

#### Figure 6-56 Spurious Emissions 2110.7MHz TX2\_64QAM 1.4MHz Band Edge (ACP 15kHz -550kHz)

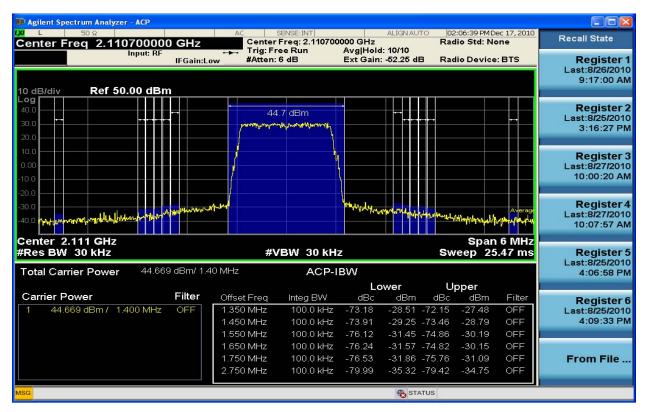


Figure 6-57 Spurious Emissions 2110.7MHz TX2\_64QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)

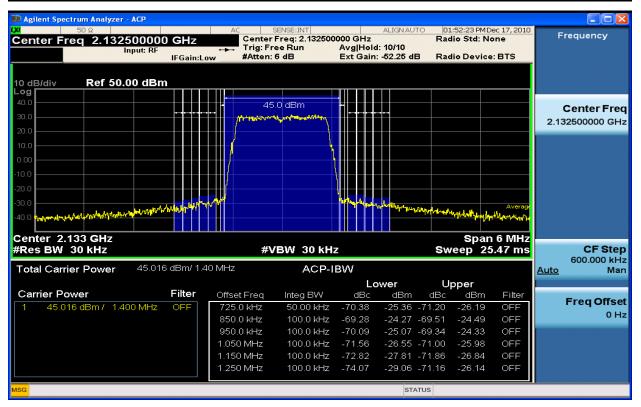


Figure 6-58 Spurious Emissions 2132.5MHz TX1\_QPSK 1.4MHz Band Edge (ACP 15kHz – 550kHz)

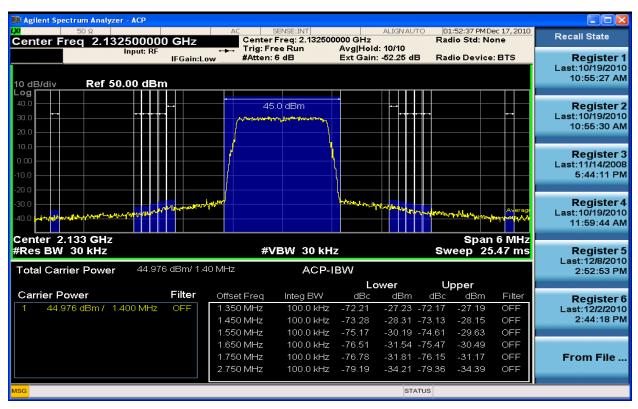


Figure 6-59 Spurious Emissions 2132.5MHz TX1\_QPSK 1.4MHz Band Edge (ACP 650kHz – 2MHz)

| Agilent Spectrum Analyzer - ACP  |                      |   |  | 10   |   |  |   |      |                                   |
|--|----------------------|---|--|--|---|--|---|------|-----------------------------------|
| Center Freq 2.13250000   | 0 GHz<br>IFGain:Lov  | Center<br>Trig: Fr  |  | Avg Hold   | ALIGNAUTO<br>1: 10/10<br>: -52.25 dB  | 01:50:29 PMI<br>Radio Std: N<br>Radio Devic  | one   | F    | requency                          |
| 10 dB/div Ref 50.00 dBn  | n                    |   |  |  |   |  |   |      |                                   |
| 40.0<br>30.0<br>20.0   |                      | -   | .8 dBm   | •  |   |  |   |      | <b>Center Freq</b><br>2500000 GHz |
| 10.0<br>0.00<br>-10.0<br>-20.0   |                      |   |  |  |   |  |   |      |                                   |
|  |                      | 11. <b>P</b>  |  |  |   |  |   |      |                                   |
| -30.0<br>-40.0 Markaharana makawakarana ang  |                      |   |  | HI HIN YONGH   |   |  | Average   |      |                                   |
| -40.0 when when when when when we want when when when when when when when when   | rend and a grad of f | #V  | /BW 30 kH2   | r fillen for the second |   |  | 1 6 MHz   |      |                                   |
| 40.0 whole who are a second and | 4 dBm/ 1.40          |   | /BW 30 kH;<br>ACP-I  | BW   |   | Spar<br>Sweep 2  | 1 6 MHz   | Auto | 600.000 kHz                       |
| 40.0 who   |                      | ) MHz   | ACP-I  | BW<br>Lo   | ower  | Spar<br>Sweep 2:<br>Upper  | 6 MHz<br>5.47 ms  |      | CF Step<br>600.000 kHz<br>Man     |
| .40.0 Implementation   Center 2.133 GHz   #Res BW 30 kHz   Total Carrier Power 44.79   | 4 dBm/ 1.40          |   |  | BW   | ower  | Spar<br>Sweep 2:<br>Upper<br>IBc dBm   | 1 6 MHz   |      | 600.000 kHz<br>Man<br>Freq Offset |
| 40.0   Implementation and the second secon   | 4 dBm/ 1.40          | ) MHz<br>Offset Freq  | ACP-I  | BW<br>Lo<br>dBc  | wer<br>dBm c  | Spar<br>Sweep 2:<br>Upper<br>IBc dBm<br>.16 -25.37   | n 6 MHz<br>5.47 ms                                      |      | 600.000 kHz<br>Man<br>Freq Offset |
| 40.0   Implementation and the second secon   | 4 dBm/ 1.40          | 0 MHz<br>Offset Freq<br>725.0 kHz   | ACP-I<br>Integ BW<br>50.00 kHz   | BW<br>La<br>dBc<br>-70.08  | dBm c<br>-25.28 -70   | Spar<br>Sweep 2:<br>Upper<br>IBc dBm<br>.16 -25.37<br>.05 -23.26   | 6 MHz<br>5.47 ms<br>Filter<br>OFF                       |      | 600.000 kHz<br>Man<br>Freq Offset |
| Center 2.133 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.79<br>Carrier Power   | 4 dBm/ 1.40          | 0 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz<br>1.050 MHz              | ACP-I<br>Integ BW<br>50.00 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz              | BW<br>Lo<br>dBc<br>-70.08<br>-68.99  | dBm c<br>-25.28 -70<br>-24.20 -68   | Spar<br>Sweep 2:<br>Upper<br>IBc dBm<br>.16 -25.37<br>.05 -23.26<br>.57 -24.77<br>.16 -25.36               | Filter<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF               |      | 600.000 kHz<br>Man<br>Freq Offset |
| 40.0   Implementation and the second secon   | 4 dBm/ 1.40          | 0 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz<br>1.050 MHz<br>1.150 MHz | ACP-I<br>Integ BW<br>50.00 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz | BW Lc<br>dBc<br>-70.08<br>-68.99<br>-69.87<br>-70.73<br>-71.24   | dBm c<br>-25.28 -70<br>-24.20 -68<br>-25.07 -69<br>-25.94 -70<br>-26.44 -70 | Spar<br>Sweep 2:<br>Upper<br>IBc dBm<br>.16 -25.37<br>.05 -23.26<br>.57 -24.77<br>.16 -25.36<br>.85 -26.05 | Filter<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF |      | 600.000 kHz<br>Man<br>Freq Offset |
| Center 2.133 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.79<br>Carrier Power   | 4 dBm/ 1.40          | 0 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz<br>1.050 MHz              | ACP-I<br>Integ BW<br>50.00 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz              | BW Lo<br>dBc<br>-70.08<br>-68.99<br>-69.87<br>-70.73   | dBm c<br>-25.28 -70<br>-24.20 -68<br>-25.07 -69<br>-25.94 -70               | Spar<br>Sweep 2:<br>Upper<br>IBc dBm<br>.16 -25.37<br>.05 -23.26<br>.57 -24.77<br>.16 -25.36<br>.85 -26.05 | Filter<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF               |      | 600.000 kHz                       |

