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## **FCC PART 90 AND IC RSS-119, RSS-GEN CLASS II PERMISSIVE CHANGE TEST REPORT**

<b>APPLICANT</b>	Daniel Electronics Limited 43 Erie Street Victoria, BC, Canada
<b>FCC ID</b>	FCC ID: H4JUT-4E850
<b>IC CERTIFICATION</b>	IC: 142A-UT4E850
<b>MODEL NUMBER</b>	UT-4E850-00-300
<b>PRODUCT DESCRIPTION</b>	UT4E850 Transmitter
<b>DATE SAMPLE RECEIVED</b>	January 18, 2010
<b>DATE TESTED</b>	February 5, 2010
<b>TESTED BY</b>	Joe Scoglio
<b>APPROVED BY</b>	Mario de Aranzeta
<b>TIMCO REPORT NO.</b>	121AUT10Testreport.pdf
<b>TEST RESULTS</b>	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

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## GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

## Summary

The device under test does:

- ☒ fulfill the general approval requirements as identified in this test report  
☐ not fulfill the general approval requirements as identified in this test report

## Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, FL 32669



## Authorized Signatory Name:

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

## DUT SPECIFICATION

DUT Description	UT4E850 Transmitter
FCC ID	H4JUT-4E850
IC Certification	IC: 142A-UT4E850
Model Number	UT-4E850-00-300
Serial Number	N/A
Operating Frequency	768 ~ 869 MHz
DUT Power Source	<input type="checkbox"/> 110-120Vac/50- 60Hz
	<input checked="" type="checkbox"/> DC Power 13.8V
	<input type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Type of Equipment	<input checked="" type="checkbox"/> Fixed
	<input type="checkbox"/> Mobile
	<input type="checkbox"/> Portable

## TEST ENVIRONMENT AND SETUP

Test Conditions	The temperature was 26°C with a relative humidity of 50%.
Modification to the DUT	None
Test Exercise	The DUT was placed in continuous transmit mode.
Applicable Standards	ANSI/TIA 603-C:2004, FCC CFR 47 Part 90, IC RSS-119, RSS-GEN
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

## TEST PROCEDURES

**Power Line Conducted Interference:** The procedure used was ANSI/TIA 603-C:2004 using a 50uH LISN. Both lines were observed with the DUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**Bandwidth 20 dB:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

**Power Output:** The RF power output was measured at the antenna feed point using a peak power meter.

**Antenna Conducted Emissions:** The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10<sup>th</sup> harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

**Radiation Interference:** The test procedure used was ANSI/TIA 603-C:2004 using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a micro volt at the output of the antenna.

## **AUDIO FREQUENCY RESPONSE**

**Rule Part No.:** FCC Part 2.1047(a)(b), IC RSS-119 5.2

**Test Requirements:** FCC Part 2.1047(a)(b), IC RSS-119 5.2

### **Method of Measurement:**

The audio frequency response was measured in accordance with ANSI/TIA 603-C:2004. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

### **AUDIO FREQUENCY RESPONSE PLOT**

This is a class II change only.

## SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

**Rule Part No.:** FCC Part 2.1051(a), RSS-GEN 7.1.4

### Requirements:

**Method of Measurement:** The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI/TIA 603-C:2004.

FCC Limit for:

25 kHz Channel Spacing = 59.5

12.5 kHz Spacing = 66.5

6.25 kHz Channel Spacing = N/A

### Test Data:

TF HIGH POWER	EF	dB below carrier		TF LOW POWER	EF	dB below carrier
768	768	0		768	768	0
	1536	82.4			1536	85.7
	2304	88.4			2304	95.6
	3072	105			3072	101.7
	3840	87.7			3840	93.2
	4608	95.8			4608	93.5
	5376	113.5			5376	111
	6144	107.8			6144	102.7
	6912	112.7			6912	106.2
	7680	109.8			7680	106.3

TF HIGH POWER	EF	dB below carrier		TF LOW POWER	EF	dB below carrier
783.5	783.5	0		783.5	783.5	0
	1567	80.3			1567	84
	2350.5	84.3			2350.5	95.6
	3134	103.2			3134	100.7
	3917.5	92.6			3917.5	89.2
	4701	106.9			4701	105.4
	5484.5	111.1			5484.5	113.1
	6268	103.6			6268	100.9
	7051	113.5			7051	108.2
	7835	113.6			7835	108.4

