



5775 Morehouse Drive, San Diego, CA 92121-2779

Report #

14352:1126345732

Certificate of Calibration

Manufacturer: GIGATRONICS

Model #: 8542C

Asset #: K82228

Serial Number: 1834430

Description: POWER METER

QUALCOMM Incorporated hereby certifies that...

the above described instrument met or exceeded all published specifications at the time of calibration specified below; and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology (NIST) within the limitations of the Institute's calibration services, or have been derived from accepted values or physical constants, or have been derived by ratio or self calibration techniques. The collective uncertainty of the measurement standards have not exceeded 4:1 test accuracy ratio for each characteristic calibrated, unless otherwise noted. All calibration activities performed are in compliance with MIL-STD-45662A, ANSI/NCSL Z540-1-1994, ISO-9001-1994, and ISO 10012-1:1992. This report and its results refer only to the item(s) calibrated and are not to be reproduced, except in full, without the written approval of the Qualcomm Incorporated Calibration Laboratory.

CALIBRATION INFORMATION

Cal Date	09/10/2005	Interval	12	Cal Temp	22
Cal Due	09/10/2006	Data	YES	Humidity	60
Tech	DAVID FOSTER	Pass	YES	Seals OK	YES

Condition Received IN TOLERANCE

Condition Returned MEETS MFR'S SPECS

Physical Condition of Equipment GOOD

Out of Tolerance Conditions/Limitation

Cal Procedure Gigatronics 8540C Series Power Meters

Revision QUAL- 031125 REV 1.1

STANDARDS USED FOR CALIBRATION

Asset Number	MFG	Model	Description	Cal Date	Due Date
X03045	AGILENT TECHNOLOGIES	34401A	MULTIMETER	05/04/05	11/04/05
K66151	AGILENT TECHNOLOGIES	3335A	SYNTHESIZER/LEVEL GENERATOR	11/05/04	11/05/05
X21432	GIGATRONICS	80301A	POWER SENSOR	11/02/04	11/02/05
K65267	AGILENT TECHNOLOGIES	432A	POWER METER	11/05/04	11/05/05
X21384	AGILENT TECHNOLOGIES	478A	THERMISTOR MOUNT	03/09/05	03/09/06

Signed:

Date:

09/10/2005

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5775 Morehouse Drive, San Diego, CA 92121-2779

Report # X18310:QC-181920462

Certificate of Calibration

Manufacturer: GIGATRONICS

Model #: 80601A

Asset #: X18310

Serial Number: 1830296

Description: POWER SENSOR

QUALCOMM Incorporated hereby certifies that...

the above described instrument met or exceeded all published specifications at the time of calibration specified below; and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology (NIST) within the limitations of the Institute's calibration services, or have been derived from accepted values or physical constants, or have been derived by ratio or self calibration techniques. The collective uncertainty of the measurement standards have not exceeded 4:1 test accuracy ratio for each characteristic calibrated, unless otherwise noted. All calibration activities performed are in compliance with MIL-STD-45662A, ANSI/NCSS Z540-1-1994, ISO-9001-1994, and ISO 10012-1:1992. This report and its results refer only to the item(s) calibrated and are not to be reproduced, except in full, without the written approval of the Qualcomm Incorporated Calibration Laboratory.

CALIBRATION INFORMATION

Cal Date	10/06/2005	Interval	12	Cal Temp	22
Cal Due	10/06/2006	Data	NO	Humidity	46
Tech	KHANH VU	Pass	YES	Seals OK	YES

Condition Received IN TOLERANCE

Condition Returned MEETS MFR'S SPECS

Physical Condition of Equipment GOOD

Out of Tolerance Conditions/Limitation

Cal Procedure MANUFACTURER

Revision NA

STANDARDS USED FOR CALIBRATION

Asset Number	MFG	Model	Description	Cal Date	Due Date
K74805	GIGATRONICS	8541C	POWER METER	03/03/05	03/03/06
K66152	WEINSCHEL	1805B	RF POWER LEVEL CONTROLLER	04/14/05	04/14/06
K66153	WEINSCHEL	F1109	POWER STANDARD	04/04/05	04/04/06
K13397	AGILENT TECHNOLOGIES	8350B	SWEEP OSCILLATOR	04/01/05	04/01/06
K84807	AGILENT TECHNOLOGIES	83592B	RF PLUG IN	04/01/05	04/01/06

Signed: 

