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# 8.31.2. 99% BANDWIDTH

### <u>LIMITS</u>

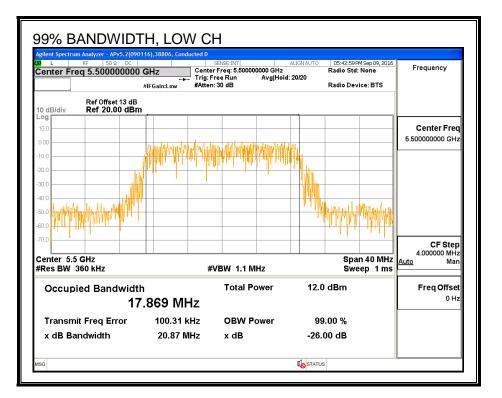
None; for reporting purposes only.

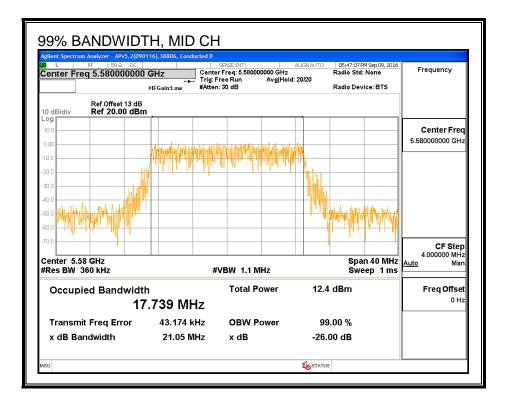
# **RESULTS**

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 2
	(MHz)	(MHz)	(MHz)
Low	5500	17.869	17.816
Mid	5580	17.739	17.752
High	5700	17.864	17.901
144	5720	17.880	17.754

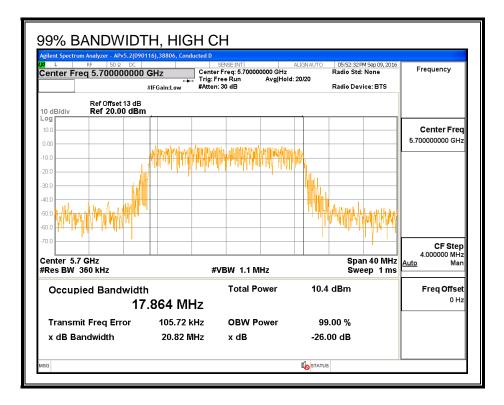
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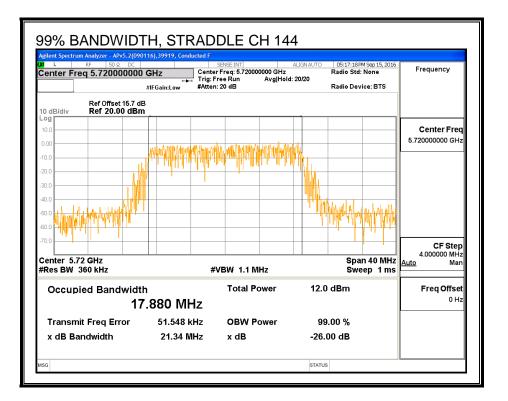
# 99% BANDWIDTH, CHAIN 0





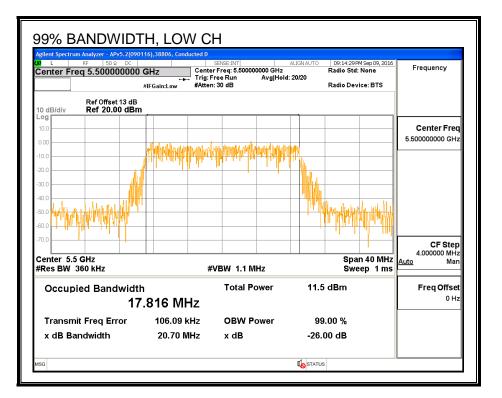
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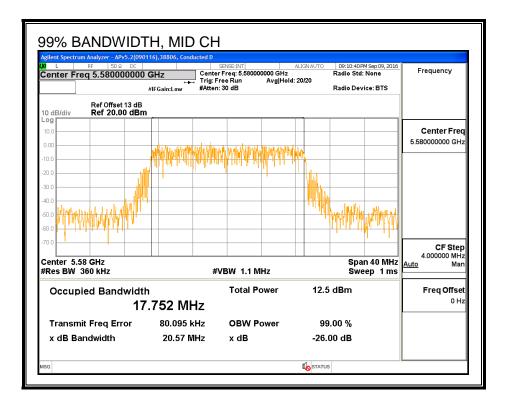




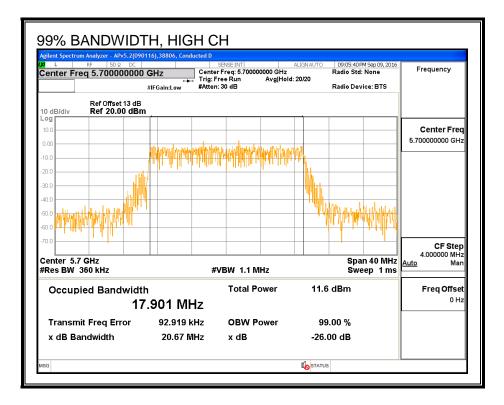
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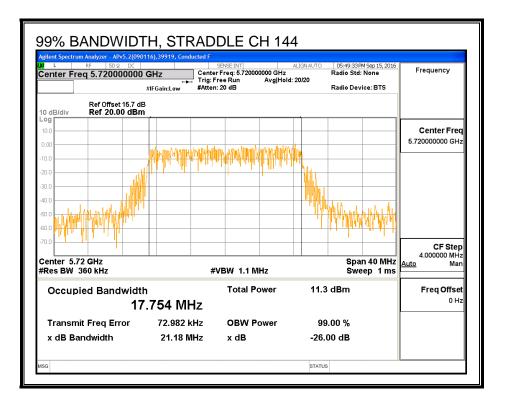
# 99% BANDWIDTH, CHAIN 2





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# 8.31.3. **AVERAGE POWER**

# **LIMITS**

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

### **RESULTS**

	-		
ID:	44353	Date:	9/9/16

### Average Power Results

Channel	Frequency	Chain 0	Chain 2	Total
		Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5500	11.82	11.87	14.85
Mid	5580	11.98	11.93	14.97
High	5700	10.45	10.35	13.41
144	5720	11.88	11.84	14.87

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# 8.31.4. OUTPUT POWER AND PSD

# <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-247 (6.2.3) (1)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

# TEST PROCEDURE

Measurements perform 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 the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

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### DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 2	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
4.90	5.20	8.06

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# <u>RESULTS</u>

ID:	44353	Date:	9/9/16
-----	-------	-------	--------

1.05

### Bandwidth, Antenna Gain and Limits

Channel	Frequency	Min	Min	Directional	Directional	Power	PSD
		26 dB	99%	Gain	Gain	Limit	Limit
		BW	BW	for Power	for PSD		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
Low	5500	21.68	17.816	8.06	8.06	21.45	8.94
Mid	5580	21.78	17.739	8.06	8.06	21.43	8.94
High	5700	21.81	17.864	8.06	8.06	21.46	8.94

Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

### **Output Power Results**

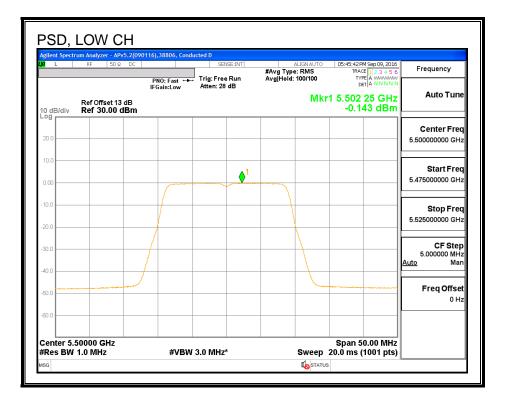
Channel	Frequency	Chain 0	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	11.82	11.867	14.85	21.45	-6.59
Mid	5580	11.98	11.932	14.97	21.43	-6.46
High	5700	10.454	10.348	13.41	21.46	-8.05

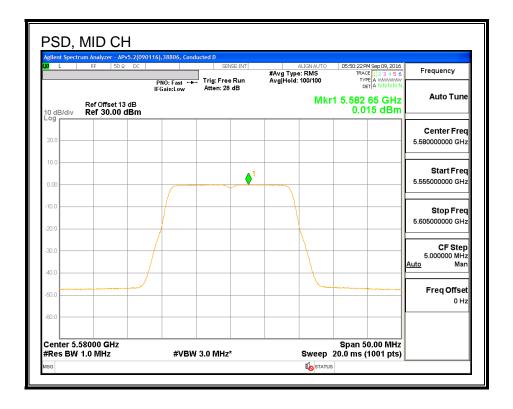
## **PSD Results**

Channel	Frequency	Chain 0	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	-0.143	-0.096	3.94	8.94	-5.00
Mid	5580	0.015	-0.02	4.06	8.94	-4.88
High	5700	-1.493	-1.606	2.51	8.94	-6.43

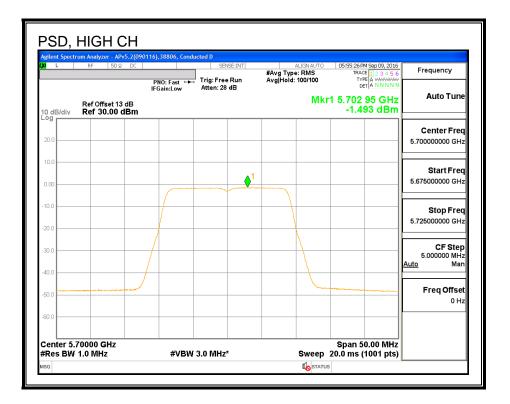
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# PSD, CHAIN 0

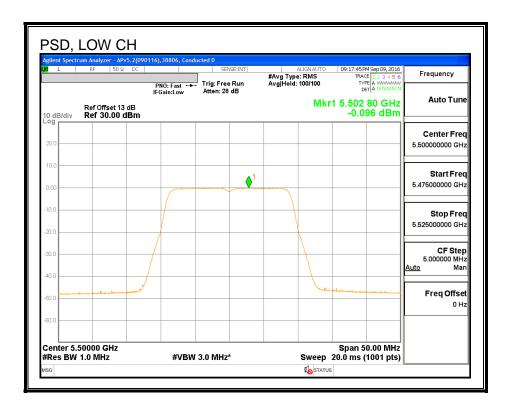




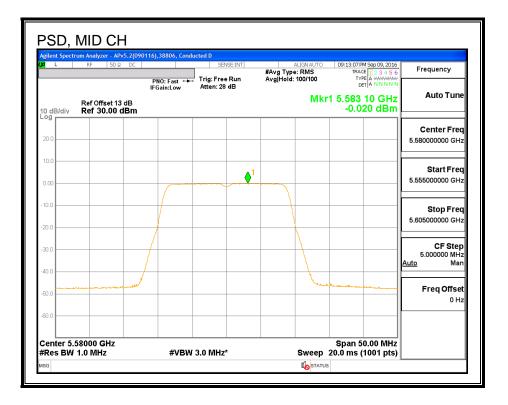
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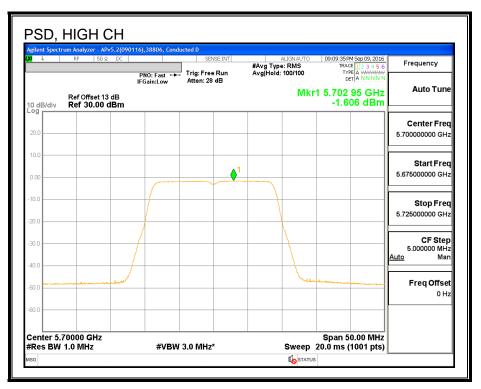


