

Laboratory Test Report

ELECTROMAGNETIC COMPATIBILITY

for the

TPDB1D Handportable Transceiver

Tested In accordance with

47CFR 15.109 & 15.111

Report Revision: 1
Issue Date: 4 October 2018
FCC ID: CASTPDB1D

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Laboratory Technical Manager



IANZ
ACCREDITED LABORATORY

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

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FCC ID: CASTPDB1D

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Revision History

Date	Revision	Comments
4 October 2018	1	Initial test report

Introduction

Type Approval Testing of the
TPDB1D
Serial No 26072208
136 → 174 MHz

in accordance with:

47CFR 15.109 & 15.111

Report Prepared For

Tait International Ltd
245 Wooldridge Road
Harewood
Christchurch 8051
New Zealand

Description of Sample

Manufacturer: Tait International Limited
Equipment: Handportable Transceiver
Type: TPDB1D
Product code: T03-00043-BZZL
Serial Numbers: 26072208
Quantity: 1
Hardware & Software:

Hardware ID	TPDB5X-B100_0001
Boot Code	QPD5B_S00_3.05.11.0001
DSP	QPD5A_E00_2.19.03.0049
Radio Application	QPD5F_E00_2.19.03.0049
Firmware Package	QI93P_E00_2.19.03.0049
FPGA Image	QPD5G_S00_1.12.14.0001

Statement of Compliance

The TPDB1D Handportable transceiver as tested in this report was found to conform to the following standards:

47CFR 15.109 & 15.111

Test Conditions

Environmental Conditions

All testing was performed between 19 September → 2 October 2018, and under the following conditions:

Ambient Temperature: 15° C → 30° 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)

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

Test Results

RADIATED SPURIOUS EMISSIONS – Unintentional Radiator

Note: This test is not accredited

SPECIFICATION: FCC 47 CFR 15.109

GUIDE: TIA-603E 2.1.1

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 .
2. 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.

LIMIT CLAUSE: FCC 47CFR 15.109

EMISSION FREQUENCY (MHz)	µVolts / Metre @ 3 Metres
30 → 88	100
88 → 216	150
216 → 960	200
960 →	500

Measurement Uncertainty (dB)	±4.6 dB
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RADIATED SPURIOUS EMISSIONS – Unintentional Radiator

SPECIFICATION: FCC 47CFR 15.109

12.5 kHz Channel Spacing		138.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (μV/m)	
~		~	
12.5 kHz Channel Spacing		152.0 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (μV/m)	
~		~	
12.5 kHz Channel Spacing		173.9 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (μV/m)	
~		~	
Measurement Uncertainty (dB)		±4.6 dB	
No emissions were detected within 10 dB of Limit.			

CONDUCTED SPURIOUS EMISSIONS - Receiver

SPECIFICATION: FCC 47CFR 15.111

GUIDE: TIA-603E 2.1.2

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

LIMIT CLAUSE: FCC 47CFR 15.111

MEASUREMENT RESULTS:

12.5 kHz Channel Spacing		138.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (nW)	
~		~	
12.5 kHz Channel Spacing		152.0 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (nW)	
~		~	
12.5 kHz Channel Spacing		173.9 MHz Receive / Tx Standby	
Emission Frequency (MHz)		Level (nW)	
~		~	
Measurement Uncertainty		≤12.75 GHz ± 3.0 dB	
No emissions were detected within 20 dB of Limit.			

LIMITS:

