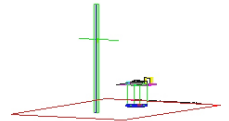


PCTEST Engineering Laboratory, Inc.

6660-B Dobbin Road • Columbia, MD 21045 • U.S.A.

TEL (410) 290-6652 • FAX (410) 290-6654

<http://www.pctestlab.com>



CERTIFICATE OF COMPLIANCE

Matsushita Electric Industrial Co., Ltd.
1006 Oaza Kadoma, Kadoma, Osaka
571 JAPAN

Attn: K. Nawata (KMECL)
Rich Mullen (PSCD, MECA)

Dates of Tests: November 18-19, 2002
Test Report S/N: SAR.221118621.ACJ
Test Site: PCTEST Lab, Columbia MD

FCC ID

ACJ96NKX-TG2770

APPLICANT

Matsushita Electric Industrial Co., Ltd.

FCC Rule Part(s): § 15.247; ANSI C-63.4 (1992)
 Classification: Part 15 Spread Spectrum Transmitter (DSS)
 Max Output Power: 0.161W Conducted (Base)
 0.076W Conducted (Hand Set)
 Method/System: Frequency Hopping Spread Spectrum (FHSS)
 Equipment Type: 2.4 GHz FHSS Cordless Phone
 Frequency Range: 2400.917 – 2479.401 MHz
 Model No(s): KX-TG2770

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C-63-4.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Power output is conducted. This transmitter has been tested for SAR compliance for head and body-worn configurations. SAR compliance for body-worn operating configurations is limited to the specific belt-clip tested for this filing. Users must be informed of the operating requirements for satisfying body-worn RF exposure compliance. The highest reported SAR value is Head: 0.173 W/kg; Body: 0.254 W/kg at 25 % duty factor.



PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Randy Ortanez
President



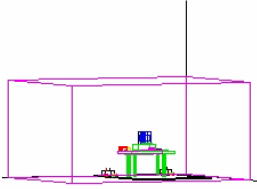
PCTEST™ PT. 15.247 REPORT	FCC MEASUREMENT REPORT			Reviewed By: Quality Manager
Test Report S/N: 15.221118621.ACJ	Test Dates: Nov. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96NKX- TG2770	Page 1 of 24

TABLE OF CONTENTS

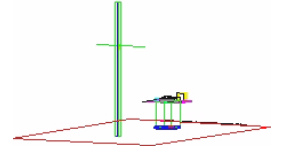
APPENDIX A –	COVER LETTER	
APPENDIX B -	ATTESTATION STATEMENT	
APPENDIX C -	TEST REPORT	
SCOPE		3
INTRODUCTION (SITE DESCRIPTION)		4
PRODUCT INFORMATION		5
DESCRIPTION OF TESTS		
A.	CONDUCTED EMISSIONS	6
B.	RADIATED EMISSIONS	7
C.	RESTRICTED BANDS	8
D.	ANTENNA REQUIREMENT	9
E.	MAXIMUM PEAK POWER OUTPUT	10-11
F.	CHANNEL SPACING	12-13
RADIATED MEASUREMENTS (FUNDAMENTAL & HARMONICS)		14-21
FREQUENCY MEASUREMENTS (SPURIOUS)		22
LIST OF TEST EQUIPMENT		23
CONCLUSION		24
APPENDIX D -	TEST PLOTS	
APPENDIX E -	FCC ID LABEL & LOCATION	
APPENDIX F -	TEST SETUP PHOTOGRAPHS	
APPENDIX G -	EXTERNAL PHOTOGRAPHS	
APPENDIX H -	INTERNAL PHOTOGRAPHS	
APPENDIX I -	BLOCK DIAGRAM(S)	
APPENDIX J-	SCHEMATIC DIAGRAM(S)	
APPENDIX K -	CIRCUIT DESCRIPTION	
APPENDIX L -	USER’S MANUAL	
APPENDIX M -	SAR MEASUREMENT REPORT	
APPENDIX N -	SAR TEST DATA	
APPENDIX O -	SAR TEST SETUP PHOTOGRAPHS	
APPENDIX P -	DIPOLE VALIDATION	
APPENDIX Q -	PROBE CALIBRATION	

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE
		FCC ID: ACJ96KX-TG2770
Page 2 of 24		

MEASUREMENT REPORT



Scope - Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.




