

Exhibit O: Peak Power Spectral Density

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: Lowest data rate produced the highest PPSD.

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
Spectrum Analyzer	Hewlett Packard	HP8593E	AAP	05/03/2002	12 mo

Test Description

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

For the 5.15 to 5.25 GHz band, the peak power spectral density shall not exceed 4 dBm/MHz.

For the 5.25 to 5.35 GHz band, the peak power spectral density shall not exceed 11 dBm/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 power spectral density was measured with the EUT set to low, medium, and high transmit frequencies; at the worst case data rate (investigations showed that the lowest data rate produced the highest PPSD). The EUT was transmitting at its maximum output power.

Per the workshop notes provided by Joe Dichoso of the FCC during the TCB training February 2002, the measurement was made in the following manner: using a direct connection between the RF output of the EUT and a spectrum analyzer, the RBW was set to 1 MHz and the VBW was set greater than the RBW. The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of video averaging.

Completed by:



NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: WN-5MP01			Work Order: INMC0024		
Serial Number: 002-032			Date: 08/26/02		
Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel	Humidity: 40% RH		
Customer Ref. No.: N/A		Power: 120 V, 60 Hz	Job Site: EV06		
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(1)		Year: Most Current	Method: ANSI C63.4	Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point. Maximum antenna gain in this band is 5 dBi					
EUT OPERATING MODES					
Modulated with worst case data rate (lowest) at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.15 to 5.25 GHz band, the peak power spectral density shall not exceed 4 dBm / MHz. The deFacto EIRP requirement is 10 dBm/MHz.					
RESULTS			Peak Power Density (EIRP)		
Pass			-0.9 dBm / MHz		
SIGNATURE					
<div style="text-align: center;">  Tested By: _____ </div>					
DESCRIPTION OF TEST					
Peak Power Spectral Density - Low Channel - 5.15 to 5.25 GHz Band					

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hp

MKR 5.1825 GHz

REF 10.0 dBm

AT 10 dB

-5.90 dBm

No us
Me:

