Errata

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. To reduce potential confusion, the only change to product numbers and names has been in the company name prefix: where a product number/name was HP XXXX the current name/number is now Agilent XXXX. For example, model number HP8648 is now model number Agilent 8648.

Ce manuel peut contenir des références à <<HP>> ou <<Hewlett-Packard.>> Veuillez noter que les produits de test et mesure, de semi-conducteur et d'analyse chimique qui avaient fait partie de la société Hewlett-Packard sont maintenent une partie de la société Agilent Technologies. Pour reduire la confusion potentielle, le seul changement aux noms de reference a été dans le préfixe de nom de société : là où un nom de référence était HP XXXX, le nouveau nom de référence est maintenant Agilent XXXX. Par example, le HP 8648 s'appelle maintenent Agilent 8648.

Diese Gebrauchsanweiseung kann Bezug nehmen auf die Namen HP oder Hewlett-Packard. Bitte beachten Sie, dass ehemalige Betriebsbereiche von Hewlett-Packard wie HP-Halbleiterprodukte, HP-chemische Analysen oder HP-Test- und Messwesen nun zu der Firma Agilent Technology gehören. Um Verwirrung zu vermeiden wurde lediglich bei Produktname und - Nummer der vo laufende Firmenname geändert: Produkte mit dem Namen/Nummer HP XXXX lauten nun mehr Agilent XXXX. Z.B, das Modell HP 8648 heißt nun Agilent 8648.

Questo manuale potrebbe contenere riferimenti ad HP o Hewlett-Packard. Si noti che le attività precedentemente gestite da Hewlett-Packard nel campo di Test & Misura, Semiconduttori, ed Analisi Chimica sono ora diventate parte di Agilent Technologies. Al fine di ridurre il rischio di confusione, l'unica modifica effettuata sui numeri di prodotto e sui nomi ha riguardato il prefisso con il nome dell'azienda : dove precedentemente compariva "HP XXXX" compare ora "Agilent XXXX". Ad esempio: il modello HP8648 è ora indicato come Agilent 8648.

Este manual puede hacer referencias a HP o Hewlett Packard. Las organizaciones de Prueba y Medición (Test and Measurement), Semiconductores (Semiconductor Products) y Análisis Químico (Chemical Analysis) que pertenecían a Hewlett Packard, ahora forman parte de Agilent Technologies. Para reducir una potencial confusión, el único cambio en el número de producto y nombre, es el prefijo de la compañía: Si el producto solía ser HP XXXX, ahora pasa a ser Agilent XXXX. Por ejemplo, el modelo HP8648 es ahora Agilent 8648.

这个手册里面可能含有惠普公司的资料. 请注意惠普公司以前的测试, 半导体产品
, 化学分析部门现在属于安捷伦公司. 为了减少可能的误解, 产品号码和名字只改变最前面的公司名字. 如果一个产品的号码/名字以前是HP XXXX, 现在的号码/名字是安捷伦 XXXX. 例如模型号码是惠普8648. 现在是模型号码安捷伦8648.

Document Part Number 84811-90010
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Agilent Technologies

マニュアル・チェンジ

変更

本文中の「HP(YHP)」、または「(横河)ヒューレット・パッカード株式会社」という語句を、「Agilent」、または「アジレント・テクノロジー株式会社」と変更してください。

ヒューレット・パッカード社の電子計測、半導体製品、化学分析ビジネス部門は分離独立し、アジレント・テクノロジー社となりました。
社名変更に伴うお客様の混乱を避けるため、製品番号の接頭部のみ変更しております。
（例: 旧製品名　HP 4294A　は、現在　Agilent 4294A　として販売いたしております。）

OPERATING AND SERVICE MANUAL

HP 84811A
PEAK POWER SENSOR

HP Part No. 84811-90010

HEWLETT PACKARD

OPERATING AND SERVICE MANUAL

HP 84811A
PEAK POWER SENSOR

SERIAL NUMBERS

This manual applies directly to instruments with serial numbers prefixed 2131A and above.

For additional important information about serial numbers, see INSTRUMENTS COVERED BY MANUAL on Page 2.

HEWLETT PACKARD

MANUAL PART NUMBER. 84811-90010

GENERAL INFORMATION

Introduction

This Operating and Service Manual contains information about initial inspection, performance tests, adjustments, operation, troubleshooting and repair of the HP 84811A Peak Power Sensor.

