



# **FCC Part 74H ISED PART RSS-210 Test Report**

|                             |                                                                        |
|-----------------------------|------------------------------------------------------------------------|
| <b>APPLICANT</b>            | <b>AUDIO-TECHNICA CORPORATION</b>                                      |
|                             | <b>2-46-1 Nishi-Naruse, Machida<br/>Tokyo 194-8666 JAPAN</b>           |
| <b>FCC ID</b>               | <b>JFZT210BI</b>                                                       |
| <b>IC</b>                   | <b>1752B-T210BI</b>                                                    |
| <b>MODEL NUMBER</b>         | <b>ATW-T210bI</b>                                                      |
| <b>PRODUCT DESCRIPTION</b>  | BODY-PACK WIRELESS MICROPHONE TRANSMITTER                              |
| <b>STANDARD APPLIED</b>     | CFR 47 Part 74                                                         |
| <b>DATE SAMPLE RECEIVED</b> | 1/3/2020                                                               |
| <b>DATE TESTED</b>          | 1/21/2020                                                              |
| <b>TESTED BY</b>            | Tim Royer                                                              |
| <b>APPROVED BY</b>          | Franklin Rose                                                          |
| <b>TEST RESULTS</b>         | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |

| <b>Report Number</b> | <b>Report Version</b> | <b>Description</b>             | <b>Issue Date</b> |
|----------------------|-----------------------|--------------------------------|-------------------|
| 33AUT20TestReport    |                       | Initial Issue                  | 2/17/2020         |
|                      | Rev1                  | Clerical Updates               | 5/20/2020         |
|                      | Rev2                  | Added Maximum Deviation Page 3 | 5/29/2020         |
|                      | Rev3                  | Clerical Updates               | 6/2/2020          |
|                      | Rev4                  | Clerical Updates               | 6/4/2020          |

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

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## GENERAL REMARKS

### Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- ☐ Not fulfill the general approval requirements as identified in this test report

### Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

**Timco Engineering Inc.**  
**849 NW State Road 45**  
**Newberry, FL 32669**  
**Designation #: US1070**

### Tested by:



|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Name and Title</b> | Tim Royer, Project Manager / EMC Testing Engineer |
| <b>Date</b>           | 02/17/2020                                        |

### Reviewed and Approved by:



|                       |                                                         |
|-----------------------|---------------------------------------------------------|
| <b>Name and Title</b> | Franklin Rose, Project Manager / EMC Testing Technician |
| <b>Date</b>           | 02/17/2020                                              |

## GENERAL INFORMATION

|                                |                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT Description</b>         | <b>BODY-PACK WIRELESS MICROPHONE TRANSMITTER</b>                                                                             |
| <b>FCC ID</b>                  | <b>JFZT210BI</b>                                                                                                             |
| <b>IC</b>                      | <b>1752B-T210BI</b>                                                                                                          |
| <b>Model Number</b>            | <b>ATW-T210bI</b>                                                                                                            |
| <b>Operating Frequency</b>     | 487.125-506.500 MHz                                                                                                          |
| <b>Test Frequencies</b>        | 487.13, 494.38 and 505.75 MHz                                                                                                |
| <b>Modulation</b>              | FM                                                                                                                           |
| <b>Maximum Deviation</b>       | ±40kHz                                                                                                                       |
| <b>EUT Power Source</b>        | <input type="checkbox"/> 110-120Vac/50- 60Hz                                                                                 |
|                                | <input type="checkbox"/> DC Power                                                                                            |
|                                | <input checked="" type="checkbox"/> Battery Operated Exclusively                                                             |
| <b>Test Item</b>               | <input type="checkbox"/> Prototype                                                                                           |
|                                | <input checked="" type="checkbox"/> Pre-Production                                                                           |
|                                | <input type="checkbox"/> Production                                                                                          |
| <b>Type of Equipment</b>       | <input type="checkbox"/> Fixed                                                                                               |
|                                | <input type="checkbox"/> Mobile                                                                                              |
|                                | <input checked="" type="checkbox"/> Portable                                                                                 |
| <b>Antenna Connector</b>       | UFL                                                                                                                          |
| <b>Test Conditions</b>         | The temperature was 26°C<br>Relative humidity of 50%.                                                                        |
| <b>Modification to the EUT</b> | No Modification to EUT.                                                                                                      |
| <b>Test Exercise</b>           | The EUT was placed in continuous transmit and was operated in "Test Mode" for digital emissions tests.                       |
| <b>Applicable Standards</b>    | FCC CFR 47 Part 2, & 74<br>KDB 971168 D01 V02R02<br>KDB 206256<br>ANSI/TIA 603-D:2010<br>ANSI C63.4 2014<br>ANSI C63.26 2015 |
| <b>Test Facility</b>           | Timco Engineering Inc. at 849 NW State Road 45 Newberry,<br>FL 32669 USA.<br><b>Designation #: US1070</b>                    |

## RESULTS SUMMARY

| FCC Rule Part                  | ISED Rules Part        | Requirement         | Test Item                            | Result      |
|--------------------------------|------------------------|---------------------|--------------------------------------|-------------|
| 2.1046(a),<br>74.861(e)(1)(ii) | RSS-210 G.1<br>RSS-GEN | Conducted Power     | RF Power Output                      | <b>PASS</b> |
| 2.1049(c),<br>74.861(e)(5)     | RSS-210 G.2<br>RSS-GEN | Operating Bandwidth | Occupied Bandwidth                   | <b>PASS</b> |
| 2.1049(c),<br>74.861(e)(7)     | RSS-210 G.4<br>RSS-GEN | Unwanted Emissions  | Emission Mask                        | <b>PASS</b> |
| 2.1053,<br>74.861(e)           | RSS-210<br>RSS-GEN     | Unwanted Emissions  | Field Strength of Spurious Emissions | <b>PASS</b> |
| 2.1055,<br>74.861(e)(4)        | RSS-210 G.3<br>RSS-GEN | Frequency Tolerance | Frequency Stability                  | <b>PASS</b> |

## RF POWER OUTPUT

**Rule Part No.:** 2.1046(a), 74.861(e) (1)(ii), RSS-210

### Requirement:

(e) For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply:

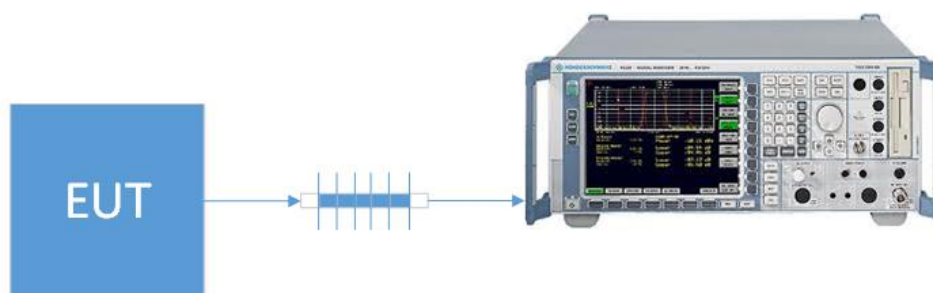
(1) The power may not exceed the following values.

