Compliance Worldwide

ACCREDITED
CERTIFICATE NUMBER: 1073.01

TEST NUMBER - 424-04

TEST REPORT TO

FEDERAL COMMUNICATIONS COMMISSION CFR47 PART95

Low Power Licensed Radio communication Devices
Medical Telemetry Service Transceiver
In the bands 1395-1400 and 1427-1432 MHz

for

Philips Medical Systems
Cardiac and Monitoring Systems
3000 Minuteman Drive
Andover, MA 01810
978-659-2800

of

Instrument Telemetry Service Module-ITS

Model M4840-65708

on

1/5/2005

Tested by

Andrew Mertinooke

Reviewed by

Clifton P. Brick

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TEST DESCRIPTION

1. TEST OBJECTIVE

To test the Instrument Telemetry Service Module, Model M4840-65708 to FCC Part 95 Rules and write a report.

2. E.U.T. DESCRIPTION

GENERAL

The Instrument Telemetry Service Module, Model M4840-65708 is RF module that provides an RF link to a monitoring station via Philips telemetry infrastructure including the Access Point transceiver.

FREQUENCIES USED: 1395.9, 1397.5, 1399.1, 1427.9, 1429.5, 1431.1 MHz

MODULATION SCHEME: FSK with Root Raised Cosine Filtering

SERIAL NUMBERS: A00010

TEST RESULTS AND CONCLUSIONS

Rule Section	Requirement	Notes	Pass	Fail
95.1109(b)	Labeling	See Exhibits FCC Label Sample and Label Location.	1	
95.115(a)(2)	Field Strength Limits		X	
95.115(b)	Undesired Emissions Limits		X	
95.115(c)	Emission Type	Transmits Data and ECG Waveform	X	
95.115(e)	Frequency Stability	Data Provided By Philips Medical	1	
95.1125	RF Safety	Statement and Technical Basis	1	

Note 1.) Exhibits provided by Philips for approval submission.

TEST RESULTS AND CONCLUSIONS

PRODUCT TESTED - Instrument Telemetry Service Module-ITS

MODEL NUMBER - M4840-65708

RADIATED TEST RESULTS

The test results show that the emissions radiated from this equipment are in compliance with FCC Rules Part 95.

OCCUPIED BANDWIDTH & OUTPUT POWER

The test results show that the occupied bandwidth and output power of this equipment are in compliance with FCC Rules Part 95 .

CONDUCTED TEST RESULTS

N/A see part 15 report

ANALYSIS AND CONCLUSIONS

Based upon the radiated and conducted measurements we find that this equipment is within the limits of the FCC Rules Part 95. All results are based on a test of one sample, and represent other production units, only in as much as a sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

NOTES (Special conditions unique to this test)

None.

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TEST PROCEDURES

1. TEST EQUIPMENT

   A. HP 8546A (9 kHz - 6.5 GHz) EMI Receiver w/ RF Filter Section, S/N 3704A00323 / 3650A00360. Calibration Date 1-16-2004, calibrated annually.

   B. HP 8593E (9 kHz - 26.5 GHz) Spectrum Analyzer, S/N 3829A03887. Calibration Date 1-17-2005, rec'd and ret'd in tolerance, calibrated annually.

   B. Com-Power Biconilog Antenna, Model AC220, S/N 25509. Calibration Date 7-16-2004, calibrated annually.

   C. Electro-Metrics Double Ridged Guide Antenna, Model EM-6961, S/N 6337. Calibration Date: 7-30-2004, calibrated annually.

   D. HP 1 - 26.5 GHz Preamplifier, Model 08449B, S/N 3008A01323. Calibration Date: 8-3-2004, calibrated annually.

2. FREQUENCY RANGE TO BE SCANNED.

   A. Radiated Test from 30 MHz to 40 GHz (or the 10^{th} harmonic of the highest frequency whichever is lower).

   B. Conducted Test from 150 kHz to 30 MHz.

3. TEST PROCEDURES.

Radiated test procedure:

The EUT, associated cables and peripheral devices are placed on the supporting table and any support equipment is placed off the site. The EUT is turned on and any necessary operating or test software installed and allowed to warm up. The EUT is pre-scanned in our ferrite tile lined chamber where it is rotated 360 degrees and examined in both horizontal and vertical polarization, all emission frequencies are identified and recorded. The EUT is then moved to the OATS and the frequency band from 30 MHz to 40 GHz is scanned, all frequencies identified in the chamber are investigated, as well as harmonic frequencies of the EUT. When an emission is found the emission is maximized by varying the bundle position of the connecting cables, the antenna height, the antenna polarization (vertical and horizontal) and the table orientation (360 degrees). The maximum reading is recorded and the next signal is searched for.

Conducted test procedure:

The power line of the EUT is connected to the LISN (Line Impedance Stabilization Network). A measurement of the emissions are made from the power line for both phase and neutral on the analyzer in the frequency range from 450 kHz to 30 MHz. The maximum readings are recorded for each phase.

All measurements are made according to the procedures defined in: "ANSI C63.4-1992 Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz, American National Standard for (ISBN 1-55937-215-5).

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FCC Part 95.1115 Test Limits

1. Part 95.1115(a)(2) Field Strength Radiation Limits (Quasi-Peak):

Frequency MHz	Distance meters	Limit dBµV/m	Limit µV/m
1395-1400	3	117.4*	740000*
1427-1429.5	3	117.4*	740000*

*NOTE: Average Limits

2. FCC Part 95.1115(b) Out-of-band emissions Limits (Quasi-Peak):

Frequency MHz	Distance meters	Limit dBµV/m	Limit µV/m
Below 960	3	46	200
Above 960	3	54*	500*

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TEST FACILITY DESCRIPTION

Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information is also on file with Industry Canada, anyone wishing to review this Test Facility Description is referred to file number **IC 3023**. This is currently on file at Industry Canada, 1241 Clyde Avenue, Ottawa, ON K2C 1Y3.

The radiated site is a 3/10 meter indoor site with an enclosure for the product and a basement for the personnel, support equipment and test equipment.

The conducted site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical metal wall required by EN 55022.

Both sites are designed to test products or systems 1.5 meter x 1.0 meter, floor standing or table top.