# PSD, CHAIN 2



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# 8.32. 802.11ac VHT20 2Tx (CHAIN 0 + CHAIN 2) BEAM FORMING STRADDLE CHANNEL 144 RESULTS (FCC)

# 8.32.1. OUTPUT POWER AND PSD

### UNII-2C BAND

### Bandwidth, Antenna Gain, and Limits

Channel	Frequency	Min	Directional	Directional	Power	PSD
		26 dB	Gain	Gain	Limit	Limit
		BW	for Power	for PSD		
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	16.05	8.06	8.06	20.99	8.94

Duty Cycle CF (dB) 1.05	Included in Calculations of Corr'd Power & PSD
-------------------------	--

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	10.70	10.66	14.74	20.99	-6.25

#### PSD Results

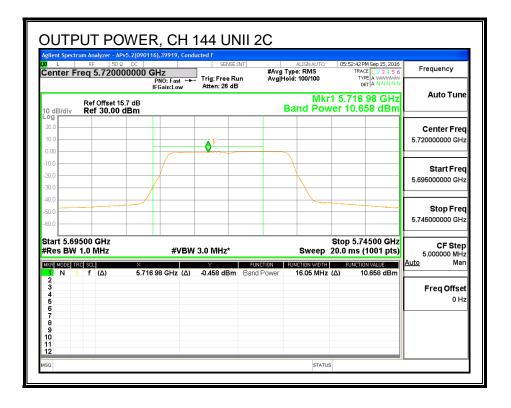
Channel	Frequency	Chain 0	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-0.07	-0.094	3.98	8.94	-4.96

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# **OUTPUT POWER, CHAIN 0**

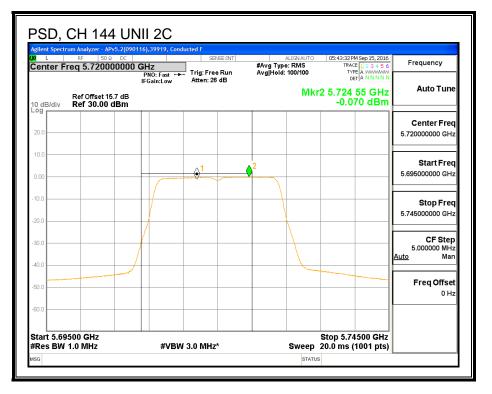
L Center F	RF 50 Ω DC Freq 5.7200000	00 GHz PNO: Fast	SENSE:	#Avg in Avg H	ALIGNAUTO Type: RMS old: 100/100		18 PM Sep 15, 2016 IRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Frequency
0 dB/div	Ref Offset 15.7 d Ref 30.00 dBn		Atten: 26 dB				6 93 GHz .701 dBm	Auto Tune
og 20.0 10.0			<b>\$</b> <sup>1</sup>					Center Fred 5.720000000 GHz
0.0 0.0 0.0								Start Fred 5.695000000 GHz
i0.0 i0.0 i0.0								Stop Frec 5.745000000 GHz
	9500 GHz 1.0 MHz	#VE	3W 3.0 MHz*	SUNCTION	Sweep	20.0 m	.74500 GHz s (1001 pts) monwaue	CF Step 5.000000 MHz Auto Mar
1 N 2 3 4 5 6 7 8 9 0 1 1 2		6.716 93 GHz(	∆) -0.352 dBm	Band Power	16.14 MHz		10.701 dBm	Freq Offsel

### **OUTPUT POWER, CHAIN 2**

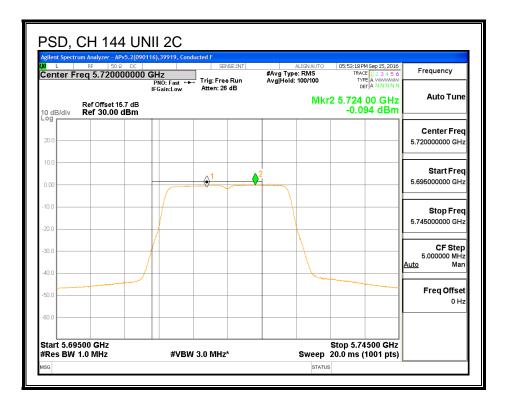


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# PSD, CHAIN 0



### PSD, CHAIN 2



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# UNII-3 BAND

### Antenna Gain and Limit

Channel	Frequency	Min	Directional	Directional	Power	PSD
		26 dB	Gain	Gain	Limit	Limit
		BW	For Power For PSD			
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	6.05	8.06	8.06	27.94	27.94

Duty Cycle CF (dB)	1.05	Included in Calculations of Corr'd Power & PSD
--------------------	------	--

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	5.46	5.41	9.49	27.94	-18.45

### **PSD** Results

Channel	Frequency	Chain 0	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-2.72	-2.65	1.37	27.94	-26.57

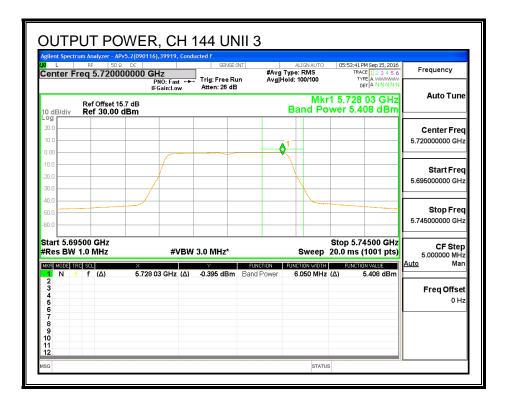
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# **OUTPUT POWER, CHAIN 0**

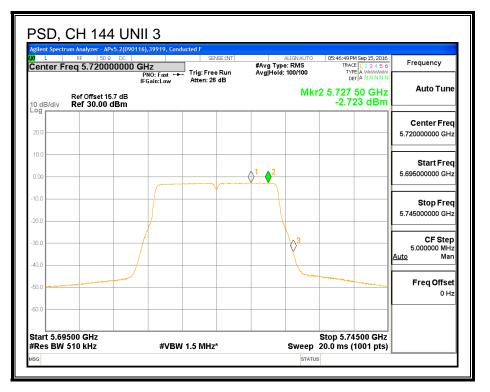
L Center F		Ω DC 00000 GHz		SENSE:	#Avg	ALIGN AUTO Type: RMS	TF	4 PM Sep 15, 2016 RACE 1 2 3 4 5 6	Frequency
ontor i	100 011 200		Fast ↔ :Low	Trig: Free Ru Atten: 26 dE		Hold: 100/100		DET A NNNNN	
0 dB/div	Ref Offset 1 Ref 30.00							8 07 GHz 455 dBm	Auto Tune
og 20.0									Center Fred
10.0						1			5.720000000 GHz
0.0		1							
20.0									Start Fred
0.0									5.695000000 GHz
10.0									
i0.0									Stop Fred 5.745000000 GHz
0.0									0.140000000 011
	9500 GHz / 1.0 MHz		#VBW	3.0 MHz*		Sweep		74500 GHz s (1001 pts)	CF Step 5.000000 MHz
KR MODE 1	ric SCL 1 f (Δ)	× 5.728 07 G	Hz (Λ)	۲ -0.315 dBm	FUNCTION Band Power	FUNCTION WIDTH 6.135 MHz		5,455 dBm	<u>Auto</u> Mar
2	1 (1)	0.120 01 0		0.0 TO GEM	Dunut ovor	0.100 11112	(11)	0.400 0.511	Freq Offset
4									0 Hz
6 7									
8 9									
0									

### **OUTPUT POWER, CHAIN 2**

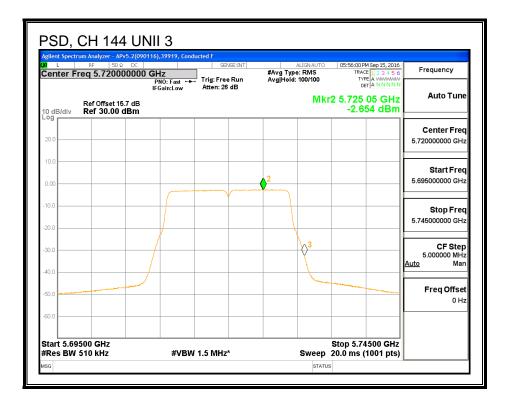


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# PSD, CHAIN 0



### PSD, CHAIN 2



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# 8.33. 802.11ac VHT20 2Tx (CHAIN 0 + CHAIN 2) BEAM FORMING STRADDLE CHANNEL 144 RESULTS (IC)

# 8.33.1. OUTPUT POWER AND PSD

### UNII-2C BAND

### Bandwidth, Antenna Gain, and Limits

Channel	Frequency	Min	Directional	Directional	Power	PSD
		99%	Gain	Gain	Limit	Limit
		BW	for Power for PSD			
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	13.880	8.06	8.06	20.36	8.94

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 2	Total	Power	Power
		Meas	Meas	Meas Corr'd		Margin
		Power	Power Power			
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	10.65	10.60	14.68	20.36	-5.68

### **PSD Results**

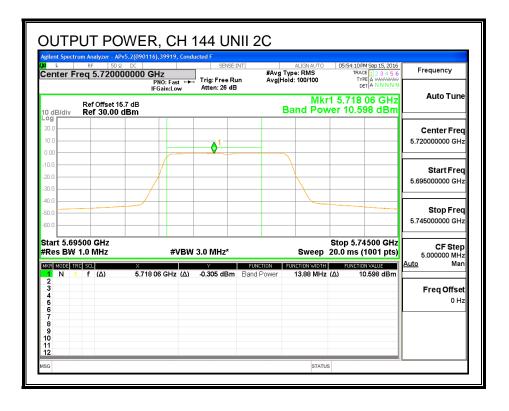
Channel	Frequency	Chain 0	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-0.07	-0.09	3.98	8.94	-4.96

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# **OUTPUT POWER, CHAIN 0**

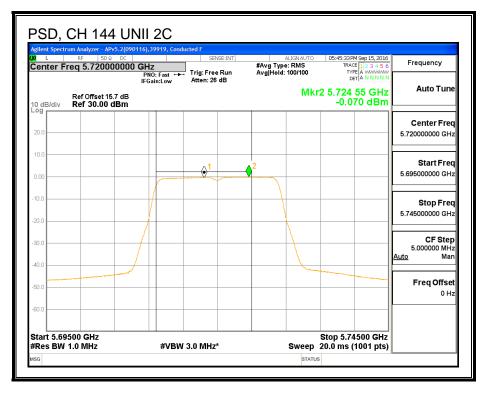
L enter F	RF 50 Ω DC Freq 5.7200000			SENSE:	un A	Avg Type vg Hold:			24 PM Sep 15, 2016 IRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
) dB/div	Ref Offset 15.7 dE Ref 30.00 dBm		N P	ktten: 26 d⊟	3	Ва			8 03 GHz .650 dBm	
				<b>♦</b> <sup>1</sup>						Center Frec 5.720000000 GH;
0.0 0.0 0.0										Start Free 5.695000000 GH:
0.0 0.0 0.0										<b>Stop Fred</b> 5.745000000 GH2
	9500 GHz / 1.0 MHz	#\	/BW 3.0	0 MHz*	EUNCTION	I EIN	Sweep	20.0 m	.74500 GHz s (1001 pts) monvaue	
1 N 2 3 4 5 6 7 8 9 0 0 1 2		5.718 03 GHz	(Δ) -C	.343 dBm			13.94 MHz		10.650 dBm	Freq Offse 0 H:

### **OUTPUT POWER, CHAIN 2**

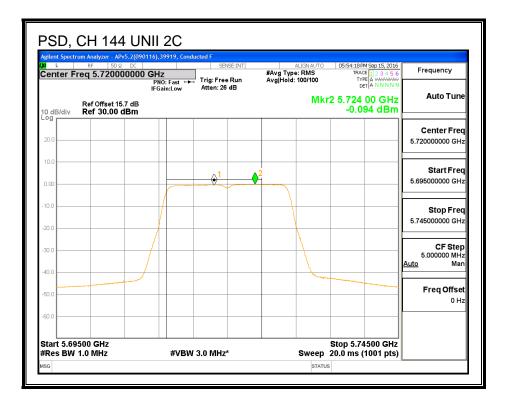


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# PSD, CHAIN 0



### PSD, CHAIN 2



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# UNII-3 BAND

#### Antenna Gain and Limit

Channel	Frequency	Min	Directional	Directional	Power	PSD
		99%	Gain	Gain	Limit	Limit
		BW	For Power For PSD			
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	3.877	8.06	8.06	27.94	27.94

Duty Cycle CF (dB)	1.05	Included in Calculations of Corr'd Power & PSD

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	5.27	5.19	9.29	27.94	-18.65

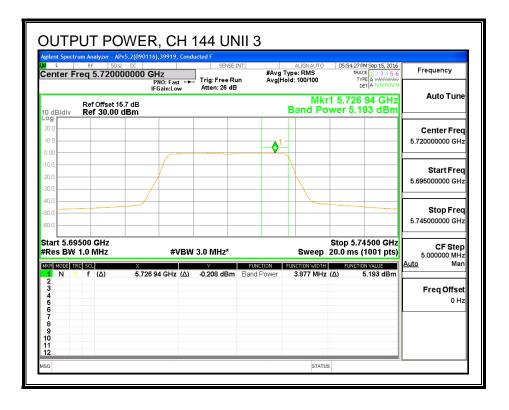
### **PSD** Results

Channel	Frequency	Chain 0	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-2.72	-2.65	1.37	27.94	-26.57

# **OUTPUT POWER, CHAIN 0**

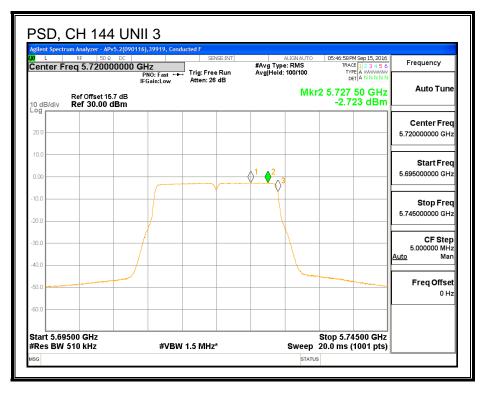
enter F	RF 50 req 5.7200		Hz PNO: Fast ↔	SENSE: Trig: Free Ru Atten: 26 dB	#Avg un Avg H	ALIGN AUTO Type: RMS Iold: 100/100	TF	8PM Sep 15, 2016 RACE 1 2 3 4 5 6 TYPE A WANNAW DET A N N N N N	Frequency
0 dB/div	Ref Offset 1 Ref 30.00	15.7 dB	Gam.cow					6 97 GHz 273 dBm	Auto Tune
og 20.0 10.0					^1				Center Fred 5.720000000 GHz
0.0 0.0 0.0									Start Fred 5.695000000 GHz
i0.0 i0.0 i0.0									Stop Fred 5.745000000 GHz
Res BW	9500 GHz 1.0 MHz	×	#VBW	3.0 MHz*	runemon	Sweep	20.0 ms	74500 GHz ; (1001 pts)	CF Step 5.000000 MHz Auto Mar
KE MODE T 2 3 4 5 5 6 7 8 9 0 0 1 2	f(Δ)		97 GHz (Δ)	-0.249 dBm	Band Power	3.940 MHz		5.273 dBm	Freq Offset

### **OUTPUT POWER, CHAIN 2**

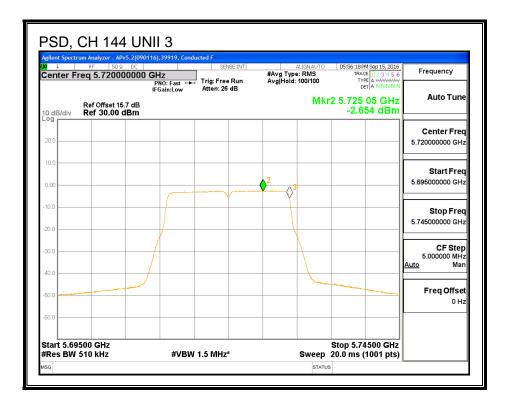


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# PSD, CHAIN 0



#### PSD, CHAIN 2



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# 8.33.2. 6 dB BANDWIDTH

# <u>LIMITS</u>

FCC §15.407 (e)

IC RSS-247 (6.2.4) (1)

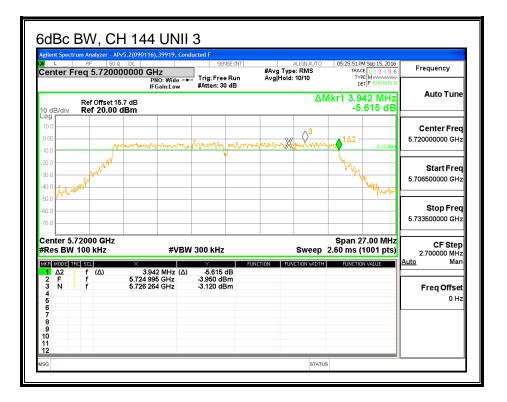
The minimum 6 dB bandwidth shall be at least 500 kHz.

# <u>RESULTS</u>

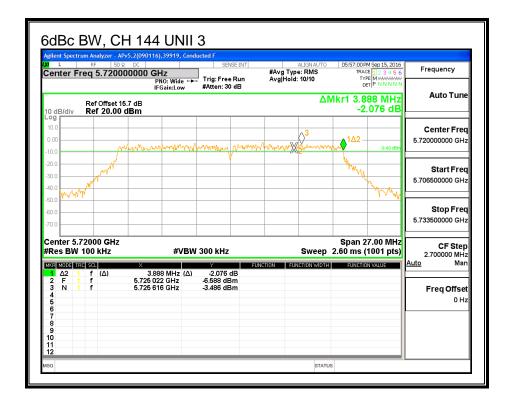
Channel	Frequency	6 dB BW	6 dB BW
		Chain 0	Chain 2
	(MHz)	(MHz)	(MHz)
144	5720	3.942	3.888

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### CHAIN 0



#### CHAIN 2



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# 8.34. 802.11n HT20 2Tx (CHAIN 1 + CHAIN 2) BEAM FORMING MODE IN THE 5.6 GHz BAND

# 8.34.1. **26 dB BANDWIDTH**

# <u>LIMITS</u>

None; for reporting purposes only.

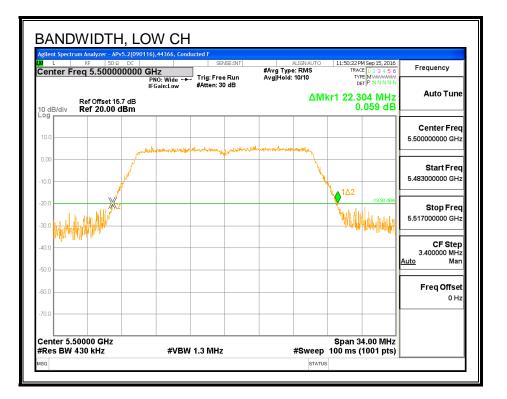
# **RESULTS**

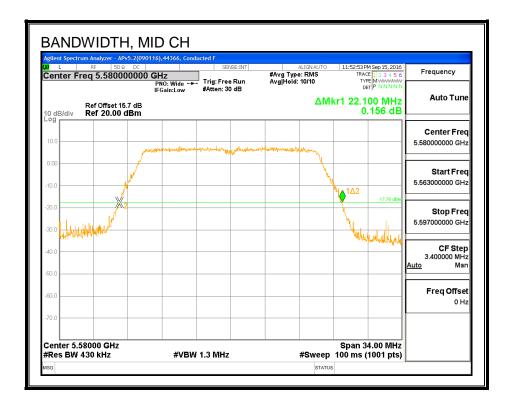
Channel	Frequency	26 dB BW	26 dB BW
		Chain 1	Chain 2
	(MHz)	(MHz)	(MHz)
Low	5500	22.304	21.714
Mid	5580	22.100	21.747
High	5700	22.100	22.338
144	5720	22.202	22.032

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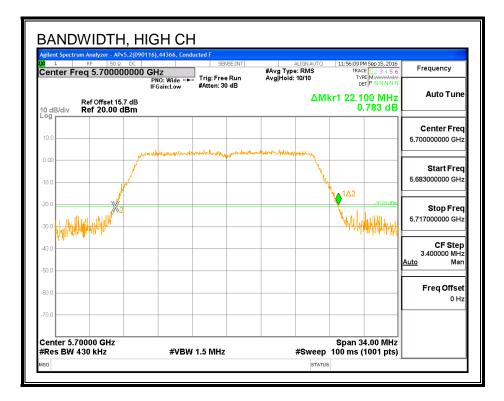
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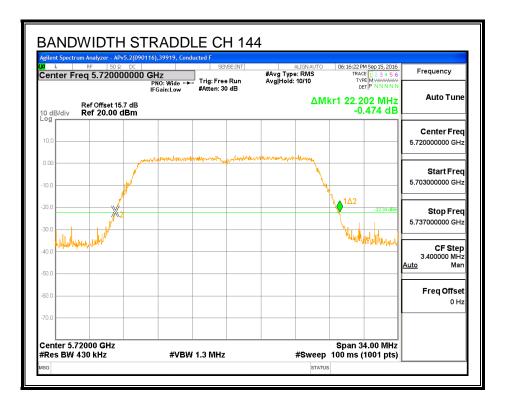
# 26 dB BANDWIDTH, CHAIN 1





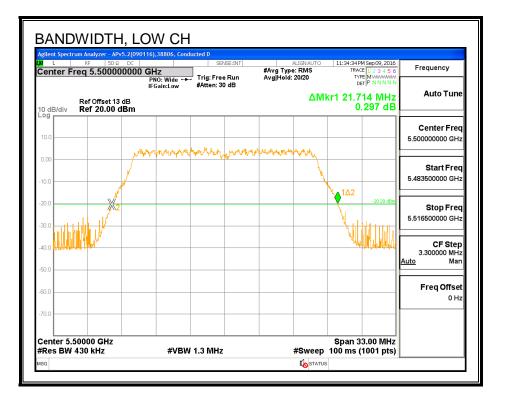
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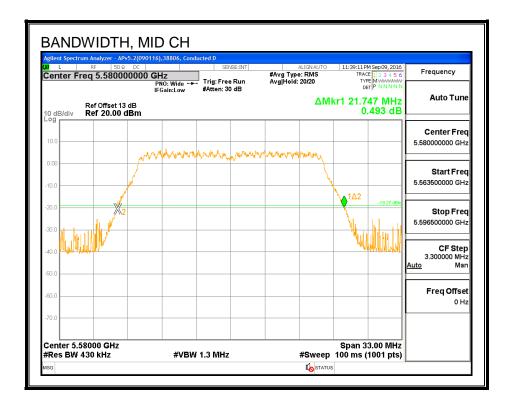




