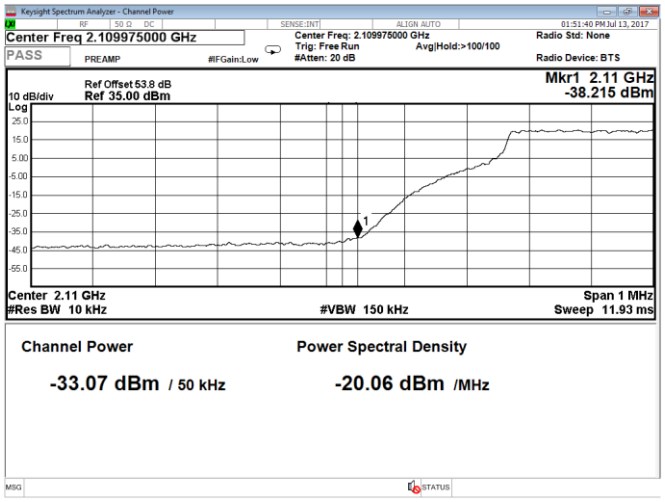



***Figure 8.2-41:*** *Conducted band edge emission at 2110 MHz, Port A, LTE, 5 MHz channel, QPSK (RBW = 1% of EBW)*

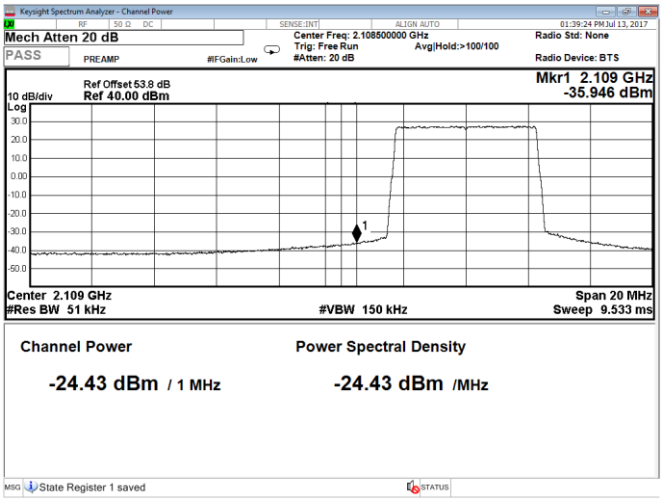



***Figure 8.2-42:*** *Conducted band edge emission at 2109 MHz, Port A, LTE, 5 MHz channel, QPSK (RBW = 1 MHz)*

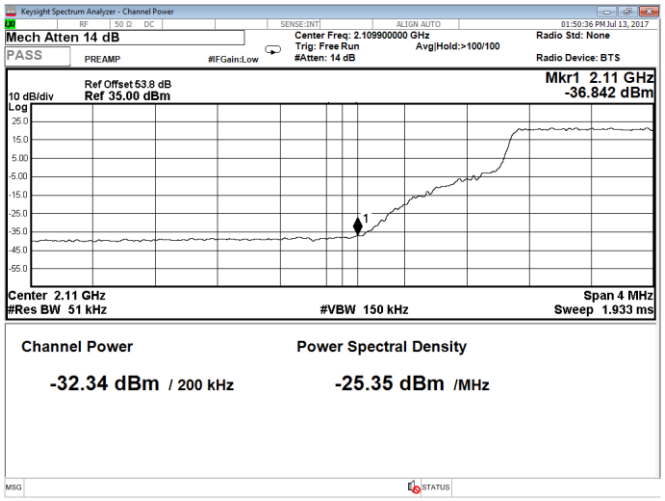



***Figure 8.2-43:*** *Conducted band edge emission at 2110 MHz, Port A, LTE, 20 MHz channel, QPSK (RBW = 1% of EBW)*

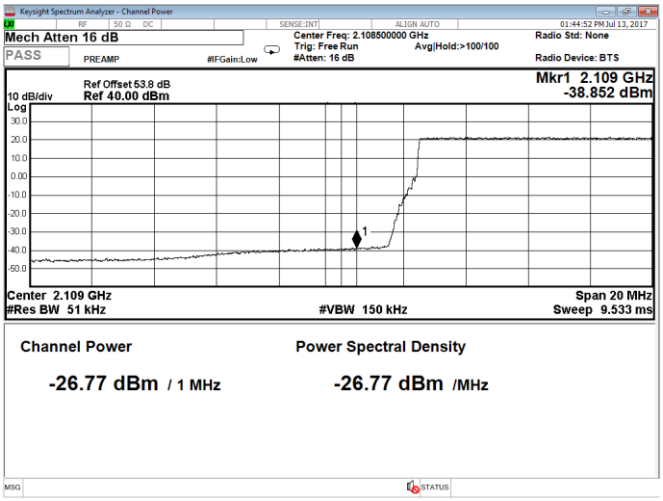



***Figure 8.2-44:*** *Conducted band edge emission at 2109 MHz, Port A, LTE, 20 MHz channel, QPSK (RBW = 1 MHz)*

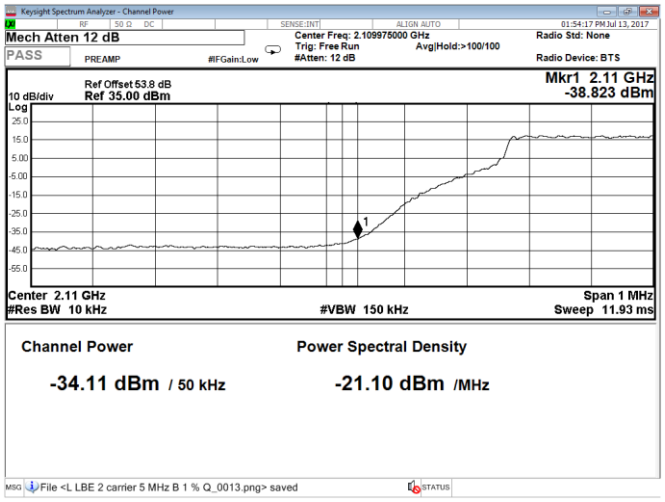



***Figure 8.2-45:*** *Conducted band edge emission at 2110 MHz, Port A, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

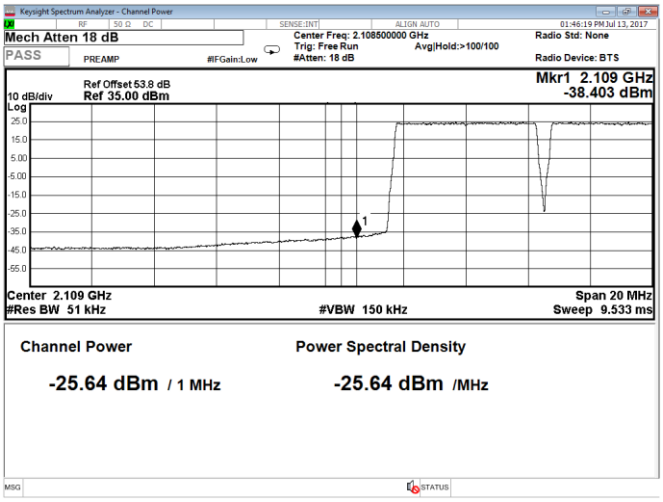



***Figure 8.2-46:*** *Conducted band edge emission at 2109 MHz, Port A, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

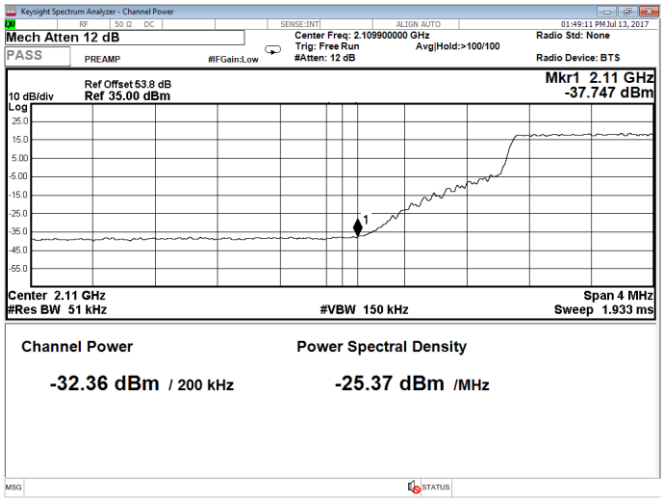



***Figure 8.2-47:*** *Conducted band edge emission at 2110 MHz, Port A, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

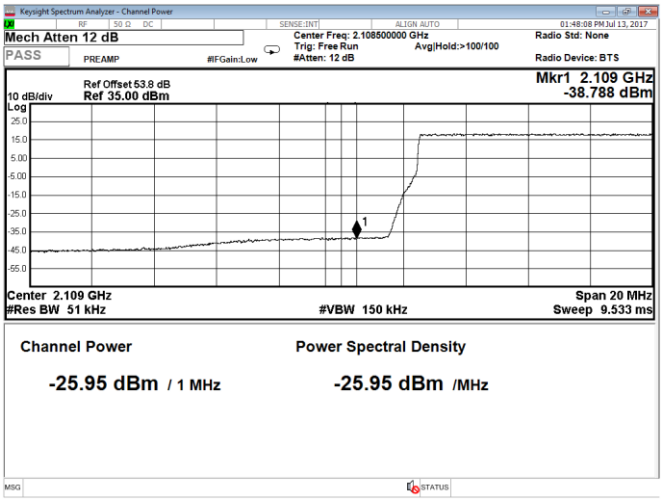



***Figure 8.2-48:*** *Conducted band edge emission at 2109 MHz, Port A, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

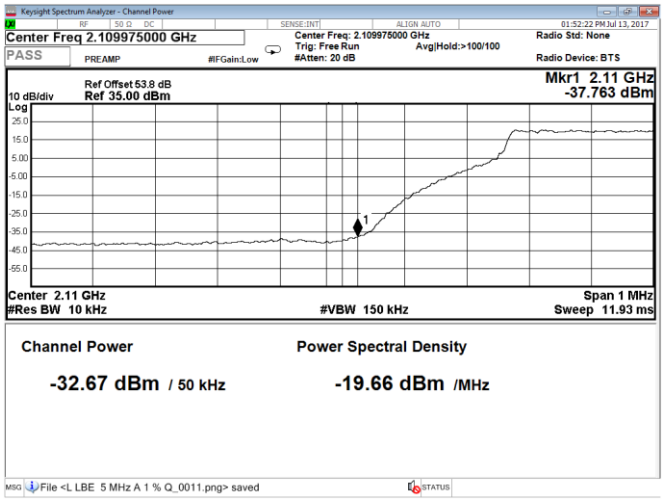



***Figure 8.2-49:*** *Conducted band edge emission at 2110 MHz, Port B, LTE, 5 MHz channel, QPSK (RBW = 1% of EBW)*

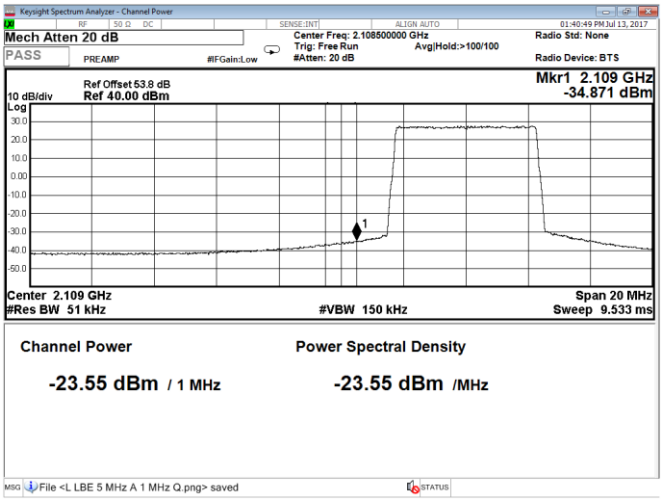



***Figure 8.2-50:*** *Conducted band edge emission at 2109 MHz, Port B, LTE, 5 MHz channel, QPSK (RBW = 1 MHz)*

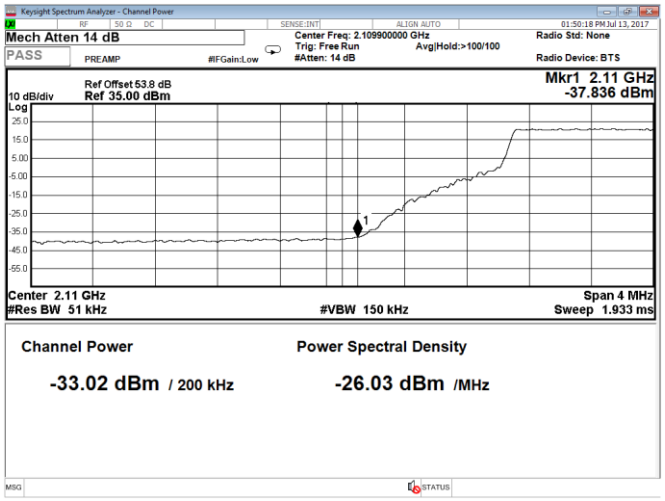



***Figure 8.2-51:*** *Conducted band edge emission at 2110 MHz, Port B, LTE, 20 MHz channel, QPSK (RBW = 1% of EBW)*

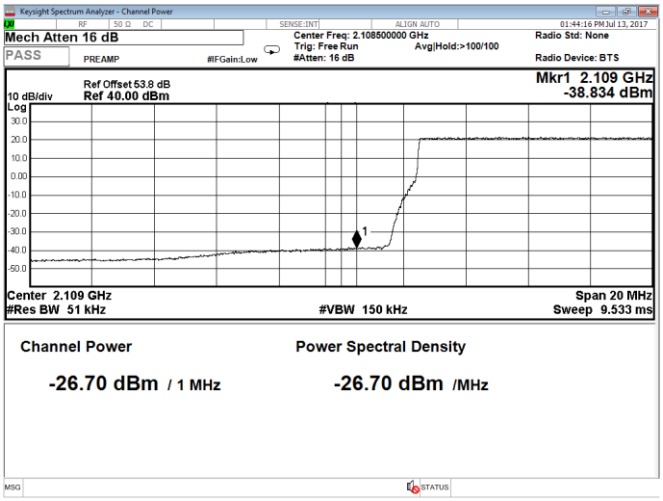



***Figure 8.2-52:*** *Conducted band edge emission at 2109 MHz, Port B, LTE, 20 MHz channel, QPSK (RBW = 1 MHz)*

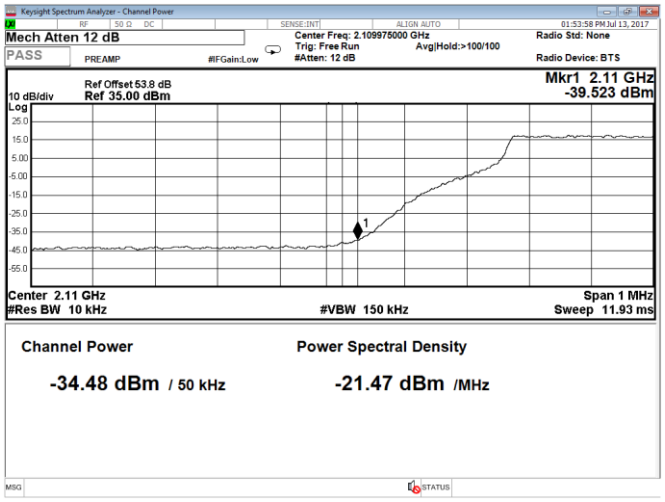



***Figure 8.2-53:*** *Conducted band edge emission at 2110 MHz, Port B, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

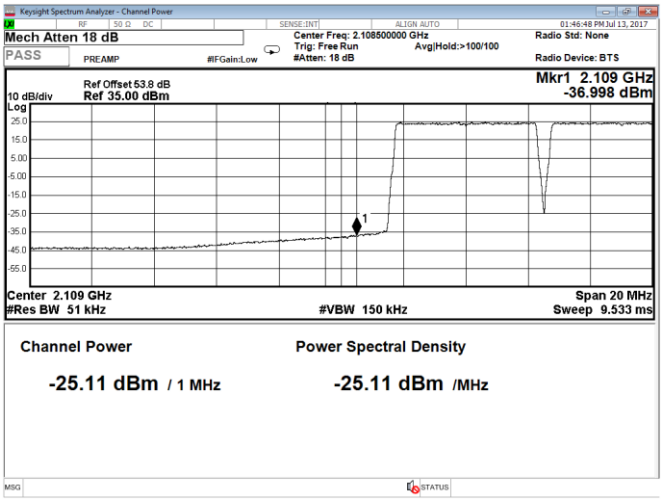



***Figure 8.2-54:*** *Conducted band edge emission at 2109 MHz, Port B, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

