

## Annex E – Spurious Emissions 15.209

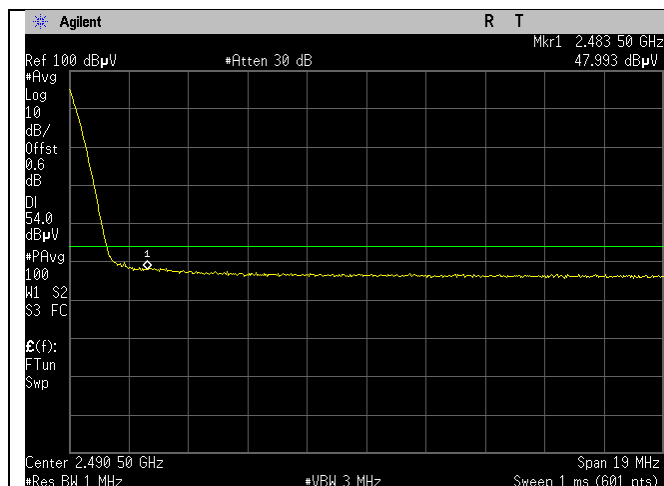
Note: below measurements are in units of dBuV/m at 3meters. These measurements are performed conducted in lieu of radiated as permitted by ANSI C63.10-2020. The following formula was used in making such conversions:

Above 1GHz:  $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] - 20 \log(d[\text{m}]) + 104.77$ , where E is field strength and d is distance at which the field strength limit is specified in the applicable requirements.  $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2$ , for  $d = 3 \text{ m}$ . Straight conversion between  $E[\text{dB}\mu\text{V}/\text{m}]$  and  $\text{EIRP}[\text{dBm}] = 107$ . Thus offset for dBuV/m at 3meters is  $95.2 - 107 + \text{antenna gain}$ . 2dBi antenna gain to be assumed if actual is less than 2dBi.

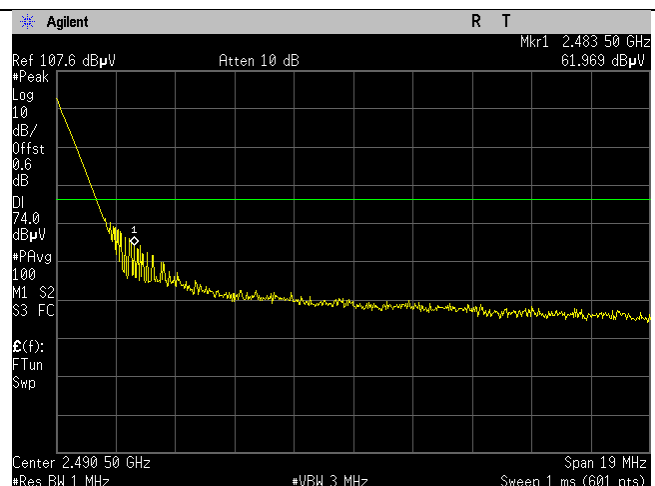
Note: cable loss is also included into offset.

### Naming Convention

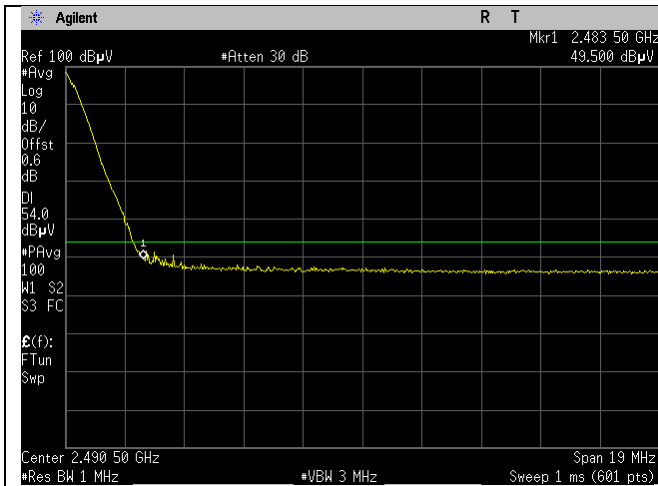
Radio (WIFI, BLE)\_Channel (Low Ch, Mid Ch, High Ch)\_Frequency (MHz)\_Bandwidth (MHz BW)\_Rate/Mode(b-mode, g-mode, n-mode ,Mbit)\_Measurement (15.209)\_Range (MHz, Lower Band Edge, Upper Band Edge, Peak, Avg)



