

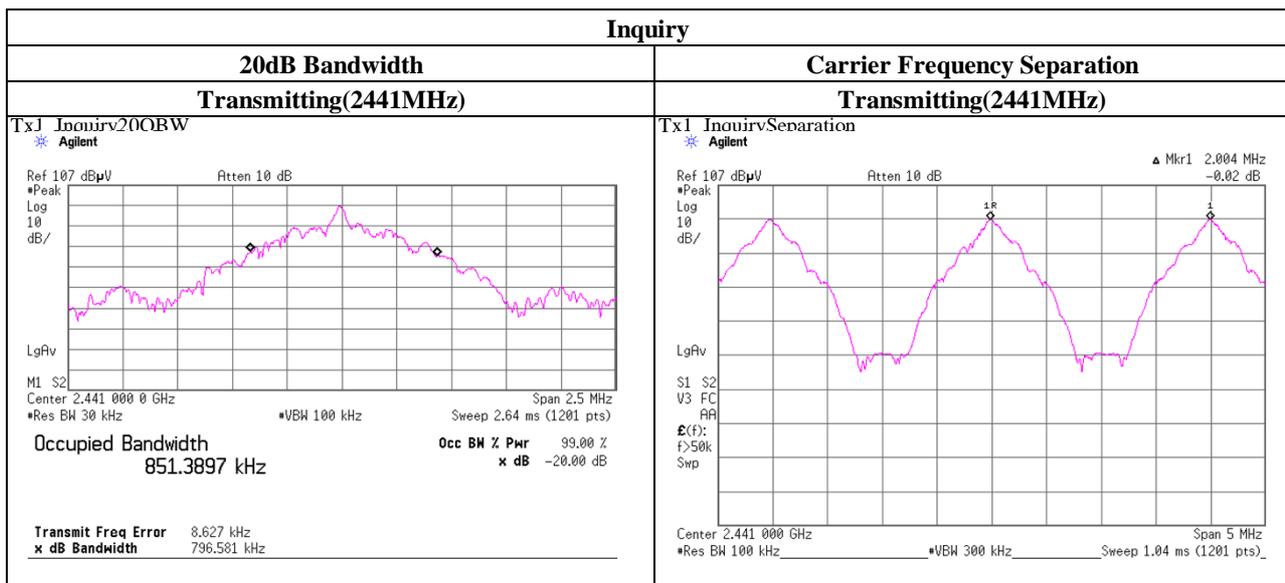
## 20dB Bandwidth and Carrier Frequency Separation

|                        |                                |                    |
|------------------------|--------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab. | No.5 Shielded Room |
| Date                   | August 8, 2011                 |                    |
| Temperature / Humidity | 28deg.C , 51%RH                |                    |
| Engineer               | Hikaru Shirasawa               |                    |
| Mode                   | Tx, Bluetooth, BDR, PRBS9      |                    |

| Mode    | Freq.<br>[MHz] | 20dB<br>Bandwidth<br>[MHz] | Carrier<br>Frequency<br>Separation<br>[MHz] | Limit for<br>Carrier<br>Frequency<br>Separation<br>[MHz] |
|---------|----------------|----------------------------|---|--|
| DH5     | 2402.0         | 0.928                      | 1.000                                       | >= 0.619   |
| DH5     | 2441.0         | 0.925                      | 1.000                                       | >= 0.617   |
| DH5     | 2480.0         | 0.928                      | 1.000                                       | >= 0.619   |
| Inquiry | 2441.0         | 0.797                      | 2.004                                       | >= 0.531   |

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.



**UL Japan, Inc.**

**Shonan EMC Lab.**

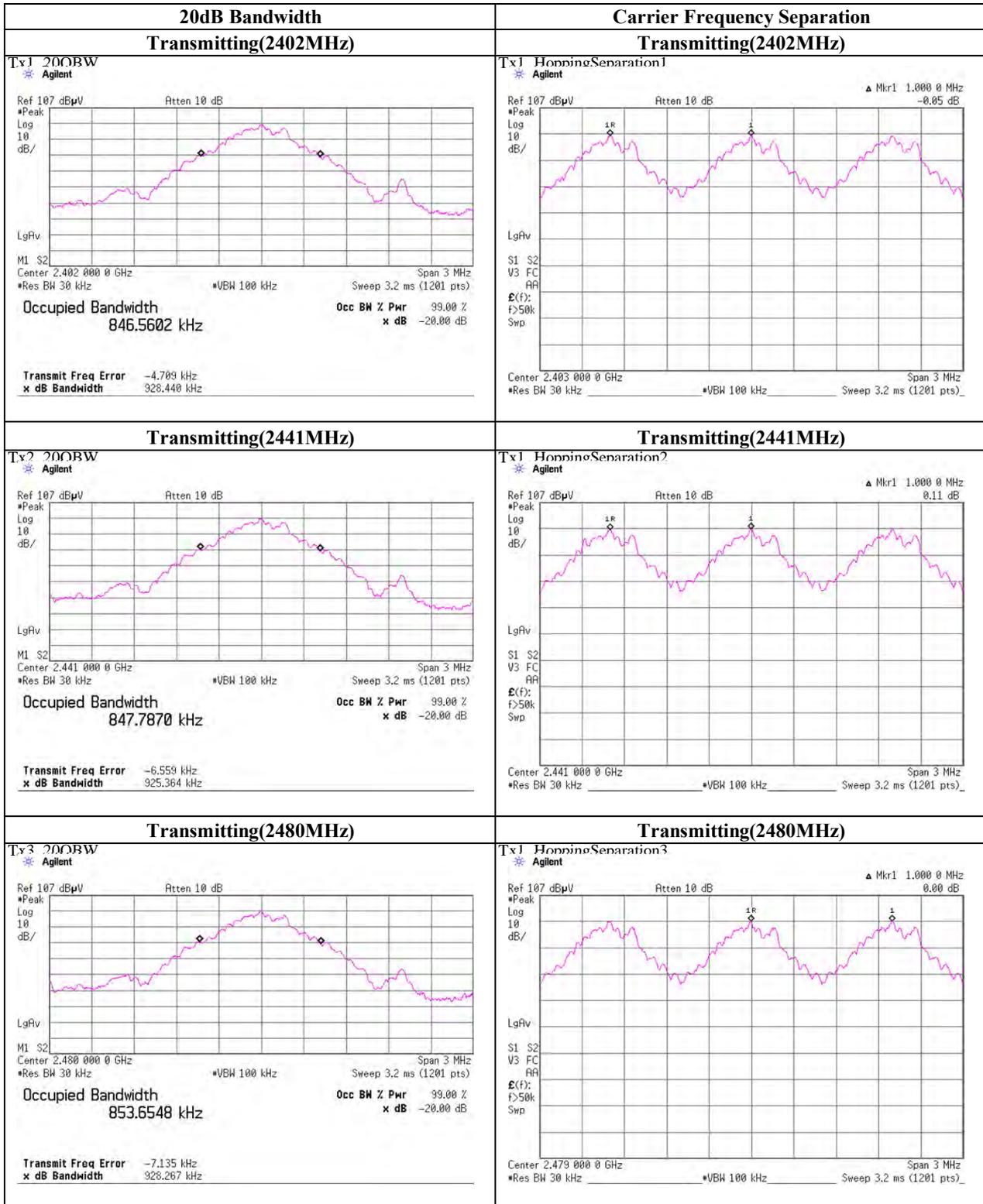
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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## 20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR (Worst: DH5), PRBS9



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## 20dB Bandwidth and Carrier Frequency Separation

Test place                   UL Japan, Inc. Shonan EMC Lab.      No.5 Shielded Room  
 Date                            August 8, 2011  
 Temperature / Humidity    28deg.C      , 51%RH  
 Engineer                     Hikaru Shirasawa  
 Mode                         Tx, Bluetooth, EDR, PRBS9

| Mode  | Freq.<br>[MHz] | 20dB<br>Bandwidth<br>[MHz] | Carrier<br>Frequency<br>Separation<br>[MHz] | Limit for<br>Carrier<br>Frequency<br>Separation<br>[MHz] |
|-------|----------------|----------------------------|---|--|
| 3-DH5 | 2402.0         | 1.275                      | 1.003                                       | >= 0.850   |
| 3-DH5 | 2441.0         | 1.274                      | 1.003                                       | >= 0.849   |
| 3-DH5 | 2480.0         | 1.270                      | 1.005                                       | >= 0.847   |

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

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**Shonan EMC Lab.**

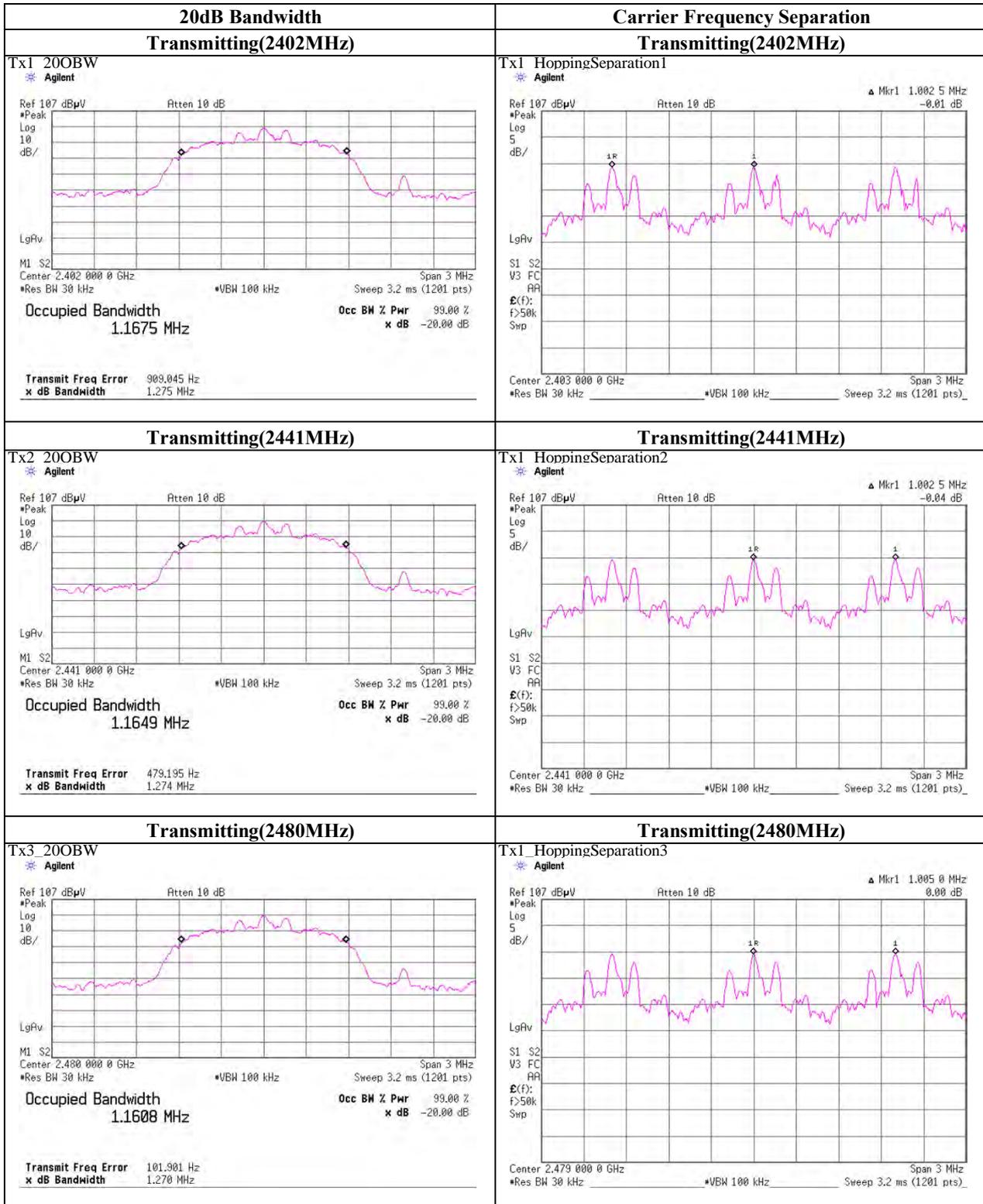
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## 20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9



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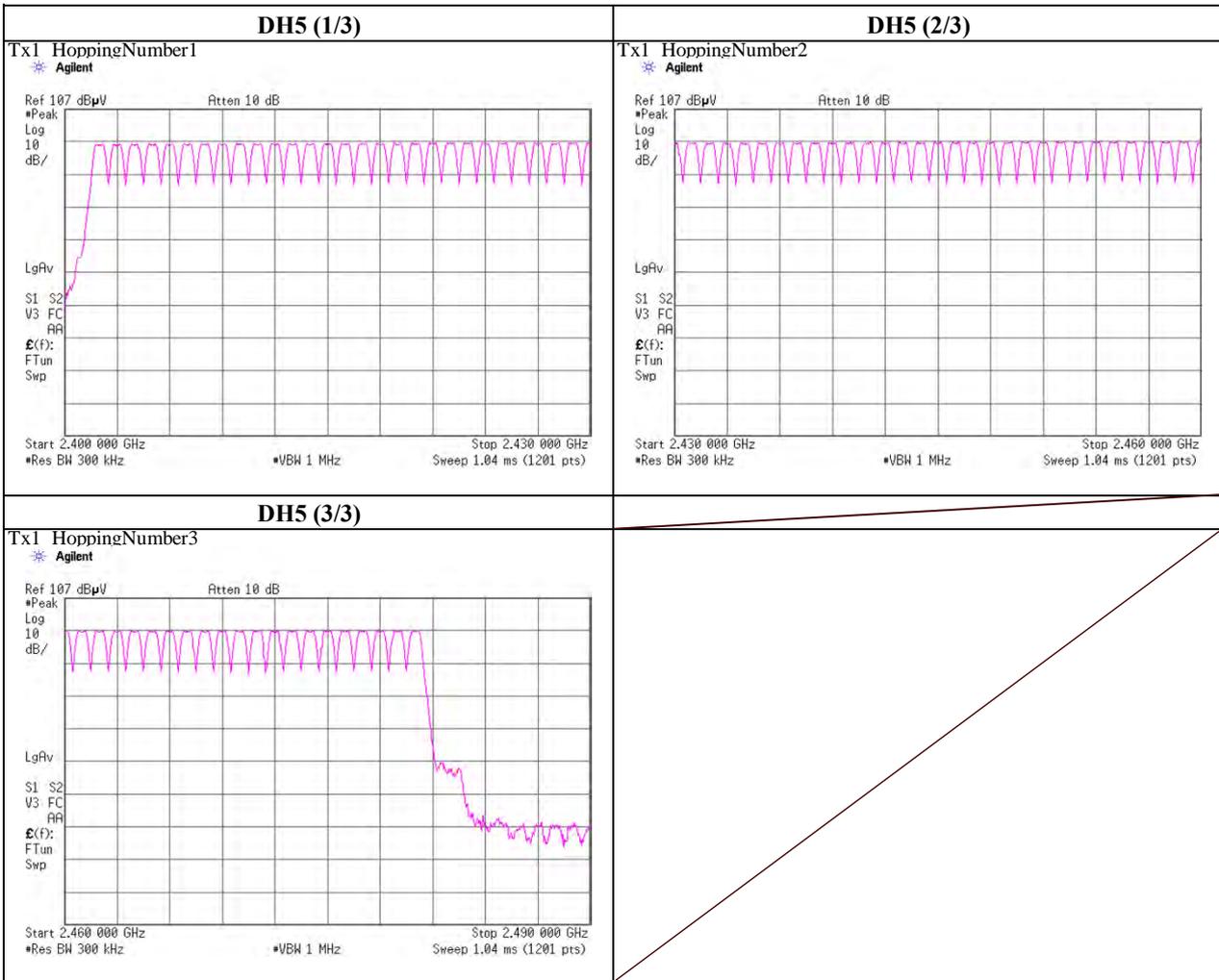
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### Number of Hopping Frequency

|                        |                                |
|------------------------|--------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab. |
| Date                   | August 9, 2011                 |
| Temperature / Humidity | 26deg.C , 57%RH                |
| Engineer               | Hikaru Shirasawa               |
| Mode                   | Tx, Bluetooth, BDR, PRBS9      |

| Mode | Number of Channel [times] | Limit [times] |
|------|---------------------------|---------------|
| DH5  | 79                        | >= 15         |



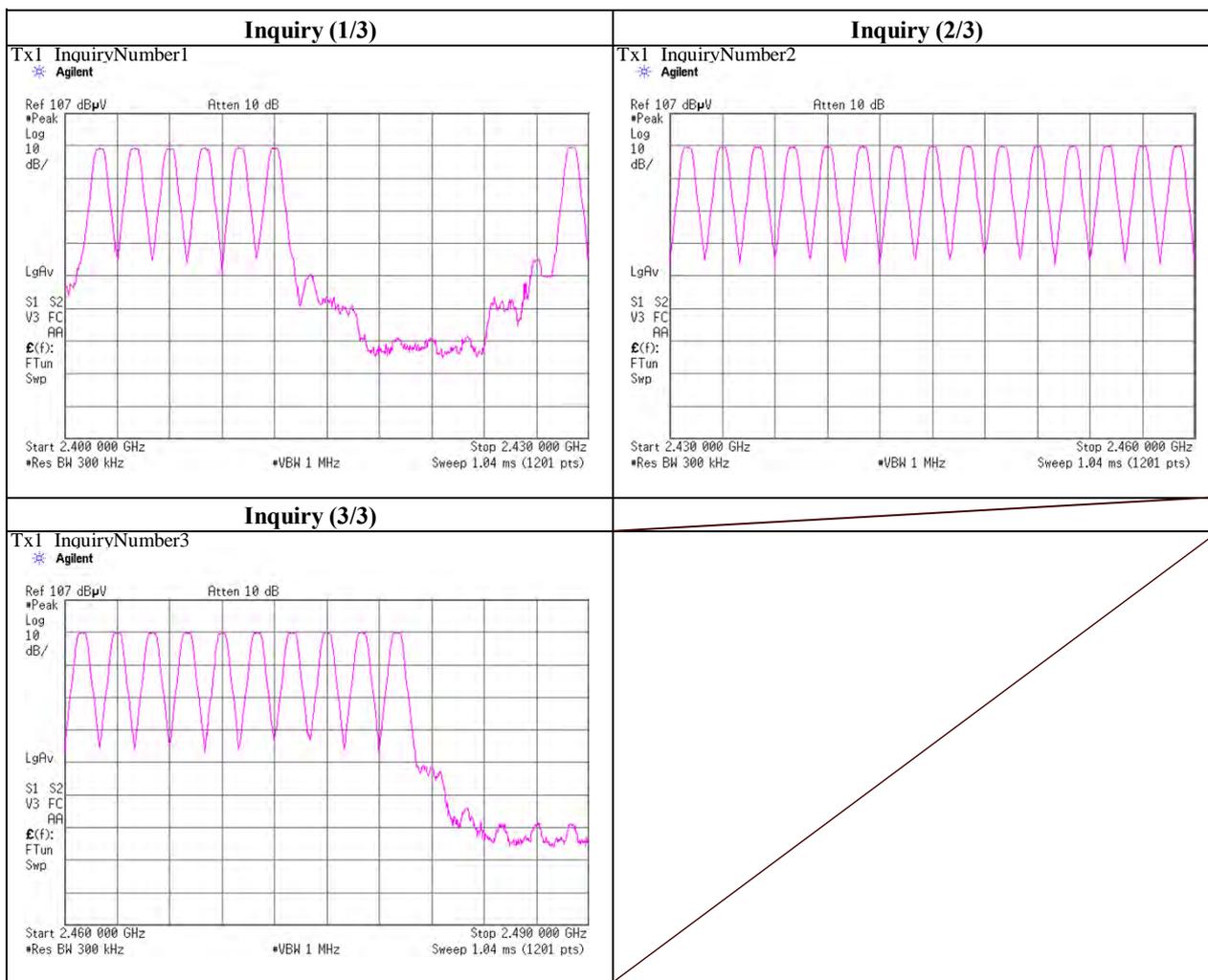
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### Number of Hopping Frequency

|                        |                                |
|------------------------|--------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab. |
| Date                   | August 9, 2011                 |
| Temperature / Humidity | 26deg.C , 57%RH                |
| Engineer               | Hikaru Shirasawa               |
| Mode                   | Tx, Bluetooth, BDR, Inquiry    |

| Mode    | Number of Channel [times] | Limit [times] |
|---------|---------------------------|---------------|
| Inquiry | 32                        | >= 15         |

