849 NW STATE ROAD 45
NEWBERRY, FL 32669 USA
PH: 888.472.2424 OR 352.472.5500
FAX: 352.472.2030
Email: tei@timcoengr.com
Email: info@timcoengr.com
HTTP://WWW.TIMCOENGR.COM

FCC PT 15.247 & PT 95H COMPOSITE DEVICE

MODULAR APPROVAL

Pt 95H WMTS TEST REPORT

APPLICANT	Cleveland Medical Devices, Inc.
ADDRESS	4415 Euclid Ave 4th Floor Cleveland Ohio 44103 USA
FCC ID	N9Y0086
MODEL NUMBER	WMTS Transceiver Board
PRODUCT DESCRIPTION	15.247 DSSS and Part 95 WMTS transceiver
DATE SAMPLE RECEIVED	September 20, 2006
DATE TESTED	September 20, 2006
TESTED BY	Mario de Aranzeta
APPROVED BY	Frank DeNuzzo
TIMCO REPORT NO.	2681BUT6TestReport_WMTS.PDF
TEST RESULTS	☒ PASS ☐ FAIL

ACCREDITED

Certificate # 0955-01

TABLE OF CONTENTS

LETTER OF EXPLANATION

10/05/2006

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046 USA

Subject: Cleveland Medical Devices, Inc

FCC ID: N9Y0086 / Descripton: 15.247 DSSS and 95H WMTS module

To Whom It May Concern:

The attached application is for both a 902-928 MHz DSSS operating under 15.247 and a WMTS device operating under Part 95H. The assembly consists of the module and antennas.

This system has only one type of antenna per service. The antenna is a vertical dipole type that has a gain of 2.14dBi. The radio may not operate both services at the same time.

Cleveland Medical Devices, Inc purchases standard antennas from the manufacturer. The N9Y0086 module uses a unique connector (Hirose U.FL).

Cleveland Medical Devices, Inc. currently proposes two products for the module one being a patient worn device with no interface to a CPU (USB) or powerline. The other has provisions for both. This device's radiated and conducted emissions were tested under the DoC procedure. The powerline conducted emissions are included in this report to show that the module complies with 15.207.

Should you have any questions or require any further information with regards to this, please feel free to contact me.

Sincerely,

Mario de Aranzeta C.E.T.

STATEMENT OF COMPLIANCE

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards.

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

ACCREDITED

Certificate #0955-01

Authorized by: Mario de Aranzeta

Signature: On file

Function: Engineer

Date: October 5, 2006

REPORT SUMMARY

Purpose of Test:	To demonstrate the DUT in compliance with FCC Pt 95H for wireless medical telemetry radio.
Disclaimer:	The test results relate only to the items tested.
Applicable Standards:	Pt 15.247, Pt 95.111, ANSI C63.4: 2003
Related Reports:	1) 2681BUT6TestReport_DSSS.pdf 2) 2681AUT6TestReport.pdf

TEST ENVIRONMENT AND TEST SETUP

Test Facilities:	All measurements were made at one or more of the test sites of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.
Laboratory Test Conditions:	Temperature: 26°C, Humidity: 55%
Test Exercise:	The DUT was set in continuous transmit mode of operation.
Deviation to the Standards:	There was no deviation from the standard.
Modification to the DUT:	No modification was made.
Supporting Accessories:	None

DUT DESCRIPTION

Manufacturer:	Cleveland Medical Devices, Inc.
Description of Certified System:	A hybrid medical monitoring system using DSSS and WMTS technologies.
Product Description:	WMTS and 15.247 module
FCC ID:	N9Y0086
Model Number:	100-0086
Brand Name:	N/A
Operating Frequency:	DSSS: 902 – 928 MHz; WMTS: 608 – 614 MHz
Power Output	98.9 dBuV/m
Emission Designator:	322K0F1D
EUT Power Source:	Primary Power – Any 3 V or greater source
	Secondary Power – N/A
Test Item:	Prototype
Type of Equipment	Mobile
Antennas	Vertical dipole type that has a gain of 2.14dBi
Antenna Connector	Hirose U.FL