§2983(a) General Information

Applicant Name:	Matsushita Electric Industrial Co., Ltd.
Address:	1006 Oaza Kadoma Kadoma, Osaka 571 JAPAN
Attention:	Rich Mullen (PSCD)

- FCC ID: **ACJ96NKX-TG2770**
- Class: Spread Spectrum Transceiver (DSS)
- Type: 2.4 GHz FHSS Cordless Phone
- Freq. Range: 2400.917 – 2479.401 MHz
- Method/System: TDMA
- Model No(s): **KX-TG2770**
- Max. RF Output Power: 0.161W Conducted (Base)
0.076W Conducted (Hand Set)
- Rule Part(s): § 15.247
- Dates of Tests: November 18-19, 2002
- Place of Tests: PCTEST Lab, Columbia, MD U.S.A.
- Test Report S/N: 221118621.ACJ

NOTE: The receiver portion was tested and complies with Part 15B under the verification procedure.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE
	FCC ID: ACJ96KX-TG2770	Page 3 of 24

INTRODUCTION

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-1992) and FCC Public Notice dated July 12, 1995 entitled "Guidance on Measurement for Direct Sequence Spread Spectrum Systems" were used in the measurement of **Panasonic Spread Spectrum 2.4 GHz FHSS Cordless Phone**.

These measurement tests were conducted at **PCTEST Engineering Laboratory, Inc.** facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 1992.

PCTEST Location

The map at right shows the location of the PCTEST Lab, its proximity to the FCC Lab, the Columbia vicinity area, the Baltimore-Washington International (BWI) airport, and the city of Baltimore, and the Washington, D.C. area. (see Figure1).

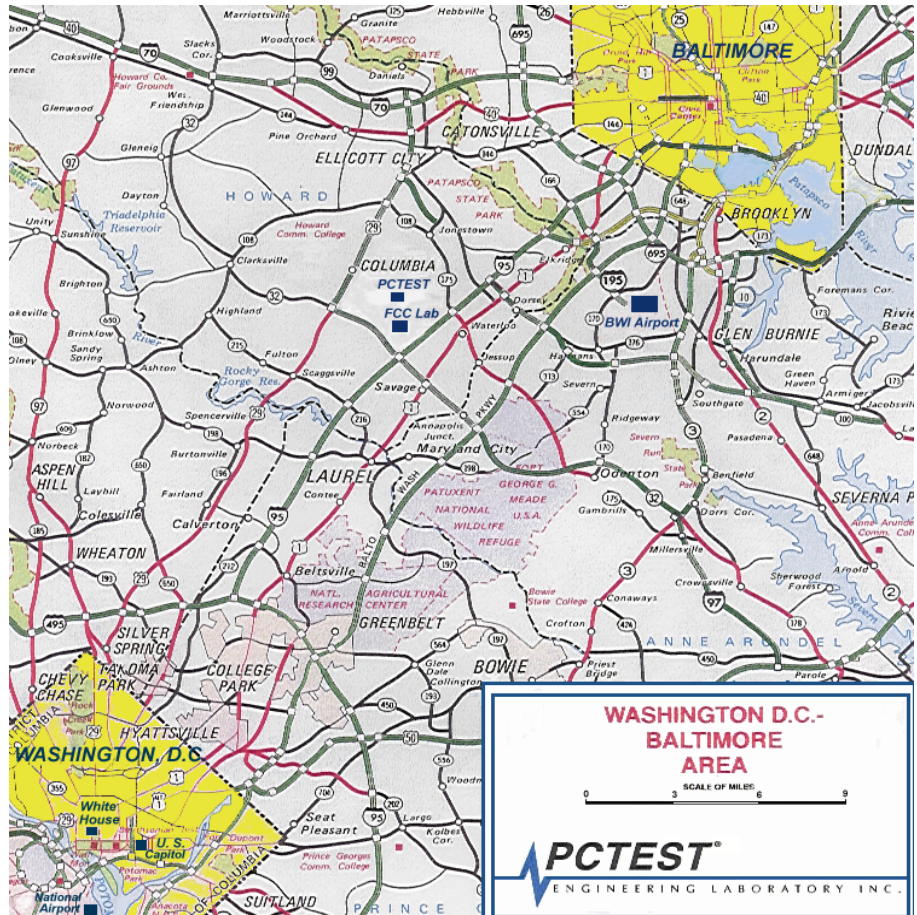


Figure 1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

PCTEST™ PT. 15.247 REPORT	PCTEST	FCC MEASUREMENT REPORT	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 4 of 24

PRODUCT INFORMATION

Table-1. Channel frequency table

Channel	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.916581	2401.808452	2402.700323	2403.592194	2404.484065	2405.375936	2406.267807	2407.159678	2408.051549	2408.943420	2409.835291