#### Figure 6-60 Spurious Emissions 2132.5MHz TX2\_QPSK 1.4MHz Band Edge (ACP 15kHz – 550kHz)

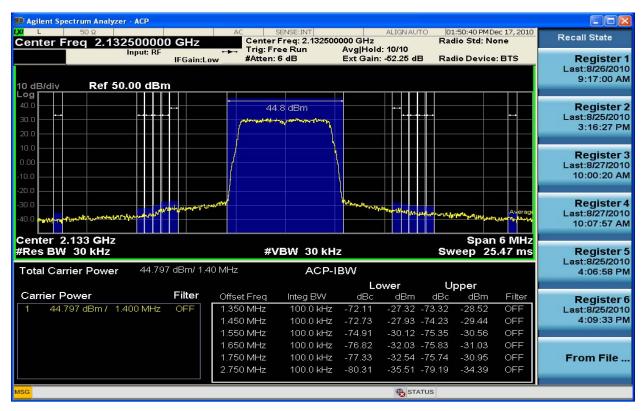


Figure 6-61 Spurious Emissions 2132.5MHz TX2\_QPSK 1.4MHz Band Edge (ACP 650kHz – 2MHz)

| Magilent Spectrum Analyzer - ACP   |   |  |   |   |   |                                    |      |                                   |
|--|---|--|---|---|---|------------------------------------|------|-----------------------------------|
| 50 Ω       Center Freq     2.132500000 GHz       Input: RF     IFGain:L  | Center  |  |   | Ra<br>10/10   | 1:47:23 PMD<br>dio Std: No<br>dio Device  | one                                | Fi   | requency                          |
| 10 dB/div Ref 50.00 dBm  |   |  |   |   |   |                                    |      |                                   |
| 40.0<br>30.0<br>20.0   |   | i.0 dBm<br>Mayler and the second                                       | •   | •   |   |                                    |      | <b>Center Freq</b><br>2500000 GHz |
| 10.0<br>0.00<br>-10.0<br>-20.0<br>-30.0  |   |  | 7000 00 00  |   |   |                                    |      |                                   |
| -30.0  |   |  |   | and a second and and  | whenly help here  |                                    |      |                                   |
| -40.0 http://www.angle.com/angle/ang | ¥\<br>#\  | /BW 30 kHz   |   | Sv  |   | 6 MHz                              |      | CF Step                           |
| Center 2.133 GHz   |   | /BW 30 kHz<br>ACP-IE   |   | Sv  | Span<br>veep 25   | i.47 ms                            | Auto | CF Step<br>600.000 kHz<br>Man     |
| Center 2.133 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 45.017 dBm/ 1.4  | 40 MHz  | ACP-IE   | 3W<br>Low   | ver L   | Span<br>veep 25<br>Jpper  | .47 ms                             | Auto | 600.000 kHz                       |
| Center 2.133 GHz<br>#Res BW 30 kHz   |   |  | <b>BW</b><br>Low<br>dBc<br>-71.11                           | Sv  | Span<br>veep 25<br>Jpper<br>dBm<br>-25.53   | i.47 ms                            |      | 600.000 kHz                       |
| Center 2.133 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 45.017 dBm/ 1.4<br>Carrier Power Filter  | 40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz<br>1.050 MHz | ACP-IE<br>Integ BW<br>50.00 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz | <b>BW</b><br>dBc<br>-71.11<br>-70.36<br>-70.86<br>-71.84    | <b>Per L</b><br>dBm dBc<br>26.09 -70.55<br>25.34 -69.48<br>-25.84 -70.48<br>-26.82 -71.21 | Span<br>veep 25<br>Jpper<br>dBm<br>-25.53<br>-24.46<br>-25.46<br>-25.46<br>-26.19 | Filter<br>OFF<br>OFF<br>OFF<br>OFF |      | 600.000 kHz<br>Man<br>Freq Offset |
| Center 2.133 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 45.017 dBm/ 1.4<br>Carrier Power Filter  | 40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz              | ACP-IE<br>Integ BW<br>50.00 kHz<br>100.0 kHz<br>100.0 kHz<br>100.0 kHz | 3W<br>dBc<br>-71.11<br>-70.36<br>-70.86<br>-71.84<br>-71.99 | <b>rer L</b><br>dBm dBc<br>26.09 -70.55<br>-25.34 -69.48<br>-25.84 -70.48                 | Span<br>veep 25<br>Jpper<br>dBm<br>-25.53<br>-24.46<br>-25.46                     | Filter<br>OFF<br>OFF<br>OFF        |      | 600.000 kHz<br>Man<br>Freq Offset |

Figure 6-62 Spurious Emissions 2132.5MHz TX1\_16QAM 1.4MHz Band Edge (ACP 15kHz – 550kHz)

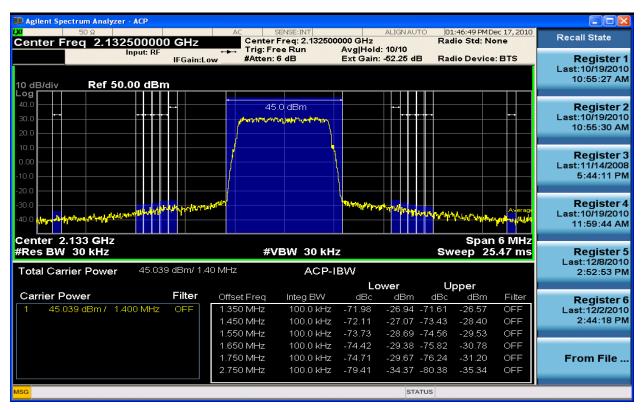


Figure 6-63 Spurious Emissions 2132.5MHz TX1\_16QAM 1.4MHz Band Edge (ACP 650kHz – 2MHz)

| 💷 Agilent Spectrum Analyzer - ACP  |            |                             | 48                    |                        |                              |                  |  |
|------------------------------------|------------|-----------------------------|-----------------------|------------------------|------------------------------|------------------|--|
| Center Freg 2.132500000 GH         | AC Center  | SENSE:INT<br>Freq: 2.132500 | 000 GHz               |                        | 01:45:20 PMD<br>adio Std: No |                  | Recall State                                       |
| Input: RF<br>IFGa                  |            | ree Run                     | Avg Hold<br>Ext Gain: |                        | adio Device                  | BTS              | <b>Register 1</b><br>Last:8/26/2010<br>9:17:00 AM  |
| 10 dB/div Ref 50.00 dBm            |            |                             |                       |                        |                              |                  |  |
| 40.0<br>30.0<br>20.0               |            | 4.8 dBm                     | -                     |                        |                              |                  | <b>Register 2</b><br>Last:8/25/2010<br>3:16:27 PM  |
| 10.0                               |            |                             |                       |                        |                              |                  | <b>Register 3</b><br>Last:8/27/2010<br>10:00:20 AM |
| -20.0<br>-30.0<br>-40.0            |            |                             | wond on a             | H. A. Martin March and |                              |                  | <b>Register 4</b><br>Last:8/27/2010<br>10:07:57 AM |
| Center 2.133 GHz<br>#Res BW 30 kHz | #\         | VBW 30 kH;                  | Z                     | s                      | Span<br>weep 25              | 6 MHz<br>6.47 ms | Register 5<br>Last:8/25/2010                       |
| Total Carrier Power 44.768 dBm     | ' 1.40 MHz | ACP-I                       | BW                    |                        |                              |                  | 4:06:58 PM   |
| -                                  |            |                             |                       |                        | Upper                        |                  |  |
| Carrier Power Filte                | enserred   | Integ BW<br>50.00 kHz       | dBc<br>-69.76         | dBm dB                 |                              | Filter           | Register 6   |
| 1 44.768 dBm 7 1.400 MHZ OFF       | 850.0 kHz  | 50.00 kHz<br>100.0 kHz      | -69.76<br>-68.51      | -23.74 -68.50          |                              | OFF              | Last:8/25/2010<br>4:09:33 PM                       |
|                                    | 950.0 kHz  | 100.0 kHz                   | -69.92                | -25.14 -08.50          |                              | OFF              | 4.03.0011  |
|                                    | 1.050 MHz  | 100.0 kHz                   | -69.33                | -24.56 -69.9           |                              | OFF              |  |
|                                    | 1.150 MHz  | 100.0 kHz                   | -69.97                | -25.20 -70.6           |                              | OFF              | From File  |
|                                    | 1.250 MHz  | 100.0 kHz                   | -70.47                | -25.70 -71.0           | 7 -26.30                     | OFF              |  |
| MSG                                |            |                             |                       | STATUS                 |                              |                  |  |

#### Figure 6-64 Spurious Emissions 2132.5MHz TX2\_16QAM 1.4MHz Band Edge (ACP 15kHz - 550kHz)

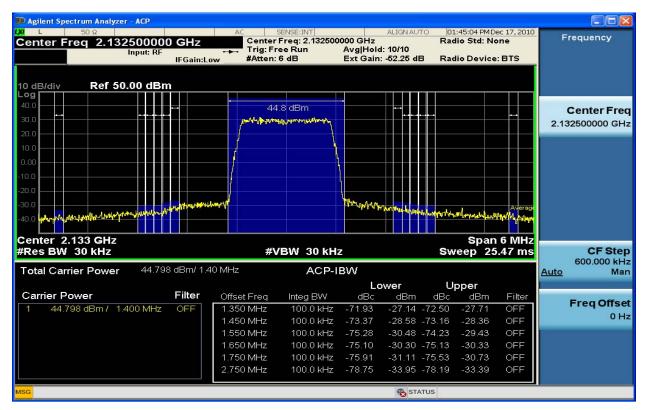
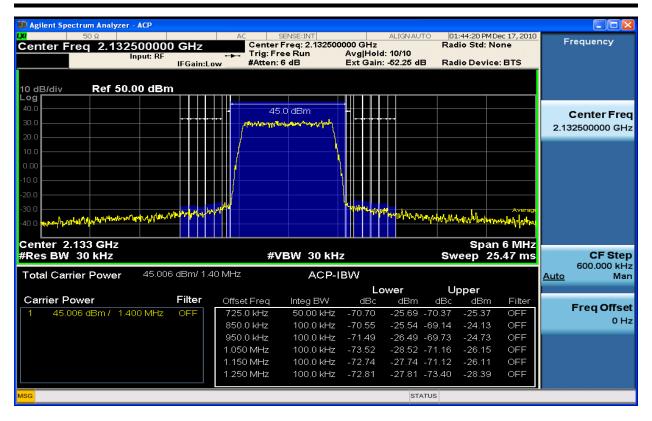


