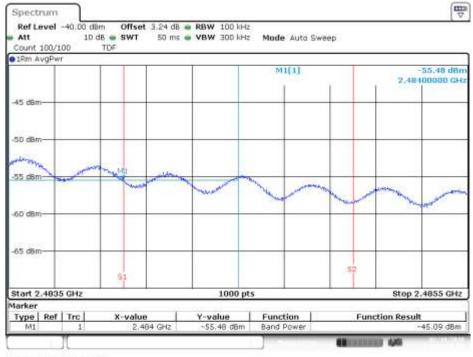
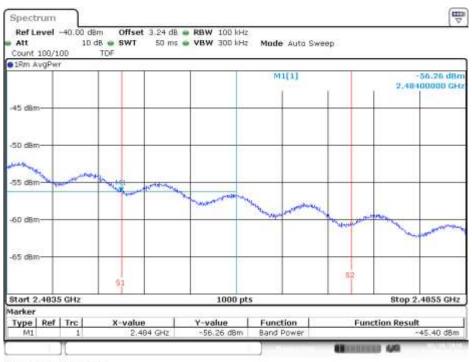


Channel 12 - BE High Freq Section RMS within 2MHz (restricted)



Date: 19 FEB.2018 10.4614

Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

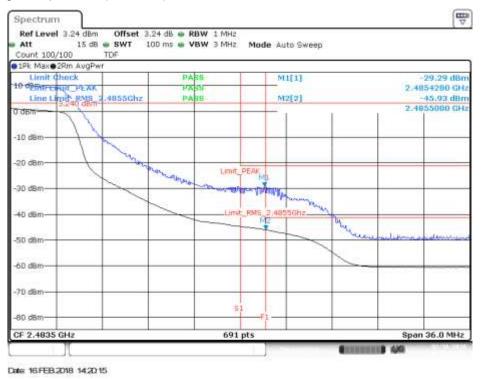


Date 19 FEB 2018 11:00.41

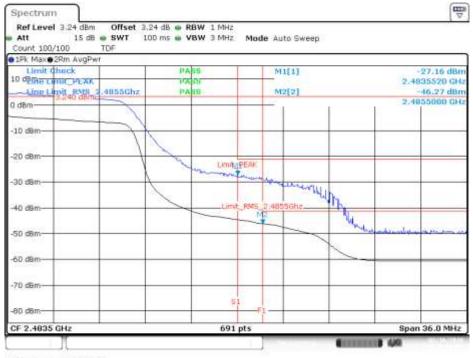


MIMO-A, 802.11n40, HT8

Channel 9F - BE High Freq Section (restricted)



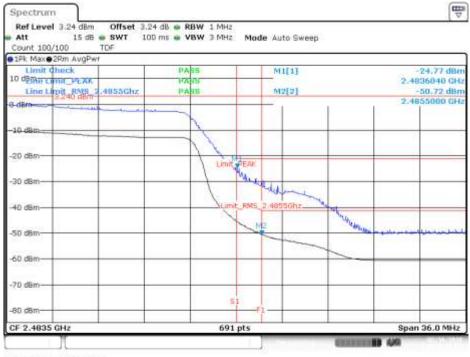
Channel 10F - BE High Freq Section (restricted)



Date 16.FEB.2018 14:29.04

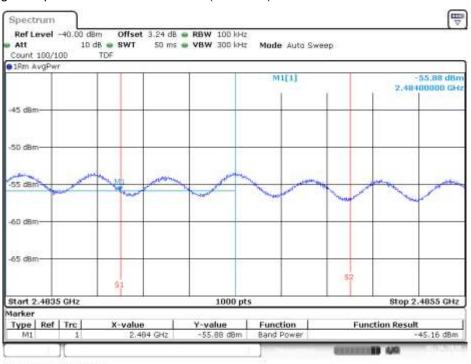


Channel 11F - BE High Freq Section (restricted)



Date 16.FEB.2018 15.16.19

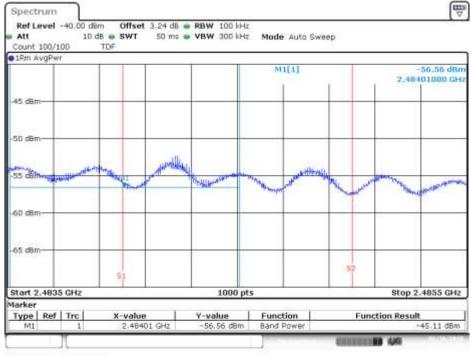
Channel 9F - BE High Freq Section RMS within 2MHz (restricted)



Date: 16.FEB.2018 14:19:30

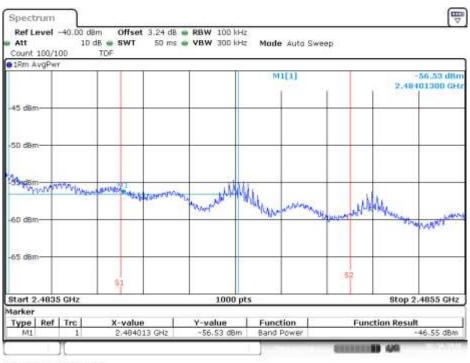


Channel 10F - BE High Freq Section RMS within 2MHz (restricted)



Date 16.FEB.2018 14.28:30

Channel 11F - BE High Freq Section RMS within 2MHz (restricted)

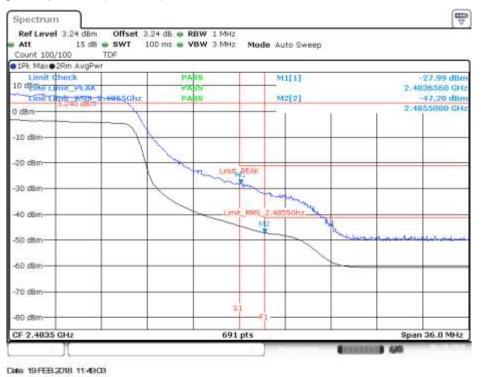


Date 16.FEB.2018 15.17.01

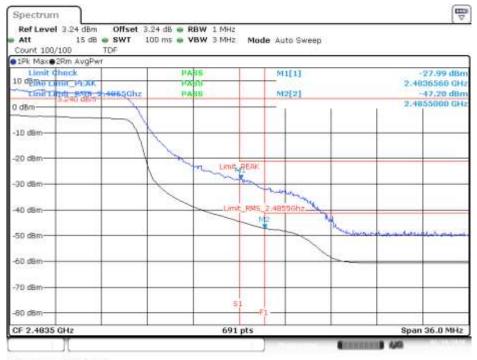


MIMO-B, 802.11n40, HT8

Channel 9F - BE High Freq Section (restricted)



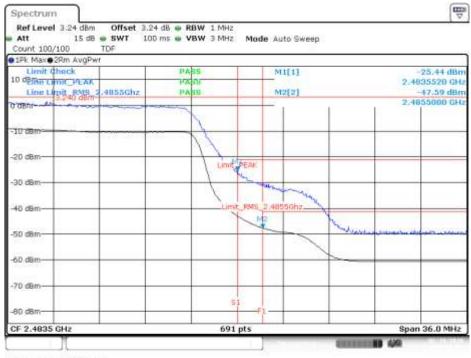
Channel 10F - BE High Freq Section (restricted)



Date: 19/FEB.2018 11:49:03

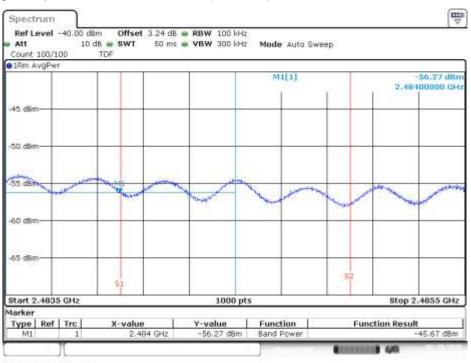


Channel 11F - BE High Freq Section (restricted)



Date 19 FEB 2018 12 00 09

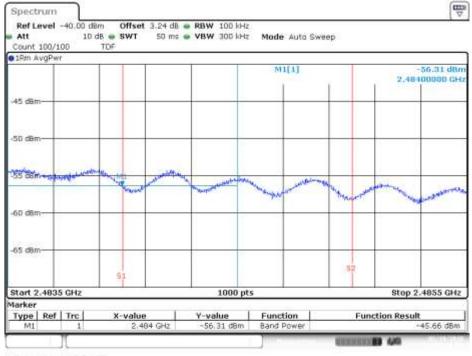
Channel 9F - BE High Freq Section RMS within 2MHz (restricted)



Date: 19 FEB.2018 11:41:17

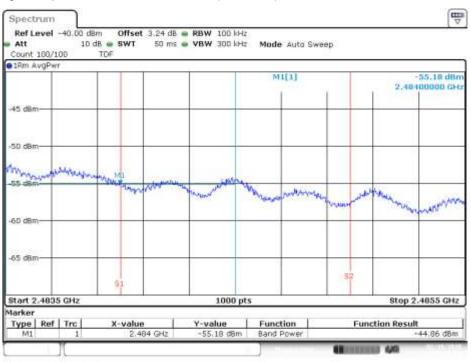


Channel 10F - BE High Freq Section RMS within 2MHz (restricted)



Date 19 FEB.2018 11:49:41

Channel 11F - BE High Freq Section RMS within 2MHz (restricted)



Date: 19 FEB.2018 11:59:36



B.3.7 Out of band emissions - spurious

SISO-A, 802.11b, 1Mbps



u U U Spectrum Ref Level 5.00 dBm Mode Auto Sweep STOP 1 Viev M1[1] 69,47 dBn 30.0000 MH 10 dBr -5.000 (D2[1] -39,11 dt 0 dBm 2.4419870 GH -10 dBm FXD -8.190 19Am -20 dBm -30 dBm 40 d8n -50 dBn 60 d8r Stop 9.0 GHz Start 30.0 MHz 90002 pts Spurious Emissions Frequency 2.44407 GHz 4.88399 GHz RBW Power Abs Range Low Range Up **ALimit** 100.000 kHz 100.000 kHz -200.00 dB -200.00 dB 3.000 GHz 6.000 GHz 10.77 dBm 47.24 dBm 30-000 MHz 3.000 GHz 6.000 GHz 9.000 GHz 100.000 kHz 7.32701 GHz 48.16 dBm 200.00 dB Marker Type | Ref | Trc Function Function Result X-value Y-value 2.442 GHz 30.0 MHz 2.441987 GHz -8.13 dBm -69.47 dBm D M1 -39.11 dB FDX D2 t 1 44

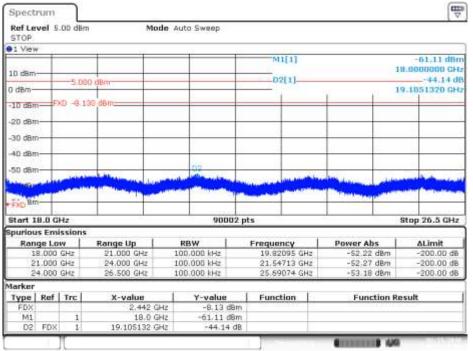
Date 15 FEB 2018 17:02:02

Channel 7 - Spurious 2 Delta Marker Measurement

| Ref Lev | el 5.0 | 0 dBm | | Mod | e Auto | s Sweep | | | | | | |
|---|--|-------------|--|-------------------|-------------------------------|--|--|-------------------------------------|-----|----------------------|-----------------------------------|--|
| 1 View | 5 m. | | <i>x</i> | 103 | | 20 | 62 | 14145-0 | | | | 2010/07/02/02 |
| 10 dam- | | 1.000 | | | | - | | -M1[1] | | | | -67.60 dBr 9.0000000 GH -37.51 d |
| 0 dBm- | | -5.000 | dBm | | | | | -orin- | | | 12 | 5.0696660 GH |
| -10 dBm- | FXD | -8.13 | døm | - | | | | + | | | - | Contraction of the |
| -20 dBm- | | | | - | | | | - | _ | - | - | |
| -30 dBm- | _ | | L | - | | | <u></u> | _ | | - | - | - 22 |
| -20 0000 | | | | | | | | | | | | |
| -40 dBm- | _ | | <u> </u> | - | _ | | - | - | | | 1 | 0.0 |
| -40 dBm- | | _ | | | _ | | | | - | _ | | DS |
| -40 dBm- -50 dBm- | | _ | | | | | | arte | 4.0 | المتغام | and and a second second | DE |
| -40 dBm- | | ing stated. | and the state of t | | d an | - | | | | | | PR. |
| -40 dBm- -50 dBm- | | | | | | | | | | | | De |
| -40 dBm -50 dBm -60 dBm -FXD | | | | | | 9000 | | | - | | | - |
| -40 dBm -50 dBm -60 dBm -60 dBm -500 Pm Start 9. | 0 GHz | | | | | 9000 | 2 pts | | | en ateri Terre en | | 5top 18.0 GHz |
| -40 dBm -50 dBm -60 dBm -Fx0 Pm Start 9.1 Spurious | 0 GHz | | Range U | P | RE | 9000 | 2 pts | quency | | Power | | - |
| -40 dBm -50 dBm -60 dBm -60 dBm -90 dB | 0 GHz s Emiss | sions | | | | | 2 pts Free | 100000 | Hz | | | Stop 18.0 CHz |
| -40 dBm -50 dBm -60 dBm FDD Start 9.1 Sparlous Rang 9 12 | 0 GHz 5 Emiss 10 00 GHz 1000 GH | sions | Range U 12.000 15.000 | GHz GHz | 100 100 | 3W 000 kHz | 2 pts Free 1 1 | 0.61605 G 4.98425 G | Hz | -60. -54. | Abs 32 dBm 23 dBm | Stop 18.0 GHz <u>ALImit</u> -200.00 dB -200.00 dB |
| -40 dBm -50 dBm -60 dBm FPC Start 9.1 Sporlous Rang 9 12 | 0 GHz 5 Emiss 1000 GH | sions | Range U | GHz GHz | 100 100 | w | 2 pts Free 1 1 | 0.61605 G | Hz | -60. -54. | Abs | Stop 18.0 GHz ALimit -200.00 dB |
| -40 dBm -50 dBm -60 dBm -60 dBm FRD Start 9.1 Spurious Rang 9 12 15 | 0 GHz 5 Emiss 10 00 GHz 1000 GH | sions | Range U 12.000 15.000 | GHz GHz | 100 100 | 3W 000 kHz | 2 pts Free 1 1 | 0.61605 G 4.98425 G | Hz | -60. -54. | Abs 32 dBm 23 dBm | Stop 18.0 GHz <u>ALImit</u> -200.00 dB -200.00 dB |
| -40 dBm -50 dBm -60 dBm -FXD Start 9.1 Spurious Rang 9 12 15 | 0 GHz s Emiss je Low .000 GH .000 GH | sions | Range U 12.000 15.000 | GHZ GHZ GHZ | 100 100 | 3W 000 kHz | 2 pts Free 1 1 1 | 0.61605 G 4.98425 G | Hz | -60. -54. -45. | Abs 32 dBm 23 dBm | Stop 18.0 GHz ALimit -200.00 dB -200.00 dB |
| -40 dBm -50 dBm -60 dBm -60 dBm -FND Start 9.1 Start 9.1 | 0 GHz s Emiss je Low .000 GH .000 GH | sions | Range U 12.000 15.000 18.000 X-va | GHZ GHZ GHZ | 100 100 | 3W .000 kHz .000 kHz .000 kHz | 2 pts Free 10 1 1 1 1 | 0.61605 G 4.98425 G 7.56686 G | Hz | -60. -54. -45. | Abs 32 dBm 23 dBm 16 dBm | Stop 18.0 GHz ALimit -200.00 dB -200.00 dB |
| -40 dBm -50 dBm -60 dBm -60 dBm -FRD Start 9.1 Spurious Rang 9 12 15 12 15 Marker Type FDX M1 | 0 GHz s Emiss je Low .000 GH .000 GH | sions | Range U 12.000 15.000 18.000 X-va 2 | GHZ GHZ GHZ | 100 100 100 4z 4z | 3W 000 kHz 000 kHz 000 kHz 000 kHz Y-value | 12 pts Free 11 12 12 12 12 12 12 12 12 12 12 12 12 | 0.61605 G 4.98425 G 7.56686 G | Hz | -60. -54. -45. | Abs 32 dBm 23 dBm 16 dBm | Stop 18.0 GHz ALimit -200.00 dB -200.00 dB |

