

Laboratory Test Report

ELECTROMAGNETIC COMPATIBILITY

for the

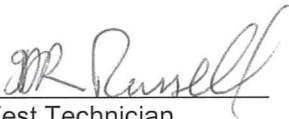
TBDK4F Transportable Transceiver

Tested In accordance with

47CFR 15.107, 15.109 & 15.111

Report Revision: 1
Issue Date: 6 December 2024
FCC ID: CASTBDK4F

PREPARED BY: I. D. Russell


Test Technician

CHECKED & APPROVED BY: M. C. James


Laboratory Technical Manager



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

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TELTEST Laboratories
 Tait International Ltd
 Report Number 4398a
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Revision History

Date	Revision	Comments
6 December 2024	1	Initial test report

Introduction

Type approval testing of the TBDK4F, 15 Watt, Transportable transceiver in order to demonstrate compliance with 47CFR 15.107, 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: Transportable Transceiver
Type: TBDK4F
Product code: TB7304/6-K4K0
Serial Numbers: 18396951 reciter, 18396952 PA
Quantity: 1
Hardware & Software

Unit	Serial Number	Firmware	Hardware Version
Reciter	18396951	Dmr-3.45.00.0004	06.02
Power Amplifier	18396952		00.02
Top Panel		1.10.04.0004	00.01

Diplexer Type	Serial Number	High Frequency MHz	Low Frequency MHz
DPF 900/6 N (f)	SN200053051	851.025	810.05
DPF 900/6 N (f)	SN200093778	860.025	823.95
DPF 900/6 N (f)	SN200053065	868.975	823.95

TEST REQUIREMENTS AND RESULT SUMMARY

FCC Specification	Test Items	Test Methods	Result
FCC 47 CFR 15.109	Receiver Spurious Emissions (Radiated)	ANSI C63.4 8.3 *	Pass
FCC 47 CFR 15.111	Receiver Spurious Emissions (Conducted)	TIA-603-E 2.1.2	Pass
FCC 47 CFR 15.107	Power Line Conducted Emissions	ANSI C63.4 7.3	Pass

*Not Accredited

Statement of Compliance

The TBDK4F Transportable transceiver as tested in this report was found to conform to the following standards:

47CFR 15.107, 15.109 & 15.111

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.

Test Conditions

Environmental Conditions

All testing was performed between 21 → 28 November 2024, and under the following conditions:

Ambient Temperature 15° C → 30° C
Relative Humidity 20% → 75%
Standard Test Voltage 13.8 V_{DC} and 120 V_{AC}

A separately tuned Diplexer was used for each RF channel tested, and the PA output power adjusted to provide 15Watts at the common antenna port.

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	<input type="checkbox"/>
1.705 – 108	1000	<input type="checkbox"/>
108 – 500	2000	<input type="checkbox"/>
500 – 1000	5000	<input checked="" type="checkbox"/>
Above 1000	5 th Harmonic of highest frequency or 40 GHz, whichever is lower	<input type="checkbox"/> MHz

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

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)	<1GHz ±5.0 dB >1GHz ±5.5 dB
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RADIATED SPURIOUS EMISSIONS – Unintentional Radiator

SPECIFICATION: FCC 47CFR 15.109

12.5 kHz Channel Spacing		810.05 MHz Receive / Tx Standby 851.025MHz	
Emission Frequency (MHz)		Level (µV/m)	
~		~	
12.5 kHz Channel Spacing		823.95 MHz Receive / Tx Standby 860.025 MHz	
Emission Frequency (MHz)		Level (µV/m)	
~		~	
12.5 kHz Channel Spacing		823.95 MHz Receive / Tx Standby 868.975 MHz	
Emission Frequency (MHz)		Level (µV/m)	
~		~	
No emissions were detected within 10 dB of Limit.			