SMPL

LOG

10

dB/

OFFST

22.0

dB

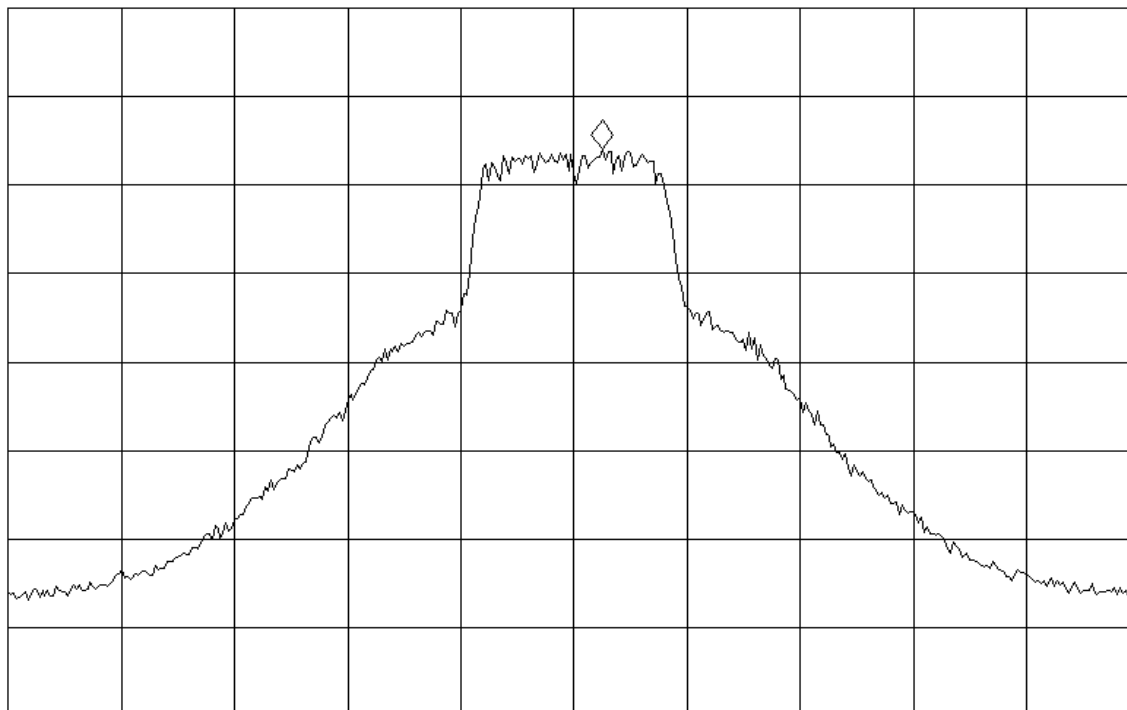
AVG

100

WA SB

SC FC

CORR




CENTER 5.1800 GHz

SPAN 100.0 MHz

#RES BW 1.0 MHz

#VBW 3 MHz

SWP 20.0 msec

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Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel		Humidity: 40% RH	
Customer Ref. No.: N/A		Power: 120 V, 60 Hz		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(1)		Year: Most Current		Method: ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point					
EUT OPERATING MODES					
Tested in WA21 Access Point. Maximum antenna gain in this band is 5 dBi					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.15 to 5.25 GHz band, the peak power spectral density shall not exceed 4 dBm / MHz. The deFacto EIRP requirement is 10 dBm/MHz.					
RESULTS			Peak Power Density (EIRP)		
Pass			-2.75 dBm / MHz		
SIGNATURE					
<div style="text-align: center;">  Tested By: _____ </div>					
DESCRIPTION OF TEST					
Peak Power Spectral Density - Mid Channel - 5.15 to 5.25 GHz Band					

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hp

MKR 5.1960 GHz

REF 10.0 dBm

AT 10 dB

-7.75 dBm

No us
Me:

SMPL

LOG

10

dB/

OFFST

22.0

dB

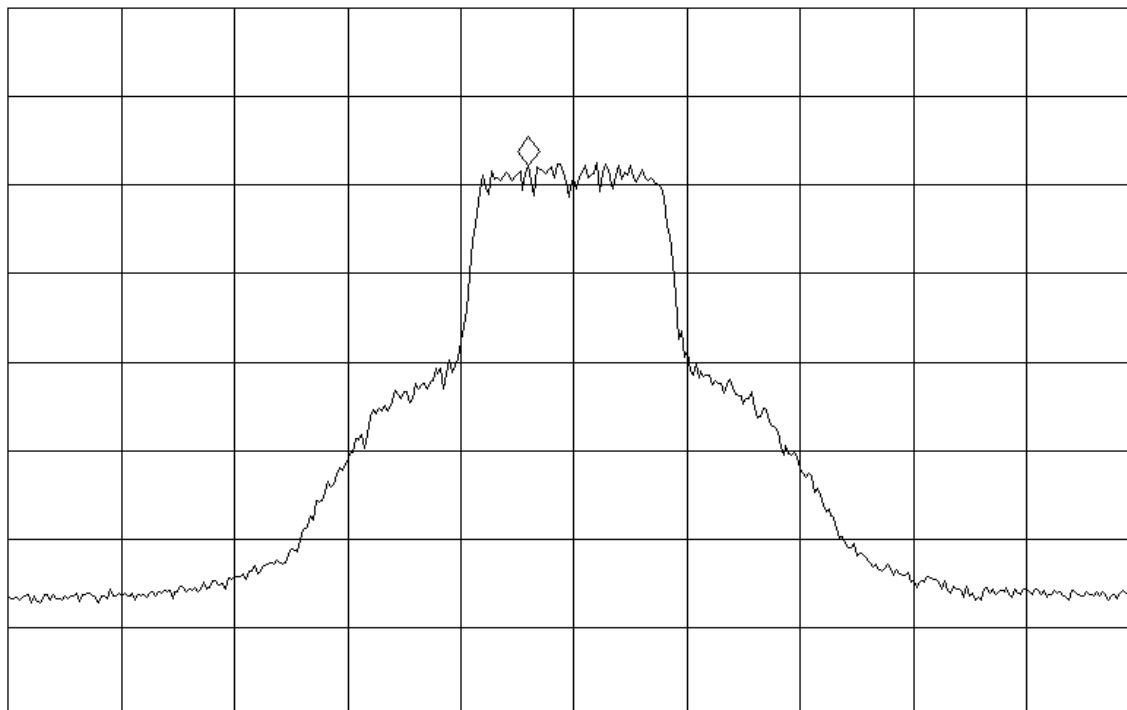
AVG

100

WA SB

SC FC

CORR




CENTER 5.2000 GHz

SPAN 100.0 MHz

#RES BW 1.0 MHz

#VBW 3 MHz

SWP 20.0 msec

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Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel		Humidity: 40% RH	
Customer Ref. No.: N/A		Power: 120 V, 60 Hz		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(1)		Year: Most Current		Method: ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point					
EUT OPERATING MODES					
Tested in WA21 Access Point. Maximum antenna gain in this band is 5 dBi					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.15 to 5.25 GHz band, the peak power spectral density shall not exceed 4 dBm / MHz. The deFacto EIRP requirement is 10 dBm/MHz.					
RESULTS			Peak Power Density (EIRP)		
Pass			-2.33 dBm / MHz		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Peak Power Spectral Density - High Channel - 5.15 to 5.25 GHz Band					