Figure 6-65 Spurious Emissions 2132.5MHz TX2\_16QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)



#### Figure 6-66 Spurious Emissions 2132.5MHz TX1\_64QAM 1.4MHz Band Edge (ACP 15kHz – 550kHz)

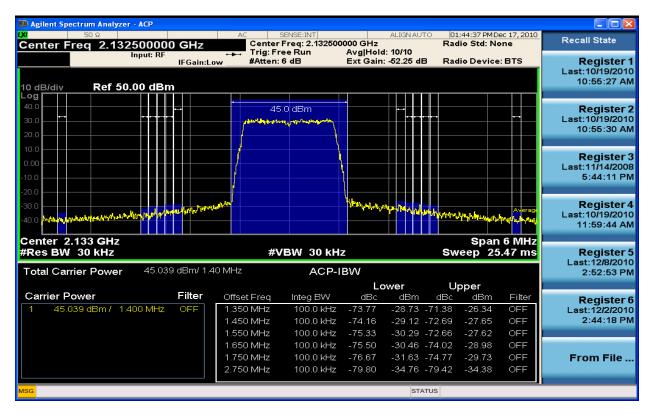
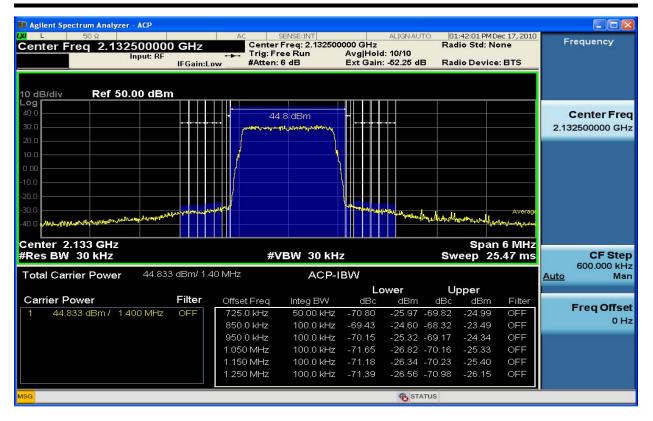


Figure 6-67 Spurious Emissions 2132.5MHz TX1\_64QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)



#### Figure 6-68 Spurious Emissions 2132.5MHz TX2\_64QAM 1.4MHz Band Edge (ACP 15kHz – 550kHz)



Figure 6-69 Spurious Emissions 2132.5MHz TX2\_64QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)

| 💴 Agilent Spectrum Analyzer - ACP             |                   |                          |                             |   |                     |                              |                  |   |
|---|-------------------|--------------------------|-----------------------------|---|---------------------|------------------------------|------------------|---|
| <mark>₩</mark> 50 Ω<br>Center Freg 2.15430000 | 0 GHz             |                          | SENSE:INT<br>Freg: 2.154300 | 000 GHz                                 |                     | 02:35:20 PMD<br>adio Std: No |                  | Recall State  |
| Input: RF                                     | IFGain:Lo         | Trig: Fr<br>w #Atten:    |                             | Avg Hold<br>Ext Gain:                   |                     | adio Device                  | : BTS            | <b>Register 1</b><br>Last:10/19/2010<br>10:55:27 AM |
| 10 dB/div Ref 50.00 dB                        | m                 |                          |                             |   |                     |                              |                  | 10:55:27 AM   |
| 40.0<br>30.0<br>20.0                          |                   |                          | .0 dBm<br>Mynthethetheth    |   | •••                 |                              |                  | <b>Register 2</b><br>Last:10/19/2010<br>10:55:30 AM |
| 10.0<br>0.00<br>-10.0<br>-20.0                |                   |                          |                             |   |                     |                              |                  | <b>Register 3</b><br>Last:11/14/2008<br>5:44:11 PM  |
| -30.0   | and the advertise |                          |                             | V-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1 | hay on the second   |                              |                  | <b>Register 4</b><br>Last:10/19/2010<br>11:59:44 AM |
| Center 2.154 GHz<br>#Res BW 30 kHz            |                   | #\                       | /BW 30 kH;                  | Z                                       | s                   | Span<br>weep 25              | 6 MHz<br>5.47 ms | Register 5<br>Last:12/8/2010                        |
| Total Carrier Power 45.04                     | 18 dBm/ 1.4       | 0 MHz                    | ACP-I                       | BW                                      |                     |                              |                  | 2:52:53 PM  |
|   | Filter            |                          |                             |   |                     | Upper                        |                  |   |
| Carrier Power<br>1 45.048 dBm / 1.400 MHz     |                   | Offset Freq<br>725.0 kHz | Integ BW<br>50.00 kHz       | dBc<br>-69.81                           | dBmdB<br>24.7771.92 |                              | Filter<br>OFF    | Register 6<br>Last:12/2/2010                        |
| 1 43.048 dBitti 1.400 MiHz                    |                   | 850.0 kHz                | 100.0 kHz                   | -69.24                                  | -24.19 -69.22       |                              | OFF              | 2:44:18 PM  |
|   |                   | 950.0 kHz                | 100.0 kHz                   | -71.11                                  | -26.06 -69.94       |                              | OFF              |   |
|   |                   | 1.050 MHz                | 100.0 kHz                   | -71.45                                  | -26.41 -71.64       |                              | OFF              |   |
|   |                   | 1.150 MHz                | 100.0 kHz                   | -73.42                                  | -28.37 -72.15       | 5 -27.10                     | OFF              | From File   |
|   |                   | 1.250 MHz                | 100.0 kHz                   | -73.44                                  | -28.39 -72.47       | 7 -27.42                     | OFF              |   |
|   |                   |                          |                             |   |                     |                              |                  |   |

#### Figure 6-70 Spurious Emissions 2154.3MHz TX1\_QPSK 1.4MHz Band Edge (ACP 15kHz - 550KHz)

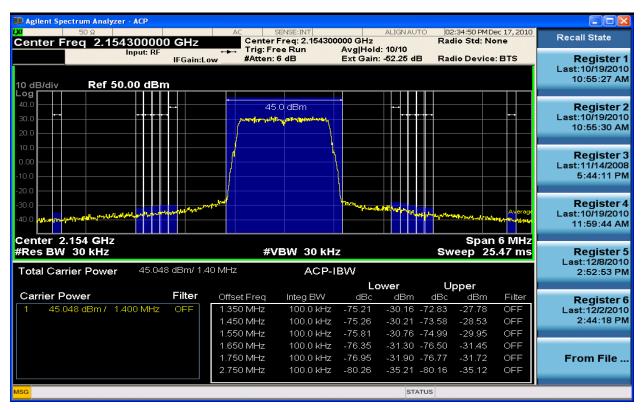


Figure 6-71 Spurious Emissions 2154.3MHz TX1\_QPSK 1.4MHz Band Edge (ACP 650kHz – 2MHz)

