



FCC Test Report

Equipment : 7" Rugged Tablet Computer
Brand Name : AAEON
Model No. : **xxxRTC-700C-TAy-WBGzxx-xxxx**
1. xxx=TF-(TF: Toxic Free) or blank
2. y is for Touch version , ex: A=rev1, y:A~Z
3. z is blank or H, blank means without 3G
function; H means with 3G function
4. xxx is for marketing purpose
5. xxxx=SW revision, ex: 1110=rev1, x:0~9
FCC ID : OHBRTC700CWBGB
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Applicant : AAEON Technology Inc.
Manufacturer : 5F, No. 135, Lane 235, Pao Chiao Rd.,
Hsin-Tien Dist., New Taipei City,
Taiwan, R.O.C

The product sample received on Jul. 13, 2014 and completely tested on Aug. 07, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:


Wayne Hsu / Assistant Manager



Testing Laboratory
1190



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APPENDIX A. TEST PHOTOS

APPENDIX B. PHOTOGRAPHS OF EUT



Summary of Test Result

| Conformance Test Specifications | | | | | |
|---------------------------------|------------------|---|---|--|----------|
| Report Clause | Ref. Std. Clause | Description | Measured | Limit | Result |
| 1.1.2 | 15.203 | Antenna Requirement | Antenna connector mechanism complied | FCC 15.203 | Complied |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | [dBuV]: 0.2575110MHz 35.61 (Margin 15.90dB) - AV 42.86 (Margin 18.65dB) - QP | FCC 15.207 | Complied |
| 3.2 | 15.247(a) | 6dB Bandwidth | LE: 703.3000 kHz | \geq 500kHz | Complied |
| 3.3 | 15.247(b) | RF Output Power (Maximum Peak Conducted Output Power) | Power [dBm] LE: 7.42 | Power [dBm] LE:30 | Complied |
| 3.4 | 15.247(e) | Power Spectral Density | PSD [dBm/100kHz] LE: -12.18 | PSD [dBm/3kHz]: 8 | Complied |
| 3.5 | 15.247(d) | Transmitter Bandedge Emissions | Restricted Bands [dBuV/m at 3m]: 2483.50MHz 60.13 (Margin 13.87dB) - PK 49.66 (Margin 4.34dB) - AV | Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209 | Complied |
| 3.6 | 15.247(d) | Transmitter Unwanted Emissions | Restricted Bands [dBuV/m at 3m]: 4804.00MHz 60.08 (Margin 13.92dB) – PK 45.97 (Margin 8.03dB) - AV | Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209 | Complied |



Revision History



1 General Description

1.1 Information

1.1.1 RF General Information

| RF General Information | | | | |
|------------------------|-------------------|---------------------|----------------|-----------------------|
| Frequency Range (MHz) | Bluetooth Version | Ch. Frequency (MHz) | Channel Number | RF Output Power (dBm) |
| 2400-2483.5 | v4.0 LE | 2402-2480 | 0-39 [40] | 7.42 |

Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.
Note 2: RF output power specifies that Maximum Peak Conducted Output Power.

1.1.2 Antenna Information

| Antenna Category | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Integral antenna (antenna permanently attached) |
| <input checked="" type="checkbox"/> | Temporary RF connector provided |
| <input type="checkbox"/> | No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |

| Antenna General Information | | | |
|-----------------------------|-----------|-----------|------------|
| No. | Ant. Cat. | Ant. Type | Gain (dBi) |
| 1 | Integral | PIFA | 3.00 |



1.1.3 Type of EUT

| Identify EUT | |
|--|---|
| EUT Serial Number | N/A |
| Presentation of Equipment | <input checked="" type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype |
| Type of EUT | |
| <input checked="" type="checkbox"/> Stand-alone | |
| <input type="checkbox"/> Combined (EUT where the radio part is fully integrated within another device) Combined Equipment – Brand Name / Model No.: ... | |
| <input type="checkbox"/> Plug-in radio (EUT intended for a variety of host systems) Host System – Brand Name / Model No.: ... | |
| <input type="checkbox"/> Other: | |

1.1.4 Test Signal Duty Cycle

| Operated Mode for Worst Duty Cycle | |
|---|--|
| <input checked="" type="checkbox"/> Operated test mode for worst duty cycle | |
| Test Signal Duty Cycle (x) | Power Duty Factor [dB] – (10 log 1/x) |
| <input checked="" type="checkbox"/> 72.10% - test mode single channel – LE | 1.42 |

1.1.5 EUT Operational Condition

| | | | |
|-------------------|--|--|---|
| Supply Voltage | <input checked="" type="checkbox"/> AC mains | <input checked="" type="checkbox"/> DC | <input type="checkbox"/> System |
| Type of DC Source | <input type="checkbox"/> Internal DC supply | <input checked="" type="checkbox"/> From adapter | <input checked="" type="checkbox"/> Battery |



1.2 Accessories And Support Equipment

| Accessories | | | | |
|-------------|----------------|---|------------|-------------|
| AC Adapter | Brand Name | LTE | Model Name | LTE24E-S2-2 |
| | Power Rating | I/P: 100-240V---1A ; O/P: 12V---2A | | |
| | DC Power Cable | 1.8 meter, non-shielded cable, without ferrite core | | |
| Battery | Brand Name | JHT | Model Name | J1067 |
| | Power Rating | 7.4 Vdc, 3700 mAh | Type | Li-ion |
| LCD Panel | Brand Name | CHIMEI | Model Name | N070ICG-LD1 |

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2009
- FCC KDB 558074 D01v03r02

1.4 Testing Location Information

| Testing Location | | | | |
|-------------------|--------|--|----------------------|----------------------|
| | HWA YA | ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. | TEL : 886-3-327-3456 | FAX : 886-3-327-0973 |
| Test Condition | | Test Site No. | Test Engineer | Test Environment |
| AC Conduction | | CO04-HY | Zeus | 25°C / 46% |
| RF Conducted | | TH06-HY | Howard | 21°C / 62% |
| Radiated Emission | | 03CH02-HY | Hunter | 24.6°C / 60% |



1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

| Measurement Uncertainty | | |
|-----------------------------------|---------------|---------|
| Test Item | Uncertainty | |
| AC power-line conducted emissions | ±2.2 dB | |
| Emission bandwidth, 6dB bandwidth | ±1.4 % | |
| RF output power, conducted | ±0.6 dB | |
| Power density, conducted | ±0.8 dB | |
| Unwanted emissions, conducted | 30 – 1000 MHz | ±0.5 dB |
| | 1 – 18 GHz | ±0.6 dB |
| | 18 – 40 GHz | ±0.8 dB |
| | 40 – 200 GHz | N/A |
| All emissions, radiated | 30 – 1000 MHz | ±2.5 dB |
| | 1 – 18 GHz | ±3.5 dB |
| | 18 – 40 GHz | ±3.8 dB |
| | 40 – 200 GHz | N/A |
| Temperature | ±0.8 °C | |
| Humidity | ±3 % | |
| DC and low frequency voltages | ±3 % | |
| Time | ±1.4 % | |
| Duty Cycle | ±1.4 % | |



2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

| Worst Modulation Used for Conformance Testing | | | |
|---|------------------------------|-----------|-----------------|
| Bluetooth Version | Transmit Chains (N_{TX}) | Data Rate | Modulation Mode |
| LE | 1 | 1 Mbps | LE-1Mbps |

Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.
Note 2: Modulation modes consist below configuration:
DSSS LE-1Mbps: GFSK (1Mbps)

2.2 The Worst Case Power Setting Parameter

| The Worst Case Power Setting Parameter | | | |
|--|-------------|----------|----------|
| Test Software Version | DOS Command | | |
| Modulation Mode | 2402 MHz | 2440 MHz | 2480 MHz |
| LE,1Mbps | Default | Default | Default |



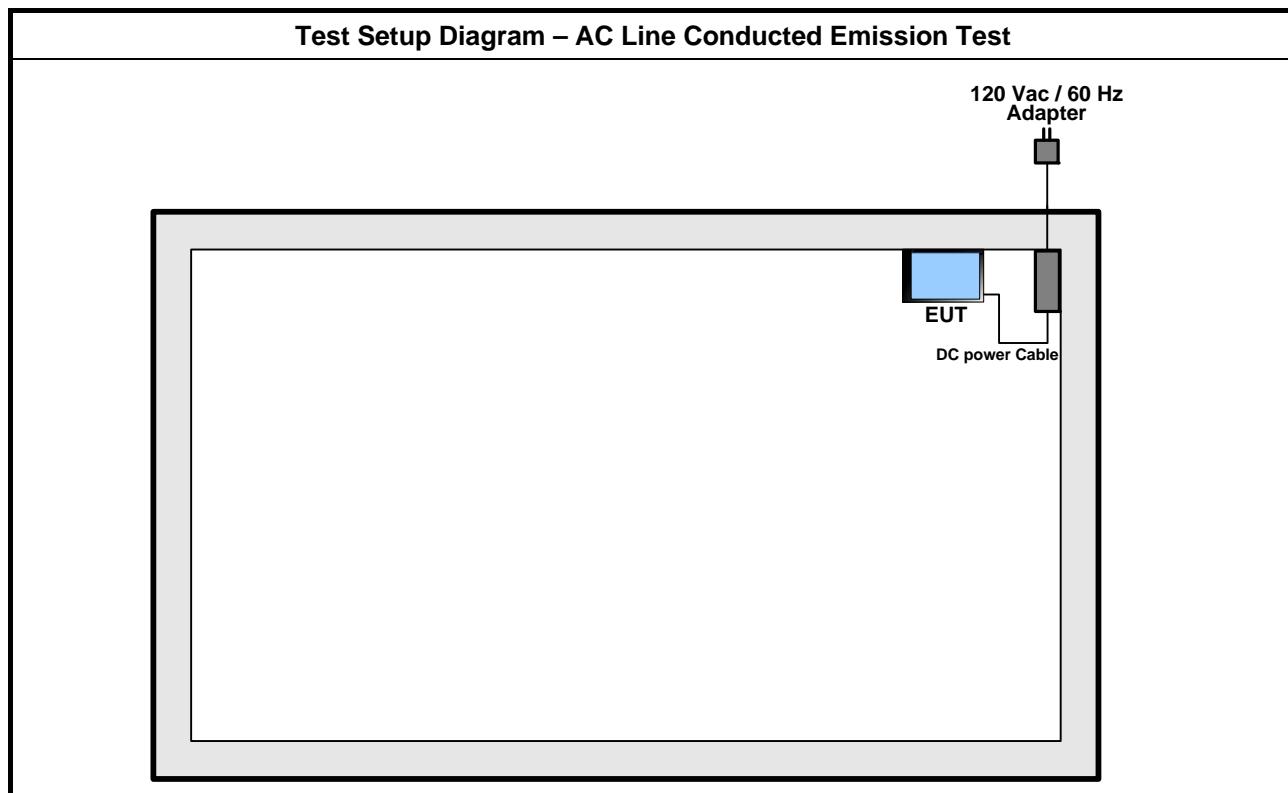
2.3 The Worst Case Measurement Configuration