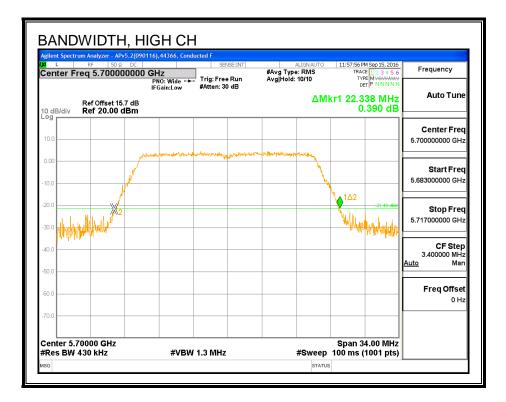
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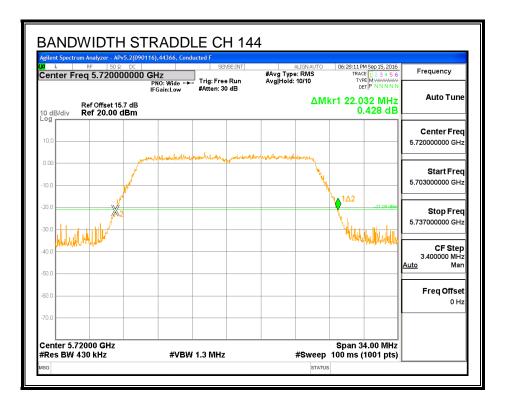
# 26 dB BANDWIDTH, CHAIN 2





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# 8.34.2. 99% BANDWIDTH

### <u>LIMITS</u>

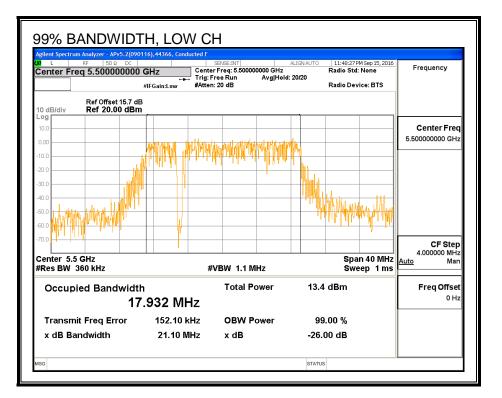
None; for reporting purposes only.

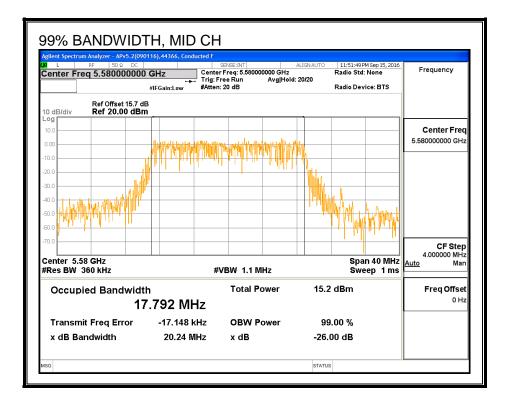
# **RESULTS**

Channel	Frequency	99% BW	99% BW
		Chain 1	Chain 2
	(MHz)	(MHz)	(MHz)
Low	5500	17.932	17.844
Mid	5580	17.792	17.710
High	5700	17.769	17.880
144	5720	17.798	17.796

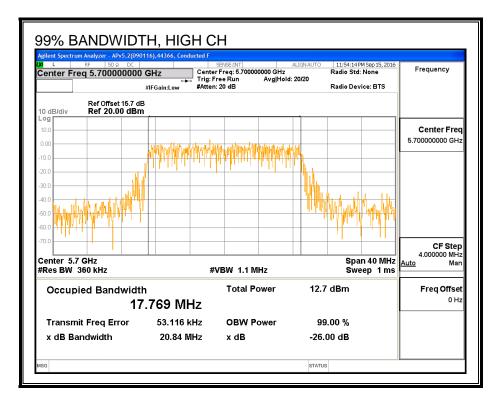
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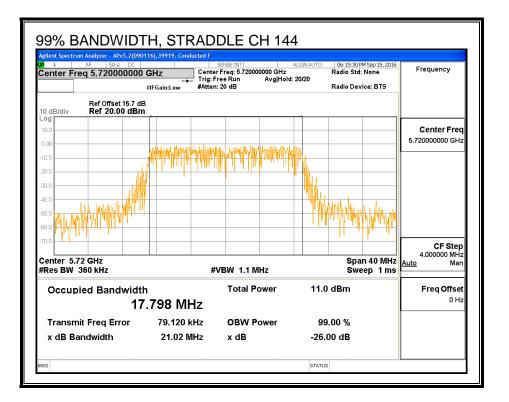
# 99% BANDWIDTH, CHAIN 1





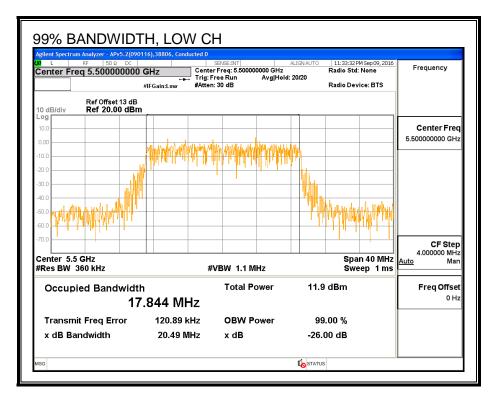
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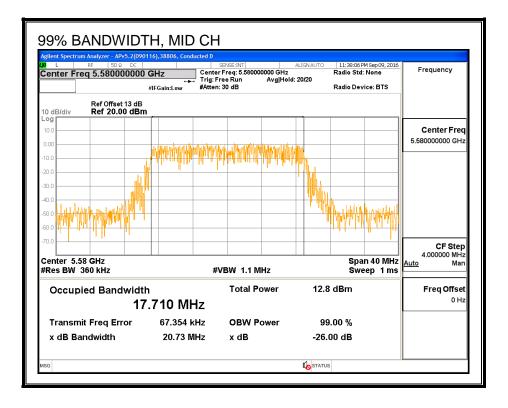




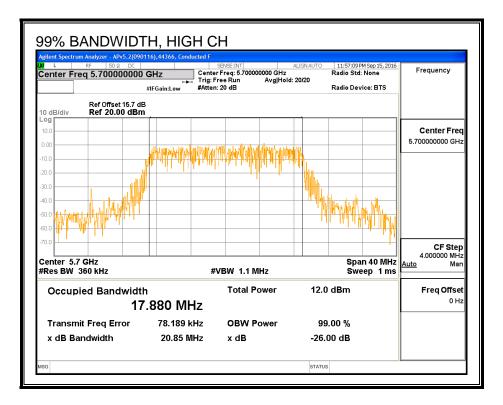
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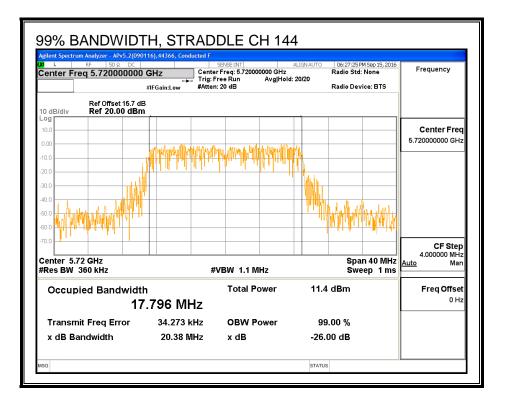
# 99% BANDWIDTH, CHAIN 2





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## 8.34.3. **AVERAGE POWER**

### **LIMITS**

None; for reporting purposes only.

#### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

#### **RESULTS**

ID:	44366	Date:	9/12/16

#### Average Power Results

Channel	Frequency	Chain 1	Chain 2	Total
		Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5500	11.96	11.91	14.95
Mid	5580	11.84	11.61	14.74
High	5700	10.46	10.40	13.44
144	5720	12.00	11.91	14.97

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# 8.34.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-247 (6.2.3) (1)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## TEST PROCEDURE

Measurements perform 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 the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

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### DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 1	Chain 2	<b>Correlated Chains</b>		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
7.40	5.20	9.38		

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## <u>RESULTS</u>

ID:	44366	Date:	9/12/16
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### Bandwidth, Antenna Gain and Limits

1.05

Channel	Frequency	Min	Min	Directional	Directional	Power	PSD
		26 dB	99%	Gain	Gain	Limit	Limit
		BW	BW	for Power	for PSD		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
Low	5500	21.71	17.844	9.38	9.38	20.13	7.62
Mid	5580	21.75	17.71	9.38	9.38	20.10	7.62
High	5700	22.10	17.769	9.38	9.38	20.12	7.62

Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

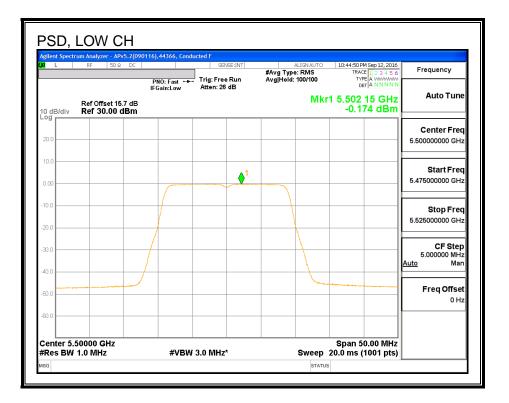
#### **Output Power Results**

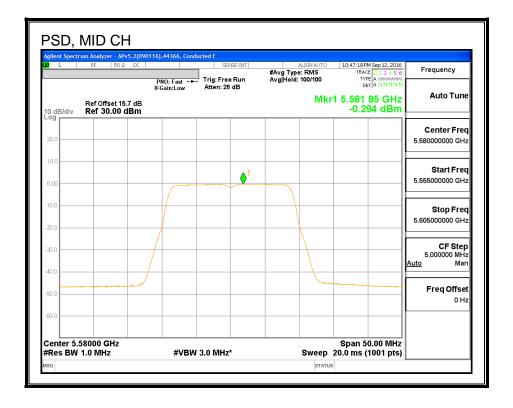
Channel	Frequency	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	11.96	11.912	14.95	20.13	-5.19
Mid	5580	11.84	11.607	14.74	20.10	-5.37
High	5700	10.46	10.4	13.44	20.12	-6.68

#### PSD Results

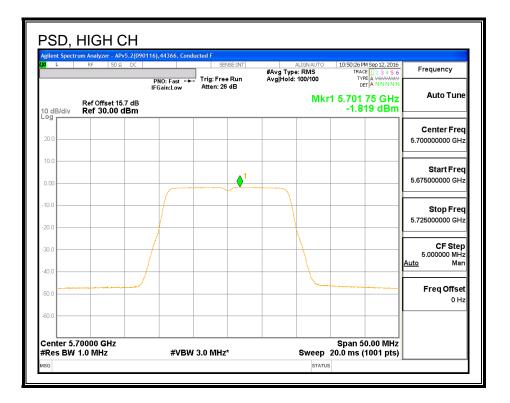
Channel	Frequency	Chain 1	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	-0.174	-0.033	3.96	7.62	-3.66
Mid	5580	-0.294	-0.307	3.76	7.62	-3.86
High	5700	-1.819	-1.773	2.26	7.62	-5.36

