

1 CO-LOCATION

1.1 Transmitter Radiated Unwanted Emissions

1.1.1 Transmitter Radiated Unwanted Emissions Limit

| Restricted Band Emissions Limit | | | | | | | | | | |
|---------------------------------|-----------------------|-------------------------|----------------------|--|--|--|--|--|--|--|
| Frequency Range (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) | | | | | | | |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 | | | | | | | |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 | | | | | | | |
| 1.705~30.0 | 30 | 29 | 30 | | | | | | | |
| 30~88 | 100 | 40 | 3 | | | | | | | |
| 88~216 | 150 | 43.5 | 3 | | | | | | | |
| 216~960 | 200 | 46 | 3 | | | | | | | |
| Above 960 | 500 | 54 | 3 | | | | | | | |

Report No.: FR632202

- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

| Un-restricted Band Emissions Limit | | | | | | |
|------------------------------------|------------|--|--|--|--|--|
| RF output power procedure | Limit (dB) | | | | | |
| Peak output power procedure | 20 | | | | | |
| Average output power procedure | 30 | | | | | |

- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

SPORTON INTERNATIONAL INC. Page No. : 1 of 8
TEL: 886-3-327-3456 Report Version : Rev. 01



1.1.2 Test Procedures

| | | Test Method |
|-------------|---------------------------------|--|
| | perfo equi extra dista | surements may be performed at a distance other than the limit distance provided they are not be ormed in the near field and the emissions to be measured can be detected by the measurement pment. When performing measurements at a distance other than that specified, the results shall be applated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear ance for field-strength measurements, inverse of linear distance-squared for power-density surements). |
| \boxtimes | The | average emission levels shall be measured in [duty cycle ≥ 98 or duty factor]. |
| \boxtimes | For | the transmitter unwanted emissions shall be measured using following options below: |
| | \boxtimes | Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands. |
| | \boxtimes | Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands. |
| | | Refer as FCC KDB 558074, clause 12.2.5.1 and 9.2.1 Option 1 (spectral trace averaging) |
| | | Refer as FCC KDB 558074, clause 12.2.5.2 and 9.2.1 Option 2 (slow sweep speed). |
| | | Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time. |
| | | Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. |
| | | Refer as FCC KDB 558074, clause 12.2.4 and 9.1.1 measurement procedure peak limit. |
| | | Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit. |
| | For | radiated measurement, refer as FCC KDB 558074, clause 12.1. |
| | \boxtimes | Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m. |
| | \boxtimes | Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m. |
| | \boxtimes | Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m. |
| | For | conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2. |
| | | For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs. |
| | | For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB |

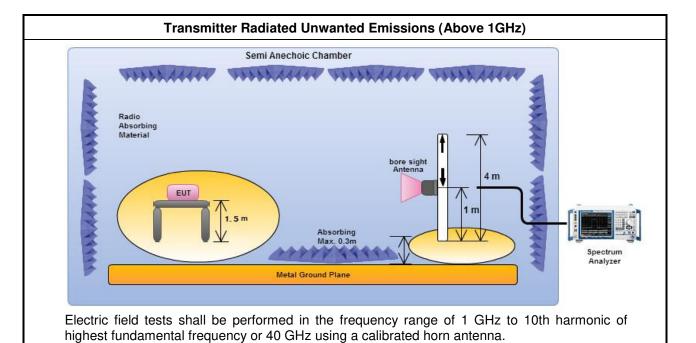
SPORTON INTERNATIONAL INC. Page No. : 2 of 8
TEL: 886-3-327-3456 Report Version : Rev. 01



1.1.3 Test Setup

Semi Anechoic Chamber Radio Absorbing Material Antenna Antenna Antenna Antenna Antenna Metal Ground Plane

Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.



1.1.4 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

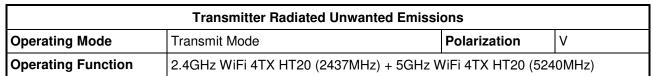
SPORTON INTERNATIONAL INC.

