Laboratory Test Report

ELECTROMAGNETIC COMPATIBILITY

for the

TPGB1B Handportable Transceiver

Tested In accordance with

47CFR 15.109 & 15.111 and RSS-Gen Issue 5, 7.3 & 7.4

Report Revision: Issue Date: FCC ID: ISED:

1 11 April 2024 CASTPGB1B 737A-TPGB1B

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Tests indicated as not accredited are outside the laboratory's scope of accreditation.

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Report Revision: 1 Issue Date: 11 April 2024

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TELTEST Laboratories Tait International Ltd

Report Number 4351

Revision History

| Date | Revision | Comments |
|---------------|----------|---------------------|
| 11 April 2024 | 1 | Initial test report |
| | | |

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Tait International Ltd Report Number 4351

Introduction

This report is to prove compliance of the TPGB1B 136-174MHz IS Handportable Transceiver, in accordance with:

47CFR 15.109 & 15.111

and

RSS-Gen Issue 5, sections 7.3 & 7.4

This radio supports Analogue, Digital FFSK, Digital Mobile Radio (DMR), APCO P25 Phase-1, and APCO P25 Phase-2 modulations.

Previous PCB IPN: N/A New PCB IPN: 220-01992-02

Report Prepared For

Tait International Ltd 245 Wooldridge Road Harewood Christchurch 8051 New Zealand

Description of Sample

| Manufacturer: | Tait International Limited |
|----------------|----------------------------|
| Equipment: | Handportable Transceiver |
| Туре: | TPGB1B |
| Product Code: | T03-25007-BAAA |
| Serial Number: | 26908394 |
| Quantity: | 1 |

HARDWARE & SOFTWARE

| Quantity. | | |
|------------------|------------------------|-----------------|
| Туре | Code and Version | Target Hardware |
| Hardware ID | TPGB11-B101_0005 | Portable |
| Firmware Package | QIDMR_3.04.00.0016 | Portable |
| FPGA Image | QPG1G_S02_3.09.03.32c9 | Portable |

Test Requirements and Result Summary

| FCC Specification | RSS-Gen Specification | Test Items | Test Methods | Result |
|----------------------|--------------------------|--|------------------|--------|
| FCC 47 CFR 15.109 | RSS-Gen 7.3 | Receiver Spurious Emissions (Radiated) | ANSI C63.4 8.3 * | Pass |
| FCC 47 CFR 15.111 | RSS-Gen 7.4 | Receiver Spurious Emissions (Conducted) | TIA-603-E 2.1.2 | Pass |

*Not Accredited

Statement of Compliance

The TPGB1B Handportable Transceiver as tested in this report was found to conform to the following standards:

47CFR 15.109 & 15.111 and RSS-Gen Issue 5, sections 7.3 & 7.4

The results obtained in this test report pertain only to the item(s) tested. Teltest does not make any claims of compliance for samples or variants that were not tested.

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Test Conditions

Environmental Conditions

All testing was performed on the 10th of April 2024, and under the following conditions:

| Ambient Temperature | $15^{\circ} \text{C} \rightarrow 30^{\circ} \text{C}$ |
|-----------------------|---|
| Relative Humidity | 20% → 75% |
| Standard Test Voltage | $7.5 V_{DC}$ |

Measurement Frequency Range for Unintentional Radiators The measured frequency range is determined in accordance with FCC 47CFR 15.33 (b) (1)

and RSS-Gen section 6.13.2

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement (MHz) | Upper frequency selected for test |
|--|---|-----------------------------------|
| Below 1.705 | 30 | |
| 1.705 – 108 | 1000 | |
| 108 – 500 | 2000 | |
| 500 – 1000 | 5000 | |
| Above 1000 | 5 th Harmonic of highest frequency or 40 GHz, whichever is lower | MHz |

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Test Results

RADIATED SPURIOUS EMISSIONS – Unintentional Radiator

Note: This test is not accredited

| SPECIFICATION: | FCC 47 CFR 15.109 |
|----------------|-------------------|
| GUIDE: | ANSI C63.4 8.3 |

RSS-Gen 7.3

RSS-Con 7 3

MEASUREMENT PROCEDURE: Direct Measurement

Initial Scan:

- 1. The EUT is placed in the S-Line TEM cell and emissions are measured from 30 MHz to 800 MHz. Any emission within 10 dB of the limit is then re-tested on the OATS.
- The EUT is placed in the reverberation chamber and emissions are measured from 800 MHz to the upper frequency required. Any emission within 10 dB of the limit is then re-tested on the OATS.

