

# **Exhibit M: Occupied Bandwidth**

**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 largest bandwidth.

**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

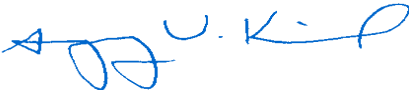
**Test Description**

**Requirement:** Per 47 CFR 15.407(a)(1), the limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied bandwidth that is 26 dB down from the peak of the emission.

**Configuration:** The 26-dB emission bandwidth 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 largest bandwidth). 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% of the emission bandwidth, the VBW was set greater than the RBW, and a peak detector was used. The Max hold feature was not used, rather, a single sweep was used to capture the emission. The widest occupied BW that is 26 dB down from the peak of the emission was measured.

**Completed by:**



**NORTHWEST EMC EMISSIONS DATA SHEET** Rev BETA 01/30/01

EUT: <b>WN-5MP01</b>		Work Order: <b>INMC0024</b>	
Serial Number: <b>002-032</b>		Date: <b>08/27/02</b>	
Customer: <b>Intermec Corporation</b>		Temperature: <b>24 degrees C</b>	
Attendees: <b>None</b>		Humidity: <b>40% RH</b>	
Customer Ref. No.: <b>N/A</b>	Tested by: <b>Greg Kiemel</b>	Job Site: <b>EV06</b>	
Power: <b>120 V, 60 Hz</b>			

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

**SAMPLE CALCULATIONS**

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**COMMENTS**

Tested in WA21 Access Point

**EUT OPERATING MODES**

Modulated with worst case data rate (lowest) at maximum output power.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	40.8 MHz

**SIGNATURE**

Tested By: *Greg Kiemel*

**DESCRIPTION OF TEST**

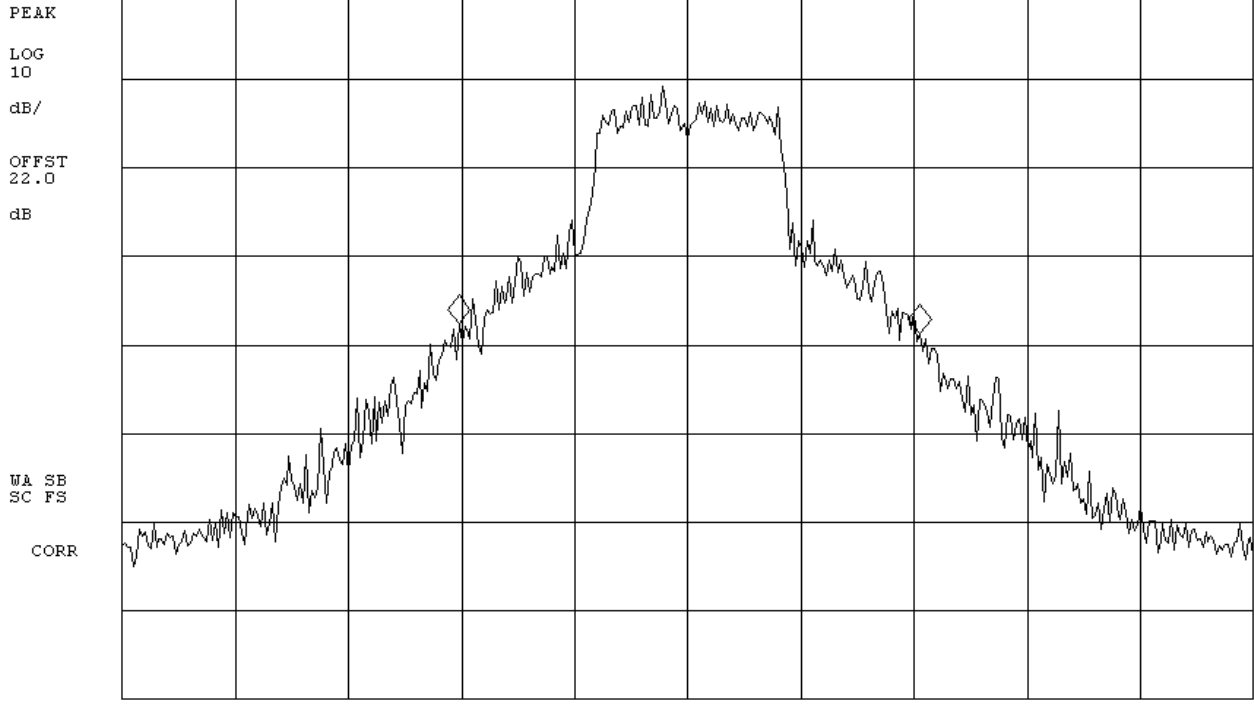
**Occupied Bandwidth - Low Channel - 5.15 to 5.25 GHz Band**

