

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11a 5320 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-------------|
| Hori.    | 5350.000        | PK       | 49.50          | 31.99           | 17.62     | 39.74     | 2.28                 | 61.65           | 73.9           | 12.2        | 397         | 358          | -           |
| Hori.    | 5350.000        | AV       | 36.68          | 31.99           | 17.62     | 39.74     | 2.28                 | 48.83           | 53.9           | 5.0         | 397         | 358          | VBW:1.5 kHz |
| Vert.    | 5350.000        | PK       | 45.85          | 31.99           | 17.62     | 39.74     | 2.28                 | 58.00           | 73.9           | 15.9        | 345         | 281          | -           |
| Vert.    | 5350.000        | AV       | 34.30          | 31.99           | 17.62     | 39.74     | 2.28                 | 46.45           | 53.9           | 7.4         | 345         | 281          | VBW:1.5 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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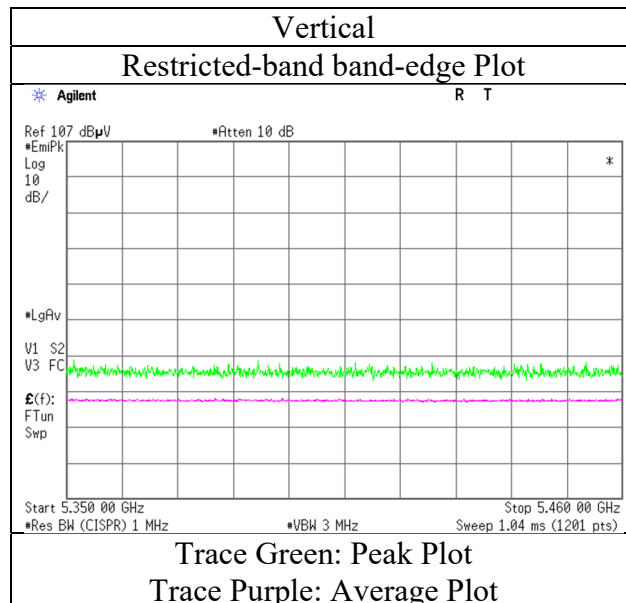
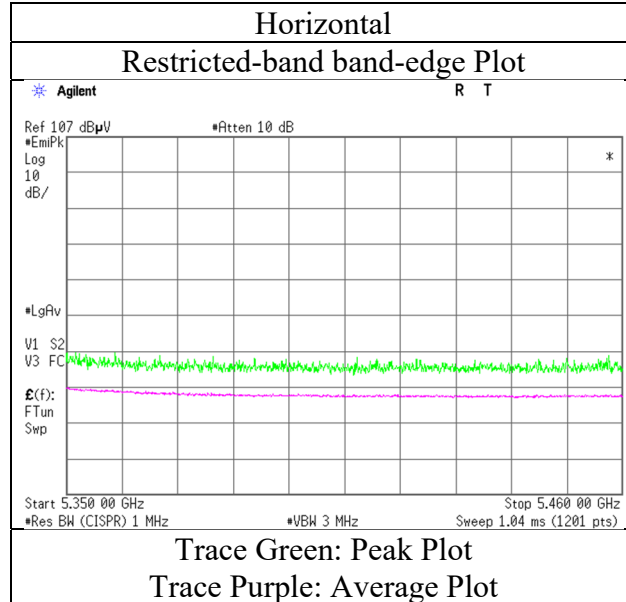
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

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| Report No.             | 13554183S-I-R1   |
| Test place             | Shonan EMC Lab.  |
| Semi Anechoic Chamber  | 1  |
| Date                   | November 22, 2020  |
| Temperature / Humidity | 24 deg.C, 52 %RH   |
| Engineer               | Hiromasa Sato  |
| Mode                   | Tx 11a 5320 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11a 5500 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-------------|
| Hori.    | 5460.000        | PK       | 47.28          | 32.22           | 17.72     | 39.75     | 2.28                 | 59.75           | 73.9           | 14.1        | 389         | 258          | -           |
| Hori.    | 5460.000        | AV       | 36.36          | 32.22           | 17.72     | 39.75     | 2.28                 | 48.83           | 53.9           | 5.0         | 389         | 258          | VBW:1.5 kHz |
| Vert.    | 5460.000        | PK       | 45.32          | 32.22           | 17.72     | 39.75     | 2.28                 | 57.79           | 73.9           | 16.1        | 397         | 302          | -           |
| Vert.    | 5460.000        | AV       | 35.47          | 32.22           | 17.72     | 39.75     | 2.28                 | 47.94           | 53.9           | 5.9         | 397         | 302          | VBW:1.5 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5470.000        | PK       | 48.69          | 32.24           | 17.72     | 39.75     | 2.28                 | 61.18           | -34.05              | -27.0       | 7.0         | 389         | 258          | -      |
| Vert.    | 5470.000        | PK       | 46.55          | 32.24           | 17.72     | 39.75     | 2.28                 | 59.04           | -36.19              | -27.0       | 9.1         | 397         | 302          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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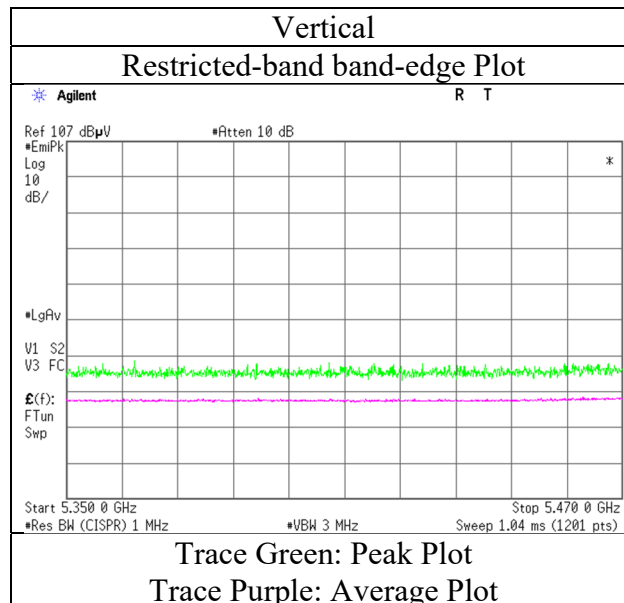
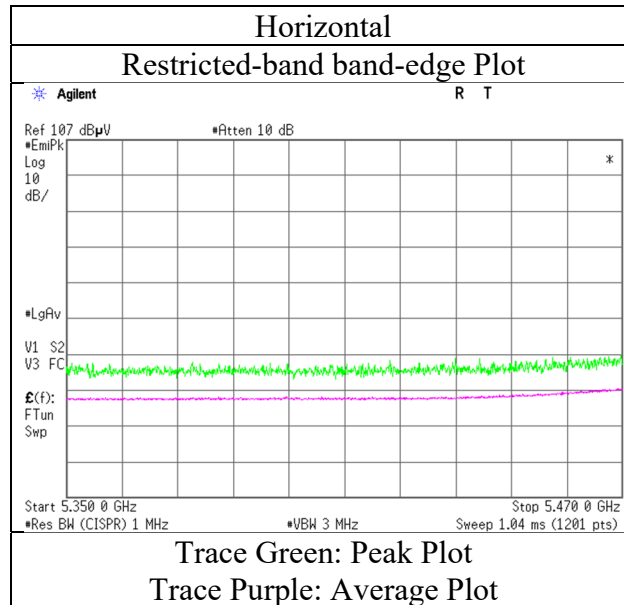
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## Radiated Spurious Emission

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| Report No.             | 13554183S-I-R1   |
| Test place             | Shonan EMC Lab.  |
| Semi Anechoic Chamber  | 1  |
| Date                   | November 22, 2020  |
| Temperature / Humidity | 24 deg.C, 52 %RH   |
| Engineer               | Hiromasa Sato  |
| Mode                   | Tx 11a 5500 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11a 5700 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5725.000        | PK       | 48.19          | 32.64           | 17.89     | 39.92     | 2.28                 | 61.08           | -34.15              | -27.0       | 7.1         | 354         | 348          | -      |
| Vert.    | 5725.000        | PK       | 45.92          | 32.64           | 17.89     | 39.92     | 2.28                 | 58.81           | -36.42              | -27.0       | 9.4         | 388         | 278          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m]) ^ 2 / 30 \* 10 ^ 3)

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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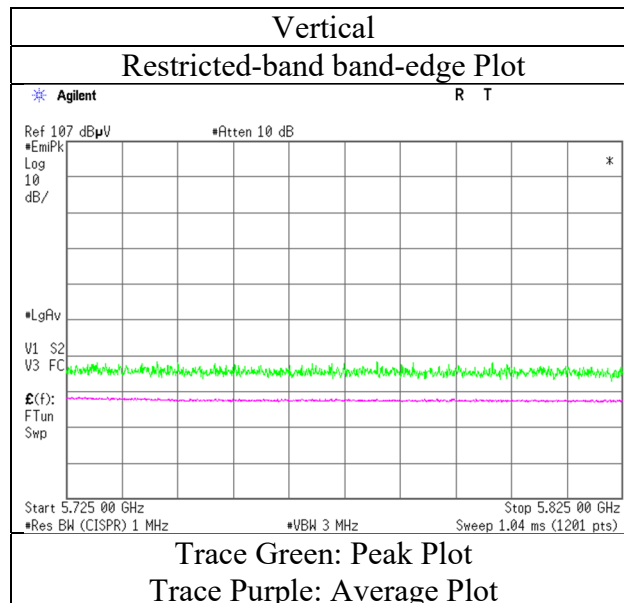
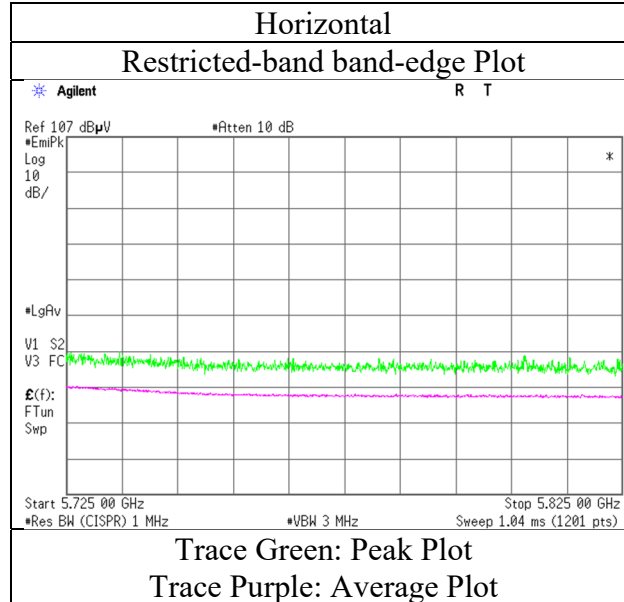
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| Test place             | Shonan EMC Lab.  |
| Semi Anechoic Chamber  | 1  |
| Date                   | November 22, 2020  |
| Temperature / Humidity | 24 deg.C, 52 %RH   |
| Engineer               | Hiromasa Sato  |
| Mode                   | Tx 11a 5700 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

