to control the receiver and record the data.</p>				
	30MHz to 1GHz				



Above 1GHz



**Test Procedure:**

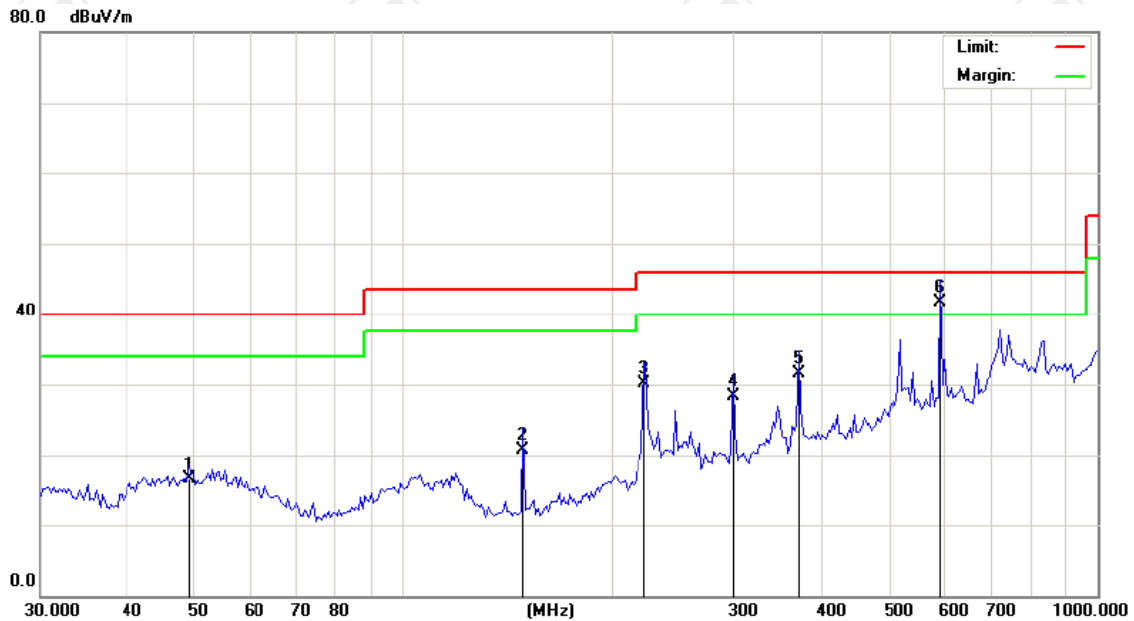
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**Test results:** PASS

6.8.3. Test Data

Please refer to following diagram for individual  
Below 1GHz

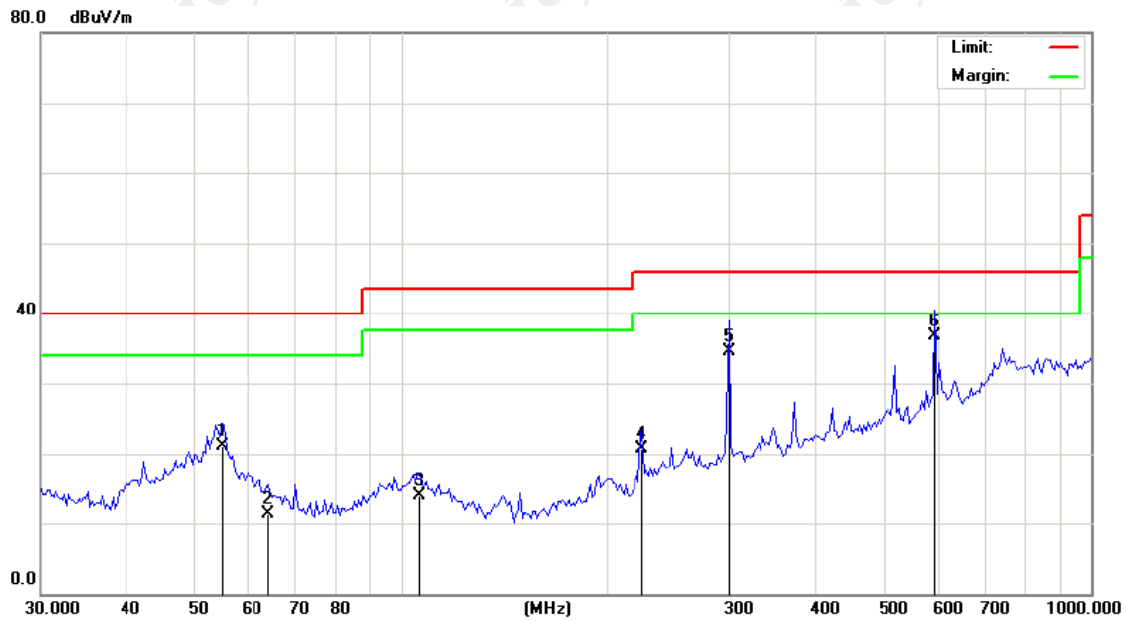
Horizontal:



Site: Polarization: **Horizontal** Temperature: 23  
Limit: FCC Part 15B Class B RE\_3 m Power: Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		49.0626	26.30	-9.71	16.59	40.00	-23.41	QP	0	
2		148.9173	35.70	-14.90	20.80	43.50	-22.70	QP	0	
3		222.2804	40.00	-9.87	30.13	46.00	-15.87	QP	0	
4		298.5932	35.10	-6.74	28.36	46.00	-17.64	QP	0	
5		371.2680	36.60	-5.18	31.42	46.00	-14.58	QP	0	
6	*	594.5143	41.30	0.43	41.73	46.00	-4.27	QP	0	

Vertical:



Site: Polarization: **Vertical** Temperature: 23  
 Limit: FCC Part 15B Class B RE\_3 m Power: Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		54.9010	30.60	-9.47	21.13	40.00	-18.87	QP	0	
2		64.0800	23.30	-12.01	11.29	40.00	-28.71	QP	0	
3		106.2810	23.60	-9.61	13.99	43.50	-29.51	QP	0	
4		223.8480	30.40	-9.72	20.68	46.00	-25.32	QP	0	
5		298.5932	41.30	-6.74	34.56	46.00	-11.44	QP	0	
6	*	594.5143	36.20	0.43	36.63	46.00	-9.37	QP	0	

**Note:** 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

2. Measurements were conducted in all three channels (high, middle, low) and all modulation (802.11n), and the worst case Mode (Middle channel and 11n(HT20)) was submitted only.



Modulation Type: Band I									
11n(HT20) CH36: 5180MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10360	H	51.48	---	0.66	52.14	---	74	54	-1.86
15540	H	42.35	---	9.5	51.85	---	74	54	-2.15
---	H	---	---	---	---	---	---	---	---
10360	V	49.62	---	0.66	50.28	---	74	54	-3.72
15540	V	44.15	---	9.5	53.65	---	74	54	-0.35
---	V	---	---	---	---	---	---	---	---
11n(HT20) CH44: 5220MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10440	H	52.62	---	0.99	53.61	---	74	54	-0.39
15660	H	40.29	---	9.85	50.14	---	74	54	-3.86
---	H	---	---	---	---	---	---	---	---
10440	V	50.78	---	0.99	51.77	---	74	54	-2.23
15660	V	43.52	---	9.85	53.37	---	74	54	-0.63
---	V	---	---	---	---	---	---	---	---
11n(HT20) CH48: 5240MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10480	H	49.25	---	1.33	50.58	---	74	54	-3.42
15720	H	43.92	---	10.22	54.14	---	74	54	0.14
---	H	---	---	---	---	---	---	---	---
10480	V	51.23	---	1.33	52.56	---	74	54	-1.44
15720	V	42.64	---	10.22	52.86	---	74	54	-1.14
---	V	---	---	---	---	---	---	---	---
11n(HT40) CH38: 5190MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10380	H	49.82	---	0.66	50.48	---	74	54	-3.52
15570	H	41.07	---	9.5	50.57	---	74	54	-3.43
---	H	---	---	---	---	---	---	---	---
10380	V	50.13	---	0.66	50.79	---	74	54	-3.21
15570	V	43.08	---	9.5	52.58	---	74	54	-1.42
---	V	---	---	---	---	---	---	---	---
11n(HT40) CH46: 5230MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10460	H	51.33	---	0.99	52.32	---	74	54	-1.68
15690	H	41.26	---	9.85	51.11	---	74	54	-2.89
---	H	---	---	---	---	---	---	---	---
10460	V	50.67	---	0.99	51.66	---	74	54	-2.34
15690	V	42.32	---	9.85	52.17	---	74	54	-1.83
---	V	---	---	---	---	---	---	---	---

**Note:**

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (Peak) (dB $\mu$ V/m)-Average limit (dB $\mu$ V/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.*
5. *Data of measurement shown “---“in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*