Channel	12	13	14	15	16	17	18	19	20	21	22
Frequency (MHz)	2410.727162	2411.619033	2412.510904	2413.402775	2414.294646	2415.186517	2416.078388	2416.970259	2417.862130	2418.754001	2419.645872

Channel	23	24	25	26	27	28	29	30	31	32	33
Frequency (MHz)	2420.537743	2421.429614	2422.321485	2423.213356	2424.105227	2424.997098	2425.888969	2426.780840	2427.672711	2428.564582	2429.456453

Channel	34	35	36	37	38	39	40	41	42	43	44
Frequency (MHz)	2430.348324	2431.240195	2432.132066	2433.023937	2433.915808	2434.807679	2435.69955	2436.591421	2437.483292	2438.375163	2439.267034


Channel	45	46	47	48	49	50	51	52	53	54	55
Frequency (MHz)	2440.158905	2441.050776	2441.942647	2442.834518	2443.726389	2444.618260	2445.510131	2446.402002	2447.293873	2448.185744	2449.077615

Channel	56	57	58	59	60	61	62	63	64	65	66
Frequency (MHz)	2449.969486	2450.861357	2451.753228	2452.645099	2453.536970	2454.428841	2455.320712	2456.212583	2457.104454	2457.996325	2458.888196

Channel	67	68	69	70	71	72	73	74	75	76	77
Frequency (MHz)	2459.780067	2460.671938	2461.563809	2462.455680	2463.347551	2464.239422	2465.131293	2466.023164	2466.915035	2467.806906	2468.698777

Channel	78	79	80	81	82	83	84	85	86	87	88
Frequency (MHz)	2469.590648	2470.482519	2471.374390	2472.266261	2473.158132	2474.050003	2474.941874	2475.833745	2476.725616	2477.617487	2478.509358

Channel	89
Frequency (MHz)	2479.401229

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770
			Page 5 of 24

Description of Tests

Conducted Emissions

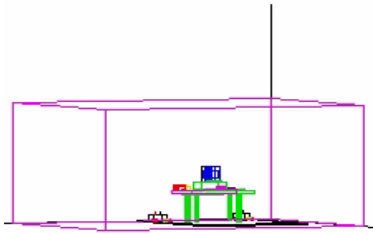


Figure 4. Shielded Enclosure Line-Conducted Test Facility

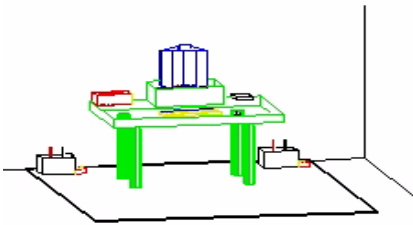


Figure 2. Line Conducted Emission Test Set-Up

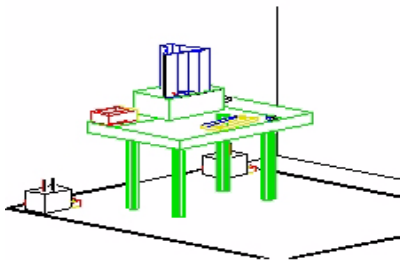


Figure 3. Wooden Table & Bonded LISNs

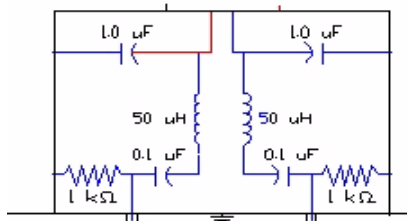



Figure 5. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure. It is manufactured by Ray Proof Series 81 (see Figure 2). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. A 1m. x 1.5m. wooden table 80cm. high is placed 40cm. away from the vertical wall and 1.5m away from the side wall of the shielded room (see Figure 3). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (see Figure 4). The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filters (100dB 14kHz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the Solar LISN. LISN schematic diagram is shown in Figure 5. All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The spectrum was scanned from 450kHz to 30MHz with 20 msec. sweep time. The frequency producing the maximum level was reexamined using EMI/ Field Intensity Meter and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode. The bandwidth of the receiver was set to 10 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Appendix C. Each EME reported was calibrated using the HP8640B signal generator.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770
			Page 6 of 24

Description of Tests (Continued)