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Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11a 5745 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5650.000        | PK       | 44.96          | 32.44           | 17.84     | 39.86     | 2.28                 | 57.66           | -37.57              | -27.0       | <b>10.5</b> | 397         | 358          | -      |
| Hori.    | 5700.000        | PK       | 45.93          | 32.56           | 17.87     | 39.90     | 2.28                 | 58.74           | -36.49              | 10.0        | 46.4        | 397         | 358          | -      |
| Hori.    | 5720.000        | PK       | 46.29          | 32.62           | 17.88     | 39.92     | 2.28                 | 59.15           | -36.08              | 15.6        | 51.6        | 397         | 358          | -      |
| Hori.    | 5725.000        | PK       | 57.40          | 32.64           | 17.89     | 39.92     | 2.28                 | 70.29           | -24.94              | 27.0        | 51.9        | 397         | 358          | -      |
| Vert.    | 5650.000        | PK       | 44.99          | 32.44           | 17.84     | 39.86     | 2.28                 | 57.69           | -37.54              | -27.0       | <b>10.5</b> | 383         | 302          | -      |
| Vert.    | 5700.000        | PK       | 45.12          | 32.56           | 17.87     | 39.90     | 2.28                 | 57.93           | -37.30              | 10.0        | 47.3        | 383         | 302          | -      |
| Vert.    | 5720.000        | PK       | 45.25          | 32.62           | 17.88     | 39.92     | 2.28                 | 58.11           | -37.12              | 15.6        | 52.7        | 383         | 302          | -      |
| Vert.    | 5725.000        | PK       | 46.22          | 32.64           | 17.89     | 39.92     | 2.28                 | 59.11           | -36.12              | 27.0        | 63.1        | 383         | 302          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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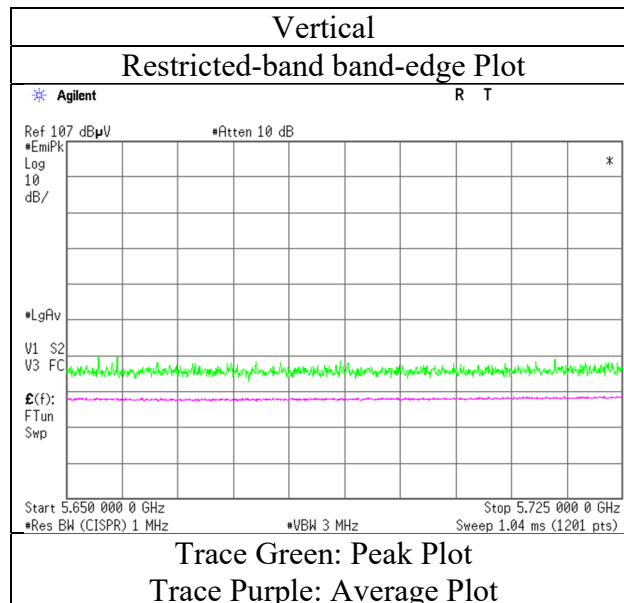
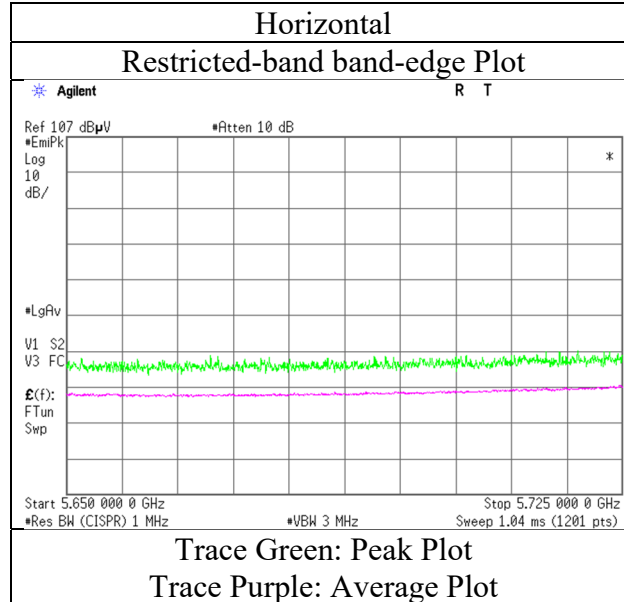
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| Report No.             | 13554183S-I-R1   |
| Test place             | Shonan EMC Lab.  |
| Semi Anechoic Chamber  | 1  |
| Date                   | November 22, 2020  |
| Temperature / Humidity | 24 deg.C, 52 %RH   |
| Engineer               | Hiromasa Sato  |
| Mode                   | Tx 11a 5745 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.



## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11a 5825 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5850.000        | PK       | 47.00          | 32.91           | 17.96     | 40.02     | 2.28                 | 60.13           | -35.10              | 27.0        | 62.1        | 369         | 358          | -      |
| Hori.    | 5855.000        | PK       | 47.56          | 32.92           | 17.96     | 40.02     | 2.28                 | 60.70           | -34.53              | 15.6        | 50.1        | 369         | 358          | -      |
| Hori.    | 5875.000        | PK       | 45.39          | 32.95           | 17.99     | 40.04     | 2.28                 | 58.57           | -36.66              | 10.0        | 46.6        | 369         | 358          | -      |
| Hori.    | 5925.000        | PK       | 44.77          | 32.99           | 18.01     | 40.07     | 2.28                 | 57.98           | -37.25              | -27.0       | 10.2        | 369         | 358          | -      |
| Vert.    | 5850.000        | PK       | 45.94          | 32.91           | 17.96     | 40.02     | 2.28                 | 59.07           | -36.16              | 27.0        | 63.1        | 342         | 266          | -      |
| Vert.    | 5855.000        | PK       | 44.84          | 32.92           | 17.96     | 40.02     | 2.28                 | 57.98           | -37.25              | 15.6        | 52.8        | 342         | 266          | -      |
| Vert.    | 5875.000        | PK       | 46.18          | 32.95           | 17.99     | 40.04     | 2.28                 | 59.36           | -35.87              | 10.0        | 45.8        | 342         | 266          | -      |
| Vert.    | 5925.000        | PK       | 44.95          | 32.99           | 18.01     | 40.07     | 2.28                 | 58.16           | -37.07              | -27.0       | <b>10.0</b> | 342         | 266          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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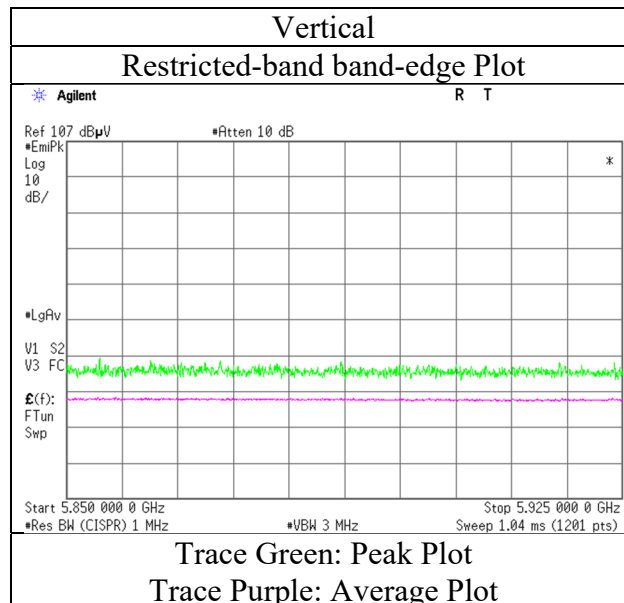
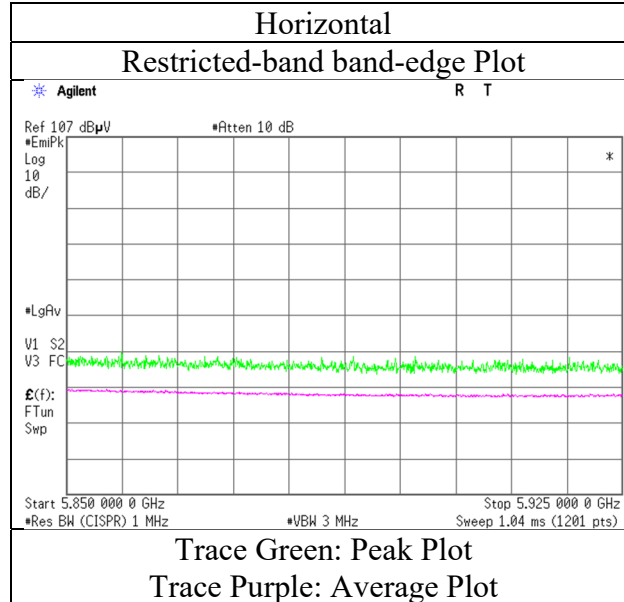
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| Mode                   | Tx 11a 5825 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