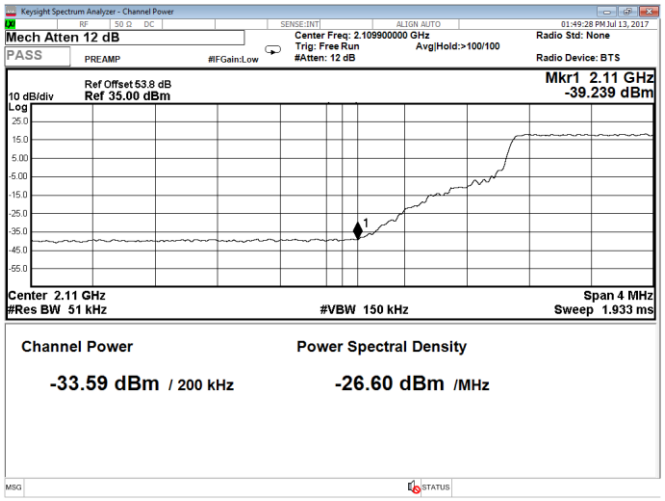



***Figure 8.2-55:*** *Conducted band edge emission at 2110 MHz, Port B, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

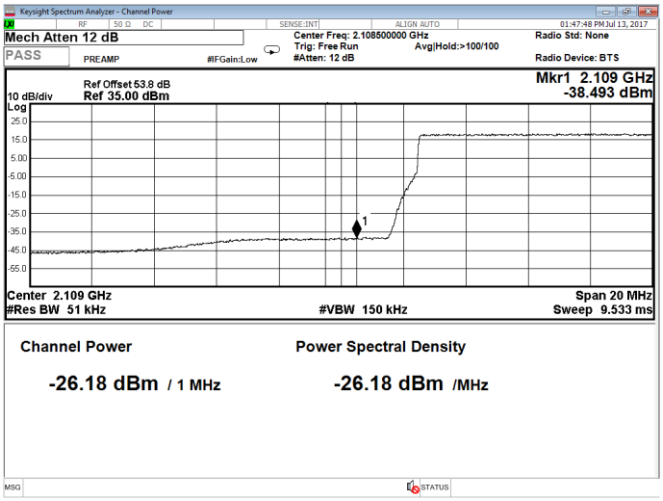



***Figure 8.2-56:*** *Conducted band edge emission at 2109 MHz, Port B, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

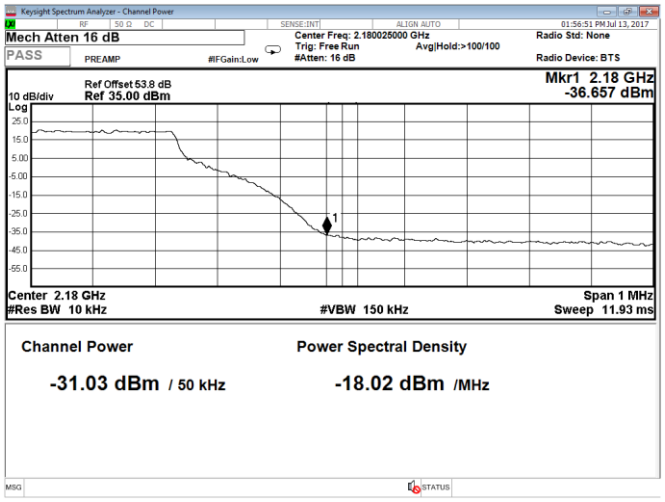



***Figure 8.2-57:*** *Conducted band edge emission at 2180 MHz, Port A, LTE, 5 MHz channel, QPSK (RBW = 1% of EBW)*

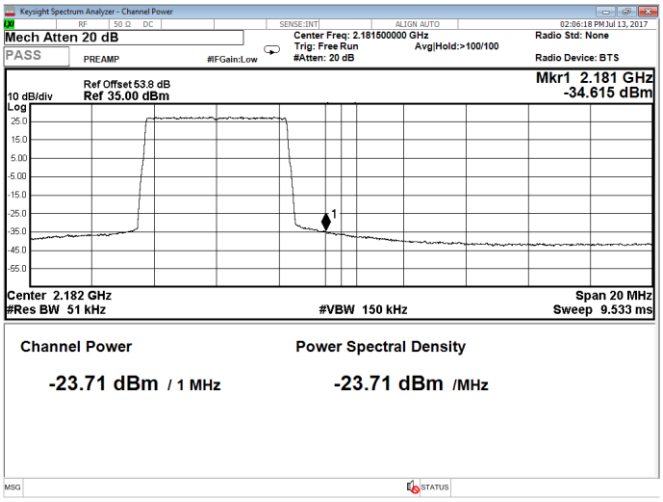



***Figure 8.2-58:*** *Conducted band edge emission at 2181 MHz, Port A, LTE, 5 MHz channel, QPSK (RBW = 1 MHz)*

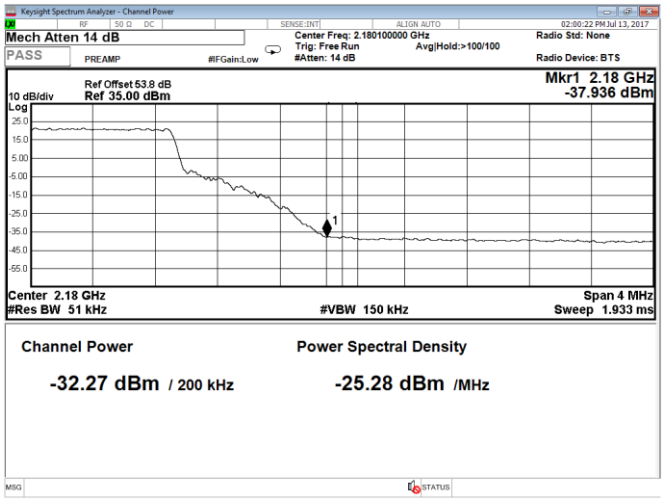



***Figure 8.2-59:*** *Conducted band edge emission at 2180 MHz, Port A, LTE, 20 MHz channel, QPSK (RBW = 1% of EBW)*

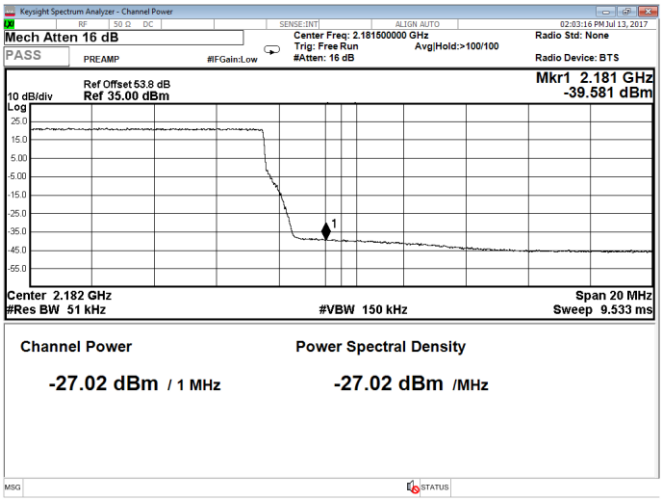



***Figure 8.2-60:*** *Conducted band edge emission at 2181 MHz, Port A, LTE, 20 MHz channel, QPSK (RBW = 1 MHz)*

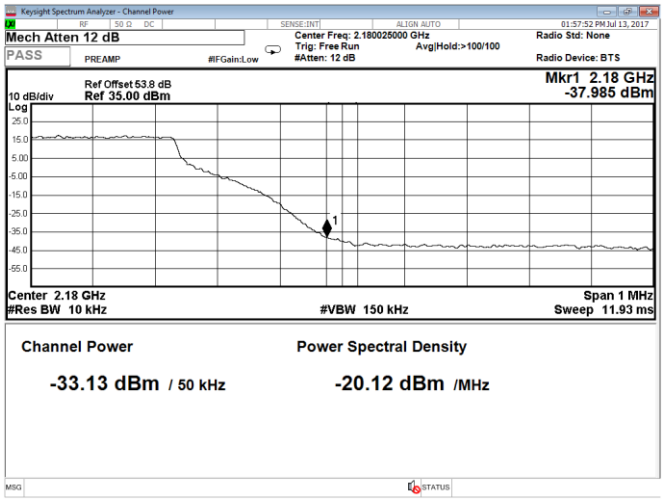



***Figure 8.2-61:*** *Conducted band edge emission at 2180 MHz, Port A, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

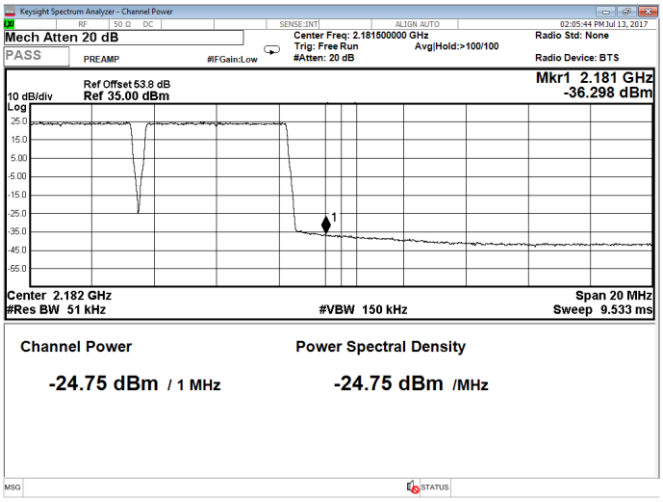



***Figure 8.2-62:*** *Conducted band edge emission at 2181 MHz, Port A, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

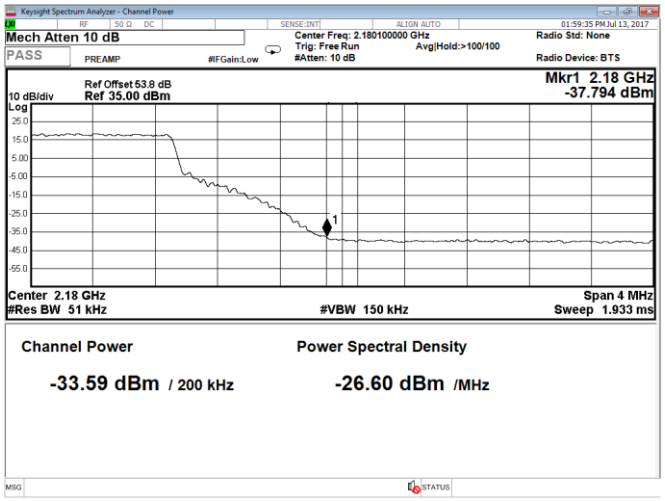



***Figure 8.2-63:*** *Conducted band edge emission at 2180 MHz, Port A, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

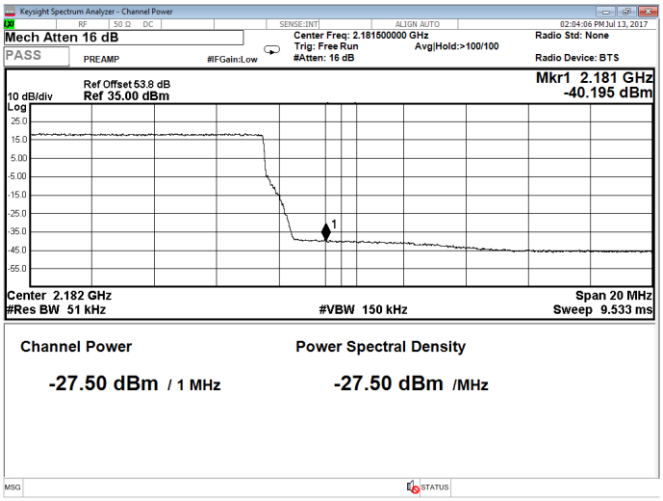



***Figure 8.2-64:*** *Conducted band edge emission at 2181 MHz, Port A, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

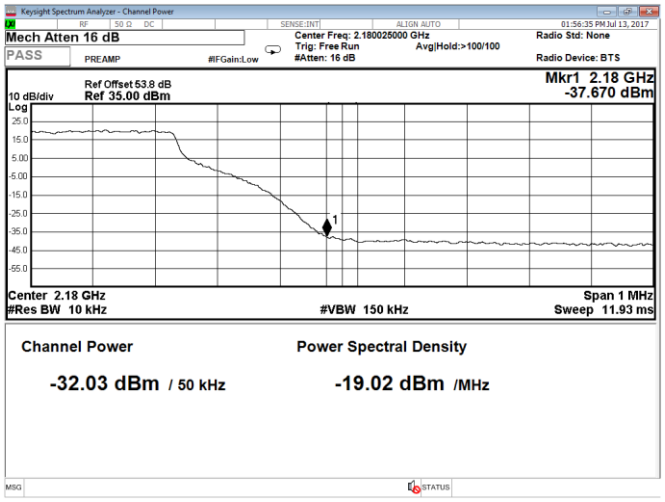



***Figure 8.2-65:*** *Conducted band edge emission at 2180 MHz, Port B, LTE, 5 MHz channel, QPSK (RBW = 1% of EBW)*

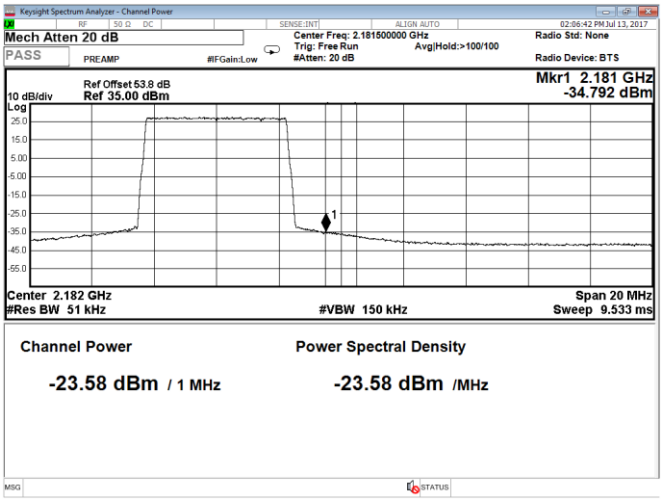



***Figure 8.2-66:*** *Conducted band edge emission at 2181 MHz, Port B, LTE, 5 MHz channel, QPSK (RBW = 1 MHz)*

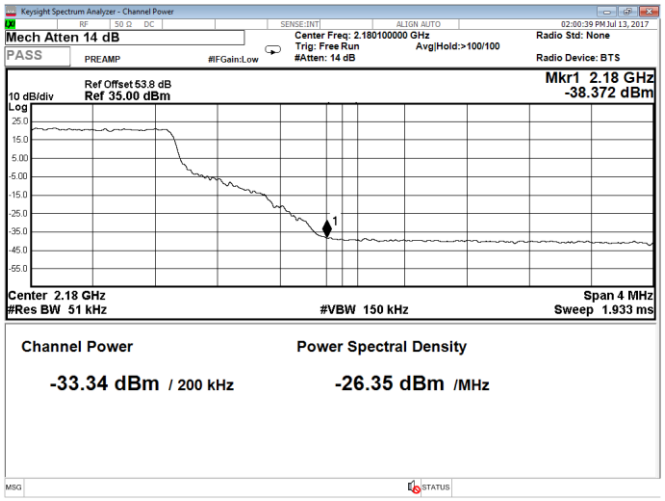



***Figure 8.2-67:*** *Conducted band edge emission at 2180 MHz, Port B, LTE, 20 MHz channel, QPSK (RBW = 1% of EBW)*

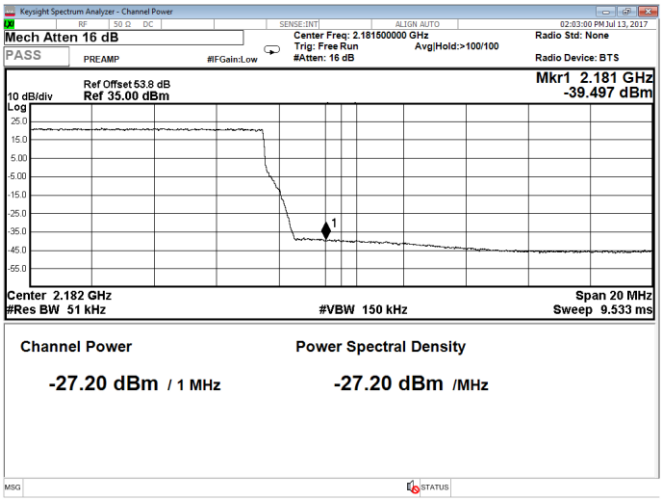



***Figure 8.2-68:*** *Conducted band edge emission at 2181 MHz, Port B, LTE, 20 MHz channel, QPSK (RBW = 1 MHz)*

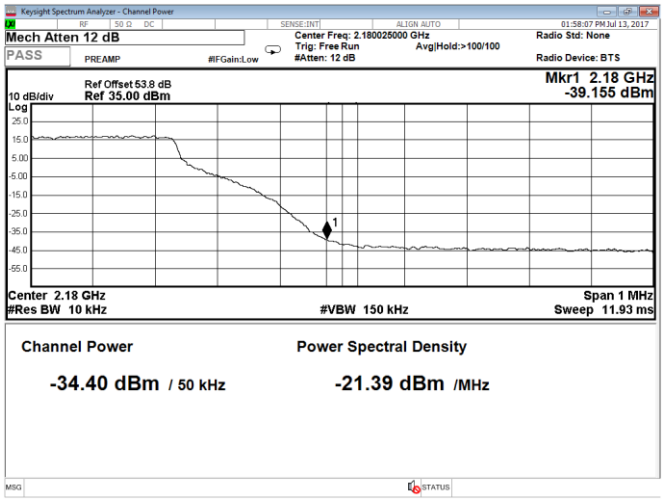



***Figure 8.2-69:*** *Conducted band edge emission at 2180 MHz, Port B, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