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Report Number 4398a

CONDUCTED SPURIOUS EMISSIONS – Receiver and Transmitter Standby

SPECIFICATION: FCC 47CFR 15.111

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

LIMIT CLAUSE: FCC 47CFR 15.111

LIMIT	2 nW (-57 dBm)
Measurement Uncertainty	≤ 12.75 GHz ± 2.8 dB

MEASUREMENT RESULTS:

12.5 kHz Channel Spacing 810.05 MHz Receive / Tx Standby 851.025MHz	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 823.95 MHz Receive / Tx Standby 860.025 MHz	
Emission Frequency (MHz)	Level (nW)
~	~
12.5 kHz Channel Spacing 823.95 MHz Receive / Tx Standby 868.975 MHz	
Emission Frequency (MHz)	Level (nW)
~	~
No emissions were detected within 20 dB of Limit.	

POWER LINE CONDUCTED EMISSIONS

SPECIFICATION: FCC 47CFR 15.107 Unintentional Radiator

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment set up.
2. The frequency range examined was from 150 kHz to 30 MHz.
3. Emissions were measured using a 50Ω/50μH+5Ω line impedance stabilization network (LISN).

LIMIT CLAUSE: FCC 47CFR 15.107

LIMIT: CLASS A

Frequency Range MHz	Limits dBμV	
	Quasi-Peak	Average
0.15 → 0.5	79	66
> 0.5 → 30	73	60

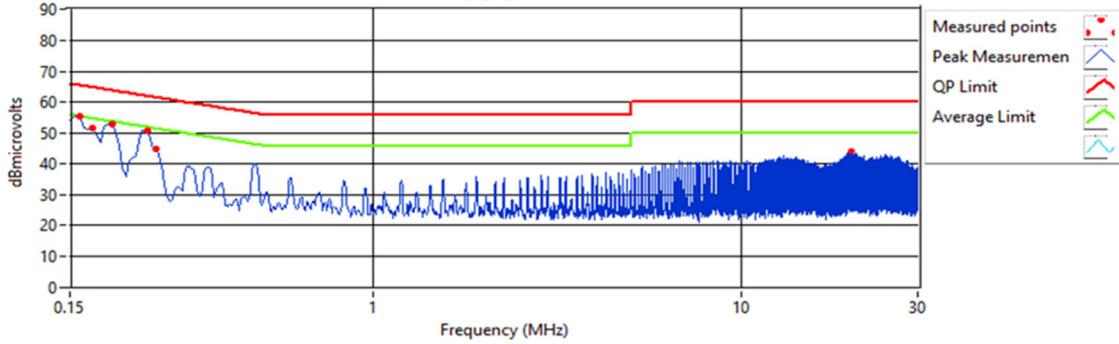
LIMIT: CLASS B

Frequency Range MHz	Limits dBμV	
	Quasi-Peak	Average
0.15 → 0.5	66 → 56 ¹	56 → 46 ¹
0.5 → 5.0	56	46
5.0 → 30	60	50
1. The limit decreases linearly with the logarithm of the frequency		

Measurement Uncertainty:

Measurement Uncertainty (dB)	with a 95% confidence interval is ± 3.5 dB
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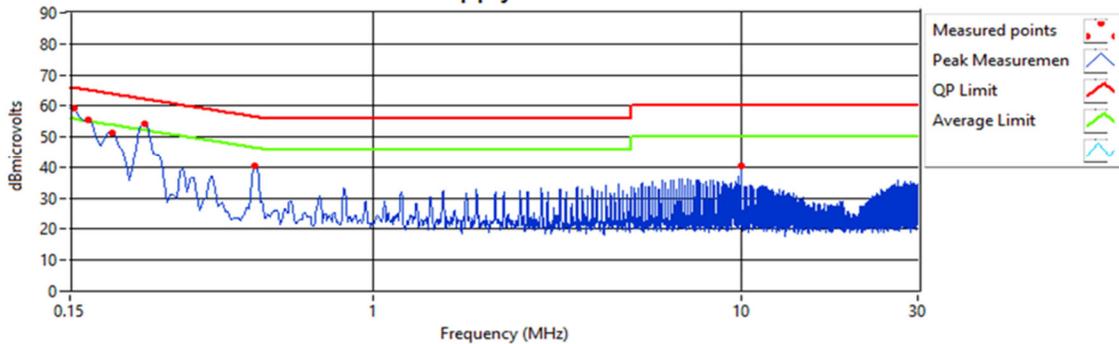
4398 - AC Supply Phase Tx 15W