Date: 10/06/2005

1 of 1

**Agilent Technologies**AGILENT TECHNOLOGIES
INTERNAL ASSESSMENT
PROGRAM : AQ-SSU-12/95

EMG Support Operation

10090 Foothills Blvd.

Roseville, CA. 95747

(800) 829-4444

Certificate of Calibration

Agilent Inclusive Calibration PLUS
Certificate Number: 1-287259662-1

Manufacturer: Hewlett-Packard Co.**Model Number:** 8714C**Serial Number:** US38171129**Customer:**

Qualcomm Inc

6455 Lusk Blvd

Description: RF Network Analyzer, 3 GHz**Options Installed:****Customer Asset Numb** K82012**Location of Calibration:** _____

EMG Support Operation

10090 Foothills Blvd.

Roseville, CA. 95747

(800) 829-4444

SAN DIEGO CA 92121 United States

Procedure: STE-50112873-A.04.00**Date of Calibration:** 13 Apr 2006**Temperature:** 18-28 °C**Customer PO Number** Credit Card**Humidity:** 20-80% RH

This certifies that the above product was calibrated in compliance with a quality system registered to ISO 9001:2000 using applicable Agilent Technologies procedures.

As Received Conditions:

Initial testing found the equipment to be **IN-SPECIFICATION** at the points tested.

As Shipped Conditions:

At the completion of the calibration, measured values were **IN-SPECIFICATION** at the points tested.

Remarks or Special Requirements:

Our calibration procedures are designed to provide measurement uncertainty of less than or equal to one quarter of the specification of the unit under test, where possible, with a coverage factor of 2.


The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

This certificate is composed of 2 pages containing a summary of calibration information.

Based on the recommended calibration interval, the next calibration is due on 13 Apr 2007.

Print Date: 13 Apr 2006

Larry Goins Calibration District Mgr.

 Agilent Technologies <small>AGILENT TECHNOLOGIES INTERNAL ASSESSMENT PROGRAM: AQ-SSU-12/95</small>	EMG Support Operation 10090 Foothills Blvd. Roseville, CA. 95747 (800) 829-4444
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Certificate of Calibration
Agilent Inclusive Calibration PLUS
Certificate Number: 1-287259662-1

Traceability Information:

Technician ID Number: 88880

Traceability is to national standards administered by the U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories.

Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements.

Supporting documentation relative to traceability is available for review by appointment.

This certificate shall not be reproduced, except in full, without prior written approval of the laboratory.

Calibration Equipment Used:

Model Number:	Model Description:	Trace Number:	Cal Due Date:	Certificate Number:
11667A	DC-18 GHz power splitter, Type N, 50 ohm	11667A23842	12 Oct 2007	1-228745016-1
438A	Dual-channel power meter with GPIB	438A06600	12 Aug 2006	1-169481804-1
8116A	PULSE/FUNCTION GENERATOR	8116A02166	6 Oct 2007	1-284199219-1
8482A	Power sensor, 100 kHz to 4.2 GHz	8482A01646	8 Nov 2006	1-240072081-1
8491B	COAXIAL ATTENUATOR	8491B22418	21 Feb 2009	1-265849051-1
8491B	COAXIAL ATTENUATOR	8491B23996	21 Feb 2009	1-265848768-1
8491B	COAXIAL ATTENUATOR	8491B24024	21 Feb 2009	1-265876274-1
8491B	COAXIAL ATTENUATOR	8491B30482	21 Feb 2009	1-265876417-1
85032B	50-ohm Type N cal. kit for 8752A/C	85032B10850	5 Jun 2006	1-82252990-1
8563E	9 kHz - 26.5 GHz MW spectrum analyzer	8563E07558	24 Jan 2007	1-143935910-1

**Agilent Technologies**

Agilent Technologies Inc
A03
10090 Foothills Blvd
ROSEVILLE CA 95747
United States

Agilent Service Request Number:
1-287259432

Agilent Service Order Number:
1-287259662

Customer Service Information

Qualcomm Inc
6455 Lusk Blvd
SAN DIEGO CA 92121
United States

Customer Contact:

Derick Myler

Telephone:

(858) 651-2535

Receive Date:

12/APR/2006

Schedule Date:

19/APR/2006

Shipped Date:**Product Number:**

AGILENT 8714C

Product Serial Number:

US38171129

Product Description:

RF Network analyzer

Purchase Order Number:

BBP K82012

Problem Description:

Agilent cal. 12 month cal interval.

