# Test Report

| | | |
|---|---|---|
| **Report No.** | : | **MTi240717017-01E2** |
| **Date of issue** | : | **2025-01-21** |
| **Applicant** | : | **ALOGIC Corporation Pty Ltd.** |
| **Product** | : | **Apex Wireless Mouse** |
| **Model(s)** | : | **AMBT7K, AMBT7KBK, AMBT7KWH, AMBT7KXX (XX represents color)** |
| **FCC ID** | : | **2ATCA-AMBT7K** |

**Shenzhen Microtest Co., Ltd.**

# TEST REPORT

Report No.: MTi240717017-01E2

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# TEST REPORT

Report No.: MTi240717017-01E2

| | | |
|---|---|---|
| **Test Result Certification** | | |
| Applicant | ALOGIC Corporation Pty Ltd. | |
| Applicant Address | Level 40, 140 William Street, Melbourne VIC, 3000 Australia | |
| Manufacturer | SHENZHEN KEYCEO TECH CO., LIMITED | |
| Manufacturer Address | Room 705-706, 12th Building, South Bank Plaza, Exhibition Bay, Zhancheng Community, Fuhai Street, Bao'an District, Shenzhen, China | |
| **Product description** | | |
| Product name | Apex Wireless Mouse | |
| Trademark | ALOGIC | |
| Model name | AMBT7K | |
| Series Model(s) | AMBT7KBK, AMBT7KWH, AMBT7KXX (XX represents color) | |
| Standards | 47 CFR Part 15.249 | |
| Test Method | ANSI C63.10-2013 | |
| **Testing Information** | | |
| Date of test | 2024-09-13 to 2025-01-21 | |
| Test result | Pass | |
| Prepared by: | Letter Lan | Letter. Lan. |
| Reviewed by: | David Lee | David. Lee |
| Approved by: | Leon Chen | Leon chen |

# 1 General Description

## 1.1 Description of the EUT

| | |
|---|---|
| Product name: | Apex Wireless Mouse |
| Model name: | AMBT7K |
| Series Model(s): | AMBT7KBK, AMBT7KWH, AMBT7KXX (XX represents color) |
| Model difference: | All the models are the same circuit and module, except the model name, colour and appearance. |
| Electrical rating: | Input: DC 5V/1A<br>Battery: DC 3.7V 700mAh |
| Accessories: | N/A |
| Hardware version: | 1.01 |
| Software version: | 1.02 |
| Test sample(s) number: | MTi240717017-01S1001 |
| **RF specification** | |
| Operating frequency range: | 2405MHz to 2475MHz |
| Channel number: | 16 |
| Modulation type: | GFSK |
| Antenna(s) type: | PCB |
| Antenna(s) gain: | -0.71dBi |

## 1.2 Description of test modes

| No. | Emission test modes |
|---|---|
| Mode1 | TX |

### 1.2.1 Operation channel list

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 1 | 2405 | 12 | 2436 |
| 2 | 2463 | 13 | 2419 |
| 3 | 2441 | 14 | 2475 |
| 4 | 2426 | 15 | 2453 |
| 5 | 2408 | 16 | 2439 |
| 6 | 2466 | / | / |
| 7 | 2445 | / | / |
| 8 | 2422 | / | / |
| 9 | 2414 | / | / |
| 10 | 2471 | / | / |

| | | | |
|---|---|---|---|
| 11 | 2459 | / | / |

**Test Channel List**
**Operation Band: 2.4G**

| Bandwidth (MHz) | Lowest Channel (LCH) (MHz) | Middle Channel (MCH) (MHz) | Highest Channel (HCH) (MHz) |
|---|---|---|---|
| 1 | 2405 | 2445 | 2475 |

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

**Test Software: BK32xx RF test – V2.1.0_en(Built On Nov 4 2020)**
For power setting, refer to below table.

| Mode | 2405MHz | 2445MHz | 2475MHz |
|---|---|---|---|
| GFSK | 7 | 7 | 7 |

### 1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature: | 15°C ~ 35°C |
| Humidity: | 20% RH ~ 75% RH |
| Atmospheric pressure: | 98 kPa ~ 101 kPa |

### 1.4 Description of support units

| **Support equipment list** | | | |
|---|---|---|---|
| Description | Model | Serial No. | Manufacturer |
| / | / | / | / |
| **Support cable list** | | | |
| Description | Length (m) | From | To |
| / | / | / | / |