EMC EQUIPMENT LIST

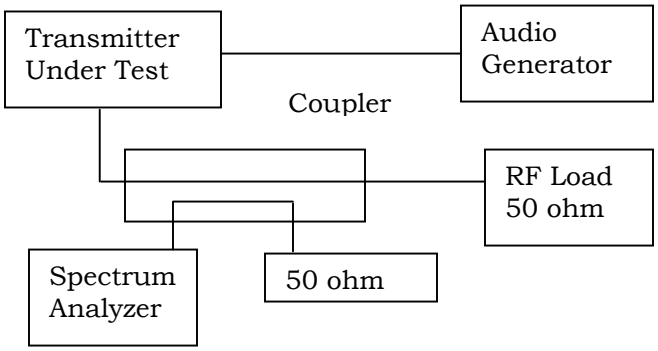
Device	Manufacturer	Model Number	Serial Number	Cal/Char Date	Due Date
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Antenna: Double-Ridged Horn	Electro-Metrics	RGA-180	2319	CAL 12/29/04	12/29/06
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/14/05	12/14/07

TEST PROCEDURES

Power Line Conducted Interference: The procedure used was ANSI Standard C63.4-2003. The measurement used a 50uH LISN. The spectrum was scanned from 0.15 to 30 MHz.

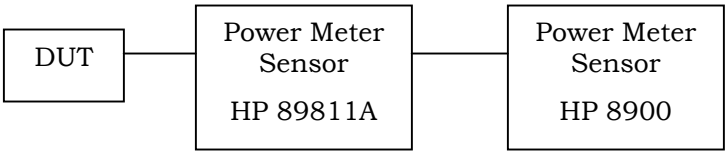
Bandwidth 6dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW)=1.0MHz and the video bandwidth (VBW) >=RBW and the span set as shown on plot.

Bandwidth Test Setup Diagram



RF Power Output: The RF power output was measured at the antenna feed point using a peak power meter.

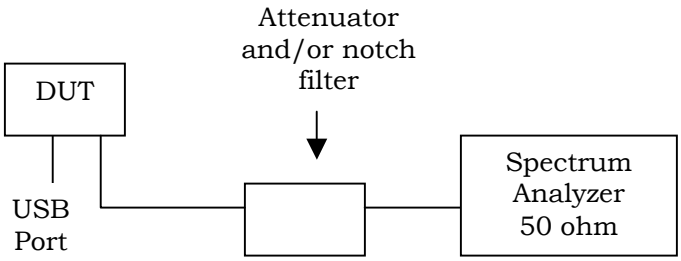
Output Power Test Setup Diagram



Radiation Interference: The test procedure used was ANSI standard C63.4-2003 using an Agilent spectrum analyzer with a preselector. The bandwidth (RBW) of the spectrum analyzer was 100 kHz up to 1GHz and 1.0MHz above 1GHz with an appropriate sweep speed. The VBW was always greater than or equal to the RBW unless notes. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

Antenna Conducted Spurious Emissions: The RBW=100 kHz, VBW>= RBW and the span set to 10.0MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = >RBW and the span to 50MHz.

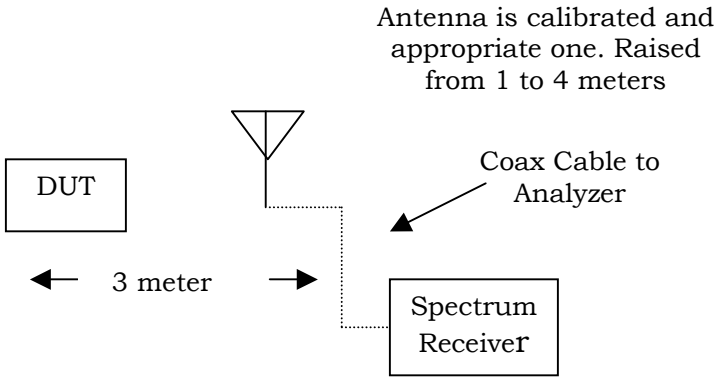
RF Conducted Spurious Emissions Test Setup Diagram



Radiated Spurious Emissions Into Adjacent Restricted Band: An inband plot of the fundamental emission at the lowest and highest frequencies was made using the RBW and detector function required by C63.4-2003 and FCC Rules.