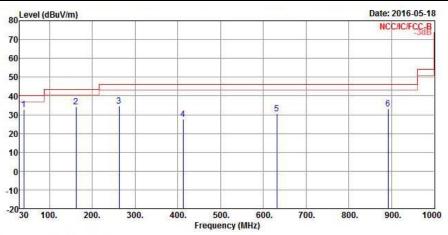
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 3 of 8

Report Version : Rev. 01

Report No.: FR632202

1.1.5 Results of Radiated Emissions (30MHz~1GHz)





| | (122) | 120 | 0ver | 1 50 | | Antenna | | Preamp | |
|---|---------|--------|--------|--------|-------|---------|------|--------|--------|
| | Freq | Level | Limit | Line | revel | Factor | Loss | Factor | Kemark |
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | |
| 1 | 39.700 | 32.72 | -7.28 | 40.00 | 39.66 | 19.69 | 0.90 | 27.53 | Peak |
| 2 | 161.920 | 34.32 | -9.18 | 43.50 | 43.08 | 16.34 | 2.00 | 27.10 | Peak |
| 3 | 262.800 | 34.73 | -11.27 | 46.00 | 39.36 | 19.65 | 2.50 | 26.78 | Peak |
| 4 | 412.180 | 27.68 | -18.32 | 46.00 | 28.73 | 22.50 | 3.28 | 26.83 | Peak |
| 5 | 631.400 | 30.40 | -15.60 | 46.00 | 29.04 | 25.17 | 4.18 | 27.99 | Peak |
| 6 | 891.360 | 33.22 | -12.78 | 46.00 | 28.41 | 27.45 | 4.90 | 27.54 | Peak |

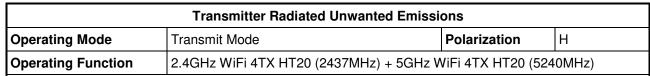
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

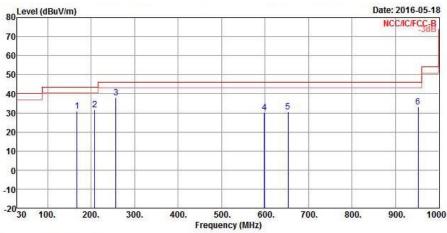
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

SPORTON INTERNATIONAL INC. Page No. : 4 of 8
TEL: 886-3-327-3456 Report Version : Rev. 01

Report No. : FR632202





| | Freq | | | ntenna Factor | | 100000000000000000000000000000000000000 | Remark | | |
|---|---------|--------|--------|------------------|-------|---|--------|-------|------|
| - | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | |
| 1 | 167.740 | 30.81 | -12.69 | 43.50 | 39.78 | 16.06 | 2.04 | 27.07 | Peak |
| 2 | 208.480 | 31.81 | -11.69 | 43.50 | 40.07 | 16.33 | 2.31 | 26.90 | Peak |
| 3 | 256.980 | 38.06 | -7.94 | 46.00 | 42.87 | 19.50 | 2.48 | 26.79 | Peak |
| 3 | 598.420 | 30.19 | -15.81 | 46.00 | 29.32 | 24.83 | 4.06 | 28.02 | Peak |
| 5 | 652.740 | 30.41 | -15.59 | 46.00 | 28.75 | 25.37 | 4.26 | 27.97 | Peak |
| 6 | 951.500 | 33.20 | -12.80 | 46.00 | 27.46 | 27.94 | 5.18 | 27.38 | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

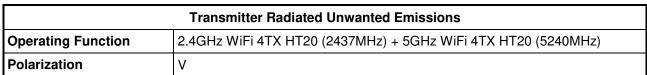
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

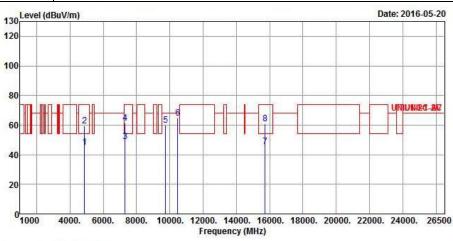
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

SPORTON INTERNATIONAL INC. Page No. : 5 of 8

TEL: 886-3-327-3456 Report Version : Rev. 01

1.1.6 Results for Radiated Emissions (1GHz~10th Harmonic)





| | Freq | Level | Over Limit | Limit Line | | Antenna Factor | | Preamp Factor | Remark |
|---|-----------|--------|---------------|---------------|-------|-------------------|------|------------------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | - |
| 1 | 4874.000 | 45.00 | -9.00 | 54.00 | 37.58 | 33.16 | 6.79 | 32.53 | Average |
| 2 | 4874.000 | 59.30 | -14.70 | 74.00 | 51.88 | 33.16 | 6.79 | 32.53 | Peak |
| 3 | 7311.000 | 48.76 | -5.24 | 54.00 | 37.64 | 36.01 | 7.91 | 32.80 | Average |
| 4 | 7311.000 | 61.48 | -12.52 | 74.00 | 50.36 | 36.01 | 7.91 | 32.80 | Peak |
| 5 | 9748.000 | 60.11 | -8.09 | 68.20 | 46.16 | 38.42 | 8.75 | 33.22 | Peak |
| 6 | 10480.000 | 64.73 | -3.47 | 68.20 | 49.79 | 38.90 | 8.82 | 32.78 | Peak |
| 7 | 15720.000 | 45.80 | -8.20 | 54.00 | 31.28 | 37.45 | 9.46 | 32.39 | Average |
| 8 | 15720.000 | 61.13 | -12.87 | 74.00 | 46.61 | 37.45 | 9.46 | 32.39 | Peak |