(i) 54-72, 76-88, and 174-216 MHz bands: 50 mW EIRP

(ii) 470-608 and 614-698: 250 mW conducted power

**Procedure:** KDB 971168 D01 Average Power Measurements section 5.2.1  
TIA-603-E, 2.2.1

### Setup Diagram:



### Test Data: Mean Output Power Measurement Table

| Tuned Freq.<br>MHz | Power Output   |               |                |
|--------------------|----------------|---------------|----------------|
|                    | Level<br>(dBm) | Level<br>(mW) | Margin<br>(mW) |
| 487.1300           | 13.98          | 25.0          | 225.0          |
| 494.3800           | 14.03          | 25.3          | 224.7          |
| 505.7500           | 14.15          | 26.0          | 224.0          |

### Results Meet Requirements

## OCCUPIED BANDWIDTH

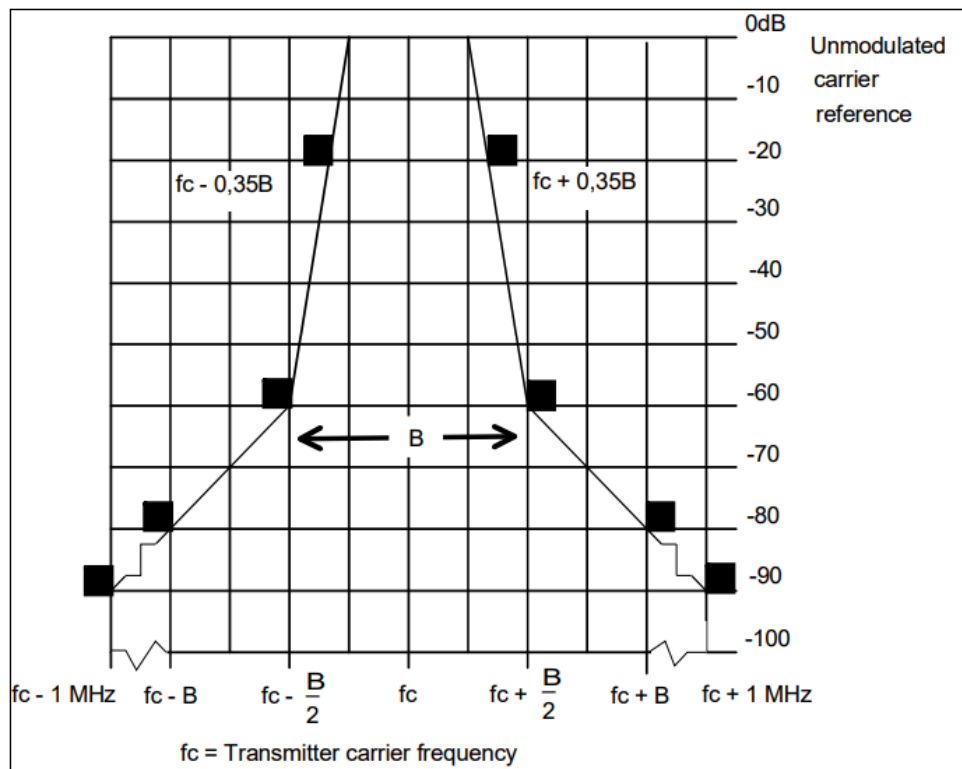
**Rule Part No.:** 2.1049(c), 74.802(c)(2), 74.861(e)(5)(7), RSS-210

### Requirement:

(e) For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply:

(5) The operating bandwidth shall not exceed 200 kHz.

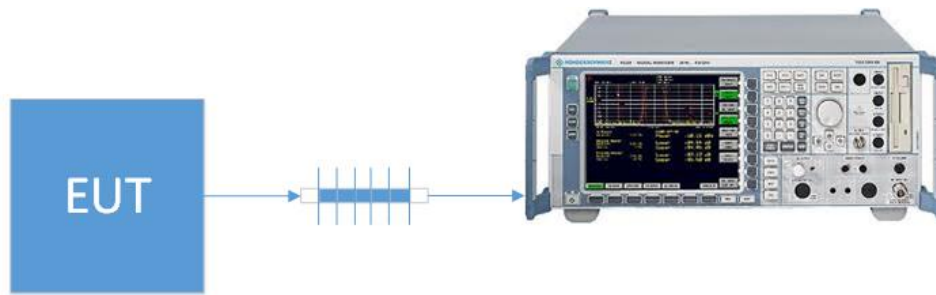
(7) Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter.



**Procedure:** KDB 971168 D01 Power Bandwidth 99% section 4.2  
 KDB 971168 D01 Spurious Emissions at antenna term section 6  
 ANSI C63.26, 5.4.4 (using Test Setup from TIA 603-E 2.2.11, below)

## OCCUPIED BANDWIDTH

### Setup Diagram:



### Test Data: Operating Bandwidth Measurement Table

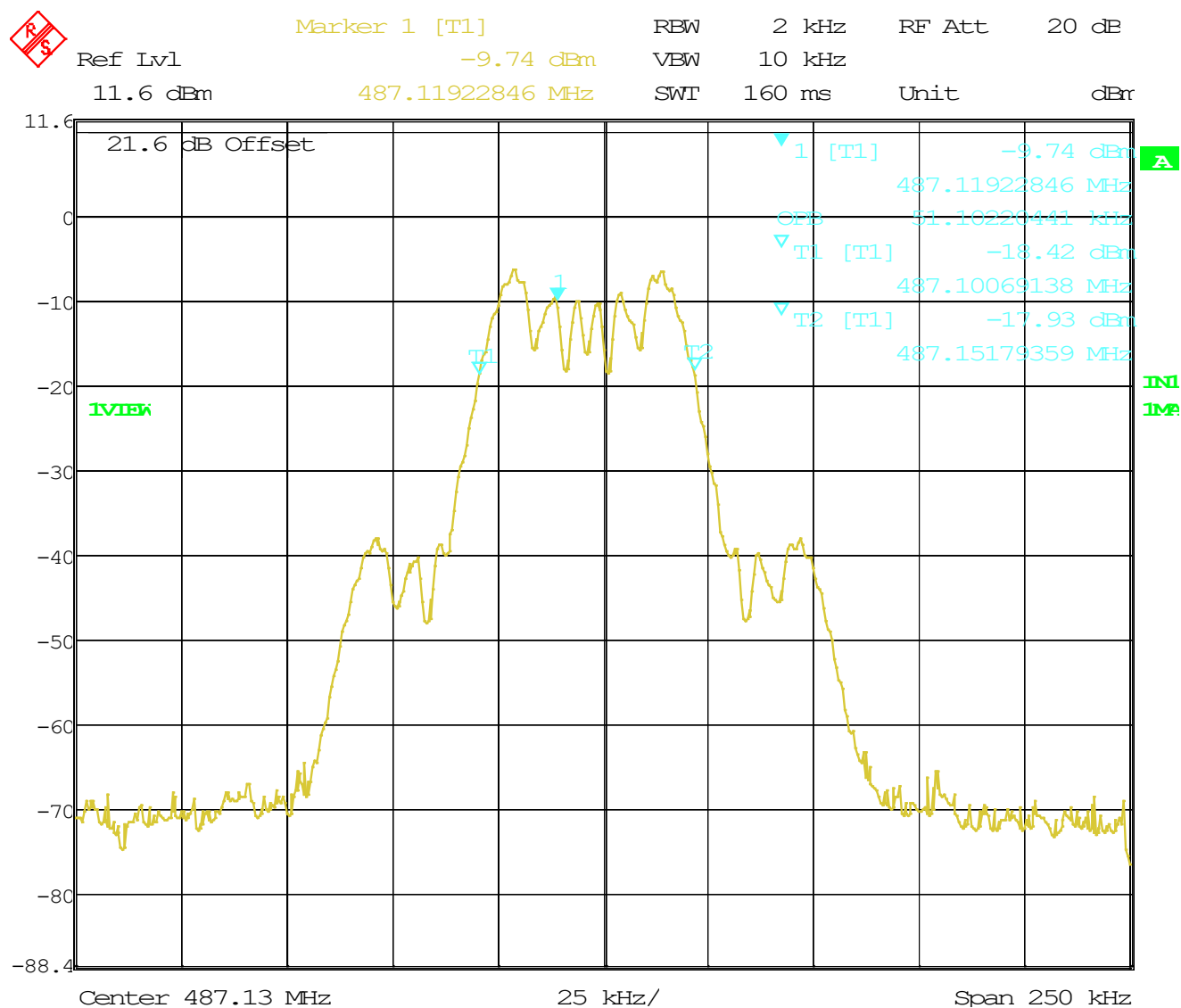
| Tuned Freq (MHz) | Measured 99% BW (KHz) | Margin (KHz) |
|------------------|-----------------------|--------------|
| 487.13           | 51.1                  | 148.9        |
| 494.38           | 51.1                  | 148.9        |
| 505.75           | 51.1                  | 148.9        |

