



**FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

3x3 MIMO BASE STATION

MODEL NUMBER: A1470

**FCC ID: BCGA1470
IC: 579C-A1470**

REPORT NUMBER: 12U14745-3, Revision B

ISSUE DATE: JUNE 11, 2013

Prepared for
**APPLE INC.
1 INIFINITE LOOP
CUPERTINO, CA 95014
U.S.A.**

Prepared by
**UL CCS
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/24/13	Initial Issue	F. Ibrahim
A	04/29/13	Revised DFS section	D. Anderson
B	06/11/13	Revised DFS section	D. Anderson

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	12
2. TEST METHODOLOGY	13
3. FACILITIES AND ACCREDITATION	13
4. CALIBRATION AND UNCERTAINTY	13
4.1. MEASURING INSTRUMENT CALIBRATION	13
4.2. SAMPLE CALCULATION	13
4.3. MEASUREMENT UNCERTAINTY	13
5. EQUIPMENT UNDER TEST	14
5.1. DESCRIPTION OF EUT	14
5.2. MAXIMUM OUTPUT POWER	15
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	19
5.4. SOFTWARE AND FIRMWARE	19
5.5. WORST-CASE CONFIGURATION AND MODE	20
5.6. DESCRIPTION OF TEST SETUP	21
6. TEST AND MEASUREMENT EQUIPMENT	23
7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS	24
7.1. ON TIME AND DUTY CYCLE RESULTS	24
7.2. MEASUREMENT METHOD FOR POWER AND PPSD	24
7.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSION ABOVE 1 GHz	24
7.4. DUTY CYCLE PLOTS	25
8. ANTENNA PORT TEST RESULTS	30
8.1. 802.11a Legacy 1TX MODE IN THE 5.2 GHz BAND	30
8.1.1. 26 dB BANDWIDTH	30
8.1.2. 99% BANDWIDTH	33
8.1.3. OUTPUT AVERAGE POWER AND PSD	36
8.1.4. PEAK EXCURSION	40
8.2. 802.11n HT20 CDD 2TX MODE IN THE 5.2 GHz BAND	42
8.2.1. 26 dB BANDWIDTH	42
8.2.2. 99% BANDWIDTH	46
8.2.3. OUTPUT AVERAGE POWER AND PSD	50
8.2.4. PEAK EXCURSION	55
8.3. 802.11n HT20 BF 2TX MODE IN THE 5.2 GHz BAND	58
8.3.1. OUTPUT AVERAGE POWER	58
8.4. 802.11n HT20 STBC 2TX MODE IN THE 5.2 GHz BAND	60
8.4.1. 26 dB BANDWIDTH	60

8.4.2.	99% BANDWIDTH.....	64
8.4.3.	OUTPUT AVERAGE POWER AND PSD.....	68
8.4.4.	PEAK EXCURSION.....	73
8.5.	<i>802.11n HT20 CDD 3TX MODE IN THE 5.2 GHz BAND</i>	<i>76</i>
8.5.1.	26 dB BANDWIDTH.....	76
8.5.2.	99% BANDWIDTH.....	82
8.5.3.	OUTPUT AVERAGE POWER AND PSD.....	88
8.5.4.	PEAK EXCURSION.....	95
8.6.	<i>802.11n HT20 BF 3TX MODE IN THE 5.2 GHz BAND</i>	<i>99</i>
8.6.1.	OUTPUT AVERAGE POWER	99
8.7.	<i>802.11n HT20 STBC 3TX MODE IN THE 5.2 GHz BAND</i>	<i>101</i>
8.7.1.	26 dB BANDWIDTH.....	101
8.7.2.	99% BANDWIDTH.....	107
8.7.3.	OUTPUT AVERAGE POWER AND PSD.....	113
8.7.4.	PEAK EXCURSION.....	120
8.8.	<i>802.11n HT40 1TX MODE IN THE 5.2 GHz BAND.....</i>	<i>123</i>
8.8.1.	26 dB BANDWIDTH.....	123
8.8.2.	99% BANDWIDTH.....	125
8.8.3.	OUTPUT AVERAGE POWER AND PSD.....	127
8.8.4.	PEAK EXCURSION.....	130
8.9.	<i>802.11n HT40 CDD 2TX MODE IN THE 5.2 GHz BAND</i>	<i>132</i>
8.9.1.	26 dB BANDWIDTH.....	132
8.9.2.	99% BANDWIDTH.....	135
8.9.3.	OUTPUT AVERAGE POWER AND PSD.....	138
8.9.4.	PEAK EXCURSION.....	142
8.10.	<i>802.11n HT40 BF 2TX MODE IN THE 5.2 GHz BAND.....</i>	<i>145</i>
8.10.1.	OUTPUT AVERAGE POWER.....	145
8.11.	<i>802.11n HT40 STBC 2TX MODE IN THE 5.2 GHz BAND.....</i>	<i>147</i>
8.11.1.	26 dB BANDWIDTH	147
8.11.2.	99% BANDWIDTH	150
8.11.3.	OUTPUT AVERAGE POWER AND PSD	153
8.11.4.	PEAK EXCURSION	157
8.12.	<i>802.11n HT40 CDD 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>160</i>
8.12.1.	26 dB BANDWIDTH	160
8.12.2.	99% BANDWIDTH	164
8.12.3.	OUTPUT AVERAGE POWER AND PSD	168
8.12.4.	PEAK EXCURSION	173
8.13.	<i>802.11n HT40 BF 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>177</i>
8.13.1.	OUTPUT AVERAGE POWER.....	177
8.14.	<i>802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>179</i>
8.14.1.	26 dB BANDWIDTH	179
8.14.2.	99% BANDWIDTH	183
8.14.3.	OUTPUT AVERAGE POWER AND PSD	187
8.14.4.	PEAK EXCURSION	192
8.15.	<i>802.11ac VHT80 1TX MODE IN THE 5.2 GHz BAND</i>	<i>196</i>
8.15.1.	26 dB BANDWIDTH	196
8.15.2.	99% BANDWIDTH	197

8.15.3.	OUTPUT POWER AND PSD	198
8.15.4.	PEAK EXCURSION	201
8.16.	<i>802.11ac VHT80 CDD 2TX MODE IN THE 5.2 GHz BAND.....</i>	<i>202</i>
8.16.1.	26 dB BANDWIDTH	202
8.16.2.	99% BANDWIDTH	205
8.16.3.	OUTPUT AVERAGE POWER AND PSD	208
8.17.	<i>802.11ac VHT80 BF 2TX MODE IN THE 5.2 GHz BAND.....</i>	<i>212</i>
8.17.1.	OUTPUT AVERAGE POWER.....	212
8.18.	<i>802.11ac VHT80 STBC 2TX MODE IN THE 5.2 GHz BAND.....</i>	<i>214</i>
8.18.1.	26 dB BANDWIDTH	214
8.18.2.	99% BANDWIDTH	217
8.18.3.	OUTPUT AVERAGE POWER AND PSD	220
8.19.	<i>802.11ac VHT80 CDD 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>225</i>
8.19.1.	26 dB BANDWIDTH	225
8.19.2.	99% BANDWIDTH	228
8.19.3.	OUTPUT AVERAGE POWER AND PSD	231
8.19.4.	PEAK EXCURSION	235
8.20.	<i>802.11ac VHT80 BF 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>238</i>
8.20.1.	OUTPUT AVERAGE POWER AND PSD	238
8.21.	<i>802.11ac VHT80 STBC 3TX MODE IN THE 5.2 GHz BAND.....</i>	<i>240</i>
8.21.1.	26 dB BANDWIDTH	240
8.21.2.	99% BANDWIDTH	243
8.21.3.	OUTPUT AVERAGE POWER AND PSD	246
8.21.4.	PEAK EXCURSION	251
8.22.	<i>802.11a Legacy 1TX MODE IN THE 5.3 GHz BAND.....</i>	<i>254</i>
8.22.1.	26 dB BANDWIDTH	254
8.22.2.	99% BANDWIDTH	257
8.22.3.	OUTPUT AVERAGE POWER AND PSD	260
8.22.4.	TPC POWER	264
8.23.	<i>802.11n HT20 CDD 2TX MODE IN THE 5.3 GHz BAND.....</i>	<i>265</i>
8.23.1.	26 dB BANDWIDTH	265
8.23.2.	99% BANDWIDTH	269
8.23.3.	OUTPUT AVERAGE POWER AND PSD	273
8.23.4.	TPC POWER	278
8.24.	<i>802.11n HT20 BF 2TX MODE IN THE 5.3 GHz BAND.....</i>	<i>279</i>
8.24.1.	OUTPUT AVERAGE POWER.....	279
8.25.	<i>802.11n HT20 STBC 2TX MODE IN THE 5.3 GHz BAND.....</i>	<i>281</i>
8.25.1.	26 dB BANDWIDTH	281
8.25.2.	99% BANDWIDTH	285
8.25.3.	OUTPUT AVERAGE POWER AND PSD	289
8.25.4.	TPC POWER	297
8.26.	<i>802.11n HT20 CDD 3TX MODE IN THE 5.3 GHz BAND.....</i>	<i>298</i>
8.26.1.	26 dB BANDWIDTH	298
8.26.2.	99% BANDWIDTH	304
8.26.3.	OUTPUT AVERAGE POWER AND PSD	310
8.26.4.	TPC POWER	317

8.27.	802.11n HT20 BF 3TX MODE IN THE 5.3 GHz BAND.....	318
8.27.1.	OUTPUT AVERAGE POWER.....	318
8.28.	802.11n HT20 STBC 3TX MODE IN THE 5.3 GHz BAND.....	320
8.28.1.	26 dB BANDWIDTH	320
8.28.2.	99% BANDWIDTH	326
8.28.3.	OUTPUT AVERAGE POWER AND PSD	332
8.28.4.	TPC POWER	339
8.29.	802.11n HT40 1TX MODE IN THE 5.3 GHz BAND	340
8.29.1.	26 dB BANDWIDTH	340
8.29.2.	99% BANDWIDTH	342
8.29.3.	OUTPUT AVERAGE POWER AND PSD	344
8.29.4.	TPC POWER	347
8.30.	802.11n HT40 CDD 2TX MODE IN THE 5.3 GHz BAND.....	348
8.30.1.	26 dB BANDWIDTH	348
8.30.2.	99% BANDWIDTH	351
8.30.3.	OUTPUT AVERAGE POWER AND PSD	354
8.30.4.	TPC POWER	358
8.31.	802.11n HT40 BF 2TX MODE IN THE 5.3 GHz BAND.....	359
8.31.1.	OUTPUT AVERAGE POWER.....	359
8.32.	802.11n HT40 STBC 2TX MODE IN THE 5.3 GHz BAND.....	361
8.32.1.	26 dB BANDWIDTH	361
8.32.2.	99% BANDWIDTH	364
8.32.3.	OUTPUT AVERAGE POWER AND PSD	367
8.32.4.	TPC POWER	371
8.33.	802.11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND.....	372
8.33.1.	26 dB BANDWIDTH	372
8.33.2.	99% BANDWIDTH	376
8.33.3.	OUTPUT AVERAGE POWER AND PSD	380
8.33.4.	TPC POWER	385
8.34.	802.11n HT40 BF 3TX MODE IN THE 5.3 GHz BAND.....	386
8.34.1.	OUTPUT AVERAGE POWER.....	386
8.35.	802.11n HT40 STBC 3TX MODE IN THE 5.3 GHz BAND.....	388
8.35.1.	26 dB BANDWIDTH	388
8.35.2.	99% BANDWIDTH	392
8.35.3.	OUTPUT AVERAGE POWER AND PSD	396
8.35.4.	TPC POWER	401
8.36.	802.11ac VHT80 1X MODE IN THE 5.3 GHz BAND	402
8.36.1.	26 dB BANDWIDTH	402
8.36.2.	99% BANDWIDTH	404
8.36.3.	OUTPUT AVERAGE POWER AND PSD	406
8.36.4.	TPC POWER	409
8.37.	802.11ac VHT80 CDD 2TX MODE IN THE 5.3 GHz BAND.....	410
8.37.1.	26 dB BANDWIDTH	410
8.37.2.	99% BANDWIDTH	413
8.37.3.	OUTPUT AVERAGE POWER AND PSD	416
8.37.4.	TPC POWER	420
8.38.	802.11ac VHT80 BF 2TX MODE IN THE 5.3 GHz BAND.....	421

8.38.1.	OUTPUT AVERAGE POWER	421
8.39.	802.11ac VHT80 2TX STBC MODE IN THE 5.3 GHz BAND	423
8.40.	802.11n HT80 CDD 3TX MODE IN THE 5.3 GHz BAND	424
8.40.1.	26 dB BANDWIDTH	424
8.40.2.	99% BANDWIDTH	428
8.40.3.	OUTPUT AVERAGE POWER AND PSD	432
8.40.4.	TPC POWER	437
8.41.	802.11n HT80 BF 3TX MODE IN THE 5.3 GHz BAND	438
8.41.1.	OUTPUT AVERAGE POWER	438
8.42.	802.11ac VHT80 3TX STBC MODE IN THE 5.3 GHz BAND	440
8.43.	802.11a 1TX MODE IN THE 5.6 GHz BAND	441
8.43.1.	26 dB BANDWIDTH	441
8.43.2.	99% BANDWIDTH	444
8.43.3.	OUTPUT AVERAGE POWER AND PSD	447
8.43.4.	TPC POWER	451
8.44.	802.11n HT20 CDD 2TX MODE IN THE 5.6 GHz BAND	452
8.44.1.	26 dB BANDWIDTH	452
8.44.2.	99% BANDWIDTH	456
8.44.3.	OUTPUT AVERAGE POWER AND PSD	460
8.44.4.	TPC POWER	465
8.45.	802.11n HT20 BF 2TX MODE IN THE 5.6 GHz BAND	466
8.45.1.	OUTPUT AVERAGE POWER	466
8.46.	802.11n HT20 STBC 2TX MODE IN THE 5.6 GHz BAND	468
8.46.1.	26 dB BANDWIDTH	468
8.46.2.	99% BANDWIDTH	472
8.46.3.	OUTPUT AVERAGE POWER AND PSD	476
8.46.4.	TPC POWER	484
8.48.	802.11n HT20 CDD 3TX MODE IN THE 5.6 GHz BAND	485
8.48.1.	26 dB BANDWIDTH	485
8.48.2.	99% BANDWIDTH	491
8.48.3.	OUTPUT AVERAGE POWER AND PSD	497
8.48.4.	TPC POWER	504
8.49.	802.11n HT20 BF 3TX MODE IN THE 5.6 GHz BAND	505
8.49.1.	OUTPUT AVERAGE POWER	505
8.50.	802.11n HT20 STBC 3TX MODE IN THE 5.6 GHz BAND	507
8.50.1.	26 dB BANDWIDTH	507
8.50.2.	99% BANDWIDTH	513
8.50.3.	OUTPUT AVERAGE POWER AND PSD	519
8.50.4.	TPC POWER	526
8.51.	802.11a 1TX MODE, CH 144 (5720 MHz), 5.6 GHz BAND	527
8.51.1.	26 dB BANDWIDTH	527
8.51.2.	99% BANDWIDTH	528
8.51.3.	OUTPUT AVERAGE POWER AND PSD	529
8.51.4.	TPC POWER	533
8.52.	802.11n HT20 CDD 2TX MODE, CH 144 (5720 MHz), 5.6 GHz BAND	534
8.52.1.	26 dB BANDWIDTH	534

8.52.2.	99% BANDWIDTH	536
8.52.3.	OUTPUT AVERAGE POWER AND PSD	538
8.52.4.	TPC POWER	543
8.53.	<i>802.11n HT20 STBC 2TX MODE, CH 144 (5720 MHz), 5.6 GHz BAND</i>	<i>544</i>
8.53.1.	26 dB BANDWIDTH	544
8.53.2.	99% BANDWIDTH	546
8.53.3.	OUTPUT AVERAGE POWER AND PSD	548
8.53.4.	TPC POWER	553
8.54.	<i>802.11n HT20 CDD 3TX MODE, CH 144 (5720 MHz), 5.6 GHz BAND</i>	<i>554</i>
8.54.1.	26 dB BANDWIDTH	554
8.54.2.	99% BANDWIDTH	556
8.54.3.	OUTPUT AVERAGE POWER AND PSD	558
8.54.4.	TPC POWER	564
8.55.	<i>802.11n HT20 STBC 3TX MODE, CH 144 (5720 MHz), 5.6 GHz BAND</i>	<i>565</i>
8.55.1.	26 dB BANDWIDTH	565
8.55.2.	99% BANDWIDTH	567
8.55.3.	OUTPUT AVERAGE POWER AND PSD	569
8.55.4.	TPC POWER	575
8.56.	<i>802.11n HT40 1TX MODE IN THE 5.6 GHz BAND</i>	<i>576</i>
8.56.1.	26 dB BANDWIDTH	576
8.56.2.	99% BANDWIDTH	579
8.56.3.	OUTPUT AVERAGE POWER AND PSD	582
8.56.4.	TPC POWER	586
8.57.	<i>802.11n HT40 CDD 2TX MODE IN THE 5.6 GHz BAND</i>	<i>587</i>
8.57.1.	26 dB BANDWIDTH	587
8.57.2.	99% BANDWIDTH	591
8.57.3.	OUTPUT AVERAGE POWER AND PSD	595
8.57.4.	TPC POWER	600
8.58.	<i>802.11n HT40 BF 2TX MODE IN THE 5.6 GHz BAND</i>	<i>601</i>
8.58.1.	OUTPUT AVERAGE POWER	601
8.59.	<i>802.11n HT40 STBC 2TX MODE IN THE 5.6 GHz BAND</i>	<i>603</i>
8.59.1.	26 dB BANDWIDTH	603
8.59.2.	99% BANDWIDTH	607
8.59.3.	OUTPUT AVERAGE POWER AND PSD	611
8.59.4.	TPC POWER	616
8.60.	<i>802.11n HT40 CDD 3TX MODE IN THE 5.6 GHz BAND</i>	<i>617</i>
8.60.1.	26 dB BANDWIDTH	617
8.60.2.	99% BANDWIDTH	623
8.60.3.	OUTPUT AVERAGE POWER AND PSD	629
8.60.4.	TPC POWER	636
8.61.	<i>802.11n HT40 BF 3TX MODE IN THE 5.6 GHz BAND</i>	<i>637</i>
8.61.1.	OUTPUT AVERAGE POWER	637
8.62.	<i>802.11n HT40 STBC 3TX MODE IN THE 5.6 GHz BAND</i>	<i>639</i>
8.62.1.	26 dB BANDWIDTH	639
8.62.2.	99% BANDWIDTH	645
8.62.3.	OUTPUT AVERAGE POWER AND PSD	651
8.62.4.	TPC POWER	658

8.63.	802.11n HT40 1TX MODE, CH 142 (5710 MHz), 5.6 GHz BAND.....	659
8.63.1.	26 dB BANDWIDTH	659
8.63.2.	99% BANDWIDTH	660
8.63.3.	OUTPUT AVERAGE POWER AND PSD	661
8.63.4.	TPC POWER	665
8.64.	802.11n HT40 CDD 2TX MODE, CH 142 (5710 MHz), 5.6 GHz BAND	666
8.64.1.	26 dB BANDWIDTH	666
8.64.2.	99% BANDWIDTH	668
8.64.3.	OUTPUT AVERAGE POWER AND PSD	670
8.64.4.	TPC POWER	675
8.65.	802.11n HT40 BF 2TX MODE, CH142 (5710 MHz), 5.6 GHz BAND	676
8.65.1.	OUTPUT AVERAGE POWER	676
8.66.	802.11n HT40 STBC 2TX MODE, CH142 (5710 MHz), 5.6 GHz BAND	681
8.66.1.	26 dB BANDWIDTH	681
8.66.2.	99% BANDWIDTH	683
8.66.3.	OUTPUT AVERAGE POWER AND PSD	685
8.66.4.	TPC POWER	690
8.67.	802.11n HT40 CDD 3TX MODE, CH142 (5710 MHz), 5.6 GHz BAND	691
8.67.1.	26 dB BANDWIDTH	691
8.67.2.	99% BANDWIDTH	693
8.67.3.	OUTPUT AVERAGE POWER AND PSD	695
8.67.4.	TPC POWER	701
8.68.	802.11n HT40 BF 3TX MODE, CH142 (5710 MHz), 5.6 GHz BAND	702
8.68.1.	OUTPUT AVERAGE POWER	702
8.69.	802.11n HT40 STBC 3TX MODE, CH142 (5710 MHz), 5.6 GHz BAND	708
8.69.1.	26 dB BANDWIDTH	708
8.69.2.	99% BANDWIDTH	710
8.69.3.	OUTPUT AVERAGE POWER AND PSD	712
8.69.4.	TPC POWER	718
8.70.	802.11ac VHT80 1TX MODE IN THE 5.6 GHz BAND	719
8.70.1.	26 dB BANDWIDTH	719
8.70.2.	99% BANDWIDTH	722
8.70.3.	OUTPUT AVERAGE POWER AND PSD	724
8.70.4.	TPC POWER	730
8.71.	802.11ac VHT80 CDD 2TX MODE IN THE 5.6 GHz BAND	731
8.71.1.	26 dB BANDWIDTH	731
8.71.2.	99% BANDWIDTH	734
8.71.3.	OUTPUT AVERAGE POWER AND PSD	737
8.71.4.	TPC POWER	744
8.72.	802.11ac VHT80 BF 2TX MODE IN THE 5.6 GHz BAND	745
8.72.1.	OUTPUT AVERAGE POWER AND PSD	745
8.73.	802.11ac VHT80 2TX STBC MODE IN THE 5.6 GHz BAND	750
8.74.	802.11ac VHT80 3TX STBC MODE IN THE 5.6 GHz BAND	750
8.75.	802.11ac VHT80 CDD 3TX MODE IN THE 5.6 GHz BAND	751
8.75.1.	26 dB BANDWIDTH	751
8.75.2.	99% BANDWIDTH	755

8.75.3.	OUTPUT AVERAGE POWER AND PSD	759
8.75.4.	TPC POWER	768
8.76.	802.11ac VHT80 BF 3TX MODE IN THE 5.6 GHz BAND.....	769
8.76.1.	OUTPUT AVERAGE POWER AND PSD	769
9.	RADIATED TEST RESULTS.....	777
9.1.	LIMITS AND PROCEDURE	777
9.2.	TRANSMITTER ABOVE 1 GHz.....	778
9.2.1.	TX ABOVE 1 GHz, 802.11a 1TX MODE, 5.2 GHz BAND	778
9.2.2.	TX ABOVE 1 GHz, 802.11n HT20 CDD 2TX MODE, 5.2 GHz BAND	782
9.2.3.	TX ABOVE 1 GHz 802.11n HT20 CDD 3TX MODE, 5.2 GHz BAND	786
9.2.4.	TX ABOVE 1 GHz, 802.11n HT40 1TX MODE, 5.2 GHz BAND.....	790
9.2.5.	TX ABOVE 1 GHz, 802.11n HT40 CDD 2TX MODE, 5.2 GHz BAND	794
9.2.6.	TX ABOVE 1 GHz, 802.11n HT40 CDD 3TX MODE, 5.2 GHz BAND	797
9.2.7.	TX ABOVE 1 GHz, 802.11ac VHT80 1TX MODE, 5.2 GHz BAND.....	801
9.2.8.	TX ABOVE 1 GHz, 802.11ac VHT80 2TX MODE, 5.2 GHz BAND.....	805
9.2.9.	TX ABOVE 1 GHz, 802.11ac VHT80 3TX, 5.2 GHz BAND	809
9.2.10.	TX ABOVE 1 GHz, 802.11n HT20 BF 3TX MODE, 5.2 GHz BAND.....	813
9.2.11.	TX ABOVE 1 GHz, 802.11n HT40 BF 3TX MODE, 5.2 GHz BAND.....	816
9.2.12.	TX ABOVE 1 GHz, 802.11ac VHT80 BF 2TX MODE, 5.2 GHz BAND.....	819
9.2.13.	TX ABOVE 1 GHz, 802.11ac VHT80 BF 3TX MODE, 5.2 GHz BAND.....	823
9.2.14.	TX ABOVE 1 GHz, 802.11a 1TX MODE, 5.3 GHz BAND.....	827
9.2.15.	TX ABOVE 1 GHz, 802.11n HT20 CDD 2TX MODE, 5.3 GHz BAND.....	830
9.2.16.	TX ABOVE 1 GHz, 802.11n HT20 CDD 3TX MODE, 5.3 GHz BAND.....	834
9.2.17.	TX ABOVE 1 GHz, 802.11n HT40 1TX MODE, 5.3 GHz BAND	838
9.2.18.	TX ABOVE 1 GHz, 802.11n HT40 CDD 2TX MODE, 5.3 GHz BAND.....	841
9.2.19.	TX ABOVE 1 GHz, 802.11n HT40 CDD 3TX MODE, 5.3 GHz BAND.....	845
9.2.20.	TX ABOVE 1 GHz, 802.11ac VHT80 1TX MODE, 5.3 GHz BAND	848
9.2.21.	TX ABOVE 1 GHz, 802.11ac VHT80 2TX MODE, 5.3 GHz BAND	851
9.2.22.	TX ABOVE 1 GHz, 802.11ac VHT80 3TX MODE, 5.3 GHz BAND	855
9.2.23.	TX ABOVE 1 GHz, 802.11n HT20 BF 3TX MODE, 5.3 GHz BAND.....	858
9.2.24.	TX ABOVE 1 GHz, 802.11n HT40 BF 3TX MODE, 5.3 GHz BAND.....	861
9.2.25.	TX ABOVE 1 GHz, 802.11n HT80 BF 2TX MODE, 5.3 GHz BAND.....	864
9.2.26.	TX ABOVE 1 GHz, 802.11n HT80 BF 3TX MODE, 5.3 GHz BAND.....	867
9.2.27.	TX ABOVE 1 GHz, 802.11a 1TX MODE, 5.6 GHz BAND.....	870
9.2.28.	TX ABOVE 1 GHz, 802.11n HT20 CDD 2TX MODE, 5.6 GHz BAND.....	877
9.2.29.	TX ABOVE 1 GHz, 802.11n HT20 CDD 3TX MODE, 5.6 GHz BAND.....	884
9.2.30.	TX ABOVE 1 GHz, 802.11n HT20 BF 2TX MODE, 5.6 GHz BAND.....	891
9.2.31.	TX ABOVE 1 GHz, 802.11n HT20 BF 3TX MODE, 5.6 GHz BAND.....	897
9.2.32.	TX ABOVE 1 GHz, 802.11n HT40 1TX MODE, 5.6 GHz BAND	901
9.2.33.	TX ABOVE 1 GHz, 802.11n HT40 CDD 2TX MODE, 5.6 GHz BAND.....	907
9.2.34.	TX ABOVE 1 GHz, 802.11n HT40 CDD 3TX MODE, 5.6 GHz BAND.....	914
9.2.35.	TX ABOVE 1 GHz, 802.11n HT40 BF 2TX MODE, GHz BAND.....	921
9.2.36.	TX ABOVE 1 GHz, 802.11n HT40 BF 3TX MODE, 5.6 GHz BAND.....	925
9.2.37.	TX ABOVE 1 GHz, 802.11ac VHT80 1TX MODE, 5.6 GHz BAND	929
9.2.38.	TX ABOVE 1 GHz, 802.11ac VHT80 2TX MODE, 5.6 GHz BAND	932
9.2.39.	TX ABOVE 1 GHz, 802.11ac VHT80 3TX MODE, 5.6 GHz BAND	935
9.2.40.	TX ABOVE 1 GHz, 802.11ac VHT80 BF 2TX MODE, 5.6 GHz BAND.....	938
9.2.41.	TX ABOVE 1 GHz, 802.11ac VHT80 BF 3TX MODE, 5.6 GHz BAND.....	942
9.3.	RADIATED EMISSIONS, WORST-CASE BELOW 1 GHz	945

10. AC POWER LINE CONDUCTED EMISSIONS	948
11. DYNAMIC FREQUENCY SELECTION.....	952
11.1. OVERVIEW.....	952
11.1.1. LIMITS	952
11.1.2. TEST AND MEASUREMENT SYSTEM	955
11.1.3. SETUP OF EUT	958
11.1.4. DESCRIPTION OF EUT.....	959
11.2. RESULTS FOR 20 MHz BANDWIDTH.....	960
11.2.1. TEST CHANNEL	960
11.2.2. RADAR WAVEFORMS AND TRAFFIC	960
11.2.3. CHANNEL AVAILABILITY CHECK TIME	967
11.2.4. OVERLAPPING CHANNEL TESTS	972
11.2.5. MOVE AND CLOSING TIME.....	972
11.2.6. DETECTION BANDWIDTH	979
11.2.7. IN-SERVICE MONITORING.....	981
11.1. RESULTS FOR 40 MHz BANDWIDTH.....	988
11.1.1. TEST CHANNEL	988
11.1.2. RADAR WAVEFORMS AND TRAFFIC	988
11.1.3. CHANNEL AVAILABILITY CHECK TIME	995
11.1.4. OVERLAPPING CHANNEL TESTS	1000
11.1.5. MOVE AND CLOSING TIME.....	1000
11.1.6. NON-OCCUPANCY PERIOD.....	1007
11.1.7. DETECTION BANDWIDTH	1008
11.1.1. IN-SERVICE MONITORING.....	1010
11.2. RESULTS FOR 80 MHz BANDWIDTH.....	1017
11.2.1. TEST CHANNEL	1017
11.2.2. RADAR WAVEFORMS AND TRAFFIC	1017
11.2.3. CHANNEL AVAILABILITY CHECK TIME	1024
11.2.4. OVERLAPPING CHANNEL TESTS	1029
11.2.5. MOVE AND CLOSING TIME.....	1029
11.2.6. NON-OCCUPANCY PERIOD.....	1035
11.2.7. DETECTION BANDWIDTH	1036
11.2.8. IN-SERVICE MONITORING.....	1039
13. SETUP PHOTOS.....	1047
13.1. ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP	1047
13.2. RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION	1048
13.3. POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP	1051
13.4. DYNAMIC FREQUENCY SELECTION MEASUREMENT SETUP	1052

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 INIFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: 3x3 MIMO BASE STATION

MODEL: A1470

SERIAL NUMBER: C86K500PFGCP and C86K5029FGCP (RF);
C86K5013FGCP and C86K501CFGCP (DFS)

DATE TESTED: DECEMBER 10, 2012 to MARCH 22, 2013 and
APRIL 04 to 25, 2013

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:



FRANK IBRAHIM
WISE PROGRAM MANAGER
UL CCS

Tested By:



TOM CHEN
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.10-2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 3x3 802.11a/g/n/ac MIMO base station. The EUT also supports Transmit beam forming on 11n and 11ac modes.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5150-5250 MHz Authorized Frequency Band						
Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
5180-5240	802.11a Legacy 1TX	N/A	14.1	N/A	14.10	25.70
5180-5240	802.11n HT20 CDD 2TX	10.26	10.00	N/A	13.14	20.61
5180-5240	802.11n HT20 BF 2TX	10.26	10.00	N/A	13.14	20.61
5180-5240	802.11n HT20 STBC 2TX	11.20	11.10	N/A	14.16	26.06
5180-5240	802.11n HT20 CDD 3TX	7.15	7.31	7.66	12.15	16.41
5180-5240	802.11n HT20 BF 3TX	7.15	7.31	7.66	12.15	16.41
5180-5240	802.11n HT20 STBC 3TX	9.40	9.10	8.96	13.93	24.72
5190-5230	802.11n HT40 1TX	N/A	16.5	N/A	16.50	44.67
5190-5230	802.11n HT40 CDD 2TX	12.70	12.80	N/A	15.76	37.67
5190-5230	802.11n HT40 BF 2TX	12.70	12.80	N/A	15.76	37.67
5190-5230	802.11n HT40 STBC 2TX	13.70	13.80	N/A	16.76	47.42
5190-5230	802.11n HT40 CDD 3TX	9.80	9.50	9.60	14.41	27.61
5190-5230	802.11n HT40 BF 3TX	9.80	9.50	9.60	14.41	27.61
5190-5230	802.11n HT40 STBC 3TX	11.73	11.55	11.50	16.37	43.35
5210	802.11ac VHT80 1TX	N/A	13.00	N/A	13.00	19.95
5210	802.11ac VHT80 CDD 2TX	12.50	12.60	N/A	15.56	35.97
5210	802.11ac VHT80 BF 2TX	12.50	12.60	N/A	15.56	35.97
5210	802.11ac VHT80 STBC 2TX	12.70	12.40	N/A	15.56	35.97
5210	802.11ac VHT80 CDD 3TX	11.90	12.10	11.95	16.76	47.42
5210	802.11ac VHT80 BF 3TX	10.00	10.30	10.10	14.91	30.97
5210	802.11ac VHT80 STBC 3TX	11.90	11.98	12.10	16.77	47.53

Note:

802.11n HT20 BF 3TX was tested for BE and Harmonics, and this covers 802.11n HT20 BF 2TX, 802.11n AC20 BF 2TX, and 802.11n AC20 BF 3TX.

802.11ac VHT20 SISO is leveraged from HT20 SISO.
802.11ac VHT20 2TX CDD is leveraged from HT20 2TX CDD.
802.11ac VHT20 2TX STBC is leveraged from HT20 2TX STBC.
802.11ac VHT20 3TX CDD is leveraged from HT20 3TX CDD.
802.11ac VHT20 3TX STBC is leveraged from HT20 3TX STBC.

802.11ac VHT40 SISO is leveraged from HT40 SISO.
802.11ac VHT40 2TX CDD is leveraged from HT40 2TX CDD.
802.11ac VHT40 2TX STBC is leveraged from HT40 2TX STBC.
802.11ac VHT40 3TX CDD is leveraged from HT40 3TX CDD.
802.11ac VHT40 3TX STBC is leveraged from HT40 3TX STBC.

5250-5325 MHz Authorized Frequency Band						
Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
5260-5320	802.11a Legacy 1TX	N/A	20.5	N/A	20.50	112.20
5260-5320	802.11n HT20 CDD 2TX	16.50	16.60	N/A	19.56	90.36
5260-5320	802.11n HT20 BF 2TX	16.50	16.60	N/A	19.56	90.36
5260-5320	802.11n HT20 STBC 2TX	18.10	18.00	N/A	21.06	127.64
5260-5320	802.11n HT20 CDD 3TX	13.60	13.80	13.50	18.41	69.34
5260-5320	802.11n HT20 BF 3TX	13.60	13.80	13.50	18.41	69.34
5260-5320	802.11n HT20 STBC 3TX	16.10	16.30	16.20	20.97	125.03
5270-5310	802.11n HT40 1TX	N/A	17.5	N/A	17.50	56.23
5270-5310	802.11n HT40 CDD 2TX	17.30	17.30	N/A	20.31	107.40
5270-5310	802.11n HT40 BF 2TX	17.30	17.30	N/A	20.31	107.40
5270-5310	802.11n HT40 STBC 2TX	17.30	17.20	N/A	20.26	106.17
5270-5310	802.11n HT40 CDD 3TX	16.00	16.30	16.10	20.91	123.31
5270-5310	802.11n HT40 BF 3TX	16.00	16.30	16.10	20.91	123.31
5270-5310	802.11n HT40 STBC 3TX	16.00	16.30	16.10	20.91	123.31
5290	802.11ac VHT80 1TX	N/A	13.50	N/A	13.50	22.39
5290	802.11ac VHT80 CDD 2TX	13.10	13.00	N/A	16.06	40.36
5290	802.11ac VHT80 BF 2TX	13.10	13.00	N/A	16.06	40.36
5290	802.11ac VHT80 STBC 2TX	13.10	13.00	N/A	16.06	40.36
5290	802.11ac VHT80 CDD 3TX	12.12	12.00	12.00	16.81	47.97
5290	802.11ac VHT80 BF 3TX	12.12	12.00	12.00	16.81	47.97
5290	802.11ac VHT80 STBC 3TX	12.12	12.00	12.00	16.81	47.97

Note:

802.11n HT20 BF 3TX was tested for BE and Harmonics, and this covers 802.11n HT20 BF 2TX, 802.11n AC20 BF 2TX, and 802.11n AC20 BF 3TX

802.11ac VHT20 SISO is leveraged from HT20 SISO.
802.11ac VHT20 2TX CDD is leveraged from HT20 2TX CDD.
802.11ac VHT20 2TX STBC is leveraged from HT20 2TX STBC.
802.11ac VHT20 3TX CDD is leveraged from HT20 3TX CDD.
802.11ac VHT20 3TX STBC is leveraged from HT20 3TX STBC.

802.11ac VHT40 SISO is leveraged from HT40 SISO.
802.11ac VHT40 2TX CDD is leveraged from HT40 2TX CDD.
802.11ac VHT40 2TX STBC is leveraged from HT40 2TX STBC.
802.11ac VHT40 3TX CDD is leveraged from HT40 3TX CDD.
802.11ac VHT40 3TX STBC is leveraged from HT40 3TX STBC.

5500-5700 MHz Authorized Frequency Band						
Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
5500-5700	802.11a Legacy 1TX	N/A	20.50	N/A	20.50	112.20
5500-5700	802.11n HT20 CDD 2TX	16.70	16.60	N/A	19.66	92.47
5500-5700	802.11n HT20 BF 2TX	16.70	16.60	N/A	19.66	92.47
5500-5700	802.11n HT20 STBC 2TX	18.20	18.10	N/A	21.16	130.62
5500-5700	802.11n HT20 CDD 3TX	13.50	13.75	13.60	18.39	69.02
5500-5700	802.11n HT20 BF 3TX	13.50	13.75	13.60	18.39	69.02
5500-5700	802.11n HT20 STBC 3TX	16.00	16.30	16.20	20.94	124.17
5510-5670	802.11n HT40 1TX	N/A	19.50	N/A	19.50	89.13
5510-5670	802.11n HT40 CDD 2TX	18.20	18.10	N/A	21.16	130.62
5510-5670	802.11n HT40 BF 2TX	18.20	18.10	N/A	21.16	130.62
5510-5670	802.11n HT40 STBC 2TX	18.10	18.00	N/A	21.06	127.64
5510-5670	802.11n HT40 CDD 3TX	16.00	16.25	16.10	20.89	122.74
5510-5670	802.11n HT40 BF 3TX	16.00	16.25	16.10	20.89	122.74
5510-5670	802.11n HT40 STBC 3TX	16.00	16.30	16.10	20.91	123.31
5530	802.11ac VHT80 1TX	N/A	13.00	N/A	13.00	19.95
5530	802.11ac VHT80 CDD 2TX	12.59	12.79	N/A	15.61	36.39
5530	802.11ac VHT80 BF 2TX	12.59	12.79	N/A	15.61	36.39
5530	802.11ac VHT80 STBC 2TX	12.59	12.79	N/A	15.61	36.39
5530	802.11ac VHT80 STBC 3TX	12.09	12.29	12.19	16.87	48.64
5530	802.11ac VHT80 CDD 3TX	12.09	12.29	12.19	16.87	48.64
5530	802.11ac VHT80BF 3TX	12.09	12.29	12.19	16.87	48.64

Note:

"802.11n HT20 BF 3TX was tested for Harmonics, and this covers 802.11n HT20 BF 2TX, 802.11n AC20 BF 2TX, and 802.11n AC20 BF 3TX".

"802.11n HT20 BF 3TX was tested for BE, and this covers 802.11n AC20 BF 3TX".

"802.11n HT20 BF 3TX was tested for BE, and this covers 802.11n AC20 BF 2TX".

802.11ac VHT20 SISO is leveraged from HT20 SISO.
802.11ac VHT20 2TX CDD is leveraged from HT20 2TX CDD.
802.11ac VHT20 2TX STBC is leveraged from HT20 2TX STBC.
802.11ac VHT20 3TX CDD is leveraged from HT20 3TX CDD.
802.11ac VHT20 3TX STBC is leveraged from HT20 3TX STBC.

802.11ac VHT40 SISO is leveraged from HT40 SISO.
802.11ac VHT40 2TX CDD is leveraged from HT40 2TX CDD.
802.11ac VHT40 2TX STBC is leveraged from HT40 2TX STBC.
802.11ac VHT40 3TX CDD is leveraged from HT40 3TX CDD.
802.11ac VHT40 3TX STBC is leveraged from HT40 3TX STBC.

Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
5.6 GHz band, 1TX (Channels overlapping UNII and DTS bands)						
5720 (UNII portion)	802.11a 1TX	N/A	20.29	N/A	20.29	106.91
5720 (DTS portion)	802.11a 1TX	N/A	14.58	N/A	14.58	28.71
5720 (Whole signal)	802.11a 1TX	N/A	21.32	N/A	21.32	135.61
5710 (UNII portion)	802.11n HT40 1TX	N/A	23.12	N/A	23.12	205.12
5710 (DTS portion)	802.11n HT40 1TX	N/A	12.56	N/A	12.56	18.03
5710 (Whole signal)	802.11n HT40 1TX	N/A	23.49	N/A	23.49	223.15
5690 (UNII portion)	802.11ac VHT80 1TX	N/A	23.87	N/A	23.87	243.78
5690 (DTS portion)	802.11ac VHT80 1TX	N/A	8.48	N/A	8.48	7.05
5690 (Whole signal)	802.11ac VHT80 1TX	N/A	23.99	N/A	23.99	250.83
5.6 GHz band, 2TX (Channels overlapping UNII and DTS bands)						
5720 (UNII portion)	802.11n HT20 CDD 2TX	16.15	16.23	N/A	19.20	83.19
5720 (DTS portion)	802.11n HT20 CDD 2TX	10.26	10.30	N/A	13.29	21.33
5720 (Whole signal)	802.11n HT20 CDD 2TX	17.15	17.22	N/A	20.19	104.52
5720 (UNII portion)	802.11n HT20 STBC 2TX	18.09	18.27	N/A	21.19	131.56
5720 (DTS portion)	802.11n HT20 STBC 2TX	10.96	11.12	N/A	14.05	25.42
5720 (Whole signal)	802.11n HT20 STBC 2TX	18.86	19.04	N/A	21.96	156.98
5710 (UNII portion)	802.11n HT40 CDD 2TX	19.35	19.15	N/A	22.26	168.32
5710 (DTS portion)	802.11n HT40 CDD 2TX	8.46	9.40	N/A	11.97	15.72
5710 (Whole signal)	802.11n HT40 CDD 2TX	19.69	19.59	N/A	22.65	184.05
5710 (UNII portion)	802.11n HT40 BF 2TX	19.35	19.15	N/A	22.26	168.32
5710 (DTS portion)	802.11n HT40 BF 2TX	8.46	9.40	N/A	11.97	15.72
5710 (Whole signal)	802.11n HT40 BF 2TX	19.69	19.59	N/A	22.65	184.05
5710 (UNII portion)	802.11n HT40 STBC 2TX	20.36	20.68	N/A	23.53	225.59
5710 (DTS portion)	802.11n HT40 STBC 2TX	9.64	10.41	N/A	13.05	20.19
5710 (Whole signal)	802.11n HT40 STBC 2TX	20.71	21.07	N/A	23.91	245.79
5690 (UNII portion)	802.11ac VHT80 CDD 2TX	20.91	20.60	N/A	23.77	238.13
5690 (DTS portion)	802.11ac VHT80 CDD 2TX	3.79	6.02	N/A	8.06	6.39
5690 (Whole signal)	802.11ac VHT80 CDD 2TX	20.99	20.75	N/A	23.88	244.52
5690 (UNII portion)	802.11ac VHT80 BF 2TX	19.44	19.47	N/A	22.47	176.41
5690 (DTS portion)	802.11ac VHT80 BF 2TX	5.91	6.00	N/A	8.97	7.88
5690 (Whole signal)	802.11ac VHT80 BF 2TX	19.63	19.66	N/A	22.66	184.29
5690 (UNII portion)	802.11ac VHT80 STBC 2TX	20.91	20.60	N/A	23.77	238.13
5690 (DTS portion)	802.11ac VHT80 STBC 2TX	3.79	6.02	N/A	8.06	6.39
5690 (Whole signal)	802.11ac VHT80 STBC 2TX	20.99	20.75	N/A	23.88	244.52
5.6 GHz band, 3TX (Channels overlapping UNII and DTS bands)						
5720 (UNII portion)	802.11n HT20 CDD 3TX	13.86	13.74	13.54	18.49	70.58
5720 (DTS portion)	802.11n HT20 CDD 3TX	7.86	7.71	7.95	12.61	18.25
5720 (Whole signal)	802.11n HT20 CDD 3TX	14.83	14.71	14.60	19.49	88.82
5720 (UNII portion)	802.11n HT20 STBC 3TX	16.57	15.95	16.30	21.05	127.41
5720 (DTS portion)	802.11n HT20 STBC 3TX	9.45	8.85	9.14	13.92	24.69
5720 (Whole signal)	802.11n HT20 STBC 3TX	17.34	16.72	17.06	21.82	152.09
5710 (UNII portion)	802.11n HT40 CDD 3TX	15.82	16.63	15.92	20.91	123.30
5710 (DTS portion)	802.11n HT40 CDD 3TX	5.86	5.89	6.25	10.77	11.95
5710 (Whole signal)	802.11n HT40 CDD 3TX	16.24	16.98	16.36	21.31	135.26
5710 (UNII portion)	802.11n HT40 BF 3TX	15.82	16.63	15.92	20.91	123.30
5710 (DTS portion)	802.11n HT40 BF 3TX	5.86	5.89	6.25	10.77	11.95
5710 (Whole signal)	802.11n HT40 BF 3TX	16.24	16.98	16.36	21.31	135.26
5710 (UNII portion)	802.11n HT40 STBC 3TX	18.66	18.66	18.56	23.40	218.68
5710 (DTS portion)	802.11n HT40 STBC 3TX	8.50	7.94	8.33	13.03	20.11
5710 (Whole signal)	802.11n HT40 STBC 3TX	19.06	19.01	18.95	23.78	238.79
5690 (UNII portion)	802.11ac VHT80 CDD 3TX	18.58	18.72	18.73	23.45	221.23
5690 (DTS portion)	802.11ac VHT80 CDD 3TX	4.85	4.04	4.31	9.18	8.29
5690 (Whole signal)	802.11ac VHT80 CDD 3TX	18.76	18.87	18.88	23.61	229.52
5690 (UNII portion)	802.11ac VHT80 BF 3TX	16.47	16.30	16.22	21.10	128.90
5690 (DTS portion)	802.11ac VHT80 BF 3TX	4.85	4.04	4.31	9.18	8.29
5690 (Whole signal)	802.11ac VHT80 BF 3TX	16.76	16.55	16.49	21.37	137.19
5690 (UNII portion)	802.11ac VHT80 STBC 3TX	18.58	18.72	18.73	23.45	221.23
5690 (DTS portion)	802.11ac VHT80 STBC 3TX	4.85	4.04	4.31	9.18	8.29
5690 (Whole signal)	802.11ac VHT80 STBC 3TX	18.76	18.87	18.88	23.61	229.52

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Band (GHz)	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.4	3.00	3.00	3.10	3.03
5.2	3.20	1.40	2.20	2.33
5.3	3.40	1.60	2.30	2.50
5.6	3.00	1.70	3.80	2.92
5.8	2.70	1.90	4.40	3.13

Band (GHz)	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	3.00	3.00	3.10	7.80
5.2	3.20	1.40	2.20	7.07
5.3	3.40	1.60	2.30	7.24
5.6	3.00	1.70	3.80	7.65
5.8	2.70	1.90	4.40	7.83

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 6.10.56.166.

5.5. WORST-CASE CONFIGURATION AND MODE

The fundamental emission of the EUT was investigated in three orthogonal orientations; X,Y and Z. It was determined that Y orientation is worst-case; therefore, all final radiated emissions testing was performed with the EUT in Y orientation

The EUT was a 3x3 MIMO Base Station connected to a host Laptop PC.

Worst-Case data rates, as provided by the client, were as follows:

For 5 GHz Bands:

802.11a: 6 Mb/s.

802.11n 20MHz, CDD and STBC: MCS0.

802.11n 40MHz, CDD and STBC: MCS0.

802.11n 80MHz, CDD and STBC: MCS0.

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

For the modes where a second LOW channel and a second HIGH channel were tested for output power, all other test items at the second LOW and second HIGH channels were performed with the higher power level between LOW and second LOW channels, and between HIGH and second HIGH channels, as worst-case scenario.

For all modes with single chain, chain 1 was selected per the software provided by the client. Based on the client a preliminary investigation was performed on the three chains and chain 1 was found to be worst-case.

Peak Excursion testing was performed for each modulation in the 5.2 GHz band to show compliance with the applicable limits.

Nss (number of spatial streams) used for all the testing on 2Tx & 3Tx modes was 1 as worst-case scenario.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop PC	Apple	MacBook M42A	PT358811	DoC
Direct Plug-In AC-DC Adapter	Apple	PA-1850	N/A	N/A
Mouse	HP	MOE2UO	CNP10300BB	DoC

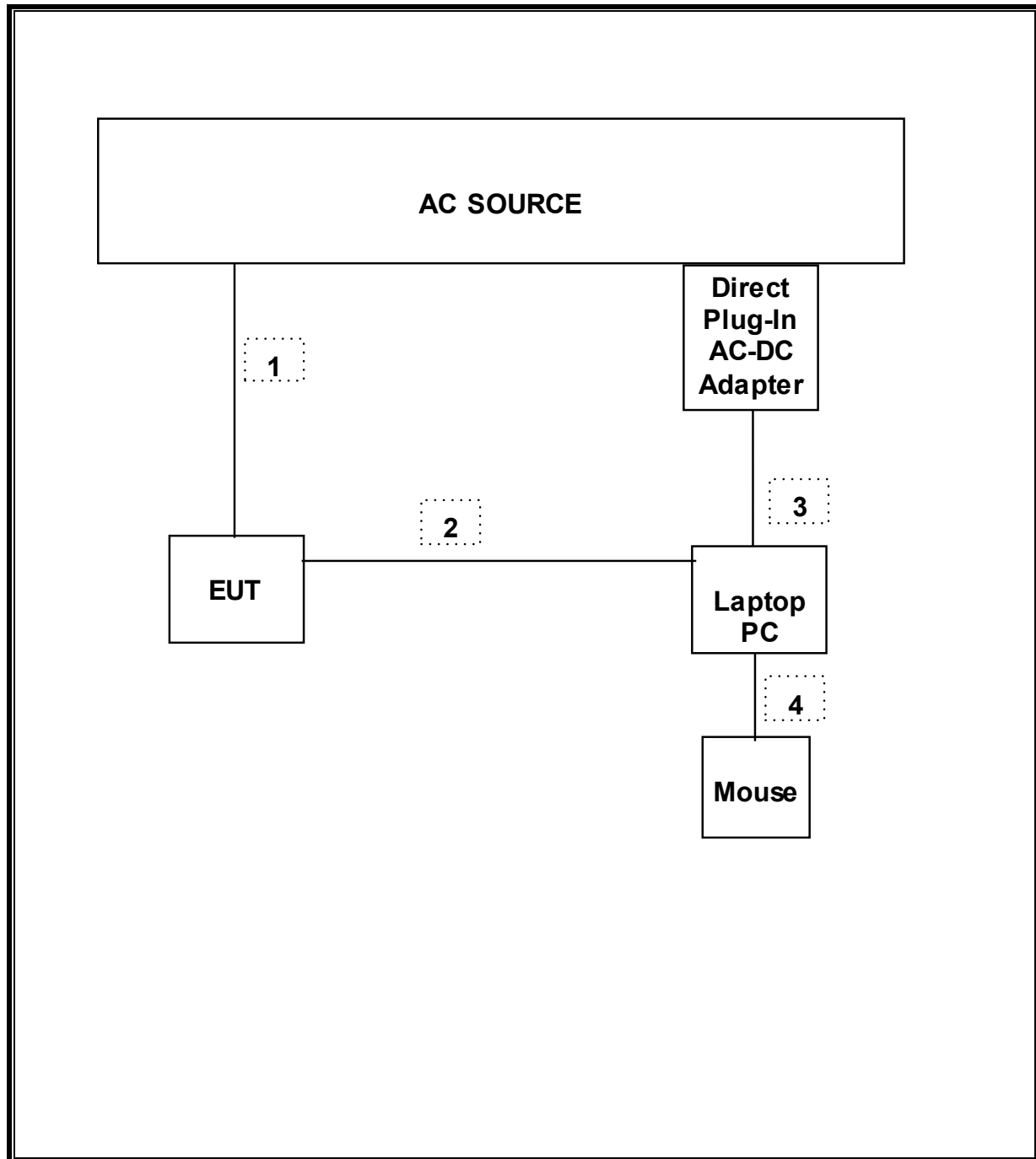
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	2P	Non-shielded	1.8	
2	Ethernet	1	Ethernet	Non-shielded	3	
3	DC	1	DC	Non-shielded	1.75	
4	USB	1	USB	Non-shielded	0.6	

TEST SETUP

The EUT is powered by AC source only during test. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/12	02/26/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/08/12	08/08/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	N/A	08/21/12	08/21/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	11/12/12	11/12/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/11	06/14/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	N/A	02/07/12	03/06/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/12	10/19/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/20/11	12/30/13
P-Series single channel Power Meter	Agilent / HP	N1911A	N/A	07/27/12	07/27/13
Peak / Average Power Sensor	Agilent / HP	E9323A	N/A	07/26/12	07/26/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	01/13/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a 20 MHz	2.055	2.090	0.983	98.3%	0.00	0.010
802.11n HT20 CDD	1.915	1.940	0.987	98.7%	0.00	0.010
802.11n HT20 STBC	1.925	1.945	0.990	99.0%	0.00	0.010
802.11n HT40 SISO	0.9424	0.9601	0.982	98.2%	0.00	0.010
802.11n HT40 CDD	0.9449	0.9627	0.982	98.2%	0.00	0.010
802.11n HT40 STBC	0.9520	0.9707	0.981	98.1%	0.00	0.010
802.11ac VHT80 SISO	0.6000	0.6133	0.978	97.8%	0.10	1.667
802.11ac VHT80 CDD	0.5953	0.6080	0.979	97.9%	0.09	1.680
802.11ac VHT80 STBC	0.5979	0.6105	0.979	97.9%	0.09	1.673

7.2. MEASUREMENT METHOD FOR POWER AND PPSD

For output power measurement, KDB 789033 Method PM as described in section C) f) was used.

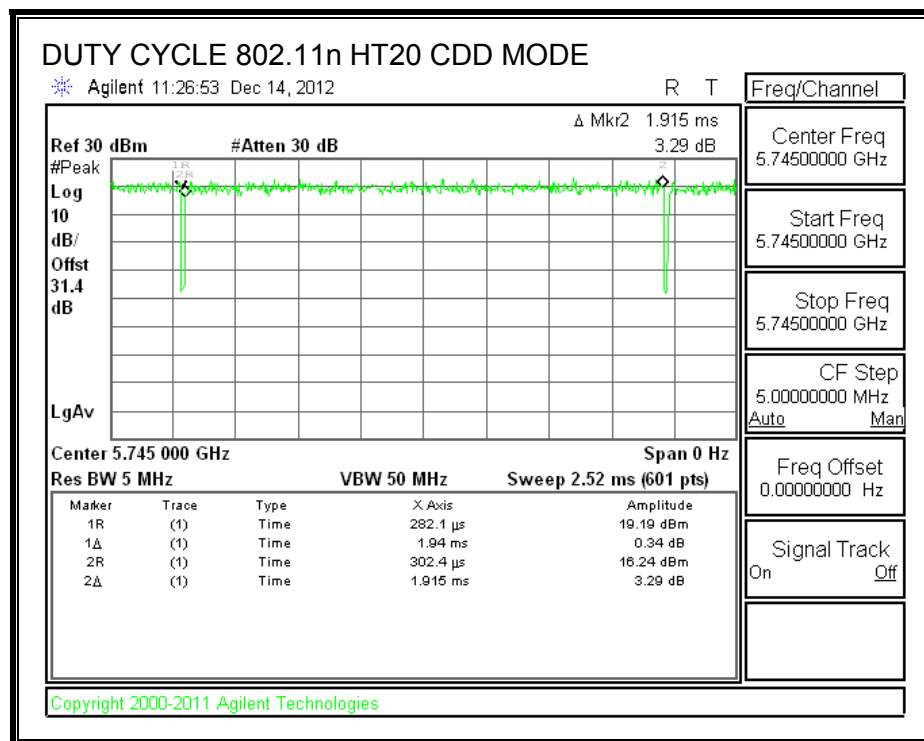
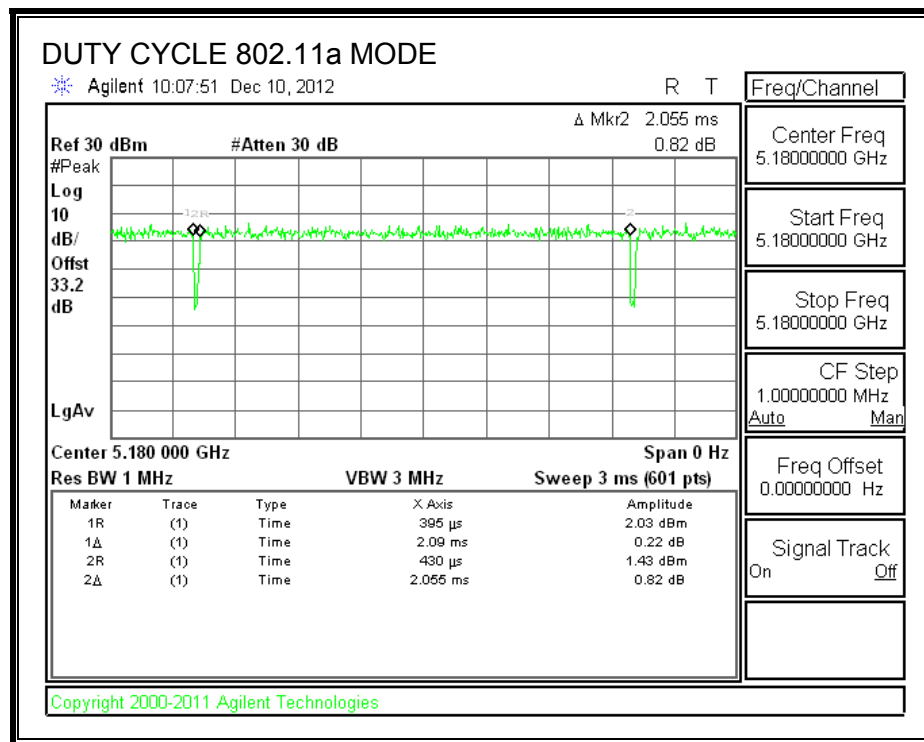
For PSD measurement, KDB 789033 Method SA-1 was used when Duty Cycle is greater than or equal to 98%.

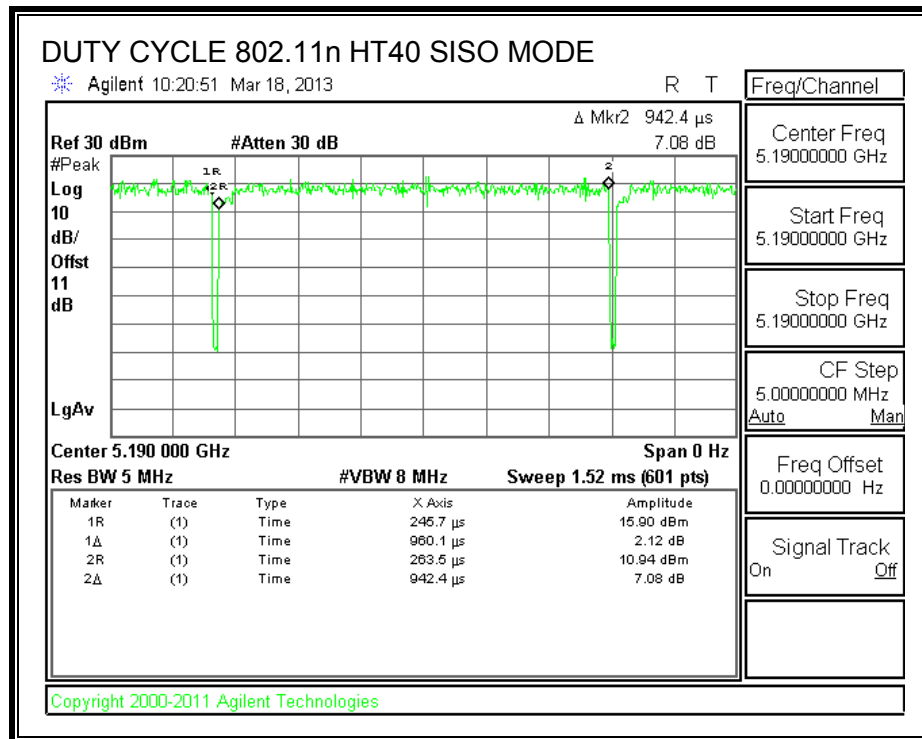
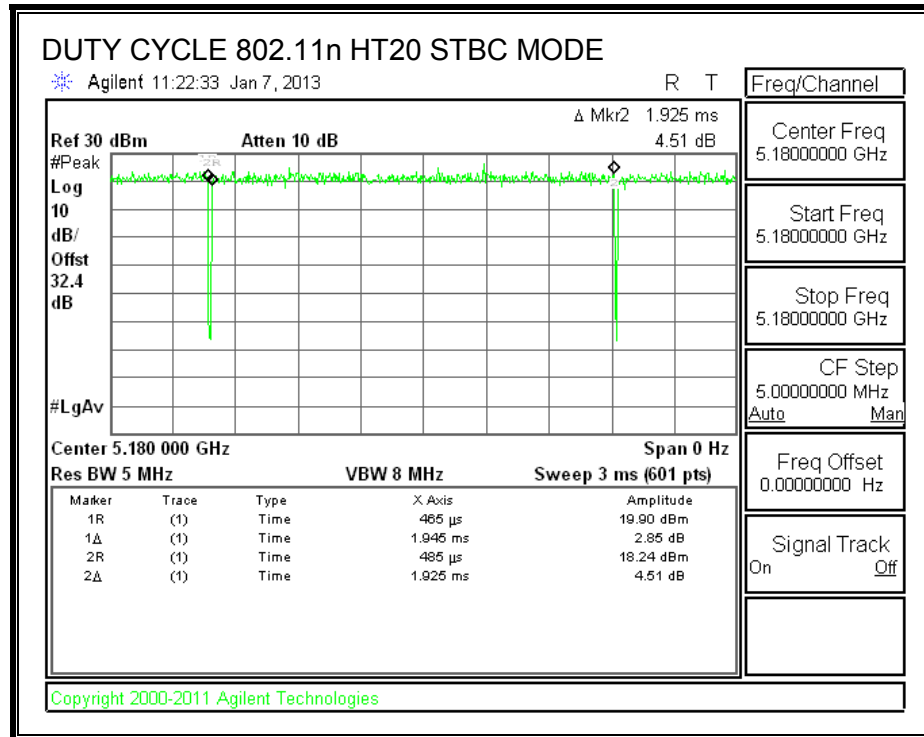
For PSD measurement, KDB 789033 Method SA-2 was used when Duty Cycle is less than 98%.

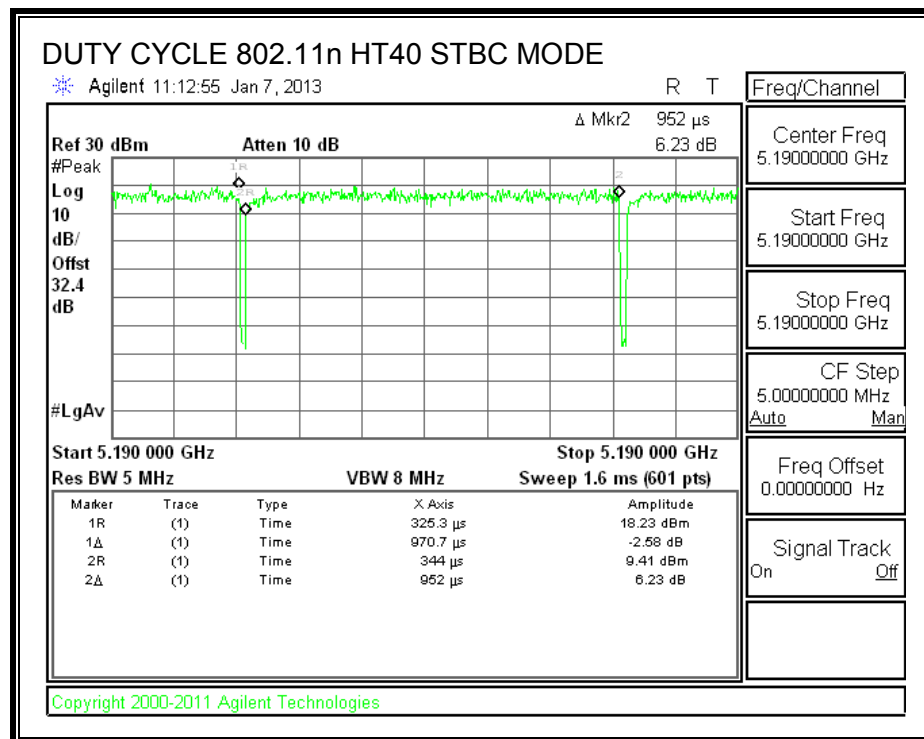
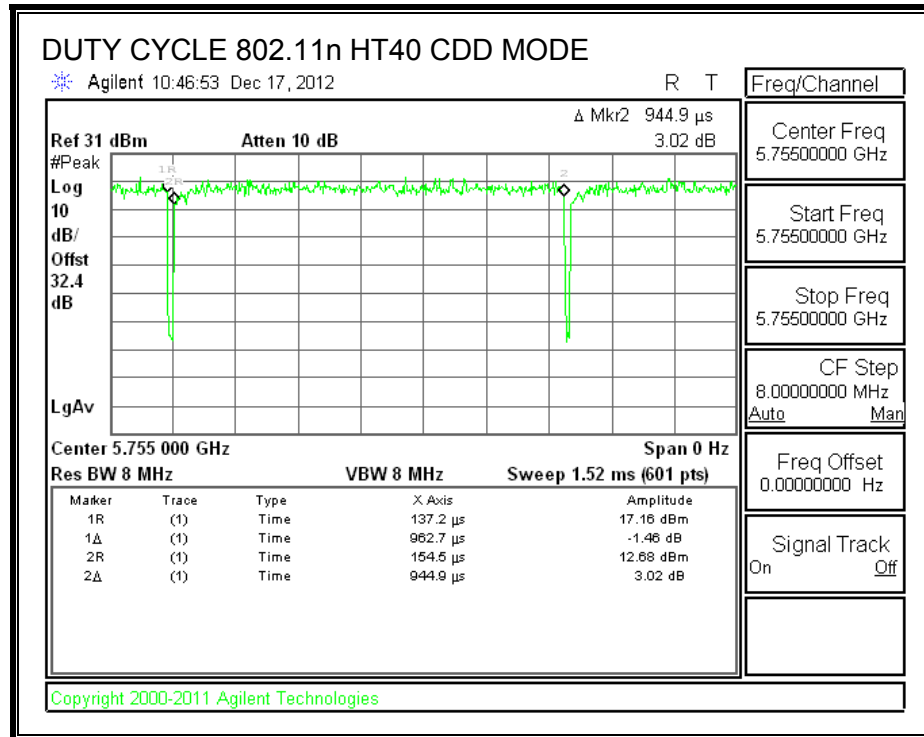
7.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSION ABOVE 1 GHz

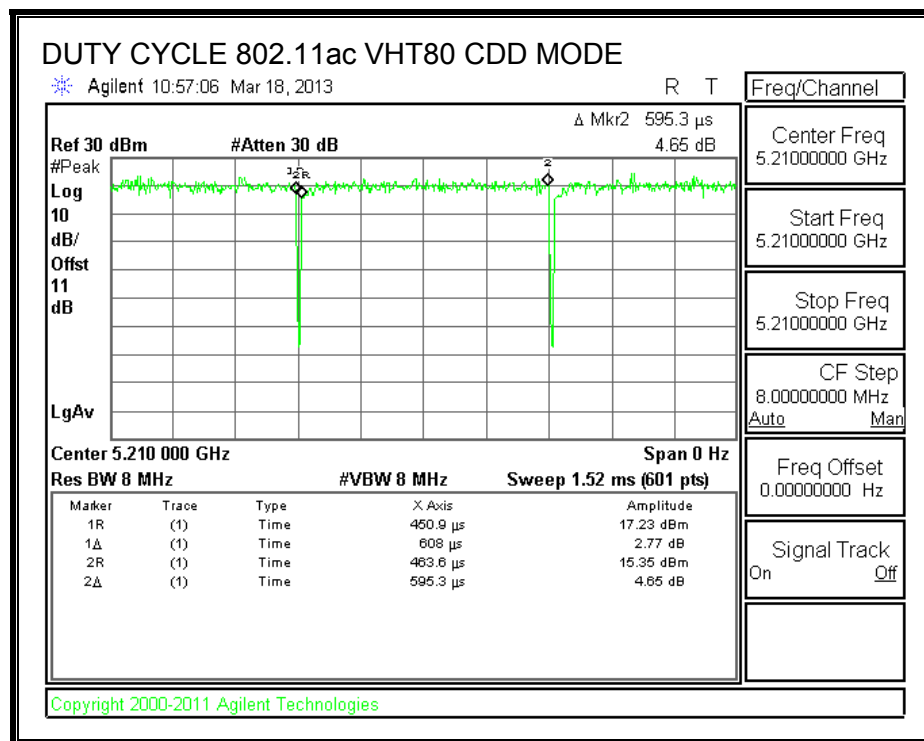
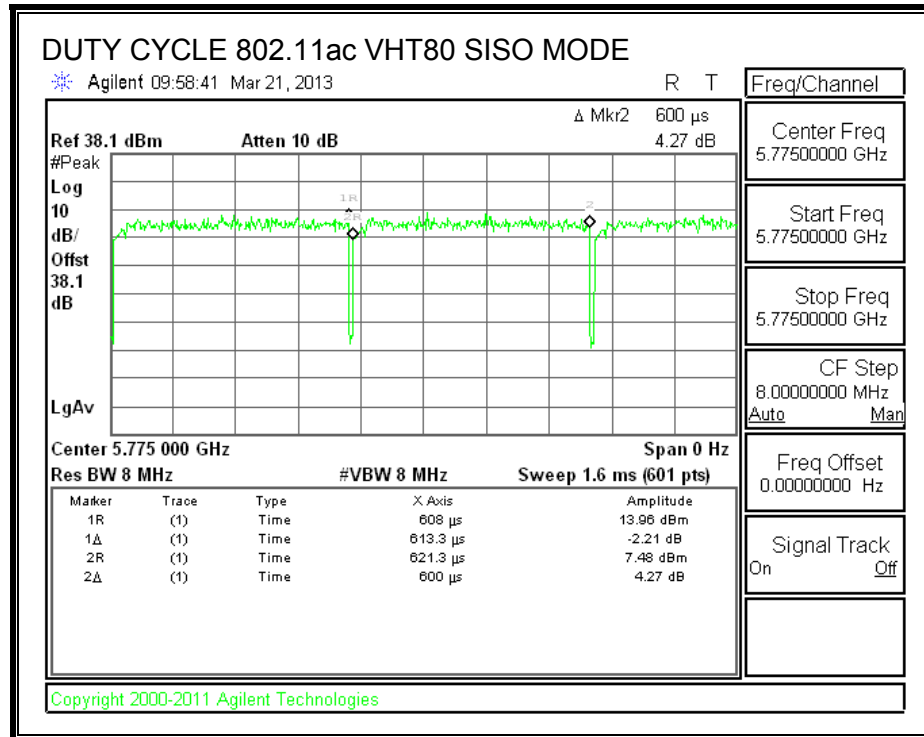
KDB 789033 Method VB with Power RMS Averaging is used.

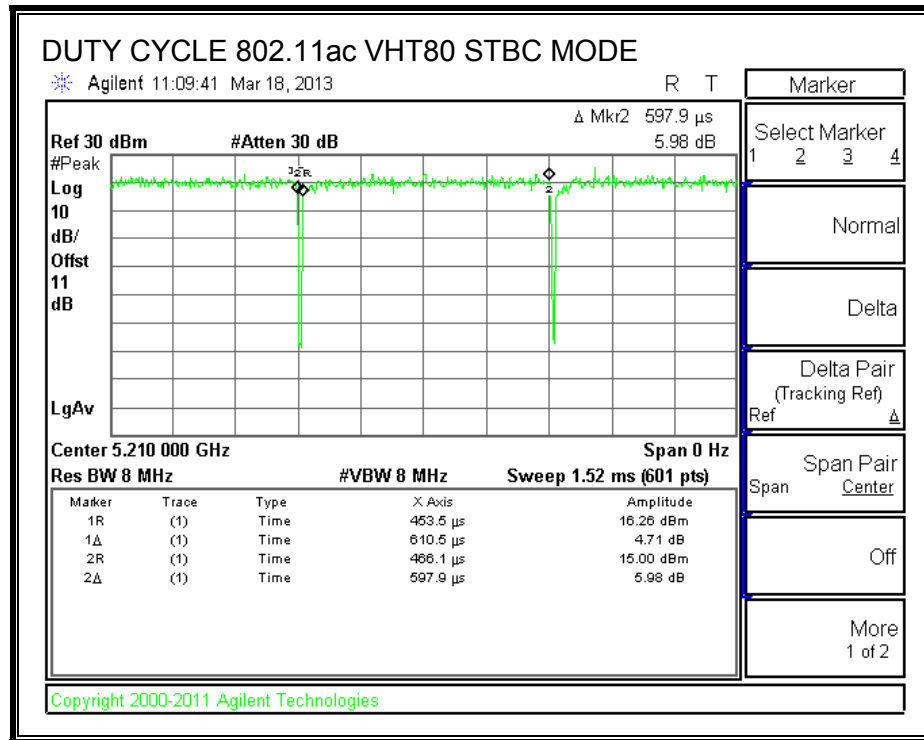
7.4. DUTY CYCLE PLOTS











8. ANTENNA PORT TEST RESULTS

8.1. 802.11a Legacy 1TX MODE IN THE 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

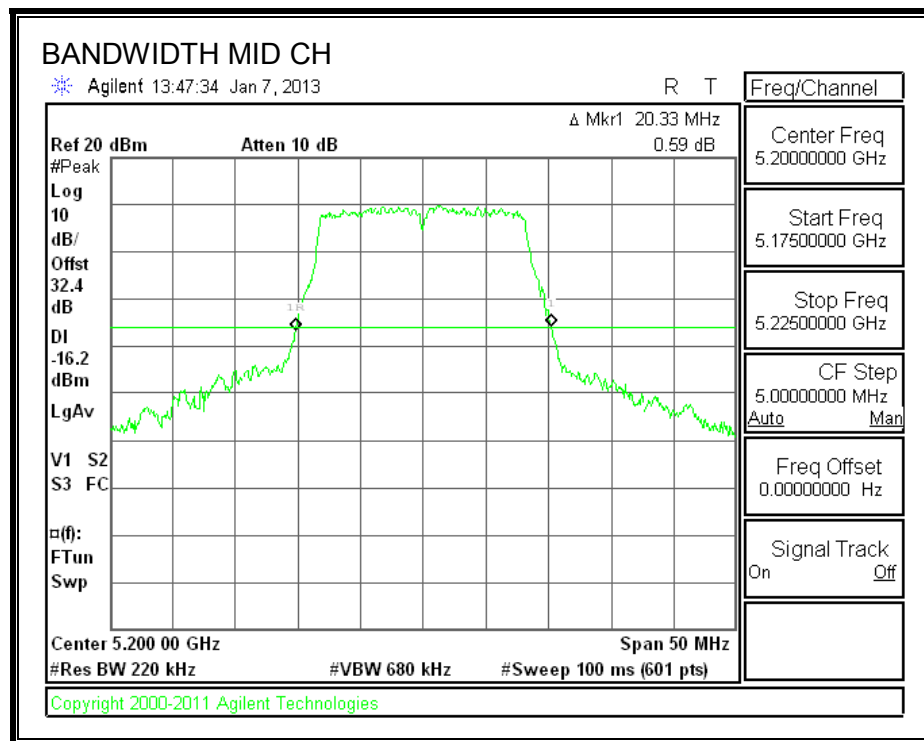
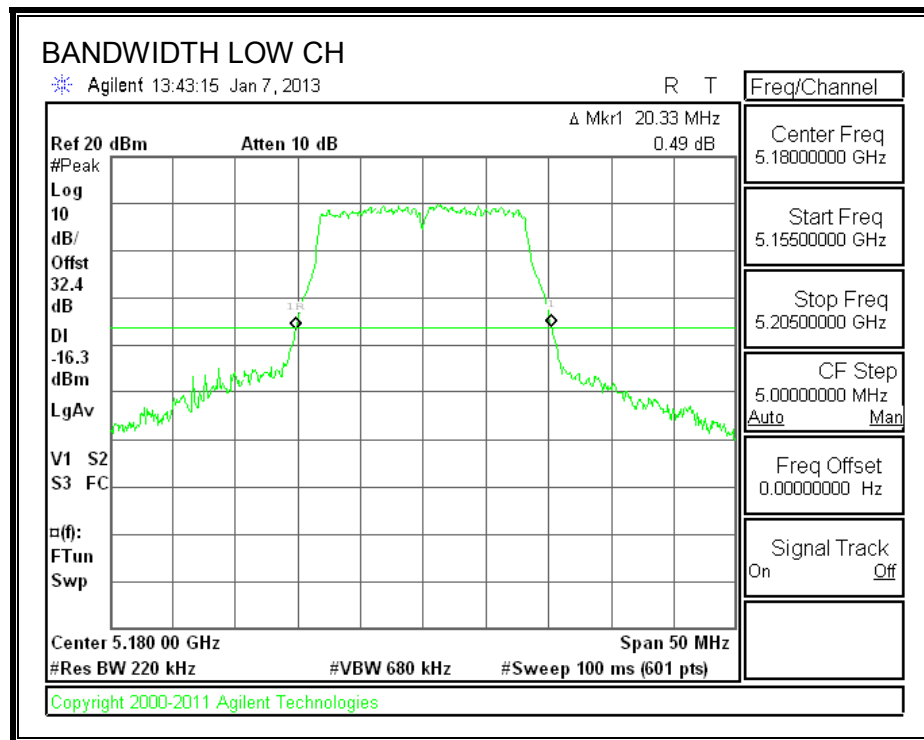
LIMITS

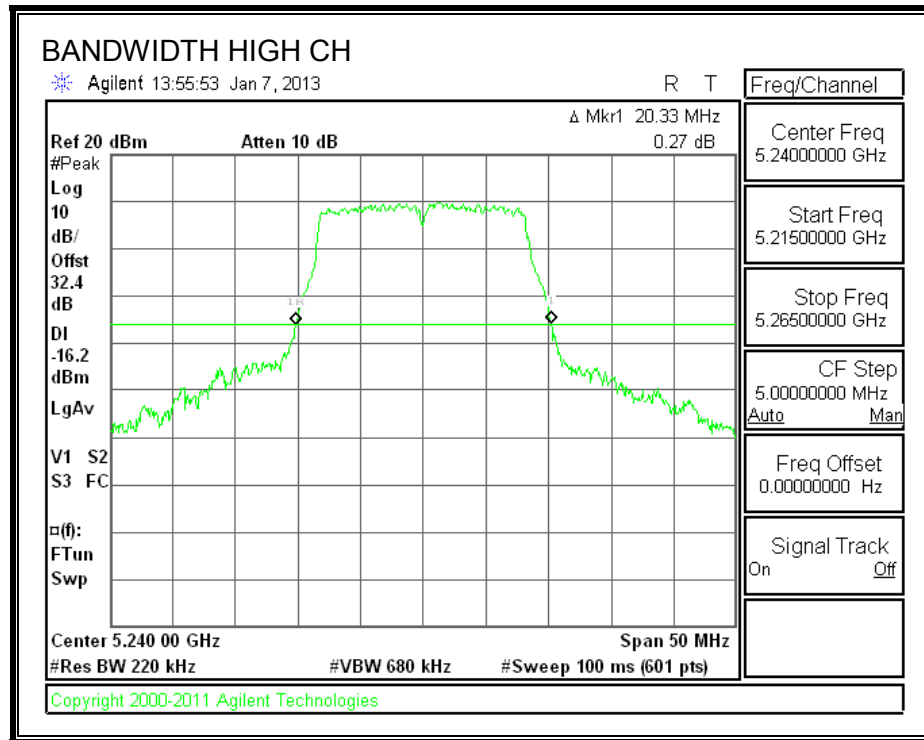
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.33
Mid	5200	20.33
High	5240	20.33

26 dB BANDWIDTH





8.1.2. 99% BANDWIDTH

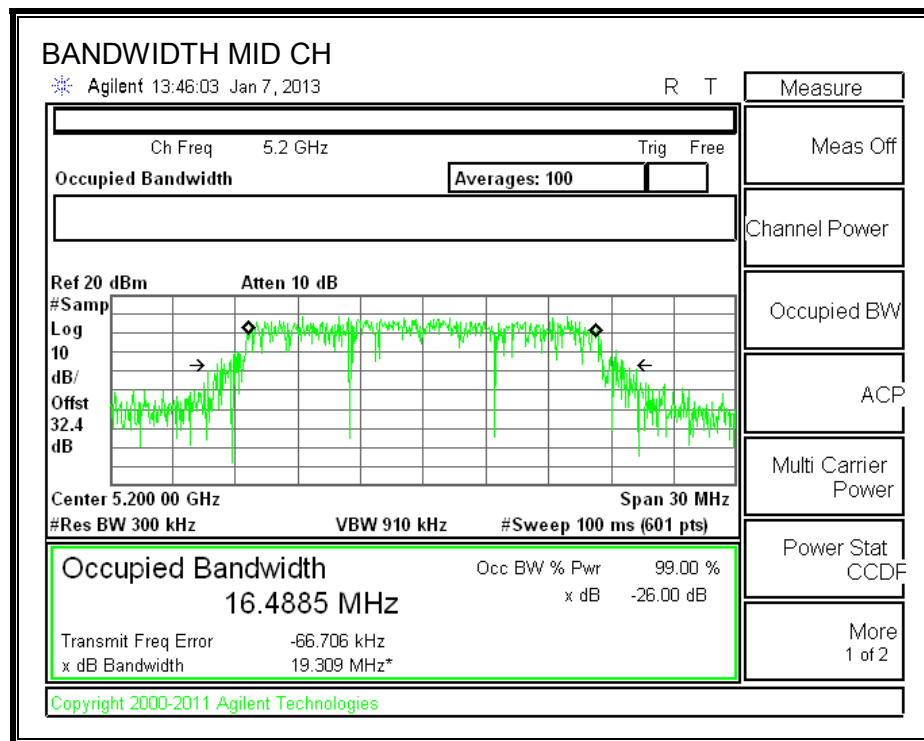
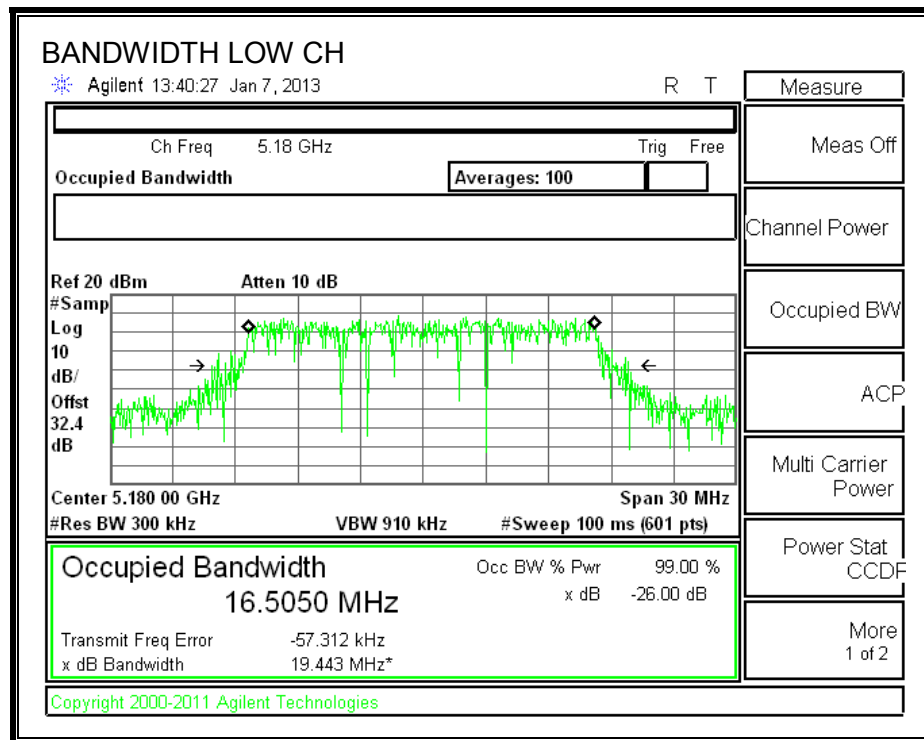
LIMITS

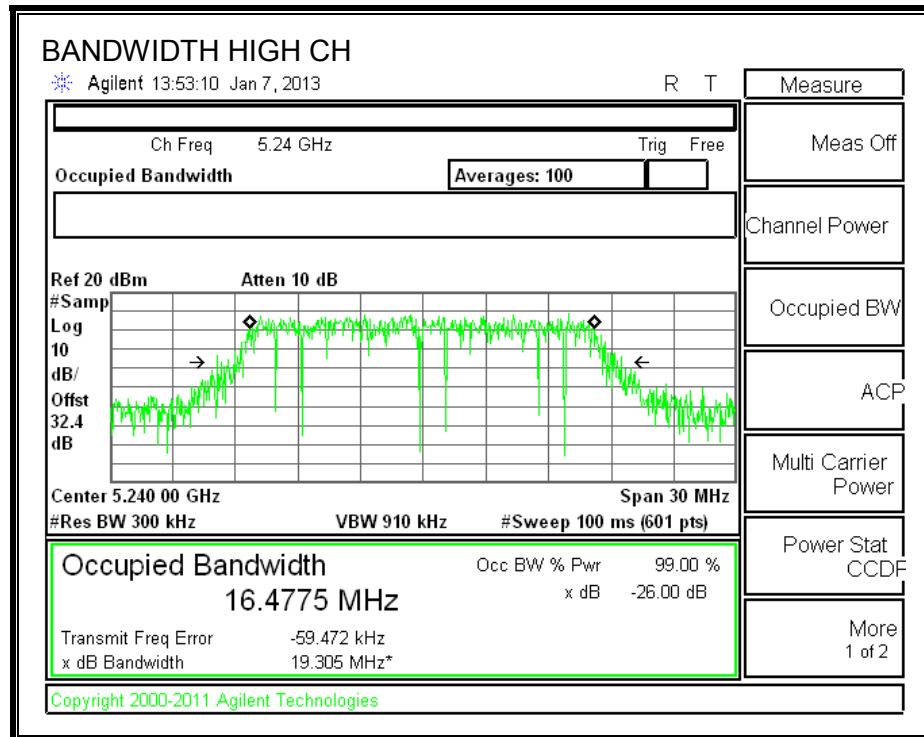
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.5050
Mid	5200	16.4885
High	5240	16.4770

99% BANDWIDTH





8.1.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.33	16.5050	3.20
Mid	5200	20.33	16.4885	3.20
High	5240	20.33	16.4770	3.20

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5180	17.00	22.18	18.98	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.17	18.97	17.00	4.00	10.00	4.00
High	5240	17.00	22.17	18.97	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00
--------------------	------

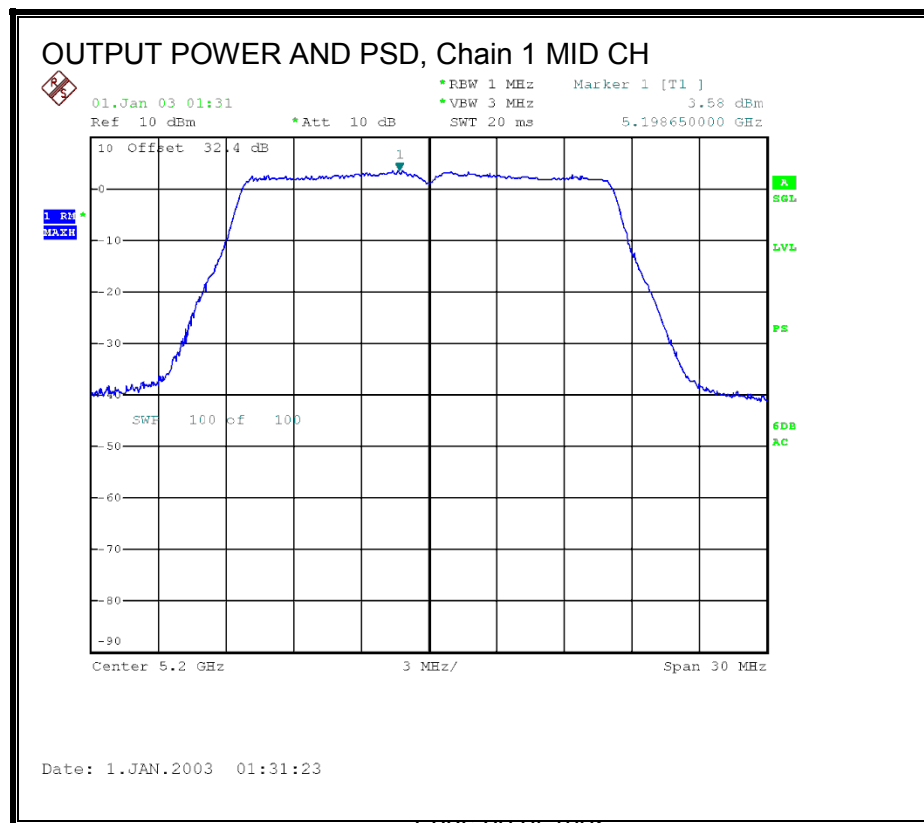
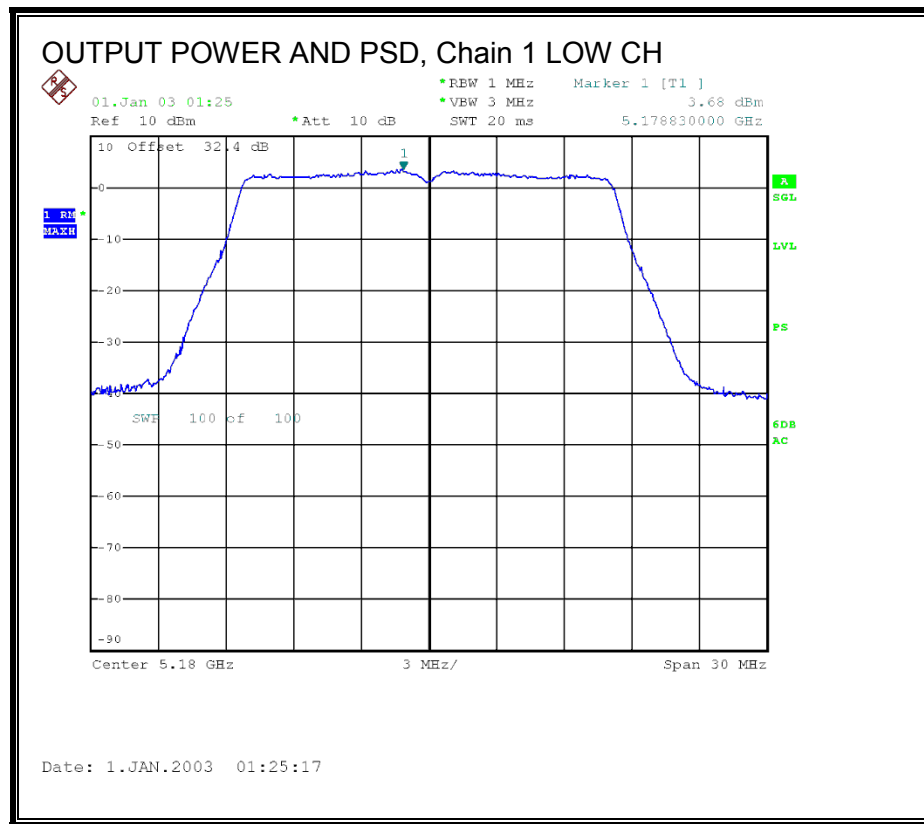
Output Power Results

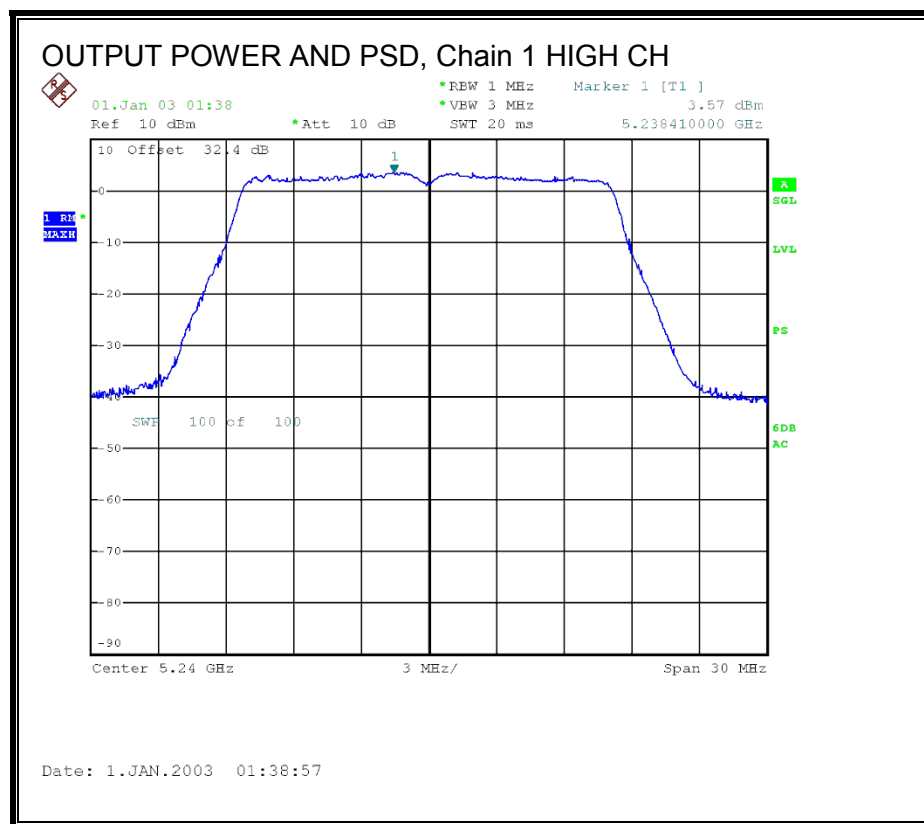
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.00	14.00	17.00	-3.00
Mid	5200	14.10	14.10	17.00	-2.90
High	5240	14.00	14.00	17.00	-3.00

PSD Results

Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	3.68	3.68	4.00	-0.32
Mid	5200	3.58	3.58	4.00	-0.42
High	5240	3.57	3.57	4.00	-0.43

OUTPUT POWER AND PSD, Chain 1





8.1.4. PEAK EXCURSION

LIMITS

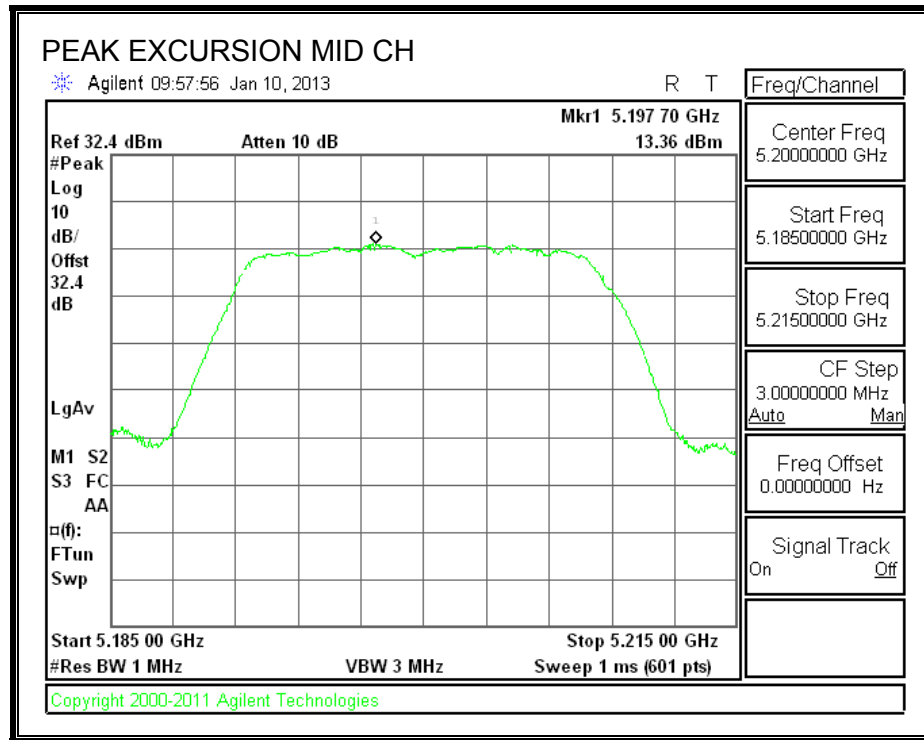
FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	13.36	3.58	0.00	9.78	13	-3.22

PEAK EXCURSION



8.2. 802.11n HT20 CDD 2TX MODE IN THE 5.2 GHz BAND

8.2.1. 26 dB BANDWIDTH

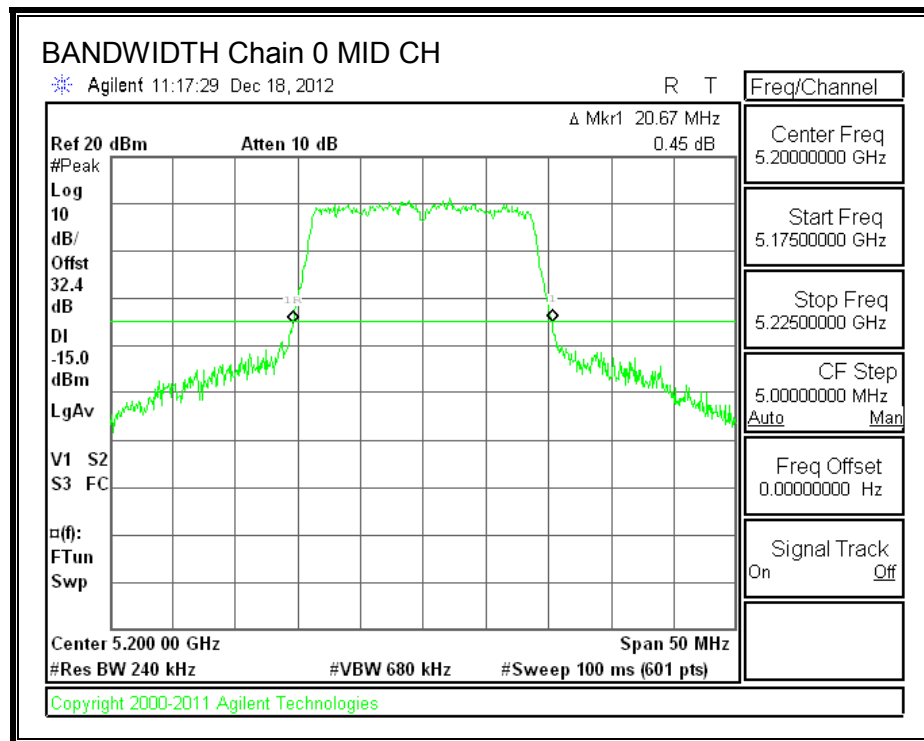
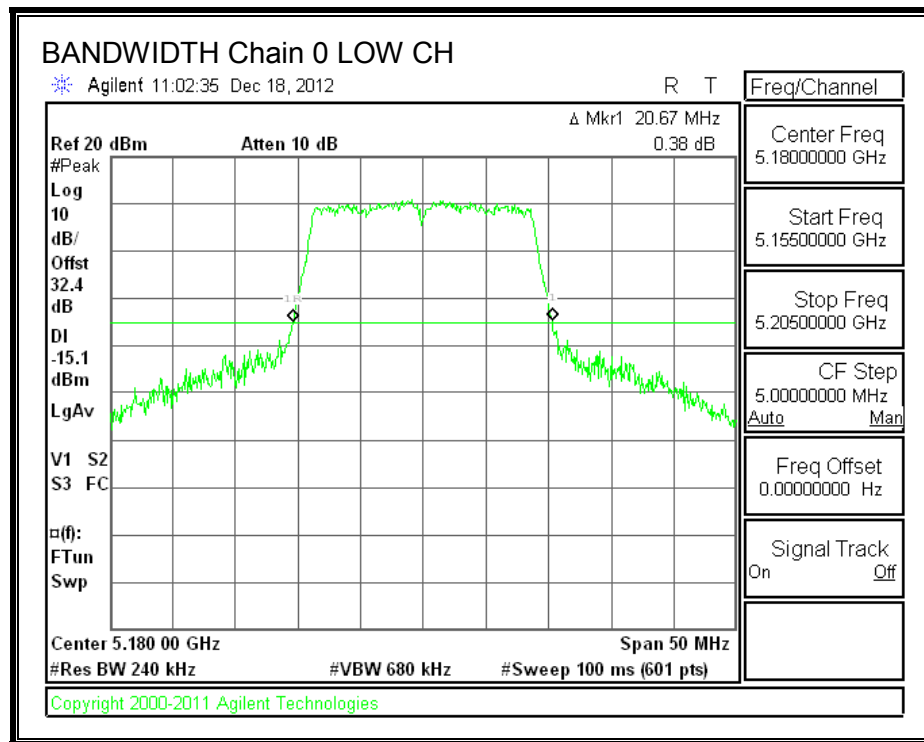
LIMITS

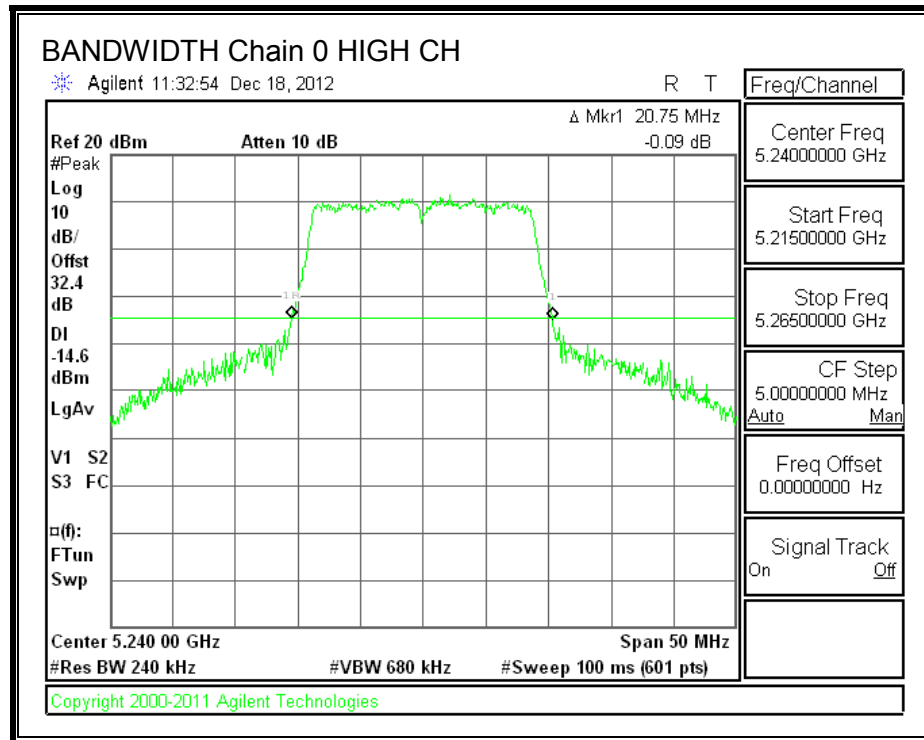
None; for reporting purposes only.