### 1.5 Measurement uncertainty

| Measurement | Uncertainty |
|---|---|
| Occupied channel bandwidth | ±3 % |
| Radiated spurious emissions (above 1GHz) | ±5.3dB |
| Radiated spurious emissions (9kHz~30MHz) | ±4.3dB |
| Radiated spurious emissions (30MHz~1GHz) | ±4.7dB |
| Temperature | ±1 °C |
| Humidity | ± 5 % |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2 Summary of Test Result

| No. | Item | Standard | Requirement | Result |
|---|---|---|---|---|
| 1 | Antenna requirement | 47 CFR Part 15.249 | 47 CFR Part 15.203 | Pass |
| 2 | Occupied Bandwidth | 47 CFR Part 15.249 | 47 CFR 15.215(c) | Pass |
| 3 | Field strength of fundamental | 47 CFR Part 15.249 | 47 CFR 15.249(a)<br>47 CFR 15.249(b)(1) | Pass |
| 4 | Band edge emissions (Radiated) | 47 CFR Part 15.249 | 47 CFR 15.249(d) | Pass |
| 5 | Emissions in frequency bands (below 1GHz) | 47 CFR Part 15.249 | 47 CFR 15.249(a)<br>47 CFR 15.249(d)<br>47 CFR 15.249(e) | Pass |
| 6 | Emissions in frequency bands (above 1GHz) | 47 CFR Part 15.249 | 47 CFR 15.249(a)<br>47 CFR 15.249(d)<br>47 CFR 15.249(e) | Pass |

# 3 Test Facilities and accreditations

## 3.1 Test laboratory

| | |
|---|---|
| Test laboratory: | Shenzhen Microtest Co., Ltd. |
| Test site location: | 101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| Telephone: | (86-755)88850135 |
| Fax: | (86-755)88850136 |
| CNAS Registration No.: | CNAS L5868 |
| FCC Registration No.: | 448573 |
| IC Registration No.: | 21760 |
| CABID: | CN0093 |

# 4 List of test equipment

| No. | Equipment | Manufacturer | Model | Serial No. | Cal. date | Cal. Due |
|---|---|---|---|---|---|---|
| Occupied Bandwidth | | | | | | |
| 1 | Wideband Radio Communication Tester | Rohde&schwarz | CMW500 | 149155 | 2024-03-20 | 2025-03-19 |
| 2 | ESG Series Analog Ssignal Generator | Agilent | E4421B | GB40051240 | 2024-03-21 | 2025-03-20 |
| 3 | PXA Signal Analyzer | Agilent | N9030A | MY51350296 | 2024-03-21 | 2025-03-20 |
| 4 | Synthesized Sweeper | Agilent | 83752A | 3610A01957 | 2024-03-21 | 2025-03-20 |
| 5 | MXA Signal Analyzer | Agilent | N9020A | MY50143483 | 2024-03-21 | 2025-03-20 |
| 6 | RF Control Unit | Tonscend | JS0806-1 | 19D8060152 | 2024-03-21 | 2025-03-20 |
| 7 | Band Reject Filter Group | Tonscend | JS0806-F | 19D8060160 | 2024-03-21 | 2025-03-20 |
| 8 | ESG Vector Signal Generator | Agilent | N5182A | MY50143762 | 2024-03-20 | 2025-03-19 |
| 9 | DC Power Supply | Agilent | E3632A | MY40027695 | 2024-03-21 | 2025-03-20 |
| Field strength of fundamental | | | | | | |
| Band edge emissions (Radiated)<br>Emissions in frequency bands (above 1GHz) | | | | | | |
| 1 | EMI Test Receiver | Rohde&schwarz | ESCI7 | 101166 | 2024-03-20 | 2025-03-19 |
| 2 | Double Ridged Broadband Horn Antenna | schwarabeck | BBHA 9120 D | 2278 | 2023-06-17 | 2025-06-16 |
| 3 | Amplifier | Agilent | 8449B | 3008A01120 | 2024-03-20 | 2025-03-19 |
| 4 | MXA signal analyzer | Agilent | N9020A | MY54440859 | 2024-03-21 | 2025-03-20 |
| 5 | PXA Signal Analyzer | Agilent | N9030A | MY51350296 | 2024-03-21 | 2025-03-20 |
| 6 | Horn antenna | Schwarzbeck | BBHA 9170 | 00987 | 2023-06-17 | 2025-06-16 |
| 7 | Pre-amplifier | Space-Dtronics | EWLAN1840G | 210405001 | 2024-03-21 | 2025-03-20 |
| Emissions in frequency bands (below 1GHz) | | | | | | |
| 1 | EMI Test Receiver | Rohde&schwarz | ESCI7 | 101166 | 2024-03-20 | 2025-03-19 |
| 2 | TRILOG Broadband Antenna | schwarabeck | VULB 9163 | 9163-1338 | 2023-06-11 | 2025-06-10 |
| 3 | Active Loop Antenna | Schwarzbeck | FMZB 1519 B | 00066 | 2024-03-23 | 2025-03-22 |
| 4 | Amplifier | Hewlett-Packard | 8447F | 3113A06184 | 2024-03-20 | 2025-03-19 |

