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# Report On

Limited FCC and Industry Canada Testing of the  
ETELM SAS NetisB25 (460.025 MHz to 464.025 MHz)  
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and  
Industry Canada RSS-119

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FCC ID: 2AF3I-BSTETRA460  
IC: 20543-BSTETRA460

Document 75932976 Report 04 Issue 1

December 2015



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**DATED**

16 December 2015

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**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Tuckwell



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## **SECTION 1**

### **REPORT SUMMARY**

Limited FCC and Industry Canada Testing of the  
ETELM SAS NetisB25 (460.025 MHz to 464.025 MHz)  
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119



## 1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC and Industry Canada Testing of the ETELM SAS NetisB25 (460.025 MHz to 464.025 MHz) to the requirements of FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119.

|                                |                                                                                                                                                                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective                      | To perform Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out. |
| Manufacturer                   | ETELM SAS                                                                                                                                                       |
| Model Number(s)                | NetisB25                                                                                                                                                        |
| Serial Number(s)               | 0155                                                                                                                                                            |
| Number of Samples Tested       | 1                                                                                                                                                               |
| Test Specification/Issue/Date  | FCC 47 CFR Part 90 (2014)<br>FCC 47 CFR Part 2 (2014)<br>Industry Canada RSS-119 (Issue 11, 2011)                                                               |
| Incoming Release Date          | Application Form<br>14 August 2015                                                                                                                              |
| Disposal Reference Number Date | Held Pending Disposal<br>Not Applicable<br>Not Applicable                                                                                                       |
| Order Number Date              | 7883<br>16 July 2015                                                                                                                                            |
| Start of Test                  | 19 August 2015                                                                                                                                                  |
| Finish of Test                 | 19 August 2015                                                                                                                                                  |
| Name of Engineer(s)            | J Tuckwell                                                                                                                                                      |
| Related Document(s)            | ANSI C63.4: 2009                                                                                                                                                |



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## 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119 is shown below.

| Section | Specification Clause |        |         | Test Description               | Result | Comments/Base Standard |
|---------|----------------------|--------|---------|--------------------------------|--------|------------------------|
|         | Part 90              | Part 2 | RSS-119 |                                |        |                        |
| Tetra   |                      |        |         |                                |        |                        |
| 2.1     | 90.210<br>(c)(3)     | 2.1051 | 5.8     | Transmitter Unwanted Emissions | Pass   |                        |



### 1.3 APPLICATION FORM

| EQUIPMENT DESCRIPTION                                                                           |                                                                                                                                   |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Model Name/Number                                                                               | NetisB25                                                                                                                          |
| Part Number                                                                                     | 360                                                                                                                               |
| Hardware Version                                                                                | 1                                                                                                                                 |
| Software Version                                                                                | 9.05e                                                                                                                             |
| FCC ID (if applicable)                                                                          | 2AF3I-BSTETRA460                                                                                                                  |
| Industry Canada ID (if applicable)                                                              | 20543-BSTETRA460                                                                                                                  |
| Technical Description (Please provide a brief description of the intended use of the equipment) | Tetra Base Station which can work in stand-alone mode or which can be connected to others Base Station to create a Tetra Network. |

| POWER SOURCE                                           |                                                        |
|--------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> AC mains                      | State voltage                                          |
| AC supply frequency (Hz)                               |                                                        |
| VAC                                                    |                                                        |
| Max Current                                            |                                                        |
| Hz                                                     |                                                        |
| <input type="checkbox"/> Single phase                  | <input type="checkbox"/> Three phase                   |
| And / Or                                               |                                                        |
| <input checked="" type="checkbox"/> External DC supply |                                                        |
| Nominal voltage                                        | 48 V Max Current 15 A                                  |
| Extreme upper voltage                                  | 55.2 V                                                 |
| Extreme lower voltage                                  | 40.8 V                                                 |
| Battery                                                |                                                        |
| <input type="checkbox"/> Nickel Cadmium                | <input type="checkbox"/> Lead acid (Vehicle regulated) |
| <input type="checkbox"/> Alkaline                      | <input type="checkbox"/> Leclanche                     |
| <input type="checkbox"/> Lithium                       | <input type="checkbox"/> Other Details :               |
| Volts nominal.                                         |                                                        |
| End point voltage as quoted by equipment manufacturer  | V                                                      |

| FREQUENCY INFORMATION                    |                                                        |
|------------------------------------------|--------------------------------------------------------|
| Frequency Range                          | 460.025 to 464.025 MHz                                 |
| Channel Spacing (where applicable)       | 5                                                      |
| Receiver Frequency Range (if different)  | 465.025 to 469.025 MHz                                 |
| Channel Spacing (if different)           |                                                        |
| Test Frequencies*                        | Bottom 460.025 MHz Channel Number (if applicable) 2401 |
|                                          | Middle 462.025 MHz Channel Number (if applicable) 2481 |
|                                          | Top 464.025 MHz Channel Number (if applicable) 2561    |
| Intermediate Frequencies                 | 23.3 MHz                                               |
| Highest Internally Generated Frequency : | TX freq+23.3 MHz                                       |