Date 15 FEB 2018 17:02:27





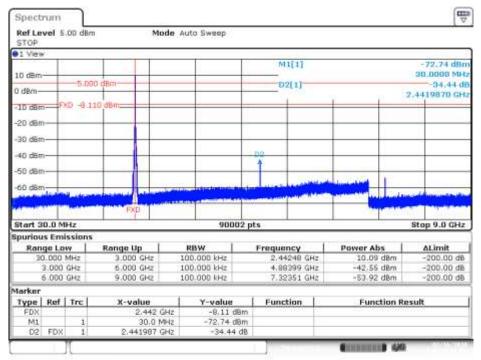
Channel 7 - Spurious 3 Delta Marker Measurement

Date 15 FEB 2018 17 02 52

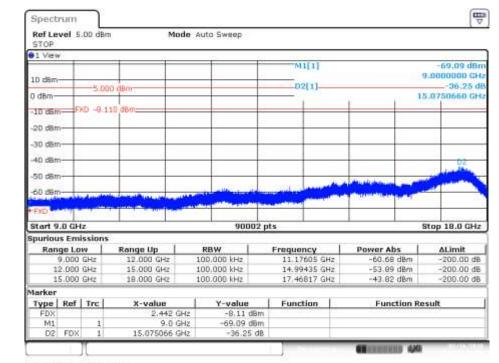


SISO-B, 802.11b, 1Mbps

Channel 7 - Spurious 1 Delta Marker Measurement



Date 16/FEB.2018 15:42:49



Channel 7 - Spurious 2 Delta Marker Measurement

Date 16.FEB.2018 15.43.15



Channel 7 - Spurious 3 Delta Marker Measurement

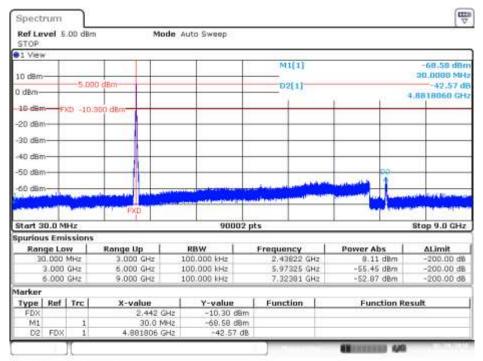
| Ref Le | vel 5 | .00 dBm | Mo | ie Au | to Sweep | | | | | | |
|---------|------------------|----------------|--|-------|----------------------|--------|-----------------------|-------------------|----------------|------------|--------------------------|
| 91 Viev | Й. н. | | x 300 | | 922 | 1.5 | 110 | 1482 | | | 2000 BR00 |
| 10 d8m | | | | | | | | 1[1] | | 18 | -60.18 dB 8.000000 GF |
| 0 dBm- | | -5.000 | dBm | | | | D | 2[1] | | | -44.30 d 9.0450340 GF |
| u asm- | | | | | | | | 1 | 9 | 1 1 | 1.0450340 GP |
| -10 cBh | n - P | KD -8.110 |) dBm: | | | | | | | - | |
| -20 dBn | - | | | | - | | 1 | | - | | |
| | | | | | | | | | | | - |
| -30 dBn | 0 | | | | | | | | | | |
| -40 dBn | 1 | | - | | - | - | _ | - | - | | |
| -50 dBn | | | | | 12 | 0 | _ | | | | |
| -Se den | | and Production | A COLORED TO A COL | | - Million | | | and an other last | and the second | a malately | and the second |
| ALC: NO | | | The second se | - | of the second second | | | - | - | | |
| FXD Bn | | | | | | - | | | | | |
| Start 1 | 8.0 G | Hz | 1 1 | | 9000 | 12 pts | | | 1 | 1 | Stop 26.5 GHz |
| spuriou | is Em | ssions | | | | | | | | | |
| Ran | ge Lo | w | Range Up | R | BW | F | eque | ncy | Power / | Abs | ALimit |
| | 8.000 | | 21.000 GHz | | 0.000 kHz | | and the second second | 1385 GHz | | +4 dBm | -200.00 dB |
| | 1.000 | | 24.000 GHz | | 0.000 kHz | | | 9733 GHz | | 7 dBm | -200.00 dB |
| . 2 | 4.000 | GH2 | 26.500 GHz | 10 | 0.000 kHz | | 25.7 | 1740 GHz | -53.4 | 2 dBm | -200.00 dB |
| Marker | | | | | | | | | | | |
| Туре | Ref | Trc | X-value | | Y-value | | Func | tion | Fu | iction Re | sult |
| FDX | 1.000 | 1221204 | 2.442 G | | -8.11 d | | 630.005 | euces pi | | | 2001 |
| M1 | | 1 | 18.0 G | 42 | -60.10 d | 8m | | | | | |

Date 16 FEB 2018 15 43 40



SISO-A, 802.11g, 6Mbps

Channel 7 - Spurious 1 Delta Marker Measurement



Date 20 FEB.2018 10:55:40

₩ Spectrum Ref Level 5.00 dBm Mode Auto Sweep STOP 1 View M1[1] 69,37 dBn 9.0000000 CH 10 dan -34.59 di 5.000 d D2[1] 0 dBm 15.0646660 GH 10 d8 FXD -10.300 dBm -20 dBm -30 dBm 40 dBn 50 dBtr 60 Start 9.0 GHz 90002 pts Stop 18.0 GHz Spurious Emissions Range Up 12.000 GHz 15.000 GHz Range Low RBW Frequency 10.63445 GHz **Power Abs ALimit** -200.00 dB -200.00 dB .000 GHz 100.000 kHz 59.07 dBm 14.99985 GHz 17.54307 GHz 12.000 GHz 100.000 kHz -53.97 dBm 15.000 GHz 18.000 GHz 100.000 kHz 44.05 dBm 200.00 dB larker Type | Ref | Trc X-value Y-value Function **Function Result** 2.442 GHz 9.0 GHz 15.064666 GHz -10.30 dBm -69.37 dBm ED) Μ1 FDX -34.59 dB 02 Constanting 449

Channel 7 - Spurious 2 Delta Marker Measurement

Date 20 FEB 2018 10:58:05



Channel 7 - Spurious 3 Delta Marker Measurement

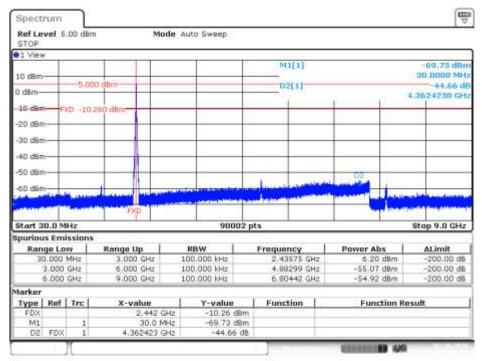
| STOP | vel 5 | .00 dBm | Mo | de Aut | to Sweep | | | | | |
|-----------------------|-------|-----------------|--|--------|--------------------------|---------------------|----------|----------------|-----------------|------------------------|
| 1 Vier | ¥2 | | 10 VOI | | 92 | 12 23 | 14922 | | | See Desiry 1 |
| 10 dām | | | | | | 1 | 11[1] | | | -62.01 dB 000000 GF |
| - | - | -5.000 | dBm | | | D | 2[1] | | | -42.54 d |
| 0 dBm- | | | | | | | 1 | x = v | 17.3 | 614500 GH |
| 10 dBt | R-FT | CD -10.30 | 00 dBm | | - | | | | | - |
| -20 dBr | | 10 20 - | | | | 1 | | | | |
| | | | | | | | | | | |
| -30 dBr | n | | | | 1 | | | + + | | - |
| -40 dBr | n | | | | - | | | - | | - |
| 12.1 | 1. | | | | | | | - | | |
| -50 dBt | n | Contract of the | CONTRACTOR OF | . dist | A STATE OF STATE | | L. HALL | | . Carlo | in the second |
| - number | | | The state of the second s | | and Ballin street of the | All a state | | and the second | | - |
| FIXD Br | n | | | | a second a | None and the second | | and the set of | CALCULAR STREET | |
| Start 1 | 5.0.1 | Hz | | | 9000 | 12 pts | - | | Sto | p 26.5 GH: |
| Inueiou | is Em | issions | | | | | | | 0.011 | |
| and the second second | ge Lo | | Range Up | R | BW | Freque | incy | Power Abs | 1 | ALimit |
| | 8.000 | | 21.000 GHz | | 0.000 kHz | | 0345 GHz | -52.84 d | | -200.00 dB |
| 2 | 1.000 | GHz | 24.000 GHz | 10 | 0.000 kHz | 21.6 | 4763 GHz | -52.66 d | Brn | -200.00 dB |
| 2 | 4.000 | GH2 | 26.500 GHz | 10 | 0.000 kHz | 25.6 | 9374 GHz | -53.29 d | Bm | -200.00 dB |
| | | | | | | | | | | |
| larker | Ref | Trc | X-value | | Y-value | Fund | tion | Functi | on Resu | lt |
| larker | | 2.59.59 | 2,442 0 | | -10.30 d | | 10030 | | 2000000000 | a |
| Type FDX | 1994 | | | | | | | | | |
| larker Type | 19650 | 1 | 18.0 0 | | -62.01 d | | | | | |

Date: 20 FEB 2018 10:58:30

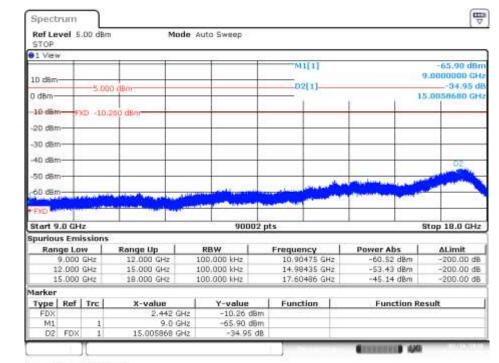


SISO-B, 802.11g, 6Mbps

Channel 7 - Spurious 1 Delta Marker Measurement



Date 16.FEB.2018 16.28.49



Channel 7 - Spurious 2 Delta Marker Measurement

Date 16.FEB.2018 16:29.14



Channel 7 - Spurious 3 Delta Marker Measurement

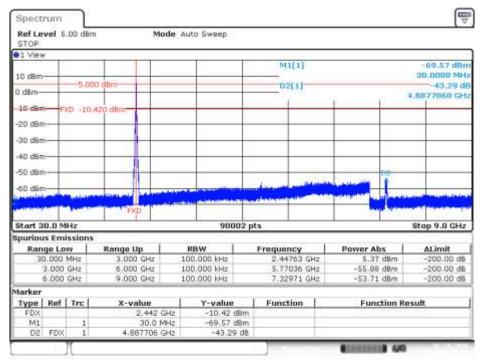
| STOP. | | .00 dBm | | ac Au | to Sweep | | | | |
|---------|-------|-------------|-----------------------|-------|-----------------|------------------------------|-----------|---|-----------------------------------|
| 1 View | ê | | v 103 | | 00 | 151 151 | 14922 | | 2010-202 |
| 10 d8m | | | | | | 1 | 11[1] | | -60,03 dt 18.000000 c |
| 0 dBm- | | -5.000 | dBm | | | D | 2[1] | | -42.55 19.0388340 G |
| 0 dBen- | | | | | | | 1 | 7 P | 19.0306340 6 |
| 10-d8m | s-F | 0 -10.20 | 0 dBen | | - | | | | |
| -20 dBm | - | | | | - | <u>.</u> | | | 1 |
| | | | | | | | | | |
| -30 dBm | 1 | | | | | | | | |
| -40 dBm | - | | - | | - | - | | - | |
| -50 dBm | 1 | | | | hai | ÷ | | | |
| 1 | · | Jun al male | and the second second | lines | and so that is | and the second second second | | and | and the second second |
| Te | | | 1 | - | a Charles and a | and the second division of | ALL DOG | and the second second | and the state of the state of the |
| FXD Bin | + | | | | | | | | |
| Start 1 | 8.0 G | Hz | | | 9000 | 12 pts | | 1 12 | Stop 26.5 GF |
| spuriou | s Em | ssions | | | | | | | |
| Ran | ge Lo | w | Range Up | R | BW | Freque | incy | Power Abs | ∆Limit |
| 1 | 8.000 | GHz | 21.000 GHz | 10 | 0.000 kHz | 19.9 | 1765 GHz | -53.14 dBr | n -200.00 c |
| | 1.000 | | 24.000 GHz | | 0.000 kHz | | 6733 GHz | -52,22 dBr | |
| 2 | 4.000 | GHz | 26.500 GHz | 10 | 0.000 kHz | 25.9 | 6306 GHz | -53.81 dBr | n -200.00 d |
| Marker | | | | | | | | | |
| Type | Ref | Trc | X-value | | Y-value | Fund | tion | Function | n Result |
| FDX | 1.000 | 2,2412,2 | 2.442 G 18.0 G | | -10.26 d | | 100000 21 | 100000000000000000000000000000000000000 | 2002/12/2020 |
| M1 | | 1 | | | | | | | |

