

RETLIF TESTING LABORATORIES  
TEST REPORT R-4600N-1  
May 28, 2006

FCC COMPLIANCE TEST REPORT  
ON

MICROHEAT, INC.  
WINDSHIELD WASHER FLUID HEATER SYSTEM  
REMOTE CONTROL FOB  
FCC ID: T7SMHFOB72

<b>APPLICANT</b> Microheat, Inc. 27611 Halsted Road Farmington Hills, MI 48331	<b>MANUFACTURER</b>  Same
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TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.249

TEST PROCEDURE: ANSI C63.4:2003

**TEST SAMPLE DESCRIPTION:**

BRANDNAME: HOTSHOT

Part #: 01039-01

TYPE: Windshield Washer Fluid Heater Remote Control FOB

POWER REQUIREMENTS: 4.5VDC Internal Battery

FREQUENCY BAND OF OPERATION: 902 - 928MHz

MODULATION: FSK

APPLICATION: Wireless Control of the Hotshot Engine Compartment Washer Fluid Heating System

FCC ID: T7SMHFOB72

**TESTS PERFORMED:**

15.249 (a) Fundamental & Harmonic Emissions

15.249 (d) Out of Band/Band Edge Emissions (30MHz to 930MHz)

**TEST SAMPLE OPERATION:**

The Microheat Windshield Washer Fluid Heater System Remote Control FOB is used for Wireless Control of the Hotshot Engine Compartment Washer Fluid Heating System. It is manually activated by the user and will transmit a control signal to the Engine Compartment Control Unit and receive an acknowledgment signal back from the Engine Compartment Control Unit. The unit will transmit and receive in the 902MHz to 928MHz band. During testing the EUT was continuously transmitting with new batteries installed.

## TEST SAMPLE / TEST PROGRAM

- 15.203 Antenna Requirements - The device uses a permanently attached internal antenna. The antenna is totally enclosed inside the case.
- 15.205 Restricted Bands - No emissions were observed from the EUT in any restricted bands.
- 15.207 Conducted Emissions - Not applicable (battery operated device)
- Radiated Emissions from the EUT were measured in all three axis. The attached Radiated Emissions test data shows the maximized fundamental emission for the worst case orientation.
- The test sample can operate at multiple channels within the 902 to 928MHz band with the lowest available channel being 905.48MHz and the highest available channel being 925.05MHz. Testing was performed at three frequencies (low, mid and high).

## FIELD STRENGTH LIMITS

The 3 meter field strength limits shown below were as specified in Section 15.249 (a)

<b>Fundamental Frequency</b>	<b>Fundamental</b>	<b>Harmonics</b>
902 - 928MHz	50mV/M (94dBuV)	500uV/M (54dBuV)

The out of band emissions limits except for harmonics must be attenuated by at least 50dB below the level of the fundamental or to the general radiated emissions limits of 15.209 whichever is the lesser attenuation.