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| POWER CHARACTERISTICS            |    |                                         |                                        |
|----------------------------------|----|-----------------------------------------|----------------------------------------|
| Maximum TX power                 | 25 | W                                       |                                        |
| Minimum TX power                 |    | W (if variable)                         |                                        |
| Is transmitter intended for :    |    |                                         |                                        |
| Continuous duty                  |    | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| Intermittent duty                |    | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| If intermittent state DUTY CYCLE |    |                                         |                                        |
| Transmitter ON                   |    | seconds                                 |                                        |
| Transmitter OFF                  |    | seconds                                 |                                        |

| ANTENNA CHARACTERISTICS             |                             |                 |                     |
|-------------------------------------|-----------------------------|-----------------|---------------------|
| <input checked="" type="checkbox"/> | Antenna connector           | State impedance | 50 Ohm              |
| <input type="checkbox"/>            | Temporary antenna connector | State impedance | Ohm                 |
| <input type="checkbox"/>            | Integral antenna            | Type            | State impedance dBi |
| <input type="checkbox"/>            | External antenna            | Type            | State impedance dBi |

| MODULATION CHARACTERISTICS                |           |                          |                                                          |
|-------------------------------------------|-----------|--------------------------|----------------------------------------------------------|
| <input type="checkbox"/>                  | Amplitude | <input type="checkbox"/> | Frequency                                                |
| <input checked="" type="checkbox"/>       | Phase     | <input type="checkbox"/> | Other (please provide details):                          |
| Can the transmitter operate un-modulated? |           |                          | <input type="checkbox"/> Yes <input type="checkbox"/> No |

| CLASS OF EMISSION USED                                   |  |
|----------------------------------------------------------|--|
| ITU designation or Class of Emission:                    |  |
| 1                                                        |  |
| (if applicable) 2                                        |  |
| (if applicable) 3                                        |  |
| If more than three classes of emission, list separately: |  |

| BATTERY POWER SUPPLY |                            |
|----------------------|----------------------------|
| Model name/number    | Identification/Part number |
| Manufacturer         | Country of Origin          |

| ANCILLARIES (If applicable) |                            |
|-----------------------------|----------------------------|
| Model name/number           | Identification/Part number |
| Manufacturer                | Country of Origin          |

| EXTREME CONDITIONS          |      |    |                             |      |    |
|-----------------------------|------|----|-----------------------------|------|----|
| Extreme test voltages (Max) | 55.2 | V  | Extreme test voltages (Mix) | 40.8 | V  |
| Nominal DC Voltage          | 48   | V  | DC Maximum Current          | 15   | A  |
| Maximum temperature         | 55   | °C | Minimum temperature         | -10  | °C |

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature:

Name: VELTZ

Position held: Tests Manager

Date: 14/08/15



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## **1.4 PRODUCT INFORMATION**

### **1.4.1 Technical Description**

The Equipment Under Test (EUT) was a ETELM SAS NetisB25 (460.025 MHz to 464.025 MHz). A full technical description can be found in the manufacturer's documentation.

## **1.5 TEST CONDITIONS**

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 48 V DC supply.

FCC Measurement Facility Registration Number  
90987 Octagon House, Fareham Test Laboratory

Industry Canada Company Address Code  
IC2932B-1 Octagon House, Fareham Test Laboratory

## **1.6 DEVIATIONS FROM THE STANDARD**

No deviations from the applicable test standard were made during testing.

## **1.7 MODIFICATION RECORD**

Modification 0 - No modifications were made to the test sample during testing.