### Results Meet Requirements



## OCCUPIED BANDWIDTH

### Test Data: 487.13 MHz 99% OBW Plot



Date: 1.JAN.1997 01:14:09

## OCCUPIED BANDWIDTH

### Test Data: 494.38 MHz 99% OBW Plot



Marker 1 [T1]

RBW 2 kHz RF Att 20 dB

Ref Lvl -7.41 dBm

VBW 10 kHz

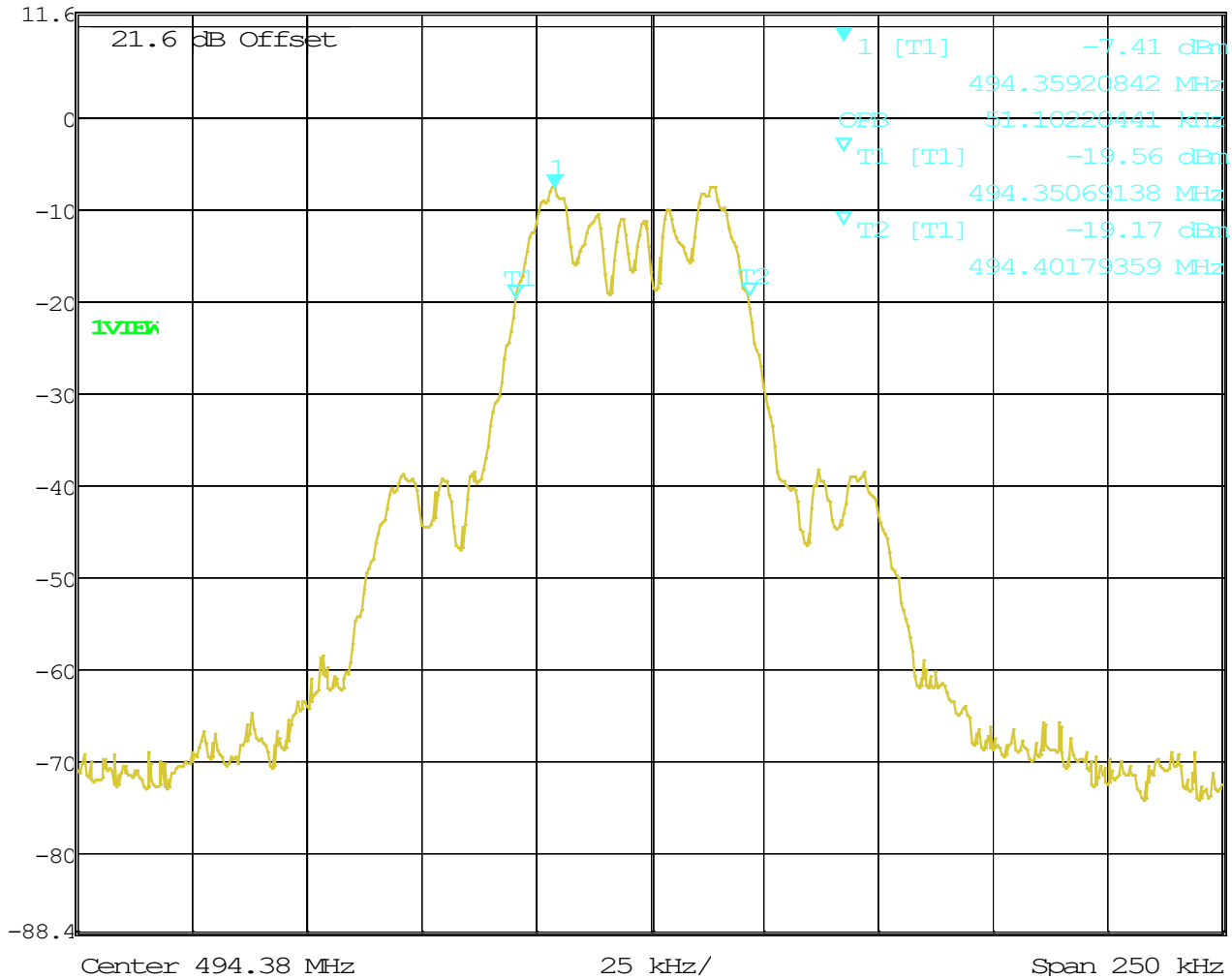
11.6 dBm

494.35920842 MHz

SWT 160 ms

Unit

dBm

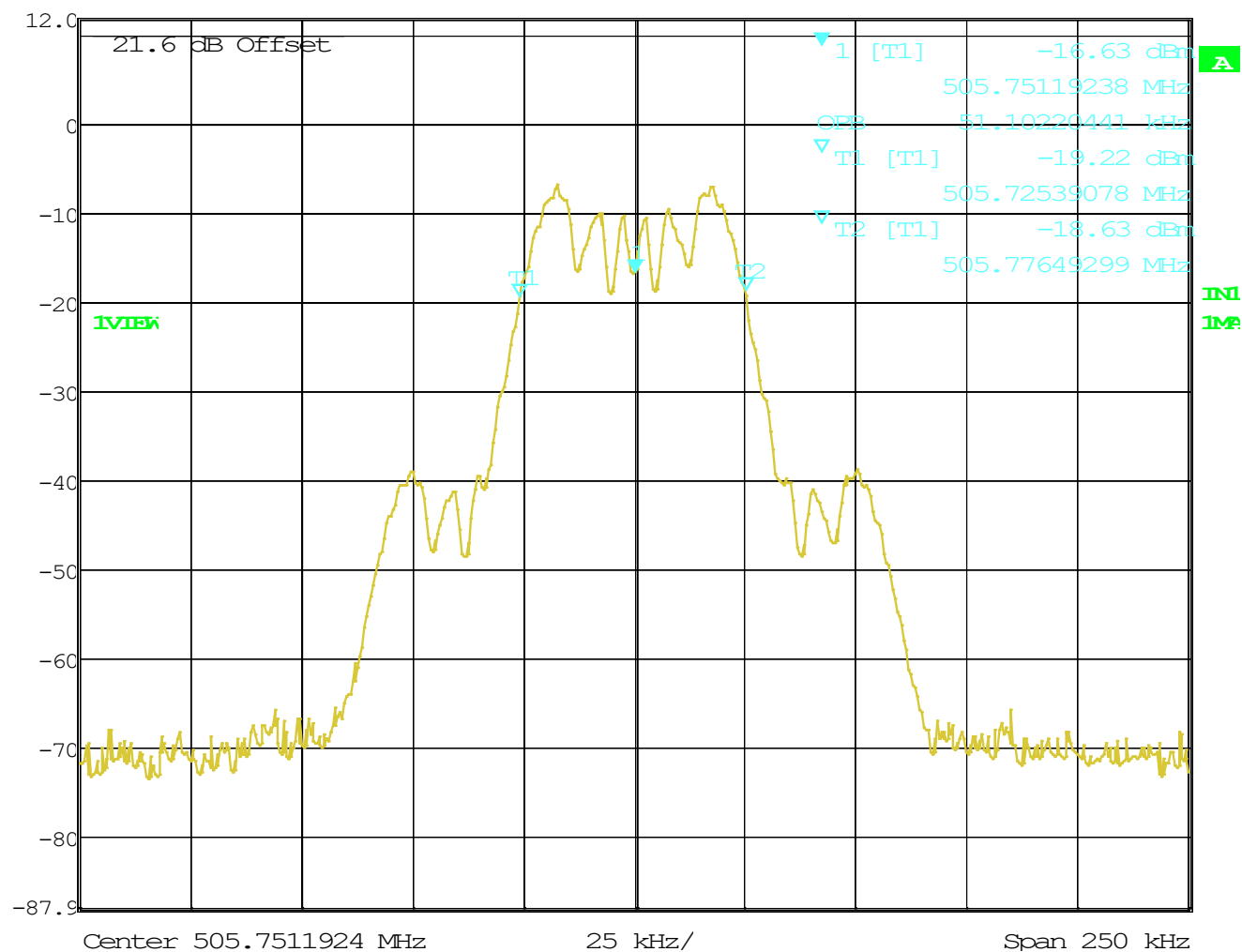