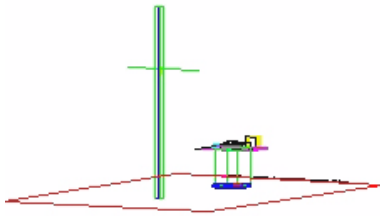


Figure 6. 3-Meter Test Site

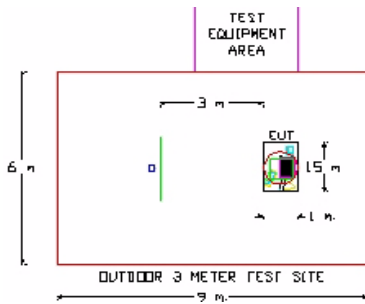


Figure 7. Dimensions of Outdoor Test Site

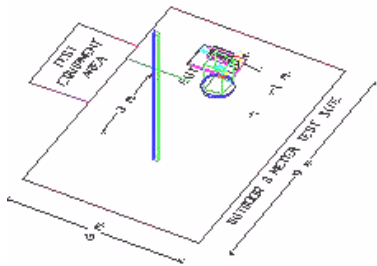


Figure 8. Turntable and System Setup

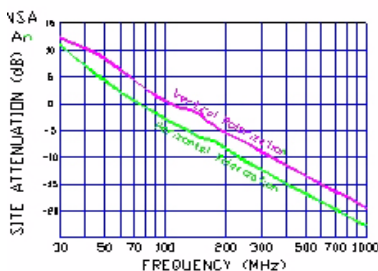


Figure 9. Normalized Site Attenuation Curves (H&V)

Radiated Emissions

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using biconical antenna and from 200 to 1000 MHz using log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antenna (see Figure 6). The test equipment was placed on a wooden and plastic bench situated on a 1.5 x 2 meter area adjacent to the measurement area (see Figure 7). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100kHz or 1 MHz depending on the frequency or type of signal.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 8). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Appendix C. Each EME reported was calibrated using the HP8640B signal generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 9.

PCTEST™ PT. 15.247 REPORT	FCC MEASUREMENT REPORT	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770
			Page 7 of 24

§ 15.205 Restricted Bands


Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operation. The EUT was tested from 9kHz and up to the tenth harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average measurements was used using RBW 1 MHz – VBW 10Hz and linearly polarized horn antennas. In addition, peak measurements were taken to ensure that the peak levels are not more than 20dB above the average limit. All out of band emissions, other than those created by the spreading sequence, data sequence, and the carrier modulation must not exceed the limits show in Table 2 per 15.209.

Frequency (MHz)	F/S (UV/m)	Meas. Dist. (Meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.00	30	30
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

Tab. 2. Radiated Emission Limits Per 15.209

Test Equipment

HP 8566B	Spectrum Analyzer 100Hz-22HGhz
HP83017A	Microwave Analyzer 40dB Gain (0.5 – 26.5 GHz)
HP 3784A	Digital Transmission Analyzer
EMCO 3115	Horn Antenna (1 – 18GHz)
HP 8495A	20dB Attenuator (DC-40GHz) 0-70dB
HP 8493B	10dB Attenuator
MicroCoax Cables	Low Loss Microwave Cables (1-26.5 GHz)
CDI Dipoles	Dipole Antennas (30 – 1000 MHz)
EMCO 3116	Horn Antenna (18 – 40GHz)

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE
	FCC ID: ACJ96KX-TG2770	Page 8 of 24


§ 15.203 Antenna Requirement

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the applicant can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with this requirement.

The Uniden **KX-TG2770** unit complies with the requirement of §15.203. The antenna is a **permanently attached omni-directional antenna**.

CONCLUSION

There are no provisions for connection to an external antenna. The unit meets the Antenna Requirements of §15.203.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic	Reviewed By: Quality Manager		
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 9 of 24

§15.247(a)(2) – 20dB Bandwidth (Base)

Res. Bandwidth = 100 kHz (7dB/div)
 Vid. BW = 100 kHz
 Span = 3.0MHz
 Ref. Level - 23.00 dBm
 Sweep 5ms

(see attached spectrum plots)


FREQ (MHz)	Channel	6dB Bandwidth (MHz)
2400.917	00	.880
2440.159	44	.878
2479.401	88	.855

Table 3. 20dB Bandwidth measurements

Minimum Standard – The transmitter shall have a minimum 20dB bandwidth of 1000 kHz .

REMARKS:

PASS

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 10 of 24

§15.247(a)(2) – 20dB Bandwidth (Hand Set)

Res. Bandwidth = 100 kHz (7dB/div)
 Vid. BW = 100 kHz
 Span = 3.0 MHz
 Ref. Level - 26.40 dBm
 Sweep 5.0ms
 (see attached spectrum plots)


FREQ (MHz)	Channel	6dB Bandwidth (MHz)
2400.917	00	.855
2440.159	44	.848
2479.401	88	.855

Table 3. 20dB Bandwidth measurements

Minimum Standard – The transmitter shall have a minimum 20dB bandwidth of 1000Hz.