On the title page of this manual is a "Microfiche" part number. This number can be used to order a 4 x 6-inch microfilm transparency of the manual.

Specifications

Instrument specifications are listed in Table 1. These specifications are the performance standards or limits against which the instrument is tested.

Table 1. Specifications*

Power range: 0 to +20 dBm (1 mW to 100 mW).
Frequency range: 100 MHz to 18 GHz.
SWR: 100 MHz to 12 GHz <1.5,
12 GHz to 18 GHz <2.0.
Maximum Peak Power: +24 dBm (250 mW) for 5 min.
Connector type: N(male).
Calibration: every 2 GHz from 2 to 10 GHz,
every 1 GHz from 11 to 18 GHz.
Operating temperature: 0 to +55°C.
Calibration accuracy: (+10 to +40°C).
±0.7 dB 0.1 to 12 GHz,
±1.0 dB 12 to 18 GHz.
0—10°C and 40—55°C: add ±0.2 dB.
General:
Dimensions: 30 mm H x 38 mm W x 140 mm L (1.2 x 1.5 x 5.5 inches).
Weight: 0.5 kg, (1 lb.) net.
Sensor cable length: 1.2 metres (4.1 ft).

*Specifications only apply in combination with specifications of HP 8900C/D peak power meters.

Instruments Covered by Manual

This instrument has a two-part serial number. The first four digits and the letter are the serial number prefix. The last five digits form a sequential suffix which is unique to each instrument. The contents of this manual apply directly to instruments having the serial number prefix listed under SERIAL NUMBERS on the title page.

An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates that the manual for this instrument is supplied with a Manual Changes supplement that documents the differences.

In addition to change information, the supplement may contain information for correcting errors in the manual. The supplement for this manual is keyed to this manual's print date and part number, both of which appear on the title page.

For information concerning a serial number prefix not listed on the title page or in the Manual Changes supplement, contact your nearest Hewlett-Packard office.

Description

The HP 84811A is a Peak Power Sensor. With a compatible peak power meter it measures power levels in a range from 0 to +20 dBm (1 mW to 100 mW), and at frequencies from 100 MHz to 18 GHz. Compatible meters are the HP 8900C and HP 8900D Peak Power Meters.

CAUTION

The HP 84811A Peak Power Sensor has a maximum peak power rating of +24 dBm (250 mW). Maintaining an input power level of 250 mW for longer than five (5) minutes or exceeding the maximum peak power rating may cause severe component damage.

NOTE

The diode (U1) is easily replaceable. Hewlett-Packard recommends that replacement diodes be kept as spares if the HP 84811A is used in applications where inadvertent high power overload might occur.

For instructions on disassembly and reassembly of the HP 84811A, refer to the service section of this manual.

Recommended Test Equipment

Table 2 lists the test equipment recommended to check, adjust, and troubleshoot the Peak Power Sensor. If substitute equipment is used, it must meet or exceed the critical specifications.

Table 2. Recommended Test Equipment

Instrument Type	Critical Specifications	Suggested Model
Peak Power Meter	Compatability with Peak Power Sensor	HP 8900C
Digital Voltmeter	Resolution = at least 0.0001 Vdc; Range = ±1.5 Vdc	HP 3455A
Power Supply	Regulation −load effect 5 mV, source effect 3 mV. Range: 0—1.5 V min. Periodic and random deviation: 200 μVrms, 1 mV peak to peak	HP6203B
Potentiometer	Non-wirewound 50 Ohm. 1/4 Watt	HP 2100-0671
Sweep Oscillator Mainframe		HP 8620C
RF Plug-in		HP 86290A
Microwave Amplifier		HP 489A, 491C, 493A, 495A
Coaxial Step Attenuator	1 dB/step	HP 8494B
Dual Directional Coupler		HP 11692D
Power Meter (2 required)		HP 436A
Power Sensor 2 required)	Compatability with HP 436A Power Meter	HP 8481A
Coaxial Attenuator	20 dB	HP 8491B Opt. 010
Type N Coaxial Short		HP 11512
Type N Coaxial Open (made from the following parts):		HP 1250-0916, Body HP 1250-0016 Snap Ring HP 1250-0918 Nut

INSTALLATION

Initial Inspection

Inspect the shipping container for damage. If the shipping container or packaging material is damaged, it should be kept until the contents of the shipment have been checked mechanically and electrically. If there is mechanical damage or if the instrument does not pass the performance tests, notify the nearest Hewlett-Packard office. Keep the damaged shipping materials (if any) for inspection by the carrier and a Hewlett-Packard representative.

