

KTL Test Report: 8R01405.1

Applicant: VTECH Engineering Canada Ltd.
200 – 7671 Alderbridge Way
Richmond, BC
V6X 1Z9

Equipment Under Test: VTECH VT9108 and Sony SPP-900
(E.U.T.) Cordless Telephone Set

FCC ID: EW780-4177-B6

In Accordance With: **FCC Part 15, Subpart C, 15.249**
For 900 MHz Cordless Telephones

Tested By: KTL Ottawa Inc.
3325 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By:
T. Tidwell, Laboratory Manager

Date:

Total Number of Pages: 28

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FCC PART 15, SUBPART C
FOR 900 MHz CORDLESS TELEPHONES
PROJECT NO.: 8R01405.1

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

Section 1. Summary Of Test Results

Manufacturer: VTECH Engineering Canada Ltd.

Model No.: VTECH VT9108 & Sony SPP-900

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15.249. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated Emissions were made on an open area test site.



New Submission



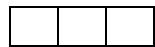
Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".

NVLAP[®]

NVLAP LAB CODE: 100351-0

TESTED BY: _____ DATE: _____
Wayne Clarke, Technologist

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**FCC PART 15, SUBPART C
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FCC ID: EW780-4177-B6

Summary Of Test Data

Base:

NAME OF TEST	PARA. NO.	RESULT
Conducted Emissions	15.207	Complies
Radiated Emissions	15.249	Complies

Handset:

NAME OF TEST	PARA. NO.	RESULT
Radiated Emissions	15.249	Complies

Footnotes For N/A's:

Test Conditions:

Indoor Temperature: 22 °C
 Humidity: 30 %

Outdoor Temperature: Not Applicable
 Humidity: Not Applicable

Section 2A. General Equipment Specification

Base:

Frequency Range: 902.3 – 906.65 MHz

Operating Frequency(ies) of Sample: 302.3, 905.000

Tunable Bands: 1

Number of Channels: 30

Channel Spacing: 150 kHz

Emission Designator: 100KF1D

Crystal Frequencies: Not Applicable

User Frequency Adjustment: Push Button Channel Selection On Handset

Integral Antenna

Yes



No



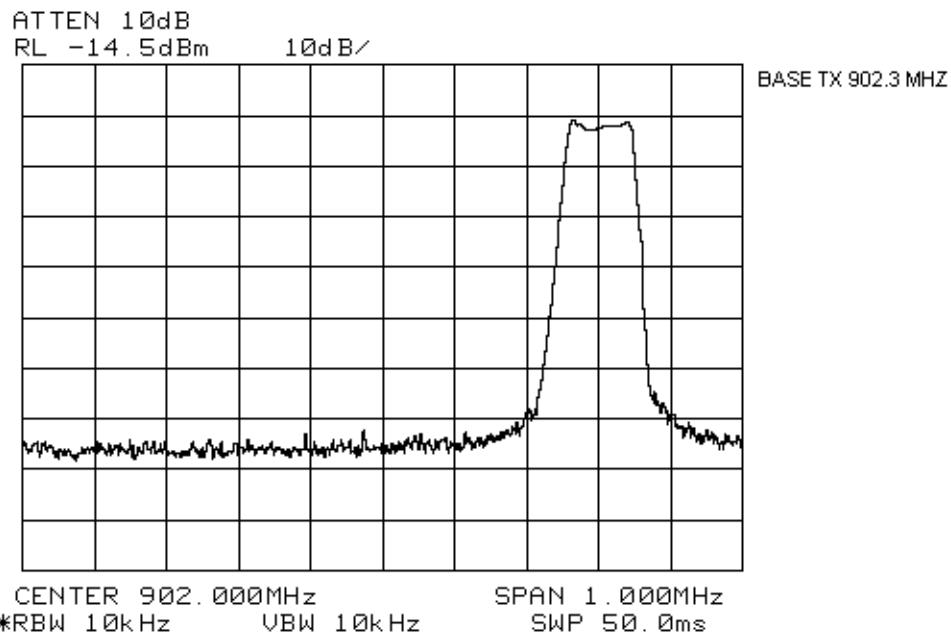
***Note:** If antenna is not integral to transmitter explain method of attachment and type of unique connector:*

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Section 2B. General Equipment Specification

