

APPLICATION FOR CERTIFICATION

On Behalf of
Wintecronics Ltd.
FRS Radio Transceiver

Model : ETALK-2000

FCC ID : NJQFRS-168

Prepared for : Wintecronics Ltd.
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Taipei Hsien, Taiwan, R.O.C.

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TEST REPORT CERTIFICATION

Applicant : Wintecronics Ltd.
Manufacturer : Wintecronics Ltd.
FCC ID : NJQFRS-168
EUT Description : FRS Radio Transceiver
(A) MODEL NO. : ETALK-2000
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : 6V DC

Measurement Procedure Used :

FCC RULES AND REGULATIONS:

Part 2 Subpart J and Part 15 Subpart B & C: October 1998

Part 95 Subpart B and Subpart E, Family Radio Service : October 1998

And FCC / ANSI C63.4-1992

The device described above was tested by Taiwan Tokin EMC Eng. Corp. to determine the maximum emission levels emanating from the device. The measurement results were contained in this test report and Taiwan Tokin EMC Eng. Corp. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Part 2, Part 15, Part 95 FRS official requirements.

This report applied to the above tested sample only. This report shall not be reproduced in part without written approval by Taiwan Tokin EMC Eng. Corp.

Date of Test : Aug. 13 ~ Oct. 28, 1999

Prepared by: 
(CHERRY WANG)

Test Engineer: 
(ERIC HSU)

Approve & Authorized Signer: 
(JACKIE DENG)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	FRS Radio Transceiver
Model Number	:	ETALK-2000
FCC ID	:	NJQFRS-168
Applicant	:	Wintecronics Ltd. No. 7, Ming Lee St., Chung Ho City, Taipei Hsien, Taiwan, R.O.C.
Manufacturer	:	Wintecronics Ltd. No. 7, Ming Lee St., Chung Ho City, Taipei Hsien, Taiwan, R.O.C.
AC Adapter	:	Ming Bao Electric Co., Ltd. N/N MW35-0600350 I/P: 120Vac, 60Hz O/P: 6Vdc, 350mA Cord: Non-Shielded, Undetachable, 1.8m
Frequency Range	:	462 ~ 467 MHz 462.5625MHz (Channel 1) and 467.5625MHz (Channel 8) were tested and including in this report.
Data of Receipt of Sample	:	Aug. 04, 1999
Date of Test	:	Aug. 13 ~ Oct. 28, 1999

1.2. Description of Test Facility

Site Description (No. 1 Open Site)	:	Oct. 21, 1996 Re-file on Federal Communication Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, U.S.A.
Name of Firm	:	Taiwan Tokin EMC Eng. Corp.
Site Location	:	No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C
NVLAP Lab Code	:	200077-0

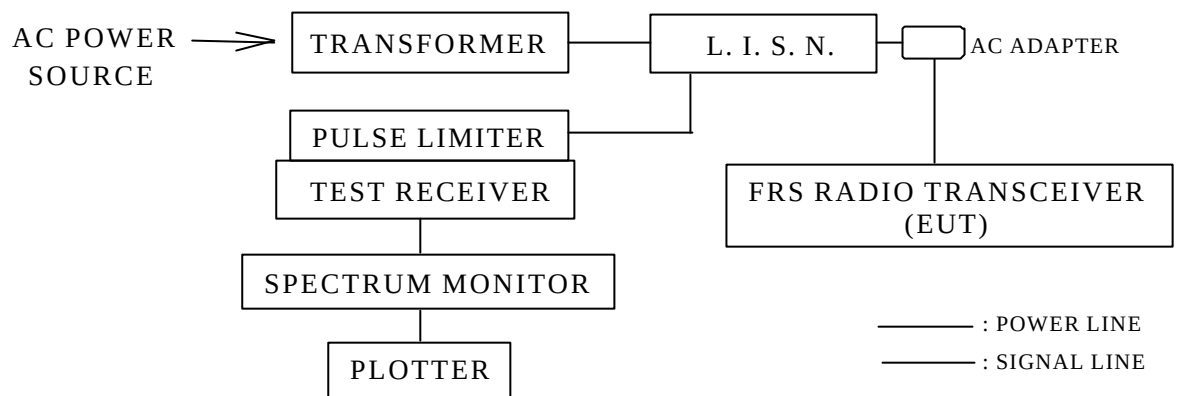
2. POWERLINE CONDUCTED TEST

2.1. Test Equipment

The following test equipment are used during the Powerline Conducted Test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESH3	880647/035	Jun. 19, 99'	1 Year
2.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	Apr. 21, 99'	1 Year

