

RadioShack, A Division of Tandy Corporation

Application
For
Class II Permissive Change
(FCC ID: AAO21-1670)

October 9, 1998

WO# 9805020

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed a refer to bulk from which such a sample may be said to have been obtained
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FCC ID: AAO21-1670

CKL/at
October 9, 1998

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FCC ID: AAO21-1670

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INTRODUCTION

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MEASUREMENT/TECHNICAL REPORT

Application: RadioShack, A Division of Tandy Corporation
Trade Name: Radio Shack
Model No.: 21-1670
Date: October 9, 1998

This report concerns (check one:) Original Grant _____ Class II Change X _____

Equipment Type: CB Radio Station (example: computer, printer, modem. etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No X _____

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

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List of attached file

Exhibit type	File Description	filename
Cover Letter	Letter of Agency	letter.pdf
Test Report	Test Report	report.doc
Operational Description	Technical Change	change.pdf
Operational Description	Technical Description	descri.pdf
Test Report	Modulation Frequency Response	mfr.pdf
Test Report	Modulation Limiting characteristics	mlc.pdf
Test Report	Modulation Transient Response	mtr.pdf
Test Report	Bandwidth plot	bw.pdf
Test Setup Photo	Radiated emission	radiated.jpg
Test Report	spurious emission plot	spurious.pdf
External Photo	External Photo	ophoto1.jpg, ophoto2 .jpg
Internal Photo	Internal Photo	ipphoto1.jpg to ipphoto4 .jpg
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Operation Description	Electronic Tube specification	power.pdf

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STATEMENT OF CONFORMITY

This unit has been found to conform with the following parts of the 47 CFR as detailed below:

- 2.911 This report is certified by a qualified individual. This signature is located in the Measurement Section.
- 2.983 The name of the applicant and identification of the equipment is provided on Form 731. The product will be produced in mass quantities. The technical description information is included in Exhibit 1, Exhibit 8 to 12.
- 2.985 RF power data is located in Exhibit 3.1.
- 2.987 Modulation characteristics are detailed in Exhibit 4.0.
- 2.989 Occupied bandwidth measurements are detailed in Exhibit 5.0.
- 2.993 The field strength of spurious emissions was measured and the data is recorded in Exhibit 6.0.
- 2.995 The frequency stability of the unit, with respect to voltage and temperature variation, was measured and the results are recorded in Exhibit 7.0.
- 2.997 The frequency range investigated was from the lowest frequency present in the device to higher than the tenth harmonic of the carrier frequency.

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The 21-1670 is a 40 Channel mobile citizen Band (CB) transceiver. The unit is powered from 13.8 Vdc.

Transmitter portion:

- i) Type of emission: 6K00A3E
- ii) Frequency Range: 26.965 MHz to 27.405 MHz
- iii) Maximum Power Rating: 4 Watt

Receiver Portion:

- i) Type of Receiver: Superheterodyne receiver
- ii) Tuning Frequency: 26.965 MHz to 27.405 MHz
- iii) Local oscillator: 26.965 -27.405 MHz
- iv) IF: 10.695 MHz and 455 kHz

The brief circuit description and technical change are saved with filename: descri.pdf and change.pdf respectively.

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1.2 Related Submittal(s) Grants

This is an Application for Class II permissive change of the transmitter portion of a CB Transceiver. The receiver section of the CB Transceiver is subject to the Class II permissive change process and the same FCC ID: AAO21-1670 is used. A separate application has been prepared for the receiver section.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurement were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure of maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna the EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. The test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). The device was mounted to a cardboard box, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes. When the radiated emissions are measured.

The device was powered by a DC power supply adjusted to give 13.8 Vdc.

For measuring spurious and harmonic emissions of the transmitter, a 50 Ω load was connected to the antenna terminal.

The frequency range from 25 MHz to 1 GHz was searched for spurious emissions from the device. Harmonic emissions of the transmitter were investigated up to 5 GHz. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

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2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered on, a signal is transmitted.

2.3 Special Accessories

There is no special accessory necessary for compliance of this product.

2.4 Equipment Modification

Any modification installed previous to testing by RadioShack, A Division of Tandy Corporation will be incorporated in each production model sold/leased in the United States.

No modification were installed by Intertek Testing Services.

Confirmed by:

C. K. Lam

Assistant Manager

Intertek Testing Services

Agent for RadioShack, A Division of Tandy Corporation



_ Signature

October 9, 1998 Date

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EXHIBIT 3

RF POWER OUTPUT

INTERTEK TESTING SERVICES

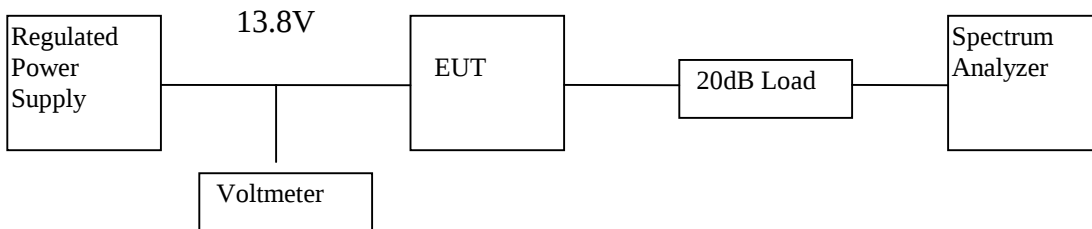
3.0 RF Power Output (Section 2.985(a))