Frequency Stability: The frequency stability was measured per TIA/EIA 603-C-2004.

Radiated Spurious Emissions: The procedure used was ANSI standard C63.4-2003 & the FCC/OET Guidance on Measurements for Direct Sequence Spread Spectrum Systems – Public Notice 54797 Dated July 12, 1995.



DUT is placed 80 cm above groundplane on a rotatable platform

RF POWER OUTPUT

Rule Part No.: Pt 95.639, Pt 95.649, 2.1033(c) (6), 2.1033(c) (7), Pt 2.1033 (c) (8), Pt 2.1046 (a)

Requirements: The maximum filed strength is 200 mV/m (106 dBuV/m) at 3 meters. The unit shall not incorporate provisions for increasing or varying its transmitter power to any level in excess of this limit.

The dc voltage applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range

Test Data: RF power is measured radiated as a field strength. With a nominal voltage of 3.0 V, and the transmitter properly adjusted the RF output measures:

Input Voltage 3V Input Current 0.15 A
Input Power: (3.0V)(0.15A) = 0.45 Watt

608.3 MHz 98.33 dBuV/m @ 3m
613.6 MHz 98.88 dBuV/m @ 3m

RF conducted Power

608.3 MHz 1 mWatt or 0 dBm
613.6 MHz 1 mWatt or 0 dBm

MODULATION CHARACTERISTICS

Rule Part No.: Pt 2.1047(a), (b)

Requirements: Video and audio not allowed in this service

Test Data: The module is a data radio with the following characteristics.

Type of Emission: gaussian filtered GFSK (F1D) 322K0F1D

Bn = 2M + 2DK
M = B/2 = 86000
D = 50000
K=1
Bn = 2(B/2)+2DK
Bn= 172000+(75000)
Bn=322000

6 dB BANDWIDTH

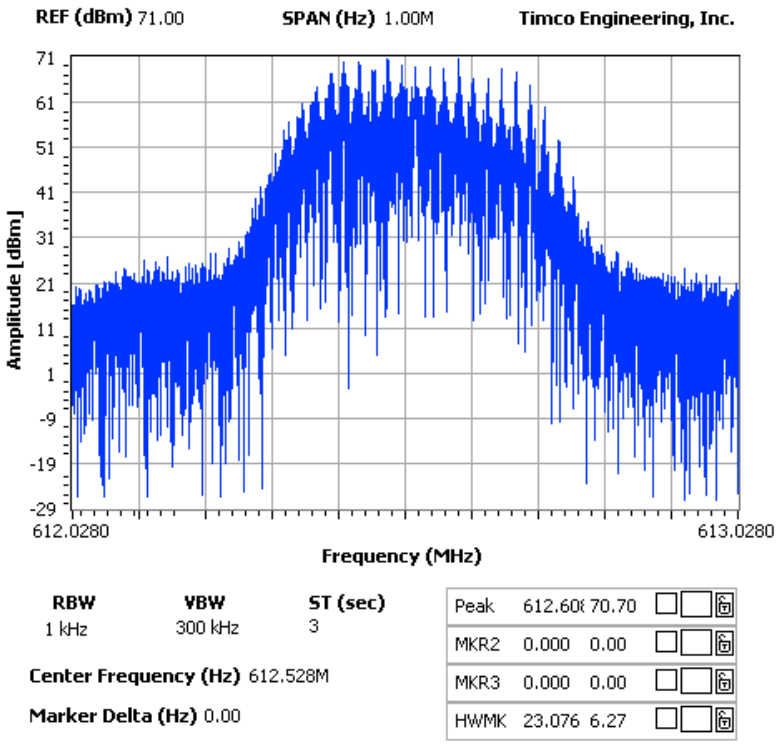
Rules Part No.: Pt 95.1115 (d) (2), Pt 95.633, Pt 2.1049

Requirements: WMTS utilizing broadband technologies such as spread spectrum shall be capable fo operating within one or more the following channels of 1.5 MHz each, up to maximum of 6 MHz, and shall operate on the minimum number of channels.