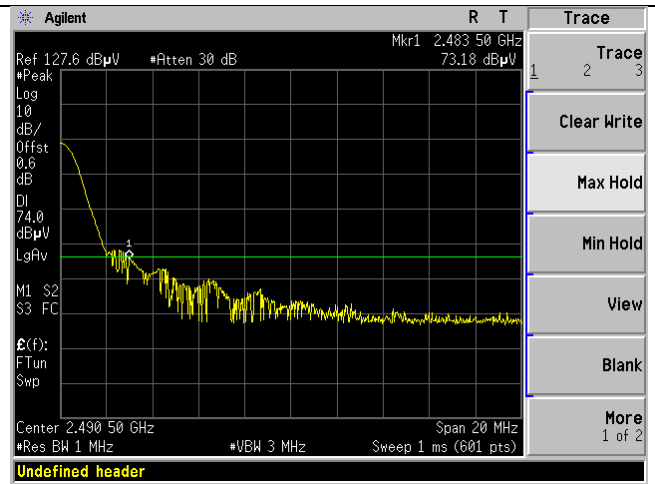
BLE\_High Ch\_2480MHz\_1MBit\_15.209\_Upper  
Band Edge Avg



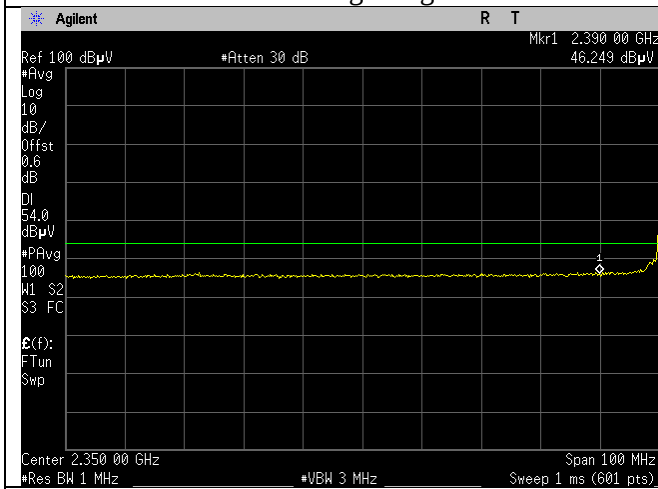
BLE\_High Ch\_2480MHz\_1MBit\_15.209\_Upper  
Band Edge Peak



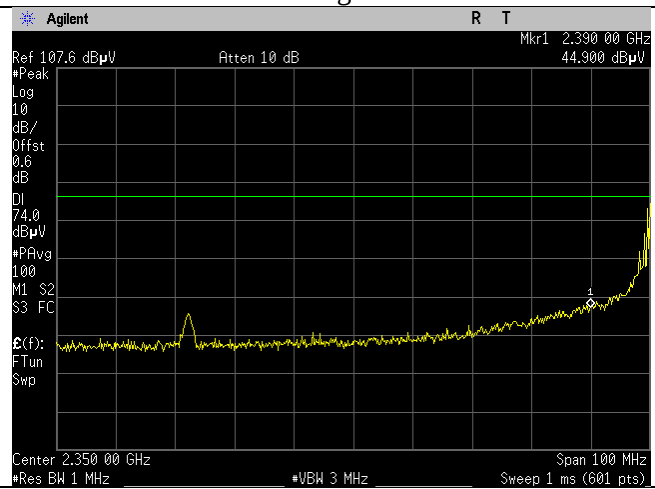
BLE\_High Ch\_2480MHz\_2MBit\_15.209\_Upper  
Band Edge Avg