A. Equipment Used

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	35-30L
Voltmeter	Fluke	87
Spectrum Analyzer	Hewlett Packard	8591EM
20dB RF Load	Bird	8304-200-N

B. Testing Procedure

- 1) Setup the test equipment in the following configuration:



- 2) Measure the power of all channels (40 channels) by Spectrum Analyzer in Watt.
- 3) Calculate the actual power by times the measured power with a correction factor, 104.7*
ie. Actual Power = measured Power * 104.7

* The Correction Factor is included the 20dB Load and cable loss between EUT and 20dB load.

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Table 1

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Transmission Power

Channel	Frequency (MHz)	Measured Power (mW)	Net Power (W)	Limit (W)	Margin (W)
1	26.965	35.05	3.67	4	-0.33
2	26.975	35.05	3.67	4	-0.33
3	26.985	35.05	3.67	4	-0.33
4	27.005	35.05	3.67	4	-0.33
5	27.015	35.05	3.67	4	-0.33
6	27.025	35.05	3.67	4	-0.33
7	27.035	35.05	3.67	4	-0.33
8	27.055	35.05	3.67	4	-0.33
9	27.065	35.05	3.67	4	-0.33
10	27.075	35.05	3.67	4	-0.33
11	27.085	35.05	3.67	4	-0.33
12	27.105	35.05	3.67	4	-0.33
13	27.115	35.05	3.67	4	-0.33
14	27.125	35.05	3.67	4	-0.33
15	27.135	35.05	3.67	4	-0.33

Notes: Negative sign in the margin column shows the value below limits.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

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Table 1 (Cont'd...)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Transmission Power

Channel	Frequency (MHz)	Measured Power (mW)	Net Power (W)	Limit (W)	Margin (W)
16	27.155	35.05	3.67	4	-0.33
17	27.165	35.05	3.67	4	-0.33
18	27.175	35.05	3.67	4	-0.33
19	27.185	35.05	3.67	4	-0.33
20	27.205	35.05	3.67	4	-0.33
21	27.215	35.05	3.67	4	-0.33
22	27.225	35.05	3.67	4	-0.33
23	27.255	35.05	3.67	4	-0.33
24	27.235	35.05	3.67	4	-0.33
25	27.245	35.05	3.67	4	-0.33
24	27.265	35.05	3.67	4	-0.33
27	27.275	35.05	3.67	4	-0.33
28	27.285	35.05	3.67	4	-0.33
29	27.295	35.05	3.67	4	-0.33
30	27.305	35.05	3.67	4	-0.33

Notes: Negative sign in the margin column shows the value below limits.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

Table 1 (Cont'd...)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Transmission Power

Channel	Frequency (MHz)	Measured Power (mW)	Net Power (W)	Limit (W)	Margin (W)
31	27.315	35.05	3.67	4	-0.33
32	27.325	35.05	3.67	4	-0.33
33	27.335	35.05	3.67	4	-0.33
34	27.345	35.05	3.67	4	-0.33
35	27.355	35.05	3.67	4	-0.33
36	27.365	35.05	3.67	4	-0.33
37	27.375	35.05	3.67	4	-0.33
38	27.385	35.05	3.67	4	-0.33
39	27.395	35.05	3.67	4	-0.33
40	27.405	35.05	3.67	4	-0.33

Notes: Negative sign in the margin column shows the value below limits.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

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EXHIBIT 4

MODULATION CHARACTERISTICS

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4.0 **Modulation Characteristics**

In order to satisfy the 2.987 requirement, Modulation Frequency Response, Modulation Limit Characteristics and Over Modulation Transient Response, are attached in Exhibit 4.1, 4.2 & 4.3.

Plots for each tests are included in the following sections.

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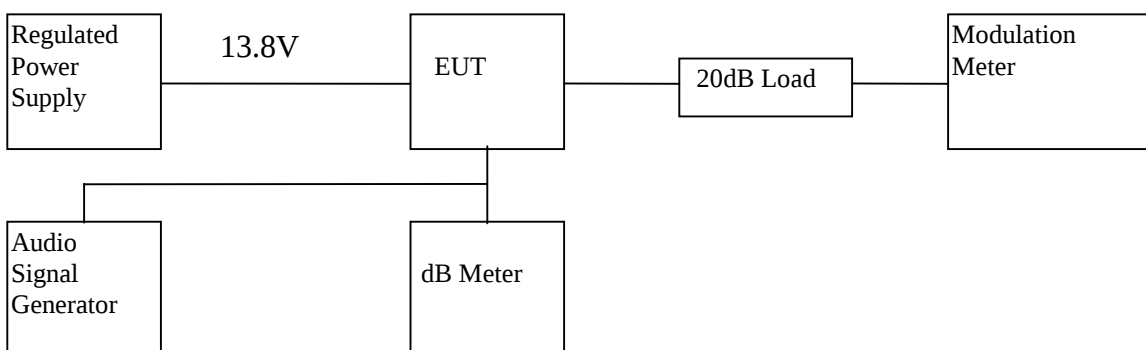
4.1 Modulation Frequency Response