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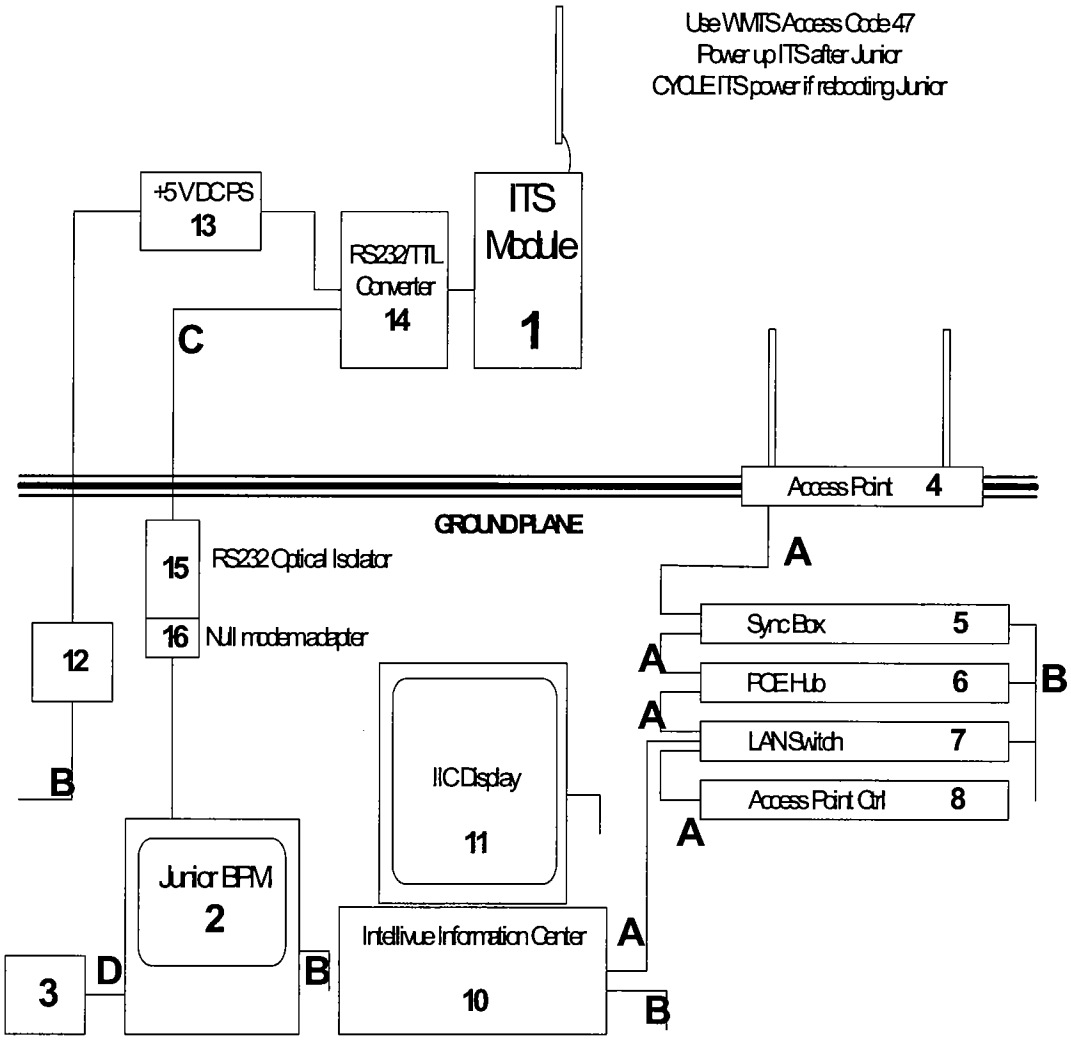
TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION



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TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION CONTINUED

EUT

Block #	Mfr.	Model / Part #	Opt.(s)	HW Rev.	FW Rev.	SW Rev.	Serial # (if available)	Description
1	Philips Medical	M4840-65708	N/A	0001	5.1	N/A	A00010	Instrument Telemetry Service Module- ITS

Support Equipment

Block #	Mfgr	Model / Part #	Opt.(s)	SW Rev.	Serial # (if available)	Description
2	Philips	M4605A	M3001A-C18, S/N DE22753085	B.11.04	DE44010453	Patient Bedside Monitor MP50 / Junior
3	Bio-Tek	Lionheart2	NA	NA	TBD	Multi-parameter patient simulator
4	Philips	M4842A/ 453563495091	ABA	NA	US34300060	WMTS Access Point
5	Philips	M4844A/ 453563495101	NA	NA	US42200058	Sync Unit
6	Power DSine	PD6006/AC	NA	NA	M03056809512000	Power-over-Ethernet Hub
7	HP	2950 Catalyst	NA	NA	F0C07321WX	Ethernet Switch
8	Proxim	7560-05AG	NA	NA	24600009	WMTS Access Point Controller
10	Philips	M3167-60003	NA	NA	USU32301H2	IntelliVue Information Center (HP PC)
11	HP	D2835/ D2835-60501	NA	NA	KR72032442	Display for IIC

Cables

Block Item Letter	Shield Y or N	Length	No. of Conductors (if avail.)	Termination	Function / Description
A	N	2 m	8	Various devices	Category 5 UTP LAN cable
B	N	2 m	3	Various devices	AC power cord
C	Y	10 m	5	RS232/TTL converter	Serial cable
D	N	3 m	10	M4605A	ECG cable

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DETERMINATION OF AVERAGE FACTOR

Total Duration of 1 cycle:	100ms
Total On-Time in 1 cycle:	4*<425uS=1.7mS
On-Time divided by cycle:	1.7ms/100ms = 0.017
Average Factor:	20*log(0.017) = -35.4dB

FCC maximum allowed average factor is -20dB.

See the next pages for supporting data.