Handset

Frequency Range: 923.1 – 927.75 MHz
Operating Frequency(ies) of Sample: 923.1, 927.7 MHz
Tunable Bands: 1
Number of Channels: 30
Channel Spacing: 150 kHz
Emission Designator: 100FK1D
Crystal Frequencies: Not Applicable
User Frequency Adjustment: Push Button Channel Selector

Integral Antenna

Yes



No



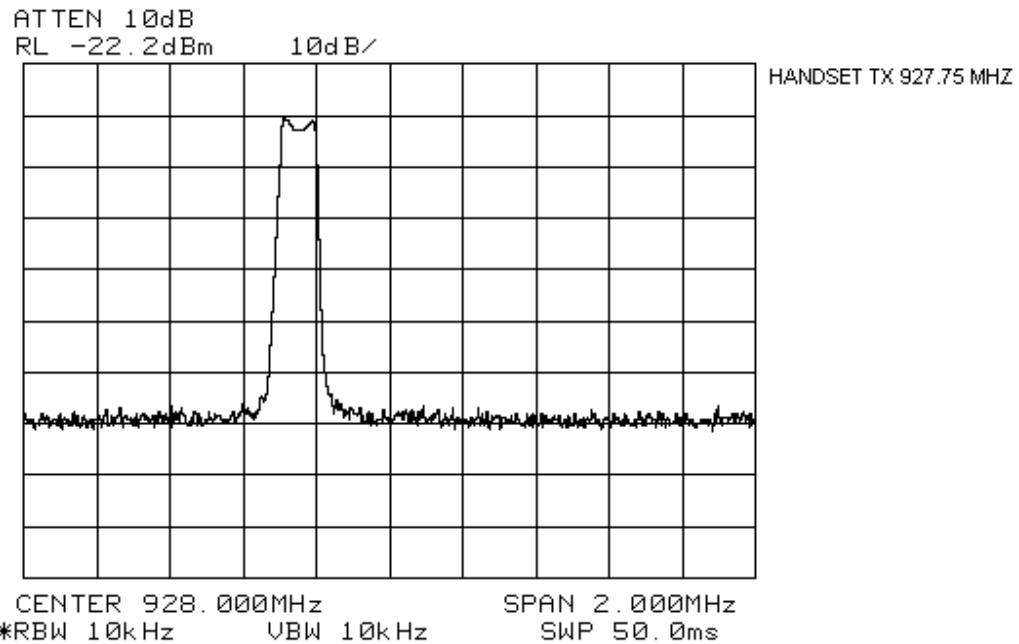
Note: If antenna is not integral to transmitter explain method of attachment and type of unique connector:

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EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set