OATS Measurement:

- 1. The EUT is placed on a wooden turntable at a distance of three metres from the test antenna. The output terminal is connected to an RF dummy load.
- 2. The test antenna is raised from 1 m to 4 m to obtain a maximum reading; the turntable is then rotated through 360° to obtain the maximum response of each spurious emission. Valid emissions are determined by switching the EUT on and off.
- 3. The maximum response of each spurious emission is recorded.

ECC 47CER 15 100

| EMISSION FREQUENCY (MHz) | μVolts / Metre @ 3 Metres |
|------------------------------|----------------------------------|
| 30 → 88 | 100 |
| 88 → 216 | 150 |
| 216 → 960 | 200 |
| 960 → | 500 |
| | |
| Measurement Uncertainty (dB) | < 1GHz ±5.0 dB > 1GHz ±5.5 dB |

RADIATED SPURIOUS EMISSIONS – Unintentional Radiator

MEASUREMENT RESULTS:

SPECIFICATION:

FCC 47CFR 15.109 RSS-Gen 7.3

| 12.5 kHz Channel Spacing 1 | 38.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (µV/m) |
| ~ | ~ |
| | |
| No emissions were detected within 10 dB of Limit. | |

| 12.5 kHz Channel Spacing 14 | 43.950 MHz Receive / Tx Standby | |
|---|---------------------------------|--|
| Emission Frequency (MHz) | Level (µV/m) | |
| ~ | ~ | |
| | | |
| No emissions were detected within 10 dB of Limit. | | |

| 12.5 kHz Channel Spacing 14 | 48.050 MHz Receive / Tx Standby | |
|---|---------------------------------|--|
| Emission Frequency (MHz) | Level (µV/m) | |
| ~ | ~ | |
| | | |
| No emissions were detected within 10 dB of Limit. | | |

| 12.5 kHz Channel Spacing 1 | 50.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (µV/m) |
| ~ | ~ |
| | |
| No emissions were detected within 10 dB of Limit. | |

RADIATED SPURIOUS EMISSIONS - Unintentional Radiator

MEASUREMENT RESULTS:

SPECIFICATION:

FCC 47CFR 15.109

RSS-Gen 7.3

| 12.5 kHz Channel Spacing 150.025 MHz Receive / Tx Standby | |
|---|--------------|
| Emission Frequency (MHz) | Level (µV/m) |
| ~ | ~ |
| | |
| No emissions were detected within 10 dB of Limit. | |

| 12.5 kHz Channel Spacing 10 | 62.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (µV/m) |
| ~ | ~ |
| | |
| No emissions were detected within 10 dB of Limit. | |

| 12.5 kHz Channel Spacing 1 | 73.950 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (µV/m) |
| ~ | ~ |
| | |
| No emissions were detected within 10 dB of Limit. | |

CONDUCTED SPURIOUS EMISSIONS

SPECIFICATION: FCC 47CFR 15.111

RSS-Gen 7.4

GUIDE: TIA-603-E 2.1.2 (Analogue) TIA-102-CAAA-C 2.1.2 (Digital)

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up.
- 2. The measurement frequency range is from 30 MHz to the upper frequency limit as determined by FCC 47 CFR 15.33 and table 2

3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.

| LIMIT CLAUSE: | FCC 47CFF | R 15.111 | RSS-Gen 7.4 | |
|---------------|----------------|---------------|-------------|-----------|
| | | 30 → 1000 MHz | 2 nW | (-57 dBm) |
| LIMII | > 1000 MHz | 5 nW | (-53 dBm) | |
| | | | | |
| Measuremer | nt Uncertainty | / | ≤ 12.75 GHz | ± 2.8 dB |

CONDUCTED SPURIOUS EMISSIONS

MEASUREMENT RESULTS:

SPECIFICATION:

FCC 47CFR 15.111

RSS-Gen 7.4

| 12.5 kHz Channel Spacing 13 | 38.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

| 12.5 kHz Channel Spacing 14 | 43.950 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

| 12.5 kHz Channel Spacing 14 | 48.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

| 12.5 kHz Channel Spacing 1 | 50.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

