



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

CERTIFICATION TEST REPORT

FOR

Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94360CS

**FCC ID: QDS-BRCM1069
IC: 4324A-BRCM1069**

REPORT NUMBER: 12U14668-2

ISSUE DATE: MAY 31, 2013

Prepared for

**BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, 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

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	05/31/13	Initial Issue	F. Ibrahim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	13
2. TEST METHODOLOGY	14
3. FACILITIES AND ACCREDITATION	14
4. CALIBRATION AND UNCERTAINTY	14
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>14</i>
4.2. <i>SAMPLE CALCULATION</i>	<i>14</i>
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>14</i>
5. EQUIPMENT UNDER TEST	15
5.1. <i>DESCRIPTION OF EUT</i>	<i>15</i>
5.2. <i>MAXIMUM AVERAGE OUTPUT POWER</i>	<i>15</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>18</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>18</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>19</i>
5.6. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>20</i>
6. TEST AND MEASUREMENT EQUIPMENT	22
7. ANTENNA PORT TEST RESULTS	23
7.1. <i>ON TIME, DUTY CYCLE AND MEASUREMENT METHODS.....</i>	<i>23</i>
7.1.1. <i>ON TIME AND DUTY CYCLE RESULTS.....</i>	<i>23</i>
7.1.2. <i>DUTY CYCLE PLOTS</i>	<i>24</i>
7.1.3. <i>MEASUREMENT METHOD FOR POWER AND PPSD</i>	<i>28</i>
7.1.4. <i>MEASUREMENT METHOD FOR AVG SPURIOUS EMISSION ABOVE 1 GHz ..28</i>	
7.2. <i>802.11a LEGACY 1TX MODE, 5.2 GHz BAND.....</i>	<i>29</i>
7.2.1. <i>26 dB BANDWIDTH.....</i>	<i>29</i>
7.2.2. <i>99% BANDWIDTH.....</i>	<i>32</i>
7.2.3. <i>OUTPUT POWER & PPSD.....</i>	<i>35</i>
7.3. <i>802.11a CDD 2TX MODE, 5.2 GHz BAND</i>	<i>39</i>
7.4. <i>802.11a CDD 3TX MODE, 5.2 GHz BAND</i>	<i>39</i>
7.5. <i>802.11a BF 2TX MODE, 5.2 GHz BAND</i>	<i>39</i>
7.6. <i>802.11a BF 3TX MODE, 5.2 GHz BAND</i>	<i>39</i>
7.7. <i>802.11n HT20 1TX MODE, 5.2 GHz BAND</i>	<i>39</i>
7.8. <i>802.11n HT20 CDD 2TX MODE, 5.2 GHz BAND.....</i>	<i>39</i>
7.9. <i>802.11n HT20 CDD 3TX MODE, 5.2 GHz BAND.....</i>	<i>39</i>
7.10. <i>802.11n HT20 STBC 2TX MODE, 5.2 GHz BAND</i>	<i>40</i>
7.10.1. <i>26 dB BANDWIDTH</i>	<i>40</i>
7.10.2. <i>99% BANDWIDTH</i>	<i>44</i>

7.10.3. OUTPUT POWER AND PPSD48

7.11. 802.11n HT20 STBC 3TX MODE, 5.2 GHz BAND53

7.11.1. 26 dB BANDWIDTH53

7.11.2. 99% BANDWIDTH59

7.11.3. OUTPUT POWER AND PPSD65

7.12. 802.11n HT20 BF 2TX MODE, 5.2 GHz BAND72

7.13. 802.11n HT20 BF 3TX MODE, 5.2 GHz BAND72

7.14. 802.11ac VHT20 BF 2TX MODE, 5.2 GHz BAND72

7.15. 802.11ac VHT20 BF 3TX MODE, 5.2 GHz BAND72

7.16. 802.11n HT40 1TX MODE, 5.2 GHz BAND.....73

7.16.1. 26 dB BANDWIDTH73

7.16.2. 99% BANDWIDTH75

7.16.3. OUTPUT POWER AND PPSD77

7.17. 802.11n HT40 CDD 2TX MODE, 5.2 GHz BAND80

7.17.1. 26 dB BANDWIDTH80

7.17.2. 99% BANDWIDTH83

7.17.3. OUTPUT POWER AND PPSD86

7.18. 802.11n HT40 CDD 3TX MODE, 5.2 GHz BAND91

7.18.1. 26 dB BANDWIDTH91

7.18.2. 99% BANDWIDTH95

7.18.3. OUTPUT POWER AND PPSD99

7.19. 802.11n HT40 STBC 2TX MODE, 5.2 GHz BAND 104

7.20. 802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND 105

7.20.1. 26 dB BANDWIDTH105

7.20.2. 99% BANDWIDTH109

7.20.3. OUTPUT POWER AND PPSD113

7.20.4. PEAK EXCURSION118

7.21. 802.11n HT40 BF 2TX MODE, 5.2 GHz BAND 122

7.22. 802.11ac VHT40 BF 2TX MODE, 5.2 GHz BAND 123

7.22.1. 26 dB BANDWIDTH123

7.22.2. 99% BANDWIDTH126

7.22.3. OUTPUT POWER AND PPSD129

7.23. 802.11ac VHT40 BF 3TX MODE, 5.2 GHz BAND 133

7.23.1. 26 dB BANDWIDTH133

7.23.2. 99% BANDWIDTH137

7.23.3. OUTPUT POWER AND PPSD141

7.24. 802.11ac VHT80 1TX MODE, 5.2 GHz BAND..... 146

7.24.1. 26 dB BANDWIDTH146

7.24.2. 99% BANDWIDTH148

7.24.3. OUTPUT POWER AND PPSD150

7.25. 802.11ac VHT80 CDD 2TX MODE, 5.2 GHz BAND 153

7.25.1. 26 dB BANDWIDTH153

7.25.2. 99% BANDWIDTH155

7.25.3. OUTPUT POWER AND PPSD157

7.26. 802.11ac VHT80 CDD 3TX MODE, 5.2 GHz BAND 161

7.26.1. 26 dB BANDWIDTH 161
7.26.2. 99% BANDWIDTH 164
7.26.3. OUTPUT POWER AND PPSD 167
7.26.4. PEAK EXCURSION 172
7.27. 802.11ac VHT80 BF 2TX MODE, 5.2 GHz BAND 175
7.27.1. 26 dB BANDWIDTH 175
7.27.2. 99% BANDWIDTH 177
7.27.3. OUTPUT POWER AND PPSD 179
7.28. 802.11ac VHT80 BF 3TX MODE, 5.2 GHz BAND 183
7.28.1. 26 dB BANDWIDTH 183
7.28.2. 99% BANDWIDTH 186
7.28.3. OUTPUT POWER AND PPSD 189
7.29. 802.11a Legacy 1TX MODE, 5.3 GHz BAND 193
7.29.1. 26 dB BANDWIDTH 193
7.29.2. 99% BANDWIDTH 196
7.29.3. OUTPUT POWER AND PPSD 199
7.30. 802.11a CDD 2Tx MODE, 5.3 GHz BAND 203
7.31. 802.11a CDD 3Tx MODE, 5.3 GHz BAND 203
7.32. 802.11a BF 2TX MODE, 5.3 GHz BAND 203
7.33. 802.11a BF 3TX MODE, 5.3 GHz BAND 203
7.34. 802.11n HT20 1TX MODE, 5.3 GHz BAND 203
7.35. 802.11n HT20 CDD 2TX MODE, 5.3 GHz BAND 204
7.35.1. 26 dB BANDWIDTH 204
7.35.2. 99% BANDWIDTH 208
7.35.3. OUTPUT POWER AND PPSD 212
7.36. 802.11n HT20 CDD 3TX MODE, 5.3 GHz BAND 218
7.36.1. 26 dB BANDWIDTH 218
7.36.2. 99% BANDWIDTH 224
7.36.3. OUTPUT POWER AND PPSD 230
7.36.4. PEAK EXCURSION 238
7.37. 802.11n HT20 STBC 2TX MODE, 5.3 GHz BAND 241
7.37.1. 26 dB BANDWIDTH 241
7.37.2. 99% BANDWIDTH 245
7.37.3. OUTPUT POWER AND PPSD 249
7.38. 802.11n HT20 STBC 3TX MODE, 5.3 GHz BAND 254
7.38.1. 26 dB BANDWIDTH 254
7.38.2. 99% BANDWIDTH 260
7.38.3. OUTPUT POWER AND PPSD 266
7.39. 802.11n HT20 BF 2TX MODE, 5.3 GHz BAND 273
7.40. 802.11n HT20 BF 3TX, 5.3 GHz BAND 273
7.41. 802.11ac VHT20 BF 2TX MODE, 5.3 GHz BAND 273
7.42. 802.11ac VHT20 BF 3TX MODE, 5.3 GHz BAND 274
7.42.1. OUTPUT POWER 274
7.43. 802.11n HT40 1TX MODE, 5.3 GHz BAND 276

7.43.1. 26 dB BANDWIDTH276
7.43.2. 99% BANDWIDTH278
7.43.3. OUTPUT POWER AND PPSD280
7.44. 802.11n HT40 CDD 2TX MODE, 5.3 GHz BAND283
7.44.1. 26 dB BANDWIDTH283
7.44.2. 99% BANDWIDTH286
7.44.3. OUTPUT POWER AND PPSD289
7.45. 802.11n HT40 CDD 3TX MODE, 5.3 GHz BAND294
7.45.1. 26 dB BANDWIDTH294
7.45.2. 99% BANDWIDTH298
7.45.3. OUTPUT POWER AND PPSD302
7.45.4. PEAK EXCURSION308
7.46. 802.11n HT40 STBC 2TX MODE, 5.3 GHz BAND312
7.47. 802.11n HT40 STBC 3TX MODE, 5.3 GHz BAND313
7.47.1. 26 dB BANDWIDTH313
7.47.2. 99% BANDWIDTH317
7.47.3. OUTPUT POWER AND PPSD320
7.48. 802.11n HT40 BF 2TX MODE, 5.3 GHz BAND325
7.49. 802.11n HT40 BF 3TX MODE, 5.3 GHz BAND325
7.50. 802.11ac VHT40 BF 2TX MODE, 5.3 GHz BAND326
7.50.1. 26 dB BANDWIDTH326
7.50.2. 99% BANDWIDTH329
7.50.3. OUTPUT POWER AND PPSD332
7.51. 802.11ac VHT40 BF 3TX MODE, 5.3 GHz BAND336
7.51.1. OUTPUT POWER AND PPSD336
7.52. 802.11ac VHT80 1TX MODE, 5.3 GHz BAND338
7.52.1. 26 dB BANDWIDTH338
7.52.2. 99% BANDWIDTH340
7.52.3. OUTPUT POWER AND PPSD342
7.53. 802.11ac VHT80 CDD 2TX MODE, 5.3 GHz BAND345
7.53.1. 26 dB BANDWIDTH345
7.53.2. 99% BANDWIDTH347
7.53.3. OUTPUT POWER AND PPSD349
7.54. 802.11ac VHT80 CDD 3TX MODE, 5.3 GHz BAND353
7.54.1. 26 dB BANDWIDTH353
7.54.1. 99% BANDWIDTH356
7.54.2. OUTPUT POWER AND PPSD359
7.55. 802.11ac VHT80 BF 2TX MODE, 5.3 GHz BAND364
7.55.1. 26 dB BANDWIDTH364
7.55.2. 99% BANDWIDTH366
7.55.3. OUTPUT POWER AND PPSD368
7.56. 802.11ac VHT80 BF 3TX, 5.3 GHz BAND371
7.56.1. 26 dB BANDWIDTH371
7.56.2. 99% BANDWIDTH374
7.56.3. OUTPUT POWER AND PPSD377
7.57. 802.11a LEGACY 1TX MODE, 5.6 GHz BAND381

7.57.1. 26 dB BANDWIDTH381
7.57.2. 99% BANDWIDTH384
7.57.3. OUTPUT POWER AND PPSD387
7.57.4. PEAK EXCURSION391
7.58. 802.11a CDD 2TX MODE, 5.6 GHz BAND.....392
7.59. 802.11a CDD 3TX MODE, 5.6 GHz BAND.....392
7.60. 802.11a BF 2TX MODE, 5.6 GHz BAND.....392
7.61. 802.11a BF 3TX MODE, 5.6 GHz BAND.....392
7.62. 802.11n HT20 1TX MODE, 5.6 GHz BAND.....392
7.63. 802.11n HT20 CDD 2TX, 5.6 GHz BAND.....393
7.63.1. 26 dB BANDWIDTH393
7.63.2. 99% BANDWIDTH397
7.63.3. OUTPUT POWER AND PPSD401
7.63.4. PEAK EXCURSION407
7.64. 802.11n HT20 CDD 2TX MODE, CHANNEL 144, 5.6 GHz BAND.....408
7.64.1. 26 dB BANDWIDTH408
7.64.2. 99% BANDWIDTH410
7.64.3. OUTPUT POWER AND PSD412
7.65. 802.11n HT20 CDD 3TX MODE IN THE 5.6 GHz BAND.....417
7.65.1. 26 dB BANDWIDTH417
7.65.2. 99% BANDWIDTH423
7.65.3. OUTPUT POWER AND PPSD429
7.65.4. PEAK EXCURSION437
7.66. 802.11n HT20 CDD 3TX MODE, CHANNEL 144, 5.6 GHz BAND.....438
7.66.1. 26 dB BANDWIDTH- UNII438
7.66.2. 99% BANDWIDTH441
7.66.3. OUTPUT POWER AND PSD444
7.67. 802.11n HT20 STBC 2Tx MODE, 5.6 GHz BAND450
7.67.1. 26 dB BANDWIDTH450
7.67.2. 99% BANDWIDTH454
7.67.3. OUTPUT POWER AND PPSD458
7.67.4. PEAK EXCURSION463
7.68. 802.11n HT20 STBC 2TX MODE, CHANNEL 144, 5.6 GHz BAND.....464
7.68.1. 26 dB BANDWIDTH- UNII464
7.68.2. 99% BANDWIDTH466
7.68.3. OUTPUT POWER AND PSD468
7.69. 802.11n HT20 STBC 3Tx MODE, 5.6 GHz BAND473
7.69.1. 26 dB BANDWIDTH473
7.69.2. 99% BANDWIDTH479
7.69.3. OUTPUT POWER AND PPSD485
7.69.4. PEAK EXCURSION492
7.70. 802.11n HT20 STBC 3TX MODE, CHANNEL 144, 5.6 GHz BAND.....495
7.70.1. 26 dB BANDWIDTH- UNII495
7.70.2. 99% BANDWIDTH498
7.70.3. OUTPUT POWER AND PSD501
7.71. 802.11n HT20 BF 2TX MODE, 5.6 GHz BAND507

7.72. 802.11n HT20 BF 3TX MODE, 5.6 GHz BAND507

7.73. 802.11ac VHT20 BF 2TX MODE, 5.6 GHz BAND507

7.74. 802.11ac VHT20 BF 3TX MODE, 5.6 GHz BAND508

7.74.1. OUTPUT POWER.....508

7.75. 802.11n HT40 1TX MODE, 5.6 GHz BAND.....510

7.75.1. 26 dB BANDWIDTH510

7.75.2. 99% BANDWIDTH513

7.75.3. OUTPUT POWER AND PPSD.....516

7.76. 802.11n HT40 1TX MODE, CHANNEL 142, 5.6 GHz BAND520

7.76.1. 26 dB BANDWIDTH520

7.76.2. 99% BANDWIDTH522

7.76.3. OUTPUT POWER AND PSD524

7.77. 802.11n HT40 CDD 2TX MODE, 5.6 GHz BAND528

7.77.1. 26 dB BANDWIDTH528

7.77.2. 99% BANDWIDTH532

7.77.3. OUTPUT POWER AND PPSD.....536

7.78. 802.11n HT40 CDD 2TX MODE CHANNEL 142, 5.6 GHz BAND.....542

7.78.1. 26 dB BANDWIDTH- UNII542

7.78.2. 99% BANDWIDTH544

7.78.3. OUTPUT POWER AND PSD546

7.79. 802.11n HT40 CDD 3TX MODE IN THE 5.6 GHz BAND.....551

7.79.1. 26 dB BANDWIDTH551

7.79.2. 99% BANDWIDTH557

7.79.3. OUTPUT POWER AND PPSD563

7.80. 802.11n HT40 CDD 3TX MODE CHANNEL 142, 5.6 GHz BAND.....571

7.80.1. 26 dB BANDWIDTH- UNII571

7.80.2. 99% BANDWIDTH574

7.80.3. OUTPUT POWER AND PSD577

7.81. 802.11n HT40 STBC 2TX MODE IN THE 5.6 GHz BAND.....583

7.82. 802.11n HT40 STBC 3TX MODE IN THE 5.6 GHz BAND584

7.82.1. 26 dB BANDWIDTH584

7.82.2. 99% BANDWIDTH590

7.82.3. OUTPUT POWER AND PPSD596

7.82.4. PEAK EXCURSION603

7.83. 802.11n HT40 STBC 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND606

7.83.1. 26 dB BANDWIDTH- UNII606

7.83.2. 99% BANDWIDTH609

7.83.3. OUTPUT POWER AND PSD612

7.84. 802.11n HT40 BF 2TX MODE IN THE 5.6 GHz BAND.....618

7.85. 802.11n HT40 BF 3TX MODE IN THE 5.6 GHz BAND.....618

7.86. 802.11ac VHT40 BF 2TX MODE IN THE 5.6 GHz BAND.....619

7.86.1. 26 dB BANDWIDTH619

7.86.2. 99% BANDWIDTH623

7.86.3. OUTPUT POWER AND PPSD627

7.87. 802.11ac VHT40 BF 2TX MODE, CHANNEL 142 IN THE 5.6 GHz BAND632

7.87.1. 26 dB BANDWIDTH- UNII632
7.87.2. 99% BANDWIDTH634
7.87.3. OUTPUT POWER AND PSD636
7.88. 802.11ac VHT40 BF 3TX MODE IN THE 5.6 GHz BAND.....641
7.88.1. OUTPUT POWER AND PPSD641
7.89. 802.11ac VHT80 1TX MODE IN THE 5.6 GHz BAND643
7.89.1. 26 dB BANDWIDTH643
7.89.2. 99% BANDWIDTH645
7.89.3. OUTPUT POWER AND PPSD647
7.89.4. PEAK EXCURSION650
7.90. 802.11ac VHT80 1TX MODE CHANNEL 138 IN THE 5.6 GHz BAND652
7.90.1. 26 dB BANDWIDTH652
7.90.2. 99% BANDWIDTH654
7.90.3. OUTPUT POWER AND PSD656
7.91. 802.11ac VHT80 CDD 2TX MODE IN THE 5.6 GHz BAND.....660
7.91.1. 26 dB BANDWIDTH660
7.91.2. 99% BANDWIDTH662
7.91.3. OUTPUT POWER AND PPSD664
7.92. 802.11ac VHT80 CDD 2TX MODE CHANNEL 138 IN THE 5.6 GHz BAND.....668
7.92.1. 26 dB BANDWIDTH- UNII668
7.92.2. 99% BANDWIDTH670
7.92.3. OUTPUT POWER AND PSD672
7.93. 802.11ac VHT80 CDD 3TX MODE IN THE 5.6 GHz BAND.....677
7.93.1. 26 dB BANDWIDTH677
7.93.2. 99% BANDWIDTH680
7.93.3. OUTPUT POWER AND PPSD683
7.93.4. PEAK EXCURSION689
7.94. 802.11ac VHT80 CDD 3TX MODE CHANNEL 138 IN THE 5.6 GHz BAND.....692
7.94.1. 26 dB BANDWIDTH- UNII692
7.94.2. 99% BANDWIDTH695
7.94.3. OUTPUT POWER AND PSD698
7.95. 802.11ac VHT80 BF 2TX MODE IN THE 5.6 GHz BAND.....704
7.95.1. 26 dB BANDWIDTH704
7.95.2. 99% BANDWIDTH706
7.95.3. OUTPUT POWER AND PPSD708
7.95.4. PEAK EXCURSION711
7.96. 802.11ac VHT80 BF 2TX MODE CHANNEL 138 IN THE 5.6 GHz BAND.....713
7.96.1. 26 dB BANDWIDTH- UNII713
7.96.2. 99% BANDWIDTH715
7.96.3. OUTPUT POWER AND PSD717
7.97. 802.11ac VHT80 BF 3TX MODE IN THE 5.6 GHz BAND.....722
7.97.1. 26 dB BANDWIDTH722
7.97.2. 99% BANDWIDTH725
7.97.3. OUTPUT POWER AND PPSD728
7.98. 802.11ac VHT80 BF 3TX MODE CHANNEL 138 IN THE 5.6 GHz BAND.....733
7.98.1. 26 dB BANDWIDTH- UNII733
7.98.2. 99% BANDWIDTH736

7.98.3. OUTPUT POWER AND PSD739

8. RADIATED TEST RESULTS.....745

8.1. LIMITS AND PROCEDURE.....745

8.2. TRANSMITTER ABOVE 1 GHz.....746

8.2.1. 802.11a LEGACY 1TX MODE IN THE 5.2 GHz BAND746

8.2.2. 802.11a CDD 2TX MODE IN THE 5.2 GHz BAND.....746

8.2.3. 802.11a CDD 3TX MODE IN THE 5.2 GHz BAND.....746

8.2.4. 802.11a BF 2TX MODE IN THE 5.2 GHz BAND.....746

8.2.5. 802.11a BF 3TX MODE IN THE 5.2 GHz BAND.....746

8.2.6. 802.11n HT20 1TX MODE IN THE 5.2 GHz BAND.....746

8.2.7. 802.11n HT20 CDD 2TX MODE IN THE 5.2 GHz BAND746

8.2.8. 802.11n HT20 STBC 2TX MODE IN THE 5.2 GHz BAND746

8.2.9. 802.11n HT20 STBC 3TX MODE IN THE 5.2 GHz BAND747

8.2.10. 802.11n HT20 BF 2TX MODE IN THE 5.2 GHz BAND.....747

8.2.11. 802.11n HT20 BF 3TX MODE IN THE 5.2 GHz BAND.....747

8.2.12. 802.11ac VHT20 BF 2TX MODE IN THE 5.2 GHz BAND.....747

8.2.13. 802.11ac VHT20 BF 3TX MODE IN THE 5.2 GHz BAND.....747

8.2.14. 802.11n HT20 CDD 3TX MODE IN THE 5.2 GHz BAND.....748

8.2.15. 802.11n HT40 1TX MODE IN THE 5.2 GHz BAND750

8.2.16. 802.11n HT40 CDD 2TX MODE IN THE 5.2 GHz BAND.....752

8.2.17. 802.11n HT40 CDD 3TX MODE IN THE 5.2 GHz BAND.....754

8.2.18. 802.11n HT40 STBC 2TX MODE IN THE 5.2 GHz BAND756

8.2.19. 802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND756

8.2.20. 802.11n HT40 BF 2TX MODE IN THE 5.2 GHz BAND.....756

8.2.21. 802.11n HT40 BF 3TX MODE IN THE 5.2 GHz BAND.....756

8.2.22. 802.11ac VHT40 BF 2TX MODE IN THE 5.2 GHz BAND.....757

8.2.23. 802.11ac VHT40 BF 3TX MODE IN THE 5.2 GHz BAND.....759

8.2.24. 802.11ac VHT80 1TX MODE IN THE 5.2 GHz BAND761

8.2.25. 802.11ac HT80 CDD 2TX MODE IN THE 5.2 GHz BAND.....763

8.2.26. 802.11ac VHT80 CDD 3TX MODE IN THE 5.2 GHz BAND765

8.2.27. 802.11ac VHT80 BF 2TX MODE IN THE 5.2 GHz BAND.....767

8.2.28. 802.11ac VHT80 BF 3TX MODE IN THE 5.2 GHz BAND.....769

8.2.29. 802.11a LEGACY MODE IN THE 5.3 GHz BAND771

8.2.30. 802.11a CDD 2Tx MODE IN THE 5.3 GHz BAND.....774

8.2.31. 802.11a CDD 3Tx MODE IN THE 5.3 GHz BAND.....774

8.2.32. 802.11a BF 2TX MODE IN THE 5.3 GHz BAND774

8.2.33. 802.11a BF 3TX MODE IN THE 5.3 GHz BAND774

8.2.34. 802.11n HT20 1TX MODE IN THE 5.3 GHz BAND774

8.2.35. 802.11n HT20 CDD 2TX MODE IN THE 5.3 GHz BAND.....774

8.2.36. 802.11n HT20 STBC 2TX MODE IN THE 5.3 GHz BAND774

8.2.37. 802.11n HT20 STBC 3TX MODE IN THE 5.3 GHz BAND774

8.2.38. 802.11n HT20 BF 2TX MODE IN THE 5.3 GHz BAND.....775

8.2.39. 802.11n HT20 BF 3TX MODE IN THE 5.3 GHz BAND.....775

8.2.40. 802.11n HT20 CDD 3TX MODE IN THE 5.3 GHz BAND.....776

8.2.41. 802.11ac VHT20 BF 3TX MODE IN THE 5.3 GHz BAND.....778

8.2.42. 802.11n HT40 1TX MODE IN THE 5.3 GHz BAND780

8.2.43. 802.11n HT40 CDD 2TX MODE IN THE 5.3 GHz BAND.....782

8.2.44. 802.11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND.....784

8.2.45. 802.11n HT40 STBC 1TX MODE IN THE 5.3 GHz BAND786

8.2.46. 802.11n HT40 STBC 2TX MODE IN THE 5.3 GHz BAND786

8.2.47.	802.11n HT40 STBC 3TX MODE IN THE 5.3 GHz BAND	786
8.2.48.	802.11n HT40 BF 2TX MODE IN THE 5.3 GHz BAND	786
8.2.49.	802.11n HT40 BF 3TX MODE IN THE 5.3 GHz BAND	786
8.2.50.	802.11ac VHT40 BF 2TX MODE IN THE 5.3 GHz BAND	787
8.2.51.	802.11ac VHT40 BF 3TX MODE IN THE 5.3 GHz BAND	789
8.2.52.	802.11ac VHT80 1TX MODE IN THE 5.3 GHz BAND	791
8.2.53.	802.11ac HT80 CDD 2TX MODE IN THE 5.3 GHz BAND	793
8.2.54.	802.11ac HT80 CDD 3TX MODE IN THE 5.3 GHz BAND	795
8.2.55.	802.11ac VHT80 BF 2TX MODE IN THE 5.3 GHz BAND	797
8.2.56.	802.11ac VHT80 BF 3TX MODE IN THE 5.3 GHz BAND	799
8.2.57.	802.11a LEGACY 1TX MODE IN THE 5.6 GHz BAND	801
8.2.58.	802.11a CDD 2Tx MODE IN THE 5.6 GHz BAND	803
8.2.59.	802.11a CDD 3Tx MODE IN THE 5.6 GHz BAND	803
8.2.60.	802.11a BF 2TX MODE IN THE 5.6 GHz BAND	803
8.2.61.	802.11a BF 3TX MODE IN THE 5.6 GHz BAND	803
8.2.62.	802.11n HT20 1TX MODE IN THE 5.6 GHz BAND	803
8.2.63.	802.11n HT20 STBC 3TX MODE IN THE 5.6 GHz BAND	803
8.2.64.	802.11n HT20 BF 2TX MODE IN THE 5.6 GHz BAND	803
8.2.65.	802.11n HT20 BF 3TX MODE IN THE 5.6 GHz BAND	803
8.2.66.	802.11ac VHT20 BF 2TX MODE IN THE 5.6 GHz BAND	804
8.2.67.	802.11n HT20 CDD 2TX MODE IN THE 5.6 GHz BAND	805
8.2.68.	802.11n HT20 CDD 3TX MODE IN THE 5.6 GHz BAND	808
8.2.69.	802.11n HT20 STBC 2TX MODE IN THE 5.6 GHz BAND	811
8.2.70.	802.11ac VHT20 BF 3TX MODE IN THE 5.6 GHz BAND	814
8.2.71.	802.11ac VHT20 BF 3TX MODE CHANNEL 144 IN THE 5.6 GHz BAND	817
8.2.72.	802.11n HT40 1TX MODE IN THE 5.6 GHz BAND	819
8.2.73.	802.11n HT40 1TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	822
8.2.74.	802.11n HT40 CDD 2TX MODE IN THE 5.6 GHz BAND	823
8.2.75.	802.11n HT40 CDD 2TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	825
8.2.76.	802.11n HT40 CDD 3TX MODE IN THE 5.6 GHz BAND	826
8.2.77.	802.11n HT40 CDD 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	829
8.2.78.	802.11n HT40 STBC 3TX MODE IN THE 5.6 GHz BAND	831
8.2.79.	802.11n HT40 STBC 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	831
8.2.80.	802.11ac VHT40 BF 2TX MODE IN THE 5.6 GHz BAND	832
8.2.81.	802.11ac VHT40 BF 2TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	835
8.2.82.	802.11ac VHT40 BF 3TX MODE IN THE 5.6 GHz BAND	836
8.2.83.	802.11ac VHT40 BF 3TX MODE CHANNEL 142 IN THE 5.6 GHz BAND	839
8.2.84.	802.11ac VHT80 1TX MODE IN THE 5.6 GHz BAND	841
8.2.85.	802.11ac VHT80 CDD 2TX MODE IN THE 5.6 GHz BAND	843
8.2.86.	802.11ac VHT80 CDD 3TX MODE IN THE 5.6 GHz BAND	845
8.2.87.	802.11ac VHT80 BF 2TX MODE IN THE 5.6 GHz BAND	847
8.3.	802.11ac VHT80 BF 3TX MODE IN THE 5.6 GHz BAND	849
8.4.	WORST-CASE BELOW 1 GHz	851
9.	AC POWER LINE CONDUCTED EMISSIONS	852
10.	DYNAMIC FREQUENCY SELECTION	856
10.1.	OVERVIEW	856
10.1.1.	LIMITS	856
10.1.2.	TEST AND MEASUREMENT SYSTEM	859
10.1.3.	SETUP OF EUT (CLIENT MODE)	862

10.1.4. SETUP OF EUT (CLIENT-TO-CLIENT COMMUNICATIONS MODE)863
10.1.5. DESCRIPTION OF EUT864
10.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH.....866
10.2.1. TEST CHANNEL866
10.2.2. RADAR WAVEFORM AND TRAFFIC866
10.2.3. OVERLAPPING CHANNEL TESTS868
10.2.4. MOVE AND CLOSING TIME868
10.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH.....873
10.3.1. TEST CHANNEL873
10.3.2. RADAR WAVEFORM AND TRAFFIC873
10.3.3. OVERLAPPING CHANNEL TESTS875
10.3.4. MOVE AND CLOSING TIME875
10.3.5. NON-OCCUPANCY PERIOD880
10.4. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz
BANDWIDTH.....881
10.4.1. TEST CHANNEL881
10.4.2. RADAR WAVEFORM AND TRAFFIC881
10.4.3. OVERLAPPING CHANNEL TESTS883
10.4.4. MOVE AND CLOSING TIME883
10.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz
BANDWIDTH.....889
10.5.1. TEST CHANNEL889
10.5.2. RADAR WAVEFORM AND TRAFFIC889
10.5.3. OVERLAPPING CHANNEL TESTS891
10.5.4. MOVE AND CLOSING TIME891
11. SETUP PHOTOS.....897
11.1. ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP897
11.2. RADIATED RF MEASUREMENT SETUP898
11.3. RADIATED RF (TxBF) MEASUREMENT SETUP899
11.4. POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP900
11.5. DYNAMIC FREQUENCY SELECTION MEASUREMENT SETUP901
11.5.1. Client Mode901
11.5.2. Client to Client Mode903

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

EUT DESCRIPTION: Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom
Combination Card

MODEL: BCM94360CS

SERIAL NUMBER: C8Y2426006LF5563EX & C8Y2426005LF5563EXTF563ET

DATE TESTED: OCTOBER 3, 2012 to MAY 30, 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:



KRISTOPHER NGUYEN
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:

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

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 Broadcom 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM AVERAGE OUTPUT POWER

The transmitter has a maximum conducted average output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX						
5180 - 5240	802.11a Legacy	N/A	15.10	N/A	15.10	32.36
5190 - 5230	802.11n HT40 MCS0	N/A	15.71	N/A	15.71	37.24
5210	802.11ac VHT80 MCS0	N/A	14.70	N/A	14.70	29.51
5.2 GHz band, 2TX						
5180 - 5240	802.11n HT20 STBC MCS0	12.51	12.56	N/A	15.55	35.85
5190 - 5230	802.11n HT40 CDD MCS0	12.16	12.31	N/A	15.25	33.47
5190 - 5230	802.11ac VHT40 STBC MCS0	9.51	10.48	N/A	13.03	20.10
5190 - 5230	802.11ac VHT40 BF	9.51	10.48	N/A	13.03	20.10
5210	802.11ac VHT80 CDD MCS0	13.31	12.62	N/A	15.99	39.71
5210	802.11ac VHT80 BF	10.02	10.10	N/A	13.07	20.28
5.2 GHz band, 3TX						
5180 - 5240	802.11n HT20 STBC MCS0	11.27	12.01	11.56	16.40	43.60
5190 - 5230	802.11n HT40 CDD MCS0	11.67	11.65	11.58	16.40	43.70
5190 - 5230	802.11n HT40 STBC MCS0	12.03	12.36	12.01	16.91	49.06
5190 - 5230	802.11ac VHT40 BF	7.21	7.84	7.32	12.24	16.74
5210	802.11ac VHT80 CDD MCS0	12.04	12.15	12.04	16.85	48.40
5210	802.11ac VHT80 BF	7.47	7.48	7.39	12.22	16.67

5.3 GHz BAND

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX						
5260 - 5320	802.11a Legacy	N/A	20.50	N/A	20.50	112.20
5270 - 5310	802.11n HT40	N/A	19.46	N/A	19.46	88.31
5290	802.11ac VHT80 MCS0	N/A	16.00	N/A	16.00	39.81
5.3 GHz band, 2TX						
5260 - 5320	802.11n HT20 CDD MCS0	17.38	17.45	N/A	20.43	110.29
5260 - 5320	802.11n HT20 STBC MCS0	19.46	19.56	N/A	22.52	178.67
5270 - 5310	802.11n HT40 CDD MCS0	19.92	19.81	N/A	22.88	193.89
5270 - 5310	802.11ac VHT40 BF	16.60	16.84	N/A	19.73	94.01
5290	802.11ac VHT80 CDD MCS0	13.74	13.03	N/A	16.41	43.75
5290	802.11ac VHT80 BF	13.32	13.78	N/A	16.57	45.36
5.3 GHz band, 3TX						
5260 - 5320	802.11n HT20 CDD MCS0	14.71	14.54	14.45	19.34	85.89
5260 - 5320	802.11n HT20 STBC MCS0	18.49	18.52	18.47	23.26	212.06
5260 - 5320	802.11ac VHT20 BF	13.67	13.64	14.21	18.62	72.76
5270 - 5310	802.11n HT40 CDD MCS0	17.70	17.75	17.78	22.51	178.43
5270	802.11n HT40 STBC MCS0	18.62	18.80	18.56	23.43	220.42
5270 - 5310	802.11ac VHT40 BF	14.12	14.54	14.39	19.12	81.75
5290	802.11ac VHT80 CDD MCS0	12.12	12.29	12.34	17.02	50.38
5290	802.11ac VHT80 BF	13.21	13.88	13.19	18.21	66.22

5.6 GHz BAND

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX						
5500-5700	802.11a Legacy	N/A	20.12	N/A	20.12	102.80
5510-5670	802.11n HT40 MCS0	N/A	20.38	N/A	20.38	109.14
5710	802.11n HT40 MCS0	N/A	18.67	N/A	18.67	73.62
5530	802.11ac VHT80 CDD MCS0	N/A	19.40	N/A	19.40	87.10
5690	802.11ac VHT80 CDD MCS0	N/A	20.10	N/A	20.10	102.33
5.6 GHz band, 2TX						
5500-5700	802.11n HT20 CDD MCS0	18.00	17.37	N/A	20.71	117.67
5720	802.11n HT20 CDD MCS0	17.52	17.56	N/A	20.55	113.51
5500-5700	802.11n HT20 STBC MCS0	18.70	18.84	N/A	21.78	150.69
5720	802.11n HT20 STBC MCS0	18.53	18.67	N/A	21.61	144.91
5510-5670	802.11n HT40 CDD MCS0	18.94	18.54	N/A	21.75	149.79
5710	802.11n HT40 CDD MCS0	18.10	18.25	N/A	21.19	131.40
5510-5670	802.11ac VHT40 BF	18.09	18.01	N/A	21.06	127.66
5710	802.11ac VHT40 BF	18.10	18.25	N/A	21.19	131.40
5530	802.11ac VHT80 CDD MCS0	14.38	14.45	N/A	17.43	55.28
5690	802.11ac VHT80 CDD MCS0	19.46	20.18	N/A	22.85	192.54
5530	802.11ac VHT80 BF	14.81	15.59	N/A	18.23	66.49
5690	802.11ac VHT80 BF	17.90	17.70	N/A	20.81	120.54
5.6 GHz band, 3TX						
5500-5700	802.11n HT20 CDD MCS0	14.98	14.78	14.69	19.59	90.98
5720	802.11n HT20 CDD MCS0	14.45	14.67	14.54	19.33	85.61
5500-5700	802.11n HT20 STBC MCS0	17.84	18.03	17.72	22.64	183.50
5720	802.11n HT20 STBC MCS0	19.04	19.60	19.68	24.22	264.27
5500-5700	802.11ac VHT20 BF	14.52	14.61	14.74	19.40	87.01
5510-5670	802.11n HT40 CDD MCS0	17.91	17.60	17.85	22.56	180.30
5710	802.11n HT40 CDD MCS0	15.67	15.72	15.86	20.52	112.77
5510-5670	802.11n HT40 STBC MCS0	18.97	19.13	18.92	23.78	238.72
5510-5670	802.11ac VHT40 BF	15.04	15.08	15.11	19.85	96.56
5530	802.11ac VHT80 CDD MCS0	12.82	13.14	12.87	17.72	59.11
5690	802.11ac VHT80 CDD MCS0	20.12	20.45	20.27	25.05	320.13
5530	802.11ac VHT80 BF	13.42	13.00	13.12	17.95	62.44
5690	802.11ac VHT80 BF	14.11	14.65	14.19	19.09	81.18

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The following antennas are utilized for this device:

No	Antenna Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5580, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz	
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi1	0.12	7.04	7.09	5.03	2.66	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN/BT Antenna	613-1143 Wi-Fi2	5.3	6.7	7.06	6.06	5.93	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi3 & Bluetooth	4.69	3.79	3.58	3.94	6.04	Host2 antenna

2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi1	2.47	4.18	3.35	3.32	3.56	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi2	2.64	4.22	3.44	2.41	3.68	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi3 & Bluetooth	4.82	4.63	3.01	4.63	4.31	Host1 antenna

Antenna mapping:

WiFi 3	WiFi 2	WiFi 1
Chain 1	Chain 0	Chain 2

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.118.23.

The test utility software used during testing was BCM Internal, rev. 6.30.RC118.23.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC.

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

For 5.2, 5.3 and 5.6 GHz Bands:

802.11a: 6 Mb/s.

802.11n 20MHz: MCS0.

802.11n 40MHz: MCS0.

802.11n 80MHz: 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 Radiated Band Edge measurements preliminary testing showed that the worst case was vertical polarization, so some final measurements were performed with vertical polarization only.

For the modes where second low and second high were tested for output power, all other test items at low and high channels were performed with the higher power level between low and second low channels, and between second high and 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.

For all modes with two chains, chains 0 and 1 were selected per the software provided by the client. Based on the client a preliminary investigation was performed on the three chains and chains 0 and 1 were found to be worst-case.

For 802.11n HT20 CDD 3TX mode in the UNII bands, the output power for each chain used for the testing purpose was equal to the output power on single chain for 802.11a 1TX mode; therefore, 802.11n HT20 CDD 3TX mode covers 802.11a 1TX mode as worst-case scenario.

For 802.11n HT20 CDD 3TX mode in the UNII bands, the output power for each chain used for the testing purpose was equal to the output power on single chain for 802.11n HT20 1TX mode; therefore, 802.11n HT20 CDD 3TX mode covers 802.11n HT20 1TX mode as worst-case scenario.

For 802.11n HT40 CDD 3TX mode in the UNII bands, the output power for each chain used for the testing purpose was equal to the output power on single chain for 802.11n HT40 1TX mode; therefore, 802.11n HT40 CDD 3TX mode covers 802.11n HT40 1TX mode as worst-case scenario.

For Peak Excursion testing, one channel in each modulation in the 5.6 GHz band was selected to demonstrate compliance.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	679	CBU3475167	DoC
Laptop	Lenovo	4446	RA-CAD03 98/08	DoC
AC Adapter	Lenovo	ADP-65KH B	11S36001646ZZ10011FKY6	DoC
AC Adapter	Lenovo	PA-1650-02H	11S36001646ZZ1000AD9WJ	DoC
Adapter Board	Catalyst	MINI2EXP	N/A	N/A
Adapter Board	Catalyst	MINI2EXP	BRCM 2011-04	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1504020	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1504021	N/A

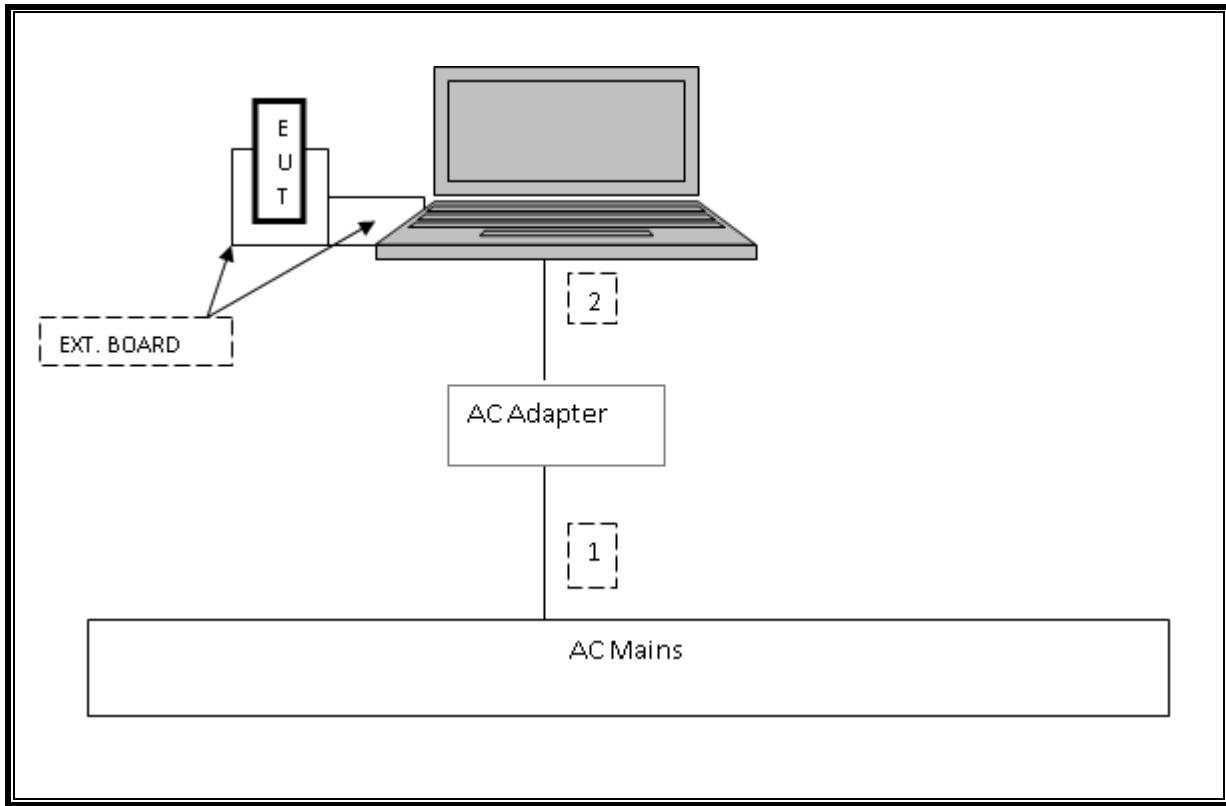
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-Shielded	1.0m	NA
2	DC	1	DC	Un-Shielded	1.8m	Ferrite at laptop's end

TEST SETUP

The EUT is attached to a jig board which is installed in the PCMCIA slot of a host laptop computer during the tests. 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, 44 GHz	Agilent / HP	E4446A	C01069	12/13/11	12/13/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	05/11/11	05/11/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/13/12	07/06/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/11	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/11	12/13/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	11/12/12	11/12/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00946	11/12/12	11/12/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/12	06/14/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C00682	02/07/12	02/07/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	02/21/12	02/21/13
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
LISN, 30 MHz	FCC	50/250-25-2	N02396	08/08/12	08/08/13
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	CNR
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02680	CNR	CNR
Reject Filter, 5.47-5.725 GHz	Micro-Tronics	BRC13191	N02678	CNR	CNR
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR	CNR

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

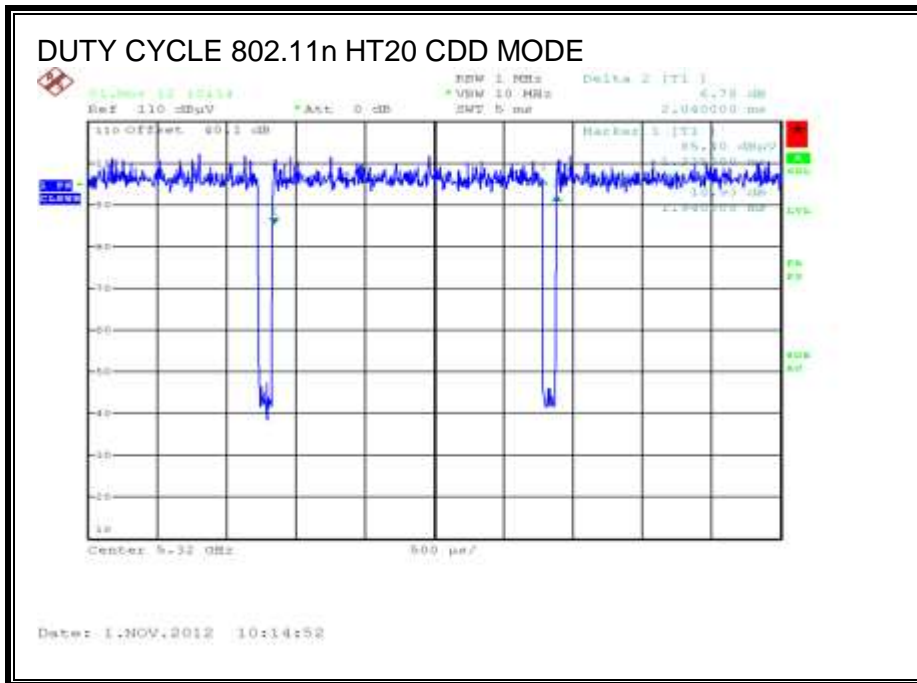
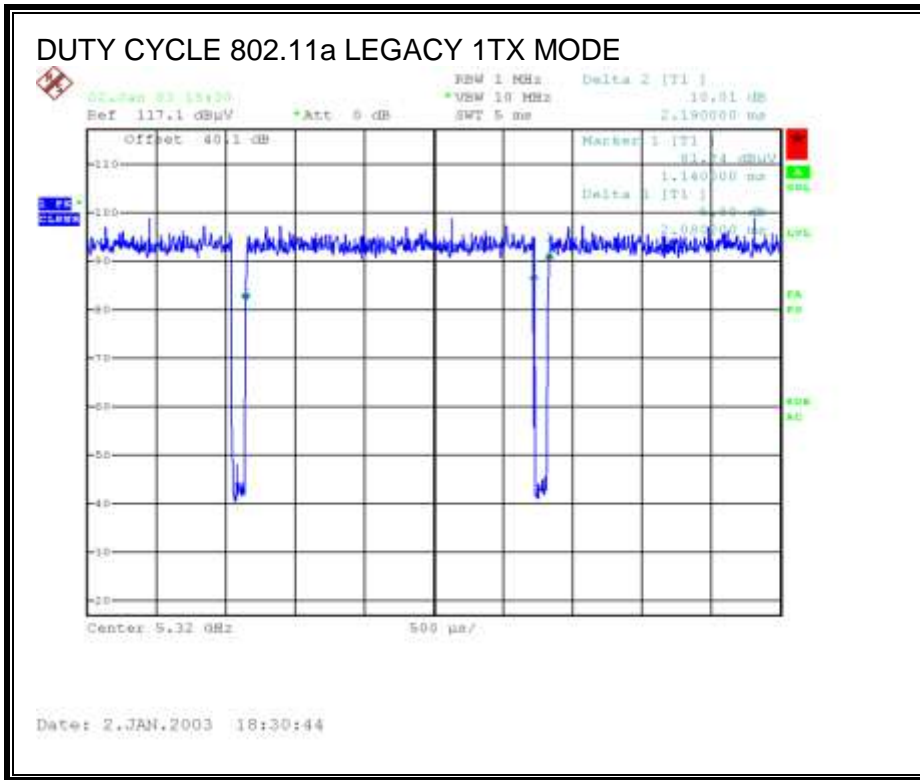
PROCEDURE

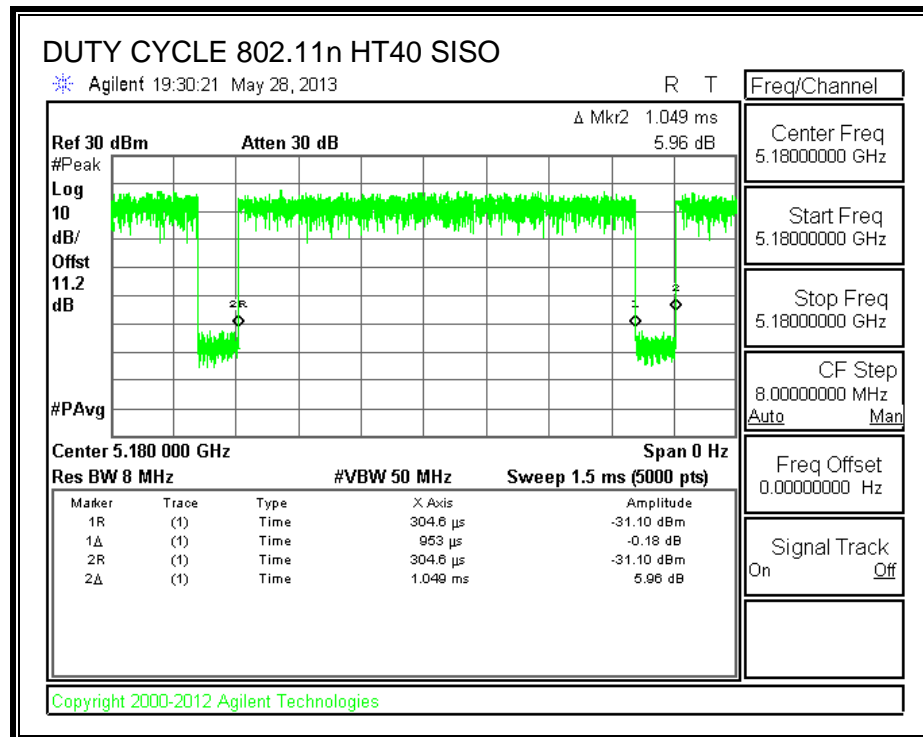
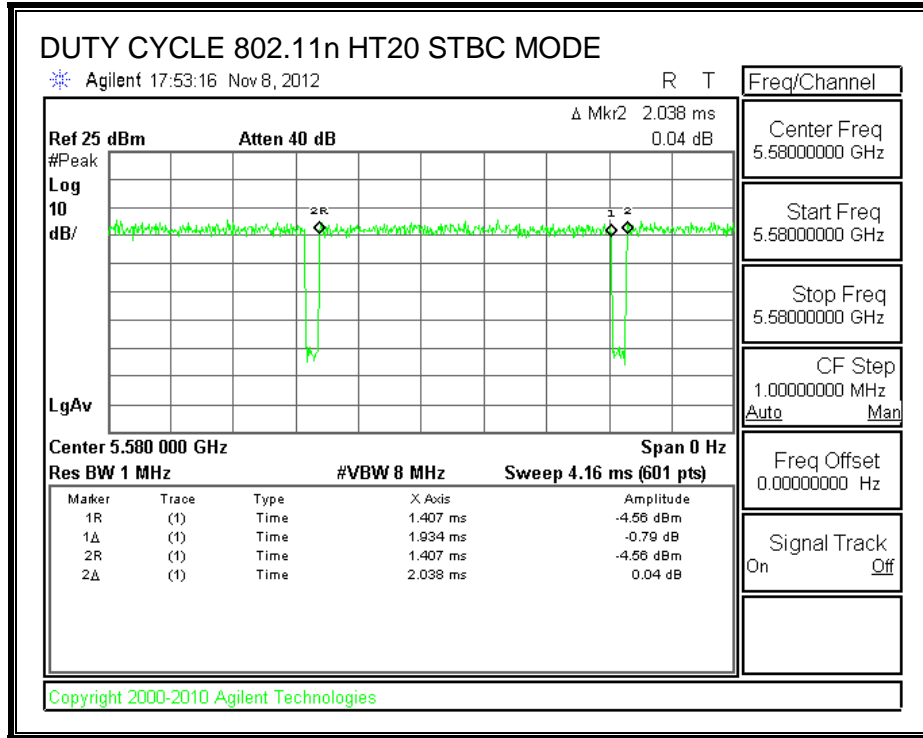
KDB 789033 D01 v01r02; Zero-Span Spectrum Analyzer Method.

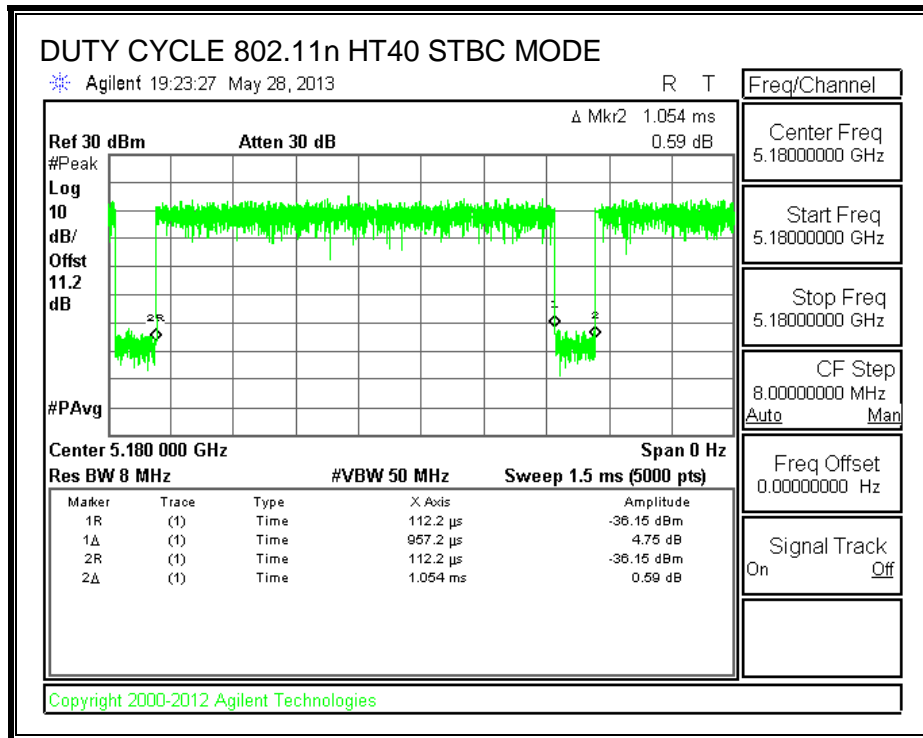
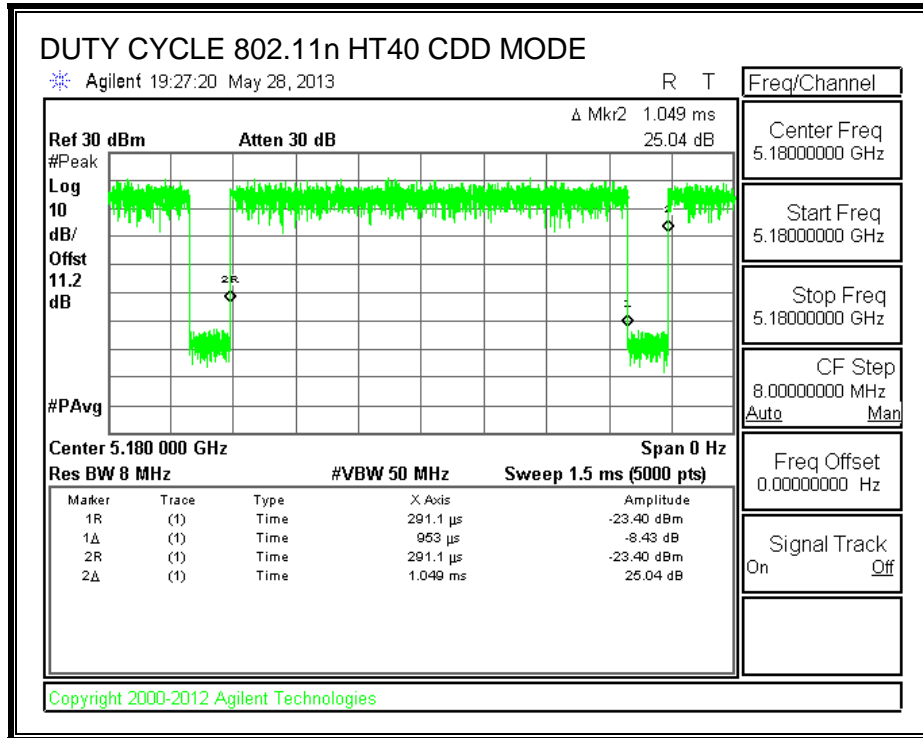
7.1.1. ON TIME AND DUTY CYCLE RESULTS

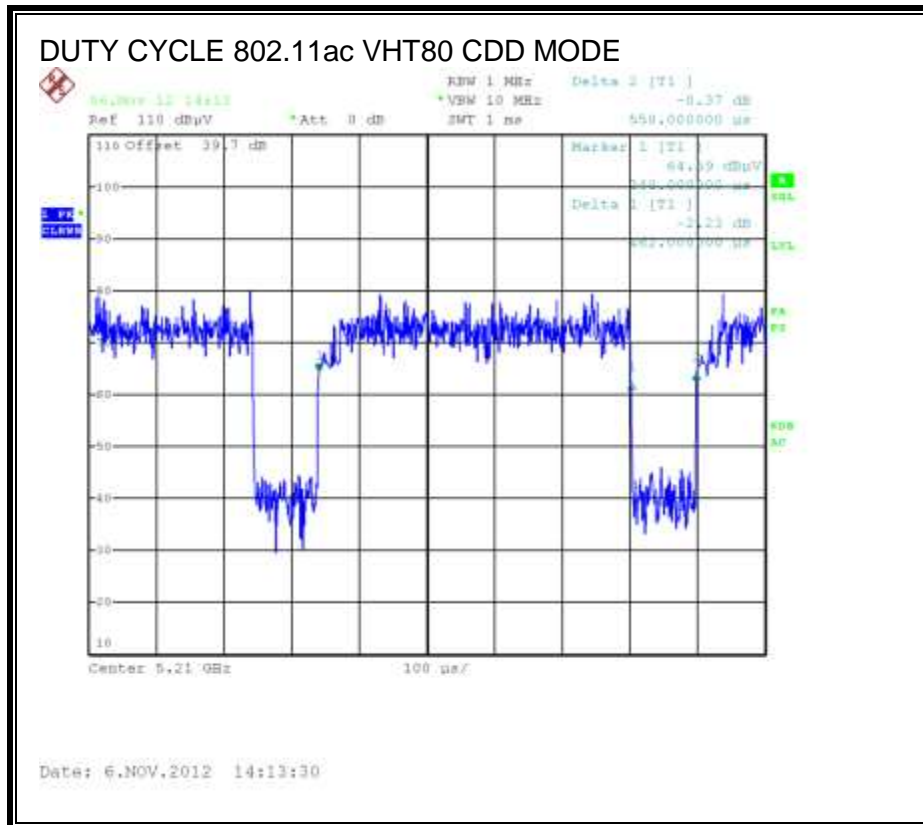
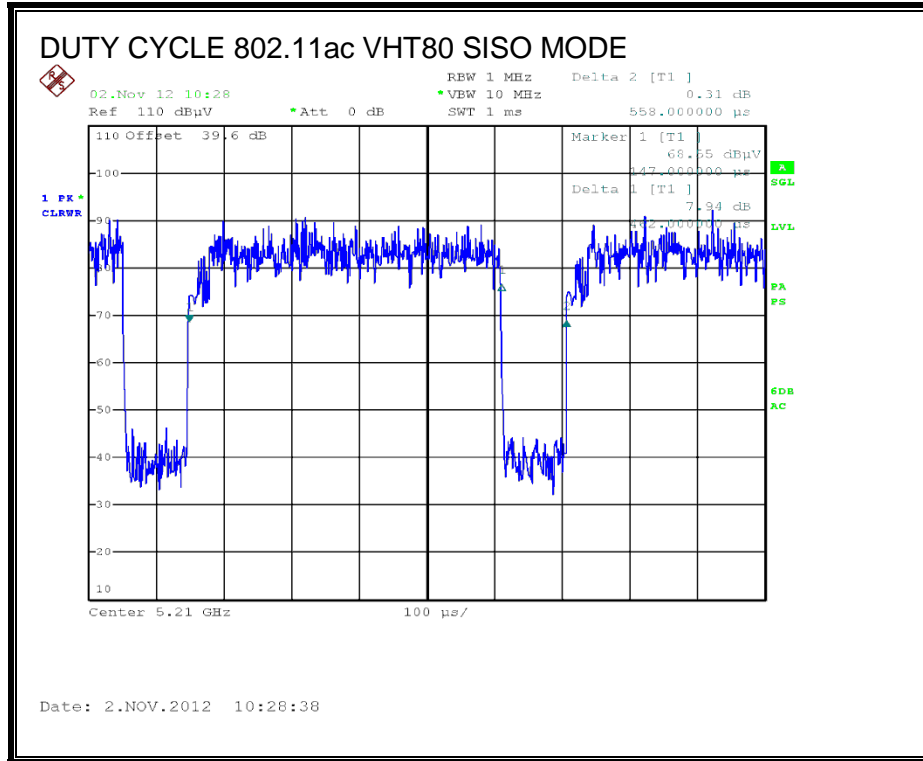
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b CDD	12.45	12.54	0.993	99.3%	0.00	0.0
802.11g Legacy	2.08	2.18	0.954	95.4%	0.20	0.5
802.11n HT20 CDD	1.94	2.04	0.951	95.1%	0.22	0.5
5GHz Band						
802.11a	2.08	2.19	0.950	95.0%	0.22	0.5
802.11n HT20 CDD	1.94	2.04	0.951	95.1%	0.22	0.5
802.11n HT20 STBC	1.93	2.04	0.949	94.9%	0.23	0.5
802.11n HT40 SISO	0.95	1.05	0.908	90.8%	0.42	1.0
802.11n HT40 CDD	0.95	1.05	0.908	90.8%	0.42	1.0
802.11n HT40 STBC	0.96	1.05	0.908	90.8%	0.42	1.0
802.11n AC80 SISO	0.46	0.56	0.828	82.8%	0.82	2.2
802.11n AC80 CDD	0.46	0.56	0.828	82.8%	0.82	2.2

7.1.2. DUTY CYCLE PLOTS









7.1.3. MEASUREMENT METHOD FOR POWER AND PPSD

KDB 789033 D01 v01r02:

For output power, Method PM as detailed in section C) 4) was used.

For PSD, Method SA-1 as detailed in section C) 3) b) was used.

7.1.4. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSION ABOVE 1 GHz

KDB 789033 D01 v01r02:

Method VB with Power RMS Averaging as detailed in section G) 6) d) was used.

7.2. 802.11a LEGACY 1TX MODE, 5.2 GHz BAND

7.2.1. 26 dB BANDWIDTH

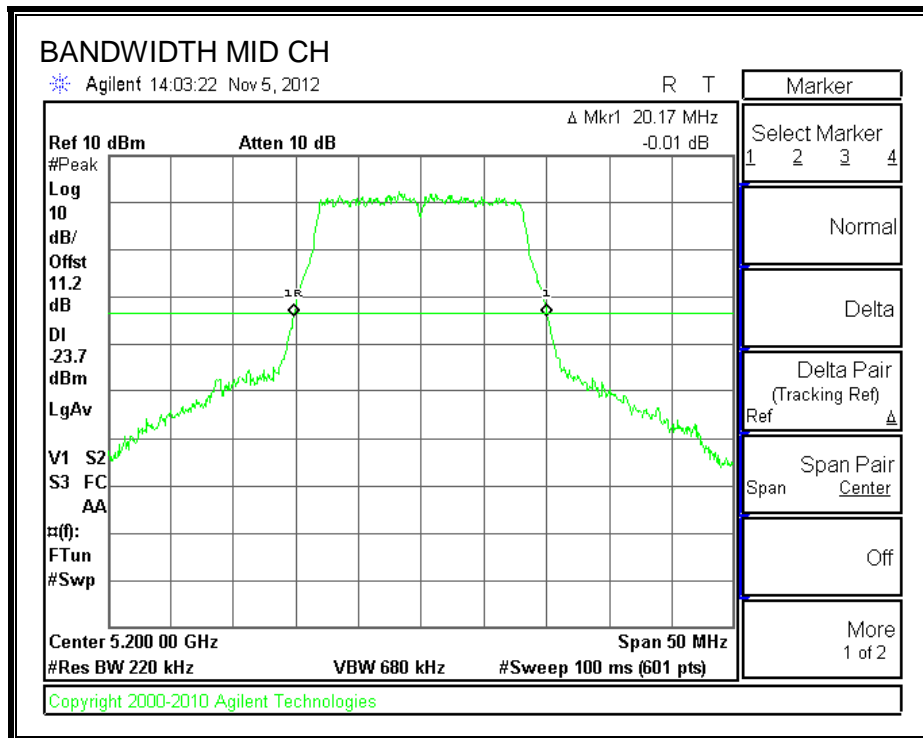
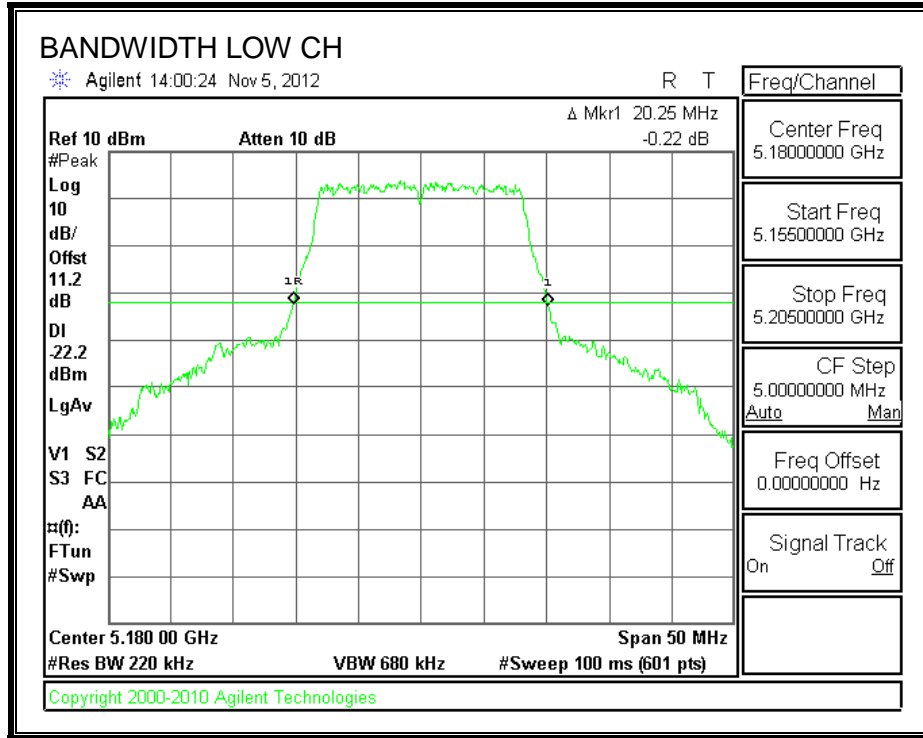
LIMITS

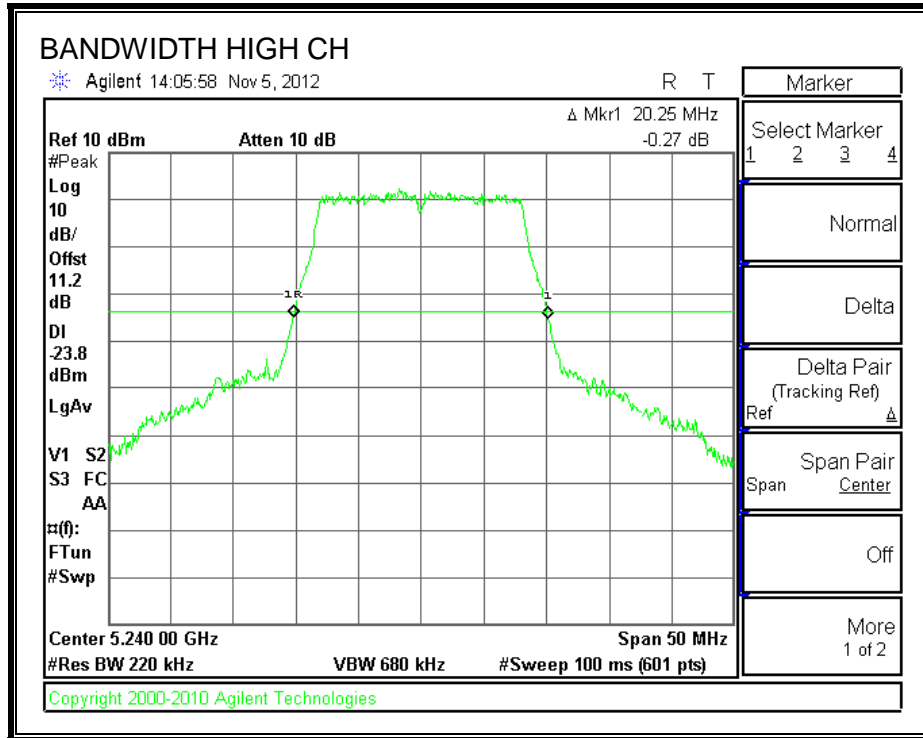
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.25
Mid	5200	20.17
High	5240	20.25

26 dB BANDWIDTH





7.2.2. 99% BANDWIDTH

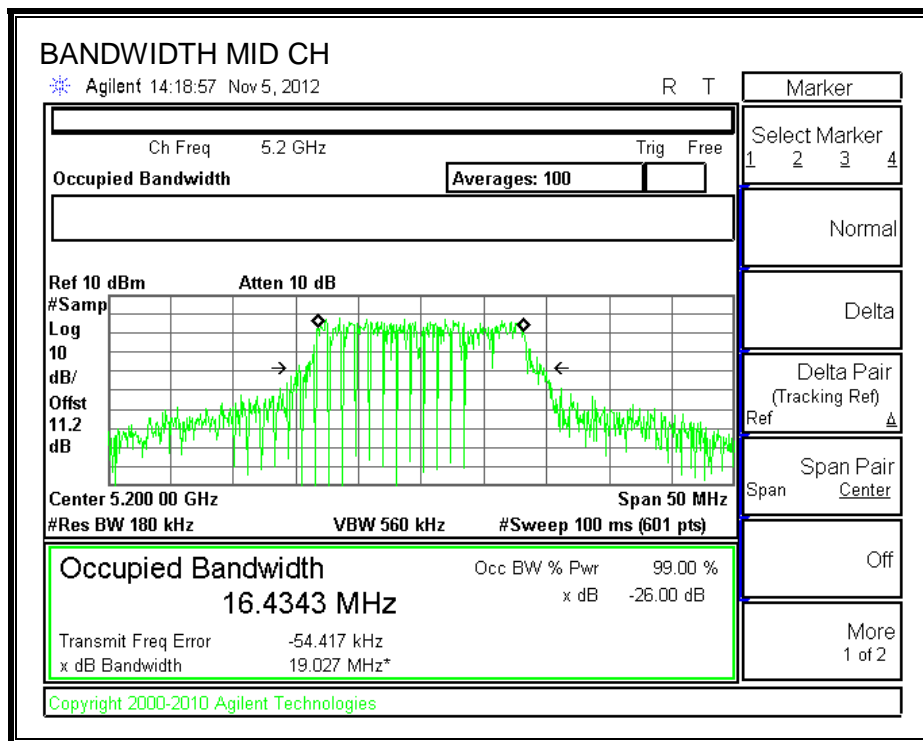
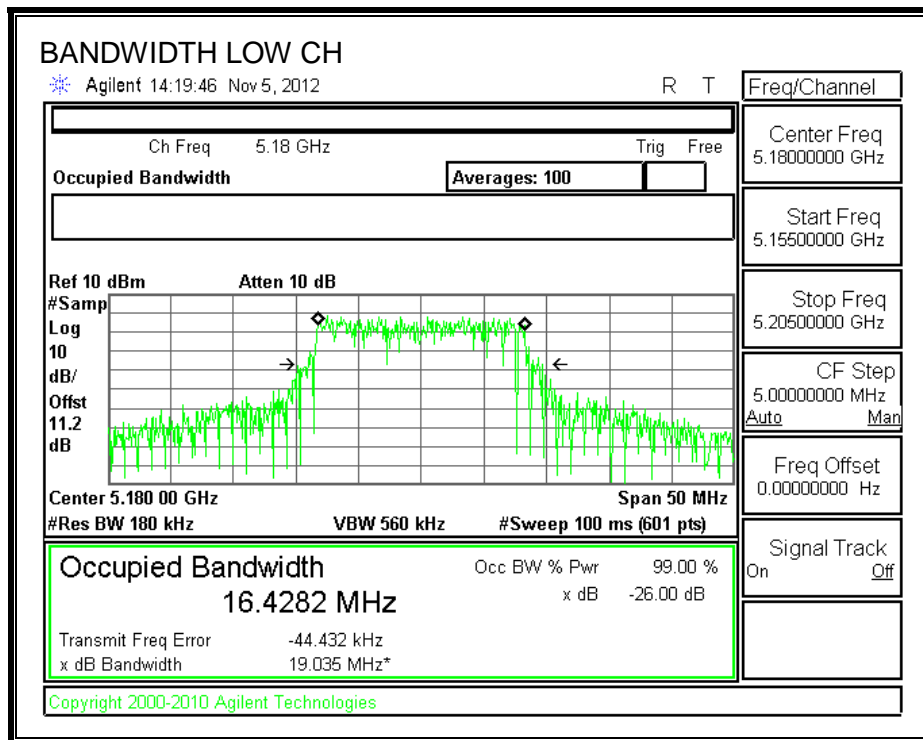
LIMITS

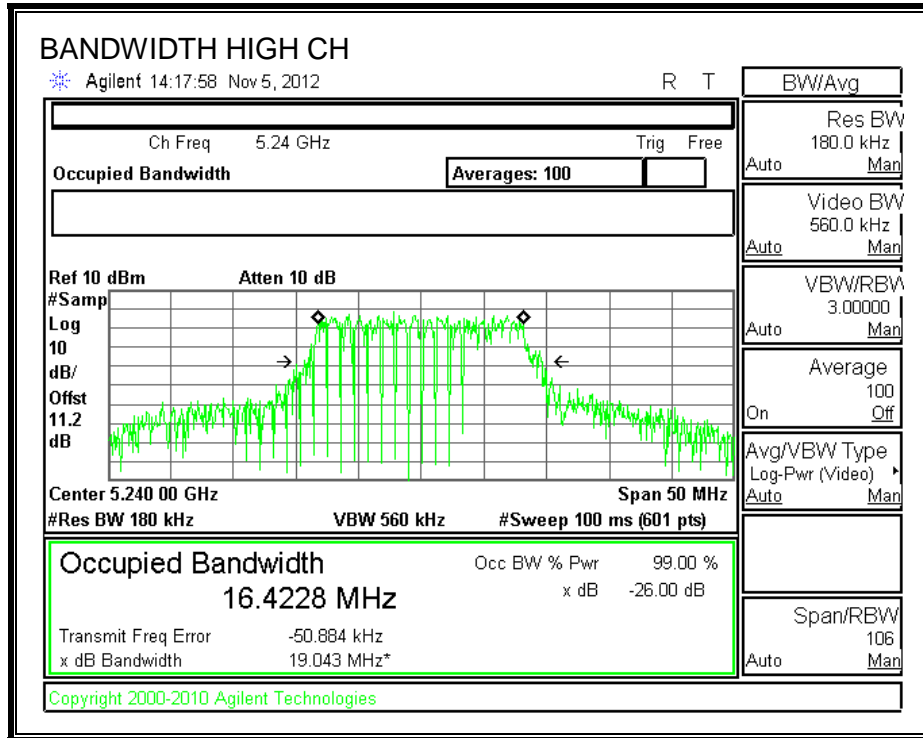
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.4282
Mid	5200	16.4343
High	5240	16.4228

99% BANDWIDTH





7.2.3. OUTPUT POWER & PPSD

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	5180	20.25	16.4282	7.04
Mid	5200	20.17	16.4343	7.04
High	5240	20.25	16.4228	7.04

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)	PPSD Limit (dBm)
Low	5180	15.96	22.16	15.12	15.12	2.96	10.00	2.96
Mid	5200	15.96	22.16	15.12	15.12	2.96	10.00	2.96
High	5240	15.96	22.15	15.11	15.11	2.96	10.00	2.96

Duty Cycle CF (dB)	0.22	Included in Calculations of PPSD
---------------------------	------	---

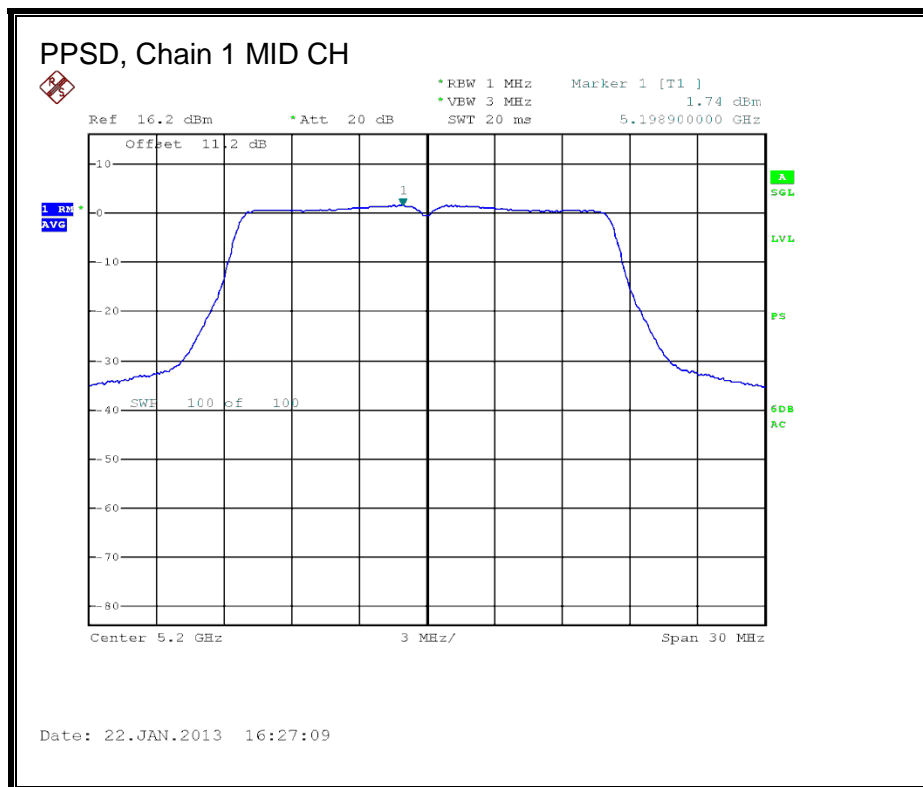
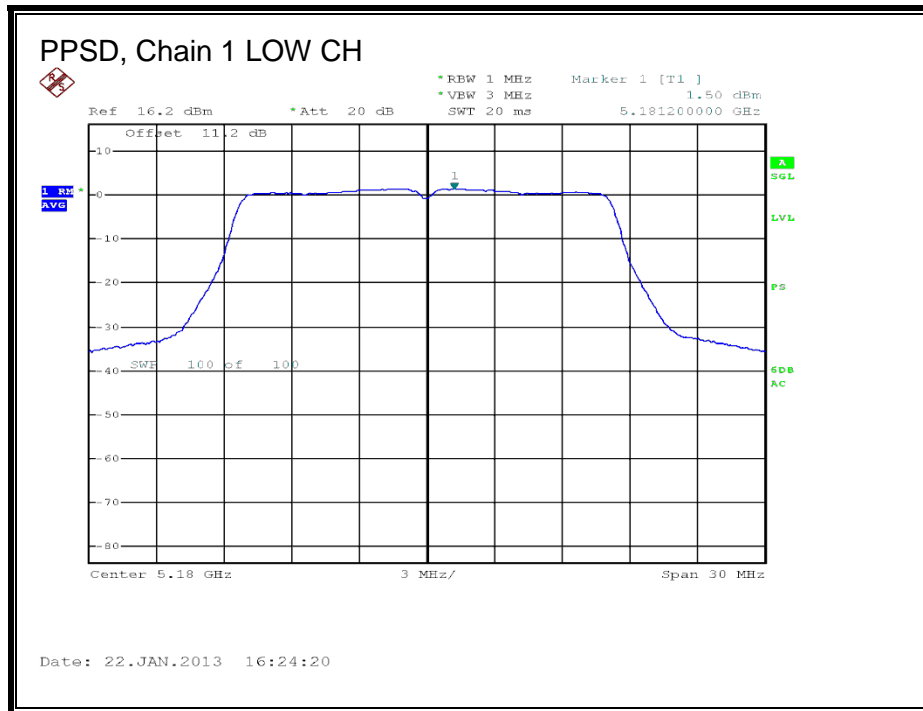
Output Power Results

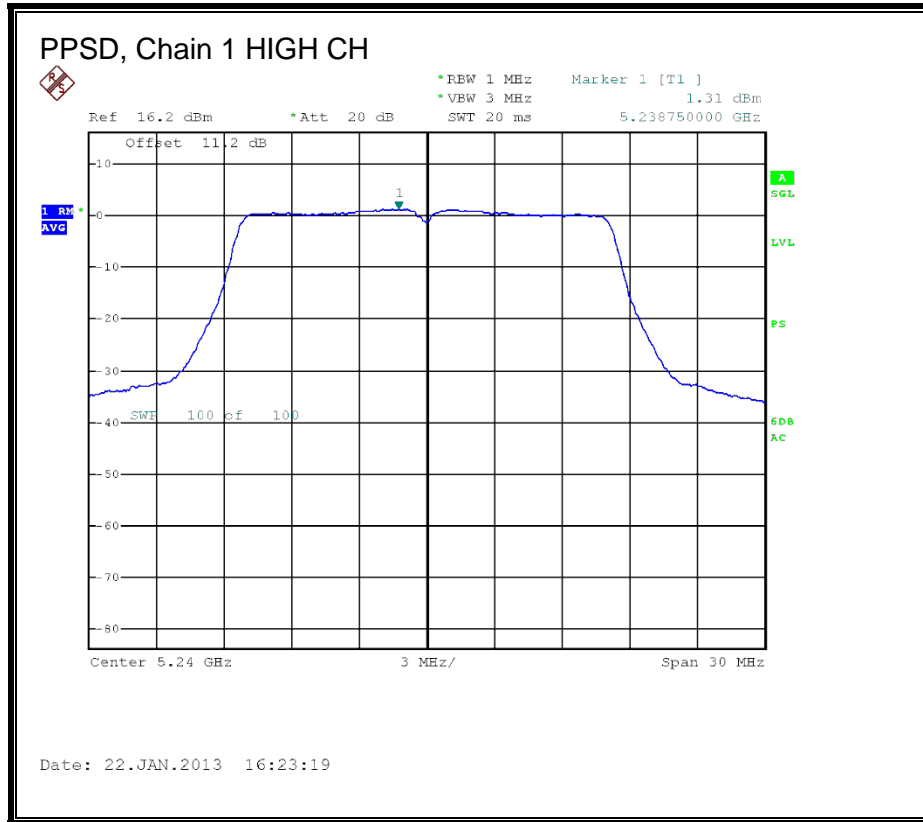
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	15.10	15.10	15.12	-0.02
Mid	5200	14.95	14.95	15.12	-0.17
High	5240	15.02	15.02	15.11	-0.09

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	1.50	1.72	2.96	-1.24
Mid	5200	1.74	1.96	2.96	-1.00
High	5240	1.31	1.53	2.96	-1.43

PPSD, Chain 1





7.3. 802.11a CDD 2TX MODE, 5.2 GHz BAND

Covered by testing 802.11n HT20 CDD 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.4. 802.11a CDD 3TX MODE, 5.2 GHz BAND

Covered by testing 802.11n HT20 CDD 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.5. 802.11a BF 2TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.6. 802.11a BF 3TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.7. 802.11n HT20 1TX MODE, 5.2 GHz BAND

Covered by testing 802.11a Legacy 1TX mode at the same power level.

7.8. 802.11n HT20 CDD 2TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.9. 802.11n HT20 CDD 3TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.10. 802.11n HT20 STBC 2TX MODE, 5.2 GHz BAND

7.10.1. 26 dB BANDWIDTH

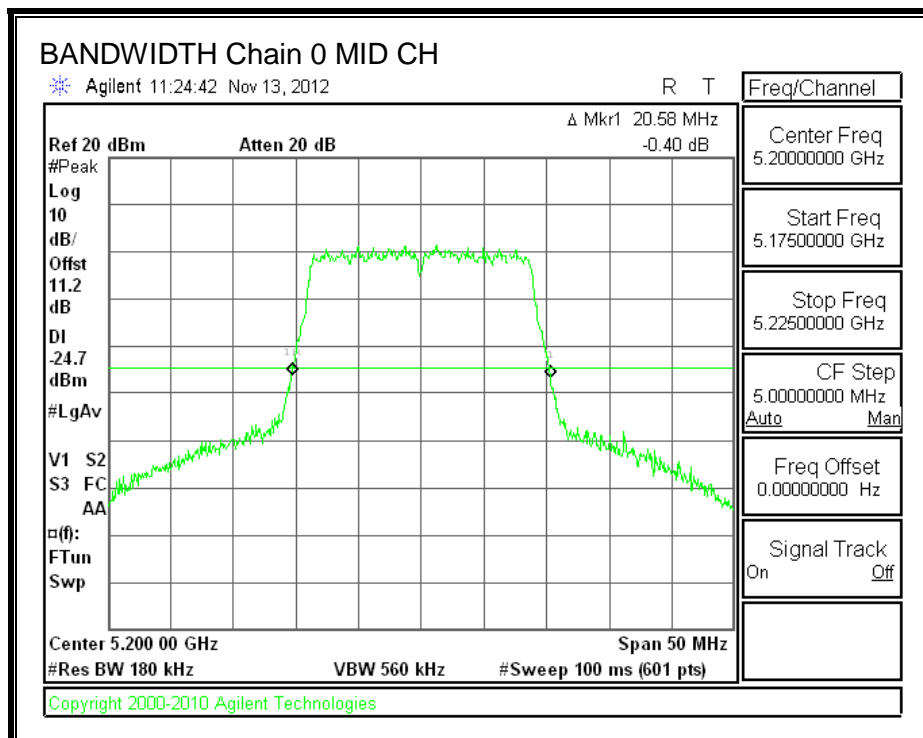
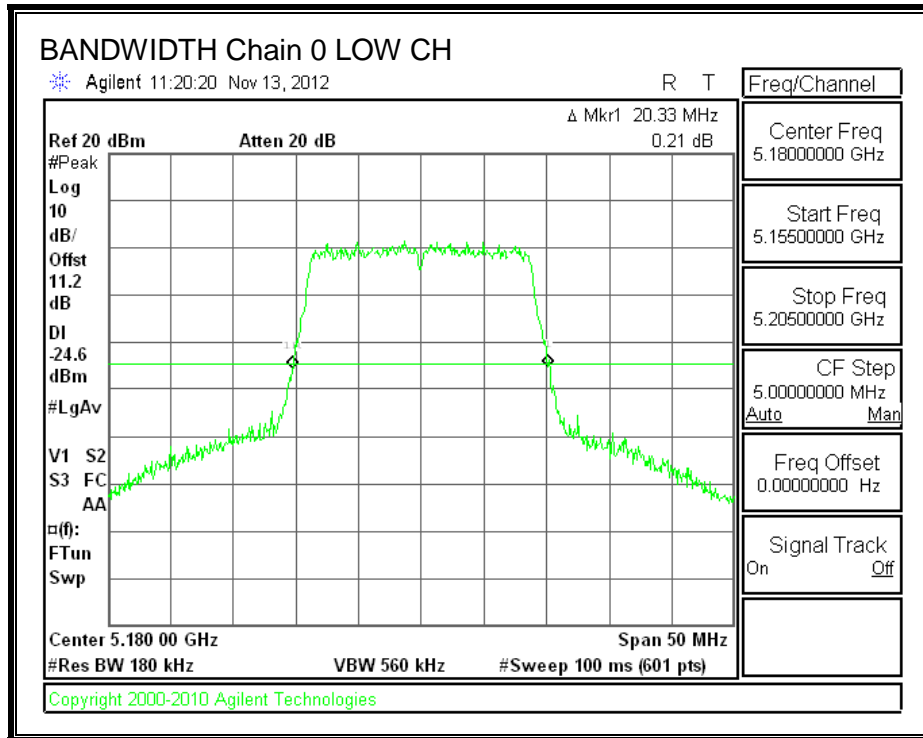
LIMITS

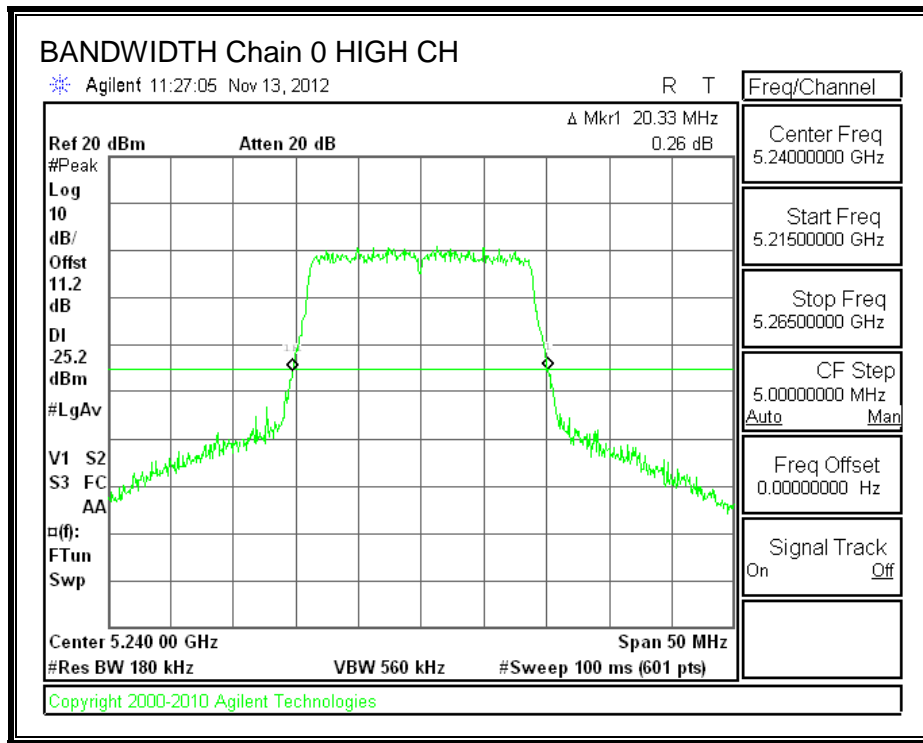
None; for reporting purposes only.