LIMIT	2 nW
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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	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack2	E4623	20-Dec-18
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack3	E4624	20-Dec-18
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	20-Dec-18
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	20-Dec-18
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	20-Dec-18
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	20-Dec-18
Power Supply	60V/50A/1000W	Hewlett Packard	HP6012B	2524A00616	E3712	30-Sep-19
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	17-Apr-19
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	9-Oct-18
RF Attenuator	20dB 25W	Weinschel	33-20-33	BD5871	E3673	20-Dec-18
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	12-Sep-20
RF Chamber	Reverb - 0.5 - 18GHz Reverberation Chamber	Teseq	RVC XS	29765	E4855	
RF Load	50W	Weinschel	F1426	AE2490	E3624	20-Dec-18
Signal Generator	Analog 4GHz	Agilent	E4422B	GB40050320	E3788	27-Sep-19
Spectrum Analyser	13.2GHz	Hewlett Packard	HP8562E	3821A00779	E3715	2-Oct-18
Spectrum Analyser	13.2GHz	Agilent	E4445A	MY42510072	E4139	19-Jul-20
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	18-Oct-18
Temp & Humidity datalogger		Hobo	U21-011	10134276	E4981	22-Apr-19
Testware	Reverb Emissions		June 2018	-	-	
Testware	S-Line Radiated Emissions		April 2018	-	-	

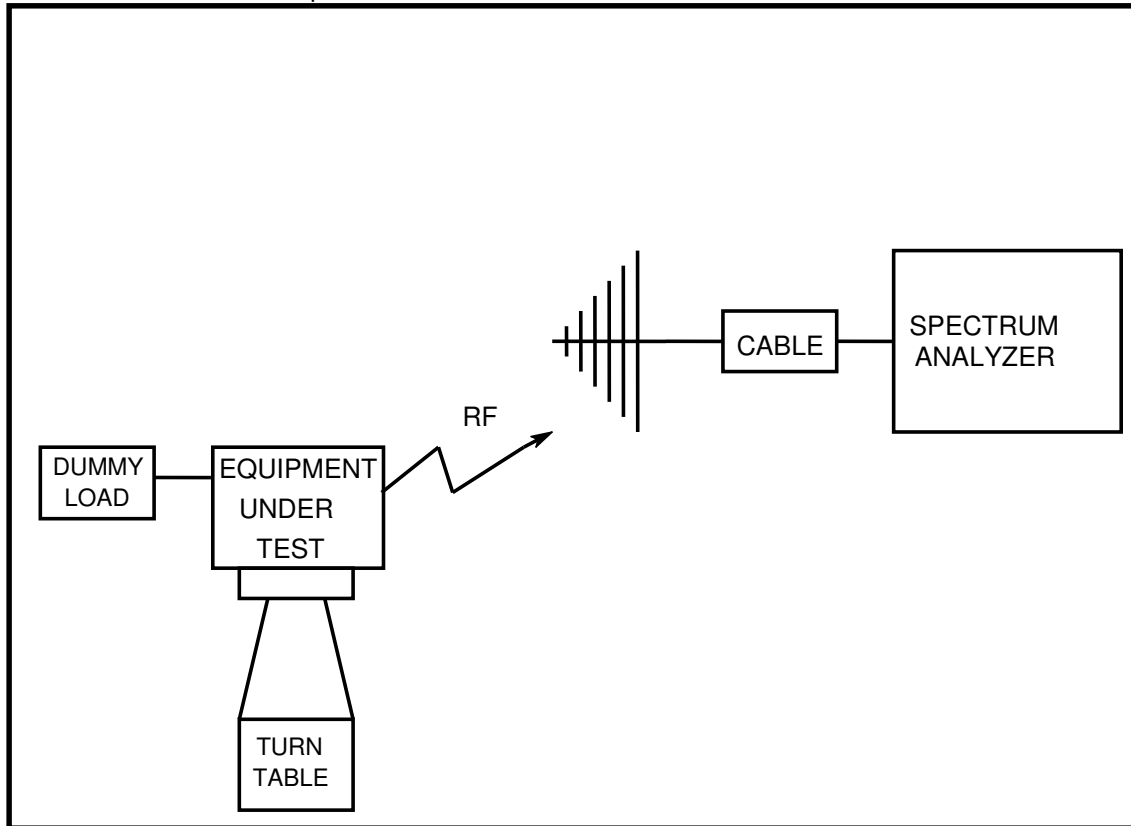
* NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments.

*The Signal Generator and HP8562E Spectrum Analyser were in use for tests before the calibration due date.

ANNEX A

Test Setup Details

Radiated Emissions Set up.



Conducted Emissions Set up.