2.2. Block Diagram of Test Setup



2.3. Test Rules

CRF 47 Part 15 Subpart B & C, § 15.207

2.4. Powerline Conducted Emission Limit (Part 15, § 15.207)

Frequency	Maximum RF Line Voltage	
	μV	$dB \mu V$
0.45MHz ~ 30MHz	250	48

REMARKS : RF LINE VOLTAGE ($dB \mu V$) = $20 \log$ RF LINE VOLTAGE (μV)

2.5. EUT's Configuration during Compliance Measurement

The following equipment were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

2.5.1. FRS Radio Transceiver (EUT)

Model Number	:	ETALK-2000
Serial Number	:	N/A
FCC ID	:	NJQFRS-168
Manufacturer	:	Wintecronics Ltd.
AC Adapter	:	Ming Bao Electric Co., Ltd. M/N MW35-0600350 I/P: 120Vac, 60Hz; O/P: 6Vdc, 350mA Cord: Non-Shielded, Undetachable, 1.8m

2.6. Operating Condition of EUT

2.6.1. Setup the EUT and test equipment as shown on 2.2.

2.6.2. Turned on the power of all equipment.

2.6.3. Operated the FRS Radio Transceiver(EUT) on transmitting status during the testing.

2.6.4. Operated the FRS Radio Transceiver(EUT) on receiving status during the testing.

2.7. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of the R&S Test Receiver ESH3 was set at 10KHz.

The frequency range from 450KHz to 30MHz was checked.

EUT with two kinds of test modes (Transmitting & Receiving Mode) were investigated during prescanning and report the **worst mode (Transmitting Mode)** in section 2.9., the others test data are attached within Appendix I.

2.8. Test Results

PASSED. Please refer to the following pages.

2.9. Line Conducted RF Voltage Measurement Results

The frequency range from 450KHz to 30MHz was checked.

All emissions not reported below are too low against the prescribed limits.