RESULTS

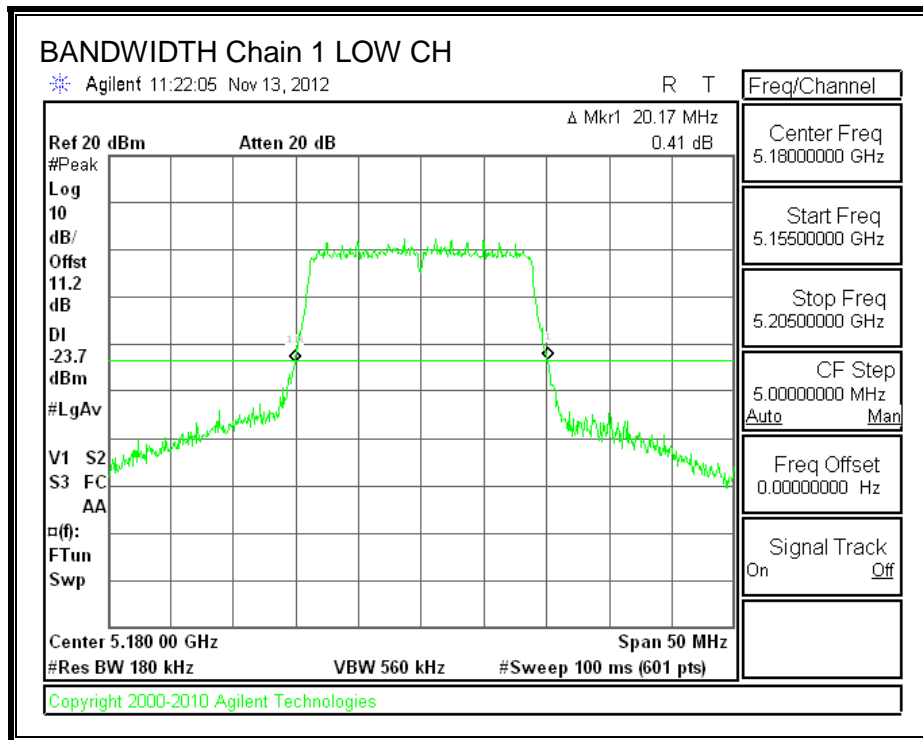
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	20.33	20.17
Mid	5200	20.58	20.42
High	5240	20.33	20.17

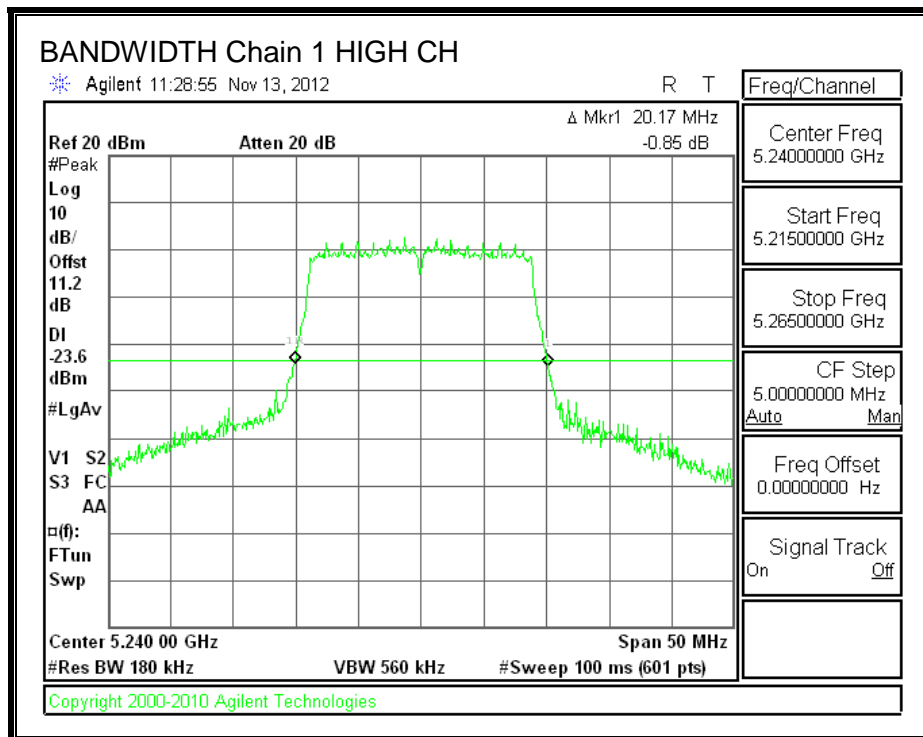
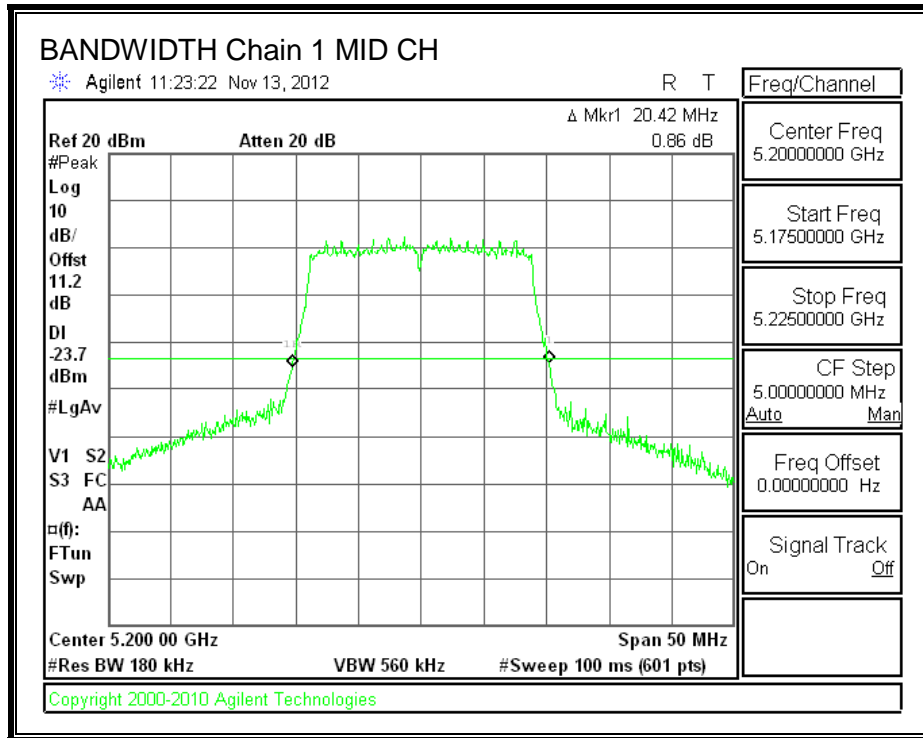
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





7.10.2. **99% BANDWIDTH**

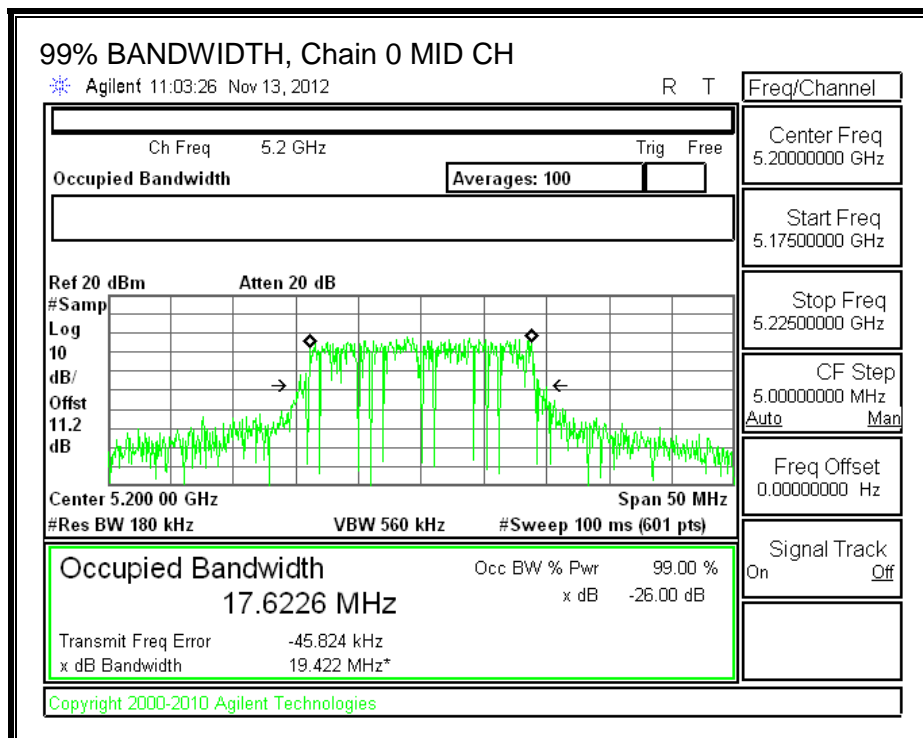
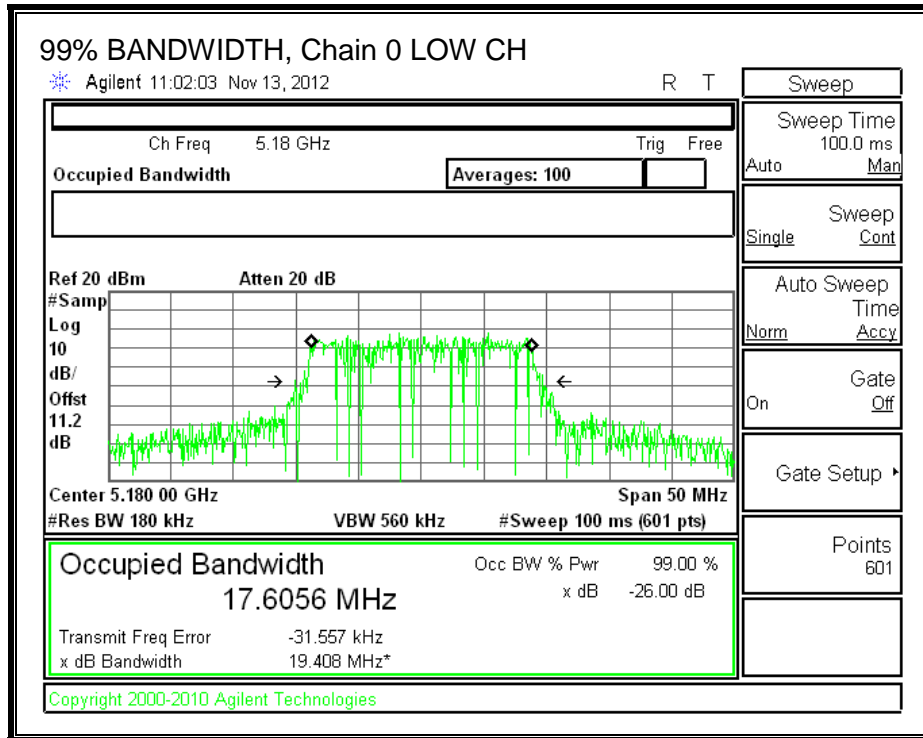
LIMITS

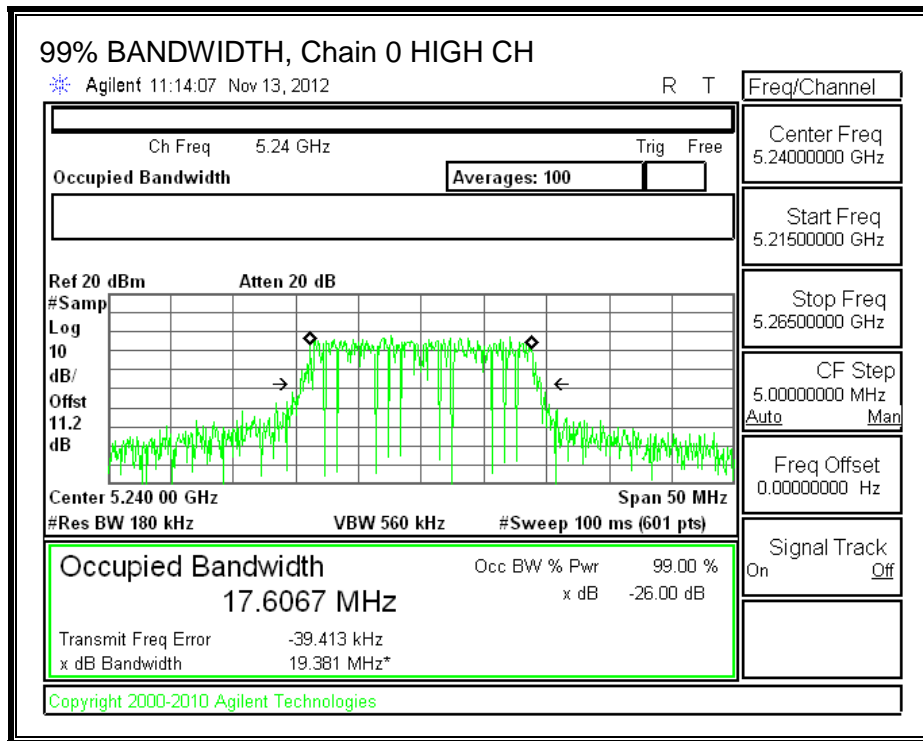
None; for reporting purposes only.

RESULTS

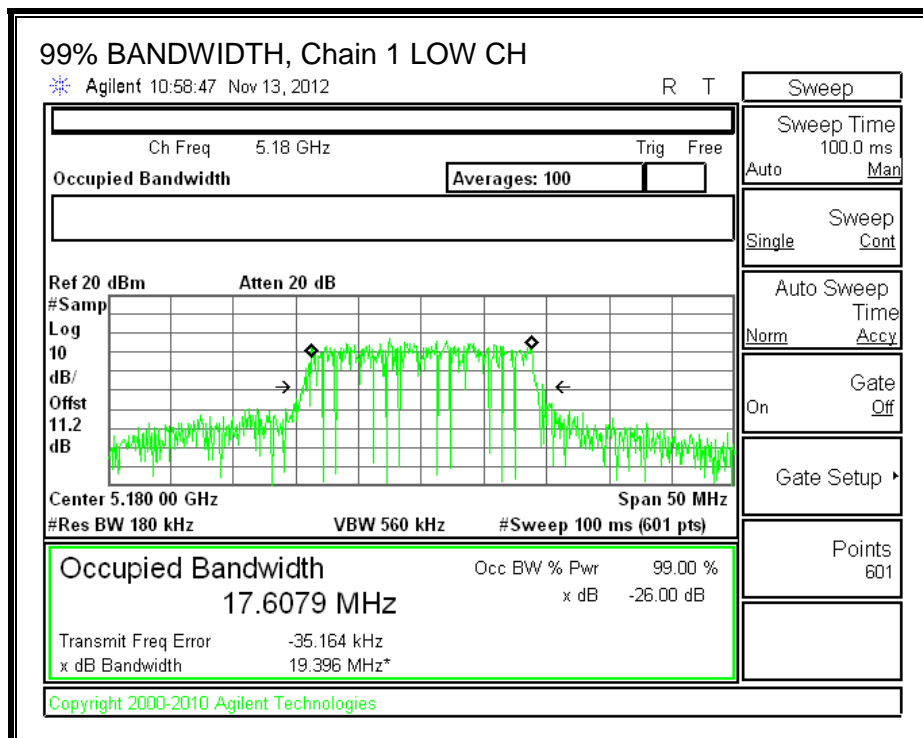
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.6056	17.6079
Mid	5200	17.6226	17.6169
High	5240	17.6067	17.6173

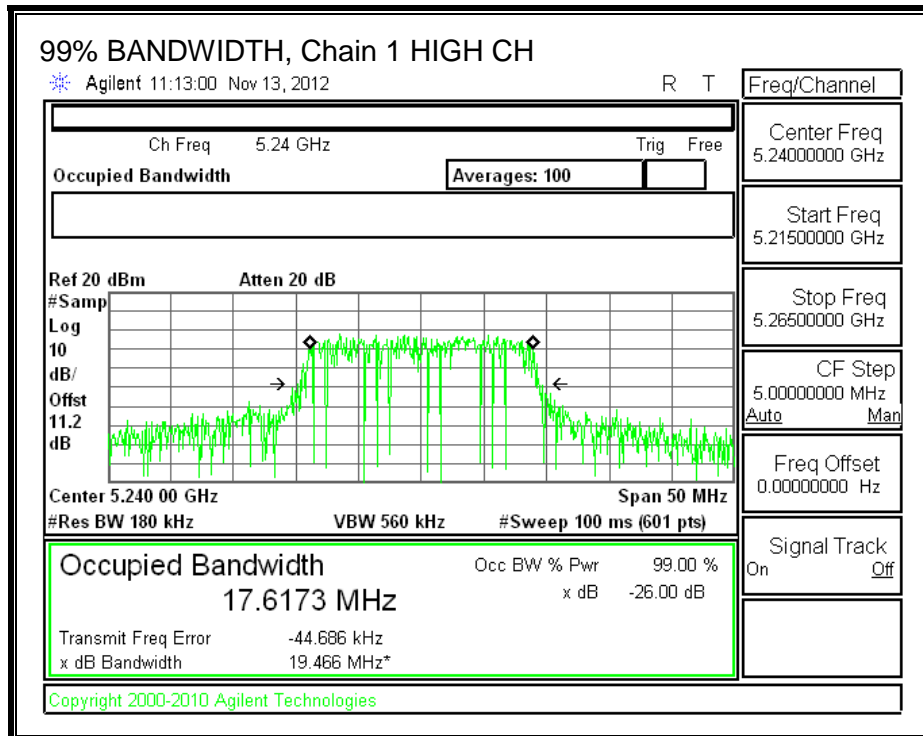
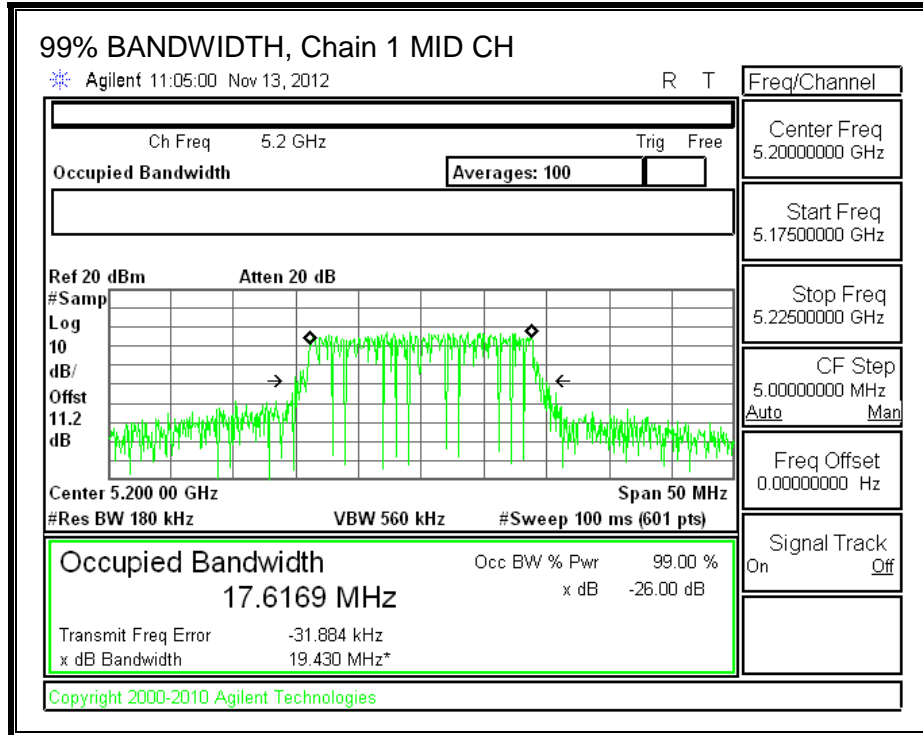
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





7.10.3. OUTPUT POWER AND PPSD

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)
7.04	6.7	6.87

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.17	17.6056	6.87
Mid	5200	20.42	17.6169	6.87
High	5240	20.17	17.6067	6.87

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)	PPSD Limit (dBm)
Low	5180	16.13	22.46	15.59	15.59	3.13	10.00	3.13
Mid	5200	16.13	22.46	15.59	15.59	3.13	10.00	3.13
High	5240	16.13	22.46	15.59	15.59	3.13	10.00	3.13

Duty Cycle CF (dB)	0.24	Included in Calculations of PPSD
---------------------------	------	---

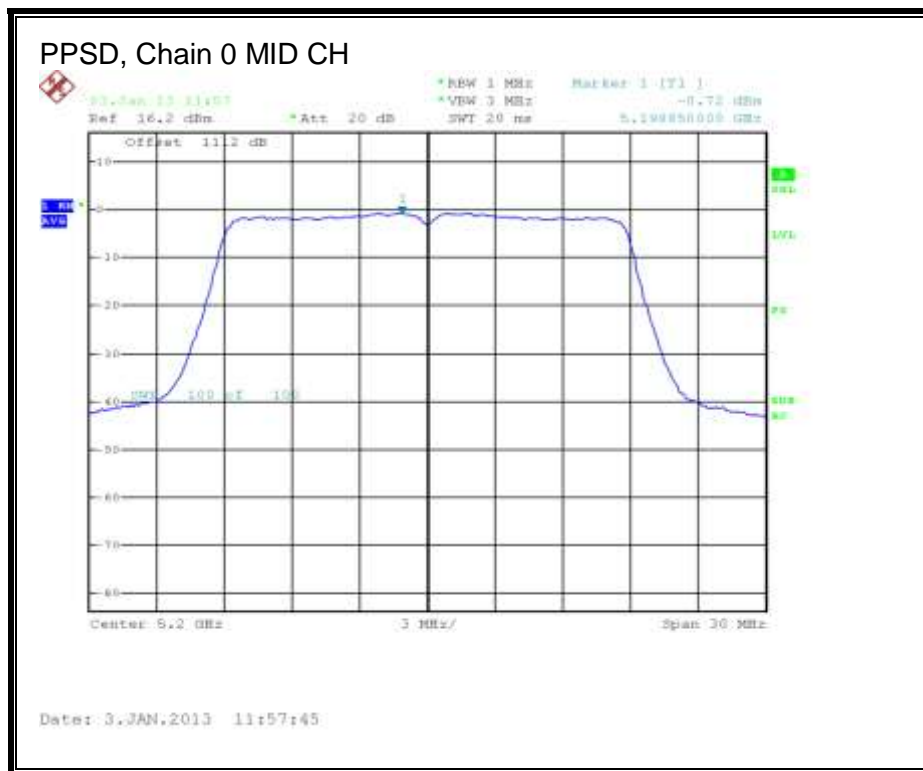
Output Power Results

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	12.46	12.51	15.50	15.59	-0.09
Mid	5200	12.51	12.56	15.55	15.59	-0.04
High	5240	12.51	12.52	15.53	15.59	-0.06

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.75	-0.44	2.66	3.13	-0.47
Mid	5200	-0.72	-0.50	2.64	3.13	-0.49
High	5240	-0.76	-0.97	2.39	3.13	-0.74

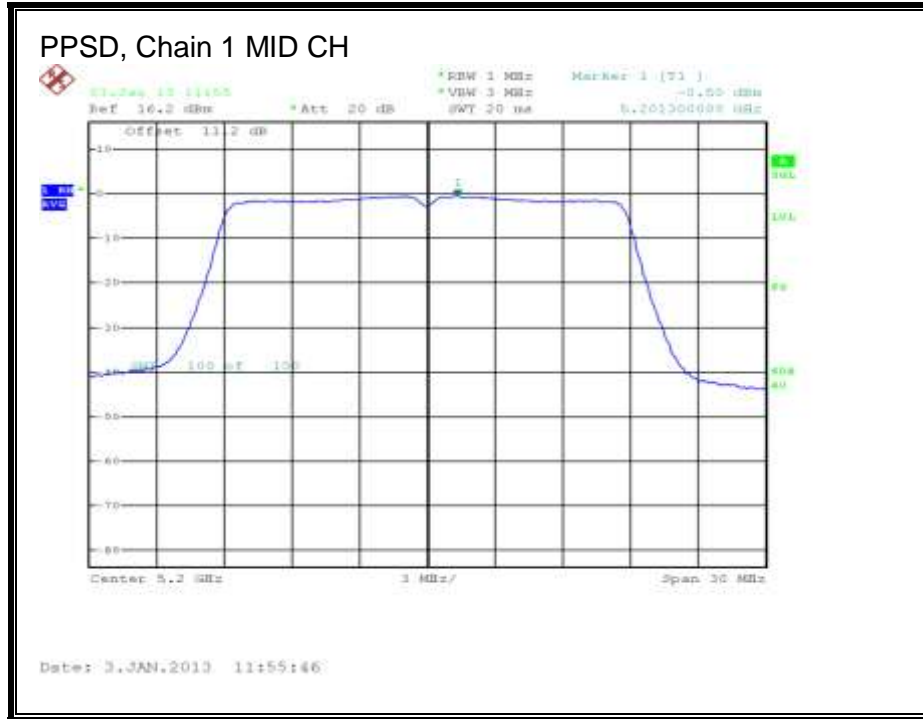
PPSD, Chain 0





PPSD, Chain 1





7.11. 802.11n HT20 STBC 3TX MODE, 5.2 GHz BAND

7.11.1. 26 dB BANDWIDTH

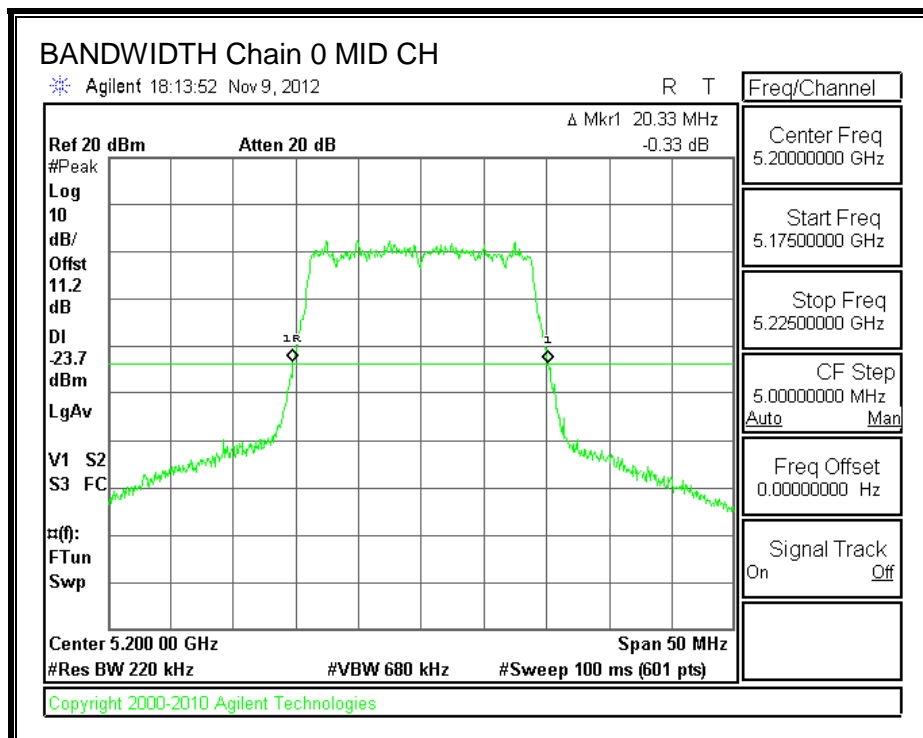
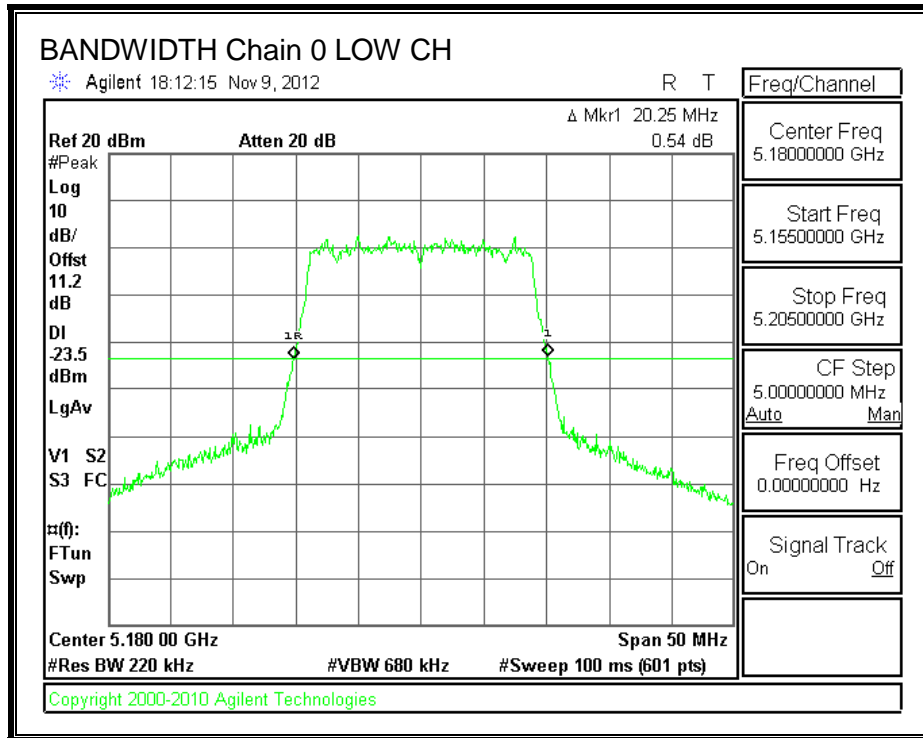
LIMITS

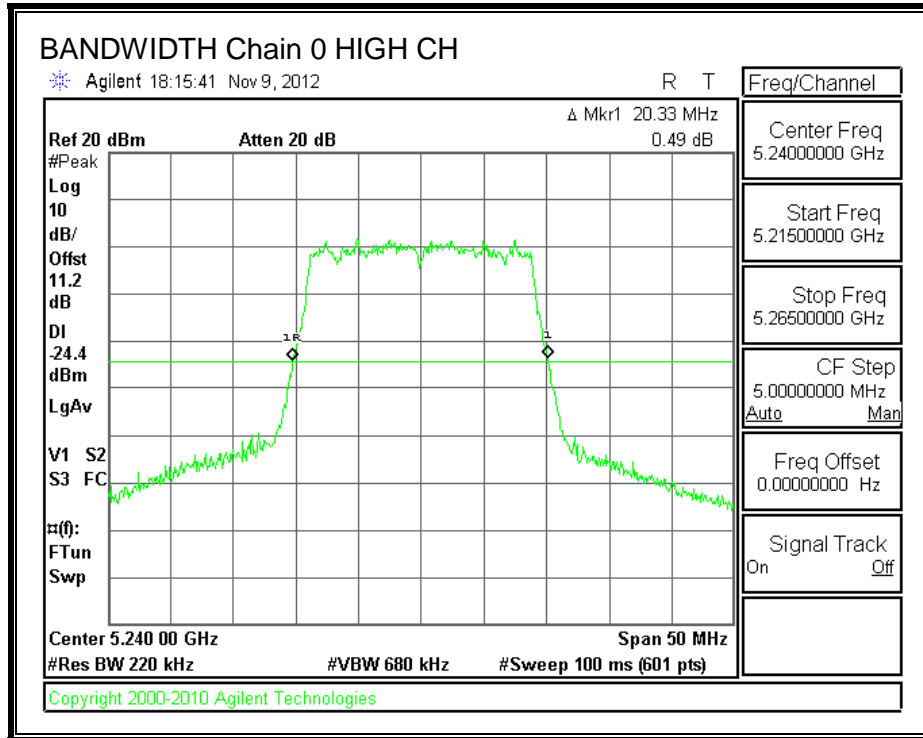
None; for reporting purposes only.

RESULTS

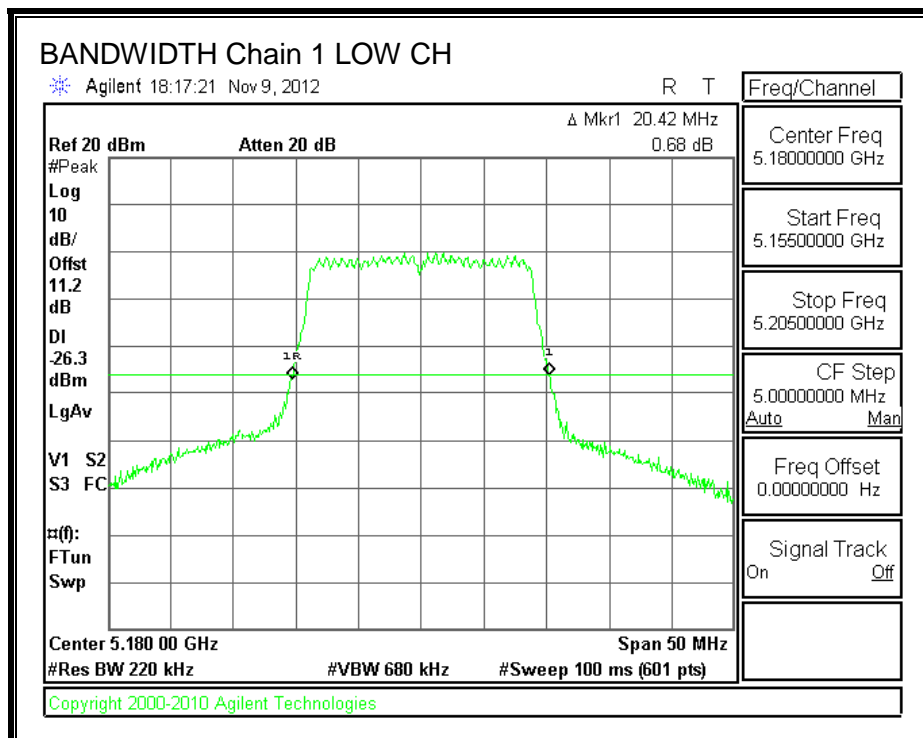
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	20.25	20.42	20.25
Mid	5200	20.33	20.58	20.17
High	5240	20.33	20.42	20.25

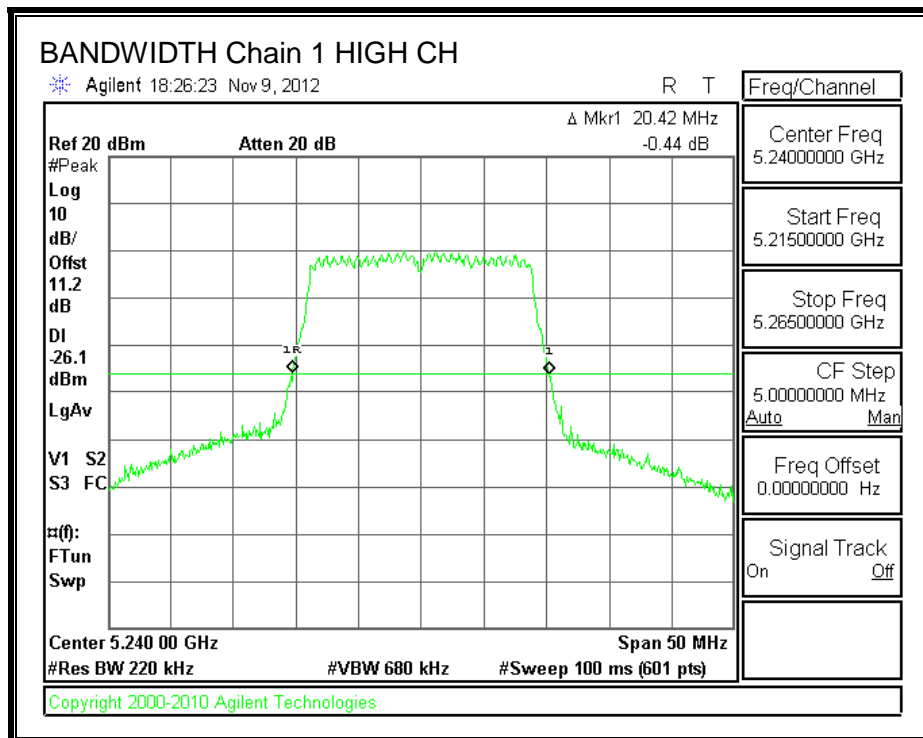
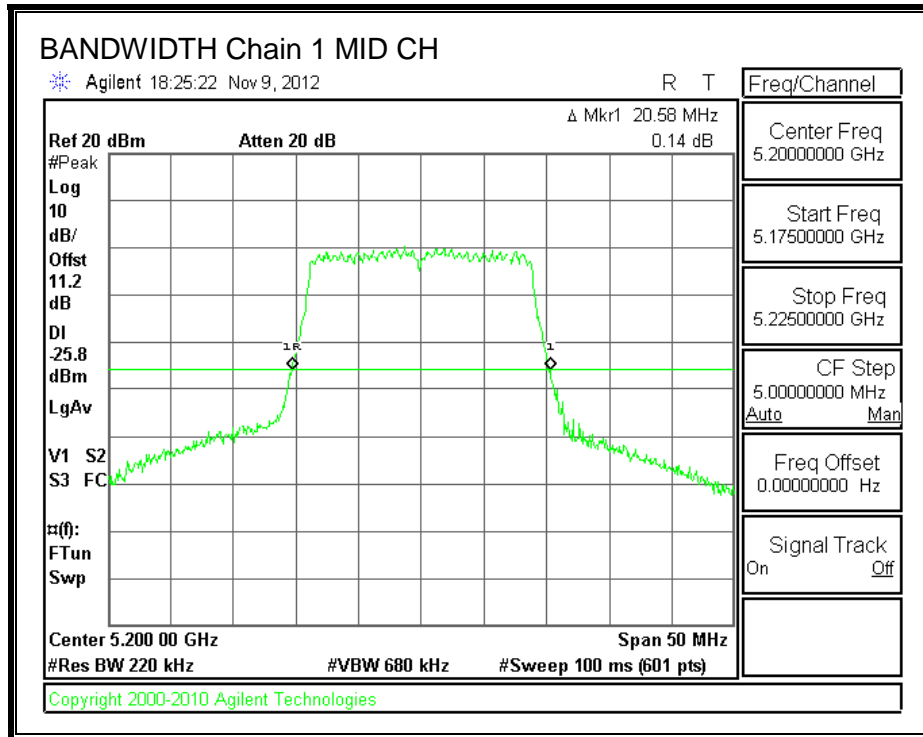
26 dB BANDWIDTH, Chain 0



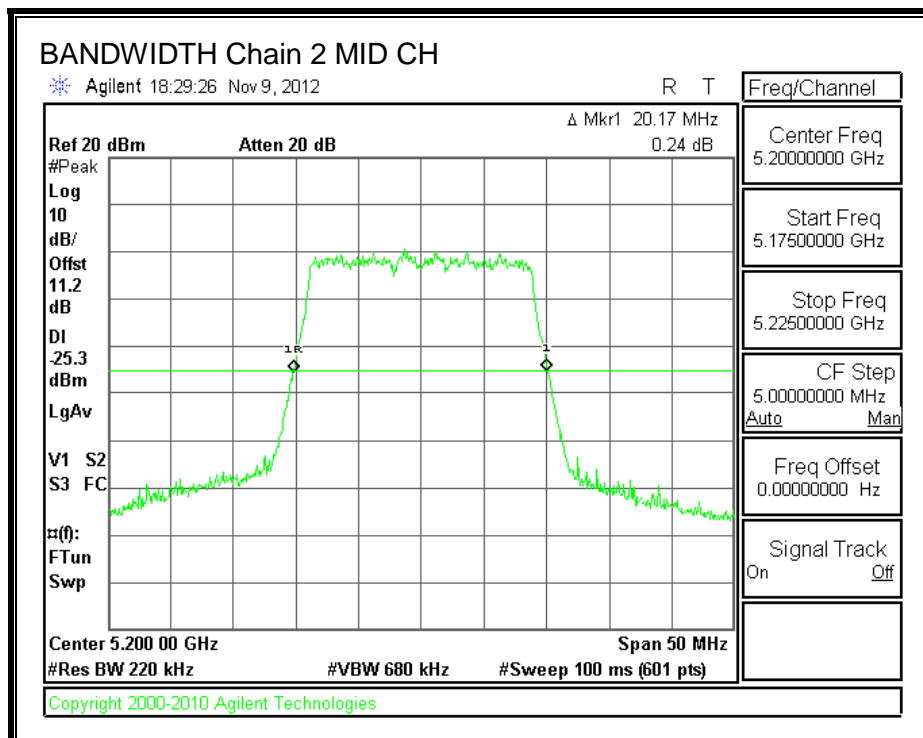
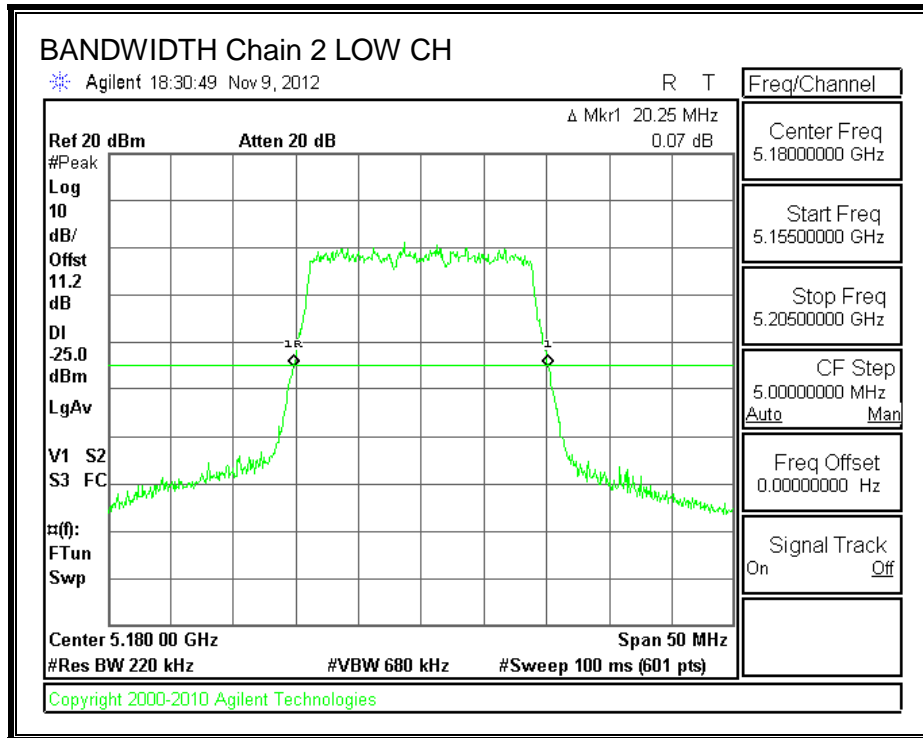


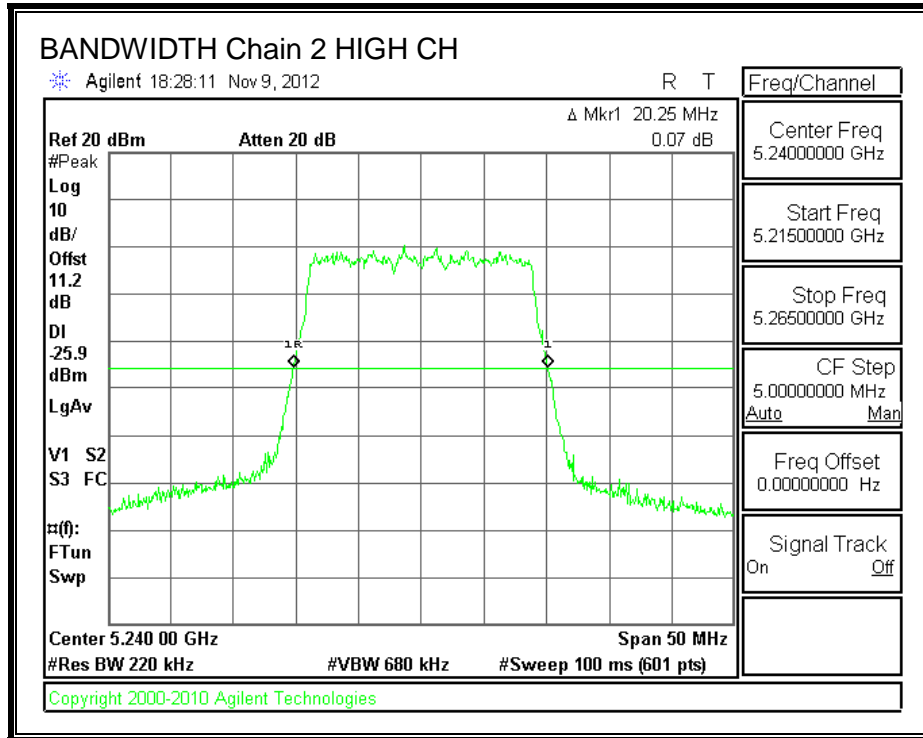
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





7.11.2. **99% BANDWIDTH**

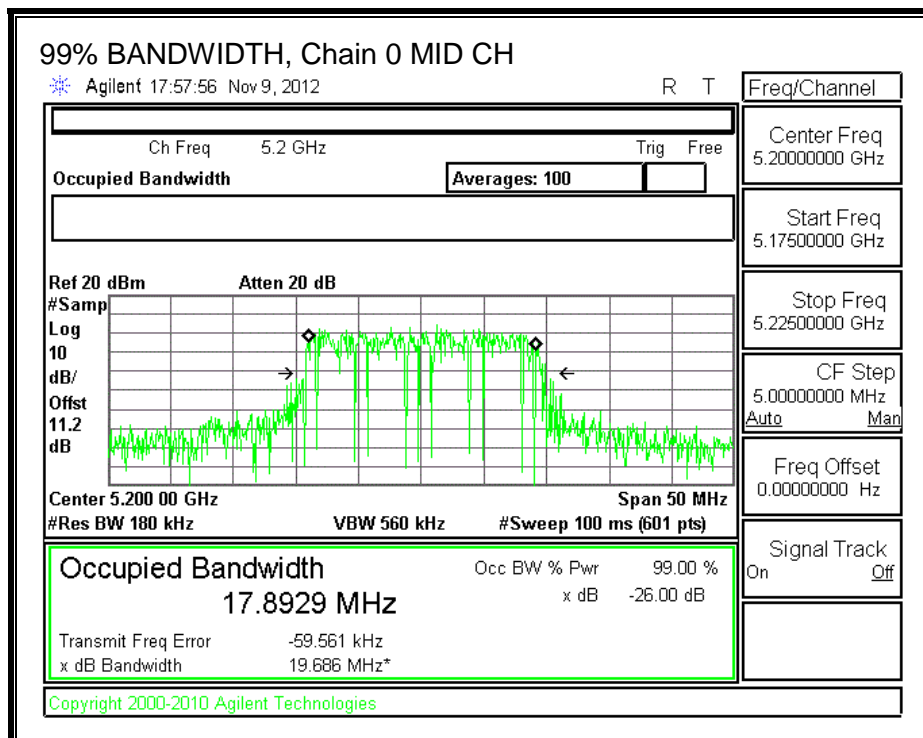
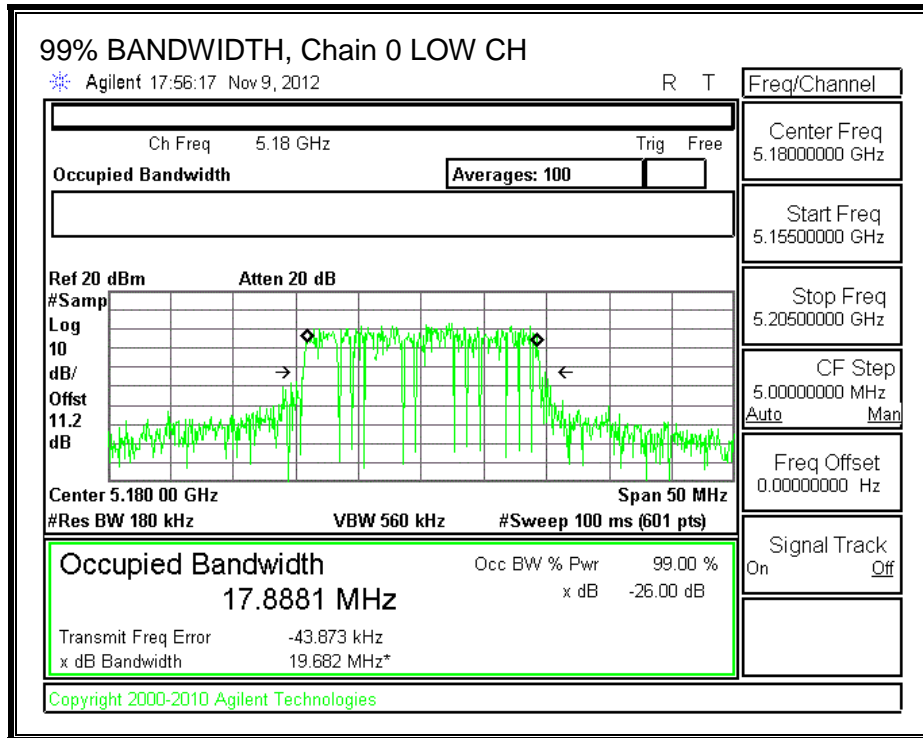
LIMITS

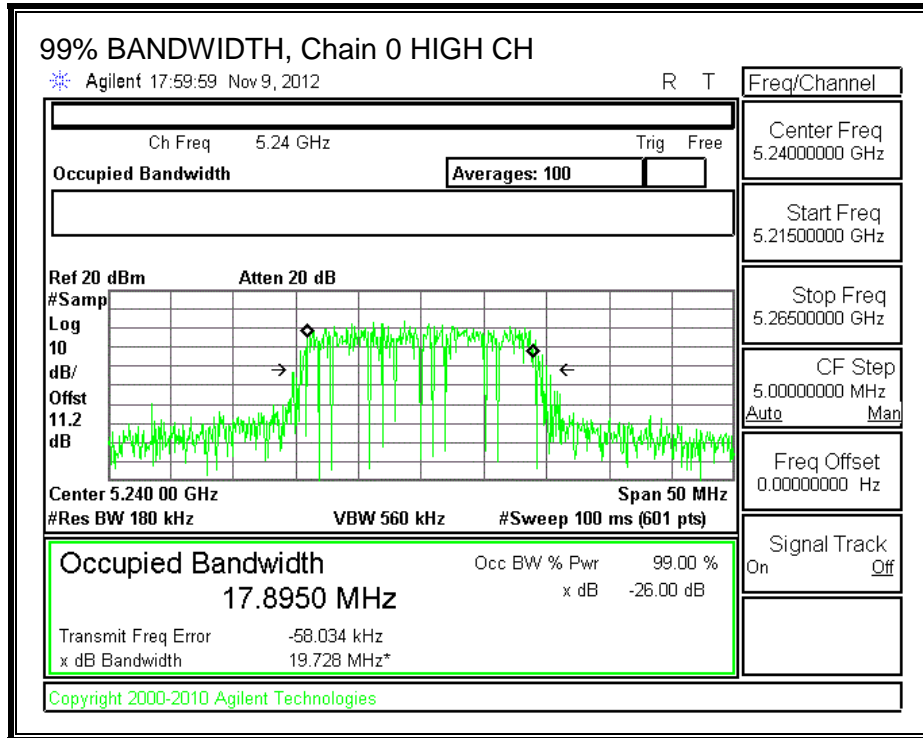
None; for reporting purposes only.

RESULTS

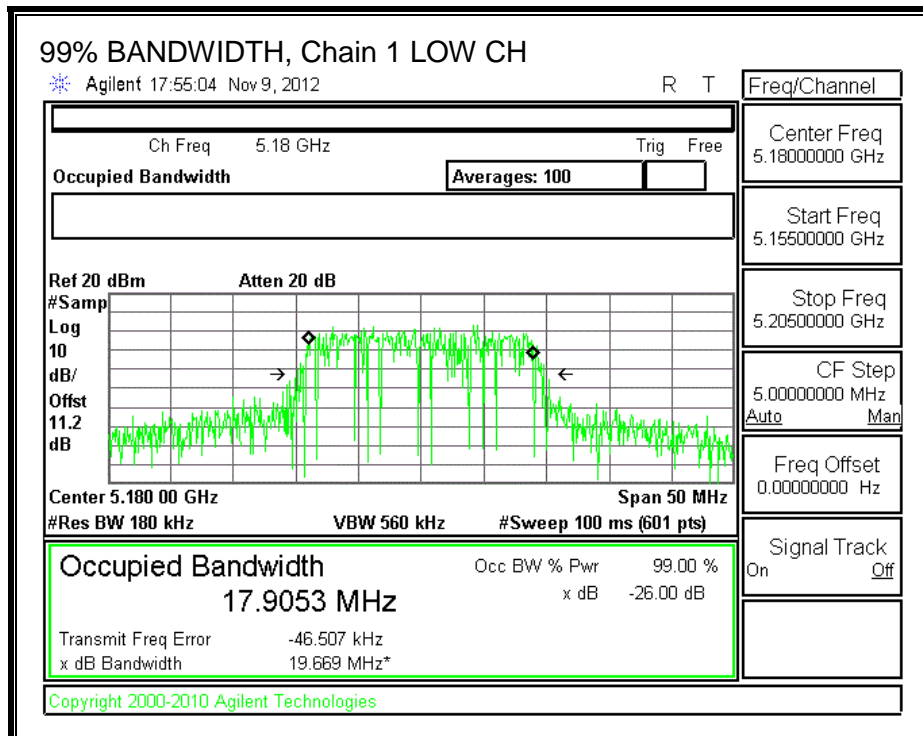
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.8881	17.9053	17.8894
Mid	5200	17.8929	17.9320	17.8686
High	5240	17.8950	17.9245	17.8993

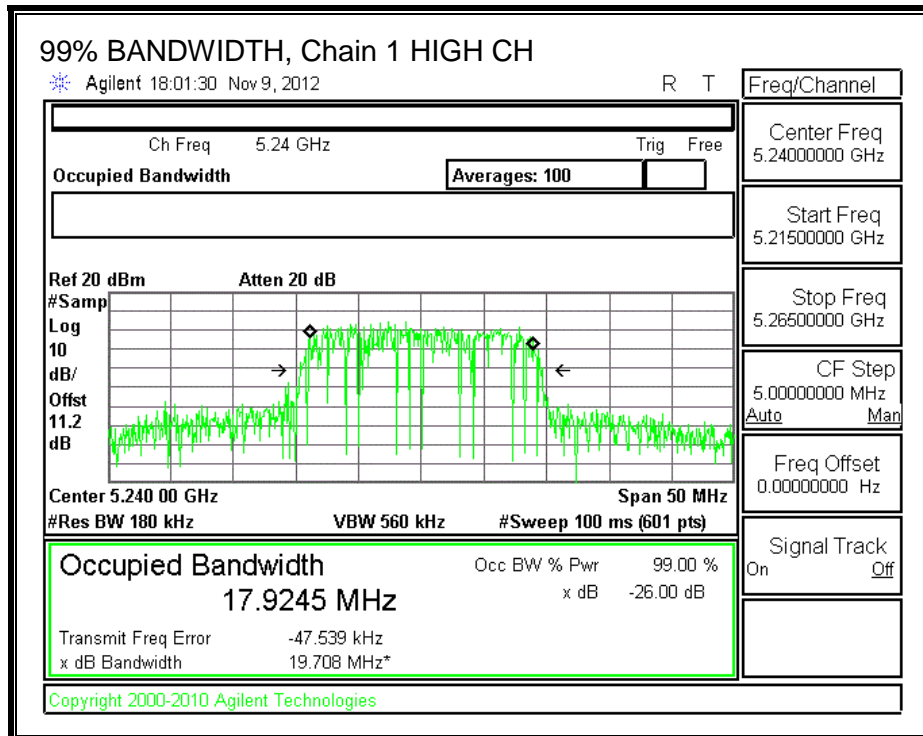
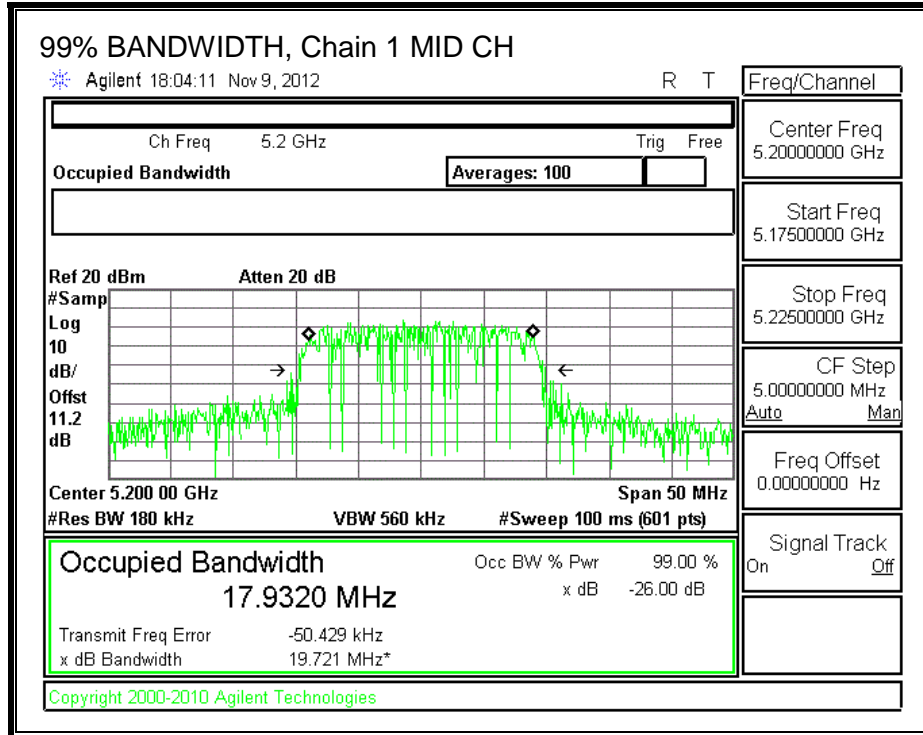
99% BANDWIDTH, Chain 0



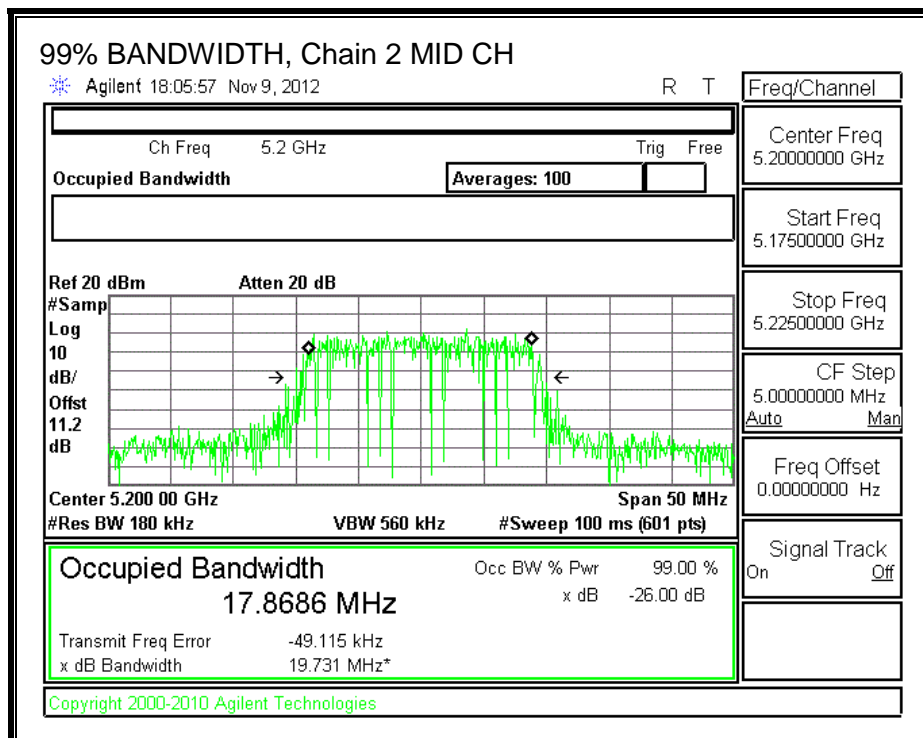
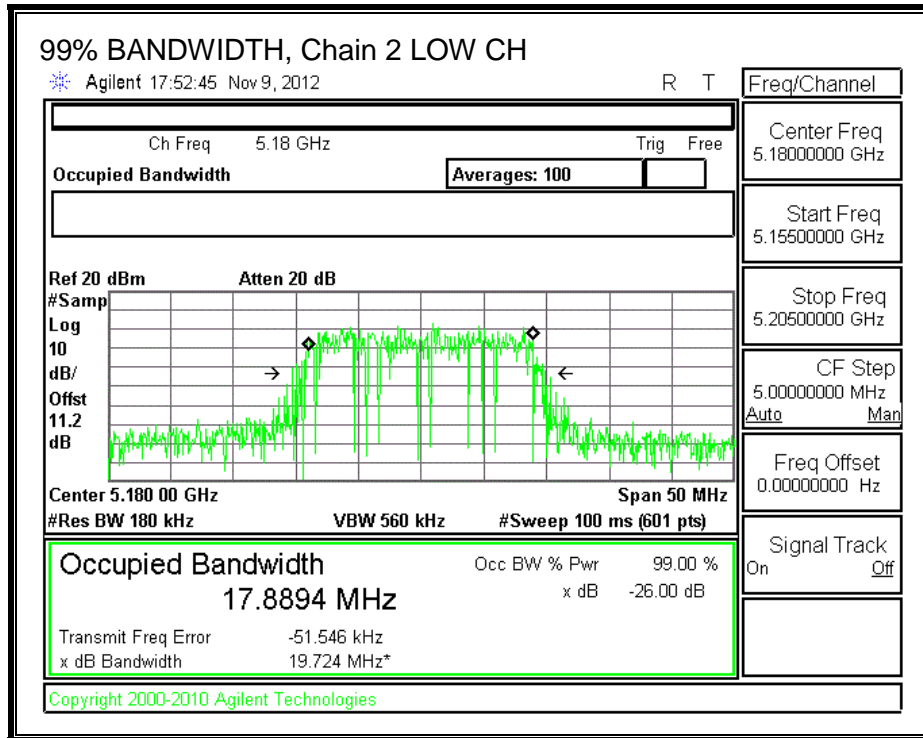


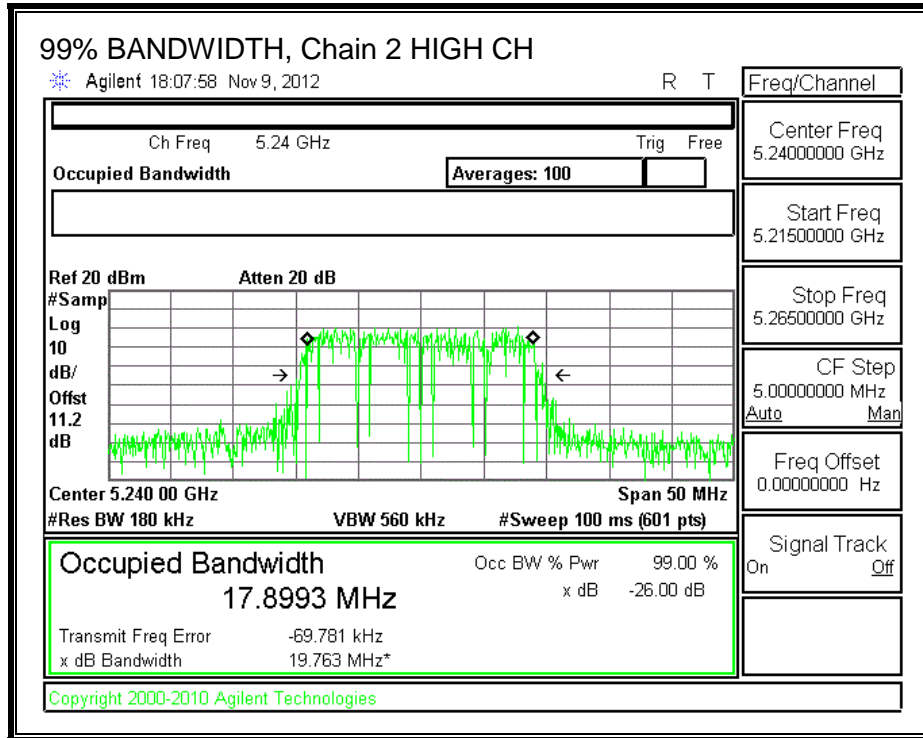
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





7.11.3. **OUTPUT POWER AND PPSD**

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)
7.04	6.70	3.79	6.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.25	17.8881	6.07
Mid	5200	20.42	17.8686	6.07
High	5240	20.17	17.8950	6.07

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)	PPSD Limit (dBm)
Low	5180	16.93	22.53	16.46	16.46	3.93	10.00	3.93
Mid	5200	16.93	22.52	16.45	16.45	3.93	10.00	3.93
High	5240	16.93	22.53	16.46	16.46	3.93	10.00	3.93

Duty Cycle CF (dB)	0.24	Included in Calculations of PPSD
---------------------------	------	---

Output Power Results

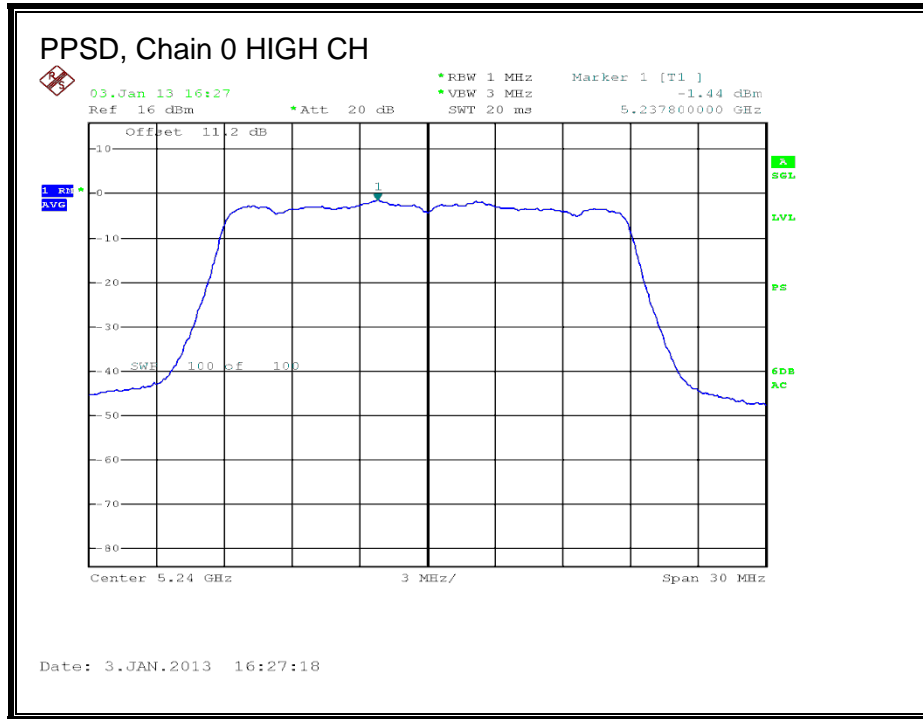
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.50	12.06	11.30	16.40	16.46	-0.05
Mid	5200	11.27	12.01	11.56	16.40	16.45	-0.06
High	5240	11.36	12.10	11.40	16.40	16.46	-0.05

PPSD Results

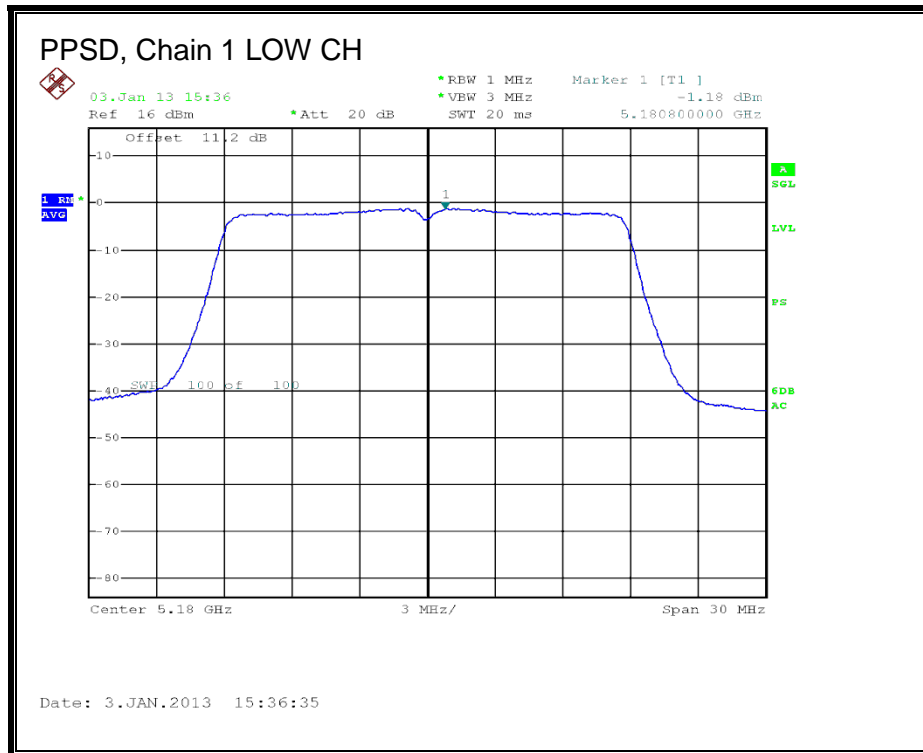
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-1.01	-1.18	-1.52	3.78	3.93	-0.15
Mid	5200	-1.01	-1.16	-1.50	3.79	3.93	-0.14
High	5240	-1.44	-1.57	-1.99	3.35	3.93	-0.58

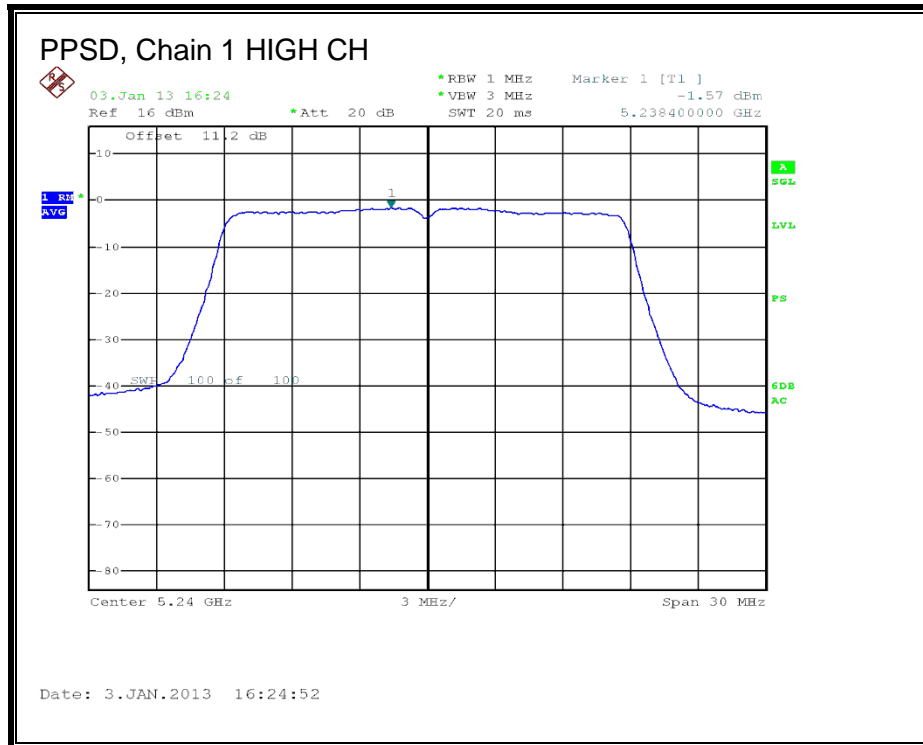
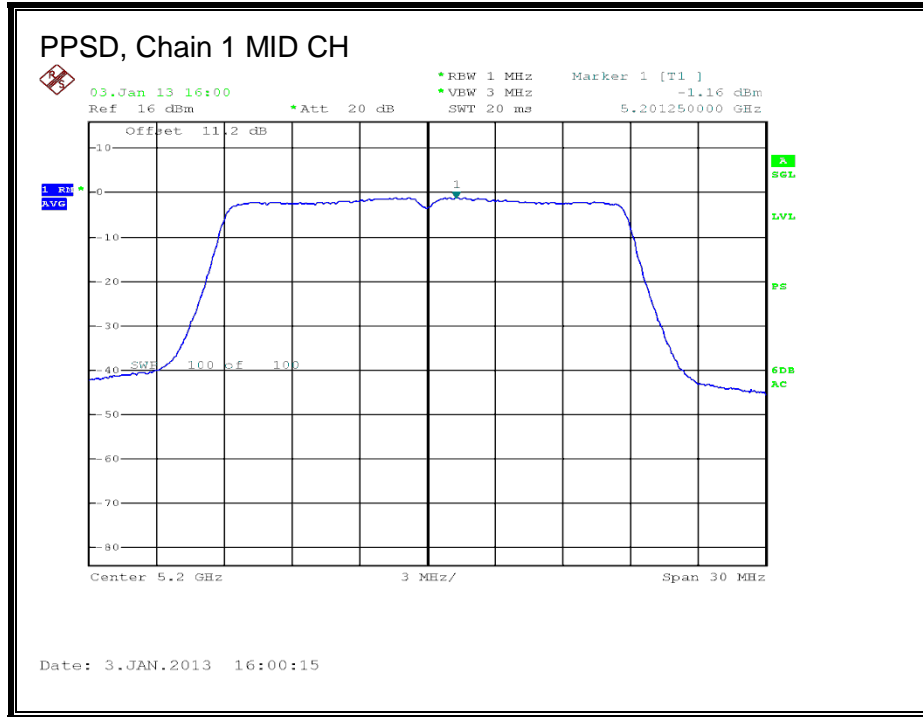
PPSD, Chain 0



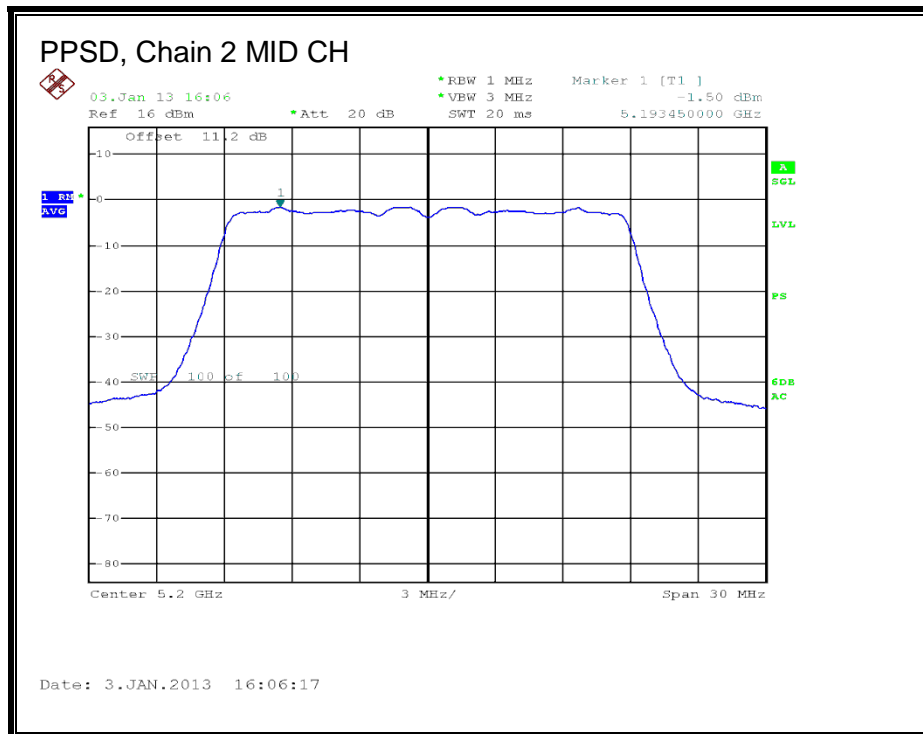
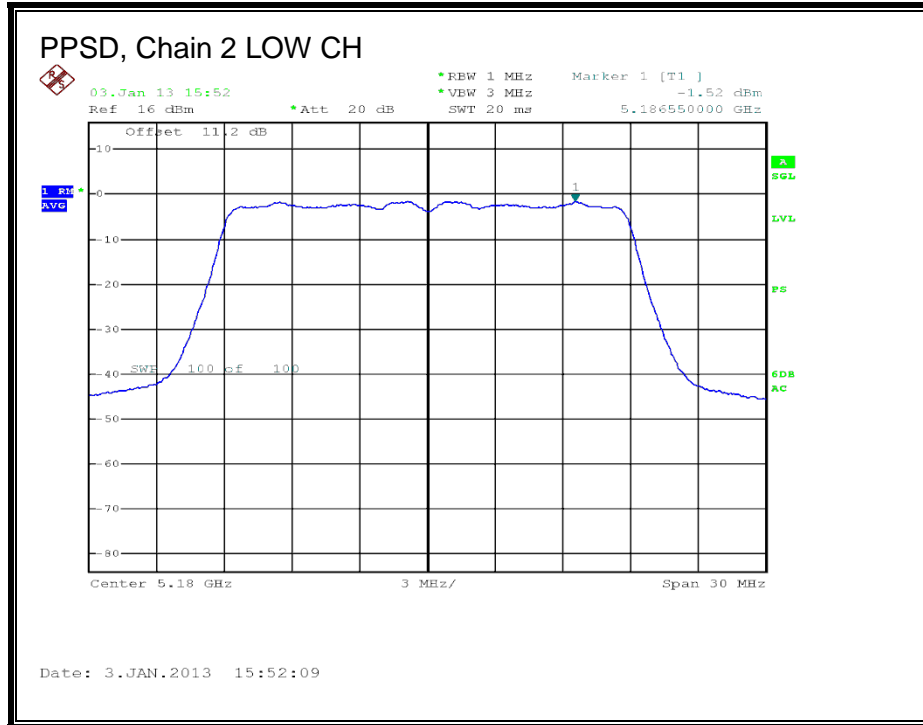


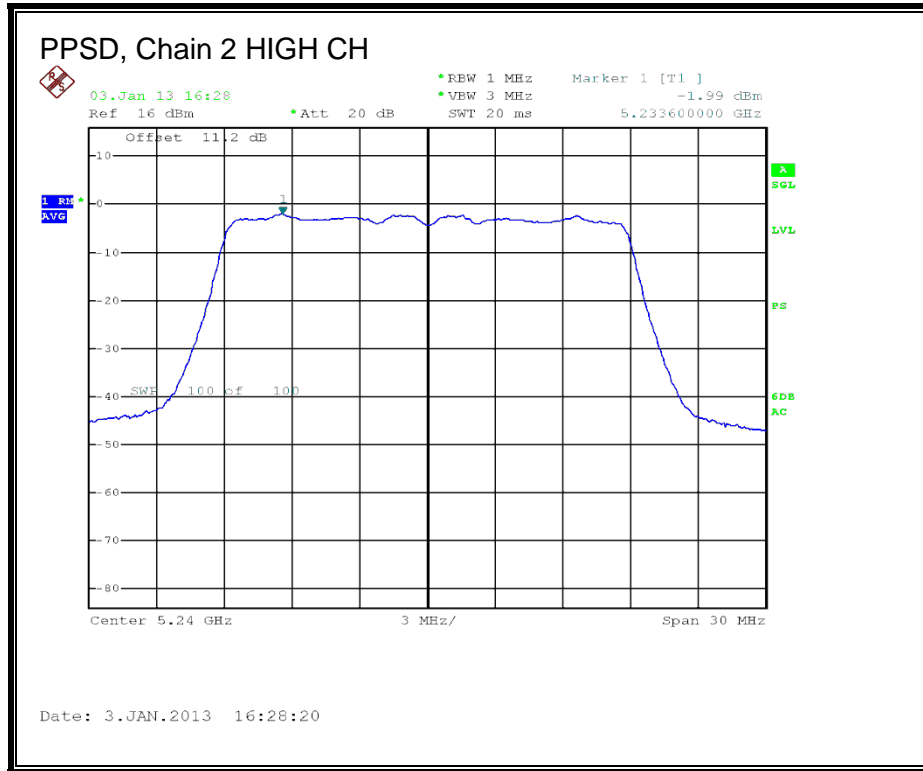
PPSD, Chain 1





PPSD, Chain 2





7.12. 802.11n HT20 BF 2TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.13. 802.11n HT20 BF 3TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.14. 802.11ac VHT20 BF 2TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.15. 802.11ac VHT20 BF 3TX MODE, 5.2 GHz BAND

This mode is disabled in the driver.

7.16. 802.11n HT40 1TX MODE, 5.2 GHz BAND

7.16.1. 26 dB BANDWIDTH

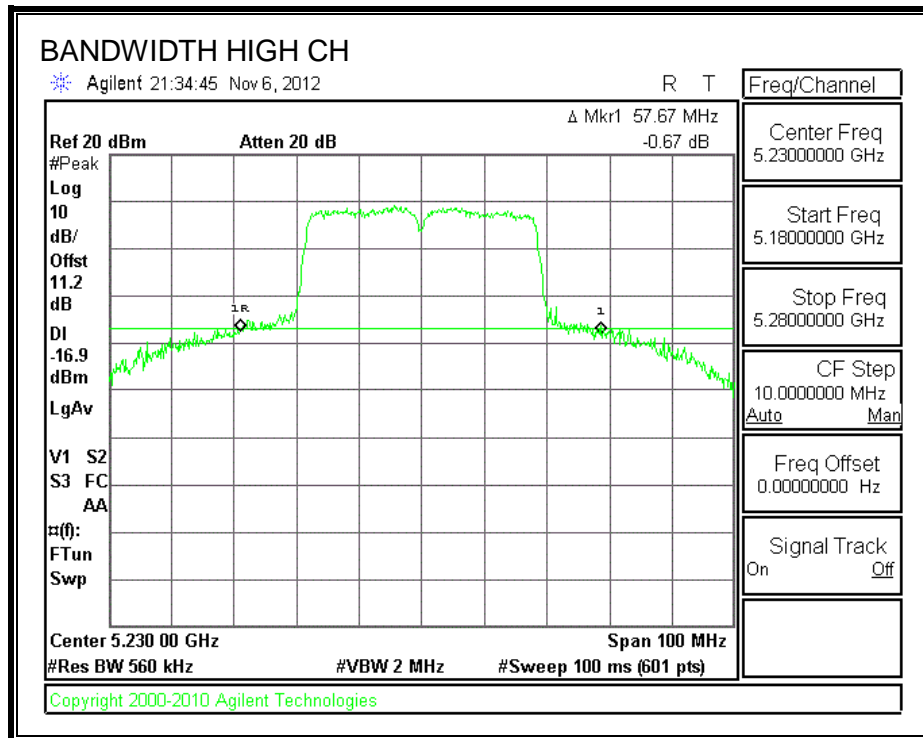
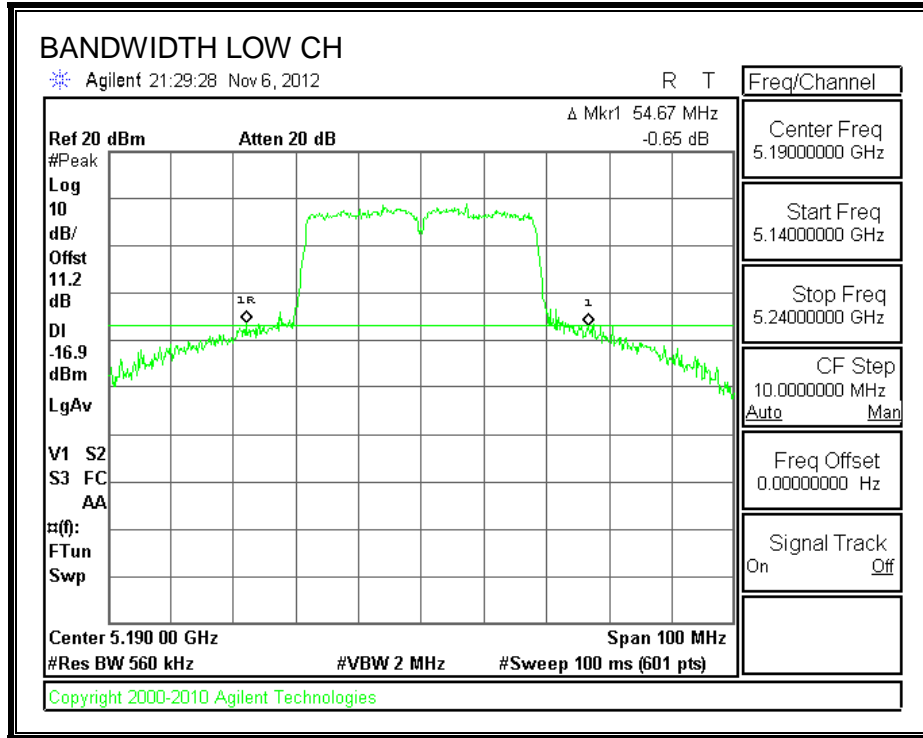
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5190	54.67
High	5230	57.67

26 dB BANDWIDTH



7.16.2. **99% BANDWIDTH**

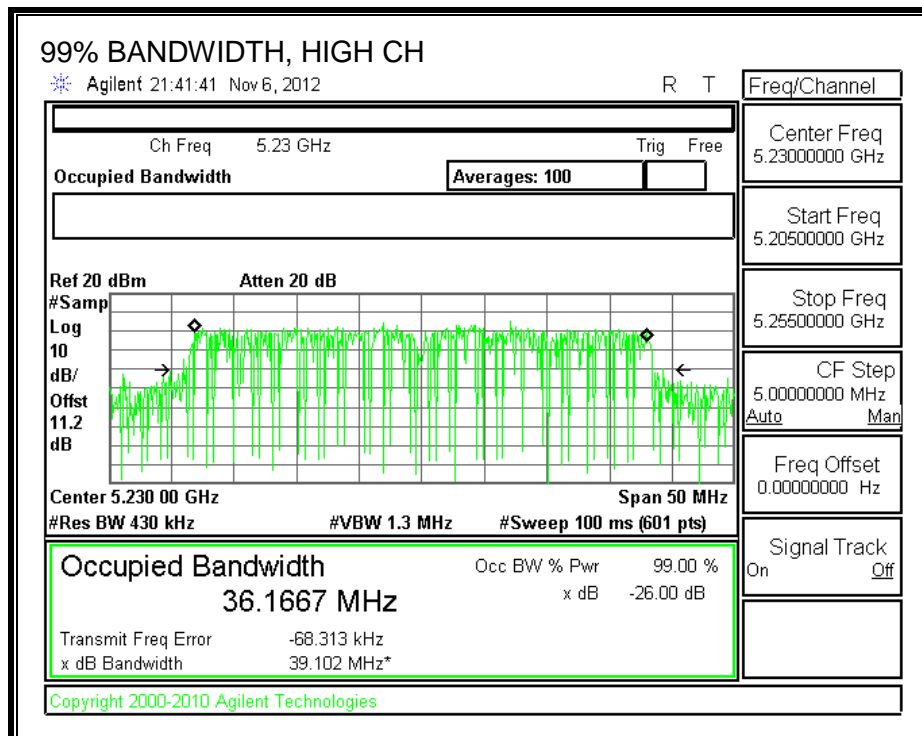
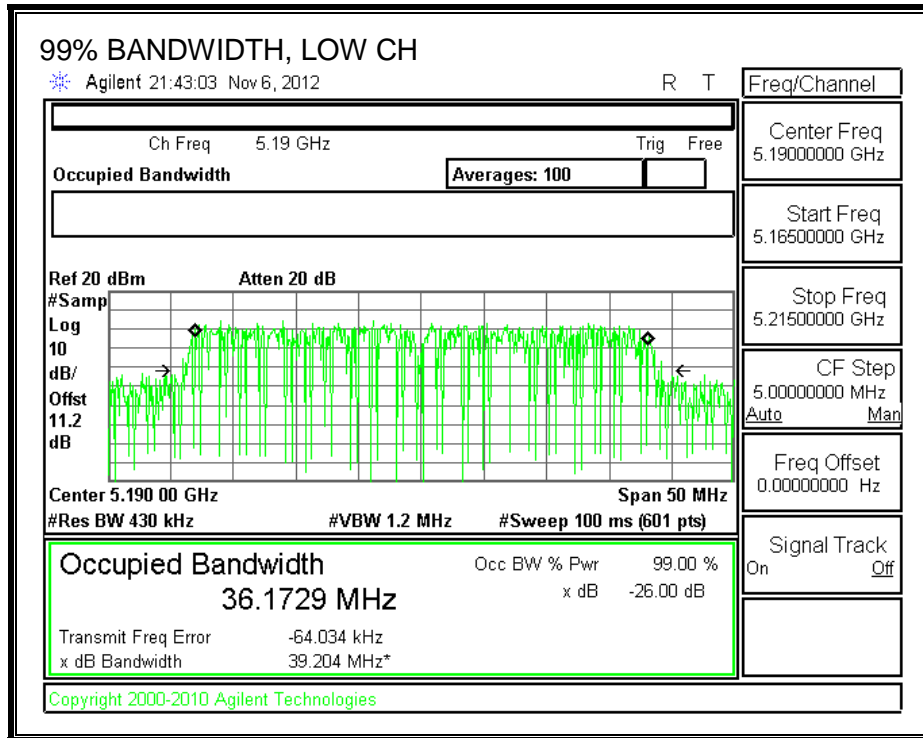
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.1729
High	5230	36.1667

99% BANDWIDTH



7.16.3. OUTPUT POWER AND PPSD

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	54.67	36.1729	7.04
High	5230	57.67	36.1667	7.04

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)	PPSD Limit (dBm)
Low	5190	15.96	23.00	15.96	15.96	2.96	10.00	2.96
High	5230	15.96	23.00	15.96	15.96	2.96	10.00	2.96

Duty Cycle CF (dB)	0.43	Included in Calculations of PSD
---------------------------	------	--

Output Power Results

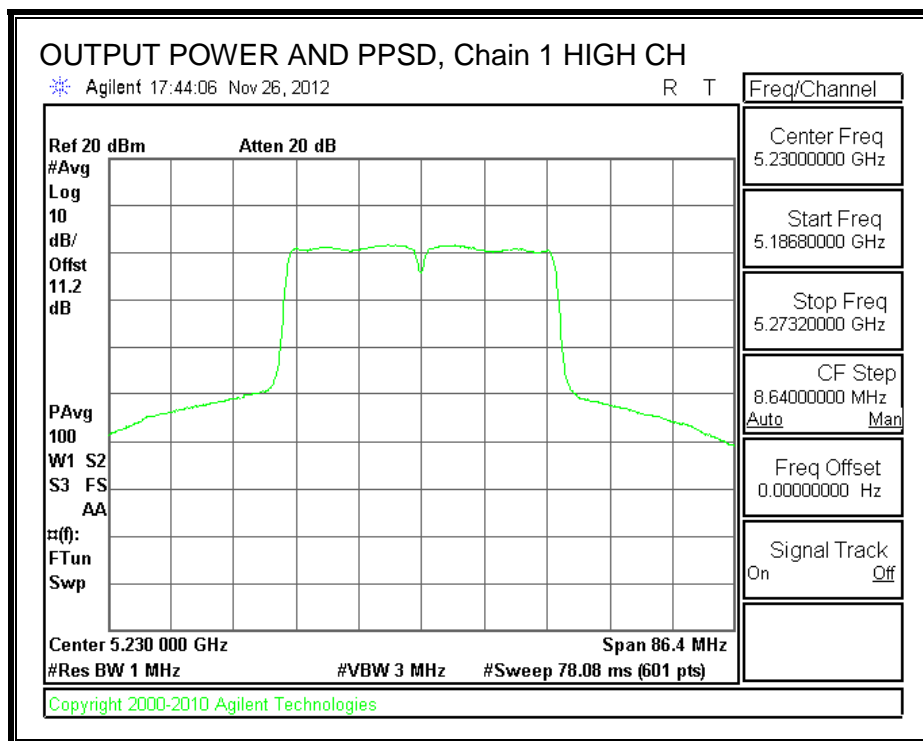
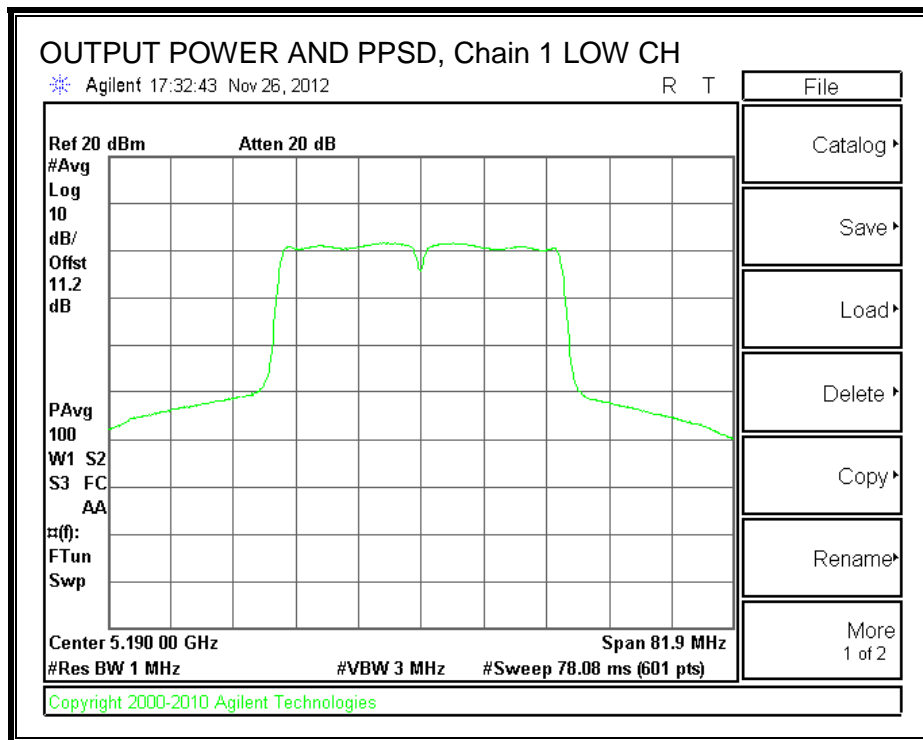
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	15.68	15.68	15.96	-0.28
High	5230	15.71	15.71	15.96	-0.25

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	1.62	2.05	2.96	-0.91
High	5230	1.62	2.05	2.96	-0.91

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 1



7.17. 802.11n HT40 CDD 2TX MODE, 5.2 GHz BAND

7.17.1. 26 dB BANDWIDTH

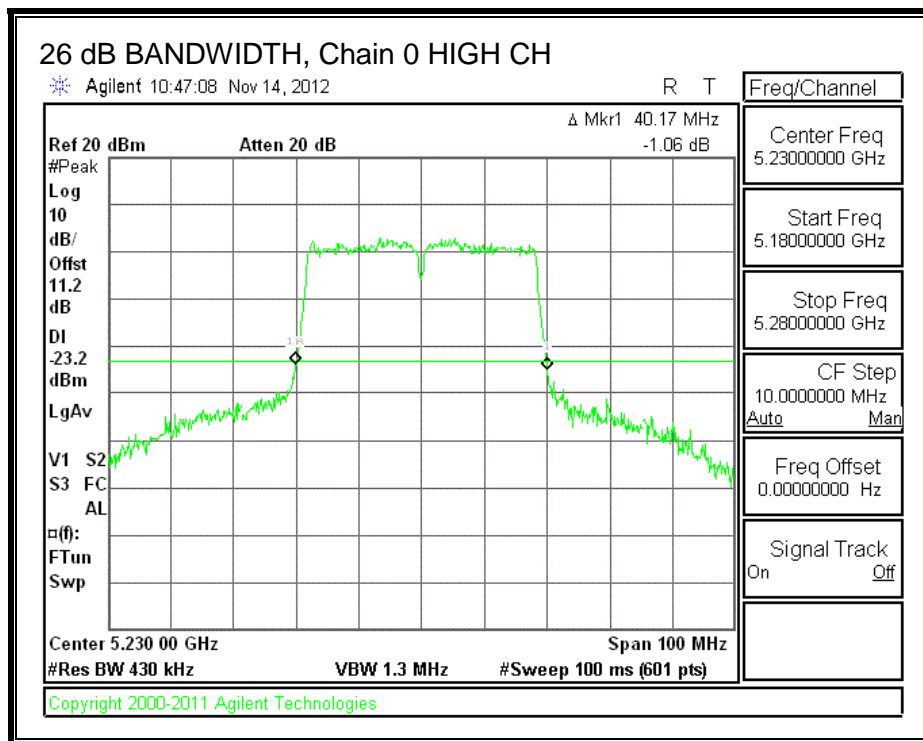
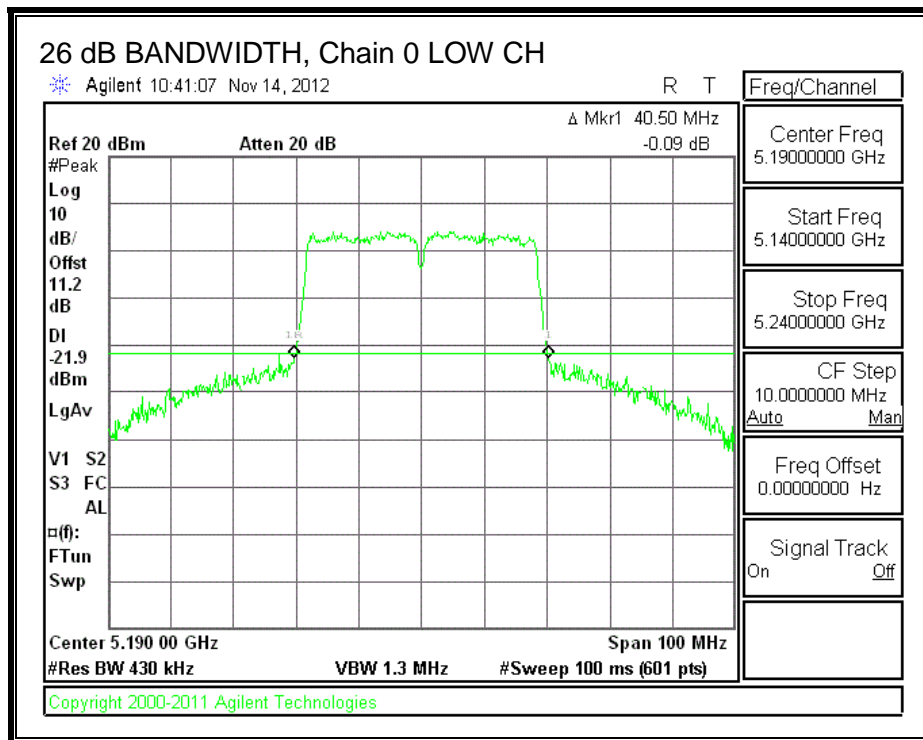
LIMITS

None; for reporting purposes only.