# 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. |

# 6 Radio Spectrum Matter Test Results (RF)

## 6.1 Occupied Bandwidth

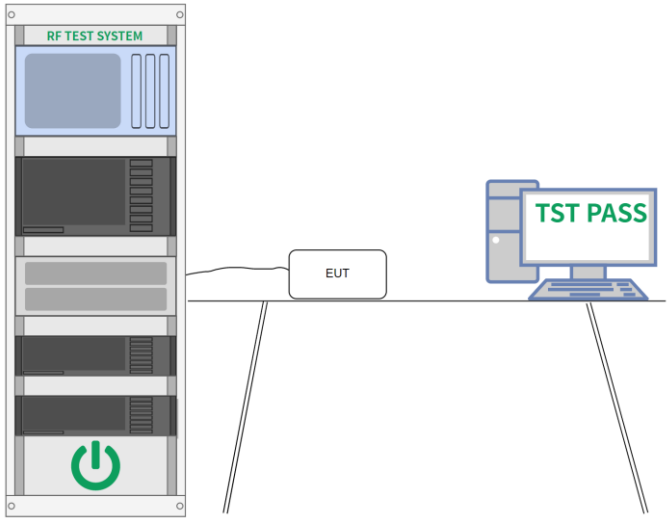
| | |
|---|---|
| Test Requirement: | 47 CFR 15.215(c) |
| Test Limit: | Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. |
| Test Method: | ANSI C63.10-2013, section 6.9.2 |
| Procedure: | a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.<br>b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.<br>c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.<br>d) Steps a) through c) might require iteration to adjust within the specified tolerances.<br>e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “−xx dB down” requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.<br>f) Set detection mode to peak and trace mode to max hold.<br>g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).<br>h) Determine the “−xx dB down amplitude” using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.<br>i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to |

| | |
|---|---|
| | stabilize. Otherwise, the trace from step g) shall be used for step j).<br>j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined in step h). If a marker is below this “−xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.<br>k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s). |

### 6.1.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 19.2 °C | Humidity: | 26.6 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1 | | | | |
| Final test mode: | Mode1 | | | | |

