



Nemko

Test Report: 5W47733

Applicant: VTech Telecommunications Canada Ltd.
Suite 200 – 7671 Alderbridge Way
Richmond, B.C., V6X 1Z9
Canada

Equipment Under Test: ia5823 – Basic 5.8 GHz Analogue Cordless Phone
with CID
ia5854 – 5.8 GHz Analogue Cordless Phone with CID
and Answering Machine

In Accordance With: FCC Part 15, Subpart C, 15.249

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By: 
Sim Jagpal, General Manager

Date: 14 July 2005

Total Number of Pages: 34

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Section 1. Summary Of Test Results

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 C63.4-2003. Radiated Emissions were made on an open area test site. A description of the test facility is on file with the FCC.

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".

TESTED BY: 
Roman Kuleba, Wireless Specialist

DATE: 14 July 2005

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This report applies only to the items tested.

Section 2. Summary Of Test Data**Summary Of Test Data**

Name Of Test	Para. No.	Result
Power line Conducted Emissions	15.207(a)	Complies
Radiated Emissions	15.249	Complies

Test Conditions:**Indoor**

Temperature: 24°C

Humidity: 50%

Outdoor

Temperature: 27°C

Humidity: 60%

Section 3. General Equipment Specification

Manufacturer:	VTech Telecommunications Canada Ltd.
Model No.:	ia5823 ia5854
Serial No.:	Handset unit: PA 05/05 487 Base unit: PA 05/05 480
Date Received In Laboratory:	June 27, 2005
Nemko Identification No.:	Handset unit: Item No. 1 Base unit: Item No. 3
Frequency Range:	Handset unit: 5863.80 – 5872.50 MHz Base unit: 912.75 – 917.10 MHz
Number of Channels:	30
Modulation:	Voice: FM (Deviation: 30 kHz) Data: FSK at 1000 bps
Power Source:	Base: 120 VAC / 60 Hz to 9 VDC Adapter Handset : 3.6 VDC

Theory of Operation

The ia5823/ia5854 is the second generation of the VTech Analog 5.8GHz hybrid cordless telephone. It consists of a mobile handset and a fixed base unit.

The base and Handset RF module are used as a RF combo to provide a full duplex wireless links between the handsets and base unit. This is accomplished by setting up two simultaneous communications links between the handset and base RF Modules. The RF receiver and transmitter circuitries essentially provide a link between the microphone and speaker in the handset to telephone line connected to the base.

The RF link between the Handset and the Base occurs in two frequency bands. The upper end of the 5.8 GHz band is used for the RF carrier of the audio signal from the handset microphone to the base station. The transmitting frequencies from the handset to the base: 5863.80 MHz to 5872.50 MHz.. The 900 MHz band is used for the RF carrier of the audio signal from the base to the handset's speaker. The transmitting frequencies from the base to the handset: 912.75 MHz to 917.10 MHz.

The voice signals wideband frequency modulate (FM) the RF carriers and the data packets use frequency shift keying (FSK) to modulate the RF carriers.

There are two types of bases, first is the basic 5.8 GHz Analogue Cordless Phone with CID ia5823 (C Model) and the second is the 5.8GHz Analogue Cordless Phone with CID and Answering Machine ia5854 (Ci Base Model).

Both models use the same type of handset. The Base RF module used on the ia5823 is the same as the RF module used on the ia5854.

Section 4. Powerline Conducted Emissions

Para. No.: 15.207 (a)

Test Performed By: Roman Kuleba	Date of Test: July 5, 2005
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Test Results: Complies.**Measurement Data:** See attached graph(s) and table.*Limits For Conducted Disturbance At The Mains Ports Of Class B*

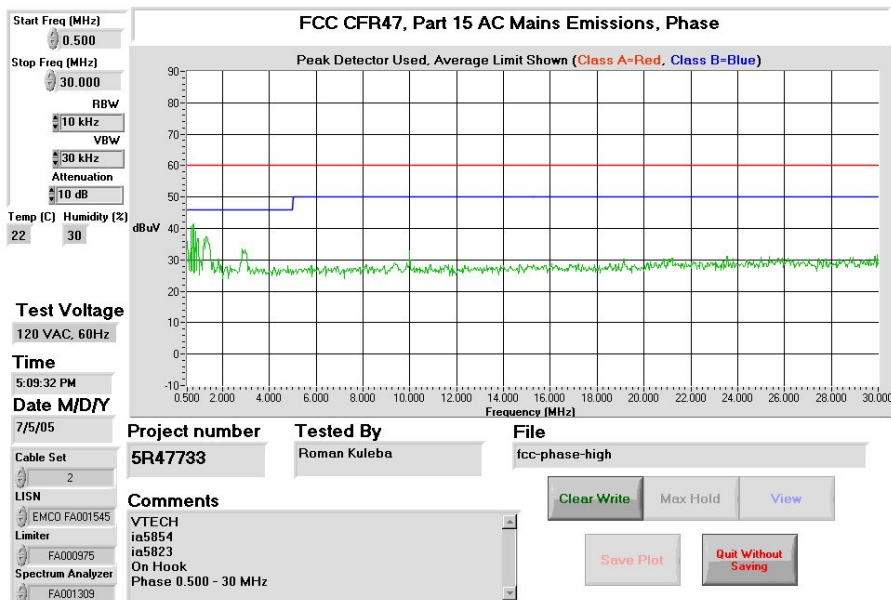
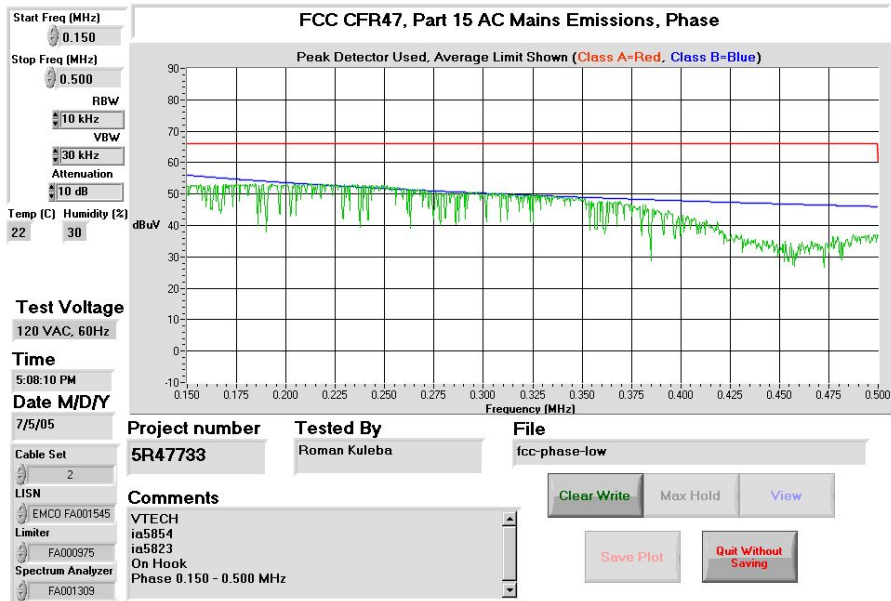
Frequency Range MHz	Limits dB(μV)		Result
	Quasi-Peak	Average	
0.15 to 0.50	66 to 56	56 to 46	Complies.
0.5 to 5	56	46	
5 to 30	60	50	
Note: 1. The lower limit shall apply at the transition frequency. 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz. 3. The test was performed using a peak detector.			