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Audio Signal Generator	Leader	LFG-1300S
dB meter	Leader	LMV-182A
20 dB RF Load	Bird	8304-200-N
Modulation Meter	Marconi Instrument	2945

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the audio signal generator frequency to 2kHz and adjust level to obtain 50% modulation. And then adjust the frequency to obtain the maximum audio frequency response of the EUT.
- 3) Adjust the level of audio signal generator to give 50% modulation at the maximum audio frequency response and take this level as the 0dB reference level.
- 4) The frequency of the audio signal generator is changed from 200Hz to 10kHz and adjust the level to obtain the 50% modulation at each frequency.
- 5) Record the level at each frequency reference to 0dB Level.

INTERTEK TESTING SERVICES

C. Test Result

Table 2

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Modulation Frequency Response (Section 2.987(a))

Test Channel : 19

0 dB Level: 55.0 dBm

Modulation Output : 50%

Modulation Frequency (Hz)	Modulation input relative to max. output. (dB)
200	27.5
300	17.0
400	16.0
500	15.0
600	13.0
700	11.0
800	9.5
900	7.5
1000	5.0
1200	0.0
1500	0.5
2000	8.5
2500	12.5
3000	15.5
4000	20.5
5000	23.5
6000	26.5
7000	29.5
8000	32.5
9000	35.0
10000	40.5

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

For electronic filing, the graph is saved with filename: mfr.pdf

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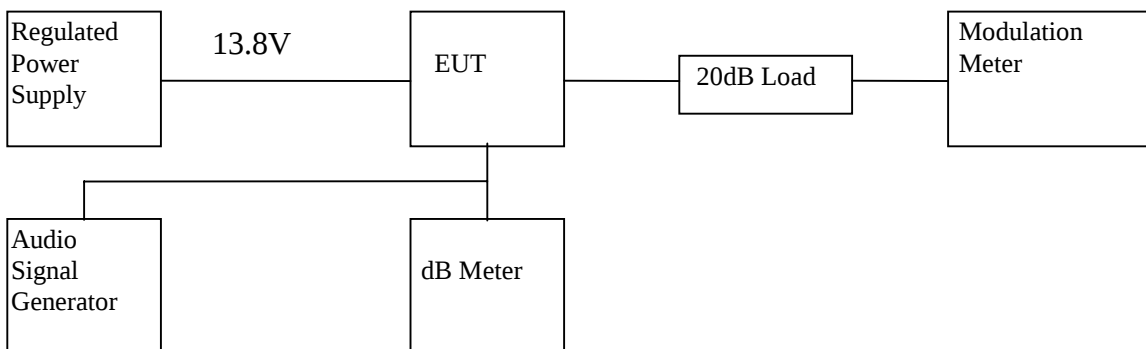
4.2 Modulation Limiting Characteristics (Section 2.987(b))

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Audio Signal Generator	Leader	LFG-1300S
dB meter	Leader	LMV-182A
20 dB RF Load	Bird	8304-200-N
Modulation Meter	Marconi	2950

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the frequency of the audio signal generator to 400Hz and adjust the level from -70dBm to 0dBm. Record the output modulation index.
- 3) Repeat the above procedure with frequency 1200Hz, 1500Hz, 2500Hz & 5000Hz.

INTERTEK TESTING SERVICES

C. Test Result

Table 3

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Modulation Limiting Characteristics

Test Channel : 19

Modulation Input (dBm)	Modulation Index(%) at 400Hz	Modulation Index(%) at 1200Hz	Modulation Index(%) at 1500Hz	Modulation Index(%) at 2500Hz	Modulation Index(%) at 5000Hz
-60	6	20	18	7	5
-50	16	80	80	25	9
-40	43	81	80	70	22
-30	78	82	80	78	63
-20	81	83	82	80	76
-10	90	87	86	83	78
0	100	93	92	87	79

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

For electronic filing, the graph is saved with filename: mlc.pdf.

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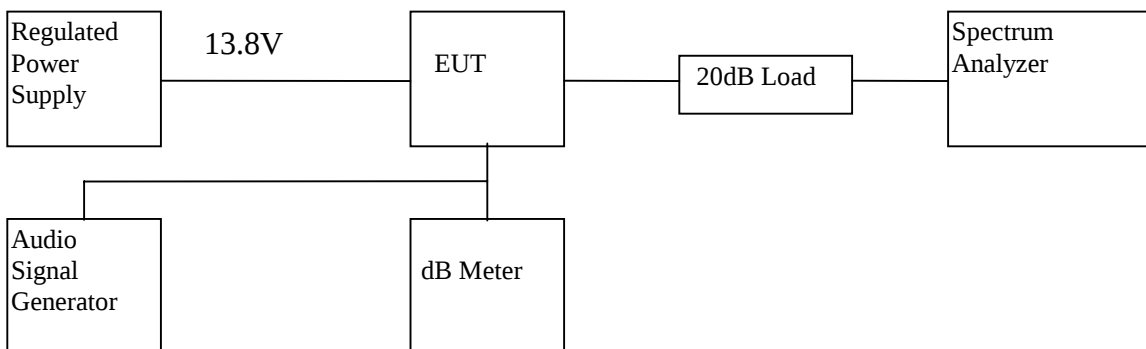
4.3 Over Modulation Transient Response (Section 2.987(b))