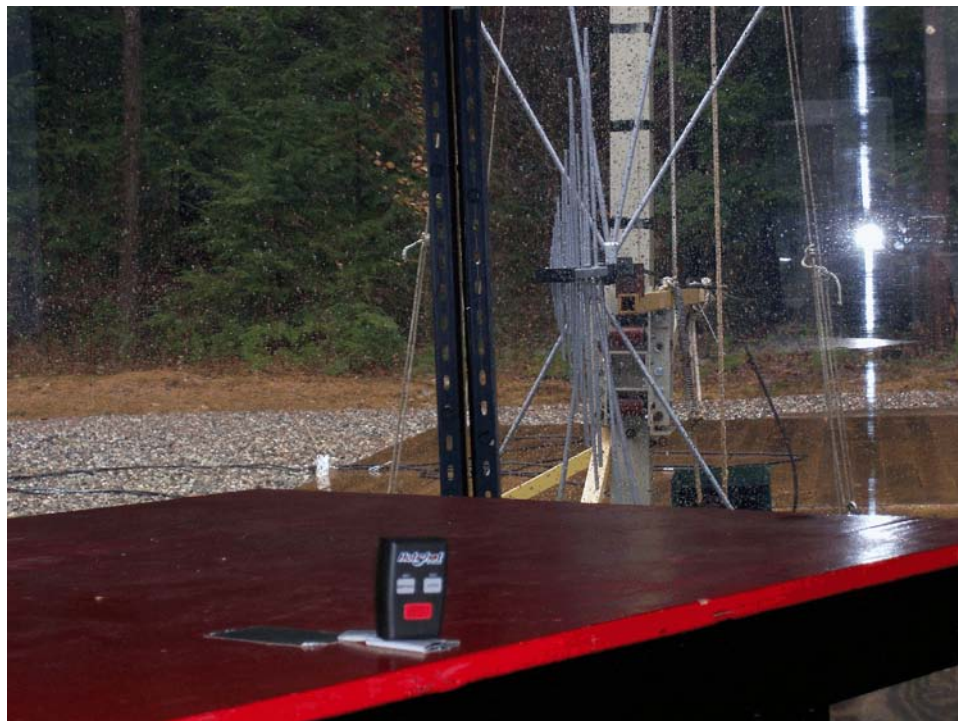
## **Test Method**

### 15.249/15.209 Fundamental, Harmonic & Out of Band/Band Edge Radiated Emissions

The test sample was placed on a 80cm high wooden test stand which was located 3 meters from the test antenna on an FCC listed open area test site. Emissions from the EUT were maximized by rotating the test sample and adjusting the test sample orientation and antenna polarization. The maximized peak field strength of each emission was measured and recorded and compared to the specified limits. Testing was performed at 3 frequencies (low mid and high within the operational band. Band Edge emissions were measured with the EUT transmitting at the lowest and highest channels within the band. When necessary the marker/delta method was used to verify compliance of band edge emissions.

**Test Results:** The maximized peak field strength at 905.66MHz was 82.42dBuV. The maximized peak field strength at 916.80MHz was 80.54dBuV. The maximized peak field strength at 924.41MHz was 78.9dBuV. No harmonic or out of band spurious emissions were observed at 1 or 3 meter test distances. Band edge emissions were more than 50dB below the level of the fundamental.

## RADIATED EMISSIONS SETUP PHOTOGRAPHS



# RETLIF TESTING LABORATORIES

# TABULAR DATA SHEET

Fundamental Field Strength

R-4600N-1

FOB Transceiver

	N/A
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Paragraph: n/a

### Continuously Transmitting

4/3/2006

### Notes:

[illegible]

## TABULAR DATA SHEET

# RETLIF TESTING LABORATORIES

# TABULAR DATA SHEET


Test Method:	Fundamental Field Strength		
Customer:	Microheat, Inc.	Job No:	R-4600N-1
Test Sample:	FOB Transceiver		
Part No.	01039-01	Serial No:	N/A
Test Specification:	FCC Part 15.249 Paragraph: n/a		
Operating Mode:	Continuously Transmitting		
Technician:	T. Hannemann	Date:	4/3/2006
Notes:			

[illegible]



# RETLIF TESTING LABORATORIES

## TABULAR DATA SHEET

<b>Test Method:</b>	Harmonic Emissions		
<b>Customer:</b>	Microheat, Inc.	<b>Job No:</b>	R-4600N-1
<b>Test Sample:</b>	FOB Transceiver		
<b>Part No.</b>	01039-01	<b>Serial No:</b>	N/A
<b>Test Specification:</b>	FCC Part 15.249 Paragraph: n/a		
<b>Operating Mode:</b>	Continuously Transmitting		
<b>Technician:</b>	T. Hannemann	 <b>Date:</b>	4/4/2006
<b>Notes:</b>			

[illegible]

# TABULAR DATA SHEET

## Harmonic Emissions

Microheat, Inc.

R-4600N-1

## FOB Transceiver

01039-01

	N/A
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FCC Part 15.249

Paragraph: n/a

Continuously Transmitting

T. Hannemann

Date:

4/4/2006

### Notes:

[illegible]



# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

**Test Method:**

## Out of Band Emissions 30MHz to 9.3GHz

## Customer

Microheat, Inc.

Job No.

R-4600N-1

## Test Sample

## FOB Transceiver

Part No.