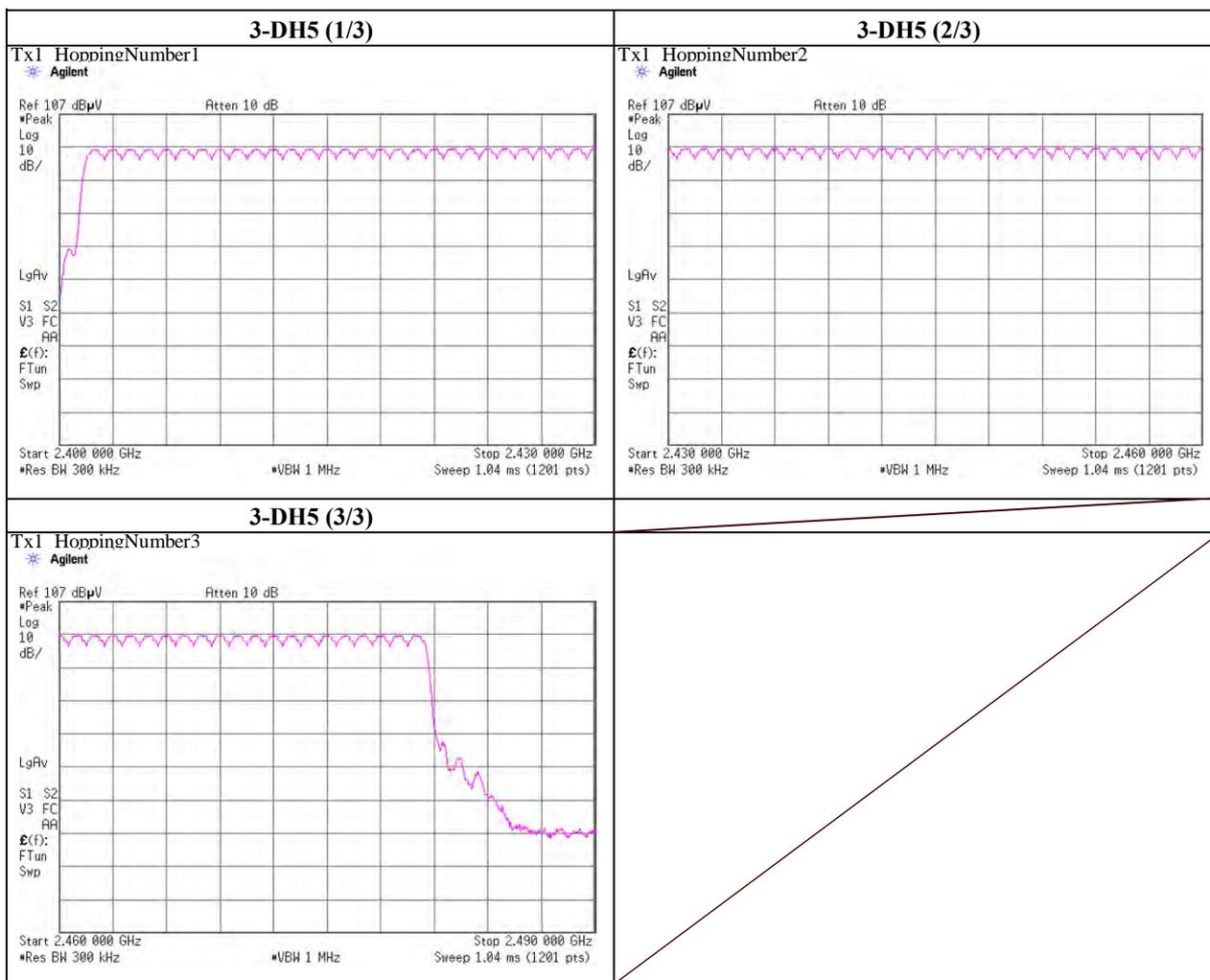


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### Number of Hopping Frequency

|                        |                                |
|------------------------|--------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab. |
| Date                   | August 9, 2011                 |
| Temperature / Humidity | 26deg.C , 57%RH                |
| Engineer               | Hikaru Shirasawa               |
| Mode                   | Tx, Bluetooth, EDR, PRBS9      |

| Mode  | Number of Channel [times] | Limit [times] |
|-------|---------------------------|---------------|
| 3-DH5 | 79                        | >= 15         |



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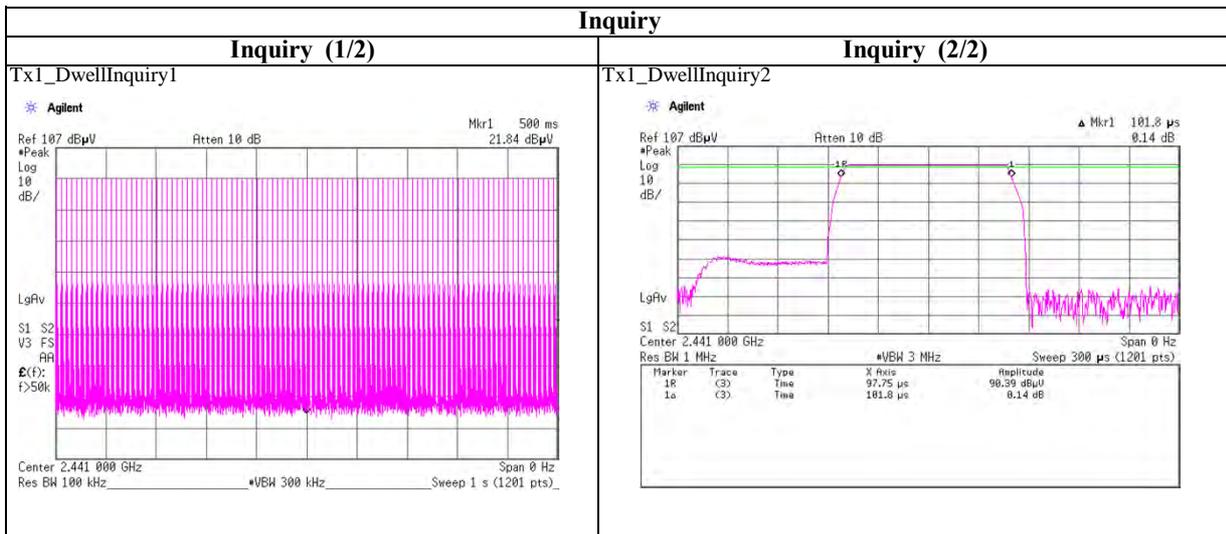
## Dwell Time

Test place           UL Japan, Inc. Shonan EMC Lab.   No.5 Shielded Room  
 Date                 August 9, 2011  
 Temperature / Humidity  26deg.C     , 57%RH  
 Engineer            Hikaru Shirasawa  
 Mode                Tx, Bluetooth, BDR, PRBS9

| Mode    | Number of transmission<br>in a 31.6(79 Hopping x 0.4)<br>/ 12.8(32 Hopping x 0.4)second period |                                     | Length of<br>transmission<br>time [msec] | Result<br>[msec] | Limit<br>[msec] |
|---------|--|-------------------------------------|--|------------------|-----------------|
| DH1     | 51.0   | / 5.0 sec. x 31.6 sec. = 323 times  | 0.400                                    | 129              | 400             |
| DH3     | 25.0   | / 5.0 sec. x 31.6 sec. = 158 times  | 1.660                                    | 262              | 400             |
| DH5     | 17.0   | / 5.0 sec. x 31.6 sec. = 108 times  | 2.907                                    | 314              | 400             |
| Inquiry | 100.0  | / 1.0 sec. x 12.8 sec. = 1280 times | 0.102                                    | 130              | 400             |

Sample Calculation

Result = Number of transmission x Length of transmittion time



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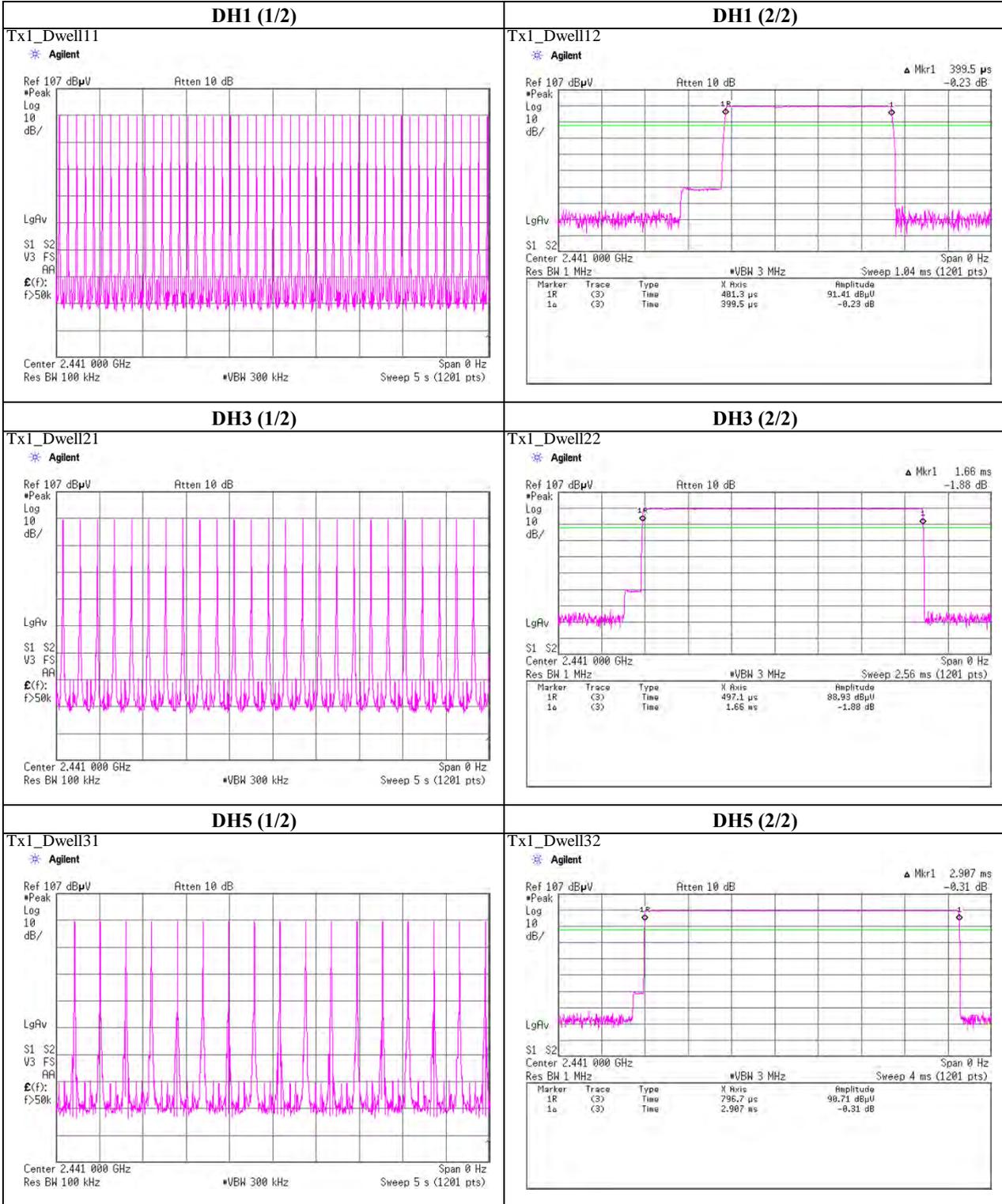
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## Dwell time

### Tx, Bluetooth, BDR, PRBS9



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## Dwell Time

Test place           UL Japan, Inc. Shonan EMC Lab.   No.5 Shielded Room  
 Date                 August 9, 2011  
 Temperature / Humidity   26deg.C     , 57%RH  
 Engineer             Hikaru Shirasawa  
 Mode                 Tx, Bluetooth, EDR, PRBS9

| Mode  | Number of transmission<br>in a 31.6(79 Hopping x 0.4)<br>/ 12.8(32 Hopping x 0.4)second period |            |                         | Length of<br>transmission<br>time [msec] | Result<br>[msec] | Limit<br>[msec] |
|-------|--|------------|-------------------------|--|------------------|-----------------|
| 3-DH1 | 51.0   | / 5.0 sec. | x 31.6 sec. = 323 times | 0.414                                    | 134              | 400             |
| 3-DH3 | 26.0   | / 5.0 sec. | x 31.6 sec. = 165 times | 1.664                                    | 275              | 400             |
| 3-DH5 | 17.0   | / 5.0 sec. | x 31.6 sec. = 108 times | 2.917                                    | 315              | 400             |

Sample Calculation

Result = Number of transmission x Length of transmission time

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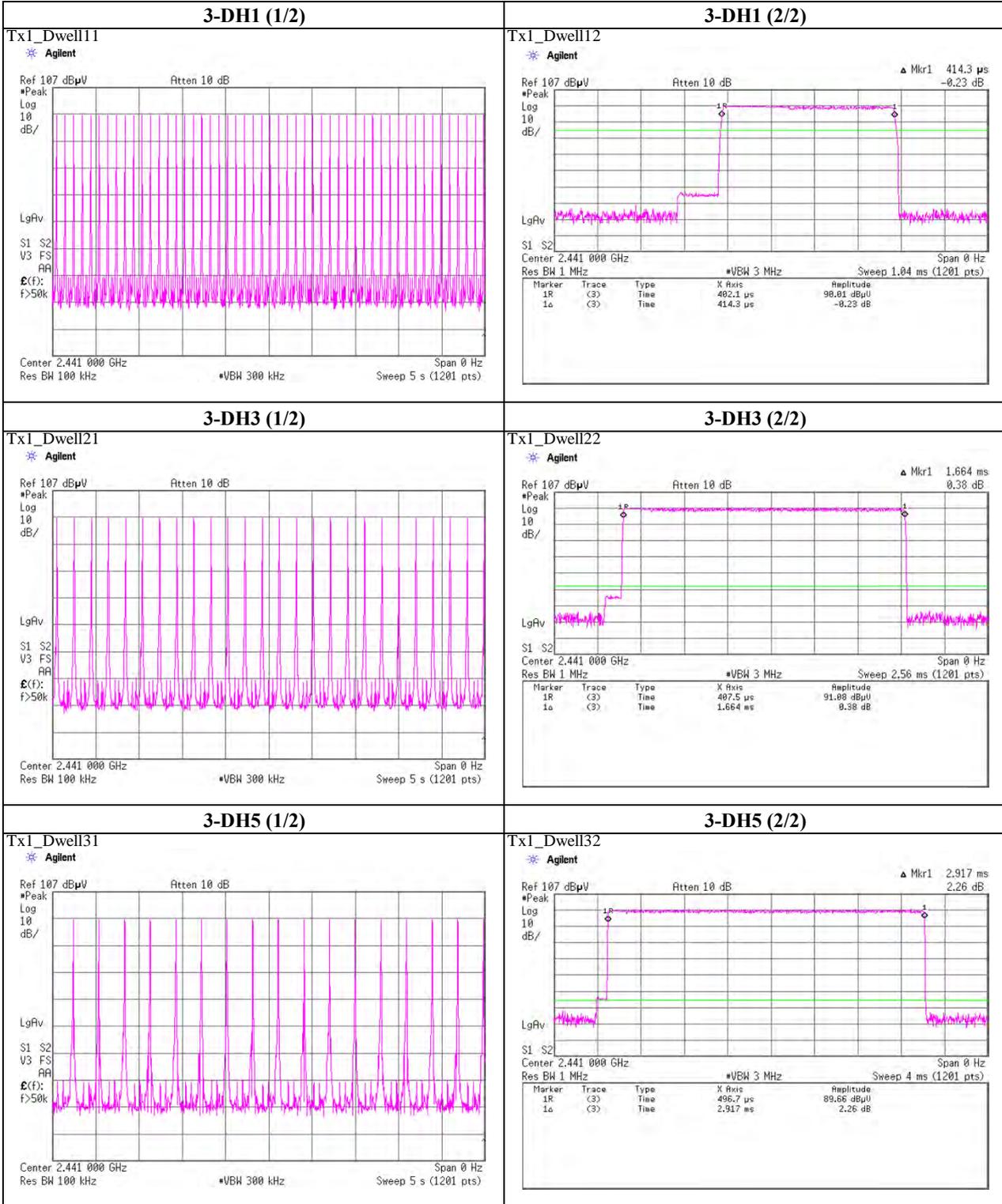
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## Dwell time

Tx, Bluetooth, EDR, PRBS9



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## Peak Output Power (Conducted)

Test place                   UL Japan, Inc. Shonan EMC Lab.      No.5 Shielded Room  
 Date                         August 8, 2011  
 Temperature / Humidity    28deg.C           , 51%RH  
 Engineer                  Hikaru Shirasawa  
 Mode                        Tx, Bluetooth

|       | Freq.<br>[MHz] | P/M (PK)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |      | Limit |      | Margin<br>[dB] |
|-------|----------------|------------------------------|-----------------------|------------------------|--------|------|-------|------|----------------|
|       |                |                              |                       |                        | [dBm]  | [mW] | [dBm] | [mW] |                |
| DH5   | 2402.0         | -10.43                       | 1.44                  | 9.97                   | 0.98   | 1.25 | 20.97 | 125  | 19.99          |
| DH5   | 2441.0         | -9.97                        | 1.43                  | 9.97                   | 1.43   | 1.39 | 20.97 | 125  | 19.54          |
| DH5   | 2480.0         | -9.74                        | 1.44                  | 9.97                   | 1.67   | 1.47 | 20.97 | 125  | 19.30          |
| 2-DH5 | 2402.0         | -9.59                        | 1.44                  | 9.97                   | 1.82   | 1.52 | 20.97 | 125  | 19.15          |
| 2-DH5 | 2441.0         | -9.30                        | 1.43                  | 9.97                   | 2.10   | 1.62 | 20.97 | 125  | 18.87          |
| 2-DH5 | 2480.0         | -9.36                        | 1.44                  | 9.97                   | 2.05   | 1.60 | 20.97 | 125  | 18.92          |
| 3-DH5 | 2402.0         | -9.51                        | 1.44                  | 9.97                   | 1.90   | 1.55 | 20.97 | 125  | 19.07          |
| 3-DH5 | 2441.0         | -9.16                        | 1.43                  | 9.97                   | 2.24   | 1.67 | 20.97 | 125  | 18.73          |
| 3-DH5 | 2480.0         | -9.20                        | 1.44                  | 9.97                   | 2.21   | 1.66 | 20.97 | 125  | 18.76          |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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## Radiated Emission