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Audio Signal Generator	Leader	LFG-1300S
dB meter	Leader	LMV-182A
20 dB RF Load	Bird	8304-200-N
Spectrum Analyzer	Hewlett Packard	8951EM

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the frequency of the audio signal generator to 2.5kHz at level 16dB greater than required for 50% modulation.
- 3) Use the other audio signal generator pulse the previous signal at one P.P.S. with pulse width of 0.5 second.
- 4) Tune the spectrum analyzer to the channel on which the transmitter is set and adjust the setting as for the measurement of occupied bandwidth.
- 5) And then tune the spectrum analyser to adjacent channel(+/-10kHz) and use “Zero-scan” to observe the transients caused by the pulsed modulation.

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C. Test Result

Table 4

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Over Modulation Transient Response

Channel	Adjacent Frequency (MHz)	Transient Level with respect to TP in (dB)	Transient Duration (ms)
1	26.955	-59.5	10.2
1	26.975	-60.5	25.6
19	27.175	-58.8	16.4
19	27.195	-59.6	12.3
40	27.395	-61.6	25.6
40	27.405	-61.2	11.3

Remark: ‘-’ sign in the Transient Level respect to the carrier Level column mean below the carrier level.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

For electronic filing, the plots are saved with filename: mtr.pdf.

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EXHIBIT 5

OCCUPIED BANDWIDTH

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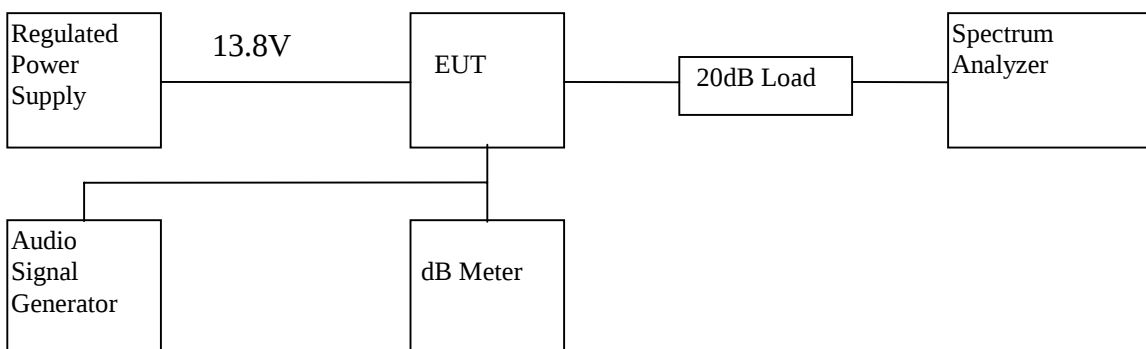
5.0 Occupied Bandwidth (Section 2.989 & Section 95.633)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Audio Signal Generator	Leader	LFG-1300S
dB meter	Leader	LMV-182A
20 dB RF Load	Bird	8304-200-N
Spectrum Analyzer	Hewlett Packard	8951EM

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the level of audio signal generator to obtain 16 dB greater than required for 50% modulation.
- 3) The occupied bandwidth is measured with the spectrum analyzer set at 5kHz/div scan and 10dB/div.

C. Test Result

The occupied Bandwidth is measured to be 5.5 kHz.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

For electronic filing, the plot is saved with filename: bw.pdf

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EXHIBIT 6

SPURIOUS EMISSION

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6.0 **Spurious Emission**

In order to satisfy the 2.991 & 2.993 requirement, the spurious emission from the antenna terminal and from the EUT are measured and shown in the Exhibit 6.1 & 6.2

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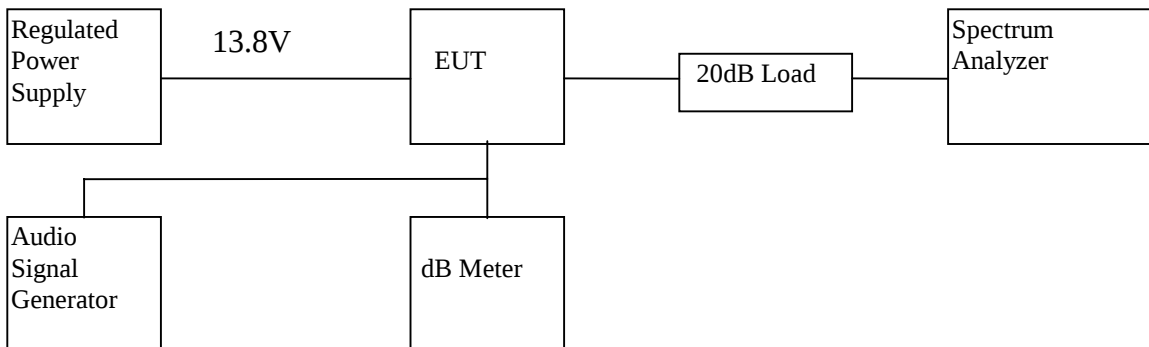
6.1 Spurious emission at the antenna terminal (Section 2.991 & Section 95.631)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Audio Signal Generator	Leader	LFG-1300S
dB meter	Leader	LMV-182A
20 dB RF Load	Bird	8304-200-N
RF Filter	Tailithic	3VF
Spectrum Analyzer	Hewlett Packard	8951EM

