

Laboratory Test Report
ELECTROMAGNETIC COMPATIBILITY
for the
TPDB1C HANDPORTABLE Transceiver

Tested In accordance with
47CFR 15.109 & 15.111

Report Revision: 1
Issue Date: 19-January-2018
FCC ID: CASTPDB1C

PREPARED BY: Alf Schinkelshoek


Test Technician

CHECKED & APPROVED BY: M. C. James


Laboratory Technical Manager



IANZ
ACCREDITED LABORATORY

FCC LISTING REGISTRATION: 8382288

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

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TELTEST Laboratories (A Division of Tait Communications) Telephone: 64 3 358 3399
PO Box 1645, 558 Wairakei Road, Christchurch, New Zealand. FAX: 64 3 359 4632

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Revision History

Date	Revision	Comments
19-January-2018	1	Initial test report

Introduction

Type Approval Testing of the
TPDB1C

Serial No 25939660

136 → 174 MHz

in accordance with:

47CFR 15.109 & 15.111

Report Prepared For

Tait Ltd

245 Wooldridge Road

Harewood

Christchurch 8051

New Zealand

Description of Sample

Manufacturer Tait Limited

Equipment: HANDPORTABLE Transceiver

Type: TPDB1C

Product code: T03-00072-BCAB

Serial Numbers: 25939660

Quantity: 1

Hardware & Software:

Hardware ID	TPDB1X-C000_0008
Boot Code	QPD1B_S00_3.01.03.0001
DSP	QPD1A_E00_2.15.02.0066
Radio Application	QPD1F_E00_2.15.02.0066
FPGA Image	QI93P_E00_2.15.02.0066

Statement of Compliance

The TPDB1C 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 03 → 16 January 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 143.9 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 148.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 149.8 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 152.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 153.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 158.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~

Radiated Spurious Emissions - continued

12.5 kHz Channel Spacing 161.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (µV/m)
~	~
12.5 kHz Channel Spacing 173.1 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 and Transmitter Standby

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.
4. Rx and Tx (Standby) ports are tested separately.

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 143.9 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 148.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 149.8 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 152.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~

Conducted Spurious Emissions - continued

12.5 kHz Channel Spacing 153.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 158.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 161.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 173.1 MHz Receive / Tx Standby	
Emission Frequency (MHz)	Level (nW)
~	~
Measurement Uncertainty	≤2.75 GHz ± 3.0 dB
No emissions were detected within 20 dB of Limit.	

LIMITS:

LIMIT	2 nW
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TEST EQUIPMENT LIST

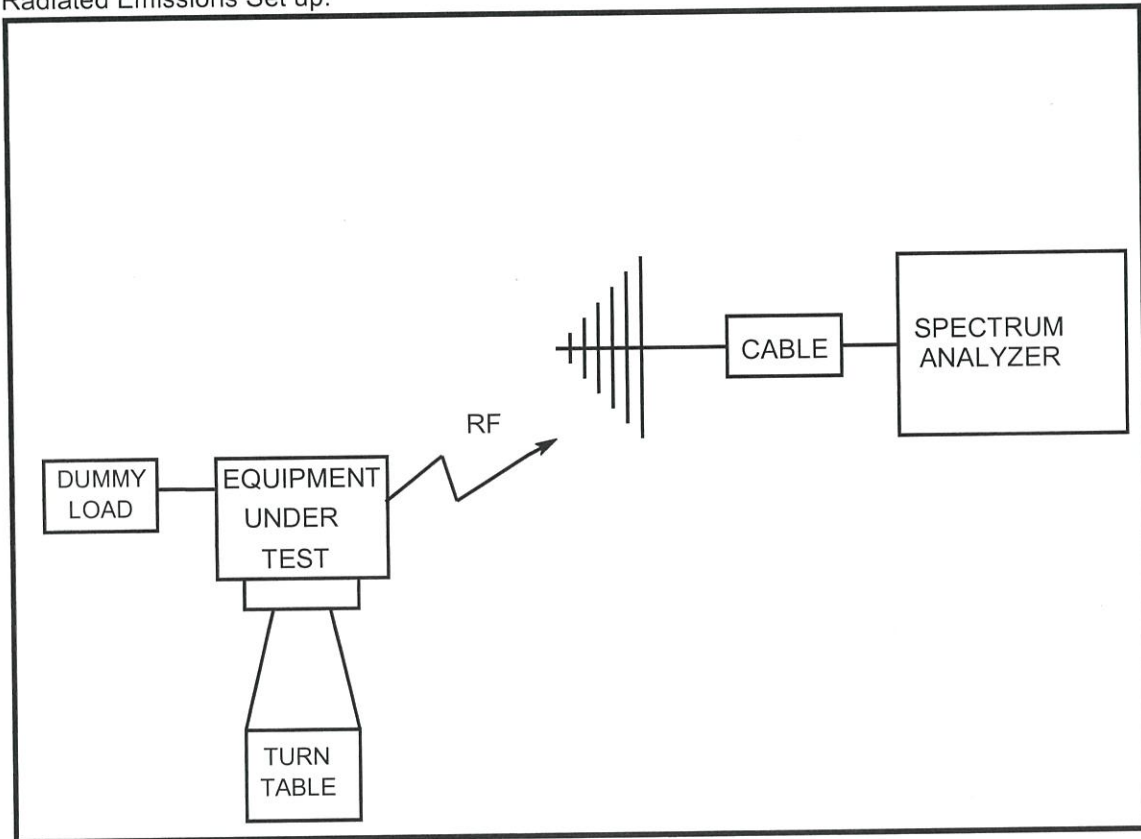
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Signal Generator	Analog 3.2GHz	Hewlett Packard	HP8648C	3443U00543	E3558	26-Sep-18
Power Supply	TREVA2 60V/25A	Agilent	N5767A	US09F4901H	E4656	7-Oct-19
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	
OATS	NSA	Tait				9-Jul-18
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	1-Jan-19
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	1-Jan-19
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack5	E4850	20-Dec-18
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack6	E4849	20-Dec-18
Antenna	Log Periodic	Schwarzbeck	VUSLP	9111-219	E4617	
TREVA 2		Teltest	-	2	-	2-Jul-18
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	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	TeltestBlue2	MF 141	TeltestBlue2	E4847	20-Dec-18
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	20-Dec-18
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	
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	OATS Turntable Cable 2	Intelcom	RG215	OATS3	E4995	1-Jan-19
Testware	Conducted Emissions		16/12/2015			
Testware	Radiated Emissions		September 2015			
Testware	Reverb Emissions		28 May 2015			
Testware	S-Line Radiated Emissions		May 2016			
RF Attenuator	20dB 25W	Weinschel	33-20-33	BD5871	E3673	20-Dec-18

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

ANNEX A

Test Setup Details

Radiated Emissions Set up.



Conducted Emissions Set up.