11:15:48 AUG 27, 2002

*hp*

MKR  $\triangle$  40.8 MHz

REF 10.0 dBm                      AT 10 dB                      -1.07 dB



No us Me:

CENTER 5.1800 GHz                      SPAN 100.0 MHz  
 #RES BW 300 kHz                      #VBW 1 MHz                      SWP 20.0 msec

NORTHWEST  
**EMC EMISSIONS DATA SHEET** Rev BETA  
01/30/01

EUT: WN-5MP01		Work Order: INMC0024	
Serial Number: 002-032		Date: 08/27/02	
Customer: Intermec Corporation		Temperature: 24 degrees C	
Attendees: None		Humidity: 40% RH	
Customer Ref. No.: N/A	Tested by: Greg Kiemel	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			

**COMMENTS**

Tested in WA21 Access Point  
**EUT OPERATING MODES**

Modulated with worst case data rate (lowest) at maximum output power.  
**DEVIATIONS FROM TEST STANDARD**

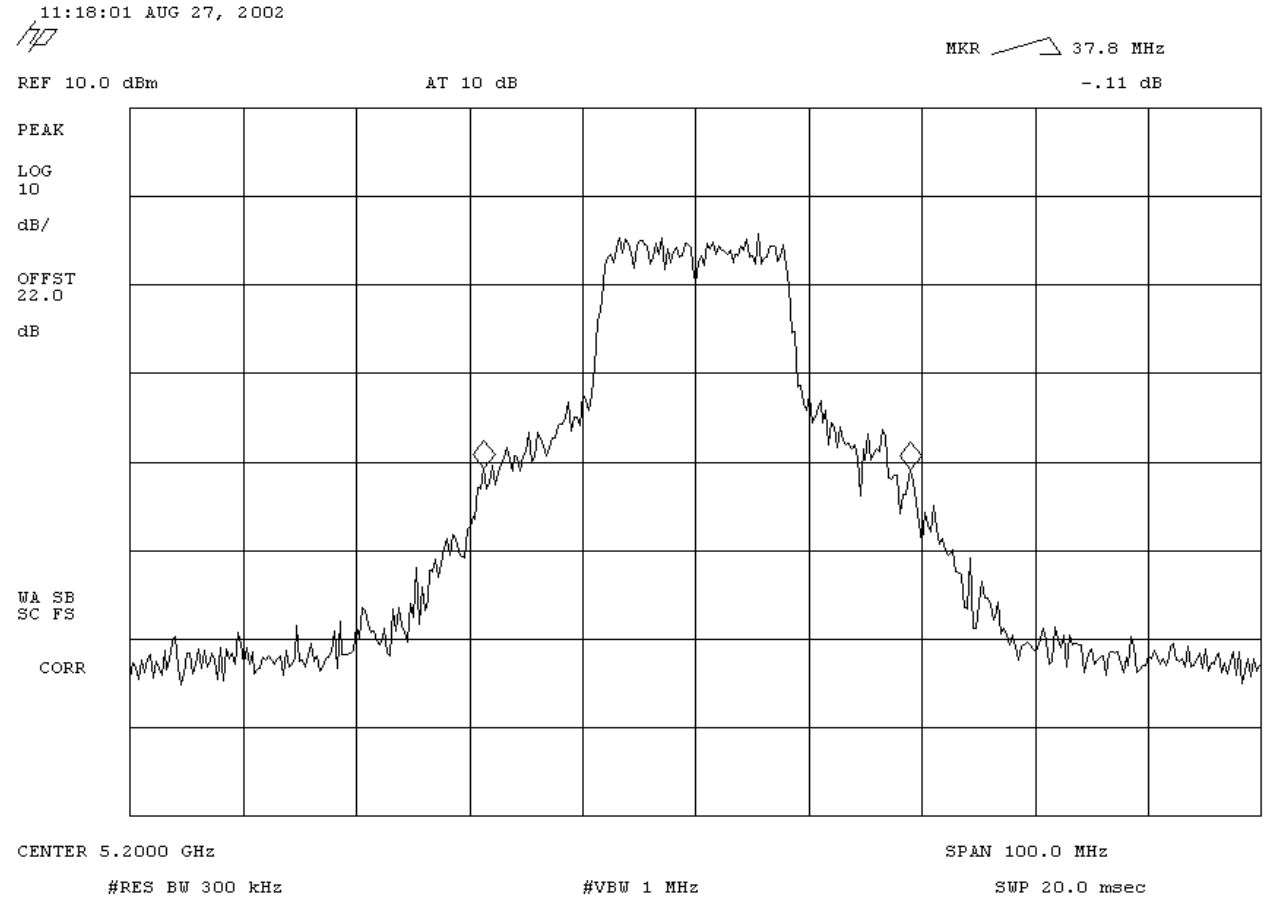
None  
**REQUIREMENTS**

The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	37.8 MHz

**SIGNATURE**  
  
 Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Occupied Bandwidth - Mid Channel - 5.15 to 5.25 GHz Band**



**NORTHWEST EMC EMISSIONS DATA SHEET** Rev BETA 01/30/01

EUT: WN-5MP01		Work Order: INMC0024	
Serial Number: 002-032		Date: 08/27/02	
Customer: Intermec Corporation		Temperature: 24 degrees C	
Attendees: None		Humidity: 40% RH	
Customer Ref. No.: N/A	Tested by: Greg Kiemel	Job Site: EV06	
Power: 120 V, 60 Hz			

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

**SAMPLE CALCULATIONS**

**COMMENTS**

Tested in WA21 Access Point  
**EUT OPERATING MODES**  
 Modulated with worst case data rate (lowest) at maximum output power.