### 6.1.2 Test Setup Diagram:

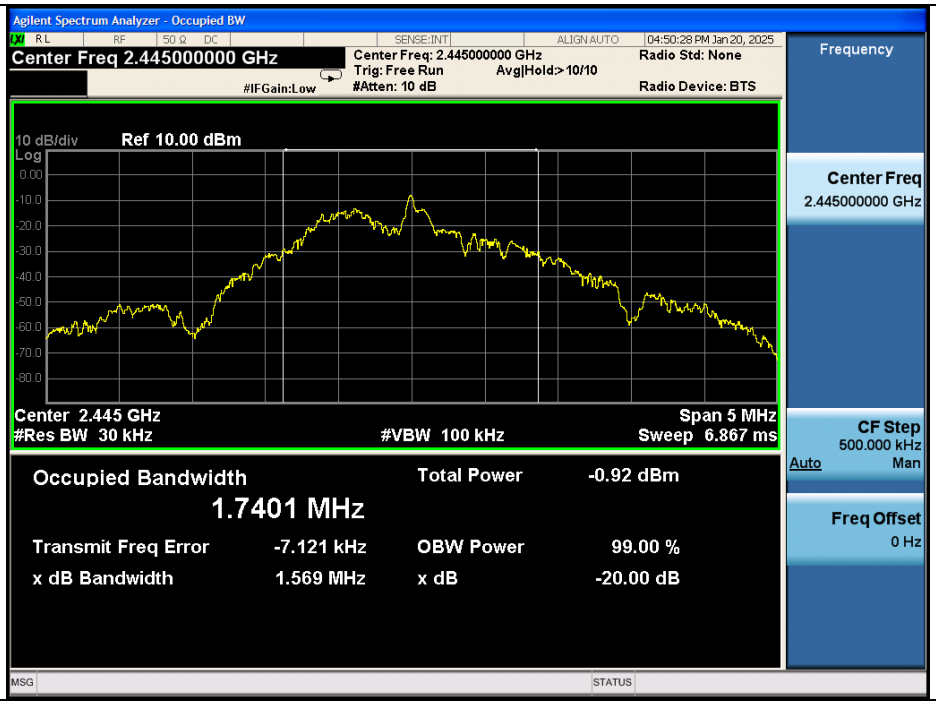



### 6.1.3 Test Data:

Test plots

2405MHz


2445MHz



| 2475MHz |
| --- |
|  |

Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω
DC
SENSE:INT
ALIGN AUTO
04:50:49 PM Jan 20, 2025
Center Freq 2.475000000 GHz
#IFGain:Low
Center Freq: 2.475000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center Freq
2.475000000 GHz
Center 2.475 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 5 MHz
Sweep 6.867 ms
CF Step
500.000 kHz
Auto
Man
Occupied Bandwidth
1.7352 MHz
Total Power
-1.82 dBm
Transmit Freq Error
-5.410 kHz
OBW Power
99.00 %
x dB Bandwidth
1.540 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

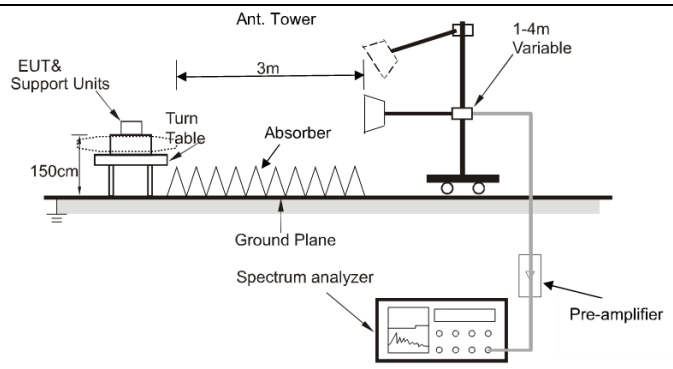
## 6.2 Field strength of fundamental

| | |
|---|---|
| Test Requirement: | Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:<br><br>Fundamental frequency / Field strength of fundamental (millivolts/meter) / Field strength of harmonics (microvolts/meter)<br>902-928 MHz / 50 / 500<br>2400-2483.5 MHz / 50 / 500<br>5725-5875 MHz / 50 / 500<br>24.0-24.25 GHz / 250 / 2500<br><br>The field strength of emissions in this band shall not exceed 2500 millivolts/meter. |
| Test Method: | ANSI C63.10-2013 section 6.6 |
| Procedure: | ANSI C63.10-2013 section 6.6 |

### 6.2.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 0 °C | Humidity: | 0 % | Atmospheric Pressure: | 0 kPa |
| Pre test mode: | Mode1 | | | | |
| Final test mode: | Mode1 | | | | |

### 6.2.2 Test Setup Diagram:



**6.2.3 Test Data:**

| Frequency | Ant. Polarization | Emission level | Limits | Detector | Result |
|---|---|---|---|---|---|
| (MHz) | H / V | dBμV/m | dBμV/m | | |
| 2405 | H | 79.90 | 114 | PK | PASS |
| 2405 | H | 79.80 | 94 | AV | PASS |
| 2405 | V | 70.38 | 114 | PK | PASS |
| 2405 | V | 70.14 | 94 | AV | PASS |

| Frequency | Ant. Polarization | Emission level | Limits | Detector | Result |
|---|---|---|---|---|---|
| (MHz) | H / V | dBμV/m | dBμV/m | | |
| 2445 | H | 65.87 | 114 | PK | PASS |
| 2445 | H | 65.30 | 94 | AV | PASS |
| 2445 | V | 79.00 | 114 | PK | PASS |
| 2445 | V | 78.89 | 94 | AV | PASS |

| Frequency | Ant. Polarization | Emission level | Limits | Detector | Result |
|---|---|---|---|---|---|
| (MHz) | H / V | dBμV/m | dBμV/m | | |
| 2475 | H | 76.12 | 114 | PK | PASS |
| 2475 | H | 75.97 | 94 | AV | PASS |
| 2475 | V | 73.04 | 114 | PK | PASS |
| 2475 | V | 72.86 | 94 | AV | PASS |

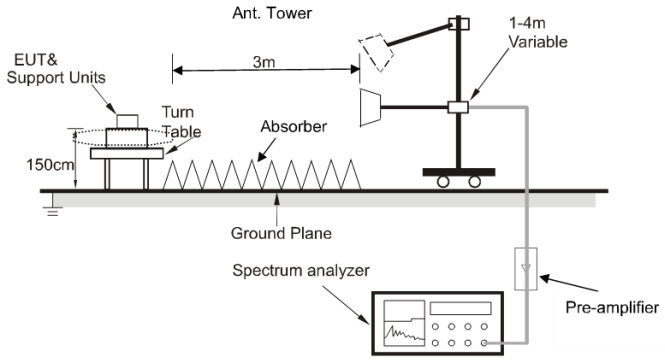
### 6.3 Band edge emissions (Radiated)

