

## Appendix D-1: Spurious Analysis Part 1 – Middle Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1952.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

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|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

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| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 2142.5             | 190.                | 1071.25                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 2142.5             | 190.                | 1762.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 2142.5             | 190.                | 1857.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 2142.5             | 190.                | 1889.167                | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 2142.5             | 190.                | 2015.833                | 266.4                     | 3                    | -3                 | 47                         | 73.1                        |
| 2142.5             | 190.                | 2047.5                  | 159.3                     | 2                    | -2                 | 49                         | 55.2                        |
| 2142.5             | 190.                | 2142.5                  | 0                         | 1                    | -1                 | 0                          | 0                           |
| 2142.5             | 190.                | 2540.                   | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 2142.5             | 190.                | 2666.67                 | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 2142.5             | 190.                | 2833.75                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |

## Appendix D-2: Spurious Analysis Part 2 – Middle Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1952.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

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|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

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| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 1622.5             | 330.                | 1141.25                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 1622.5             | 330.                | 1622.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 1622.5             | 330.                | 1787.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 1622.5             | 330.                | 1842.5                  | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 1622.5             | 330.                | 2062.5                  | 180.4                     | 3                    | -3                 | 47                         | 44.5                        |
| 1622.5             | 330.                | 2117.5                  | 49.                       | 2                    | -2                 | 49                         | .                           |
| 1622.5             | 330.                | 2282.5                  | 75.4                      | 1                    | -1                 | 0                          | 75.4                        |
| 1622.5             | 330.                | 2493.333                | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 1622.5             | 330.                | 2713.333                | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 1622.5             | 330.                | 2763.75                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |

## Appendix D-3: Spurious Analysis Part 3 - Middle Channel

### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |     |     |
|-------------------------------|-----|-----|
| Output Frequency = Difference |     |     |
| Input Start Frequency         | 100 | MHz |
| Input Stop Frequency          | 400 | MHz |
| LO Frequency Selected         | 260 | MHz |
| Maximum Spur Table Level      | 65  | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

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|                            |     |     |
|----------------------------|-----|-----|
| Number of Sections         | 7   |     |
| Filter Center Frequency    | 190 | MHz |
| Filter Bandwidth Frequency | 4.6 | MHz |
| Filter Corner Attenuation  | 1   | dB  |
| Filter Maximum Attenuation | 40  | dB  |

#### Spurious Data

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| Input Freq. | Output Freq. | Input Spur Freq. | Output Spur Level | Mixer Spur | Mixer Spur | Mixer Table Atten. | Input Filter Atten. |
|-------------|--------------|------------------|-------------------|------------|------------|--------------------|---------------------|
| MHz         | MHz          | MHz              | (dB)              | MxSPUR     | NxLO       | (dB)               | (dB)                |
| 190         | 70.          | 110.             | 166.              | 3          | -1         | 46                 | 40.                 |
| 190         | 70.          | 150.             | 169.              | -3         | 2          | 49                 | 40.                 |
| 190         | 70.          | 165.             | 134.              | 2          | -1         | 54                 | 40.                 |
| 190         | 70.          | 177.5            | 221.              | -4         | 3          | 61                 | 40.                 |
| 190         | 70.          | 190.             | 0                 | -1         | 1          | 0                  | 0                   |
| 190         | 70.          | 196.667          | 169.              | 3          | -2         | 49                 | 40.                 |
| 190         | 70.          | 212.5            | 221.              | 4          | -3         | 61                 | 40.                 |
| 190         | 70.          | 236.667          | 169.              | -3         | 3          | 49                 | 40.                 |
| 190         | 70.          | 246.             | 259.              | -5         | 5          | 59                 | 40.                 |
| 190         | 70.          | 274.             | 259.              | 5          | -5         | 59                 | 40.                 |
| 190         | 70.          | 283.333          | 169.              | 3          | -3         | 49                 | 40.                 |
| 190         | 70.          | 298.             | 264.              | -5         | 6          | 64                 | 40.                 |
| 190         | 70.          | 307.5            | 224.              | -4         | 5          | 64                 | 40.                 |
| 190         | 70.          | 323.333          | 174.              | -3         | 4          | 54                 | 40.                 |
| 190         | 70.          | 326.             | 264.              | 5          | -6         | 64                 | 40.                 |
| 190         | 70.          | 330.             | 40.               | 1          | -1         | 0                  | 40.                 |
| 190         | 70.          | 342.5            | 224.              | 4          | -5         | 64                 | 40.                 |
| 190         | 70.          | 350.             | 255.              | -5         | 7          | 55                 | 40.                 |

## Appendix D-4: Spurious Analysis Part 1 - Bottom Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1922.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

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|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