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## **SECTION 2**

### **TEST DETAILS**

Limited FCC and Industry Canada Testing of the  
ETELM SAS NetisB25 (460.025 MHz to 464.025 MHz)  
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119



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## **2.1 TRANSMITTER UNWANTED EMISSIONS**

### **2.1.1 Specification Reference**

FCC 47 CFR Part 90, Clause 90.210 (c)(3)  
FCC 47 CFR Part 2, Clause 2.1051  
Industry Canada RSS-119, Clause 5.8

### **2.1.2 Equipment Under Test and Modification State**

NetisB25 S/N: 0155 - Modification State 0

### **2.1.3 Date of Test**

19 August 2015

### **2.1.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.1.5 Test Procedure**

The test was performed in accordance with ANSI C63.10, Clause 6.3, 6.5, and 6.6

#### Remarks

All final measurements were assessed against the emission limits in Industry Canada RSS-119, Clause 5.8.10 and FCC 47 CFR Part 90, Clause 90.210 (c)(3)

### **2.1.6 Environmental Conditions**

|                     |        |
|---------------------|--------|
| Ambient Temperature | 19.3°C |
| Relative Humidity   | 54.0%  |

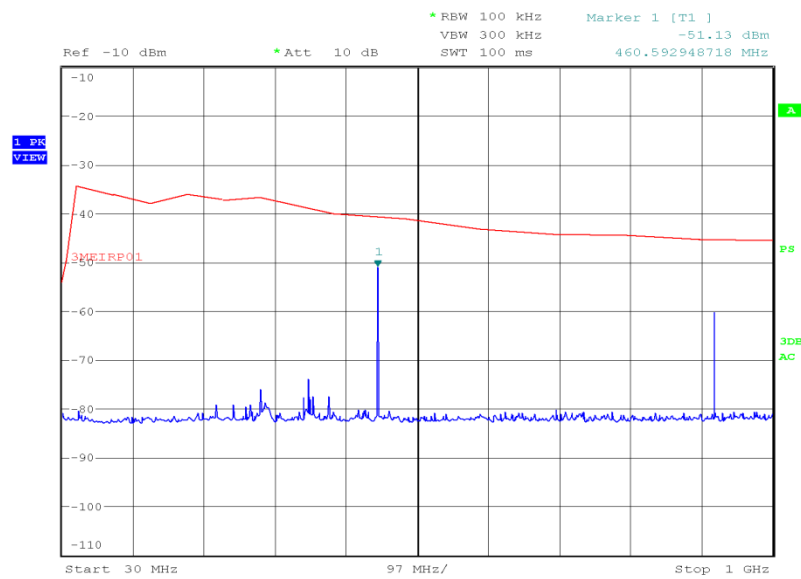


## 2.1.7 Test Results

### Radiated

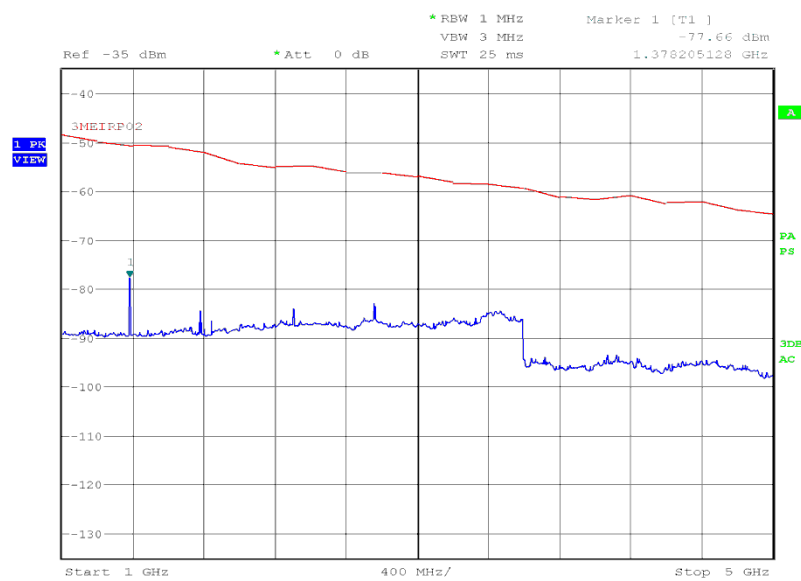
460.025 MHz

30 MHz to 1 GHz



Date: 19.AUG.2015 13:39:42

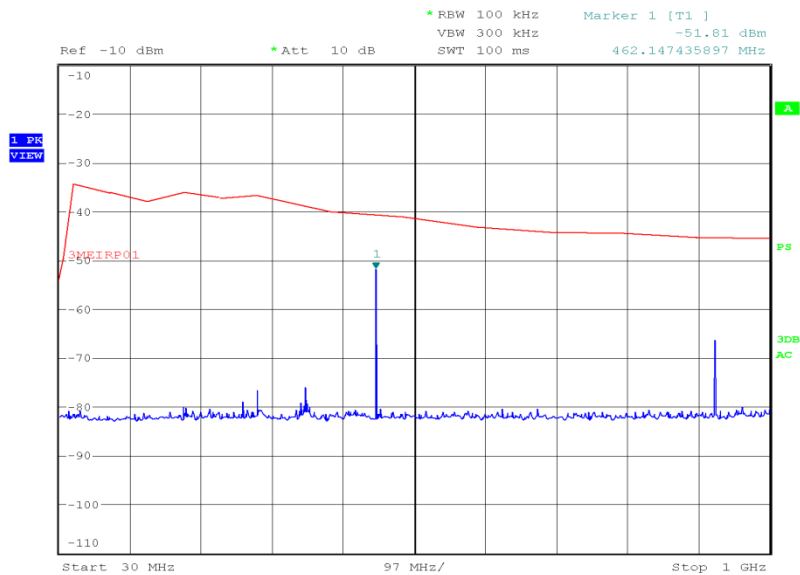
1 GHz to 5 GHz



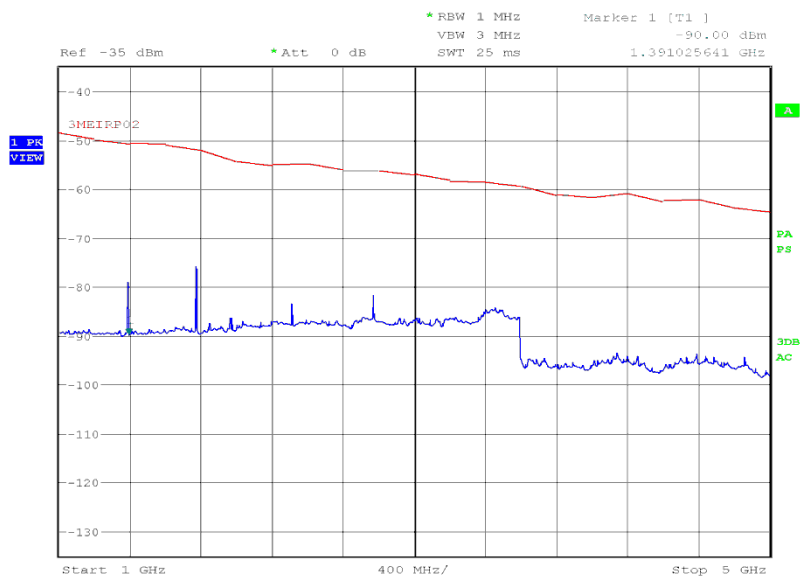
Date: 19.AUG.2015 15:18:39



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462.025 MHz30 MHz to 1 GHz

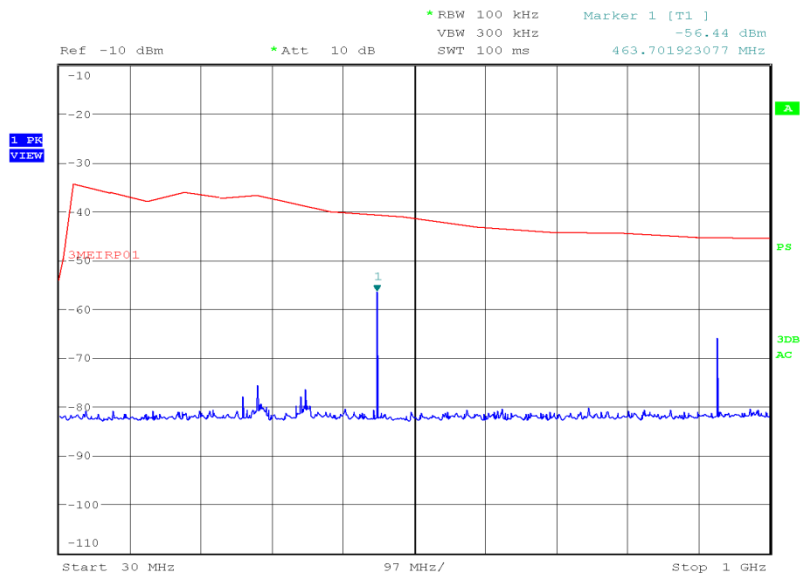
Date: 19.AUG.2015 13:56:11

1 GHz to 5 GHz

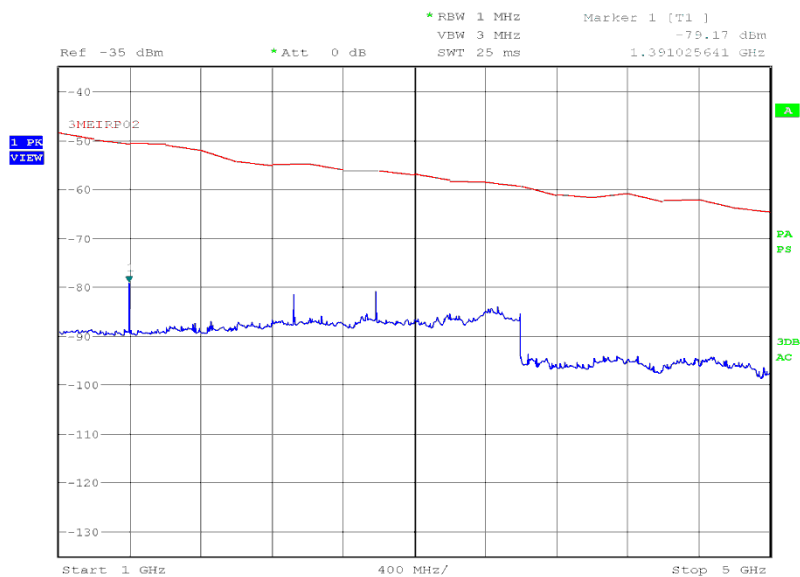
Date: 19.AUG.2015 14:58:44



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464.025 MHz30 MHz to 1 GHz

Date: 19.AUG.2015 14:10:17

1 GHz to 5 GHz