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Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5180 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-------------|
| Hori.    | 5150.000        | PK       | 51.00          | 32.25           | 17.45     | 39.72     | 2.28                 | 63.26           | 73.9           | 10.6        | 396         | 359          | -           |
| Hori.    | 5150.000        | AV       | 38.59          | 32.25           | 17.45     | 39.72     | 2.28                 | 50.85           | 53.9           | <b>3.0</b>  | 396         | 359          | VBW:4.3 kHz |
| Vert.    | 5150.000        | PK       | 44.00          | 32.25           | 17.45     | 39.72     | 2.28                 | 56.26           | 73.9           | 17.6        | 400         | 319          | -           |
| Vert.    | 5150.000        | AV       | 34.23          | 32.25           | 17.45     | 39.72     | 2.28                 | 46.49           | 53.9           | 7.4         | 400         | 319          | VBW:4.3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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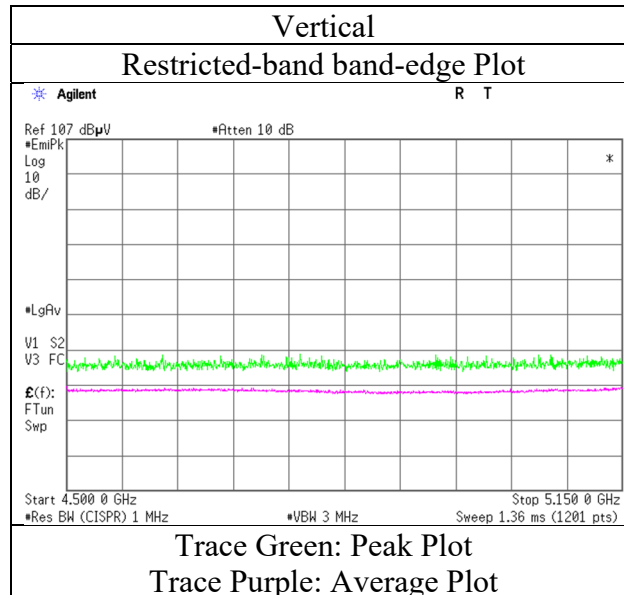
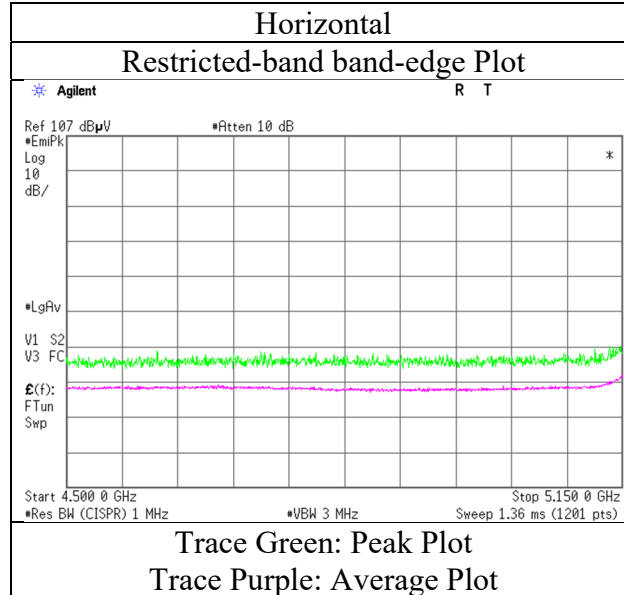
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Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5320 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-------------|
| Hori.    | 5350.000        | PK       | 51.43          | 31.99           | 17.62     | 39.74     | 2.28                 | 63.58           | 73.9           | 10.3        | 388         | 359          | -           |
| Hori.    | 5350.000        | AV       | 38.53          | 31.99           | 17.62     | 39.74     | 2.28                 | 50.68           | 53.9           | 3.2         | 388         | 359          | VBW:4.3 kHz |
| Vert.    | 5350.000        | PK       | 46.08          | 31.99           | 17.62     | 39.74     | 2.28                 | 58.23           | 73.9           | 15.6        | 400         | 305          | -           |
| Vert.    | 5350.000        | AV       | 35.46          | 31.99           | 17.62     | 39.74     | 2.28                 | 47.61           | 53.9           | 6.2         | 400         | 305          | VBW:4.3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**UL Japan, Inc.**

**Shonan EMC Lab.**

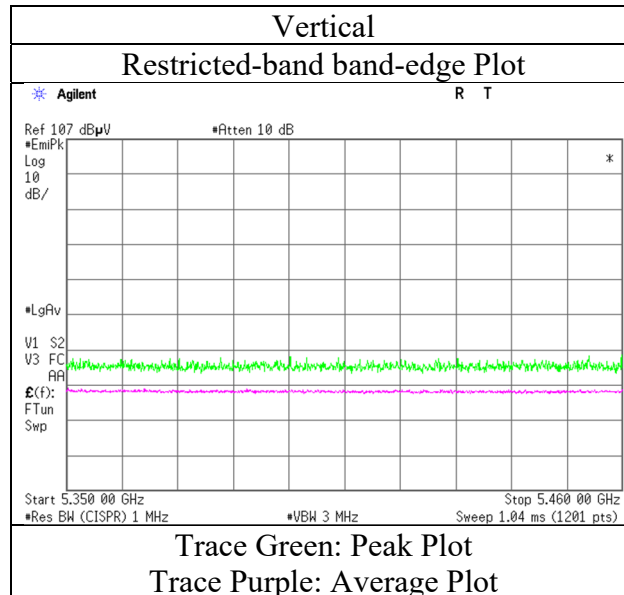
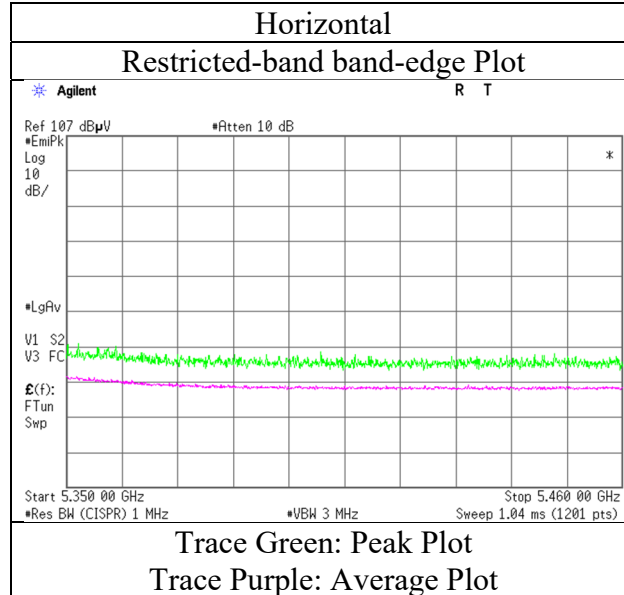
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-20 5320 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5500 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-------------|
| Hori.    | 5460.000        | PK       | 47.90          | 32.22           | 17.72     | 39.75     | 2.28                 | 60.37           | 73.9           | 13.5        | 391         | 355          | -           |
| Hori.    | 5460.000        | AV       | 37.33          | 32.22           | 17.72     | 39.75     | 2.28                 | 49.80           | 53.9           | 4.1         | 391         | 355          | VBW:4.3 kHz |
| Vert.    | 5460.000        | PK       | 45.88          | 32.22           | 17.72     | 39.75     | 2.28                 | 58.35           | 73.9           | 15.5        | 400         | 302          | -           |
| Vert.    | 5460.000        | AV       | 35.43          | 32.22           | 17.72     | 39.75     | 2.28                 | 47.90           | 53.9           | 6.0         | 400         | 302          | VBW:4.3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5470.000        | PK       | 53.21          | 32.24           | 17.72     | 39.75     | 2.28                 | 65.70           | -29.53              | -27.0       | 2.5         | 391         | 355          | -      |
| Vert.    | 5470.000        | PK       | 46.11          | 32.24           | 17.72     | 39.75     | 2.28                 | 58.60           | -36.63              | -27.0       | 9.6         | 400         | 302          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m] / 20) * 10^{\wedge}(-6) * \text{Distance : } 3\text{ [m]})^{\wedge}2 / 30 * 10^{\wedge}3))$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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**Shonan EMC Lab.**

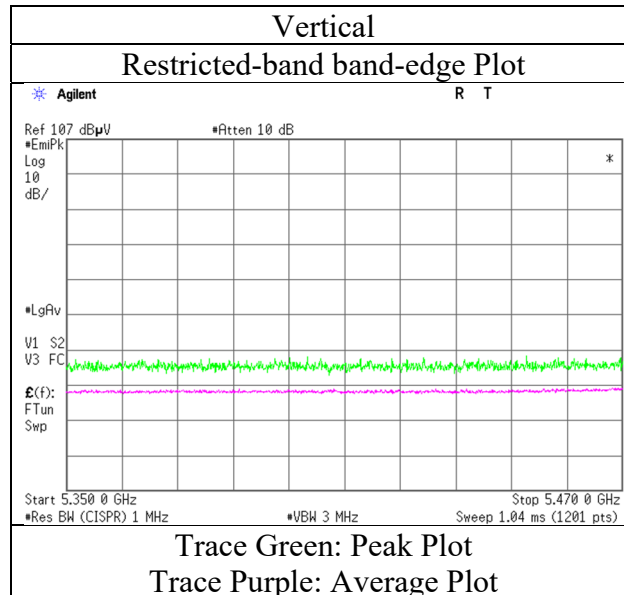
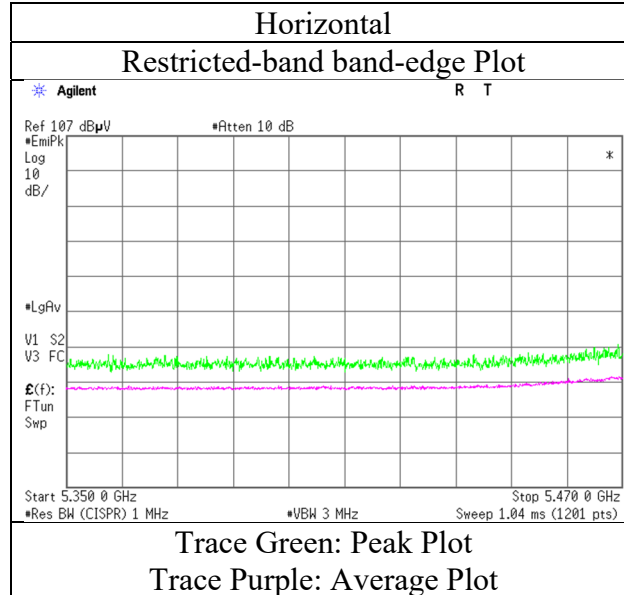
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-20 5500 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

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**Shonan EMC Lab.**

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Facsimile : +81 463 50 6401



## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 1  
Date November 27, 2020 November 25, 2020 November 26, 2020  
Temperature / Humidity 20 deg.C, 46 %RH 20 deg.C, 46 %RH 21 deg.C, 48 %RH  
Engineer Yosuke Murakami Yosuke Murakami Yosuke Murakami  
( 30 MHz -1 GHz ) ( 1 GHz -10 GHz ) ( 10 GHz -40 GHz )  
Mode Tx 11n-20 5580 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (below 1 GHz and above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark       |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|--------------|
| Hori.    | 11160.000       | PK       | 46.33          | 37.52           | 10.39     | 39.61     | -9.54                | 45.09           | 73.9           | 28.8        | 150         | 0            | -            |
| Hori.    | 11160.000       | AV       | 36.32          | 37.52           | 10.39     | 39.61     | -9.54                | 35.08           | 53.9           | 18.8        | 150         | 0            | VBW :4.3 kHz |
| Vert.    | 38.873          | QP       | 35.83          | 15.27           | 7.24      | 31.83     | 0.00                 | 26.51           | 40.0           | 13.4        | 100         | 3            | -            |
| Vert.    | 48.293          | QP       | 45.47          | 11.79           | 7.44      | 31.83     | 0.00                 | 32.87           | 40.0           | 7.1         | 100         | 200          | -            |
| Vert.    | 66.333          | QP       | 41.57          | 7.01            | 7.30      | 31.83     | 0.00                 | 24.05           | 40.0           | 15.9        | 100         | 258          | -            |
| Vert.    | 66.333          | QP       | 41.57          | 7.01            | 7.30      | 31.83     | 0.00                 | 24.05           | 40.0           | 15.9        | 100         | 258          | -            |
| Vert.    | 137.589         | QP       | 34.91          | 14.36           | 8.55      | 31.79     | 0.00                 | 26.03           | 43.5           | 17.4        | 100         | 240          | -            |
| Vert.    | 137.589         | QP       | 34.91          | 14.36           | 8.55      | 31.79     | 0.00                 | 26.03           | 43.5           | 17.4        | 100         | 240          | -            |
| Vert.    | 170.763         | QP       | 35.54          | 15.67           | 8.96      | 31.78     | 0.00                 | 28.39           | 43.5           | 15.1        | 100         | 178          | -            |
| Vert.    | 170.763         | QP       | 35.54          | 15.67           | 8.96      | 31.78     | 0.00                 | 28.39           | 43.5           | 15.1        | 100         | 178          | -            |
| Vert.    | 860.153         | QP       | 32.49          | 21.71           | 9.47      | 31.68     | 0.00                 | 31.99           | 46.0           | 14.0        | 183         | 331          | -            |
| Vert.    | 860.153         | QP       | 32.49          | 21.71           | 9.47      | 31.68     | 0.00                 | 31.99           | 46.0           | 14.0        | 183         | 331          | -            |
| Vert.    | 958.461         | QP       | 31.74          | 22.16           | 9.85      | 31.03     | 0.00                 | 32.72           | 46.0           | 13.2        | 108         | 174          | -            |
| Vert.    | 958.461         | QP       | 31.74          | 22.16           | 9.85      | 31.03     | 0.00                 | 32.72           | 46.0           | 13.2        | 108         | 174          | -            |
| Vert.    | 11160.000       | PK       | 46.44          | 37.52           | 10.39     | 39.61     | -9.54                | 45.20           | 73.9           | 28.7        | 150         | 0            | -            |
| Vert.    | 11160.000       | AV       | 36.39          | 37.52           | 10.39     | 39.61     | -9.54                | 35.15           | 53.9           | 18.7        | 150         | 0            | VBW :4.3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 16740.000       | PK       | 44.87          | 39.75           | 13.40     | 40.11     | -9.54                | 48.37           | -46.86              | -27.0       | 19.8        | 150         | 0            | -      |
| Vert.    | 16740.000       | PK       | 46.21          | 39.75           | 13.40     | 40.11     | -9.54                | 49.71           | -45.52              | -27.0       | 18.5        | 150         | 0            | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3)