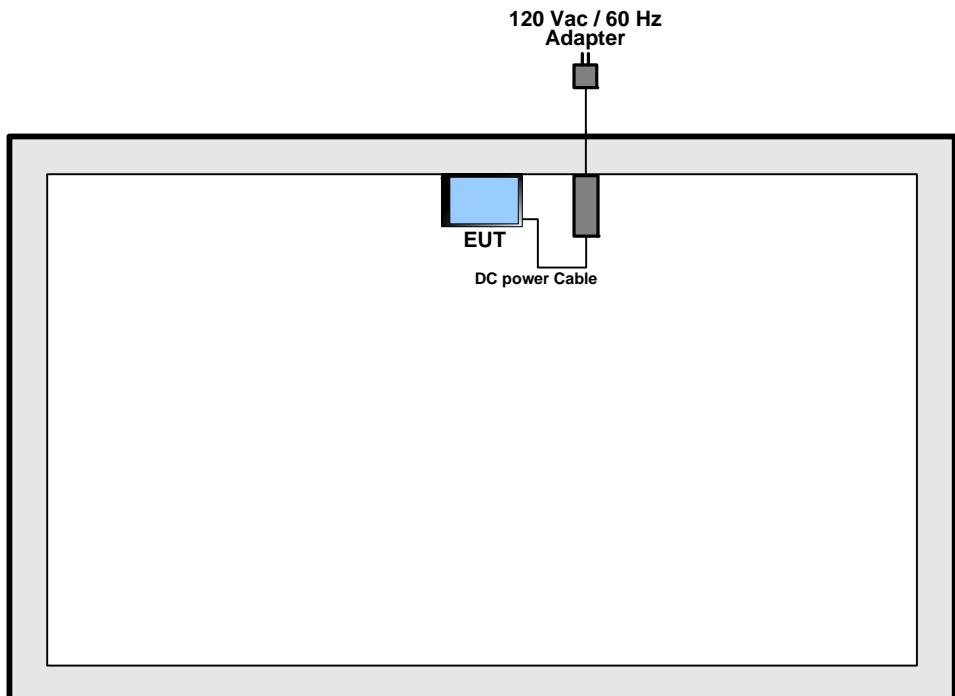
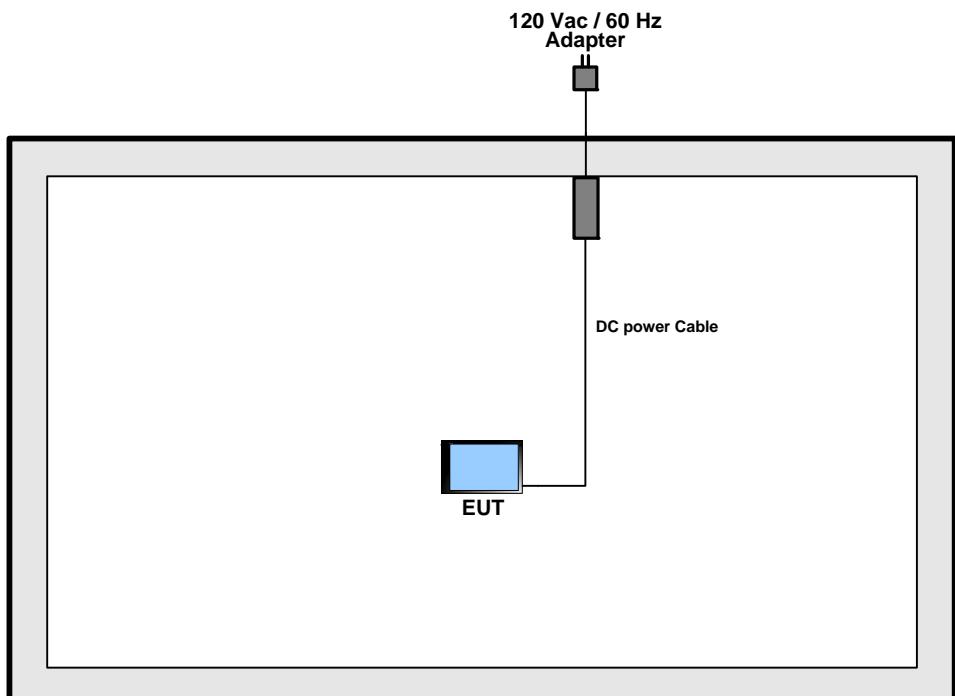
| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | AC power-line conducted emissions |
| Condition | AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz |
| Operating Mode | Operating Mode Description |
| 1 | EUT with adapter & transmitting |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | RF Output Power, Power Spectral Density, 6 dB Bandwidth |
| Test Condition | Conducted measurement at transmit chains |
| Modulation Mode | LE-1Mbps |

| The Worst Case Mode for Following Conformance Tests | | | | | | | |
|---|--|---------|---------|---------|--|--|--|
| Tests Item | Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions | | | | | | |
| Test Condition | Radiated measurement | | | | | | |
| User Position | <input type="checkbox"/> EUT will be placed in fixed position. <input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. <input checked="" type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes. The worst plane is X. | | | | | | |
| Operating Mode | Operating Mode Description | | | | | | |
| 1 | EUT with adapter & transmitting | | | | | | |
| Modulation Mode | LE-1Mbps | | | | | | |
| Orthogonal Planes of EUT | <table><thead><tr><th>X Plane</th><th>Y Plane</th><th>Z Plane</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table> | X Plane | Y Plane | Z Plane | | | |
| X Plane | Y Plane | Z Plane | | | | | |
| | | | | | | | |

2.4 Test Setup Diagram



Test Setup Diagram - Radiated Test (Below 1GHz)**Test Setup Diagram - Radiated Test (Above 1GHz)**

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit | | |
|---|------------|-----------|
| Frequency Emission (MHz) | Quasi-Peak | Average |
| 0.15-0.5 | 66 - 56 * | 56 - 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Note 1: * Decreases with the logarithm of the frequency.

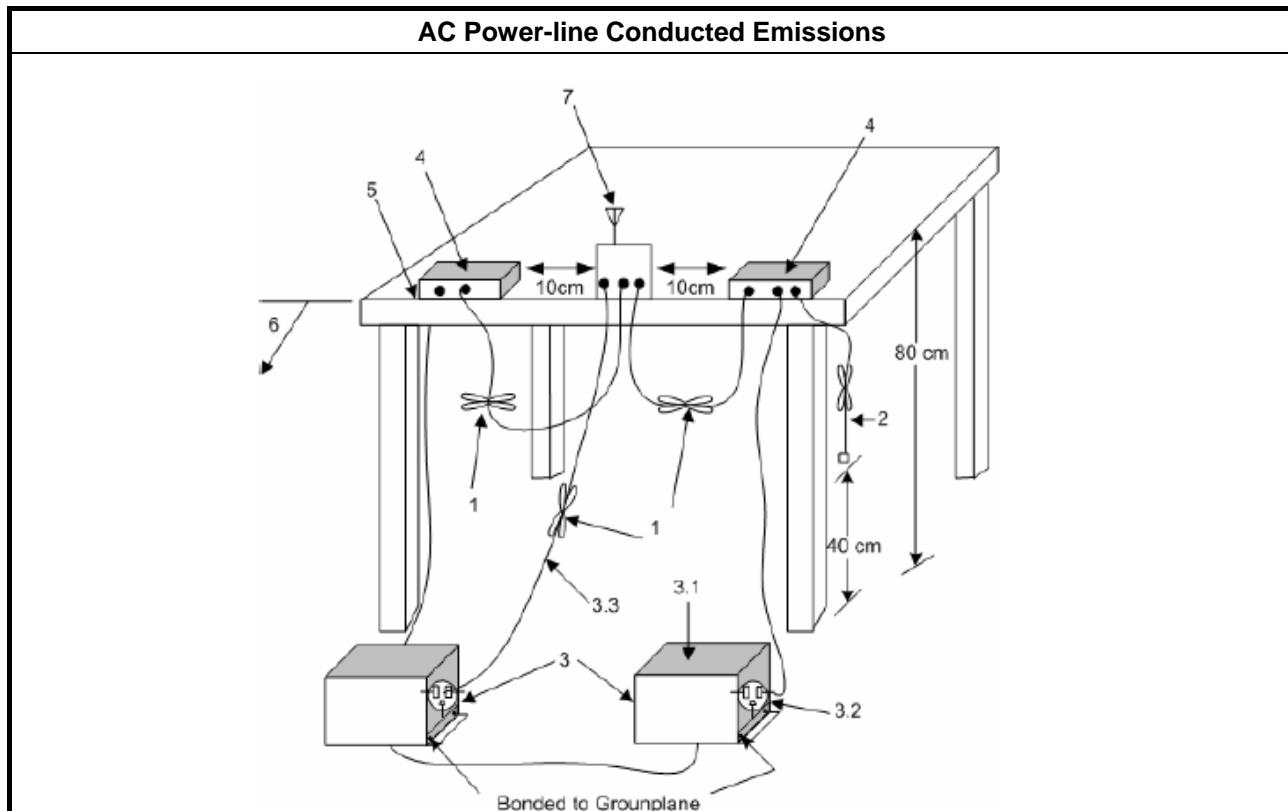
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