**DEVIATIONS FROM TEST STANDARD**  
 None

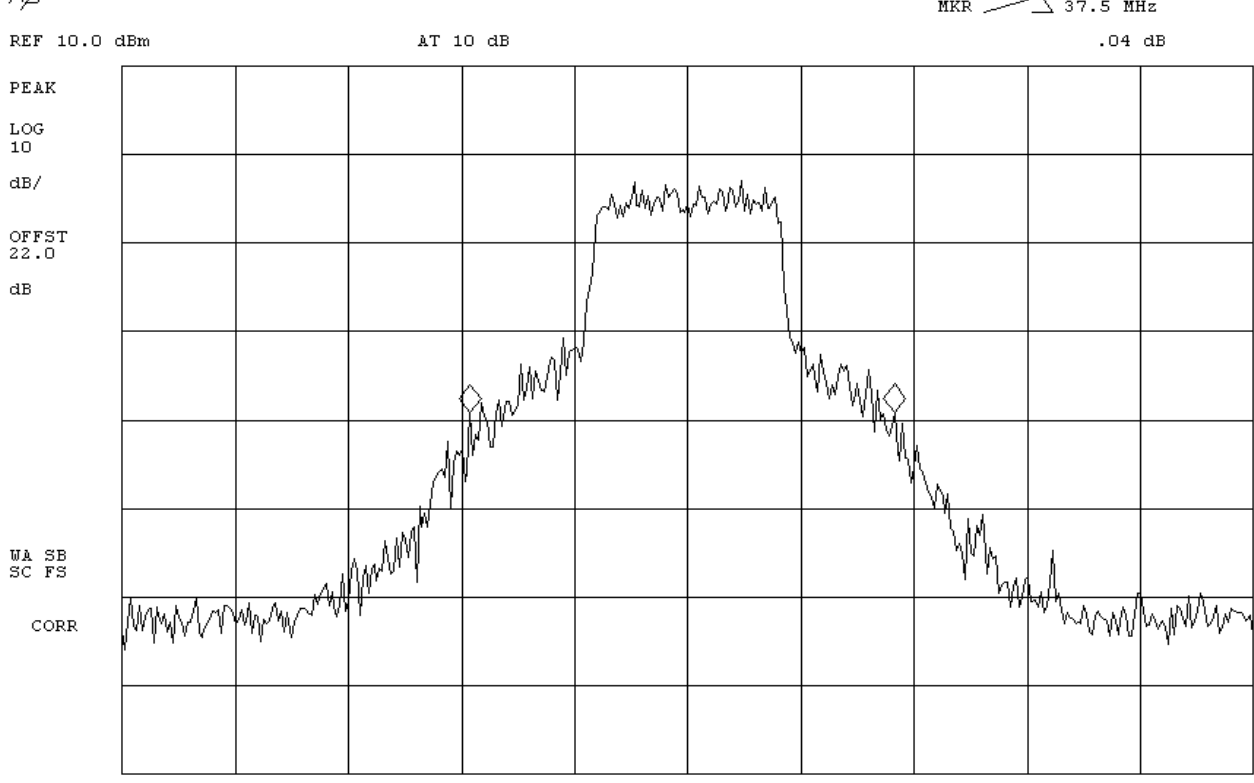
**REQUIREMENTS**  
 The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	37.5 MHz

**SIGNATURE**  
 Tested By: *Greg Kiemel*

**DESCRIPTION OF TEST**  
**Occupied Bandwidth - High Channel - 5.15 to 5.25 GHz Band**

11:21:46 AUG 27, 2002



No us  
Me:

# EMISSIONS DATA SHEET

EUT: WN-5MP01		Work Order: INMC0024	
Serial Number: 002-032		Date: 08/27/02	
Customer: Intermec Corporation		Temperature: 24 degrees C	
Attendees: None		Humidity: 40% RH	
Customer Ref. No.: N/A	Tested by: Greg Kiemel	Job Site: EV06	
Power: 120 V, 60 Hz			

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

SAMPLE CALCULATIONS

**COMMENTS**

Tested in WA21 Access Point

**EUT OPERATING MODES**

Modulated with worst case data rate (lowest) at maximum output power.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