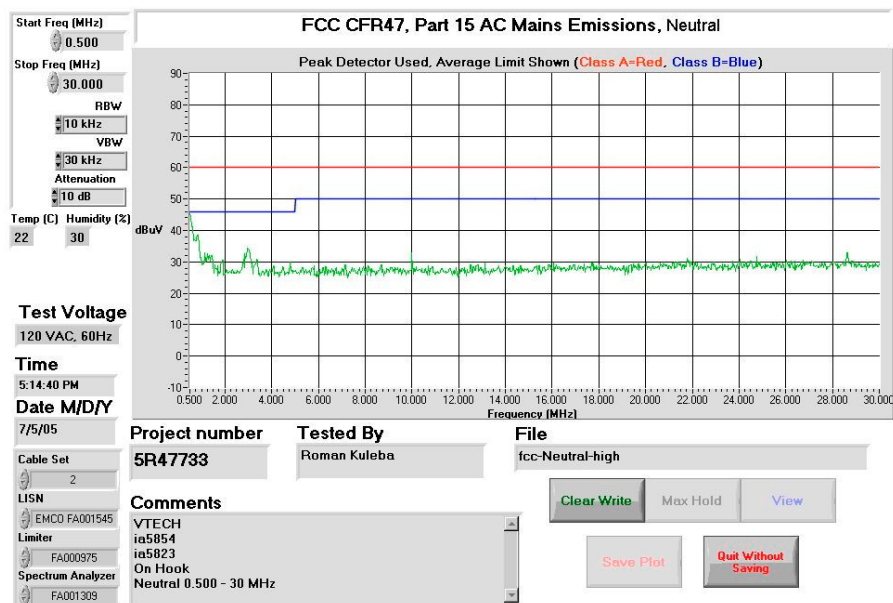
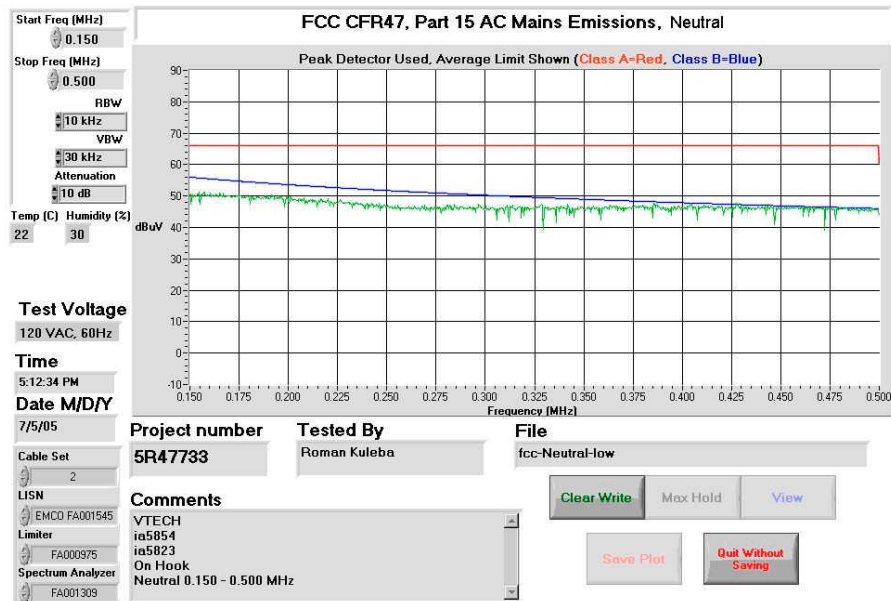
Note:

Power line conducted emissions test was conducted for base unit with the handset on cradle.
The handset was operated with fully charged battery.

Conducted Disturbance at Mains Detailed Setup Photos



Conducted Disturbance at Mains Plots**Line: Phase**

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Conducted Disturbance at Mains – Plots****Line: Neutral**

EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID

Conducted Disturbance at Mains Test Data

Standard:		FCC 15 Subpart B		Class:	B		Input Voltage:		120 VAC	
Analyzer:		HP8566B, FA001309		Location:	Ottawa		Input Frequency:		60 Hz	
Receiver:		ESHS 10, FA001918		Temp:	23		Date:	July 5, 2005		
Tester:		Roman Kuleba		Humidity:	36		Other:			
Project Number:		5R47733		EUT Description:		ia5854/ia 5823 Cordless Phone				
Conductor		Frequency (MHz)	Detector	Emission Level (dBuV)	LISN Loss (dB)	Cable Loss (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	
1	Phase	0.1500	Quasi Peak	41.0	0.00	0.00	41.00	66.0	25.0	
			Average	11.3	0.00	0.00	11.30	56.0	44.7	
2	Phase	0.2000	Quasi Peak	41.0	0.00	0.20	41.20	63.6	22.4	
			Average	10.8	0.00	0.20	11.00	53.6	42.6	
3	Phase	0.2500	Quasi Peak	40.7	0.00	0.20	40.90	61.8	20.9	
			Average	11.3	0.00	0.20	11.50	51.8	40.3	
4	Phase	0.3000	Quasi Peak	35.5	0.00	0.20	35.70	60.2	24.5	
			Average	7.2	0.00	0.20	7.40	50.2	42.8	
5	Phase	0.3500	Quasi Peak	36.6	0.00	0.20	36.80	59.0	22.2	
			Average	5.4	0.00	0.20	5.60	49.0	43.4	
6	Phase	0.4000	Quasi Peak	31.1	0.00	0.20	31.30	57.9	26.6	
			Average	1.5	0.00	0.20	1.70	47.9	46.2	
7	Neutral	0.1500	Quasi Peak	39.7	0.00	0.00	39.70	66.0	26.3	
			Average	10.7	0.00	0.00	10.70	56.0	45.3	
8	Neutral	0.3500	Quasi Peak	34.4	0.00	0.20	34.60	59.0	24.4	
			Average	3.5	0.00	0.20	3.70	49.0	45.3	
9	Neutral	0.4000	Quasi Peak	34.6	0.00	0.20	34.80	57.9	23.1	
			Average	2.3	0.00	0.20	2.50	47.9	45.4	
10	Neutral	0.4500	Quasi Peak	34.4	0.00	0.20	34.60	56.9	22.3	
			Average	1.5	0.00	0.20	1.70	46.9	45.2	
11	Neutral	0.5000	Quasi Peak	33.8	0.00	0.20	34.00	56.0	22.0	
			Average	1.5	0.00	0.20	1.70	46.0	44.3	
12	Neutral	0.7774	Quasi Peak	26.2	0.00	0.00	26.20	56.0	29.8	
			Average	-2.8	0.00	0.00	-2.80	46.0	48.8	

Section 5. Radiated Emissions

Para. No.: 15.249

Test Performed By: Roman Kuleba
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Date of Test: May 31, 2005

Minimum Standard: 15.209&15.249
Band edge check must comply with 50dBc requirement.
Radiated Emission must comply with 15.209 general requirement

Frequency (MHz)	Field Strength (mV/m)	Field Strength (dBµV/m)
Fundamental		
902-928	50	94
5725-5875	50	94
Spurious out side the frequency band		
33-88	0.1	40.0
88-216	0.15	43.5
216-960	0.2	46.0
960 above	0.5	54.0

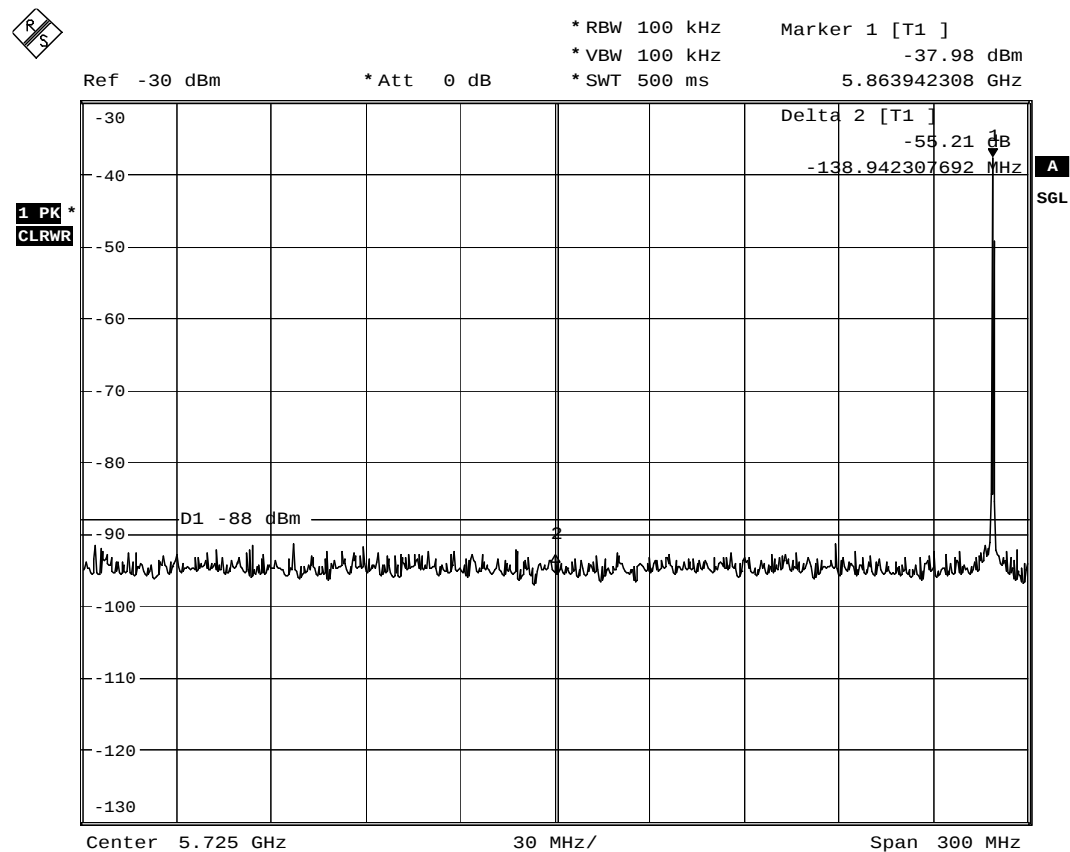
Test Results: See graphic and data of this section.

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Radiated emission test was conducted at 3 meter at open area test site. The EUT was searched from 30 MHz to the 40 GHz, and for low, medium and high frequencies at the frequency band.

The EUT was searched for 3 orthogonal axis to determine the worst case emissions.

Only worst cases have been reported.