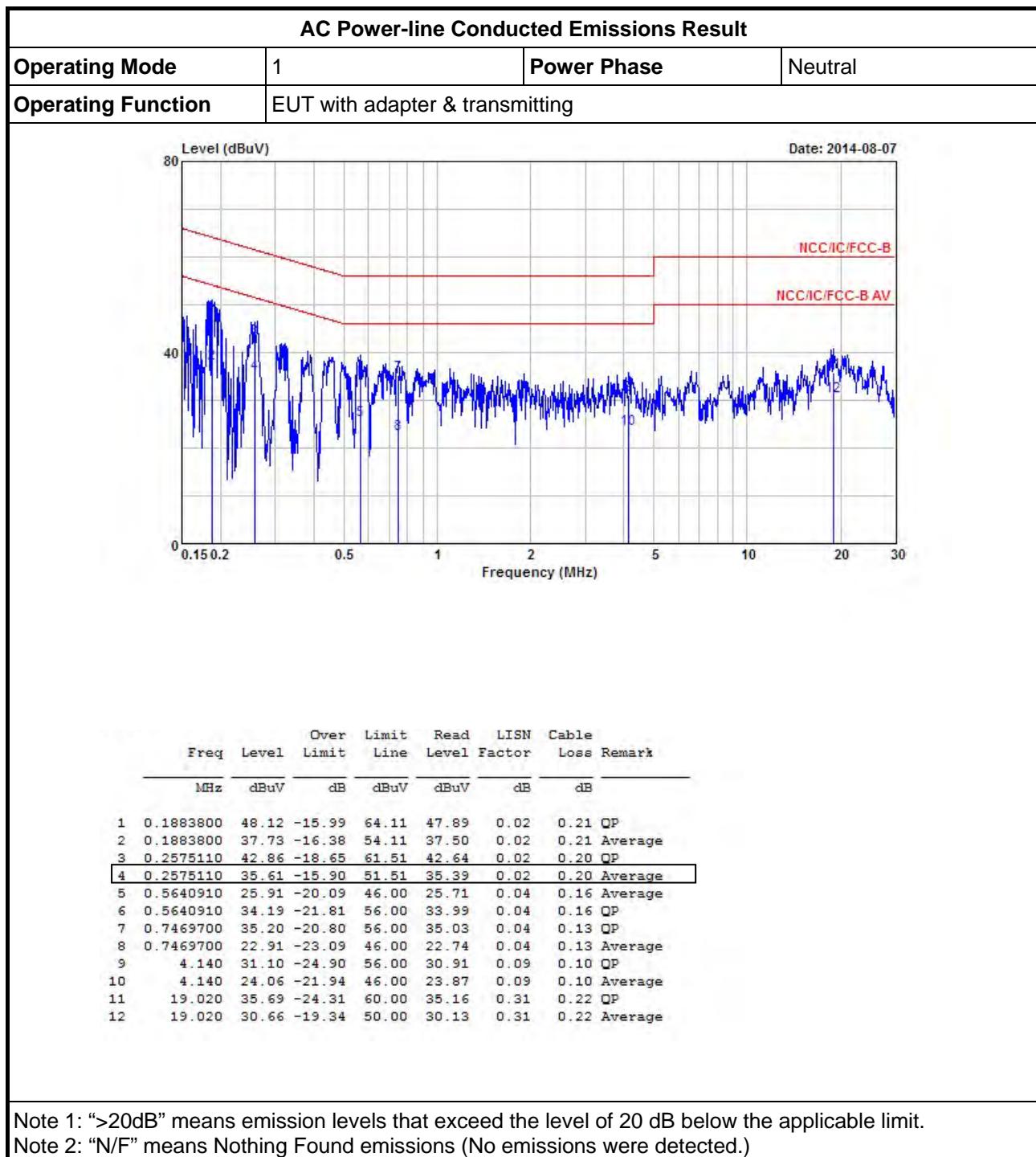
| Test Method |
|--|
| <input checked="" type="checkbox"/> Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions. |

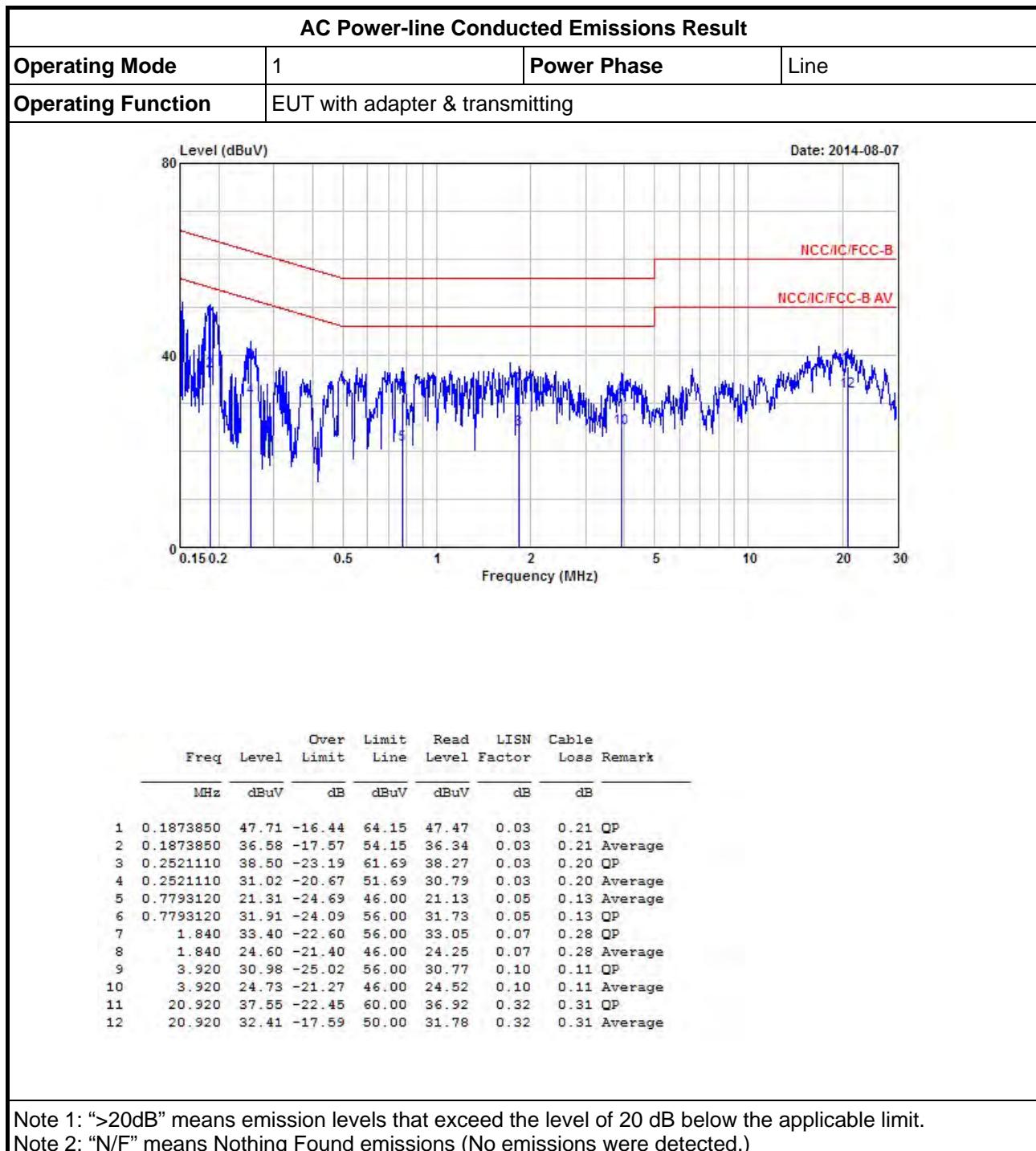
3.1.4 Test Setup





3.1.5 Test Result of AC Power-line Conducted Emissions





3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

| 6dB Bandwidth Limit |
|--|
| Systems using digital modulation techniques: |
| <input checked="" type="checkbox"/> 6 dB bandwidth \geq 500 kHz. |

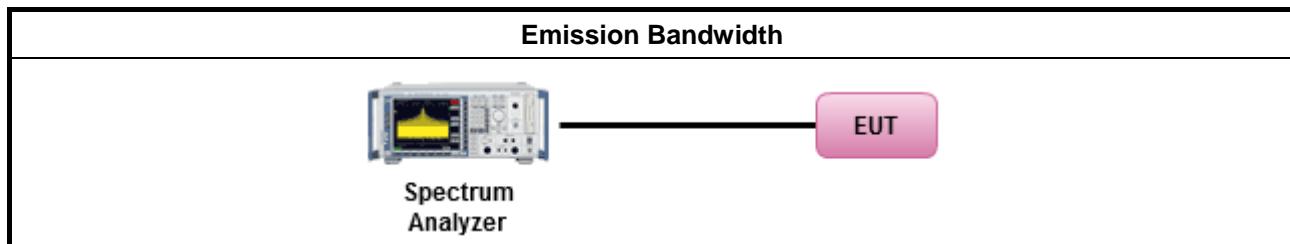
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

| Test Method |
|---|
| <input checked="" type="checkbox"/> For the emission bandwidth shall be measured using one of the options below: |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement. |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement. |
| <input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing. |
| <input checked="" type="checkbox"/> For conducted measurement. |
| <input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

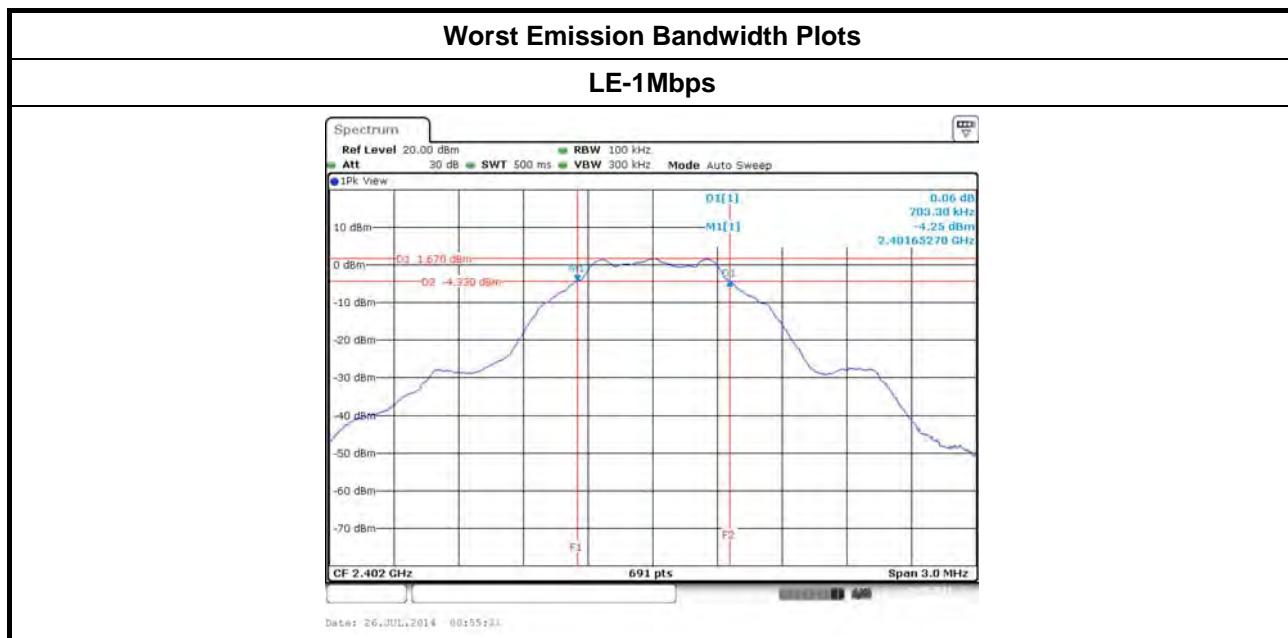
3.2.4 Test Setup





3.2.5 Test Result of Emission Bandwidth

| Emission Bandwidth Result | | | |
|---------------------------|-------------|---------------------|---------------------|
| Modulation Mode | Freq. (MHz) | 99% Bandwidth (kHz) | 6dB Bandwidth (kHz) |
| LE-1Mbps | 2402 | 1072.3589 | 703.3000 |
| LE-1Mbps | 2440 | 1072.3589 | 703.3000 |
| LE-1Mbps | 2480 | 1076.7004 | 703.3000 |
| Limit | | N/A | ≥500 kHz |
| Result | | Complied | |