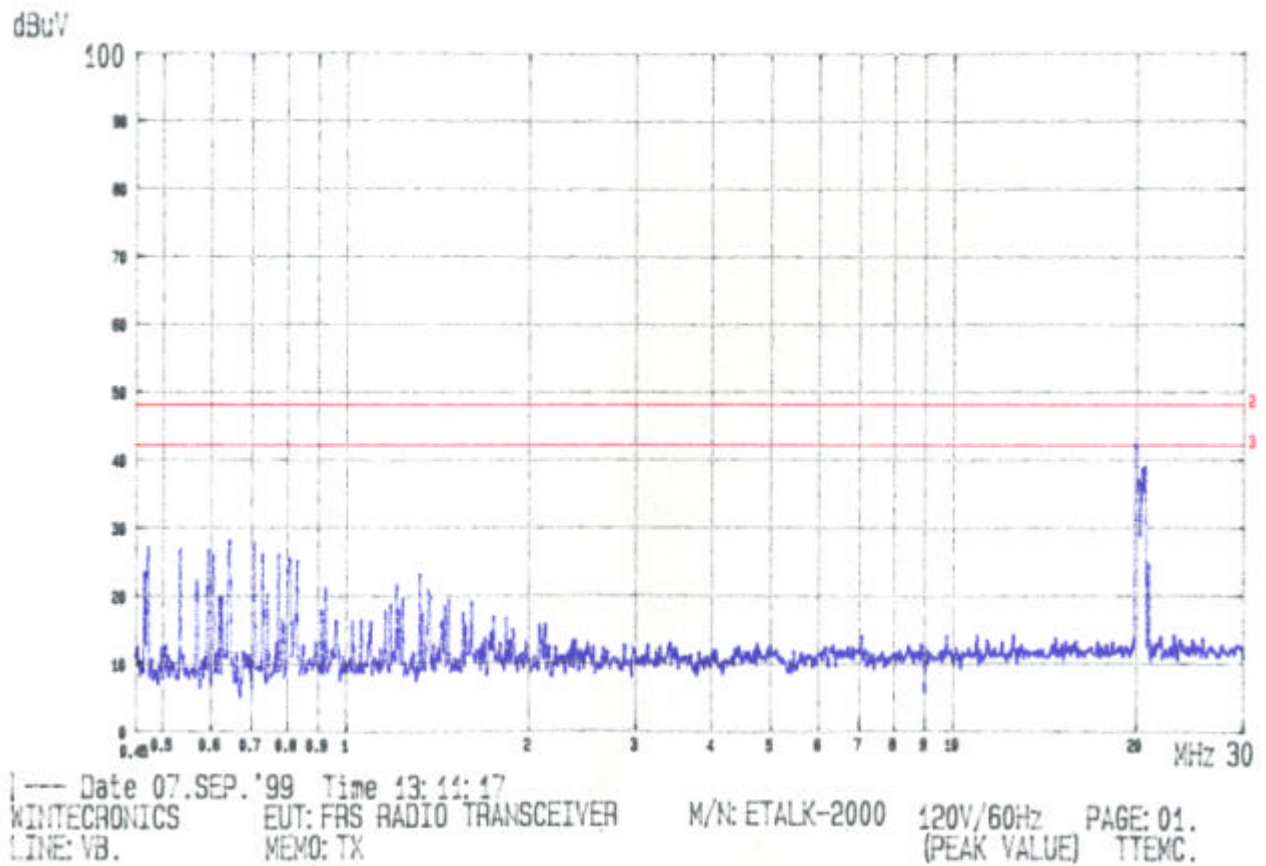
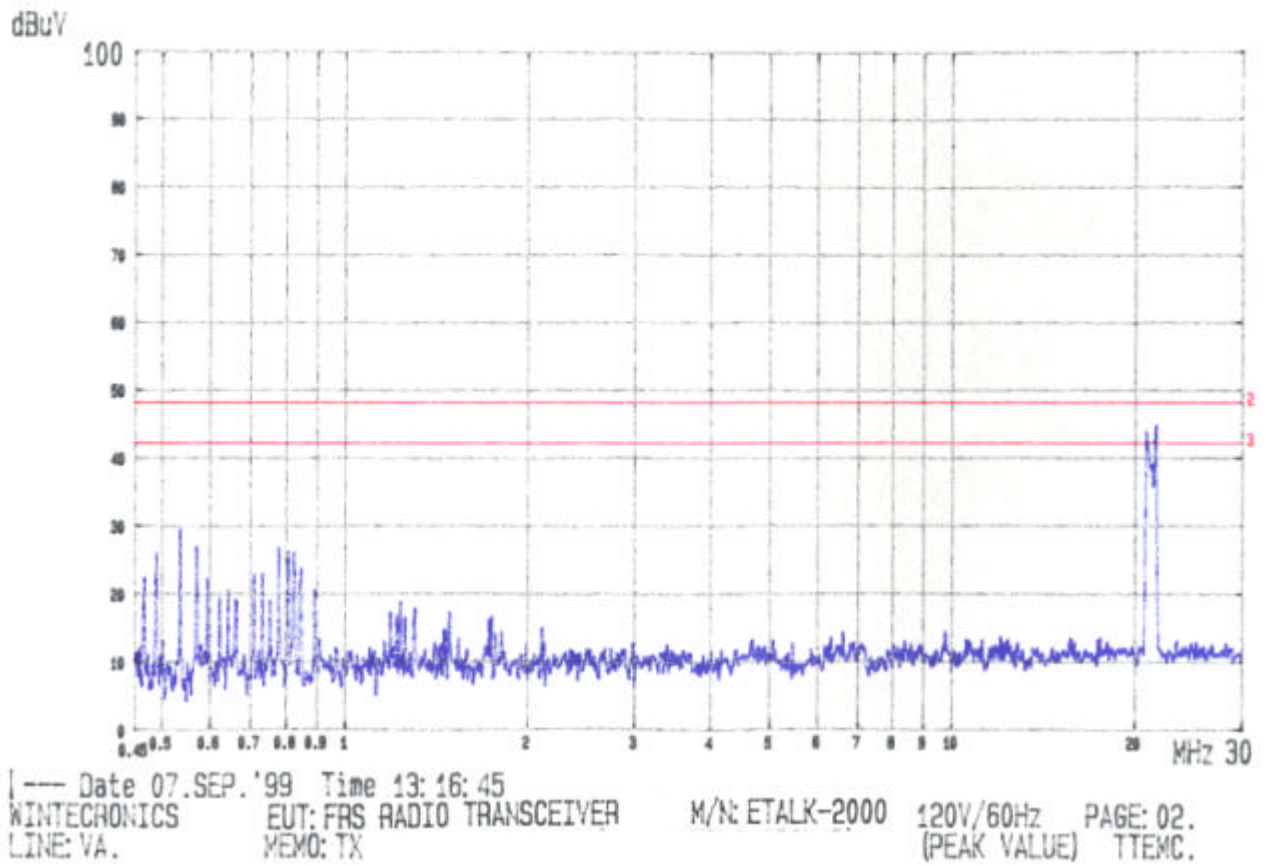
Date of Test : Sep. 07, 1999 Temperature : 27°C