608.0 – 609.5 MHz
609.5 – 611.0 MHz
611.0 – 612.5 MHz
612.5 – 614.0 MHz

Test Data:

NOTES:
2853ut6 occupied bandwidth 600mhz



FIELD STRENGTH SPURIOUS EMISSIONS

Rules Part No.: Pt 95.1115(a), 95.635(b)(7), Pt 2.1053

Requirements: 500 uV/m @3m above 960 MHz (average)(1 MHz RBW)
200 uV/m @3m below 960 MHz (QP)

Test Data:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m
608.3	608.3	77.1	H	1.61	19.42	98.13
608.3	608.3	77.8	V	1.61	18.92	98.33
608.3	1216.6	25.6	H	2.27	27.69	55.56P
608.3	1216.6	17.8	H	2.27	27.69	47.76A
608.3	1216.6	28.9	V	2.27	27.69	58.86P
608.3	1216.6	21.8	V	2.27	27.69	51.76A
608.3	1824.9	28.5	V	2.76	30.14	61.40P
608.3	1824.9	21.0	V	2.76	30.14	53.90A
608.3	1824.9	27.8	H	2.76	30.14	60.70P
608.3	1824.9	19.9	H	2.76	30.14	52.80A
608.3	2433.2	14.5	H	3.20	32.41	50.11
608.3	2433.2	15.4	V	3.20	32.41	51.01
608.3	3041.5	18.2	H	3.64	33.21	55.05P
608.3	3041.5	11.0	H	3.64	33.21	47.85A
608.3	3041.5	20.8	V	3.64	33.21	57.65P
608.3	3041.5	13.5	V	3.64	33.21	50.35A
608.3	3649.8	21.5	V	4.18	33.42	59.10P
608.3	3649.8	13.6	V	4.18	33.42	51.20A
608.3	3649.8	22.8	H	4.18	33.42	60.40P
608.3	3649.8	14.9	H	4.18	33.42	52.50A
608.3	4258.1	11.1	V	4.63	33.90	49.63
608.3	4258.1	12.4	H	4.63	33.90	50.93
608.3	4866.4	6.5	V	4.93	34.39	45.82
608.3	4866.4	8.6	H	4.93	34.39	47.92
608.3	6083.0	7.3	H	5.32	35.76	48.38
608.3	6083.0	7.6	V	5.32	35.76	48.68

[Continued]

[Continued]

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m
613.6	613.60	77.4	H	1.61	19.54	98.55
613.6	613.60	78.2	V	1.61	19.07	98.88
613.6	1,227.30	23.0	H	2.28	27.71	52.99
613.6	1,227.30	28.9	V	2.28	27.71	58.89P
613.6	1227.30	21.0	V	2.28	27.71	50.99A
613.6	1,840.90	26.1	V	2.77	30.25	59.12P
613.6	1,840.90	18.5	V	2.77	30.25	51.52A
613.6	1,840.90	29.1	H	2.77	30.25	62.12P
613.6	1840.90	20.9	H	2.77	30.25	53.92A
613.6	2,454.60	13.5	H	3.22	32.47	49.19
613.6	2,454.60	13.6	V	3.22	32.47	49.29
613.6	3,068.20	19.2	H	3.66	33.21	56.07P
613.6	3,068.20	12.0	H	3.66	33.21	48.87A
613.6	3,068.20	21.4	V	3.66	33.21	58.27P
613.6	3,068.20	13.5	V	3.66	33.21	50.37A
613.6	3,681.80	21.2	V	4.21	33.45	58.86P
613.6	3,681.80	13.5	V	4.21	33.45	51.16A
613.6	3,681.80	24.2	H	4.21	33.45	61.86P
613.6	3,681.80	16.0	H	4.21	33.45	53.66A
613.6	4,295.40	8.7	H	4.65	33.94	47.29
613.6	4,295.40	11.4	V	4.65	33.94	49.99
613.6	4,909.10	6.4	V	4.95	34.43	45.78
613.6	4,909.10	7.9	H	4.95	34.43	47.28
613.6	6,136.40	7.0	V	5.34	35.81	48.15
613.6	6,136.40	8.7	H	5.34	35.81	49.85

All measurements are peak unless indicated as average by an 'A'.