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***50 dBc Band Edge Test****Handset Unit****Lower Band Edge (5725 MHz)****Channel: 0 (5863.80 MHz)****Modulation: 3 kHz Audio Tone (worst case)**

Date: 5.JUL.2005 20:50:40

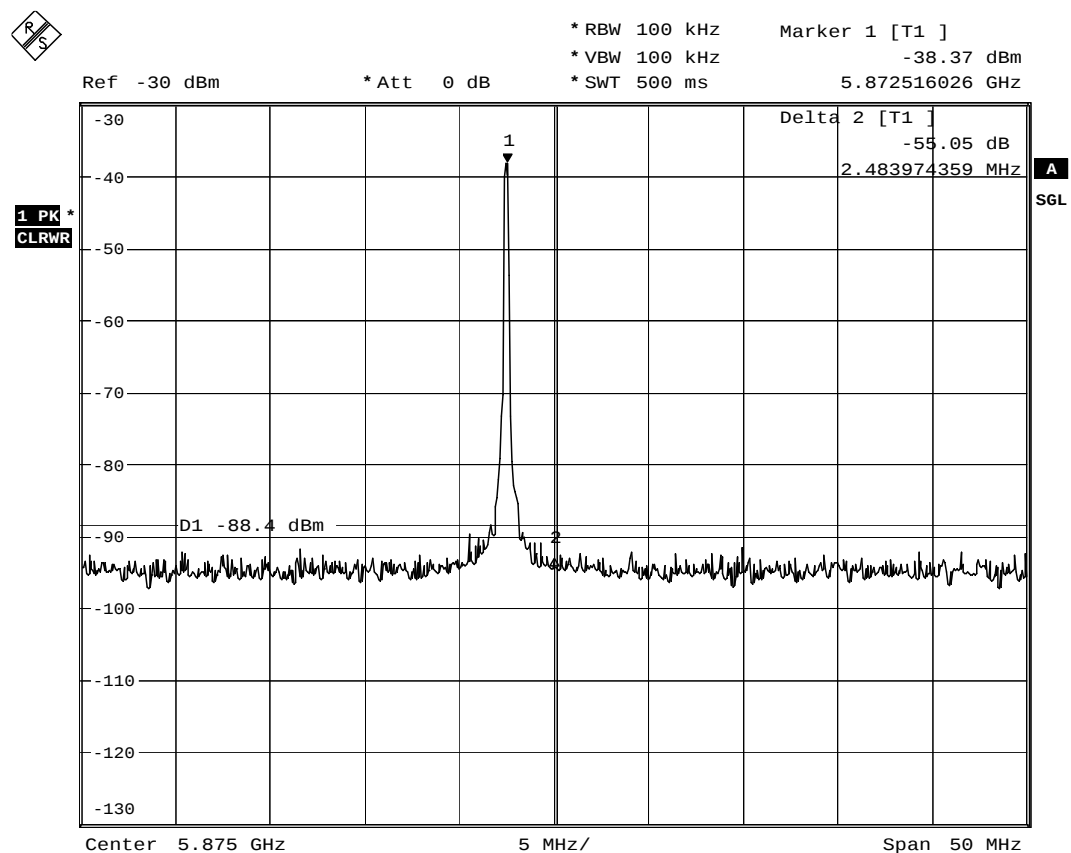
50 dBc Band Edge Test

Handset Unit

Upper Band Edge (5875 MHz)

Channel: 29 (5872.50 MHz)

Modulation: 3 kHz Audio Tone (worst case)



Date: 5.JUL.2005 20:53:44

Band Edge Test

Peak Radiated Emissions Limit: 74 dBuV/m

Test Distance: 3m

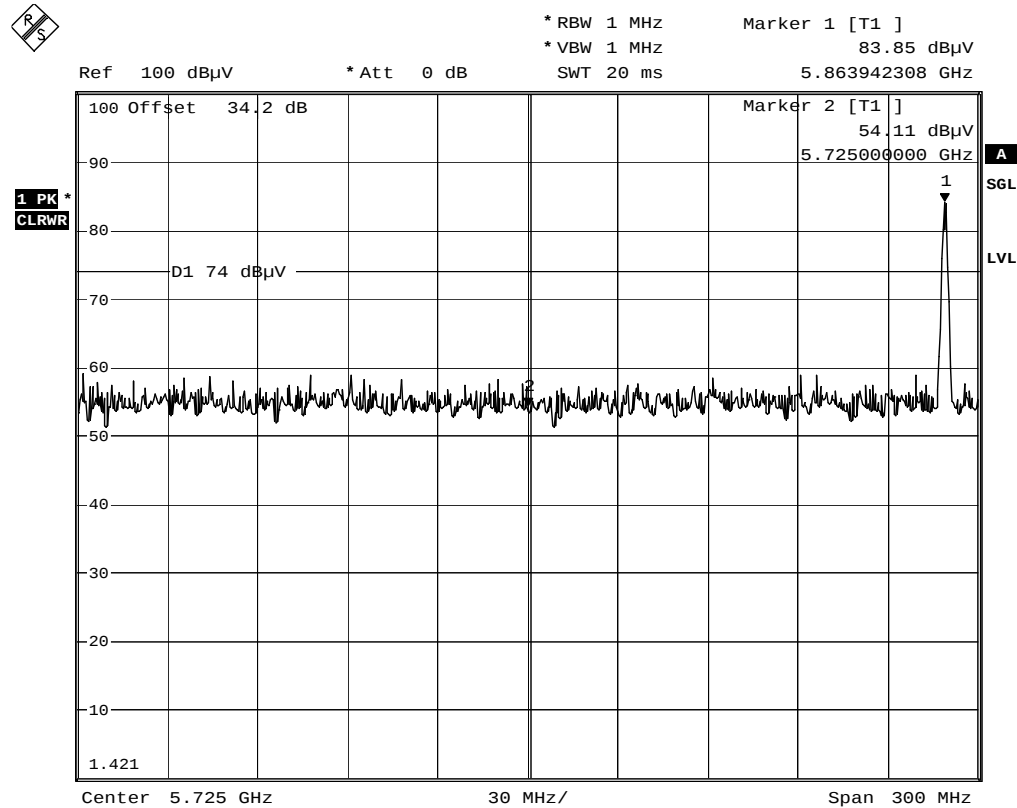
Handset Unit

Lower Band Edge (5725 MHz)

Channel: 0 (5863.80 MHz)

Modulation: 3 kHz Audio Tone (worst case)

Handset_PEAK_5725.WMF

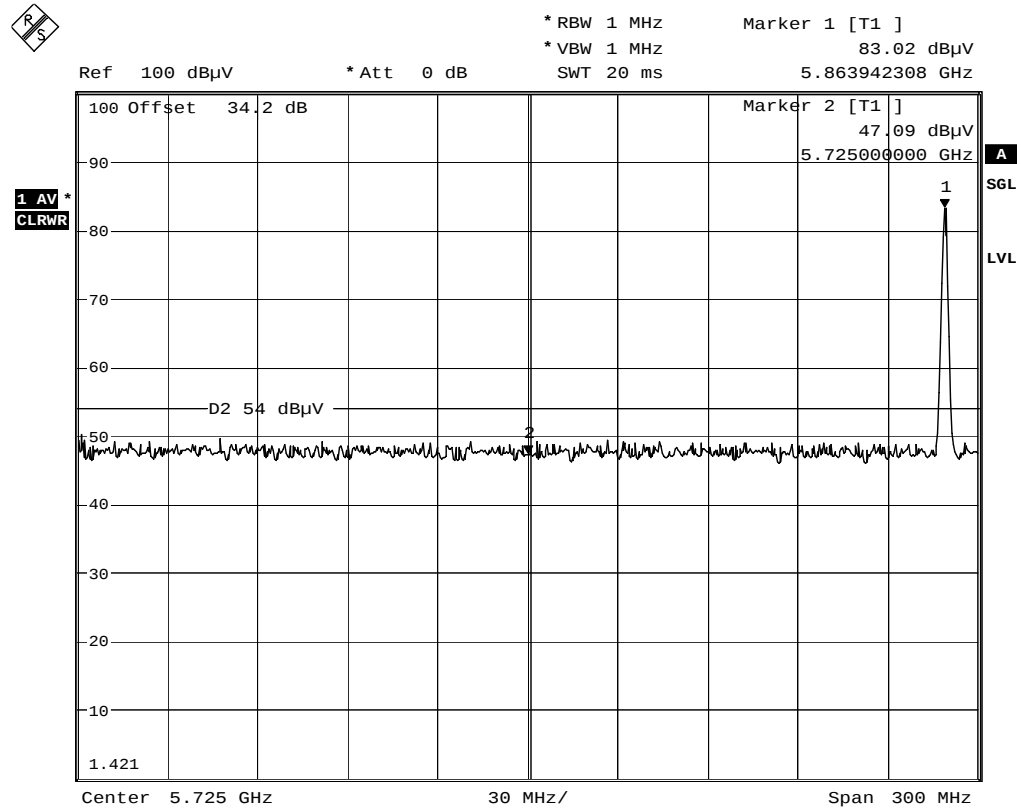


Date: 5.JUL.2005 20:24:07

EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID

Band Edge Test**Average Radiated Emissions Limit: 54 dBuV/m****Test Distance: 3m****Handset Unit****Lower Band Edge (5725 MHz)****Channel: 0 (5863.80 MHz)****Modulation: 3 kHz Audio Tone (worst case)**