|                        |   |                                   |
|------------------------|---|-----------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.            | No.1 & No.2 Semi Anechoic Chamber |
| Date                   | August 8, 2011                            | August 10, 2011                   |
| Temperature / Humidity | 27deg.C , 66%RH                           | 23deg.C , 45%RH                   |
| Engineer               | Hikaru Shirasawa                          | Kenichi Adachi                    |
| Mode                   | Tx, 2402 MHz<br>Tx, Bluetooth, BDR, PRBS9 |                                   |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|--------------|--------|
| Hori.    | 37.153          | QP       | 26.0           | 16.1            | 7.1       | 31.8      | 17.4            | 40.0           | 22.6        | 200         | 13           |        |
| Hori.    | 66.009          | QP       | 34.2           | 7.4             | 7.5       | 31.8      | 17.3            | 40.0           | 22.7        | 294         | 321          |        |
| Hori.    | 163.110         | QP       | 36.4           | 15.5            | 8.6       | 31.8      | 28.7            | 43.5           | 14.8        | 211         | 283          |        |
| Hori.    | 800.300         | QP       | 23.4           | 21.0            | 9.5       | 31.9      | 22.0            | 46.0           | 24.0        | 100         | 359          |        |
| Hori.    | 1601.999        | PK       | 47.8           | 25.7            | 12.9      | 38.4      | 48.0            | 73.9           | 25.9        | 100         | 22           |        |
| Hori.    | 2350.000        | PK       | 46.2           | 27.3            | 13.6      | 37.9      | 49.2            | 73.9           | 24.7        | 118         | 70           |        |
| Hori.    | 2377.975        | PK       | 46.8           | 27.4            | 13.7      | 37.8      | 50.1            | 73.9           | 23.8        | 118         | 70           |        |
| Hori.    | 2390.000        | PK       | 45.3           | 27.4            | 13.7      | 37.8      | 48.6            | 73.9           | 25.3        | 118         | 70           |        |
| Hori.    | 2400.000        | PK       | 53.2           | 27.4            | 13.7      | 37.8      | 56.5            | 73.9           | 17.4        | 118         | 70           |        |
| Hori.    | 3203.000        | PK       | 45.9           | 28.6            | 5.4       | 37.9      | 42.0            | 73.9           | 31.9        | 100         | 0            |        |
| Hori.    | 4007.000        | PK       | 45.7           | 29.3            | 5.5       | 37.3      | 43.2            | 73.9           | 30.7        | 100         | 0            |        |
| Hori.    | 4804.000        | PK       | 52.5           | 30.5            | 5.9       | 36.6      | 52.3            | 73.9           | 21.6        | 103         | 105          |        |
| Hori.    | 7206.000        | PK       | 46.9           | 36.2            | 7.3       | 38.4      | 52.0            | 73.9           | 21.9        | 100         | 0            |        |
| Hori.    | 9608.000        | PK       | 45.1           | 38.3            | 8.6       | 37.1      | 54.9            | 73.9           | 19.0        | 100         | 0            |        |
| Hori.    | 12010.000       | PK       | 44.9           | 39.4            | 9.9       | 37.9      | 56.3            | 73.9           | 17.6        | 100         | 0            |        |
| Hori.    | 24020.000       | PK       | 51.4           | 40.2            | 7.4       | 47.2      | 51.8            | 73.9           | 22.1        | 100         | 0            |        |
| Vert.    | 56.361          | QP       | 31.0           | 9.3             | 7.4       | 31.8      | 15.9            | 40.0           | 24.1        | 100         | 243          |        |
| Vert.    | 160.531         | QP       | 39.2           | 15.3            | 8.6       | 31.8      | 31.3            | 43.5           | 12.2        | 111         | 260          |        |
| Vert.    | 199.003         | QP       | 35.4           | 16.8            | 9.0       | 31.8      | 29.4            | 43.5           | 14.1        | 100         | 359          |        |
| Vert.    | 800.300         | QP       | 23.4           | 21.0            | 9.5       | 31.9      | 22.0            | 46.0           | 24.0        | 100         | 333          |        |
| Vert.    | 1601.999        | PK       | 48.3           | 25.7            | 12.9      | 38.4      | 48.5            | 73.9           | 25.4        | 152         | 91           |        |
| Vert.    | 2350.000        | PK       | 46.3           | 27.3            | 13.6      | 37.9      | 49.3            | 73.9           | 24.6        | 100         | 14           |        |
| Vert.    | 2377.975        | PK       | 47.2           | 27.4            | 13.7      | 37.8      | 50.5            | 73.9           | 23.4        | 100         | 14           |        |
| Vert.    | 2390.000        | PK       | 45.2           | 27.4            | 13.7      | 37.8      | 48.5            | 73.9           | 25.4        | 100         | 14           |        |
| Vert.    | 2400.000        | PK       | 55.4           | 27.4            | 13.7      | 37.8      | 58.7            | 73.9           | 15.2        | 100         | 14           |        |
| Vert.    | 3203.000        | PK       | 46.0           | 28.6            | 5.4       | 37.9      | 42.1            | 73.9           | 31.8        | 100         | 0            |        |
| Vert.    | 4007.000        | PK       | 45.8           | 29.3            | 5.5       | 37.3      | 43.3            | 73.9           | 30.6        | 100         | 0            |        |
| Vert.    | 4804.000        | PK       | 52.6           | 30.5            | 5.9       | 36.6      | 52.4            | 73.9           | 21.5        | 121         | 182          |        |
| Vert.    | 7206.000        | PK       | 46.8           | 36.2            | 7.3       | 38.4      | 51.9            | 73.9           | 22.0        | 100         | 0            |        |
| Vert.    | 9608.000        | PK       | 45.0           | 38.3            | 8.6       | 37.1      | 54.8            | 73.9           | 19.1        | 100         | 0            |        |
| Vert.    | 12010.000       | PK       | 45.0           | 39.4            | 9.9       | 37.9      | 56.4            | 73.9           | 17.5        | 100         | 0            |        |
| Vert.    | 24020.000       | PK       | 51.5           | 40.2            | 7.4       | 47.2      | 51.9            | 73.9           | 22.0        | 100         | 0            |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 & No.2 Semi Anechoic Chamber  
Date                           August 8, 2011   August 10, 2011  
Temperature / Humidity   27deg.C , 66%RH                               23deg.C , 45%RH  
Engineer                    Hikaru Shirasawa                               Kenichi Adachi  
Mode                         Tx,                           2402 MHz  
                                  Tx, Bluetooth, BDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Dwell time factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------------|-----------------|----------------|-------------|----------|
| Hori.    | 1601.999        | AV       | 39.1           | 25.7            | 12.9      | 38.4      | -24.7                  | 14.6            | 53.9           | 39.3        | VBW300Hz |
| Hori.    | 2350.000        | AV       | 33.8           | 27.3            | 13.6      | 37.9      | -24.7                  | 12.1            | 53.9           | 41.8        | VBW300Hz |
| Hori.    | 2377.975        | AV       | 35.4           | 27.4            | 13.7      | 37.8      | -24.7                  | 14              | 53.9           | 39.9        | VBW300Hz |
| Hori.    | 2390.000        | AV       | 34.1           | 27.4            | 13.7      | 37.8      | -24.7                  | 12.7            | 53.9           | 41.2        | VBW300Hz |
| Hori.    | 2400.000        | AV       | 44.1           | 27.4            | 13.7      | 37.8      | -24.7                  | 22.7            | 53.9           | 31.2        | VBW300Hz |
| Hori.    | 3203.000        | AV       | 33.4           | 28.6            | 5.4       | 37.9      | -24.7                  | 4.8             | 53.9           | 49.1        | VBW300Hz |
| Hori.    | 4007.000        | AV       | 33.4           | 29.3            | 5.5       | 37.3      | -24.7                  | 6.2             | 53.9           | 47.7        | VBW300Hz |
| Hori.    | 4804.000        | AV       | 47.4           | 30.5            | 5.9       | 36.6      | -24.7                  | 22.5            | 53.9           | 31.4        | VBW300Hz |
| Hori.    | 7206.000        | AV       | 35.2           | 36.2            | 7.3       | 38.4      | -24.7                  | 15.6            | 53.9           | 38.3        | VBW300Hz |
| Hori.    | 9608.000        | AV       | 32.9           | 38.3            | 8.6       | 37.1      | -24.7                  | 18              | 53.9           | 35.9        | VBW300Hz |
| Hori.    | 12010.000       | AV       | 33.8           | 39.4            | 9.9       | 37.9      | -24.7                  | 20.5            | 53.9           | 33.4        | VBW300Hz |
| Hori.    | 24020.000       | AV       | 39.2           | 40.2            | 7.4       | 47.2      | -24.7                  | 14.9            | 53.9           | 39.0        | VBW300Hz |
| Vert.    | 1601.999        | AV       | 40.5           | 25.7            | 12.9      | 38.4      | -24.7                  | 16              | 53.9           | 37.9        | VBW300Hz |
| Vert.    | 2350.000        | AV       | 33.9           | 27.3            | 13.6      | 37.9      | -24.7                  | 12.2            | 53.9           | 41.7        | VBW300Hz |
| Vert.    | 2377.975        | AV       | 35.8           | 27.4            | 13.7      | 37.8      | -24.7                  | 14.4            | 53.9           | 39.5        | VBW300Hz |
| Vert.    | 2390.000        | AV       | 34.1           | 27.4            | 13.7      | 37.8      | -24.7                  | 12.7            | 53.9           | 41.2        | VBW300Hz |
| Vert.    | 2400.000        | AV       | 46.4           | 27.4            | 13.7      | 37.8      | -24.7                  | 25              | 53.9           | 28.9        | VBW300Hz |
| Vert.    | 3203.000        | AV       | 33.5           | 28.6            | 5.4       | 37.9      | -24.7                  | 4.9             | 53.9           | 49.0        | VBW300Hz |
| Vert.    | 4007.000        | AV       | 33.4           | 29.3            | 5.5       | 37.3      | -24.7                  | 6.2             | 53.9           | 47.7        | VBW300Hz |
| Vert.    | 4804.000        | AV       | 48.1           | 30.5            | 5.9       | 36.6      | -24.7                  | 23.2            | 53.9           | 30.7        | VBW300Hz |
| Vert.    | 7206.000        | AV       | 35.2           | 36.2            | 7.3       | 38.4      | -24.7                  | 15.6            | 53.9           | 38.3        | VBW300Hz |
| Vert.    | 9608.000        | AV       | 32.8           | 38.3            | 8.6       | 37.1      | -24.7                  | 17.9            | 53.9           | 36.0        | VBW300Hz |
| Vert.    | 12010.000       | AV       | 33.8           | 39.4            | 9.9       | 37.9      | -24.7                  | 20.5            | 53.9           | 33.4        | VBW300Hz |
| Vert.    | 24020.000       | AV       | 39.2           | 40.2            | 7.4       | 47.2      | -24.7                  | 14.9            | 53.9           | 39.0        | VBW300Hz |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:           13GHz-40GHz           20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                    UL Japan, Inc. Shonan EMC Lab.                    No.1 & No.2 Semi Anechoic Chamber  
 Date                            August 8, 2011    August 10, 2011  
 Temperature / Humidity    27deg.C , 66%RH                                    23deg.C , 45%RH  
 Engineer                      Hikaru Shirasawa                                    Kenichi Adachi  
 Mode                            Tx,    2441 MHz  
    Tx, Bluetooth, BDR, PRBS9

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|-----------------|--------|
| Hori.    | 37.042             | QP       | 25.4              | 16.1               | 7.0          | 31.8         | 16.7               | 40.0              | 23.3           | 259            | 11              |        |
| Hori.    | 66.023             | QP       | 34.2              | 7.3                | 7.5          | 31.8         | 17.2               | 40.0              | 22.8           | 303            | 332             |        |
| Hori.    | 164.098            | QP       | 36.0              | 15.5               | 8.6          | 31.8         | 28.3               | 43.5              | 15.2           | 193            | 289             |        |
| Hori.    | 813.300            | QP       | 23.3              | 21.2               | 9.6          | 31.8         | 22.3               | 46.0              | 23.7           | 100            | 357             |        |
| Hori.    | 1626.663           | PK       | 47.5              | 25.8               | 12.9         | 38.4         | 47.8               | 73.9              | 26.1           | 100            | 19              |        |
| Hori.    | 2416.980           | PK       | 46.0              | 27.4               | 13.6         | 37.7         | 49.3               | 73.9              | 24.6           | 121            | 73              |        |
| Hori.    | 3257.000           | PK       | 46.0              | 28.7               | 5.3          | 37.8         | 42.2               | 73.9              | 31.7           | 100            | 0               |        |
| Hori.    | 4070.000           | PK       | 45.3              | 29.3               | 5.6          | 37.3         | 42.9               | 73.9              | 31.0           | 100            | 0               |        |
| Hori.    | 4882.000           | PK       | 52.4              | 30.8               | 5.9          | 36.6         | 52.5               | 73.9              | 21.4           | 104            | 101             |        |
| Hori.    | 7323.000           | PK       | 46.7              | 36.4               | 7.4          | 38.4         | 52.1               | 73.9              | 21.8           | 100            | 0               |        |
| Hori.    | 9764.000           | PK       | 45.3              | 38.5               | 8.6          | 37.1         | 55.3               | 73.9              | 18.6           | 100            | 0               |        |
| Hori.    | 12205.000          | PK       | 45.2              | 39.4               | 9.9          | 38.0         | 56.5               | 73.9              | 17.4           | 100            | 0               |        |
| Hori.    | 24410.000          | PK       | 51.4              | 40.2               | 7.5          | 47.3         | 51.8               | 73.9              | 22.1           | 100            | 0               |        |
| Vert.    | 30.011             | QP       | 27.2              | 18.5               | 6.9          | 31.8         | 20.8               | 40.0              | 19.2           | 100            | 243             |        |
| Vert.    | 56.806             | QP       | 31.6              | 9.2                | 7.4          | 31.8         | 16.4               | 40.0              | 23.6           | 102            | 233             |        |
| Vert.    | 66.340             | QP       | 32.2              | 7.3                | 7.5          | 31.8         | 15.2               | 40.0              | 24.8           | 100            | 244             |        |
| Vert.    | 160.486            | QP       | 39.2              | 15.3               | 8.6          | 31.8         | 31.3               | 43.5              | 12.2           | 100            | 295             |        |
| Vert.    | 813.300            | QP       | 23.4              | 21.2               | 9.6          | 31.8         | 22.4               | 46.0              | 23.6           | 100            | 8               |        |
| Vert.    | 1626.663           | PK       | 48.4              | 25.8               | 12.9         | 38.4         | 48.7               | 73.9              | 25.2           | 154            | 93              |        |
| Vert.    | 2416.980           | PK       | 46.1              | 27.4               | 13.6         | 37.7         | 49.4               | 73.9              | 24.5           | 100            | 16              |        |
| Vert.    | 3257.000           | PK       | 46.1              | 28.7               | 5.3          | 37.8         | 42.3               | 73.9              | 31.6           | 100            | 0               |        |
| Vert.    | 4070.000           | PK       | 45.4              | 29.3               | 5.6          | 37.3         | 43.0               | 73.9              | 30.9           | 100            | 0               |        |
| Vert.    | 4882.000           | PK       | 52.6              | 30.8               | 5.9          | 36.6         | 52.7               | 73.9              | 21.2           | 119            | 184             |        |
| Vert.    | 7323.000           | PK       | 46.6              | 36.4               | 7.4          | 38.4         | 52.0               | 73.9              | 21.9           | 100            | 0               |        |
| Vert.    | 9764.000           | PK       | 45.2              | 38.5               | 8.6          | 37.1         | 55.2               | 73.9              | 18.7           | 100            | 0               |        |
| Vert.    | 12205.000          | PK       | 45.3              | 39.4               | 9.9          | 38.0         | 56.6               | 73.9              | 17.3           | 100            | 0               |        |
| Vert.    | 24410.000          | PK       | 51.3              | 40.2               | 7.5          | 47.3         | 51.7               | 73.9              | 22.2           | 100            | 0               |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:            13GHz-40GHz             $20\log(3.0m/1.0m) = 9.5dB$

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 & No.2 Semi Anechoic Chamber  
Date                           August 8, 2011   August 10, 2011  
Temperature / Humidity   27deg.C , 66%RH                               23deg.C , 45%RH  
Engineer                    Hikaru Shirasawa                               Kenichi Adachi  
Mode                         Tx,                           2441 MHz  
                                  Tx, Bluetooth, BDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Dwell time<br>factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|---------------------------|--------------------|-------------------|----------------|----------|
| Hori.    | 1626.663           | AV       | 39.0              | 25.8               | 12.9         | 38.4         | -24.7                     | 14.6               | 53.9              | 39.3           | VBW300Hz |
| Hori.    | 2416.980           | AV       | 33.8              | 27.4               | 13.6         | 37.7         | -24.7                     | 12.4               | 53.9              | 41.5           | VBW300Hz |
| Hori.    | 3257.000           | AV       | 33.3              | 28.7               | 5.3          | 37.8         | -24.7                     | 4.8                | 53.9              | 49.1           | VBW300Hz |
| Hori.    | 4070.000           | AV       | 33.4              | 29.3               | 5.6          | 37.3         | -24.7                     | 6.3                | 53.9              | 47.6           | VBW300Hz |
| Hori.    | 4882.000           | AV       | 47.2              | 30.8               | 5.9          | 36.6         | -24.7                     | 22.6               | 53.9              | 31.3           | VBW300Hz |
| Hori.    | 7323.000           | AV       | 35.3              | 36.4               | 7.4          | 38.4         | -24.7                     | 16.0               | 53.9              | 37.9           | VBW300Hz |
| Hori.    | 9764.000           | AV       | 33.0              | 38.5               | 8.6          | 37.1         | -24.7                     | 18.3               | 53.9              | 35.6           | VBW300Hz |
| Hori.    | 12205.000          | AV       | 33.9              | 39.4               | 9.9          | 38.0         | -24.7                     | 20.5               | 53.9              | 33.4           | VBW300Hz |
| Hori.    | 24410.000          | AV       | 39.9              | 40.2               | 7.5          | 47.3         | -24.7                     | 15.6               | 53.9              | 38.3           | VBW300Hz |
| Vert.    | 1626.663           | AV       | 40.3              | 25.8               | 12.9         | 38.4         | -24.7                     | 15.9               | 53.9              | 38.0           | VBW300Hz |
| Vert.    | 2416.980           | AV       | 33.8              | 27.4               | 13.6         | 37.7         | -24.7                     | 12.4               | 53.9              | 41.5           | VBW300Hz |
| Vert.    | 3257.000           | AV       | 33.4              | 28.7               | 5.3          | 37.8         | -24.7                     | 4.9                | 53.9              | 49.0           | VBW300Hz |
| Vert.    | 4070.000           | AV       | 33.5              | 29.3               | 5.6          | 37.3         | -24.7                     | 6.4                | 53.9              | 47.5           | VBW300Hz |
| Vert.    | 4882.000           | AV       | 47.9              | 30.8               | 5.9          | 36.6         | -24.7                     | 23.3               | 53.9              | 30.6           | VBW300Hz |
| Vert.    | 7323.000           | AV       | 35.2              | 36.4               | 7.4          | 38.4         | -24.7                     | 15.9               | 53.9              | 38.0           | VBW300Hz |
| Vert.    | 9764.000           | AV       | 33.0              | 38.5               | 8.6          | 37.1         | -24.7                     | 18.3               | 53.9              | 35.6           | VBW300Hz |
| Vert.    | 12205.000          | AV       | 33.9              | 39.4               | 9.9          | 38.0         | -24.7                     | 20.5               | 53.9              | 33.4           | VBW300Hz |
| Vert.    | 24410.000          | AV       | 39.9              | 40.2               | 7.5          | 47.3         | -24.7                     | 15.6               | 53.9              | 38.3           | VBW300Hz |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:           13GHz-40GHz           20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 & No.2 Semi Anechoic Chamber  
Date                           August 8, 2011   August 10, 2011  
Temperature / Humidity   27deg.C , 66%RH                               23deg.C , 45%RH  
Engineer                    Hikaru Shirasawa                               Kenichi Adachi  
Mode                         Tx,                           2480 MHz  
                                  Tx, Bluetooth, BDR, PRBS9

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|--------------|--------|
| Hori.    | 65.816          | QP       | 32.8           | 7.4             | 7.5       | 31.8      | 15.9            | 40.0           | 24.1        | 268         | 332          |        |
| Hori.    | 162.533         | QP       | 36.0           | 15.5            | 8.6       | 31.8      | 28.3            | 43.5           | 15.2        | 192         | 285          |        |
| Hori.    | 826.200         | QP       | 23.5           | 21.3            | 9.7       | 31.8      | 22.7            | 46.0           | 23.3        | 150         | 307          |        |
| Hori.    | 1652.663        | PK       | 47.5           | 25.9            | 13.0      | 38.4      | 48.0            | 73.9           | 25.9        | 100         | 21           |        |
| Hori.    | 2483.500        | PK       | 46.4           | 27.4            | 13.6      | 37.6      | 49.8            | 73.9           | 24.1        | 122         | 75           |        |
| Hori.    | 2503.898        | PK       | 46.8           | 27.4            | 13.7      | 37.6      | 50.3            | 73.9           | 23.6        | 122         | 75           |        |
| Hori.    | 2533.000        | PK       | 46.4           | 27.5            | 13.7      | 37.6      | 50.0            | 73.9           | 23.9        | 122         | 75           |        |
| Hori.    | 3307.000        | PK       | 46.0           | 28.8            | 5.3       | 37.8      | 42.3            | 73.9           | 31.6        | 100         | 0            |        |
| Hori.    | 4137.000        | PK       | 46.1           | 29.4            | 5.6       | 37.2      | 43.9            | 73.9           | 30.0        | 100         | 0            |        |
| Hori.    | 4960.000        | PK       | 51.9           | 31.0            | 5.9       | 36.5      | 52.3            | 73.9           | 21.6        | 100         | 0            |        |
| Hori.    | 7440.000        | PK       | 46.1           | 36.7            | 7.3       | 38.4      | 51.7            | 73.9           | 22.2        | 100         | 0            |        |
| Hori.    | 9920.000        | PK       | 45.3           | 38.7            | 8.6       | 37.2      | 55.4            | 73.9           | 18.5        | 100         | 0            |        |
| Hori.    | 12400.000       | PK       | 45.3           | 39.4            | 9.9       | 38.0      | 56.6            | 73.9           | 17.3        | 100         | 0            |        |
| Hori.    | 24800.000       | PK       | 50.6           | 40.2            | 7.7       | 47.1      | 51.4            | 73.9           | 22.5        | 100         | 0            |        |
| Vert.    | 30.051          | QP       | 27.4           | 18.5            | 6.9       | 31.8      | 21.0            | 40.0           | 19.0        | 100         | 173          |        |
| Vert.    | 37.020          | QP       | 24.7           | 16.1            | 7.0       | 31.8      | 16.0            | 40.0           | 24.0        | 100         | 93           |        |
| Vert.    | 161.018         | QP       | 39.6           | 15.4            | 8.6       | 31.8      | 31.8            | 43.5           | 11.7        | 100         | 267          |        |
| Vert.    | 198.998         | QP       | 35.3           | 16.8            | 9.0       | 31.8      | 29.3            | 43.5           | 14.2        | 100         | 6            |        |
| Vert.    | 826.200         | QP       | 23.4           | 21.3            | 9.7       | 31.8      | 22.6            | 46.0           | 23.4        | 100         | 234          |        |
| Vert.    | 1652.663        | PK       | 47.9           | 25.9            | 13.0      | 38.4      | 48.4            | 73.9           | 25.5        | 148         | 92           |        |
| Vert.    | 2483.500        | PK       | 46.5           | 27.4            | 13.6      | 37.6      | 49.9            | 73.9           | 24.0        | 100         | 18           |        |
| Vert.    | 2503.898        | PK       | 47.0           | 27.4            | 13.7      | 37.6      | 50.5            | 73.9           | 23.4        | 100         | 18           |        |
| Vert.    | 2533.000        | PK       | 46.5           | 27.5            | 13.7      | 37.6      | 50.1            | 73.9           | 23.8        | 100         | 18           |        |
| Vert.    | 3307.000        | PK       | 46.1           | 28.8            | 5.3       | 37.8      | 42.4            | 73.9           | 31.5        | 100         | 0            |        |
| Vert.    | 4137.000        | PK       | 46.2           | 29.4            | 5.6       | 37.2      | 44.0            | 73.9           | 29.9        | 100         | 0            |        |
| Vert.    | 4960.000        | PK       | 52.0           | 31.0            | 5.9       | 36.5      | 52.4            | 73.9           | 21.5        | 118         | 189          |        |
| Vert.    | 7440.000        | PK       | 46.0           | 36.7            | 7.3       | 38.4      | 51.6            | 73.9           | 22.3        | 100         | 0            |        |
| Vert.    | 9920.000        | PK       | 45.3           | 38.7            | 8.6       | 37.2      | 55.4            | 73.9           | 18.5        | 100         | 0            |        |
| Vert.    | 12400.000       | PK       | 45.3           | 39.4            | 9.9       | 38.0      | 56.6            | 73.9           | 17.3        | 100         | 0            |        |
| Vert.    | 24800.000       | PK       | 50.5           | 40.2            | 7.7       | 47.1      | 51.3            | 73.9           | 22.6        | 100         | 0            |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:           13GHz-40GHz           20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 & No.2 Semi Anechoic Chamber  
Date                           August 8, 2011   August 10, 2011  
Temperature / Humidity   27deg.C , 66%RH                               23deg.C , 45%RH  
Engineer                    Hikaru Shirasawa                               Kenichi Adachi  
Mode                         Tx,                           2480 MHz  
                                  Tx, Bluetooth, BDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Dwell time factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------------|-----------------|----------------|-------------|----------|
| Hori.    | 1652.663        | AV       | 38.6           | 25.9            | 13.0      | 38.4      | -24.7                  | 14.4            | 53.9           | 39.5        | VBW300Hz |
| Hori.    | 2483.500        | AV       | 36.3           | 27.4            | 13.6      | 37.6      | -24.7                  | 15.0            | 53.9           | 38.9        | VBW300Hz |
| Hori.    | 2503.898        | AV       | 35.4           | 27.4            | 13.7      | 37.6      | -24.7                  | 14.2            | 53.9           | 39.7        | VBW300Hz |
| Hori.    | 2533.000        | AV       | 34.2           | 27.5            | 13.7      | 37.6      | -24.7                  | 13.1            | 53.9           | 40.8        | VBW300Hz |
| Hori.    | 3307.000        | AV       | 33.3           | 28.8            | 5.3       | 37.8      | -24.7                  | 4.9             | 53.9           | 49.0        | VBW300Hz |
| Hori.    | 4137.000        | AV       | 33.4           | 29.4            | 5.6       | 37.2      | -24.7                  | 6.5             | 53.9           | 47.4        | VBW300Hz |
| Hori.    | 4960.000        | AV       | 47.0           | 31.0            | 5.9       | 36.5      | -24.7                  | 22.7            | 53.9           | 31.2        | VBW300Hz |
| Hori.    | 7440.000        | AV       | 35.2           | 36.7            | 7.3       | 38.4      | -24.7                  | 16.1            | 53.9           | 37.8        | VBW300Hz |
| Hori.    | 9920.000        | AV       | 33.1           | 38.7            | 8.6       | 37.2      | -24.7                  | 18.5            | 53.9           | 35.4        | VBW300Hz |
| Hori.    | 12400.000       | AV       | 33.8           | 39.4            | 9.9       | 38.0      | -24.7                  | 20.4            | 53.9           | 33.5        | VBW300Hz |
| Hori.    | 24800.000       | AV       | 40.2           | 40.2            | 7.7       | 47.1      | -24.7                  | 16.3            | 53.9           | 37.6        | VBW300Hz |
| Vert.    | 1652.663        | AV       | 40.2           | 25.9            | 13.0      | 38.4      | -24.7                  | 16.0            | 53.9           | 37.9        | VBW300Hz |
| Vert.    | 2483.500        | AV       | 36.7           | 27.4            | 13.6      | 37.6      | -24.7                  | 15.4            | 53.9           | 38.5        | VBW300Hz |
| Vert.    | 2503.898        | AV       | 35.5           | 27.4            | 13.7      | 37.6      | -24.7                  | 14.3            | 53.9           | 39.6        | VBW300Hz |
| Vert.    | 2533.000        | AV       | 34.3           | 27.5            | 13.7      | 37.6      | -24.7                  | 13.2            | 53.9           | 40.7        | VBW300Hz |
| Vert.    | 3307.000        | AV       | 33.4           | 28.8            | 5.3       | 37.8      | -24.7                  | 5.0             | 53.9           | 48.9        | VBW300Hz |
| Vert.    | 4137.000        | AV       | 33.3           | 29.4            | 5.6       | 37.2      | -24.7                  | 6.4             | 53.9           | 47.5        | VBW300Hz |
| Vert.    | 4960.000        | AV       | 46.8           | 31.0            | 5.9       | 36.5      | -24.7                  | 22.5            | 53.9           | 31.4        | VBW300Hz |
| Vert.    | 7440.000        | AV       | 35.1           | 36.7            | 7.3       | 38.4      | -24.7                  | 16.0            | 53.9           | 37.9        | VBW300Hz |
| Vert.    | 9920.000        | AV       | 33.2           | 38.7            | 8.6       | 37.2      | -24.7                  | 18.6            | 53.9           | 35.3        | VBW300Hz |
| Vert.    | 12400.000       | AV       | 33.7           | 39.4            | 9.9       | 38.0      | -24.7                  | 20.3            | 53.9           | 33.6        | VBW300Hz |
| Vert.    | 24800.000       | AV       | 40.2           | 40.2            | 7.7       | 47.1      | -24.7                  | 16.3            | 53.9           | 37.6        | VBW300Hz |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:           13GHz-40GHz           20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