Preparation for Use

Interconnections. The Peak Power Sensor and the peak power meter are integral parts of a measurement system. Before measurements can be performed, the peak power meter and Peak Power Sensor must be connected.

Mating Connectors. The rf input of the Peak Power Sensor can only be connected to a 50 ohm type N female connector that is compatible with US MIL-C-39012.

Operating Environment

The operating environment for the Peak Power Sensor should be within the following limits:

Temperature: 0 to +55°C
Relative humidity: less than 95% at 40°C
Altitude: less than 4600 metres (15 000 ft).

Storage and Shipment

Storage Environment. The instrument should be stored in a clean, dry environment. The following limitations apply to both storage and shipment:

Temperature: −40 to +75°C
Relative humidity: less than 95% at 40°C
Altitude: less than 15 300 metres (50 000 ft).

Storage and Shipment (cont'd)

Original Packaging. Containers and materials identical to those used in factory packaging are available through Hewlett-Packard offices. If the instrument is being returned to Hewlett-Packard for servicing, attach a blue tag (found at the end of this manual) indicating the type of service required, return address, model number, and serial number. Also, mark the container FRAGILE to assure careful handling. In any correspondence, refer to the instrument by model number and serial number.

OPERATION

WARNING

BEFORE CONNECTING THE PEAK POWER SENSOR TO OTHER INSTRUMENTS, ensure that all instruments are connected to the protective (earth) ground. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in personal injury.

Correction Factor

Before taking a measurement, find the correction factor on the label attached to the Peak Sensor cover. Find the correction factor that is associated with the frequency of the measurement. The correction factor for 2 GHz applies to frequencies from 100 MHz to 2 GHz. Enter the data into your HP 8900C or 8900D peak power meter.

NOTE

Correction Factor data and Calibration Factor data are not the same. Correction Factor data must be set on the power meter before the measurement. That is, the measured value cannot be corrected mathematically afterwards based on this data.

Operating Instructions

Once the Peak Power Sensor has been attached to the power meter and the Correction Factor has been set, the power meter is ready to take a reading. For more information on operating the power meter, refer to the operating instructions in the power meter operating and service manual.

RETURN LOSS PERFORMANCE TEST

Specification SWR: 100 MHz to 12 GHz <1.5
12 GHz to 18 GHz <2.0

Description To verify SWR specifications a Return Loss Test is performed. The Return Loss Test may be run without the Peak Power Sensor being connected to the Peak Power Meter. A microwave source is connected by appropriate attenuation to a dual directional coupler. The Peak Power Sensor is connected to the test port of the directional coupler. The incident and reflected ports of the directional coupler are connected to power meters. From the power measurements made on the incident and reflected ports, Return Loss can be calculated.

Equipment

Sweep Oscilator Mainframe	~~HP 8620C~~ HP 83650A & HP 8757 D
RF Plug-in	~~HP 86290A~~ SG NA
Microwave Amplifier	HP 489A, 491C, 493A, 495A HP 8349B
Coaxial Step Attenuator (1 dB/step)	~~HP 8494B~~
Dual Directional Coupler	~~HP 11692D~~ HP 85027 C Bridge
Power Meter (2 required)	HP 436A
Power Sensor (2 required)	HP 8481A
Coaxial Attenuator (10 dB)	~~HP 8491B Opt. 010~~
Type N Coaxial Short	HP 11512A
Type N Coaxial Open (made from the following parts):	HP 1250-0916 Body, HP 1250-0016 Snap Ring, HP 1250-0918 Nut

Refer See HP8900C Manual to do performance Test.