CONDUCTED SPURIOUS EMISSIONS

MEASUREMENT RESULTS:

SPECIFICATION:

FCC 47CFR 15.111

RSS-Gen 7.4

| 12.5 kHz Channel Spacing | 50.025 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

| 12.5 kHz Channel Spacing 16 | 62.050 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

| 12.5 kHz Channel Spacing 1 | 73.950 MHz Receive / Tx Standby |
|---|---------------------------------|
| Emission Frequency (MHz) | Level (dBm) |
| ~ | ~ |
| | |
| No emissions were detected within 20 dB of Limit. | |

Test Equipment List

| Equipment Type | Information | Manufacturer | Model No | Serial No# | Tait ID | Cal Due |
|-------------------------------|---|-----------------|-----------------------------|------------------|------------|-----------|
| Antenna | Reverb - 1-18GHz DRG | Schwarzbeck | BBHA 9120 D | 9120D-885 | E4857 | |
| Antenna | Reverb - 1-18GHz DRG | Schwarzbeck | BBHA 9120 D | 9120D-884 | E4858 | |
| Coax Cable | Reverb - 4.5m Multiflex 141 | TeltestBlue6 | MF 141 | TeltestBlue6 | E4843 | 08-Oct-24 |
| Coax Cable | Reverb - 2m Multiflex 141 | TeltestBlue5 | MF 141 | TeltestBlue5 | E4844 | 08-Oct-24 |
| Coax Cable | Reverb - 2m Multiflex 141 | TeltestBlue4 | MF 141 | TeltestBlue4 | E4845 | 08-Oct-24 |
| Coax Cable | Reverb - 1m Multiflex 141 | TeltestBlue3 | MF 141 | TeltestBlue3 | E4846 | 08-Oct-24 |
| Coax Cable | Reverb - 1m Multiflex 141 | TeltestBlue2 | MF 141 | TeltestBlue2 | E4847 | 08-Oct-24 |
| Coax Cable | Reverb - 1m Multiflex 141 | TeltestBlue1 | MF 141 | TeltestBlue1 | E4848 | 08-Oct-24 |
| Coax Cable | 1.5m Blue | Suhner | Sucoflex 126EA | 502868/126E A | E5028 | 08-Oct-24 |
| Power Supply | TREVA 1 60V/25A | Agilent | N5767A | US23D6941R | E1137 2 | 03-Oct-24 |
| RF Amplifier | +21.7 dB 1GHz | Tait | ZFL-1000LN | E3660 | E3360 | 15-Aug-24 |
| RF Amplifier | Pre-amplifier | Agilent | 87405C | MY47010688 | E4941 | 16-Oct-24 |
| RF Chamber | S-LINE TEM CELL | Rohde & Schwarz | 1089.9296.02 | 338232/003 | E3636 | 07-May-25 |
| RF Chamber | Reverb - Stirrer controller for reverb chamber | Teseq | Stirrer Controller | 29765.1 | E4854 | |
| RF Chamber | Reverb - 0.5 - 18GHz Reverberation Chamber | Teseq | RVC XS | 29765 | E4855 | |
| RF Load | 50W | Weinschel | F1426 | BF0487 | E3675 | 08-Oct-24 |
| Spectrum Analyser | 13.2GHz | Agilent | PSA E4445A | MY42510072 | E4139 | 18-Oct-24 |
| Spectrum Analyser | 26.5GHz | Agilent | PXA N9030A | MY49432161 | E4907 | 02-Mar-25 |
| Temp & Humidity datalogger | | Hobo | U21-011 | 10134275 | E4980 | 07-Aug-24 |
| Testware | Conducted Emissions | | March 2018 | - | - | |
| Testware | Reverb Emissions | | TTEL_REVEMIS 2.00.03 | - | - | |
| Testware | S-Line Radiated Emissions | | TTEL_SLINERADE M 2.00.01 | - | - | |

* NOTE: Items without calibration dates are calibrated immediately before use or was set using calibrated instruments.

ANNEX A

Test Setup Details

Radiated Emissions Set up.



Conducted Emissions Set up.



END OF REPORT