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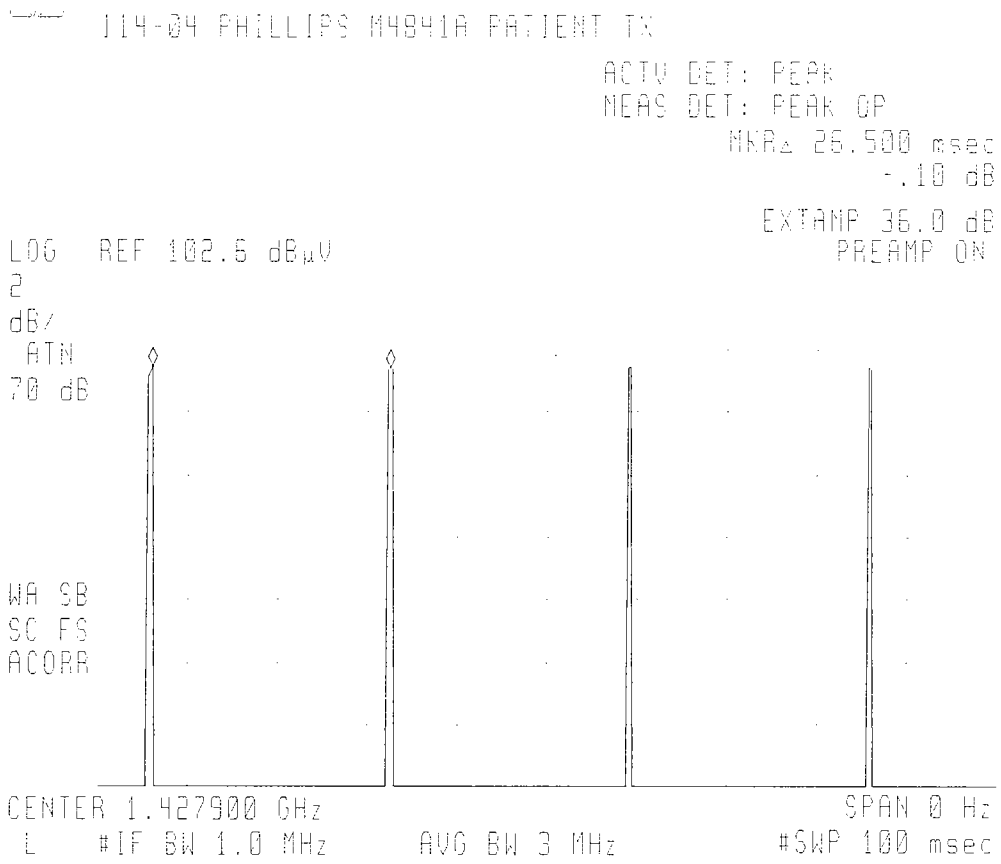
DETERMINATION OF AVERAGE FACTOR

Plot showing 4 transmissions in 100 ms window.



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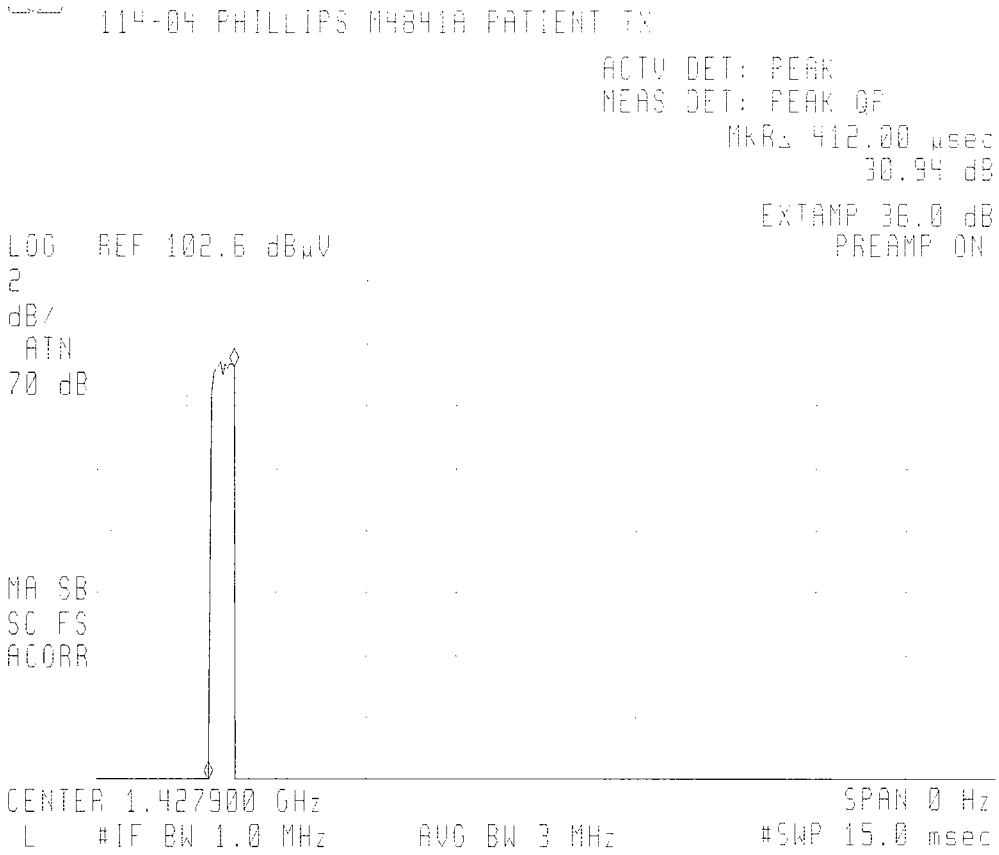
DETERMINATION OF AVERAGE FACTOR

Plot showing the length of individual transmission at 412uS.



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RADIATED TEST RESULTS

Frequency Range:	30 MHz - 14.5 GHz.
Measurement Distance:	3.0 Meters.
Bandwidth:	120 kHz, Per ANSI C63.4-1992.*
Detector Functions:	Peak, Quasi Peak
Table Height:	0.8 meters
Antenna Height Variation:	1 - 4 Meters.

Horizontal and Vertical Polarization Measurements Taken.

*Measurement Bandwidth is 1 MHz above 960 MHz.