RETURN LOSS PERFORMANCE TEST (cont'd)

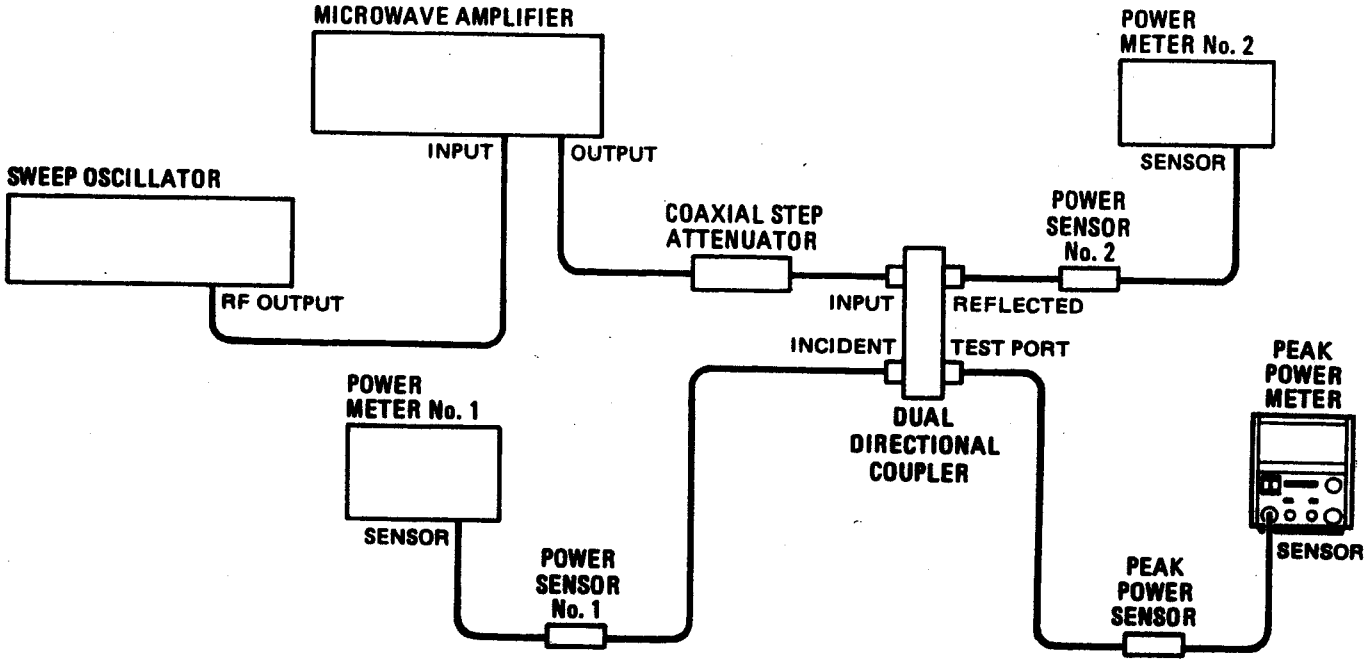

Figure 1. Return Loss Performance Test Setup

NOTES

Use the appropriate microwave amplifier depending on the frequency of interest.

The type N coaxial open is required only for measurements above 10 GHz.

Procedure

1. Set the coaxial step attenuator to 11 dB of attenuation. Connect the equipment as shown in Figure 1. Allow at least one half hour for the equipment to warm up. Then before doing the performance test, be sure the test port output of the coupler is less than 100 mW.

2. Set the sweep oscillator to CW, and set to the frequency of interest. Make sure that the microwave amplifier is compatible with the frequency of the sweep oscillator.

Frequency of interest _____

3. Using the 10 dB coaxial attenuator connected to the test port of the dual directional coupler, measure the power output with power meter #2. Adjust the sweep oscillator and/or the microwave amplifier for +10 dBm at the attenuator output. Read and record the power level of power meter #1. This value is the incident wave reference level. Remove the attenuator and connect power meter #2 to the reflected port of the dual directional coupler.

Power Meter #1 (Incident Wave Reference Level) _____

4. Terminate the test port of the dual directional coupler with a type N open constructed from the parts listed in the equipment list. It is not necessary to use this

RETURN LOSS PERFORMANCE TEST (cont'd)

non-radiating open if operating below 10 GHz. Readjust the source so that the reading on power meter #1 is equal to the incident wave reference level measured in step #3. Measure and record the power level using power meter #2, at the reflected port.