3.3 RF Output Power

3.3.1 RF Output Power Limit

| RF Output Power Limit for Digital Modulation Systems | |
|--|---|
| Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit | |
| <input checked="" type="checkbox"/> 2400-2483.5 MHz Band: | |
| | <input checked="" type="checkbox"/> If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W) |
| | <input type="checkbox"/> Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm |
| e.i.r.p. Power Limit: | |
| <input checked="" type="checkbox"/> 2400-2483.5 MHz Band | |
| | <input checked="" type="checkbox"/> Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W) |
| P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm. | |

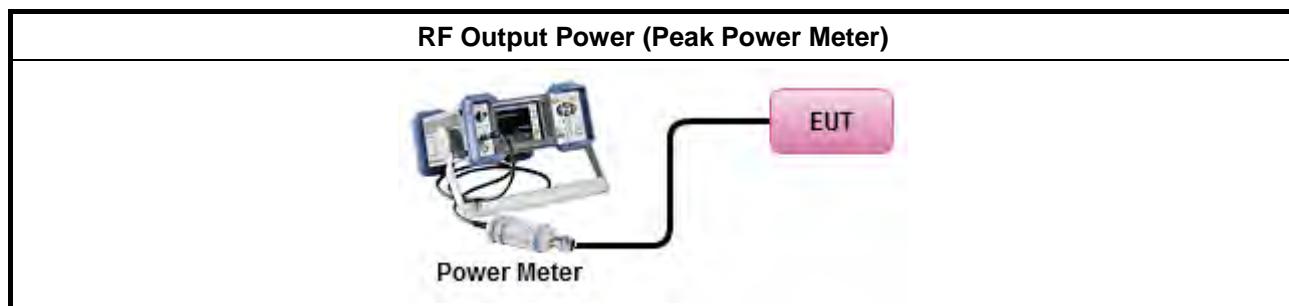
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

| Test Method | |
|---|---|
| <input checked="" type="checkbox"/> Maximum Peak Conducted Output Power | |
| | <input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter. |
| | <input type="checkbox"/> Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW \geq EBW). |
| <input checked="" type="checkbox"/> For conducted measurement. | |
| | <input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain. |
| | <input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

3.3.4 Test Setup





3.3.5 Test Result of Maximum Peak Conducted Output Power

| Maximum Peak Conducted Output Power Result | | | | | | |
|--|-------------|-----------------------|-------------|--------------------|------------|------------|
| Condition | | RF Output Power (dBm) | | | | |
| Modulation Mode | Freq. (MHz) | RF Output Power | Power Limit | Antenna Gain (dBi) | EIRP Power | EIRP Limit |
| LE-1Mbps | 2402 | 6.46 | 30 | 3.00 | 9.46 | 36 |
| LE-1Mbps | 2440 | 7.42 | 30 | 3.00 | 10.42 | 36 |
| LE-1Mbps | 2480 | 6.43 | 30 | 3.00 | 9.43 | 36 |
| Result | | Complied | | | | |

3.3.6 Test Result of Maximum Average Conducted Output Power

| Maximum Average Conducted Output Power Result | | | | | | |
|---|-------------|-----------------------|------------------|-----------------|--------------------|------------|
| Condition | | RF Output Power (dBm) | | | | |
| Modulation Mode | Freq. (MHz) | Average Power | Duty Factor (dB) | RF Output Power | Antenna Gain (dBi) | EIRP Power |
| LE-1Mbps | 2402 | 4.31 | 1.42 | 5.73 | 3.00 | 8.73 |
| LE-1Mbps | 2440 | 5.23 | 1.42 | 6.65 | 3.00 | 9.65 |
| LE-1Mbps | 2480 | 4.28 | 1.42 | 5.70 | 3.00 | 8.70 |
| Result | | Complied | | | | |

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

| Power Spectral Density Limit |
|--|
| <input checked="" type="checkbox"/> Power Spectral Density (PSD) $\leq 8 \text{ dBm/3kHz}$ |

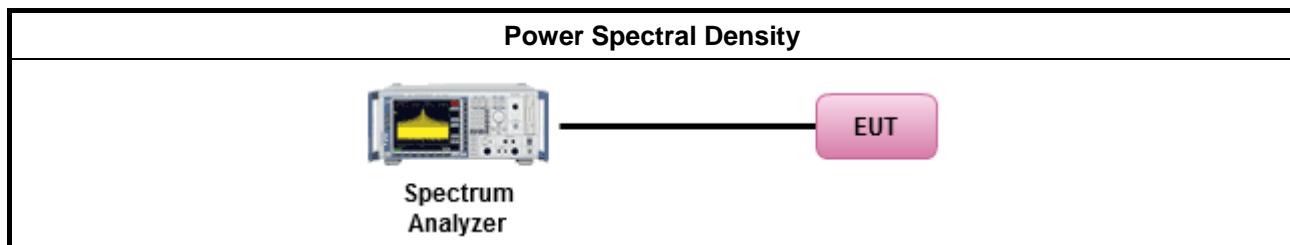
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

| Test Method |
|--|
| <input checked="" type="checkbox"/> Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option). |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz;detector=peak).. [duty cycle $\geq 98\%$ or external video / power trigger] |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 10.3 Method AVGPSD-1 (spectral trace averaging). |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 10.4 Method AVGPSD-1 Alt. (slow sweep speed) |
| duty cycle $< 98\%$ and average over on/off periods with duty factor |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 10.5 Method AVGPSD-2 (spectral trace averaging). |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed) |
| <input checked="" type="checkbox"/> For conducted measurement. |
| <input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

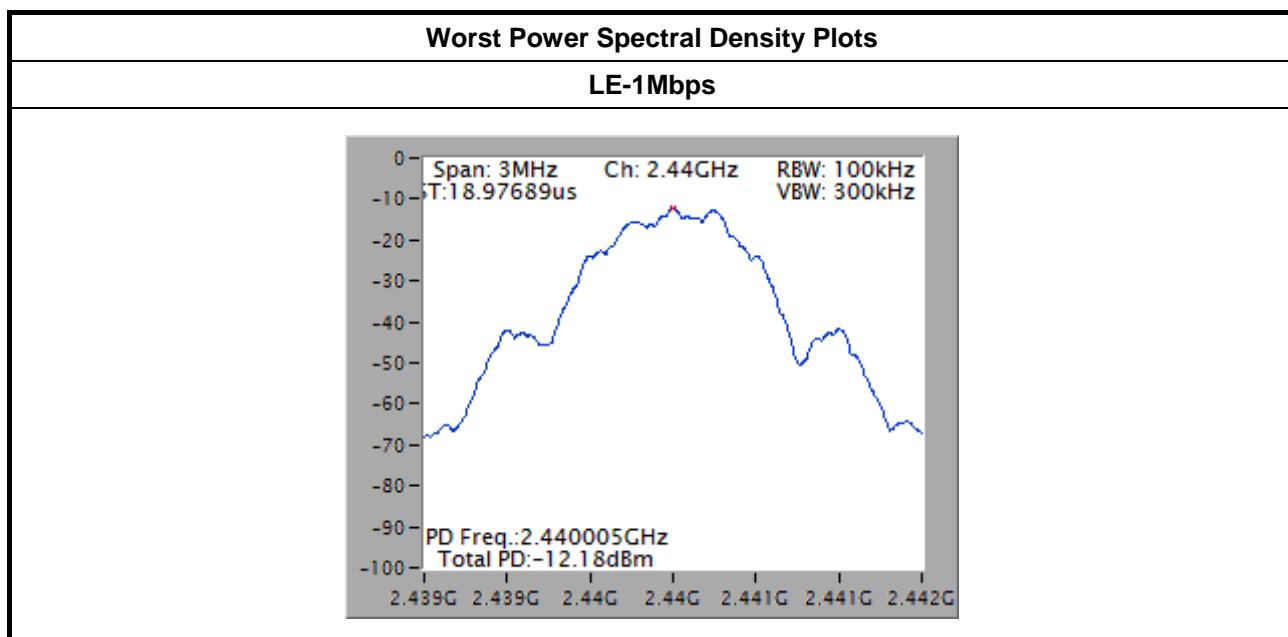
3.4.4 Test Setup





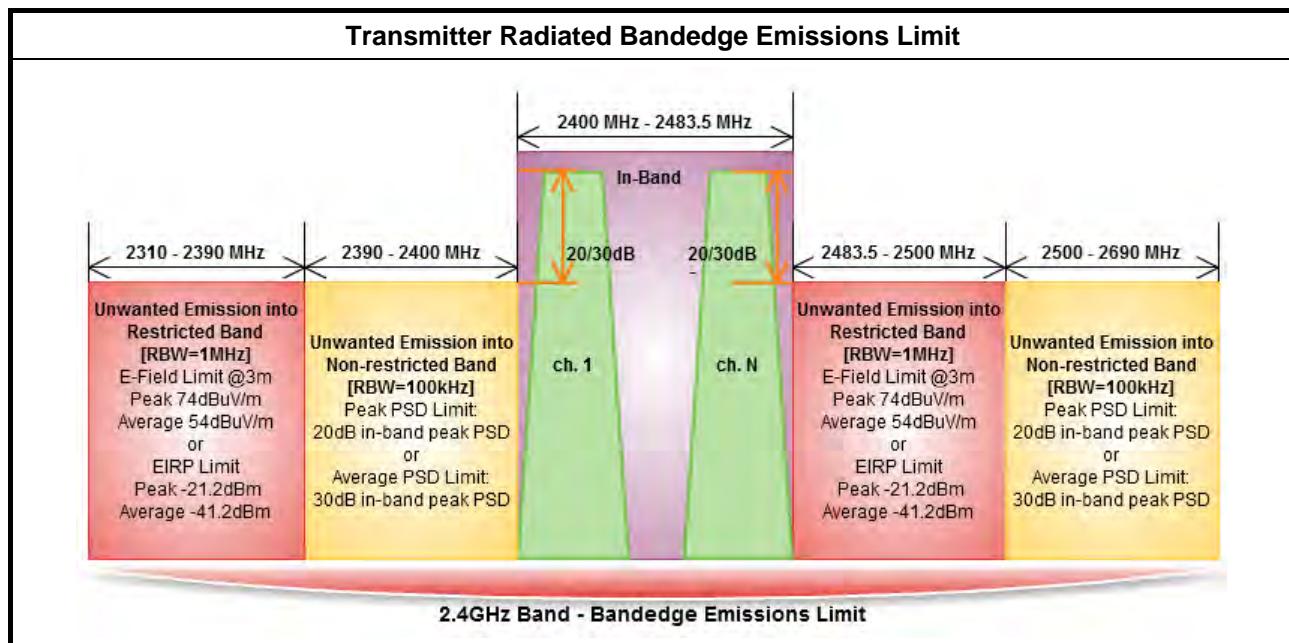
3.4.5 Test Result of Power Spectral Density

| Power Spectral Density Result | | | |
|-------------------------------|-------------|------------------|----------------------|
| Modulation Mode | Freq. (MHz) | PSD (dBm/100kHz) | PSD Limit (dBm/3kHz) |
| LE-1Mbps | 2402 | -14.33 | 8 |
| LE-1Mbps | 2440 | -12.18 | 8 |
| LE-1Mbps | 2480 | -13.37 | 8 |
| Result | | Complied | |