Handset_AVG_5725.WMF



Date: 5.JUL.2005 20:22:54

Band Edge Test

Peak Radiated Emissions Limit: 74 dBuV/m

Test Distance: 3m

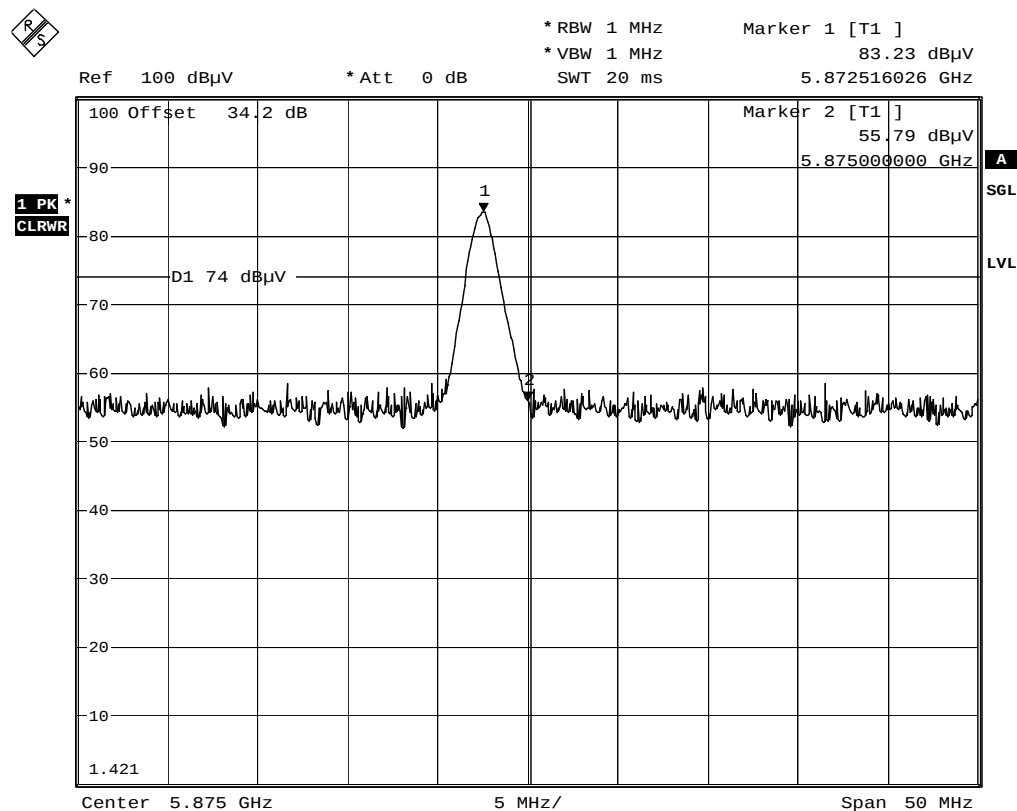
Handset Unit

Upper Band Edge (5875 MHz)

Channel: 29 (5872.5 MHz)

Modulation: 3 kHz Audio Tone (worst case)

Handset_PEAK_5875.WMF



Date: 5.JUL.2005 20:29:37

Band Edge Test

Average Radiated Emissions Limit: 54 dBuV/m

Test Distance: 3m

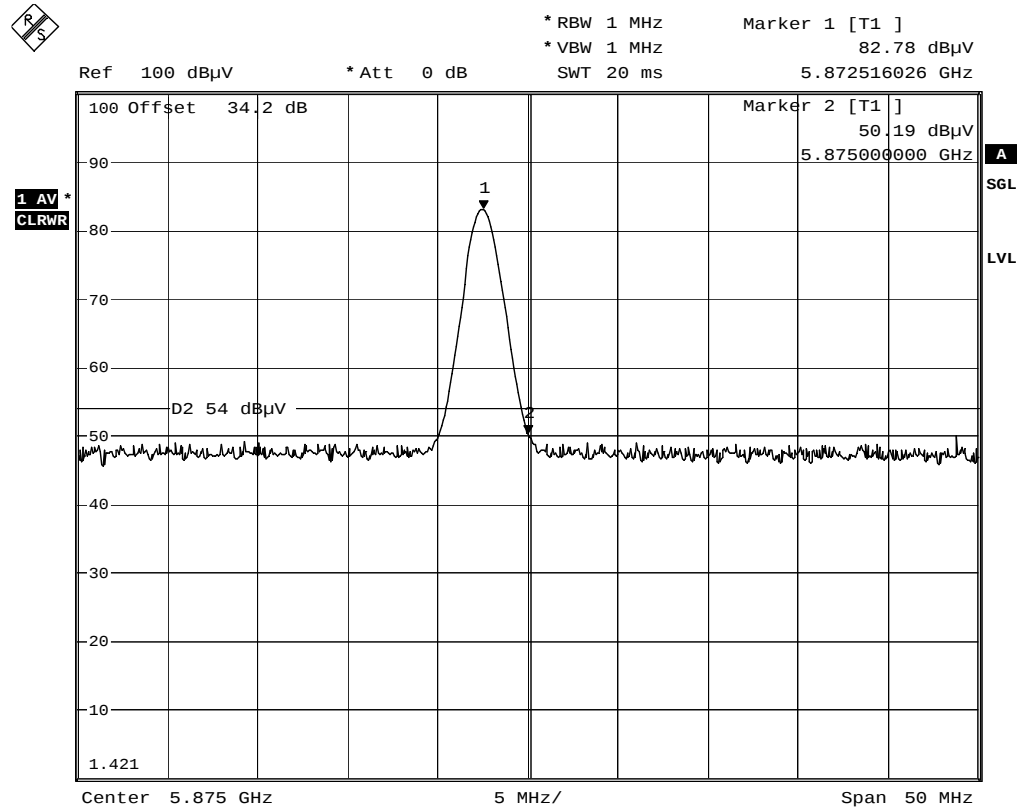
Handset Unit

Upper Band Edge (5875 MHz)

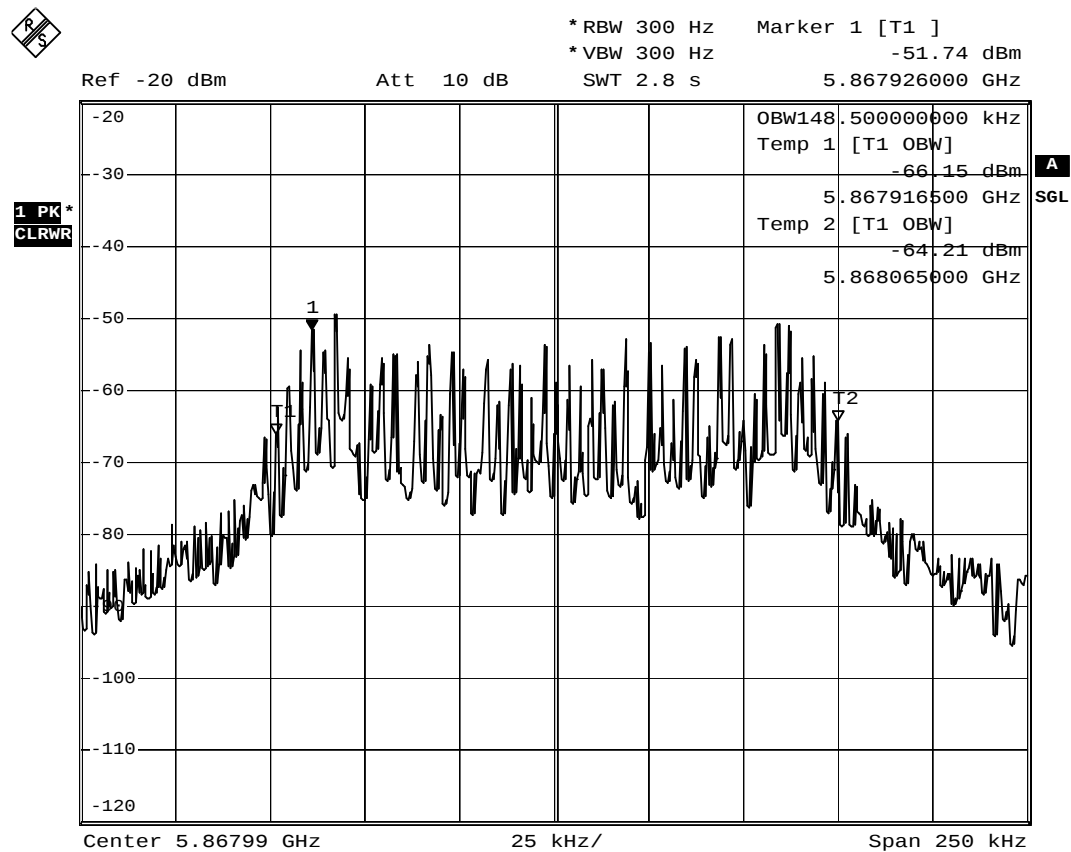
Channel: 29 (5872.5 MHz)