Power Meter #2 (reflected port) _____

5. Terminate the test port with a type N coaxial short. Readjust the source so that the reading on power meter #1 is equal to the incident wave reference level measured in step #3. Measure and record the power level at the reflected port as in the previous step.

Power Meter #2 (reflected port) _____

6. Compute the average power measured on power meter #2 in steps 4 and 5 above. This value is the return loss reference.

Return loss reference _____

7. Connect the Peak Power Sensor and Peak Power Meter to the test port. Using power meter #1, monitor the power level at the incident port and adjust to the same level as in step 3 if necessary.

8. Read and record the power level indicated on power meter #2.

Power Meter #2 _____

9. Determine and record the maximum error of the test system using the following data:

Test Frequency	Error
100 MHz to 8 GHz	1.5 dB
8 GHz to 12 GHz	2.1 dB
12 GHz to 18 GHz	1.4 dB

Error _____ dB

10. Compute the return loss for D.U.T. using the following formula.

(Power Meter #2 reading — step 8) _____

− (Return Loss Reference — step 6) _____

+ (Maximum Error of test system — Step 9) _____

Return Loss of D.U.T. _____

For frequencies between 100 MHz and 12 GHz return loss for D.U.T. must be > 14 dB (or < 1.5 SWR).

For frequencies between 12 GHz and 18 GHz the return loss for D.U.T. must be > 9.55 dB (or < 2.0 SWR).

OFFSET AND GAIN ADJUSTMENTS

Description The Sensor is connected to the peak power meter to perform the following adjustments. The power supply voltages in the peak power meter are first checked to ensure that they are within limits. A digital voltmeter is connected to the output of the Sensor to enable adjustment of the OFFSET Potentiometer with no input applied. A DC power supply is then used to apply a DC voltage to the Amplifier Assembly input. The Sensor output is monitored with the digital voltmeter to enable adjustment of the GAIN potentiometer.

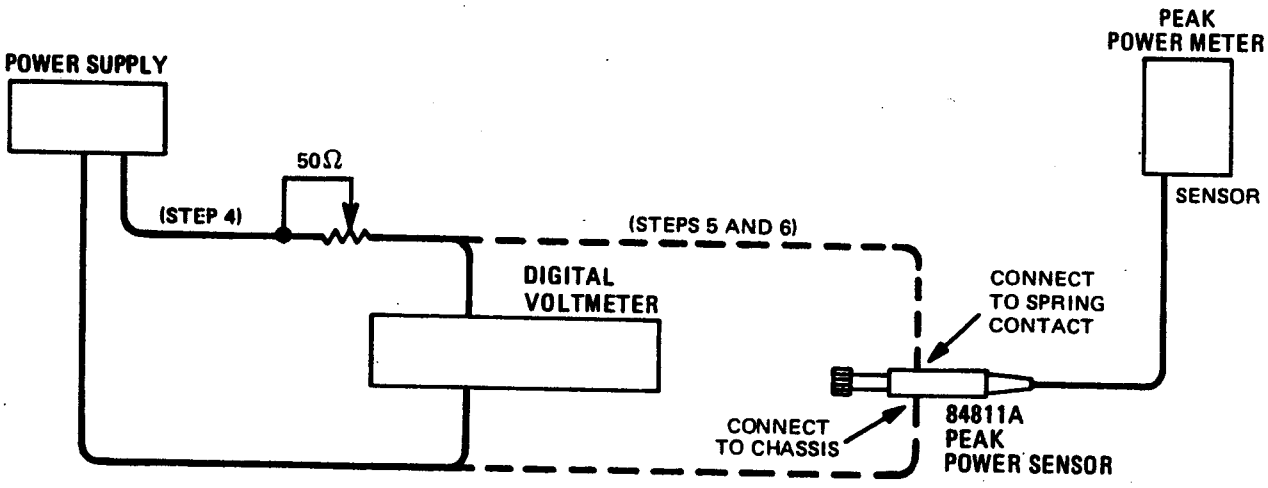

Figure 2. Power Supply and Gain (G) Adjustments Setup

Equipment

Peak Power Meter	HP 8900C/D
Digital Voltmeter	HP 3455A
Power Supply	HP 6203B
50 ohm potentiometer	HP 2100-0671