|                        |   |                                   |
|------------------------|---|-----------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.            | No.1 & No.2 Semi Anechoic Chamber |
| Date                   | August 8, 2011                            | August 10, 2011                   |
| Temperature / Humidity | 27deg.C , 66%RH                           | 23deg.C , 45%RH                   |
| Engineer               | Hikaru Shirasawa                          | Kenichi Adachi                    |
| Mode                   | Tx, 2402 MHz<br>Tx, Bluetooth, EDR, PRBS9 |                                   |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|--------------|--------|
| Hori.    | 57.525          | QP       | 26.5           | 9.0             | 7.4       | 31.8      | 11.1            | 40.0           | 28.9        | 300         | 190          |        |
| Hori.    | 163.053         | QP       | 36.3           | 15.5            | 8.6       | 31.8      | 28.6            | 43.5           | 14.9        | 211         | 289          |        |
| Hori.    | 713.677         | QP       | 23.3           | 20.4            | 9.2       | 32.0      | 20.9            | 46.0           | 25.1        | 100         | 139          |        |
| Hori.    | 1601.998        | PK       | 46.5           | 25.7            | 12.9      | 38.4      | 46.7            | 73.9           | 27.2        | 103         | 18           |        |
| Hori.    | 2350.000        | PK       | 46.2           | 27.3            | 13.6      | 37.9      | 49.2            | 73.9           | 24.7        | 122         | 78           |        |
| Hori.    | 2377.973        | PK       | 46.8           | 27.4            | 13.7      | 37.8      | 50.1            | 73.9           | 23.8        | 122         | 78           |        |
| Hori.    | 2390.000        | PK       | 46.2           | 27.4            | 13.7      | 37.8      | 49.5            | 73.9           | 24.4        | 122         | 78           |        |
| Hori.    | 2400.000        | PK       | 60.7           | 27.4            | 13.7      | 37.8      | 64.0            | 73.9           | 9.9         | 122         | 78           |        |
| Hori.    | 3203.000        | PK       | 45.8           | 28.6            | 5.4       | 37.9      | 41.9            | 73.9           | 32.0        | 100         | 0            |        |
| Hori.    | 4003.000        | PK       | 45.8           | 29.3            | 5.5       | 37.3      | 43.3            | 73.9           | 30.6        | 100         | 0            |        |
| Hori.    | 4804.000        | PK       | 47.8           | 30.5            | 5.9       | 36.6      | 47.6            | 73.9           | 26.3        | 106         | 112          |        |
| Hori.    | 7206.000        | PK       | 46.8           | 36.2            | 7.3       | 38.4      | 51.9            | 73.9           | 22.0        | 100         | 0            |        |
| Hori.    | 9608.000        | PK       | 45.2           | 38.3            | 8.6       | 37.1      | 55.0            | 73.9           | 18.9        | 100         | 0            |        |
| Hori.    | 24020.000       | PK       | 51.2           | 40.2            | 7.4       | 47.2      | 51.6            | 73.9           | 22.3        | 100         | 0            |        |
| Vert.    | 57.171          | QP       | 31.7           | 9.1             | 7.4       | 31.8      | 16.4            | 40.0           | 23.6        | 100         | 243          |        |
| Vert.    | 66.349          | QP       | 31.9           | 7.3             | 7.5       | 31.8      | 14.9            | 40.0           | 25.1        | 100         | 237          |        |
| Vert.    | 161.021         | QP       | 39.6           | 15.4            | 8.6       | 31.8      | 31.8            | 43.5           | 11.7        | 100         | 292          |        |
| Vert.    | 198.862         | QP       | 35.4           | 16.8            | 9.0       | 31.8      | 29.4            | 43.5           | 14.1        | 100         | 12           |        |
| Vert.    | 713.677         | QP       | 23.2           | 20.4            | 9.2       | 32.0      | 20.8            | 46.0           | 25.2        | 100         | 59           |        |
| Vert.    | 1601.998        | PK       | 47.7           | 25.7            | 12.9      | 38.4      | 47.9            | 73.9           | 26.0        | 153         | 94           |        |
| Vert.    | 2350.000        | PK       | 46.3           | 27.3            | 13.6      | 37.9      | 49.3            | 73.9           | 24.6        | 100         | 17           |        |
| Vert.    | 2377.973        | PK       | 47.0           | 27.4            | 13.7      | 37.8      | 50.3            | 73.9           | 23.6        | 100         | 17           |        |
| Vert.    | 2390.000        | PK       | 46.1           | 27.4            | 13.7      | 37.8      | 49.4            | 73.9           | 24.5        | 100         | 17           |        |
| Vert.    | 2400.000        | PK       | 61.0           | 27.4            | 13.7      | 37.8      | 64.3            | 73.9           | 9.6         | 100         | 17           |        |
| Vert.    | 3203.000        | PK       | 45.9           | 28.6            | 5.4       | 37.9      | 42.0            | 73.9           | 31.9        | 100         | 0            |        |
| Vert.    | 4003.000        | PK       | 45.9           | 29.3            | 5.5       | 37.3      | 43.4            | 73.9           | 30.5        | 100         | 0            |        |
| Vert.    | 4804.000        | PK       | 48.1           | 30.5            | 5.9       | 36.6      | 47.9            | 73.9           | 26.0        | 109         | 183          |        |
| Vert.    | 7206.000        | PK       | 46.9           | 36.2            | 7.3       | 38.4      | 52.0            | 73.9           | 21.9        | 100         | 0            |        |
| Vert.    | 9608.000        | PK       | 45.1           | 38.3            | 8.6       | 37.1      | 54.9            | 73.9           | 19.0        | 100         | 0            |        |
| Vert.    | 24020.000       | PK       | 51.3           | 40.2            | 7.4       | 47.2      | 51.7            | 73.9           | 22.2        | 100         | 0            |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 13GHz-40GHz  $20\log(3.0m/1.0m) = 9.5dB$

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 & No.2 Semi Anechoic Chamber  
Date                           August 8, 2011   August 10, 2011  
Temperature / Humidity   27deg.C , 66%RH                               23deg.C , 45%RH  
Engineer                    Hikaru Shirasawa                               Kenichi Adachi  
Mode                         Tx,                           2402 MHz  
                                  Tx, Bluetooth, EDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Dwell time factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark    |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------------|-----------------|----------------|-------------|-----------|
| Hori.    | 1601.998        | AV       | 37.8           | 25.7            | 12.9      | 38.4      | -24.7                  | 13.3            | 53.9           | 40.6        | VBW300Hz, |
| Hori.    | 2350.000        | AV       | 33.9           | 27.3            | 13.6      | 37.9      | -24.7                  | 12.2            | 53.9           | 41.7        | VBW300Hz, |
| Hori.    | 2377.973        | AV       | 34.3           | 27.4            | 13.7      | 37.8      | -24.7                  | 12.9            | 53.9           | 41.0        | VBW300Hz, |
| Hori.    | 2390.000        | AV       | 34.0           | 27.4            | 13.7      | 37.8      | -24.7                  | 12.6            | 53.9           | 41.3        | VBW300Hz, |
| Hori.    | 2400.000        | AV       | 49.0           | 27.4            | 13.7      | 37.8      | -24.7                  | 27.6            | 53.9           | 26.3        | VBW300Hz, |
| Hori.    | 3203.000        | AV       | 33.3           | 28.6            | 5.4       | 37.9      | -24.7                  | 4.7             | 53.9           | 49.2        | VBW300Hz, |
| Hori.    | 4003.000        | AV       | 33.3           | 29.3            | 5.5       | 37.3      | -24.7                  | 6.1             | 53.9           | 47.8        | VBW300Hz, |
| Hori.    | 4804.000        | AV       | 36.6           | 30.5            | 5.9       | 36.6      | -24.7                  | 11.7            | 53.9           | 42.2        | VBW300Hz, |
| Hori.    | 7206.000        | AV       | 35.1           | 36.2            | 7.3       | 38.4      | -24.7                  | 15.5            | 53.9           | 38.4        | VBW300Hz, |
| Hori.    | 9608.000        | AV       | 33.0           | 38.3            | 8.6       | 37.1      | -24.7                  | 18.1            | 53.9           | 35.8        | VBW300Hz, |
| Hori.    | 24020.000       | AV       | 39.2           | 40.2            | 7.4       | 47.2      | -24.7                  | 14.9            | 53.9           | 39.0        | VBW300Hz, |
| Vert.    | 1601.998        | AV       | 38.9           | 25.7            | 12.9      | 38.4      | -24.7                  | 14.4            | 53.9           | 39.5        | VBW300Hz, |
| Vert.    | 2350.000        | AV       | 34.0           | 27.3            | 13.6      | 37.9      | -24.7                  | 12.3            | 53.9           | 41.6        | VBW300Hz, |
| Vert.    | 2377.973        | AV       | 34.5           | 27.4            | 13.7      | 37.8      | -24.7                  | 13.1            | 53.9           | 40.8        | VBW300Hz, |
| Vert.    | 2390.000        | AV       | 34.0           | 27.4            | 13.7      | 37.8      | -24.7                  | 12.6            | 53.9           | 41.3        | VBW300Hz, |
| Vert.    | 2400.000        | AV       | 49.2           | 27.4            | 13.7      | 37.8      | -24.7                  | 27.8            | 53.9           | 26.1        | VBW300Hz, |
| Vert.    | 3203.000        | AV       | 33.3           | 28.6            | 5.4       | 37.9      | -24.7                  | 4.7             | 53.9           | 49.2        | VBW300Hz, |
| Vert.    | 4003.000        | AV       | 33.4           | 29.3            | 5.5       | 37.3      | -24.7                  | 6.2             | 53.9           | 47.7        | VBW300Hz, |
| Vert.    | 4804.000        | AV       | 36.9           | 30.5            | 5.9       | 36.6      | -24.7                  | 12.0            | 53.9           | 41.9        | VBW300Hz, |
| Vert.    | 7206.000        | AV       | 35.1           | 36.2            | 7.3       | 38.4      | -24.7                  | 15.5            | 53.9           | 38.4        | VBW300Hz, |
| Vert.    | 9608.000        | AV       | 32.9           | 38.3            | 8.6       | 37.1      | -24.7                  | 18.0            | 53.9           | 35.9        | VBW300Hz, |
| Vert.    | 24020.000       | AV       | 39.3           | 40.2            | 7.4       | 47.2      | -24.7                  | 15.0            | 53.9           | 38.9        | VBW300Hz, |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:           13GHz-40GHz           20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                    UL Japan, Inc. Shonan EMC Lab.                    No.1 & No.2 Semi Anechoic Chamber  
Date                            August 8, 2011    August 10, 2011  
Temperature / Humidity    27deg.C , 66%RH                                    23deg.C , 45%RH  
Engineer                      Hikaru Shirasawa                                    Kenichi Adachi  
Mode                            Tx,    2441 MHz  
   Tx, Bluetooth, EDR, PRBS9

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|-----------------|--------|
| Hori.    | 36.995             | QP       | 25.6              | 16.2               | 7.0          | 31.8         | 17.0               | 40.0              | 23.0           | 200            | 16              |        |
| Hori.    | 66.009             | QP       | 33.7              | 7.4                | 7.5          | 31.8         | 16.8               | 40.0              | 23.2           | 296            | 309             |        |
| Hori.    | 163.573            | QP       | 36.1              | 15.5               | 8.6          | 31.8         | 28.4               | 43.5              | 15.1           | 200            | 292             |        |
| Hori.    | 879.609            | QP       | 23.2              | 21.8               | 9.9          | 31.5         | 23.4               | 46.0              | 22.6           | 150            | 226             |        |
| Hori.    | 1626.668           | PK       | 46.2              | 25.8               | 12.9         | 38.4         | 46.5               | 73.9              | 27.4           | 104            | 15              |        |
| Hori.    | 2416.985           | PK       | 46.3              | 27.4               | 13.6         | 37.7         | 49.6               | 73.9              | 24.3           | 117            | 69              |        |
| Hori.    | 3257.000           | PK       | 45.9              | 28.7               | 5.3          | 37.8         | 42.1               | 73.9              | 31.8           | 100            | 0               |        |
| Hori.    | 4070.000           | PK       | 45.8              | 29.3               | 5.6          | 37.3         | 43.4               | 73.9              | 30.5           | 100            | 0               |        |
| Hori.    | 4882.000           | PK       | 47.5              | 30.8               | 5.9          | 36.6         | 47.6               | 73.9              | 26.3           | 106            | 102             |        |
| Hori.    | 7323.000           | PK       | 46.5              | 36.4               | 7.4          | 38.4         | 51.9               | 73.9              | 22.0           | 100            | 0               |        |
| Hori.    | 9764.000           | PK       | 45.4              | 38.5               | 8.6          | 37.1         | 55.4               | 73.9              | 18.5           | 100            | 0               |        |
| Hori.    | 24410.000          | PK       | 50.6              | 40.2               | 7.5          | 47.3         | 51.0               | 73.9              | 22.9           | 100            | 0               |        |
| Vert.    | 56.285             | QP       | 30.7              | 9.3                | 7.4          | 31.8         | 15.6               | 40.0              | 24.4           | 100            | 235             |        |
| Vert.    | 159.975            | QP       | 39.7              | 15.3               | 8.6          | 31.8         | 31.8               | 43.5              | 11.7           | 100            | 300             |        |
| Vert.    | 199.018            | QP       | 35.4              | 16.8               | 9.0          | 31.8         | 29.4               | 43.5              | 14.1           | 100            | 5               |        |
| Vert.    | 879.609            | QP       | 23.3              | 21.8               | 9.9          | 31.5         | 23.5               | 46.0              | 22.5           | 100            | 337             |        |
| Vert.    | 1626.668           | PK       | 47.1              | 25.8               | 12.9         | 38.4         | 47.4               | 73.9              | 26.5           | 152            | 96              |        |
| Vert.    | 2416.985           | PK       | 46.2              | 27.4               | 13.6         | 37.7         | 49.5               | 73.9              | 24.4           | 100            | 19              |        |
| Vert.    | 3257.000           | PK       | 45.9              | 28.7               | 5.3          | 37.8         | 42.1               | 73.9              | 31.8           | 100            | 0               |        |
| Vert.    | 4070.000           | PK       | 45.9              | 29.3               | 5.6          | 37.3         | 43.5               | 73.9              | 30.4           | 100            | 0               |        |
| Vert.    | 4882.000           | PK       | 48.2              | 30.8               | 5.9          | 36.6         | 48.3               | 73.9              | 25.6           | 119            | 190             |        |
| Vert.    | 7323.000           | PK       | 46.5              | 36.4               | 7.4          | 38.4         | 51.9               | 73.9              | 22.0           | 100            | 0               |        |
| Vert.    | 9764.000           | PK       | 45.5              | 38.5               | 8.6          | 37.1         | 55.5               | 73.9              | 18.4           | 100            | 0               |        |
| Vert.    | 24410.000          | PK       | 50.5              | 40.2               | 7.5          | 47.3         | 50.9               | 73.9              | 23.0           | 100            | 0               |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:            13GHz-40GHz             $20\log(3.0m/1.0m) = 9.5dB$

## Radiated Emission

Test place                    UL Japan, Inc. Shonan EMC Lab.                    No.1 & No.2 Semi Anechoic Chamber  
Date                            August 8, 2011    August 10, 2011  
Temperature / Humidity    27deg.C , 66%RH                                    23deg.C , 45%RH  
Engineer                      Hikaru Shirasawa                                    Kenichi Adachi  
Mode                            Tx,    2441 MHz  
   Tx, Bluetooth, EDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Dwell time factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------------|-----------------|----------------|-------------|----------|
| Hori.    | 1626.668        | AV       | 37.4           | 25.8            | 12.9      | 38.4      | -24.7                  | 13              | 53.9           | 40.9        | VBW300Hz |
| Hori.    | 2416.985        | AV       | 34             | 27.4            | 13.6      | 37.7      | -24.7                  | 12.6            | 53.9           | 41.3        | VBW300Hz |
| Hori.    | 3257.000        | AV       | 33.4           | 28.7            | 5.3       | 37.8      | -24.7                  | 4.9             | 53.9           | 49.0        | VBW300Hz |
| Hori.    | 4070.000        | AV       | 33.3           | 29.3            | 5.6       | 37.3      | -24.7                  | 6.2             | 53.9           | 47.7        | VBW300Hz |
| Hori.    | 4882.000        | AV       | 36.4           | 30.8            | 5.9       | 36.6      | -24.7                  | 11.8            | 53.9           | 42.1        | VBW300Hz |
| Hori.    | 7323.000        | AV       | 35.1           | 36.4            | 7.4       | 38.4      | -24.7                  | 15.8            | 53.9           | 38.1        | VBW300Hz |
| Hori.    | 9764.000        | AV       | 33             | 38.5            | 8.6       | 37.1      | -24.7                  | 18.3            | 53.9           | 35.6        | VBW300Hz |
| Hori.    | 24410.000       | AV       | 39.9           | 40.2            | 7.5       | 47.3      | -24.7                  | 15.6            | 53.9           | 38.3        | VBW300Hz |
| Vert.    | 1626.668        | AV       | 38.4           | 25.8            | 12.9      | 38.4      | -24.7                  | 14              | 53.9           | 39.9        | VBW300Hz |
| Vert.    | 2416.985        | AV       | 33.9           | 27.4            | 13.6      | 37.7      | -24.7                  | 12.5            | 53.9           | 41.4        | VBW300Hz |
| Vert.    | 3257.000        | AV       | 33.3           | 28.7            | 5.3       | 37.8      | -24.7                  | 4.8             | 53.9           | 49.1        | VBW300Hz |
| Vert.    | 4070.000        | AV       | 33.3           | 29.3            | 5.6       | 37.3      | -24.7                  | 6.2             | 53.9           | 47.7        | VBW300Hz |
| Vert.    | 4882.000        | AV       | 37             | 30.8            | 5.9       | 36.6      | -24.7                  | 12.4            | 53.9           | 41.5        | VBW300Hz |
| Vert.    | 7323.000        | AV       | 35             | 36.4            | 7.4       | 38.4      | -24.7                  | 15.7            | 53.9           | 38.2        | VBW300Hz |
| Vert.    | 9764.000        | AV       | 33.1           | 38.5            | 8.6       | 37.1      | -24.7                  | 18.4            | 53.9           | 35.5        | VBW300Hz |
| Vert.    | 24410.000       | AV       | 39.8           | 40.2            | 7.5       | 47.3      | -24.7                  | 15.5            | 53.9           | 38.4        | VBW300Hz |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:            13GHz-40GHz             $20\log(3.0m/1.0m) = 9.5dB$