Date: 1.JAN.1997 01:15:59

## OCCUPIED BANDWIDTH

### Test Data: 505.75 MHz 99% OBW Plot

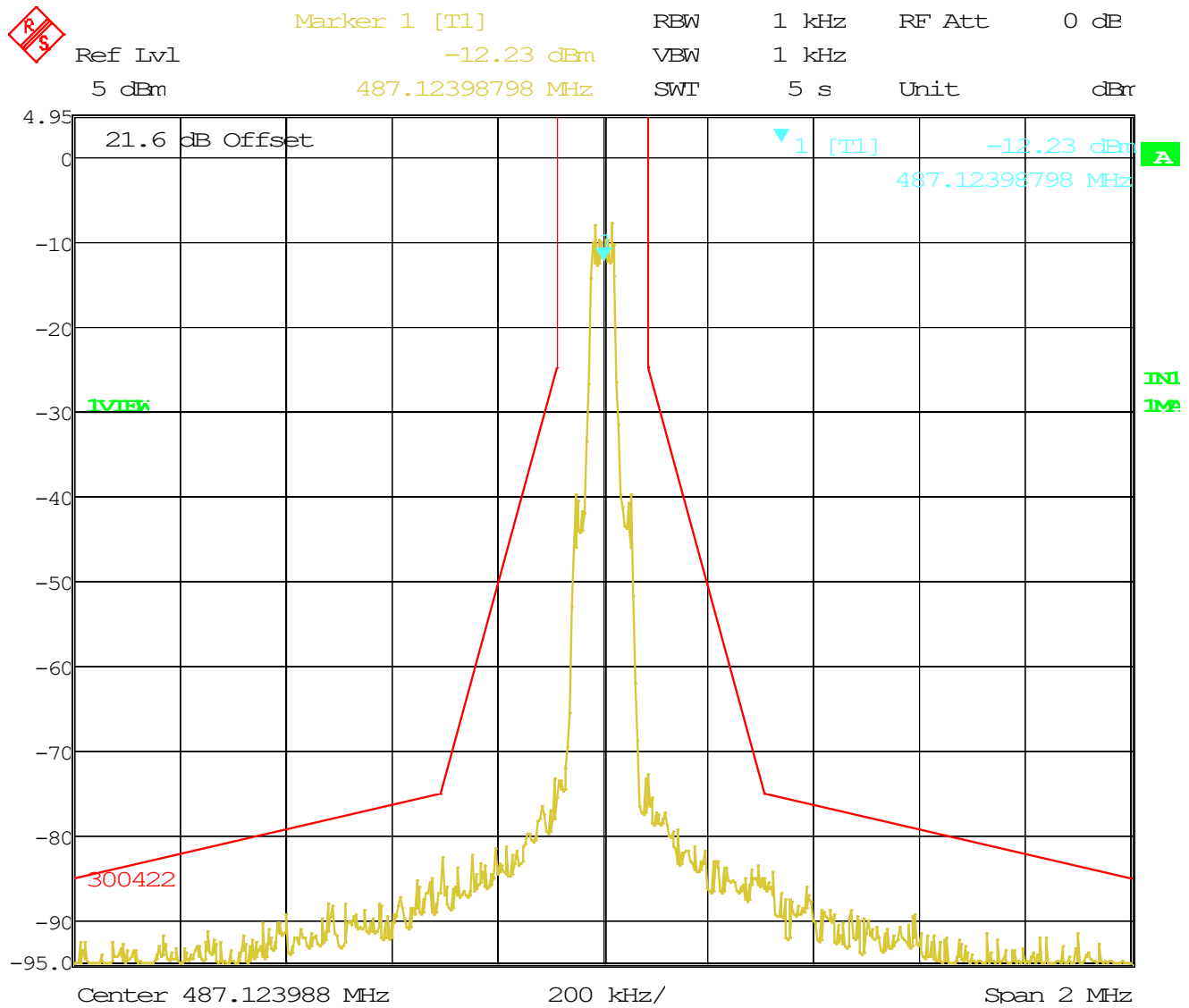

 Marker 1 [T1] RBW 2 kHz RF Att 20 dB  
 Ref Lvl -16.63 dBm VBW 10 kHz  
 12.1 dBm 505.75119238 MHz SWT 160 ms Unit dBm



Date: 1.JAN.1997 01:18:45

## OCCUPIED BANDWIDTH

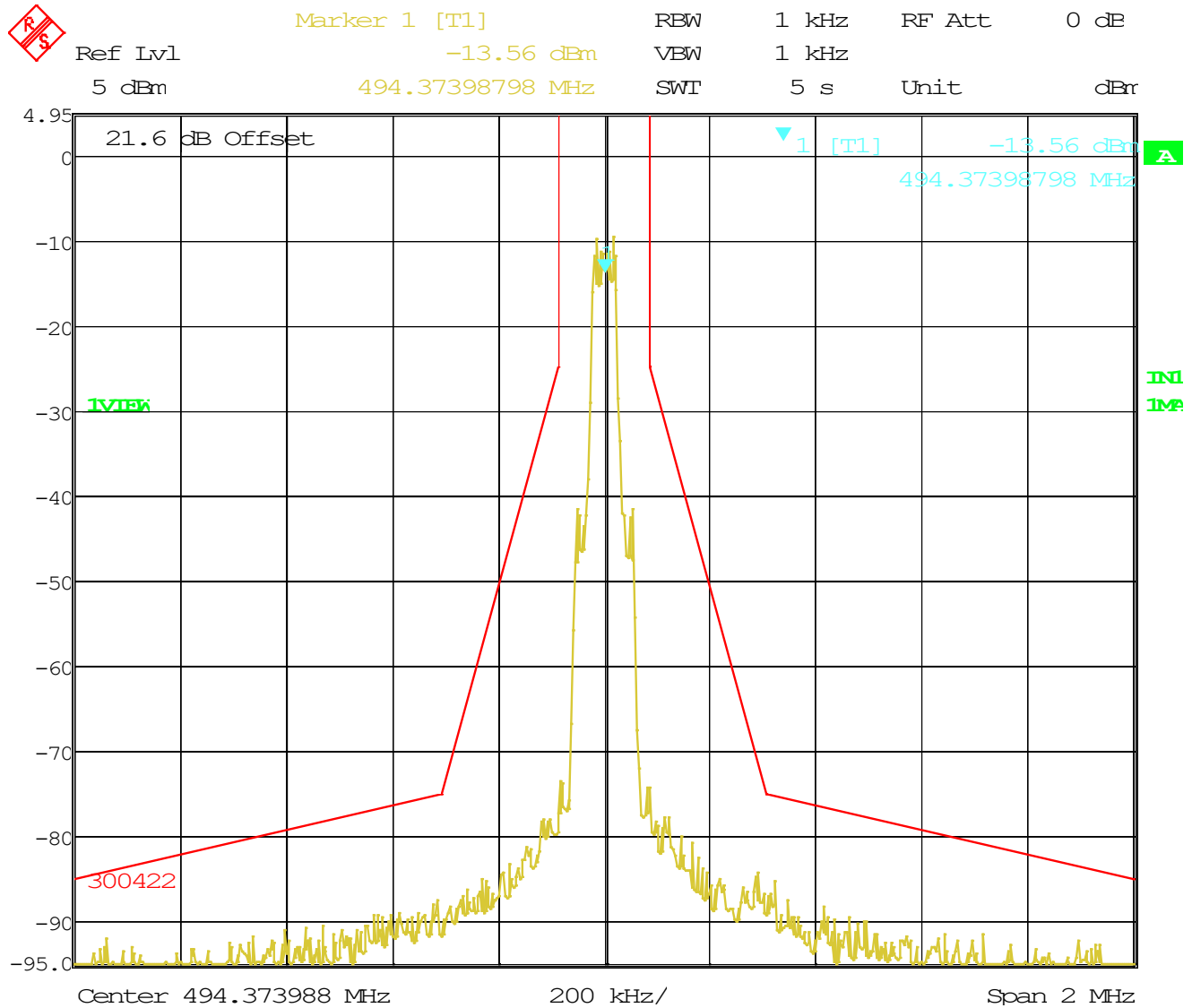
### Test Data: 487.13 MHz Emission Mask Plot