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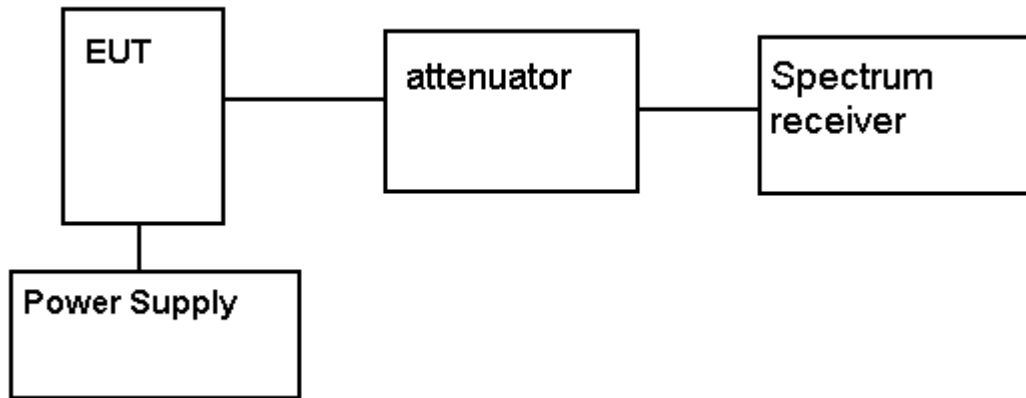
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TF HIGH POWER	EF	dB below carrier		TF LOW POWER	EF	dB below carrier
799	799	0		799	799	0
	1598	79.6			1598	83.5
	2397	84.2			2397	92.9
	3196	98			3196	100.9
	3995	106.8			3995	95.5
	4794	96.2			4794	99.4
	5593	117			5593	110.1
	6392	98.9			6392	102.3
	7191	110.7			7191	105.6
	7990	110.3			7990	108.4

### Method of Measuring Conducted Spurious Emissions



**METHOD OF MEASUREMENT:** The procedure used was ANSI/TIA 603-C:2004.

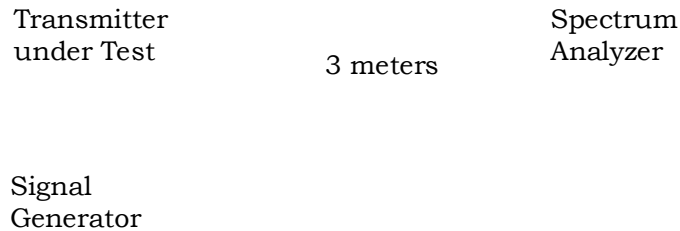
## FIELD STRENGTH OF SPURIOUS EMISSIONS

**Rule Parts. No.:** FCC Part 2.1053, RSS-GEN 4.9

**Requirements:** The FCC limits for radiated emissions are the same as previously stated for the conducted emissions.

**METHOD OF MEASUREMENT:** The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-C:2004 using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

### Test Setup Diagram:



**Test Data:**
**High Power**

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
768.00	V	0		768.00	V	0
1536.00	H	77.78		1536.00	H	73.88
2304.00	V	84.45		2304.00	H	83.15
3072.00	V	84.02		3072.00	V	78.52
3840.00	H	75.11		3840.00	H	74.61
4608.00	H	77.07		4608.00	V	70.57
5376.00	V	81.22				
6144.00	H	74.09				
6912.00	V	80.59				

**Low Power**

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
783.50	V	0		783.50	V	0
1567.00	V	76.87		1567.00	V	75.37
2350.50	V	82.17		2350.50	V	81.57
3134.00	V	81.47		3134.00	V	77.77
3917.50	H	67.82		3917.50	V	64.62
4701.00	V	77.49		4701.00	V	73.29
5484.50	H	80.49				
6268.00	H	82.27				
7051.50	H	84.25				

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**TEST DATA CONTD.**

**High Power**

**Low Power**

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
799.00	V	0		799.00	V	0
1598.00	V	80.51		1598.00	V	77.81
2397.00	V	83.42		2397.00	V	79.62
3196.00	V	82.82		3196.00	H	79.72
3995.00	H	81.57		3995.00	H	73.37
4794.00	H	75.47		4794.00	H	74.47
5593.00	V	76.90				
6392.00	H	77.41				

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## EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/09	1/10/12
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/11/10
AC Voltmeter	HP	400FL	2213A14499	CAL 12/29/08	12/29/10
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/30/09	11/30/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/30/09	11/30/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/30/09	11/30/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/30/09	11/30/11
Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 3/30/09	3/30/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/3/09	3/3/12
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 4/5/09	4/5/12
Frequency Counter	HP	5385A	2730A03025	CAL 7/6/09	7/6/11
Hygro-Thermometer	Extech	445703	0602	CAL 11/15/09	11/15/11
Antenna: Log-Periodic	Electro-Metrics	LPA-25	1122	CAL 12/1/08	12/1/10
Measuring Tape-7.5M	Kraftixx	7.5M PROFI		CHAR 11/13/09	11/13/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/9/09	5/9/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/14/09	5/14/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/08	4/25/10