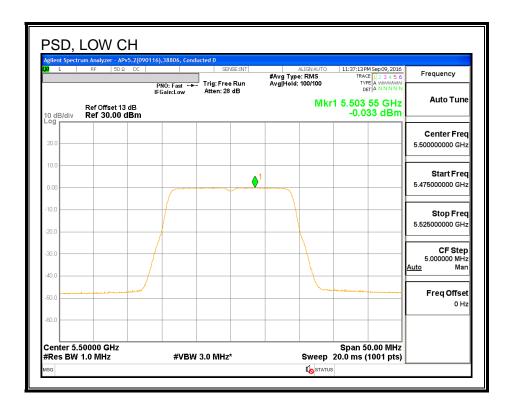
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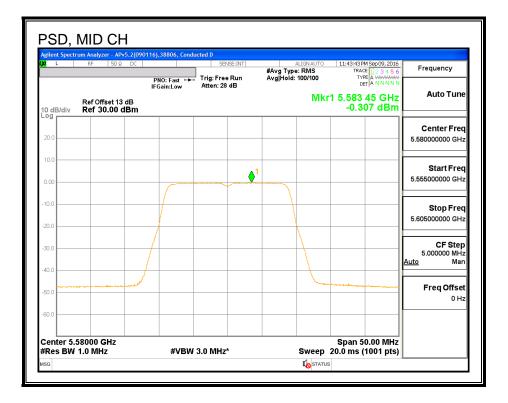


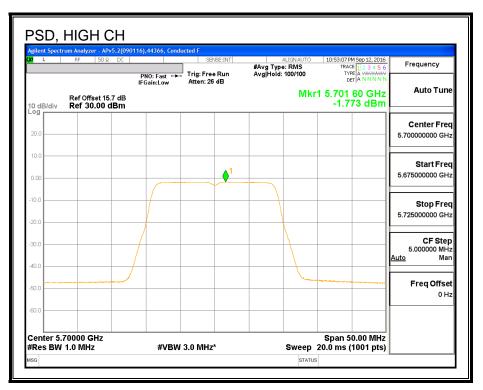
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# 8.35. 802.11ac VHT20 2Tx (CHAIN 1 + CHAIN 2) BEAM FORMING STRADDLE CHANNEL 144 RESULTS (FCC)

## 8.35.1. OUTPUT POWER AND PSD

#### UNII-2C BAND

#### Bandwidth, Antenna Gain, and Limits

Channel	Frequency	Min	Directional	Directional	Power	PSD
		26 dB	Gain	Gain	Limit	Limit
		BW	for Power	for PSD		
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	16.02	9.38	9.38	19.67	7.62

Duty Cycle CF (dB)	1.05	Included in Calculations of Corr'd Power & PSD
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#### **Output Power Results**

Channel	Frequency	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	10.65	10.73	14.75	19.67	-4.92

### PSD Results

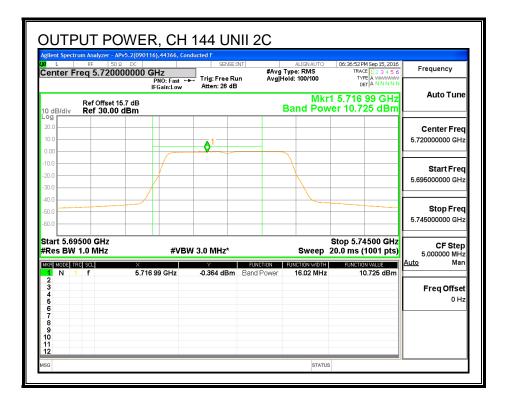
Channel	Frequency	Chain 1	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-0.142	-0.058	3.96	7.62	-3.66

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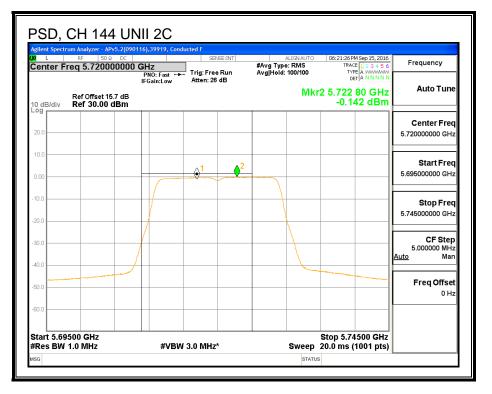
## **OUTPUT POWER, CHAIN 1**

enter l	RF 50Ω DC Freq 5.720000000	OGHz PNO: Fast ← IFGain:Low	SENSE:IN Trig: Free Run Atten: 26 dB	#Avg 1	ALIGNAUTO Fype: RMS old: 100/100	06:21:11 PM Sep 15, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
0 dB/div	Ref Offset 15.7 dB Ref 30.00 dBm	IFGain:Low	Atten: 20 th			1 5.716 95 GHz er 10.645 dBm	Auto Tune
°g 20.0							Center Fred
0.0			1				5.720000000 GHz
			<b>2</b>				
0.0					<b>1</b>		Start Fred
0.0							5.695000000 GHz
0.0							
0.0							Stop Fred
0.0							5.745000000 GHz
	9500 GHz / 1.0 MHz	#VB	W 3.0 MHz*	FUNCTION		Stop 5.74500 GHz 20.0 ms (1001 pts)	CF Step 5.000000 MHz Auto Mar
1 N 2		16 95 GHz	-0.482 dBm		16.10 MHz	10.645 dBm	
3							Freq Offset
5							0 Hz
7 8							
9 0							
1							

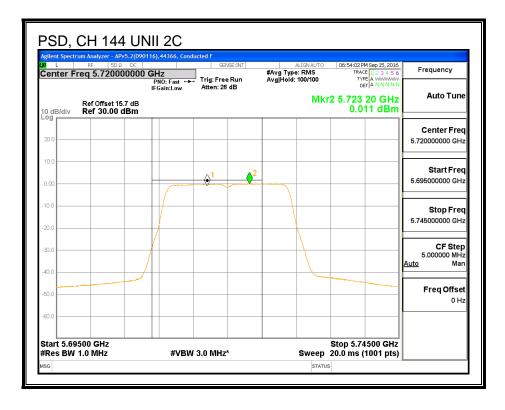
#### **OUTPUT POWER, CHAIN 2**



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#### PSD, CHAIN 2



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## UNII-3 BAND

#### Antenna Gain and Limit

Channel	Frequency	Min Directiona		Directional	Power	PSD
		26 dB	Gain	Gain	Limit	Limit
		BW	For Power	For PSD		
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	6.02	9.38	9.38	26.62	26.62

Duty Cycle CF (dB)	1.05	Included in Calculations of Corr'd Power & PSD

#### **Output Power Results**

Channel	Frequency	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	5.60	5.47	9.60	26.62	-17.02

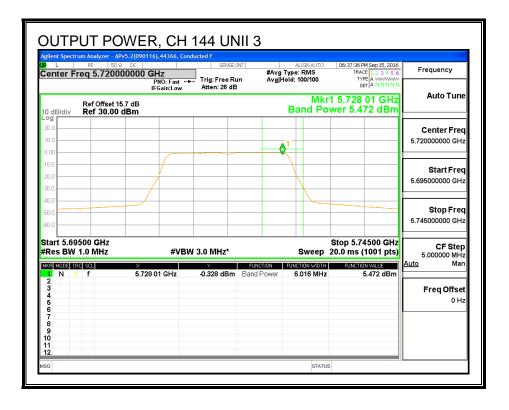
#### **PSD Results**

Channel	Frequency	Chain 1	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-2.73	-2.91	1.24	26.62	-25.38

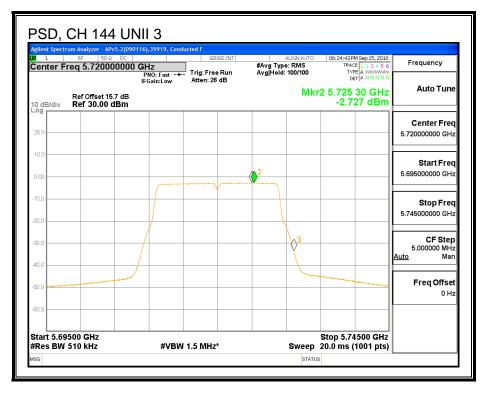
## **OUTPUT POWER, CHAIN 1**

enter l	RF 50 s Freq 5.7200	F	NO:Fast ↔	SENSE	#Avg un Avg	ALIGN AUTO   Type: RMS Hold: 100/100	06:23:09 PM Sep 15, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWM DETLA N N N N	Frequency
0 dB/div	Ref Offset 1 Ref 30.00	5.7 dB	Gain:Low	Atten: 26 dl	3		r1 5.728 05 GHz ower 5.603 dBm	Auto Tune
og 20.0 10.0								Center Frec 5.720000000 GHz
0.0 0.0 0.0								Start Free 5.695000000 GH;
0.0 0.0 0.0								<b>Stop Frec</b> 5.745000000 GHz
Res BW	9500 GHz / 1.0 MHz	×		№ 3.0 MHz*		FUNCTION WIDTH		5.000000 MH Auto Mar
1 N 2 3 4 5 6 7 8 9 0 0	1 f	5.728 (	95 GHz	-0.299 dBm	Band Power	6.101 MHz	5.603 dBm	Freq Offsel

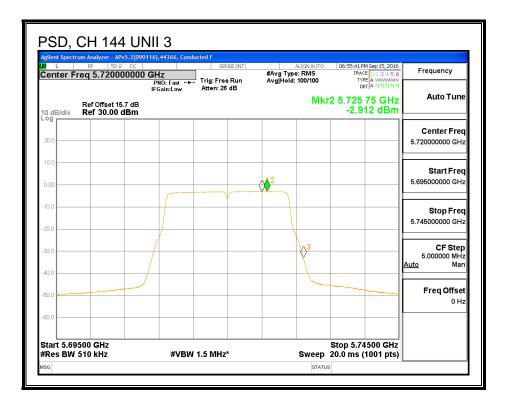
#### **OUTPUT POWER, CHAIN 2**



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#### PSD, CHAIN 2



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# 8.36. 802.11ac VHT20 2Tx (CHAIN 1 + CHAIN 2) BEAM FORMING STRADDLE CHANNEL 144 RESULTS (IC)

## 8.36.1. OUTPUT POWER AND PSD

#### UNII-2C BAND

#### Bandwidth, Antenna Gain, and Limits

Channel	Frequency	Min	Directional	Directional	Power	PSD
		99%	Gain	Gain	Limit	Limit
		BW	for Power	for PSD		
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	13.900	9.38	9.38	19.05	7.62

Duty Cycle CF (dB) 1.05 Included in Calculations of Corr'd Power & PSD	
--	--

#### **Output Power Results**

Channel	Frequency	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	10.80	10.67	14.79	19.05	-4.26

#### **PSD** Results

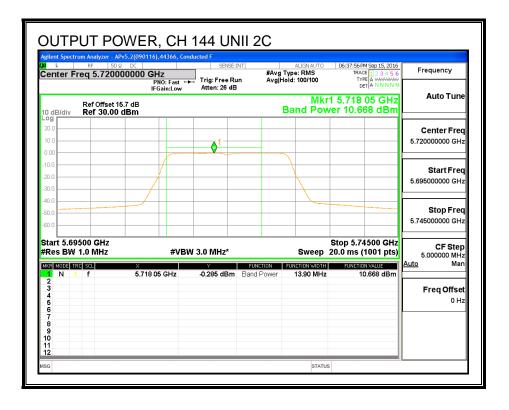
Channel	Frequency	Chain 1	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	0.07	0.01	4.10	7.62	-3.52