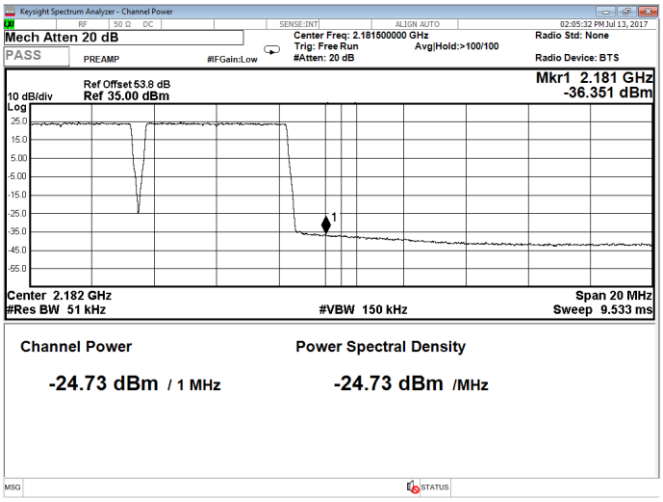



***Figure 8.2-70:*** *Conducted band edge emission at 2181 MHz, Port B, LTE, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

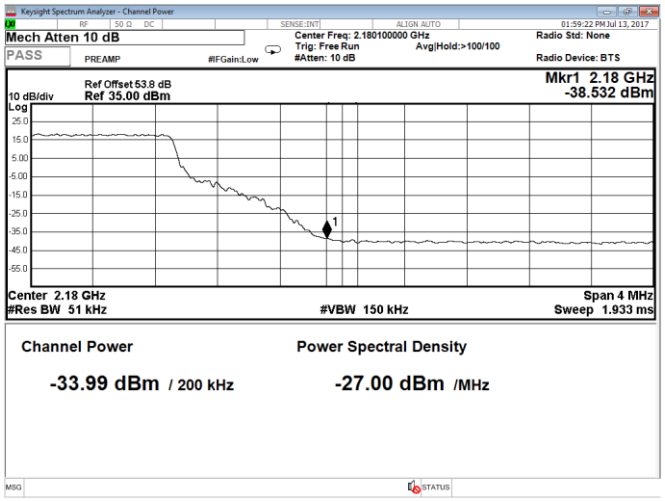



***Figure 8.2-71:*** *Conducted band edge emission at 2180 MHz, Port B, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

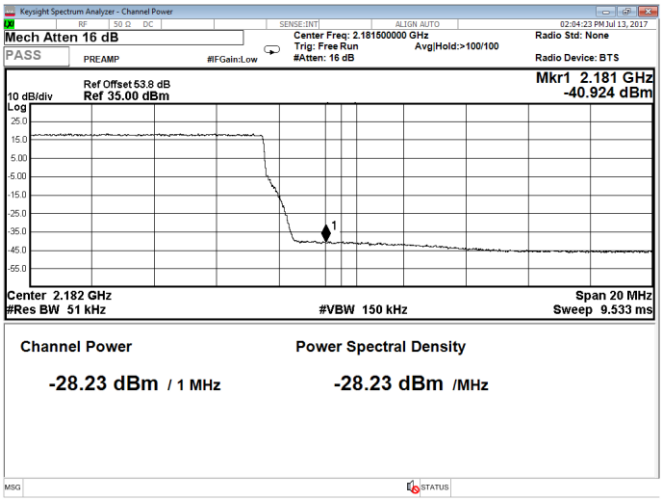



***Figure 8.2-72:*** *Conducted band edge emission at 2181 MHz, Port B, LTE, 20 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

***Table 8.2-1:*** *Lower band edge measurement results for SISO LTE operation*

| Remarks | Frequency, MHz | Emission level, dBm | Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -33.07 | -13.00 | 20.07 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -24.43 | -13.00 | 11.43 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -32.34 | -13.00 | 19.34 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -26.77 | -13.00 | 13.77 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -32.67 | -13.00 | 19.67 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -23.55 | -13.00 | 10.55 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -33.02 | -13.00 | 20.02 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -26.70 | -13.00 | 13.70 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -34.11 | -13.00 | 21.11 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.64 | -13.00 | 12.64 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -32.36 | -13.00 | 19.36 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.95 | -13.00 | 12.95 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -34.48 | -13.00 | 21.48 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -25.11 | -13.00 | 12.11 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -33.59 | -13.00 | 20.59 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -26.18 | -13.00 | 13.18 |

***Table 8.2-2:*** *Upper band edge measurement results for SISO LTE operation*

| Remarks | Frequency, MHz | Emission level, dBm | Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2180 | -31.03 | -13.00 | 18.03 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2181 | -23.71 | -13.00 | 10.71 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2180 | -32.27 | -13.00 | 19.27 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2181 | -27.02 | -13.00 | 14.02 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2180 | -32.03 | -13.00 | 19.03 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2181 | -23.58 | -13.00 | 10.58 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2180 | -33.34 | -13.00 | 20.34 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2181 | -27.20 | -13.00 | 14.20 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2180 | -33.13 | -13.00 | 20.13 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2181 | -24.75 | -13.00 | 11.75 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2180 | -33.59 | -13.00 | 20.59 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2181 | -27.50 | -13.00 | 14.50 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2180 | -34.40 | -13.00 | 21.40 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2181 | -24.73 | -13.00 | 11.73 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2180 | -33.99 | -13.00 | 20.99 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2181 | -28.23 | -13.00 | 15.23 |

***Table 8.2-3:*** *Lower band edge measurement results for LTE MIMO 2×2 operation*

| Remarks | Frequency, MHz | Emission level, dBm | MIMO 2×2 Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -33.07 | -16.00 | 17.07 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -24.43 | -16.00 | 8.43 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -32.34 | -16.00 | 16.34 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -26.77 | -16.00 | 10.77 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -32.67 | -16.00 | 16.67 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -23.55 | -16.00 | 7.55 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -33.02 | -16.00 | 17.02 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -26.70 | -16.00 | 10.70 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -34.11 | -16.00 | 18.11 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.64 | -16.00 | 9.64 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -32.36 | -16.00 | 16.36 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.95 | -16.00 | 9.95 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -34.48 | -16.00 | 18.48 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -25.11 | -16.00 | 9.11 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -33.59 | -16.00 | 17.59 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -26.18 | -16.00 | 10.18 |

Note: MIMO 2×2 limit correction was calculated as follows: $10 \times \text{Log}_{10}(2) = 3$ dB, therefore limit is −16 dBm.

***Table 8.2-4:*** *Upper band edge measurement results for LTE MIMO 2×2 operation*

| Remarks | Frequency, MHz | Emission level, dBm | MIMO 2×2 Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2180 | -31.03 | -16.00 | 15.03 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2181 | -23.71 | -16.00 | 7.71 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2180 | -32.27 | -16.00 | 16.27 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2181 | -27.02 | -16.00 | 11.02 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2180 | -32.03 | -16.00 | 16.03 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2181 | -23.58 | -16.00 | 7.58 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2180 | -33.34 | -16.00 | 17.34 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2181 | -27.20 | -16.00 | 11.20 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2180 | -33.13 | -16.00 | 17.13 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2181 | -24.75 | -16.00 | 8.75 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2180 | -33.59 | -16.00 | 17.59 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2181 | -27.50 | -16.00 | 11.50 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2180 | -34.40 | -16.00 | 18.40 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2181 | -24.73 | -16.00 | 8.73 |
| 20 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2180 | -33.99 | -16.00 | 17.99 |
| 20 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2181 | -28.23 | -16.00 | 12.23 |

Note: MIMO 2×2 limit correction was calculated as follows: $10 \times \text{Log}_{10}(2) = 3$ dB, therefore limit is −16 dBm.

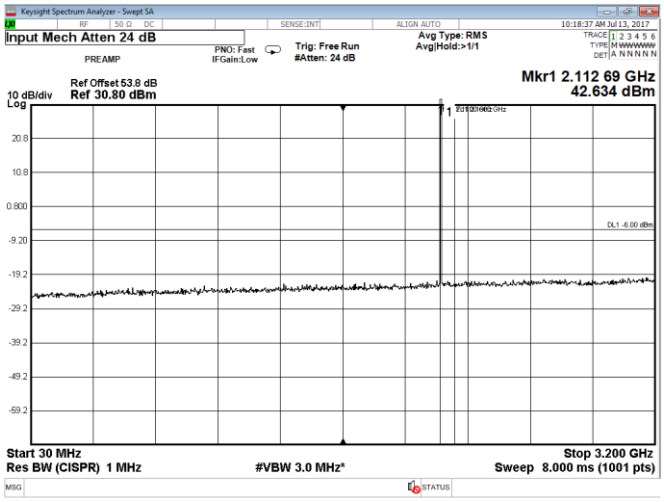



***Figure 8.2-73:*** *Conducted spurious emissions within 30–3200 MHz, Port A, WCDMA, 5 MHz low channel, QPSK*

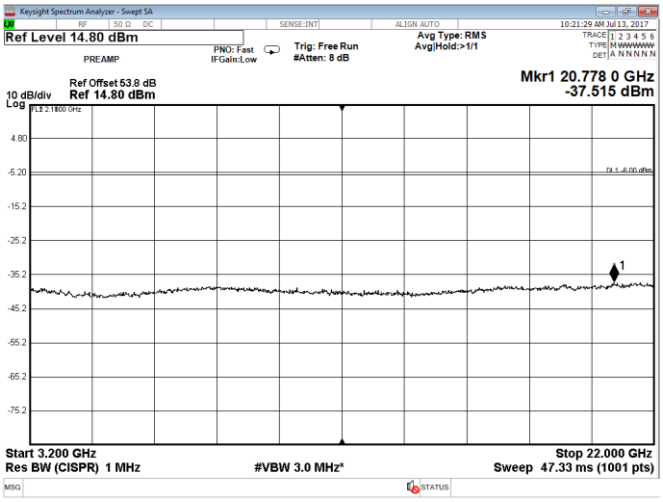



***Figure 8.2-74:*** *Conducted spurious emissions within 3200–22000 MHz, Port A, WCDMA, 5 MHz low channel, QPSK*

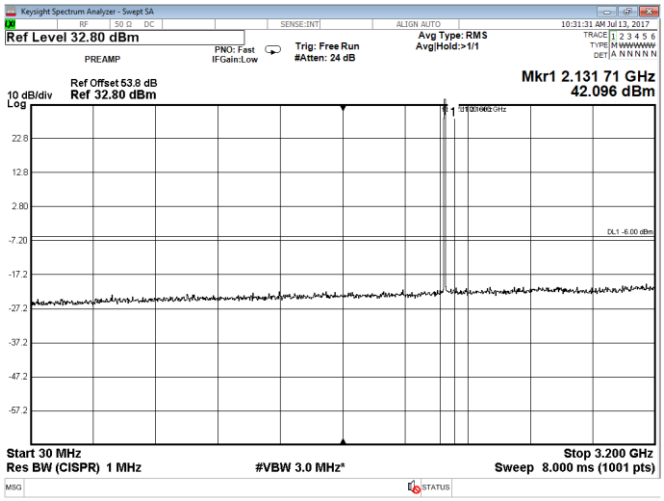



***Figure 8.2-75:*** *Conducted spurious emissions within 30–3200 MHz, Port A, WCDMA, 5 MHz mid channel, QPSK*

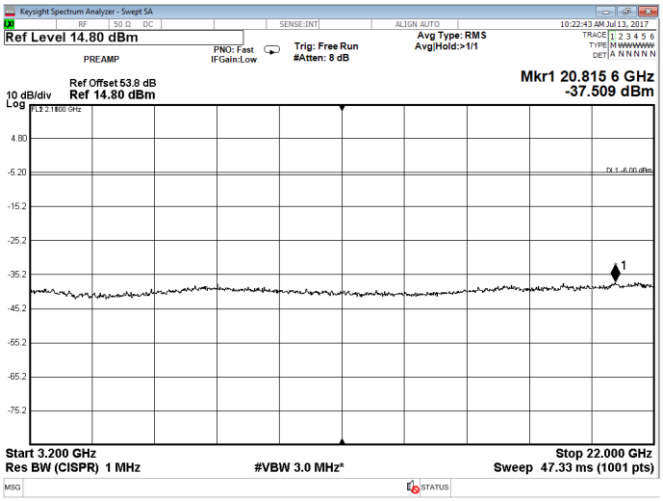



***Figure 8.2-76:*** *Conducted spurious emissions within 3200–22000 MHz, Port A, WCDMA, 5 MHz mid channel, QPSK*

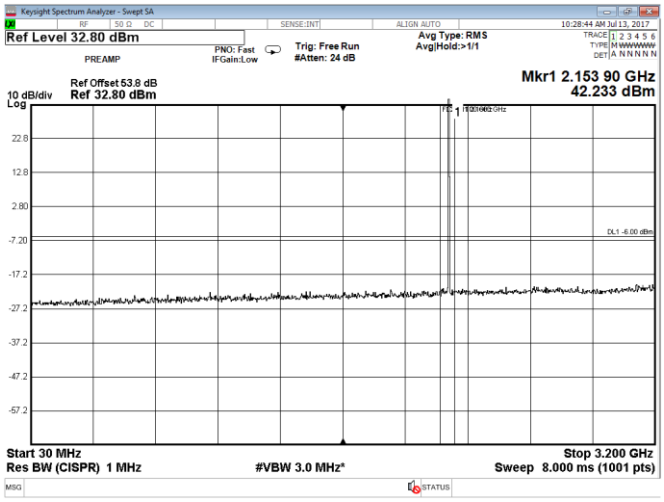



***Figure 8.2-77:*** *Conducted spurious emissions within 30–3200 MHz, Port A, WCDMA, 5 MHz high channel, QPSK*

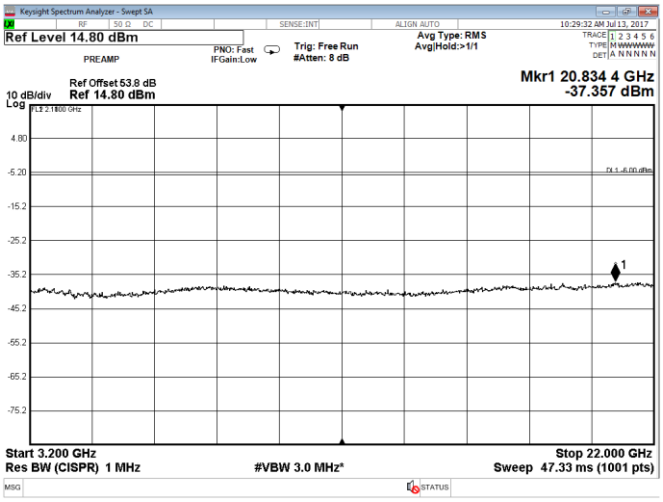



***Figure 8.2-78:*** *Conducted spurious emissions within 3200–22000 MHz, Port A, WCDMA, 5 MHz high channel, QPSK*

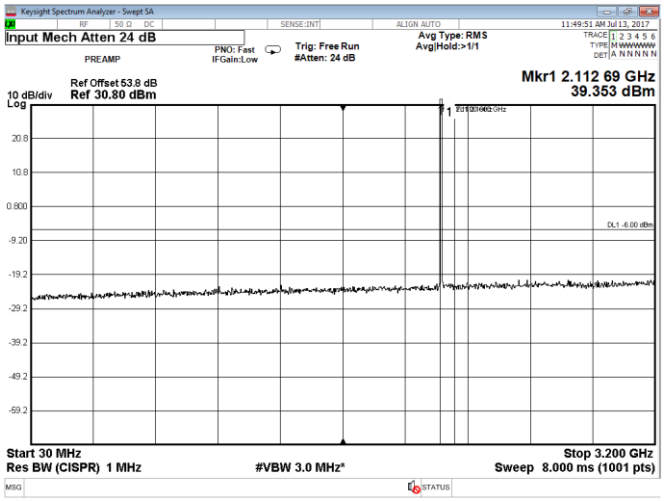



***Figure 8.2-79:*** *Conducted spurious emissions within 30–3200 MHz, Port A, WCDMA, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