| 💶 Agilent Spectrum Analyzer - ACP   |  |                             |                      |                          |                               |                         |  |
|---|--|-----------------------------|----------------------|--------------------------|-------------------------------|-------------------------|--|
| Center Freg 2.154300000 GHz   | Center   | SENSE:INT<br>Freq: 2.154300 |                      | ALIGN AUTO               | 02:33:16 PMD<br>Radio Std: No |                         | Recall State                                       |
| Input: RF<br>IFGain:<br>10 dB/div Ref 50.00 dBm   |  | ee Run<br>6 dB              | Avg Hold<br>Ext Gain | l: 10/10<br>: -52.25 dB  | Radio Device                  | : BTS                   | <b>Register 1</b><br>Last:8/26/2010<br>9:17:00 AM  |
| 40.0<br>30.0<br>20.0  |  | .7 dBm                      | *                    |                          |                               |                         | <b>Register 2</b><br>Last:8/25/2010<br>3:16:27 PM  |
| 10.0  |  |                             |                      |                          |                               |                         | <b>Register 3</b><br>Last:8/27/2010<br>10:00:20 AM |
| -20.0<br>-30.0<br>-40.0 Waltschutgelachunghtlandlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunghtlachunght | yn freder de fan de |                             | 1-maniputa           | and many and a           | APP                           | Average<br>Mul/Angerene | <b>Register 4</b><br>Last:8/27/2010<br>10:07:57 AM |
| Center 2.154 GHz<br>#Res BW 30 kHz  | -#1)   | /BW 30 kH                   | _                    |                          | Span<br>Sweep 25              | 6 MHz                   | Register 5   |
| Total Carrier Power 44.729 dBm/ 1   |  | ACP-I                       |                      |                          | Sweep 20                      | .47 1115                | Last:8/25/2010<br>4:06:58 PM                       |
|   |  |                             |                      | ower                     | Upper                         |                         |  |
| Carrier Power Filter  | Offset Freq  | Integ BW                    | dBc                  |                          | Bc dBm                        | Filter                  | Register 6   |
| 1 44.729 dBm / 1.400 MHz OFF  | 725.0 kHz  | 50.00 kHz                   | -69.03               | -24.30 -69               |                               | OFF                     | Last:8/25/2010<br>4:09:33 PM                       |
|   | 850.0 kHz<br>950.0 kHz   | 100.0 kHz<br>100.0 kHz      | -67.80<br>-68.71     | -23.07 -68<br>-23.98 -69 |                               | OFF                     | 4.09:33 PN   |
|   | 950.0 KHZ<br>1.050 MHz   | 100.0 kHz<br>100.0 kHz      | -68.71<br>-69.78     | -23.98 -69               |                               | OFF                     |  |
|   | 1.150 MHz  | 100.0 kHz                   | -70.82               | -26.09 -71               |                               | OFF                     | From File  |
|   | 1.250 MHz  | 100.0 kHz                   | -71.20               | -26.47 -72               |                               | OFF                     |  |
| 150   |  |                             |                      | STATUS                   |                               |                         |  |

#### Figure 6-72 Spurious Emissions 2154.3MHz TX2\_QPSK 1.4MHz Band Edge (ACP 15kHz – 550KHz)

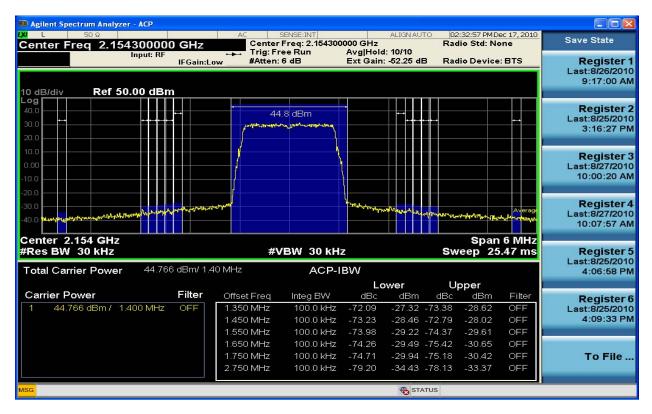


Figure 6-73 Spurious Emissions 2154.3MHz TX2\_QPSK 1.4MHz Band Edge (ACP 650kHz - 2MHz)

| Agilent Spectrum Analyzer - ACP  |   |   |  |  |  |   |
|--|---|---|--|--|--|---|
| 50 Ω<br>Center Freg 2.154300000 GHz  | Center  | SENSE:INT<br>Freq: 2.154300000 G  |  | O [02:32:41 PM<br>Radio Std:   | 1Dec 17, 2010<br>None  | Save State  |
| Input: RF<br>IFGain:   | Trig: Fr  |   | Hold: 10/10<br>Gain: -52.25 dB   | Radio Devi   | ce: BTS  | <b>Register 1</b><br>Last:10/19/2010  |
| 10 dB/div Ref 50.00 dBm  |   |   |  |  |  | 10:55:27 AN   |
| 20.0   |   | 5.0 dBm   | • • • • • • • • • • • • • • • • • • •  |  |  | <b>Register 2</b><br>Last:10/19/2010<br>10:55:30 AM   |
| 10.0   |   |   |  |  |  | <b>Register 3</b><br>Last:11/14/2008<br>5:44:11 PM  |
| 30.0   | an a                                    |   | When you and the second second   | human  | Average  | Register 4  |
| 40.0 with the way of the second of the secon |   |   |  |  | have been been   | Last:10/19/2010<br>11:59:44 AM  |
| 40.0 million 40.0 million 40 mill | #\  | /BW 30 kHz  |  |  | 4,4,4,4,4,4,4,4<br>an 6 MHz<br>25.47 ms                      | 11:59:44 AN<br>Register 5   |
| Center 2.154 GHz   |   | /BW 30 kHz<br>ACP-IBW   |  | Spa  |  | 11:59:44 AN   |
| Center 2.154 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1  | I.40 MHz  | ACP-IBW   | Lower  | Sweep 2  | 25.47 ms   | 11:59:44 AN<br>Register :<br>Last:12/8/2010   |
| Center 2.154 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1<br>Carrier Power Filter  | 0ffset Freq   | ACP-IBW   | Lower<br>IBc dBm   | Sweep 2<br>Sweep 2<br>Upper<br>dBc dBm   | 2 <b>5.47 ms</b>   | 11:59:44 AM<br>Register 5<br>Last:12/8/2010<br>2:52:53 PM<br>Register 6                           |
| Center 2.154 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1  | 0.40 MHz<br>Offset Freq<br>725.0 kHz  | ACP-IBW<br>Integ BW d<br>50.00 kHz -71.   | Lower<br>IBc dBm<br>23 -26.25 -  | Sweep 2<br>Sweep 2<br>Upper<br>dBc dBm<br>68.90 -23.92   | 2 <b>5.47 ms</b><br>n Filter<br>2 OFF                        | 11:59:44 Al<br>Register<br>Last:12/8/201<br>2:52:53 Pl<br>Register<br>Last:12/2/201               |
| Center 2.154 GHz<br>Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1<br>Carrier Power Filter   | 1.40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz                           | ACP-IBW<br>Integ BW d<br>50.00 kHz -71.<br>100.0 kHz -70.                                     | Lower<br>IBc dBm<br>23 -26.25 -<br>05 -25.07 -   | Spa<br>Sweep 2<br>Upper<br>dBc dBr<br>68.90 -23.92<br>68.36 -23.38   | 25.47 ms<br>Filter<br>OFF<br>OFF                             | 11:59:44 Al<br><b>Register</b><br>Last:12/8/201<br>2:52:53 Pl<br><b>Register</b><br>Last:12/2/201 |
| Center 2.154 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1<br>Carrier Power Filter  | 0.40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz              | ACP-IBW<br>Integ BW d<br>50.00 kHz -71.<br>100.0 kHz -70.<br>100.0 kHz -70.                   | Lower<br>Bc dBm<br>23 -26.25 -<br>05 -25.07 -<br>54 -25.56 -                               | Spa<br>Sweep 2<br>dBc dBm<br>68.36 -23.38<br>69.98 -25.00  | 2 <b>5.47 ms</b><br>Filter<br>OFF<br>OFF<br>OFF              | 11:59:44 Al<br><b>Register</b><br>Last:12/8/201<br>2:52:53 Pl<br><b>Register</b><br>Last:12/2/201 |
| Center 2.154 GHz<br>#Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1<br>Carrier Power Filter  | 1.40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz                           | ACP-IBW<br>Integ BW d<br>50.00 kHz -71.<br>100.0 kHz -70.                                     | Lower<br>Bc dBm<br>23 -26.25 -<br>05 -25.07 -<br>54 -25.56 -<br>92 -26.94 -                | Upper       dBc     dBm       68.90     -23.92       68.36     -23.38       69.98     -25.00       71.41     -26.43                          | 25.47 ms<br>Filter<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF        | 11:59:44 AI<br>Register<br>Last:12/8/201<br>2:52:53 PI<br>Register<br>Last:12/2/201<br>2:44:18 PI |
| Center 2.154 GHz<br>Res BW 30 kHz<br>Total Carrier Power 44.980 dBm/ 1<br>Carrier Power Filter   | 1.40 MHz<br>Offset Freq<br>725.0 kHz<br>850.0 kHz<br>950.0 kHz<br>1.050 MHz | ACP-IBW<br>Integ BW d<br>50.00 kHz -71.<br>100.0 kHz -70.<br>100.0 kHz -70.<br>100.0 kHz -71. | Lower<br>Bc dBm<br>23 -26.25 -<br>05 -25.07 -<br>54 -25.56 -<br>92 -26.94 -<br>02 -27.04 - | Upper       dBc     dBm       68.90     -23.92       68.36     -23.38       69.98     -25.00       .71.41     -26.43       .72.46     -27.48 | 25.47 ms<br>Filter<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF<br>OFF | 11:59:44 Al<br>Register<br>Last:12/8/201<br>2:52:53 Pt  |