RESULTS

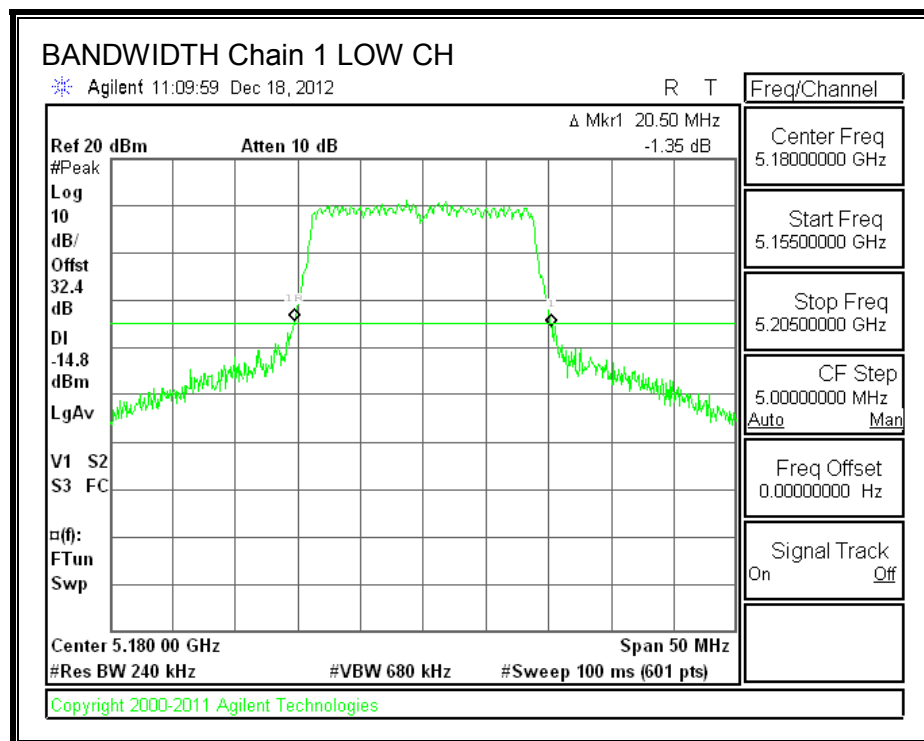
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	20.67	20.50
Mid	5200	20.67	20.42
High	5240	20.75	20.42

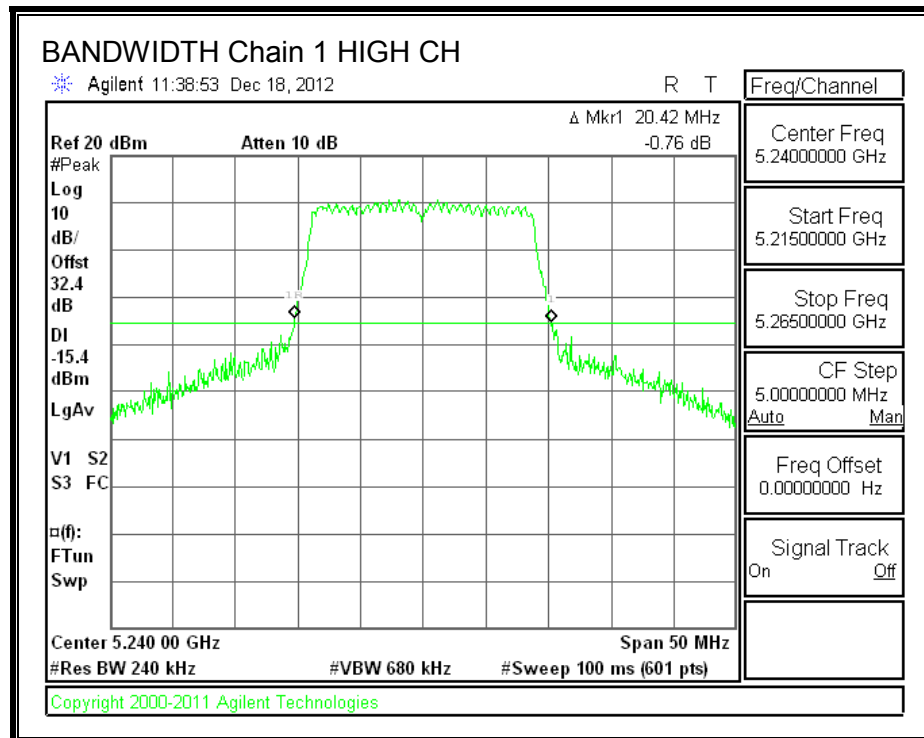
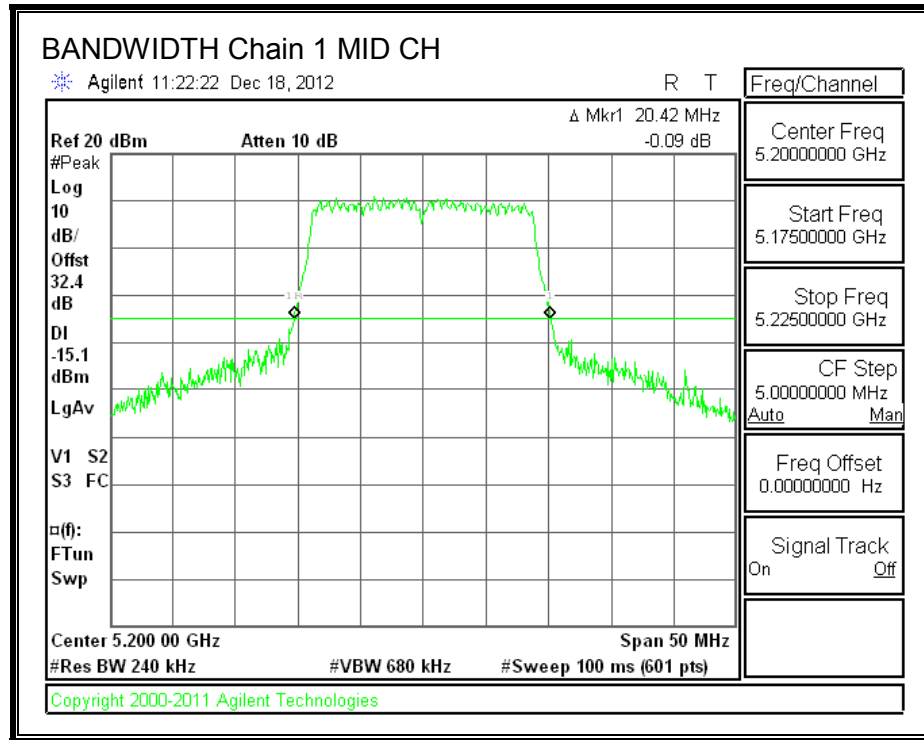
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.2.2. 99% BANDWIDTH

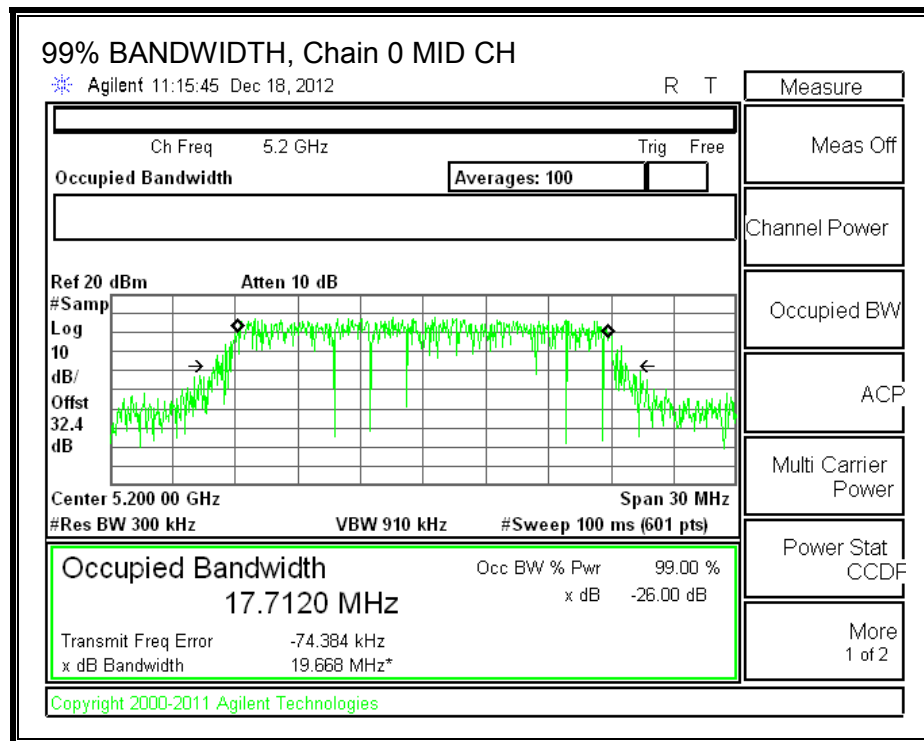
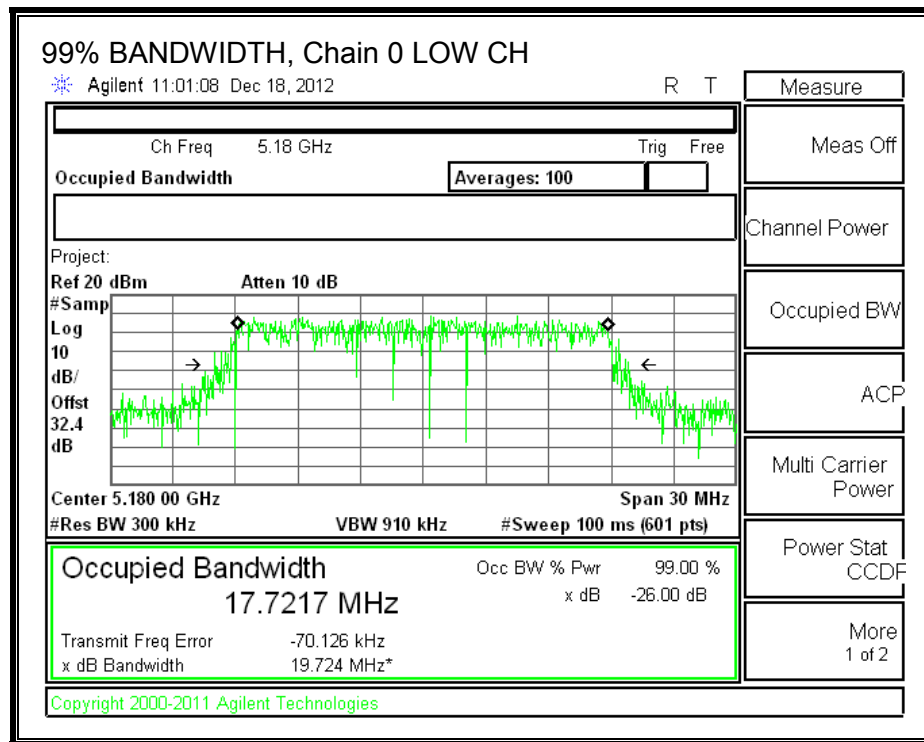
LIMITS

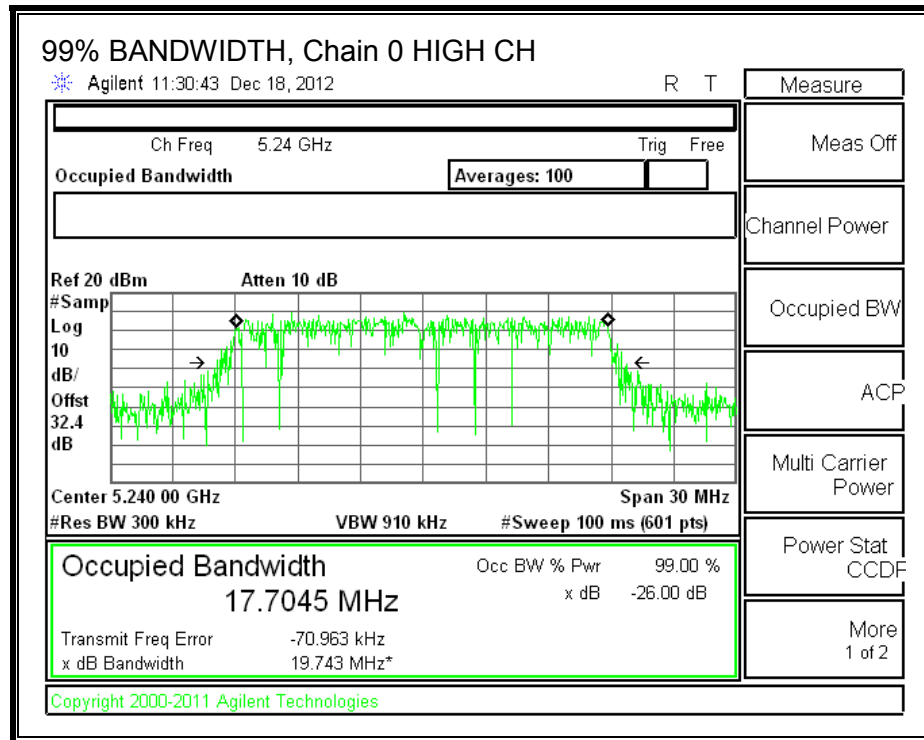
None; for reporting purposes only.

RESULTS

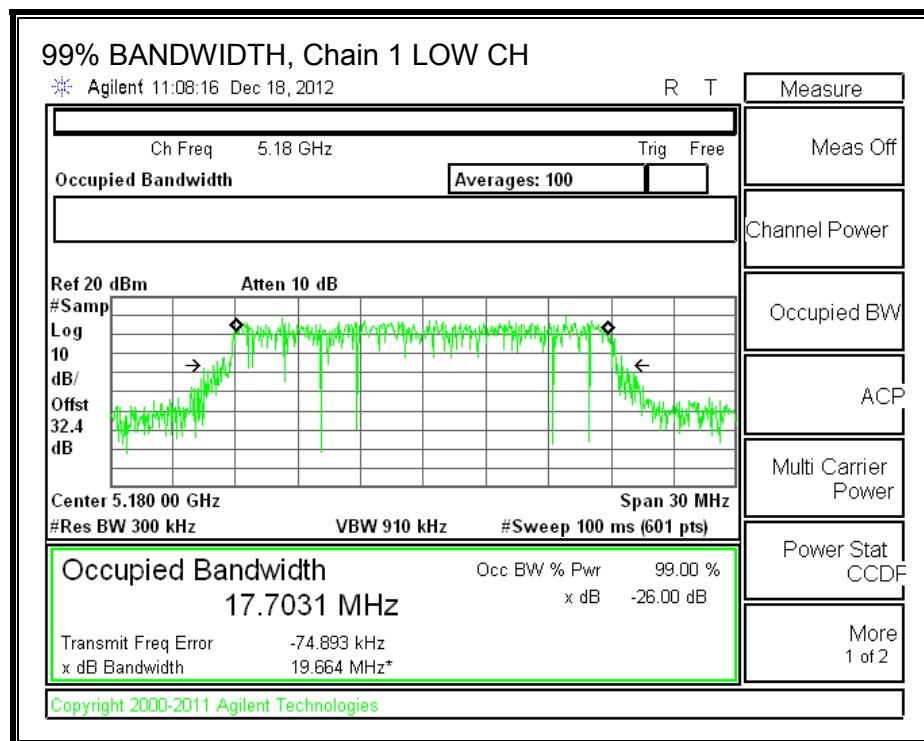
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.7217	17.7031
Mid	5200	17.7120	17.7066
High	5240	17.7045	17.6986

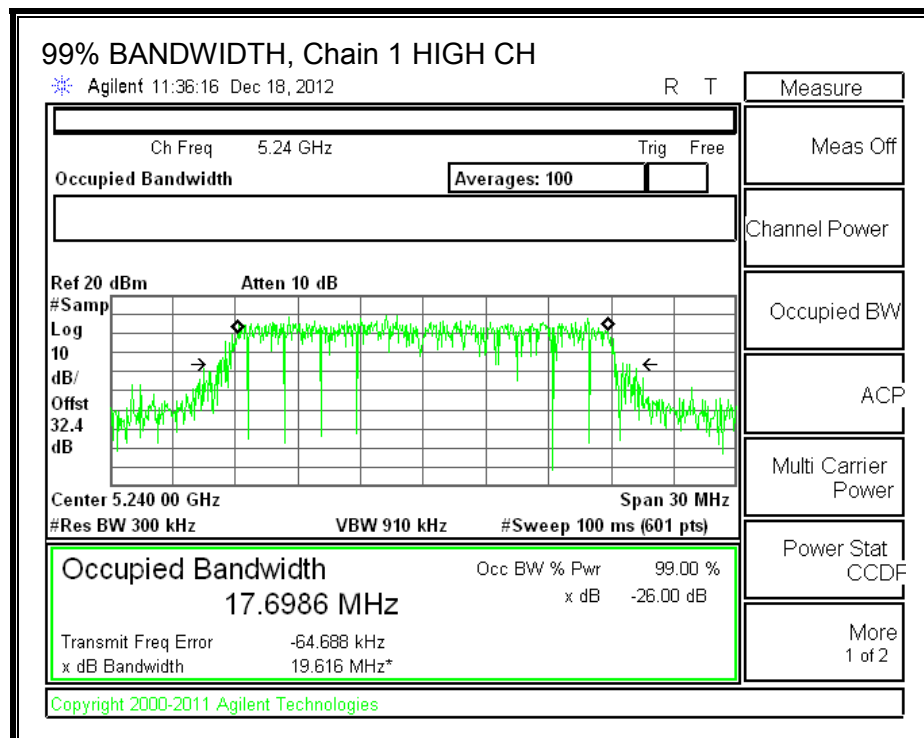
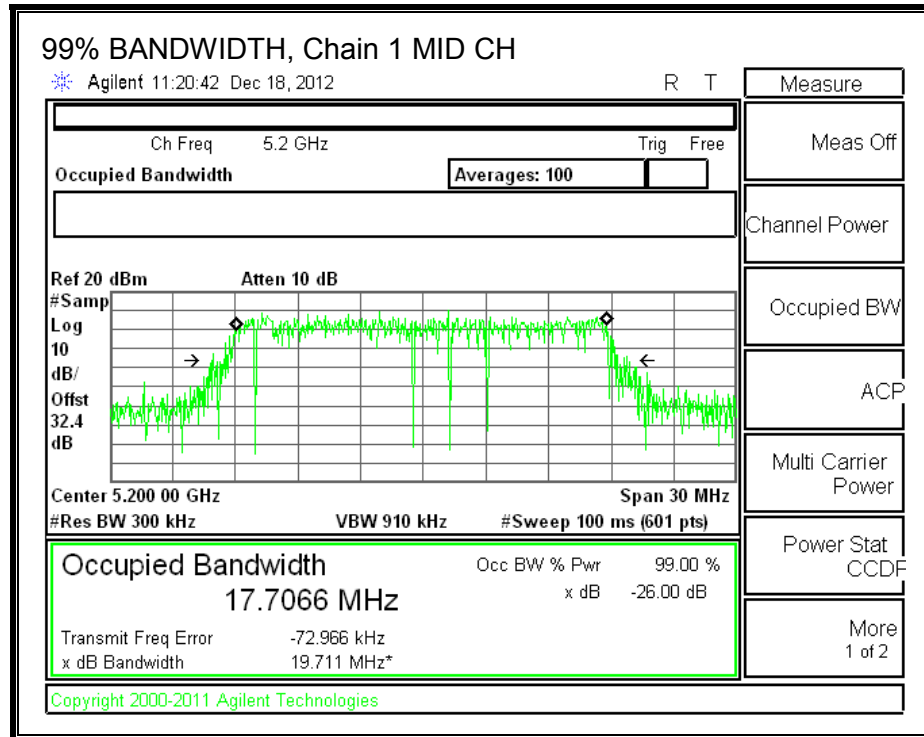
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.2.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

For PSD, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Low	5180	20.5	17.6	5.72	2.73
Mid	5200	20.4	17.7	5.72	2.73
High	5240	20.4	17.7	5.72	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5180	17.00	22.46	19.73	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.48	19.75	17.00	4.00	10.00	4.00
High	5240	17.00	22.48	19.75	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00
---------------------------	------

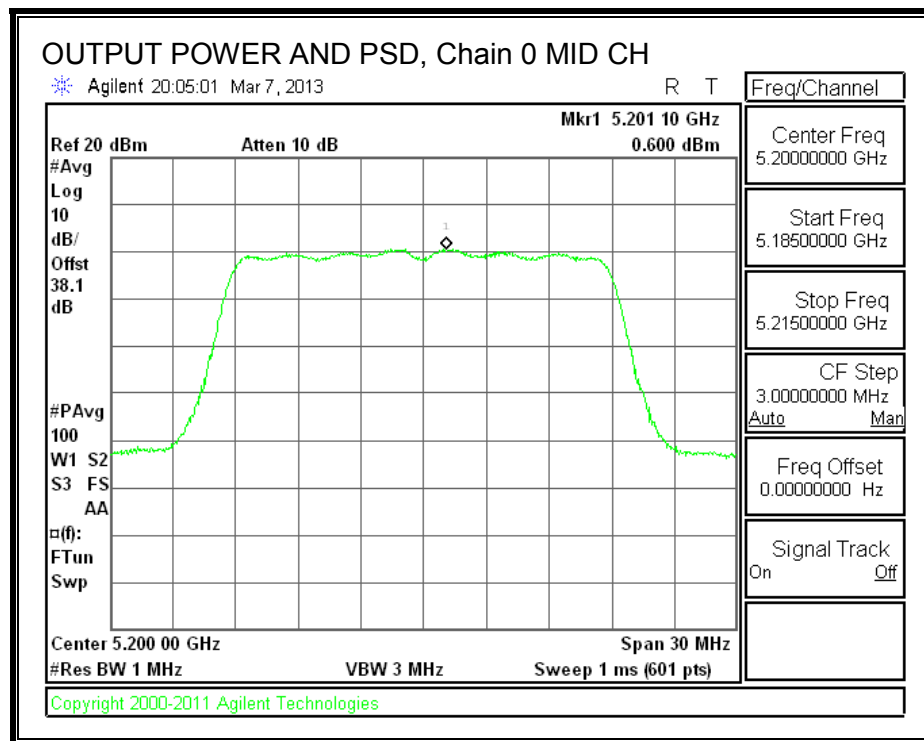
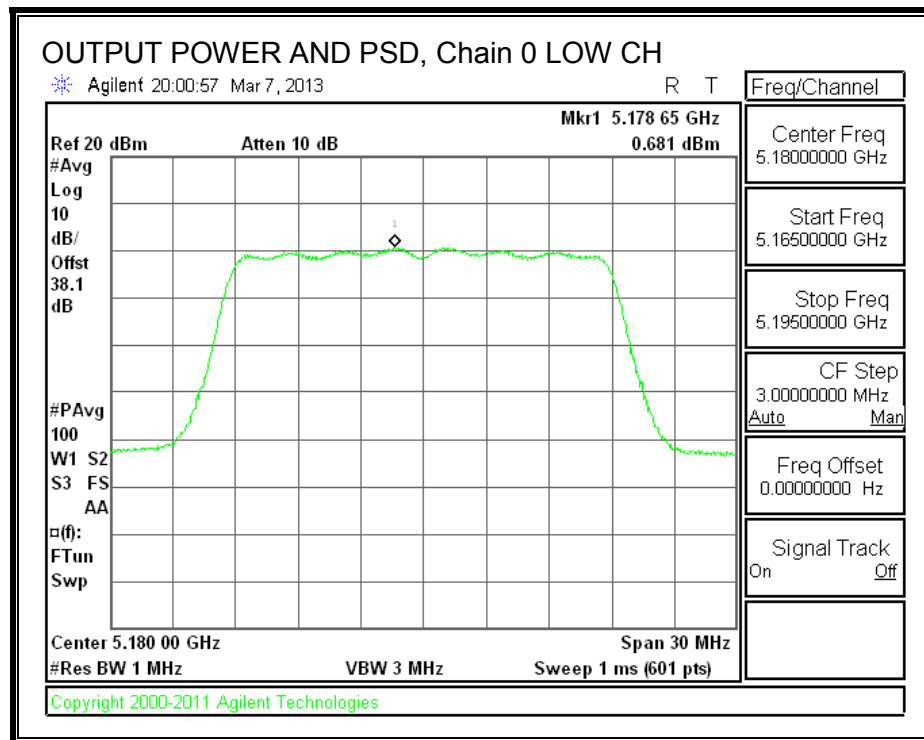
Output Power Results

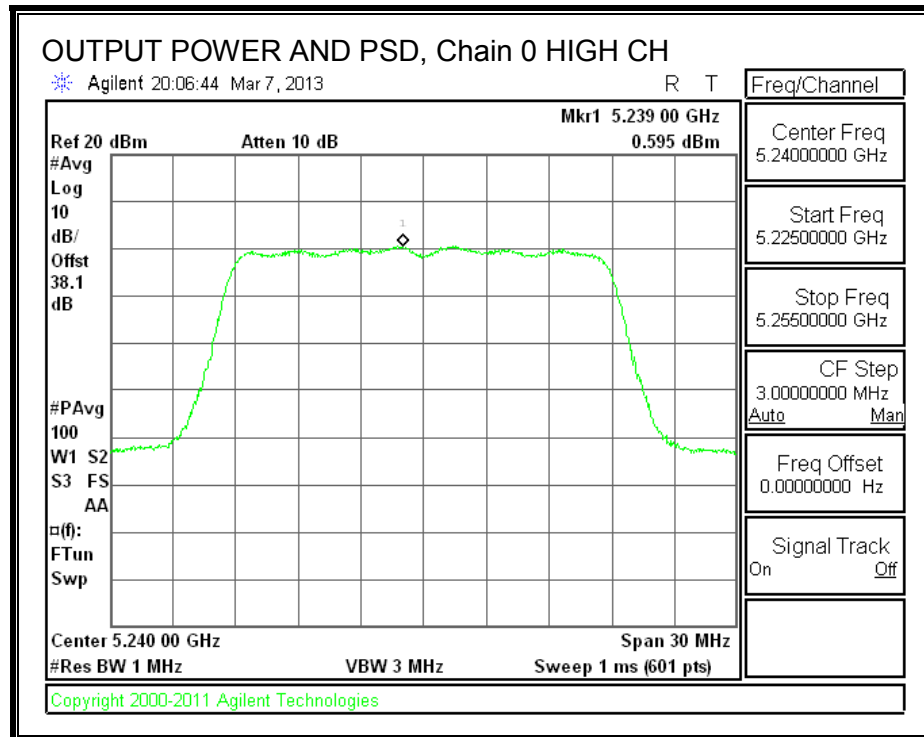
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.10	10.00	13.06	17.00	-3.94
Mid	5200	10.10	9.90	13.01	17.00	-3.99
High	5240	10.26	10.00	13.14	17.00	-3.86

PSD Results

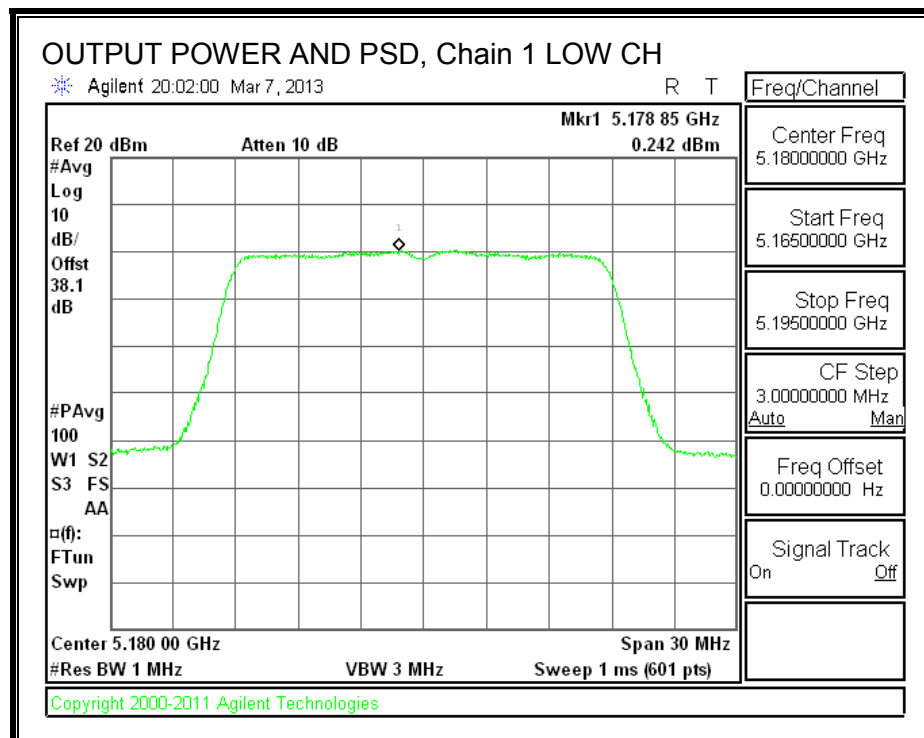
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	0.681	0.242	3.48	4.00	-0.52
Mid	5200	0.600	0.191	3.41	4.00	-0.59
High	5240	0.595	0.255	3.44	4.00	-0.56

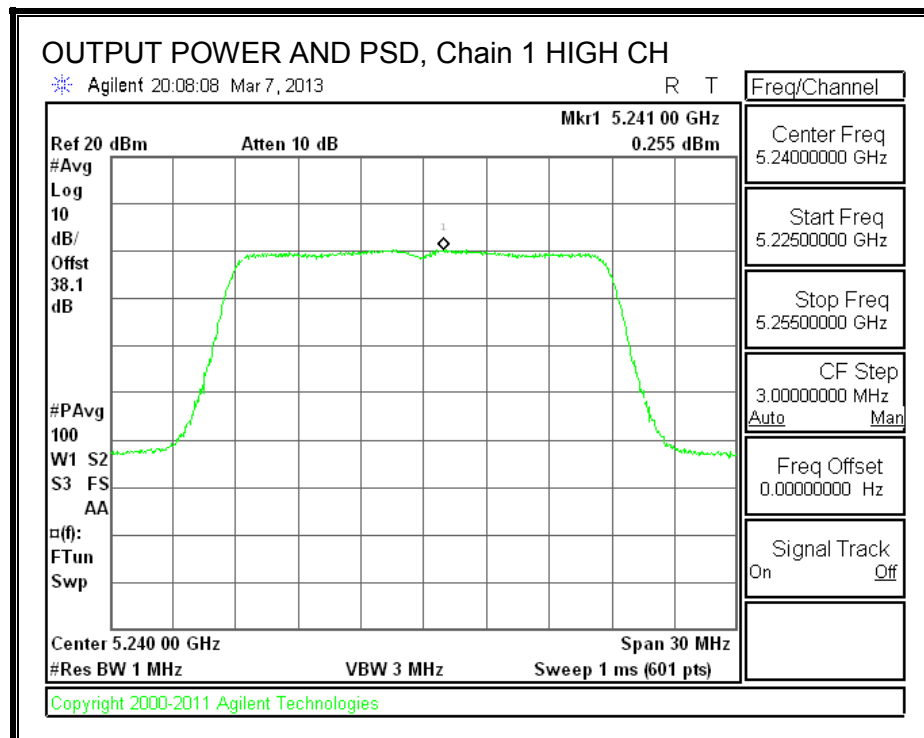
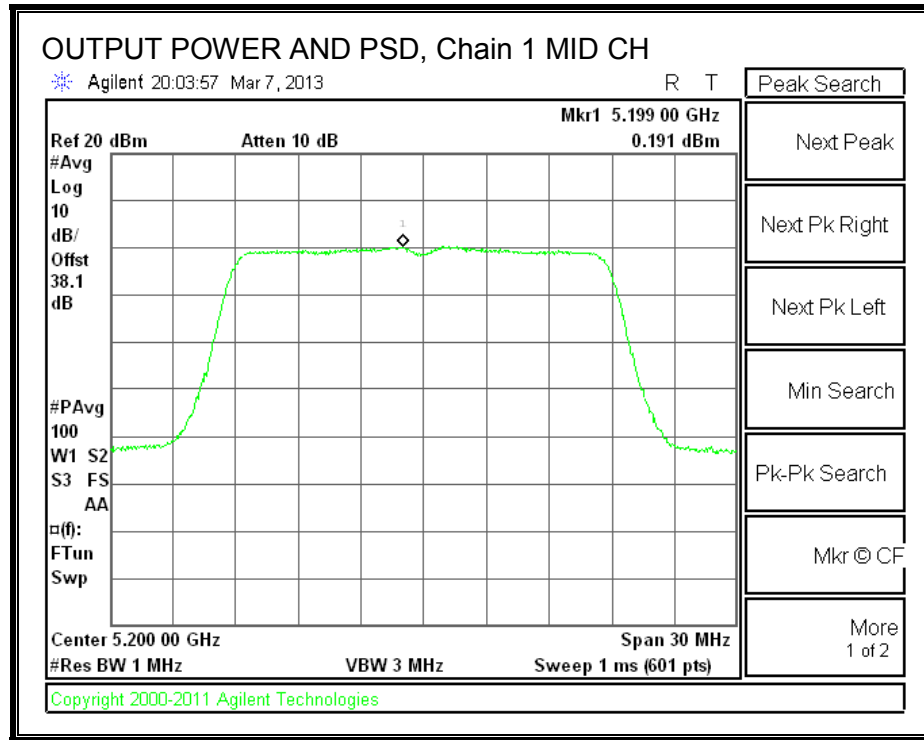
OUTPUT POWER AND PSD, Chain 0





OUTPUT POWER AND PSD, Chain 1





8.2.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

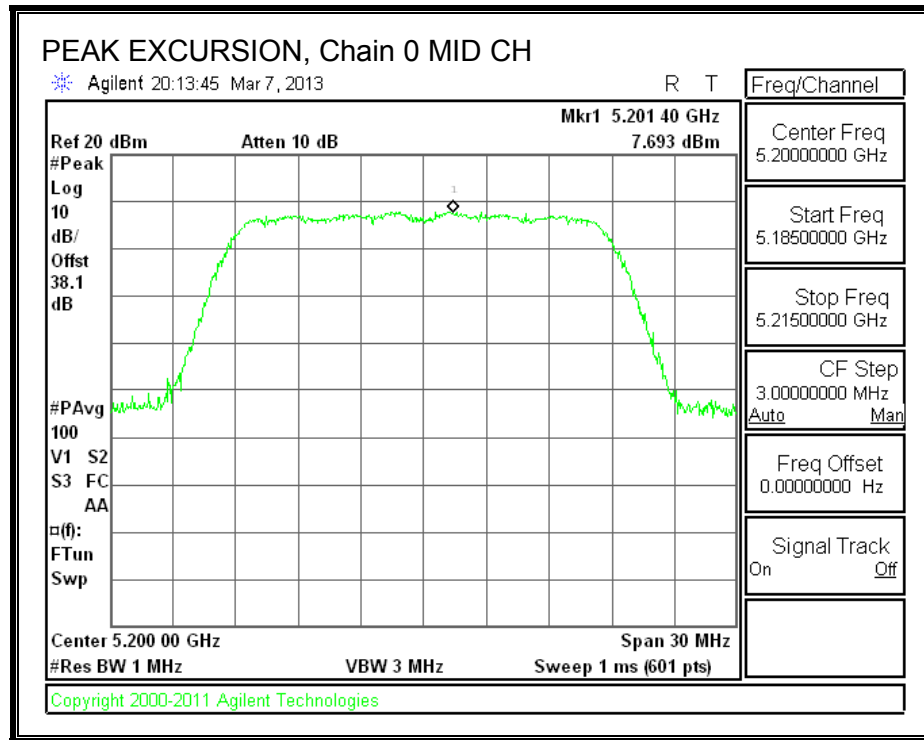
Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	7.693	0.600	0.00	7.09	13	-5.91

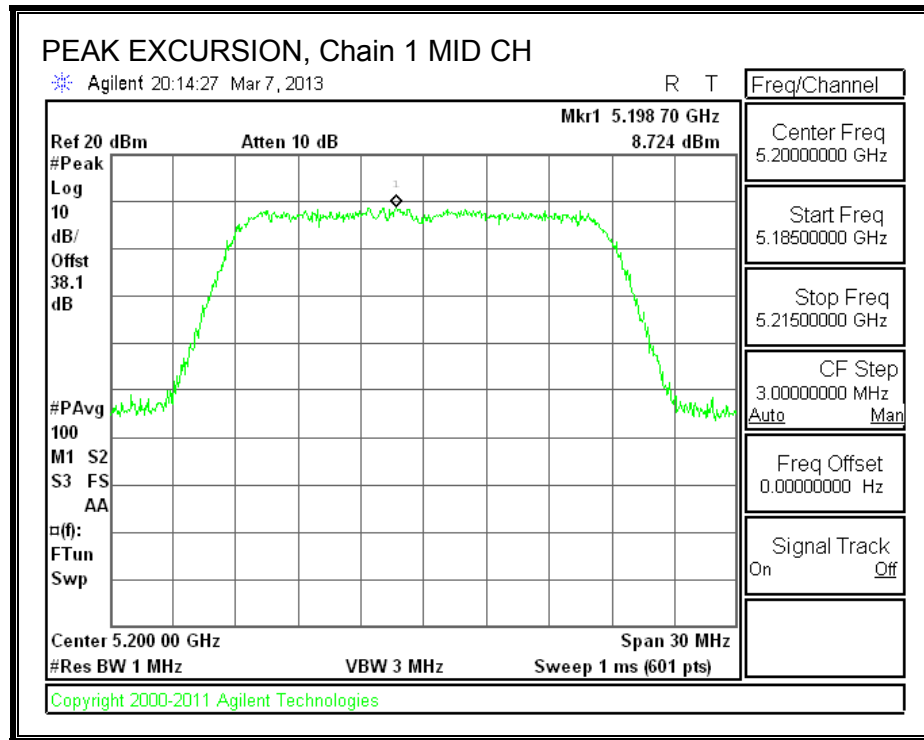
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.724	0.191	0.00	8.53	13	-4.47

PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



8.3. 802.11n HT20 BF 2TX MODE IN THE 5.2 GHz BAND

Covered by testing HT20 CDD 2TX mode, the power per chain used for HT20 CDD 2TX mode is the same power per chain that will be used for HT20 BF 2TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.3.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5180	20.5	17.6	5.72
Mid	5200	20.4	17.7	5.72
High	5240	20.4	17.7	5.72

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Low	5180	17.00	22.46	16.74	16.74
Mid	5200	17.00	22.48	16.76	16.76
High	5240	17.00	22.48	16.76	16.76

Duty Cycle CF (dB)	0.00	
---------------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.10	10.00	13.06	16.74	-3.68
Mid	5200	10.10	9.90	13.01	16.76	-3.75
High	5240	10.26	10.00	13.14	16.76	-3.62

8.4. 802.11n HT20 STBC 2TX MODE IN THE 5.2 GHz BAND

8.4.1. 26 dB BANDWIDTH

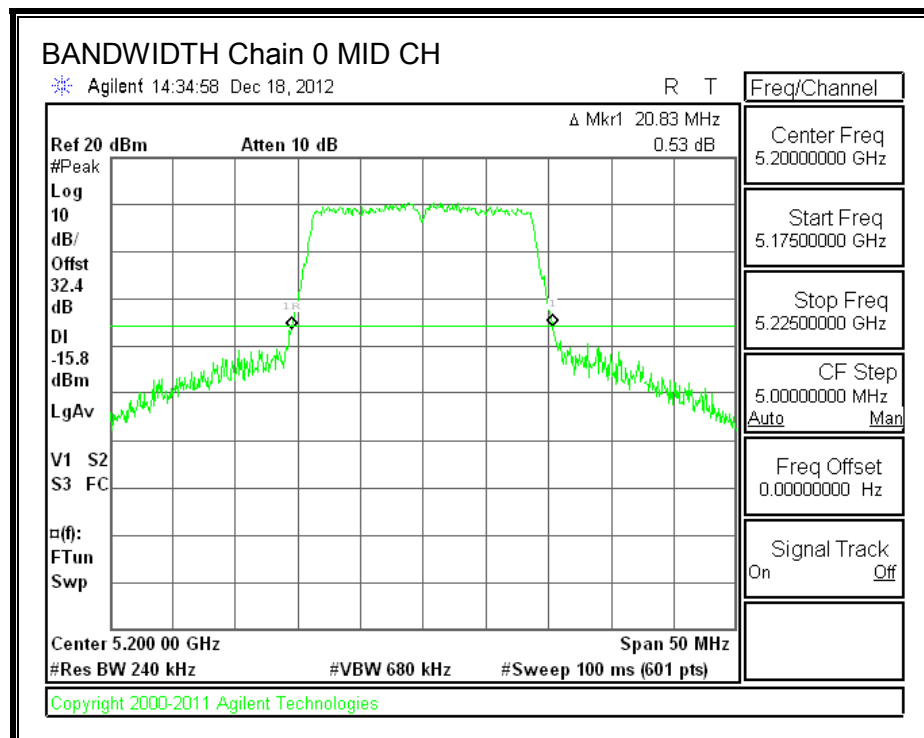
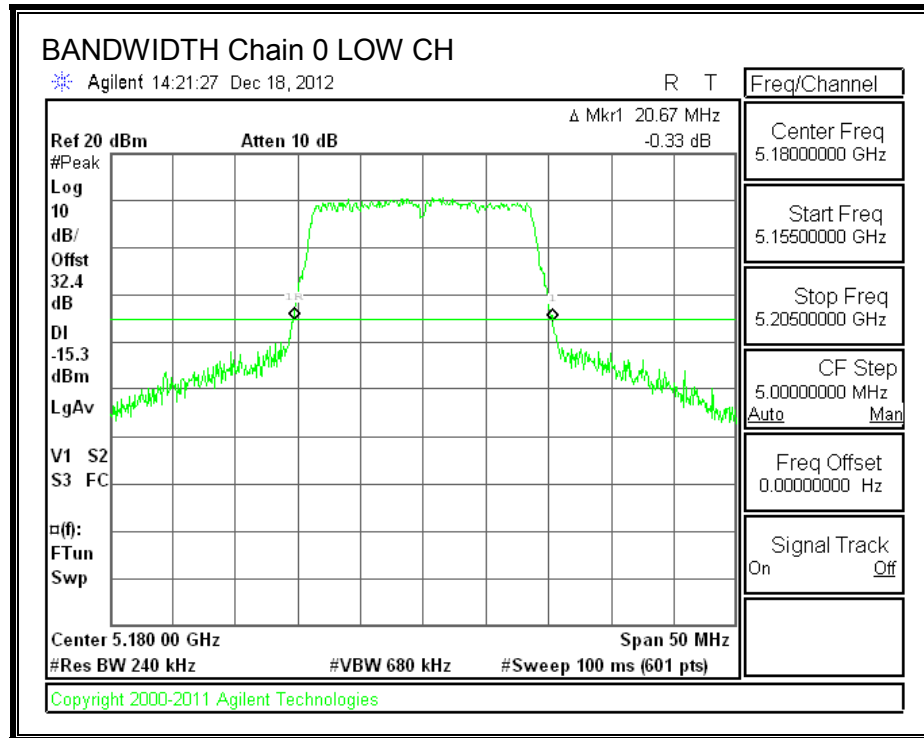
LIMITS

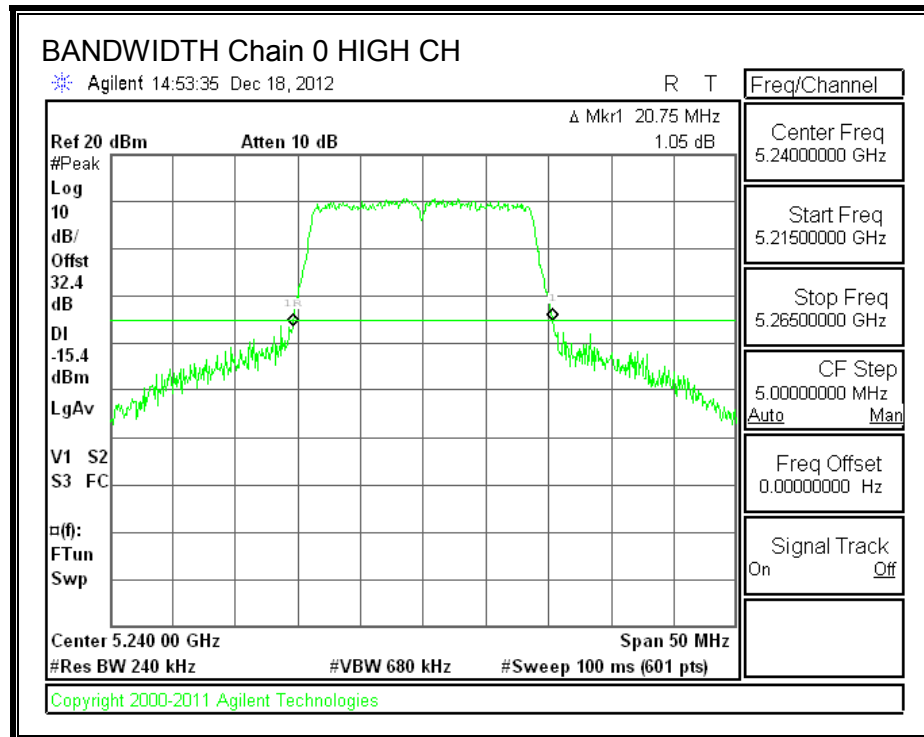
None; for reporting purposes only.

RESULTS

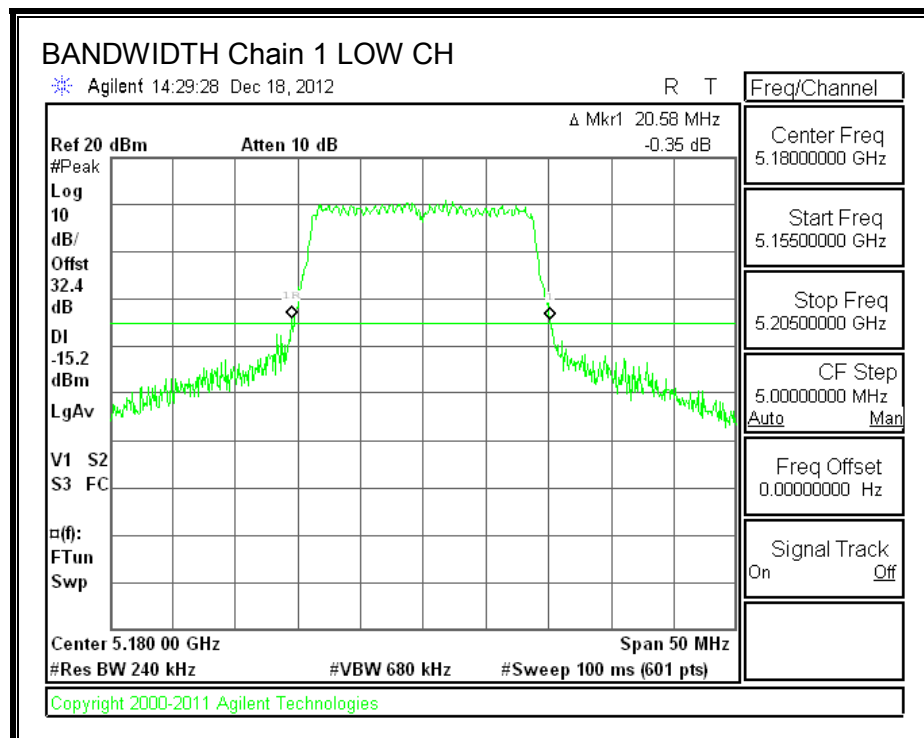
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	20.67	20.58
Mid	5200	20.83	20.58
High	5240	20.75	20.50

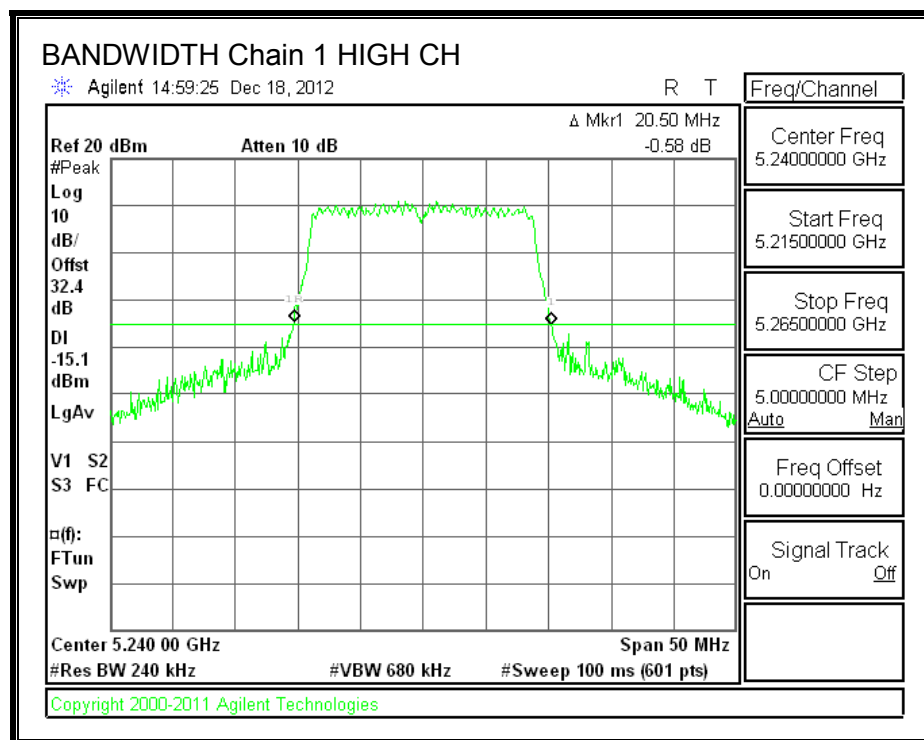
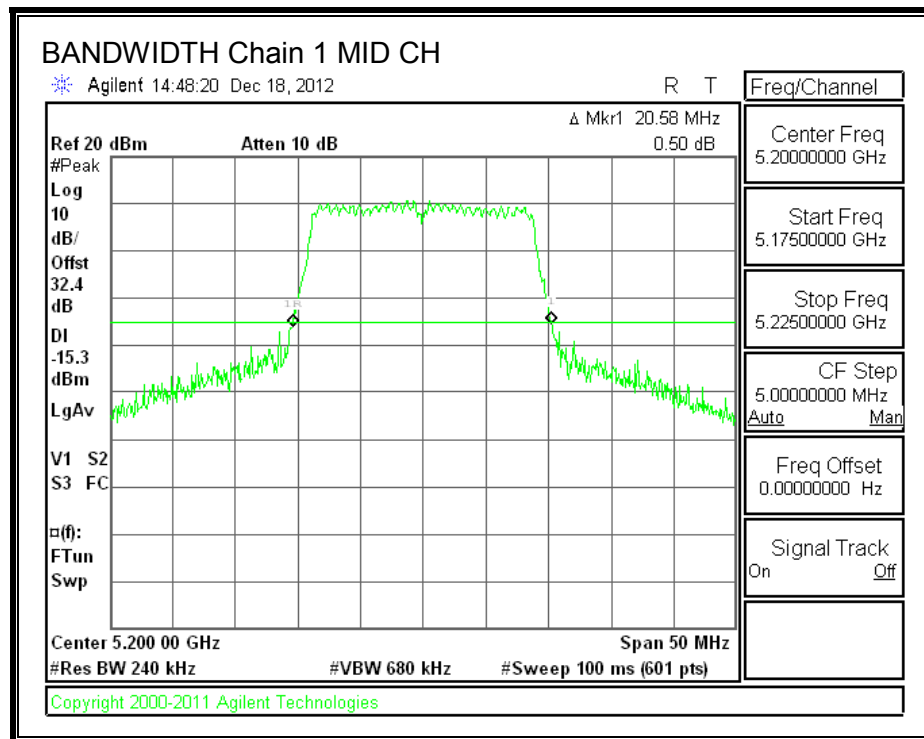
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.4.2. 99% BANDWIDTH

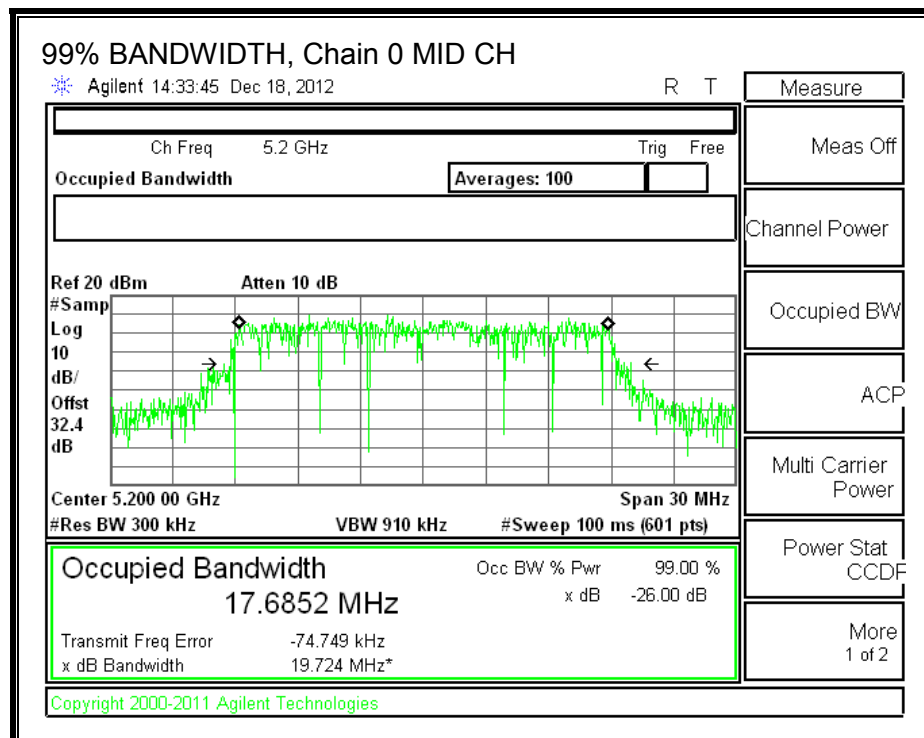
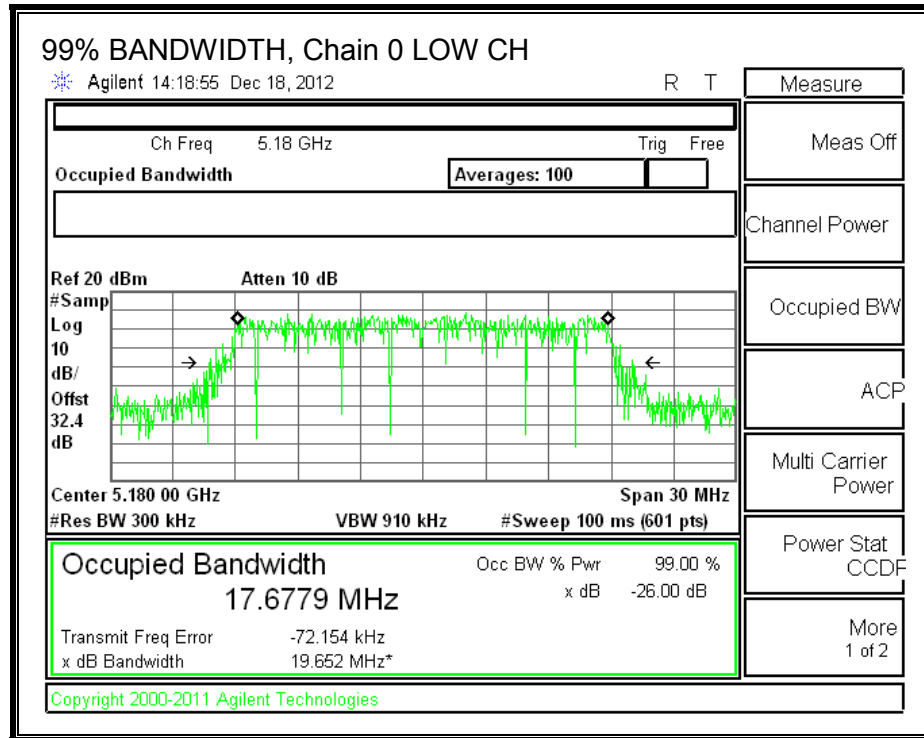
LIMITS

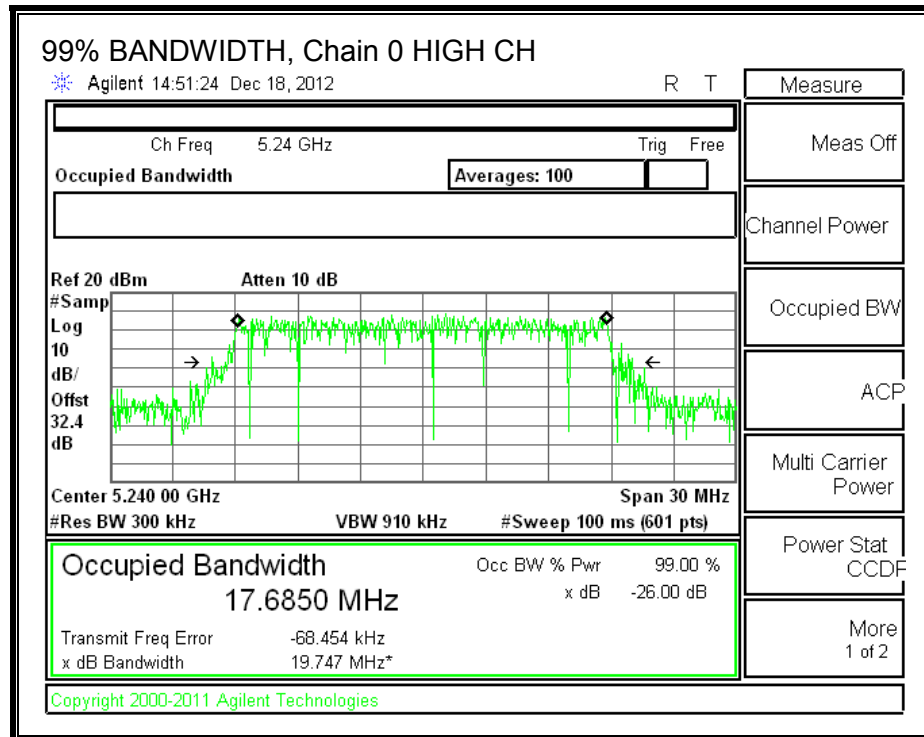
None; for reporting purposes only.

RESULTS

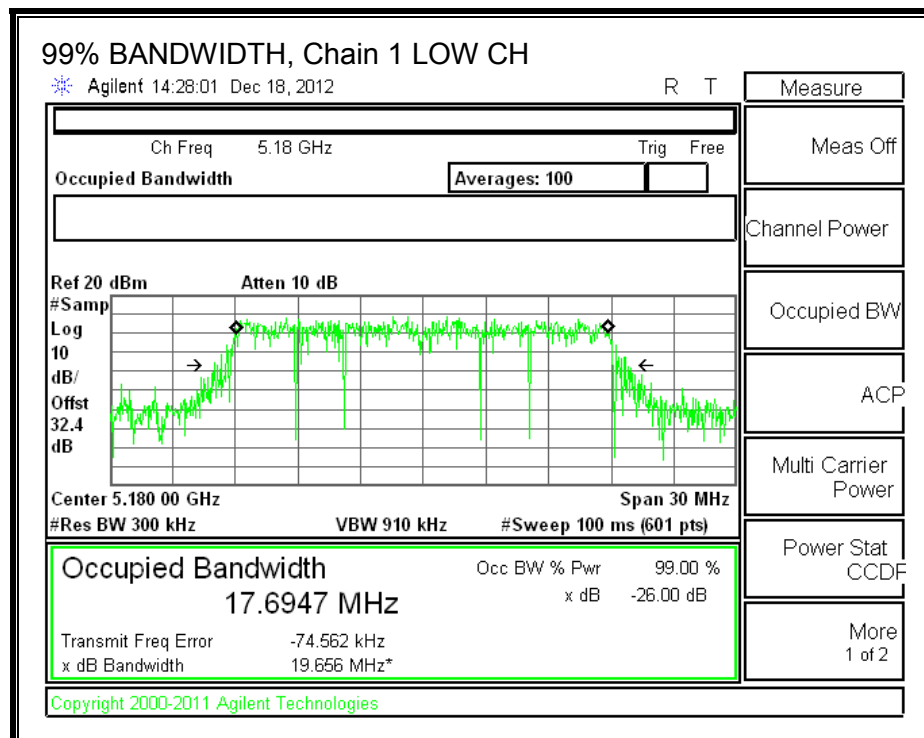
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.6779	17.6947
Mid	5200	17.6852	17.6885
High	5240	17.6850	17.6906

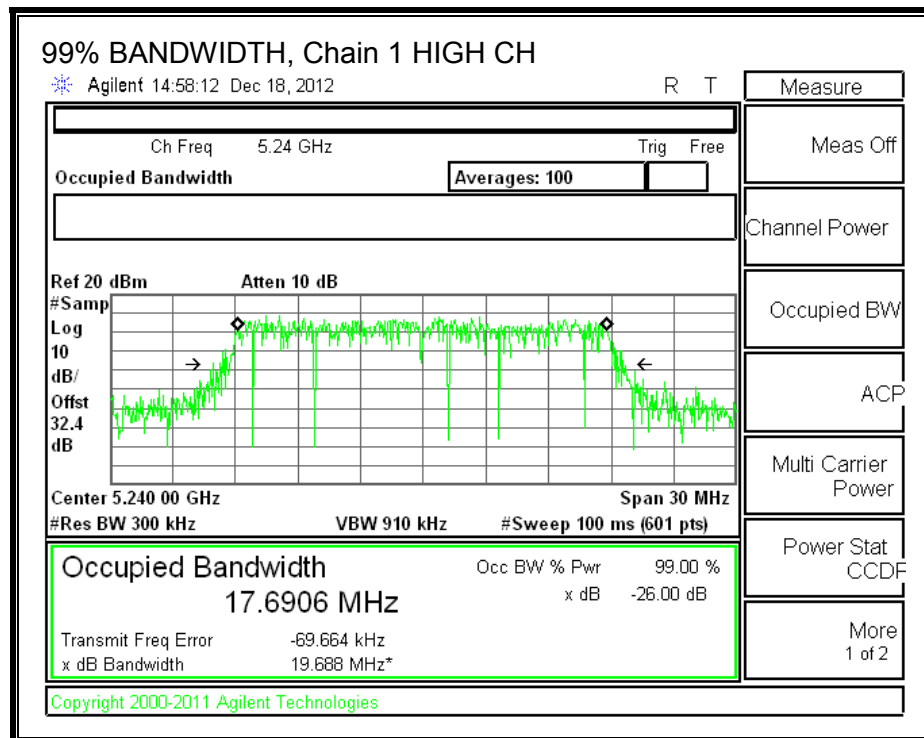
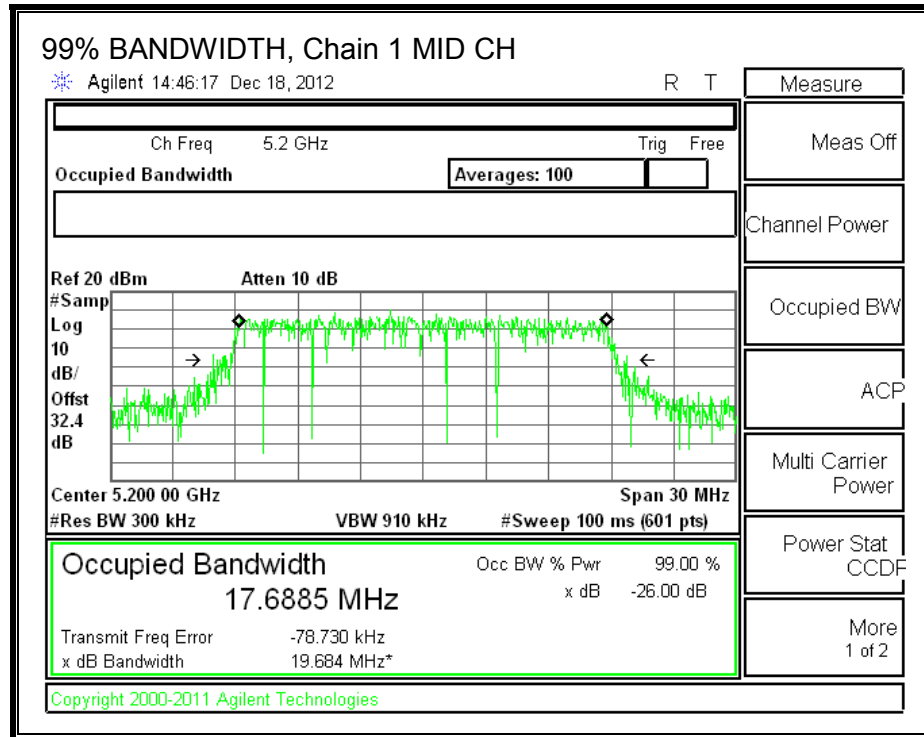
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.4.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.58	17.6779	2.73
Mid	5200	20.58	17.6852	2.73
High	5240	20.50	17.6850	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5180	17.00	22.47	19.74	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.48	19.75	17.00	4.00	10.00	4.00
High	5240	17.00	22.48	19.75	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

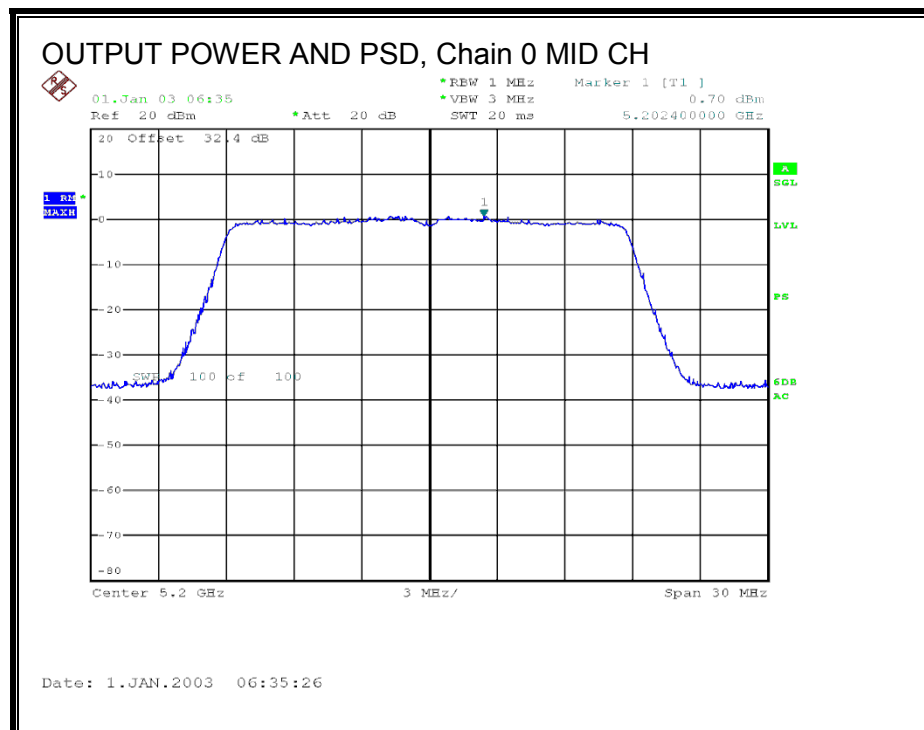
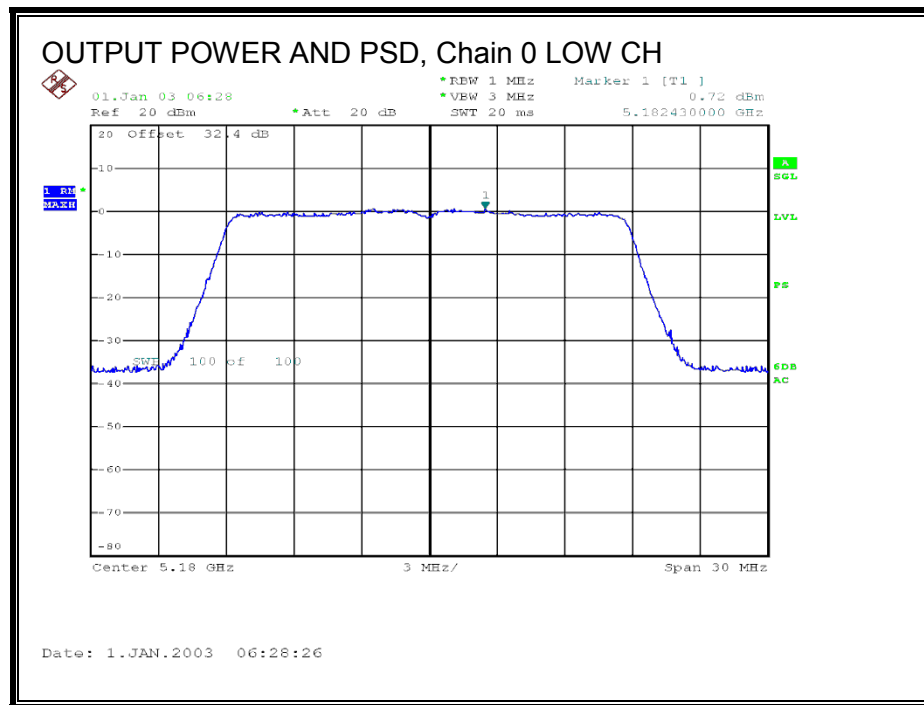
Output Power Results

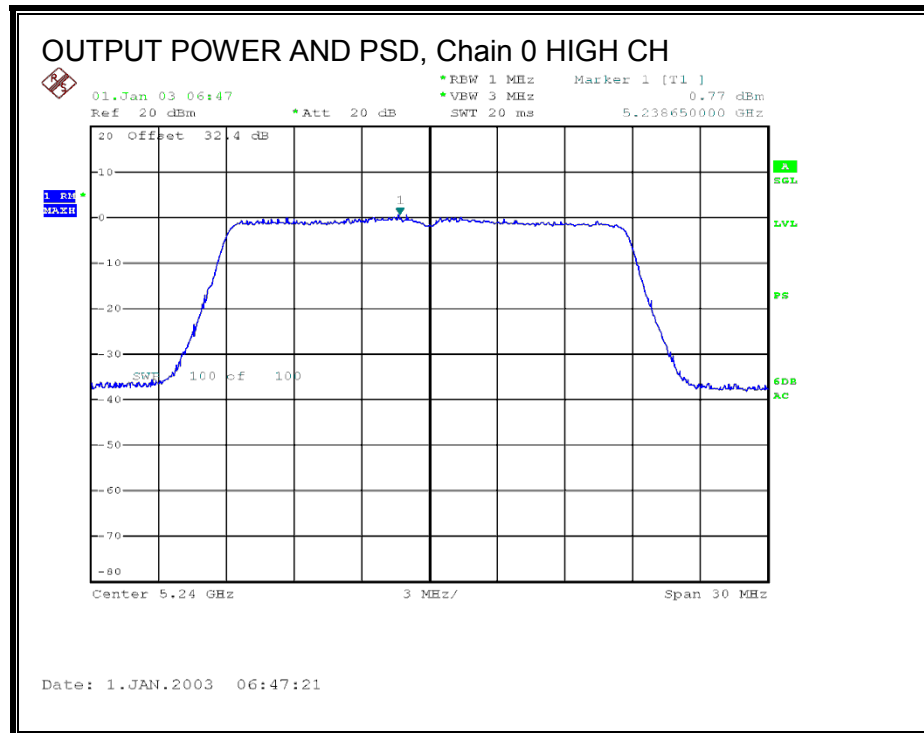
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.10	11.20	14.16	17.00	-2.84
Mid	5200	11.21	10.98	14.11	17.00	-2.89
High	5240	11.20	11.10	14.16	17.00	-2.84

PSD Results

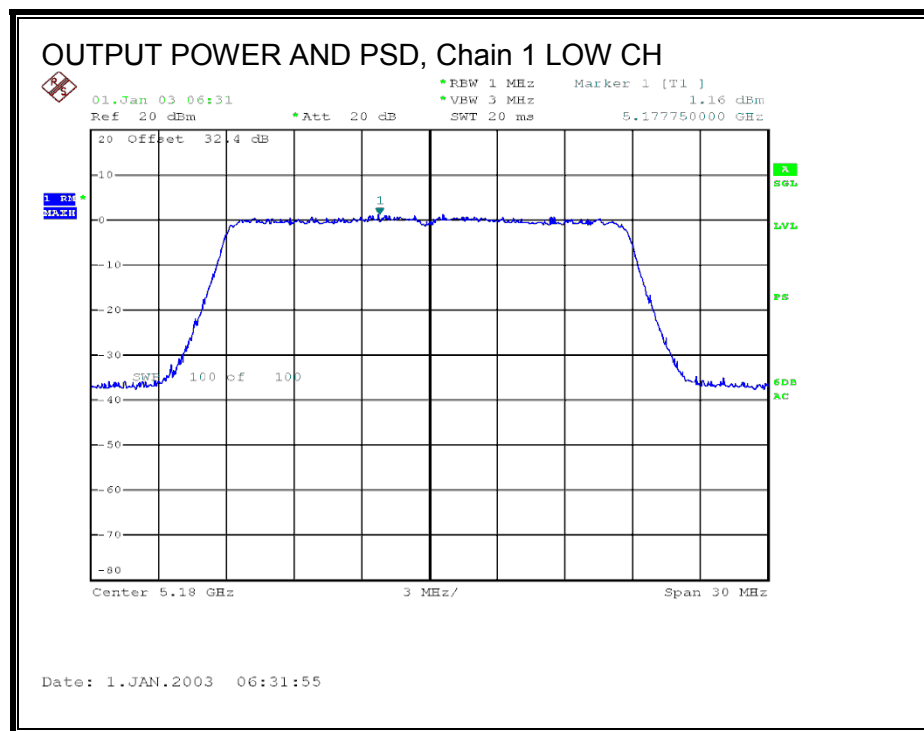
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	0.72	1.16	3.96	4.00	-0.04
Mid	5200	0.70	1.12	3.93	4.00	-0.07
High	5240	0.77	0.67	3.73	4.00	-0.27

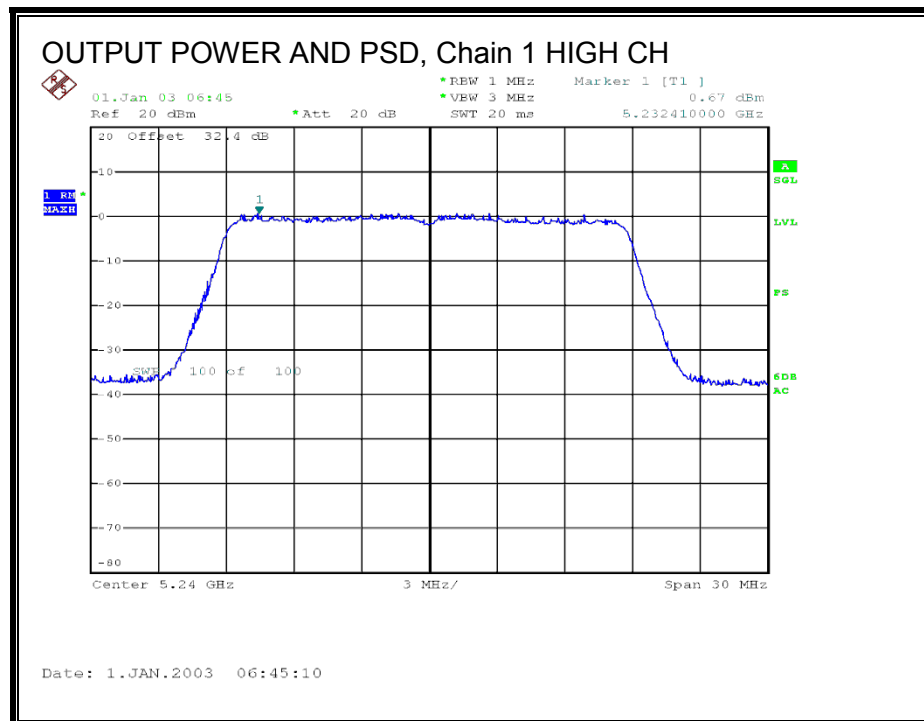
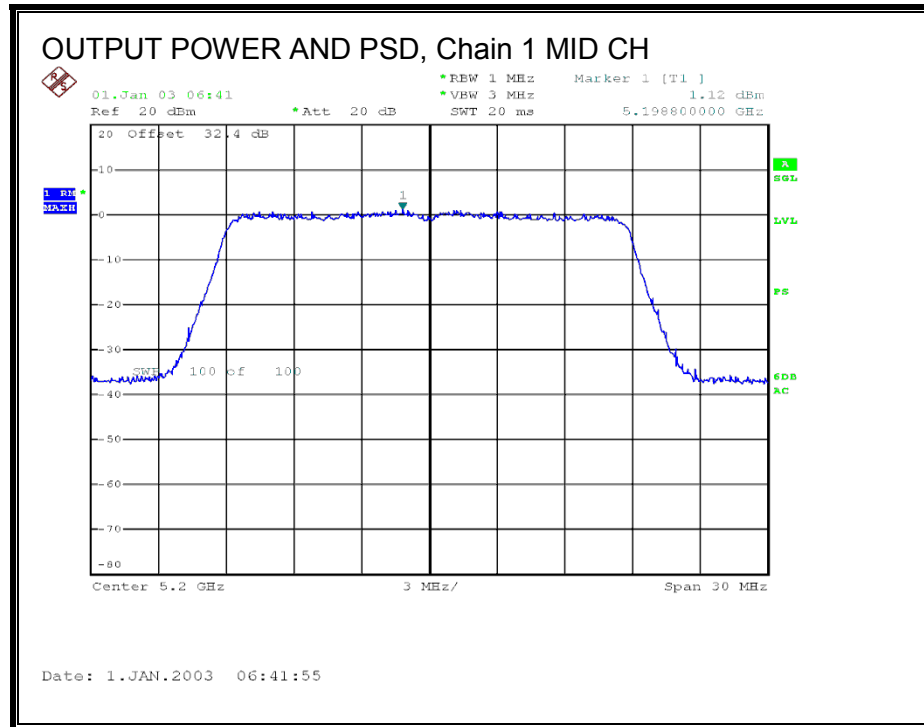
OUTPUT POWER AND PSD, Chain 0





OUTPUT POWER AND PSD, Chain 1





8.4.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

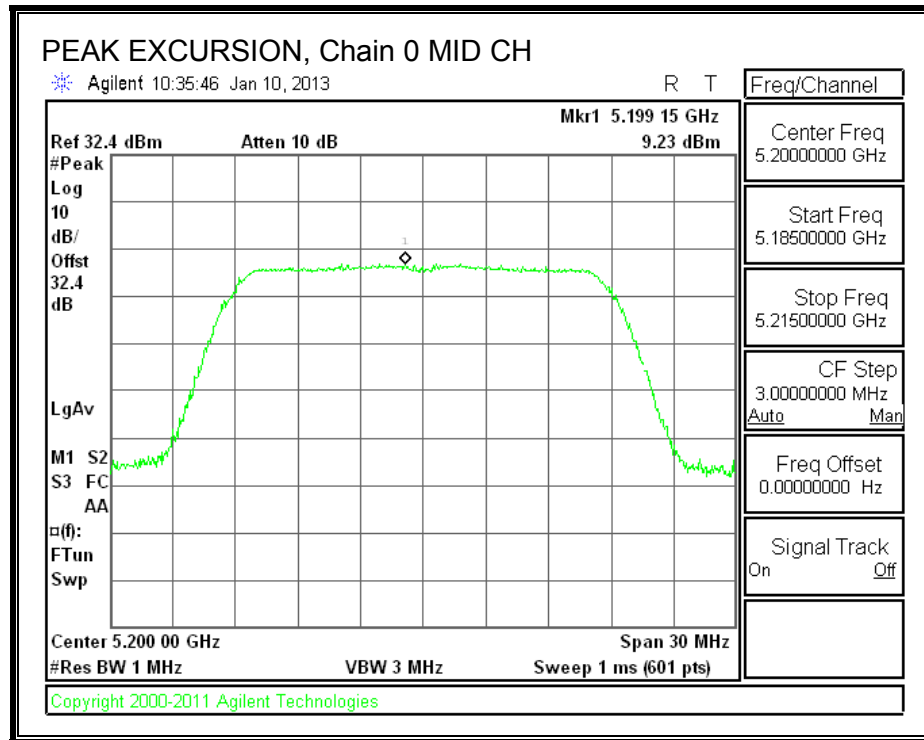
Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	9.23	0.70	0.00	8.53	13	-4.47

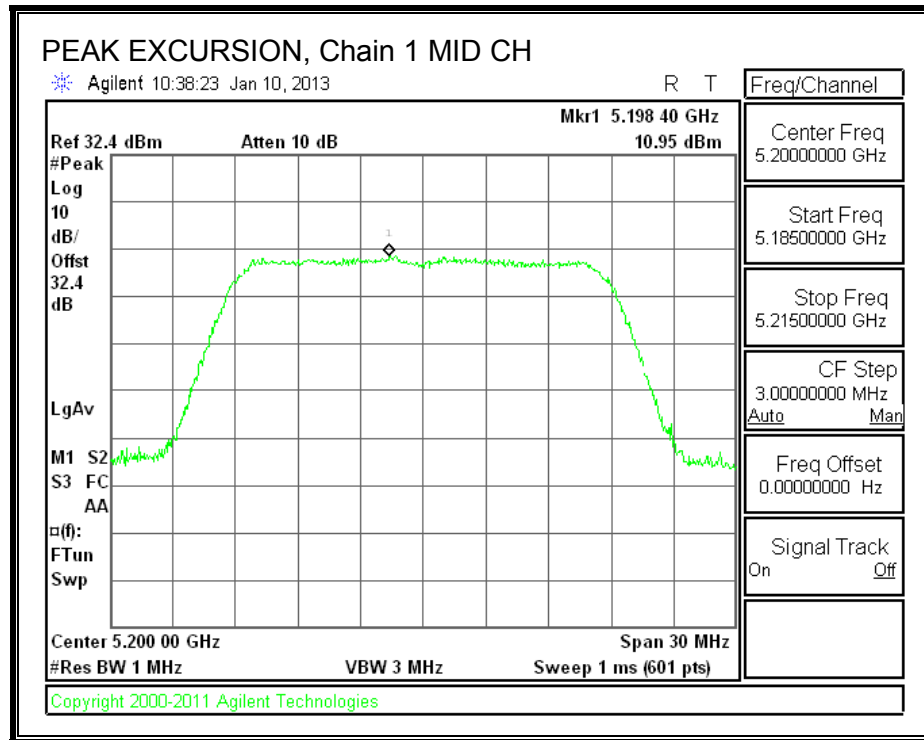
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	10.95	1.12	0.00	9.83	13	-3.17

PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



8.5. 802.11n HT20 CDD 3TX MODE IN THE 5.2 GHz BAND

8.5.1. 26 dB BANDWIDTH

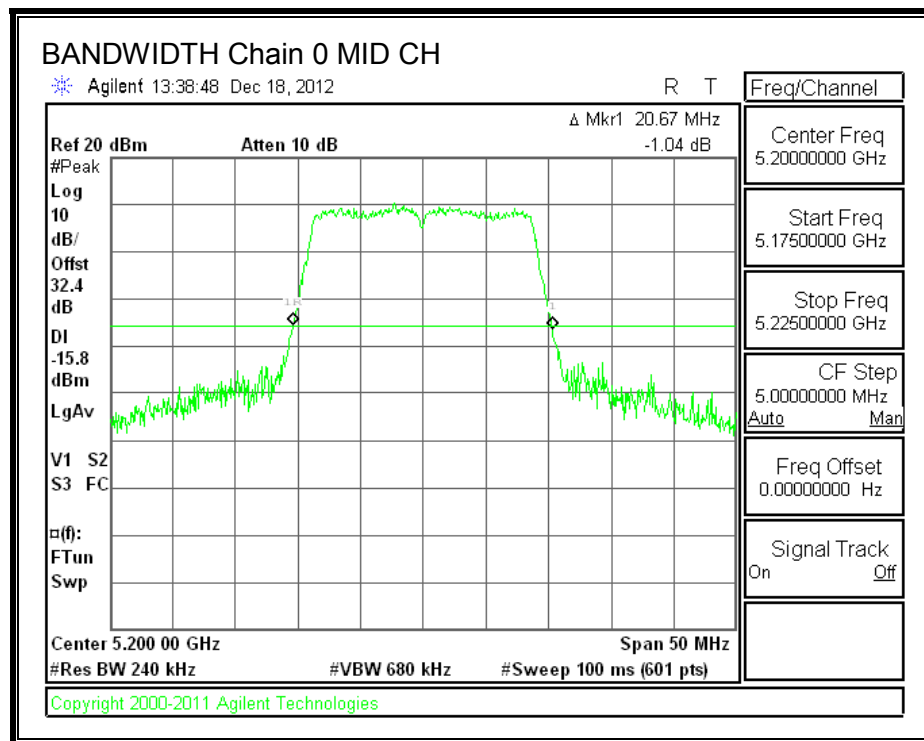
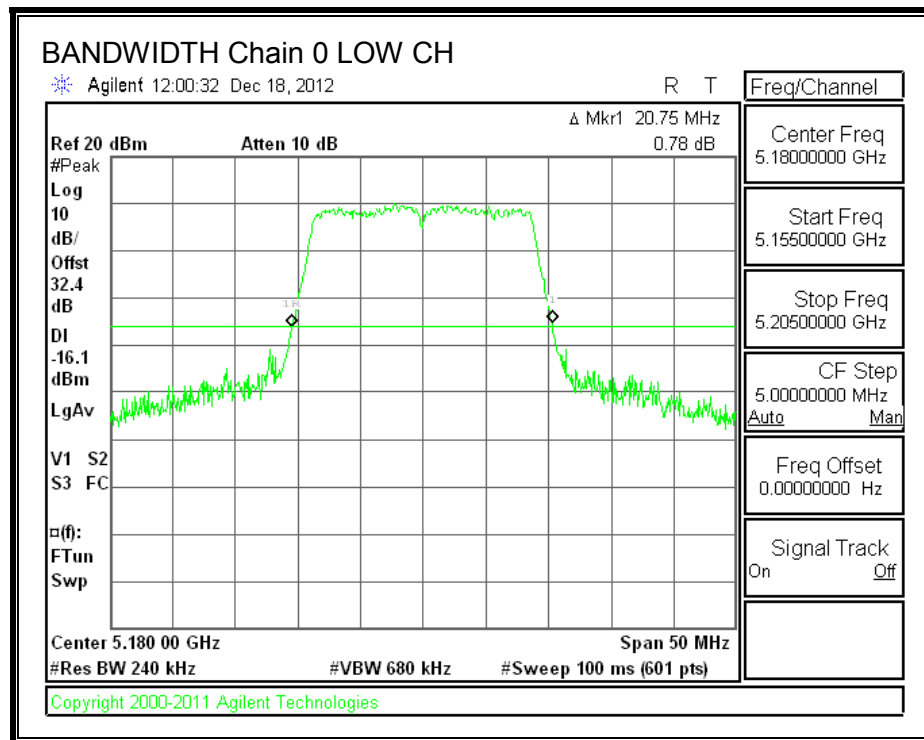
LIMITS

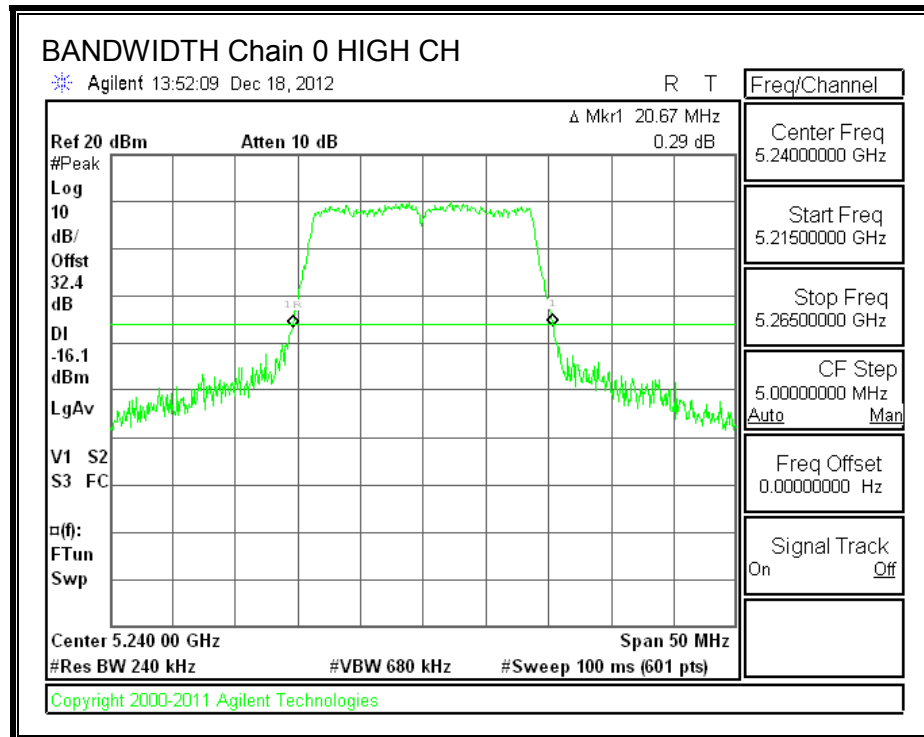
None; for reporting purposes only.

RESULTS

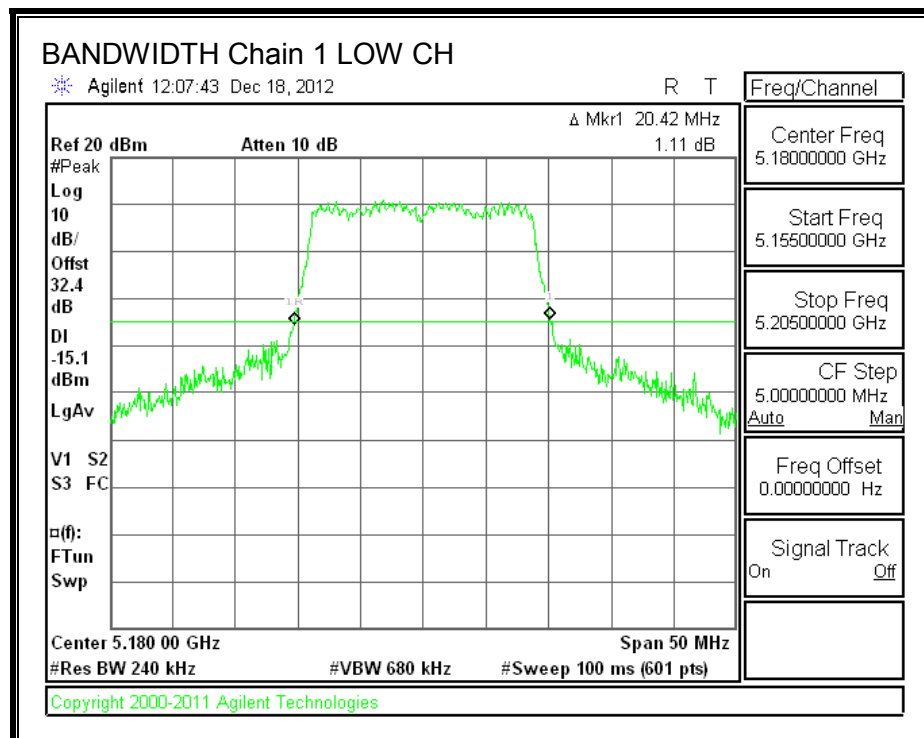
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	20.75	20.42	20.67
Mid	5200	20.67	20.50	20.67
High	5240	20.67	20.50	20.92

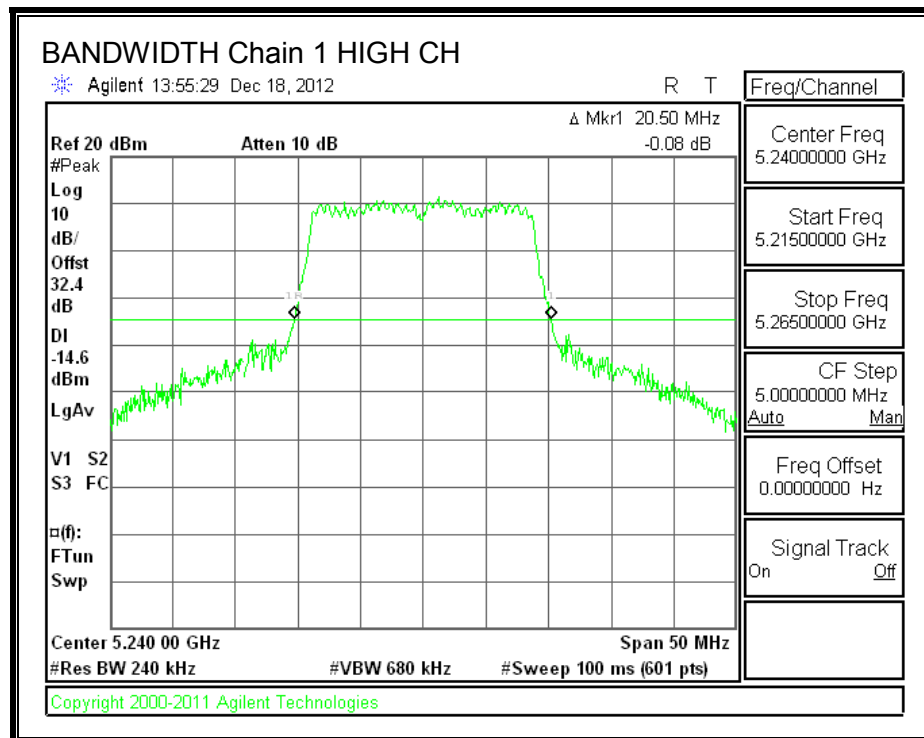
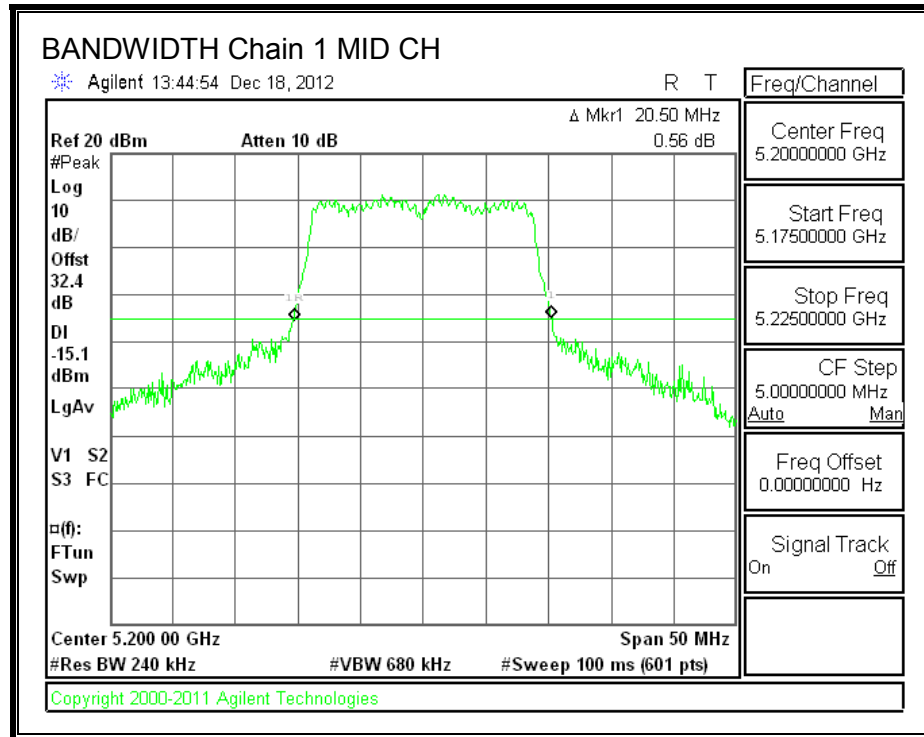
26 dB BANDWIDTH, Chain 0



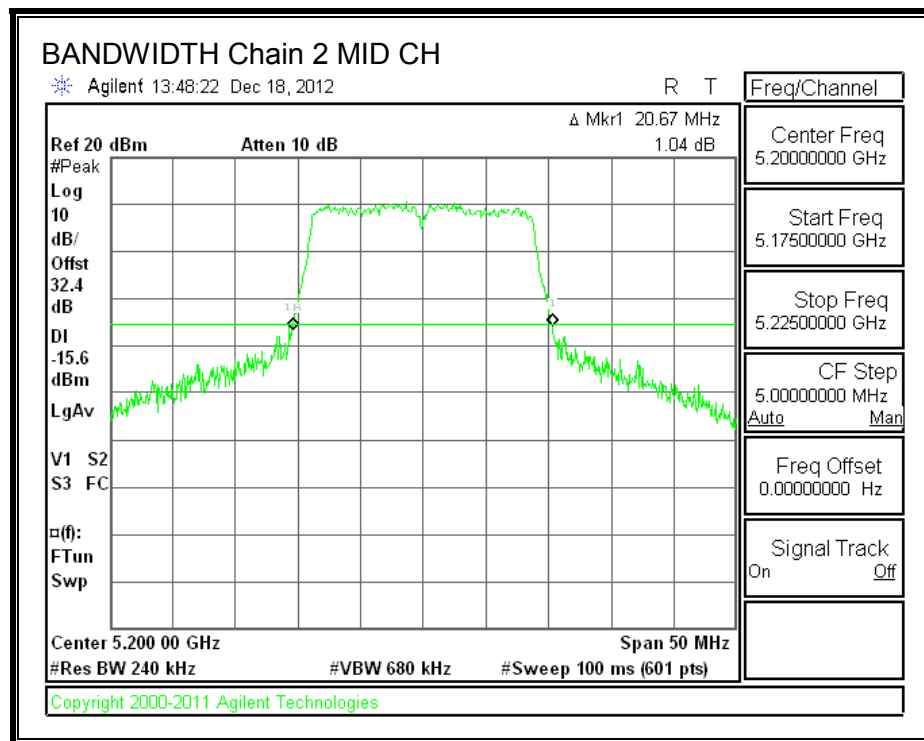
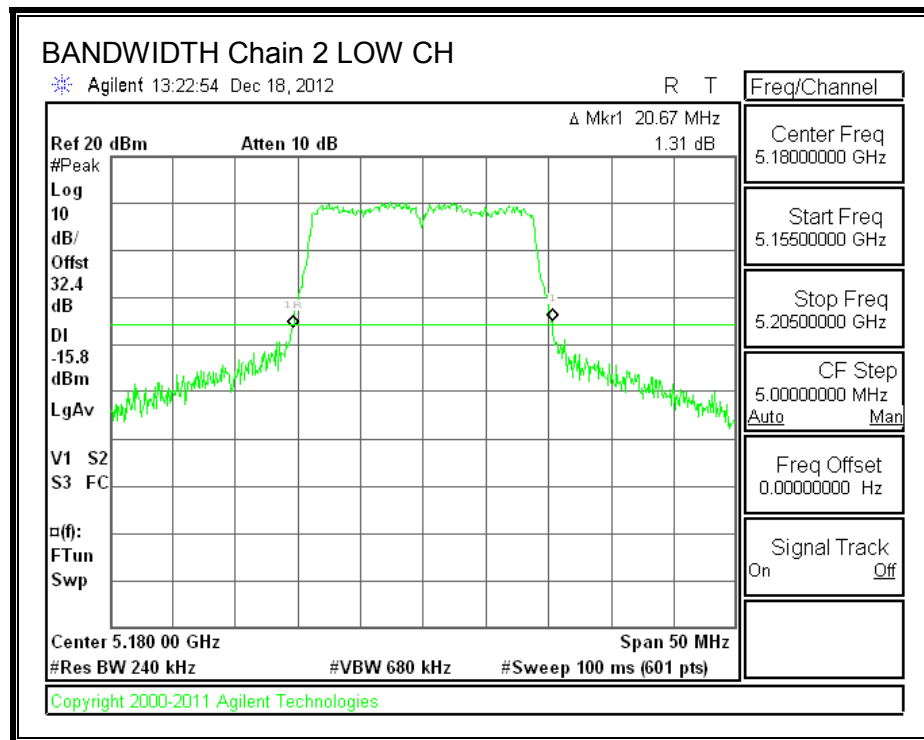


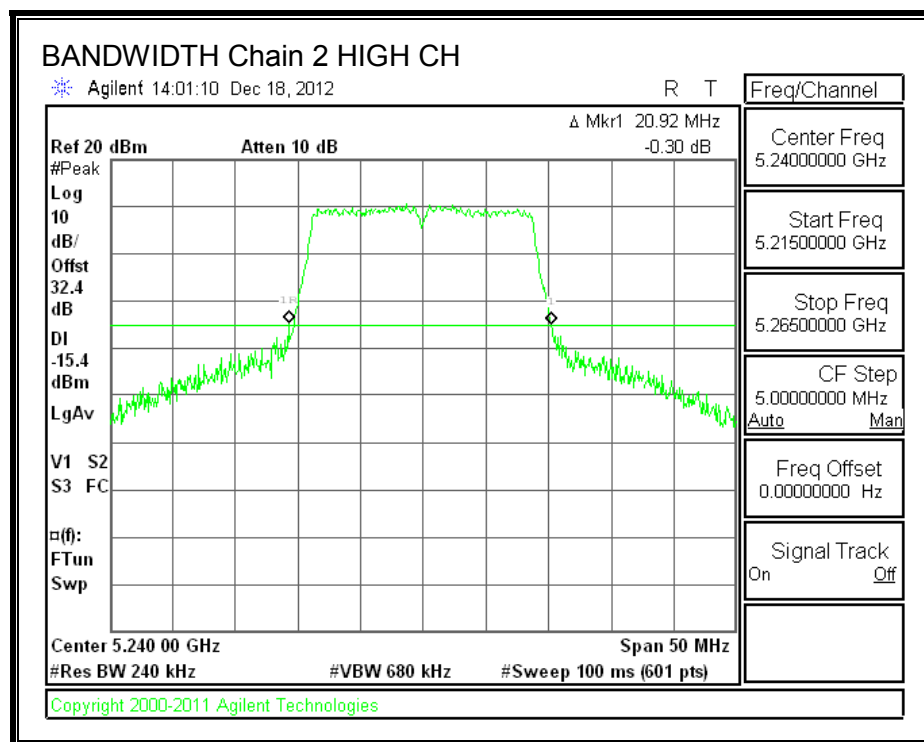
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.5.2. 99% BANDWIDTH

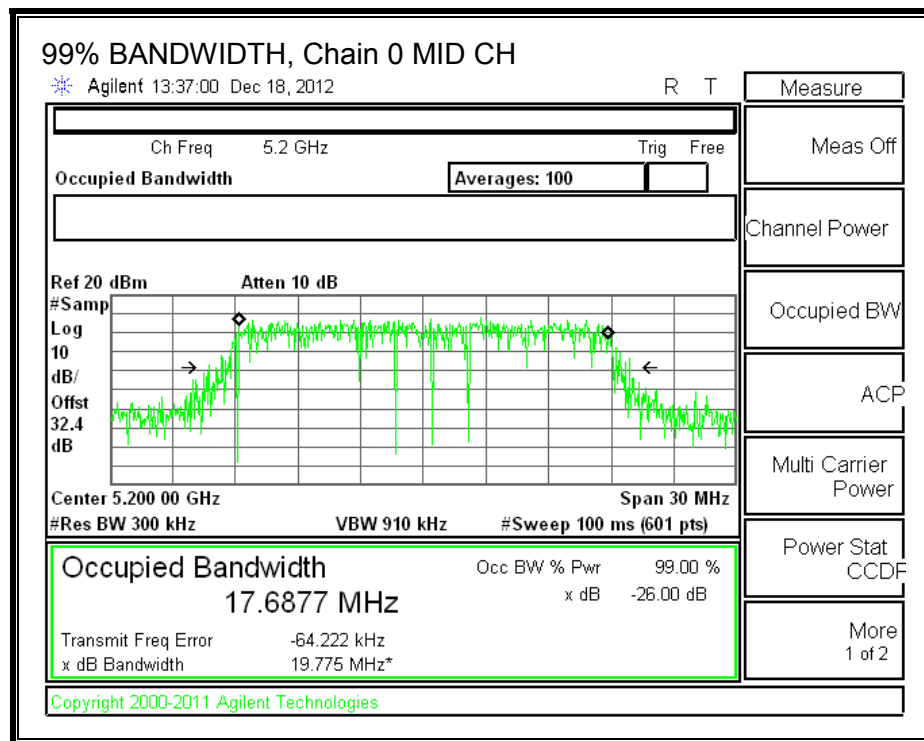
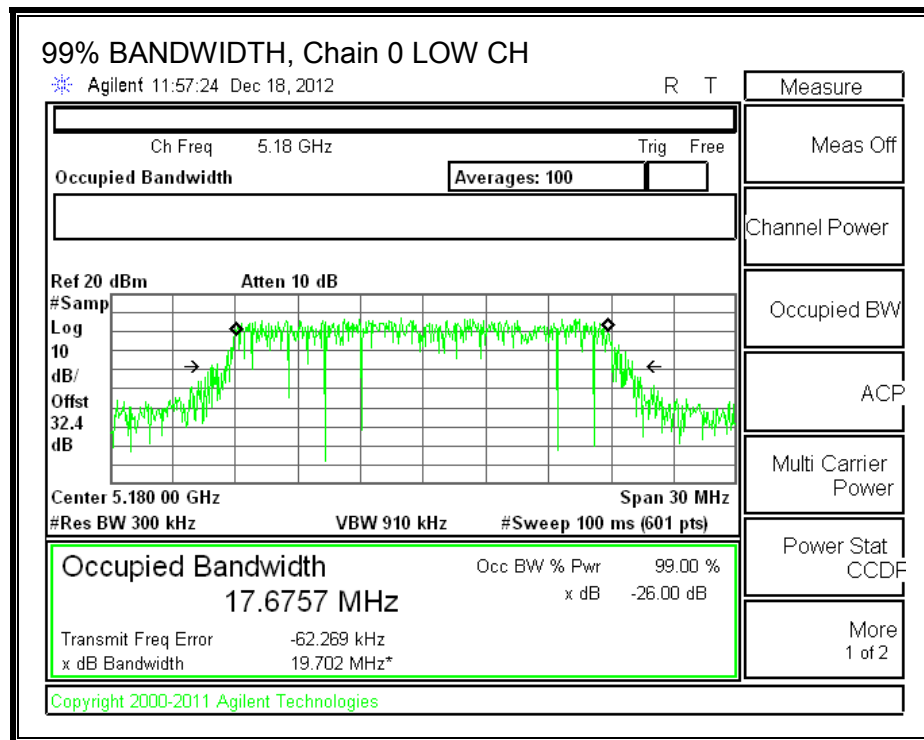
LIMITS

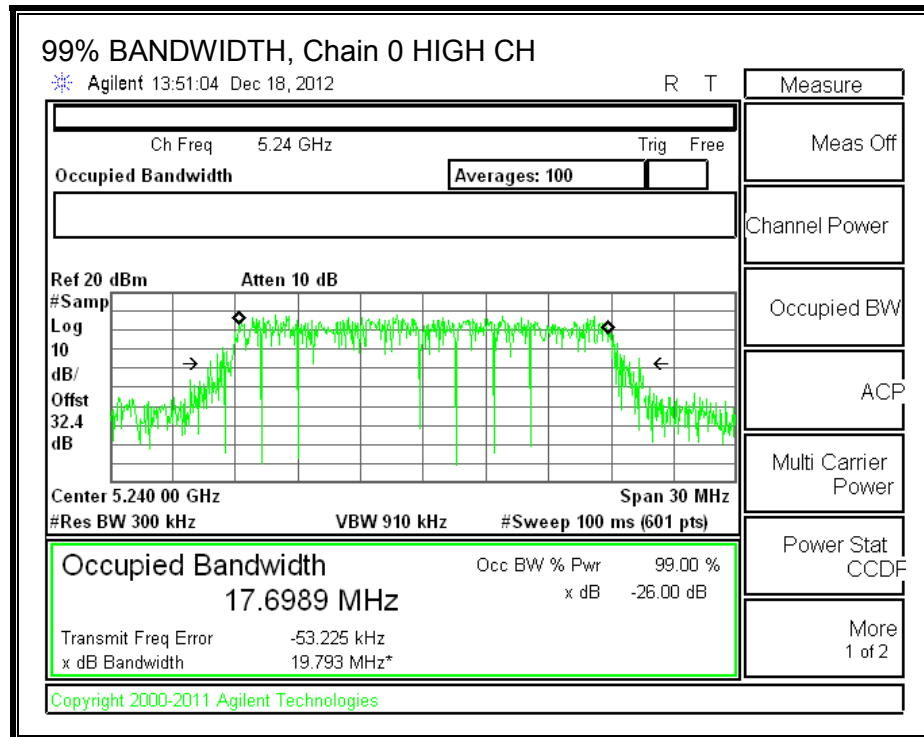
None; for reporting purposes only.