PLEASE SEE NEXT PAGE FOR RADIATED TEST DATA

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Radiated Worst Case Tabular Data

Data taken at 1 meter

Channel frequency 1395.9 MHz

Frequency (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	QP Margin (dB)
2791.18	V	66.0	46.0	64.0	-18.0
4188.40	V	68.6	48.6	64.0	-15.4
5584.54	V	48.8	28.8	64.0	-35.2
6979.50	V	47.7	27.7	64.0	-36.3
8373.61	V	57.3	37.3	64.0	-26.7
9769.51	V	52.4	32.4	64.0	-31.6
11167.20	V	43.7	23.7	64.0	-40.3

Channel Frequency 1399.1

Frequency (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Limit (dBuV/m)	QP Margin (dB)
2798.69	V	66.0	46.0	64.0	-18.0
4198.09	V	68.6	48.6	64.0	-15.4
5595.19	V	48.7	28.7	64.0	-35.3
6994.24	V	48.9	28.9	64.0	-35.1
8396.53	V	56.7	36.7	64.0	-27.3
9793.45	V	53.2	33.2	64.0	-30.8
11195.11	V	55.5	35.5	64.0	-28.5

Channel Frequency 1427.9 MHz

Frequency (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Limit (dBuV/m)	QP Margin (dB)
2855.84	V	58.8	38.8	64.0	-25.2
4282.77	V	60.8	40.8	64.0	-23.2
5712.64	V	50.4	30.4	64.0	-33.6
7140.53	V	50.1	50.1	64.0	-13.9
8567.33	V	50.0	40.0	64.0	-24.0
9995.21	V	52.9	32.9	64.0	-31.1
11423.10	V	54.8	34.8	64.0	-29.2

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Radiated Worst Case Tabular Data Continued

Channel Frequency 1431.1 MHz

Frequency (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Limit (dBuV/m)	QP Margin (dB)
2862.20	V	58.4	38.4	64.0	-25.6
4294.04	V	58.3	38.3	64.0	-25.7
5725.51	V	50.8	50.8	64.0	-13.2
7155.50	V	50.1	30.1	64.0	-33.9
8587.34	V	49.7	39.7	64.0	-24.3
10018.44	V	52.5	32.5	64.0	-31.5
11449.54	V	53.4	33.4	64.0	-30.6

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RADIATED OUTPUT POWER & OCCUPIED BANDWIDTH TEST RESULTS

Frequency Range:	1395-1400 and 1427-1429.5 MHz.
Measurement Distance:	3.0 Meters.
Bandwidth:	As Noted, Per ANSI C63.4-1992.
Detector Functions:	Peak
Table Height:	0.8 meters
Antenna Height Variation:	1 - 4 Meters.

Horizontal and Vertical Polarization Measurements Taken, Worst Case Reported.

PLEASE SEE NEXT PAGE(S) FOR OCCUPIED BANDWIDTH RADIATED TEST DATA

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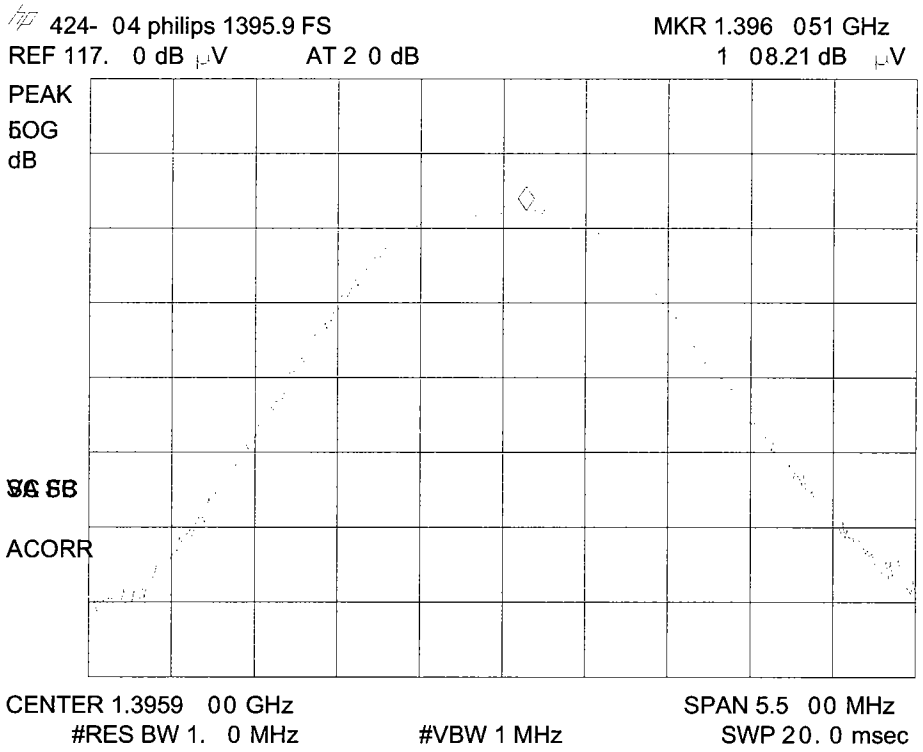
Channel 0 Output Power Plot



Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
1395.9	H	108.2	88.2	117.4	-29.2

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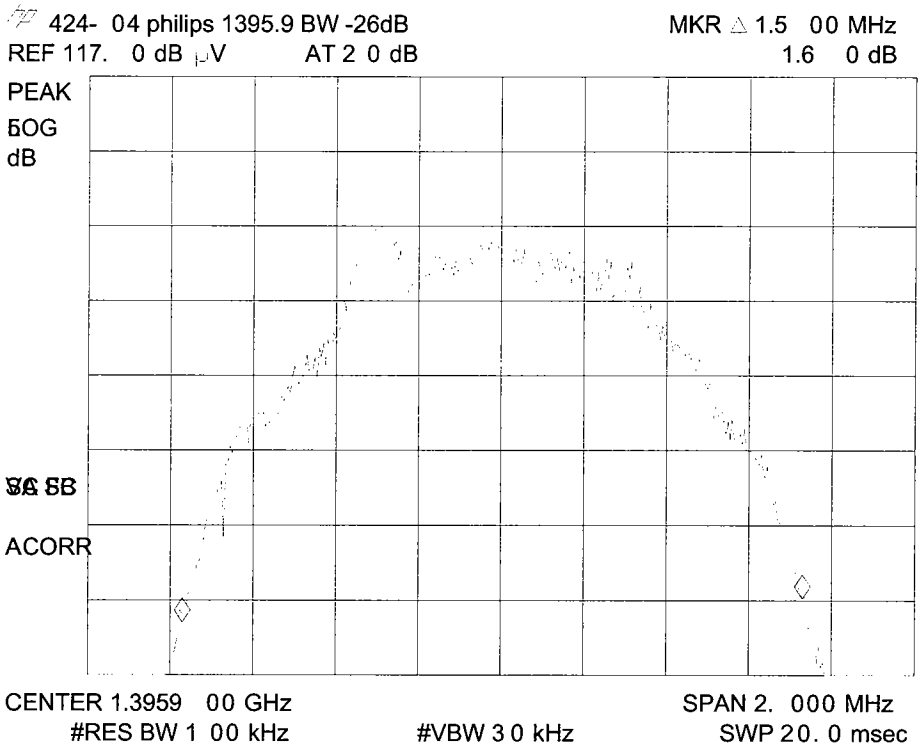
Channel 0 Occupied Bandwidth Plot