Limit FCC Part 15 General

Frequency (MHz)	Peak Measurement (dBmicroVolt)	Average Measurement (dBmicroVolt)	Average Limit (dBmicroVolt)	Average Result	Quasi-Peak Measurement (dBmicroVolt)	Quasi-Peak Limit (dBmicroVolt)	Quasi-Peak Result
0.156	56.2	25.8	55.5	Pass	49.0	65.5	Pass
0.154	57.0	25.9	54.8	Pass	49.8	64.8	Pass
0.192	53.6	49.1	53.8	Pass	53.2	63.8	Pass
0.238	53.5	46.2	51.9	Pass	51.5	61.9	Pass
0.239	53.7	46.1	51.5	Pass	51.5	61.5	Pass
19.876	43.2	39.3	50.0	Pass	42.0	60.0	Pass

4398 - AC Supply Neutral Tx 15W

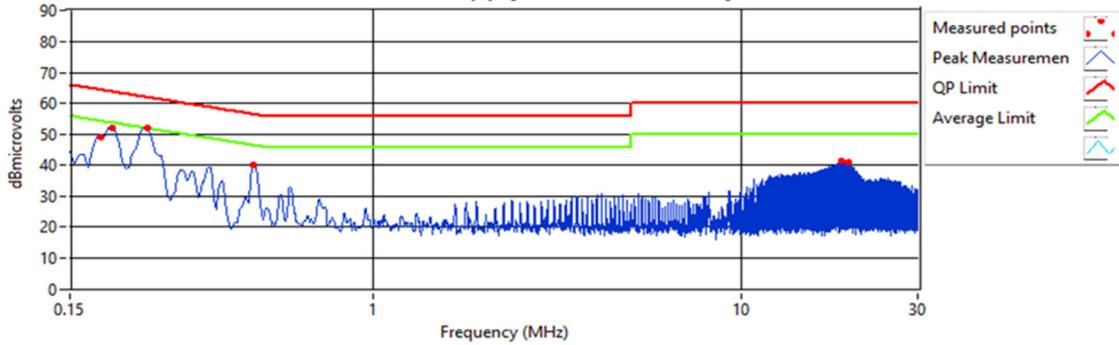


Limit FCC Part 15 General

Frequency (MHz)	Peak Measurement (dBmicroVolt)	Average Measurement (dBmicroVolt)	Average Limit (dBmicroVolt)	Average Result	Quasi-Peak Measurement (dBmicroVolt)	Quasi-Peak Limit (dBmicroVolt)	Quasi-Peak Result
0.162	55.1	24.9	55.8	Pass	47.9	65.8	Pass
0.159	55.6	25.5	55.1	Pass	48.1	65.1	Pass
0.192	52.8	48.0	53.8	Pass	52.3	63.8	Pass
0.238	54.7	45.6	52.1	Pass	53.1	62.1	Pass
0.476	40.2	35.7	46.4	Pass	37.8	56.4	Pass
9.957	37.8	12.9	50.0	Pass	25.0	60.0	Pass