Date 16.FEB.2018 16:29:40

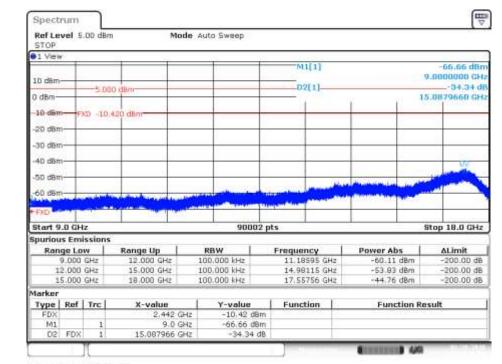


SISO-A, 802.11n20, HT0

Channel 7 - Spurious 1 Delta Marker Measurement



Date 20 FEB 2018 11:13:52



Channel 7 - Spurious 2 Delta Marker Measurement

Date 20 FEB 2018 11:14:17



Channel 7 - Spurious 3 Delta Marker Measurement

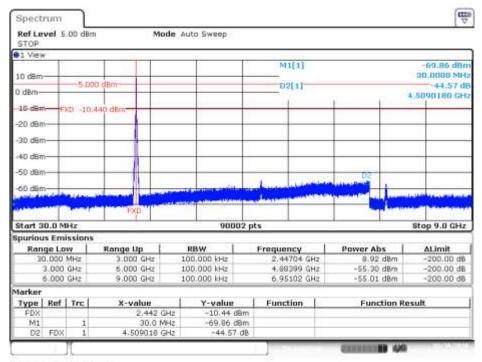
| STOP | vel 5 | .00 dBm | | Mode | Auto Sweep | | | | | |
|--|---|--------------------------|---|----------|--|----------------------------------|-------------------------------------|----------------------------|-------------------|--|
| 91 Viev | 93 I.I. | | 3.5 | 502 | 92 | | 0482 | | | Manager M |
| 10 dam | | | | | | 1 | M1[1] | | 1 | -58.73 dB 8.000000 CF |
| 0 dBm- | | -5.00 | 0 dBm | - | - | 11 2 | D2[1] | | i. | -41,93 d |
| Sec. | | | and and a | | | | 1 | 1 1 | | |
| 10-d8n | n Fi | XD -10,4 | 20 dBm | - | _ | - | | | - | |
| -20 dBh | n | | | - | - | - | - | - | | |
| | 1 | | | | | 0 | | | | |
| -30 dBn | n | | | | | | | | | |
| | | | | | | | | | | |
| -40 dBn | n | | | - | | - | - | | - | |
| | 8. | | 02 | | | 1 | | - | | |
| -40 dBr -50 dBr | 8. | والمعامر ال | DP Line | | and a barren ster | | | | | |
| | 8. | | 07 | | | | | | awett | |
| | | | 07 | | | | | | | |
| -50 dan | n | Hz | .02 | | | 02 pts | | | | Stop 26.5 GHz |
| -50 dBn -Fxo Bn Start 1 | n | Hz | .02 | | | 02 pts | | | | Stop 26.5 GH |
| -50 dBn -Pxo Bn Start 1 Spuriou Ran | n LB.0 G US Emi | issions w | Range Up | | | | Jency | Power Ab | | Stop 26.5 GH |
| -50 dBn -Fx0 ^{-Bn} Start 1 Spuriou Ran | n 18.0 G Is Emi ige Lo 8.000 | issions w GHz | 21.000 G | | 900 RBW 100.000 kHz | Frequ 19. | 88825 GHz | -52.35 | dBm | ∆Limit -200.00 d€ |
| -50 dBr -Fico Br Start 1 Spuriou Ran 1 2 | n 18.0 G 19 Emi 19 Co 8.000 1.000 | GHz GHz | 21.000 G | Hz | 900 RBW 100.000 kHz 100.000 kHz | Freq. 19. 21. | 98825 GHz 50513 GHz | -52.35 -51.23 | dBm dBm | -200.00 de |
| -50 dBr -Fico Br Start 1 Spuriou Ran 1 2 | n 18.0 G Is Emi ige Lo 8.000 | GHz GHz | 21.000 G | Hz | 900 RBW 100.000 kHz | Freq. 19. 21. | 88825 GHz | -52.35 | dBm dBm | ∆Limit -200.00 d€ |
| 50 dBn Fic Bn Start 1 Spuriou Ran 1 2 2 4arker | n 18.0 G 15 Em 1990 Lo 1,000 1,000 | GHz GHz GHz GHz | 21.000 G | Hz | 900 RBW 100.000 kHz 100.000 kHz | Freq. 19. 21. 25. | 88825 GHz 50513 GHz 23208 GHz | -52.35 -51.23 -53.65 | dBm dBm dBm | ▲Limit -200.00 dt -200.00 dt -200.00 dt |
| 50 dBr Pic Br Start I Spurios Ran 1 2 2 Marker Type | n 18.0 G 15 Em 1990 Lo 1,000 1,000 | GHz GHz GHz GHz | 21.000 G 24.000 G 26.500 G X-valu | Hz Hz | 900 RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz Y-value | Freq. 19. 21. 25. | 98825 GHz 50513 GHz | -52.35 -51.23 -53.65 | dBm dBm | ▲Limit -200.00 df -200.00 df -200.00 df |
| 50 dBn Fic Bn Start 1 Spuriou Ran 1 2 2 4arker | n 18.0 G 15 Em 1990 Lo 1,000 1,000 | GHz GHz GHz GHz | 21.000 G 24.000 G 26.500 G X-valu 2.1 | Hz | 900 RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz | Frequ 19. 21. 25. Fu | 88825 GHz 50513 GHz 23208 GHz | -52.35 -51.23 -53.65 | dBm dBm dBm | ▲Limit -200.00 df -200.00 df -200.00 df |

Date 20 FEB 2018 11:14:42

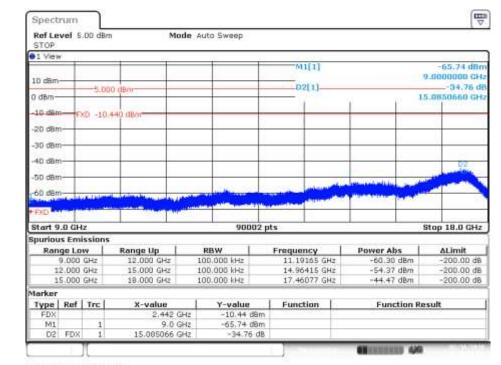


SISO-B, 802.11n20, HT0

Channel 7 - Spurious 1 Delta Marker Measurement



Date 16.FEB.2018 17:16:33



Channel 7 - Spurious 2 Delta Marker Measurement

Date 16 FEB 2018 17:17:05



Channel 7 - Spurious 3 Delta Marker Measurement

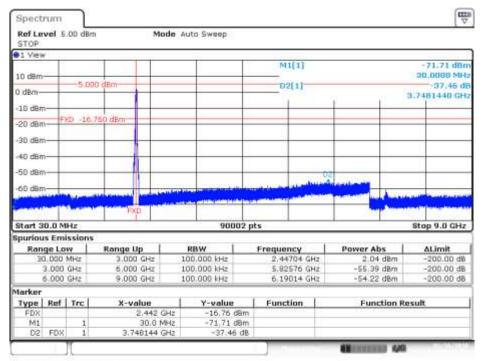
| STOP | vel 5 | .00 dBm | | Mode | Auto Sweep | | | | | |
|--|--|--------------------------|---|----------------|---|--------------------------|---|--|-------------------------------------|------|
| 1 Viev | ¥2 | | | 0 | 00 | | 10000 | | | 116 |
| 10 dam | | 110.31 | | | | | -M1[1] | | -61,42 | |
| 0 dBm- | - | -5.000 |) dBm | | | | _D2[1] | | -41,3 | |
| 2.22 | | | diana a | | | | 1 | 1 1 | | |
| -10 den | F | XD -10.4 | 40 dBor | _ | - | | _ | | | _ |
| -20 dBh | n- | | - | | - | - | - | - | | |
| - | 8 - E | | | | | | _ | | | |
| -30 dBn | 1 | | | | | | | | | |
| -40 dBn | n | | | | - | - | - | - | | |
| -50 dBn | | | 2 | | | 0 | | | | |
| | 1 | A CONTRACTOR OF | States Inde Serve | and the second | and a state of the second | | and the second de | and the second second second | And and the state | 4. |
| Contractor of the | and and | - | and the second second | | and the second second | and the second | and the second se | - Charles and a second s | | |
| | | | | | the second second second second | - | | | | |
| FRO BI | n | | | | | All have a set | | and a second sec | | |
| Start 1 | 51 mar 14 | Hz | | | 900 | 02 pts | | | Stop 26.5 (| 3Hz |
| Start 1 | 18.0 G | Hz | | | 900 | 02 pts | | | Stop 26.5 (| GH2 |
| Start 1 Spuriou | 18.0 G | issions | Range Up | 1 | 900 RBW | | quency | Power Abs | Stop 26.5 (| _ |
| Start 1 Spuriou Ran 1 | 18.0 G Is Em Ige Lo 8.000 | issions w GHz | 21.000 GH | | RBW 100.000 kHz | Fre 1 | 9.54255 GHz | -51.80 dBr | ΔLimit m -200.00 | D de |
| Spuriou Ran 1 2 | 18.0 G us Em ige Lo 8.000 1.000 | GHz GHz | 21.000 GH 24.000 GH | 2 | RBW 100.000 kHz 100.000 kHz | Fre: 1 2 | 9.54255 GHz 1.52923 GHz | -51.80 dBn -51.62 dBn | ΔLimit m -200.00 m -200.00 | o de |
| Start 1 Spuriou Ran 1 2 | 18.0 G Is Em Ige Lo 8.000 | GHz GHz | 21.000 GH | 2 | RBW 100.000 kHz | Fre: 1 2 | 9.54255 GHz | -51.80 dBr | ΔLimit m -200.00 m -200.00 | o de |
| Start 1 Spuriou Ran 1 2 2 Marker | 18.0 G Is Em 9 Lo 8.000 1.000 4.000 | GH2 GH2 GH2 GH2 | 21.000 GH 24.000 GH 26.500 GH | 2 | RBW 100.000 kHz 100.000 kHz 100.000 kHz | Fre: 1 2 2 | 9.54255 GHz 1.52923 GHz 5.98906 GHz | -51.80 dBr -51.62 dBr -53.20 dBr | m -200.00 m -200.00 m -200.00 | D de |
| Start 1 Spuriou Ran 1 2 2 Marker Type | 18.0 G Is Em 9 Lo 8.000 1.000 4.000 | GH2 GH2 GH2 GH2 | 21.000 GH 24.000 GH 26.500 GH X-value | 2 | RBW 100,000 kHz 100,000 kHz 100,000 kHz 100,000 kHz Y-value | Fre: 1 2 2 | 9.54255 GHz 1.52923 GHz | -51.80 dBn -51.62 dBn | m -200.00 m -200.00 m -200.00 | D de |
| Start 1 Spuriou Ran 1 2 2 Marker | 18.0 G Is Em 9 Lo 8.000 1.000 4.000 | GH2 GH2 GH2 GH2 | 21.000 GH 24.000 GH 26.500 GH X-value 2.4 | 2 | RBW 100.000 kHz 100.000 kHz 100.000 kHz | Fre 1 2 2 8m | 9.54255 GHz 1.52923 GHz 5.98906 GHz | -51.80 dBr -51.62 dBr -53.20 dBr | m -200.00 m -200.00 m -200.00 | D de |

Date 16 FEB 2018 17:17:34



SISO-A, 802.11n40, HT0

Channel 7F - Spurious 1 Delta Marker Measurement

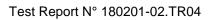


Date 16.FEB.2018 11:45:00

₩ Spectrum Ref Level 5.00 dBm Mode Auto Sweep STOP 1 View M1[1] 67,78 dBn 9.0000000 CH 10 dan -27.99 di 5.000 di D2[1] 15.1612630 GH 0 dBm -10 dBn FXD -16,760 dBm -20 dBm 30 dan 40 dBn 50 dBtr 60 Start 9.0 GHz 90002 pts Stop 18.0 GHz **Spurious Emissions** Range Up 12.000 GHz 15.000 GHz Frequency 11.17855 GHz 14.99755 GHz 17.43927 GHz Range Low RBW **Power Abs ALimit** .000 GHz -60.29 dBm -54.40 dBm -200.00 dB -200.00 dB 100.000 kHz 12.000 GHz 100.000 kHz 15.000 GHz 18.000 GHz 100.000 kHz 44.61 dBm 200.00 dB larker Type | Ref | Trc | X-value Y-value Function **Function Result** 2.442 GHz 9.0 GHz 15.161263 GHz -16,76 dBm -67,78 dBm ED) Μ1 FDX D2 -27.99 dB DISCOURSE AND

Channel 7F - Spurious 2 Delta Marker Measurement

Date 16/FEB.2018 11:45:31





Channel 7F - Spurious 3 Delta Marker Measurement

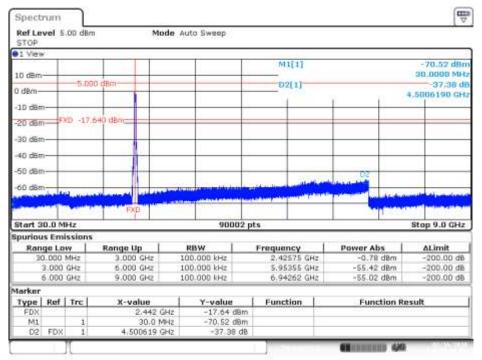
| Ref Le | vel 5 | .00 dBr | n P | 1ode | Auto Sweep | | | | | |
|------------|-------|----------|-------------------------------|-------|---------------------------|--------|---------------|--|-----------|--------------------------|
| 91 Viev | Й. н. | | 9 X 302 | | 92 | 152 | 1882 | | | 2210-2604 |
| 10 dBm | | | | | | 1 | 11[1] | | 18. | -60.30 dBr 0000000 CH |
| | | -5.00 | 00 dBm | | _ | D | 2[1] | | 222 | |
| 0 dBm- | | | | | | | 1 | $\bar{x} = \bar{x}$ | 17. | 4376500 GH |
| -10 dBn | 1 | | - | | - | - | | - | | |
| -20 dBh | E) | KD -16. | 760 dBm | | | | | | | |
| | | | | | | | | | | |
| -30 dBn | n | | - | | - | - | | - | | |
| -40 dBn | 1 | | - | | - | - | | | | |
| -50 dBn | 1 | | 1 miles | | | 2 | | | | |
| -50 080 | | - المنام | International Property in the | | and a state of the second | | in an article | and an and a state of the state | Traffic | No. al and a second |
| Charles of | Abd | | and the second second | | and the second second | Mar | - Internet | | and the | |
| FRO Br | - | | | 17 | | | | | | |
| Start 1 | 8.0 G | Hz | | | 9000 | 12 pts | - | | St | op 26.5 GHz |
| Spuriou | IS Em | ssions | í. | | | | | | | |
| Ran | ge Lo | w | Range Up | 1 | RBW | Freque | mcy | Power Ab | 5 | ALimit |
| | 8.000 | | 21.000 GHz | | 100.000 kHz | | 7965 GHz | -52.66 | | -200.00 dB |
| | 1.000 | | 24.000 GHz | | 100.000 kHz | | 5133 GHz | -51.69 | | -200.00 dB |
| 2 | 4.000 | GH2 | 26.500 GHz | 1 | 100.000 kHz | 25,4 | 5124 GHz | -53.41 | dBm | -200.00 dB |
| Marker | | | | | | | | | | |
| Type | Ref | Trc | X-value | | Y-value | Fune | tion | Funct | ion Res | ult |
| FDX | 1.000 | 10101 | 2.442 | | -16,76 d | | reacest pi | | 0.0000120 | 1945 |
| M1 D2 | FDX | 1 | 18.0 |) GHz | -60.30 d | | | | | |

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SISO-B, 802.11n40, HT0

Channel 7F - Spurious 1 Delta Marker Measurement

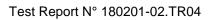


Date 16 FEB 2018 17:55 26

₩ Spectrum Ref Level 5.00 dBm Mode Auto Sweep STOP 1 View M1[1] 69.52 dBn 9.0000000 GH 10 dan -27.22 di 5.000 d D2[1] 0 dBm 15.0582670 GH -10 dBn FXD -17.640 dBm--20 dBm -30 dBm 40 dBn 50 dBtr 60.48 Start 9.0 GHz 90002 pts Stop 18.0 GHz **Spurious Emissions** Range Up 12.000 GHz 15.000 GHz Frequency 11.20185 GHz 14.98875 GHz 17.33887 GHz Range Low RBW **Power Abs ALimit** .000 GHz -200.00 dB -200.00 dB 100.000 kHz 61.07 dBm 12.000 GHz 100.000 kHz -54.01 dBm 15.000 GHz 18.000 GHz 100.000 kHz 43.95 dBm 200.00 dB larker Type | Ref | Trc | X-value Y-value Function **Function Result** 2.442 GHz 9.0 GHz 15.058267 GHz -17.64 dBm -69.52 dBm ED) Μ1 FDX D2 -27.22 dB 100 BR 430