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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

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## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5700 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5725.000        | PK       | 49.68          | 32.64           | 17.89     | 39.92     | 2.28                 | 62.57           | -32.66              | -27.0       | 5.6         | 354         | 359          | -      |
| Vert.    | 5725.000        | PK       | 45.43          | 32.64           | 17.89     | 39.92     | 2.28                 | 58.32           | -36.91              | -27.0       | 9.9         | 390         | 316          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3)

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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**Shonan EMC Lab.**

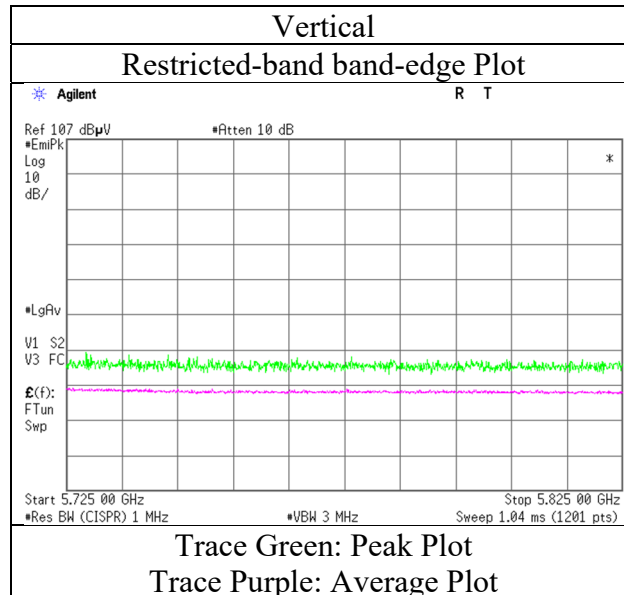
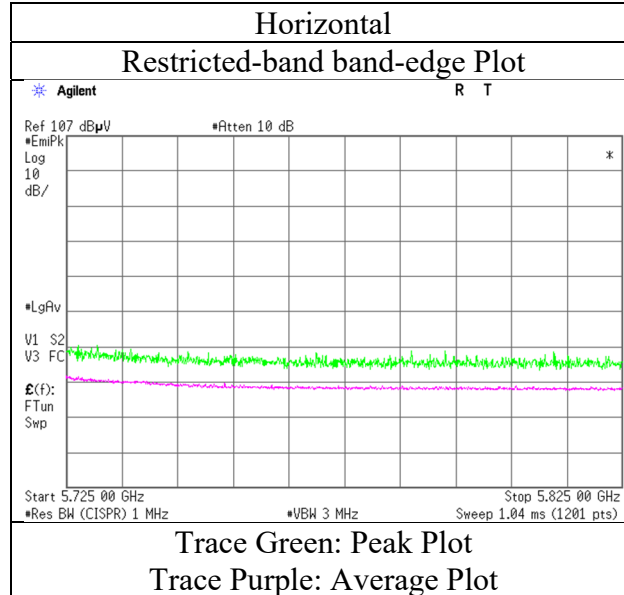
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-20 5700 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5745 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5650.000        | PK       | 45.97          | 32.44           | 17.84     | 39.86     | 2.28                 | 58.67           | -36.56              | -27.0       | 9.5         | 377         | 357          | -      |
| Hori.    | 5700.000        | PK       | 47.35          | 32.56           | 17.87     | 39.90     | 2.28                 | 60.16           | -35.07              | 10.0        | 45.0        | 377         | 357          | -      |
| Hori.    | 5720.000        | PK       | 52.14          | 32.62           | 17.88     | 39.92     | 2.28                 | 65.00           | -30.23              | 15.6        | 45.8        | 377         | 357          | -      |
| Hori.    | 5720.000        | PK       | 50.42          | 32.62           | 17.88     | 39.92     | 2.28                 | 63.28           | -31.95              | 15.6        | 47.5        | 377         | 357          | -      |
| Vert.    | 5650.000        | PK       | 45.34          | 32.44           | 17.84     | 39.86     | 2.28                 | 58.04           | -37.19              | -27.0       | 10.1        | 400         | 310          | -      |
| Vert.    | 5700.000        | PK       | 45.58          | 32.56           | 17.87     | 39.90     | 2.28                 | 58.39           | -36.84              | 10.0        | 46.8        | 400         | 310          | -      |
| Vert.    | 5720.000        | PK       | 46.05          | 32.62           | 17.88     | 39.92     | 2.28                 | 58.91           | -36.32              | 15.6        | 51.9        | 400         | 310          | -      |
| Vert.    | 5720.000        | PK       | 46.51          | 32.62           | 17.88     | 39.92     | 2.28                 | 59.37           | -35.86              | 15.6        | 51.4        | 400         | 310          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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**Shonan EMC Lab.**

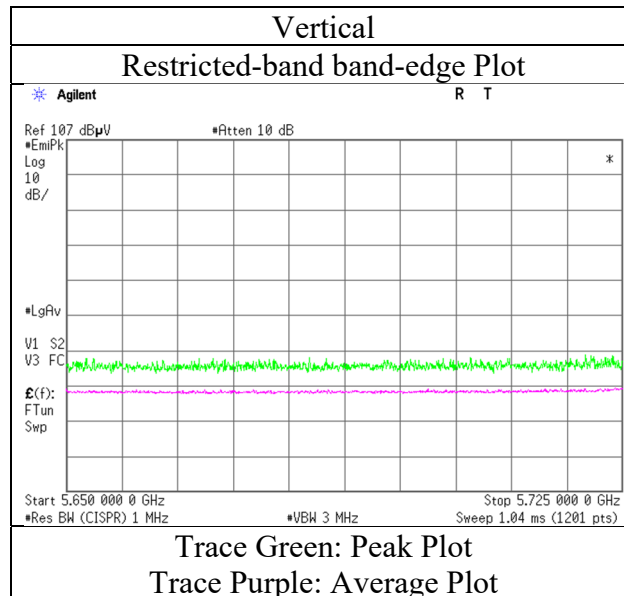
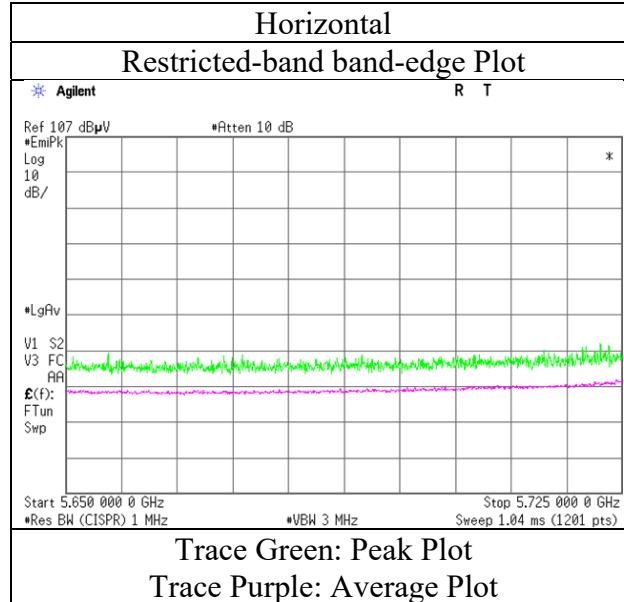
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-20 5745 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-20 5825 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5850.000        | PK       | 50.58          | 32.91           | 17.96     | 40.02     | 2.28                 | 63.71           | -31.52              | 27.0        | 58.5        | 386         | 359          | -      |
| Hori.    | 5855.000        | PK       | 48.97          | 32.92           | 17.96     | 40.02     | 2.28                 | 62.11           | -33.12              | 15.6        | 48.7        | 386         | 359          | -      |
| Hori.    | 5875.000        | PK       | 46.48          | 32.95           | 17.99     | 40.04     | 2.28                 | 59.66           | -35.57              | 10.0        | 45.5        | 386         | 359          | -      |
| Hori.    | 5925.000        | PK       | 45.02          | 32.99           | 18.01     | 40.07     | 2.28                 | 58.23           | -37.00              | -27.0       | <b>9.9</b>  | 386         | 359          | -      |
| Vert.    | 5850.000        | PK       | 45.73          | 32.91           | 17.96     | 40.02     | 2.28                 | 58.86           | -36.37              | 27.0        | 63.3        | 392         | 323          | -      |
| Vert.    | 5855.000        | PK       | 45.11          | 32.92           | 17.96     | 40.02     | 2.28                 | 58.25           | -36.98              | 15.6        | 52.5        | 392         | 323          | -      |
| Vert.    | 5875.000        | PK       | 45.41          | 32.95           | 17.99     | 40.04     | 2.28                 | 58.59           | -36.64              | 10.0        | 46.6        | 392         | 323          | -      |
| Vert.    | 5925.000        | PK       | 45.01          | 32.99           | 18.01     | 40.07     | 2.28                 | 58.22           | -37.01              | -27.0       | 10.0        | 392         | 323          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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**Shonan EMC Lab.**