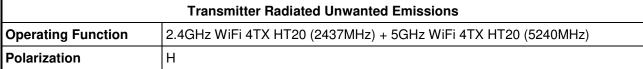
- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 30 dB relative to the maximum measured in-band level.

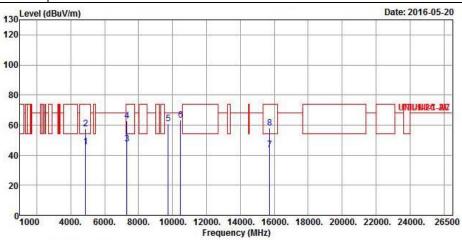
SPORTON INTERNATIONAL INC. Page No. : 6 of 8

TEL: 886-3-327-3456 Report Version : Rev. 01

FCC Test Report

Report No.: FR632202





| | Freq | Level | Over Limit | Limit Line | | Antenna Factor | | Preamp Factor | Remark |
|---|-----------|--------|---------------|---------------|-------|-------------------|------|------------------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | |
| 1 | 4874.000 | 45.62 | -8.38 | 54.00 | 38.20 | 33.16 | 6.79 | 32.53 | Average |
| 2 | 4874.000 | 57.59 | -16.41 | 74.00 | 50.17 | 33.16 | 6.79 | 32.53 | Peak |
| 3 | 7311.000 | 47.61 | -6.39 | 54.00 | 36.49 | 36.01 | 7.91 | 32.80 | Average |
| 4 | 7311.000 | 62.90 | -11.10 | 74.00 | 51.78 | 36.01 | 7.91 | 32.80 | Peak |
| 5 | 9748.000 | 61.08 | -7.12 | 68.20 | 47.13 | 38.42 | 8.75 | 33.22 | Peak |
| 6 | 10480.000 | 63.28 | -4.92 | 68.20 | 48.34 | 38.90 | 8.82 | 32.78 | Peak |
| 7 | 15720.000 | 43.79 | -10.21 | 54.00 | 29.27 | 37.45 | 9.46 | 32.39 | Average |
| 8 | 15720.000 | 57.87 | -16.13 | 74.00 | 43.35 | 37.45 | 9.46 | 32.39 | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 30 dB relative to the maximum measured in-band level.

SPORTON INTERNATIONAL INC. Page No. : 7 of 8 Report Version TEL: 886-3-327-3456 : Rev. 01



2 TEST EQUIPMENT AND CALIBRATION DATA

< Radiated Emission >

| Instrument | Manufacturer | Model No. Serial No | | Characteristics | Calibration Last Cal. | Calibration Due Date |
|--------------------------------|-------------------|---------------------|-------------|--------------------|--------------------------|-------------------------|
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 30MHz ~ 1GHz 3m | Nov. 28, 2015 | Nov. 27, 2016 |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 1GHz ~ 18GHz 3m | Dec. 16, 2015 | Dec. 15, 2016 |
| Amplifier | Amplifier HP | | 2944A08033 | 10kHz ~ 1.3GHz | May 10, 2016 | May 09, 2017 |
| Amplifier | Agilent | 8449B | 3008A02120 | 1GHz ~ 26.5GHz | Sep. 02, 2015 | Sep. 01, 2016 |
| Spectrum | R&S | FSV40 | 101513 | 9kHz ~ 40GHz | Feb. 16, 2016 | Feb. 15, 2017 |
| Bilog Antenna | SCHAFFNER | CBL 6112D | 22237 | 30MHz ~ 1GHz | Sep. 18, 2015 | Sep. 17, 2016 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 1531 | 1GHz ~ 18GHz | Apr. 22, 2016 | Apr. 21, 2017 |
| Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170154 | 18GHz ~ 40GHz | Jan. 29, 2016 | Jan. 28, 2017 |

SPORTON INTERNATIONAL INC. Page No. : 8 of 8
TEL: 886-3-327-3456 Report Version : Rev. 01