Date: 19.AUG.2015 14:42:36



### Remarks

EIRP 01 limit line refers to a -13 dBm limit line which has been derived from -57 dBc from the cutomers declared power of 44 dBm using a Bilog antenna between 30 MHz and 1 GHz

EIRP 02 limit line refers to a -13 dBm limit line which has been derived from -57 dBc from the cutomers declared power of 44 dBm using a Double Ridge Guide (DRG) antenna between 1 GHz and 5 GHz, 48 V DC Supply

### FCC 47 CFR Part 90, Limit Clause 90.210 (c)(3)

On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

### Industry Canada RSS-119, Limit Clause 5.8.10

### Emission Mask Y

| Displacement Frequency, $f_d$ (kHz) | Minimum Attenuation (dB)                                                                    |
|-------------------------------------|---------------------------------------------------------------------------------------------|
| $12.375 < f_d \leq 13.975$          | Whichever is the lesser attenuation:<br>$30 + 16.67(f_d - 12.375)$ or $55 + 10\log_{10}(p)$ |
| $f_d > 13.975$                      | Whichever is the lesser attenuation:<br>57 or $55 + 10\log_{10}(p)$                         |



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### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

| Instrument                                          | Manufacturer    | Type No.   | TE No.         | Calibration Period (months) | Calibration Due |
|-----------------------------------------------------|-----------------|------------|----------------|-----------------------------|-----------------|
| <b>Section 2.1 - Transmitter Spurious Emissions</b> |                 |            |                |                             |                 |
| Antenna (Double Ridge Guide, 1GHz-18GHz)            | EMCO            | 3115       | 234            | 12                          | 29-Apr-2016     |
| Screened Room (5)                                   | Rainford        | Rainford   | 1545           | 0                           | 20-Dec-2017     |
| Turntable Controller                                | Inn-Co GmbH     | CO 1000    | 1606           | -                           | TU              |
| Antenna (Bilog)                                     | Chase           | CBL6143    | 2904           | 24                          | 11-Jun-2017     |
| EMI Test Receiver                                   | Rohde & Schwarz | ESU40      | 3506           | 12                          | 27-Oct-2015     |
| Tilt Antenna Mast                                   | maturo GmbH     | TAM 4.0-P  | 3916           | -                           | TU              |
| Mast Controller                                     | maturo GmbH     | NCD        | 3917           | -                           | TU              |
| 50 ohm load                                         | Delta Ohm       | 06 150 011 | Not serialised | -                           | TU              |

TU – Traceability Unscheduled



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### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

| Test Discipline                | MU                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------|
| Transmitter Unwanted Emissions | Radiated: 30 MHz to 1 GHz: $\pm 5.1$ dB<br>Radiated: 1 GHz to 40 GHz: $\pm 6.3$ dB |



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## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



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#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

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Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
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