<table>
<tr><td>Test Requirement:</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.</td></tr>
<tr><td>Test Limit:</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.6.4</td></tr>
<tr><td>Procedure:</td><td>ANSI C63.10-2013 section 6.6.4</td></tr>
</table>

### 6.3.1 E.U.T. Operation:

<table>
<tr><td colspan="6">Operating Environment:</td></tr>
<tr><td>Temperature:</td><td>19.2 °C</td><td>Humidity:</td><td>26.6 %</td><td>Atmospheric Pressure:</td><td>101 kPa</td></tr>
<tr><td>Pre test mode:</td><td colspan="5">Mode1</td></tr>
<tr><td>Final test mode:</td><td colspan="5">Mode1</td></tr>
</table>

### 6.3.2 Test Setup Diagram:



**6.3.3 Test Data:**

Mode1 / Polarization: Horizontal / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2310.000 | 47.24 | -4.83 | 42.41 | 74.00 | -31.59 | peak |
| 2 | | 2310.000 | 37.81 | -4.83 | 32.98 | 54.00 | -21.02 | AVG |
| 3 | | 2390.000 | 48.57 | -4.31 | 44.26 | 74.00 | -29.74 | peak |
| 4 | | 2390.000 | 37.96 | -4.31 | 33.65 | 54.00 | -20.35 | AVG |
| 5 | | 2400.000 | 47.33 | -4.25 | 43.08 | 74.00 | -30.92 | peak |
| 6 | | 2400.000 | 38.02 | -4.25 | 33.77 | 54.00 | -20.23 | AVG |

Mode1 / Polarization: Vertical / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2310.000 | 49.59 | -4.83 | 44.76 | 74.00 | -29.24 | peak |
| 2 | | 2310.000 | 37.97 | -4.83 | 33.14 | 54.00 | -20.86 | AVG |
| 3 | | 2390.000 | 48.60 | -4.31 | 44.29 | 74.00 | -29.71 | peak |
| 4 | | 2390.000 | 38.12 | -4.31 | 33.81 | 54.00 | -20.19 | AVG |
| 5 | | 2400.000 | 48.83 | -4.25 | 44.58 | 74.00 | -29.42 | peak |
| 6 | * | 2400.000 | 38.28 | -4.25 | 34.03 | 54.00 | -19.97 | AVG |

Mode1 / Polarization: Horizontal / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2483.500 | 48.09 | -4.21 | 43.88 | 74.00 | -30.12 | peak |
| 2 | | 2483.530 | 38.06 | -4.21 | 33.85 | 54.00 | -20.15 | AVG |
| 3 | | 2500.000 | 47.85 | -4.10 | 43.75 | 74.00 | -30.25 | peak |
| 4 | | 2500.000 | 37.86 | -4.10 | 33.76 | 54.00 | -20.24 | AVG |

Mode1 / Polarization: Vertical / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2483.500 | 48.54 | -4.21 | 44.33 | 74.00 | -29.67 | peak |
| 2 | | 2483.500 | 37.97 | -4.21 | 33.76 | 54.00 | -20.24 | AVG |
| 3 | | 2500.000 | 48.10 | -4.10 | 44.00 | 74.00 | -30.00 | peak |
| 4 | | 2500.000 | 37.91 | -4.10 | 33.81 | 54.00 | -20.19 | AVG |