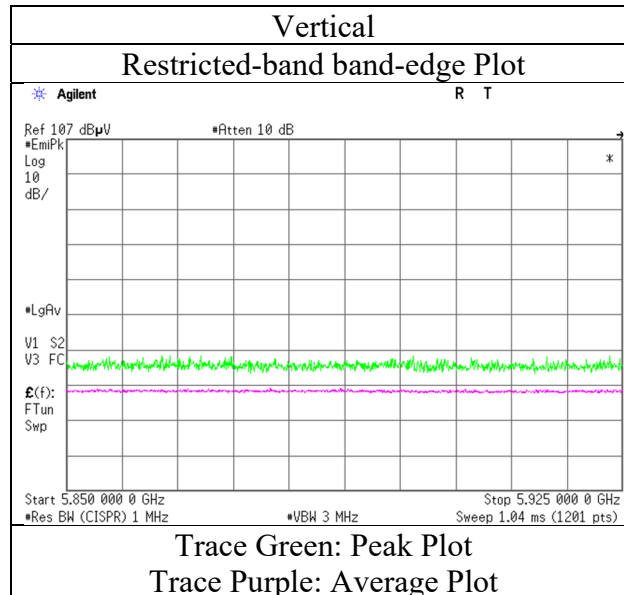
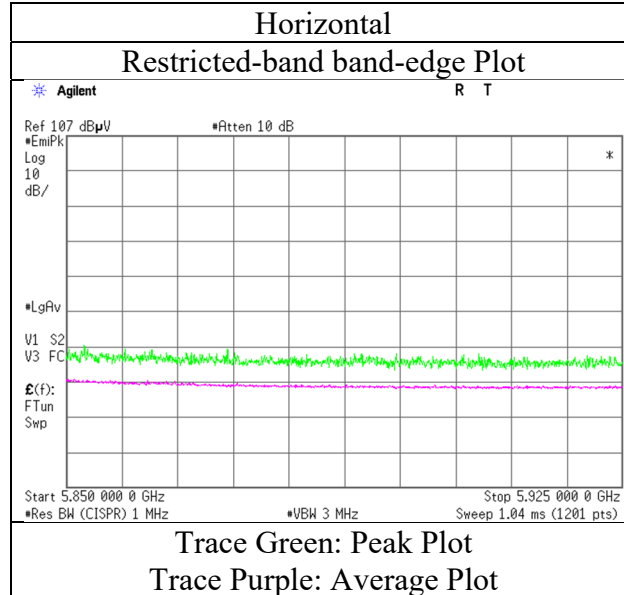
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-20 5825 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5190 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark    |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-----------|
| Hori.    | 5150.000        | PK       | 49.94          | 32.25           | 17.45     | 39.72     | 2.28                 | 62.20           | 73.9           | 11.7        | 398         | 358          | -         |
| Hori.    | 5150.000        | AV       | 38.75          | 32.25           | 17.45     | 39.72     | 2.28                 | 51.01           | 53.9           | 2.8         | 398         | 358          | VBW:3 kHz |
| Vert.    | 5150.000        | PK       | 46.11          | 32.25           | 17.45     | 39.72     | 2.28                 | 58.37           | 73.9           | 15.5        | 400         | 308          | -         |
| Vert.    | 5150.000        | AV       | 34.45          | 32.25           | 17.45     | 39.72     | 2.28                 | 46.71           | 53.9           | 7.1         | 400         | 308          | VBW:3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

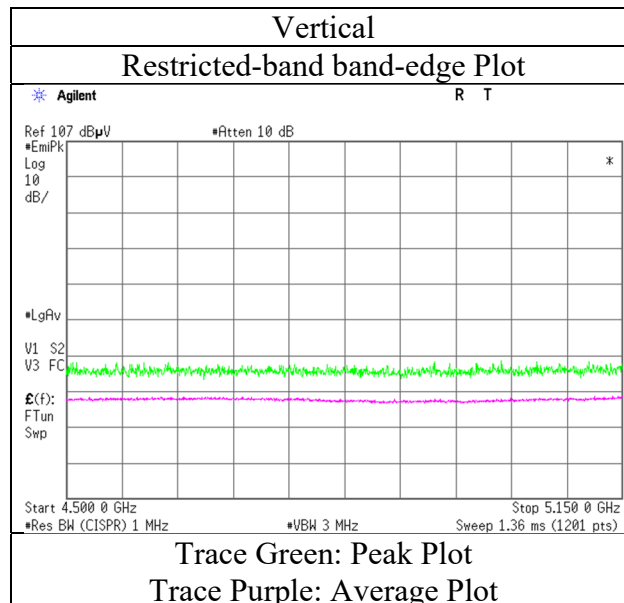
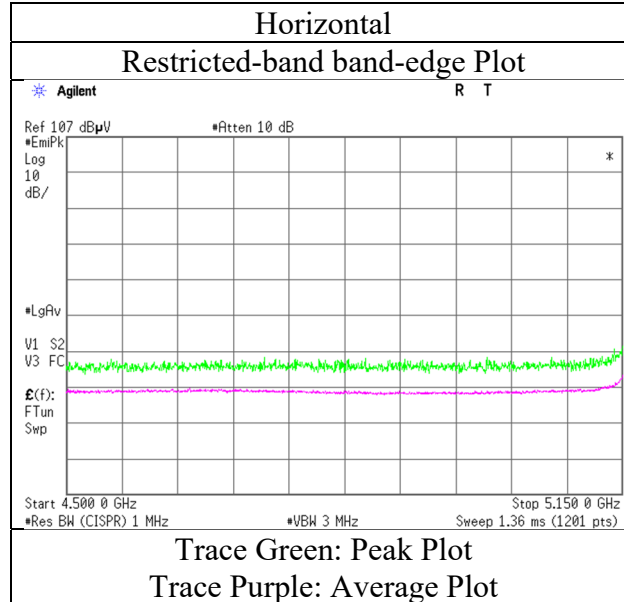
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401



## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5190 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5310 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark    |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-----------|
| Hori.    | 5350.000        | PK       | 55.27          | 31.99           | 17.62     | 39.74     | 2.28                 | 67.42           | 73.9           | 6.4         | 390         | 357          | -         |
| Hori.    | 5350.000        | AV       | 41.34          | 31.99           | 17.62     | 39.74     | 2.28                 | 53.49           | 53.9           | 0.4         | 390         | 357          | VBW:3 kHz |
| Vert.    | 5350.000        | PK       | 45.71          | 31.99           | 17.62     | 39.74     | 2.28                 | 57.86           | 73.9           | 16.0        | 386         | 287          | -         |
| Vert.    | 5350.000        | AV       | 35.26          | 31.99           | 17.62     | 39.74     | 2.28                 | 47.41           | 53.9           | 6.4         | 386         | 287          | VBW:3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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**Shonan EMC Lab.**

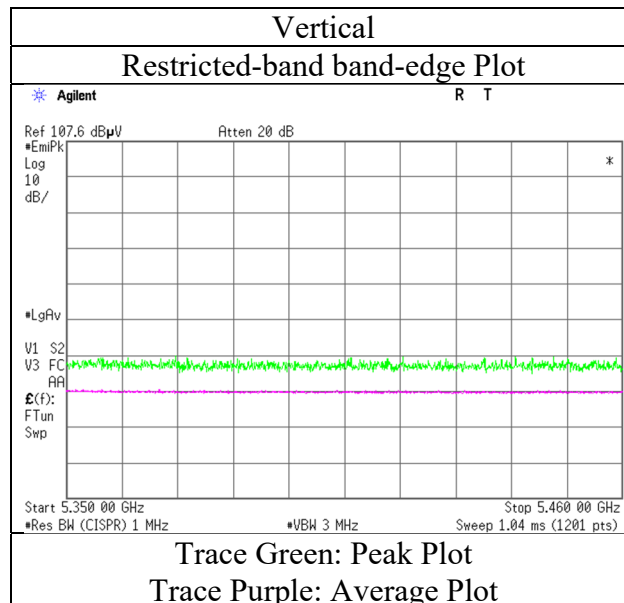
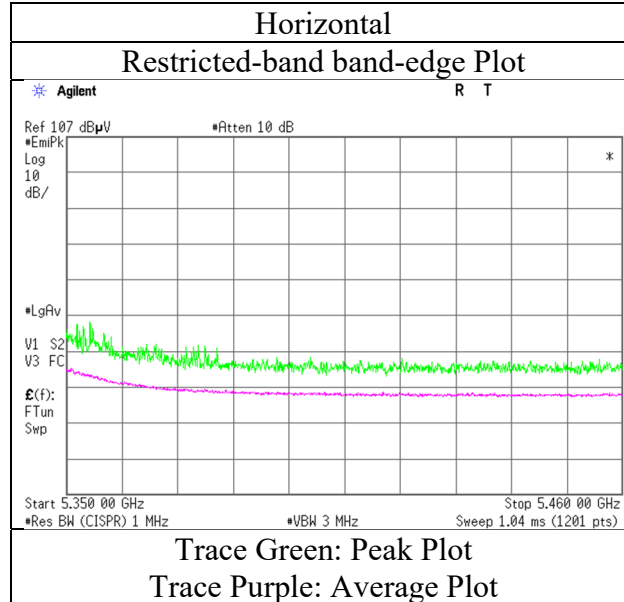
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5310 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5510 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (above 1 GHz Inside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark    |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|-----------|
| Hori.    | 5460.000        | PK       | 47.57          | 32.22           | 17.72     | 39.75     | 2.28                 | 60.04           | 73.9           | 13.8        | 390         | 359          | -         |
| Hori.    | 5460.000        | AV       | 35.99          | 32.22           | 17.72     | 39.75     | 2.28                 | 48.46           | 53.9           | 5.4         | 390         | 359          | VBW:3 kHz |
| Vert.    | 5460.000        | PK       | 45.60          | 32.22           | 17.72     | 39.75     | 2.28                 | 58.07           | 73.9           | 15.8        | 391         | 308          | -         |
| Vert.    | 5460.000        | AV       | 34.67          | 32.22           | 17.72     | 39.75     | 2.28                 | 47.14           | 53.9           | 6.7         | 391         | 308          | VBW:3 kHz |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5470.000        | PK       | 49.92          | 32.24           | 17.72     | 39.75     | 2.28                 | 62.41           | -32.82              | -27.0       | 5.8         | 390         | 359          | -      |
| Vert.    | 5470.000        | PK       | 45.50          | 32.24           | 17.72     | 39.75     | 2.28                 | 57.99           | -37.24              | -27.0       | 10.2        | 391         | 308          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m] / 20) * 10^{\wedge}(-6) * \text{Distance} : 3 [\text{m}]^{\wedge}2 / 30 * 10^{\wedge}3))$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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**Shonan EMC Lab.**