Procedure

1. Turn on all equipment and allow at least one half-hour warmup period. Remove both side covers from the peak power meter.
2. Set the peak power meter's front panel CORRECTION control to 50. Connect the digital voltmeter between the +5.2 V test point in the peak power meter and chassis ground. The voltage measured at the test point should be 5.20 ±0.01 Vdc. Connect the digital voltmeter to the −5.4 V test point in the peak power meter. The voltage measured should be −5.40 ±0.01 Vdc. If either of the two previous voltages are out of limits, refer to the Peak Power Meter operating and service manuals for adjustment procedures.
3. Connect the digital voltmeter between the terminal with the green wire on the CORRECTION control, in the peak power meter and chassis ground. There should be no input applied to the Sensor. Adjust the OFS potentiometer for a digital voltmeter reading of 0.0000 ±0.0005 Vdc.
4. Connect the 50 ohm potentiometer in series with the negative power supply output terminal (see Figure 2). Connect the digital voltmeter between the output of the potentiometer and the return terminal of the power supply. Adjust the power supply for a reading of −1.35 ±0.01 Vdc.
5. Connect the potentiometer output to the spring contact on the input to the Sensor Amplifier Assembly, A1. Connect the return line to chassis ground. Keep the digital voltmeter connected as above. Adjust the potentiometer for a reading of −1.2744 ±0.0005 Vdc.
6. Connect the digital voltmeter between the green wire on the CORRECTION control and chassis ground on the peak power meter. Adjust the G potentiometer for a voltage reading of −0.5562 ±0.0005 Vdc.

REPLACEABLE PARTS

Table 3 is a list of replaceable parts. Figure 3 is the illustrated parts breakdown (IPB) that identifies the major assemblies and chassis parts. The mounting locations of the components on the A1 Input Amplifier Assembly are shown in Figure 4. To order a part, quote the Hewlett-Packard part number and Check Digit (CD), specify the quantity required, and address the order to the nearest Hewlett-Packard office (see NOTE below). To order a part not listed in Table 3, give the instrument model number, instrument serial number, the description and function of the part, and the quantity of parts required.

NOTE

Within the USA, it is better to order directly from the HP Parts Center in Mt. View, California. Ask your nearest HP office for information and forms for the "Direct Mail Order System".