3.5 Transmitter Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



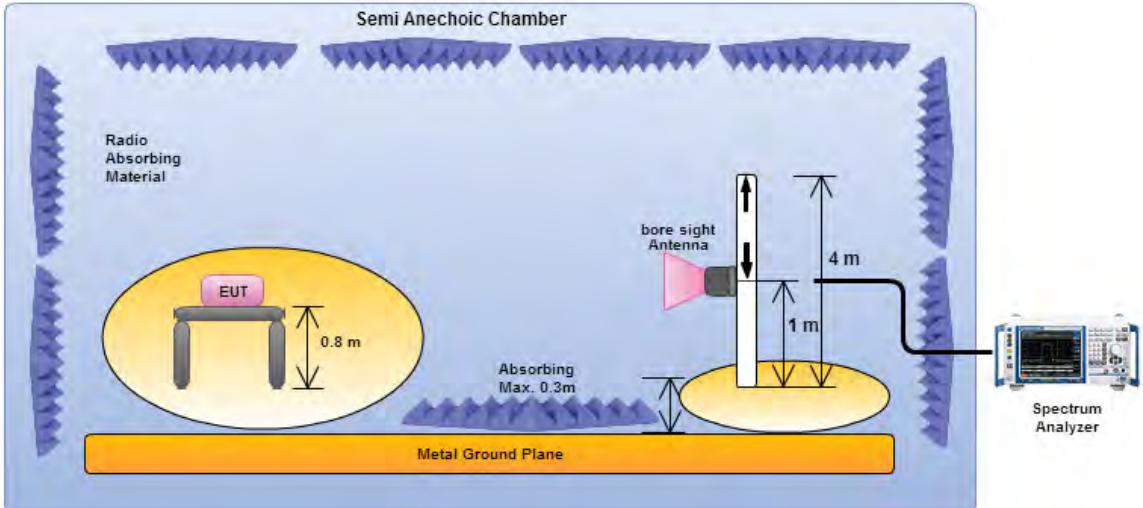
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

| Test Method |
|---|
| <input checked="" type="checkbox"/> The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. |
| <input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. |
| <input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands. |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands. |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$) |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor). |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$). |
| <input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time. |
| <input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit. |
| <input checked="" type="checkbox"/> For the transmitter bandedge emissions shall be measured using following options below: |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz). |
| <input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.9.2 for band-edge testing. |
| <input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements. |
| <input checked="" type="checkbox"/> For radiated measurement, refer as FCC KDB 558074, clause 12.2.7. |
| <input type="checkbox"/> For conducted measurement, refer as FCC KDB 558074, clause 12.2.2. |

3.5.4 Test Setup

| Transmitter Radiated Bandedge Emissions |
|--|
|  <p>Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.</p> |



3.5.5 Transmitter Radiated Bandedge Emissions

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)

| Modulation | N _{TX} | Test Freq. (MHz) | In-band PSD [i] (dBuV/100kHz) | Freq. (MHz) | Out-band PSD [o] (dBuV/100kHz) | [i] – [o] (dB) | Limit (dB) | Pol. |
|------------|-----------------|------------------|-------------------------------|-------------|--------------------------------|----------------|------------|------|
| LE-1Mbps | 1 | 2402 | 104.81 | 2396.390 | 63.23 | 31.56 | 20 | H |
| LE-1Mbps | 1 | 2480 | 103.11 | 2517.400 | 65.01 | 34.70 | 20 | H |

Note 1: Measurement worst emissions of receive antenna polarization

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)

| Modulation Mode | N _{TX} | Freq. (MHz) | Measure Distance (m) | Freq. (MHz) PK | Level (dBuV/m) PK | Limit (dBuV/m) PK | Freq. (MHz) AV | Level (dBuV/m) AV | Limit (dBuV/m) AV | Pol. |
|-----------------|-----------------|-------------|----------------------|----------------|-------------------|-------------------|----------------|-------------------|-------------------|------|
| LE-1Mbps | 1 | 2402 | 3 | 2332.24 | 60.29 | 74 | 2315.61 | 48.52 | 54 | H |
| LE-1Mbps | 1 | 2480 | 3 | 2484.92 | 60.13 | 74 | 2483.50 | 49.66 | 54 | H |

Note 1: Measurement worst emissions of receive antenna polarization.

Note 2: Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., LE VBW $\geq 1/625\mu s$, VBW=3kHz.



3.6 Transmitter Unwanted Emissions

3.6.1 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 |

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.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

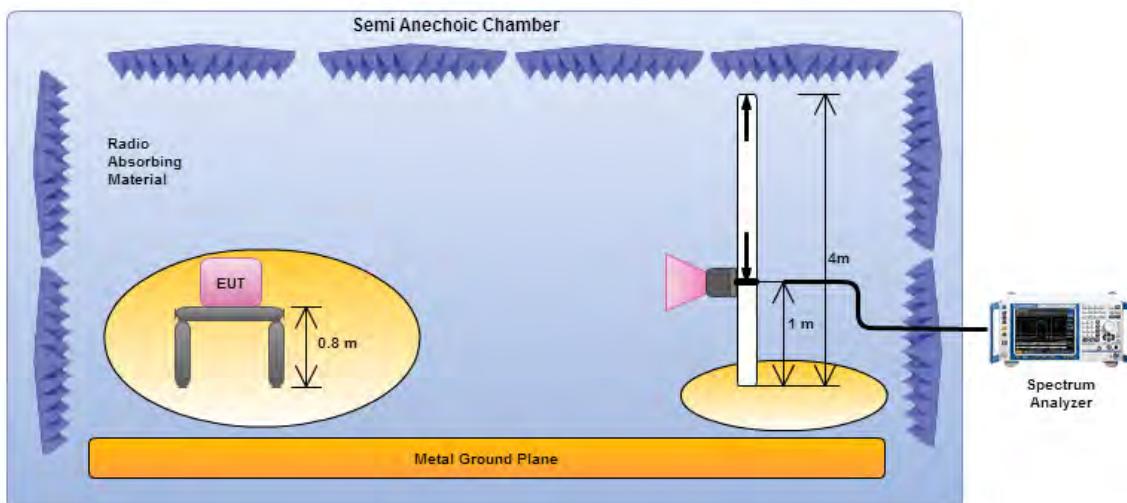


3.6.3 Test Procedures

| Test Method | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | 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). |
| <input checked="" type="checkbox"/> | Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit. |
| <input checked="" type="checkbox"/> | Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit. |
| <input checked="" type="checkbox"/> | The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. |
| <input checked="" type="checkbox"/> | For the transmitter unwanted emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands. |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands. |
| | <input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle \geq 98%) |
| | <input type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor). |
| | <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced $VBW \geq 1/T$). |
| | <input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). $VBW \geq 1/T$, where T is pulse time. |
| | <input type="checkbox"/> Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. |
| | <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit. |
| | <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit. |
| <input checked="" type="checkbox"/> | For radiated measurement, refer as FCC KDB 558074, clause 12.2.7. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m. |
| <input type="checkbox"/> | For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2. |

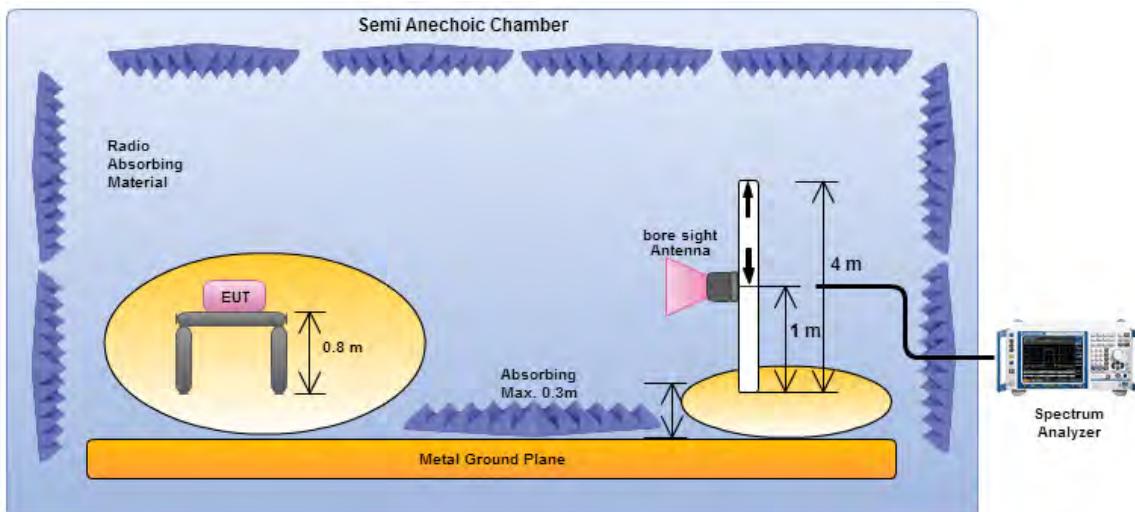
3.6.4 Test Setup

Transmitter Radiated Unwanted Emissions (below 1GHz)



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.