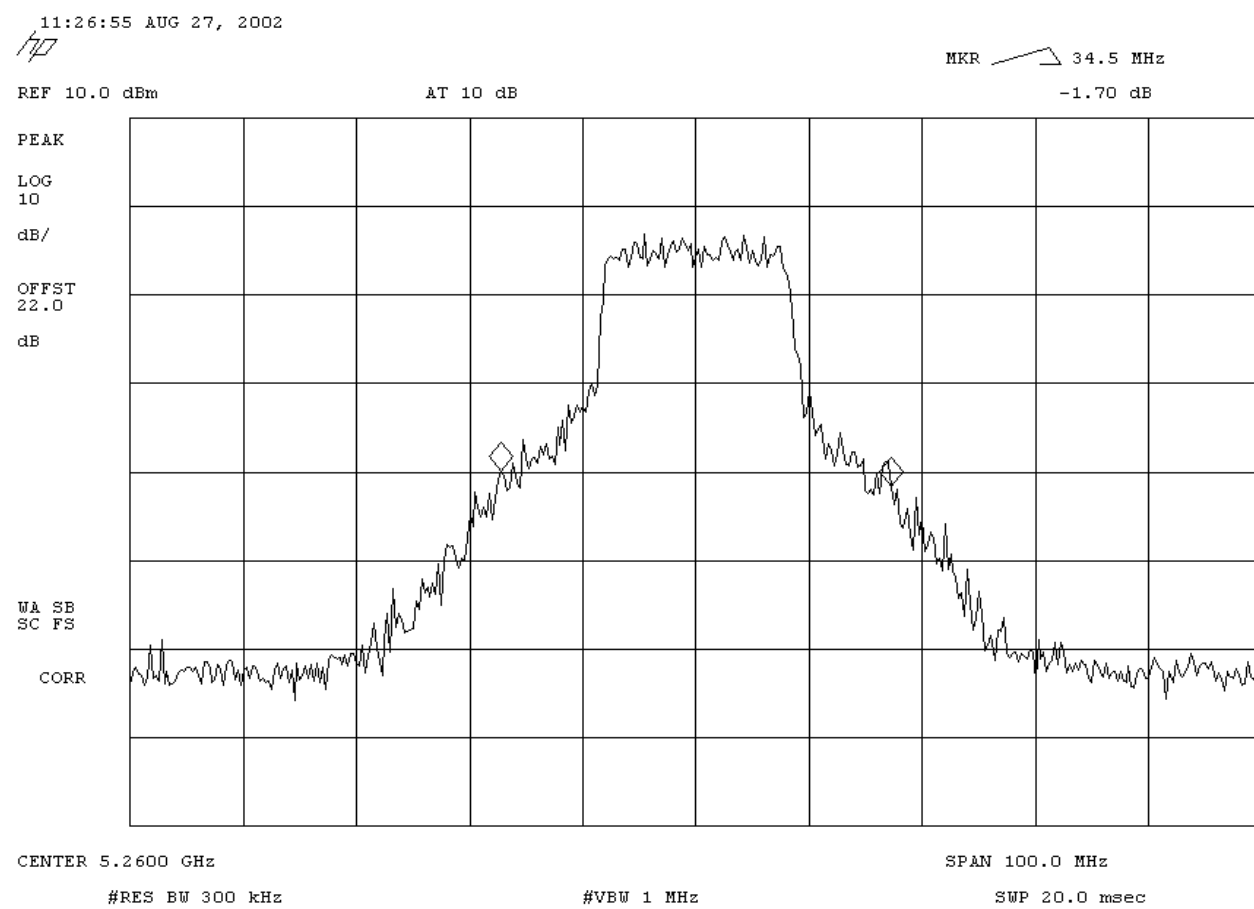
<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	34.5 MHz

SIGNATURE

Tested By: 

**DESCRIPTION OF TEST**

Occupied Bandwidth - Low Channel - 5.25 to 5.35 GHz Band



**NORTHWEST EMC EMISSIONS DATA SHEET** Rev BETA 01/30/01

EUT: WN-5MP01		Work Order: INMC0024	
Serial Number: 002-032		Date: 08/27/02	
Customer: Intermec Corporation		Temperature: 24 degrees C	
Attendees: None		Humidity: 40% RH	
Customer Ref. No.: N/A	Tested by: Greg Kiemel	Power: 120 V, 60 Hz	
		Job Site: EV06	

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

**SAMPLE CALCULATIONS**

**COMMENTS**

Tested in WA21 Access Point

**EUT OPERATING MODES**  
Modulated with worst case data rate (lowest) at maximum output power.

**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**  
The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	35.8 MHz