## Radiated Emission

|                        |   |                                   |
|------------------------|---|-----------------------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.            | No.1 & No.2 Semi Anechoic Chamber |
| Date                   | August 8, 2011                            | August 10, 2011                   |
| Temperature / Humidity | 27deg.C , 66%RH                           | 23deg.C , 45%RH                   |
| Engineer               | Hikaru Shirasawa                          | Kenichi Adachi                    |
| Mode                   | Tx, 2480 MHz<br>Tx, Bluetooth, EDR, PRBS9 |                                   |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|--------------|--------|
| Hori.    | 37.038          | QP       | 26.3           | 16.1            | 7         | 31.8      | 17.6            | 40             | 22.4        | 301         | 0            |        |
| Hori.    | 66.499          | QP       | 33.2           | 7.3             | 7.5       | 31.8      | 16.2            | 40             | 23.8        | 320         | 307          |        |
| Hori.    | 164.607         | QP       | 36.2           | 15.6            | 8.6       | 31.8      | 28.6            | 43.5           | 14.9        | 203         | 298          |        |
| Hori.    | 880.104         | QP       | 23.3           | 21.8            | 9.9       | 31.5      | 23.5            | 46             | 22.5        | 100         | 0            |        |
| Hori.    | 1652.665        | PK       | 46.1           | 25.9            | 13        | 38.4      | 46.6            | 73.9           | 27.3        | 102         | 19           |        |
| Hori.    | 2483.500        | PK       | 46.2           | 27.4            | 13.6      | 37.6      | 49.6            | 73.9           | 24.3        | 123         | 67           |        |
| Hori.    | 2503.879        | PK       | 46.7           | 27.4            | 13.7      | 37.6      | 50.2            | 73.9           | 23.7        | 123         | 67           |        |
| Hori.    | 3307.000        | PK       | 46.2           | 28.8            | 5.3       | 37.8      | 42.5            | 73.9           | 31.4        | 123         | 67           |        |
| Hori.    | 4137.000        | PK       | 46.1           | 29.4            | 5.6       | 37.2      | 43.9            | 73.9           | 30.0        | 123         | 67           |        |
| Hori.    | 4960.000        | PK       | 47.4           | 31              | 5.9       | 36.5      | 47.8            | 73.9           | 26.1        | 123         | 67           |        |
| Hori.    | 7440.000        | PK       | 46.6           | 36.7            | 7.3       | 38.4      | 52.2            | 73.9           | 21.7        | 123         | 67           |        |
| Hori.    | 9920.000        | PK       | 45.7           | 38.7            | 8.6       | 37.2      | 55.8            | 73.9           | 18.1        | 123         | 67           |        |
| Hori.    | 17360.000       | PK       | 48.3           | 42.7            | 11.8      | 37.7      | 65.1            | 73.9           | 8.8         | 100         | 0            |        |
| Hori.    | 24800.000       | PK       | 50.8           | 40.2            | 7.7       | 47.1      | 51.6            | 73.9           | 22.3        | 100         | 0            |        |
| Vert.    | 57.565          | QP       | 32.3           | 9               | 7.4       | 31.8      | 16.9            | 40             | 23.1        | 100         | 236          |        |
| Vert.    | 159.974         | QP       | 39.5           | 15.3            | 8.6       | 31.8      | 31.6            | 43.5           | 11.9        | 100         | 291          |        |
| Vert.    | 198.857         | QP       | 36             | 16.8            | 9         | 31.8      | 30              | 43.5           | 13.5        | 100         | 7            |        |
| Vert.    | 880.104         | QP       | 23.3           | 21.8            | 9.9       | 31.5      | 23.5            | 46             | 22.5        | 100         | 52           |        |
| Vert.    | 1652.665        | PK       | 47.4           | 25.9            | 13        | 38.4      | 47.9            | 73.9           | 26.0        | 155         | 94           |        |
| Vert.    | 2483.500        | PK       | 47.1           | 27.4            | 13.6      | 37.6      | 50.5            | 73.9           | 23.4        | 100         | 21           |        |
| Vert.    | 2503.879        | PK       | 46.3           | 27.4            | 13.7      | 37.6      | 49.8            | 73.9           | 24.1        | 100         | 21           |        |
| Vert.    | 3307.000        | PK       | 46.1           | 28.8            | 5.3       | 37.8      | 42.4            | 73.9           | 31.5        | 100         | 0            |        |
| Vert.    | 4137.000        | PK       | 46             | 29.4            | 5.6       | 37.2      | 43.8            | 73.9           | 30.1        | 100         | 0            |        |
| Vert.    | 4960.000        | PK       | 48.3           | 31              | 5.9       | 36.5      | 48.7            | 73.9           | 25.2        | 107         | 192          |        |
| Vert.    | 7440.000        | PK       | 46.5           | 36.7            | 7.3       | 38.4      | 52.1            | 73.9           | 21.8        | 100         | 0            |        |
| Vert.    | 9920.000        | PK       | 45.6           | 38.7            | 8.6       | 37.2      | 55.7            | 73.9           | 18.2        | 100         | 0            |        |
| Vert.    | 17360.000       | PK       | 48.3           | 42.7            | 11.8      | 37.7      | 65.1            | 73.9           | 8.8         | 100         | 0            |        |
| Vert.    | 24800.000       | PK       | 50.7           | 40.2            | 7.7       | 47.1      | 51.5            | 73.9           | 22.4        | 100         | 0            |        |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                    UL Japan, Inc. Shonan EMC Lab.                    No.1 & No.2 Semi Anechoic Chamber  
Date                            August 8, 2011    August 10, 2011  
Temperature / Humidity    27deg.C , 66%RH                                    23deg.C , 45%RH  
Engineer                      Hikaru Shirasawa                                    Kenichi Adachi  
Mode                            Tx,    2480 MHz  
   Tx, Bluetooth, EDR, PRBS9

### Dwell time factor relaxation

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Dwell time factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------------|-----------------|----------------|-------------|----------|
| Hori.    | 1652.665        | AV       | 37.2           | 25.9            | 13.0      | 38.4      | -24.7                  | 13.0            | 53.9           | 40.9        | VBW300Hz |
| Hori.    | 2483.500        | AV       | 36.0           | 27.4            | 13.6      | 37.6      | -24.7                  | 14.7            | 53.9           | 39.2        | VBW300Hz |
| Hori.    | 2503.879        | AV       | 35.2           | 27.4            | 13.7      | 37.6      | -24.7                  | 14.0            | 53.9           | 39.9        | VBW300Hz |
| Hori.    | 3307.000        | AV       | 33.4           | 28.8            | 5.3       | 37.8      | -24.7                  | 5.0             | 53.9           | 48.9        | VBW300Hz |
| Hori.    | 4137.000        | AV       | 33.3           | 29.4            | 5.6       | 37.2      | -24.7                  | 6.4             | 53.9           | 47.5        | VBW300Hz |
| Hori.    | 4960.000        | AV       | 36.9           | 31.0            | 5.9       | 36.5      | -24.7                  | 12.6            | 53.9           | 41.3        | VBW300Hz |
| Hori.    | 7440.000        | AV       | 35.0           | 36.7            | 7.3       | 38.4      | -24.7                  | 15.9            | 53.9           | 38.0        | VBW300Hz |
| Hori.    | 9920.000        | AV       | 33.0           | 38.7            | 8.6       | 37.2      | -24.7                  | 18.4            | 53.9           | 35.5        | VBW300Hz |
| Hori.    | 17360.000       | AV       | 36.7           | 42.7            | 11.8      | 37.7      | -24.7                  | 28.8            | 53.9           | 25.1        | VBW300Hz |
| Hori.    | 24800.000       | AV       | 40.0           | 40.2            | 7.7       | 47.1      | -24.7                  | 16.1            | 53.9           | 37.8        | VBW300Hz |
| Vert.    | 1652.665        | AV       | 38.2           | 25.9            | 13.0      | 38.4      | -24.7                  | 14.0            | 53.9           | 39.9        | VBW300Hz |
| Vert.    | 2483.500        | AV       | 36.5           | 27.4            | 13.6      | 37.6      | -24.7                  | 15.2            | 53.9           | 38.7        | VBW300Hz |
| Vert.    | 2503.879        | AV       | 35.4           | 27.4            | 13.7      | 37.6      | -24.7                  | 14.2            | 53.9           | 39.7        | VBW300Hz |
| Vert.    | 3307.000        | AV       | 33.4           | 28.8            | 5.3       | 37.8      | -24.7                  | 5.0             | 53.9           | 48.9        | VBW300Hz |
| Vert.    | 4137.000        | AV       | 33.4           | 29.4            | 5.6       | 37.2      | -24.7                  | 6.5             | 53.9           | 47.4        | VBW300Hz |
| Vert.    | 4960.000        | AV       | 37.0           | 31.0            | 5.9       | 36.5      | -24.7                  | 12.7            | 53.9           | 41.2        | VBW300Hz |
| Vert.    | 7440.000        | AV       | 34.9           | 36.7            | 7.3       | 38.4      | -24.7                  | 15.8            | 53.9           | 38.1        | VBW300Hz |
| Vert.    | 9920.000        | AV       | 33.0           | 38.7            | 8.6       | 37.2      | -24.7                  | 18.4            | 53.9           | 35.5        | VBW300Hz |
| Vert.    | 17360.000       | AV       | 36.8           | 42.7            | 11.8      | 37.7      | -24.7                  | 28.9            | 53.9           | 25.0        | VBW300Hz |
| Vert.    | 24800.000       | AV       | 40.0           | 40.2            | 7.7       | 47.1      | -24.7                  | 16.1            | 53.9           | 37.8        | VBW300Hz |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

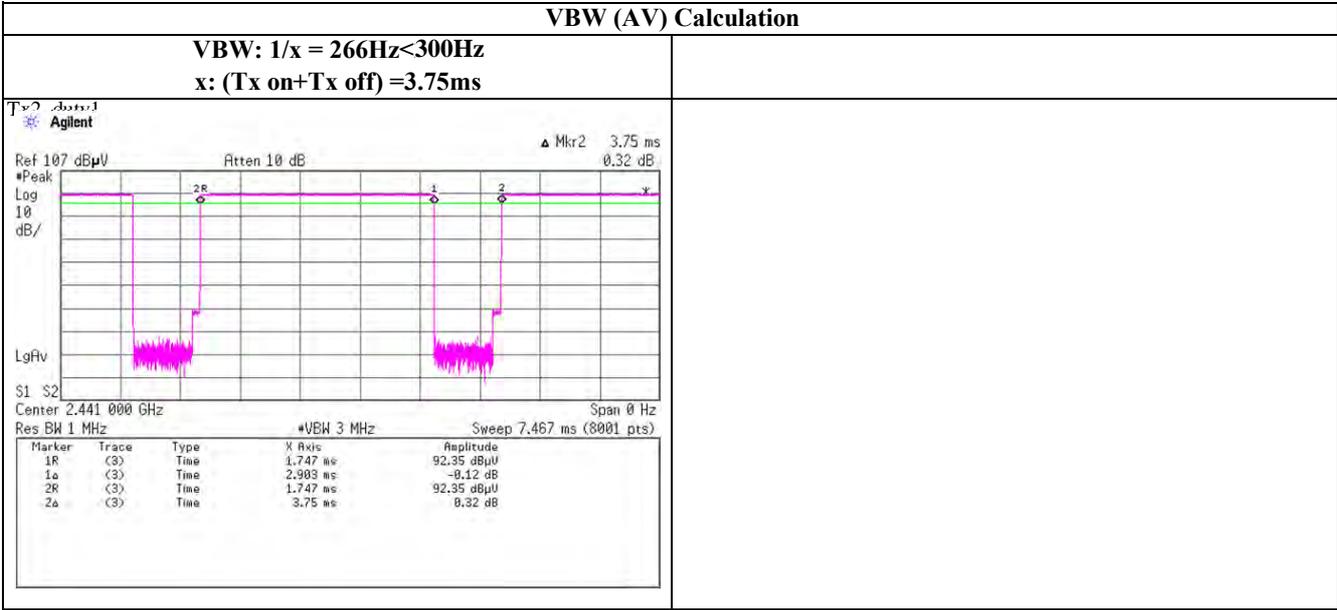
\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:            13GHz-40GHz             $20\log(3.0m/1.0m) = 9.5dB$

**Spurious emission (Radiated)**

**Tx, Bluetooth, BDR, PRBS9**

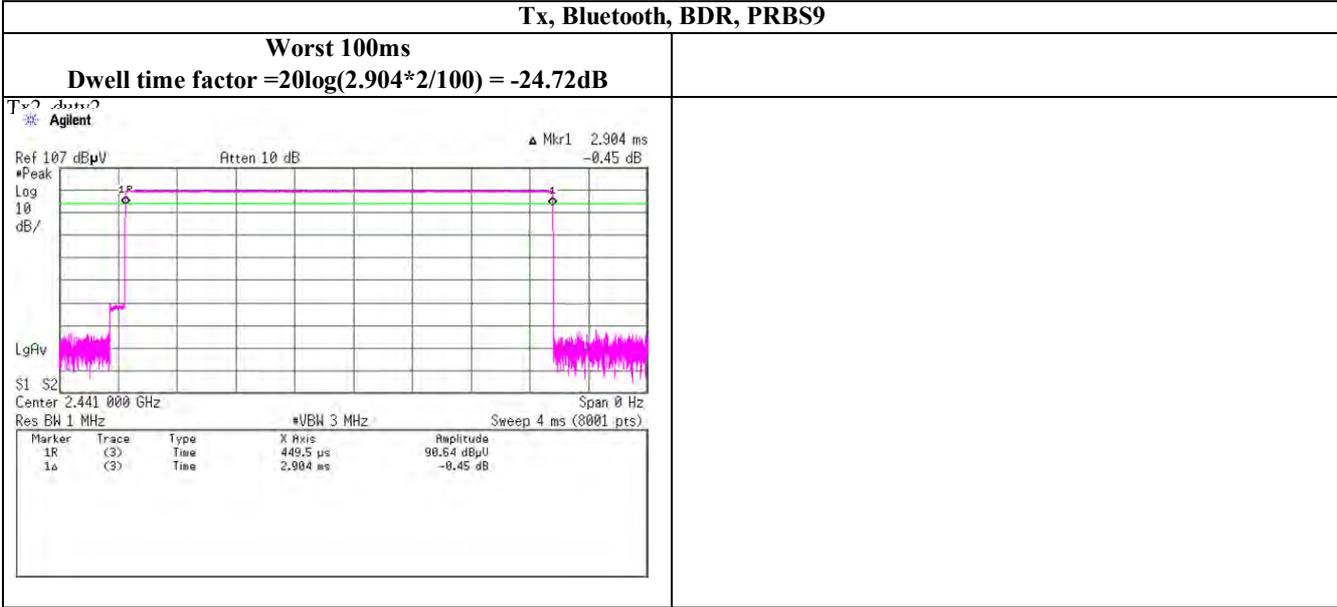
**VBW (AV) Calculation**



**Tx, Bluetooth, BDR, PRBS9**

**Worst 100ms**

**Dwell time factor =  $20\log(2.904*2/100) = -24.72\text{dB}$**



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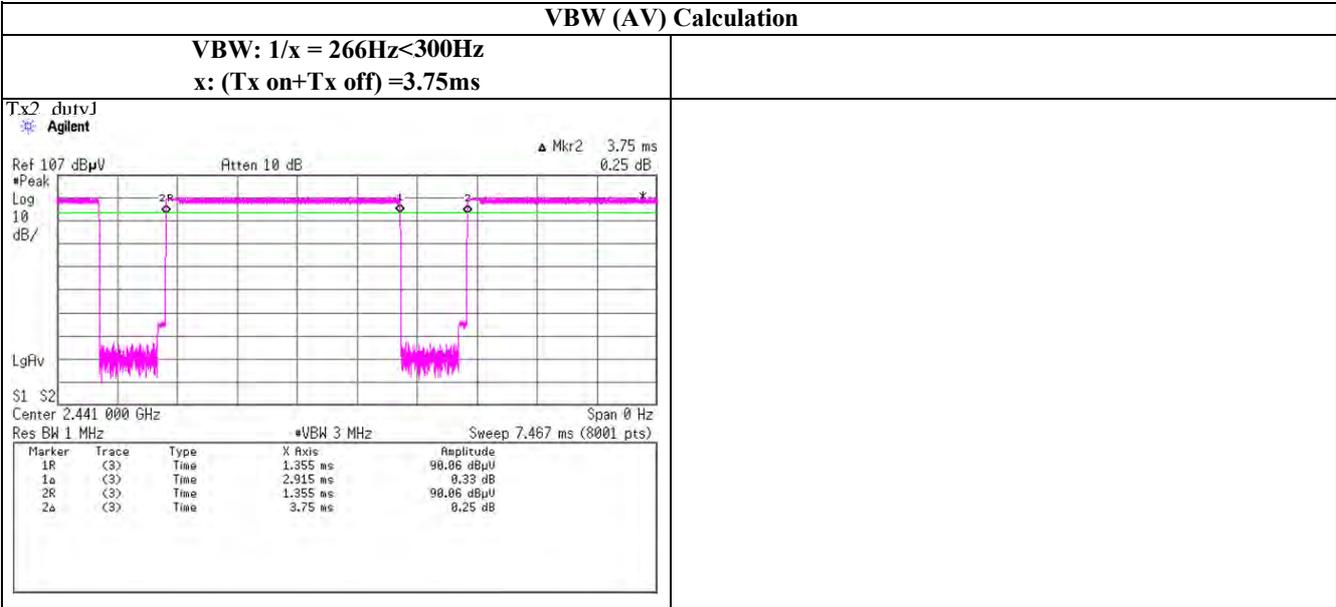
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Radiated)**

**Tx, Bluetooth, EDR, PRBS9**

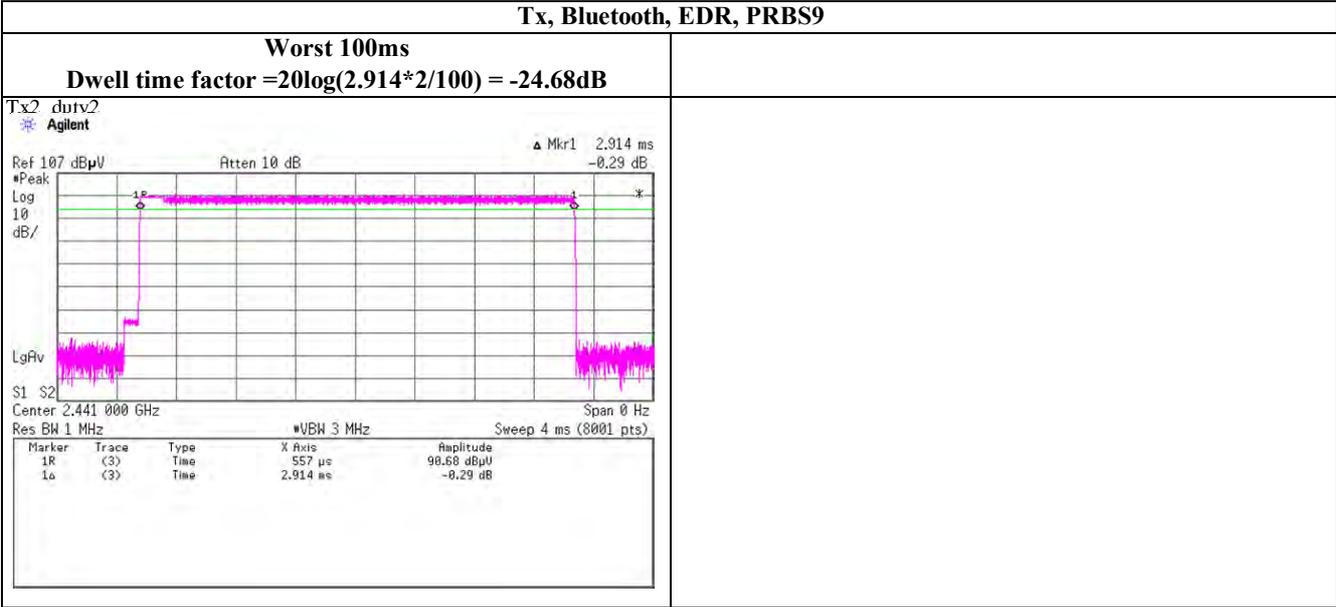
**VBW (AV) Calculation**



**Tx, Bluetooth, EDR, PRBS9**

**Worst 100ms**

**Dwell time factor  $= 20\log(2.914 * 2/100) = -24.68\text{dB}$**



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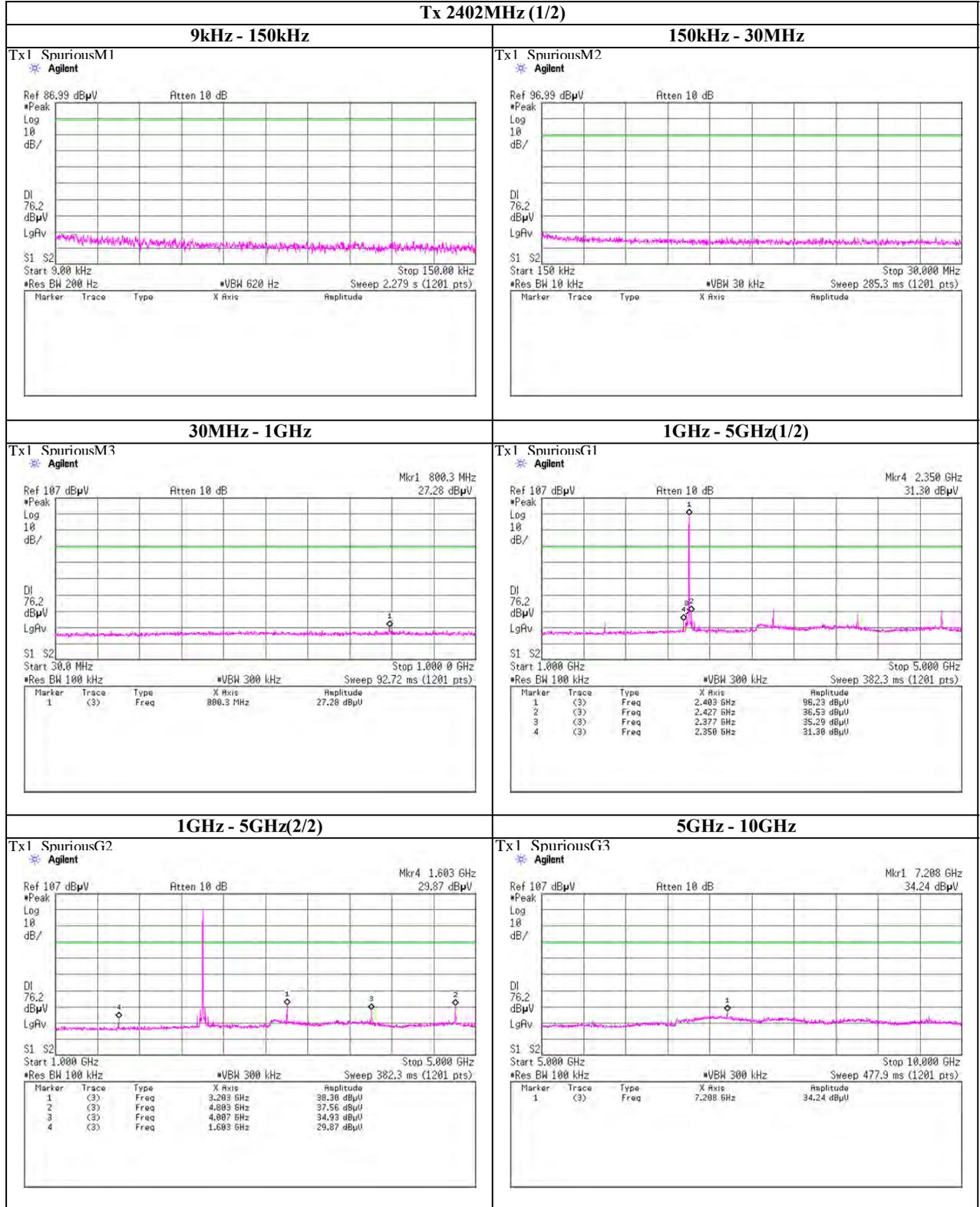
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## Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (1/2)