Channel 7F - Spurious 2 Delta Marker Measurement

Date 16.FEB.2018 17:5807





Channel 7F - Spurious 3 Delta Marker Measurement

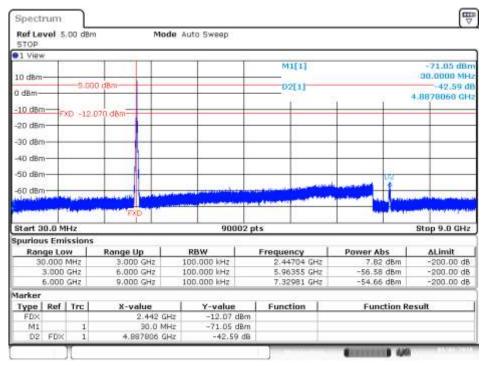
| STOP | vel 5 | .00 dBn | n | Mode / | Auto Sweep | | | | | |
|-------------------------------|-------|------------|-------------|----------------|---|--|-----------------|---|----------|--------------------------|
| 1 Vier | ¥2 | | 3.7 102 | | 922 | 152 - 174 | 1492 | | | 04-09-04 |
| 10 dām | | | | | | - | 11[1] | | 18. | -61.01 dBr 0000000 CH |
| 0 dBm- | | -5.00 | O dBm | | - | D | 2[1] | | 1.7 | -35.18 d 1184500 GH |
| U dBm- | | | | | | | 1 | т т | 1/- | 1184500 GH |
| -10 dBr | n | | 1 | | - | | - | | | |
| -20 dBr | P-F | XD -17. | 640 dBm | | | | | | | |
| 10.00 | 10 | | | | | | | | | |
| -30 dBr | n | | | | | | | | | |
| -40 dBr | n | | | | - | - | | + + | | |
| | 5 - L | | | | | | | | | |
| -50 dBt | n | Lun and an | State State | Int | and a stand of the | | a summer of | | land li | and the second |
| and a sector | - All | | | AL. CAR | | the state of the s | | and the second se | 14 | |
| FIXE Br | n | | | | and you want | dissued by the | - | | 1 | |
| Start 1 | 10.00 | Hz. | | | 9000 | 12 pts | - | | - | op 26.5 GHz |
| | | issions | | _ | 3000 | iz pra | | | - 01 | oh 2010 dei |
| spurio | | | Range Up | 1 | RBW | Freque | | Power Abs | | ALimit |
| 12 | 8.000 | | 21.000 GHz | | 100.000 kHz | | 3755 GHz | -52.64 | | -200.00 dB |
| Ran | 1.000 | | 24.000 GHz | | 100.000 kHz | | 3023 GHz | -52,88 (| | -200.00 dB |
| -1 | | | 26.500 GHz | | 100.000 kHz | | 3215 GHz | -52.90 (| | -200.00 dB |
| 1 | 4.000 | | | | | | | | | |
| 1 | - | | | | Y-value | Fund | tion | Funct | ion Resi | ult |
| 1 2 2 Marker | | Tre | X-value | | | | | | | 1005/T |
| 1 2 2 | | Trc | | 2 GHz | -17.64 d | Bm | 100230 20 | | | |
| 1 2 2 Marker Type | | Trc 1 | 2.44 | 2 GHZ 0 GHZ | and the second se | | 1995 (St. 1997) | | | 525. |

Date 16.FEB.2018 17:58.43



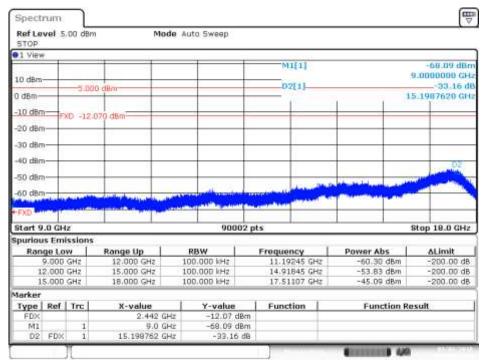
MIMO-A, 802.11n20, HT8

Channel 7 - Spurious 1 Delta Marker Measurement



Date: 2 MAR 2018 135349

Channel 7 - Spurious 2 Delta Marker Measurement



Date: 2.MAR2018 135417



Channel 7 - Spurious 3 Delta Marker Measurement

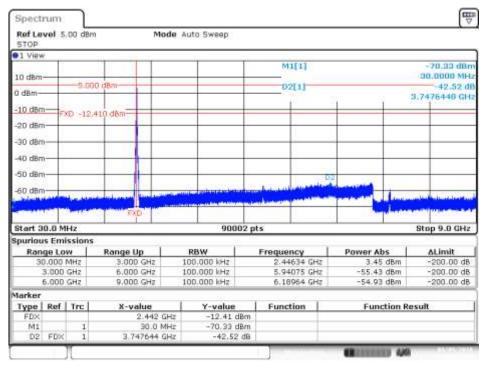
| Spect | | | | | | | | | | | [[™] |
|----------|-------|------------------|-----------------------|---|----------------|------------|---------|--------------------|--|-------------------|-------------------------|
| STOP | vel 5 | .00 dem | | Mode | Auto Sweep | | | | | | |
| 01 View | 6 | | - 20 - <i>2</i> 7 | | 114 | | | | | | |
| 10 dBm | | | | | | | | 1[1] | | | -63.40 dBn 000000 GH |
| 0 d8m- | - | 5,000 |) dBm | | | - | _0 | 2[1] | S - M | 17.3 | -40.85 di 746500 GH |
| -10 dBm | E F | (D -12.0 | 70 dBm | | | - | | | | | |
| -20 dBm | | 1. Dei | Sec. Shi | | | - | _ | | | | - |
| -30 dBn | - | | | | | | | | | | - |
| -40 dBn | - | | | | | | | | | | |
| -50 dBm | | | 00 | | | | | | | | |
| - neduce | and a | and and a second | and the second second | - al las | | a starting | C.P.M.M | and a share of the | the share and | and a second | Mar Renting |
| FXD Br | 1 | * | (Sector) | 1.000 | 4191 - L 11113 | - | | | and the second s | - | a second second |
| Start 1 | | Hz | <u></u> | | 900 | 02 pts | | | <u> </u> | Sto | p 26.5 GHz |
| Spuriou | s Emi | issions | | | | | | | | | |
| | ge Lo | | Range Up | | RBW | F | reque | ncy | Power Abs | | ΔLimit |
| | 8.000 | | 21,000 GH | | 100.000 kHz | | | 665 GHz | -52.92 dB | N.L. | -200.00 dB |
| | 1.000 | | 24.000 GH | | 100.000 kHz | _ | | 982 GHz | ~52.61 dB | the second second | -200.00 dB |
| 2 | 4.000 | GHz | 26.500 GH | 12 | 100:000 kHz | | 24.05 | 771 GHz | ~53.48 dB | m | ~200.00 dB |
| Marker | | | | | | | | | | | |
| Type | Ref | Tre | X-value | the last state of the last state of the | Y-value | | Func | tion | Functio | n Resul | t |
| FDX | 1 | 1 | | 42 GHz | -12.07 | | | | | | |
| M1 | | 1 | | 0.0 GHz | -63.40 | | | | | | |
| D2 | FDX | 1 | 17.374 | 65 GHz | -40.85 | 5 dB | | | | | |

Date 21/WR 2018 13:54:45



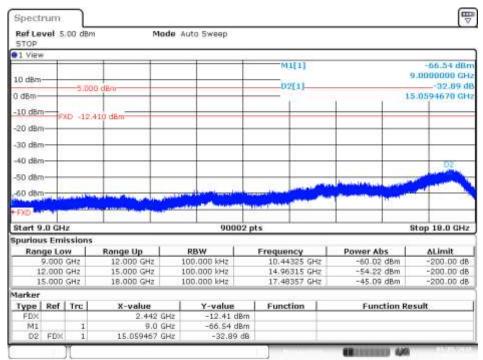
MIMO-B, 802.11n20, HT8

Channel 7 - Spurious 1 Delta Marker Measurement



Date: 5.MAR2018 1607:23

Channel 7 - Spurious 2 Delta Marker Measurement



Date: 5.MAR2018 1607.55



Channel 7 - Spurious 3 Delta Marker Measurement

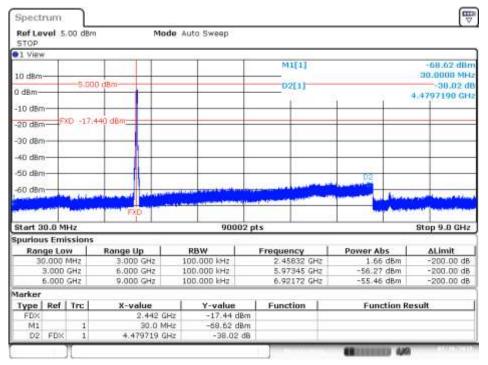
| STOP | vel 5 | .00 dBm | 1 | node / | luto Sweep | | | | |
|---|---|---------------------------------|--|--------|--|--|----------------------------------|---|--|
| 1 Viev | Ý | | | | 12 | | | | |
| | | | | | | 0 | 11[1] | | -60.93 dB 18.000000 GF |
| 10 dBm | | - | | | - | 1 | 2[1] | | -40.47.0 |
| 0 dBm- | _ | 2,000 |) dBm | | _ | - | alla! | n n 1 | 17,4453500 GH |
| - | - | | | | | 1 | 1 | 1 1 | ATA DO DO DO DO DO |
| -10 dBn | F | ND -12.4 | 10 dBm | | | - | | | |
| -20 dBr | n | | + + | | _ | | - | | |
| -30 dBr | | | | | | | | | |
| | · · | | | | | | | | |
| -40 dBr | n | | and the second s | | | | 1 | | |
| -SD dBr | 0 | | - 02 | | | | - | - | |
| - | in the | in subset to be deal | and the second second | 1000 | A DESCRIPTION OF A DESC | CONTRACTOR OF CONTRACTOR | Jacob Stationer | A DOMESTIC STORE | and a full of the second s |
| | | | | | | State of the second | | CONTRACTOR AND A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRI | |
| 1.0 | | - | the second s | | and the second | | and the second second | | |
| 1.0 | | | | | | | - | | |
| FXD Br | | Hz | | | 900 | D2 pts | | | Stop 26.5 GH |
| FXD ^{Br} Start 1 | .8.0 G | Hz | | | 900 | 02 pts | | | Stop 26.5 GH |
| FXD ^{Br} Start 1 Spuriou Ran | 8.0 G Is Emi ge Lo | issions w | Range Up | 1 | RBW | Freque | | Power Abs | ∆Limit |
| FXD ^{Br} Start 1 Spuriou Ran 1 | 8.0 G IS Emi ge Lo 8.000 | issians w GHz | 21.000 GHz | | RBW 100.000 kHz | Freque 19.8 | 8735 GHz | -52.88 dBm | ALimit |
| Start 1 Spuriou Ran 1 2 | 8.0 G is Emi ge Lo 8.000 1.000 | issions W GH2 GH2 | 21.000 GHz 24.000 GHz | | RBW 00.000 kHz 00.000 kHz | Freque 19.8 21.5 | 8735 GHz 4143 GHz | -52.88 dBm -52.22 dBm | ΔLimit -200.00 dt -200.00 dt |
| FXD ^{Br} Start 1 Spuriou Ran 1 2 2 | 8.0 G IS Emi ge Lo 8.000 | issions W GH2 GH2 | 21.000 GHz | | RBW 100.000 kHz | Freque 19.8 21.5 | 8735 GHz | -52.88 dBm | ΔLimit -200.00 dt -200.00 dt |
| FXD Br Start 1 purlou Ran 1 2 2 1arker | 8.0 G is Emi ge Lo 8.000 3.000 4.000 | GH2 GH2 GH2 GH2 GH2 | 21.000 GHz 24.000 GHz 26.500 GHz | | RBW 100.000 kHz 100.000 kHz 100.000 kHz | Freque 19.8 21.5 25.6 | 8735 GHz 4143 GHz 8890 GHz | -52.88 dBm -52.22 dBm -53.51 dBm | ALimit -200.00 dt -200.00 dt -200.00 dt |
| FXD ^{Br} Start 1 Spuriou Ran 1 2 2 4 arker Type | 8.0 G is Emi ge Lo 8.000 3.000 4.000 | GH2 GH2 GH2 GH2 GH2 | 21.000 GHz 24.000 GHz 26.500 GHz X-value | 1 | RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz Y-value | Freque 19.8 21.5 25.6 | 8735 GHz 4143 GHz | -52.88 dBm -52.22 dBm | ALimit -200.00 dt -200.00 dt -200.00 dt |
| Start 1 Spuriou Ran 1 2 2 Marker | 8.0 G is Emi ge Lo 8.000 3.000 4.000 | GH2 GH2 GH2 GH2 GH2 | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.442 | | RBW 100.000 kHz 100.000 kHz 100.000 kHz | Freque 19.8 21.5 25.6 Fune Bm | 8735 GHz 4143 GHz 8890 GHz | -52.88 dBm -52.22 dBm -53.51 dBm | ALimit -200.00 dt -200.00 dt -200.00 dt |

Date: 5.MAR2018 160826



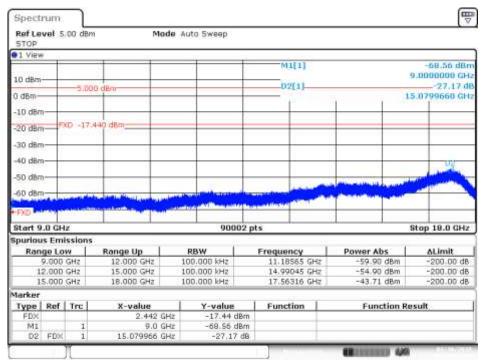
MIMO-A, 802.11n40, HT8

Channel 7F - Spurious 1 Delta Marker Measurement



Date 16FEB 2018 14:12:45

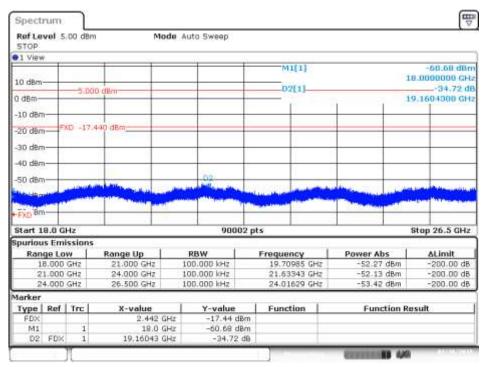
Channel 7F - Spurious 2 Delta Marker Measurement