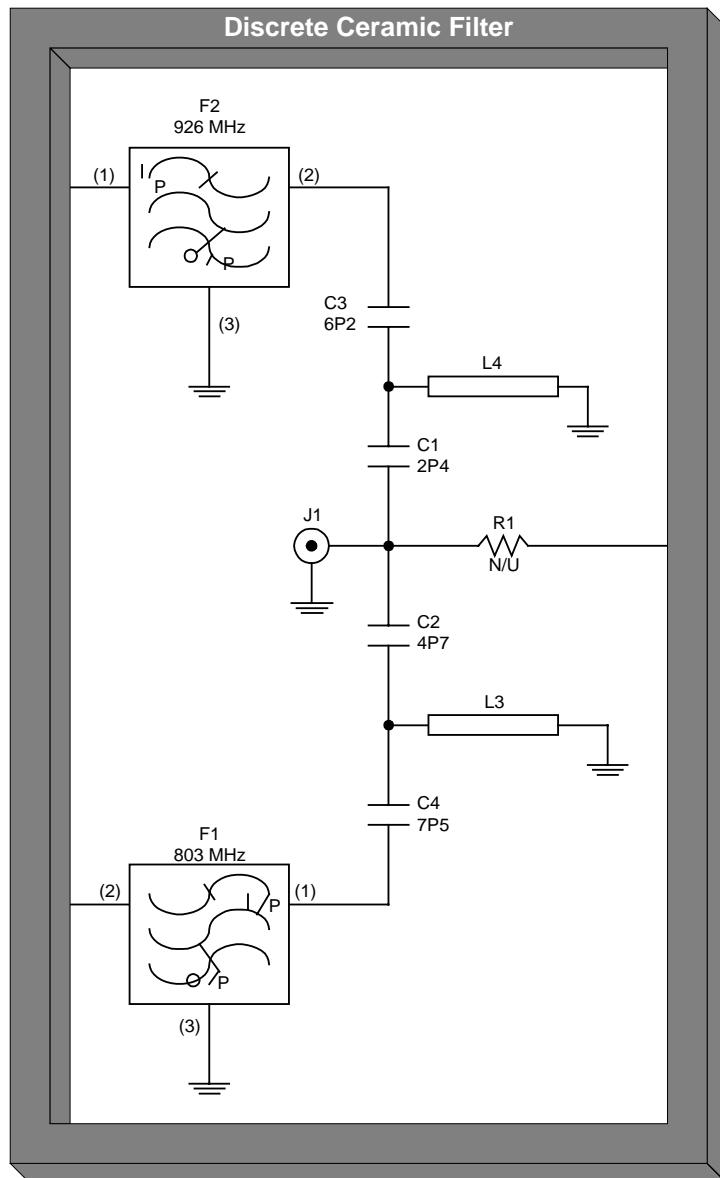
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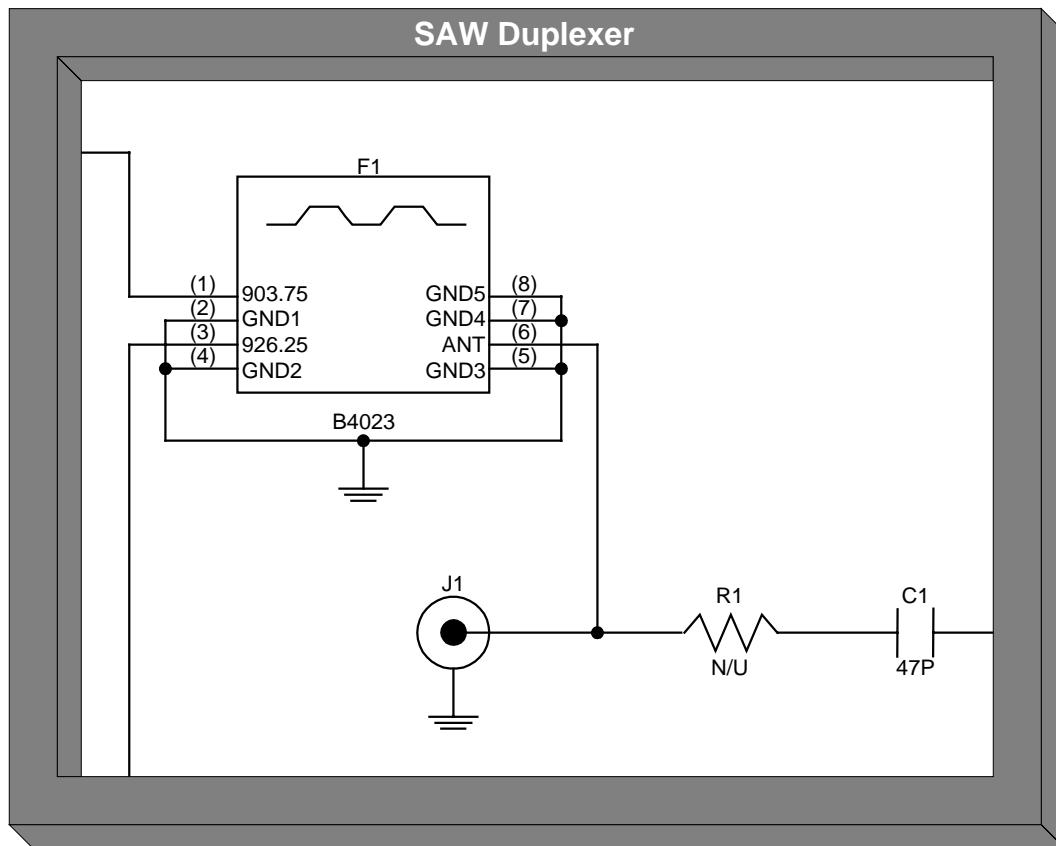
EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Description of Modification for Class II Permissive Change

The modification is to remove two discrete ceramic filters in the handset and replace them with a SAW duplexer.

Schematic Diagram of Before & After Modification

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Schematic Diagram of Before & After Modification, cont.

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Modifications Made During Testing

NOT APPLICABLE

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set

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Theory of Operation

The E.U.T. is a basic analogue cordless telephone. It has 30 channels which are operator controllable.