POWERLINE CONDUCTED EMISSIONS - Continued

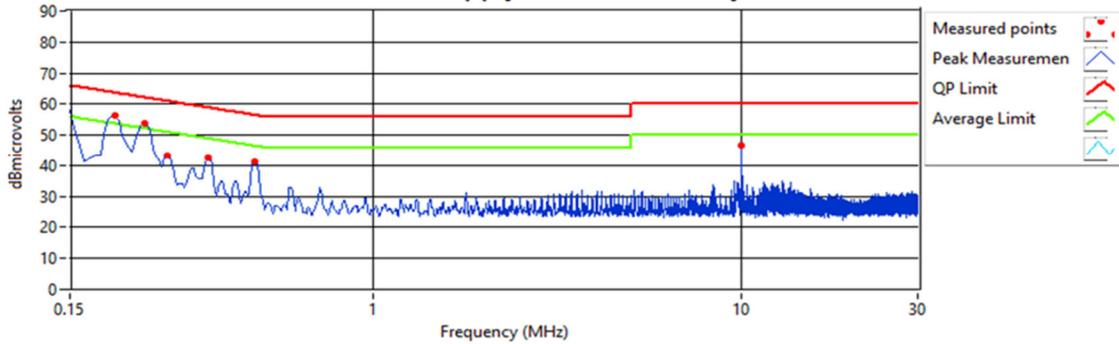
4398 - AC Supply Phase Tx Stby



Limit FCC Part 15 General

Frequency (MHz)	Peak Measurement (dBmicroVolt)	Average Measurement (dBmicroVolt)	Average Limit (dBmicroVolt)	Average Result	Quasi-Peak Measurement (dBmicroVolt)	Quasi-Peak Limit (dBmicroVolt)	Quasi-Peak Result
0.194	58.1	46.3	54.4	Pass	52.9	64.4	Pass
0.197	56.3	40.6	53.8	Pass	50.3	63.8	Pass
0.239	53.8	46.1	51.9	Pass	52.0	61.9	Pass
0.476	41.3	35.1	46.5	Pass	39.9	56.5	Pass
18.677	40.9	39.6	50.0	Pass	40.3	60.0	Pass
19.512	40.7	38.9	50.0	Pass	39.7	60.0	Pass

4398 - AC Supply Neutral Tx Stby



Limit FCC Part 15 General

Frequency (MHz)	Peak Measurement (dBmicroVolt)	Average Measurement (dBmicroVolt)	Average Limit (dBmicroVolt)	Average Result	Quasi-Peak Measurement (dBmicroVolt)	Quasi-Peak Limit (dBmicroVolt)	Quasi-Peak Result
0.193	56.6	46.0	53.6	Pass	52.1	63.6	Pass
0.239	54.5	46.9	52.1	Pass	46.9	62.1	Pass
0.258	46.4	37.5	50.9	Pass	42.2	60.9	Pass
0.357	43.4	37.0	48.8	Pass	41.8	58.8	Pass
0.475	41.4	34.4	46.4	Pass	39.4	56.4	Pass
10.016	42.1	14.2	50.0	Pass	31.7	60.0	Pass

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TEST EQUIPMENT LIST

Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Antenna	Log Periodic	Schwarzbeck	VUSLP	9111-219	E4617	7-Mar-27
Antenna	Log Periodic	Schwarzbeck	VUSLP	9111-503	E111375	7-Mar-27
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 1	Intelcom	RG214	OATS1	E4621	18-Sep-25
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	18-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack2	E4623	10-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack3	E4624	10-Sep-25
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	12-Sep-25
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	11-Sep-25
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	11-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	12-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	13-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	11-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack7	E5004	10-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack8	E5005	10-Sep-25
Coax Cable	3m Blue	Suhner	Sucoflex 126EA	503429/126EA	E5015	11-Sep-25
Coax Cable	1.5m Blue	Suhner	Sucoflex 126EA	502868/126EA	E5028	11-Sep-25
Filter High Pass/ Notch	550 to 885MHz	Tait		N/A	E3785	22-May-25
ISN		Rohde & Schwarz	ENY41	100136	E4277	5-Aug-26
LISN	50Ω/50μH+5Ω	Schwarzbeck	NSLK 8117	7	E5016	5-Oct-25
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
OATS	NSA	Tait				1-Nov-25
Power Meter	Reverb - USB interface for NRT Z44	Rohde & Schwarz	NRT Z5	100586	E4852	
Power Meter	Reverb - 0.2 - 4GHz directional power meter	Rohde & Schwarz	NRT Z44	105151	E4853	8-Oct-26
Power Meter	Power Sensor-6GHz Reverb FWD	Raditeq	RPR2006C	2201014	E11366	9-Oct-25
Power Meter	Power Sensor-6GHz Reverb REV	Raditeq	RPR2006C	2201015	E11367	9-Oct-25
Power Supply	AC Variac	Yamabishi	S-260-5	TX-533	E1737	
Power Supply		Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	20-May-25
Power Supply	60V/50A/1000W	Hewlett Packard	HP6012B	2524A00616	E3712	5-Oct-25
Power Supply	40V/38A	Agilent	N5766A	US09E4663L	E4719	11-Oct-25
Power Supply	60V/25A	Agilent	N5767A	3111A05573	E4979	9-Oct-26