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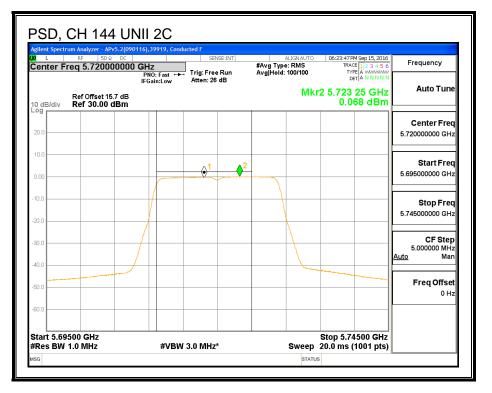
## **OUTPUT POWER, CHAIN 1**

L enter F	RF 50 Ω DC Freq 5.72000000	00 GHz PN0: Fast ↔	SENSE:INT		ALIGNAUTO ype: RMS ild: 100/100	06:23:38 PM Sep 15, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
) dB/div	Ref Offset 15.7 dE Ref 30.00 dBm		Atten: 26 dB			1 5.718 05 GHz er 10.798 dBm	Auto Ture
			<b>0</b> 1				Center Frec 5.720000000 GH;
0.0							<b>Start Free</b> 5.695000000 GH;
0.0							<b>Stop Fred</b> 5.745000000 GHz
	9500 GHz / 1.0 MHz		V 3.0 MHz*	FUNCTION		Stop 5.74500 GHz 20.0 ms (1001 pts) FUNCTION VALUE	
1 N 2 3 4 5 6 7 8 9 0 1 2		.718 05 GHz	-0.197 dBm E		13.90 MHz	10.798 dBm	Freq Offset

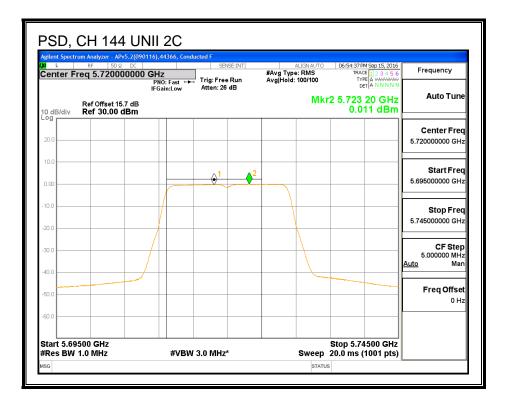
#### **OUTPUT POWER, CHAIN 2**



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#### PSD, CHAIN 2



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## UNII-3 BAND

#### Antenna Gain and Limit

Channel	Frequency	Min Direction		Directional	Power	PSD
		99%	Gain	Gain	Limit	Limit
		BW	For Power	For PSD		
	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
144	5720	3.898	9.38	9.38	26.62	26.62

Duty Cycle CF (dB)	1.05	Included in Calculations of Corr'd Power & PSD

#### **Output Power Results**

Channel	Frequency	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	5.40	5.33	9.43	26.62	-17.19

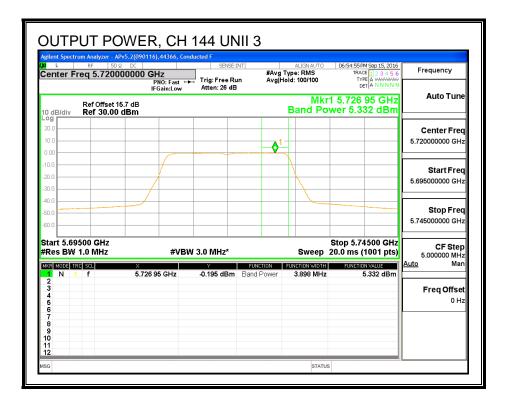
#### **PSD Results**

Channel	Frequency	Chain 1	Chain 2	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
144	5720	-2.73	-2.91	1.24	26.62	-25.38

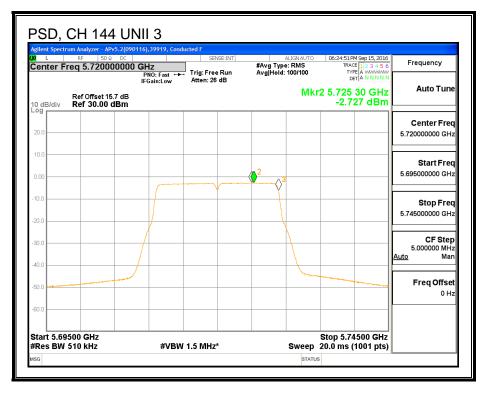
## **OUTPUT POWER, CHAIN 1**

enter F	RF 50 Ω req 5.72000	PNO: Fast	SENSE:I	#Avg	ALIGNAUTO Type: RMS fold: 100/100	06:23:56 PM Sep 15, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
0 dB/div	Ref Offset 15 Ref 30.00 (		Atten: 26 dB			5.726 95 GHz ver 5.400 dBm	Auto Tune
og 20.0 10.0				<b>\$</b> <sup>1</sup>			Center Freq 5.720000000 GHz
0.0 0.0 0.0							Start Freq 5.695000000 GHz
0.0 0.0 0.0							<b>Stop Freq</b> 5.745000000 GHz
	1500 GHz 1.0 MHz	#VE	SW 3.0 MHz*	EUNCTION		Stop 5.74500 GHz 0.0 ms (1001 pts)	CF Step 5.000000 MHz <u>Auto</u> Man
	f	5.726 95 GHz	-0.049 dBm	Band Power	3.899 MHz	5.400 dBm	Freq Offset 0 Hz

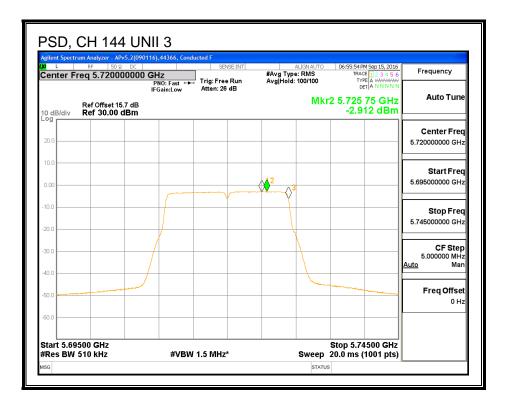
#### **OUTPUT POWER, CHAIN 2**



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#### PSD, CHAIN 2



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## 8.36.2. 6 dB BANDWIDTH

## LIMITS

FCC §15.407 (e)

IC RSS-247 (6.2.4) (1)

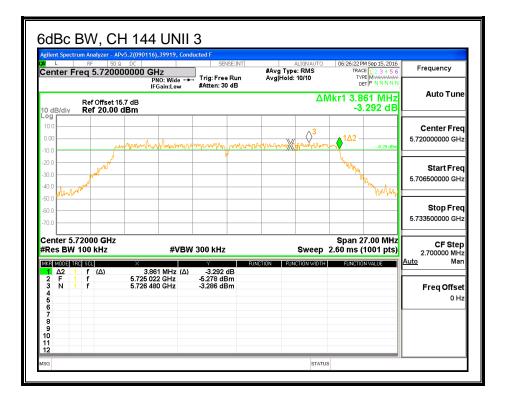
The minimum 6 dB bandwidth shall be at least 500 kHz.

## **RESULTS**

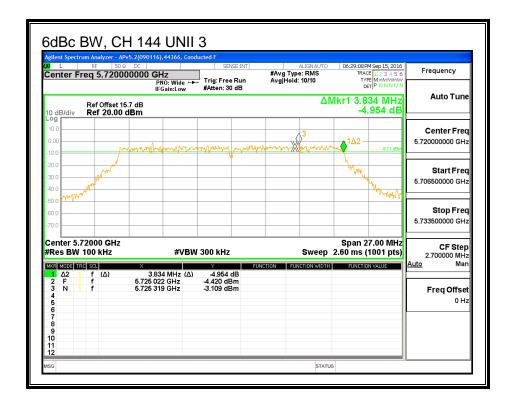
Channel	Frequency	6 dB BW	6 dB BW	
		Chain 1	Chain 2	
	(MHz)	(MHz)	(MHz)	
144	5720	3.861	3.834	

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### <u>CHAIN 1</u>



#### CHAIN 2



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# 8.37. 802.11n HT20 3Tx CDD MODE IN THE 5.6 GHz BAND

## 8.37.1. 26 dB BANDWIDTH

## **LIMITS**

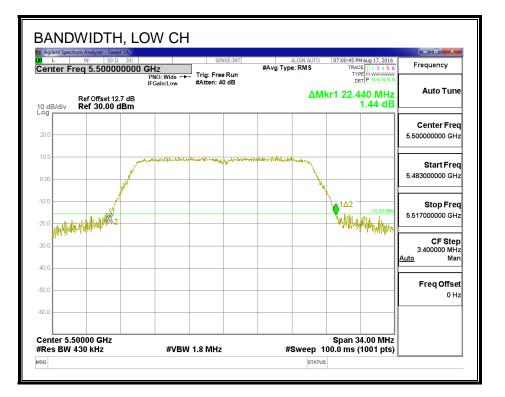
None; for reporting purposes only.

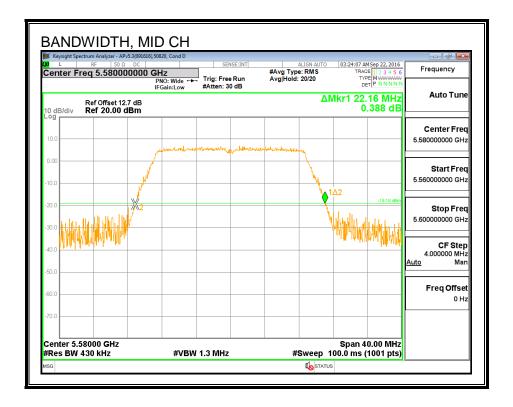
## <u>RESULTS</u>

Channel	Frequency	26 dB BW	26 dB BW	26 dB BW
		Chain 0	Chain 1	Chain 2
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5500	22.440	22.202	21.800
Mid	5580	22.160	21.760	21.880
High	5700	22.160	22.032	21.880
144	5720	22.238	21.747	21.912

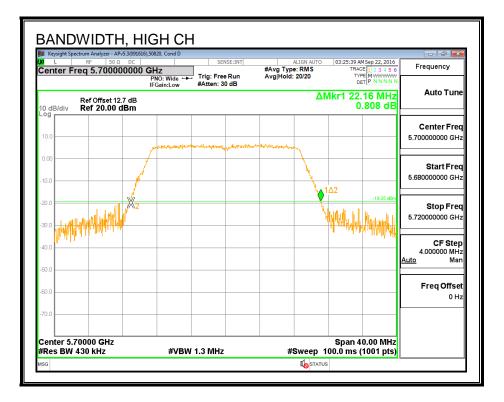
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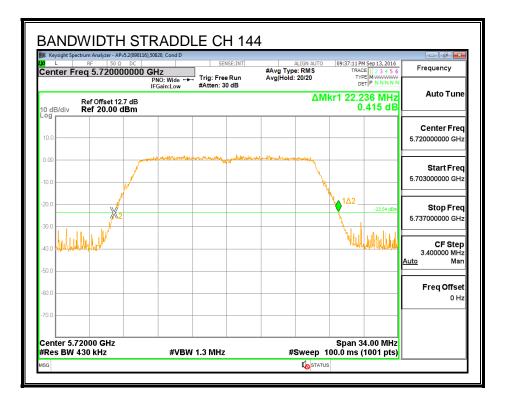
## 26 dB BANDWIDTH, CHAIN 0