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Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY: Wayne Clarke	DATE: March 18, 1999

Minimum Standard:

Frequency (MHz)	Maximum Powerline Conducted RF Voltage (μ V)	(dB μ V)
0.45 - 30.0	250	48

Test Results: Complies. See attached graph(s).

Measurement Data: See attached graph(s).

Method of Measurement: **(Procedure ANSI C63.4-1992)**

Measurements were made using a spectrum analyzer with 10 kHz RBW, Peak Detector. Any emissions that are close to the limit are measured using a test receiver with 10 kHz bandwidth, CISPR Quasi-Peak Detector.

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INSERT CONDUCTED EMISSIONS GRAPH(S)

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EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set

FCC ID: EW780-4177-B6

Conducted Photographs (Worst Case Configuration)

Side View



Front View



EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

Section 4A. Radiated Emissions (Base)

NAME OF TEST: Radiated Emissions (Base)	PARA. NO.: 15.249
TESTED BY: Wayne Clarke	DATE: March 26, 1999

Minimum Standard: Para no. 15.249

(a) The field strengths shall not exceed the following:

Fundamental (MHz)	Field Strength (mV/m)	Field Strength (dB μ V)	Harmonic (mV/m)	Harmonic (dB μ V)
902-928	50	94	0.5	54

(b) Field strength limits are specified at a distance of 3 metres.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits of 15.209 whichever is the less attenuation.

(d) The emission limits shown above are based on measurement instrumentation employing a CISPR quasi-peak detector below 1000 MHz and an averaging detector above 1000 MHz. However, the peak field strength of any emission shall not exceed the average limit by more than 20 dB.

Test Results: Complies. The worst-case emission level is 84.3 dB μ V/m @ 3m at 902.297 MHz. This is 9.7 dB below the specification limit.

Measurement Data: See attached table.

Maximizing Emission Levels:

For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels.

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Test Data - Radiated Emissions (Base)

Test Distance (meters) : 3		Range: B Tower		Receiver: ESVS 30		RBW(kHz): 120		Detector: CISPR			
Freq. (MHz)	Ant. *	Pol. (V/H)	Ant. HGT. (m)	Table (deg.)	RCVD Signal (dB μ V/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
905.004	E/D4	V			45.6	35.4			81.0	94.0	13.0
905.004	E/D4	H			42.4	35.4			77.8	94.0	16.2
902.297	E/D4	V			48.9	35.4			84.3	94.0	9.7
902.297	E/D4	H			43.9	35.4			79.3	94.0	14.7

Notes:
 B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole
 * Re-measured using dipole antenna.
 ** Includes cable loss when amplifier is not used.
 *** Includes cable loss.
 () Denotes failing emission level.

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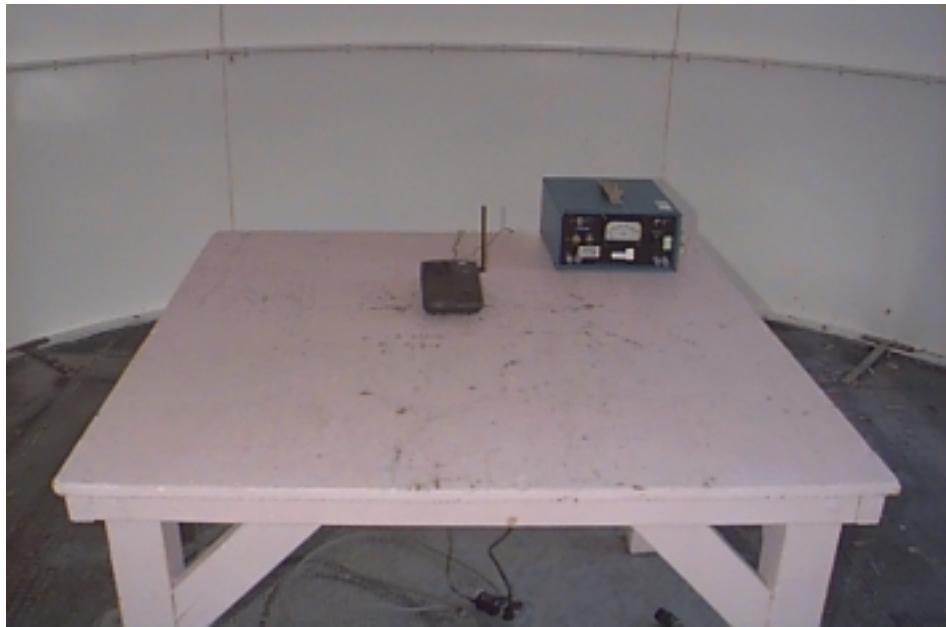
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EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set