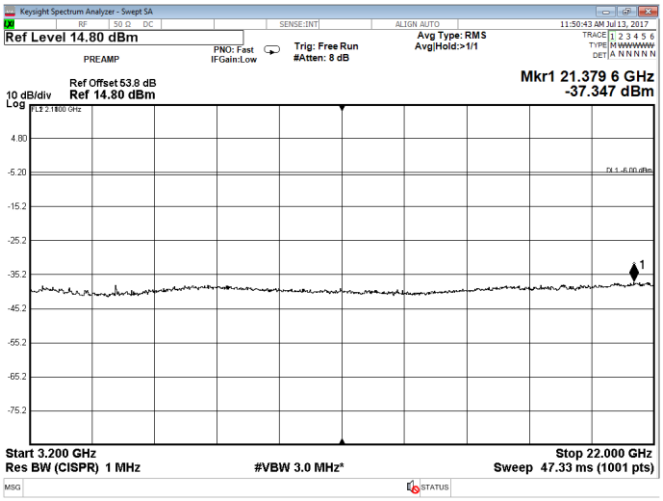



***Figure 8.2-80:*** *Conducted spurious emissions within 3200–22000 MHz, Port A, WCDMA, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

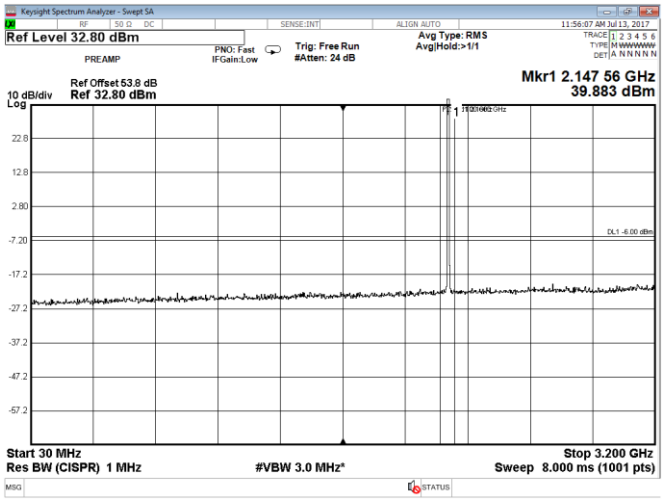



***Figure 8.2-81:*** *Conducted spurious emissions within 30–3200 MHz, Port A, WCDMA, 2 carriers: 5 MHz each at the top of the band, QPSK*

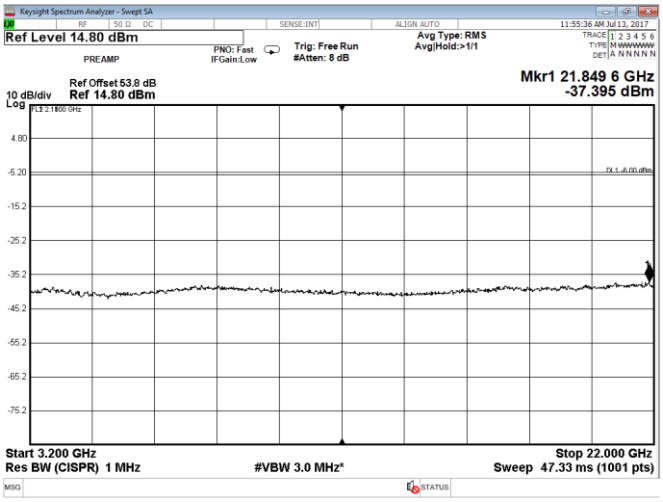



***Figure 8.2-82:*** *Conducted spurious emissions within 3200–22000 MHz, Port A, WCDMA, 2 carriers: 5 MHz each at the top of the band, QPSK*

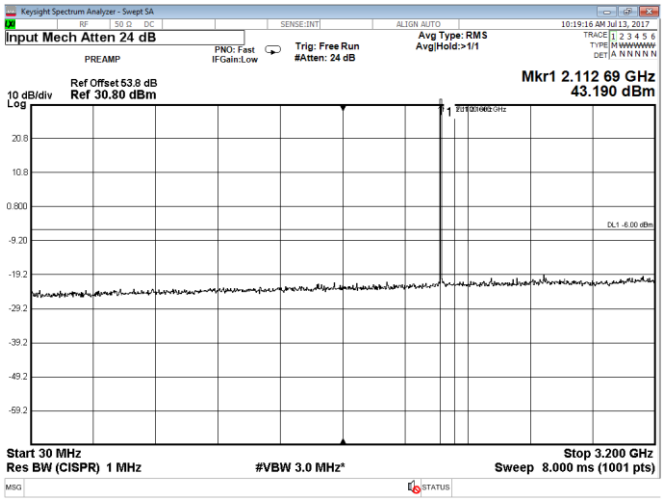



***Figure 8.2-83:*** *Conducted spurious emissions within 30–3200 MHz, Port B, WCDMA, 5 MHz low channel, QPSK*

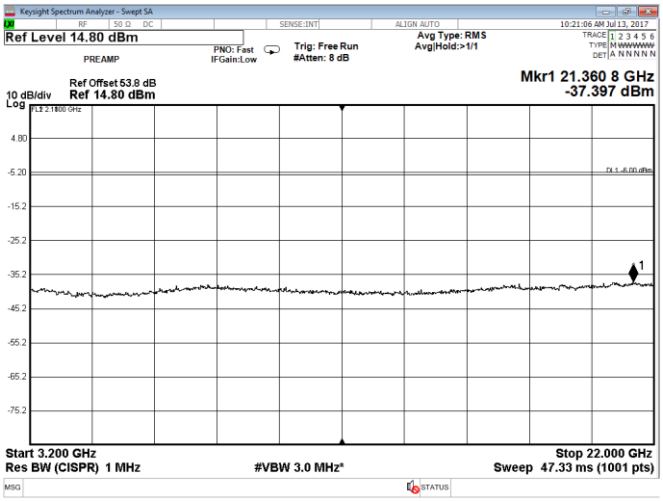



***Figure 8.2-84:*** *Conducted spurious emissions within 3200–22000 MHz, Port B, WCDMA, 5 MHz low channel, QPSK*

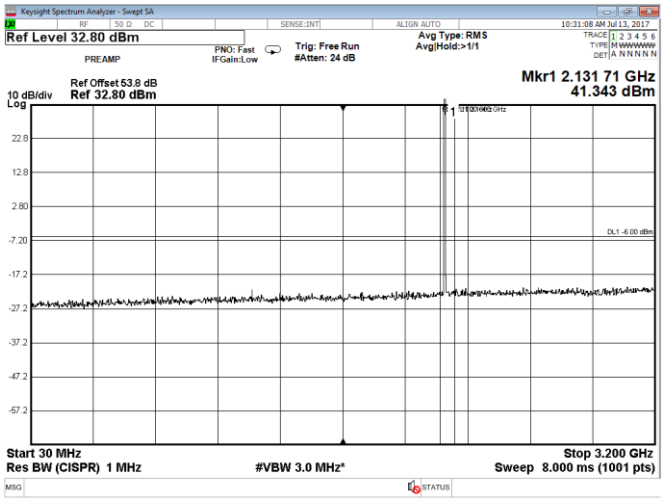



***Figure 8.2-85:*** *Conducted spurious emissions within 30–3200 MHz, Port B, WCDMA, 5 MHz mid channel, QPSK*

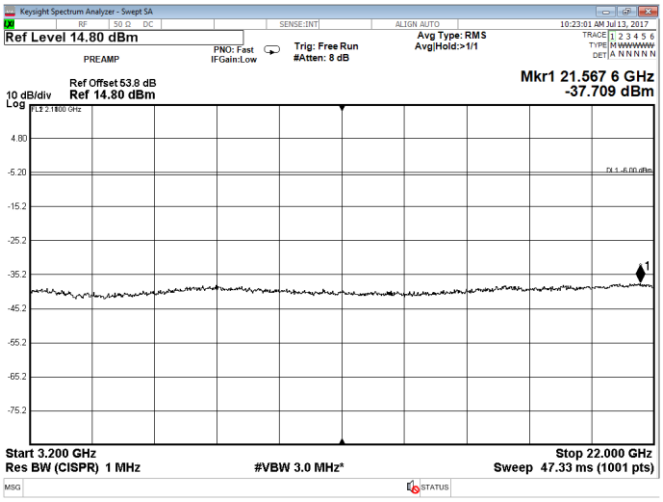



***Figure 8.2-86:*** *Conducted spurious emissions within 3200–22000 MHz, Port B, WCDMA, 5 MHz mid channel, QPSK*

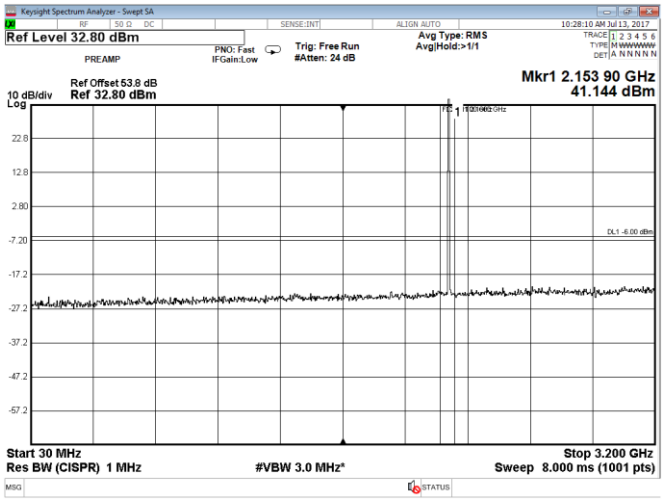



***Figure 8.2-87:*** *Conducted spurious emissions within 30–3200 MHz, Port B, WCDMA, 5 MHz high channel, QPSK*

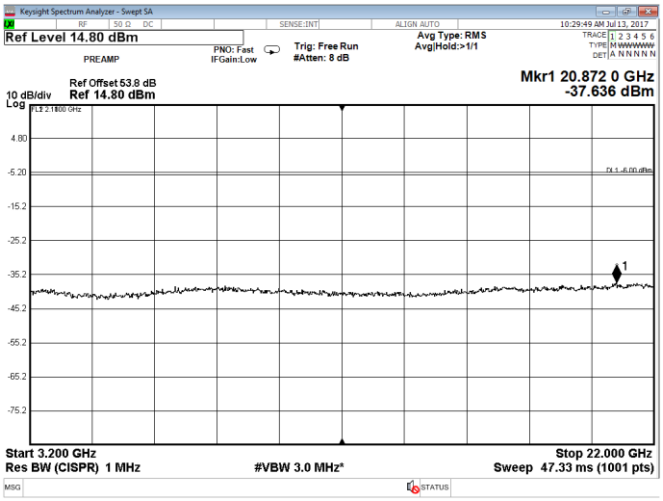



***Figure 8.2-88:*** *Conducted spurious emissions within 3200–22000 MHz, Port B, WCDMA, 5 MHz high channel, QPSK*

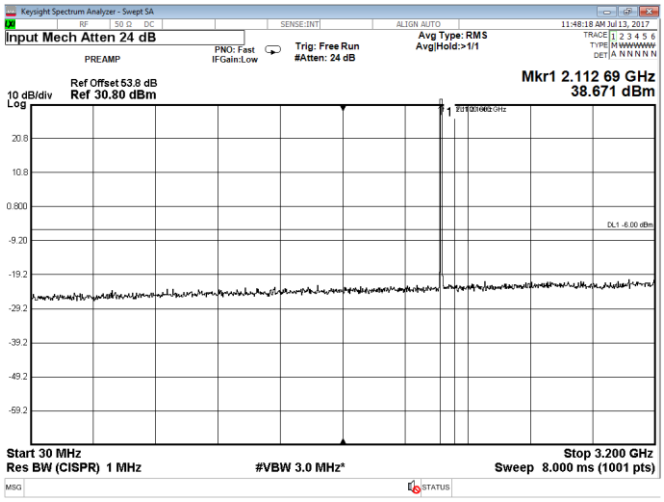



***Figure 8.2-89:*** *Conducted spurious emissions within 30–3200 MHz, Port B, WCDMA, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

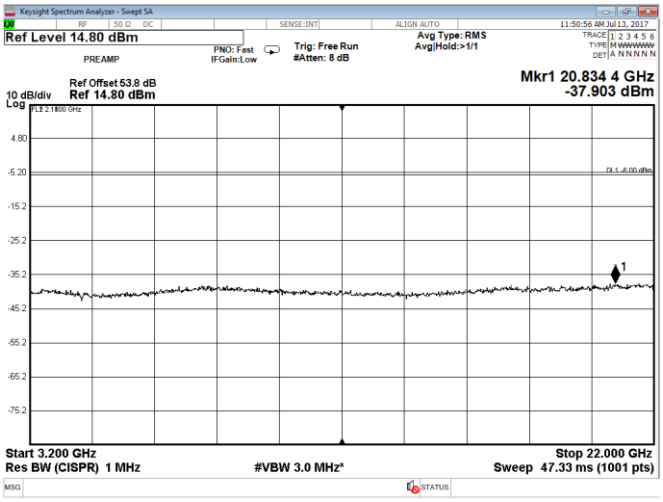



***Figure 8.2-90:*** *Conducted spurious emissions within 3200–22000 MHz, Port B, WCDMA, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

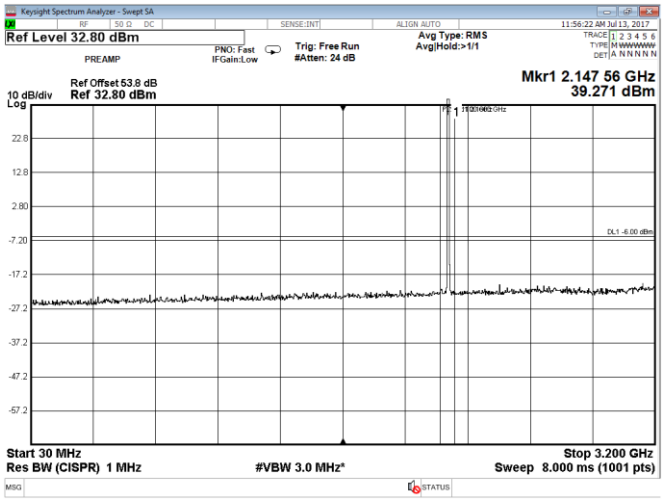



***Figure 8.2-91:*** *Conducted spurious emissions within 30–3200 MHz, Port B, WCDMA, 2 carriers: 5 MHz each at the top of the band, QPSK*

