

Power Spectral Density

§15.247(d)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

The spectrum analyzer is set to:

RBW = 3 kHz (7dB/div)

VBW = 3 kHz Span = 40 MHz Ref. Level = 5 dBmSweep = 1000 sec

Frequency	Channel	Test Results			
(MHz)	No.	Power Density (dBm)	Limit	Margin	
2412	1	-3.29	+ 8 dBm	-11.29	
2437	6	-3.16	+ 8 dBm	-11.16	
2462	11	-4.07	+ 8 dBm	-12.07	

See next pages for actual measured spectrum plots Peak Power Density + Attenuation = dBm

Table A-4. Conducted Power Density Measurements

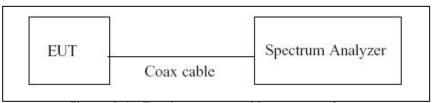
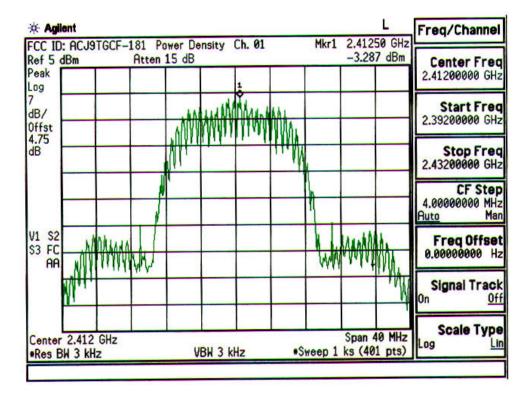


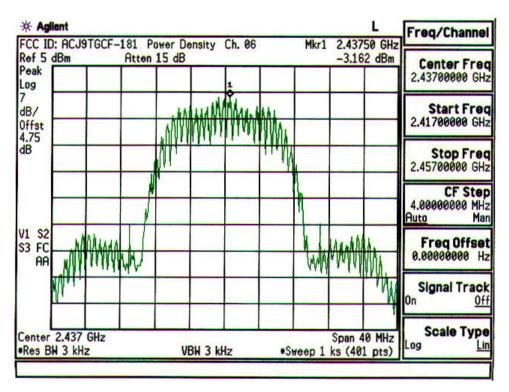
Figure A-3. Test Instrument & Measurement Setup

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 16 of 44





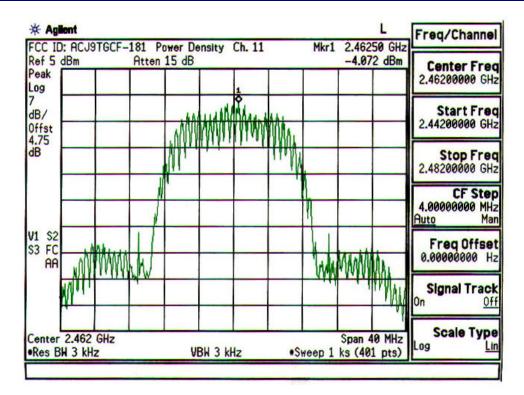
Plot A-7. Max. Power Density Plot - Ch. 01



Plot A-8. Max. Power Density Plot - Ch.06

PCTEST LAB TEST REPORT 15.247	PCTEST University Street Law	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF-18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 17 of 44



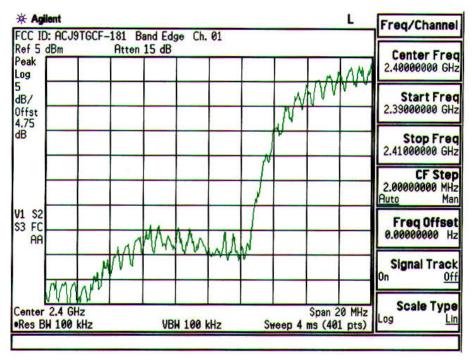


Plot A-9. Max. Power Density Plot - Ch.11

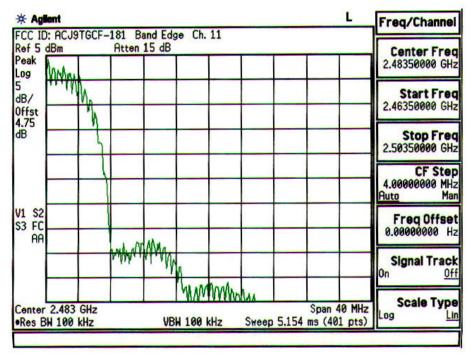
PCTEST LAB TEST REPORT	POTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Language Streets Lat			Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 18 of 44