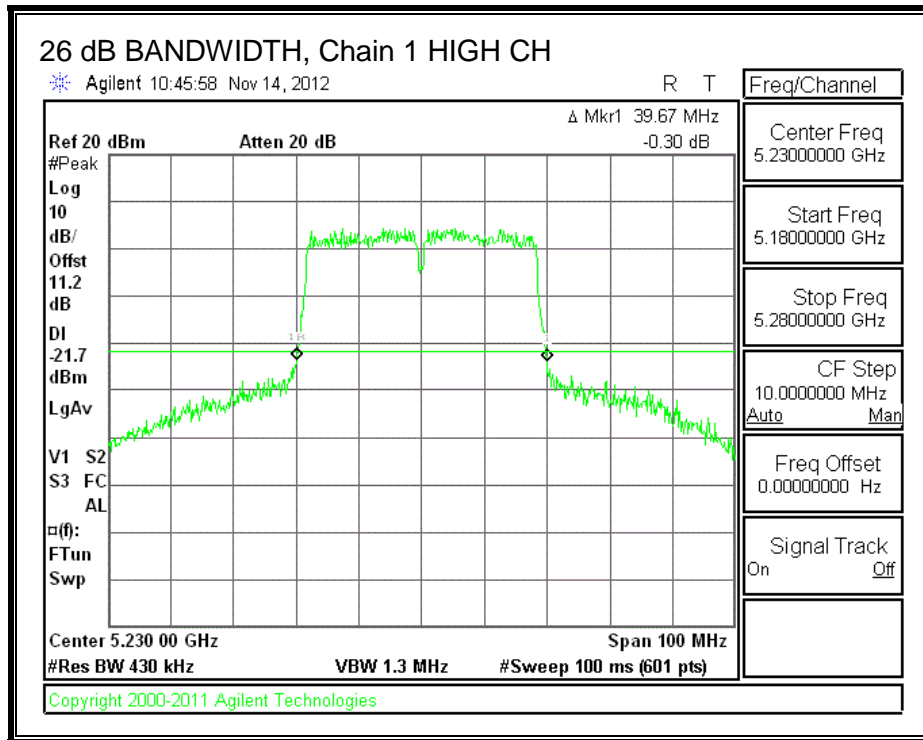
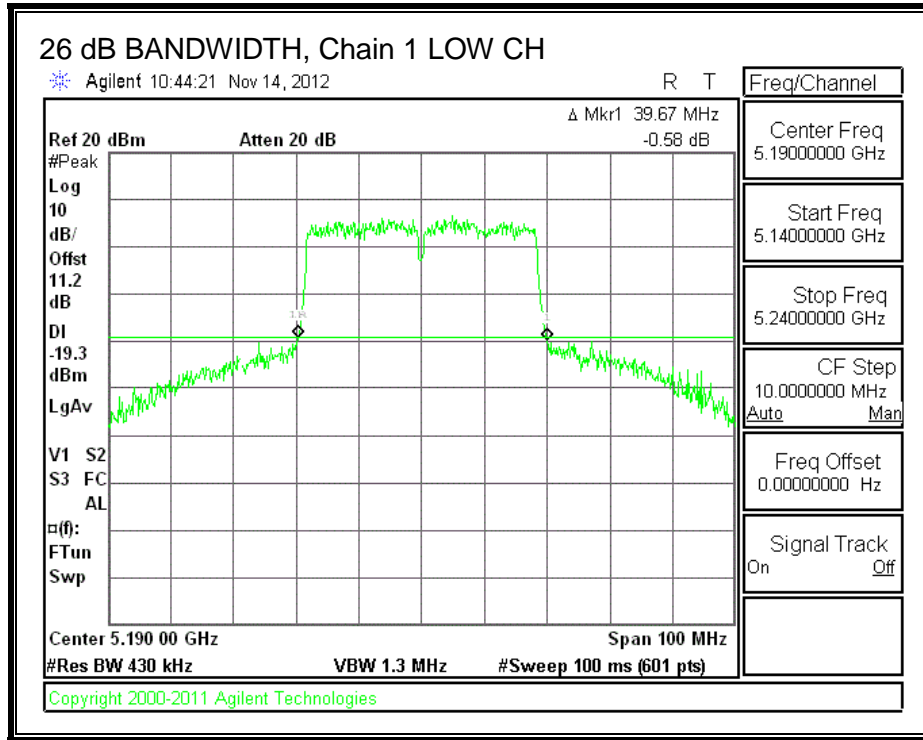
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	40.50	39.67
High	5230	40.17	39.67

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.17.2. **99% BANDWIDTH**

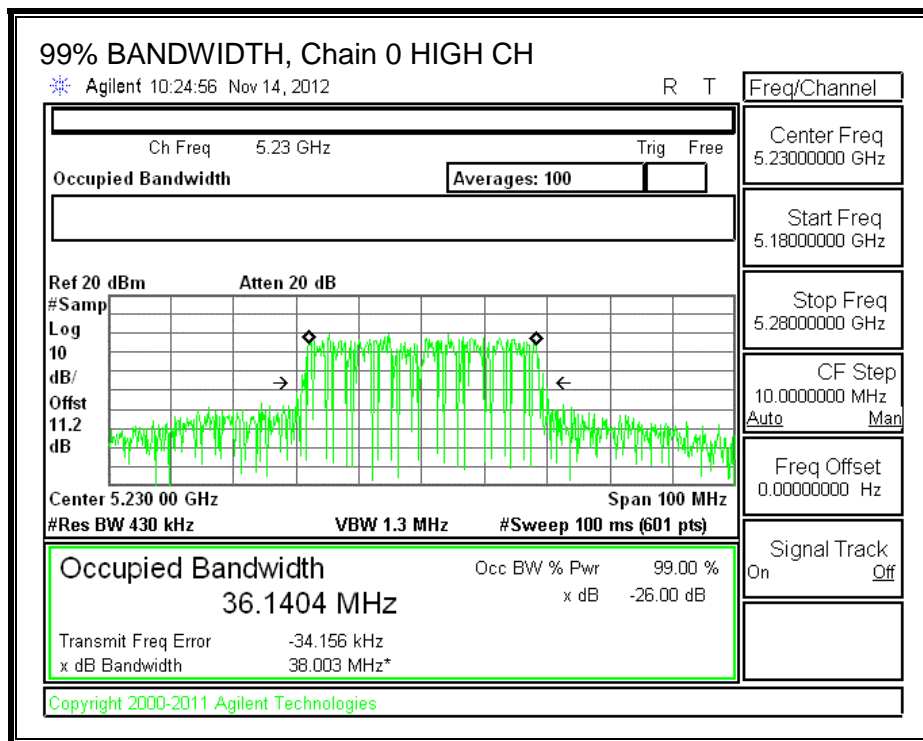
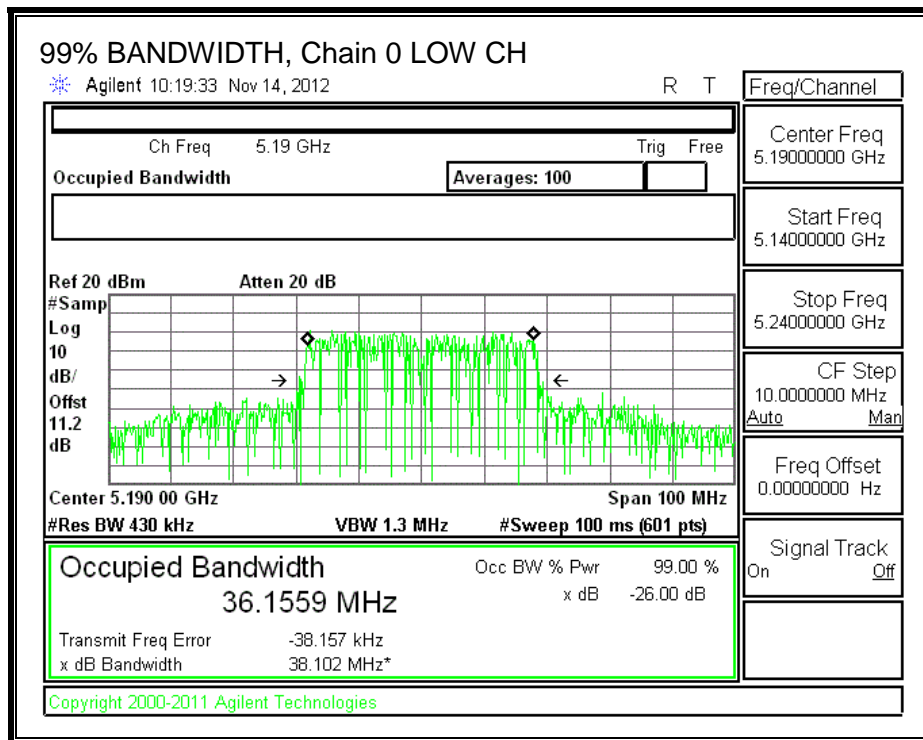
LIMITS

None; for reporting purposes only.

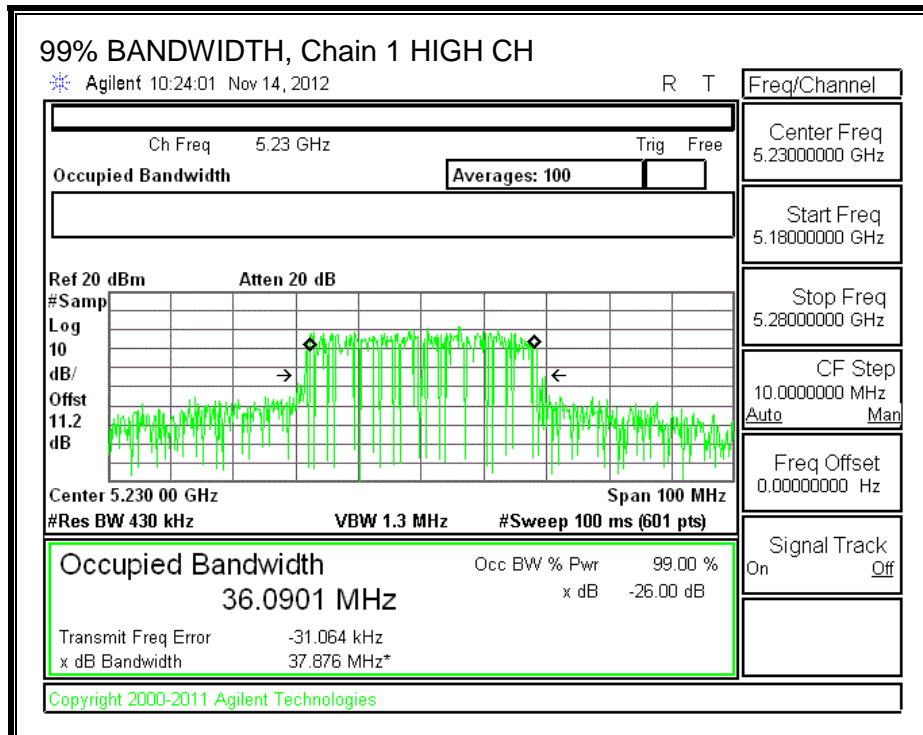
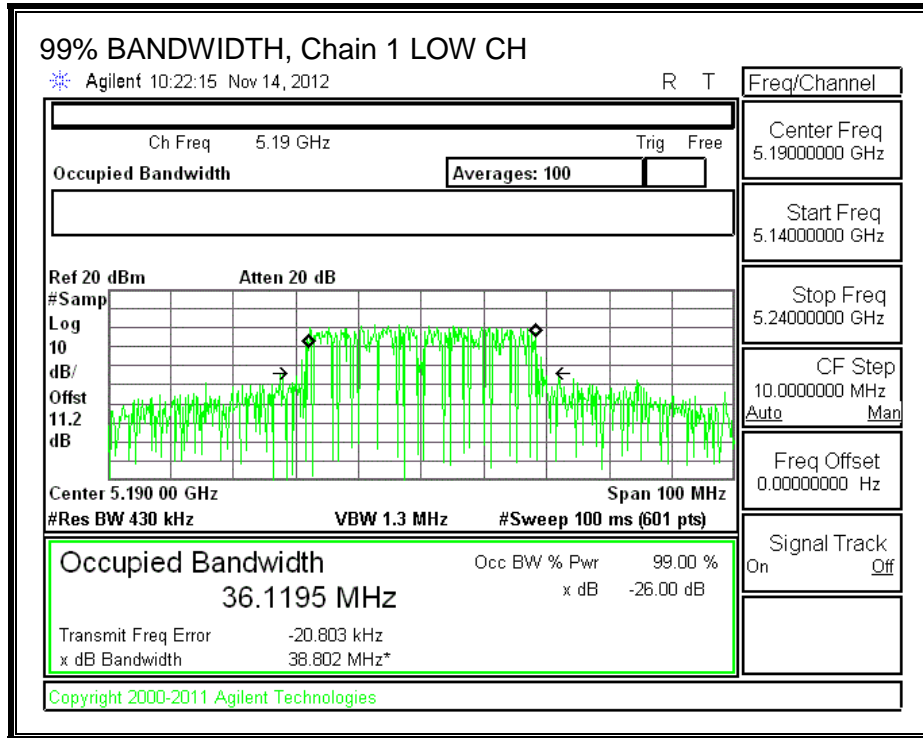
RESULTS

Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
5190	36.1559	36.1195
5230	36.1404	36.0901

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.17.3. OUTPUT POWER AND PPSD

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 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)
7.04	6.70	6.87

For PPSD, the TX chains are 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)
7.04	6.70	9.88

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.67	36.1195	6.87
High	5230	39.67	36.0901	6.87

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Low	5190	16.13	23.00	16.13	16.13
High	5230	16.13	23.00	16.13	16.13

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	11.95	12.21	15.09	16.13	-1.04
High	5230	12.16	12.31	15.25	16.13	-0.88

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.67	36.1195	9.88
High	5230	39.67	36.0901	9.88

Limits

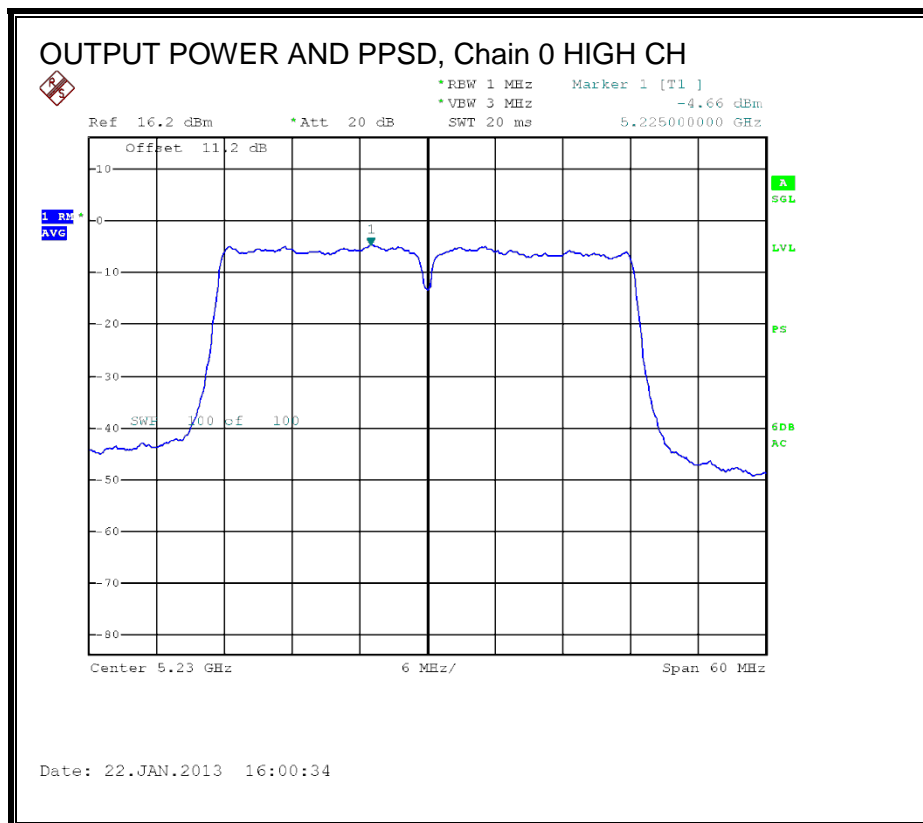
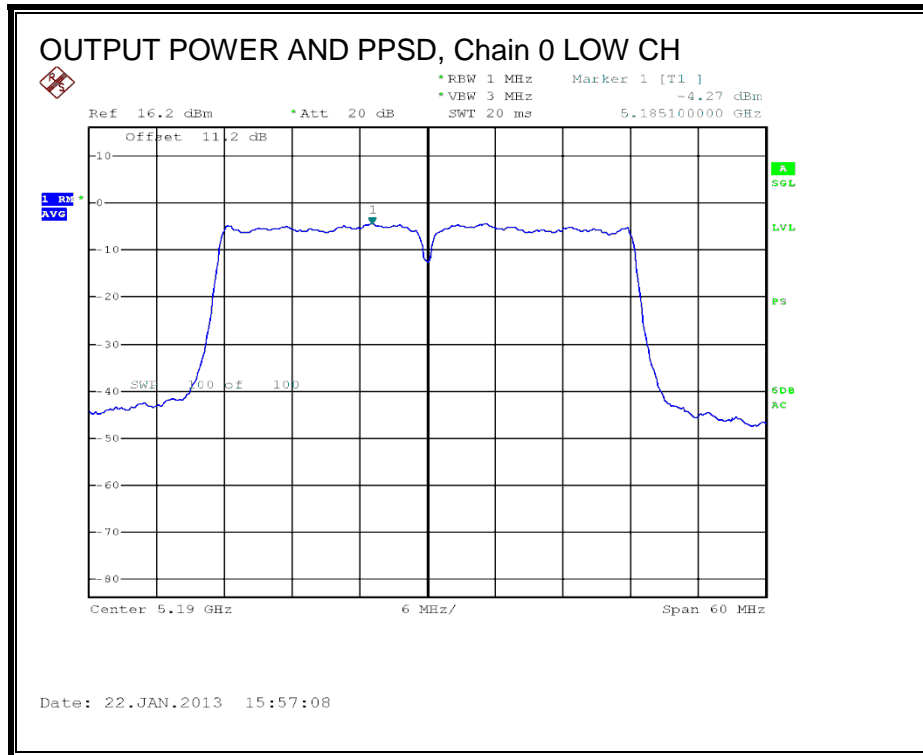
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	0.12	10.00	0.12
High	5230	0.12	10.00	0.12

Duty Cycle CF (dB)	0.43	Included in Calculations of PSD
---------------------------	------	--

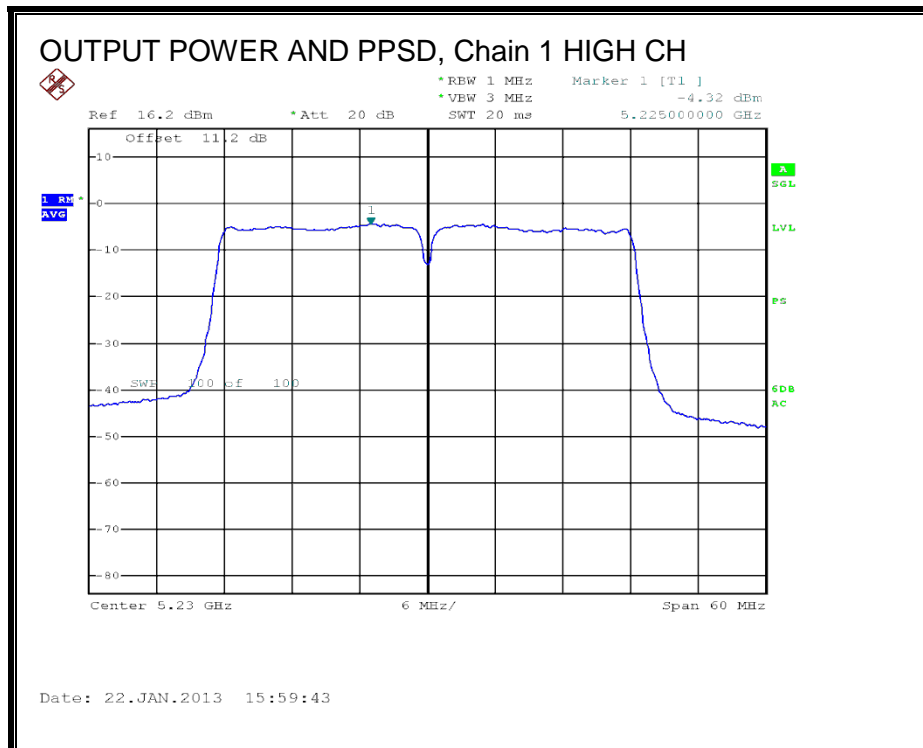
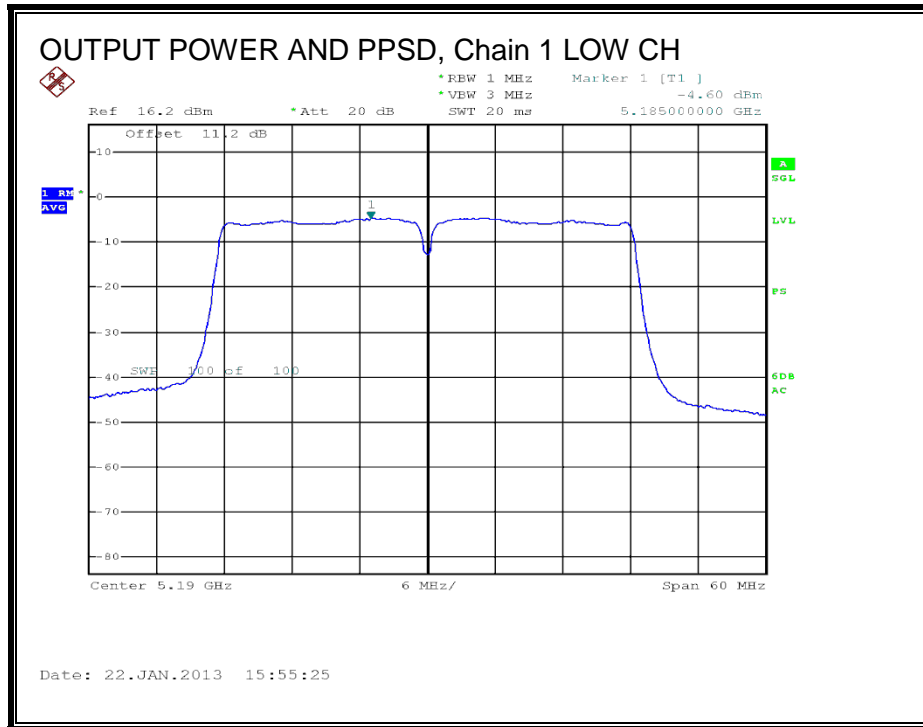
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-4.27	-4.60	-0.99	0.12	-1.11
High	5230	-4.66	-4.32	-1.05	0.12	-1.17

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.18. 802.11n HT40 CDD 3TX MODE, 5.2 GHz BAND

7.18.1. 26 dB BANDWIDTH

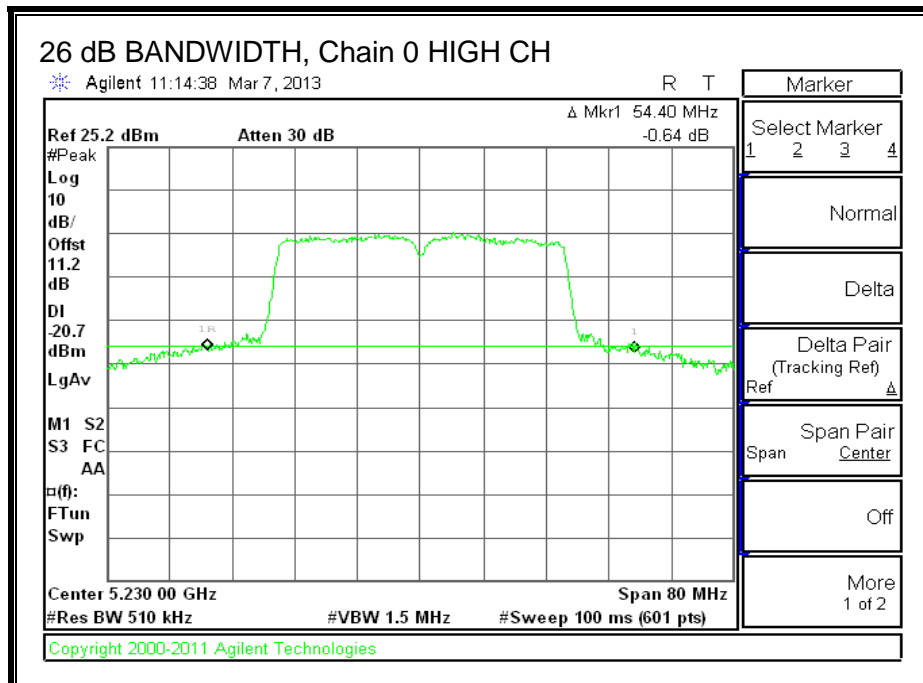
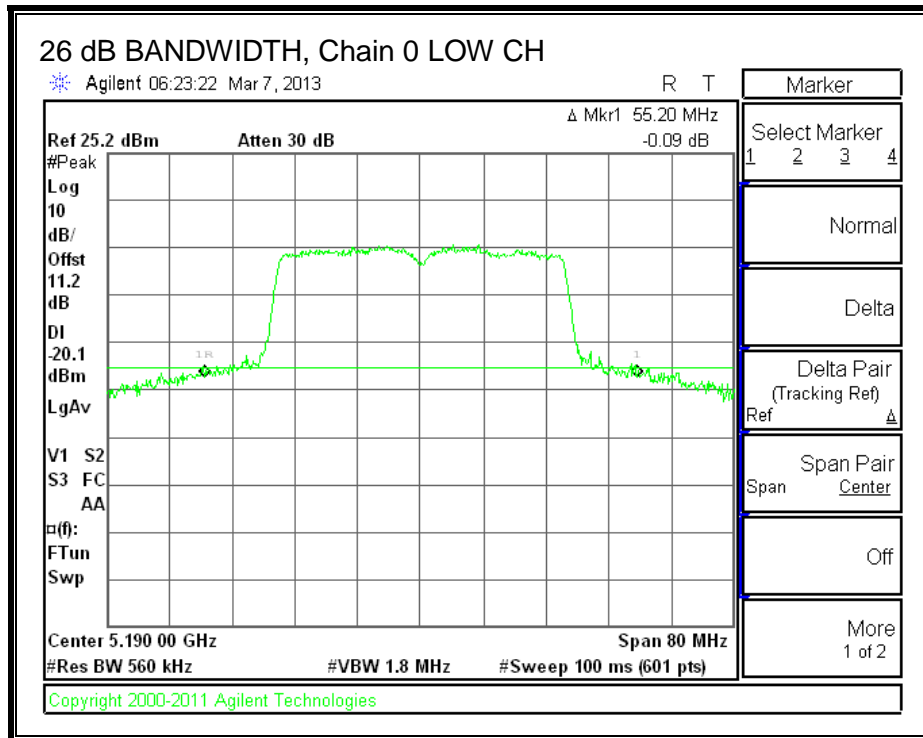
LIMITS

None; for reporting purposes only.

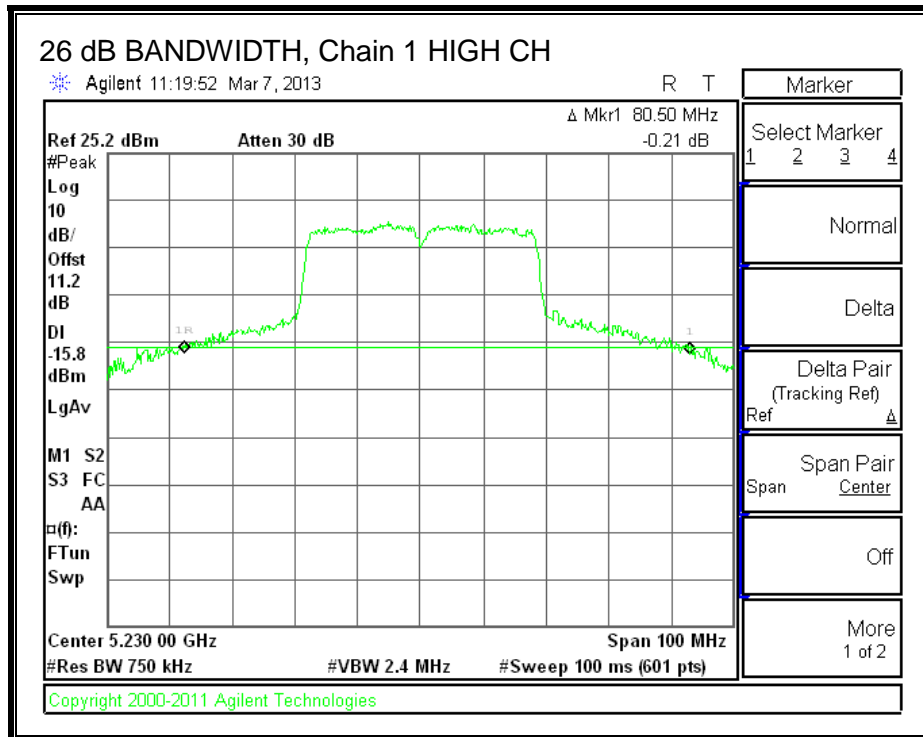
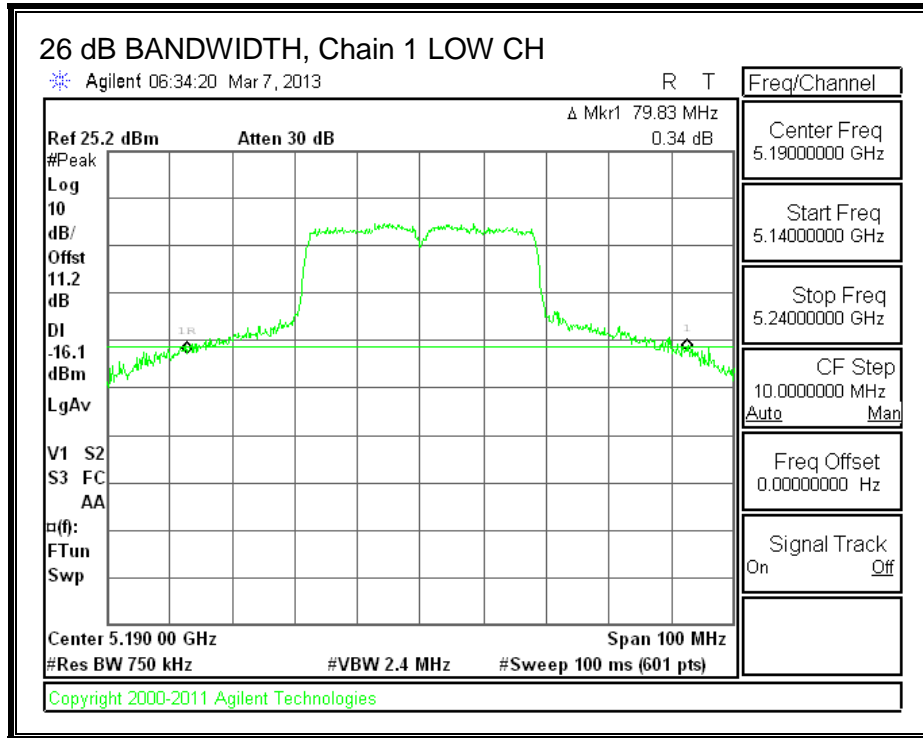
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	55.20	79.83	44.93
High	5230	54.40	80.50	40.20

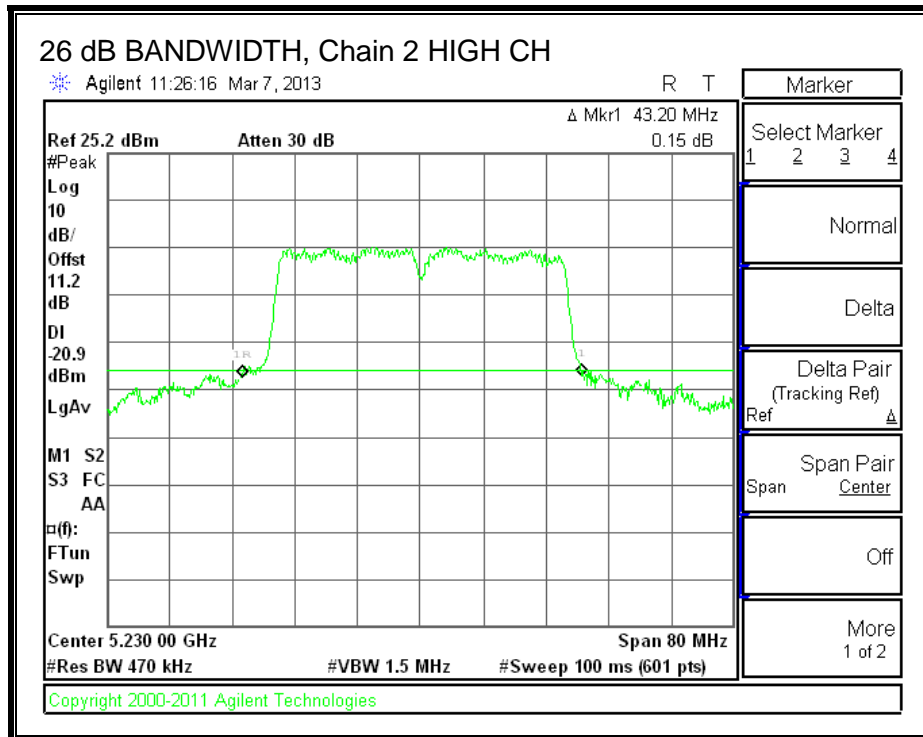
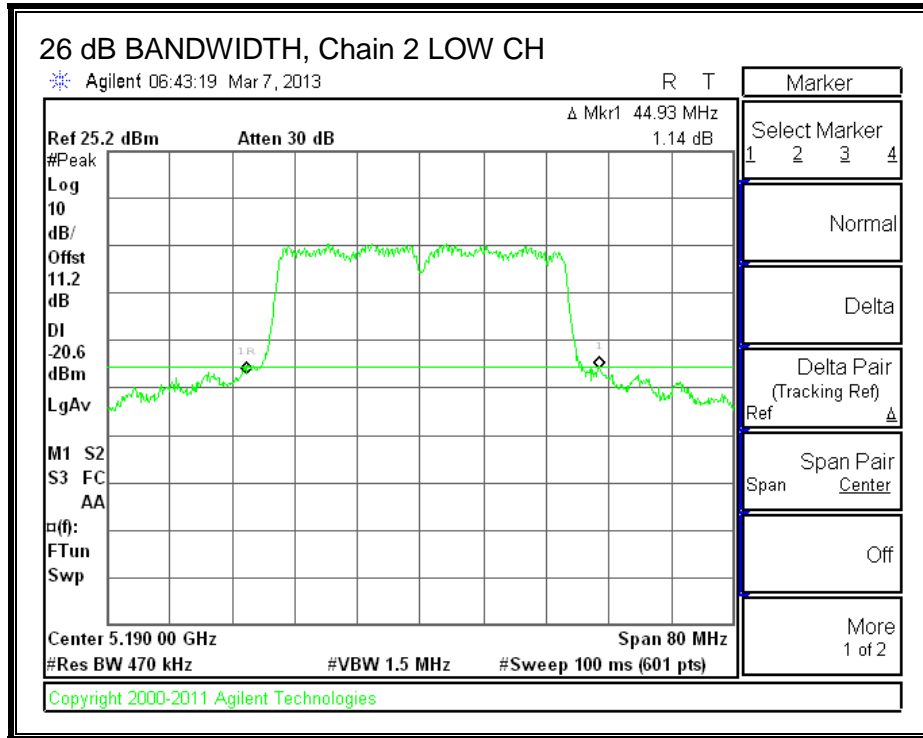
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.18.2. **99% BANDWIDTH**

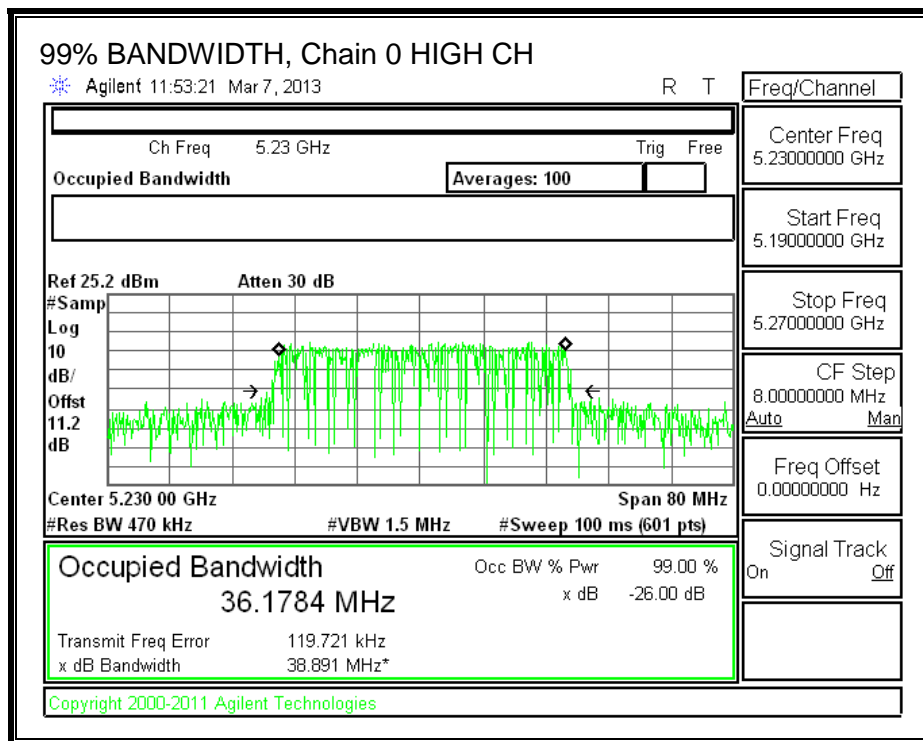
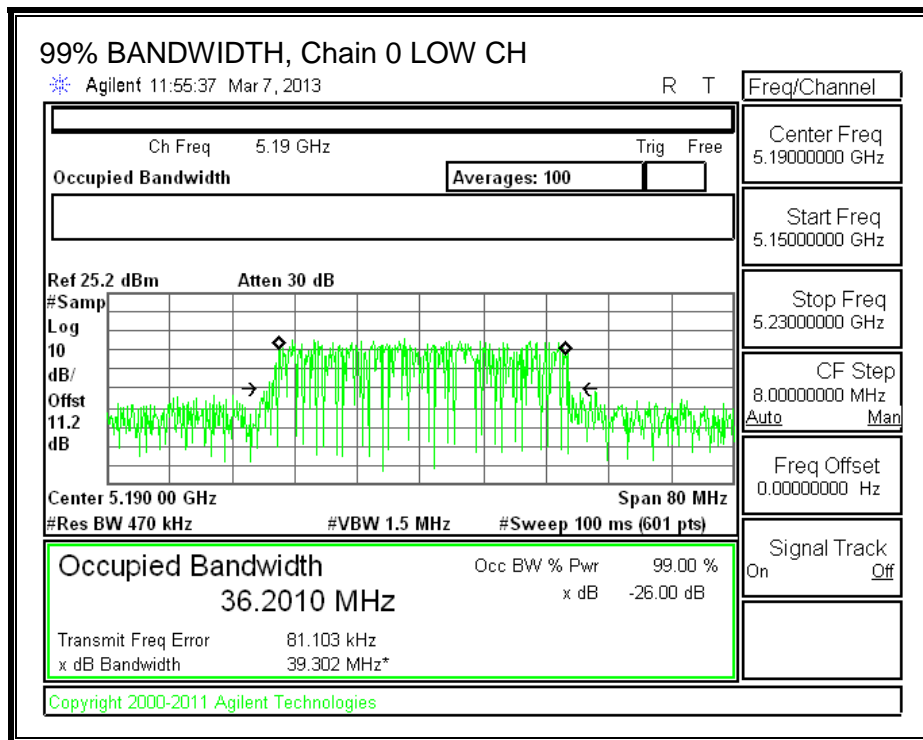
LIMITS

None; for reporting purposes only.

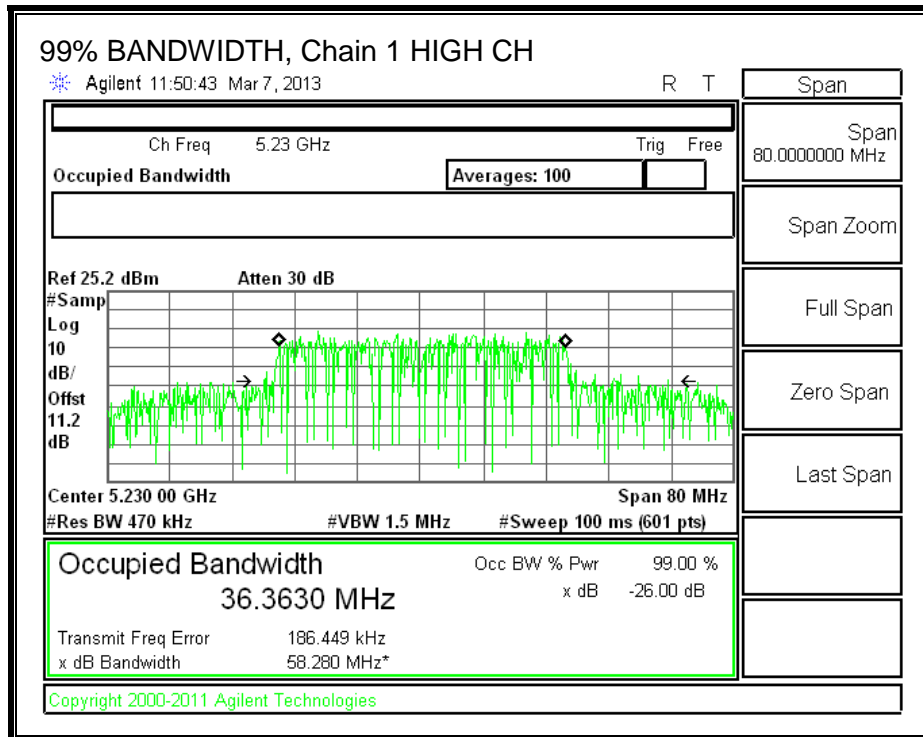
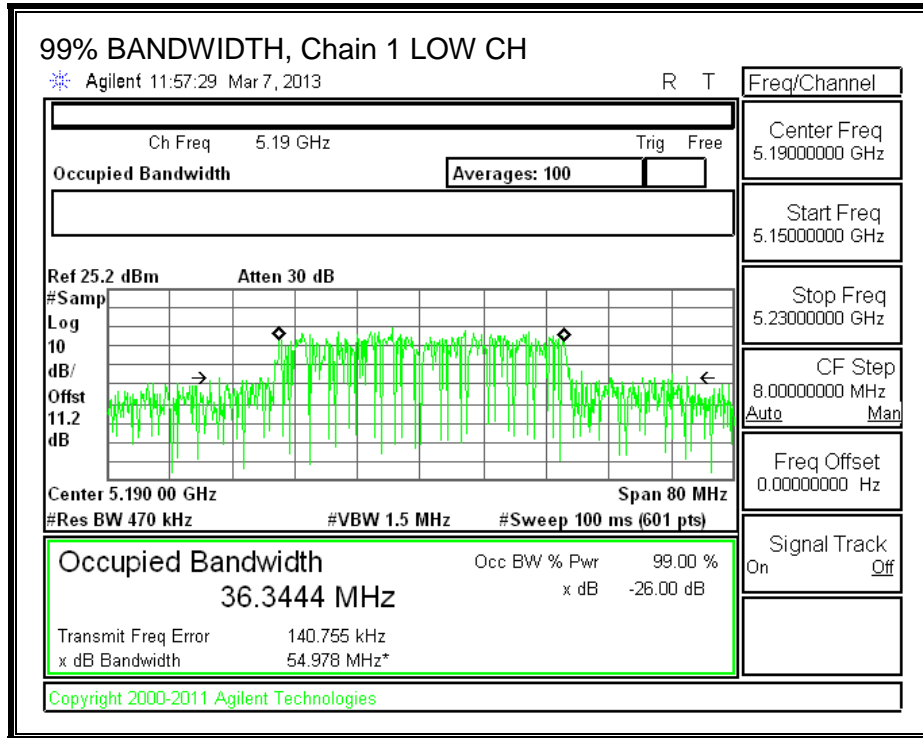
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.2010	36.3444	36.2036
High	5230	36.1784	36.3630	36.5346

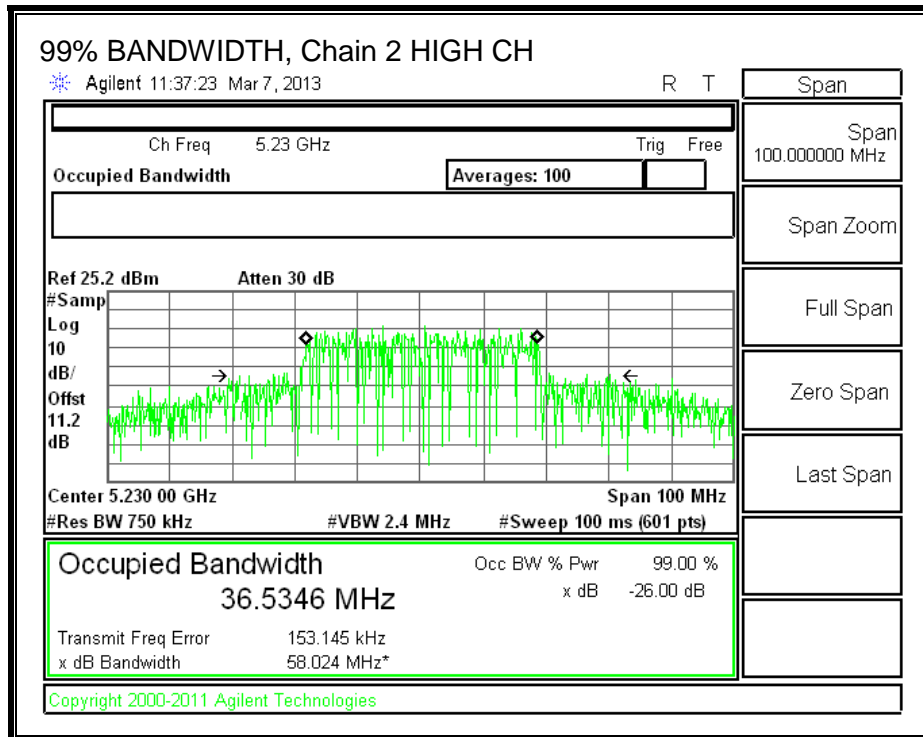
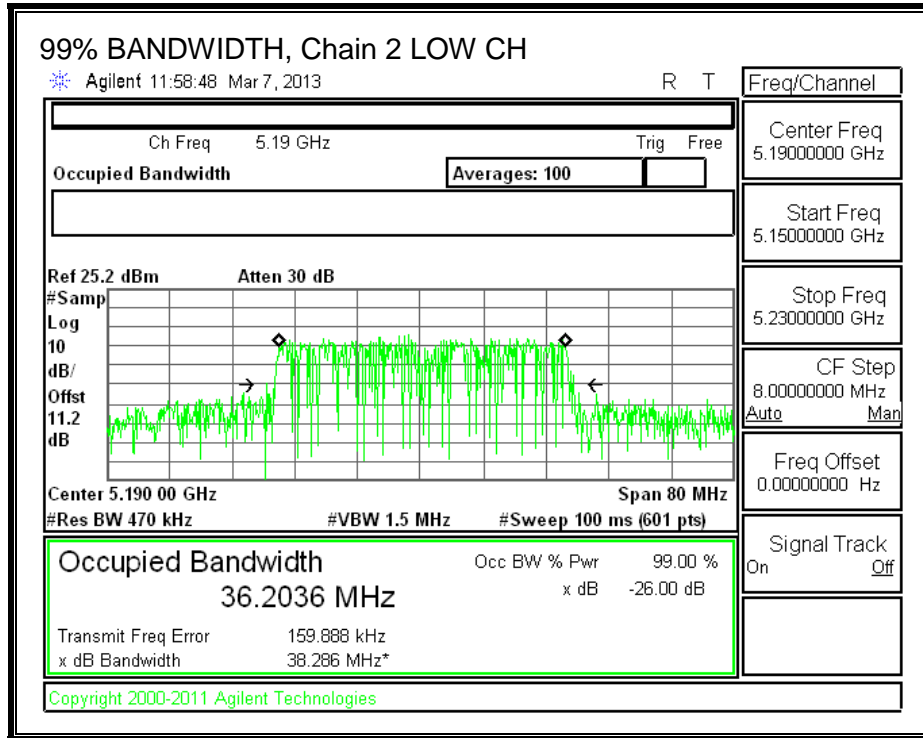
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.18.3. OUTPUT POWER AND PPSD

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 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)
7.04	6.70	3.79	6.07

For PPSD, the TX chains are correlated 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)
7.04	6.70	3.79	10.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Uncorrelated Directional Gain (dBi)	Correlated Directional Gain (dBi)
Low	5190	44.90	36.2010	6.07	10.73
High	5230	40.20	36.1784	6.07	10.73

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)	PPSD Limit (dBm)
Low	5190	16.93	23.00	16.93	16.93	-0.73	10.00	-0.73
High	5230	16.93	23.00	16.93	16.93	-0.73	10.00	-0.73

Duty Cycle CF (dB)	0.43	Included in Calculations of PSD
---------------------------	------	--

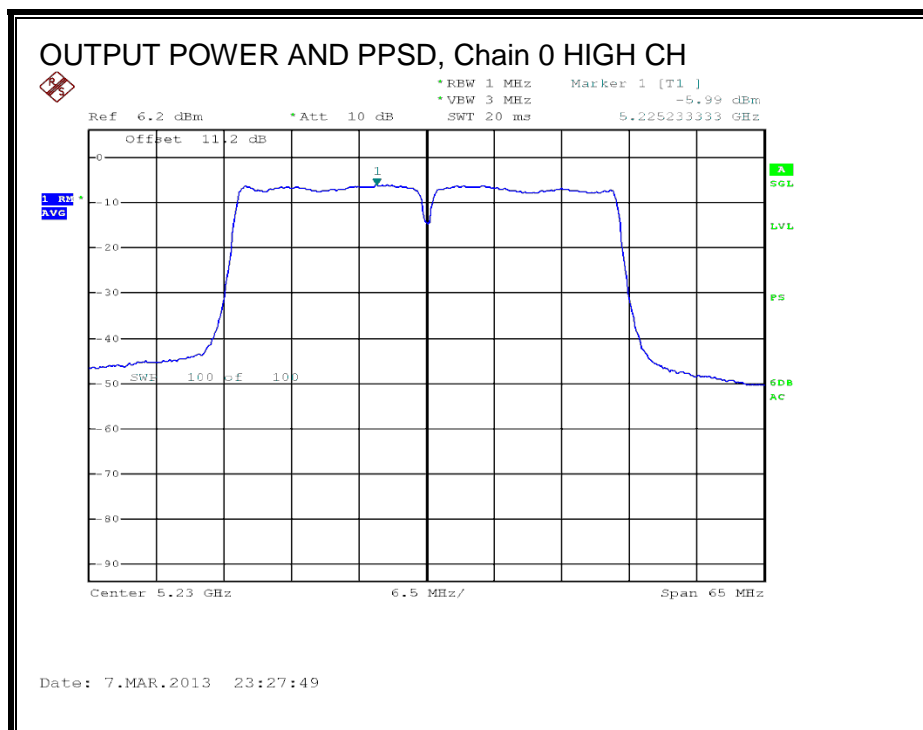
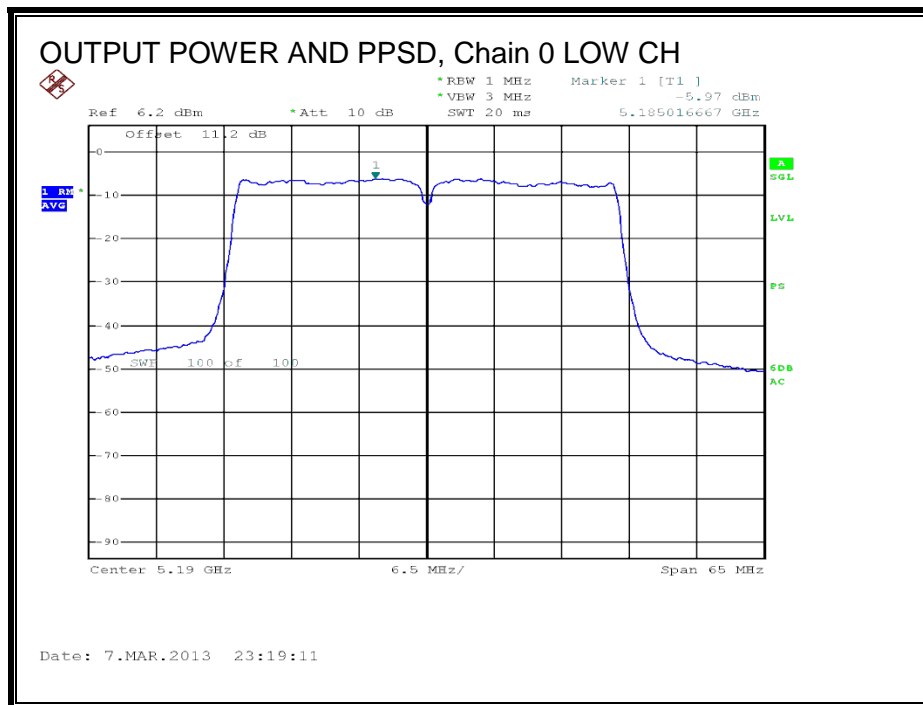
Output Power Results

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	11.53	11.35	11.14	16.11	16.93	-0.82
High	5230	11.67	11.65	11.58	16.40	16.93	-0.53

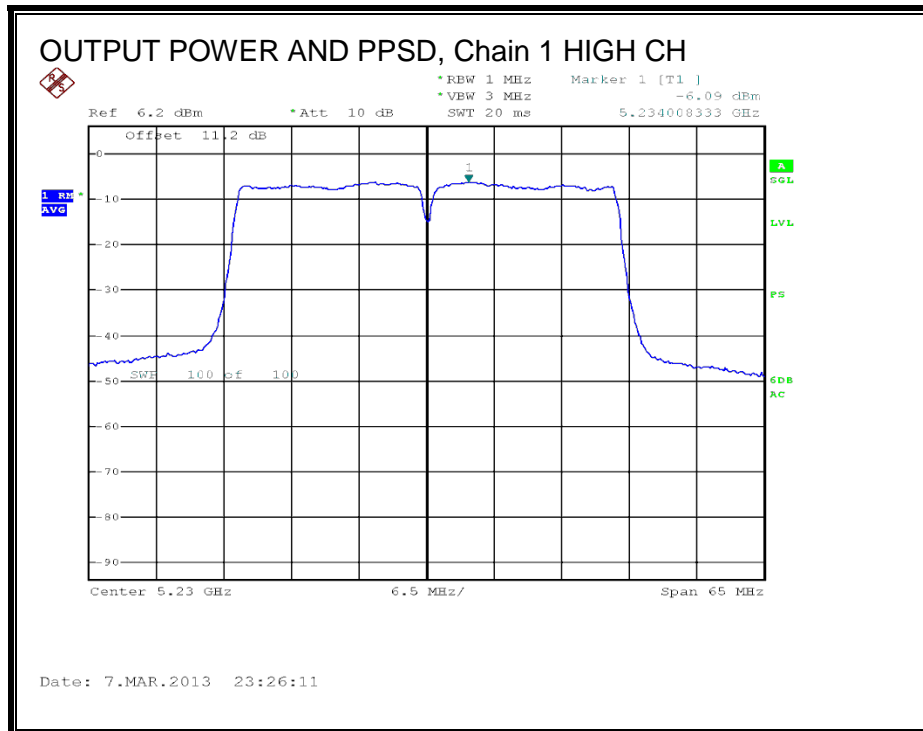
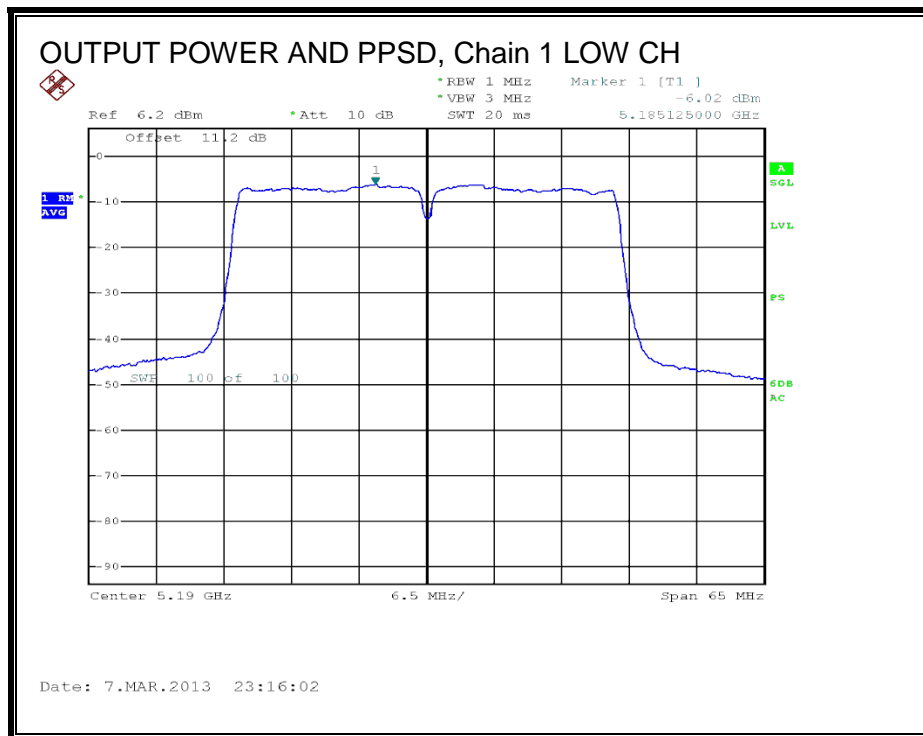
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-5.97	-6.02	-6.15	-0.84	-0.73	-0.11
High	5230	-5.99	-6.09	-5.84	-0.77	-0.73	-0.04

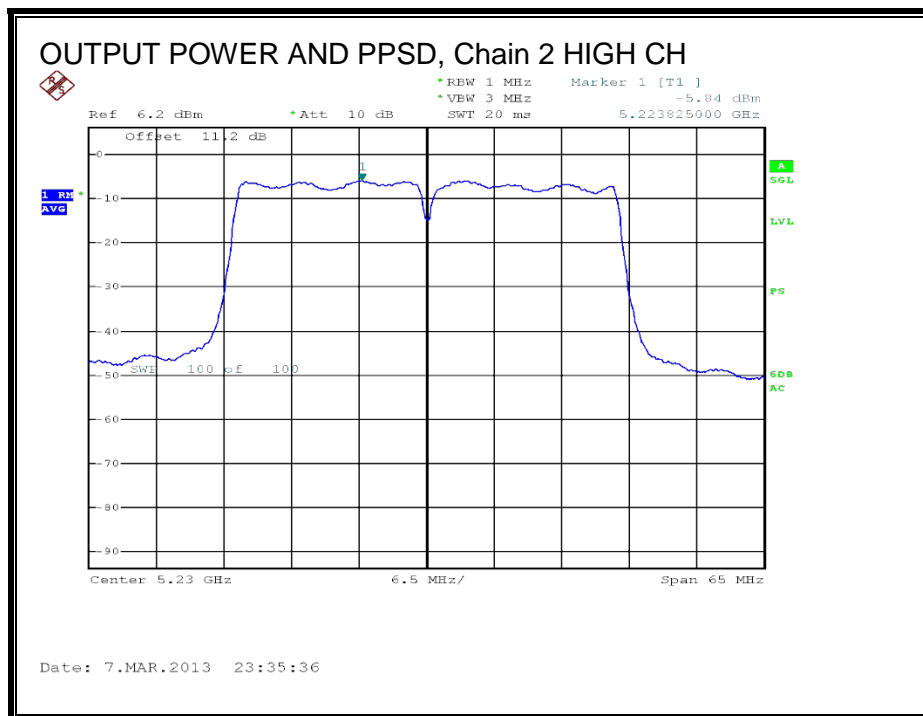
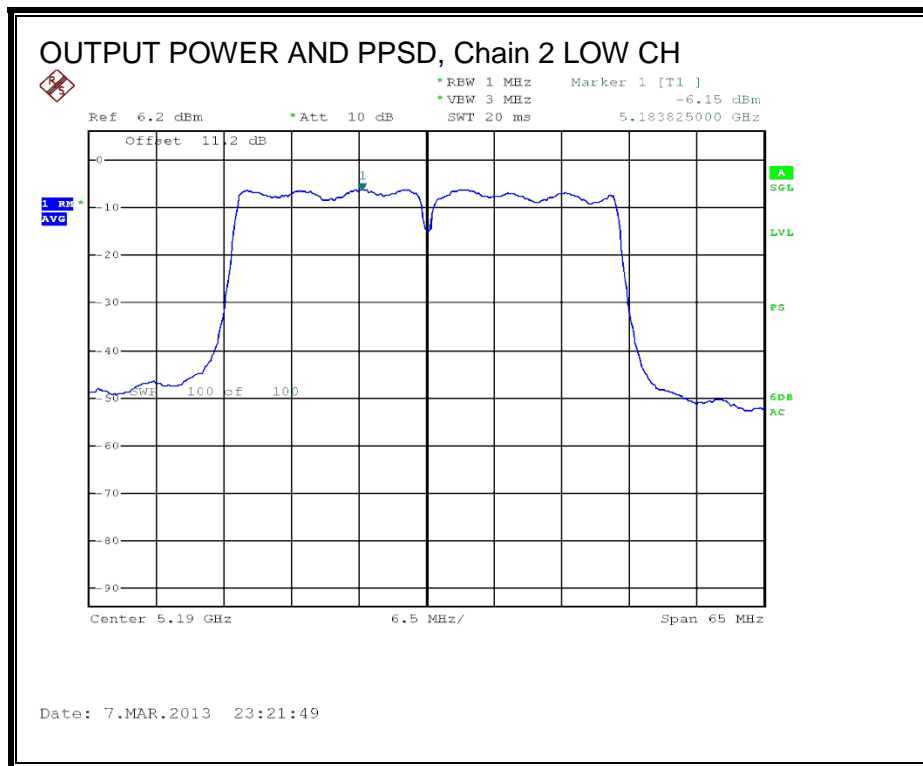
OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



7.19. 802.11n HT40 STBC 2TX MODE, 5.2 GHz BAND

Covered by testing 802.11n HT40 STBC 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.20. 802.11n HT40 STBC 3TX MODE IN THE 5.2 GHz BAND

7.20.1. 26 dB BANDWIDTH

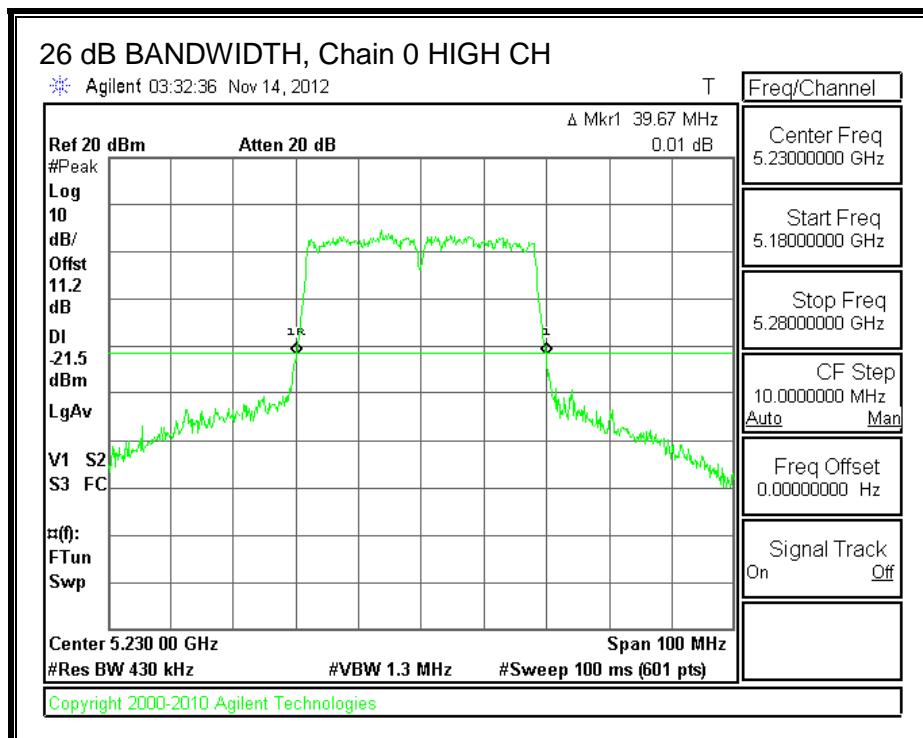
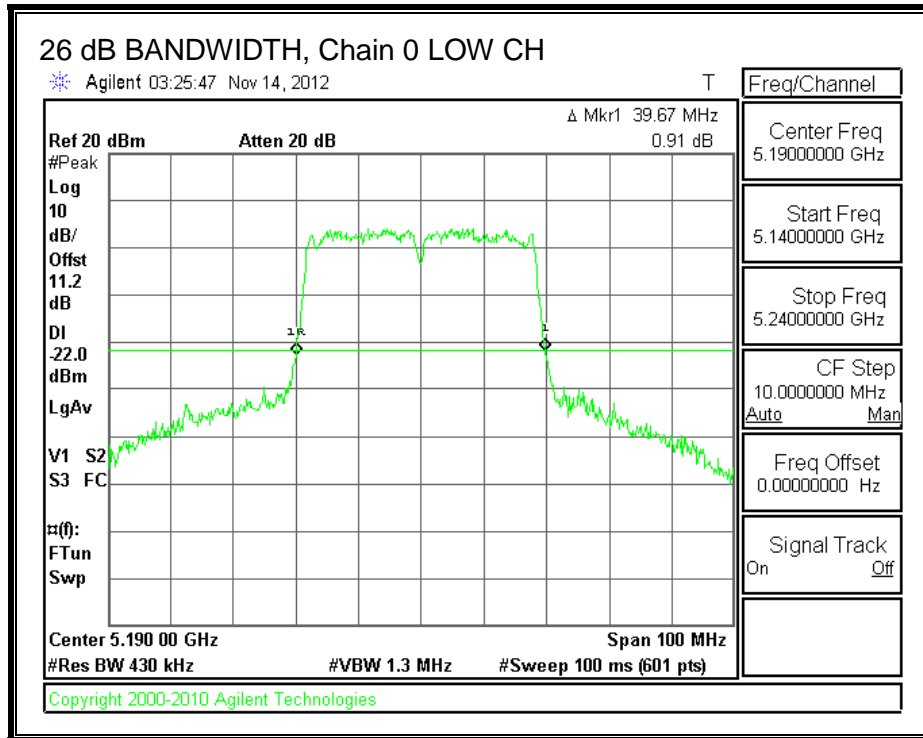
LIMITS

None; for reporting purposes only.

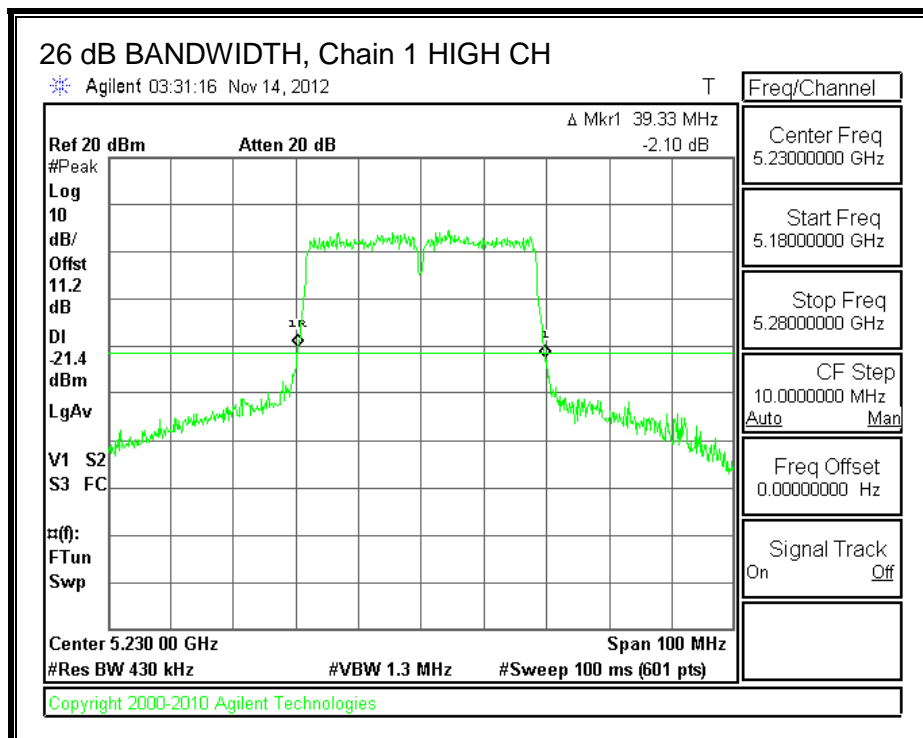
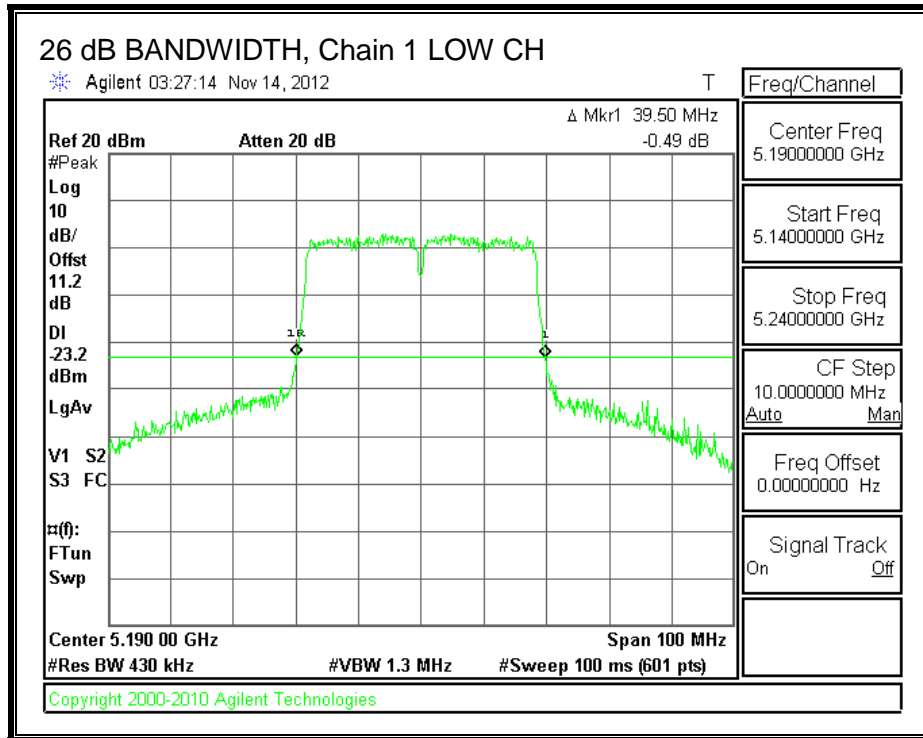
RESULTS

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	39.50	39.50
High	5230	39.67	39.33	39.83

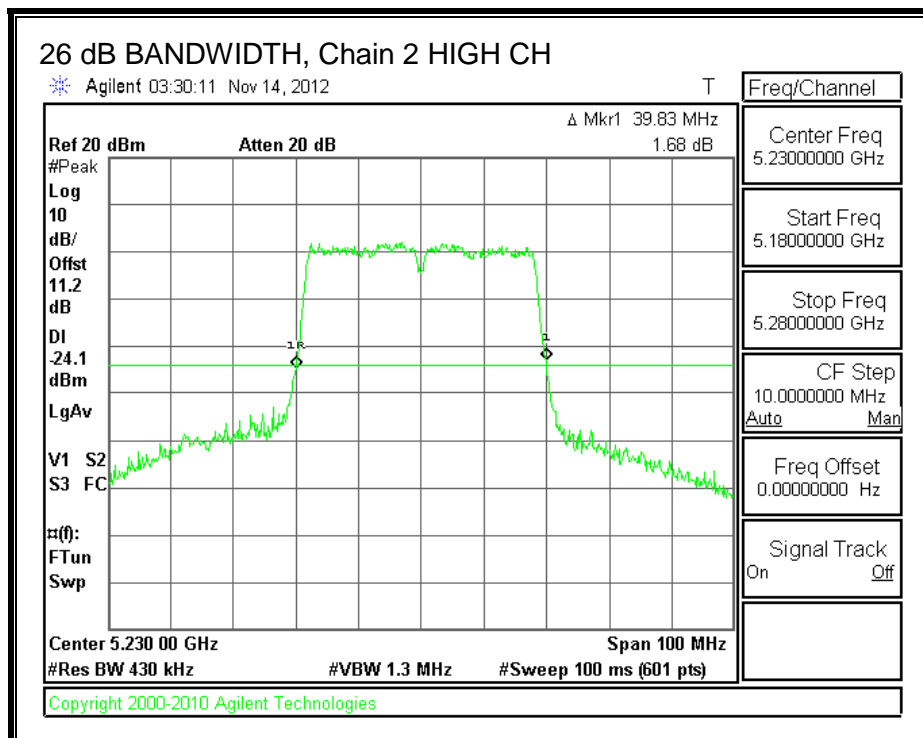
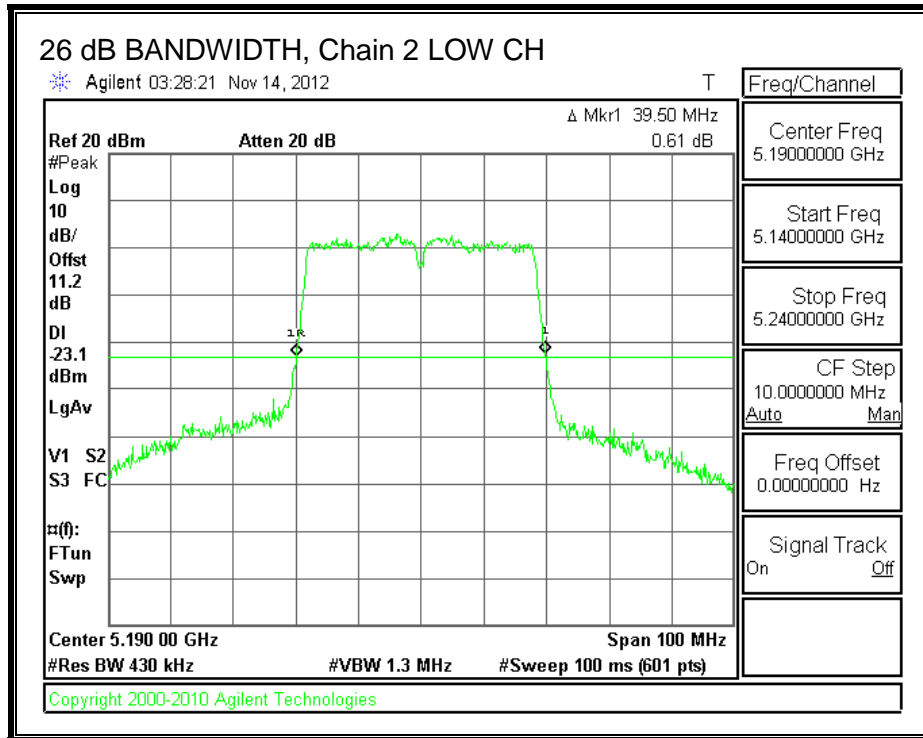
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.20.2. **99% BANDWIDTH**

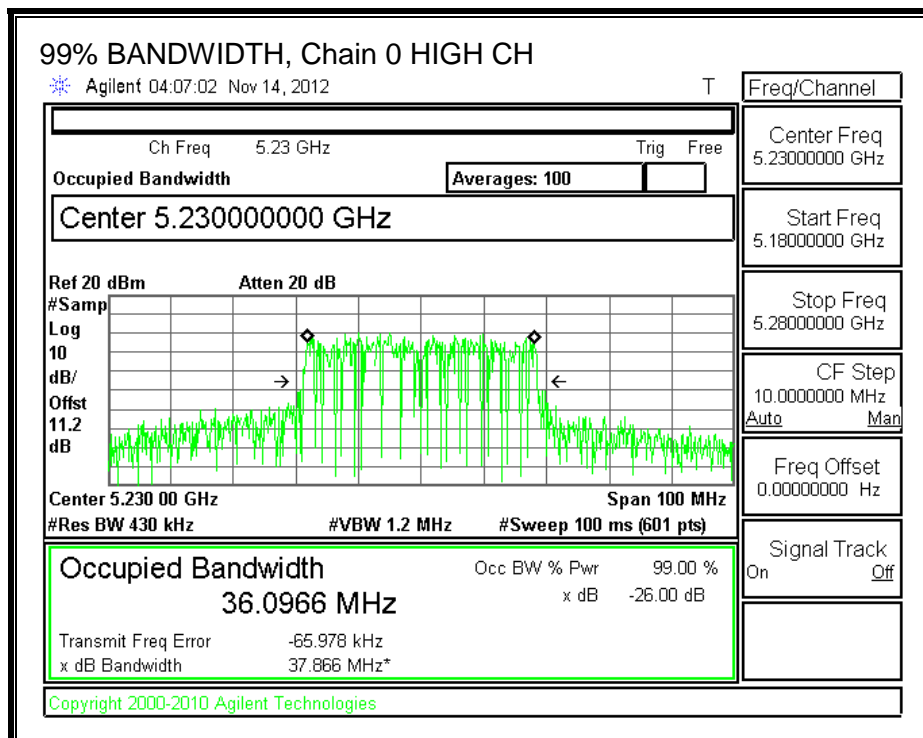
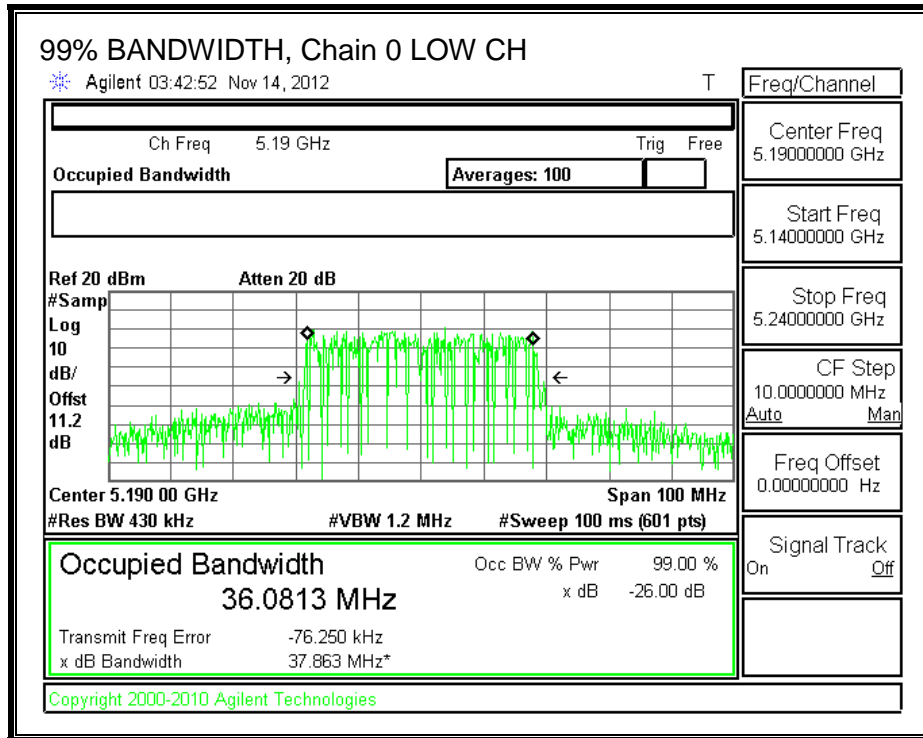
LIMITS

None; for reporting purposes only.