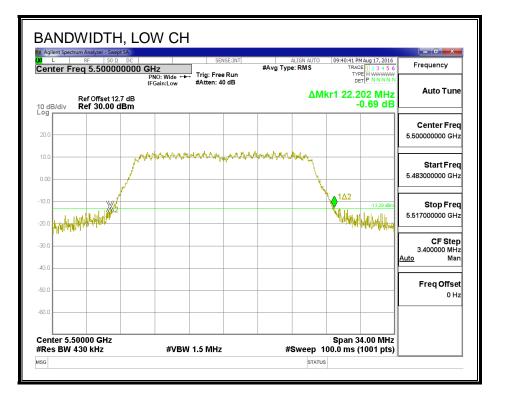
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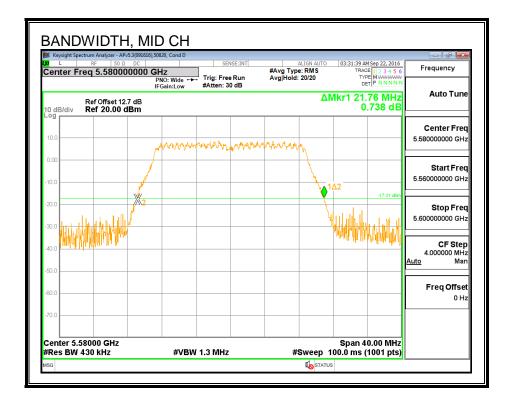




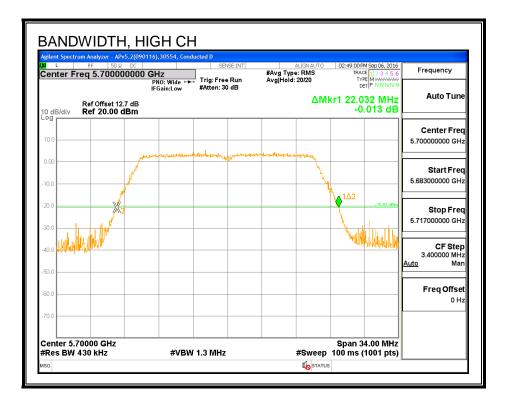
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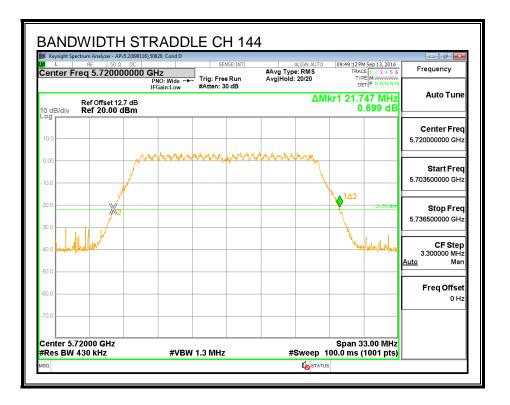
## 26 dB BANDWIDTH, CHAIN 1





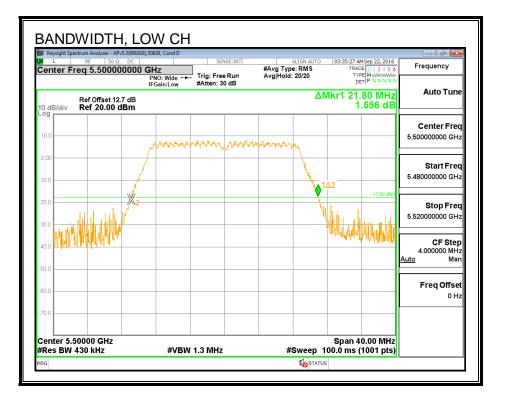
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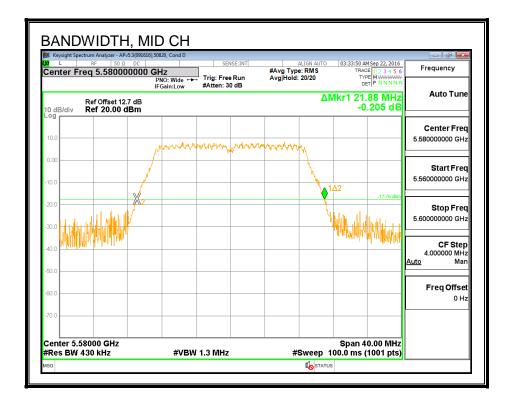




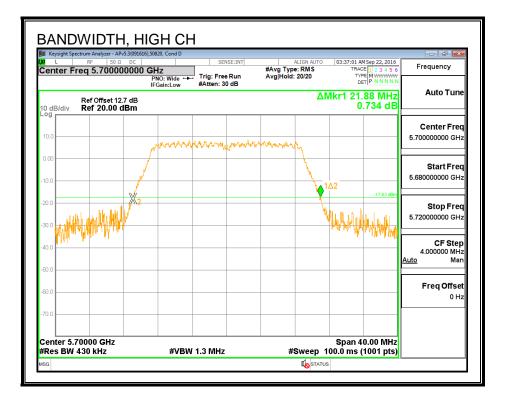
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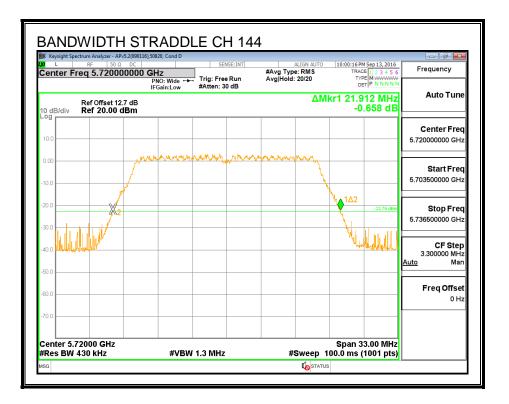
## 26 dB BANDWIDTH, CHAIN 2





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## 8.37.2. 99% BANDWIDTH

### **LIMITS**

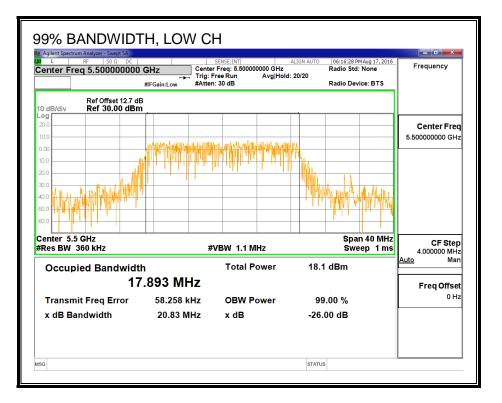
None; for reporting purposes only.

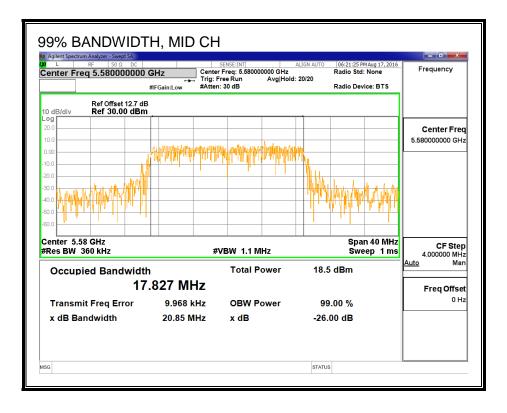
## **RESULTS**

Channel	Frequency	99% BW	99% BW	99% BW
		Chain 0	Chain 1	Chain 2
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5500	17.893	17.733	17.786
Mid	5580	17.827	17.756	17.687
High	5700	17.950	17.814	17.831
144	5720	17.853	17.867	17.841

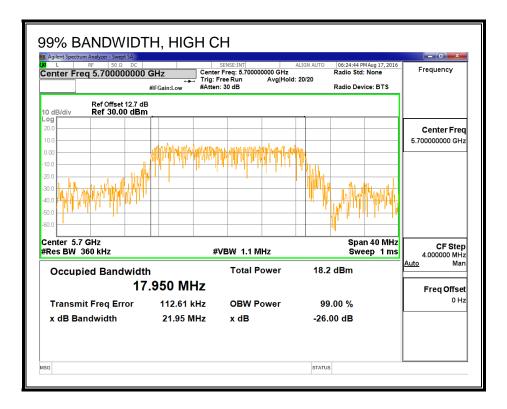
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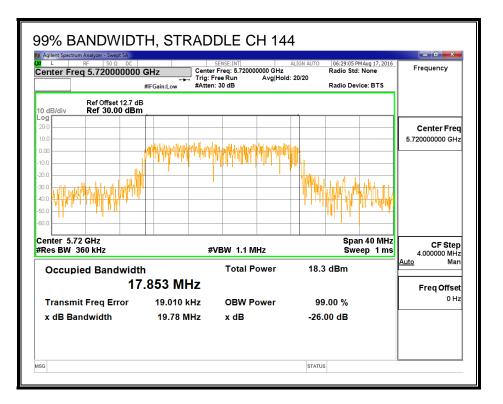
## 99% BANDWIDTH, CHAIN 0





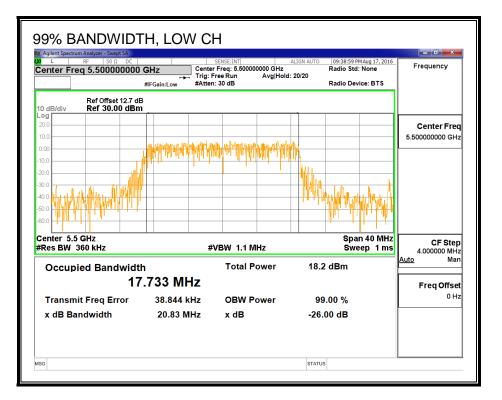
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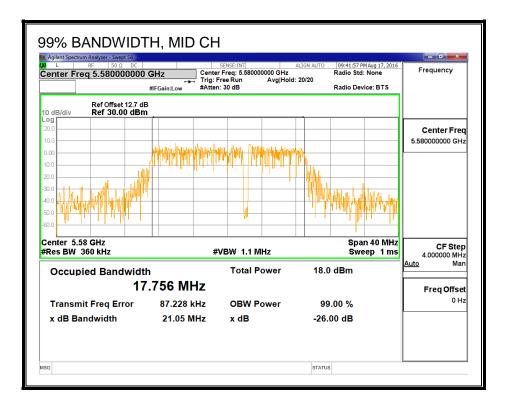