Date: 1.JAN.1997 01:37:24

## OCCUPIED BANDWIDTH

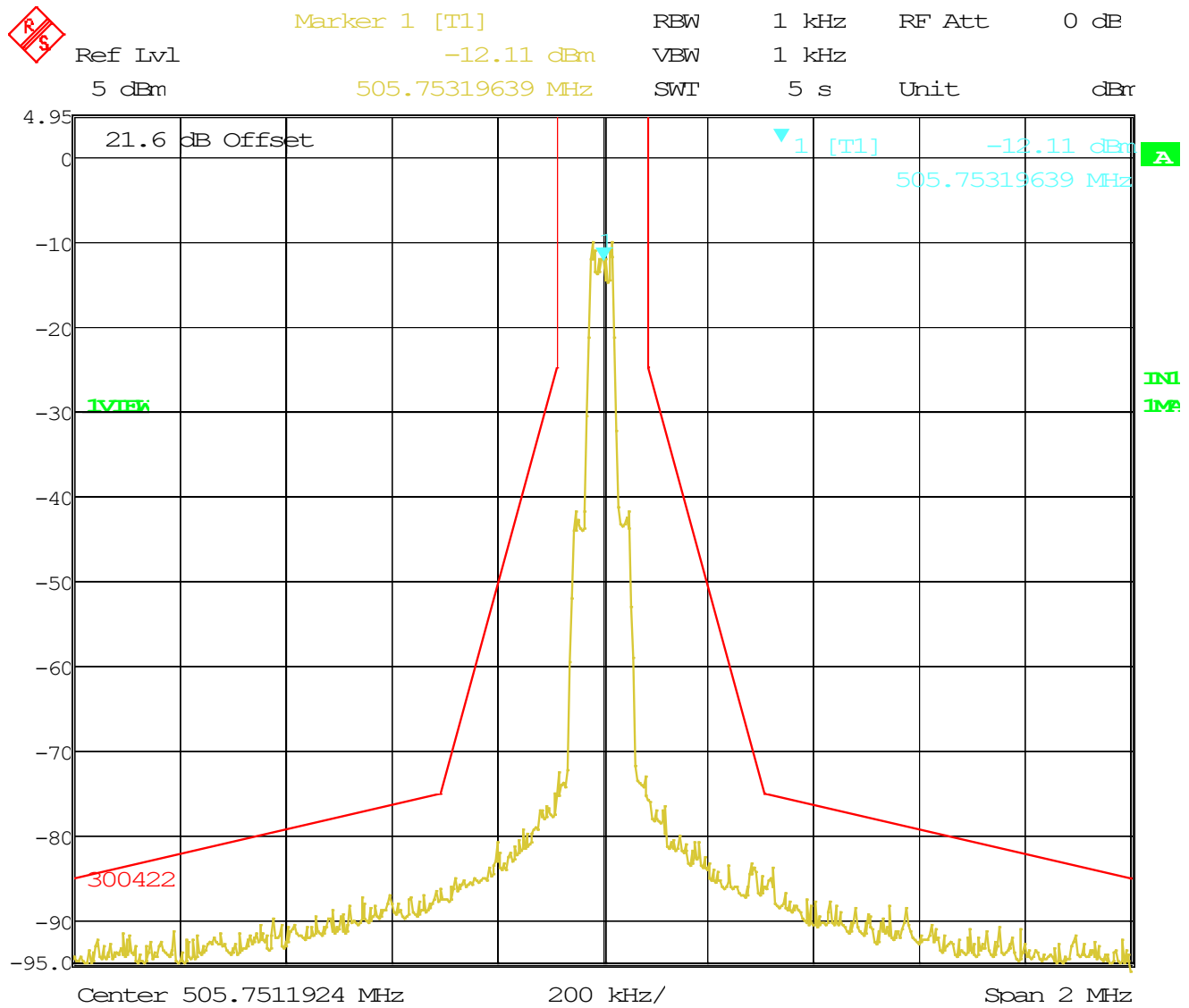
### Test Data: 494.38 MHz Emission Mask Plot



Date: 1.JAN.1997 01:36:30

## OCCUPIED BANDWIDTH

### Test Data: 505.75 MHz Emission Mask Plot



Date: 1.JAN.1997 01:35:20

## OCCUPIED BANDWIDTH

### FIELD STRENGTH OF SPURIOUS EMISSIONS

**Rule Part No.:** 2.1053, 74.861(e)(7), EN 300-422 v1.4.1 sec 8.4.3, RSS-210

#### Requirement:

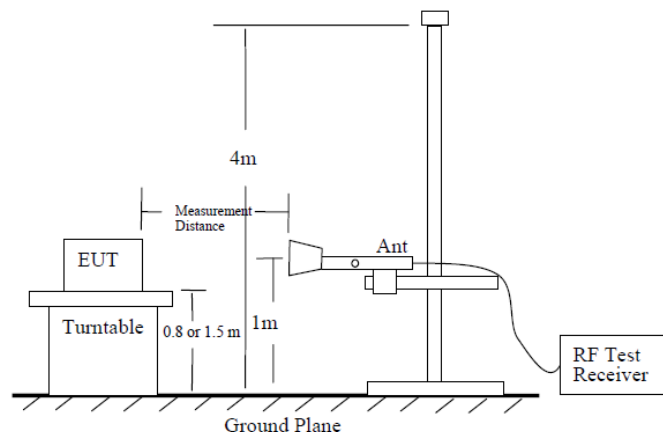
(7) Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter.