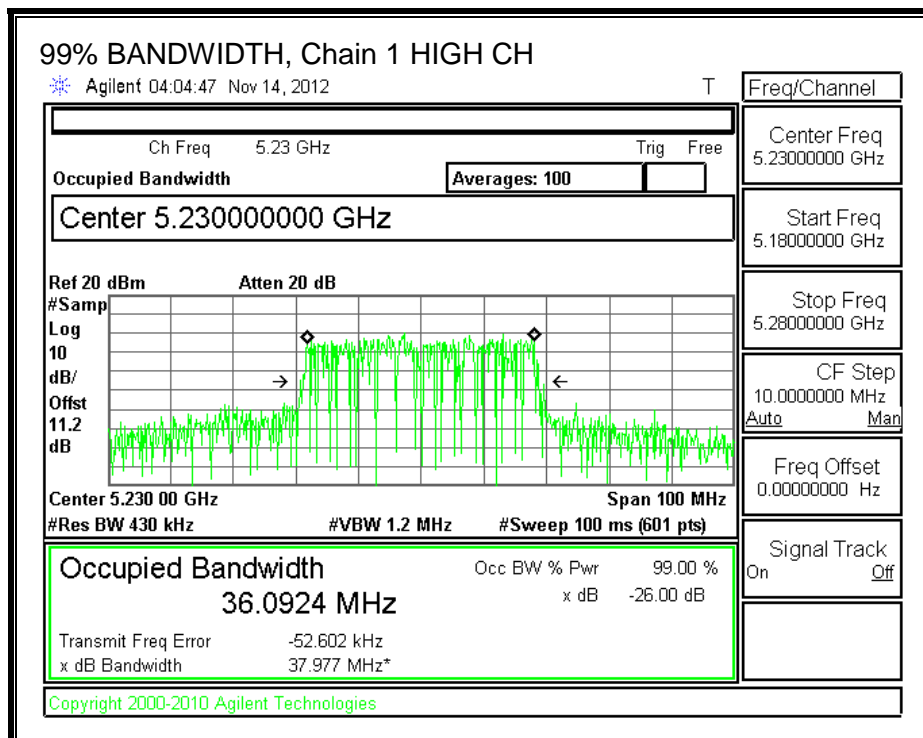
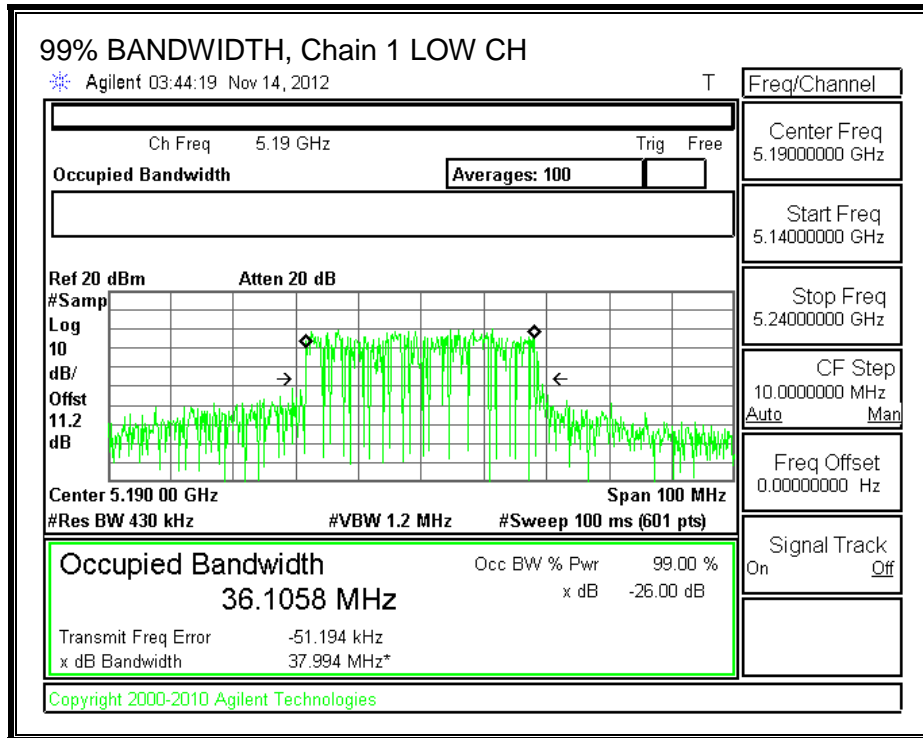
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.0813	36.1058	36.1539
High	5230	36.0966	36.0924	36.1237

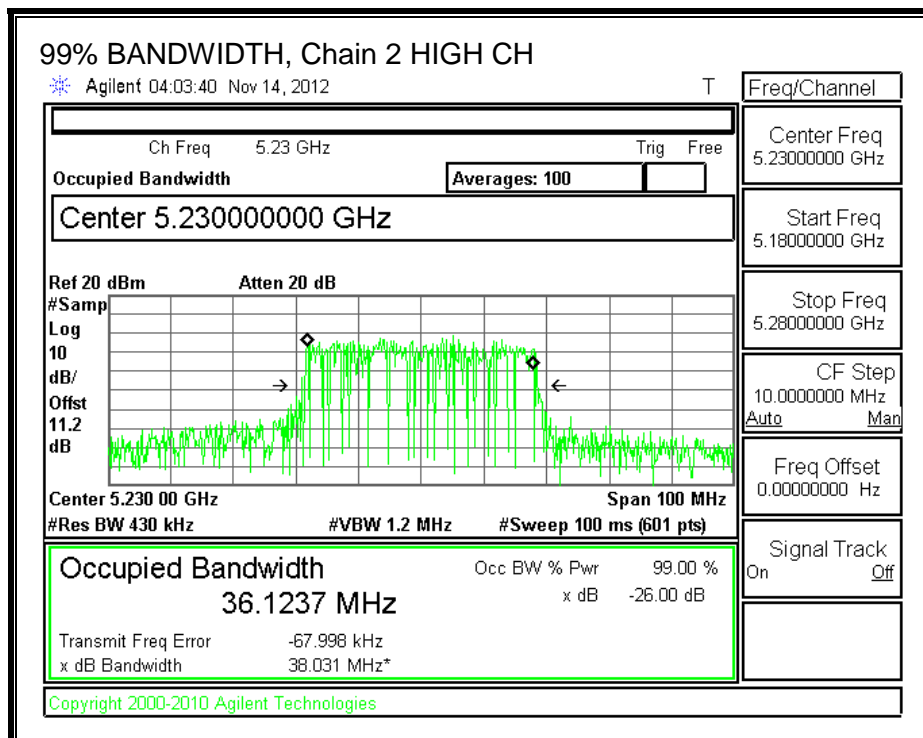
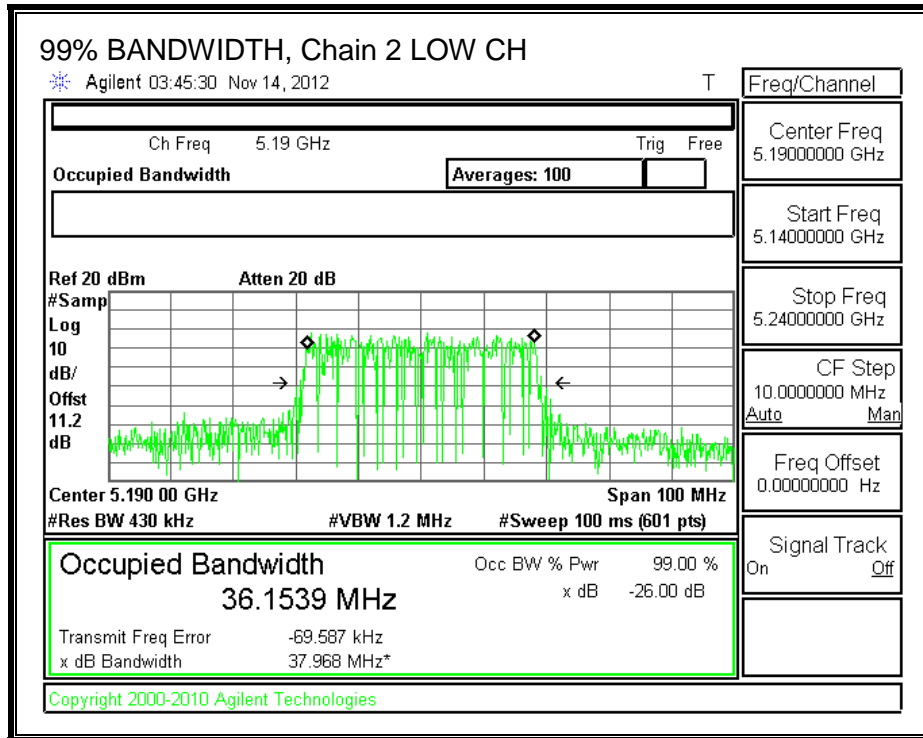
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.20.3. OUTPUT POWER AND PPSD

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)
7.04	6.70	3.79	6.07

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.50	36.0813	6.07
High	5230	39.33	36.0924	6.07

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)	PPSD Limit (dBm)
Low	5190	16.93	23.00	16.93	16.93	3.93	10.00	3.93
High	5230	16.93	23.00	16.93	16.93	3.93	10.00	3.93

Duty Cycle CF (dB)	0.57	Included in Calculations of PPCD
---------------------------	------	---

Output Power Results

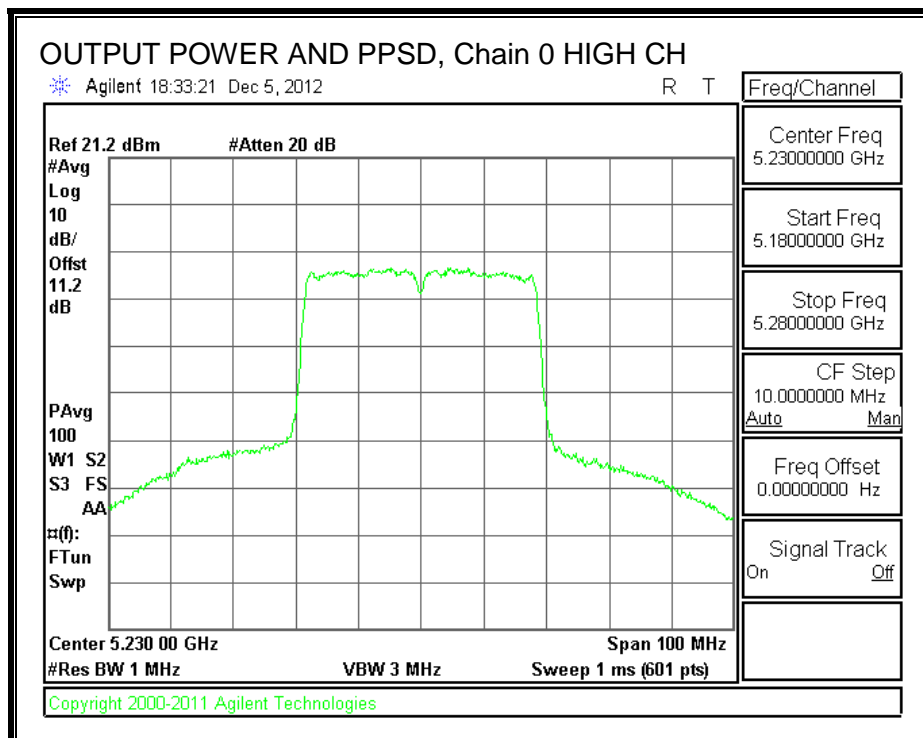
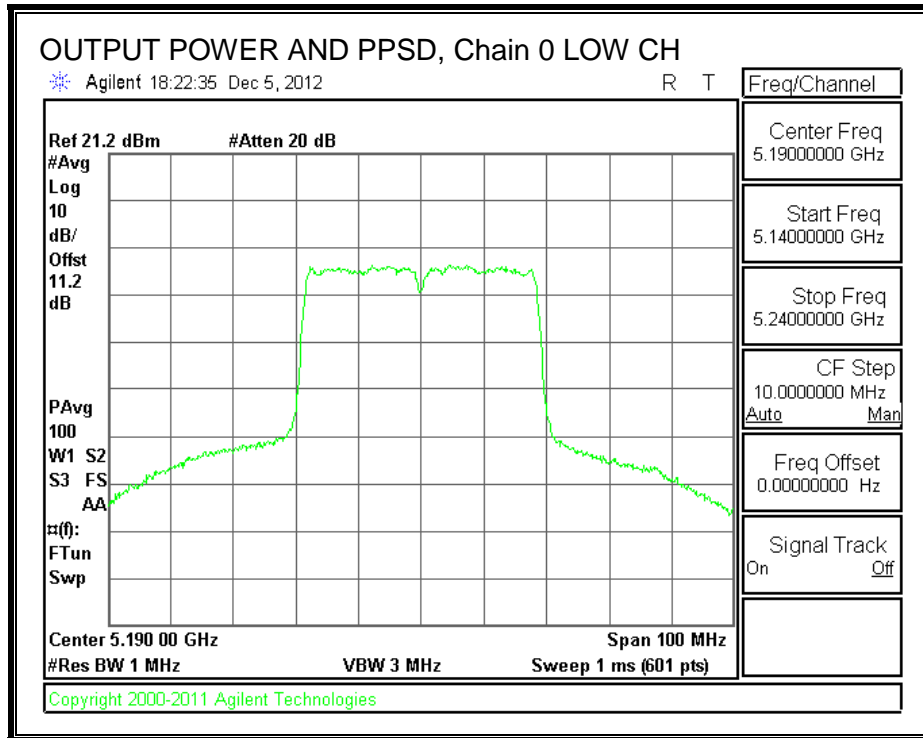
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	12.03	12.36	12.01	16.91	16.93	-0.02
High	5230	12.01	12.45	11.87	16.89	16.93	-0.04

PPSD Results

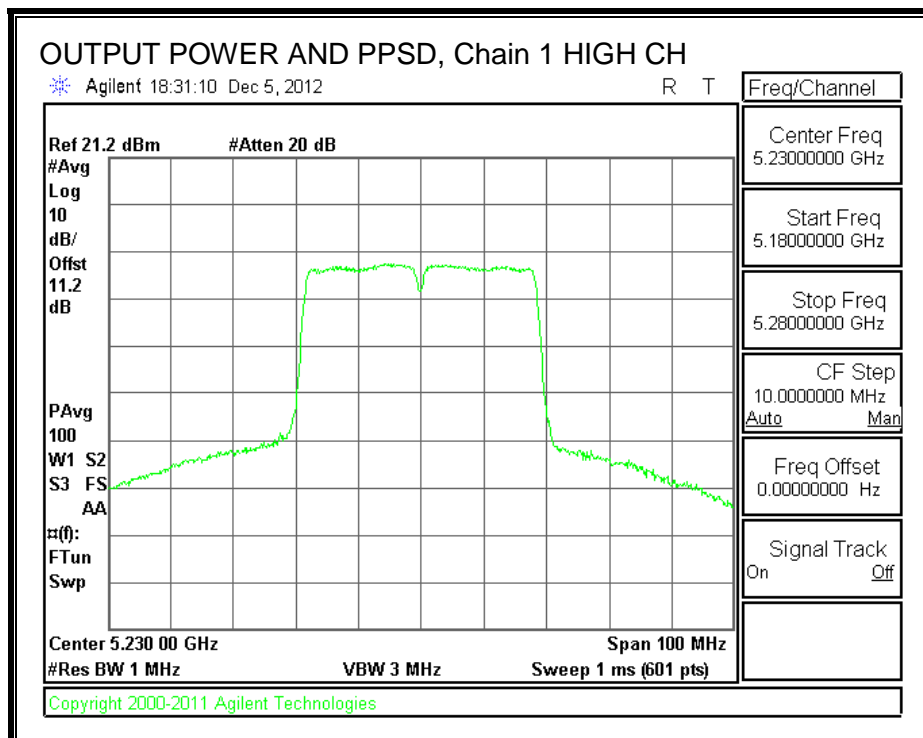
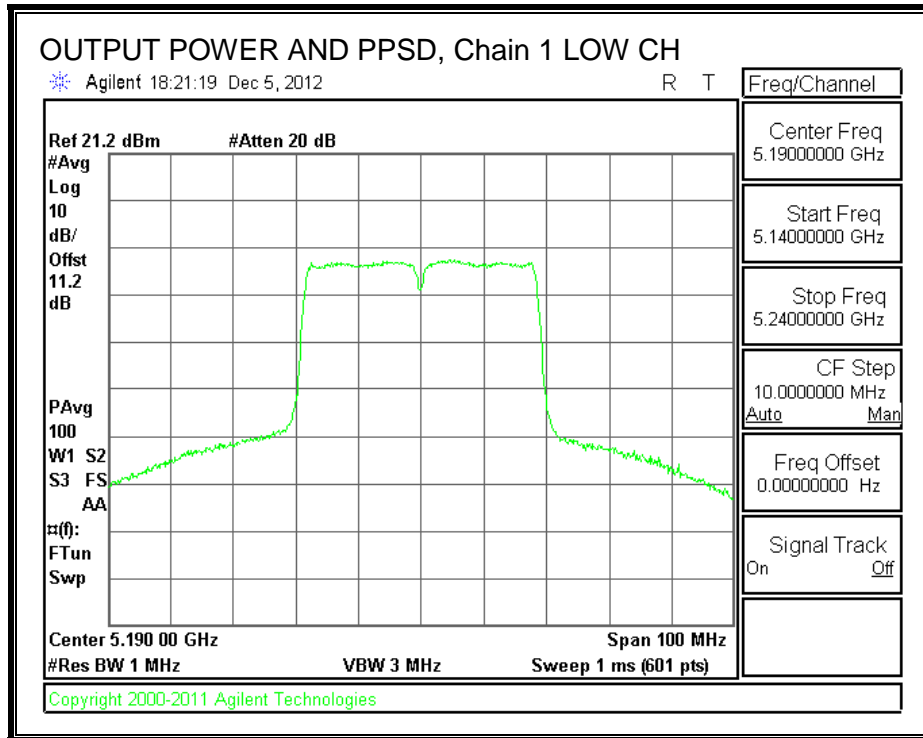
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-2.51	-1.62	-2.49	3.15	3.93	-0.78
High	5230	-2.27	-1.91	-1.94	3.30	3.93	-0.63

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

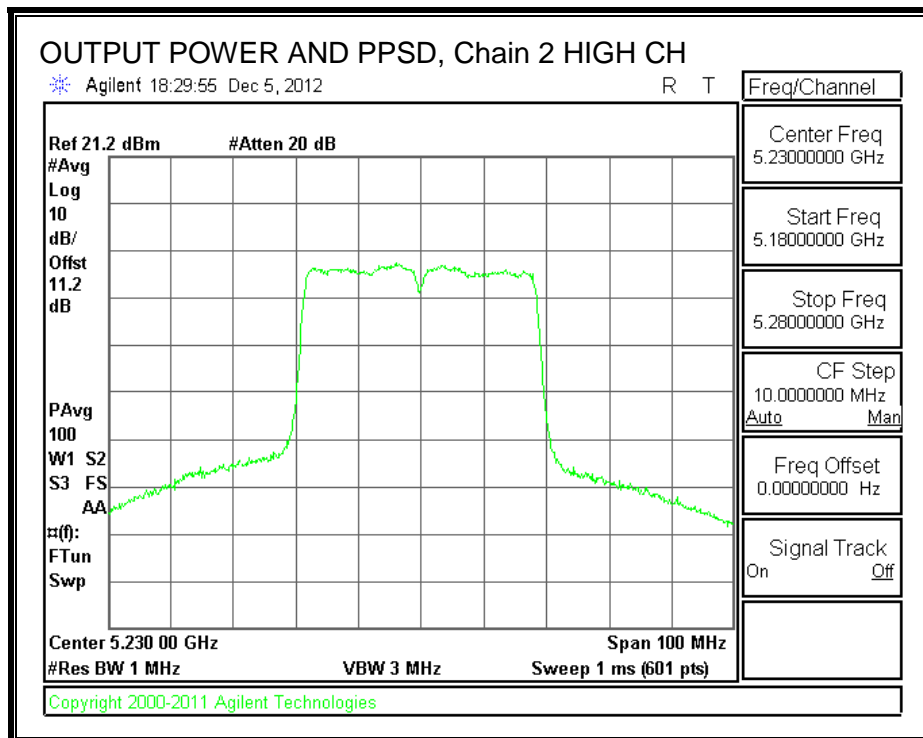
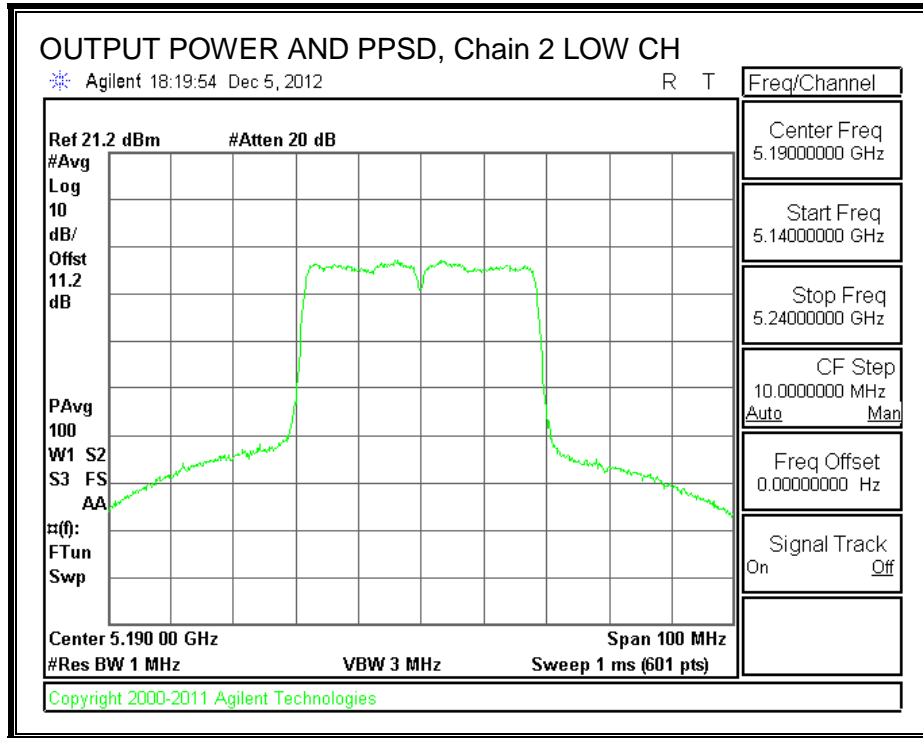
OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



7.20.4. 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	6.44	-2.51	0.57	8.38	13	-4.62
High	5230	6.07	-2.27	0.57	7.77	13	-5.23

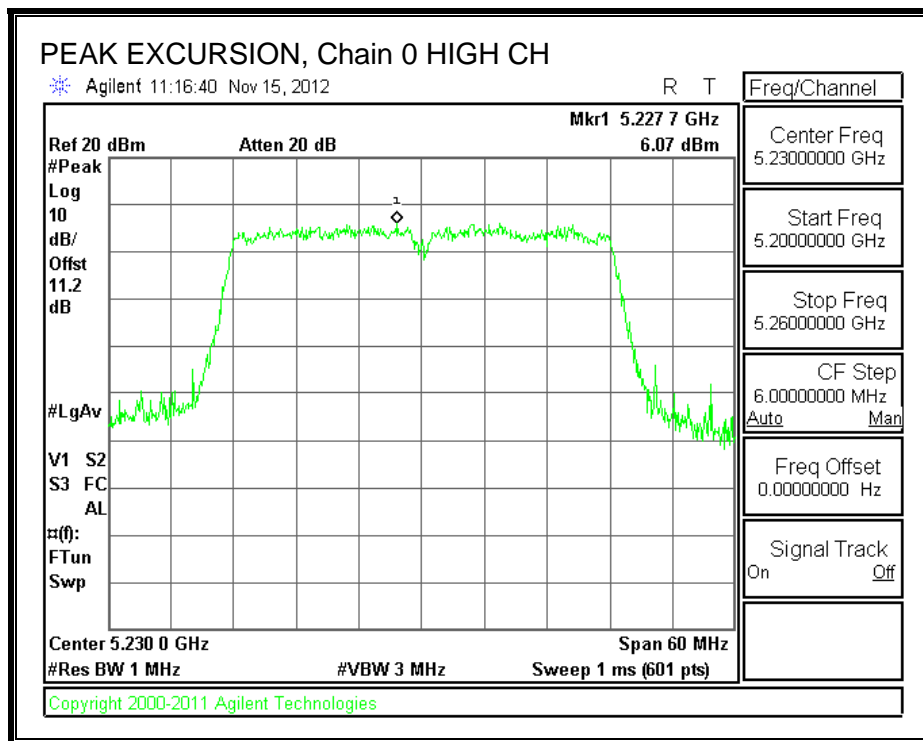
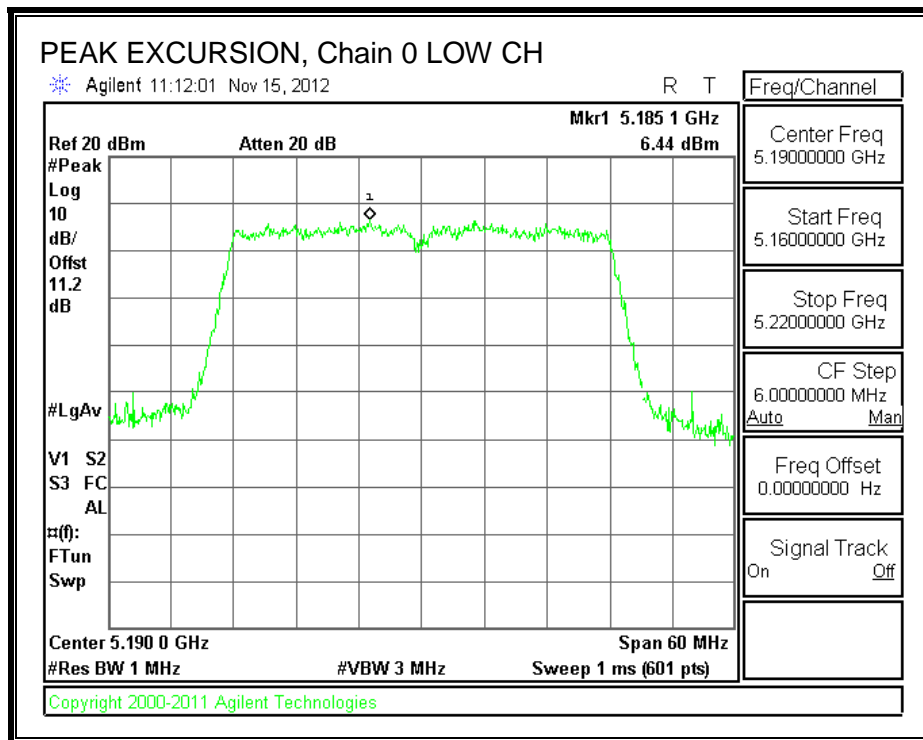
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.08	-1.62	0.57	8.13	13	-4.87
High	5230	6.89	-1.91	0.57	8.23	13	-4.77

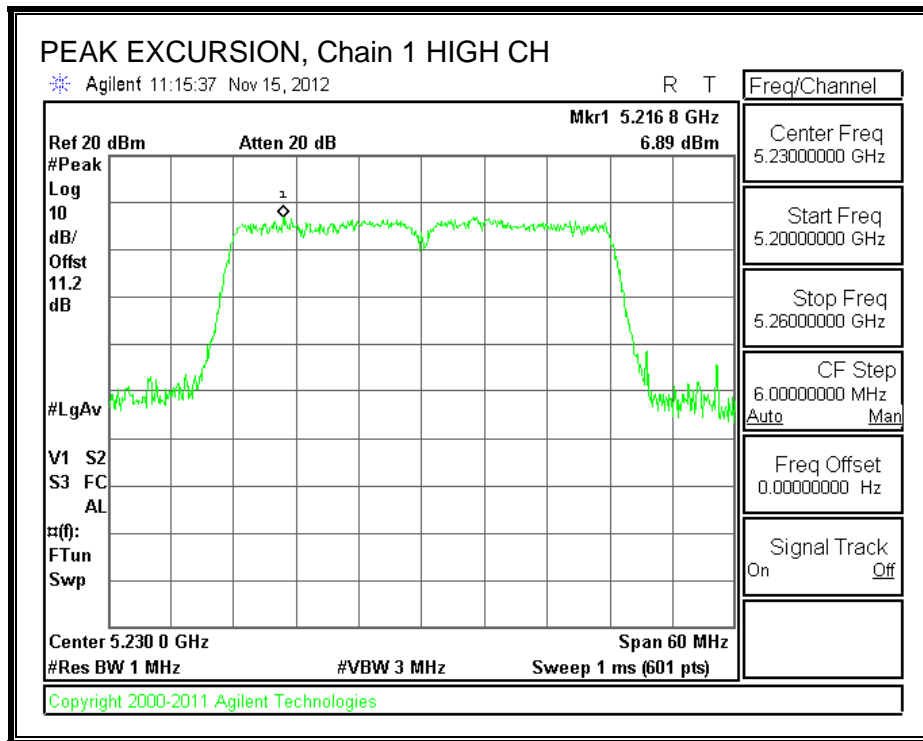
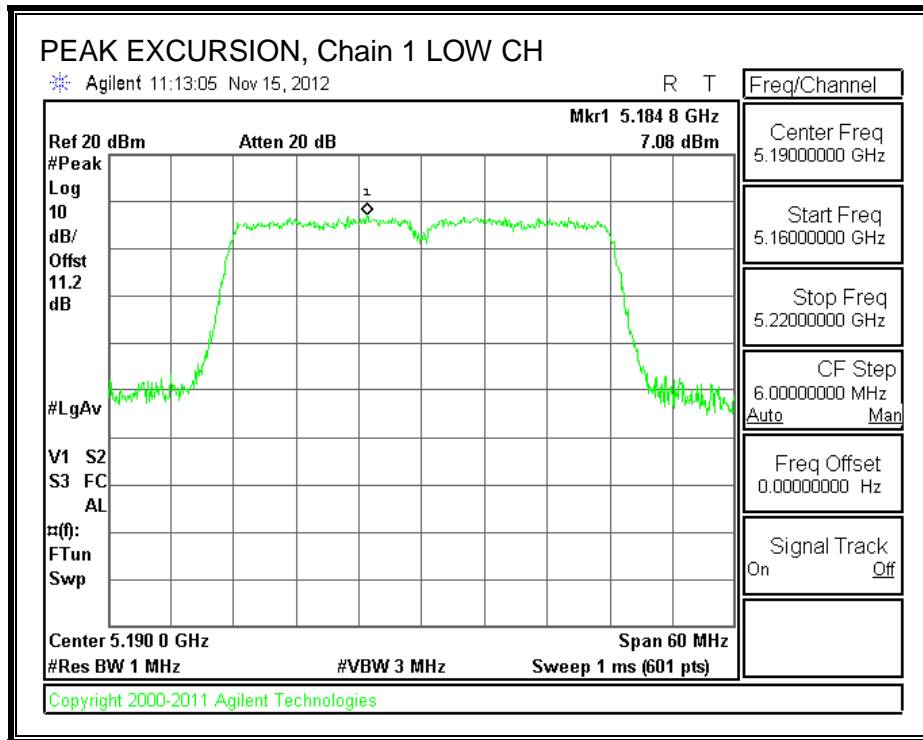
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	3.42	-2.49	0.57	5.34	13	-7.66
High	5230	2.58	-1.94	0.57	3.95	13	-9.05

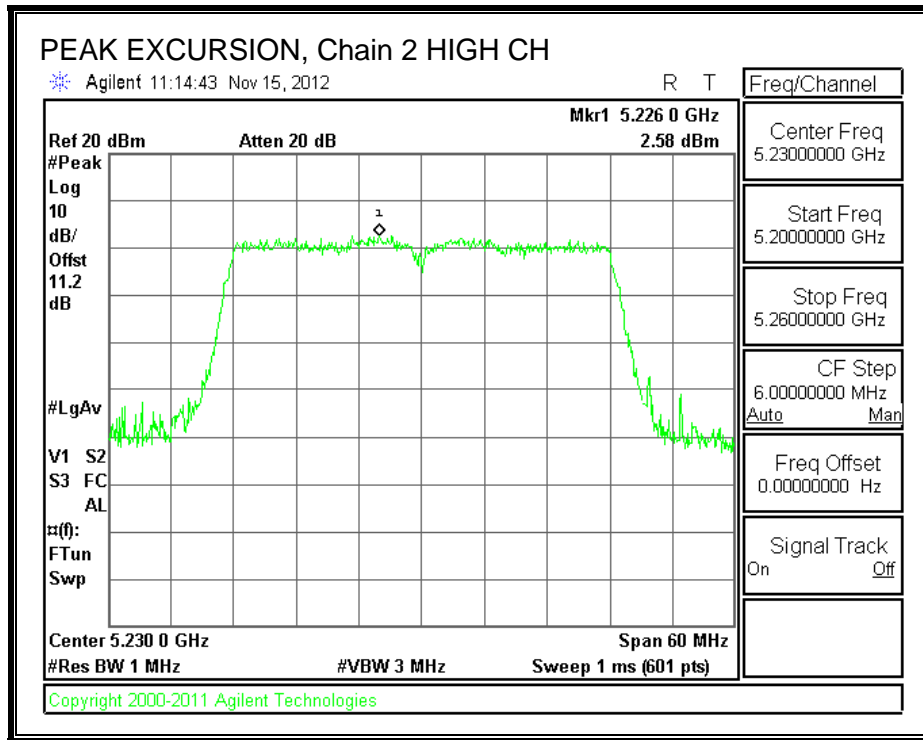
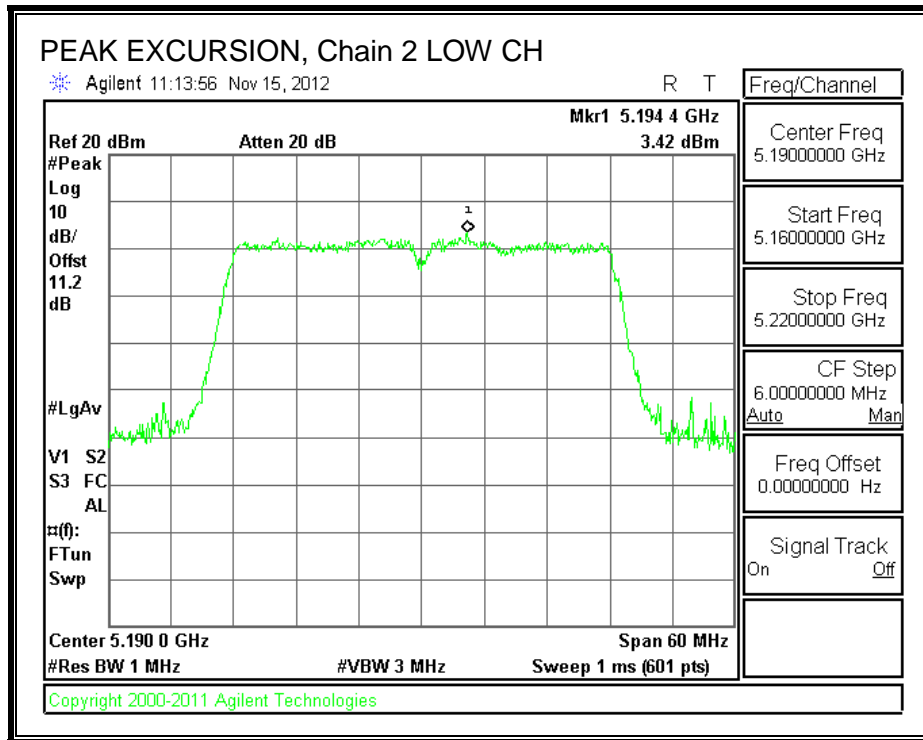
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



7.21. 802.11n HT40 BF 2TX MODE, 5.2 GHz BAND

Covered by testing 802.11ac VHT40 BF 2TX mode, total power across the two chains is higher than the power level the device will operate at.

7.22. 802.11ac VHT40 BF 2TX MODE, 5.2 GHz BAND

7.22.1. 26 dB BANDWIDTH

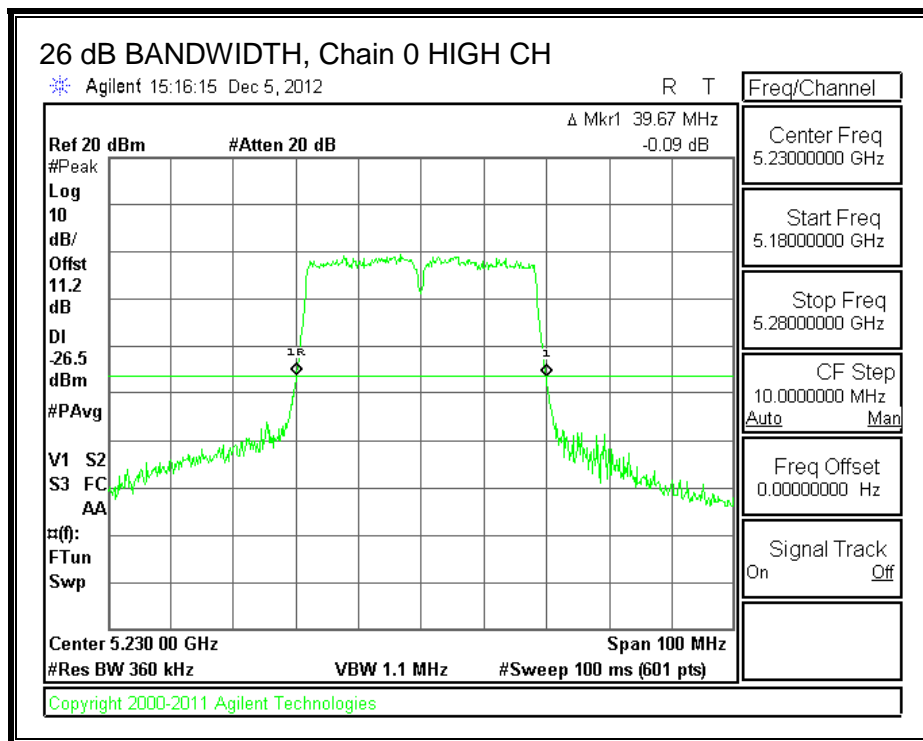
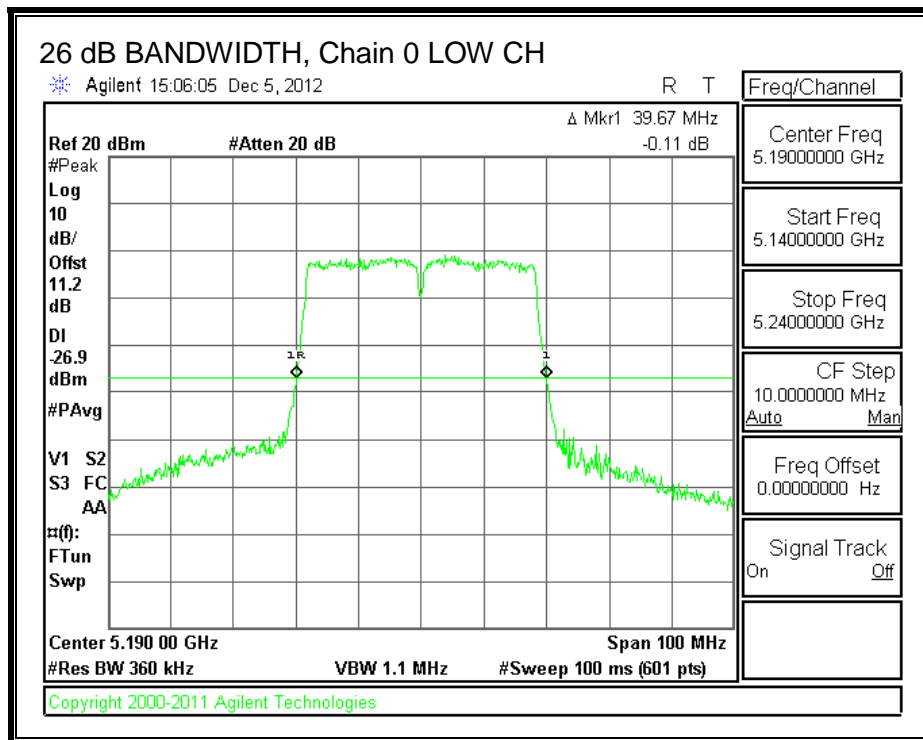
LIMITS

None; for reporting purposes only.

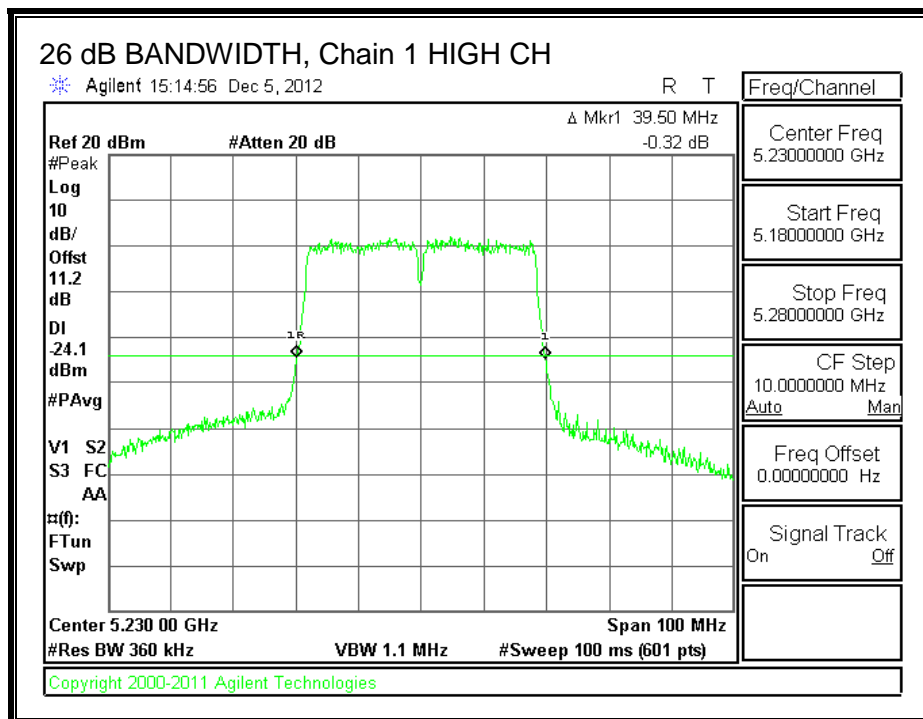
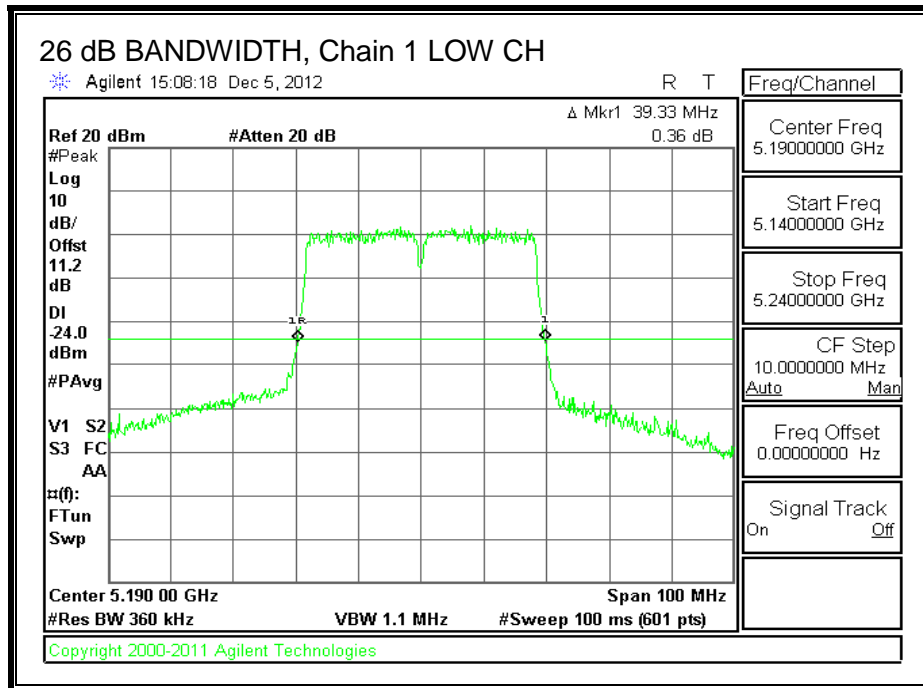
RESULTS

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

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.22.2. **99% BANDWIDTH**

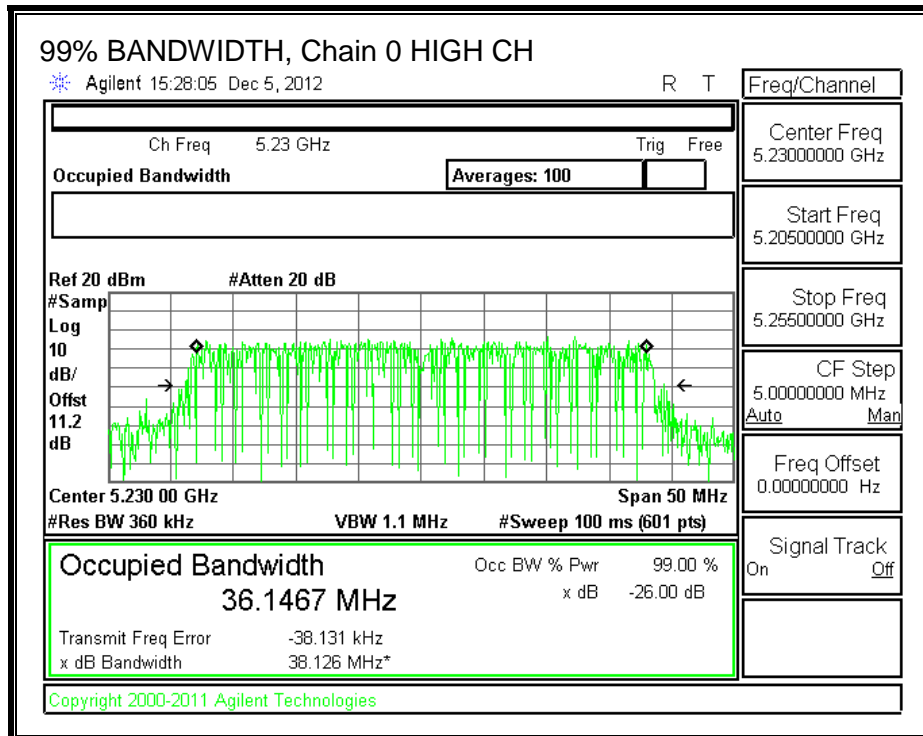
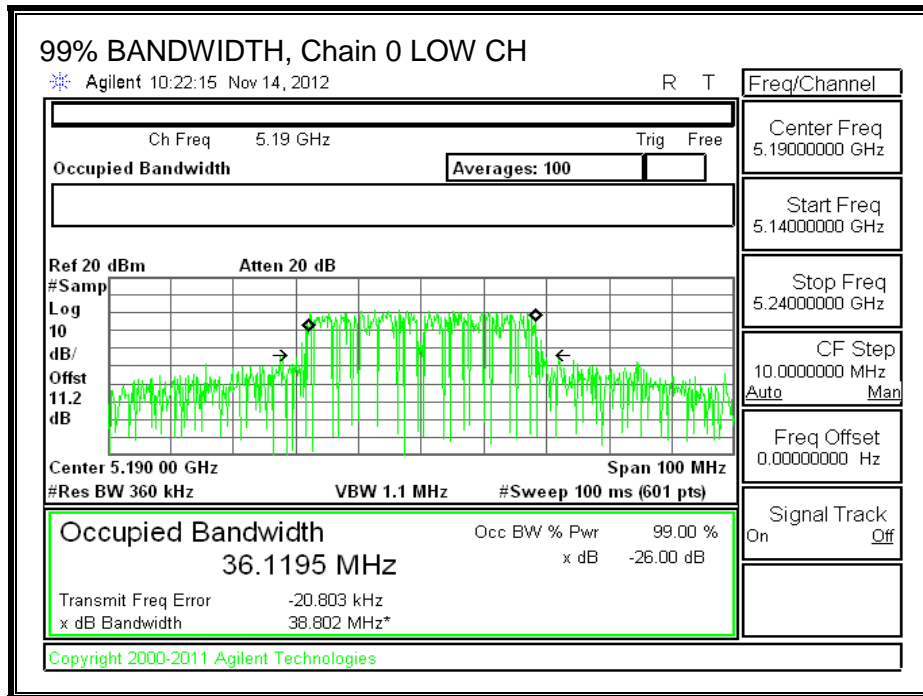
LIMITS

None; for reporting purposes only.

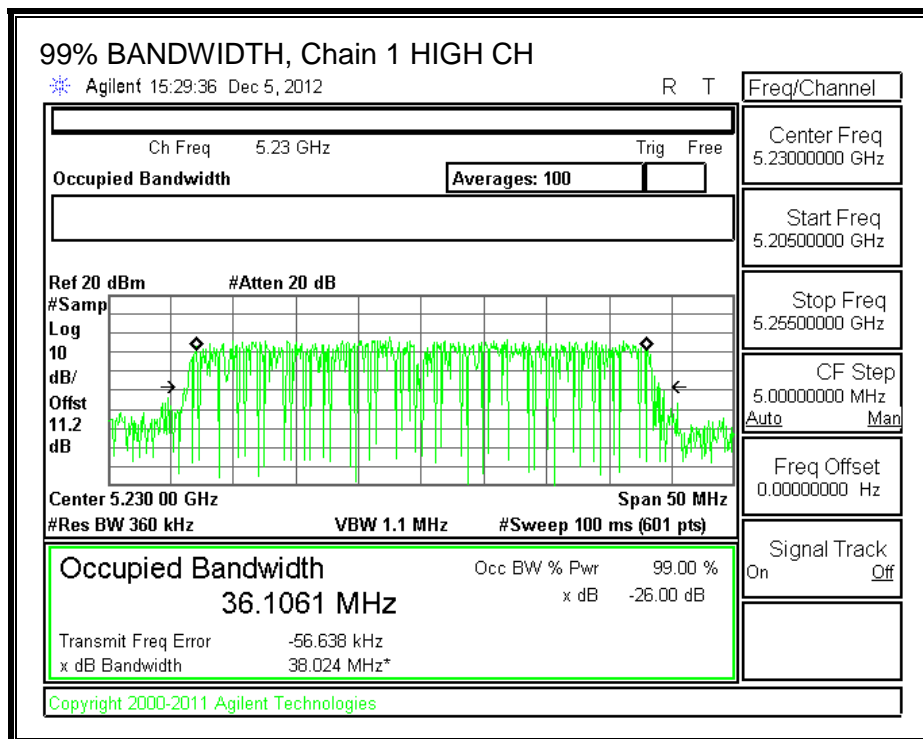
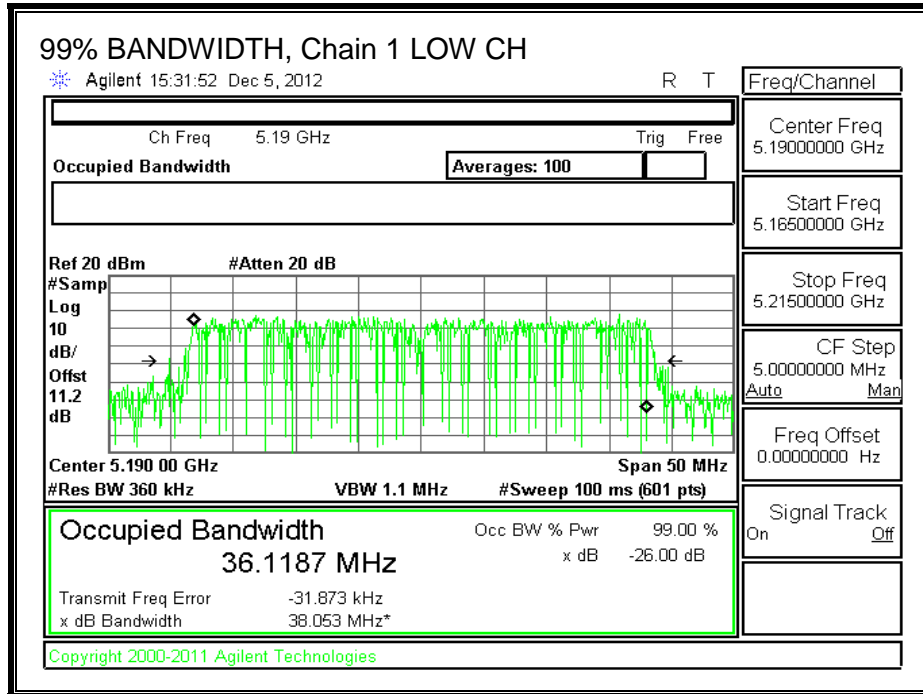
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	36.1195	36.1187
High	5230	36.1467	36.1061

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.22.3. OUTPUT POWER AND PPSD

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 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)
7.04	6.70	9.88

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	39.33	36.1187	9.88
High	5230	39.50	36.1061	9.88

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)	PPSD Limit (dBm)
Low	5190	13.12	23.00	13.12	13.12	0.12	10.00	0.12
High	5230	13.12	23.00	13.12	13.12	0.12	10.00	0.12

Duty Cycle CF (dB)	0.43	Included in Calculations of PPSD
---------------------------	------	---

Output Power Results

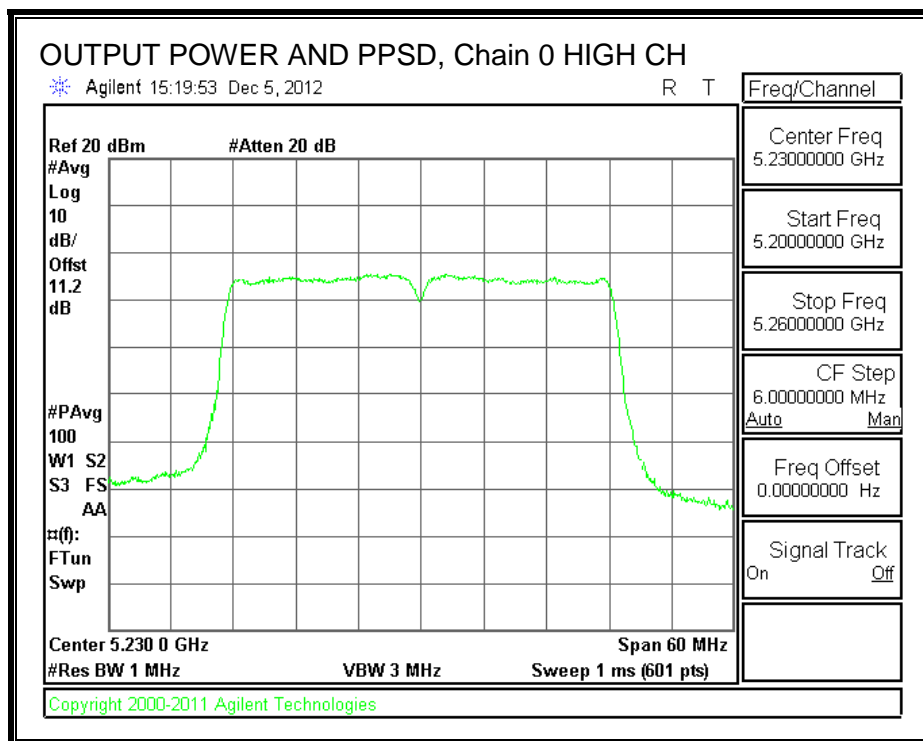
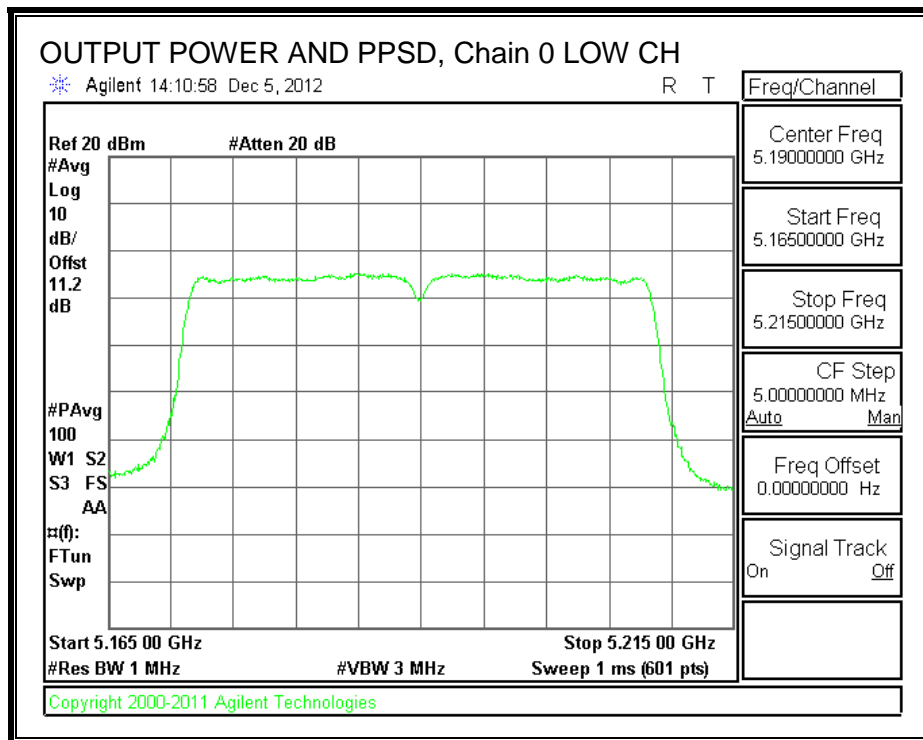
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	9.56	10.30	12.96	13.12	-0.16
High	5230	9.51	10.48	13.03	13.12	-0.09

PPSD Results

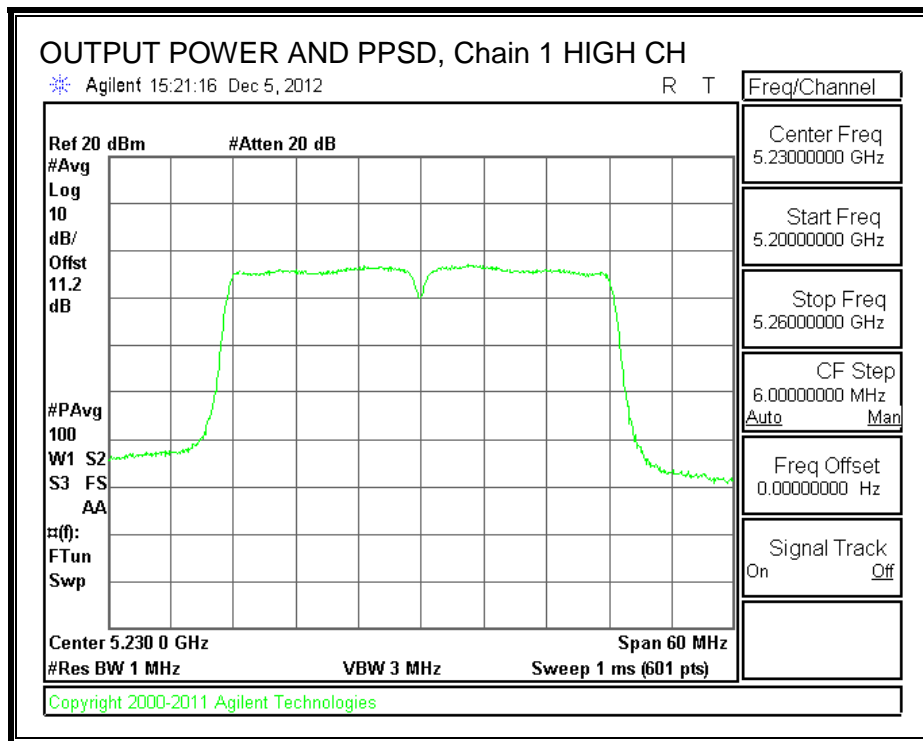
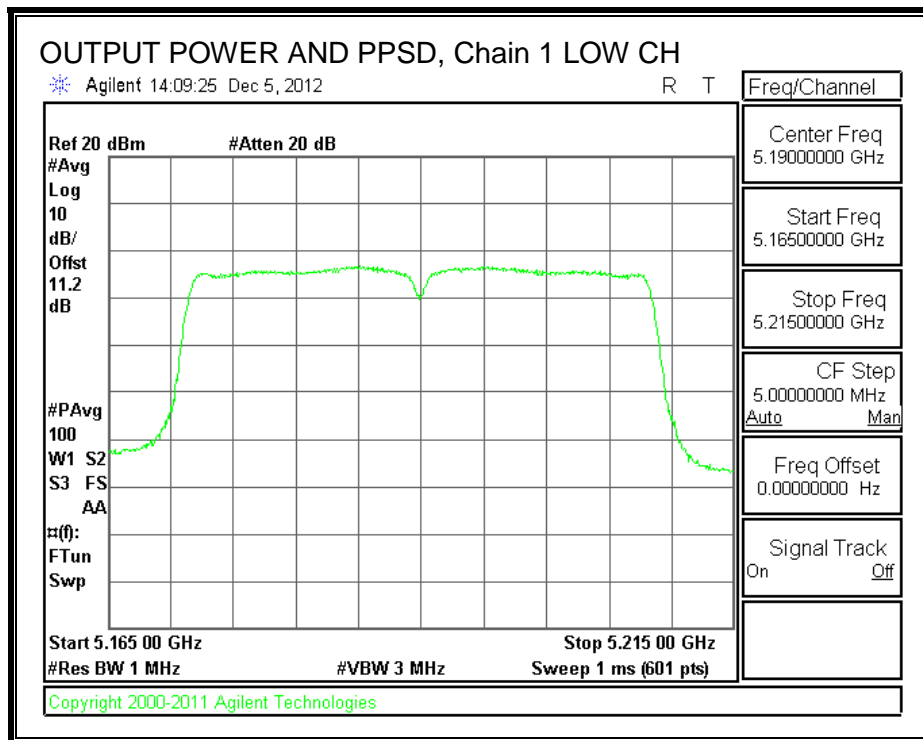
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-4.890	-3.300	-0.58	0.12	-0.70
High	5230	-4.564	-2.934	-0.23	0.12	-0.35

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.23. 802.11ac VHT40 BF 3TX MODE, 5.2 GHz BAND

7.23.1. 26 dB BANDWIDTH

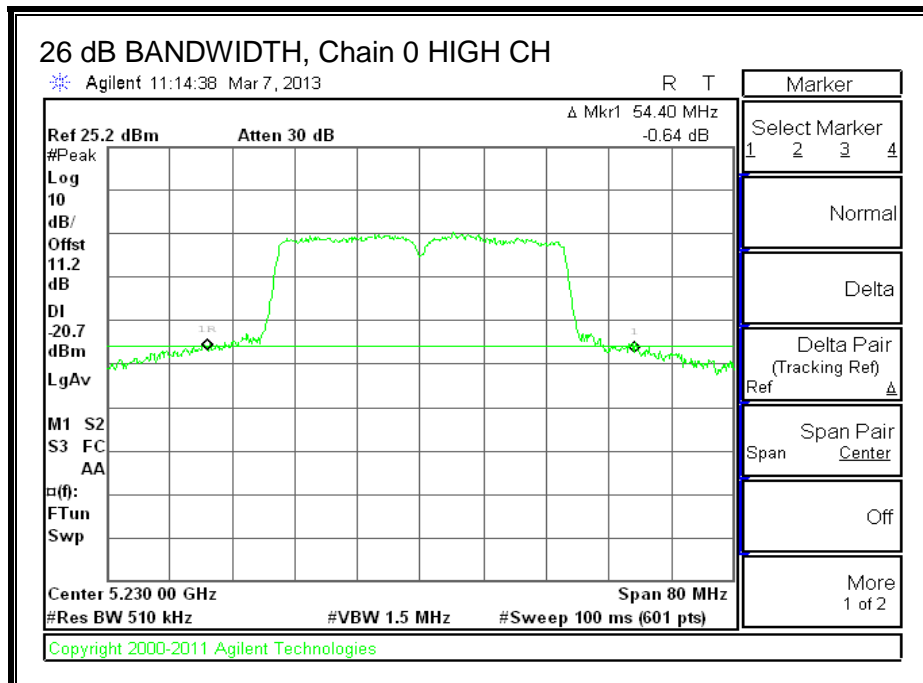
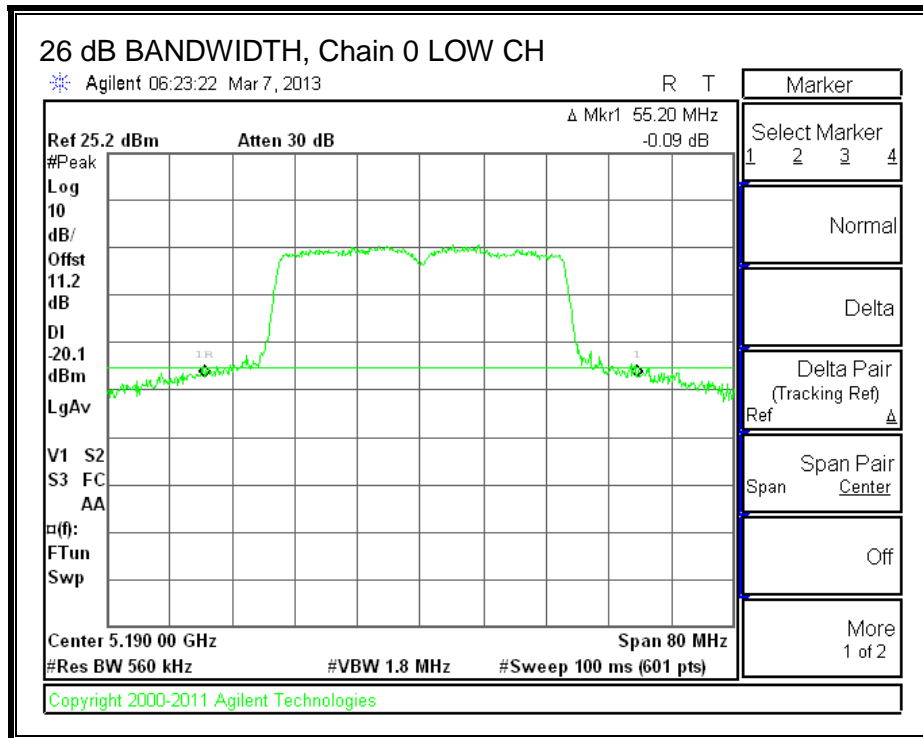
LIMITS

None; for reporting purposes only.

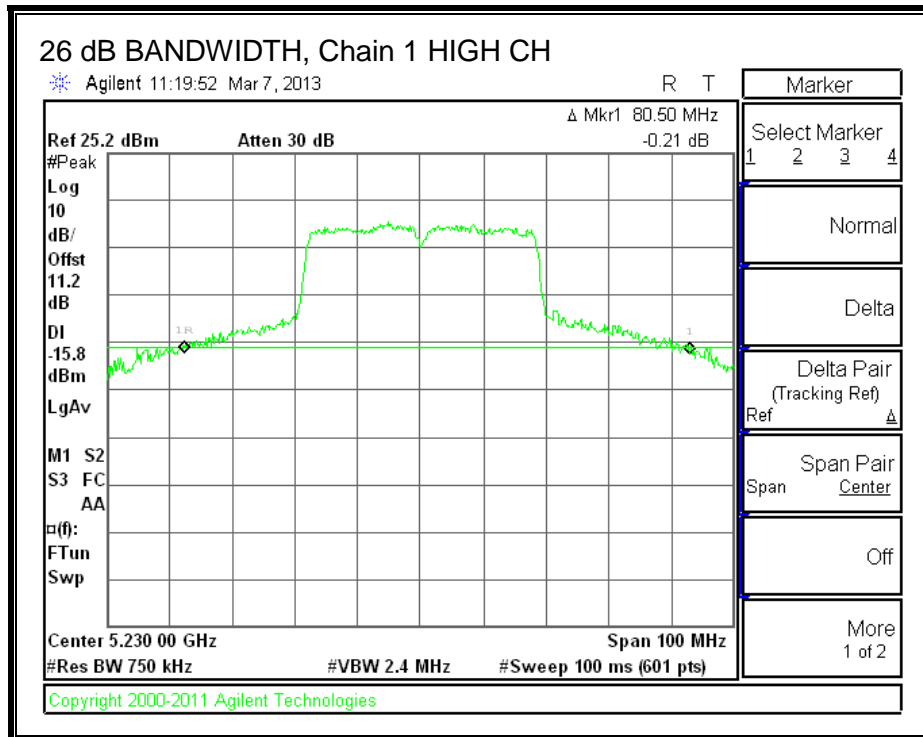
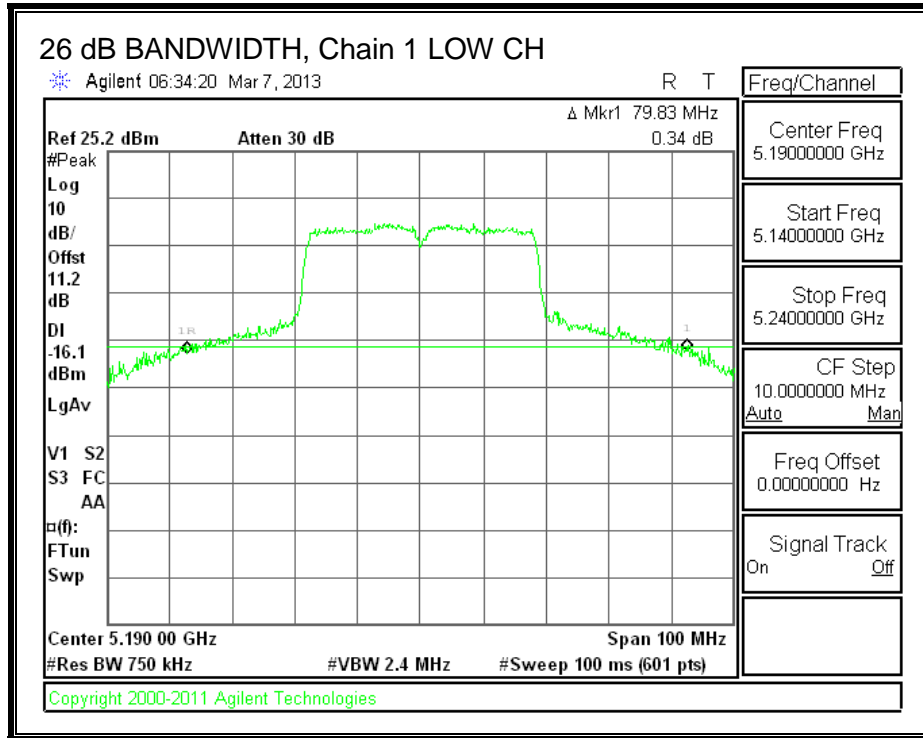
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	55.20	79.83	44.93
High	5230	54.40	80.50	40.20

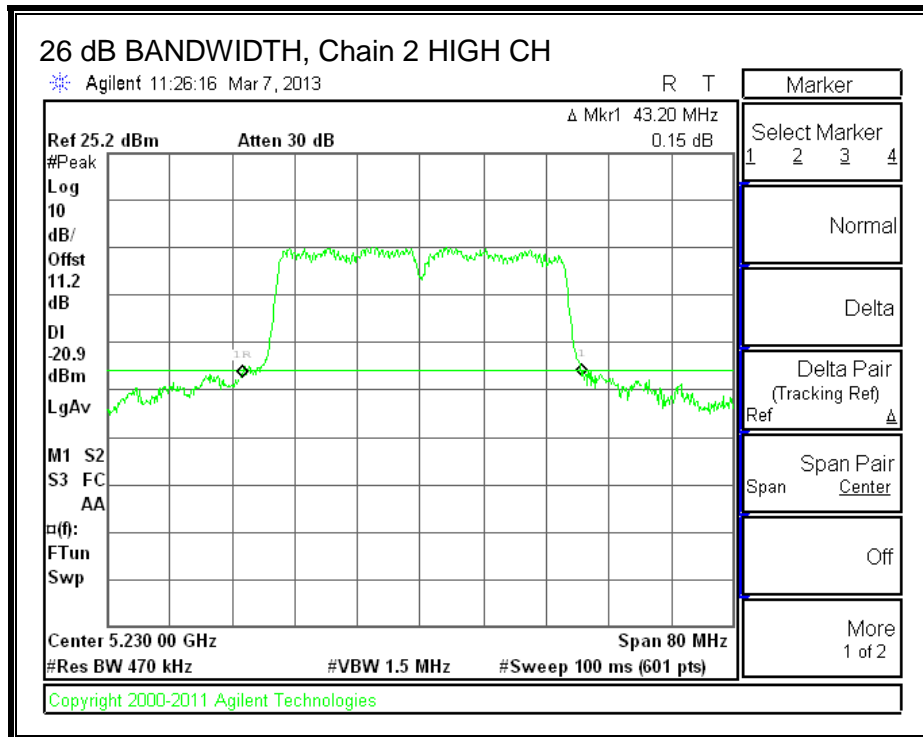
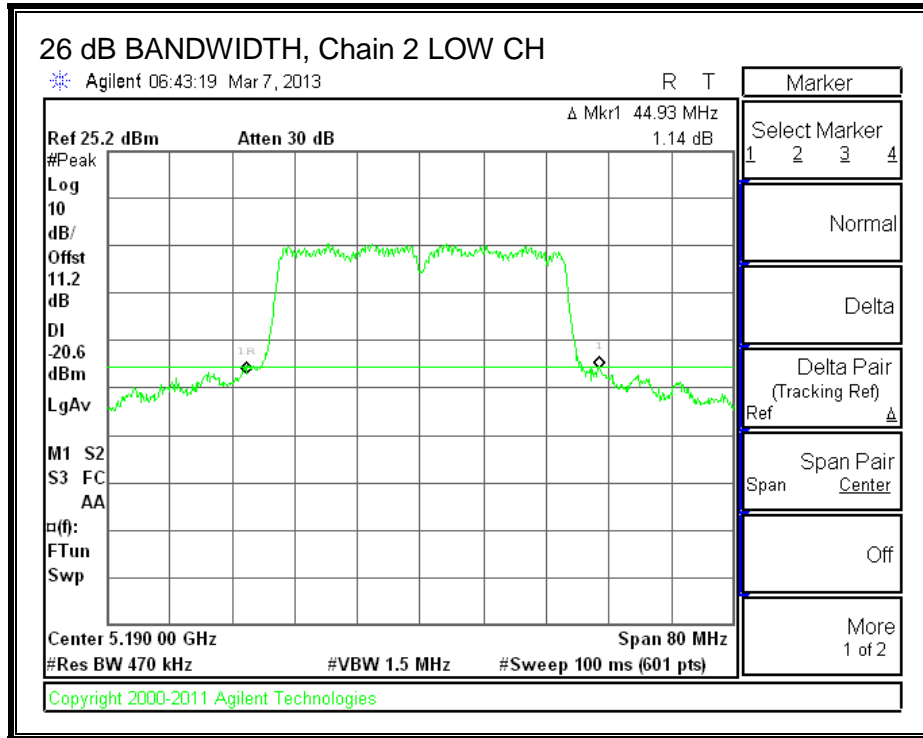
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.23.2. **99% BANDWIDTH**

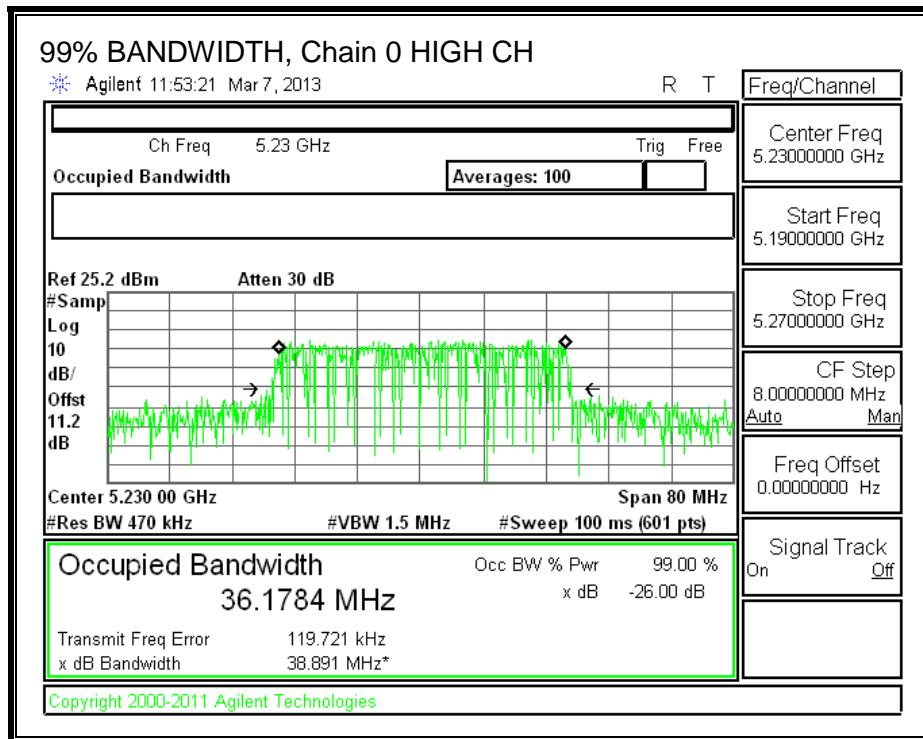
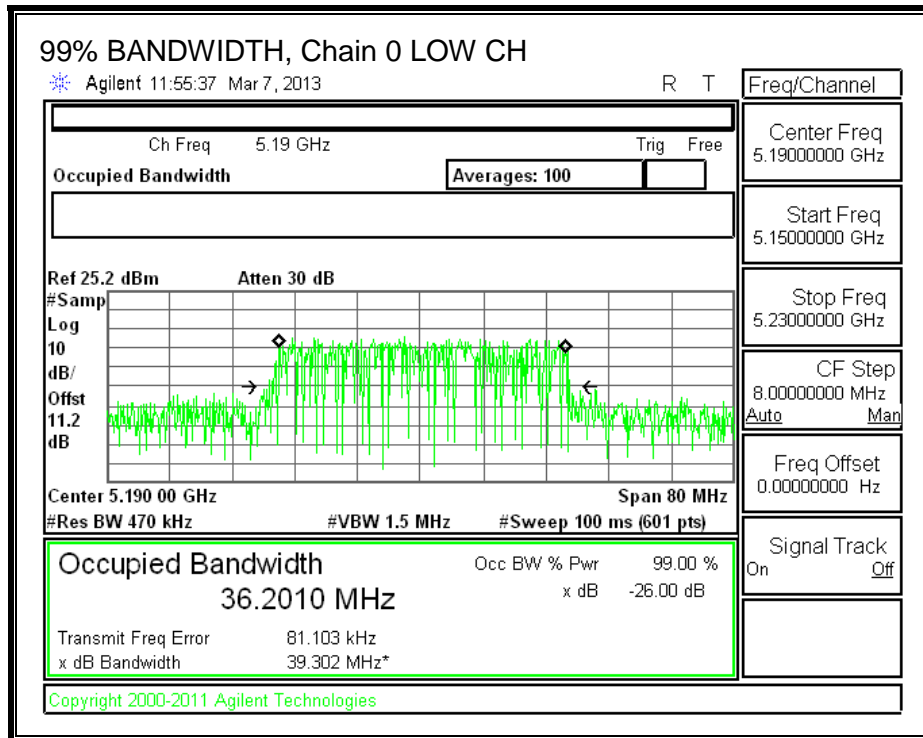
LIMITS

None; for reporting purposes only.

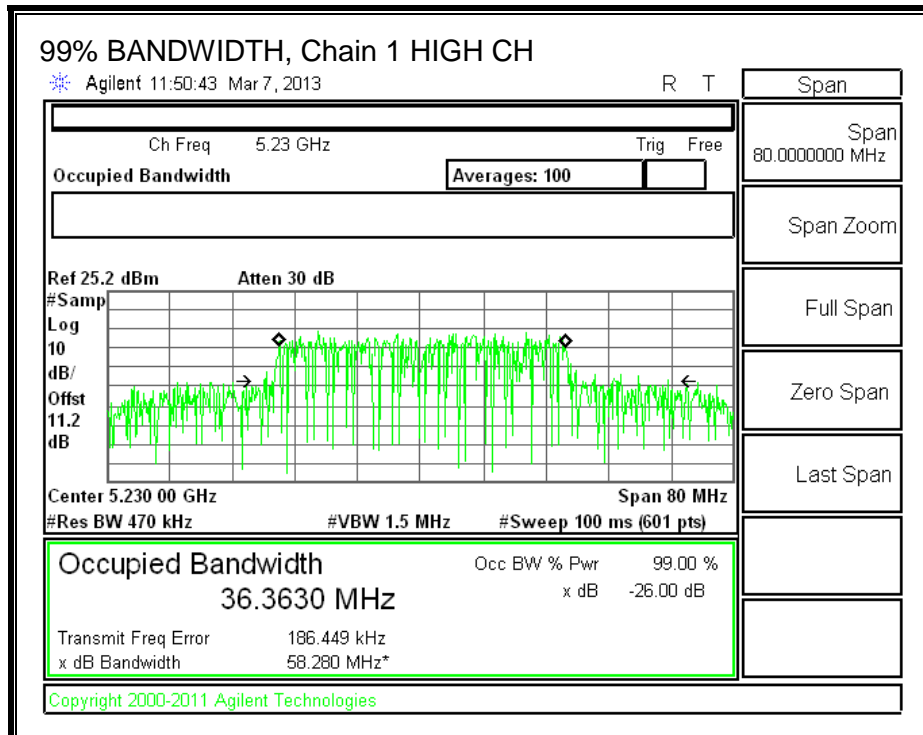
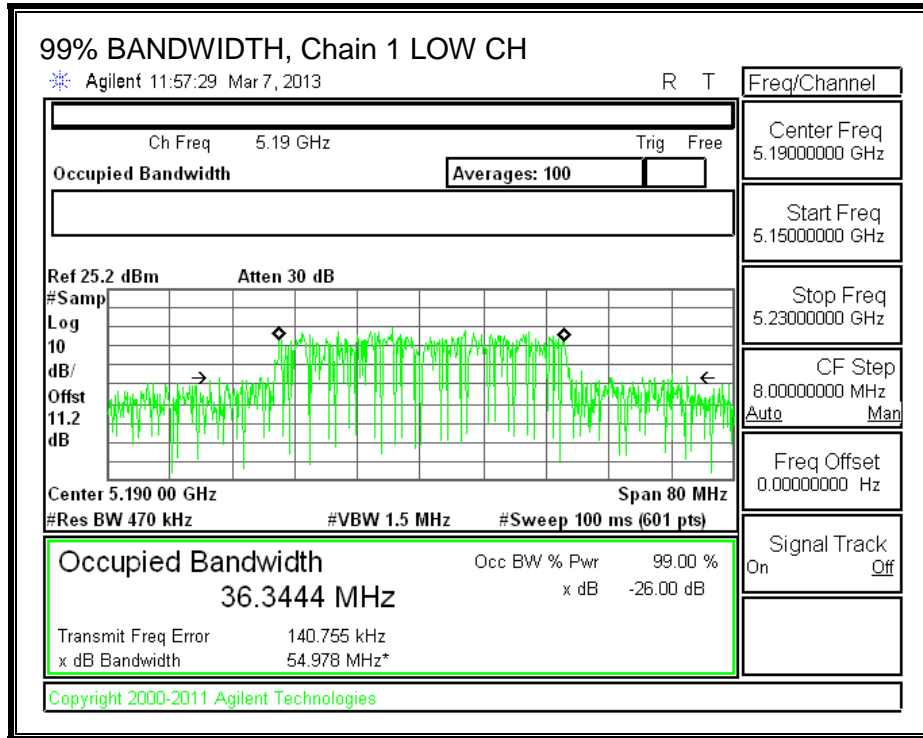
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.2010	36.3444	36.2036
High	5230	36.1784	36.3630	36.5346

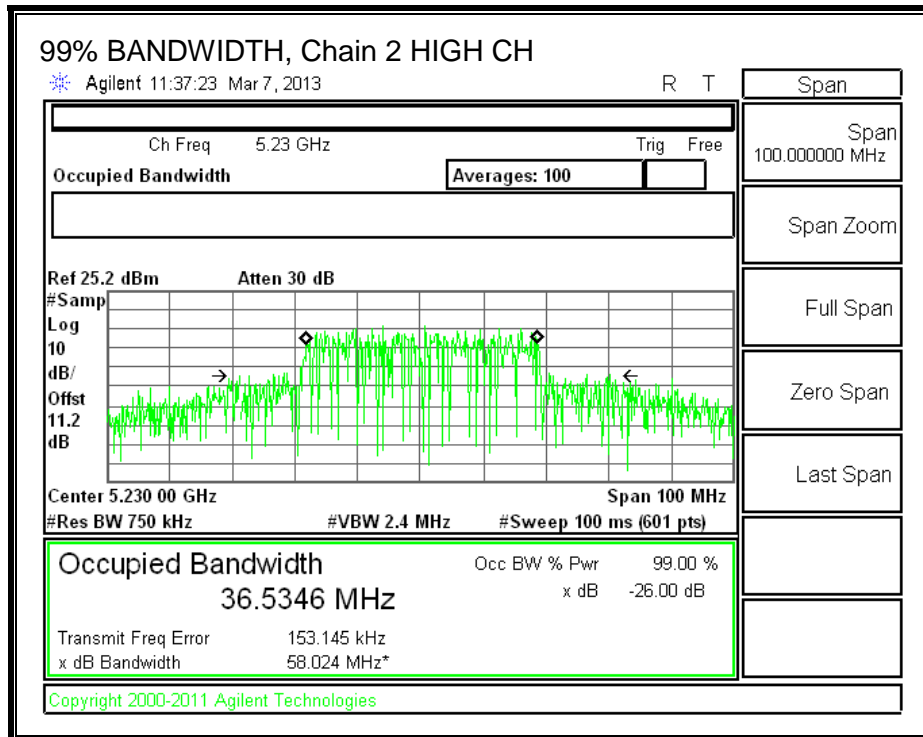
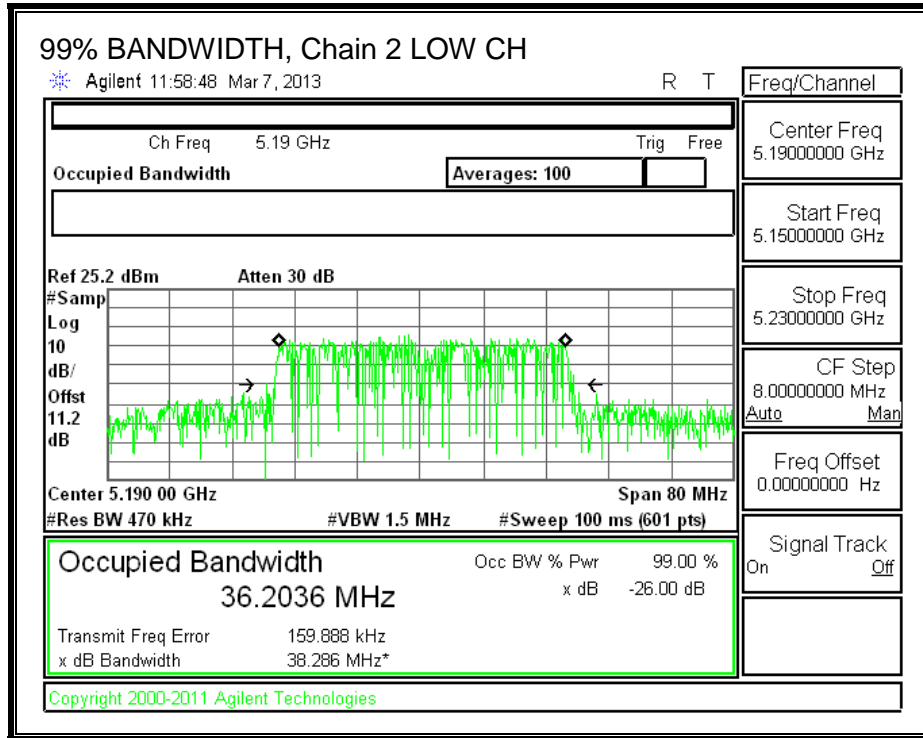
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.23.3. OUTPUT POWER AND PPSD

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 correlated 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)
7.04	6.70	3.79	10.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Correlated Directional Gain (dBi)
Low	5190	44.93	36.2010	10.73
High	5230	40.20	36.1784	10.73

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)	PPSD Limit (dBm)
Low	5190	12.27	23.00	12.27	12.27	-0.73	10.00	-0.73
High	5230	12.27	23.00	12.27	12.27	-0.73	10.00	-0.73

Duty Cycle CF (dB)	0.43	Included in Calculations of PPCD
---------------------------	------	---

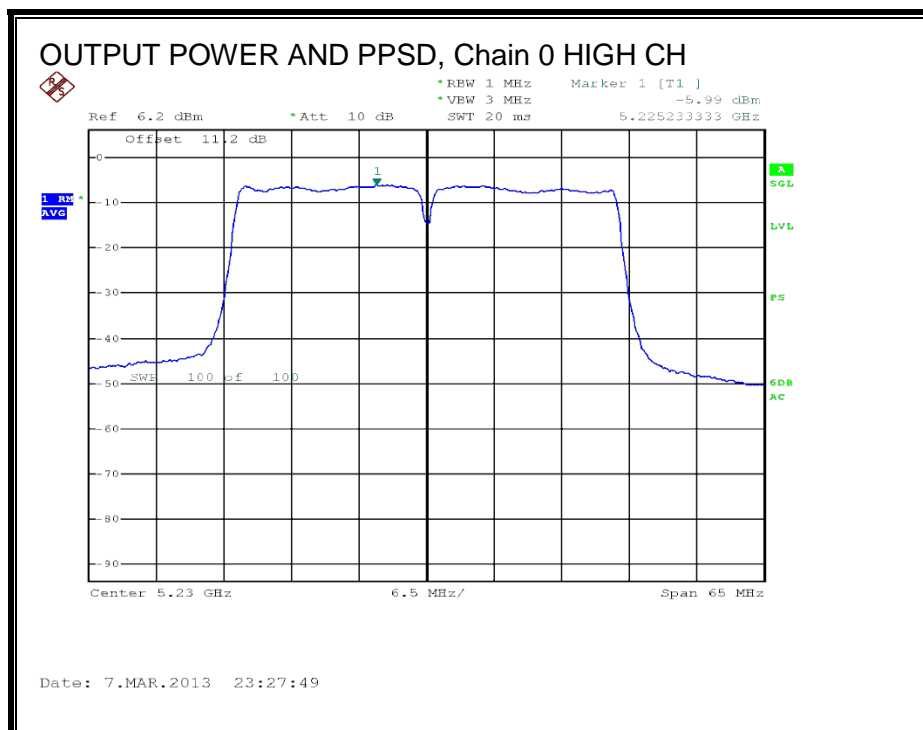
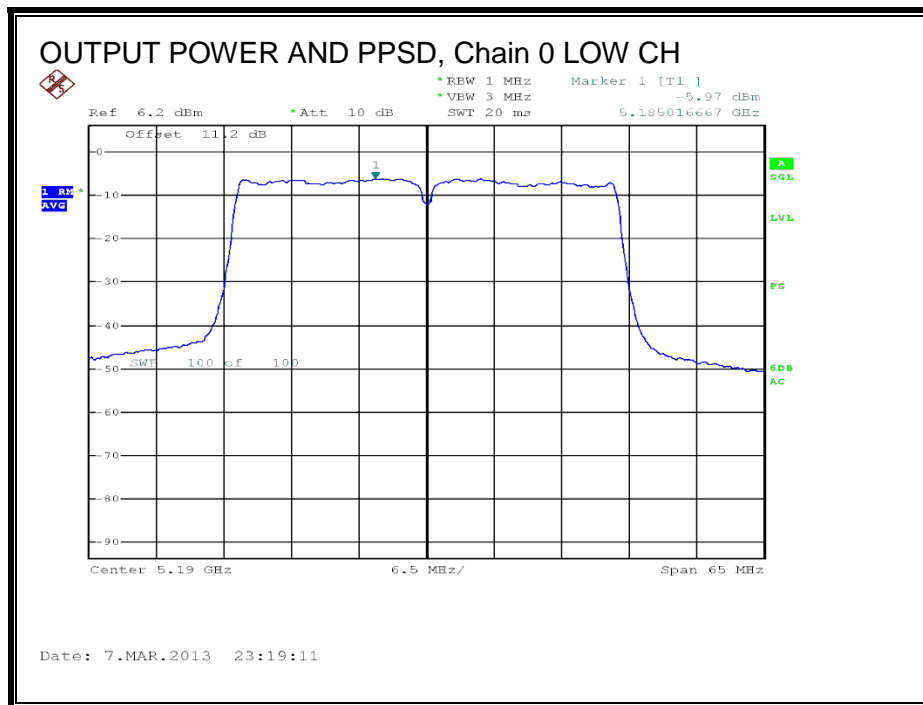
Output Power Results

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	7.21	7.84	7.32	12.24	12.27	-0.03
High	5230	7.33	7.64	7.28	12.19	12.27	-0.08

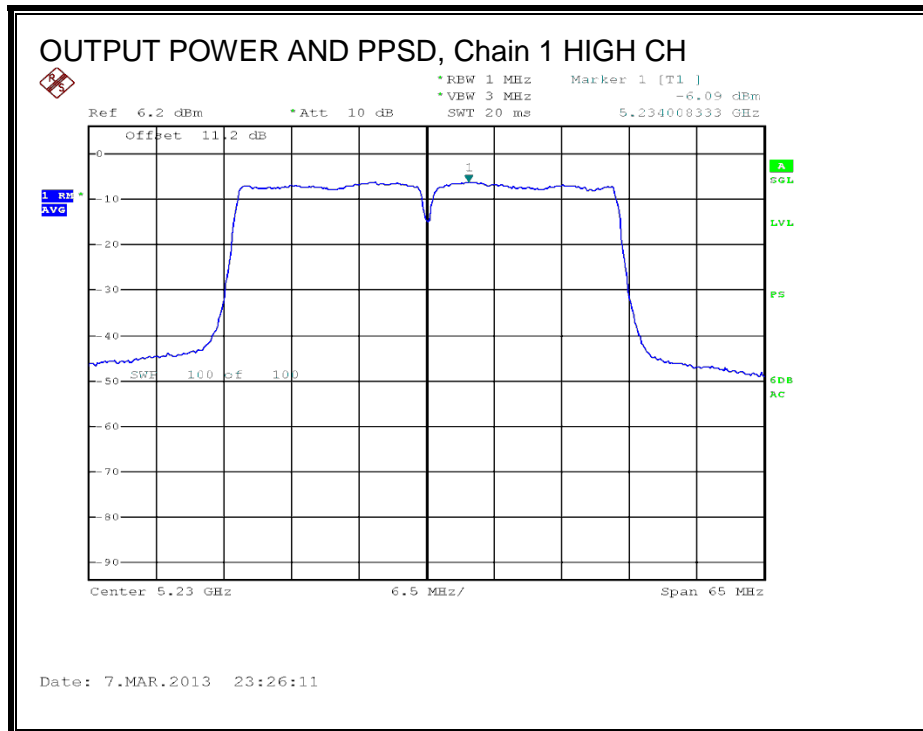
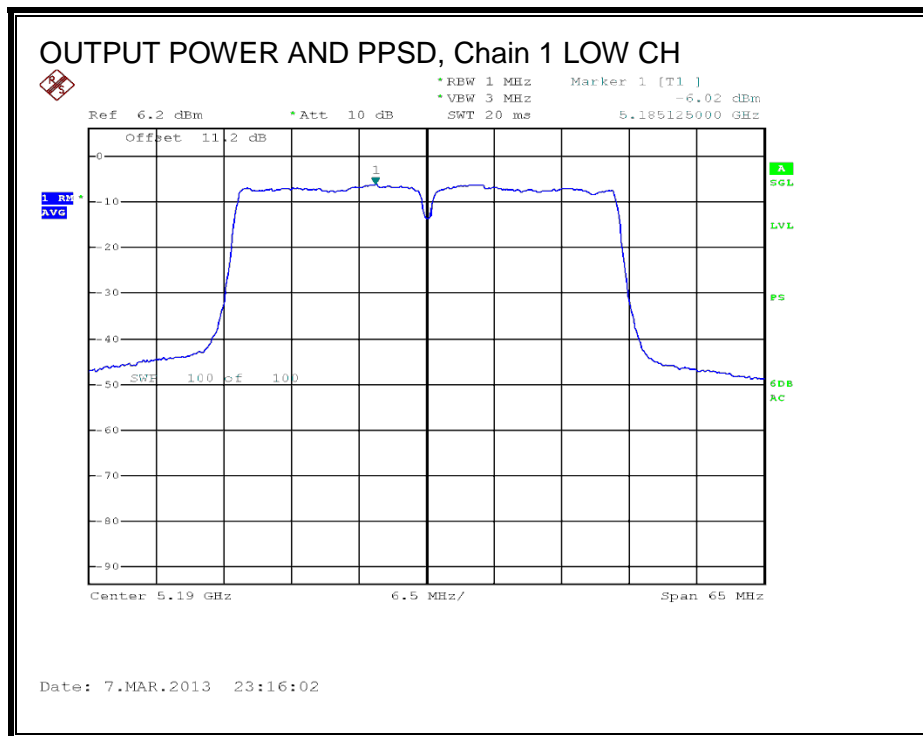
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-5.97	-6.02	-6.15	-0.84	-0.73	-0.11
High	5230	-5.99	-6.09	-5.84	-0.77	-0.73	-0.04