Modulation: 3 kHz Audio Tone (worst case)

Handset_AVG_5875.WMF

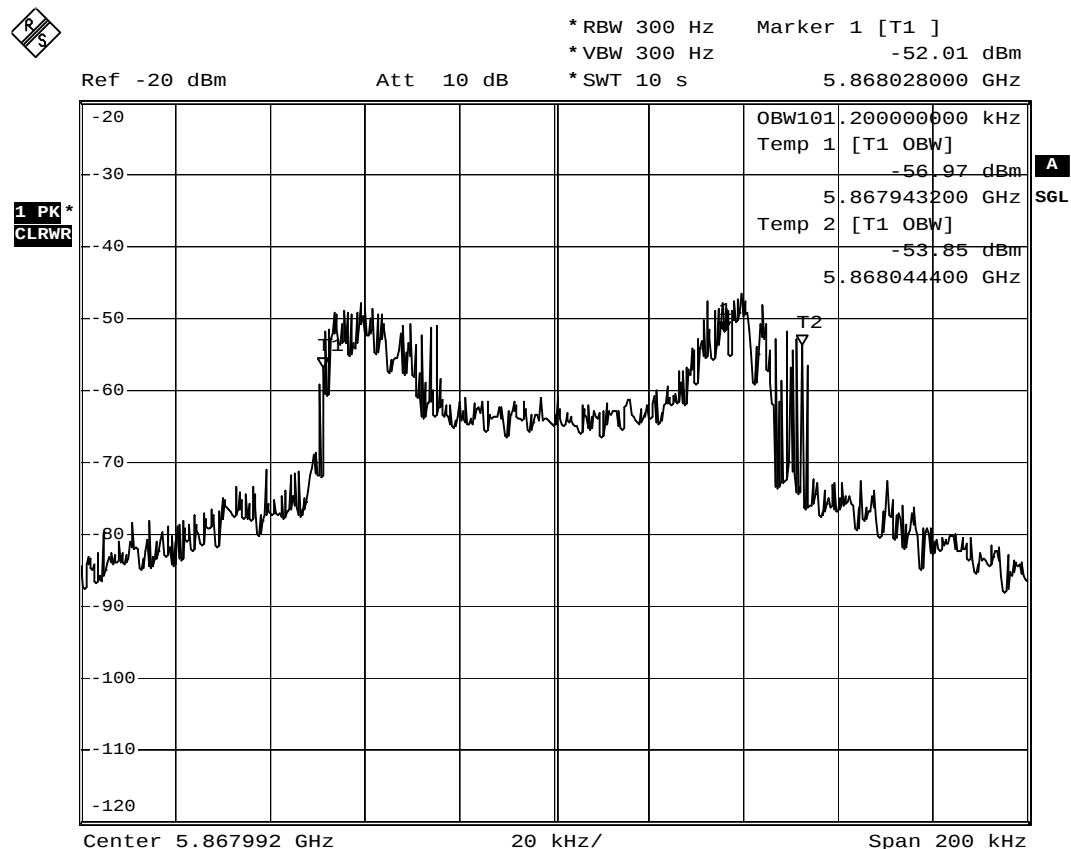


Date: 5.JUL.2005 20:30:58

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Occupied Bandwidth****Handset Unit****Modulation: 3 kHz Audio Tone**

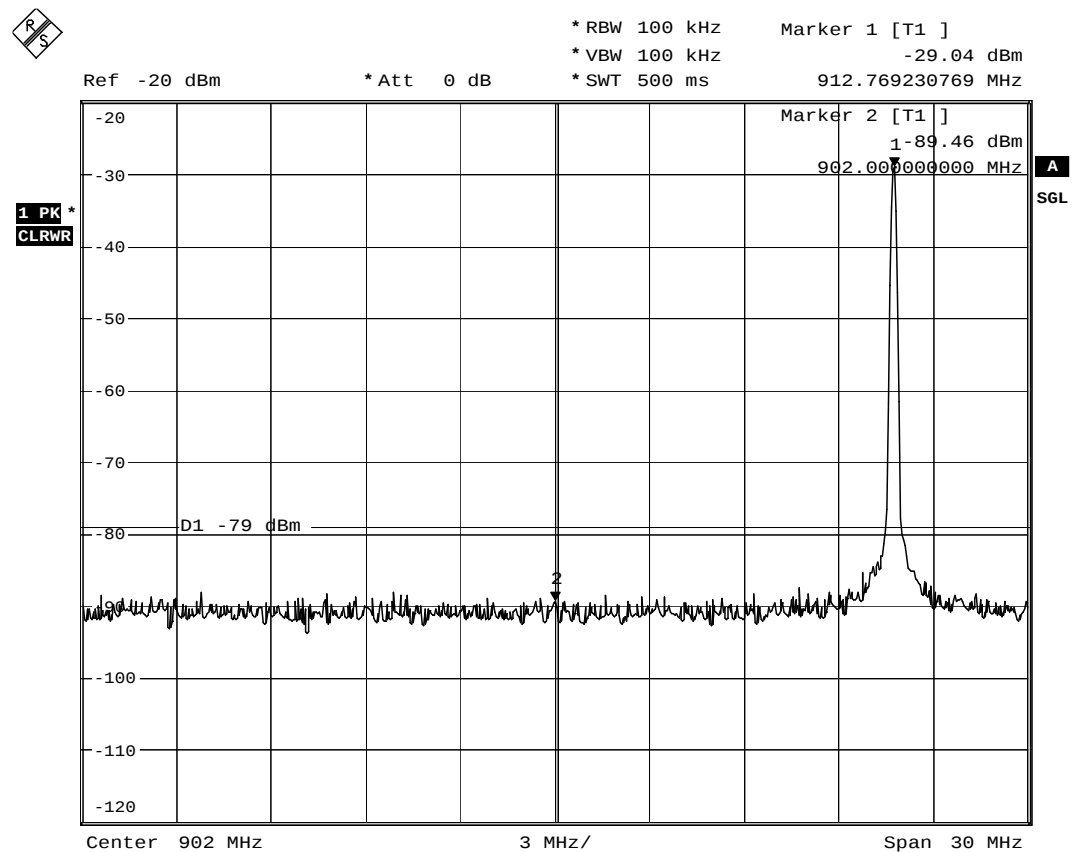
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Measured 99% Occupied Bandwidth: 148.5 kHz

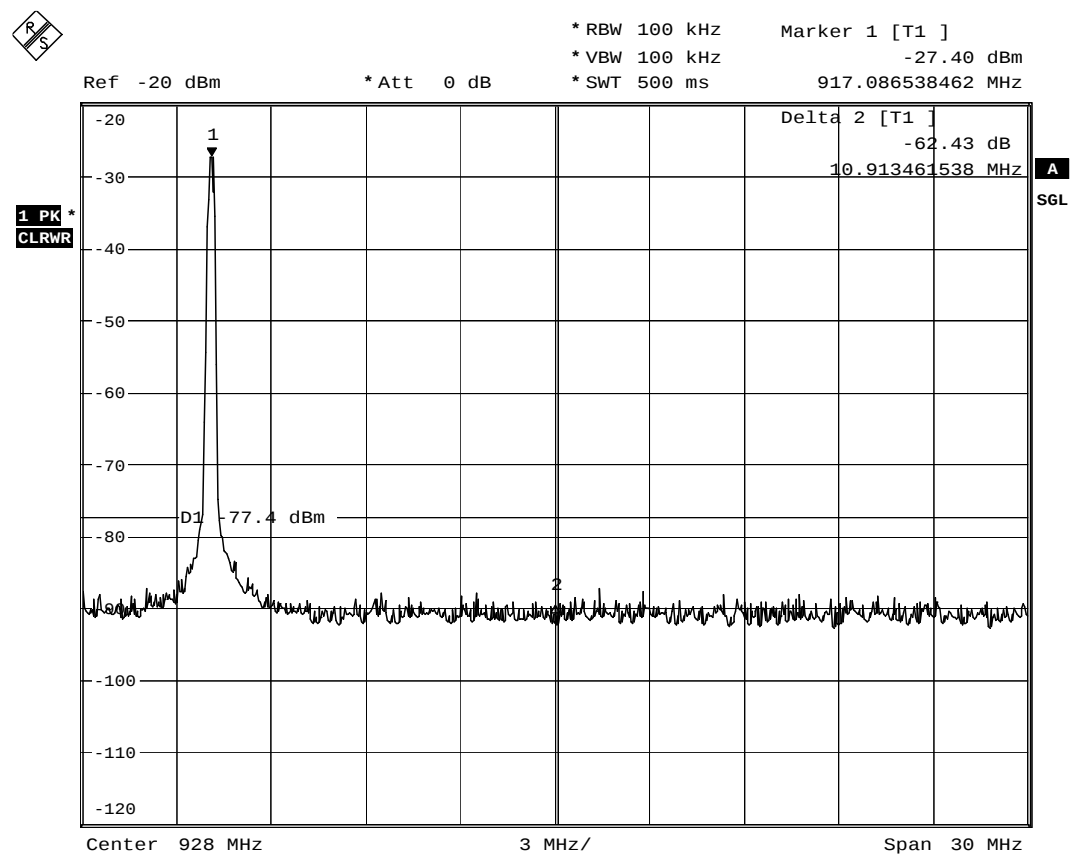
*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Occupied Bandwidth****Handset Unit****Modulation: Data Transmission (FSK)**