REMARKS:

PASS

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 11 of 24

§15.247(b) Maximum Peak Output Power (Base)

Minimum Standard – The maximum peak output power of the transmitter shall not exceed 1 watt. Radiated power measurements were taken at 3 meters.

Max. Power Peak + Atten = dBm \Rightarrow Watts



FREQ (MHz)	Channel	Power Output (dBm)
2400.917	00	21.41
2440.159	44	21.82
2479.401	88	22.07

Table 4. Output Power Measurements

Minimum Standard – The transmitter peak output power of the transmitter shall not exceed 1 watt.

REMARKS:

PASS

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1			Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 12 of 24

§15.247(b) Maximum Peak Output Power (Hand Set)

Minimum Standard – The maximum peak output power of the transmitter shall not exceed 1 watt. Radiated power measurements were taken at 3 meters.

Max. Power Peak + Atten = dBm \Rightarrow Watts



FREQ (MHz)	Channel	Power Output (dBm)
2400.917	00	18.72
2440.159	44	18.90
2479.401	88	17.72

Table 4. Output Power Measurements

Minimum Standard – The transmitter peak output power of the transmitter shall not exceed 1 watt.

REMARKS:

PASS

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1			Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 13 of 24

RADIATED Measurements (Fundamental & Harmonics) (Base)

A. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 00

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (μ V/m)	F/S (dB μ V/m)	Margin (dB)
2401	- 21.2	34.9	V	Peak	1077705	120.7	n/a
4802	- 108.0	40.4	V	Peak	93.218	39.4	14.61
7203	- 120.0	47.4	V	Peak	52.6017	34.4	19.58
9604	- 125.0	50.3	V	Peak	41.2098	32.3	21.7
12005	- 135.0	53.7	V	Peak	19.2752	25.7	28.3

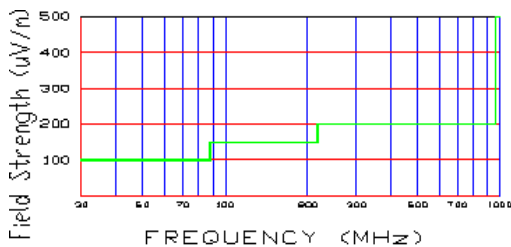



Figure 10. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:

- All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
- All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
- The peak emissions above 1 GHz are not more than 20 dB above the average limit.
- The antenna is manipulated through typical positions, polarity and length during the tests.
- The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
- The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
- < - 135 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 14 of 24

RADIATED Measurements (Fund. & Harmonics) (CONT.) (Base)

B. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 44

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (μV/m)	F/S (dBμV/m)	Margin (dB)
2440	- 20.9	35.0	V	Peak	1128496	121.1	n/a
4880	- 109.0	40.5	V	Peak	84.1396	38.5	15.5
7320	- 119.0	48.0	V	Peak	63.0957	36.0	18.0
9760	- 125.0	50.3	V	Peak	41.2098	32.3	21.7
12200	- 135.0	53.7	V	Peak	19.2752	25.7	28.3

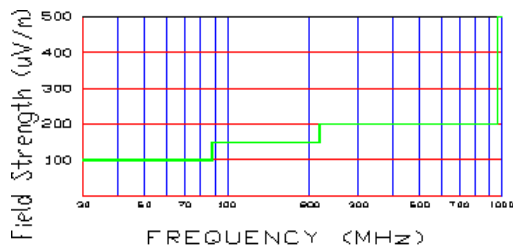


Figure 11. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:

- All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
- All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
- The peak emissions above 1 GHz are not more than 20 dB above the average limit.
- The antenna is manipulated through typical positions, polarity and length during the tests.
- The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
- The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
- < - 135 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	PCTEST	FCC MEASUREMENT REPORT	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 15 of 24

RADIATED Measurements (Fund. & Harmonics) (CONT.) (Base)

C. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 88

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S ($\mu\text{V/m}$)	F/S ($\text{dB}\mu\text{V/m}$)	Margin (dB)
2479	- 20.8	35.1	V	Peak	1161449	121.3	n/a
4958	- 109.1	40.7	V	Peak	85.1138	38.6	15.4
7437	- 119.0	48.2	V	Peak	64.5654	36.2	17.8
9916	- 124.0	50.4	V	Peak	46.7735	33.4	20.6
12395	- 135.0	53.8	V	Peak	19.4984	25.8	28.2