Occupied BandEdge /BandEdge at 20dB below. & Out of Band Emissions



Plot A-10. Occupied Band Edge Plot - Ch.1



Plot A-11. Occupied Band Edge Plot - Ch.11

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	University Street Law			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 19 of 44



Radiated Measurements

§15.247(b) / §15.205 & §15.209

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Channel: 01

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml//m)	Margin (dB)
4824	-99.5	40.4	V	47.9	248.0	6.1
7236	-112.5	47.4	V	41.9	124.7	12.1
9648	-128.5	50.3	V	28.8	27.5	25.2
12060	-135.0	53.7	V	25.7	19.3	28.3

Table A-6. Radiated Measurements @ 3 meters

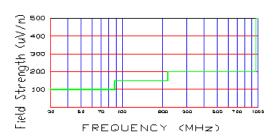


Figure A-5. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 20 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Channel: 06

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4874	-99.6	40.5	V	47.9	248.3	6.1
7311	-113.0	48.0	V	42.0	125.9	12.0
9748	-128.3	50.3	V	29.0	28.2	25.0
12185	-135.0	53.7	V	25.7	19.3	28.3

Table A-7. Radiated Measurements @ 3 meters

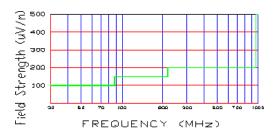


Figure A-6. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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 9 kHz to the 10^{th} harmonic and the worst-case emissions are reported.
- 8. < - 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Visional Street Lab			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 21 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Channel: 11

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4924	-100.0	40.7	V	47.7	242.7	6.3
7386	-113.6	48.2	V	41.6	120.2	12.4
9848	-128.1	50.4	V	29.3	29.2	24.7
12310	-135.0	53.8	V	25.8	19.5	28.2

Table A-8. Radiated Measurements @ 3 meters

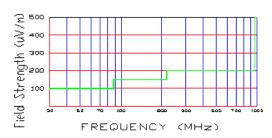


Figure A-7. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < - 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 22 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 2 Mbps

Distance of Measurements: 3 Meters

Channel: 01

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml//m)	Margin (dB)
4824	-99.9	40.4	V	47.5	236.9	6.5
7236	-112.8	47.4	V	41.6	120.5	12.4
9648	-129.2	50.3	V	28.1	25.4	25.9
12060	-135.0	53.7	V	25.7	19.3	28.3

Table A-9. Radiated Measurements @ 3 meters

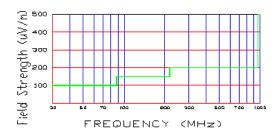


Figure A-8. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 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. < - 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Lamina Welling Lab			Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 23 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 2 Mbps

Distance of Measurements: 3 Meters

Channel: 06

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4874	-102.6	40.5	V	44.9	175.79	9.1
7311	-106.4	48	V	48.6	269.15	5.4
9748	-120.0	50.3	V	37.3	73.28	16.7
12185	-135.0	53.7	V	25.7	19.27	28.3

Table A-10. Radiated Measurements @ 3 meters

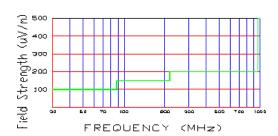


Figure A-9. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in $\S15.205$ are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < - 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Lamina Welling Lab			Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 24 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 2 Mbps