Modulation Type: Band IV									
11n(HT20) CH149: 5745MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11490	H	52.16	---	0.66	52.82	---	74	54	-1.18
17235	H	41.88	---	9.5	51.38	---	74	54	-2.62
---	H	---	---	---	---	---	---	---	---
11490	V	51.74	---	0.66	52.4	---	74	54	-1.6
17235	V	43.55	---	9.5	53.05	---	74	54	-0.95
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH157: 5785MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11570	H	51.28	---	0.66	51.94	---	74	54	-2.06
17355	H	40.53	---	9.5	50.03	---	74	54	-3.97
---	H	---	---	---	---	---	---	---	---
11570	V	50.15	---	0.66	50.81	---	74	54	-3.19
17355	V	41.67	---	9.5	51.17	---	74	54	-2.83
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH161: 5825MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11650	H	51.24	---	0.99	52.23	---	74	54	-1.77
17475	H	39.05	---	9.85	48.9	---	74	54	-5.1
---	H	---	---	---	---	---	---	---	---
11650	V	50.25	---	0.99	51.24	---	74	54	-2.76
17475	V	40.96	---	9.85	50.81	---	74	54	-3.19
---	V	---	---	---	---	---	---	---	---

11n(HT40) CH151: 5755MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11510	H	50.53	---	1.33	51.86	---	74	54	-2.14
17265	H	41.62	---	10.22	51.84	---	74	54	-2.16
---	H	---	---	---	---	---	---	---	---
11510	V	51.68	---	1.33	53.01	---	74	54	-0.99
17265	V	41.46	---	10.22	51.68	---	74	54	-2.32
---	V	---	---	---	---	---	---	---	---

11n(HT40) CH159: 5795MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11590	H	51.39	---	0.66	52.05	---	74	54	-1.95
17385	H	39.86	---	9.5	49.36	---	74	54	-4.64
---	H	---	---	---	---	---	---	---	---
11590	V	51.77	---	0.66	52.43	---	74	54	-1.57
17385	V	41.56	---	9.5	51.06	---	74	54	-2.94
---	V	---	---	---	---	---	---	---	---

**Note:**

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.
5. Data of measurement shown "---" in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

## 6.9. Frequency Stability Measurement

### 6.9.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
<b>Test Method:</b>	ANSI C63.10: 2013
<b>Limit:</b>	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
<b>Test Setup:</b>	<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]     subgraph TC [Temperature Chamber]         EUT     end     P[AC/DC Power supply] --- EUT     </pre>
<b>Test Procedure:</b>	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
<b>Test Result:</b>	PASS
<b>Remark:</b>	Pre-scan was performed at Antenna 0 and Antenna 1, the worst case was found. Only the test data of Antenna 0 was shown in this report.

Test plots as follows:

Test mode:		802.11n(HT20)	Frequency(MHz):	5180
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5180.0089	8900	PASS
35		5180.0012	1200	PASS
25		5179.9981	-1900	PASS
15		5179.9989	-1100	PASS
5		5180.0027	2700	PASS
0		5180.0041	4100	PASS
20		3.795	5180.0028	2800
	3.3	5179.9990	-1000	PASS
	2.805	5179.9995	-500	PASS

Test mode:		802.11n(HT20)	Frequency(MHz):	5220
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5220.0046	4600	PASS
35		5220.0066	6600	PASS
25		5220.0035	3500	PASS
15		5220.0009	900	PASS
5		5220.0025	2500	PASS
0		5220.0032	3200	PASS
20		3.795	5219.9976	-2400
	3.3	5219.9985	-1500	PASS
	2.805	5220.0040	4000	PASS

Test mode:		802.11n(HT20)	Frequency(MHz):	5240
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5240.0078	7800	PASS
35		5240.0021	2100	PASS
25		5240.0036	3600	PASS
15		5240.0015	1500	PASS
5		5240.0037	3700	PASS
0		5240.0049	4900	PASS
20		3.795	5240.0028	2800
	3.3	5239.9987	-1300	PASS
	2.805	5239.9970	-3000	PASS

Test mode:		802.11n(HT40)	Frequency(MHz):	5190
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5190.0032	3200	PASS
35		5190.0128	12800	PASS
25		5190.0008	800	PASS
15		5190.0027	2700	PASS
5		5190.0060	6000	PASS
0		5190.0075	7500	PASS
20		3.795	5189.9921	-7900
	3.3	5189.9950	-5000	PASS
	2.805	5190.0060	6000	PASS

Test mode:		802.11n(HT40)	Frequency(MHz):	5230
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5230.0088	8800	PASS
35		5230.0110	11000	PASS
25		5230.0049	4900	PASS
15		5229.9977	-2300	PASS
5		5229.9979	-2100	PASS
0		5230.0068	6800	PASS
20		3.795	5230.0031	3100
	3.3	5230.0026	2600	PASS
	2.805	5230.0080	8000	PASS

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