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the level of audio signal generator to obtain 16 dB greater than required for 50% modulation.
- 3) Plot the graph of emissions with 50kHz span.
- 4) Measure the emissions relative to TP in region $\text{CARRIER} \pm 4\text{kHz}$ to $\text{CARRIER} \pm 20\text{kHz}$ from the plot.
- 5) Record the emissions relative to TP from region $\text{CARRIER} \pm 20\text{kHz}$ to 1000MHz.

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C. Test Result

RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Table 5(a)

- 1) Unwanted emission from CARRIER $\pm$ 4kHz to Carrier $\pm$ 20kHz (Refer to the plots which is saved with filename: spurious.pdf)

Region	Unwanted emission		
	Channel 1	Channel 19	Channel 40
CARRIER $\pm$ 4kHz to $\pm$ 8kHz	< 25dB	< 25dB	< 25dB
CARRIER $\pm$ 8kHz to $\pm$ 20kHz	< 35dB	< 35dB	< 35dB

- 2) Unwanted emission from CARRIER $\pm$ 20kHz to 1000MHz

Table 5(b): Channel 1

Frequency (MHz)	Emission relative to TP (dB)	Limit (dB)	Margin (dB)
53.930	-74.2	-60	-14.2
80.895	-83.5	-60	-23.5
107.860	-85.5	-60	-25.5
134.825	-69.9	-60	-9.9
161.790	-69.2	-60	-9.2
188.755	-79.1	-60	-19.1
215.720	-89.9	-60	-29.9
242.685	-96.3	-60	-36.3
242.685	-95.0	-60	-35.0

- Remark:
1. '-' sign in margin column shows the value below the limits.
 2. Any emissions and other harmonics which are attenuated more than 20dB below the permissible value need not be recorded.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

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**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Table 5(c): Channel 19

Frequency (MHz)	Emission relative to TP (dB)	Limit (dB)	Margin (dB)
54.370	-73.0	-60	-13.0
81.555	-86.1	-60	-26.1
108.740	-86.9	-60	-26.9
135.925	-76.1	-60	-16.1
163.110	-69.2	-60	-9.2
190.295	-89.1	-60	-29.1
217.480	-93.5	-60	-33.5
244.655	-98.6	-60	-38.6
271.850	-96.1	-60	-36.1

- Remark:
1. ‘-’ sign in margin column shows the value below the limits.
 2. Any emissions and any other harmonics which are attenuated more than 20dB below the permissible value need not be recorded.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

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Table 5(d): Channel 40

Frequency (MHz)	Emission relative to TP (dB)	Limit (dB)	Margin (dB)
54.810	-66.1	-60	-6.1
82.215	-87.1	-60	-27.1
109.620	-87.6	-60	-27.6
137.025	-75.3	-60	-15.3
164.430	-69.4	-60	-9.4
191.835	-89.8	-60	-29.8
219.240	-96.1	-60	-36.1
246.645	-99.1	-60	-39.1
274.050	-93.3	-60	-33.3

- Remark:
1. ‘-’ sign in margin column shows the value below the limits.
 2. Any emissions and any other harmonics which are attenuated more than 20dB below the permissible value need not be recorded.

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

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6.2 Field Strength of Spurious Radiation (Section 2.993)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
Antenna	CDI	B100,B200,B300
Test receiver	Rohde & Schwarz	ESVS30
RF Filter	Tailithic	3VF

B. Testing Procedure

Radiated emission measurements were performed according to the procedures in ANSI C63.4(1992). All measurements were performed in Open Area Test Sites located at Roof Top of Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.

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C. Radiated Emission Configuration Photograph

Worst Case Radiated Emission

Front View

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated.jpg

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D. Test Result

Table 6

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 1

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Net at 3m (dBμV/m)	ERP (dBm)	ERP to related TOP*
V	53.931	44.8	11	55.8	-39.4	-75.0
H	80.895	52.7	6	58.7	-36.5	-72.1
H	107.862	37.9	13	50.9	-44.3	-79.9
H	134.826	41.7	13	54.7	-40.5	-76.1
H	161.791	30.2	16	46.2	-49.0	-84.6
H	188.755	51.7	16	67.7	-27.5	-63.1
H	215.720	41.5	17	58.5	-36.7	-72.3
H	242.685	44.2	19	63.2	-32.0	-67.6
H	269.651	33.8	22	55.8	-39.4	-75.0
H	296.615	39.7	22	61.7	-33.5	-69.1
H	323.580	37.8	24	61.8	-33.4	-69.0
H	350.545	27.9	24	51.9	-43.3	-78.9
H	377.511	29.2	24	53.2	-42.0	-77.6