#### Figure 6-74 Spurious Emissions 2154.3MHz TX1\_16QAM 1.4MHz Band Edge (ACP 15kHz - 550KHz)

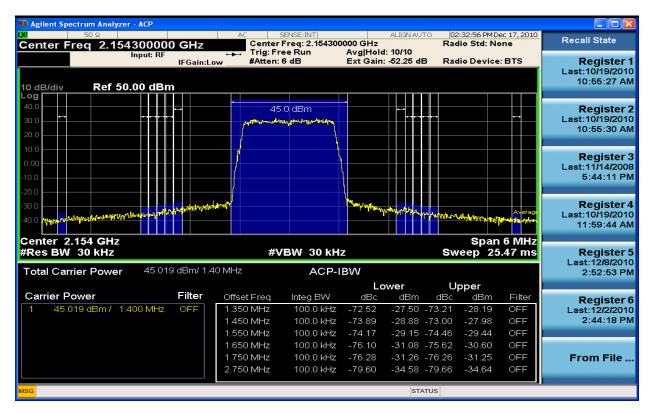
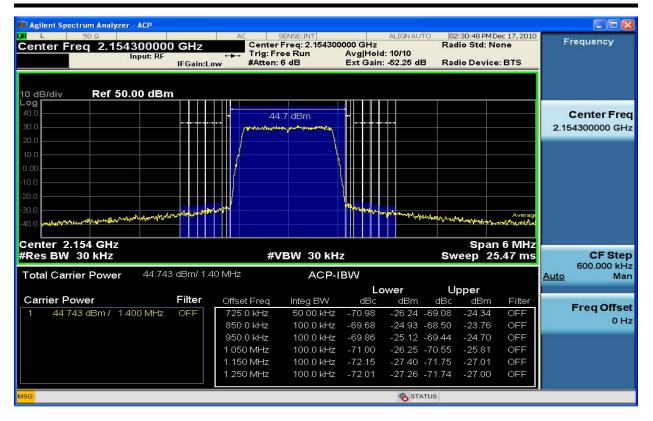


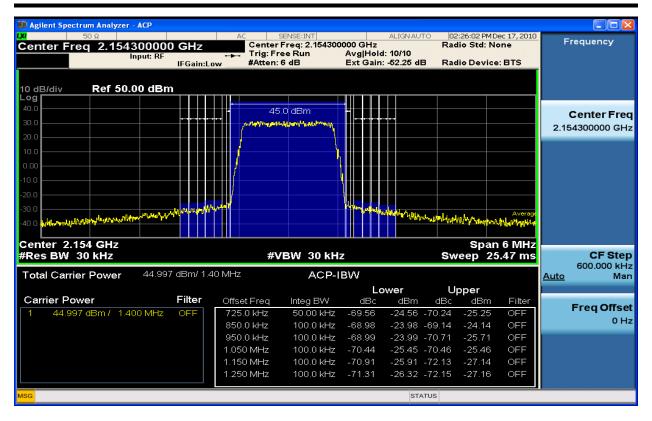
Figure 6-75 Spurious Emissions 2154.3MHz TX1\_16QAM 1.4MHz Band Edge (ACP 650KHz - 2MHz)



#### Figure 6-76 Spurious Emissions 2154.3MHz TX2\_16QAM 1.4MHz Band Edge (ACP 15kHz - 550KHz)



Figure 6-77 Spurious Emissions 2154.3MHz TX2\_16QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)



#### Figure 6-78 Spurious Emissions 2154.3MHz TX1\_64QAM 1.4MHz Band Edge (ACP 15kHz – 550KHz)

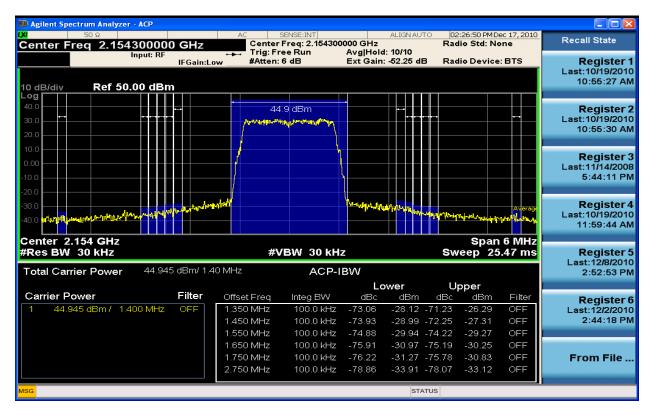


Figure 6-79 Spurious Emissions 2154.3MHz TX1\_64QAM 1.4MHz Band Edge (ACP 650kHz - 2MHz)

| Agilent Spectrum Analyzer - ACP<br>Conter Freq 2.154300000<br>Input: RF  | GHz<br>IFGain:Lov              | Center<br>Trig: Fr       |                        | Avg Hold  | Ra<br>I: 10/10 | 2:23:19 PMD<br>dio Std: No<br>dio Device | one                          | F    | requency                    |
|--|--------------------------------|--------------------------|------------------------|---|----------------|--|------------------------------|------|-----------------------------|
| 10 dB/div Ref 50.00 dBm<br>Log<br>40.0   |                                | 44                       | .7 dBm<br>vymetuwning  |   |                |  |                              |      | Center Freq<br>54300000 GHz |
| 20.0<br>20.0<br>10.0<br>-10.0<br>-20.0<br>-30.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0<br>-40.0 | ay, or her pairs of the second |                          |                        | 1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 |                |  | Average<br>Muddadda<br>6 MHz | 2.10 | 4500000 8112                |
| #Res BW 30 kHz   |                                | #∖                       | /BW 30 kH:             | z   | S              | veep 25                                  |                              |      | CF Step                     |
| Total Carrier Power 44.726   | dBm/ 1.40                      | MHz                      | ACP-I                  | BW  |                |  |                              | Auto | 600.000 kHz<br>Man          |
|  | Filter                         |                          |                        |   |                | pper                                     |                              |      |                             |
|  |                                | Offset Freq<br>725.0 kHz | Integ BW<br>50.00 kHz  | dBc<br>-71.03   | dBm dBc        | dBm<br>-25,96                            | Filter<br>OFF                |      | Freq Offset                 |
| 44.720 GBITT 1.400 MINZ  |                                | 725.0 kHz<br>850.0 kHz   | 50.00 kHz<br>100.0 kHz | -71.05  | -25.76 -70.37  | -25.96                                   | OFF                          |      | 0 Hz                        |
|  |                                | 950.0 kHz                | 100.0 kHz              | -71.55  | -26.82 -71.43  | -26.70                                   | OFF                          |      | -                           |
|  |                                | 1.050 MHz                | 100.0 kHz              | -70.79  | -26.06 -71.81  | -27.08                                   | OFF                          |      |                             |
|  |                                | 1.050 MHZ                | 100.0 Ki 12            |   |                |  |                              |      |                             |
|  |                                | 1.050 MHz<br>1.150 MHz   | 100.0 kHz              | -73.12  | -28.40 -71.96  | -27.24                                   | OFF                          |      |                             |
|  |                                |                          |                        |   |                |  | OFF<br>OFF                   |      |                             |

#### Figure 6-80 Spurious Emissions 2154.3MHz TX2\_64QAM 1.4MHz Band Edge (ACP 15kHz – 550KHz)

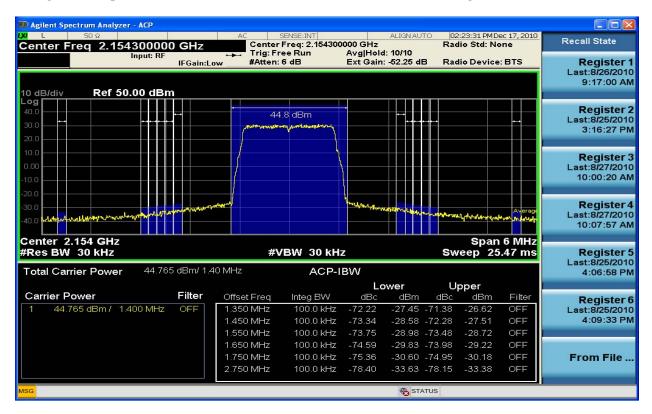
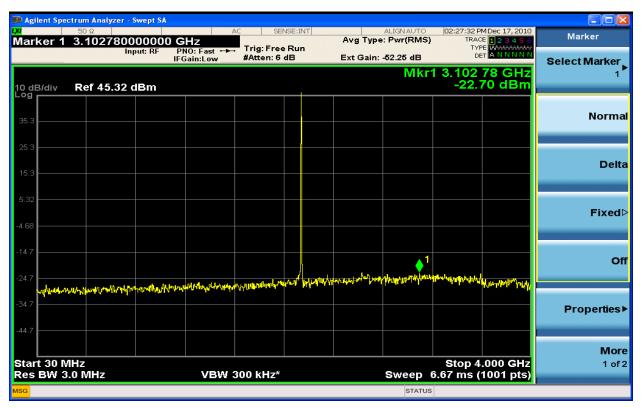