RESULTS

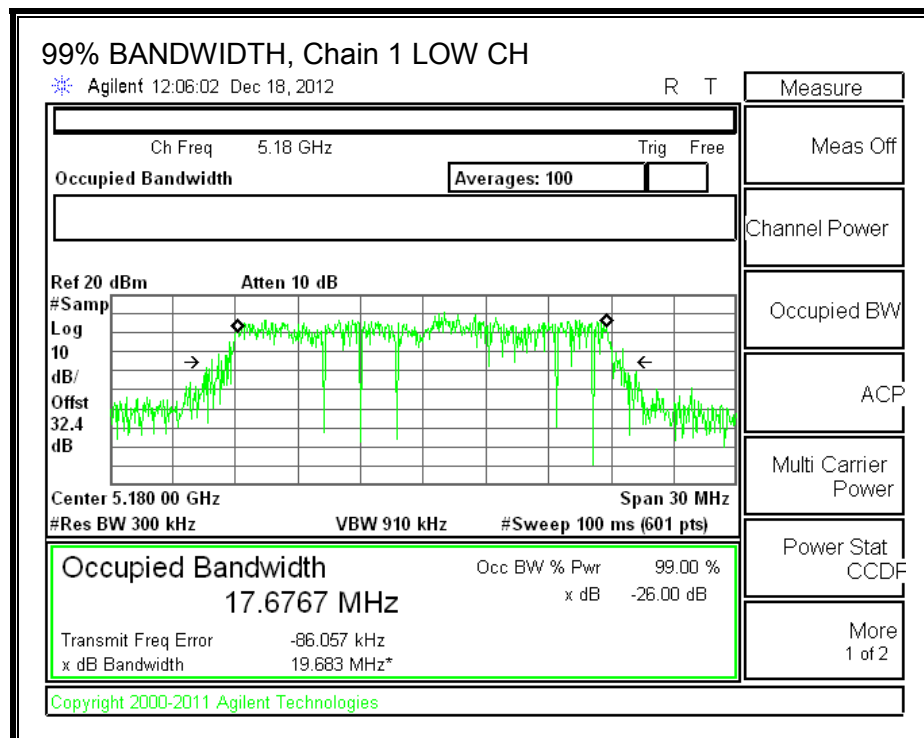
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.6757	17.6767	17.6812
Mid	5200	17.6877	17.6801	17.6888
High	5240	17.6989	17.6850	17.6956

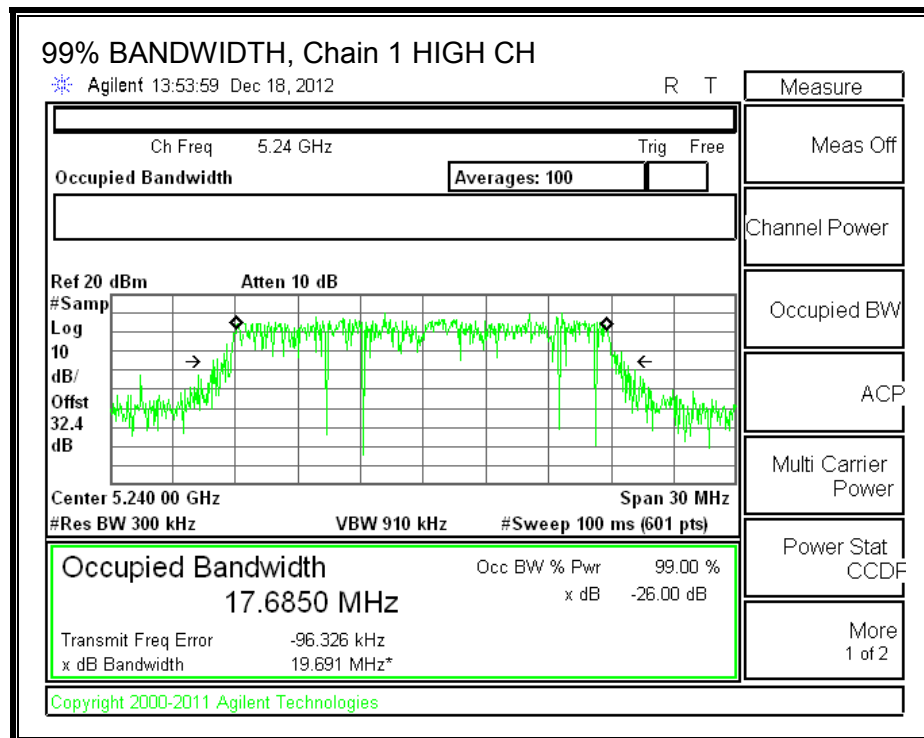
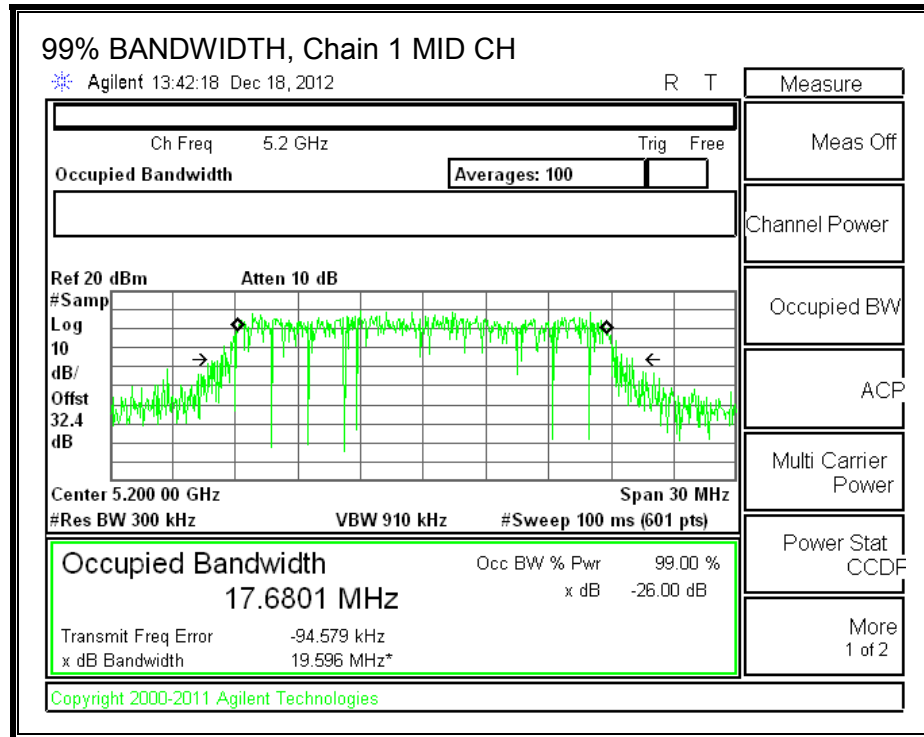
99% BANDWIDTH, Chain 0



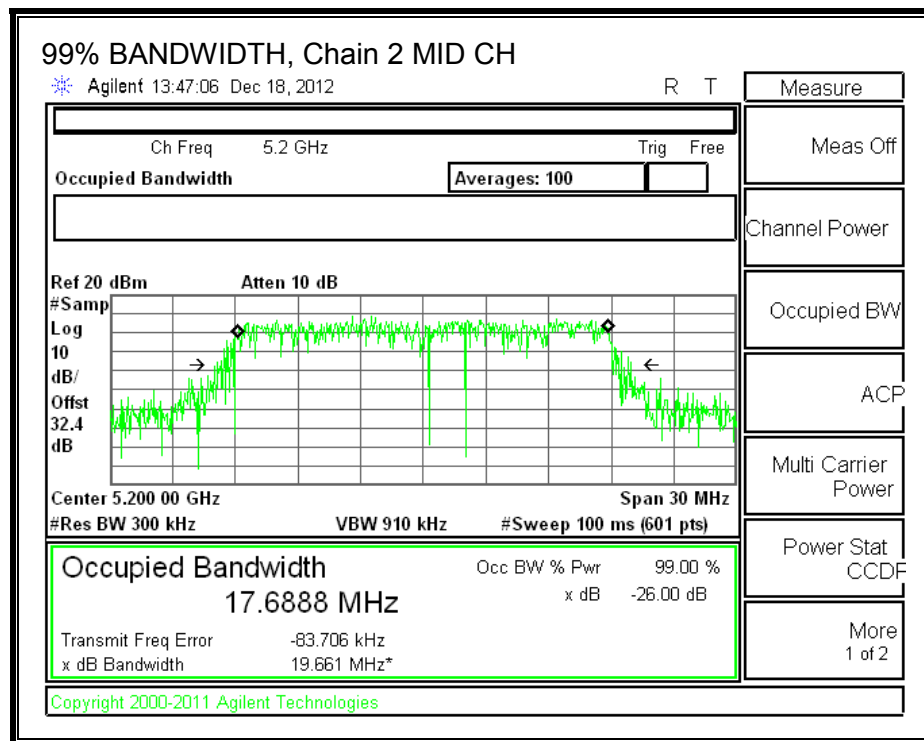
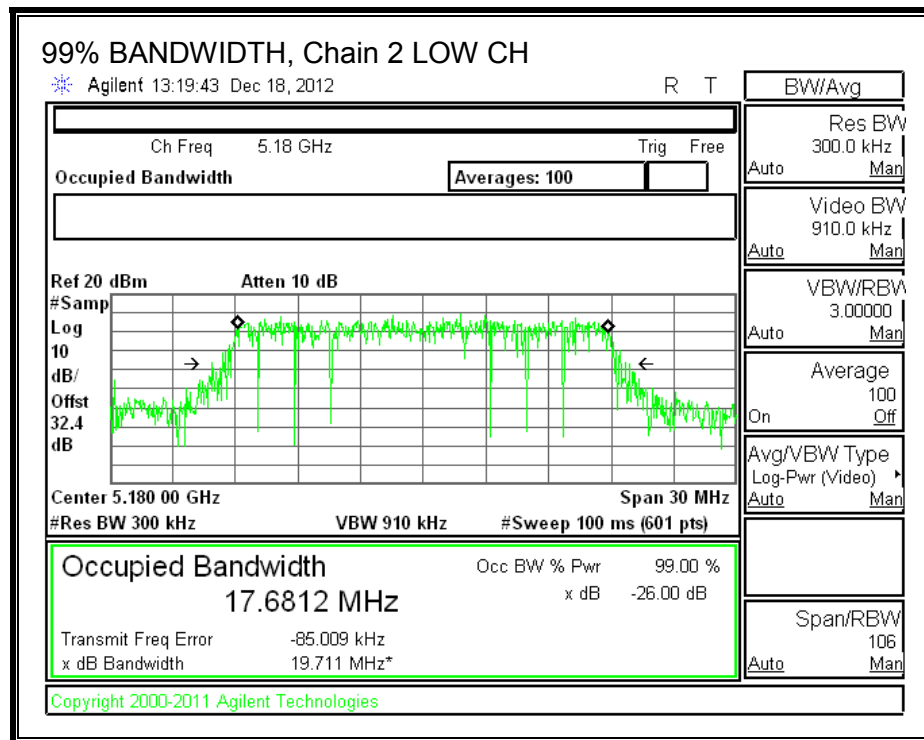


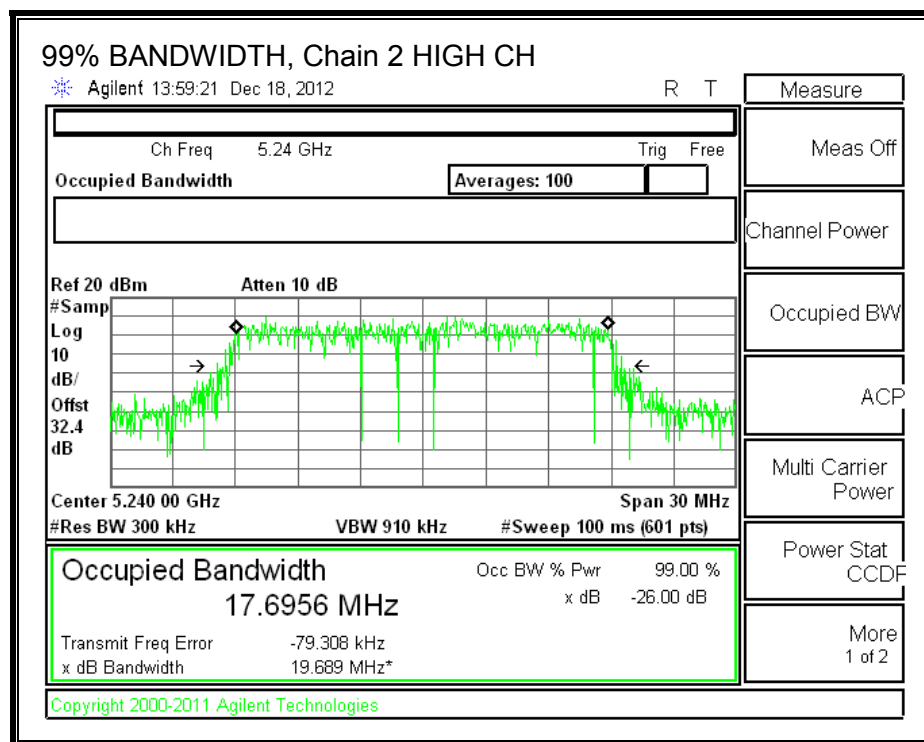
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.5.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Low	5180	20.42	17.6757	7.07	2.33
Mid	5200	20.50	17.6801	7.07	2.33
High	5240	20.50	17.6850	7.07	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5180	17.00	22.47	20.14	17.00	2.93	10.00	2.93
Mid	5200	17.00	22.47	20.14	17.00	2.93	10.00	2.93
High	5240	17.00	22.48	20.15	17.00	2.93	10.00	2.93

Duty Cycle CF (dB)	0.00
--------------------	------

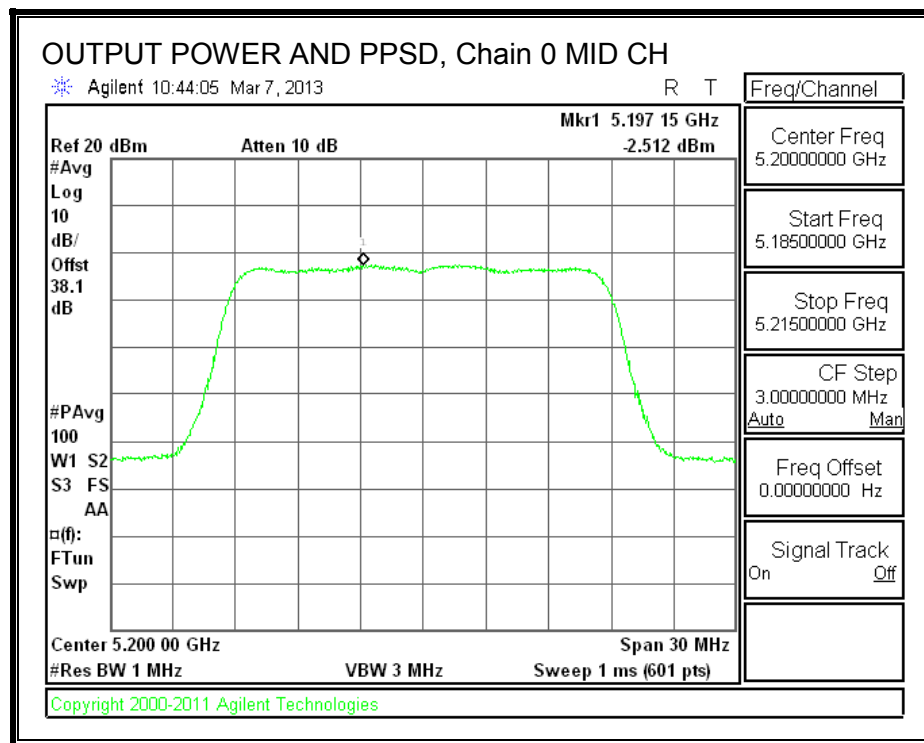
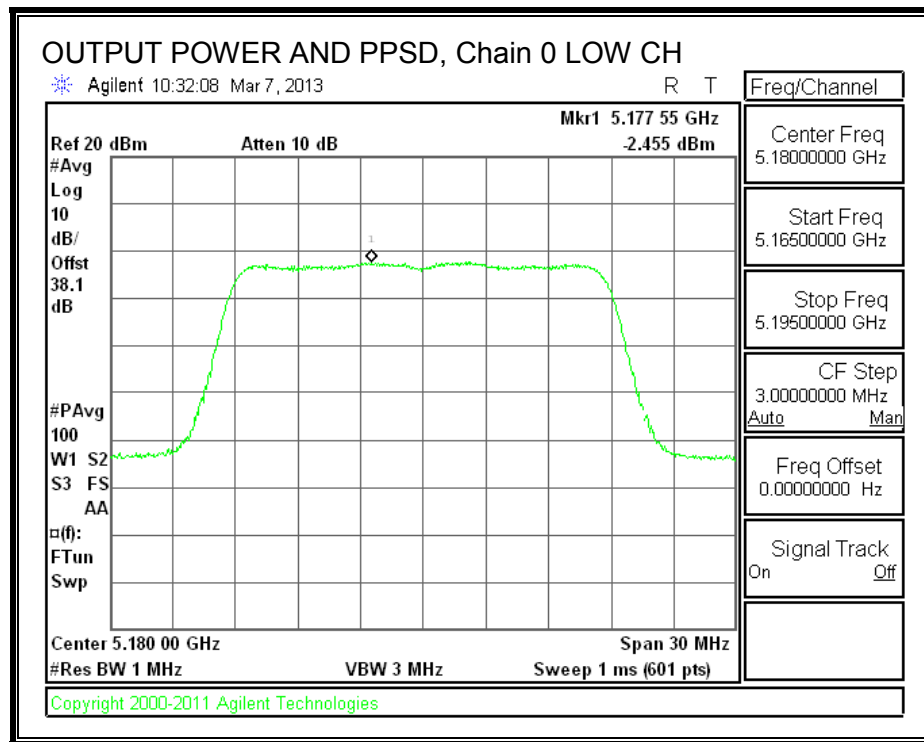
Output Power Results

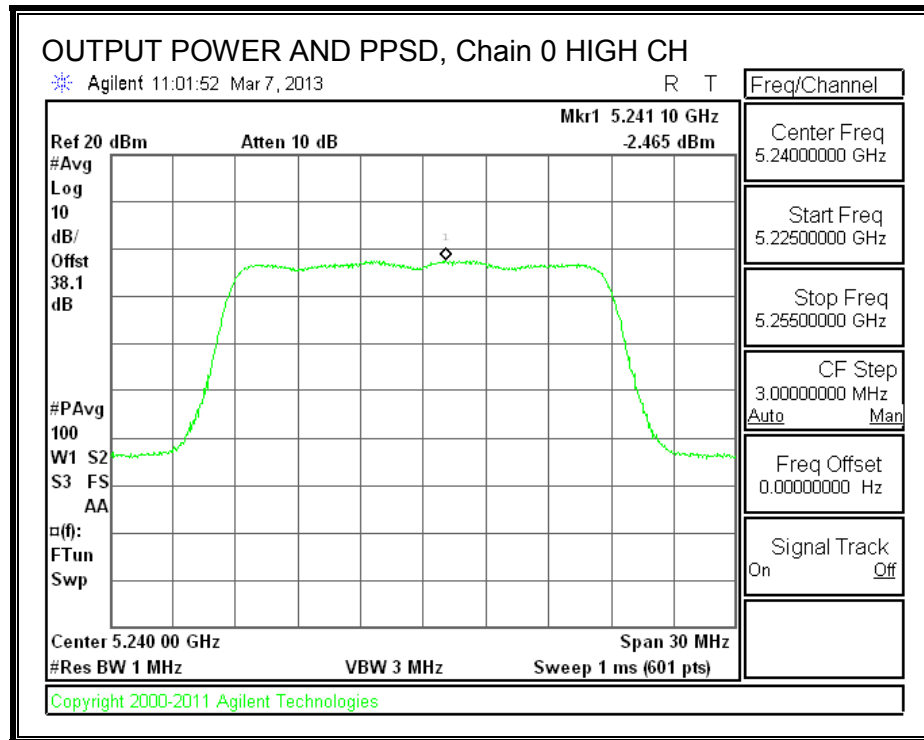
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	7.10	7.10	7.40	11.97	17.00	-5.03
Mid	5200	7.06	7.30	7.42	12.03	17.00	-4.97
High	5240	7.15	7.31	7.66	12.15	17.00	-4.85

PSD Results

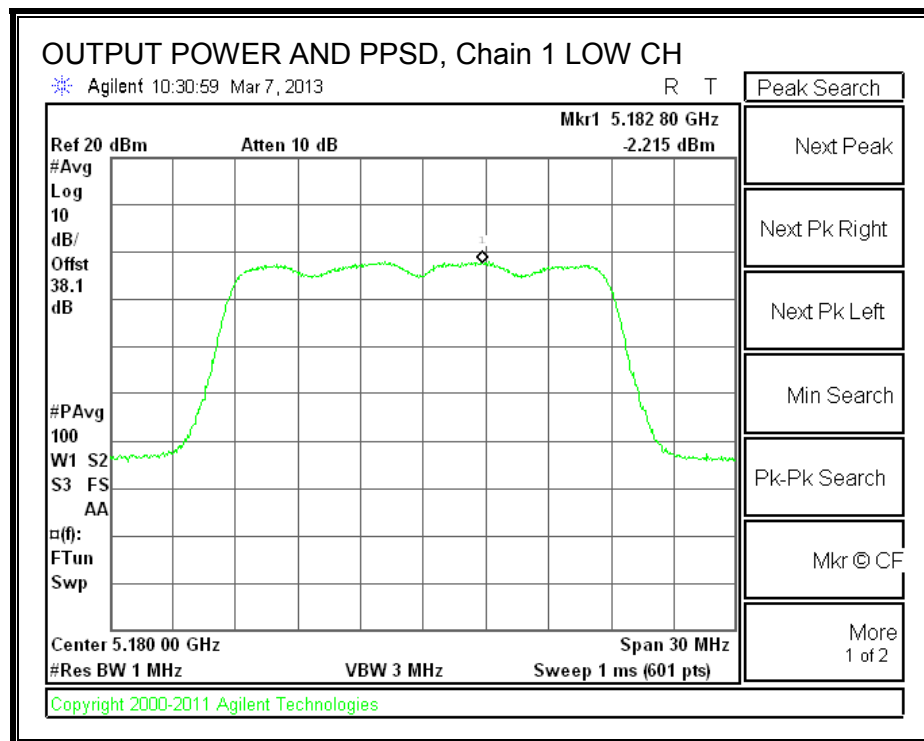
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-2.455	-2.215	-1.661	2.67	2.93	-0.26
Mid	5200	-2.512	-2.098	-2.077	2.55	2.93	-0.38
High	5240	-2.465	-1.885	-1.989	2.67	2.93	-0.26

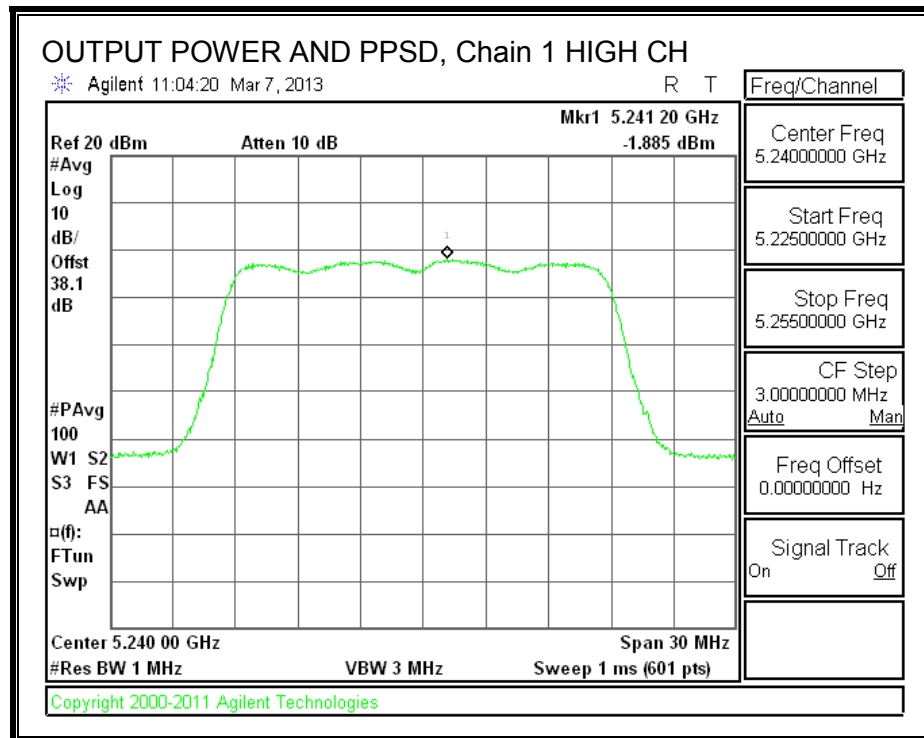
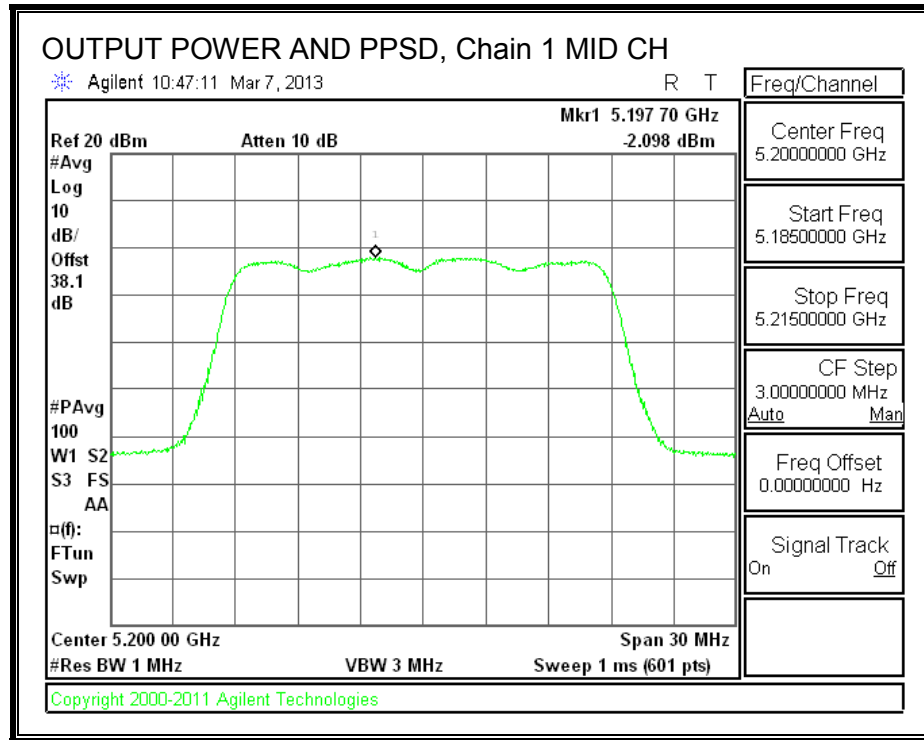
OUTPUT POWER AND PPSD, Chain 0



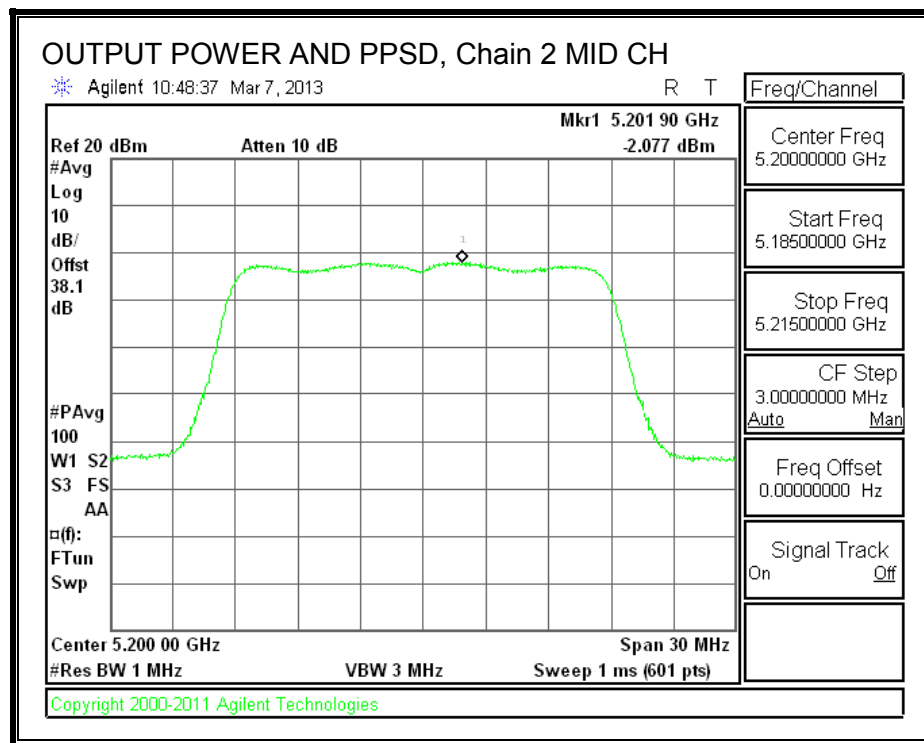
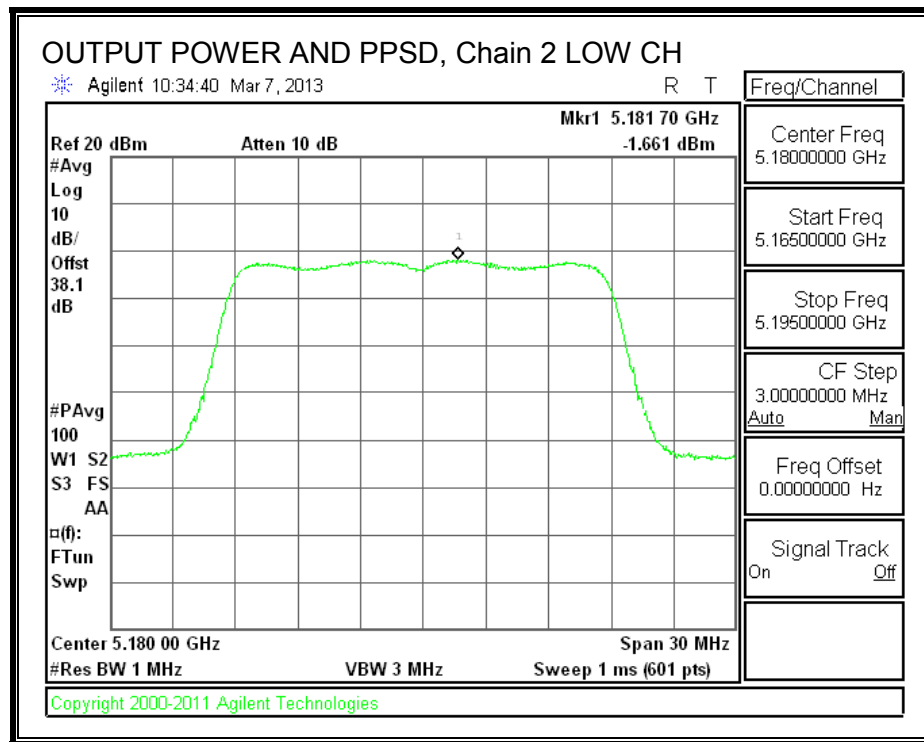


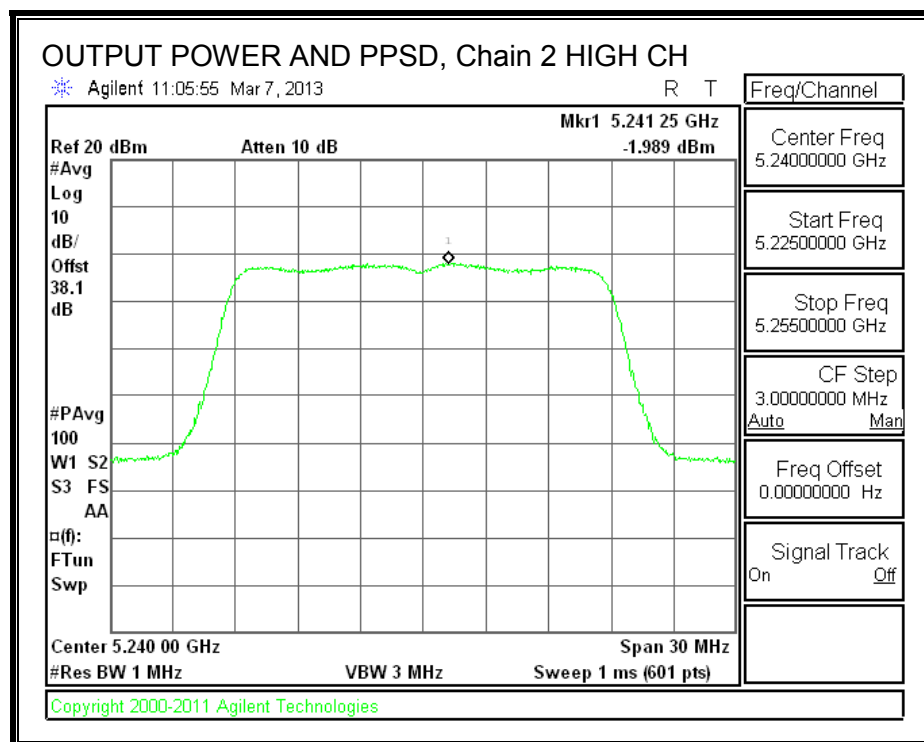
OUTPUT POWER AND PPSD, Chain 1





OUTPUT POWER AND PPSD, Chain 2





8.5.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	6.069	-2.512	0.00	8.58	13	-4.42

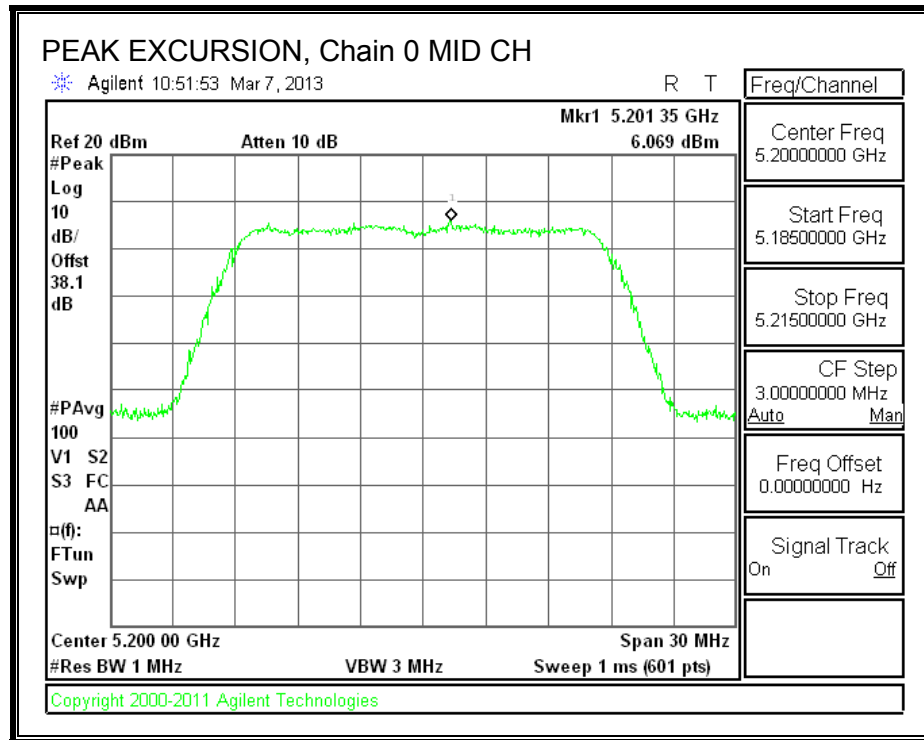
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	6.952	-2.098	0.00	9.05	13	-3.95

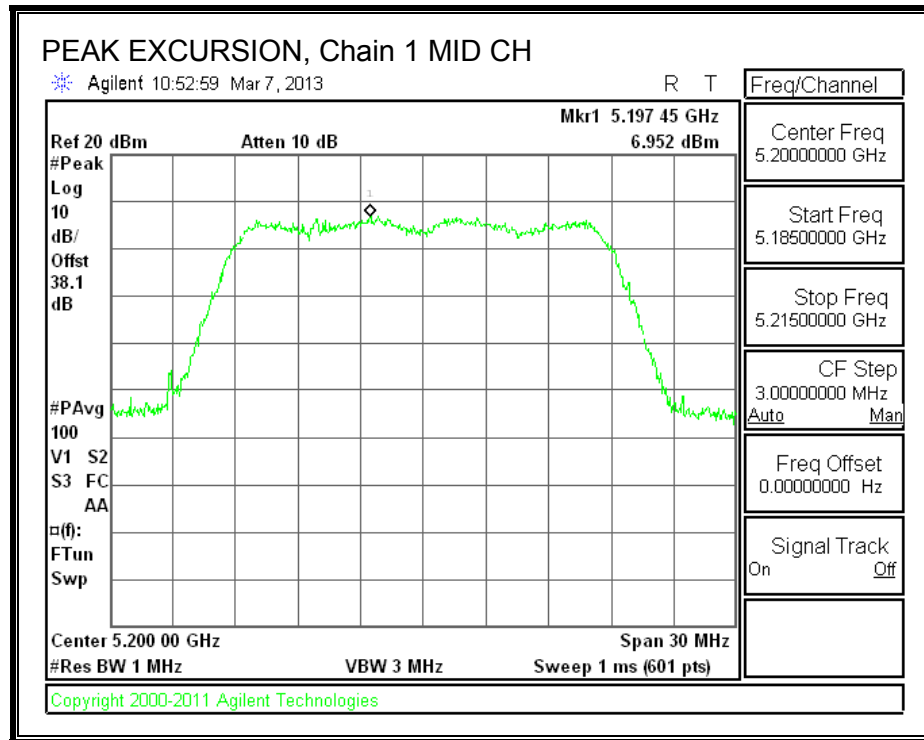
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.105	-2.077	0.00	10.18	13	-2.82

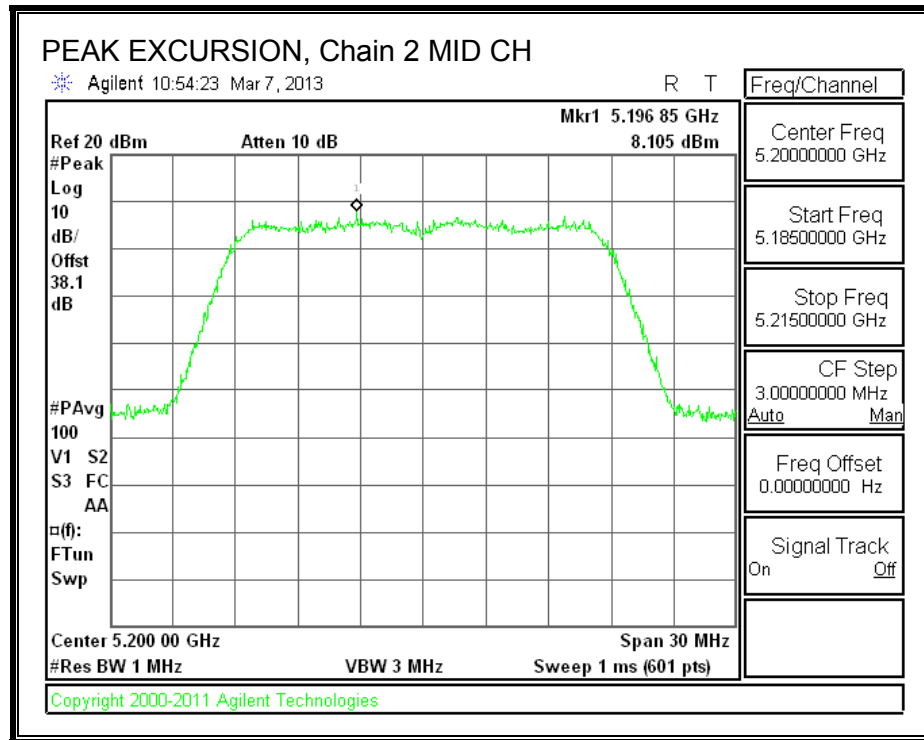
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.6. 802.11n HT20 BF 3TX MODE IN THE 5.2 GHz BAND

Covered by testing HT20 CDD 3TX mode, the power per chain used for HT20 CDD 3TX mode is the same power per chain that will be used for HT20 BF 3TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.6.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5180	20.42	17.6757	7.07
Mid	5200	20.50	17.6801	7.07
High	5240	20.50	17.6850	7.07

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Low	5180	15.93	22.47	15.40	15.40
Mid	5200	15.93	22.47	15.40	15.40
High	5240	15.93	22.48	15.41	15.41

Duty Cycle CF (dB)	0.00	
--------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	7.10	7.10	7.40	11.97	15.40	-3.43
Mid	5200	7.06	7.30	7.42	12.03	15.40	-3.37
High	5240	7.15	7.31	7.66	12.15	15.41	-3.26

8.7. 802.11n HT20 STBC 3TX MODE IN THE 5.2 GHz BAND

8.7.1. 26 dB BANDWIDTH

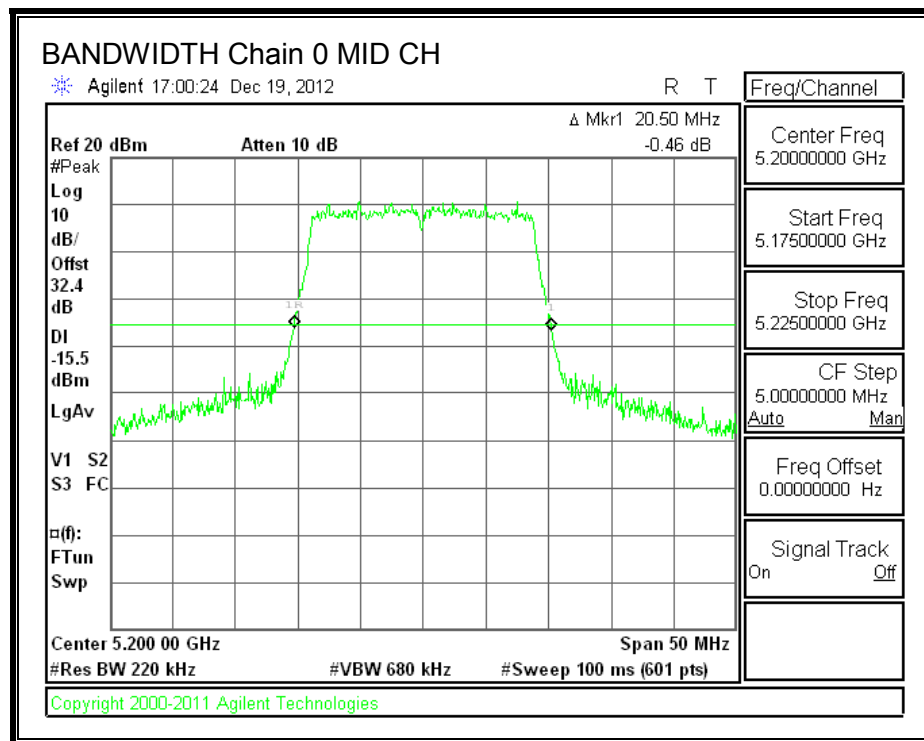
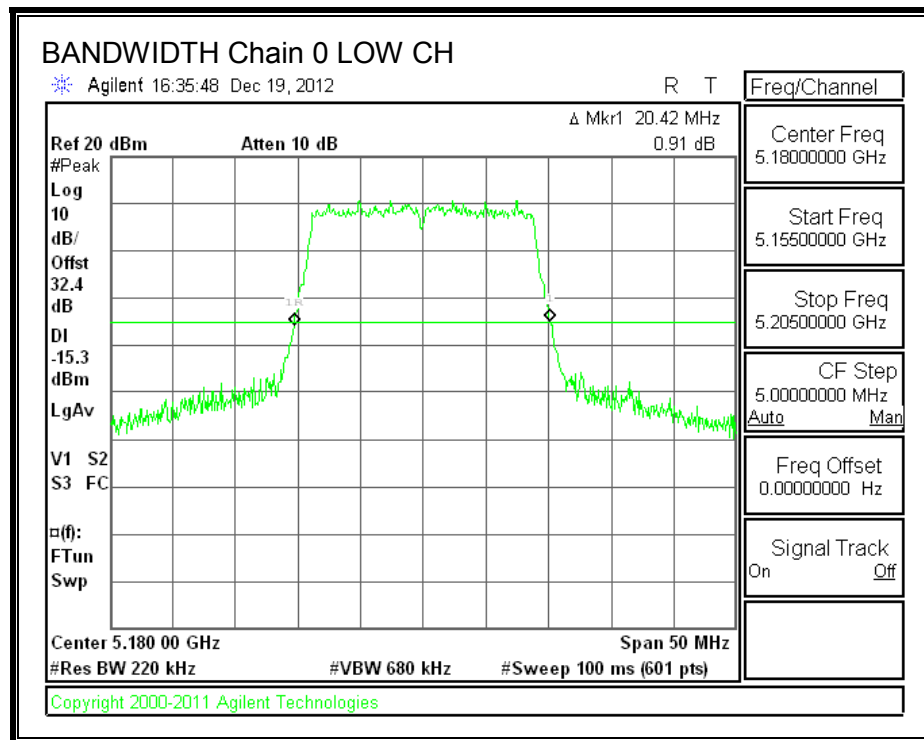
LIMITS

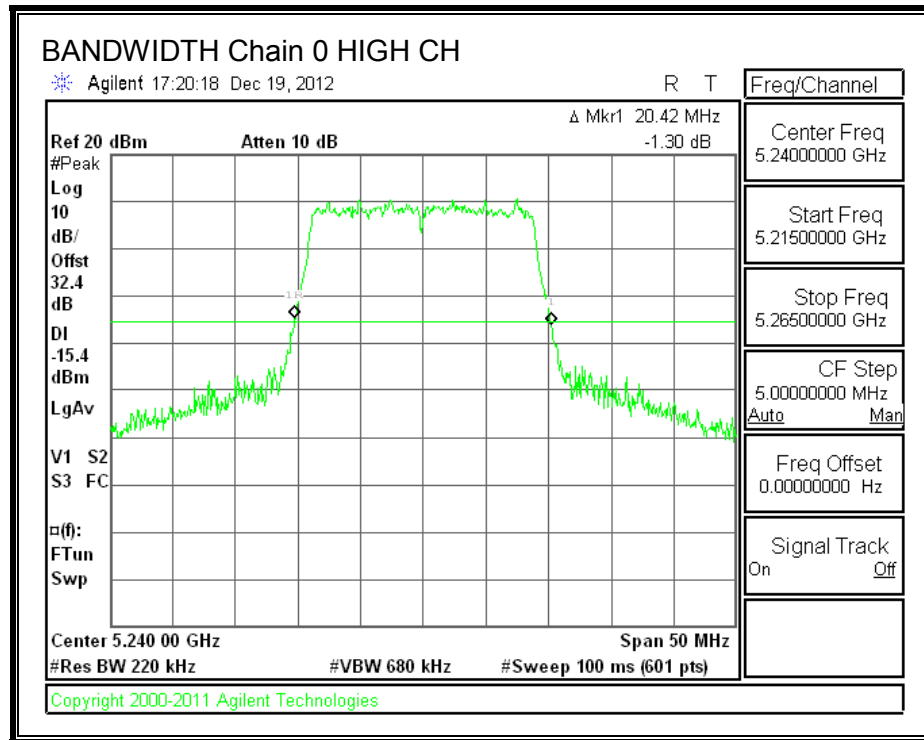
None; for reporting purposes only.

RESULTS

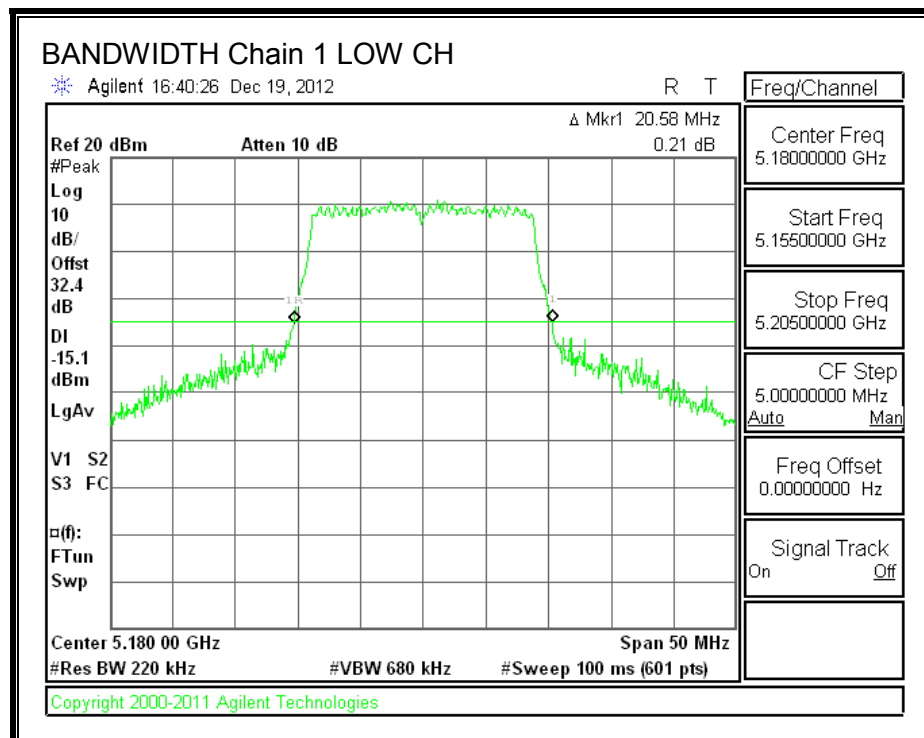
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	20.42	20.58	20.33
Mid	5200	20.50	20.67	20.42
High	5240	20.42	21.00	20.42

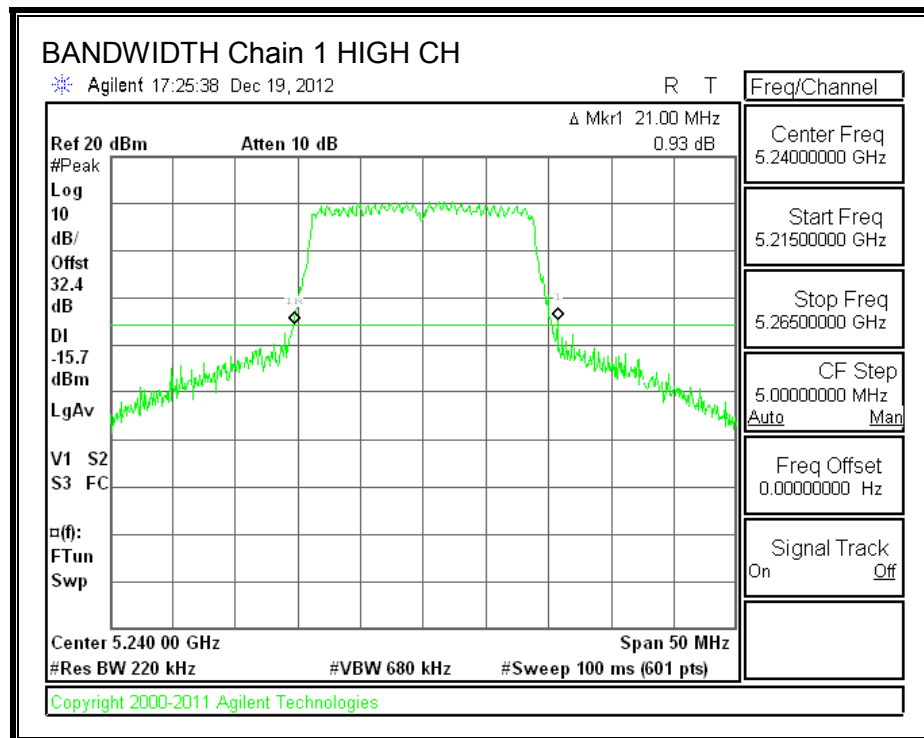
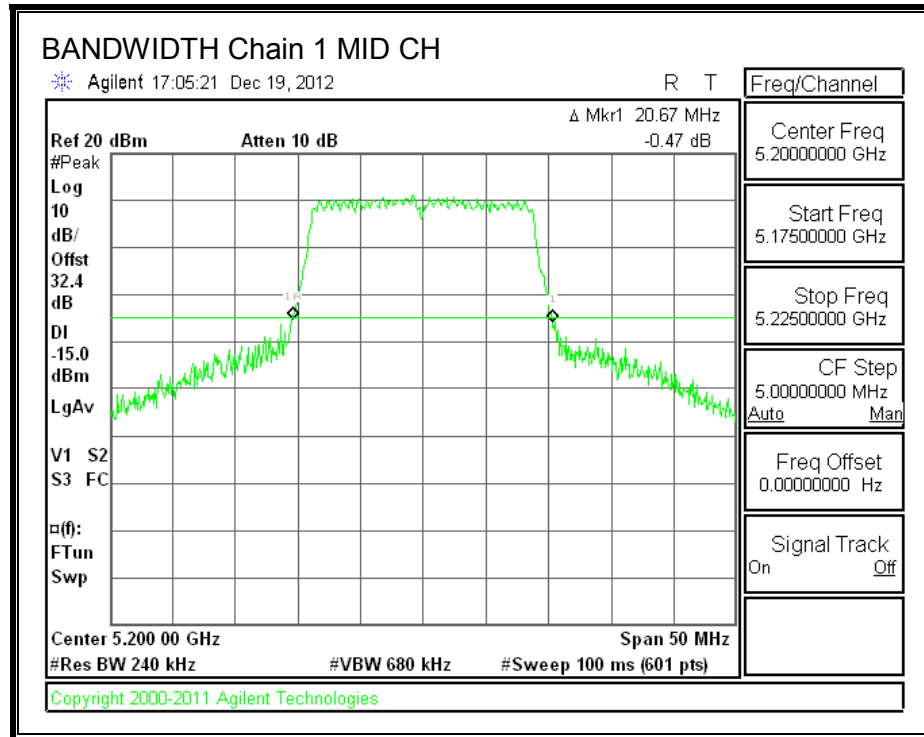
26 dB BANDWIDTH, Chain 0



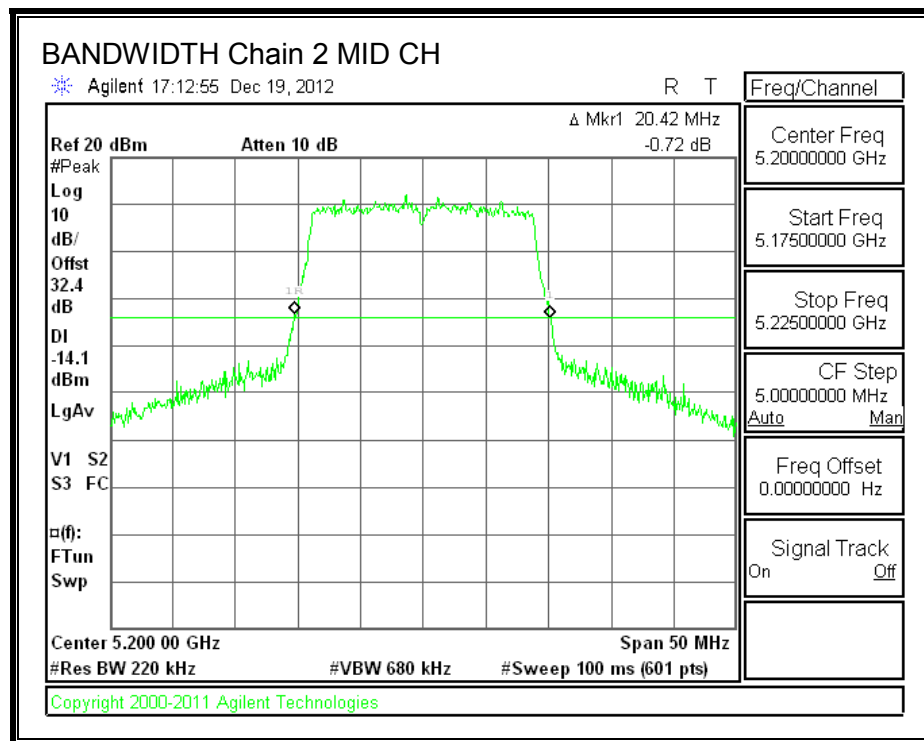
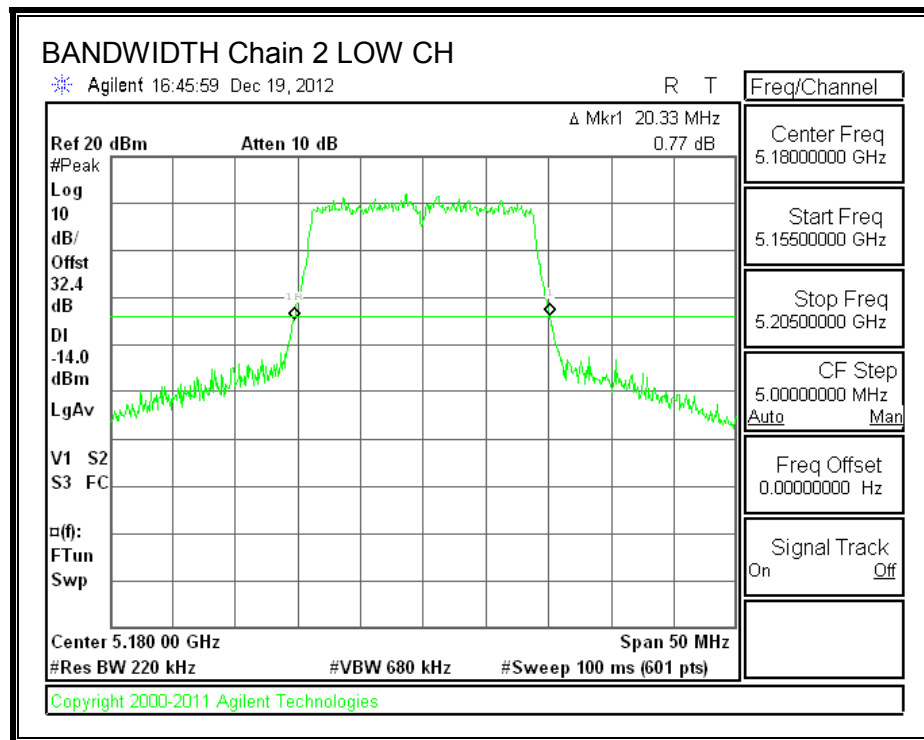


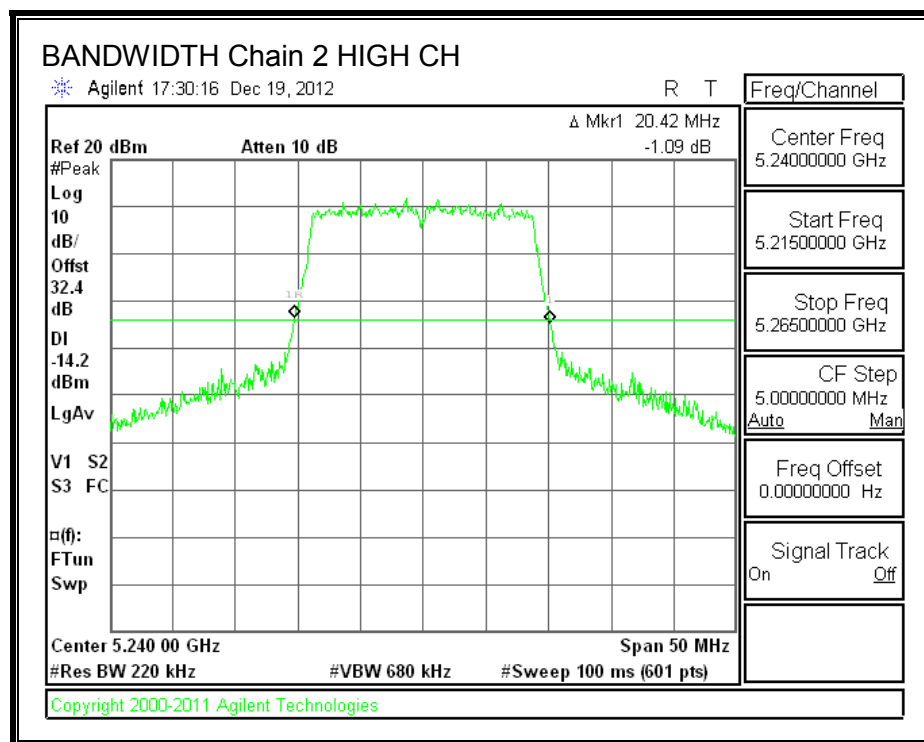
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.7.2. 99% BANDWIDTH

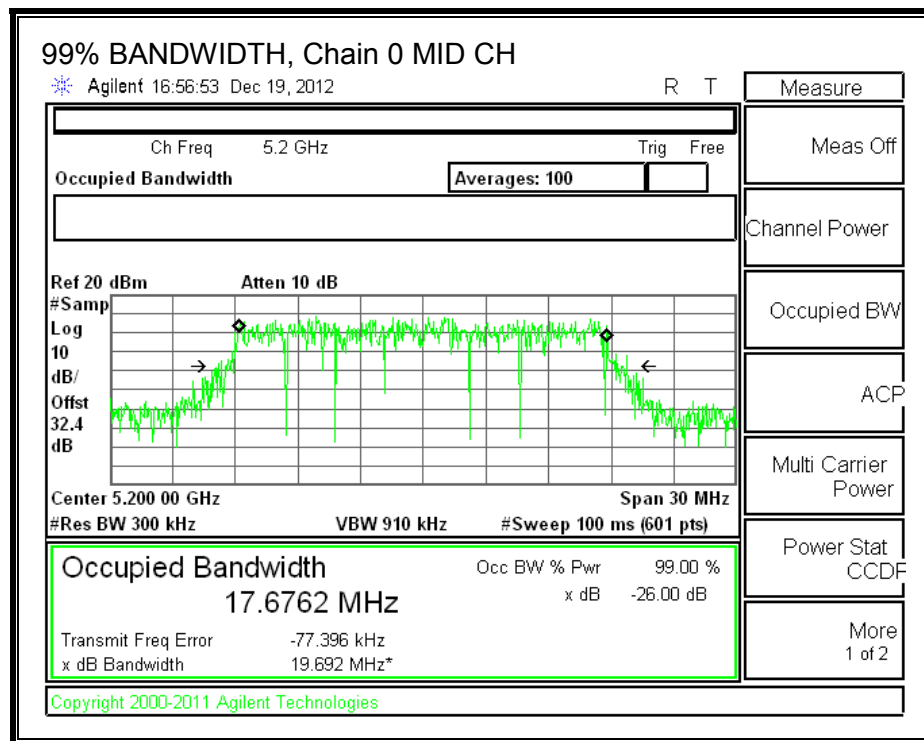
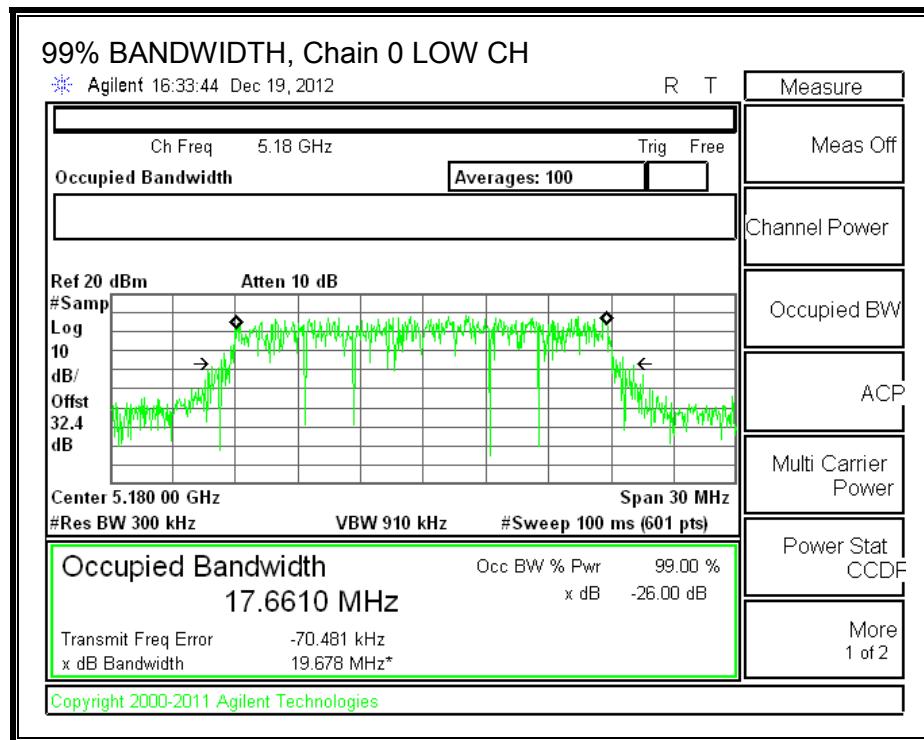
LIMITS

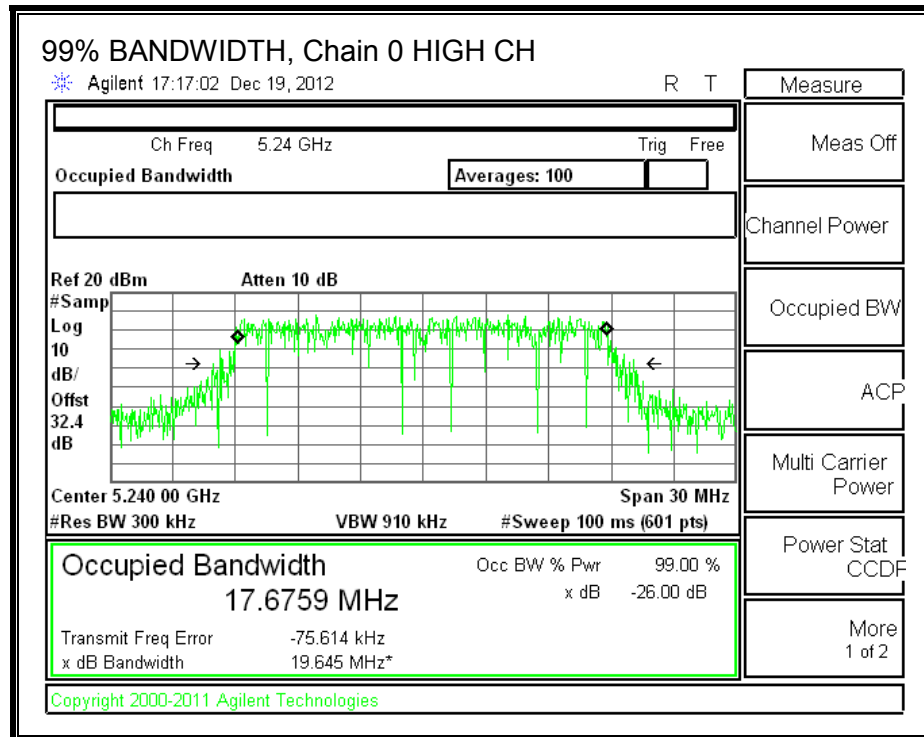
None; for reporting purposes only.

RESULTS

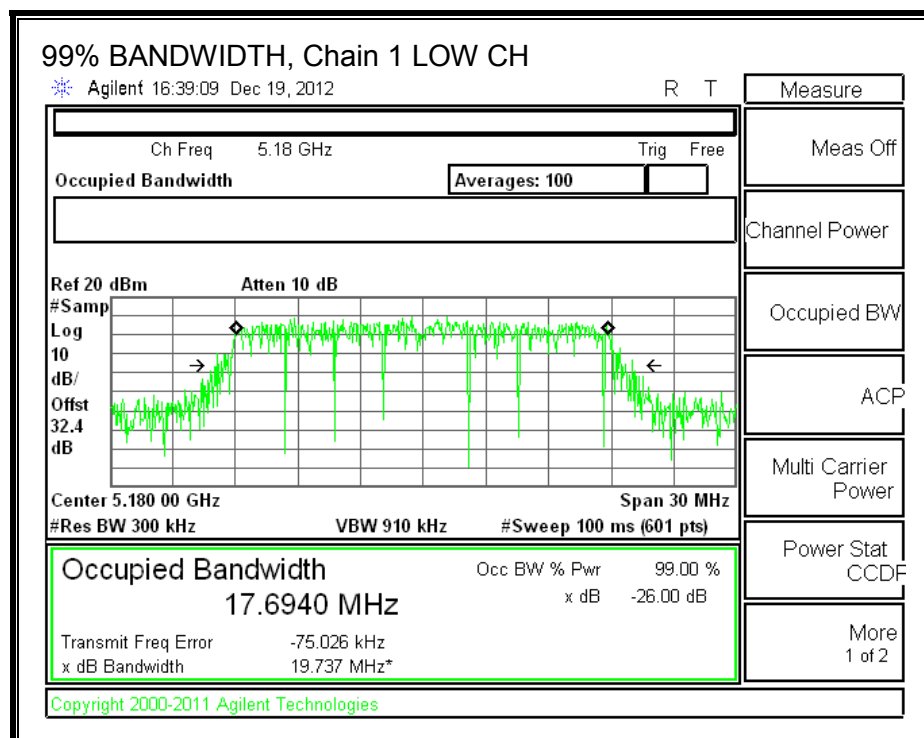
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.6610	17.6940	17.6556
Mid	5200	17.6762	17.6872	17.6725
High	5240	17.6759	17.6865	17.6673

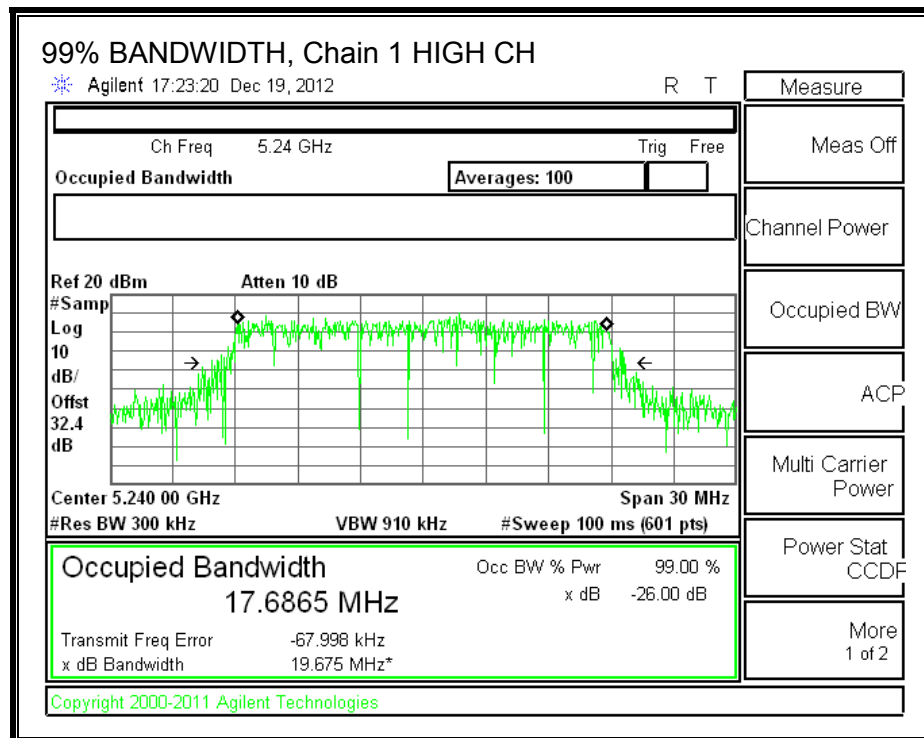
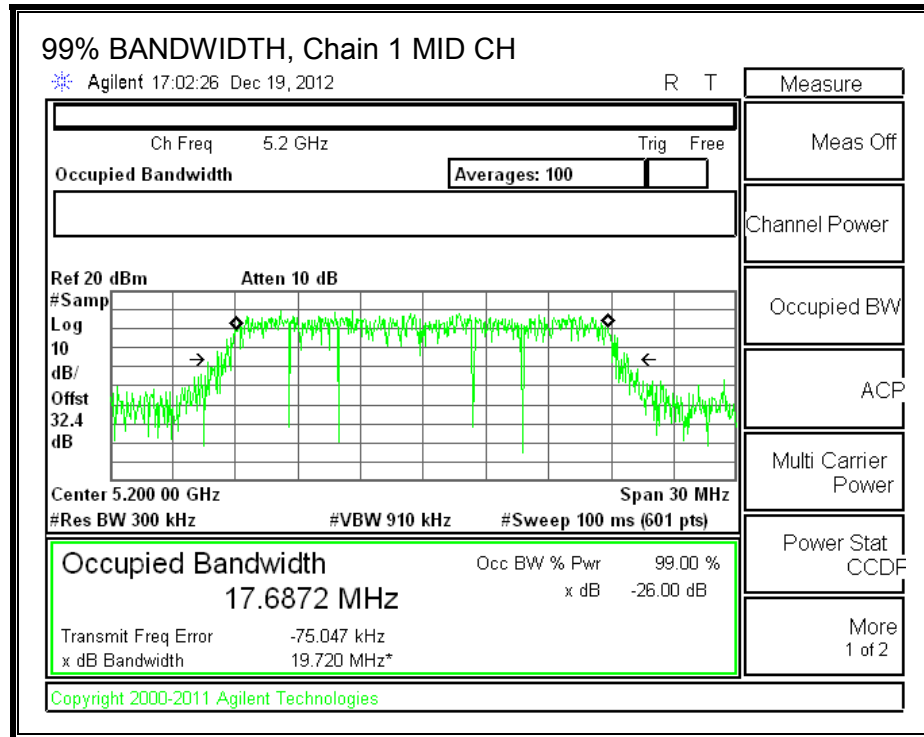
99% BANDWIDTH, Chain 0



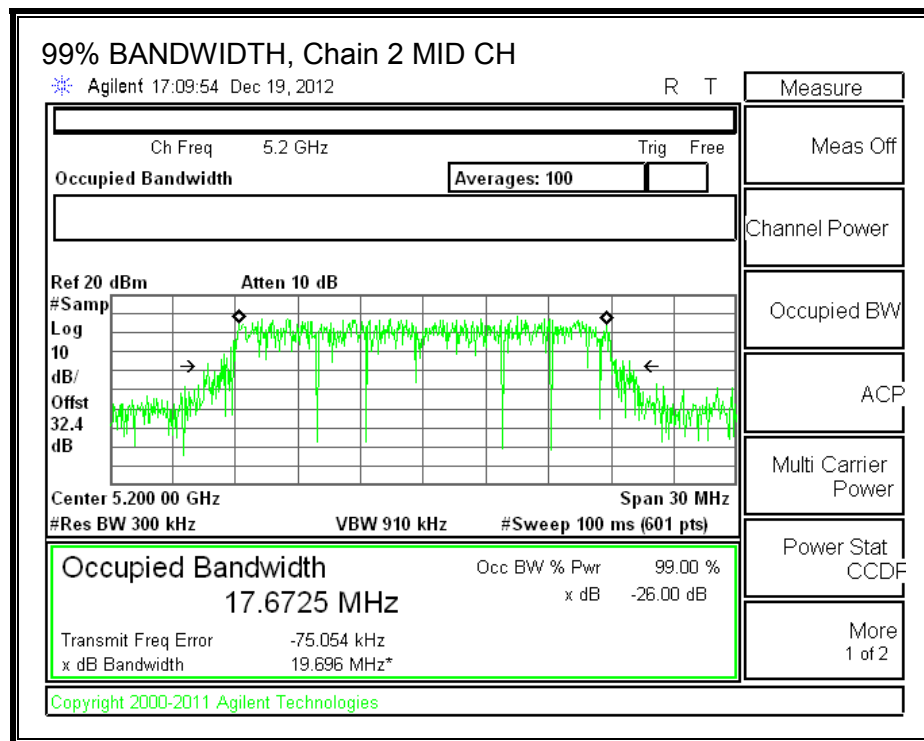
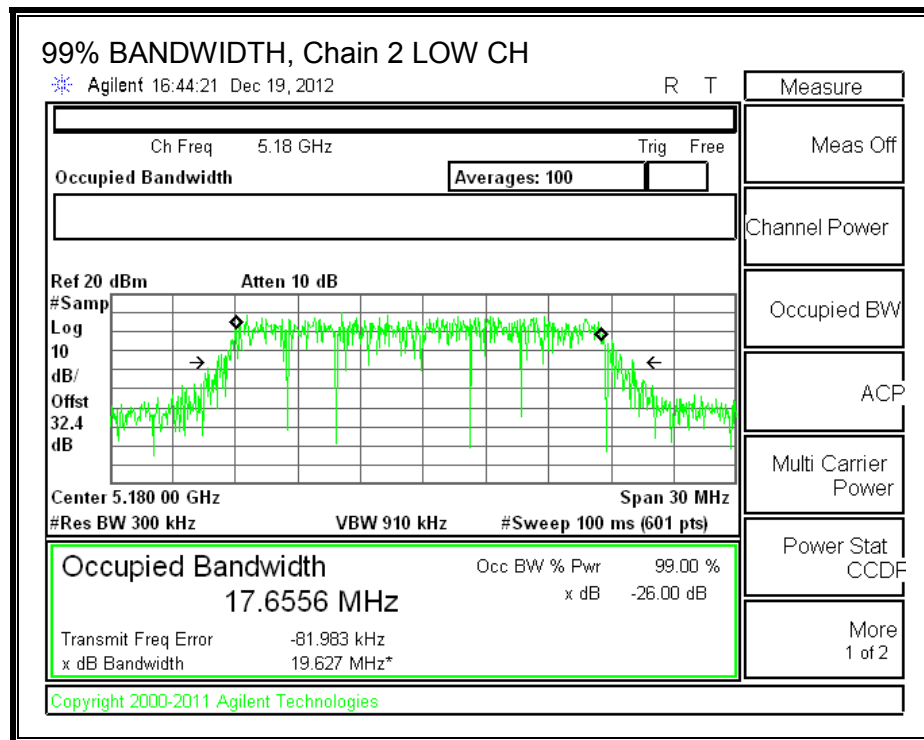


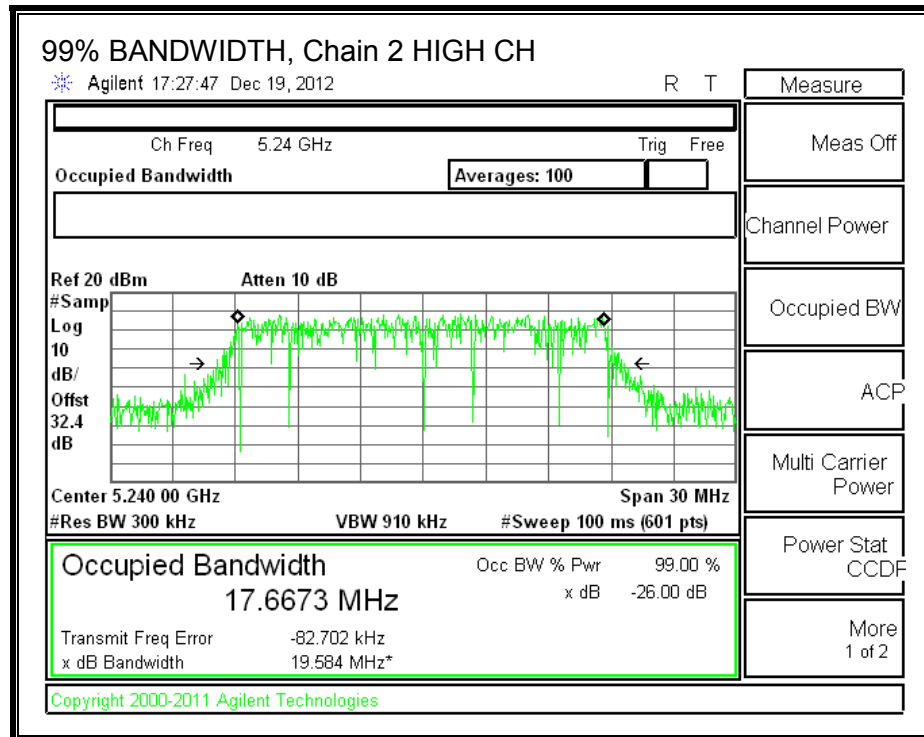
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.7.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.33	17.6556	2.33
Mid	5200	20.42	17.6725	2.33
High	5240	20.42	17.6673	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5180	17.00	22.47	20.14	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.47	20.14	17.00	4.00	10.00	4.00
High	5240	17.00	22.47	20.14	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00
--------------------	------

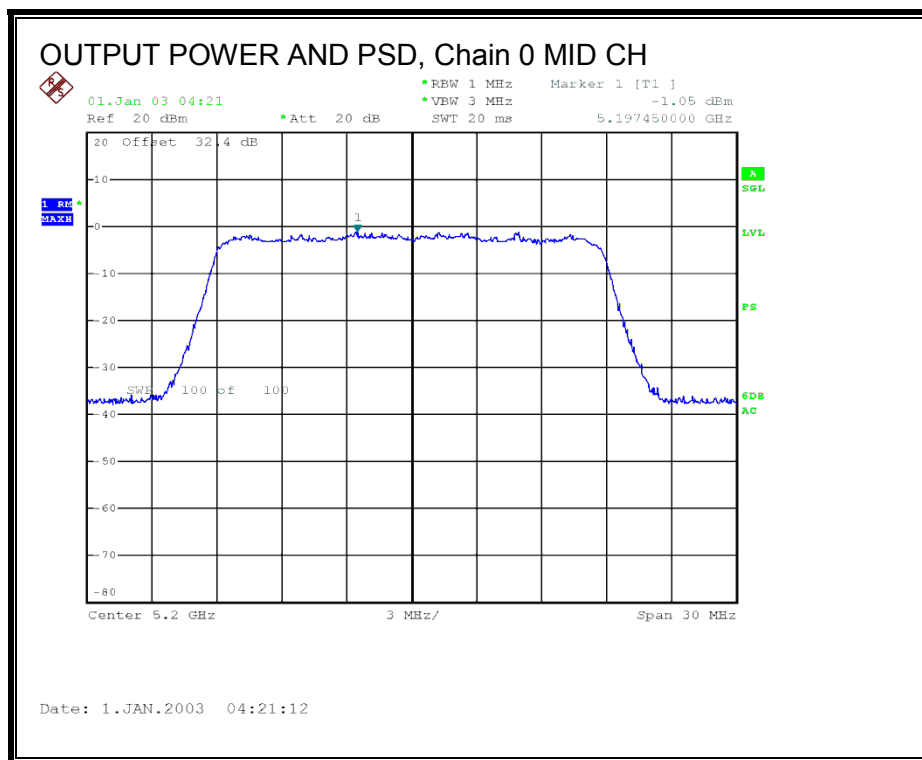
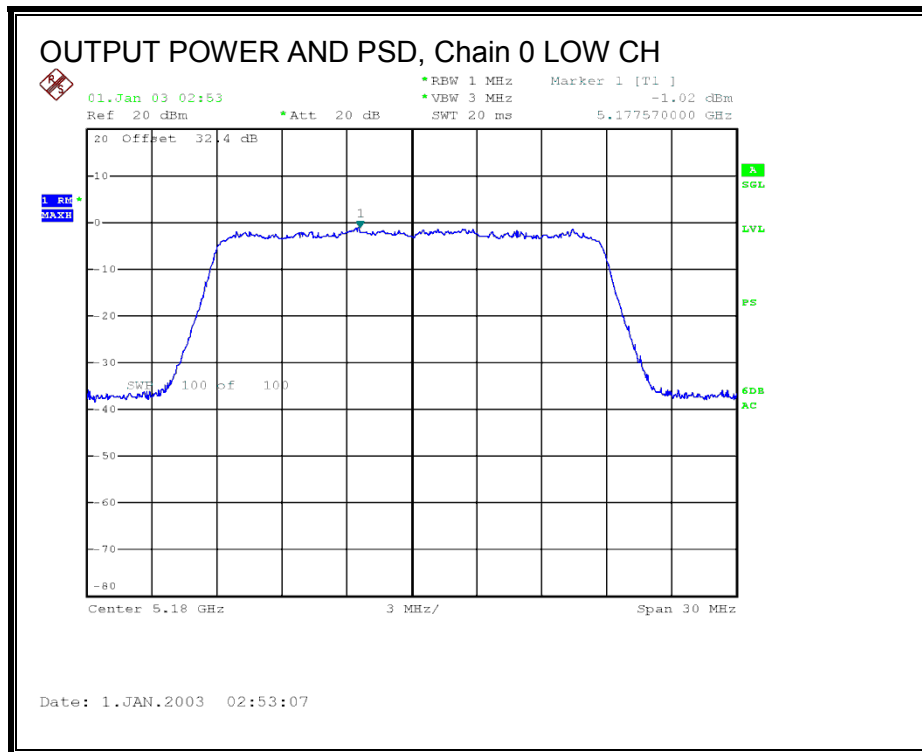
Output Power Results

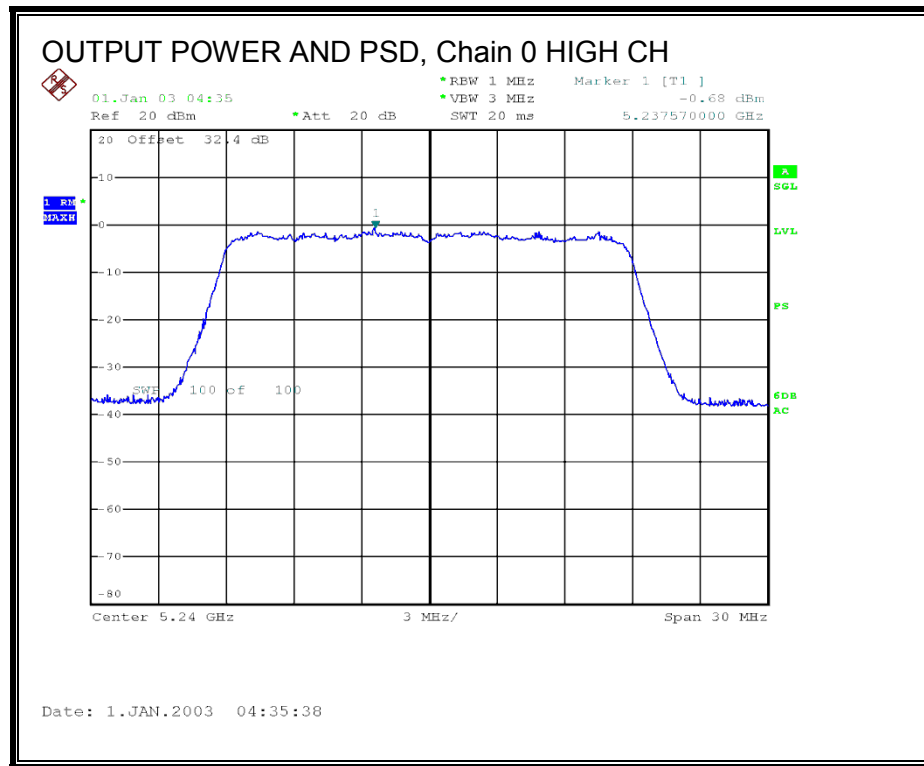
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.00	8.95	8.96	13.74	17.00	-3.26
Mid	5200	8.90	8.95	8.86	13.67	17.00	-3.33
High	5240	9.40	9.10	8.96	13.93	17.00	-3.07

PSD Results

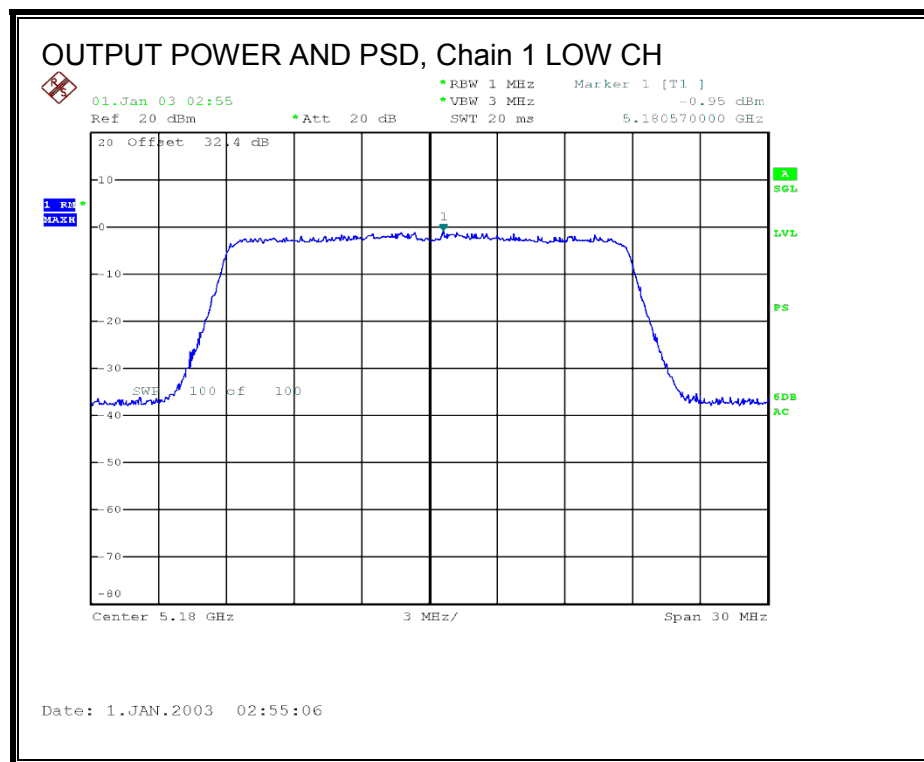
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-1.02	-0.95	-0.92	3.81	4.00	-0.19
Mid	5200	-1.05	-0.93	-0.95	3.79	4.00	-0.21
High	5240	-0.68	-1.24	-1.35	3.69	4.00	-0.31

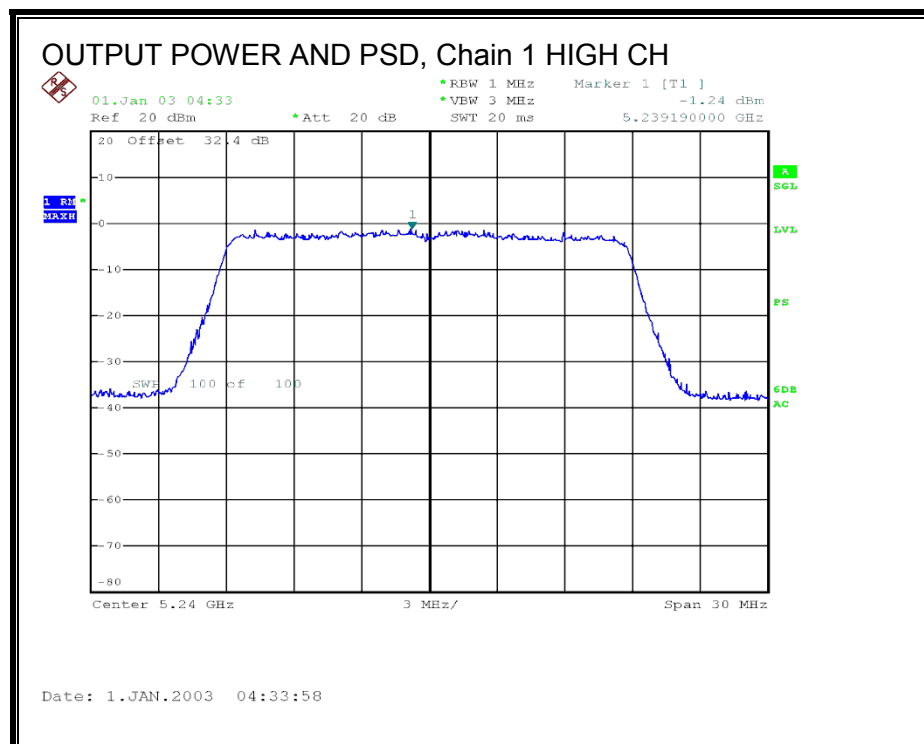
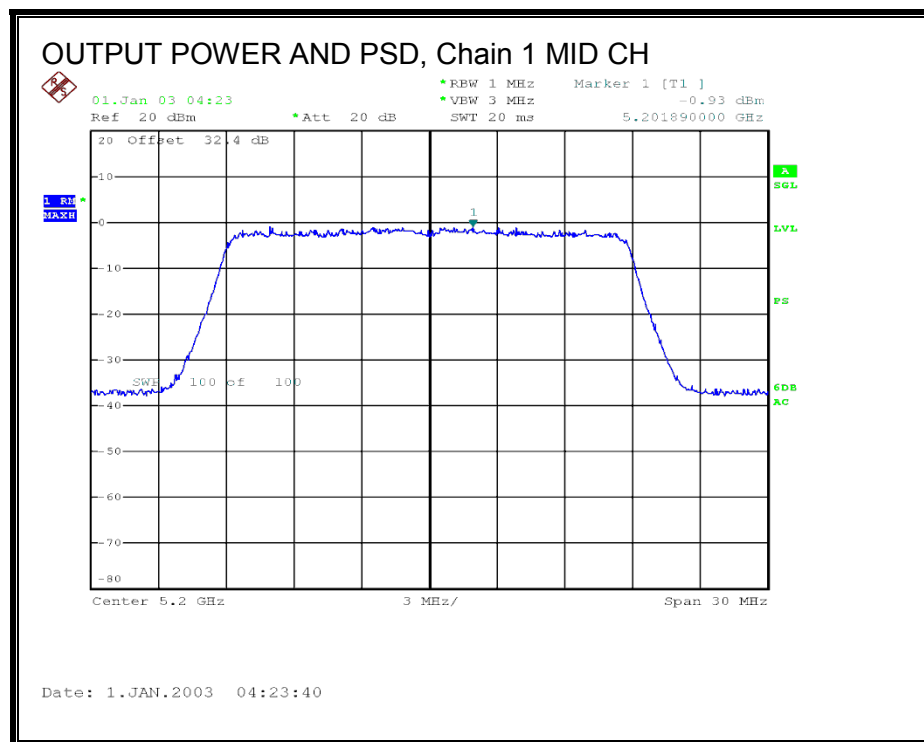
OUTPUT POWER AND PSD, Chain 0