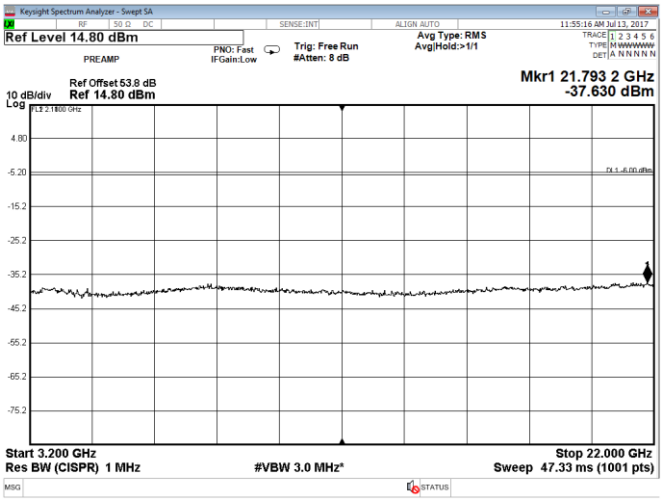



***Figure 8.2-92:*** *Conducted spurious emissions within 3200–22000 MHz, Port B, WCDMA, 2 carriers: 5 MHz each at the top of the band, QPSK*

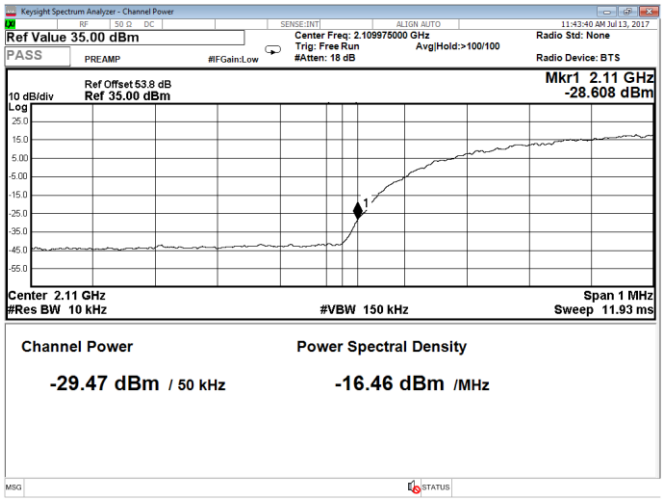



***Figure 8.2-93:*** *Conducted band edge emission at 2110 MHz, Port A, WCDMA, 5 MHz channel, QPSK (RBW = 1% of EBW)*

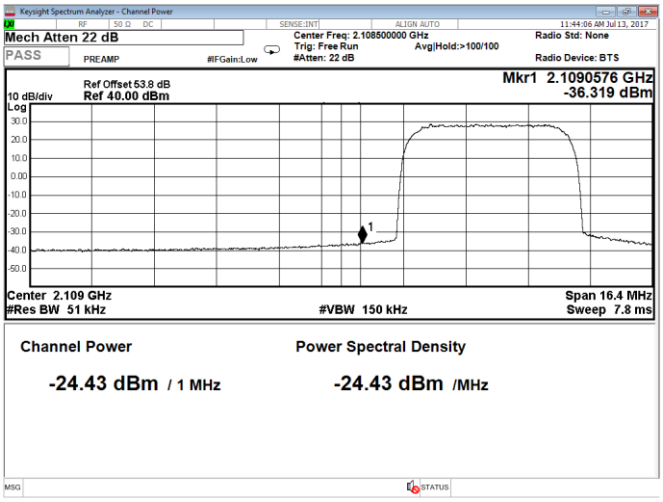



***Figure 8.2-94:*** *Conducted band edge emission at 2109 MHz, Port A, WCDMA, 5 MHz channel, QPSK (RBW = 1 MHz)*

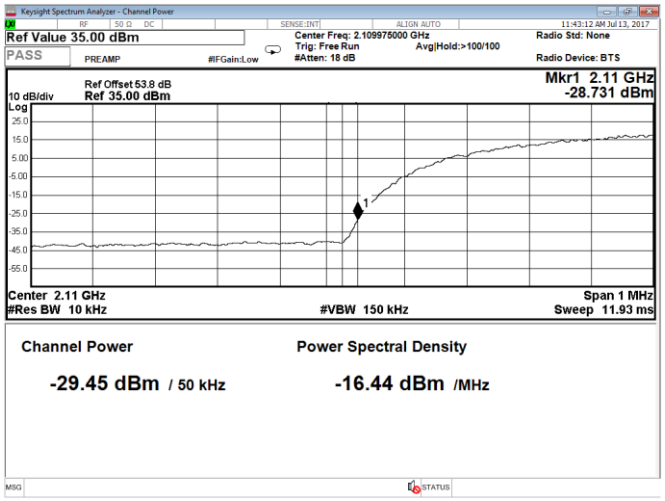



***Figure 8.2-95:*** *Conducted band edge emission at 2110 MHz, Port B, WCDMA, 5 MHz channel, QPSK (RBW = 1% of EBW)*

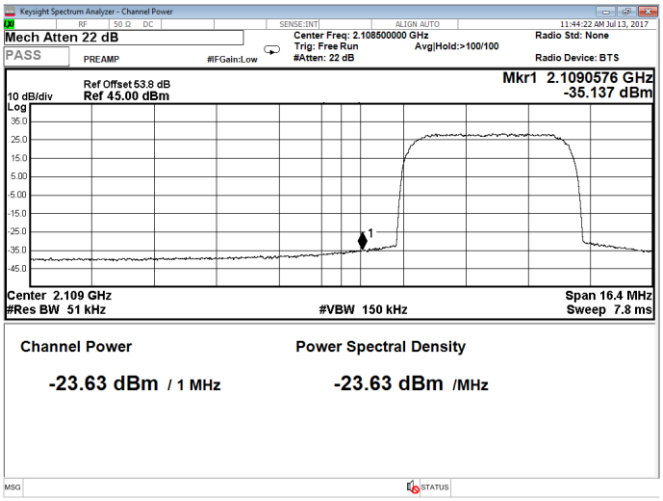



***Figure 8.2-96:*** *Conducted band edge emission at 2109 MHz, Port B, WCDMA, 5 MHz channel, QPSK (RBW = 1 MHz)*

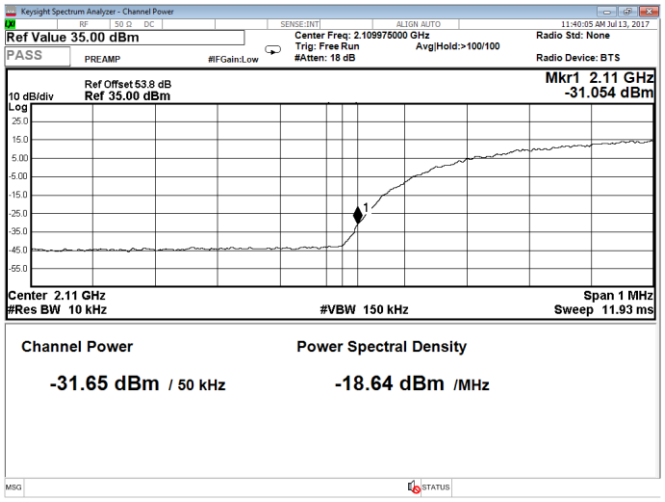



***Figure 8.2-97:*** *Conducted band edge emission at 2110 MHz, Port A, WCDMA, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

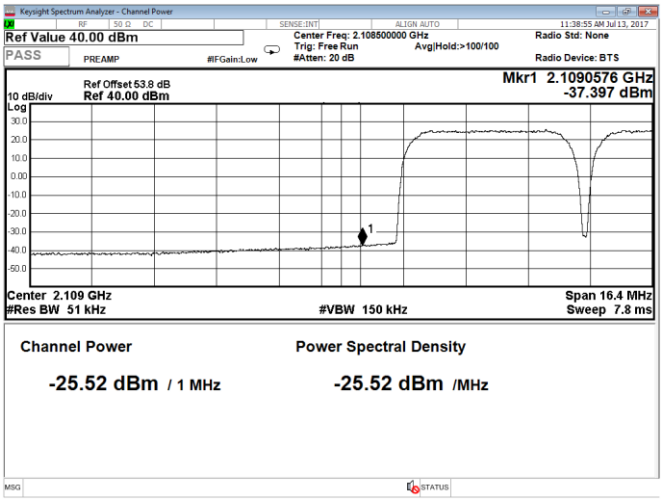



***Figure 8.2-98:*** *Conducted band edge emission at 2109 MHz, Port A, WCDMA, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

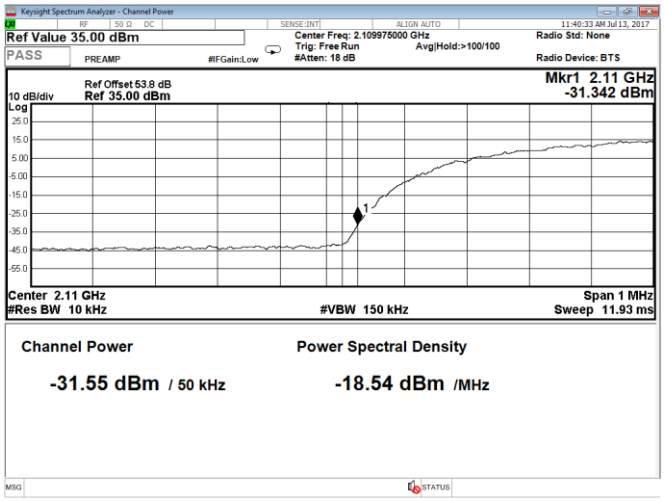



***Figure 8.2-99:*** *Conducted band edge emission at 2110 MHz, Port B, WCDMA, 5 MHz channel, 2 carriers, QPSK (RBW = 1% of EBW)*

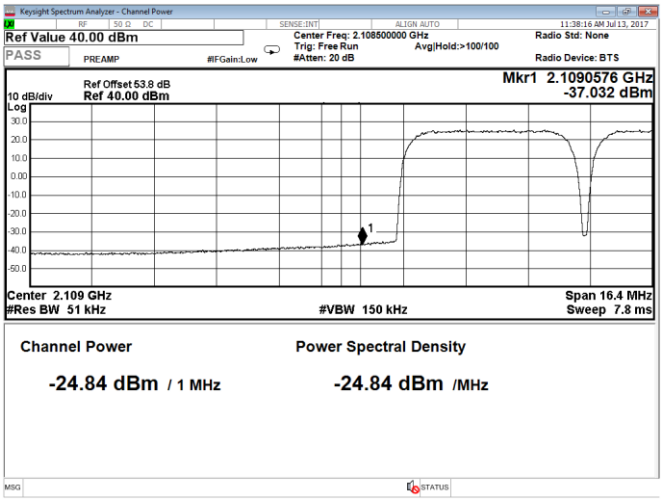



***Figure 8.2-100:*** *Conducted band edge emission at 2109 MHz, Port B, WCDMA, 5 MHz channel, 2 carriers, QPSK (RBW = 1 MHz)*

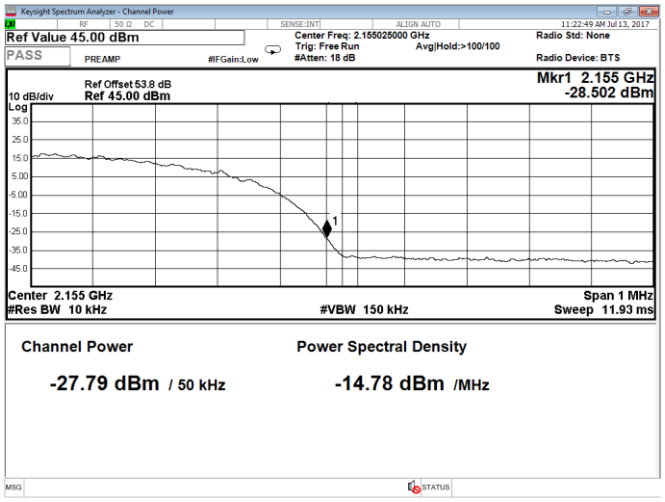



***Figure 8.2-101:*** *Conducted band edge emission at 2155 MHz, Port A, WCDMA, 5 MHz channel, QPSK (RBW = 1% of EBW)*

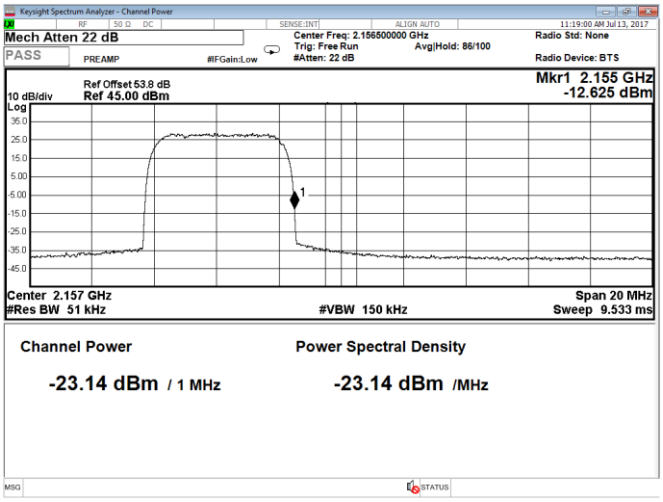



***Figure 8.2-102:*** *Conducted band edge emission at 2156 MHz, Port A, WCDMA, 5 MHz channel, QPSK (RBW = 1 MHz)*

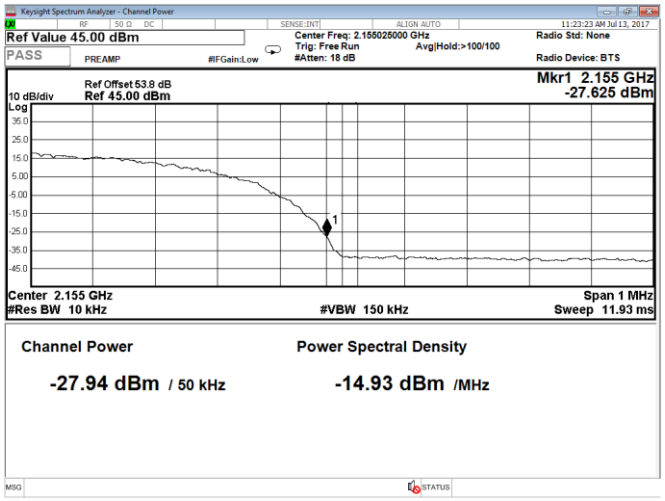



***Figure 8.2-103:*** *Conducted band edge emission at 2155 MHz, Port B, WCDMA, 5 MHz channel, QPSK (RBW = 1% of EBW)*

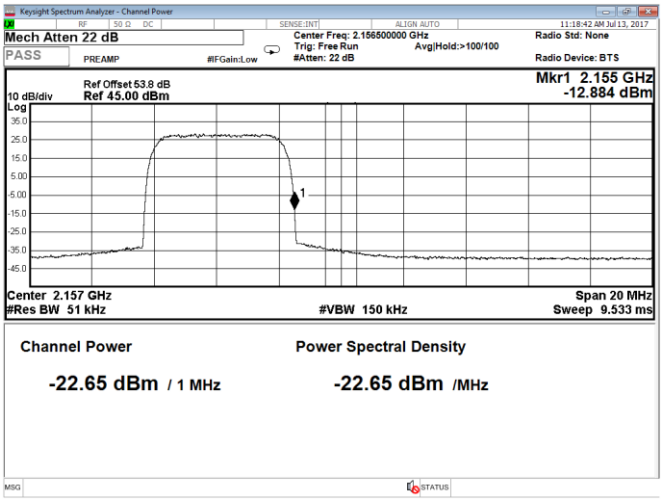



***Figure 8.2-104:*** *Conducted band edge emission at 2156 MHz, Port B, WCDMA, 5 MHz channel, QPSK (RBW = 1 MHz)*

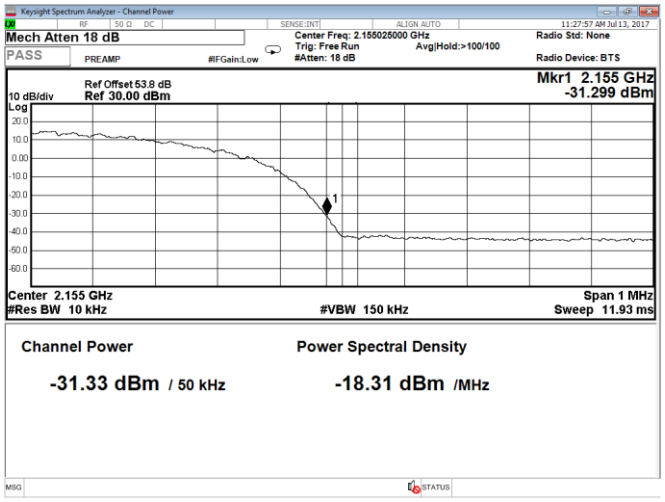



***Figure 8.2-105:*** *Conducted band edge emission at 2155 MHz, Port A, WCDMA, 2 carriers, 5 MHz channel, QPSK (RBW = 1% of EBW)*