Figure 6-81 Spurious Emissions 2154.3MHz TX2\_64QAM 1.4MHz Band Edge (ACP 650kHz – 2MHz)

| Agilent Spectrum Analyzer - Swept So<br>So Ω<br>Marker 1 3.19012000000<br>Input: RF | AC SE<br>OGHZ<br>PN0: Fast ↔ Trig: Free   | e Run                      | ALIGN AUTO<br>J Type: Pwr(RMS)         | 02:09:50 PMDec 17, 2010<br>TRACE 123456<br>TYPE WWMMMM<br>DET A N N N N | Peak Search    |
|---|---|----------------------------|--|---|----------------|
| 0 dB/div Ref 45.32 dBm  | IFGain:Low #Atten: 6  | dB Ext                     | Gain: -52.25 dB<br>Mkr                 | 3.190 12 GHz<br>-23.10 dBm  | Next Peak      |
| <b>og</b><br>35.3   |   |                            |  |   | Next Pk Righ   |
| 15.3  |   |                            |  |   | Next Pk Lef    |
| 4.68  |   |                            |  |   | Marker Delt    |
| 24.7  |   | u al-tanotsioniten muttati | ······································ | 1   | Mkr→Cł         |
| 24.7<br>34.7<br>44.7  | hereed by ffer have be for the second sec |                            |  |   | Mkr→RefLv      |
| Start 30 MHz<br>Res BW 3.0 MHz  | VBW 300 kHz*  |                            | Sweep (                                | Stop 4.000 GHz<br>5.67 ms (1001 pts)                                    | More<br>1 of 2 |

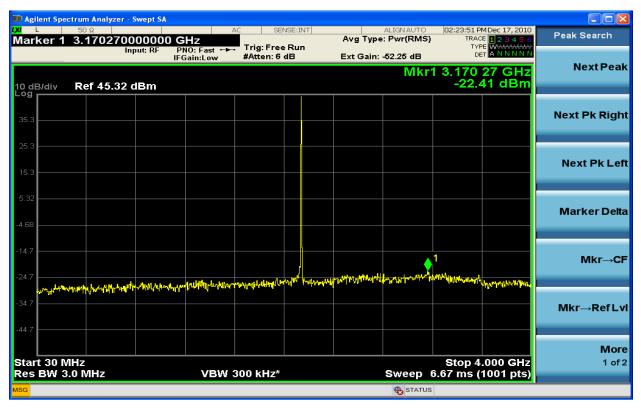
#### Figure 6-82 Spurious Emission TX1 64QAM 2110.7MHz - 1.4MHz (30MHz - 4GHz)



#### Figure 6-83 Spurious Emission TX1 64QAM 2154.3MHz – 1.4MHz (30MHz - 4GHz)

| larker 1             | <sup>50 Ω</sup><br>3.158360                                 | 000000                      | GHz A                                  |  | NSE:INT        | Avg Ty                   | ALIGN AUTO<br>pe: Pwr(RMS)   | 02:07:05 PMDec 17, 2010<br>TRACE 1 2 3 4 5 6         | Peak Search       |
|----------------------|---|-----------------------------|--|--|----------------|--------------------------|--|--|-------------------|
|                      |   | nput: RF                    | PNO: Fast ↔↔<br>FGain:Low              | Trig: Free<br>#Atten: 6                      |                | Ext Gaiı                 | n: -52.25 dB   |  |                   |
| 0 dB/div             | Ref 45.32   | dBm                         |  |  |                |                          | Mkr1   | 3.158 36 GHz<br>-22.54 dBm                           | Next Pea          |
| 35.3                 |   |                             |  |  |                |                          |  |  | Next Pk Righ      |
| 15.3                 |   |                             |  |  |                |                          |  |  | Next Pk Le        |
| .68                  |   |                             |  |  |                |                          |  |  | Marker Del        |
| 4.7                  |   |                             |  |  |                | all and the Merrik links | Prilipping, agentic the state of the state o | I  | Mkr→C             |
| 4.7                  | ĸ <mark>ĮŪdinų</mark> ė su <sub>d</sub> rintentininta. Subs | rulyd <sup>a</sup> ffwrwywy | hyrdisternyllyndfallyn <sup>a</sup> fr | uller an | dhad i Mix dat |                          |  | <sup>nan</sup> iharanti <mark>y</mark> anaku pinanak | Mkr→RefL          |
| tart 30 N<br>es BW 3 |   |                             | VBW 3                                  | 00 kHz*                                      |                |                          | Sweep 6  | Stop 4.000 GHz<br>5.67 ms (1001 pts)                 | <b>Mo</b><br>1 of |

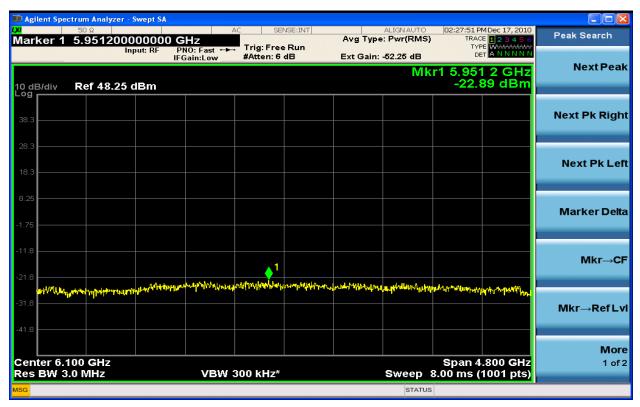
#### Figure 6-84 Spurious Emission TX2 64QAM 2110.7MHz - 1.4MHz (30MHz - 4GHz)



#### Figure 6-85 Spurious Emission TX2 64QAM 2154.3MHz – 1.4MHz (30MHz - 4GHz)

| 💴 Agilent Spec          | trum Analyzer               | - Swept SA                                       |                           |                             |                            |                                   |  |   |                                       |                |
|-------------------------|-----------------------------|--|---------------------------|-----------------------------|----------------------------|-----------------------------------|--|---|---------------------------------------|----------------|
| w<br>Marker 1           | <sup>50 Ω</sup><br>5.898400 | 000000   | GHz                       |                             | NSE:INT                    |                                   | ALIGNAUTO<br>Pwr(RMS)                  | TRAC  | MDec 17, 2010<br>E <b>1 2 3 4 5 6</b> | Peak Search    |
| 10 dB/div               | Ref 48.25                   |  | PNO: Fast ↔<br>IFGain:Low | Trig: Free<br>#Atten: 6     |                            | Ext Gain:                         |  | r1 5.898  | 3 4 GHz<br>12 dBm                     | Next Peak      |
| 38.3                    |                             |  |                           |                             |                            |                                   |  |   |                                       | Next Pk Right  |
| 28.3 ———<br>18.3 ———    |                             |  |                           |                             |                            |                                   |  |   |                                       | Next Pk Left   |
| 8.25<br>-1.75           |                             |  |                           |                             |                            |                                   |  |   |                                       | Marker Delta   |
| -11.8                   |                             |  |                           | 1                           | իներություն                | n-willowalder                     | - di sui                               |   |                                       | Mkr→CF         |
| -31.8                   | erenti estatores fines.     | And An and A | nervenneterretennetere    | er fran yn Jina ys fran y d | a tel evel der util differ | ŊŗſŧĬĹŊ <b>ĸſ</b> ġĸŀġĸĊĬŴĸŢŊŊŧĸĬ | ŊĸĿŊĸĿĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸ | ~~ <b>T</b> ¥ULVYBPIU <sub>B</sub> si <sub>VI</sub> | laptronuluilly                        | Mkr→RefLvl     |
| Center 6.1<br>Res BW 3. |                             |  | VBW 3                     | 300 kHz*                    |                            |                                   |  | 8.00 ms ('  | .800 GHz<br>1001 pts)                 | More<br>1 of 2 |
| MSG                     |                             |  |                           |                             |                            |                                   | STATUS                                 |   |                                       |                |

#### Figure 6-86 Spurious Emission TX1 64QAM 2110.7MHz - 1.4MHz (3.5GHz - 8.4GHz)



#### Figure 6-87 Spurious Emission TX1 64QAM 2154.3MHz – 1.4MHz (3.5GHz – 8.4GHz)

| 🗖 Agilent Spe                | ctrum Analyzer -    | Swept SA   |  |                         |   |                         |                               |   |             |              |
|------------------------------|---------------------|--|--|-------------------------|---|-------------------------|-------------------------------|---|-------------|--------------|
| Marker 1                     | 50 Ω<br>6.359200    | 000000 0   | GHz  |                         | NSE:INT                                       | Avg Typ                 | ALIGN AUTO<br>e: Pwr(RMS)     | 02:07:24 PM Dec 1<br>TRACE 1 2  | 2456        | Peak Search  |
|                              | lı                  |  | PNO: Fast ↔<br>Gain:Low                          | Trig: Free<br>#Atten: 6 |   | Ext Gain                | : -52.25 dB                   |   | NNNN        |              |
| I0 dB/div                    | Ref 48.25           | dBm  |  |                         |   |                         | Mkı                           | 1 6.359 2 0<br>-23.10 c   | GHz<br>iBm  | NextPea      |
| - <b>og</b><br>38.3          |                     |  |  |                         |   |                         |                               |   |             | Next Pk Righ |
| 28.3 <b></b><br>18.3 <b></b> |                     |  |  |                         |   |                         |                               |   |             | Next Pk Le   |
| 8.25                         |                     |  |  |                         |   |                         |                               |   |             | Marker Delt  |
| 21.8                         |                     |  |  |                         | <b>↓</b> 1                                    |                         |                               |   |             | Mkr→C        |
| 31.8                         | *tylorap~17thynape& | the production of the producti | ~IP/~IP <sup>erterl®®®</sup> ¥I <sup>®</sup> +++ | whener phase            | ĸſĦŀſ <sup>ĸĸIJ</sup> ĬŶŀŶĹ <mark>Ŀŀ</mark> Ĺ | ered hered and a strang | poponted in resolution of the | un and a second s | *********   | Mkr→RefL     |
| center 6.1<br>Res BW 3       |                     |  | VBW 3  | 800 kHz*                |   |                         | Sweep 8                       | Span 4.800<br>.00 ms (1001  | GHz<br>pts) | Mor<br>1 of  |
| SG                           |                     |  |  |                         |   |                         | 🗞 STATUS                      |   |             |              |