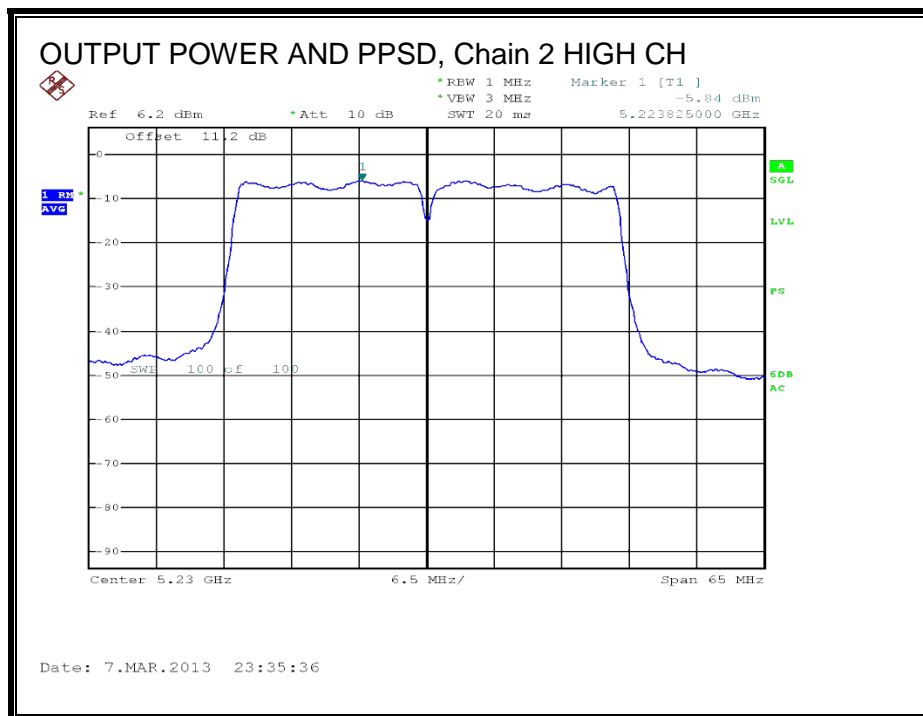
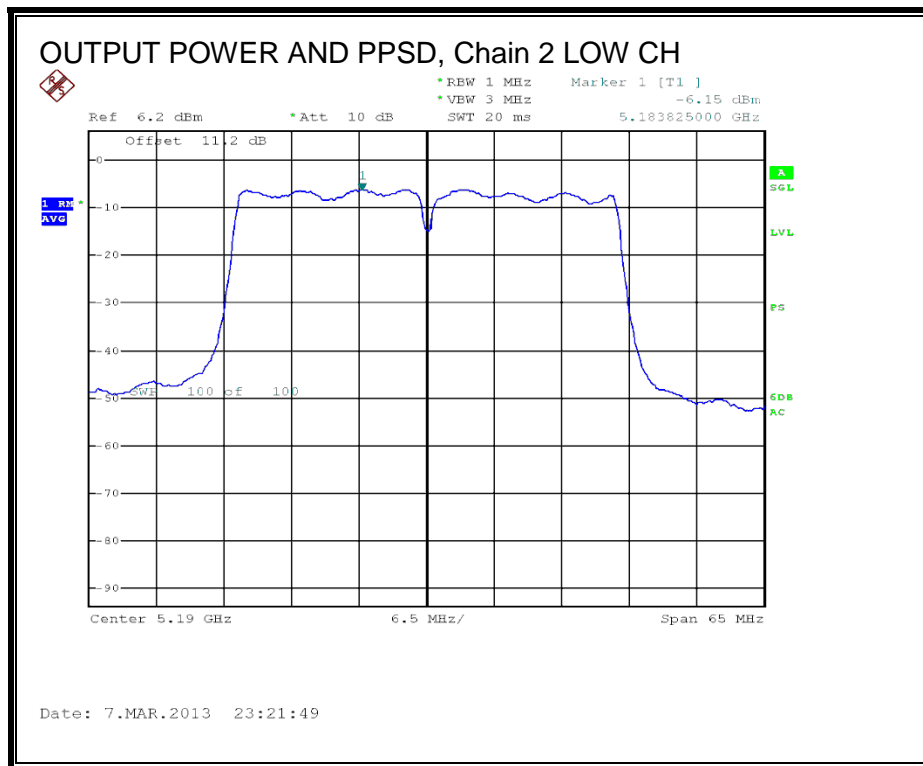
OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



7.24. 802.11ac VHT80 1TX MODE, 5.2 GHz BAND

7.24.1. 26 dB BANDWIDTH

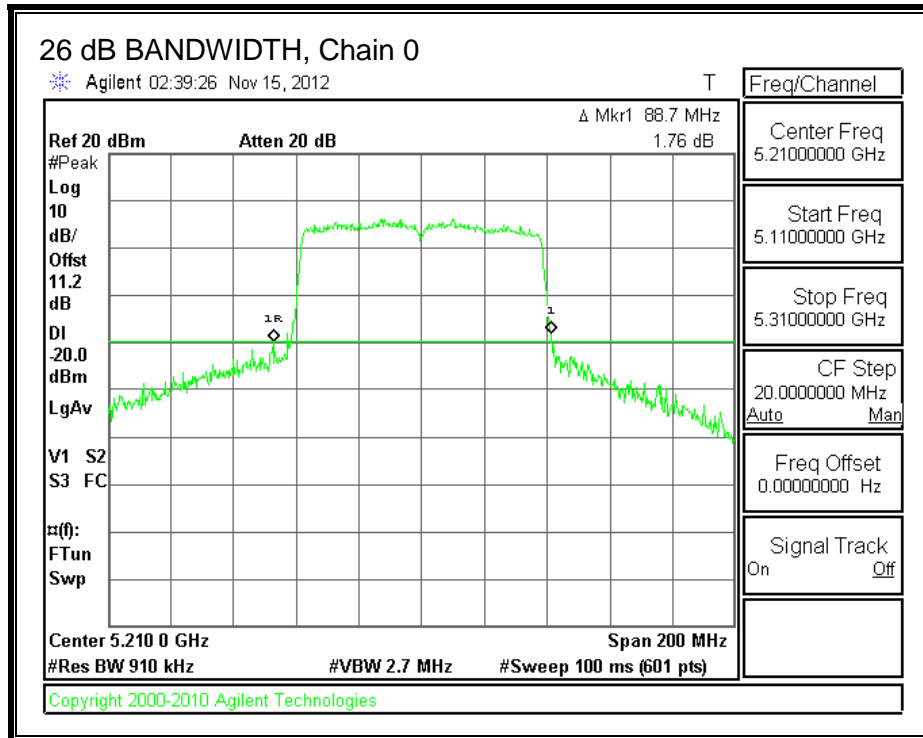
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)
Mid	5210	88.7

26 dB BANDWIDTH, Chain 0



7.24.2. **99% BANDWIDTH**

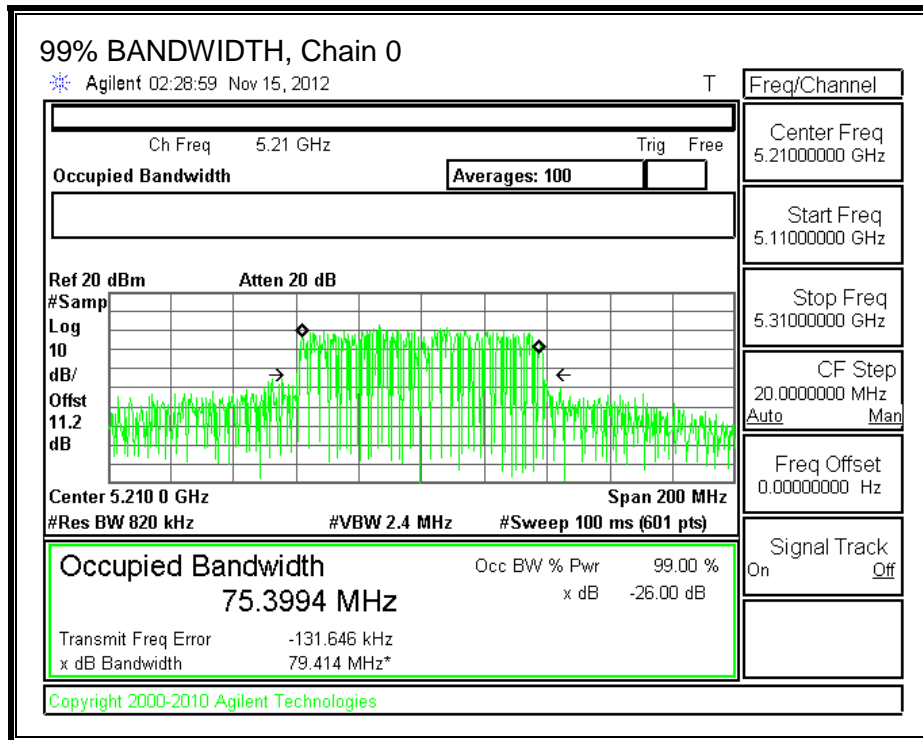
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)
Mid	5210	75.3994

99% BANDWIDTH, Chain 0



7.24.3. OUTPUT POWER AND PPSD

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	88.7	75.3994	7.04

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)	PPSD Limit (dBm)
Mid	5210	15.96	23.00	15.96	15.96	2.96	10.00	2.96

Duty Cycle CF (dB)	0.85	Included in Calculations of PSD
---------------------------	------	--

Output Power Results

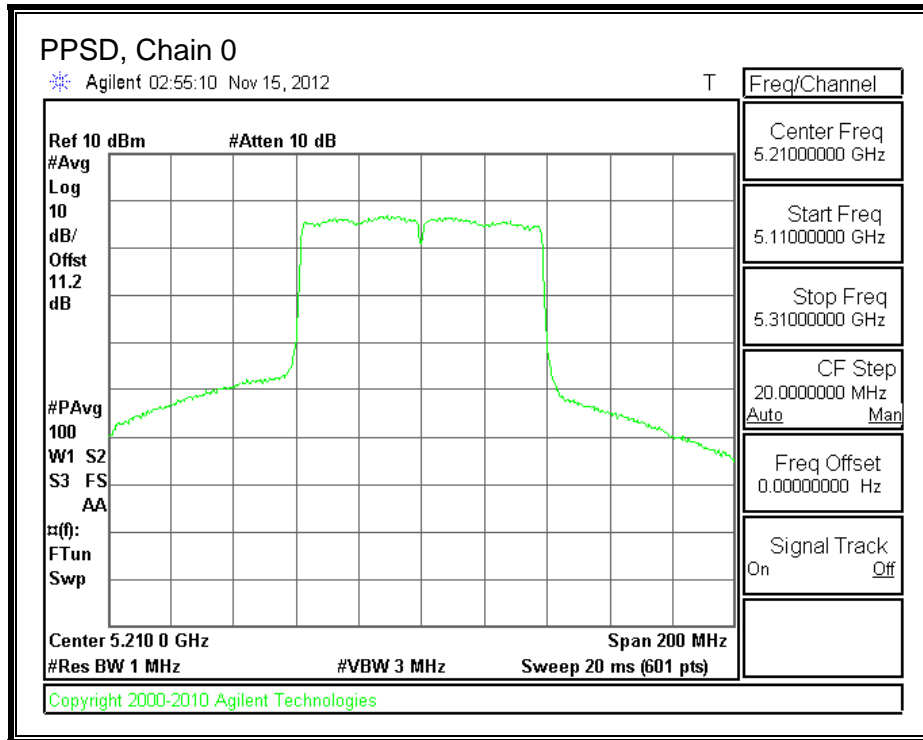
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	14.70	14.70	15.96	-1.26

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5210	-3.30	-2.45	2.96	-5.41

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



7.25. 802.11ac VHT80 CDD 2TX MODE, 5.2 GHz BAND

7.25.1. 26 dB BANDWIDTH

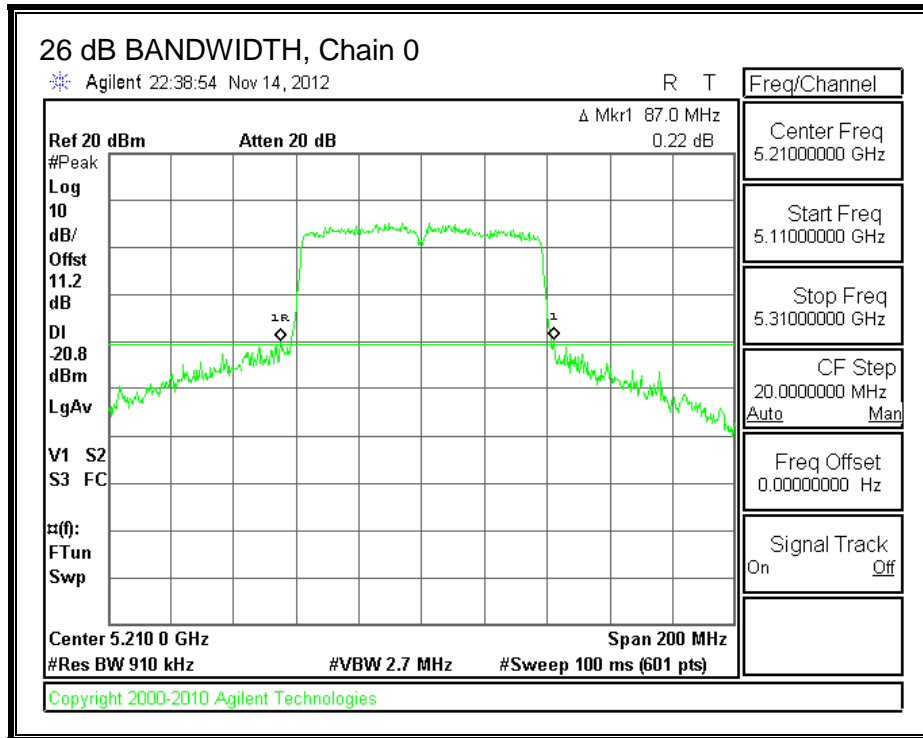
LIMITS

None; for reporting purposes only.

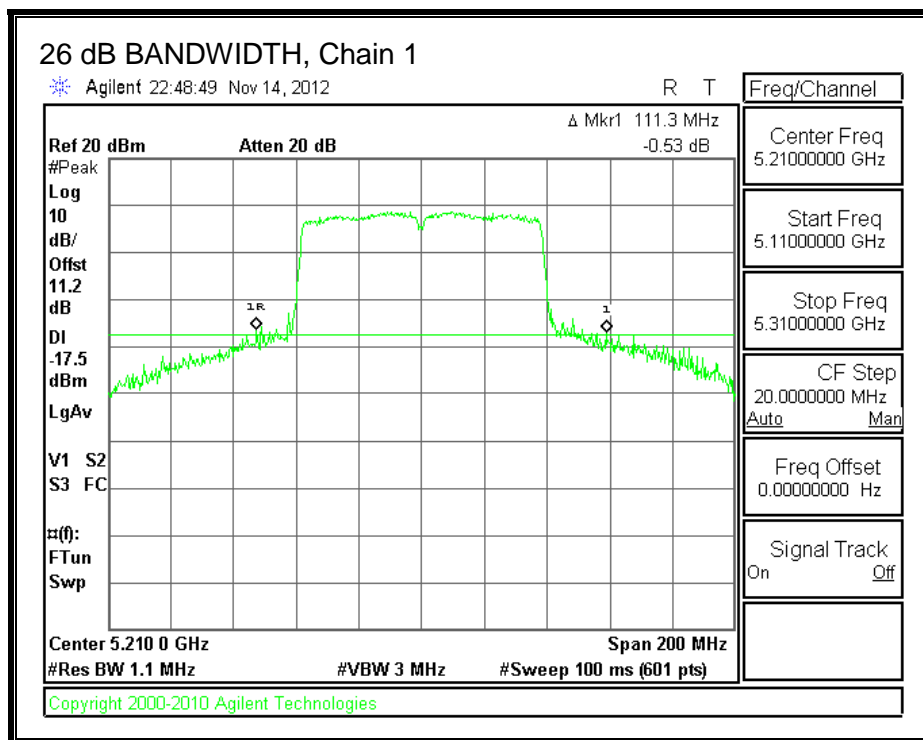
RESULTS

Channel	Frequency (MHz)	26 dB BW	
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	87.0	111.3

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.25.2. **99% BANDWIDTH**

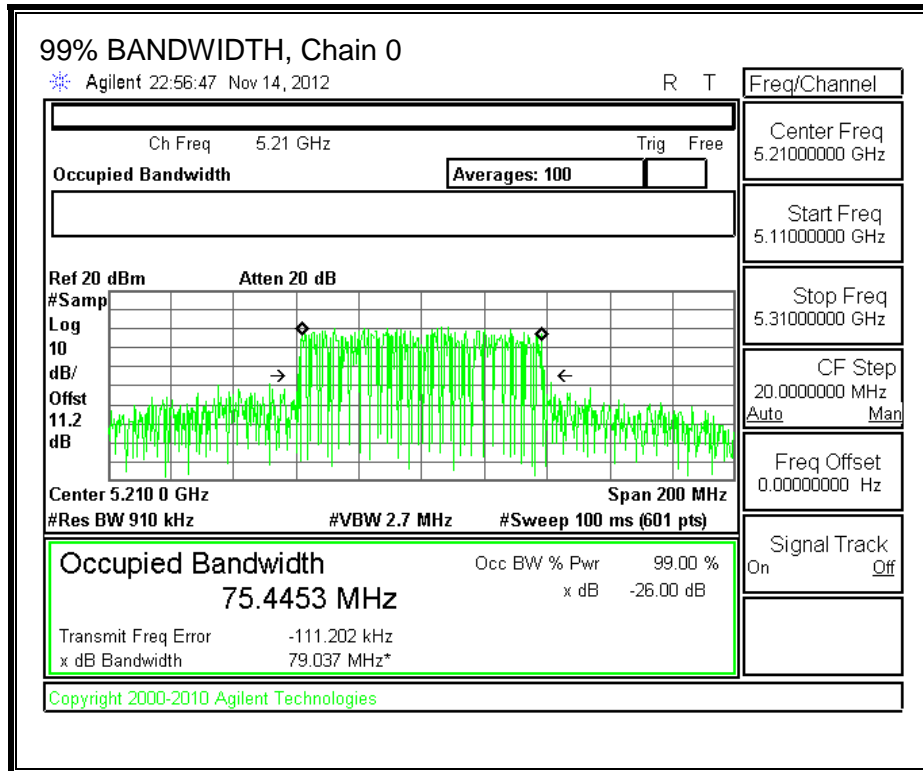
LIMITS

None; for reporting purposes only.

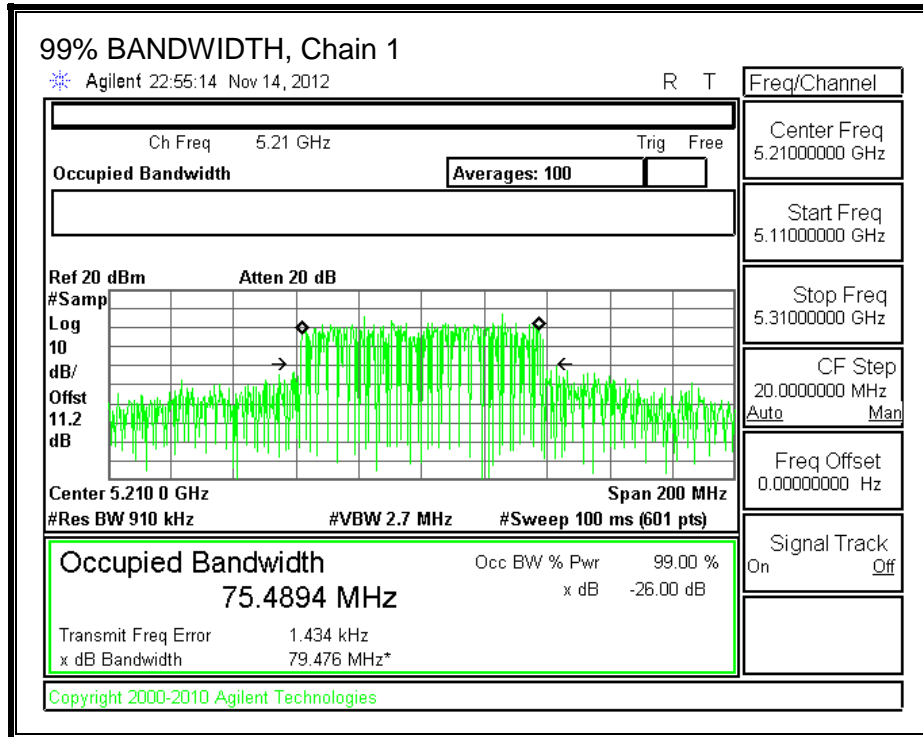
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5210	75.4453	75.4894

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.25.3. OUTPUT POWER AND PPSD

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 15.99 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

For output power, 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)
7.04	6.70	6.87

For PPSD, the TX chains are 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)
7.04	6.70	9.88

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
MID	5210	87.00	75.4453	6.87

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
MID	5210	16.13	23.00	16.13	16.13

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	13.31	12.62	15.99	16.13	-0.14

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
MID	5210	87.00	75.4453	9.88

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
MID	5210	0.12	10.00	0.12

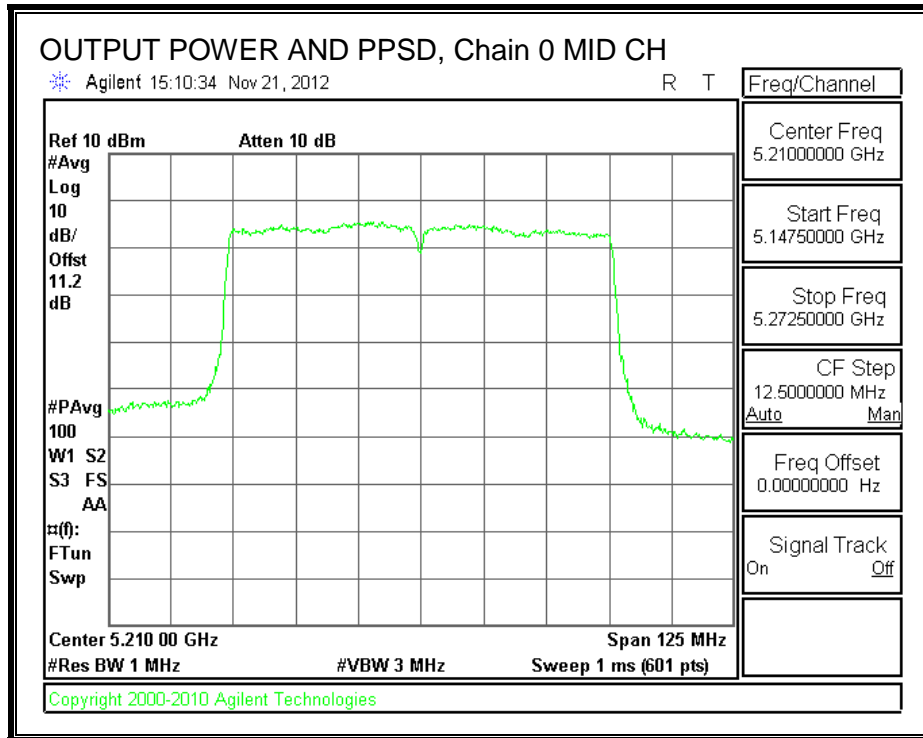
Duty Cycle CF (dB)	0.85	Included in Calculations of PPSD
---------------------------	------	---

PPSD Results

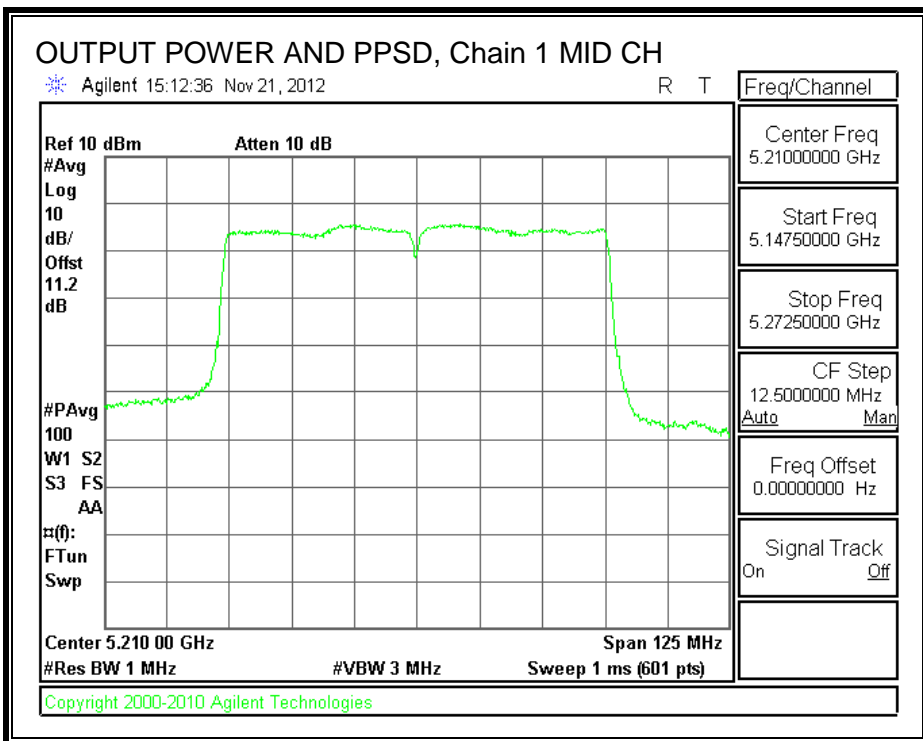
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
MID	5210	-4.50	-4.41	-0.60	0.12	-0.72

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.26. 802.11ac VHT80 CDD 3TX MODE, 5.2 GHz BAND

7.26.1. 26 dB BANDWIDTH

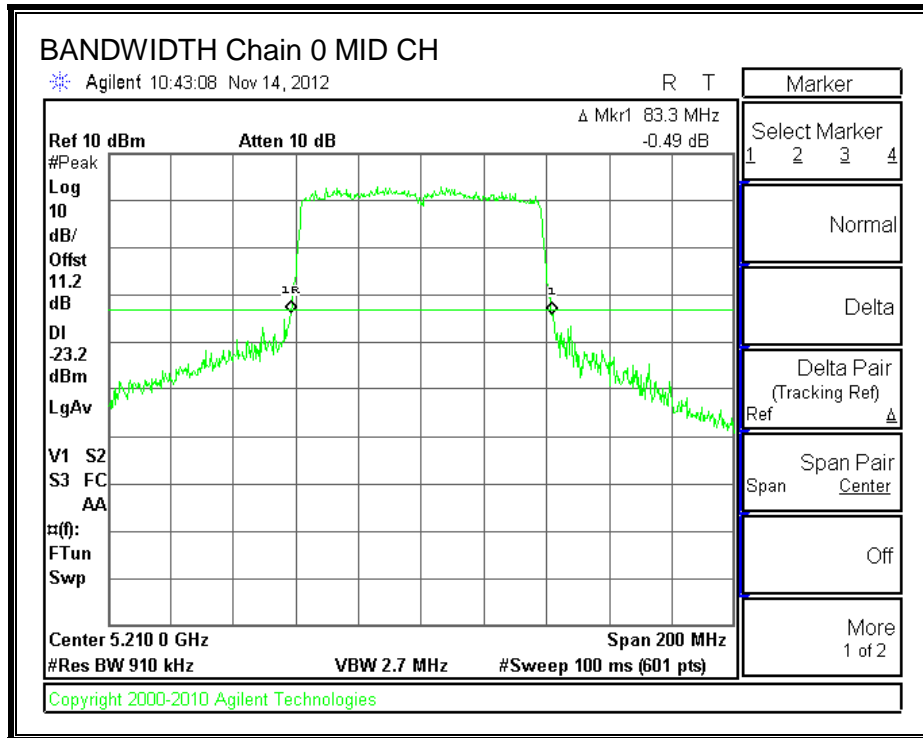
LIMITS

None; for reporting purposes only.

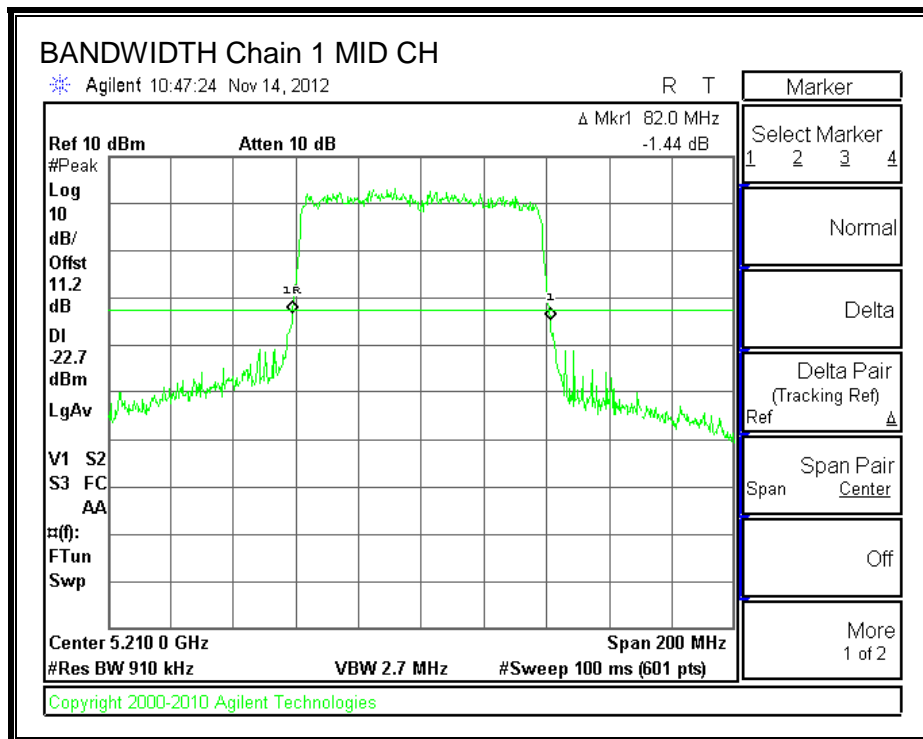
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5210	83.30	82.00	82.00

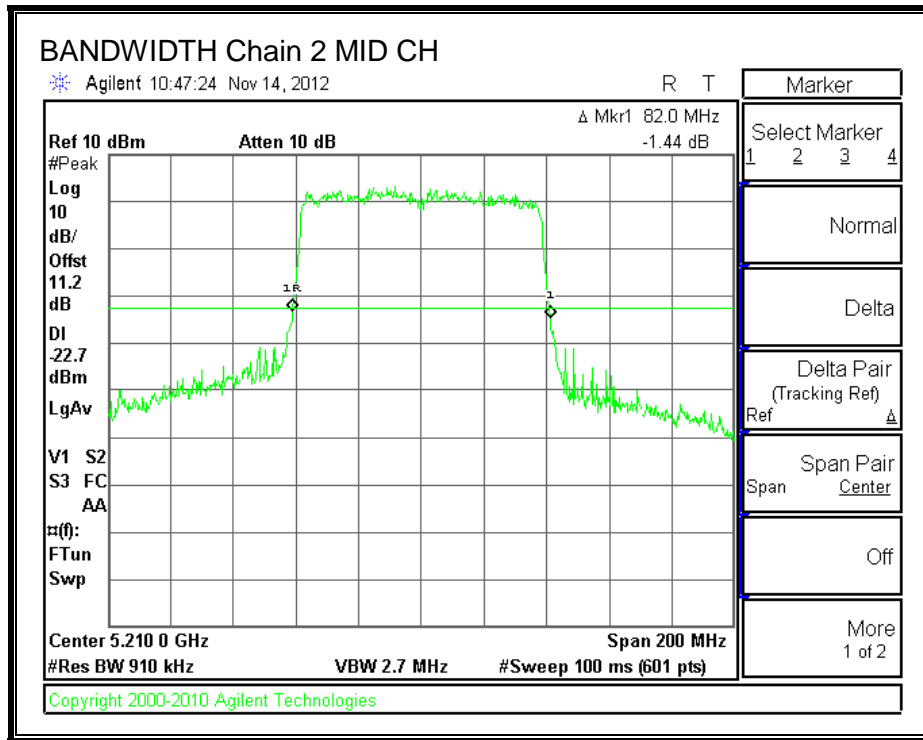
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.26.2. **99% BANDWIDTH**

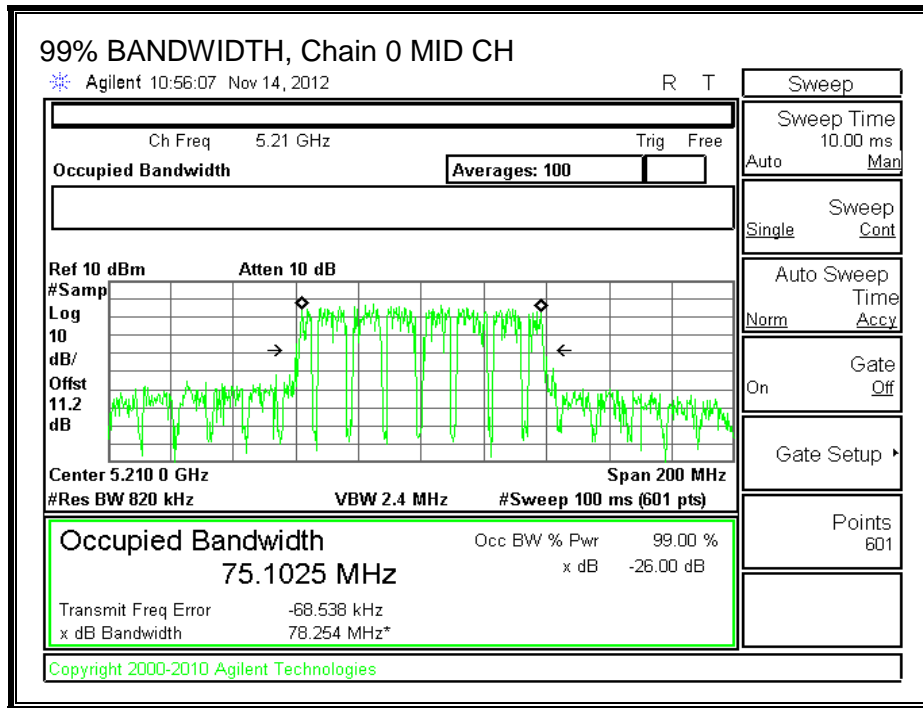
LIMITS

None; for reporting purposes only.

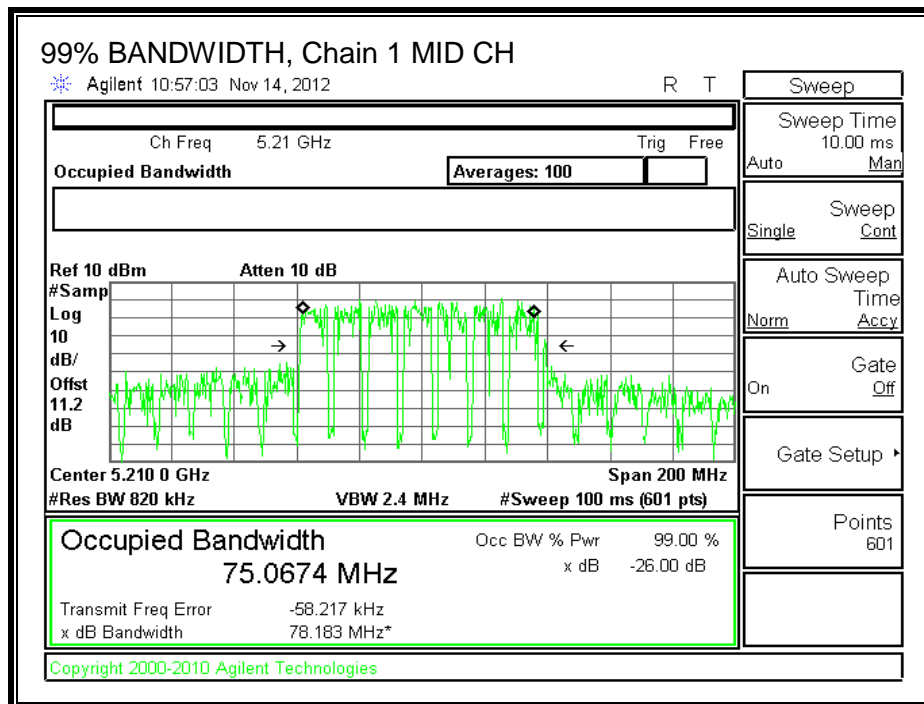
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5210	75.1025	75.0674	75.0863

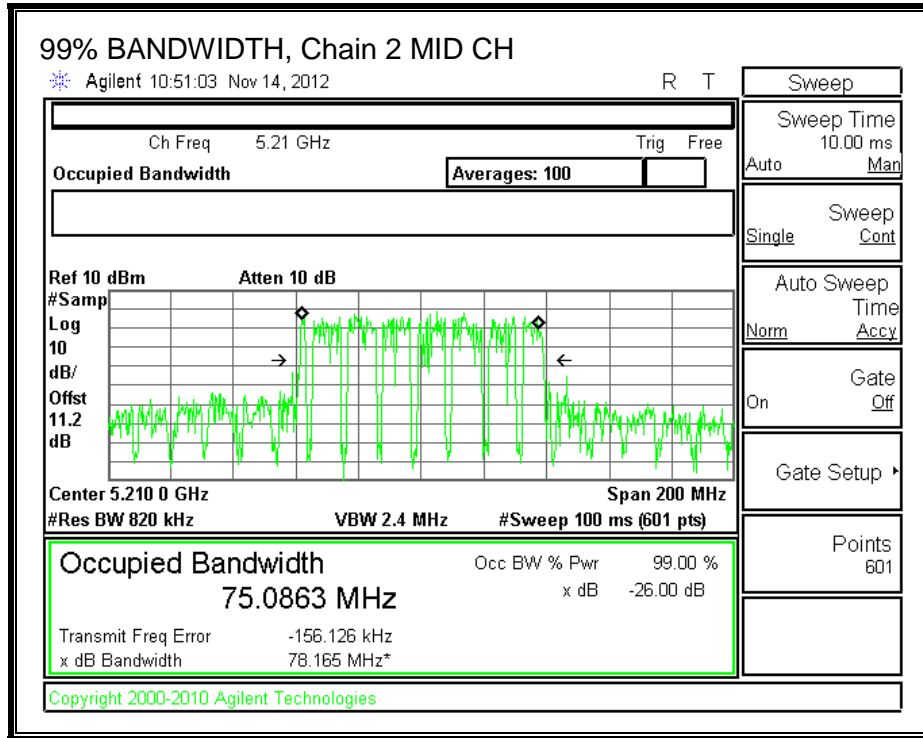
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.26.3. OUTPUT POWER AND PPSD

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 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)
7.04	6.70	3.79	6.07

For PPSD, the TX chains are correlated 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)
7.04	6.70	3.79	10.73

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.0	75.0674	6.07

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
Mid	5210	16.93	23.00	16.93	16.93

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	12.04	12.15	12.04	16.85	16.93	-0.08

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.0	75.0674	10.73

Limits

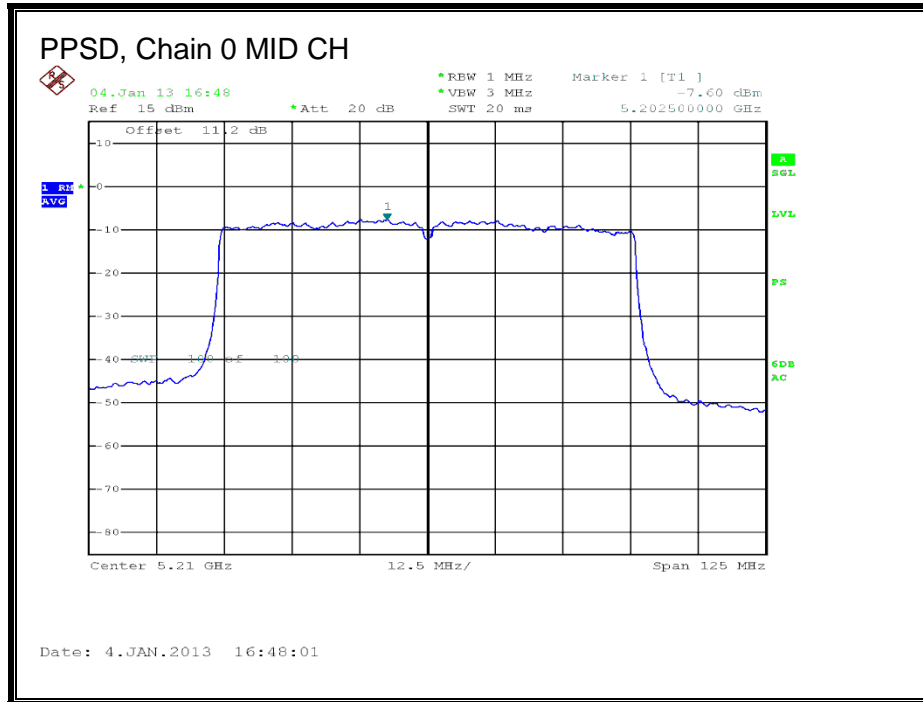
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Mid	5210	-0.73	10.00	-0.73

Duty Cycle CF (dB)	0.85	Included in Calculations of PSD
---------------------------	------	--

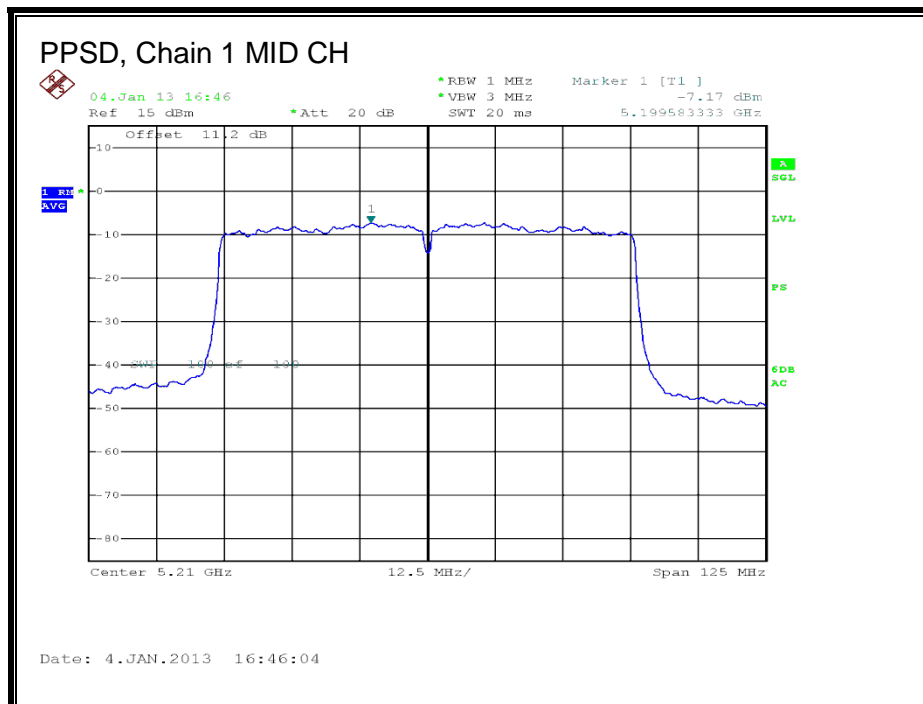
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5210	-7.60	-7.17	-7.40	-1.77	-0.73	-1.04

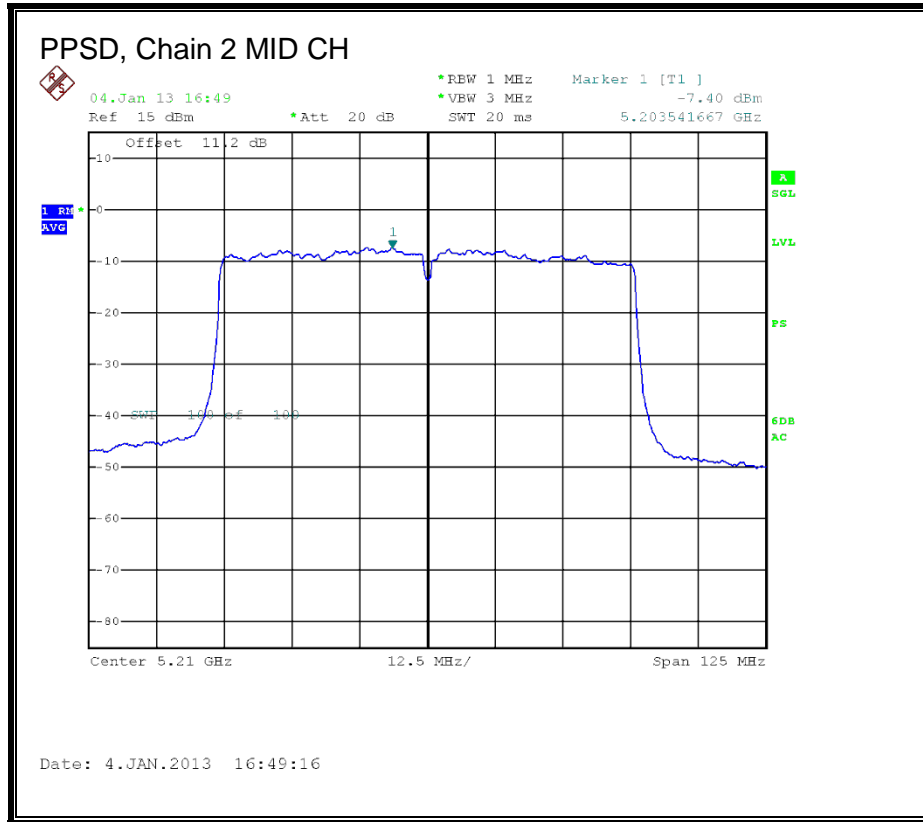
PPSD, Chain 0



PPSD, Chain 1



PPSD, Chain 2



7.26.4. 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	3.11	-7.60	0.85	9.86	13	-3.14

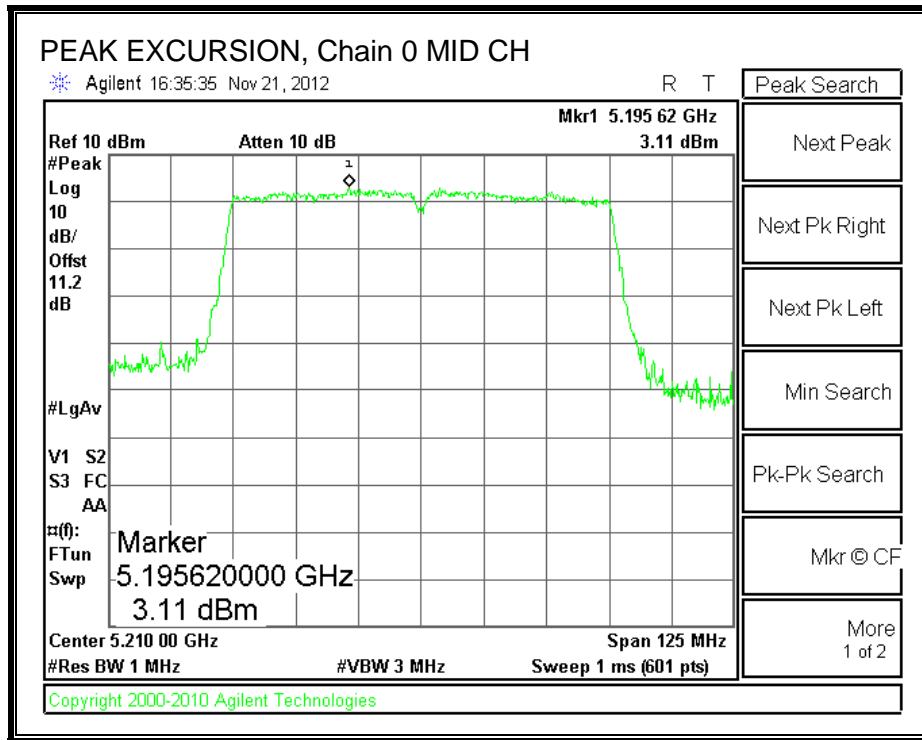
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	2.52	-7.17	0.85	8.84	13	-4.16

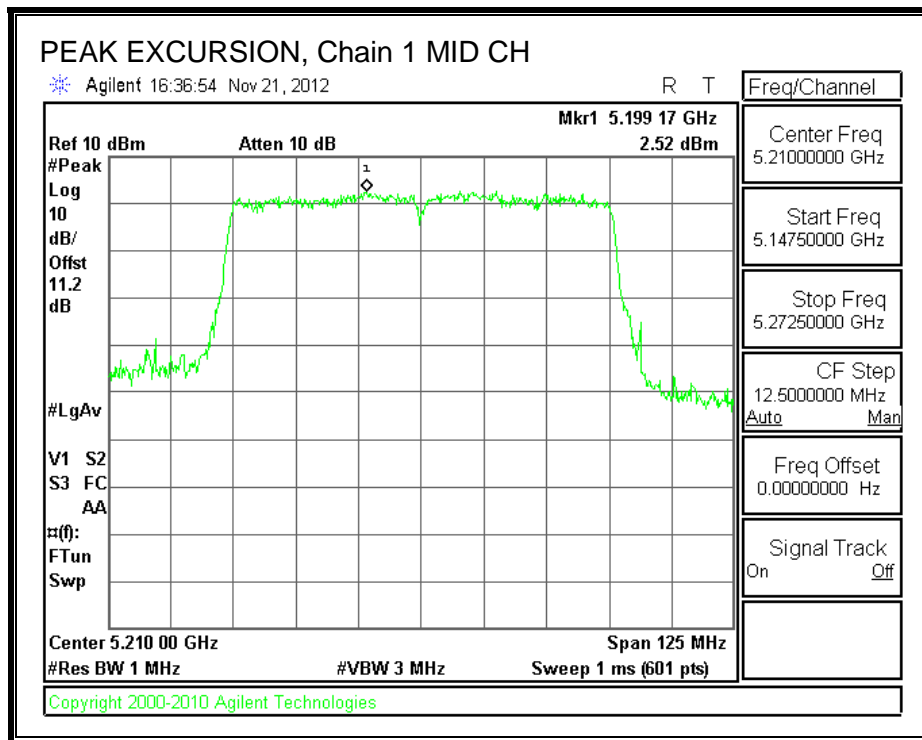
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5210	3.12	-7.40	0.85	9.67	13	-3.33

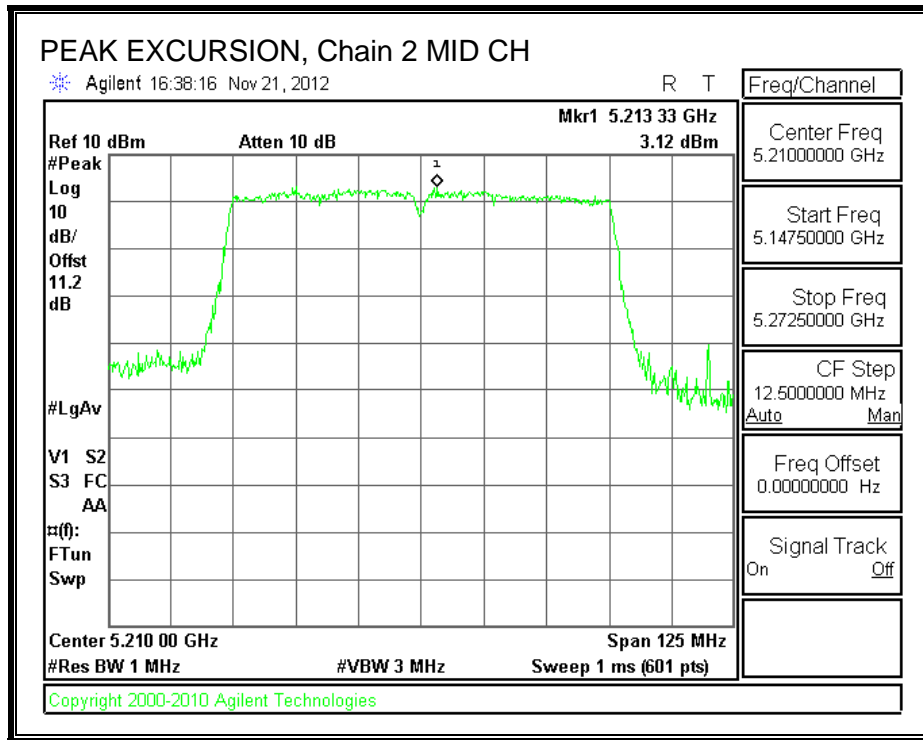
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



7.27. 802.11ac VHT80 BF 2TX MODE, 5.2 GHz BAND

7.27.1. 26 dB BANDWIDTH

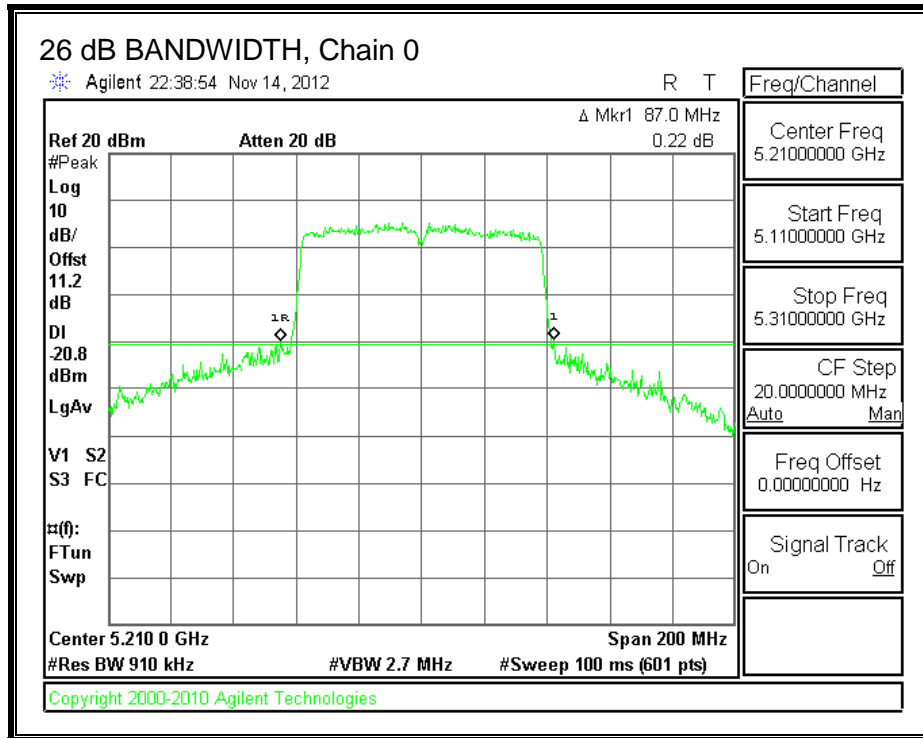
LIMITS

None; for reporting purposes only.

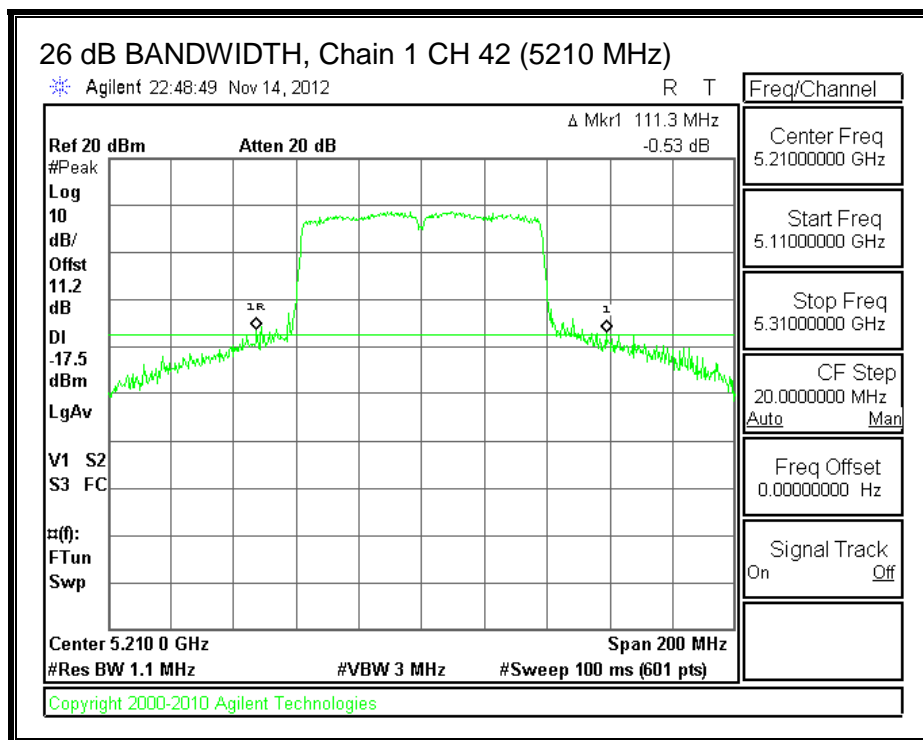
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5210	87.0	111.3

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.27.2. **99% BANDWIDTH**

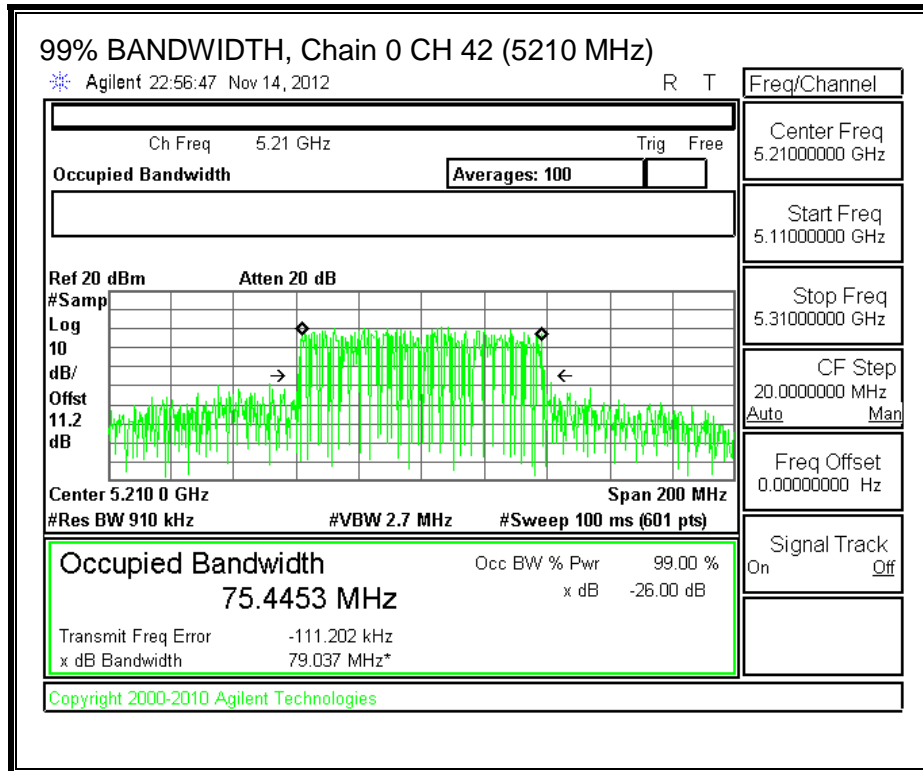
LIMITS

None; for reporting purposes only.

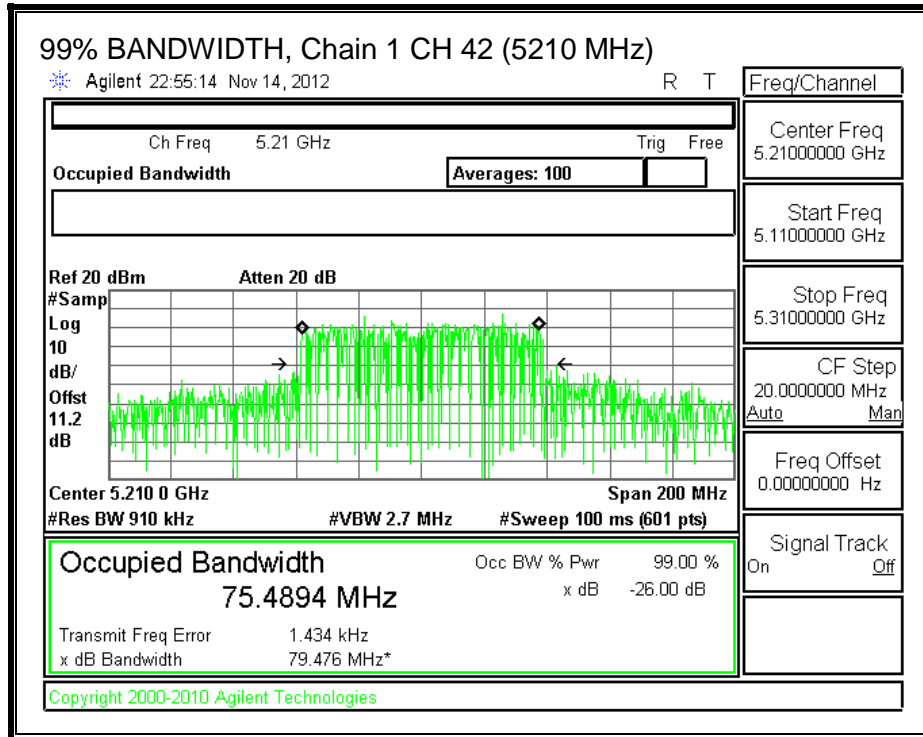
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5210	75.4453	75.4894

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.27.3. OUTPUT POWER AND PPSD

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 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)
7.04	6.70	9.88

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
MID	5210	87.00	75.4453	9.88

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)
MID	5210	13.12	23.00	13.12	13.12

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	10.02	10.10	13.07	13.12	-0.05

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
MID	5210	87.00	75.4453	9.88

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
MID	5210	0.12	10.00	0.12

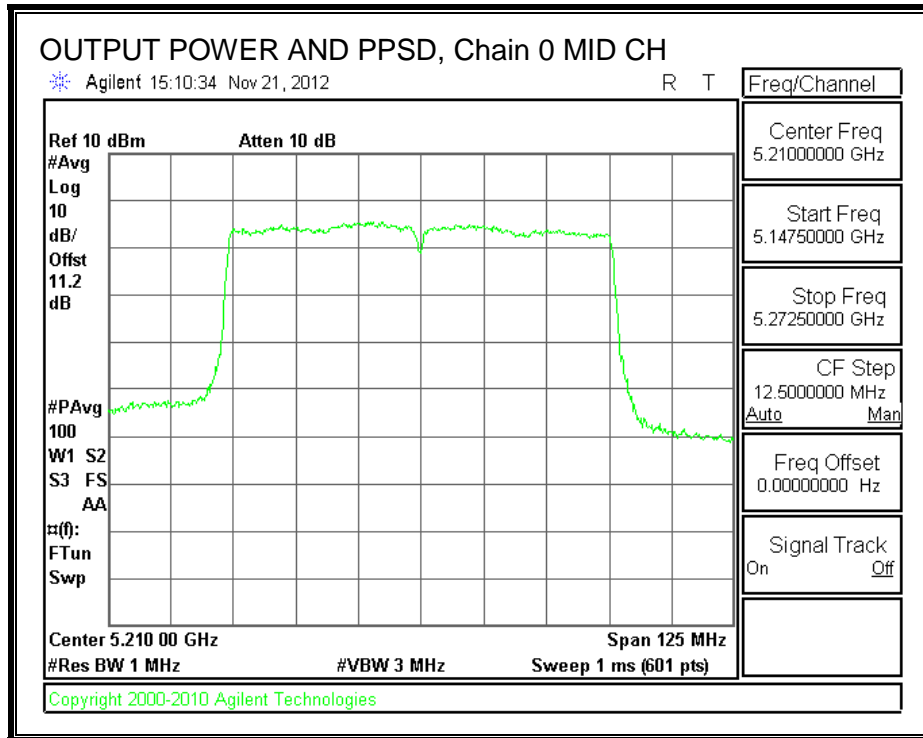
Duty Cycle CF (dB)	0.85	Included in Calculations of PSD
---------------------------	------	--

PPSD Results

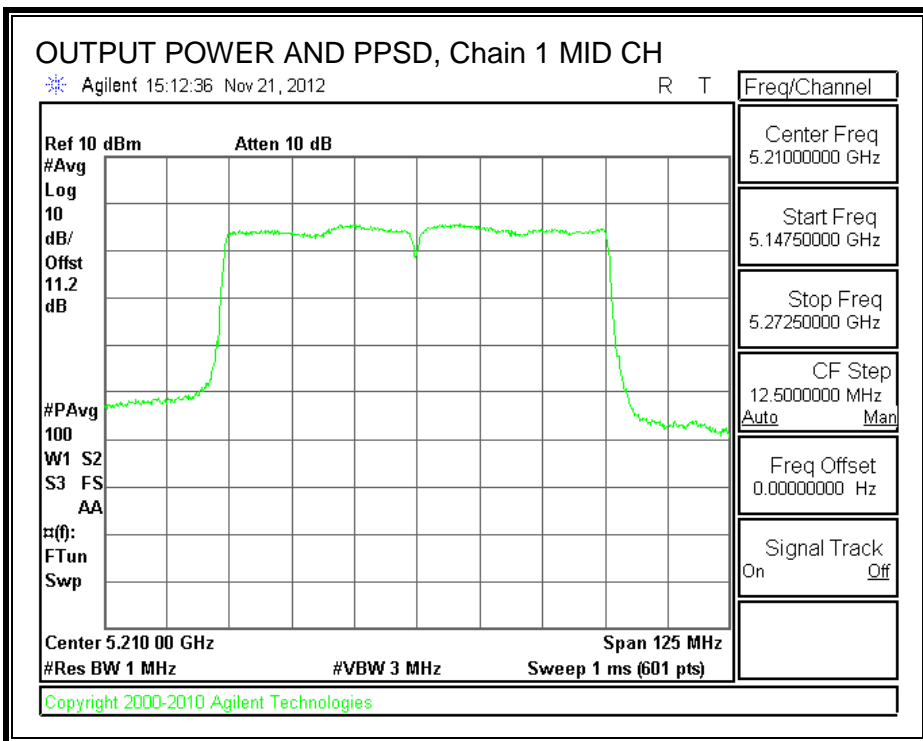
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
MID	5210	-4.50	-4.41	-0.60	0.12	-0.72

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



7.28. 802.11ac VHT80 BF 3TX MODE, 5.2 GHz BAND

7.28.1. 26 dB BANDWIDTH

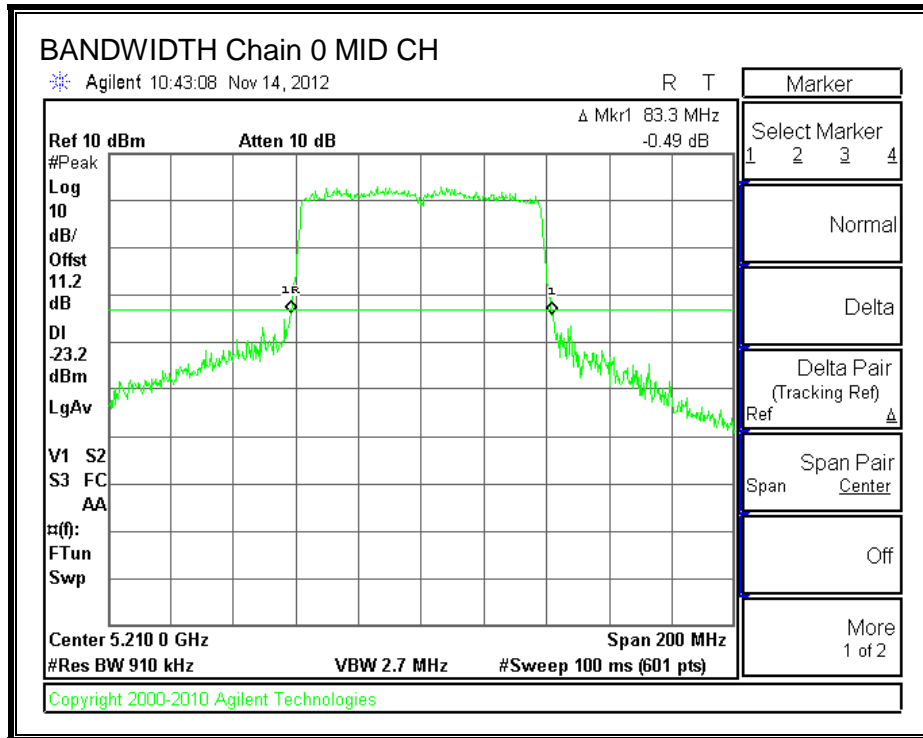
LIMITS

None; for reporting purposes only.

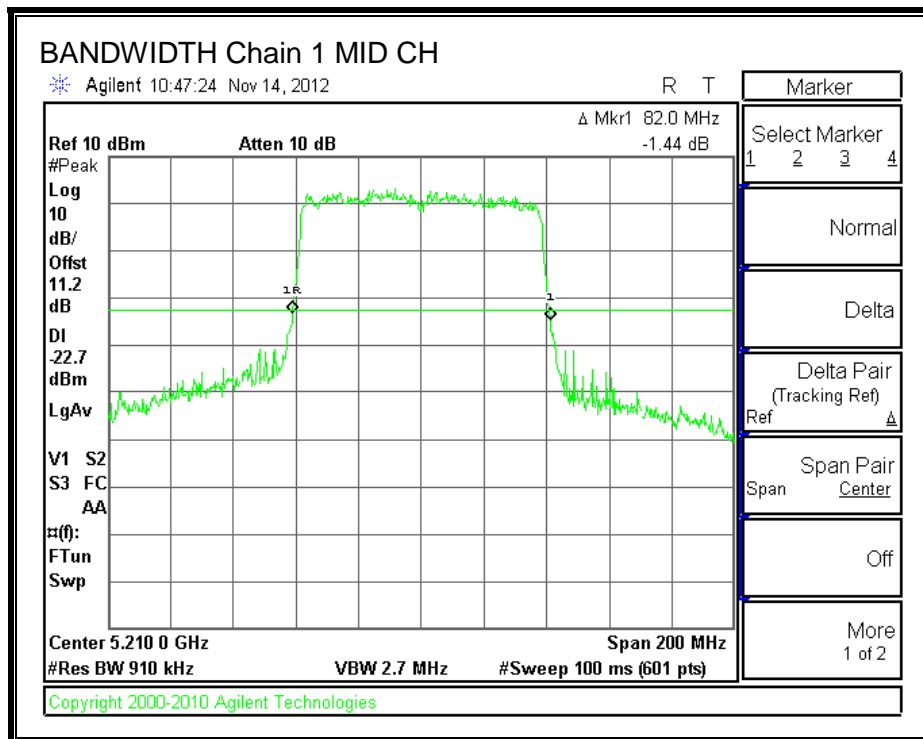
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5210	83.3	82.0	82.0

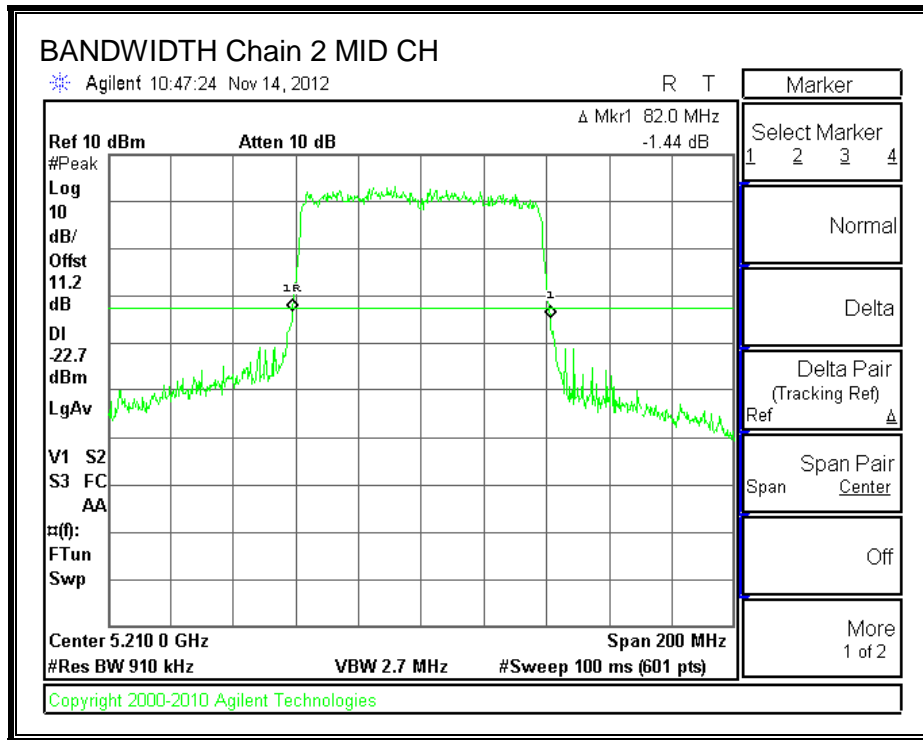
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.28.2. 99% BANDWIDTH

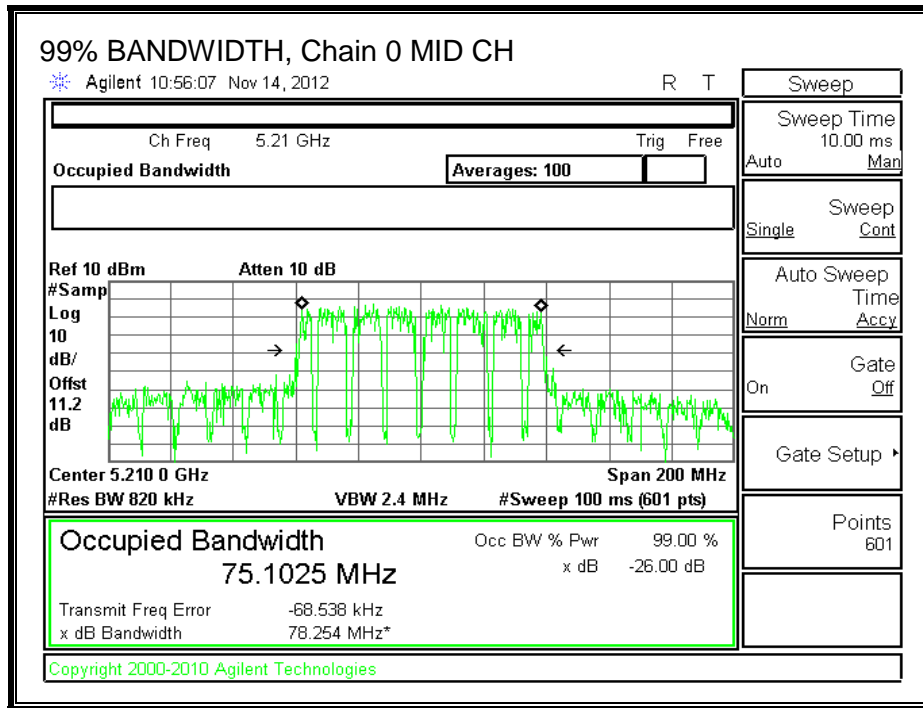
LIMITS

None; for reporting purposes only.

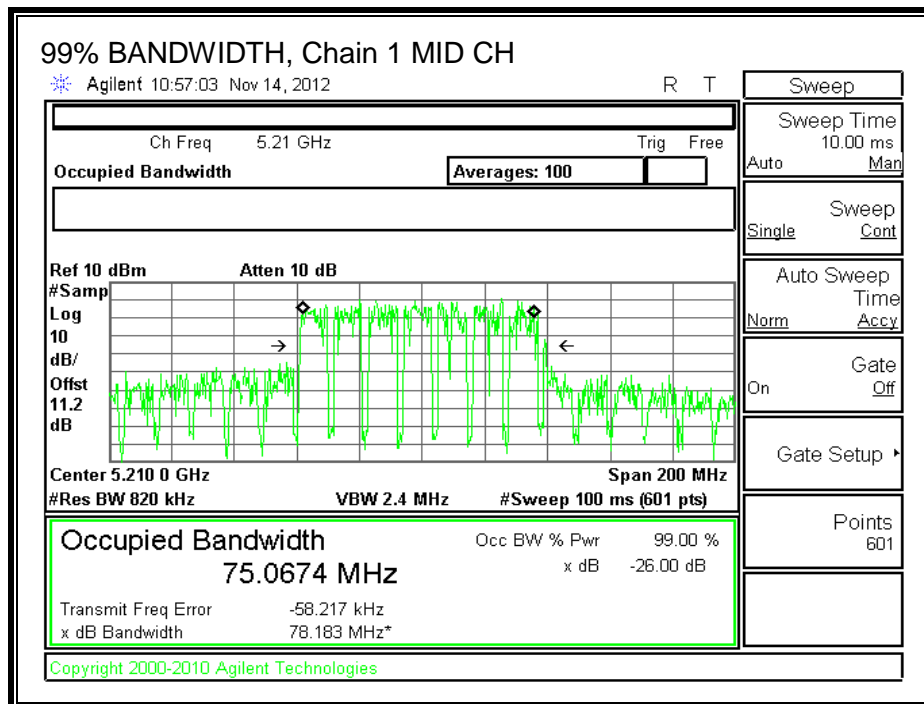
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5210	75.1025	75.0674	75.0863

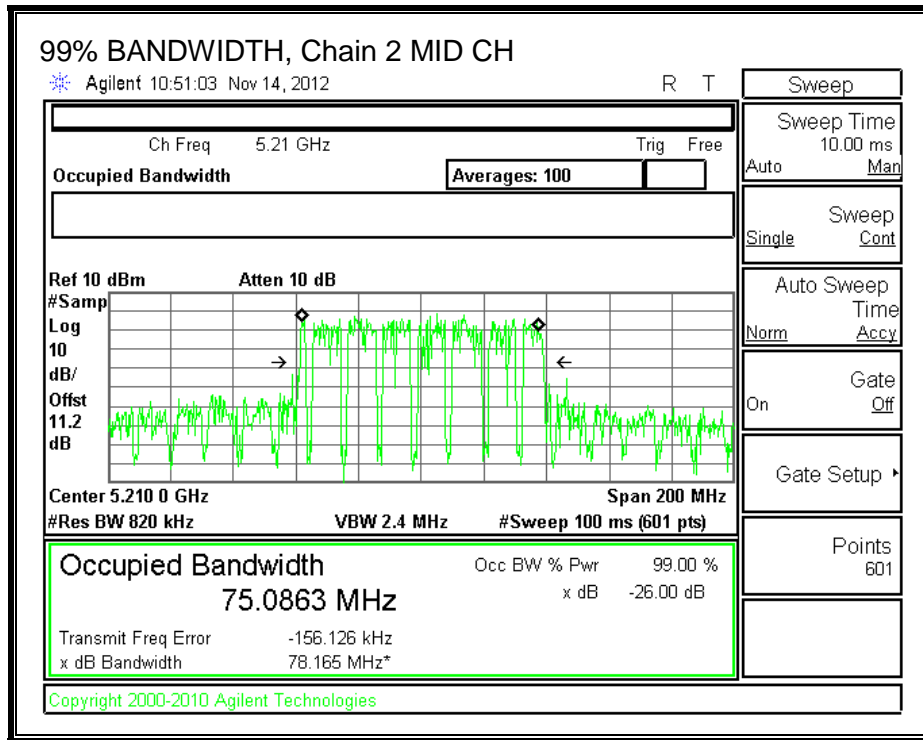
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



7.28.3. OUTPUT POWER AND PPSD

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 correlated 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)
7.04	6.70	3.79	10.73

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Mid	5210	82.0	75.0674	10.73

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)	PPSD Limit (dBm)
Mid	5210	12.27	23.00	12.27	12.27	-0.73	10.00	-0.73

Duty Cycle CF (dB)	0.85	Included in Calculations of PPSP
---------------------------	------	---

Output Power Results

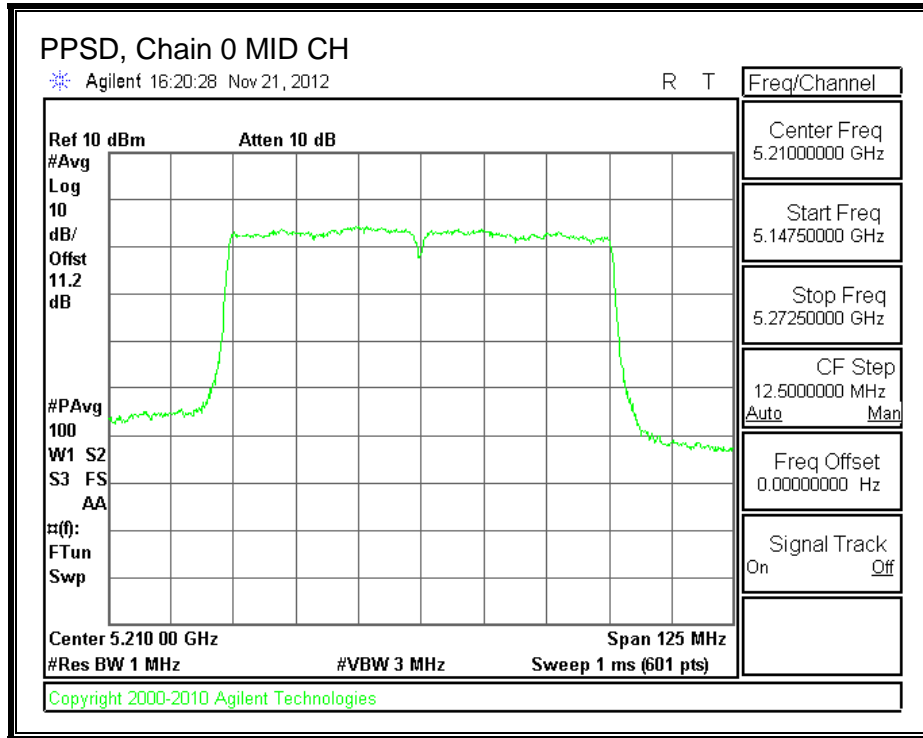
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	7.47	7.48	7.39	12.22	12.27	-0.05

PPSD Results

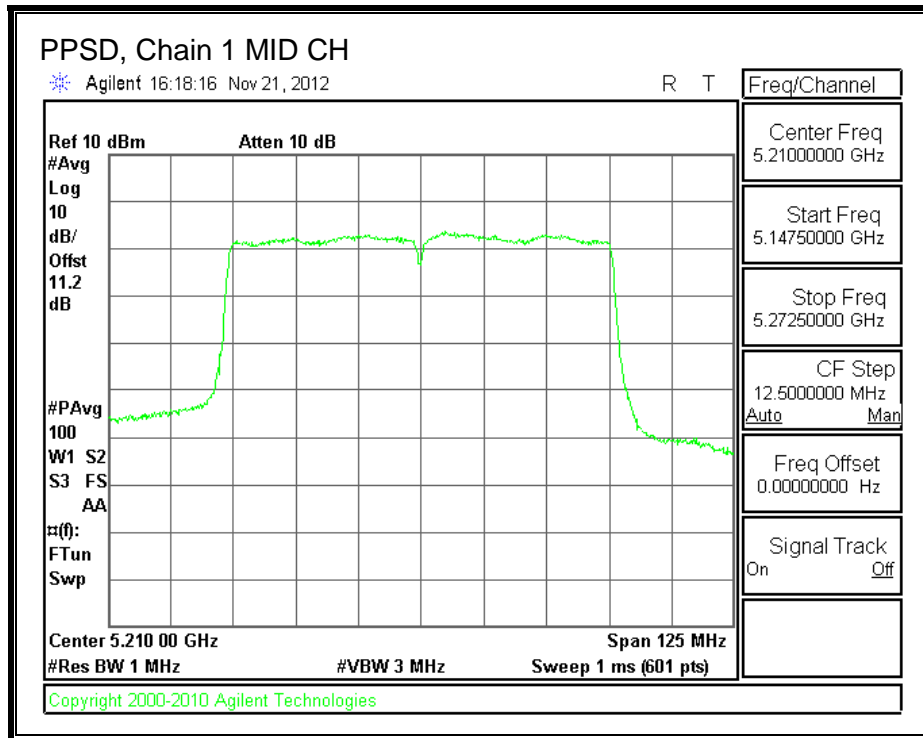
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5210	-5.80	-7.60	-6.88	-1.08	-0.73	-0.35

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for this PSD measurements.