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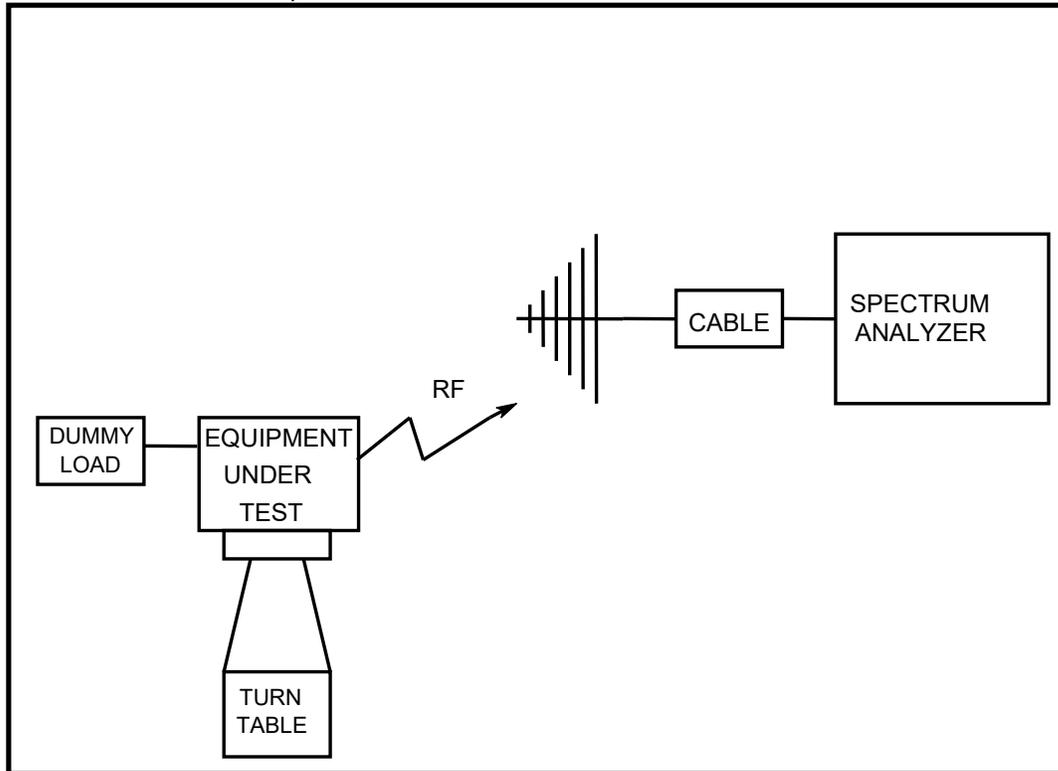
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	7-Aug-25
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	16-Oct-25
RF Attenuator	10dB 50W	Weinschel	24-10-34	AZ0401	E3388	13-Sep-25
RF Attenuator	30+3dB 350W	Weinschel	67-30-33 & BW-N3W5+	CK9178	E5023	17-Sep-25
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	7-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	150W	Bird	8166	524	E3625	17-Sep-25
Signal Generator	Analog 3.2GHz	Hewlett Packard	HP8648C	3443U00543	E3558	11-Oct-25
Signal Generator	Digital 3GHz	Agilent	E4438C	MY49070242	E4657	14-Oct-26
Signal Generator	Analog 12.75GHz	Rohde & Schwarz	SMB100A	183236	E11369	28-Mar-25
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	2-Mar-25
Temp & Humidity datalogger		TP-Link TAPO	T315	22383M6000671	E11377	8-Feb-25
Transient Limiter	9kHz to 200MHz	Agilent	11947A	3107A03657	E4982	9-Oct-25
Testware	Conducted Disturbances		TTEL_CONDDIST_2.02.02	-	-	
Testware	Reverb Emissions		TTEL_REVEMIS 2.01.00	-	-	
Testware	S-Line Radiated Emissions		TTEL_SLINERADEM 2.01.00	-	-	
Testware	Radio Conducted Emissions		TTEL_RADIOCOND_1.02.01	-	-	