Distance of Measurements: 3 Meters

Channel: 11

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4924	-101.2	40.7	V	46.5	211.3	7.5
7386	-113.9	48.2	V	41.3	116.1	12.7
9848	-128.9	50.4	V	28.5	26.6	25.5
12310	-135.0	53.8	V	25.8	19.5	28.2

Table A-11. Radiated Measurements @ 3 meters

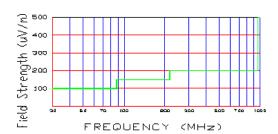


Figure A-10. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Lamina Welling Lab			Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 25 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 5.5 Mbps

Distance of Measurements: 3 Meters

Channel: 01

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4824	-100.0	40.4	V	47.4	234.2	6.6
7236	-113.1	47.4	V	41.3	116.4	12.7
9648	-129.5	50.3	V	27.8	24.5	26.2
12060	-135.0	53.7	V	25.7	19.3	28.3

Table A-12. Radiated Measurements @ 3 meters

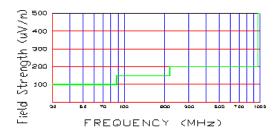


Figure A-11. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in $\S15.205$ are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 26 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 5.5 Mbps

Distance of Measurements: 3 Meters

Channel: 06

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml//m)	Margin (dB)
4874	-100.6	40.5	V	46.9	221.3	7.1
7311	-113.8	48.0	V	41.2	114.8	12.8
9748	-129.2	50.3	V	28.1	25.4	25.9
12185	-135.0	53.7	V	25.7	19.3	28.3

Table A-13. Radiated Measurements @ 3 meters

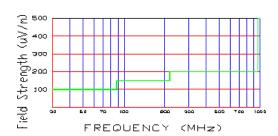


Figure A-12. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in $\S15.205$ are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 27 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 5.5 Mbps

Distance of Measurements: 3 Meters

Channel: 11

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4924	-101.5	40.7	V	46.2	204.2	7.8
7386	-114.0	48.2	V	41.2	114.8	12.8
9848	-129.3	50.4	V	28.1	25.4	25.9
12310	-135.0	53.8	V	25.8	19.5	28.2

Table A-14. Radiated Measurements @ 3 meters

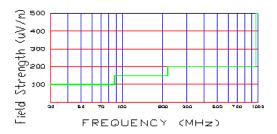


Figure A-13. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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 9 kHz to the 10^{th} harmonic and the worst-case emissions are reported.
- 8. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\!\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Lamina Welling Lab			Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 28 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 11 Mbps

Distance of Measurements: 3 Meters

Channel: 01

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4824	-100.5	40.4	V	46.9	221.1	7.1
7236	-113.5	47.4	V	40.9	111.2	13.1
9648	-129.9	50.3	V	27.4	23.4	26.6
12060	-135.0	53.7	V	25.7	19.3	28.3

Table A-15. Radiated Measurements @ 3 meters

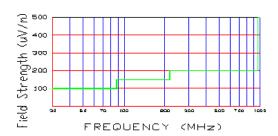


Figure A-14. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Visional Street Lab			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 29 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 11 Mbps

Distance of Measurements: 3 Meters

Channel: 06

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4874	-100.8	40.5	V	46.7	216.3	7.3
7311	-114.3	48.0	V	40.7	108.4	13.3
9748	-129.8	50.3	V	27.5	23.7	26.5
12185	-135.0	53.7	V	25.7	19.3	28.3

Table A-16. Radiated Measurements @ 3 meters

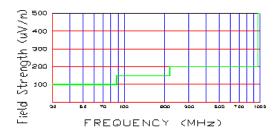


Figure A-15. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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 10^{th} harmonic and the worst-case emissions are reported.
- 8. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\!\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Management of			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 30 of 44



Radiated Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Transfer Rate: 11 Mbps

Distance of Measurements: 3 Meters

Channel: 11

Frequency (MHz)	Level (dBm)	AFCL (dB)	POL (H/V)	F/S (dB ml/ /m)	F/S (ml/ /m)	Margin (dB)
4924	-101.8	40.7	V	45.9	197.2	8.1
7386	-114.3	48.2	V	40.9	110.9	13.1
9848	-129.5	50.4	V	27.9	24.8	26.1
12310	-135.0	53.8	V	25.8	19.5	28.2

Table A-17. Radiated Measurements @ 3 meters

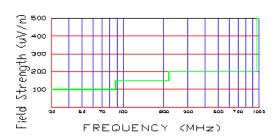


Figure A-16. Radiated limits at 3 meters.