Freq (MHz)	26dB Bandwidth (MHz)
1395.9	1.500

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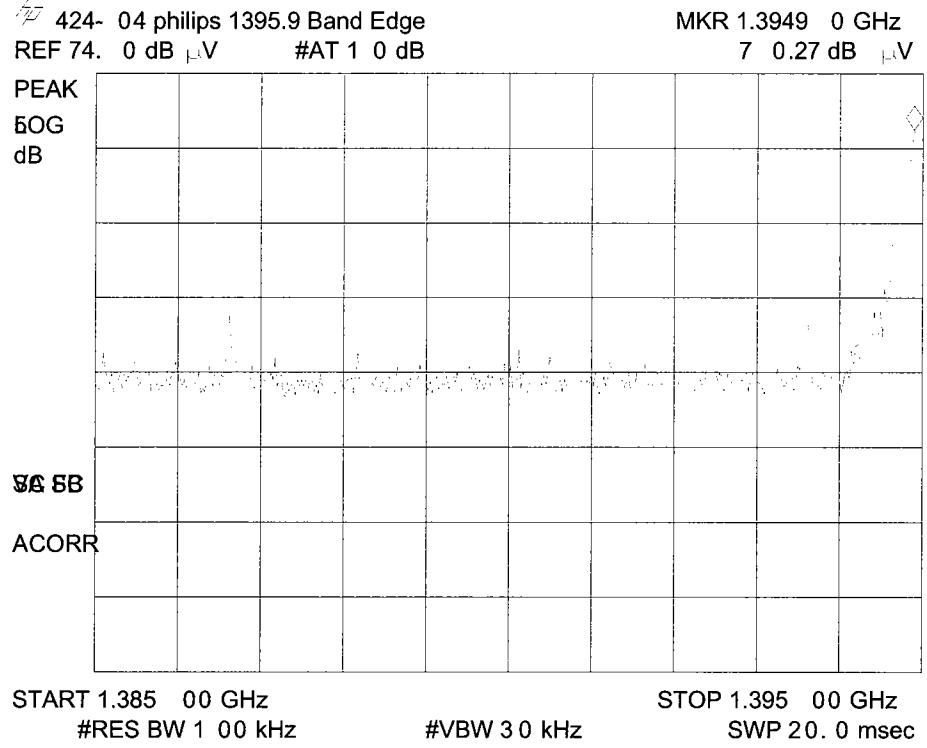
Channel 0 Occupied Bandwidth Lower Band Edge



Plot shows lower band edge on right and 10 MHz window. A peak measurement of 70.27 dBuV/m peak /50.27 dBuV/m avg with a limit of 74 dBuV/m peak and 54 dBuV/m avg, data shows a margin of -3.73 dB.

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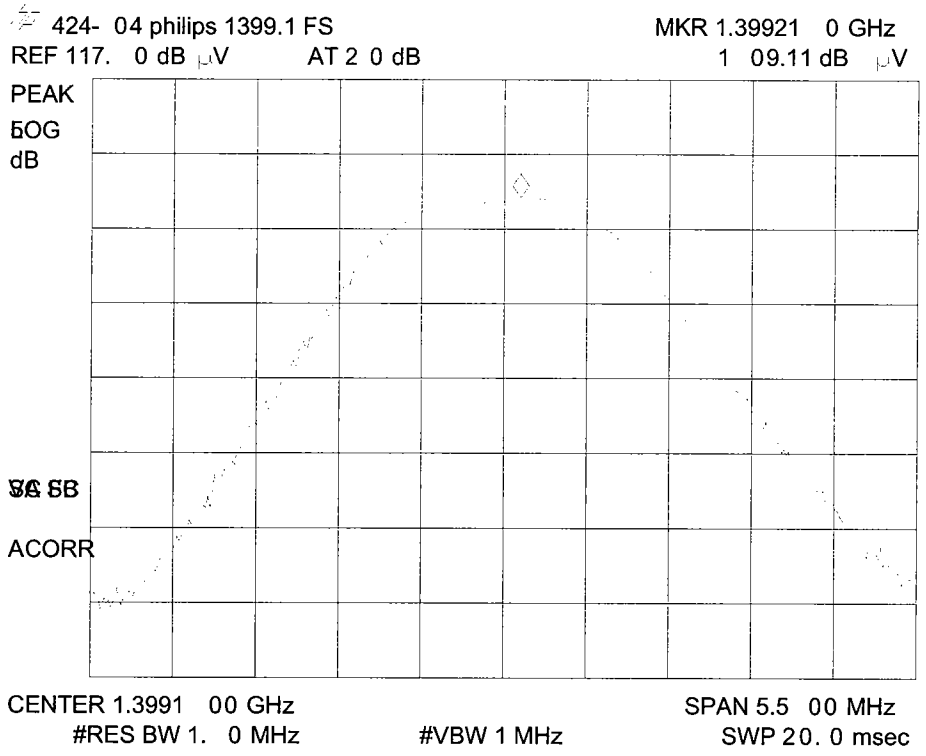
Channel 2 Output Power Plot



Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
1399.1	H	109.1	89.1	117.4	-28.3

