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914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313
33439 WESTERN AVENUE • UNION CITY, CALIFORNIA 94587 • PHONE (510) 489-6300 • FAX (510) 489-6372
3162 BELICK STREET • SANTA CLARA, CALIFORNIA 95054 • PHONE (408) 748-3585 • FAX (510) 489-6372
13501 MCCALLEN PASS • AUSTIN, TX 78753 • PHONE (512) 287-2500 • FAX (512) 287-2513

June 14, 2018

Harris Corp- Communication Systems
221 Jefferson Ridge Parkway,
Lynchburg, VA 24501

Dear Thomas Camper, Jr.,

Enclosed is the EMC Wireless test report for compliance testing of the Harris Corp- Communication Systems, Harris RF-7800W Broadband Ethernet Radio as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Title 47 of the CFR, Part 15.407, Subpart E (UNII 1).

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Joel Huna
Documentation Department

Reference: (\\Harris Corp- Communication Systems\ EMC93979-FCC407 UNII 1 Rev. 3)

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**Electromagnetic Compatibility Criteria
Test Report**

for the

**Harris Corp- Communication Systems
Model Harris RF-7800W Broadband Ethernet Radio**

Tested under
The FCC Certification Rules
contained in
Title 47 of the CFR
15.407 Subpart E

MET Report: EMC93979-FCC407 UNII 1 Rev. 3

June 14, 2018

Prepared For:

**Harris Corp- Communication Systems
221 Jefferson Ridge Parkway,
Lynchburg, VA 24501**

Prepared By:
MET Laboratories, Inc.
914 West Patapsco Avenue,
Baltimore, MD 21230



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Harris Corp- Communication Systems Model Harris RF-7800W Broadband Ethernet Radio

Tested under

The FCC Certification Rules
contained in
Title 47 of the CFR
15.407 Subpart E

Bradley Jones, Project Engineer
Electromagnetic Compatibility Lab

Joel Huna
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Parts 15B, 15.407, of the FCC Rules under normal use and maintenance.

John Mason,
Director, Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
∅	February 20, 2018	Initial Issue.
1	May 22, 2018	TCB Corrections.
2	June 7, 2018	TCB Corrections.
3	June 14, 2018	Addition of Duty Cycle Information.



Table of Contents

I.	Executive Summary	1
	A. Purpose of Test	2
	B. Executive Summary	2
II.	Equipment Configuration	3
	A. Overview.....	4
	B. References.....	5
	C. Test Site	5
	D. Measurement Uncertainty	5
	E. Description of Test Sample.....	5
	F. Equipment Configuration.....	7
	G. Support Equipment	7
	H. Ports and Cabling Information.....	8
	I. Mode of Operation.....	8
	J. Method of Monitoring EUT Operation	8
	K. Modifications.....	9
	a) Modifications to EUT	9
	b) Modifications to Test Standard	9
	L. Disposition of EUT.....	9
	M. Antenna Key	9
III.	Electromagnetic Compatibility Criteria for Intentional Radiators.....	10
	§ 15.203 Antenna Requirement	11
	§ 15.403(i) 26dB Bandwidth	12
	§ 15.407(a)(1) Maximum Conducted Output Power	39
	§ 15.407(a)(1) EIRP Above Elevation Angle.....	92
	§ 15.407(a)(1) Maximum Power Spectral Density	94
	§ 15.407(b) & (6 - 7) Undesirable Emissions.....	147
	§ 15.407(b)(6) Conducted Emissions	344
	§ 15.247(i) Maximum Permissible Exposure	355
IV.	Test Equipment	356
V.	Certification & User's Manual Information.....	358
	A. Certification Information	359
	B. Label and User's Manual Information	363



List of Tables

Table 1. Executive Summary of EMC Part 15.407 Compliance Testing	2
Table 2. EUT Summary.....	4
Table 3. References	5
Table 4. Uncertainty Calculations Summary.....	5
Table 5. Equipment Configuration	7
Table 6. Support Equipment.....	7
Table 7. Ports and Cabling Information	8
Table 8. Antenna Key.....	9
Table 9. 26 dB Occupied Bandwidth, Test Results	14
Table 10. Maximum Conducted Output Power, 5' Omni, Test Results	40
Table 11. Maximum Conducted Transmitter Power, 8 Omni, Test Results	40
Table 12. Maximum Conducted Transmitter Power, 90 Sector, Test Results	41
Table 13. Maximum Conducted Transmitter Power, 1' Panel, Test Results	41
Table 14. Maximum Conducted Transmitter Power, 2' Panel, Test Results	42
Table 15. Maximum Conducted Transmitter Power, 3' Para, Test Results	42
Table 16. EIRP Above Elevation Angle, 2' Panel, Test Results.....	93
Table 17. EIRP Above Elevation Angle, 3' Para, Test Results	93
Table 18. EIRP Above Elevation Angle, 8 Omni, Test Results	93
Table 19. EIRP Above Elevation Angle, 5 Omni, Test Results	93
Table 20. EIRP Elevation Angle, 90 Sector, Test Results.....	93
Table 21. EIRP Elevation Angle, 1' Panel, Test Results	93
Table 22. Power Spectral Density, 5 Omni, Test Results.....	95
Table 23. Power Spectral Density, 8 Omni, Test Results.....	95
Table 24. Power Spectral Density, 90 Sector, Test Results.....	96
Table 25. Power Spectral Density, 1' Panel, Test Results.....	96
Table 26. Power Spectral Density, 2' Panel, Test Results.....	97
Table 27. Power Spectral Density, 3' Para, Test Results	97
Table 28. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)	344
Table 29. Conducted Emissions, Phase Line, Test Results	345
Table 30. Conducted Emissions, Neutral Line, Test Results.....	345
Table 31. Test Equipment List	357

List of Figures

Figure 1. Block Diagram of Test Configuration, Emissions	6
Figure 2. Block Diagram of Test Configuration, DFS	6

List of Photographs

Photograph 1. Undesirable Emissions, 1' Panel below 1 GHz, Test Setup	338
Photograph 2. Undesirable Emissions, 1' Panel above 1 GHz, Test Setup	338
Photograph 3. Undesirable Emissions, 2' Panel below 1 GHz, Test Setup	339
Photograph 4. Undesirable Emissions, 2' Panel above 1 GHz, Test Setup	339
Photograph 5. Undesirable Emissions, Para below 1 GHz, Test Setup	340
Photograph 6. Undesirable Emissions, Para above 1 GHz, Test Setup	340
Photograph 7. Undesirable Emissions, 5 Omni below 1 GHz, Test Setup	341
Photograph 8. Undesirable Emissions, 5 Omni above 1 GHz, Test Setup	341
Photograph 9. Undesirable Emissions, 8 Omni below 1 GHz, Test Setup	342
Photograph 10. Undesirable Emissions, 8 Omni above 1 GHz, Test Setup	342
Photograph 11. Undesirable Emissions, 90 Sector below 1 GHz, Test Setup	343
Photograph 12. Undesirable Emissions, 90 Sector above 1 GHz, Test Setup	343
Photograph 13. Conducted Emissions, 1' Panel, Test Setup	352



Photograph 14. Conducted Emissions, 2’ Panel, Test Setup..... 352
 Photograph 15. Conducted Emissions, 3’ Para, Test Setup..... 353
 Photograph 16. Conducted Emissions, 5 Omni, Test Setup..... 353
 Photograph 17. Conducted Emissions, Omni 8, Test Setup..... 354
 Photograph 18. Conducted Emissions, 90 Sector, Test Setup..... 354

List of Plots

Plot 1. 26 dB Occupied Bandwidth, 5M, 5170, 1'Panel, rf2..... 15
 Plot 2. 26 dB Occupied Bandwidth, 5M, 5210, 1'Panel, rf2..... 15
 Plot 3. 26 dB Occupied Bandwidth, 5M, 5242.5, 1'Panel, rf2..... 15
 Plot 4. 26 dB Occupied Bandwidth, 10M, 5170, 1'Panel, rf2..... 16
 Plot 5. 26 dB Occupied Bandwidth, 10M, 5210, 1'Panel, rf2..... 16
 Plot 6. 26 dB Occupied Bandwidth, 10M, 5240.5, 1'Panel, rf2..... 16
 Plot 7. 26 dB Occupied Bandwidth, 20M, 5170, 1'Panel, rf2..... 17
 Plot 8. 26 dB Occupied Bandwidth, 20M, 5210, 1'Panel, rf2..... 17
 Plot 9. 26 dB Occupied Bandwidth, 20M, 5235.5, 1'Panel, rf2..... 17
 Plot 10. 26 dB Occupied Bandwidth, 40M, 5171, 1'Panel, rf2..... 18
 Plot 11. 26 dB Occupied Bandwidth, 40M, 5210, 1'Panel, rf2..... 18
 Plot 12. 26 dB Occupied Bandwidth, 40M, 5230, 1'Panel, rf2..... 18
 Plot 13. 26 dB Occupied Bandwidth, 5M, 5170, 2'Panel, rf2..... 19
 Plot 14. 26 dB Occupied Bandwidth, 5M, 5210, 2'Panel, rf2..... 19
 Plot 15. 26 dB Occupied Bandwidth, 5M, 5242.5, 2'Panel, rf2..... 19
 Plot 16. 26 dB Occupied Bandwidth, 10M, 5170, 2'Panel, rf2..... 20
 Plot 17. 26 dB Occupied Bandwidth, 10M, 5210, 2'Panel, rf2..... 20
 Plot 18. 26 dB Occupied Bandwidth, 10M, 5240.5, 2'Panel, rf2..... 20
 Plot 19. 26 dB Occupied Bandwidth, 20M, 5170, 2'Panel, rf2..... 21
 Plot 20. 26 dB Occupied Bandwidth, 20M, 5210, 2'Panel, rf2..... 21
 Plot 21. 26 dB Occupied Bandwidth, 20M, 5235.5, 2'Panel, rf2..... 21
 Plot 22. 26 dB Occupied Bandwidth, 40M, 5171, 2'Panel, rf2..... 22
 Plot 23. 26 dB Occupied Bandwidth, 40M, 5210, 2'Panel, rf2..... 22
 Plot 24. 26 dB Occupied Bandwidth, 40M, 5230, 2'Panel, rf2..... 22
 Plot 25. 26 dB Occupied Bandwidth, 5M, 5170, 3'Para, rf2 23
 Plot 26. 26 dB Occupied Bandwidth, 5M, 5210, 3'Para, rf2 23
 Plot 27. 26 dB Occupied Bandwidth, 5M, 5242.5, 3'Para, rf2 23
 Plot 28. 26 dB Occupied Bandwidth, 10M, 5170, 3'Para, rf2 24
 Plot 29. 26 dB Occupied Bandwidth, 10M, 5210, 3'Para, rf2 24
 Plot 30. 26 dB Occupied Bandwidth, 10M, 5240.5, 3'Para, rf2 24
 Plot 31. 26 dB Occupied Bandwidth, 20M, 5170, 3'Para, rf2 25
 Plot 32. 26 dB Occupied Bandwidth, 20M, 5210, 3'Para, rf2 25
 Plot 33. 26 dB Occupied Bandwidth, 20M, 5235.5, 3'Para, rf2 25
 Plot 34. 26 dB Occupied Bandwidth, 40M, 5170, 3'Para, rf2 26
 Plot 35. 26 dB Occupied Bandwidth, 40M, 5210, 3'Para, rf2 26
 Plot 36. 26 dB Occupied Bandwidth, 40M, 5230, 3'Para, rf2 26
 Plot 37. 26 dB Occupied Bandwidth, 5M, 5170, 90Sector, rf2 27
 Plot 38. 26 dB Occupied Bandwidth, 5M, 5210, 90Sector, rf2 27
 Plot 39. 26 dB Occupied Bandwidth, 5M, 5247.5, 90Sector, rf2 27
 Plot 40. 26 dB Occupied Bandwidth, 10M, 5170, 90Sector, rf2 28
 Plot 41. 26 dB Occupied Bandwidth, 10M, 5210, 90Sector, rf2 28
 Plot 42. 26 dB Occupied Bandwidth, 10M, 5245, 90Sector, rf2 28
 Plot 43. 26 dB Occupied Bandwidth, 20M, 5170, 90Sector, rf2 29
 Plot 44. 26 dB Occupied Bandwidth, 20M, 5210, 90Sector, rf2 29
 Plot 45. 26 dB Occupied Bandwidth, 20M, 5240, 90Sector, rf2 29
 Plot 46. 26 dB Occupied Bandwidth, 40M, 5170, 90Sector, rf2 30
 Plot 47. 26 dB Occupied Bandwidth, 40M, 5210, 90Sector, rf2 30
 Plot 48. 26 dB Occupied Bandwidth, 40M, 5230, 90Sector, rf2 30



Plot 49. 26 dB Occupied Bandwidth, 5M, 5170, Omni8, rf2 31

Plot 50. 26 dB Occupied Bandwidth, 5M, 5210, Omni8, rf2 31

Plot 51. 26 dB Occupied Bandwidth, 5M, 5247.5, Omni8, rf2 31

Plot 52. 26 dB Occupied Bandwidth, 10M, 5170, Omni8, rf2 32

Plot 53. 26 dB Occupied Bandwidth, 10M, 5210, Omni8, rf2 32

Plot 54. 26 dB Occupied Bandwidth, 10M, 5245, Omni8, rf2 32

Plot 55. 26 dB Occupied Bandwidth, 20M, 5170, Omni8, rf2 33

Plot 56. 26 dB Occupied Bandwidth, 20M, 5210, Omni8, rf2 33

Plot 57. 26 dB Occupied Bandwidth, 20M, 5240, Omni8, rf2 33

Plot 58. 26 dB Occupied Bandwidth, 40M, 5170, Omni8, rf2 34

Plot 59. 26 dB Occupied Bandwidth, 40M, 5210, Omni8, rf2 34

Plot 60. 26 dB Occupied Bandwidth, 40M, 5230, Omni8, rf2 34

Plot 61. 26 dB Occupied Bandwidth, 5M, 5170, 5Omni, rf2 35

Plot 62. 26 dB Occupied Bandwidth, 5M, 5210, 5Omni, rf2 35

Plot 63. 26 dB Occupied Bandwidth, 5M, 5247.5, 5Omni, rf2 35

Plot 64. 26 dB Occupied Bandwidth, 10M, 5170, 5Omni, rf2 36

Plot 65. 26 dB Occupied Bandwidth, 10M, 5210, 5Omni, rf2 36

Plot 66. 26 dB Occupied Bandwidth, 10M, 5245, 5Omni, rf2 36

Plot 67. 26 dB Occupied Bandwidth, 20M, 5170, 5Omni, rf2 37

Plot 68. 26 dB Occupied Bandwidth, 20M, 5210, 5Omni, rf2 37

Plot 69. 26 dB Occupied Bandwidth, 20M, 5240, 5Omni, rf2 37

Plot 70. 26 dB Occupied Bandwidth, 40M, 5170, 5Omni, rf2 38

Plot 71. 26 dB Occupied Bandwidth, 40M, 5210, 5Omni, rf2 38

Plot 72. 26 dB Occupied Bandwidth, 40M, 5230, 5Omni, rf2 38

Plot 73. Duty Cycle 43

Plot 74. Maximum Conducted Output Power, 5M, 5170, 1Panel, rf1 43

Plot 75. Maximum Conducted Output Power, 5M, 5170, 1Panel, rf2 43

Plot 76. Maximum Conducted Output Power, 5M, 5210, 1Panel, rf1 44

Plot 77. Maximum Conducted Output Power, 5M, 5210, 1Panel, rf2 44

Plot 78. Maximum Conducted Output Power, 5M, 5242.5, 1Panel, rf1 44

Plot 79. Maximum Conducted Output Power, 5M, 5242.5, 1Panel, rf2 45

Plot 80. Maximum Conducted Output Power, 10M, 5170, 1Panel, rf1 45

Plot 81. Maximum Conducted Output Power, 10M, 5170, 1Panel, rf2 45

Plot 82. Maximum Conducted Output Power, 10M, 5210, 1Panel, rf1 46

Plot 83. Maximum Conducted Output Power, 10M, 5210, 1Panel, rf2 46

Plot 84. Maximum Conducted Output Power, 10M, 5240.5, 1Panel, rf1 46

Plot 85. Maximum Conducted Output Power, 10M, 5240.5, 1Panel, rf2 47

Plot 86. Maximum Conducted Output Power, 20M, 5170, 1Panel, rf1 47

Plot 87. Maximum Conducted Output Power, 20M, 5170, 1Panel, rf2 47

Plot 88. Maximum Conducted Output Power, 20M, 5210, 1Panel, rf1 48

Plot 89. Maximum Conducted Output Power, 20M, 5210, 1Panel, rf2 48

Plot 90. Maximum Conducted Output Power, 20M, 5235.5, 1Panel, rf1 48

Plot 91. Maximum Conducted Output Power, 20M, 5235.5, 1Panel, rf2 49

Plot 92. Maximum Conducted Output Power, 40M, 5171, 1Panel, rf1 49

Plot 93. Maximum Conducted Output Power, 40M, 5171, 1Panel, rf2 49

Plot 94. Maximum Conducted Output Power, 40M, 5210, 1Panel, rf1 50

Plot 95. Maximum Conducted Output Power, 40M, 5210, 1Panel, rf2 50

Plot 96. Maximum Conducted Output Power, 40M, 5230, 1Panel, rf1 50

Plot 97. Maximum Conducted Output Power, 40M, 5230, 1Panel, rf2 51

Plot 98. Maximum Conducted Output Power, 5M, 5170, 2Panel, rf1 51

Plot 99. Maximum Conducted Output Power, 5M, 5170, 2Panel, rf2 51

Plot 100. Maximum Conducted Output Power, 5M, 5210, 2Panel, rf1 52

Plot 101. Maximum Conducted Output Power, 5M, 5210, 2Panel, rf2 52

Plot 102. Maximum Conducted Output Power, 5M, 5242.5, 2Panel, rf1 52

Plot 103. Maximum Conducted Output Power, 5M, 5242.5, 2Panel, rf2 53

Plot 104. Maximum Conducted Output Power, 10M, 5170, 2Panel, rf1 53

Plot 105. Maximum Conducted Output Power, 10M, 5170, 2Panel, rf2 53



Plot 106. Maximum Conducted Output Power, 10M, 5210, 2Panel, rf1	54
Plot 107. Maximum Conducted Output Power, 10M, 5210, 2Panel, rf2	54
Plot 108. Maximum Conducted Output Power, 10M, 5240.5, 2Panel, rf1	54
Plot 109. Maximum Conducted Output Power, 10M, 5240.5, 2Panel, rf2	55
Plot 110. Maximum Conducted Output Power, 20M, 5170, 2Panel, rf1	55
Plot 111. Maximum Conducted Output Power, 20M, 5170, 2Panel, rf2	55
Plot 112. Maximum Conducted Output Power, 20M, 5210, 2Panel, rf1	56
Plot 113. Maximum Conducted Output Power, 20M, 5210, 2Panel, rf2	56
Plot 114. Maximum Conducted Output Power, 20M, 5235.5, 2Panel, rf1	56
Plot 115. Maximum Conducted Output Power, 20M, 5235.5, 2Panel, rf2	57
Plot 116. Maximum Conducted Output Power, 40M, 5171, 2Panel, rf1	57
Plot 117. Maximum Conducted Output Power, 40M, 5171, 2Panel, rf2	57
Plot 118. Maximum Conducted Output Power, 40M, 5210, 2Panel, rf1	58
Plot 119. Maximum Conducted Output Power, 40M, 5210, 2Panel, rf2	58
Plot 120. Maximum Conducted Output Power, 40M, 5230, 2Panel, rf1	58
Plot 121. Maximum Conducted Output Power, 40M, 5230, 2Panel, rf2	59
Plot 122. Maximum Conducted Output Power, 5M, 5170, 3Para, rf1	59
Plot 123. Maximum Conducted Output Power, 5M, 5170, 3Para, rf2	59
Plot 124. Maximum Conducted Output Power, 5M, 5210, 3Para, rf1	60
Plot 125. Maximum Conducted Output Power, 5M, 5210, 3Para, rf2	60
Plot 126. Maximum Conducted Output Power, 5M, 5242.5, 3Para, rf1	60
Plot 127. Maximum Conducted Output Power, 5M, 5242.5, 3Para, rf2	61
Plot 128. Maximum Conducted Output Power, 10M, 5170, 3Para, rf1	61
Plot 129. Maximum Conducted Output Power, 10M, 5170, 3Para, rf2	61
Plot 130. Maximum Conducted Output Power, 10M, 5210, 3Para, rf1	62
Plot 131. Maximum Conducted Output Power, 10M, 5210, 3Para, rf2	62
Plot 132. Maximum Conducted Output Power, 10M, 5240.5, 3Para, rf1	62
Plot 133. Maximum Conducted Output Power, 10M, 5240.5, 3Para, rf2	63
Plot 134. Maximum Conducted Output Power, 20M, 5170, 3Para, rf1	63
Plot 135. Maximum Conducted Output Power, 20M, 5170, 3Para, rf2	63
Plot 136. Maximum Conducted Output Power, 20M, 5210, 3Para, rf1	64
Plot 137. Maximum Conducted Output Power, 20M, 5210, 3Para, rf2	64
Plot 138. Maximum Conducted Output Power, 20M, 5235.5, 3Para, rf1	64
Plot 139. Maximum Conducted Output Power, 20M, 5235.5, 3Para, rf2	65
Plot 140. Maximum Conducted Output Power, 40M, 5171, 3Para, rf1	65
Plot 141. Maximum Conducted Output Power, 40M, 5171, 3Para, rf2	65
Plot 142. Maximum Conducted Output Power, 40M, 5210, 3Para, rf1	66
Plot 143. Maximum Conducted Output Power, 40M, 5210, 3Para, rf2	66
Plot 144. Maximum Conducted Output Power, 40M, 5230, 3Para, rf1	66
Plot 145. Maximum Conducted Output Power, 40M, 5230, 3Para, rf2	67
Plot 146. Maximum Conducted Output Power, 5M, 5170, 5Omni, rf1	67
Plot 147. Maximum Conducted Output Power, 5M, 5170, 5Omni, rf2	67
Plot 148. Maximum Conducted Output Power, 5M, 5210, 5Omni, rf1	68
Plot 149. Maximum Conducted Output Power, 5M, 5210, 5Omni, rf2	68
Plot 150. Maximum Conducted Output Power, 5M, 5247.5, 5Omni, rf1	68
Plot 151. Maximum Conducted Output Power, 5M, 5247.5, 5Omni, rf2	69
Plot 152. Maximum Conducted Output Power, 10M, 5170, 5Omni, rf1	69
Plot 153. Maximum Conducted Output Power, 10M, 5170, 5Omni, rf2	69
Plot 154. Maximum Conducted Output Power, 10M, 5210, 5Omni, rf1	70
Plot 155. Maximum Conducted Output Power, 10M, 5210, 5Omni, rf2	70
Plot 156. Maximum Conducted Output Power, 10M, 5245, 5Omni, rf1	70
Plot 157. Maximum Conducted Output Power, 10M, 5245, 5Omni, rf2	71
Plot 158. Maximum Conducted Output Power, 20M, 5170, 5Omni, rf1	71
Plot 159. Maximum Conducted Output Power, 20M, 5170, 5Omni, rf2	71
Plot 160. Maximum Conducted Output Power, 20M, 5210, 5Omni, rf1	72
Plot 161. Maximum Conducted Output Power, 20M, 5210, 5Omni, rf2	72
Plot 162. Maximum Conducted Output Power, 20M, 5240, 5Omni, rf1	72



Plot 163. Maximum Conducted Output Power, 20M, 5240, 5Omni, rf2 73

Plot 164. Maximum Conducted Output Power, 40M, 5170, 5Omni, rf1 73

Plot 165. Maximum Conducted Output Power, 40M, 5170, 5Omni, rf2 73

Plot 166. Maximum Conducted Output Power, 40M, 5210, 5Omni, rf1 74

Plot 167. Maximum Conducted Output Power, 40M, 5210, 5Omni, rf2 74

Plot 168. Maximum Conducted Output Power, 40M, 5230, 5Omni, rf1 74

Plot 169. Maximum Conducted Output Power, 40M, 5230, 5Omni, rf2 75

Plot 170. Maximum Conducted Output Power, 5M, 5170, Omni8, rf1 75

Plot 171. Maximum Conducted Output Power, 5M, 5170, Omni8, rf2 75

Plot 172. Maximum Conducted Output Power, 5M, 5210, Omni8, rf1 76

Plot 173. Maximum Conducted Output Power, 5M, 5210, Omni8, rf2 76

Plot 174. Maximum Conducted Output Power, 5M, 5247.5, Omni8, rf1 76

Plot 175. Maximum Conducted Output Power, 5M, 5247.5, Omni8, rf2 77

Plot 176. Maximum Conducted Output Power, 10M, 5170, Omni8, rf1 77

Plot 177. Maximum Conducted Output Power, 10M, 5170, Omni8, rf2 77

Plot 178. Maximum Conducted Output Power, 10M, 5210, Omni8, rf1 78

Plot 179. Maximum Conducted Output Power, 10M, 5210, Omni8, rf2, 15..... 78

Plot 180. Maximum Conducted Output Power, 10M, 5245, Omni8, rf1 78

Plot 181. Maximum Conducted Output Power, 10M, 5245, Omni8, rf2 79

Plot 182. Maximum Conducted Output Power, 20M, 5170, Omni8, rf1 79

Plot 183. Maximum Conducted Output Power, 20M, 5170, Omni8, rf2 79

Plot 184. Maximum Conducted Output Power, 20M, 5210, Omni8, rf1 80

Plot 185. Maximum Conducted Output Power, 20M, 5210, Omni8, rf2 80

Plot 186. Maximum Conducted Output Power, 20M, 5240, Omni8, rf1 80

Plot 187. Maximum Conducted Output Power, 20M, 5240, Omni8, rf2 81

Plot 188. Maximum Conducted Output Power, 40M, 5170, Omni8, rf1 81

Plot 189. Maximum Conducted Output Power, 40M, 5170, Omni8, rf2 81

Plot 190. Maximum Conducted Output Power, 40M, 5210, Omni8, rf1 82

Plot 191. Maximum Conducted Output Power, 40M, 5210, Omni8, rf2 82

Plot 192. Maximum Conducted Output Power, 40M, 5230, Omni8, rf1 82

Plot 193. Maximum Conducted Output Power, 40M, 5230, Omni8, rf2 83

Plot 194. Maximum Conducted Output Power, 5M, 5170, 90Sector, rf1 83

Plot 195. Maximum Conducted Output Power, 5M, 5170, 90Sector, rf2 83

Plot 196. Maximum Conducted Output Power, 5M, 5210, 90Sector, rf1 84

Plot 197. Maximum Conducted Output Power, 5M, 5210, 90Sector, rf2 84

Plot 198. Maximum Conducted Output Power, 5M, 5247.5, 90Sector, rf1 84

Plot 199. Maximum Conducted Output Power, 5M, 5247.5, 90Sector, rf2 85

Plot 200. Maximum Conducted Output Power, 10M, 5170, 90Sector, rf1 85

Plot 201. Maximum Conducted Output Power, 10M, 5170, 90Sector, rf2 85

Plot 202. Maximum Conducted Output Power, 10M, 5210, 90Sector, rf1 86

Plot 203. Maximum Conducted Output Power, 10M, 5210, 90Sector, rf2 86

Plot 204. Maximum Conducted Output Power, 10M, 5245, 90Sector, rf1 86

Plot 205. Maximum Conducted Output Power, 10M, 5245, 90Sector, rf2 87

Plot 206. Maximum Conducted Output Power, 20M, 5170, 90Sector, rf1 87

Plot 207. Maximum Conducted Output Power, 20M, 5170, 90Sector, rf2 87

Plot 208. Maximum Conducted Output Power, 20M, 5210, 90Sector, rf1 88

Plot 209. Maximum Conducted Output Power, 20M, 5210, 90Sector, rf2 88

Plot 210. Maximum Conducted Output Power, 20M, 5240, 90Sector, rf1 88

Plot 211. Maximum Conducted Output Power, 20M, 5240, 90Sector, rf2 89

Plot 212. Maximum Conducted Output Power, 40M, 5170, 90Sector, rf1 89

Plot 213. Maximum Conducted Output Power, 40M, 5170, 90Sector, rf2 89

Plot 214. Maximum Conducted Output Power, 40M, 5210, 90Sector, rf1 90

Plot 215. Maximum Conducted Output Power, 40M, 5210, 90Sector, rf2 90

Plot 216. Maximum Conducted Output Power, 40M, 5230, 90Sector, rf1 90

Plot 217. Maximum Conducted Output Power, 40M, 5230, 90Sector, rf2 91

Plot 218. Duty Cycle 98

Plot 219. Maximum Power Spectral Density, 5M, 5170, 1Panel, rf1..... 98



Plot 220. Maximum Power Spectral Density, 5M, 5170, 1Panel, rf2.....	98
Plot 221. Maximum Power Spectral Density, 5M, 5210, 1Panel, rf1.....	99
Plot 222. Maximum Power Spectral Density, 5M, 5210, 1Panel, rf2.....	99
Plot 223. Maximum Power Spectral Density, 5M, 5242.5, 1Panel, rf1.....	99
Plot 224. Maximum Power Spectral Density, 5M, 5242.5, 1Panel, rf2.....	100
Plot 225. Maximum Power Spectral Density, 10M, 5170, 1Panel, rf1.....	100
Plot 226. Maximum Power Spectral Density, 10M, 5170, 1Panel, rf2.....	100
Plot 227. Maximum Power Spectral Density, 10M, 5210, 1Panel, rf1.....	101
Plot 228. Maximum Power Spectral Density, 10M, 5210, 1Panel, rf2.....	101
Plot 229. Maximum Power Spectral Density, 10M, 5240.5, 1Panel, rf1.....	101
Plot 230. Maximum Power Spectral Density, 10M, 5240.5, 1Panel, rf2.....	102
Plot 231. Maximum Power Spectral Density, 20M, 5170, 1Panel, rf1.....	102
Plot 232. Maximum Power Spectral Density, 20M, 5170, 1Panel, rf2.....	102
Plot 233. Maximum Power Spectral Density, 20M, 5210, 1Panel, rf1.....	103
Plot 234. Maximum Power Spectral Density, 20M, 5210, 1Panel, rf2.....	103
Plot 235. Maximum Power Spectral Density, 20M, 5235.5, 1Panel, rf1.....	103
Plot 236. Maximum Power Spectral Density, 20M, 5235.5, 1Panel, rf2.....	104
Plot 237. Maximum Power Spectral Density, 40M, 5171, 1Panel, rf1.....	104
Plot 238. Maximum Power Spectral Density, 40M, 5171, 1Panel, rf2.....	104
Plot 239. Maximum Power Spectral Density, 40M, 5210, 1Panel, rf1.....	105
Plot 240. Maximum Power Spectral Density, 40M, 5210, 1Panel, rf2.....	105
Plot 241. Maximum Power Spectral Density, 40M, 5230, 1Panel, rf1.....	105
Plot 242. Maximum Power Spectral Density, 40M, 5230, 1Panel, rf2.....	106
Plot 243. Maximum Power Spectral Density, 5M, 5170, 2Panel, rf1.....	106
Plot 244. Maximum Power Spectral Density, 5M, 5170, 2Panel, rf2.....	106
Plot 245. Maximum Power Spectral Density, 5M, 5210, 2Panel, rf1.....	107
Plot 246. Maximum Power Spectral Density, 5M, 5210, 2Panel, rf2.....	107
Plot 247. Maximum Power Spectral Density, 5M, 5242.5, 2Panel, rf1.....	107
Plot 248. Maximum Power Spectral Density, 5M, 5242.5, 2Panel, rf2.....	108
Plot 249. Maximum Power Spectral Density, 10M, 5170, 2Panel, rf1.....	108
Plot 250. Maximum Power Spectral Density, 10M, 5170, 2Panel, rf2.....	108
Plot 251. Maximum Power Spectral Density, 10M, 5210, 2Panel, rf1.....	109
Plot 252. Maximum Power Spectral Density, 10M, 5210, 2Panel, rf2.....	109
Plot 253. Maximum Power Spectral Density, 10M, 5240.5, 2Panel, rf1.....	109
Plot 254. Maximum Power Spectral Density, 10M, 5240.5, 2Panel, rf2.....	110
Plot 255. Maximum Power Spectral Density, 20M, 5170, 2Panel, rf1.....	110
Plot 256. Maximum Power Spectral Density, 20M, 5170, 2Panel, rf2.....	110
Plot 257. Maximum Power Spectral Density, 20M, 5210, 2Panel, rf1.....	111
Plot 258. Maximum Power Spectral Density, 20M, 5210, 2Panel, rf2.....	111
Plot 259. Maximum Power Spectral Density, 20M, 5235.5, 2Panel, rf1.....	111
Plot 260. Maximum Power Spectral Density, 20M, 5235.5, 2Panel, rf2.....	112
Plot 261. Maximum Power Spectral Density, 40M, 5171, 2Panel, rf1.....	112
Plot 262. Maximum Power Spectral Density, 40M, 5171, 2Panel, rf2.....	112
Plot 263. Maximum Power Spectral Density, 40M, 5210, 2Panel, rf1.....	113
Plot 264. Maximum Power Spectral Density, 40M, 5210, 2Panel, rf2.....	113
Plot 265. Maximum Power Spectral Density, 40M, 5230, 2Panel, rf1.....	113
Plot 266. Maximum Power Spectral Density, 40M, 5230, 2Panel, rf2.....	114
Plot 267. Maximum Power Spectral Density, 5M, 5170, 3Para, rf1.....	114
Plot 268. Maximum Power Spectral Density, 5M, 5170, 3Para, rf2.....	114
Plot 269. Maximum Power Spectral Density, 5M, 5210, 3Para, rf1.....	115
Plot 270. Maximum Power Spectral Density, 5M, 5210, 3Para, rf2.....	115
Plot 271. Maximum Power Spectral Density, 5M, 5242.5, 3Para, rf1.....	115
Plot 272. Maximum Power Spectral Density, 5M, 5242.5, 3Para, rf2.....	116
Plot 273. Maximum Power Spectral Density, 10M, 5170, 3Para, rf1.....	116
Plot 274. Maximum Power Spectral Density, 10M, 5170, 3Para, rf2.....	116
Plot 275. Maximum Power Spectral Density, 10M, 5210, 3Para, rf1.....	117
Plot 276. Maximum Power Spectral Density, 10M, 5210, 3Para, rf2.....	117



Plot 277. Maximum Power Spectral Density, 10M, 5240.5, 3Para, rf1	117
Plot 278. Maximum Power Spectral Density, 10M, 5240.5, 3Para, rf2	118
Plot 279. Maximum Power Spectral Density, 20M, 5170, 3Para, rf1	118
Plot 280. Maximum Power Spectral Density, 20M, 5170, 3Para, rf2	118
Plot 281. Maximum Power Spectral Density, 20M, 5210, 3Para, rf1	119
Plot 282. Maximum Power Spectral Density, 20M, 5210, 3Para, rf2	119
Plot 283. Maximum Power Spectral Density, 20M, 5235.5, 3Para, rf1	119
Plot 284. Maximum Power Spectral Density, 20M, 5235.5, 3Para, rf2	120
Plot 285. Maximum Power Spectral Density, 40M, 5171, 3Para, rf1	120
Plot 286. Maximum Power Spectral Density, 40M, 5171, 3Para, rf2	120
Plot 287. Maximum Power Spectral Density, 40M, 5210, 3Para, rf1	121
Plot 288. Maximum Power Spectral Density, 40M, 5210, 3Para, rf2	121
Plot 289. Maximum Power Spectral Density, 40M, 5230, 3Para, rf1	121
Plot 290. Maximum Power Spectral Density, 40M, 5230, 3Para, rf2	122
Plot 291. Maximum Power Spectral Density, 5M, 5170, 5Omni, rf1	122
Plot 292. Maximum Power Spectral Density, 5M, 5170, 5Omni, rf2	122
Plot 293. Maximum Power Spectral Density, 5M, 5210, 5Omni, rf1	123
Plot 294. Maximum Power Spectral Density, 5M, 5210, 5Omni, rf2	123
Plot 295. Maximum Power Spectral Density, 5M, 5247.5, 5Omni, rf1	123
Plot 296. Maximum Power Spectral Density, 5M, 5247.5, 5Omni, rf2	124
Plot 297. Maximum Power Spectral Density, 10M, 5170, 5Omni, rf1	124
Plot 298. Maximum Power Spectral Density, 10M, 5170, 5Omni, rf2	124
Plot 299. Maximum Power Spectral Density, 10M, 5210, 5Omni, rf1	125
Plot 300. Maximum Power Spectral Density, 10M, 5210, 5Omni, rf2	125
Plot 301. Maximum Power Spectral Density, 10M, 5245, 5Omni, rf1	125
Plot 302. Maximum Power Spectral Density, 10M, 5245, 5Omni, rf2	126
Plot 303. Maximum Power Spectral Density, 20M, 5170, 5Omni, rf1	126
Plot 304. Maximum Power Spectral Density, 20M, 5170, 5Omni, rf2	126
Plot 305. Maximum Power Spectral Density, 20M, 5210, 5Omni, rf1	127
Plot 306. Maximum Power Spectral Density, 20M, 5210, 5Omni, rf2	127
Plot 307. Maximum Power Spectral Density, 20M, 5240, 5Omni, rf1	127
Plot 308. Maximum Power Spectral Density, 20M, 5240, 5Omni, rf2	128
Plot 309. Maximum Power Spectral Density, 40M, 5170, 5Omni, rf1	128
Plot 310. Maximum Power Spectral Density, 40M, 5170, 5Omni, rf2	128
Plot 311. Maximum Power Spectral Density, 40M, 5210, 5Omni, rf1	129
Plot 312. Maximum Power Spectral Density, 40M, 5210, 5Omni, rf2	129
Plot 313. Maximum Power Spectral Density, 40M, 5230, 5Omni, rf1	129
Plot 314. Maximum Power Spectral Density, 40M, 5230, 5Omni, rf2	130
Plot 315. Maximum Power Spectral Density, 5M, 5170, Omni8, rf1	130
Plot 316. Maximum Power Spectral Density, 5M, 5170, Omni8, rf2	130
Plot 317. Maximum Power Spectral Density, 5M, 5210, Omni8, rf1	131
Plot 318. Maximum Power Spectral Density, 5M, 5210, Omni8, rf2, 11	131
Plot 319. Maximum Power Spectral Density, 5M, 5247.5, Omni8, rf1	131
Plot 320. Maximum Power Spectral Density, 5M, 5247.5, Omni8, rf2	132
Plot 321. Maximum Power Spectral Density, 10M, 5170, Omni8, rf1	132
Plot 322. Maximum Power Spectral Density, 10M, 5170, Omni8, rf2	132
Plot 323. Maximum Power Spectral Density, 10M, 5210, Omni8, rf1	133
Plot 324. Maximum Power Spectral Density, 10M, 5210, Omni8, rf2	133
Plot 325. Maximum Power Spectral Density, 10M, 5245, Omni8, rf1	133
Plot 326. Maximum Power Spectral Density, 10M, 5245, Omni8, rf2	134
Plot 327. Maximum Power Spectral Density, 20M, 5170, Omni8, rf1	134
Plot 328. Maximum Power Spectral Density, 20M, 5170, Omni8, rf2	134
Plot 329. Maximum Power Spectral Density, 20M, 5210, Omni8, rf1	135
Plot 330. Maximum Power Spectral Density, 20M, 5210, Omni8, rf2	135
Plot 331. Maximum Power Spectral Density, 20M, 5240, Omni8, rf1	135
Plot 332. Maximum Power Spectral Density, 20M, 5240, Omni8, rf2	136
Plot 333. Maximum Power Spectral Density, 40M, 5170, Omni8, rf1	136



Plot 334. Maximum Power Spectral Density, 40M, 5170, Omni8, rf2 136

Plot 335. Maximum Power Spectral Density, 40M, 5210, Omni8, rf1 137

Plot 336. Maximum Power Spectral Density, 40M, 5210, Omni8, rf2 137

Plot 337. Maximum Power Spectral Density, 40M, 5230, Omni8, rf1 137

Plot 338. Maximum Power Spectral Density, 40M, 5230, Omni8, rf2 138

Plot 339. Maximum Power Spectral Density, 20M, 5170, 90Sector, rf1 138

Plot 340. Maximum Power Spectral Density, 20M, 5170, 90Sector, rf2 138

Plot 341. Maximum Power Spectral Density, 20M, 5210, 90Sector, rf1 139

Plot 342. Maximum Power Spectral Density, 20M, 5210, 90Sector, rf2 139

Plot 343. Maximum Power Spectral Density, 20M, 5240, 90Sector, rf1 139

Plot 344. Maximum Power Spectral Density, 20M, 5240, 90Sector, rf2 140

Plot 345. Maximum Power Spectral Density, 40M, 5170, 90Sector, rf1 140

Plot 346. Maximum Power Spectral Density, 40M, 5170, 90Sector, rf2 140

Plot 347. Maximum Power Spectral Density, 5M, 5170, 90Sector, rf1 141

Plot 348. Maximum Power Spectral Density, 5M, 5170, 90Sector, rf2 141

Plot 349. Maximum Power Spectral Density, 5M, 5210, 90Sector, rf1 141

Plot 350. Maximum Power Spectral Density, 5M, 5210, 90Sector, rf2 142

Plot 351. Maximum Power Spectral Density, 5M, 5247.5, 90Sector, rf1 142

Plot 352. Maximum Power Spectral Density, 5M, 5247.5, 90Sector, rf2 142

Plot 353. Maximum Power Spectral Density, 10M, 5170, 90Sector, rf1 143

Plot 354. Maximum Power Spectral Density, 10M, 5170, 90Sector, rf2 143

Plot 355. Maximum Power Spectral Density, 10M, 5210, 90Sector, rf1 143

Plot 356. Maximum Power Spectral Density, 10M, 5210, 90Sector, rf2 144

Plot 357. Maximum Power Spectral Density, 10M, 5245, 90Sector, rf1 144

Plot 358. Maximum Power Spectral Density, 10M, 5245, 90Sector, rf2 144

Plot 359. Maximum Power Spectral Density, 40M, 5210, 90Sector, rf1 145

Plot 360. Maximum Power Spectral Density, 40M, 5210, 90Sector, rf2 145

Plot 361. Maximum Power Spectral Density, 40M, 5230, 90Sector, rf1 145

Plot 362. Maximum Power Spectral Density, 40M, 5230, 90Sector, rf2 146

Plot 363. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5170 pow7 148

Plot 364. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5170 pow7 zoom left of fundamental 148

Plot 365. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5210 pow11 149

Plot 366. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5210 pow11 zoom left of fundamental 149

Plot 367. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14 150

Plot 368. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14 zoom left of fundamental 150

Plot 369. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14 zoom right of fundamental 151

Plot 370. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5170 pow6 151

Plot 371. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5210 pow17 152

Plot 372. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5240.5 pow17 152

Plot 373. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5170 pow-2 153

Plot 374. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5210 pow15 153

Plot 375. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5235.5 pow20 154

Plot 376. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5171 pow-10 154

Plot 377. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5210 pow10 155

Plot 378. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5230 pow14 155

Plot 379. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5170 pow7 156

Plot 380. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5210 pow11 156

Plot 381. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5242.5 pow14 157

Plot 382. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5170 pow6 157

Plot 383. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5210 pow17 158

Plot 384. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5240.5 pow17 158

Plot 385. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5170 pow-2 159

Plot 386. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5210 pow15 159

Plot 387. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5235.5 pow20 160

Plot 388. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5170 pow-10 160

Plot 389. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5210 pow10 161

Plot 390. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5230 pow14 161



Plot 391. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5170 pow7 162

Plot 392. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5210 pow11 162

Plot 393. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5242.5 pow14 163

Plot 394. Undesirable Emissions, 1Panel Peak 7-18GHz 10M 5170 pow6 163

Plot 395. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5170 pow-2 164

Plot 396. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5170 pow-2 zoom left of fundamental 164

Plot 397. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1 165

Plot 398. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1 left of fundamental 165

Plot 399. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1 right of fundamental 166

Plot 400. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5242.5 pow1 166

Plot 401. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5242.5 pow1 zoom left of fundamental 167

Plot 402. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5170 pow0 167

Plot 403. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5170 pow0 zoom left of fundamental 168

Plot 404. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5210 pow5 168

Plot 405. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5210 pow5 zoom left of fundamental 169

Plot 406. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4 169

Plot 407. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4 zoom left of fundamental 170

Plot 408. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4 zoom near left of fundamental 170

Plot 409. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5170 pow-1 171

Plot 410. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5210 pow6 171

Plot 411. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5210 pow6 zoom left of center 172

Plot 412. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5235.5 pow7 172

Plot 413. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5235.5 pow7 zoom left of center 173

Plot 414. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5171 pow-10 173

Plot 415. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5210 pow7 174

Plot 416. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5230 pow10 174

Plot 417. Undesirable Emissions, 2Panel Avg 7-18GHz 5M 5170 pow-2 175

Plot 418. Undesirable Emissions, 2Panel Avg 7-18GHz 5M 5210 pow1 175

Plot 419. Undesirable Emissions, 2Panel Avg 7-18GHz 5M 5242.5 pow1 176

Plot 420. Undesirable Emissions, 2Panel Avg 7-18GHz 10M 5170 pow0 176

Plot 421. Undesirable Emissions, 2Panel Avg 7-18GHz 10M 5210 pow5 177

Plot 422. Undesirable Emissions, 2Panel Avg 7-18GHz 10M 5240.5 pow4 177

Plot 423. Undesirable Emissions, 2Panel Avg 7-18GHz 20M 5170 pow-1 178

Plot 424. Undesirable Emissions, 2Panel Avg 7-18GHz 20M 5210 pow6 178

Plot 425. Undesirable Emissions, 2Panel Avg 7-18GHz 20M 5235.5 pow7 179

Plot 426. Undesirable Emissions, 2Panel Avg 7-18GHz 40M 5171 pow-10 179

Plot 427. Undesirable Emissions, 2Panel Avg 7-18GHz 40M 5210 pow7 180

Plot 428. Undesirable Emissions, 2Panel Avg 7-18GHz 40M 5230 pow10 180

Plot 429. Undesirable Emissions, 2Panel Peak 1-7GHz 5M 5170 pow-2 181

Plot 430. Undesirable Emissions, 2Panel Peak 1-7GHz 5M 5210 pow1 181

Plot 431. Undesirable Emissions, 2Panel Peak 1-7GHz 5M 5242.5 pow1 182

Plot 432. Undesirable Emissions, 2Panel Peak 1-7GHz 10M 5170 pow0 182

Plot 433. Undesirable Emissions, 2Panel Peak 1-7GHz 10M 5210 pow5 183

Plot 434. Undesirable Emissions, 2Panel Peak 1-7GHz 10M 5240.5 pow4 183

Plot 435. Undesirable Emissions, 2Panel Peak 1-7GHz 20M 5170 pow-1 184

Plot 436. Undesirable Emissions, 2Panel Peak 1-7GHz 20M 5210 pow6 184

Plot 437. Undesirable Emissions, 2Panel Peak 1-7GHz 20M 5235.5 pow7 185

Plot 438. Undesirable Emissions, 2Panel Peak 1-7GHz 40M 5171 pow-10 185

Plot 439. Undesirable Emissions, 2Panel Peak 1-7GHz 40M 5210 pow7 186

Plot 440. Undesirable Emissions, 2Panel Peak 1-7GHz 40M 5230 pow10 186

Plot 441. Undesirable Emissions, 2Panel Peak 7-18GHz 5M 5170 pow-2 187

Plot 442. Undesirable Emissions, 2Panel Peak 7-18GHz 5M 5210 pow1 187

Plot 443. Undesirable Emissions, 2Panel Peak 7-18GHz 5M 5242.5 pow1 188

Plot 444. Undesirable Emissions, 2Panel Peak 7-18GHz 10M 5170 pow0 188

Plot 445. Undesirable Emissions, 2Panel Peak 7-18GHz 10M 5210 pow5 189

Plot 446. Undesirable Emissions, 2Panel Peak 7-18GHz 10M 5240.5 pow4 189

Plot 447. Undesirable Emissions, 2Panel Peak 7-18GHz 20M 5170 pow-1 190



Plot 448. Undesirable Emissions, 2Panel Peak 7-18GHz 20M 5210 pow6 190

Plot 449. Undesirable Emissions, 2Panel Peak 7-18GHz 20M 5235.5 pow7 191

Plot 450. Undesirable Emissions, 2Panel Peak 7-18GHz 40M 5171 pow-10 191

Plot 451. Undesirable Emissions, 2Panel Peak 7-18GHz 40M 5210 pow7 192

Plot 452. Undesirable Emissions, 2Panel Peak 7-18GHz 40M 5230 pow10 192

Plot 453. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5170 pow-4..... 193

Plot 454. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5170 pow-4 left of fundamental 193

Plot 455. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5210 pow0 194

Plot 456. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5210 pow0 left of fundamental..... 194

Plot 457. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5242.5 pow0 195

Plot 458. Undesirable Emissions, 3Para Avg 1-7GHz 5M 5242.5 pow0 left of fundamental..... 195

Plot 459. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5170 pow-1 196

Plot 460. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5170 pow-1 left of fundamental 196

Plot 461. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5210 pow3 197

Plot 462. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5210 pow3 left of fundamental..... 197

Plot 463. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5240.5 pow3 198

Plot 464. Undesirable Emissions, 3Para Avg 1-7GHz 10M 5240.5 pow3 left of fundamental..... 198

Plot 465. Undesirable Emissions, 3Para Avg 1-7GHz 20M 5170 pow-1 199

Plot 466. Undesirable Emissions, 3Para Avg 1-7GHz 20M 5210 pow5 199

Plot 467. Undesirable Emissions, 3Para Avg 1-7GHz 20M 5210 pow5 zoom left of fundamental 200

Plot 468. Undesirable Emissions, 3Para Avg 1-7GHz 20M 5235.5 pow5 200

Plot 469. Undesirable Emissions, 3Para Avg 1-7GHz 20M 5235.5 pow5 zoom left of fundamental 201

Plot 470. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5170 pow-10 201

Plot 471. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5210 pow5 202

Plot 472. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5230 pow8 202

Plot 473. Undesirable Emissions, 3Para Avg 7-18GHz 5M 5170 pow-4..... 203

Plot 474. Undesirable Emissions, 3Para Avg 7-18GHz 5M 5210 pow0 203

Plot 475. Undesirable Emissions, 3Para Avg 7-18GHz 5M 5242.5 pow0 204

Plot 476. Undesirable Emissions, 3Para Avg 7-18GHz 10M 5170 pow-1 204

Plot 477. Undesirable Emissions, 3Para Avg 7-18GHz 10M 5210 pow3 205

Plot 478. Undesirable Emissions, 3Para Avg 7-18GHz 10M 5240.5 pow3 205

Plot 479. Undesirable Emissions, 3Para Avg 7-18GHz 20M 5170 pow-1 206

Plot 480. Undesirable Emissions, 3Para Avg 7-18GHz 20M 5210 pow5 206

Plot 481. Undesirable Emissions, 3Para Avg 7-18GHz 20M 5235.5 pow5 207

Plot 482. Undesirable Emissions, 3Para Avg 7-18GHz 40M 5171 pow-10 207

Plot 483. Undesirable Emissions, 3Para Avg 7-18GHz 40M 5210 pow5 208

Plot 484. Undesirable Emissions, 3Para Avg 7-18GHz 40M 5230 pow5 208

Plot 485. Undesirable Emissions, 3Para Peak 1-7GHz 5M 5170 pow-4..... 209

Plot 486. Undesirable Emissions, 3Para Peak 1-7GHz 5M 5210 pow0 209

Plot 487. Undesirable Emissions, 3Para Peak 1-7GHz 5M 5242.5 pow0 210

Plot 488. Undesirable Emissions, 3Para Peak 1-7GHz 10M 5170 pow-1 210

Plot 489. Undesirable Emissions, 3Para Peak 1-7GHz 10M 5210 pow3 211

Plot 490. Undesirable Emissions, 3Para Peak 1-7GHz 10M 5240.5 pow3 211

Plot 491. Undesirable Emissions, 3Para Peak 1-7GHz 20M 5170 pow-1 212

Plot 492. Undesirable Emissions, 3Para Peak 1-7GHz 20M 5210 pow5 212

Plot 493. Undesirable Emissions, 3Para Peak 1-7GHz 20M 5235.5 pow5 213

Plot 494. Undesirable Emissions, 3Para Peak 1-7GHz 40M 5171 pow-10 213

Plot 495. Undesirable Emissions, 3Para Peak 1-7GHz 40M 5210 pow5 214

Plot 496. Undesirable Emissions, 3Para Peak 1-7GHz 40M 5230 pow8 214

Plot 497. Undesirable Emissions, 3Para Peak 7-18GHz 5M 5170 pow-4..... 215

Plot 498. Undesirable Emissions, 3Para Peak 7-18GHz 5M 5210 pow0 215

Plot 499. Undesirable Emissions, 3Para Peak 7-18GHz 5M 5242.5 pow0 216

Plot 500. Undesirable Emissions, 3Para Peak 7-18GHz 10M 5170 pow-1 216

Plot 501. Undesirable Emissions, 3Para Peak 7-18GHz 10M 5210 pow3 217

Plot 502. Undesirable Emissions, 3Para Peak 7-18GHz 10M 5240.5 pow3 217

Plot 503. Undesirable Emissions, 3Para Peak 7-18GHz 20M 5170 pow-1 218

Plot 504. Undesirable Emissions, 3Para Peak 7-18GHz 20M 5210 pow5 218



Plot 505. Undesirable Emissions, 3Para Peak 7-18GHz 20M 5235.5 pow5 219

Plot 506. Undesirable Emissions, 3Para Peak 7-18GHz 40M 5171 pow-10..... 219

Plot 507. Undesirable Emissions, 3Para Peak 7-18GHz 40M 5210 pow5 220

Plot 508. Undesirable Emissions, 3Para Peak 7-18GHz 40M 5230 pow8 220

Plot 509. Undesirable Emissions, 5Omni Avg 1-7GHz 5M 5170 pow14 221

Plot 510. Undesirable Emissions, 5Omni Avg 1-7GHz 5M 5210 pow14 221

Plot 511. Undesirable Emissions, 5Omni Avg 1-7GHz 5M 5247.5 pow14 222

Plot 512. Undesirable Emissions, 5Omni Avg 1-7GHz 10M 5170 pow17 222

Plot 513. Undesirable Emissions, 5Omni Avg 1-7GHz 10M 5210 pow17 223

Plot 514. Undesirable Emissions, 5Omni Avg 1-7GHz 10M 5245 pow17 223

Plot 515. Undesirable Emissions, 5Omni Avg 1-7GHz 20M 5170 pow10 224

Plot 516. Undesirable Emissions, 5Omni Avg 1-7GHz 20M 5210 pow19 224

Plot 517. Undesirable Emissions, 5Omni Avg 1-7GHz 20M 5240 pow20 225

Plot 518. Undesirable Emissions, 5Omni Avg 1-7GHz 40M 5170 pow3 225

Plot 519. Undesirable Emissions, 5Omni Avg 1-7GHz 40M 5210 pow21 226

Plot 520. Undesirable Emissions, 5Omni Avg 1-7GHz 40M 5210 pow21 zoom 226

Plot 521. Undesirable Emissions, 5Omni Avg 1-7GHz 40M 5230 pow22 227

Plot 522. Undesirable Emissions, 5Omni Avg 1-7GHz 40M 5230 pow22 zoom 227

Plot 523. Undesirable Emissions, 5Omni Avg 7-18GHz 5M 5170 pow14 228

Plot 524. Undesirable Emissions, 5Omni Avg 7-18GHz 5M 5210 pow14 228

Plot 525. Undesirable Emissions, 5Omni Avg 7-18GHz 5M 5247.5 pow14 229

Plot 526. Undesirable Emissions, 5Omni Avg 7-18GHz 10M 5170 pow17 229

Plot 527. Undesirable Emissions, 5Omni Avg 7-18GHz 10M 5210 pow17 230

Plot 528. Undesirable Emissions, 5Omni Avg 7-18GHz 10M 5245 pow17 230

Plot 529. Undesirable Emissions, 5Omni Avg 7-18GHz 20M 5170 pow10 231

Plot 530. Undesirable Emissions, 5Omni Avg 7-18GHz 20M 5210 pow19 231

Plot 531. Undesirable Emissions, 5Omni Avg 7-18GHz 20M 5240 pow20 232

Plot 532. Undesirable Emissions, 5Omni Avg 7-18GHz 40M 5170 pow3 232

Plot 533. Undesirable Emissions, 5Omni Avg 7-18GHz 40M 5210 pow21 233

Plot 534. Undesirable Emissions, 5Omni Avg 7-18GHz 40M 5230 pow22 233

Plot 535. Undesirable Emissions, 5Omni Peak 1-7GHz 5M 5170 pow14 234

Plot 536. Undesirable Emissions, 5Omni Peak 1-7GHz 5M 5210 pow14 234

Plot 537. Undesirable Emissions, 5Omni Peak 1-7GHz 5M 5247.5 pow14 235

Plot 538. Undesirable Emissions, 5Omni Peak 1-7GHz 10M 5170 pow17 235

Plot 539. Undesirable Emissions, 5Omni Peak 1-7GHz 10M 5210 pow17 236

Plot 540. Undesirable Emissions, 5Omni Peak 1-7GHz 10M 5245 pow17 236

Plot 541. Undesirable Emissions, 5Omni Peak 1-7GHz 20M 5170 pow10 237

Plot 542. Undesirable Emissions, 5Omni Peak 1-7GHz 20M 5210 pow19 237

Plot 543. Undesirable Emissions, 5Omni Peak 1-7GHz 20M 5230 pow20 238

Plot 544. Undesirable Emissions, 5Omni Peak 1-7GHz 40M 5170 pow3 238

Plot 545. Undesirable Emissions, 5Omni Peak 1-7GHz 40M 5210 pow21 239

Plot 546. Undesirable Emissions, 5Omni Peak 1-7GHz 40M 5230 pow22 239

Plot 547. Undesirable Emissions, 5Omni Peak 7-18GHz 5M 5170 pow14 240

Plot 548. Undesirable Emissions, 5Omni Peak 7-18GHz 5M 5210 pow14 240

Plot 549. Undesirable Emissions, 5Omni Peak 7-18GHz 5M 5247.5 pow14 241

Plot 550. Undesirable Emissions, 5Omni Peak 7-18GHz 10M 5170 pow17 241

Plot 551. Undesirable Emissions, 5Omni Peak 7-18GHz 10M 5210 pow17 242

Plot 552. Undesirable Emissions, 5Omni Peak 7-18GHz 10M 5245 pow17 242

Plot 553. Undesirable Emissions, 5Omni Peak 7-18GHz 20M 5170 pow10 243

Plot 554. Undesirable Emissions, 5Omni Peak 7-18GHz 20M 5210 pow19 243

Plot 555. Undesirable Emissions, 5Omni Peak 7-18GHz 20M 5230 pow20 244

Plot 556. Undesirable Emissions, 5Omni Peak 7-18GHz 40M 5170 pow3 244

Plot 557. Undesirable Emissions, 5Omni Peak 7-18GHz 40M 5210 pow21 245

Plot 558. Undesirable Emissions, 5Omni Peak 7-18GHz 40M 5230 pow22 245

Plot 559. Undesirable Emissions, 8Omni Avg 1-7GHz 5M 5170 pow12 246

Plot 560. Undesirable Emissions, 8Omni Avg 1-7GHz 5M 5210 pow11 246

Plot 561. Undesirable Emissions, 8Omni Avg 1-7GHz 5M 5247.5 pow11 247



Plot 562. Undesirable Emissions, 8Omni Avg 1-7GHz 10M 5170 pow15 247

Plot 563. Undesirable Emissions, 8Omni Avg 1-7GHz 10M 5210 pow15 248

Plot 564. Undesirable Emissions, 8Omni Avg 1-7GHz 10M 5245 pow15 248

Plot 565. Undesirable Emissions, 8Omni Avg 1-7GHz 20M 5170 pow9 249

Plot 566. Undesirable Emissions, 8Omni Avg 1-7GHz 20M 5210 pow18 249

Plot 567. Undesirable Emissions, 8Omni Avg 1-7GHz 20M 5240 pow18 250

Plot 568. Undesirable Emissions, 8Omni Avg 1-7GHz 40M 5170 pow4 250

Plot 569. Undesirable Emissions, 8Omni Avg 1-7GHz 40M 5210 pow22 251

Plot 570. Undesirable Emissions, 8Omni Avg 1-7GHz 40M 5210 pow22 zoom 251

Plot 571. Undesirable Emissions, 8Omni Avg 1-7GHz 40M 5230 pow22 252

Plot 572. Undesirable Emissions, 8Omni Avg 7-18GHz 5M 5170 pow12 252

Plot 573. Undesirable Emissions, 8Omni Avg 7-18GHz 5M 5210 pow11 253

Plot 574. Undesirable Emissions, 8Omni Avg 7-18GHz 5M 5247.5 pow11 253

Plot 575. Undesirable Emissions, 8Omni Avg 7-18GHz 10M 5170 pow15 254

Plot 576. Undesirable Emissions, 8Omni Avg 7-18GHz 10M 5210 pow15 254

Plot 577. Undesirable Emissions, 8Omni Avg 7-18GHz 10M 5245 pow15 255

Plot 578. Undesirable Emissions, 8Omni Avg 7-18GHz 20M 5170 pow9 255

Plot 579. Undesirable Emissions, 8Omni Avg 7-18GHz 20M 5210 pow18 256

Plot 580. Undesirable Emissions, 8Omni Avg 7-18GHz 20M 5240 pow18 256

Plot 581. Undesirable Emissions, 8Omni Avg 7-18GHz 40M 5170 pow4 257

Plot 582. Undesirable Emissions, 8Omni Avg 7-18GHz 40M 5210 pow22 257

Plot 583. Undesirable Emissions, 8Omni Avg 7-18GHz 40M 5230 pow22 258

Plot 584. Undesirable Emissions, 8Omni Peak 1-7GHz 5M 5170 pow12 258

Plot 585. Undesirable Emissions, 8Omni Peak 1-7GHz 5M 5210 pow11 259

Plot 586. Undesirable Emissions, 8Omni Peak 1-7GHz 5M 5247.5 pow11 259

Plot 587. Undesirable Emissions, 8Omni Peak 1-7GHz 10M 5170 pow15 260

Plot 588. Undesirable Emissions, 8Omni Peak 1-7GHz 10M 5210 pow15 260

Plot 589. Undesirable Emissions, 8Omni Peak 1-7GHz 10M 5245 pow15 261

Plot 590. Undesirable Emissions, 8Omni Peak 1-7GHz 20M 5170 pow9 261

Plot 591. Undesirable Emissions, 8Omni Peak 1-7GHz 20M 5210 pow18 262

Plot 592. Undesirable Emissions, 8Omni Peak 1-7GHz 20M 5240 pow18 262

Plot 593. Undesirable Emissions, 8Omni Peak 1-7GHz 40M 5170 pow4 263

Plot 594. Undesirable Emissions, 8Omni Peak 1-7GHz 40M 5210 pow22 263

Plot 595. Undesirable Emissions, 8Omni Peak 1-7GHz 40M 5210 pow22 zoom 264

Plot 596. Undesirable Emissions, 8Omni Peak 1-7GHz 40M 5230 pow22 264

Plot 597. Undesirable Emissions, 8Omni Peak 7-18GHz 5M 5170 pow12 265

Plot 598. Undesirable Emissions, 8Omni Peak 7-18GHz 5M 5210 pow11 265

Plot 599. Undesirable Emissions, 8Omni Peak 7-18GHz 5M 5247.5 pow11 266

Plot 600. Undesirable Emissions, 8Omni Peak 7-18GHz 10M 5170 pow15 266

Plot 601. Undesirable Emissions, 8Omni Peak 7-18GHz 10M 5210 pow15 267

Plot 602. Undesirable Emissions, 8Omni Peak 7-18GHz 10M 5245 pow15 267

Plot 603. Undesirable Emissions, 8Omni Peak 7-18GHz 20M 5170 pow9 268

Plot 604. Undesirable Emissions, 8Omni Peak 7-18GHz 20M 5210 pow18 268

Plot 605. Undesirable Emissions, 8Omni Peak 7-18GHz 20M 5240 pow18 269

Plot 606. Undesirable Emissions, 8Omni Peak 7-18GHz 40M 5170 pow4 269

Plot 607. Undesirable Emissions, 8Omni Peak 7-18GHz 40M 5210 pow22 270

Plot 608. Undesirable Emissions, 8Omni Peak 7-18GHz 40M 5230 pow22 270

Plot 609. Undesirable Emissions, 90Sector Avg 1-7GHz 5M 5170 pow7 271

Plot 610. Undesirable Emissions, 90Sector Avg 1-7GHz 5M 5210 pow6 271

Plot 611. Undesirable Emissions, 90Sector Avg 1-7GHz 5M 5247.5 pow7 272

Plot 612. Undesirable Emissions, 90Sector Avg 1-7GHz 10M 5170 pow10 272

Plot 613. Undesirable Emissions, 90Sector Avg 1-7GHz 10M 5210 pow9 273

Plot 614. Undesirable Emissions, 90Sector Avg 1-7GHz 10M 5245 pow9 273

Plot 615. Undesirable Emissions, 90Sector Avg 1-7GHz 20M 5170 pow6 274

Plot 616. Undesirable Emissions, 90Sector Avg 1-7GHz 20M 5210 pow12 274

Plot 617. Undesirable Emissions, 90Sector Avg 1-7GHz 20M 5240 pow12 275

Plot 618. Undesirable Emissions, 90Sector Avg 1-7GHz 40M 5170 pow0 275



Plot 619. Undesirable Emissions, 90Sector Avg 1-7GHz 40M 5210 pow16..... 276

Plot 620. Undesirable Emissions, 90Sector Avg 1-7GHz 40M 5210 pow16 zoom..... 276

Plot 621. Undesirable Emissions, 90Sector Avg 1-7GHz 40M 5230 pow16..... 277

Plot 622. Undesirable Emissions, 90Sector Avg 7-18GHz 5M 5170 pow7..... 277

Plot 623. Undesirable Emissions, 90Sector Avg 7-18GHz 5M 5210 pow6..... 278

Plot 624. Undesirable Emissions, 90Sector Avg 7-18GHz 5M 5247.5 pow7..... 278

Plot 625. Undesirable Emissions, 90Sector Avg 7-18GHz 10M 5170 pow10..... 279

Plot 626. Undesirable Emissions, 90Sector Avg 7-18GHz 10M 5210 pow9..... 279

Plot 627. Undesirable Emissions, 90Sector Avg 7-18GHz 10M 5245 pow9..... 280

Plot 628. Undesirable Emissions, 90Sector Avg 7-18GHz 20M 5170 pow6..... 280

Plot 629. Undesirable Emissions, 90Sector Avg 7-18GHz 20M 5210 pow12..... 281

Plot 630. Undesirable Emissions, 90Sector Avg 7-18GHz 20M 5240 pow12..... 281

Plot 631. Undesirable Emissions, 90Sector Avg 7-18GHz 40M 5170 pow0..... 282

Plot 632. Undesirable Emissions, 90Sector Avg 7-18GHz 40M 5210 pow16..... 282

Plot 633. Undesirable Emissions, 90Sector Avg 7-18GHz 40M 5230 pow16..... 283

Plot 634. Undesirable Emissions, 90Sector Peak 1-7GHz 5M 5170 pow7..... 283

Plot 635. Undesirable Emissions, 90Sector Peak 1-7GHz 5M 5210 pow6..... 284

Plot 636. Undesirable Emissions, 90Sector Peak 1-7GHz 5M 5247.5 pow7..... 284

Plot 637. Undesirable Emissions, 90Sector Peak 1-7GHz 10M 5170 pow10..... 285

Plot 638. Undesirable Emissions, 90Sector Peak 1-7GHz 10M 5210 pow9..... 285

Plot 639. Undesirable Emissions, 90Sector Peak 1-7GHz 10M 5245 pow9..... 286

Plot 640. Undesirable Emissions, 90Sector Peak 1-7GHz 20M 5170 pow6..... 286

Plot 641. Undesirable Emissions, 90Sector Peak 1-7GHz 20M 5210 pow12..... 287

Plot 642. Undesirable Emissions, 90Sector Peak 1-7GHz 20M 5230 pow12..... 287

Plot 643. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5170 pow0..... 288

Plot 644. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5210 pow16..... 288

Plot 645. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5230 pow16..... 289

Plot 646. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5170 pow7..... 289

Plot 647. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5210 pow6..... 290

Plot 648. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5247.5 pow7..... 290

Plot 649. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5170 pow10..... 291

Plot 650. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5210 pow9..... 291

Plot 651. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5245 pow9..... 292

Plot 652. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5170 pow6..... 292

Plot 653. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5210 pow12..... 293

Plot 654. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5240 pow12..... 293

Plot 655. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5170 pow0..... 294

Plot 656. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5210 pow16..... 294

Plot 657. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5230 pow16..... 295

Plot 658. Undesirable Emissions, 1 panel..... 295

Plot 659. Undesirable Emissions, 2 panel..... 296

Plot 660. Undesirable Emissions, 3 para..... 296

Plot 661. Undesirable Emissions, 90 Sector..... 297

Plot 662. Undesirable Emissions, Omni 5..... 297

Plot 663. Undesirable Emissions, Omni 8..... 298

Plot 664. Radiated Band Edge, 1Panel, Average, 5M, 5170, pow15..... 299

Plot 665. Radiated Band Edge, 1Panel, Average, 5M, 5247.5, pow22..... 299

Plot 666. Radiated Band Edge, 1Panel, Average, 10M, 5170, pow6..... 299

Plot 667. Radiated Band Edge, 1Panel, Average, 10M, 5245, pow22..... 300

Plot 668. Radiated Band Edge, 1Panel, Average, 20M, 5170, pow-1..... 300

Plot 669. Radiated Band Edge, 1Panel, Average, 20M, 5240, pow22..... 300

Plot 670. Radiated Band Edge, 1Panel, Average, 40M, 5170, pow-10..... 301

Plot 671. Radiated Band Edge, 1Panel, Average, 40M, 5230, pow15..... 301

Plot 672. Radiated Band Edge, 1Panel, Peak, 5M, 5170, pow15..... 301

Plot 673. Radiated Band Edge, 1Panel, Peak, 5M, 5247.5, pow22..... 302

Plot 674. Radiated Band Edge, 1Panel, Peak, 10M, 5170, pow6..... 302

Plot 675. Radiated Band Edge, 1Panel, Peak, 10M, 5245, pow22..... 302



Plot 676. Radiated Band Edge, 1Panel, Peak, 20M, 5170, pow-1 303

Plot 677. Radiated Band Edge, 1Panel, Peak, 20M, 5240, pow22 303

Plot 678. Radiated Band Edge, 1Panel, Peak, 40M, 5170, pow-10 303

Plot 679. Radiated Band Edge, 1Panel, Peak, 40M, 5230, pow15 304

Plot 680. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5210 pow15 bandedge zoom 304

Plot 681. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5210 pow10 bandedge zoom 305

Plot 682. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5230 pow14 bandedge zoom 305

Plot 683. Radiated Band Edge, 2Panel, 2.5M, Average, 5M, 5170, pow9 306

Plot 684. Radiated Band Edge, 2Panel, 2.5M, Average, 5M, 5245.5, pow22 306

Plot 685. Radiated Band Edge, 2Panel, 2.5M, Average, 10M, 5170, pow4 306

Plot 686. Radiated Band Edge, 2Panel, 2.5M, Average, 10M, 5240.5, pow22 307

Plot 687. Radiated Band Edge, 2Panel, 2.5M, Average, 20M, 5170, pow-2 307

Plot 688. Radiated Band Edge, 2Panel, 2.5M, Average, 20M, 5235.5, pow20 307

Plot 689. Radiated Band Edge, 2Panel, 2.5M, Average, 40M, 5170.5, pow-10 308

Plot 690. Radiated Band Edge, 2Panel, 2.5M, Average, 40M, 5230, pow15 308

Plot 691. Radiated Band Edge, 2Panel, 2.5M, Peak, 5M, 5170, pow9 308

Plot 692. Radiated Band Edge, 2Panel, 2.5M, Peak, 5M, 5245.5, pow22 309

Plot 693. Radiated Band Edge, 2Panel, 2.5M, Peak, 10M, 5170, pow4 309

Plot 694. Radiated Band Edge, 2Panel, 2.5M, Peak, 10M, 5240.5, pow22 309

Plot 695. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5170, pow-1 310

Plot 696. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5170, pow-2 310

Plot 697. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5235.5, pow20 310

Plot 698. Radiated Band Edge, 2Panel, 2.5M, Peak, 40M, 5171, pow-10 311

Plot 699. Radiated Band Edge, 2Panel, 2.5M, Peak, 40M, 5230, pow15 311

Plot 700. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5210 pow7 zoom on bandedge 312

Plot 701. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5230 pow10 zoom on bandedge 312

Plot 702. Radiated Band 3Para, 2.5M, Average, 5M, 5170, pow15 313

Plot 703. Radiated Band 3Para, 2.5M, Average, 5M, 5242.5, pow22 313

Plot 704. Radiated Band 3Para, 2.5M, Average, 10M, 5170, pow12 313

Plot 705. Radiated Band 3Para, 2.5M, Average, 10M, 5240.5, pow22 314

Plot 706. Radiated Band 3Para, 2.5M, Average, 10M, 5350 – 5460, pow16 314

Plot 707. Radiated Band 3Para, 2.5M, Average, 20M, 5170, pow6 314

Plot 708. Radiated Band 3Para, 2.5M, Average, 20M, 5237, pow22 315

Plot 709. Radiated Band 3Para, 2.5M, Average, 40M, 5170, pow-10 315

Plot 710. Radiated Band 3Para, 2.5M, Average, 40M, 5230, pow22 315

Plot 711. Radiated Band 3Para, 2.5M, Peak, 5M, 5170, pow15 316

Plot 712. Radiated Band 3Para, 2.5M, Peak, 5M, 5242.5, pow22 316

Plot 713. Radiated Band 3Para, 2.5M, Peak, 10M, 5170, pow12 316

Plot 714. Radiated Band 3Para, 2.5M, Peak, 10M, 5240.5, pow22 317

Plot 715. Radiated Band 3Para, 2.5M, Peak, 20M, 5170, pow6 317

Plot 716. Radiated Band 3Para, 2.5M, Peak, 20M, 5237, pow22 317

Plot 717. Radiated Band 3Para, 2.5M, Peak, 40M, 5171, pow-10 318

Plot 718. Radiated Band 3Para, 2.5M, Peak, 40M, 5230, pow21 318

Plot 719. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5210 pow5 bandedge zoom 319

Plot 720. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5230 pow8 bandedge zoom 319

Plot 721. Radiated Band Edge, 90 Sector, Average, 5M, 5170, pow21 320

Plot 722. Radiated Band Edge, 90 Sector, Average, 5M, 5247.5, pow22 320

Plot 723. Radiated Band Edge, 90 Sector, Average, 10M, 5170, pow13 320

Plot 724. Radiated Band Edge, 90 Sector, Average, 10M, 5245, pow22 321

Plot 725. Radiated Band Edge, 90 Sector, Average, 20M, 5170, pow6 321

Plot 726. Radiated Band Edge, 90 Sector, Average, 20M, 5240, pow22 321

Plot 727. Radiated Band Edge, 90 Sector, Average, 40M, 5170, pow0 322

Plot 728. Radiated Band Edge, 90 Sector, Average, 40M, 5230, pow22 322

Plot 729. Radiated Band Edge, 90 Sector, Peak, 5M, 5170, pow21 322

Plot 730. Radiated Band Edge, 90 Sector, Peak, 5M, 5247.5, pow22 323

Plot 731. Radiated Band Edge, 90 Sector, Peak, 10M, 5170, pow13 323

Plot 732. Radiated Band Edge, 90 Sector, Peak, 10M, 5245, pow22 323



Plot 733. Radiated Band Edge, 90 Sector, Peak, 20M, 5170, pow6.....	324
Plot 734. Radiated Band Edge, 90 Sector, Peak, 20M, 5240, pow22.....	324
Plot 735. Radiated Band Edge, 90 Sector, Peak, 40M, 5170, pow0.....	324
Plot 736. Radiated Band Edge, 90 Sector, Peak, 40M, 5230, pow22.....	325
Plot 737. Radiated Band Edge, 5 Omni, Average, 5M, 5170, pow22.....	326
Plot 738. Radiated Band Edge, 5 Omni, Average, 5M, 5247.5, pow22.....	326
Plot 739. Radiated Band Edge, 5 Omni, Average, 10M, 5170, pow19.....	326
Plot 740. Radiated Band Edge, 5 Omni, Average, 10M, 5245, pow22.....	327
Plot 741. Radiated Band Edge, 5 Omni, Average, 20M, 5170, pow10.....	327
Plot 742. Radiated Band Edge, 5 Omni, Average, 20M, 5240, pow22.....	327
Plot 743. Radiated Band Edge, 5 Omni, Average, 40M, 5170, pow3.....	328
Plot 744. Radiated Band Edge, 5 Omni, Average, 40M, 5230, pow22.....	328
Plot 745. Radiated Band Edge, 5 Omni, Peak, 5M, 5170, pow22.....	328
Plot 746. Radiated Band Edge, 5 Omni, Peak, 5M, 5247.5, pow22.....	329
Plot 747. Radiated Band Edge, 5 Omni, Peak, 10M, 5170, pow19.....	329
Plot 748. Radiated Band Edge, 5 Omni, Peak, 10M, 5245, pow22.....	329
Plot 749. Radiated Band Edge, 5 Omni, Peak, 20M, 5170, pow10.....	330
Plot 750. Radiated Band Edge, 5 Omni, Peak, 20M, 5240, pow22.....	330
Plot 751. Radiated Band Edge, 5 Omni, Peak, 40M, 5171, pow3.....	330
Plot 752. Radiated Band Edge, 5 Omni, Peak, 40M, 5230, pow22.....	331
Plot 753. Radiated Band Edge, Average, 8 Omni, 5M, 5170, pow22.....	332
Plot 754. Radiated Band Edge, 8 Omni, Average, 5M, 5247.5, pow22.....	332
Plot 755. Radiated Band Edge, 8 Omni, Average, 10M, 5170, pow18.....	332
Plot 756. Radiated Band Edge, 8 Omni, Average, 10M, 5245, pow22.....	333
Plot 757. Radiated Band Edge, 8 Omni, Average, 20M, 5170, pow9.....	333
Plot 758. Radiated Band Edge, 8 Omni, Average, 20M, 5240, pow22.....	333
Plot 759. Radiated Band Edge, 8 Omni, Average, 40M, 5171, pow4.....	334
Plot 760. Radiated Band Edge, 8 Omni, Average, 40M, 5230, pow22.....	334
Plot 761. Radiated Band Edge, 8 Omni, Peak, 5M, 5170, pow22.....	334
Plot 762. Radiated Band Edge, 8 Omni, Peak, 5M, 5247.5, pow22.....	335
Plot 763. Radiated Band Edge, 8 Omni, Peak, 10M, 5170, pow18.....	335
Plot 764. Radiated Band Edge, 8 Omni, Peak, 10M, 5245, pow22.....	335
Plot 765. Radiated Band Edge, 8 Omni, Peak, 20M, 5170, pow9.....	336
Plot 766. Radiated Band Edge, 8 Omni, Peak, 20M, 5240, pow22.....	336
Plot 767. Radiated Band Edge, 8 Omni, Peak, 40M, 5171, pow4.....	336
Plot 768. Radiated Band Edge, 8 Omni, Peak, 40M, 5230, pow22.....	337
Plot 769. Conducted Emissions, 1' Panel Neutral.....	346
Plot 770. Conducted Emissions, 1' Panel Phase.....	346
Plot 771. Conducted Emissions, 2' Panel Neutral.....	347
Plot 772. Conducted Emissions, 2' Panel.....	347
Plot 773. Conducted Emissions, 3' Panel Neutral.....	348
Plot 774. Conducted Emissions, 3' Panel Phase.....	348
Plot 775. Conducted Emissions, 5 Omni Neutral.....	349
Plot 776. Conducted Emissions, 5 Omni Phase.....	349
Plot 777. Conducted Emissions, 8 Omni Neutral.....	350
Plot 778. Conducted Emissions, 8 Omni Phase.....	350
Plot 779. Conducted Emissions, 90 Sector Neutral.....	351
Plot 780. Conducted Emissions, 90 Sector Phase.....	351



List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB μ A	Decibels above one microamp
dB μ V	Decibels above one microvolt
dB μ A/m	Decibels above one microamp per meter
dB μ V/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	Kilohertz
kPa	Kilopascal
kV	Kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μ H	Microhenry
μ	Microfarad
μ s	Microseconds
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane



I. Executive Summary



A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Harris Corp- Communication Systems Harris RF-7800W Broadband Ethernet Radio, with the requirements of Part 15, §15.407. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the Harris RF-7800W Broadband Ethernet Radio. Harris Corp- Communication Systems should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Harris RF-7800W Broadband Ethernet Radio, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.407, in accordance with Harris Corp- Communication Systems, purchase order number 57121. All tests were conducted using measurement procedure ANSI C63.4-2014.