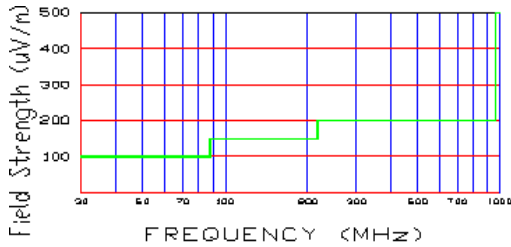



Figure 12. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 $\mu\text{V/m}$ (54dBu/m)

NOTES:

- All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
- All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
- The peak emissions above 1 GHz are not more than 20 dB above the average limit.
- The antenna is manipulated through typical positions, polarity and length during the tests.
- The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
- The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
- < - 135 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 16 of 24

RADIATED Measurements (Fundamental & Harmonics) (Hand Set)

A. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 00

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (μ V/m)	F/S (dB μ V/m)	Margin (dB)
2401	- 25.8	34.9	V	Peak	638.263	116.1	n/a
4802	- 116.0	40.4	V	Peak	37.1108	31.4	22.6
7203	- 125.0	47.4	V	Peak	29.5801	29.4	24.6
9604	- 132.0	50.3	V	Peak	18.4077	25.3	28.7
12005	- 135.0	53.7	V	Peak	19.2752	25.7	28.3

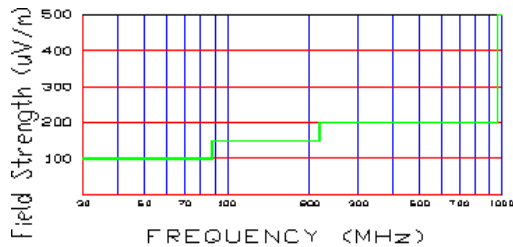



Figure 10. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:

- All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
- All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
- The peak emissions above 1 GHz are not more than 20 dB above the average limit.
- The antenna is manipulated through typical positions, polarity and length during the tests.
- The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
- The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
- < - 135 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 17 of 24

RADIATED Measurements (Fund. & Har.) (CONT.) (Hand Set)

B. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 44

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S ($\mu\text{V}/\text{m}$)	F/S ($\text{dB}\mu\text{V}/\text{m}$)	Margin (dB)
2440	- 25.8	35.0	V	Peak	644169	116.2	n/a
4880	- 117.1	40.5	V	Peak	33.1131	30.4	23.6
7320	- 126.0	48.0	V	Peak	28.1838	29.0	25.0
9760	- 133.0	50.3	V	Peak	16.4059	24.3	29.7
12200	- 135.0	53.7	V	Peak	19.2752	25.7	28.3

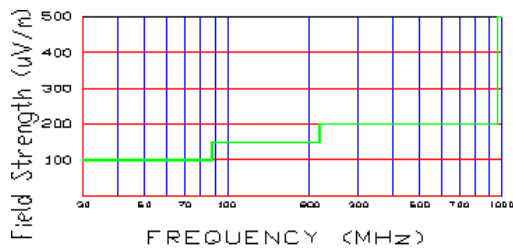



Figure 11. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 $\mu\text{V}/\text{m}$ (54 $\text{dB}\mu/\text{m}$)

NOTES:

- All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
- All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
- The peak emissions above 1 GHz are not more than 20 dB above the average limit.
- The antenna is manipulated through typical positions, polarity and length during the tests.
- The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
- The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
- < - 135 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHz FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 18 of 24

RADIATED Measurements (Fund. & Har.) (CONT.) (Hand Set)

C. Transmitter Portion

Distance of Measurements: 3 meters

Channel: 88

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (μV/m)	F/S (dBμV/m)	Margin (dB)
2479	- 27.0	35.1	V	Peak	568853	115.1	n/a
4958	- 116.3	40.7	V	Peak	37.1535	31.4	22.6
7437	- 126.2	48.2	V	Peak	28.1838	29.0	25.0
9916	- 133.0	50.4	V	Peak	16.5959	24.4	29.6
12395	- 135.0	53.8	V	Peak	19.4984	25.8	28.2

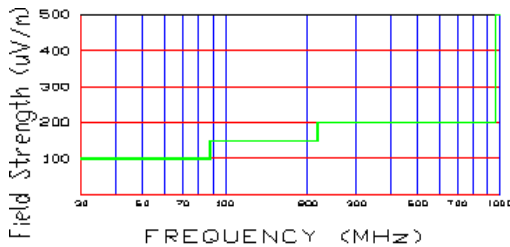



Figure 12. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.
5. The antenna is manipulated through typical positions, polarity and length during the tests.
6. The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
8. < - 130 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 19 of 24

RADIATED Measurements (Restricted Band) (Base)