### 6.4 Emissions in frequency bands (below 1GHz)

<table>
<tr><td>Test Requirement:</td><td>47 CFR 15.249(a)<br>47 CFR 15.249(d)<br>47 CFR 15.249(e)</td></tr>
<tr><td>Test Limit:</td><td>Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:<br><br>
<table>
<tr><td>Fundamental frequency</td><td>Field strength of fundamental (millivolts/meter)</td><td>Field strength of harmonics (microvolts/meter)</td></tr>
<tr><td>902-928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400-2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725-5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0-24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>
<br>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
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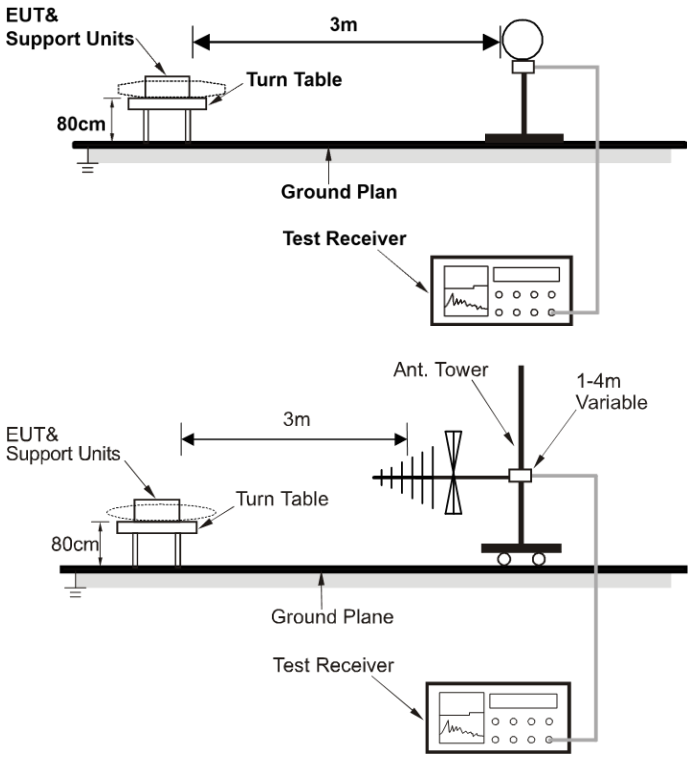
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.<br>
In the emission table above, the tighter limit applies at the band edges.<br>
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.<br>
As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.5</td></tr>
</table>

| Procedure: | ANSI C63.10-2013 section 6.5 |
|---|---|

### 6.4.1 E.U.T. Operation:

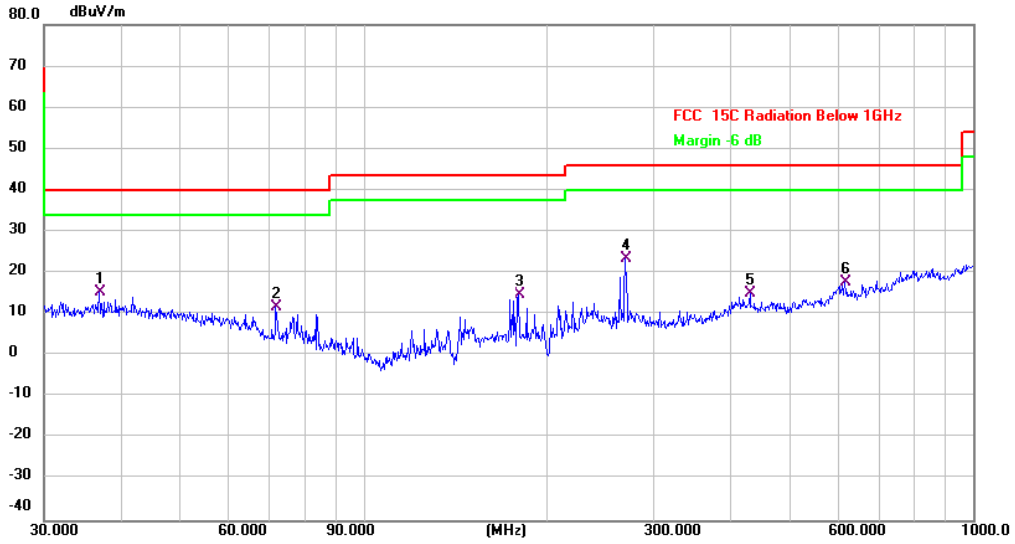
| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 19.2 °C | Humidity: | 26.6 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1 | | | | |
| Final test mode: | Mode1 | | | | |