FCC Reference	Description	Results
§15.203	Antenna Requirement	Compliant
§15.403(i)	26dB Occupied Bandwidth	Compliant
§15.407 (a)(1)	Maximum Conducted Output Power	Compliant
§15.407 (a)(1)	EIRP Above Elevation Angle	Compliant
§15.407 (a)(1)	Maximum Power Spectral Density	Compliant
§15.407 (b)(1)& (6 - 7)	Undesirable Emissions	Compliant
§15.407(b)(6)	Conducted Emission Limits	Compliant
§15.407(f)	RF Exposure	Compliant

Table 1. Executive Summary of EMC Part 15.407 Compliance Testing



II. Equipment Configuration



A. Overview

MET Laboratories, Inc. was contracted by Harris Corp- Communication Systems to perform testing on the Harris RF-7800W Broadband Ethernet Radio, under Harris Corp- Communication Systems’ purchase order number 57121.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Harris Corp- Communication Systems Harris RF-7800W Broadband Ethernet Radio.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	Harris RF-7800W Broadband Ethernet Radio	
Model(s) Covered:	Harris RF-7800W Broadband Ethernet Radio	
EUT Specifications:	Primary Power: 52 VDC	
	FCC ID: AQZ-RF-7800W-G2	
	Type of Modulations:	QPSK, 16-QAM, 64-QAM, 256-QAM
	Equipment Code:	NII
	Max. RF Output Power:	27.17 dBm
	EUT Frequency Ranges:	5150-5250 MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Type of Filing:	CIIPC	
Evaluated by:	Bradley Jones	
Report Date(s):	June 14, 2018	

Table 2. EUT Summary



B. References

CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
789033 D02 General UNII Test Procedures New Rules v01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.32 dB	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

Table 4. Uncertainty Calculations Summary

E. Description of Test Sample

The Harris Corp- Communication Systems Harris RF-7800W Broadband Ethernet Radio, Equipment Under Test (EUT), is used to provide long-range, high-throughput Ethernet network backhaul in outdoor point-to-point and point-to-multipoint scenarios.

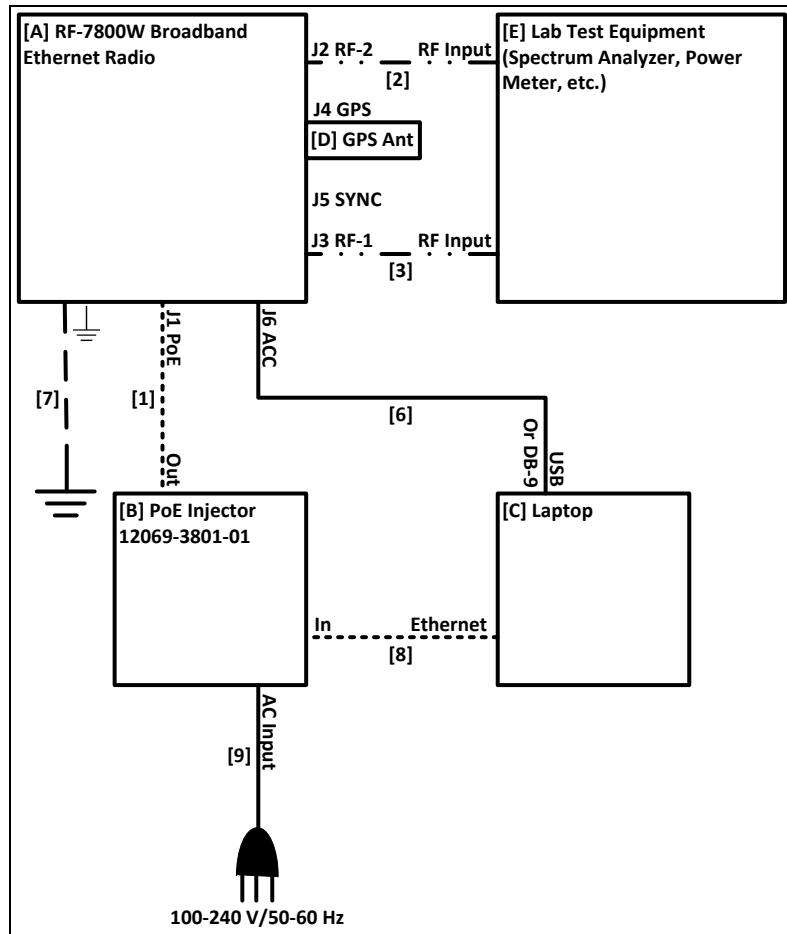


Figure 1. Block Diagram of Test Configuration, Emissions

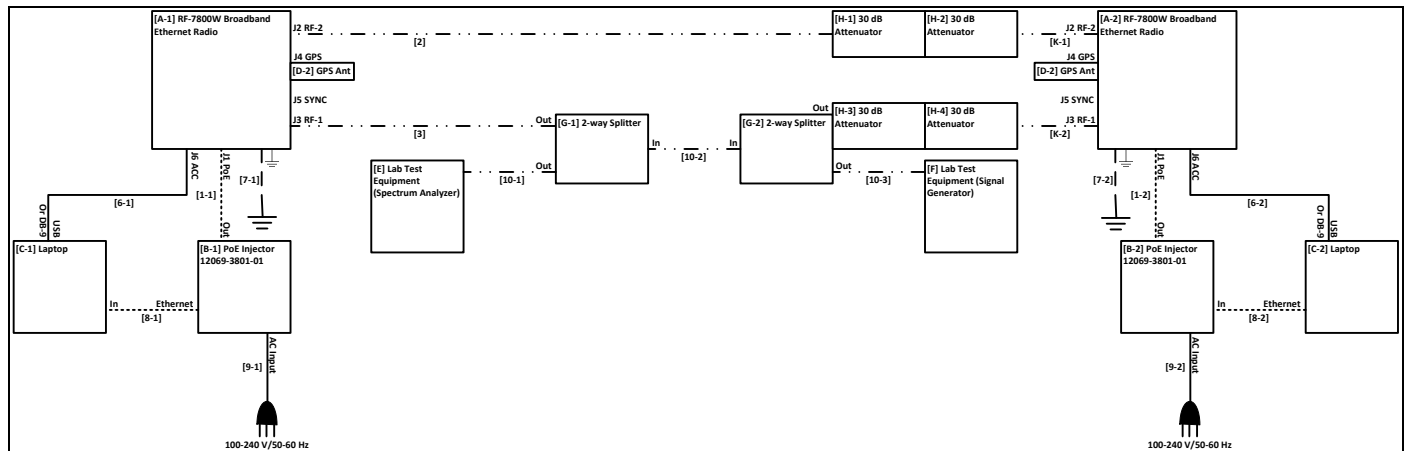


Figure 2. Block Diagram of Test Configuration, DFS



F. Equipment Configuration

The EUT was set up as outlined in Figure 1 and 2. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
A		Broadband Ethernet Radio	RF-7800W-OU501	12069-3010-02	A03392 or A03393	T502C

Table 5. Equipment Configuration

G. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number	*Customer Supplied Calibration Data
B	PoE Injector	Black Box	LPJ001-T	Not Applicable
C	Laptop	Panasonic	CF-29/CF-31	Not Applicable
D	GPS Antenna	Harris	12069-3160-01	Not Applicable
E	Lab Test Equipment (Spectrum Analyzer)			
F	Lab Test Equipment (Signal Generator)			
G	2-way Splitter	Narda	4314B-2	Not Available
H	30 dB Attenuator	Narda	Micro-Pad 4779-30	Not Available
K	N-to-SMA Adaptor			Not Available

The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.

Table 6. Support Equipment



H. Ports and Cabling Information


Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	J1 PoE	Power over Ethernet (Cat6)	1	~30	90	Yes	B.Out
2	J2 RF-2	Coaxial RF (N-to-SMA)	1	12	0.5	Yes	E.RF Input
3	J3 RF-1	Coaxial RF (N-to-SMA)	1	12	0.5	Yes	E.RF Input
4	J4 GPS	Direct connection to GPS Antenna (refer to Ref ID D)	1	N/A	N/A	N/A	D
5	J5 SYNC	Unused, future use	-	N/A	N/A	N/A	N/A
6	J6 ACC	Configuration/Monitoring (Serial Communications)	1	15	90	Yes	C.USB Or C.DB-9
7		Ground Strap	1	0.5	0.5	N/A	Ground
8	In	Ethernet (Cat6)	1	3	100 minus length of Ref ID I	Yes	C.Ethernet
9	N/A	AC Input	1	1.8	2	No	100-240 V/50-60 Hz
10	N/A	Coaxial RF (SMA-to-SMA)	3	1	N/A	Yes	N/A

Table 7. Ports and Cabling Information

I. Mode of Operation

Emissions:

The RF-7800W Broadband Ethernet Radio will be put into constant transmit mode and its RF transmissions will be measured on the lab test equipment (Spectrum Analyzer, Power Meter, etc.).

DFS:

One RF-7800W Broadband Ethernet Radio will be put into Master mode (SPTP SC) and the other will be put into Client mode (SPTP SS).

J. Method of Monitoring EUT Operation

Consistent with the Mode of Operation section above, there needs to be a means of continuously monitoring the operation of the EUT.

Emissions:

1. RF transmissions will be present on the lab test equipment (Spectrum Analyzer, Power Meter, etc.).
2. RF transmissions will not be present on the lab test equipment (Spectrum Analyzer, Power Meter, etc.).

DFS:

1. RF transmissions will not be present on the lab test equipment (Spectrum Analyzer) for the prescribed Non-Occupancy Period, etc., or change to a new operating RF frequency, depending on the configured DFS Action.
2. RF transmissions continue to be present on the lab test equipment (Spectrum Analyzer) during the prescribed Non-Occupancy Period, etc., or do not change to a new operating RF frequency, depending on the configured DFS Action.



K. Modifications

a) **Modifications to EUT**

No modifications were made to the EUT.

b) **Modifications to Test Standard**

No modifications were made to the test standard.

L. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Harris Corp- Communication Systems upon completion of testing.

M. Antenna Key

The plots in this report reference the antennas’ physical description. This table has been added in order to reference the antennas’ model numbers.

Physical Description	Antenna	Type	Mode of Operation
1’ Panel	RF-7800W-AT201	Panel	Point-to-Point (only)
2’ Panel	RF-7800W-AT202	Panel	Point-to-Point (only)
3’ Parabolic	RF-7800W-AT203	Dish	Point-to-Point (only)
8 Omni	RF-7800W-AT206	Omni	Point-to-Multipoint (only)
5 Omni	RF-7800W-AT246	Omni	Point-to-Multipoint (only)
90 degree sector	RF-7800W-AT207	Sector	Point-to-Multipoint (only)

Table 8. Antenna Key



III. Electromagnetic Compatibility Criteria for Intentional Radiators



Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: § 15.203: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

- a.) Antenna must be permanently attached to the unit.
- b.) Antenna must use a unique type of connector to attach to the EUT.
- c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The EUT as tested is compliant the criteria of §15.203.

Antenna Requirement is met because the device and its antennas are going to be professionally installed

Test Engineer(s): Bradley Jones

Test Date(s): November 21, 2017

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 403(i) 26dB Bandwidth

Test Requirements: § 15.403(i): For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

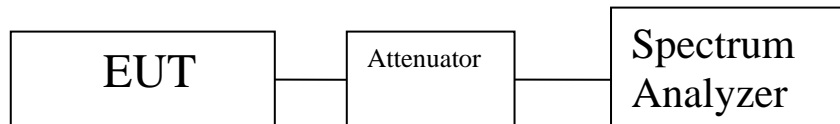
Test Procedure: The transmitter was set to low, mid, and high operating frequencies at the highest output power and connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately equal to 1% of the total emission bandwidth, VBW > RBW. The 26 dB Bandwidth was measured and recorded.

Test Results The 26 dB Bandwidth was compliant with the requirements of this section.

No anomalies detected.

Test Engineer(s): Bradley Jones

Test Date(s): November 21, 2017



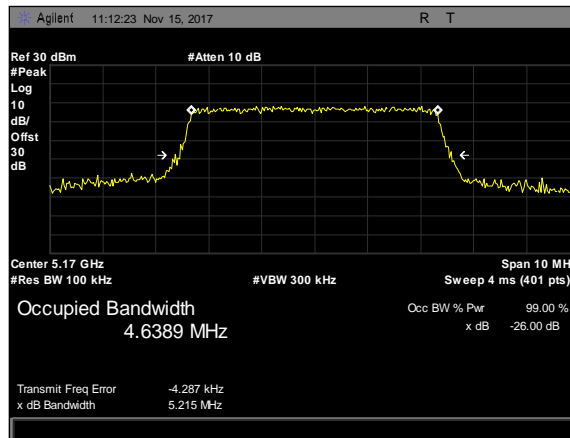


Occupied Bandwidth					
5 Omni			1' Panel		
Bandwidth	Frequency	Occupied bandwidth	Bandwidth	Frequency	Occupied bandwidth
5	5170	5.165	5	5170	5.215
	5210	5.181		5210	5.071
	5247.5	5.139		5242.5	5.129
10	5170	9.927	10	5170	10.248
	5210	10.141		5210	10.073
	5245	10.163		5240.5	10.039
20	5170	20.271	20	5170	20.874
	5210	20.464		5210	20.754
	5240	20.401		5235.5	20.787
40	5170	41.415	40	5170	42.598
	5210	53.166		5210	55.287
	5230	56.546		5230	56.945
8 Omni			2' Panel		
Bandwidth	Frequency	Occupied bandwidth	Bandwidth	Frequency	Occupied bandwidth
5	5170	5.084	5	5170	5.16
	5210	5.143		5210	5.16
	5247.5	5.209		5242.5	5.171
10	5170	10.041	10	5170	9.983
	5210	10.072		5210	10.014
	5245	9.984		5240.5	10.081
20	5170	20.445	20	5170	30
	5210	20.687		5210	20.491
	5240	20.425		5235.5	20.264
40	5170	41.649	40	5170	42.245
	5210	57.801		5210	49.733
	5230	58.214		5230	41.875

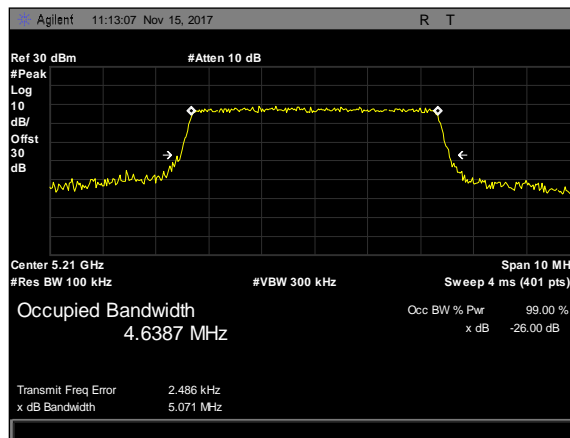


90 Sector			3' Para		
Bandwidth	Frequency	Occupied bandwidth	Bandwidth	Frequency	Occupied bandwidth
5	5170	5.23	5	5170	5.149
	5210	5.233		5210	5.133
	5247.5	5.183		5242.5	5.178
10	5170	10.132	10	5170	9.923
	5210	9.964		5210	10.037
	5245	10.103		5240.5	10.127
20	5170	20.373	20	5170	20.38
	5210	20.346		5210	20.384
	5240	20.592		5235.5	20.578
40	5170	41.595	40	5170	60
	5210	41.786		5210	41.976
	5230	41.845		5230	41.541

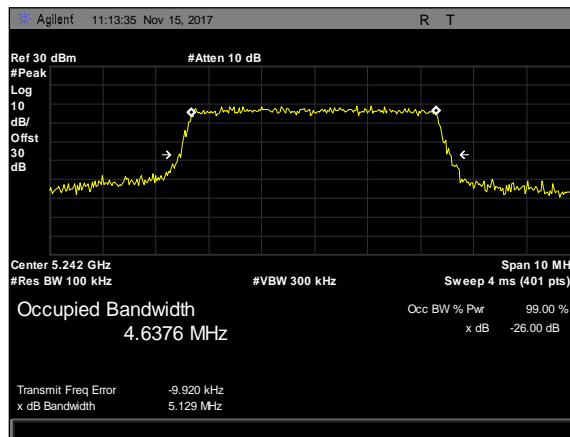
Table 9. 26 dB Occupied Bandwidth, Test Results



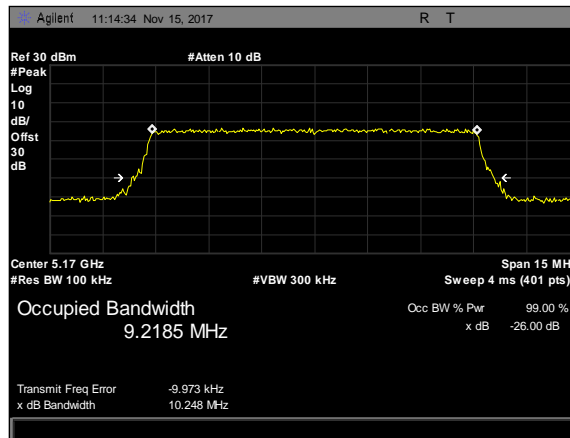
Plot 1. 26 dB Occupied Bandwidth, 5M, 5170, 1'Panel, rf2



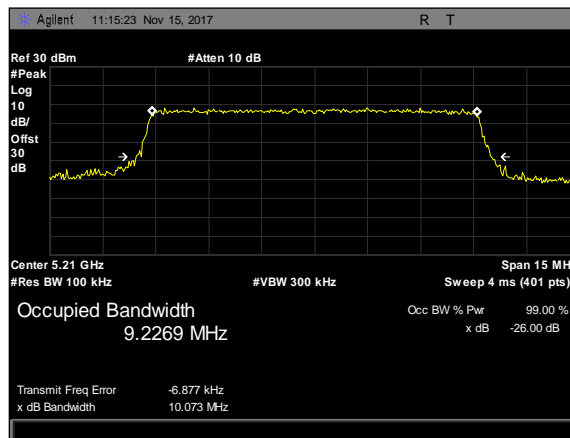
Plot 2. 26 dB Occupied Bandwidth, 5M, 5210, 1'Panel, rf2



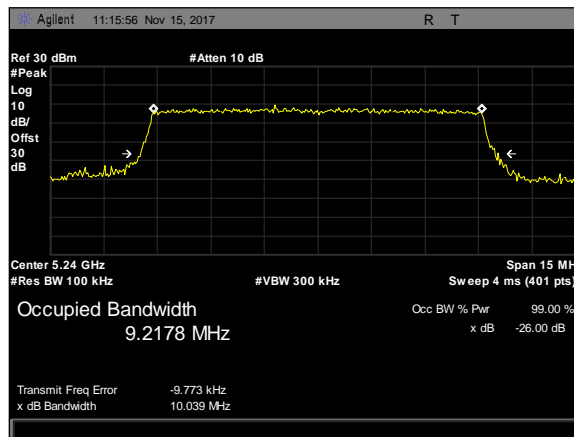
Plot 3. 26 dB Occupied Bandwidth, 5M, 5242.5, 1'Panel, rf2



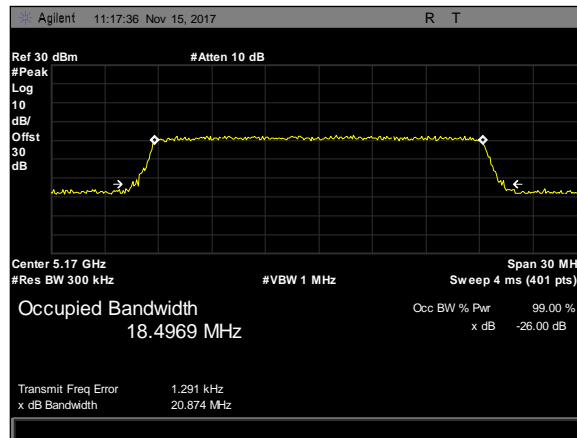
Plot 4. 26 dB Occupied Bandwidth, 10M, 5170, 1'Panel, rf2



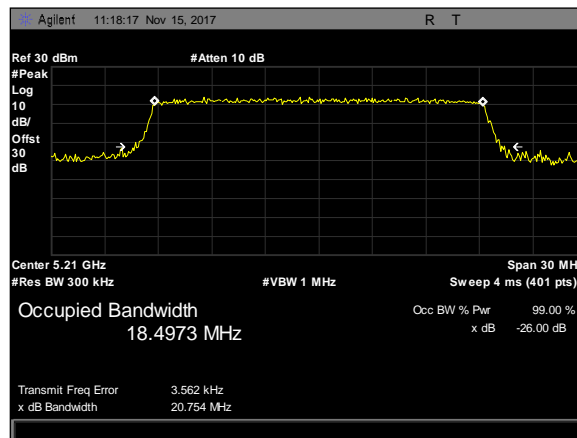
Plot 5. 26 dB Occupied Bandwidth, 10M, 5210, 1'Panel, rf2



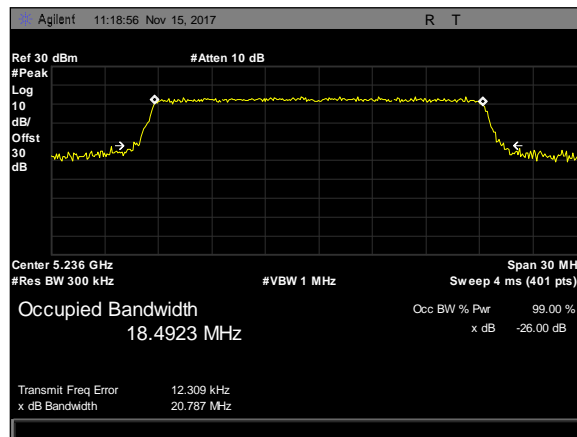
Plot 6. 26 dB Occupied Bandwidth, 10M, 5240.5, 1'Panel, rf2



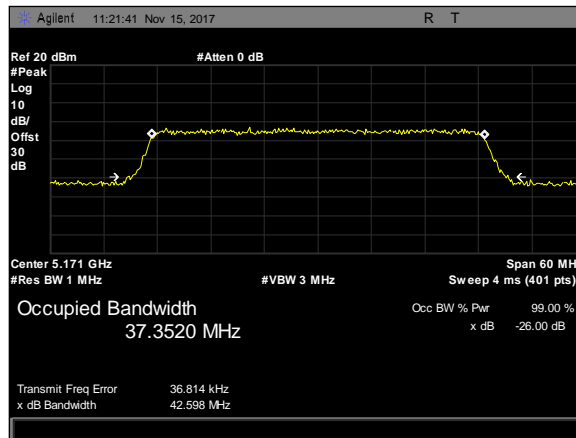
Plot 7. 26 dB Occupied Bandwidth, 20M, 5170, 1'Panel, rf2



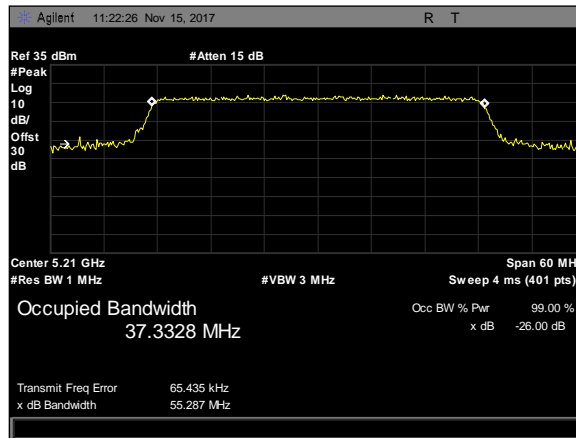
Plot 8. 26 dB Occupied Bandwidth, 20M, 5210, 1'Panel, rf2



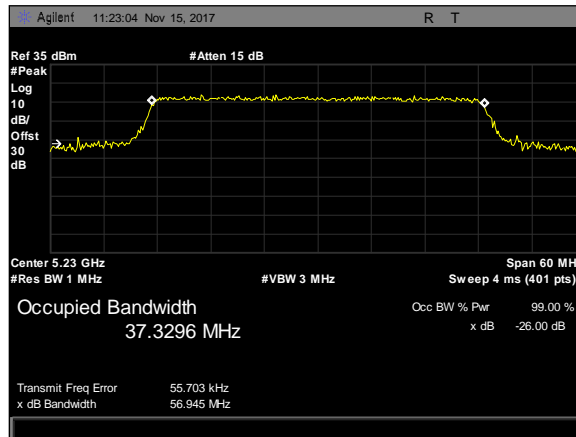
Plot 9. 26 dB Occupied Bandwidth, 20M, 5235.5, 1'Panel, rf2



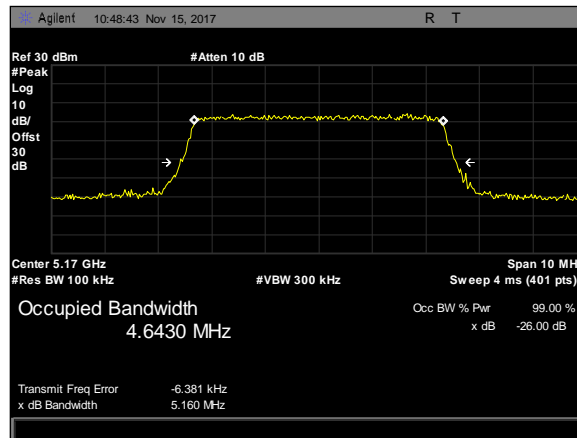
Plot 10. 26 dB Occupied Bandwidth, 40M, 5171, 1'Panel, rf2



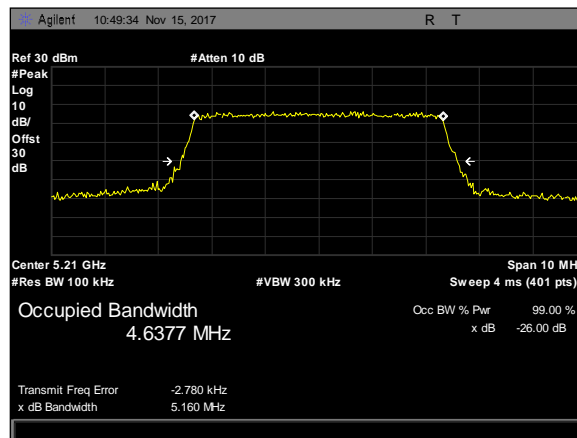
Plot 11. 26 dB Occupied Bandwidth, 40M, 5210, 1'Panel, rf2



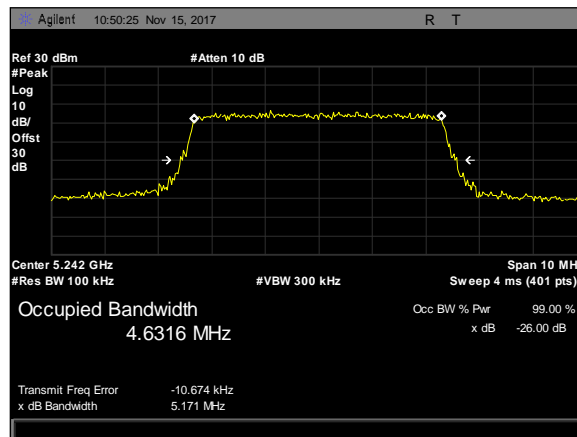
Plot 12. 26 dB Occupied Bandwidth, 40M, 5230, 1'Panel, rf2



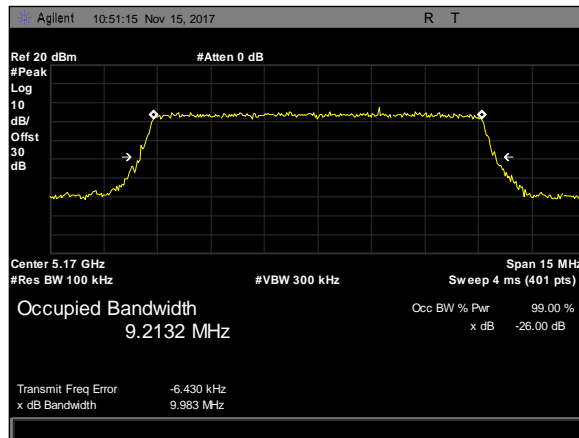
Plot 13. 26 dB Occupied Bandwidth, 5M, 5170, 2'Panel, rf2



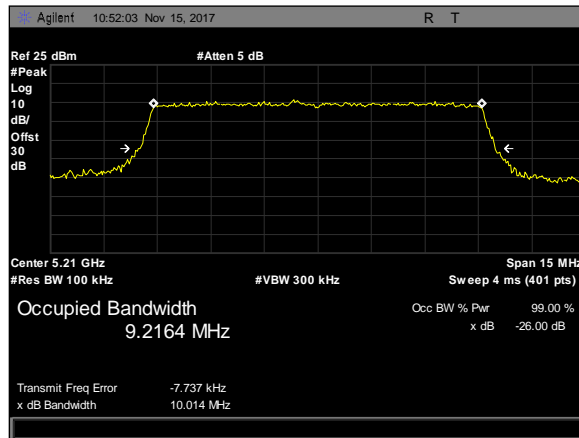
Plot 14. 26 dB Occupied Bandwidth, 5M, 5210, 2'Panel, rf2



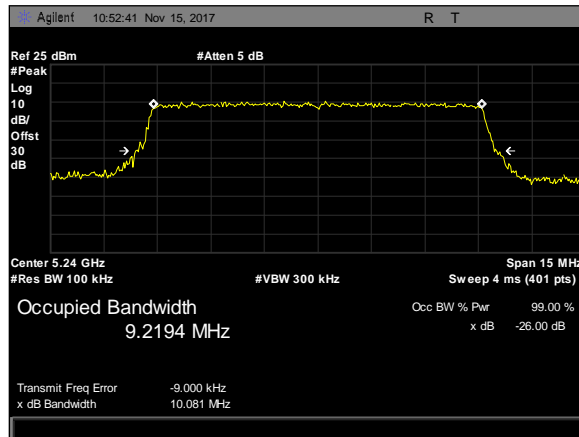
Plot 15. 26 dB Occupied Bandwidth, 5M, 5242.5, 2'Panel, rf2



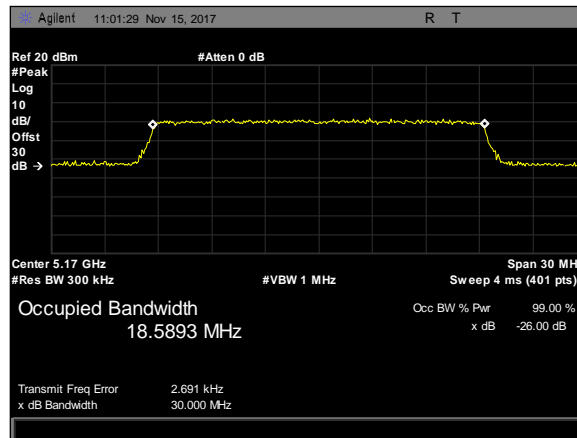
Plot 16. 26 dB Occupied Bandwidth, 10M, 5170, 2'Panel, rf2



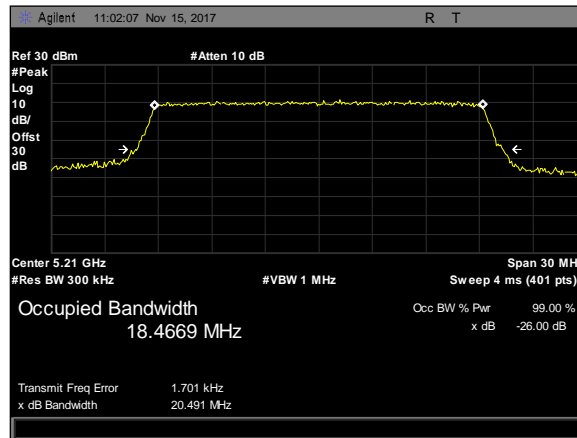
Plot 17. 26 dB Occupied Bandwidth, 10M, 5210, 2'Panel, rf2



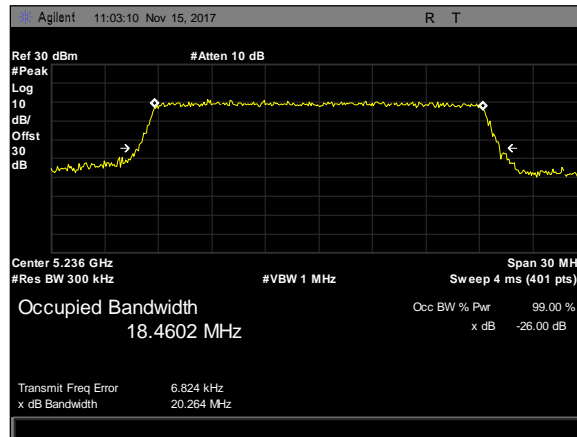
Plot 18. 26 dB Occupied Bandwidth, 10M, 5240.5, 2'Panel, rf2



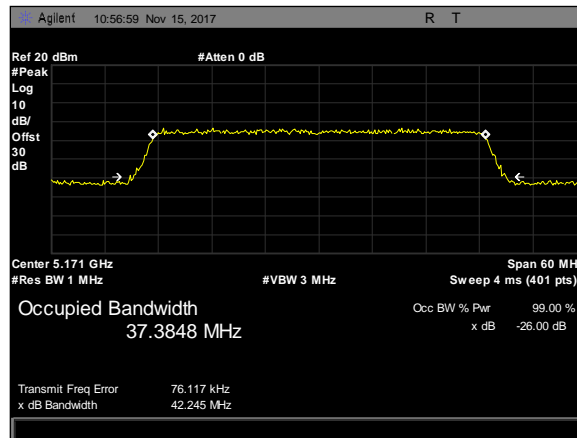
Plot 19. 26 dB Occupied Bandwidth, 20M, 5170, 2'Panel, rf2



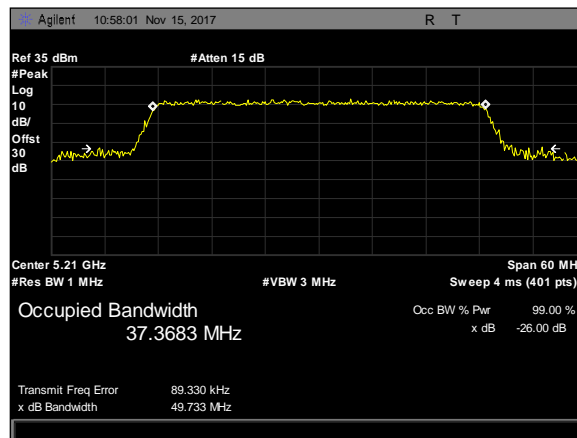
Plot 20. 26 dB Occupied Bandwidth, 20M, 5210, 2'Panel, rf2



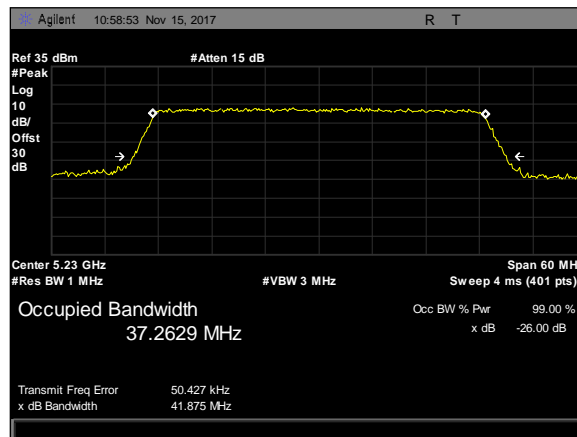
Plot 21. 26 dB Occupied Bandwidth, 20M, 5235.5, 2'Panel, rf2



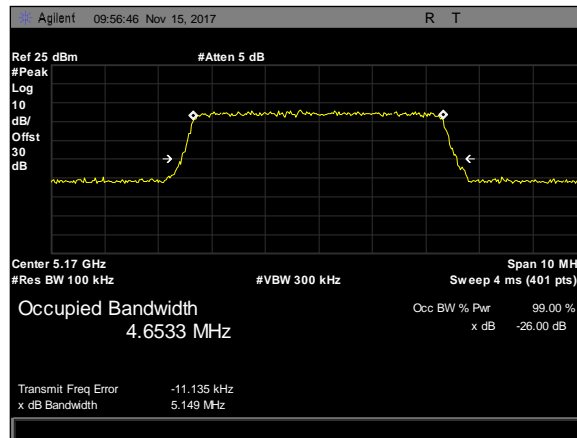
Plot 22. 26 dB Occupied Bandwidth, 40M, 5171, 2'Panel, rf2



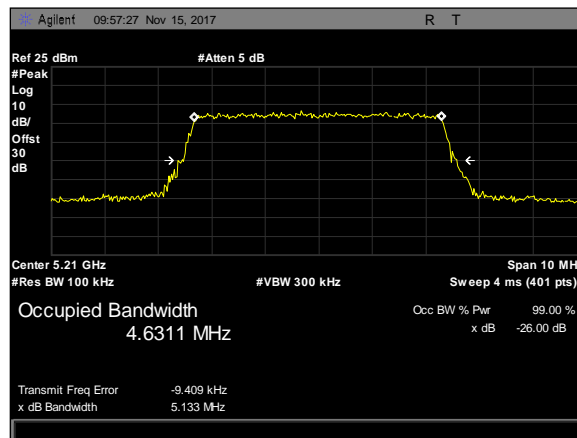
Plot 23. 26 dB Occupied Bandwidth, 40M, 5210, 2'Panel, rf2



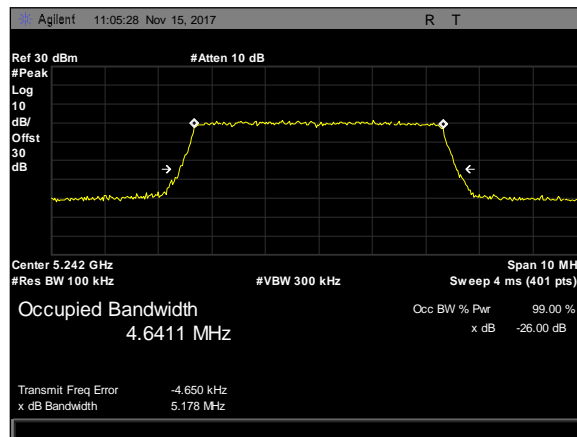
Plot 24. 26 dB Occupied Bandwidth, 40M, 5230, 2'Panel, rf2



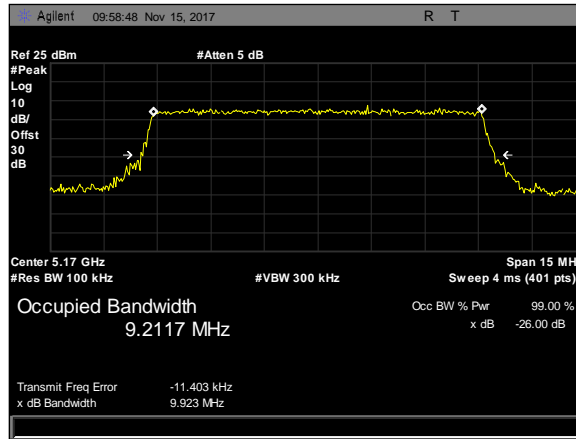
Plot 25. 26 dB Occupied Bandwidth, 5M, 5170, 3'Para, rf2



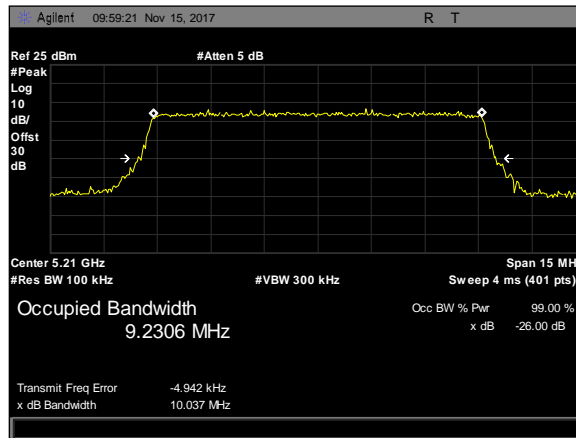
Plot 26. 26 dB Occupied Bandwidth, 5M, 5210, 3'Para, rf2



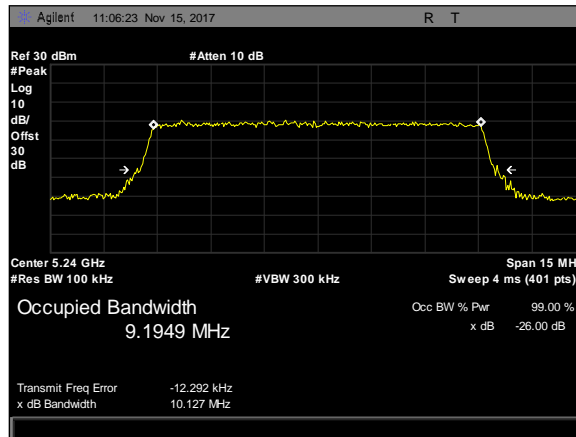
Plot 27. 26 dB Occupied Bandwidth, 5M, 5242.5, 3'Para, rf2



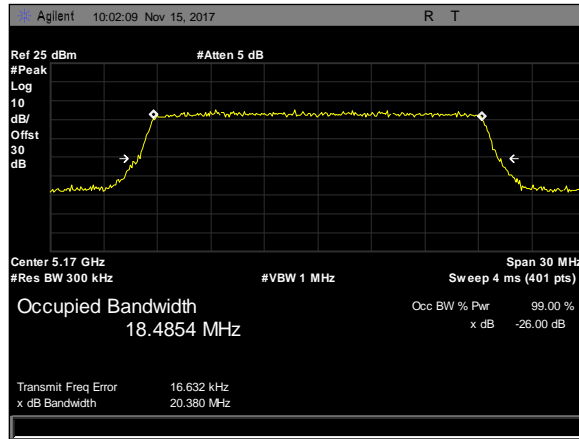
Plot 28. 26 dB Occupied Bandwidth, 10M, 5170, 3'Para, rf2



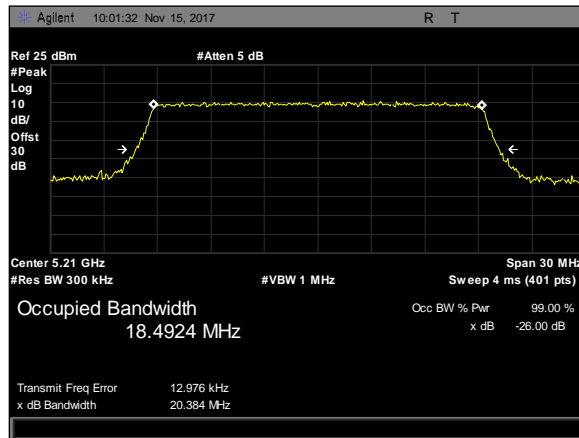
Plot 29. 26 dB Occupied Bandwidth, 10M, 5210, 3'Para, rf2



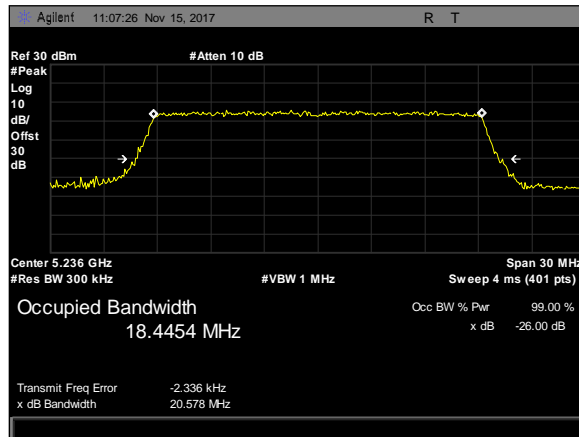
Plot 30. 26 dB Occupied Bandwidth, 10M, 5240.5, 3'Para, rf2



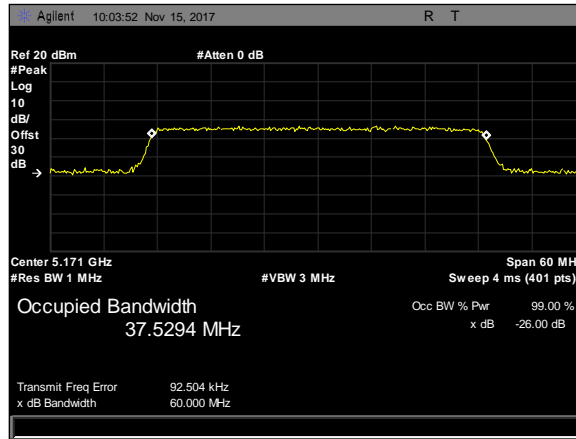
Plot 31. 26 dB Occupied Bandwidth, 20M, 5170, 3'Para, rf2



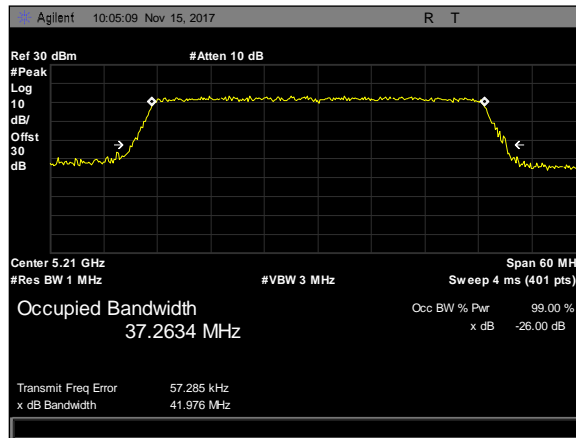
Plot 32. 26 dB Occupied Bandwidth, 20M, 5210, 3'Para, rf2



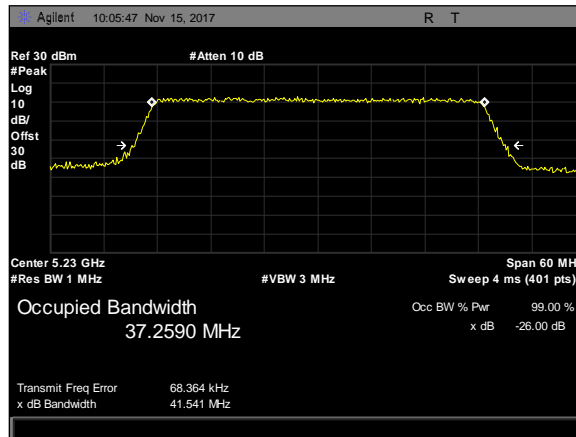
Plot 33. 26 dB Occupied Bandwidth, 20M, 5235.5, 3'Para, rf2



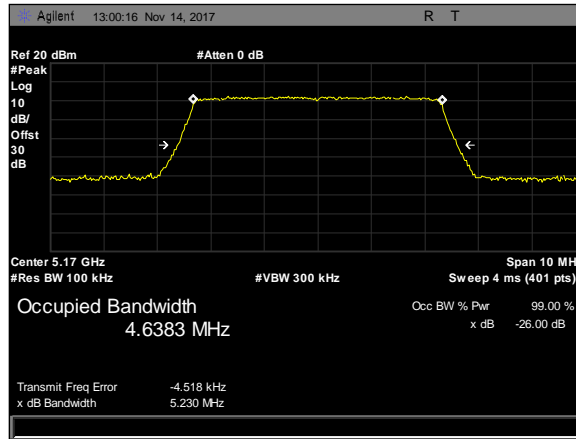
Plot 34. 26 dB Occupied Bandwidth, 40M, 5170, 3'Para, rf2



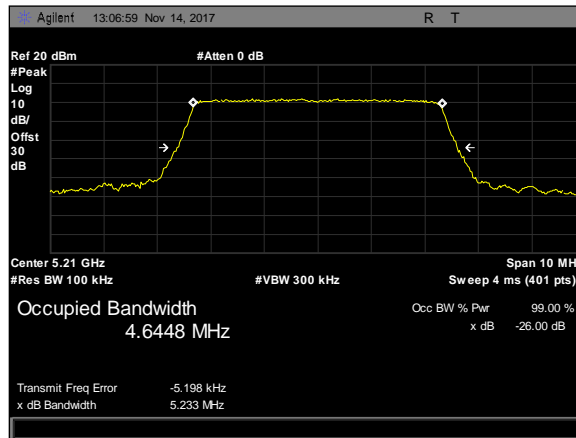
Plot 35. 26 dB Occupied Bandwidth, 40M, 5210, 3'Para, rf2



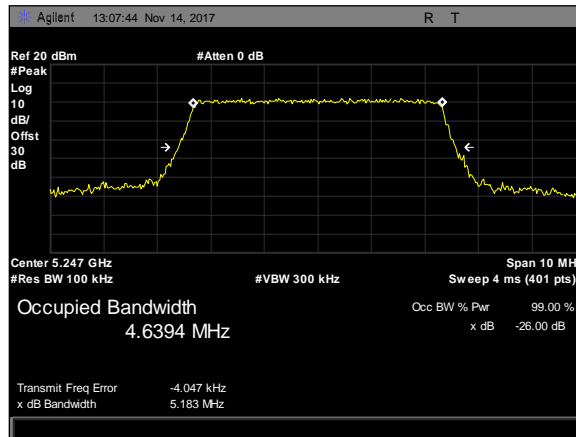
Plot 36. 26 dB Occupied Bandwidth, 40M, 5230, 3'Para, rf2



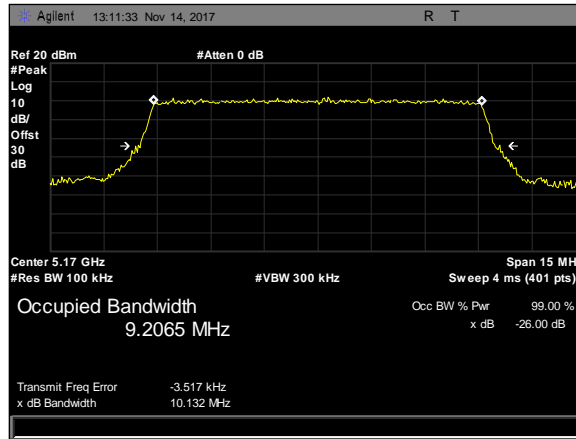
Plot 37. 26 dB Occupied Bandwidth, 5M, 5170, 90Sector, rf2



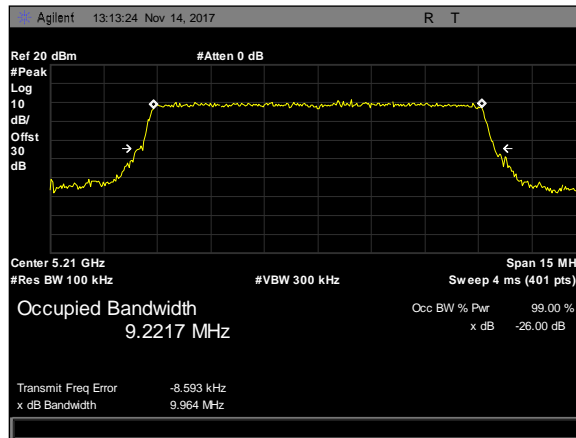
Plot 38. 26 dB Occupied Bandwidth, 5M, 5210, 90Sector, rf2



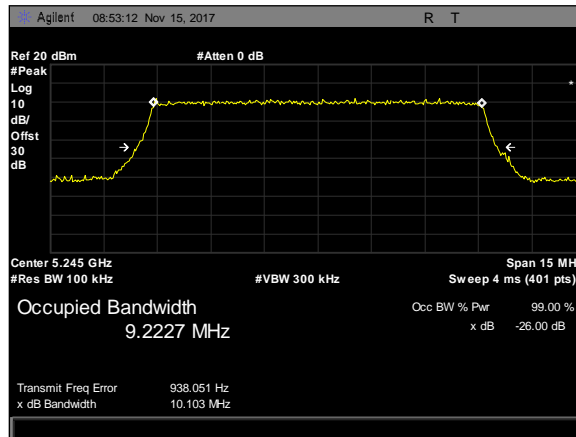
Plot 39. 26 dB Occupied Bandwidth, 5M, 5247.5, 90Sector, rf2



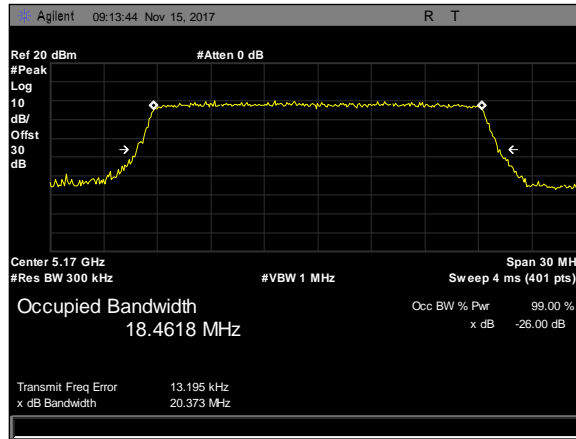
Plot 40. 26 dB Occupied Bandwidth, 10M, 5170, 90Sector, rf2



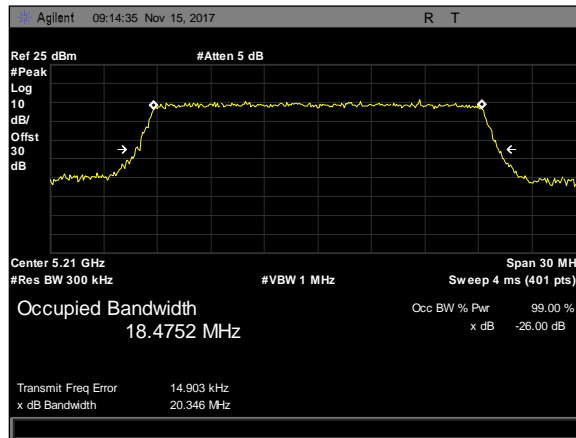
Plot 41. 26 dB Occupied Bandwidth, 10M, 5210, 90Sector, rf2



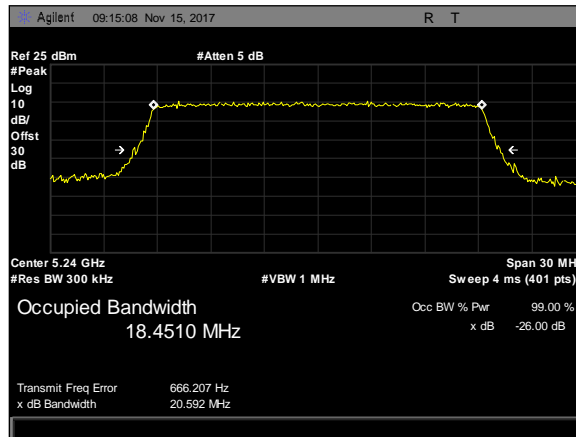
Plot 42. 26 dB Occupied Bandwidth, 10M, 5245, 90Sector, rf2



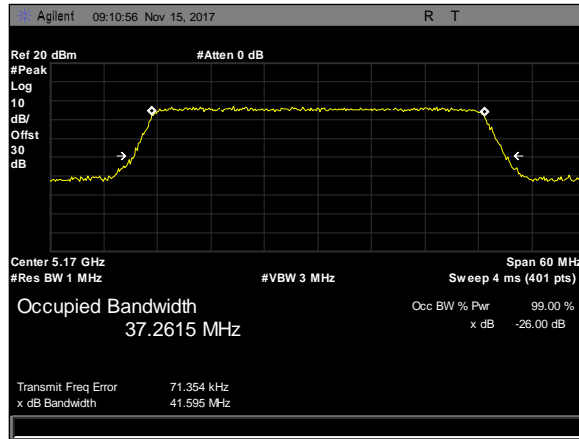
Plot 43. 26 dB Occupied Bandwidth, 20M, 5170, 90Sector, rf2



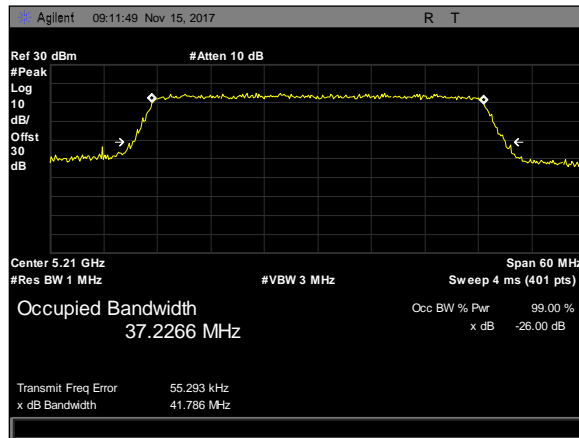
Plot 44. 26 dB Occupied Bandwidth, 20M, 5210, 90Sector, rf2



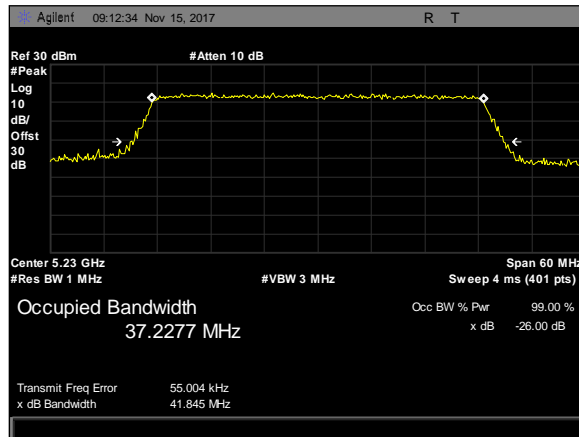
Plot 45. 26 dB Occupied Bandwidth, 20M, 5240, 90Sector, rf2



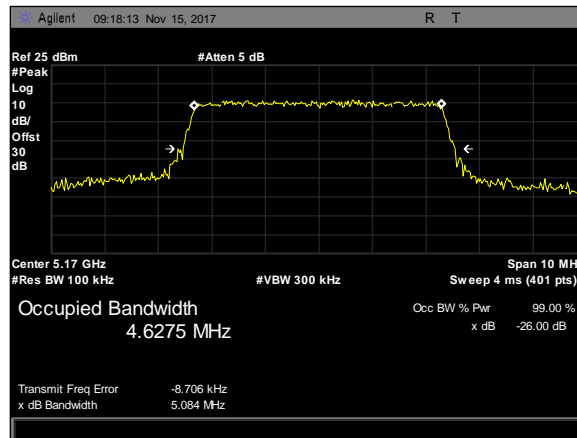
Plot 46. 26 dB Occupied Bandwidth, 40M, 5170, 90Sector, rf2



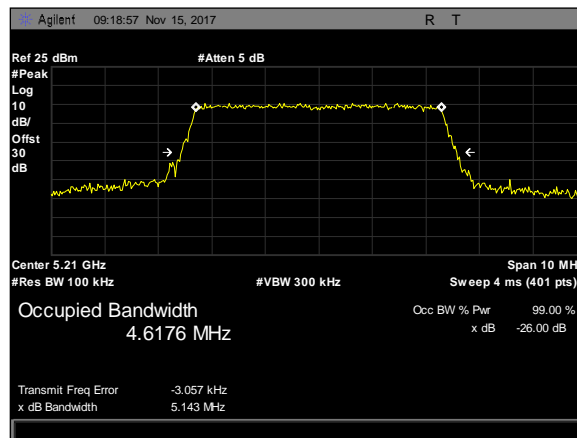
Plot 47. 26 dB Occupied Bandwidth, 40M, 5210, 90Sector, rf2



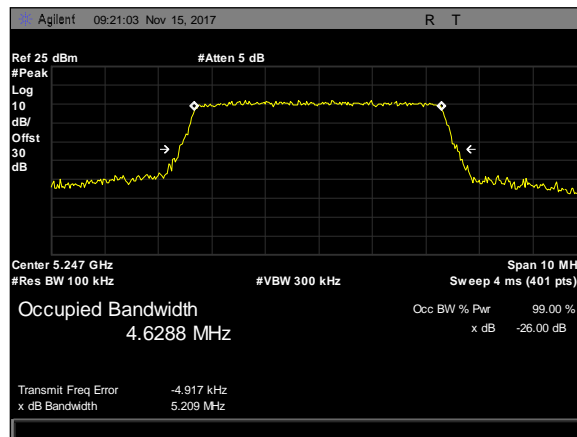
Plot 48. 26 dB Occupied Bandwidth, 40M, 5230, 90Sector, rf2



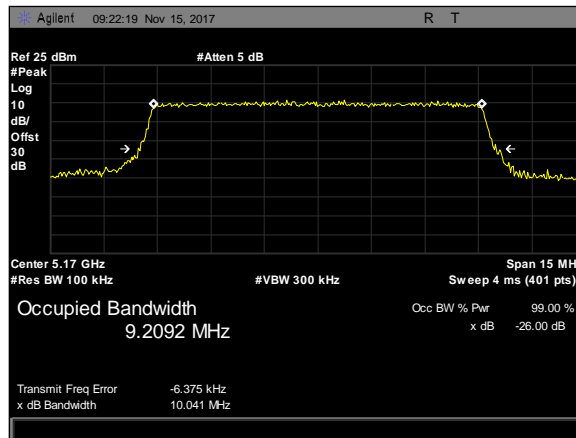
Plot 49. 26 dB Occupied Bandwidth, 5M, 5170, Omni8, rf2



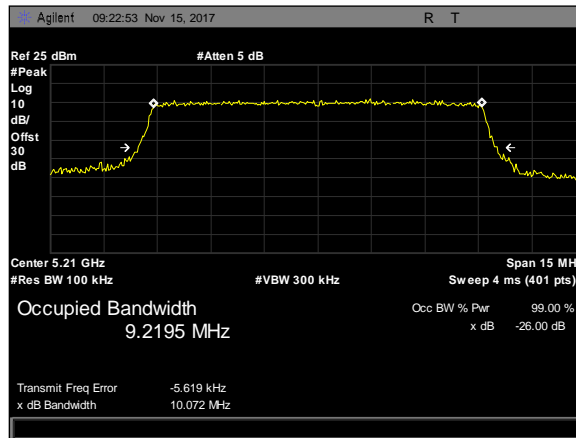
Plot 50. 26 dB Occupied Bandwidth, 5M, 5210, Omni8, rf2



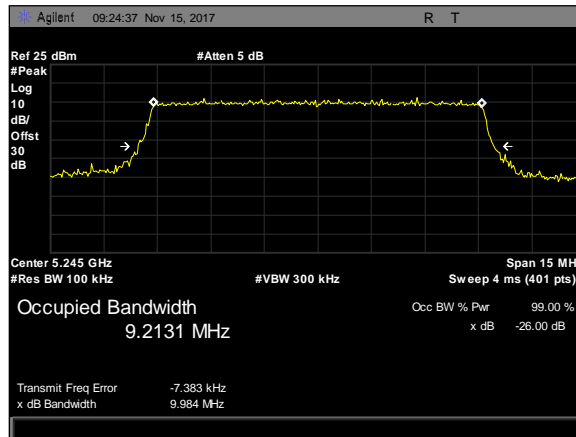
Plot 51. 26 dB Occupied Bandwidth, 5M, 5247.5, Omni8, rf2