Transmitter Portion

Operating Frequency: 2479.4 MHz
 Distance of Measurements: 3 meters
 Channel(s): 88

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (μV/m)	F/S (dBμV/m)	Margin (dB)
2484.1	- 108.3	35.1	V	Peak	48.9779	33.8	20.2
2484.3	- 111.0	35.1	V	Peak	35.8922	31.1	22.9
2484.4	- 114.7	35.1	V	Peak	23.4423	27.4	22.9
2485.6	- 119.0	35.1	V	Peak	14.2889	23.1	30.9
2490.0	- 118.4	35.2	V	Peak	15.4882	23.8	30.2
2491.3	- 119.0	35.2	V	Peak	14.4544	23.2	30.8

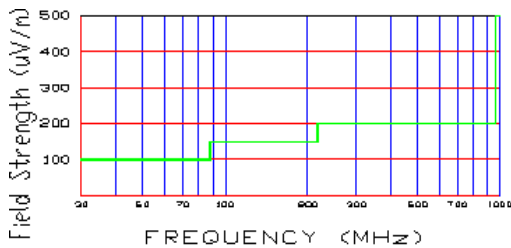



Figure 12. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.
5. The antenna is manipulated through typical positions, polarity and length during the tests.
6. The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
8. < - 130 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 20 of 24

RADIATED Measurements (Restricted Band) (Hand Set)

Transmitter Portion

Operating Frequency: 2479.4 MHz
 Distance of Measurements: 3 meters
 Channel(s): 88

FREQ. (MHz)	Level* (dBm)	AFCL (dB)	POL (H/V)	DET QP/AVG	F/S (µV/m)	F/S (dBµV/m)	Margin (dB)
2484.1	- 108.3	35.1	V	Peak	48.9779	33.8	20.2
2484.7	- 111.0	35.1	V	Peak	35.8922	31.1	22.9
2484.6	- 114.7	35.1	V	Peak	23.4423	27.4	22.9
2485.6	- 119.0	35.1	V	Peak	14.2889	23.1	30.9
2490.6	- 118.4	35.2	V	Peak	15.4882	23.8	30.2
2491.3	- 119.0	35.2	V	Peak	14.4544	23.2	30.8

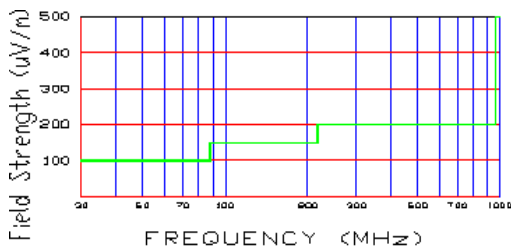




Figure 12. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 µV/m (54dBu/m)

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in table 2. (note: * Restricted Band)
2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.
5. The antenna is manipulated through typical positions, polarity and length during the tests.
6. The EUT is supplied with nominal AC voltage or/and a new/fully recharged battery.
7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
8. < - 130 are below the analyzer floor level.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 21 of 24

RADIATED Measurements (Spurious)

Transmitter Portion

Distance of Measurements: 3 meters

FREQ. (MHz)	Level* (dBm)	AFCL** (dB)	POL (H/V)	Height (m)	Azimuth (° angle)	F/S (µV/m)	Margin*** (dB)
124.4	- 85.0	11.8	H	2.6	220	49.0	- 9.7
129.6	- 87.0	12.2	H	2.5	200	40.8	- 11.3
152.1	- 88.6	13.7	V	2.3	190	40.3	- 11.4
180.2	- 88.8	15.5	V	2.0	315	48.5	- 9.8
235.1	- 87.2	18.1	V	1.5	180	78.6	- 8.1
360.4	- 92.3	22.6	H	1.3	180	73.3	- 8.7

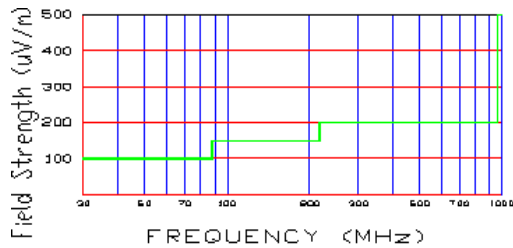



Figure 13. Restricted band harmonics and spurious limits.

Above 1 GHz limit is 500 uV/m (54dBu/m)

NOTES:


1. All emissions were investigated and the worst case emissions are reported
2. For hand-held devices, the EUT is rotated through three orthogonal axis to determine which configuration produces the maximum emissions
3. The EUT is supplied with the minimal AC voltage or/and a new/fully recharged battery.
4. The EUT was tested up to the 10th harmonic (2.5 GHz) and no significant emission was found.