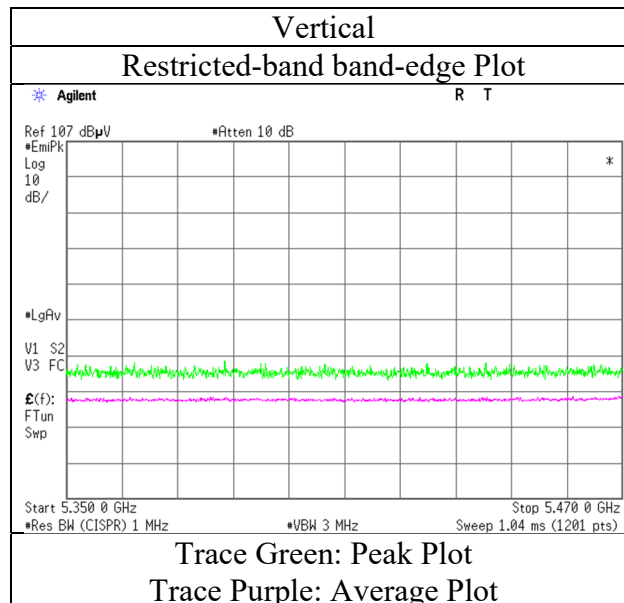
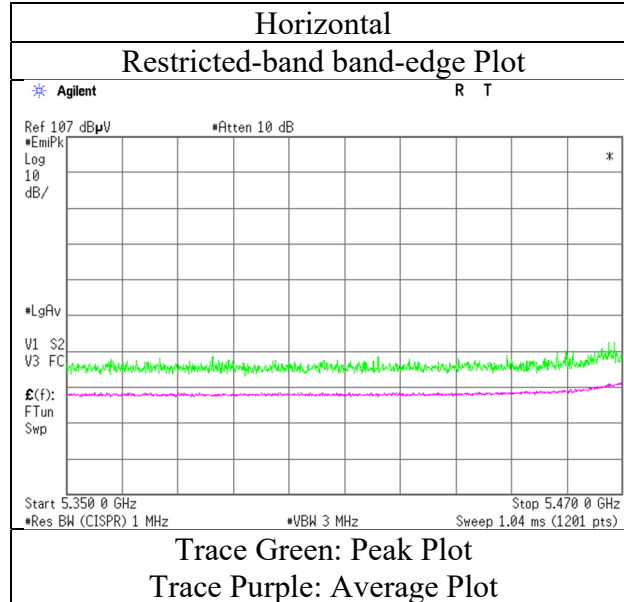
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5510 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5670 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5725.000        | PK       | 47.47          | 32.64           | 17.89     | 39.92     | 2.28                 | 60.36           | -34.87              | -27.0       | 7.8         | 374         | 359          | -      |
| Vert.    | 5725.000        | PK       | 46.39          | 32.64           | 17.89     | 39.92     | 2.28                 | 59.28           | -35.95              | -27.0       | 8.9         | 355         | 292          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3)

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

**UL Japan, Inc.**

**Shonan EMC Lab.**

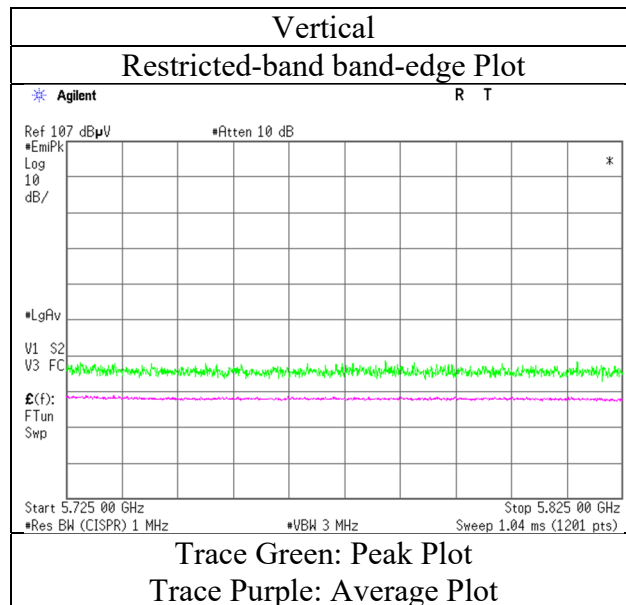
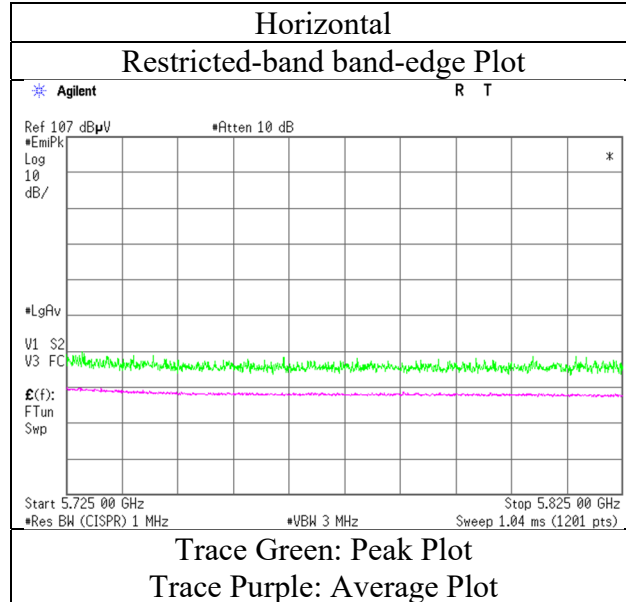
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5670 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5755 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5650.000        | PK       | 45.74          | 32.44           | 17.84     | 39.86     | 2.28                 | 58.44           | -36.79              | -27.0       | 9.7         | 400         | 357          | -      |
| Hori.    | 5700.000        | PK       | 47.15          | 32.56           | 17.87     | 39.90     | 2.28                 | 59.96           | -35.27              | 10.0        | 45.2        | 400         | 357          | -      |
| Hori.    | 5720.000        | PK       | 55.73          | 32.62           | 17.88     | 39.92     | 2.28                 | 68.59           | -26.64              | 15.6        | 42.2        | 400         | 357          | -      |
| Hori.    | 5725.000        | PK       | 53.50          | 32.64           | 17.89     | 39.92     | 2.28                 | 66.39           | -28.84              | 27.0        | 55.8        | 400         | 357          | -      |
| Vert.    | 5650.000        | PK       | 46.84          | 32.44           | 17.84     | 39.86     | 2.28                 | 59.54           | -35.69              | -27.0       | <b>8.6</b>  | 357         | 302          | -      |
| Vert.    | 5700.000        | PK       | 45.04          | 32.56           | 17.87     | 39.90     | 2.28                 | 57.85           | -37.38              | 10.0        | 47.3        | 357         | 302          | -      |
| Vert.    | 5720.000        | PK       | 45.16          | 32.62           | 17.88     | 39.92     | 2.28                 | 58.02           | -37.21              | 15.6        | 52.8        | 357         | 302          | -      |
| Vert.    | 5725.000        | PK       | 45.30          | 32.64           | 17.89     | 39.92     | 2.28                 | 58.19           | -37.04              | 27.0        | 64.0        | 357         | 302          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

**UL Japan, Inc.**

**Shonan EMC Lab.**

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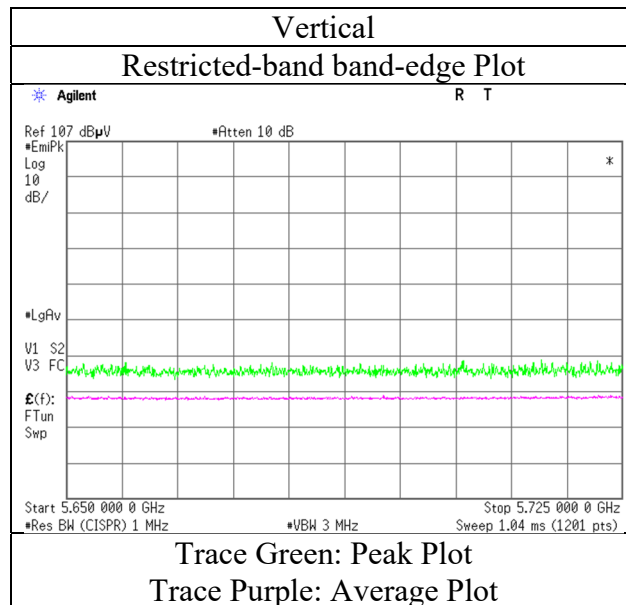
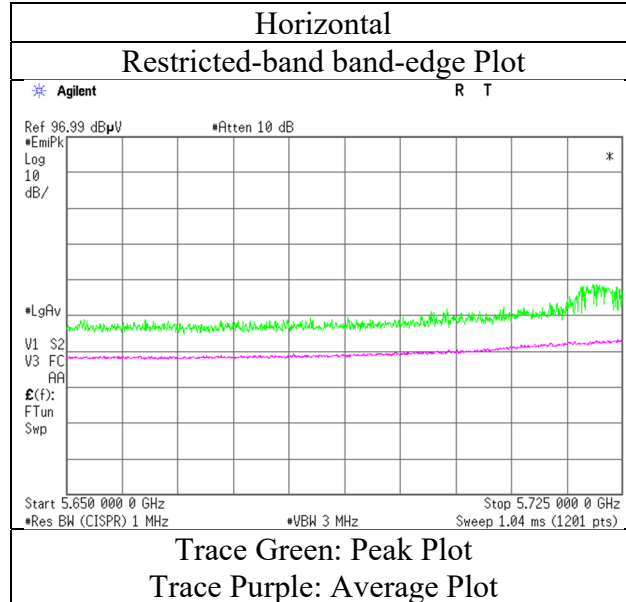
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401



## Radiated Spurious Emission

|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5755 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

Report No. 13554183S-I-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date November 22, 2020  
Temperature / Humidity 24 deg.C, 52 %RH  
Engineer Hiromasa Sato  
( 1 GHz -6.4 GHz )  
Mode Tx 11n-40 5795 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz

### (Calculation) (above 1 GHz Outside of the restricted band)

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5850.000        | PK       | 47.83          | 32.91           | 17.96     | 40.02     | 2.28                 | 60.96           | -34.27              | 27.0        | 61.2        | 359         | 301          | -      |
| Hori.    | 5855.000        | PK       | 45.71          | 32.92           | 17.96     | 40.02     | 2.28                 | 58.85           | -36.38              | 15.6        | 51.9        | 359         | 301          | -      |
| Hori.    | 5875.000        | PK       | 45.04          | 32.95           | 17.99     | 40.04     | 2.28                 | 58.22           | -37.01              | 10.0        | 47.0        | 359         | 301          | -      |
| Hori.    | 5925.000        | PK       | 45.54          | 32.99           | 18.01     | 40.07     | 2.28                 | 58.75           | -36.48              | -27.0       | 9.4         | 359         | 301          | -      |
| Vert.    | 5850.000        | PK       | 45.81          | 32.91           | 17.96     | 40.02     | 2.28                 | 58.94           | -36.29              | 27.0        | 63.2        | 382         | 354          | -      |
| Vert.    | 5855.000        | PK       | 44.83          | 32.92           | 17.96     | 40.02     | 2.28                 | 57.97           | -37.26              | 15.6        | 52.8        | 382         | 354          | -      |
| Vert.    | 5875.000        | PK       | 45.16          | 32.95           | 17.99     | 40.04     | 2.28                 | 58.34           | -36.89              | 10.0        | 46.8        | 382         | 354          | -      |
| Vert.    | 5925.000        | PK       | 45.37          | 32.99           | 18.01     | 40.07     | 2.28                 | 58.58           | -36.65              | -27.0       | 9.6         | 382         | 354          | -      |