EUT : FRS Radio Transceiver, ETALA 2000 Humidity : 43%

Test Mode : Channel 1, Transmitter / Transmitting Mode

Frequency (MHz)	Factor dB	Reading (dB μ V)		Measurement (dB μ V)		Limits (dB μ V)	Margin (dB μ V)	
		VA	VB	VA	VB		VA	VB
0.4500	0.5	20.3	21.5	20.8	22	48.0	27.2	26
0.5350	0.5	21.1	*	21.6	*	48.0	26.4	*
0.5920	0.5	*	21.6	*	22.1	48.0	*	25.9
0.7044	0.5	*	20.2	*	20.7	48.0	*	27.3
0.8000	0.5	21.3	*	21.8	*	48.0	26.2	*
0.8026	0.5	*	19.4	*	19.9	48.0	*	28.1
0.9013	0.5	18.3	*	18.8	*	48.0	29.2	*
1.3220	0.5	*	12.1	*	12.6	48.0	*	35.4
1.4320	0.5	13.3	*	13.8	*	48.0	34.2	*
21.6404	1.1	42.0	*	43.1	*	48.0	4.9	*
21.7406	1.1	*	40.3	*	41.4	48.0	*	6.6

- Remark :
1. All reading are Quasi-Peak values.
 2. Factor = Insertion Loss + Cable Loss
 3. The worst emission was detected at 21.6404MHz with corrected signal level of 43.1dB μ V (limit is 48dB μ V) when the VA side of the EUT's AC Adapter was connected to L.I.S.N.



3. FREQUENCY STABILITY TEST

3.1. Test Equipment

The following test equipment were used during the Frequency Stability Test :

3.1.1. Temperature Variation Measurement

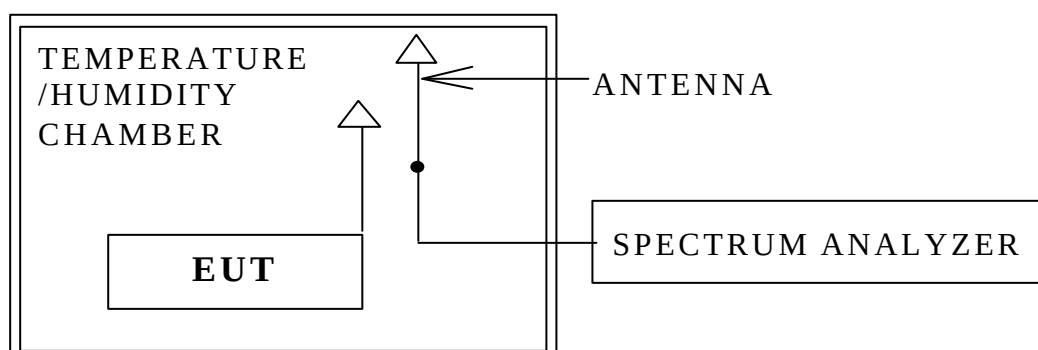
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Temperature /Humidity Chamber	Kato	SSE47BLA	IFB-615	Aug. 24, 99'	1 Year
2.	Spectrum Analyzer	HP	8595E	3829A03489	Oct. 13, 99'	1 Year
3.	Antenna	EMCO	4610	9410-1274	Dec. 28, 98'	1 Year