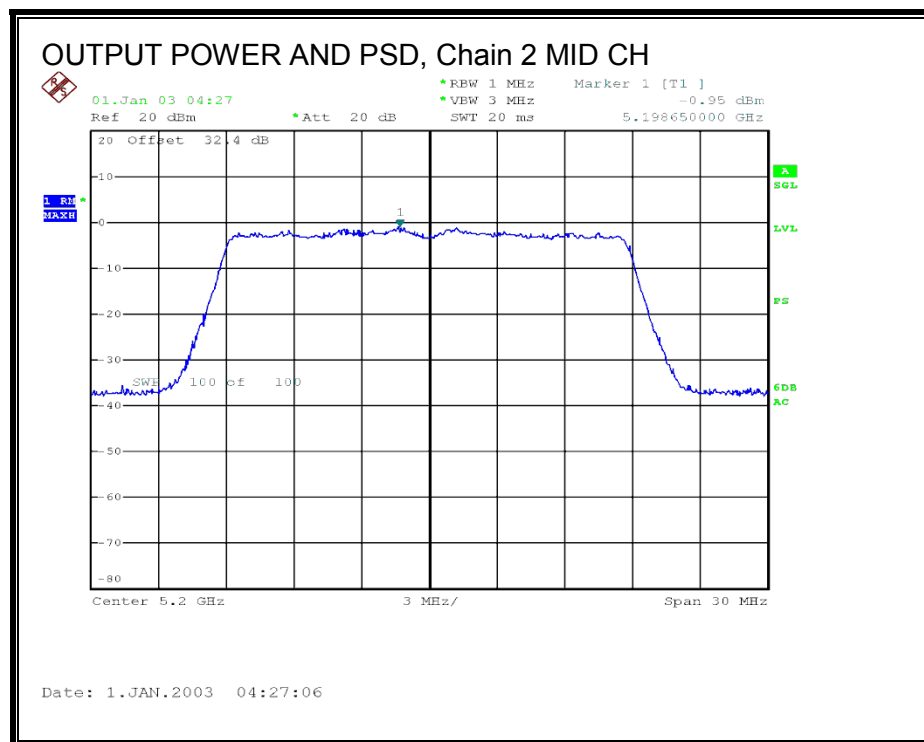
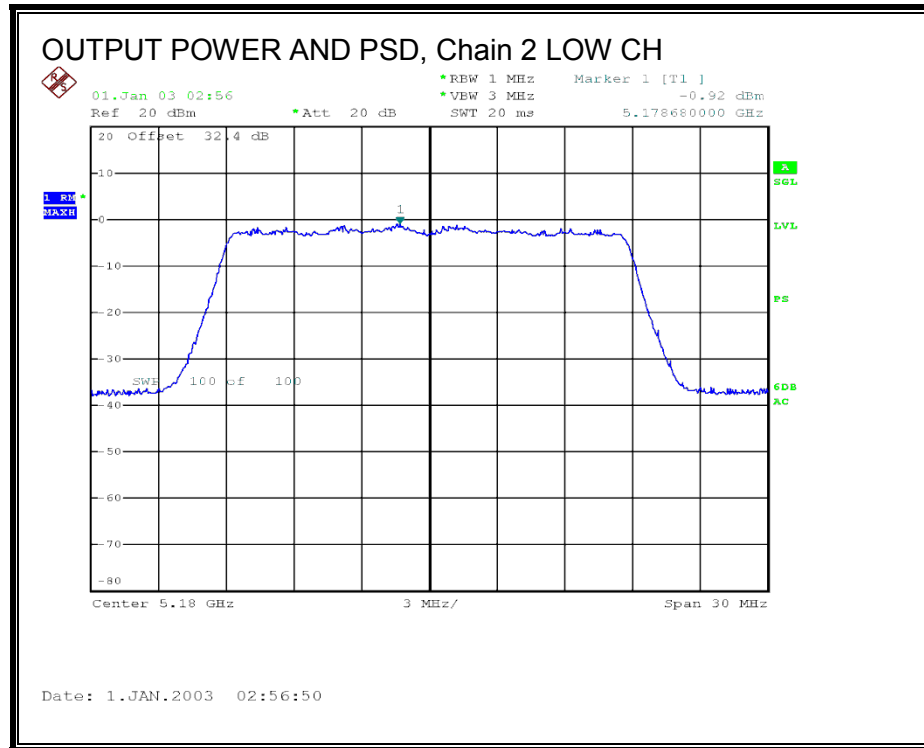


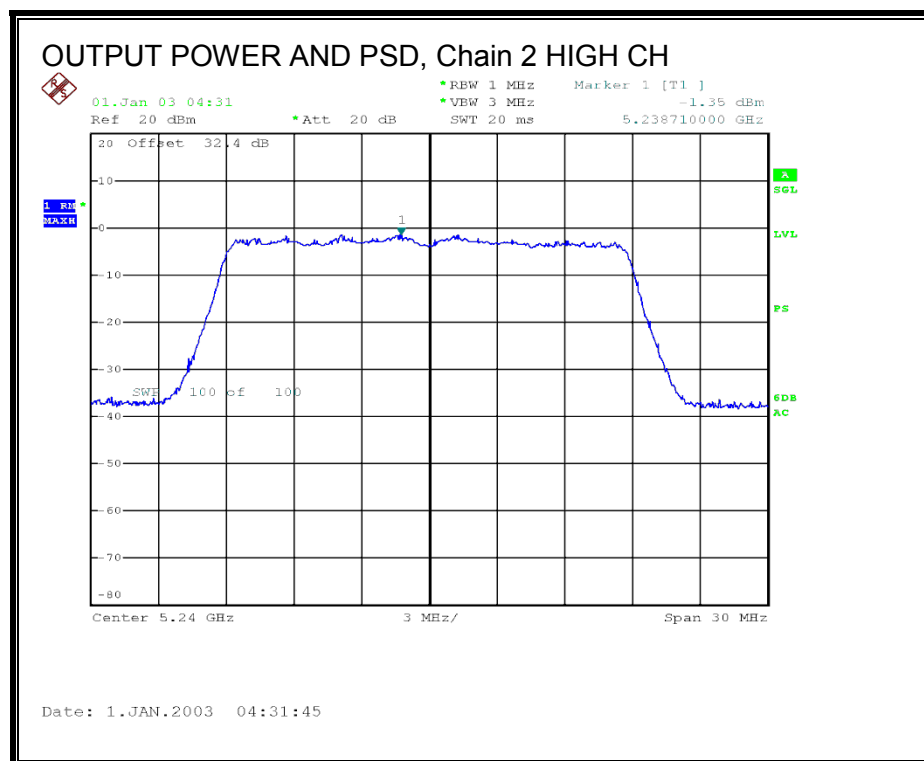
OUTPUT POWER AND PSD, Chain 1





OUTPUT POWER AND PSD, Chain 2





8.7.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.50	-1.05	0.00	9.55	13	-3.45

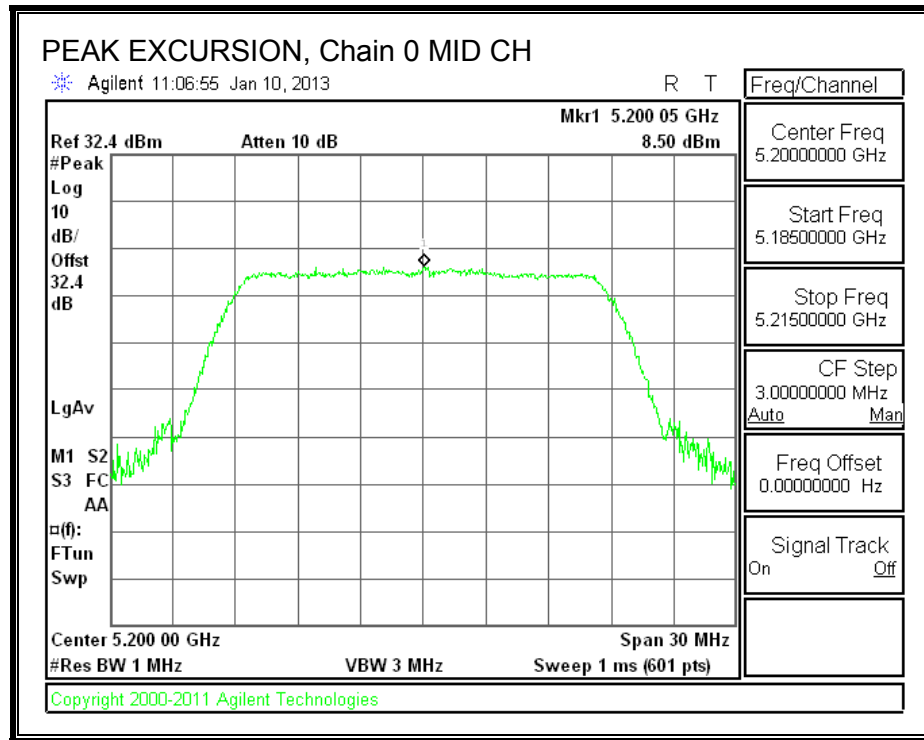
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.73	-0.93	0.00	9.66	13	-3.34

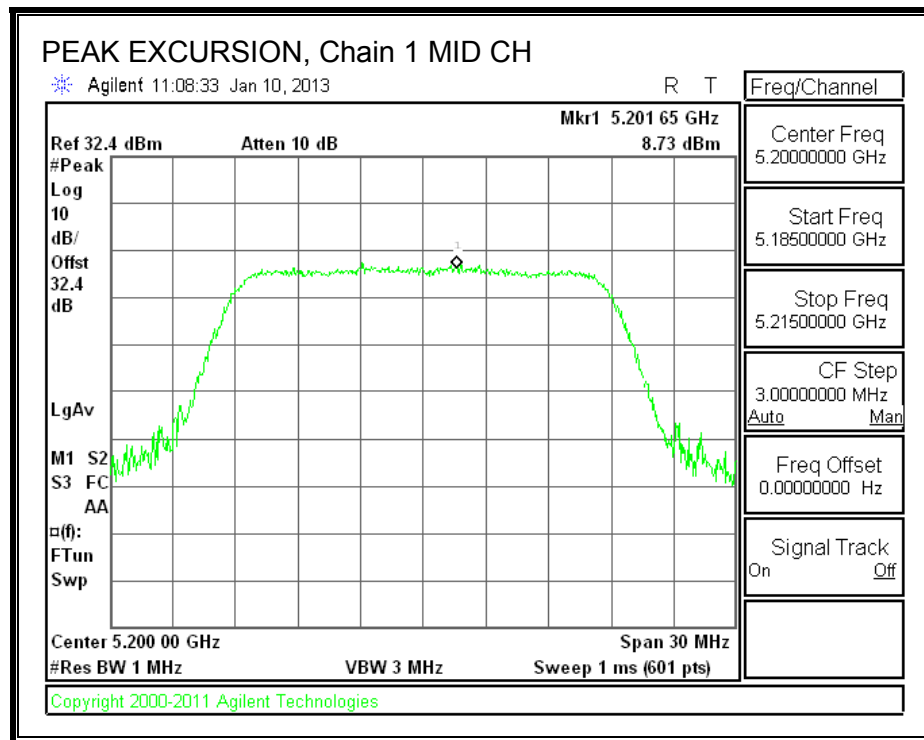
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	9.52	-0.95	0.00	10.47	13	-2.53

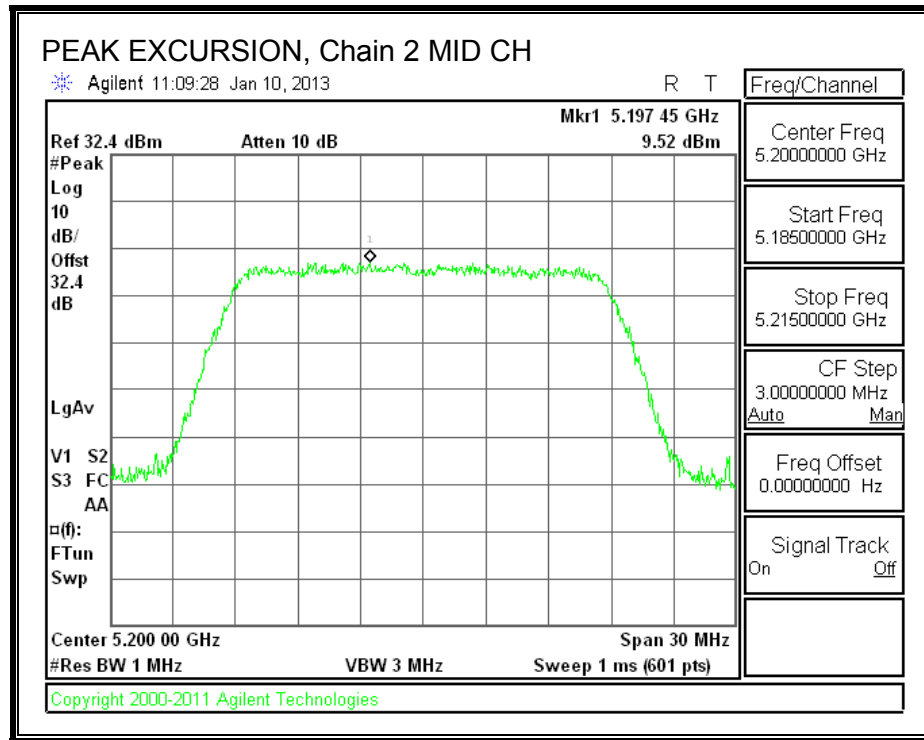
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.8. 802.11n HT40 1TX MODE IN THE 5.2 GHz BAND

8.8.1. 26 dB BANDWIDTH

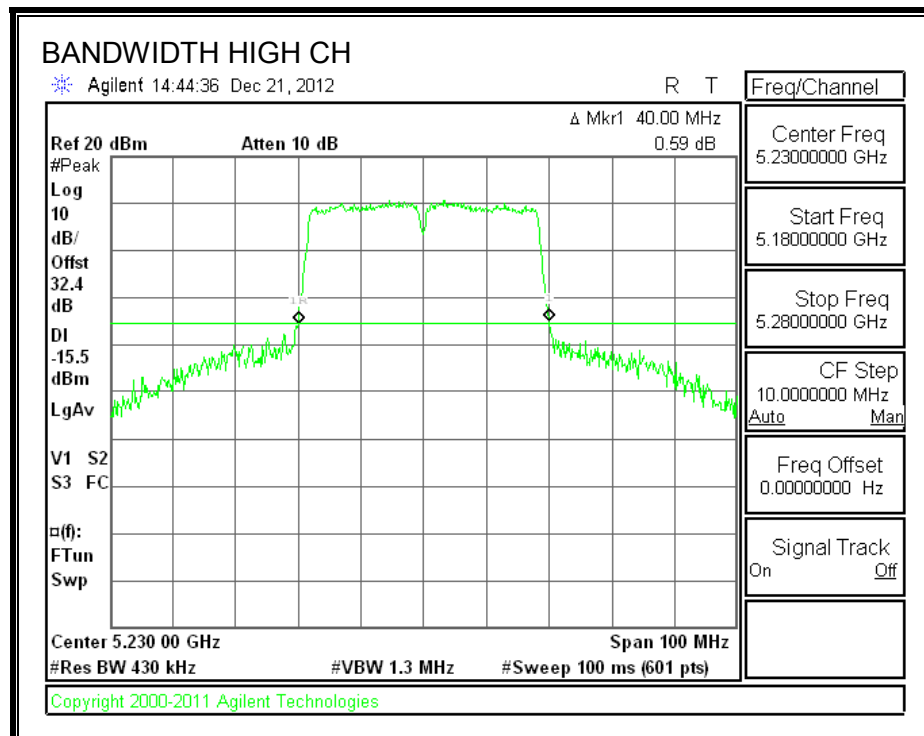
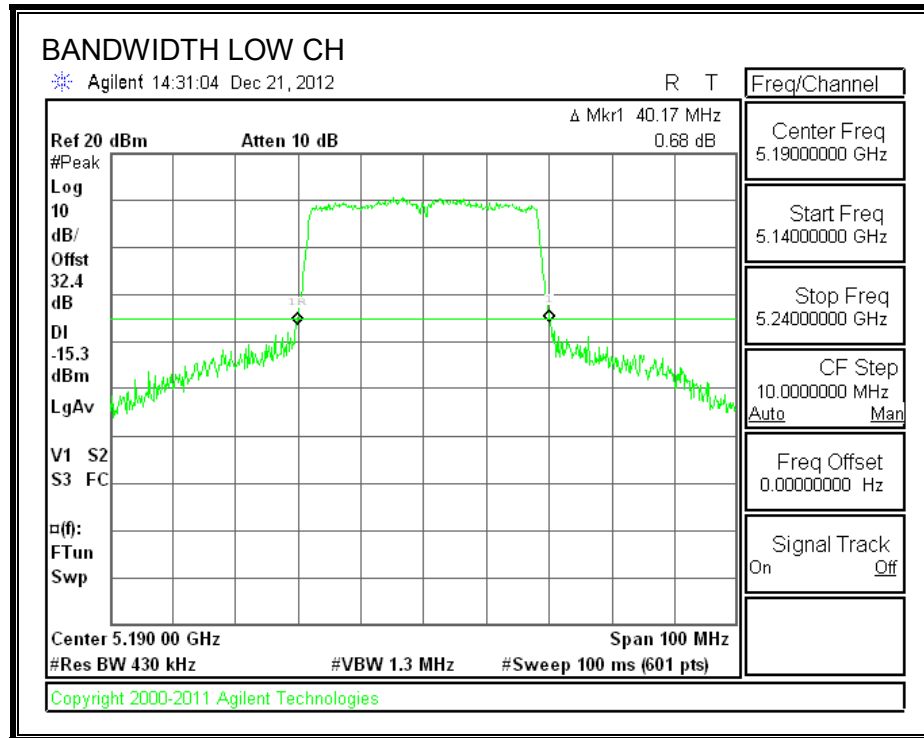
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5190	40.17
High	5230	40.00

26 dB BANDWIDTH



8.8.2. 99% BANDWIDTH

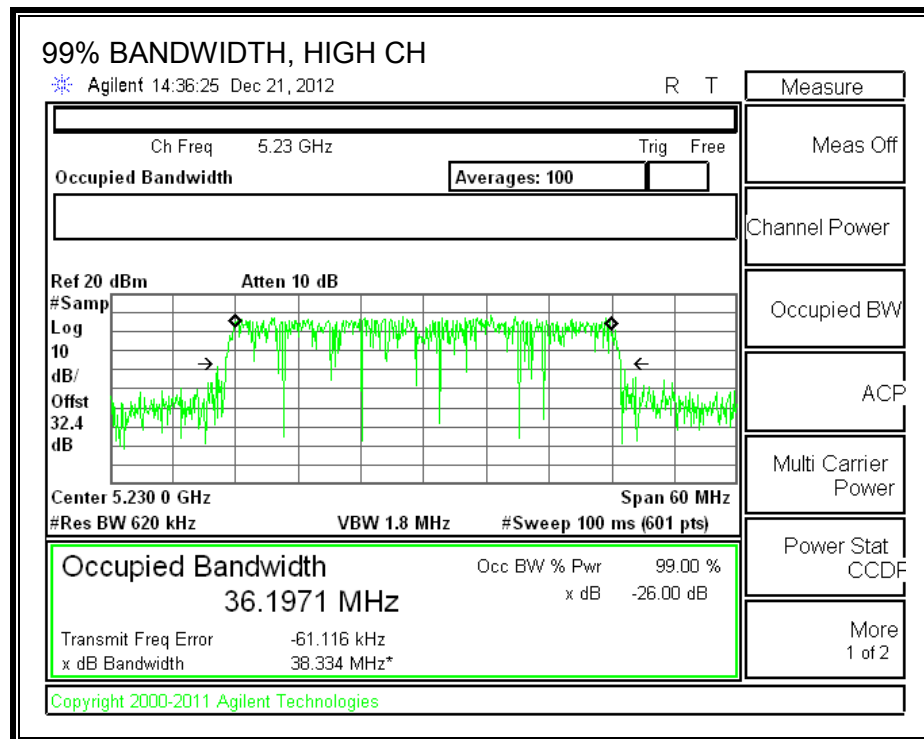
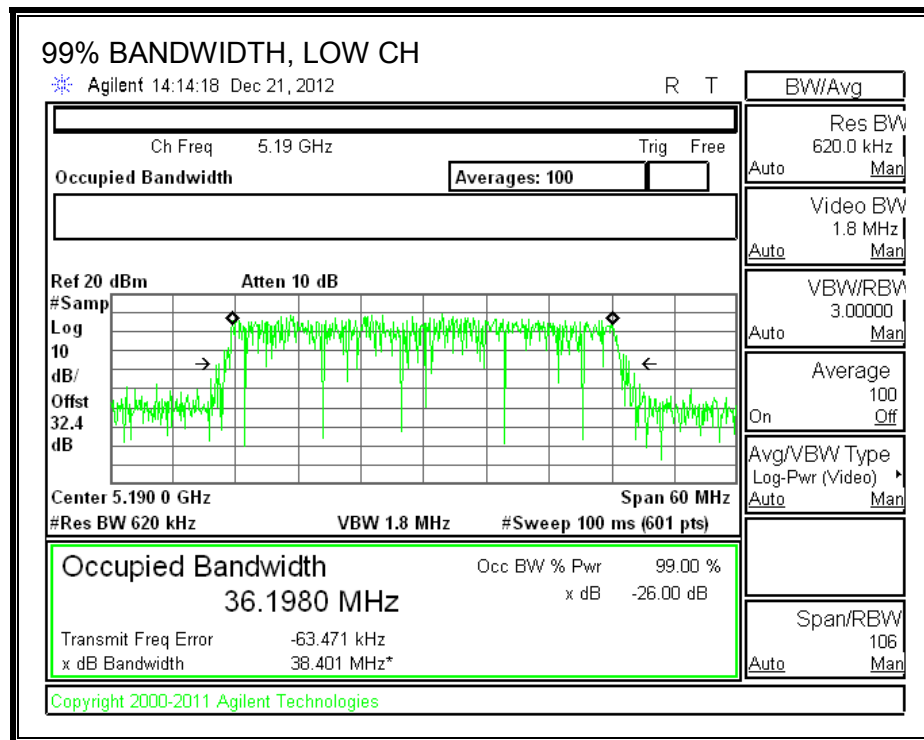
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.1980
High	5230	36.1971

99% BANDWIDTH



8.8.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	40.17	36.1980	3.20
High	5230	40.00	36.1971	3.20

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5190	17.00	23.00	19.80	17.00	4.00	10.00	4.00
High	5230	17.00	23.00	19.80	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

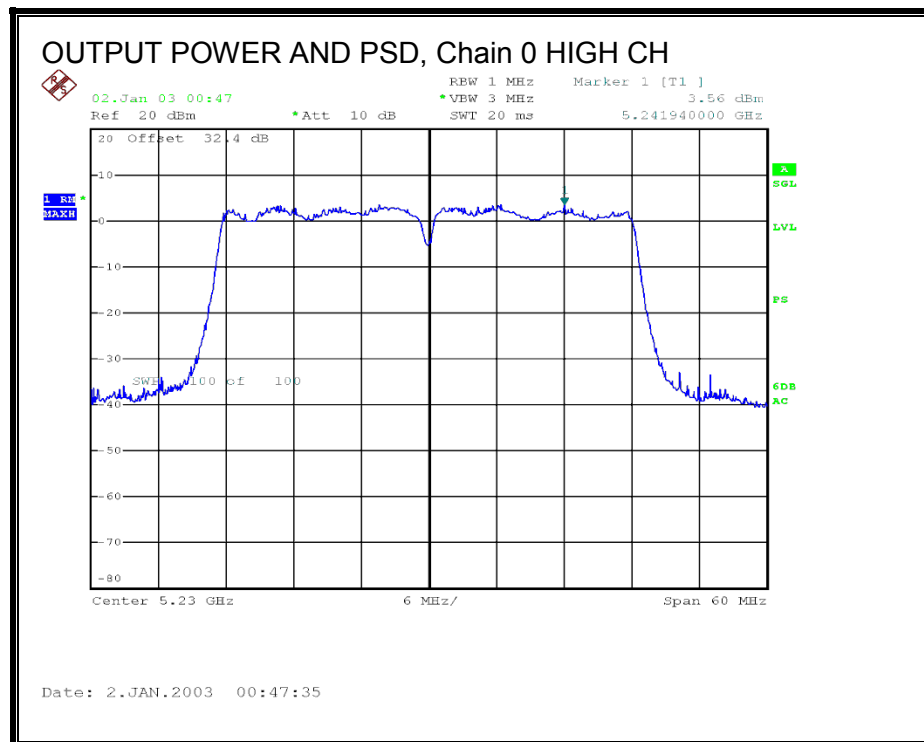
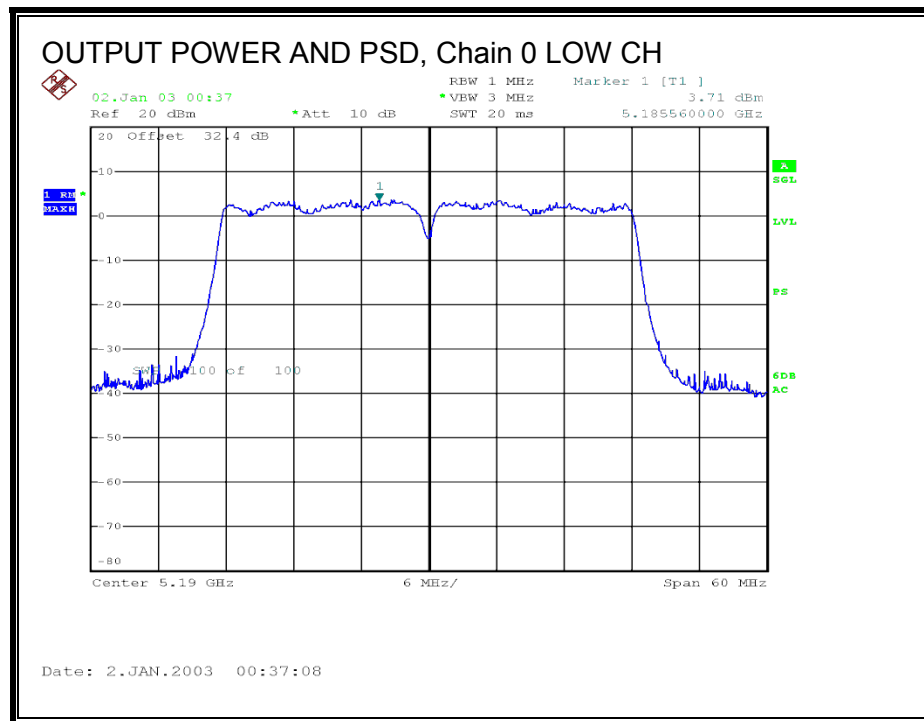
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	15.00	15.00	17.00	-2.00
High	5230	16.50	16.50	17.00	-0.50

PSD Results

Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	3.71	3.71	4.00	-0.29
High	5230	3.56	3.56	4.00	-0.44

OUTPUT POWER AND PSD, Chain 1



8.8.4. PEAK EXCURSION

LIMITS

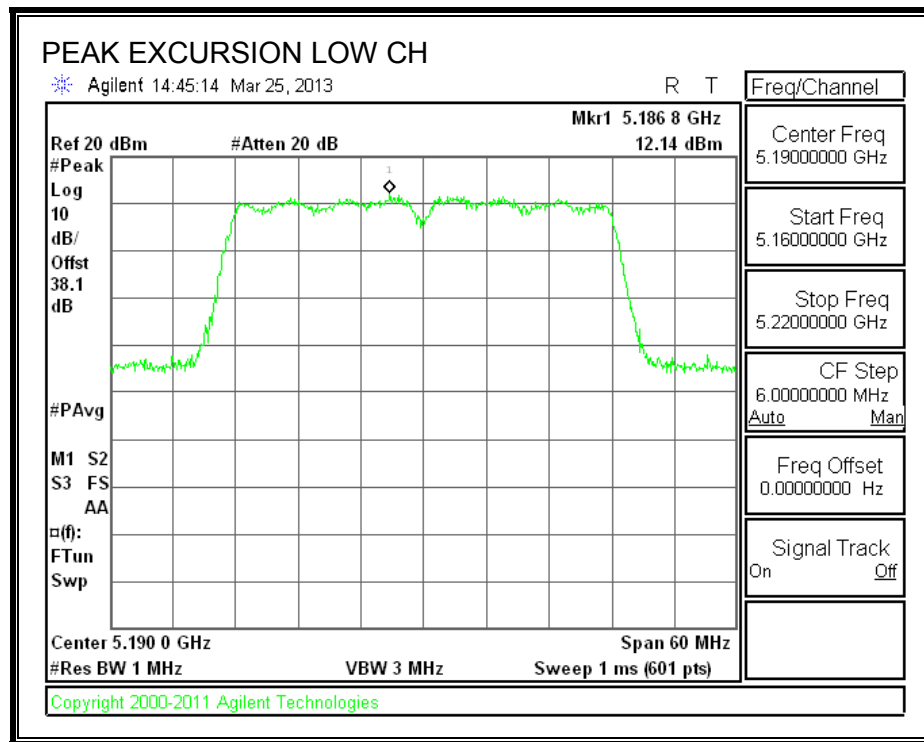
FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	12.14	3.71	0.00	8.43	13	-4.57

PEAK EXCURSION



8.9. 802.11n HT40 CDD 2TX MODE IN THE 5.2 GHz BAND

8.9.1. 26 dB BANDWIDTH

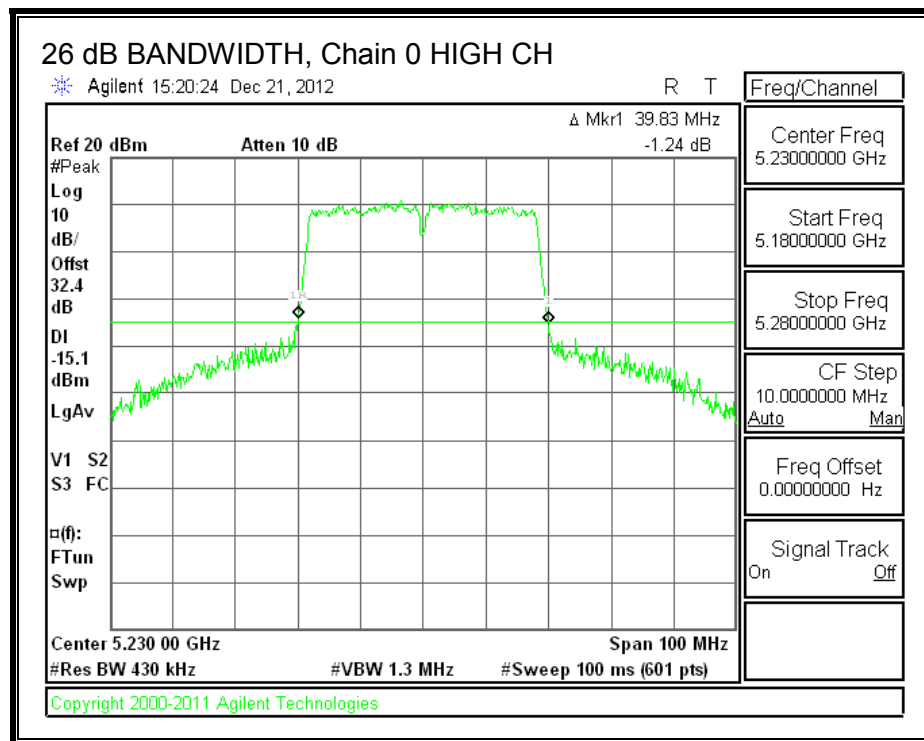
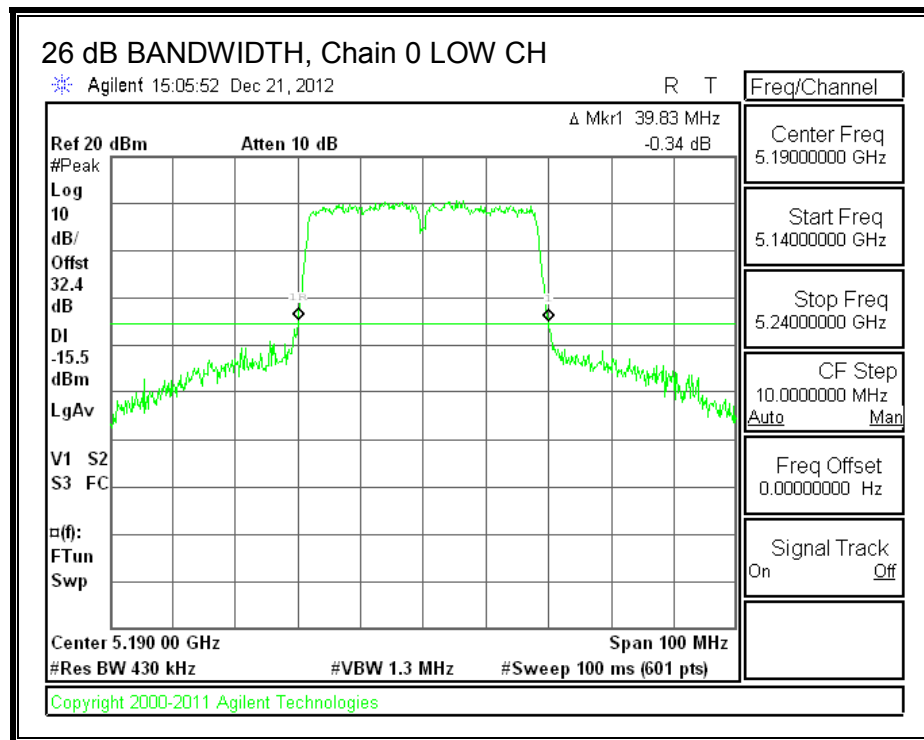
LIMITS

None; for reporting purposes only.

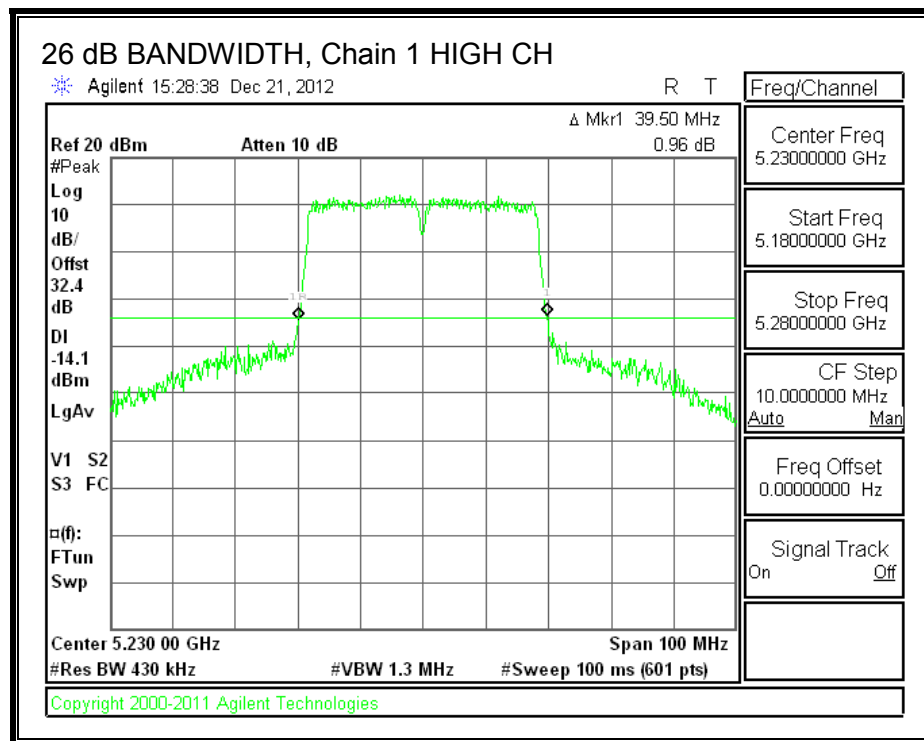
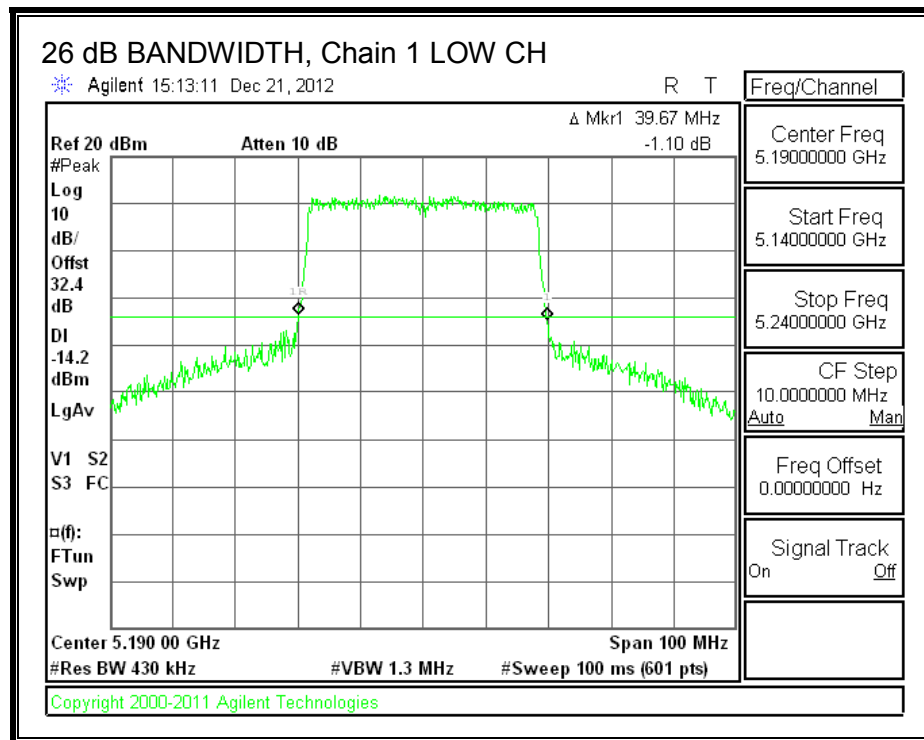
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	39.83	39.67
High	5230	39.83	39.50

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.9.2. 99% BANDWIDTH

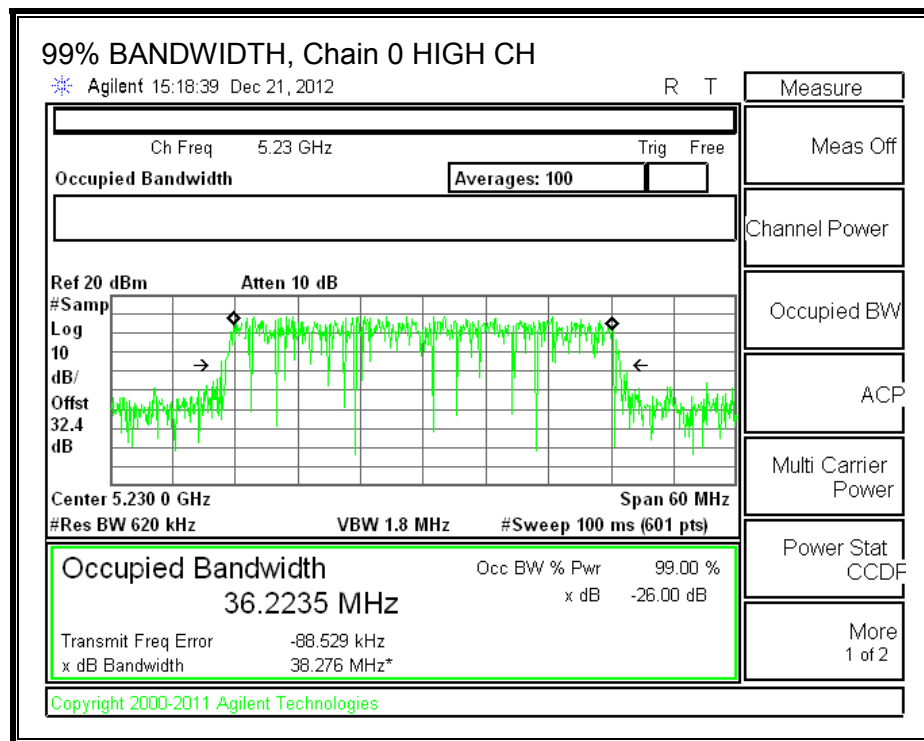
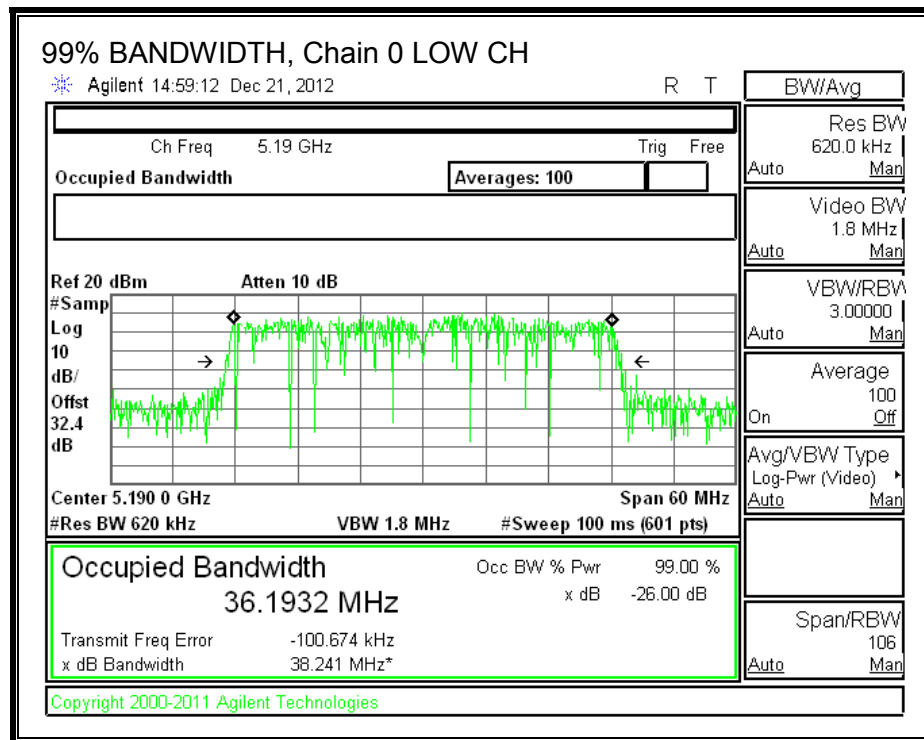
LIMITS

None; for reporting purposes only.

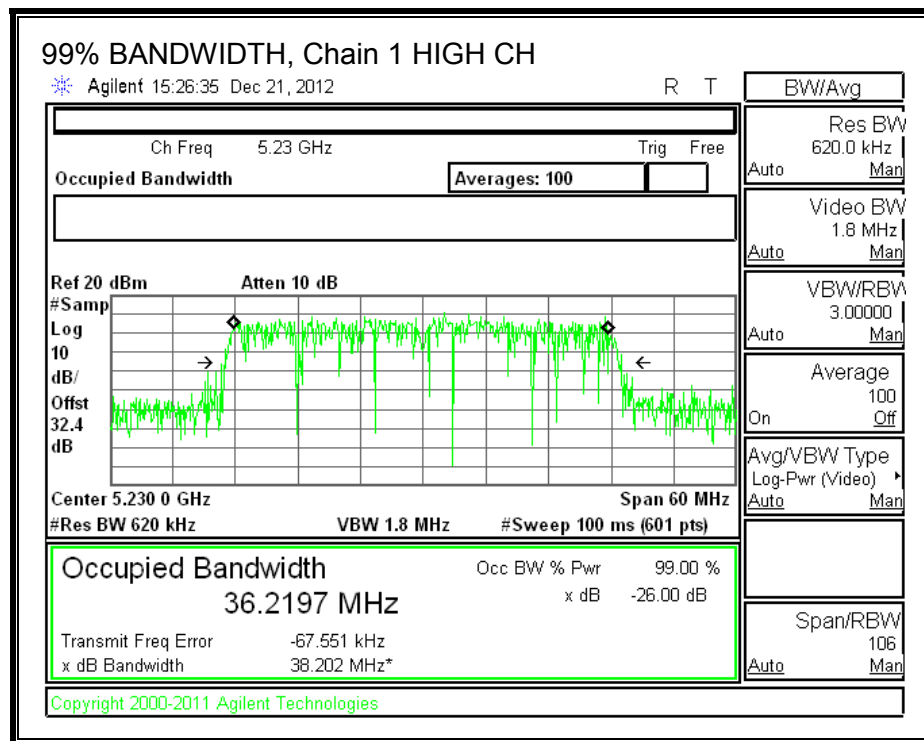
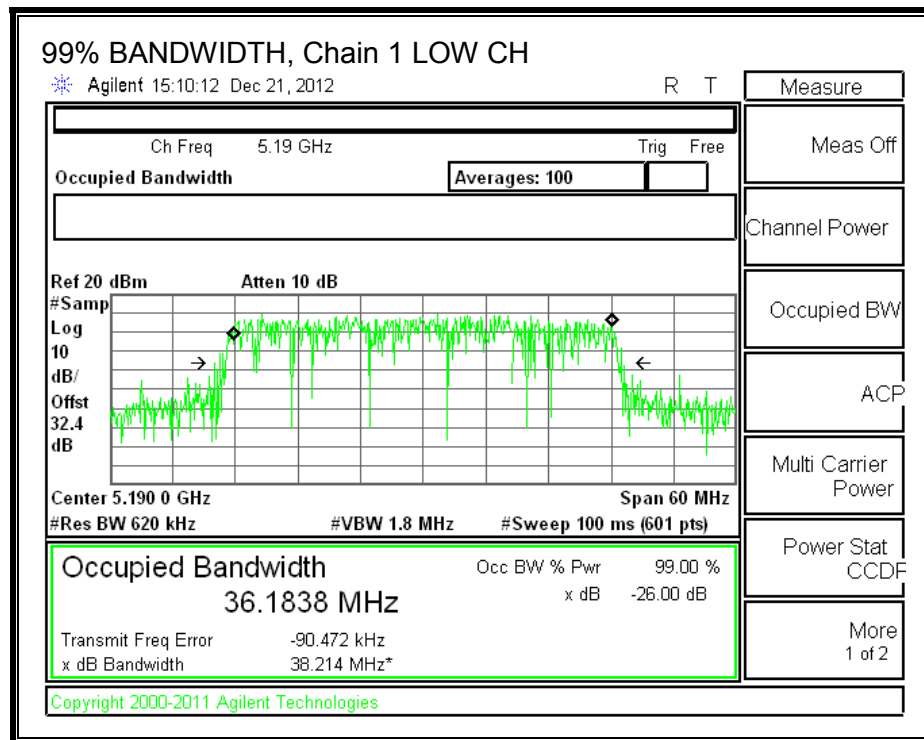
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	36.1932	36.1838
High	5230	36.2235	36.2197

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.9.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

For PSD, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Correlated Directional Gain (dBi)
Low	5190	39.67	36.1838	5.72	2.73
High	5230	39.50	36.2197	5.72	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5190	17.00	23.00	20.27	17.00	4.00	10.00	4.00
High	5230	17.00	23.00	20.27	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

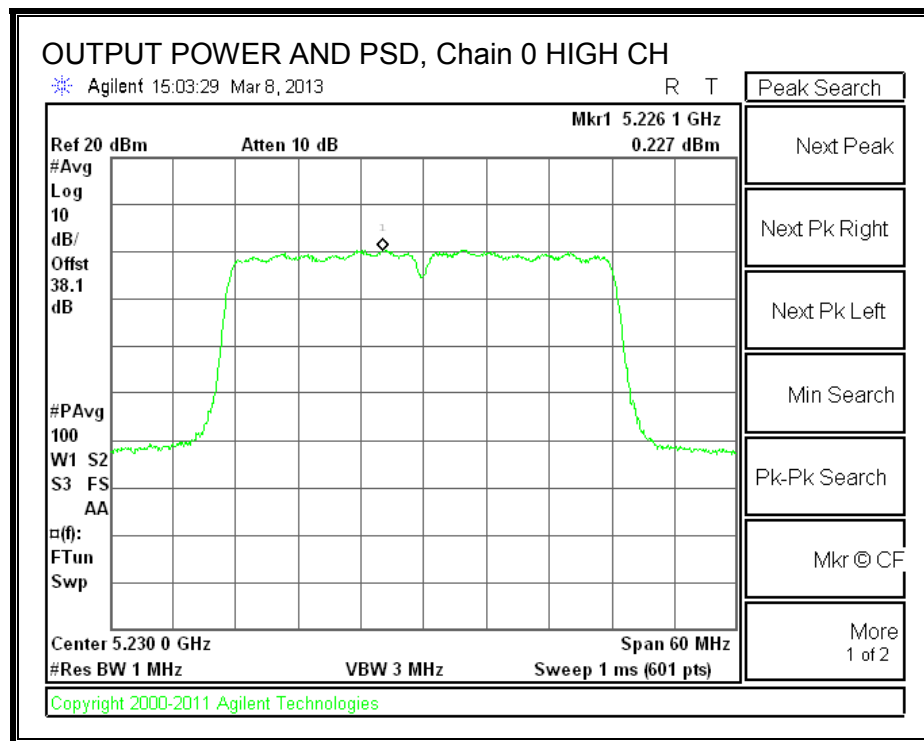
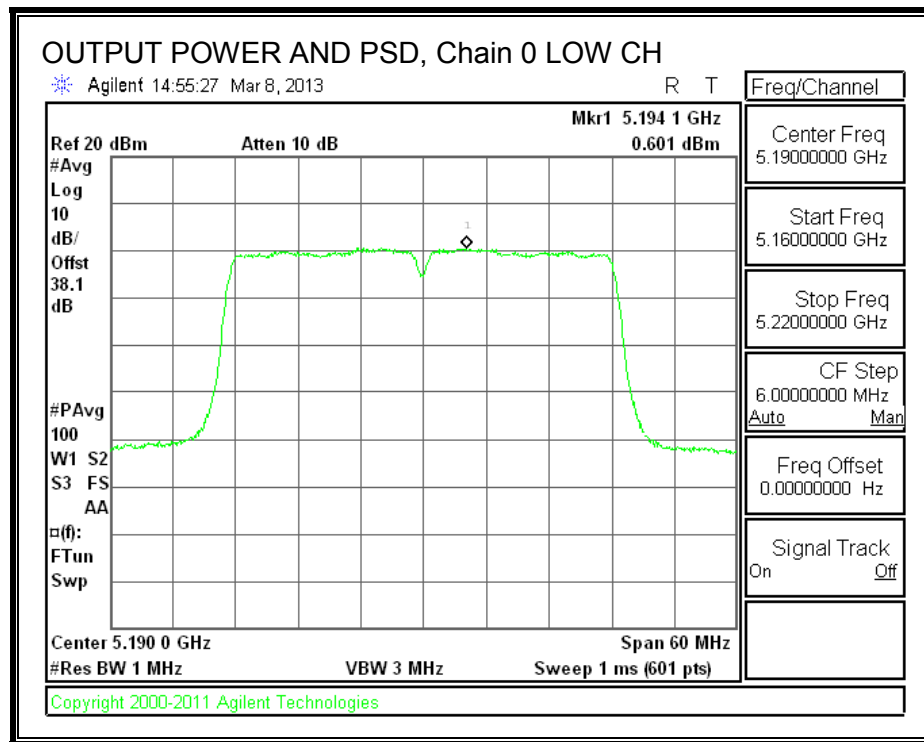
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	12.80	12.50	15.66	17.00	-1.34
High	5230	12.70	12.80	15.76	17.00	-1.24

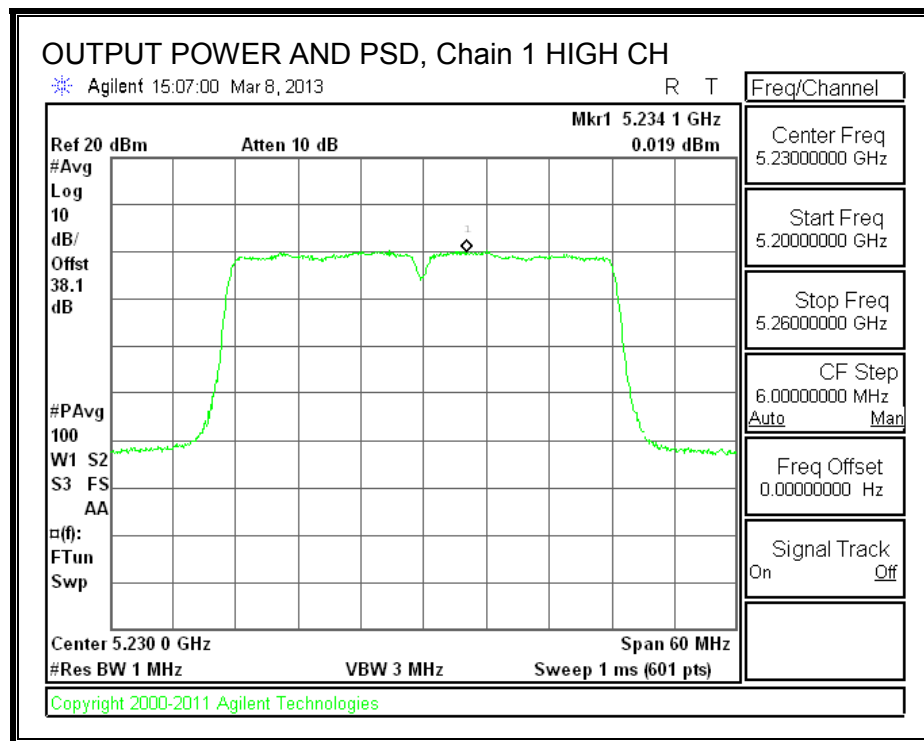
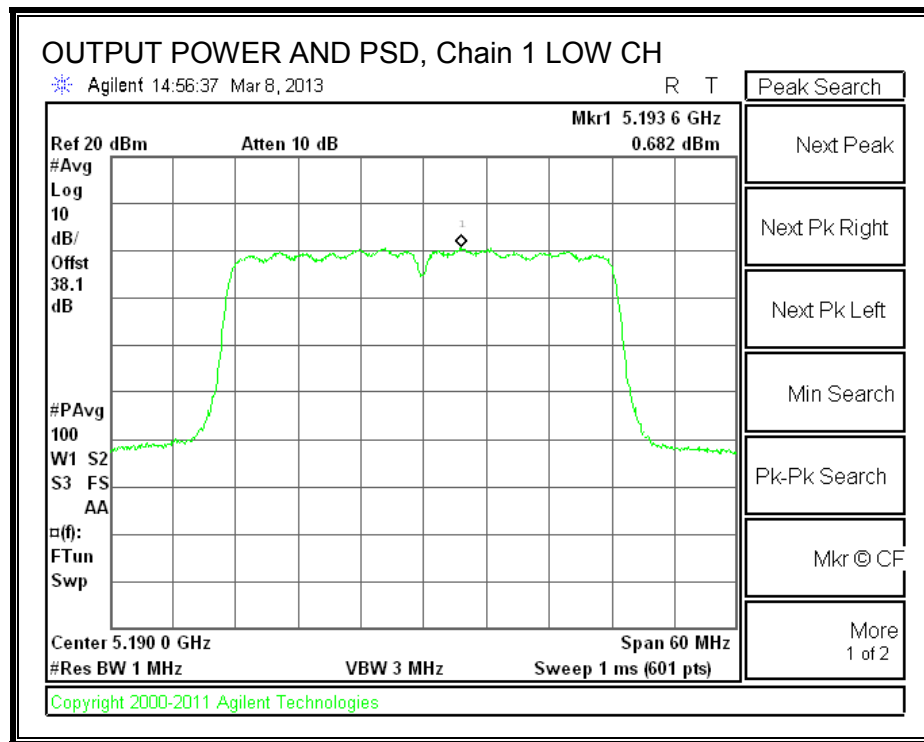
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	0.601	0.682	3.65	4.00	-0.35
High	5230	0.227	0.019	3.13	4.00	-0.87

OUTPUT POWER AND PSD, Chain 0



OUTPUT POWER AND PSD, Chain 1



8.9.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

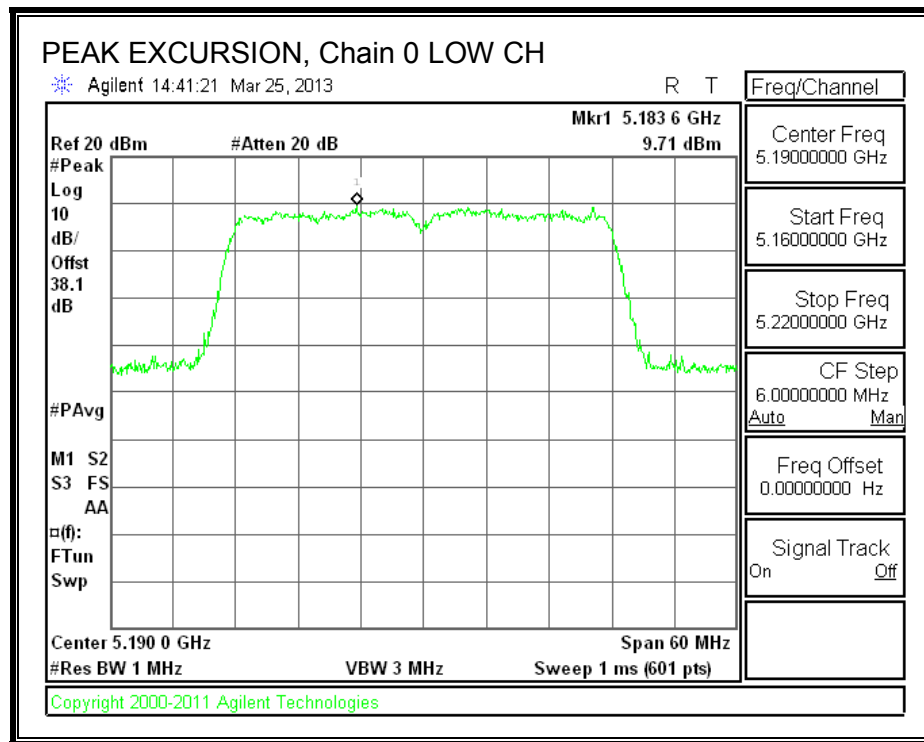
Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	9.71	0.601	0.00	9.11	13	-3.89

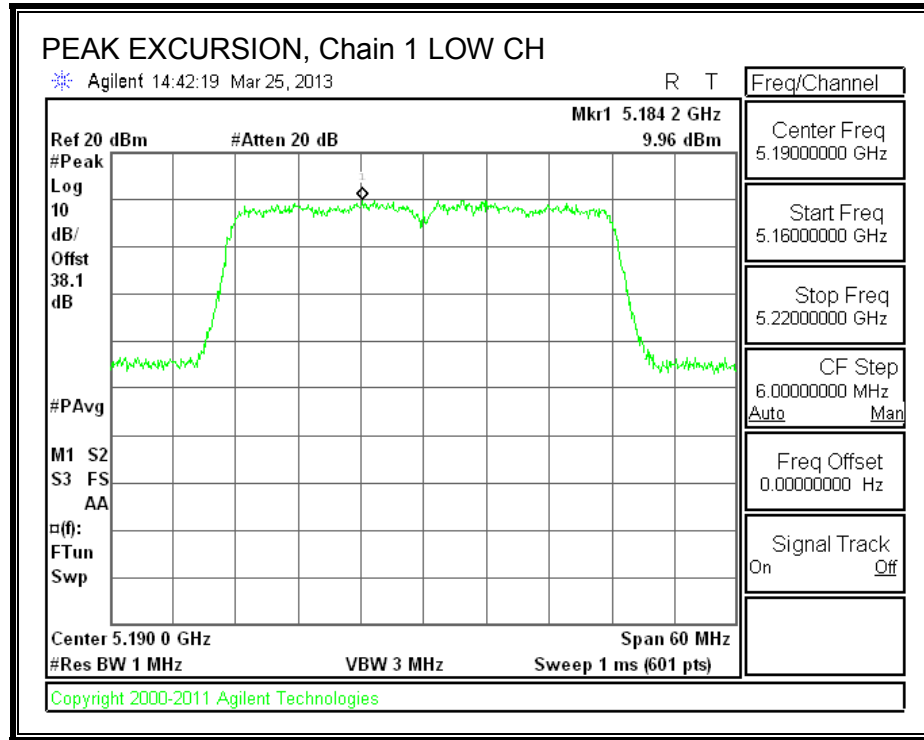
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	9.96	0.682	0.00	9.28	13	-3.72

PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



8.10. 802.11n HT40 BF 2TX MODE IN THE 5.2 GHz BAND

Covered by testing HT40 CDD 2TX mode, the power per chain used for HT40 CDD 2TX mode is the same power per chain that will be used for HT40 BF 2TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.10.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5190	39.67	36.1838	5.72
High	5230	39.50	36.2197	5.72

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Low	5190	17.00	23.00	17.28	17.00
High	5230	17.00	23.00	17.28	17.00

Duty Cycle CF (dB)	0.00
---------------------------	------

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	12.80	12.50	15.66	17.00	-1.34
High	5230	12.70	12.80	15.76	17.00	-1.24

8.11. 802.11n HT40 STBC 2TX MODE IN THE 5.2 GHz BAND

8.11.1. 26 dB BANDWIDTH

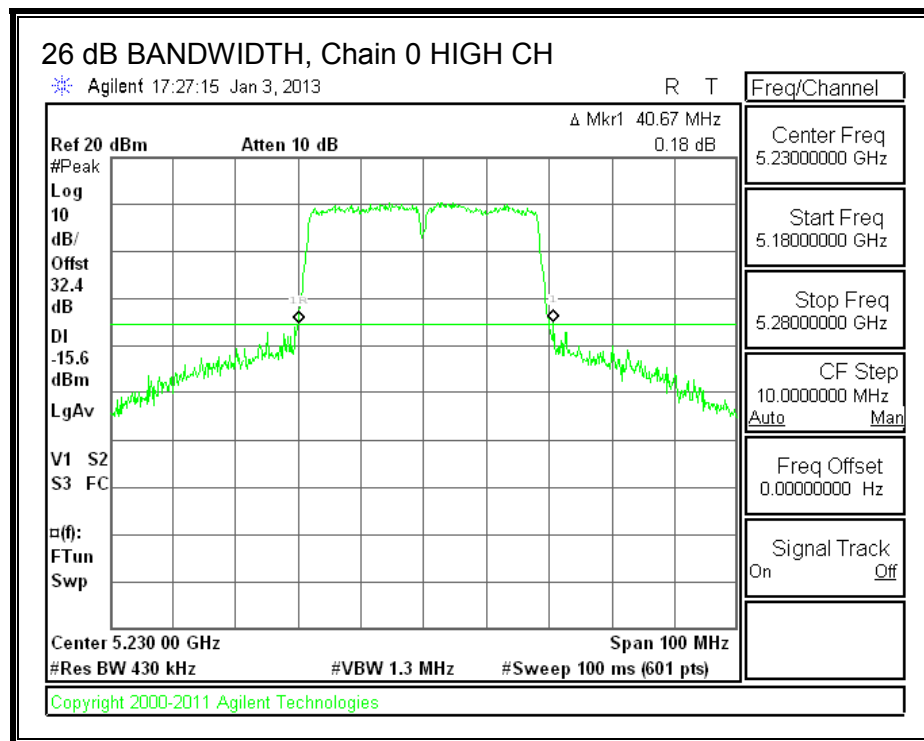
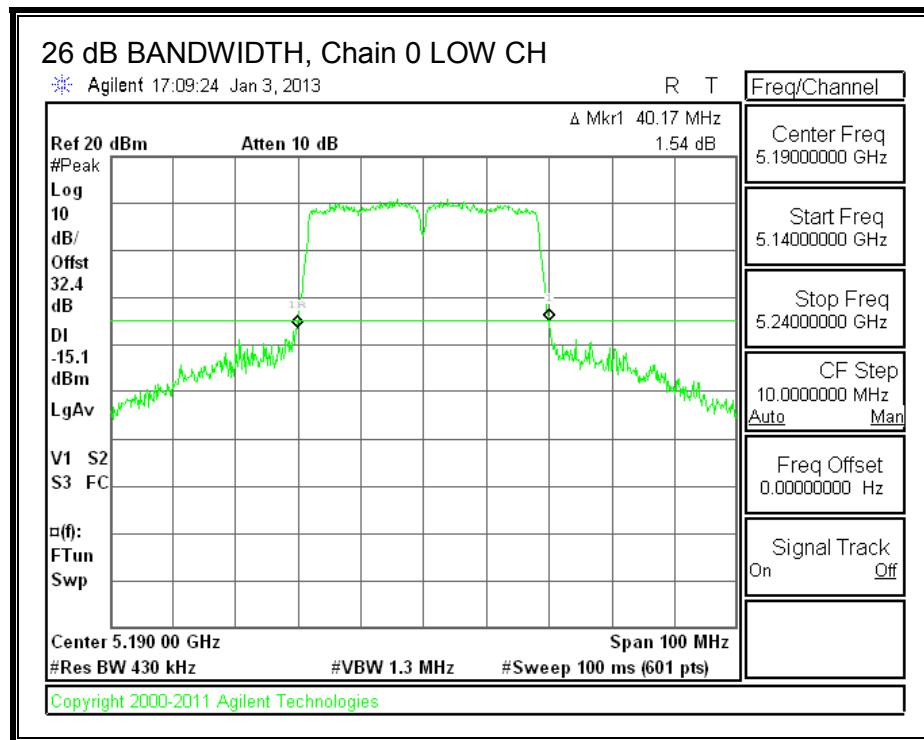
LIMITS

None; for reporting purposes only.

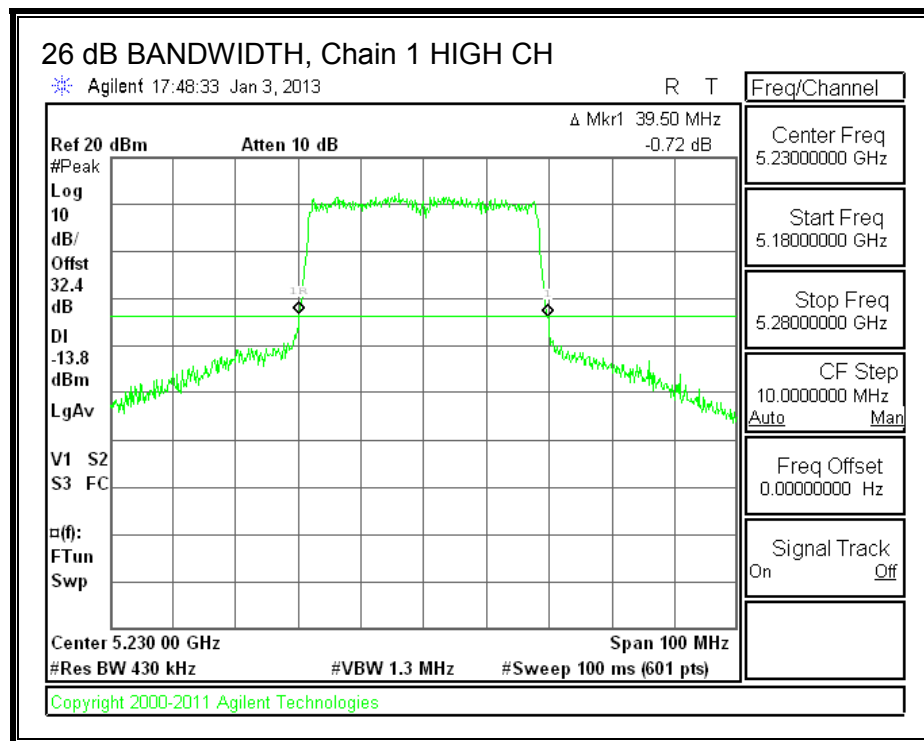
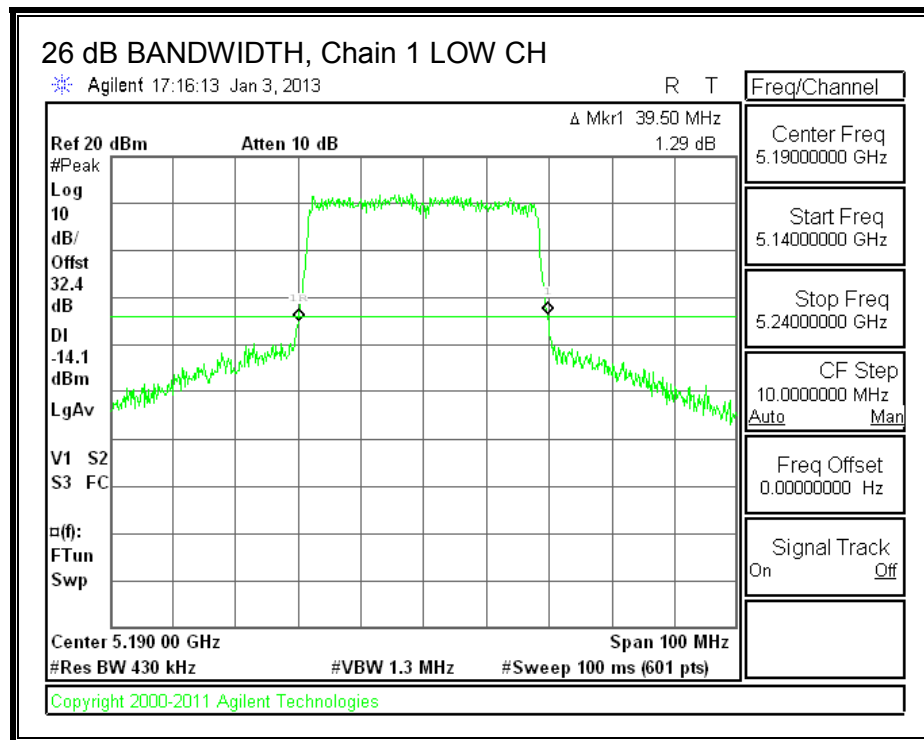
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	40.17	39.50
High	5230	40.67	39.50

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.11.2. 99% BANDWIDTH

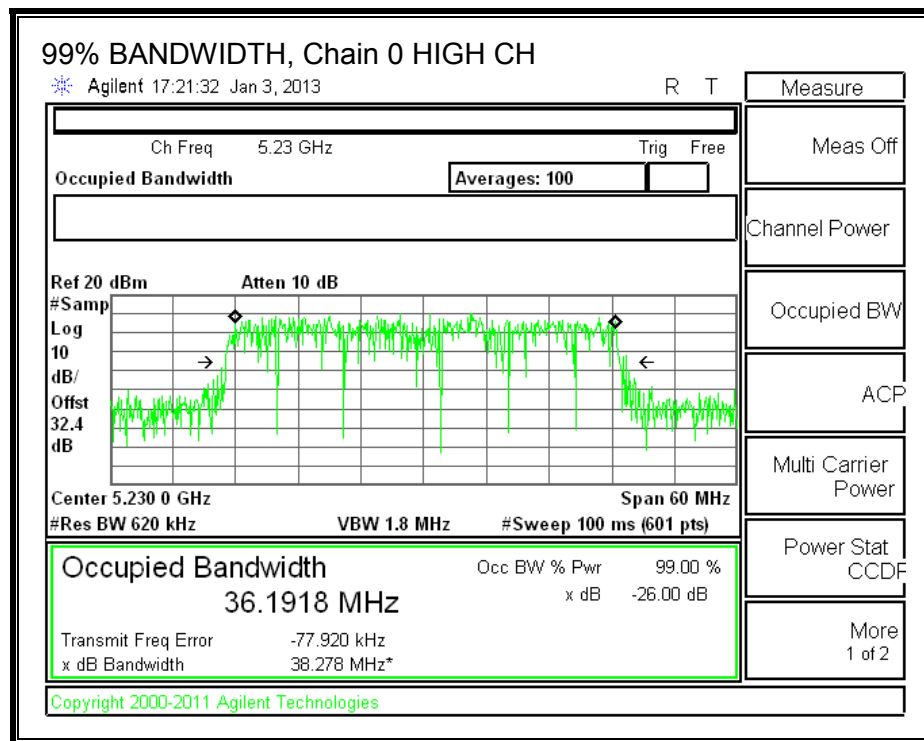
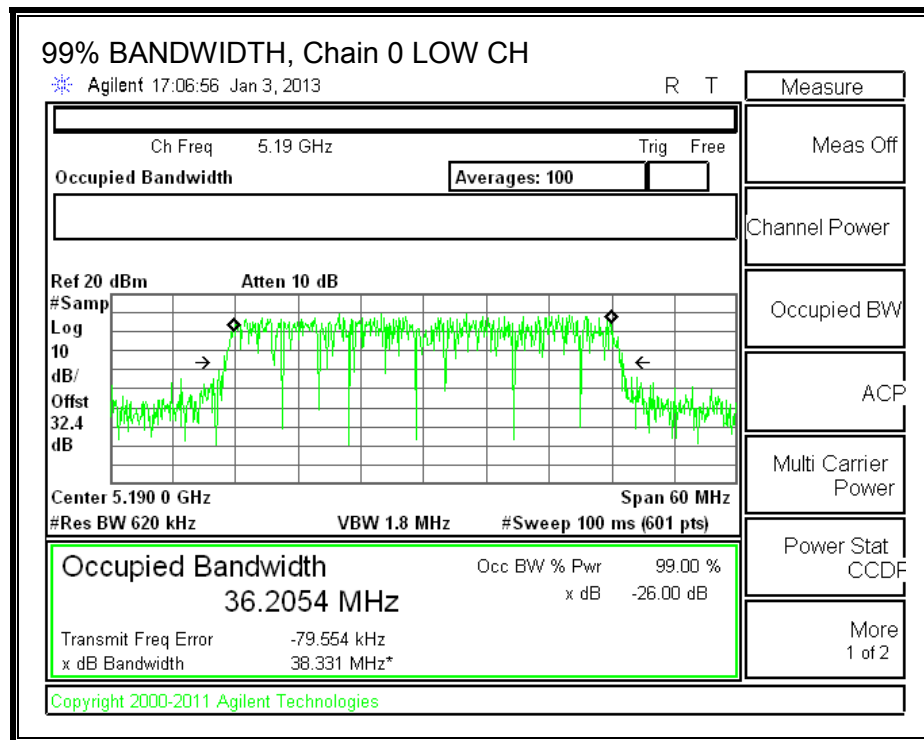
LIMITS

None; for reporting purposes only.

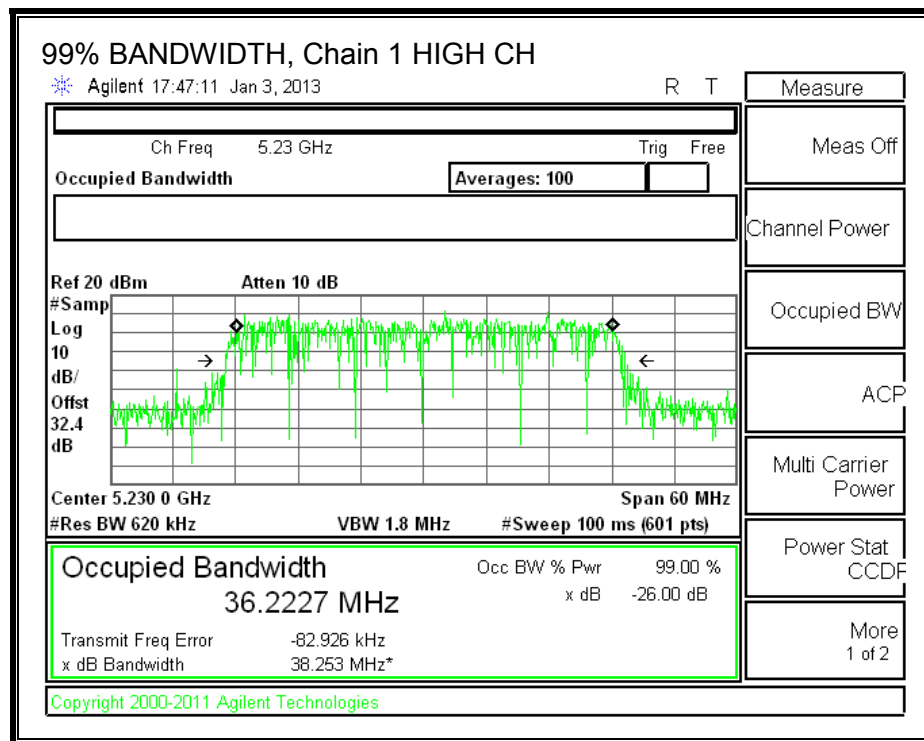
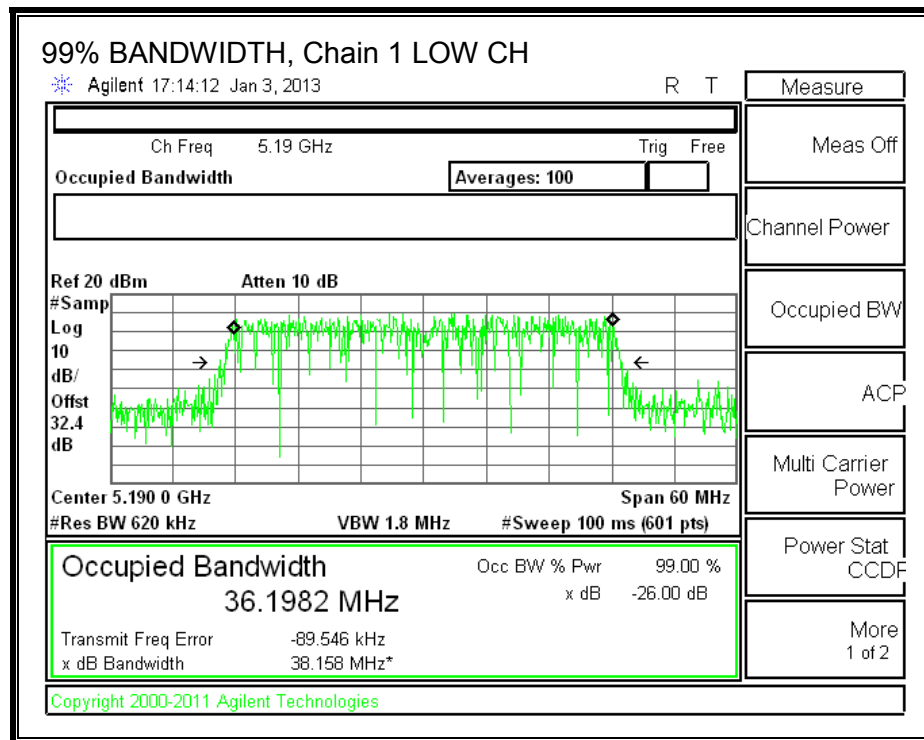
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	36.2054	36.1982
High	5230	36.1918	36.2227

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.11.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.50	36.1982	2.73
High	5230	39.50	36.1918	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5190	17.00	23.00	20.27	17.00	4.00	10.00	4.00
High	5230	17.00	23.00	20.27	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

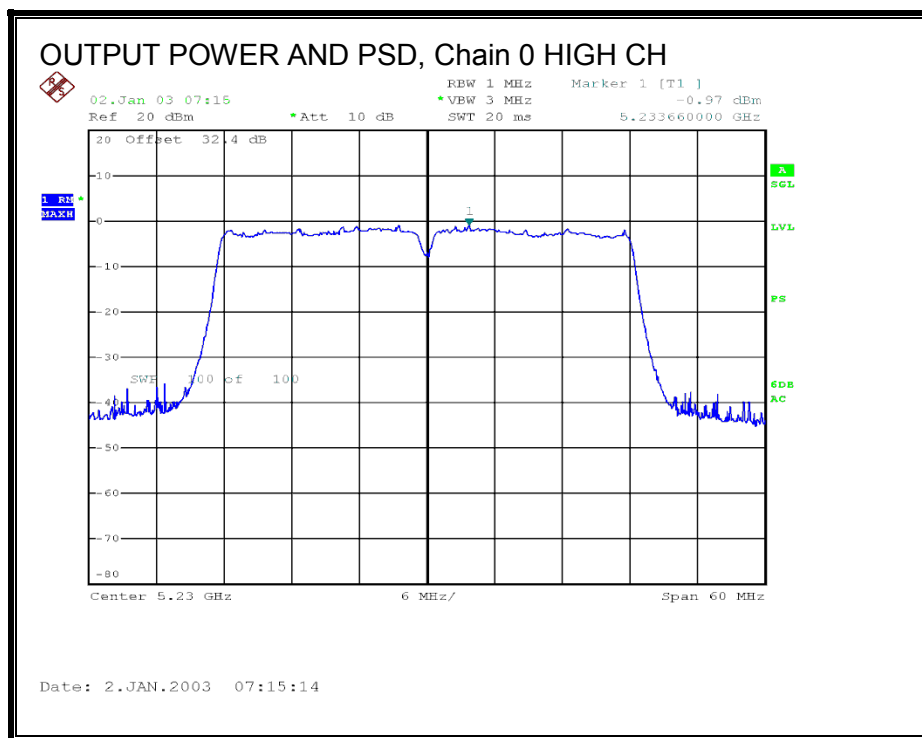
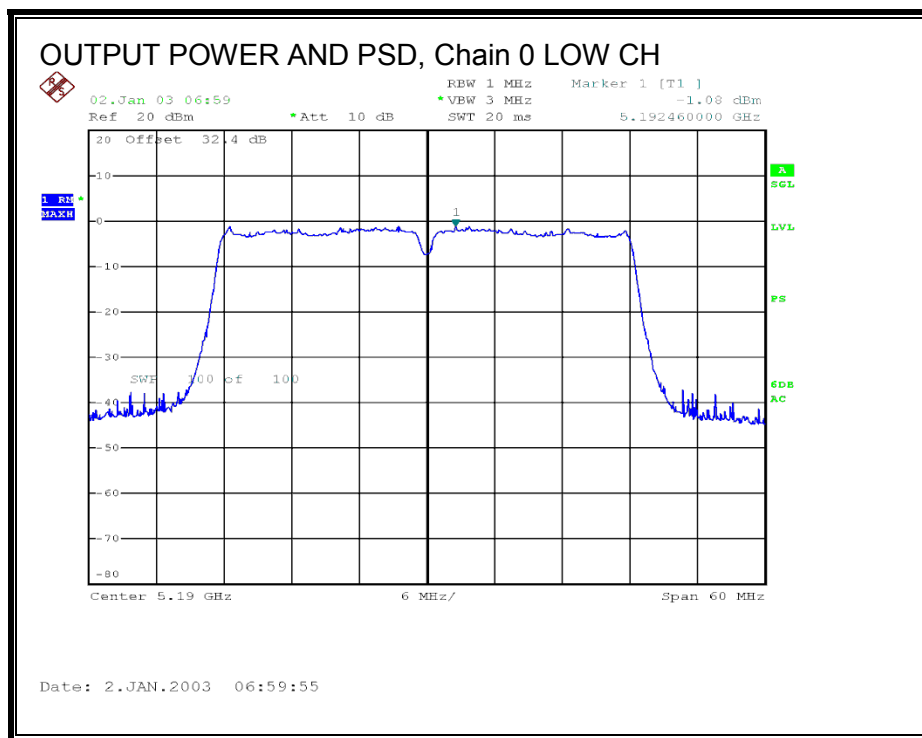
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	13.70	13.80	16.76	17.00	-0.24
High	5230	13.60	13.70	16.66	17.00	-0.34

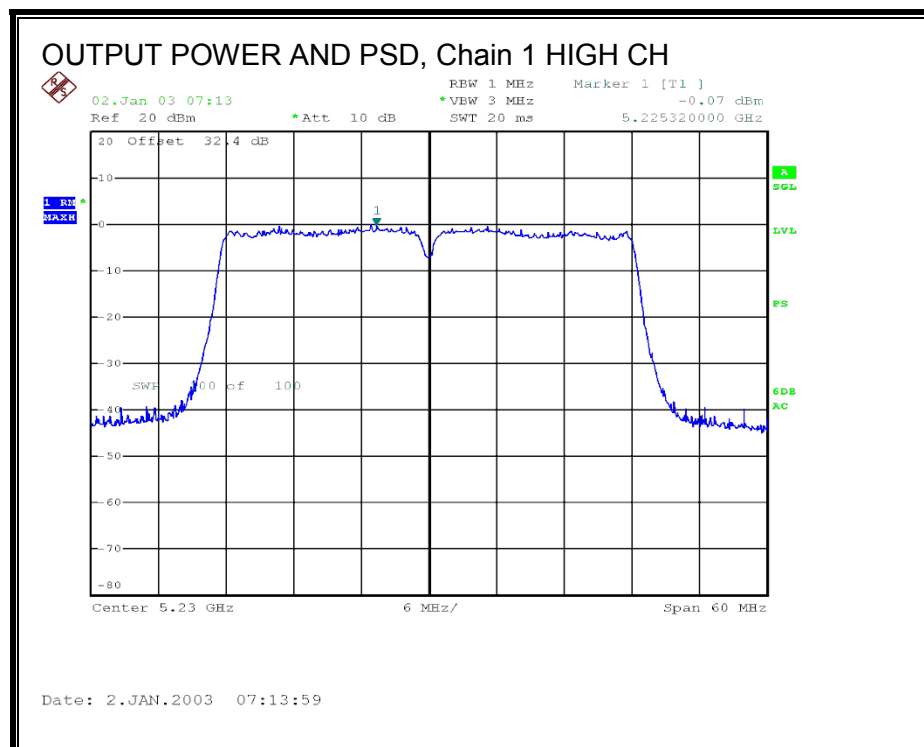
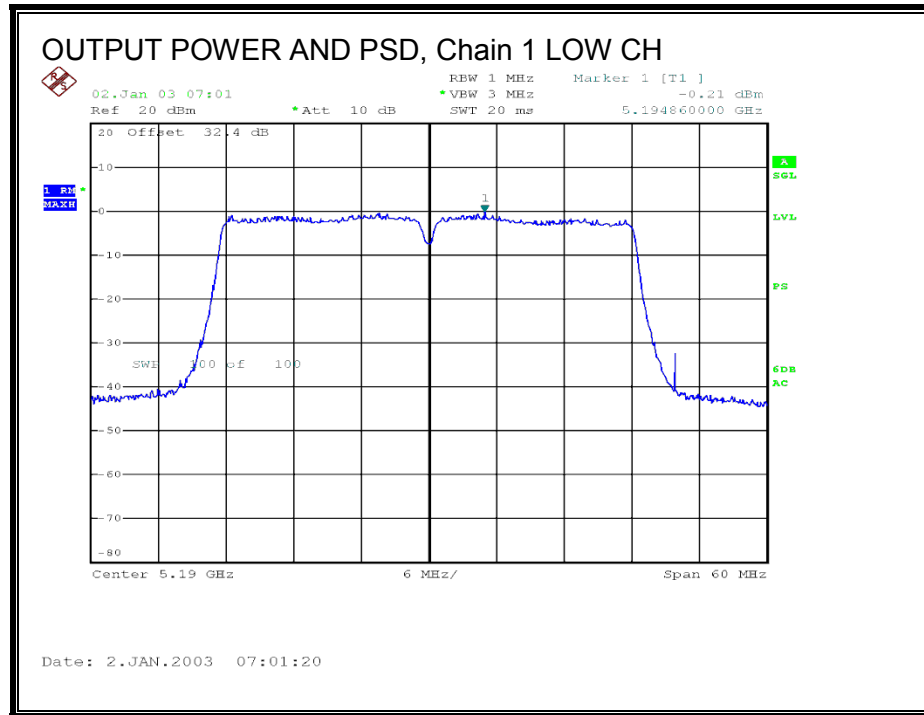
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-1.08	-0.21	2.39	4.00	-1.61
High	5230	-0.97	-0.07	2.51	4.00	-1.49

OUTPUT POWER AND PSD, Chain 0



OUTPUT POWER AND PSD, Chain 1



8.11.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

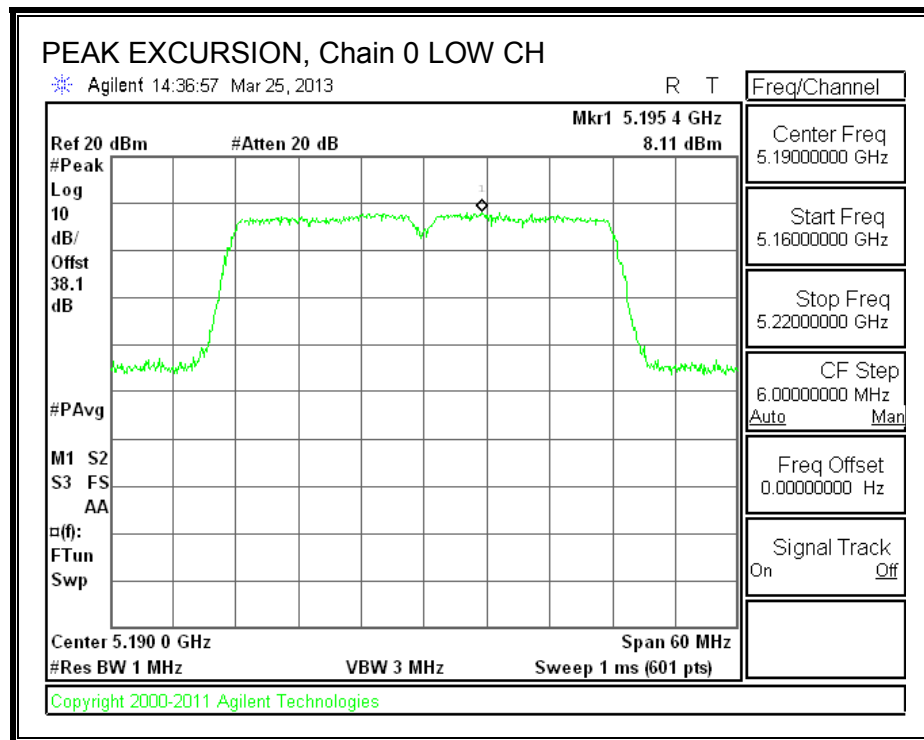
Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	8.11	-1.08	0.00	9.19	13	-3.81

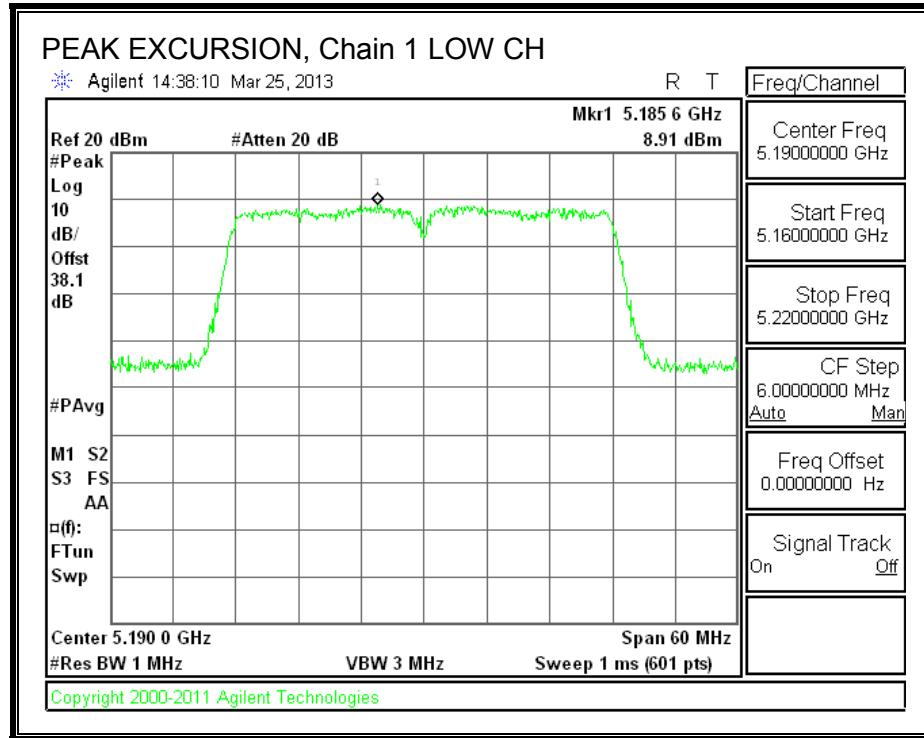
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	8.91	-0.21	0.00	9.12	13	-3.88

PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



8.12. 802.11n HT40 CDD 3TX MODE IN THE 5.2 GHz BAND

8.12.1. 26 dB BANDWIDTH

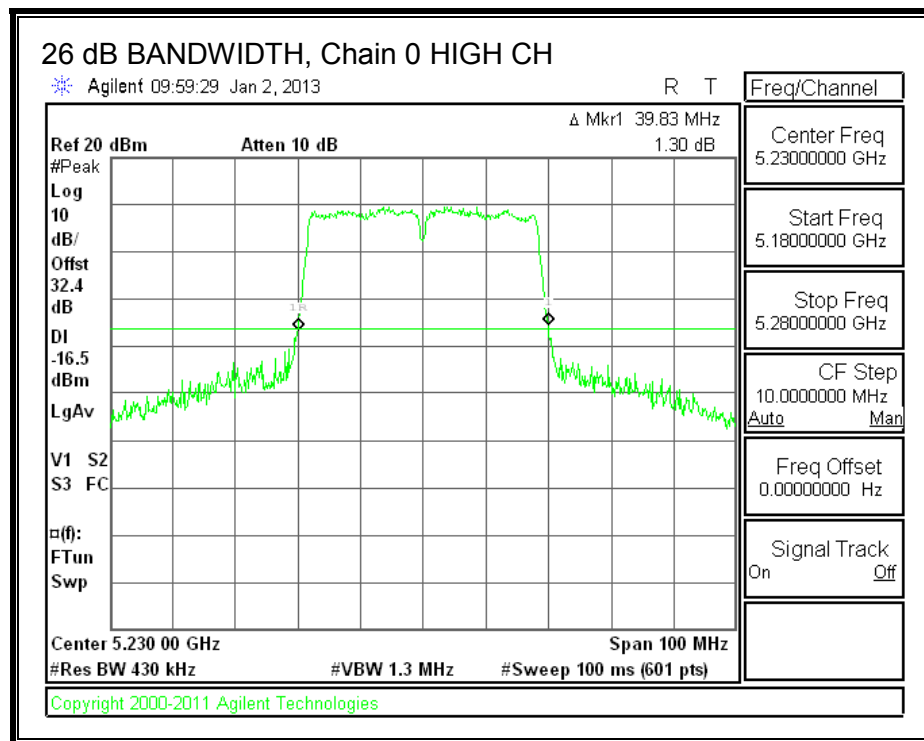
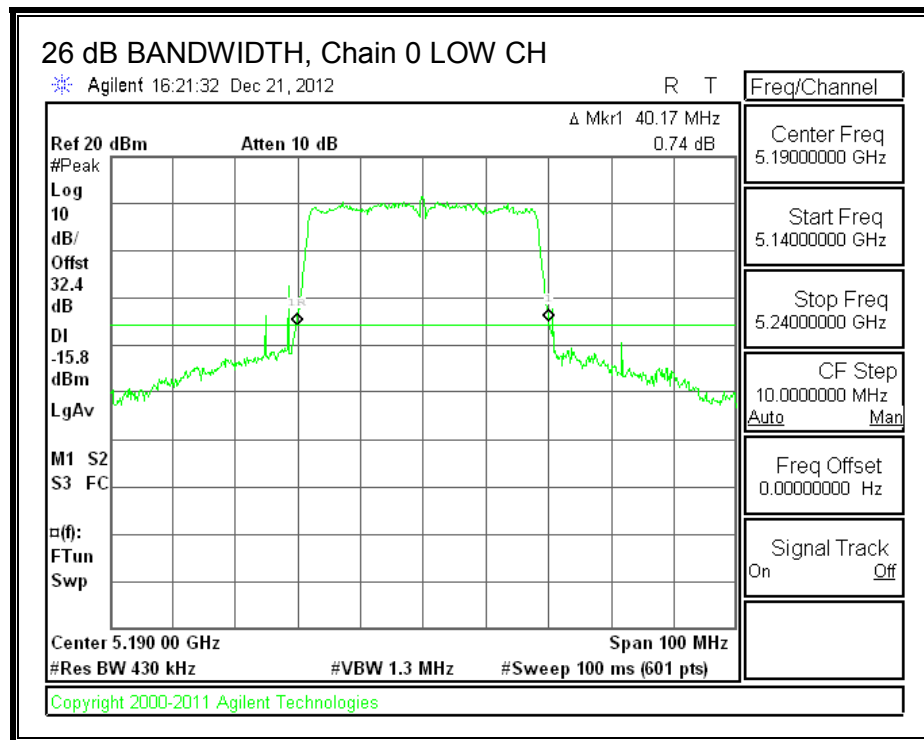
LIMITS

None; for reporting purposes only.

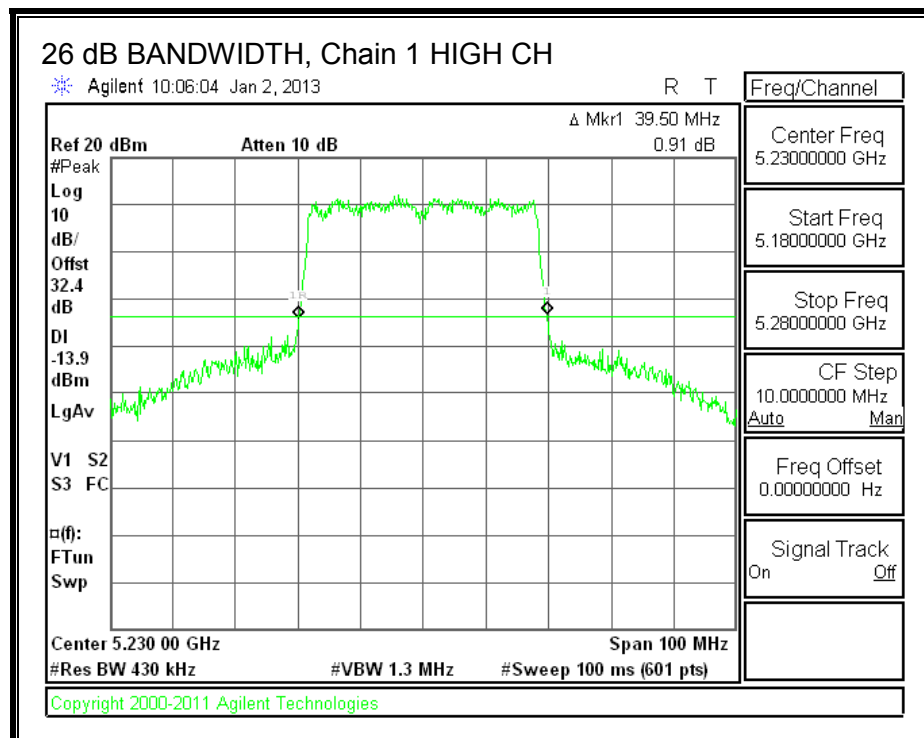
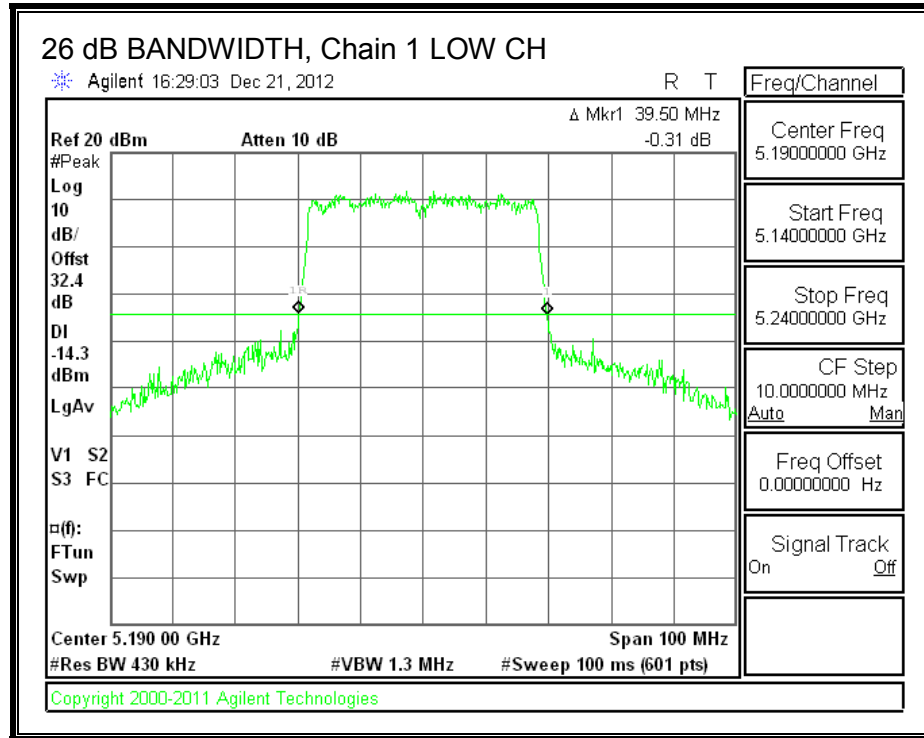
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	40.17	39.50	39.50
High	5230	39.83	39.50	39.50

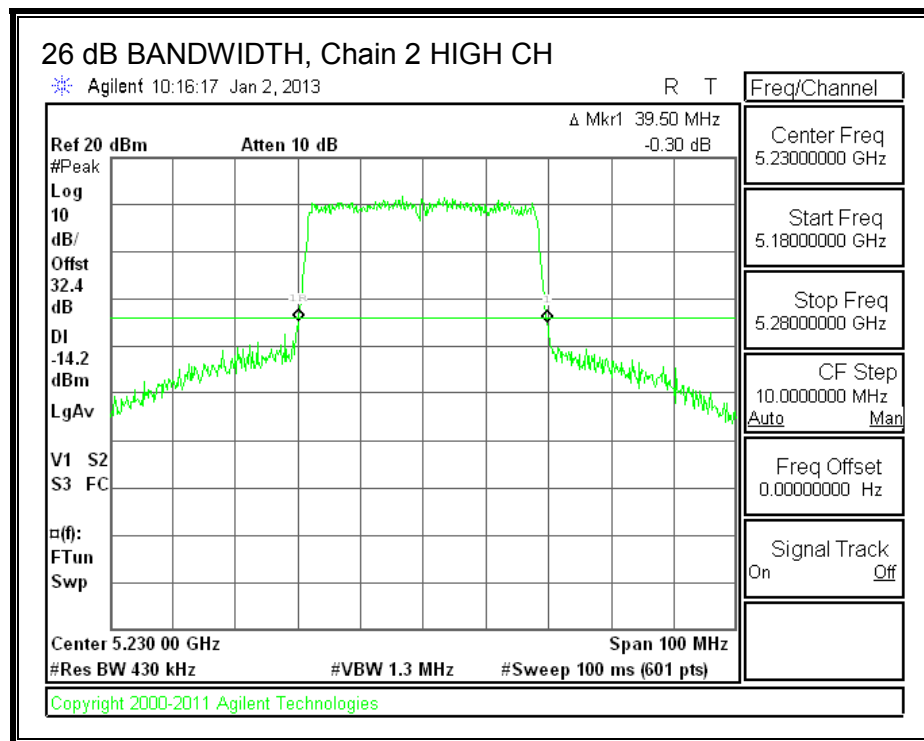
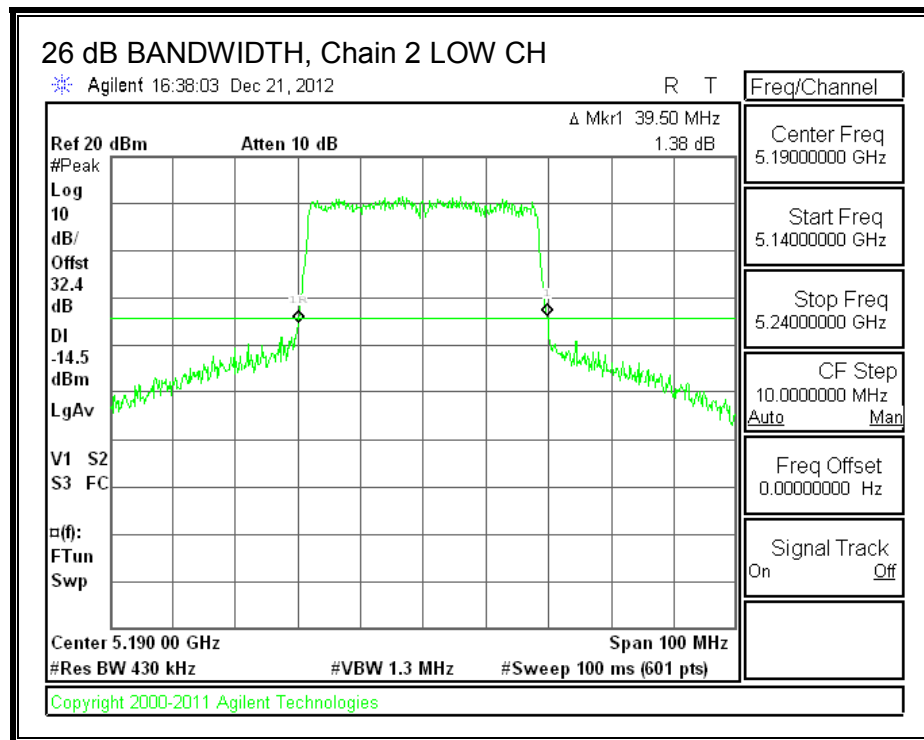
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.12.2. 99% BANDWIDTH

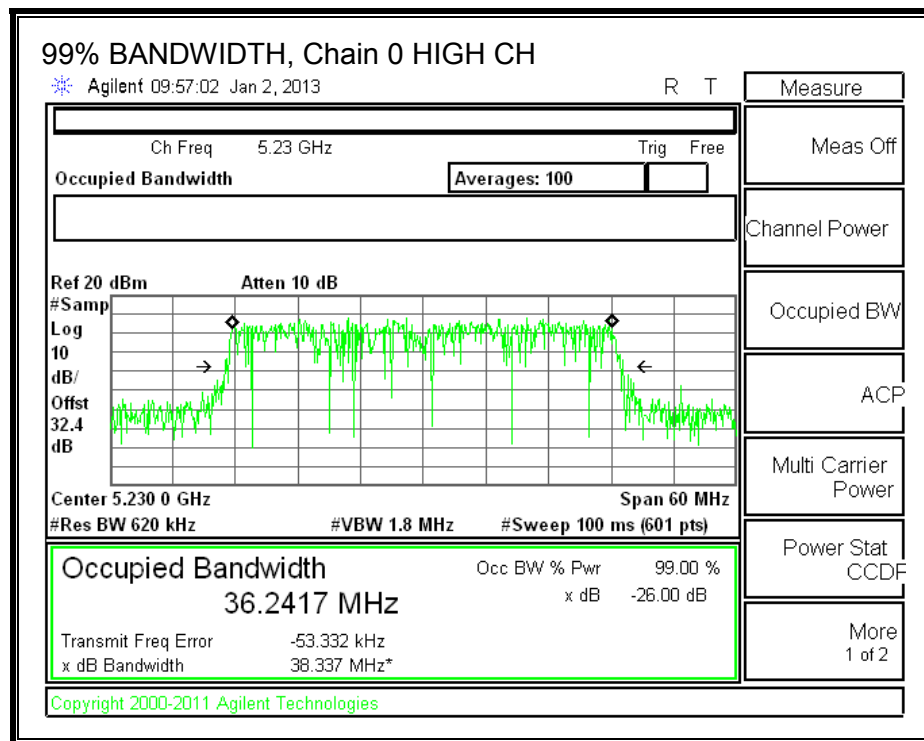
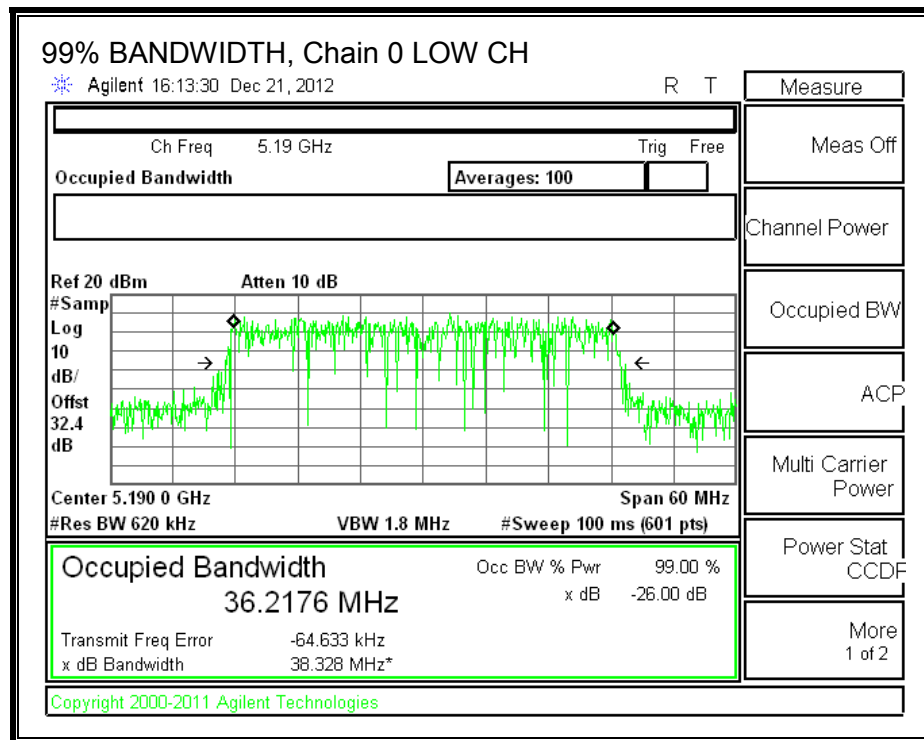
LIMITS

None; for reporting purposes only.