Date 16 FEB 2018 14 13 11



Channel 7F - Spurious 3 Delta Marker Measurement

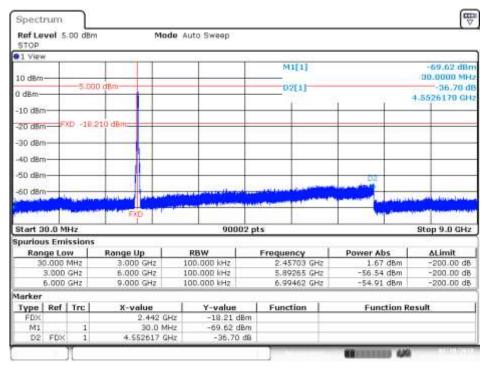


Date 16 FEB 2018 14 13 36



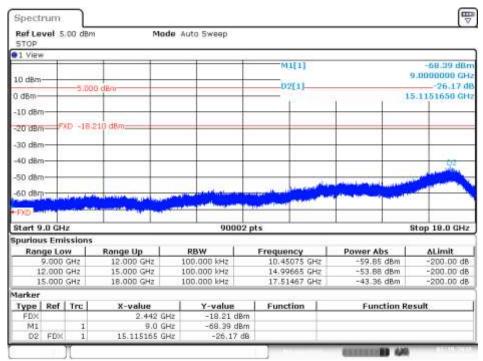
MIMO-B, 802.11n40, HT8

Channel 7F - Spurious 1 Delta Marker Measurement



Date: 19 FEB 2018 11:32:02

Channel 7F - Spurious 2 Delta Marker Measurement



Date 19 FEB 2018 11:32:27



Channel 7F - Spurious 3 Delta Marker Measurement

| STOP | vel 5 | 00 dBm | | Mode A | uto Sweep | | | | |
|---|---|----------------------------|---|--------------------------|---|--|-------------------------------|--|--|
| 1 Viev | Ψ | | Sec. 310 | | 12/ | 20 00 | | | |
| 10 dBm | | | | | | | 1[1] | | -59.97 dB 18.0000000 GF |
| 0 dBm- | | 5.000 | dEm | | - | 0 | 2[1] | | -34.88 d 17.0949500 GF |
| u ubili- | | | | | | | | 1 1 | 17.0949300 Gr |
| -10 dBn | n | | | | - | | - | - | |
| -20 dB/ | F | D -18:2 | t0 dBm | | _ | | | | |
| | 2. | | 1.0.000 | | | | | | |
| -30 dBr | n - | | | | - | | | | |
| -40 dBr | | | | | | | | | |
| 11000 | × 1 | | | | | | | | |
| -SD dBr | 0. | the set | | | | | | | |
| CUHP. | al and the | And the second second | | and the second | and the second second second | No. of Concession, Name | and in the same | the fill a second in second | and the second s |
| | | 1 | and the second se | | and the second second second | and the second second | | A second second second | |
| | 1. | | | 1.1.1 | | A Designation of the party of the | | | |
| FXD Br | n | 10 | | | | | | A CARLON AND A CARL | |
| Start 1 | | Hz | | | 9000 | 2 pts | | | Stop 26.5 GH |
| Start 1 | .8.0 G | Hz | | | 9000 | 2 pts | | | Stop 26.5 GH |
| Start 1 Spuriou | .8.0 G | ssions | Range Up | 1 | 9000 RBW | 2 pts Freque | ncy | Power Abs | Stop 26.5 GH |
| Start 1 Spuriou Ran | 18.0 G IS Em | issions w | Range Up 21.000 GHz | | 12 | Freque | ncy | Power Abs -53.05 dBr | 6Limit |
| Start 1 Spuriou Ran 1 | 19.0 G Is Em Ige Lo | issians W GHz | | 1 | RBW | Freque | | | ALimit n -200.00 df |
| Start 1 Spuriou Ran 1 2 | 19.0 G Is Em Ige Lo 8.000 | issions w GHz GHz | 21.000 GHz | 1 | RBW 00.000 kHz | Freque 19.55 21.53 | 835 GHz | -53.05 dBr | ΔLimit n -200.00 dt n -200.00 dt |
| Start 1 Spuriou Ran 1 2 2 | 18.0 G Is Em 99 Lo 8.000 1.000 4.000 | issions w GHz GHz | 21.000 GHz 24.000 GHz | 1 | RBW 00.000 kHz | Freque 19.55 21.53 | 835 GHz 863 GHz | -53.05 dBr -53.14 dBr | ΔLimit n -200.00 dt n -200.00 dt |
| Start 1 Spuriou Ran 1 2 2 | 18.0 G Is Em 8.000 1.000 4.000 | GHZ GHZ GHZ GHZ | 21.000 GHz 24.000 GHz | 1 | RBW 00.000 kHz | Freque 19.55 21.53 | 835 GHz 863 GHz 032 GHz | -53.05 dBr -53.14 dBr | ΔLimit n -200.00 dt n -200.00 dt n -200.00 dt |
| Start 1 Spuriou Ran 1 2 2 Varker Type FDX | 18.0 G Is Em 8.000 1.000 4.000 | GHZ GHZ GHZ GHZ | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.440 | 1 1 1 2 GHz | RBW 00.000 kHz 00.000 kHz 00.000 kHz Y-value -18.21 df | Freque 19.55 21.53 25.67 Func | 835 GHz 863 GHz 032 GHz | -53.05 dBn -53.14 dBn -53.67 dBn | ΔLimit n -200.00 dt n -200.00 dt n -200.00 dt |
| Start 1 Spuriou Ran 1 2 2 Marker Type | 19.0 G Is Em Ige Lo 8.000 1.000 4.000 Ref | GHZ GHZ GHZ GHZ | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.440 | 1 1 2 GHz) GHz | RBW 00.000 kHz 00.000 kHz 00.000 kHz 00.000 kHz Y-value | Freque 19.55 21.53 25.67 Eunc m | 835 GHz 863 GHz 032 GHz | -53.05 dBn -53.14 dBn -53.67 dBn | ΔLimit n -200.00 dt n -200.00 dt n -200.00 dt |

Date 19 FEB 2018 11:32:53



Annex C. Test Results BLE

C.1 Test Results BLE

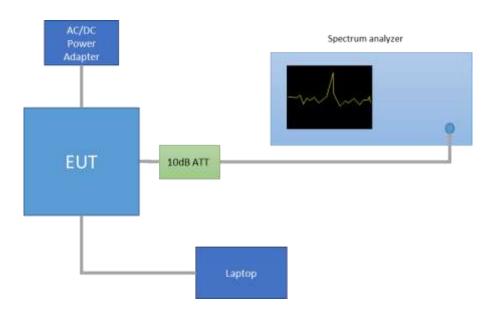
C.1.1 6dB & 99% Bandwidth

Test limits

| FCC part | RSS part | Limits |
|----------------|---------------------------|---|
| 15.247 (a) (2) | RSS-247 Clause 5.2 (a) | Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz. |

Test procedure

The setup below was used to measure the 6dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



Results tables

| Mode | Channel | Frequency [MHz] | 6dB BW [MHz] | 99% BW [MHz] |
|------|---------|--------------------|-----------------|-----------------|
| | 0 | 2402 | 0.64 | 1.15 |
| BLE | 19 | 2440 | 0.65 | 1.15 |
| | 39 | 2480 | 0.65 | 1.15 |

Results screenshot

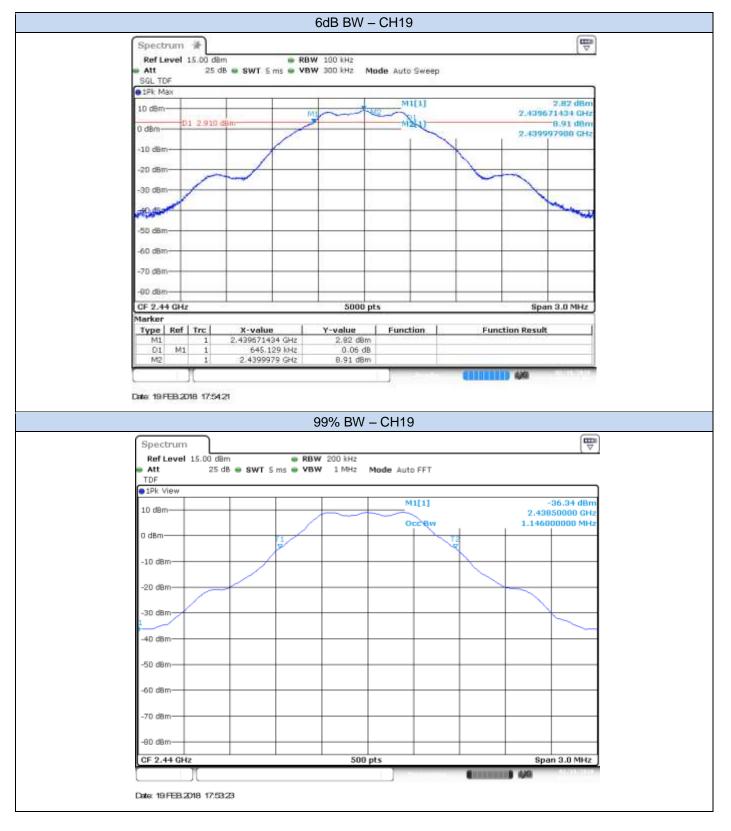
Test Report Nº 180201-02.TR04

BLE

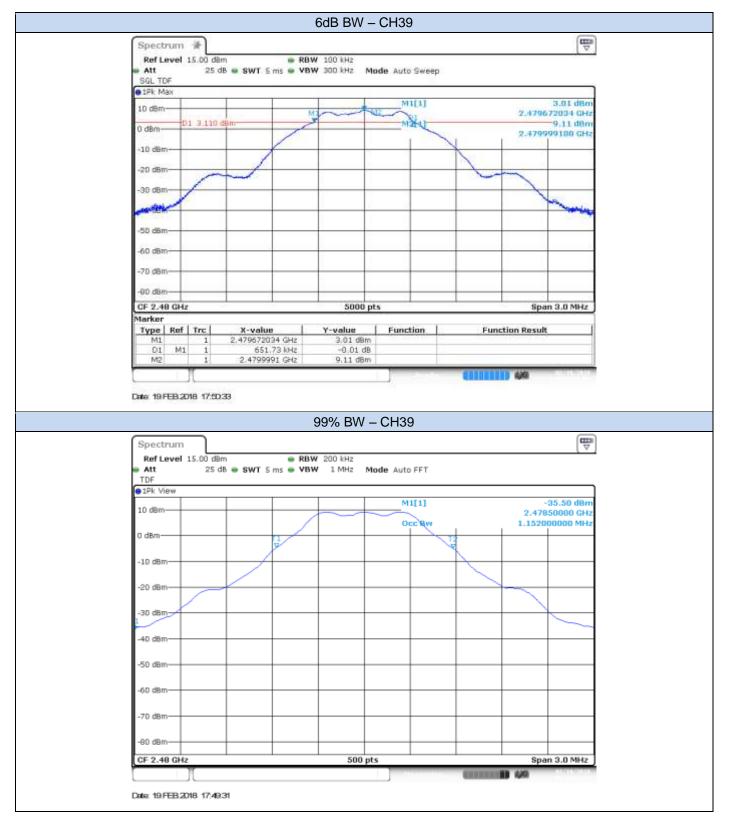
| | | 6dB BW – CH0 | | | |
|--|---|--|---------------------|--|--|
| Spectrum 🕷 | | | | tta ⊽ | |
| Ref Level 15.00 dB | m = 004 | V 100 kHz | | | |
| Att 25 c | | V 300 kHz Mode Auto Se | weep | | |
| SGL TDF | | | Ni | | |
| e 1Pk Max | | M2 M1[1 | 1 | 2.00 d8m | |
| 10 dBm- | The second se | hand a | | 01681036 GHz | |
| 0 dBm 01 2.030 | dBm | 1410 Mild | 24 | 8.03 dBm 01999100 GHz | |
| -10 dBm- | | | | a v o o o o o o o o o o o o o o o o o o | |
| | | | | | |
| -20 dBm | | | | | |
| -30 dBm | 1990 (C | | | | |
| 10 000 | | | | 1 m | |
| -40 dBgund | | | | - manual | |
| -50 dBm- | | | | | |
| -60 d8m | - | | | | |
| 5 A CV25 (A 5 4 | | | | | |
| -70 dBm | | | | | |
| -80 d8m | | | | | |
| CF 2.402 GHz | | 5000 pts | | Span 3.0 MHz | |
| Marker | | A | Lo Photo March 1997 | | |
| Type Ref Trc M1 1 | 2.401681036 GHz | 2.00 dBm | n Function Re | suit | |
| D1 M1 1 | 637.327 kHz | -0.02 dB | | | |
| M2 1 | 2,4019991 GHz | 8,03 dBm | | | |
| | | | | | |
| Date: 19 FEB.2018 17:58 | :33 | | | | |
| | | | | | |
| | | | | | |
| | | 99% BW – CH0 | | | |
| Spectrum | | 99% BW – CH0 | | Ē | |
| Spectrum Ref Level 15.00 d8 | | | | | |
| Ref Level 15.00 dB Att 25 d | | V 200 kHz | T | | |
| Ref Level 15.00 dB Att 25 c TDF | im 🖷 RBV | V 200 kHz | T | | |
| Ref Level 15.00 dB Att 25 d TDF IPk View | im 🖷 RBV | V 200 kHz V 1 MHz Mode Auto FF | | (₩) 8.05 dBm | |
| Ref Level 15.00 dB Att 25 c TDF | im 🖷 RBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 of TDF 1Pk View 10 dBm | im 🖷 RBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm | |
| Ref Level 15.00 dB Att 25 d TDF IPk View | im 🖷 RBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 of TDF 1Pk View 10 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 d TDF 1Pk View 10 dBm 0 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 d TDF 1Pk View 10 dBm 0 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 d TDF 1Pk View 10 dBm 0 dBm -10 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 d TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 d TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 10 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 10 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 10 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | 1 2. | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 10 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 kHz V 1 MHz Mode Auto FF | J 2. Bw 1.11 | 8.05 dBm 40202100 GHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm | Im • RBV IB • SWT 5 ms • VBV | V 200 KHz N 1 MHz Mode Auto FF M1 M1[1 Occv | J 2. Aw 1.11 | 8.05 dBm 40202100 GHz 52000000 MHz | |
| Ref Level 15.00 dB Att 25 c TDF 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm | Im PRBV B SWT 5 ms VBV 11 12 13 13 13 13 13 13 13 13 13 13 | V 200 KHz N 1 MHz Mode Auto FF M1 M1[1 Occv | J 2. Bw 1.11 | 8.05 dBm 40202100 GHz 52000000 MHz | |











C.1.2 Maximum Output Power and antenna gain

E.

Test limits

| | Limits | | |
|----------------------------|---|--|--|
| FCC Part 15.247 (b) (3) | (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. | | |
| RSS-247 Clause 5.4 (d) | For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e). As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode | | |





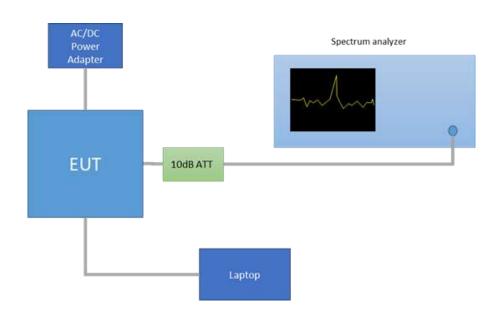
Test procedure:

The Maximum peak conducted output power was measured using the $RBW \ge DTS$ bandwidth method defined in paragraph 9.1.1 of FCC KDB 558074 D01 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

The Maximum conducted average output power was measured using the channel integration method according to Method AVGSA-2, defined in paragraph 9.2.2.4 of FCC KDB 558074 D01 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power. The declared maximum antenna gain is 3.24dBi.

The setup below was used to measure the maximum conducted output power. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.