Date: 7.JUL.2005 17:47:59

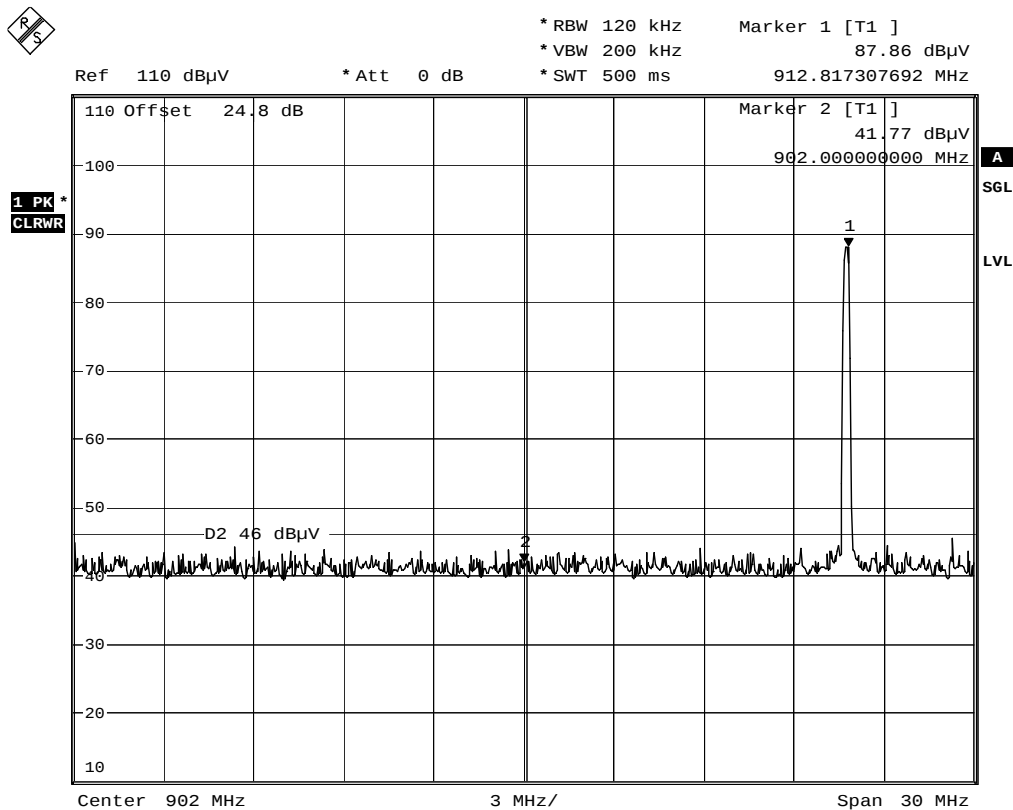
Measured 99% Occupied Bandwidth: 101.2 kHz

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***50 dBc Band Edge Test****Base Unit****Lower Band Edge (902 MHz)****Channel: 0 (912.75MHz)****Modulation: 3 kHz Audio Tone (worst case)**

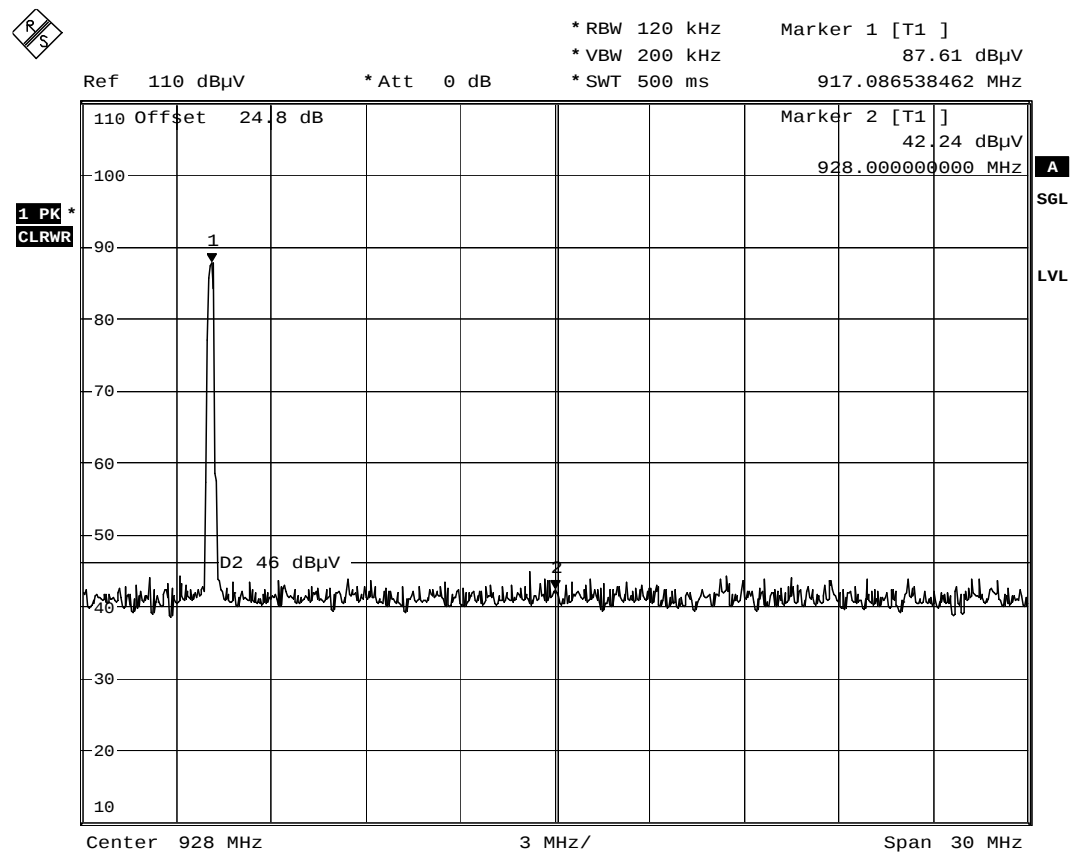
Date: 5.JUL.2005 21:19:59

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***50 dBc Band Edge Test****Base Unit****Upper Band Edge (928 MHz)****Channel: 29 (917.10 MHz)****Modulation: 3 kHz Audio Tone (worst case)**