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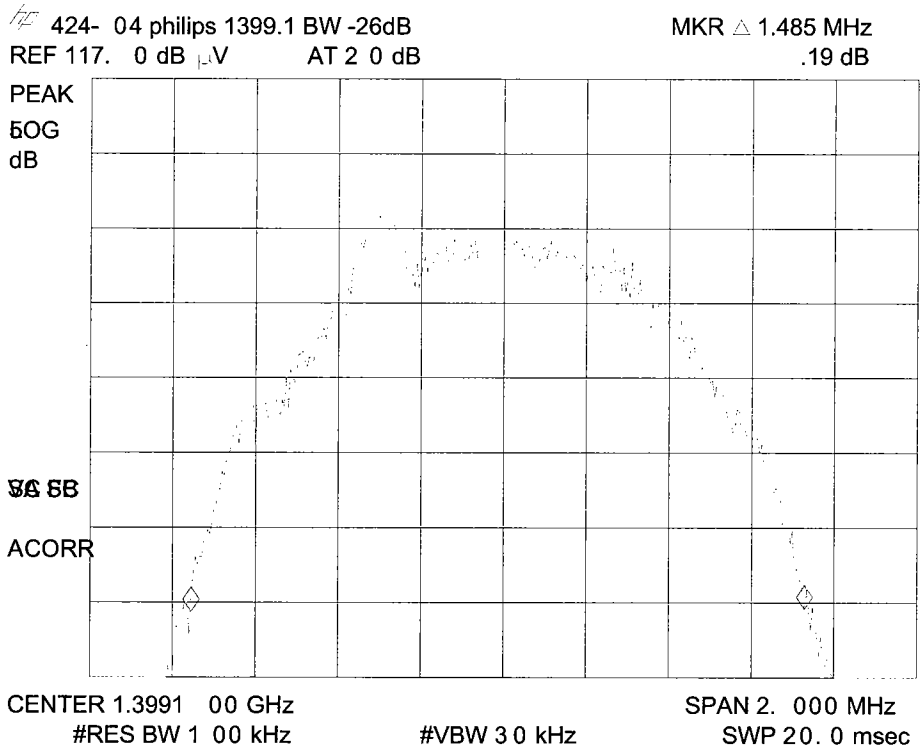
Channel 2 Occupied Bandwidth Plot



Freq (MHz)	26dB Bandwidth (MHz)
1399.1	1.485

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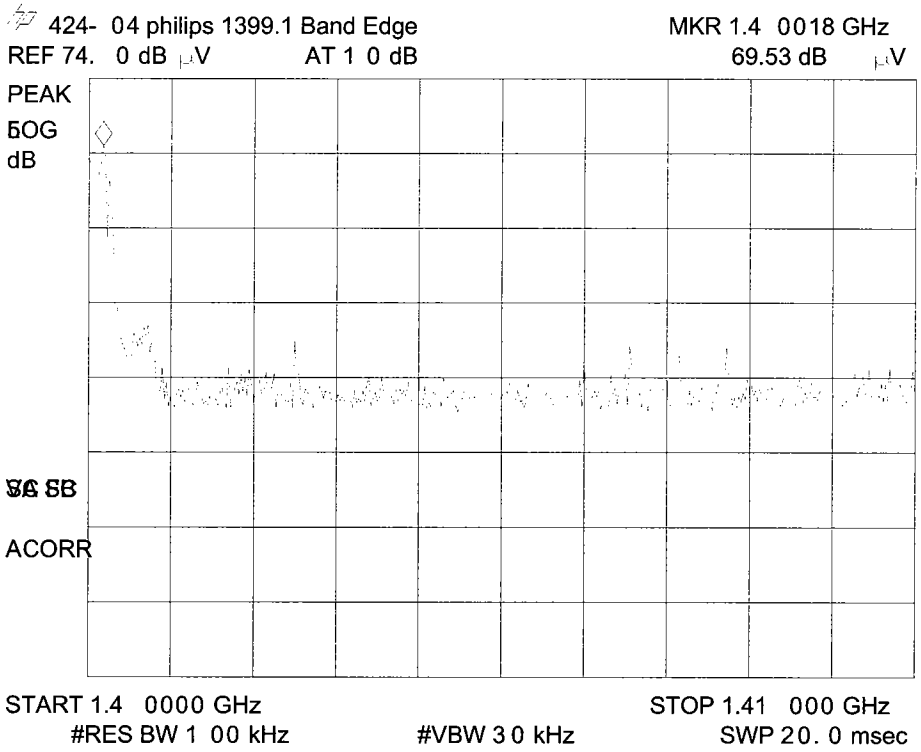
Channel 2 Occupied Bandwidth Upper Band Edge



Plot shows upper band edge on left and 10 MHz window. A peak measurement of 69.53 dBuV/m peak, 49.53 dBuV/m Avg with a limit of 74 dBuV/m Peak and 54 dBuV/m avg, data shows a margin of -4.47 dB.

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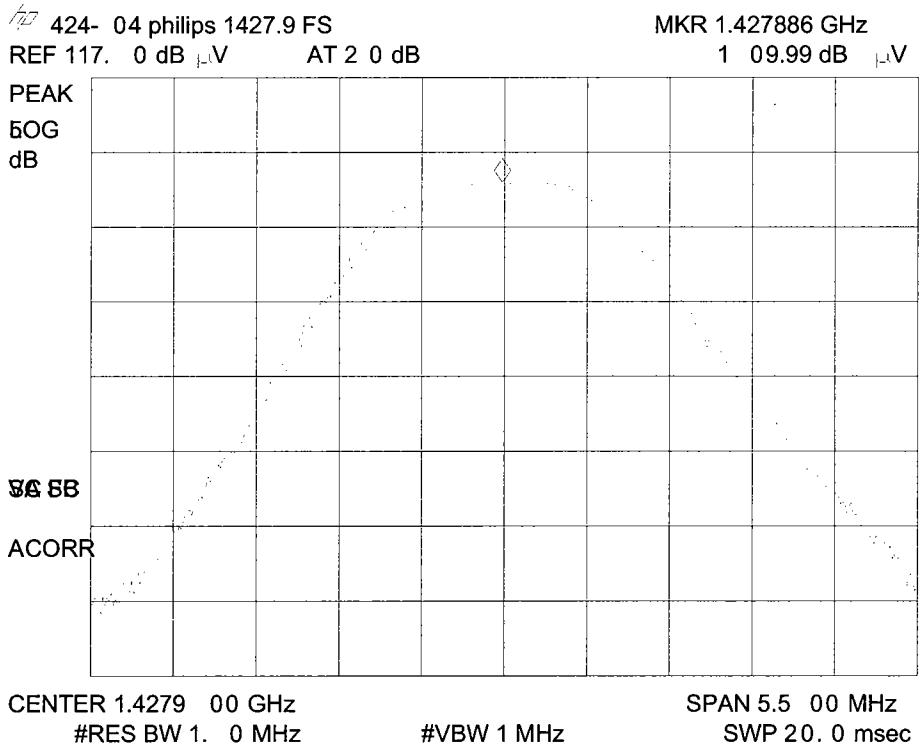
Channel 3 Output Power Plot



Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
1427.9	H	110.0	90.0	117.4	-27.4

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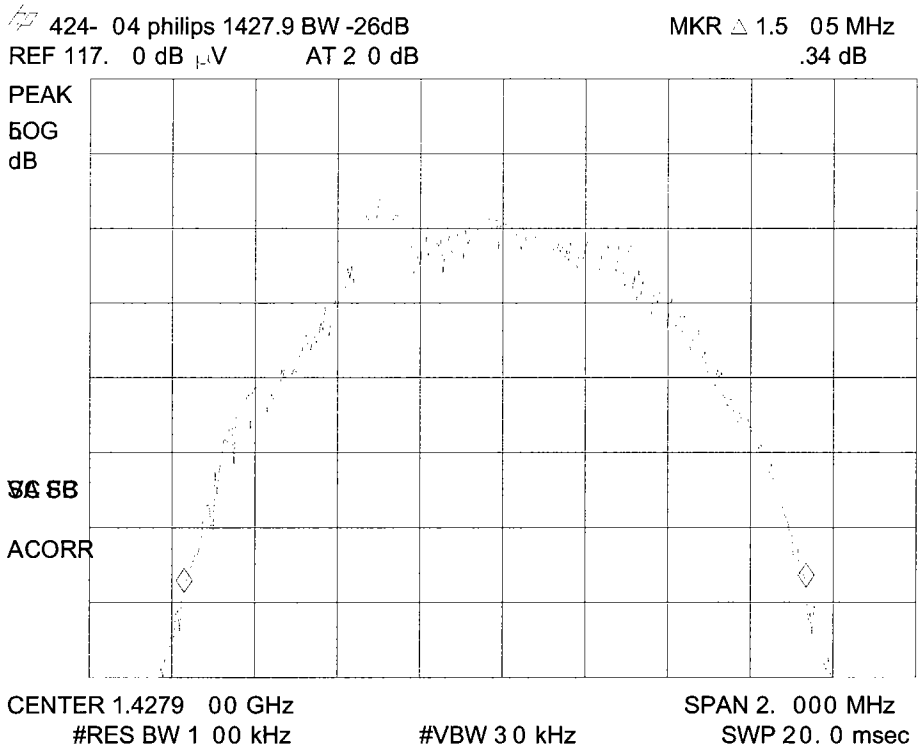
Channel 3 Occupied Bandwidth Plot



Freq (MHz)	26dB Bandwidth (MHz)
1427.9	1.505

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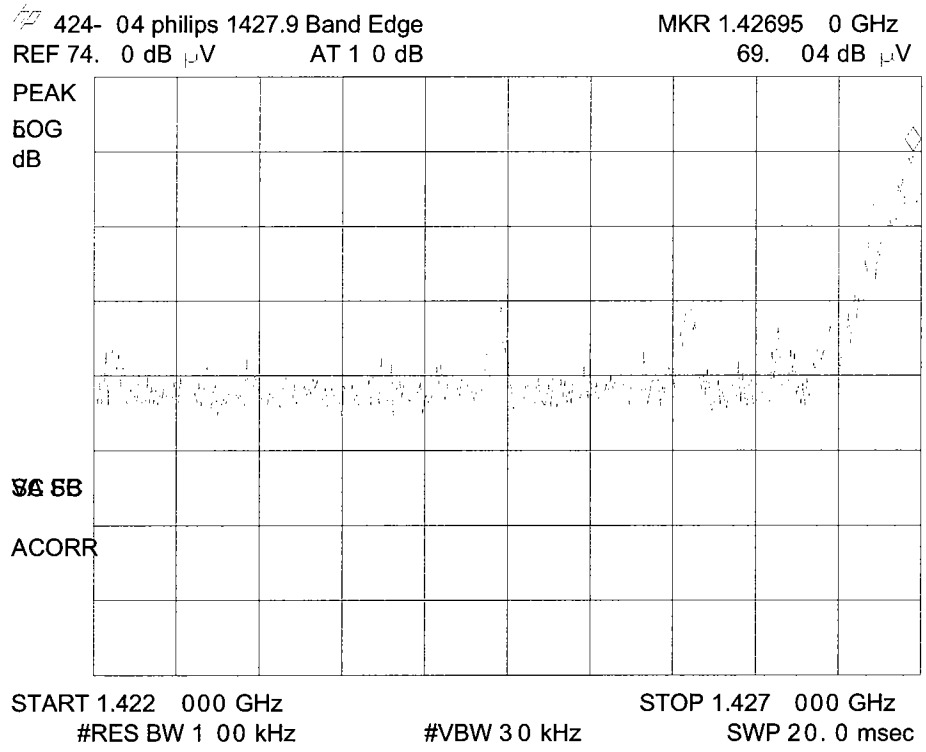
Channel 3 Occupied Bandwidth Lower Band Edge Plot



Plot shows upper band edge on right and 10 MHz window. A peak measurement of 69.04 dBuV/m peak, 49.04 dBuV/m Avg with a limit of 74 dBuV/m Peak and 54 dBuV/m avg, data shows a margin of -4.96 dB.

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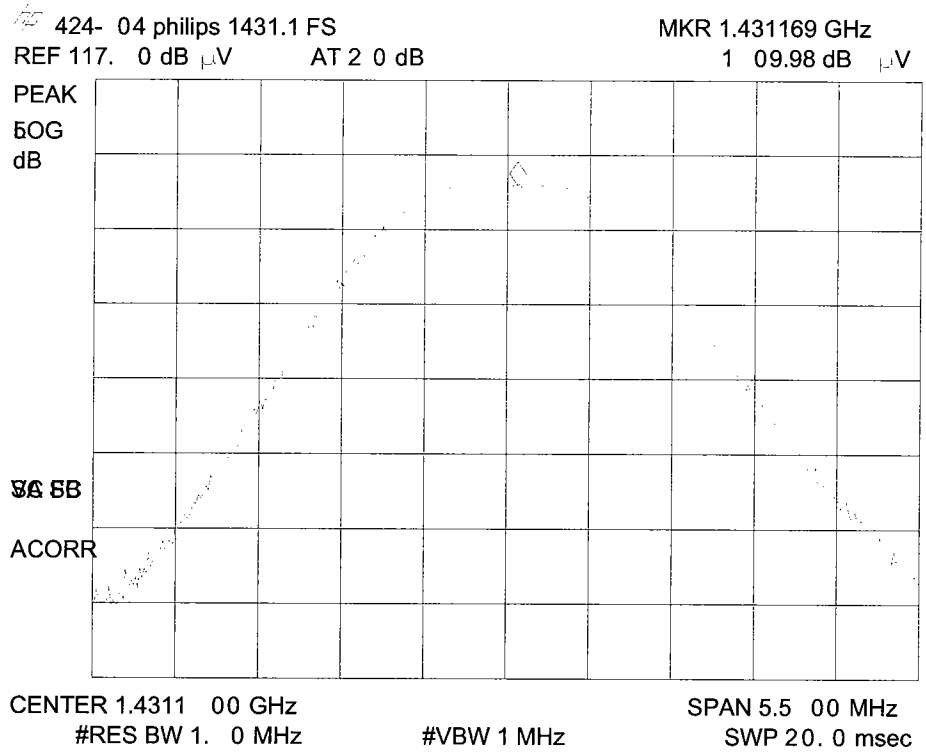
Channel 5 Output Power Plot