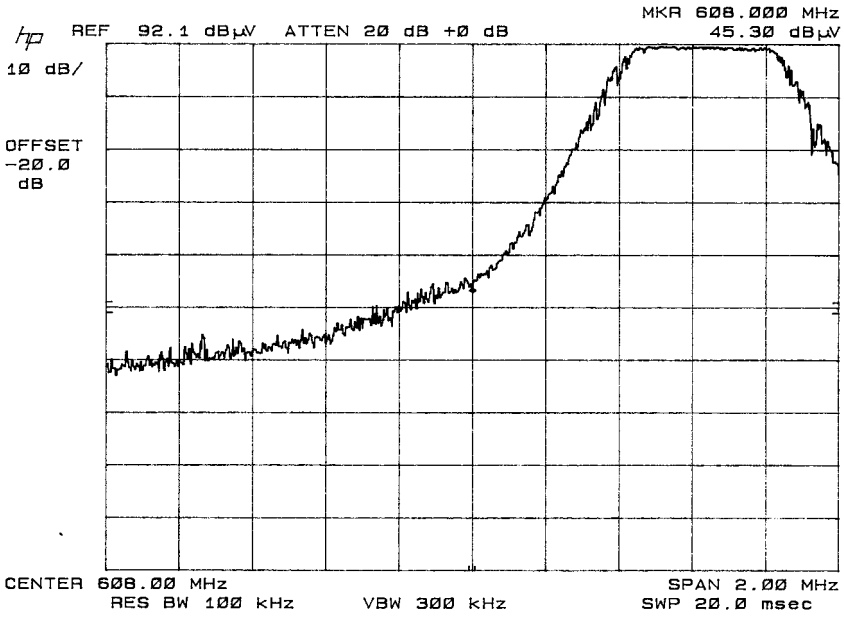
FREQUENCY STABILITY

Rule Parts. No.: Pt 95.1115 (e), Pt 2.1055

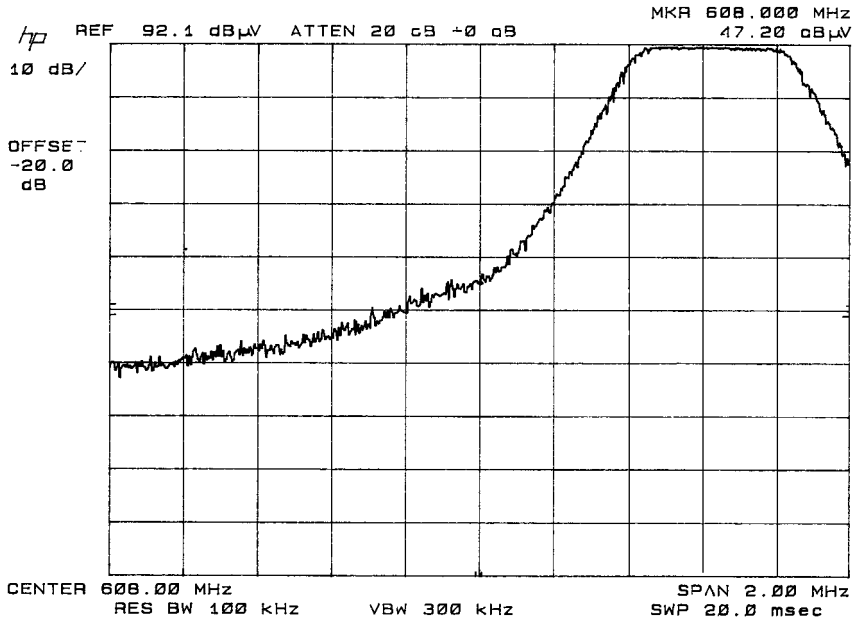
Requirements: Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.

The manufacturer specifies a temperature range of 66 to 86 °F.