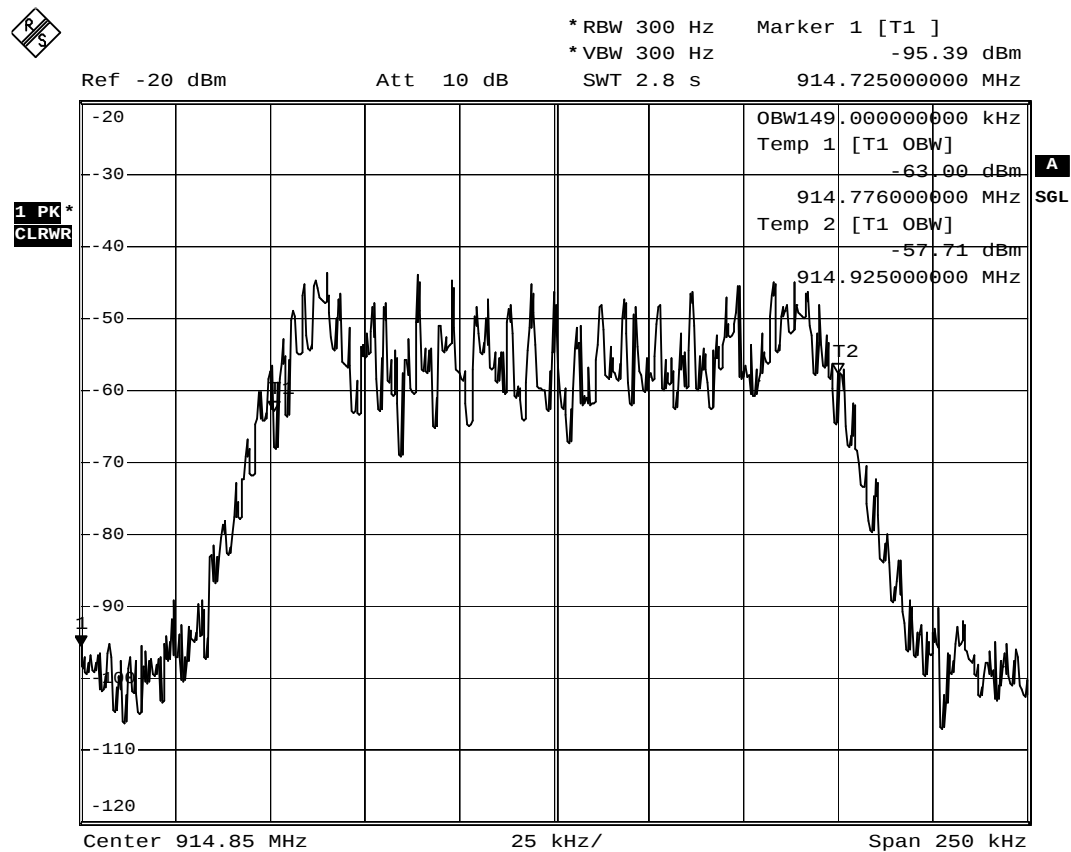
Date: 5.JUL.2005 21:28:05

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Band Edge Test****Peak Radiated Emissions Limit: 46 dBuV/m****Test Distance: 3m****Base Unit****Lower Band Edge (902 MHz)****Channel: 0 (912.75 MHz)****Modulation: 3 kHz Audio Tone (worst case)**

Date: 5.JUL.2005 22:00:15

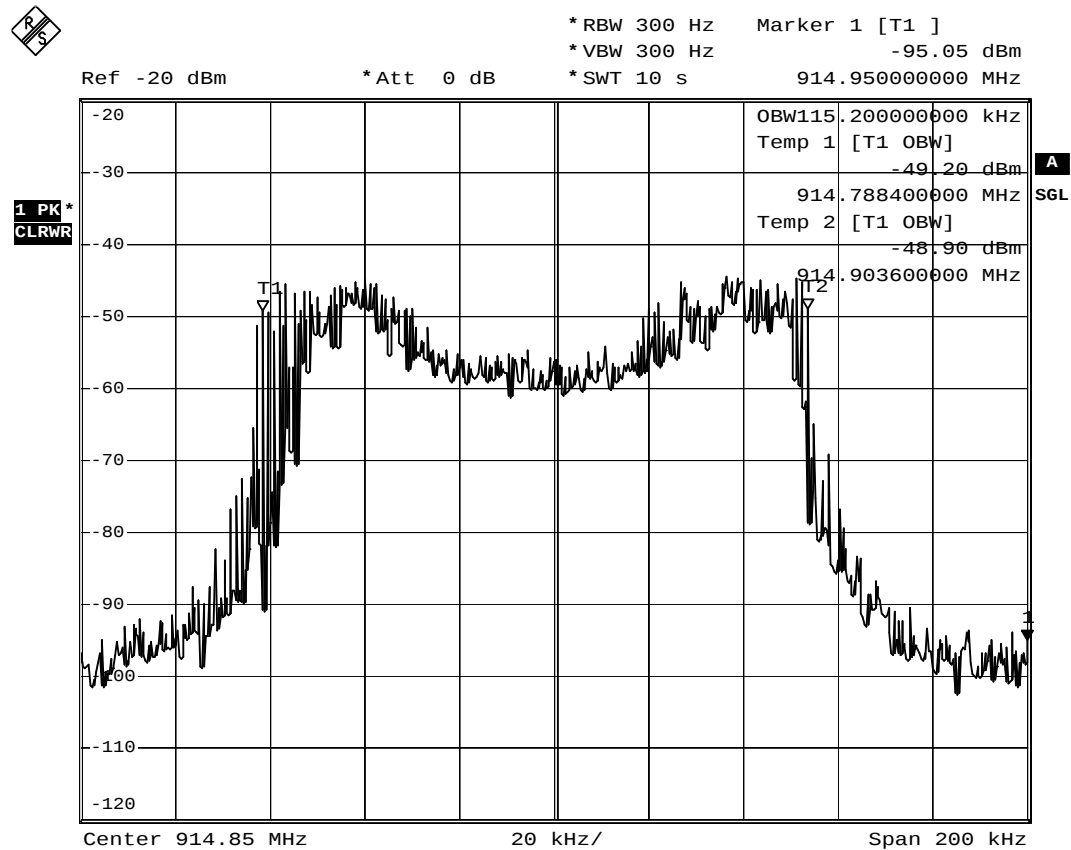
*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Band Edge Test****Peak Radiated Emissions Limit: 46 dBuV/m****Test Distance: 3m****Base Unit****Upper Band Edge (928 MHz)****Channel: 29 (917.1 MHz)****Modulation: 3 kHz Audio Tone (worst case)**

Date: 5.JUL.2005 21:56:59

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Occupied Bandwidth****Base Unit****Modulation: 3 kHz Audio Tone**

Date: 8.JUL.2005 00:28:31

Measured 99% Occupied Bandwidth: 149.0 kHz

*EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID***Occupied Bandwidth****Base Unit****Modulation: Data Transmission (FSK)**

Date: 7.JUL.2005 17:56:41

Measured 99% Occupied Bandwidth: 115.2 kHz

EQUIPMENT: VTech ia5823 & ia5854 5.8 GHz Analogue Cordless Phone with CID

Radiated Emissions Test Data

Handset Unit

Standard:		FCC 15, Subpart C, 15.249					Date:	6-July-2005		
Tower:		A		Distance:	3 m		Location:	Ottawa		
Receiver:		ESVS30		Dome #	1		Humidity:	36%		
Tester:		Roman Kuleba		Project:	5W47733 VTech		Temp:	25 °C		
Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Channel: 0										
5863.8000	Horn2	V	99.8	34.4	52.7	6.9	88.3	94.0	5.7	Peak
Channel: 14										
5868.0000	Horn2	V	99.9	34.4	52.8	6.9	88.4	94.0	5.6	Peak
Channel: 29										
5872.5000	Horn2	V	99.6	34.4	52.8	6.9	88.0	94.0	6.0	Peak
Channel: 0										
5863.8000	Horn2	H	89.1	34.3	52.7	6.9	77.5	94.0	16.5	Peak
Channel: 14										
5868.0000	Horn2	H	90.3	34.3	52.8	6.9	78.7	94.0	15.3	Peak
Channel: 29										
5872.5000	Horn2	H	89.2	34.3	52.8	6.9	77.6	94.0	16.4	Peak
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										
Note 2: Detector Legend: Below 1GHz, Peak detector with 100 kHz RBW, 100KHz VBW										
Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW										
Note 3: The spectrum was investigated for radiated emissions from 30 MHz to 40 GHz.										

Radiated Emissions Test Data**Base Unit**

Standard:		FCC 15, Subpart C, 15.249					Date:	6-July-2005		
Tower:		A		Distance:	3 m		Location:	Ottawa		
Receiver:		ESVS30		Dome #	1		Humidity:	36%		
Tester:		Roman Kuleba		Project:	5W47733 VTech		Temp:	25 °C		
Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Channel: 0										
912.7500	LP1	V	62.5	23.0	0.0	4.0	89.5	94.0	4.5	Peak
1825.5000	Horn2	V	68.4	27.6	46.6	4.2	53.6	74.0	20.4	Peak
1825.5000	Horn2	V	67.6	27.6	46.6	4.2	52.8	54.0	1.2	Average
3651.0000	Horn2	V	64.9	32.5	54.9	6.2	48.6	74.0	25.4	Peak
3651.0000	Horn2	V	56.0	32.5	54.9	6.2	39.7	54.0	14.3	Average
Channel: 14										
914.8500	LP1	V	62.8	23.0	0.0	4.0	89.8	94.0	4.2	Peak
1829.7000	Horn2	V	68.5	27.6	46.6	4.2	53.7	74.0	20.3	Peak
1829.7000	Horn2	V	67.8	27.6	46.6	4.2	53.0	54.0	1.0	Average
3659.4000	Horn2	V	64.0	32.5	54.9	6.2	47.8	74.0	26.2	Peak
3659.4000	Horn2	V	55.5	32.5	54.9	6.2	39.3	54.0	14.7	Average
Channel: 29										
917.1000	LP1	V	63.0	23.0	0.0	4.0	90.0	94.0	4.0	Peak
1834.2000	Horn2	V	68.4	27.6	46.6	4.3	53.7	74.0	20.3	Peak
1834.2000	Horn2	V	67.8	27.6	46.6	4.3	53.1	54.0	0.9	Average
3668.4000	Horn2	V	64.5	32.5	54.9	6.2	48.3	74.0	25.7	Peak
3668.4000	Horn2	V	55.8	32.5	54.9	6.2	39.6	54.0	14.4	Average
36.0000	BC1	V	11.5	11.6	0	0.8	23.8	40.0	16.2	Q-Peak
57.2714	BC1	V	13.0	9.4	0	0.9	23.3	40.0	16.7	Q-Peak
193.2927	BC1	V	11.5	14.2	0	1.8	27.5	43.5	16.0	Q-Peak
207.6103	BC1	V	9.5	14.8	0	1.8	26.1	43.5	17.4	Q-Peak
486.8127	LP1	V	9.0	17.8	0	2.9	29.7	46.0	16.3	Q-Peak
515.4486	LP1	V	11.6	18.2	0	2.9	32.7	46.0	13.3	Q-Peak
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										
Note 2: Detector Legend: Below 1GHz, Peak detector with 100 kHz RBW, 100kHz VBW										
Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW										
Note 3: The spectrum was investigated for radiated emissions from 30 MHz to 18 GH.										