* "TOP" is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

D. Test Result

Table 6 (Cont'd)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 1

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Net at 3m (dBμV/m)	ERP (dBm)	ERP to related TOP*
H	404.475	39.5	24	63.5	-31.7	-67.3
H	431.440	36.5	25	61.5	-33.7	-69.3
H	458.405	28.1	26	54.1	-41.1	-76.7
H	485.370	37.8	26	63.8	-31.4	-67.0
H	512.335	31.2	27	58.2	-37.0	-72.6
H	539.301	25.3	28	53.3	-41.9	-77.5
H	566.265	32.3	28	60.3	-34.9	-70.5
H	593.230	34.5	29	63.5	-31.7	-67.3
H	620.195	28.2	29	57.2	-38.0	-73.6
H	647.162	36.3	29	65.3	-29.9	-65.5
H	674.125	37.3	29	66.3	-28.9	-64.5
H	701.092	37.9	30	67.9	-27.3	-62.9
H	728.006	31.4	30	61.4	-33.8	-69.4
H	755.025	20.7	30	50.7	-44.5	-80.1

* “TOP” is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

D. Test Result

Table 7

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 19

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Net at 3m (dBμV/m)	ERP (dBm)	ERP to related TOP*
V	54.370	45.3	11	56.3	-38.9	-74.5
H	81.556	52.9	7	59.9	-35.3	-70.9
H	108.741	37.6	13	50.6	-44.6	-80.2
H	135.926	42.3	13	55.3	-39.9	-75.5
H	163.110	25.6	17	42.6	-52.6	-88.2
H	190.296	50.2	16	66.2	-29.0	-64.6
H	217.482	45.8	17	62.8	-32.4	-68.0
H	244.667	43.6	20	63.6	-31.6	-67.2
H	271.852	37.3	22	59.3	-35.9	-71.5
H	299.037	36.7	22	58.7	-36.5	-72.1
H	326.223	40.8	24	64.8	-30.4	-66.0
H	353.407	20.7	24	44.7	-50.5	-86.1
H	380.592	30.5	24	54.5	-40.7	-76.3
H	407.779	43.5	24	67.5	-27.7	-63.3

* “TOP” is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

D. Test Result

Table 7 (Cont'd)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 19

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Net at 3m (dBµV/m)	ERP (dBm)	ERP to related TOP*
H	434.962	43.7	25	68.7	-26.5	-62.1
H	462.145	29.4	26	55.4	-39.8	-75.4
H	489.333	39.3	26	65.3	-29.9	-65.5
H	516.529	30.0	27	57.0	-38.2	-73.8
H	543.705	33.7	28	61.7	-33.5	-69.1
H	570.890	36.2	28	64.2	-31.0	-66.6
H	598.075	38.4	29	67.4	-27.8	-63.4
H	625.261	34.3	29	63.3	-31.9	-67.5
H	652.446	38.3	29	67.3	-27.9	-63.5
H	679.631	41.7	29	70.7	-24.5	-60.1
H	706.817	38.9	30	68.9	-26.3	-61.9
H	734.002	33.4	30	63.4	-31.8	-67.4
H	761.187	25.4	30	55.4	-39.8	-75.4

* "TOP" is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

D. Test Result

Table 8

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 40

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Net at 3m (dBμV/m)	ERP (dBm)	ERP to related TOP*
V	54.810	45.3	11	56.3	-38.9	-74.5
H	82.215	53.3	7	60.3	-34.9	-70.5
H	109.620	40.8	13	53.8	-41.4	-77.0
H	137.026	39.7	13	52.7	-42.5	-78.1
H	164.431	26.1	17	43.1	-52.1	-87.7
H	191.836	51.9	16	67.9	-27.3	-62.9
H	219.241	41.3	17	58.3	-36.9	-72.5
H	246.646	42.4	20	62.4	-32.8	-68.4
H	274.058	36.2	22	58.2	-37.0	-72.6
H	301.457	41.5	22	63.5	-31.7	-67.3
H	328.862	33.3	24	57.3	-37.9	-73.5
H	356.267	31.3	24	55.3	-39.9	-75.5
H	383.673	36.1	24	60.1	-35.1	-20.7
H	411.078	44.2	25	69.2	-26.0	-61.6

* “TOP” is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

D. Test Result

Table 8 (Cont'd)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Radiated Spurious Emissions**

Channel : 40

The output power of transmitter is 35.6 dBm

Antenna Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Net at 3m (dBμV/m)	ERP (dBm)	ERP to related TOP*
H	438.483	39.7	26	65.7	-29.5	-65.1
H	465.887	36.3	26	62.3	-32.9	-68.5
H	493.293	39.4	26	65.4	-29.8	-65.4
H	520.699	30.5	27	57.5	-37.7	-73.3
H	548.104	31.2	28	59.2	-36.0	-71.6
H	575.509	37.7	28	65.7	-29.5	-65.1
H	602.914	31.3	29	60.3	-34.9	-70.5
H	630.319	35.4	29	64.4	-30.8	-66.4
H	657.725	39.2	29	68.2	-27.0	-62.6
H	685.130	38.9	29	67.9	-27.3	-62.9
H	712.535	29.8	30	59.8	-35.4	-71.0
H	739.940	20.3	30	50.3	-44.9	-80.5
H	767.346	22.2	31	53.2	-42.0	-77.6
H	794.752	19.4	31	50.4	-44.8	-80.4

* "TOP" is Transmitter Output Power

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

EXHIBIT 7

FREQUENCY STABILITY

INTERTEK TESTING SERVICES

7.0 **Frequency Stability**

The frequency tolerance was tested in normal condition & over extreme ambient conditions with respect to voltage and temperature variation.