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result (EIRP [dBm]) = 10 \* LOG( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3)

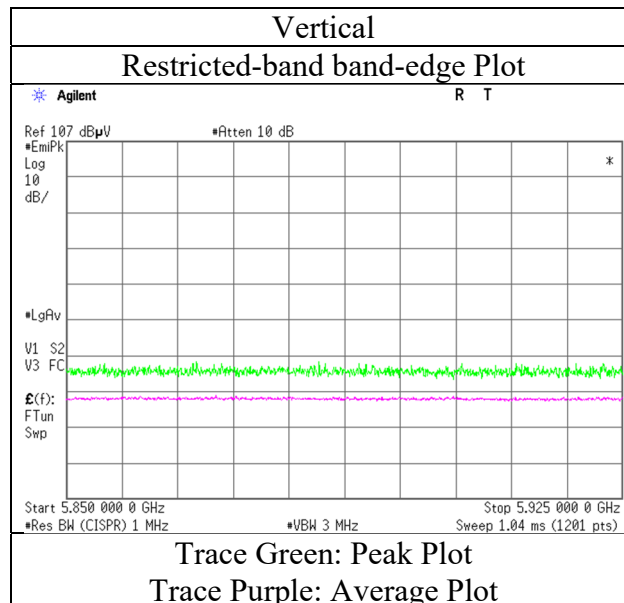
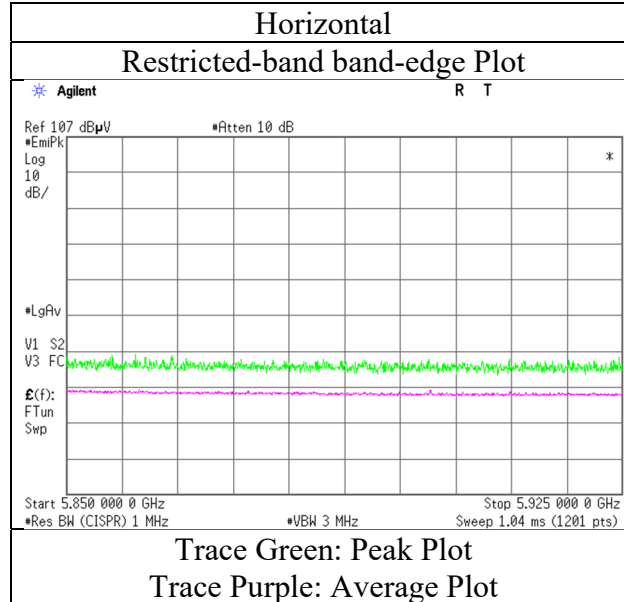
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

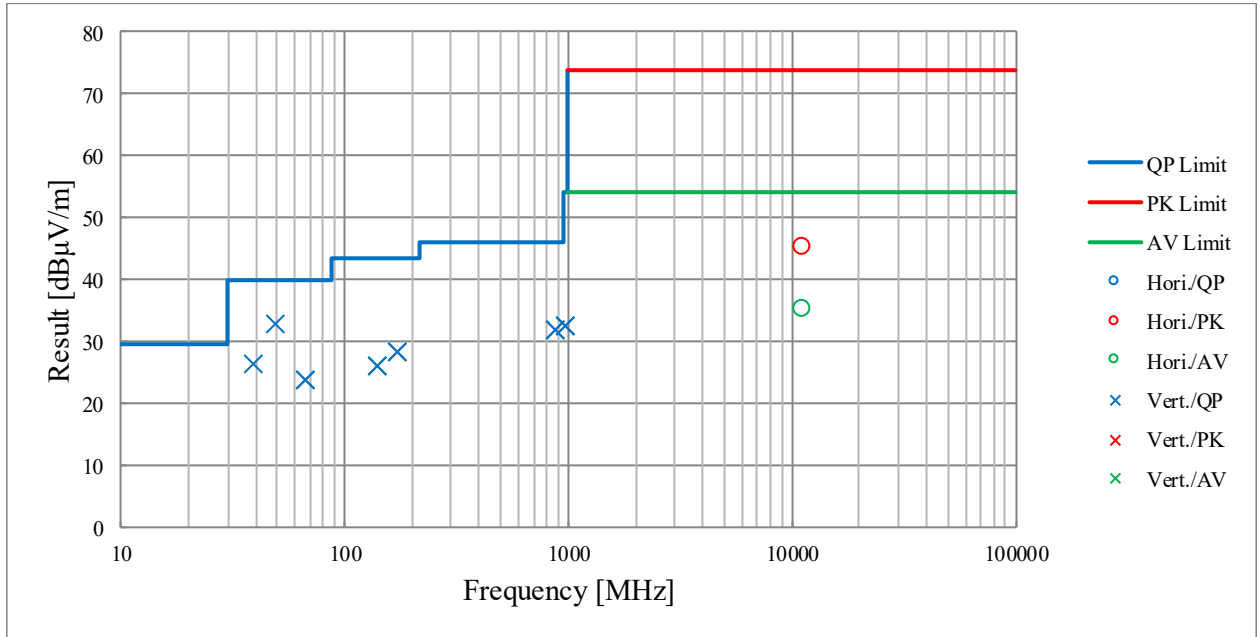
|                        |   |
|------------------------|---|
| Report No.             | 13554183S-I-R1  |
| Test place             | Shonan EMC Lab.   |
| Semi Anechoic Chamber  | 1   |
| Date                   | November 22, 2020   |
| Temperature / Humidity | 24 deg.C, 52 %RH  |
| Engineer               | Hiromasa Sato   |
| Mode                   | Tx 11n-40 5795 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

**Radiated Spurious Emission**  
**(Plot data, Worst case)**

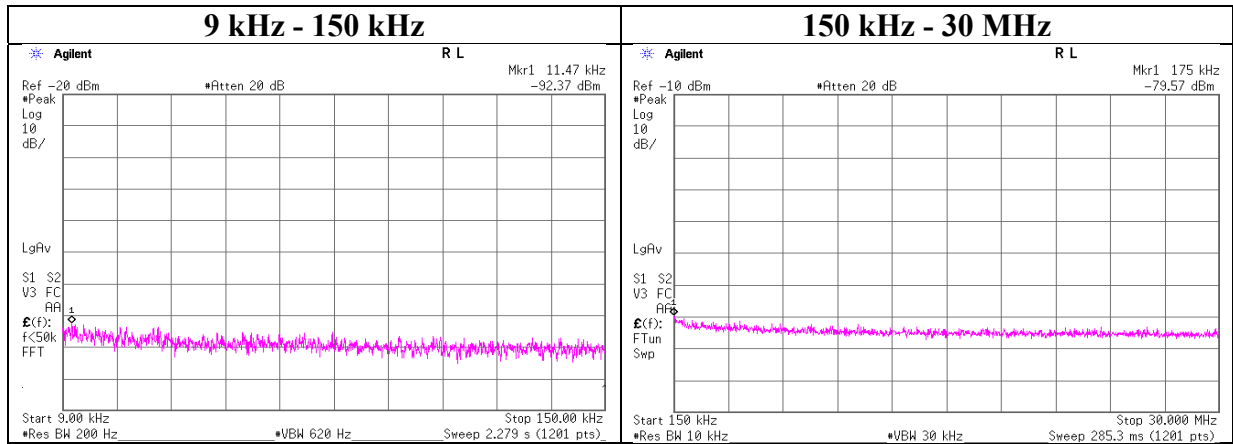
|                        |   |                   |                    |
|------------------------|---|-------------------|--------------------|
| Report No.             | 13554183S-I-R1  |                   |                    |
| Test place             | Shonan EMC Lab.   |                   |                    |
| Semi Anechoic Chamber  | 1   | 1                 | 1                  |
| Date                   | November 27, 2020   | November 25, 2020 | November 26, 2020  |
| Temperature / Humidity | 20 deg.C, 46 %RH  | 20 deg.C, 46 %RH  | 21 deg.C, 48 %RH   |
| Engineer               | Yosuke Murakami   | Yosuke Murakami   | Yosuke Murakami    |
|                        | ( 30 MHz -1 GHz )   | ( 1 GHz -10 GHz ) | ( 10 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5580 MHz with Module A 11n-20 2437 MHz and Module A BT LE 2M 2402 MHz |                   |                    |



\*These plots data contains sufficient number to show the trend of characteristic features for EUT.

## Conducted Spurious Emission

Report No. 13554183S-I-R1  
 Test place Shonan EMC Lab. No.5 Shielded Room  
 Date November 24, 2020  
 Temperature / Humidity 23 deg. C / 50 % RH  
 Engineer Toshinori Yamada  
 Mode Tx 11n-20 5580 MHz



| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain [dBi] | N (Number of Output) | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|-----------------|---------------|-----------------|-----------------|--------------------|----------------------|------------|--------------|--------------------|-----------------------------|----------------|-------------|--------|
| 11.47           | -92.37        | 0.02            | 9.53            | 4.76               | 1                    | -78.1      | 300          | 6.0                | -16.8                       | 46.4           | 63.2        | -      |
| 175.00          | -79.57        | 0.02            | 9.54            | 4.76               | 1                    | -65.3      | 300          | 6.0                | -4.0                        | 22.7           | 26.7        | -      |

$$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log(\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log(N)$$