Radiated Emissions Test Data**Base Unit**

Standard:		FCC 15, Subpart C, 15.249					Date:	6-July-2005		
Tower:		A		Distance:	3 m		Location:	Ottawa		
Receiver:		ESVS30		Dome #	1		Humidity :	36%		
Tester:		Roman Kuleba		Project:	5W47733 VTech		Temp:	25 °C		
Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Channel: 0										
912.7500	LP1	H	52.0	23.7	0.0	4.0	79.7	94.0	14.3	Peak
1825.5000	Horn2	H	62.8	27.7	46.6	4.2	48.1	74.0	25.9	Peak
1825.5000	Horn2	H	60.8	27.7	46.6	4.2	46.1	54.0	27.9	Average
3651.0000	Horn2	H	66.1	32.3	54.9	6.2	49.7	74.0	24.3	Peak
3651.0000	Horn2	H	58.0	32.3	54.9	6.2	41.6	54.0	32.4	Average
Channel: 14										
914.8500	LP1	H	53.1	23.7	0.0	4.0	80.8	94.0	13.2	Peak
1829.7000	Horn2	H	64.2	27.7	46.6	4.2	49.6	74.0	24.4	Peak
1829.7000	Horn2	H	61.9	27.7	46.6	4.2	47.3	54.0	26.7	Average
3659.4000	Horn2	H	65.1	32.3	54.9	6.2	48.7	74.0	25.3	Peak
3659.4000	Horn2	H	58.1	32.3	54.9	6.2	41.7	54.0	32.3	Average
Channel: 29										
917.1000	LP1	H	54.0	23.7	0.0	4.0	81.7	94.0	12.3	Peak
1834.2000	Horn2	H	62.9	27.7	46.6	4.3	48.3	74.0	25.7	Peak
1834.2000	Horn2	H	60.6	27.7	46.6	4.3	46.0	54.0	28.0	Average
3668.4000	Horn2	H	65.8	32.3	54.9	6.2	49.4	74.0	24.6	Peak
3668.4000	Horn2	H	57.7	32.3	54.9	6.2	41.3	54.0	32.7	Average
85.9066	BC1	H	23.0	7.4	0	1.1	31.4	40.0	8.6	Q-Peak
114.5441	BC1	H	12.0	10.9	0	1.3	24.3	43.5	19.2	Q-Peak
193.2940	BC1	H	10.8	13.4	0	1.8	26.0	43.5	17.5	Q-Peak
207.6101	BC1	H	10.5	14.4	0	1.8	26.6	43.5	16.9	Q-Peak
221.9288	BC1	H	9.0	14.7	0	1.8	25.5	46.0	20.5	Q-Peak
229.0874	BC1	H	10.0	14.9	0	1.9	26.8	46.0	19.2	Q-Peak
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										
Note 2: Detector Legend: Below 1GHz, Peak detector with 100 kHz RBW, 100KHz VBW										
Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW										
Note 3: The spectrum was investigated for radiated emissions from 30 MHz to 18 GHz.										

Radiated Emissions Test Setup Photos
Handset Unit



Radiated Emissions Test Setup Photos

Base Unit



Output Power Fluctuation due to Power Line Voltage Variation

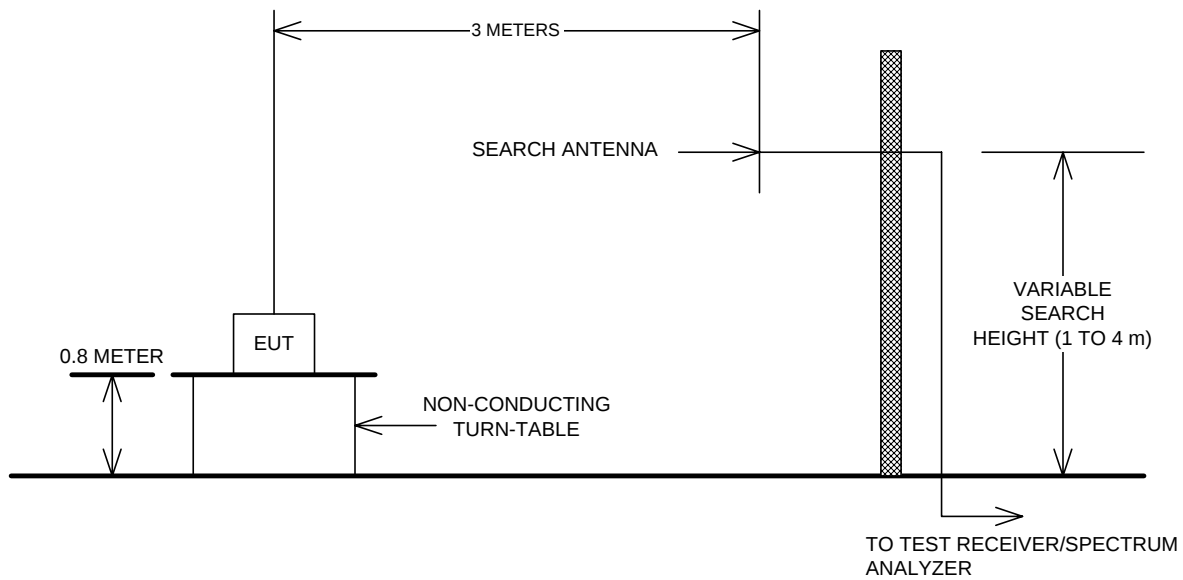
Test Method: Radiated power was monitored under power line voltage extreme conditions on Base Unit at channel 14 (914.85 MHz).

Extreme Voltage: ± 15 % of AC Mains Voltage (102 – 138 VAC).

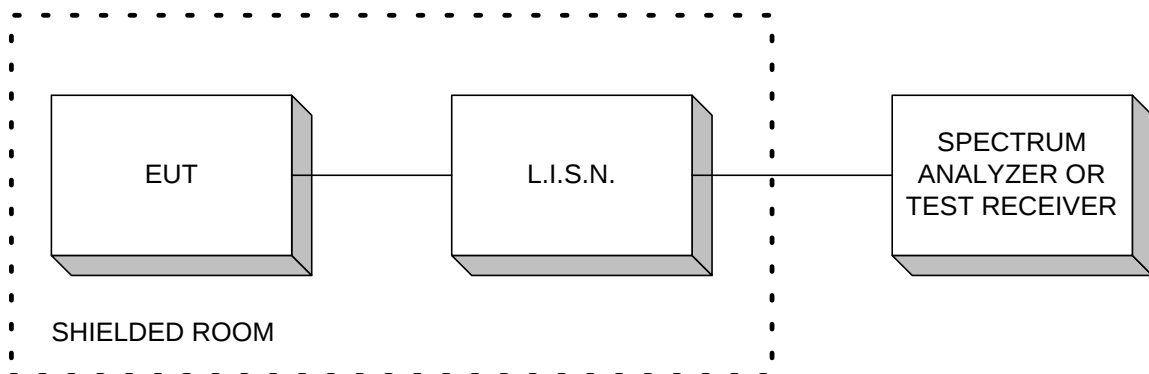
Test Result: No measurable change in fundamental power level on Base Unit was observed during the test.

Section 6. Block Diagrams

Test Site For Radiated Emissions



Conducted Emissions



Section 7. Test Equipment List

EQUIPMENT	MANUFACTURE R	MODEL	SERIAL	LAST CAL.	NEXT CAL.
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	Mar 22/05	Mar 22/06
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 18/05	May 18/06
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 18/05	May 18/06
0.1 – 1300 MHz Amplifier	Hewlett Packard	8447D	FA001909	Jan. 13/05	Jan. 13/06
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	COU	COU
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	COU	COU
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	COU	COU
5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU	COU
18.0 – 26.0 GHz Amplifier	Narda	BBS-1826N612	FA001550	COU	COU
Biconical Antenna	EMCO	3109	FA000904	Aug. 03/04	Aug. 03/05
Horn Antenna #2	EMCO	3115	FA000825	Dec. 14/04	Dec. 14/05
Log Periodic Antenna	EMCO	LPA-25	FA000477	Aug. 26/04	Aug. 26/05
18.0 – 40.0GHz Horn Antenna	EMCO	3116	FA001847	April 25/05	April 25/06
LISN	EMCO	4825/2	FA001545	Jan. 13/05	Jan. 13/06
Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June 10/04	June 10/05