INTERTEK TESTING SERVICES

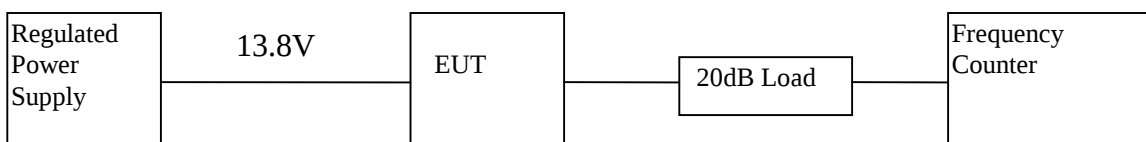
7.1 Frequency Tolerance (Section 95.625)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
20 dB RF Load	Bird	8304-200-N
Frequency Counter	Phillips	PM6668

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Measure all transmit channel frequencies in MHz.

INTERTEK TESTING SERVICES

C. Test Result

Table 9

RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Frequency Tolerance

Channel	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)
1	26.96500	26.96493	-0.00026
2	26.97500	26.97493	-0.00026
3	26.98500	26.98493	-0.00026
4	27.00500	27.00493	-0.00026
5	27.01500	27.01493	-0.00026
6	27.02500	27.02493	-0.00026
7	27.03500	27.03493	-0.00026
8	27.05500	27.05493	-0.00026
9	27.06500	27.06493	-0.00026
10	27.07500	27.07493	-0.00026
11	27.08500	27.08493	-0.00026
12	27.10500	27.10493	-0.00026
13	27.11500	27.11493	-0.00026
14	27.12500	27.12493	-0.00026
15	27.13500	27.13493	-0.00026
16	27.15500	27.15493	-0.00026
17	27.16500	27.16492	-0.00029
18	27.17500	27.16492	-0.00029
19	27.18500	27.18492	-0.00029
20	27.20500	27.20492	-0.00029
21	27.21500	27.21492	-0.00029
22	27.22500	27.22492	-0.00029
23	27.25500	27.25492	-0.00029
24	27.23500	27.23492	-0.00029
25	27.24500	27.24492	-0.00029
26	27.26500	27.26492	-0.00029

INTERTEK TESTING SERVICES

C. Test Result

Table 9 (Cont'd...)

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670
Frequency Tolerance**

Channel	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)
27	27.27500	27.27492	-0.00029
28	27.28500	27.28492	-0.00029
29	27.29500	27.29492	-0.00029
30	27.30500	27.30492	-0.00029
31	27.31500	27.31492	-0.00029
32	27.32500	27.32492	-0.00029
33	27.33500	27.33492	-0.00029
34	27.34500	27.34492	-0.00029
35	27.35500	27.35492	-0.00029
36	27.36500	27.36492	-0.00029
37	27.37500	27.37492	-0.00029
38	27.38500	27.38492	-0.00029
39	27.39500	27.39492	-0.00029
40	27.40500	27.40492	-0.00029

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

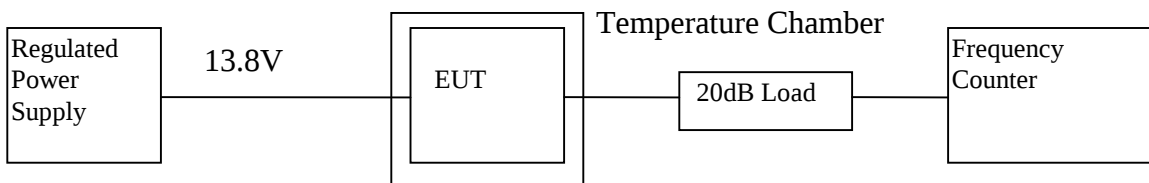
7.2 Frequency Stability - Temperature (Section 2.995)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
20 dB RF Load	Bird	8304-200-N
Frequency Counter	Phillips	PM6668

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the Temperature Chamber to -30°C and stabilize the EUT temperature for one hour. Apply standard input voltage of 13.8 volts with transmitter ON for two minutes.
- 3) Measure the channel frequency of channel 1, 19, 40 in MHz.
- 4) Turn the EUT OFF
- 5) Repeat the above procedure with 10°C intervals from -30°C to 50°C

INTERTEK TESTING SERVICES

C. Test Result

Table 10

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Frequency Deviation with Temperature Variation

Channel : 1

Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
-30	26.96500	26.96488	-0.00045
-20	26.96500	26.96500	0.00000
-10	26.96500	26.96502	0.00007
0	26.96500	26.95404	0.00015
10	26.96500	26.96504	0.00015
20	26.96500	26.96501	0.00004
30	26.96500	26.96495	-0.00019
40	26.96500	26.96496	-0.00015
50	26.96500	26.96495	-0.00019