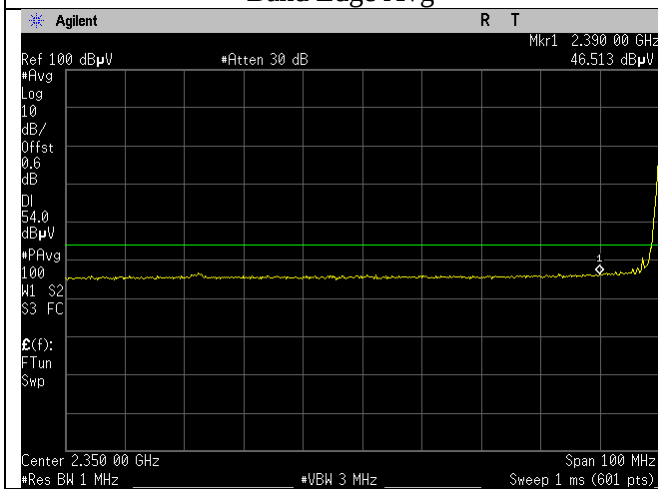
BLE\_High Ch\_2480MHz\_2MBit\_15.209\_Upper  
Band Edge Peak



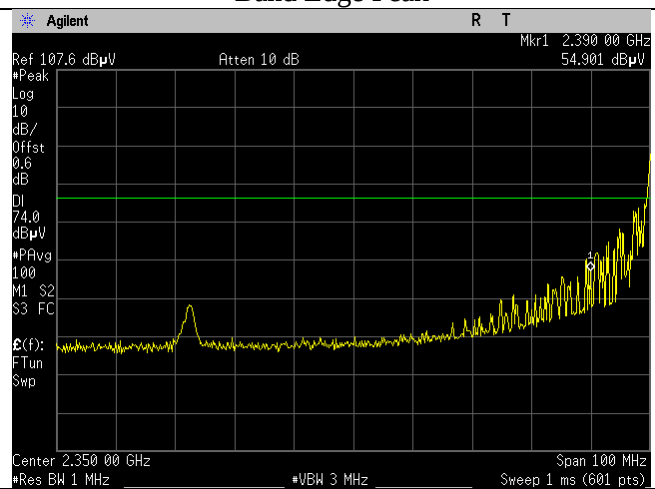
BLE\_Low Ch\_2402MHz\_1MBit\_15.209\_Lower  
Band Edge Avg



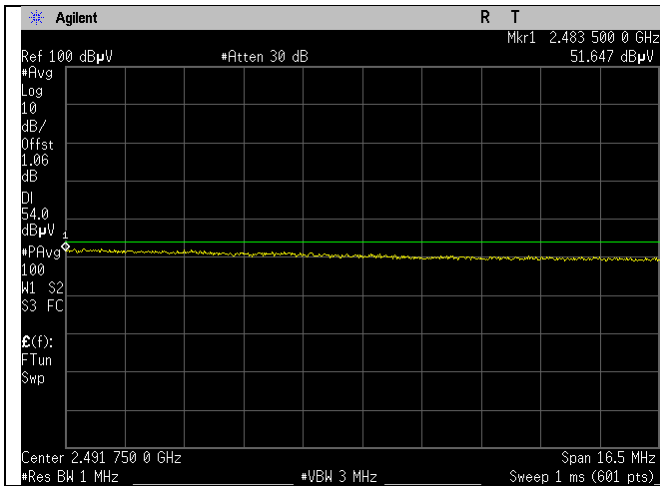
BLE\_Low Ch\_2402MHz\_1MBit\_15.209\_Lower  
Band Edge Peak