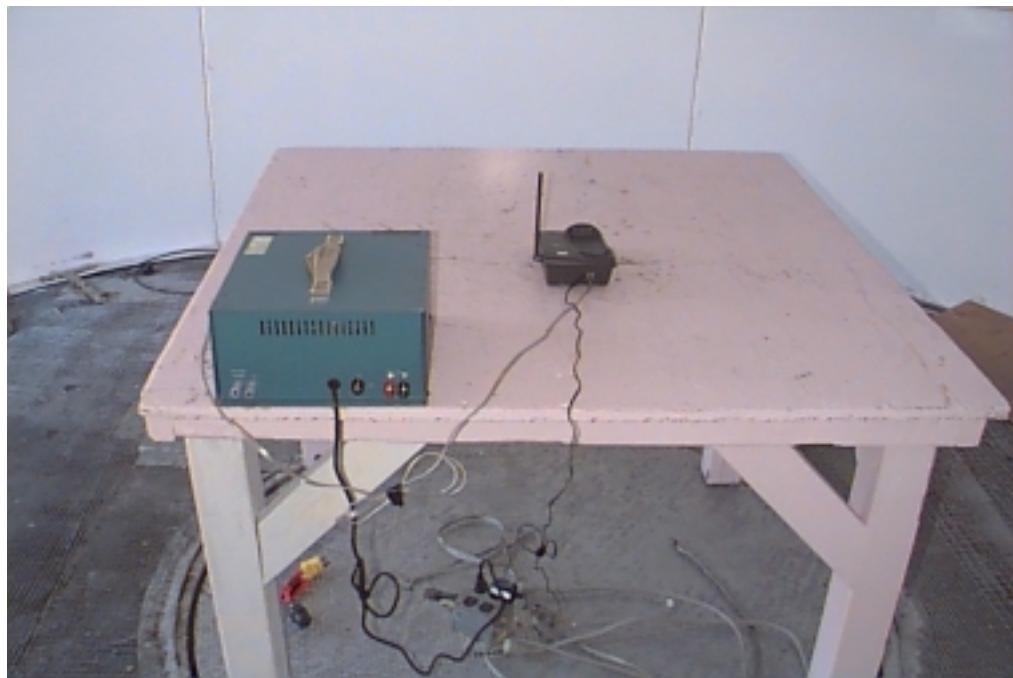
FCC ID: EW780-4177-B6

Radiated Photographs - Base (Worst Case Configuration)

Front View



Rear View



EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

Section 4B. Radiated Emissions (Handset)

NAME OF TEST: Radiated Emissions (Handset)	PARA. NO.: 15.249
TESTED BY: Wayne Clarke	DATE: March 25, 1999

Minimum Standard: Para no. 15.249

(a) The field strengths shall not exceed the following:

Fundamental (MHz)	Field Strength (mV/m)	Field Strength (dB μ V)	Harmonic (mV/m)	Harmonic (dB μ V)
902-928	50	94	0.5	54

(b) Field strength limits are specified at a distance of 3 metres.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits of 15.209 whichever is the less attenuation.

(d) The emission limits shown above are based on measurement instrumentation employing a CISPR quasi-peak detector below 1000 MHz and an averaging detector above 1000 MHz. However, the peak field strength of any emission shall not exceed the average limit by more than 20 dB.

Test Results: Complies. The worst-case emission level is 82.4 dB μ V/m @ 3m at 923.12 MHz. This is 11.6 dB below the specification limit.

Measurement Data: See attached table.

Maximizing Emission Levels:

For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels.

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Test Data - Radiated Emissions (Handset)

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVP		RBW(kHz): 120		Detector: CISPR			
Freq. (MHz)	Ant. *	Pol. (V/H)	Ant. HGT. (m)	Table (deg.)	RCVD Signal (dB μ V/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
923.12	E/D4	V			43.3	35.1			78.4	94.0	15.6
923.12	E/D4	H			47.3	35.1			82.4	94.0	11.6
927.77	E/D4	V			45.4	35.3			80.7	94.0	13.3
927.77	E/D4	H			46.7	35.3			82.0	94.0	12.0

Notes:
 B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole
 * Re-measured using dipole antenna.
 ** Includes cable loss when amplifier is not used.
 *** Includes cable loss.
 () Denotes failing emission level.