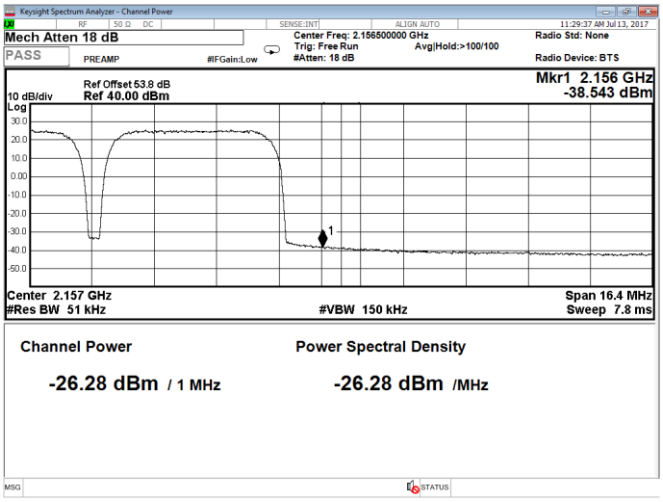



***Figure 8.2-106:*** *Conducted band edge emission at 2156 MHz, Port A, WCDMA, 2 carriers, 5 MHz channel, QPSK (RBW = 1 MHz)*

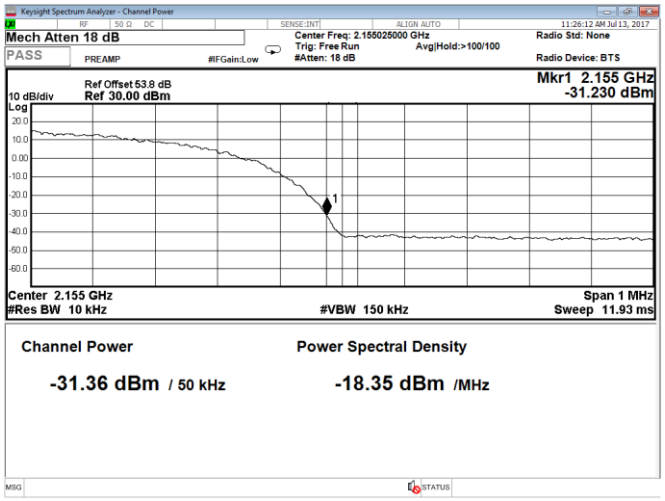



***Figure 8.2-107:*** *Conducted band edge emission at 2155 MHz, Port B, WCDMA, 2 carriers, 5 MHz channel, QPSK (RBW = 1% of EBW)*

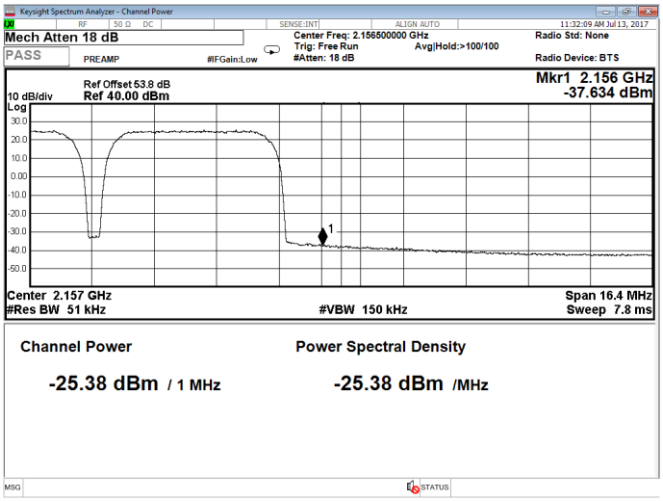



***Figure 8.2-108:*** *Conducted band edge emission at 2156 MHz, Port B, WCDMA, 2 carriers, 5 MHz channel, QPSK (RBW = 1 MHz)*

***Table 8.2-5:*** *Lower band edge measurement results for SISO WCDMA operation*

| Remarks | Frequency, MHz | Emission level, dBm | Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -29.47 | -13.00 | 16.47 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -24.43 | -13.00 | 11.43 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -29.45 | -13.00 | 16.45 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -23.63 | -13.00 | 10.63 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -31.65 | -13.00 | 18.65 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.52 | -13.00 | 12.52 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -31.55 | -13.00 | 18.55 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -24.84 | -13.00 | 11.84 |

***Table 8.2-6:*** *Upper band edge measurement results for SISO WCDMA operation*

| Remarks | Frequency, MHz | Emission level, dBm | Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2155 | -27.79 | -13.00 | 14.79 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2156 | -23.14 | -13.00 | 10.14 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2155 | -27.94 | -13.00 | 14.94 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2156 | -22.65 | -13.00 | 9.65 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2155 | -31.33 | -13.00 | 18.33 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2156 | -26.28 | -13.00 | 13.28 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2155 | -31.36 | -13.00 | 18.36 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2156 | -25.38 | -13.00 | 12.38 |

***Table 8.2-7:*** *Lower band edge measurement results for WCDMA MIMO 2×2 operation*

| Remarks | Frequency, MHz | Emission level, dBm | MIMO 2×2 Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2110 | -29.47 | -16.00 | 13.47 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2109 | -24.43 | -16.00 | 8.43 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2110 | -29.45 | -16.00 | 13.45 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2109 | -23.63 | -16.00 | 7.63 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2110 | -31.65 | -16.00 | 15.65 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2109 | -25.52 | -16.00 | 9.52 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2110 | -31.55 | -16.00 | 15.55 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2109 | -24.84 | -16.00 | 8.84 |

Note: MIMO 2×2 limit correction was calculated as follows: $10 \times \text{Log}_{10}(2) = 3$ dB, therefore limit is −16 dBm.

***Table 8.2-8:*** *Upper band edge measurement results for WCDMA MIMO 2×2 operation*

| Remarks | Frequency, MHz | Emission level, dBm | MIMO 2×2 Limit, dBm | Margin, dB |
|---|---|---|---|---|
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, Single carr. | 2155 | -27.79 | -16.00 | 11.79 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, Single carr. | 2156 | -23.14 | -16.00 | 7.14 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, Single carr. | 2155 | -27.94 | -16.00 | 11.94 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, Single carr. | 2156 | -22.65 | -16.00 | 6.65 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port A, 2 carr. | 2155 | -31.33 | -16.00 | 15.33 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port A, 2 carr. | 2156 | -26.28 | -16.00 | 10.28 |
| 5 MHz channel, QPSK, RBW = 1% of EBW, Port B, 2 carr. | 2155 | -31.36 | -16.00 | 15.36 |
| 5 MHz channel, QPSK, RBW = 1 MHz, Port B, 2 carr. | 2156 | -25.38 | -16.00 | 9.38 |

Note: MIMO 2×2 limit correction was calculated as follows: $10 \times \text{Log}_{10}(2) = 3$ dB, therefore limit is −16 dBm.

## 8.3 FCC 27.53 and RSS-139, 4.2 Radiated spurious emissions

### 8.3.1 Definitions and limits

**FCC:**
(h) AWS emission limits
(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}$ (P) dB.

(3) Measurement procedure.

(i) 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.

(ii) 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.

(iii) 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.

**RSS-139, Section 6.6:**
i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10}$ p (watts) dB.
ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10}$ p (watts) dB.

### 8.3.2 Test summary

| | | | |
|---|---|---|---|
| Test date | July 27, 2017 | Temperature | 22 °C |
| Test engineer | Andrey Adelberg | Air pressure | 1004 mbar |
| Verdict | Pass | Relative humidity | 32 % |

### 8.3.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
All measurements were performed using a peak detector.
RBW within 30–1000 MHz was 100 kHz and 1 MHz above 1 GHz. VBW was wider than RBW.
Testing was performed with RF ports terminated with 50 Ohm load.