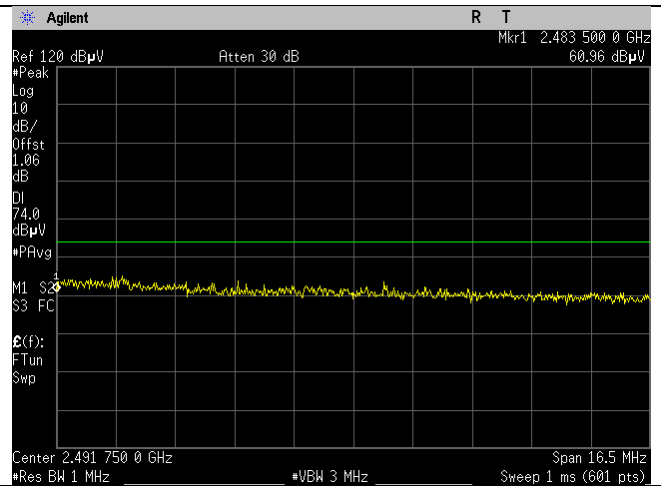
BLE\_Low Ch\_2402MHz\_2MBit\_15.209\_Lower  
Band Edge Avg



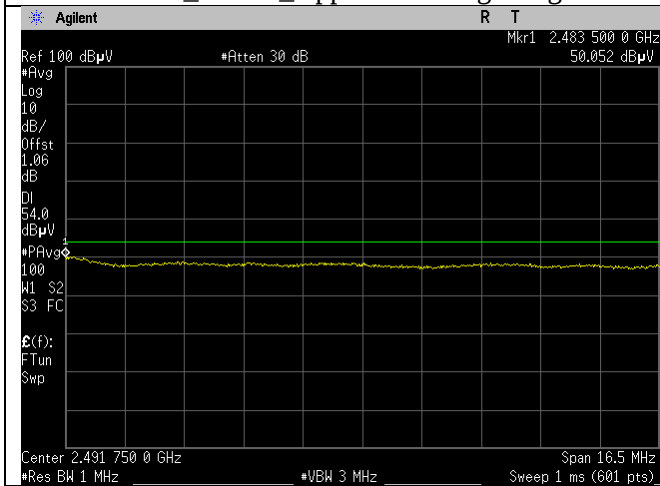
BLE\_Low Ch\_2402MHz\_2MBit\_15.209\_Lower  
Band Edge Peak



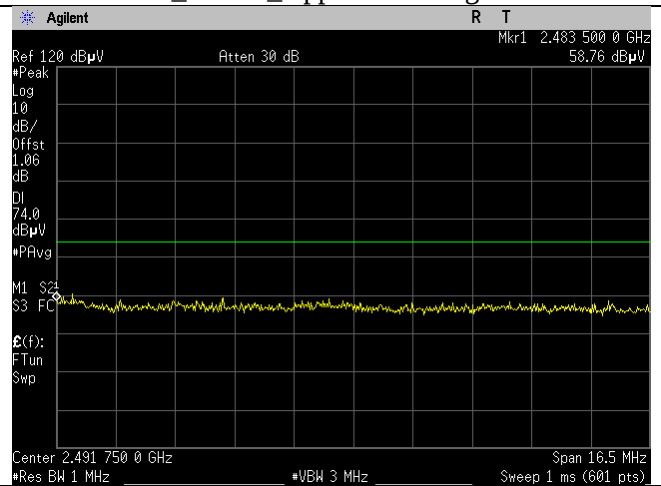
WIFI\_High Ch\_2452MHz\_40MHz BW\_n-mode\_15.209\_Upper Band Edge Avg



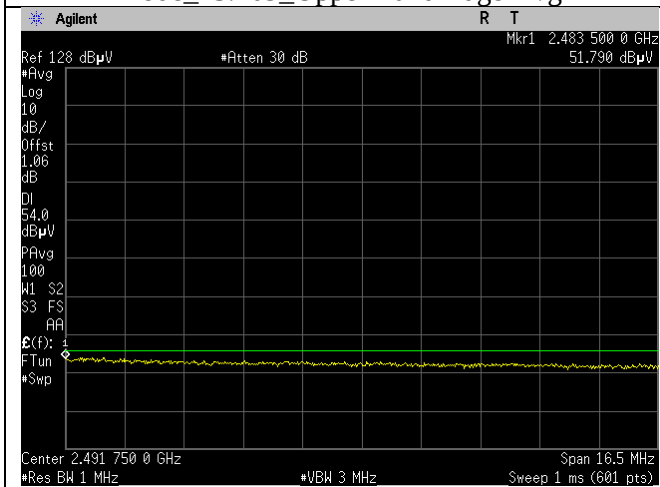
WIFI\_High Ch\_2452MHz\_40MHz BW\_n-mode\_15.209\_Upper Band Edge Peak