Results tables

| | | | | Peak Power | [dBm] | |
|------|-------------------------|----|--------------------|---------------------------------------|-------|---------------------------|
| Mode | Meas. Duty Cycle [%] | СН | Frequency [MHz] | Measured Conducted Output Power | EIRP | Peak Output Power [mW] |
| | | 0 | 2402 | 8.25 | 11.49 | 6.68 |
| BLE | 61.81 | 19 | 2440 | 9.10 | 12.34 | 8.13 |
| | | 39 | 2480 | 9.32 | 12.56 | 8.55 |

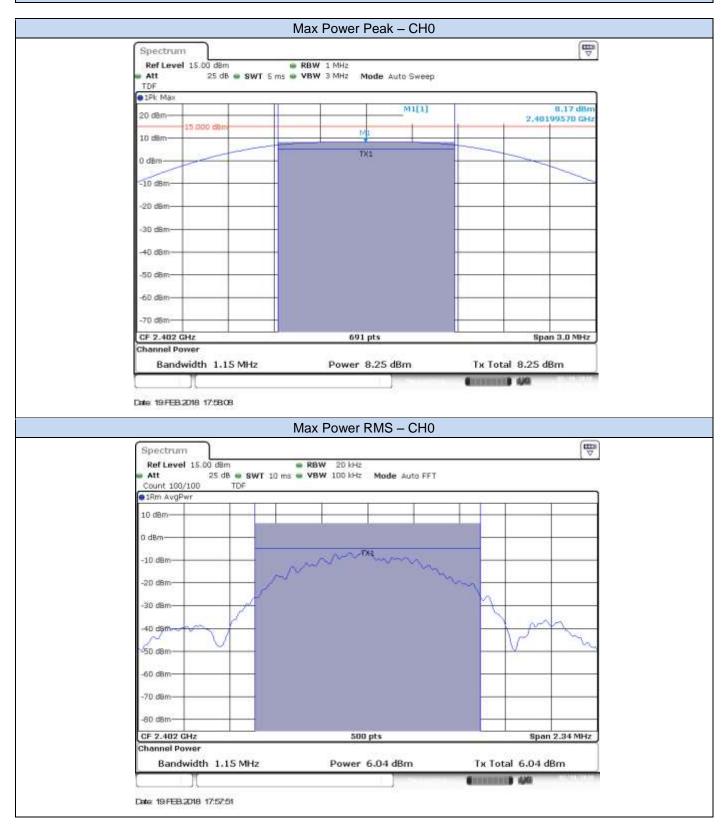
Max Value Min Value

| _ | | | | Average | Average Output Power* [dBm] | | | | |
|------|-------------------------------|----|--------------------|--------------------------------------|--|-------|---------------------------------|--|--|
| Mode | Meas. Duty Cycle [%] | СН | Frequency [MHz] | Maximum Conducted Output Power | Maximum Conducted Output Power Duty cycle Compensated | EIRP | Average Output Power [mW] | | |
| | | 0 | 2402 | 6.04 | 8.13 | 11.37 | 6.50 | | |
| BLE | 61.81 | 19 | 2440 | 6.92 | 9.01 | 12.25 | 7.96 | | |
| | | 39 | 2480 | 7.11 | 9.20 | 12.44 | 8.32 | | |

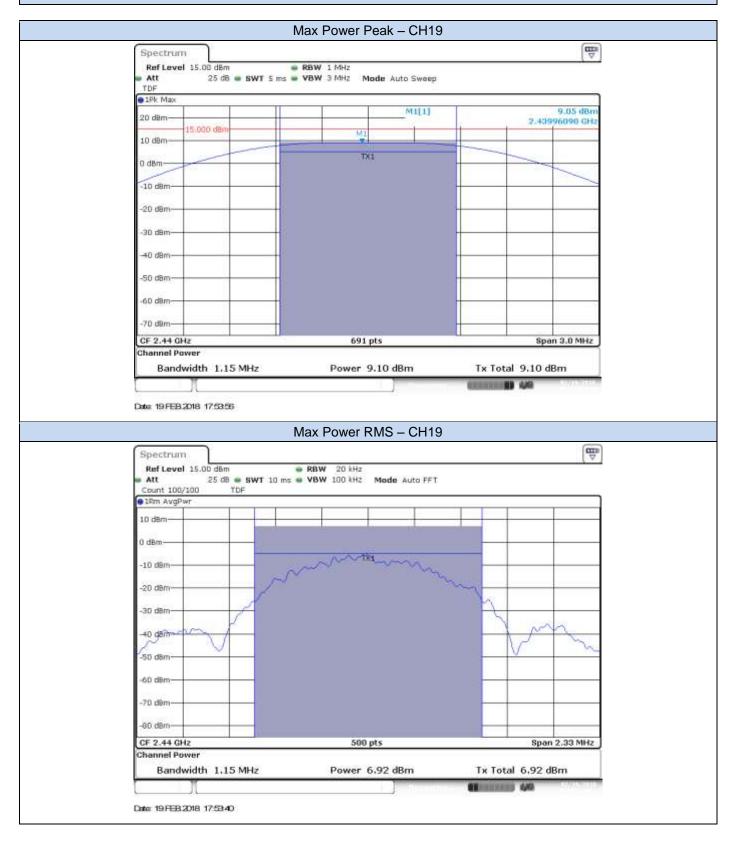
* Output Power RMS values are shown for indicative purpose only



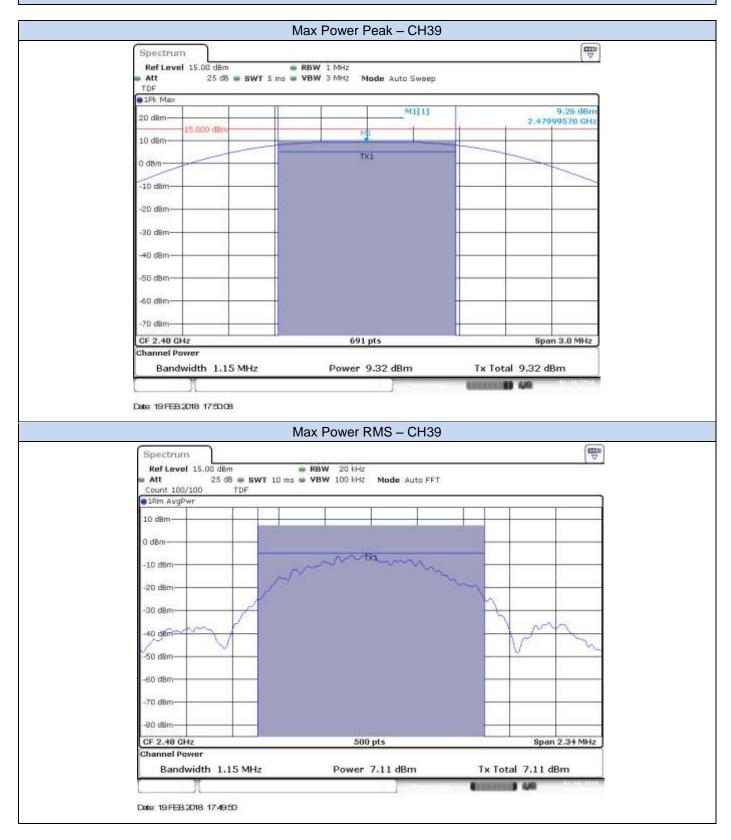
Results screenshot













C.1.3 Power Spectral Density

Test limits

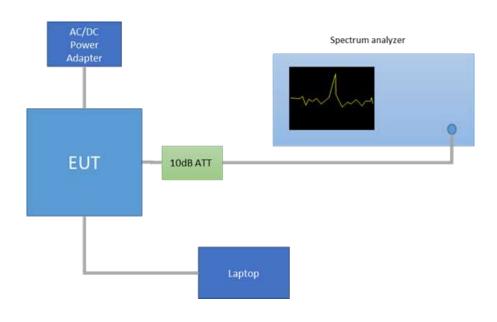
| FCC part | RSS part | Limits |
|------------|---------------------------|---|
| 15.247 (e) | RSS-247 Clause 5.2 (b) | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density. |

Test procedure

The maximum peak power spectral density level of the fundamental emission was measured using the method PKPSD, defined in paragraph 10.2 of FCC KDB 558074 D01 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

The setup below was used to measure the power spectral density. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

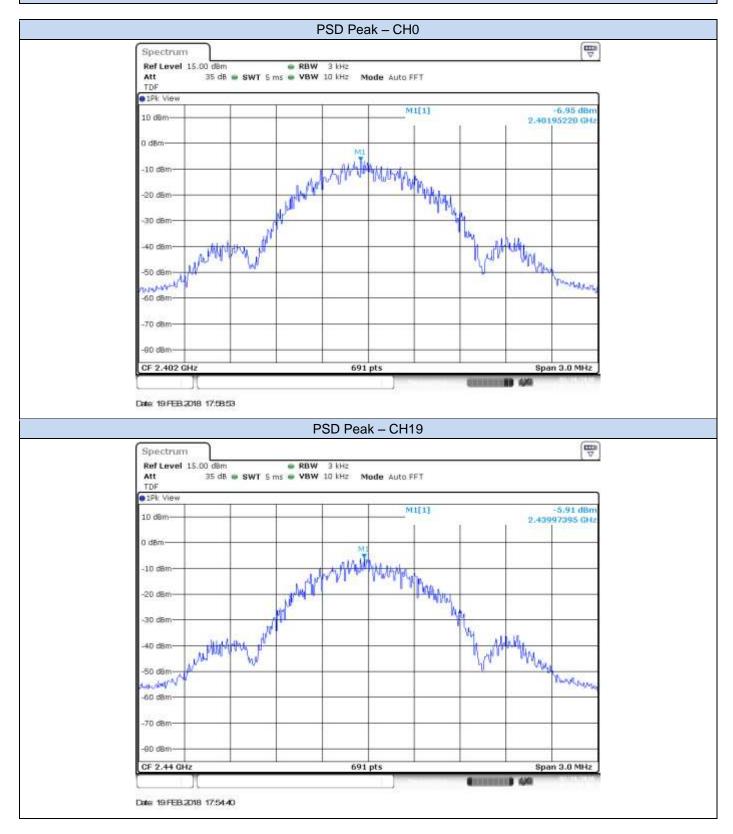
The declared maximum antenna gain is 3.24dBi.



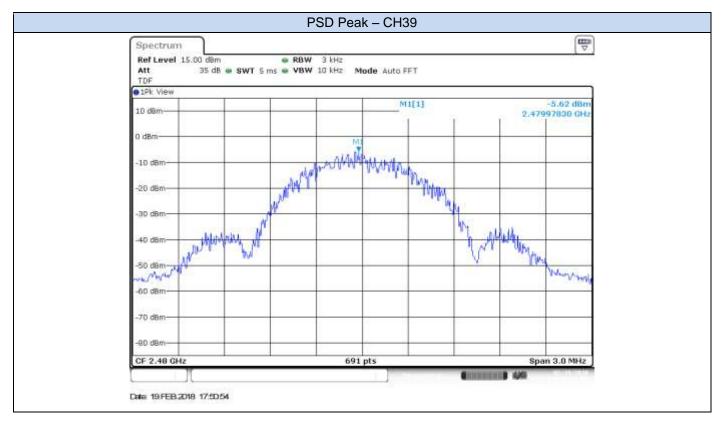
Results tables

| Mode | СН | Frequency [MHz] | PSD Peak [dBm] |
|------|----|--------------------|-------------------|
| | 0 | 2402 | -6.95 |
| BLE | 19 | 2440 | -5.91 |
| | 39 | 2480 | -5.62 |











C.1.4 Out-of-band emission (Conducted)

Test Limits

| FCC part | RSS part | | Limits | | | | | | |
|------------|-----------------------|---|---|--|---|--|--|--|--|
| 15.247 (d) | RSS-247 Clause 5.5 | spectrum frequency 20 dB bel highest le radiated r | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. | | | | | | |
| 15.209 | RSS-Gen Clause 8.9 | The emis employing kHz, 110- three ban For avera a limit spe | comply with req Range (MHz) 30-88 88-216 216-960 bove 960 sion limits s CISPR qua 490 kHz an ds are based ge radiated o ecified when | hich fall in the res the radiated em Field Stregth $(\mu V/m)$ 100 150 200 500 hown in the abo asi-peak detector d above 1000 M d on measurement emission measurement measuring with dicated values in | Field Stregth (dBµV/m) 40 43.5 46 54 ve table are bas r except for the IHz. Radiated er nts employing ar ements above 1 peak detector fu | Meas. Distance (m) 3 3 3 3 3 5 5 5 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 | a): ments s 9-90 these or. s also | | |

Test procedure

The setup below was used to measure the out-of-band emissions. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

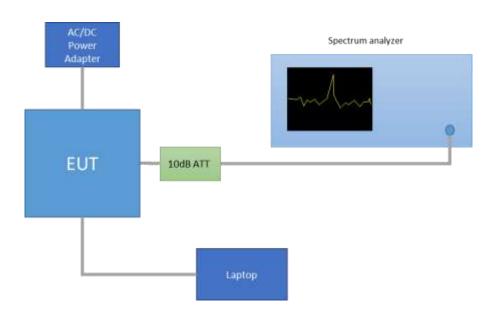
In case of Band Edge measurements falling in restricted bands, the declared Antenna Gain is also compensated in the graph. The declared maximum antenna gain is 3.24dBi.

For Band Edge measurements falling in restricted bands, the following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dB μ V/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

| | §15.209(a) | | Converted values | | |
|------------------|-----------------|--------------------------------------|---|----------------|--|
| Freq Range (MHz) | Distance (m) | Field strength (microvolts/meter) | Field strength (dB microvolts/meter) | Power (dBm) | |
| Above 960 | 3 | 500 | 54.0 | -41.2 | |



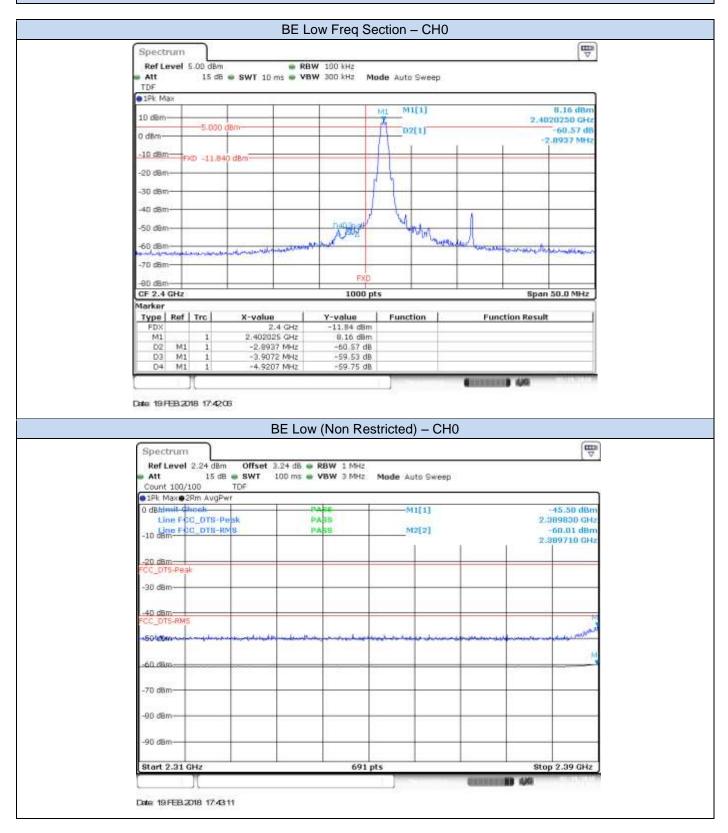
The setup below was used to measure the out-of-band emissions. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



Note: these PSD_{Peak} values are shown just as a reference for the compliance of the Out-of-band Measurements. Thus the RBW used for these measurements was 100kHz.

| Mode | СН | Frequency [MHz] | PSD Peak [dBm] |
|------|----|--------------------|-------------------|
| | 0 | 2402 | 8.10 |
| BLE | 19 | 2440 | 8.92 |
| | 39 | 2480 | 9.10 |