18:44:46 AUG 26, 2002

hp

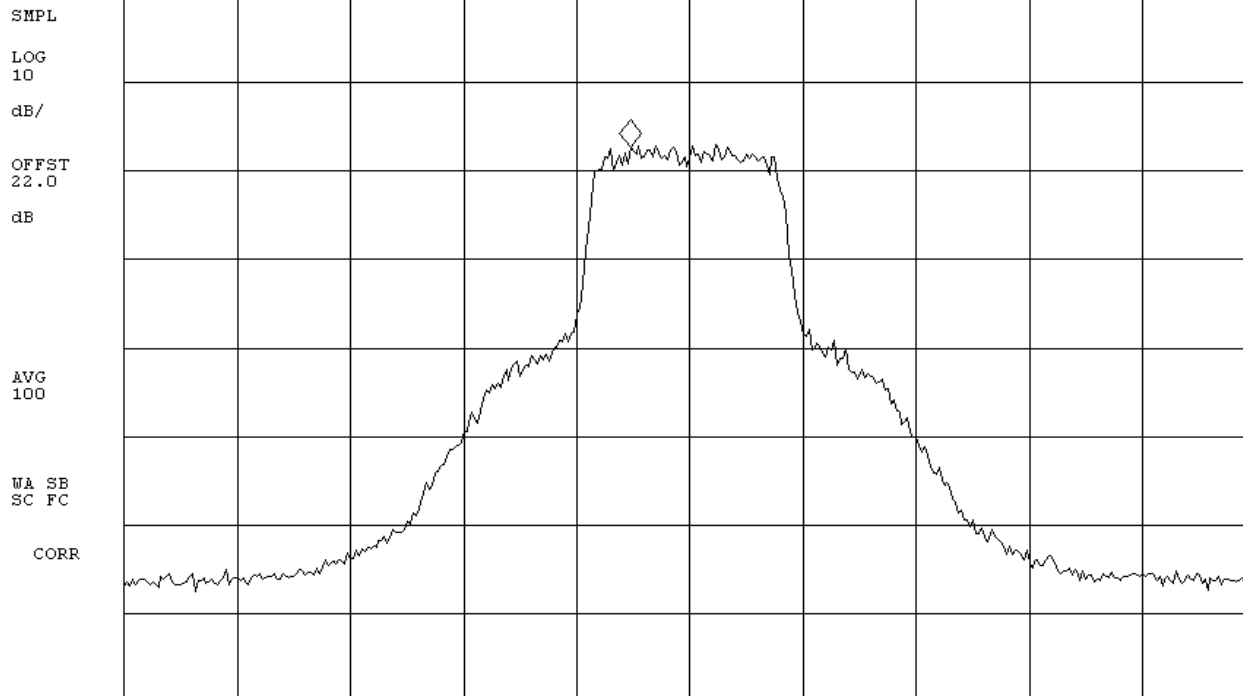
MKR 5.2148 GHz

REF 10.0 dBm

AT 10 dB

-7.33 dBm

No us
Me:




CENTER 5.2200 GHz

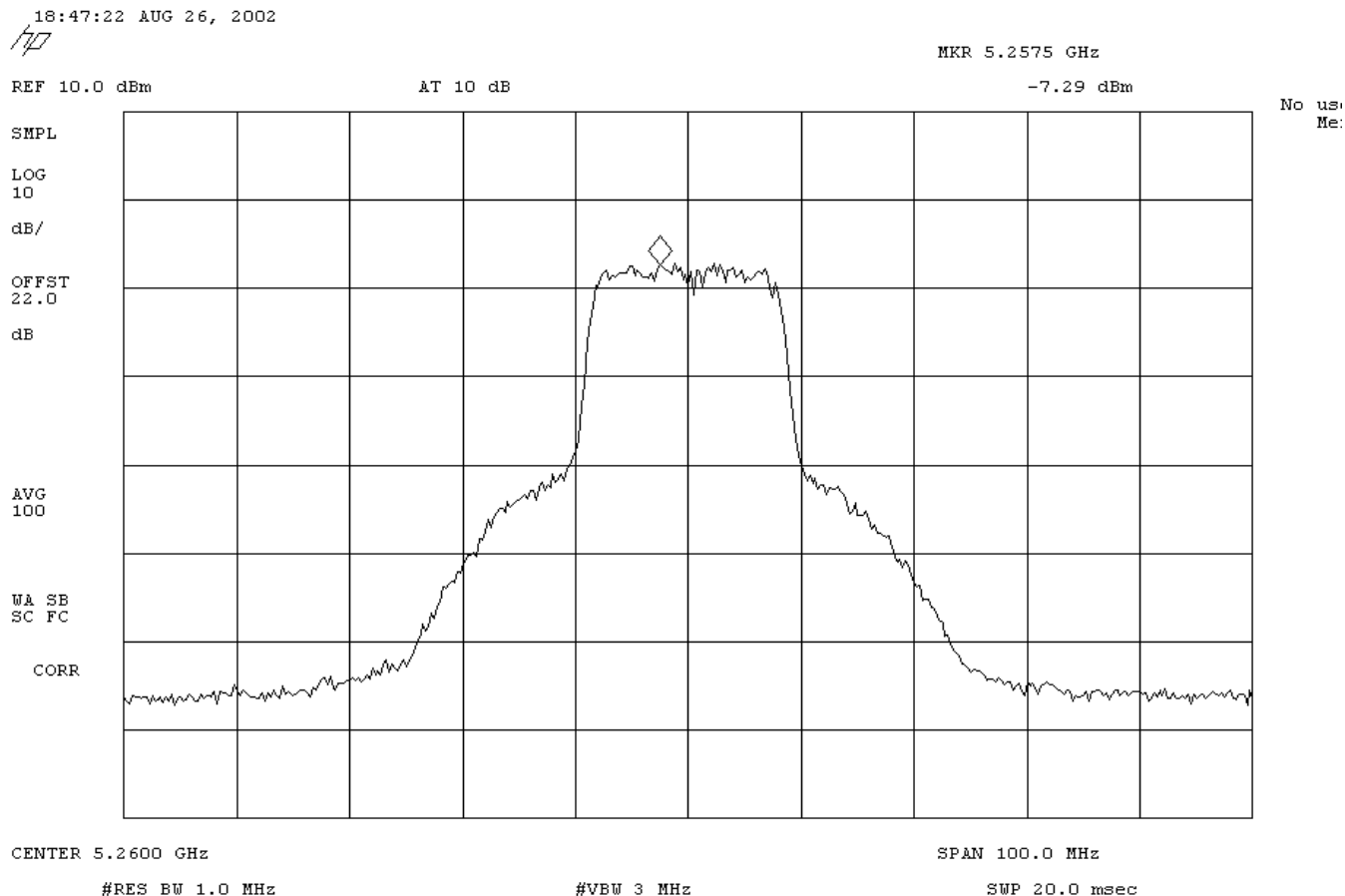
SPAN 100.0 MHz


#RES BW 1.0 MHz

#VBW 3 MHz

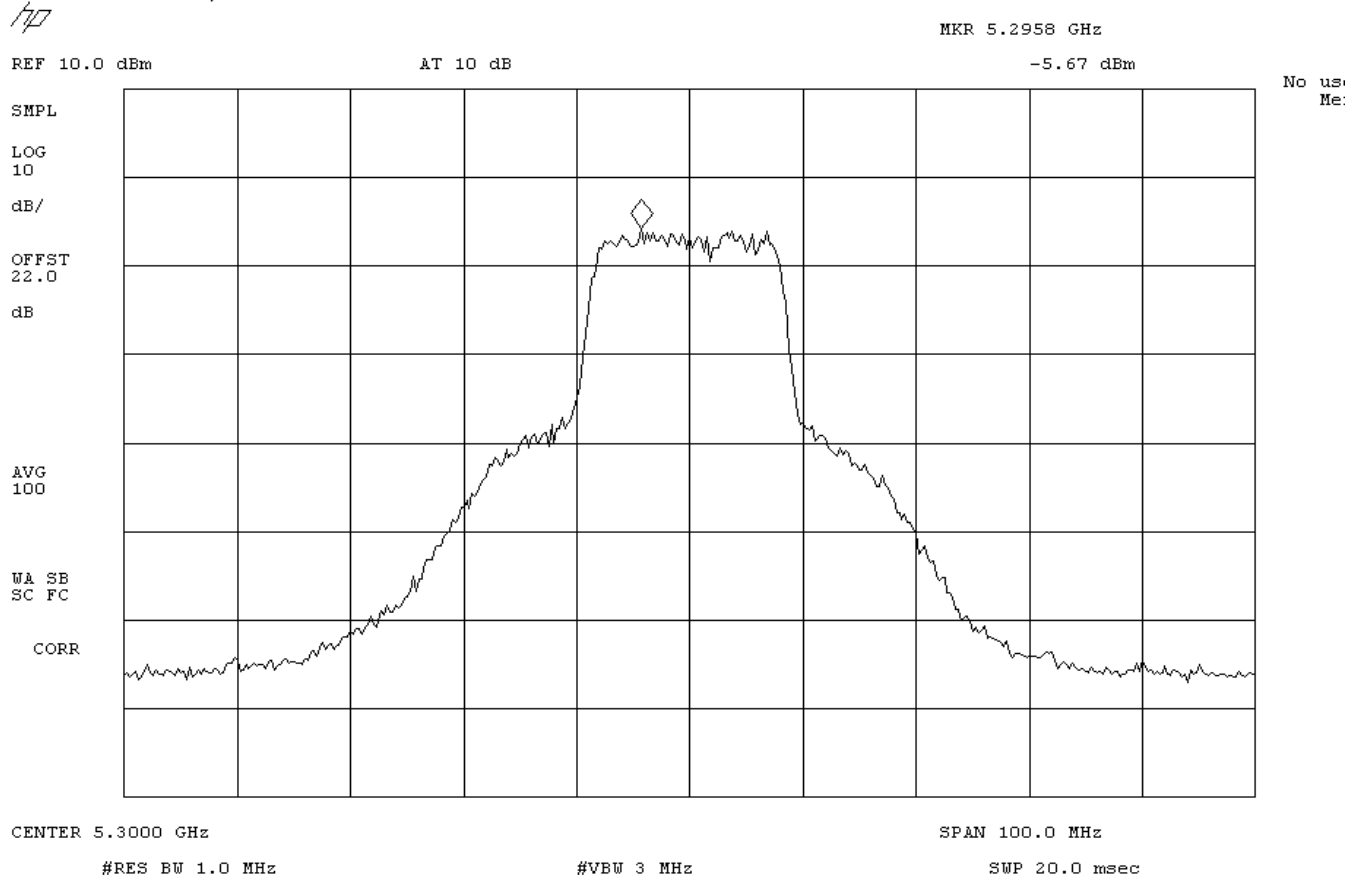
SWP 20.0 msec


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Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel		Humidity: 40% RH	
Customer Ref. No.: N/A		Power: 120 V, 60 Hz		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(2)		Year: Most Current		Method: ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point. Maximum antenna gain (less the minimum cable loss) in this band is 12 dBi					
EUT OPERATING MODES					
Modulated with worst case data rate (lowest) at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.25 to 5.35 GHz band, the peak power spectral density shall not exceed 11 dBm / MHz. The deFacto EIRP requirement is 17 dBm/MHz.					
RESULTS			Peak Power Density (EIRP)		
Pass			4.71 dBm / MHz		
SIGNATURE					
<div style="text-align: center;">  Tested By: _____ </div>					
DESCRIPTION OF TEST					
Peak Power Spectral Density - Low Channel - 5.25 to 5.35 GHz Band					



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Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel	Humidity: 40% RH		
Customer Ref. No.: N/A		Power: 120 V, 60 Hz	Job Site: EV06		
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(2)		Year: Most Current	Method: ANSI C63.4	Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point. Maximum antenna gain (less the minimum cable loss) in this band is 12 dBi					
EUT OPERATING MODES					