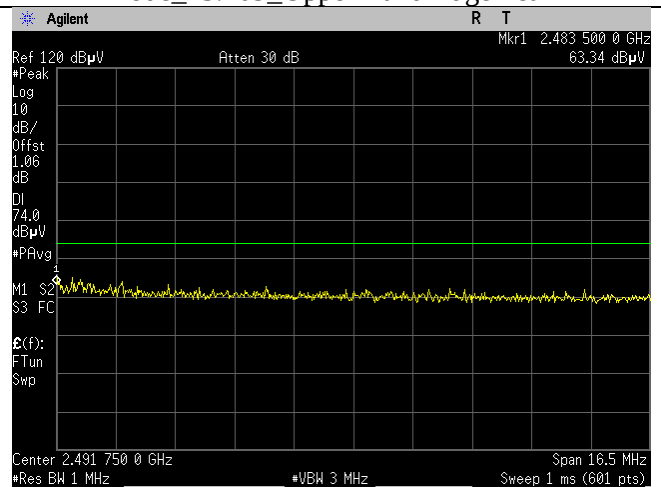
WIFI\_High Ch\_2462MHz\_20MHz BW\_b-mode\_15.209\_Upper Band Edge Avg



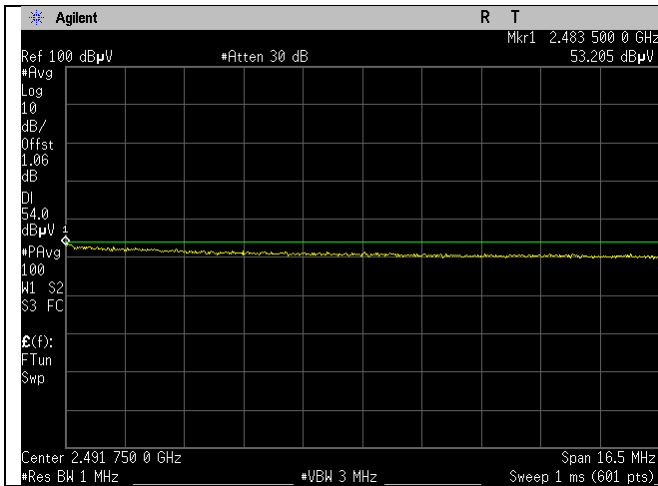
WIFI\_High Ch\_2462MHz\_20MHz BW\_b-mode\_15.209\_Upper Band Edge Peak



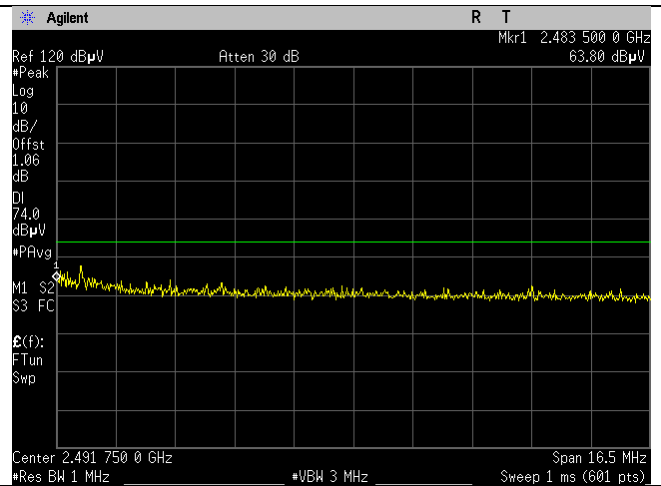
WIFI\_High Ch\_2462MHz\_20MHz BW\_g-mode\_15.209\_Upper Band Edge Avg