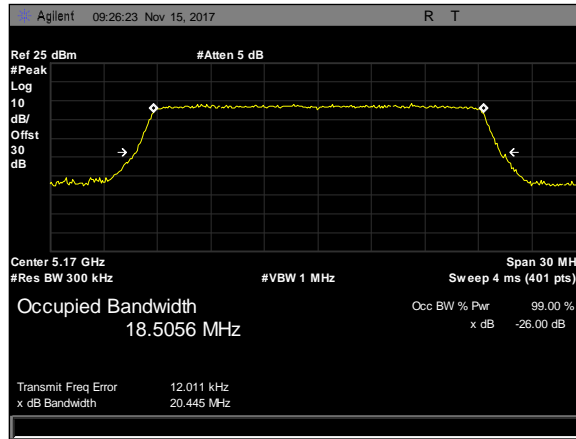
Plot 52. 26 dB Occupied Bandwidth, 10M, 5170, Omni8, rf2



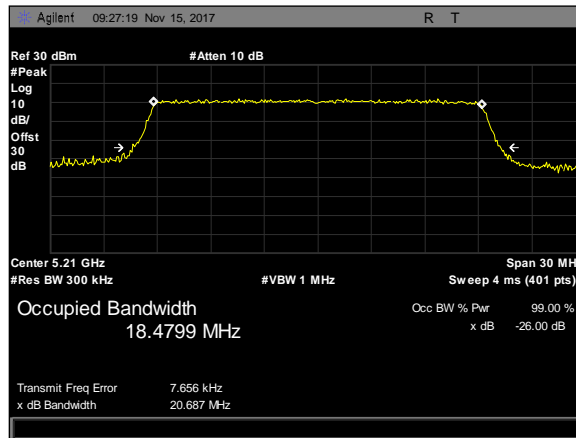
Plot 53. 26 dB Occupied Bandwidth, 10M, 5210, Omni8, rf2



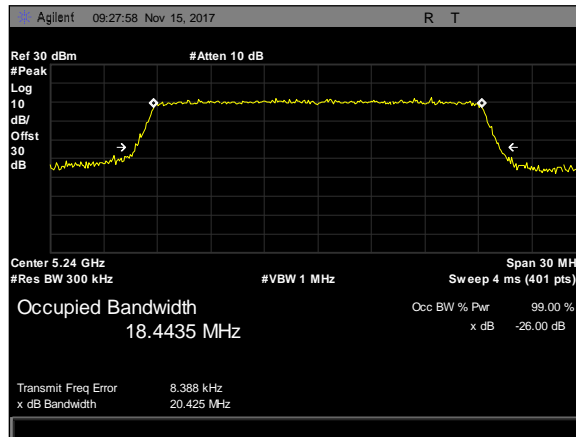
Plot 54. 26 dB Occupied Bandwidth, 10M, 5245, Omni8, rf2



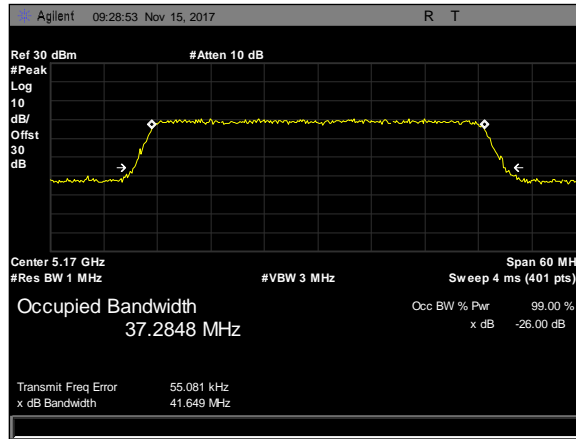
Plot 55. 26 dB Occupied Bandwidth, 20M, 5170, Omni8, rf2



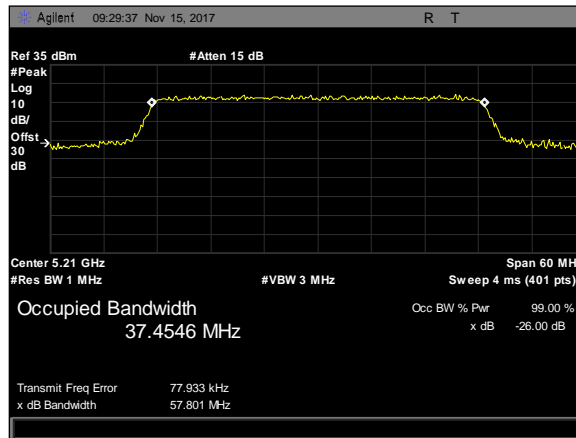
Plot 56. 26 dB Occupied Bandwidth, 20M, 5210, Omni8, rf2



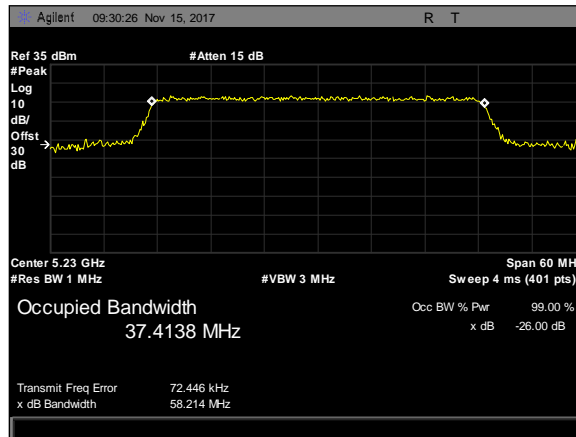
Plot 57. 26 dB Occupied Bandwidth, 20M, 5240, Omni8, rf2



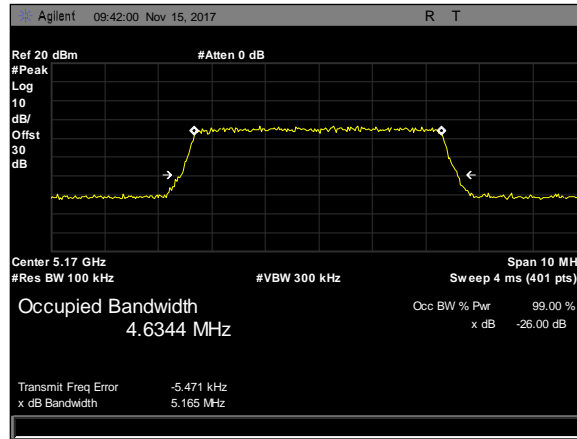
Plot 58. 26 dB Occupied Bandwidth, 40M, 5170, Omni8, rf2



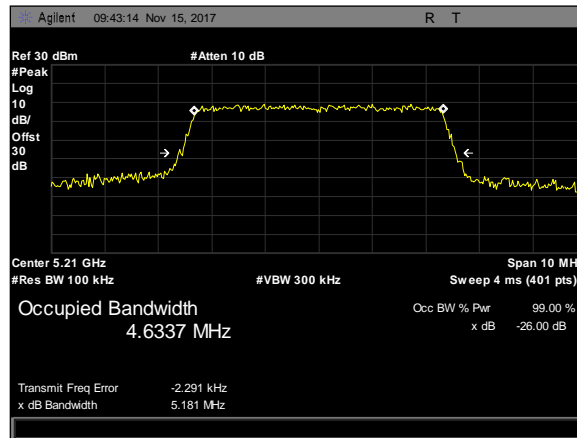
Plot 59. 26 dB Occupied Bandwidth, 40M, 5210, Omni8, rf2



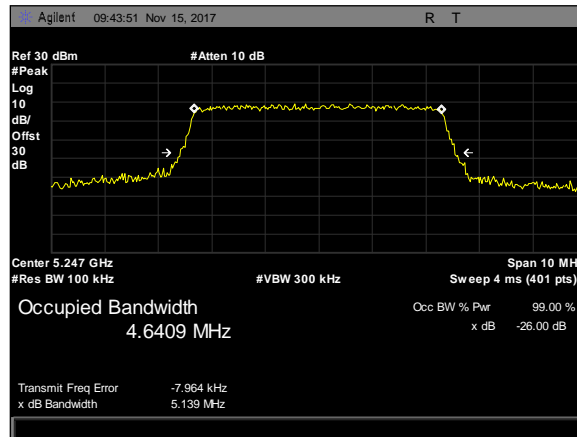
Plot 60. 26 dB Occupied Bandwidth, 40M, 5230, Omni8, rf2



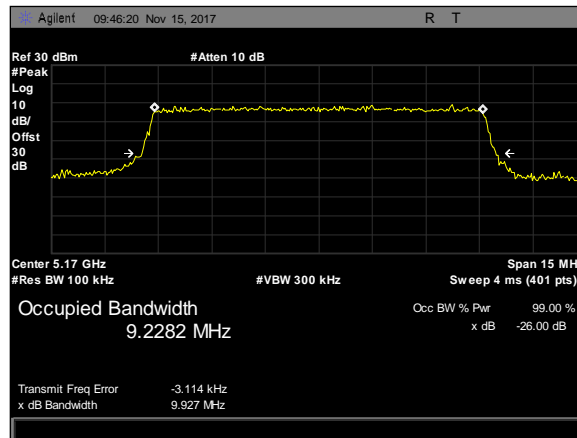
Plot 61. 26 dB Occupied Bandwidth, 5M, 5170, 50Omni, rf2



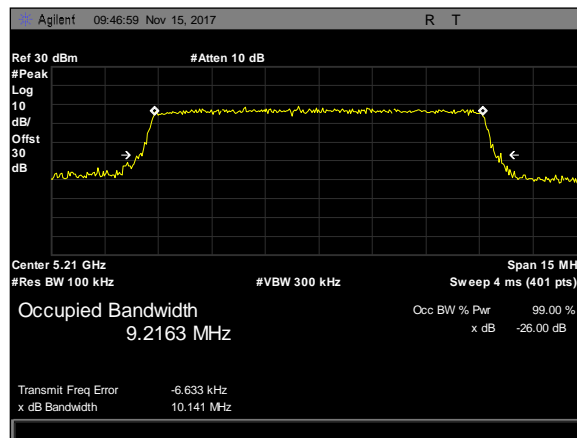
Plot 62. 26 dB Occupied Bandwidth, 5M, 5210, 50Omni, rf2



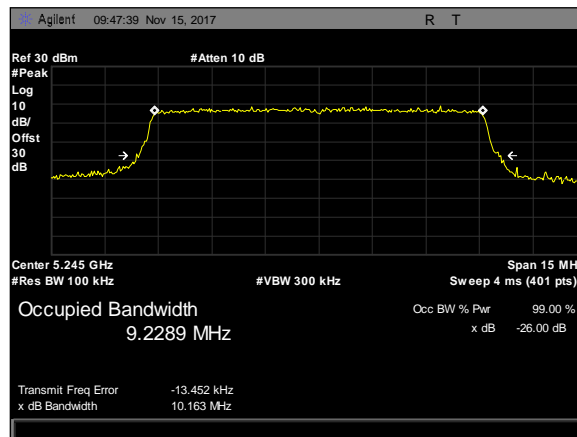
Plot 63. 26 dB Occupied Bandwidth, 5M, 5247.5, 50Omni, rf2



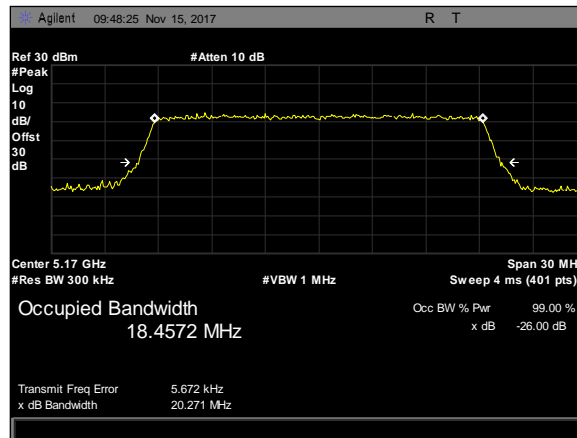
Plot 64. 26 dB Occupied Bandwidth, 10M, 5170, 50Omni, rf2



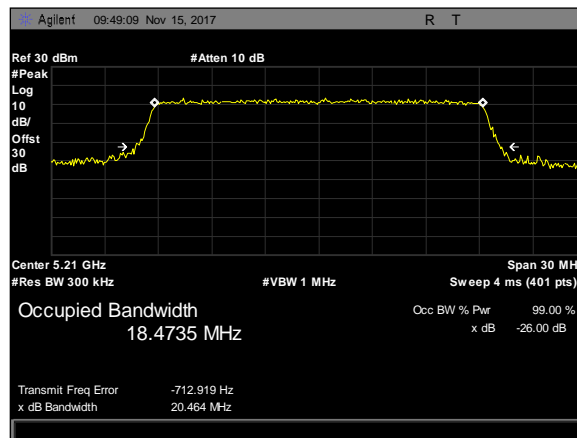
Plot 65. 26 dB Occupied Bandwidth, 10M, 5210, 50Omni, rf2



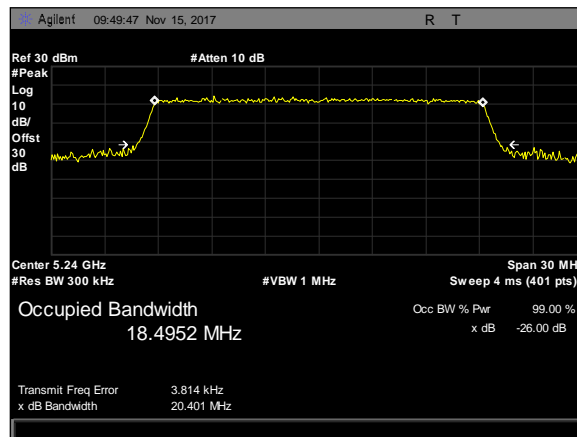
Plot 66. 26 dB Occupied Bandwidth, 10M, 5245, 50Omni, rf2



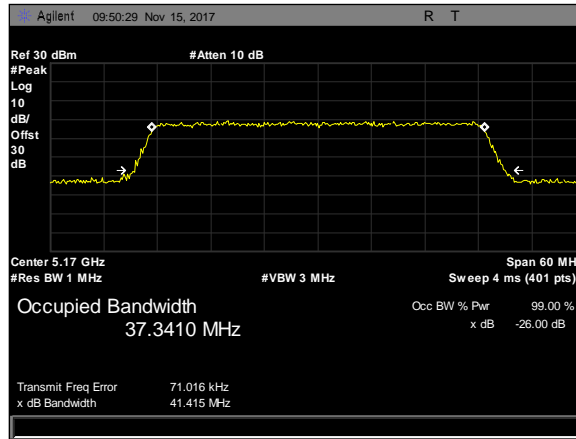
Plot 67. 26 dB Occupied Bandwidth, 20M, 5170, 50Omni, rf2



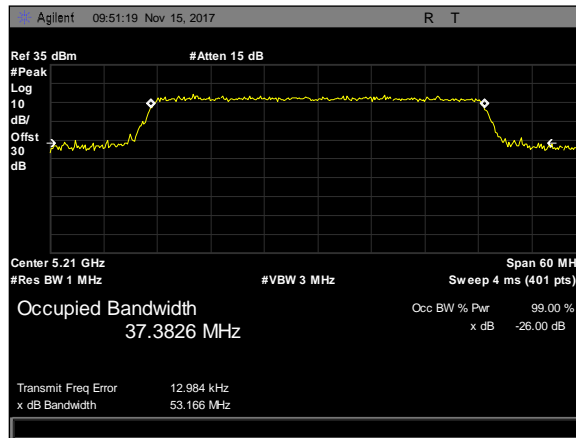
Plot 68. 26 dB Occupied Bandwidth, 20M, 5210, 50Omni, rf2



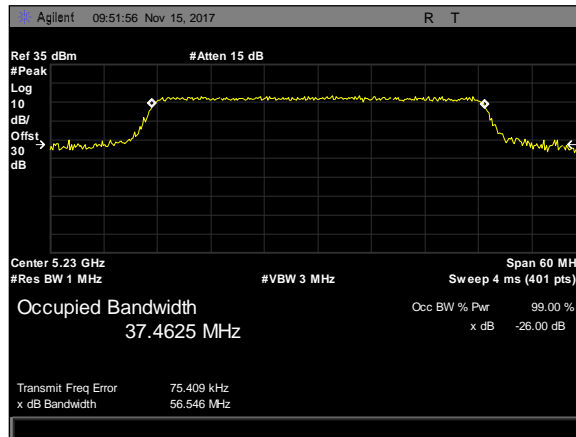
Plot 69. 26 dB Occupied Bandwidth, 20M, 5240, 50Omni, rf2



Plot 70. 26 dB Occupied Bandwidth, 40M, 5170, 50Omni, rf2



Plot 71. 26 dB Occupied Bandwidth, 40M, 5210, 50Omni, rf2



Plot 72. 26 dB Occupied Bandwidth, 40M, 5230, 50Omni, rf2

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(a)(1) Maximum Conducted Output Power

Test Requirements: §15.407(a)(1)(i): For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(a)(1)(ii): For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(a)(1)(iii): For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

§15.407(a)(1)(iv): For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according to measurement method SA-1, as described in 789033 D02 General UNII Test Procedures v01.

Test Results: The EUT as tested is compliant with the requirements of this section.

No anomalies detected.

Test Engineer(s): Bradley Jones

Test Date(s): November 21, 2017





Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	15.55	15.52	21.91774754	5	30	-8.082252456
5210	16.05	15.74	22.28048703	5	30	-7.719512967
5247.5	15.85	15.59	22.10466703	5	30	-7.895332966
10 MHz						
5170	18.7	18.58	25.02313609	5	30	-4.976863908
5210	19.25	18.83	25.42779686	5	30	-4.572203137
5245	18.98	18.68	25.21531153	5	30	-4.784688467
20 MHz						
5170	11.89	11.87	18.26273315	5	30	-11.73726685
5210	19.46	19.44	25.83273315	5	30	-4.167266847
5240	19.09	18.35	25.11846381	5	30	-4.881536195
40MHz						
5170	2.99	2.21	9.000209314	5	30	-20.99979069
5210	19.29	18.3	25.20587032	5	30	-4.794129682
5230	19.36	19.07	25.60014178	5	30	-4.399858217

Table 10. Maximum Conducted Output Power, 5' Omni, Test Results

Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	13.6	13.68	20.02290584	8	28	-7.977094156
5210	13.2	12.52	19.25601701	8	28	-8.743982991
5247.5	13.91	13.3	19.99842275	8	28	-8.001577253
10 MHz						
5170	16.62	16.61	22.99772452	8	28	-5.002275482
5210	16.98	16.79	23.2687606	8	28	-4.731239402
5245	16.96	16.6	23.16645076	8	28	-4.83354924
20 MHz						
5170	10.76	10.89	17.20820804	8	28	-10.79179196
5210	19.98	19.83	26.28836921	8	28	-1.71163079
5240	20	19.88	26.32313609	8	28	-1.676863908
40MHz						
5170	3	2.93	9.347862672	8	28	-18.65213733
5210	20.76	20.77	27.14772452	8	28	-0.852275482
5230	20.87	20.71	27.17345843	8	28	-0.826541575

Table 11. Maximum Conducted Transmitter Power, 8 Omni, Test Results



Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	7.62	7.1	13.75049973	14	22	-8.249500267
5210	8.19	7.87	14.41566828	14	22	-7.584331718
5247.5	7.14	7.04	13.47300946	14	22	-8.526990543
10 MHz						
5170	9.5	9.34	15.80345843	14	22	-6.196541575
5210	11.22	10.94	17.46497778	14	22	-4.535022217
5245	11.18	10.85	17.40085528	14	22	-4.59914472
20 MHz						
5170	7.96	7.64	14.18566828	14	22	-7.814331718
5210	14.16	13.75	20.34255815	14	22	-1.657441849
5240	14.17	13.7	20.32407655	14	22	-1.675923447
40MHz						
5170	-0.98	-1.24	5.274667034	14	22	-16.72533297
5210	14.44	14.59	20.89836921	14	22	-1.10163079
5230	15.36	15.08	21.60497778	14	22	-0.395022217

Table 12. Maximum Conducted Transmitter Power, 90 Sector, Test Results

Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	7.23	7.63	11.14978698	21	30	-18.85021302
5210	9.58	9.54	15.94276769	21	30	-14.05723231
5242.5	9.57	9.46	15.8980699	21	30	-14.1019301
10 MHz						
5170	7.16	6.87	13.40014178	21	30	-16.59985822
5210	9.68	9.37	15.91048703	21	30	-14.08951297
5240.5	9.74	8.77	15.66474682	21	30	-14.33525318
20 MHz						
5170	-0.83	-1.18	5.38124652	21	30	-24.61875348
5210	9.5	8.91	15.59773307	21	30	-14.40226693
5235.5	9.64	9.02	15.72377618	21	30	-14.27622382
40MHz						
5171	-11.7	-11.3	-5.13354924	21	30	-35.13354924
5210	8.88	8.62	15.13466703	21	30	-14.86533297
5230	9.86	8.55	15.63692884	21	30	-14.36307116

Table 13. Maximum Conducted Transmitter Power, 1' Panel, Test Results

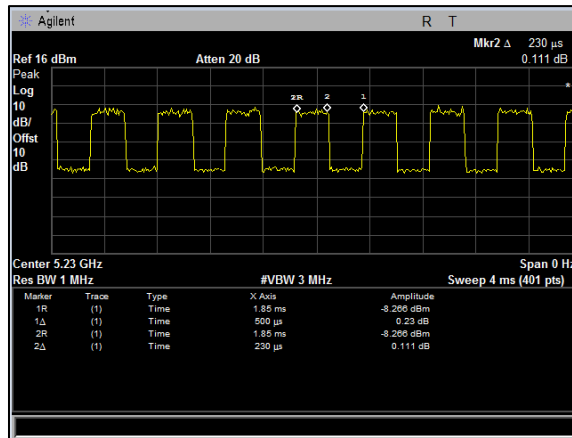


Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	-0.77	-1.43	5.295247169	26	27	-21.70475283
5210	2.44	2.5	8.852825255	26	27	-18.14717474
5247.5	2.74	2.14	8.833075043	26	27	-18.16692496
10 MHz						
5170	1.46	0.92	7.581109161	26	27	-19.41889084
5210	6.98	6.55	13.15304132	26	27	-13.84695868
5240.5	5.9	4.8	11.76745554	26	27	-15.23254446
20 MHz						
5170	0.32	-0.88	6.144036992	26	27	-20.85596301
5210	7.77	7.39	13.96687648	26	27	-13.03312352
5235.5	8.76	8.22	14.88110916	26	27	-12.11889084
40MHz						
5171	-11.6	-12.1	-5.46293369	26	27	-32.46293369
5210	5.94	5.29	12.00987083	26	27	-14.99012917
5230	9.03	8.17	15.00397435	26	27	-11.99602565

Table 14. Maximum Conducted Transmitter Power, 2' Panel, Test Results

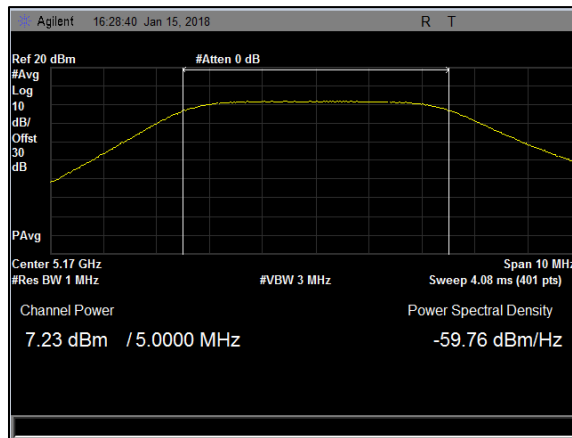
Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	OP Margin
5 MHz						
5170	-3.03	-3.63	3.063075043	30	23	-19.93692496
5210	1.48	-0.89	6.837421927	30	23	-16.16257807
5242.5	1.28	0.94	7.496048026	30	23	-15.50395197
10 MHz						
5170	0.54	-0.47	6.44701655	30	23	-16.55298345
5210	5.18	4.3	11.14497264	30	23	-11.85502736
5240.5	4.73	3.91	10.72204619	30	23	-12.27795381
20 MHz						
5170	0.68	-0.44	6.538726565	30	23	-16.46127343
5210	6.73	6.17	12.84174153	30	23	-10.15825847
5235.5	6.98	6.07	12.9315128	30	23	-10.0684872
40MHz						
5170	-11.7	-11.7	-5.33227548	30	23	-28.33227548
5210	3.77	3.46	10.00048703	30	23	-12.99951297
5230	6.64	6.28	12.84645076	30	23	-10.15354924

Table 15. Maximum Conducted Transmitter Power, 3' Para, Test Results

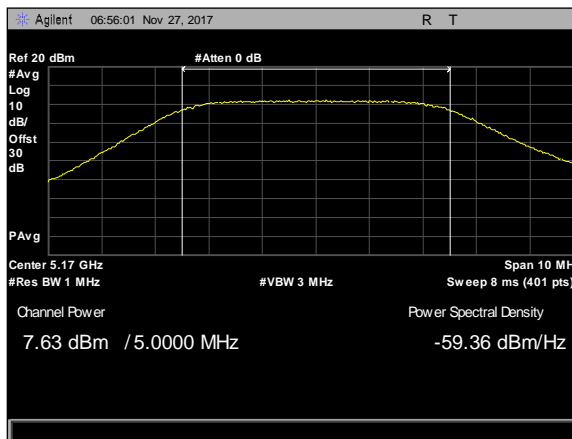


Plot 73. Duty Cycle

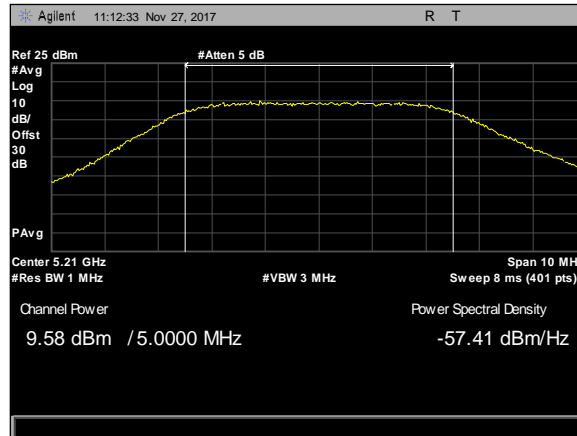
Note: Device is not capable of continuous transmission. The duty cycle was measured, and a correction factor was applied. The correction factor was calculated as $10\log(1/230/500) = 3.372$ dB.



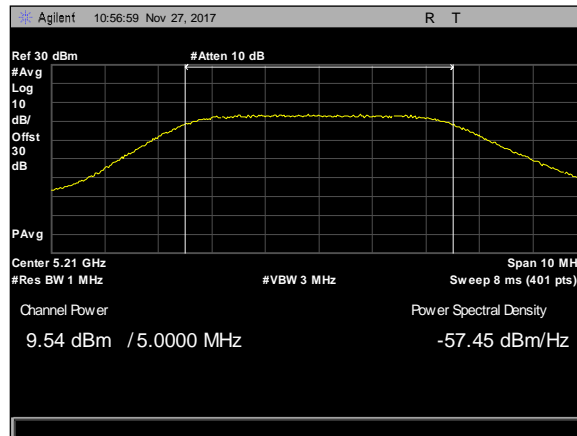
Plot 74. Maximum Conducted Output Power, 5M, 5170, 1Panel, rf1



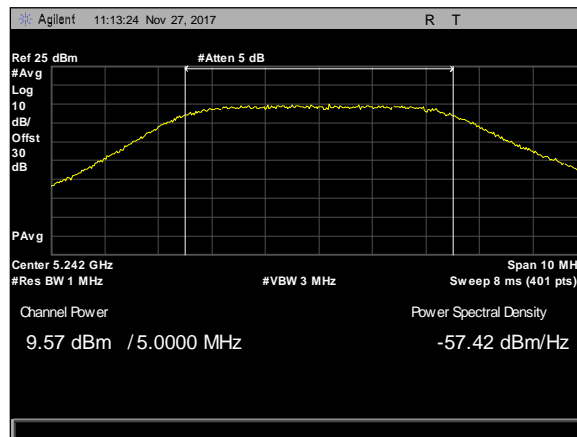
Plot 75. Maximum Conducted Output Power, 5M, 5170, 1Panel, rf2



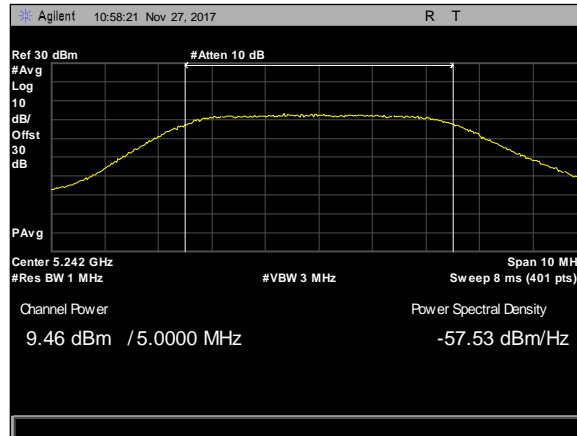
Plot 76. Maximum Conducted Output Power, 5M, 5210, 1Panel, rf1



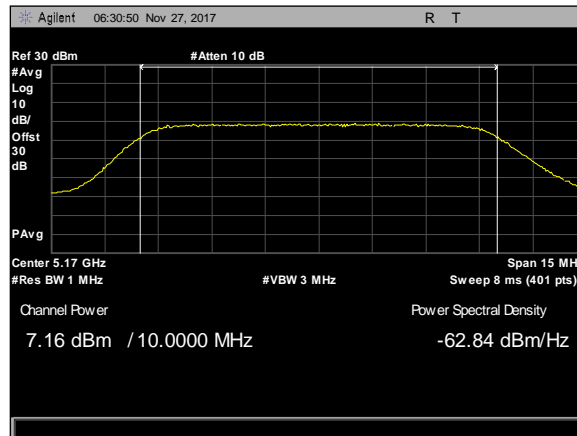
Plot 77. Maximum Conducted Output Power, 5M, 5210, 1Panel, rf2



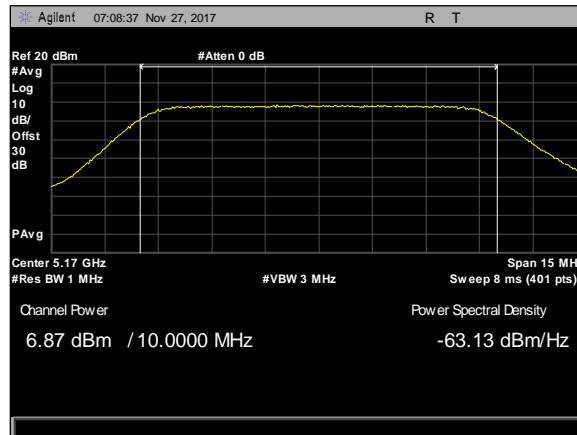
Plot 78. Maximum Conducted Output Power, 5M, 5242.5, 1Panel, rf1



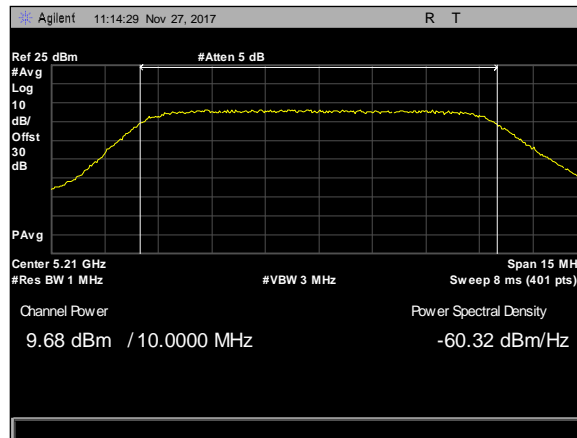
Plot 79. Maximum Conducted Output Power, 5M, 5242.5, 1Panel, rf2



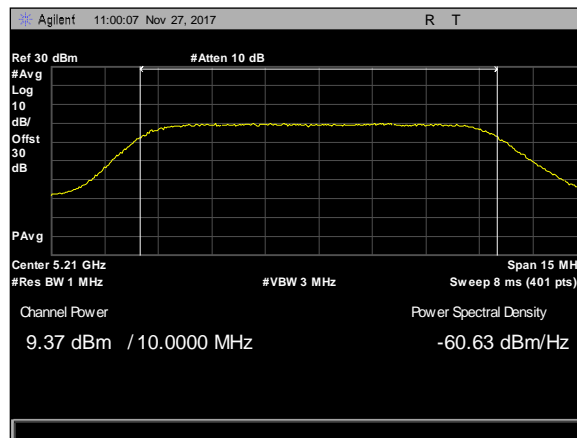
Plot 80. Maximum Conducted Output Power, 10M, 5170, 1Panel, rf1



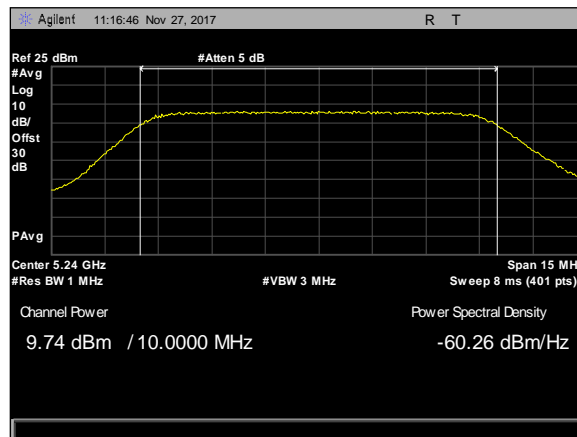
Plot 81. Maximum Conducted Output Power, 10M, 5170, 1Panel, rf2



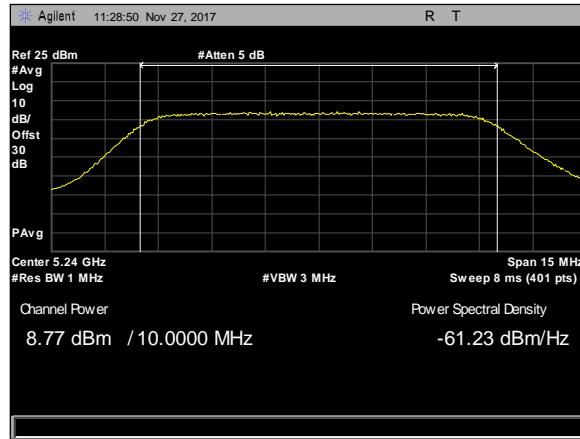
Plot 82. Maximum Conducted Output Power, 10M, 5210, 1Panel, rf1



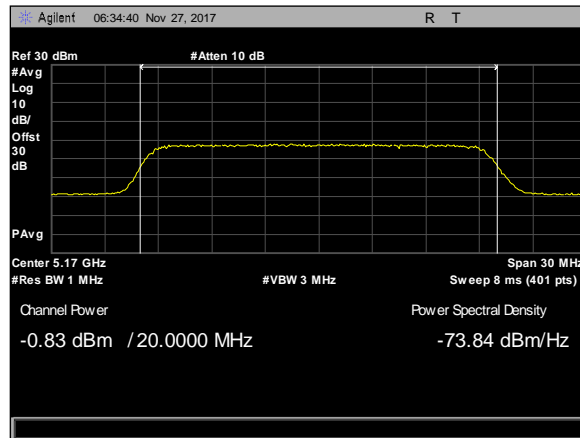
Plot 83. Maximum Conducted Output Power, 10M, 5210, 1Panel, rf2



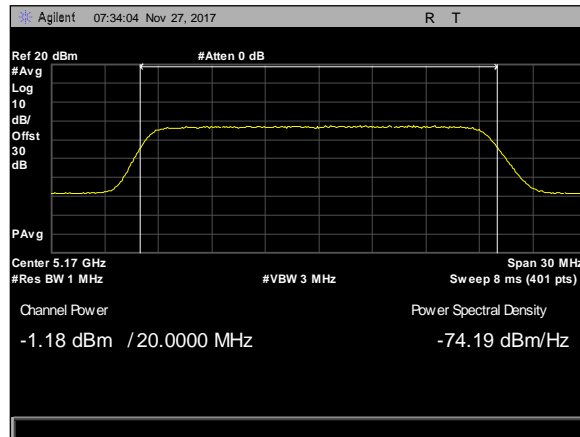
Plot 84. Maximum Conducted Output Power, 10M, 5240.5, 1Panel, rf1



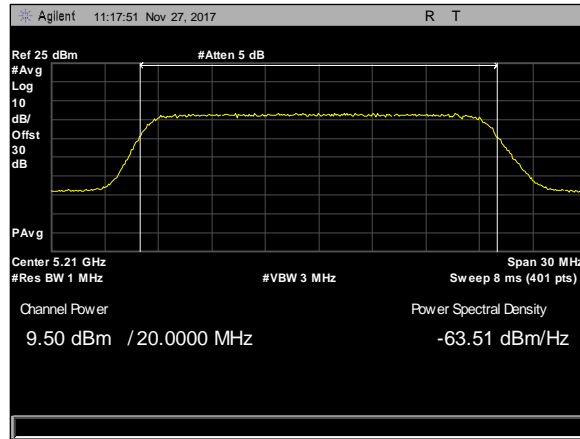
Plot 85. Maximum Conducted Output Power, 10M, 5240.5, 1Panel, rf2



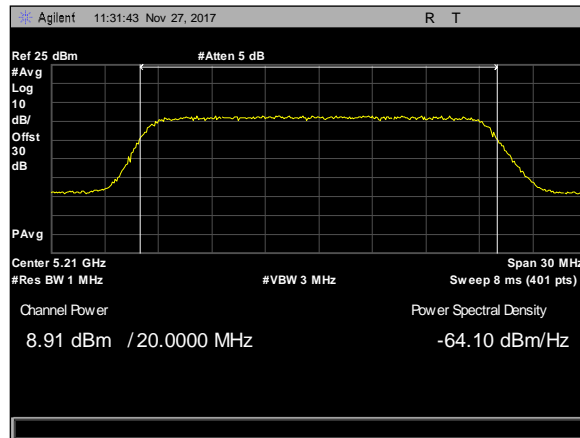
Plot 86. Maximum Conducted Output Power, 20M, 5170, 1Panel, rf1



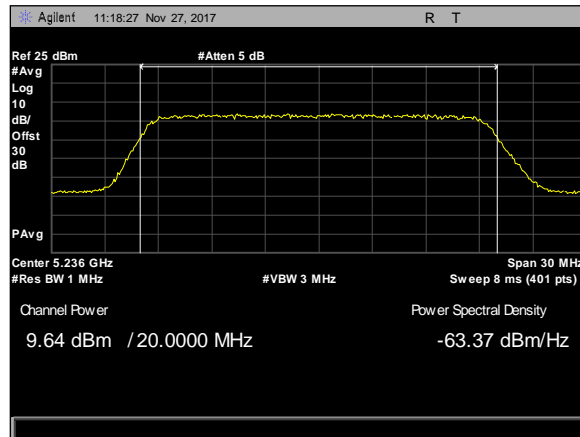
Plot 87. Maximum Conducted Output Power, 20M, 5170, 1Panel, rf2



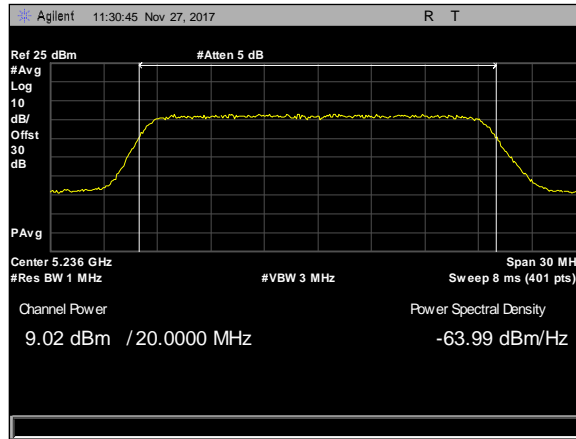
Plot 88. Maximum Conducted Output Power, 20M, 5210, 1Panel, rf1



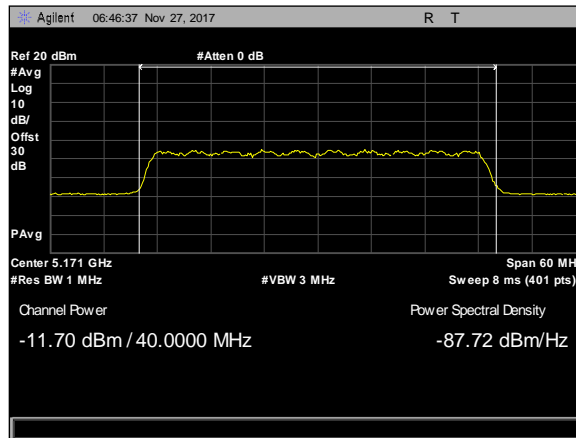
Plot 89. Maximum Conducted Output Power, 20M, 5210, 1Panel, rf1



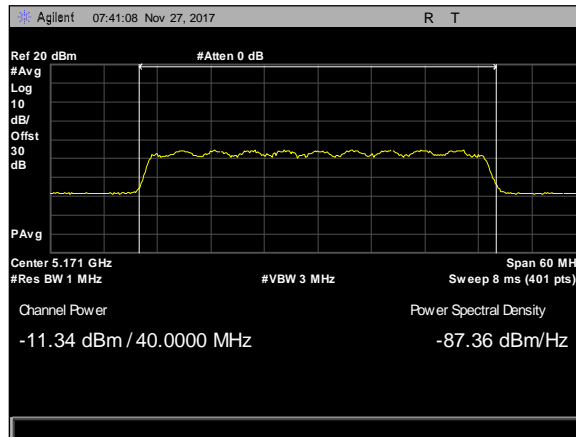
Plot 90. Maximum Conducted Output Power, 20M, 5235.5, 1Panel, rf1



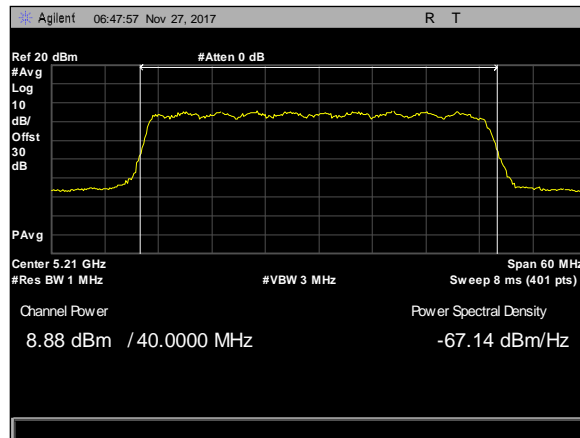
Plot 91. Maximum Conducted Output Power, 20M, 5235.5, 1Panel, rf2



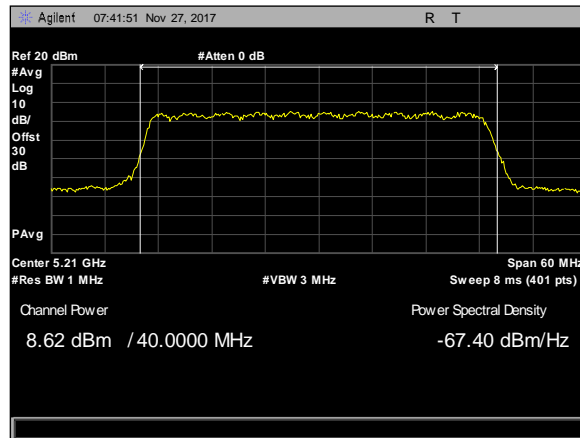
Plot 92. Maximum Conducted Output Power, 40M, 5171, 1Panel, rf1



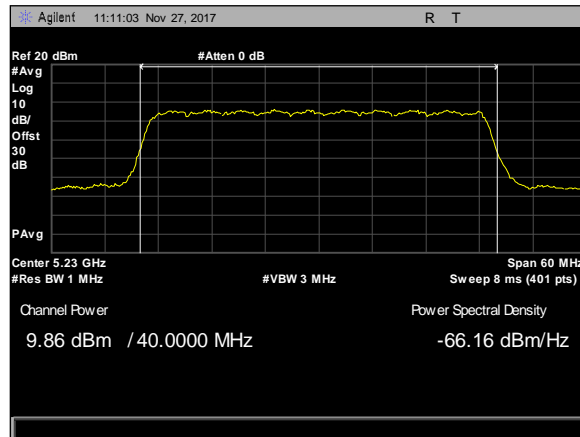
Plot 93. Maximum Conducted Output Power, 40M, 5171, 1Panel, rf2,



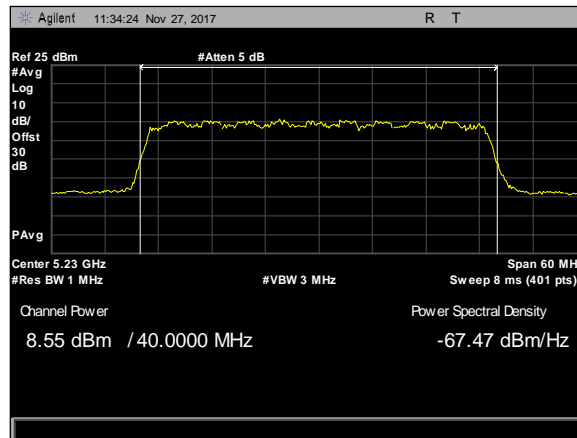
Plot 94. Maximum Conducted Output Power, 40M, 5210, 1Panel, rf1



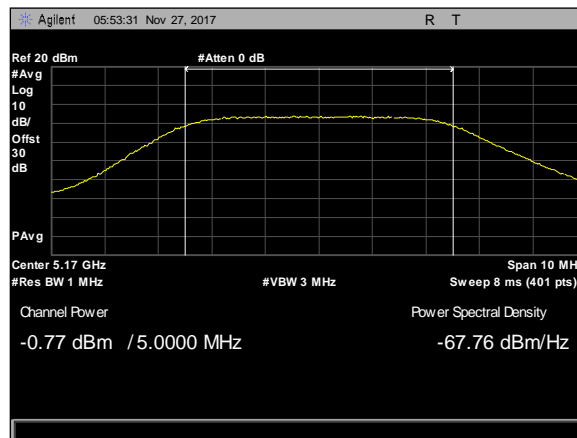
Plot 95. Maximum Conducted Output Power, 40M, 5210, 1Panel, rf1



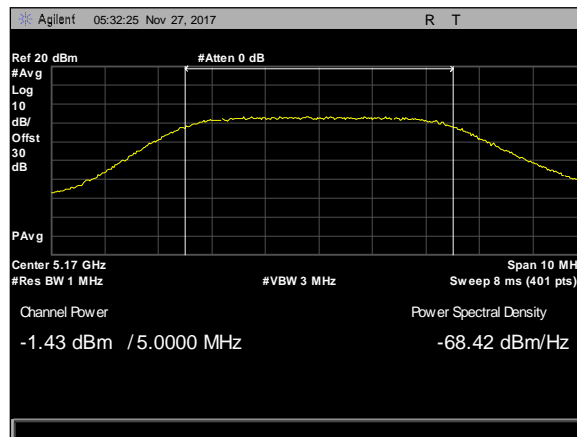
Plot 96. Maximum Conducted Output Power, 40M, 5230, 1Panel, rf1



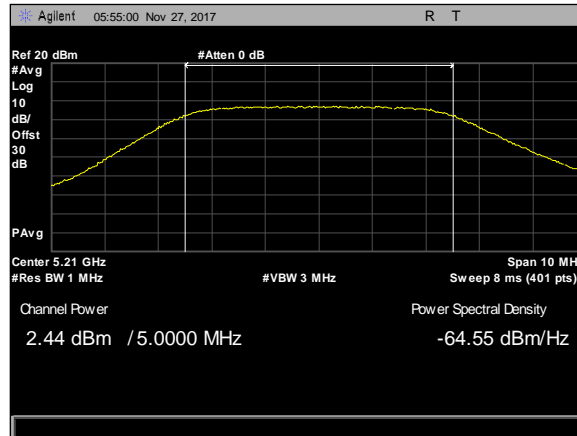
Plot 97. Maximum Conducted Output Power, 40M, 5230, 1Panel, rf2



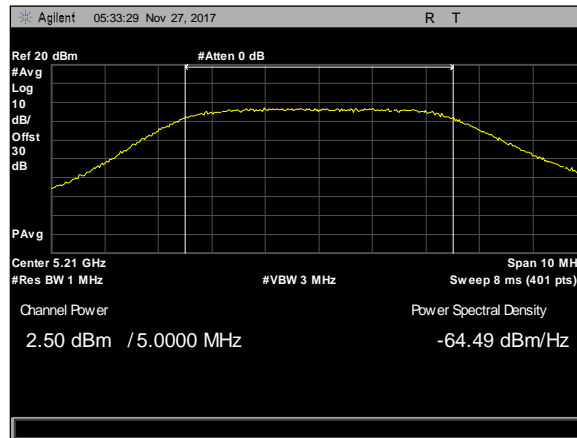
Plot 98. Maximum Conducted Output Power, 5M, 5170, 2Panel, rf1



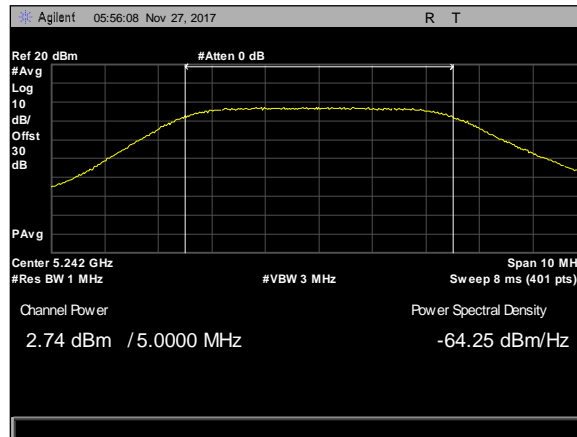
Plot 99. Maximum Conducted Output Power, 5M, 5170, 2Panel, rf2



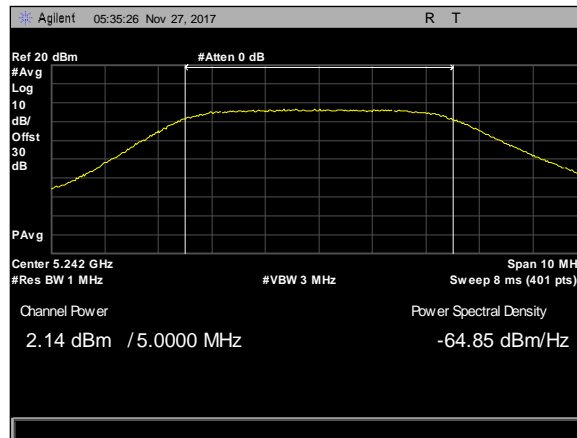
Plot 100. Maximum Conducted Output Power, 5M, 5210, 2Panel, rf1



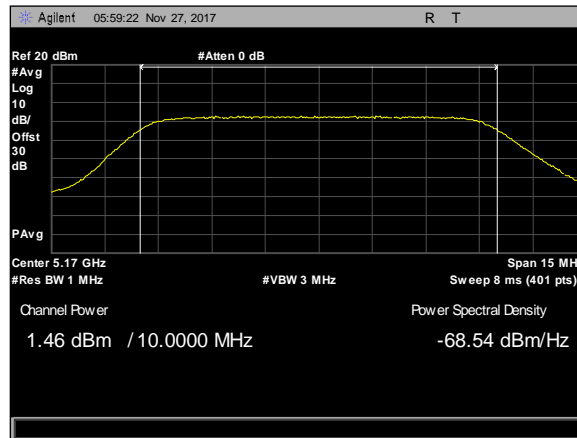
Plot 101. Maximum Conducted Output Power, 5M, 5210, 2Panel, rf1



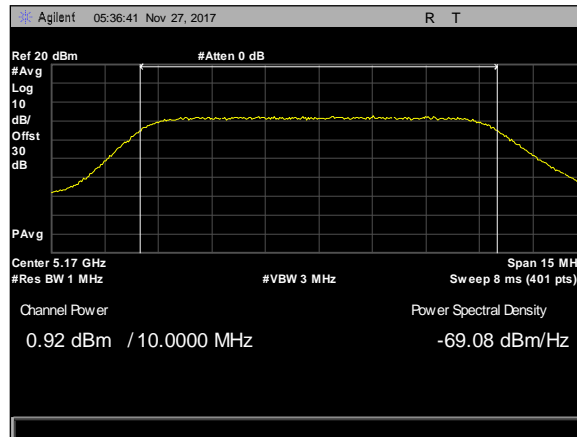
Plot 102. Maximum Conducted Output Power, 5M, 5242.5, 2Panel, rf1



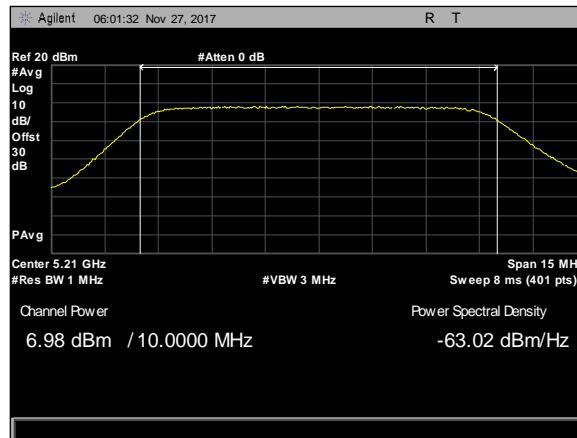
Plot 103. Maximum Conducted Output Power, 5M, 5242.5, 2Panel, rf2



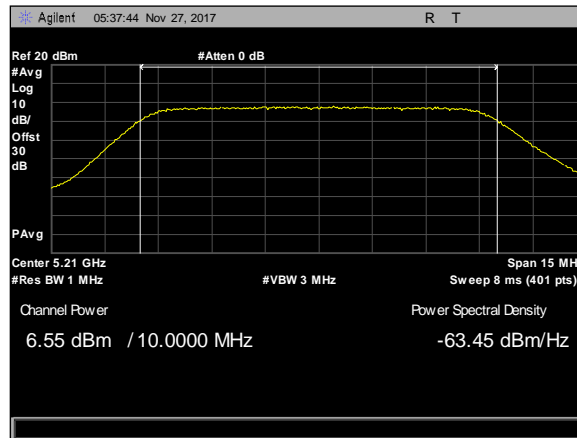
Plot 104. Maximum Conducted Output Power, 10M, 5170, 2Panel, rf1



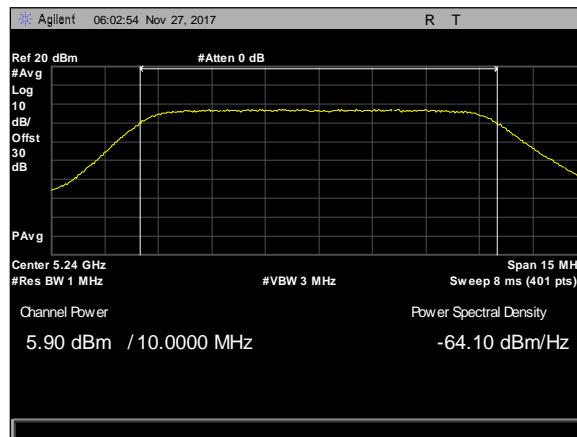
Plot 105. Maximum Conducted Output Power, 10M, 5170, 2Panel, rf2



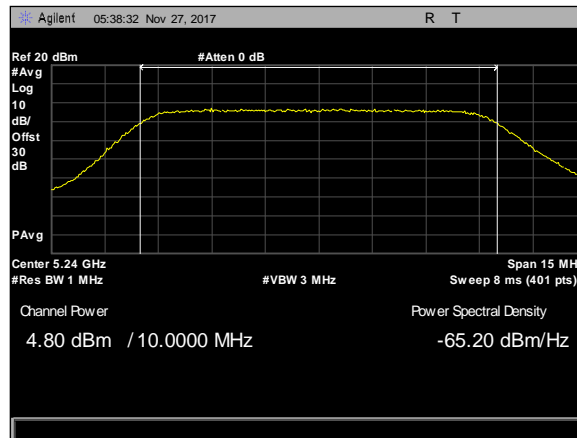
Plot 106. Maximum Conducted Output Power, 10M, 5210, 2Panel, rf1



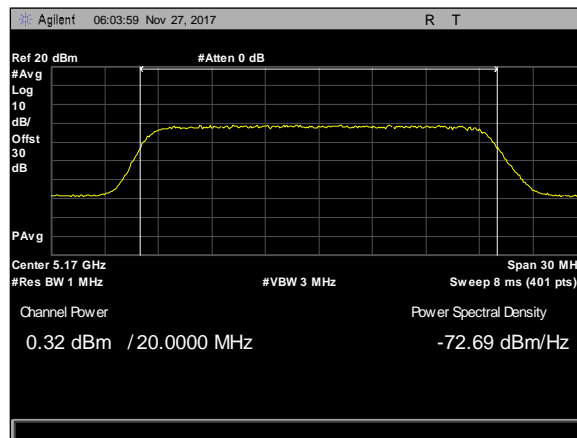
Plot 107. Maximum Conducted Output Power, 10M, 5210, 2Panel, rf2



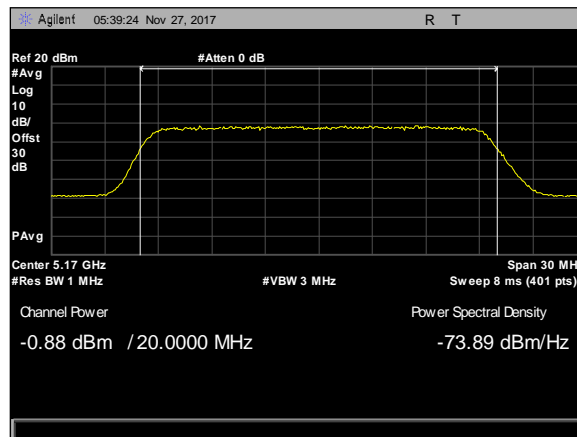
Plot 108. Maximum Conducted Output Power, 10M, 5240.5, 2Panel, rf1



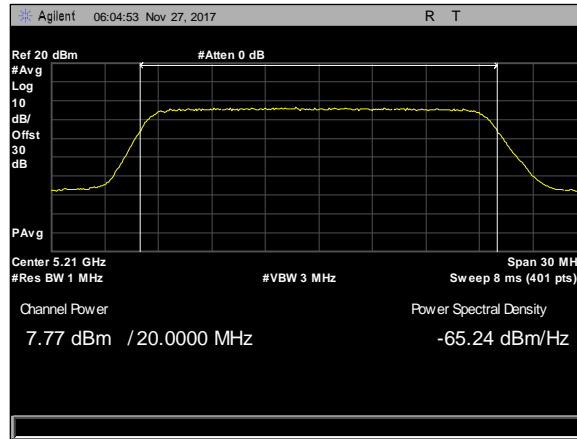
Plot 109. Maximum Conducted Output Power, 10M, 5240.5, 2Panel, rf2



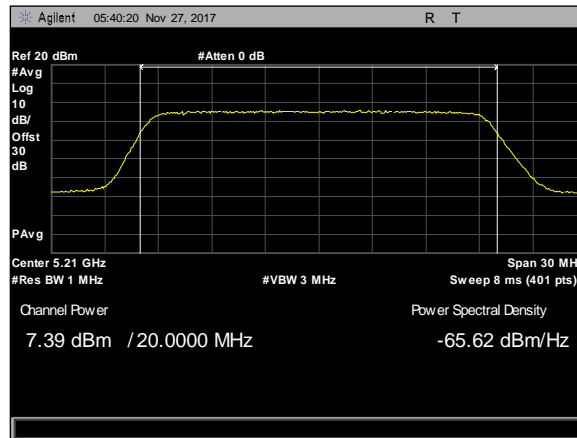
Plot 110. Maximum Conducted Output Power, 20M, 5170, 2Panel, rf1



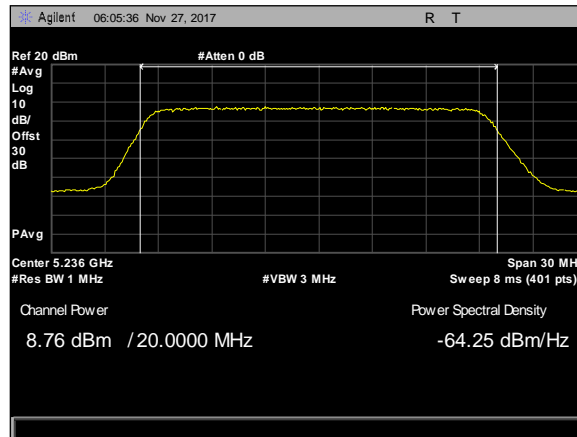
Plot 111. Maximum Conducted Output Power, 20M, 5170, 2Panel, rf2



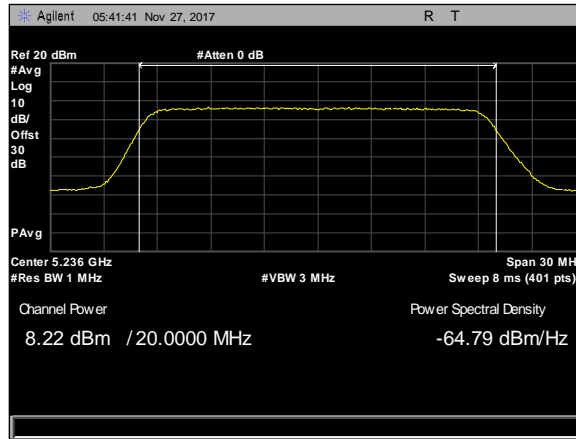
Plot 112. Maximum Conducted Output Power, 20M, 5210, 2Panel, rf1



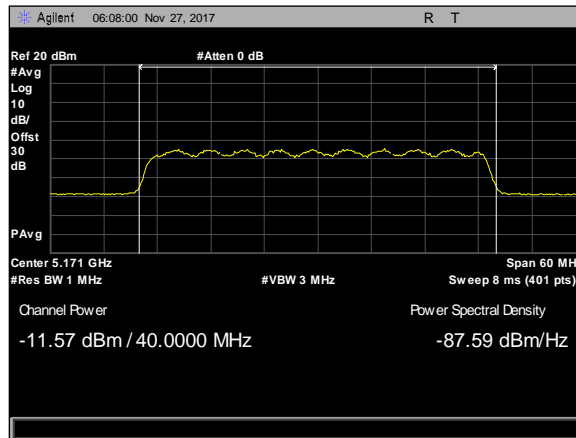
Plot 113. Maximum Conducted Output Power, 20M, 5210, 2Panel, rf2



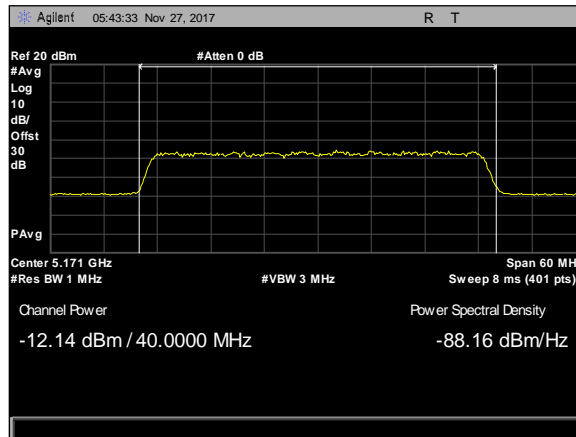
Plot 114. Maximum Conducted Output Power, 20M, 5235.5, 2Panel, rf1



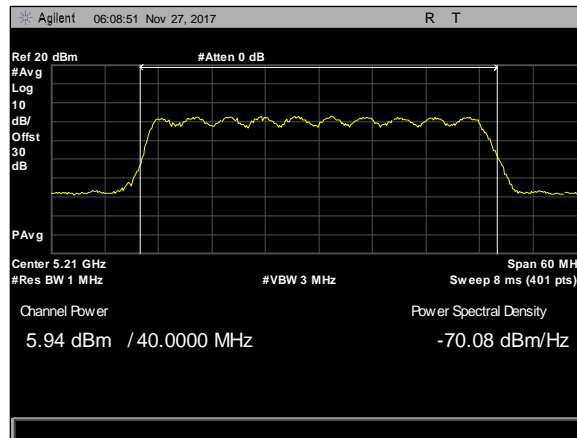
Plot 115. Maximum Conducted Output Power, 20M, 5235.5, 2Panel, rf2



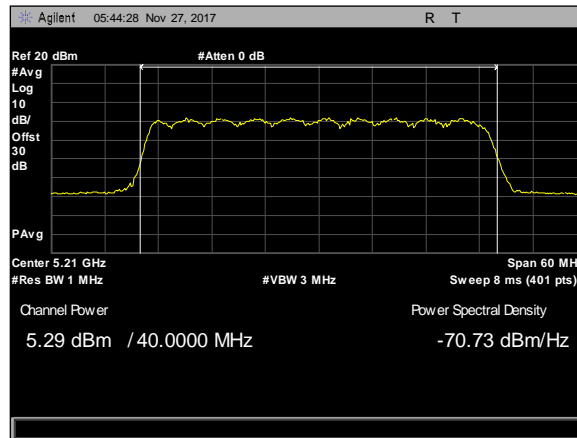
Plot 116. Maximum Conducted Output Power, 40M, 5171, 2Panel, rf1



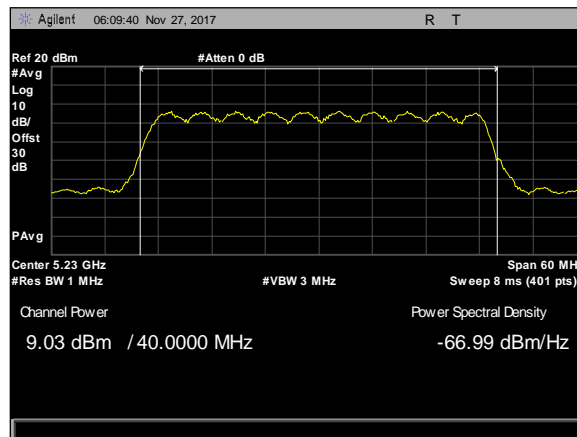
Plot 117. Maximum Conducted Output Power, 40M, 5171, 2Panel, rf2



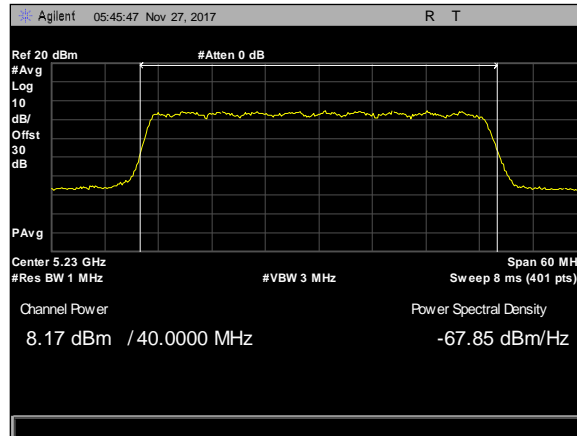
Plot 118. Maximum Conducted Output Power, 40M, 5210, 2Panel, rf1



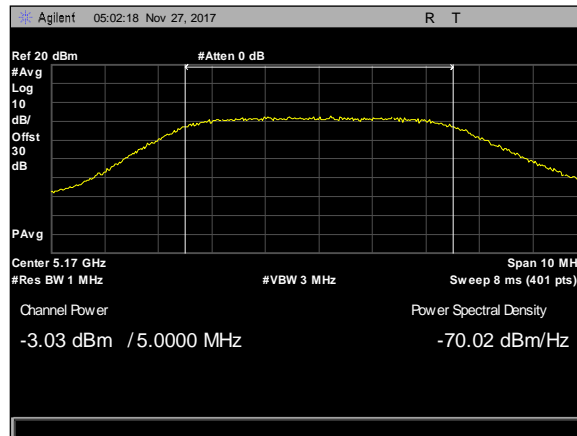
Plot 119. Maximum Conducted Output Power, 40M, 5210, 2Panel, rf2



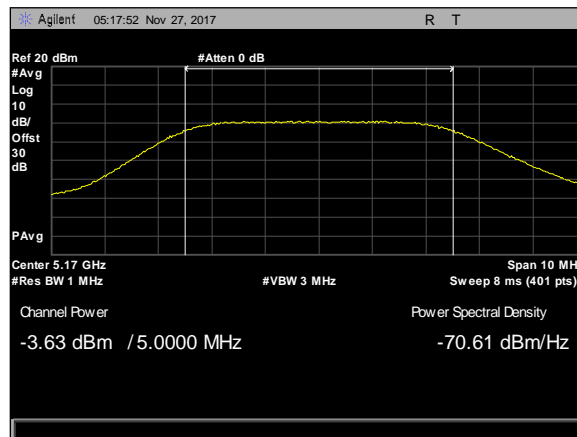
Plot 120. Maximum Conducted Output Power, 40M, 5230, 2Panel, rf1



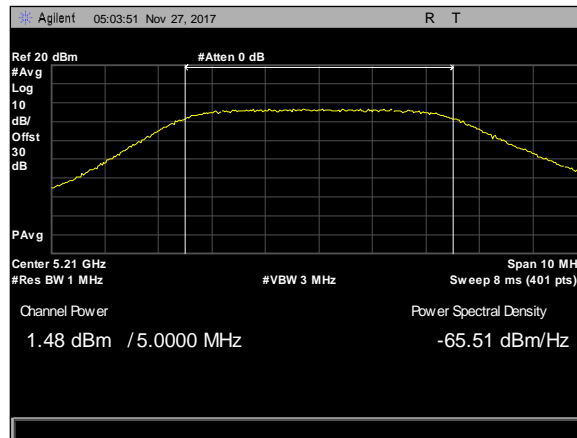
Plot 121. Maximum Conducted Output Power, 40M, 5230, 2Panel, rf2



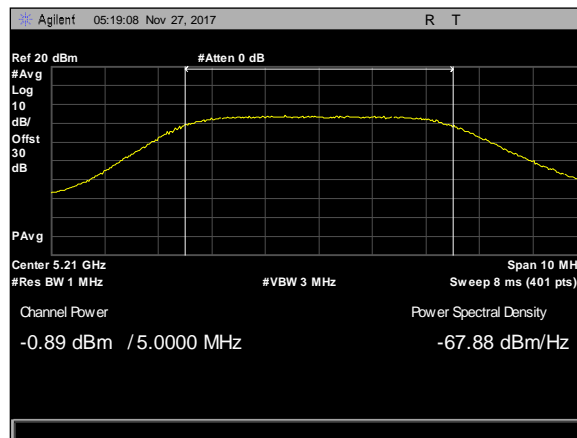
Plot 122. Maximum Conducted Output Power, 5M, 5170, 3Para, rf1



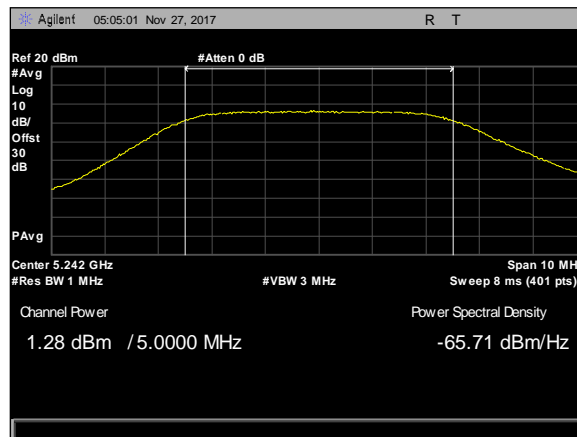
Plot 123. Maximum Conducted Output Power, 5M, 5170, 3Para, rf2