#### Figure 6-88 Spurious Emission TX2 64QAM 2110.7MHz - 1.4MHz (3.5GHz - 8.4GHz)



#### Figure 6-89 Spurious Emission TX2 64QAM 2154.3MHz – 1.4MHz (3.5GHz – 8.4GHz)

|                          | ent Spec          |                               | zer - Swept S  | ٨  |                           |                          |   |                       |                        |  |                |
|--------------------------|-------------------|-------------------------------|--|--|---------------------------|--------------------------|---|-----------------------|------------------------|--|----------------|
| <mark>.x/</mark><br>Mark | ker 1             | <sup>50 ຊ</sup>               | 0000000  | 00 GHz   |                           | NSE:INT                  | Avg Type                                | ALIGNAUTO<br>Pwr(RMS) | TRAC                   | MDec 17, 2010<br>E 1 2 3 4 5 6<br>E WWWWWW | Peak Search    |
| 10 dE                    | 3/div             | Ref 48.                       | Input: RF  | PNO: Fast ++<br>IFGain:Low   | . Trig: Free<br>#Atten: 6 |                          | Ext Gain:                               |                       | cr1 15.6               | 88 GHz<br>01 dBm                           | Next Peak      |
| Log<br>38.3              |                   |                               |  |  |                           |                          |   |                       |                        |  | Next Pk Right  |
| 28.3<br>18.3             |                   |                               |  |  |                           |                          |   |                       |                        |  | Next Pk Left   |
| 8.25                     |                   |                               |  |  |                           |                          |   |                       |                        |  | Marker Delta   |
| -11.8                    |                   |                               |  |  |                           |                          |   |                       |                        | 1  | Mkr→CF         |
| -31.8                    | Mar Mar and Andre | prvtilær, <sub>Vala</sub> vhe | and the second | natur of the stand | ener-an-eneralad          | alleyfre, TAUCEA Indevin | ana ang ang ang ang ang ang ang ang ang | and and and and and   | er ( Jung and a second |  | Mkr→RefLvl     |
| -41.8<br>Stari<br>Res    | t 8.000<br>BW 3.  | GHz<br>0 MHz                  |  | VBW  | 300 kHz*                  |                          |   | Sweep 1               | Stop 16<br>16.0 ms (   | .000 GHz<br>1001 pts)                      | More<br>1 of 2 |
| MSG                      |                   |                               |  |  |                           |                          |   | STATUS                |                        |  |                |

#### Figure 6-90 Spurious Emission TX1 64QAM 2110.7MHz - 1.4MHz (8GHz- 16GHz)



Figure 6-91 Spurious Emission TX1 64QAM 2154.3MHz – 1.4MHz (8GHz- 16GHz)

| 💴 Agilent Spectrum A               | nalyzer - Swept SA                  |                                   |  |                 |                              |                       |                             |                |
|------------------------------------|-------------------------------------|-----------------------------------|--|-----------------|------------------------------|-----------------------|-----------------------------|----------------|
| ۵۵ <mark>س</mark><br>Marker 1 15.0 | 9600000000                          |                                   | SENSE:IN   |                 | ALIGNAUTO                    | 02:10:53 PMD<br>TRACE | 23456                       | Peak Search    |
|                                    | Input: RF                           | PNO: Fast +++                     | Frig: Free Run<br>(Atten: 6 dB   |                 | in: -52.25 dB                | TYPE 6                | N <del>MMMMM</del><br>NNNNN |                |
|                                    |                                     | IFGam.Low .                       |  | Entou           |                              | (r1 15.09             | 6 GHZ                       | Next Peak      |
| 10 dB/div Ref                      | 48.25 dBm                           |                                   |  |                 |                              | -21.55                | dBm                         |                |
|                                    |                                     |                                   |  |                 |                              |                       |                             |                |
| 38.3                               |                                     |                                   |  |                 |                              |                       |                             | Next Pk Right  |
| 30.3                               |                                     |                                   |  |                 |                              |                       |                             | _              |
| 28.3                               |                                     |                                   |  |                 |                              |                       |                             |                |
|                                    |                                     |                                   |  |                 |                              |                       |                             | Next Pk Left   |
| 18.3                               |                                     |                                   |  |                 |                              |                       |                             |                |
|                                    |                                     |                                   |  |                 |                              |                       |                             |                |
| 8.25                               |                                     |                                   |  |                 |                              |                       |                             | Marker Delta   |
| -1.75                              |                                     |                                   |  |                 |                              |                       |                             | warker Della   |
| 1.10                               |                                     |                                   |  |                 |                              |                       |                             |                |
| -11.8                              |                                     |                                   |  |                 |                              |                       |                             |                |
|                                    |                                     |                                   |  |                 |                              | <u>↓</u> 1            |                             | Mkr→CF         |
| -21.8                              |                                     |                                   |  | Internationstan | theory of the same the party | Aberber Martington    | No. March March March       |                |
|                                    | whether a state of the second state | mind you lass of the shall be and | - The second s | week a second   |                              |                       |                             |                |
| -31.8                              |                                     |                                   |  |                 |                              |                       |                             | Mkr→RefLvl     |
| -41.8                              |                                     |                                   |  |                 |                              |                       |                             |                |
|                                    |                                     |                                   |  |                 |                              |                       |                             |                |
| Start 8.000 GH                     | 2                                   |                                   |  |                 |                              | Stop 16.00            |                             | More<br>1 of 2 |
| Res BW 3.0 MF                      |                                     | <b>VBW</b> 30                     | 0 kHz*   |                 | Sweep 1                      | 16.0 ms (10           | 01 pts)                     | 1012           |
| MSG                                |                                     |                                   |  |                 | STATUS                       |                       |                             |                |

#### Figure 6-92 Spurious Emission TX2 64QAM 2110.7MHz - 1.4MHz (8GHz- 16GHz)



Figure 6-93 Spurious Emission TX2 64QAM 2154.3MHz – 1.4MHz (8GHz- 16GHz)

| 💴 Agilent Spect           | trum Analyzer - Swept SA         |  |                              |                         |  |                |
|---------------------------|----------------------------------|--|------------------------------|-------------------------|--|----------------|
|                           | <sup>50 Ω</sup><br>26.5000000000 |  |                              | ALIGNAUTO               | 02:11:21 PMDec 17, 2010<br>TRACE 1 2 3 4 5 6 | Peak Search    |
|                           | 20.5000000000<br>Input: RF       | PNO: Fast +++ Trig: Free<br>IFGain:Low #Atten: 6 | e Run                        | in: -52.25 dB           |  |                |
| 10 dB/div                 | Ref 48.25 dBm                    |  |                              | Mk                      | r1 26.500 GHz<br>-16.27 dBm                  | Next Peak      |
| 38.3                      |                                  |  |                              |                         |  | Next Pk Right  |
| 28.3<br>18.3              |                                  |  |                              |                         |  | Next Pk Left   |
| 8.25                      |                                  |  |                              |                         |  | Marker Delta   |
| -11.8                     | entre castlessestrations         |  | phanet and the second second | atte and and the second | Winerel Wager way of the Winer               | Mkr→CF         |
| -31.8                     |                                  |  |                              |                         |  | Mkr→RefLvl     |
| Start 15.50<br>Res BW 3.0 |                                  | VBW 300 kHz*                                     |                              | Sweep 2                 | Stop 26.500 GHz<br>?7.5 ms (1001 pts)        | More<br>1 of 2 |
| MSG                       |                                  |  |                              | STATUS                  |  |                |