Modulated with worst case data rate (lowest) at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.25 to 5.35 GHz band, the peak power spectral density shall not exceed 11 dBm / MHz. The deFacto EIRP requirement is 17 dBm/MHz.					
RESULTS			Peak Power Density (EIRP)		
Pass			6.33 dBm / MHz		
SIGNATURE					
<div style="text-align: center;">  Tested By: _____ </div>					
DESCRIPTION OF TEST					
Peak Power Spectral Density - Mid Channel - 5.25 to 5.35 GHz Band					

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NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: WN-5MP01			Work Order: INMC0024		
Serial Number: 002-032			Date: 08/26/02		
Customer: Intermec Corporation			Temperature: 24 degrees C		
Attendees: None		Tested by: Greg Kiemel		Humidity: 40% RH	
Customer Ref. No.: N/A		Power: 120 V, 60 Hz		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 15.407(a)(2)		Year: Most Current		Method: ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
Peak Power Density (EIRP) = Peak Power Density + Maximum antenna gain (dBi)					
COMMENTS					
Tested in WA21 Access Point. Maximum antenna gain (less the minimum cable loss) in this band is 12 dBi					
EUT OPERATING MODES					
Modulated with worst case data rate (lowest) at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
For the 5.25 to 5.35 GHz band, the peak power spectral density shall not exceed 11 dBm / MHz. The deFacto EIRP requirement is 17 dBm/MHz.					
RESULTS					
			Peak Power Density (EIRP)		
Pass			4.36 dBm / MHz		
SIGNATURE					
<div style="text-align: center;">  Tested By: _____ </div>					
DESCRIPTION OF TEST					
Peak Power Spectral Density - High Channel - 5.25 to 5.35 GHz Band					