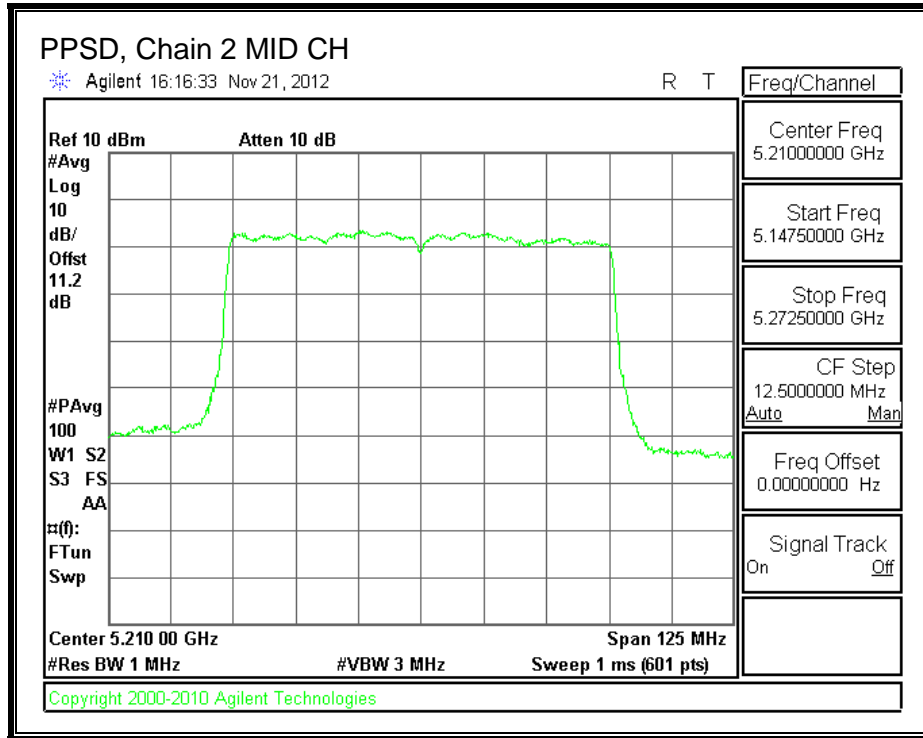
PPSD, Chain 0



PPSD, Chain 1



PPSD, Chain 2



7.29. 802.11a Legacy 1TX MODE, 5.3 GHz BAND

7.29.1. 26 dB BANDWIDTH

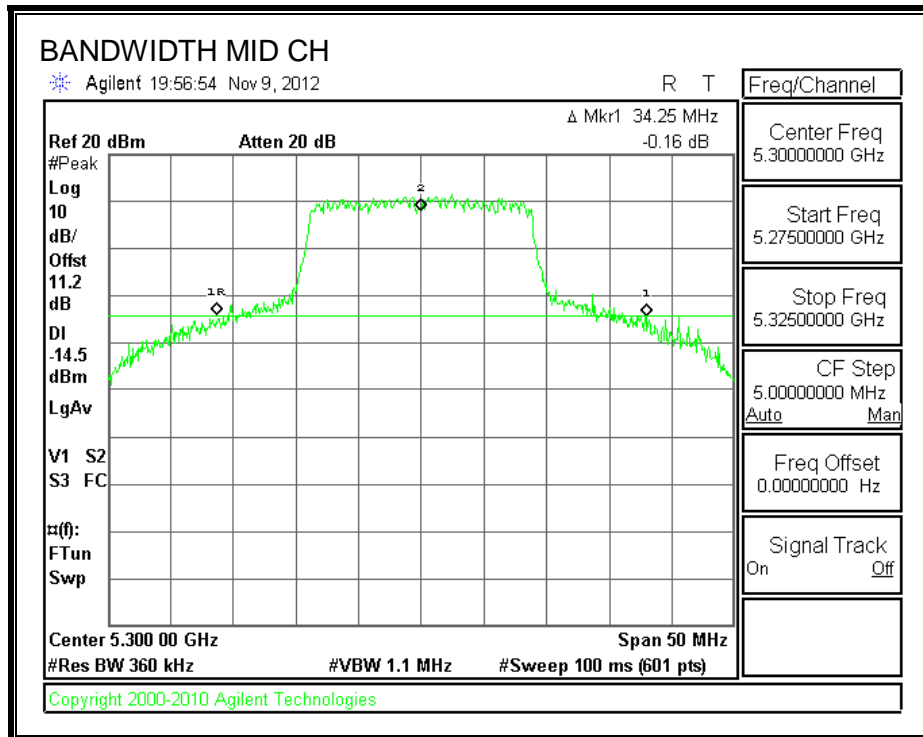
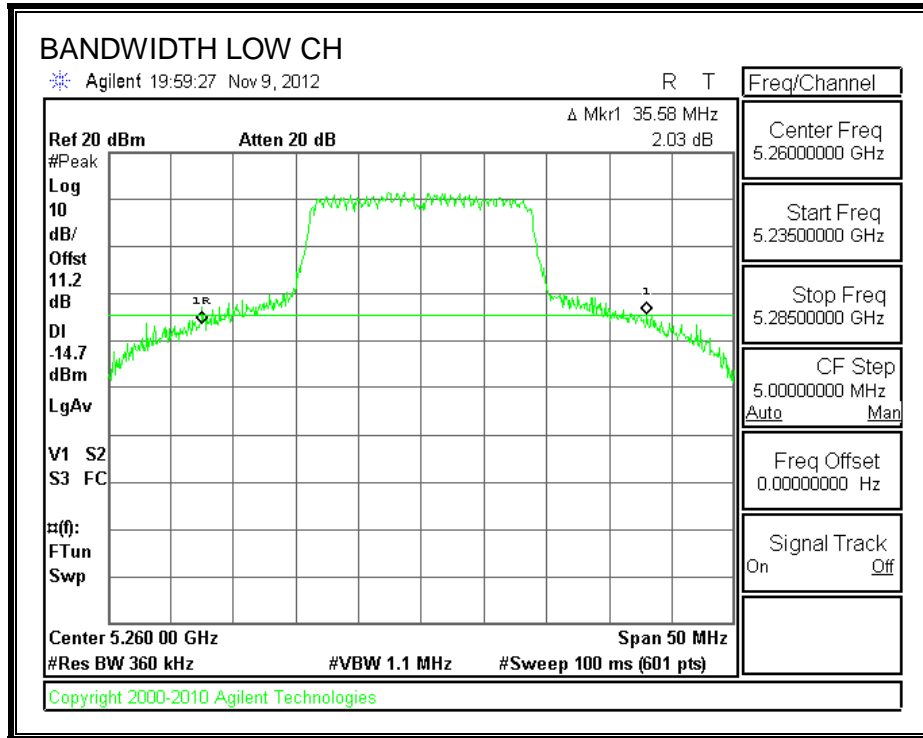
LIMITS

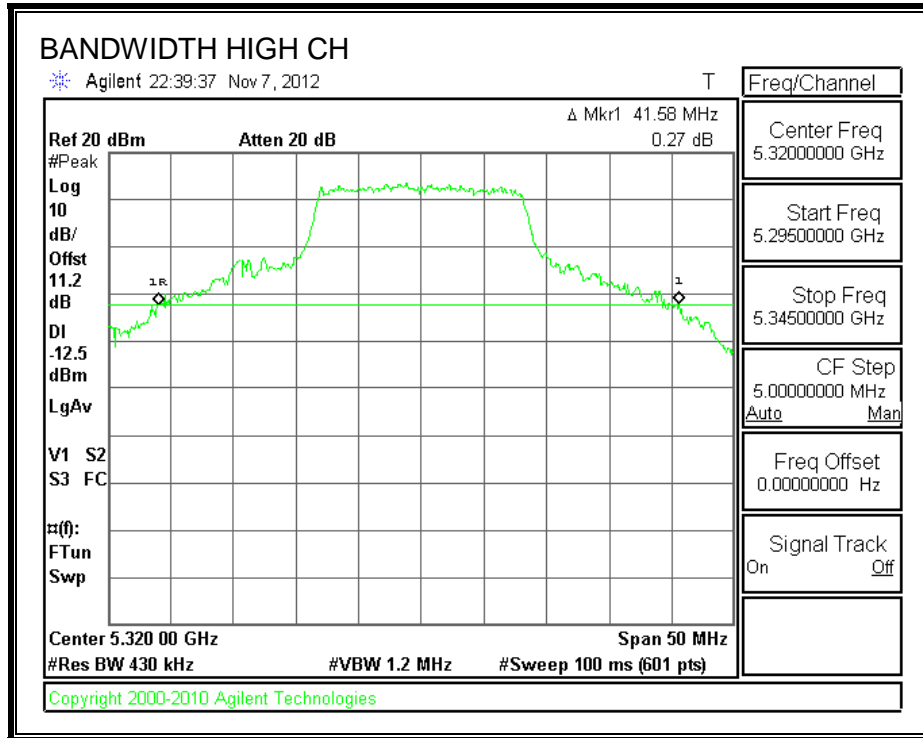
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5260	35.58
Mid	5300	34.25
High	5320	41.58

26 dB BANDWIDTH





7.29.2. **99% BANDWIDTH**

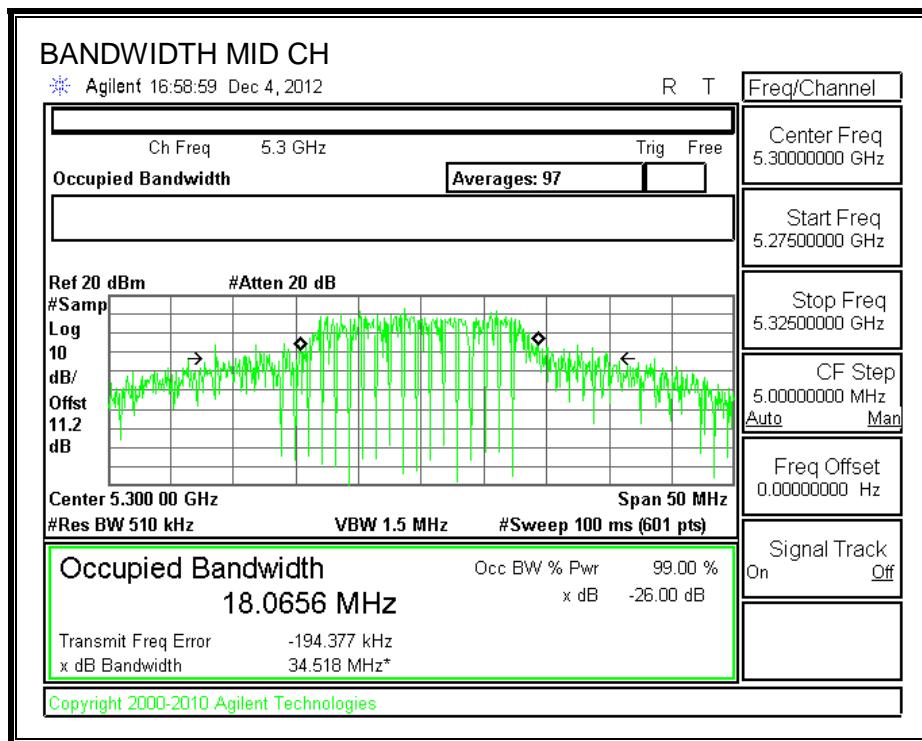
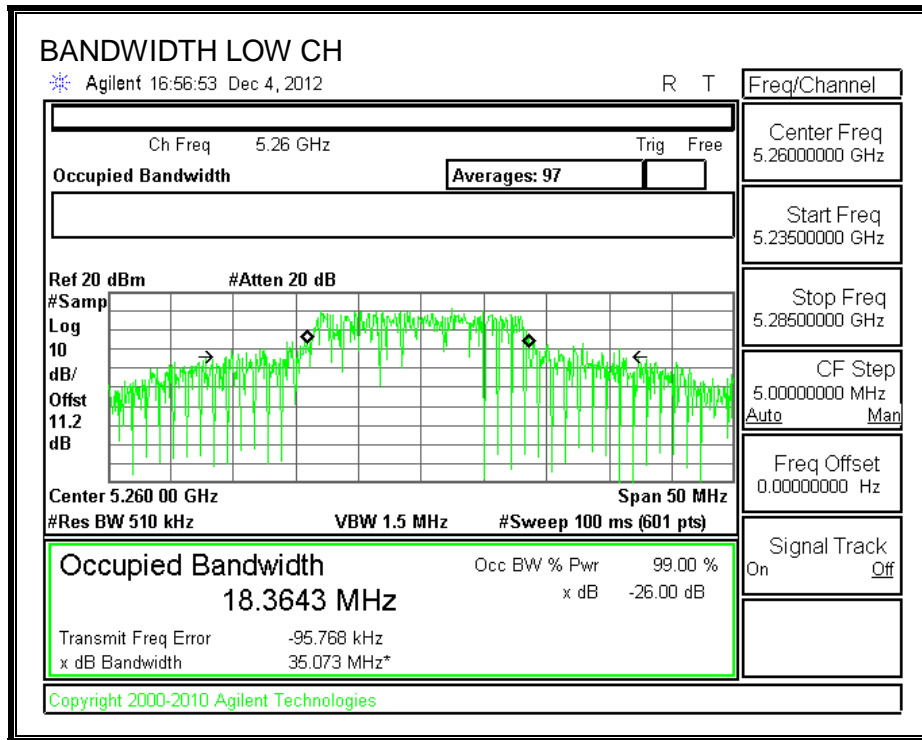
LIMITS

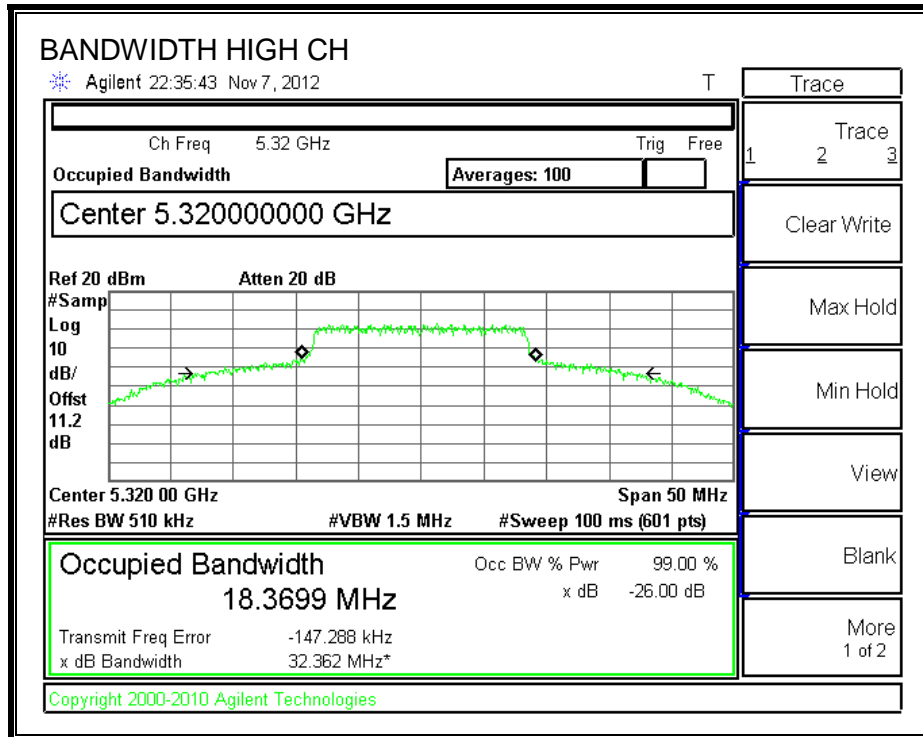
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	18.3643
Mid	5300	18.0656
High	5320	18.3699

99% BANDWIDTH





7.29.3. OUTPUT POWER AND PPSD

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	35.58	18.3643	7.09
Mid	5300	34.25	18.0656	7.09
High	5320	41.58	18.3699	7.09

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)	PPSD Limit (dBm)
Low	5260	22.91	23.64	29.64	22.55	9.91	11.00	9.91
Mid	5300	22.91	23.57	29.57	22.48	9.91	11.00	9.91
High	5320	22.91	23.64	29.64	22.55	9.91	11.00	9.91

Duty Cycle CF (dB)	0.22	Included in Calculations of PPSD
---------------------------	------	---

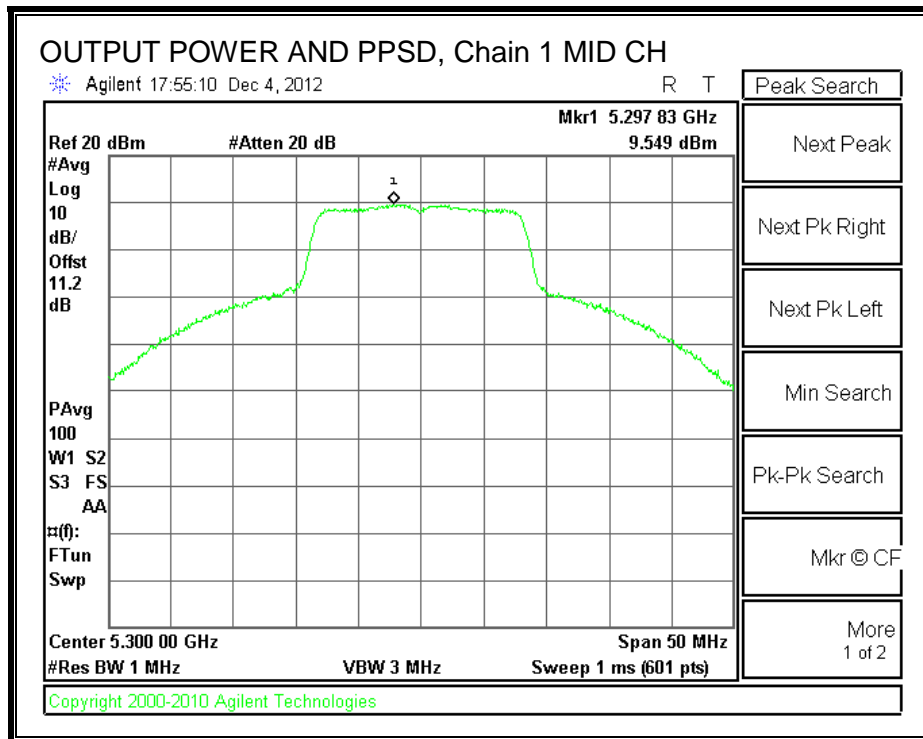
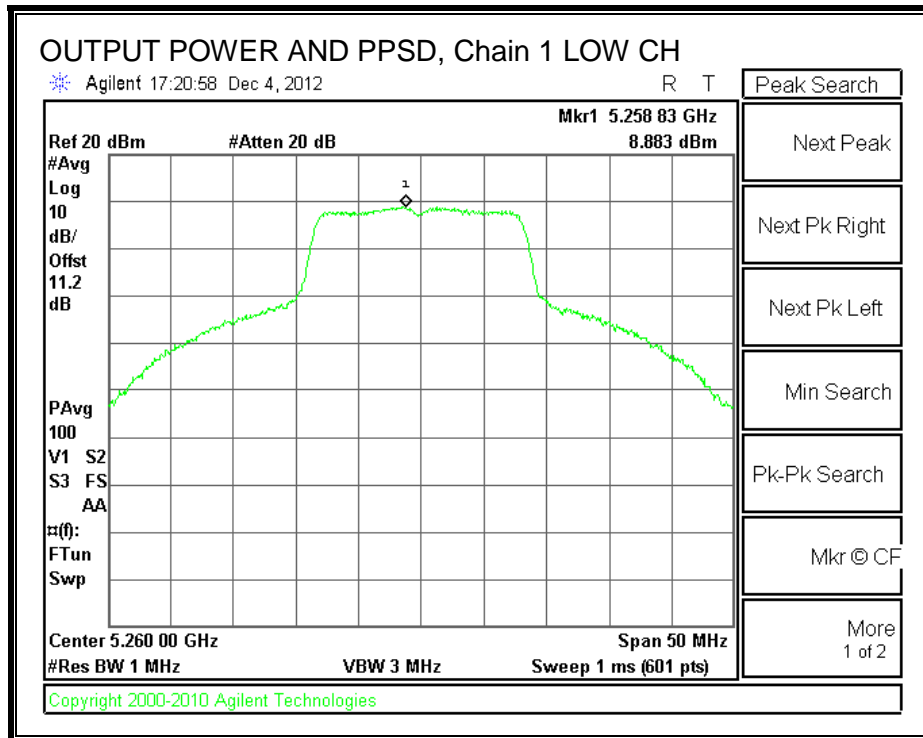
Output Power Results

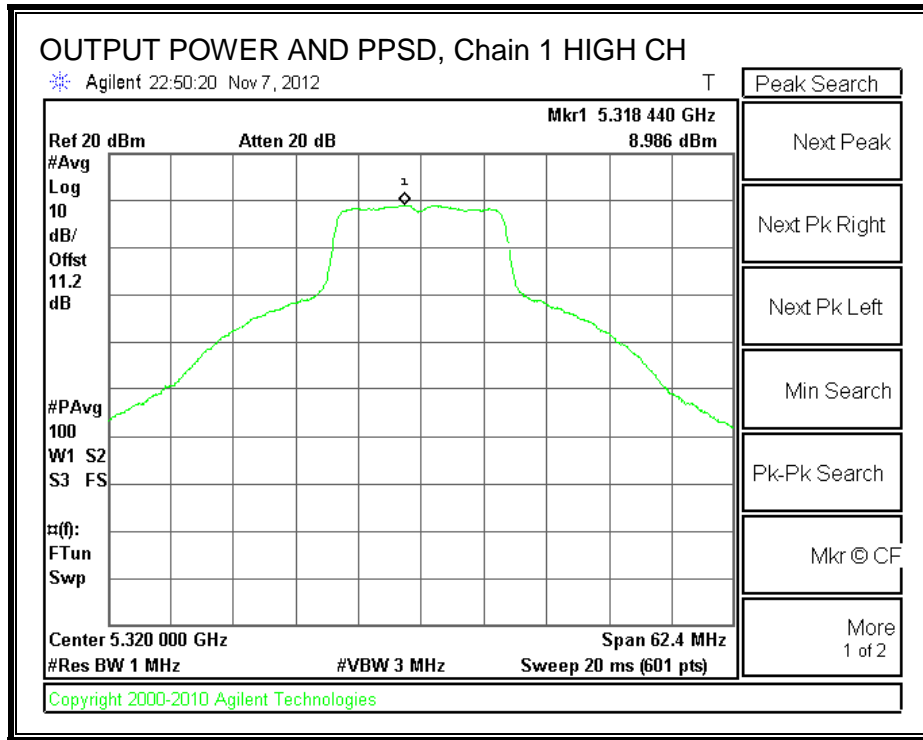
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	20.13	20.13	22.55	-2.42
Mid	5300	20.14	20.14	22.48	-2.34
High	5320	20.50	20.50	22.55	-2.05

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	8.88	9.10	9.91	-0.81
Mid	5300	9.55	9.77	9.91	-0.14
High	5320	8.99	9.21	9.91	-0.70

OUTPUT POWER AND PPSD, Chain 1





7.30. 802.11a CDD 2Tx MODE, 5.3 GHz BAND

Covered by testing 802.11n HT20 CDD 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.31. 802.11a CDD 3Tx MODE, 5.3 GHz BAND

Covered by testing 802.11n HT20 CDD 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.32. 802.11a BF 2TX MODE, 5.3 GHz BAND

Covered by testing 802.11n HT20 BF 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.33. 802.11a BF 3TX MODE, 5.3 GHz BAND

Covered by testing 802.11n HT20 BF 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.34. 802.11n HT20 1TX MODE, 5.3 GHz BAND

Covered by testing 802.11a Legacy 1TX mode at the same power level.

7.35. 802.11n HT20 CDD 2TX MODE, 5.3 GHz BAND

7.35.1. 26 dB BANDWIDTH

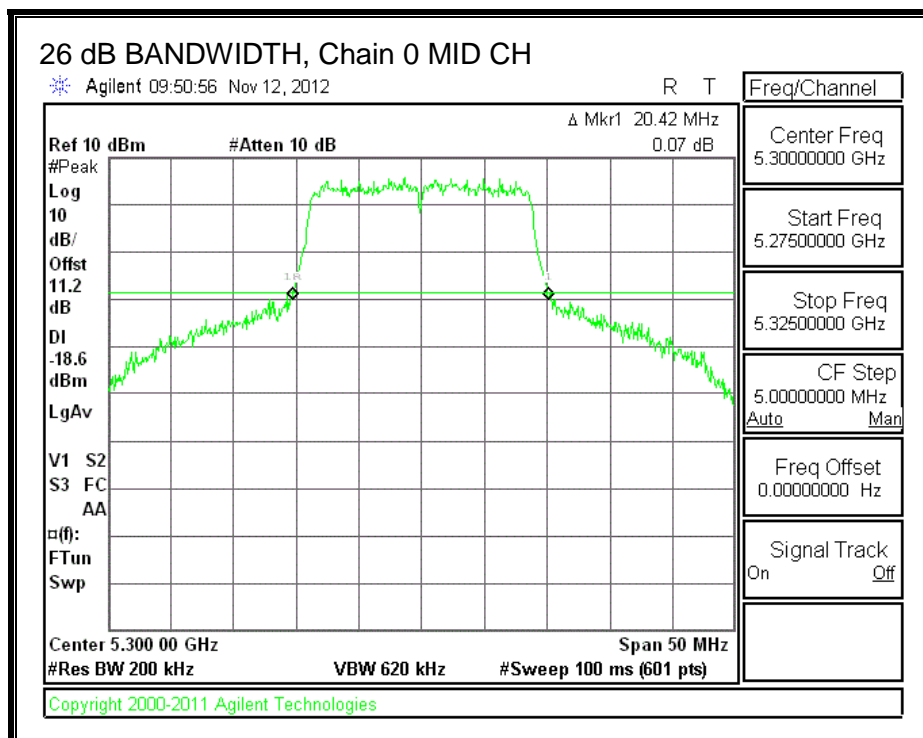
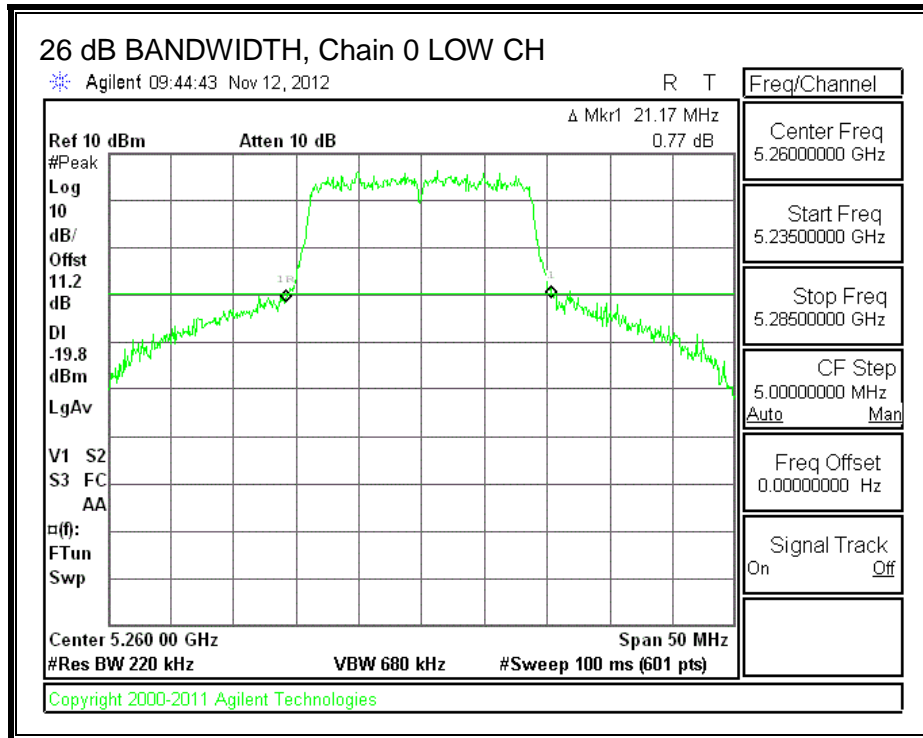
LIMITS

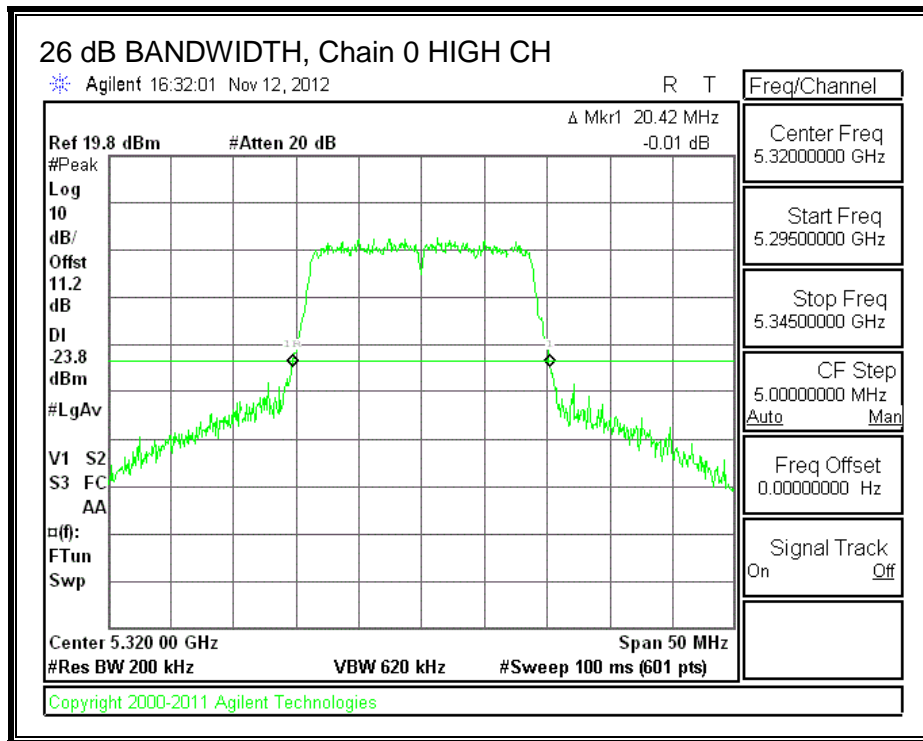
None; for reporting purposes only.

RESULTS

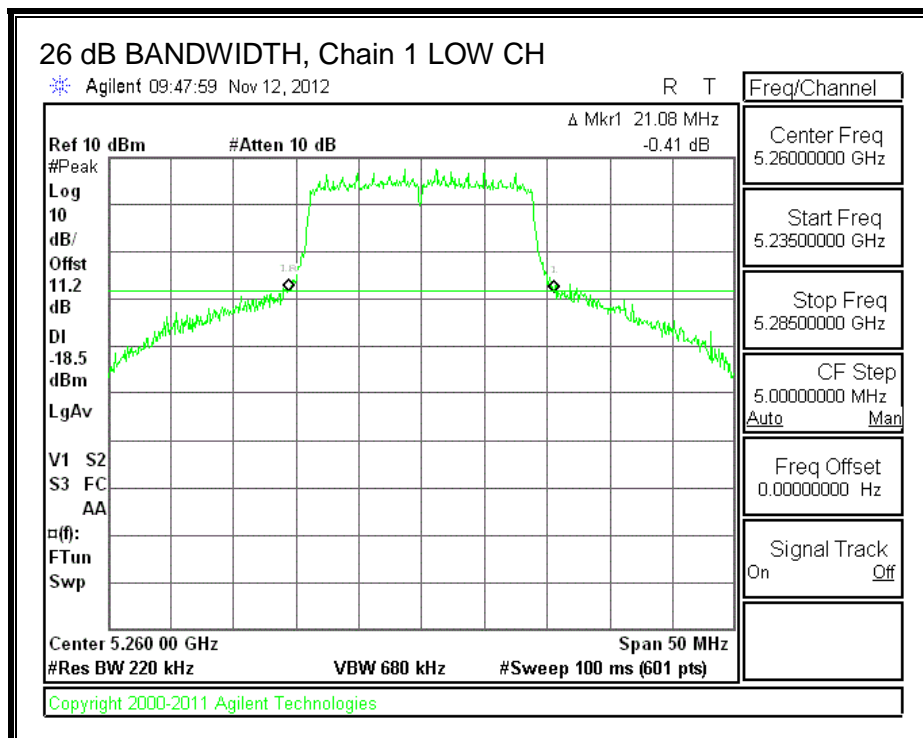
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.17	21.08
Mid	5300	20.42	20.83
High	5320	20.42	20.33

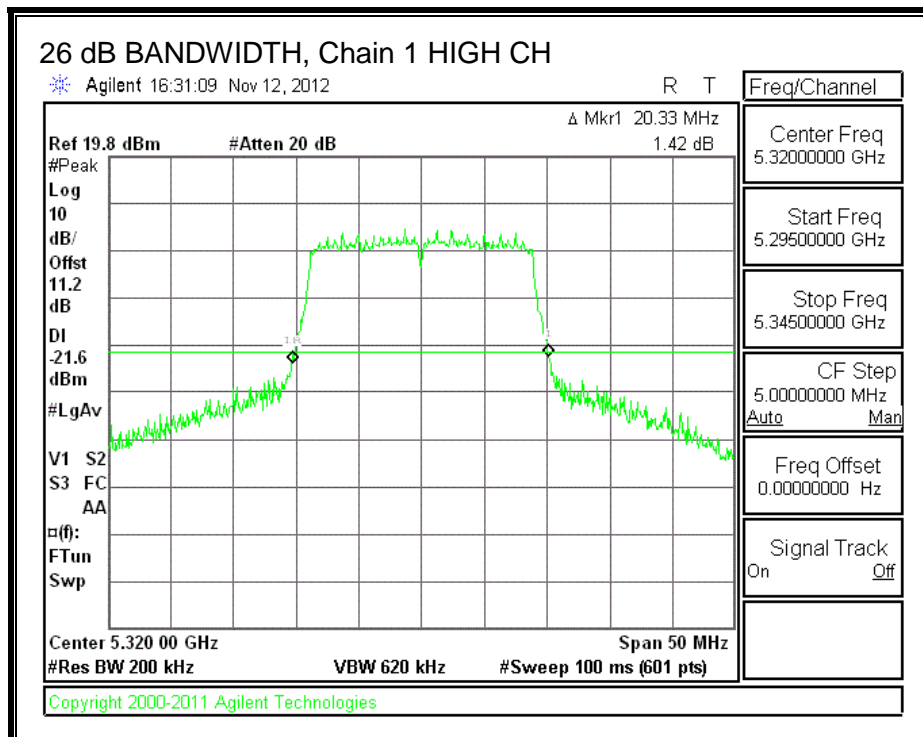
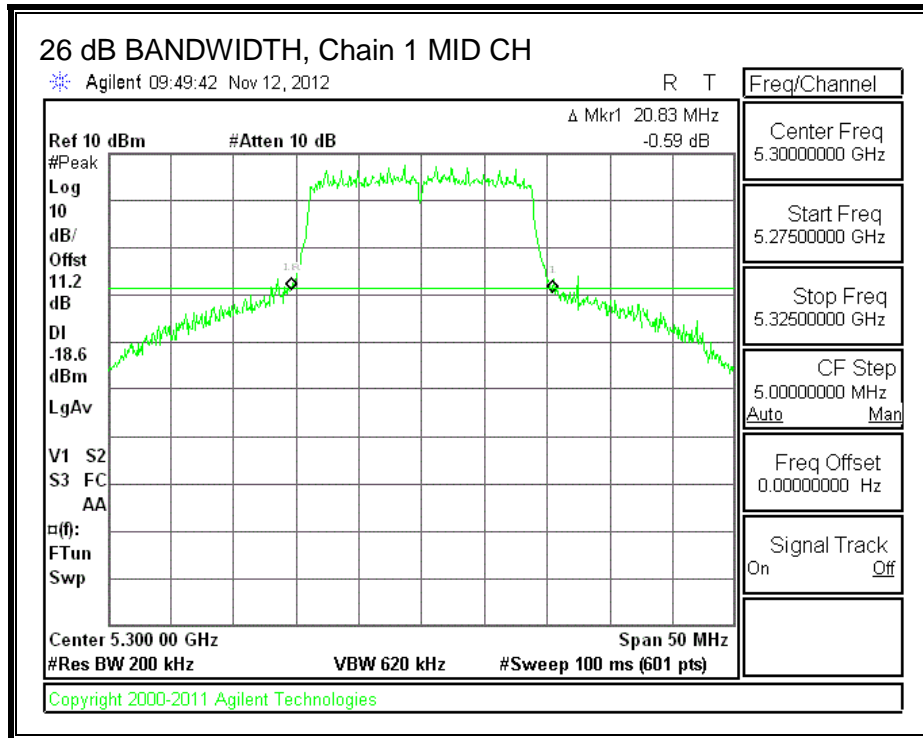
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





7.35.2. 99% BANDWIDTH

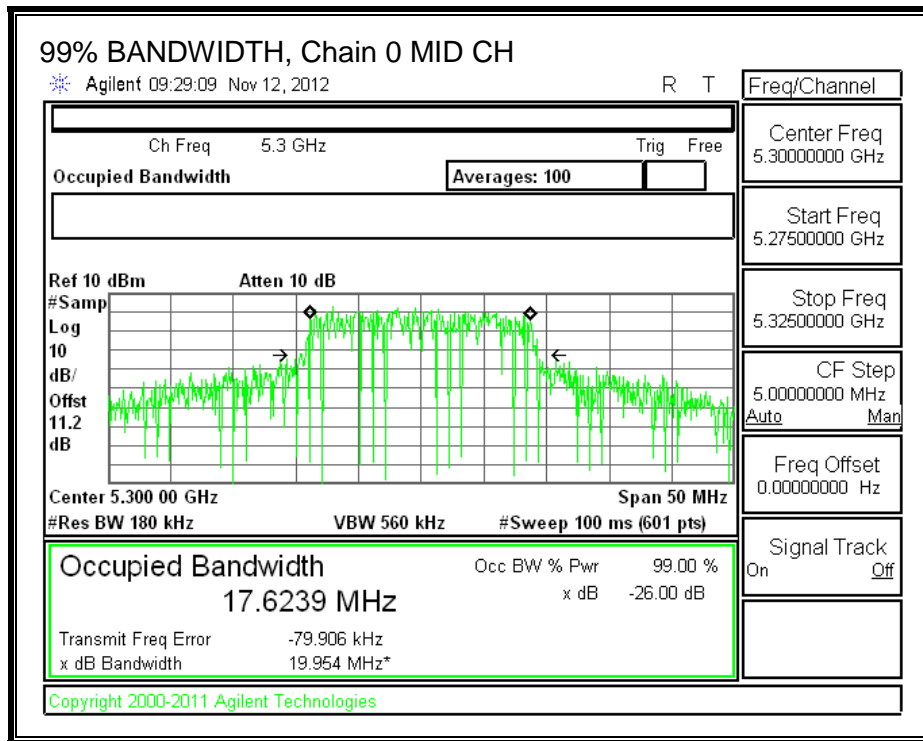
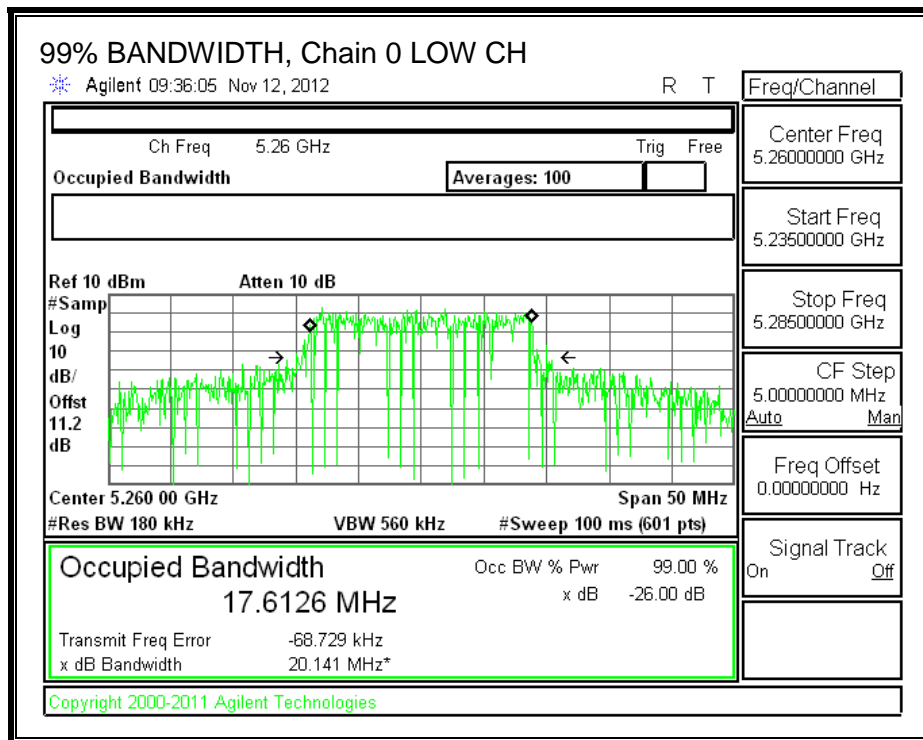
LIMITS

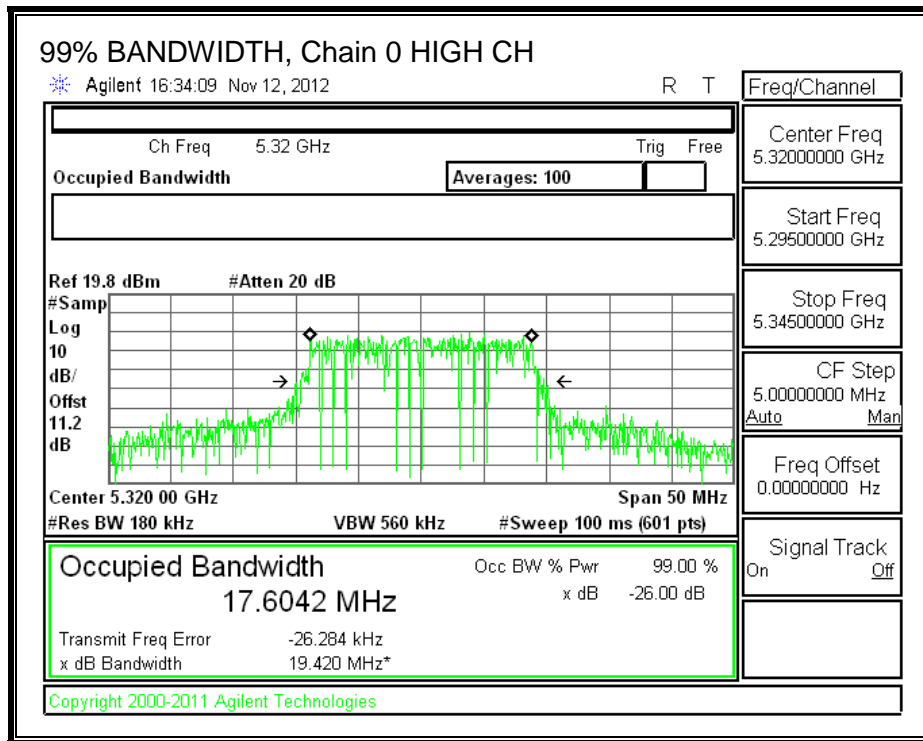
None; for reporting purposes only.

RESULTS

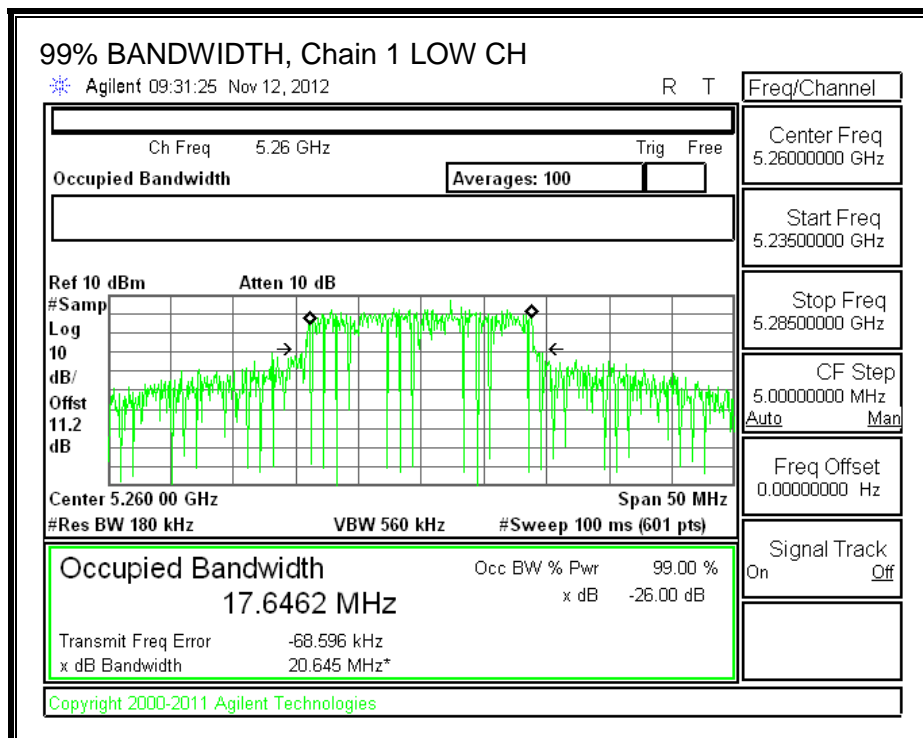
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.6126	17.6462
Mid	5300	17.6239	17.6526
High	5320	17.6042	17.6085

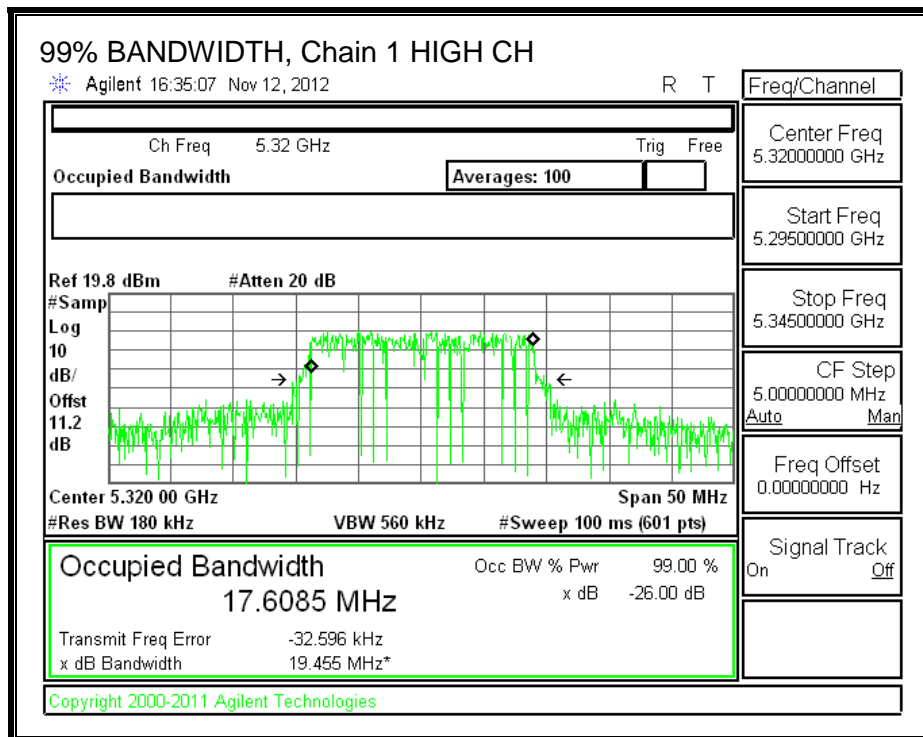
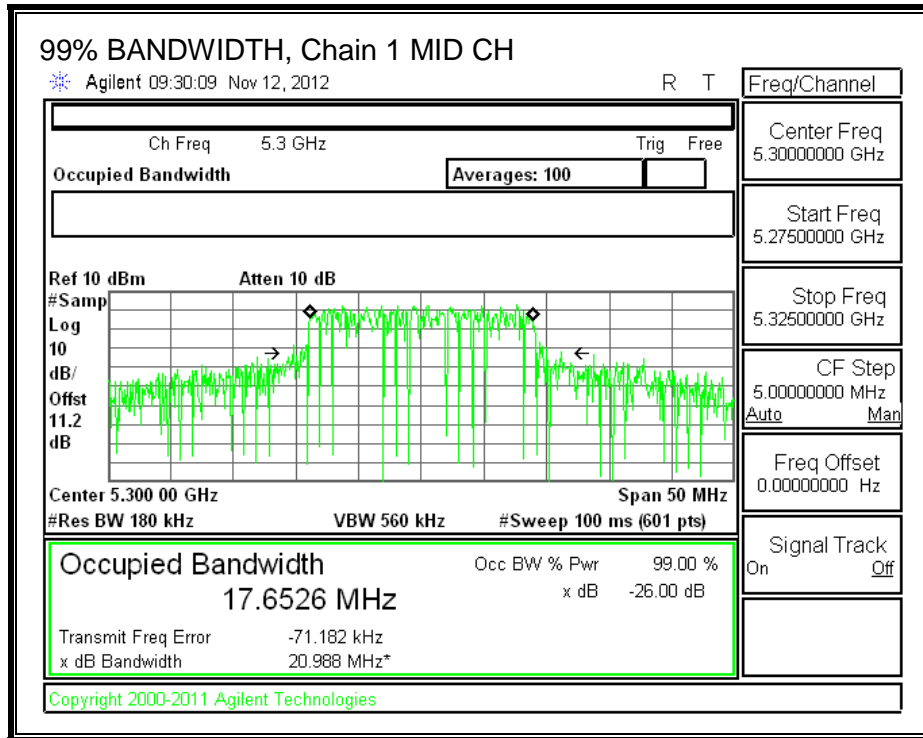
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





7.35.3. OUTPUT POWER AND PPSD

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 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 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 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)
7.09	7.06	7.08

For PPSD, the TX chains are 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)
7.09	7.06	10.09

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.08	17.6126	7.08
Mid	5300	20.42	17.6239	7.08
High	5320	20.33	17.6042	7.08

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	22.92	23.46	29.46	22.38
Mid	5300	22.92	23.46	29.46	22.38
High	5320	22.92	23.46	29.46	22.38

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	17.38	17.45	20.43	22.38	-1.95
Mid	5300	17.10	17.02	20.07	22.38	-2.31
High	5320	16.75	16.92	19.85	22.38	-2.53

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.08	17.6126	10.09
Mid	5300	20.42	17.6239	10.09
High	5320	20.33	17.6042	10.09

Limits

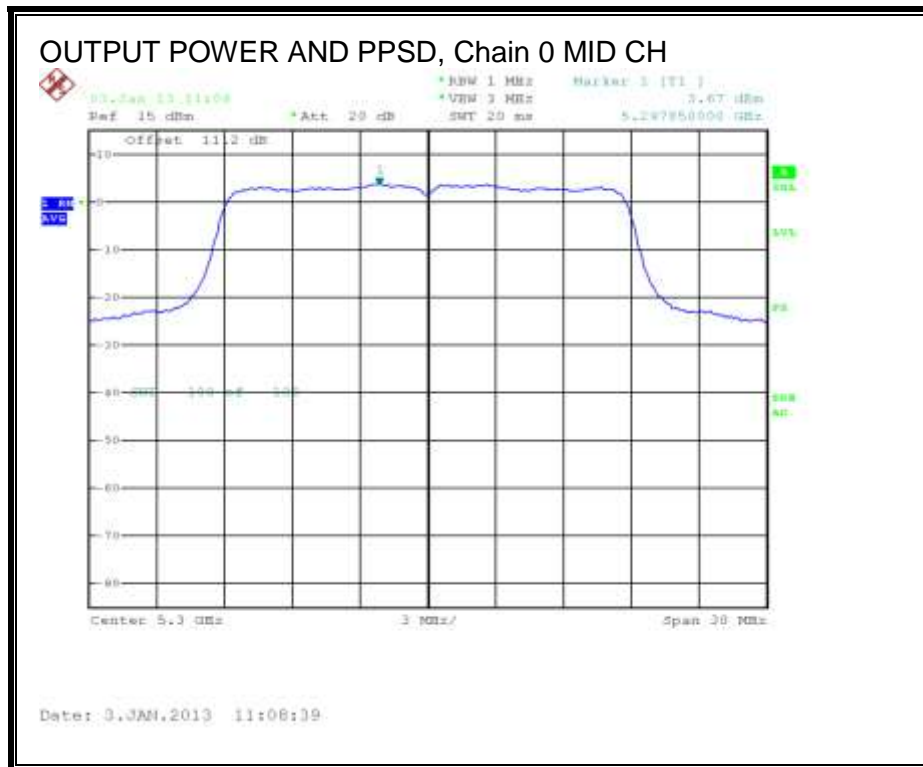
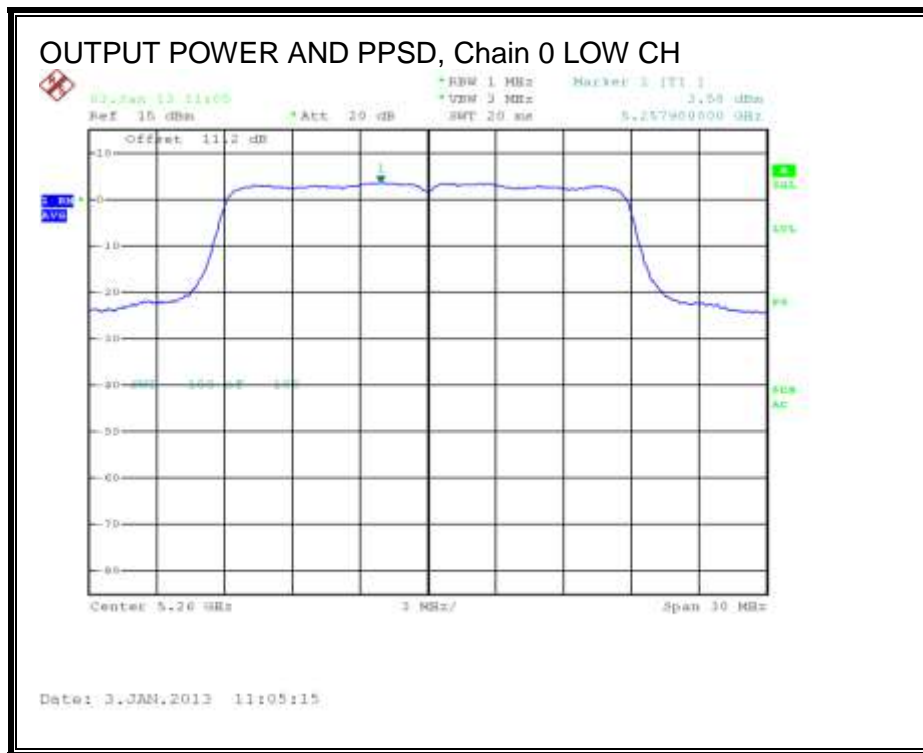
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	6.91	11.00	6.91
Mid	5300	6.91	11.00	6.91
High	5320	6.91	11.00	6.91

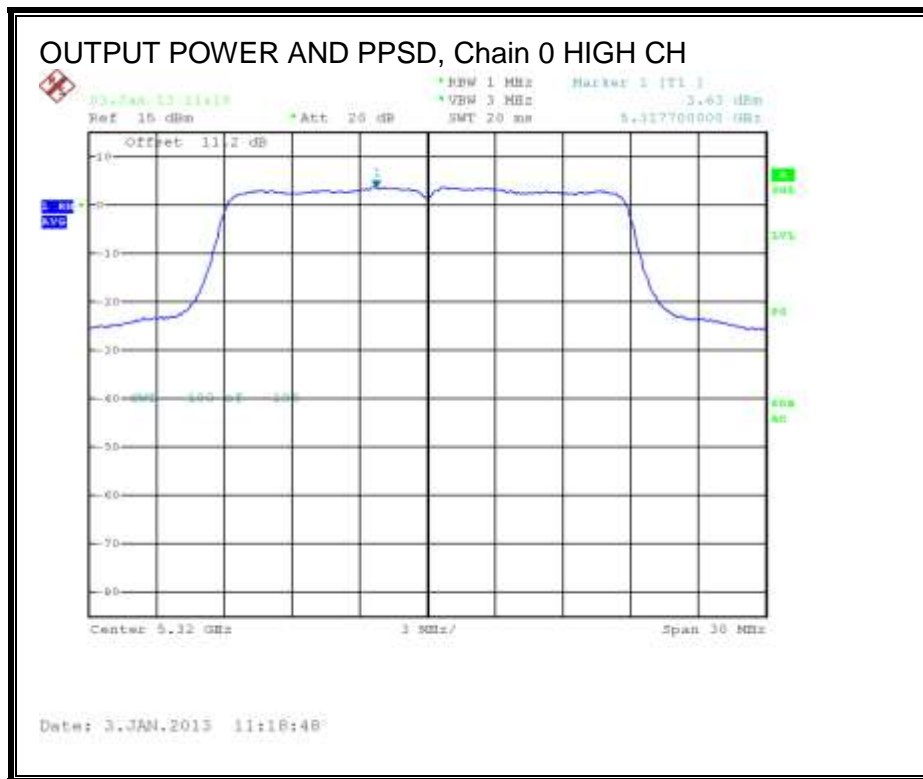
Duty Cycle CF (dB)	0.22	Included in PSD
---------------------------	------	------------------------

PPSD Results

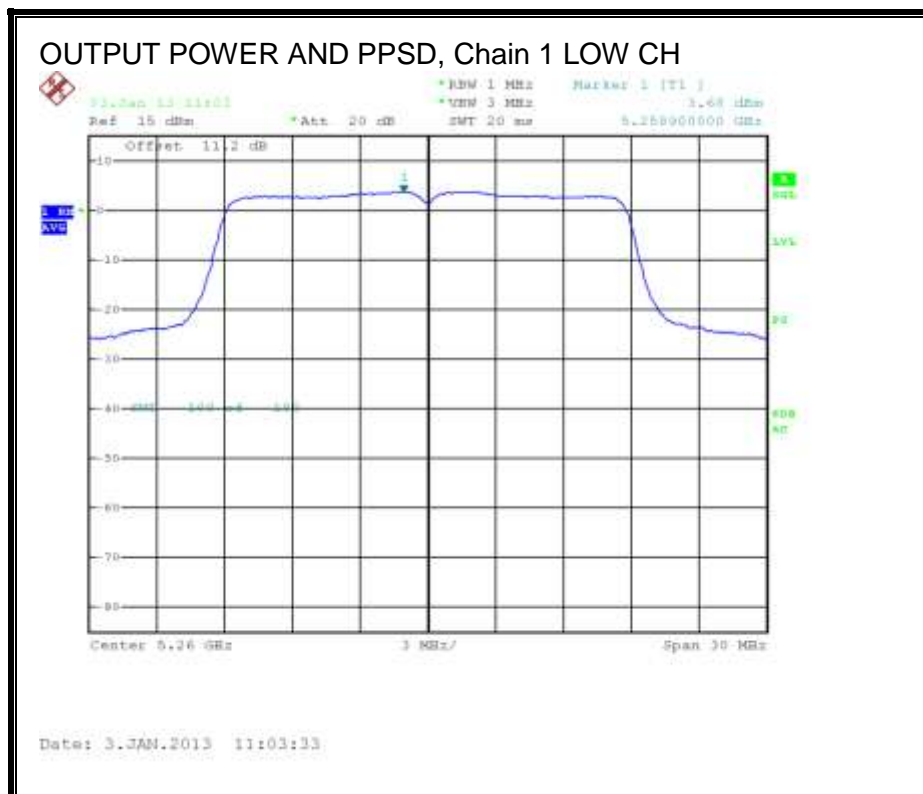
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.58	3.68	6.86	6.91	-0.05
Mid	5300	3.67	3.62	6.88	6.91	-0.03
High	5320	3.63	3.71	6.90	6.91	-0.01

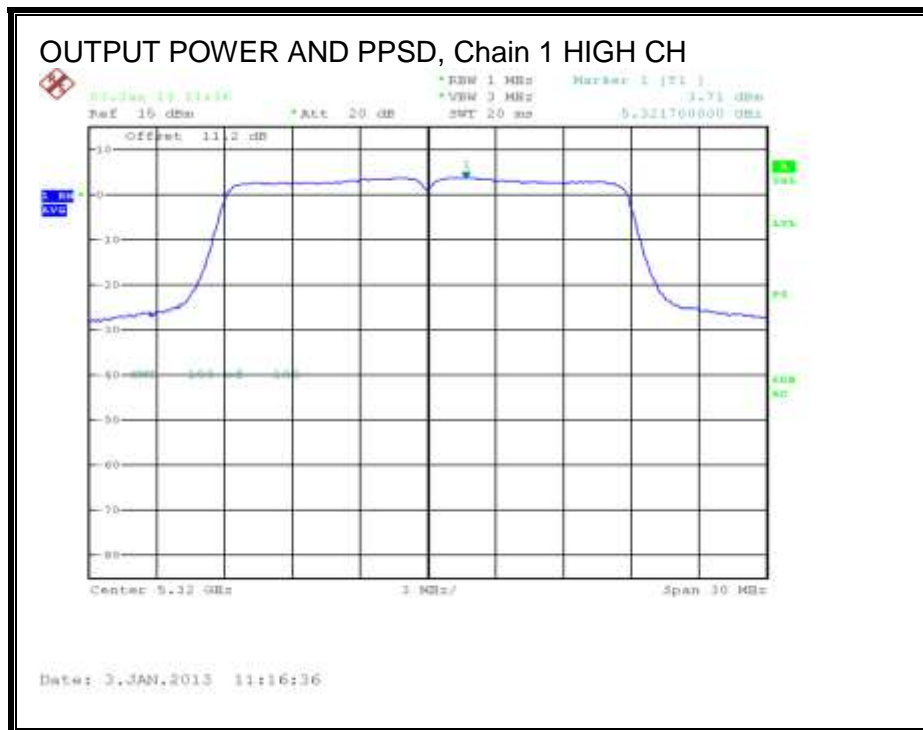
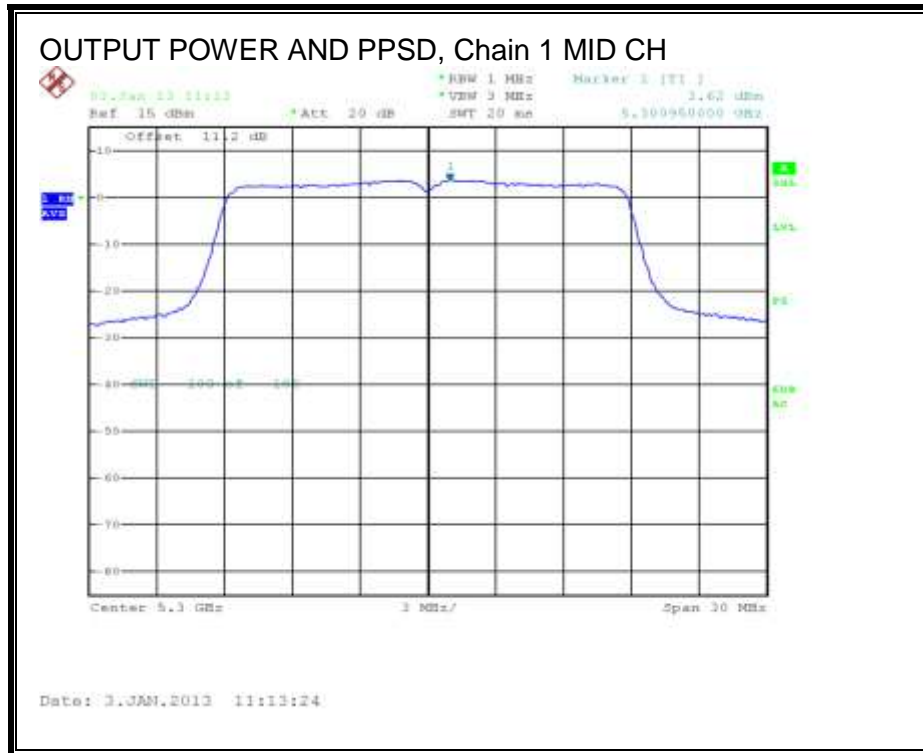
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





7.36. 802.11n HT20 CDD 3TX MODE, 5.3 GHz BAND

7.36.1. 26 dB BANDWIDTH

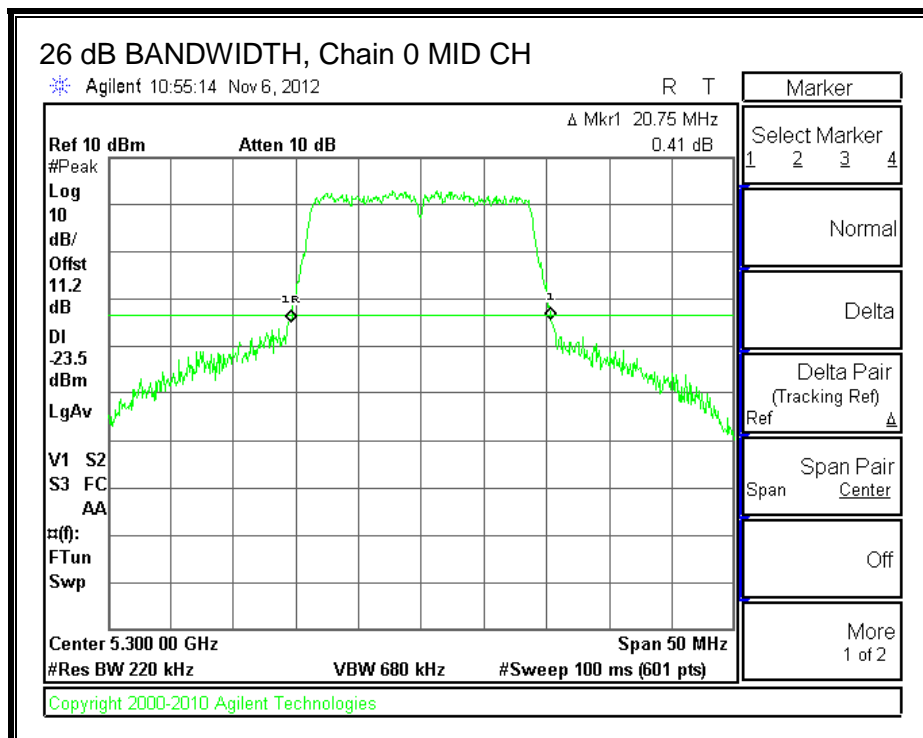
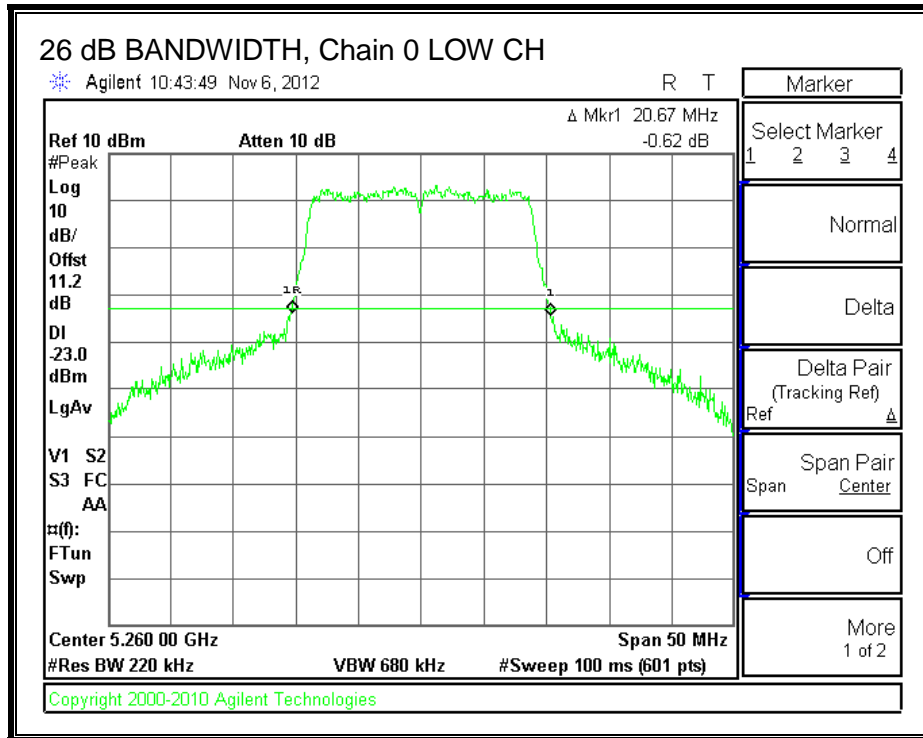
LIMITS

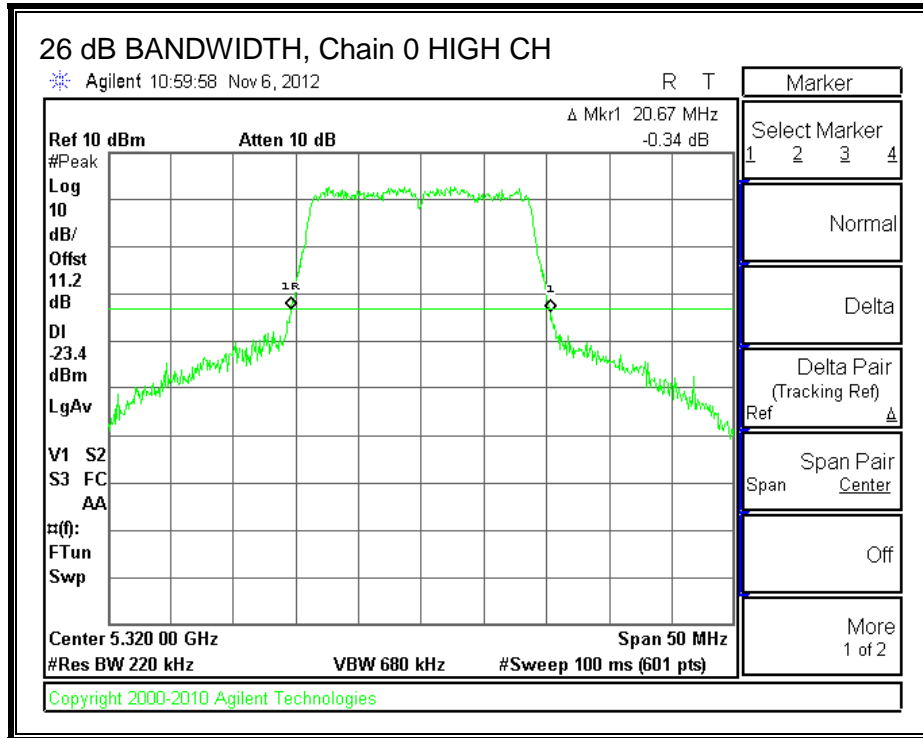
None; for reporting purposes only.

RESULTS

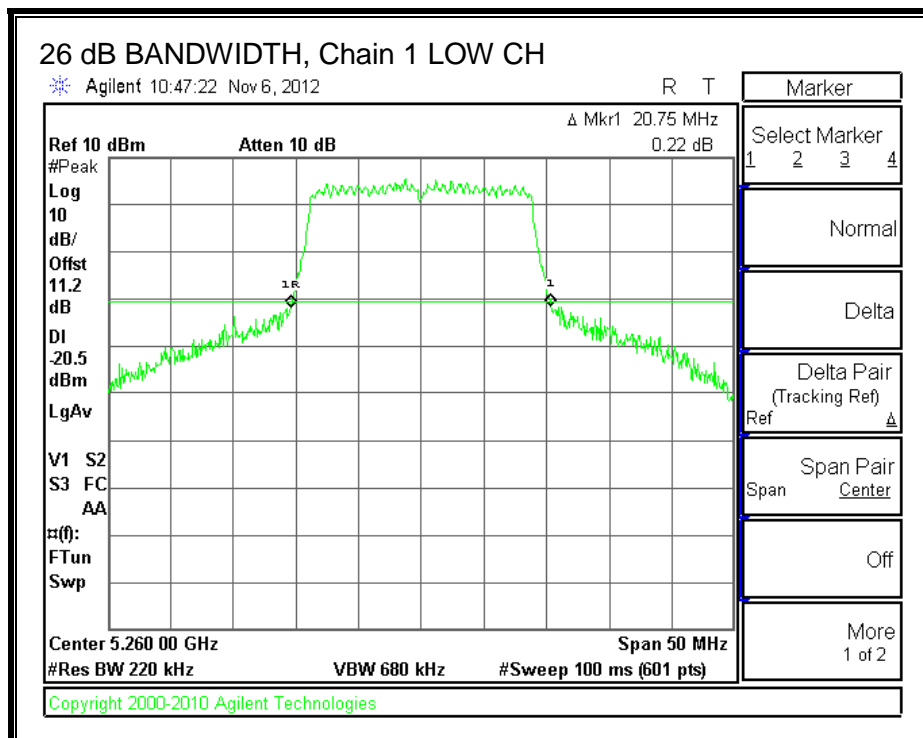
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	20.67	20.75	20.67
Mid	5300	20.75	20.83	20.75
High	5320	20.67	20.67	20.67

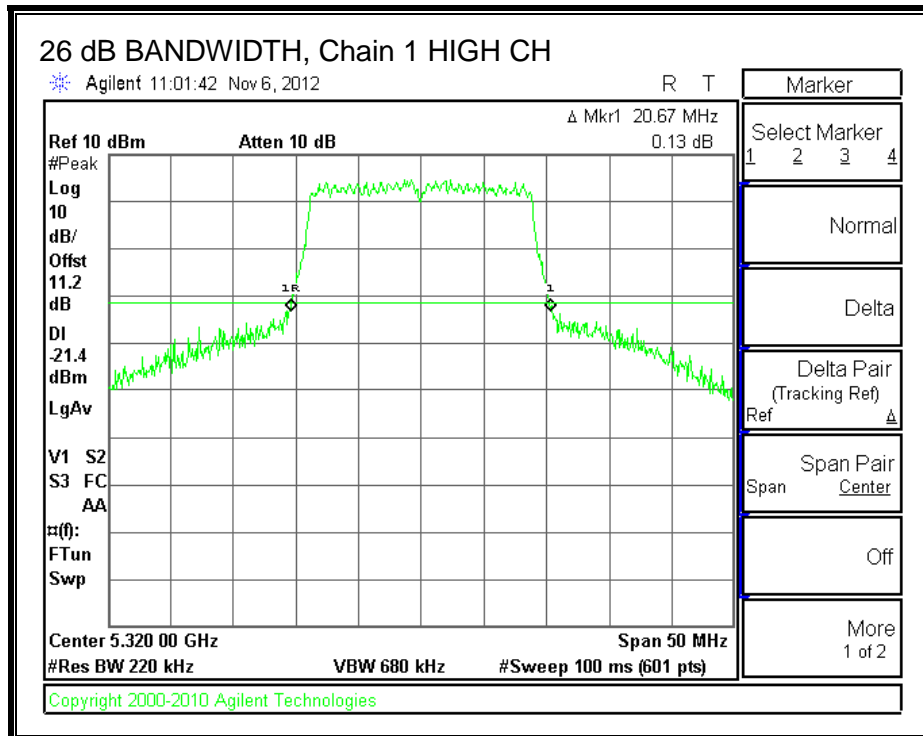
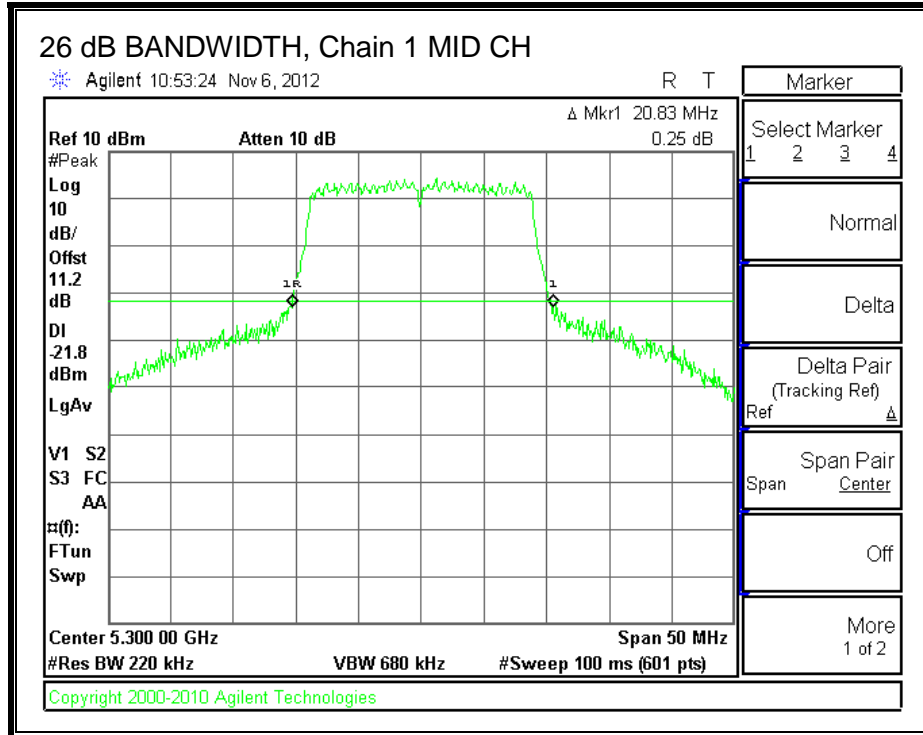
26 dB BANDWIDTH, Chain 0



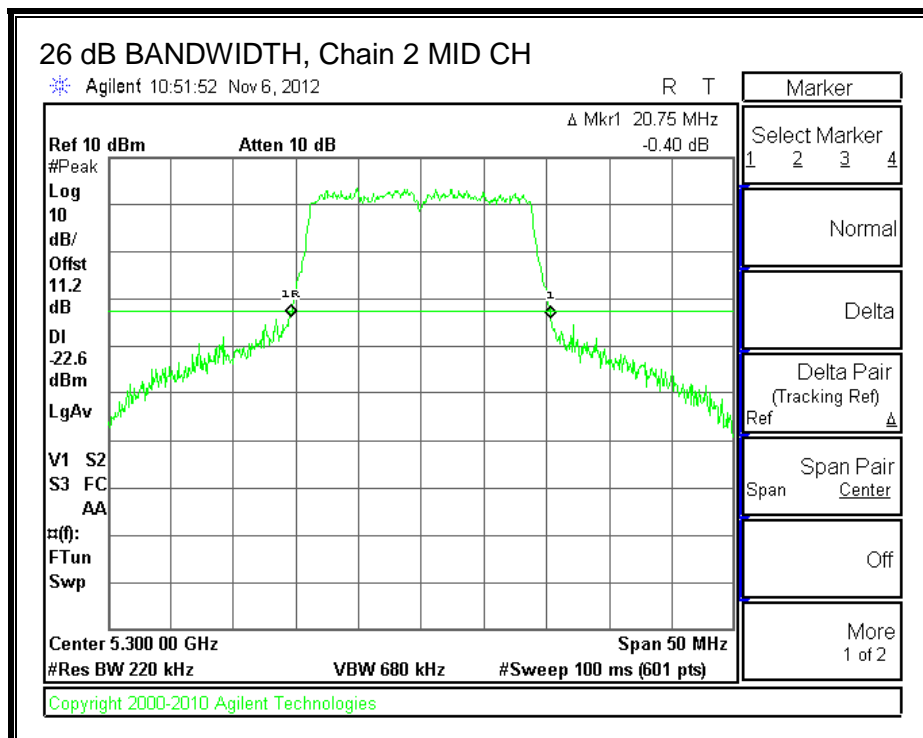
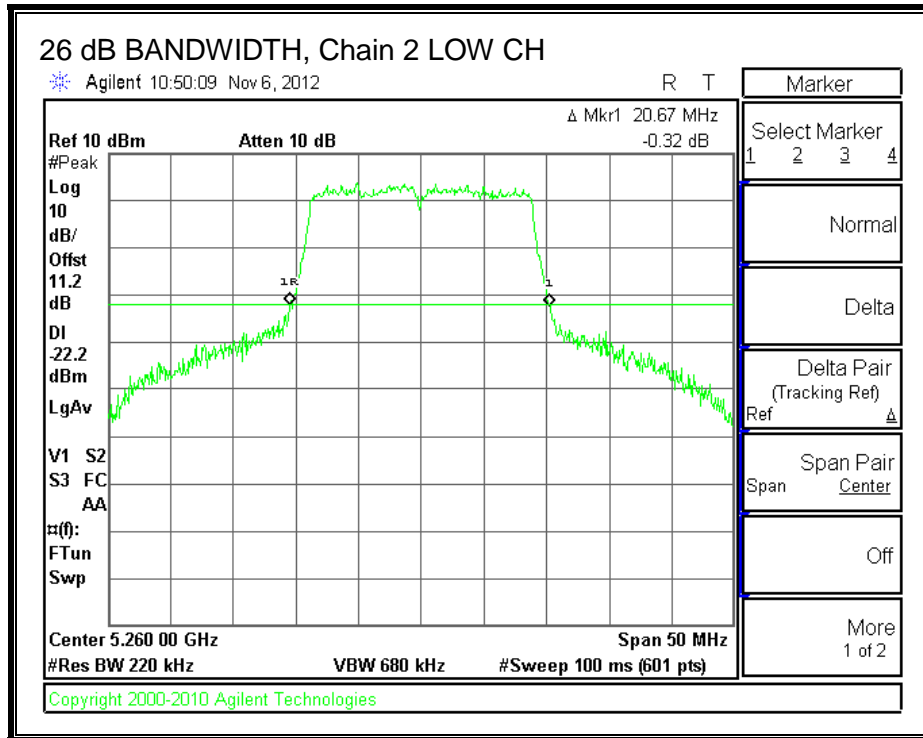


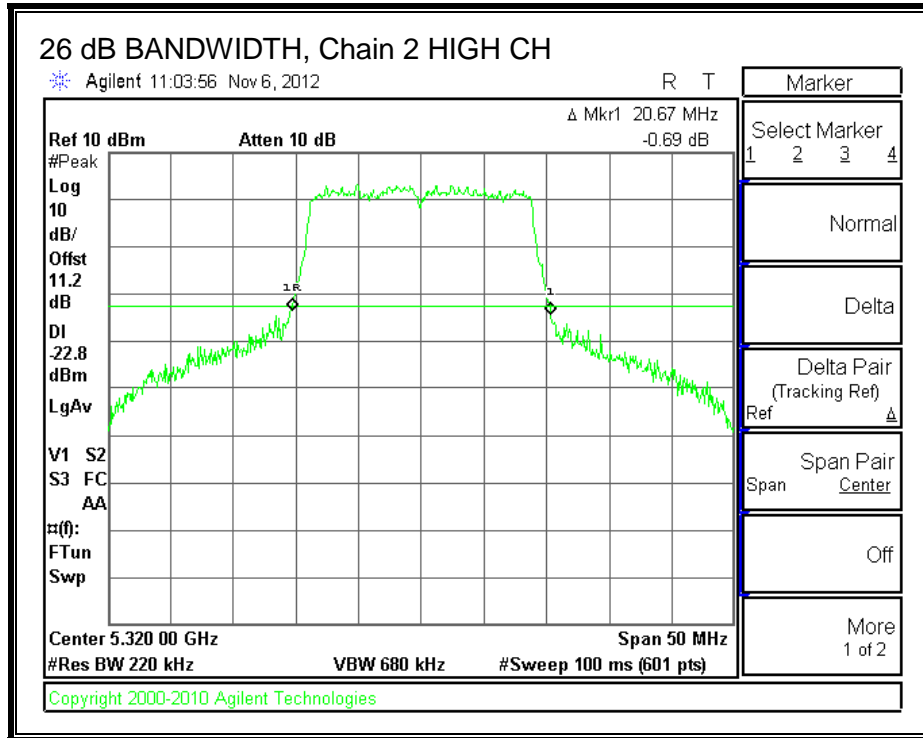
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





7.36.2. **99% BANDWIDTH**

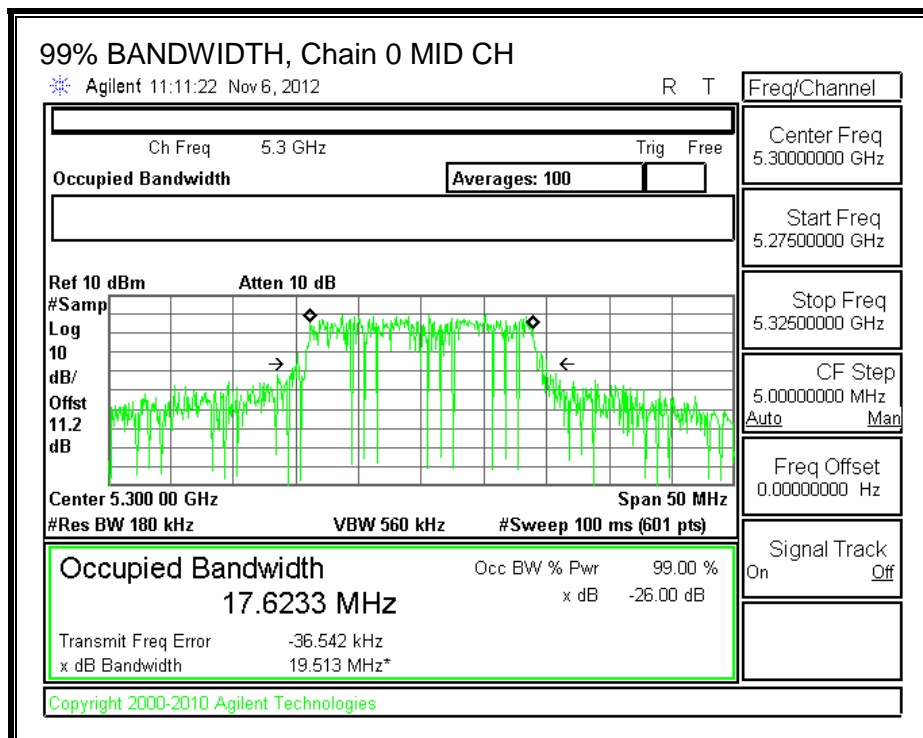
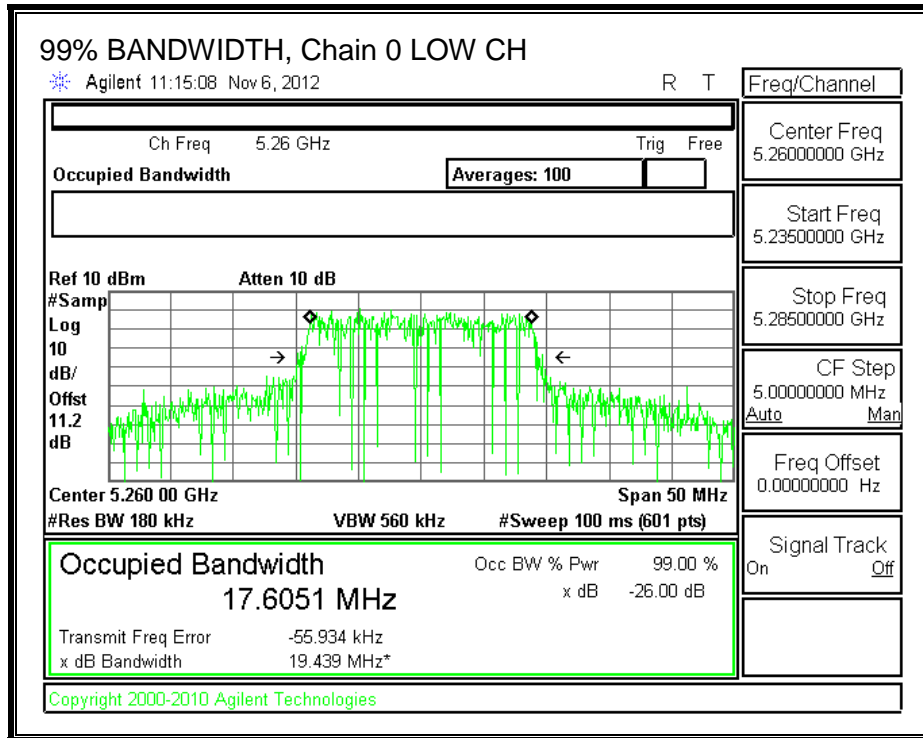
LIMITS

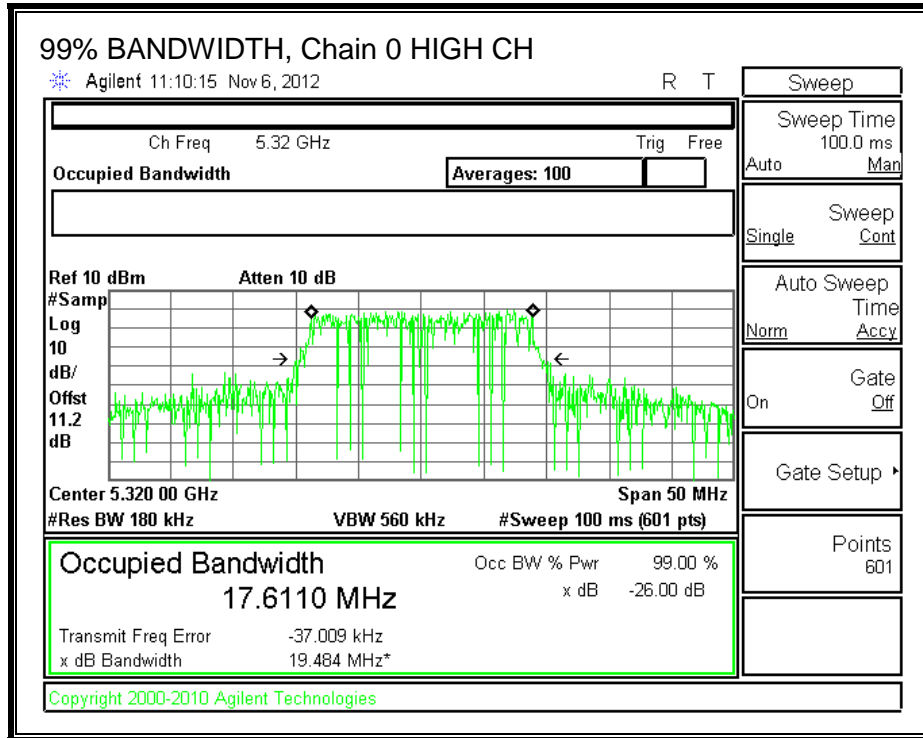
None; for reporting purposes only.