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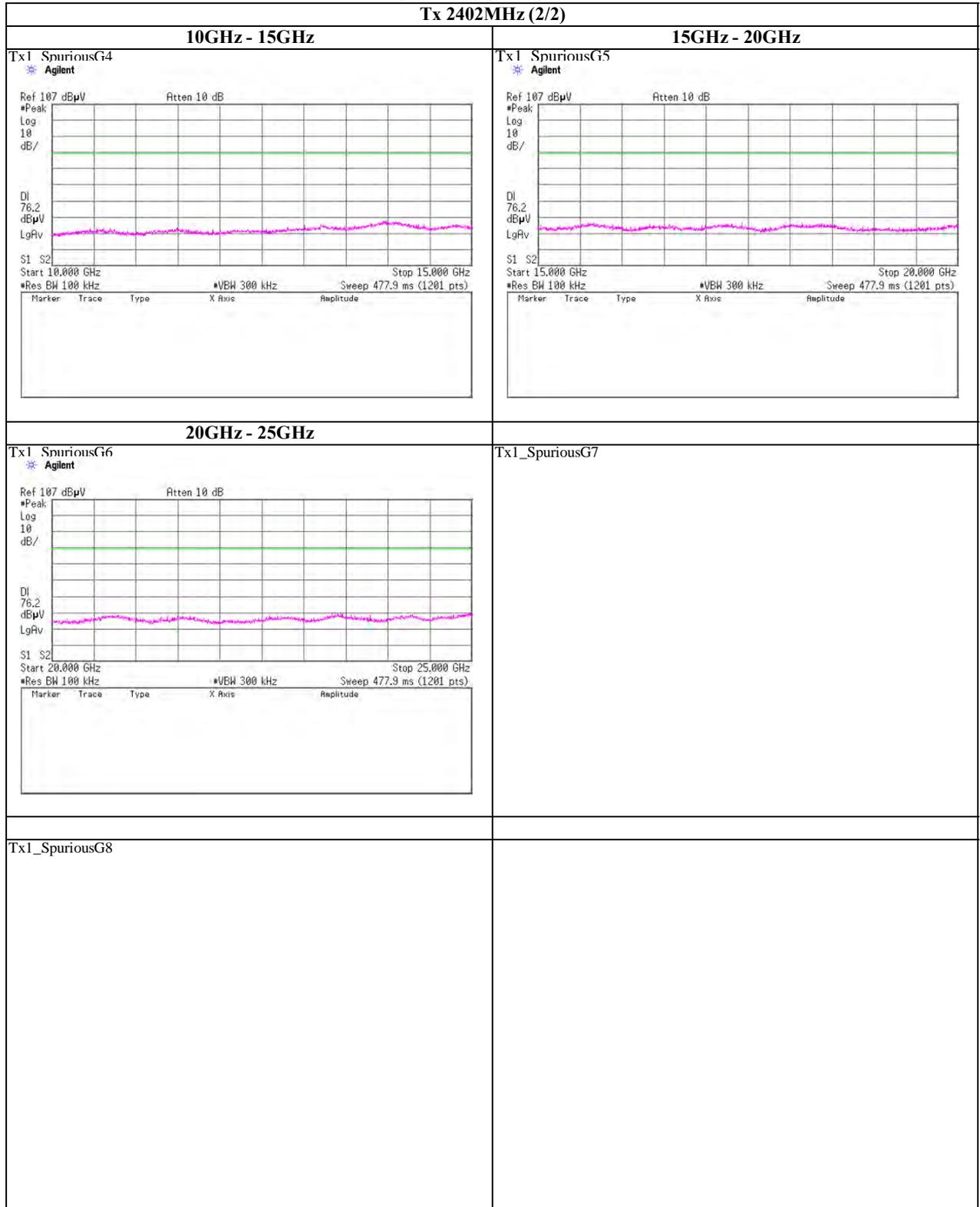
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Facsimile : +81 463 50 6401

## Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (2/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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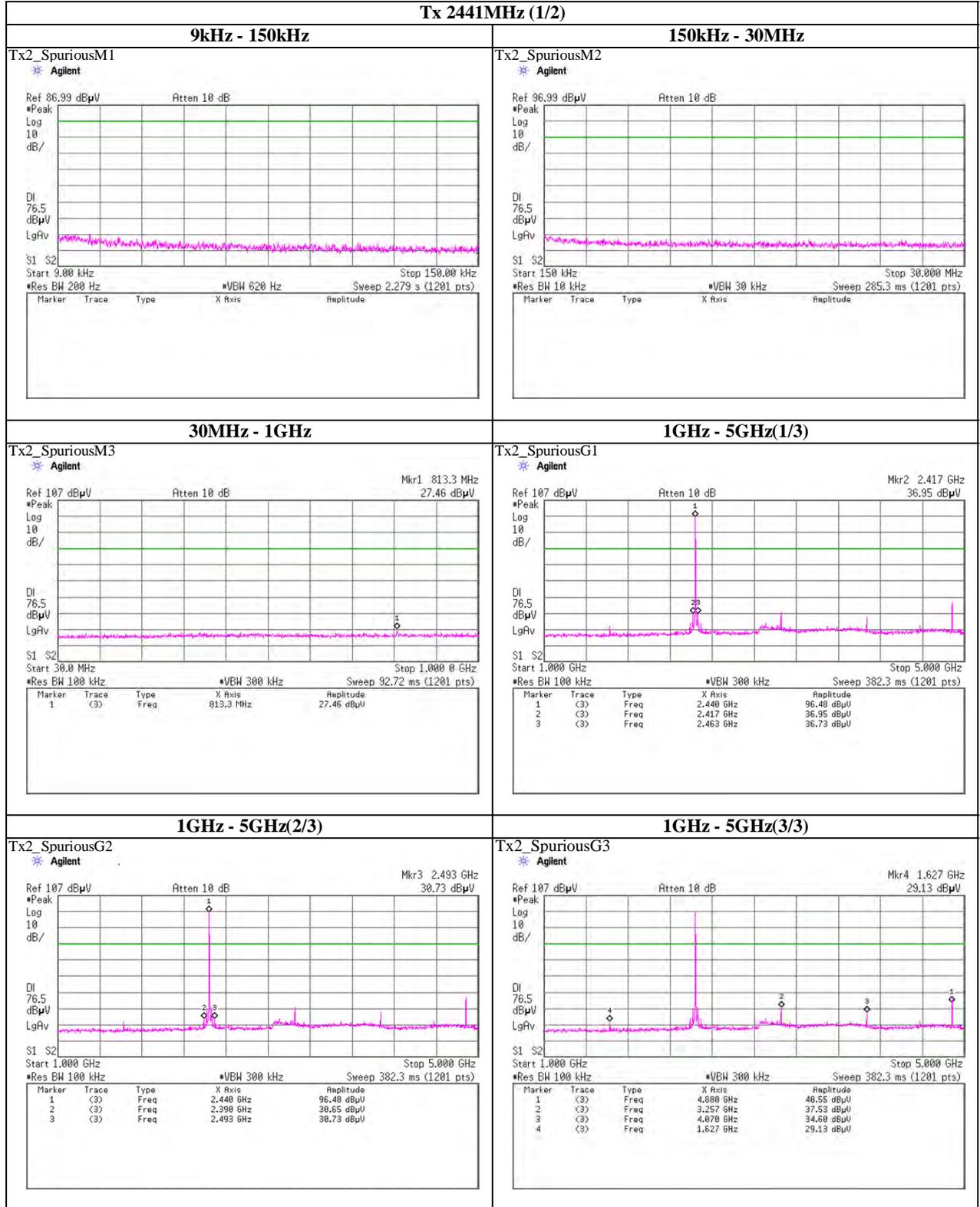
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Facsimile : +81 463 50 6401

### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2441MHz (1/2)



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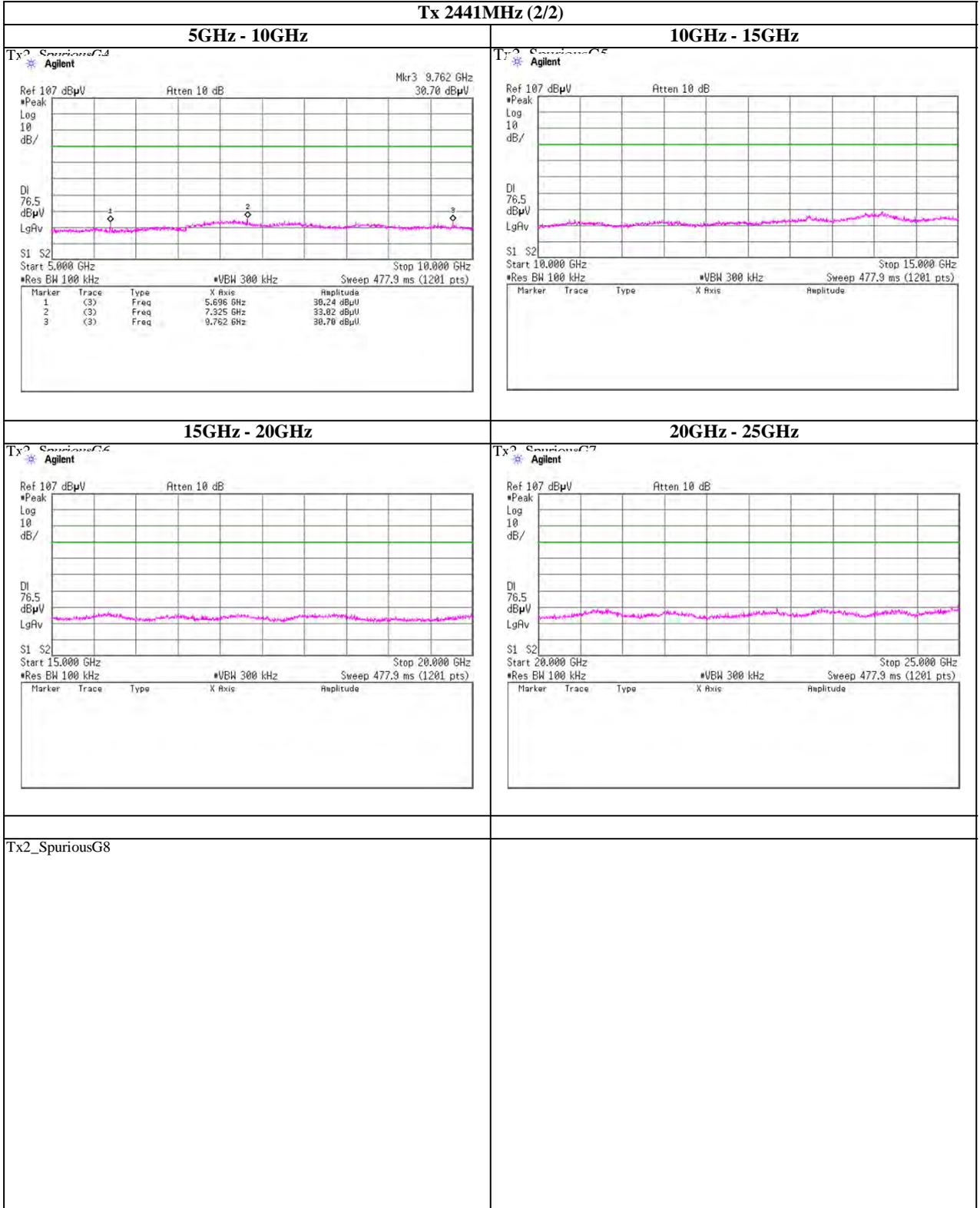
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### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2441MHz (2/2)



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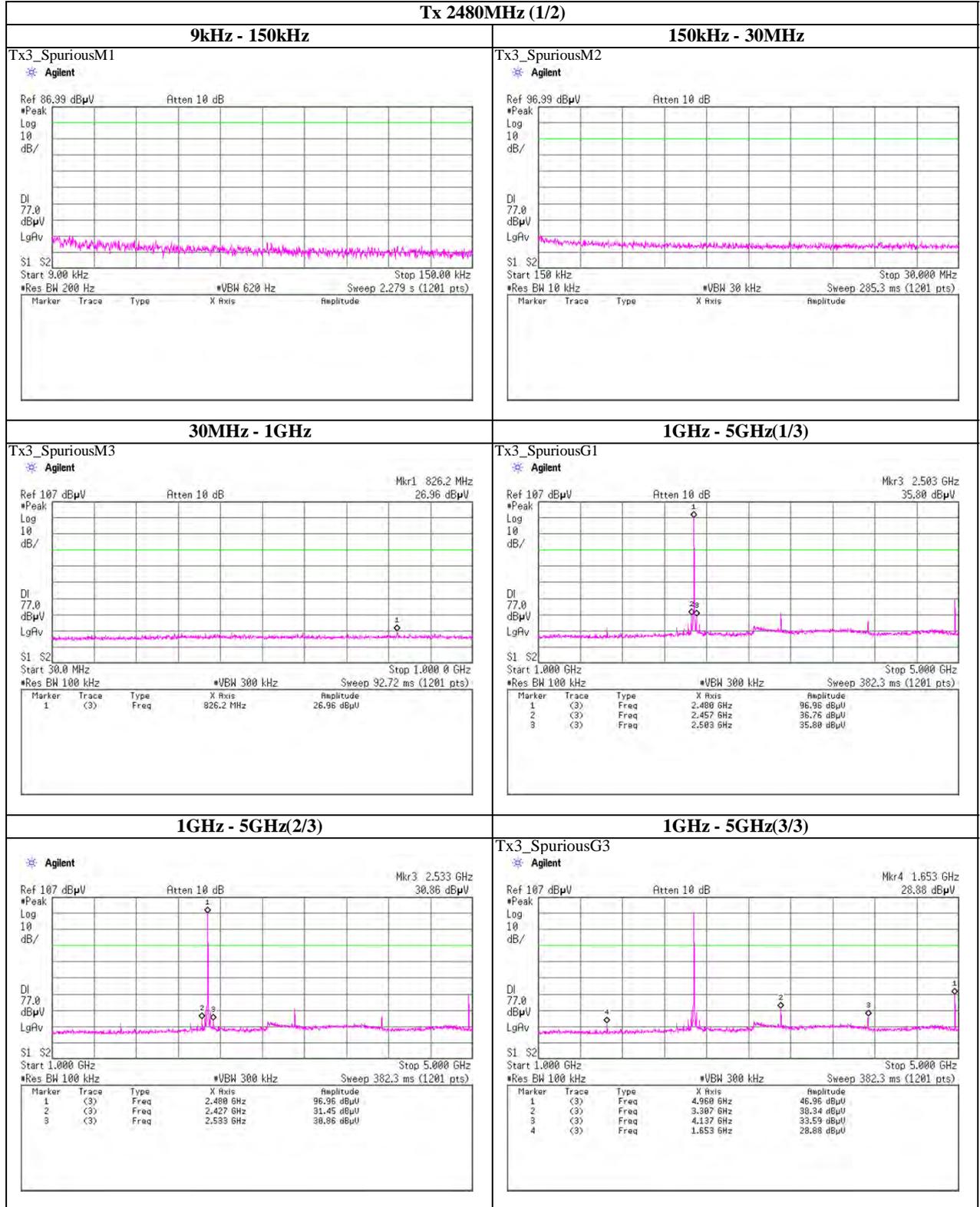
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### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2480MHz (1/2)



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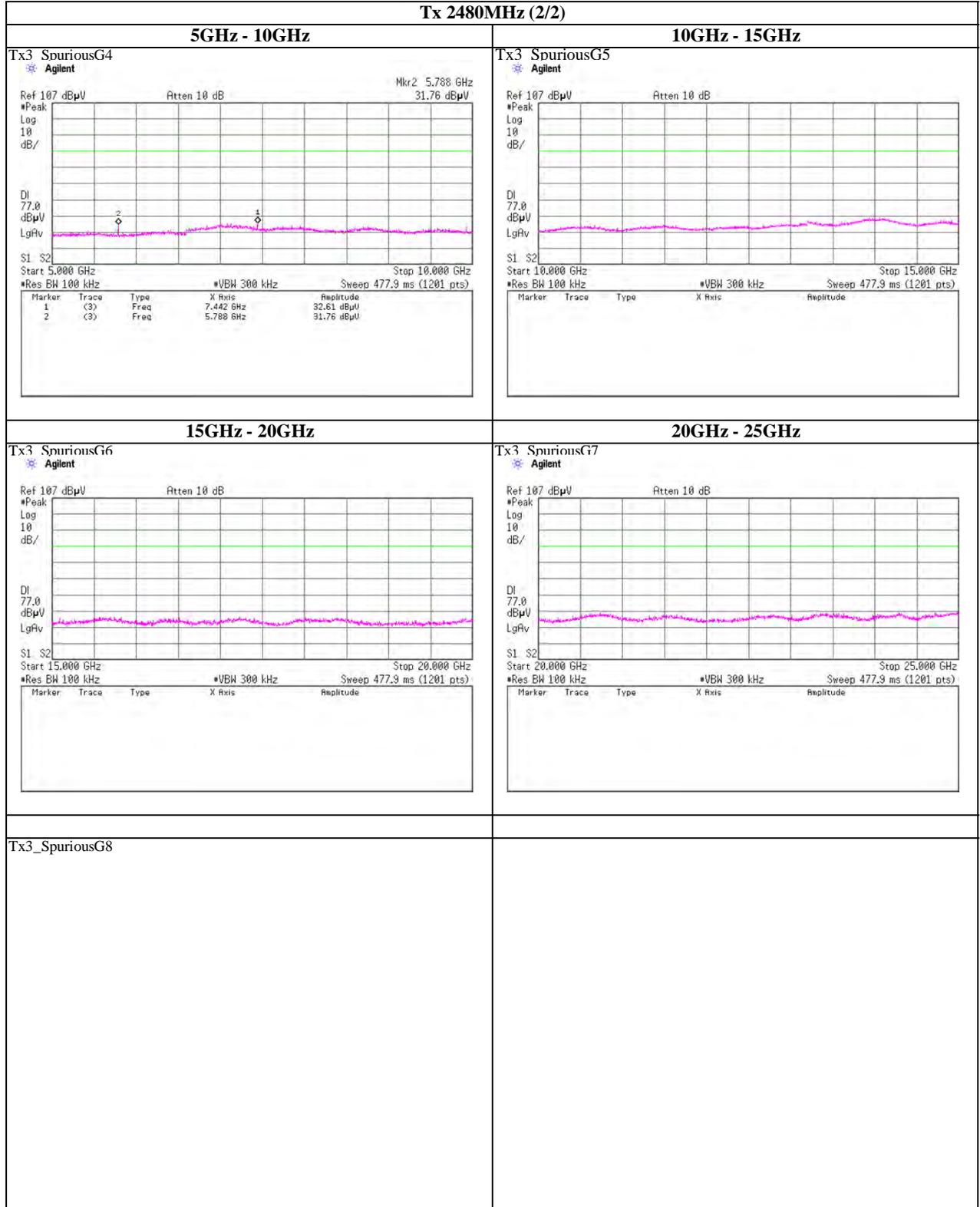
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## Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2480MHz (2/2)