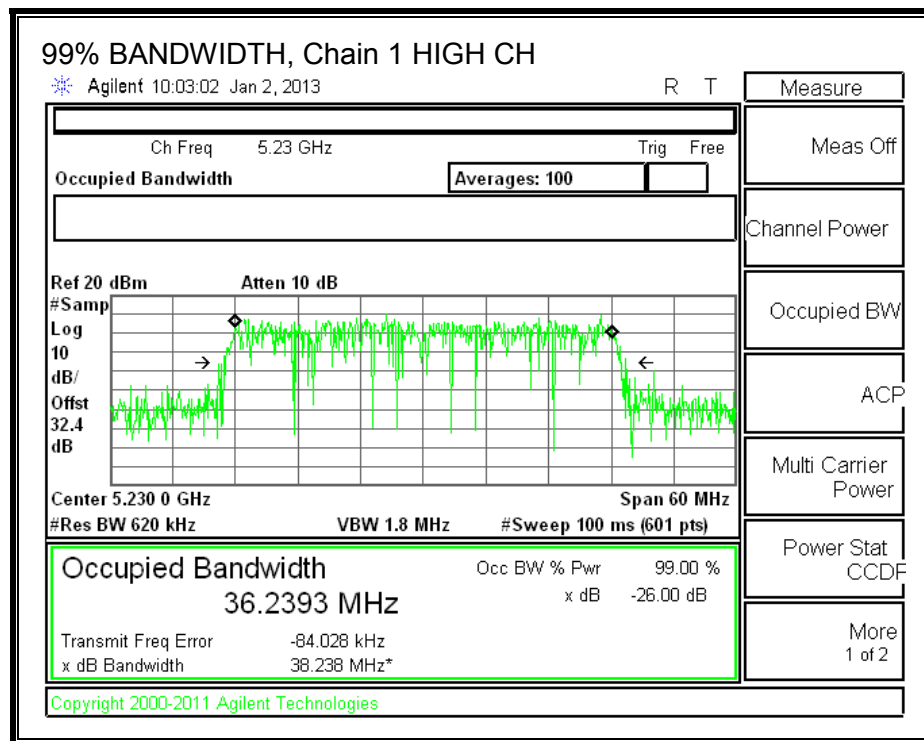
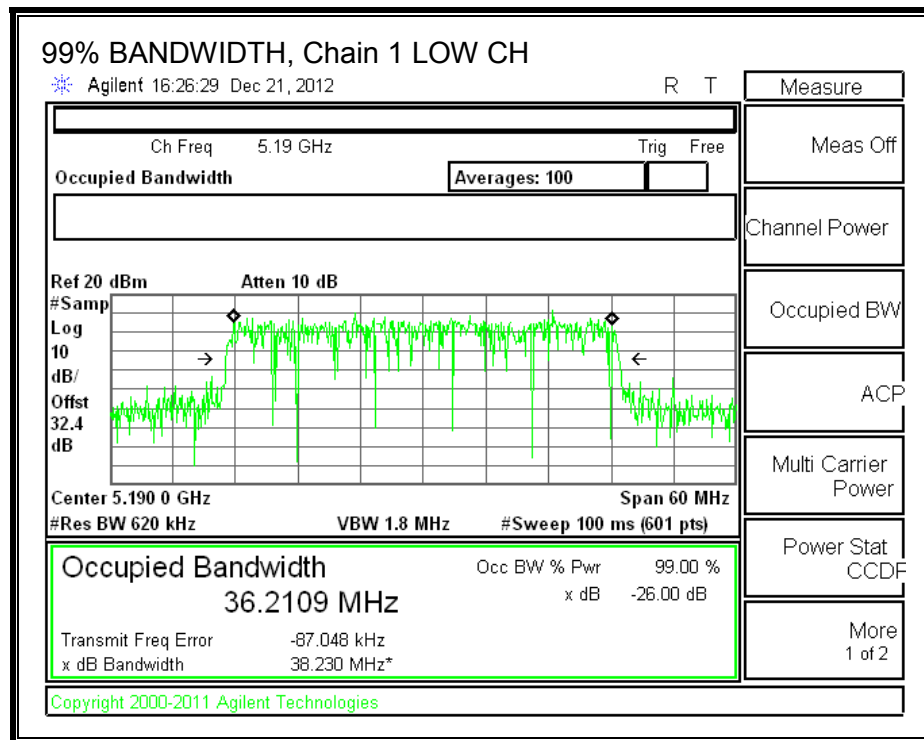
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.2176	36.2109	36.2162
High	5230	36.2417	36.2393	36.2273

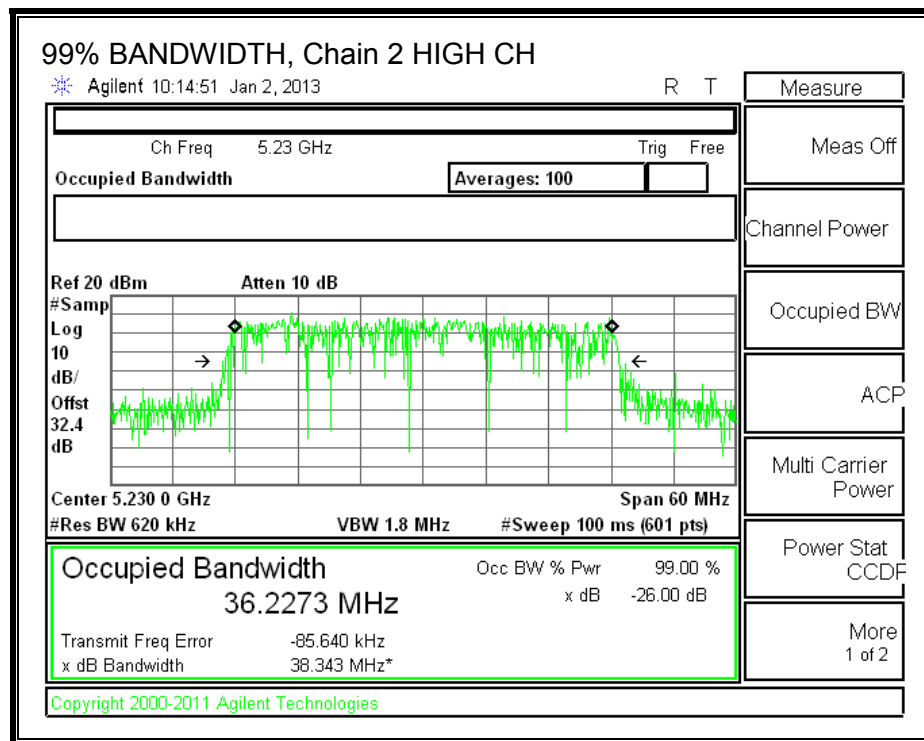
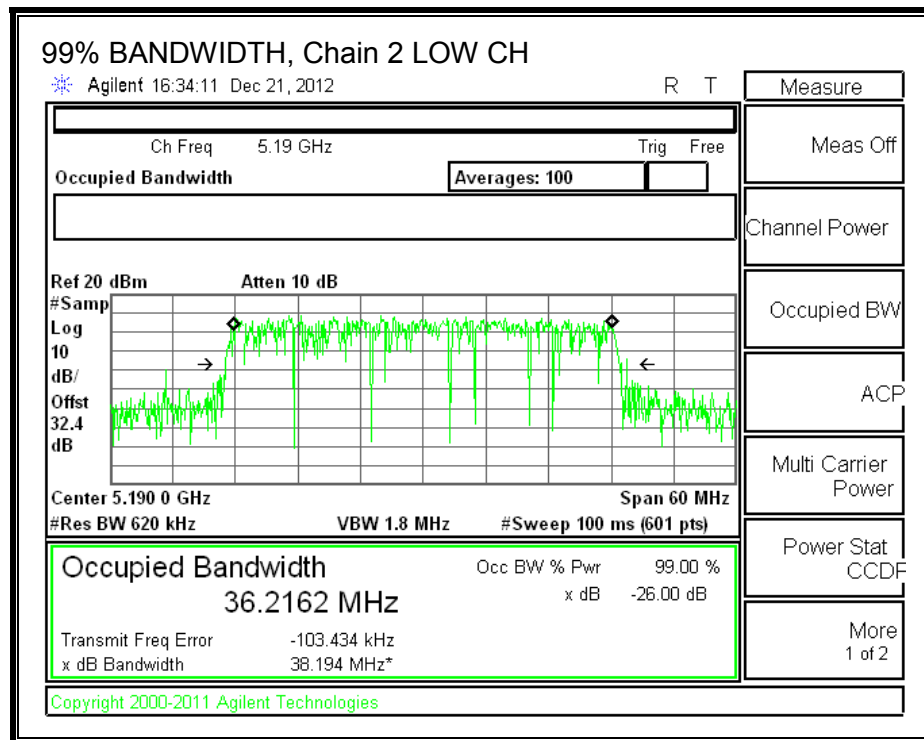
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.12.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Low	5190	39.50	36.2109	7.07	2.33
High	5230	39.50	36.2273	7.07	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5190	17.00	23.00	20.67	17.00	2.93	10.00	2.93
High	5230	17.00	23.00	20.67	17.00	2.93	10.00	2.93

Duty Cycle CF (dB)	0.00	
--------------------	------	--

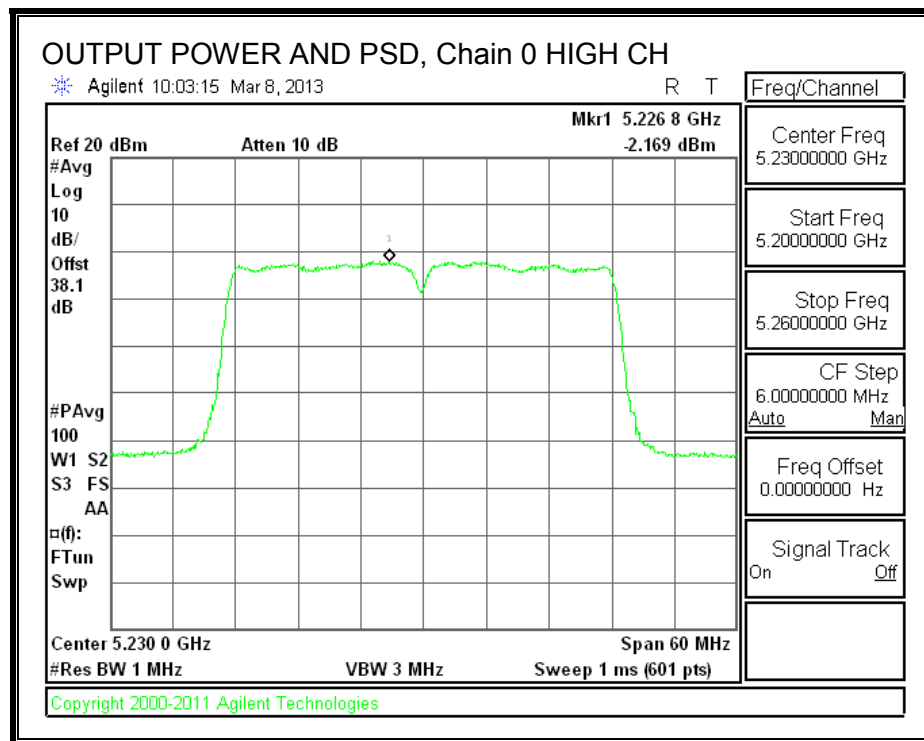
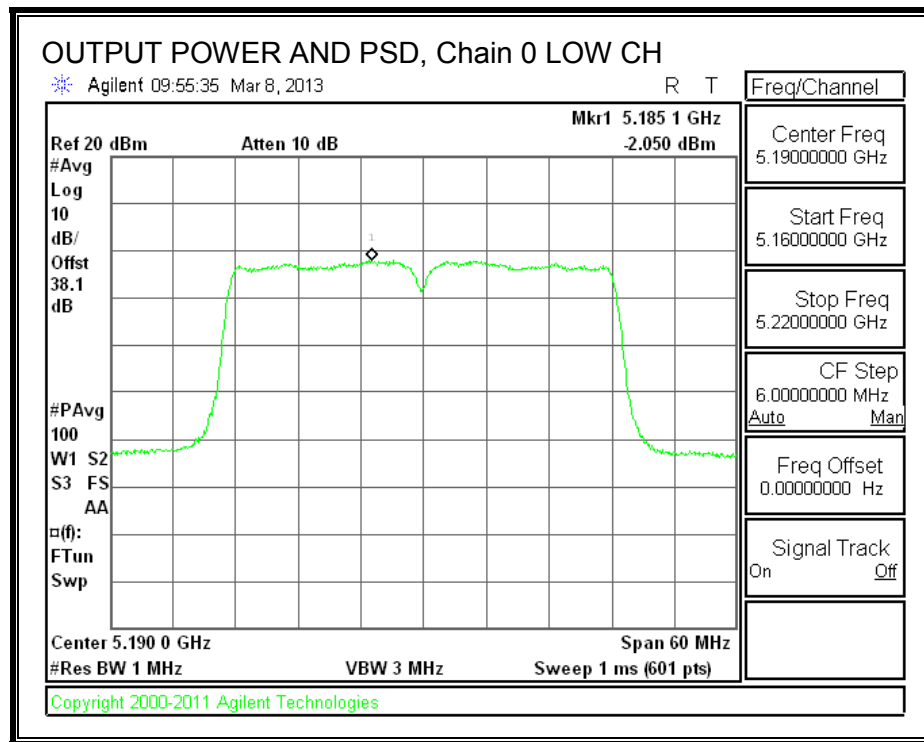
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	9.80	9.50	9.60	14.41	17.00	-2.59
High	5230	9.70	9.50	9.60	14.37	17.00	-2.63

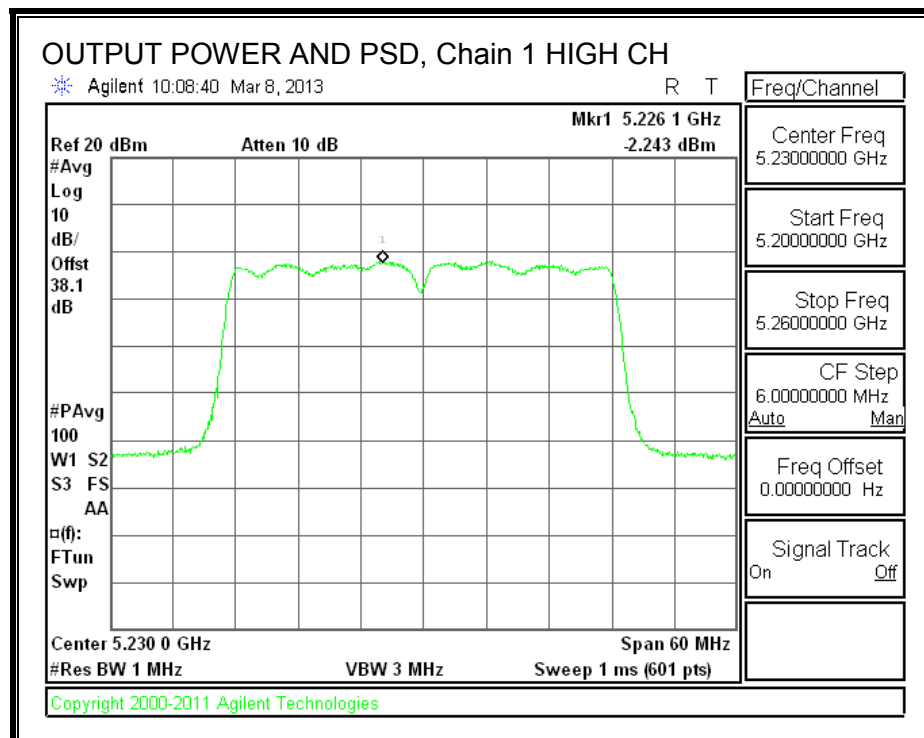
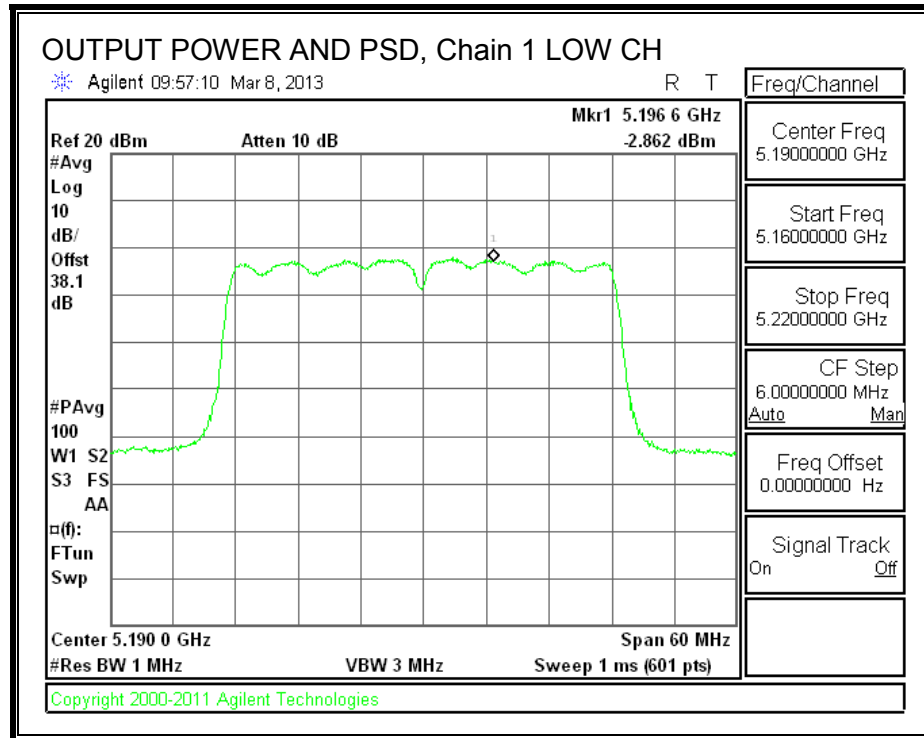
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-2.050	-2.860	-2.097	2.45	2.93	-0.48
High	5230	-2.169	-2.243	-2.284	2.54	2.93	-0.39

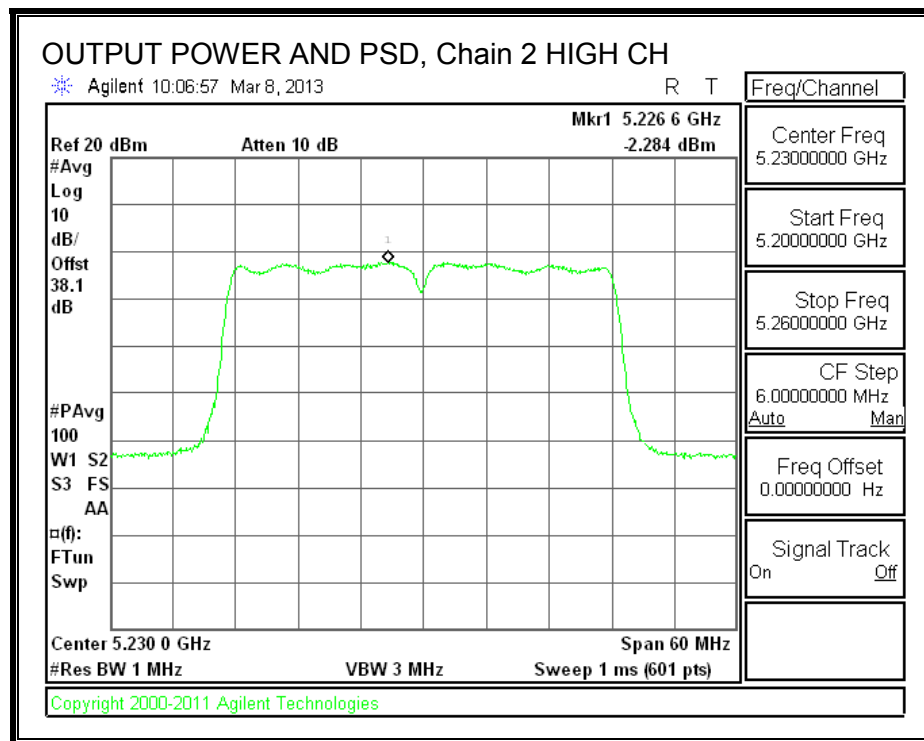
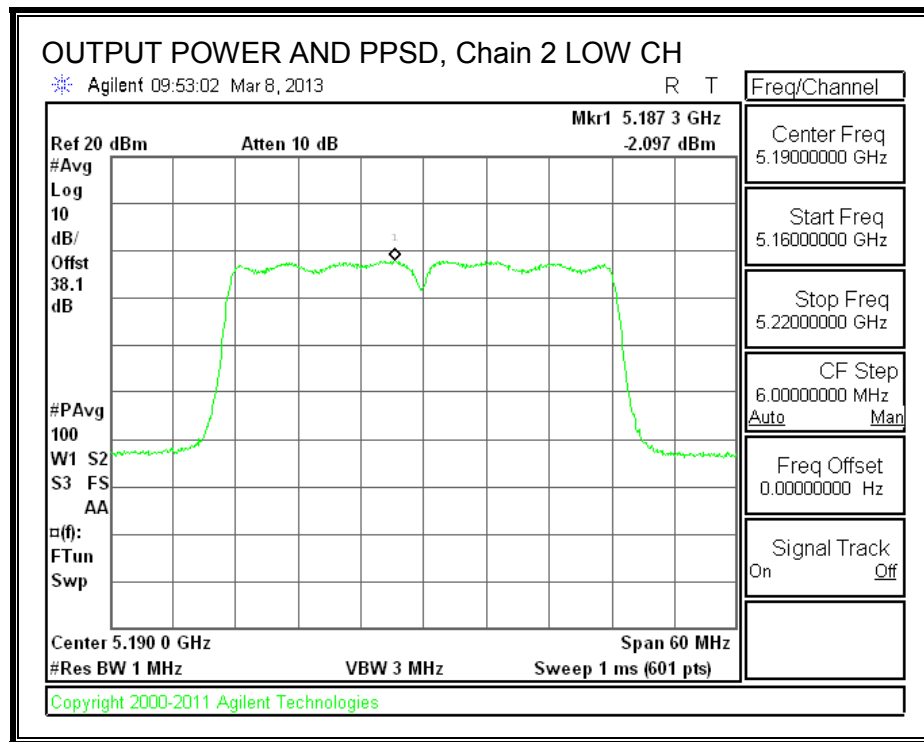
OUTPUT POWER AND PSD, Chain 0



OUTPUT POWER AND PSD, Chain 1



OUTPUT POWER AND PSD, Chain 2



8.12.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	6.68	-2.050	0.00	8.73	13	-4.27

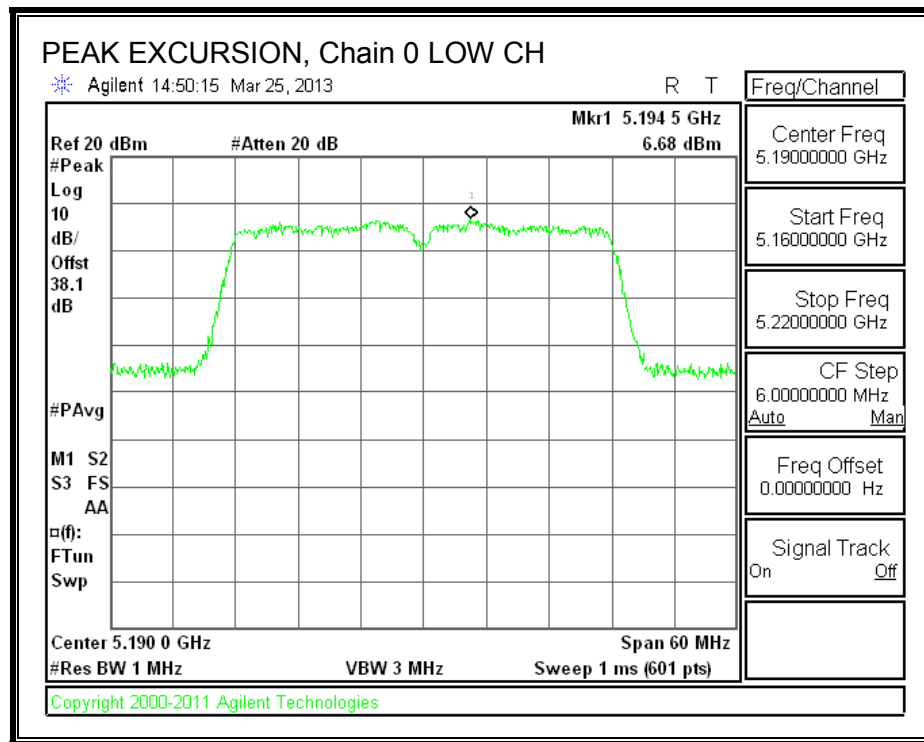
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	6.89	-2.860	0.00	9.75	13	-3.25

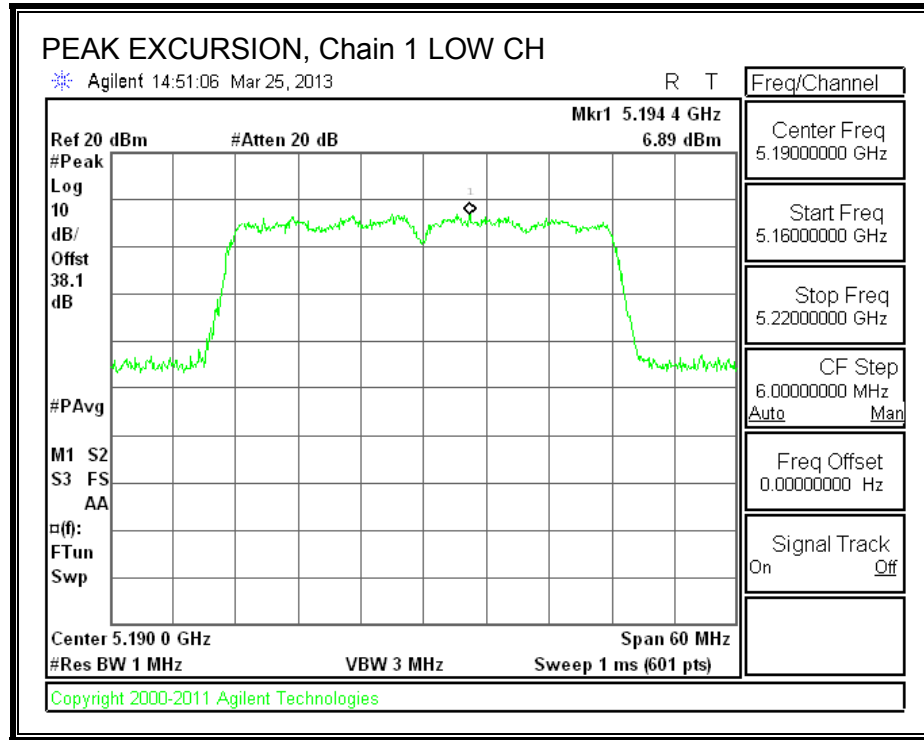
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.87	-2.097	0.00	9.97	13	-3.03

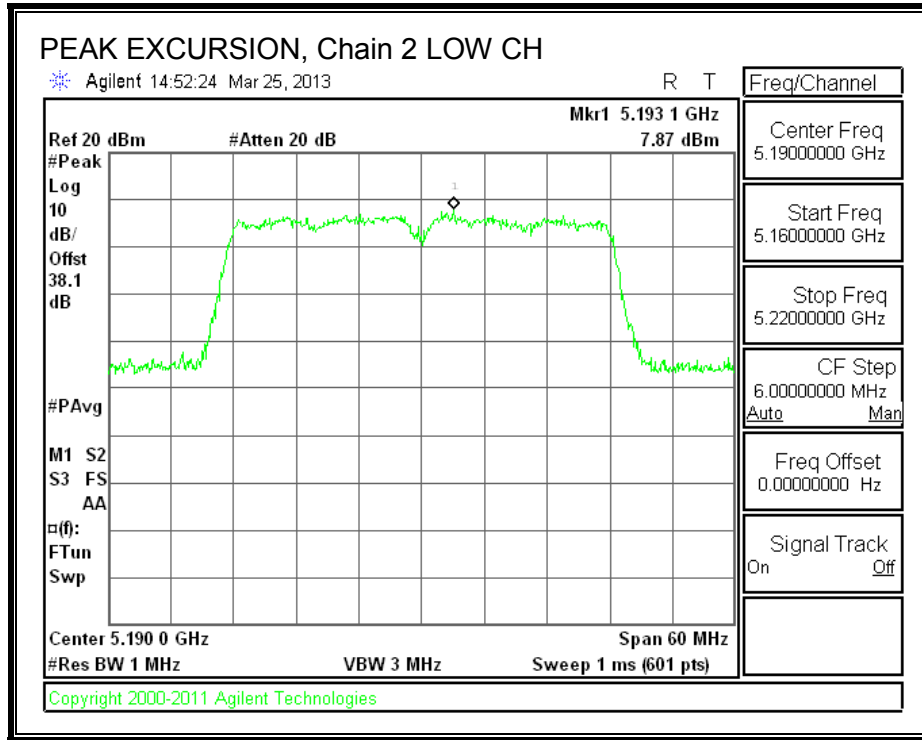
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.13. 802.11n HT40 BF 3TX MODE IN THE 5.2 GHz BAND

Covered by testing HT40 CDD 3TX mode, the power per chain used for HT40 CDD 3TX mode is the same power per chain that will be used for HT40 BF 3TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.13.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5190	39.50	36.2109	7.07
High	5230	39.50	36.2273	7.07

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Low	5190	15.93	23.00	15.93	15.93
High	5230	15.93	23.00	15.93	15.93

Duty Cycle CF (dB)	0.00
---------------------------	------

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	9.80	9.50	9.60	14.41	15.93	-1.52
High	5230	9.70	9.50	9.60	14.37	15.93	-1.56

8.14. 802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND

8.14.1. 26 dB BANDWIDTH

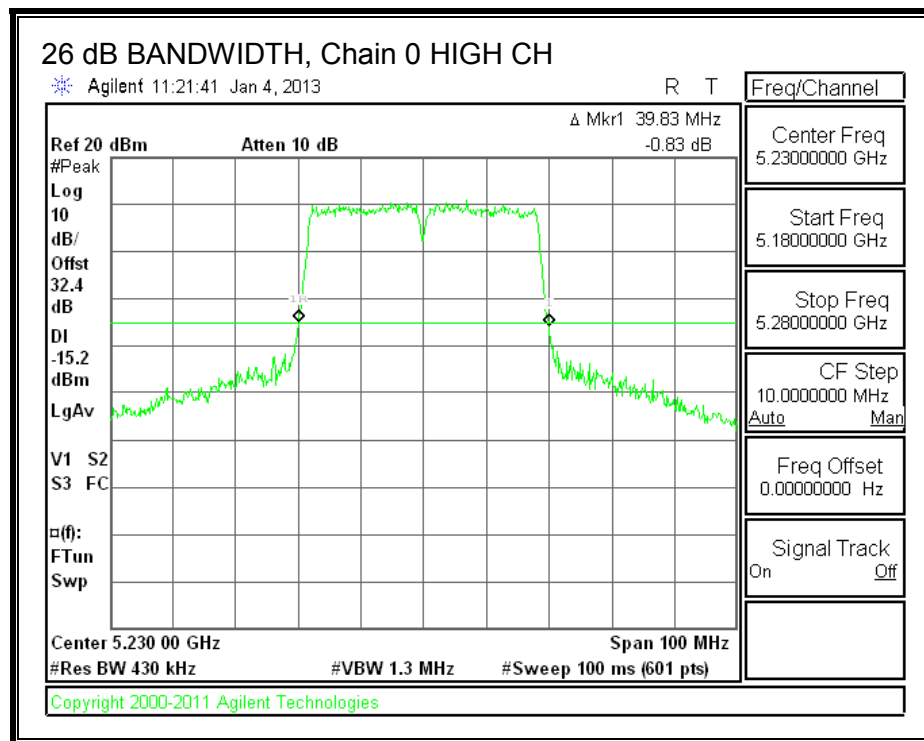
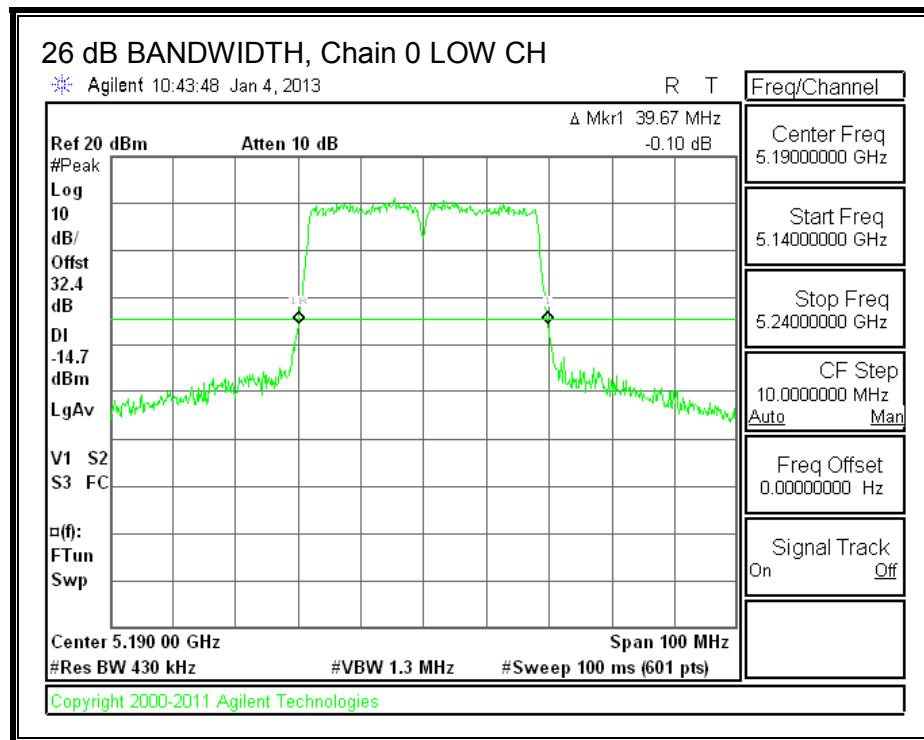
LIMITS

None; for reporting purposes only.

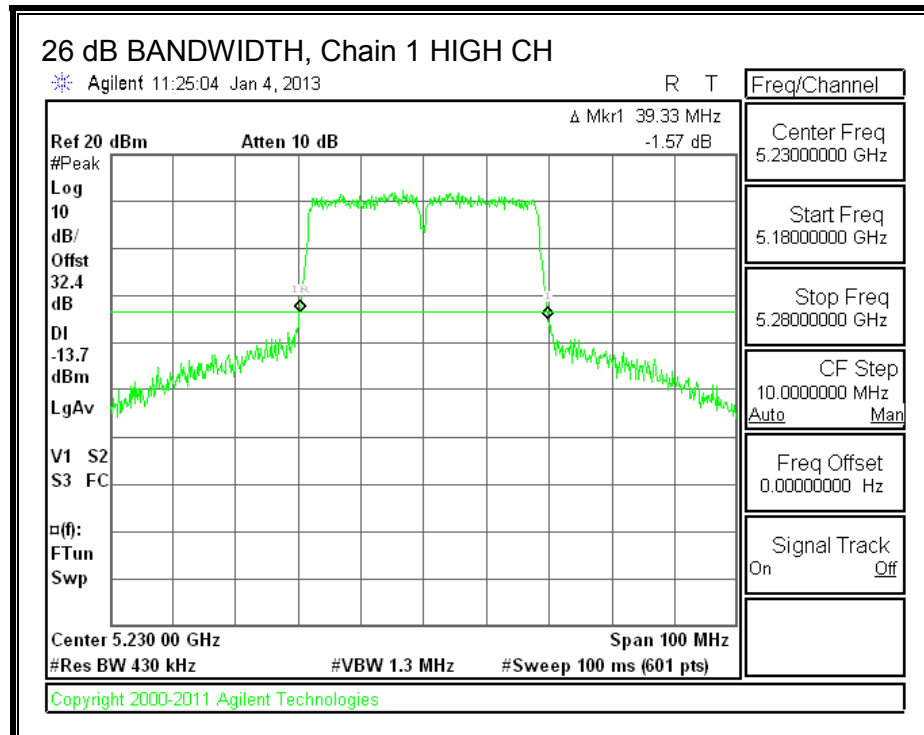
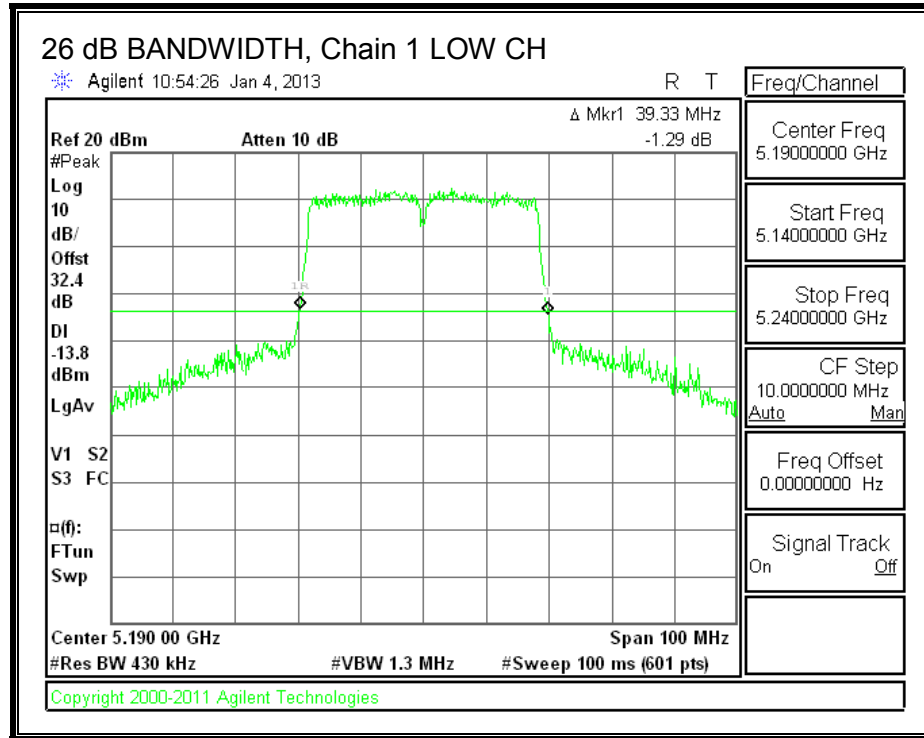
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	39.67	39.33	39.67
High	5230	39.83	39.33	39.50

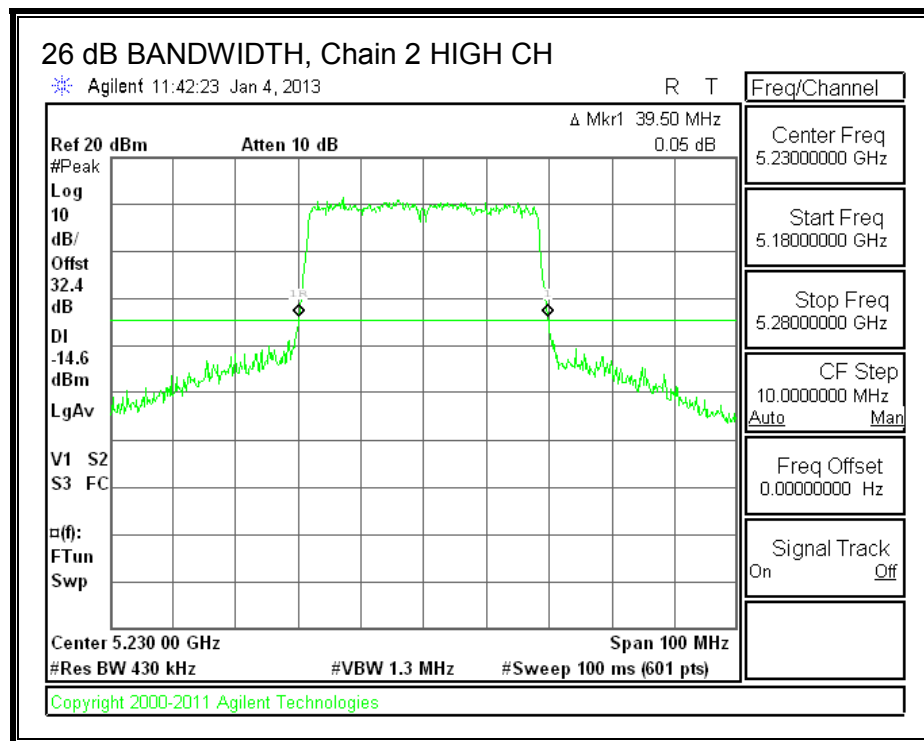
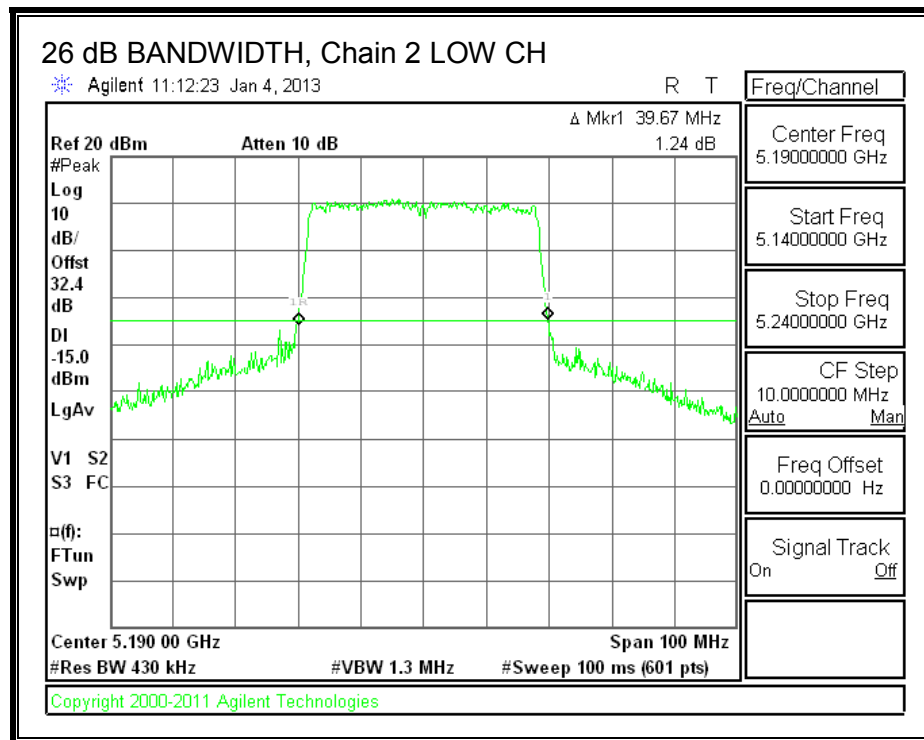
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.14.2. 99% BANDWIDTH

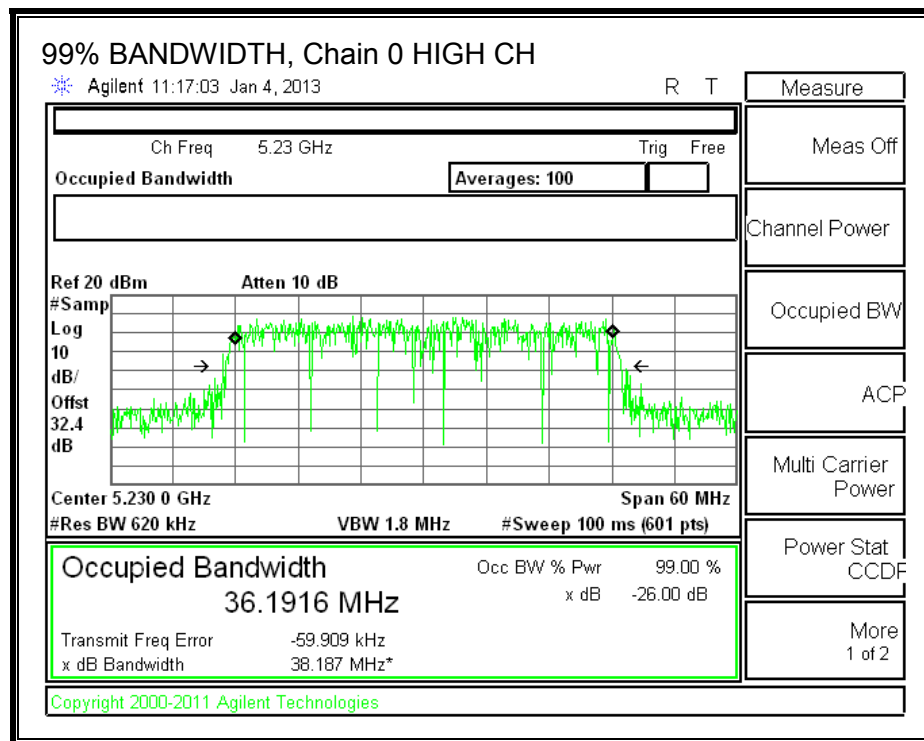
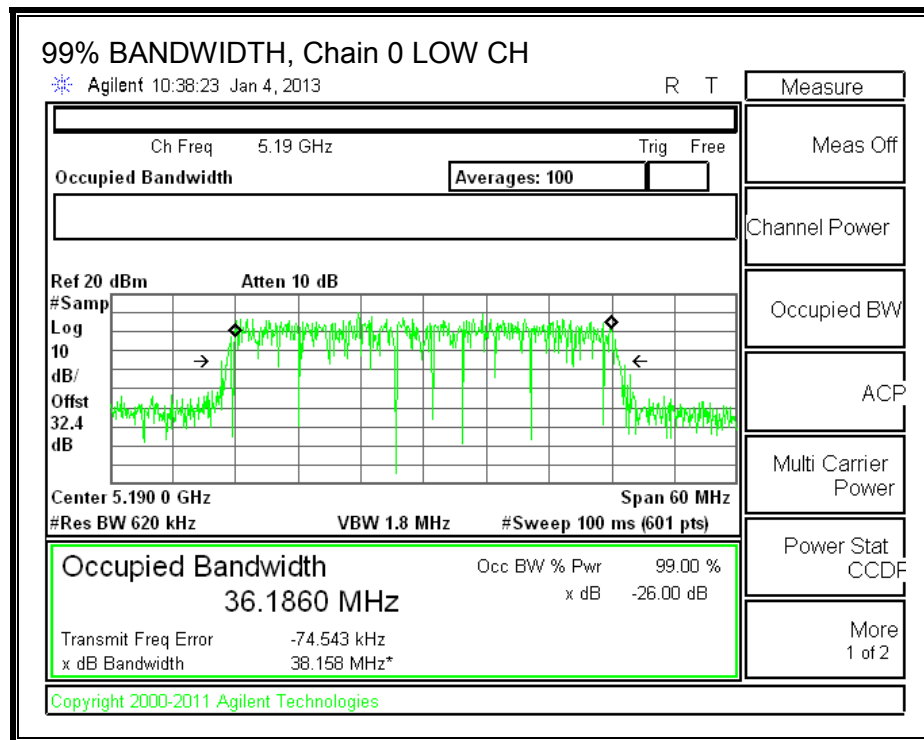
LIMITS

None; for reporting purposes only.

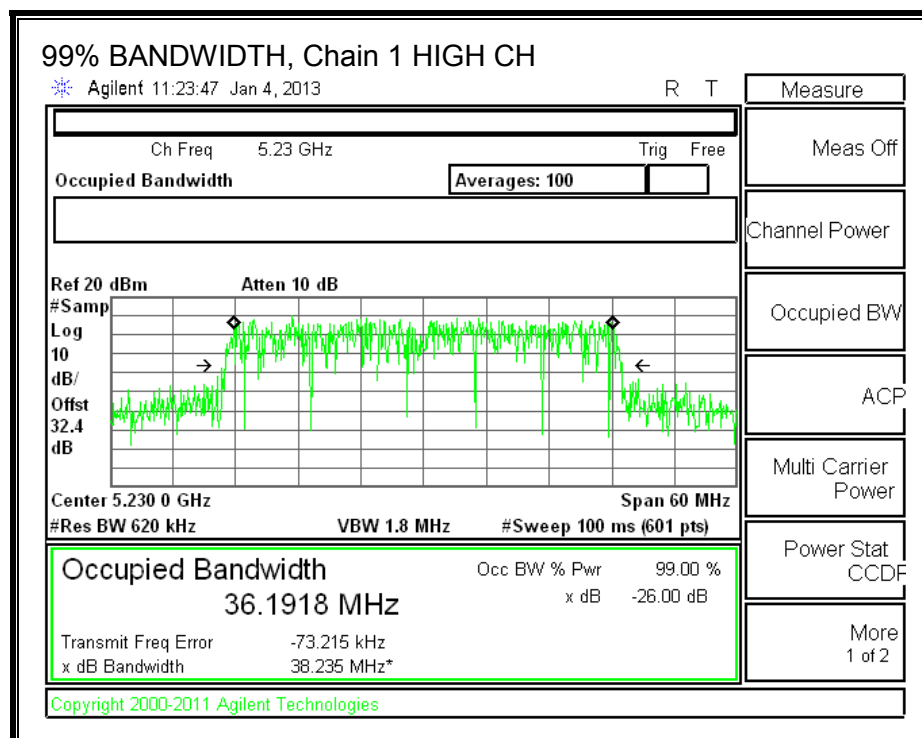
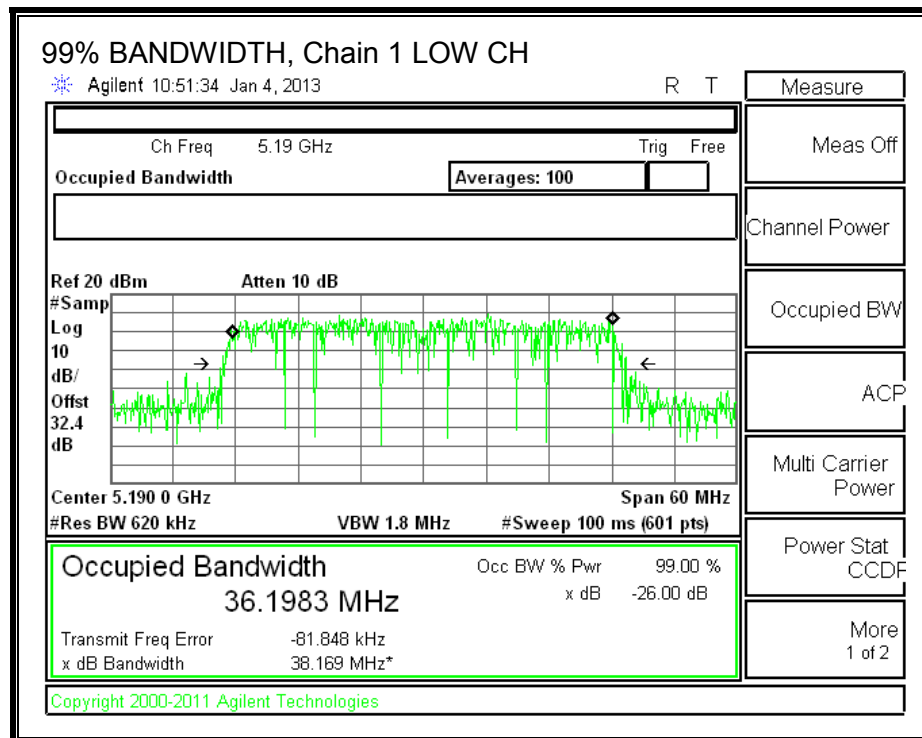
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.1860	36.1983	36.2039
High	5230	36.1916	36.1918	36.1916

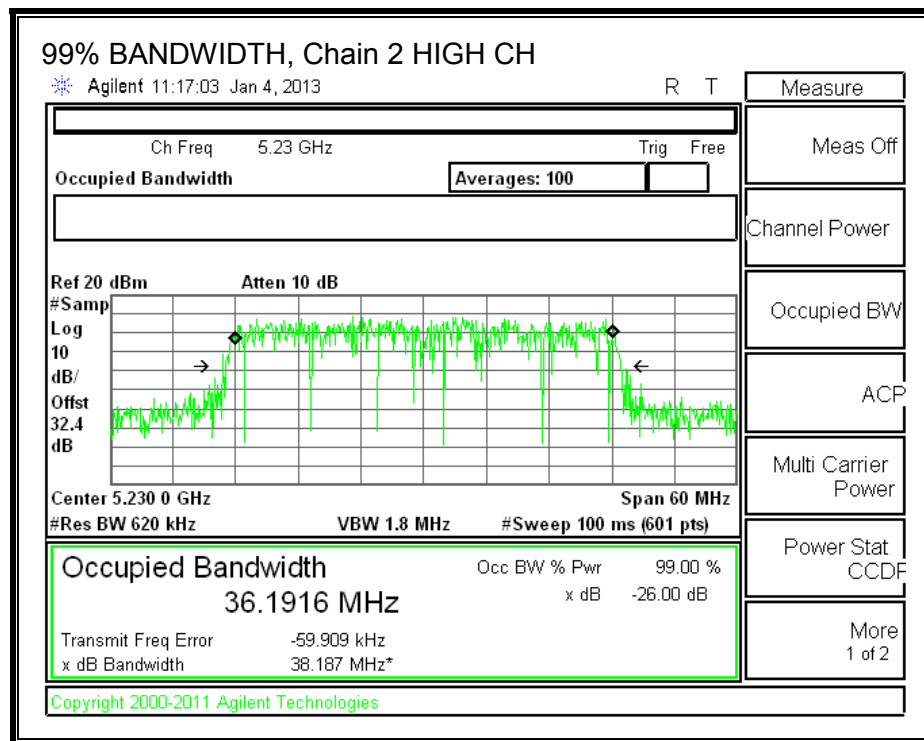
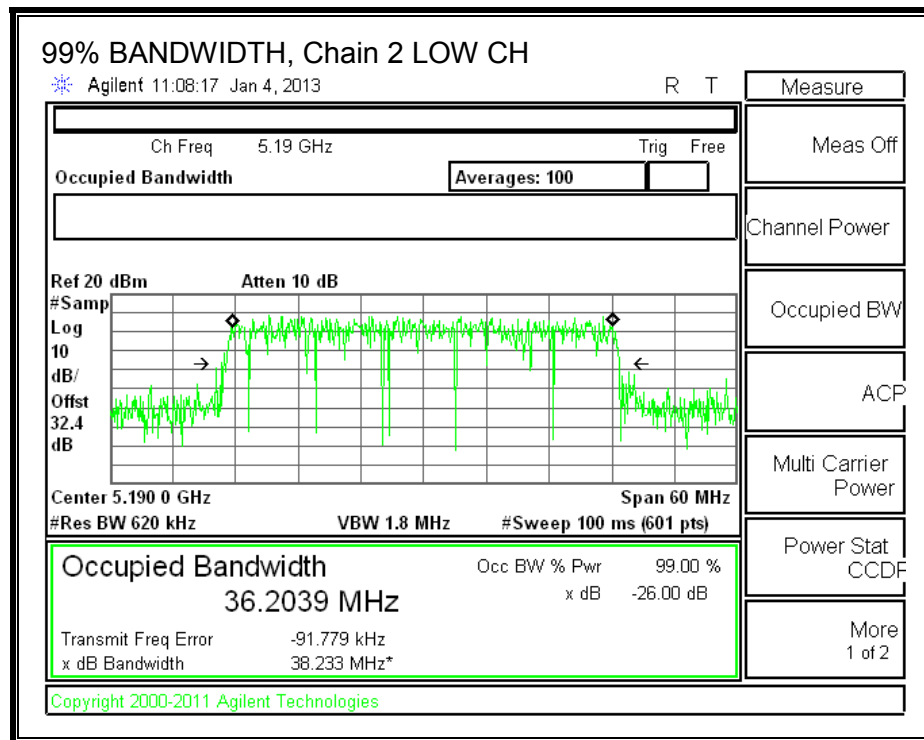
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.14.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.33	36.1860	2.33
High	5230	39.33	36.1916	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5190	17.00	23.00	20.67	17.00	4.00	10.00	4.00
High	5230	17.00	23.00	20.67	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

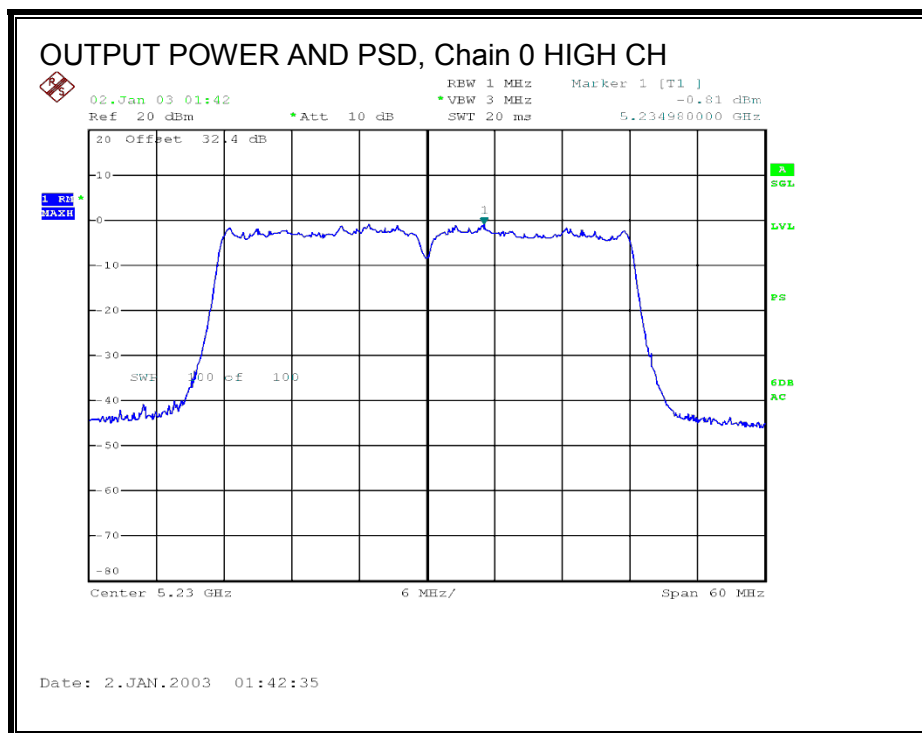
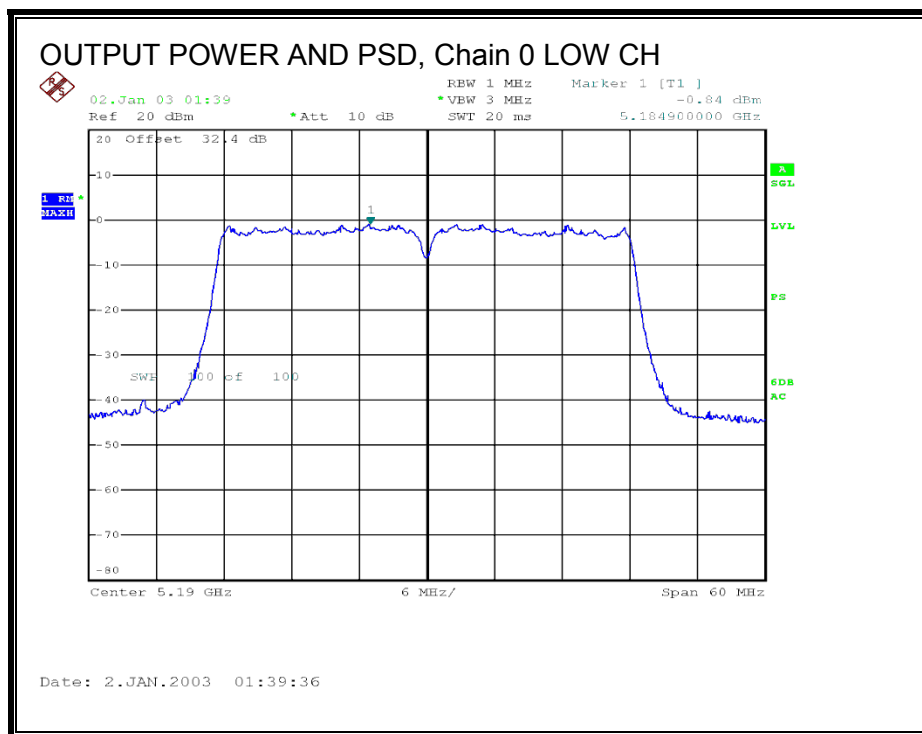
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	11.73	11.55	11.50	16.37	17.00	-0.63
High	5230	11.60	11.50	11.45	16.29	17.00	-0.71

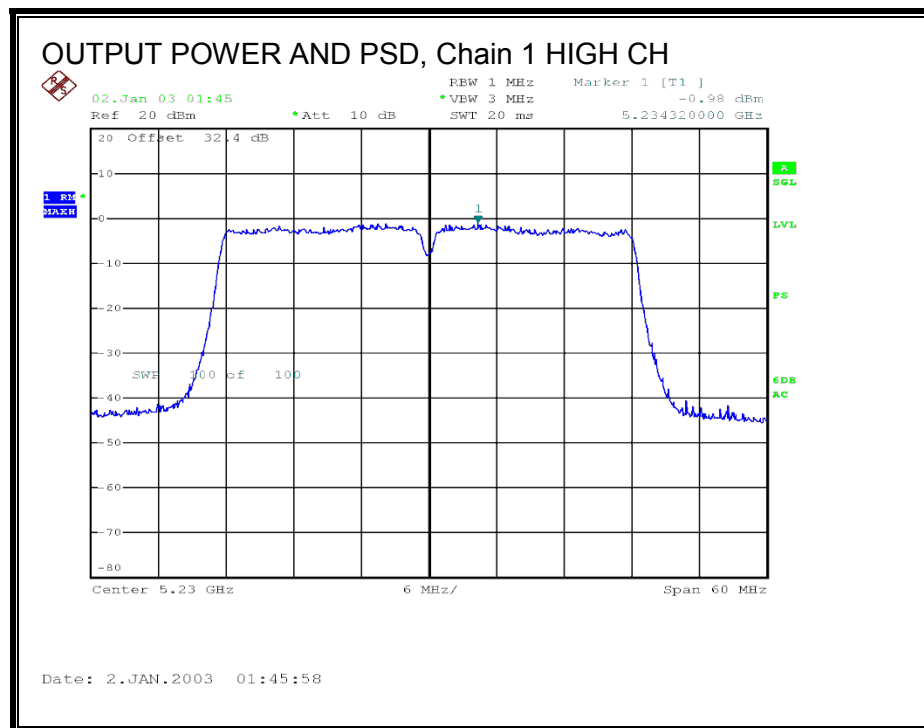
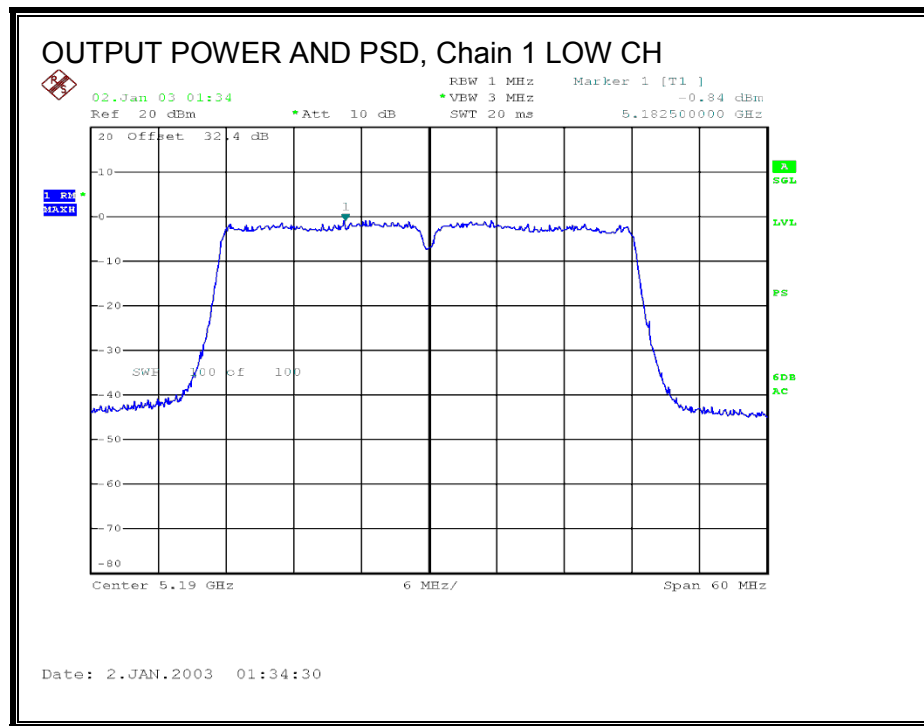
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-0.84	-0.84	-0.99	3.88	4.00	-0.12
High	5230	-0.81	-0.98	-1.07	3.82	4.00	-0.18

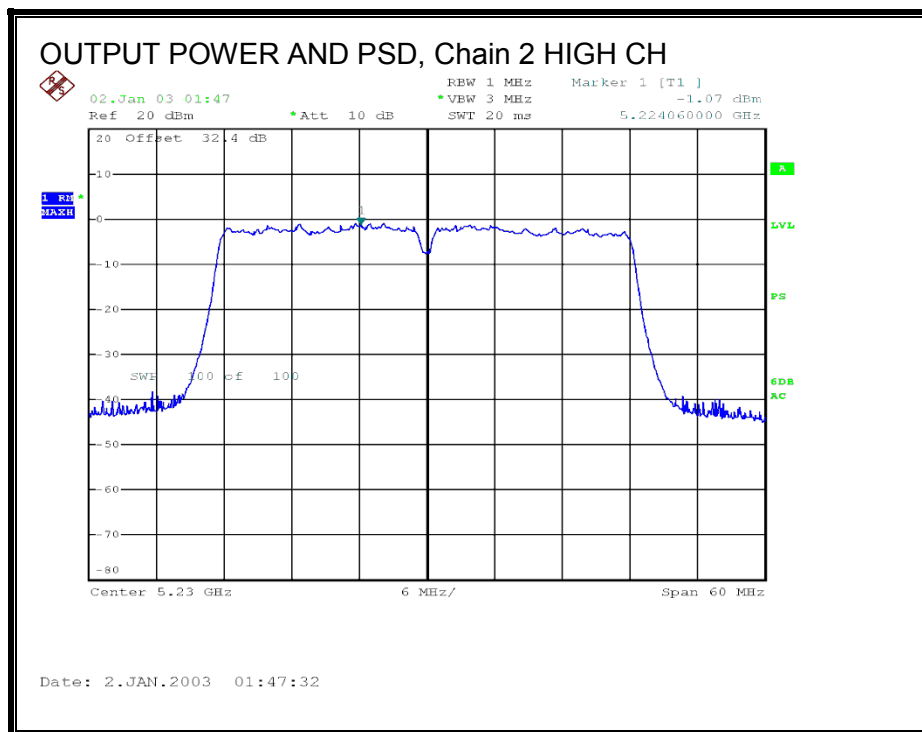
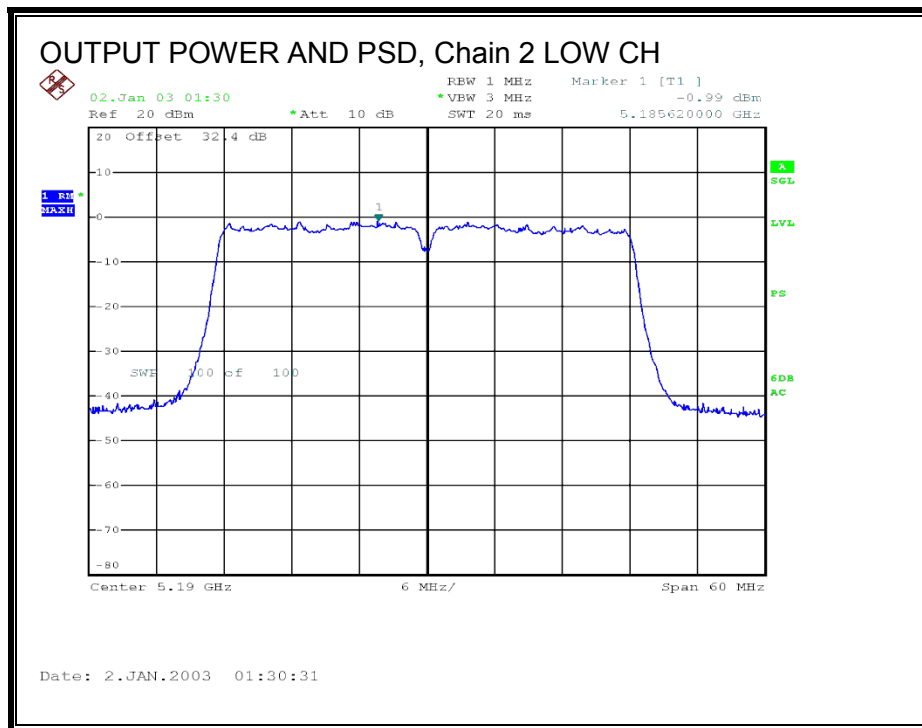
OUTPUT POWER AND PSD, Chain 0



OUTPUT POWER AND PSD, Chain 1



OUTPUT POWER AND PSD, Chain 2



8.14.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.30	-0.84	0.00	8.14	13	-4.86

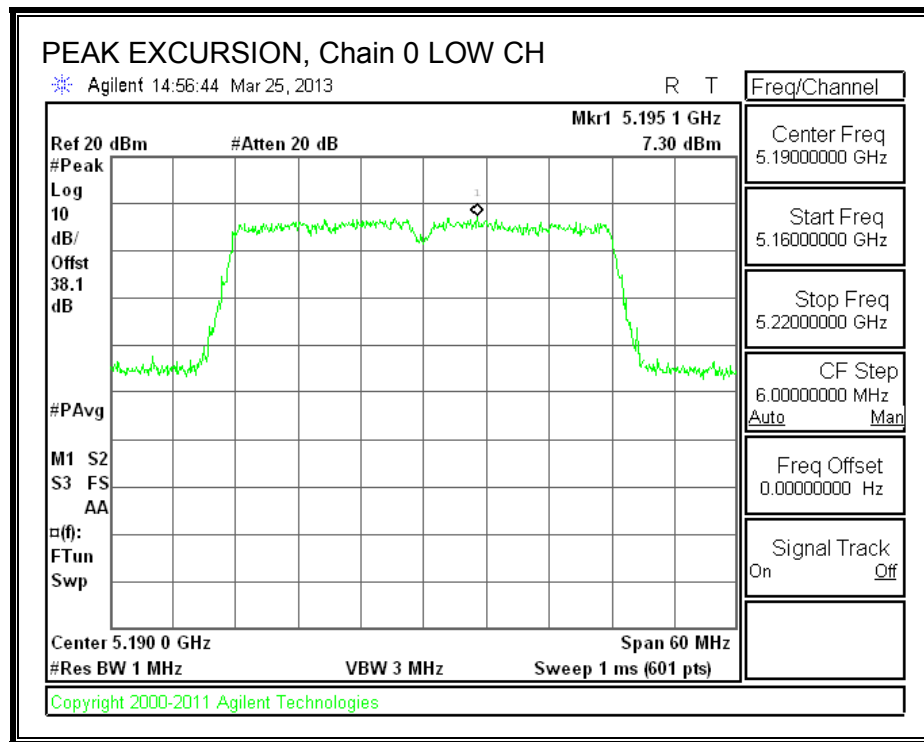
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.04	-0.84	0.00	7.88	13	-5.12

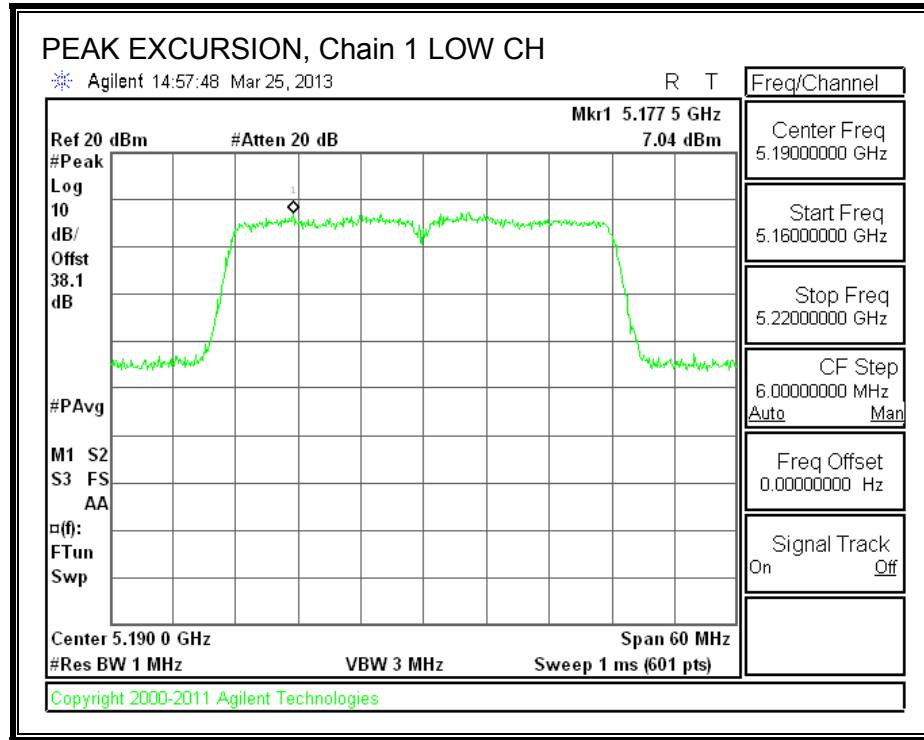
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.28	-0.99	0.00	8.27	13	-4.73

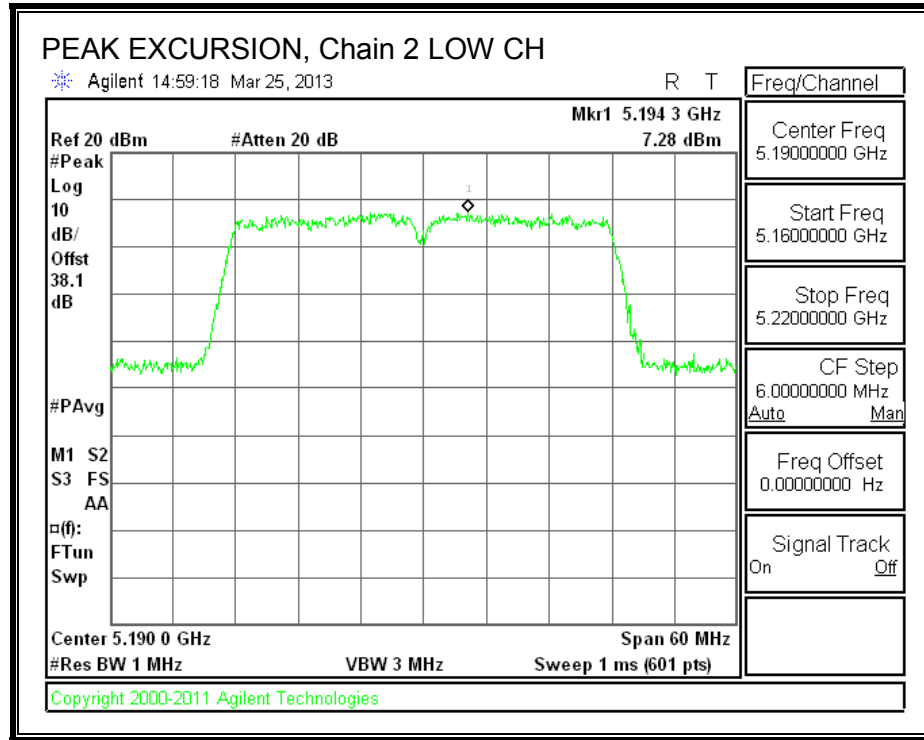
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.15. 802.11ac VHT80 1TX MODE IN THE 5.2 GHz BAND

8.15.1. 26 dB BANDWIDTH

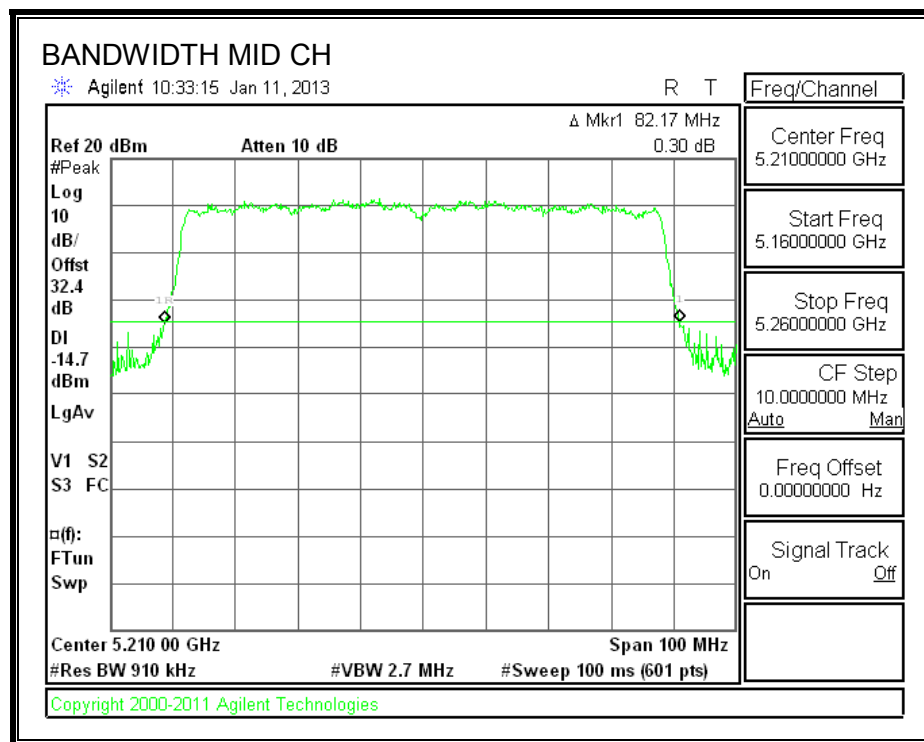
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	82.17

26 dB BANDWIDTH



8.15.2. 99% BANDWIDTH

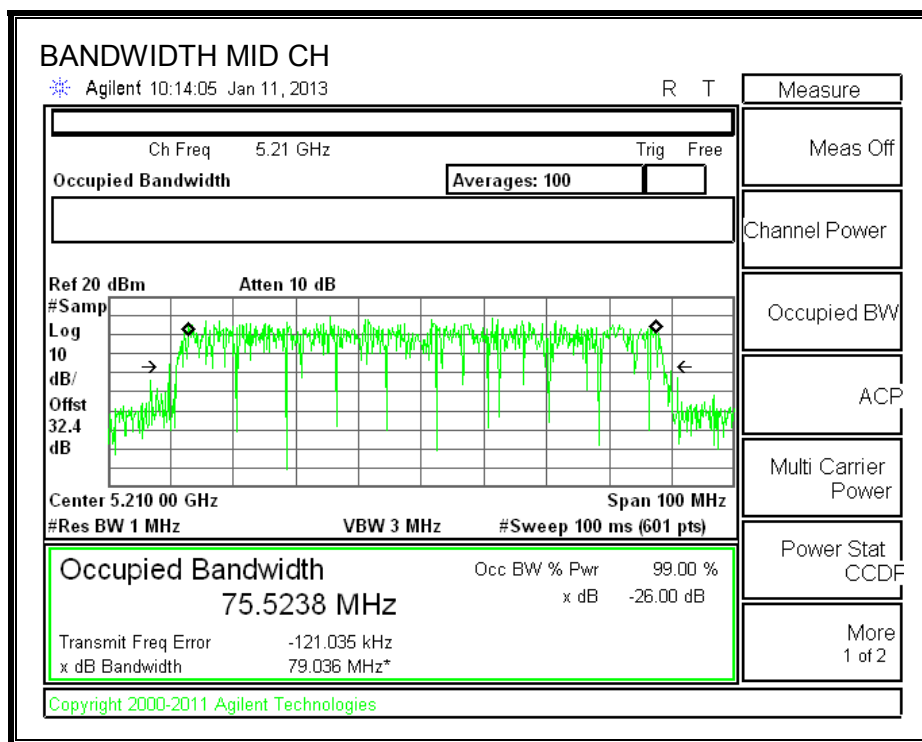
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	75.5238

99% BANDWIDTH



8.15.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.17	75.5238	3.20

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Mid	5210	17.00	23.00	19.80	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.10
--------------------	------

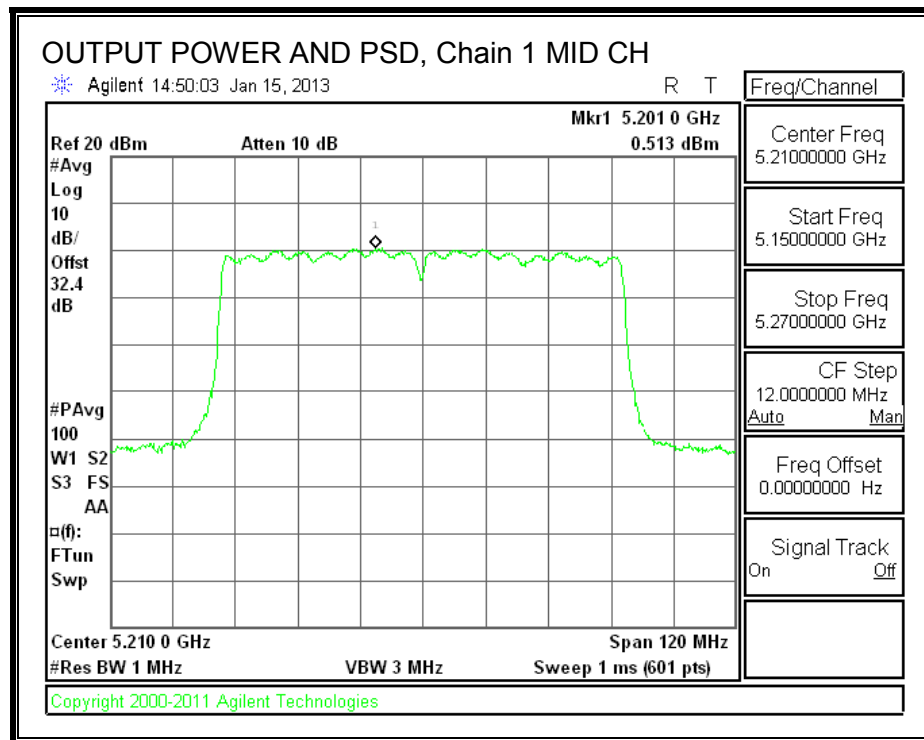
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	13.00	13.00	17.00	-4.00

PSD Results

Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	0.513	0.613	4.00	-3.39

OUTPUT POWER AND PSD, Chain 1



8.15.4. PEAK EXCURSION

LIMITS

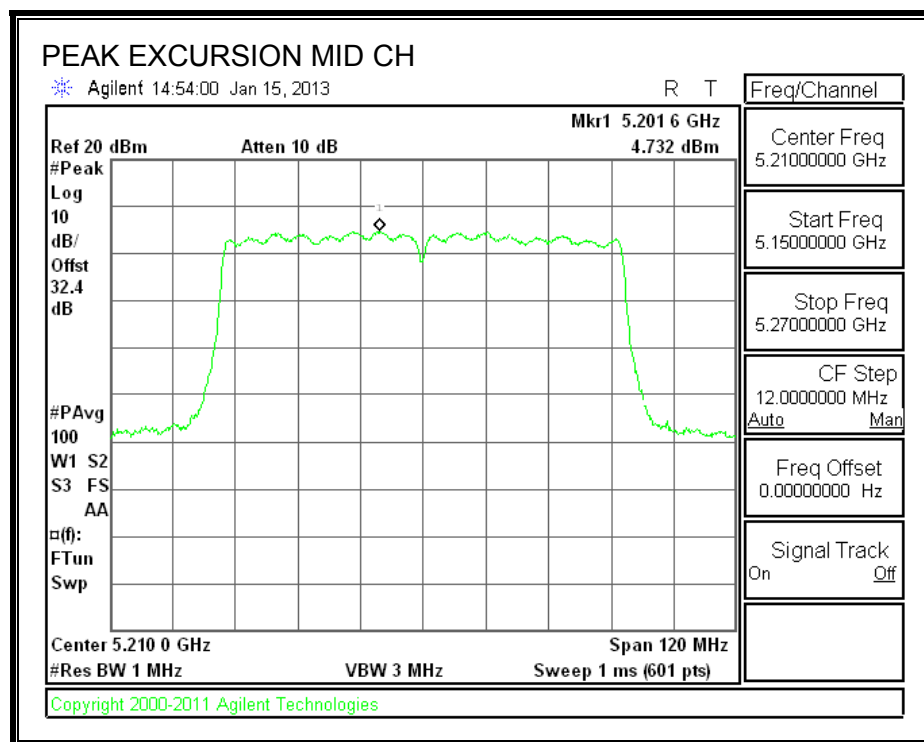
FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	4.732	0.513	0.10	4.12	13	-8.88

PEAK EXCURSION



8.16. 802.11ac VHT80 CDD 2TX MODE IN THE 5.2 GHz BAND

8.16.1. 26 dB BANDWIDTH

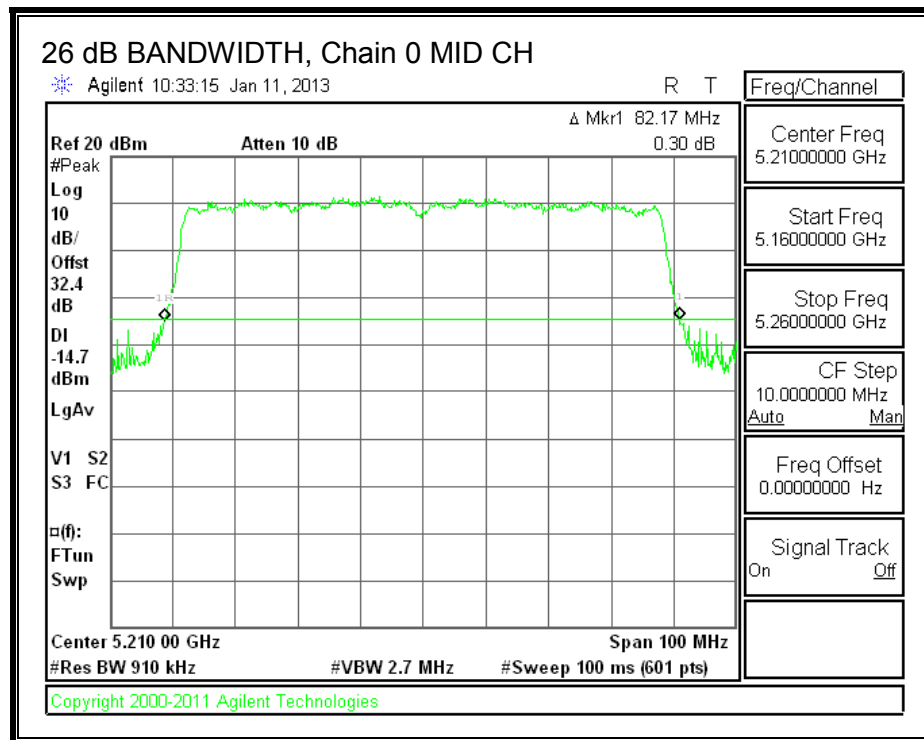
LIMITS

None; for reporting purposes only.

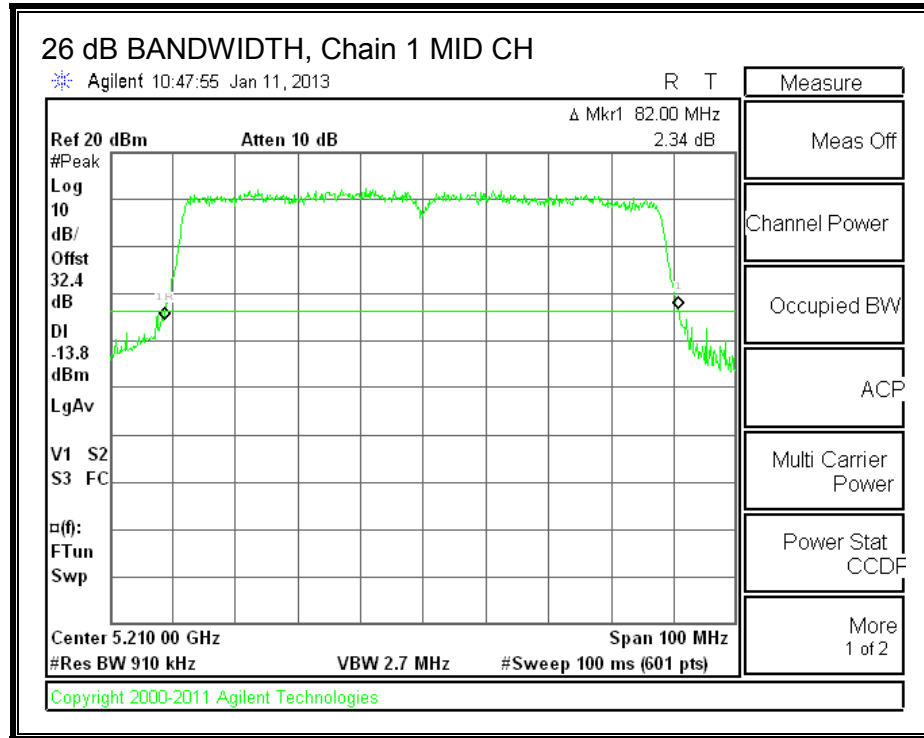
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5210	82.17	82.00

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.16.2. 99% BANDWIDTH

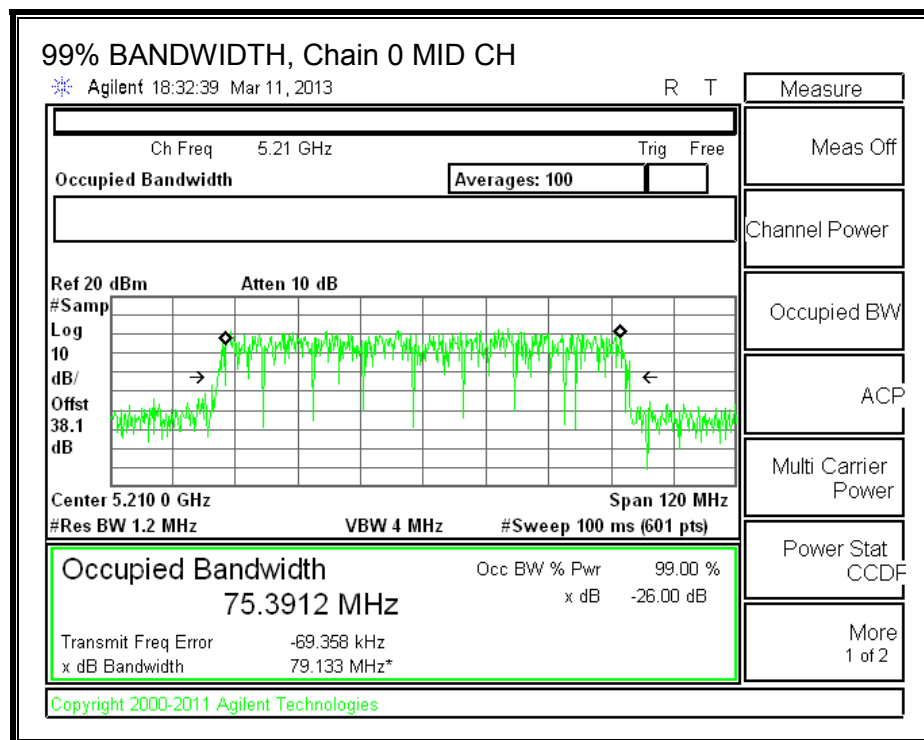
LIMITS

None; for reporting purposes only.