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

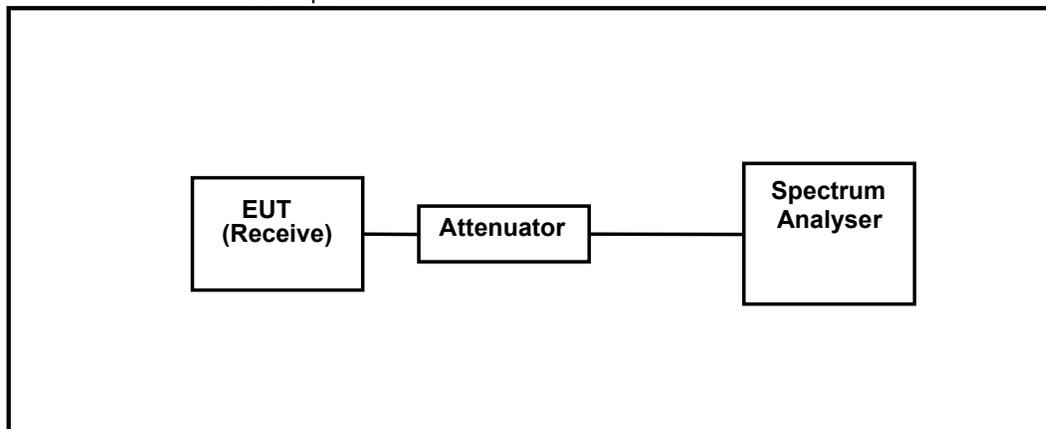
ANNEX A

TEST SETUP DETAILS

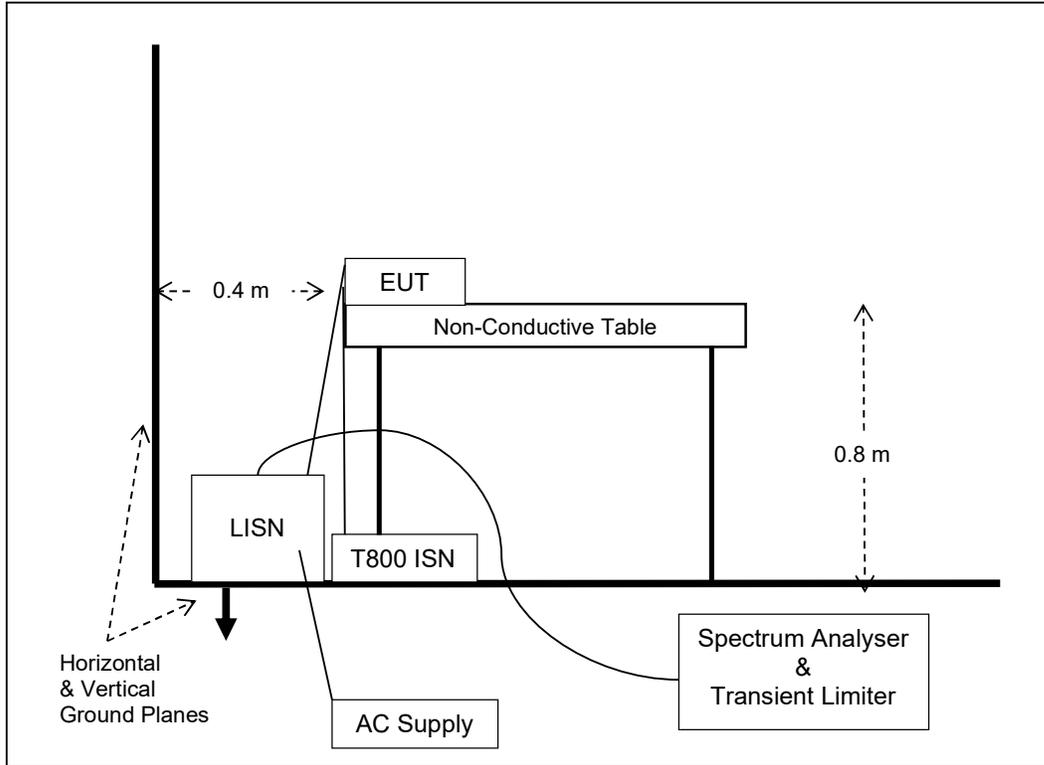
Radiated Emissions Set up.



Conducted Emissions Set up.



Power Line Conducted Emissions Setup.



END OF REPORT