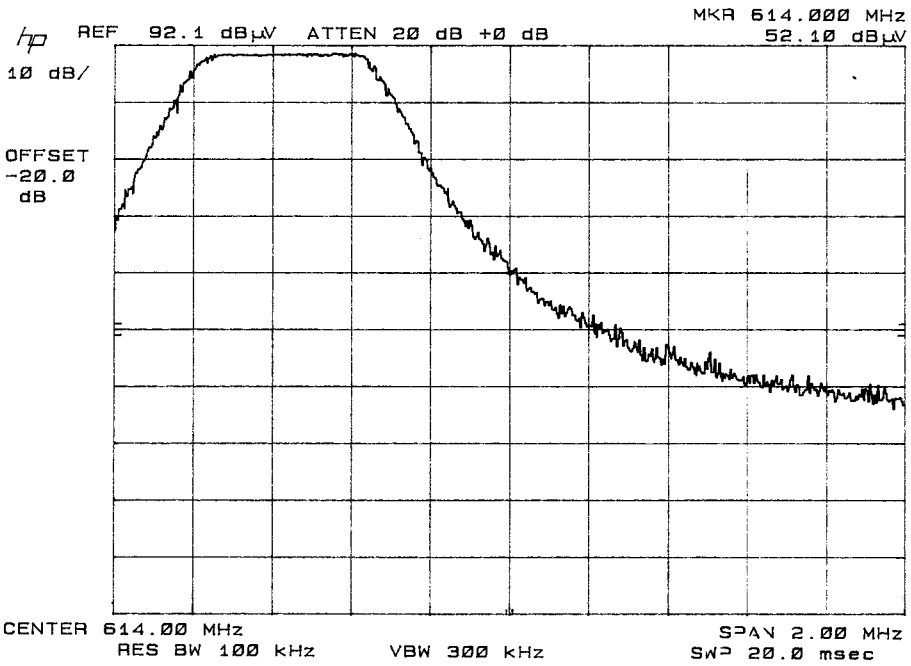
Test Data: Over the temperature range of 66 to 86 °F, the emissions did not exceed the band of 608 to 614 MHz.



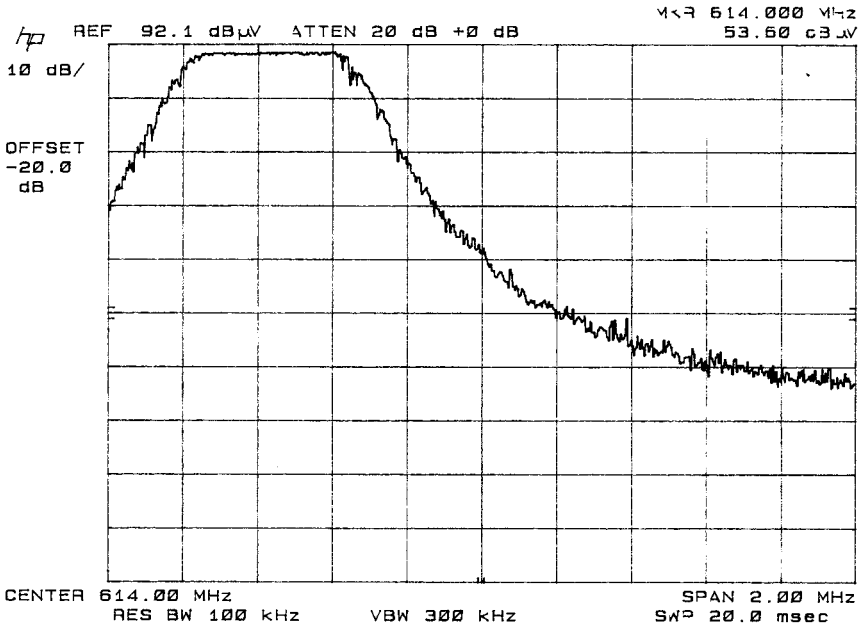
OBW at 68 °F



OBW at 88 °F



OBW at 68 °F


MKR 614.000 MHz
REF 92.1 dBµV ATTEN 20 dB +0 dB
53.60 dBµV
10 dB/
OFFSET
-20.0
dB
CENTER 614.00 MHz
SPAN 2.00 MHz
RES BW 100 kHz
VBW 300 kHz
SWP 20.0 msec

OBW at 88 °F