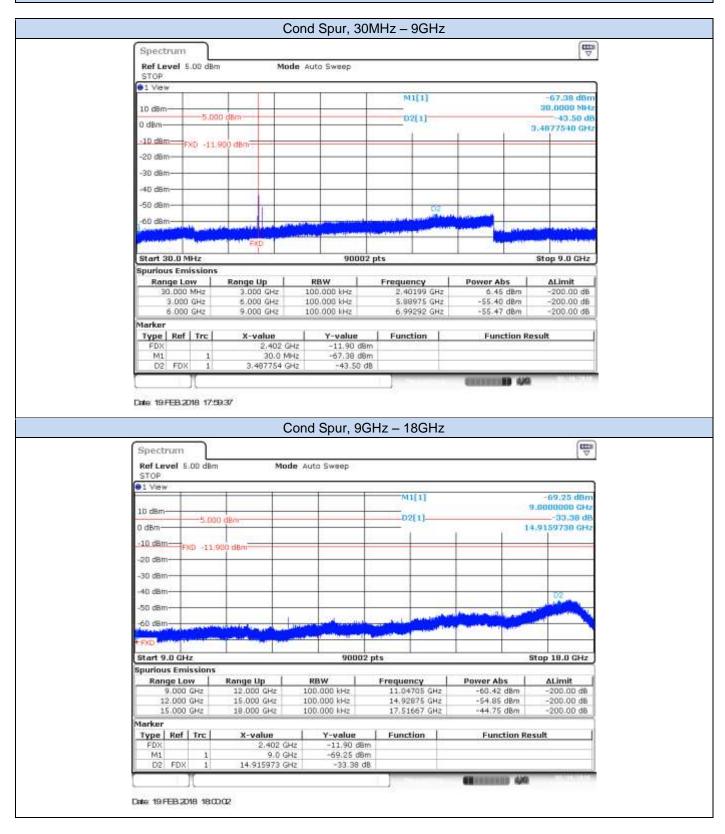








BLE, CH0

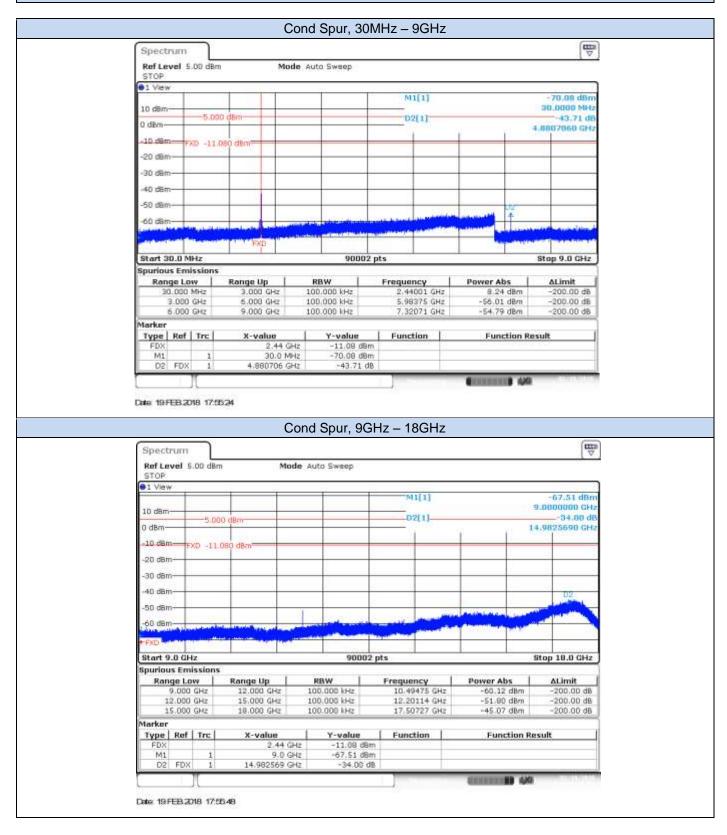




| Spectrum | _ | | | | | | | | (The second seco |
|--|---|--|------------|--|---------------------------------------|--|----------------------------------|--|--|
| Ref Level STOP | 5.00 dBm | M | tode / | auto Sweep | | | | | |
| 91 View | | - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y | | 92 (S | | 422 | | | an annaisea |
| | | | | | M | 1[1] | | 100 | -58.15 dBn 0000000 CH: |
| 10 dam | -5.000 | | | - | DS | 2[1] | | 18. | -40.38 de |
| 0 dBm | 5.000 | dBm | | | | CIA) | | 19. | 1841300 GH |
| -10 dBm | | 1 | | | | | 1 1 | a da com | a sector second |
| 10000 | FXD -11,9 | 80 dBm | | | | | | | |
| -20 dBm | | | | - | | | | | |
| -30 dBm | | - | | | | | | | |
| -40 dBm | | | | | | | | | |
| 1.660.66 | | | | 100 | | | - | | |
| -50 dBm | Julantaria | a section in the | and a | and the second second | | | | 1000 | |
| | | | | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | The second s | | the second s | and the second se |
| The second second second | | In the second second | | | - Ander | | The standards | | to be set of the set o |
| -Fkp Bm- | | | | | - Alexan | C | | | |
| + Fig 8m- | GHz | | | 90002 | pts | | | St | op 26.5 GHz |
| | and the second se | | | 90002 | pts | | | St | op 26.5 GHz |
| Start 18.0 Spurious En Range L | nissions ow | Range Up | | RBW | Freque | | Power Abs | . 1 | ΔLimit |
| Start 18.0 Spurious En Range L 18.00 | nissions ow 0 GHz | 21.000 GHz | | RBW | Freque: 19.56 | 015 GHz | -52.20 d | i IBrn | ALimit -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 | nissions ow 0 GHz 0 GHz | 21.000 GHz 24.000 GHz | 3 | RBW 00.000 kHz | Freque: 19.56 21.58 | 015 GHz 613 GHz | -52.20 d -52.28 d | iBrn IBrn | △Limit -200.00 dB -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 24.00 | nissions ow 0 GHz 0 GHz | 21.000 GHz | 3 | RBW | Freque: 19.56 21.58 | 015 GHz | -52.20 d | iBrn IBrn | ALimit -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 24.00 Marker | nissions ow 0 GHz 0 GHz 0 GHz 0 GHz | 21.000 GHz 24.000 GHz 26.500 GHz | 3 | RBW 00.000 kHz | Freque: 19.56 21.58 | 015 GHz 613 GHz 440 GHz | -52.20 d -52.28 d -52.92 d | iBrn IBrn | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 24.00 Marker Type Ref FDX | nissions ow 0 GHz 0 GHz 0 GHz 0 GHz | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.402 | GHz | RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz Y-value -11.90 dBm | Frequer 19.56 21.58 25.70 | 015 GHz 613 GHz 440 GHz | -52.20 d -52.28 d -52.92 d | iBrn IBrn IBrn | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 24.00 Marker Type Ref FDX M1 | nissions ow 0 GHz 0 GHz 0 GHz 0 GHz 1 Trc 1 | 21.000 GHz 24.000 GHz 26.500 GHz X-Value 2.402 18.0 | GH2 GH2 | RBW 000,000 kHz 000,000,000 kHz 000,000 kHz 000,000,000 kHz 000,000 kHz 000,000 kHz 000,000 kHz 000,000 kHz 000,000 kHz 000,000 kHz 000,00 | Frequer 19.56 21.58 25.70 | 015 GHz 613 GHz 440 GHz | -52.20 d -52.28 d -52.92 d | iBrn IBrn IBrn | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18.0 Spurious En Range L 18.00 21.00 24.00 Marker Type Ref FDX | nissions ow 0 GHz 0 GHz 0 GHz 0 GHz 1 Trc 1 | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.402 | GH2 GH2 | RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz Y-value -11.90 dBm | Frequer 19.56 21.58 25.70 | 015 GHz 613 GHz 440 GHz | -52.20 d -52.28 d -52.92 d | iBm IBm IBm IBm | △Limit -200.00 dB -200.00 dB -200.00 dB |



BLE, CH19

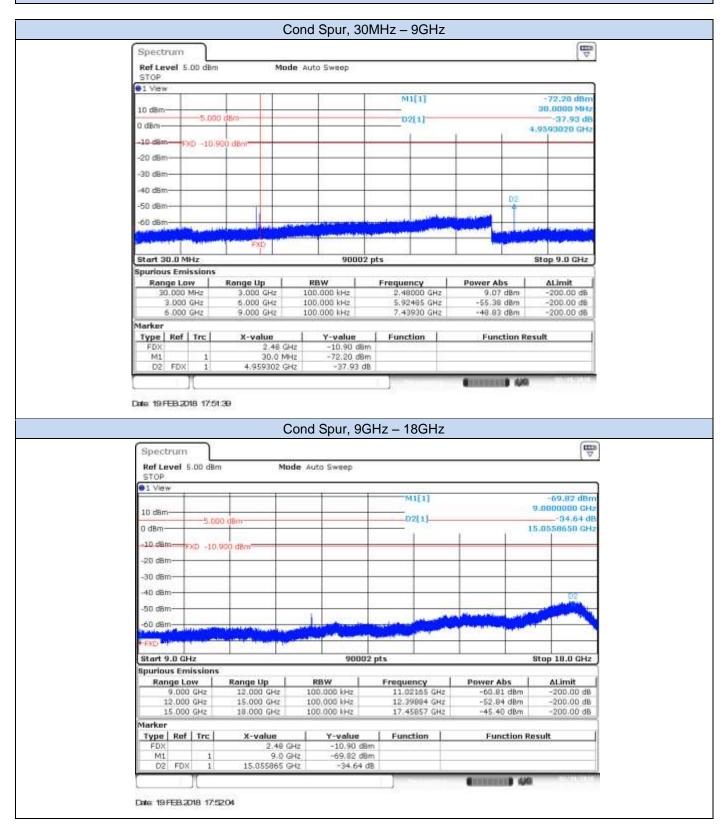




| Spectrum | | | | | | | | | (m) V |
|---|--|--|----------------|---|------------------------------------|-------------------------------|----------------------------|------------------------|--|
| Ref Level STOP | 5.00 dBm | 10 | Mode | Auto Sweep | | | | | |
| 91 View | i | s - 503 | | - 00 - 10 | | 122 | | | - contract is |
| | | | | | M | 1[1] | | | -62.62 dBm |
| 10 d8m | 1 000 | | | | DS | 2(1) | | 18.0 | -41.45 dB |
| 0 dBm | | dBm | | | | | | 19.0 | 0674330 GHz |
| -10 dBm | | | | | | | | 0.005 | |
| 10000000 | FXD -11.08 | U dBm | | | | | | | |
| -20 dBm- | | | | | | | | | |
| -30 dBm- | | + + | | - | | | + + | | |
| -40 dBm | | - | | 6 6 | | | - | 1 | 133 - B |
| -50 d8m | - | | | indi. | | | - | | |
| -So donn | a des an abreden | All and a diversity of the local diversity of | and the | and the second second | | as where | de la company | | a shall a second |
| -hanner (| - | and the second s | | about the second second | | A. Hardines | - Contraction of the | | and Breatherstein and |
| | | | | | | | | | |
| +FXD Bm | | | | | | | | | |
| Fig Bm- | GHz | | | 90002 | pts | | | St | op 26.5 GHz |
| Start 18.0 (Spurious En | nissions | | | | | | | | |
| Start 18.0 (Spurious En Range L | nissions ow | Range Up | 1 | RBW | Frequer | | Power Ab | s | ΔLimit |
| Start 18.0 (Spurious En Range L 18.000 | nissions ow | 21.000 GHz | | RBW | Frequer 19.72 | SSS GHz | -52.38 | s dBm | ΔLimit -200.00 dB |
| Start 18.0 (Spurious En Range L | nissions ow 0 GHz 0 GHz | | | RBW | Frequer 19.72 21.50 | | | s dBm dBm | ΔLimit |
| Start 18.0 (Spurious En Range L 18.000 21.000 24.000 Marker | nissions ow 0 GHz 0 GHz 0 GHz | 21.000 GHz 24.000 GHz | | RBW 100.000 kHz 100.000 kHz | Frequer 19.72 21.50 | SSS GHZ 743 GHZ | -52.38 -52.53 | s dBm dBm | ΔLimit -200.00 dB -200.00 dB |
| Start 18.0 (Spurious En Range L 18.000 21.000 24.000 Marker Type Ref | nissions ow 0 GHz 0 GHz 0 GHz | 21.000 GHz 24.000 GHz 26.500 GHz X-value | | RBW 100.000 kHz 100.000 kHz 100.000 kHz Y-value | Frequer 19.72 21.50 25.72 | 555 GHz 743 GHz 707 GHz | -52.38 -52.53 -53.33 | s dBm dBm | ALimit -200.00 dB -200.00 dB -200.00 dB |
| Start 18.0 (Spurious En Range L 18.000 21.000 24.000 Marker Type FDX | nissions ow 0 GHz 0 GHz 0 GHz 0 GHz 1 Trc | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.4 | + GHz | RBW 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz <u>Y-value</u> -11.08 dBm | Frequer 19.72 21.50 25.72 | 555 GHz 743 GHz 707 GHz | -52.38 -52.53 -53.33 | s dBm dBm dBm | ALimit -200.00 dB -200.00 dB -200.00 dB |
| Start 18.0 (Spurious En Range L 18.000 21.000 24.000 Marker Type Ref | D GHZ O GHZ O GHZ O GHZ O GHZ I Trc | 21.000 GHz 24.000 GHz 26.500 GHz X-value 2.4 | + GHz) GHz | RBW 100.000 kHz 100.000 kHz 100.000 kHz Y-value | Frequer 19.72 21.50 25.72 | 555 GHz 743 GHz 707 GHz | -52.38 -52.53 -53.33 | s dBm dBm dBm | ALimit -200.00 dB -200.00 dB -200.00 dB |