RESULTS

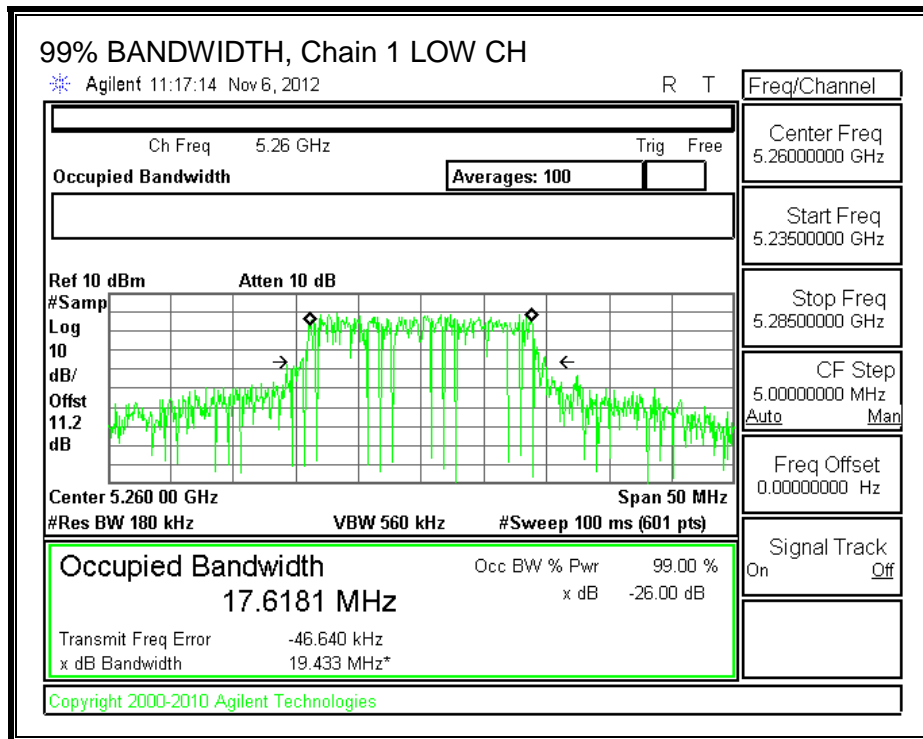
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.6051	17.6181	17.6096
Mid	5300	17.6233	17.6250	17.6104
High	5320	17.6110	17.6083	17.6245

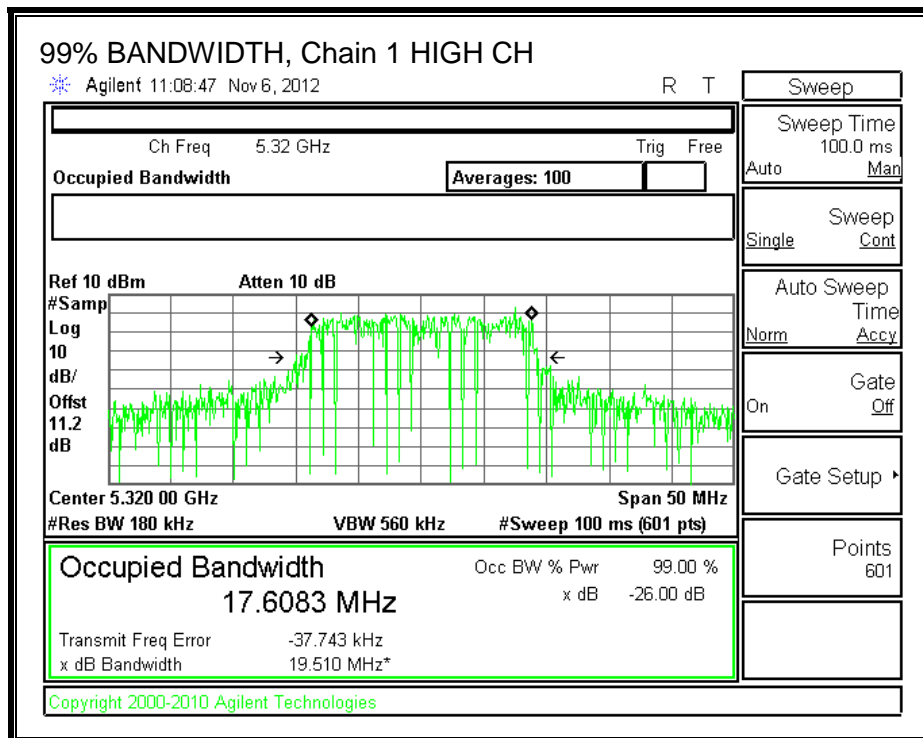
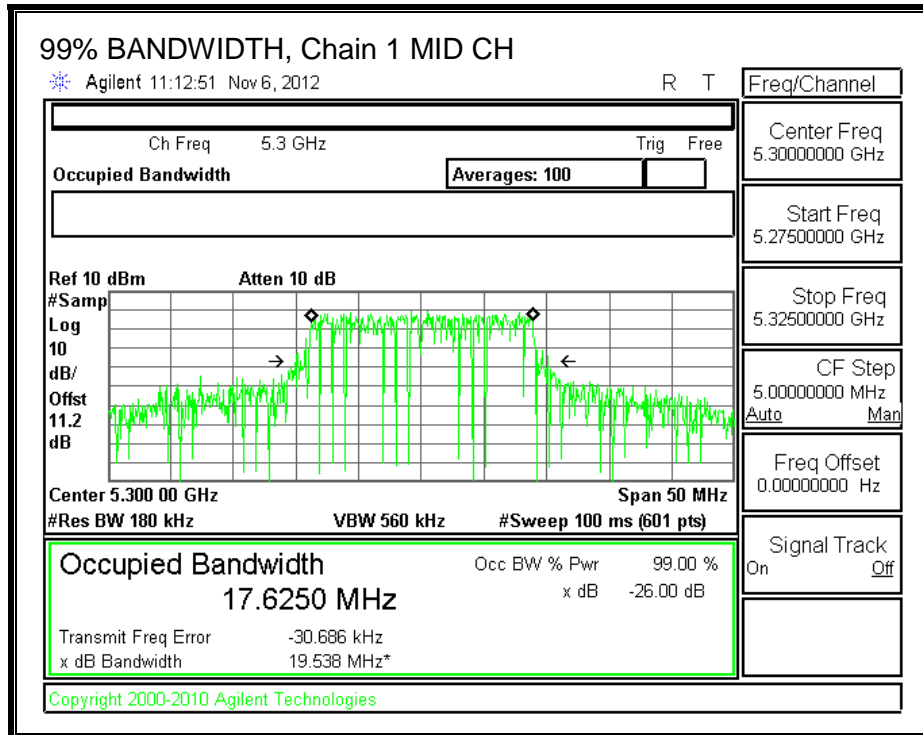
99% BANDWIDTH, Chain 0



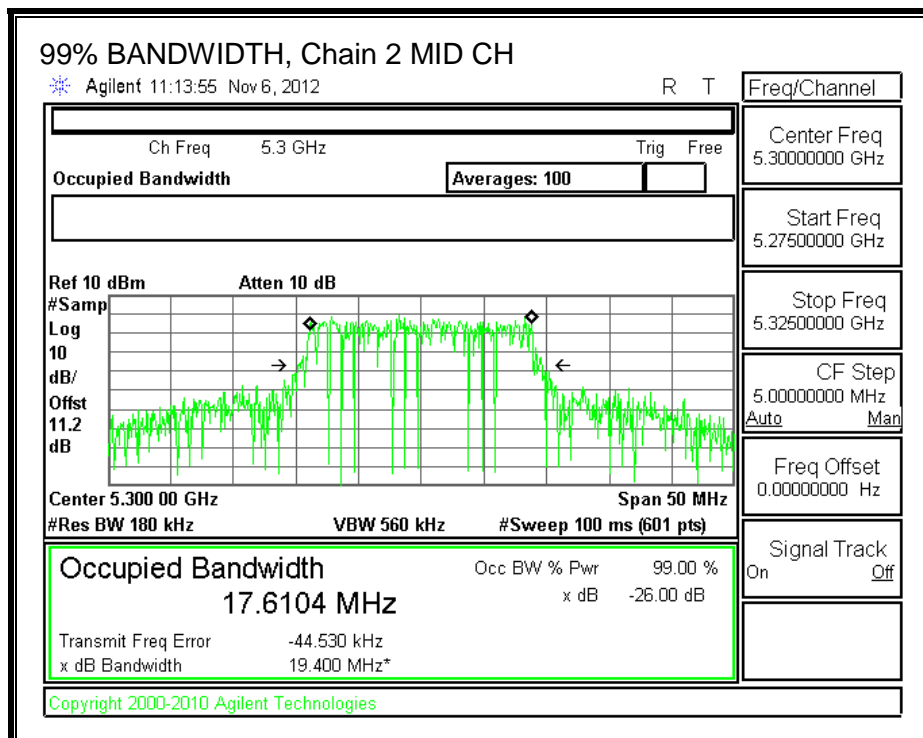
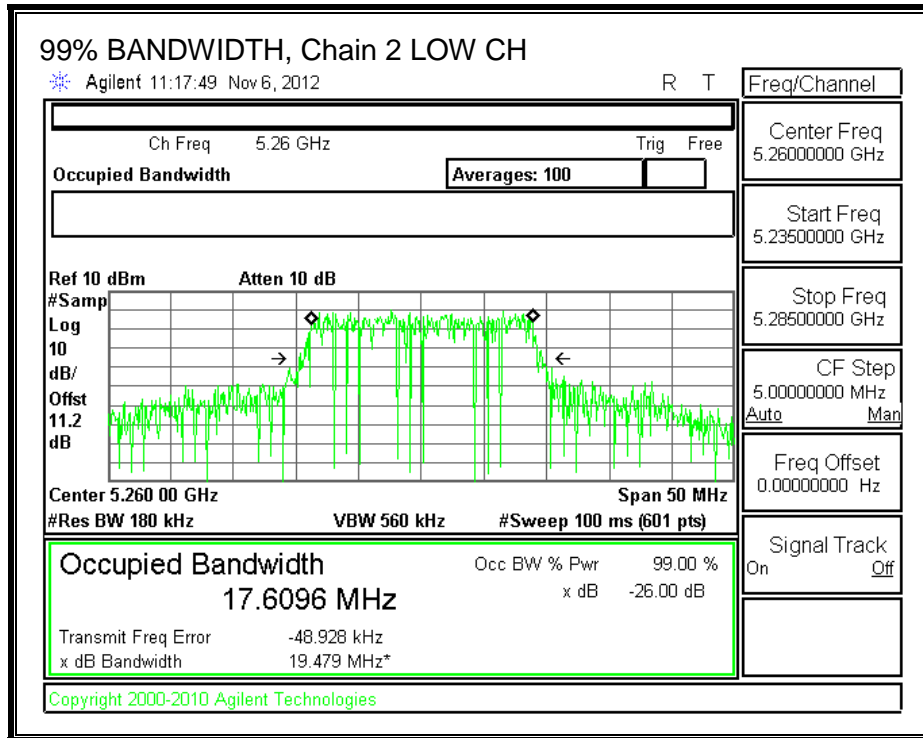


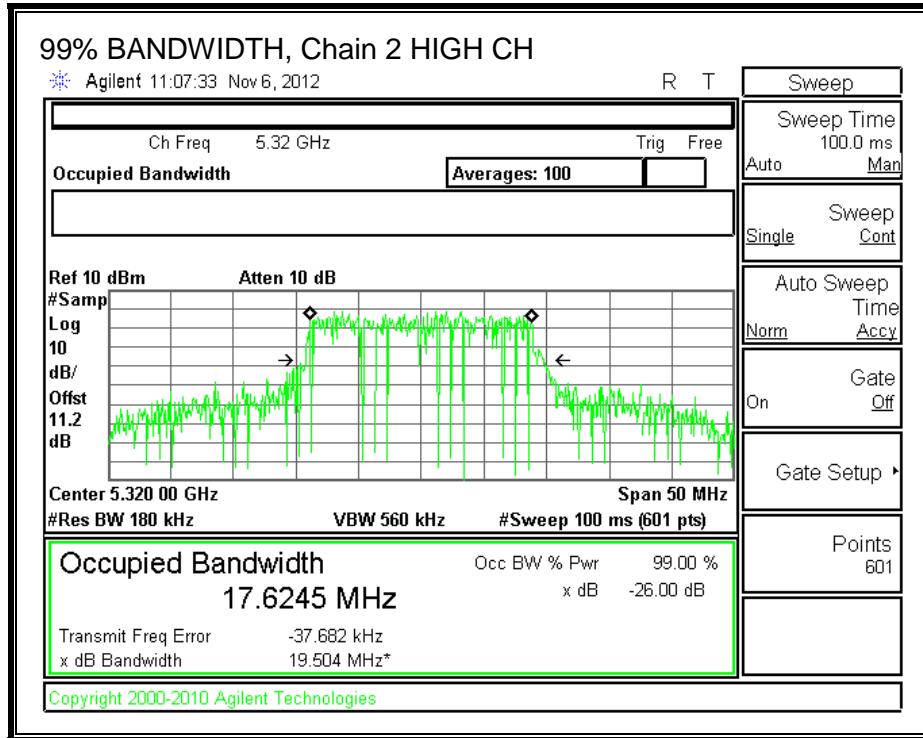
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





7.36.3. OUTPUT POWER AND PPSD

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 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 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 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)
7.09	7.06	3.58	6.19

For PPSD, the TX chains are correlated 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)
7.09	7.06	3.58	10.83

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.67	17.6051	6.19
Mid	5300	20.75	17.6104	6.19
High	5320	20.67	17.6083	6.19

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	23.81	23.46	29.46	23.27
Mid	5300	23.81	23.46	29.46	23.27
High	5320	23.81	23.46	29.46	23.27

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	14.71	14.54	14.45	19.34	23.27	-3.93
Mid	5300	14.45	14.60	14.25	19.21	23.27	-4.06
High	5320	14.37	14.13	13.88	18.90	23.27	-4.36

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.67	17.6051	10.83
Mid	5300	20.75	17.6104	10.83
High	5320	20.67	17.6083	10.83

Limits

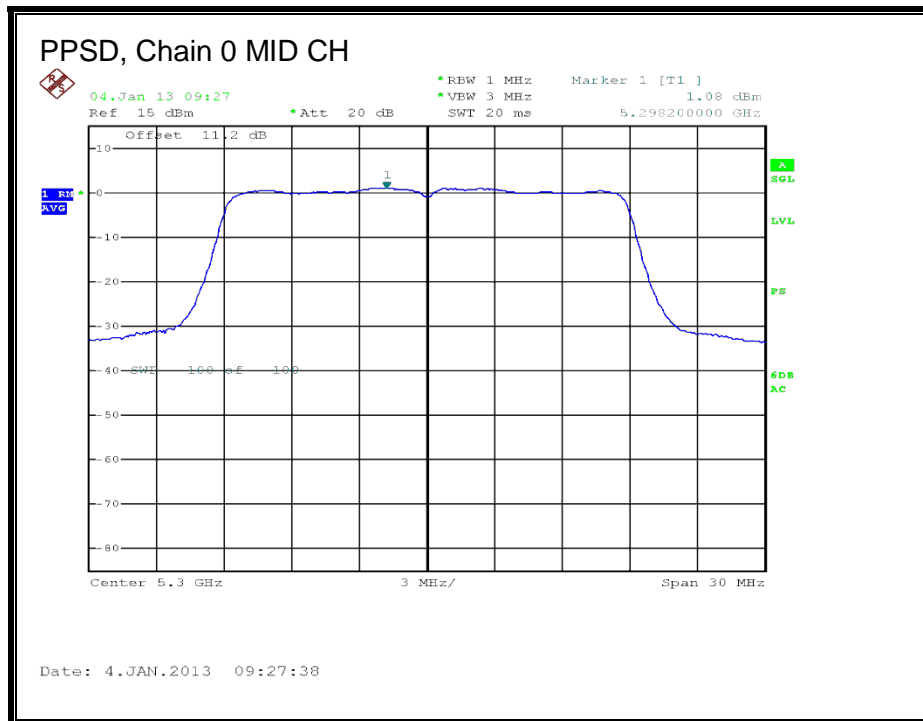
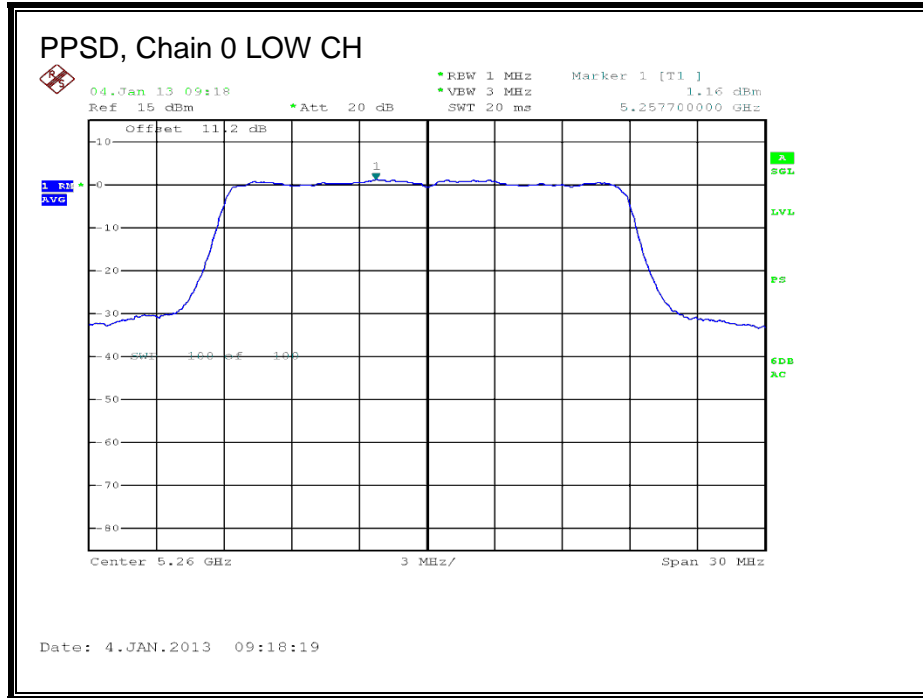
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	6.17	11.00	6.17
Mid	5300	6.17	11.00	6.17
High	5320	6.17	11.00	6.17

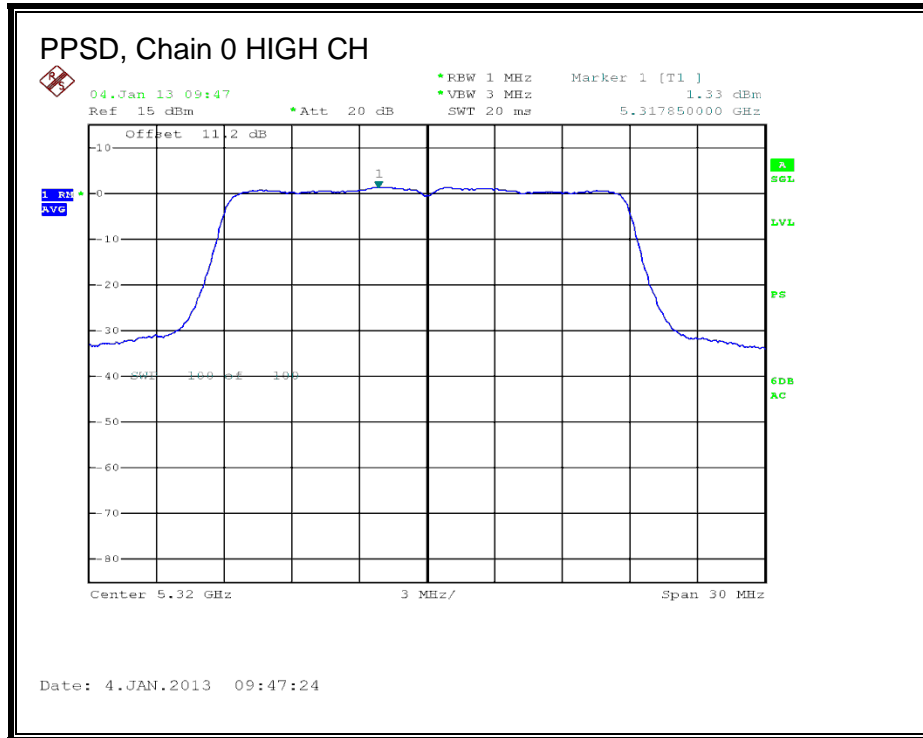
Duty Cycle CF (dB)	0.22	Included in Calculations of PSD
---------------------------	------	--

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	1.16	1.11	1.04	6.09	6.17	-0.08
Mid	5300	1.08	1.28	1.04	6.13	6.17	-0.04
High	5320	1.33	1.07	0.97	6.12	6.17	-0.05

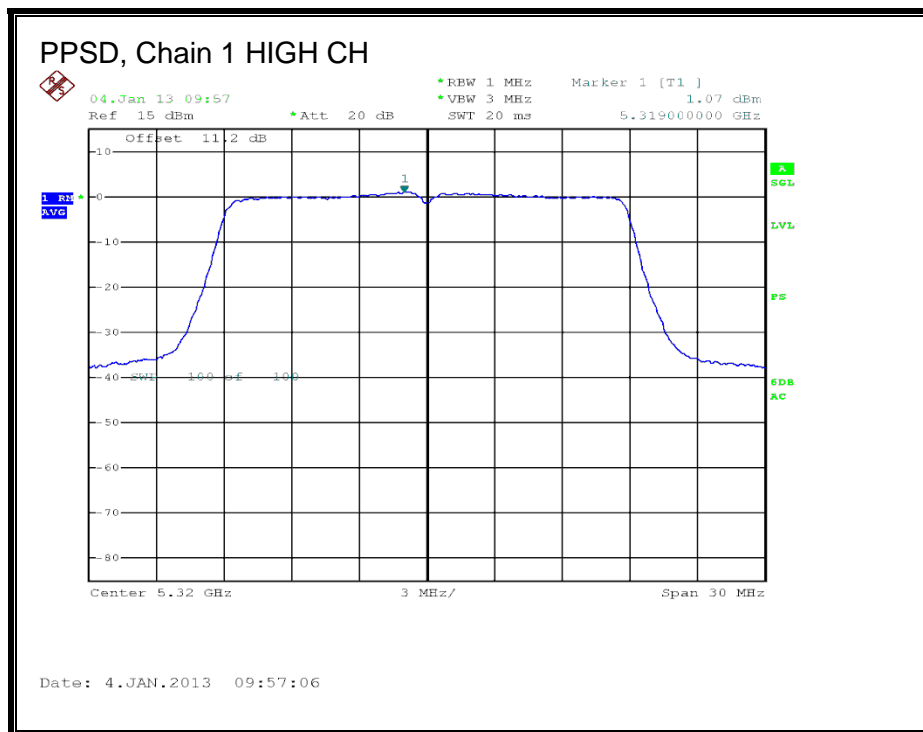
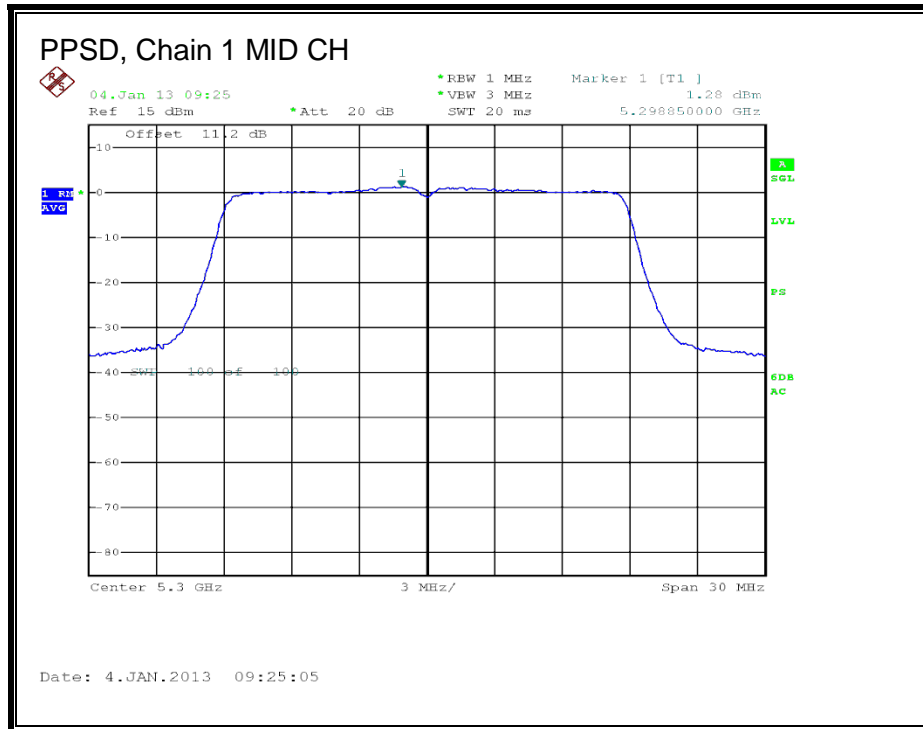
PPSD, Chain 0



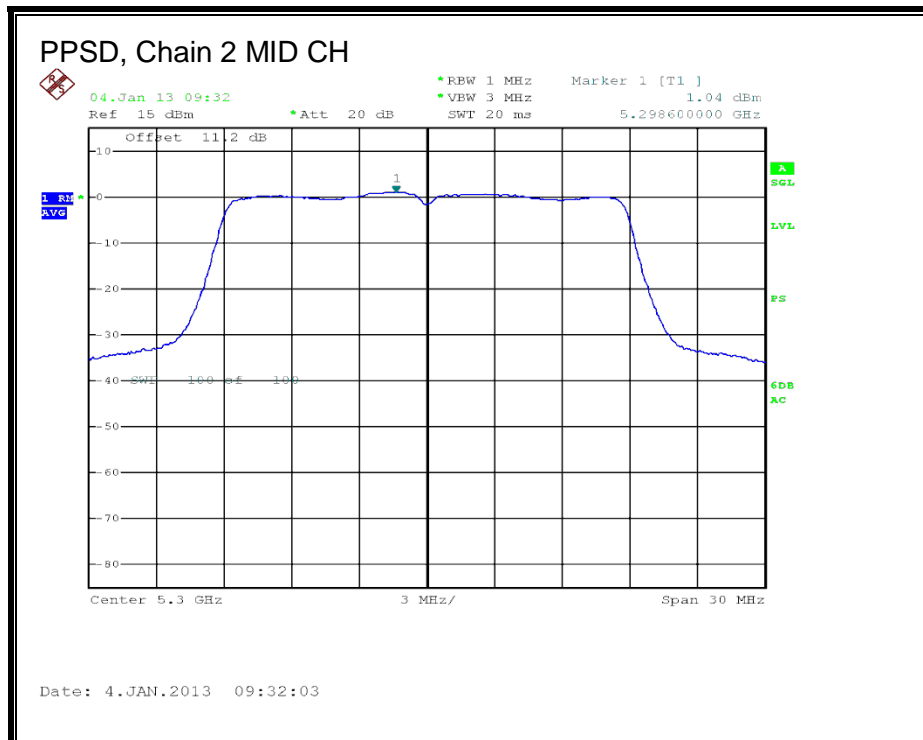
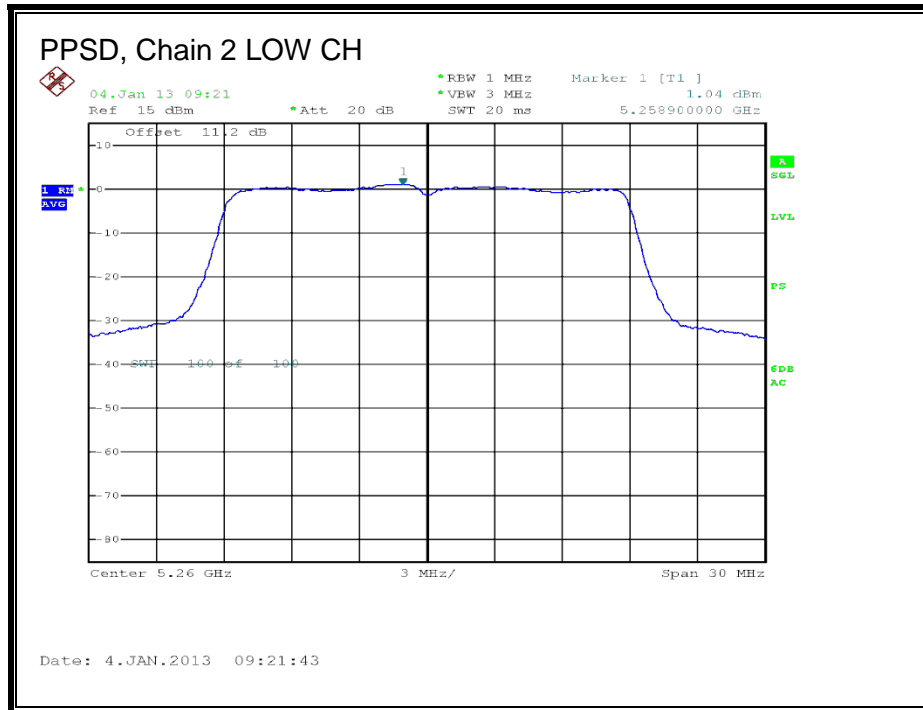


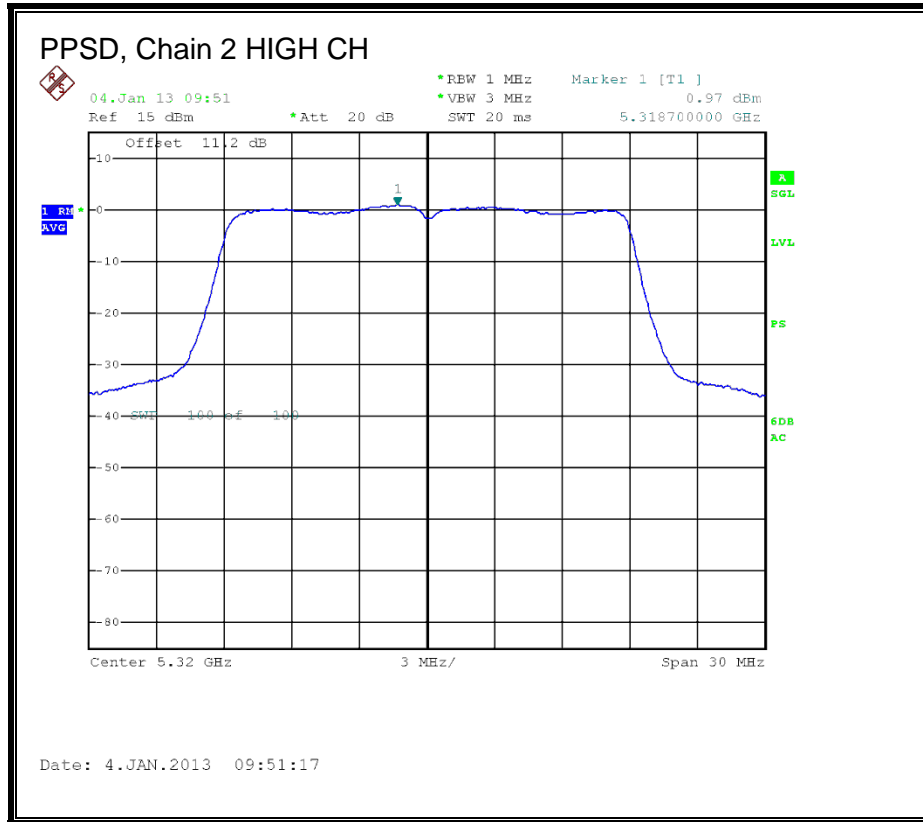
OUTPUT POWER AND PPSD, Chain 1





OUTPUT POWER AND PPSD, Chain 2





7.36.4. 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	5300	9.30	1.08	0.22	8.00	13	-5.00

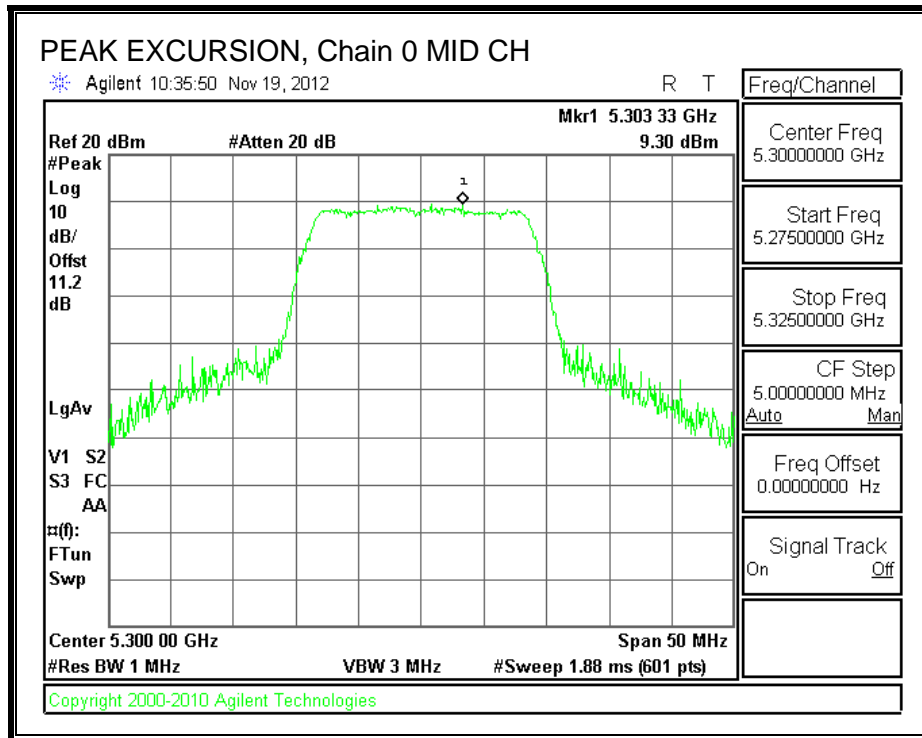
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5300	10.03	1.28	0.22	8.53	13	-4.47

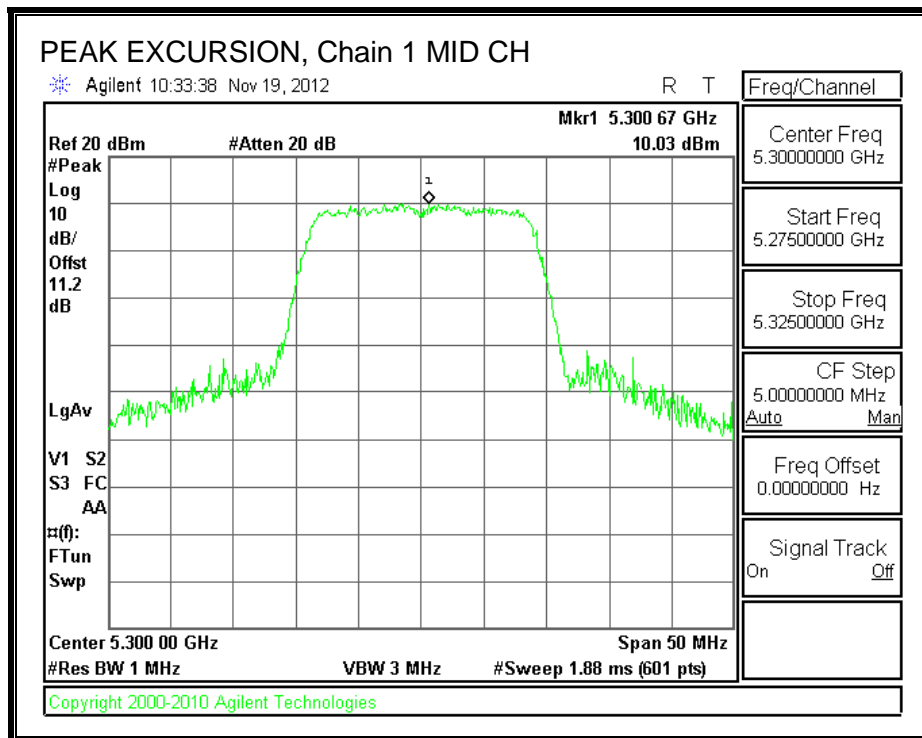
Chain 2

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5300	9.07	1.04	0.22	7.81	13	-5.19

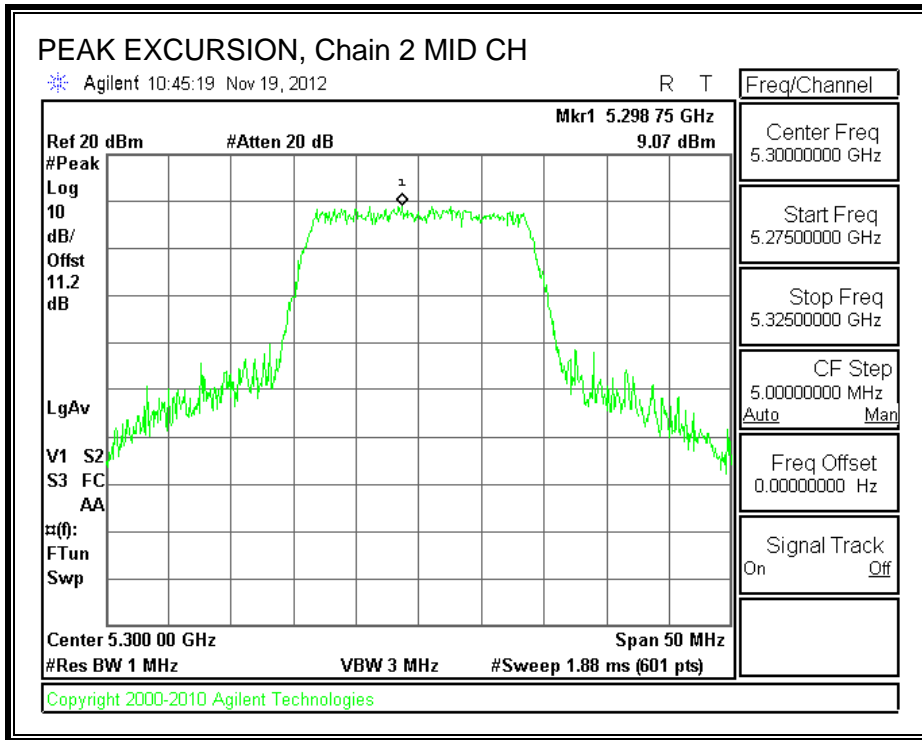
PEAK EXCURSION, Chain 0



PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



7.37. 802.11n HT20 STBC 2TX MODE, 5.3 GHz BAND

7.37.1. 26 dB BANDWIDTH

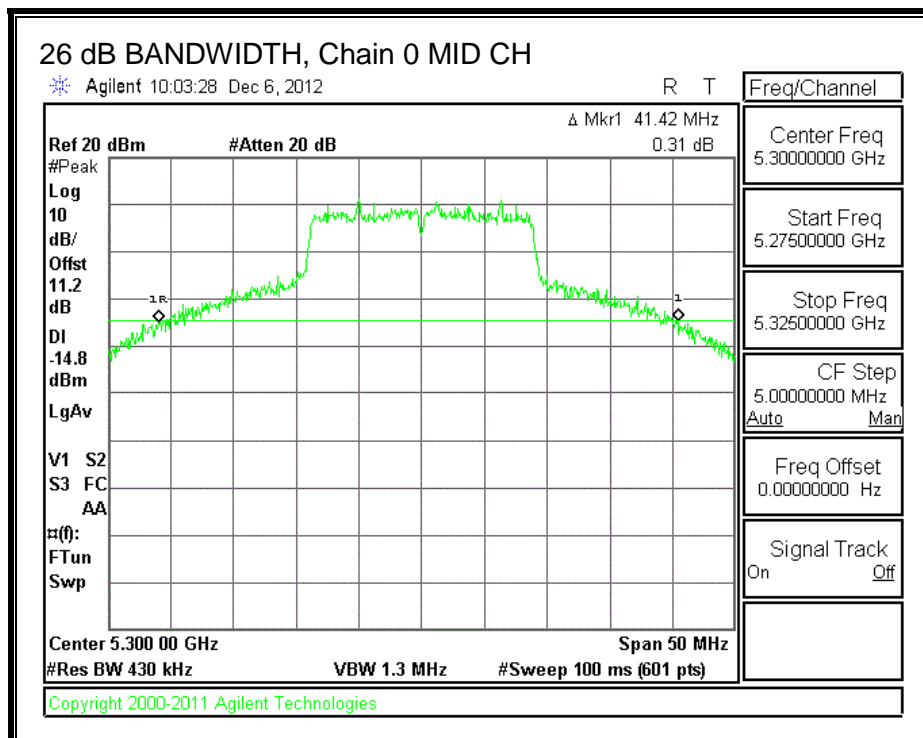
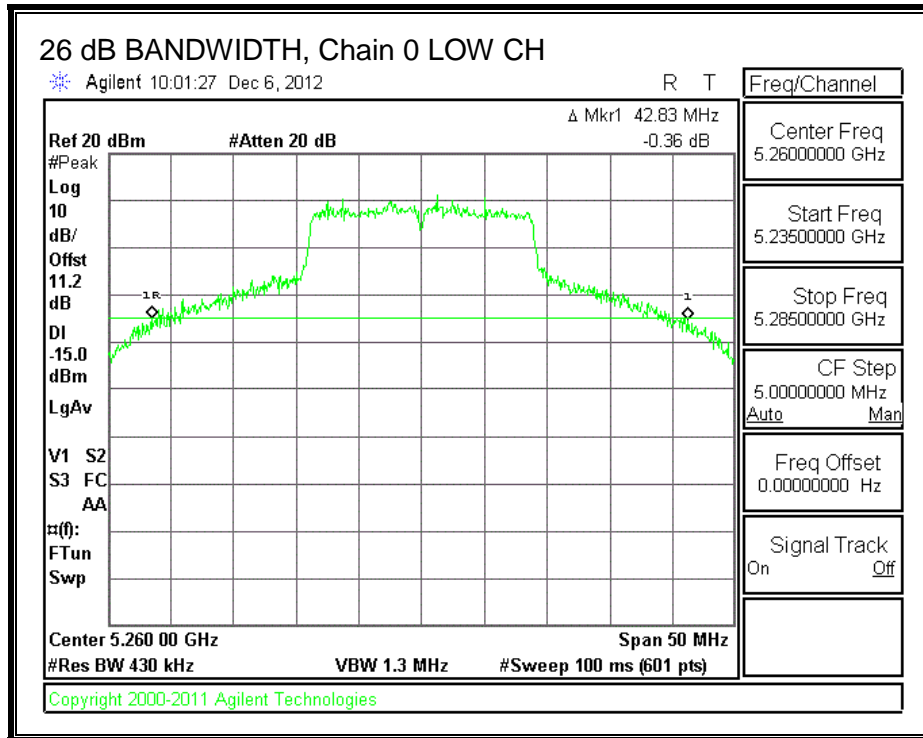
LIMITS

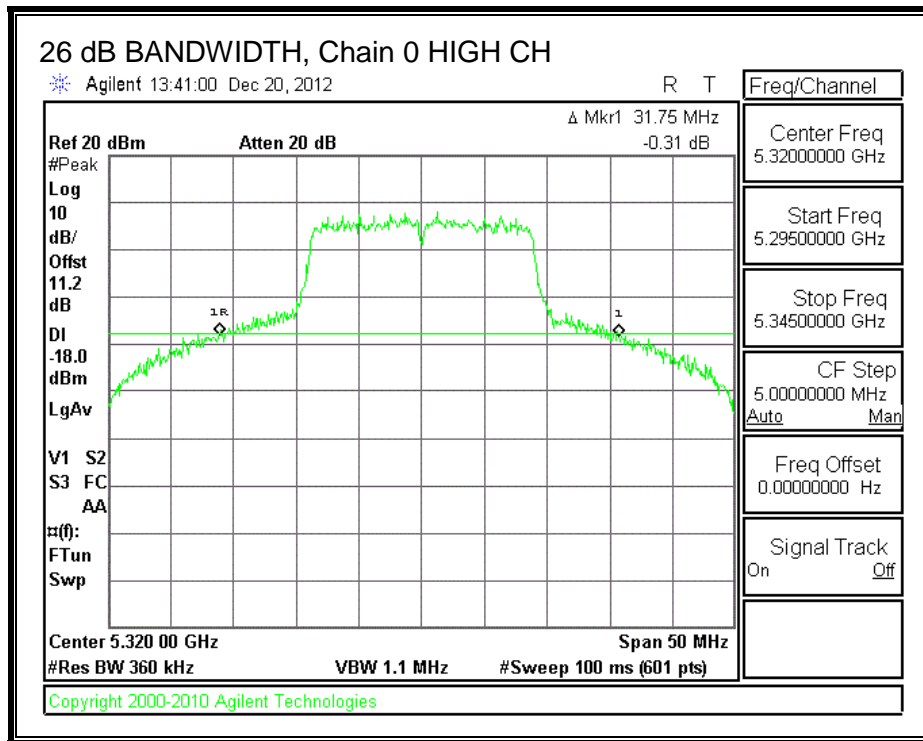
None; for reporting purposes only.

RESULTS

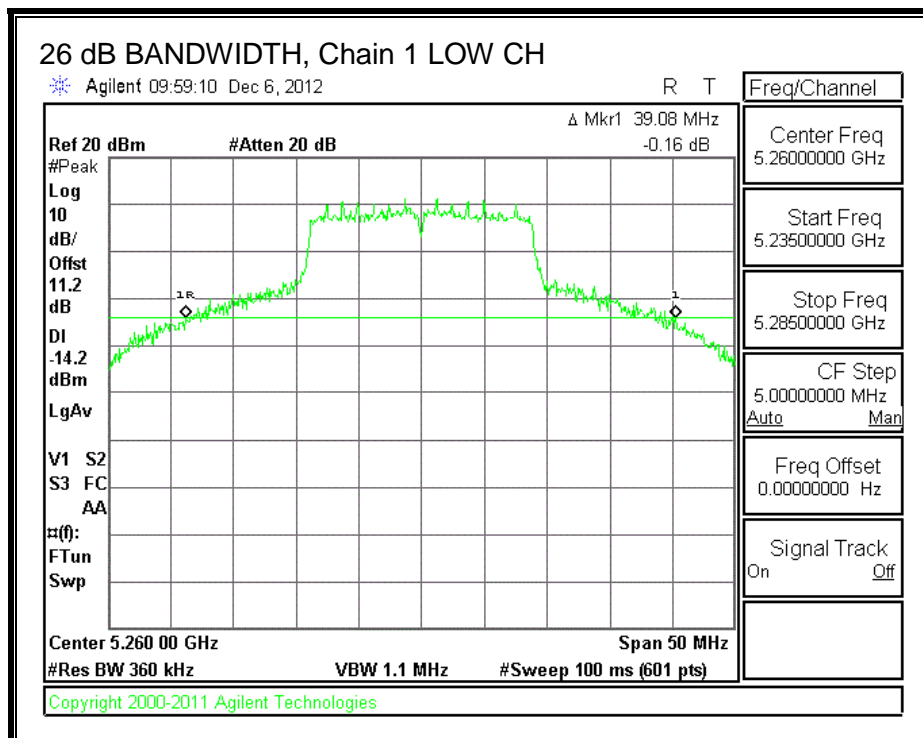
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	42.83	39.08
Mid	5300	41.42	39.75
High	5320	31.75	35.92

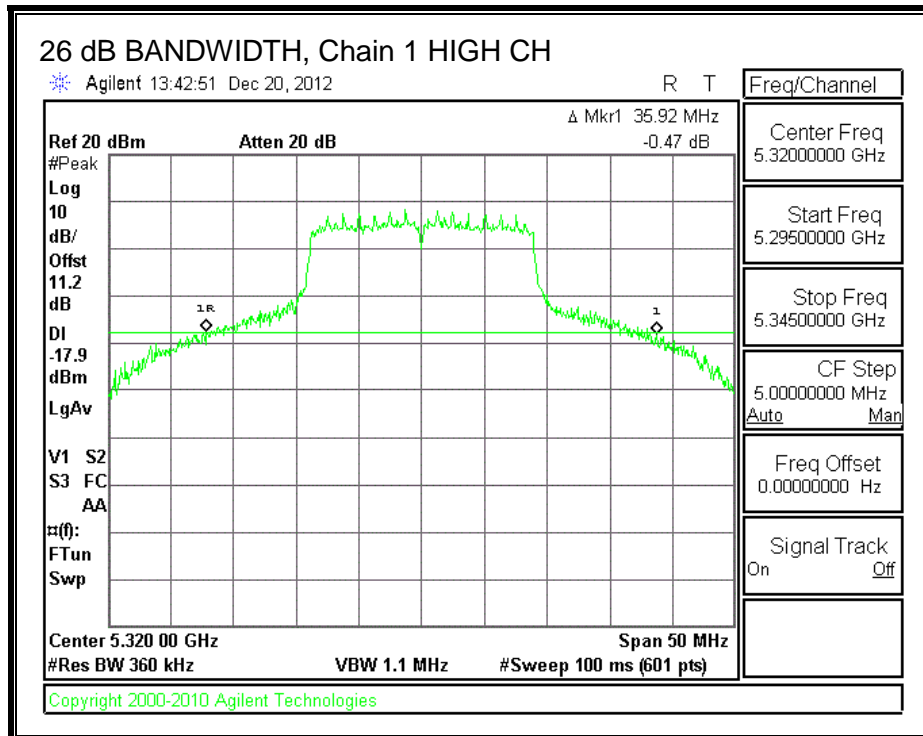
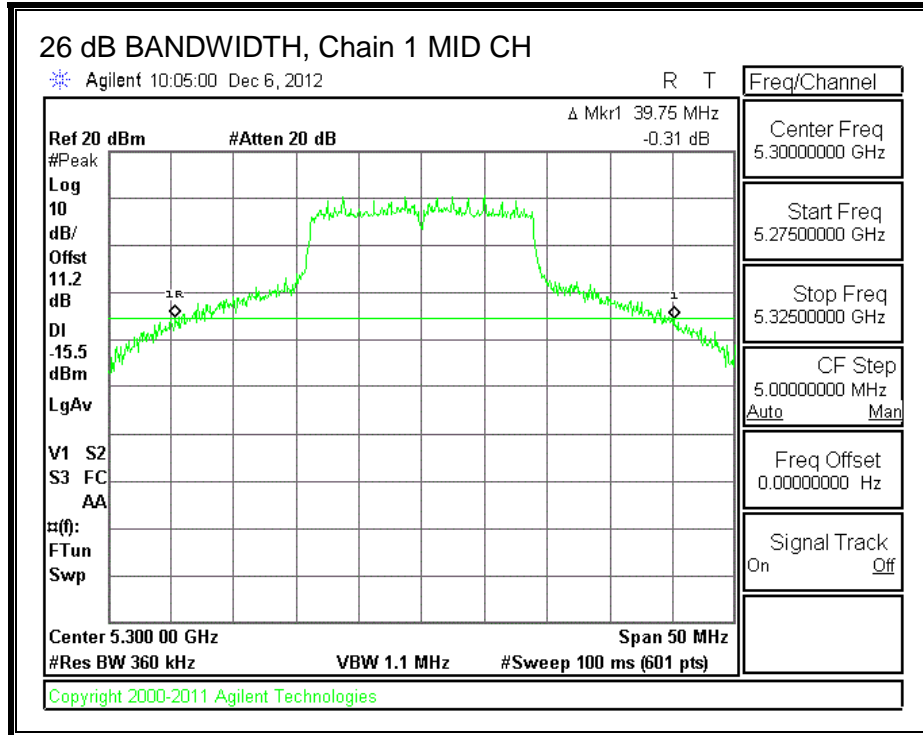
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





7.37.2. **99% BANDWIDTH**

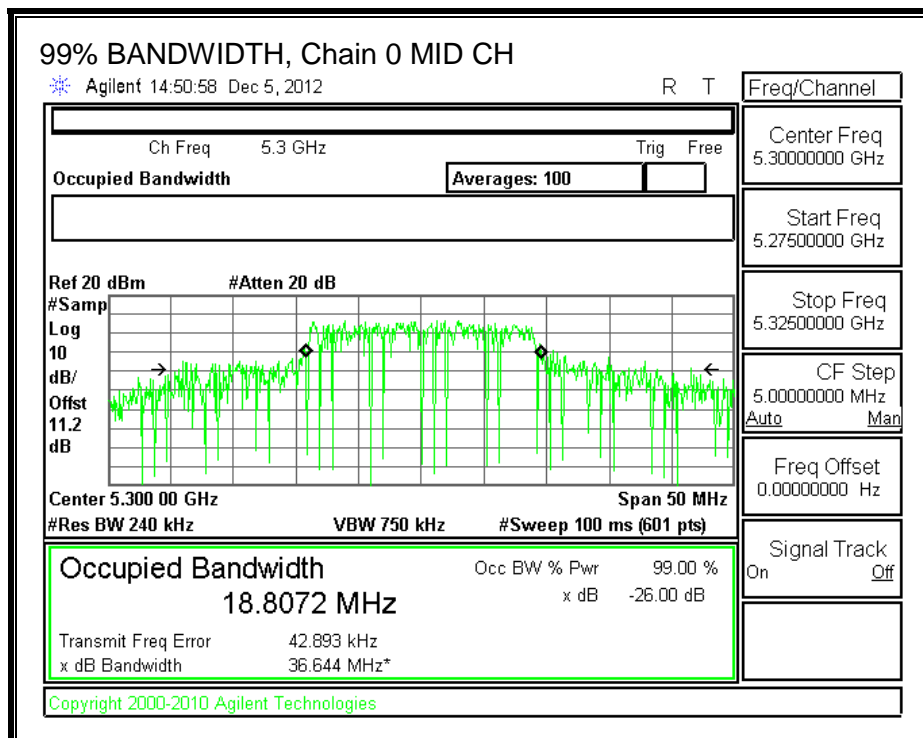
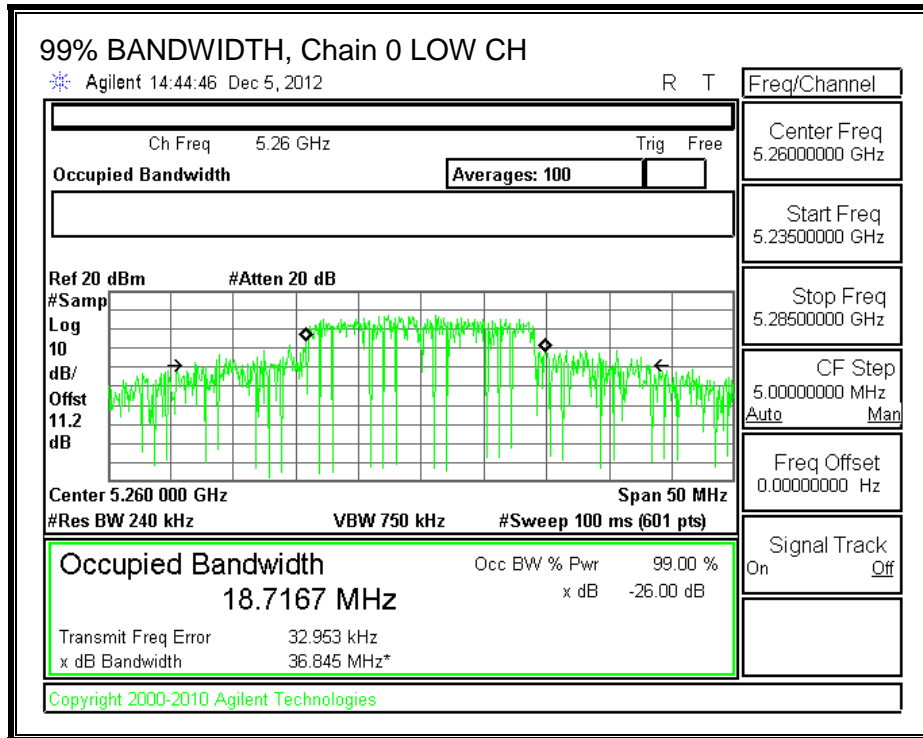
LIMITS

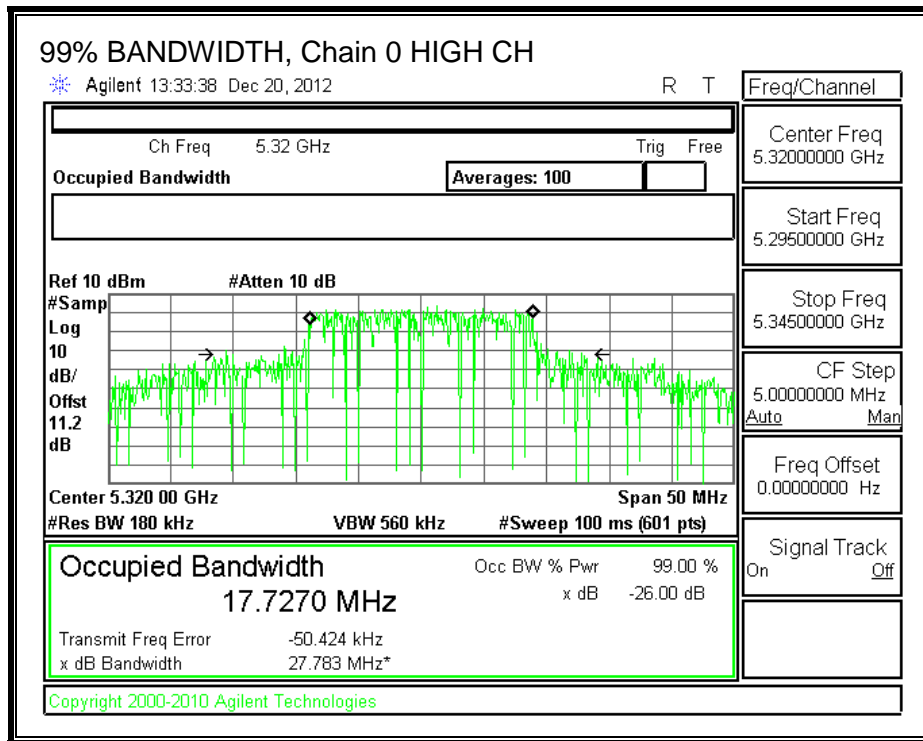
None; for reporting purposes only.

RESULTS

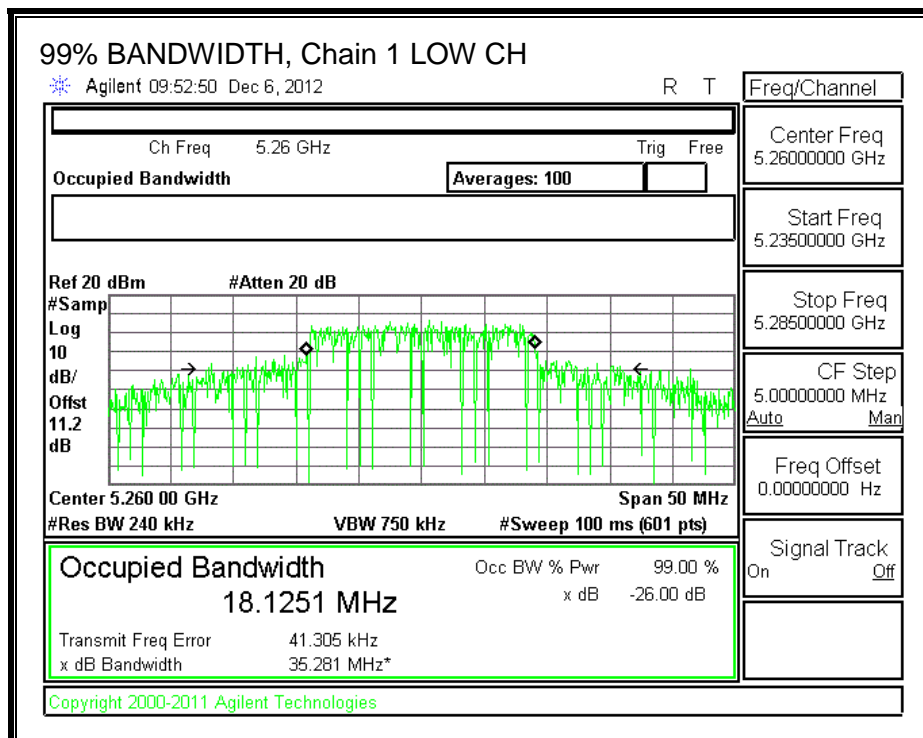
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	18.7167	18.1251
Mid	5300	18.8072	18.4738
High	5320	17.7270	17.7768

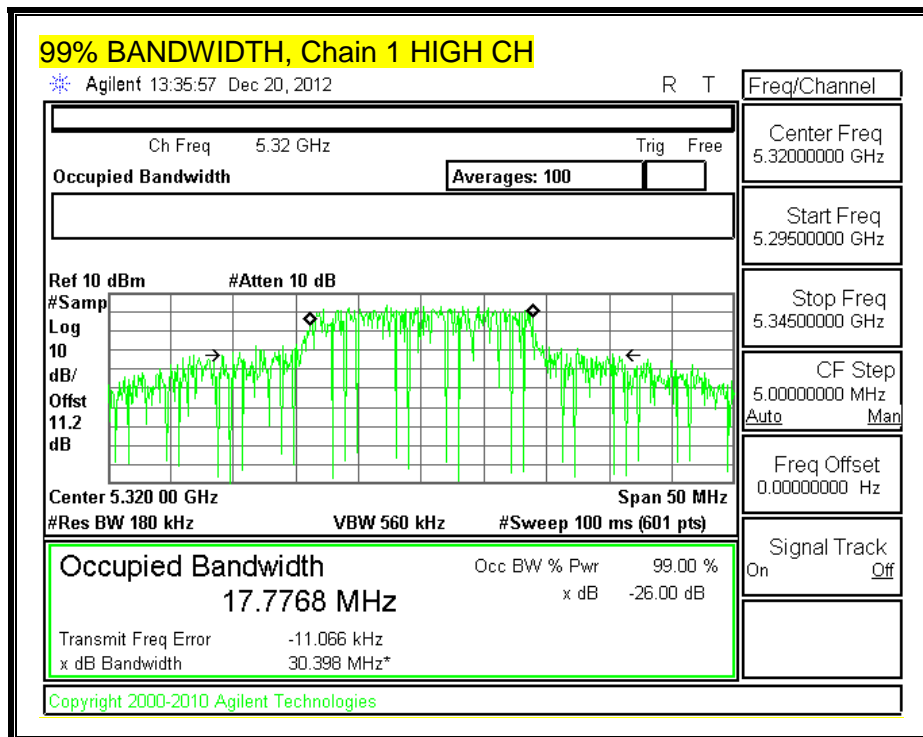
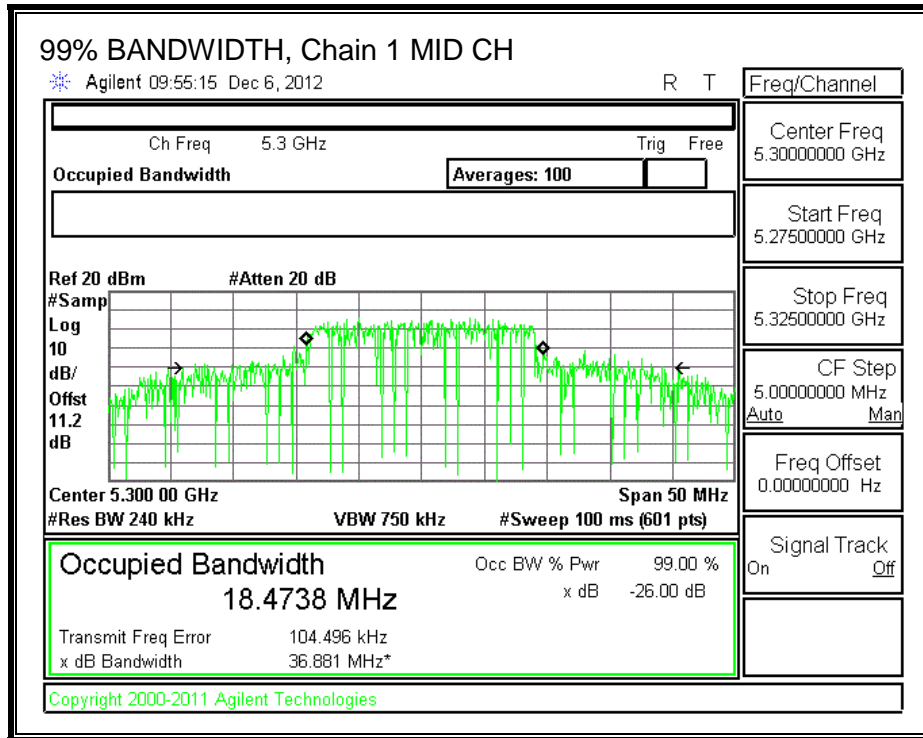
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





7.37.3. OUTPUT POWER AND PPSD

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)
7.09	7.06	7.08

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	39.08	18.1251	7.08
Mid	5300	39.75	18.4738	7.08
High	5320	31.75	17.7270	7.08

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)	PPSD Limit (dBm)
Low	5260	22.92	23.58	29.58	22.50	9.92	11.00	9.92
Mid	5300	22.92	23.67	29.67	22.59	9.92	11.00	9.92
High	5320	22.92	23.49	29.49	22.41	9.92	11.00	9.92

Duty Cycle CF (dB)	0.24	Included in Calculations of PPSD
---------------------------	------	---

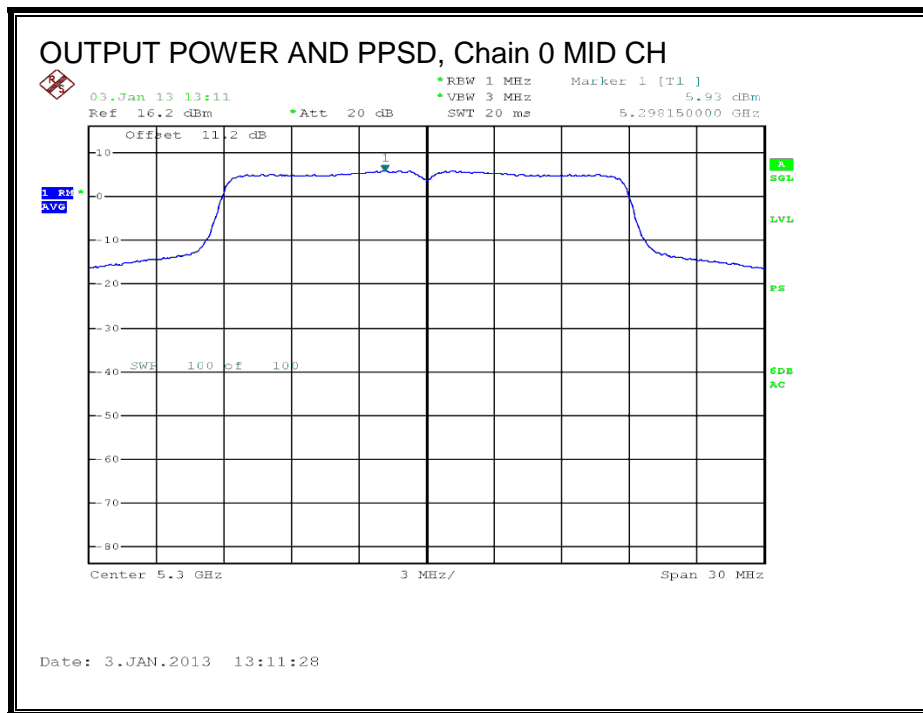
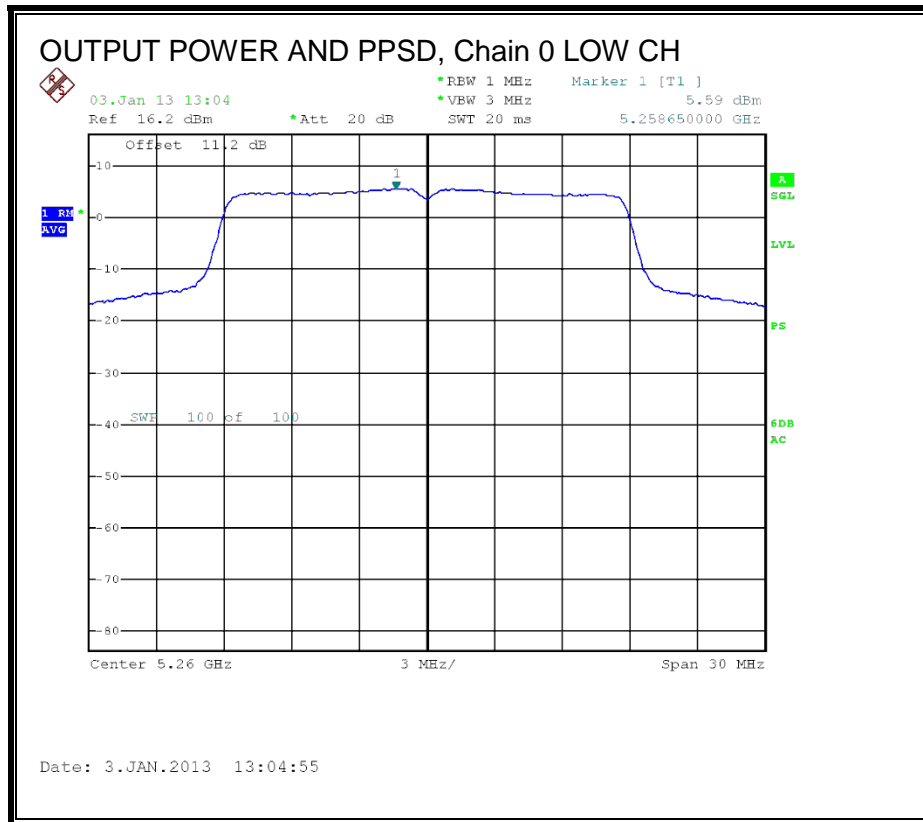
Output Power Results

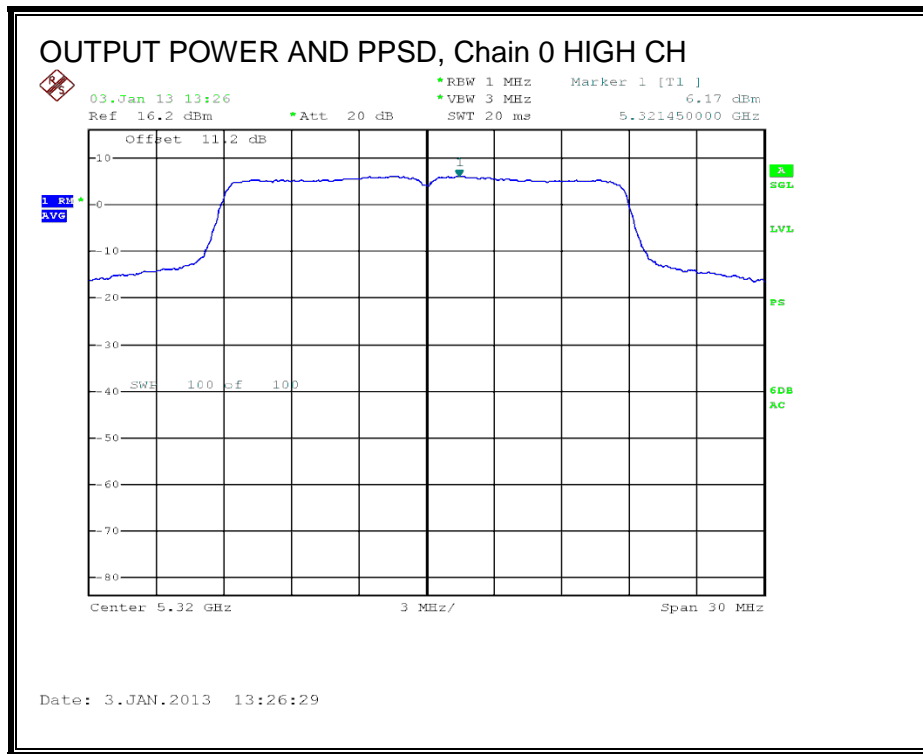
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	19.32	19.50	22.42	22.50	-0.08
Mid	5300	19.46	19.56	22.52	22.59	-0.06
High	5320	19.30	19.41	22.37	22.41	-0.04

PPSD Results

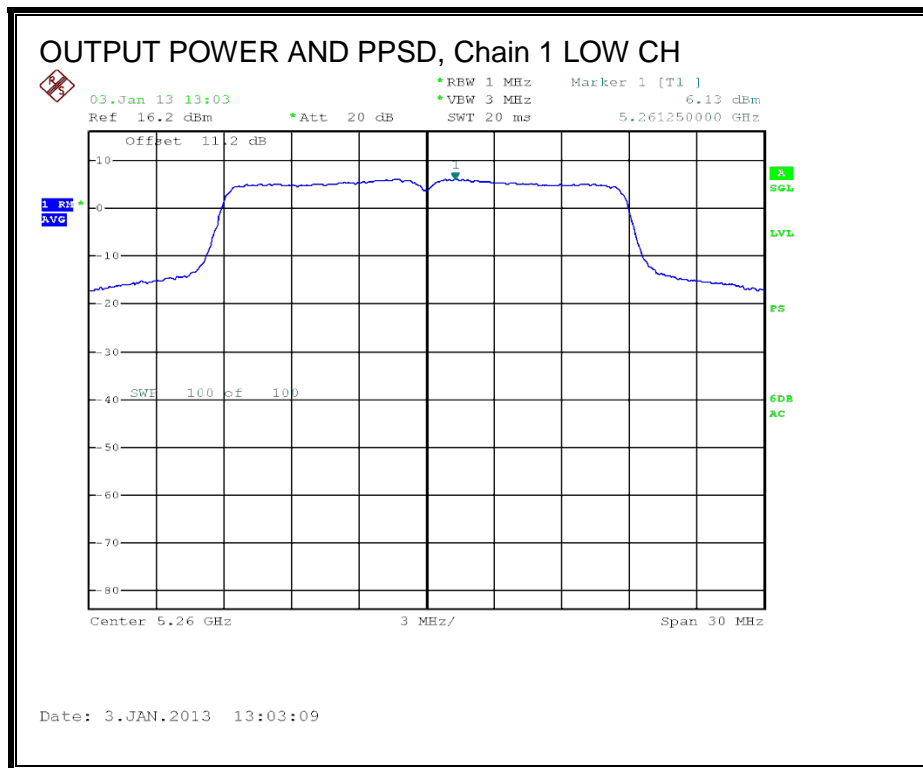
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	5.59	6.13	9.12	9.92	-0.80
Mid	5300	5.93	6.25	9.34	9.92	-0.58
High	5320	6.17	6.41	9.54	9.92	-0.38

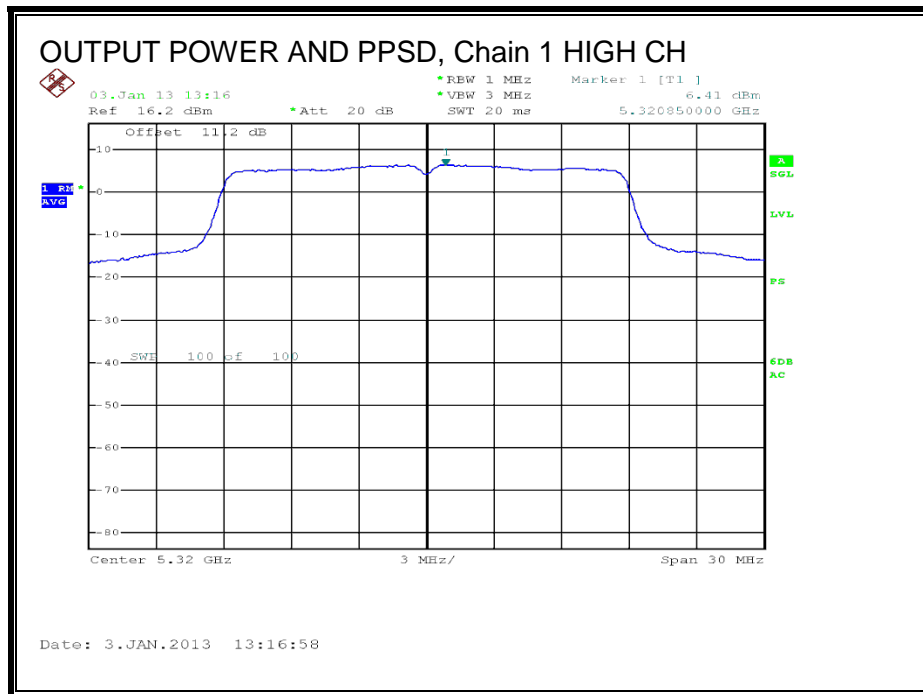
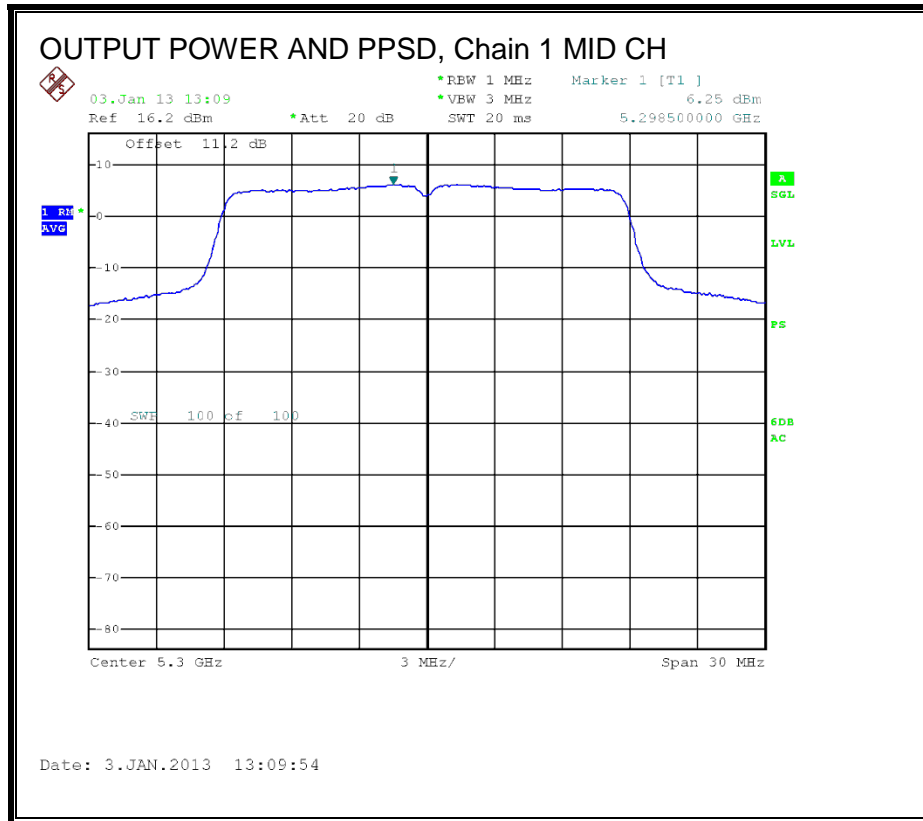
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





7.38. 802.11n HT20 STBC 3TX MODE, 5.3 GHz BAND

7.38.1. 26 dB BANDWIDTH

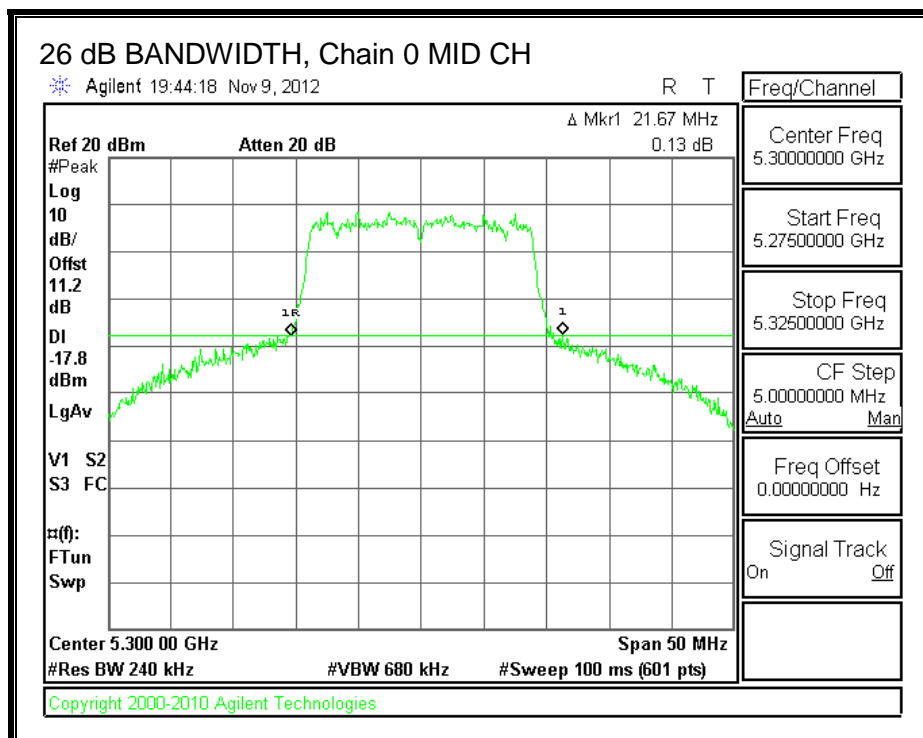
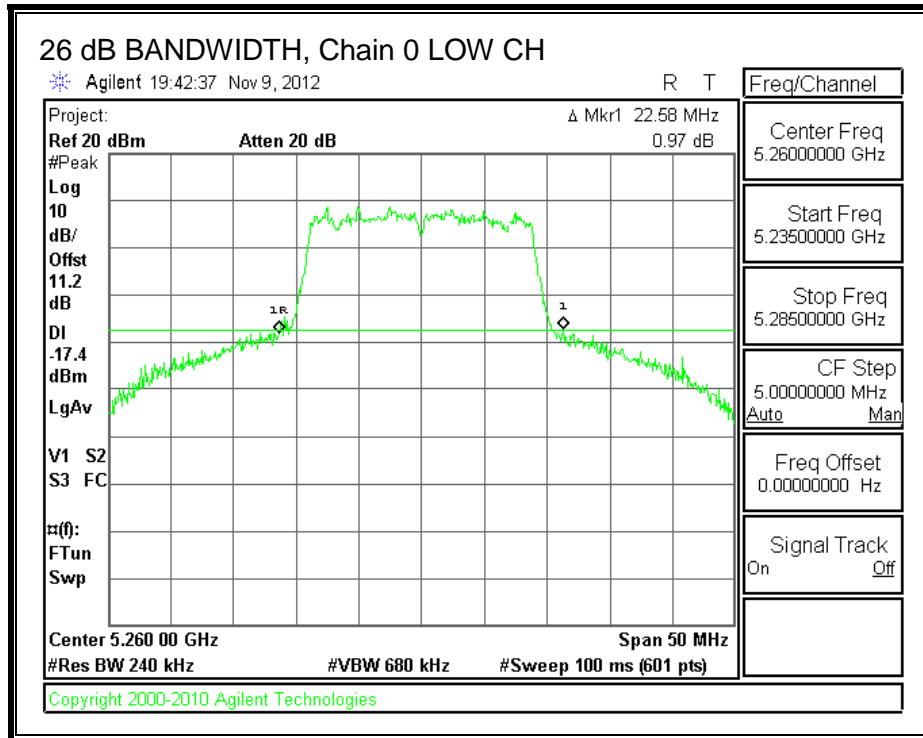
LIMITS

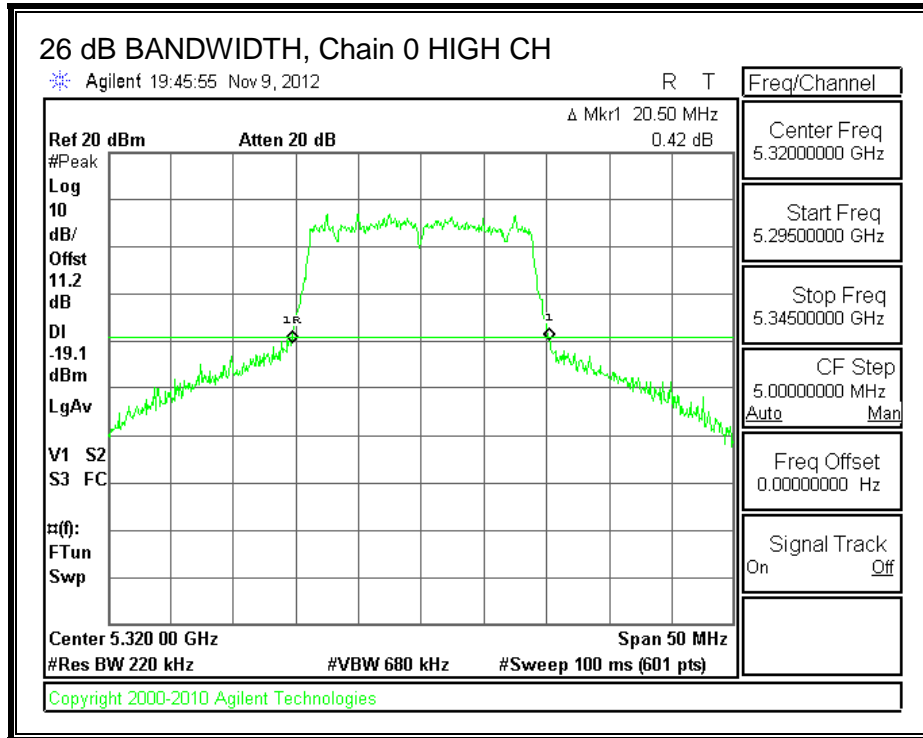
None; for reporting purposes only.

RESULTS

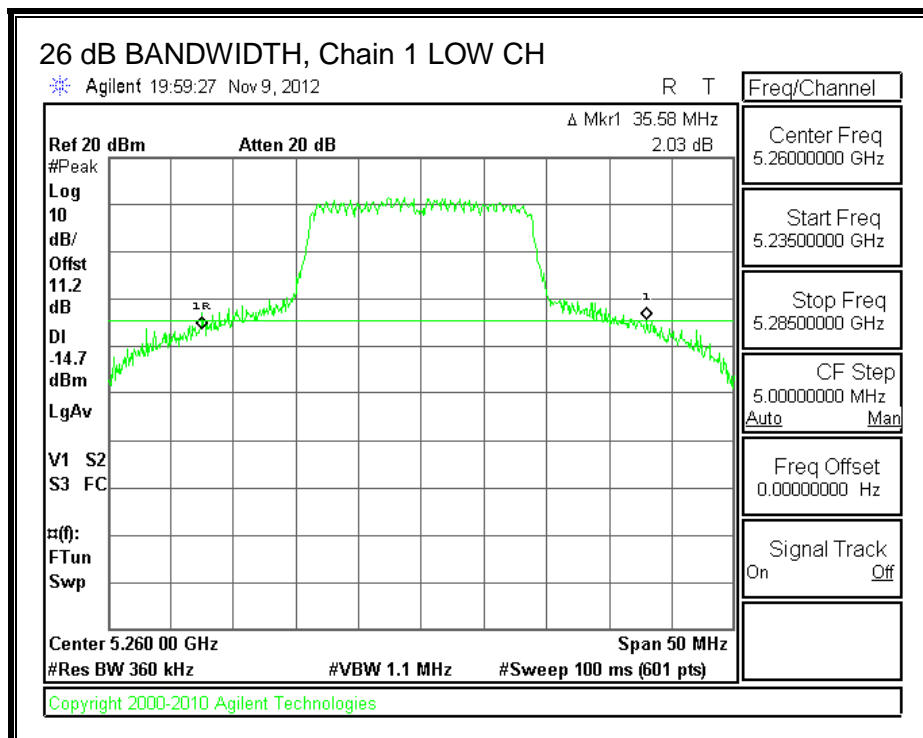
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	22.58	35.58	21.17
Mid	5300	21.67	34.25	23.50
High	5320	20.50	31.33	20.33

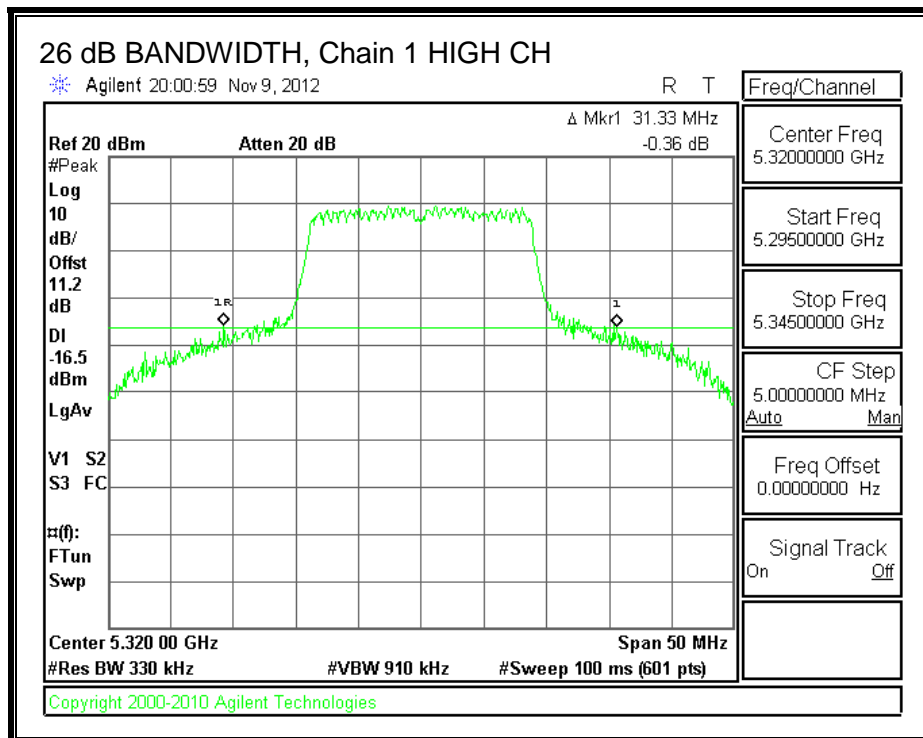
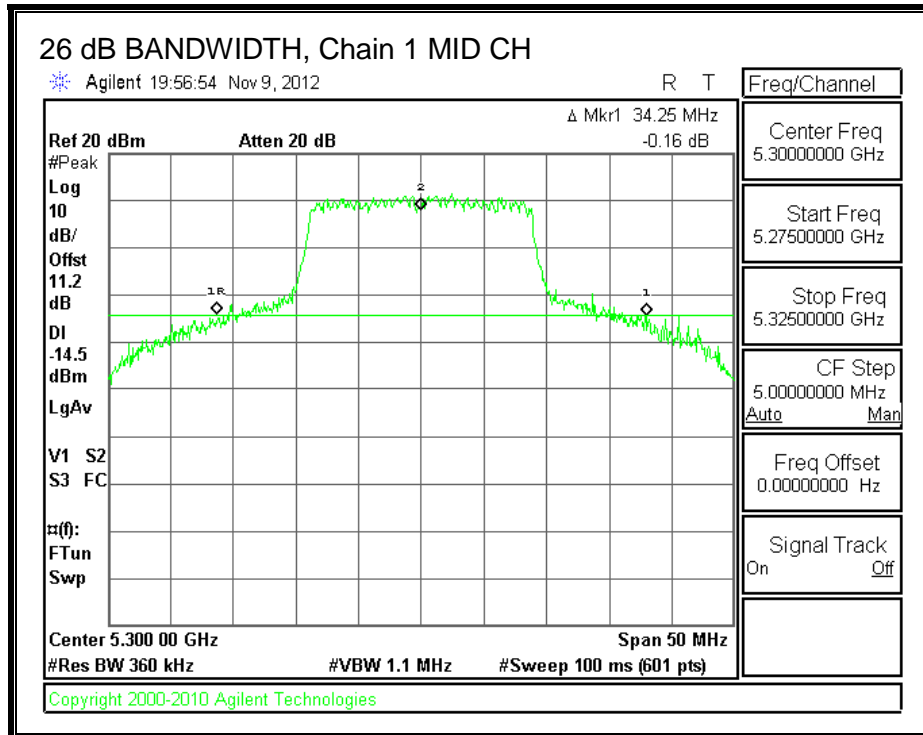
26 dB BANDWIDTH, Chain 0



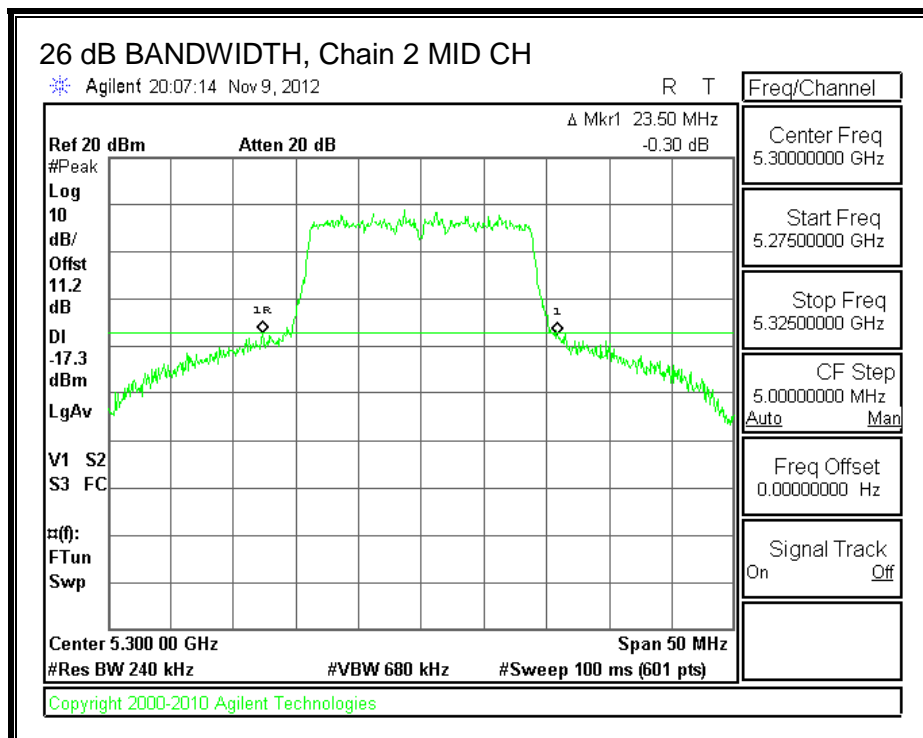
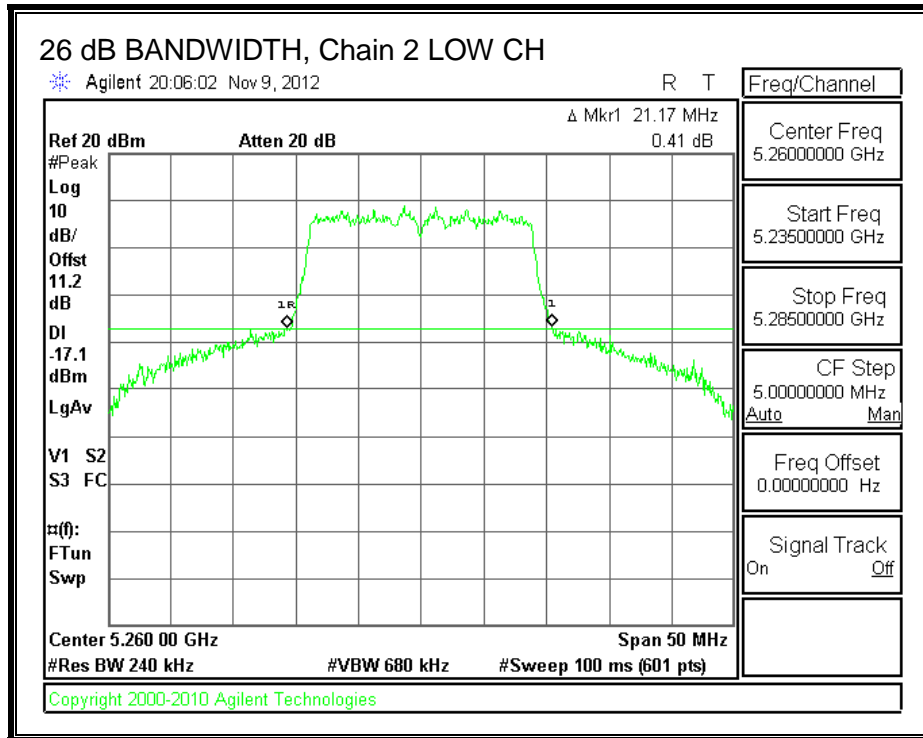


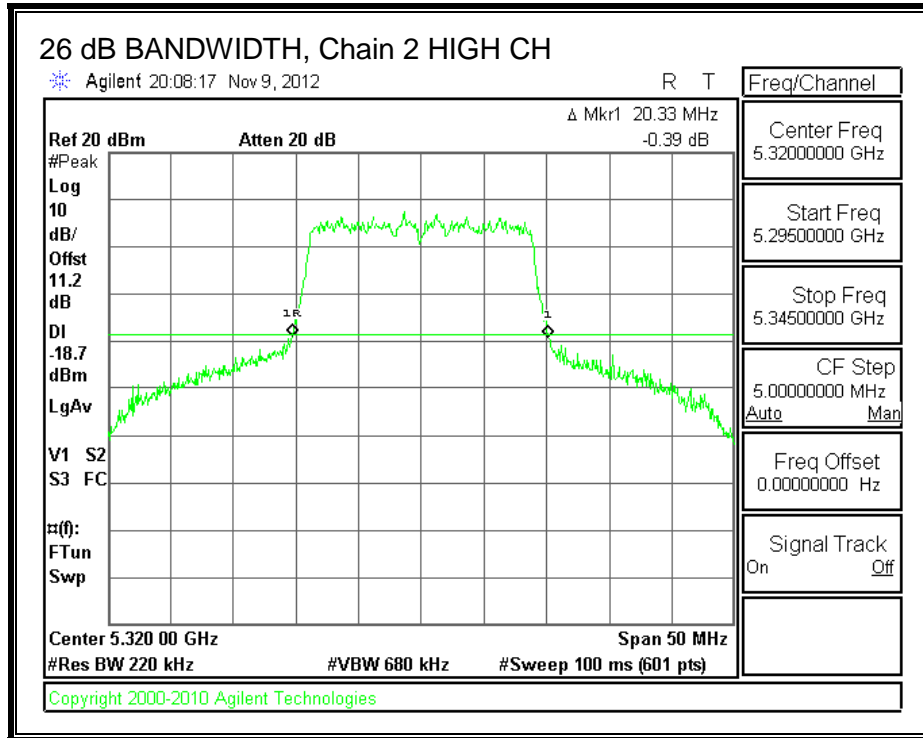
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





7.38.2. 99% BANDWIDTH

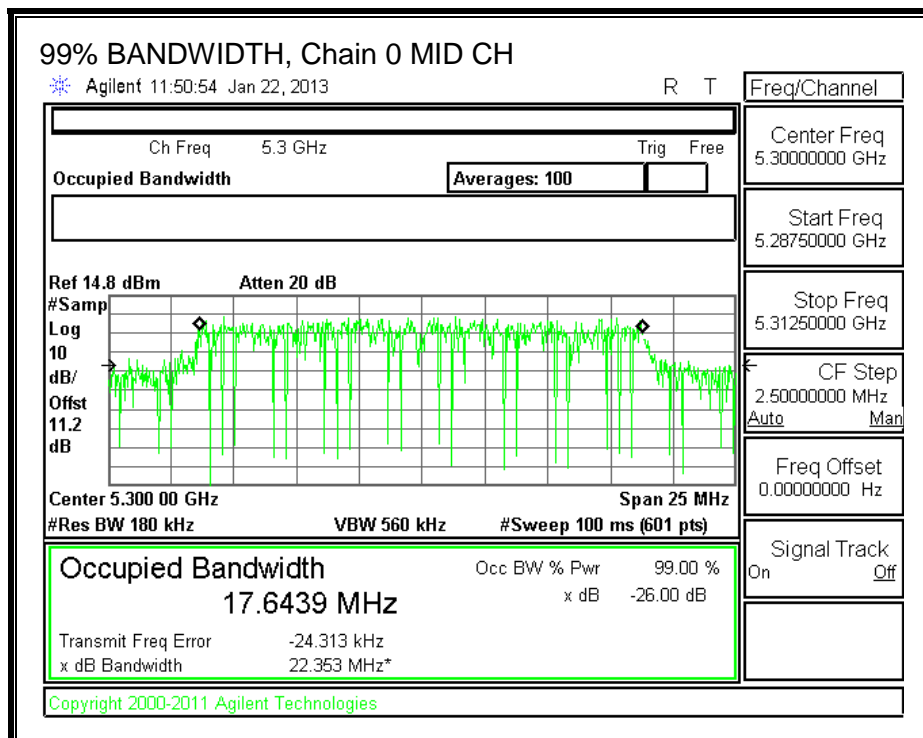
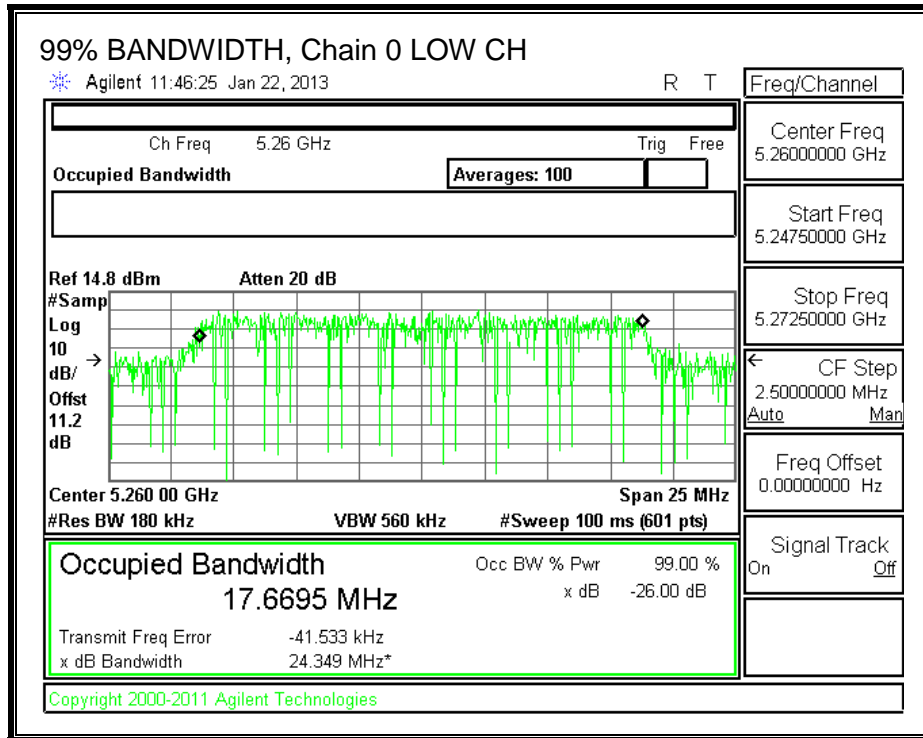
LIMITS

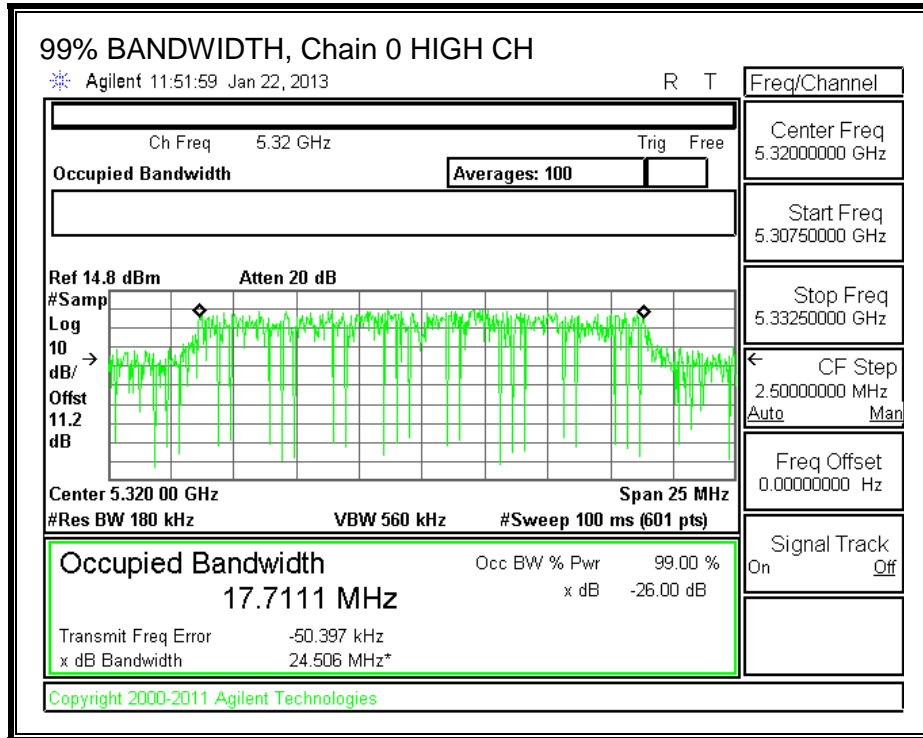
None; for reporting purposes only.