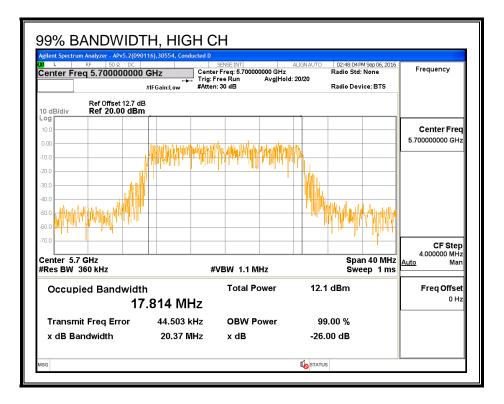
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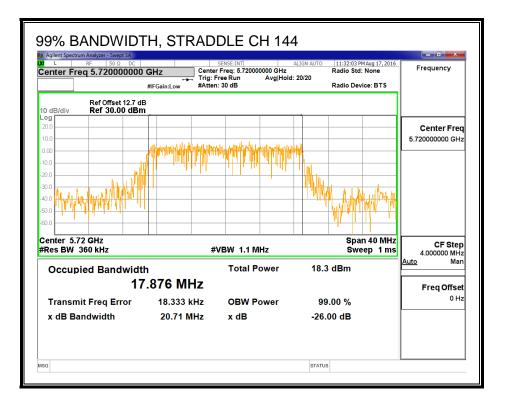
## 99% BANDWIDTH, CHAIN 1





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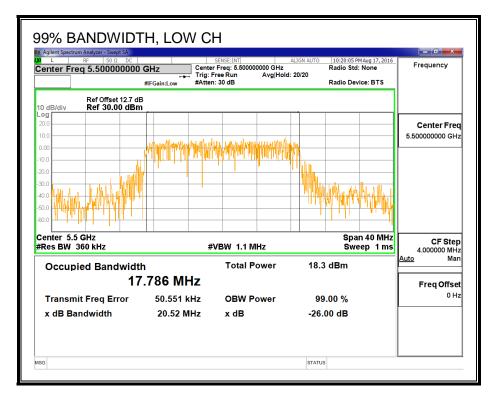


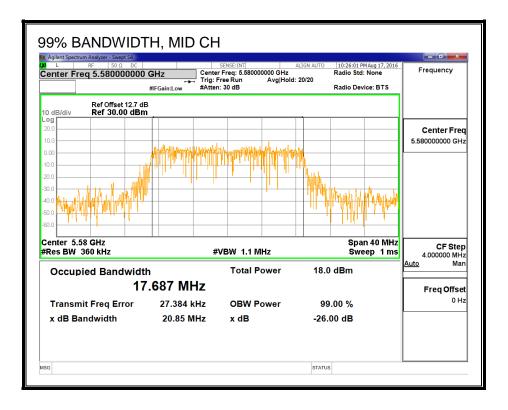


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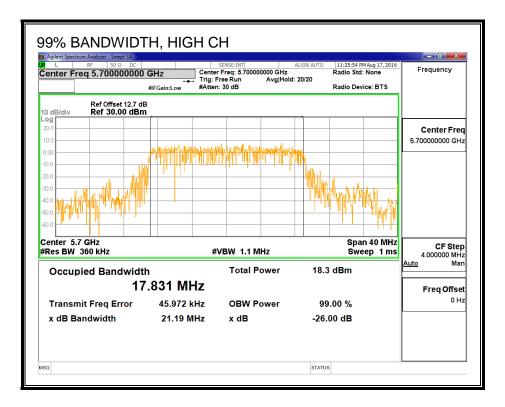
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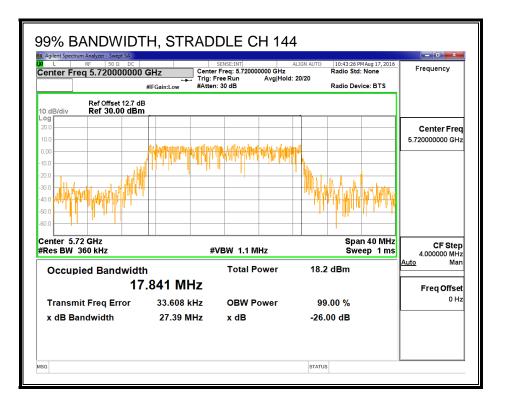
## 99% BANDWIDTH, CHAIN 2





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## 8.37.3. **AVERAGE POWER**

## **LIMITS**

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

### **RESULTS**

ID:	30606	Date:	9/1/16

#### Average Power Results

Channel	Frequency	Chain 0 Chain 1		Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	9.38	9.37	9.49	14.18
Mid	5580	9.45	9.50	9.43	14.23
High	5700	9.40	9.47	9.50	14.23
144	5720	9.37	9.44	9.34	14.15

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# 8.37.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-247 (6.2.3) (1)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## TEST PROCEDURE

Measurements perform 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 the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

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### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	Chain 2	<b>Uncorrelated Chains</b>
Antenna	Antenna	Antenna	Directional
Gain	Gain	Gain	Gain
(dBi)	(dBi)	(dBi)	(dBi)
4.90	7.40	5.20	5.98

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	Chain 2	<b>Correlated Chains</b>
Antenna	Antenna	Antenna	Directional
Gain	Gain	Gain	Gain
(dBi)	(dBi)	(dBi)	(dBi)
4.90	7.40	5.20	10.68

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## <u>RESULTS</u>

ID: 30606	Date:	9/1/16
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0.00

## Bandwidth, Antenna Gain and Limits

Channel	Frequency	Min	Min	Directional	Directional	Power	PSD
		26 dB	99%	Gain	Gain	Limit	Limit
		BW	BW	for Power	for PSD		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
Low	5500	22.20	17.733	5.98	10.68	23.49	6.32
Mid	5580	24.46	17.687	5.98	10.68	23.48	6.32
High	5700	22.03	17.814	5.98	10.68	23.51	6.32

Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

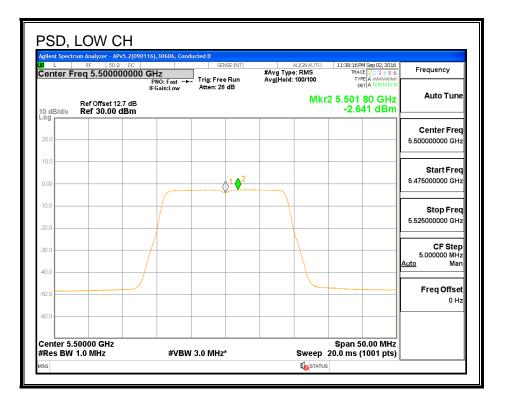
#### **Output Power Results**

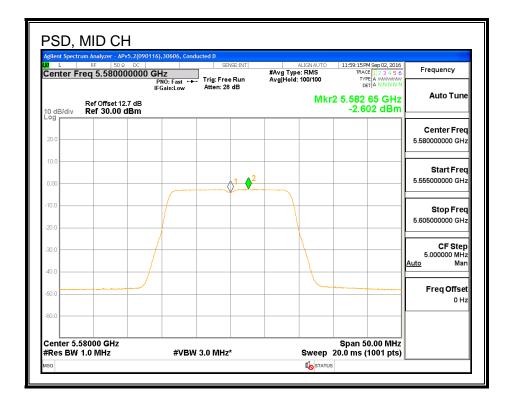
Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Power	Power
		Meas	Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	9.38	9.37	9.49	14.18	23.49	-9.30
Mid	5580	9.45	9.5	9.43	14.23	23.48	-9.25
High	5700	9.4	9.47	9.5	14.23	23.51	-9.28

## **PSD Results**

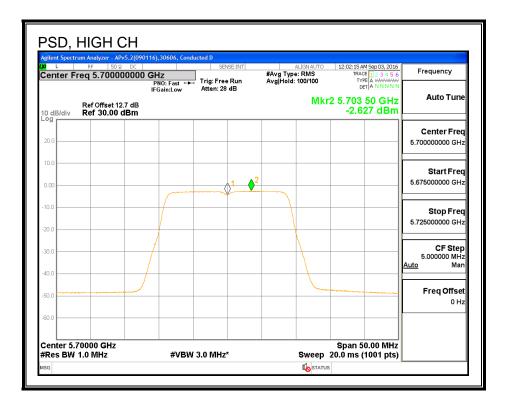
Channel	Frequency	Chain 0	Chain 1	Chain 1	Total	PSD	PSD
		Meas	Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	-2.641	-2.736	-2.449	2.16	6.32	-4.16
Mid	5580	-2.602	-2.857	-2.602	2.09	6.32	-4.23
High	5700	-2.627	-2.388	-2.606	2.23	6.32	-4.09

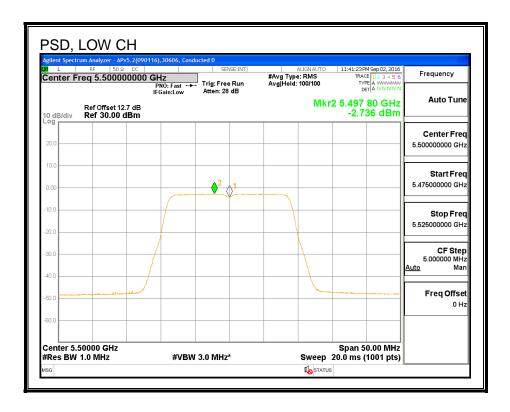
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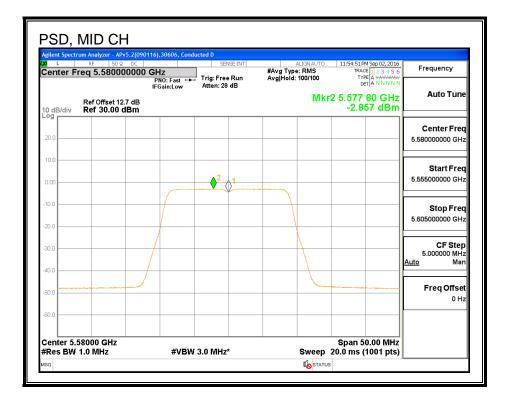


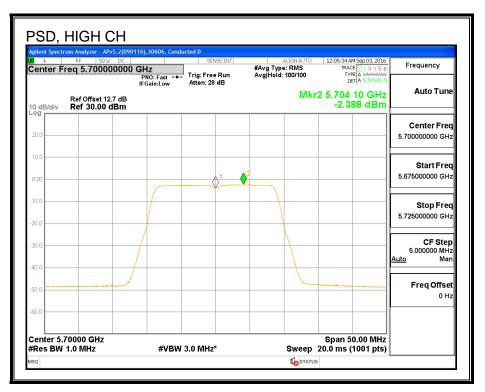
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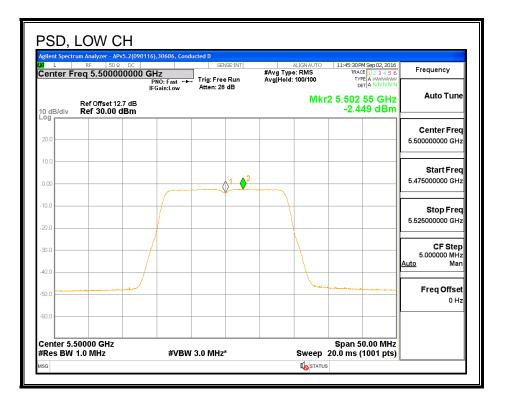


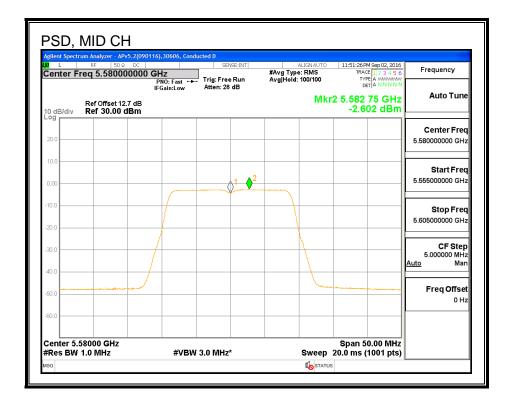
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