- 1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (Note: * = Restricted Band measured frequency)
- 2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz
- 3. Average Measurements > 1 GHz 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. < 135 dBm are below the analyzer floor level.
- 9. Above 1 GHz, the limit is 500 $\mu\text{V/m}$ (54dB $\mu\text{/m})$ at 3 meters radiated.

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15, 230328170 ACI	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 31 of 44



Radiated Spurious Measurements

§15.205 / §15.209

Distance of Measurements: 3 Meters

FREQ (MHz)	Level (dBm)	AFCL (dB/m)	POL (H/V)	Height (m)	Azimuth (° angle)	F/S (uV/M)	Margin (dB)
121.9	-82.3	11.6	Н	2.4	90	65.4	-7.2
130.6	-81.8	12.3	Н	2.2	210	74.2	-6.1
195.5	-88.3	16.3	Н	2.1	80	56.3	-8.5
233.6	-85.5	18.1	V	1.5	210	94.5	-6.5
260.6	-85.4	19.2	V	1.4	190	109.7	-5.2
380.5	-88.0	23.2	V	1.3	20	128.9	-3.8

Table A-17. Radiated Measurements at 3-meters

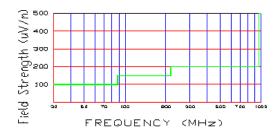


Figure A-17. Radiated limits at 3 meters

- 1. All emissions were investigated and the worst-case emissions are reported.
- 2. For hand-held devices, the EUT is rotated through three orthogonal axes to determine which configuration produces the maximum emissions.
- 3. The EUT is supplied with the minimal AC voltage or/and a new/fully re-charged battery.
- 4. The EUT was tested up to the 10th harmonic (25GHz) and no significant emission was found.
- 5. Above 1 GHz the limit is $500\mu V/m$ at 3 meters radiated.

PCTEST LAB TEST REPORT	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Internation Of Street, Lab			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 32 of 44



Radiated Restricted Band Measurements

§15.205 / §15.209

Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operations. 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 measurement was used, using RBW 1MHz – VBW 10Hz and linearly polarized horn antennas. All harmonics/spurs are at least 20dB below the highest emission in the authorized band using RBW = 100kHz. 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 G-1 per Section 15.209.

Frequency	F/S (ml/ /m)	Measured Distance (Meters)
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table A-18. Restricted Band Limits

TEST MEASUREMENT EQUIPMENT

TEOT WENCONLINE TO	OH WEIT
Agilent E4448A	PSA Spectrum Analyzer 3 Hz - 50GHz
HP 8566B	Spectrum Analyzer 100Hz – 22GHz
HP 83017A	Microwave Analyzer 40dB Gain (0.5 – 26.5GHz)
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 – 26.5GHz)
CDI Dipoles	Dipole Antennas (30 – 1000MHz)
EMCO 3116	Horn Antenna (18 – 40GHz)

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by: Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 33 of 44



Radiated Restricted Band Measurements (Cont.)

§15.205 /§15.209 courtesy

Operating Frequency: 2462 MHz

Distance of Measurements: 3 Meters

FREQ (MHz)	Level (dBm)	AFCL (dB/m)	POL (H/V)	F/S (dBμV/m)	F/S (uV/M)	Margin (dB)
2483.9	-90.0	33.0	V	50.0	316.2	4.0
2484.3	-93.6	33.0	V	46.4	208.9	7.6
2484.6	-96.0	33.1	V	44.1	160.3	7.6
2486.3	-93.6	33.1	V	46.5	211.4	7.5
2493.0	-97.5	33.2	٧	42.7	136.5	11.3
2496.0	-95.0	33.2	V	45.2	182.0	8.8