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| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 2112.5             | 190.                | 1056.25                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 2112.5             | 190.                | 1732.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 2112.5             | 190.                | 1827.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 2112.5             | 190.                | 1859.167                | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 2112.5             | 190.                | 1985.833                | 306.6                     | 3                    | -3                 | 47                         | 86.5                        |
| 2112.5             | 190.                | 2017.5                  | 193.6                     | 2                    | -2                 | 49                         | 72.3                        |
| 2112.5             | 190.                | 2112.5                  | .1                        | 1                    | -1                 | 0                          | .1                          |
| 2112.5             | 190.                | 2500.                   | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 2112.5             | 190.                | 2626.667                | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 2112.5             | 190.                | 2788.75                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |
| 2112.5             | 190.                | 2978.75                 | 261.                      | 2                    | 3                  | 41                         | 110.                        |

## Appendix D-5: Spurious Analysis Part 2 – Bottom Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1922.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

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|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

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| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 1592.5             | 330.                | 1126.25                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 1592.5             | 330.                | 1592.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 1592.5             | 330.                | 1757.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 1592.5             | 330.                | 1812.5                  | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 1592.5             | 330.                | 2032.5                  | 239.9                     | 3                    | -3                 | 47                         | 64.3                        |
| 1592.5             | 330.                | 2087.5                  | 91.7                      | 2                    | -2                 | 49                         | 21.4                        |
| 1592.5             | 330.                | 2252.5                  | 61.2                      | 1                    | -1                 | 0                          | 61.2                        |
| 1592.5             | 330.                | 2453.333                | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 1592.5             | 330.                | 2673.333                | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 1592.5             | 330.                | 2718.75                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |

## Appendix D-6: Spurious Analysis Part 1 – Top Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

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|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1977.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

---

|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

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| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 2167.5             | 190.                | 1083.75                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 2167.5             | 190.                | 1787.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 2167.5             | 190.                | 1882.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 2167.5             | 190.                | 1914.167                | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 2167.5             | 190.                | 2040.833                | 225.1                     | 3                    | -3                 | 47                         | 59.4                        |
| 2167.5             | 190.                | 2072.5                  | 121.4                     | 2                    | -2                 | 49                         | 36.2                        |
| 2167.5             | 190.                | 2167.5                  | .                         | 1                    | -1                 | 0                          | .                           |
| 2167.5             | 190.                | 2573.333                | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 2167.5             | 190.                | 2700.                   | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 2167.5             | 190.                | 2871.25                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |

## Appendix D-7: Spurious Analysis Part 2 – Top Channel

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### Input Spurious, Select LO, Tune Input, Input Filter

#### System Input/Output Parameters

---

|                               |        |     |
|-------------------------------|--------|-----|
| Output Frequency = Difference |        |     |
| Input Start Frequency         | 997.5  | MHz |
| Input Stop Frequency          | 3002.5 | MHz |
| LO Frequency Selected         | 1977.5 | MHz |
| Maximum Spur Table Level      | 65     | dB  |

#### Input Butterworth BPF with Fixed Bandwidth

---

|                            |        |     |
|----------------------------|--------|-----|
| Number of Sections         | 7      |     |
| Filter Center Frequency    | 2142.5 | MHz |
| Filter Bandwidth Frequency | 60     | MHz |
| Filter Corner Attenuation  | 0.1    | dB  |
| Filter Maximum Attenuation | 110    | dB  |

#### Spurious Data

---

| Input Freq.<br>MHz | Output Freq.<br>MHz | Input Spur Freq.<br>MHz | Output Spur Level<br>(dB) | Mixer Spur<br>MxSPUR | Mixer Spur<br>NxLO | Mixer Table Atten.<br>(dB) | Input Filter Atten.<br>(dB) |
|--------------------|---------------------|-------------------------|---------------------------|----------------------|--------------------|----------------------------|-----------------------------|
| 2307.5             | 330.                | 1153.75                 | 263.                      | 2                    | -1                 | 43                         | 110.                        |
| 2307.5             | 330.                | 1647.5                  | 110.                      | -1                   | 1                  | 0                          | 110.                        |
| 2307.5             | 330.                | 1812.5                  | 269.                      | -2                   | 2                  | 49                         | 110.                        |
| 2307.5             | 330.                | 1867.5                  | 377.                      | -3                   | 3                  | 47                         | 110.                        |
| 2307.5             | 330.                | 2087.5                  | 111.1                     | 3                    | -3                 | 47                         | 21.4                        |
| 2307.5             | 330.                | 2142.5                  | 49.                       | 2                    | -2                 | 49                         | 0                           |
| 2307.5             | 330.                | 2307.5                  | 85.1                      | 1                    | -1                 | 0                          | 85.1                        |
| 2307.5             | 330.                | 2526.667                | 394.                      | -3                   | 4                  | 64                         | 110.                        |
| 2307.5             | 330.                | 2746.667                | 394.                      | 3                    | -4                 | 64                         | 110.                        |
| 2307.5             | 330.                | 2801.25                 | 261.                      | -2                   | 3                  | 41                         | 110.                        |