Transmitter Radiated Unwanted Emissions (Above 1GHz)



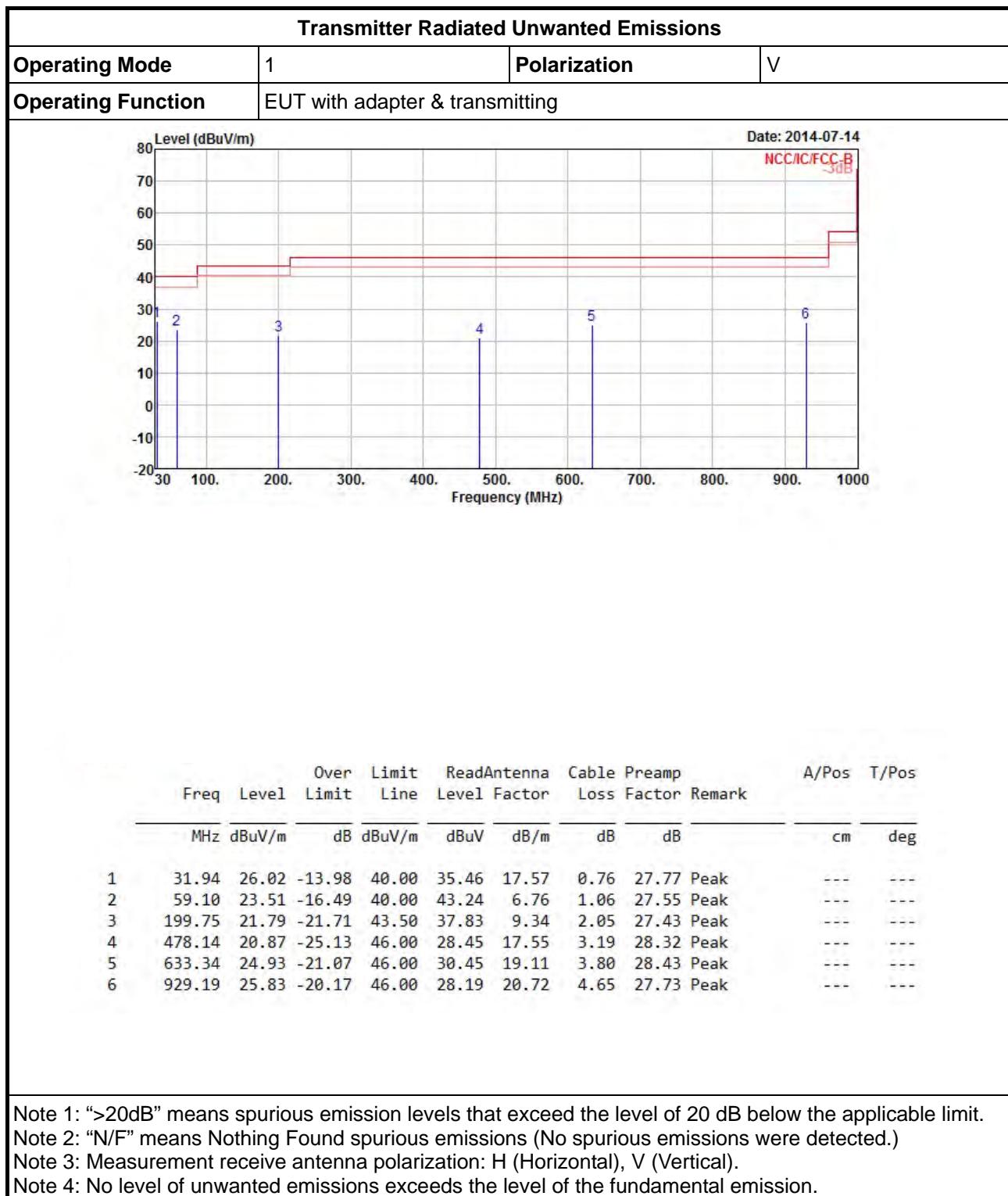
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

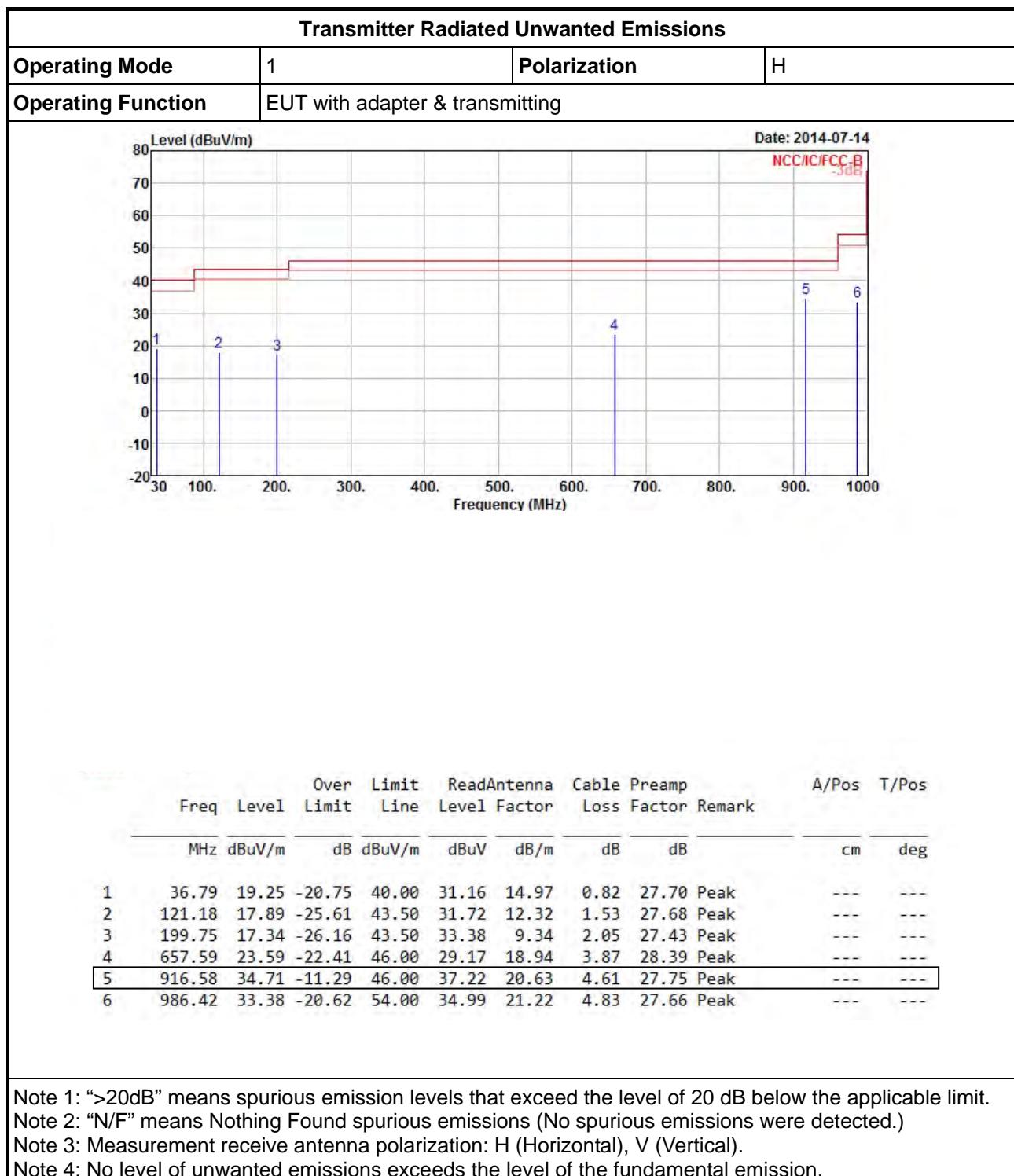
3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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



3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)