Table A-19. Radiated Restricted Band Measurements at 3-meters

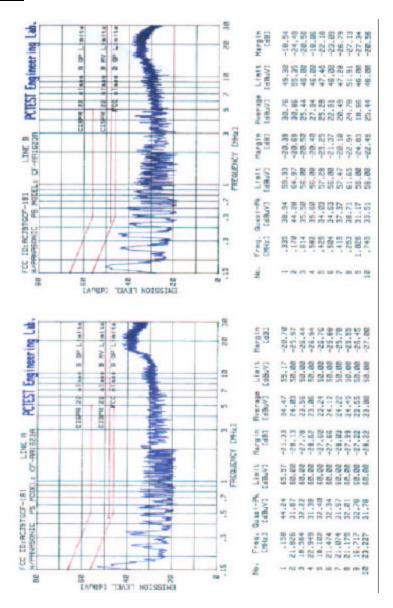
- 1. The antenna is manipulated through typical positions, polarity and length during the testing.
- 2. The EUT is supplied with the minimal AC voltage or/and a new/fully recharged battery.
- 3. The spectrum is measured from 9kHz up to the 10^{th} harmonic and the worst-case emissions are reported.
- 4. The conducted limits are shown on Figure A-14. Above 1 GHz the limit is $500\mu\text{V/m}$.
- 5. < -135 dBm is below the analyzer measurement floor level.

PCTEST LAB TEST REPORT	POTEST	FCC CERTIFICATION REPORT Panasonic		Reviewed by:
15.247	Surgestion Street, Lab			Quality Manager
Filename: 15. 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 34 of 44



Line-Conducted Test Data

§15.207



Notes:

- 1. All Modes of operation were investigated and the worst-case emissions are reported.
- 2. The limit for Class B device(s) from 150kHz to 30MHz are Specified in EN55022.
- 3. Line A = Phase; Line B = Neutral
- 4. Deviations to the Specifications: None.

PCTEST LAB TEST REPORT 15.247	PCTEST Stangard Streets Lat	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 35 of 44



EXHIBIT B - Labeling Requirements Sample Label & Location

New Labeling Requirements

Per 2.1074 & 15.19: Docket 95-19

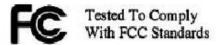
The sample label shown below shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name, FCC ID, and the FCC logo must be displayed on the device per Section 15.19 (b)(2).

FCC ID: ACJ9TGCF-181

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions.

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.



FOR HOME OR OFFICE USE

PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 36 of 44



EXHIBIT B - Labeling Requirements (Cont.) Sample Label & Location

FCC ID Label



PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 37 of 44



EXHIBIT C - Block Diagram/Schematics

PCTEST LAB TEST REPORT 15.247	PCTEST	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 38 of 44



EXHIBIT D - Parts List

PCTEST LAB TEST REPORT 15.247	PCTEST Incident Windows Late	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 39 of 44



EXHIBIT E - Operational Description

PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 40 of 44



EXHIBIT F - Test Setup Photographs

The Line-Conducted and Radiated Test Pictures show the worst-case configuration and cable placement with a minimum margin to the specifications.

PCTEST LAB TEST REPORT 15.247	PCTEST Consider Virtual Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170 ACI	Test Dates:	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WI AN ECC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 41 of 44



EXHIBIT G - EUT External/Internal Photographs

PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 42 of 44



EXHIBIT H - User's Manual

PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 43 of 44



EXHIBIT I – SAR MEASUREMENT REPORT

PCTEST LAB TEST REPORT 15.247	PCTEST Lamina Welling Lab	FCC CERTIFICATION REPOR	Panasonic	Reviewed by: Quality Manager
Filename: 15, 230328170.ACJ	Test Dates: April 7-9, 2003	EUT Type: Panasonic TOUGHBOOK CF- 18 w/ Intel WLAN FCC ID: PD9WM3B2100	FCC ID: ACJ9TGCF-181	Page 44 of 44