01039-01

**Serial No.**

	N/A
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### Test Specification:

FCC Part 15.249

**Operating Mode:**

Continuously Transmitting

**Technician:**

T. Hannemann

W

Date:

April 4, 2006

**Notes:**

Test Distance: 3 Meters

Detector: Quasi-peak and Average

Testing was performed at transmit frequencies of 905.66MHz, 916.80MHz and 924.81MHz

[illegible]

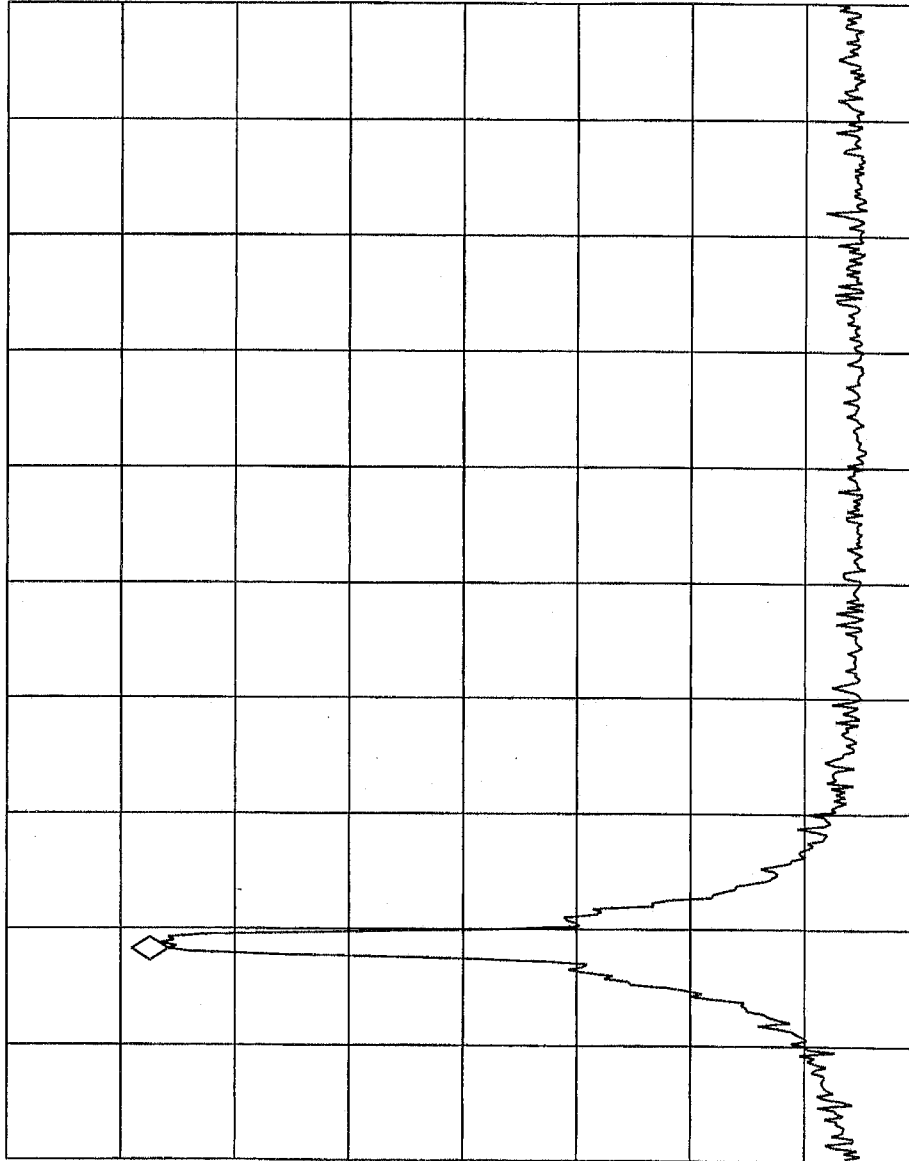
No out of band emissions were observed above the noise floor of the test equipment which was a minimum of 10dB below the specified limits.

13:52:50 APR 04, 2006

HP MKR 905.48 MHz  
82.86 dBμV

REF 97.0 dBμV #AT 0 dB

PEAK  
LOG  
10  
dB/



VA SB  
SC FC  
CORR

START 900.00 MHz STOP 930.00 MHz  
#RES BW 120 kHz VBW 300 kHz SWP 20.0 msec

Customer  
Test Sample  
Part No.  
Test Spec  
Notes:

Microheat, Inc.  
FOB Transceiver  
01039-01  
FCC Part 15.249  
Bandedge Data

Date: 4/4/2006

Tech: T. Hannemann

Sheet 1 of 4



Retlif Testing Laboratories

Report No. R-4600N-1

13: 53: 08 APR 04, 2006

MKR 902.03 MHz  
25.47 dBμV

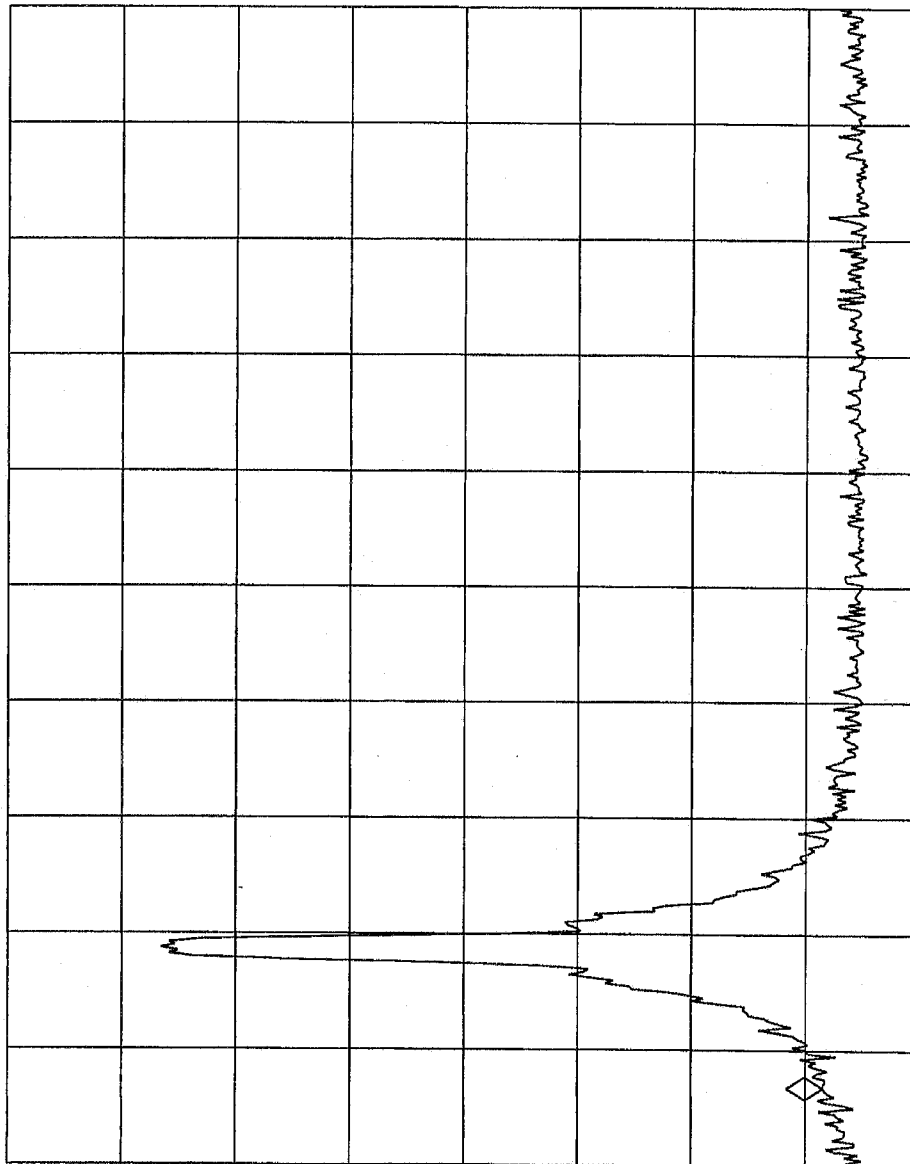
REF 97.0 dBμV #AT 0 dB

PEAK

LOG

10

dB/



VA SB  
SC FC  
CORR

START 900.00 MHz STOP 930.00 MHz  
#RES BW 120 KHZ VBW 300 KHZ SWP 20.0 msec

Customer:  
Test Sample  
Part No.  
Test Spec  
Notes:

Microheat, Inc.  
FOB Transceiver  
01039-01  
FCC Part 15.249  
Bandedge Data

Date: 4/4/2006

Tech: T. Hannemann

Sheet 2 of 4



Retlif Testing Laboratories

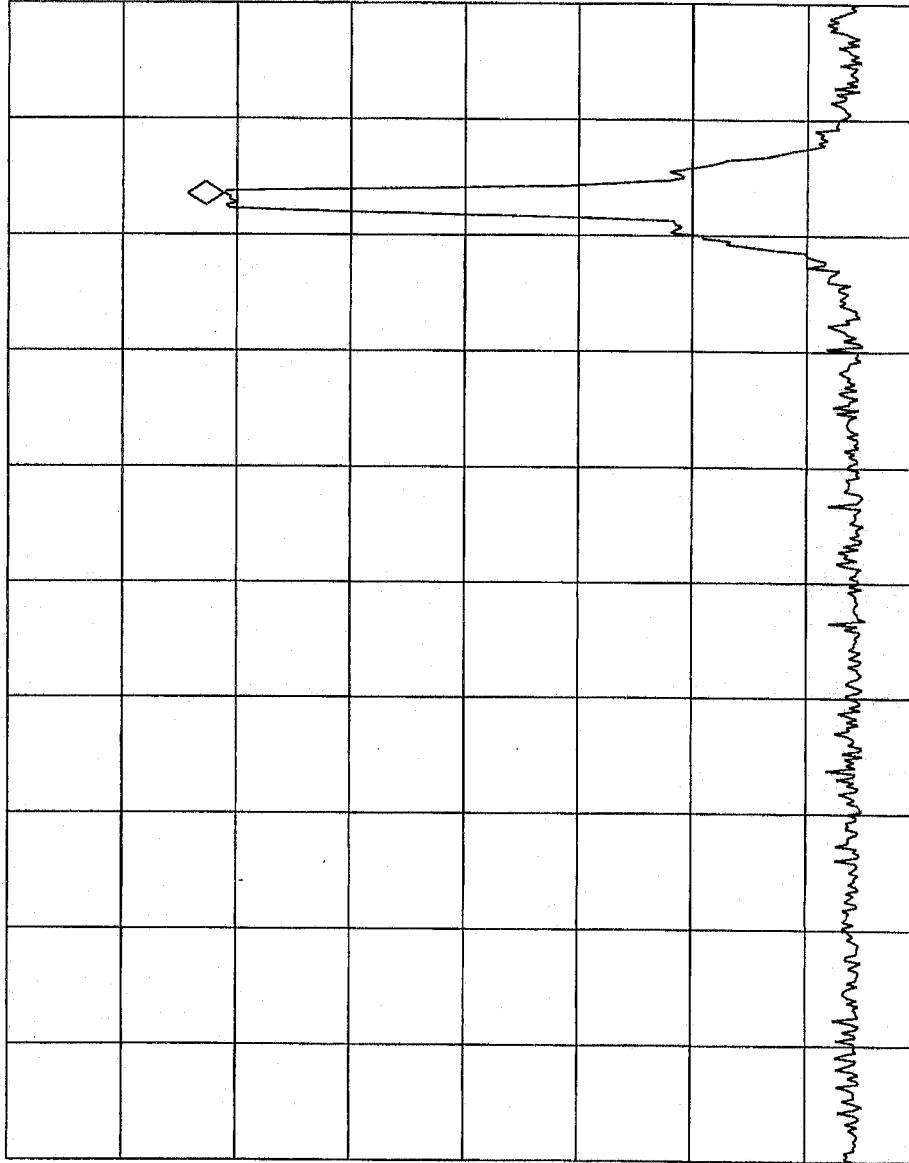
Report No. R-4600N-1

13: 55: 37 APR 04, 2006

MKR 925.05 MHz  
78.18 dB $\mu$ V

REF 97.0 dB $\mu$ V #AT 0 dB

PEAK  
LOG  
10  
dB/



VA SB  
SC FC  
CORR

START 900.00 MHz STOP 930.00 MHz  
#RES BW 120 KHZ VBW 300 KHZ SWP 20.0 msec

Customer  
Test Sample  
Part No.  
Test Spec  
Notes:

Microheat, Inc.  
FOB Transceiver  
01039-01  
FCC Part 15.249  
Bandedge Data

Date: 4/4/2006

Tech: T. Hannemann

Sheet 3 of 4



Retlif Testing Laboratories

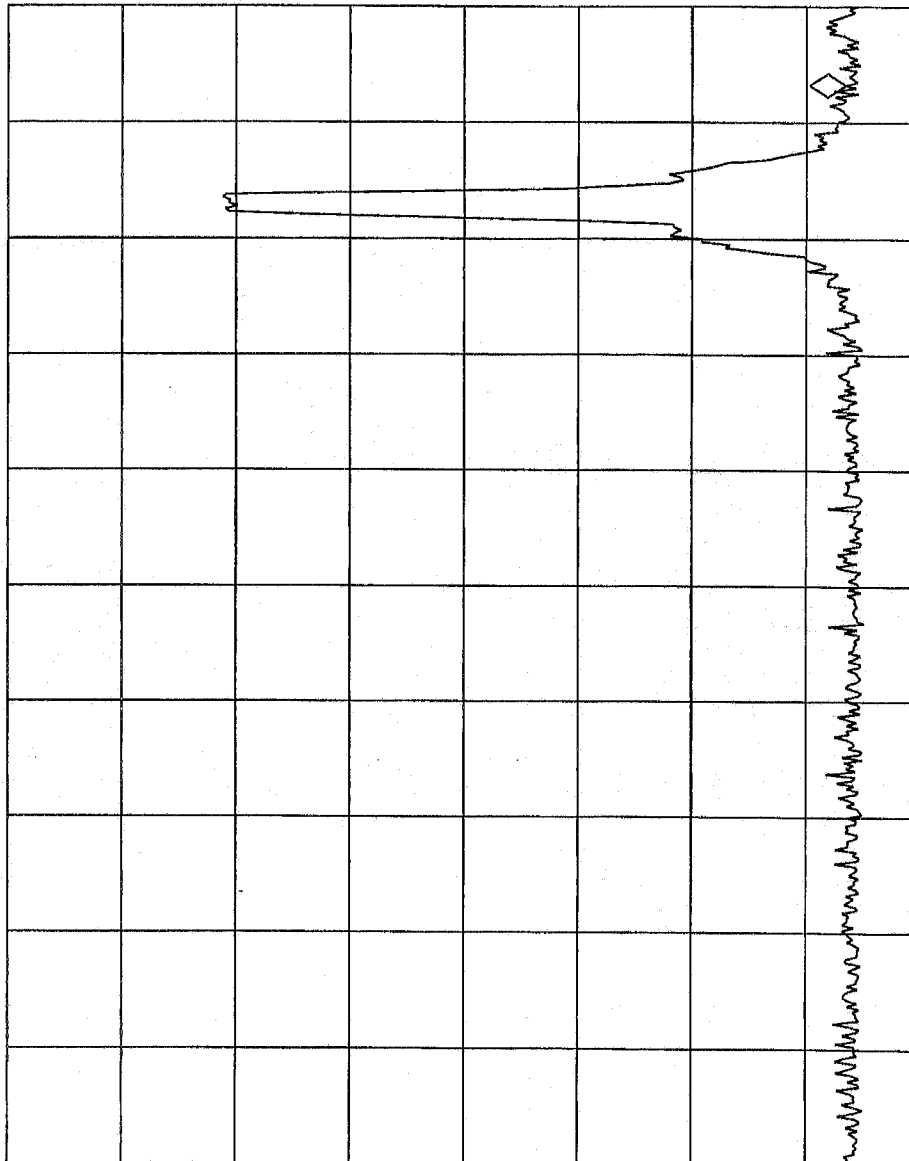
Report No. R-4600N-1

13: 55: 53 APR 04, 2006

MKR 927.98 MHz  
23.54 dB $\mu$ V

REF 97.0 dB $\mu$ V #AT 0 dB

PEAK  
LOG  
10  
dB/



VA SB  
SC FC  
CORR

START 900.00 MHz STOP 930.00 MHz  
#RES BW 120 kHz VBW 300 kHz SWP 20.0 msec

Customer:  
Test Sample:  
Part No.  
Test Spec  
Notes:

Microheat, Inc.  
FOB Transceiver  
01039-01  
FCC Part 15.249  
Bandedge Data

Date: 4/4/2006

Tech: T. Hannemann

Sheet 4 of 4



Retlif Testing Laboratories

Report No. R-4600N-1



# **RADIATED EMISSIONS EQUIPMENT LIST**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due</b>
3119A	Pre-Amplifier	Retlif	10 kHz - 1 GHz	RET-PA-SW	08/21/2005	08/21/2006
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	08/21/2005	08/21/2006
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	12/03/2004	05/03/2006
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	12/14/2005	12/14/2006
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	09/20/2005	09/20/2006

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