BLE, CH39





| Spectr | um) | ר | | | | | | | | | (E |
|---|---|--|--|--------------------------|--|-------------------|-----------------------------------|----------------------------------|----------------------------|--|--|
| Ref Lev | el 5.00 | dBm | 1 | Mode | Auto Sweep | 0 | | | | | |
| 91 View | ань — | | 30 | | 92 | 1.55 | | 482 | | | 2000.00V |
| | | | | | | | M | 1[1] | | | -61.88 dBr |
| 10 d8m- | - | 1000 | 1000 | | - | - | D | 2[1] | | 18 | -41.70 d |
| 0 dBm- | | -5.000 d | Brn | | 1 | | | 2[1] | | 17 | 4101500 GH |
| | 1.00 | 70.1 | 1848 | | | | | | 1 | 1 | State of the second second |
| -10 dBm- | FXD | -10.900 | dBm | | | | | | | | |
| -20 dBm- | - | | | | _ | - | | - | - | | |
| -30 dBm- | - | | | | | - | | | | - | -2 |
| -40 dBm- | | | | | | - | - | | | 1 | - |
| 1993 | | | 2.00 | | | | | | | | |
| -50 dBm- | 144 | dia mana | 1. | | | | | A Delater | 1.10 | 1.1977 | and the second second |
| | | | | | | | | | | | |
| and the statest | | and the second second | The state of the s | | and the state of t | and in the second | the Average | | and the second second | | and the second second |
| FXD Bm | | | | | | | | | | | |
| File Bm | in the | | | | 90 | 002 p | its | | | s | top 26.5 GHz |
| | .0 GHz | _ | | | 90 | 002 p | its | | | s | top 26.5 GHz |
| Start 18 Spurious Rang | Emiss Emiss | ions F | tange Up | 1 | RBW | 002 p | Freque | | Power A | bs | ΔLimit |
| Start 18 Spurious Rang 18 | Emiss Emiss e Low | ions F | 21.000 GH | | RBW 100.000 kHz | 002 p | Freque 19.83 | 3735 GHz | -51.70 | bs | ∆Limit -200.00 dB |
| Start 18 Spurious Rang 18 21 | Emiss Emiss | ions F iz iz | | z | RBW | 002 p | Freque 19.83 21.46 | | | bs 0 dBm 9 dBm | ΔLimit |
| Start 18 Spurious Rang 18 21 | Emiss Emiss ELow .000 GH | ions F iz iz | 21.000 GHz 24.000 GHz | z | RBW 100.000 kHz 100.000 kHz | 002 p | Freque 19.83 21.46 | 3735 GHz 443 GHz | -51.70 -53.39 | bs 0 dBm 9 dBm | ALimit -200.00 dB -200.00 dB |
| Start 18 Spurious Rang 18 21 24 | Emiss Emiss 000 GH 000 GH | ions F iz iz iz | 21.000 GHz 24.000 GHz | 2 | RBW 100.000 kHz 100.000 kHz | | Freque 19.83 21.46 | 8735 GHz 9443 GHz 9271 GHz | -51.70 -53.39 -53.18 | bs 0 dBm 9 dBm | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18 Spurious Rang 18 21 24 Marker Type FDX | Emiss Emiss 000 GH 000 GH | ions 12 12 12 12 12 | 21.000 GH 24.000 GH 26.500 GH X-value 2.4 | z z | RBW 100,000 kHz 100,000 kHz 100,000 kHz Y-value -10,90 | dBm | Freque 19.83 21.46 24.03 | 8735 GHz 9443 GHz 9271 GHz | -51.70 -53.39 -53.18 | bs 0 dBm 9 dBm 8 dBm | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18 Spurious Rang 18 21 24 Marker Type FDX M1 | Emiss Emiss 000 GH 000 GH 000 GH Ref T | ions F iz iz iz iz 1 | 21.000 GH 24.000 GH 26.500 GH X-value 2.4 18. | z z B GHz 0 GHz | RBW 100.000 kHz 100.000 kHz 100.000 kHz Y-value -10.90 -61.88 | dam dam | Freque 19.83 21.46 24.03 | 8735 GHz 9443 GHz 9271 GHz | -51.70 -53.39 -53.18 | bs 0 dBm 9 dBm 8 dBm | △Limit -200.00 dB -200.00 dB -200.00 dB |
| Start 18 Spurious Rang 18 21 24 Marker Type FDX | Emiss Emiss 000 GH 000 GH 000 GH Ref T | ions 12 12 12 12 12 | 21.000 GH 24.000 GH 26.500 GH X-value 2.4 | z z B GHz 0 GHz | RBW 100.000 kHz 100.000 kHz 100.000 kHz Y-value -10.90 -61.88 | dam dam | Freque 19.83 21.46 24.03 | 8735 GHz 9443 GHz 9271 GHz | -51.70 -53.39 -53.18 | bs 0 dBm 9 dBm 8 dBm ction Res | △Limit -200.00 dB -200.00 dB -200.00 dB |



C.1.5 Radiated spurious emission

Standards references

| FCC part | RSS part | | Limits | | | | | | | |
|------------|-----------------------|---|---|--|--|--|----------------------------------|--|--|--|
| | | | | | | defined in §15.20 cified in §15.209(a | | | | |
| | | | Freq Range (MHz) | Field Stregth (μV/m) | Field Stregth (dBµV/m) | Meas. Distance (m) | | | | |
| | | | 30-88 | 100 | 40 | 3 | | | | |
| | | | 88-216 | 150 | 43.5 | 3 | | | | |
| | RSS-247 | | 216-960 | 200 | 46 | 3 | | | | |
| 15.247 (d) | Clause 5.5 | | Above 960 | 500 | 54 | 3 | | | | |
| 15.209 | RSS-Gen Clause 8.9 | emple kHz, three For a a limi | bying CISPR qua 110-490 kHz an bands are based verage radiated o t specified when | asi-peak detector d above 1000 M d on measureme emission measur | r except for the IHz. Radiated er nts employing ar ements above 1 peak detector fu | sed on measurer frequency bands mission limits in average detecto 000 MHz, there is unction, correspo | s 9-90 these or. s also | | | |

Test procedure

The setups below were used to measure the radiated spurious emissions.

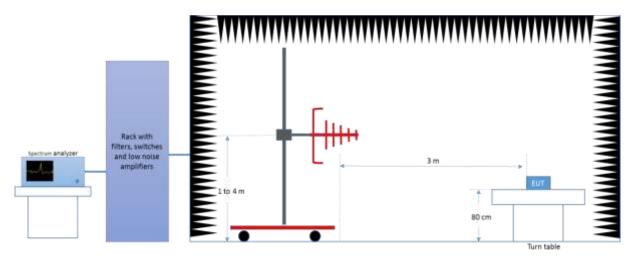
Depending of the frequency range and bands being tested, different antennas and filters were used.

The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

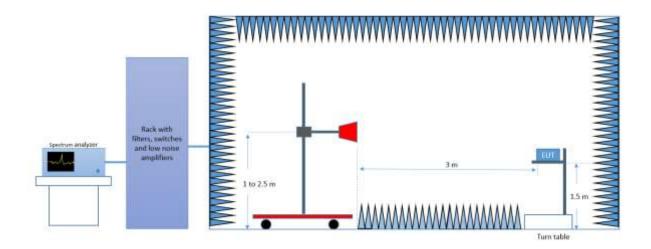
The radiated spurious emissions were measured on the lowest, middle and highest channels.



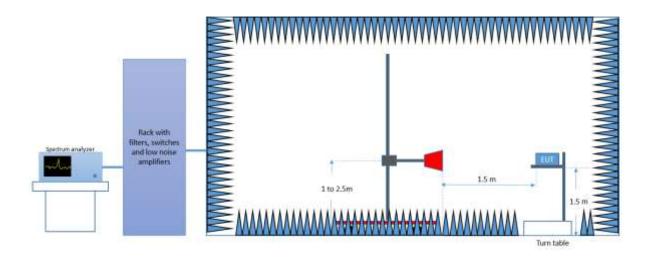
Radiated Setup 30 MHz - 1GHz



Radiated Setup 1 GHz - 18 GHz



Radiated Setup 18 GHz - 26.5 GHz





Sample Calculation

The field strength is deduced from the radiated measurement using the following equation:

 $E = 126.8 - 20log(\lambda) + P - G$

where

E is the field strength of the emission at the measurement distance, in $dB\mu V/m$

P is the power measured at the output of the test antenna, in dBm

 λ is the wavelength of the emission under investigation [300/f_{MHz}], in m

G is the gain of the test antenna, in dBi

NOTE - The measured power P includes all applicable instrument correction factors up to the connection to the test

Antenna e.g. cable losses, amplifier gains.

For field strength measurements made at other than the distance at which the applicable limit is specified, the field strength of the emission at the distance specified by the limit is deduced as follows:

E_{SpecLimit} = E_{Meas} + 20log(D_{Meas}/D_{SpecLimit})

where

 $E_{\text{SpecLimit}}$ is the field strength of the emission at the distance specified by the limit, in $dB\mu V/m$

 E_{Meas} is the field strength of the emission at the measurement distance, in $dB\mu V/m$

D_{Meas} is the measurement distance, in m

DspecLimit is the distance specified by the limit, in m

Rev. 00

Test Results

30 MHz – 26.5 GHz, BLE

Radiated Spurious – CH0

| Frequency | MaxPeak | Avg | Limit | Margin |
|-----------|---------|--------|--------|--------|
| MHz | dBuV/m | dBuV/m | dBuV/m | dB |
| 115.2 | 28.8 | | 43.6 | 14.8 |
| 216.0 | 27.1 | | 43.6 | 16.5 |
| 576.0 | 36.2 | | 46.0 | 9.8 |
| 1113.4 | | 40.6 | 54.0 | 13.4 |
| 1151.9 | | 40.2 | 54.0 | 13.8 |
| 1190.0 | 53.6 | | 74.0 | 20.4 |
| 1190.3 | | 42.2 | 54.0 | 11.8 |
| 12011.0 | | 40.0 | 54.0 | 14.0 |
| 12011.5 | 51.5 | | 74.0 | 22.5 |
| 24237.9 | | 34.9 | 54.0 | 19.1 |
| 24312.3 | 47.7 | | 74.0 | 26.3 |

Radiated Spurious – CH19

| Frequency | MaxPeak | Avg | Limit | Margin |
|-----------|---------|--------|--------|--------|
| MHz | dBuV/m | dBuV/m | dBuV/m | dB |
| 115.2 | 29.0 | | 43.6 | 14.6 |
| 216.0 | 26.6 | | 43.6 | 17.0 |
| 576.0 | 36.9 | | 46.0 | 9.1 |
| 1113.8 | | 40.6 | 54.0 | 13.4 |
| 1151.9 | | 40.1 | 54.0 | 13.9 |
| 1190.3 | | 42.0 | 54.0 | 12.0 |
| 1190.9 | 52.4 | | 74.0 | 21.6 |
| 12199.0 | | 39.1 | 54.0 | 14.9 |
| 12201.0 | 50.5 | | 74.0 | 23.5 |
| 25929.1 | | 34.9 | 54.0 | 19.1 |
| 25946.8 | 48.3 | | 74.0 | 25.7 |



Radiated Spurious – CH39

| Frequency | MaxPeak | Avg | Limit | Margin |
|-----------|---------|--------|--------|--------|
| MHz | dBuV/m | dBuV/m | dBuV/m | dB |
| 115.2 | 28.8 | | 43.6 | 14.8 |
| 216.0 | 26.5 | | 43.6 | 17.1 |
| 576.0 | 36.7 | | 46.0 | 9.3 |
| 1113.4 | | 40.6 | 54.0 | 13.4 |
| 1151.6 | 52.3 | | 74.0 | 21.7 |
| 1151.9 | | 40.4 | 54.0 | 13.6 |
| 1190.3 | | 41.8 | 54.0 | 12.2 |
| 7440.1 | | 39.4 | 54.0 | 14.6 |
| 7440.1 | 49.3 | | 74.0 | 24.7 |
| 12398.7 | 51.2 | | 74.0 | 22.8 |
| 12398.7 | | 41.2 | 54.0 | 12.8 |
| 24243.6 | | 35.0 | 54.0 | 19.0 |
| 24314.4 | 48.2 | | 74.0 | 25.8 |



C.1.6 AC power-line conducted emission

Standard references:

| FCC part | Limits | | | | |
|----------|--|------------------------|-----------|--|--|
| | Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges. | | | | |
| 15.207 | Frequency of emission (MHz) | Conducted limit (dBµV) | | | |
| | | Quasi-peak | Average | | |
| | 0.15-0.5 | 66 to 56* | 56 to 46* | | |
| | 0.5-5 | 46 | | | |
| | 5-30 60 50 | | | | |
| | *Decreases with the logarithm of the frequency. | | | | |

Test procedure:

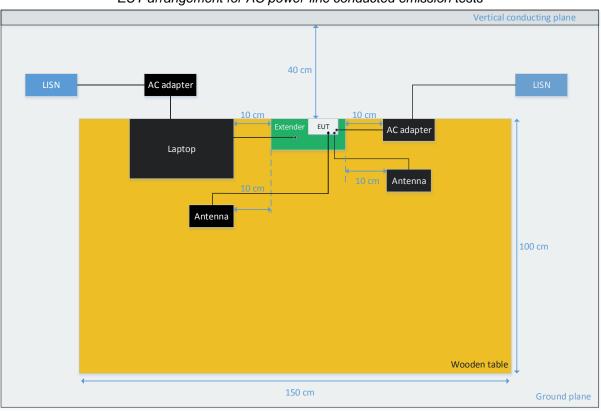
The EUT and peripherals are placed on a wooden table with a nominal size of 1.0 m by 1.5 m, raised 80 cm above the reference ground plane. The EUT is connected to AC-Power line through a Line Impedance Stabilization Network (LISN) to accommodate a 50 Ω /50 μ H coupling impedance for the measurement system. The EUT control PC is considered as a peripheric and therefore is connected to a second LISN which has the measurement port connected to a 50 ohms impedance.

Each measurement is done for each current-carrying conductor (Line and Neutral) at the end plug of the EUT power cord. The EUT is tested for several transmission modes (frequency channel, modulation, etc.) and the result providing the maximum measured emission is reported.

The exploratory measurement is done over the frequency range from 150 kHz to 30 MHz, while the measurement receiver is recording the Peak and Average signal at 10 kHz steps in Max Hold mode. The cables manipulation is performed within the range of likely configurations to determine the maximum emission. Once the EUT cable configuration, arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is found the six highest AC power-line conducted emissions relative to 20 dB of the limit are reported as the final measurement. If fewer than six emission frequencies are within 20 dB of the limit, the noise level is reported. For the final measurement, the measurement receiver records the Quasi Peak values with 9 kHz resolution bandwidth and the average values with 10 kHz resolution bandwidth.

The reported results correspond to the configuration of the worst case spurious level detected among all modes.





EUT arrangement for AC power-line conducted emission tests

Sample Calculation:

The measured level at the spectrum analyzer in dBuV is corrected by a transducer factor taking into account the losses of the RF cable and the LISN as follows:

Conducted Emission level (dBuV) = SALevel + RFCableLosses + LISNLosses

Where:

SALevel is the voltage level displayed on the measurement receiver, in dBuV.

RFCable_{Losses} is the value of the cable losses between the LISN and the measurement receiver, in dB.

 $\ensuremath{\mathsf{LISN}}_{\ensuremath{\mathsf{Losses}}}$ is the value of the insertion losses of the LISN, in dB.

Test Results:

150kHz – 30MHz, all modes

| Frequency | Max Peak | Avg | Limit | Margin |
|-----------|----------|------|-------|--------|
| MHz | dBµV | dBµV | dBµV | dB |
| 0.16 | 53.2 | | 65.8 | 12.6 |
| 0.16 | | 28.9 | 55.7 | 26.8 |
| 0.37 | 42.8 | | 59.6 | 16.8 |
| 0.37 | | 28.1 | 49.6 | 21.5 |
| 4.00 | 39.5 | | 56.0 | 16.5 |
| 4.00 | | 23.8 | 46.0 | 22.2 |
| 6.67 | 43.6 | | 60.0 | 16.4 |
| 6.75 | | 28.1 | 50.0 | 21.9 |
| 13.55 | 53.1 | | 60.0 | 6.9 |
| 13.56 | | 36.2 | 50.0 | 13.8 |
| 18.05 | 37.2 | | 60.0 | 22.8 |
| 18.11 | | 26.1 | 50.0 | 23.9 |

Note: The emissions found do not change with the modulation and/or frequency.

AC power-line conducted – Neutral N

| Frequency | Max Peak | Avg | Limit | Margin |
|-----------|----------|------|-------|--------|
| MHz | dBµV | dBµV | dBµV | dB |
| 0.16 | 53.6 | | 65.7 | 12.1 |
| 0.16 | | 28.3 | 55.7 | 27.4 |
| 0.38 | 44.5 | | 59.5 | 15.0 |
| 0.37 | | 27.9 | 49.7 | 21.8 |
| 2.79 | 31.7 | | 56.0 | 24.3 |
| 2.79 | | 22.9 | 46.0 | 23.1 |
| 4.21 | 39.8 | | 56.0 | 16.2 |
| 4.28 | | 29.7 | 46.0 | 16.3 |
| 13.57 | 52.3 | | 60.0 | 7.7 |
| 13.57 | | 31.6 | 50.0 | 18.4 |
| 25.55 | 31.8 | | 60.0 | 28.2 |
| 26.01 | | 16.9 | 50.0 | 33.1 |

Note: The emissions found do not change with the modulation and/or frequency.