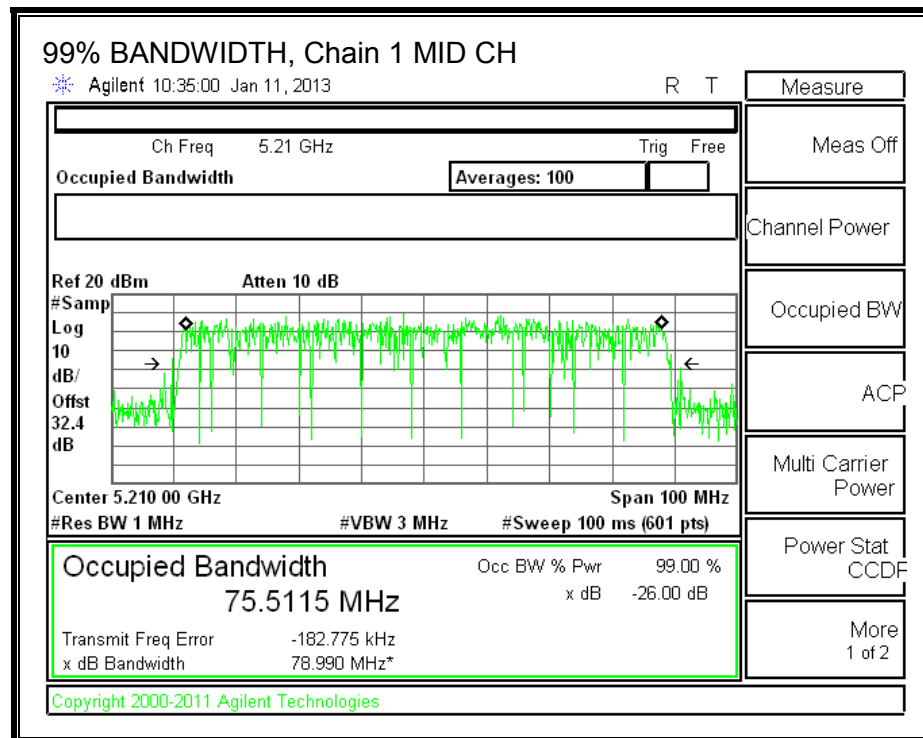
RESULTS

Channel	Frequency (MHz)	99% BW	99% BW
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	75.3912	75.5115

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.16.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

For PSD, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Unrelated Directional Gain (dBi)
Mid	5210	82.00	75.3912	5.72	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Mid	5210	17.00	23.00	20.27	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.09	
--------------------	------	--

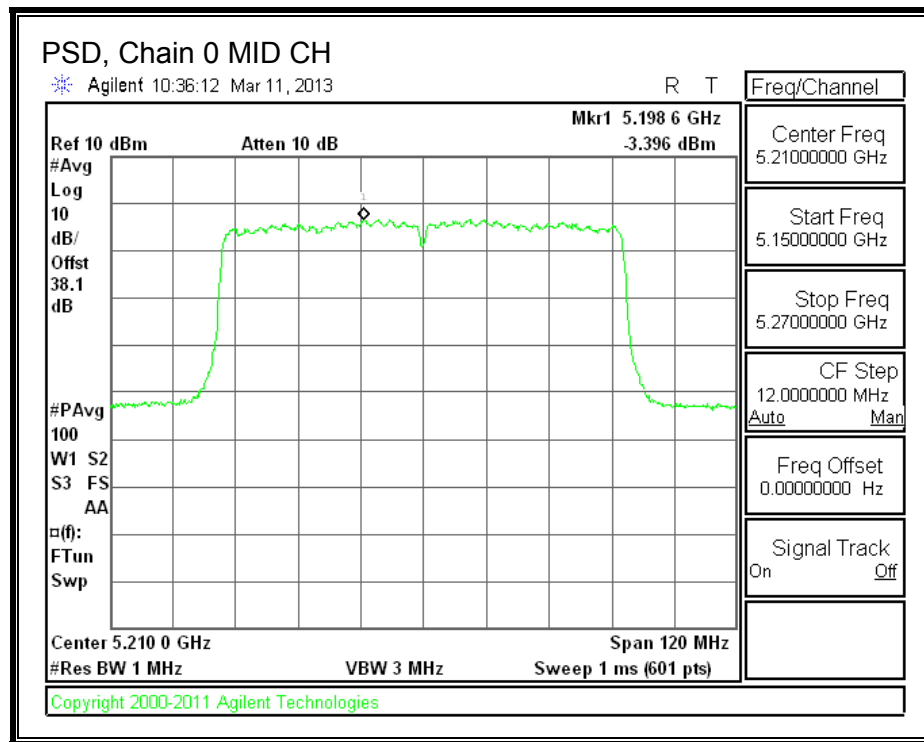
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.50	12.60	15.56	17.00	-1.44

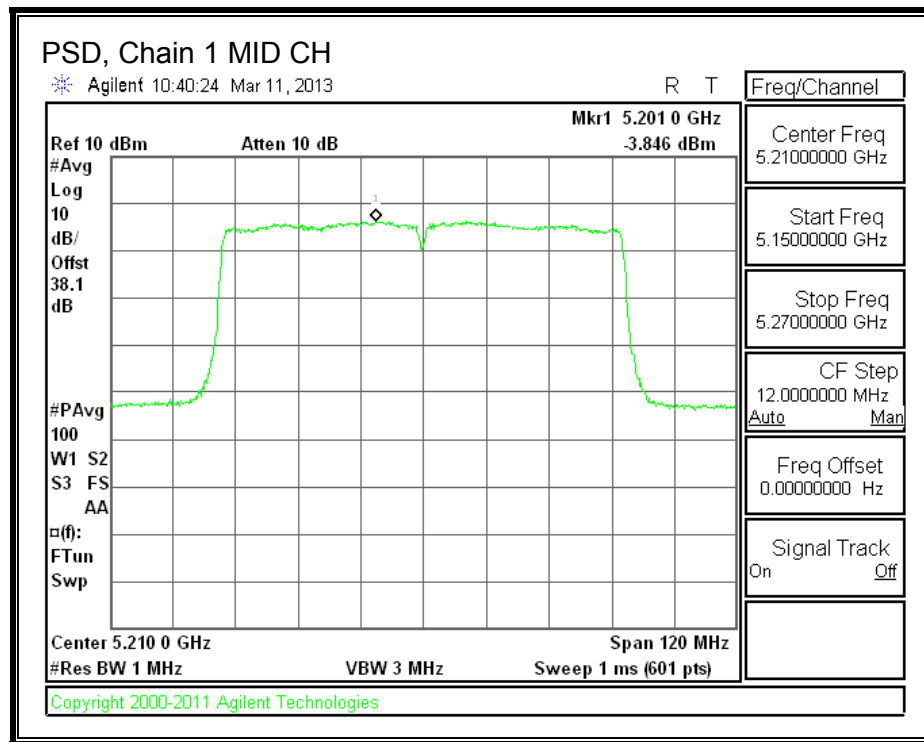
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-3.396	-3.846	-0.51	4.00	-4.51

PSD, Chain 0



PSD, Chain 1



8.17. 802.11ac VHT80 BF 2TX MODE IN THE 5.2 GHz BAND

Covered by testing 11ac VHT80 CDD 2TX mode, the power per chain used for 11ac VHT80 CDD 2TX mode is the same power per chain that will be used for 11ac VHT80 BF 2TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.17.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	2.20	5.72

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Mid	5210	82.00	75.3912	5.72

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Mid	5210	17.00	23.00	17.28	17.00

Duty Cycle CF (dB)	0.09	
---------------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.50	12.60	15.56	17.00	-1.44

8.18. 802.11ac VHT80 STBC 2TX MODE IN THE 5.2 GHz BAND

8.18.1. 26 dB BANDWIDTH

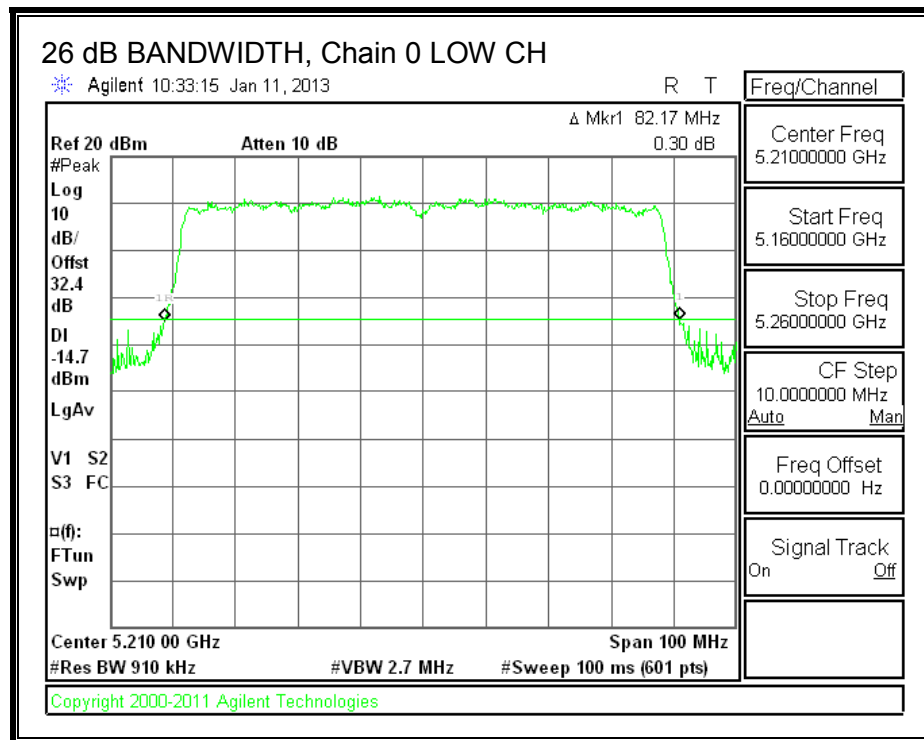
LIMITS

None; for reporting purposes only.

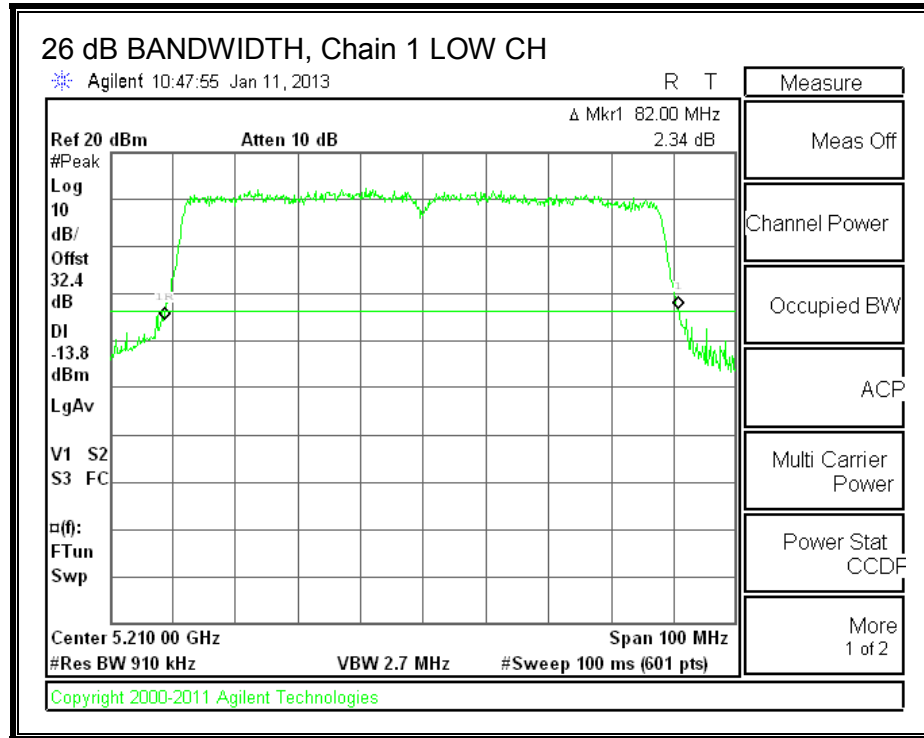
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5210	82.17	82.00

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.18.2. 99% BANDWIDTH

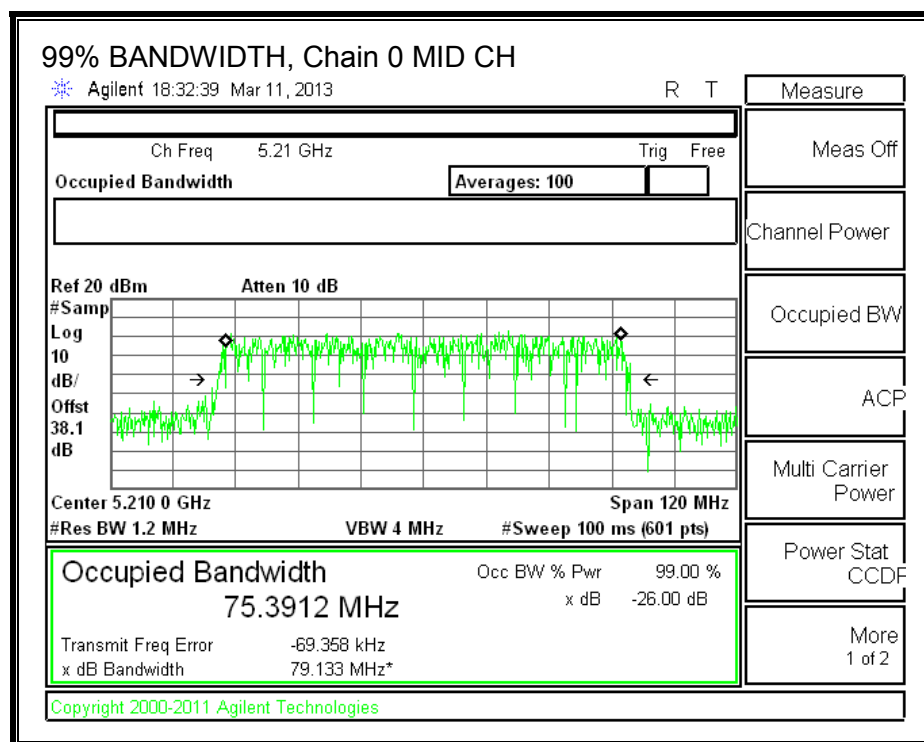
LIMITS

None; for reporting purposes only.

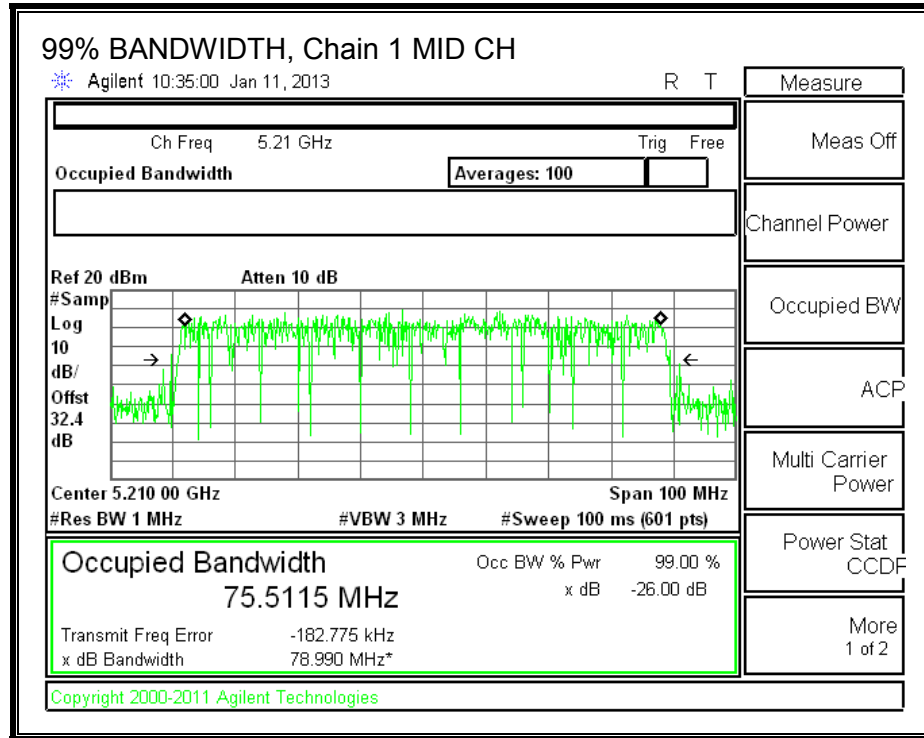
RESULTS

Channel	Frequency (MHz)	99% BW	99% BW
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	75.3912	75.5115

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.18.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	2.20	2.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5210	82.00	75.3912	2.73

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5210	17.00	23.00	20.27	17.00	4.00	10.00	4.00

Gated Output Power Measurement

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5210	12.70	12.40	15.56	17.00	-1.44

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5210	82.00	75.3912	2.73

Limits

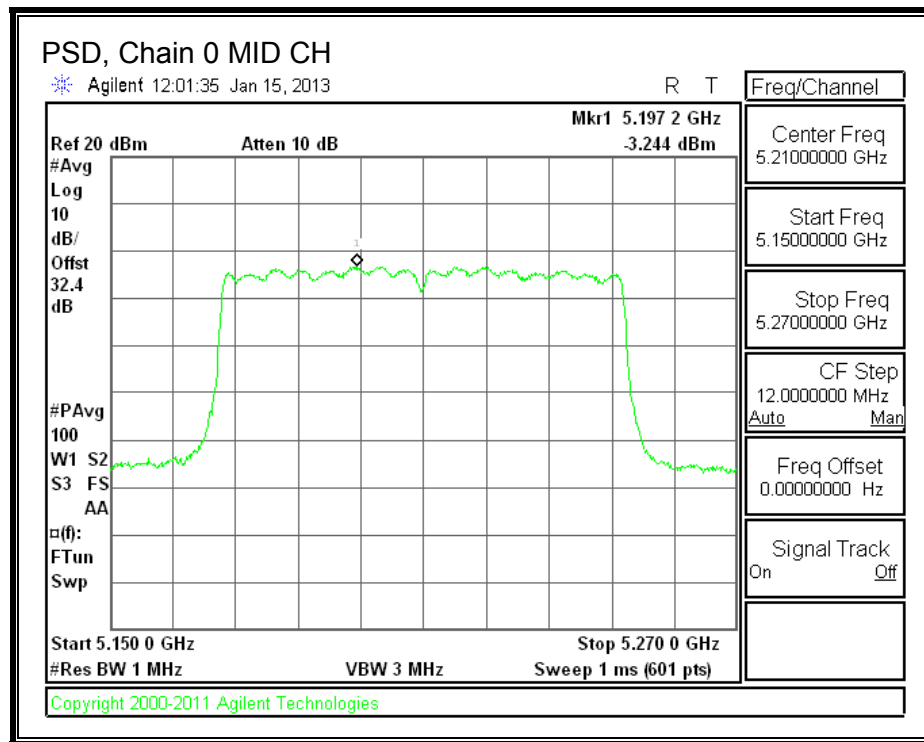
Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Low	5210	17.00	23.00	20.27	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.09	
--------------------	------	--

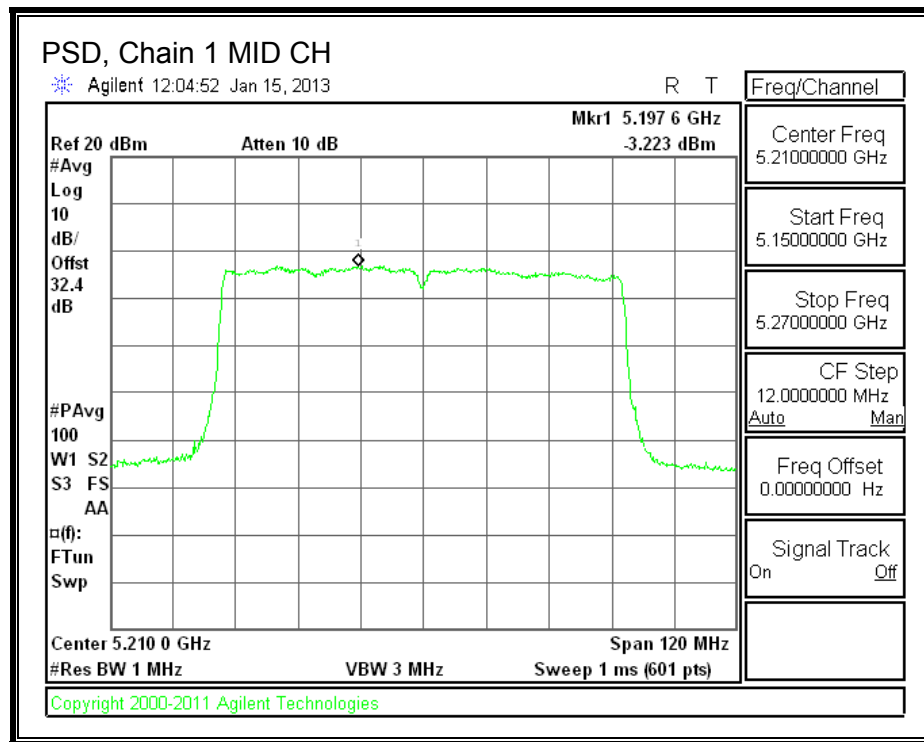
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5210	-3.244	-3.223	-0.133	4.00	-4.13

PSD, Chain 0



PSD, Chain 1



8.19. 802.11ac VHT80 CDD 3TX MODE IN THE 5.2 GHz BAND

8.19.1. 26 dB BANDWIDTH

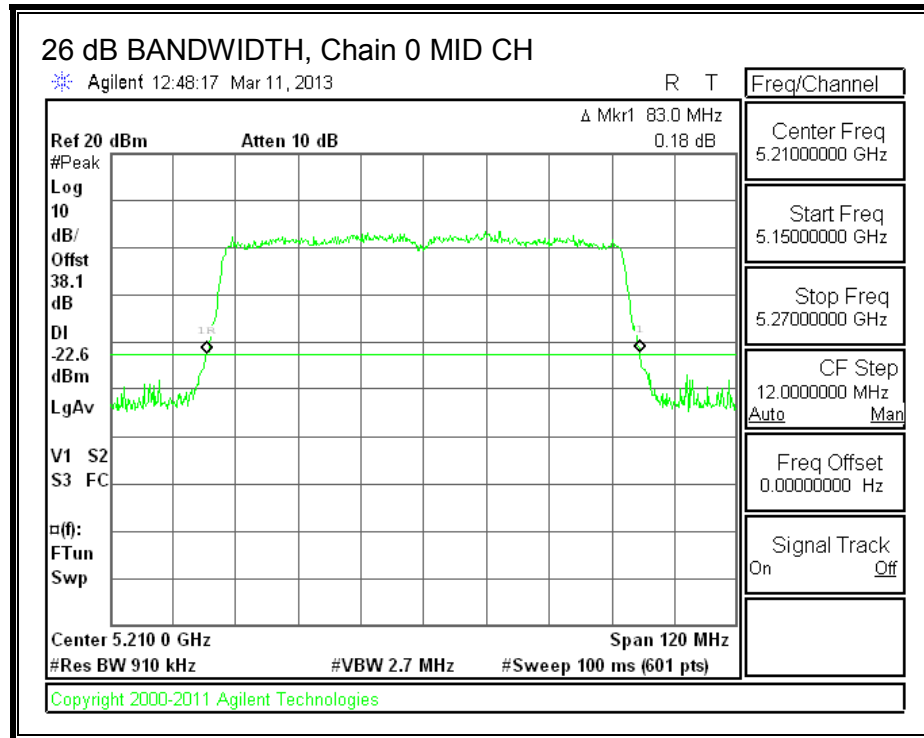
LIMITS

None; for reporting purposes only.

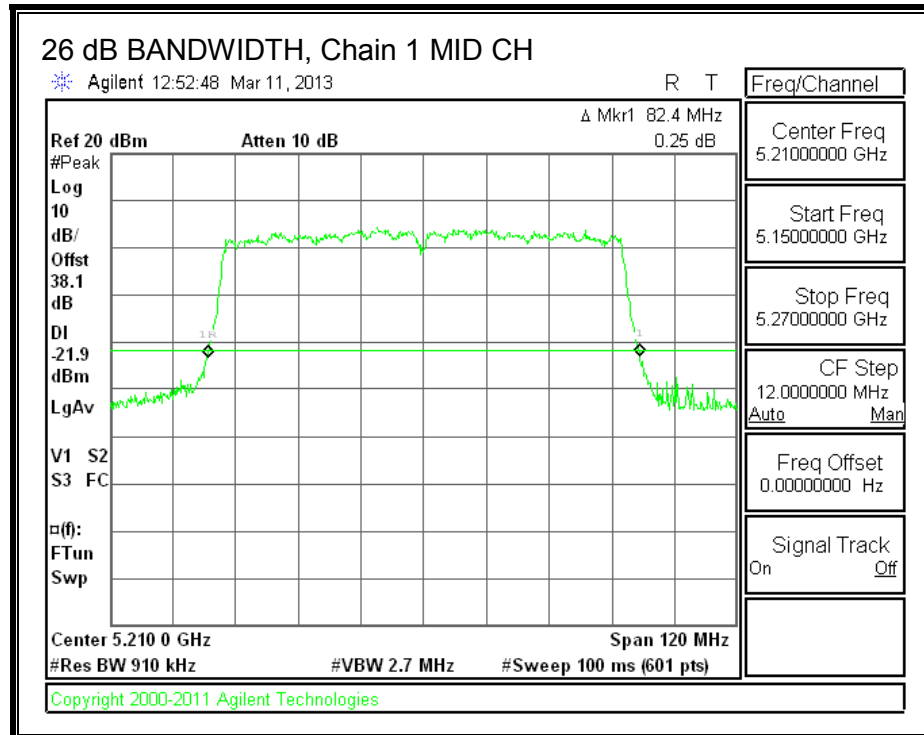
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5210	83.00	82.40	81.40

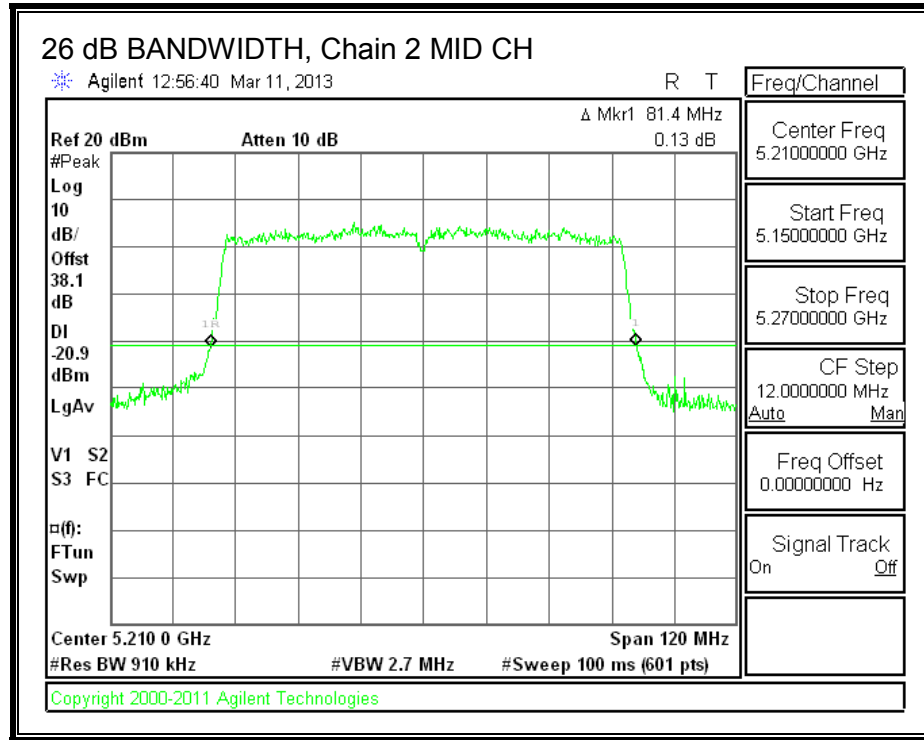
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.19.2. 99% BANDWIDTH

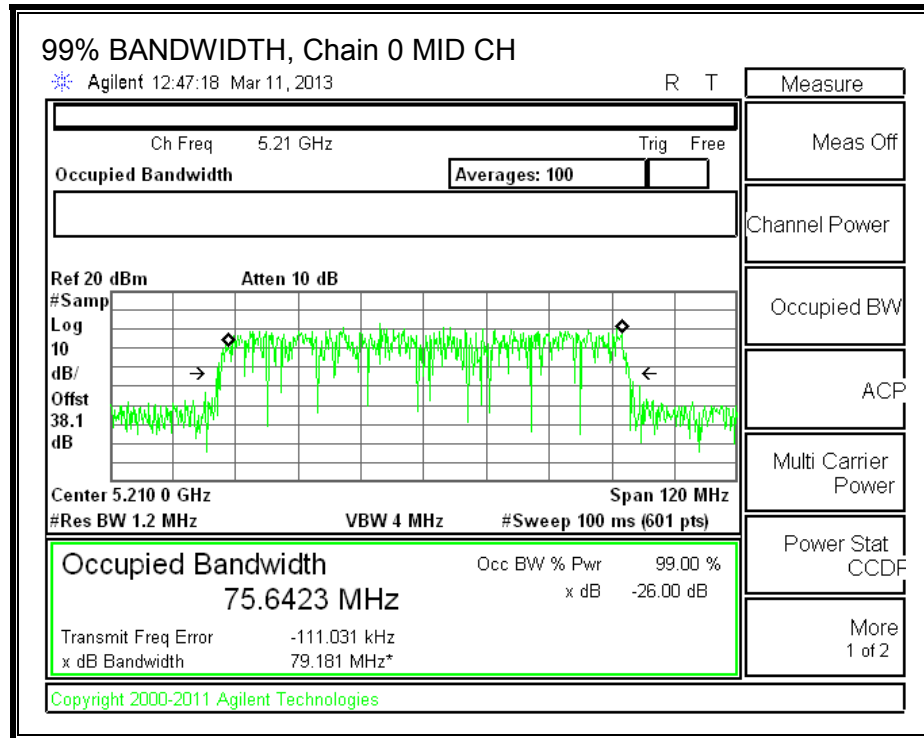
LIMITS

None; for reporting purposes only.

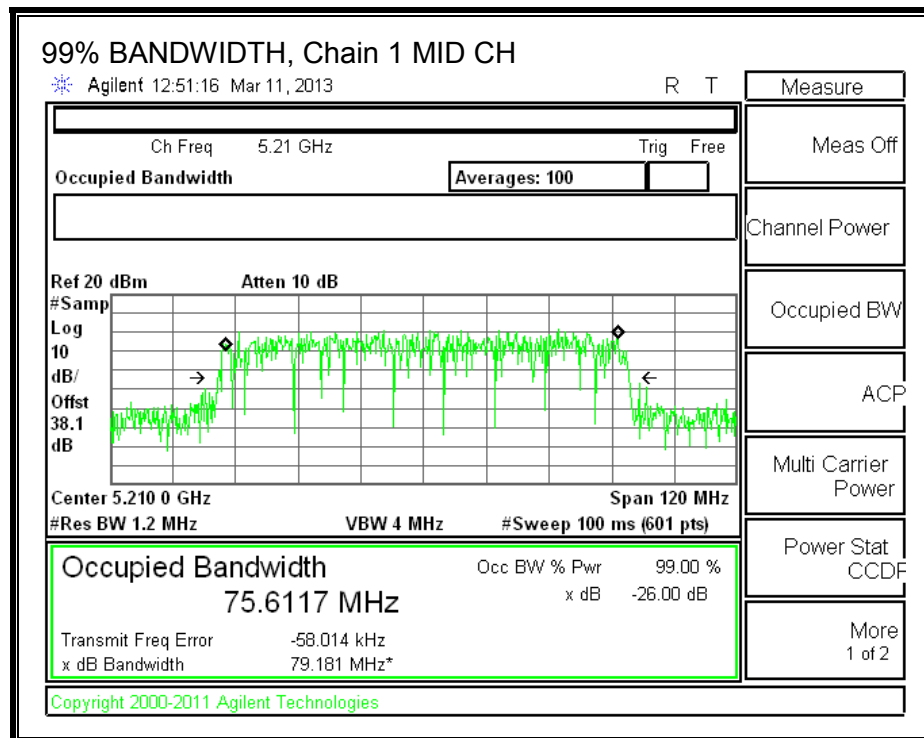
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5210	75.6423	75.6117	75.5864

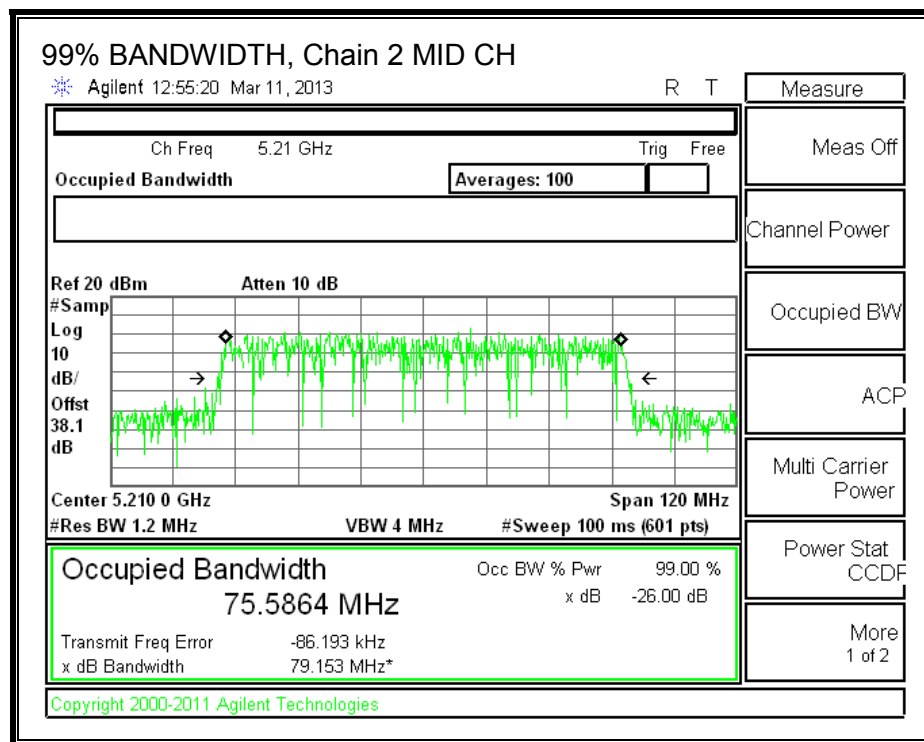
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.19.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Mid	5210	81.40	75.5864	7.07	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Mid	5210	17.00	23.00	20.67	17.00	2.93	10.00	2.93

Duty Cycle CF (dB)	0.09	
--------------------	------	--

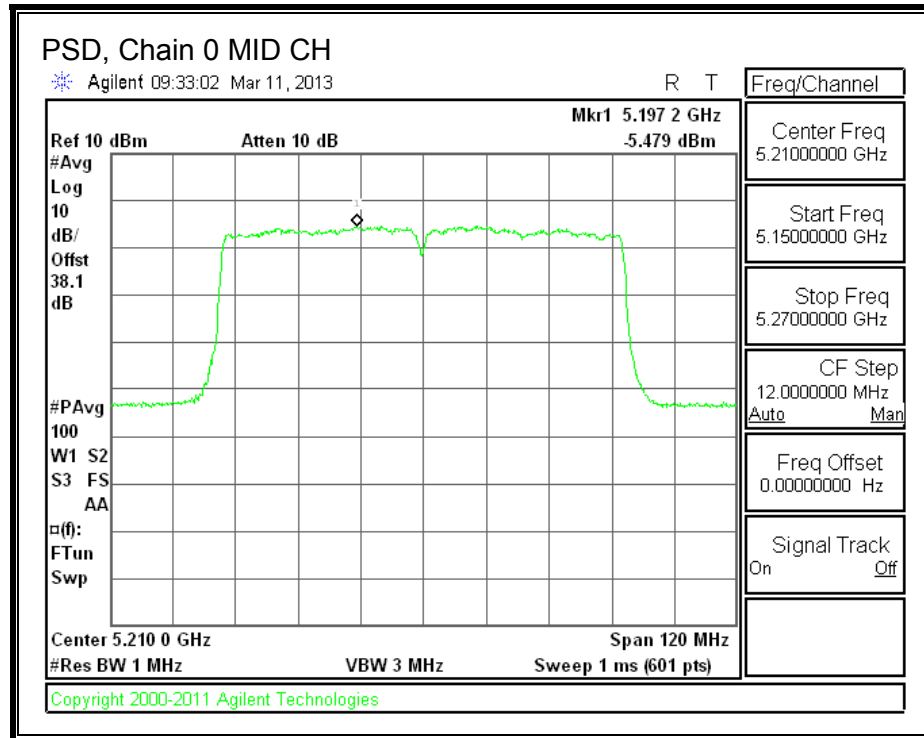
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	11.90	12.10	11.95	16.76	17.00	-0.24

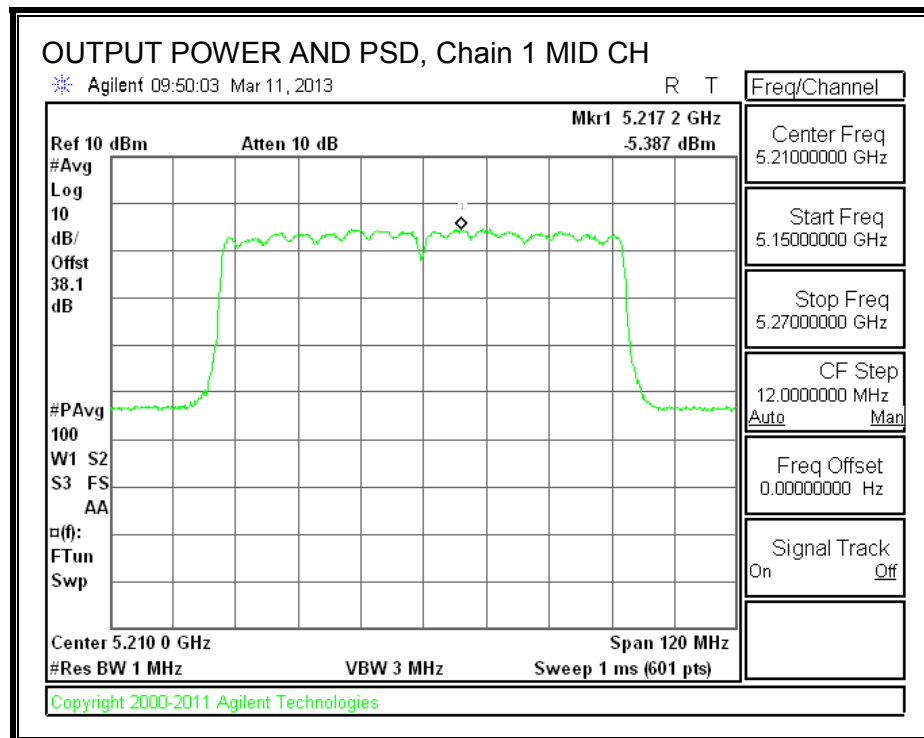
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-5.479	-5.387	-5.062	-0.44	2.93	-3.37

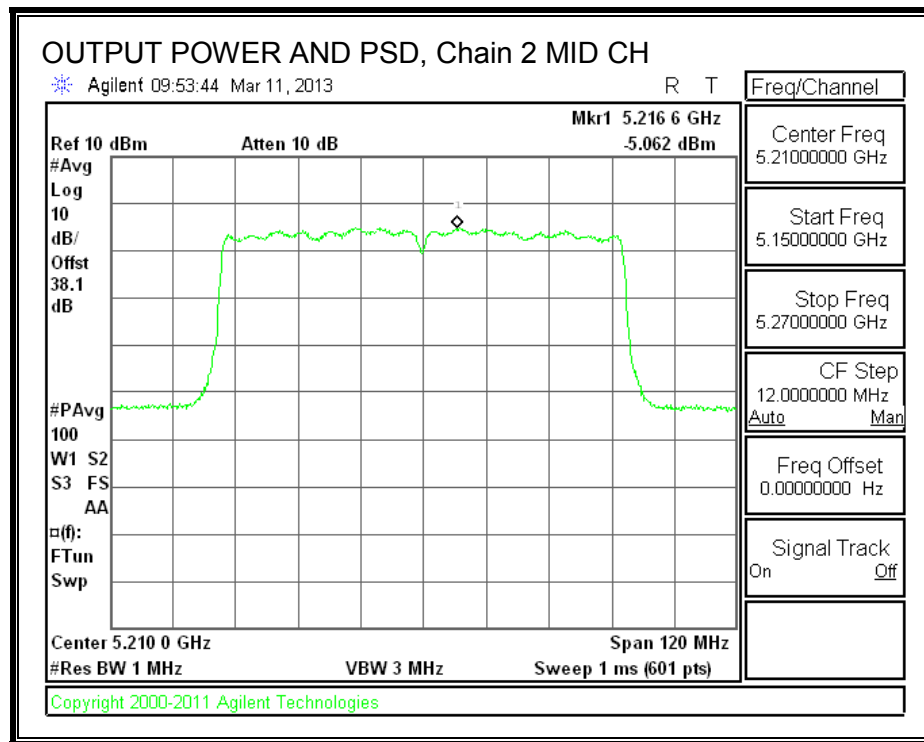
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.19.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	3.02	-5.479	0.09	8.41	13	-4.59

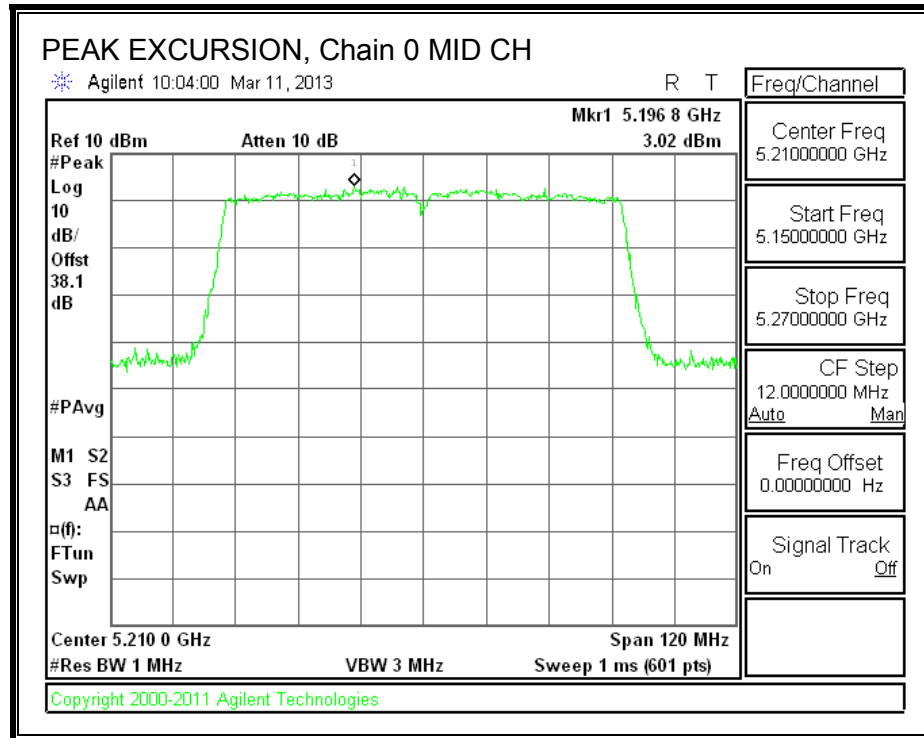
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	3.49	-5.387	0.09	8.79	13	-4.21

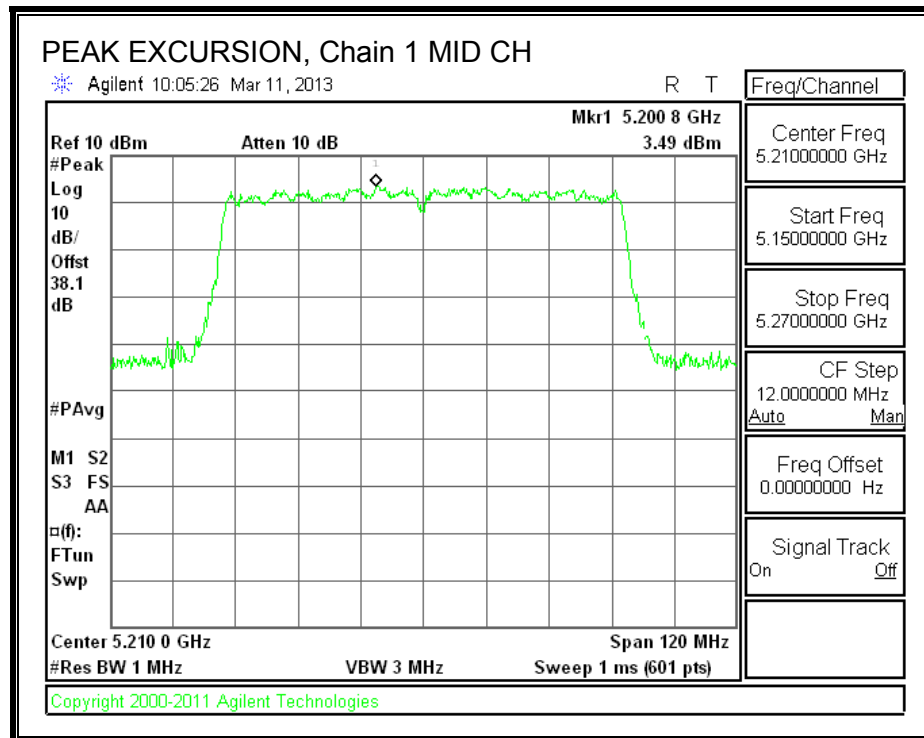
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	4.24	-5.062	0.09	9.21	13	-3.79

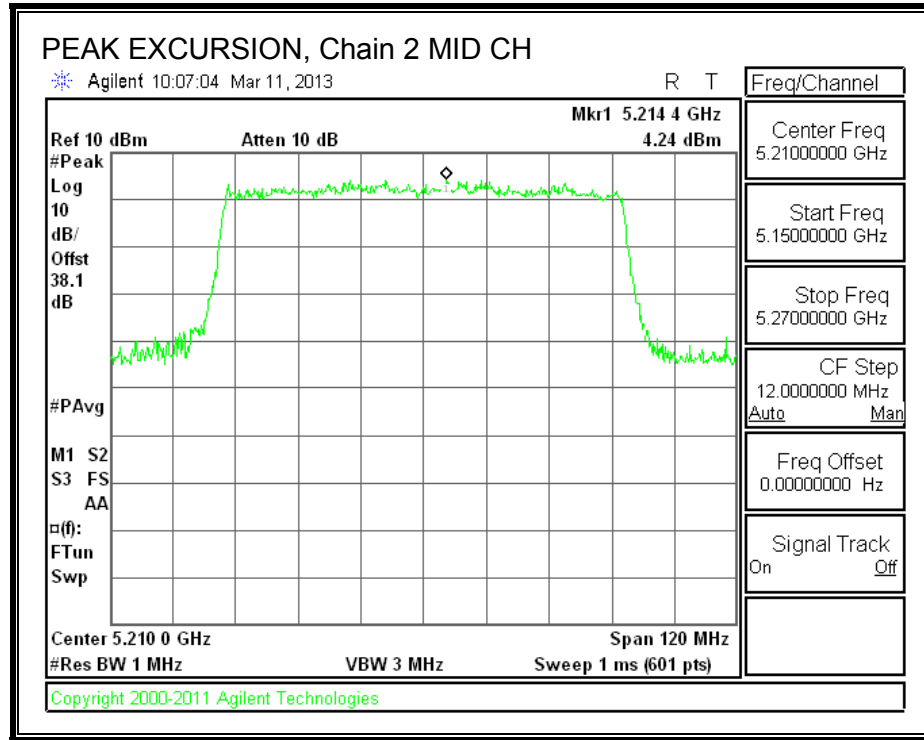
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.20. 802.11ac VHT80 BF 3TX MODE IN THE 5.2 GHz BAND

Covered by testing 11ac VHT80 CDD 3TX mode, the power per chain used for 11ac VHT80 CDD 3TX mode is the same power per chain that will be used for 11ac VHT80 BF 3TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.20.1. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.20	1.40	2.20	7.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Mid	5210	81.40	75.5864	7.07

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Mid	5210	15.93	23.00	15.93	15.93

Duty Cycle CF (dB)	0.09	
---------------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	10.00	10.30	10.10	14.91	15.93	-1.02

8.21. 802.11ac VHT80 STBC 3TX MODE IN THE 5.2 GHz BAND

8.21.1. 26 dB BANDWIDTH

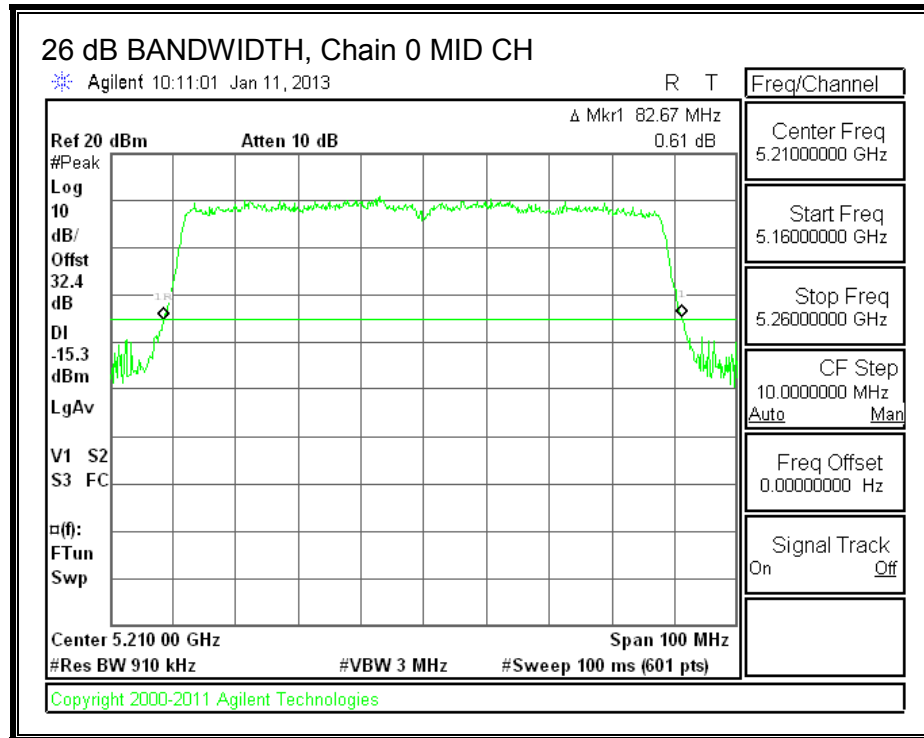
LIMITS

None; for reporting purposes only.

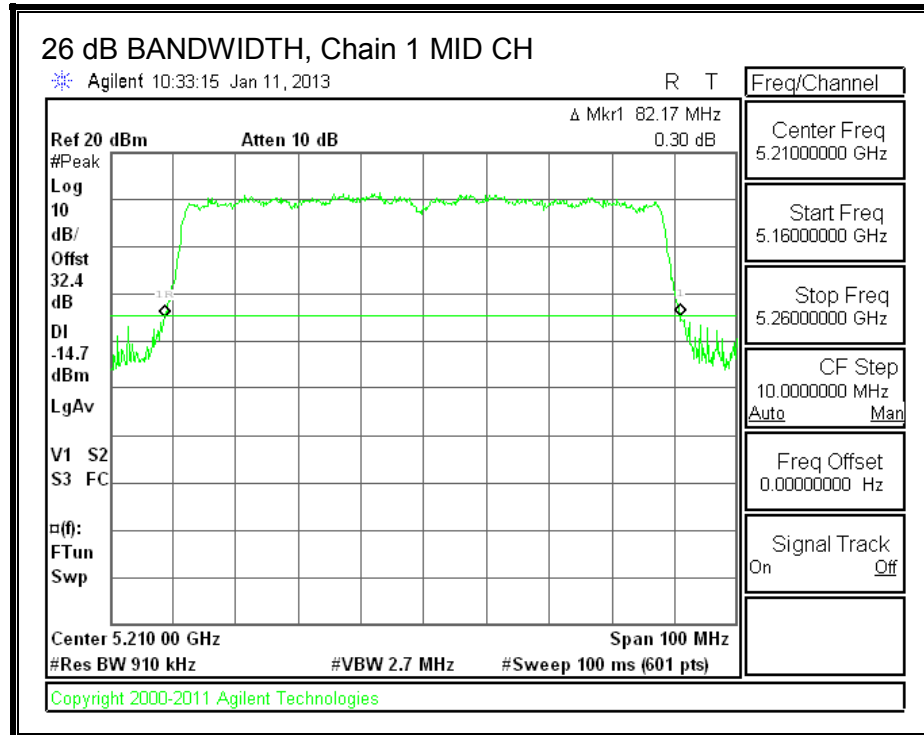
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5210	82.67	82.17	82.00

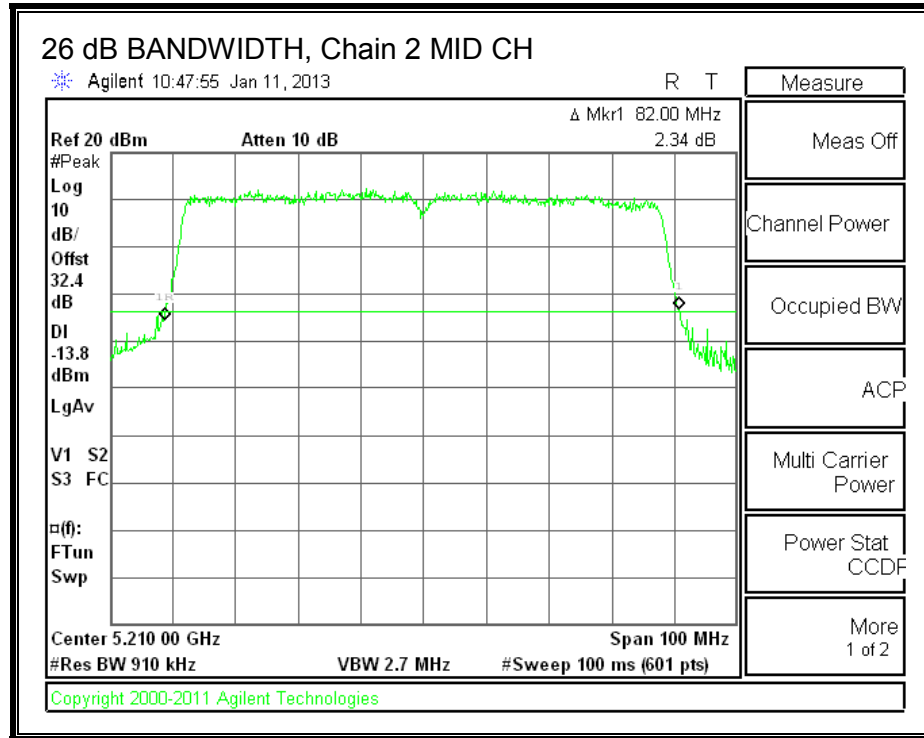
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.21.2. 99% BANDWIDTH

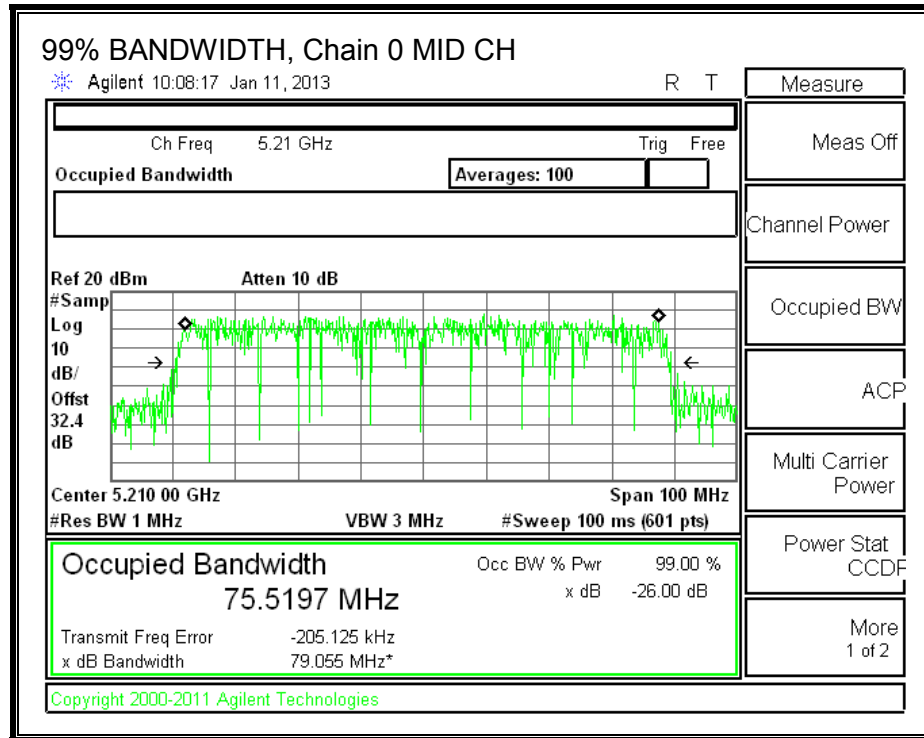
LIMITS

None; for reporting purposes only.

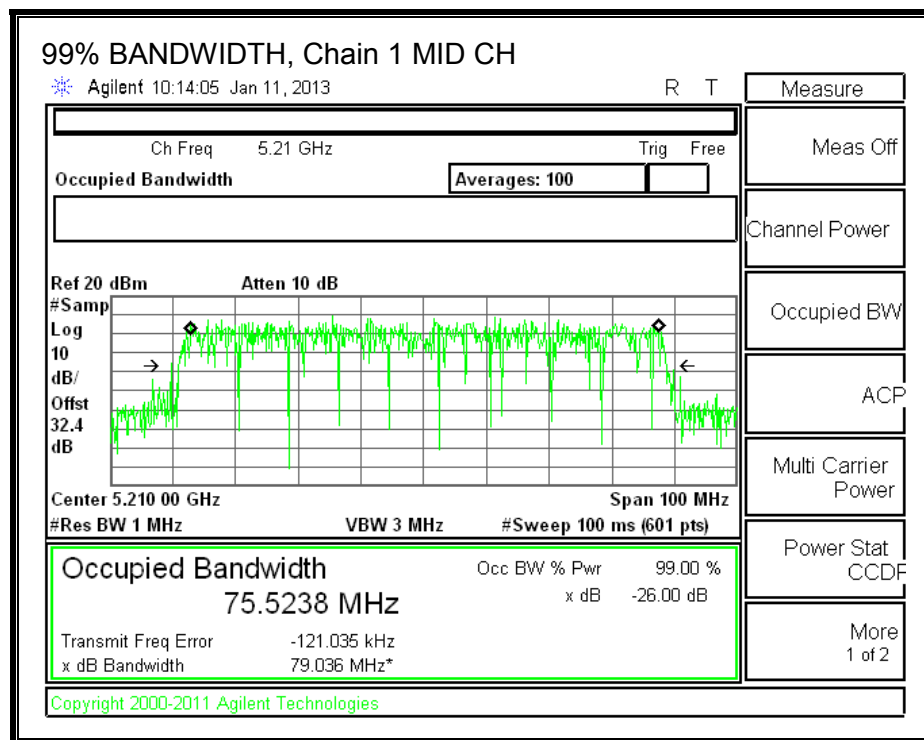
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5210	75.5197	75.5238	75.5115

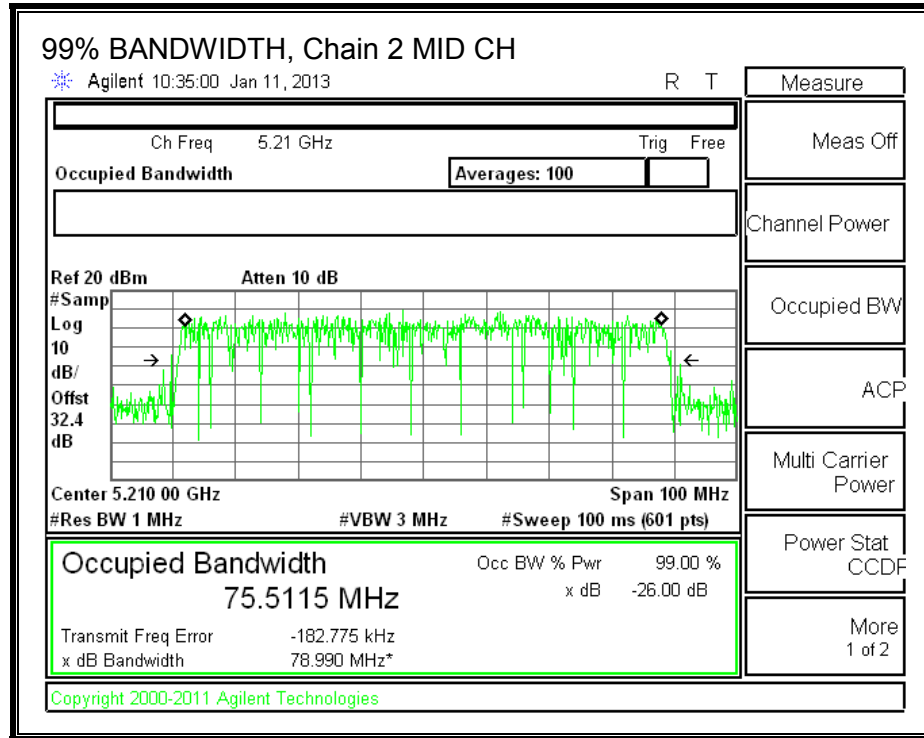
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.21.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.20	1.40	2.20	2.33

RESULTS

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.00	75.5115	2.33

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC eirp PSD Limit (dBm)
Mid	5210	17.00	23.00	20.67	17.00	4.00	10.00

Duty Cycle CF (dB)	0.09	
--------------------	------	--

Gated Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	11.90	11.98	12.10	16.77	17.00	-0.23

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.00	75.5115	2.33

Limits

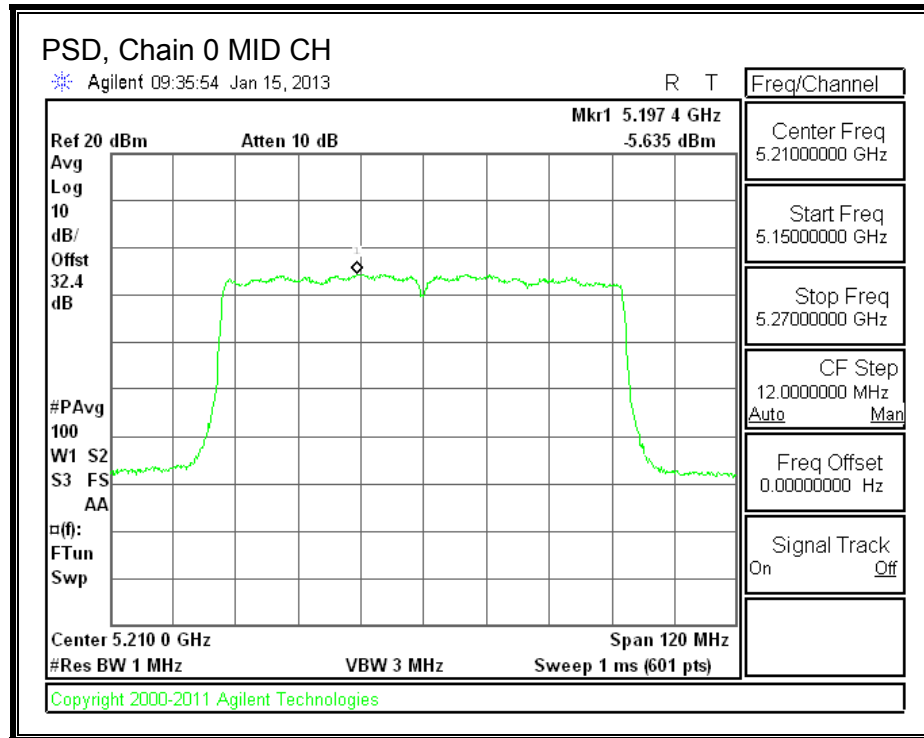
Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PSD Limit (dBm)
Mid	5210	17.00	23.00	20.67	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.09	
--------------------	------	--

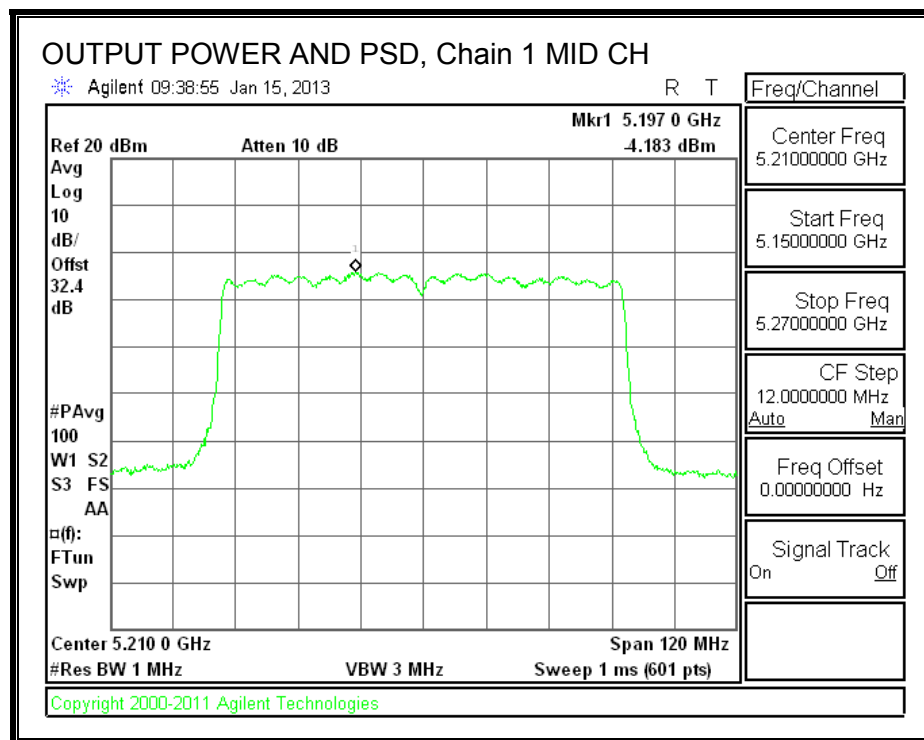
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-5.635	-4.183	-3.917	0.35	4.00	-3.65

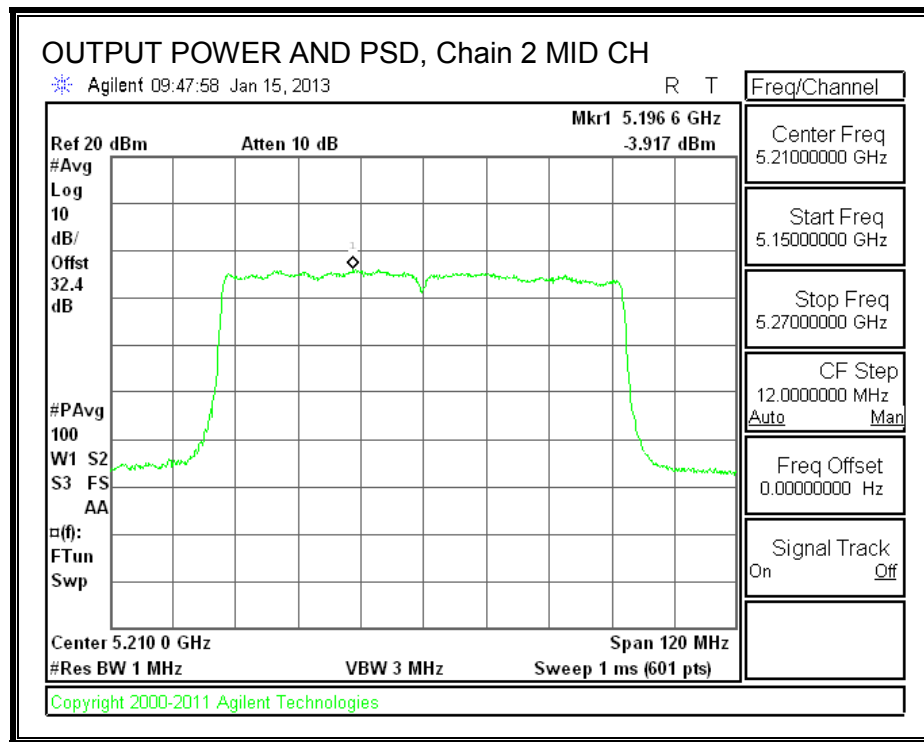
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.21.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	-2.207	-5.635	0.09	3.34	13	-9.66

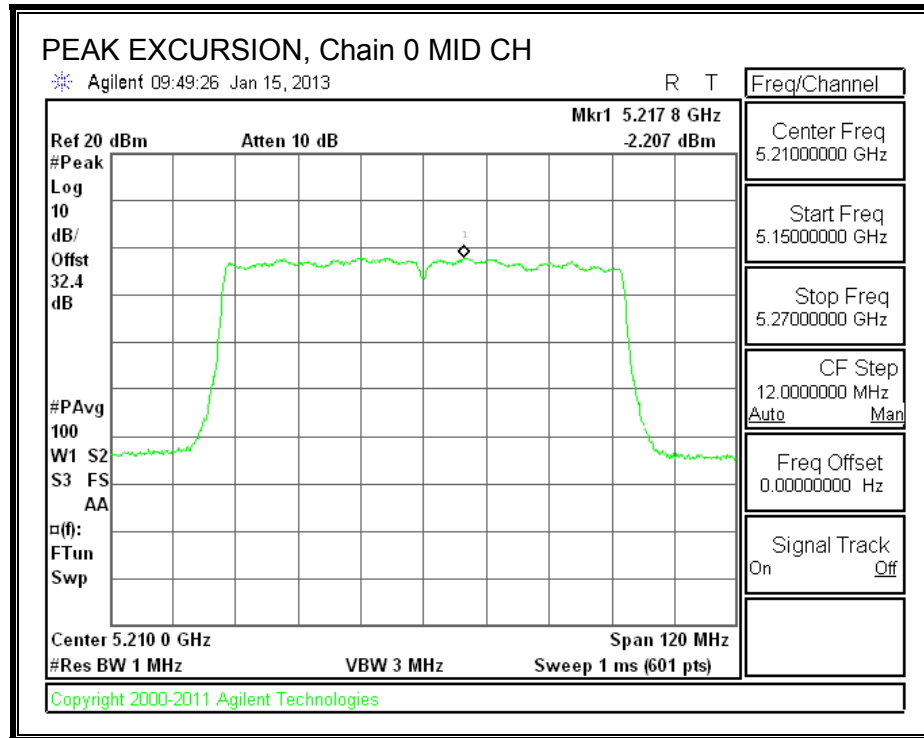
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	-0.745	-4.183	0.09	3.35	13	-9.65

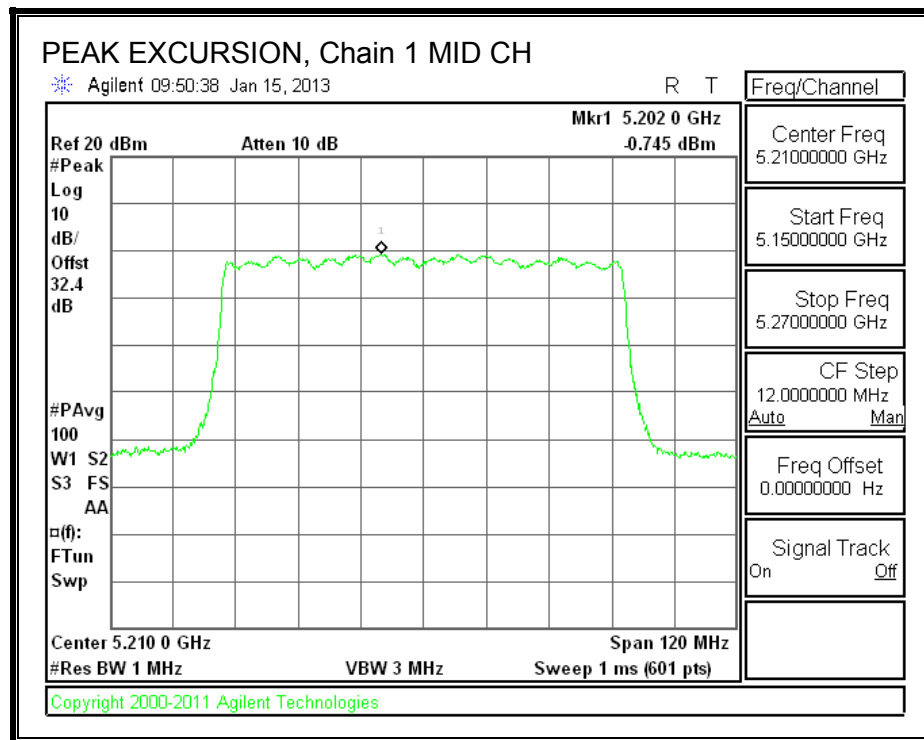
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	-0.439	-3.917	0.09	3.39	13	-9.61

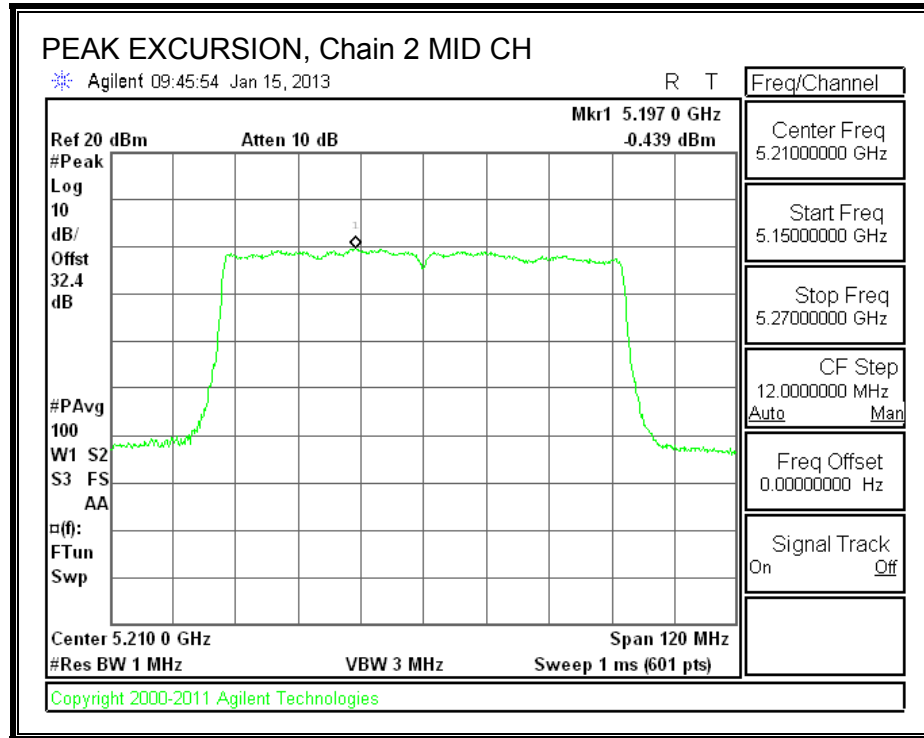
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



8.22. 802.11a Legacy 1TX MODE IN THE 5.3 GHz BAND

8.22.1. 26 dB BANDWIDTH

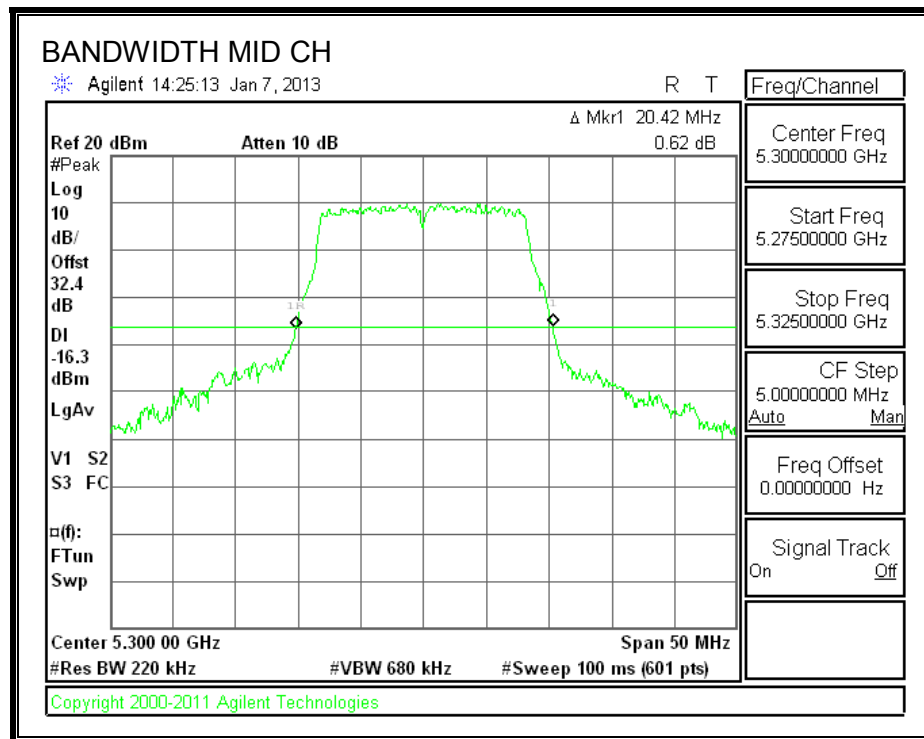
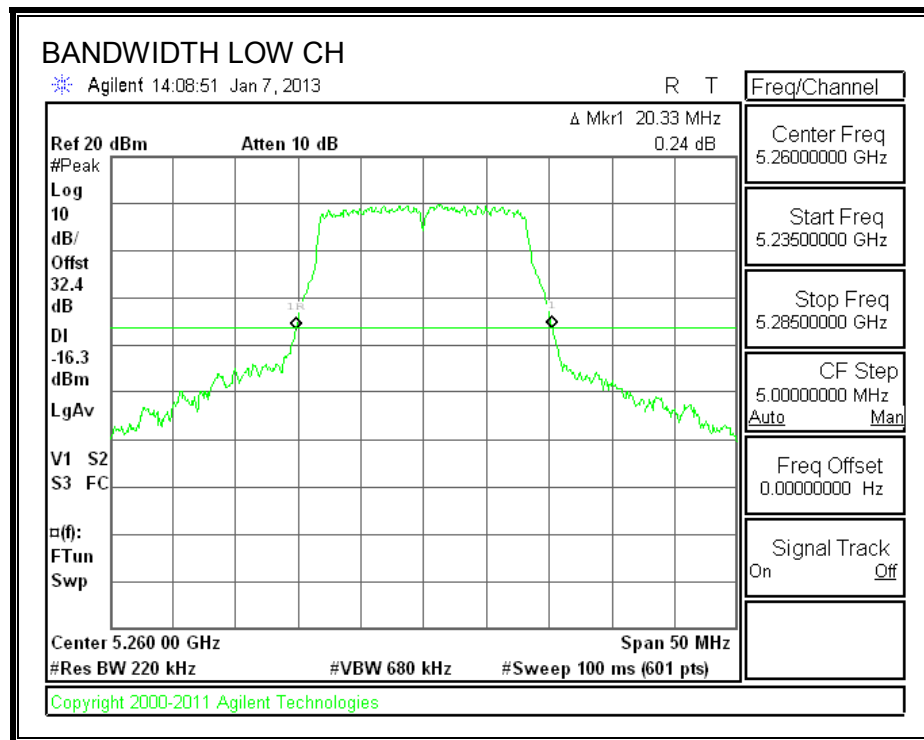
LIMITS

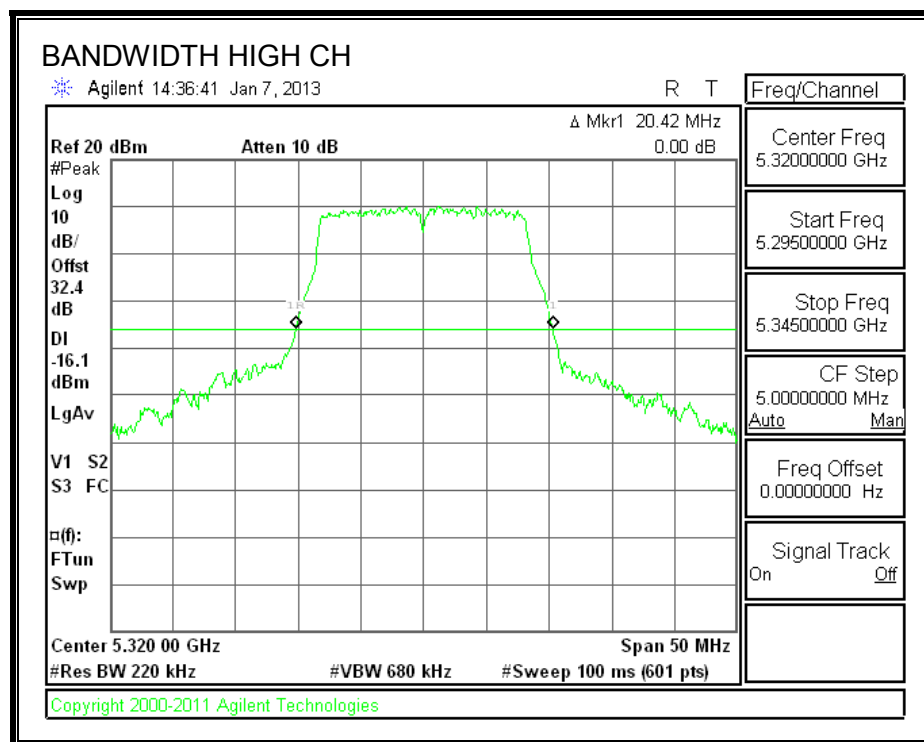
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.33
Mid	5300	20.42
High	5320	20.42

26 dB BANDWIDTH





8.22.2. 99% BANDWIDTH

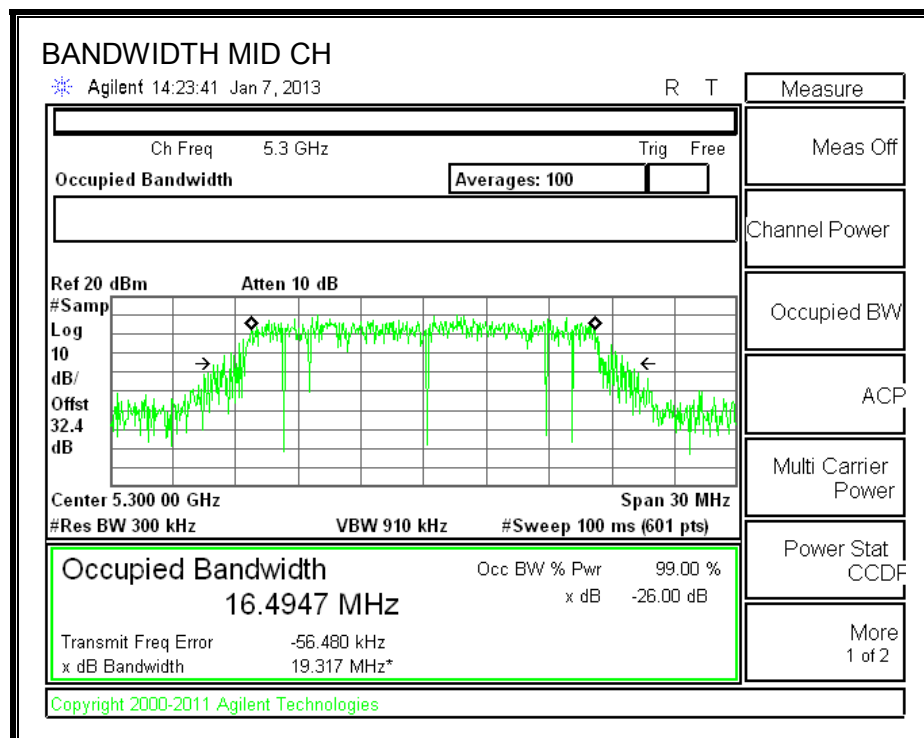
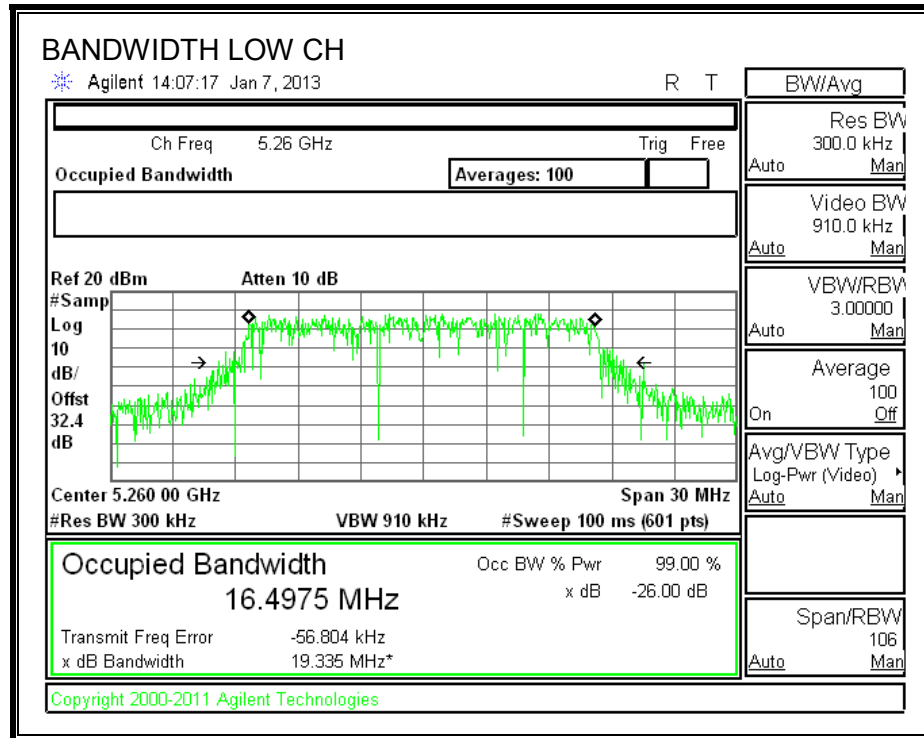
LIMITS

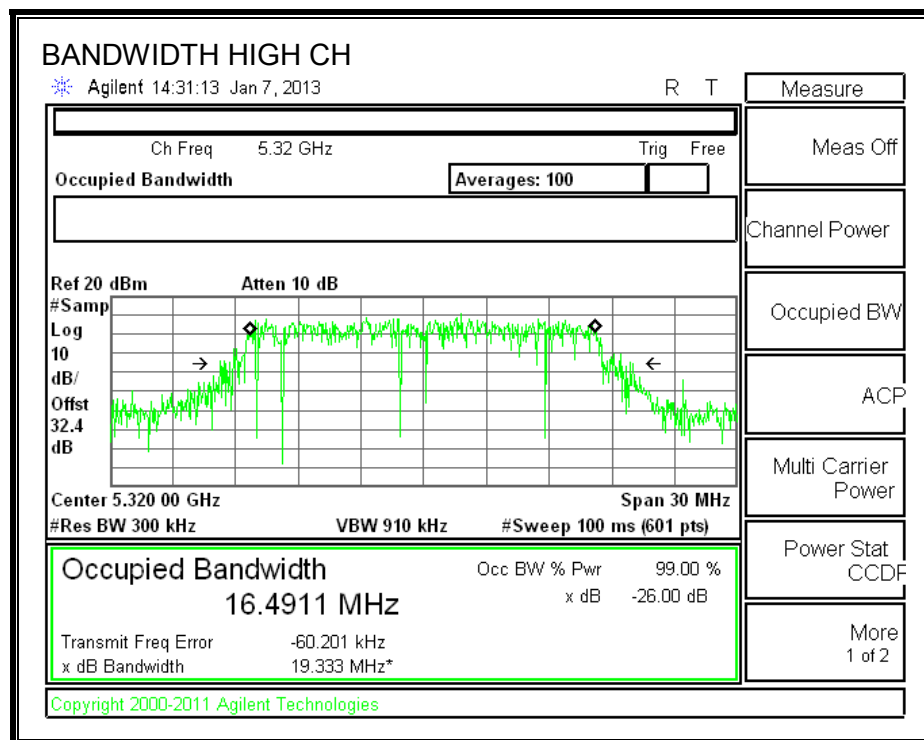
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.4975
Mid	5300	16.4947
High	5320	16.4911

99% BANDWIDTH





8.22.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.33	16.4975	3.40
Mid	5300	20.42	16.4947	3.40
High	5320	20.42	16.4911	3.40

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.17	29.17	23.17	11.00	11.00	11.00
Mid	5300	24.00	23.17	29.17	23.17	11.00	11.00	11.00
High	5320	24.00	23.17	29.17	23.17	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

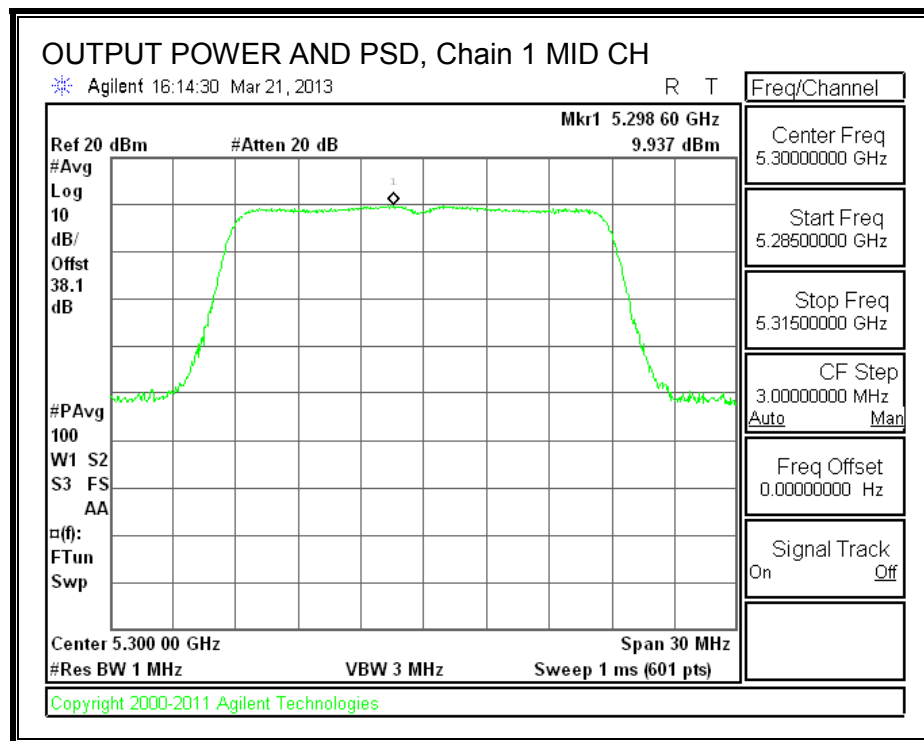
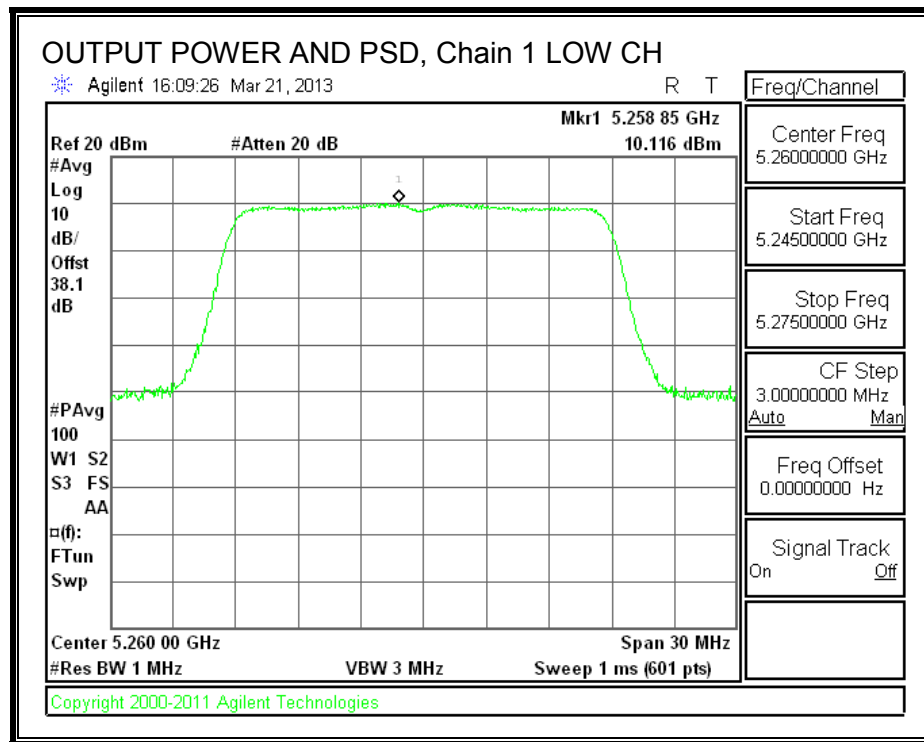
Output Power Results

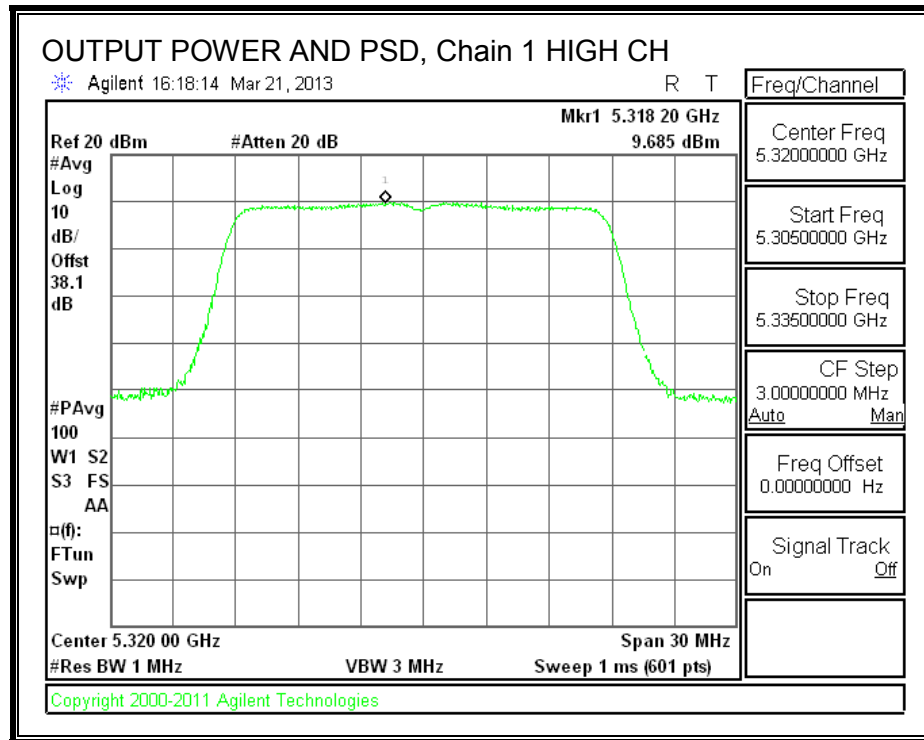
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	20.50	20.50	23.17	-2.67
Mid	5300	16.00	16.00	23.17	-7.17
High	5320	15.50	15.50	23.17	-7.67

PSD Results

Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	10.116	10.116	11.00	-0.88
Mid	5300	9.937	9.937	11.00	-1.06
High	5320	9.685	9.685	11.00	-1.32

OUTPUT POWER AND PSD, Chain 1





8.22.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.23. 802.11n HT20 CDD 2TX MODE IN THE 5.3 GHz BAND

8.23.1. 26 dB BANDWIDTH

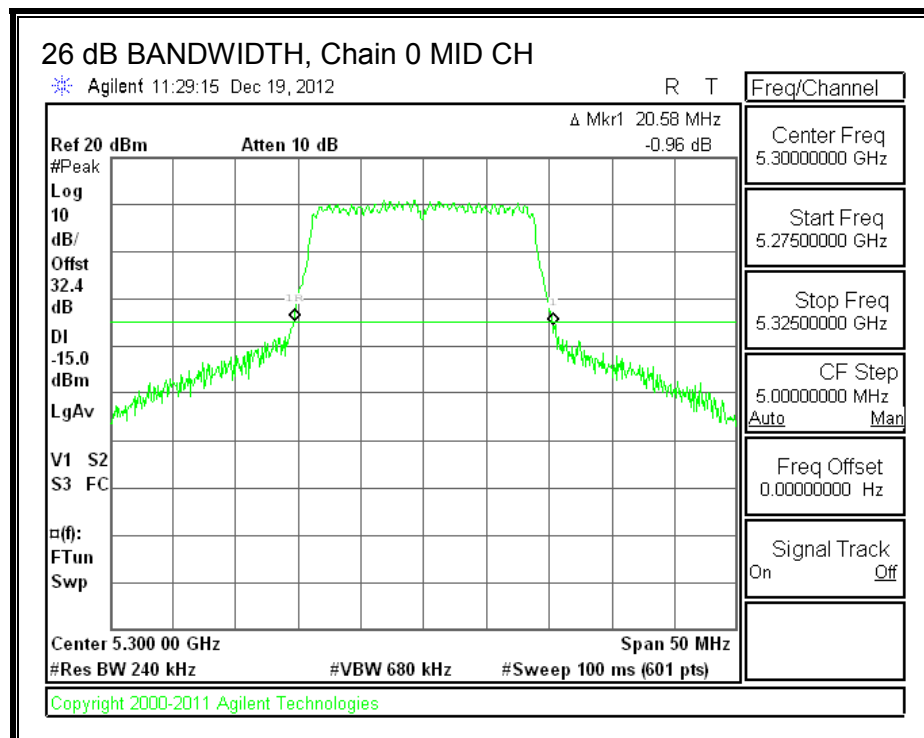
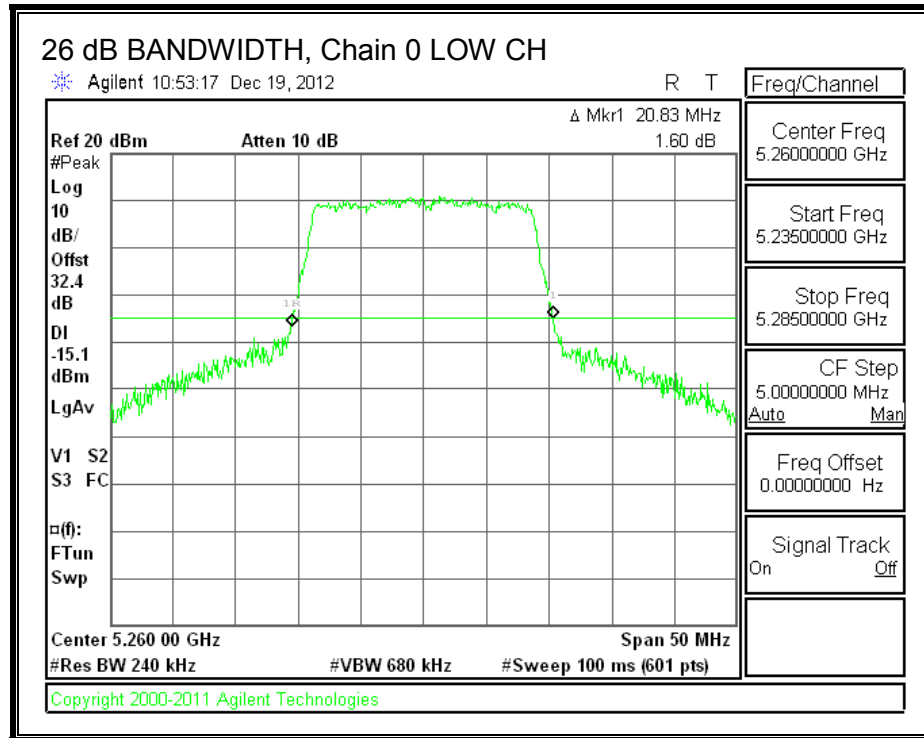
LIMITS

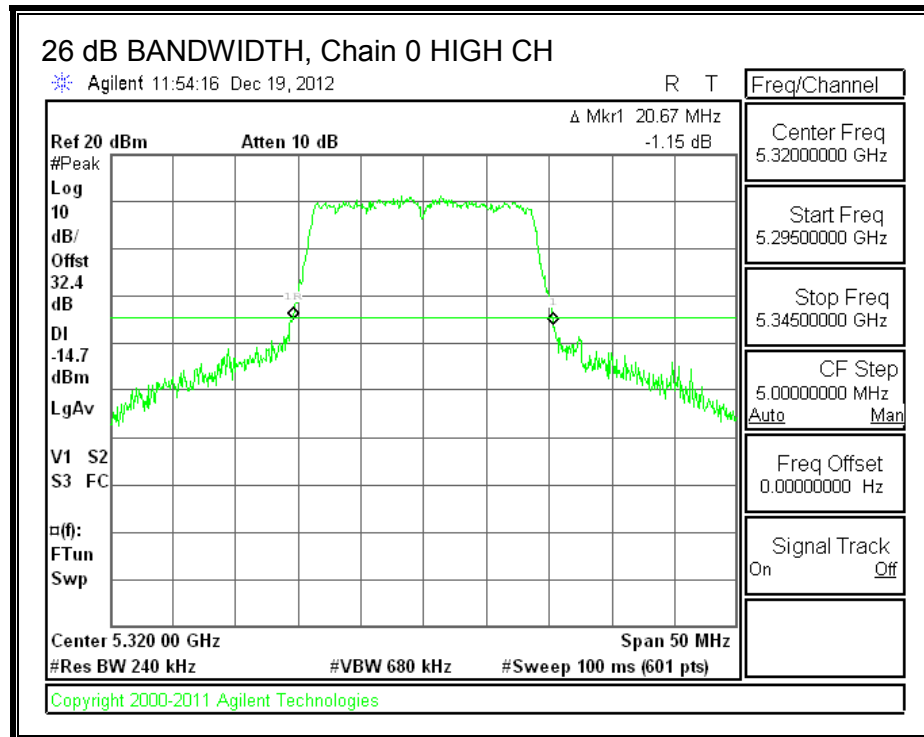
None; for reporting purposes only.