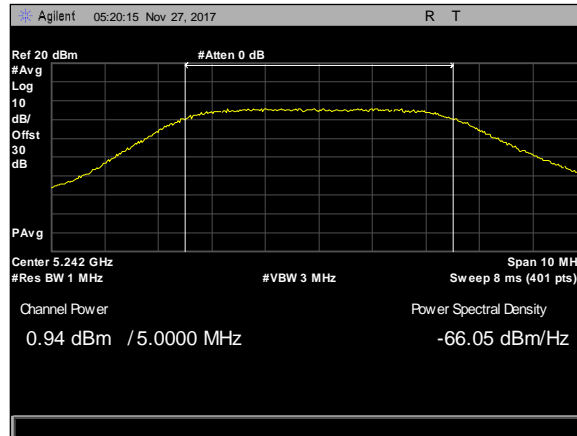
Plot 124. Maximum Conducted Output Power, 5M, 5210, 3Para, rf1



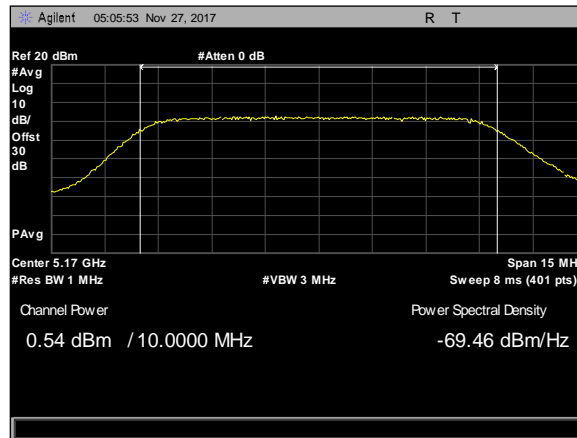
Plot 125. Maximum Conducted Output Power, 5M, 5210, 3Para, rf2



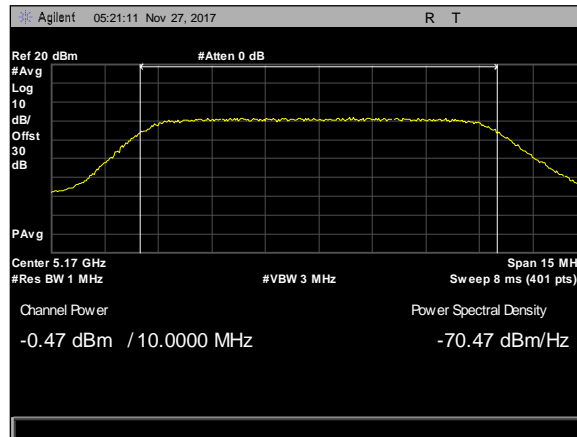
Plot 126. Maximum Conducted Output Power, 5M, 5242.5, 3Para, rf1



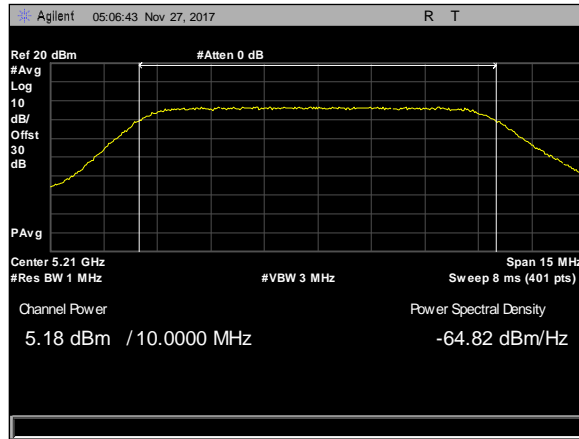
Plot 127. Maximum Conducted Output Power, 5M, 5242.5, 3Para, rf2



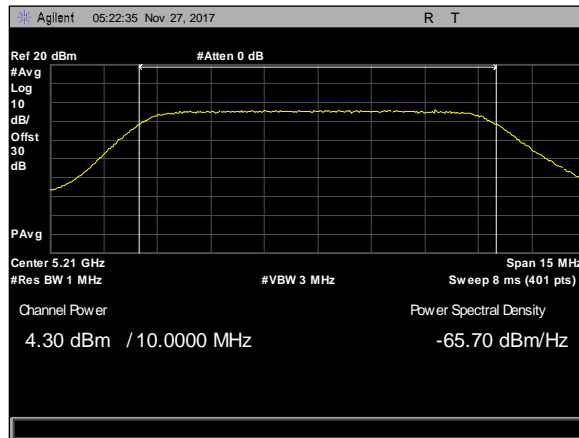
Plot 128. Maximum Conducted Output Power, 10M, 5170, 3Para, rf1



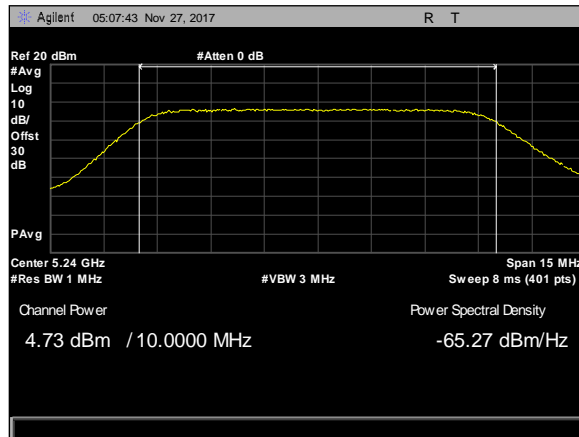
Plot 129. Maximum Conducted Output Power, 10M, 5170, 3Para, rf2



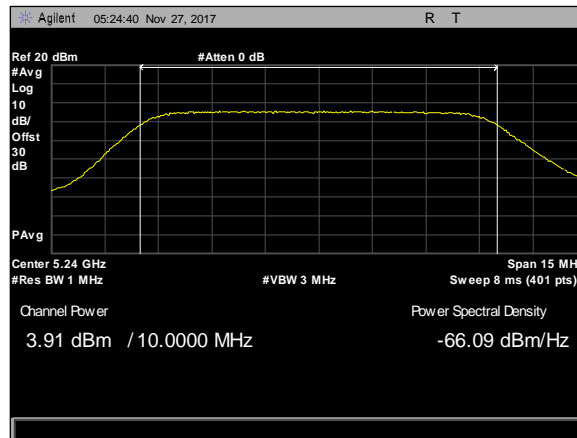
Plot 130. Maximum Conducted Output Power, 10M, 5210, 3Para, rf1



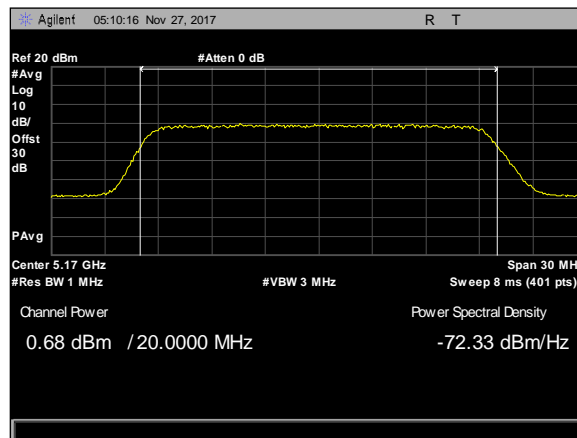
Plot 131. Maximum Conducted Output Power, 10M, 5210, 3Para, rf2



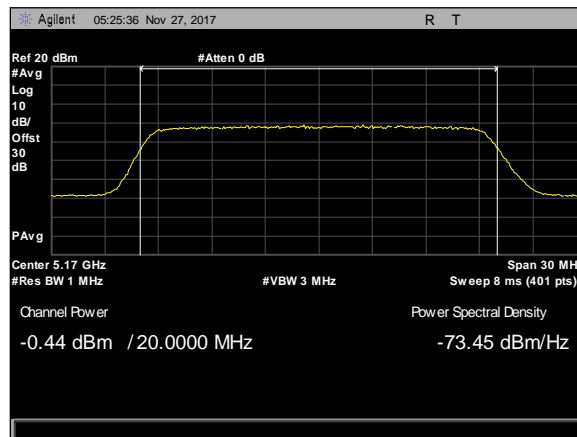
Plot 132. Maximum Conducted Output Power, 10M, 5240.5, 3Para, rf1



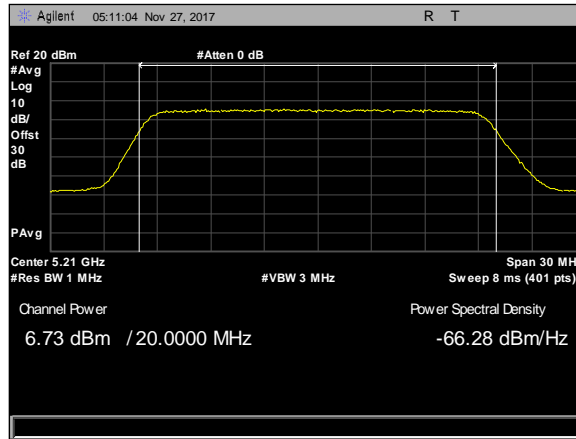
Plot 133. Maximum Conducted Output Power, 10M, 5240.5, 3Para, rf2



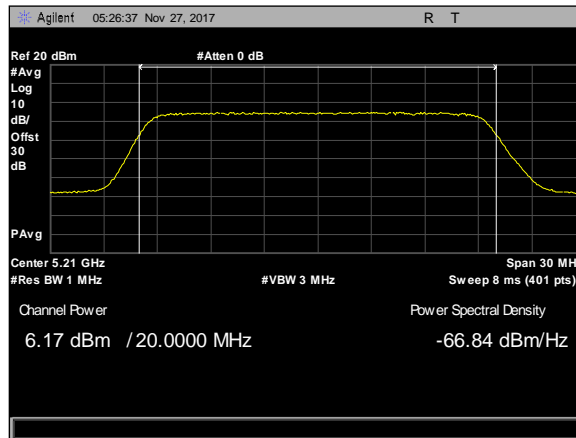
Plot 134. Maximum Conducted Output Power, 20M, 5170, 3Para, rf1



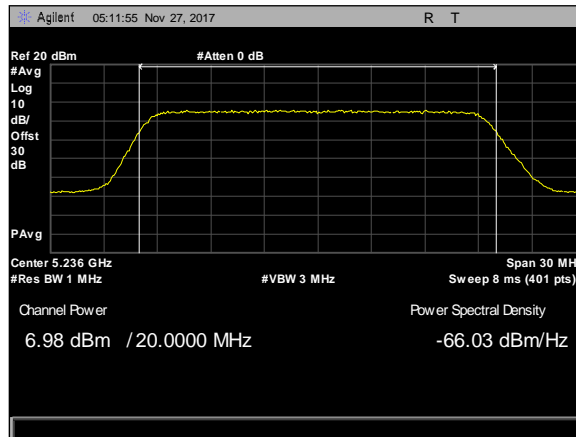
Plot 135. Maximum Conducted Output Power, 20M, 5170, 3Para, rf2



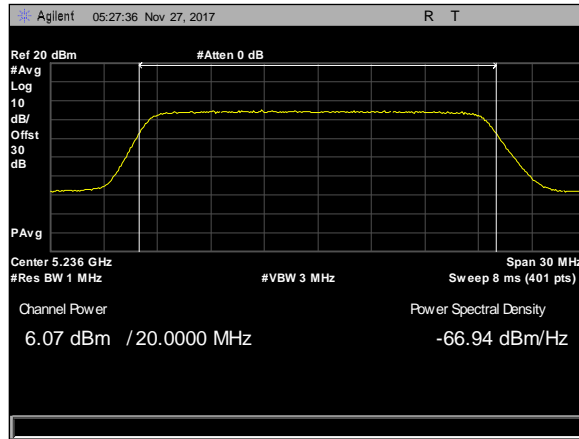
Plot 136. Maximum Conducted Output Power, 20M, 5210, 3Para, rf1



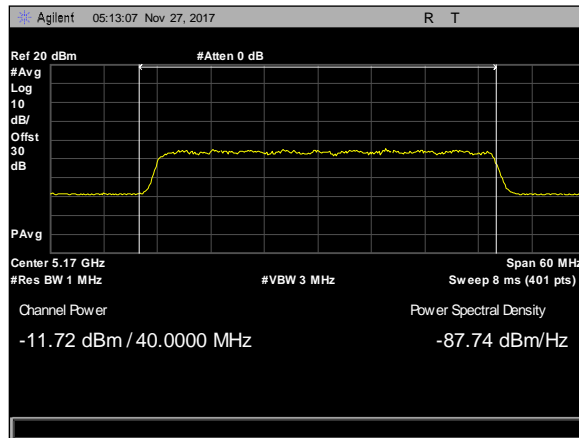
Plot 137. Maximum Conducted Output Power, 20M, 5210, 3Para, rf2



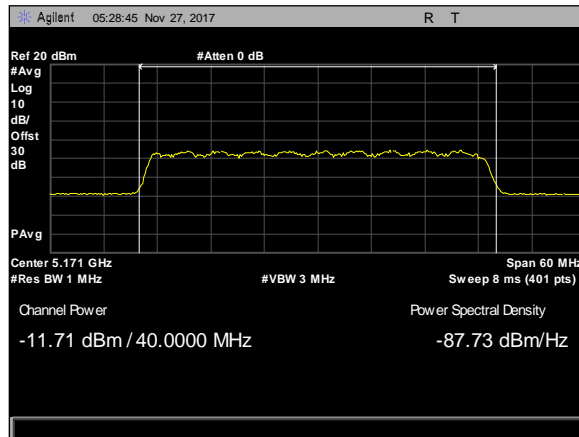
Plot 138. Maximum Conducted Output Power, 20M, 5235.5, 3Para, rf1



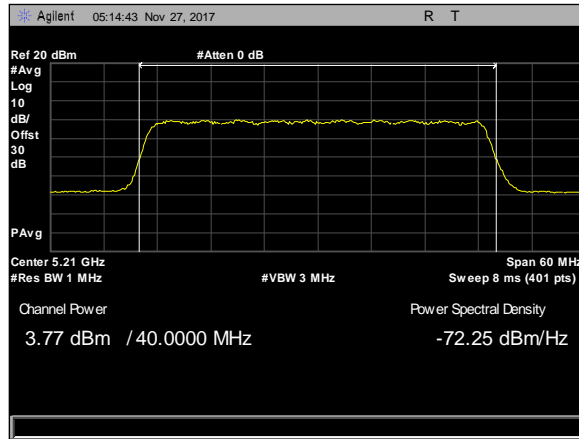
Plot 139. Maximum Conducted Output Power, 20M, 5235.5, 3Para, rf2



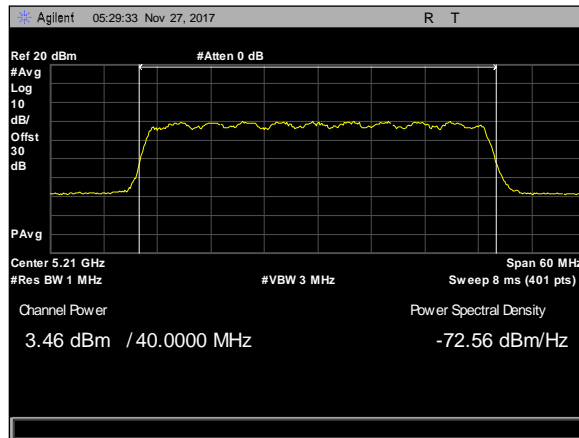
Plot 140. Maximum Conducted Output Power, 40M, 5171, 3Para, rf1



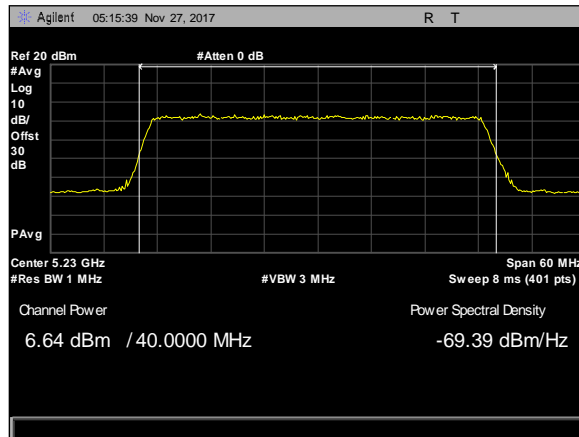
Plot 141. Maximum Conducted Output Power, 40M, 5171, 3Para, rf2



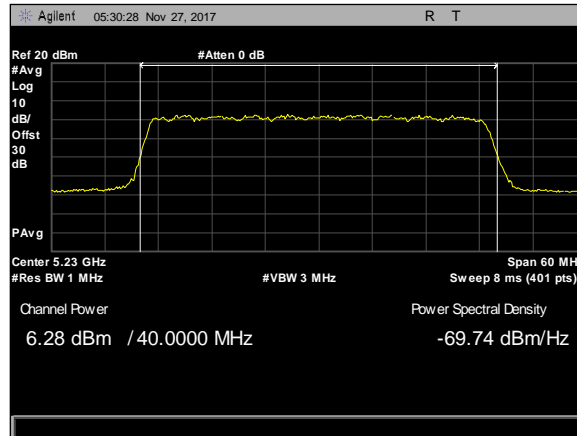
Plot 142. Maximum Conducted Output Power, 40M, 5210, 3Para, rf1



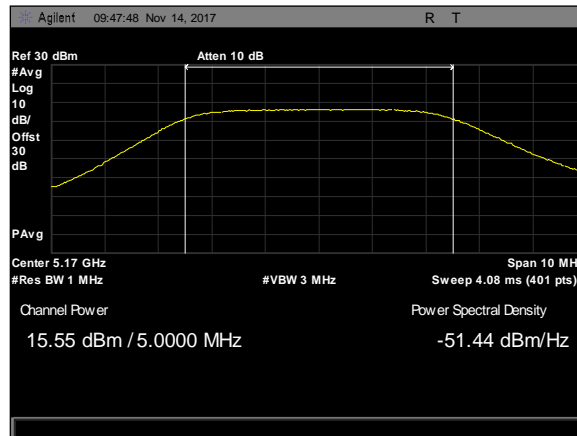
Plot 143. Maximum Conducted Output Power, 40M, 5210, 3Para, rf2



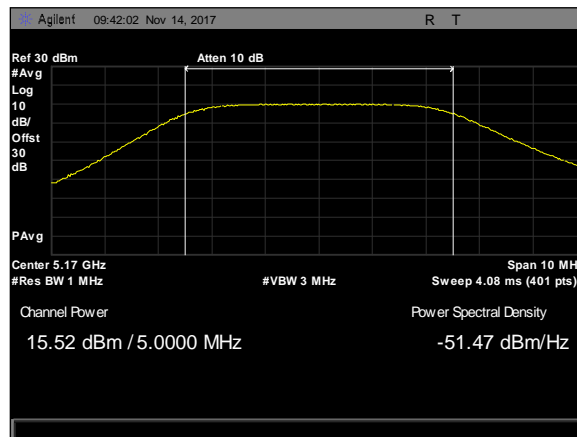
Plot 144. Maximum Conducted Output Power, 40M, 5230, 3Para, rf1



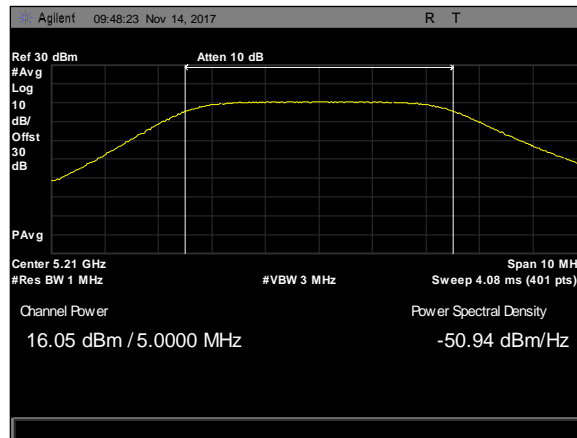
Plot 145. Maximum Conducted Output Power, 40M, 5230, 3Para, rf2



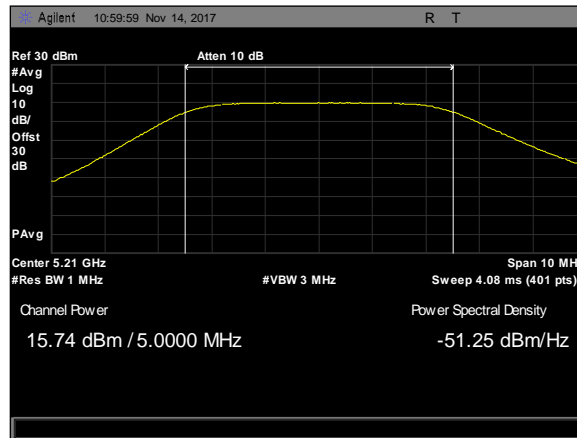
Plot 146. Maximum Conducted Output Power, 5M, 5170, 50mni, rf1



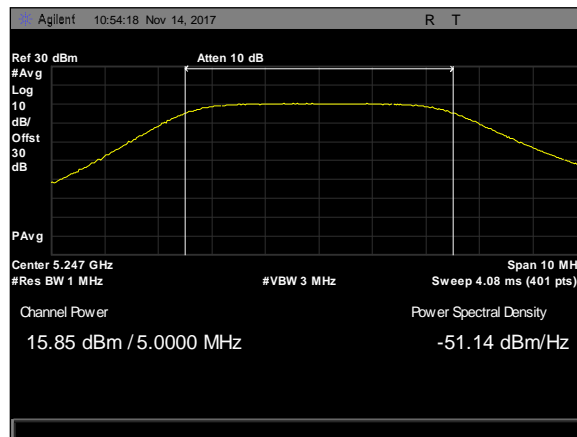
Plot 147. Maximum Conducted Output Power, 5M, 5170, 50mni, rf2



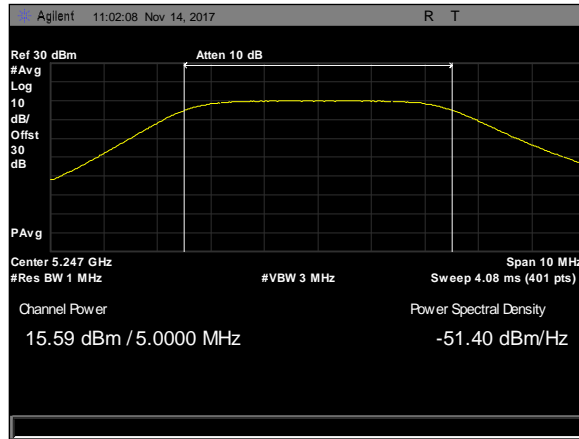
Plot 148. Maximum Conducted Output Power, 5M, 5210, 50Omni, rf1



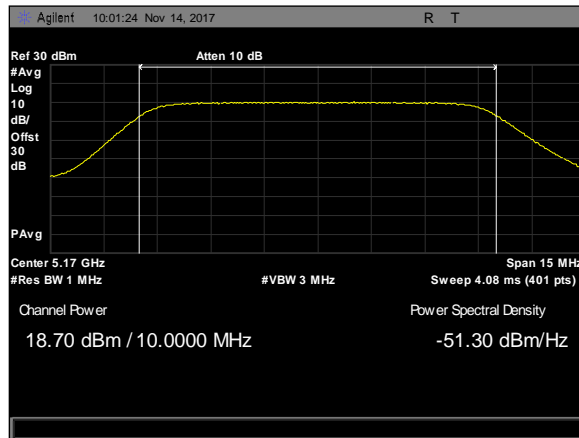
Plot 149. Maximum Conducted Output Power, 5M, 5210, 50Omni, rf2



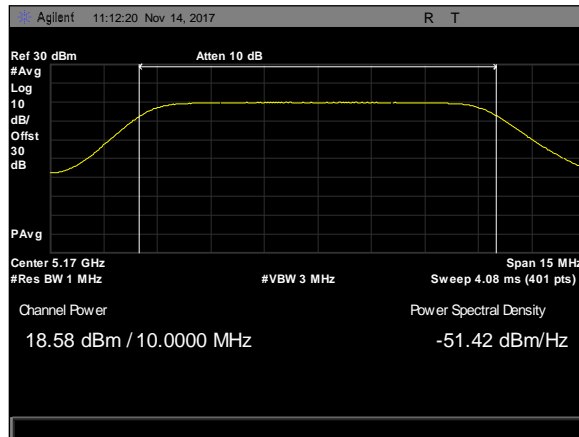
Plot 150. Maximum Conducted Output Power, 5M, 5247.5, 50Omni, rf1



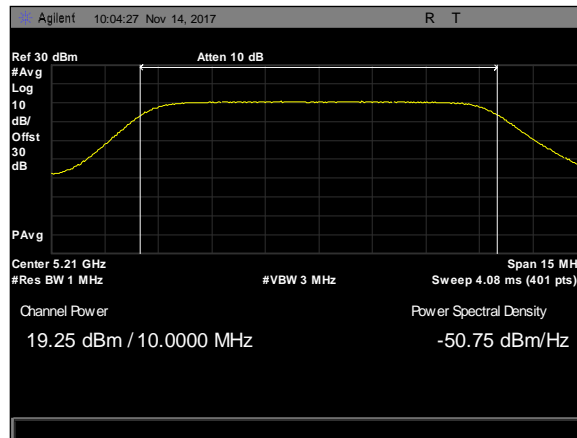
Plot 151. Maximum Conducted Output Power, 5M, 5247.5, 50Omni, rf2



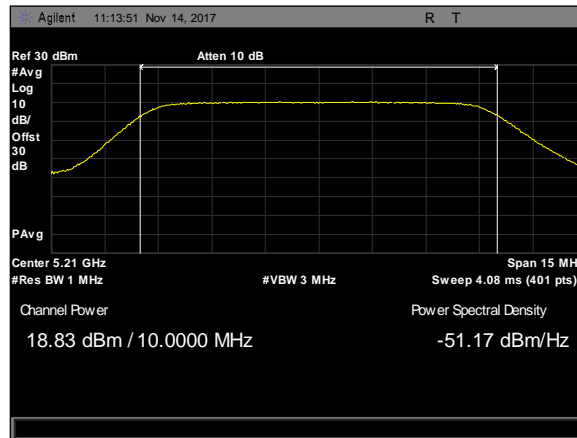
Plot 152. Maximum Conducted Output Power, 10M, 5170, 50Omni, rf1



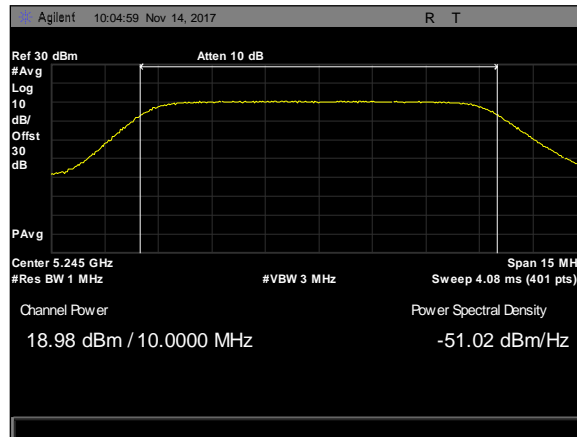
Plot 153. Maximum Conducted Output Power, 10M, 5170, 50Omni, rf2



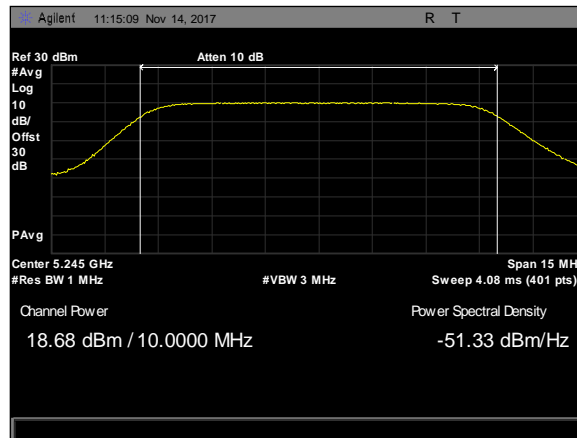
Plot 154. Maximum Conducted Output Power, 10M, 5210, 50Omni, rf1



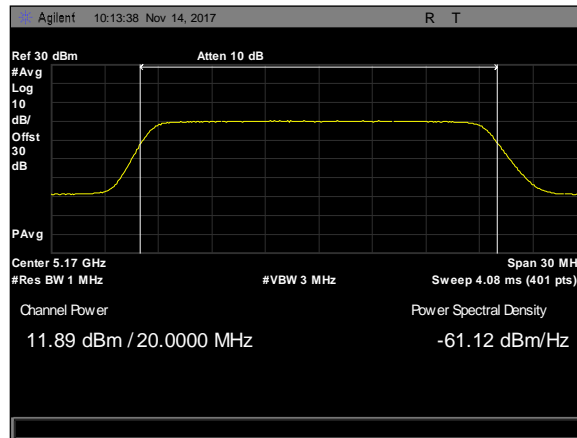
Plot 155. Maximum Conducted Output Power, 10M, 5210, 50Omni, rf2



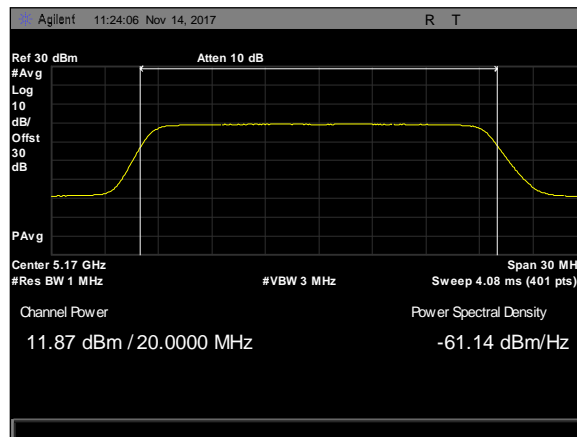
Plot 156. Maximum Conducted Output Power, 10M, 5245, 50Omni, rf1



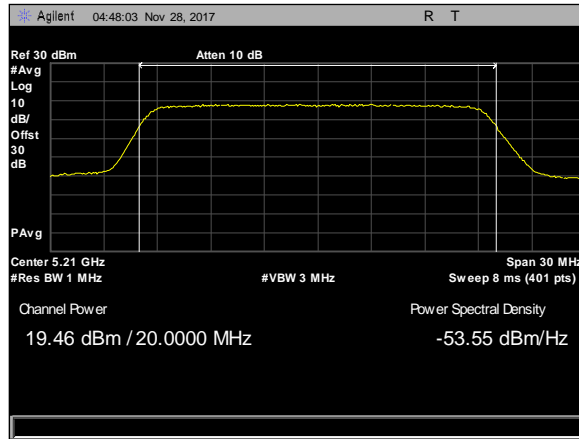
Plot 157. Maximum Conducted Output Power, 10M, 5245, 50Omni, rf2



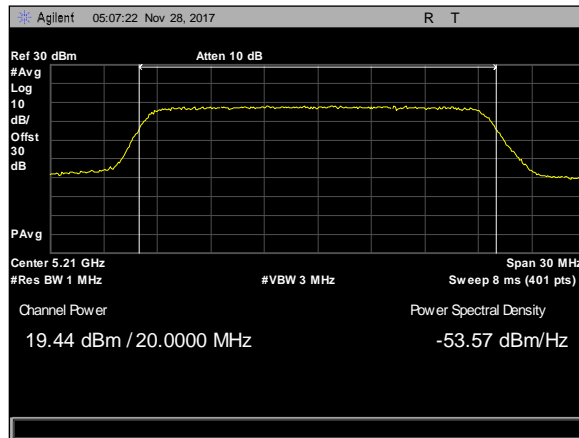
Plot 158. Maximum Conducted Output Power, 20M, 5170, 50Omni, rf1



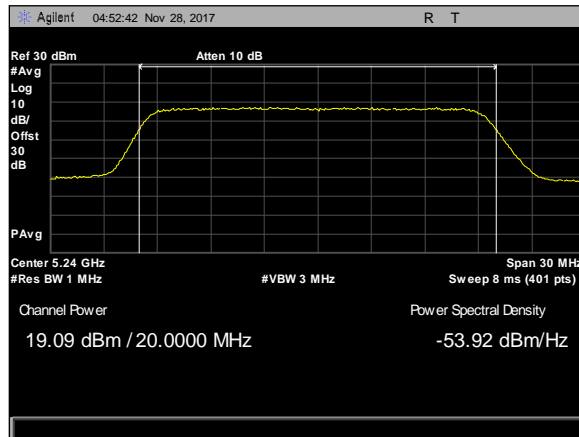
Plot 159. Maximum Conducted Output Power, 20M, 5170, 50Omni, rf2



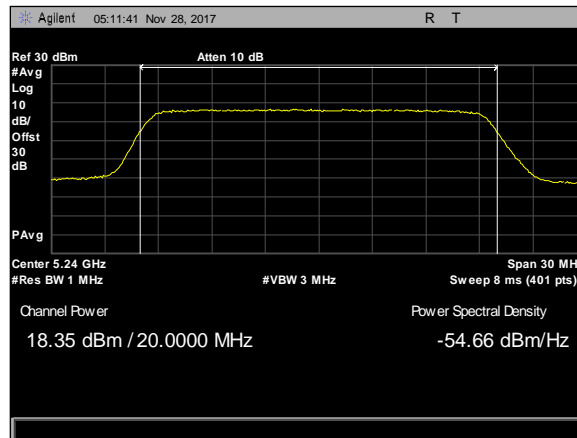
Plot 160. Maximum Conducted Output Power, 20M, 5210, 50Omni, rf1



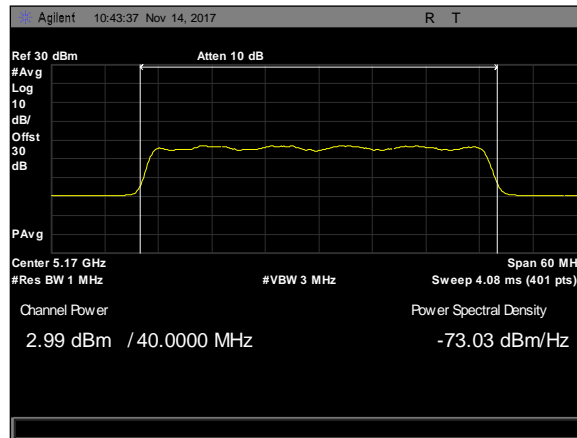
Plot 161. Maximum Conducted Output Power, 20M, 5210, 50Omni, rf2



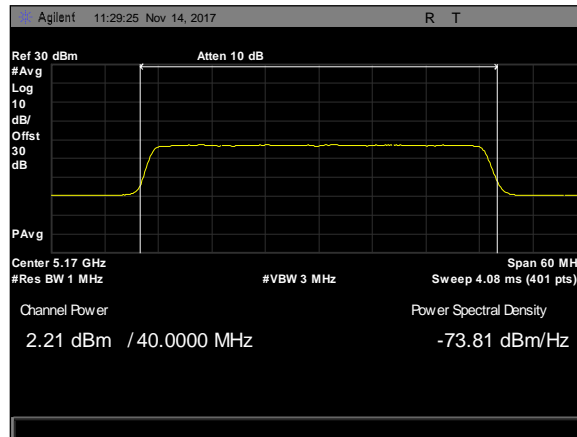
Plot 162. Maximum Conducted Output Power, 20M, 5240, 50Omni, rf1



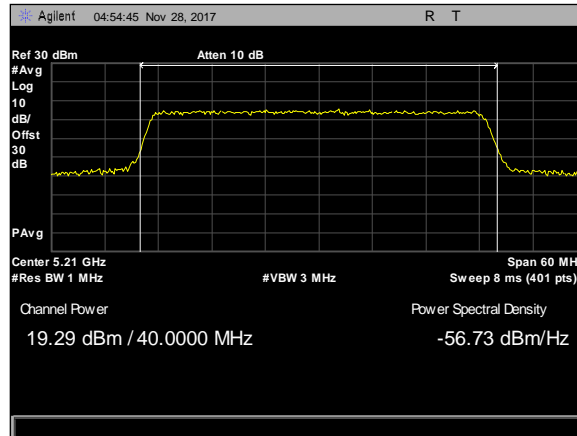
Plot 163. Maximum Conducted Output Power, 20M, 5240, 50Omni, rf2



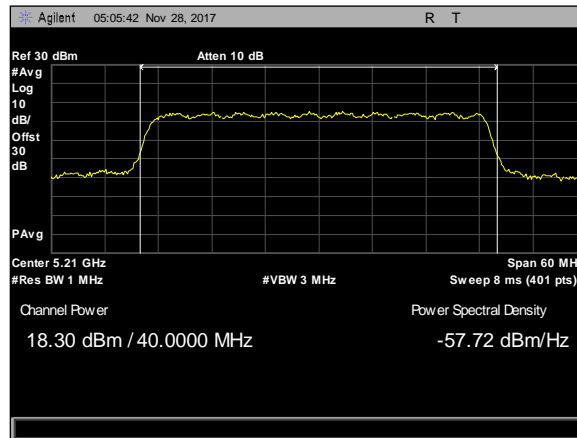
Plot 164. Maximum Conducted Output Power, 40M, 5170, 50Omni, rf1



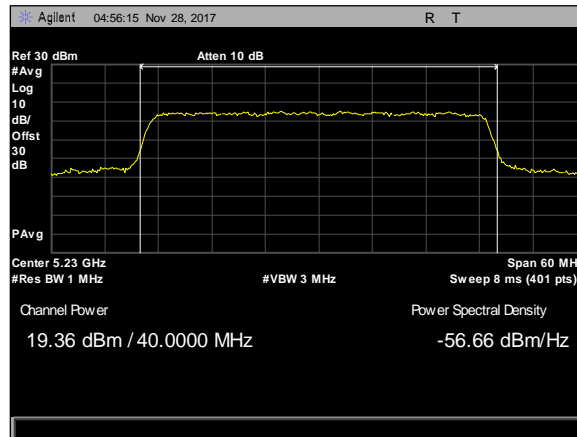
Plot 165. Maximum Conducted Output Power, 40M, 5170, 50Omni, rf2



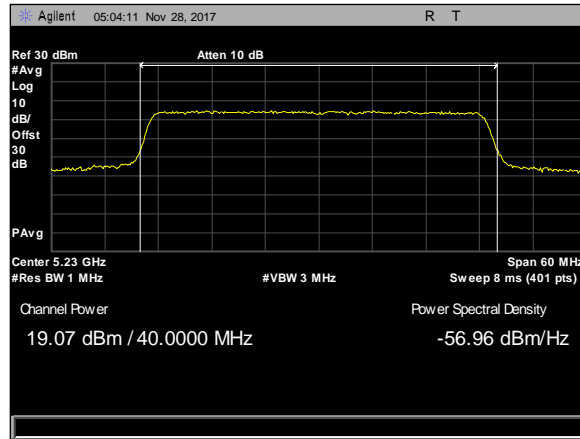
Plot 166. Maximum Conducted Output Power, 40M, 5210, 50Omni, rf1



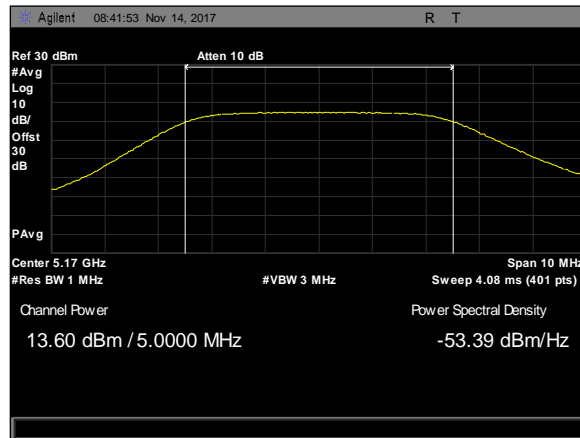
Plot 167. Maximum Conducted Output Power, 40M, 5210, 50Omni, rf2



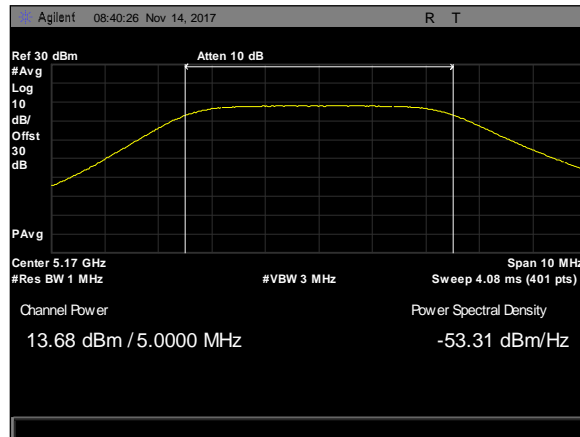
Plot 168. Maximum Conducted Output Power, 40M, 5230, 50Omni, rf1



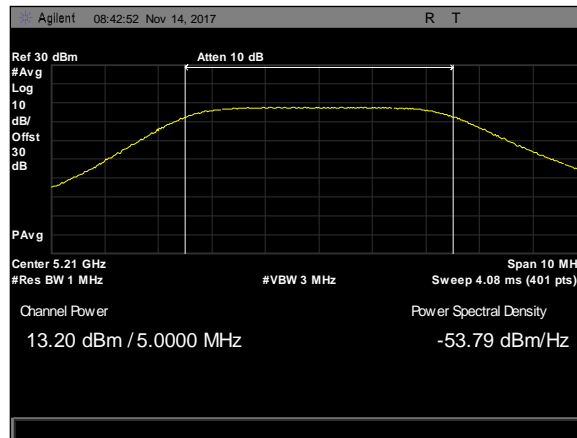
Plot 169. Maximum Conducted Output Power, 40M, 5230, 50mni, rf2



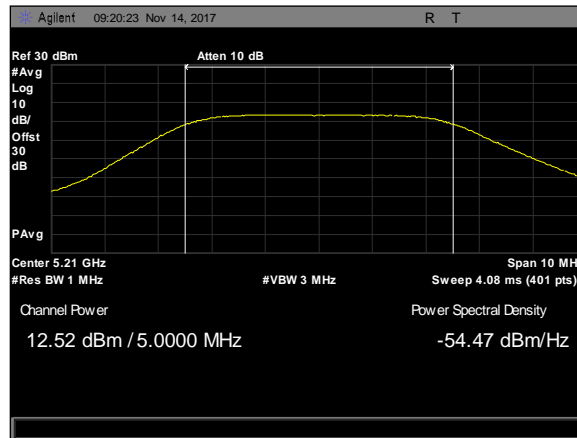
Plot 170. Maximum Conducted Output Power, 5M, 5170, Omni8, rf1



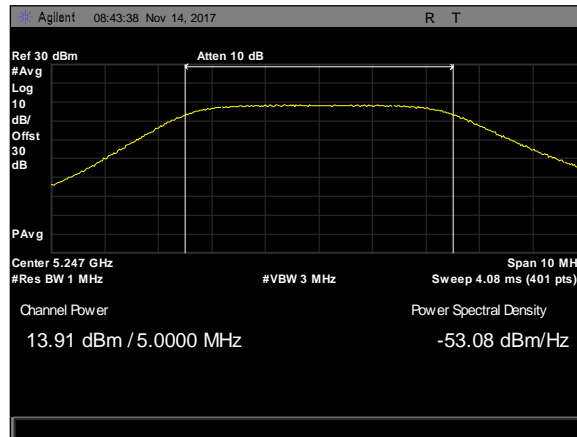
Plot 171. Maximum Conducted Output Power, 5M, 5170, Omni8, rf2



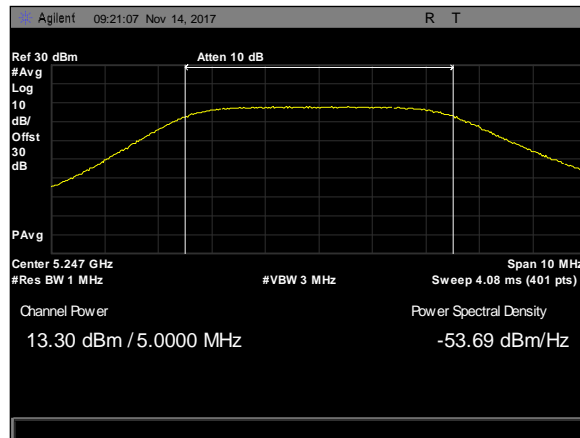
Plot 172. Maximum Conducted Output Power, 5M, 5210, Omni8, rf1



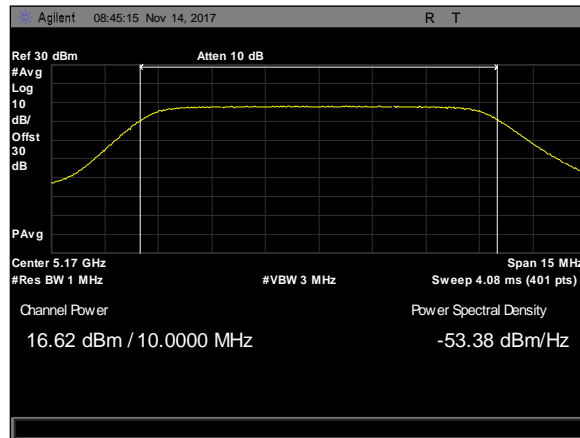
Plot 173. Maximum Conducted Output Power, 5M, 5210, Omni8, rf1



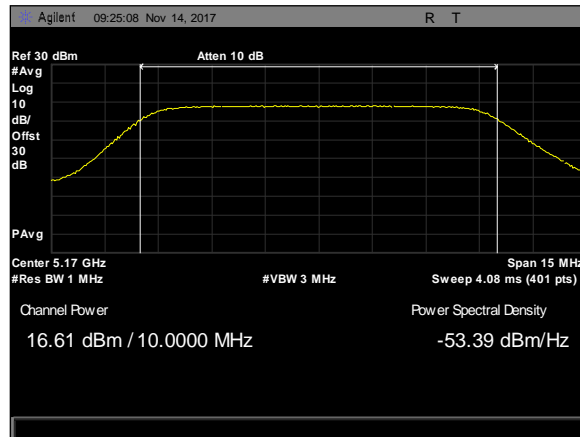
Plot 174. Maximum Conducted Output Power, 5M, 5247.5, Omni8, rf1



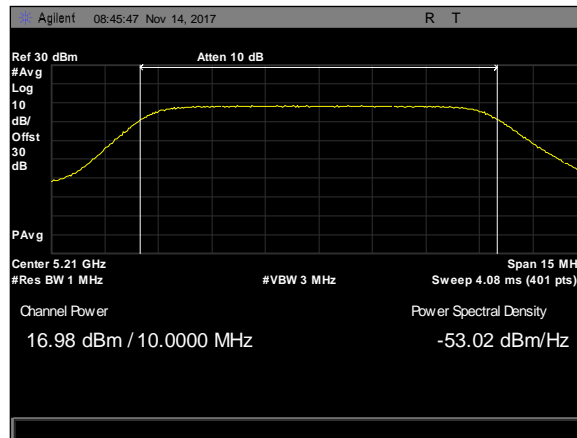
Plot 175. Maximum Conducted Output Power, 5M, 5247.5, Omni8, rf2



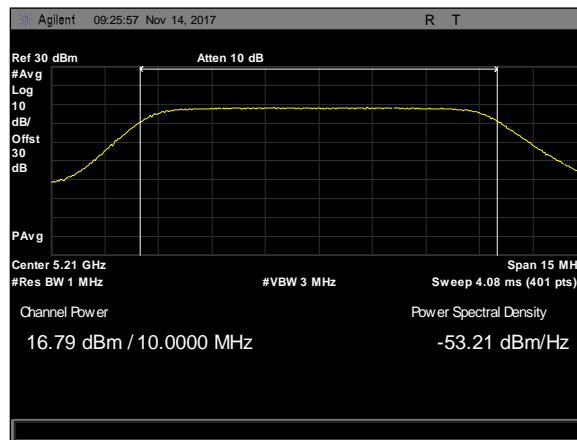
Plot 176. Maximum Conducted Output Power, 10M, 5170, Omni8, rf1



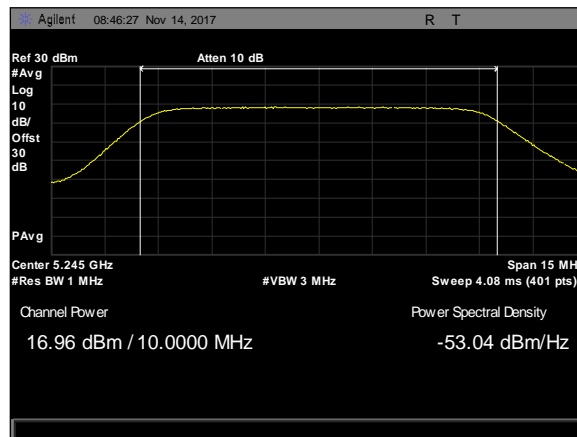
Plot 177. Maximum Conducted Output Power, 10M, 5170, Omni8, rf2



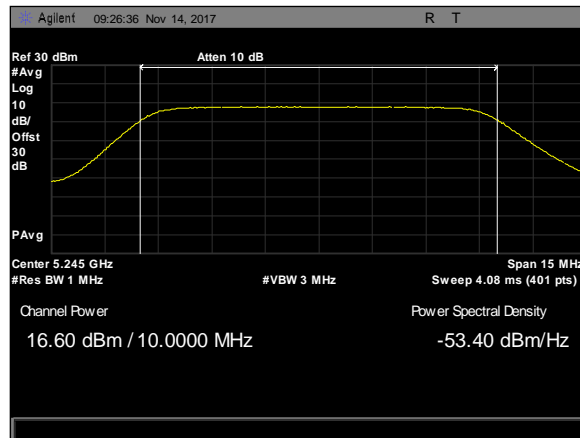
Plot 178. Maximum Conducted Output Power, 10M, 5210, Omni8, rf1



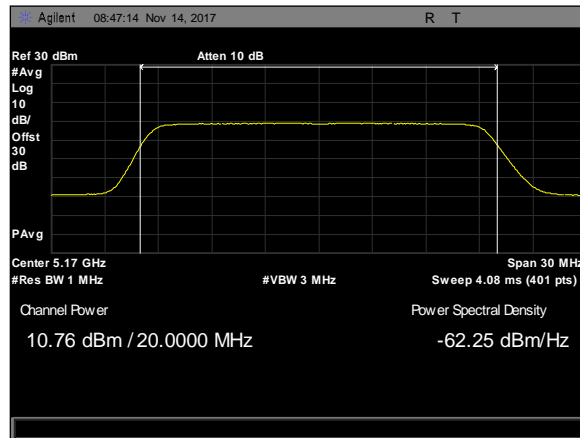
Plot 179. Maximum Conducted Output Power, 10M, 5210, Omni8, rf2, 15



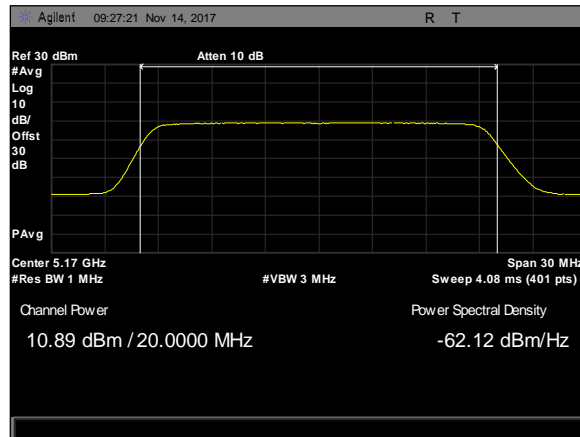
Plot 180. Maximum Conducted Output Power, 10M, 5245, Omni8, rf1



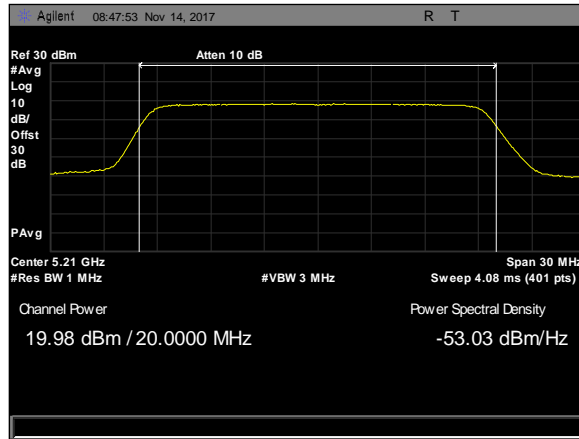
Plot 181. Maximum Conducted Output Power, 10M, 5245, Omni8, rf2



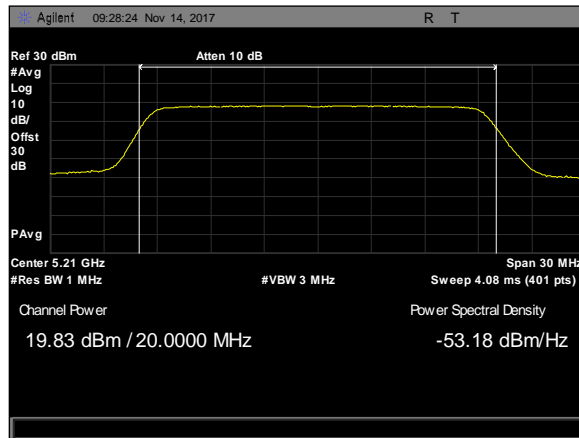
Plot 182. Maximum Conducted Output Power, 20M, 5170, Omni8, rf1



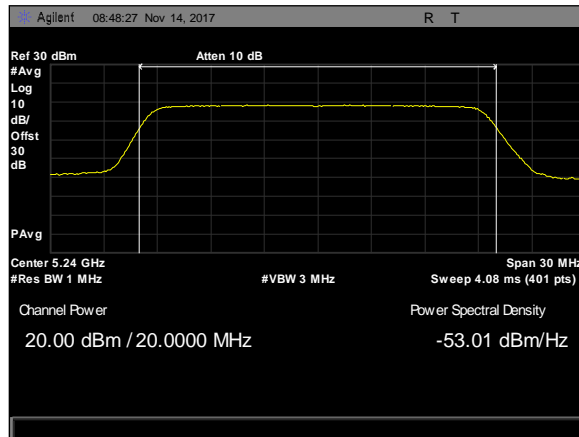
Plot 183. Maximum Conducted Output Power, 20M, 5170, Omni8, rf2



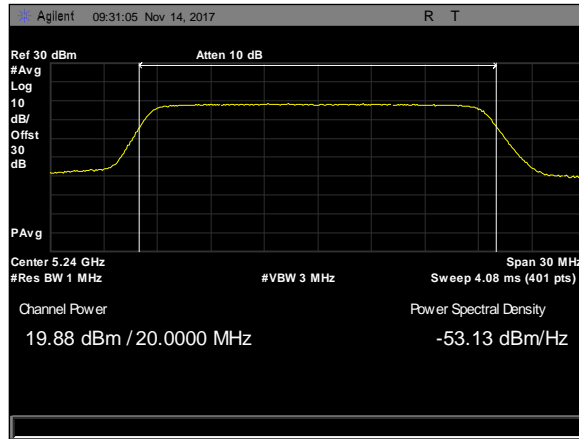
Plot 184. Maximum Conducted Output Power, 20M, 5210, Omni8, rf1



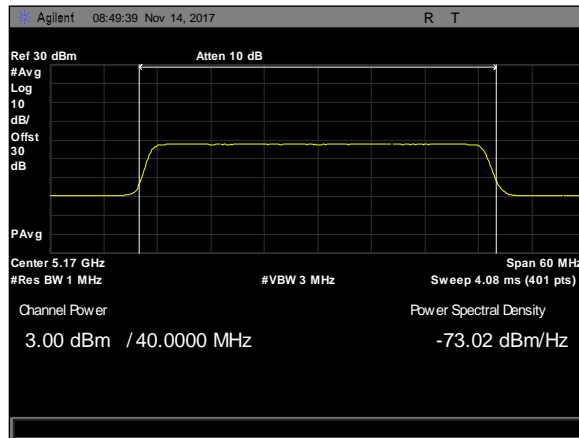
Plot 185. Maximum Conducted Output Power, 20M, 5210, Omni8, rf2



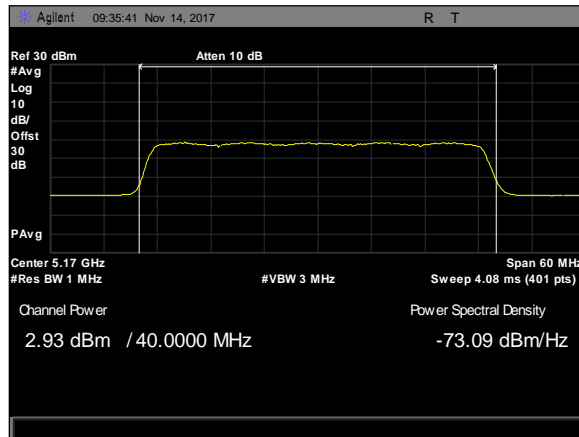
Plot 186. Maximum Conducted Output Power, 20M, 5240, Omni8, rf1



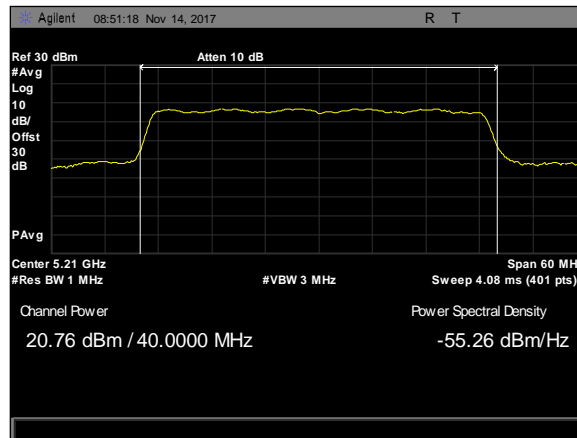
Plot 187. Maximum Conducted Output Power, 20M, 5240, Omni8, rf2



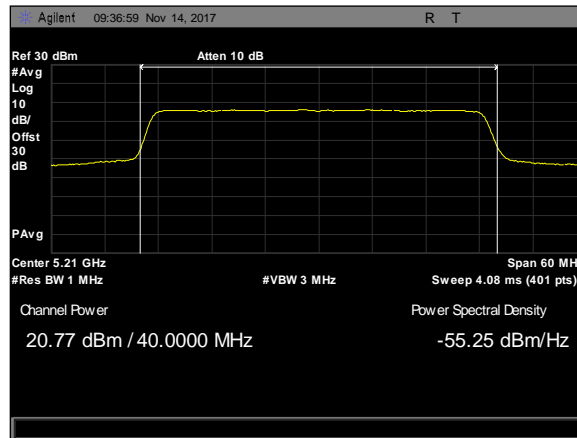
Plot 188. Maximum Conducted Output Power, 40M, 5170, Omni8, rf1



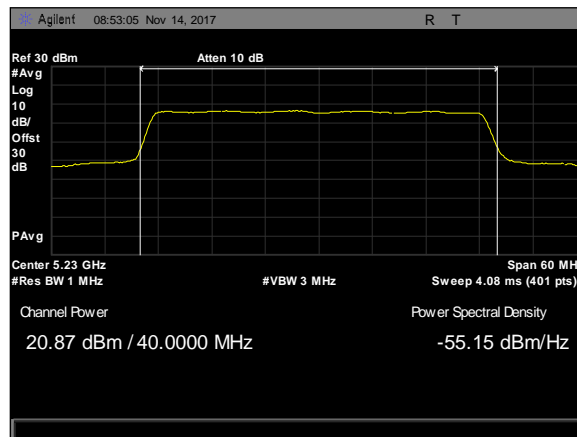
Plot 189. Maximum Conducted Output Power, 40M, 5170, Omni8, rf2



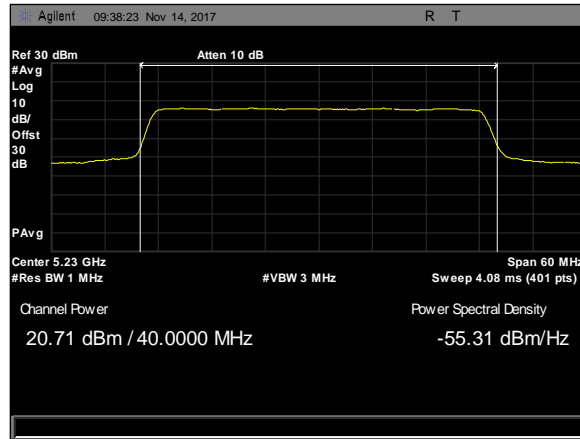
Plot 190. Maximum Conducted Output Power, 40M, 5210, Omni8, rf1



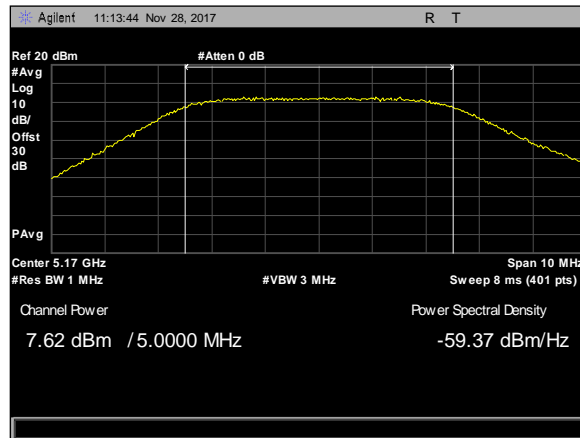
Plot 191. Maximum Conducted Output Power, 40M, 5210, Omni8, rf2



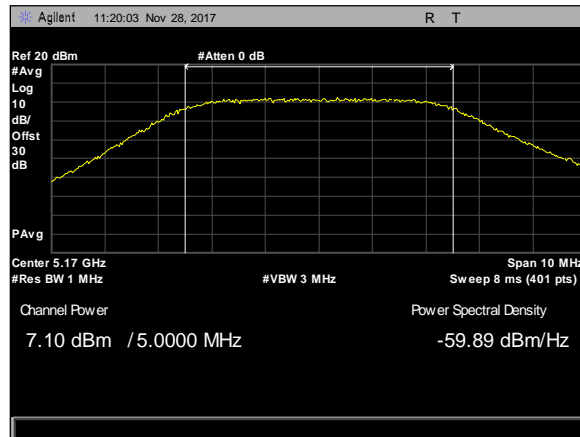
Plot 192. Maximum Conducted Output Power, 40M, 5230, Omni8, rf1



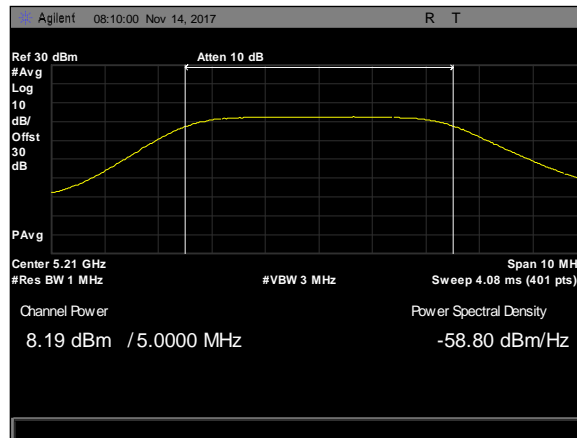
Plot 193. Maximum Conducted Output Power, 40M, 5230, Omni8, rf2



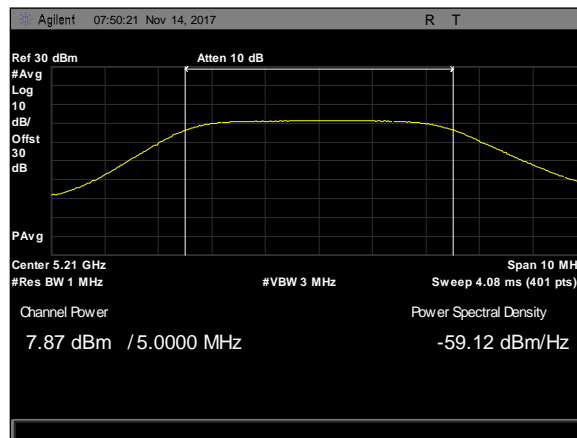
Plot 194. Maximum Conducted Output Power, 5M, 5170, 90Sector, rf1



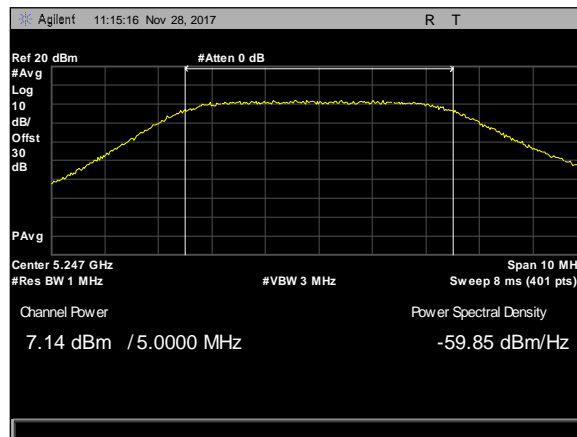
Plot 195. Maximum Conducted Output Power, 5M, 5170, 90Sector, rf2



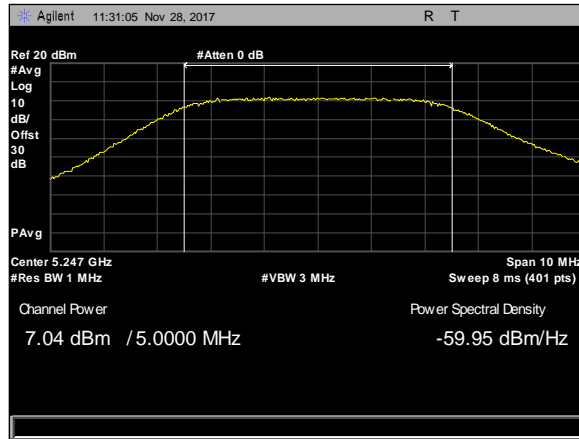
Plot 196. Maximum Conducted Output Power, 5M, 5210, 90Sector, rf1



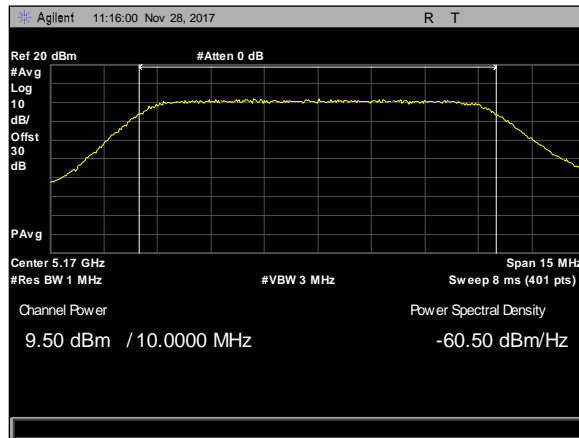
Plot 197. Maximum Conducted Output Power, 5M, 5210, 90Sector, rf2



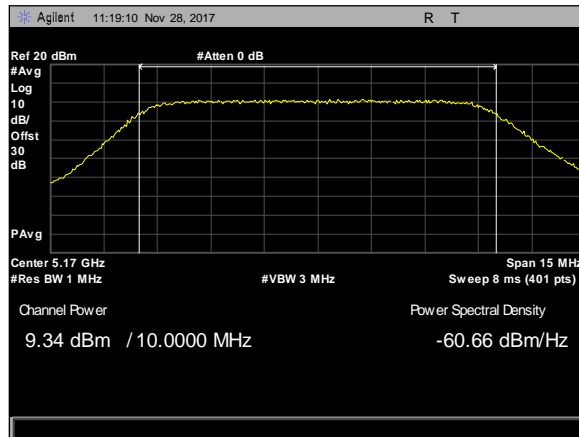
Plot 198. Maximum Conducted Output Power, 5M, 5247.5, 90Sector, rf1



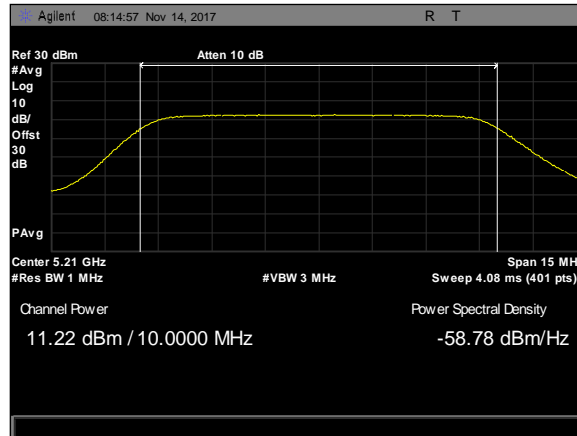
Plot 199. Maximum Conducted Output Power, 5M, 5247.5, 90Sector, rf2



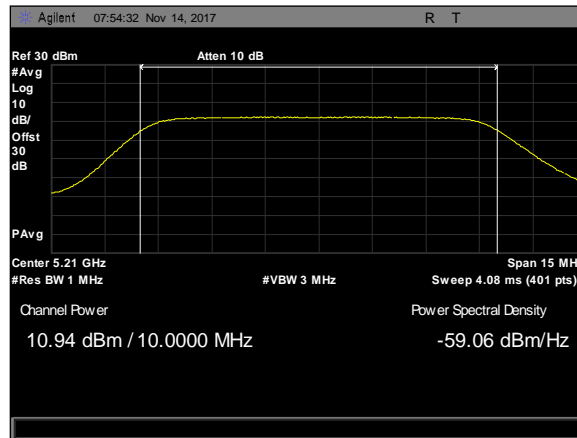
Plot 200. Maximum Conducted Output Power, 10M, 5170, 90Sector, rf1



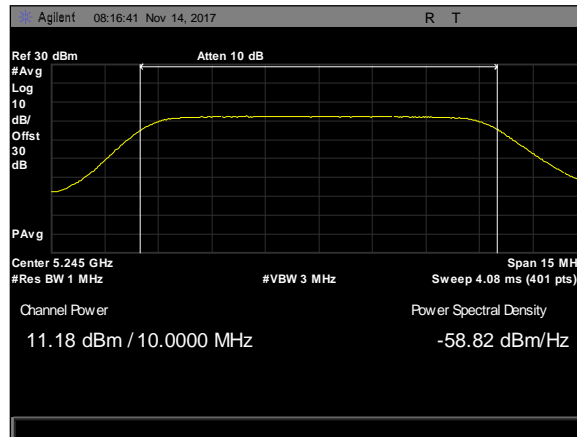
Plot 201. Maximum Conducted Output Power, 10M, 5170, 90Sector, rf2



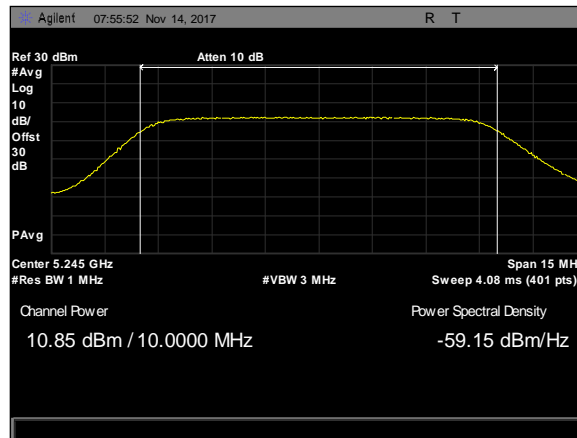
Plot 202. Maximum Conducted Output Power, 10M, 5210, 90Sector, rf1



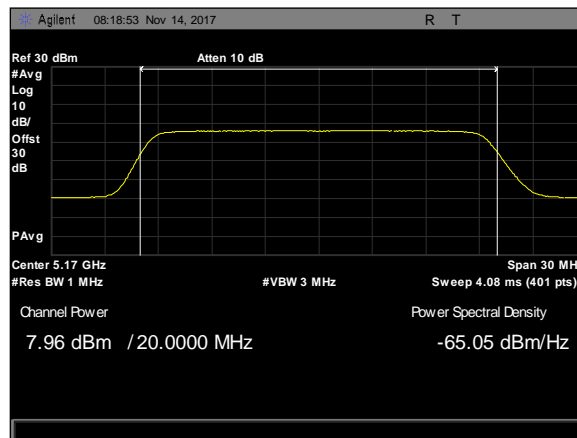
Plot 203. Maximum Conducted Output Power, 10M, 5210, 90Sector, rf2