3.1.2. Primary Supply Voltage Variation Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Communication Test Set	HP	8920A	3524A07043	Dec. 05, 98'	1 Year
2.	Antenna	EMCO	4610	9410-1274	Dec. 28, 98'	1 Year
3.	DC Power Supply	Goodwill	GPQ-3030	003517	N/A	N/A
4.	Transformer	Taili	TL-130	N/A	N/A	N/A
5.	Meter	Sanwa	YX-360TRD	6N23454	Feb. 26, 99'	1 Year

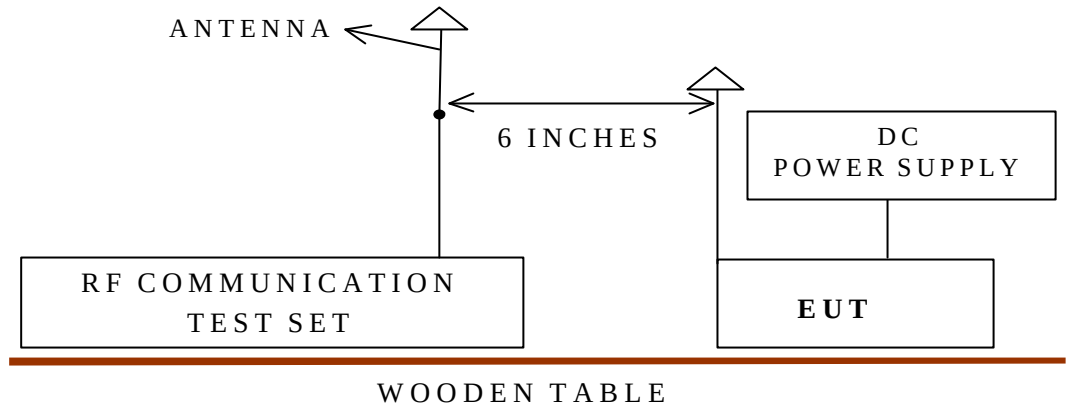
3.2. Block Diagram of Test Setup

3.2.1. Temperature Variation Test Setup

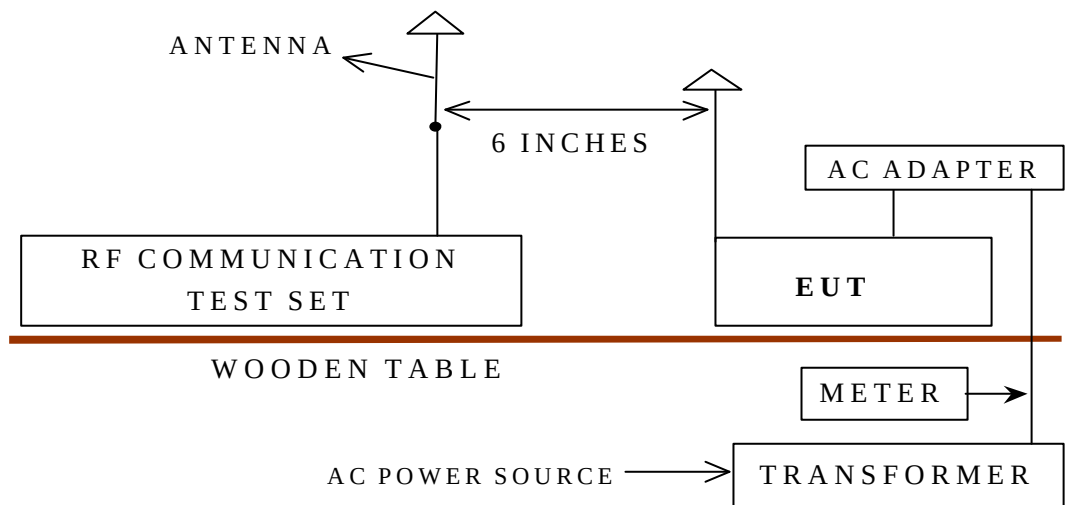


3.2.2. Primary Supply Voltage Variation Test Setup

3.2.2.1. For DC Battery (DC 6V)



3.2.2.2. For AC Adapter (AC 120V)



3.3. Test Rules

CRF 47 Part 2 § 2.1055, (a)-(1) and (d)-(1)

3.4. Specification Limits

Each FRS unit must be maintained within a frequency tolerance of 0.00025% according to Part 95 § 95.627.