**Table 3: Limits for spurious emissions**

| State     | Frequency                                                                           |                                      |                                |
|-----------|-------------------------------------------------------------------------------------|--------------------------------------|--------------------------------|
|           | 47 MHz to 74 MHz<br>87.5 MHz to 137 MHz<br>174 MHz to 230 MHz<br>470 MHz to 862 MHz | Other Frequencies<br>below 1 000 MHz | Frequencies above<br>1 000 MHz |
| Operation | 4 nW                                                                                | 250 nW                               | 1 µW                           |
| Standby   | 2 nW                                                                                | 2 nW                                 | 20 nW                          |

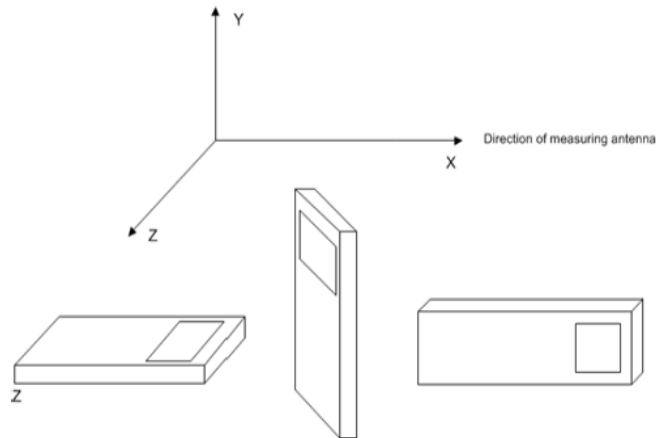
**Procedure:** KDB 971168 D01 Spurious Emissions at antenna term section 7  
ANSI C63.26, 5.5.4  
ANSI C63.4 General Radiated Testing and Site Validation

#### Test Site Setup:



## FIELD STRENGTH OF SPURIOUS EMISSIONS

### EUT Orientation(s):



**Note:** The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from the lowest frequency generated internally to at least the tenth harmonic of the fundamental. This test was conducted in accordance with the standard listed above using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669. The measurements below represent the worst case of all the frequencies tested.

**Note:** The six (6) highest emissions or more of each worst-case operational modes of the EUT are represented below. Emissions 20 dB below the limit are not required to be reported.



## FIELD STRENGTH OF SPURIOUS EMISSIONS

**Test Data: 487.13 MHz**

| Tuned Frequency (MHz) | Emission Frequency (MHz) | Meter Reading (dBμV) | Antenna Polarity | Coax Loss (dB) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Distance (m) | Field Strength (dBμV/m) | ERP (dBm) | Margin (dB) | Limit  |
|-----------------------|--------------------------|----------------------|------------------|----------------|--------------------------|-------------------------|--------------|-------------------------|-----------|-------------|--------|
| 487.13                | 974.30                   | 12.18                | H                | 3.67           | 23.50                    | 39.35                   | 3.00         | 39.35                   | -58.03    | 22.01       | -36.02 |
| 487.13                | 974.30                   | 16.78                | V                | 3.67           | 23.50                    | 43.95                   | 3.00         | 43.95                   | -53.43    | 17.41       | -36.02 |
| 487.13                | 1461.40                  | 28.88                | V                | 4.43           | 28.01                    | 61.32                   | 3.00         | 61.32                   | -36.06    | 6.06        | -30.00 |
| 487.13                | 1461.40                  | 26.79                | H                | 4.43           | 28.01                    | 59.23                   | 3.00         | 59.23                   | -38.15    | 8.15        | -30.00 |
| 487.13                | 1948.50                  | 25.04                | H                | 5.11           | 31.30                    | 61.45                   | 3.00         | 61.45                   | -35.93    | 5.93        | -30.00 |
| 487.13                | 1948.50                  | 27.71                | V                | 5.11           | 31.30                    | 64.12                   | 3.00         | 64.12                   | -33.26    | 3.26        | -30.00 |
| 487.13                | 2435.70                  | 27.90                | V                | 5.62           | 31.85                    | 65.37                   | 3.00         | 65.37                   | -32.01    | 2.01        | -30.00 |
| 487.13                | 2435.70                  | 29.04                | H                | 5.62           | 31.85                    | 66.51                   | 3.00         | 66.51                   | -30.87    | 0.87        | -30.00 |
| 487.13                | 2922.80                  | 24.23                | H                | 6.25           | 32.27                    | 62.75                   | 3.00         | 62.75                   | -34.63    | 4.63        | -30.00 |
| 487.13                | 2922.80                  | 24.42                | V                | 6.25           | 32.27                    | 62.94                   | 3.00         | 62.94                   | -34.44    | 4.44        | -30.00 |
| 487.13                | 3409.90                  | 25.12                | V                | 6.78           | 32.64                    | 64.54                   | 3.00         | 64.54                   | -32.84    | 2.84        | -30.00 |
| 487.13                | 3409.90                  | 24.12                | H                | 6.78           | 32.64                    | 63.54                   | 3.00         | 63.54                   | -33.84    | 3.84        | -30.00 |
| 487.13                | 3897.00                  | 25.60                | H                | 6.82           | 33.23                    | 65.65                   | 3.00         | 65.65                   | -31.72    | 1.72        | -30.00 |
| 487.13                | 3897.00                  | 24.63                | V                | 6.82           | 33.23                    | 64.68                   | 3.00         | 64.68                   | -32.69    | 2.69        | -30.00 |
| 487.13                | 4384.20                  | 26.02                | V                | 7.31           | 33.64                    | 66.97                   | 3.00         | 66.97                   | -30.41    | 0.41        | -30.00 |
| 487.13                | 4384.20                  | 24.13                | H                | 7.31           | 33.64                    | 65.08                   | 3.00         | 65.08                   | -32.30    | 2.30        | -30.00 |
| 487.13                | 4871.30                  | 24.43                | H                | 7.27           | 33.93                    | 65.63                   | 3.00         | 65.63                   | -31.75    | 1.75        | -30.00 |
| 487.13                | 4871.30                  | 24.04                | V                | 7.27           | 33.93                    | 65.24                   | 3.00         | 65.24                   | -32.14    | 2.14        | -30.00 |