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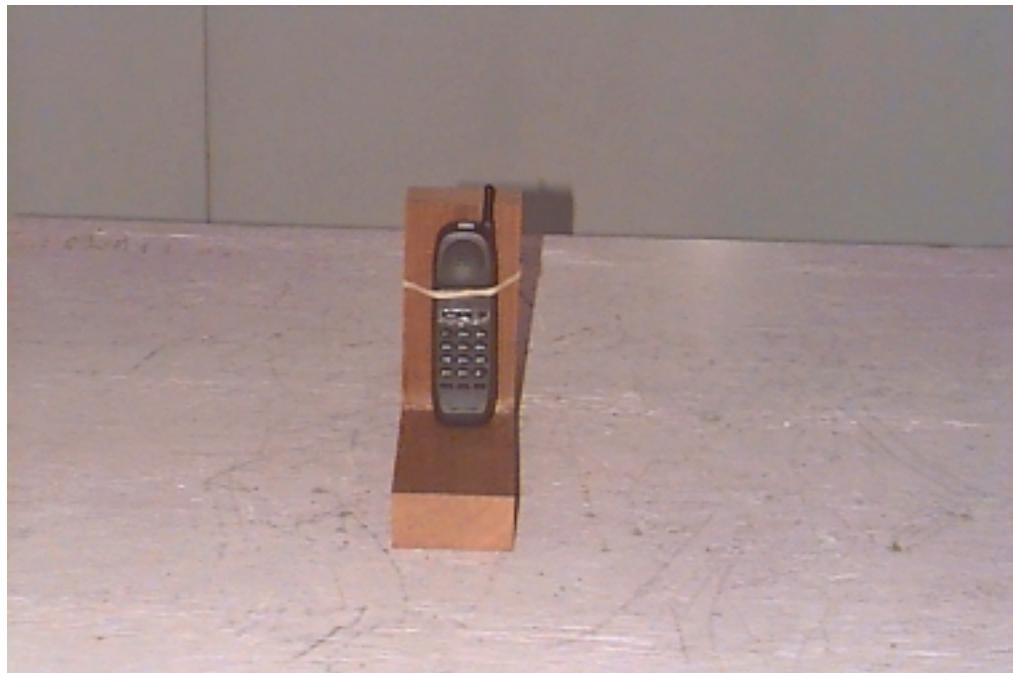
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EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set

FCC ID: EW780-4177-B6

Radiated Photographs - Handset (Worst Case Configuration)

Front View



EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

Section 5. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.	
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	May 20/98	May 20/99	
	Plotter	Hewlett Packard	7470A	2308A30807	NCR	NCR	
1 Year	Spectrum Analyzer	Hewlett Packard	3585A	846057	Oct. 22/98	Oct. 22/99	
1 Year	Spectrum Analyzer-1	Hewlett Packard	8566B	2311A02238	Oct. 22/98	Oct. 22/99	
1 Year	LISN	Rohde & Schwarz	ESH2-Z5	890485/017	July 23/98	July 23/99	
1 Year	Receiver	Rohde & Schwarz	ESH3	892473/002	July 23/98	July 23/99	
1 Year	Receiver	Rohde & Schwarz	ESVP	892661/014	Mar. 31/98	Mar. 31/99	
2 Year	Horn Antenna	EMCO #2	3115	4336	Oct. 30/97	Oct. 30/99	
1 Year	Dipole Antenna Set	EMCO	3121C	1029	Nov. 18/98	Nov. 18/99	
1 Year	Low Noise Amplifier	Avantek	AWT-8035	1005	Aug. 4/98	Aug. 4/99	