Services Provided:

Cleaned and calibrated to manufacturer's specifications. Calibration certificate and data provided.

Accessories

2 HANDLES

Parts Used

Qty

Part Number

Description

Measurement Report

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Report Number: 1-287259662-1
Model Number: HP8714C
Serial Number: US38171129

Test Date: 13 Apr 2006

PERFORMANCE TEST RESULTS SUMMARY

<u>Test Name</u>	<u>Status</u>
INITIAL SETUP	DONE
FREQUENCY ACCURACY	PASSED
GAIN COMPRESSION	PASSED
NOISE FLOOR	PASSED
DYNAMIC ACCURACY	PASSED
POWER FLATNESS	PASSED
ABSOLUTE ACCURACY	PASSED
BROADBAND FREQUENCY RESPONSE	PASSED
DIRECTIVITY	PASSED
HARMONICS	PASSED

Measurement Report

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Report Number: 1-287259662-1
Model Number: HP8714C
Serial Number: US38171129

Test Date: 13 Apr 2006

HARMONICS

PASSED

TEST CONDITIONS	MEASURED	MAXIMUM
+7 dBm Source Level		
2nd Harm. measured at		
0.3 MHz	-40.5 dBc	-20.0
1.0 MHz	-42.7 dBc	-30.0
3.0 MHz	-46.0 dBc	-30.0
10.0 MHz	-47.7 dBc	-30.0
30.0 MHz	-52.2 dBc	-30.0
100.0 MHz	-56.2 dBc	-30.0
200.0 MHz	-43.8 dBc	-30.0
300.0 MHz	-41.5 dBc	-30.0
400.0 MHz	-36.7 dBc	-30.0
500.0 MHz	-34.8 dBc	-30.0
600.0 MHz	-34.7 dBc	-30.0
700.0 MHz	-35.3 dBc	-30.0
800.0 MHz	-36.5 dBc	-30.0
900.0 MHz	-36.7 dBc	-30.0
1000.0 MHz	-39.5 dBc	-30.0
1100.0 MHz	-42.7 dBc	-30.0
1200.0 MHz	-60.7 dBc	-30.0
1440.0 MHz	-36.0 dBc	-30.0

Measurement Report

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Report Number: 1-287259662-1

Test Date: 13 Apr 2006

Model Number: HP8714C

Serial Number: US38171129

NOISE FLOOR

<u>TEST CONDITIONS</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
300 kHz - 3000 MHz	-52.6 dBm	-50.0

DYNAMIC ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
Nominal Input Level			
-10 dBm	-0.233	0.026 dB	0.233
-20 dBm	-0.100	0.001 dB	0.100
-30 dBm	-0.100	-0.003 dB	0.100
-40 dBm	-0.100	-0.002 dB	0.100
-50 dBm	-0.100	0.010 dB	0.100
-60 dBm	-0.100	0.006 dB	0.100
-70 dBm	-0.100	0.005 dB	0.100
-80 dBm	-0.400	-0.015 dB	0.400
-90 dBm	-0.700	0.022 dB	0.700
-100 dBm	-1.000	0.127 dB	1.000

POWER FLATNESS

PASSED

<u>TEST CONDITIONS</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
Nominal Power Level		
10.00 dBm	0.45 dB	2.00
Maximum: +10.30 dBm, found at:	2884.6 MHz	
Minimum: +9.84 dBm, found at:	.3 MHz	
0.00 dBm	0.28 dB	2.00
Maximum: +.21 dBm, found at:	2884.6 MHz	
Minimum: -.07 dBm, found at:	.3 MHz	
-5.00 dBm	0.16 dB	2.00
Maximum: -4.89 dBm, found at:	2884.6 MHz	
Minimum: -5.05 dBm, found at:	1269.4 MHz	

Measurement Report

AGILENT TECHNOLOGIES
TMO Support Operation
10090 Foothills Blvd.
Roseville, CA. 95747

Report Number: 1-287259662-1

Customer: QUALCOMM INC

Manufacturer: Hewlett-Packard Co.
(Agilent Technologies)

Model Number: 8714C (HP8714C)

Serial Number: US38171129

Options Installed: none

Firmware Version:

Test Date: 13 Apr 2006

Tested By: 9700081

Temperature: 23±5 °C

Humidity: 20 to 80% RH

Test Program Name: HP871X Part No. 5011-2873

Test Program Version: A.04.00

Test Executive: STE/9000 C.07.09C (MENDOR B.06.09I)

Specification Limits:

Unless indicated otherwise, the units for minimum and/or maximum specification limits are the same as the units stated for the measured value.