## 8.3.4 Test data

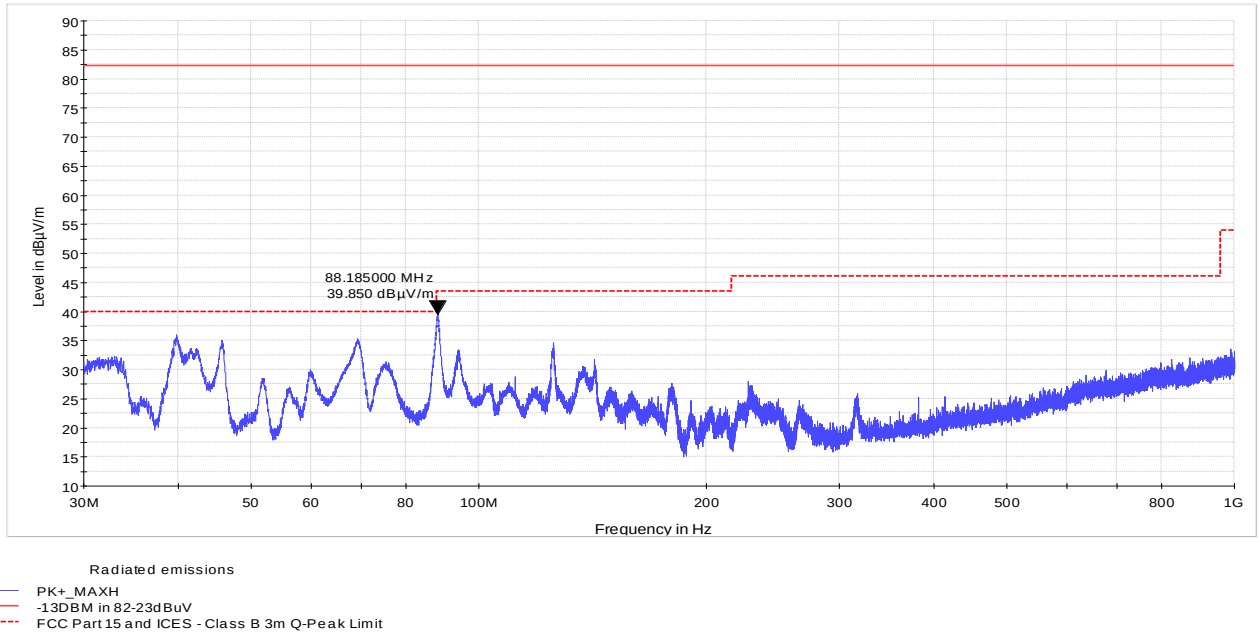



***Figure 8.3-1:*** *Radiated emissions spectral plot, LTE, low channel (30 to 1000 MHz)*

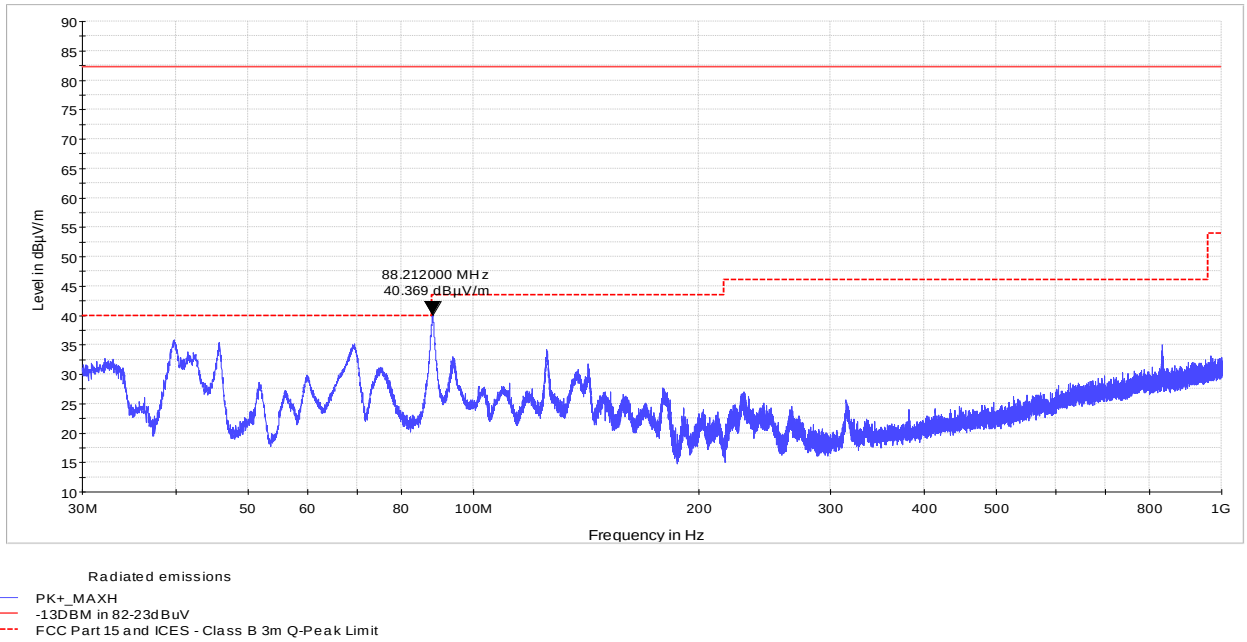



***Figure 8.3-2:*** *Radiated emissions spectral plot, LTE, mid channel (30 to 1000 MHz)*

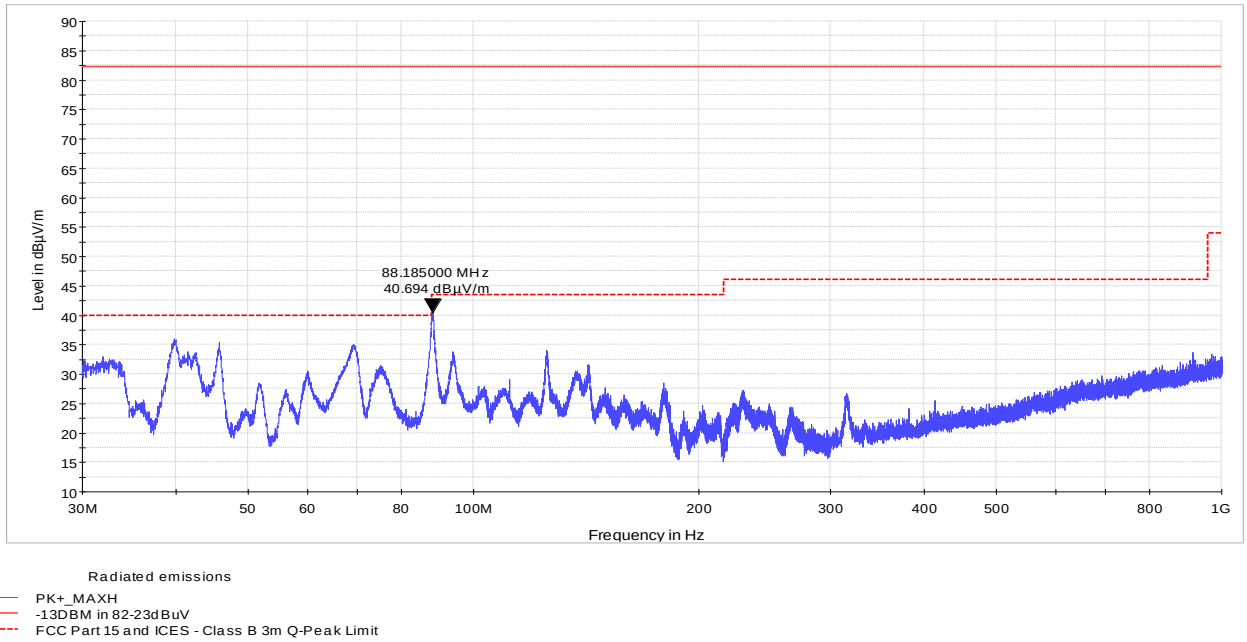



***Figure 8.3-3:*** *Radiated emissions spectral plot, LTE, high channel (30 to 1000 MHz)*

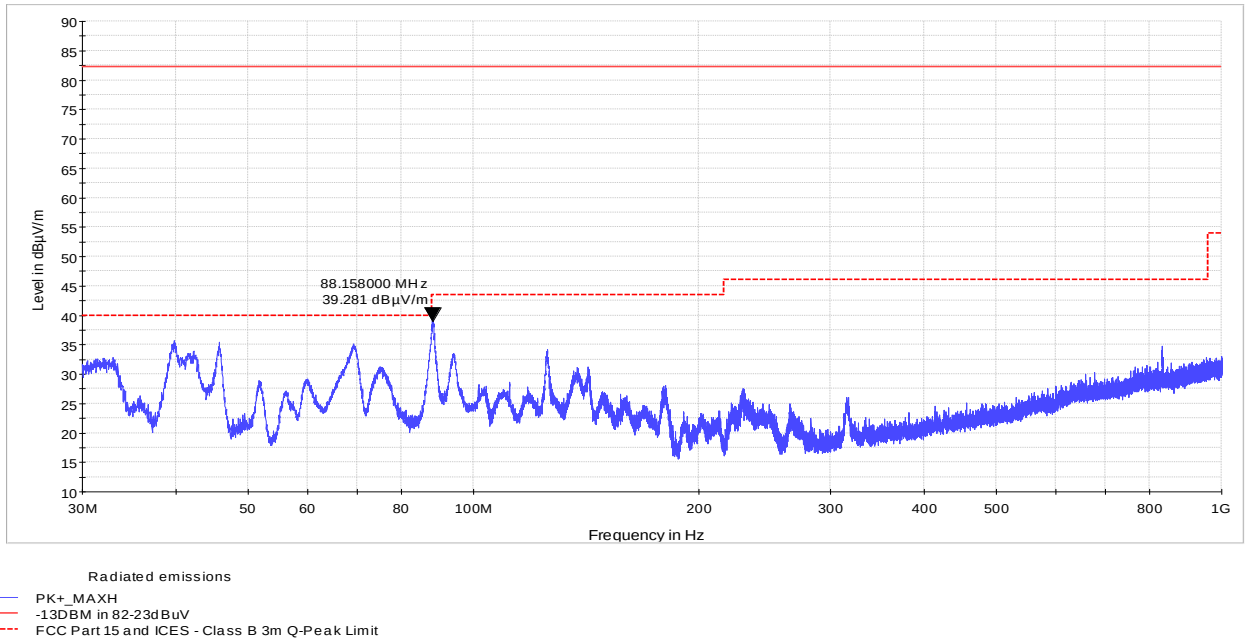



***Figure 8.3-4:*** *Radiated emissions spectral plot, LTE, two carriers at the bottom of the band (30 to 1000 MHz)*

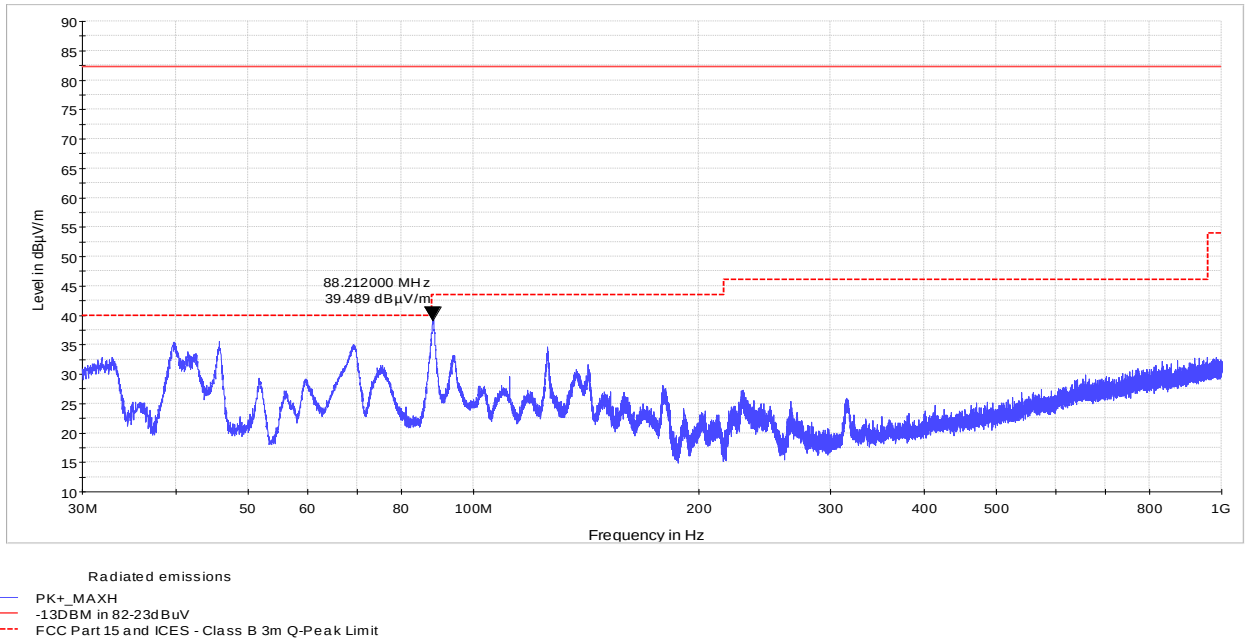
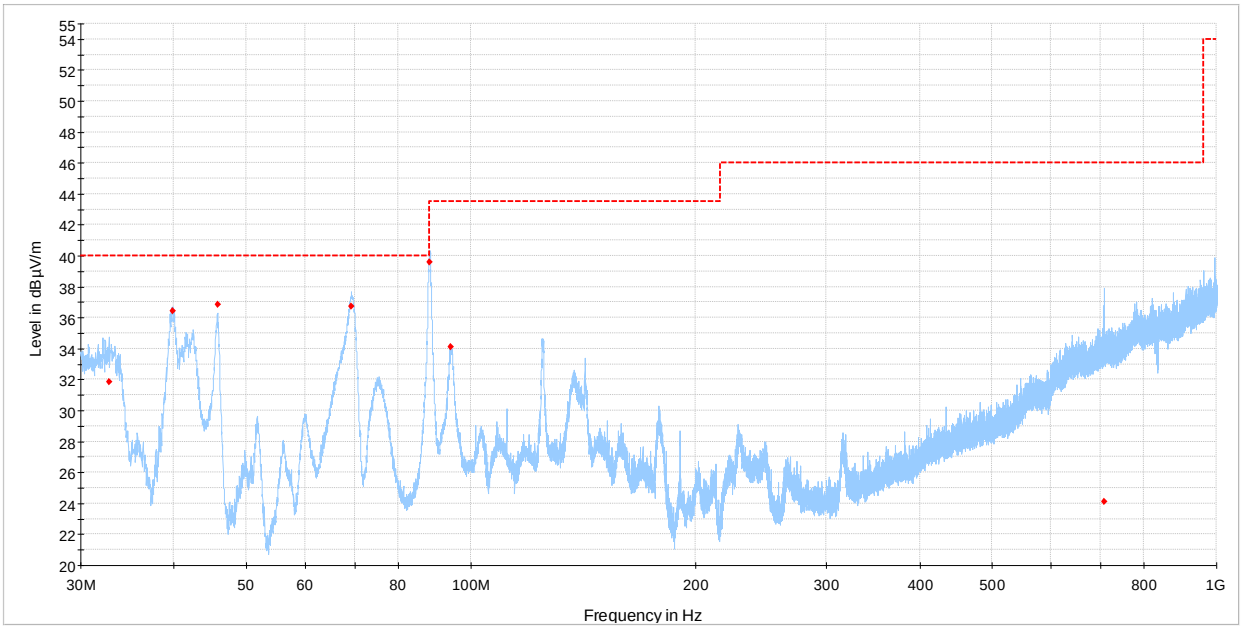



***Figure 8.3-5:*** *Radiated emissions spectral plot, LTE, two carriers at the top of the band (30 to 1000 MHz)*




The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

***Figure 8.3-6:*** *Radiated emissions spectral plot, LTE (30 to 1000 MHz)*

***Table 8.3-1:*** *Radiated emissions (Quasi-Peak) results for LTE*

| Frequency (MHz) | Quasi-Peak field strength[1] (dBµV/m) | 3 m Quasi-Peak limit [3] (dBµV/m) | Margin (dB) | Measurement time (ms) | Bandwidth (kHz) | Antenna height (cm) | Pol. (V/H) | Turn table position (°) | Correction factor[2] (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 32.730000 | 31.83 | 40.00 | 8.17 | 100 | 120 | 103.5 | V | 84.0 | 20.8 |
| 39.900000 | 36.42 | 40.00 | 3.58 | 100 | 120 | 110.3 | V | 49.0 | 14.9 |
| 45.750000 | 36.85 | 40.00 | 3.15 | 100 | 120 | 105.4 | V | 302.0 | 11.6 |
| 69.240000 | 36.71 | 40.00 | 3.29 | 100 | 120 | 305.0 | H | 166.0 | 9.7 |
| 88.080000 | 39.57 | 43.50 | 3.93 | 100 | 120 | 188.7 | H | 8.0 | 9.1 |
| 94.020000 | 34.12 | 43.50 | 9.38 | 100 | 120 | 98.0 | V | 120.0 | 10.1 |
| 706.410000 | 24.11 | 46.00 | 21.89 | 100 | 120 | 300.4 | V | 288.0 | 23.6 |

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 31.83 dBµV/m (field strength) = 11.03 dBµV (receiver reading) + 20.8 dB (Correction factor)