NA: Not Applicable

NCR: No Cal Required

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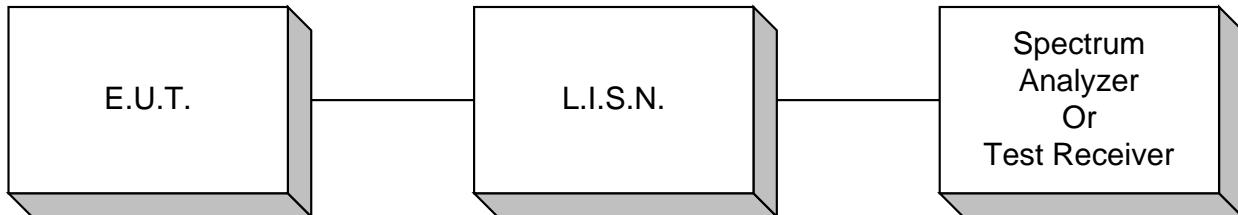
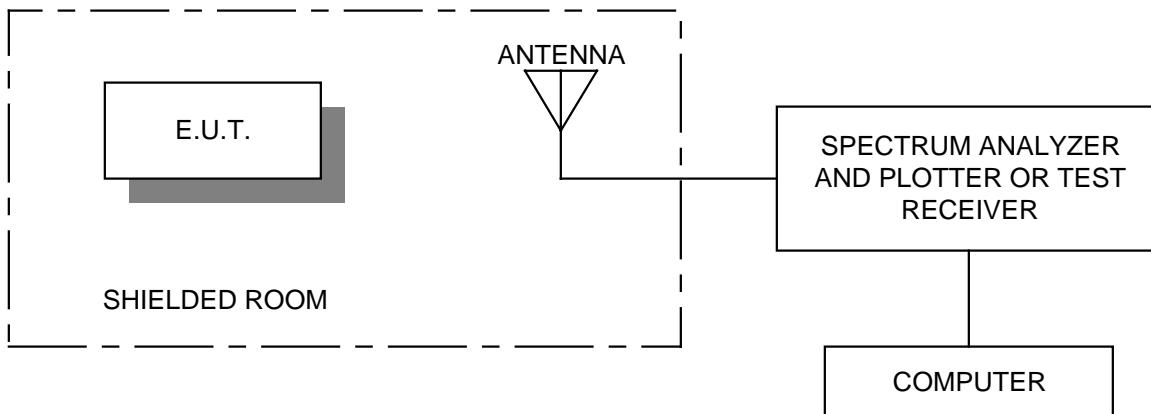
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ANNEX A

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

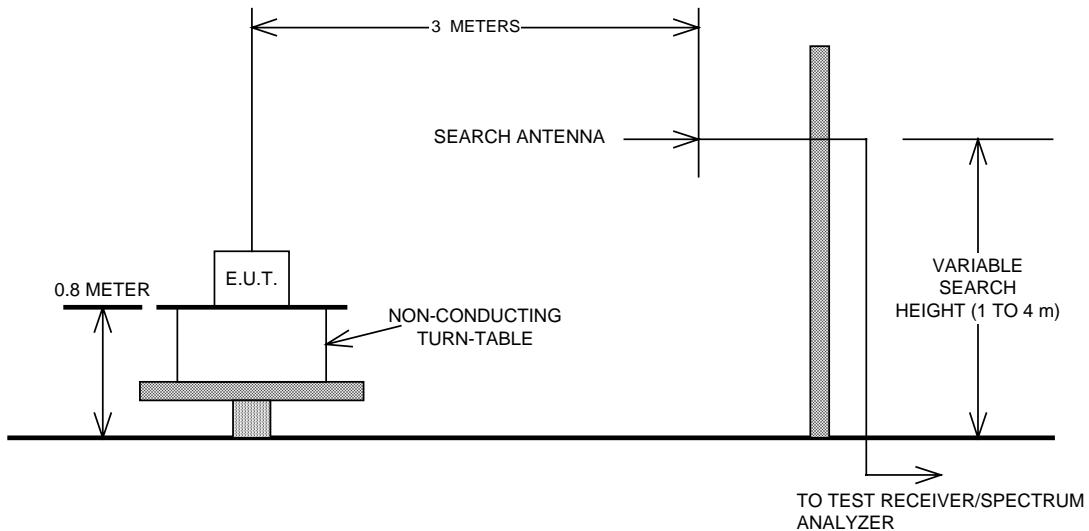
ANNEX A

TEST DIAGRAMS

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Conducted Emissions**Radiated Prescan**

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
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Test Site For Radiated Emissions

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ANNEX B

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

ANNEX B

RESTRICTED BANDS OF OPERATION

EQUIPMENT: VTECH VT9108 & Sony SPP-900 Cordless Telephone Set
FCC ID: EW780-4177-B6

Section B Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section , only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			