Calibration Standards Used

<u>Model No.</u>	<u>Serial No.</u>	<u>Trace No.</u>	<u>Cal Due Date</u>
HP11667A	23842	11667A23842	12 Oct 2007
HP438A	3513U06600	438A06600	12 Aug 2006
HP8116A	2124G02166	8116A02166	06 Oct 2007
HP8482A	1551A01646	8482A01646	08 Nov 2006
HP8491B	22418	8491B22418	21 Feb 2009
HP8491B	23996	8491B23996	21 Feb 2009
HP8491B	24024	8491B24024	21 Feb 2009
HP8491B	30482	8491B30482	21 Feb 2009
HP8496G	3247A14624	8496G14624	12 Dec 2007
HP85032B	3217A10850	85032B10850	05 Jun 2006
HP8563E	3728A07558	8563E07558	24 Jan 2007

Measurement Report

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Report Number: 1-287259662-1
Model Number: HP8714C
Serial Number: US38171129

Test Date: 13 Apr 2006

ABSOLUTE ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
+16.0 dBm	-0.55	0.17 dB	0.55
+10.0 dBm	-0.50	0.11 dB	0.50
+5.0 dBm	-0.50	0.15 dB	0.50
0.0 dBm	-0.50	0.14 dB	0.50
-5.0 dBm	-0.50	0.07 dB	0.50
-10.0 dBm	-0.50	0.10 dB	0.50
-15.0 dBm	-0.50	0.29 dB	0.50
-20.0 dBm	-0.50	0.30 dB	0.50
-25.0 dBm	-0.50	0.28 dB	0.50
-30.0 dBm	-0.50	0.30 dB	0.50
-35.0 dBm	-0.75	0.34 dB	0.75
-40.0 dBm	-1.00	0.36 dB	1.00
-45.0 dBm	-1.50	0.34 dB	1.50
-50.0 dBm	-2.00	0.43 dB	2.00
-55.0 dBm	-7.00	3.40 dB	7.00

BROADBAND FREQUENCY RESPONSE

PASSED

<u>TEST CONDITIONS</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
Nominal Input Level		
-6 dBm	1.01 dB	2.00

DIRECTIVITY

PASSED

<u>TEST CONDITIONS</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
Directivity	-47.9 dB	-30.0
Source Match	-44.1 dB	-20.0
Input Match	-21.4 dB	-18.0

Measurement Report

Page 3 of 6

Report Number: 1-287259662-1

Test Date: 13 Apr 2006

Model Number: HP8714C

Serial Number: US38171129

FREQUENCY ACCURACY

PASSED

TEST CONDITIONS	MINIMUM	MEASURED	MAXIMUM
Frequency Error at			
10.000000 MHz	-0.050	-0.006 kHz	0.050
50.000000 MHz	-0.250	-0.028 kHz	0.250
123.456789 MHz	-0.617	-0.069 kHz	0.617
500.000000 MHz	-2.500	-0.280 kHz	2.500
1000.000000 MHz	-5.000	-0.560 kHz	5.000
1300.000000 MHz	-6.500	-0.727 kHz	6.500
1905.000000 MHz	-9.525	-1.066 kHz	9.525
1915.000000 MHz	-9.575	-1.071 kHz	9.575
2500.000000 MHz	-12.500	-1.398 kHz	12.500
2850.000000 MHz	-14.250	-1.595 kHz	14.250

GAIN COMPRESSION

PASSED

TEST CONDITIONS	MEASURED	MAXIMUM
0.3 MHz	0.156 dB	0.367
1.0 MHz	0.000 dB	0.367
10.0 MHz	0.000 dB	0.367
100.0 MHz	0.000 dB	0.367
500.0 MHz	0.000 dB	0.367
1000.0 MHz	0.000 dB	0.367
2000.0 MHz	0.000 dB	0.367
3000.0 MHz	0.000 dB	0.367

NOISE FLOOR

PASSED

TEST CONDITIONS	MEASURED	MAXIMUM
Narrowband Detector Mode		
Fine BW, Spur Avoid ON		
300 kHz - 5 MHz	-107.3 dBm	-50.0
5 MHz - 3000 MHz	-97.5 dBm	-90.0

Broadband Detector Mode
Narrow BW, Spur Avoid OFF

continued...