RESULTS

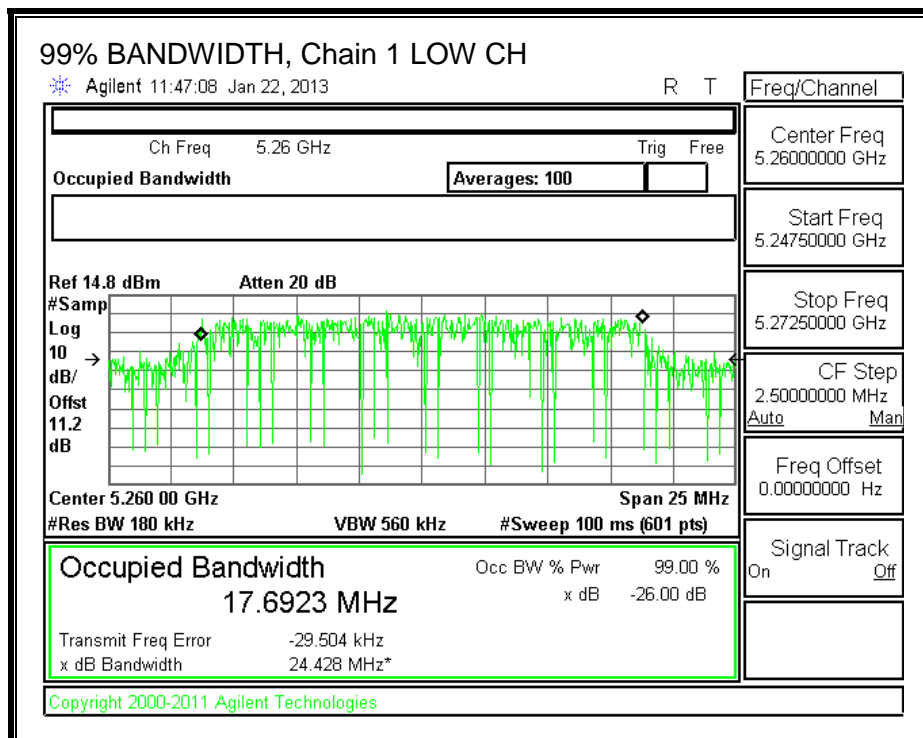
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.6695	17.6923	17.7569
Mid	5300	17.6439	17.7985	17.7701
High	5320	17.7111	17.7873	17.8125

99% BANDWIDTH, Chain 0

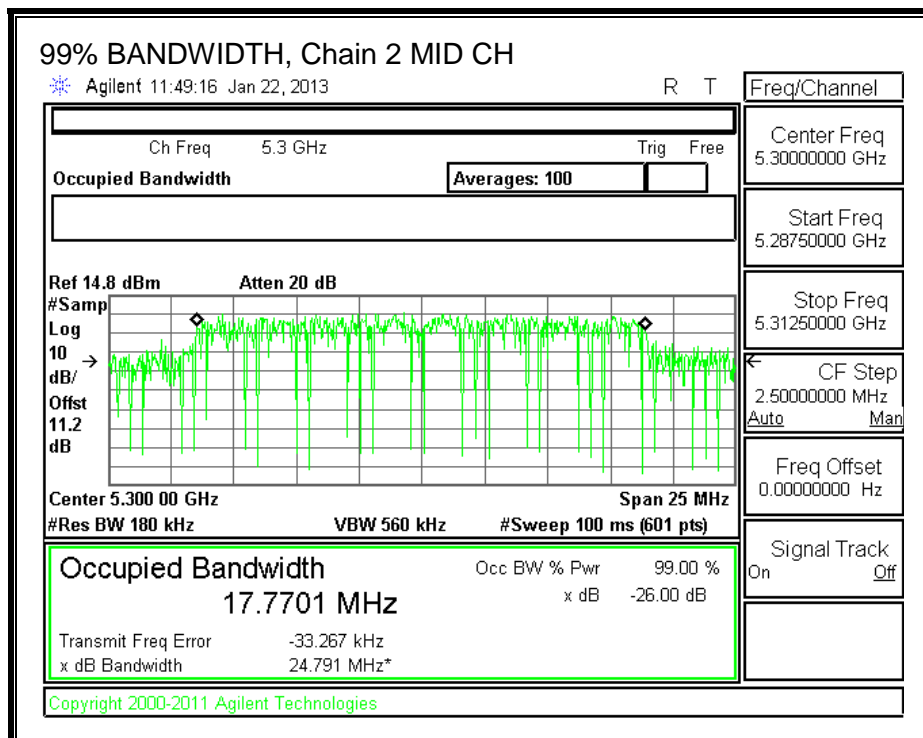
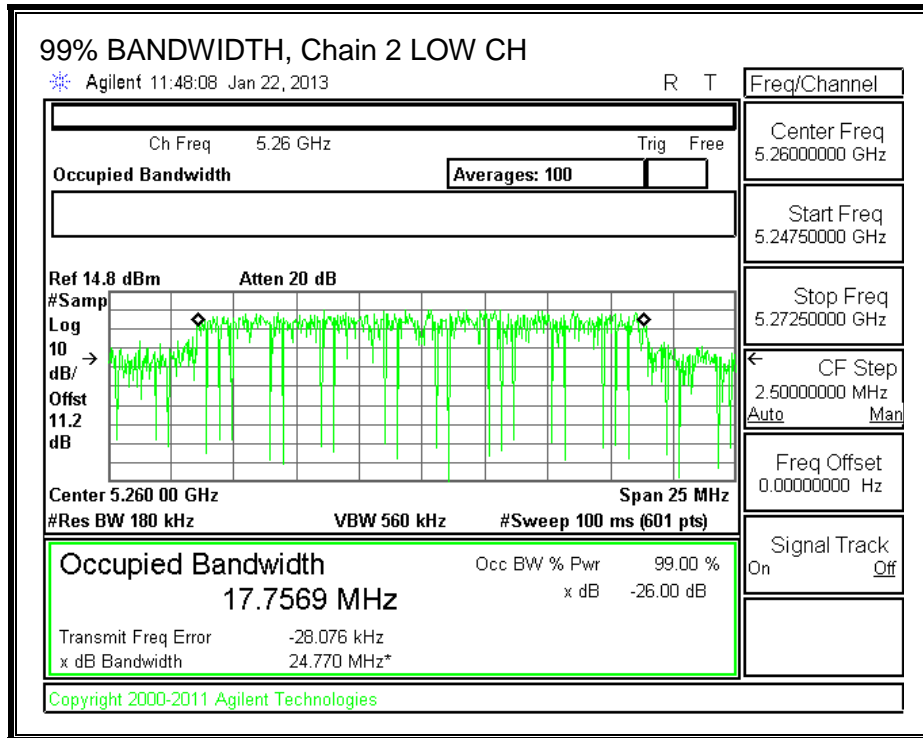


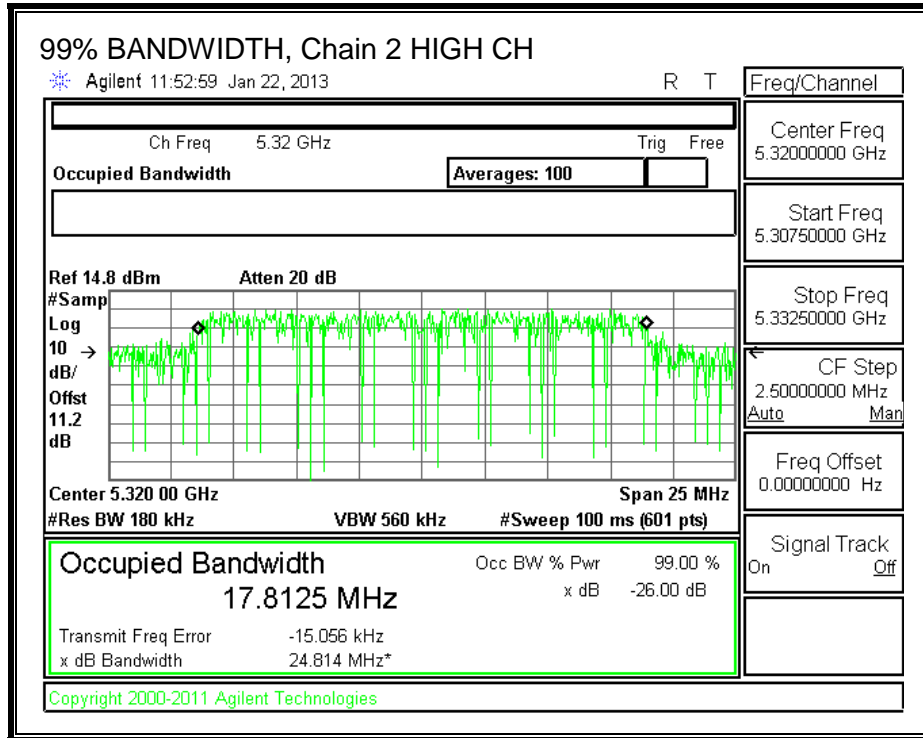


99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2





7.38.3. OUTPUT POWER AND PPSD

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)
7.09	7.06	3.58	6.19

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.17	17.6695	6.19
Mid	5300	21.67	17.6439	6.19
High	5320	20.33	17.7111	6.19

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)	PPSD Limit (dBm)
Low	5260	23.81	23.47	29.47	23.28	10.81	11.00	10.81
Mid	5300	23.81	23.47	29.47	23.28	10.81	11.00	10.81
High	5320	23.81	23.48	29.48	23.29	10.81	11.00	10.81

Duty Cycle CF (dB)	0.24	Included in Calculations of PPSD
---------------------------	------	---

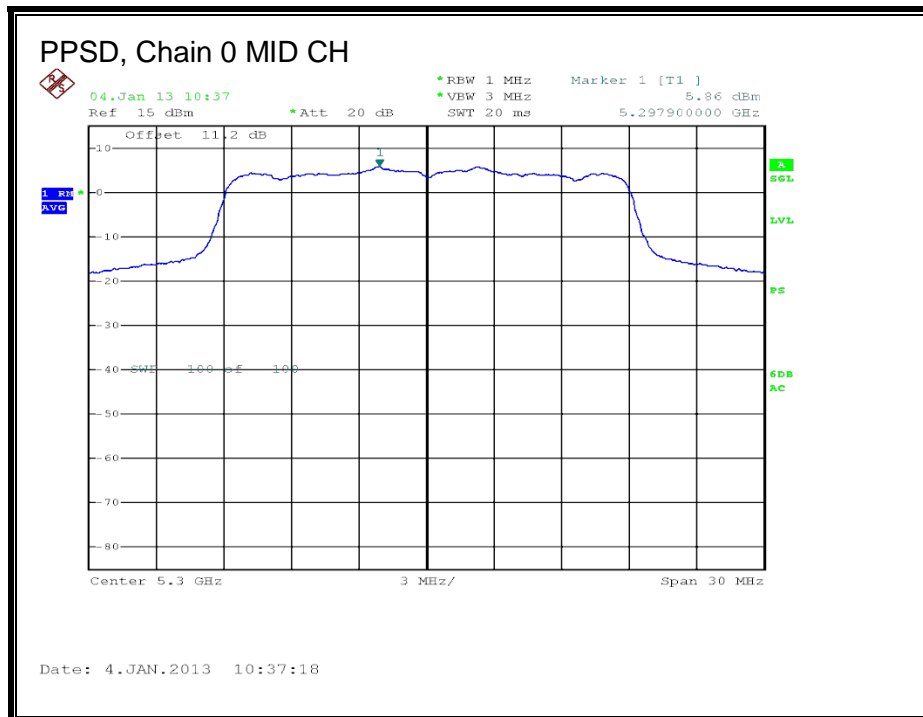
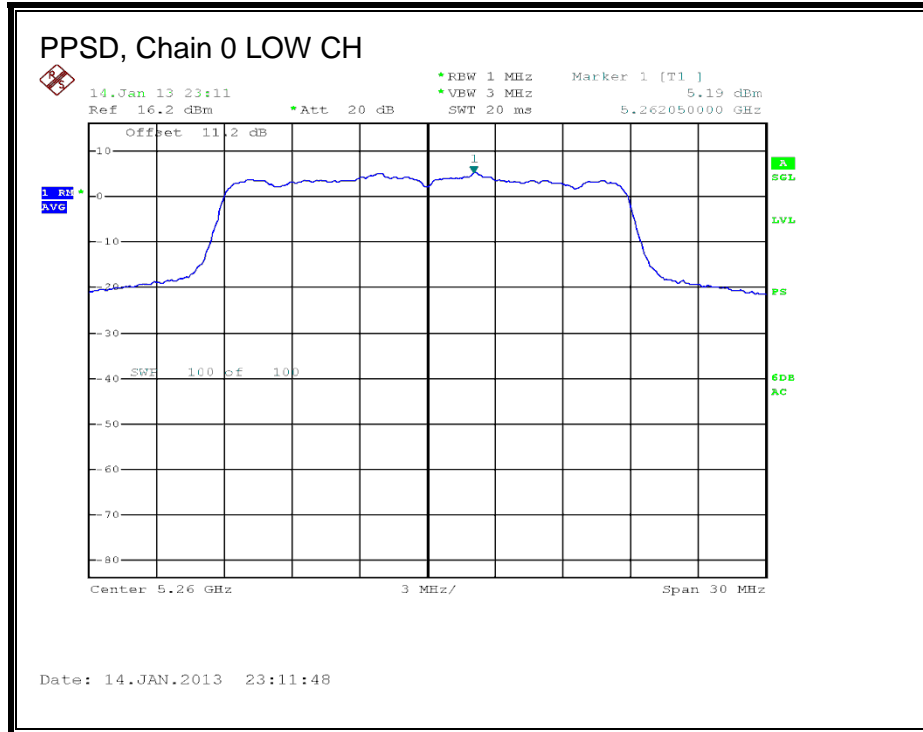
Output Power Results

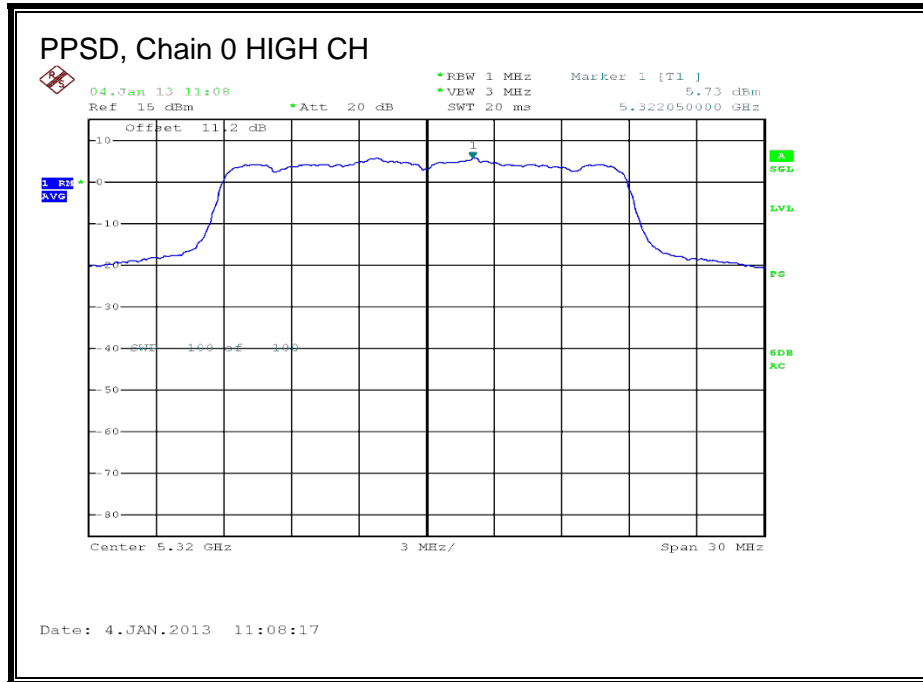
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	18.45	18.50	18.51	23.26	23.28	-0.02
Mid	5300	18.49	18.52	18.47	23.26	23.28	-0.01
High	5320	18.06	18.56	18.55	23.17	23.29	-0.13

PPSD Results

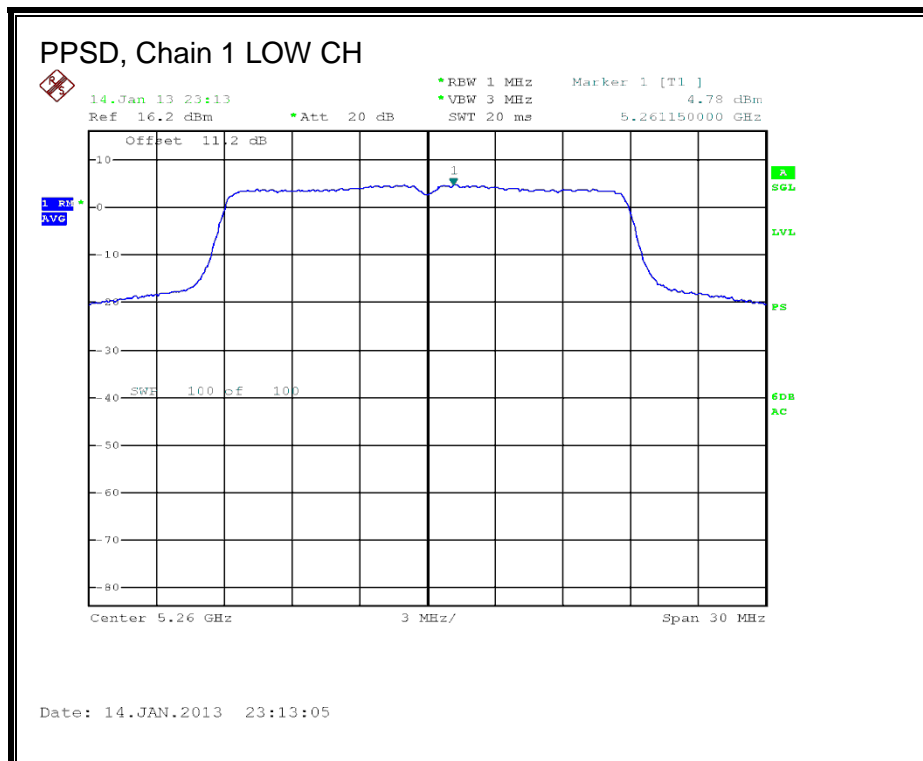
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	5.19	4.78	4.82	9.95	10.81	-0.86
Mid	5300	5.86	5.28	5.07	10.43	10.81	-0.38
High	5320	5.73	5.88	5.61	10.75	10.81	-0.06

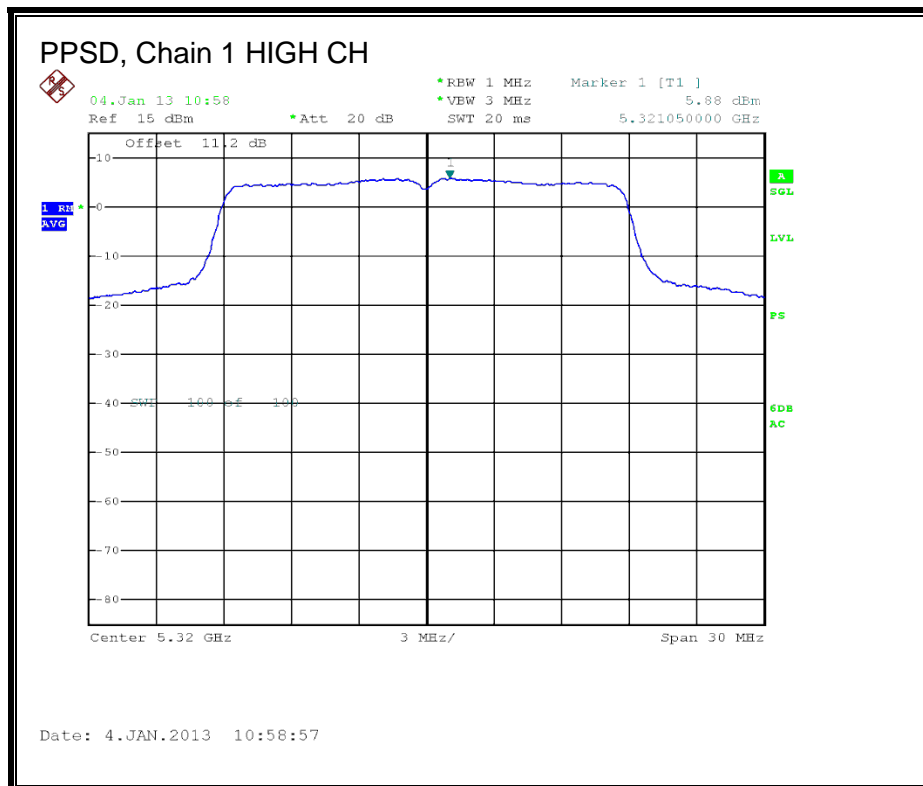
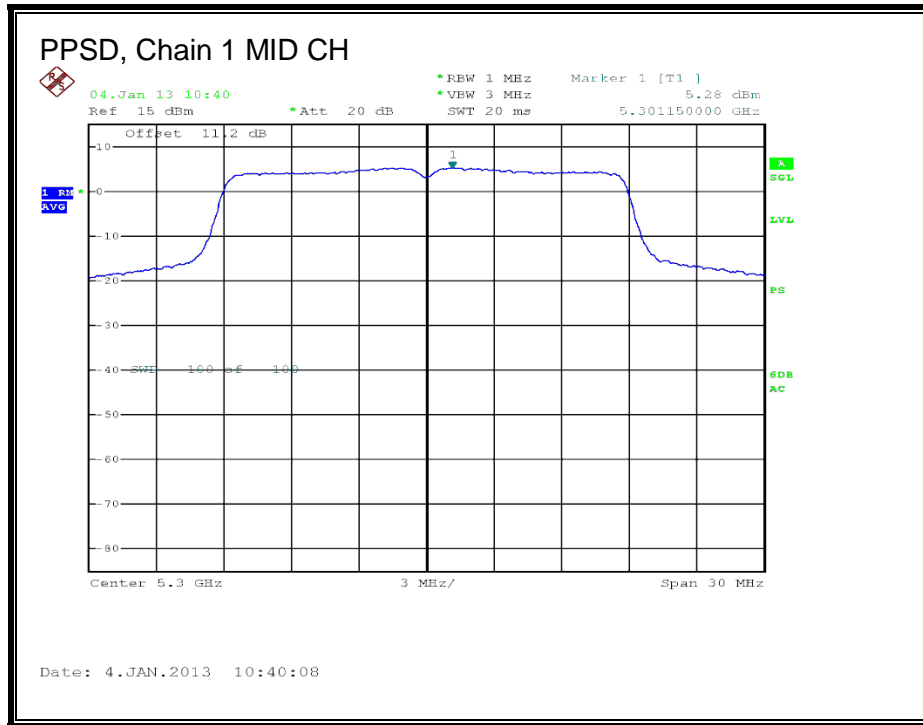
PPSD, Chain 0



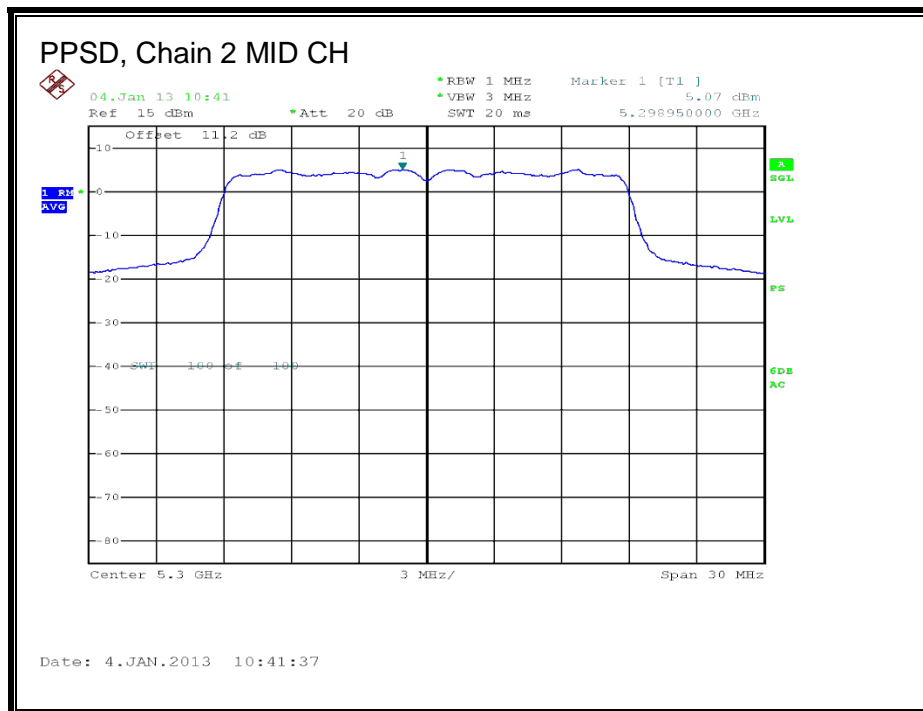
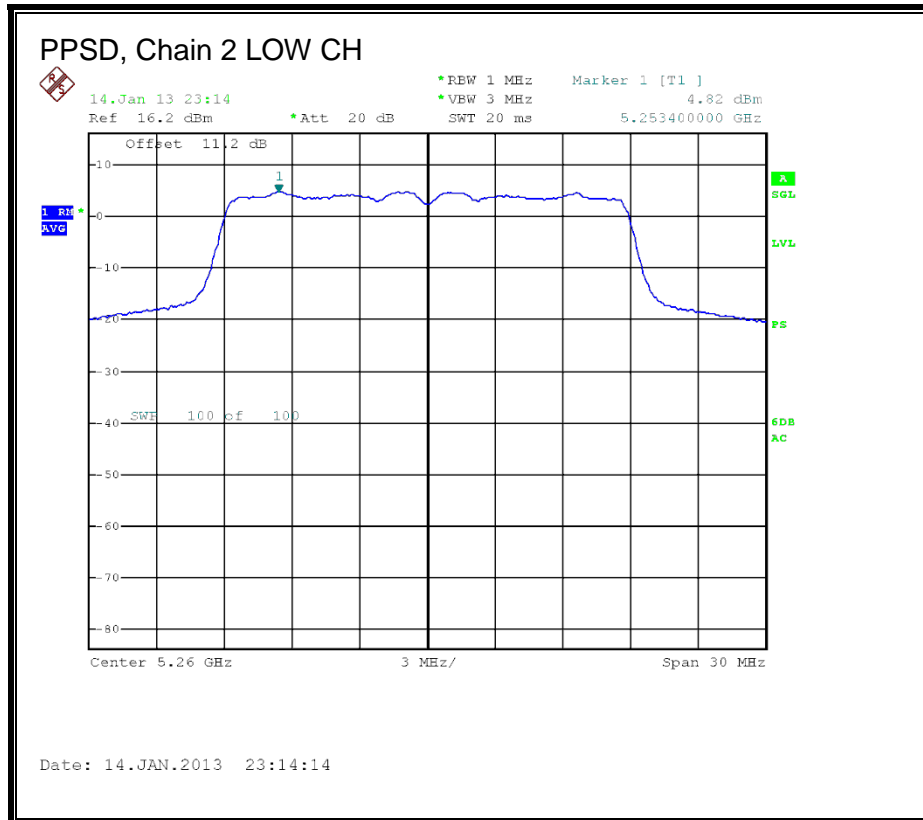


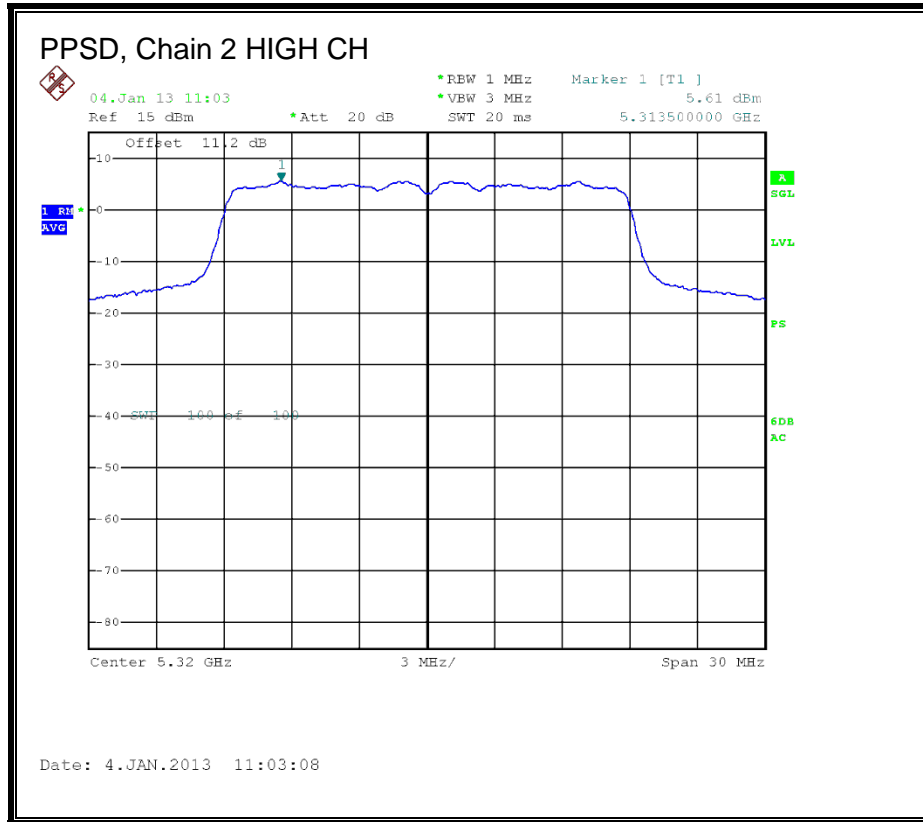
OUTPUT POWER AND PPSD, Chain 1





OUTPUT POWER AND PPSD, Chain 2





7.39. 802.11n HT20 BF 2TX MODE, 5.3 GHz BAND

Covered by testing 802.11ac VHT20 BF 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.40. 802.11n HT20 BF 3TX, 5.3 GHz BAND

Covered by testing 802.11ac VHT20 BF 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.41. 802.11ac VHT20 BF 2TX MODE, 5.3 GHz BAND

Covered by testing 802.11ac VHT20 BF 3TX mode, total power across all three chains is higher than the power level the device will operate at.

7.42. 802.11ac VHT20 BF 3TX MODE, 5.3 GHz BAND

This mode has same antenna port test results as 802.11n HT20 CDD 3TX, except for output power, which is shown below.

7.42.1. OUTPUT 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 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)
7.09	7.06	3.58	10.83

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.67	17.6051	10.83
Mid	5300	20.75	17.6104	10.83
High	5320	20.67	17.6083	10.83

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	19.17	23.46	29.46	18.63
Mid	5300	19.17	23.46	29.46	18.63
High	5320	19.17	23.46	29.46	18.63

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	13.67	13.64	14.21	18.62	18.63	-0.01
Mid	5300	13.74	14.02	13.23	18.45	18.63	-0.18
High	5320	13.43	14.13	13.88	18.59	18.63	-0.03

7.43. 802.11n HT40 1TX MODE, 5.3 GHz BAND

7.43.1. 26 dB BANDWIDTH

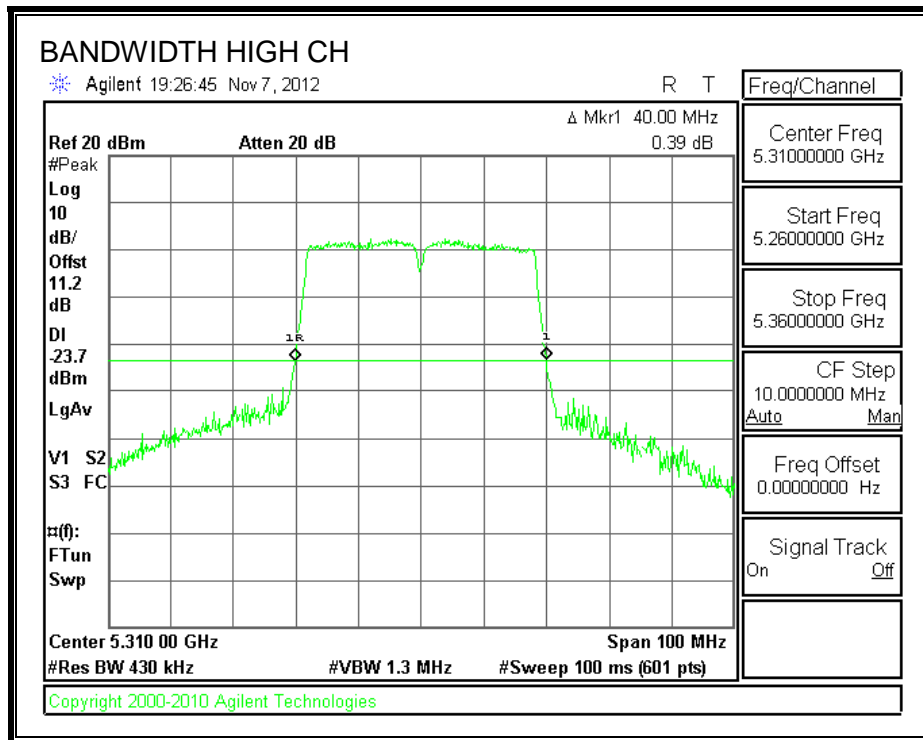
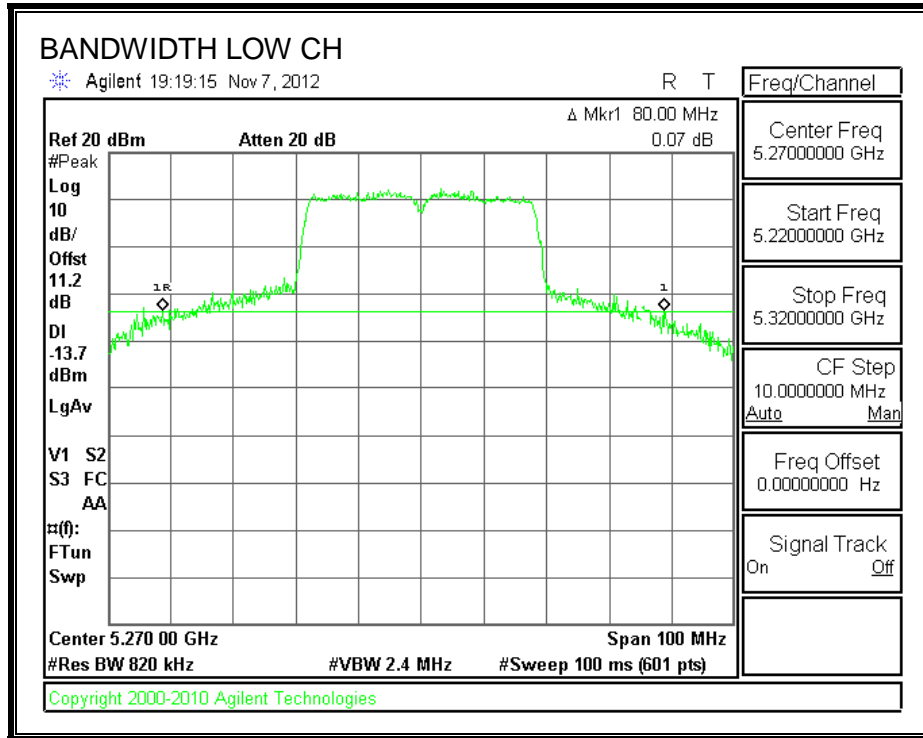
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	80.0
High	5310	40.0

26 dB BANDWIDTH



7.43.2. **99% BANDWIDTH**

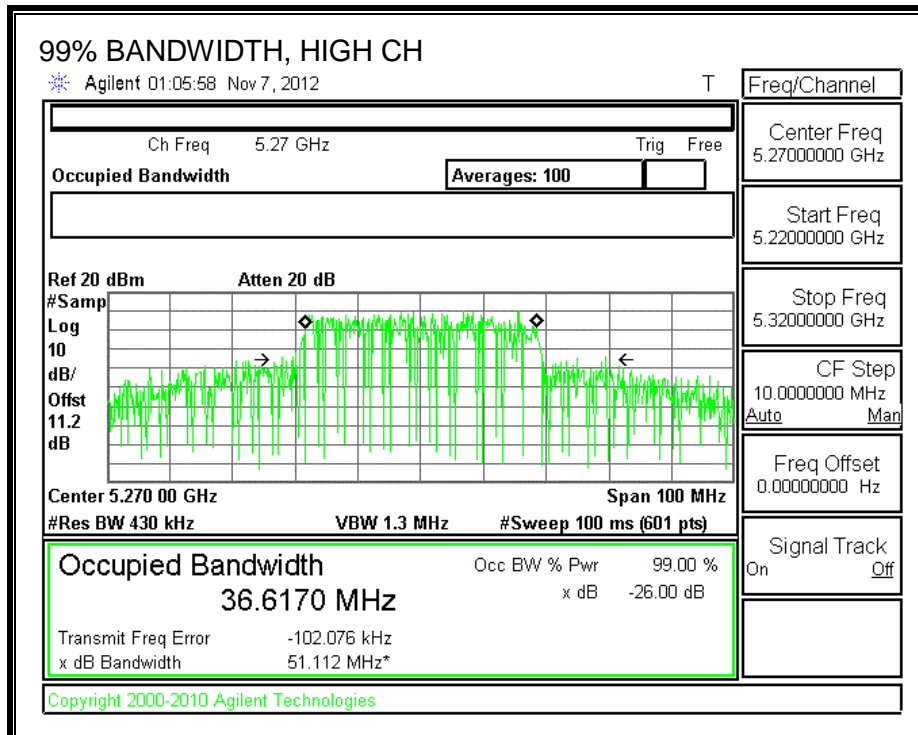
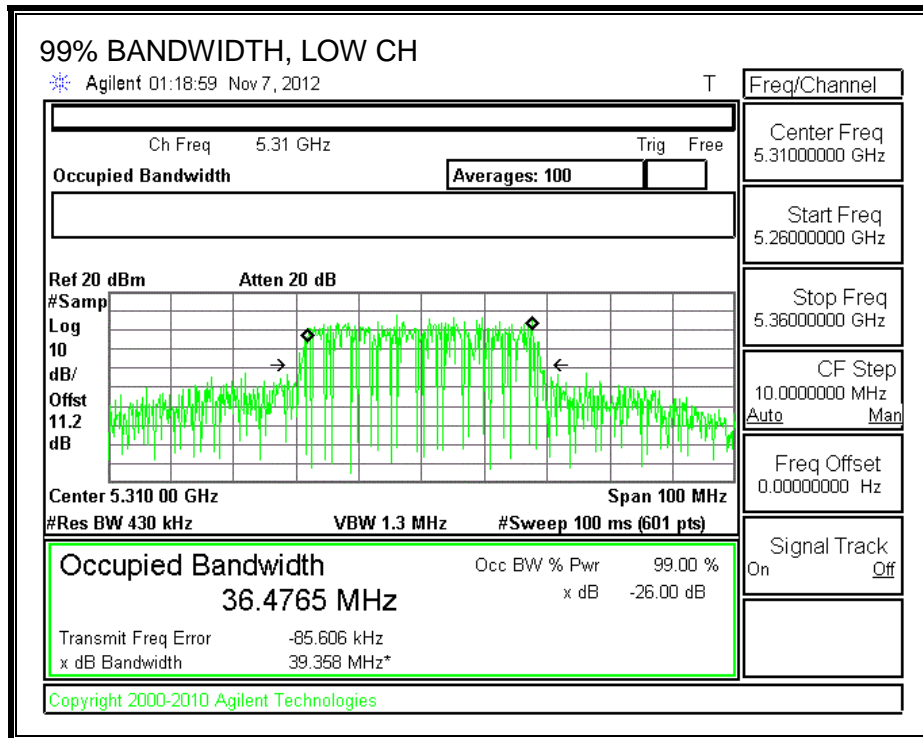
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.4765
High	5310	36.6170

99% BANDWIDTH



7.43.3. OUTPUT POWER AND PPSD

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	80.0	36.4765	7.09
High	5310	40.0	36.6170	7.09

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)	PPSD Limit (dBm)
Low	5270	22.91	24.00	30.00	22.91	9.91	11.00	9.91
High	5310	22.91	24.00	30.00	22.91	9.91	11.00	9.91

Duty Cycle CF (dB)	0.43	Included in PPSD
---------------------------	------	-------------------------

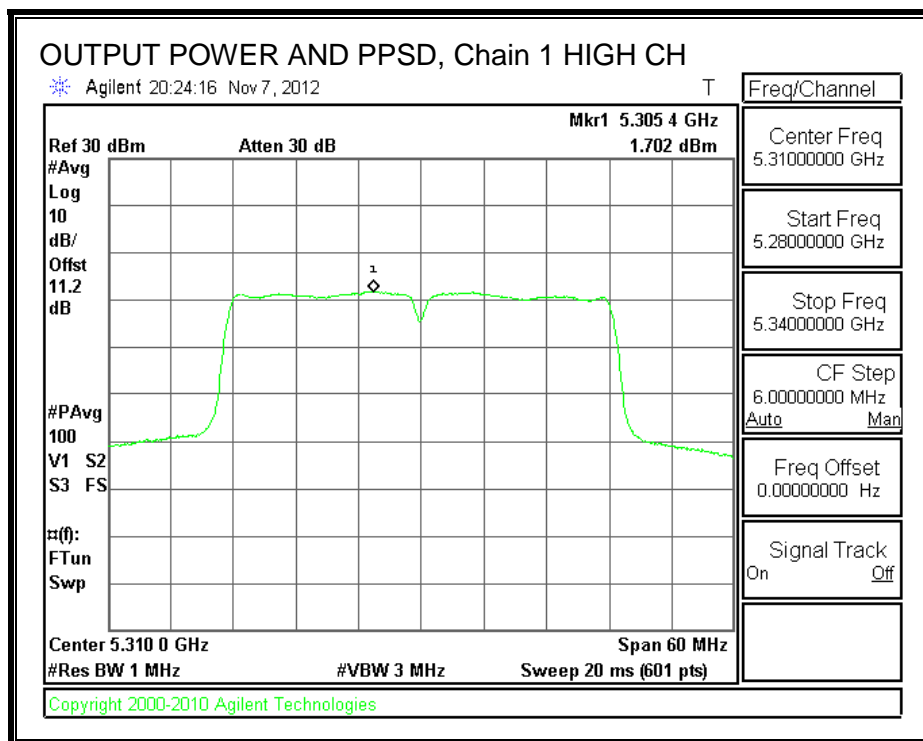
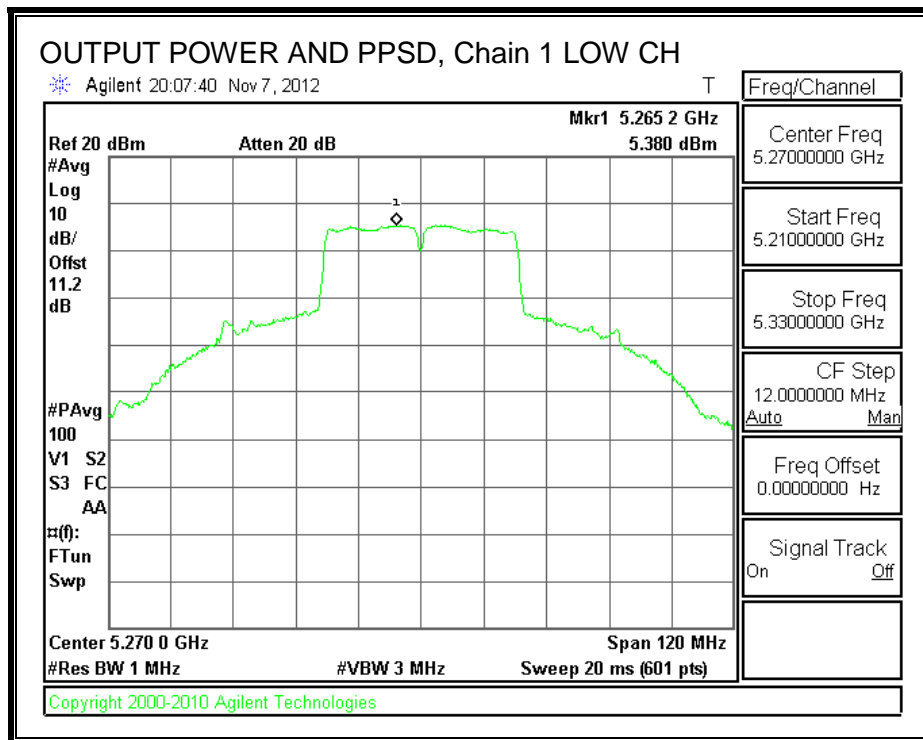
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	19.46	19.46	22.91	-3.45
High	5310	16.03	16.03	22.91	-6.88

PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	5.380	5.810	9.910	-4.10
High	5310	1.702	2.132	9.910	-7.78

OUTPUT POWER AND PPSD, Chain 1



7.44. 802.11n HT40 CDD 2TX MODE, 5.3 GHz BAND

7.44.1. 26 dB BANDWIDTH

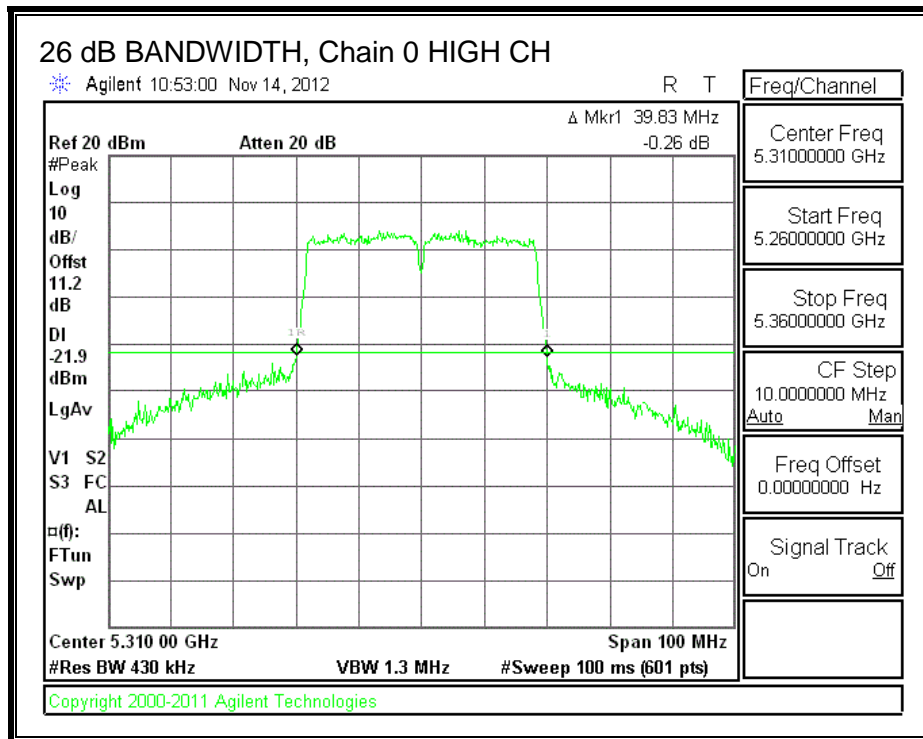
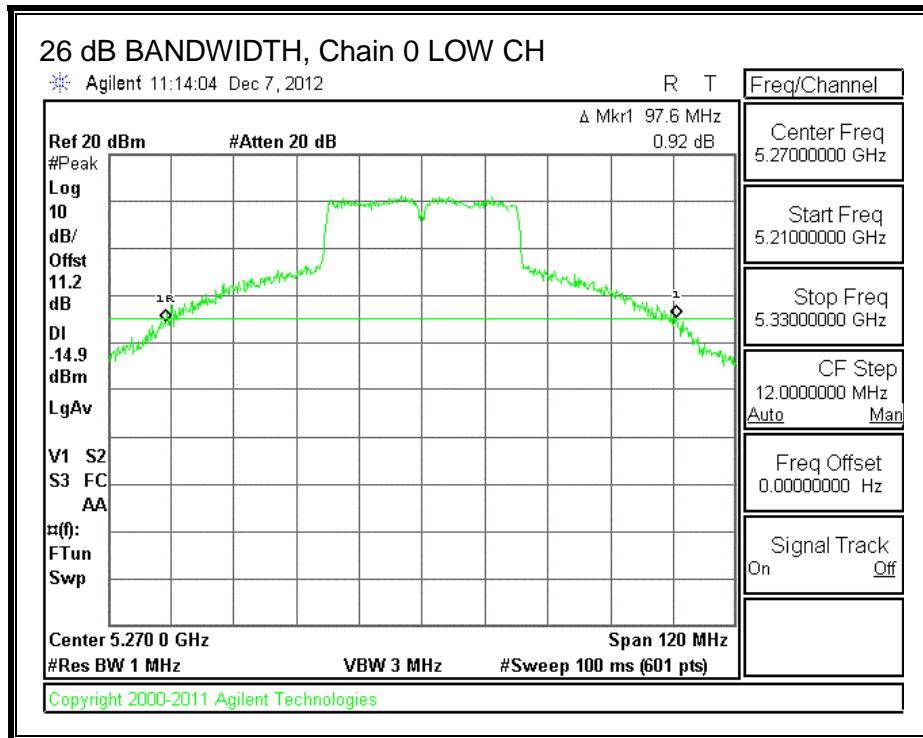
LIMITS

None; for reporting purposes only.

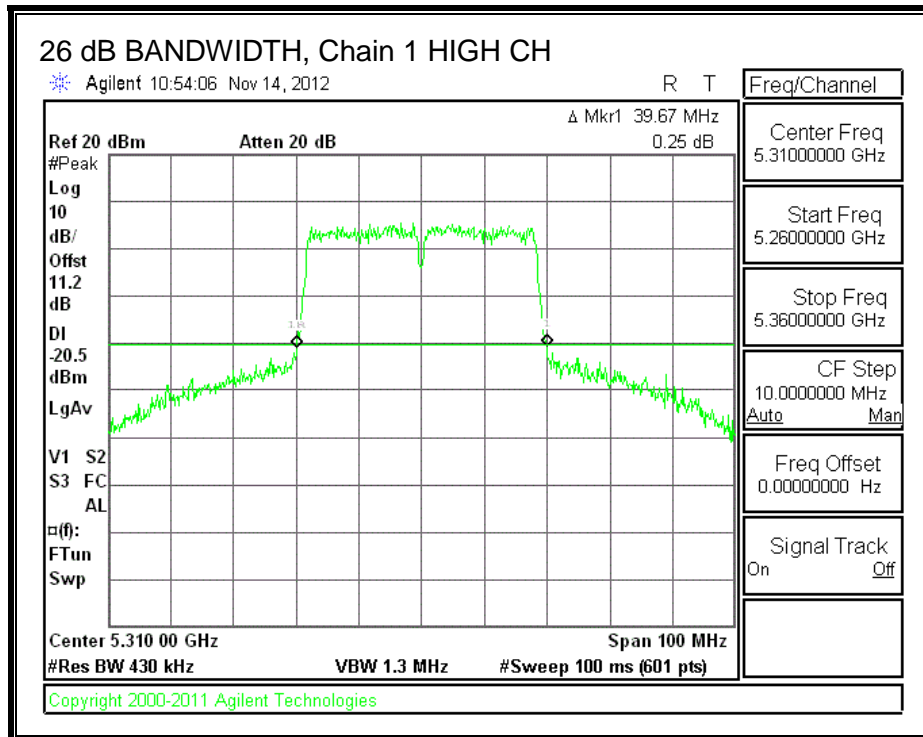
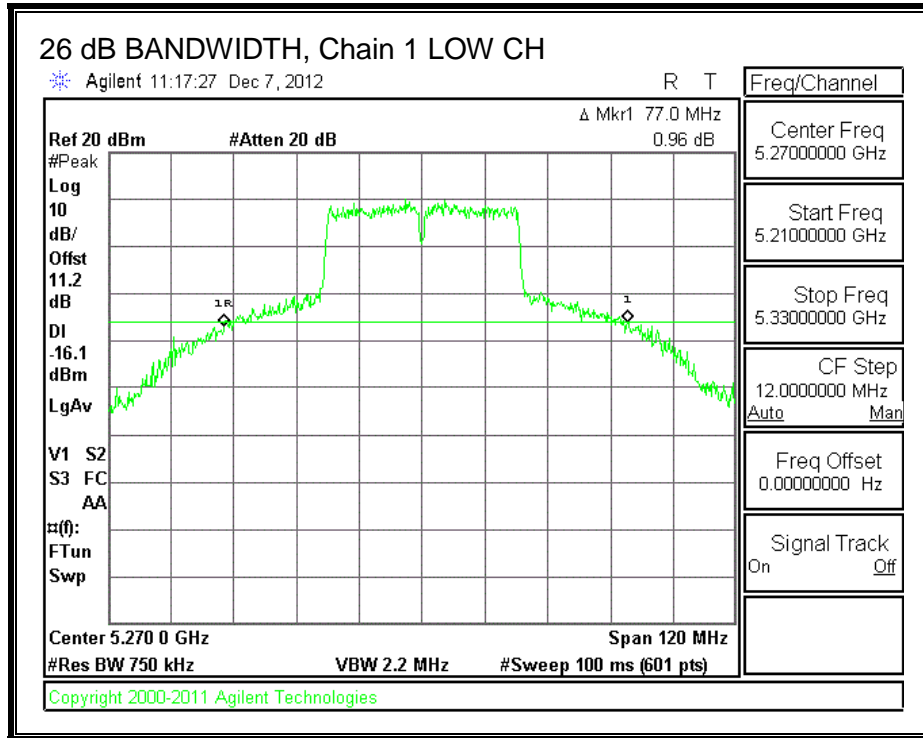
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	97.60	77.00
High	5310	39.83	39.67

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



7.44.2. **99% BANDWIDTH**

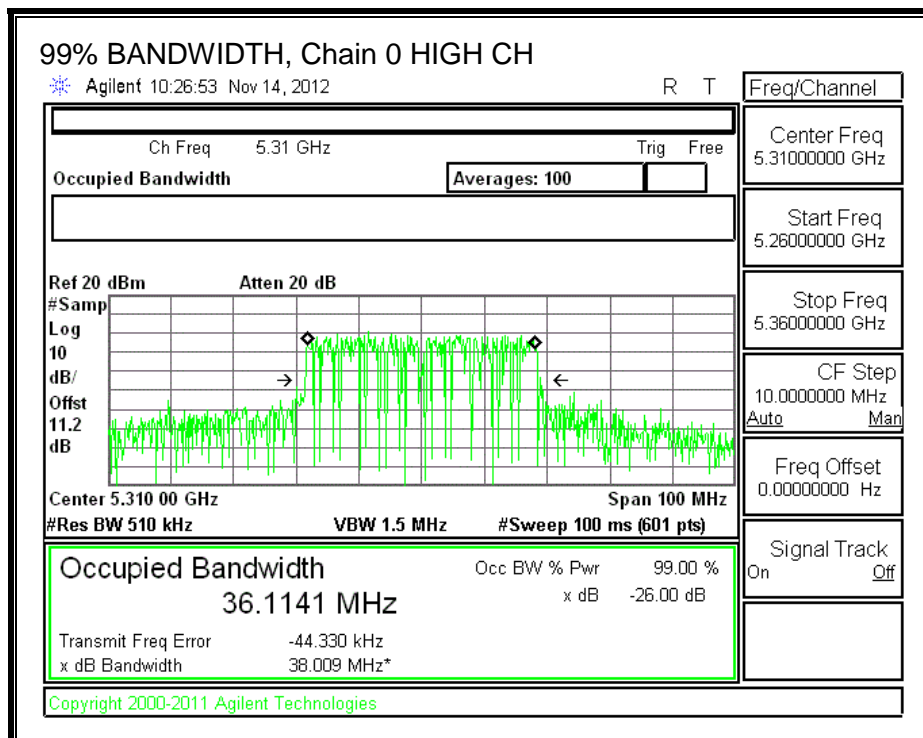
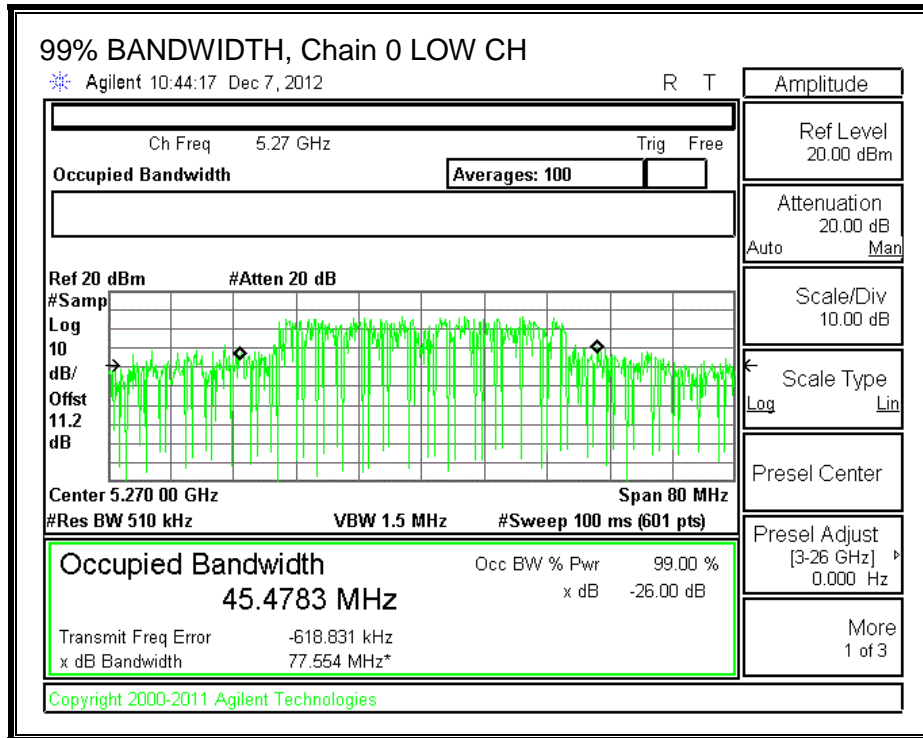
LIMITS

None; for reporting purposes only.

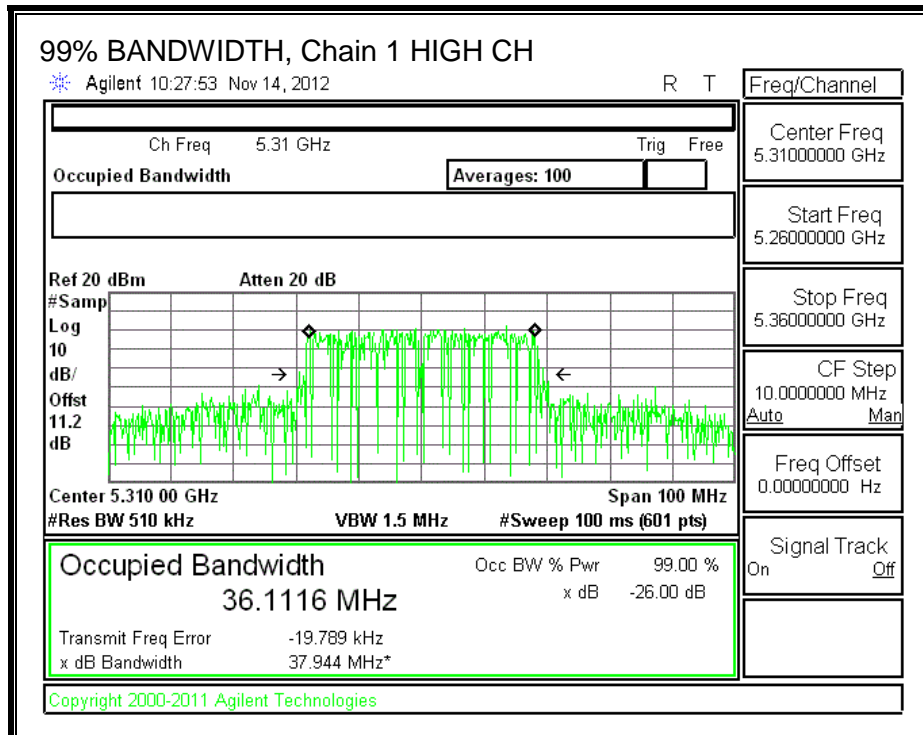
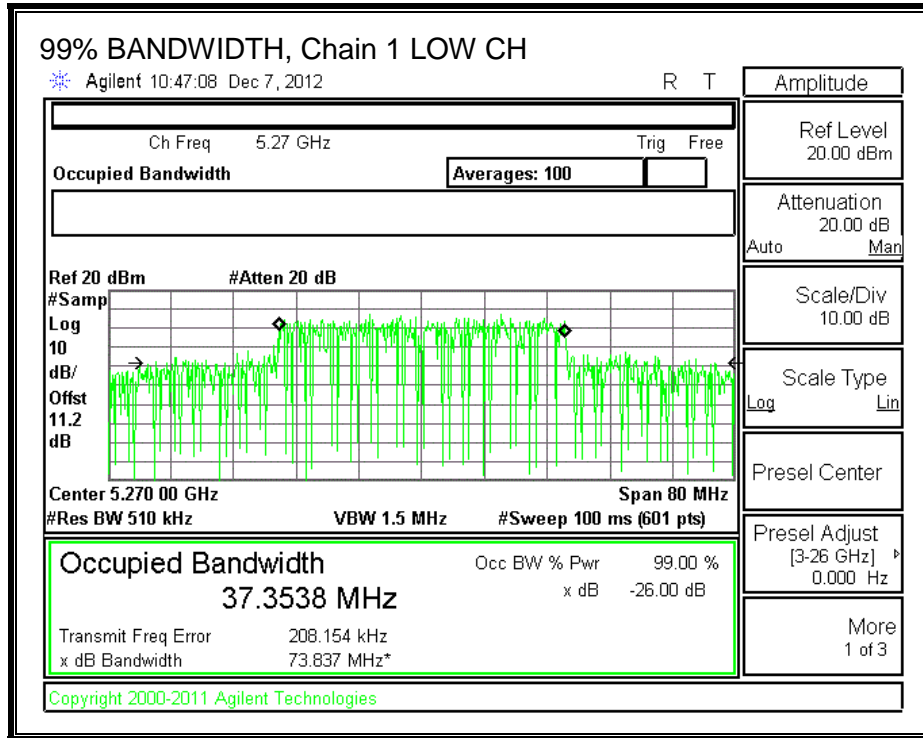
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	45.4783	37.3538
High	5310	36.1141	36.1116

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



7.44.3. OUTPUT POWER AND PPSD

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 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 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 TX chains are correlated 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)
7.09	7.06	7.08

For PPSD, 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)	Correlated Chains Directional Gain (dBi)
7.09	7.06	10.09

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	77.00	37.3538	7.08
High	5310	39.67	36.1116	7.08

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5270	22.92	24.00	30.00	22.92
High	5310	22.92	24.00	30.00	22.92

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	5270	19.92	19.81	22.88	22.92	-0.04
High	5310	14.10	15.06	17.62	22.92	-5.30

PPSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	77.00	37.3538	10.09
High	5310	39.67	36.1116	10.09

Limits

Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	6.91	11.00	6.91
High	5310	6.91	11.00	6.91

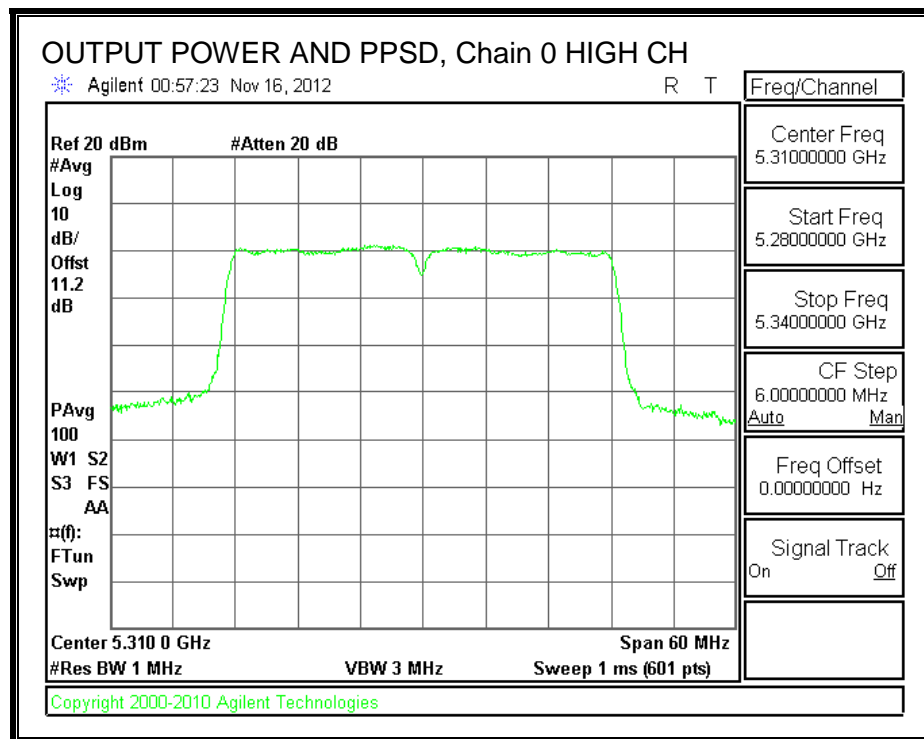
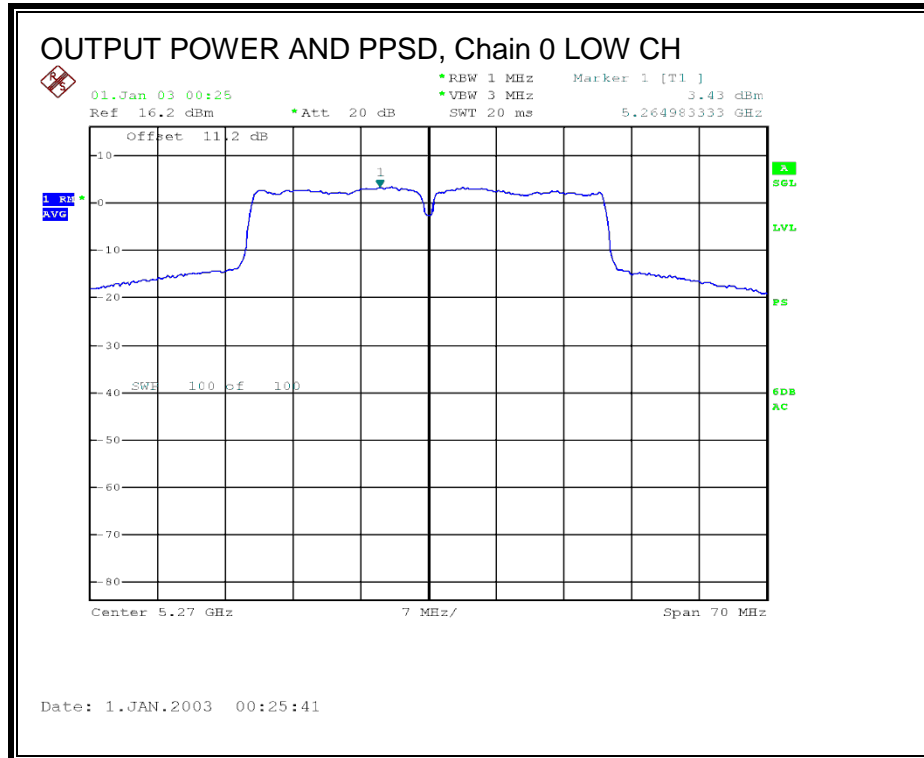
Duty Cycle CF (dB)	0.43	Included in PPSD
---------------------------	------	-------------------------

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	3.43	3.26	6.79	6.91	-0.12
High	5310	1.21	1.09	4.59	6.91	-2.32

Note: method (1) "Measure and sum the spectra across the outputs" as specified in KDB 662911 D01 v01r02 was used for High Channel for this PSD measurements.

OUTPUT POWER AND PPSD, Chain 0



7.45. 802.11n HT40 CDD 3TX MODE, 5.3 GHz BAND

7.45.1. 26 dB BANDWIDTH

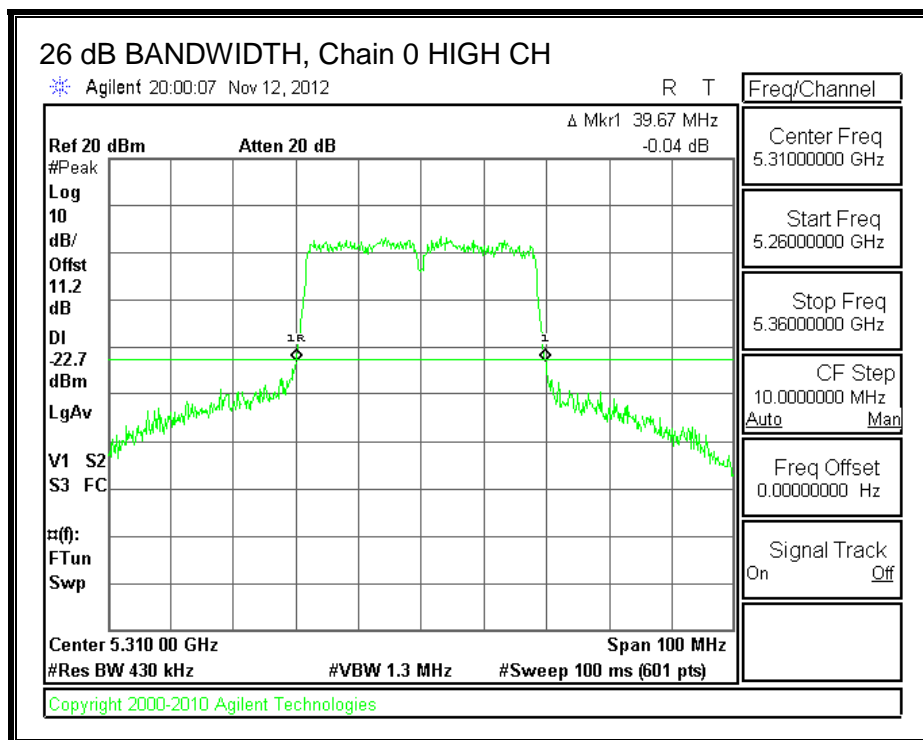
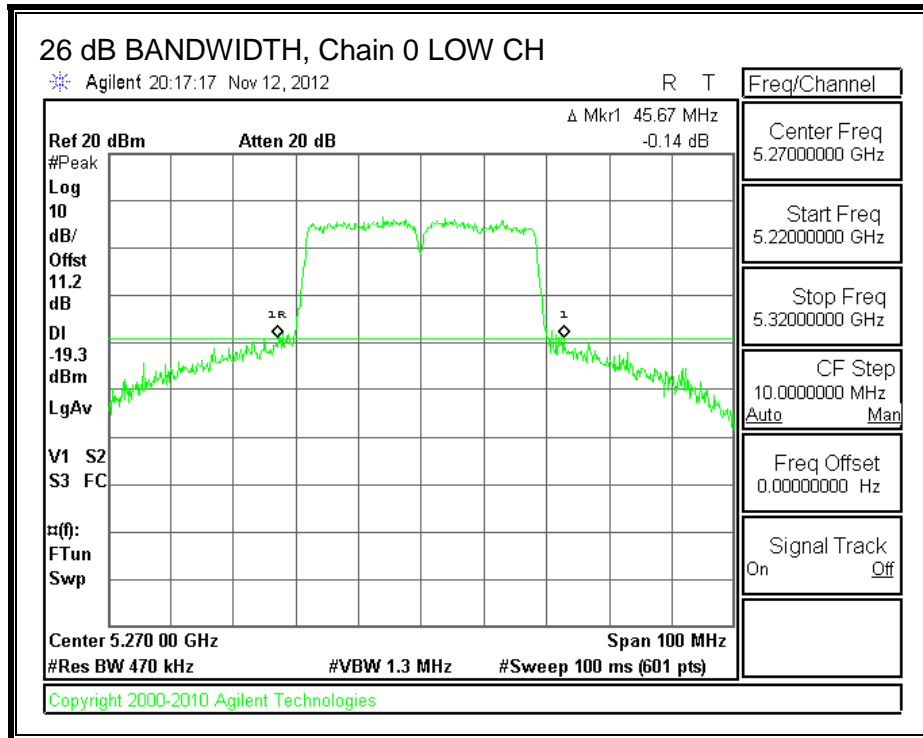
LIMITS

None; for reporting purposes only.

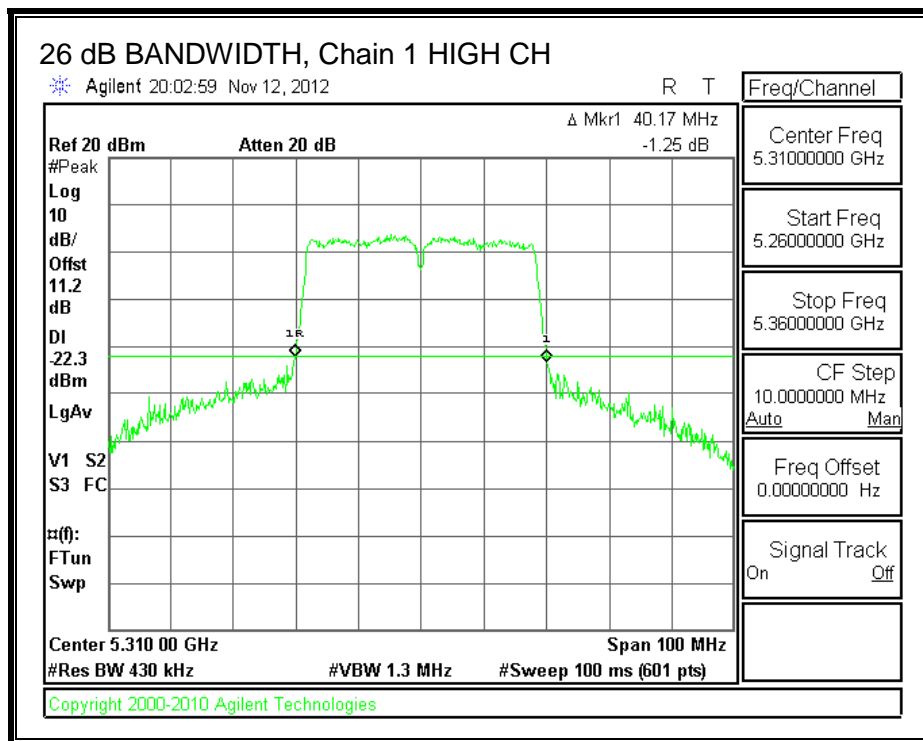
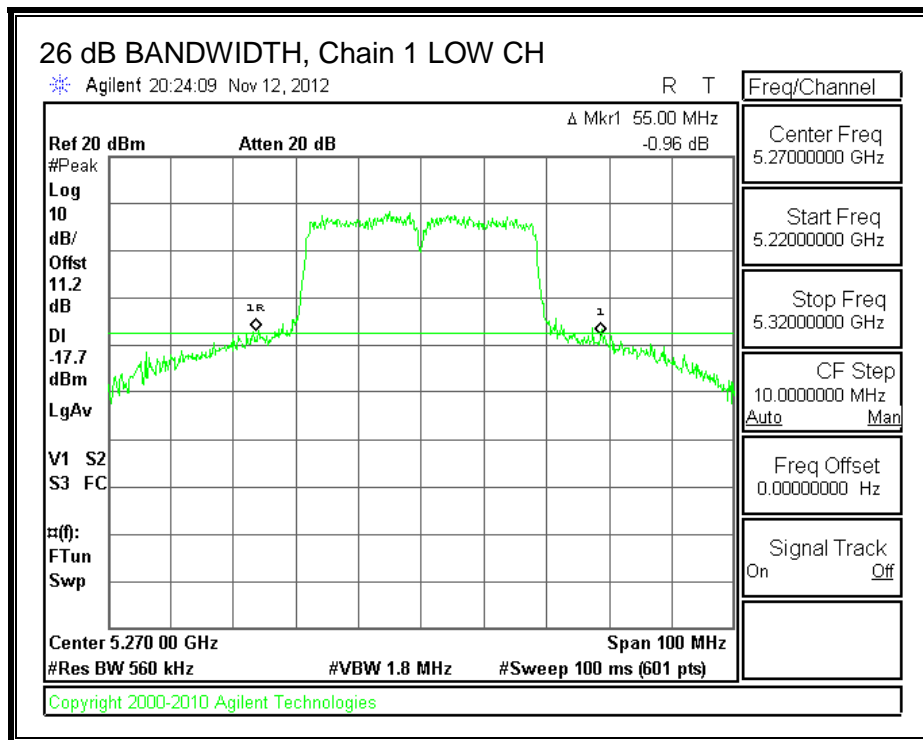
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5270	45.67	55.00	43.33
High	5310	39.67	40.17	39.50

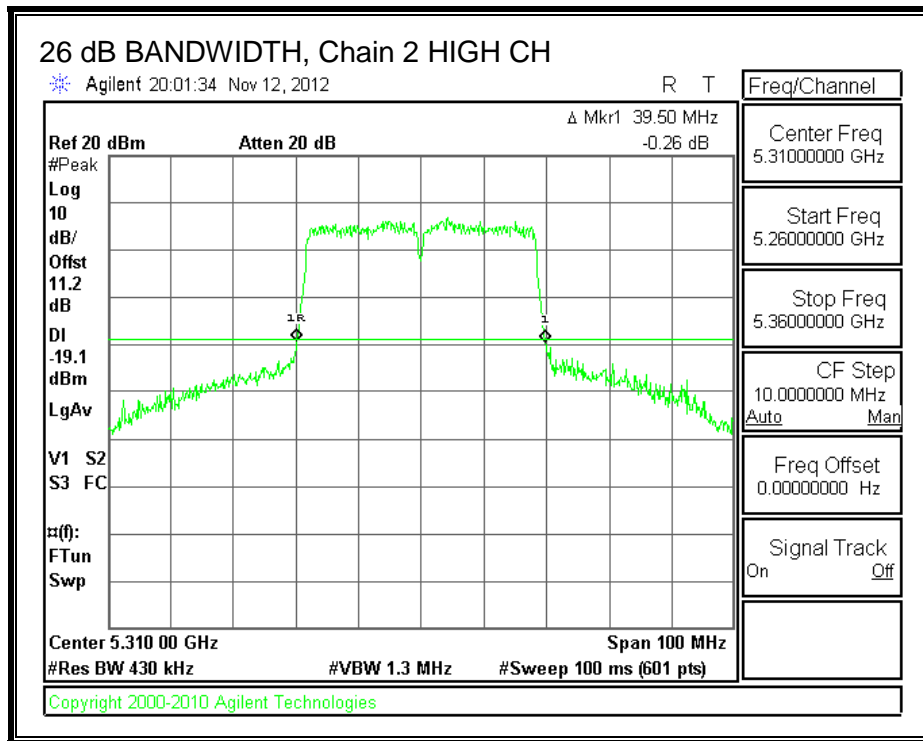
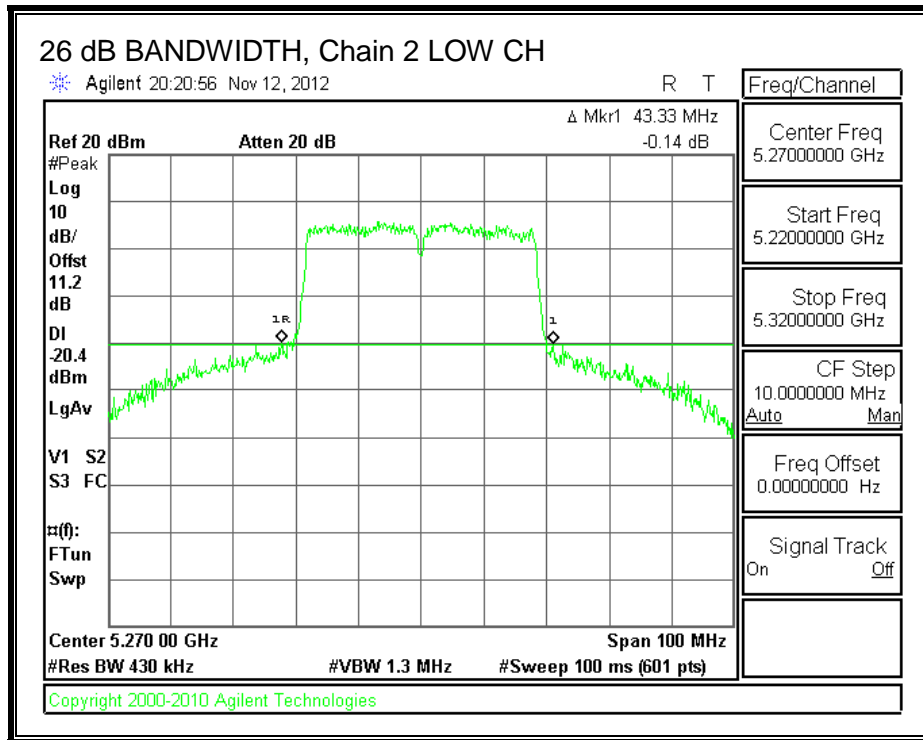
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



7.45.2. **99% BANDWIDTH**

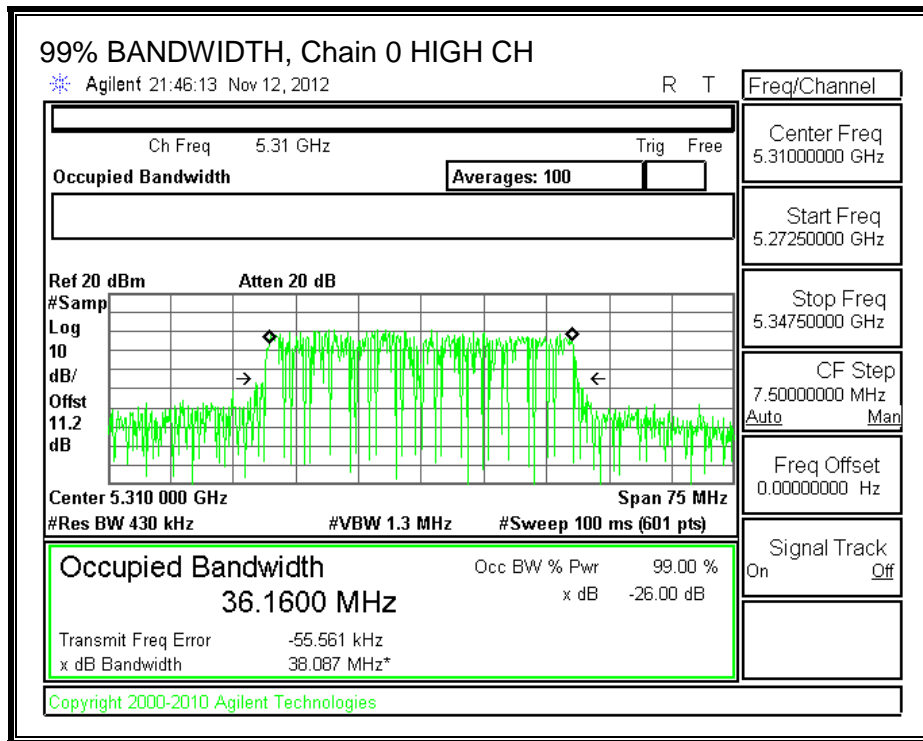
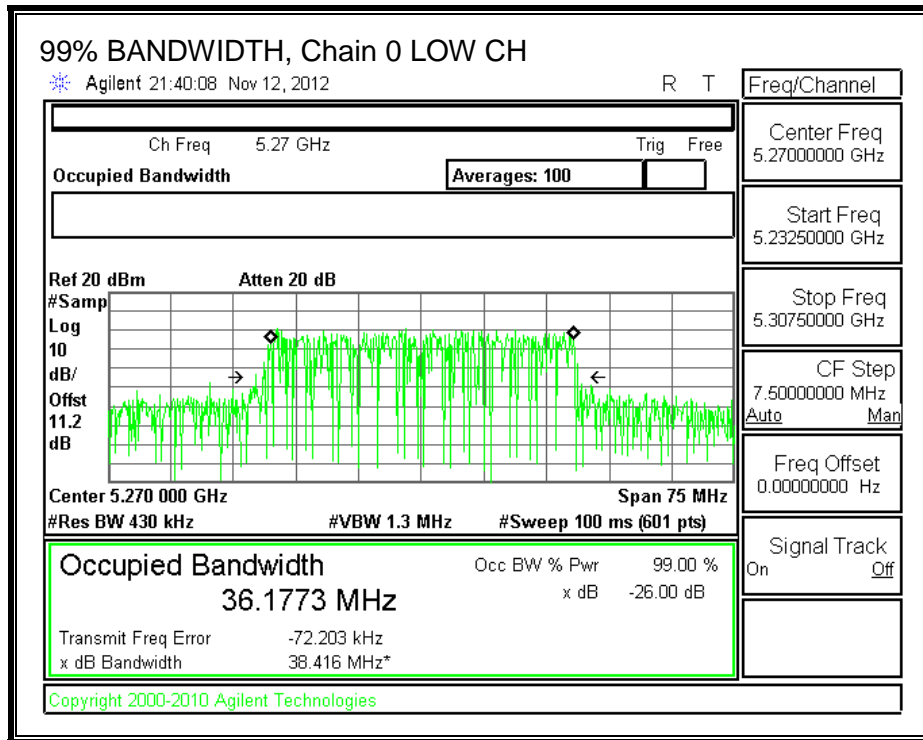
LIMITS

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	5270	36.1773	36.1451	36.1669
High	5310	36.1600	36.1327	36.1352

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1