PCTEST™ PT. 15.247 REPORT	 FCC MEASUREMENT REPORT1 Panasonic		Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770 Page 22 of 24

TEST EQUIPMENT


Type	Model	Cal. Due Date	S/N
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	12/05/02	3638A08713
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	04/17/03	2542A11898
Spectrum Analyzer/Tracking Gen.	HP 8591A (9kHz-1.8GHz)	06/02/03	3144A02458
Spectrum Analyzer	HP 8591A (9kHz-1.8GHz)	10/15/03	3108A02053
Spectrum Analyzer	HP 8594A (9kHz-2.9GHz)	11/02/03	3051A00187
Signal Generator*	HP 8640B (500Hz-1GHz)	06/02/03	2232A19558
Signal Generator*	HP 8640B (500Hz-1GHz)	06/02/03	1851A09816
Signal Generator*	Rohde & Schwarz (0.1-1000MHz)	09/11/03	894215/012
Alltech/Eaton Receiver	NM 37/57A-SL (30-1000MHz)	04/12/03	0792-03271
Alltech/Eaton Receiver	NM 37/57A (30-1000MHz)	03/11/03	0805-03334
Alltech/Eaton Receiver	NM 17/27A (0.1-32MHz)	09/17/03	0608-03241
Quasi-Peak Adapter	HP 85650A	08/09/03	2043A00301
Alltech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	03/11/03	0194-04082
RG58 Coax Test Cable	No. 167		n/a
Harmonic/Flicker Test System	HP 6841A (IEC 555-2/3)		3531A00115
Broadband Amplifier (2)	HP 8447D		1145A00470, 1937A03348
Broadband Amplifier	HP 8447F		2443A03784
Transient Limiter	HP 11947A (9kHz-200MHz)		2820A00300
Horn Antenna	EMCO Model 3115 (1-18GHz)		9704-5182
Horn Antenna	EMCO Model 3115 (1-18GHz)		9205-3874
Horn Antenna	EMCO Model 3116 (18-40GHz)		9203-2178
Biconical Antenna (4)	Eaton 94455/Eaton 94455-1/Singer 94455-1/Compliance Design 1295, 1332, 0355		
Log-Spiral Antenna (3)	Alltech/Eaton 93490-1		0608, 1103, 1104
Roberts Dipoles	Compliance Design (1 set) A100		5118
Alltech Dipoles	DM-105A (1 set)		33448-111
EMCO LISN (2)	3816/2		1077, 1079
EMCO LISN	3725/2		2009
Microwave Preamplifier 40dB Gain	HP 83017A (0.5-26.5GHz)		3123A00181
Microwave Cables	MicroCoax (1.0-26.5GHz)		
Alltech/Eaton Receiver	NM37/57A-SL		0792-03271
Spectrum Analyzer	HP 8591A		3034A01395
Modulation Analyzer	HP 8901A		2432A03467
NTSC Pattern Generator	Leader 408		0377433
Noise Figure Meter	HP 8970B		3106A02189
Noise Figure Meter	Alltech 7510		TE31700
Noise Generator	Alltech 7010		1473
Microwave Survey Meter	Holaday Model 1501 (2.450GHz)		80931
Digital Thermometer	Extech Instruments 421305		426966
Attenuator	HP 8495A (0-70dB) DC-4GHz		
Bi-Directional Coax Coupler	Narda 3020A (50-1000MHz)		
Shielded Screen Room	RF Lindgren Model 26-2/2-0		6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81		R2437 (PCT278)
Environmental Chamber	Associated Systems Model 1025 (Temperature/Humidity)		PCT285

* Calibration traceable to the National Institute of Standards and Technology (NIST).

PCTEST™ PT. 15.247 REPORT		 FCC MEASUREMENT REPORT Panasonic		Reviewed By: Quality Manager
Test Report S/N: 15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 23 of 24

Conclusion

The data collected shows that the **Panasonic 2.4 GHz FHSS Cordless Phone FCC ID: ACJ96NKX-TG2770** complies with Part 15C of the FCC Rules.

PCTEST [™] PT. 15.247 REPORT	 PCTEST Engineering Laboratory, Inc.	FCC MEASUREMENT REPORT1	Panasonic	Reviewed By: Quality Manager
Test Report S/N:15.221118621.ACJ	Test Dates: NOV. 18-19, 2002	EUT Type: 2.4 GHZ FHSS CORDLESS PHONE	FCC ID: ACJ96KX-TG2770	Page 24 of 24