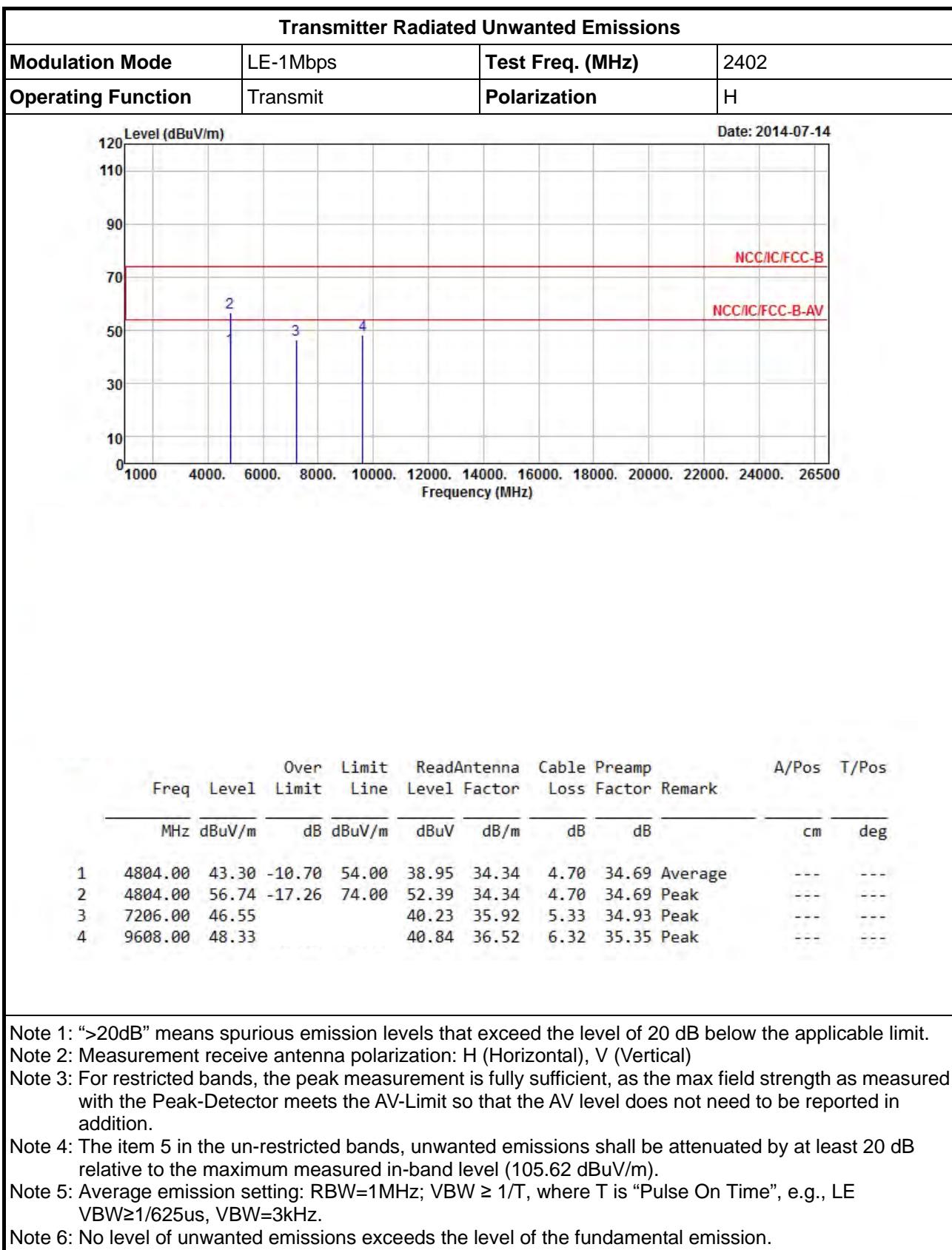


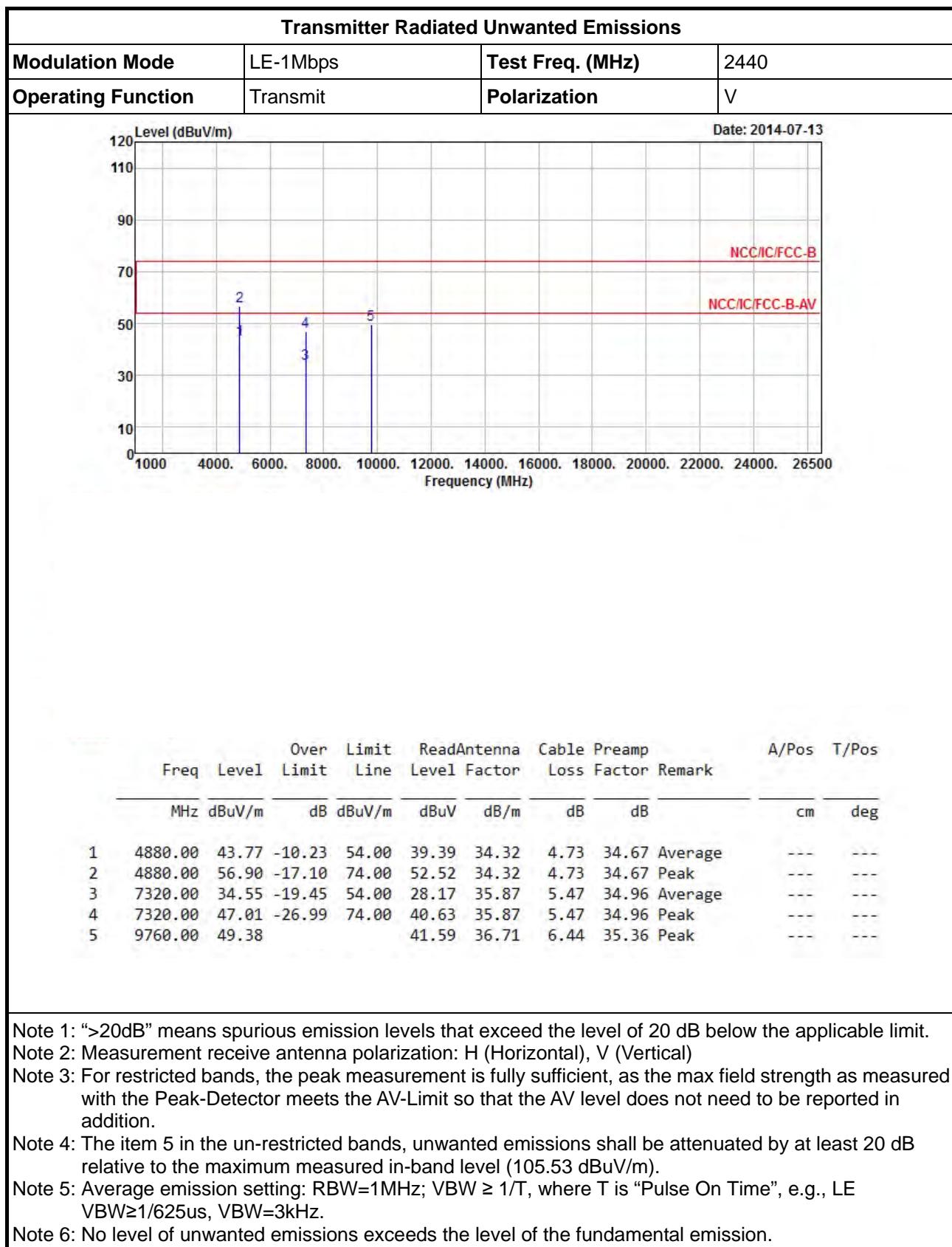


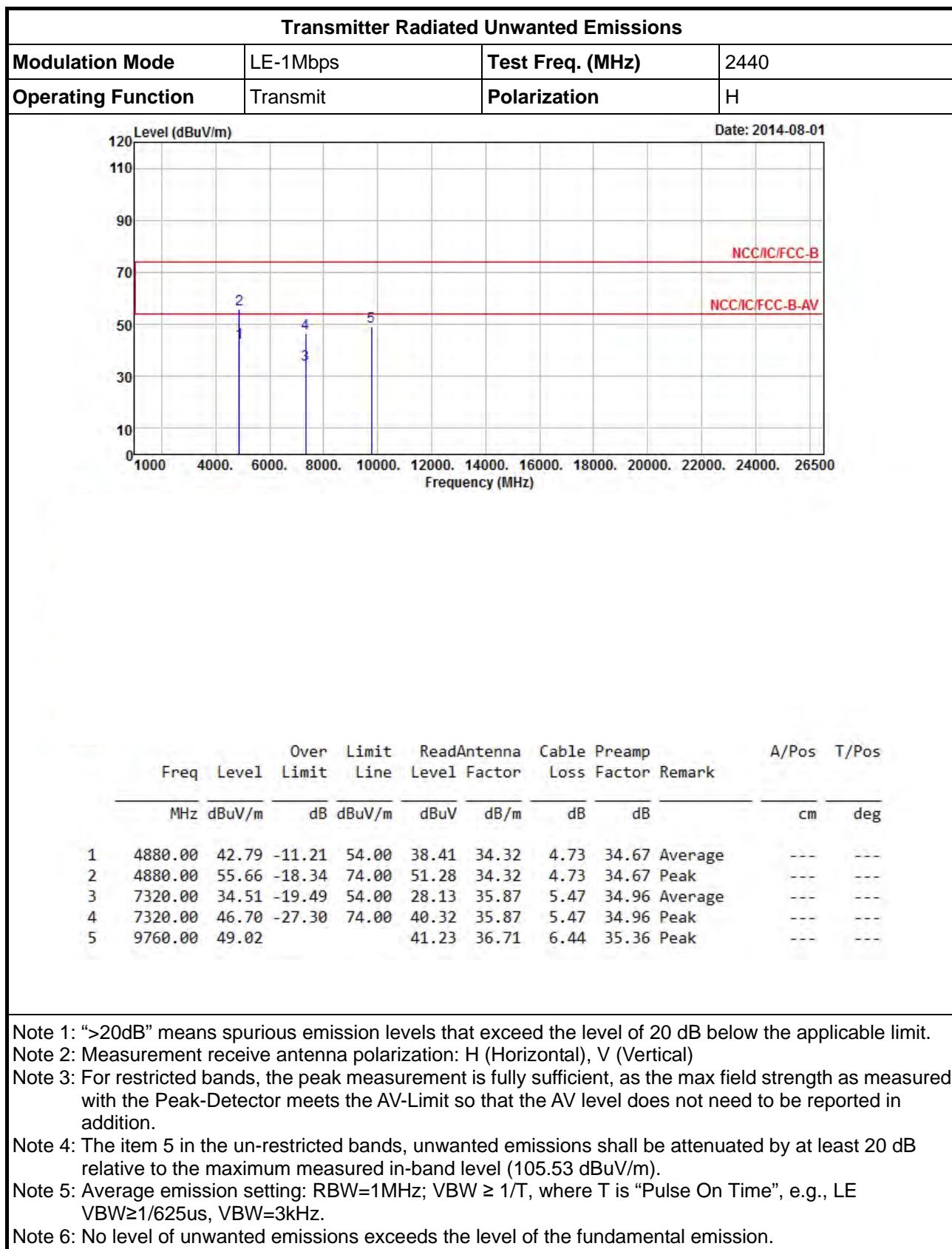
3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

| Transmitter Radiated Unwanted Emissions | | | | | | | | | | | |
|---|---------|------------|--------|--------|------------------|-------|--------|-------|---------|-------|------------------|
| Modulation Mode | | LE-1Mbps | | | Test Freq. (MHz) | | | 2402 | | | |
| Operating Function | | Transmit | | | Polarization | | | V | | | |
| Level (dBuV/m) | | | | | | | | | | | Date: 2014-07-14 |
| 1 | 4804.00 | 45.97 | -8.03 | 54.00 | 41.62 | 34.34 | 4.70 | 34.69 | Average | --- | --- |
| 2 | 4804.00 | 60.08 | -13.92 | 74.00 | 55.73 | 34.34 | 4.70 | 34.69 | Peak | --- | --- |
| 3 | 7206.00 | 47.04 | | | 40.72 | 35.92 | 5.33 | 34.93 | Peak | --- | --- |
| 4 | 9608.00 | 48.49 | | | 41.00 | 36.52 | 6.32 | 35.35 | Peak | --- | --- |
| Freq | Level | Over Limit | Line | Read | Antenna | Cable | Preamp | | A/Pos | T/Pos | |
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 4804.00 | 45.97 | -8.03 | 54.00 | 41.62 | 34.34 | 4.70 | 34.69 | Average | --- | --- |
| 2 | 4804.00 | 60.08 | -13.92 | 74.00 | 55.73 | 34.34 | 4.70 | 34.69 | Peak | --- | --- |
| 3 | 7206.00 | 47.04 | | | 40.72 | 35.92 | 5.33 | 34.93 | Peak | --- | --- |
| 4 | 9608.00 | 48.49 | | | 41.00 | 36.52 | 6.32 | 35.35 | Peak | --- | --- |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: 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 4: The item 5 in the un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (105.62 dBuV/m).
 Note 5: Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., LE VBW $\geq 1/625\mu s$, VBW=3kHz.
 Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