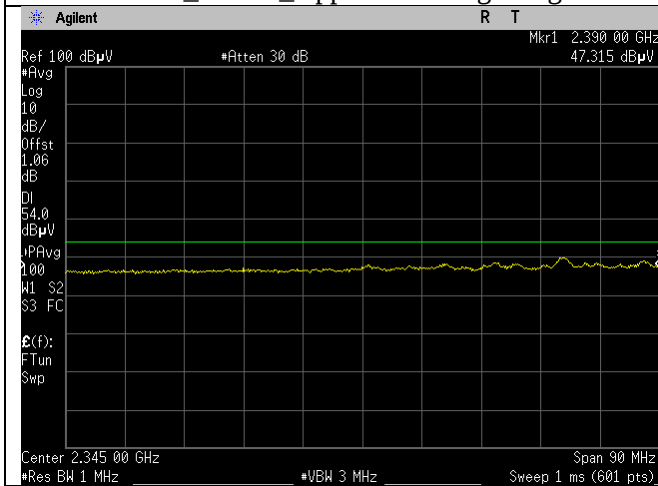
WIFI\_High Ch\_2462MHz\_20MHz BW\_g-mode\_15.209\_Upper Band Edge Peak



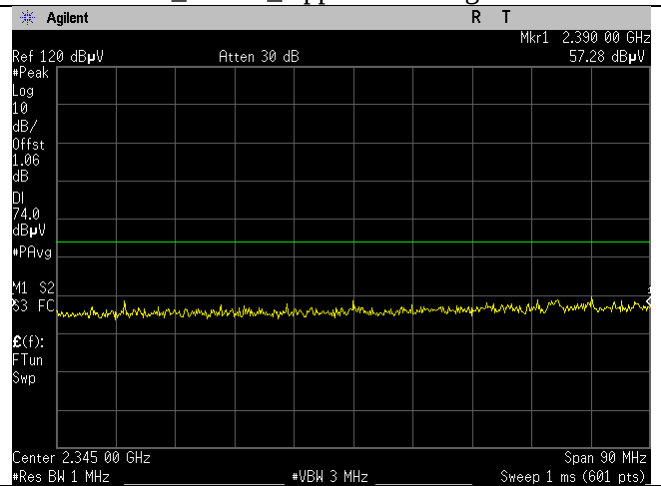
WIFI\_High Ch\_2462MHz\_20MHz BW\_n-  
mode\_15.209\_Upper Band Edge Avg



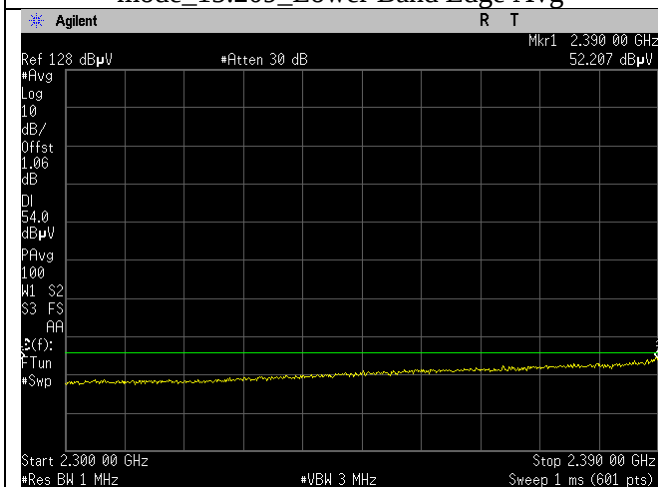
WIFI\_High Ch\_2462MHz\_20MHz BW\_n-  
mode\_15.209\_Upper Band Edge Peak