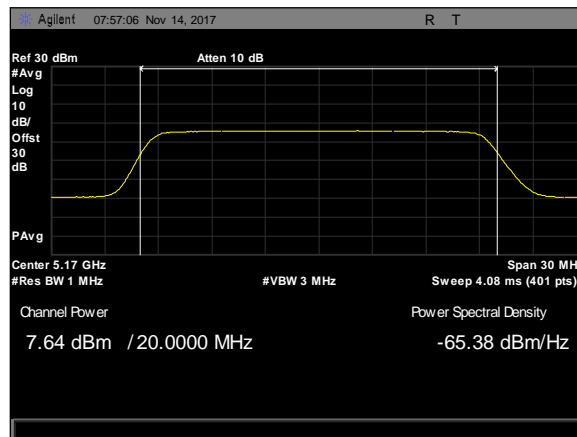
Plot 204. Maximum Conducted Output Power, 10M, 5245, 90Sector, rf1



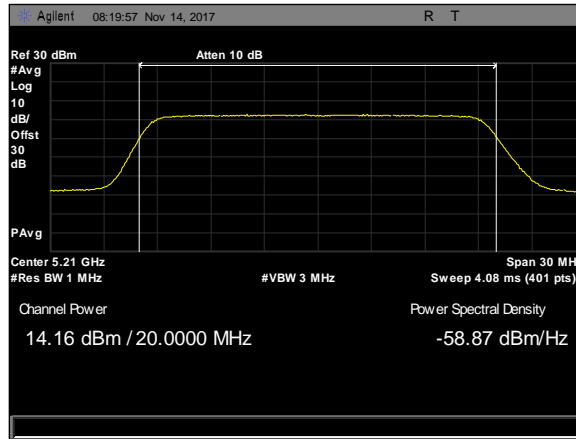
Plot 205. Maximum Conducted Output Power, 10M, 5245, 90Sector, rf2



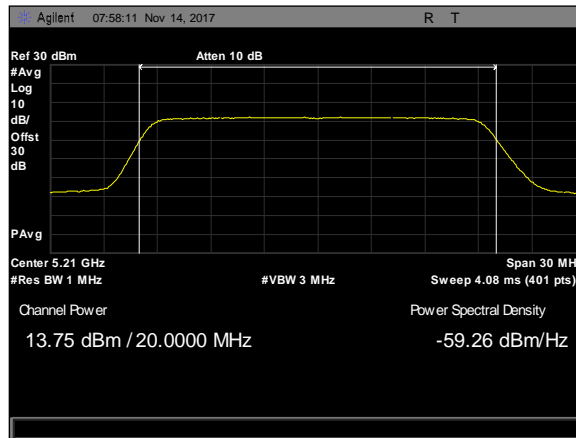
Plot 206. Maximum Conducted Output Power, 20M, 5170, 90Sector, rf1



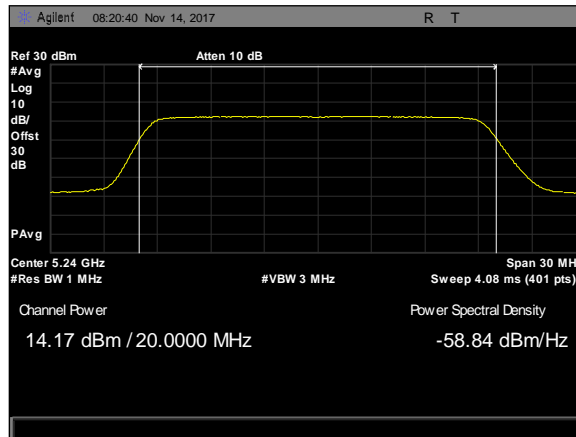
Plot 207. Maximum Conducted Output Power, 20M, 5170, 90Sector, rf2



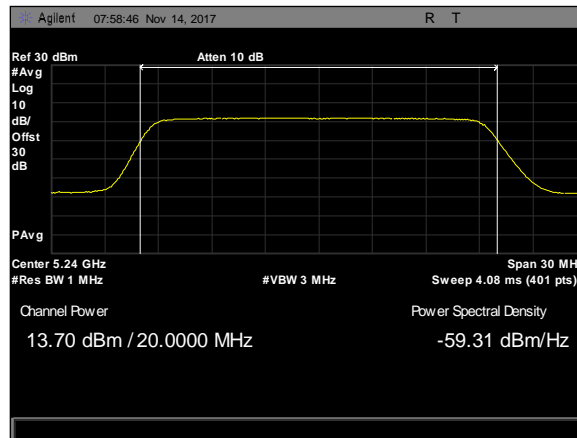
Plot 208. Maximum Conducted Output Power, 20M, 5210, 90Sector, rf1



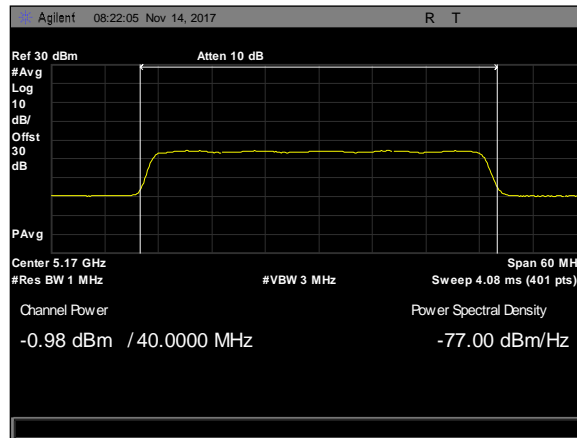
Plot 209. Maximum Conducted Output Power, 20M, 5210, 90Sector, rf2



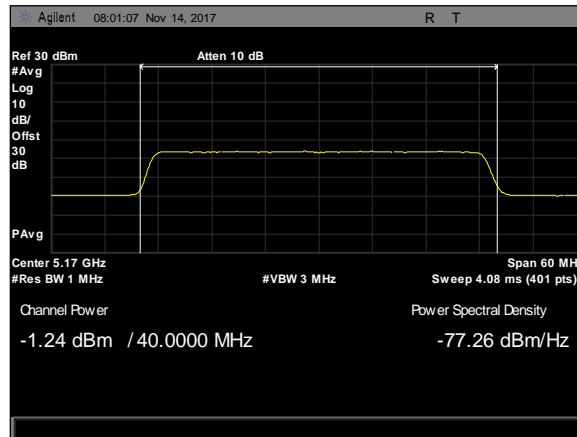
Plot 210. Maximum Conducted Output Power, 20M, 5240, 90Sector, rf1



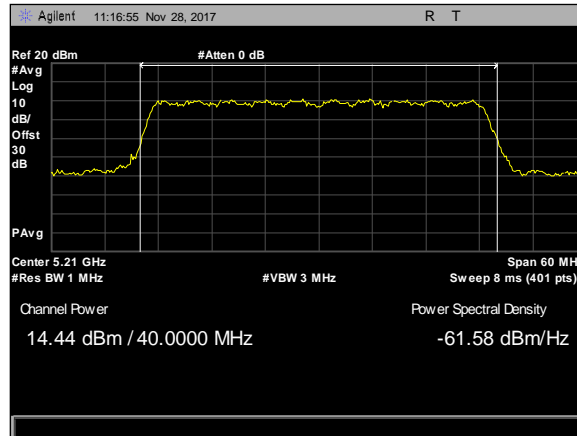
Plot 211. Maximum Conducted Output Power, 20M, 5240, 90Sector, rf2



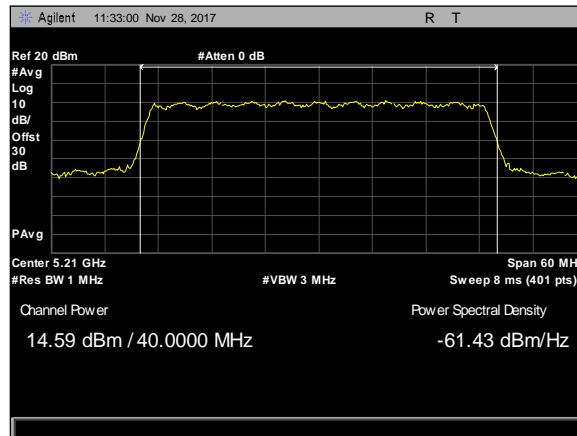
Plot 212. Maximum Conducted Output Power, 40M, 5170, 90Sector, rf1



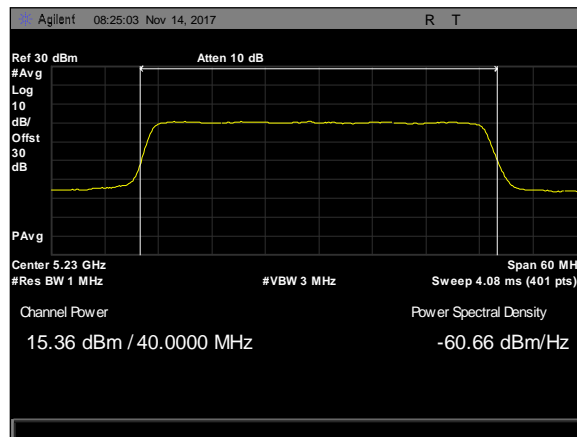
Plot 213. Maximum Conducted Output Power, 40M, 5170, 90Sector, rf2



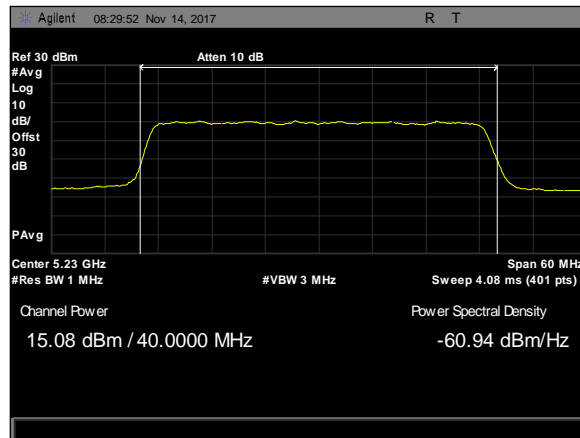
Plot 214. Maximum Conducted Output Power, 40M, 5210, 90Sector, rf1



Plot 215. Maximum Conducted Output Power, 40M, 5210, 90Sector, rf2



Plot 216. Maximum Conducted Output Power, 40M, 5230, 90Sector, rf1



Plot 217. Maximum Conducted Output Power, 40M, 5230, 90Sector, rf2

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(a)(1) EIRP Above Elevation Angle

Test Requirements: §15.407(a)(1): (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

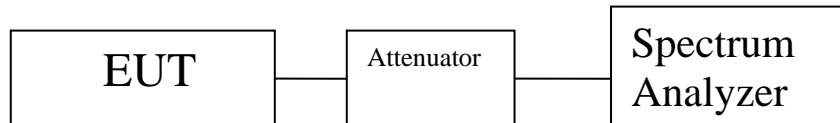
Test Procedure:

1. For fixed infrastructure, not electrically or mechanically steerable beam antenna
 - a) If elevation plane radiation pattern is available:
 - i) Determine the device intended mounting elevation angle and define 0° reference angle on the elevation plane radiation pattern.
 - ii) Indicate any radiation pattern between 30° and 90° which has highest gain.
 - iii) Calculate the EIRP based on this highest gain and conducted output power.
 - iv) Compare to the limit of 125 mW to find compliance.
 - v) Include the elevation pattern data in the application filing with the test report to show how the calculations are made.

Test Results: The EUT as tested is compliant with the requirements of this section.

Test Engineer(s): Bradley Jones

Test Date(s): November 28, 2017





202	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
2' Panel	15.004	5230	40	4.91	216	19.914	98.03925	125	-26.9607
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 16. EIRP Above Elevation Angle, 2' Panel, Test Results

203	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
3' Para	12.93	5235.5	20	5.08	216	18.01	63.24119	125	-61.7588
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 17. EIRP Above Elevation Angle, 3' Para, Test Results

206	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
8 Omni	27.17	5230	40	-8.39	221	18.78	75.50922	125	-49.4908
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 18. EIRP Above Elevation Angle, 8 Omni, Test Results

246	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
5 Omni	21.605	5210	20	-5.03	31.79	16.575	45.44645	125	-79.5535
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 19. EIRP Above Elevation Angle, 5 Omni, Test Results

207	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
90 Sector	21.06	5230	40	-2.28	31.79	18.78	75.50922	125	-49.4908
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 20. EIRP Elevation Angle, 90 Sector, Test Results

201	Max OP	Frequency	Bandwidth	Highest Gain	Angle	EIRP	mW	limit	margin
1' Panel	15.91	5210	10	4.44	31.79	20.35	108.3927	125	-16.6073
	dBm	MHz		dB	degrees				
Reference angle in radiation pattern is 180°. Search is conducted from 210-270°.									

Table 21. EIRP Elevation Angle, 1' Panel, Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(a)(1) Maximum Power Spectral Density

Test Requirements: §15.407(a)(1)(i): In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(a)(1)(ii): In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi..

§15.407(a)(1)(iii): In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

§15.407(a)(1)(iv): In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

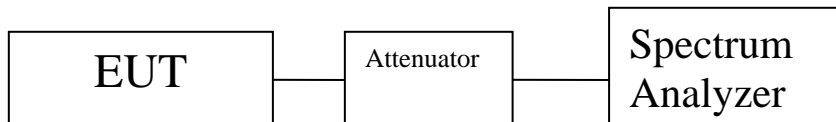
Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according KDB 789033 D02 General UNII Test Procedures v01.

Test Results: The EUT as tested is compliant with the requirements of this section.

No anomalies detected.

Test Engineer(s): Bradley Jones

Test Date(s): November 21, 2017





Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	10.37	10.55	16.84365412	5	17	-0.15634588
5210	10.71	10.67	17.07276769	5	17	0.072767691
5247.5	10.61	10.52	16.94795477	5	17	-0.052045228
10 MHz						
5170	10.28	10.45	16.7485534	5	17	-0.251446604
5210	10.51	10.54	16.90774754	5	17	-0.092252456
5245	10.56	10.48	16.90290584	5	17	-0.097094156
20 MHz						
5170	0.43	0.784	6.993327526	5	17	-10.00667247
5210	8.247	7.397	14.22548375	5	17	-2.774516245
5240	7.688	6.676	13.59413242	5	17	-3.405867577
40MHz						
5170	-12.1	-11.7	-5.50395197	5	17	-22.50395197
5210	4.732	4.59	11.04430198	5	17	-5.955698019
5230	6.017	5.296	12.05416672	5	17	-4.945833284

Table 22. Power Spectral Density, 5 Omni, Test Results

Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	8.179	8.301	14.62315002	8	15	-0.376849978
5210	8.088	7.551	14.21051628	8	15	-0.789483715
5247.5	8.791	8.363	14.96499197	8	15	-0.035008033
10 MHz						
5170	8.365	8.207	14.66944012	8	15	-0.330559878
5210	8.737	8.431	14.96941614	8	15	-0.030583857
5245	8.547	8.443	14.87803294	8	15	-0.121967058
20 MHz						
5170	-0.49	-0.65	5.812440122	8	15	-9.187559878
5210	8.674	8.441	14.94178402	8	15	-0.058215985
5240	8.504	8.517	14.8932265	8	15	-0.106773496
40MHz						
5170	-11.2	-11.3	-4.87179196	8	15	-19.87179196
5210	7.257	6.82	13.42671585	8	15	-1.573284148
5230	7.617	6.966	13.68640821	8	15	-1.31359179

Table 23. Power Spectral Density, 8 Omni, Test Results



Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	2.254	2.593	8.809528493	14	9	-0.190471507
5210	2.453	1.79	8.516861186	14	9	-0.483138814
5247.5	2.644	1.693	8.577200551	14	9	-0.422799449
10 MHz						
5170	2.181	1.345	8.165806502	14	9	-0.834193498
5210	2.465	1.915	8.581422478	14	9	-0.418577522
5245	2.48	1.828	8.548945643	14	9	-0.451054357
20 MHz						
5170	-3.65	-4.52	2.323120643	14	9	-6.676879357
5210	2.32	1.626	8.369569514	14	9	-0.630430486
5240	2.376	1.596	8.386209314	14	9	-0.613790686
40MHz						
5170	-15.1	-16	-9.13502736	14	9	-18.13502736
5210	1.61	2.454	8.435192135	14	9	-0.564807865
5230	3.038	2.08	8.968083628	14	9	-0.031916372

Table 24. Power Spectral Density, 90 Sector, Test Results

Frequency (MHz)	RF1	RF2	Total PSD	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	2.919	2.489	6.38272164	21	17	-10.61727836
5210	4.462	3.63	6.38272164	21	17	-10.61727836
5247.5	4.374	3.601	6.38272164	21	17	-10.61727836
10 MHz						
5170	-0.8	-1.14	6.38272164	21	17	-10.61727836
5210	1.551	0.884	6.38272164	21	17	-10.61727836
5245	1.919	0.452	6.38272164	21	17	-10.61727836
20 MHz						
5170	-11.6	-11.8	6.38272164	21	17	-10.61727836
5210	-1.45	-2.25	6.38272164	21	17	-10.61727836
5240	-1.37	-2.2	6.38272164	21	17	-10.61727836
40MHz						
5171	-25.4	-25.5	6.38272164	21	17	-10.61727836
5210	-4.95	-5.58	6.38272164	21	17	-10.61727836
5230	-3.83	-4.8	6.38272164	21	17	-10.61727836

Table 25. Power Spectral Density, 1' Panel, Test Results

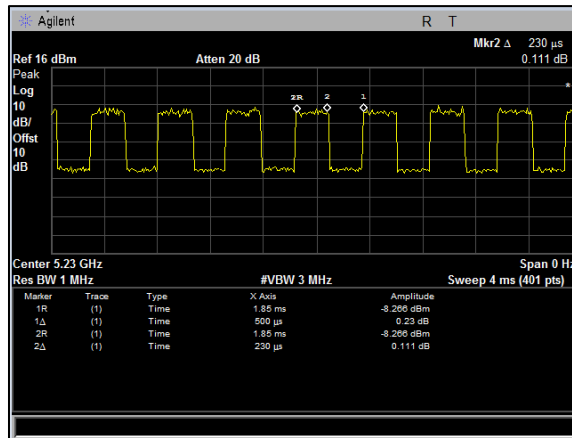


Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	-5.77	-6.17	-0.64740491	26	14	-14.64740491
5210	-3.43	-3	4.817730965	26	14	-9.182269035
5242.5	-3	-2.51	3.633044339	26	14	-10.36695566
10 MHz						
5170	-6.88	-7.19	-0.64740491	26	14	-14.64740491
5210	-1.56	-1.57	4.817730965	26	14	-9.182269035
5240.5	-2.57	-3.13	3.542209364	26	14	-10.45779064
20 MHz						
5170	-10.9	-11.1	-4.6014466	26	14	-18.6014466
5210	-3.57	-4.01	2.598291514	26	14	-11.40170849
5235.5	-2.86	-2.82	3.545274858	26	14	-10.45472514
40MHz						
5171	-25.3	-25.6	-19.0346885	26	14	-33.03468847
5210	-7.75	-8.4	-1.67674095	26	14	-15.67674095
5230	-5.5	-5.02	1.132294621	26	14	-12.86770538

Table 26. Power Spectral Density, 2' Panel, Test Results

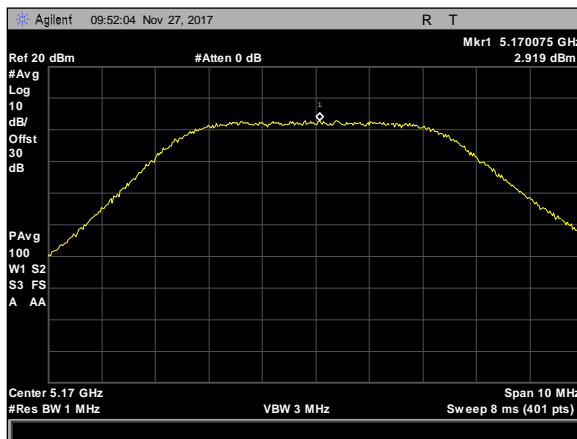
Frequency (MHz)	RF1	RF2	Total Power	Antenna Gain	Limit dBm	PSD Margin
5 MHz						
5170	-8.42	-8.48	-2.06468485	30	10	-12.06468485
5210	-3.4	-3.94	2.721578145	30	10	-7.278421855
5242.5	-3.82	-4.21	2.372802202	30	10	-7.627197798
10 MHz						
5170	-7.73	-8.49	-1.70776203	30	10	-11.70776203
5210	-3.28	-3.88	2.814937565	30	10	-7.185062435
5240.5	-3.72	-4.23	2.411732975	30	10	-7.588267025
20 MHz						
5170	-11.1	-11.5	-4.88312352	30	10	-14.88312352
5210	-4.51	-4.98	1.64660361	30	10	-8.35339639
5235.5	-4.79	-5.23	1.379665698	30	10	-8.620334302
40MHz						
5170	-25.5	-25.1	-18.9426748	30	10	-28.94267482
5210	-10.2	-9.96	-3.68203324	30	10	-13.68203324
5230	-7.26	-7.76	-1.11561547	30	10	-11.11561547

Table 27. Power Spectral Density, 3' Para, Test Results

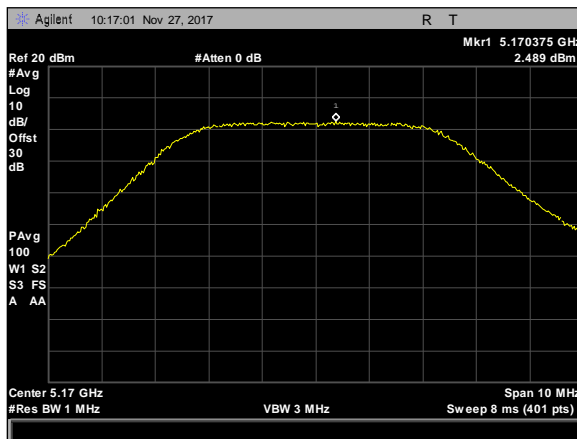


Plot 218. Duty Cycle

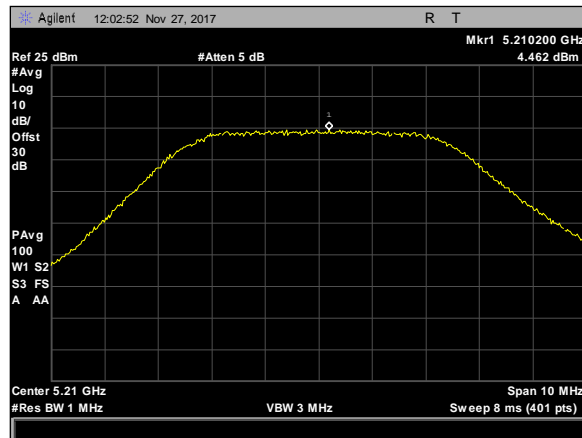
Note: Device is not capable of continuous transmission. The duty cycle was measured, and a correction factor was applied. The correction factor was calculated as $10\log(1/230/500)=-3.372$ dB.



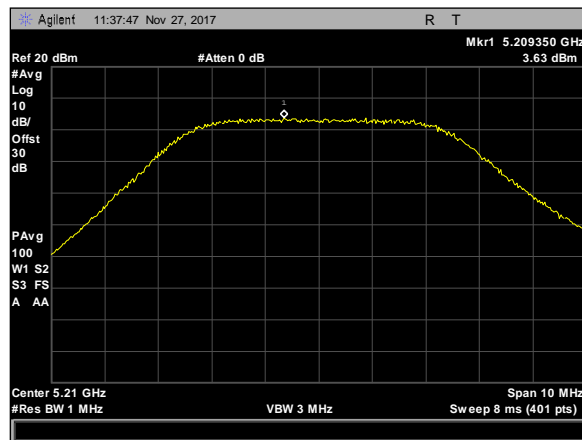
Plot 219. Maximum Power Spectral Density, 5M, 5170, 1Panel, rf1



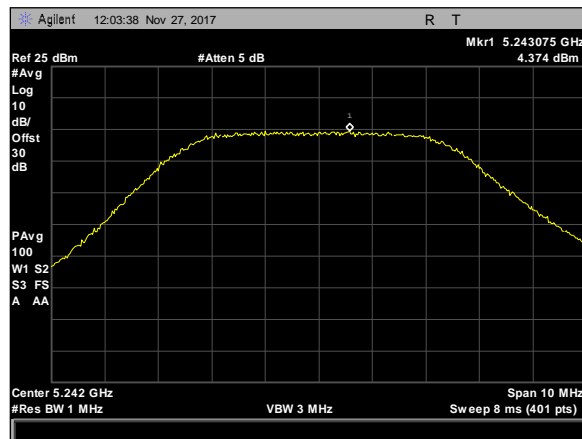
Plot 220. Maximum Power Spectral Density, 5M, 5170, 1Panel, rf2



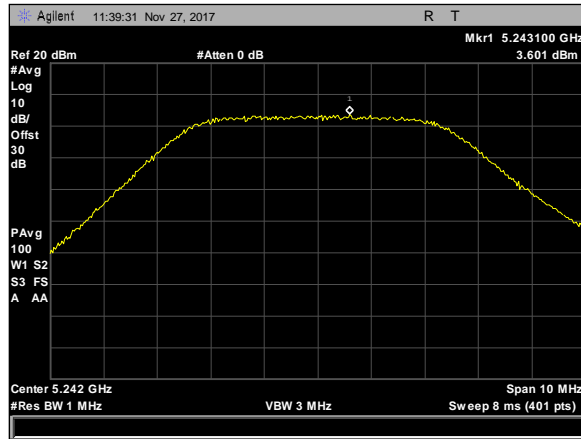
Plot 221. Maximum Power Spectral Density, 5M, 5210, 1Panel, rf1



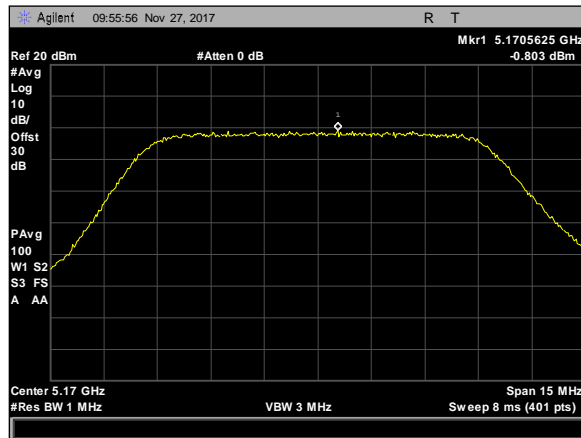
Plot 222. Maximum Power Spectral Density, 5M, 5210, 1Panel, rf2



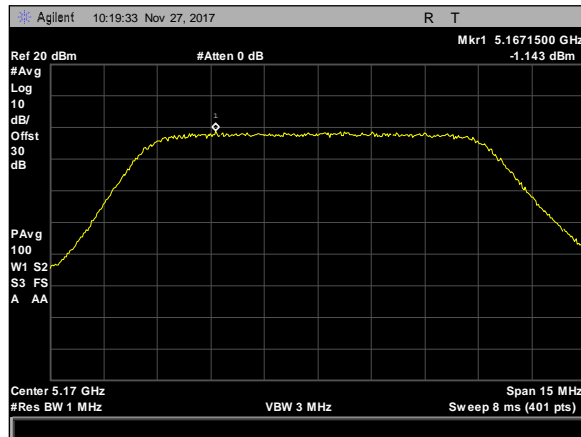
Plot 223. Maximum Power Spectral Density, 5M, 5242.5, 1Panel, rf1



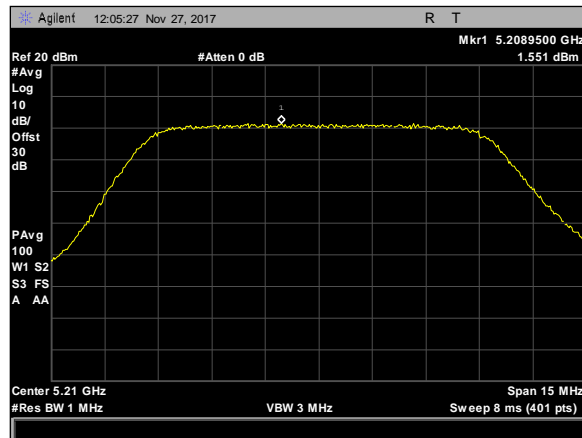
Plot 224. Maximum Power Spectral Density, 5M, 5242.5, 1Panel, rf2



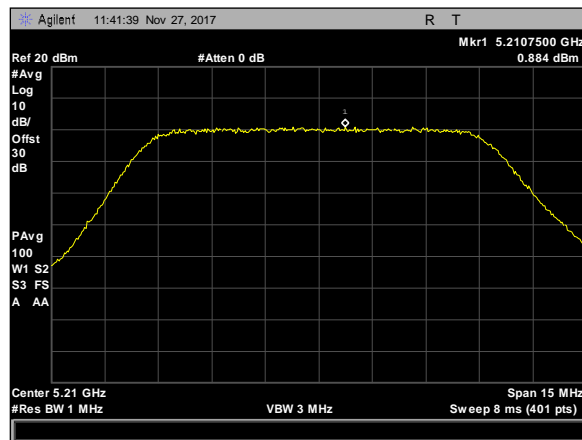
Plot 225. Maximum Power Spectral Density, 10M, 5170, 1Panel, rf1



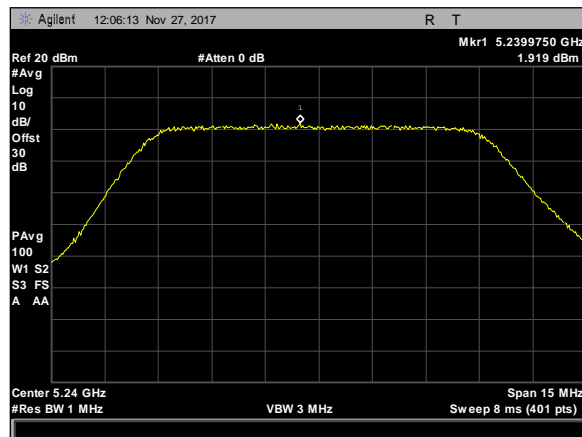
Plot 226. Maximum Power Spectral Density, 10M, 5170, 1Panel, rf2



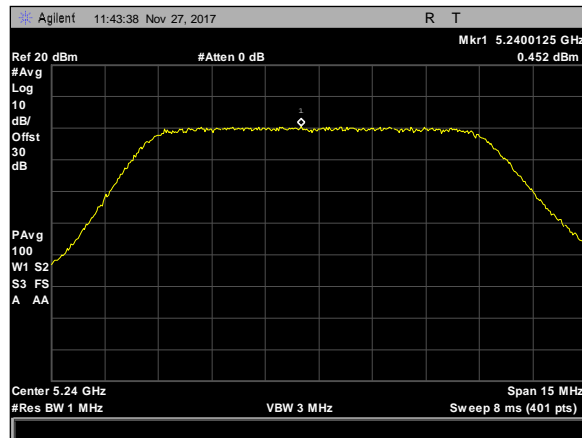
Plot 227. Maximum Power Spectral Density, 10M, 5210, 1Panel, rf1



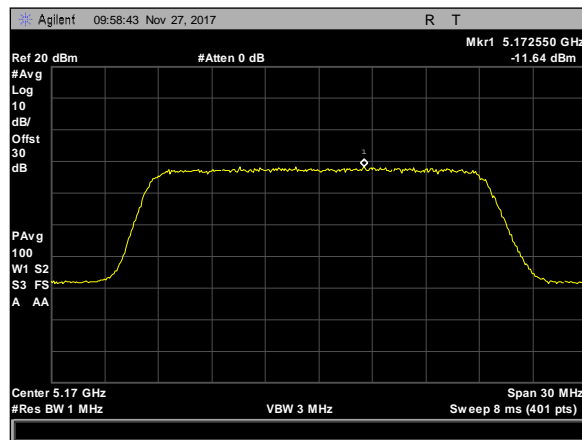
Plot 228. Maximum Power Spectral Density, 10M, 5210, 1Panel, rf2



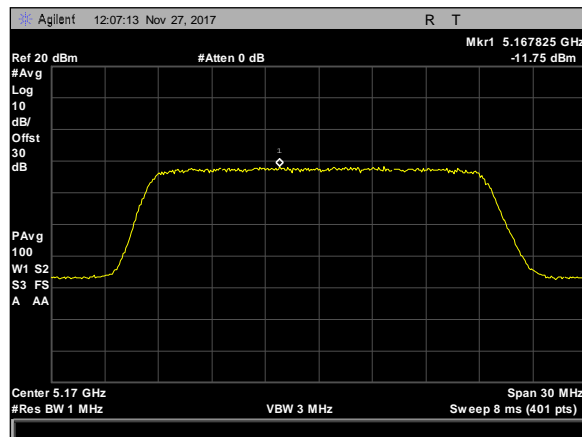
Plot 229. Maximum Power Spectral Density, 10M, 5240.5, 1Panel, rf1



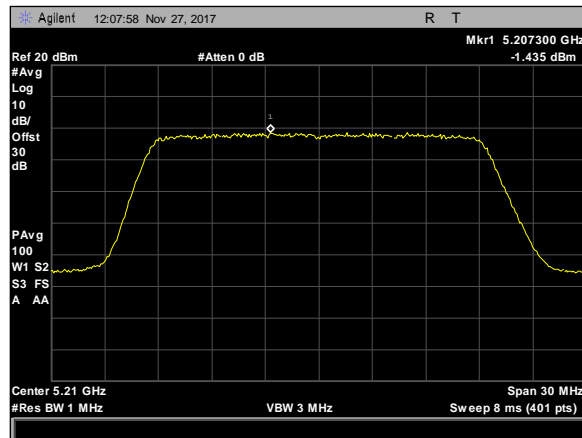
Plot 230. Maximum Power Spectral Density, 10M, 5240.5, 1Panel, rf2



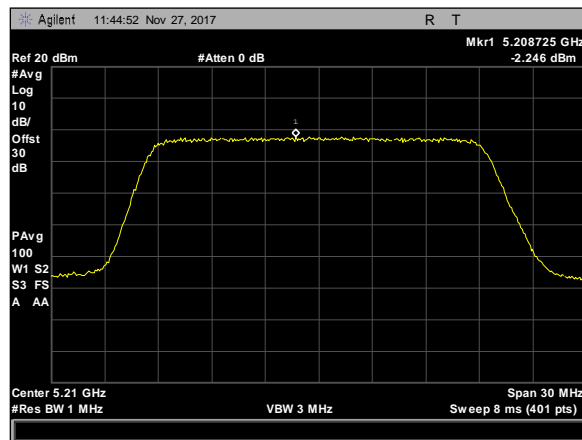
Plot 231. Maximum Power Spectral Density, 20M, 5170, 1Panel, rf1



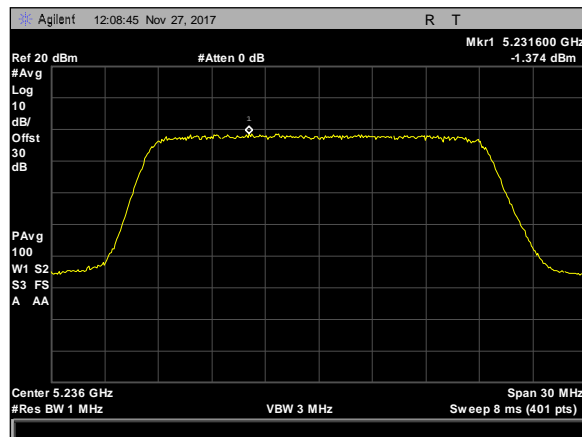
Plot 232. Maximum Power Spectral Density, 20M, 5170, 1Panel, rf2



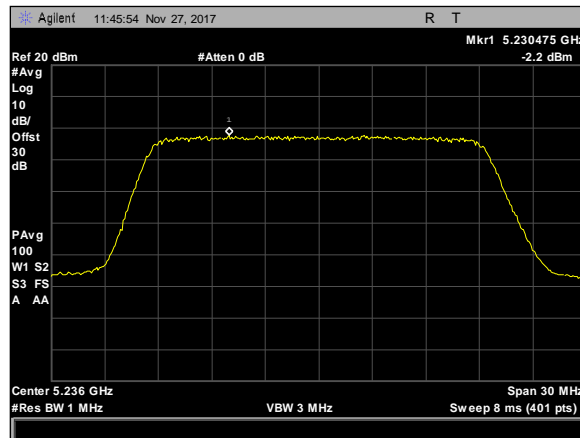
Plot 233. Maximum Power Spectral Density, 20M, 5210, 1Panel, rf1



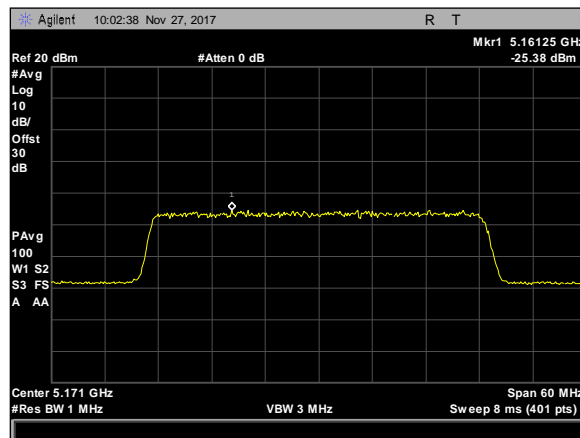
Plot 234. Maximum Power Spectral Density, 20M, 5210, 1Panel, rf2



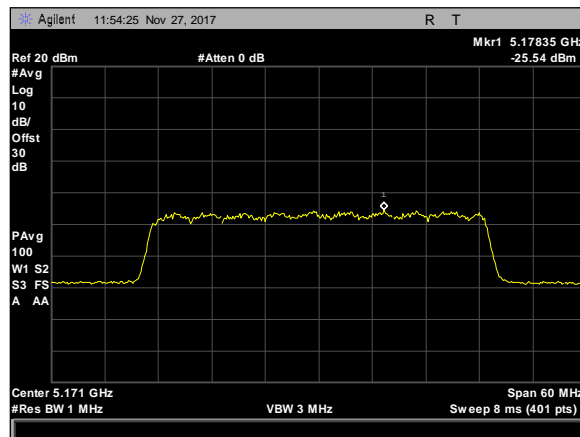
Plot 235. Maximum Power Spectral Density, 20M, 5235.5, 1Panel, rf1



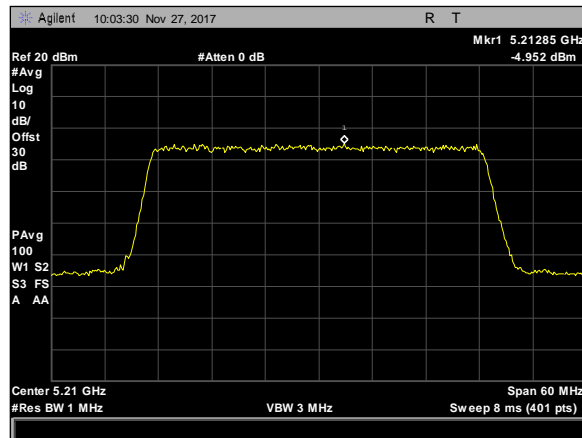
Plot 236. Maximum Power Spectral Density, 20M, 5235.5, 1Panel, rf2



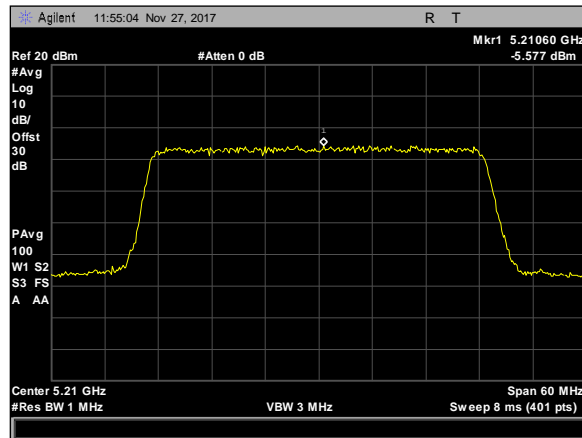
Plot 237. Maximum Power Spectral Density, 40M, 5171, 1Panel, rf1



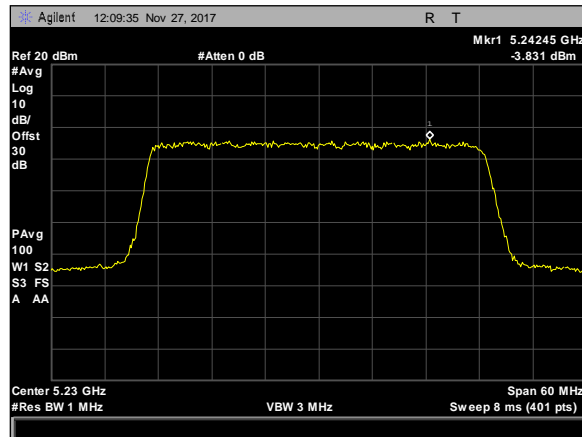
Plot 238. Maximum Power Spectral Density, 40M, 5171, 1Panel, rf2



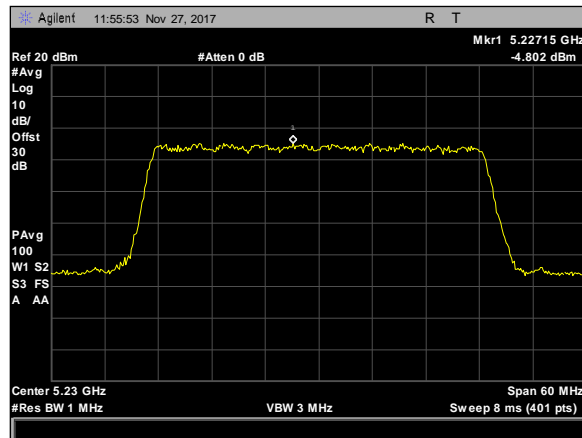
Plot 239. Maximum Power Spectral Density, 40M, 5210, 1Panel, rf1



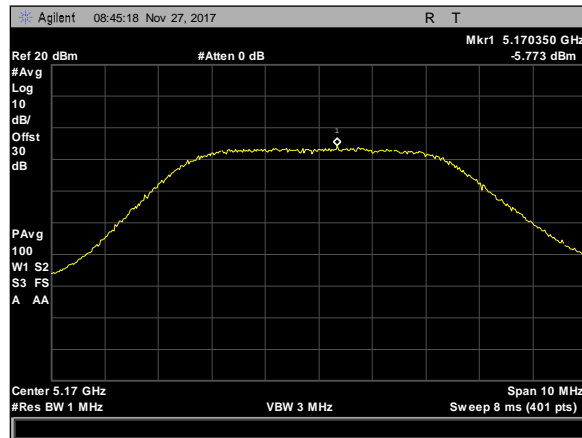
Plot 240. Maximum Power Spectral Density, 40M, 5210, 1Panel, rf2



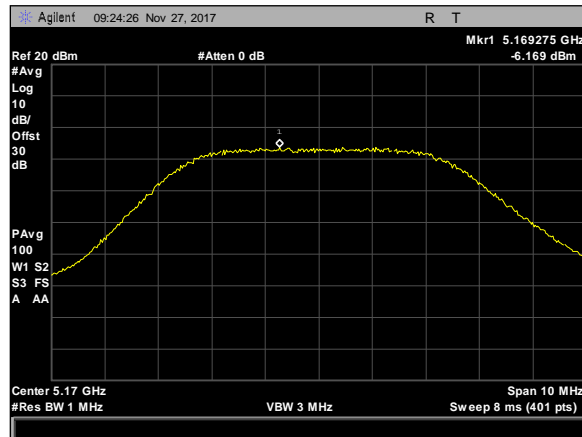
Plot 241. Maximum Power Spectral Density, 40M, 5230, 1Panel, rf1



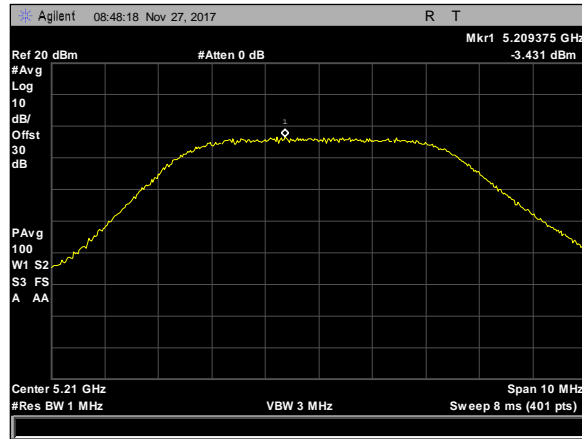
Plot 242. Maximum Power Spectral Density, 40M, 5230, 1Panel, rf2



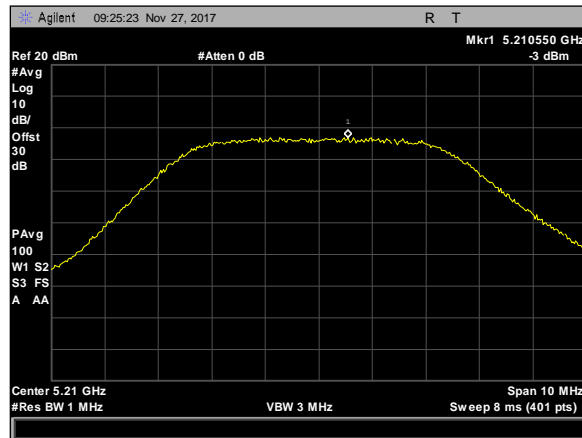
Plot 243. Maximum Power Spectral Density, 5M, 5170, 2Panel, rf1



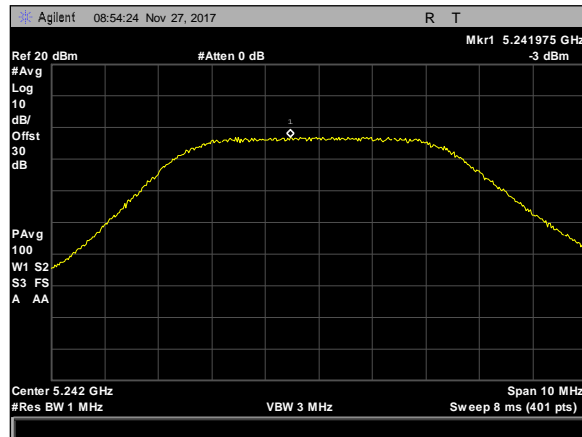
Plot 244. Maximum Power Spectral Density, 5M, 5170, 2Panel, rf2



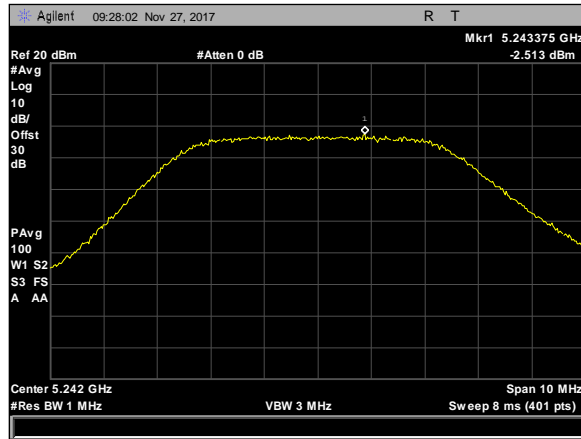
Plot 245. Maximum Power Spectral Density, 5M, 5210, 2Panel, rf1



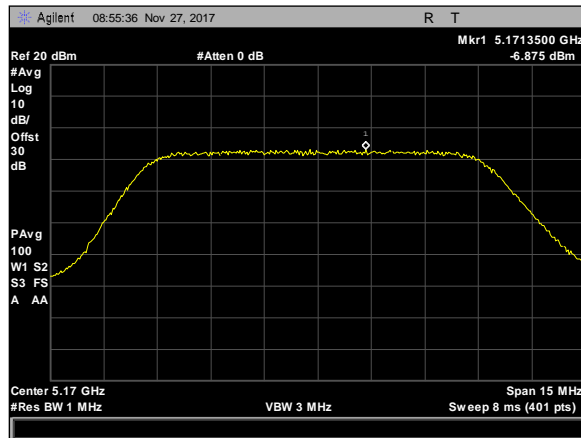
Plot 246. Maximum Power Spectral Density, 5M, 5210, 2Panel, rf2



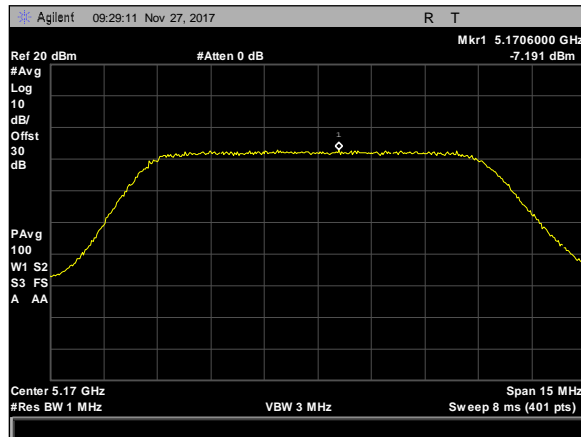
Plot 247. Maximum Power Spectral Density, 5M, 5242.5, 2Panel, rf1



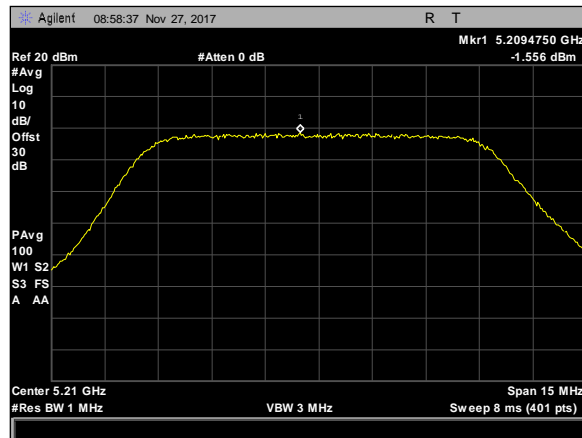
Plot 248. Maximum Power Spectral Density, 5M, 5242.5, 2Panel, rf2



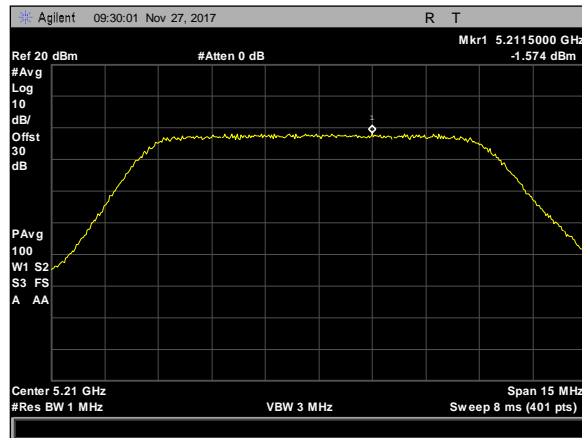
Plot 249. Maximum Power Spectral Density, 10M, 5170, 2Panel, rf1



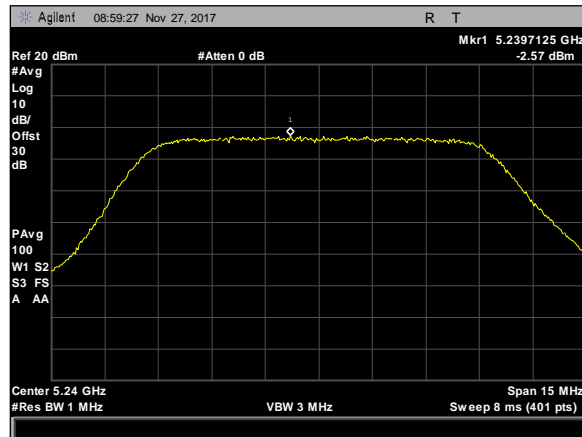
Plot 250. Maximum Power Spectral Density, 10M, 5170, 2Panel, rf2



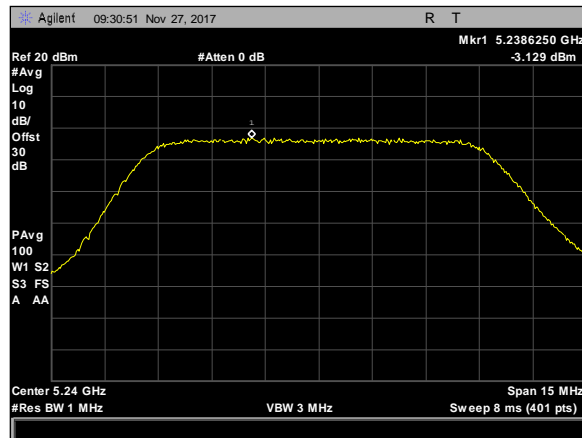
Plot 251. Maximum Power Spectral Density, 10M, 5210, 2Panel, rf1



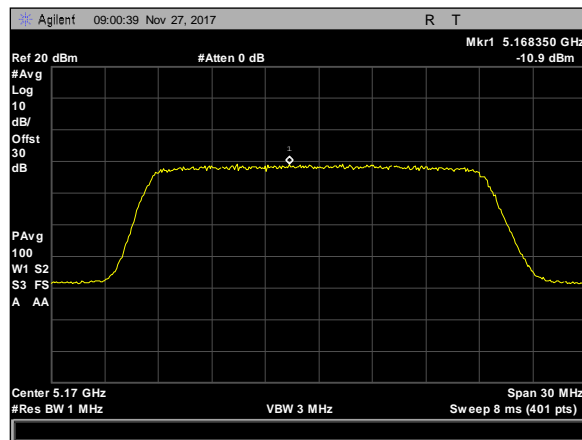
Plot 252. Maximum Power Spectral Density, 10M, 5210, 2Panel, rf2



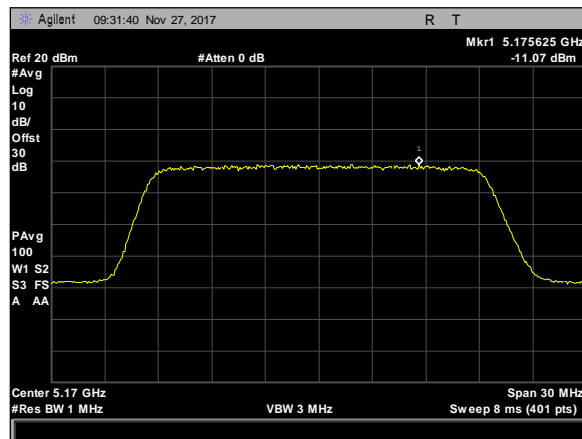
Plot 253. Maximum Power Spectral Density, 10M, 5240.5, 2Panel, rf1



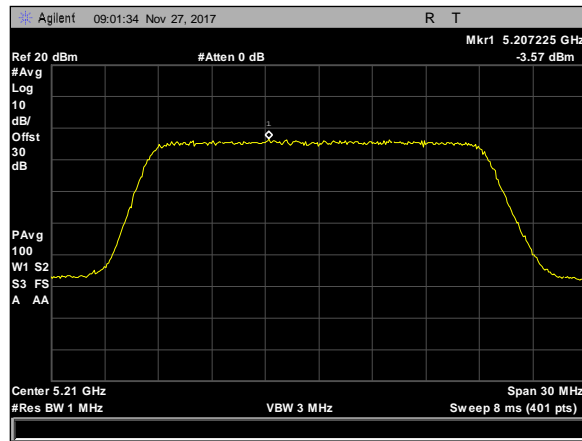
Plot 254. Maximum Power Spectral Density, 10M, 5240.5, 2Panel, rf2



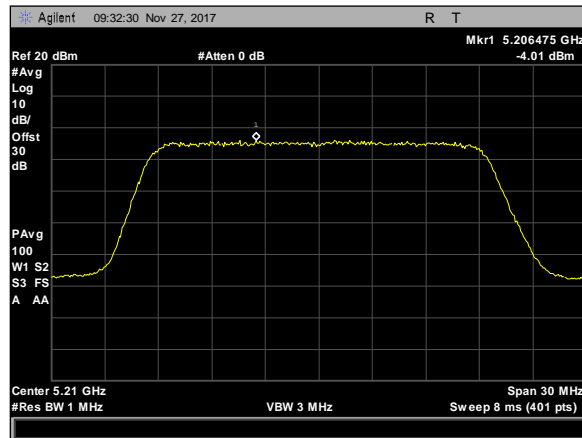
Plot 255. Maximum Power Spectral Density, 20M, 5170, 2Panel, rf1



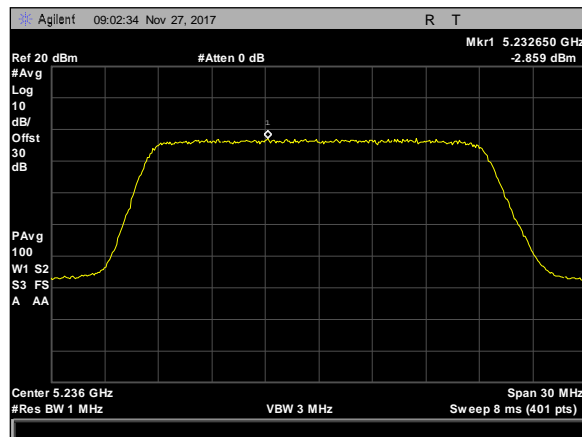
Plot 256. Maximum Power Spectral Density, 20M, 5170, 2Panel, rf2



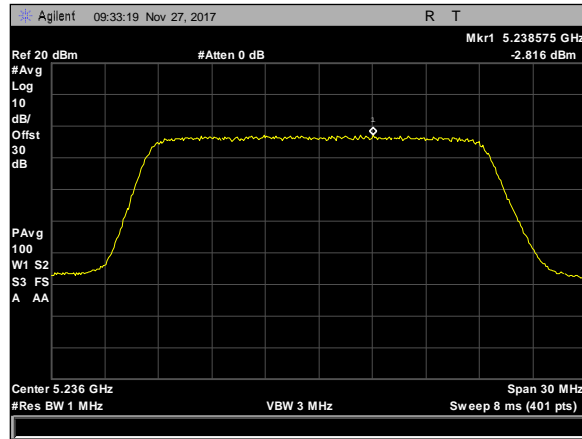
Plot 257. Maximum Power Spectral Density, 20M, 5210, 2Panel, rf1



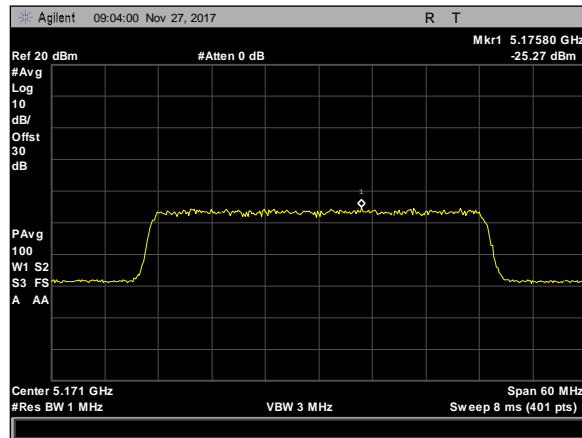
Plot 258. Maximum Power Spectral Density, 20M, 5210, 2Panel, rf2



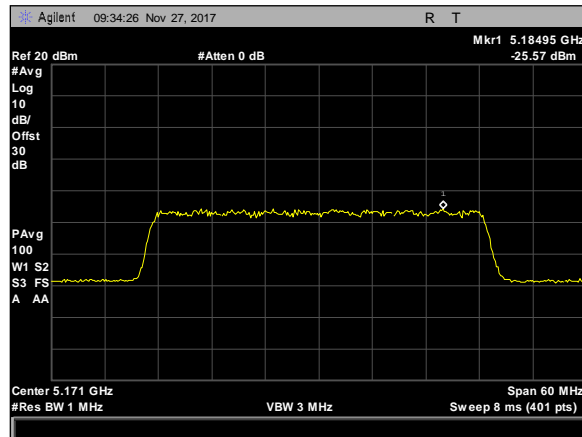
Plot 259. Maximum Power Spectral Density, 20M, 5235.5, 2Panel, rf1



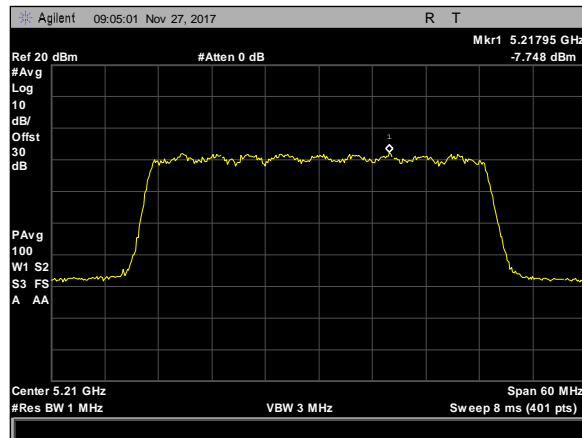
Plot 260. Maximum Power Spectral Density, 20M, 5235.5, 2Panel, rf2



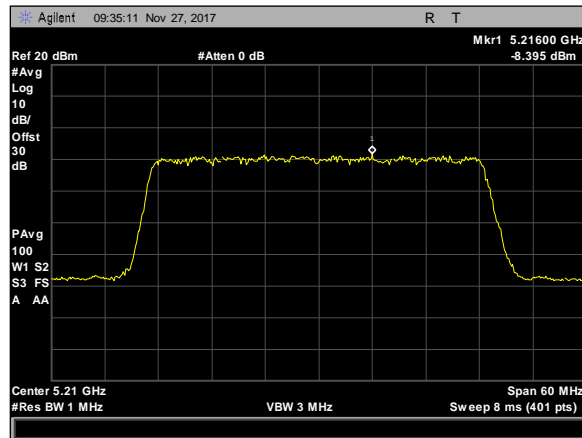
Plot 261. Maximum Power Spectral Density, 40M, 5171, 2Panel, rf1



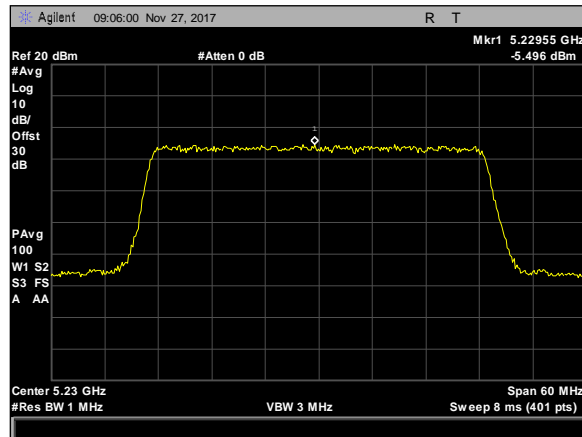
Plot 262. Maximum Power Spectral Density, 40M, 5171, 2Panel, rf2



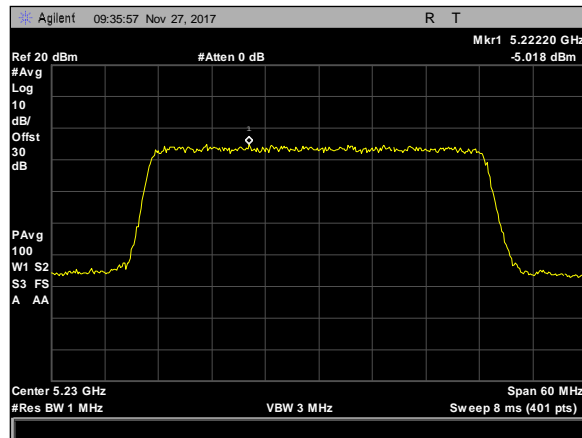
Plot 263. Maximum Power Spectral Density, 40M, 5210, 2Panel, rf1



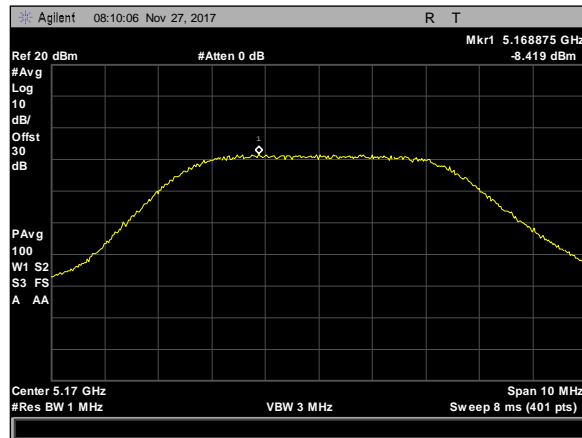
Plot 264. Maximum Power Spectral Density, 40M, 5210, 2Panel, rf2



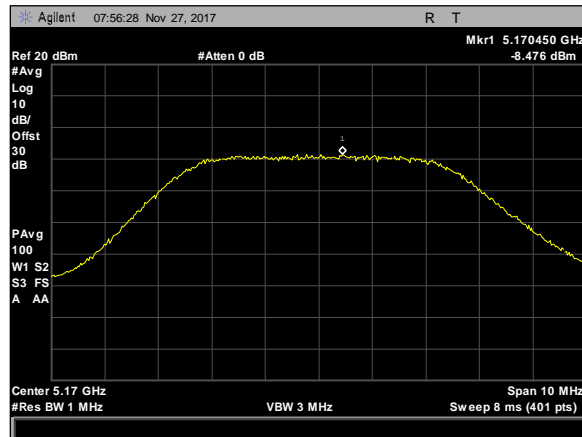
Plot 265. Maximum Power Spectral Density, 40M, 5230, 2Panel, rf1



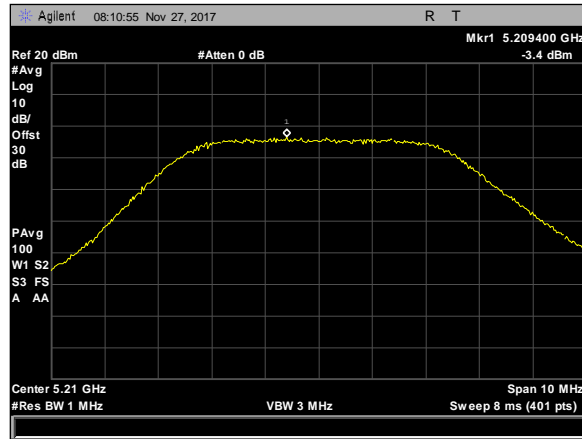
Plot 266. Maximum Power Spectral Density, 40M, 5230, 2Panel, rf2



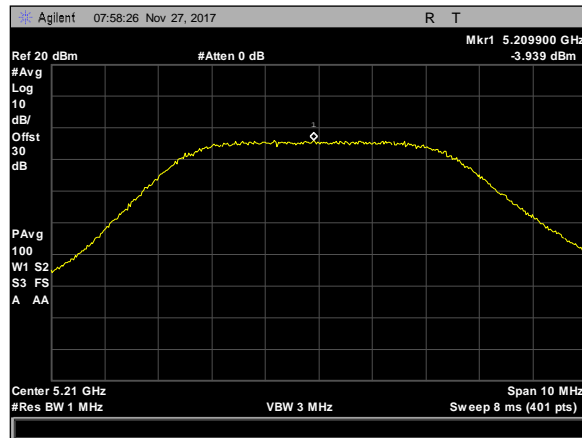
Plot 267. Maximum Power Spectral Density, 5M, 5170, 3Para, rf1



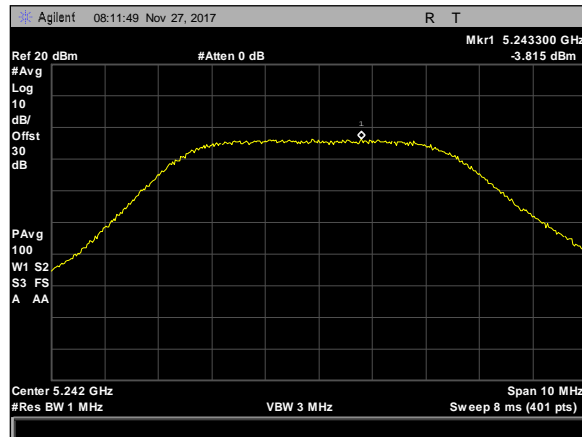
Plot 268. Maximum Power Spectral Density, 5M, 5170, 3Para, rf2



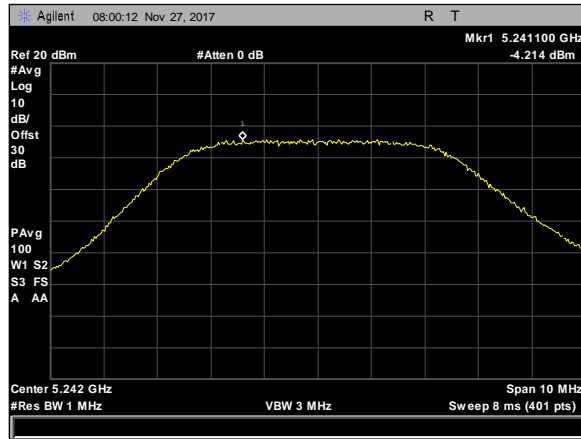
Plot 269. Maximum Power Spectral Density, 5M, 5210, 3Para, rf1



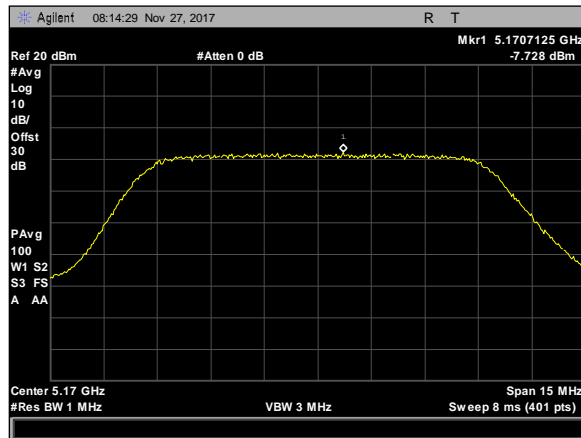
Plot 270. Maximum Power Spectral Density, 5M, 5210, 3Para, rf2



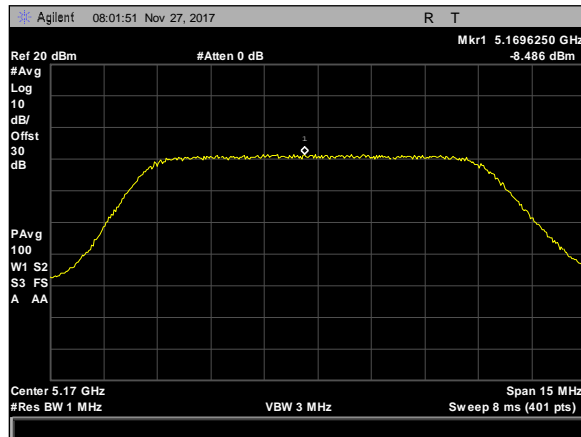
Plot 271. Maximum Power Spectral Density, 5M, 5242.5, 3Para, rf1



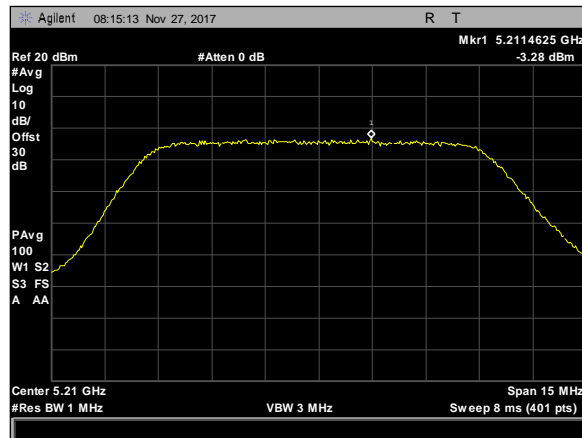
Plot 272. Maximum Power Spectral Density, 5M, 5242.5, 3Para, rf2