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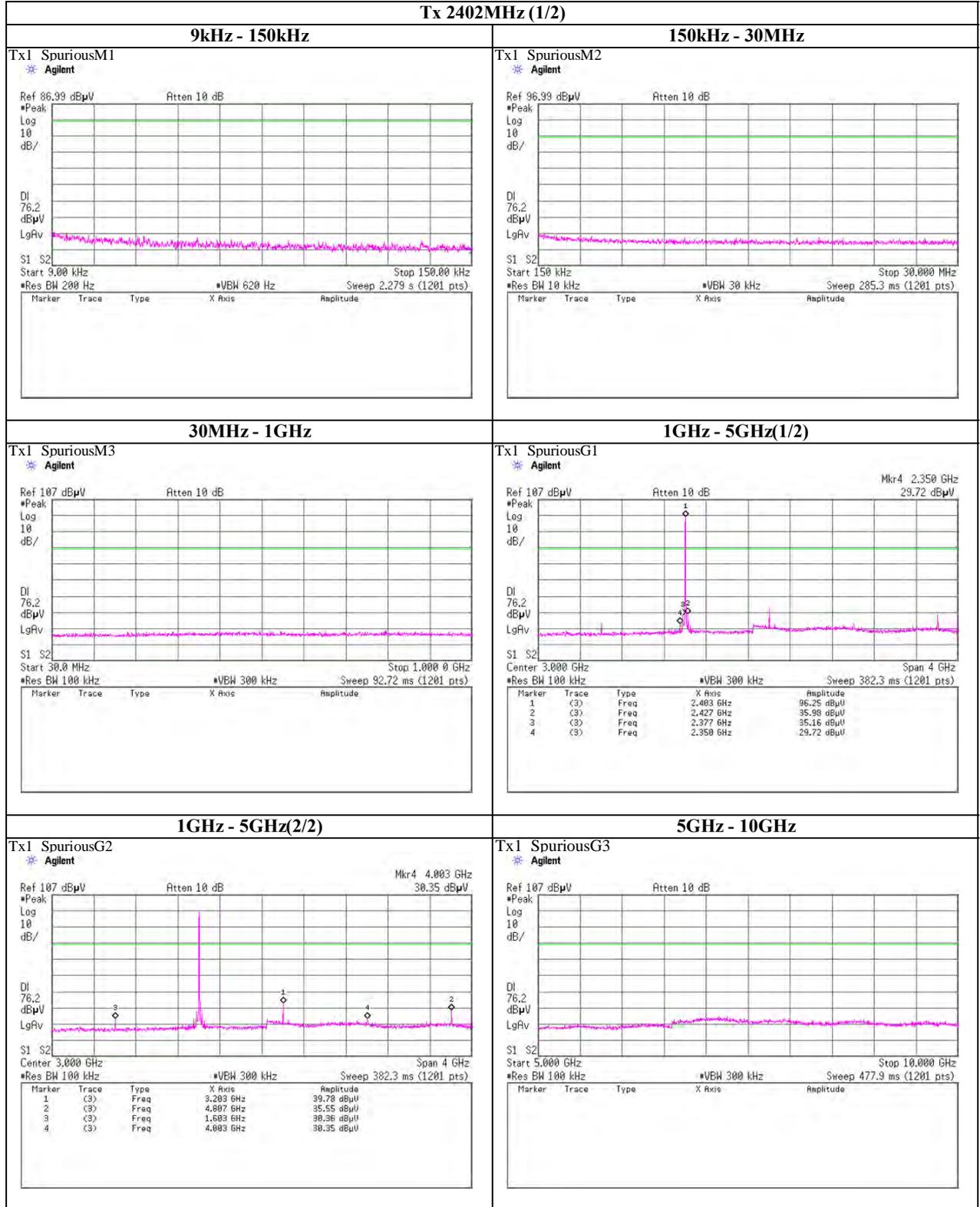
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Facsimile : +81 463 50 6401

## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (1/2)



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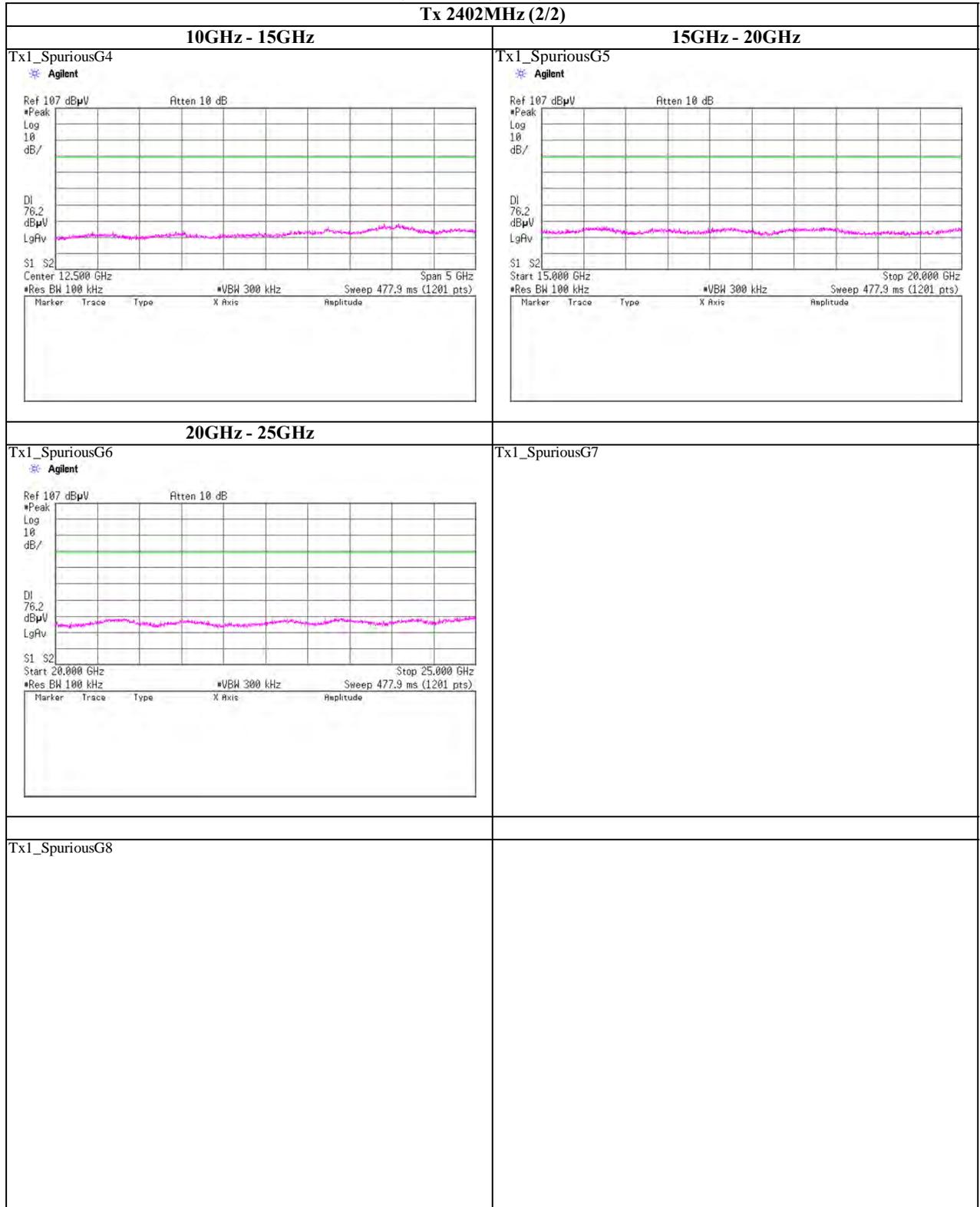
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## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (2/2)



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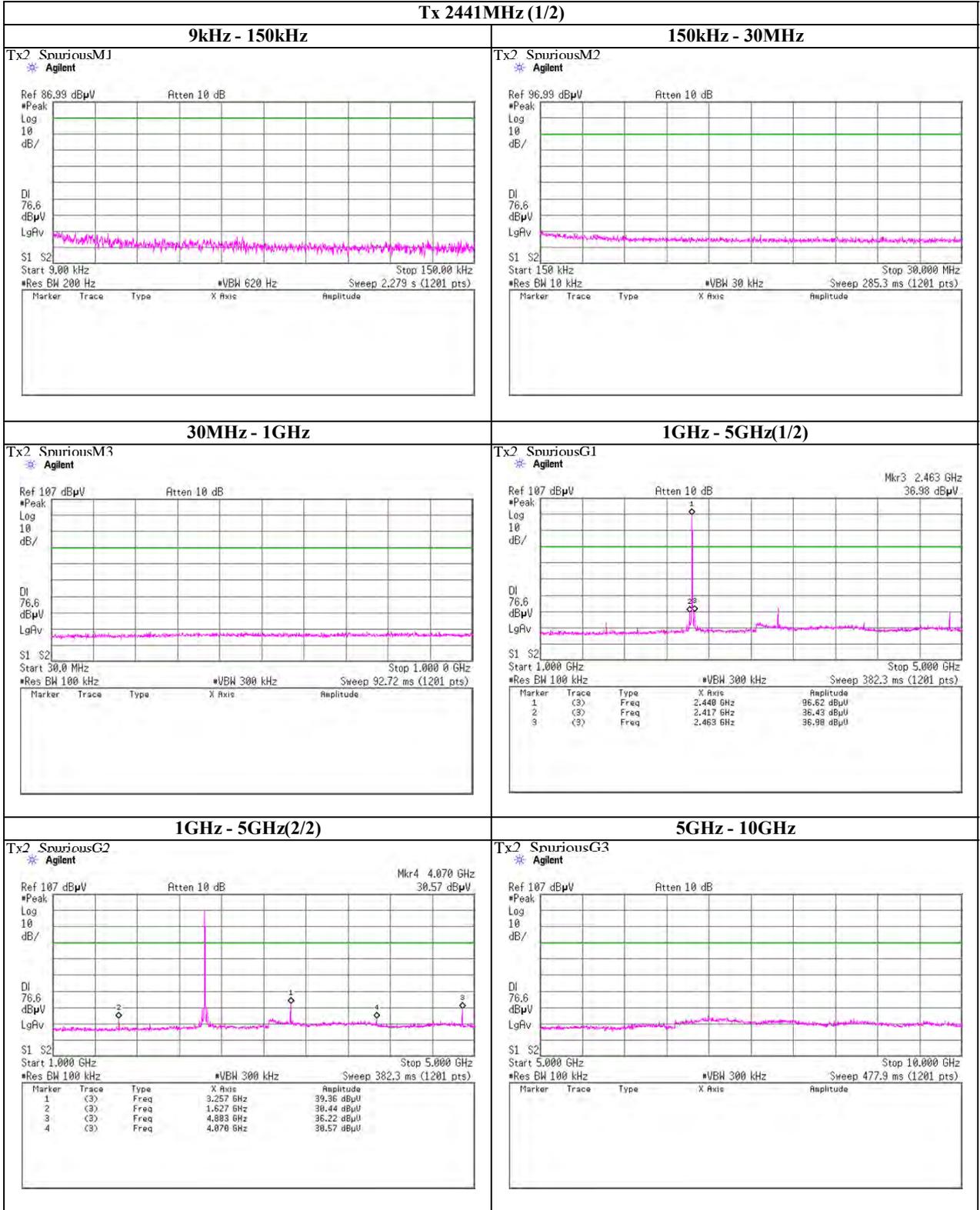
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## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (1/2)



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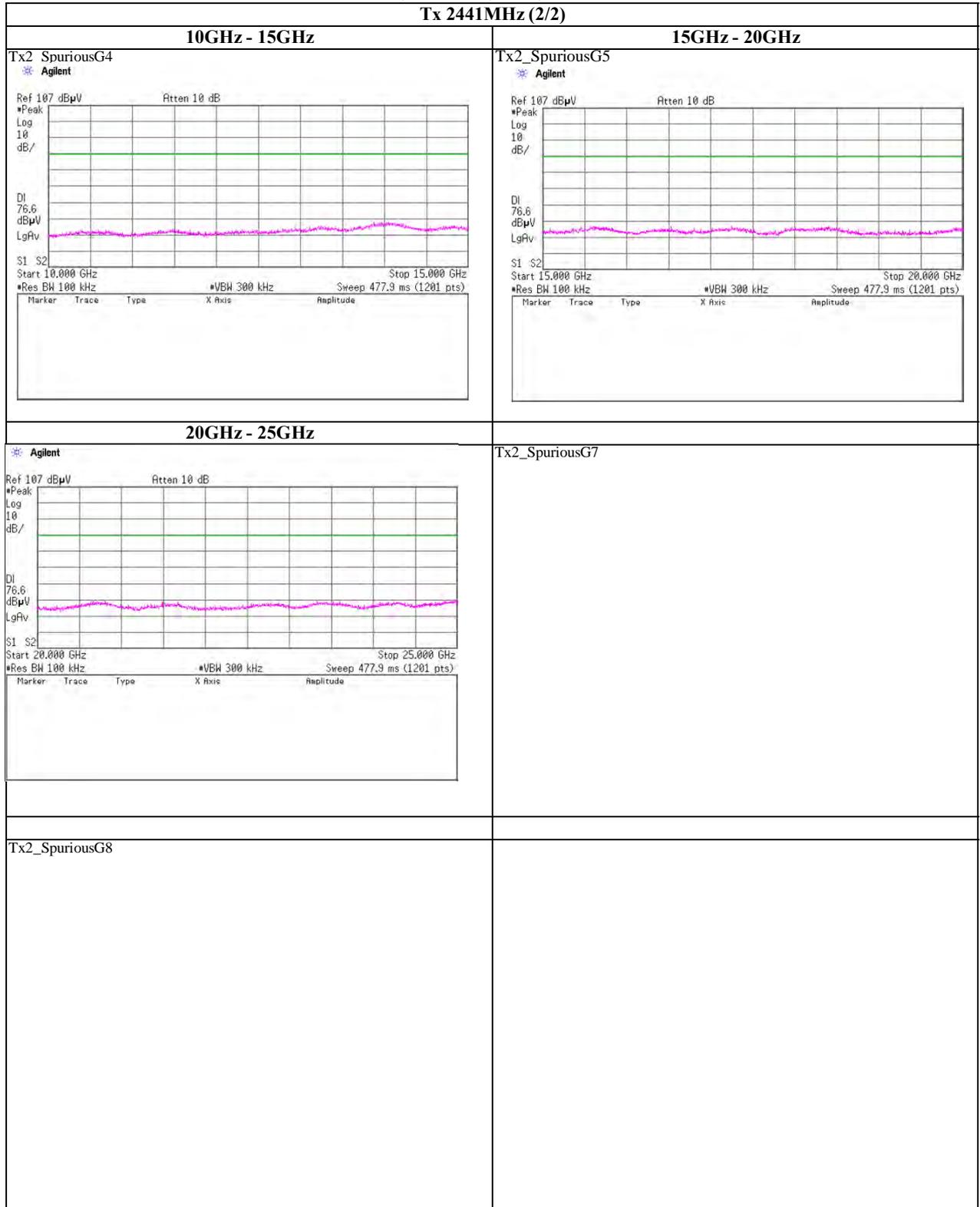
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## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (2/2)



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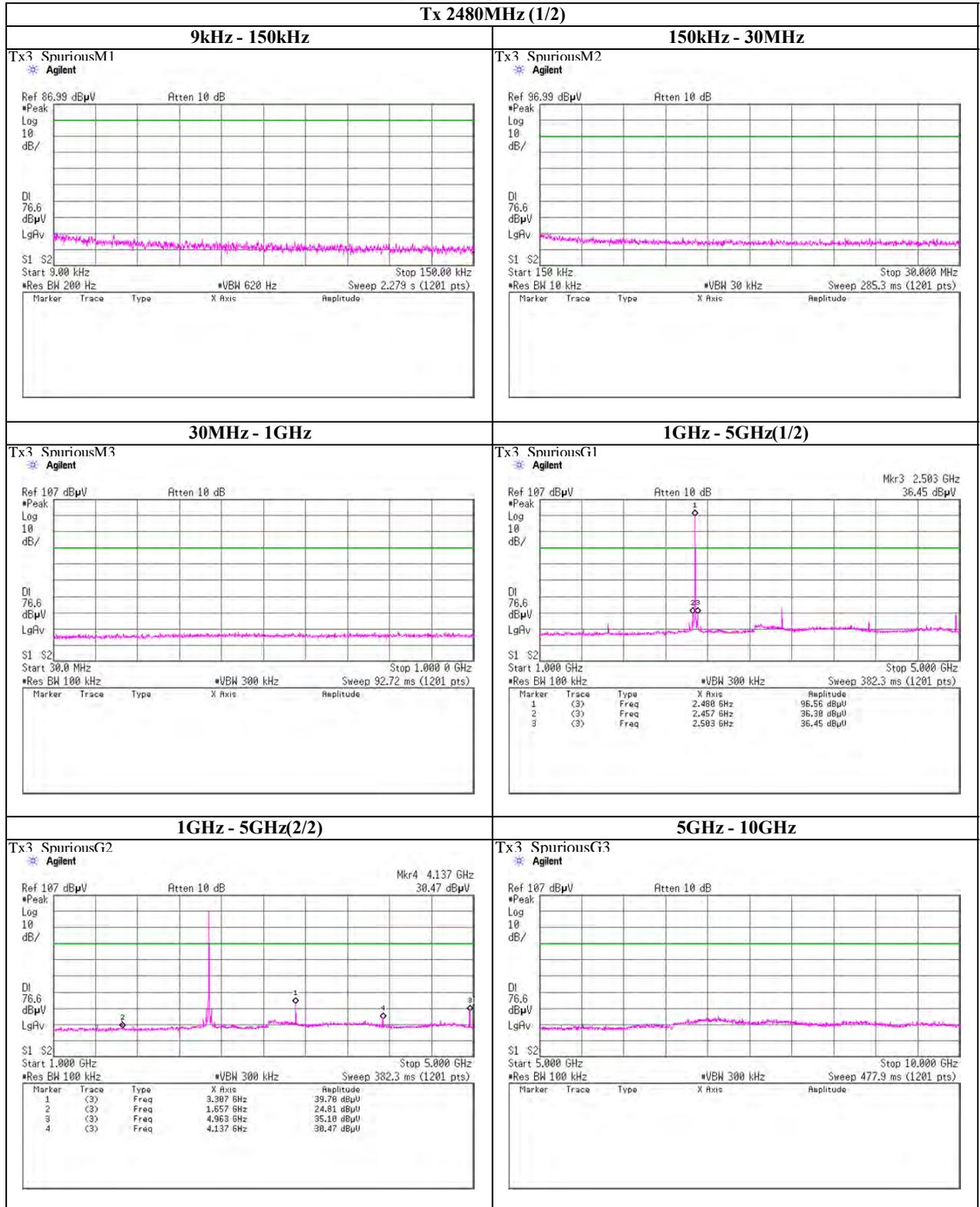
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## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2480MHz (1/2)



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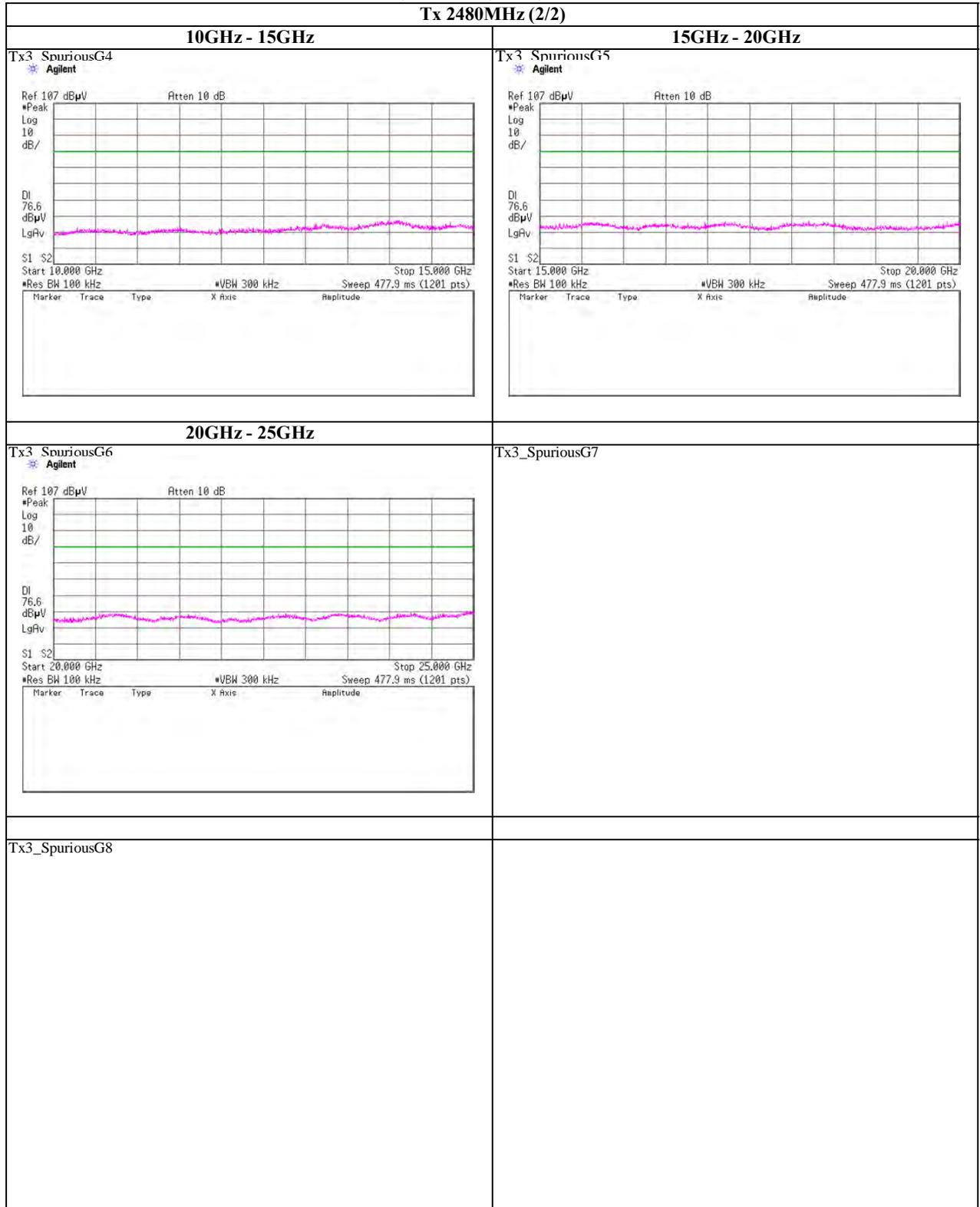
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## Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2480MHz (2/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