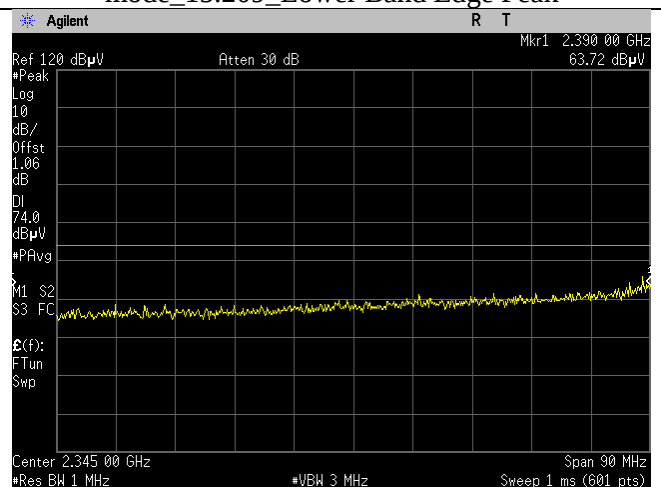
WIFI\_Low Ch\_2412MHz\_20MHz BW\_b-  
mode\_15.209\_Lower Band Edge Avg



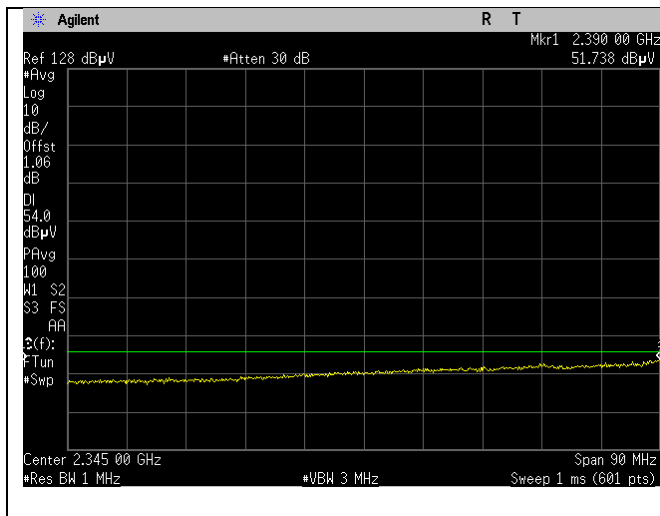
WIFI\_Low Ch\_2412MHz\_20MHz BW\_b-  
mode\_15.209\_Lower Band Edge Peak



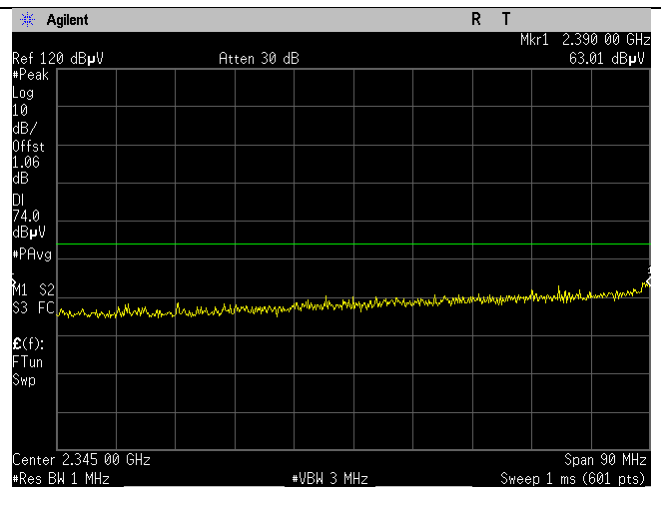
WIFI\_Low Ch\_2412MHz\_20MHz BW\_g-  
mode\_15.209\_Lower Band Edge Avg