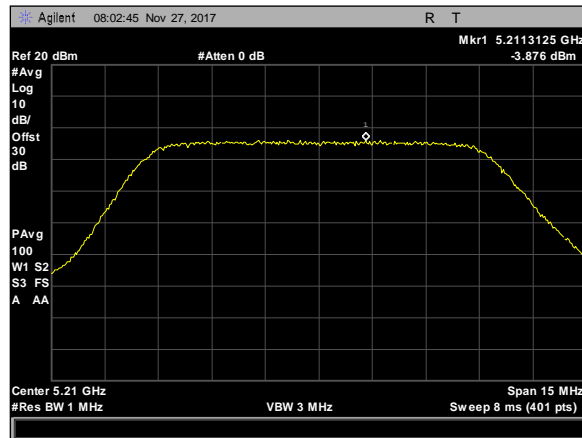
Plot 273. Maximum Power Spectral Density, 10M, 5170, 3Para, rf1



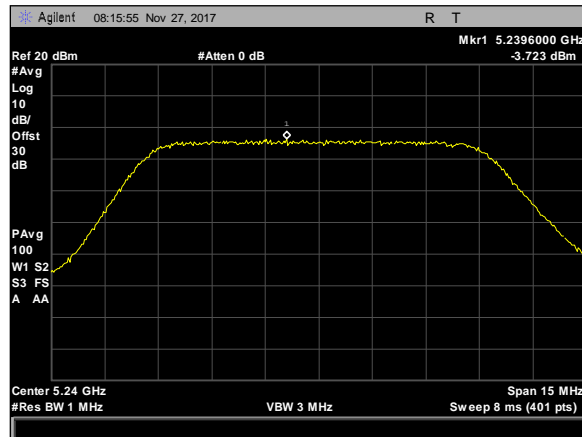
Plot 274. Maximum Power Spectral Density, 10M, 5170, 3Para, rf2



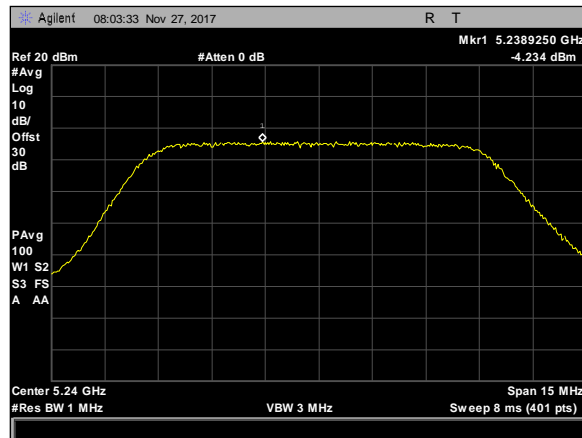
Plot 275. Maximum Power Spectral Density, 10M, 5210, 3Para, rf1



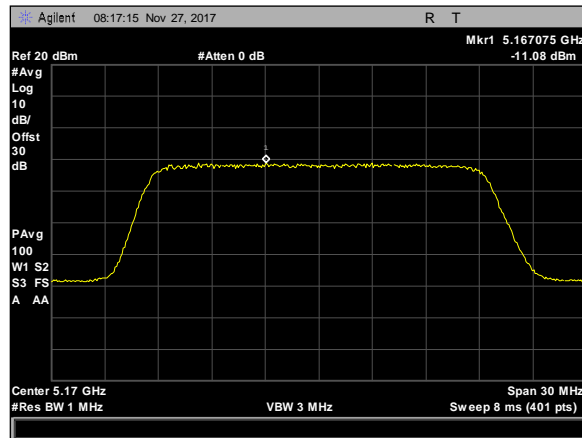
Plot 276. Maximum Power Spectral Density, 10M, 5210, 3Para, rf2



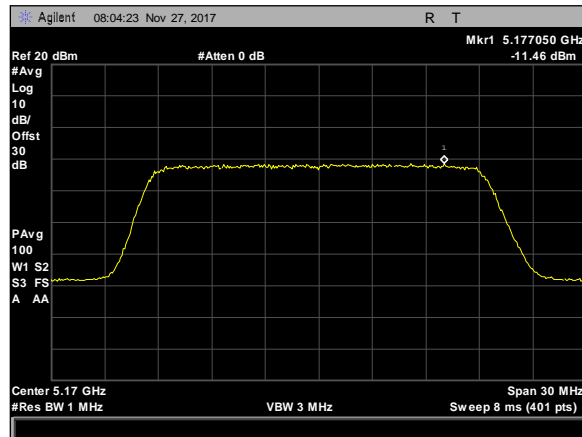
Plot 277. Maximum Power Spectral Density, 10M, 5240.5, 3Para, rf1



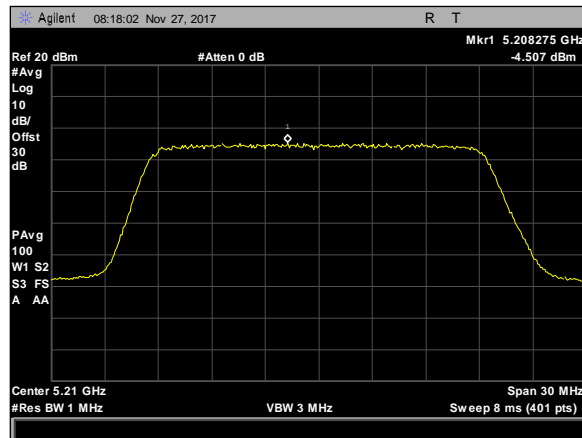
Plot 278. Maximum Power Spectral Density, 10M, 5240.5, 3Para, rf2



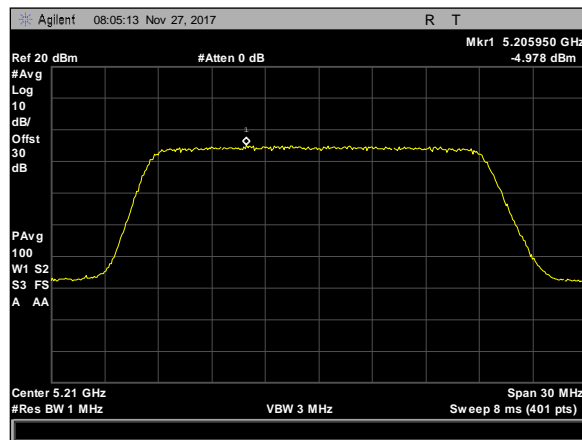
Plot 279. Maximum Power Spectral Density, 20M, 5170, 3Para, rf1



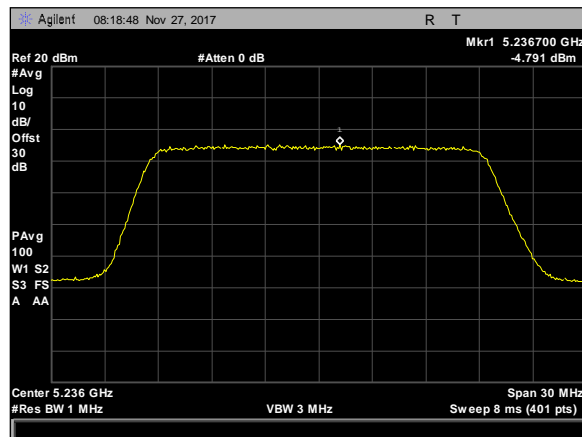
Plot 280. Maximum Power Spectral Density, 20M, 5170, 3Para, rf2



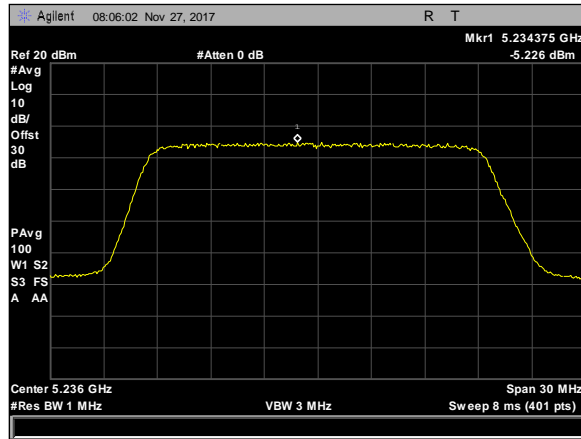
Plot 281. Maximum Power Spectral Density, 20M, 5210, 3Para, rf1



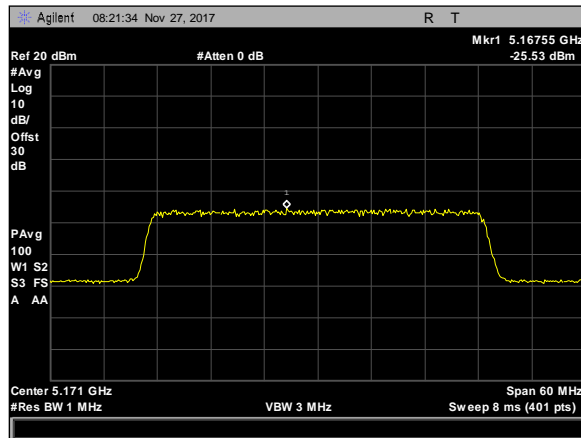
Plot 282. Maximum Power Spectral Density, 20M, 5210, 3Para, rf2



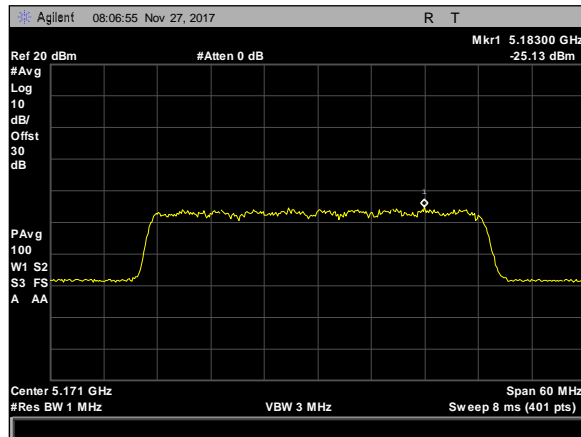
Plot 283. Maximum Power Spectral Density, 20M, 5235.5, 3Para, rf1



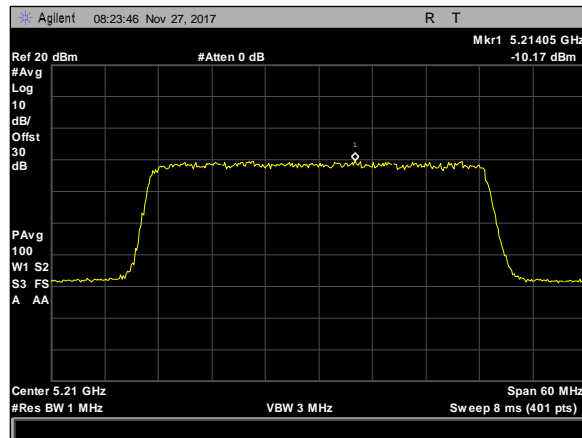
Plot 284. Maximum Power Spectral Density, 20M, 5235.5, 3Para, rf2



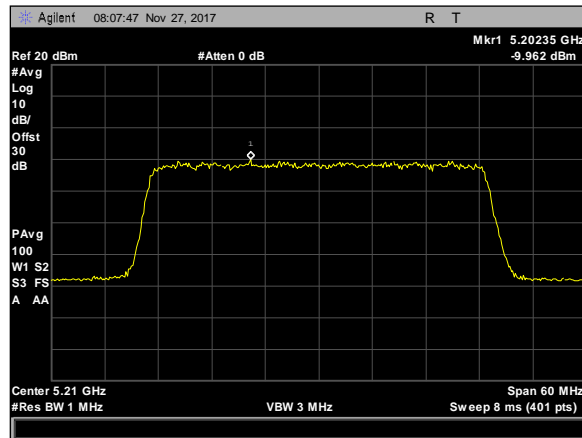
Plot 285. Maximum Power Spectral Density, 40M, 5171, 3Para, rf1



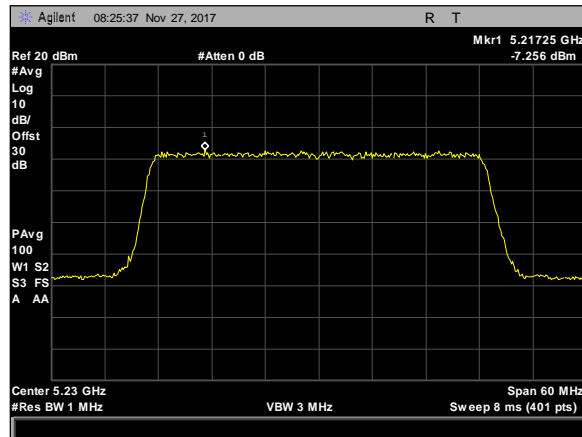
Plot 286. Maximum Power Spectral Density, 40M, 5171, 3Para, rf2



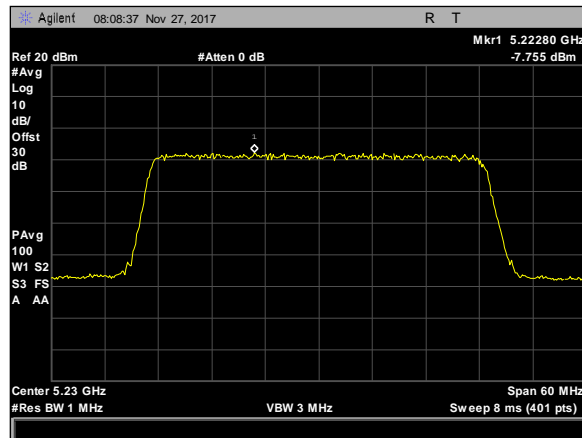
Plot 287. Maximum Power Spectral Density, 40M, 5210, 3Para, rf1



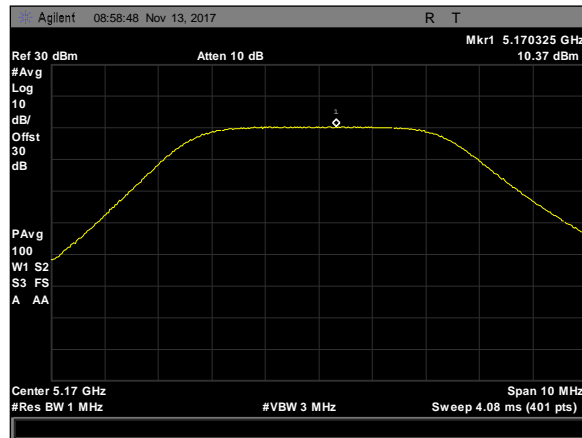
Plot 288. Maximum Power Spectral Density, 40M, 5210, 3Para, rf2



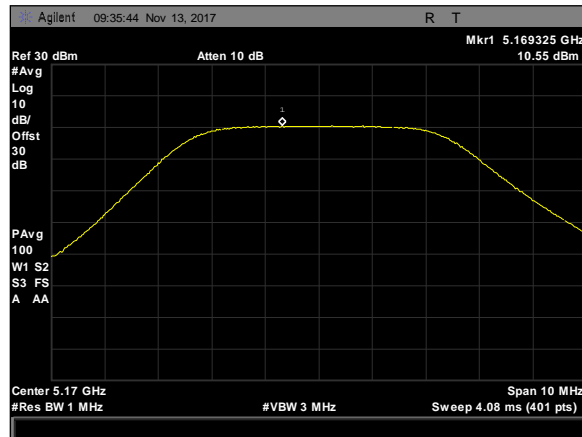
Plot 289. Maximum Power Spectral Density, 40M, 5230, 3Para, rf1



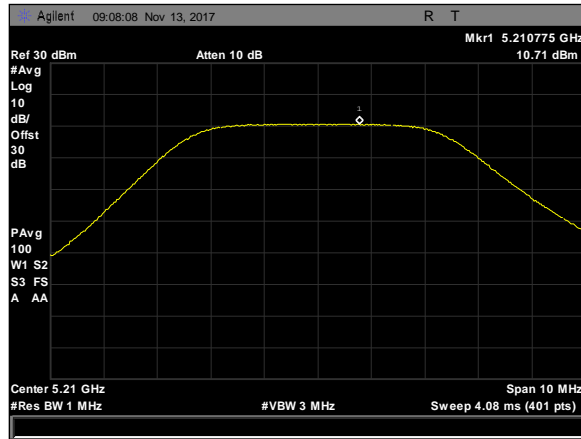
Plot 290. Maximum Power Spectral Density, 40M, 5230, 3Para, rf2



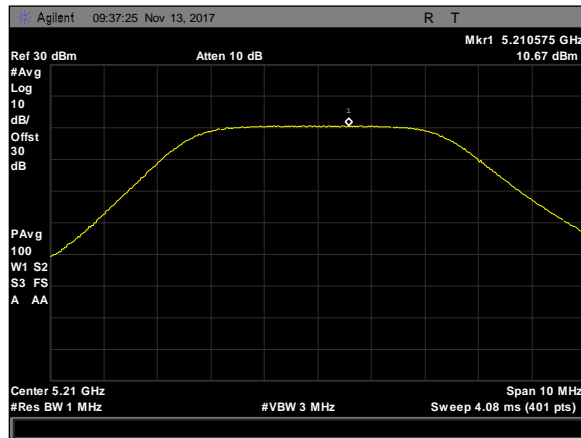
Plot 291. Maximum Power Spectral Density, 5M, 5170, 50Omni, rf1



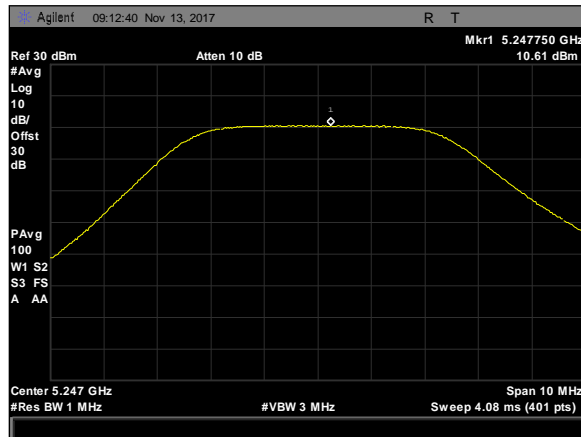
Plot 292. Maximum Power Spectral Density, 5M, 5170, 50Omni, rf2



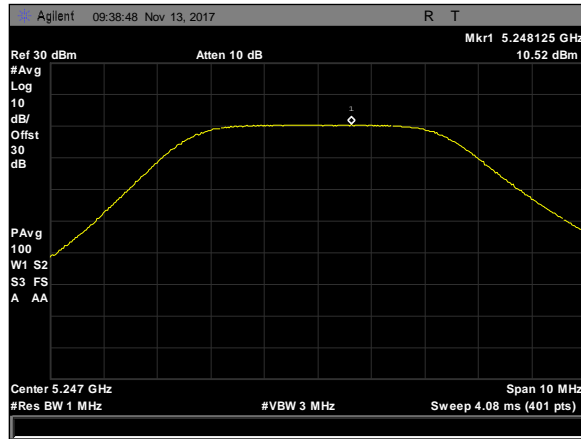
Plot 293. Maximum Power Spectral Density, 5M, 5210, 50mni, rf1



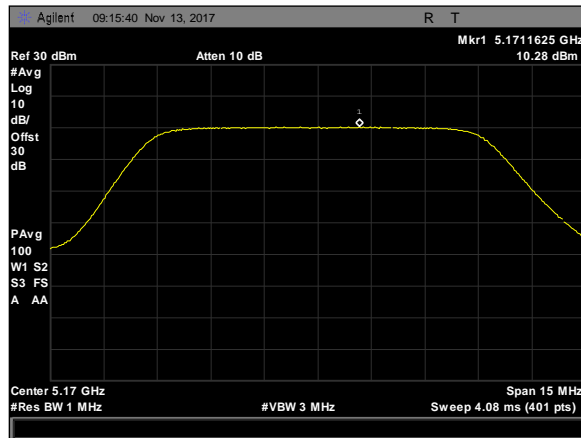
Plot 294. Maximum Power Spectral Density, 5M, 5210, 50mni, rf2



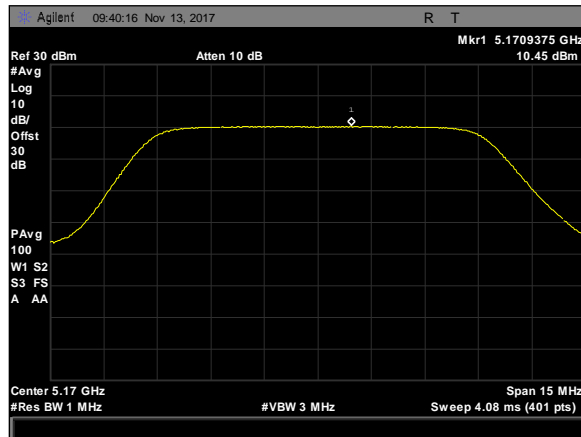
Plot 295. Maximum Power Spectral Density, 5M, 5247.5, 50mni, rf1



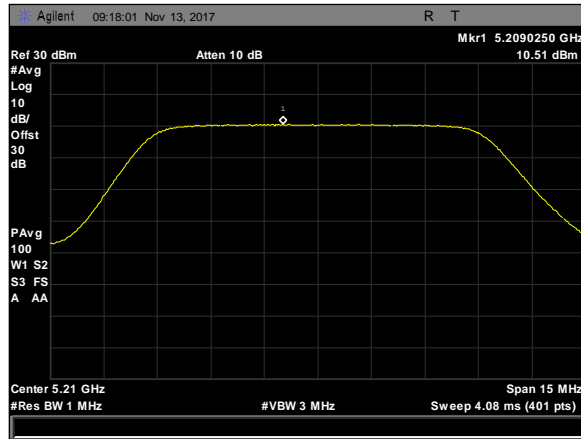
Plot 296. Maximum Power Spectral Density, 5M, 5247.5, 50mni, rf2



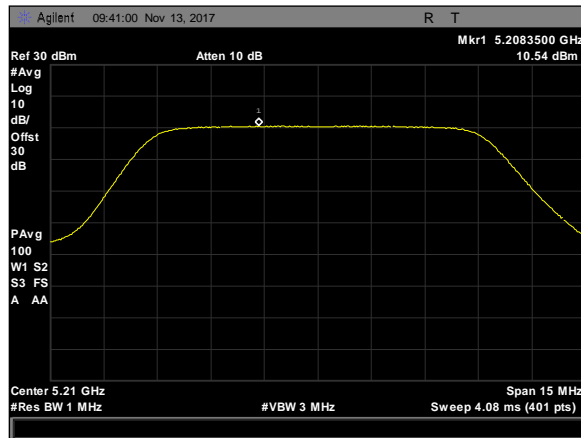
Plot 297. Maximum Power Spectral Density, 10M, 5170, 50mni, rf1



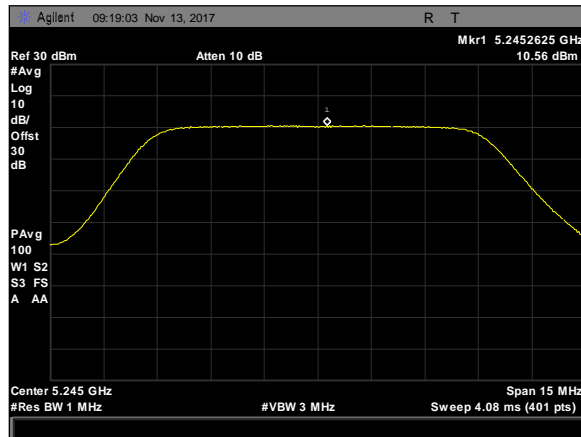
Plot 298. Maximum Power Spectral Density, 10M, 5170, 50mni, rf2



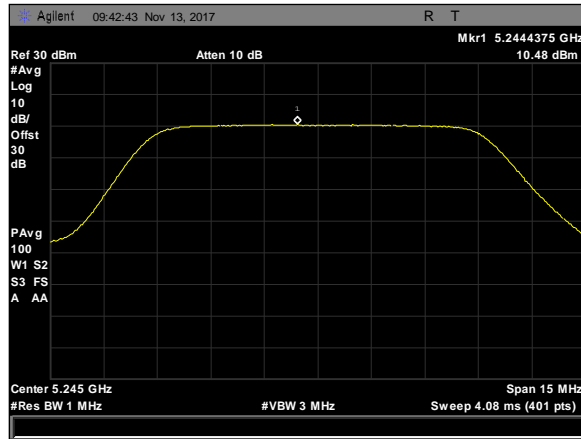
Plot 299. Maximum Power Spectral Density, 10M, 5210, 50Omni, rf1



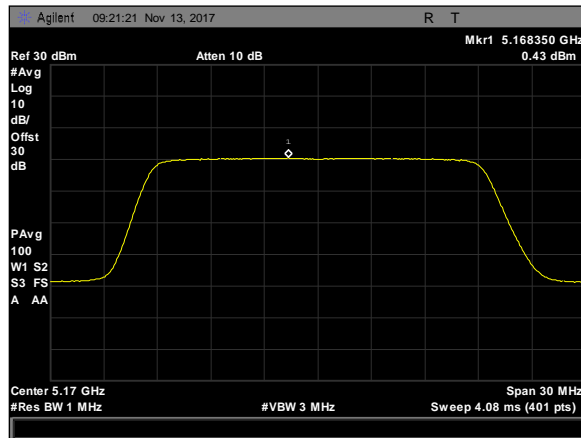
Plot 300. Maximum Power Spectral Density, 10M, 5210, 50Omni, rf2



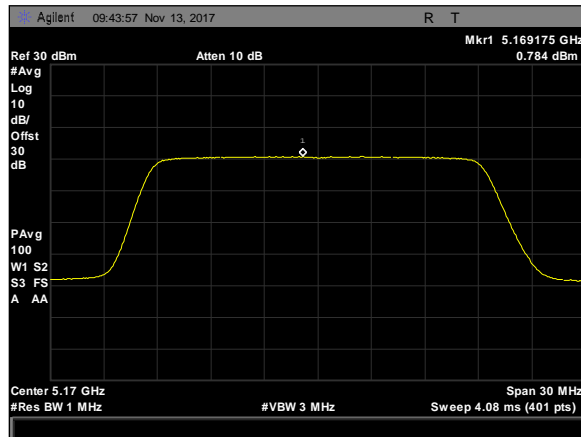
Plot 301. Maximum Power Spectral Density, 10M, 5245, 50Omni, rf1



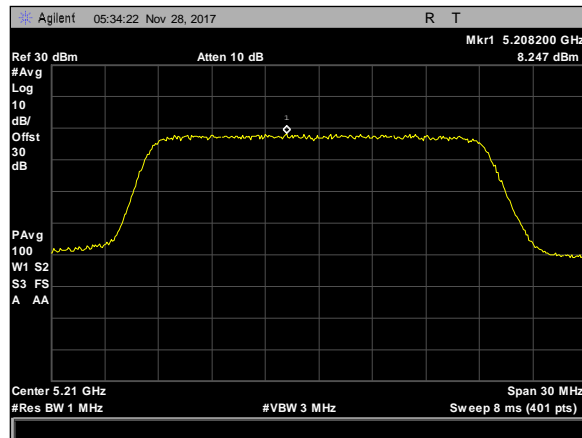
Plot 302. Maximum Power Spectral Density, 10M, 5245, 50mni, rf2



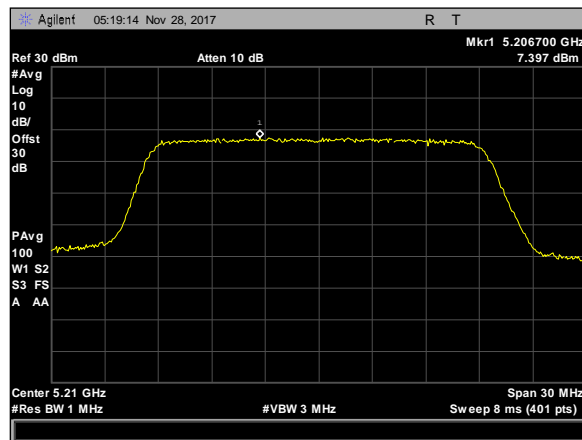
Plot 303. Maximum Power Spectral Density, 20M, 5170, 50mni, rf1



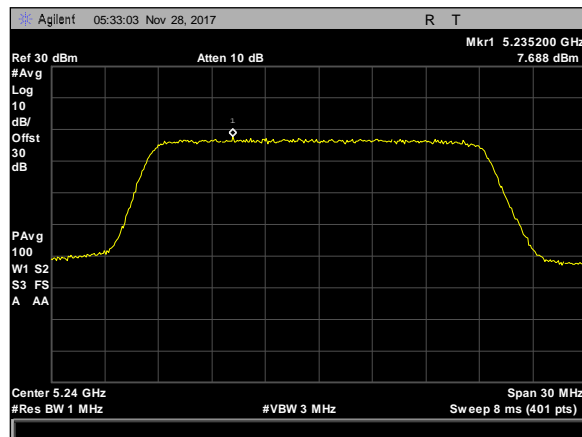
Plot 304. Maximum Power Spectral Density, 20M, 5170, 50mni, rf2



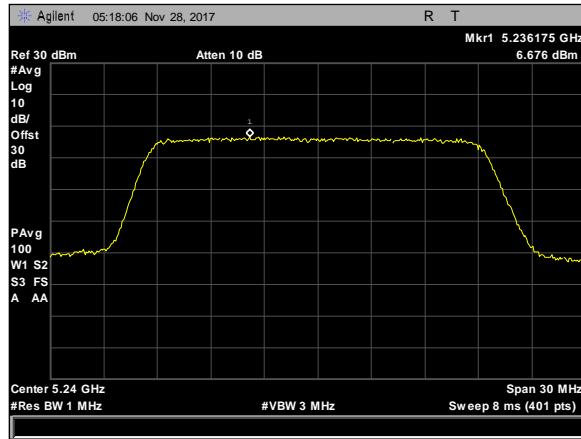
Plot 305. Maximum Power Spectral Density, 20M, 5210, 50Omni, rf1



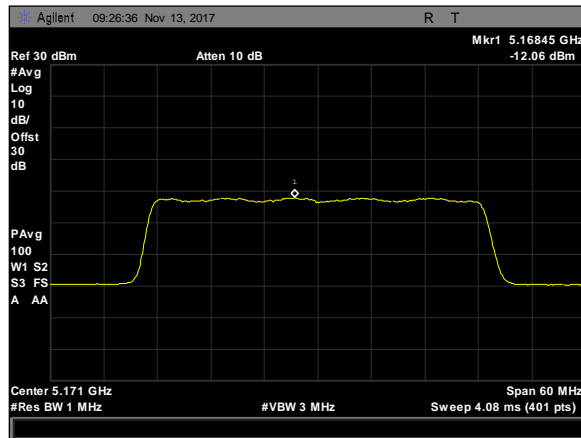
Plot 306. Maximum Power Spectral Density, 20M, 5210, 50Omni, rf2



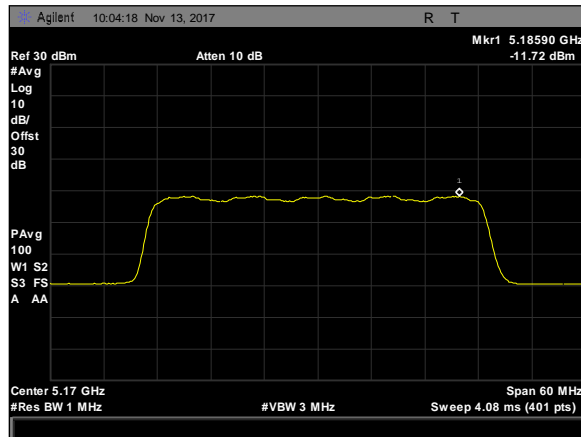
Plot 307. Maximum Power Spectral Density, 20M, 5240, 50Omni, rf1



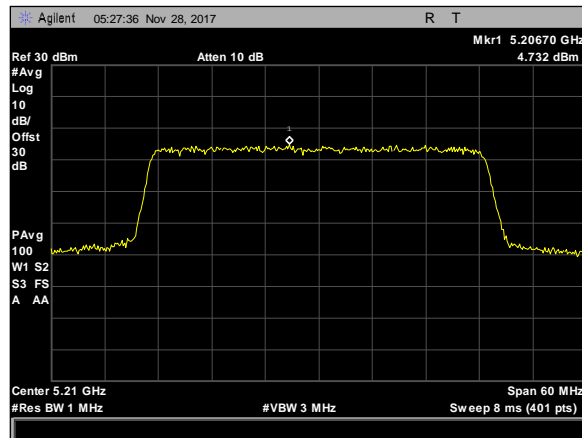
Plot 308. Maximum Power Spectral Density, 20M, 5240, 50Omni, rf2



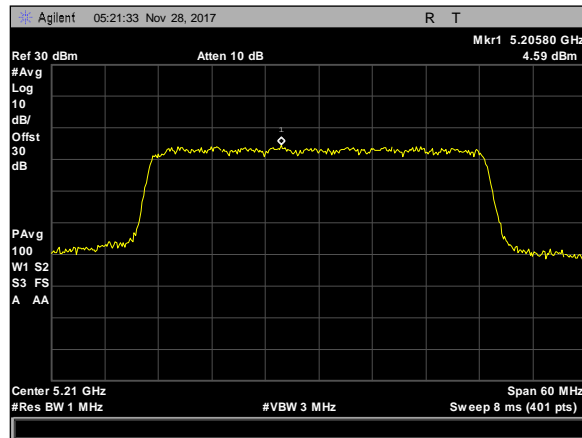
Plot 309. Maximum Power Spectral Density, 40M, 5170, 50Omni, rf1



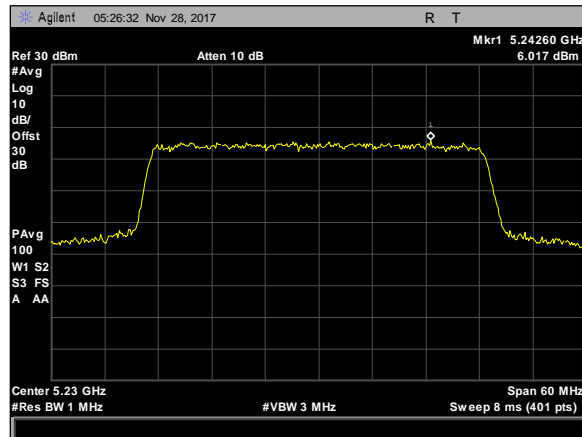
Plot 310. Maximum Power Spectral Density, 40M, 5170, 50Omni, rf2



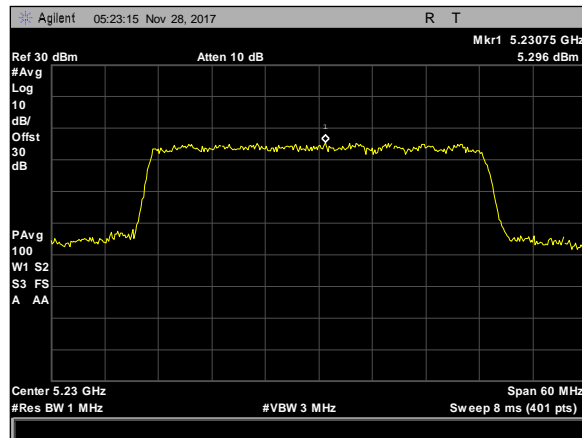
Plot 311. Maximum Power Spectral Density, 40M, 5210, 50Omni, rf1



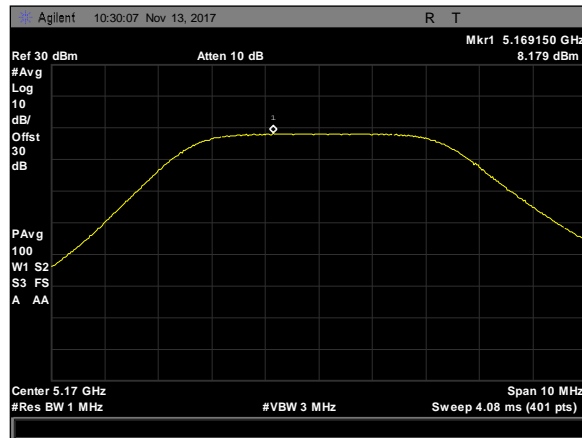
Plot 312. Maximum Power Spectral Density, 40M, 5210, 50Omni, rf2



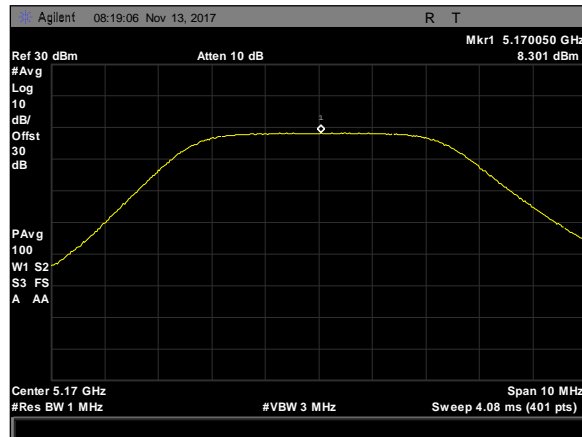
Plot 313. Maximum Power Spectral Density, 40M, 5230, 50Omni, rf1



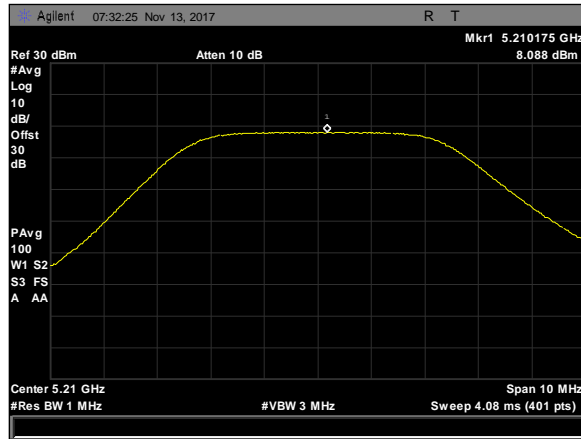
Plot 314. Maximum Power Spectral Density, 40M, 5230, 50mni, rf2



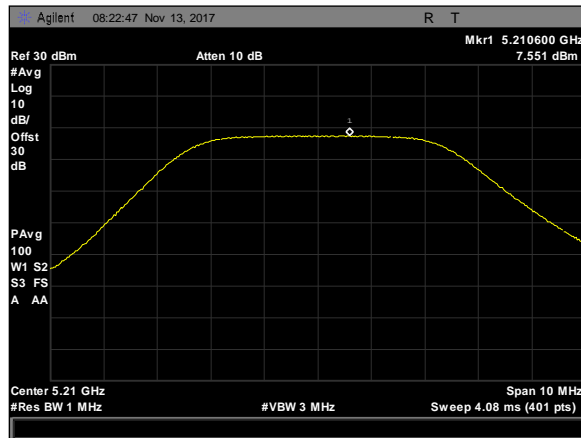
Plot 315. Maximum Power Spectral Density, 5M, 5170, Omni8, rf1



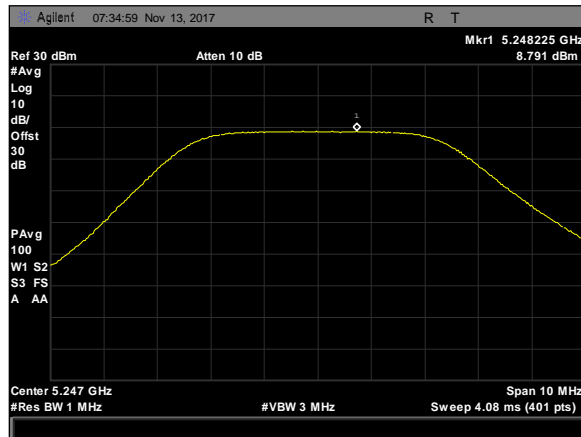
Plot 316. Maximum Power Spectral Density, 5M, 5170, Omni8, rf2



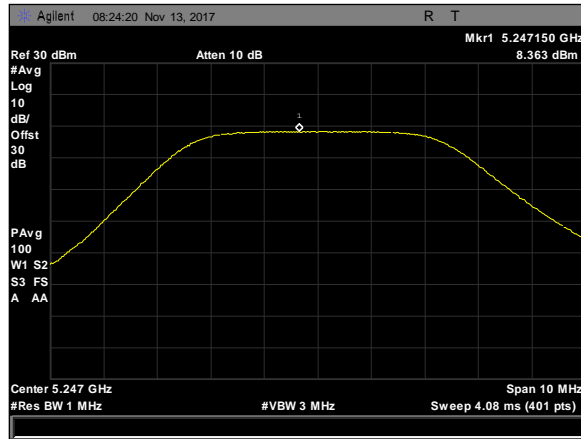
Plot 317. Maximum Power Spectral Density, 5M, 5210, Omni8, rf1



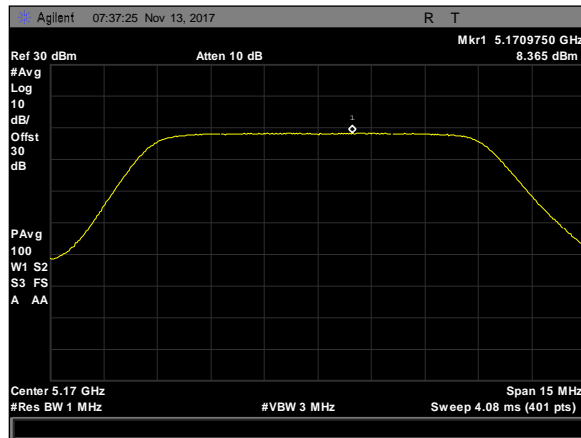
Plot 318. Maximum Power Spectral Density, 5M, 5210, Omni8, rf2, 11



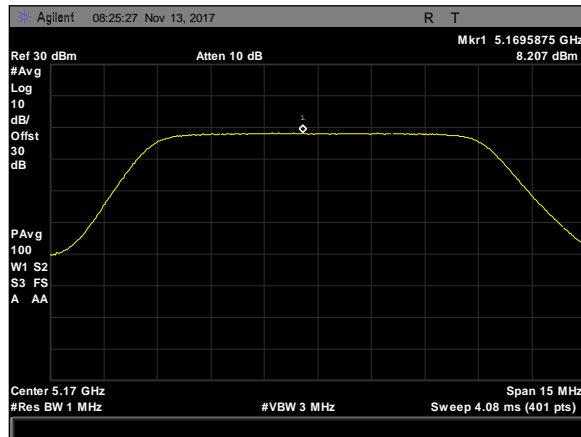
Plot 319. Maximum Power Spectral Density, 5M, 5247.5, Omni8, rf1



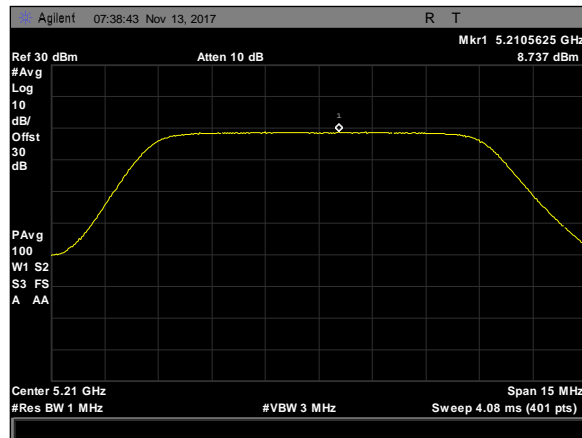
Plot 320. Maximum Power Spectral Density, 5M, 5247.5, Omni8, rf2



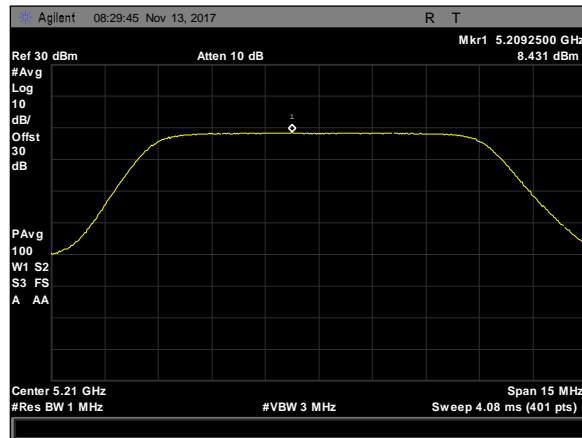
Plot 321. Maximum Power Spectral Density, 10M, 5170, Omni8, rf1



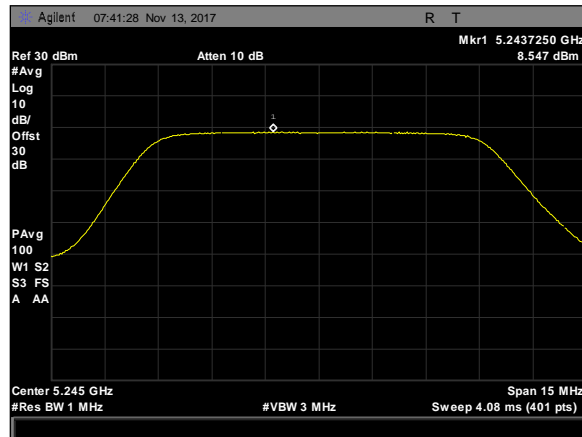
Plot 322. Maximum Power Spectral Density, 10M, 5170, Omni8, rf2



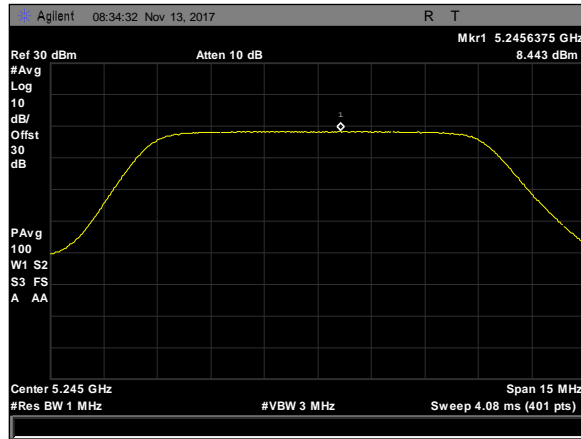
Plot 323. Maximum Power Spectral Density, 10M, 5210, Omni8, rf1



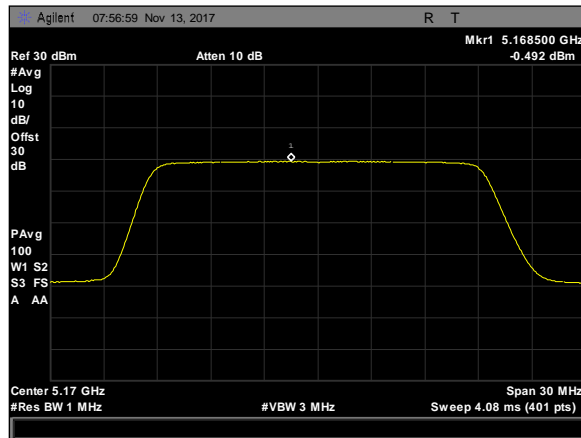
Plot 324. Maximum Power Spectral Density, 10M, 5210, Omni8, rf2



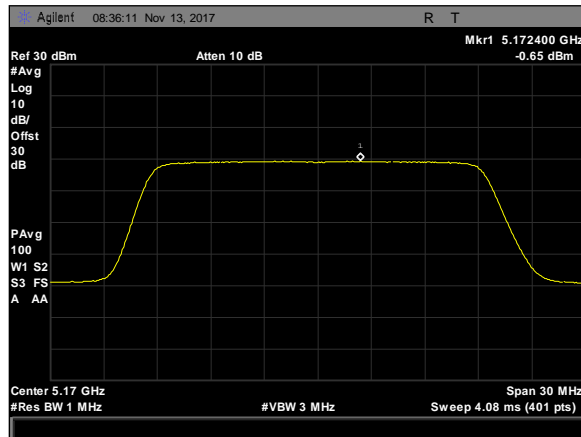
Plot 325. Maximum Power Spectral Density, 10M, 5245, Omni8, rf1



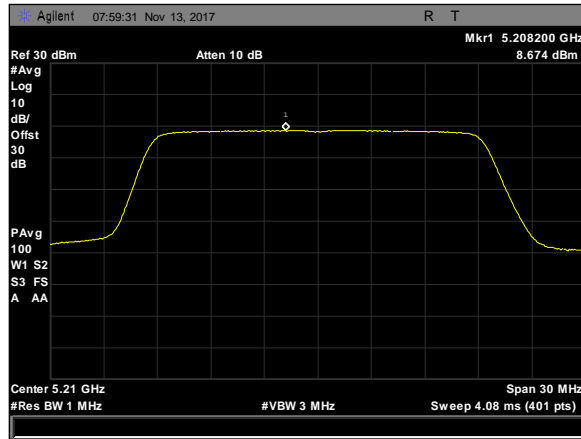
Plot 326. Maximum Power Spectral Density, 10M, 5245, Omni8, rf2



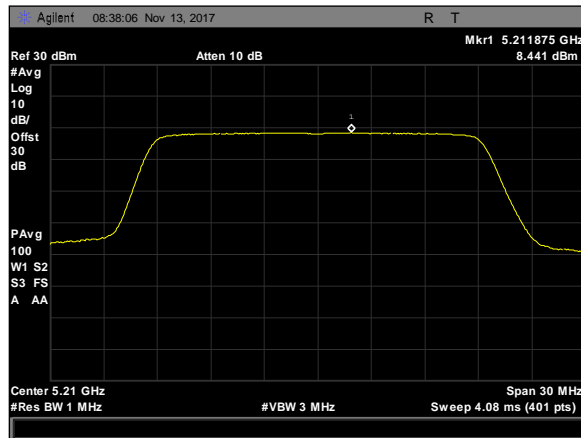
Plot 327. Maximum Power Spectral Density, 20M, 5170, Omni8, rf1



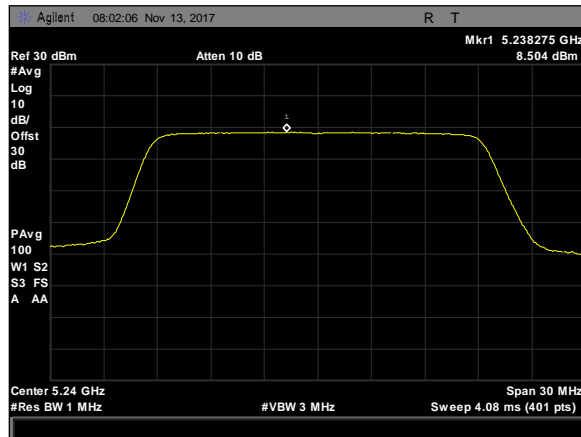
Plot 328. Maximum Power Spectral Density, 20M, 5170, Omni8, rf2



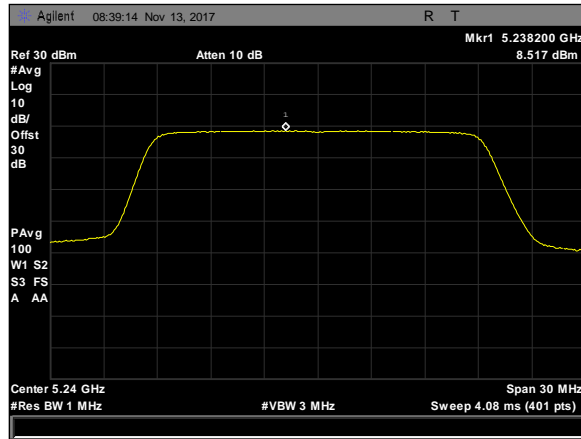
Plot 329. Maximum Power Spectral Density, 20M, 5210, Omni8, rf1



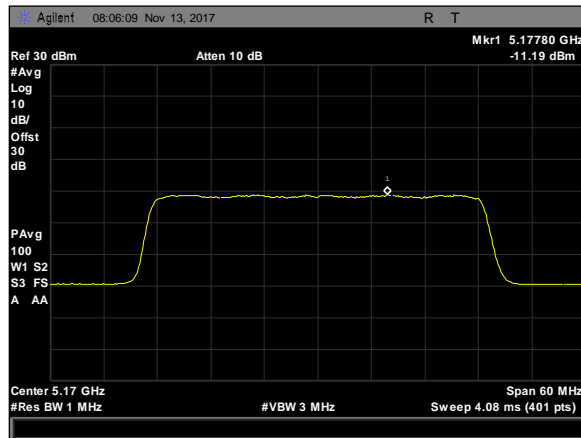
Plot 330. Maximum Power Spectral Density, 20M, 5210, Omni8, rf2



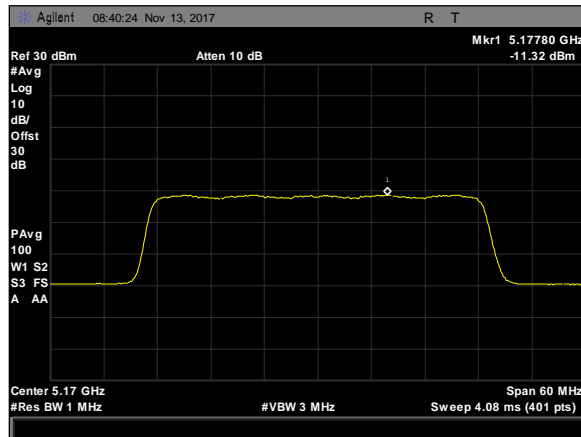
Plot 331. Maximum Power Spectral Density, 20M, 5240, Omni8, rf1



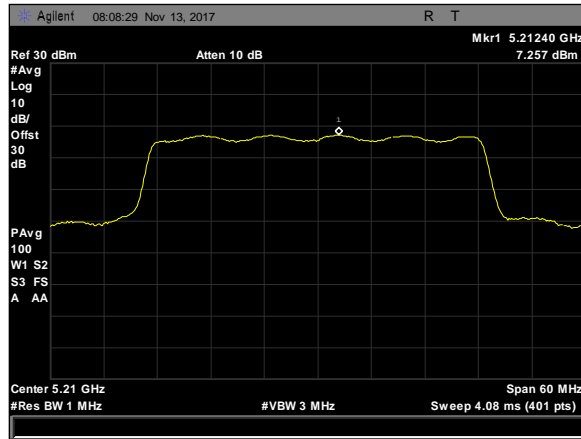
Plot 332. Maximum Power Spectral Density, 20M, 5240, Omni8, rf2



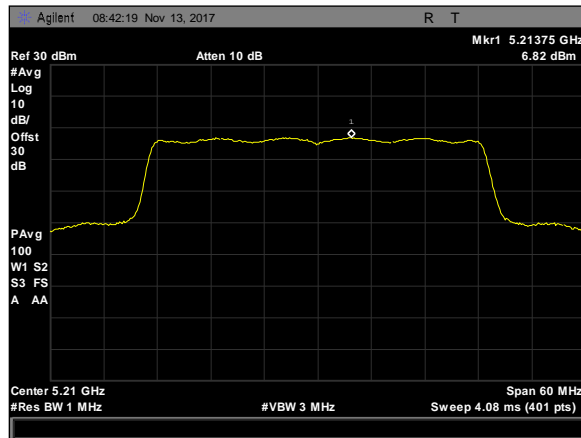
Plot 333. Maximum Power Spectral Density, 40M, 5170, Omni8, rf1



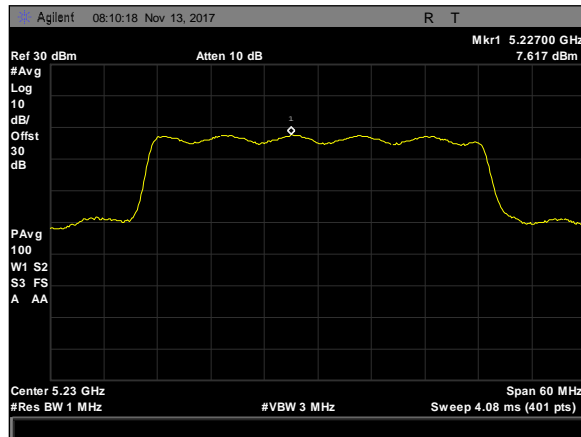
Plot 334. Maximum Power Spectral Density, 40M, 5170, Omni8, rf2



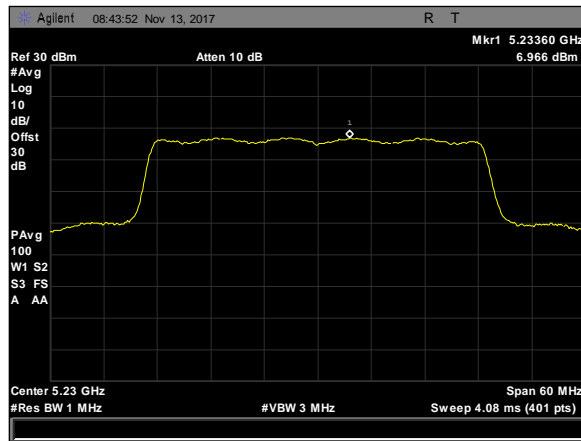
Plot 335. Maximum Power Spectral Density, 40M, 5210, Omni8, rf1



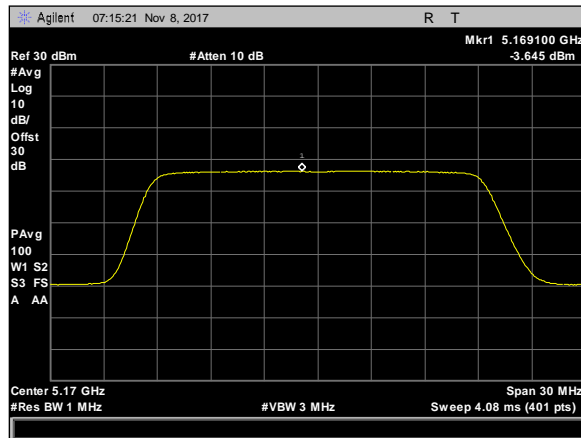
Plot 336. Maximum Power Spectral Density, 40M, 5210, Omni8, rf2



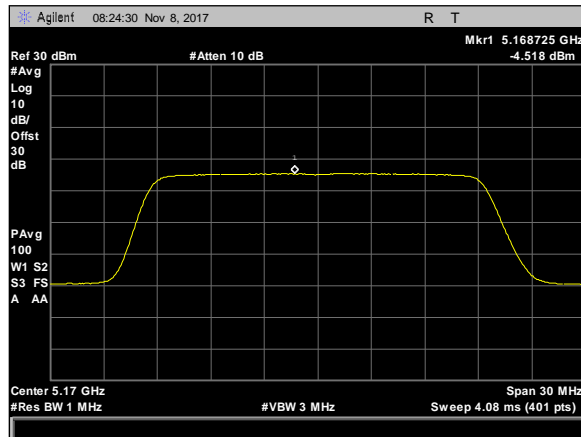
Plot 337. Maximum Power Spectral Density, 40M, 5230, Omni8, rf1



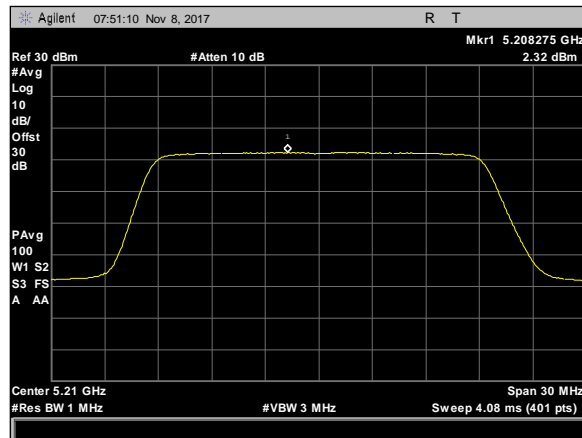
Plot 338. Maximum Power Spectral Density, 40M, 5230, Omni8, rf2



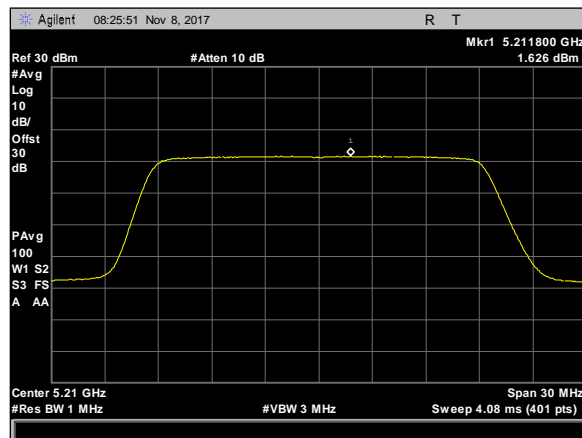
Plot 339. Maximum Power Spectral Density, 20M, 5170, 90Sector, rf1



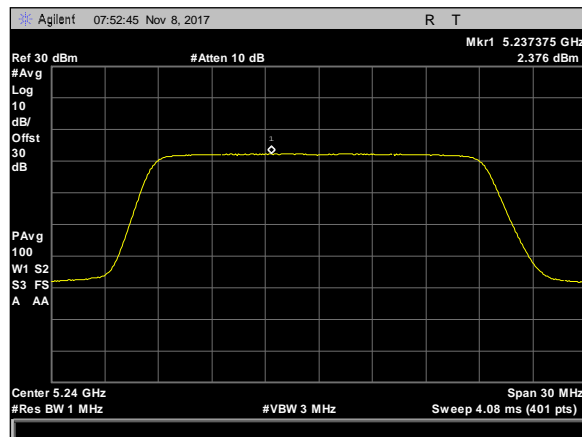
Plot 340. Maximum Power Spectral Density, 20M, 5170, 90Sector, rf2



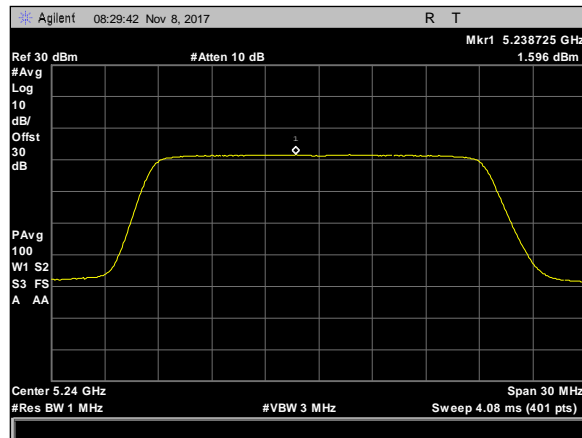
Plot 341. Maximum Power Spectral Density, 20M, 5210, 90Sector, rf1



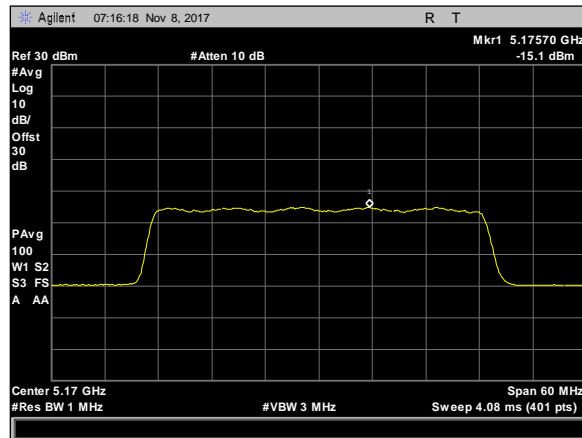
Plot 342. Maximum Power Spectral Density, 20M, 5210, 90Sector, rf2



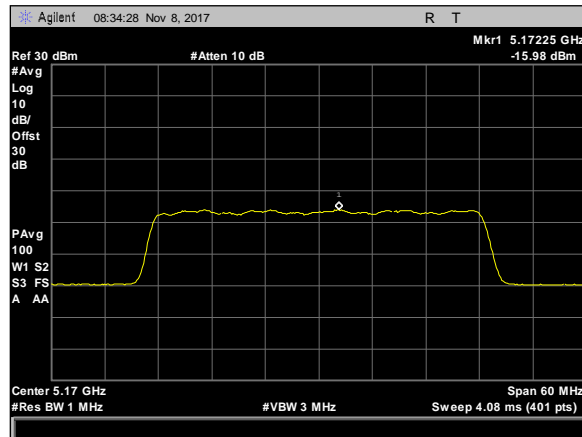
Plot 343. Maximum Power Spectral Density, 20M, 5240, 90Sector, rf1



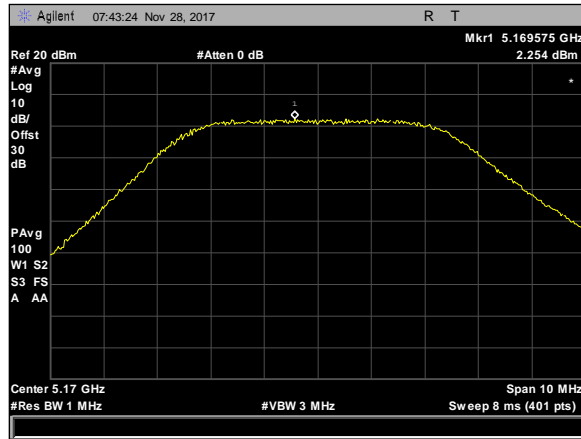
Plot 344. Maximum Power Spectral Density, 20M, 5240, 90Sector, rf2



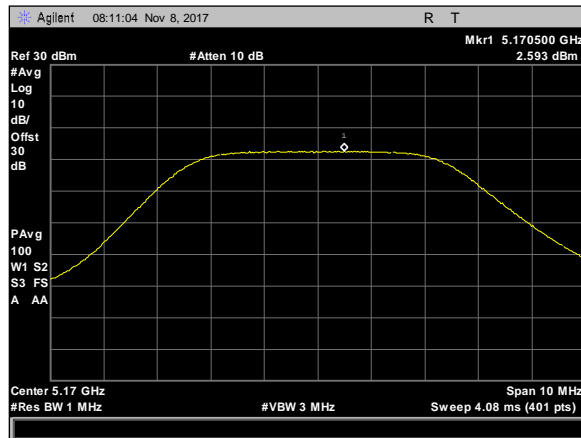
Plot 345. Maximum Power Spectral Density, 40M, 5170, 90Sector, rf1



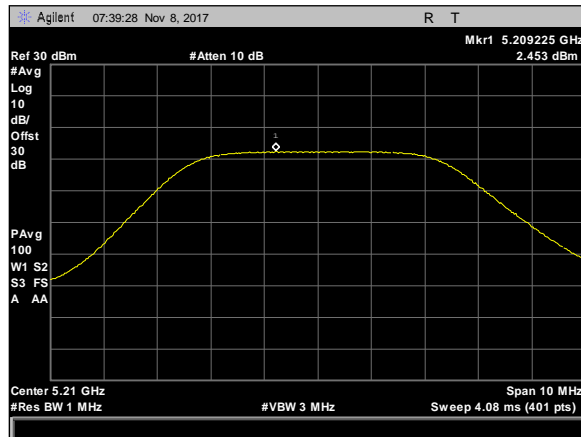
Plot 346. Maximum Power Spectral Density, 40M, 5170, 90Sector, rf2



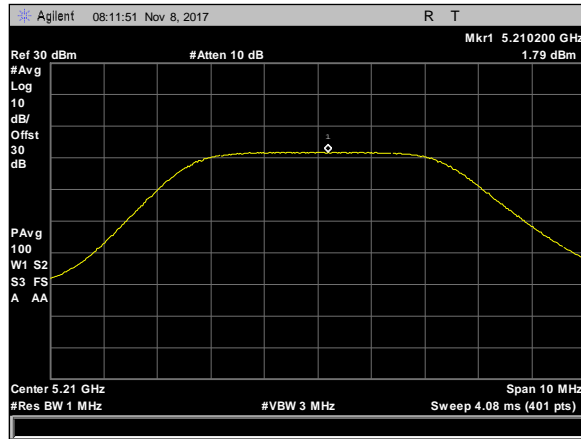
Plot 347. Maximum Power Spectral Density, 5M, 5170, 90Sector, rf1



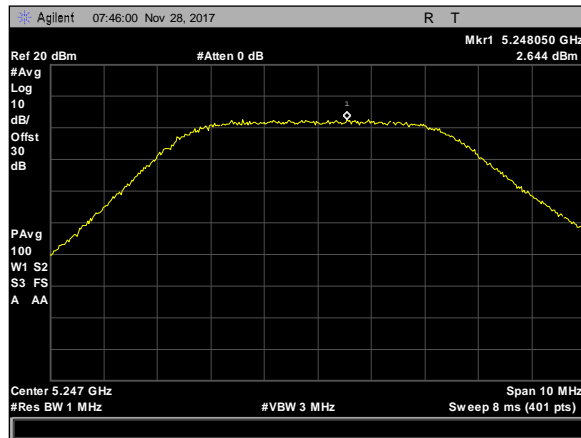
Plot 348. Maximum Power Spectral Density, 5M, 5170, 90Sector, rf2



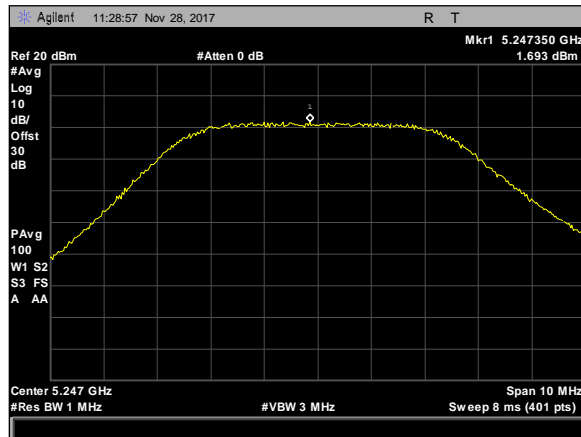
Plot 349. Maximum Power Spectral Density, 5M, 5210, 90Sector, rf1



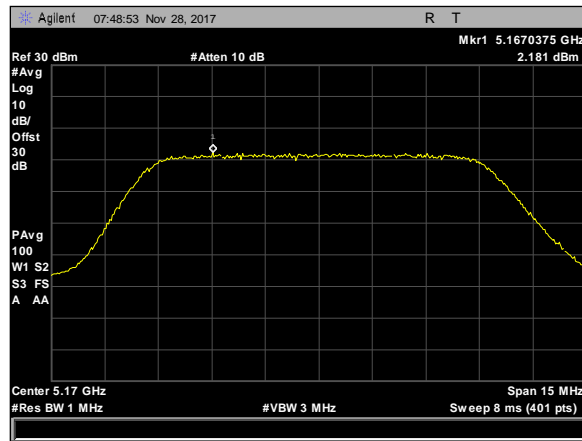
Plot 350. Maximum Power Spectral Density, 5M, 5210, 90Sector, rf2



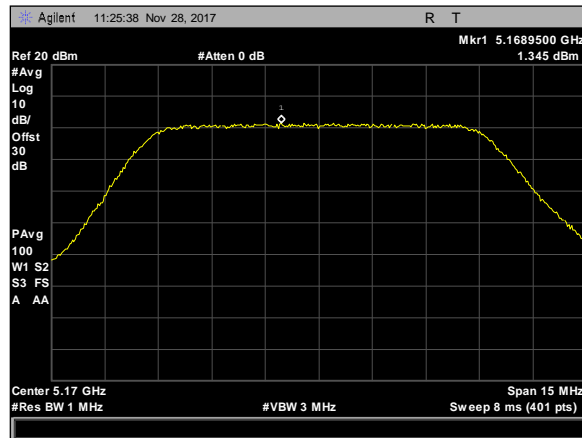
Plot 351. Maximum Power Spectral Density, 5M, 5247.5, 90Sector, rf1



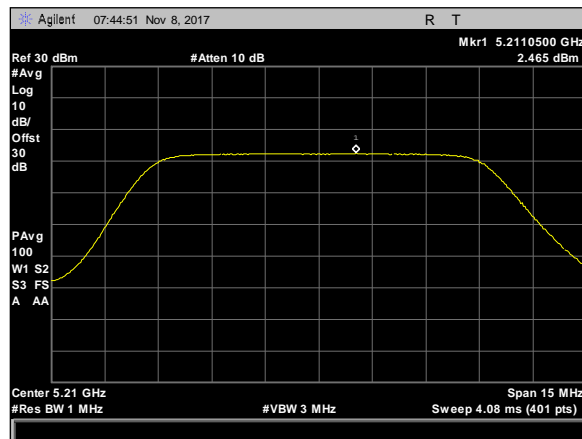
Plot 352. Maximum Power Spectral Density, 5M, 5247.5, 90Sector, rf2



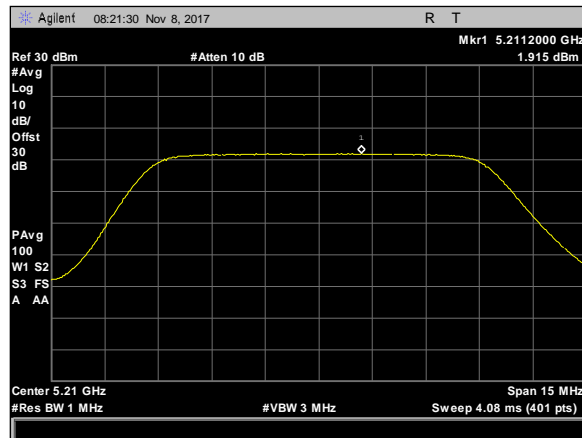
Plot 353. Maximum Power Spectral Density, 10M, 5170, 90Sector, rf1



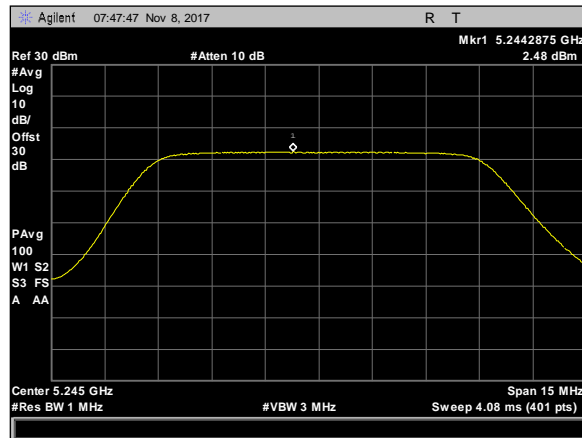
Plot 354. Maximum Power Spectral Density, 10M, 5170, 90Sector, rf2



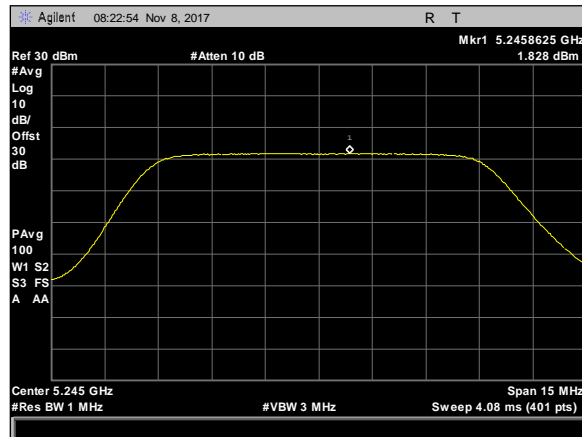
Plot 355. Maximum Power Spectral Density, 10M, 5210, 90Sector, rf1



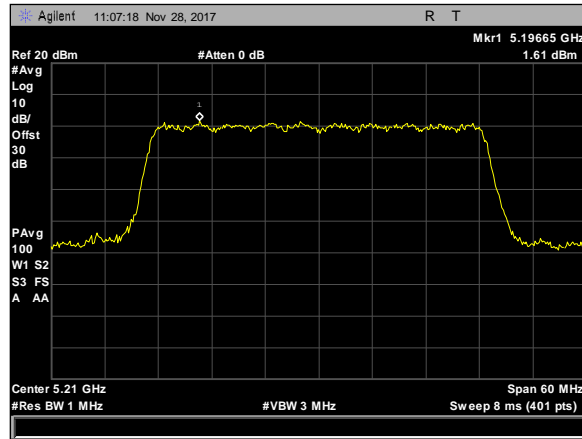
Plot 356. Maximum Power Spectral Density, 10M, 5210, 90Sector, rf2



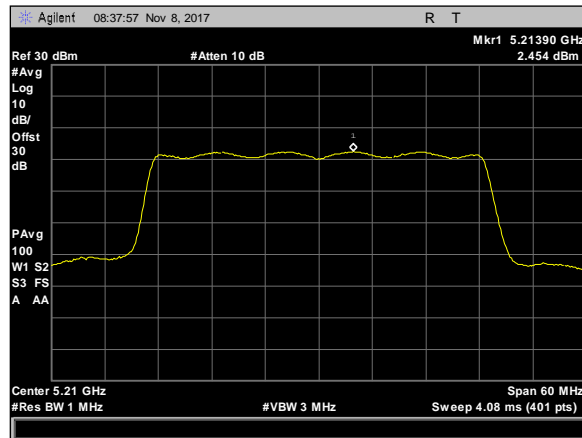
Plot 357. Maximum Power Spectral Density, 10M, 5245, 90Sector, rf1



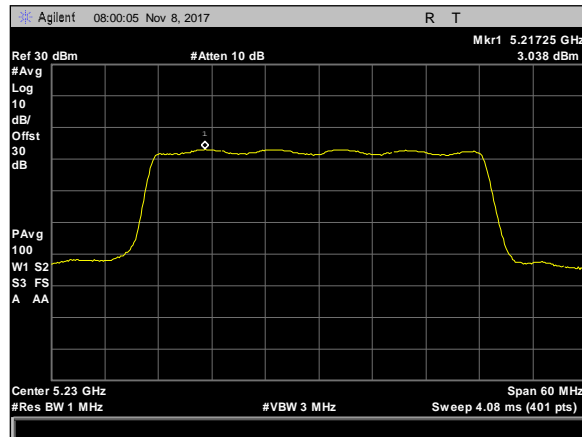
Plot 358. Maximum Power Spectral Density, 10M, 5245, 90Sector, rf2



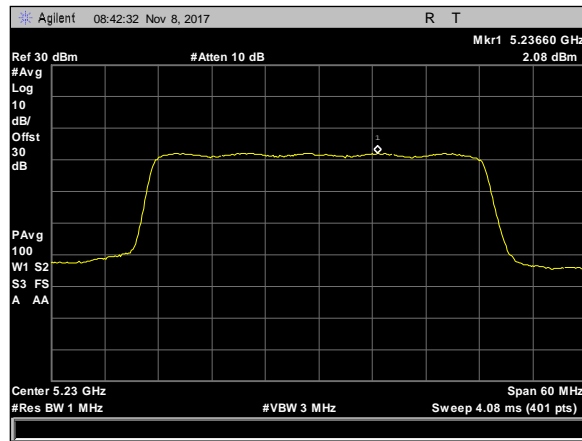
Plot 359. Maximum Power Spectral Density, 40M, 5210, 90Sector, rf1



Plot 360. Maximum Power Spectral Density, 40M, 5210, 90Sector, rf2



Plot 361. Maximum Power Spectral Density, 40M, 5230, 90Sector, rf1



Plot 362. Maximum Power Spectral Density, 40M, 5230, 90Sector, rf2



Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(b)(1) & (6 – 7) Undesirable Emissions

Test Requirements: § 15.407(b)(1): For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

§ 15.407(b)(6): Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

§ 15.407(b)(7): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Test Procedure: The EUT was placed on a non-conducting stand on a turntable in a chamber. To find the maximum emission the EUT was set to transmit on low, mid, and high channels. Additionally, the turntable was rotated 360 degrees, the EUT was oriented through its three orthogonal axes, and the receive antenna height was varied in order to maximize emissions.

