

Exhibit N: Peak Output Power

FCC ID: HN2WN-5MP01

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low

Mid

High

Operating Modes Investigated:

Typical

Data Rates Investigated:

Lowest, Middle, and Highest

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 V, 60 Hz

Software\Firmware Applied During Test

Exercise software	AP Monitor	Version	V5.37
Description			
A notebook PC controls the radio through a serial port connection on the WA21 access point. Hyper Terminal running in Windows 98 address the AP monitor commands for setting the transmit channel and data rate.			

Equipment Modifications

No EMI suppression devices were added or modified. The EUT was tested as delivered.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT – 802.11(a) radio module installed in WA21 Access Point	Intermec	WN-5MP01	002-032
Laptop PC	Panasonic	CF-35	7KHSA02247

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial cable	Yes	1.5	No	Access Point	Laptop
AC power	No	1.9	No	Access Point	AC mains
AC power	No	1.8	No	Laptop	AC mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
RF Detector	RLC Electronics	CR-133-R	ZZA	05/10/2002	12 mo
Multimeter	Tektronix	DMM912	MMH	06/20/2002	12 mo
Signal Generator	Hewlett Packard	8341B	TGN	05/31/2002	12 mo
Power Meter	Hewlett Packard	E4418A	SPA	06/21/2002	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	06/21/2002	24 mo

Test Description

Requirement: Per 47 CFR 15.407(a)(1)-(2), the maximum peak output power must not exceed the following limits:

For the 5.15 to 5.25 GHz band, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz.

For the 5.25 to 5.35 GHz band, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz.

For both bands, if the antenna gain is greater than 6 dBi, the output must be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Configuration: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies; and low, medium, and high data rates in each operational band. The EUT was transmitting at its maximum output power.

The measurement was made using a direct connection between the RF output of the EUT and a RF detector diode. The DC output of the diode was measured with the DMM. The signal generator, tuned to the transmit frequency, was then substituted for the EUT. The CW output of the signal generator was adjusted until the DC output of the RF detector diode match the level produced when connected to the EUT. To further reduce measurement error, the power meter and sensor were then used to measure the output power level of the signal generator.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +23 dBm for the 5.15 to 5.25 GHz band and +30 dBm for the 5.25 to 5.35 GHz band.

Completed by:



EUT: WN-5MP01	Work Order: INMC0024
Serial Number: 002-032	Date: 08/15/02
Customer: Intermec Corporation	Temperature: 24 degrees C
Attendees: None	Humidity: 40% RH
Customer Ref. No.: N/A	Power: 120 V, 60 Hz
Tested by: Greg Kiemel	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.407(a)(1)	Year: Most Current	Method: ANSI C63.4	Year: 1992

SAMPLE CALCULATIONS

EIRP (peak) = Peak Power Measured w/ Diode Detector + Maximum Antenna Gain

COMMENTS

Tested in WA21 Access Point. The maximum 26 dB emission bandwidth (B) is 43 MHz

EUT OPERATING MODES

Modulated at lowest, mid, and highest data rates, at maximum output power

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

For the 5.15 - 5.25 GHz band, the peak transmit power shall not exceed the lesser of 50mW or 4 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
If the antenna gain is greater than 6 dBi, the output must be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

RESULTS	AMPLITUDE
Pass	Peak Output Power = 16.9 dBm (EIRP)

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Peak Output Power - 5.15 to 5.25 GHz Band

Tx Data Rate: 54 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5180.0	3.0	5	8.0	23
5200.0	4.1	5	9.1	23
5220.0	4.7	5	9.7	23

Tx Data Rate: 24 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5180.0	8.0	5	13.0	23
5200.0	10.8	5	15.8	23
5220.0	11.3	5	16.3	23

Tx Data Rate: 6 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5180.0	8.3	5	13.3	23
5200.0	11.2	5	16.2	23
5220.0	11.9	5	16.9	23

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT: WN-5MP01	Work Order: INMC0024
Serial Number: 002-032	Date: 8/15 & 8/26/2002
Customer: Intermec Corporation	Temperature: 24 degrees C
Attendees: None	Humidity: 40% RH
Customer Ref. No.: N/A	Job Site: EV06
Tested by: Greg Kiemel	Power: 120 V, 60 Hz

TEST SPECIFICATIONS			
Specification: 47 CFR 15.407(a)(2)	Year: Most Current	Method: ANSI C63.4	Year: 1992

SAMPLE CALCULATIONS

EIRP (peak) = Peak Power Measured w/ Diode Detector + Maximum Antenna Gain

COMMENTS

Tested in WA21 Access Point. The maximum 26 dB emission bandwidth (B) is 40 MHz

EUT OPERATING MODES

Modulated at lowest, mid, and highest data rates, at maximum output power

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

For the 5.25 - 5.35 GHz band, the peak transmit power shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
If the antenna gain is greater than 6 dBi, the output must be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

RESULTS **AMPLITUDE**

Pass Peak Output Power = 23.7 dBm (EIRP)

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Peak Output Power - 5.25 to 5.35 GHz Band

Tx Data Rate: 54 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5260.0	4.2	12	16.2	30
5300.0	4.2	12	16.2	30
5320.0	2.8	12	14.8	30

Tx Data Rate: 24 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5260.0	11.2	12	23.2	30
5300.0	10.4	12	22.4	30
5320.0	9.5	12	21.5	30

Tx Data Rate: 6 Mbit

Frequency (MHz)	Peak Output Power (dBm)	Maximum Antenna Gain with Minimum Cable Loss (dBi)	EIRP (Peak) (dBm)	Spec (dBm)
5260.0	11.7	12	23.7	30
5300.0	10.6	12	22.6	30
5320.0	9.8	12	21.8	30