RESULTS

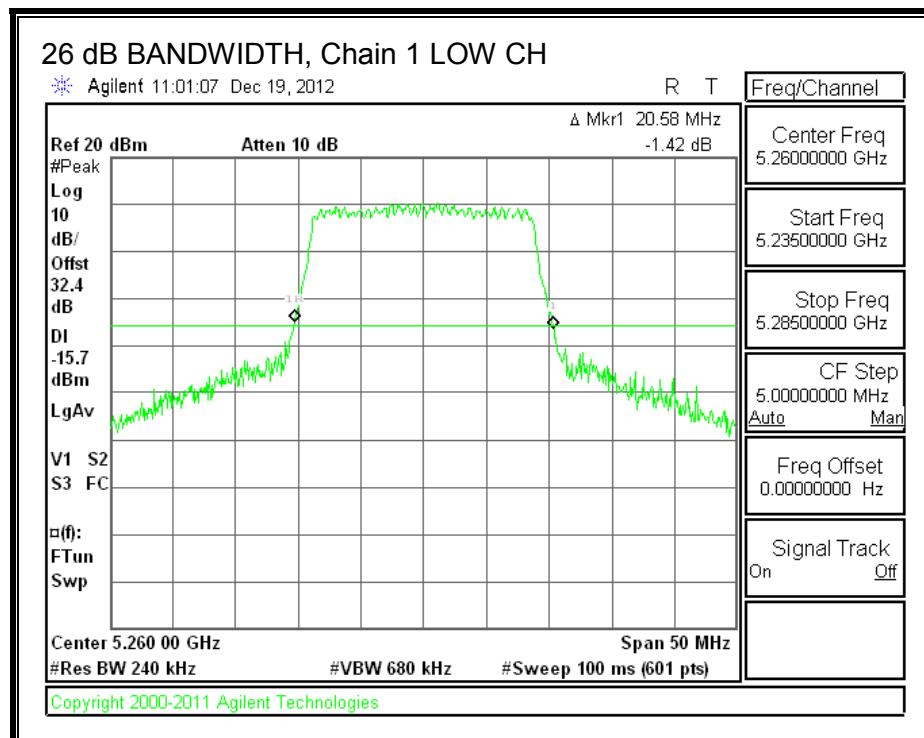
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	20.83	20.58
Mid	5300	20.58	20.58
High	5320	20.67	20.67

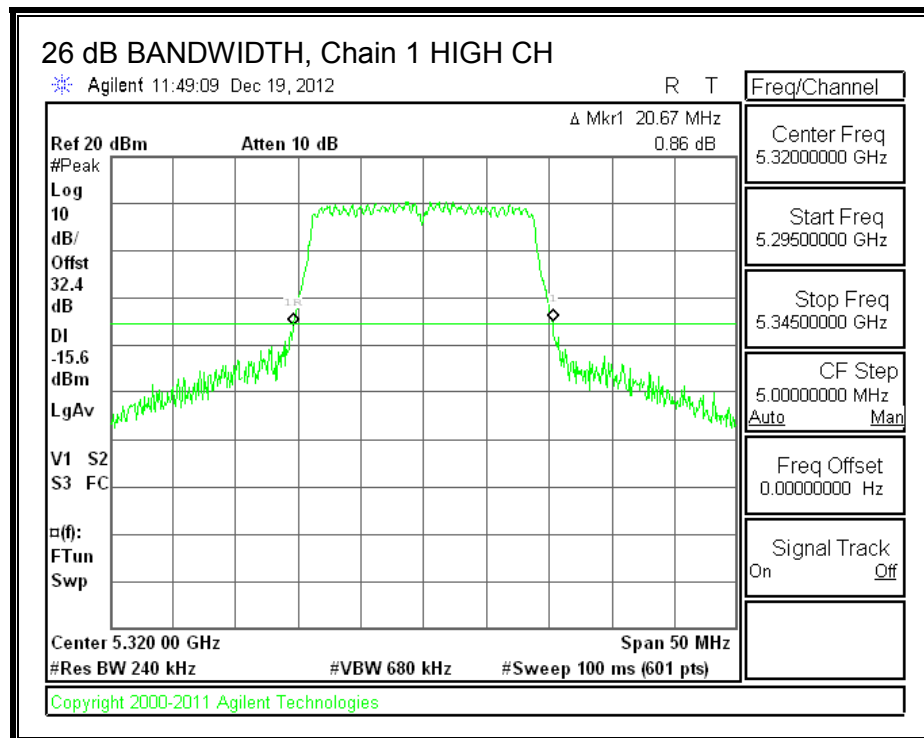
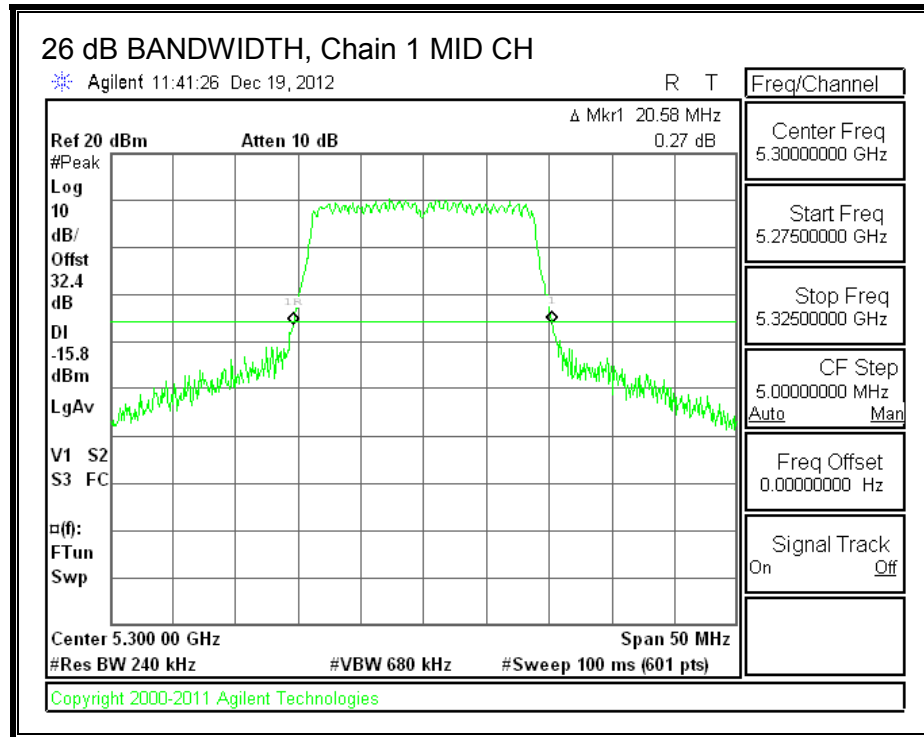
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.23.2. 99% BANDWIDTH

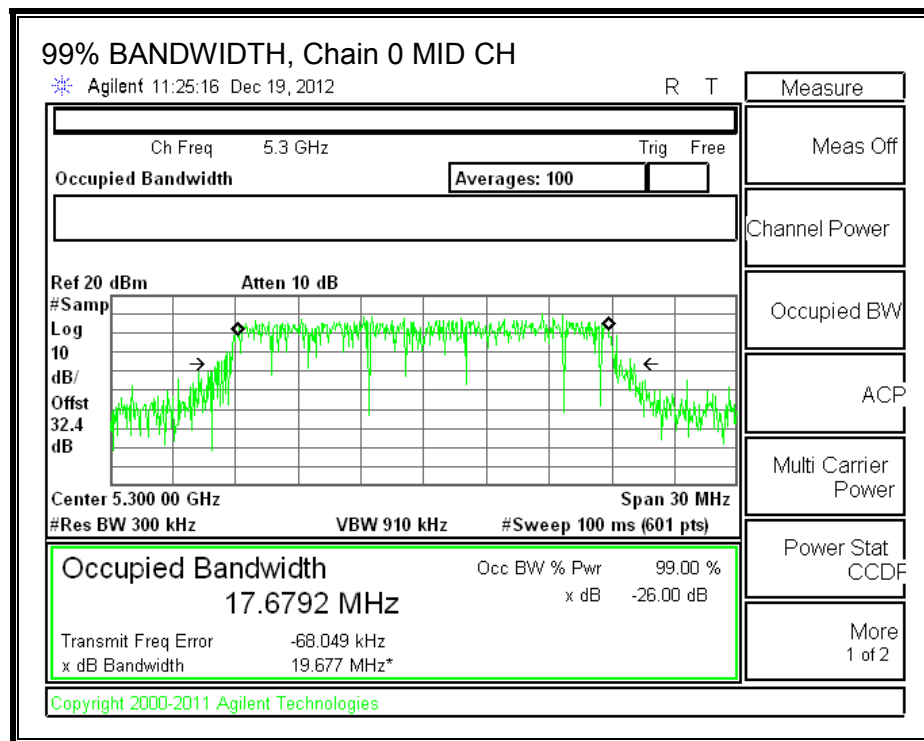
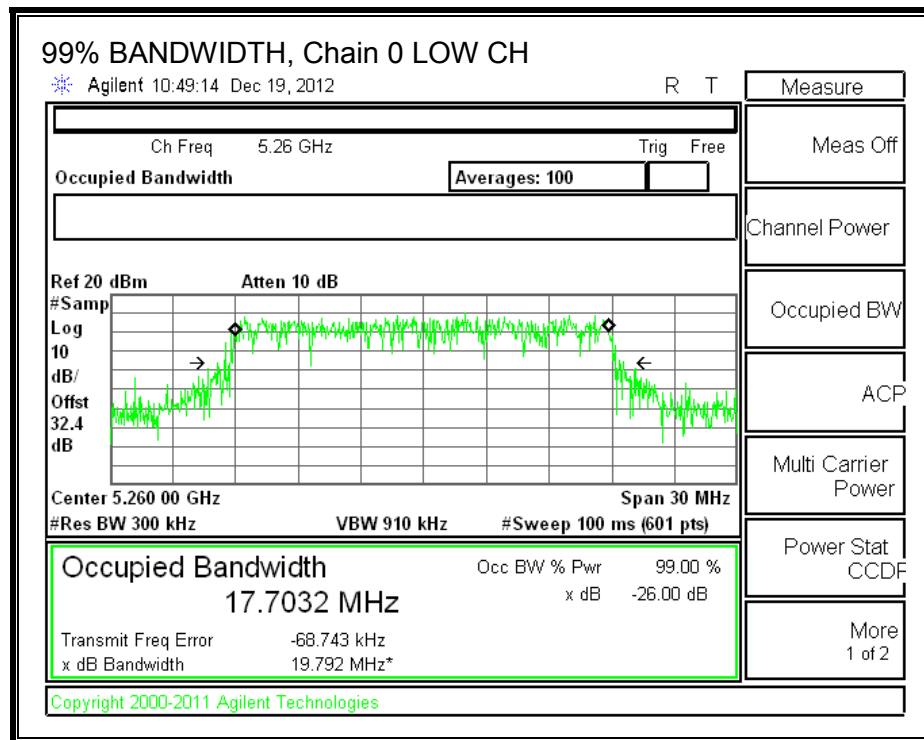
LIMITS

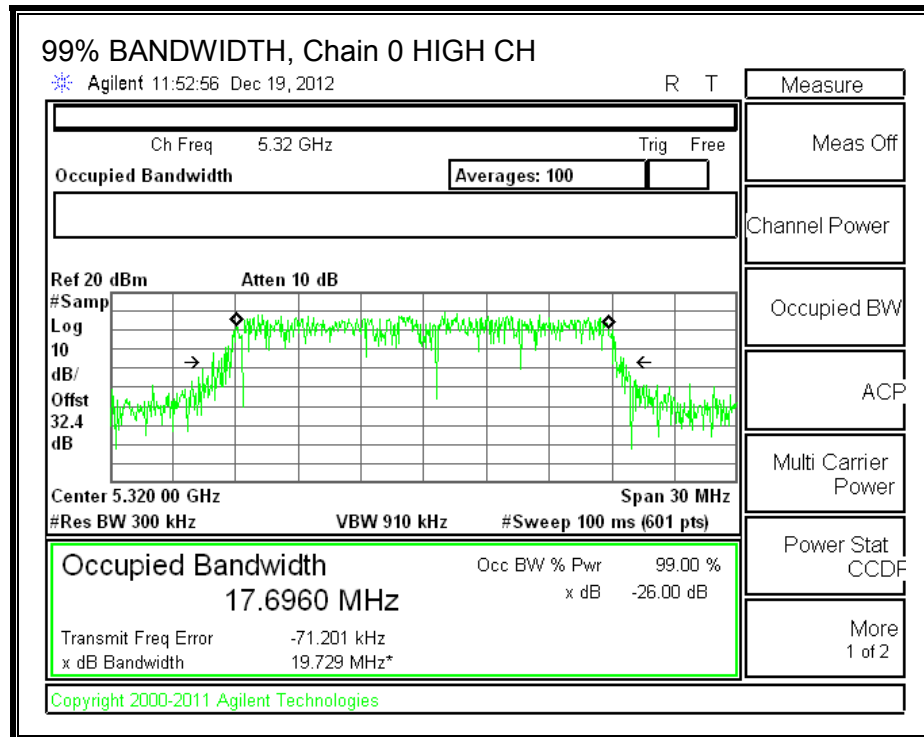
None; for reporting purposes only.

RESULTS

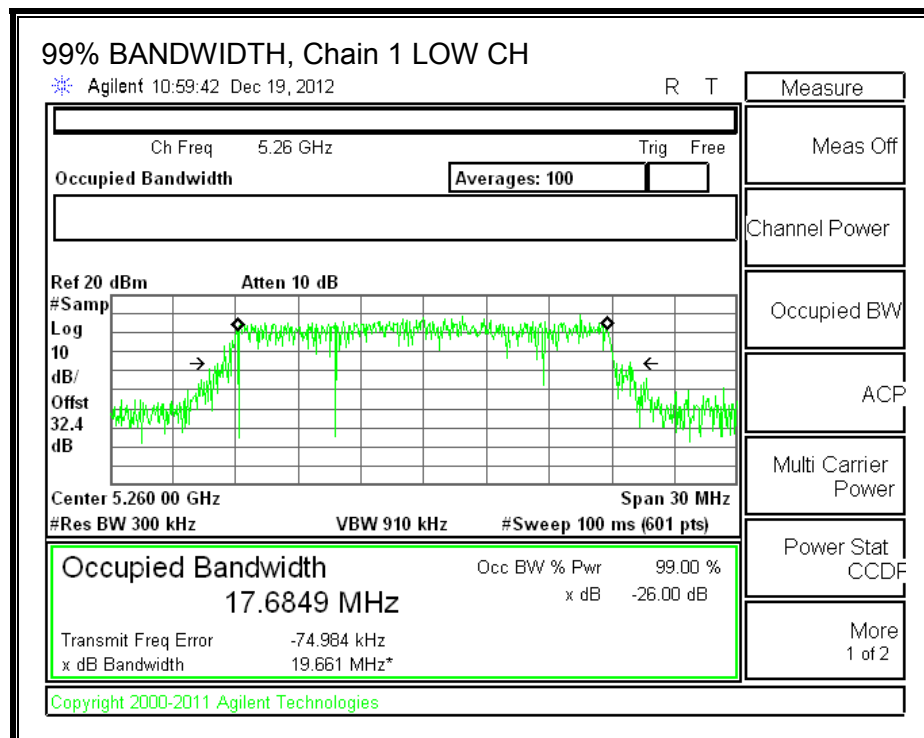
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.7032	17.6849
Mid	5300	17.6792	17.6898
High	5320	17.6960	17.6968

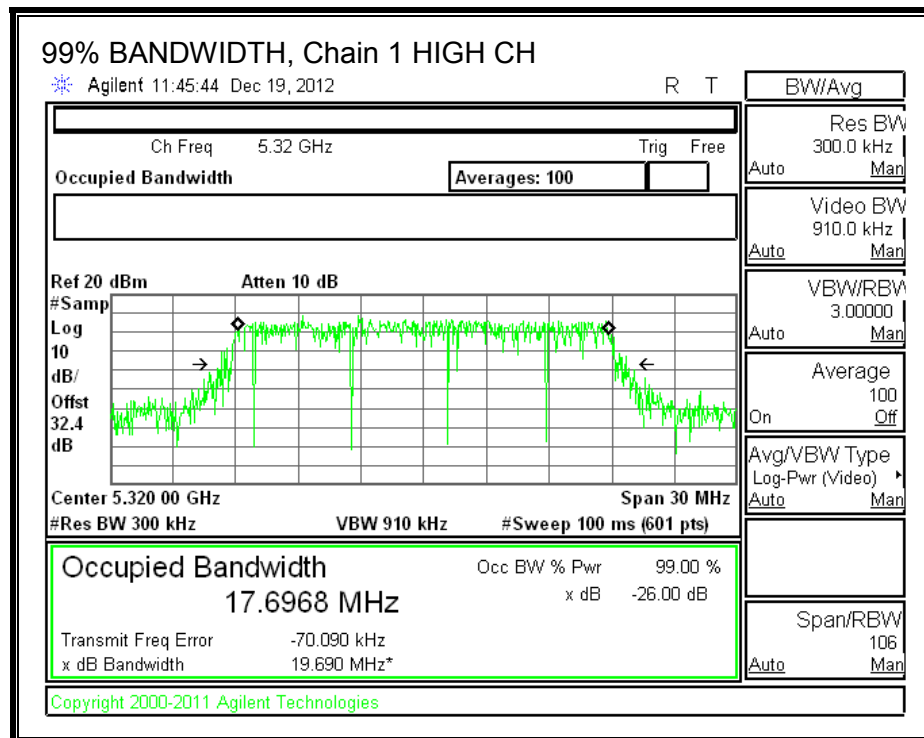
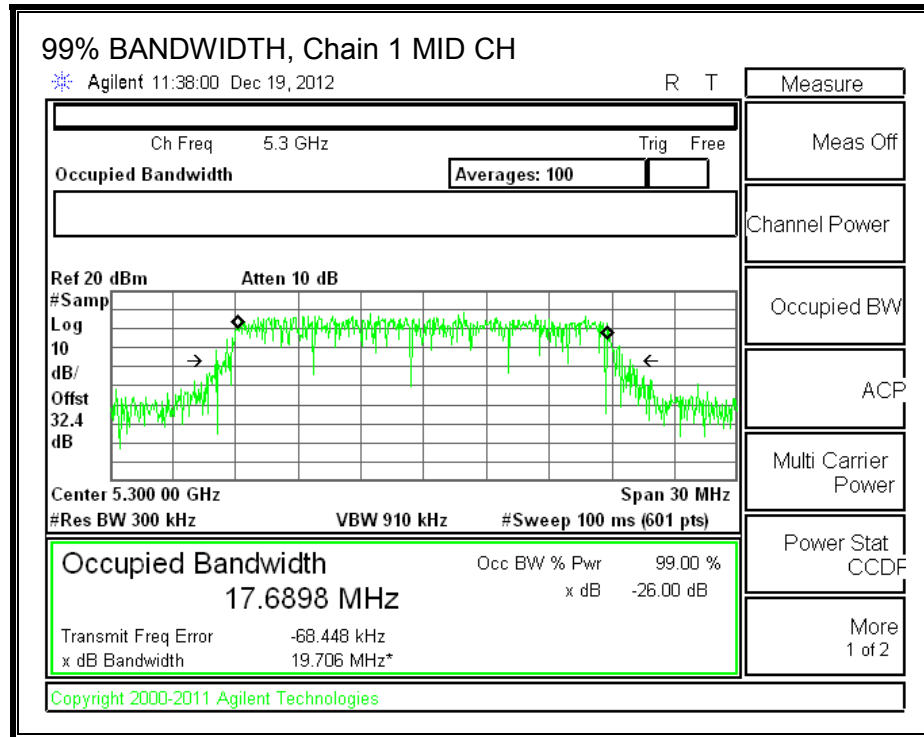
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.23.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.40	2.30	2.88

For PSD, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.40	2.30	5.88

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Low	5260	20.58	17.6849	5.88	2.88
Mid	5300	20.58	17.6792	5.88	2.88
High	5320	20.67	17.6960	5.88	2.88

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.47	29.47	23.47	11.00	11.00	11.00
High	5320	24.00	23.48	29.48	23.48	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00
--------------------	------

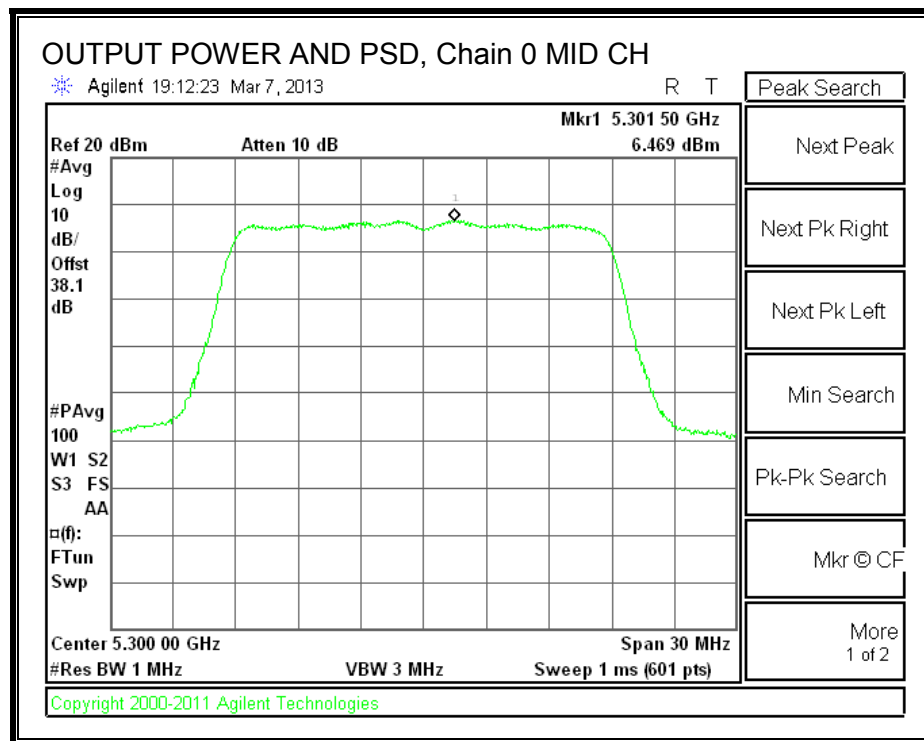
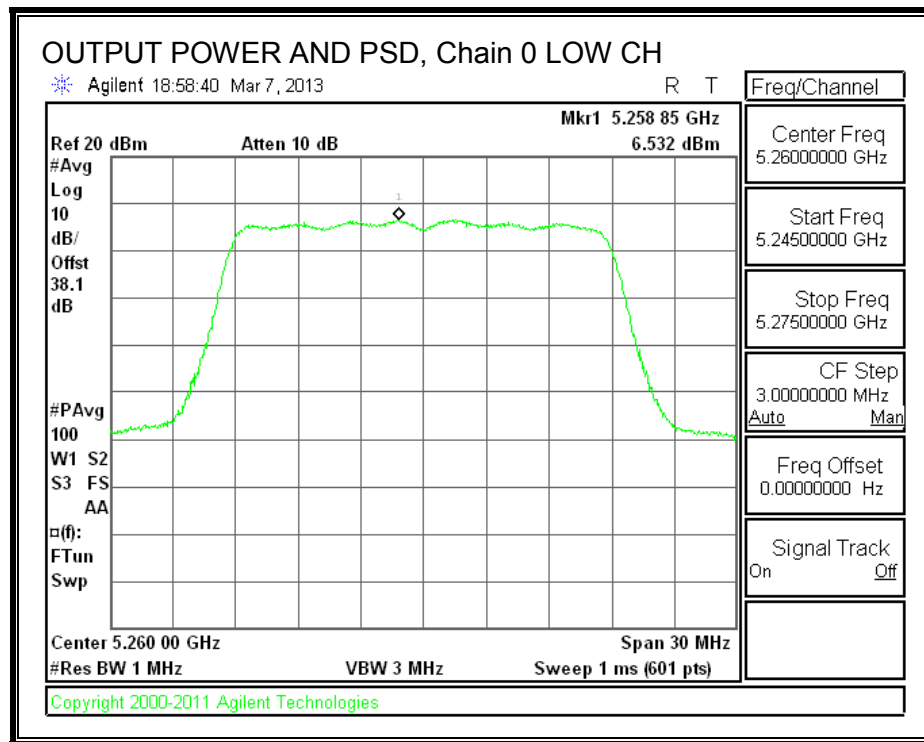
Output Power Results

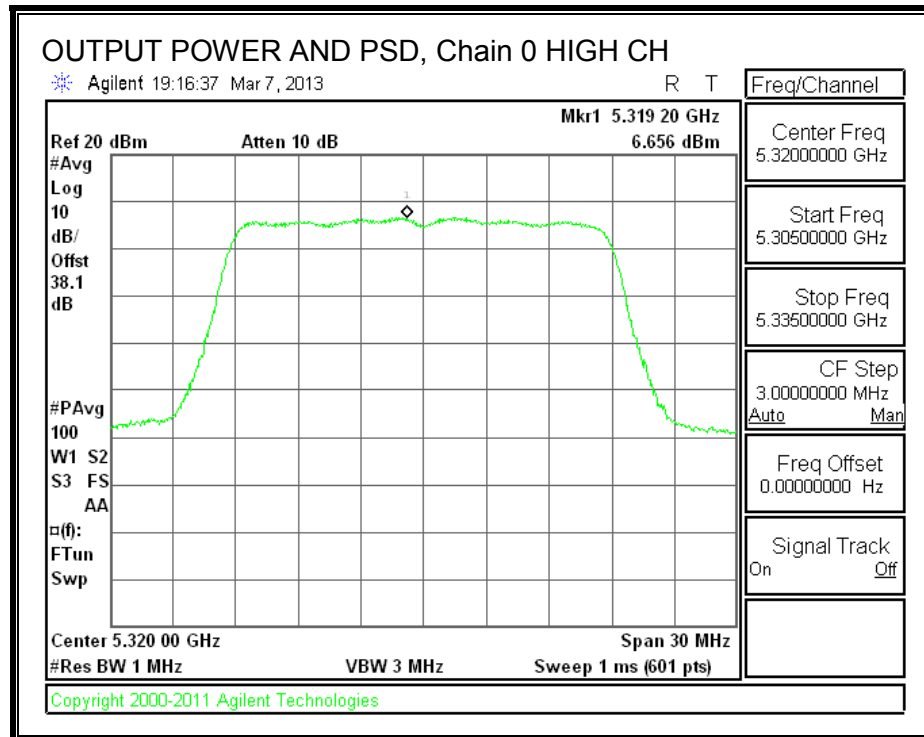
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.50	16.60	19.56	23.48	-3.92
Mid	5300	15.20	15.00	18.11	23.47	-5.36
High	5320	14.70	14.40	17.56	23.48	-5.92

PSD Results

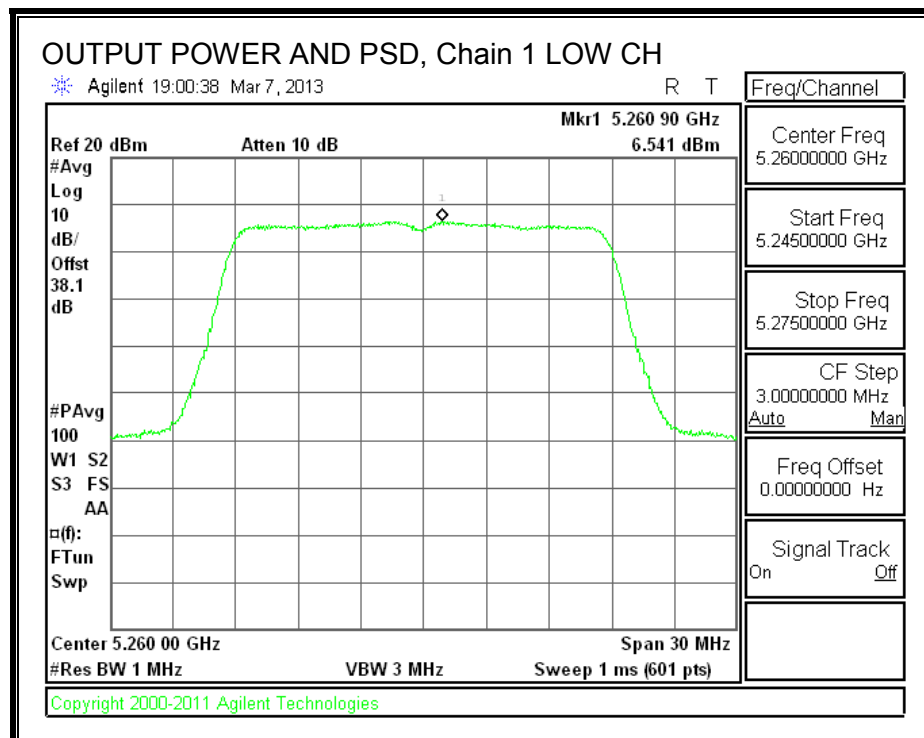
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	6.532	6.541	9.55	11.00	-1.45
Mid	5300	6.469	6.640	9.57	11.00	-1.43
High	5320	6.656	6.696	9.69	11.00	-1.31

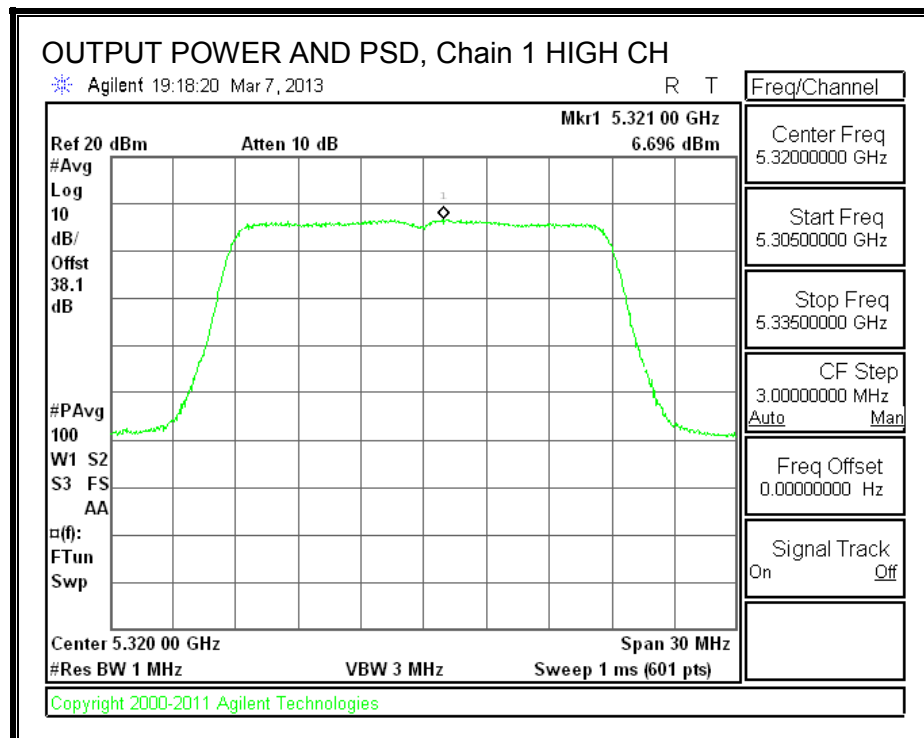
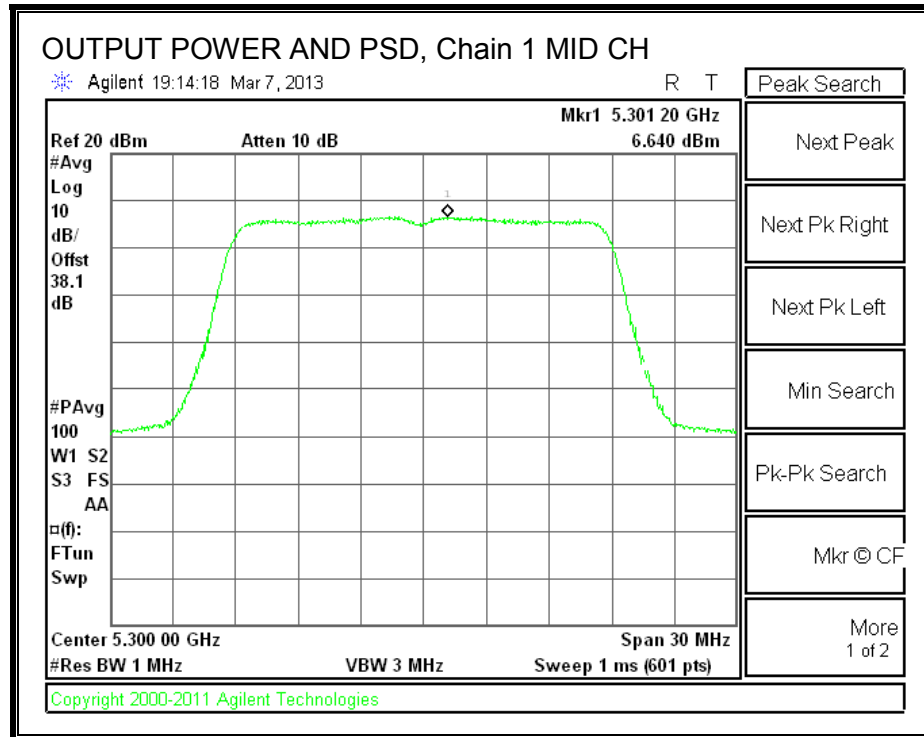
OUTPUT POWER AND PSD, Chain 0





OUTPUT POWER AND PSD, Chain 1





8.23.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.24. 802.11n HT20 BF 2TX MODE IN THE 5.3 GHz BAND

Covered by testing HT20 CDD 2TX mode, the power per chain used for HT20 CDD 2TX mode is the same power per chain that will be used for HT20 BF 2TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.24.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.40	2.30	5.88

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5260	20.58	17.6849	5.88
Mid	5300	20.58	17.6792	5.88
High	5320	20.67	17.6960	5.88

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48
Mid	5300	24.00	23.47	29.47	23.47
High	5320	24.00	23.48	29.48	23.48

Duty Cycle CF (dB)	0.00	
---------------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.50	16.60	19.56	23.48	-3.92
Mid	5300	15.20	15.00	18.11	23.47	-5.36
High	5320	14.70	14.40	17.56	23.48	-5.92

8.25. 802.11n HT20 STBC 2TX MODE IN THE 5.3 GHz BAND

8.25.1. 26 dB BANDWIDTH

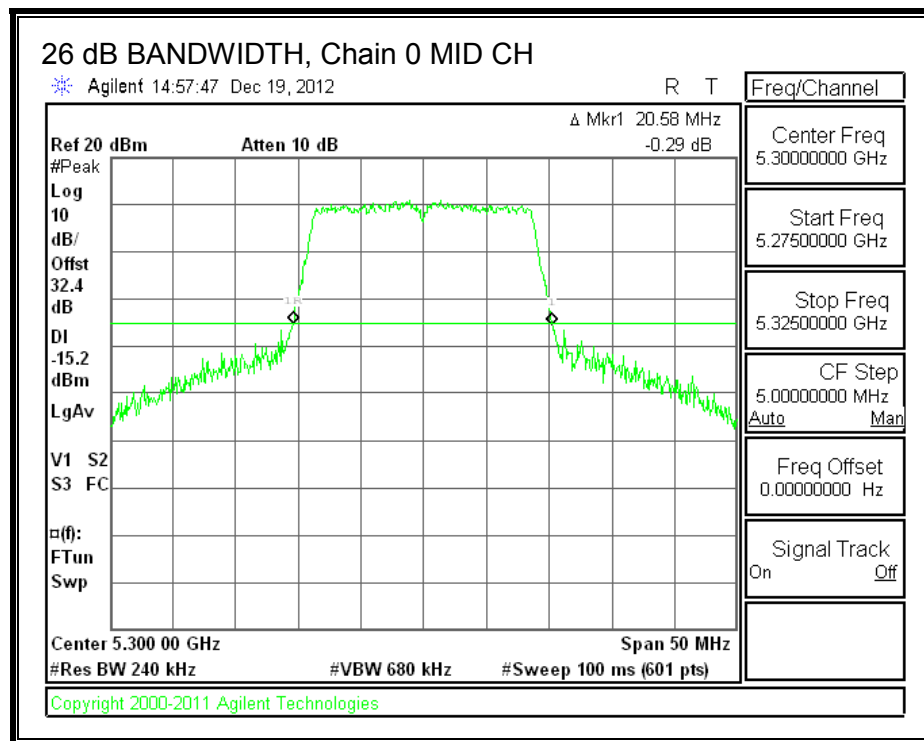
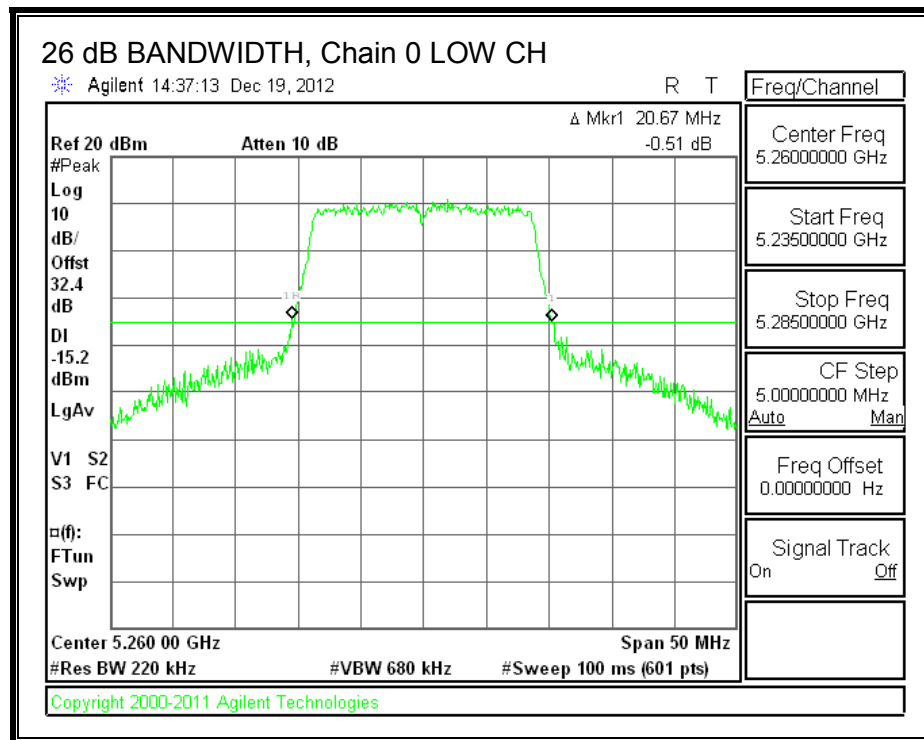
LIMITS

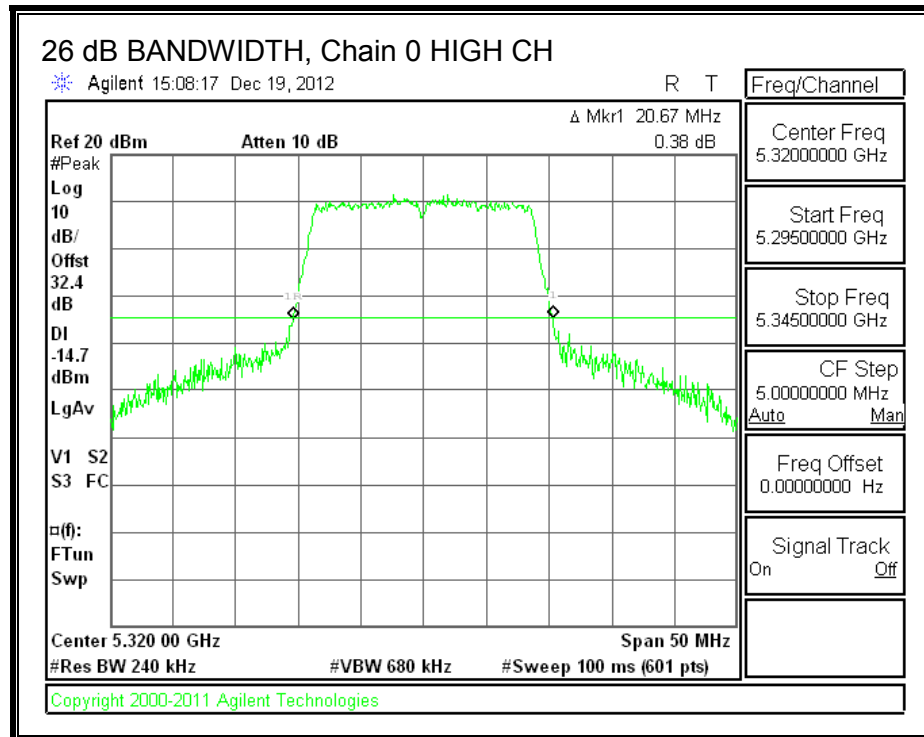
None; for reporting purposes only.

RESULTS

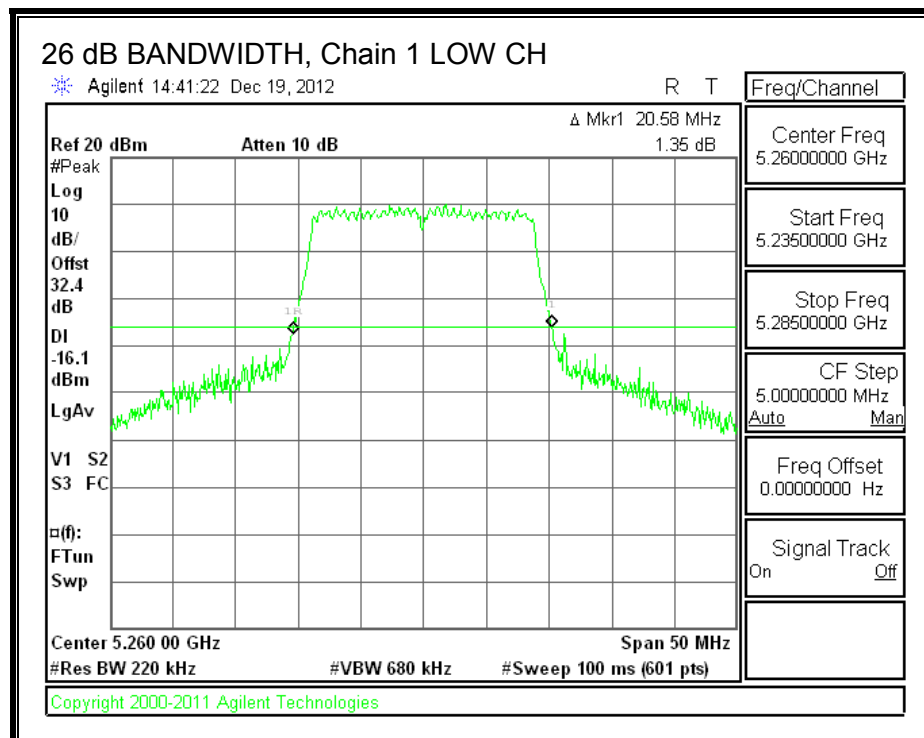
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	20.67	20.58
Mid	5300	20.58	20.50
High	5320	20.67	20.75

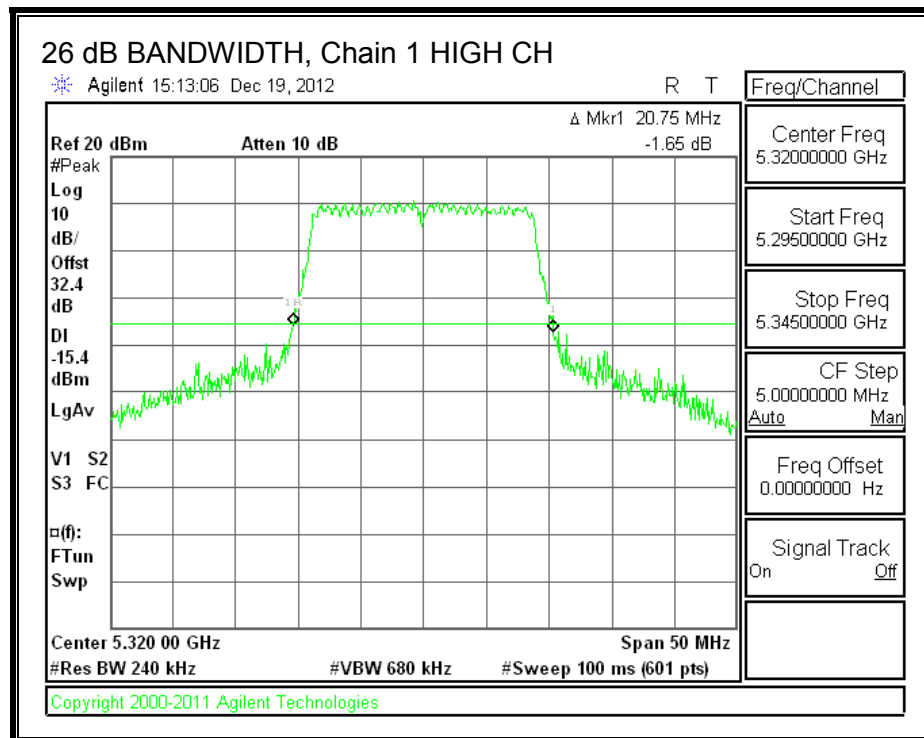
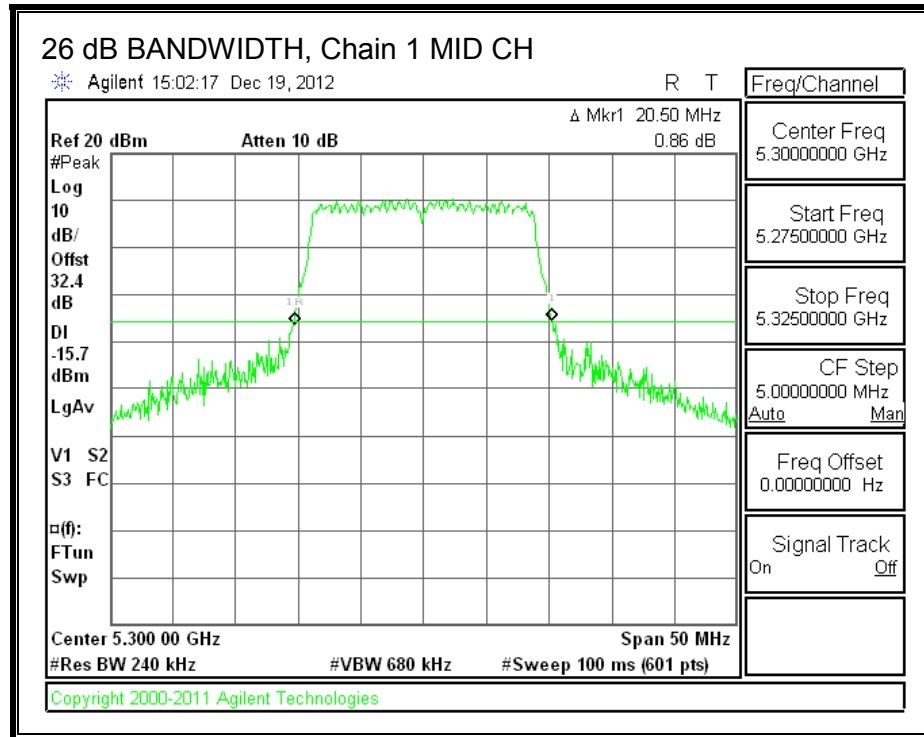
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.25.2. 99% BANDWIDTH

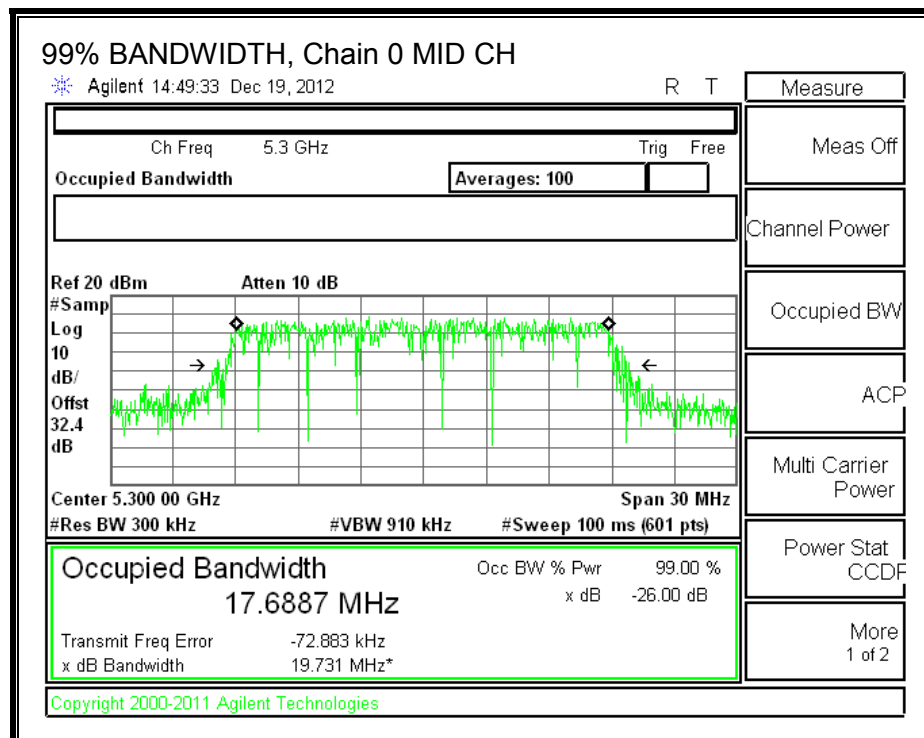
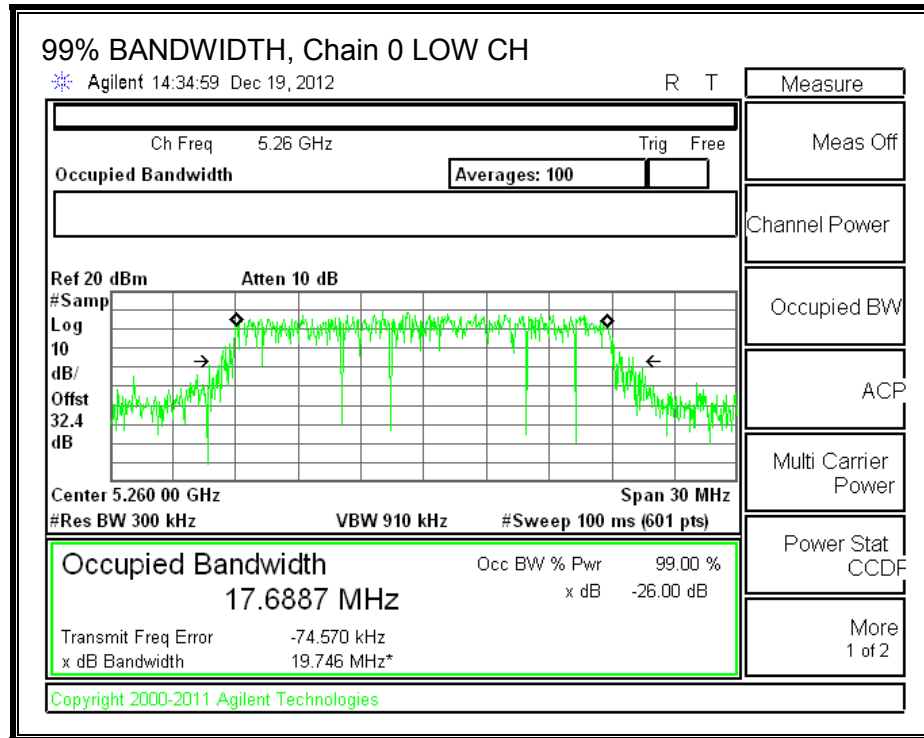
LIMITS

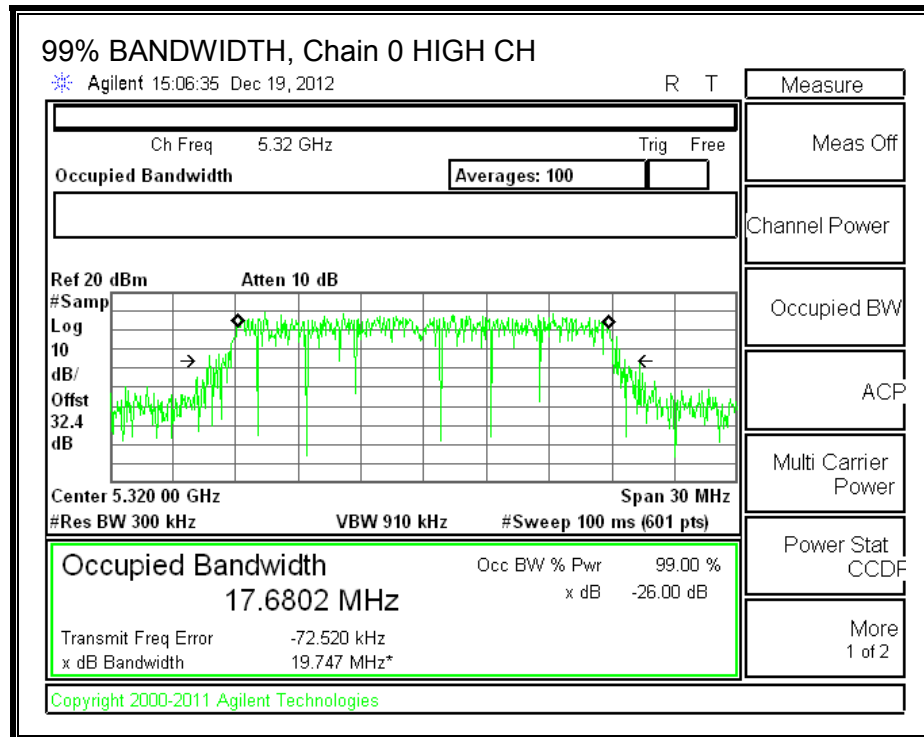
None; for reporting purposes only.

RESULTS

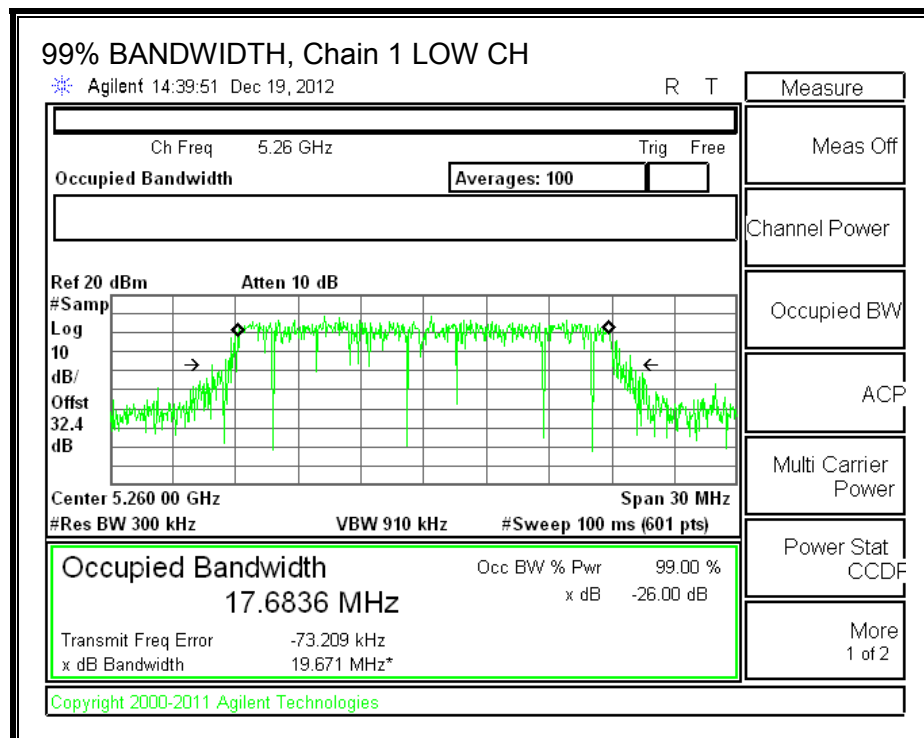
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.6887	17.6836
Mid	5300	17.6887	17.6843
High	5320	17.6802	17.6734

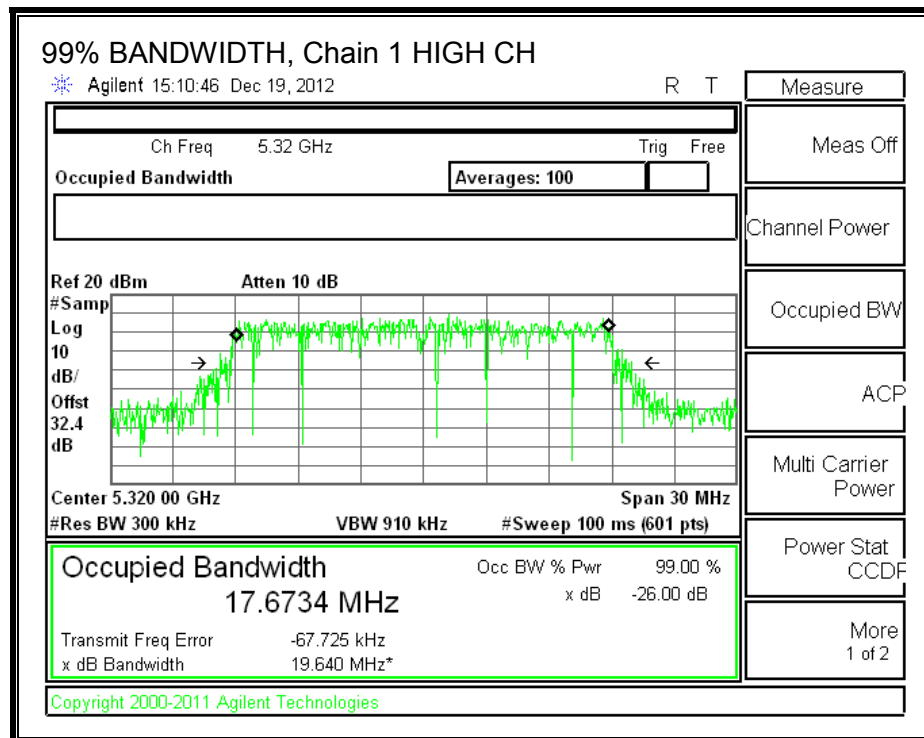
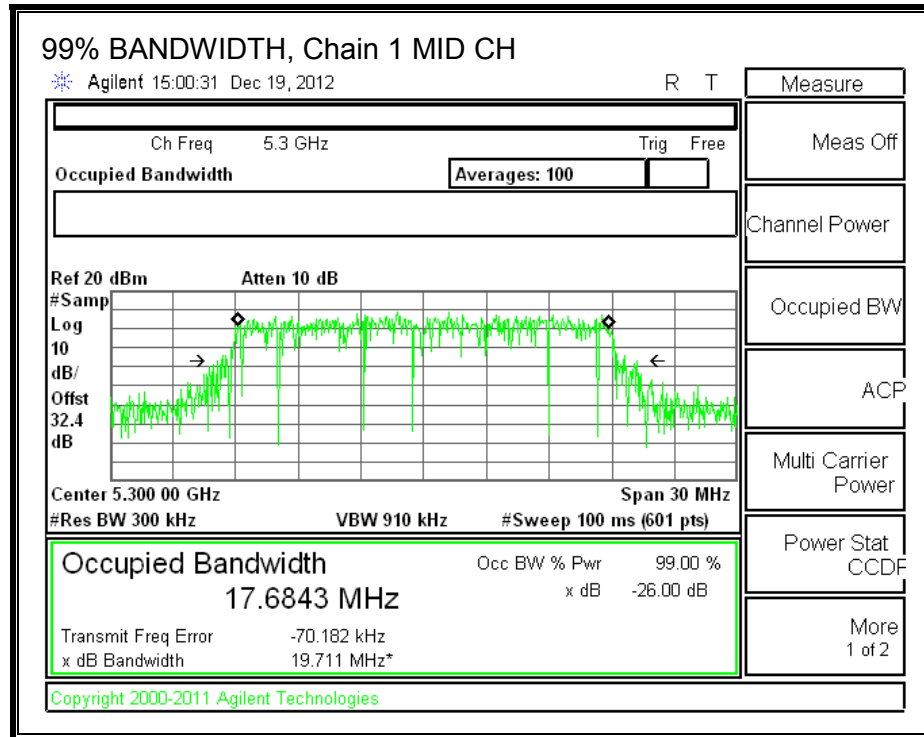
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.25.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.40	2.30	2.88

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.6	17.7	2.88
Mid	5300	20.5	17.7	2.88
High	5320	20.7	17.7	2.88

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.48	29.48	23.48	11.00	11.00	11.00
High	5320	24.00	23.47	29.47	23.47	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	
--------------------	------	--

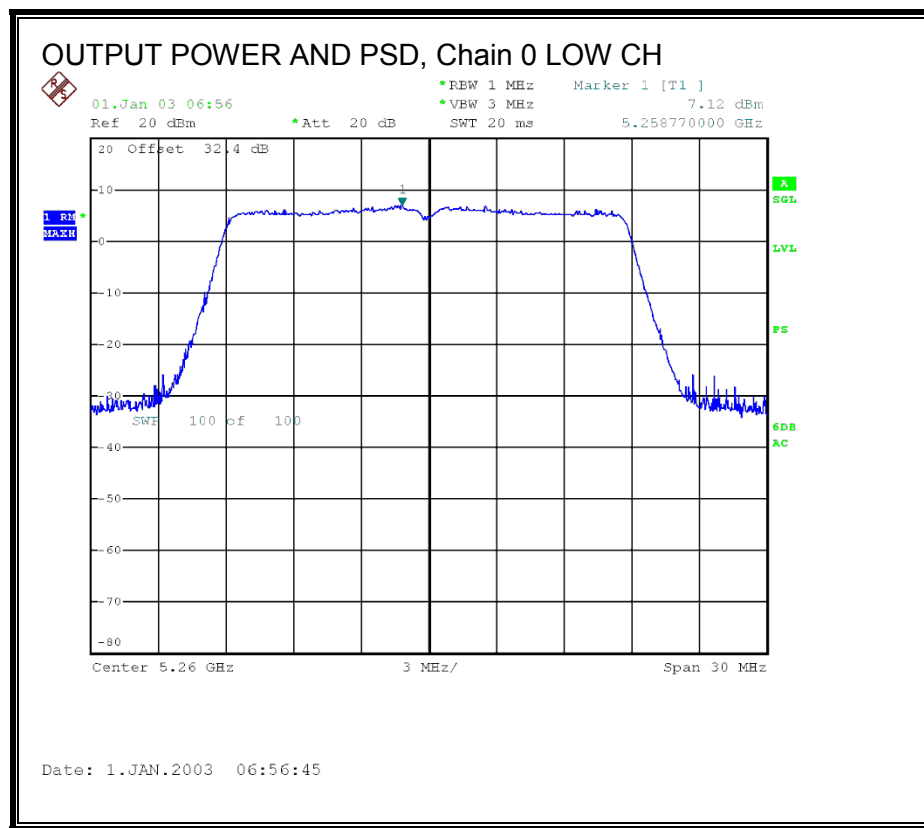
Output Power Results

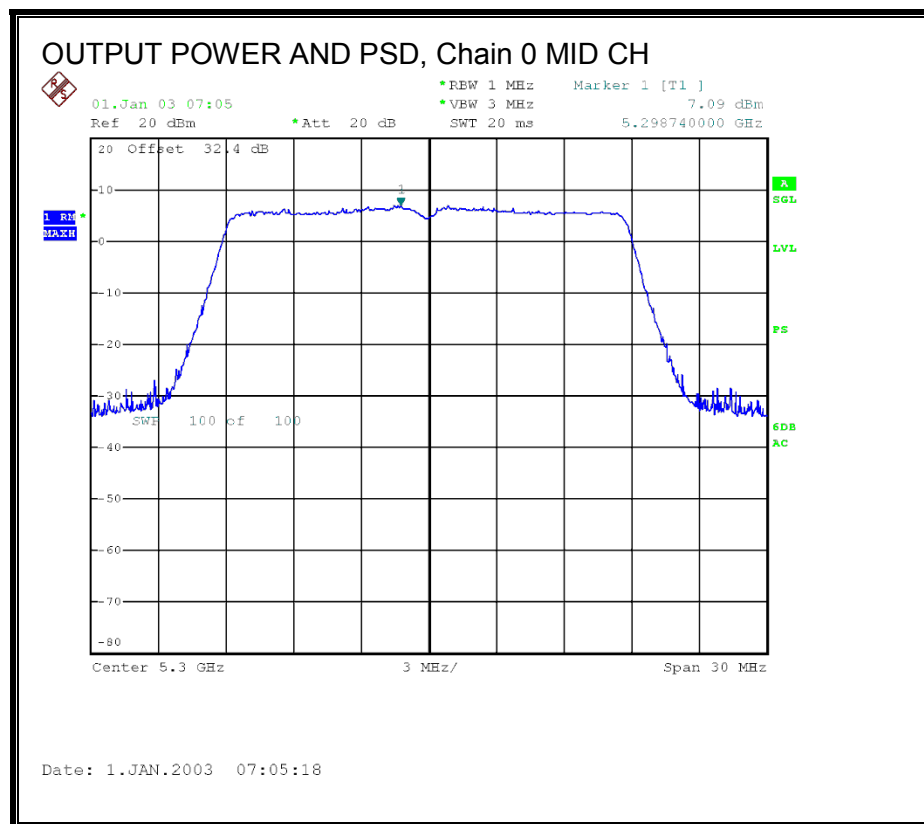
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	18.10	18.00	21.06	23.48	-2.42
Mid	5300	15.20	15.00	18.11	23.48	-5.37
High	5320	14.70	14.40	17.56	23.47	-5.91

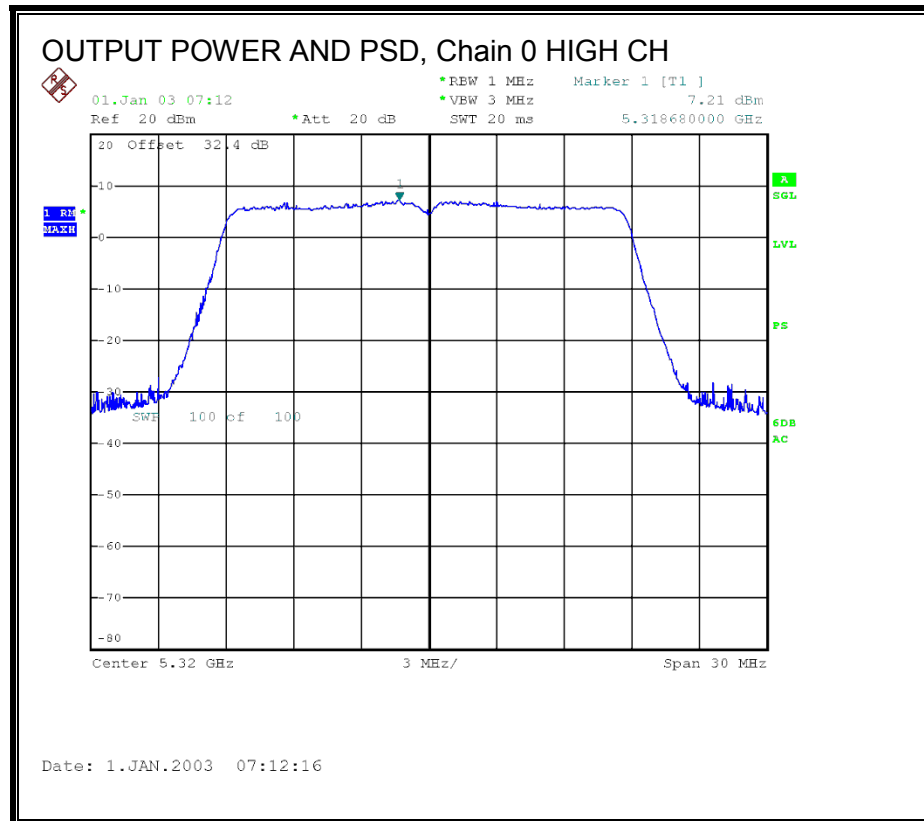
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	7.12	7.50	10.32	11.00	-0.68
Mid	5300	7.09	7.64	10.38	11.00	-0.62
High	5320	7.21	7.83	10.54	11.00	-0.46

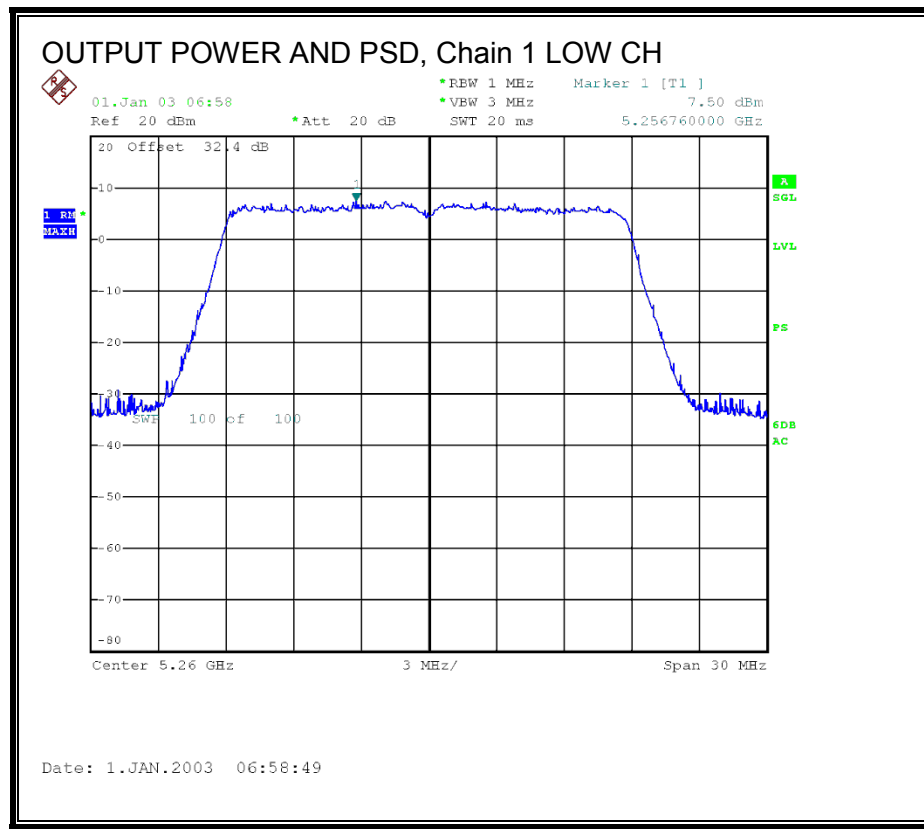
OUTPUT POWER AND PSD, Chain 0

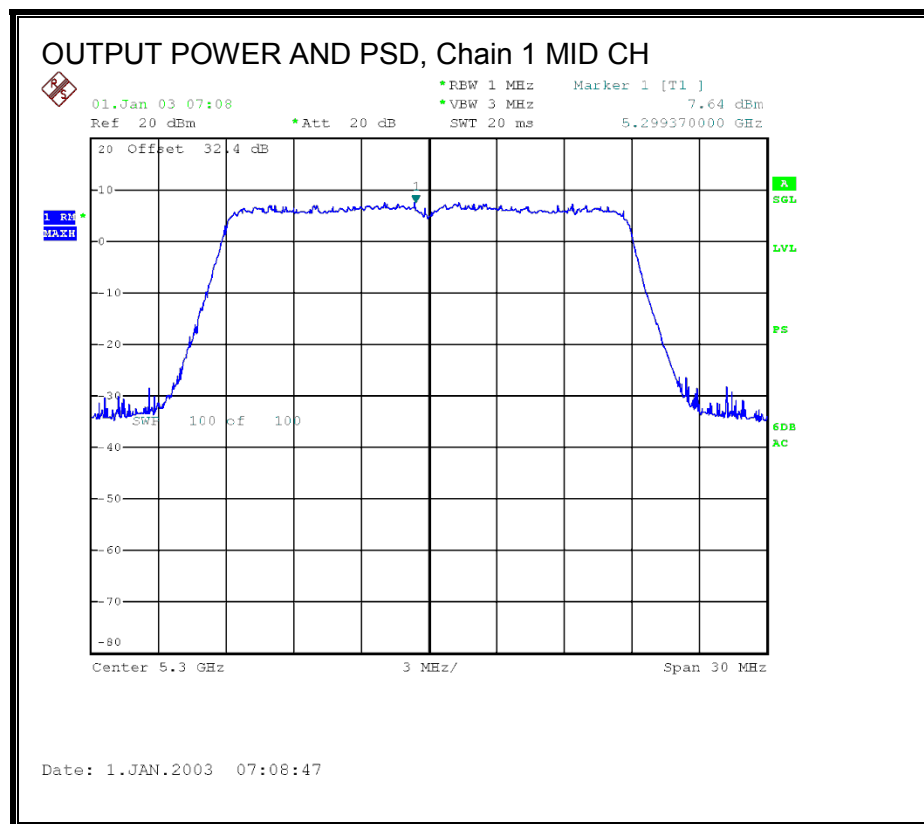


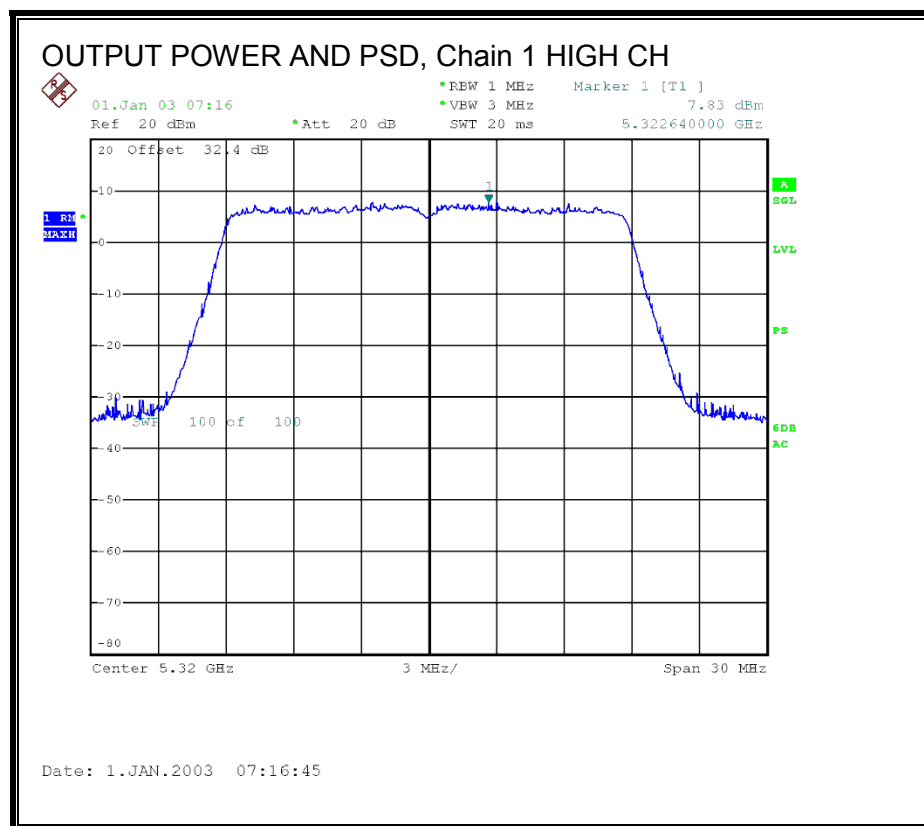




OUTPUT POWER AND PSD, Chain 1







8.25.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.26. 802.11n HT20 CDD 3TX MODE IN THE 5.3 GHz BAND

8.26.1. 26 dB BANDWIDTH

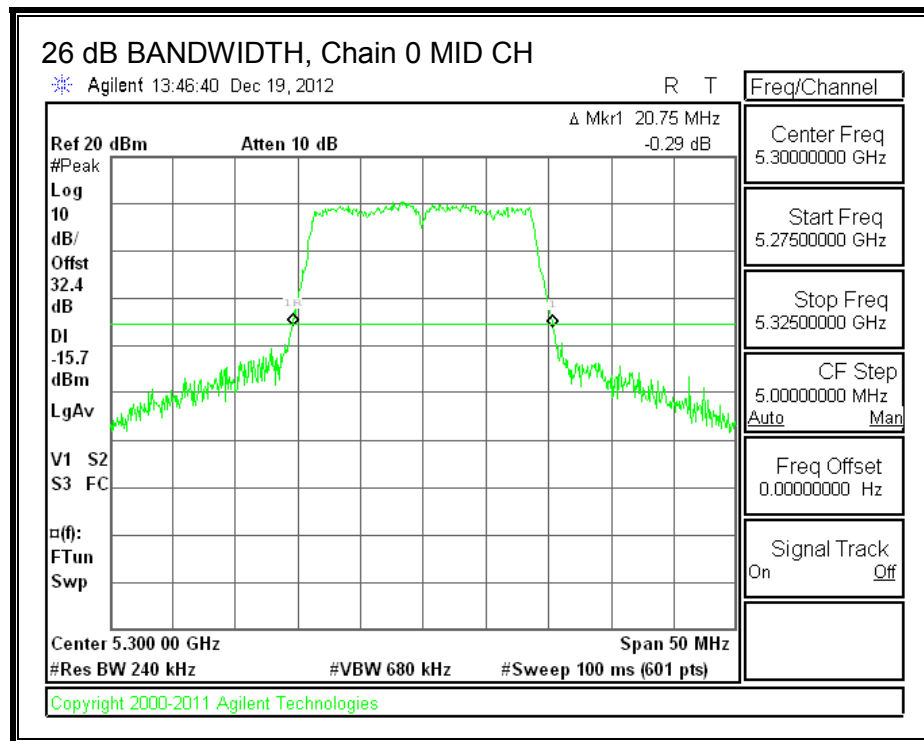
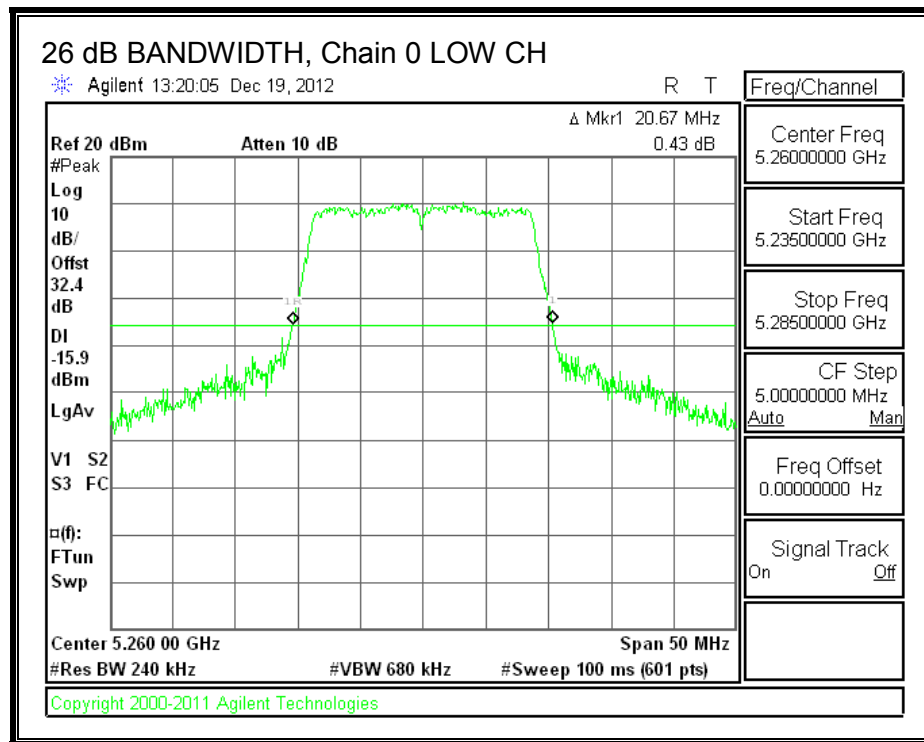
LIMITS

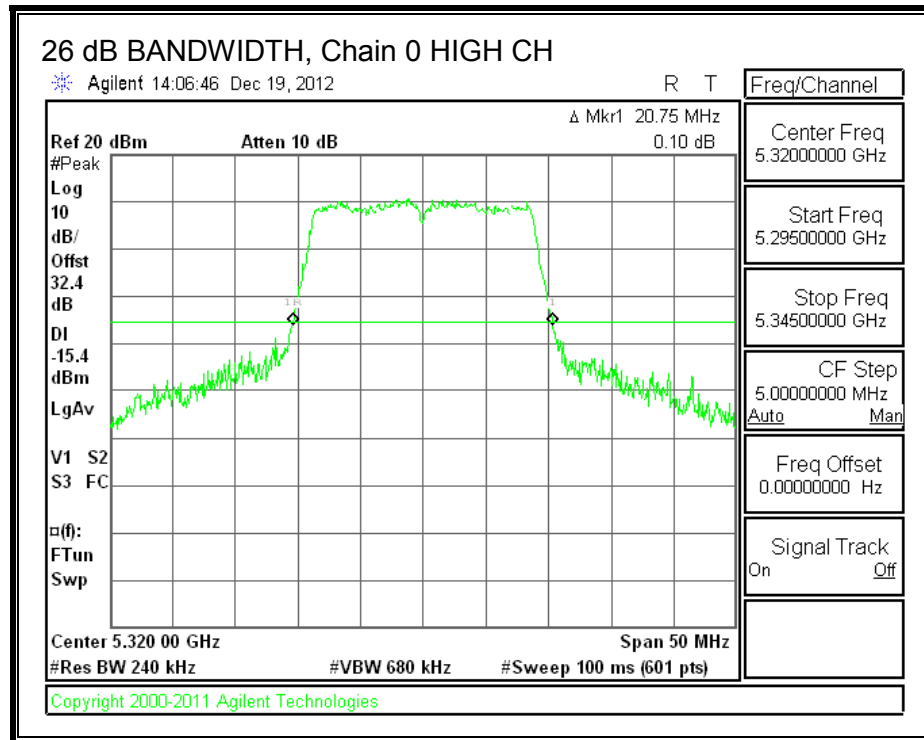
None; for reporting purposes only.

RESULTS

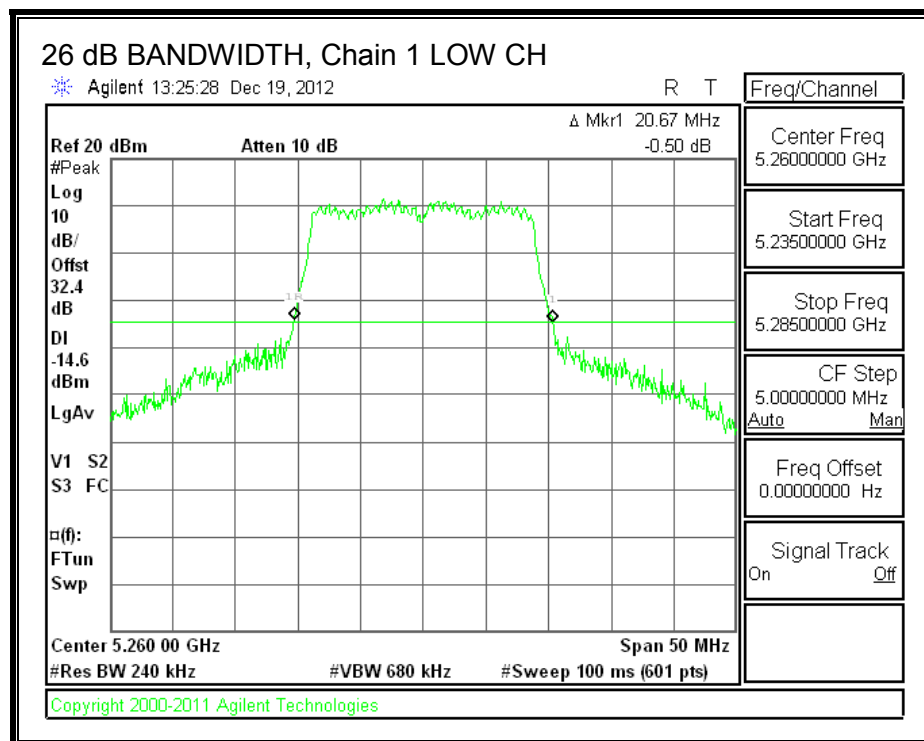
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	20.67	20.67	20.58
Mid	5300	20.75	20.58	20.58
High	5320	20.75	20.75	20.50

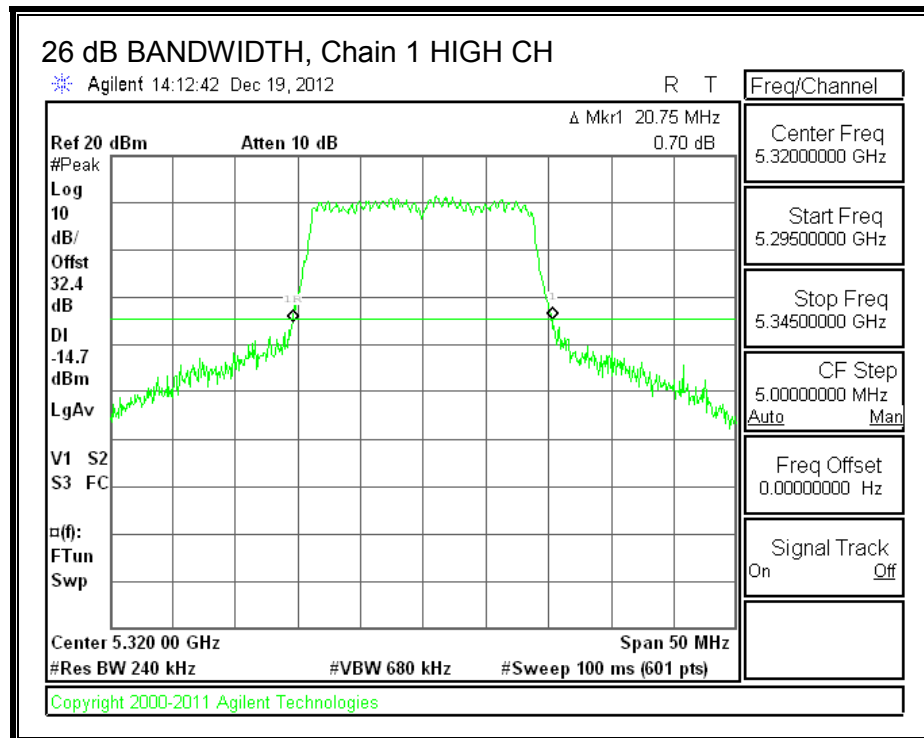
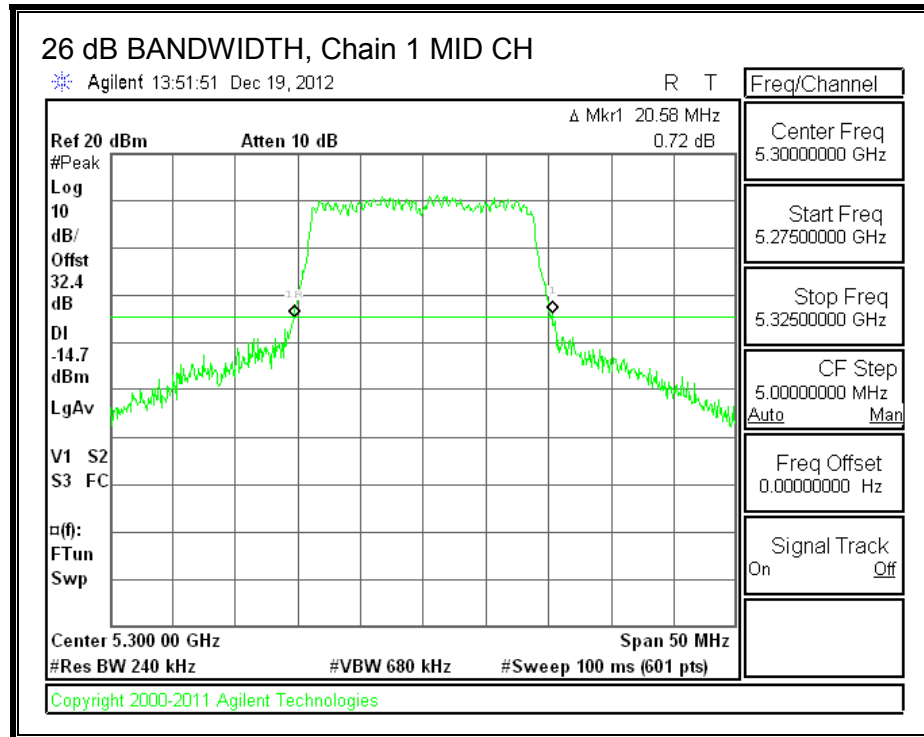
26 dB BANDWIDTH, Chain 0



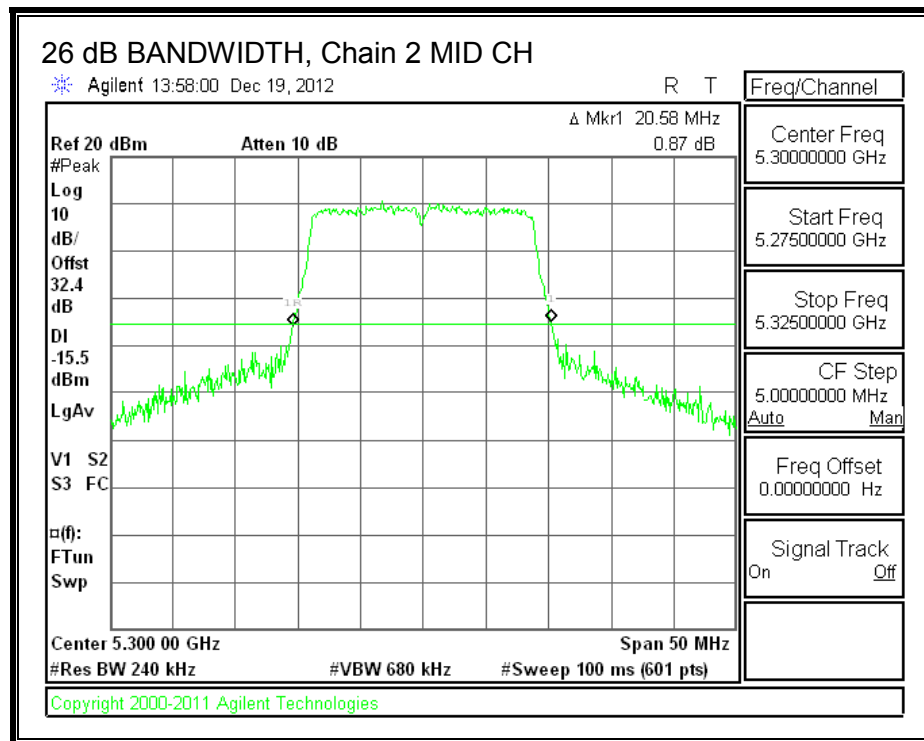
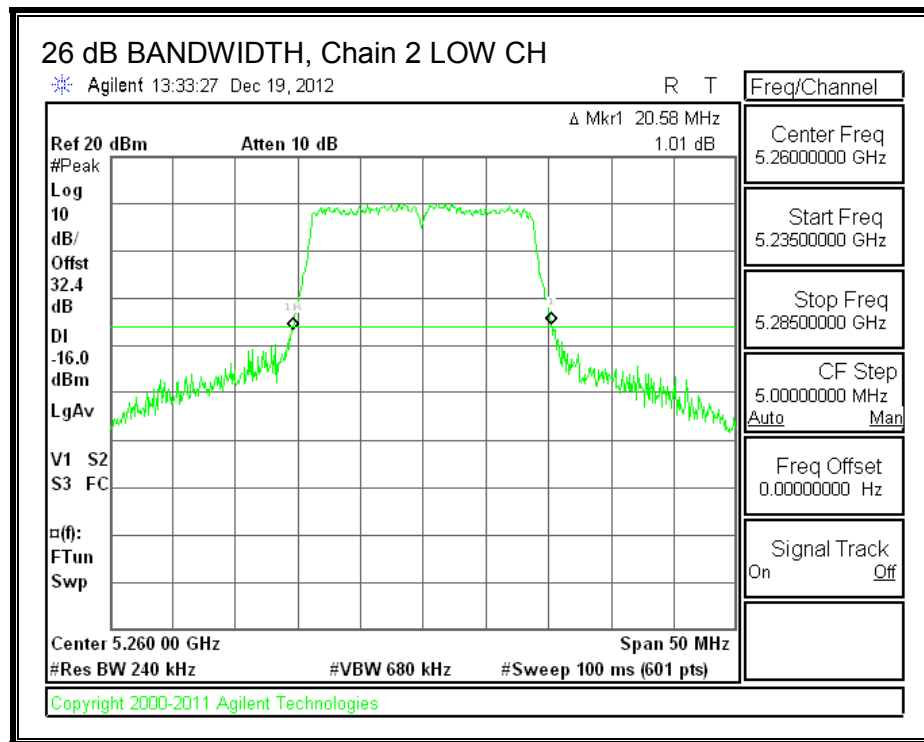


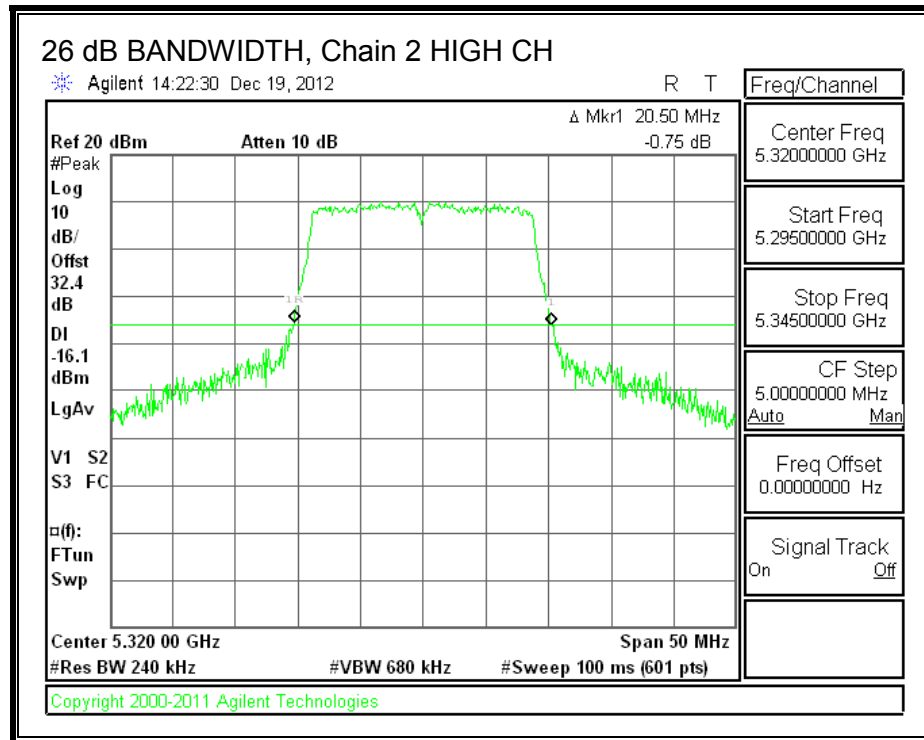
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.26.2. 99% BANDWIDTH

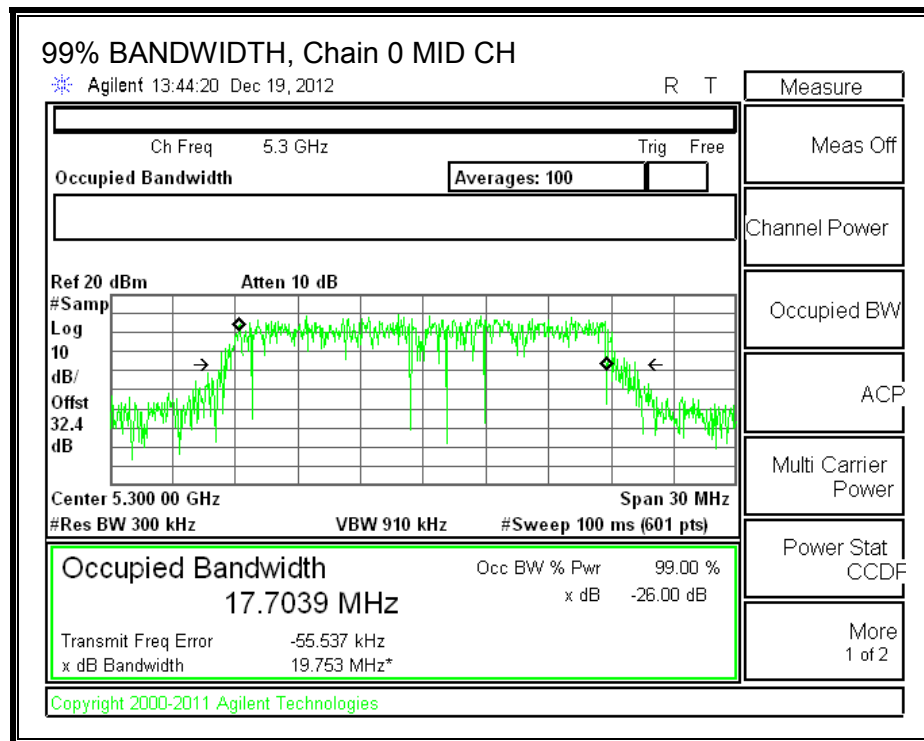
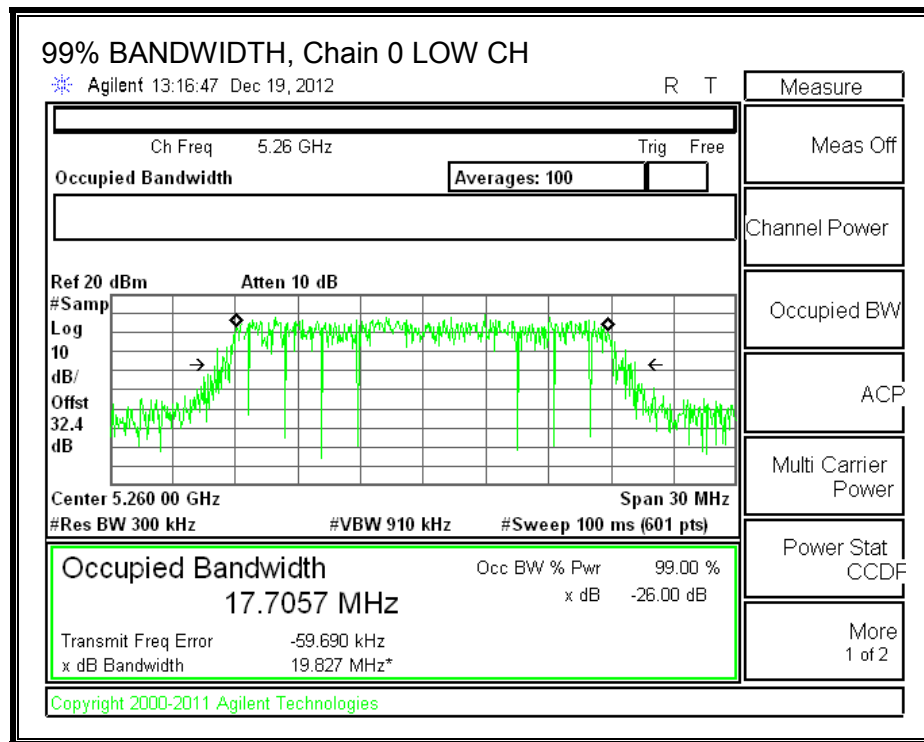
LIMITS

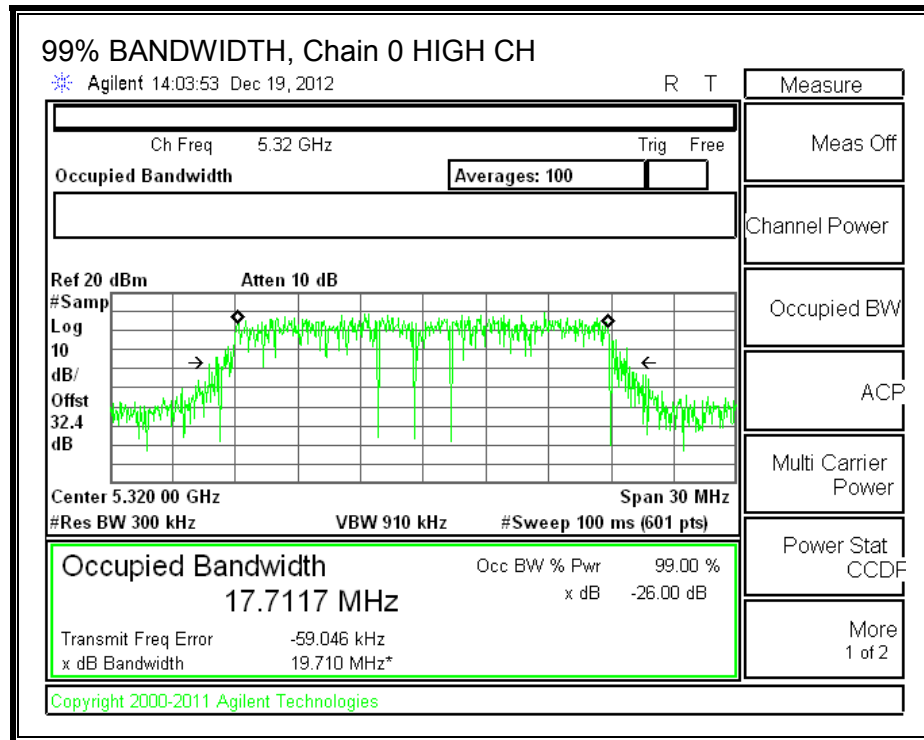
None; for reporting purposes only.