### 6.4.2 Test Setup Diagram:



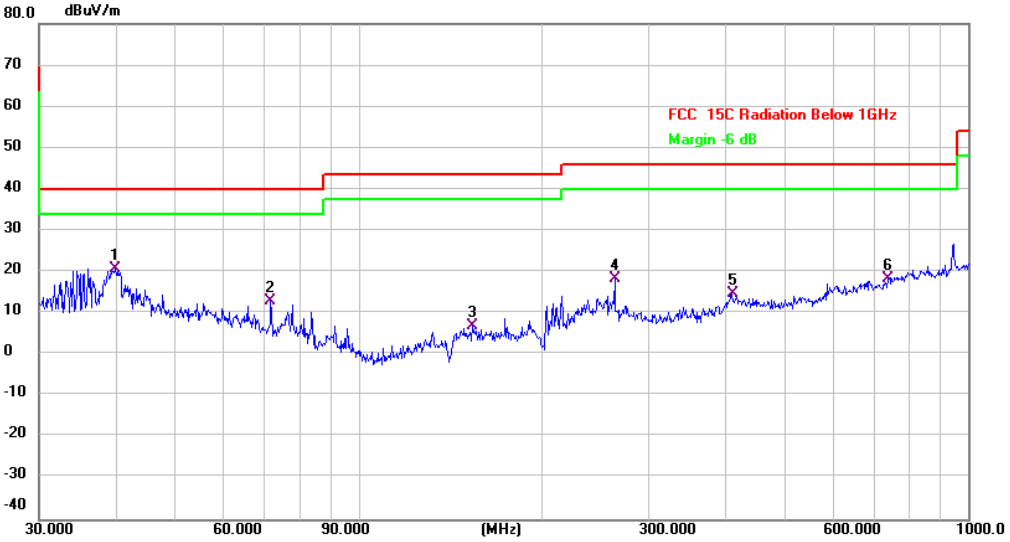
### 6.4.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 36.8953 | 30.14 | -14.68 | 15.46 | 40.00 | -24.54 | QP | |
| 2 | | 71.8320 | 33.46 | -21.68 | 11.78 | 40.00 | -28.22 | QP | |
| 3 | | 180.0165 | 35.13 | -20.37 | 14.76 | 43.50 | -28.74 | QP | |
| 4 | * | 269.4284 | 40.04 | -16.68 | 23.36 | 46.00 | -22.64 | QP | |
| 5 | | 431.0316 | 28.67 | -13.61 | 15.06 | 46.00 | -30.94 | QP | |
| 6 | | 616.3718 | 28.64 | -10.76 | 17.88 | 46.00 | -28.12 | QP | |

Mode1 / Polarization: Vertical / CH: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | * | 39.9942 | 45.39 | -24.51 | 20.88 | 40.00 | -19.12 | QP | |
| 2 | | 71.8320 | 31.82 | -18.92 | 12.90 | 40.00 | -27.10 | QP | |
| 3 | | 153.7385 | 24.27 | -17.42 | 6.85 | 43.50 | -36.65 | QP | |
| 4 | | 263.8190 | 35.20 | -16.97 | 18.23 | 46.00 | -27.77 | QP | |
| 5 | | 410.3825 | 28.65 | -13.94 | 14.71 | 46.00 | -31.29 | QP | |
| 6 | | 739.6604 | 25.47 | -7.21 | 18.26 | 46.00 | -27.74 | QP | |

## 6.5 Emissions in frequency bands (above 1GHz)

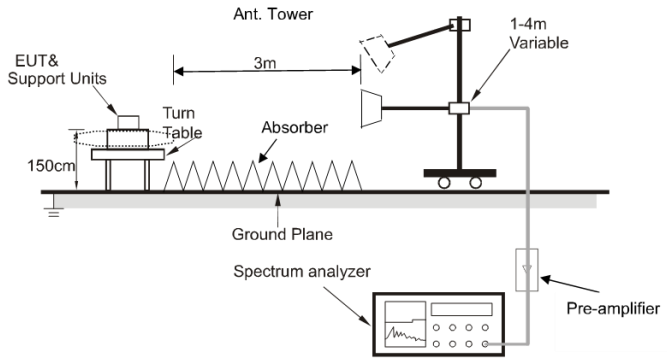
<table>
<tr><td>Test Requirement:</td><td>47 CFR 15.249(a)<br>47 CFR 15.249(d)<br>47 CFR 15.249(e)</td></tr>
<tr><td>Test Limit:</td><td>Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:<br><br>
<table>
<tr><td>Fundamental frequency</td><td>Field strength of fundamental (millivolts/meter)</td><td>Field strength of harmonics (microvolts/meter)</td></tr>
<tr><td>902-928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400-2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725-5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0-24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>
<br>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.<br>
In the emission table above, the tighter limit applies at the band edges.<br>
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.<br>
As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.6</td></tr>
</table>

| Procedure: | ANSI C63.10-2013 section 6.6 |
|---|---|

### 6.5.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 19.2 °C | Humidity: | 26.6 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1 | | | | |
| Final test mode: | Mode1 | | | | |