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

C. Test Result

Table 11

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Frequency Deviation with Temperature Variation

Channel : 19

Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
-30	27.18500	27.18488	-0.00044
-20	27.18500	27.18500	0.00000
-10	27.18500	27.18502	0.00007
0	27.18500	27.18504	0.00015
10	27.18500	27.18504	0.00015
20	27.18500	27.18500	0.00000
30	27.18500	27.18496	-0.00015
40	27.18500	27.18496	-0.00015
50	27.18500	27.18495	-0.00018

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

C. Test Result

Table 12

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Frequency Deviation with Temperature Variation

Channel : 40

Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
-30	27.40500	27.40488	-0.00044
-20	27.40500	27.40500	0.00000
-10	27.40500	27.40502	0.00007
0	27.40500	27.40504	0.00015
10	27.40500	27.40504	0.00015
20	27.40500	27.40501	0.00004
30	27.40500	27.40496	-0.00015
40	27.40500	27.40496	-0.00015
50	27.40500	27.40496	-0.00018

Test Engineer: Wilson S. K. Loke

Date of Test: August 16, 1998

INTERTEK TESTING SERVICES

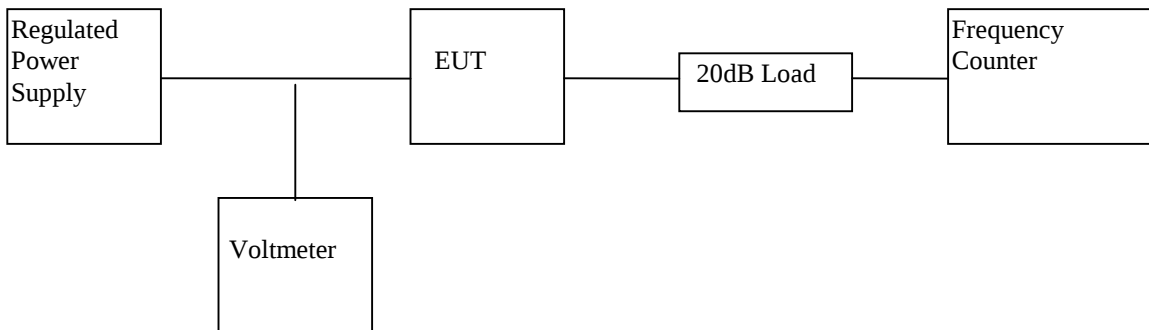
7.3 Frequency Stability - Voltage (Section 2.995)

A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
20 dB RF Load	Bird	8304-200-N
Voltage meter	Fluke	87
Frequency Counter	Phillips	PM6668

B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Vary the level of regulated power supply from 85% to 115% of the rated voltage **and the manufacturer specified battery end point** of the EUT.
- 3) Measure the channel frequency of channel 1, 19, 40 in MHz at each input power level.

INTERTEK TESTING SERVICES

C. Test Result

Table 13

**RadioShack, A Division of Tandy Corporation
Radio Shack 21-1670**

Frequency Deviation with Voltage Variation

The manufacturer specified battery end point 9.1V

Channel : 1

Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
11.7	26.96500	26.96494	-0.00022
13.8	26.96500	26.96494	-0.00022
15.9	26.96500	26.96493	-0.00026
9.1	26.96500	26.96498	-0.00007

Channel : 19

Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
11.7	27.18500	27.18494	-0.00022
13.8	27.18500	27.18494	-0.00022
15.9	27.18500	27.18493	-0.00026
9.1	27.18500	27.18498	-0.00007

Channel : 40

Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	% Deviation
11.7	27.40500	27.40494	-0.00022
13.8	27.40500	27.40494	-0.00022
15.9	27.40500	27.40492	-0.00029
9.1	27.40500	27.40498	-0.00007

INTERTEK TESTING SERVICES

EXHIBIT 8

TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

8.0 **Technical Specifications**

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

INTERTEK TESTING SERVICES

EXHIBIT 9

PRODUCT LABELLING

INTERTEK TESTING SERVICES

9.0 **Product Labelling**

The label and label location are saved with filename: label.pdf

INTERTEK TESTING SERVICES

EXHIBIT 10

PHOTOGRAPHS

INTERTEK TESTING SERVICES

10.0 **Equipment Photographs**

Photographs of the tested EUT are saved with filename: ophoto1.jpg to ophoto2.jpg and iphoto1.jpg to iphoto4.jpg.

INTERTEK TESTING SERVICES

EXHIBIT 11 INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

11.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

Please note that the required FCC Information to the User can be found at the front of this manual.

This manual will be provided to the end-user with each unit sold/leased in the United States.

INTERTEK TESTING SERVICES

EXHIBIT 12

CB TRANSMITTER POWER

INTERTEK TESTING SERVICES

12.0 **CB Transmitter Power**

The dissipation rating of all the semiconductors or electron tubes which supply RF power to the antenna terminals of each CB transmitter does not exceed 10W. The specification of the semiconductors or electron tubes is saved with filename: power.pdf