#### Figure 6-94 Spurious Emission TX1 64QAM 2110.7MHz - 1.4MHz (15.5GHz - 26.5GHz)



Figure 6-95 Spurious Emission TX1 64QAM 2154.3MHz – 1.4MHz (15.5GHz – 26.5GHz)

|                              | ctrum Analyzer - S<br>50 ົດ<br>26.137000  |               | GHz                     |                         | NSE:INT  | Avg Typ      | ALIGN AUTO           | 02:11:39 PM D<br>TRACE    | 23456             | Peak Search  |
|------------------------------|---|---------------|-------------------------|-------------------------|--|--------------|----------------------|---------------------------|-------------------|--------------|
| 10 dB/div                    |   | out: RF PI    | NO: Fast ↔↔<br>Gain:Low | Trig: Free<br>#Atten: 6 |  | Ext Gain     | :-52.25 dB<br>Mk     | r1 26.13<br>-16.15        | 7 GHz<br>dBm      | Next Peal    |
| 38.3                         |   |               |                         |                         |  |              |                      |                           |                   | Next Pk Righ |
| 28.3 <b></b><br>18.3 <b></b> |   |               |                         |                         |  |              |                      |                           |                   | Next Pk Le   |
| 8.25                         |   |               |                         |                         |  |              |                      |                           |                   | Marker Delt  |
| 11.8                         | an and a start of the start of | Walayananalah | halld your total and    |                         | / the work has the state of the | - Managering | Lite Vary Bootstorry | best garages and a second | 1-<br>*********   | Mkr→C        |
| 31.8 <b></b>                 |   |               |                         |                         |  |              |                      |                           |                   | Mkr→RefL     |
| Start 15.5<br>Res BW 3       |   |               | VBW 3                   | 300 kHz*                |  |              | Sweep 2              | Stop 26.5<br>27.5 ms (10  | 00 GHz<br>01 pts) | Mor<br>1 of  |
| sg                           |   |               |                         |                         |  |              | STATUS               |                           |                   |              |

#### Figure 6-96 Spurious Emission TX2 64QAM 2110.7MHz - 1.4MHz (15.5GHz – 26.5GHz)



Figure 6-97 Spurious Emission TX2 64QAM 2154.3MHz – 1.4MHz (15.5GHz – 26.5GHz)

# 6.4 Field Strength of Spurious Radiation

## Clause 27.53(h)

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log 10$  (P) dB.

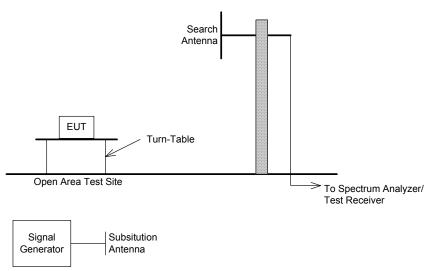
(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(i) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

## **Test Setup:**



# Figure 6-98 RRU Field Strength Set Up / Configuration

# **Test Procedure**

- The EUT was placed on a turntable inside the AFC (configured as in normal operation). The system and its cables were separated from the ground plane by an insulating support 10 mm in height. The system was grounded in accordance with its installation specifications. No additional grounding connections were connected.
- For tests between **30 MHz and 1 GHz** the receive antenna (bi-log/horn) was placed at 10 m away from the EUT. An initial scan was done to find emissions (frequencies) requiring detailed measurement. The pre-scan was done by rotating the system 360 degrees while recording all emissions (frequency and amplitude). This procedure was repeated for antenna heights of 1 to 4 m, and for horizontal and vertical polarizations of the receiving antenna. The detector mode was quasi-peak (QP) with a 120 kHz bandwidth unless otherwise noted.
- For tests between **1 GHz and 10 GHz** the receive antenna (bi-log/horn) was placed at 10 m away from the EUT. An initial scan was done to find emissions (frequencies) requiring detailed measurement. The pre-scan was done by rotating the system 360 degrees while recording all emissions (frequency and amplitude). This procedure was repeated for antenna heights of 1 to 4 m, and for horizontal and vertical polarizations of the receiving antenna. The detector mode was average (AVG) with a 1 MHz bandwidth unless otherwise noted.
- For tests between **10 GHz to 18 GHz** the receive horn antenna was placed at a 3 m distance from the EUT. An initial scan was done to find emissions (frequencies) requiring detail measurement. The pre-scan was done by rotating the system 360 degrees while recording all emissions (frequency and amplitude). This procedure was repeated for antenna heights of 1 to 4 m, and for horizontal and vertical polarizations of the receiving antenna. These measurements were made with an average detector mode (AVG) with a 1 MHz bandwidth unless otherwise noted.
- For **all the above frequency ranges** optimization was done based on the pre-scan data. For each identified frequency, the EUT was rotated in azimuth over 360 degrees and the direction of maximum emission was noted. Antenna height was then varied from 1 to 4 m at this azimuth to obtain maximum emissions. The procedure was repeated for both horizontal and vertical polarizations (where applicable) of the search antenna. The maximum level measured was recorded. The spectrum analyzer was verified to make sure it was not saturating in the presence of the radio signal.
- The highest emissions were re-evaluated using the substitution method. This is accomplished by replacing the EUT by a calibrated antenna, cable and signal generator. This equipment is used to transmit a signal that will generate a RF meter reading level identical to the one were done with a bandwidth of 1 MHz.

## **Calculation of the Compliance Margin**

The following example illustrates the manner in which the emissions levels are calculated in the "RE Test Results" Table 6-5 Spurious Emissions ERP.

The rows in these tables are defined as follows.

| Meter Reading (dBuV) =   | Voltage measured using the spectrum analyzer with quasi-peak adapter   |
|--------------------------|--|
| Gain/Loss Factor (dB) =  | Cumulative gain or loss of pre-amplifier and cables used in the measurement path (a negative value indicates gain)                             |
| Transducer Factor (dB) = | Antenna factor   |
| Level (dBuV/m) =         | Corrected value or field strength, that is, the parameter of interest that is compared to the limit  |
| Margin (dB) =            | Level with respect to the appropriate limit (a positive Margin indicates that the Level is below the limit and that the measurement is a PASS) |

The values in the Level row are calculated as follows:

Level = Meter Reading + Gain/Loss Factor + Transducer Factor

The values in the Margin row are calculated as follows: Margin = Limit – Level

The following example shows the manner in which the compliance margin is calculated for ERP: ERP = Effective radiated power or equivalent radiated power

## ERP = Signal generator level – Cable losses + Antenna gain – Half wave dipole gain Margin = Limit – ERP

Limit = EUT Rated Power – Attenuation Attenuation = (43 + 10 Log (Pwr)) Limit = 10 log (30Watt) – (43+ 10 Log(30W)) Limit = - 13 dBm

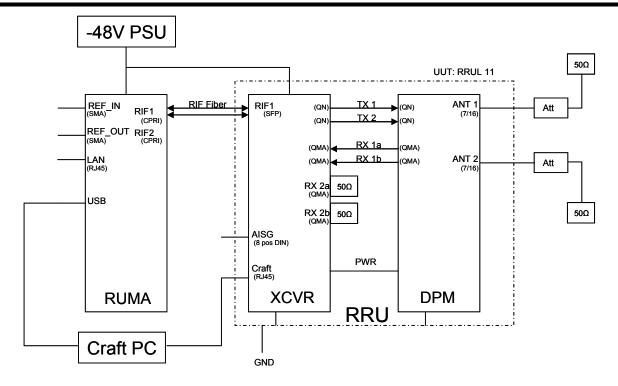


Figure 6-99 RRU EMC Set Up / Configuration

FCC 2.1053: Measurements required: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of FCC 2.1049, as appropriate.

## FCC 2.1057: Frequency spectrum to be investigated.

In all of the measurements set forth in 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

# 27.55 Power Strength Limits.

(a) *Field strength limits:* For the following bands, the predicted or measured median field strength at any location on the geographical border of a licensee's service area shall not exceed the value specified unless the adjacent affected service area licensee(s) agree(s) to a different field strength. This value applies to both the initially offered service areas and to partitioned service areas.

(1) 2110–2155, 2305–2320 and 2345–2360 MHz bands: 47 dBV/m.

EMC Reference Report: K0001795-TR-RAD-01-01, December 2010

Flextronics Design Validation Centre, 21 Richardson Side Road, Kanata On, K2K 2C1, Canada Accreditation: SCC ISO/IEC 17025

Table 6-5Spurious Emissions ERP

| Frequency<br>(MHz)                           | Field<br>Strength<br>(dBuV) | Signal<br>Substitution<br>(dBm) | Cable<br>Loss<br>(dB) | Antenna<br>Gain<br>(dBi) | dBi to dBd<br>Conversion | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |  |
|--|-----------------------------|---------------------------------|-----------------------|--------------------------|--------------------------|--------------|----------------|----------------|--|
| 4264.798                                     | 51.62                       | -44.20                          | 7.89                  | 10.67                    | 2.15                     | -44.6        | -13.0          | 30.6           |  |
| Remarks: All other spurious have more margin |                             |                                 |                       |                          |                          |              |                |                |  |

All emissions in the radiated emission scan were low compared to the FCC Part 15 limits. The worst case spurious emissions were verified using substitution method as tabulated above.



Figure 6-100 Radiated Emissions Set Up Photo

# 6.5 Submission Exhibits – Permissive Change

# 2.1033 Submission Exhibits

- FCC Form 731
- Test Report