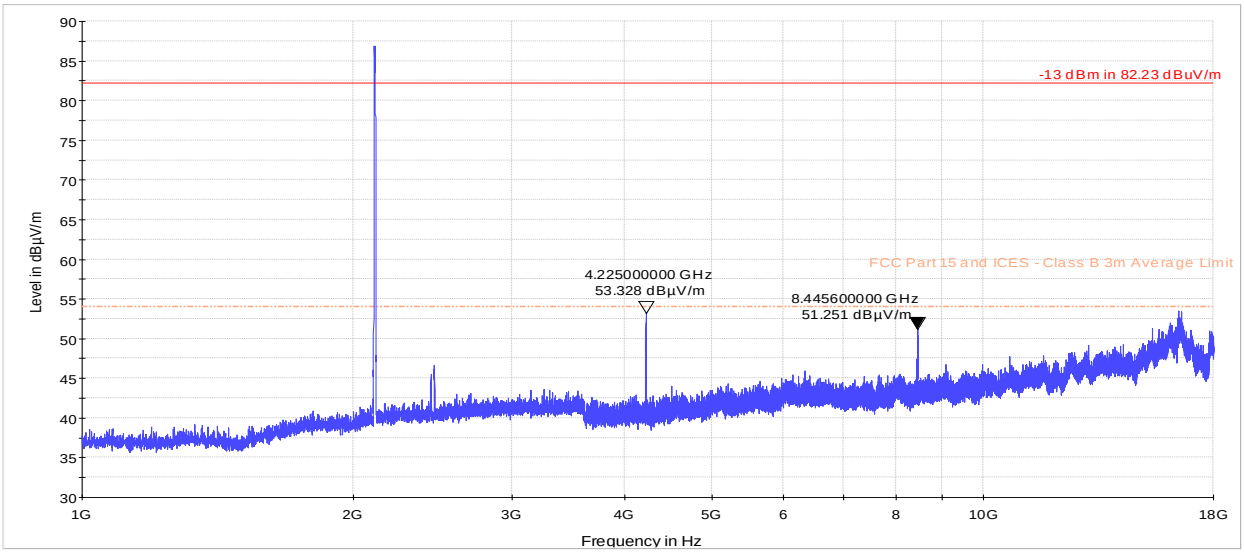



***Figure 8.3-7:*** *Radiated emissions spectral plot, LTE, low channel (1–18 GHz)*

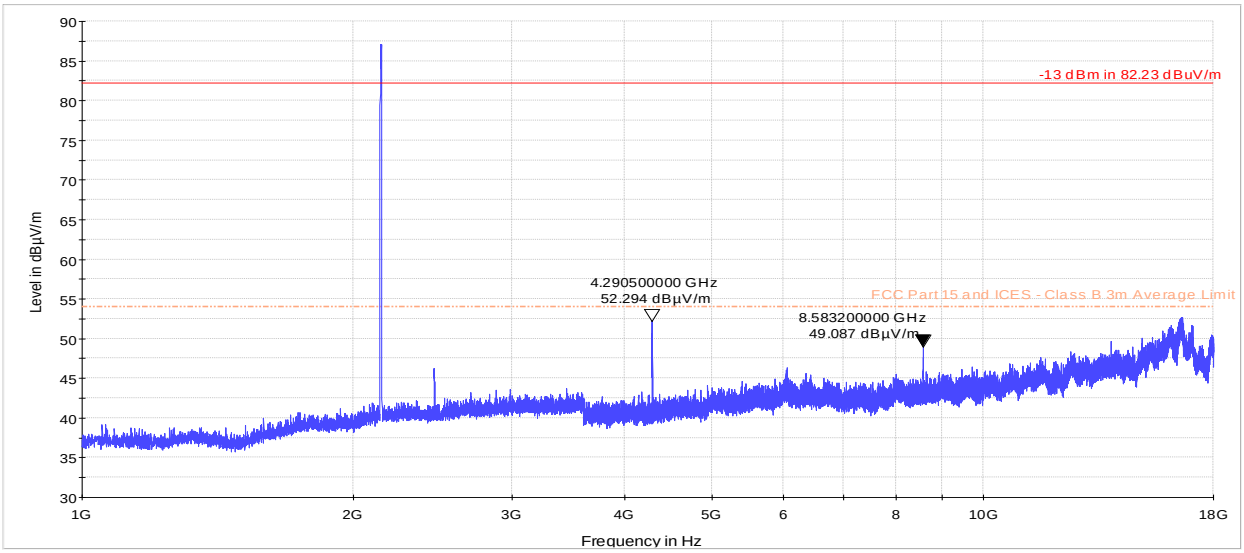



***Figure 8.3-8:*** *Radiated emissions spectral plot, LTE, mid channel (1–18 GHz)*

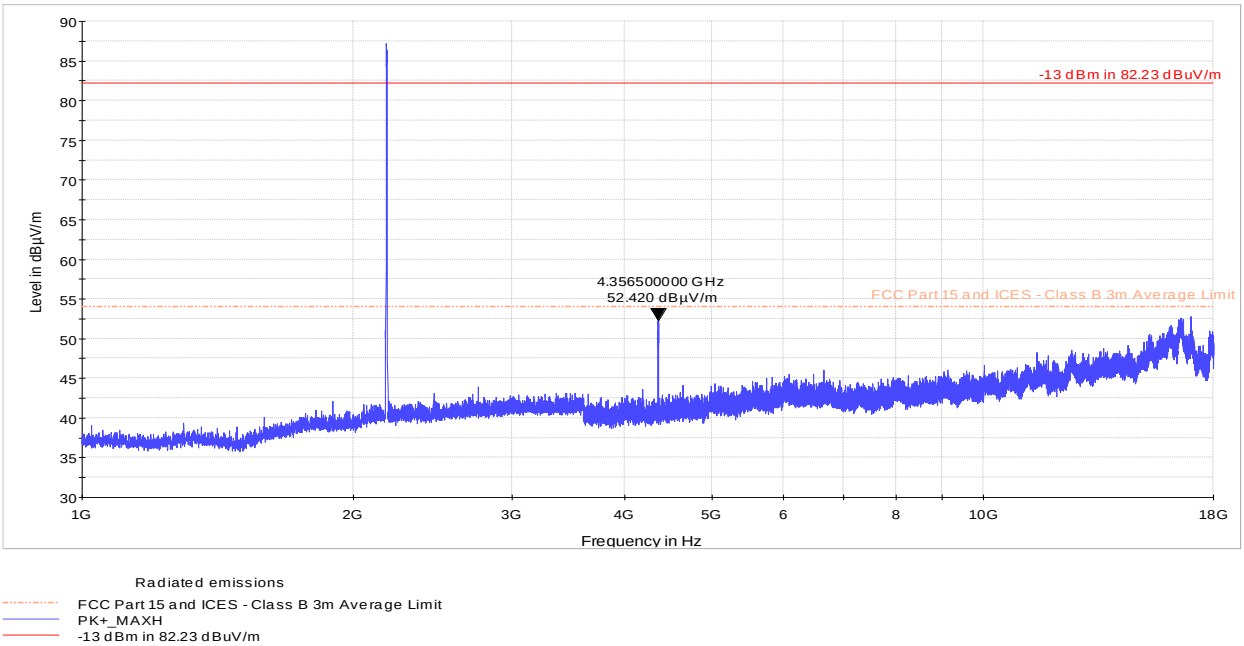



***Figure 8.3-9:*** *Radiated emissions spectral plot, LTE, high channel (1–18 GHz)*

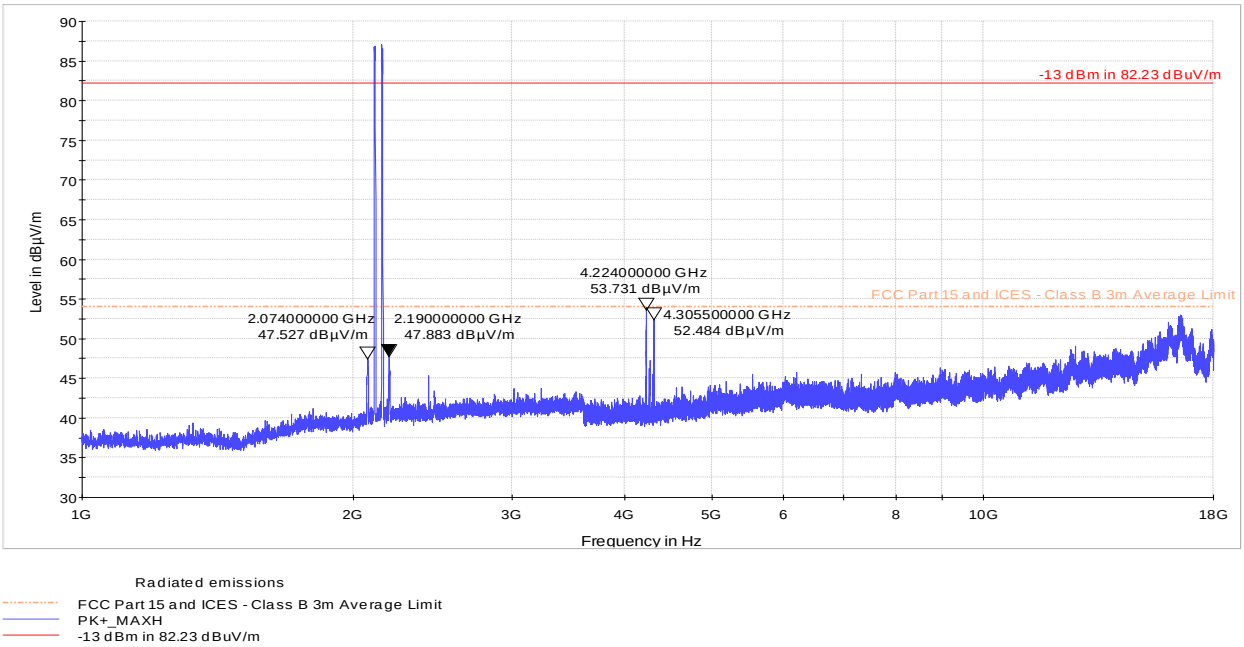



***Figure 8.3-10:*** *Radiated emissions spectral plot, LTE, two carriers at the bottom of the band (1–18 GHz)*

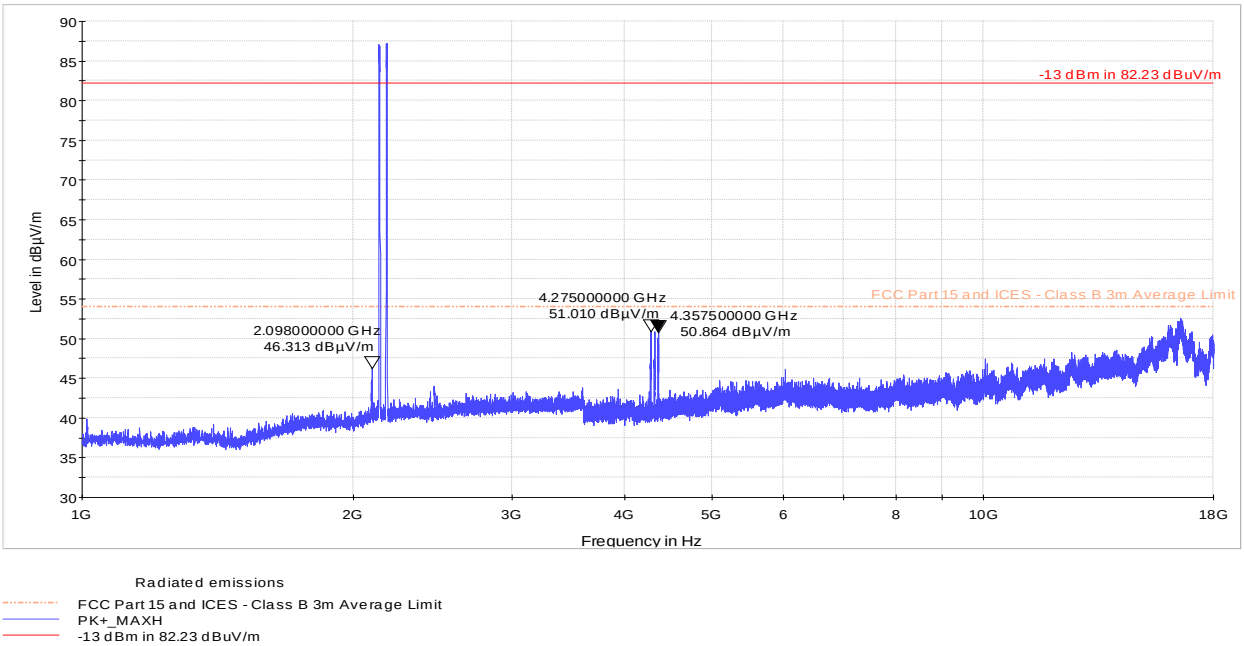
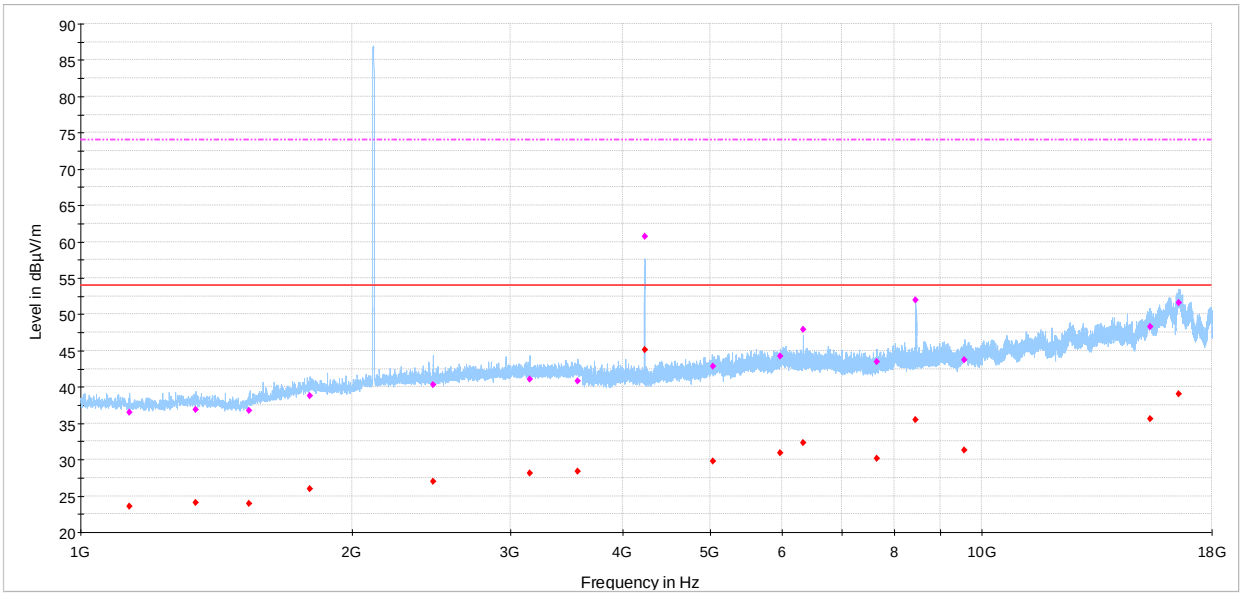



***Figure 8.3-11:*** *Radiated emissions spectral plot, LTE, two carriers at the top of the band (1–18 GHz)*




The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

***Figure 8.3-12:*** *Radiated emissions spectral plot, LTE (1 to 18 GHz)*

***Table 8.3-2:*** *Radiated emissions (Peak) results for LTE*

| Frequency (MHz) | Peak field strength (dBµV/m) | 3 m Peak limit (dBµV/m) | Margin (dB) | Measurement time (ms) | Bandwidth (kHz) | Antenna height (cm) | Pol. (V/H) | Turn table position (°) | Correction factor[2] (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4224.882143 | 60.71 | 74.00 | 13.29 | 100 | 1000 | 257.8 | H | 270.0 | -7.8 |
| 8446.567857 | 51.97 | 74.00 | 22.03 | 100 | 1000 | 155.6 | H | 136.0 | -2.0 |
| 16533.335714 | 51.58 | 74.00 | 22.42 | 100 | 1000 | 331.7 | V | 291.0 | 12.4 |
| 15391.728571 | 48.22 | 74.00 | 25.78 | 100 | 1000 | 354.6 | H | 194.0 | 7.5 |

***Table 8.3-3:*** *Radiated emissions (CAverage) results for LTE*

| Frequency (MHz) | CAverage field strength[1] (dBµV/m) | 3 m CAverage limit (dBµV/m) | Margin (dB) | Measurement time (ms) | Bandwidth (kHz) | Antenna height (cm) | Pol. (V/H) | Turn table position (°) | Correction factor[2] (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4224.882143 | 45.15 | 54.00 | 8.85 | 100 | 1000 | 257.8 | H | 270.0 | -7.8 |
| 16533.335714 | 39.04 | 54.00 | 14.96 | 100 | 1000 | 331.7 | V | 291.0 | 12.4 |
| 15391.728571 | 35.57 | 54.00 | 18.43 | 100 | 1000 | 354.6 | H | 194.0 | 7.5 |
| 8446.567857 | 35.48 | 54.00 | 18.52 | 100 | 1000 | 155.6 | H | 136.0 | -2.0 |

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 45.15 dBµV/m (field strength) = 52.95 dBµV (receiver reading) + (−7.8) dB (Correction factor)

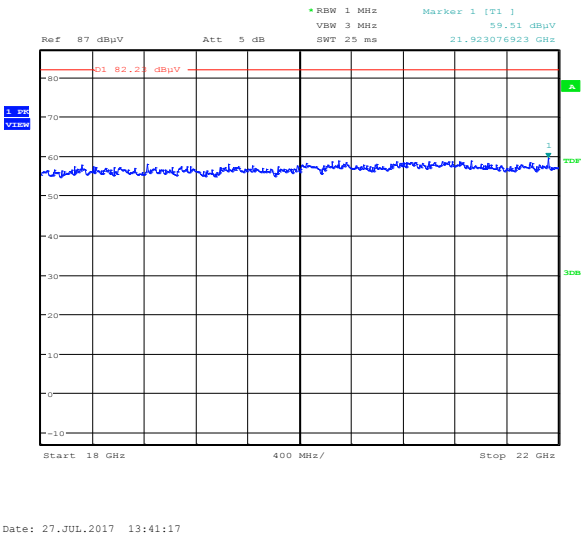



***Figure 8.3-1:*** *Radiated emissions spectral plot, LTE, low channel (18–22 GHz)*

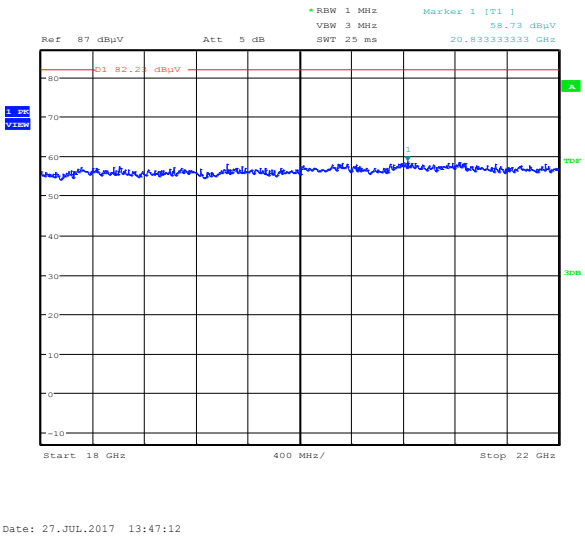



***Figure 8.3-2:*** *Radiated emissions spectral plot, LTE, mid channel (18–22 GHz)*

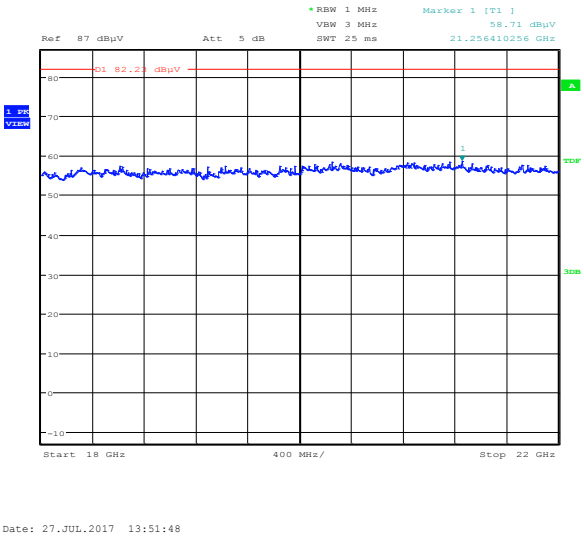



***Figure 8.3-3:*** *Radiated emissions spectral plot, LTE, high channel (18–22 GHz)*

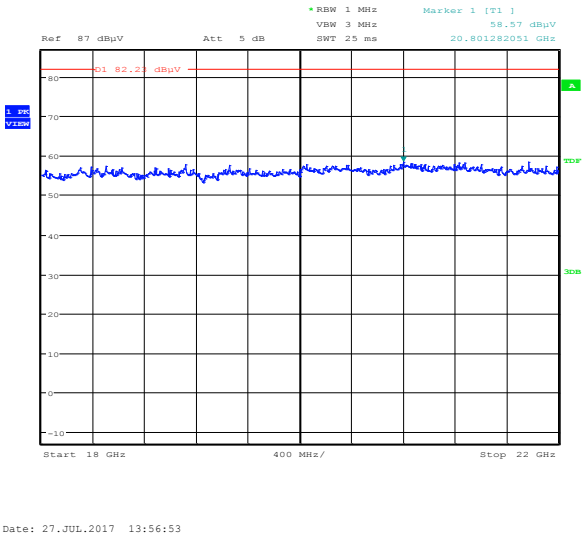



***Figure 8.3-4:*** *Radiated emissions spectral plot, LTE, two carriers at the bottom of the band (18–22 GHz)*

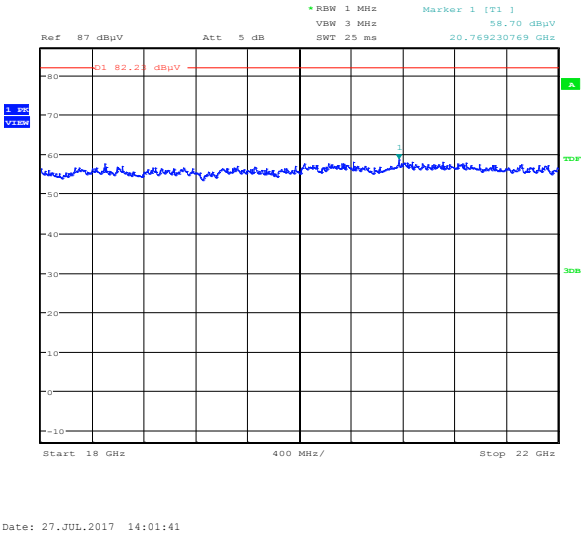



***Figure 8.3-5:*** *Radiated emissions spectral plot, LTE, two carriers at the top of the band (18–22 GHz)*