RESULTS

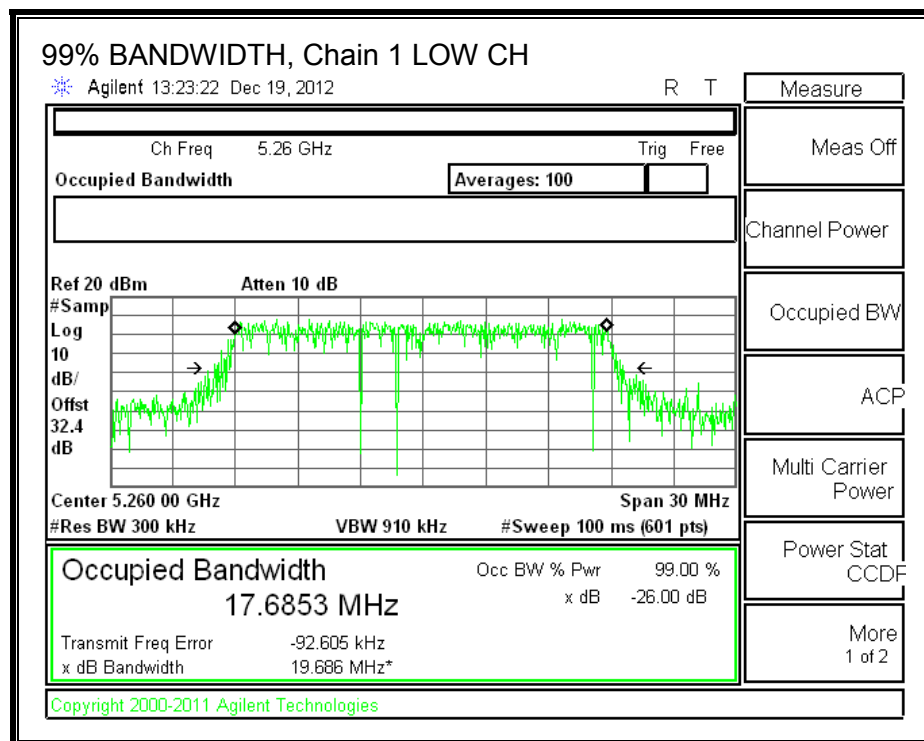
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.7057	17.6853	17.6937
Mid	5300	17.7039	17.6751	17.6908
High	5320	17.7117	17.6826	17.6386

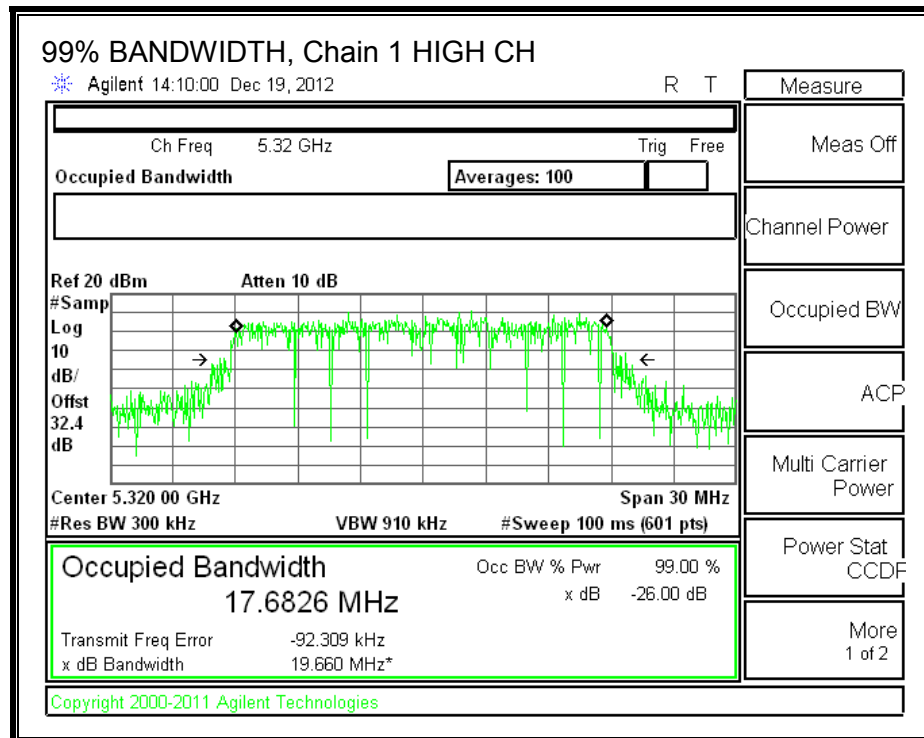
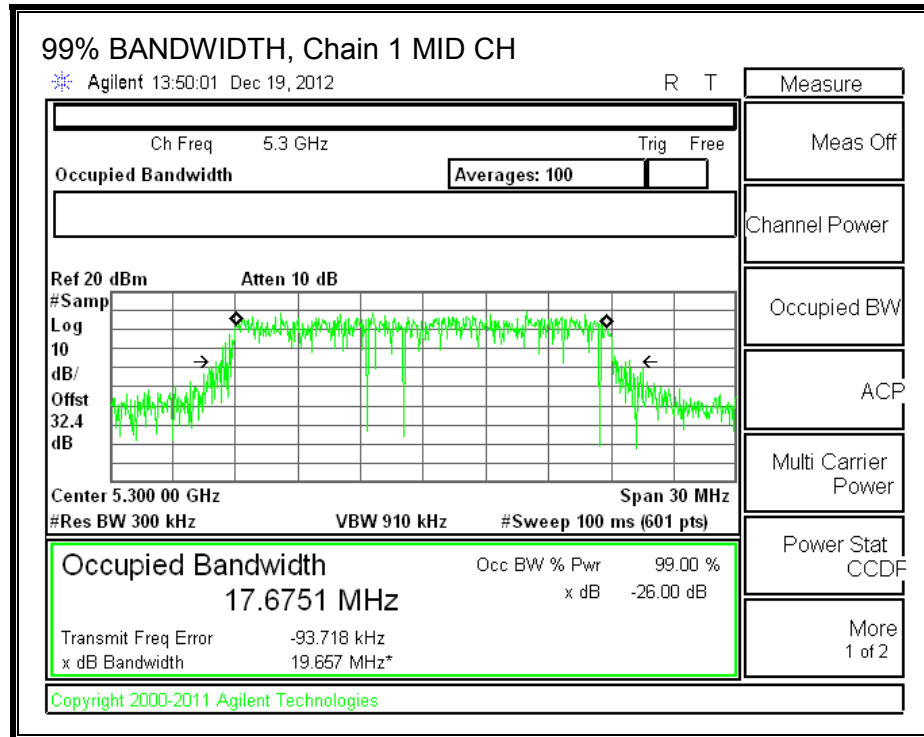
99% BANDWIDTH, Chain 0



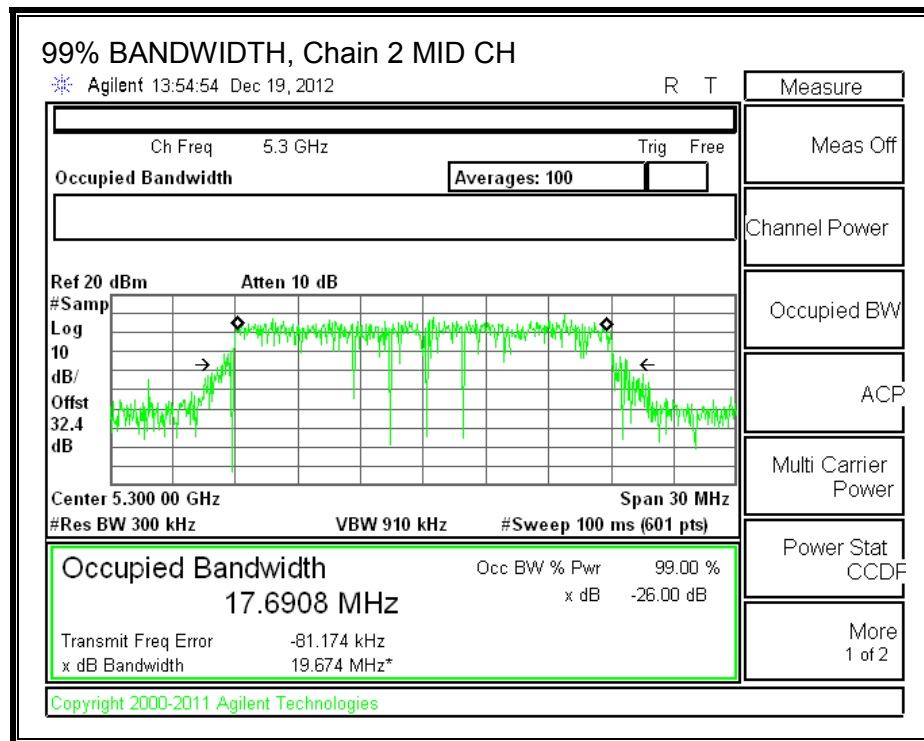
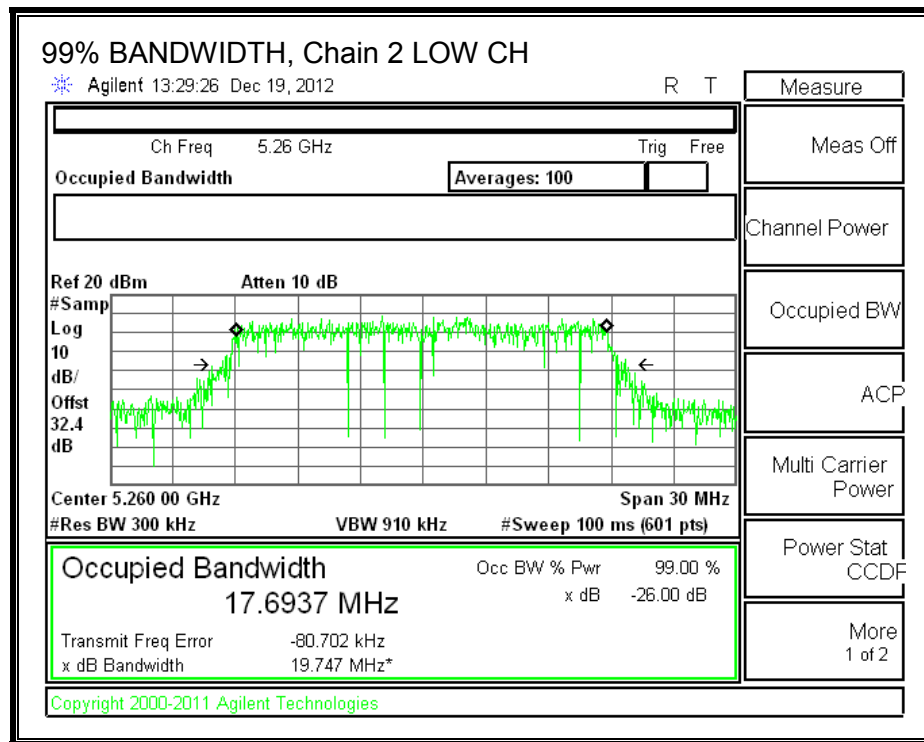


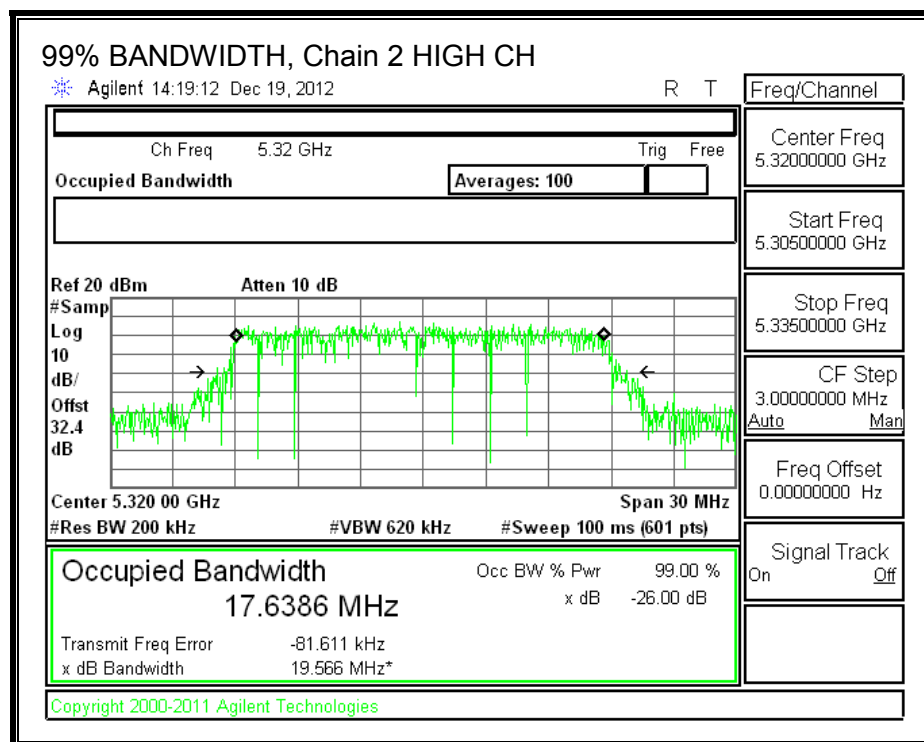
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.26.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.40	1.60	2.30	2.50

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.40	1.60	2.30	7.24

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)	Uncorrelated Directional Gain (dBi)
Low	5260	20.58	17.6853	7.24	2.50
Mid	5300	20.58	17.6751	7.24	2.50
High	5320	20.50	17.6386	7.24	2.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48	9.76	11.00	9.76
Mid	5300	24.00	23.47	29.47	23.47	9.76	11.00	9.76
High	5320	24.00	23.46	29.46	23.46	9.76	11.00	9.76

Duty Cycle CF (dB)	0.00
--------------------	------

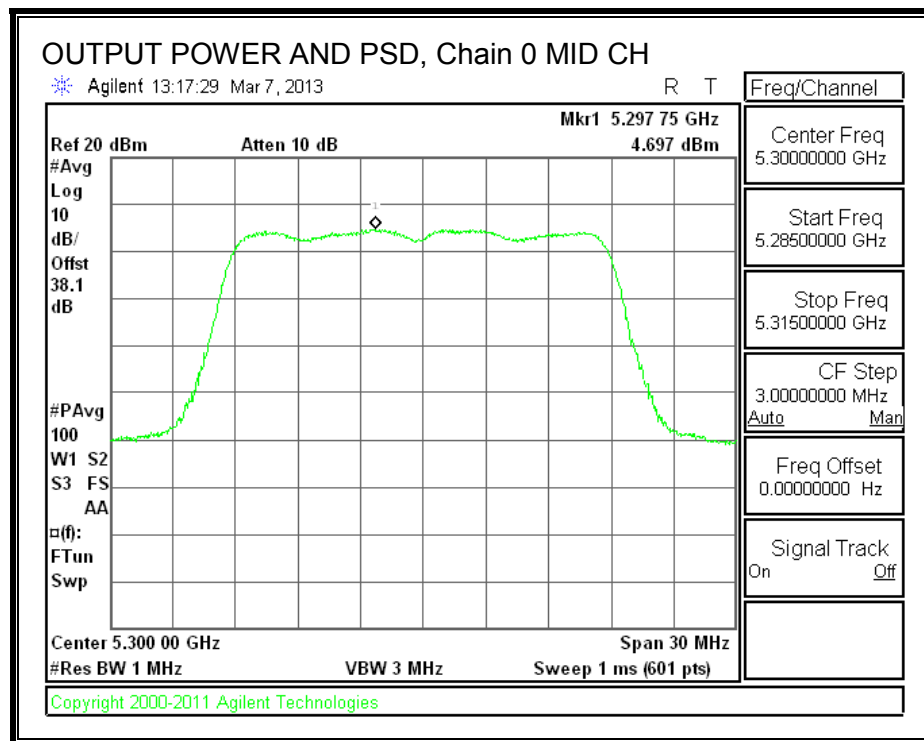
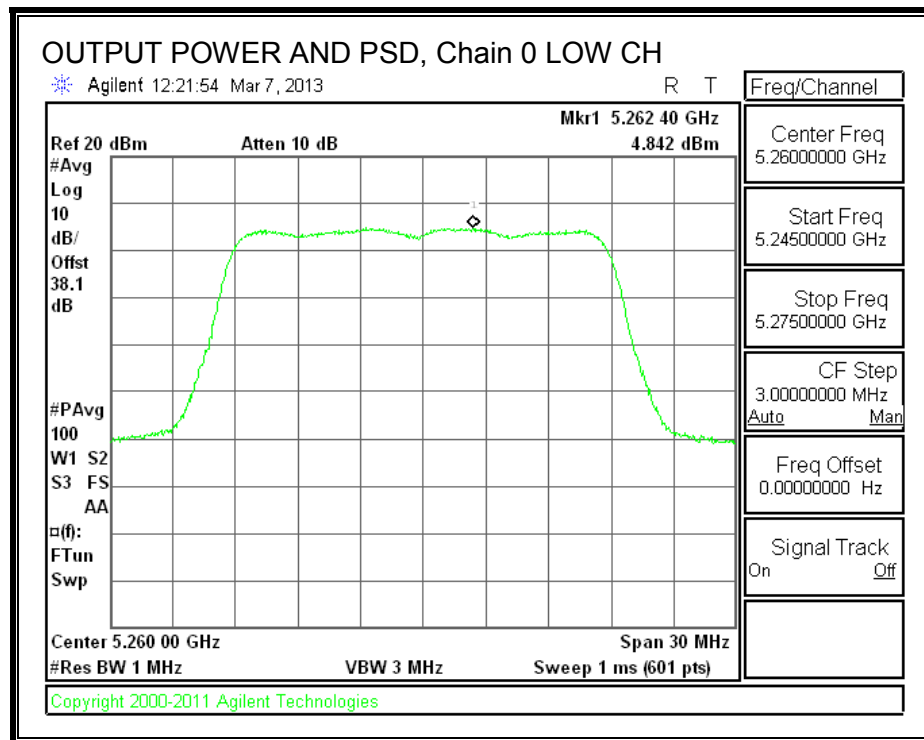
Output Power Results

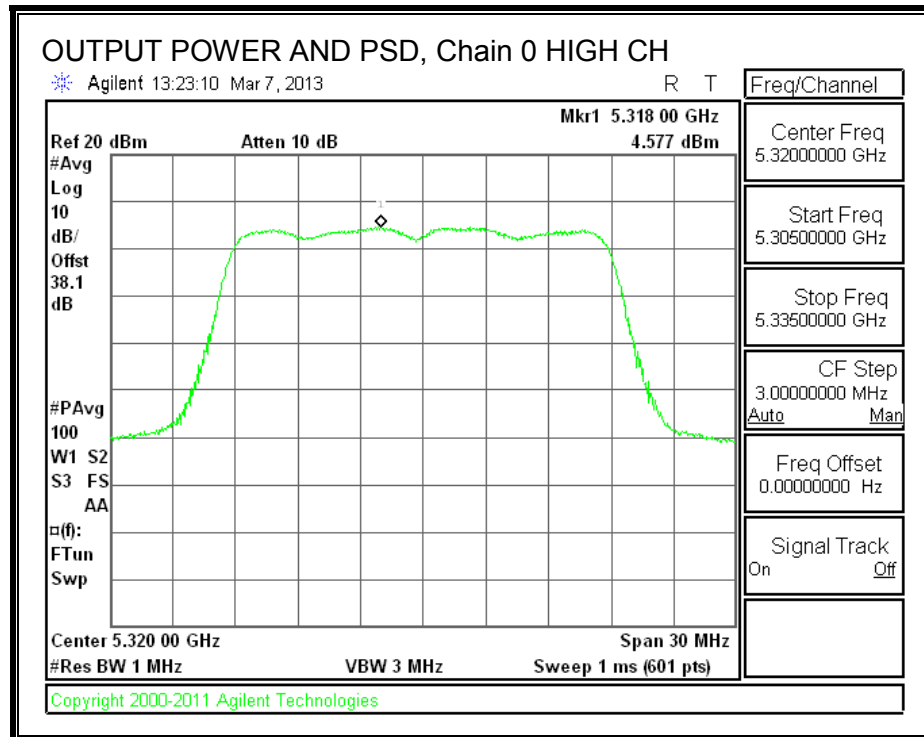
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	13.50	13.59	13.70	18.37	23.48	-5.11
Mid	5300	13.60	13.80	13.50	18.41	23.47	-5.07
High	5320	13.55	13.70	13.60	18.39	23.46	-5.08

PSD Results

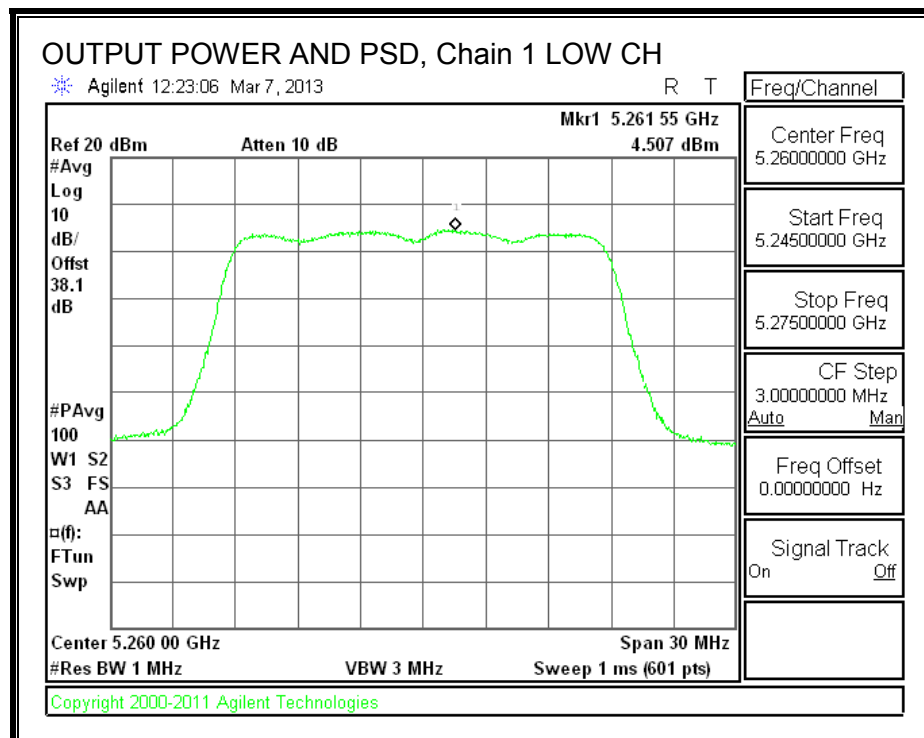
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	4.842	4.507	4.754	9.47	9.76	-0.29
Mid	5300	4.697	4.860	4.968	9.61	9.76	-0.15
High	5320	4.577	4.526	4.598	9.34	9.76	-0.42

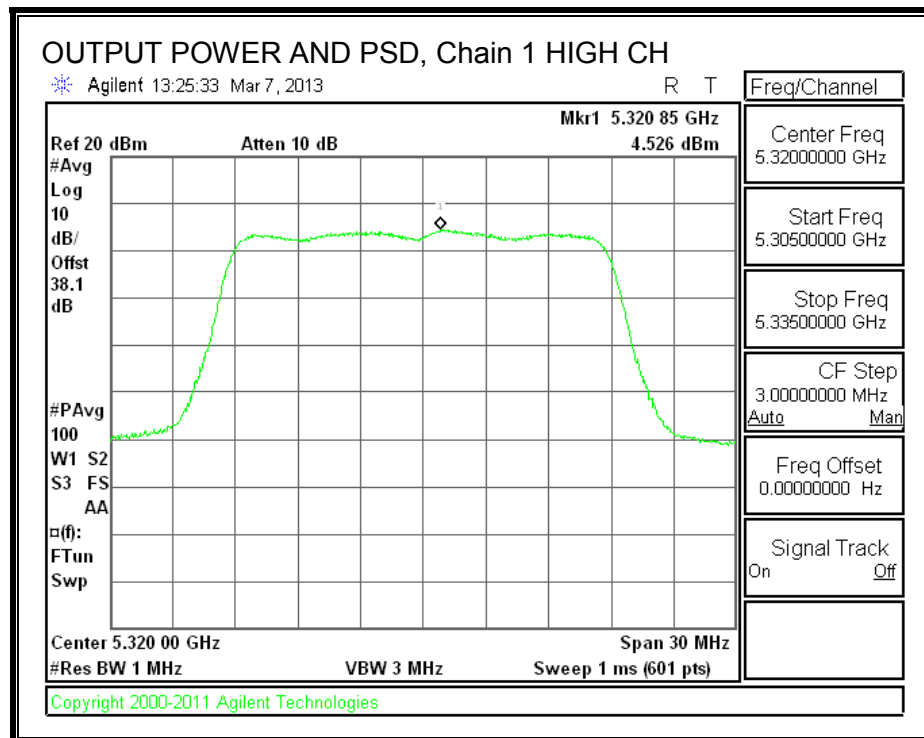
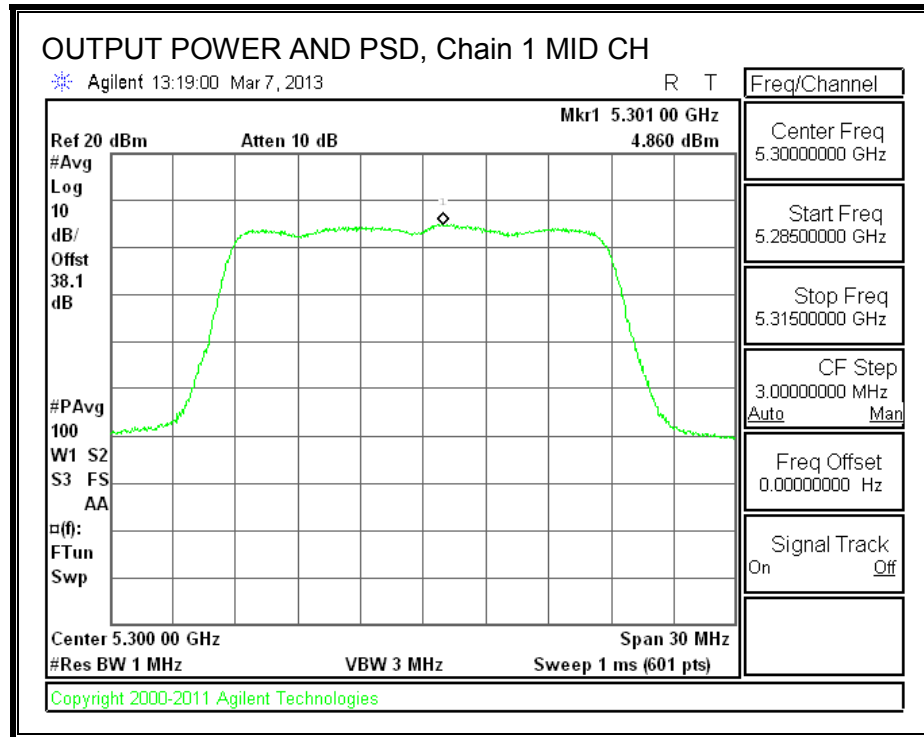
OUTPUT POWER AND PSD, Chain 0



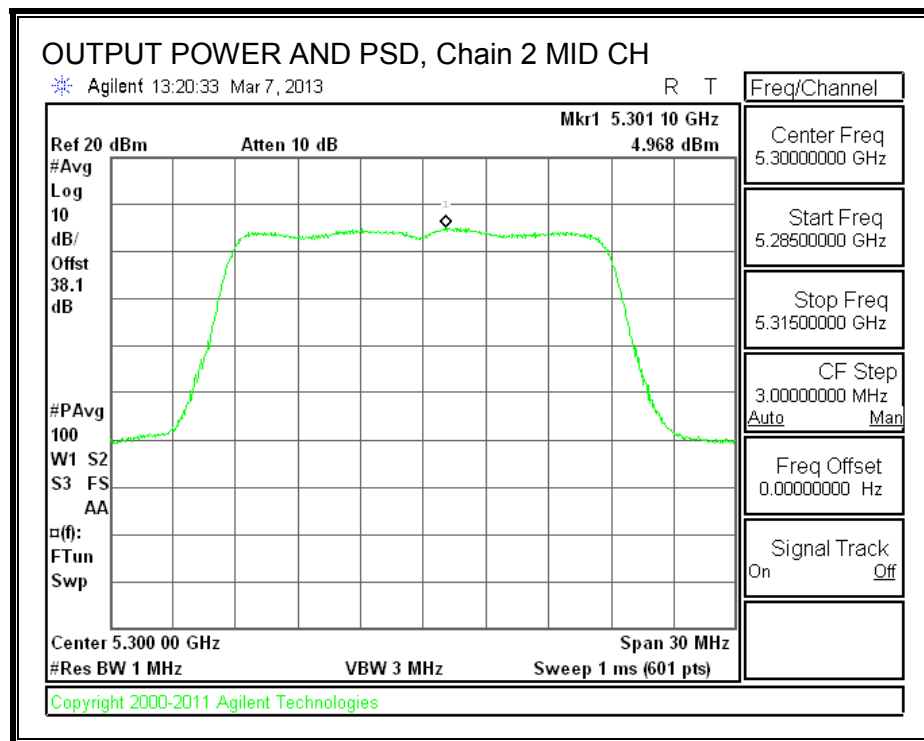
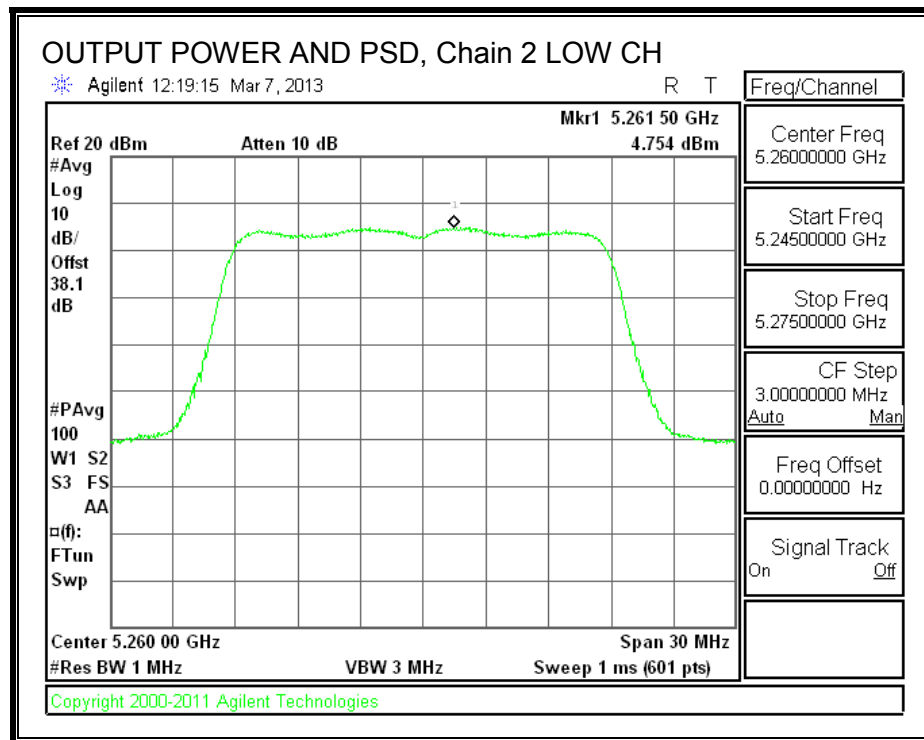


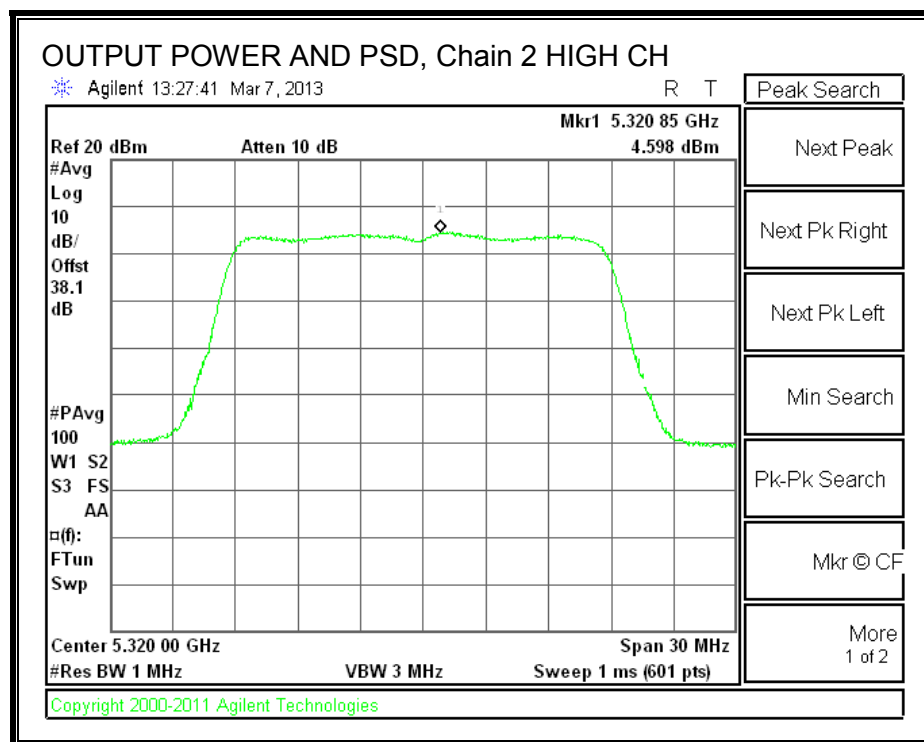
OUTPUT POWER AND PSD, Chain 1





OUTPUT POWER AND PSD, Chain 2





8.26.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.27. 802.11n HT20 BF 3TX MODE IN THE 5.3 GHz BAND

Covered by testing HT20 CDD 3TX mode, the power per chain used for HT20 CDD 3TX mode is the same power per chain that will be used for HT20 BF 3TX mode. However, since BF is correlated and CDD is uncorrelated for output power, the section below for output power using correlated AG for this BF mode shows it is still compliant.

8.27.1. OUTPUT AVERAGE POWER

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.40	1.60	2.30	7.24

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5260	20.58	17.6853	7.24
Mid	5300	20.58	17.6751	7.24
High	5320	20.50	17.6386	7.24

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	22.76	23.48	29.48	22.76
Mid	5300	22.76	23.47	29.47	22.76
High	5320	22.76	23.46	29.46	22.76

Duty Cycle CF (dB)	0.00	
--------------------	------	--

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	13.50	13.59	13.70	18.37	22.76	-4.39
Mid	5300	13.60	13.80	13.50	18.41	22.76	-4.35
High	5320	13.55	13.70	13.60	18.39	22.76	-4.37

8.28. 802.11n HT20 STBC 3TX MODE IN THE 5.3 GHz BAND

8.28.1. 26 dB BANDWIDTH

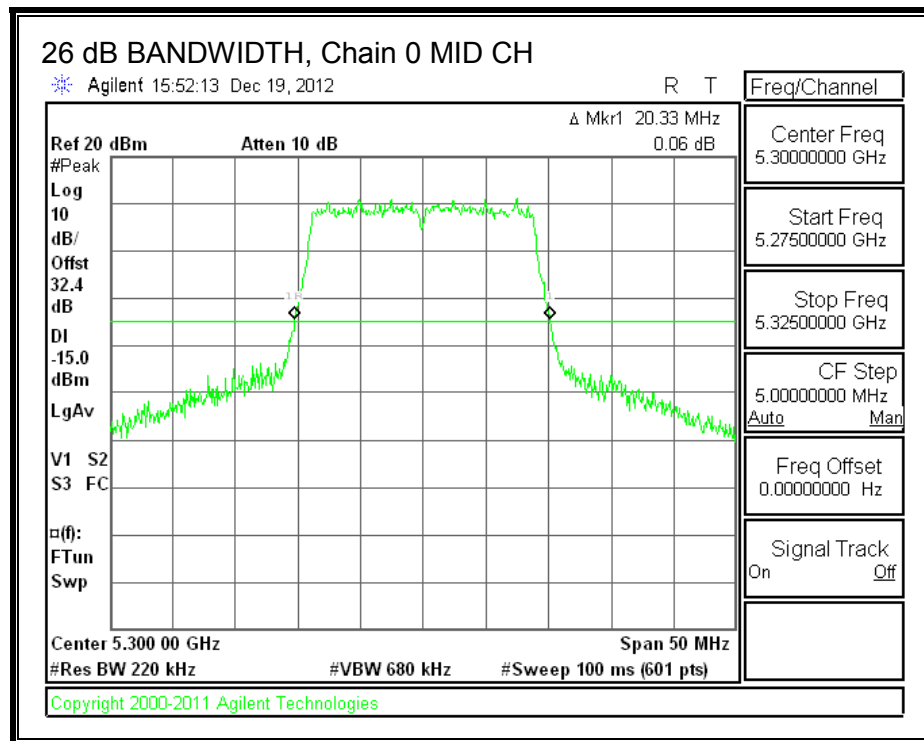
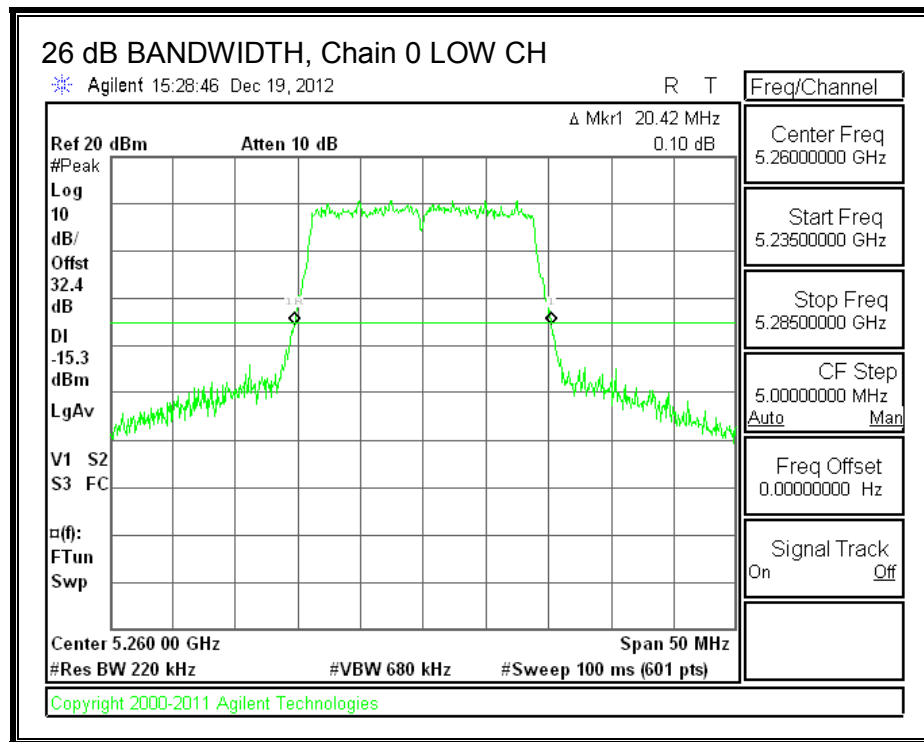
LIMITS

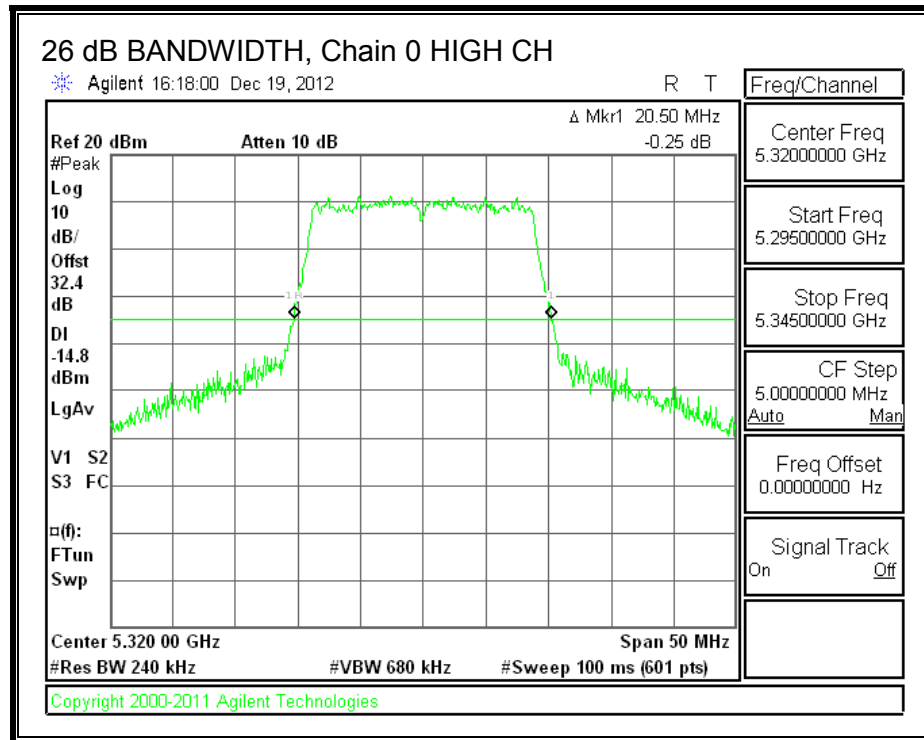
None; for reporting purposes only.

RESULTS

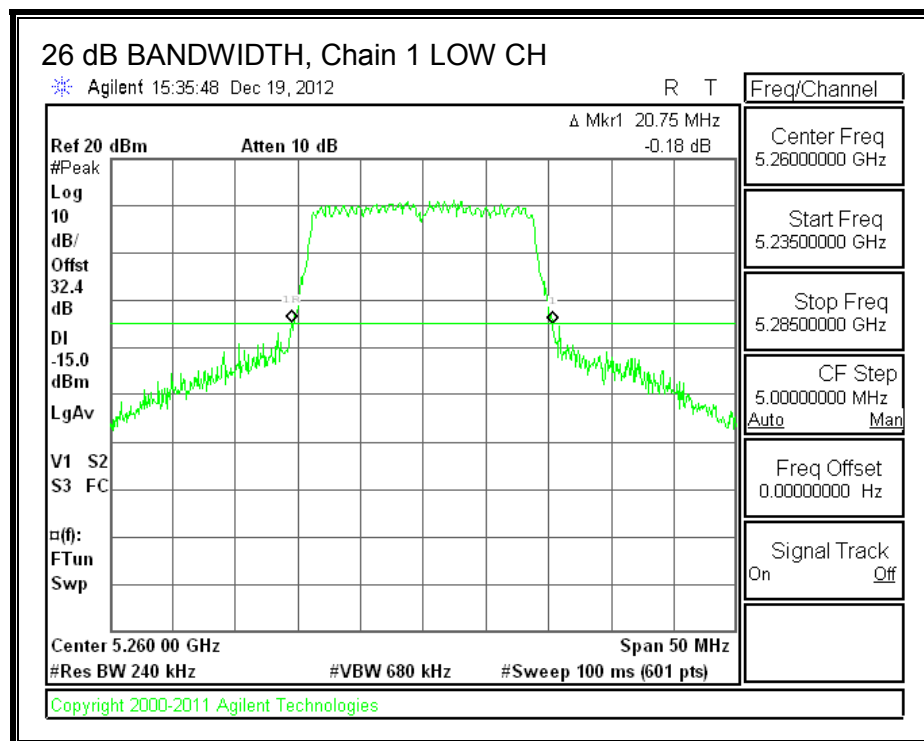
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	20.42	20.75	20.42
Mid	5300	20.33	20.67	20.42
High	5320	20.50	20.58	20.42

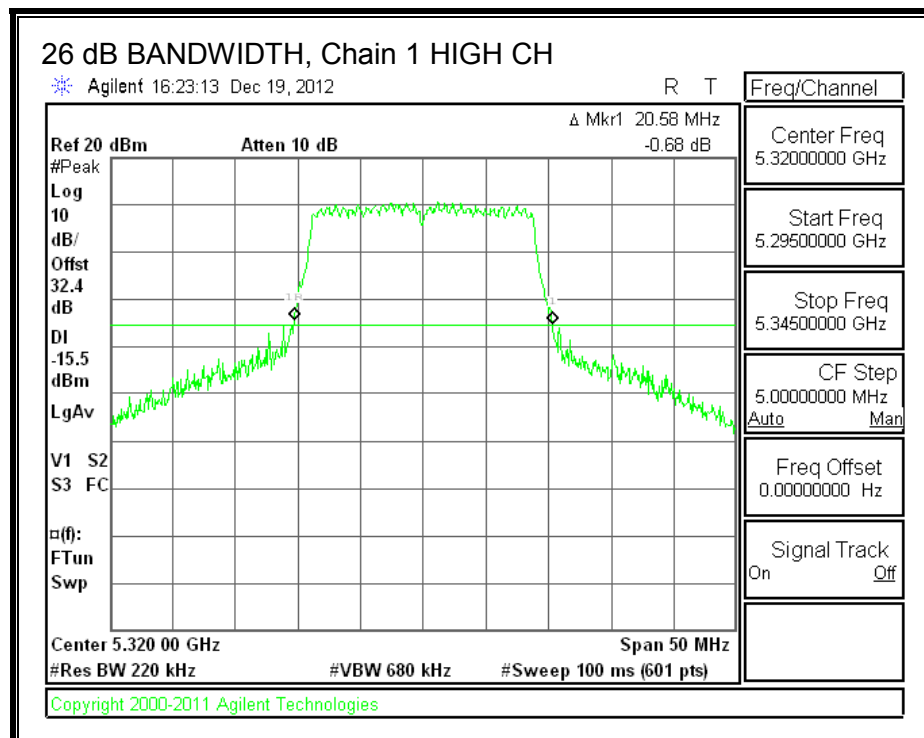
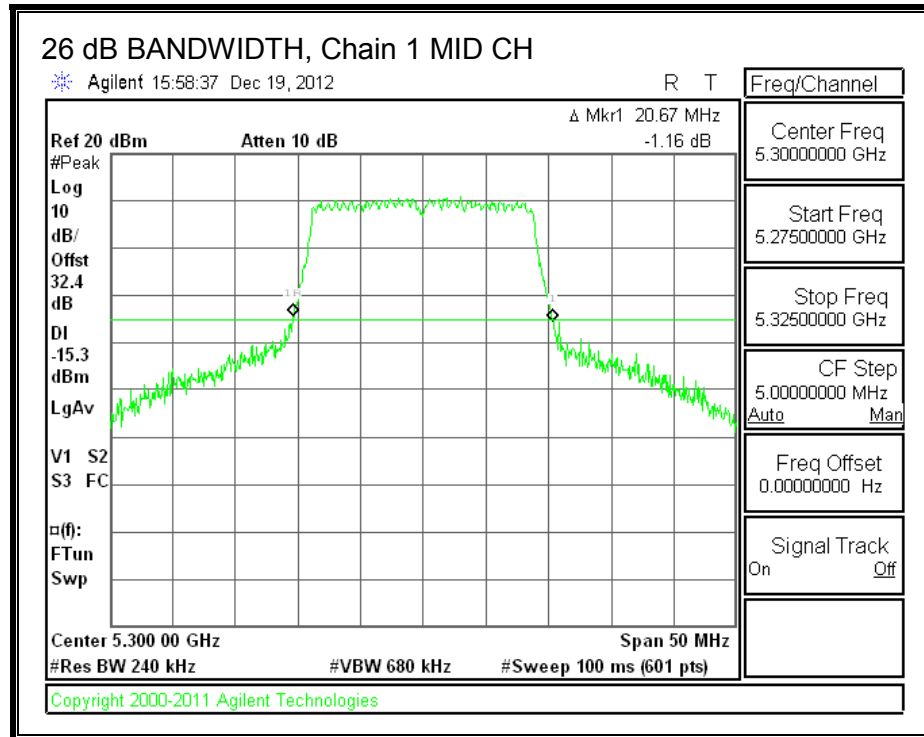
26 dB BANDWIDTH, Chain 0



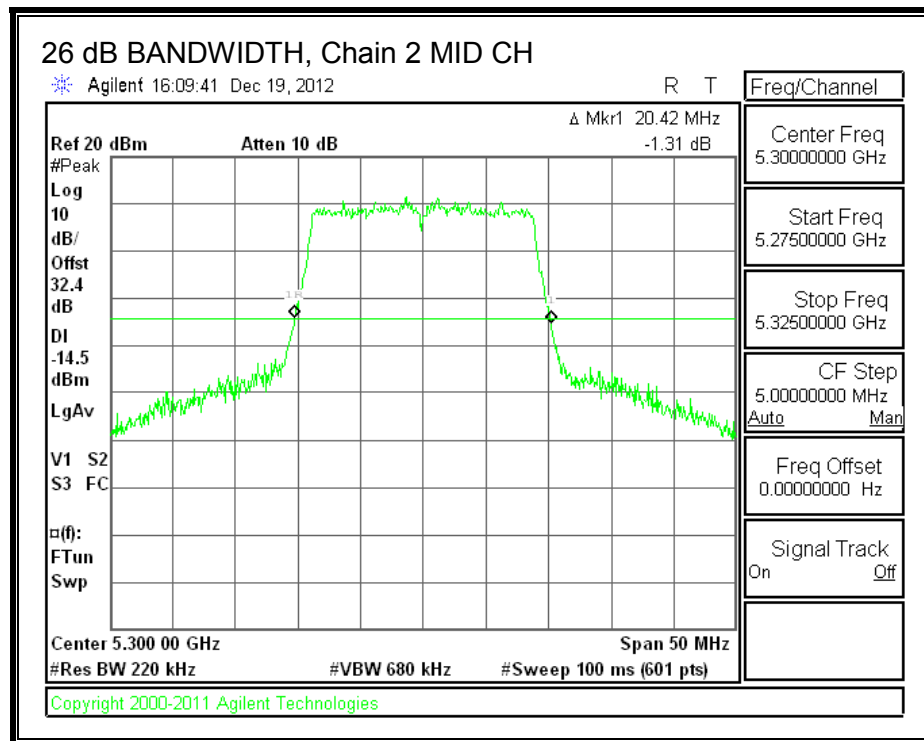
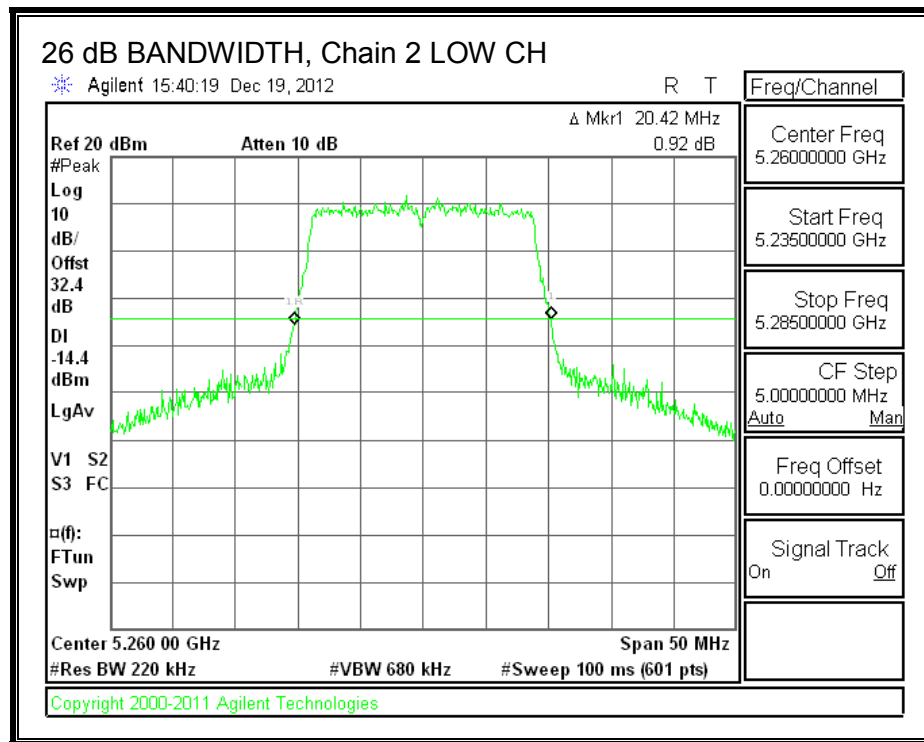


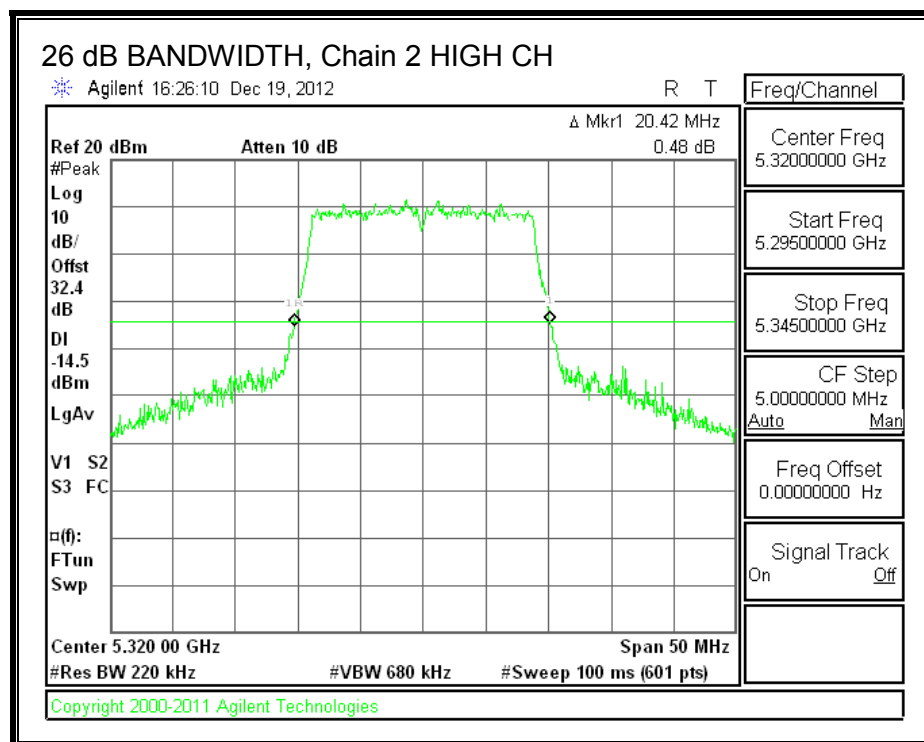
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.28.2. 99% BANDWIDTH

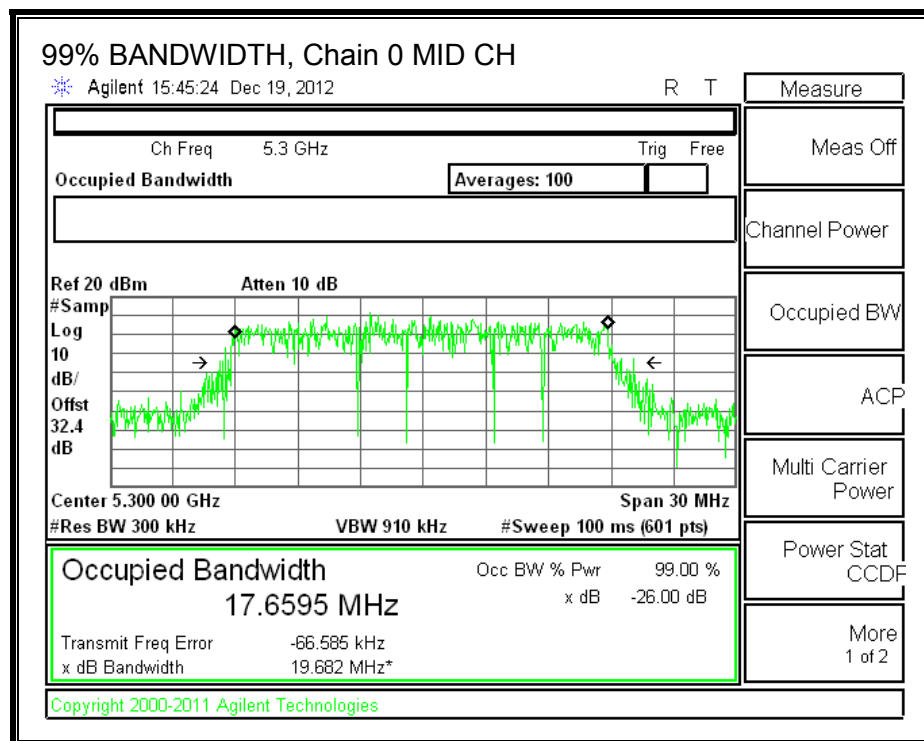
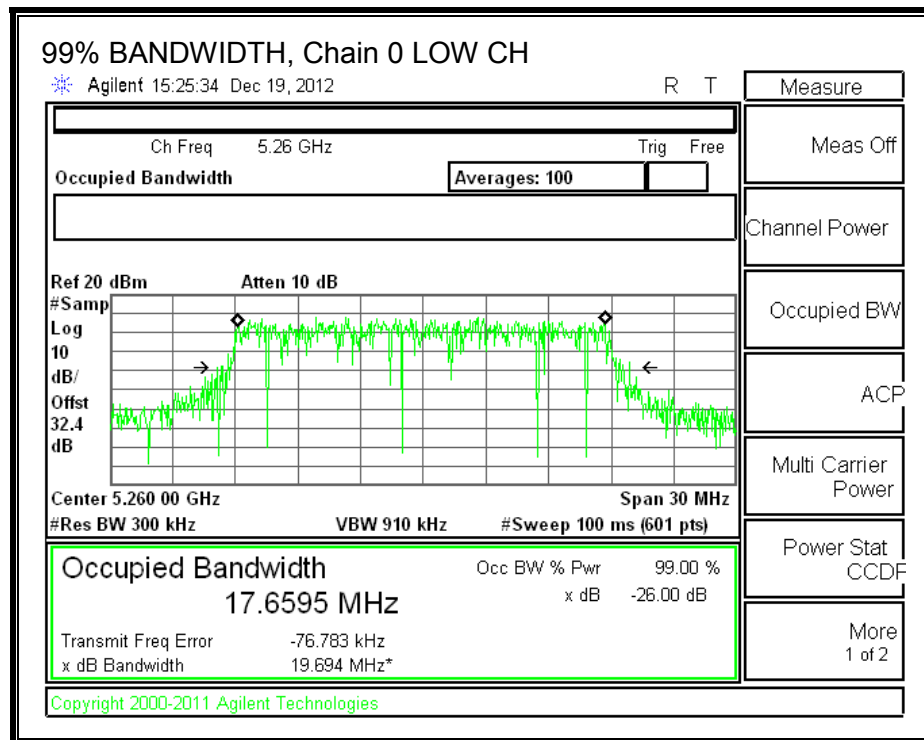
LIMITS

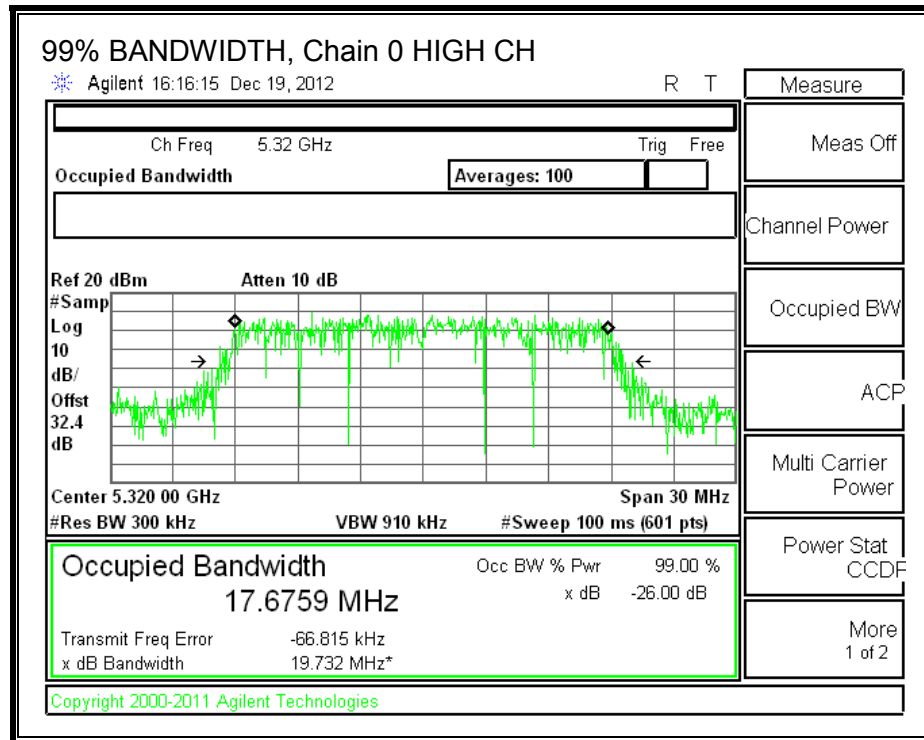
None; for reporting purposes only.

RESULTS

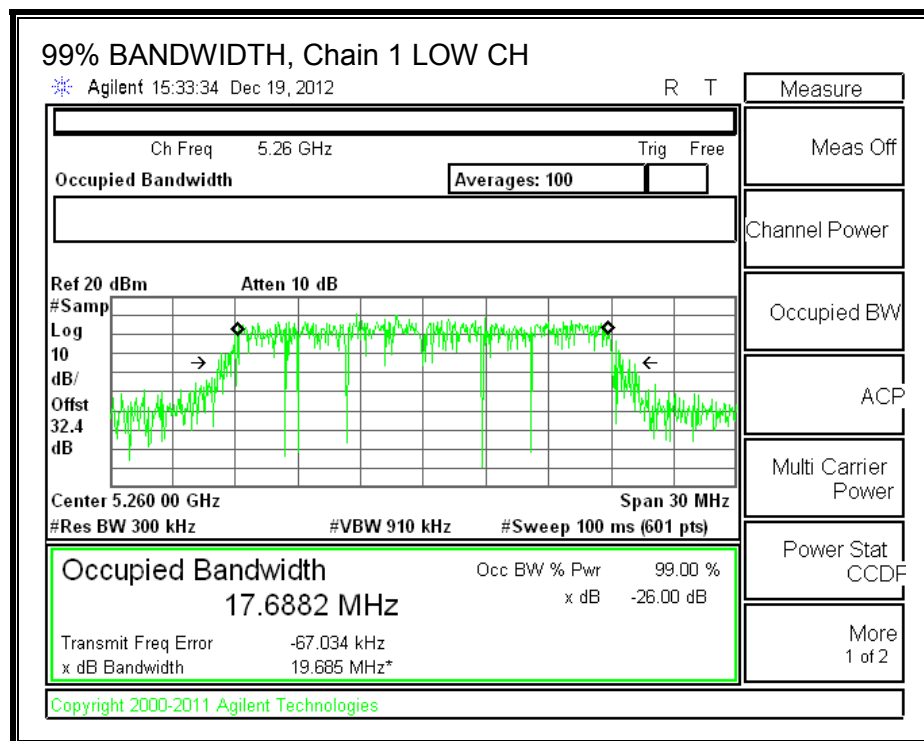
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.6595	17.6882	17.6534
Mid	5300	17.6595	17.6871	17.6422
High	5320	17.6759	17.6868	17.6698

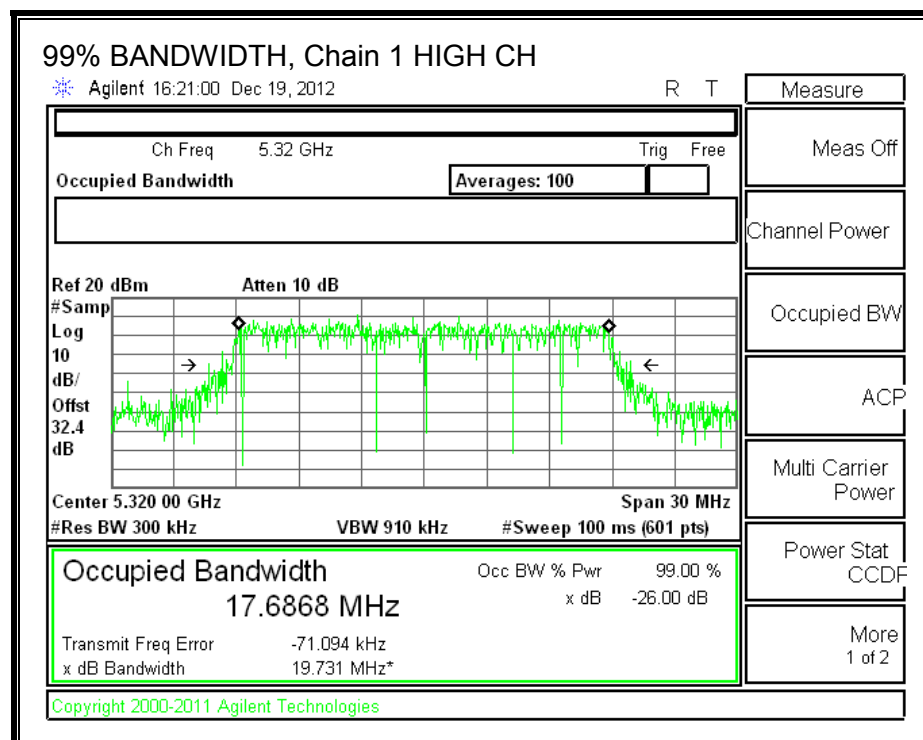
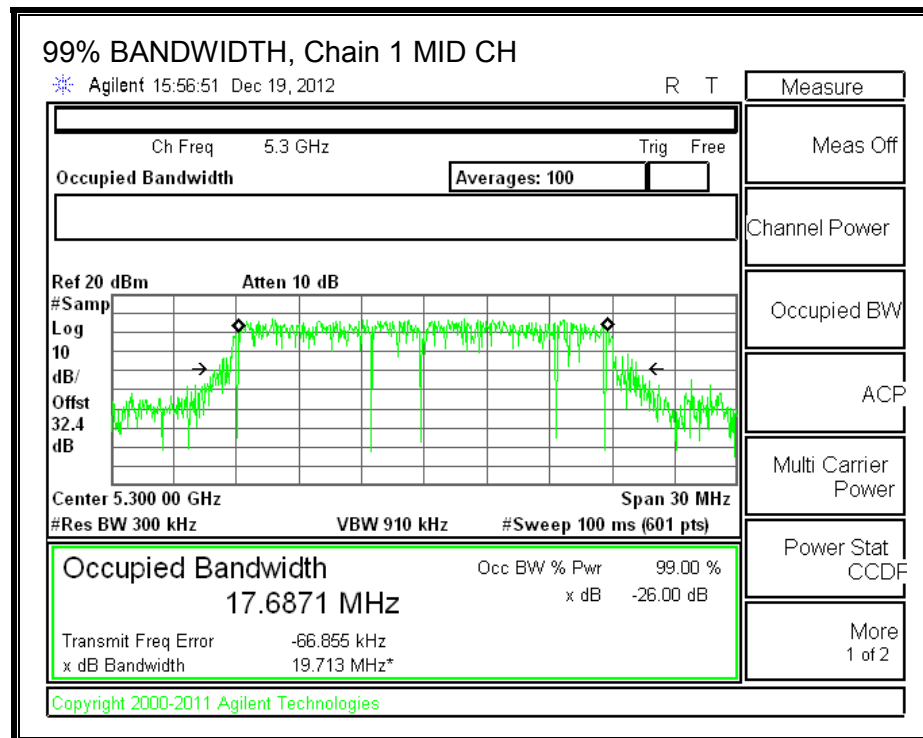
99% BANDWIDTH, Chain 0



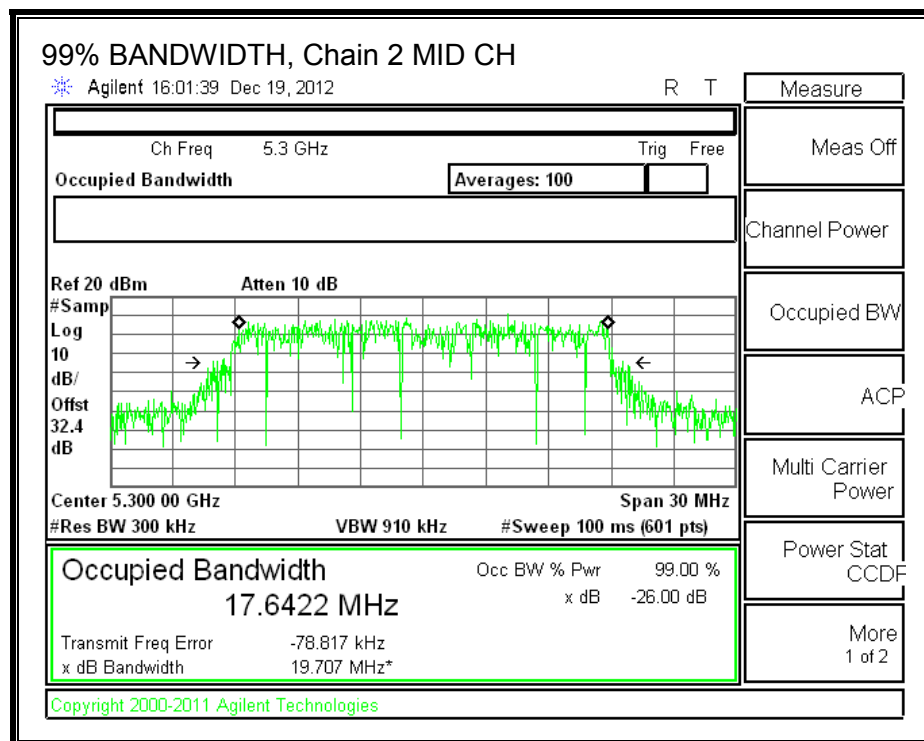
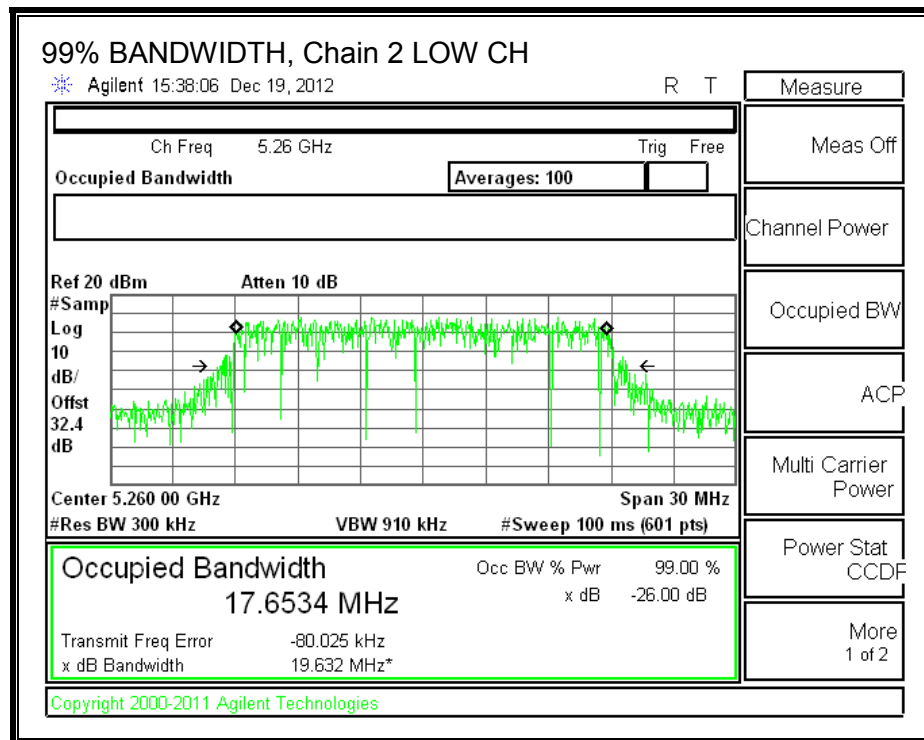


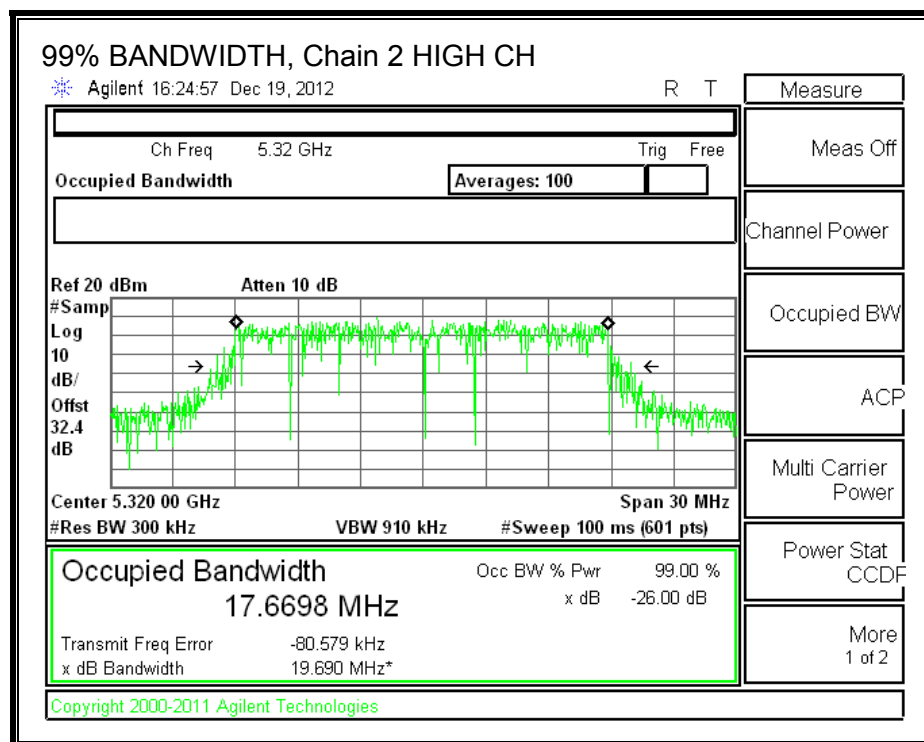
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.28.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.40	1.60	2.30	2.50

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.42	17.6534	2.50
Mid	5300	20.33	17.6422	2.50
High	5320	20.42	17.6689	2.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.47	29.47	23.47	11.00	11.00	11.00
Mid	5300	24.00	23.47	29.47	23.47	11.00	11.00	11.00
High	5320	24.00	23.47	29.47	23.47	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00
--------------------	------

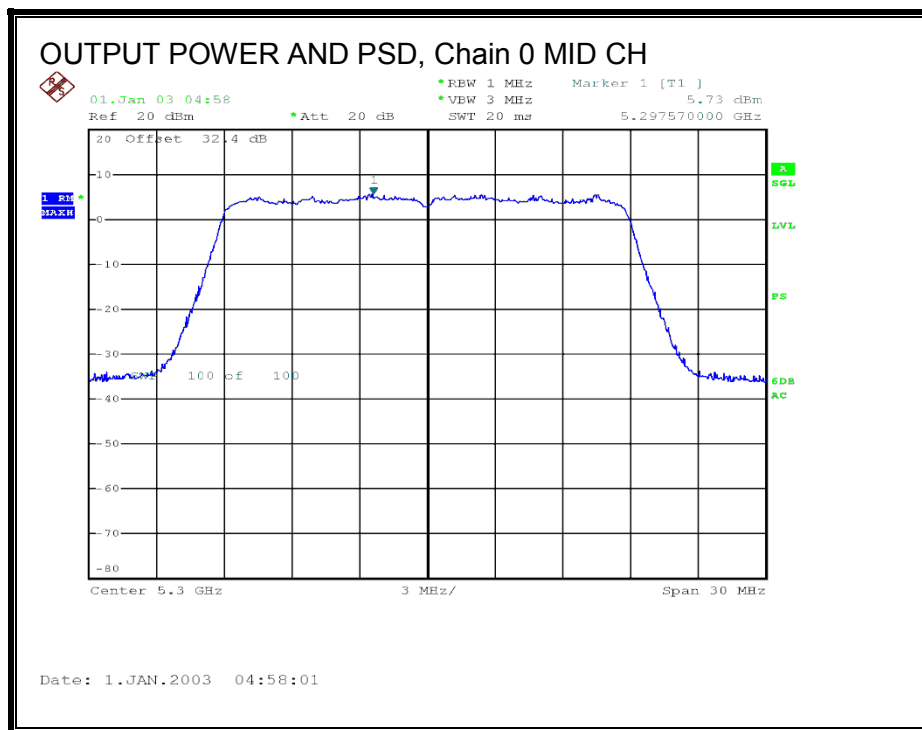
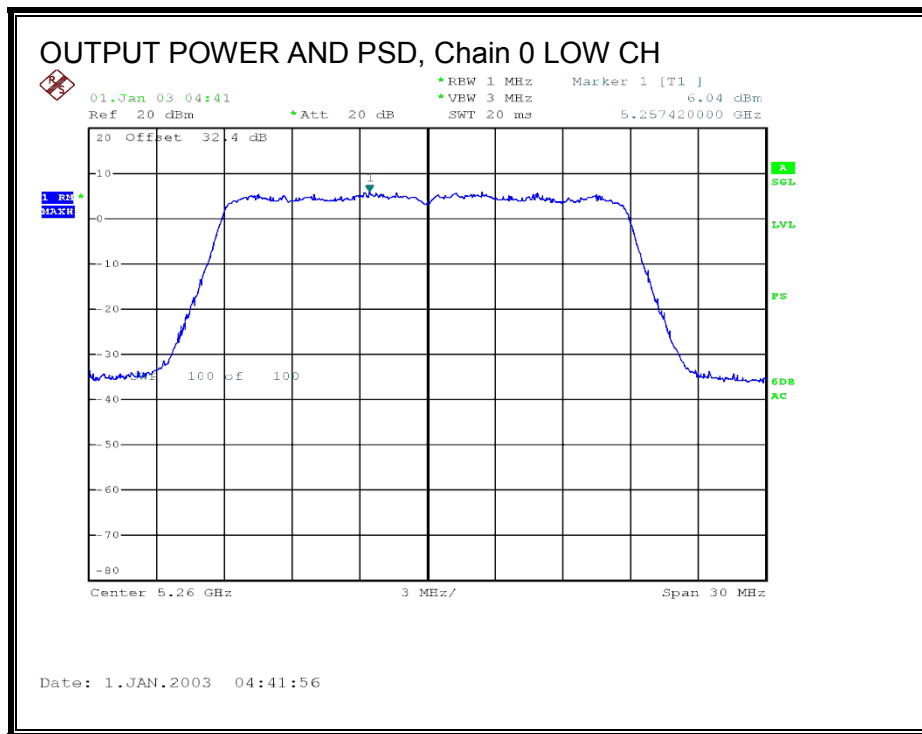
Output Power Results

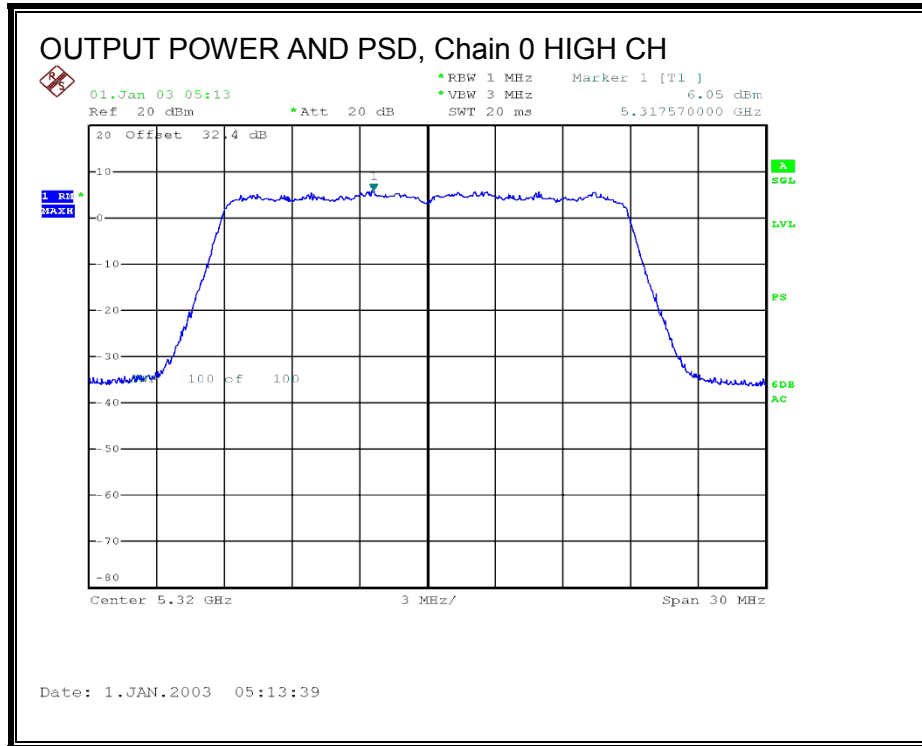
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.10	16.30	16.20	20.97	23.47	-2.50
Mid	5300	14.50	14.80	14.60	19.41	23.47	-4.06
High	5320	14.00	14.25	14.10	18.89	23.47	-4.58

PPSD Results

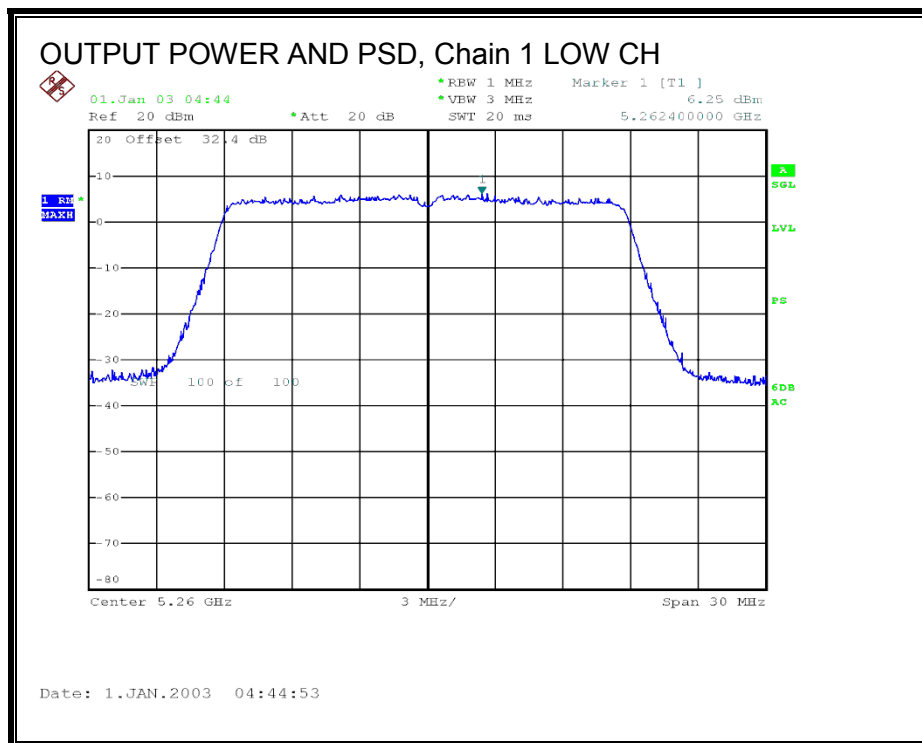
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	6.04	6.25	5.76	10.79	11.00	-0.21
Mid	5300	5.73	6.36	6.03	10.82	11.00	-0.18
High	5320	6.05	6.50	5.78	10.89	11.00	-0.11

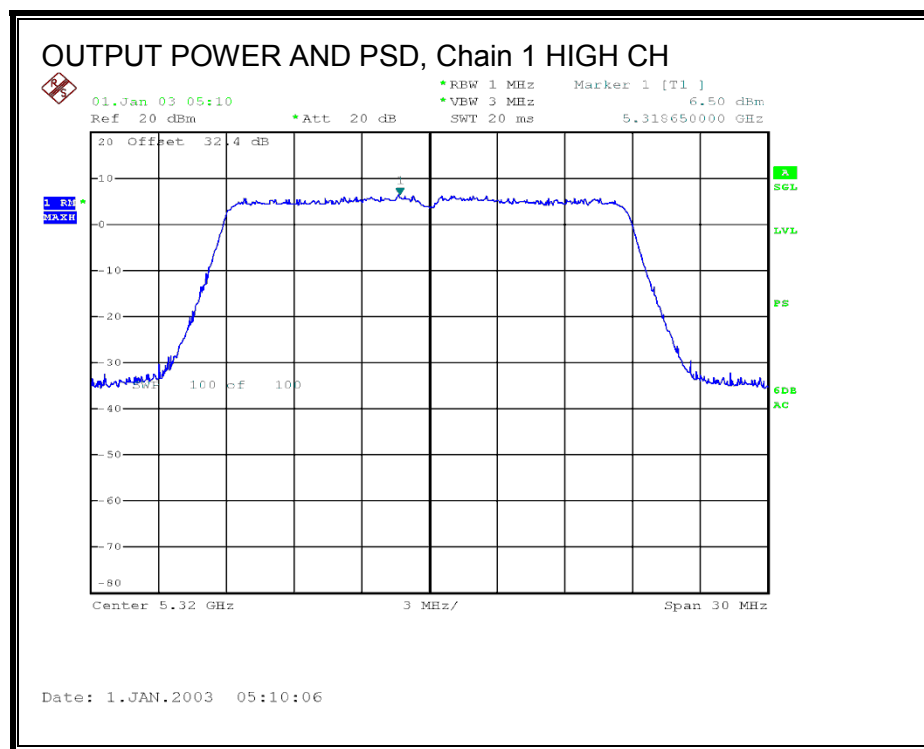
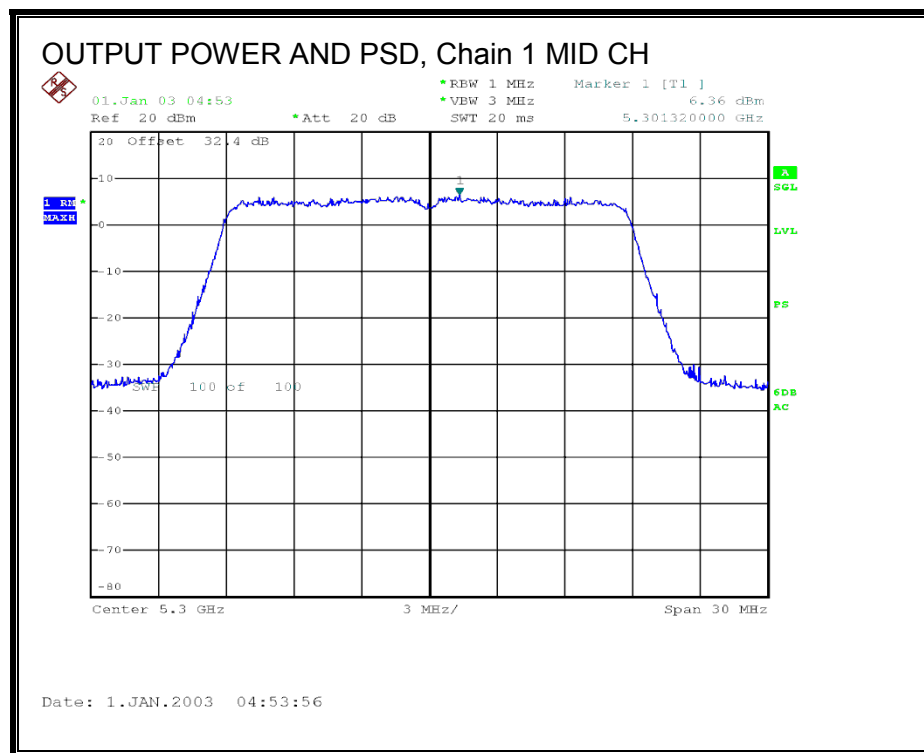
OUTPUT POWER AND PSD, Chain 0



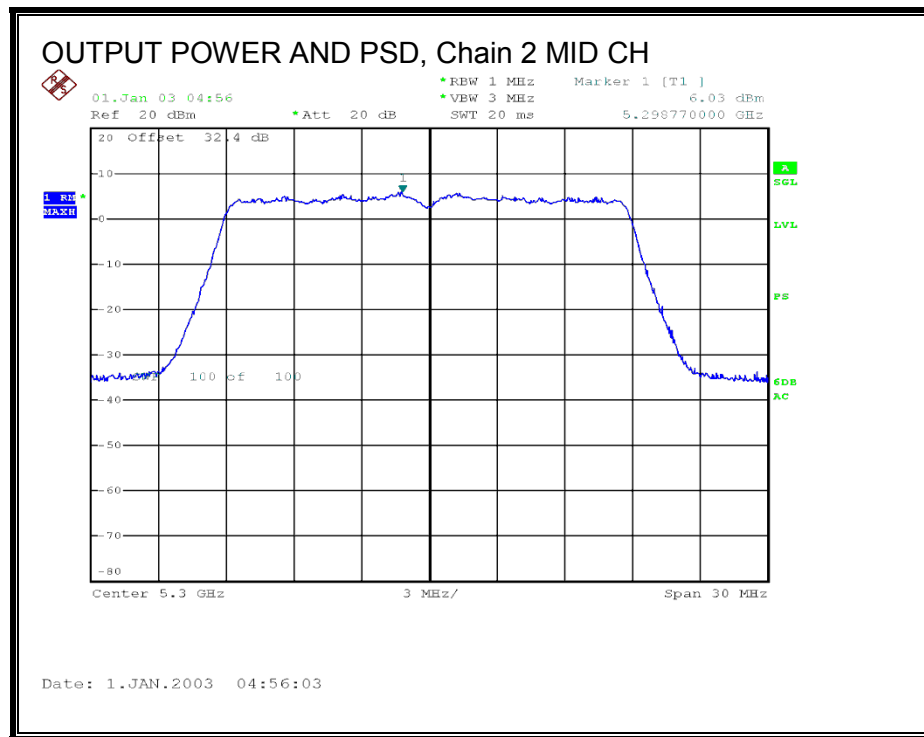
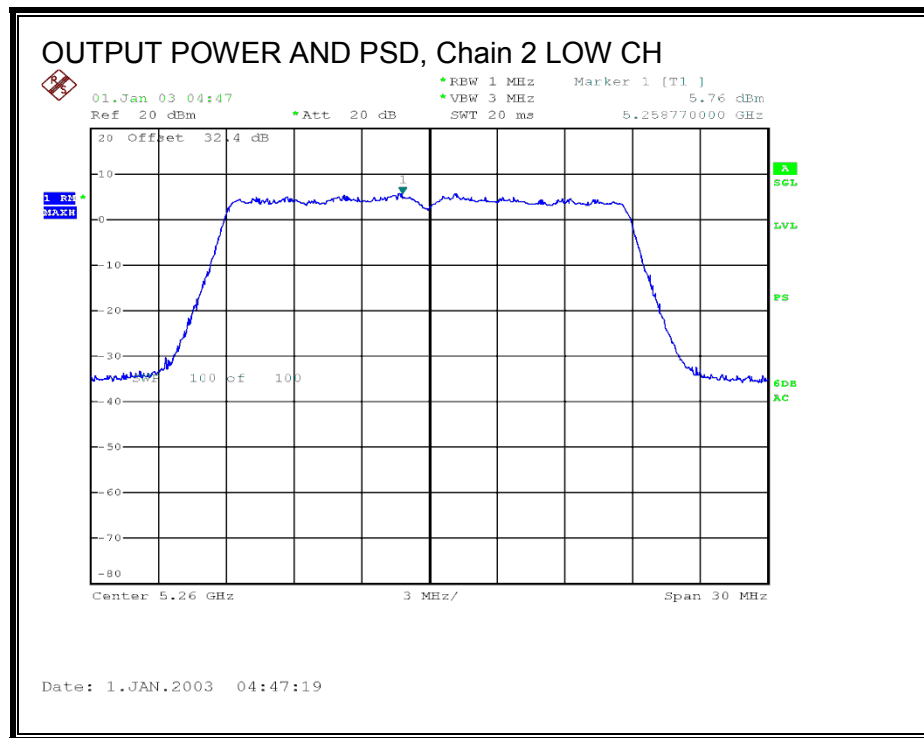


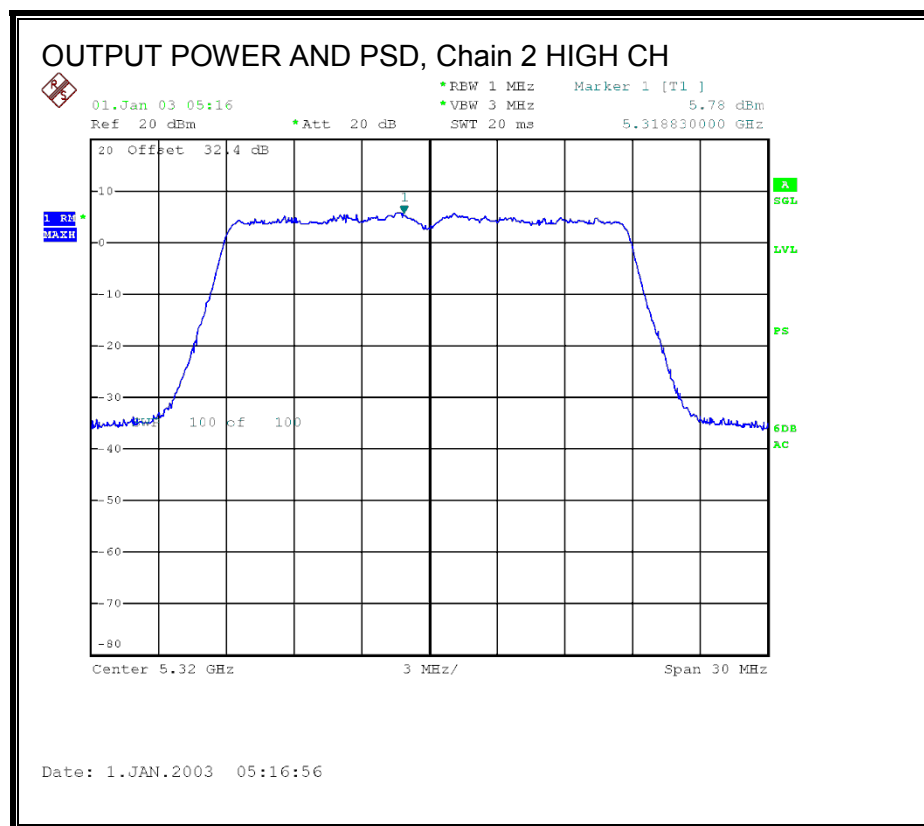
OUTPUT POWER AND PSD, Chain 1





OUTPUT POWER AND PSD, Chain 2





8.28.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.29. 802.11n HT40 1TX MODE IN THE 5.3 GHz BAND

8.29.1. 26 dB BANDWIDTH

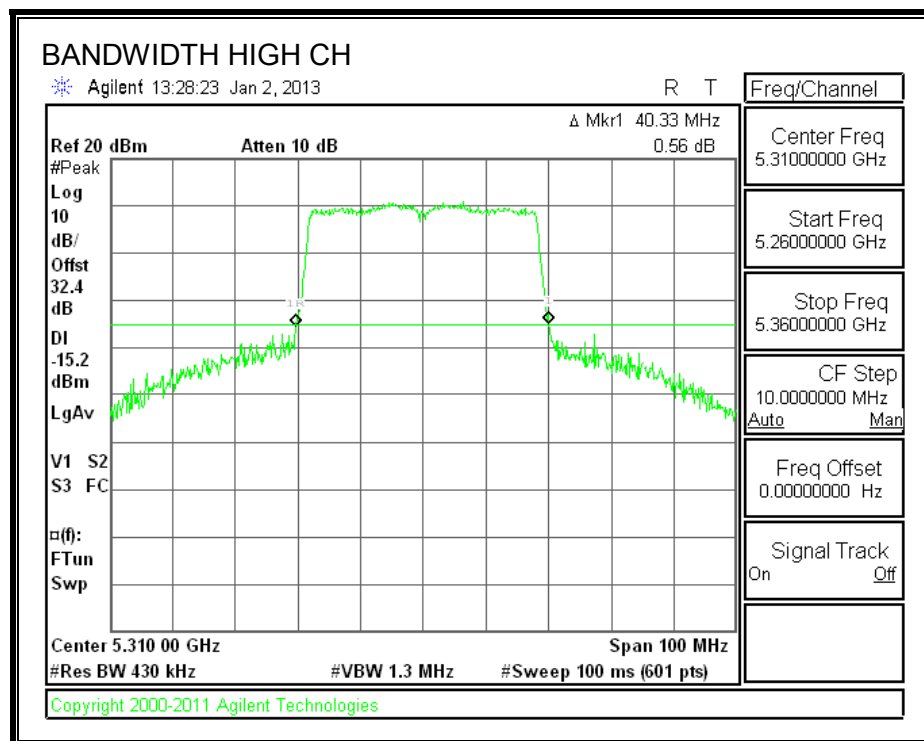
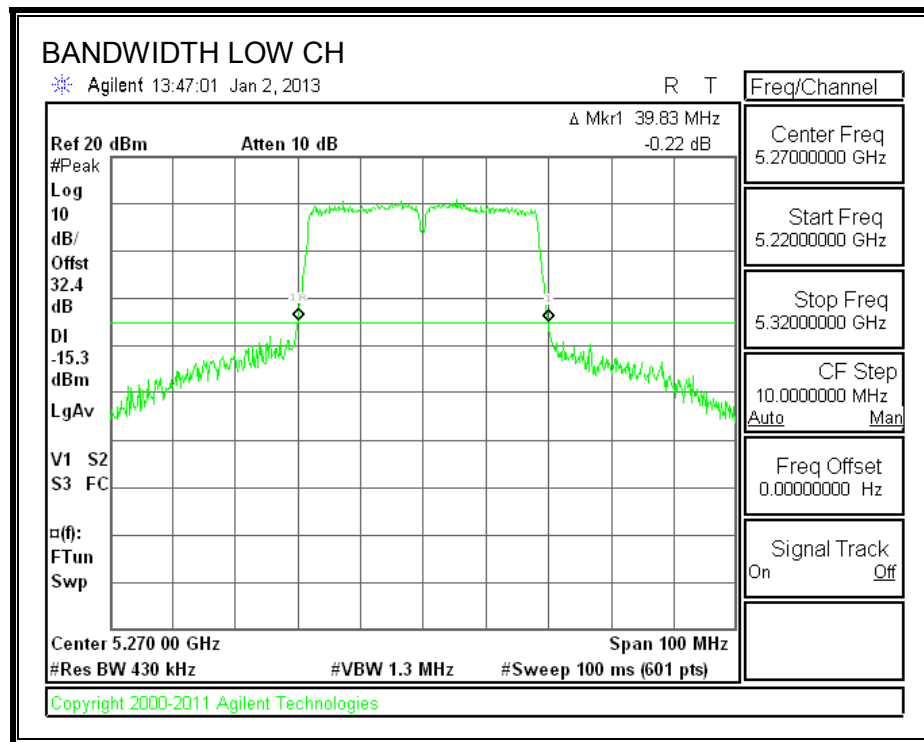
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	39.83
High	5310	40.33

26 dB BANDWIDTH



8.29.2. 99% BANDWIDTH

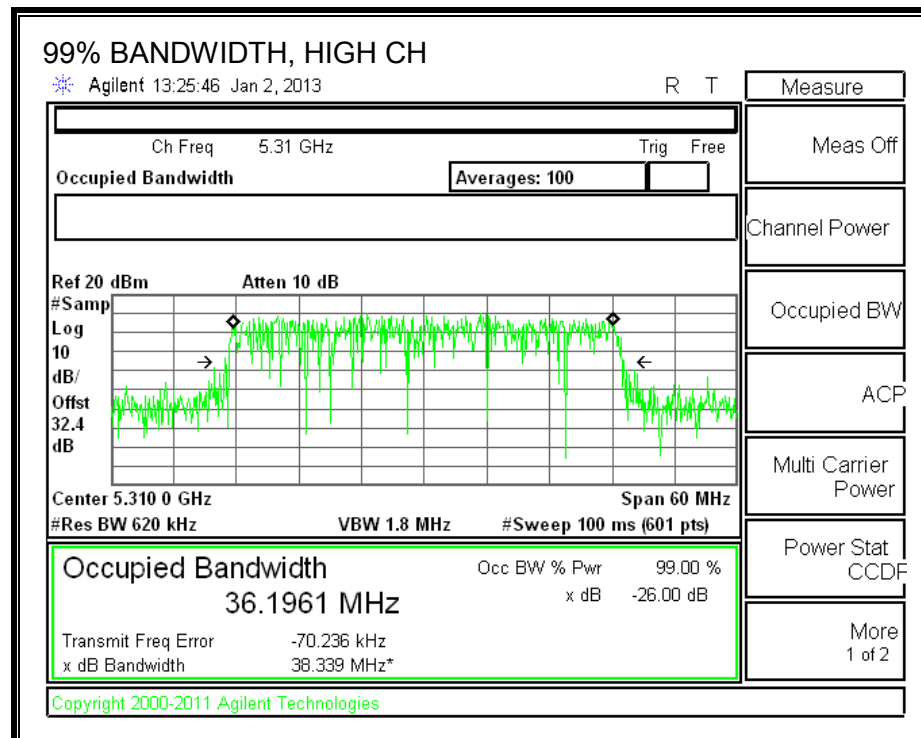
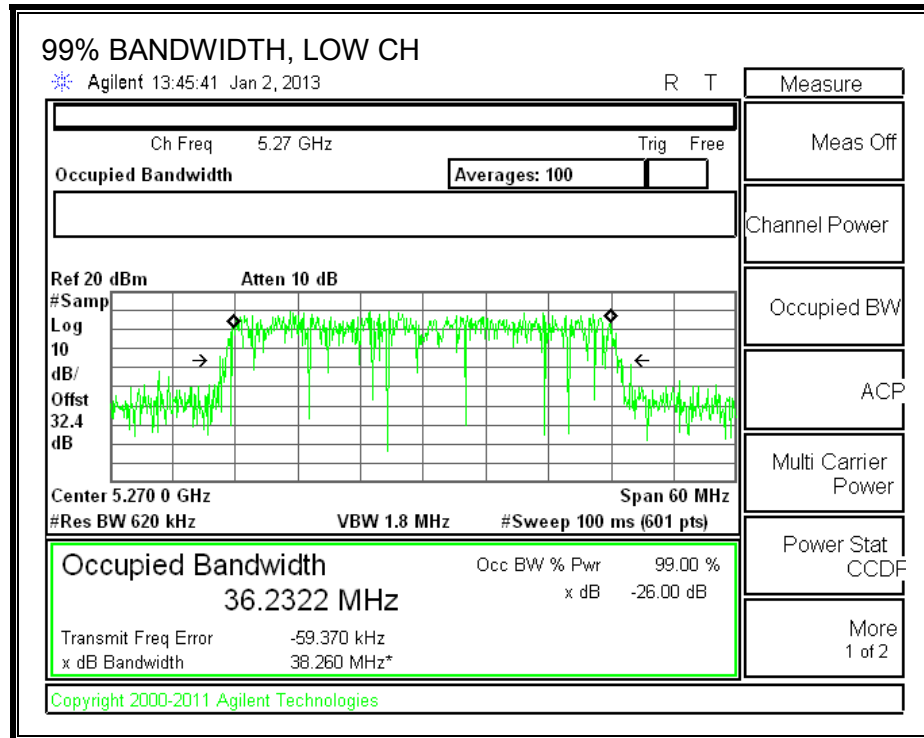
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.2322
High	5310	36.1961

99% BANDWIDTH



8.29.3. OUTPUT AVERAGE POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak 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-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	39.83	36.2322	3.40
High	5310	40.33	36.1961	3.40

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	
---------------------------	------	--

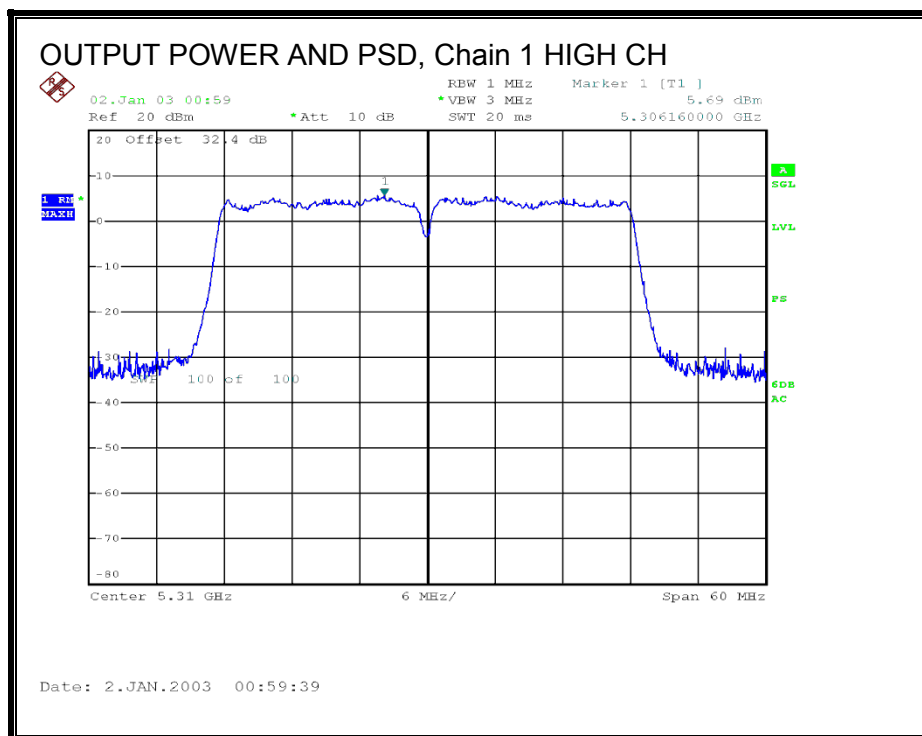
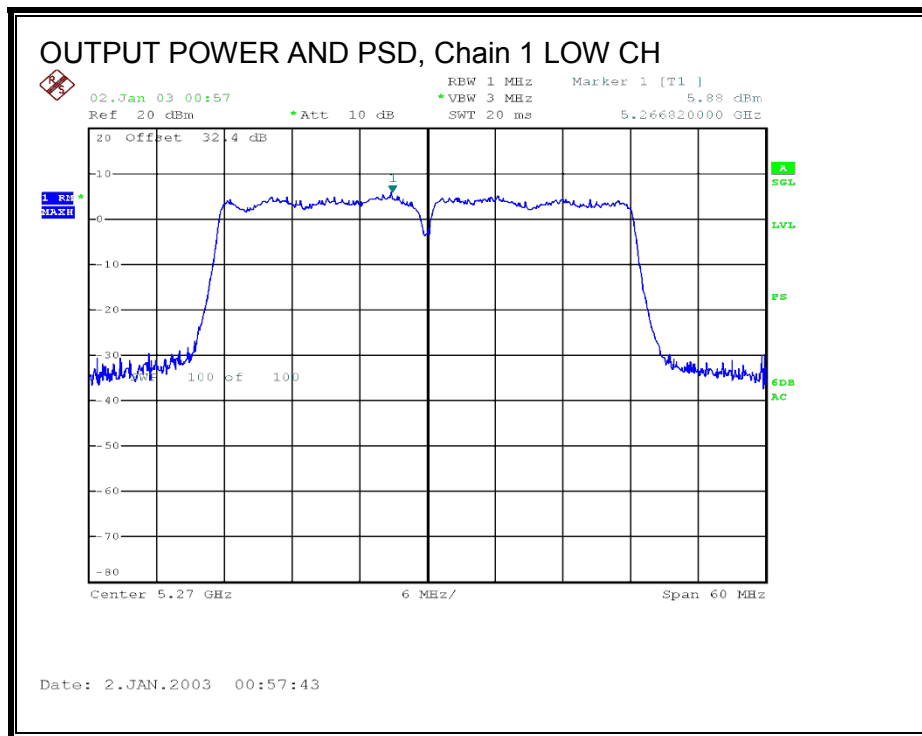
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	17.50	17.50	24.00	-6.50
High	5310	16.00	16.00	24.00	-8.00

PSD Results

Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	5.88	5.88	11.00	-5.12
High	5310	5.69	5.69	11.00	-5.31

OUTPUT POWER AND PSD, Chain 1



8.29.4. TPC POWER

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

The maximum EIRP is less than 500 mW; therefore, TPC is not required.

8.30. 802.11n HT40 CDD 2TX MODE IN THE 5.3 GHz BAND

8.30.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	39.83	39.50
High	5310	39.50	39.50

26 dB BANDWIDTH, Chain 0