For frequencies from 30 MHz to 1 GHz, measurements were first made using a peak detector with a 100 kHz resolution bandwidth. Emissions which exceeded the limits were re-measured using a quasi-peak detector with a 120 kHz resolution bandwidth.

Above 1 GHz, measurements were made pursuant the method described in FCC KDB 789033 D02 General UNII Test Procedure New Rules v01. The equation, $EIRP = E + 20 \log D - 104.8$ was used to convert field strength to EIRP (E = field strength (dB μ V/m) and D = Reference measurement distance).

For emissions above 1 GHz and in restricted bands, measurements of the field strength were made with a peak detector and an average detector and compared with the limits of 15.209.

As an alternative, according to FCC KDB 789033 D02 General UNII Test Procedure New Rules v01, all emissions above 1 GHz that comply with the peak and average limits of 15.209 satisfy the requirements of unwanted emissions in 15.407.

Test Results: For below 1 GHz, the EUT was compliant with the requirements of this section.

For above 1 GHz, the EUT was compliant with the requirements of this section.

Measured emissions were within applicable limits.

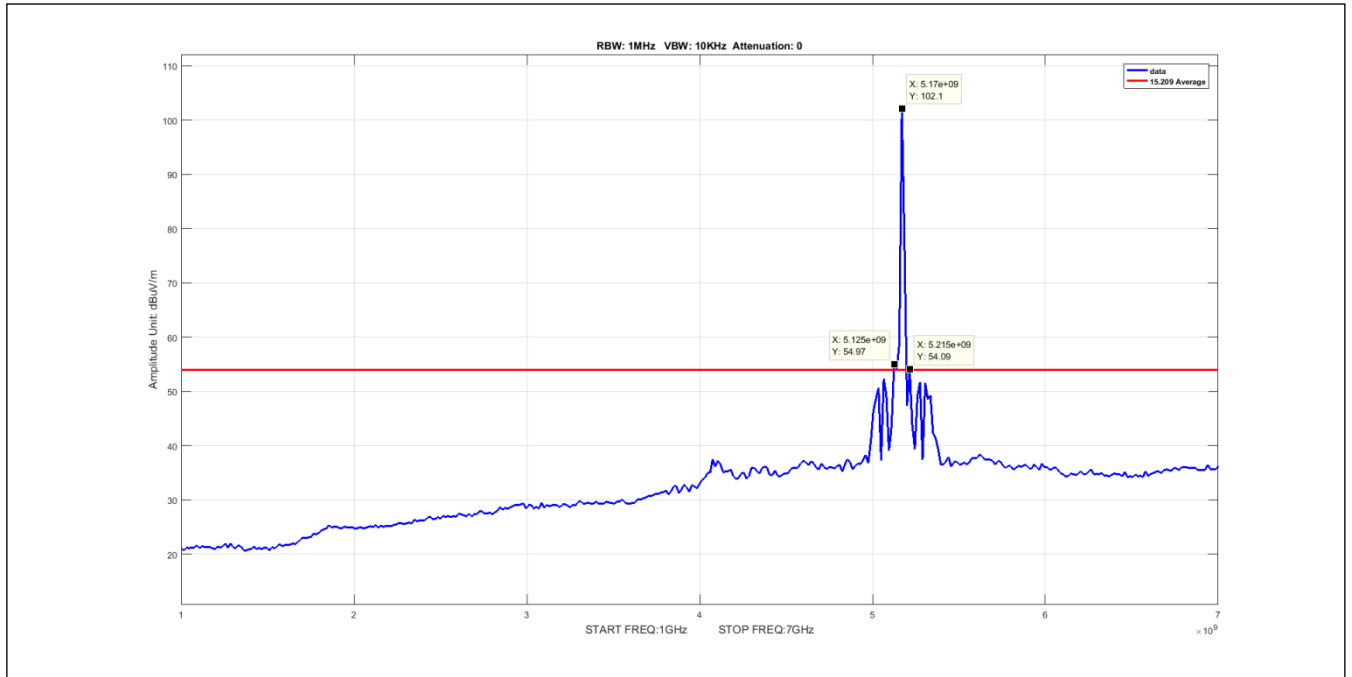
Note: While the signal does appear to be above the limit in plots 674-676 this signal is a digital emission and not part of the device's transmission and therefore the 209 limits are not applicable to that signal.

Test Engineer(s): Bradley Jones

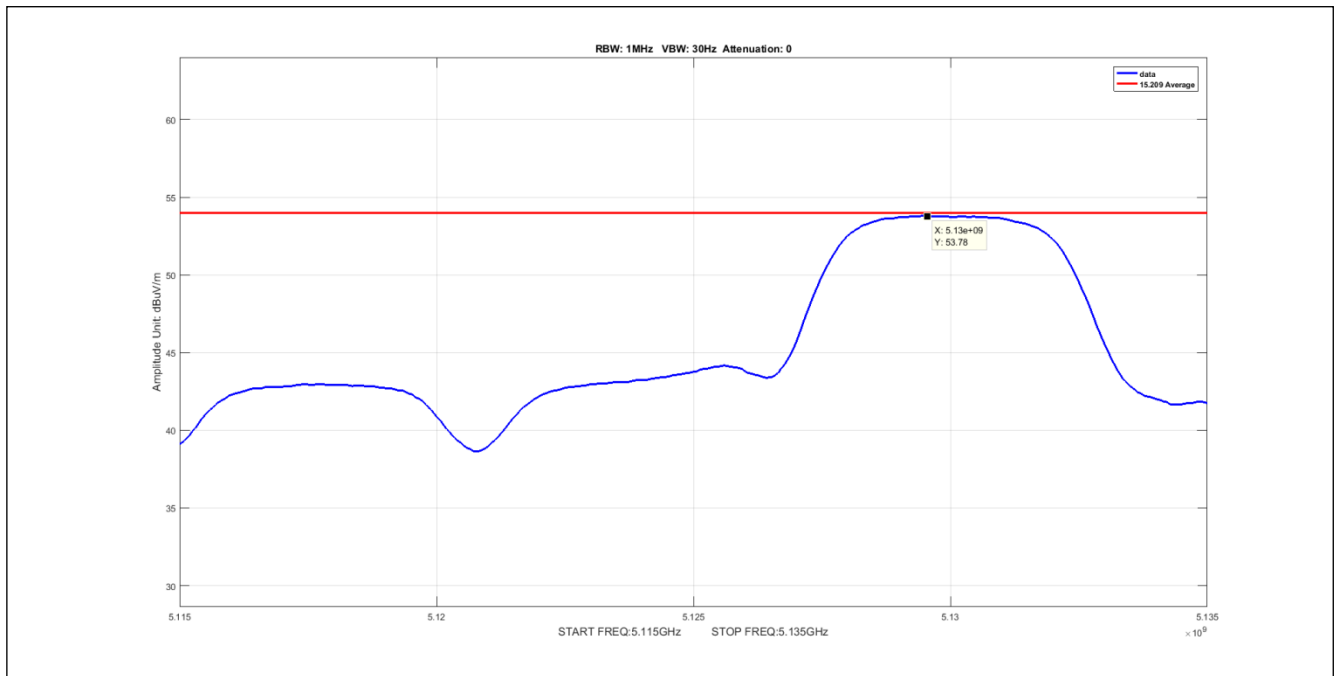
Test Date(s): November 28, 2017



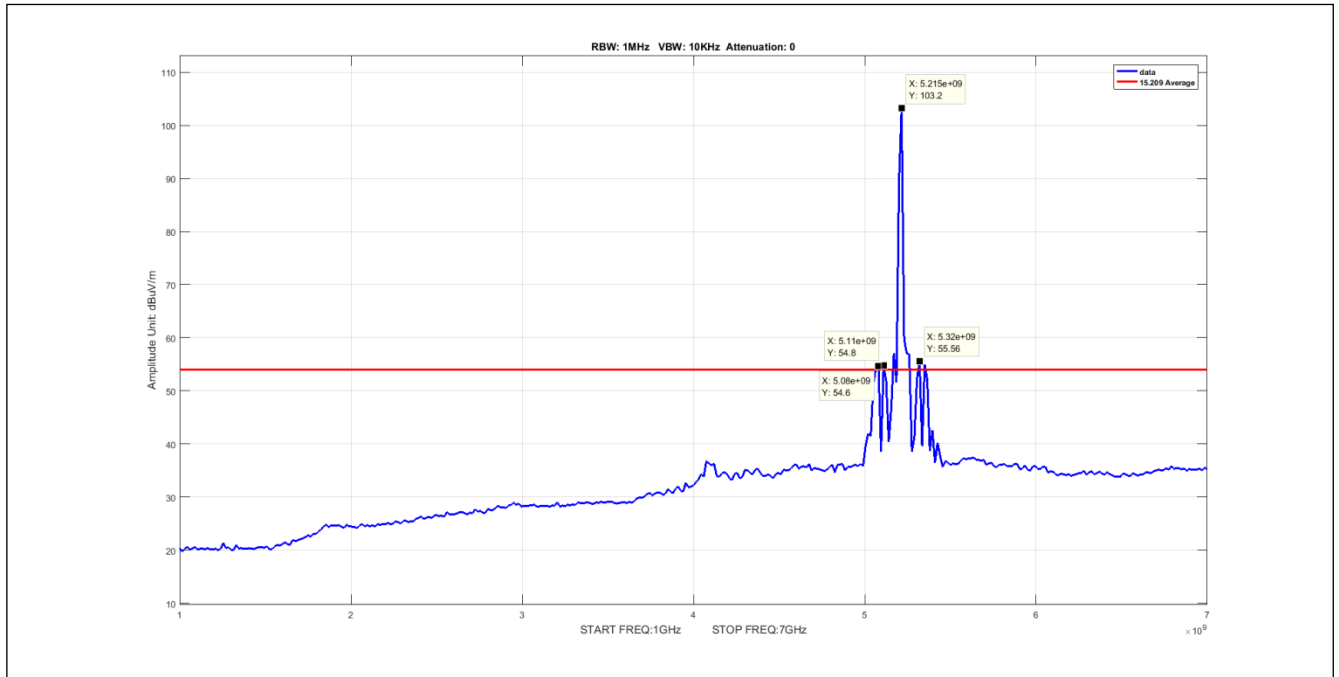
Undesirable Emissions



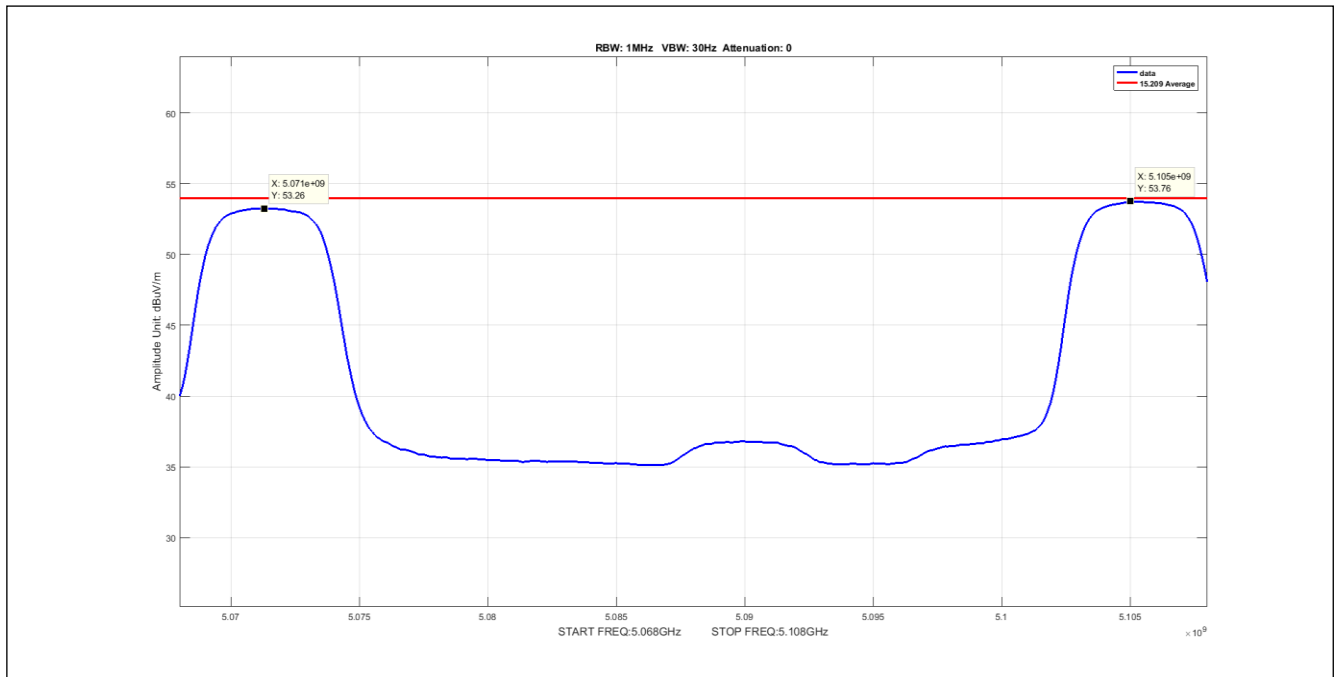
Plot 363. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5170 pow7



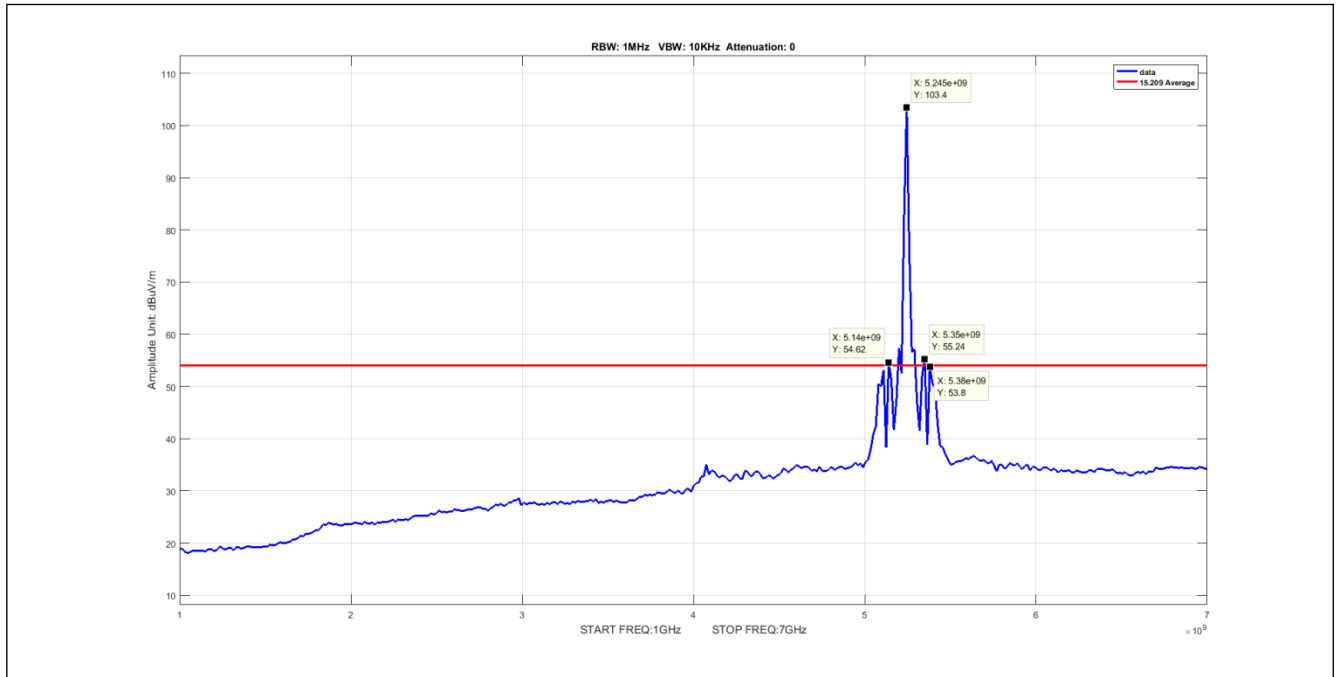
Plot 364. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5170 pow7 zoom left of fundamental



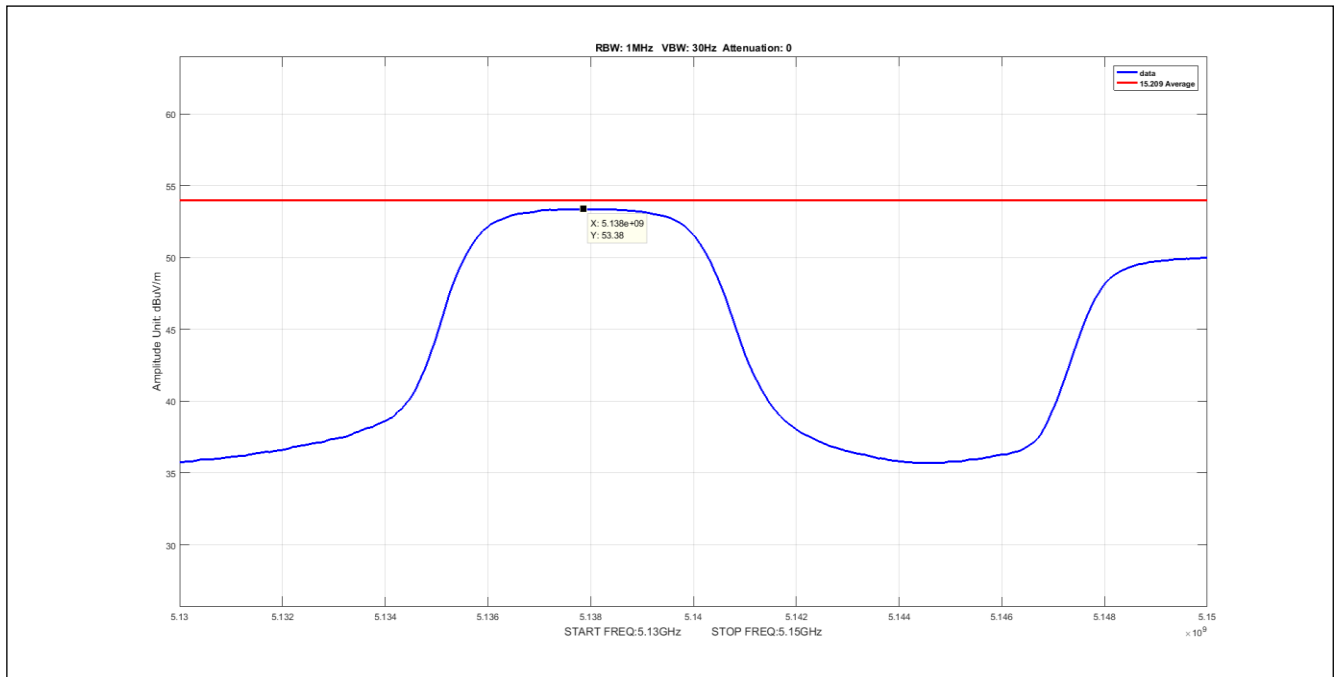
Plot 365. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5210 pow11



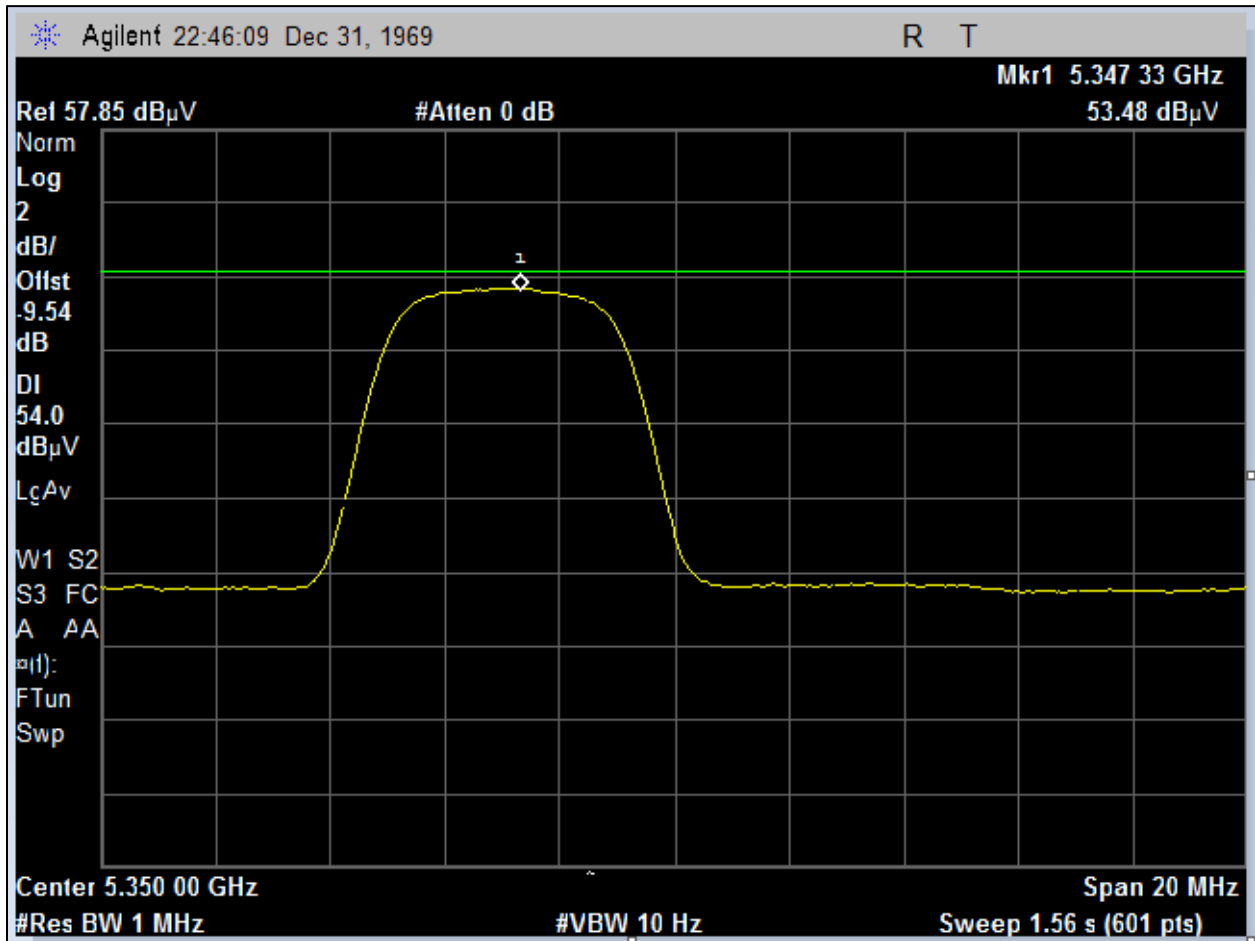
Plot 366. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5210 pow11 zoom left of fundamental



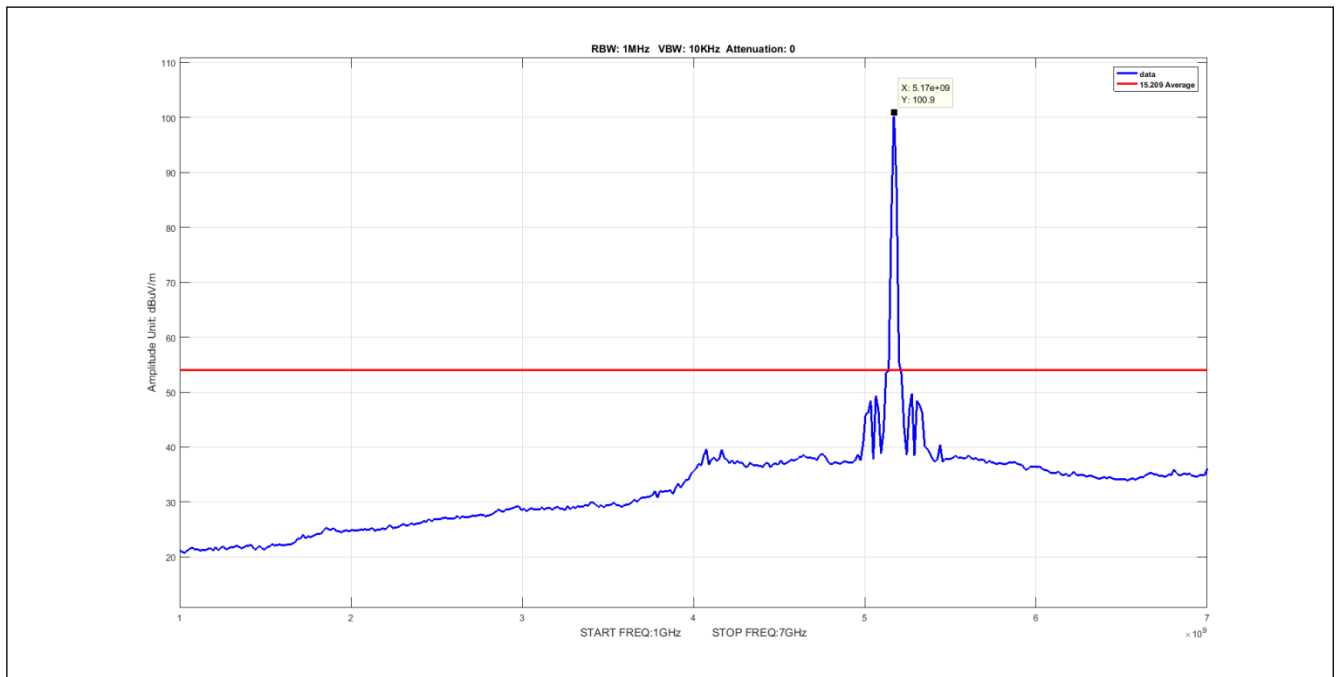
Plot 367. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14



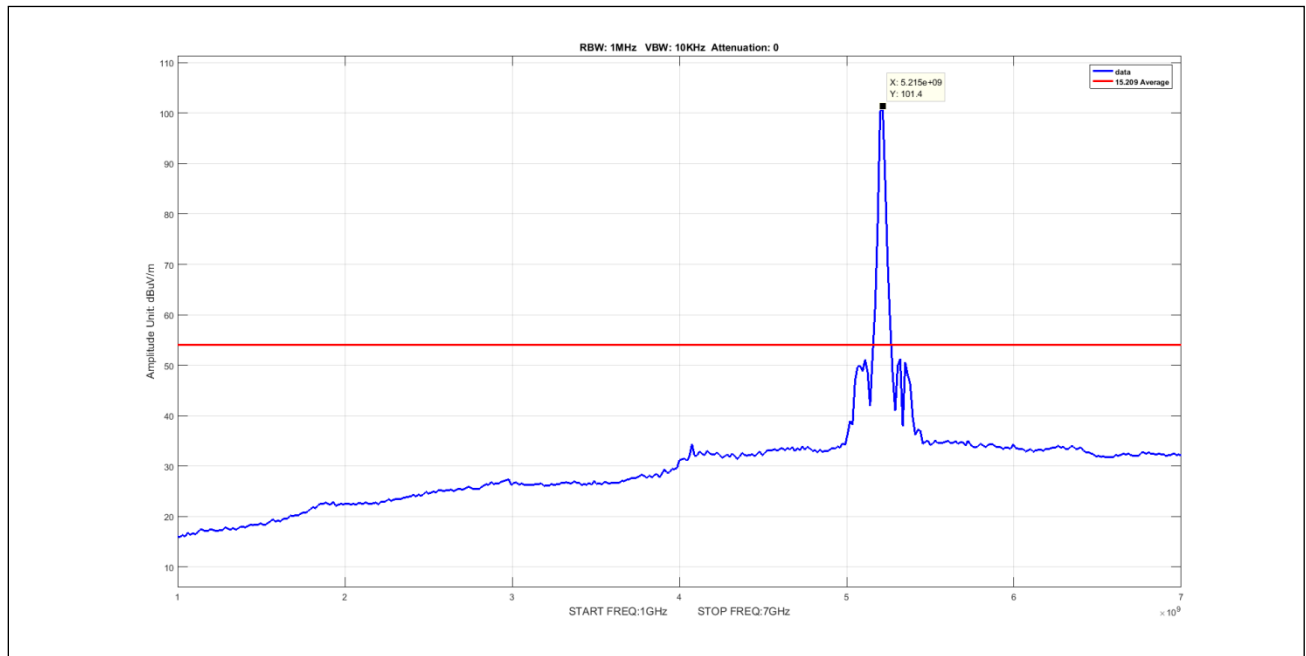
Plot 368. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14 zoom left of fundamental



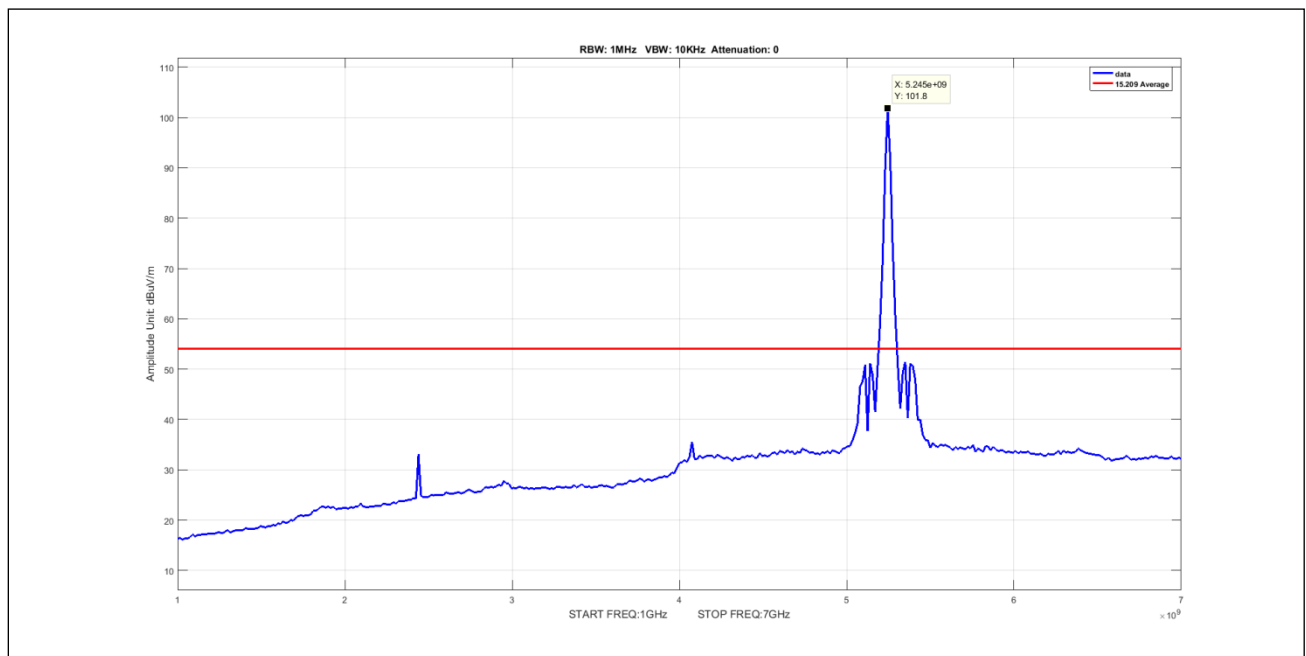
Plot 369. Undesirable Emissions, 1Panel Avg 1-7GHz 5M 5242.5 pow14 zoom right of fundamental



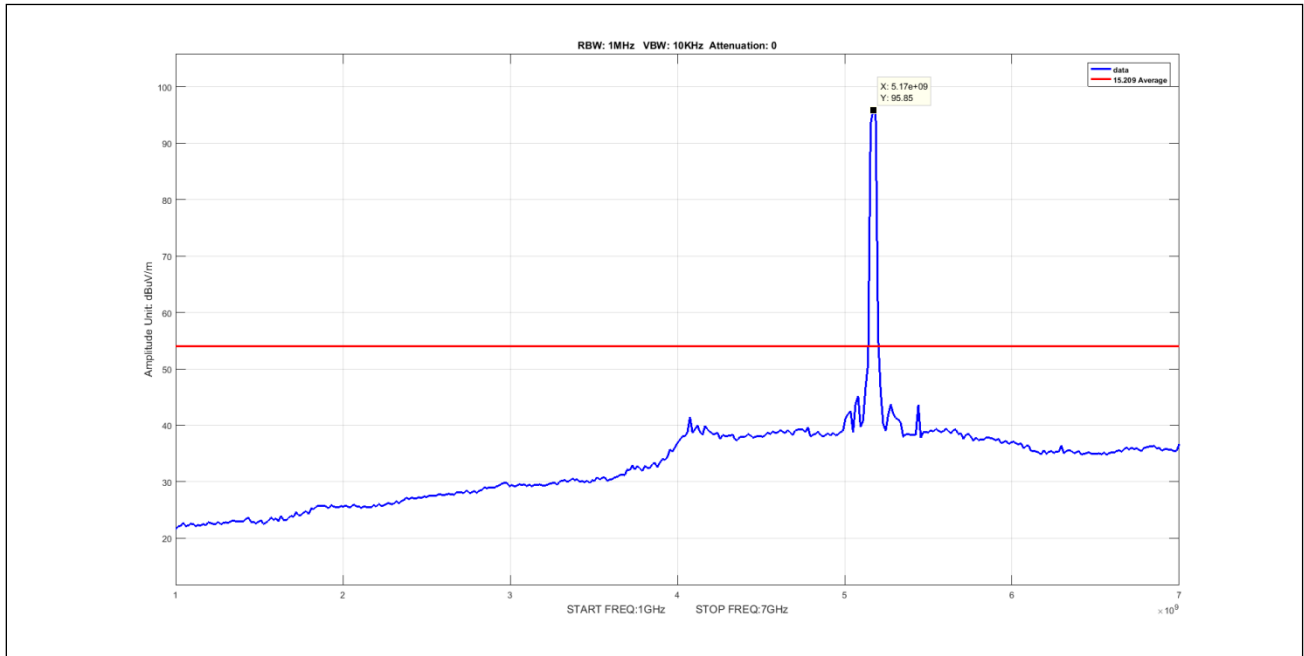
Plot 370. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5170 pow6



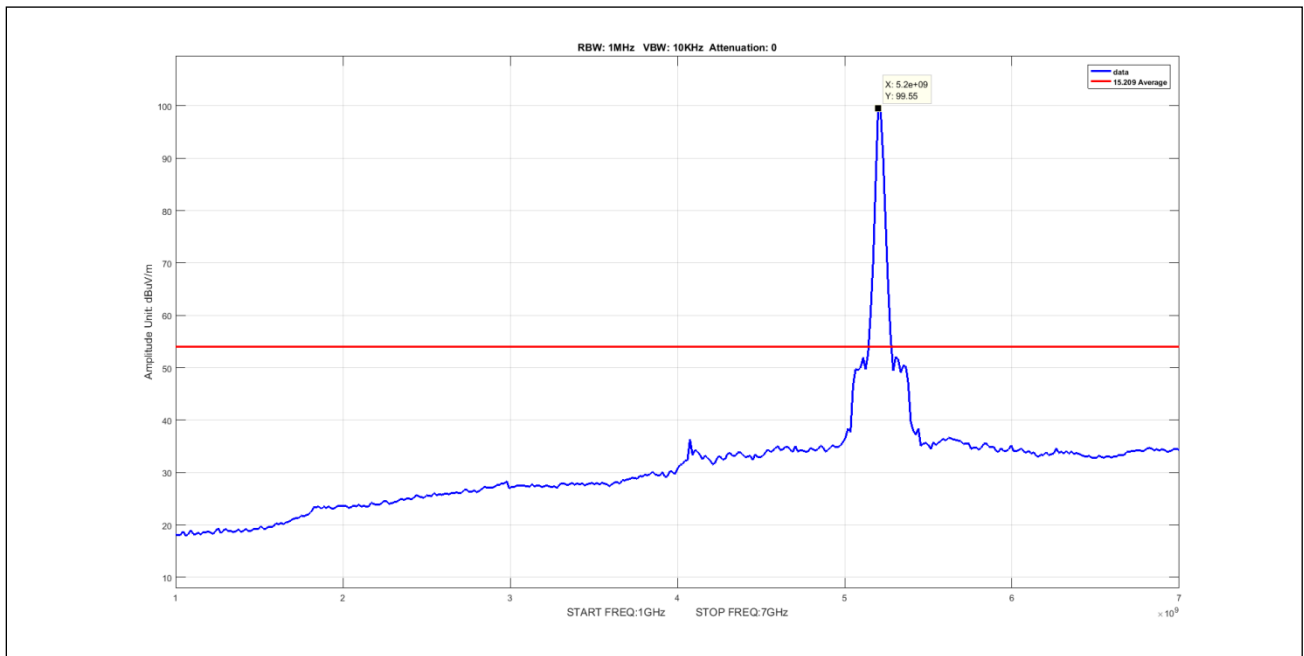
Plot 371. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5210 pow17



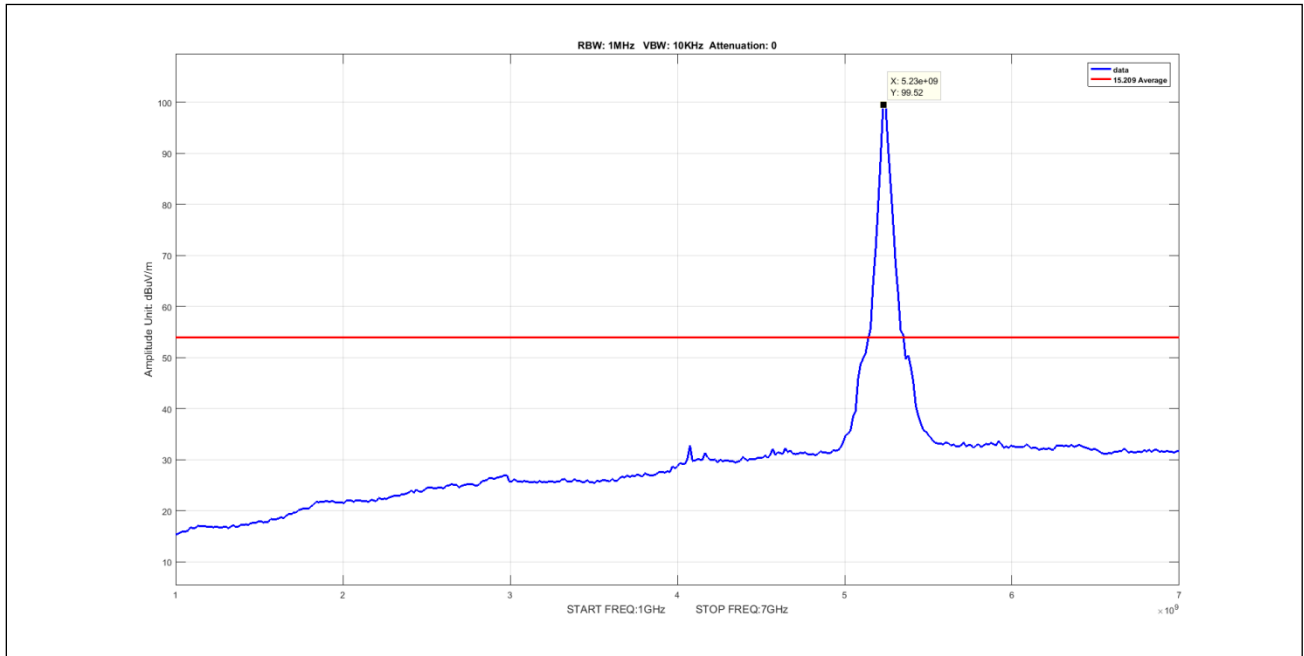
Plot 372. Undesirable Emissions, 1Panel Avg 1-7GHz 10M 5240.5 pow17



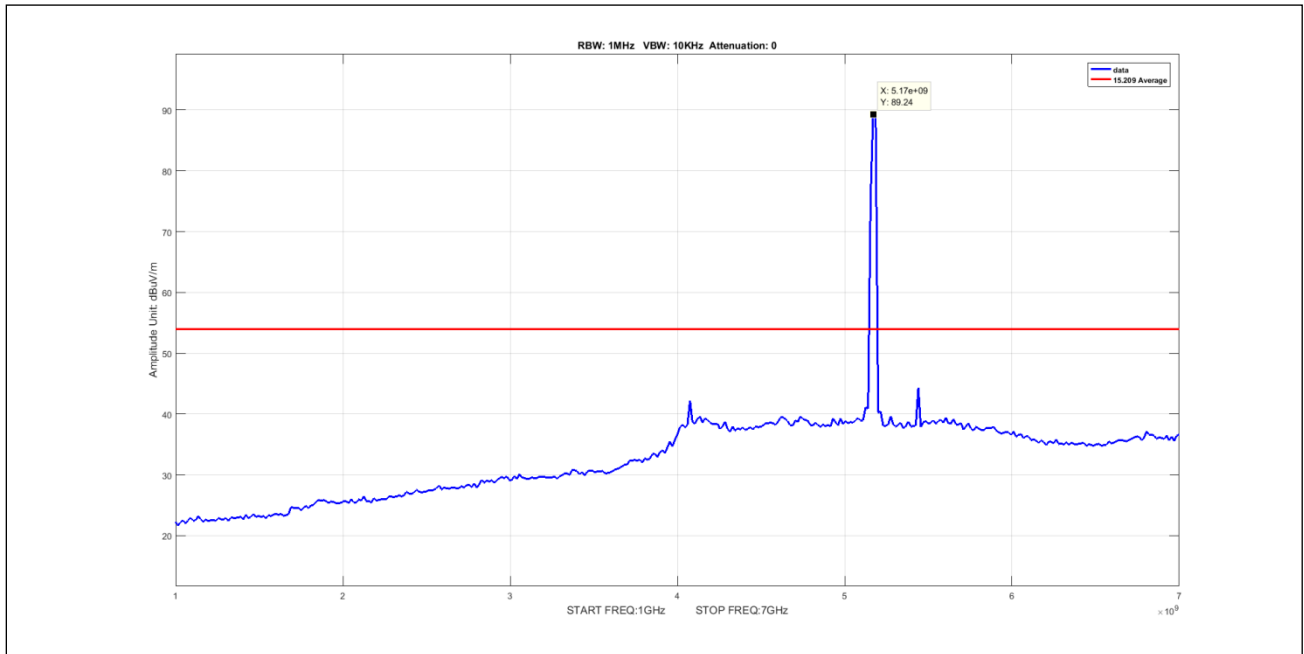
Plot 373. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5170 pow-2



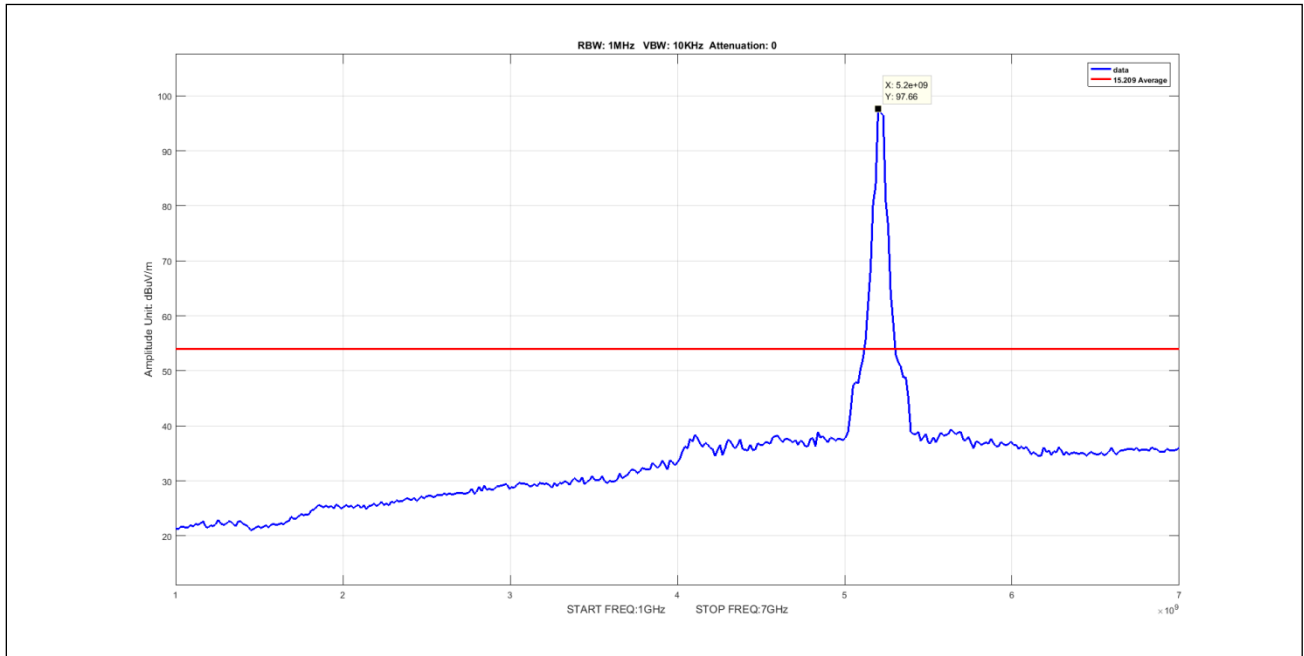
Plot 374. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5210 pow15



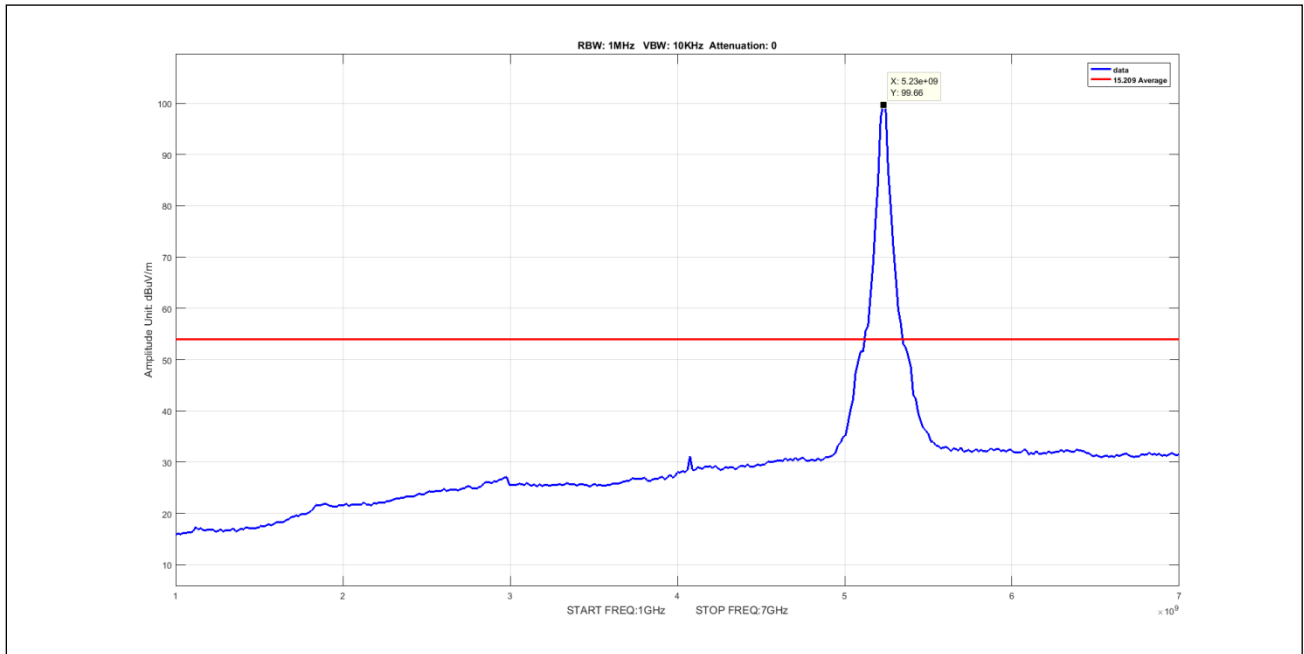
Plot 375. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5235.5 pow20



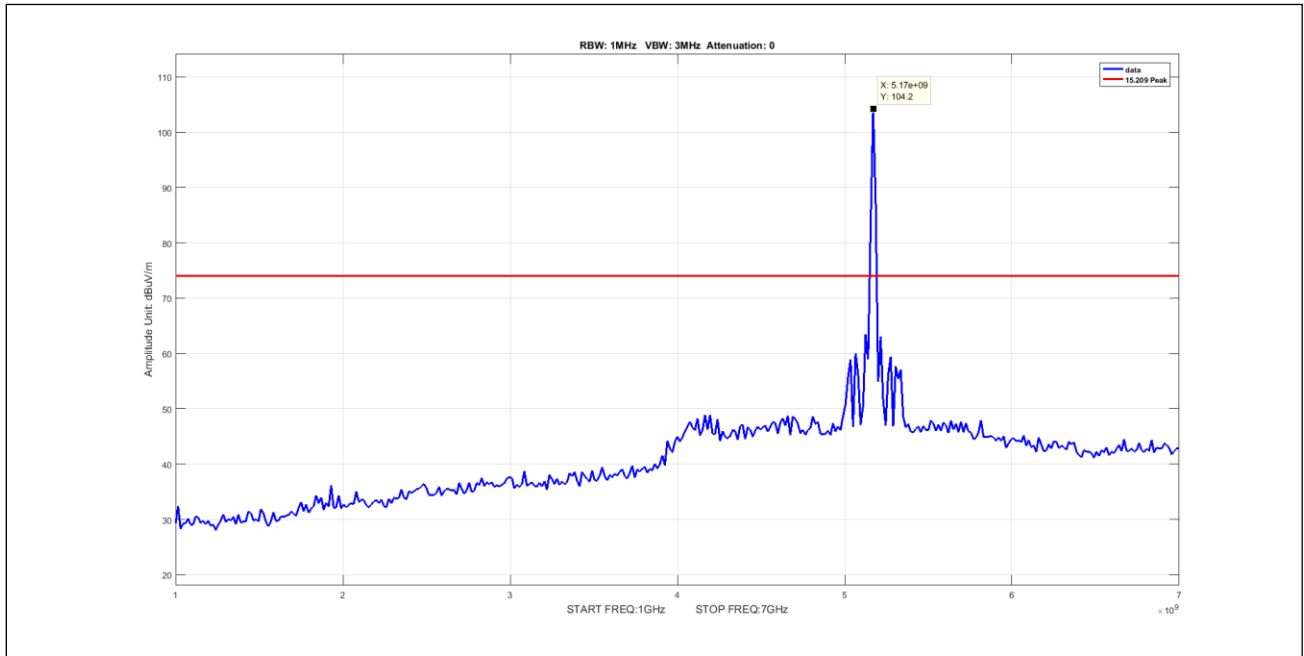
Plot 376. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5171 pow-10



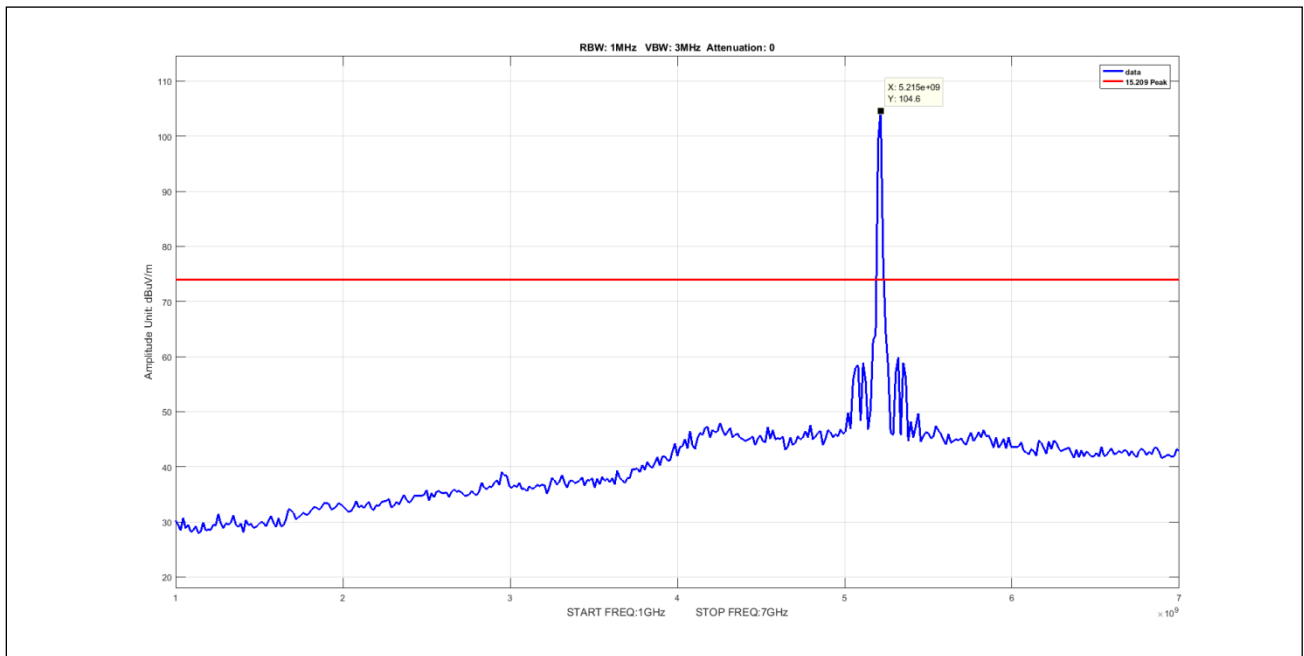
Plot 377. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5210 pow10



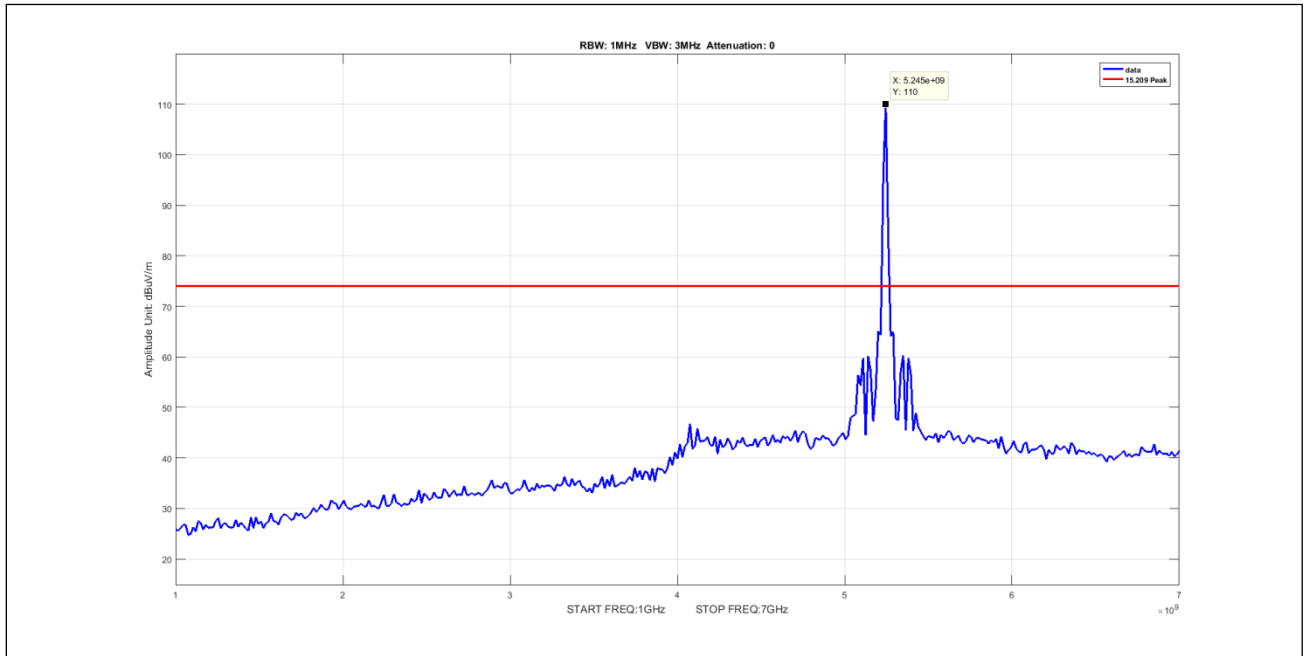
Plot 378. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5230 pow14



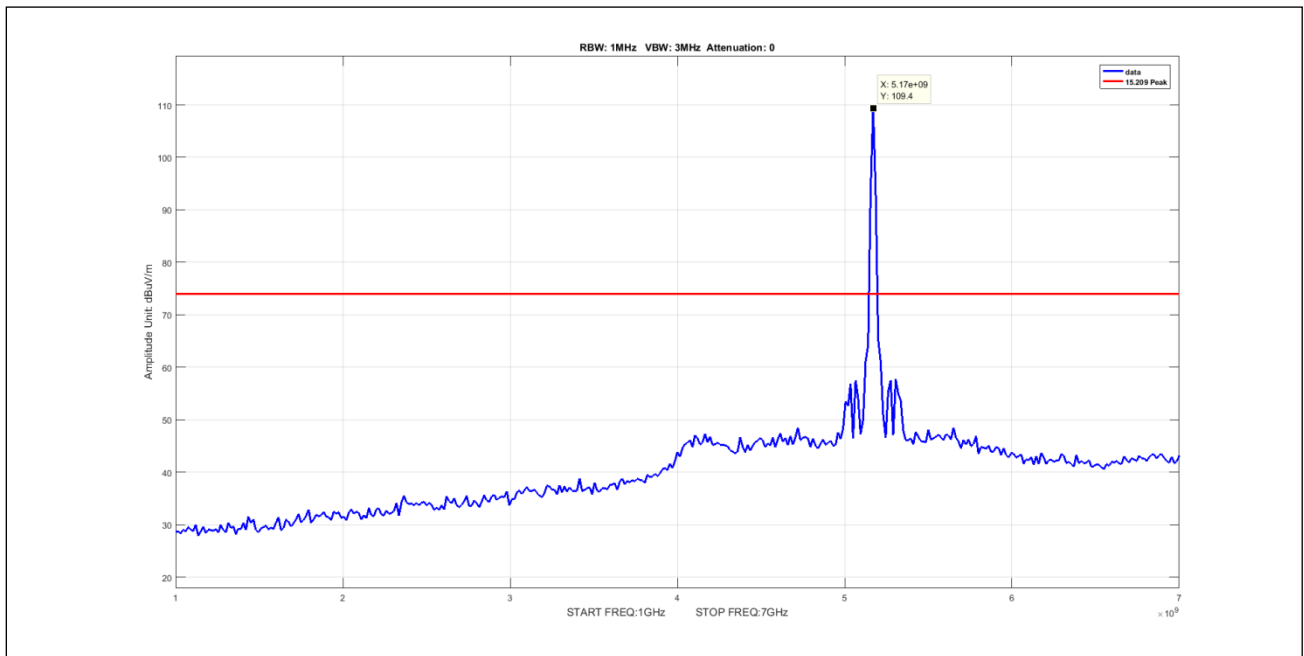
Plot 379. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5170 pow7



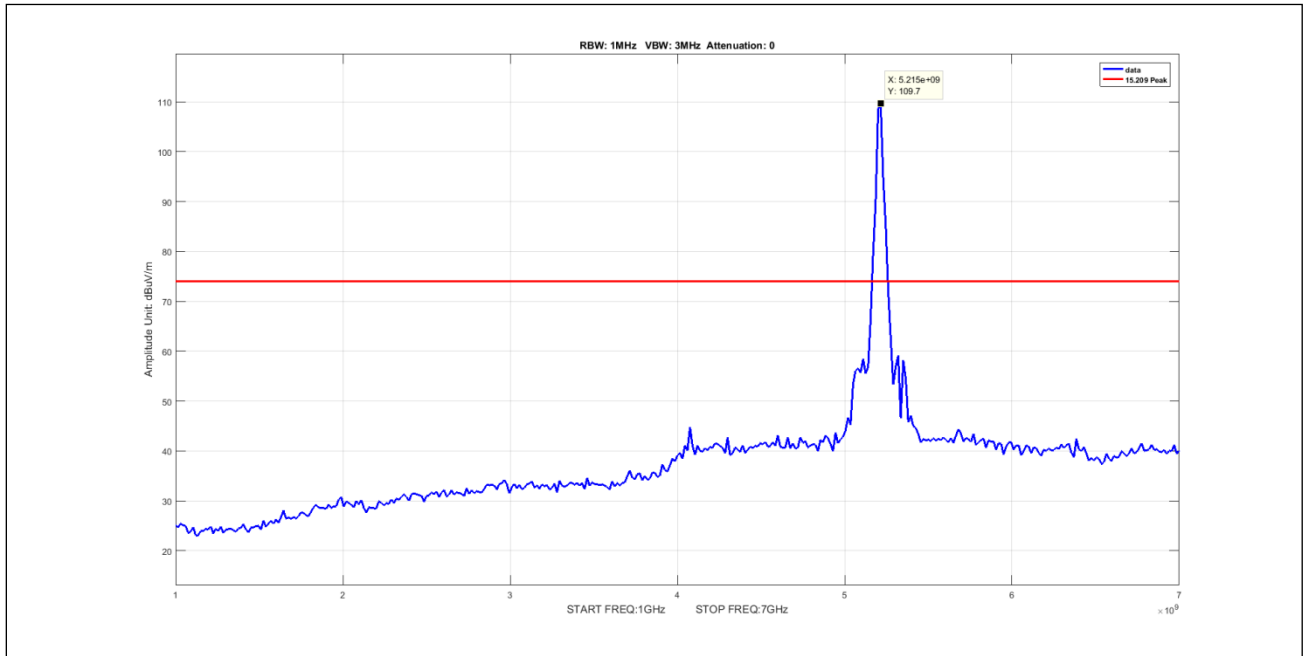
Plot 380. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5210 pow11



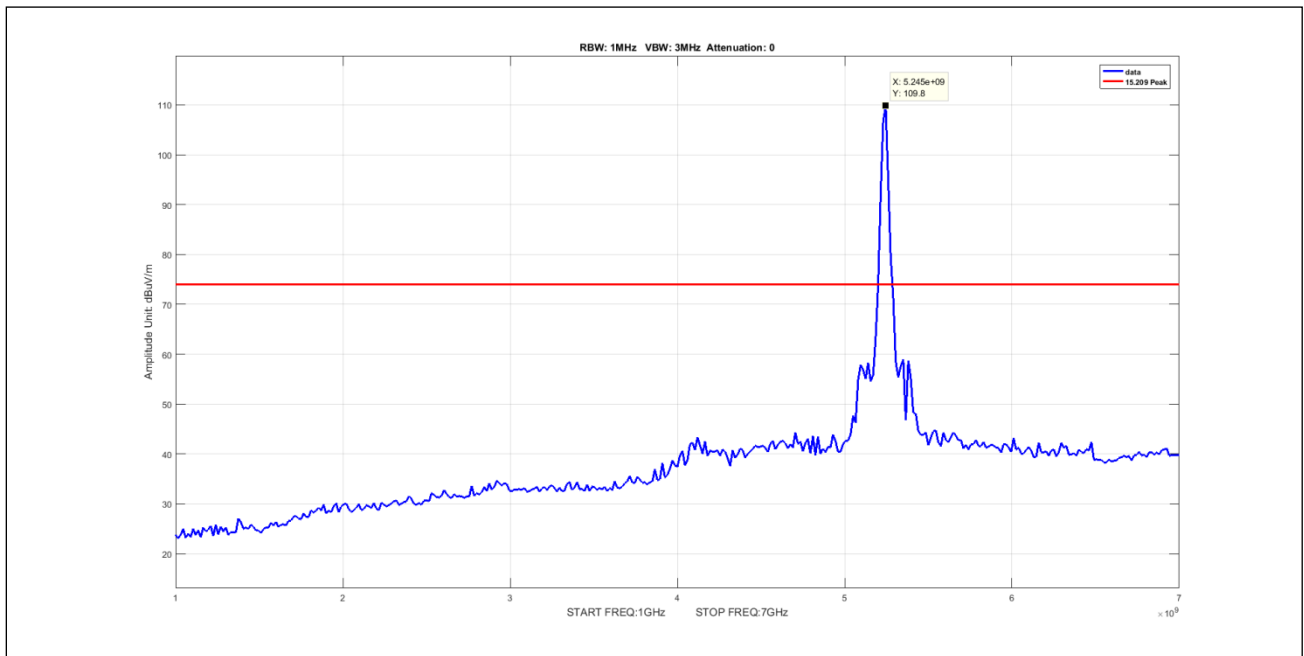
Plot 381. Undesirable Emissions, 1Panel Peak 1-7GHz 5M 5242.5 pow14