Freq (MHz)	Polarization (H/V)	Peak Amp (dBuV/m)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
1431.1	H	110.0	90.0	117.4	-27.4

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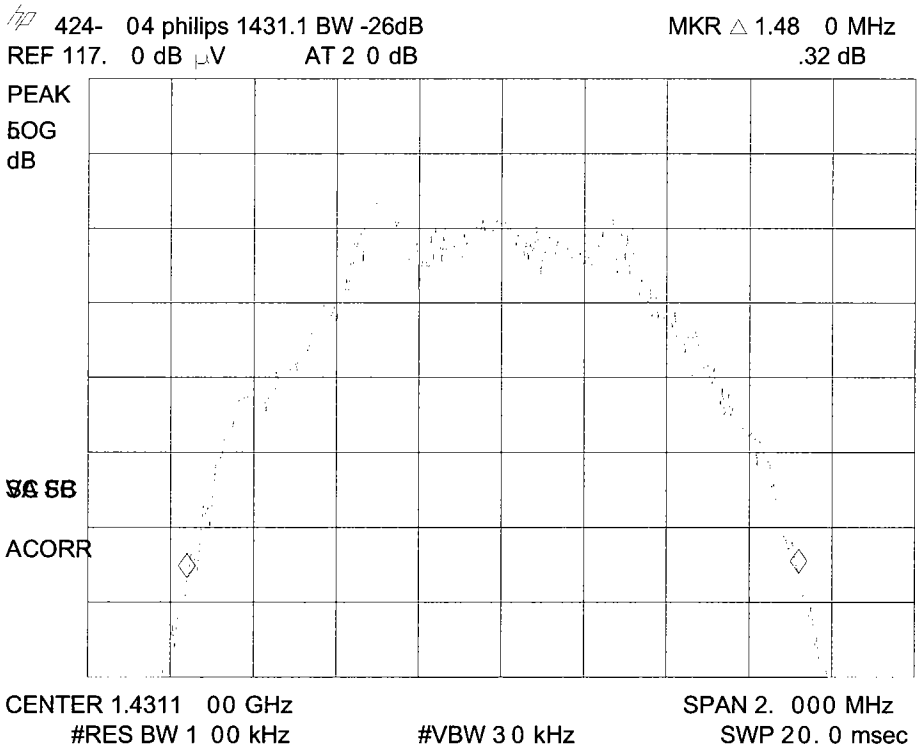
Channel 5 Occupied Bandwidth Plot



Freq (MHz)	26dB Bandwidth (MHz)
1431.1	1.480

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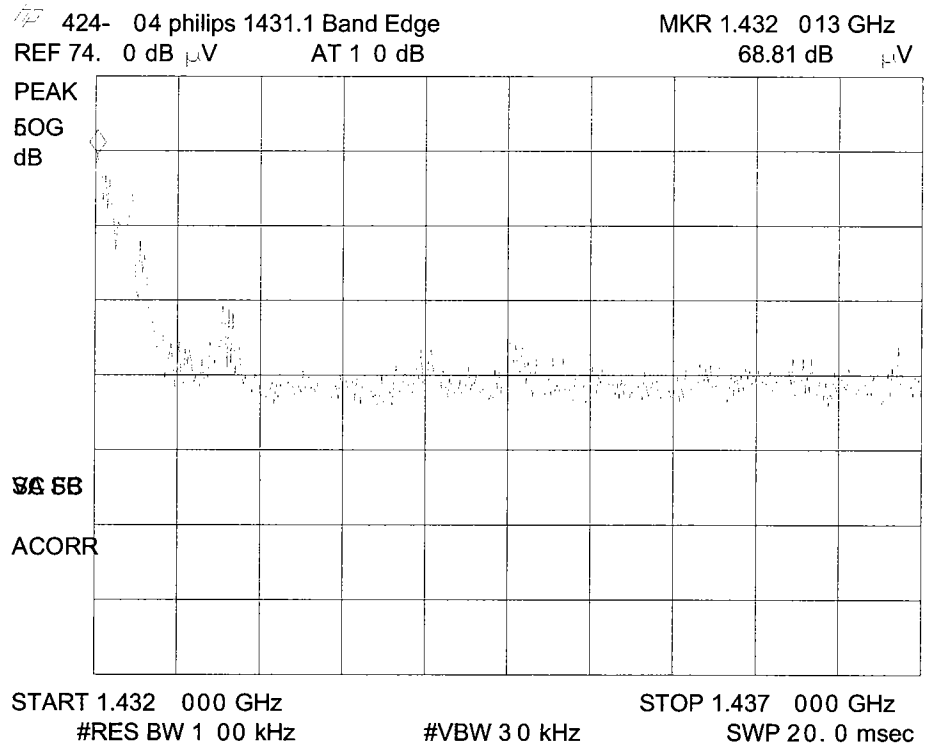
Channel 5 Occupied Bandwidth Upper Band Edge Plot



Plot shows upper band edge on left and 10 MHz window. A peak measurement of 68.81 dBuV/m peak, 48.81 dBuV/m Avg with a limit of 74 dBuV/m Peak and 54 dBuV/m avg, data shows a margin of -5.19 dB.

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NOTES AND COMMENTS

(Special conditions unique to this test)

None.

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