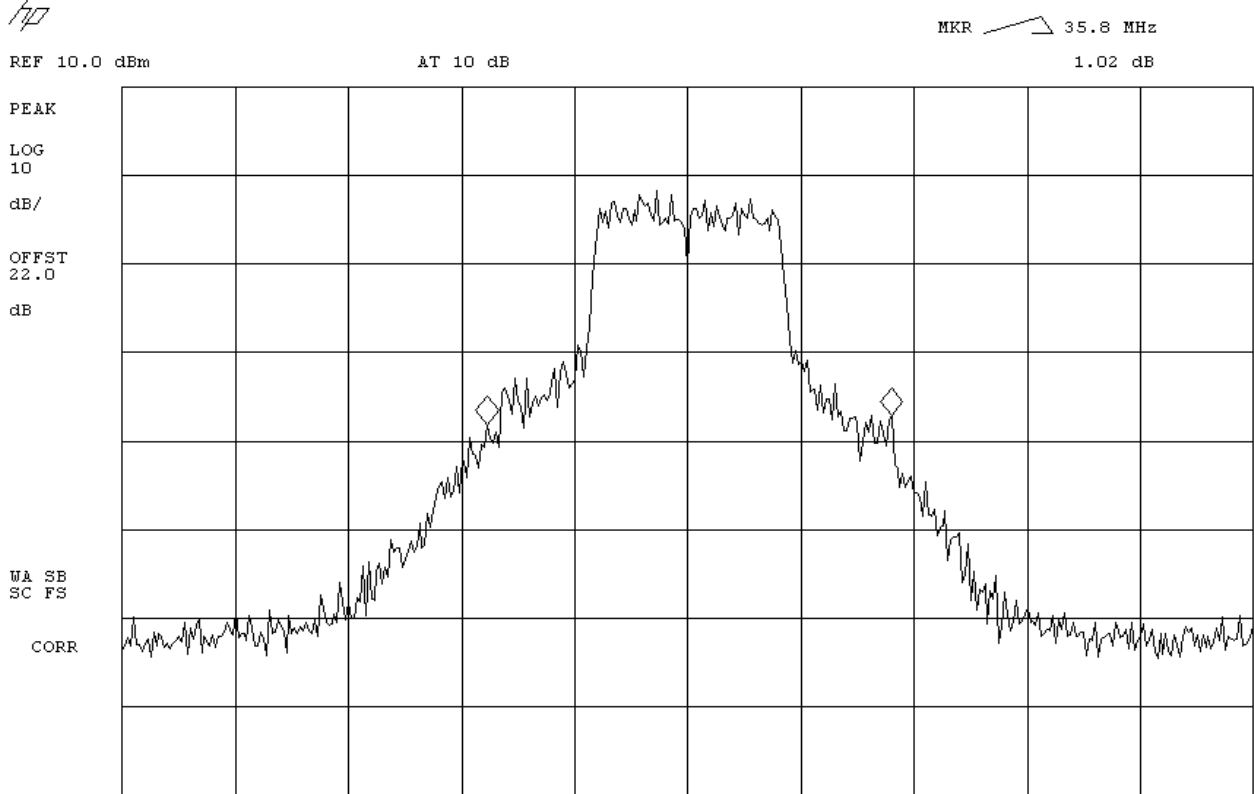
**SIGNATURE**

  
 Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**

**Occupied Bandwidth - Mid Channel - 5.25 to 5.35 GHz Band**

11:29:33 AUG 27, 2002



No us  
Me:

CENTER 5.3000 GHz      SPAN 100.0 MHz  
 #RES BW 300 kHz      #VBW 1 MHz      SWP 20.0 msec



# EMC EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: WN-5MP01		Work Order: INMC0024	
Serial Number: 002-032		Date: 08/27/02	
Customer: Intermec Corporation		Temperature: 24 degrees C	
Attendees: None		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

COMMENTS

Tested in WA21 Access Point

EUT OPERATING MODES  
Modulated with worst case data rate (lowest) at maximum output power.