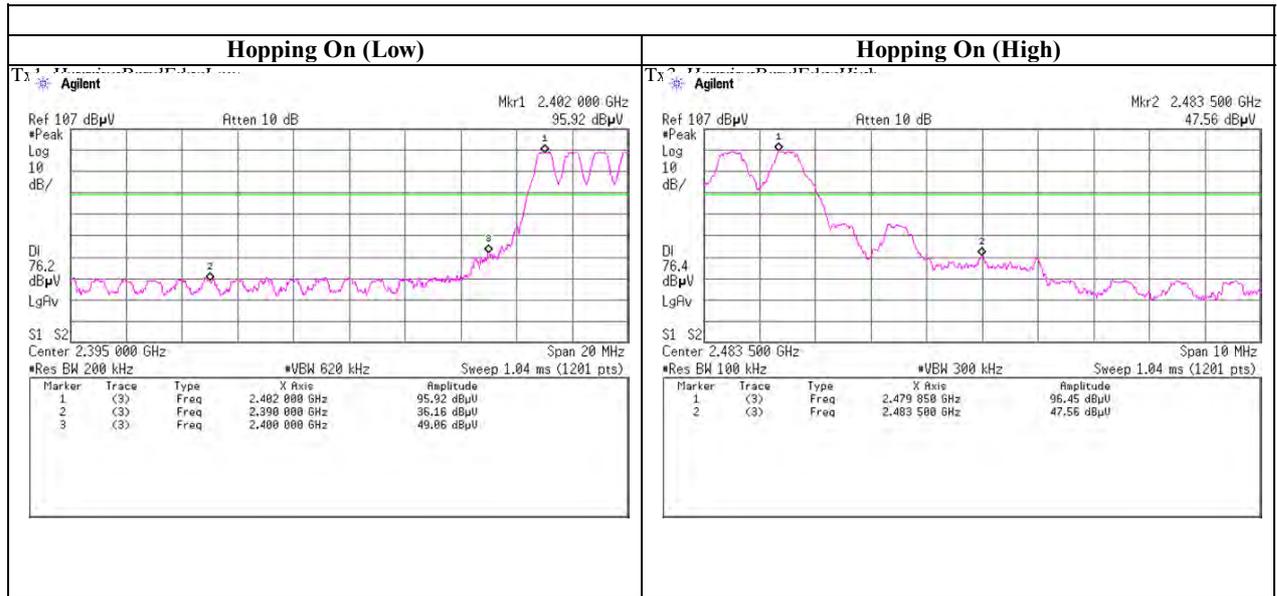
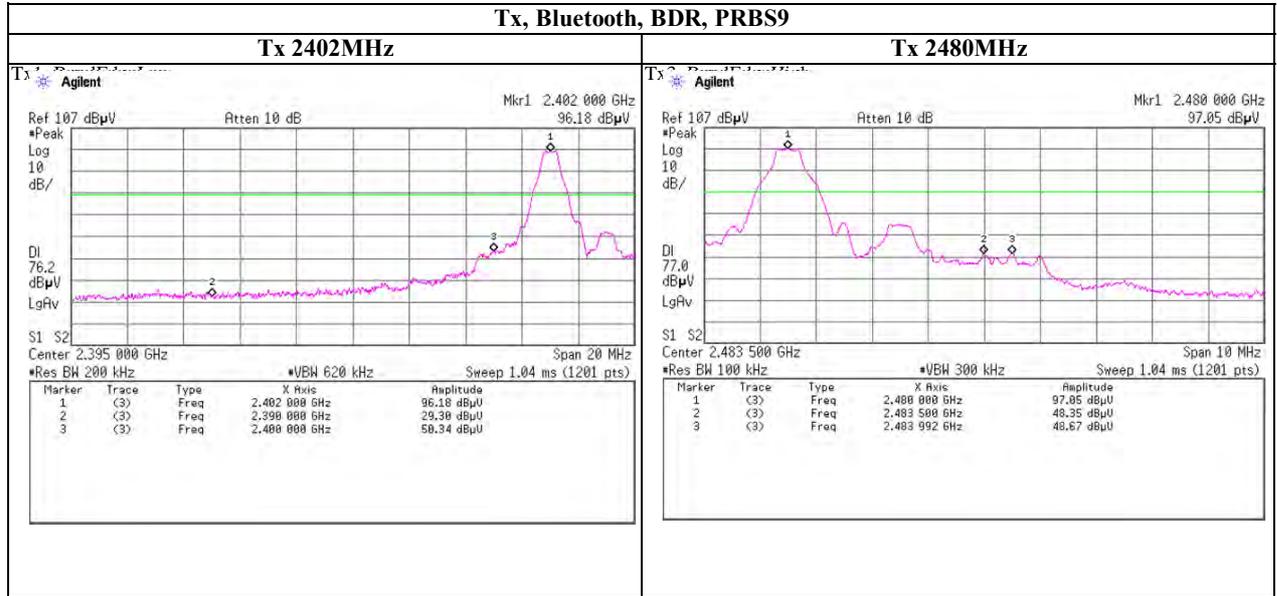
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Facsimile : +81 463 50 6401

## Spurious emission (Conducted)

### Band Edge compliance



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**Shonan EMC Lab.**

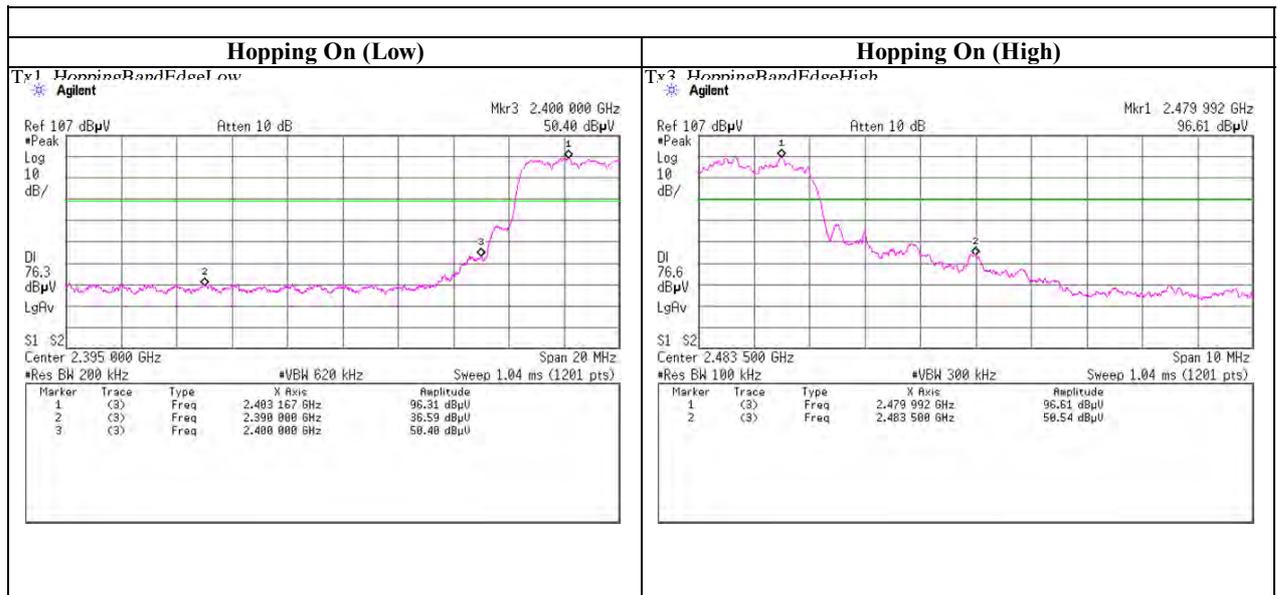
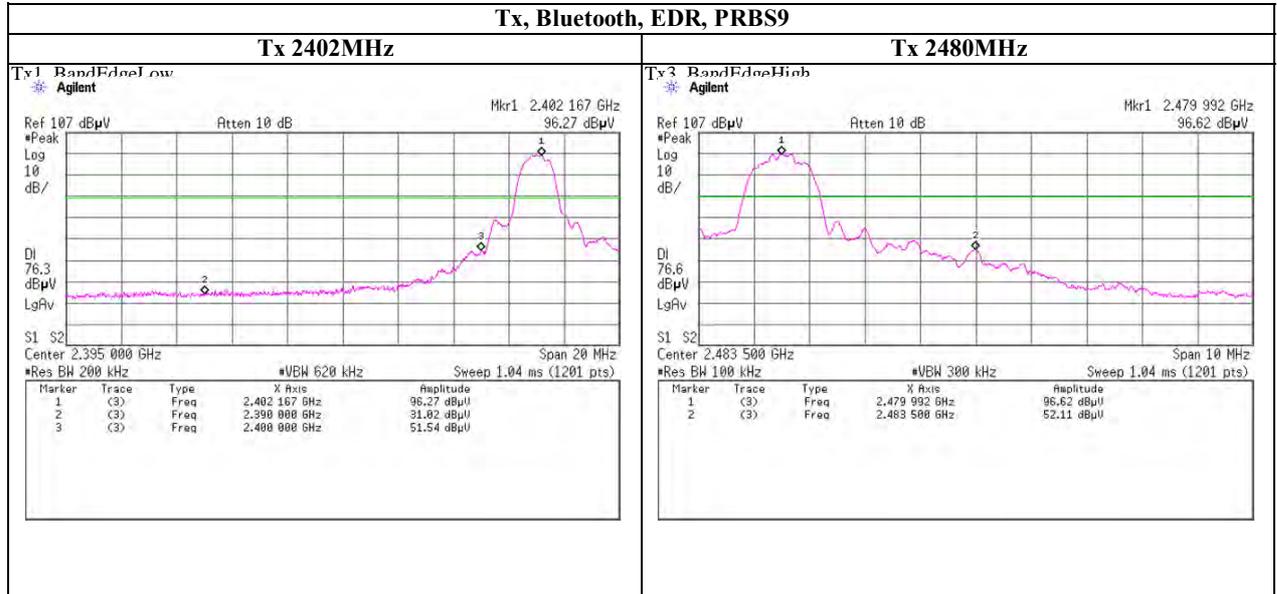
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Spurious emission (Conducted)

### Band Edge compliance



**UL Japan, Inc.**

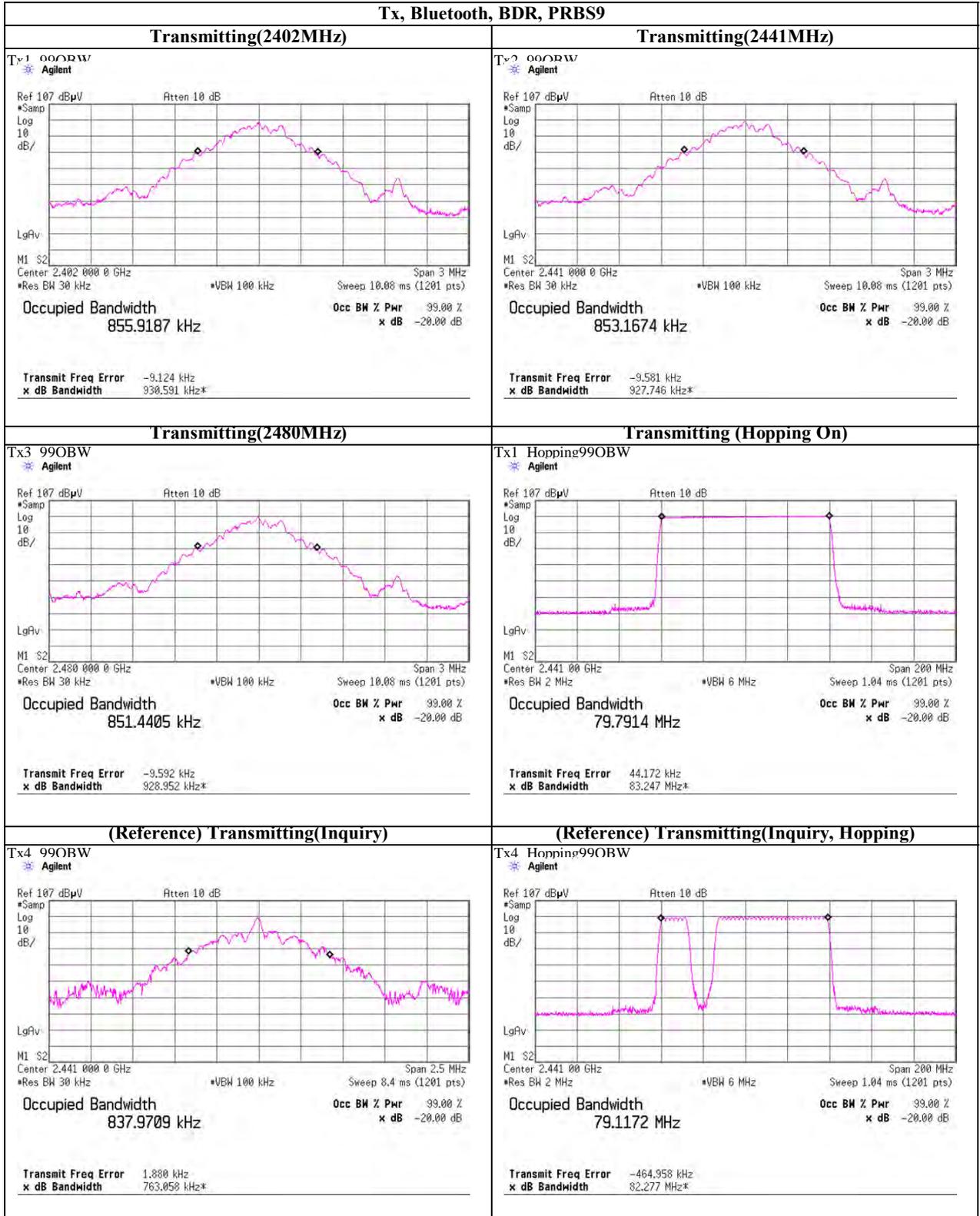
**Shonan EMC Lab.**

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## 99% Occupied Bandwidth



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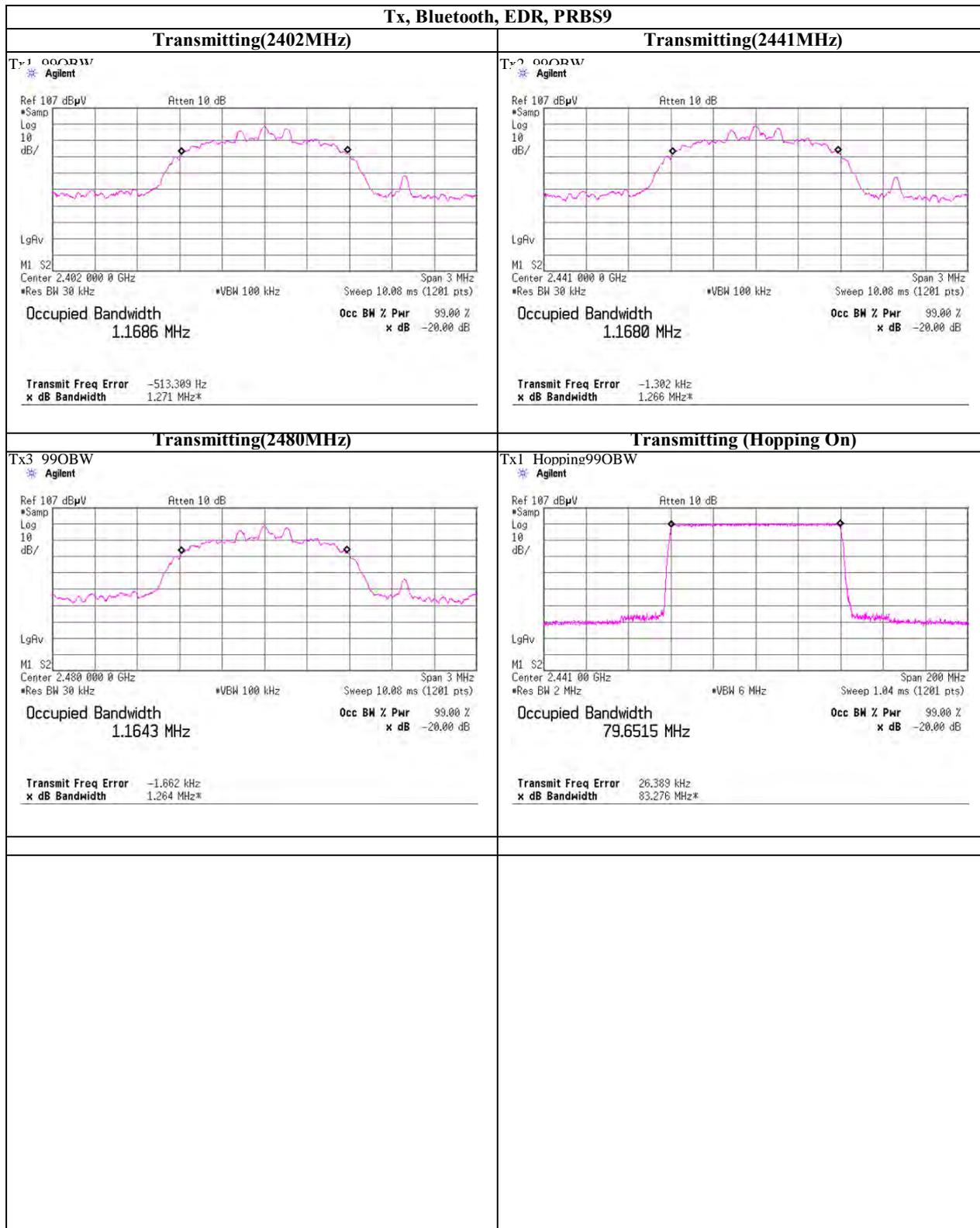
**Shonan EMC Lab.**

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### 99% Occupied Bandwidth



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### APPENDIX 3 Test Instruments

#### EMI test equipment

| Control No.                    | Instrument                | Manufacturer                                | Model No                                   | Serial No               | Test Item | Calibration Date * Interval(month) |
|--------------------------------|---------------------------|---|--|-------------------------|-----------|------------------------------------|
| SSA-03                         | Spectrum Analyzer         | Agilent                                     | E4448A                                     | MY48250152              | AT        | 2010/11/16 * 12                    |
| SCC-G11                        | Coaxial Cable             | Suhner                                      | SUCOFLEX 102                               | 31595/2                 | AT        | 2011/03/23 * 12                    |
| SAT10-06                       | Attenuator                | Agilent                                     | 8493C-010                                  | 74865                   | AT        | 2011/03/23 * 12                    |
| SPM-06                         | Power Meter               | Anritsu                                     | ML2495A                                    | 0850009                 | AT        | 2011/04/12 * 12                    |
| SPSS-03                        | Power sensor              | Anritsu                                     | MA2411B                                    | 0917063                 | AT        | 2011/04/12 * 12                    |
| SOS-09                         | Humidity Indicator        | A&D   | AD-5681                                    | 4061484                 | AT        | 2011/03/02 * 12                    |
| SAF-01                         | Pre Amplifier             | SONOMA                                      | 310N                                       | 290211                  | RE        | 2011/02/17 * 12                    |
| SAT6-01                        | Attenuator                | JFW   | 50HF-006N                                  | -                       | RE        | 2011/02/17 * 12                    |
| SAT3-04                        | Attenuator                | JFW   | 50HF-003N                                  | -                       | RE        | 2011/02/17 * 12                    |
| SBA-01                         | Biconical Antenna         | Schwarzbeck                                 | BBA9106                                    | 91032664                | RE        | 2010/10/11 * 12                    |
| SCC-A1/A3/A5/A7/A8/A13/SRSE-01 | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906 | -/0901-269(RF Selector) | RE        | 2011/04/28 * 12                    |
| SCC-A2/A4/A6/A7/A8/A13/SRSE-01 | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906 | -/0901-269(RF Selector) | RE        | 2011/04/28 * 12                    |
| SLA-01                         | Logperiodic Antenna       | Schwarzbeck                                 | UHALP9108A                                 | UHALP 9108-A 0888       | RE        | 2010/10/11 * 12                    |
| SOS-01                         | Humidity Indicator        | A&D   | AD-5681                                    | 4062555                 | RE        | 2011/02/23 * 12                    |
| STR-01                         | Test Receiver             | Rohde & Schwarz                             | ESU40                                      | 100093                  | RE        | 2010/10/29 * 12                    |
| SJM-12                         | Measure                   | PROMART                                     | SEN1935                                    | -                       | RE        | -                                  |
| SAEC-01(NSA)                   | Semi-Anechoic Chamber     | TDK   | SAEC-01(NSA)                               | 1                       | RE        | 2010/09/11 * 12                    |
| COTS-SEMI-1                    | EMI Software              | TSJ   | TEPTO-DV(RE,CE,RFLMF)                      | -                       | RE        | -                                  |
| SAF-05                         | Pre Amplifier             | TOYO Corporation                            | TPA0118-36                                 | 1440490                 | RE        | 2011/03/23 * 12                    |
| SCC-G02                        | Coaxial Cable             | Suhner                                      | SUCOFLEX 104A                              | 46498/4A                | RE        | 2011/04/28 * 12                    |
| SCC-G22                        | Coaxial Cable             | Suhner                                      | SUCOFLEX 104                               | 296199/4                | RE        | 2011/05/27 * 12                    |
| SHA-02                         | Horn Antenna              | Schwarzbeck                                 | BBHA9120D                                  | 9120D-726               | RE        | 2010/08/08 * 12                    |
| SAT10-04                       | Attenuator(above1GHz)     | Agilent                                     | 8493C-010                                  | 74863                   | RE        | 2010/12/15 * 12                    |
| SFL-02                         | Highpass Filter           | MICRO-TRONICS                               | HPM50111                                   | 051                     | RE        | 2010/12/15 * 12                    |
| SOS-03                         | Humidity Indicator        | A&D   | AD-5681                                    | 4063325                 | RE        | 2011/02/23 * 12                    |
| SSA-01                         | Spectrum Analyzer         | Agilent                                     | N9010A-526                                 | MY48031482              | RE        | 2011/04/20 * 12                    |
| SJM-02                         | Measure                   | KOMELON                                     | KMC-36                                     | -                       | RE        | -                                  |
| SHA-04                         | Horn Antenna              | ETS LINDGREN                                | 3160-09                                    | LM3640                  | RE        | 2011/03/15 * 12                    |
| SAF-08                         | Pre Amplifier             | TOYO Corporation                            | HAP18-26W                                  | 00000019                | RE        | 2011/03/16 * 12                    |
| SCC-G17                        | Coaxial Cable             | Suhner                                      | SUCOFLEX 104A                              | 46291/4A                | RE        | 2011/03/16 * 12                    |
|                                |                           |   |  |                         |           |                                    |
|                                |                           |   |  |                         |           |                                    |

The expiration date of the calibration is the end of the expired month .  
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .

Test Item :

RE: Radiated emission ,  
AT: Antenna terminal disturbance voltage