### 6.5.2 Test Setup Diagram:



**6.5.3 Test Data:**

Mode1 / Polarization: Horizontal / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4810.000 | 44.68 | 0.59 | 45.27 | 74.00 | -28.73 | peak |
| 2 | | 4810.000 | 24.65 | 0.59 | 25.24 | 54.00 | -28.76 | AVG |
| 3 | | 7215.000 | 53.40 | 7.82 | 61.22 | 74.00 | -12.78 | peak |
| 4 | * | 7215.000 | 33.54 | 7.82 | 41.36 | 54.00 | -12.64 | AVG |
| 5 | | 9620.000 | 46.28 | 8.89 | 55.17 | 74.00 | -18.83 | peak |
| 6 | | 9620.000 | 26.60 | 8.89 | 35.49 | 54.00 | -18.51 | AVG |

Mode1 / Polarization: Vertical / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4810.000 | 44.59 | 0.59 | 45.18 | 74.00 | -28.82 | peak |
| 2 | | 4810.000 | 36.95 | 0.59 | 37.54 | 54.00 | -16.46 | AVG |
| 3 | | 7215.000 | 59.35 | 7.82 | 67.17 | 74.00 | -6.83 | peak |
| 4 | * | 7215.000 | 41.65 | 7.82 | 49.47 | 54.00 | -4.53 | AVG |
| 5 | | 9620.000 | 45.66 | 8.89 | 54.55 | 74.00 | -19.45 | peak |
| 6 | | 9620.000 | 30.73 | 8.89 | 39.62 | 54.00 | -14.38 | AVG |

Mode1 / Polarization: Horizontal / CH: M

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4890.000 | 46.00 | 0.59 | 46.59 | 74.00 | -27.41 | peak |
| 2 | | 4890.000 | 28.05 | 0.59 | 28.64 | 54.00 | -25.36 | AVG |
| 3 | | 7335.000 | 57.67 | 7.68 | 65.35 | 74.00 | -8.65 | peak |
| 4 | * | 7335.000 | 39.70 | 7.68 | 47.38 | 54.00 | -6.62 | AVG |
| 5 | | 9780.000 | 45.04 | 9.32 | 54.36 | 74.00 | -19.64 | peak |
| 6 | | 9780.000 | 29.30 | 9.32 | 38.62 | 54.00 | -15.38 | AVG |

Mode1 / Polarization: Vertical / CH: M

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4890.000 | 45.91 | 0.59 | 46.50 | 74.00 | -27.50 | peak |
| 2 | | 4890.000 | 25.88 | 0.59 | 26.47 | 54.00 | -27.53 | AVG |
| 3 | * | 7335.000 | 58.04 | 7.68 | 65.72 | 74.00 | -8.28 | peak |
| 4 | | 7335.000 | 37.99 | 7.68 | 45.67 | 54.00 | -8.33 | AVG |
| 5 | | 9780.000 | 44.42 | 9.32 | 53.74 | 74.00 | -20.26 | peak |
| 6 | | 9780.000 | 24.26 | 9.32 | 33.58 | 54.00 | -20.42 | AVG |

Mode1 / Polarization: Horizontal / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4950.000 | 45.44 | 0.59 | 46.03 | 74.00 | -27.97 | peak |
| 2 | | 4950.000 | 37.88 | 0.59 | 38.47 | 54.00 | -15.53 | AVG |
| 3 | | 7425.000 | 59.75 | 7.96 | 67.71 | 74.00 | -6.29 | peak |
| 4 | * | 7425.000 | 41.63 | 7.96 | 49.59 | 54.00 | -4.41 | AVG |
| 5 | | 9900.000 | 45.20 | 9.66 | 54.86 | 74.00 | -19.14 | peak |
| 6 | | 9900.000 | 26.59 | 9.66 | 36.25 | 54.00 | -17.75 | AVG |

Mode1 / Polarization: Vertical / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4950.000 | 45.90 | 0.59 | 46.49 | 74.00 | -27.51 | peak |
| 2 | | 4950.000 | 27.98 | 0.59 | 28.57 | 54.00 | -25.43 | AVG |
| 3 | | 7425.000 | 54.00 | 7.96 | 61.96 | 74.00 | -12.04 | peak |
| 4 | * | 7425.000 | 35.30 | 7.96 | 43.26 | 54.00 | -10.74 | AVG |
| 5 | | 9900.000 | 44.35 | 9.66 | 54.01 | 74.00 | -19.99 | peak |
| 6 | | 9900.000 | 26.91 | 9.66 | 36.57 | 54.00 | -17.43 | AVG |

## Photographs of the test setup

Refer to Appendix - Test Setup Photos

## Photographs of the EUT

Refer to Appendix - EUT Photos

# Statement

1. This report is invalid without the seal and signature of the laboratory.

2. The test results of this report are only responsible for the samples submitted.Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

****** END OF REPORT ******