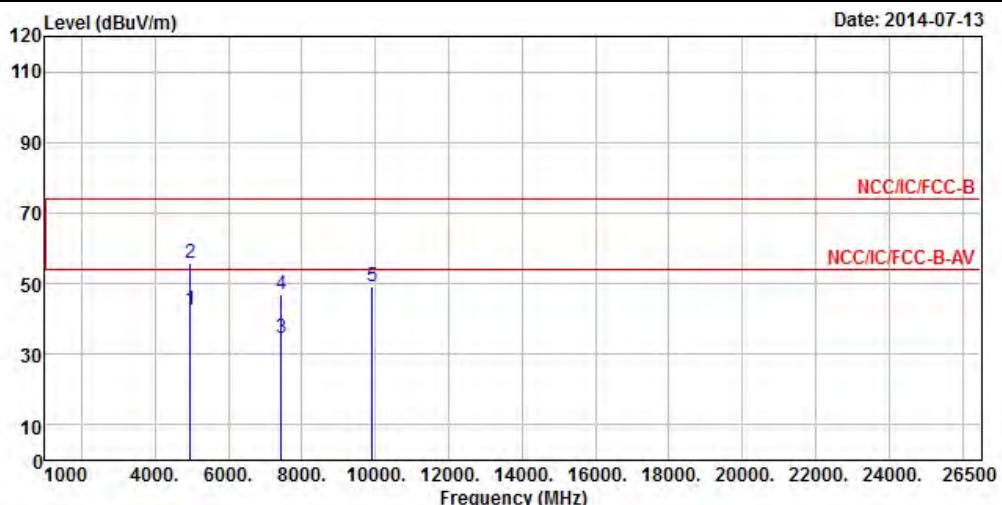






Transmitter Radiated Unwanted Emissions

| | | | |
|--------------------|----------|------------------|------|
| Modulation Mode | LE-1Mbps | Test Freq. (MHz) | 2480 |
| Operating Function | Transmit | Polarization | V |



| Freq | Level | Over | Limit | Read | Antenna | Cable | Preamp | A/Pos | T/Pos |
|------|---------|-------|--------|-------|---------|-------|--------|-------|---------|
| | | Limit | Line | Level | Factor | Cable | Preamp | | |
| MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg |
| 1 | 4960.00 | 42.44 | -11.56 | 54.00 | 37.96 | 34.31 | 4.82 | 34.65 | Average |
| 2 | 4960.00 | 55.73 | -18.27 | 74.00 | 51.25 | 34.31 | 4.82 | 34.65 | Peak |
| 3 | 7440.00 | 34.52 | -19.48 | 54.00 | 28.07 | 35.82 | 5.61 | 34.98 | Average |
| 4 | 7440.00 | 46.83 | -27.17 | 74.00 | 40.38 | 35.82 | 5.61 | 34.98 | Peak |
| 5 | 9920.00 | 49.14 | | | 41.03 | 36.92 | 6.56 | 35.37 | Peak |

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

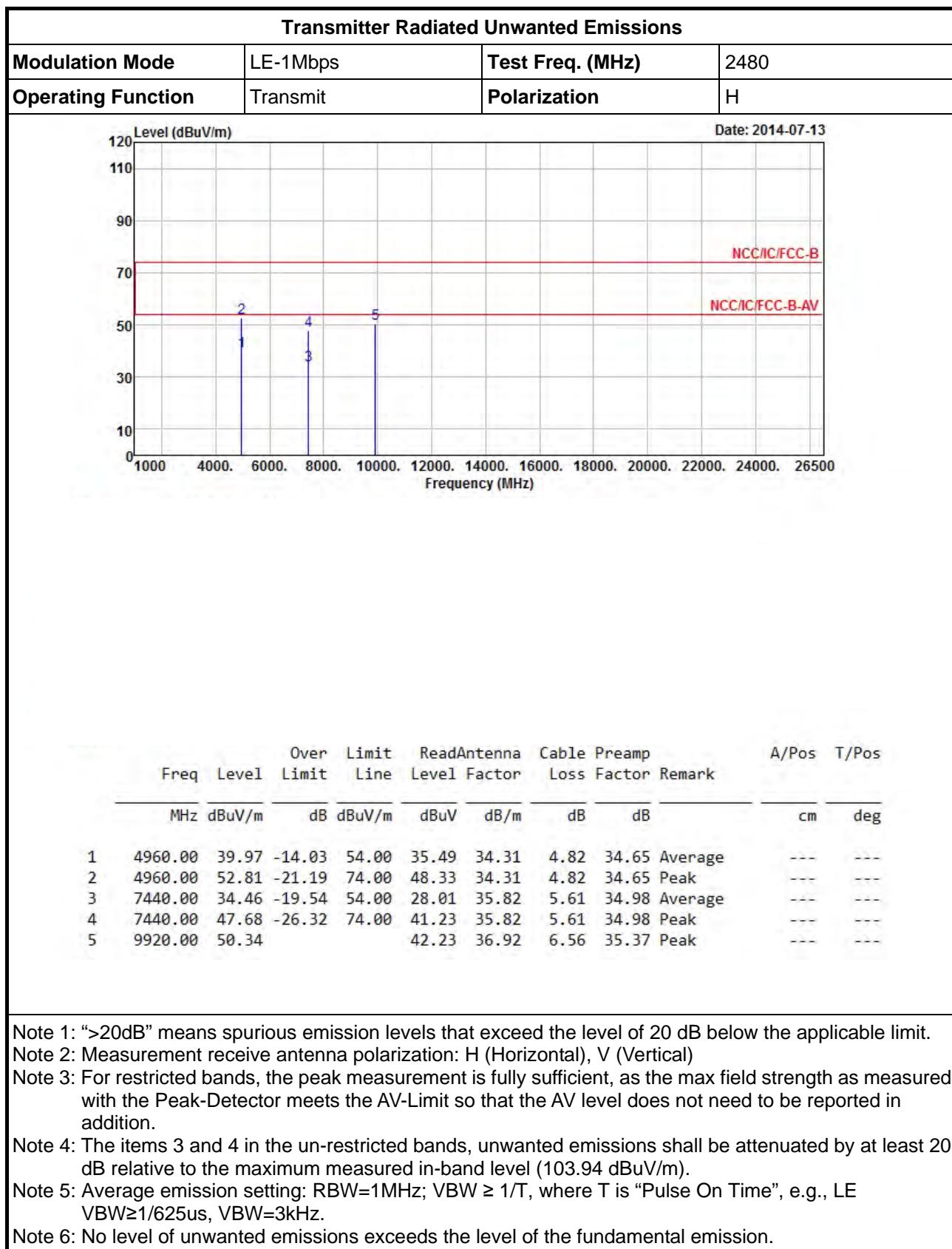
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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 4: The items 3 and 4 in the un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (103.94 dBuV/m).

Note 5: Average emission setting: RBW=1MHz; VBW $\geq 1/T$, where T is "Pulse On Time", e.g., LE VBW $\geq 1/625\mu s$, VBW=3kHz.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



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

Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 3: 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 4: The items 3 and 4 in the un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level (103.94 dBuV/m).

Note 5: Average emission setting: RBW=1MHz; VBW \geq 1/T, where T is "Pulse On Time", e.g., LE VBW \geq 1/625us, VBW=3kHz.

Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.



4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------|-----------------------------|-----------|-----------------|-----------------|------------------|---------------|
| EMC Receiver | R&S | ESCS 30 | 100174 | 9kHz ~ 2.75GHz | Mar. 26, 2014 | AC Conduction |
| LISN | SCHWARZBECK MESS-ELEKTRONIK | NSLK 8127 | 8127-477 | 9kHz ~ 30MHz | Jan. 21, 2014 | AC Conduction |
| RF Cable-CON | HUBER+SUHNER | RG213/U | 0-7611832020001 | 9kHz ~ 30MHz | Oct. 30, 2013 | AC Conduction |
| EMI Filter | LINDGREN | LRE-2030 | 2651 | < 450 Hz | N/A | AC Conduction |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|-------------------|--------------|--------------|--------------------|-----------------|------------------|--------------|
| Spectrum Analyzer | R&S | FSV 40 | 101013 | 9KHz~40GHz | Jan. 25, 2014 | RF Conducted |
| Signal Generator | R&S | SMB 100A | 175727 | 100kHz~40GHz | Jan. 07, 2014 | RF Conducted |
| Power Sensor | Anritsu | MA2411B | 1027452 | 300MHz ~ 40GHz | Sep. 11, 2013 | RF Conducted |
| Power Meter | Anritsu | ML2495A | 1124009 | 300MHz ~ 40GHz | Sep. 11, 2013 | RF Conducted |
| RF Cable-1m | HUBER+SUHNER | SUCOFLEX_104 | SN 324557 | 30MHz ~ 26.5GHz | Dec. 02, 2013 | RF Conducted |
| RF Cable-0.5m | HUBER+SUHNER | SUCOFLEX_103 | 10715/4 10716/4 | 30MHz ~ 26.5GHz | Dec. 02, 2013 | RF Conducted |
| DC Power Source | G.W. | GPS-3030DD | GEN865896 | DC 0V ~ 30V | Nov. 21, 2013 | RF Conducted |

Note: Calibration Interval of instruments listed above is one year.



| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------------------|----------------------|-------------|-------------|--------------------|------------------|-------------------|
| Spectrum Analyzer | R&S | FSP40 | 100593 | 9kHz ~ 40GHz | Oct. 03, 2013 | Radiated Emission |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH02-HY | 30MHz ~ 1GHz 3m | May 11, 2014 | Radiated Emission |
| Amplifier | Agilent | 8447D | 2944A11149 | 100kHz ~ 1.3GHz | Jul. 18, 2013 | Radiated Emission |
| Amplifier | Agilent | 8449B | 3008A02373 | 1GHz ~ 26.5GHz | Aug. 28, 2013 | Radiated Emission |
| Horn Antenna | ETS-LINDGREN | 3117 | 00091920 | 1GHz ~ 18GHz | Nov. 25, 2013 | Radiated Emission |
| Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170154 | 15GHz ~ 40GHz | Jan. 10, 2014 | Radiated Emission |
| RF Cable-R03m | Jye Bao | RG142 | CB021 | 9kHz ~ 1GHz | Nov. 09, 2013 | Radiated Emission |
| RF Cable-high | SUHNER | SUCOFLEX106 | 03CH02-HY | 1GHz ~ 40GHz | Mar. 05, 2014 | Radiated Emission |
| Bilog Antenna | SCHAFFNER | CBL61128 | 2723 | 30MHz ~ 2GHz | Oct. 10, 2013 | Radiated Emission |
| Turn Table | Chaintek Instruments | 3000 | MF7802058 | 0~ 360 degree | N/A | Radiated Emission |
| Antenna Mast | MF | MF7802 | MF780208205 | 1 ~ 4 m | N/A | Radiated Emission |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------|--------------|-----------|------------|-----------------|------------------|-------------------|
| Loop Antenna | TESEQ | HLA 6120 | 31244 | 9kHz ~ 30MHz | Dec. 02, 2012 | Radiated Emission |

Note: Calibration Interval of instruments listed above is two year.