## FIELD STRENGTH OF SPURIOUS EMISSIONS

**Test Data: 494.38 MHz**

| Tuned Frequency (MHz) | Emission Frequency (MHz) | Meter Reading (dBμV) | Antenna Polarity | Coax Loss (dB) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Distance (m) | Field Strength (dBμV/m) | ERP (dBm) | Margin (dB) | Limit  |
|-----------------------|--------------------------|----------------------|------------------|----------------|--------------------------|-------------------------|--------------|-------------------------|-----------|-------------|--------|
| 494.40                | 988.90                   | 12.81                | V                | 3.73           | 23.11                    | 39.65                   | 3.00         | 39.65                   | -57.72    | 21.70       | -36.02 |
| 494.40                | 988.90                   | 18.27                | H                | 3.73           | 23.11                    | 45.11                   | 3.00         | 45.11                   | -52.26    | 16.24       | -36.02 |
| 494.40                | 1483.30                  | 28.48                | H                | 4.46           | 27.87                    | 60.81                   | 3.00         | 60.81                   | -36.56    | 6.56        | -30.00 |
| 494.40                | 1483.30                  | 25.89                | V                | 4.46           | 27.87                    | 58.22                   | 3.00         | 58.22                   | -39.15    | 9.15        | -30.00 |
| 494.40                | 1977.80                  | 24.26                | V                | 5.14           | 31.31                    | 60.71                   | 3.00         | 60.71                   | -36.66    | 6.66        | -30.00 |
| 494.40                | 1977.80                  | 24.59                | H                | 5.14           | 31.31                    | 61.04                   | 3.00         | 61.04                   | -36.33    | 6.33        | -30.00 |
| 494.40                | 2472.20                  | 28.61                | H                | 5.62           | 32.03                    | 66.26                   | 3.00         | 66.26                   | -31.12    | 1.12        | -30.00 |
| 494.40                | 2472.20                  | 26.79                | V                | 5.62           | 32.03                    | 64.44                   | 3.00         | 64.44                   | -32.94    | 2.94        | -30.00 |
| 494.40                | 2966.60                  | 25.24                | V                | 6.29           | 32.40                    | 63.93                   | 3.00         | 63.93                   | -33.45    | 3.45        | -30.00 |
| 494.40                | 2966.60                  | 24.98                | H                | 6.29           | 32.40                    | 63.67                   | 3.00         | 63.67                   | -33.71    | 3.71        | -30.00 |
| 494.40                | 3461.10                  | 25.04                | H                | 6.85           | 32.62                    | 64.51                   | 3.00         | 64.51                   | -32.86    | 2.86        | -30.00 |
| 494.40                | 3461.10                  | 24.35                | V                | 6.85           | 32.62                    | 63.82                   | 3.00         | 63.82                   | -33.55    | 3.55        | -30.00 |
| 494.40                | 3955.50                  | 24.29                | V                | 7.07           | 33.37                    | 64.73                   | 3.00         | 64.73                   | -32.65    | 2.65        | -30.00 |
| 494.40                | 3955.50                  | 25.63                | H                | 7.07           | 33.37                    | 66.07                   | 3.00         | 66.07                   | -31.31    | 1.31        | -30.00 |
| 494.40                | 4450.00                  | 25.11                | H                | 7.32           | 33.79                    | 66.22                   | 3.00         | 66.22                   | -31.16    | 1.16        | -30.00 |
| 494.40                | 4450.00                  | 25.67                | V                | 7.32           | 33.79                    | 66.78                   | 3.00         | 66.78                   | -30.60    | 0.60        | -30.00 |
| 494.40                | 4944.40                  | 25.32                | V                | 7.45           | 33.94                    | 66.71                   | 3.00         | 66.71                   | -30.67    | 0.67        | -30.00 |
| 494.40                | 4944.40                  | 24.40                | H                | 7.45           | 33.94                    | 65.79                   | 3.00         | 65.79                   | -31.59    | 1.59        | -30.00 |

## FIELD STRENGTH OF SPURIOUS EMISSIONS

**Test Data: 505.75 MHz**

| Tuned Frequency (MHz) | Emission Frequency (MHz) | Meter Reading (dBμV) | Antenna Polarity | Coax Loss (dB) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Distance (m) | Field Strength (dBμV/m) | ERP (dBm) | Margin (dB) | Limit  |
|-----------------------|--------------------------|----------------------|------------------|----------------|--------------------------|-------------------------|--------------|-------------------------|-----------|-------------|--------|
| 506.50                | 1013.00                  | 24.15                | H                | 3.72           | 27.02                    | 54.89                   | 3.00         | 54.89                   | -42.49    | 12.49       | -30.00 |
| 506.50                | 1013.00                  | 23.20                | V                | 3.72           | 27.02                    | 53.94                   | 3.00         | 53.94                   | -43.44    | 13.44       | -30.00 |
| 506.50                | 1519.50                  | 22.11                | V                | 4.52           | 27.76                    | 54.39                   | 3.00         | 54.39                   | -42.98    | 12.98       | -30.00 |
| 506.50                | 1519.50                  | 26.79                | H                | 4.52           | 27.76                    | 59.07                   | 3.00         | 59.07                   | -38.30    | 8.30        | -30.00 |
| 506.50                | 2026.00                  | 25.73                | H                | 5.21           | 31.14                    | 62.08                   | 3.00         | 62.08                   | -35.30    | 5.30        | -30.00 |
| 506.50                | 2026.00                  | 24.15                | V                | 5.21           | 31.14                    | 60.50                   | 3.00         | 60.50                   | -36.88    | 6.88        | -30.00 |
| 506.50                | 2532.50                  | 28.20                | V                | 5.68           | 32.49                    | 66.37                   | 3.00         | 66.37                   | -31.01    | 1.01        | -30.00 |
| 506.50                | 2532.50                  | 25.68                | H                | 5.68           | 32.49                    | 63.85                   | 3.00         | 63.85                   | -33.53    | 3.53        | -30.00 |
| 506.50                | 3039.00                  | 25.19                | H                | 6.36           | 32.61                    | 64.16                   | 3.00         | 64.16                   | -33.21    | 3.21        | -30.00 |
| 506.50                | 3039.00                  | 24.05                | V                | 6.36           | 32.61                    | 63.02                   | 3.00         | 63.02                   | -34.35    | 4.35        | -30.00 |
| 506.50                | 3545.50                  | 23.57                | V                | 6.80           | 32.93                    | 63.30                   | 3.00         | 63.30                   | -34.08    | 4.08        | -30.00 |
| 506.50                | 3545.50                  | 23.79                | H                | 6.80           | 32.93                    | 63.52                   | 3.00         | 63.52                   | -33.86    | 3.86        | -30.00 |
| 506.50                | 4052.00                  | 24.58                | H                | 7.18           | 33.38                    | 65.14                   | 3.00         | 65.14                   | -32.24    | 2.24        | -30.00 |
| 506.50                | 4052.00                  | 24.86                | V                | 7.18           | 33.38                    | 65.42                   | 3.00         | 65.42                   | -31.96    | 1.96        | -30.00 |
| 506.50                | 4558.50                  | 24.42                | V                | 7.43           | 34.01                    | 65.86                   | 3.00         | 65.86                   | -31.51    | 1.51        | -30.00 |
| 506.50                | 4558.50                  | 25.21                | H                | 7.43           | 34.01                    | 66.65                   | 3.00         | 66.65                   | -30.72    | 0.72        | -30.00 |
| 506.50                | 5065.00                  | 23.99                | H                | 7.68           | 34.07                    | 65.74                   | 3.00         | 65.74                   | -31.64    | 1.64        | -30.00 |
| 506.50                | 5065.00                  | 24.64                | V                | 7.68           | 34.07                    | 66.39                   | 3.00         | 66.39                   | -30.99    | 0.99        | -30.00 |