N: Number of output

## APPENDIX 2: Test instruments

### Test equipment (1/3)

| Test Name | Local ID       | LIMS ID | Description           | Manufacturer                      | Model                  | Serial     | Last Calibration Date | Calibration Interval (Month) |
|-----------|----------------|---------|-----------------------|-----------------------------------|------------------------|------------|-----------------------|------------------------------|
| AT        | KTS-07         | 145111  | Digital Tester        | SANWA                             | PC500                  | 7019232    | 2020/10/21            | 12                           |
| AT        | SAT10-09       | 145132  | Attenuator            | Weinschel Corp.                   | 54A-10                 | W5692      | 2020/10/05            | 12                           |
| AT        | SAT10-16       | 160494  | Attenuator            | Weinschel Corp.                   | 54A-10                 | 83420      | 2019/12/12            | 12                           |
| AT        | SCC-G52        | 179106  | Coaxial Cable         | Junkosha                          | MWX241-01000KMSKMS/B   | 1901Q061-R | 2020/04/01            | 12                           |
| AT        | SCC-G64        | 196945  | Coaxial Cable         | HUBER+SUNER                       | SUCOFLEX 102           | 803414/2   | 2020/03/10            | 12                           |
| AT        | SCC-H21        | 197395  | Microwave cable       | RS Pro                            | R-132G7210 100CO-      |            | 2020/04/07            | 12                           |
| AT        | SCC-H22        | 197396  | Microwave cable       | RS Pro                            | R-132G7210 100CO-      |            | 2020/04/07            | 12                           |
| AT        | SCC-H23        | 199603  | Microwave cable       | RS Pro                            | R-132G7210 100CO-      |            | 2020/06/12            | 12                           |
| AT        | SOS-27         | 191845  | Humidity Indicator    | CUSTOM. Inc                       | CTH-201                | -          | 2020/09/29            | 12                           |
| AT        | SPM-13         | 169910  | Power Meter           | Keysight Technologies Inc         | 8990B                  | MY51000448 | 2020/01/28            | 12                           |
| AT        | SPSS-06        | 169911  | Power sensor          | Keysight Technologies Inc         | N1923A                 | MY57270004 | 2020/01/28            | 12                           |
| AT        | STR-08         | 150463  | Test Receiver         | Rohde & Schwarz                   | ESW44                  | 101581     | 2019/11/22            | 12 *1)                       |
| AT        | SRENT-09       | 150461  | Spectrum Analyzer     | Keysight Technologies Inc         | E4440A                 | MY46186392 | 2020/02/10            | 12                           |
| AT        | STM-G7         | 171614  | Terminator            | Weinschel - API Technologies Corp | M1459A                 | 88995      | 2020/06/03            | 12                           |
| AT        | STM-G8         | 171615  | Terminator            | Weinschel - API Technologies Corp | M1459A                 | 88997      | 2020/06/03            | 12                           |
| AT,RE     | SSA-02         | 145800  | Spectrum Analyzer     | Keysight Technologies Inc         | E4448A                 | MY48250106 | 2020/04/16            | 12                           |
| RE, CE    | COTS-SEMI-5    | 170932  | EMI Software          | TSJ (Techno Science Japan)        | TEPTO-DV3(RE,CE,ME,PE) |            | -                     | -                            |
| RE        | KAT6-04        | 144899  | Attenuator            | Inmet                             | 18N-6dB                | -          | 2019/12/05            | 12                           |
| RE        | KJM-02         | 146432  | Measure               | TAJIMA                            | GL19-55                | -          | -                     | -                            |
| RE, CE    | KJM-09         | 145929  | Measure               | KOMELON                           | KMC-36                 | -          | -                     | -                            |
| RE        | SAEC-01(NSA)   | 145597  | Semi-Anechoic Chamber | TDK                               | SAEC-01(NSA)           | 1          | 2020/04/08            | 12                           |
| RE        | SAEC-01(SVSWR) | 145561  | Semi-Anechoic Chamber | TDK                               | SAEC-01(SVSWR)         | 1          | 2020/05/04            | 12                           |
| RE        | SAEC-03(SVSWR) | 145566  | Semi-Anechoic Chamber | TDK                               | SAEC-03(SVSWR)         | 3          | 2020/05/11            | 12                           |
| RE        | SAF-01         | 145003  | Pre Amplifier         | SONOMA                            | 310N                   | 290211     | 2020/02/19            | 12                           |
| RE        | SAF-04         | 145127  | Pre Amplifier         | Toyo Corporation                  | TPA0118-36             | 2072554    | 2020/06/02            | 12                           |
| RE        | SAF-06         | 145005  | Pre Amplifier         | Toyo Corporation                  | TPA0118-36             | 1440491    | 2020/02/20            | 12                           |
| RE        | SAF-08         | 145007  | Pre Amplifier         | Toyo Corporation                  | HAP18-26W              | 19         | 2020/03/03            | 12                           |
| RE        | SAF-10         | 145129  | Pre Amplifier         | Toyo Corporation                  | HAP26-40W              | 10         | 2020/03/03            | 12                           |
| RE        | SAT10-05       | 145136  | Attenuator            | Keysight Technologies Inc         | 8493C-010              | 74864      | 2020/10/05            | 12                           |
| RE        | SAT10-06       | 145137  | Attenuator            | Keysight Technologies Inc         | 8493C-010              | 74865      | 2020/10/05            | 12                           |
| RE        | SAT3-09        | 144959  | Attenuator            | JFW                               | 50HF-003N              | -          | 2020/08/18            | 12                           |
| RE        | SBA-01         | 145161  | Biconical Antenna     | Schwarzbeck Mess Elektronik       | BBA9106                | 91032664   | 2020/04/04            | 12                           |

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**Test equipment (2/3)**

| Test Name | Local ID                       | LIMS ID | Description               | Manufacturer                                | Model                                | Serial                  | Last Calibration Date | Calibration Interval (Month) |
|-----------|--------------------------------|---------|---------------------------|---|--------------------------------------|-------------------------|-----------------------|------------------------------|
| RE        | SCC-A1/A3/A5/A7/A8/A13/SRSE-01 | 144967  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/NS4906 | -/0901-269(RF Selector) | 2020/04/12            | 12                           |
| RE        | SCC-A2/A4/A6/A7/A8/A13/SRSE-01 | 144968  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/NS4906 | -/0901-269(RF Selector) | 2020/04/12            | 12                           |
| RE        | SCC-G05                        | 145039  | Coaxial Cable             | Junkosha                                    | J12J102207-00                        | APR-30-15-037           | 2020/01/31            | 12                           |
| RE        | SCC-G15                        | 145176  | Coaxial Cable             | Suhner                                      | SUCOFLEX 102                         | 32703/2                 | 2020/03/04            | 12                           |
| RE        | SCC-G40                        | 166491  | Coaxial Cable             | Junkosha                                    | MWX221-01000NFSNMS/B                 | 1612S005                | 2020/01/08            | 12                           |
| RE        | SCC-G41                        | 151617  | Coaxial Cable             | Junkosha                                    | MWX221-01000NFSNMS/B                 | 1612S006                | 2020/01/08            | 12                           |
| RE        | SCC-G43                        | 156380  | Coaxial Cable             | HUBER+SUNER                                 | SUCOFLEX_104_E                       | SN MY 13406/4E          | 2020/06/04            | 12                           |
| RE        | SCC-G57                        | 179540  | Coaxial Cable             | HUBER+SUNER                                 | SUCOFLEX 102                         | 802815/2                | 2020/05/12            | 12                           |
| RE        | SCC-G58                        | 183047  | Coaxial Cable             | HUBER+SUNER                                 | SUCOFLEX 104                         | 800287/4A               | 2020/06/04            | 12                           |
| RE        | SCC-G62                        | 196985  | Coaxial Cable             | HUBER+SUNER                                 | SUCOFLEX 102                         | 803650/2                | 2020/03/10            | 12                           |
| RE        | SCC-G68                        | 200008  | Coaxial Cable             | HUBER+SUNER                                 | SUCOFLEX 104                         | 575616/4                | 2020/07/07            | 12                           |
| RE        | SFL-02                         | 145301  | Highpass Filter           | MICRO-TRONICS                               | HPM50111                             | 51                      | 2020/10/05            | 12                           |
| RE        | SFL-03                         | 145377  | Highpass Filter           | MICRO-TRONICS                               | HPM50112                             | 28                      | 2020/10/05            | 12                           |
| RE        | SHA-01                         | 145383  | Horn Antenna              | Schwarzbeck Mess - Elektronik               | BBHA9120D                            | 9120D-725               | 2020/05/27            | 12                           |
| RE        | SHA-03                         | 145501  | Horn Antenna              | Schwarzbeck Mess - Elektronik               | BBHA9120D                            | 9120D-739               | 2020/06/15            | 12                           |
| RE        | SHA-04                         | 145512  | Horn Antenna              | ETS LINDGREN                                | 3160-09                              | 00094868                | 2020/06/15            | 12                           |
| RE        | SHA-06                         | 145514  | Horn Antenna              | ETS LINDGREN                                | 3160-10                              | 00092383                | 2020/07/16            | 12                           |
| RE        | SHA-08                         | 194683  | Horn Antenna              | Schwarzbeck Mess - Elektronik               | BBHA 9120 C                          | 694                     | 2020/02/17            | 12                           |
| RE        | SLA-05                         | 145527  | Logperiodic Antenna       | Schwarzbeck Mess - Elektronik               | VUSLP9111B                           | 193                     | 2020/04/04            | 12                           |
| RE        | SOS-20                         | 191837  | Humidity Indicator        | CUSTOM. Inc                                 | CTH-201                              | -                       | 2020/09/28            | 12                           |
| RE        | SOS-23                         | 191840  | Humidity Indicator        | CUSTOM. Inc                                 | CTH-201                              | -                       | 2020/09/28            | 12                           |
| RE        | SRENT-15                       | 160899  | Spectrum Analyzer         | Keysight Technologies Inc                   | E4440A                               | MY46185516              | 2020/01/15            | 12                           |
| RE        | SSA-03                         | 145801  | Spectrum Analyzer         | Keysight Technologies Inc                   | E4448A                               | MY48250152              | 2020/08/12            | 12                           |
| RE        | STR-01                         | 145790  | Test Receiver             | Rohde & Schwarz                             | ESU40                                | 100093                  | 2020/04/24            | 12                           |
| RE, CE    | STR-06                         | 146208  | Test Receiver             | Rohde & Schwarz                             | ESCI                                 | 101259                  | 2020/04/01            | 12                           |
| RE, CE    | STS-01                         | 145792  | Digital Hitester          | Hioki                                       | 3805-50                              | 80997812                | 2020/10/19            | 12                           |
| RE        | STS-03                         | 146210  | Digital Hitester          | Hioki                                       | 3805-50                              | 80997823                | 2020/10/19            | 12                           |

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**Test equipment (3/3)**

| Test Name | Local ID            | LIMS ID | Description               | Manufacturer       | Model               | Serial                  | Last Calibration Date | Calibration Interval (Month) |
|-----------|---------------------|---------|---------------------------|--------------------|---------------------|-------------------------|-----------------------|------------------------------|
| CE        | SAT3-13             | 150923  | Attenuator                | JFW                | 50HF-003N           | -                       | 2020/01/30            | 12                           |
| CE        | SCC-A12/A13/SRSE-01 | 144966  | Coaxial Cable&RF Selector | Suhner/Suhner/TOYO | RG223U/141PE/NS4906 | -/0901-269(RF Selector) | 2020/04/12            | 12                           |
| CE        | SLS-02              | 145539  | LISN                      | Rohde & Schwarz    | ENV216              | 100512                  | 2020/02/18            | 12                           |
| CE        | SOS-16              | 167990  | Humidity Indicator        | CUSTOM. Inc        | CTH-202             | 708Q08R                 | 2020/10/01            | 12                           |

\*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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.

The expiration\*1) This test equipment was used for the tests before the expiration date of the calibration. All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

**Test item:**

**AT: Antenna Terminal Conducted test**  
**RE: Radiated Emission**  
**CE: Conducted Emission**