DEVIATIONS FROM TEST STANDARD  
None

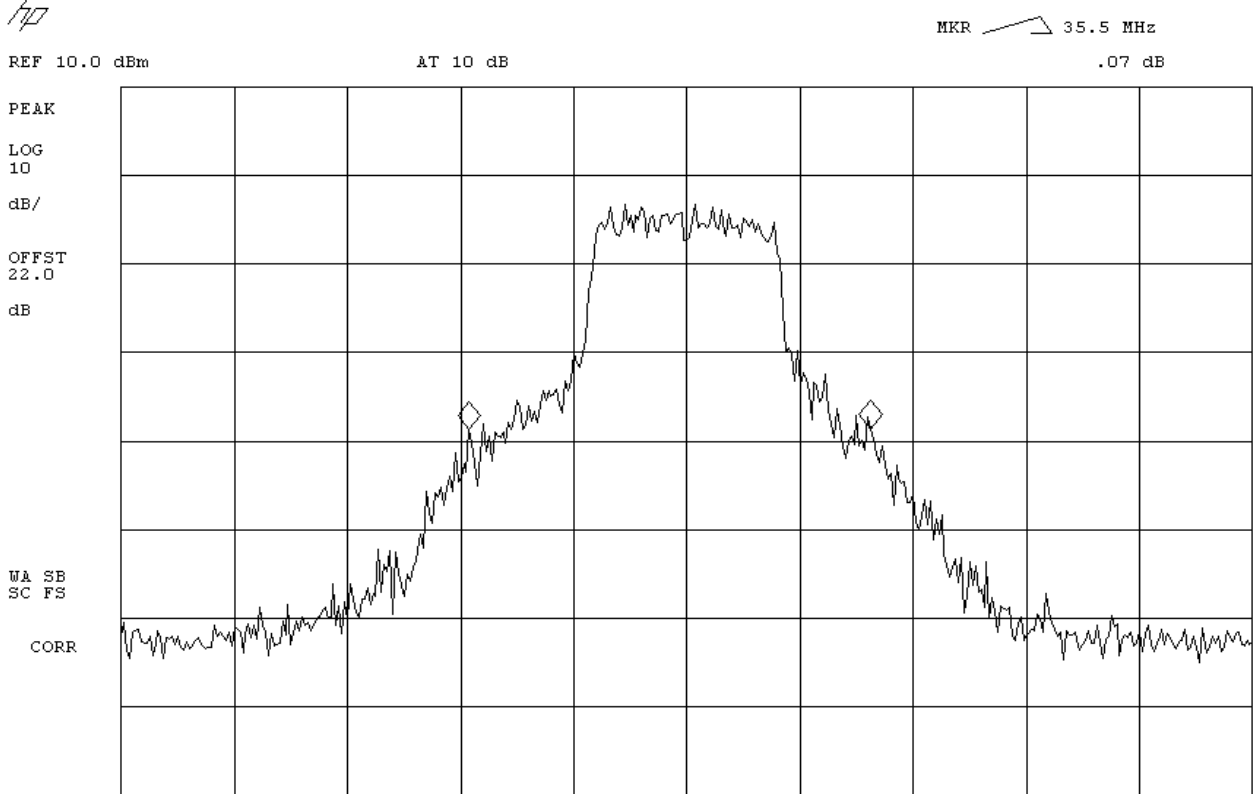
REQUIREMENTS  
The limit for peak transmit power may be dependent on the emission bandwidth "B". Measure the widest occupied BW that is 26 dB down from the peak of the emission

RESULTS	BANDWIDTH
Pass	35.5 MHz

SIGNATURE  
Tested By: *Greg Kiemel*

DESCRIPTION OF TEST  
**Occupied Bandwidth - High Channel - 5.25 to 5.35 GHz Band**

11:10:47 AUG 27, 2002



CENTER 5.3200 GHz

SPAN 100.0 MHz

#RES BW 300 kHz

#VBW 1 MHz

SWP 20.0 msec