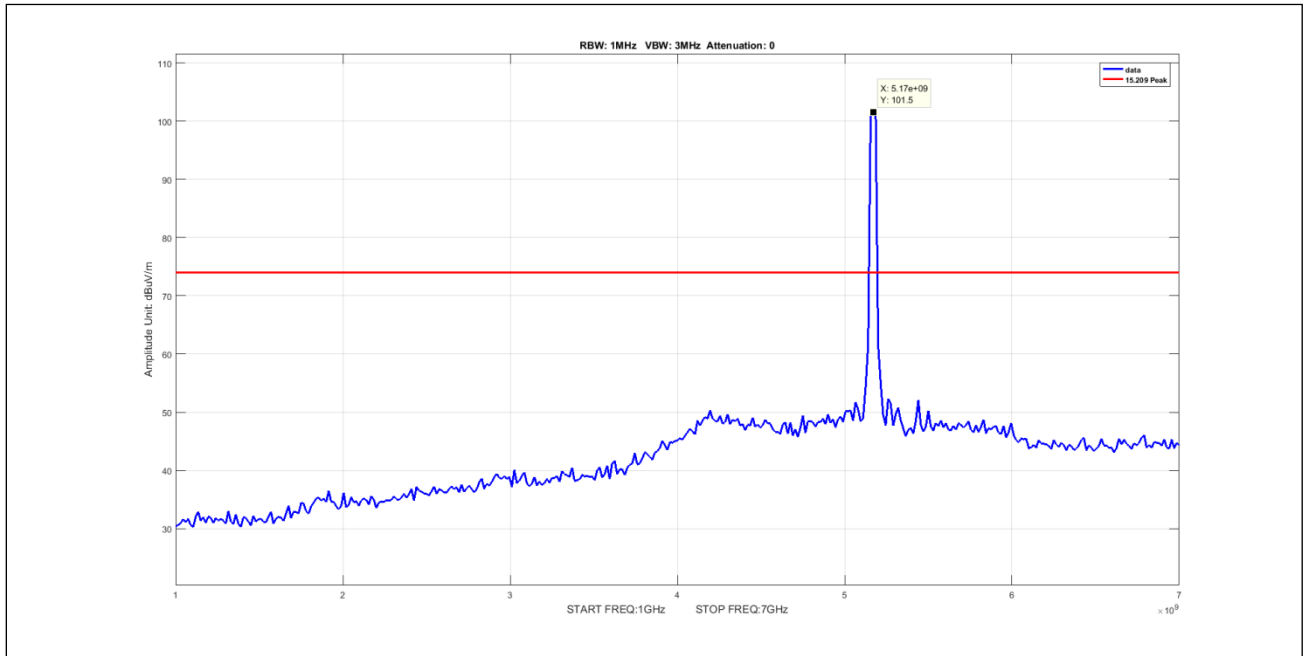
Plot 382. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5170 pow6



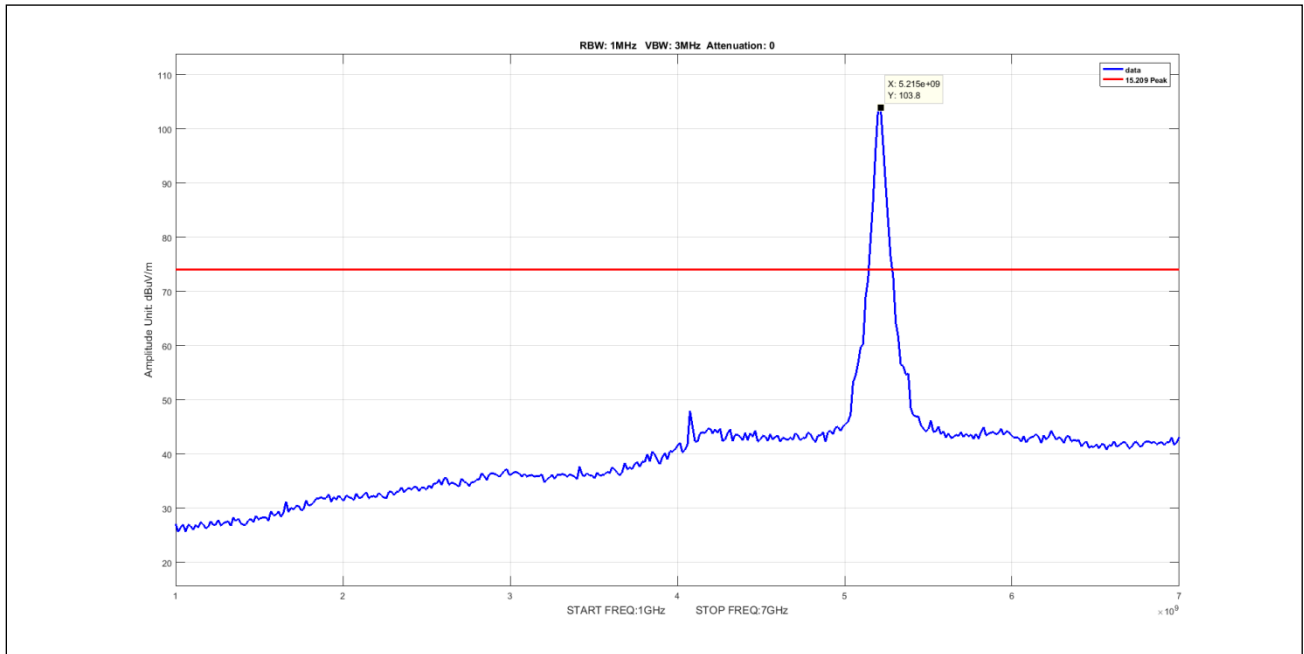
Plot 383. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5210 pow17



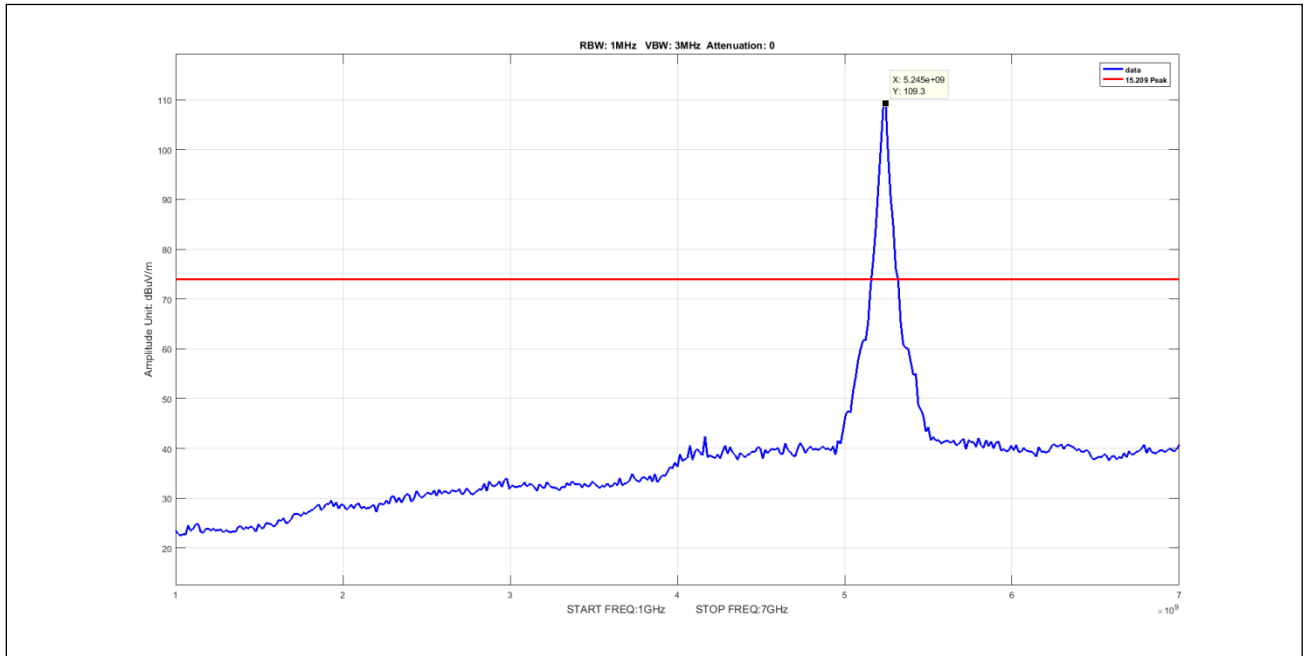
Plot 384. Undesirable Emissions, 1Panel Peak 1-7GHz 10M 5240.5 pow17



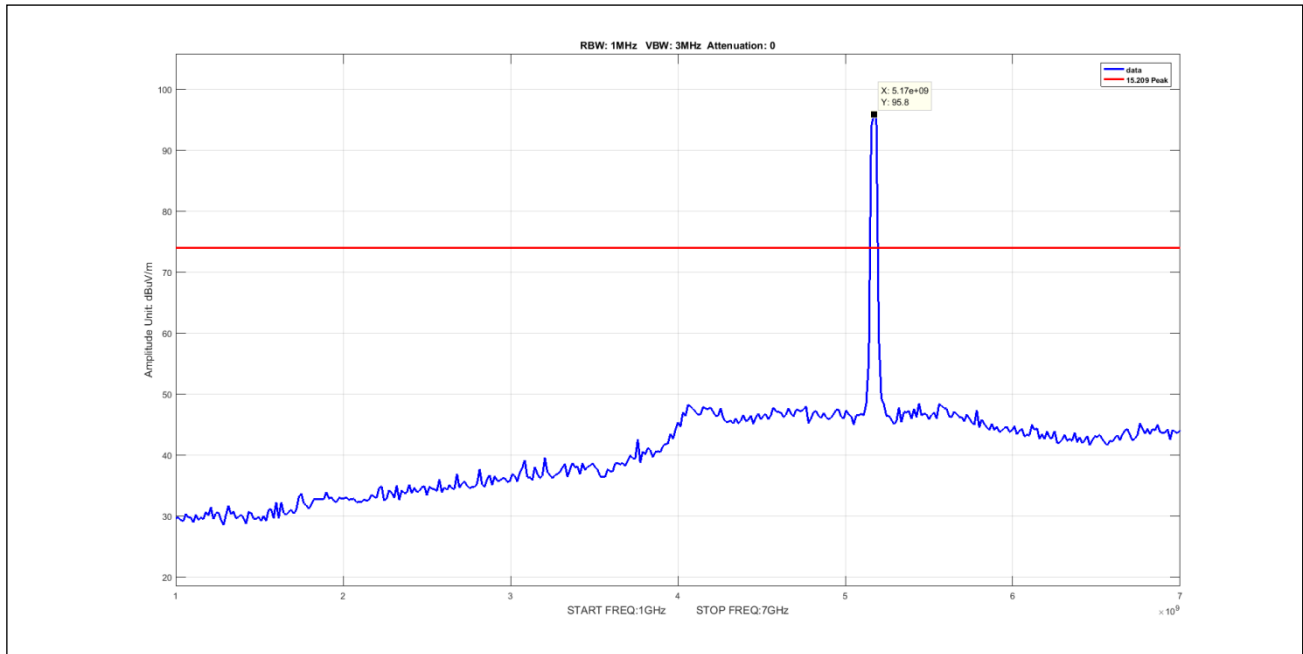
Plot 385. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5170 pow-2



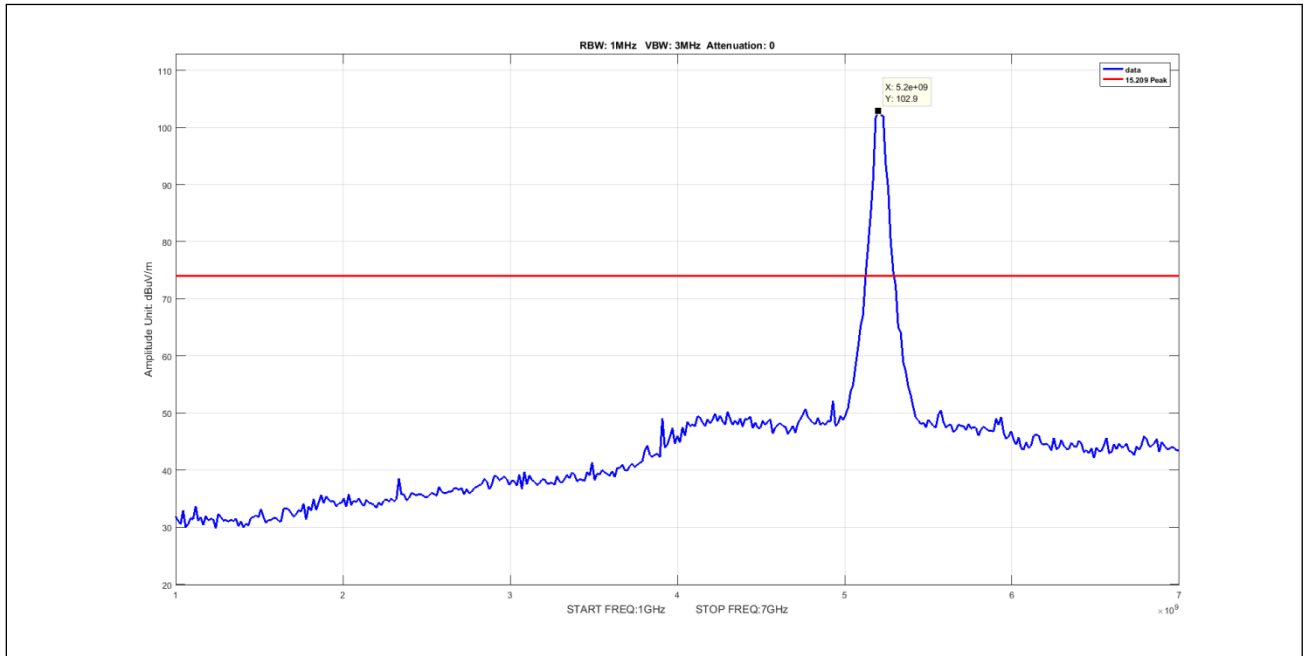
Plot 386. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5210 pow15



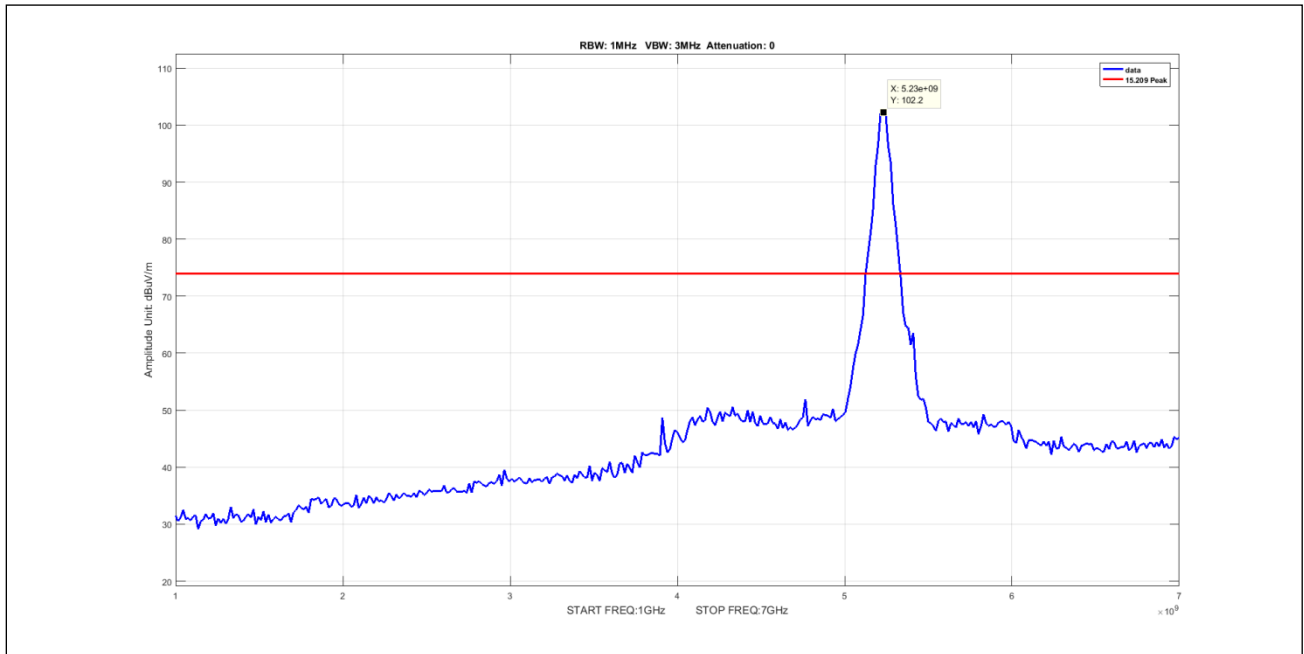
Plot 387. Undesirable Emissions, 1Panel Peak 1-7GHz 20M 5235.5 pow20



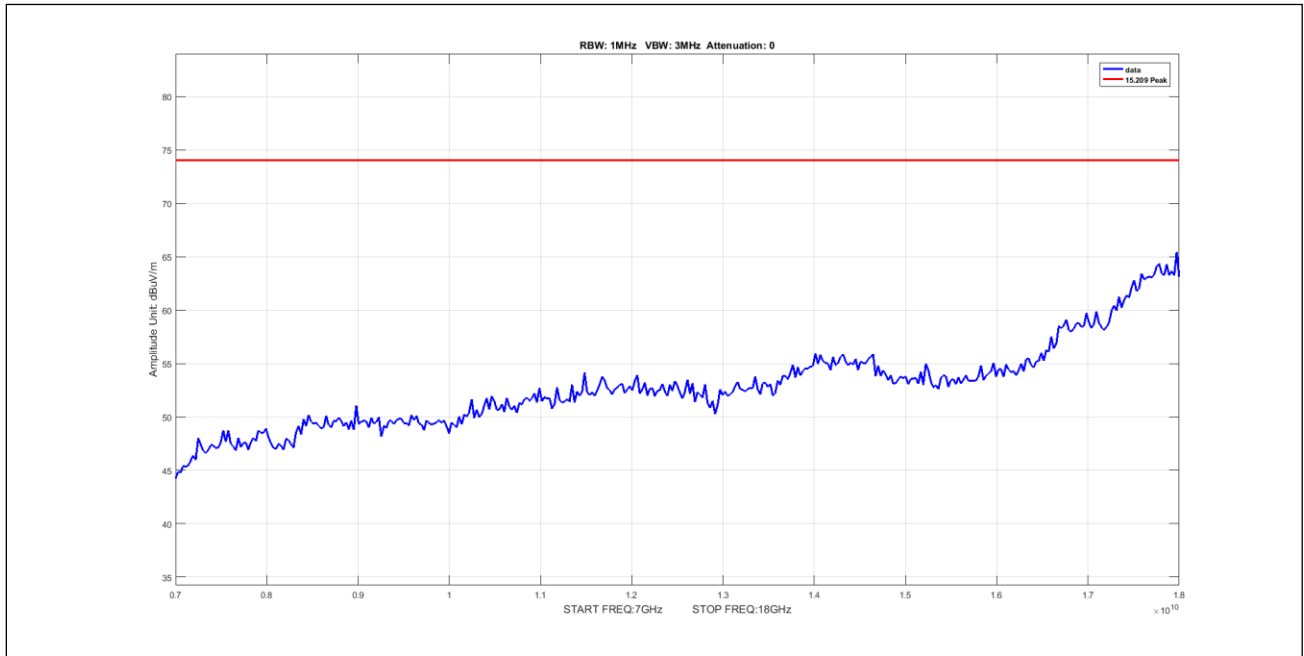
Plot 388. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5170 pow-10



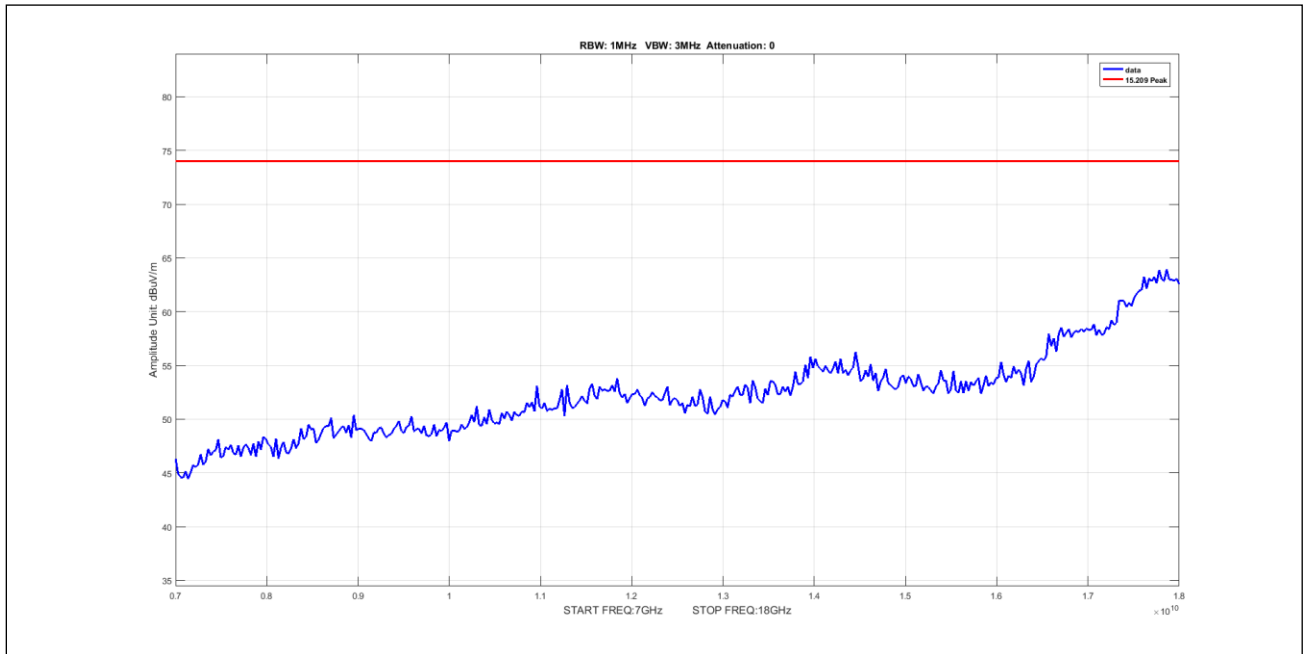
Plot 389. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5210 pow10



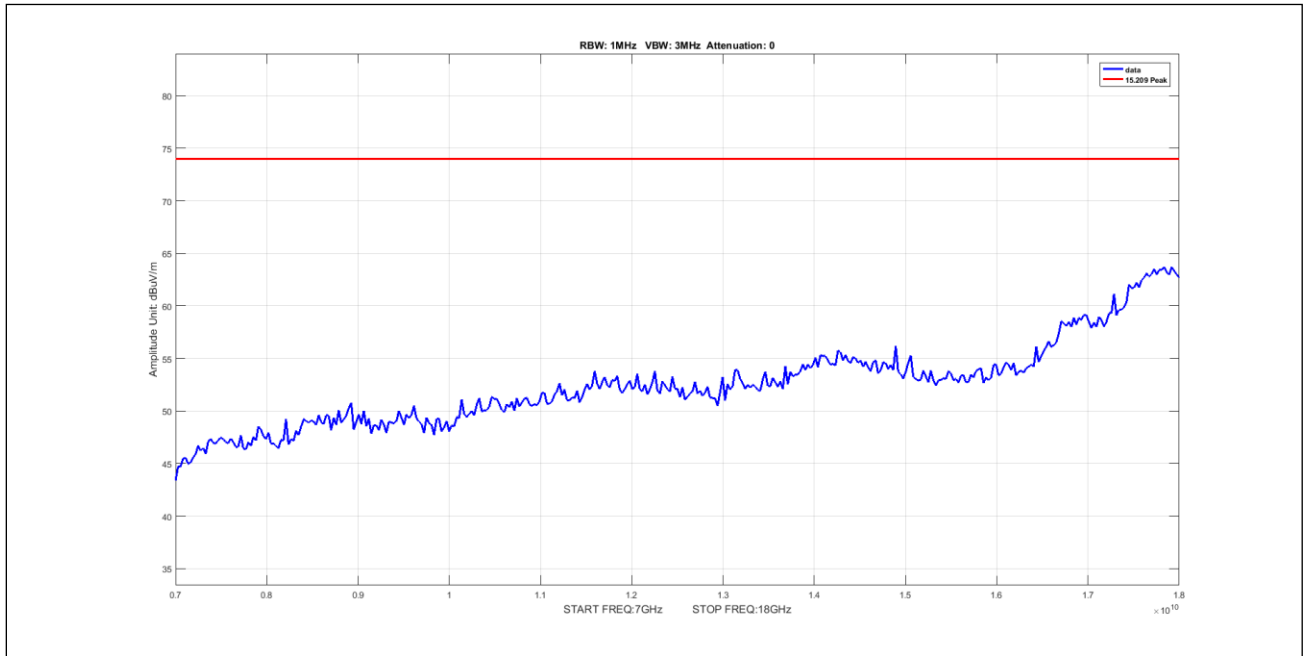
Plot 390. Undesirable Emissions, 1Panel Peak 1-7GHz 40M 5230 pow14



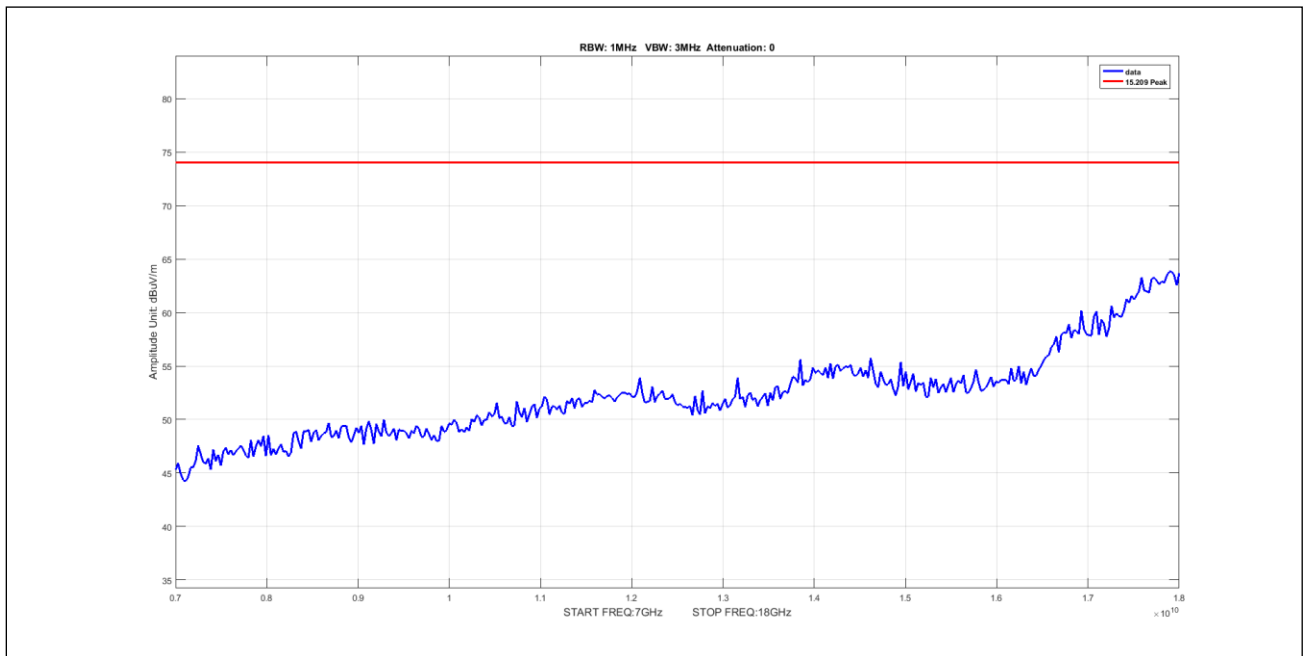
Plot 391. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5170 pow7



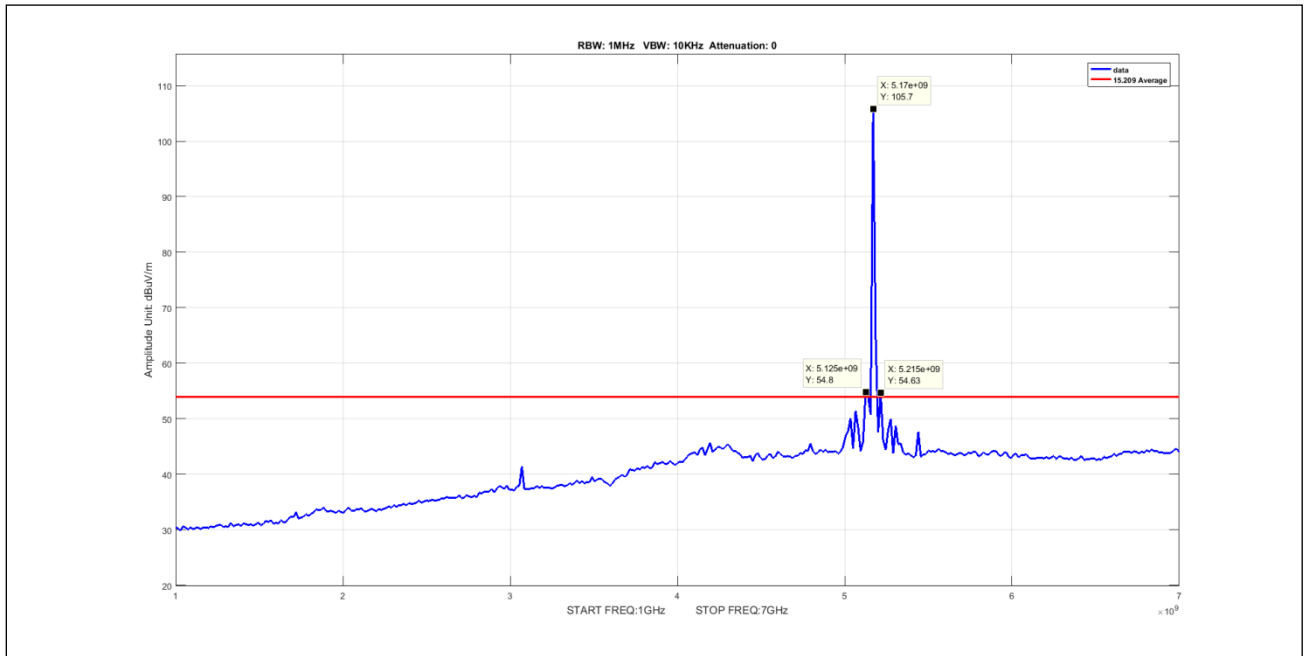
Plot 392. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5210 pow11



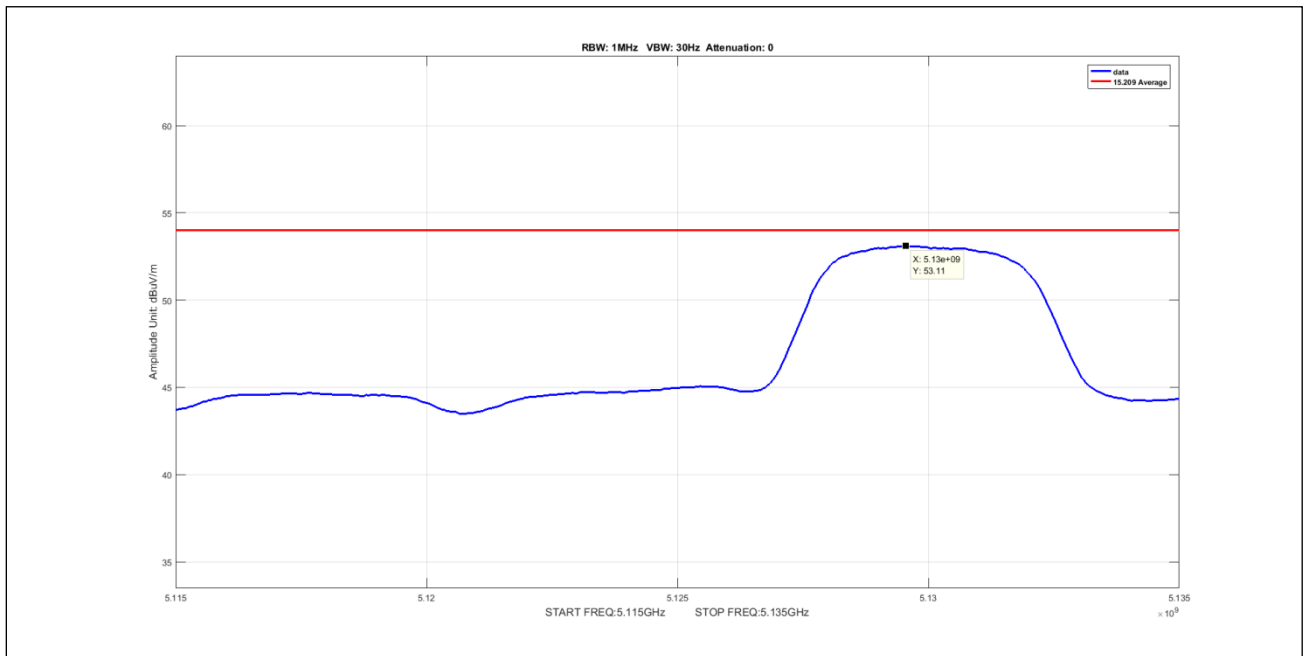
Plot 393. Undesirable Emissions, 1Panel Peak 7-18GHz 5M 5242.5 pow14



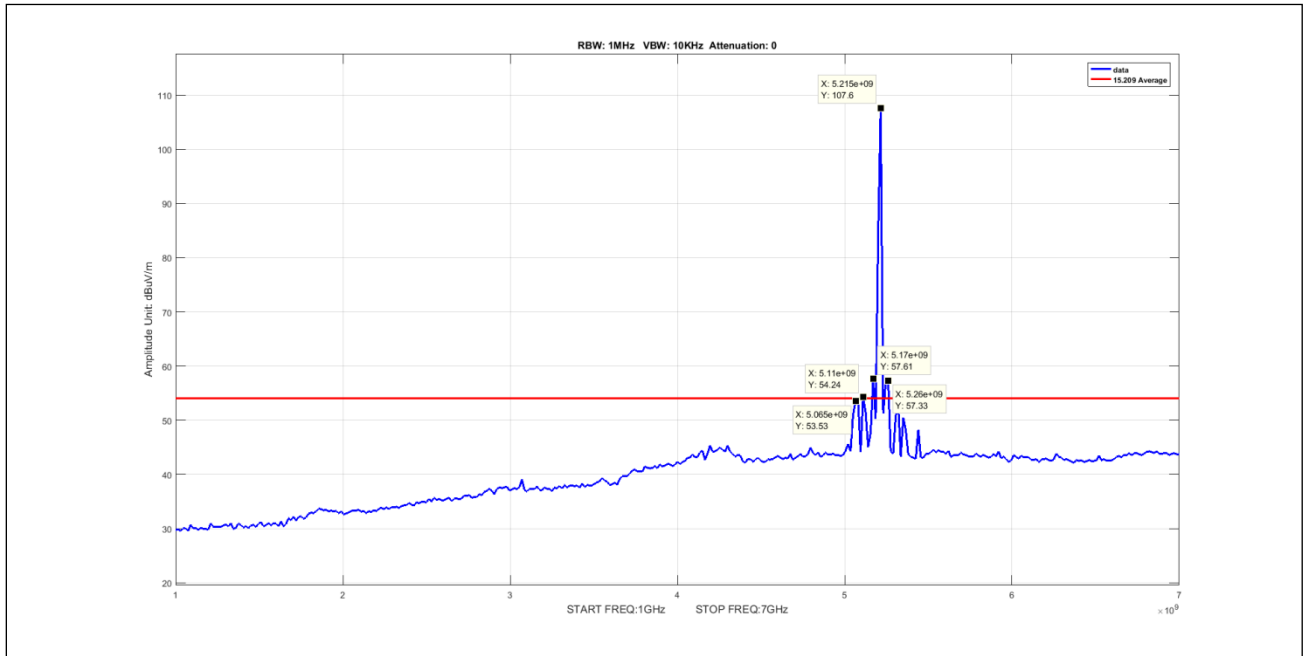
Plot 394. Undesirable Emissions, 1Panel Peak 7-18GHz 10M 5170 pow6



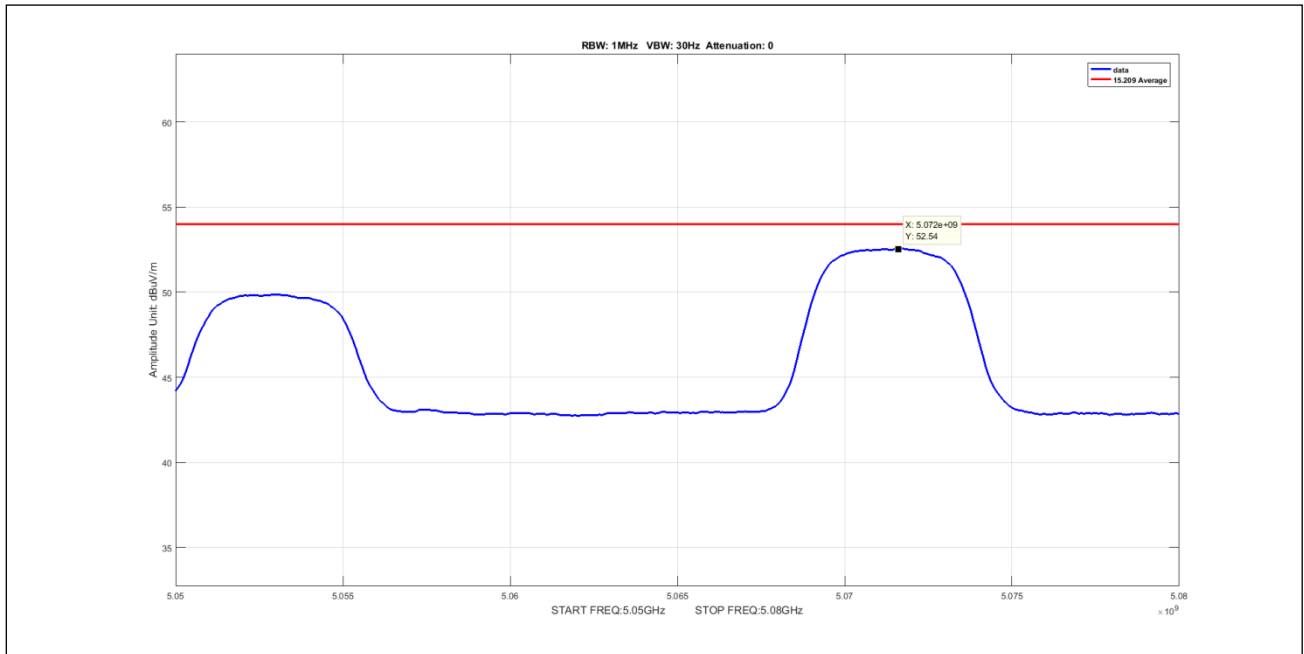
Plot 395. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5170 pow-2



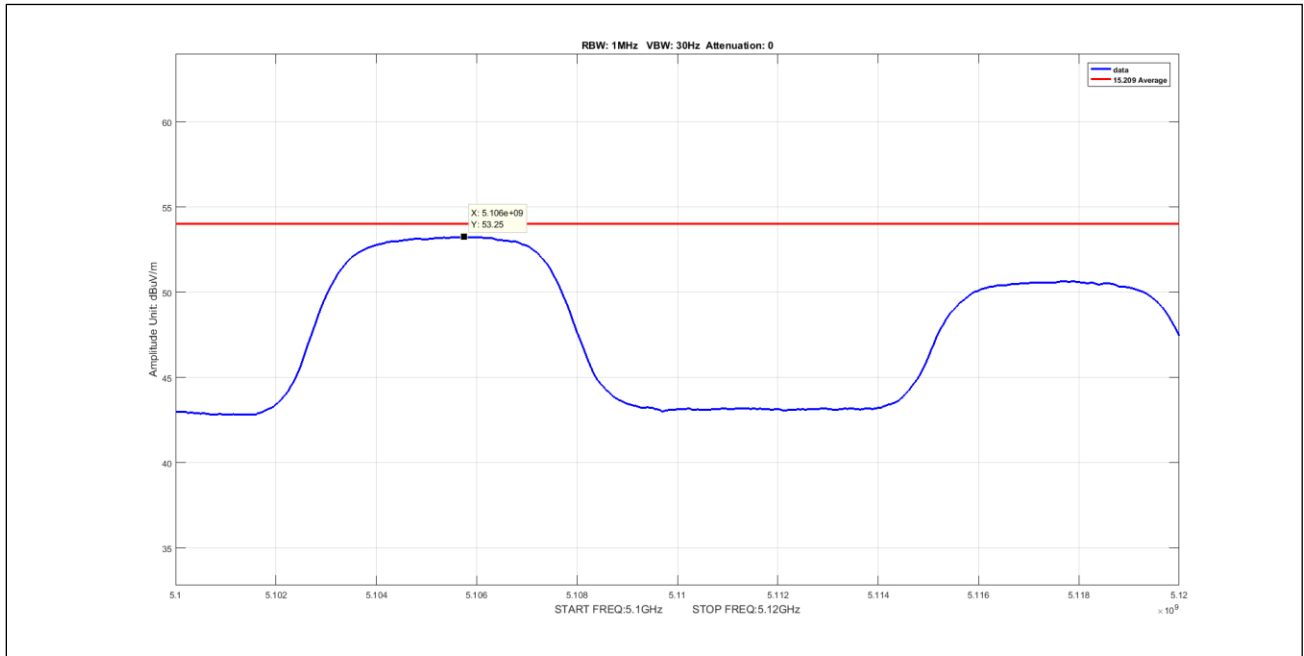
Plot 396. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5170 pow-2 zoom left of fundamental



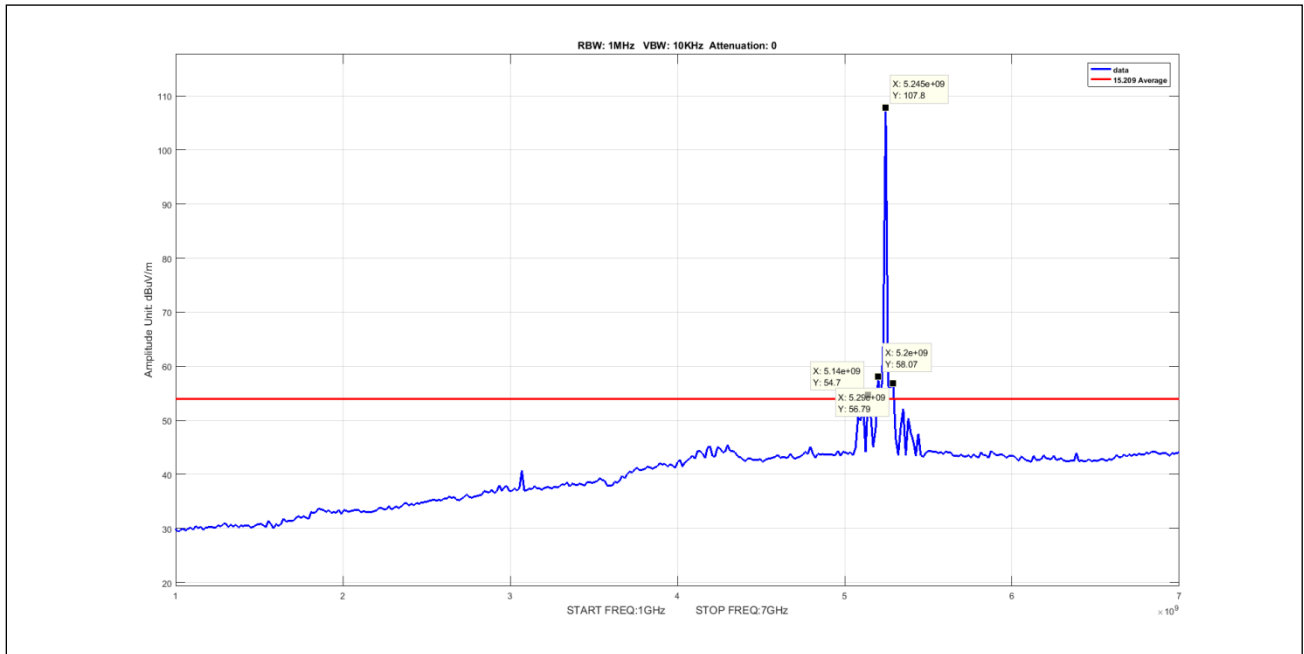
Plot 397. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1



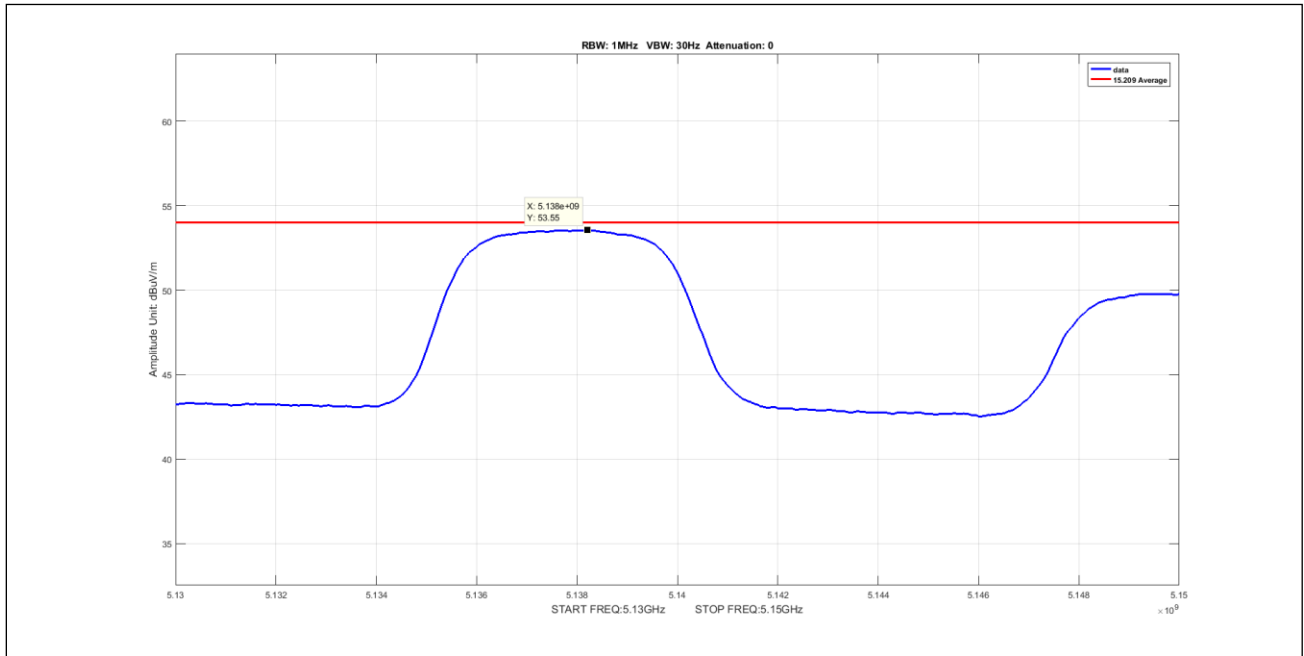
Plot 398. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1 left of fundamental



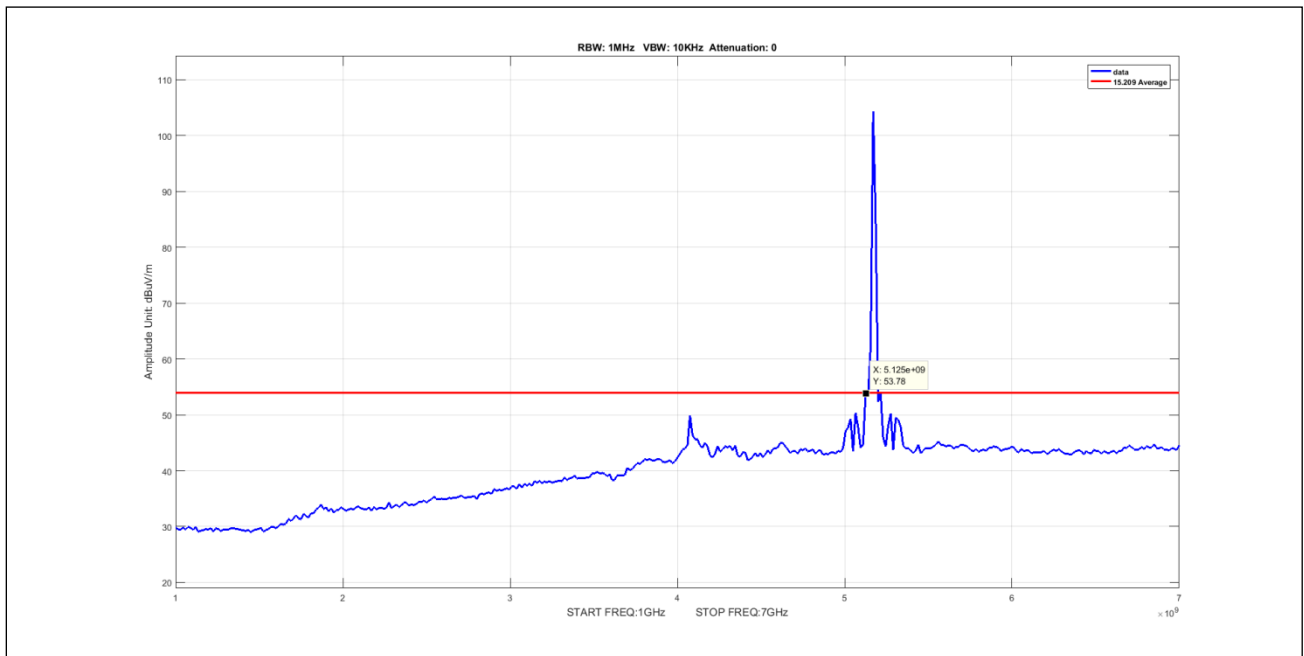
Plot 399. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5210 pow1 right of fundamental



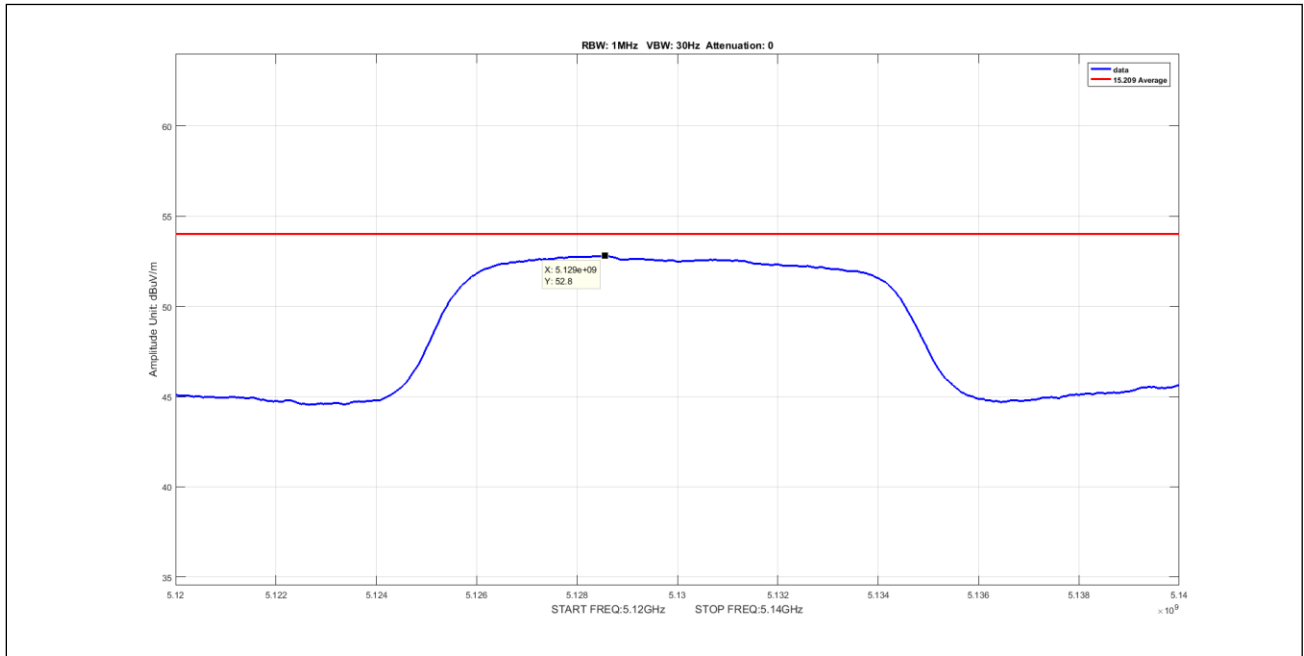
Plot 400. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5242.5 pow1



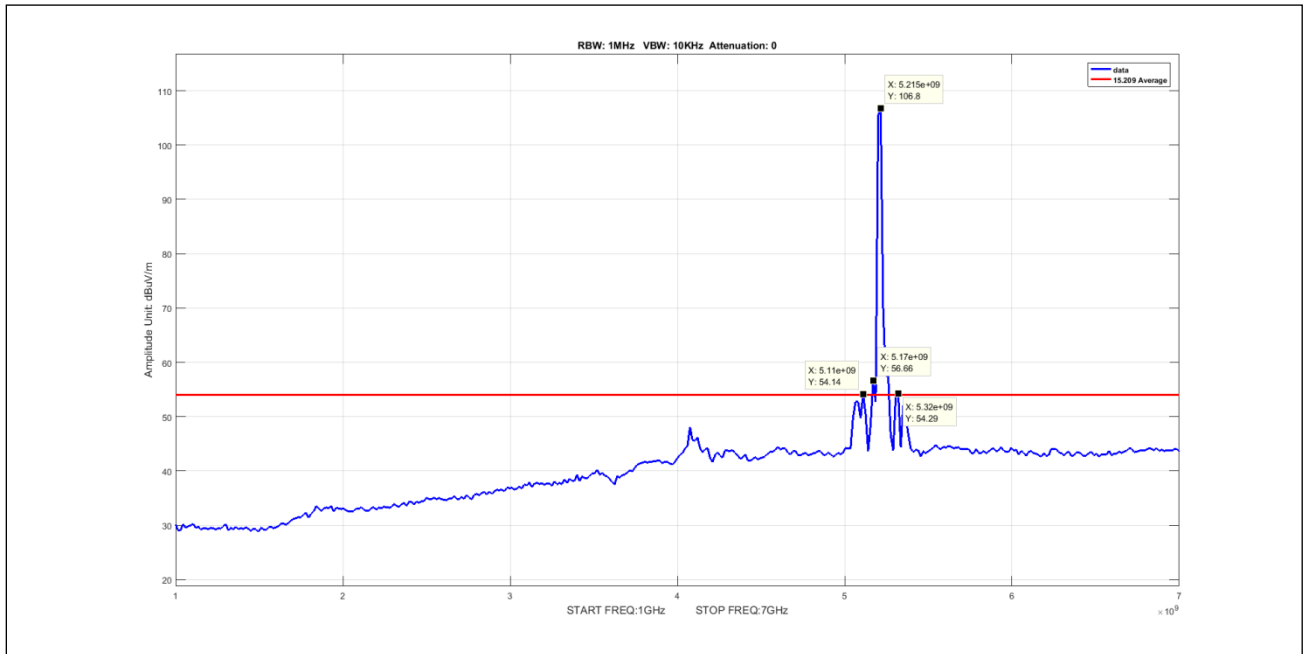
Plot 401. Undesirable Emissions, 2Panel Avg 1-7GHz 5M 5242.5 pow1 zoom left of fundamental



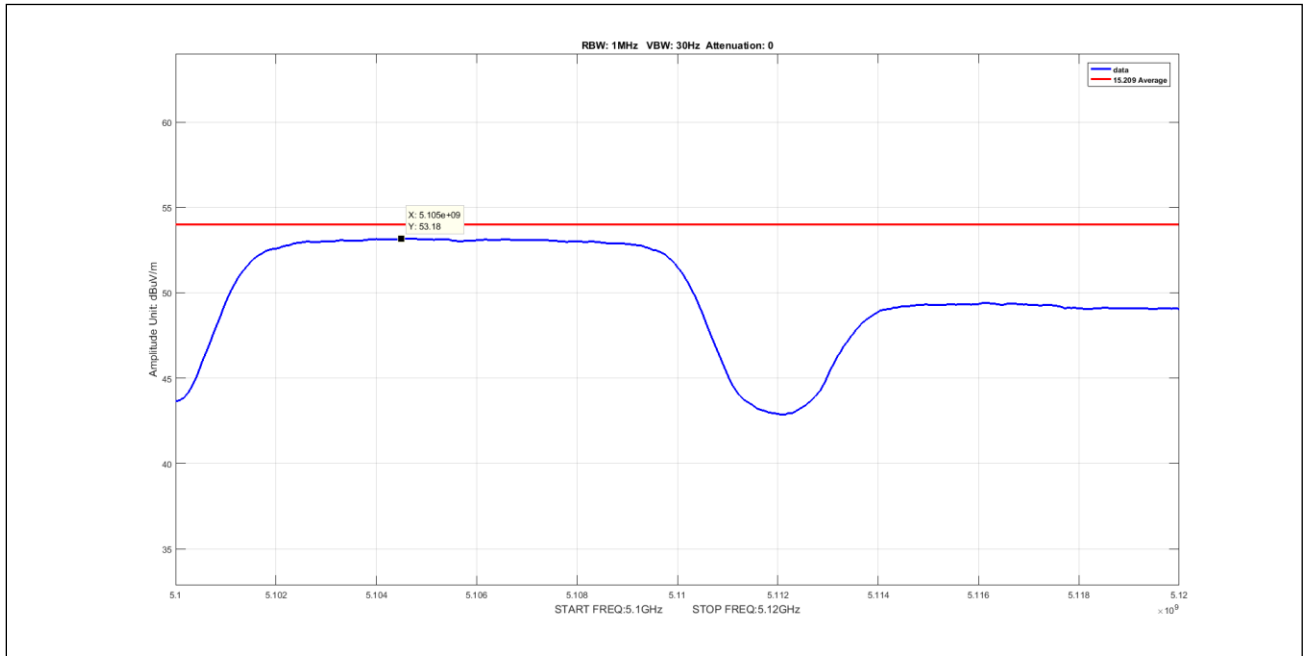
Plot 402. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5170 pow0



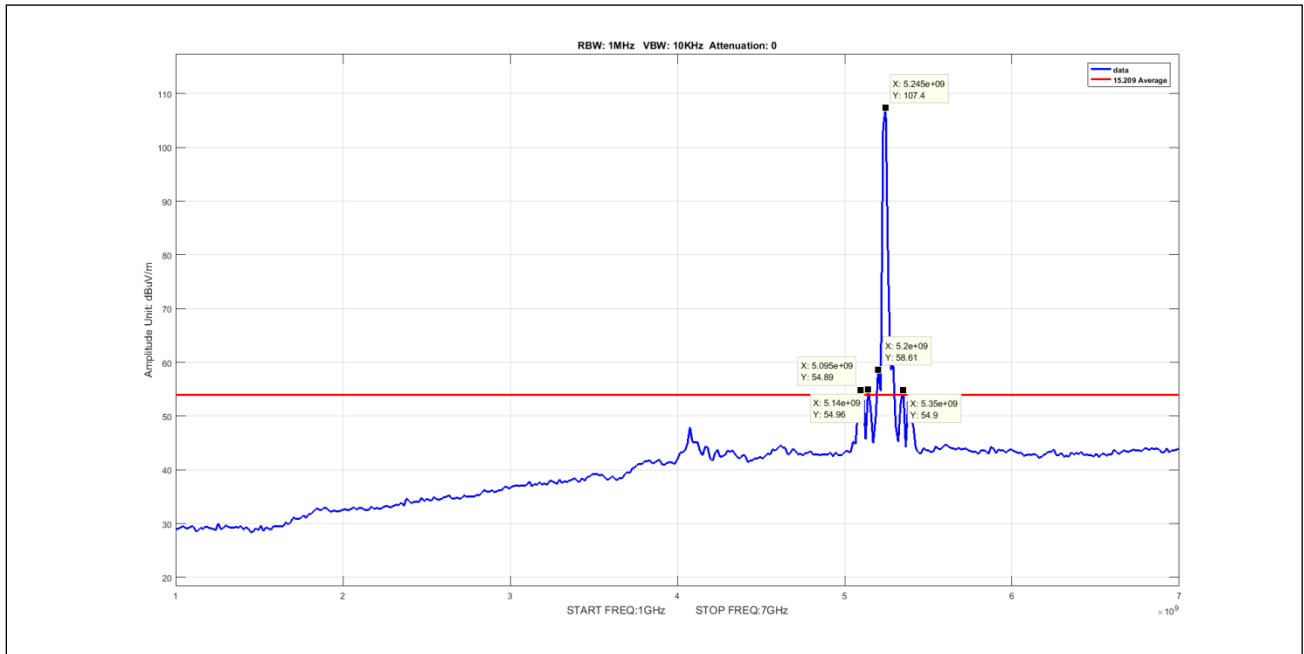
Plot 403. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5170 pow0 zoom left of fundamental



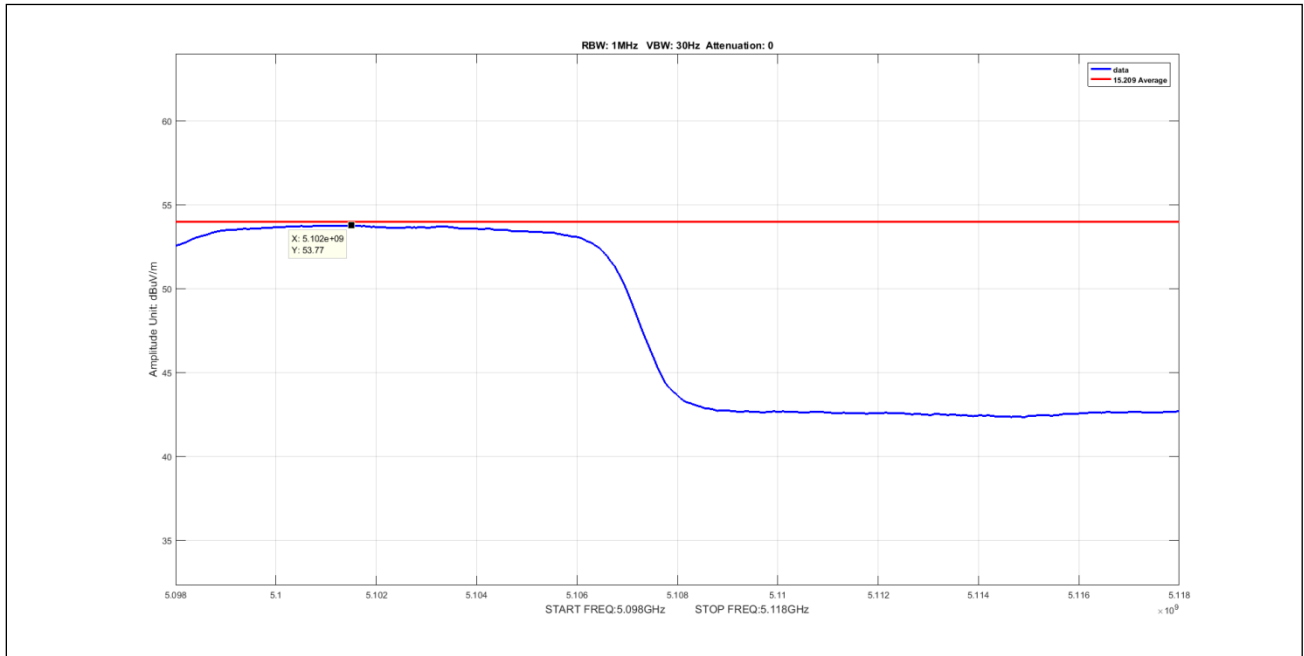
Plot 404. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5210 pow5



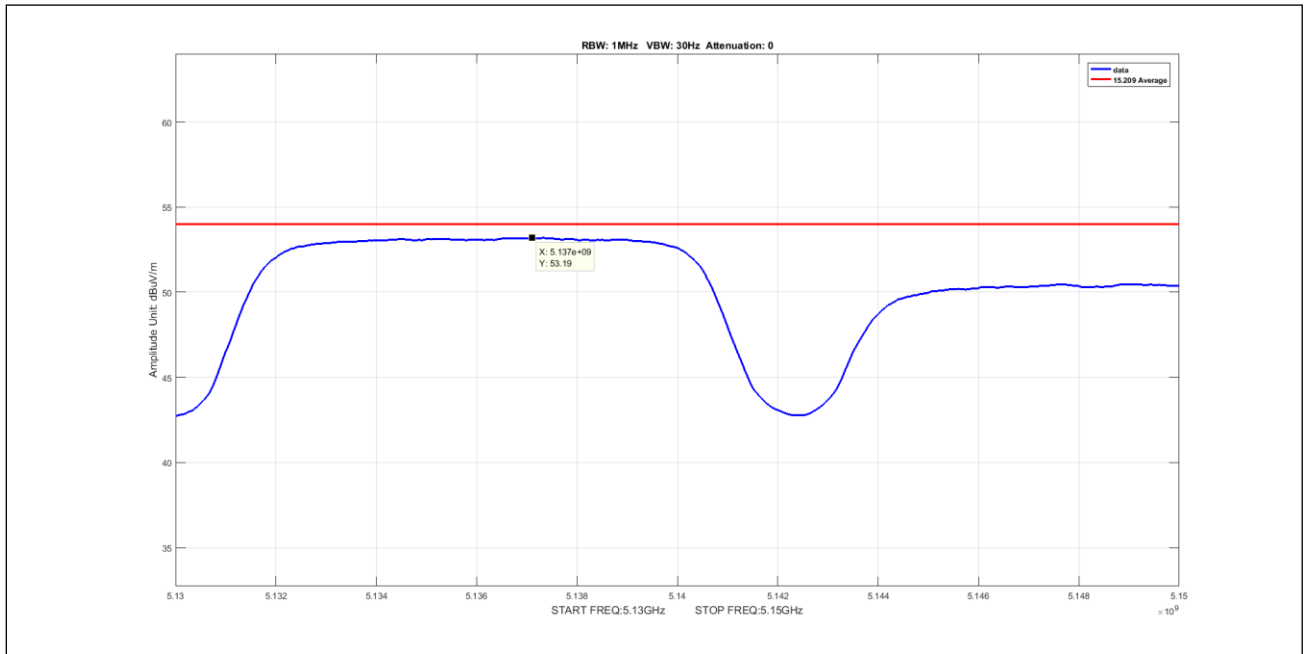
Plot 405. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5210 pow5 zoom left of fundamental



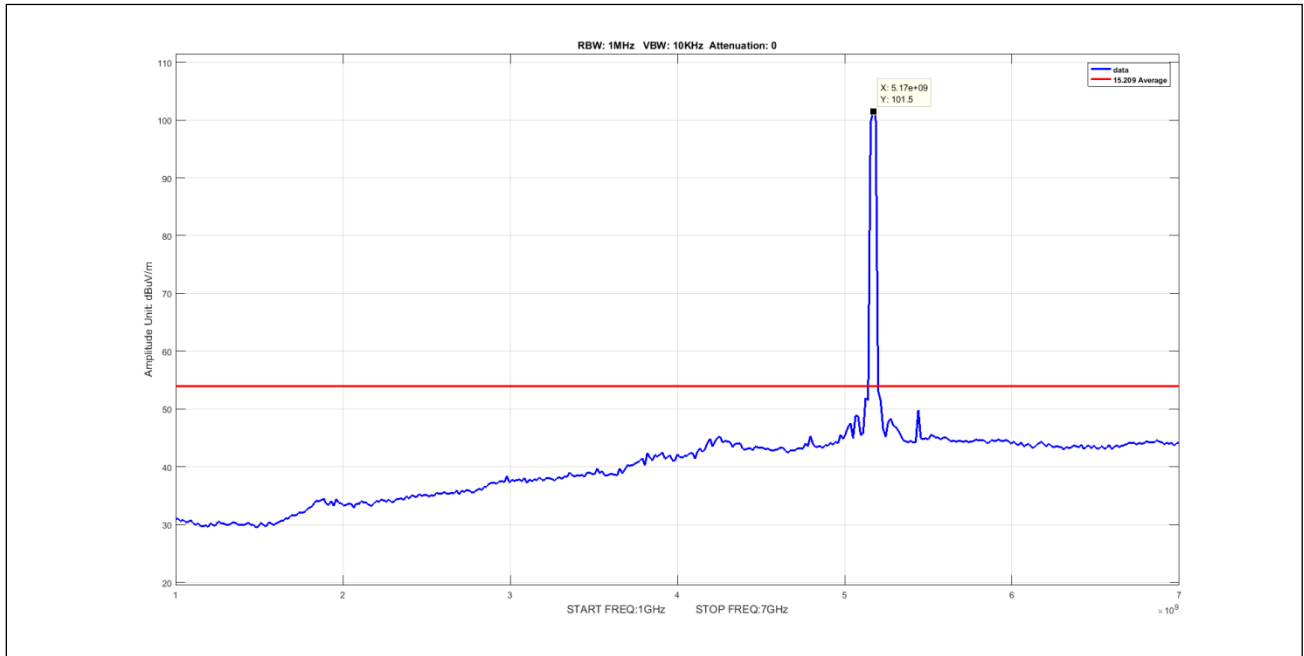
Plot 406. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4



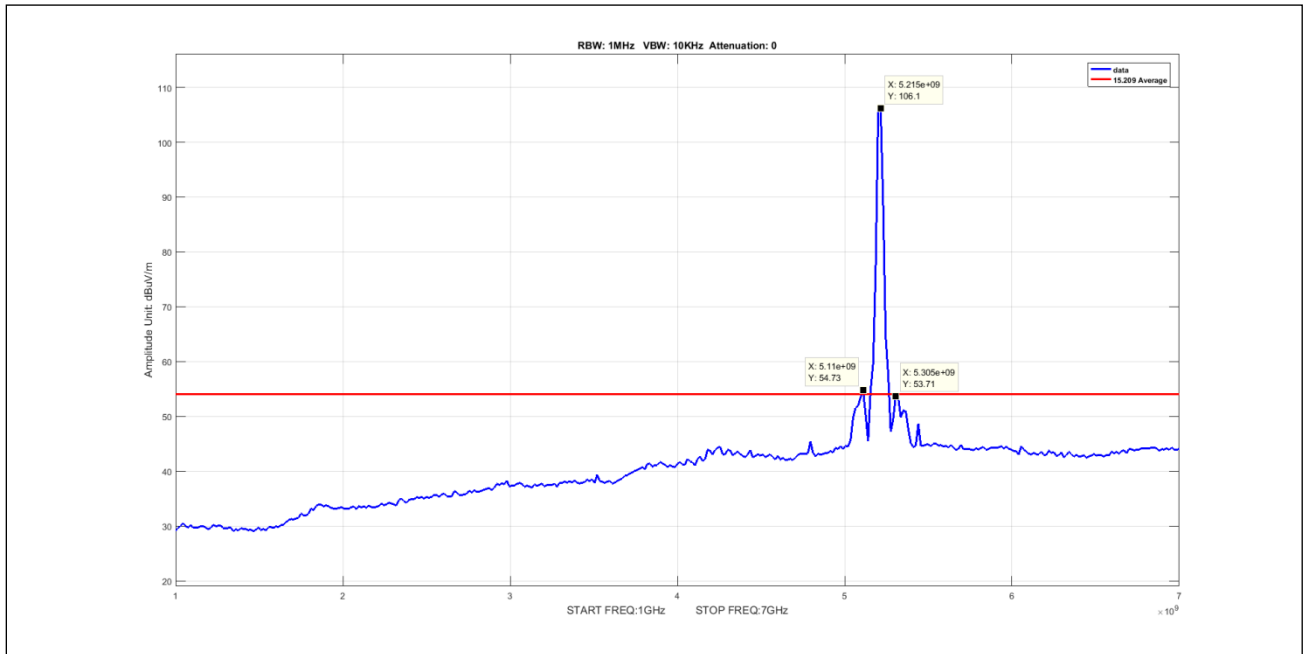
Plot 407. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4 zoom left of fundamental



Plot 408. Undesirable Emissions, 2Panel Avg 1-7GHz 10M 5240.5 pow4 zoom near left of fundamental



Plot 409. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5170 pow-1



Plot 410. Undesirable Emissions, 2Panel Avg 1-7GHz 20M 5210 pow6