## FIELD STRENGTH OF SPURIOUS EMISSIONS

### FREQUENCY STABILITY

**Rule Part No.:** 2.1053, 74.861(e) (4), RSS-210

**Requirement:** The frequency tolerance of the transmitter shall be 0.005 percent.

**Procedure:** KDB 971168 D01 Spurious Emissions at antenna term section 9  
TIA 603-D Carrier Frequency Stability 2.2.2

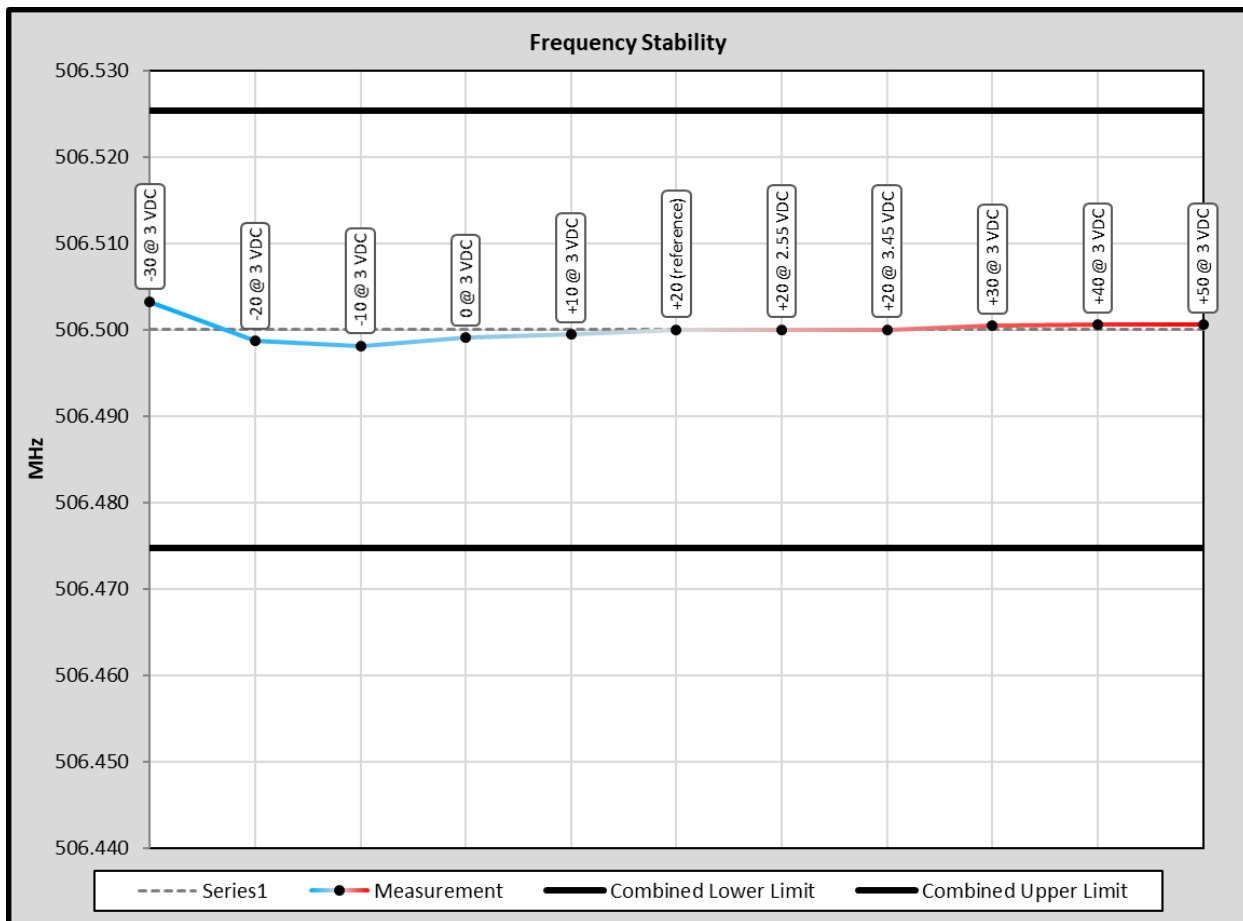
#### Test Data: Measurement Table

|                                 |                      |                                                              |                 |
|---------------------------------|----------------------|--------------------------------------------------------------|-----------------|
| FCC Part 90 Limit               | 50.0                 | ppm                                                          |                 |
| FCC Part 90 Limit, as ppb       | 50000                | ppb (Parts per Billion)                                      |                 |
| FCC Part 90 Limit, as %         | 0.00500              | %                                                            |                 |
| Strictest Combined Limit, as Hz | 25325.000            | Hz                                                           |                 |
| Combined Lower Limit            | 506.474675           | MHz                                                          |                 |
| Combined Upper Limit            | 506.525325           | MHz                                                          |                 |
| Rated Supply Voltage            | 3.0                  | <input type="radio"/> AC <input checked="" type="radio"/> DC |                 |
| Temperature / Voltage Variation |                      |                                                              |                 |
| Temperature (°C)                | Supplied Voltage (V) | Frequency (MHz)                                              | Deviation (kHz) |
| -30                             | 3.0                  | 506.503220                                                   | -3.220          |
| -20                             | 3.0                  | 506.498680                                                   | 1.320           |
| -10                             | 3.0                  | 506.498100                                                   | 1.900           |
| 0                               | 3.0                  | 506.499060                                                   | 0.940           |
| +10                             | 3.0                  | 506.499460                                                   | 0.540           |
| +20 (reference)                 | 3.0                  | 506.500000                                                   | 0.000           |
| +20                             | 2.6                  | 506.500000                                                   | 0.000           |
| +20                             | 3.5                  | 506.500000                                                   | 0.000           |
| +30                             | 3.0                  | 506.500410                                                   | -0.410          |
| +40                             | 3.0                  | 506.500554                                                   | -0.554          |
| +50                             | 3.0                  | 506.500538                                                   | -0.538          |

#### Results Meet Requirements

## FREQUENCY STABILITY

### Test Data: Measurement Graph



### Results Meet Requirements

## STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: “Uncertainty in EMC Measurements” and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

| Test Items                                                            | Measurement Uncertainty   | Notes |
|-----------------------------------------------------------------------|---------------------------|-------|
| RF Frequency Accuracy                                                 | $\pm 49.5 \text{ Hz}$     | (1)   |
| RF Conducted Power                                                    | $\pm 0.93\text{dB}$       | (1)   |
| Conducted spurious emission of transmitter valid up to 40GHz          | $\pm 1.86\text{dB}$       |       |
| Occupied Bandwidth                                                    | $\pm 2.65\%$              |       |
| Audio Frequency Response                                              | $\pm 1.86\text{dB}$       |       |
| Modulation limiting                                                   | $\pm 1.88\%$              |       |
| Radiated RF Power                                                     | $\pm 1.4\text{dB}$        |       |
| Maximum frequency deviation:<br>Within 300 Hz and 6kHz of audio freq. | $\pm 1.88\%$              |       |
| Within 6kHz and 25kHz of audio Freq.                                  | $\pm 2.04\%$              |       |
| Rad Emissions Sub Meth up to 26.5GHz                                  | $\pm 2.14\text{dB}$       |       |
| Adjacent channel power                                                | $\pm 1.47\text{dB}$       | (1)   |
| Transient Frequency Response                                          | $\pm 1.88\%$              |       |
| Temperature                                                           | $\pm 1.0^{\circ}\text{C}$ | (1)   |
| Humidity                                                              | $\pm 5.0\%$               |       |

Notes: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## EMC EQUIPMENT LIST

| Device                                                         | Manufacturer       | Model                              | SN                                           | Calibration Date | Cal Due Date |
|----------------------------------------------------------------|--------------------|------------------------------------|----------------------------------------------|------------------|--------------|
| EMI Test Receiver R & S ESIB 40<br>firmware v 4.34.3 BIOS v3.3 | Rohde & Schwarz    | ESIB 40                            | 100274                                       | 07/22/19         | 07/22/21     |
| Software: Field Strength Program                               | Timco              | N/A                                | Version 4.10.7.0                             | N/A              | N/A          |
| Coaxial Cable - Chamber 3 cable set<br>(backup)                | Micro-Coax         | Chamber<br>3 cable set<br>(backup) | KMKM-0244-02<br>KMKM-0670-01<br>KFKF-0197-00 | 02/27/19         | 02/27/21     |
| CHAMBER                                                        | Panashield         | 3M                                 | N/A                                          | 03/15/19         | 03/15/21     |
| Antenna: Active Loop                                           | ETS-Lindgren       | 6502                               | 00062529                                     | 12/11/17         | 12/11/20     |
| Antenna: Biconical 1096                                        | Eaton              | 94455-1                            | 1096                                         | 08/01/17         | 08/01/20     |
| Antenna: Log-Periodic 1122                                     | Electro-Metrics    | LPA-25                             | 1122                                         | 07/26/17         | 07/26/20     |
| Ant: Double-Ridged Horn/ETS Horn 1                             | ETS-Lindgren       | 3117                               | 00035923                                     | 01/30/17         | 01/30/20     |
| Temperature Chamber LARGE                                      | Tenney Engineering | TTRC                               | 11717-7                                      | N/A              | N/A          |
| Type K J Thermometer                                           | Martel             | 303                                | 080504494                                    | 11/06/17         | 11/06/20     |

### \*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

## END OF TEST REPORT