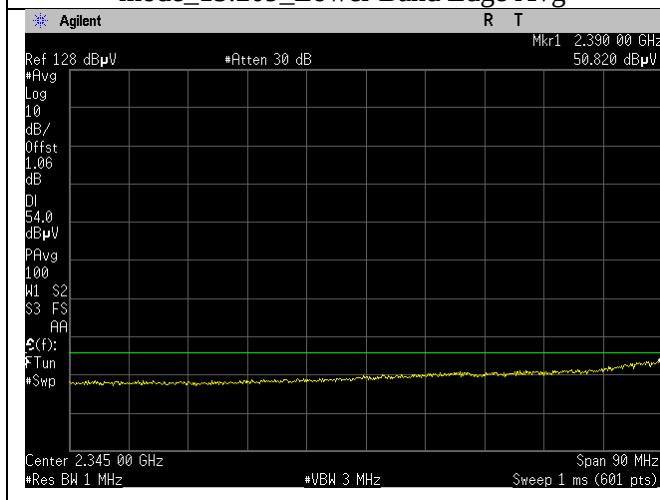
WIFI\_Low Ch\_2412MHz\_20MHz BW\_g-  
mode\_15.209\_Lower Band Edge Peak



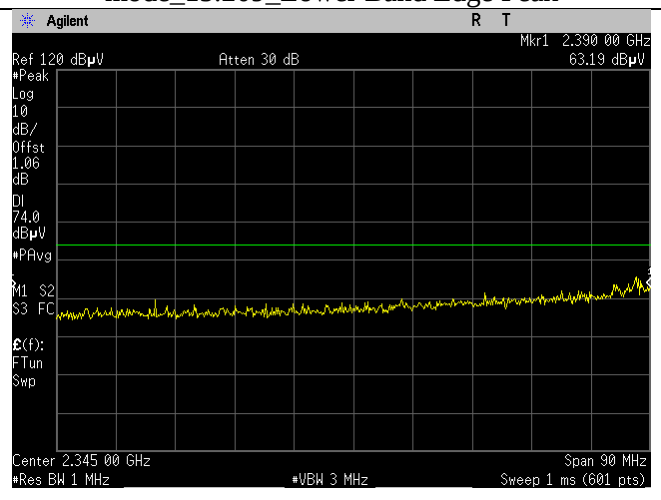
WIFI\_Low Ch\_2412MHz\_20MHz BW\_n-  
mode\_15.209\_Lower Band Edge Avg



WIFI\_Low Ch\_2412MHz\_20MHz BW\_n-  
mode\_15.209\_Lower Band Edge Peak



WIFI\_Low Ch\_2422MHz\_40MHz BW\_n-  
mode\_15.209\_Lower Band Edge Avg



WIFI\_Low Ch\_2422MHz\_40MHz BW\_n-  
mode\_15.209\_Lower Band Edge Peak

The below table applies an additional Duty Cycle Correction Factor (DCCF) to the above Average Band Edge measurements in order to accurately compare to the appropriate limit.

| Radio         | Frequency (MHz) | Configuration | BE (dBuV/m @3m) | BE Final (dBuV/m @3m) | Limit (dBuV/m @3m) | Margin (dB) |
|---------------|-----------------|---------------|-----------------|-----------------------|--------------------|-------------|
| 2.4 GHz Wi-Fi | 2412            | 802.11b       | 47.315          | 47.440                | 54                 | -6.56       |
|               | 2462            |               | 50.052          | 50.177                | 54                 | -3.823      |
|               | 2412            | 802.11g       | 52.207          | 53.028                | 54                 | -0.972      |
|               | 2462            |               | 51.79           | 52.611                | 54                 | -1.389      |
|               | 2412            | 802.11n20     | 51.738          | 53.859                | 54                 | -0.141      |
|               | 2462            |               | 53.205          | 53.896                | 54                 | -0.104      |
|               | 2422            | 802.11n40     | 50.82           | 53.110                | 54                 | -0.89       |
|               | 2452            |               | 51.647          | 53.937                | 54                 | -0.063      |
| 2.4 GHz BLE   | 2402            | 1 Mbps        | 46.249          | 46.940                | 54                 | -7.06       |
|               | 2480            |               | 47.993          | 48.684                | 54                 | -5.316      |
|               | 2402            | 2 Mbps        | 46.513          | 47.148                | 54                 | -6.852      |
|               | 2480            |               | 49.5            | 50.135                | 54                 | -3.865      |

Note: BE = Corrected Band Edge average measurement prior to applying DCCF.

Note: BE Final [dBuV/m@3m] = BE [dBuV/m@3m] + DCCF [dB]