Table 3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Manufacturer Part Number
A1	84811-60101	1	1	INPUT AMPLIFIER BOARD ASSEMBLY	28480	84811-60101
	3030-0422	8		SCREW-SKT HD CAP 0-80 .188 IN-LG SST-302 (USED TO MOUNT THE A1 ASSEMBLY)	28480	3030-0422
A1C1	0160-0576	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C2	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C3	0160-4526	3	1	CAPACITOR-FXD 42PF +-5% 200VDC CER 0+-30	28480	0160-4526
A1C4	0160-4491	1	1	CAPACITOR-FXD 8.2PF +-5% 200VDC CER	28480	0160-4491
A1CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1902-0050
A1J1	84811-80002	3	1	CONTACT-FINGER	28480	84811-80002
A1L1	9100-2256	5	1	INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A1Q1	1854-0457	3	2	TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0457
A1Q2	1854-0457	3		TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0457
A1Q3	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A1Q4	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A1R1	0698-7210	7	1	RESISTOR 82.5 1% .05W F TX=0+-100	24546	C3-1/8-TO-82R5-F
A1R2	0698-7228	7	1	RESISTOR 464 1% .05W F TC=0+-100	24546	C3-1/8-TO-464R-F
A1R3	0698-7268	5	1	RESISTOR 21.5K 1% .05W F TC=0+-100	24546	C3-1/8-TO-2152-F
A1R4	0698-7239	0	1	RESISTOR 1.33K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1331-F
A1R5	0698-7231	2	1	RESISTOR 619 1% .05W F TC=0+-100	24546	C3-1/8-TO-619R-F
A1R6	2100-2216	0	1	RESISTOR-TRMR 5K 10% C TOP-ADJ 1 TRN	73138	82PR5K
A1R7	0698-7248	1	1	RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-TO-3161-F
A1R8	2100-1986	9	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	73138	81PR1K
A1R9	0698-7229	8	1	RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-TO-511R-F
A1R10	0698-7216	3	1	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-TO-147R-F
A1R11	0698-7235	6	1	RESISTOR 909 1% .05W F TC=0+-100	24546	C3-1/8-TO-909R-F
A1R12	0698-7242	5	1	RESISTOR 1.78K 1% .05W F TC=0+-100	24546	C3-1/8-TO-1781-F
A1R13	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-TO-51R1-F
A1R14	0698-7205	0	1	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A1R15	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-TO-111-F
A1RT1	0837-0180	2	1	THERMISTOR 1K-OHM	01295	TSP102J
J1	84811-60004	3	1	RF CONNECTOR - REPLACEMENT ASSEMBLY (INCLUDES U2 ONLY)	28480	84811-60004
MP1	84811-20006	1	1	WASHER-CAP	28480	84811-20006
MP2	7121-1514	8	1	LABEL-INFO (CAUTION) 84811A	28480	7121-1514
MP3	08481-40002	9	2	SHELL-PLASTIC	28480	08481-40002
MP4	08481-40002	9		SHELL-PLASTIC	28480	08481-40002
MP5				NOT ASSIGNED		
MP6				NOT ASSIGNED		
MP7	08481-20011	8	2	CHASSIS	28480	08481-20011
MP8	08481-20011	8		CHASSIS	28480	08481-20011
MP9	08481-00002	5	2	SHIELD	28480	08481-00002
MP10	08481-00002	5		SHIELD	28480	08481-00002
MP11	2950-0043	8	1	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
MP12	2190-0016	3	1	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
MP13	5021-0801	0	1	POLYIRON-RING	28480	5021-0801
MP14-MP25	3030-0954	9	8	SCREW-SET 1/4-20 2-IN-LG CUP-PT STL	28480	3030-0952
		8	4			
MP26	84811-20002	7	1	END CAP	28480	84811-20002
MP27	84811-20001	6	1	OUTPUT COVER	28480	84811-20001
MP28	7121-2422	9	1	LABEL-WARNING .315-IN-WD 2.745-IN-LG AL	28480	7121-2422
MP29	84811-80003	4	1	LABEL-ID	28480	84811-80003
MP30	08486-80001	7	1	LABEL CAL FACTOR (BLANK)	28480	08486-80001
MP31	08481-80005	6	1	MYLAR (COVERS CF LABEL)	28480	08486-80005
MP32	08486-80005	1	1	LABEL INFO (SIDE)	28480	7120-2422
MP33	7120-2422	7	1	LABEL-WARNING (SIDE)	28480	7120-2422
U1	84811-60003	2	1	DIODE MODULE-REPLACEMENT ASSEMBLY	28480	84811-60003
U2	84811-60005	4	1	REPLACEMENT DC BLOCK ASSEMBLY (PART OF J1)	28480	84811-60005
W1	8120-1788	7	1	CABLE ASSEMBLY (NON-REPAIRABLE)	28480	8120-1788

Table 4. Code List of Manufacturers

Mfr Code	Manufacturer Name	Address		Zip Code
00000	ANY SATISFACTORY SUPPLIER			
01295	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS	TX	75222
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ	85008
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA	16701
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA	94304
73138	BECKMAN INSTRUMENTS INC HELIPOT DIV	FULLERTON	CA	92634

SERVICE NOTE

Supersedes:
None

HP MODEL 84811A PEAK POWER SENSOR

All Serials

DIODE MODULE REPLACEMENT ASSEMBLY

The HP part number 84811-60003 Diode Module Replacement Assembly is used to replace a defective diode in the Peak Power Sensor. A new Correction Factor label is supplied in the Replacement Assembly to assure proper calibration when the diode is replaced. The contents of the replacement assembly kit are listed in Table 1.

Table 1. Parts List for HP 84811-60003

Qty	Description	HP Part No.
1	Connector	1251-1556
1	Contact Sleeve Note: Connector and Contact Sleeve are pre-soldered together	84811-20004
1	Label, Caution	7121-1514
1	Label, Correction Factor	
1	Diode Module	
1	Service Note	84811-90008

1 Disconnect the Peak Power Sensor from the Peak Power Meter.

2. Disassemble the Peak Power Sensor by performing the following steps:

a. Insert the blade of a small screwdriver between the two piece plastic shell at the rear of the Peak Power Sensor. Gently pry the two pieces apart.

b. Proceed to the other side of the connector and again pry the cover sections apart. Remove the shells and the magnetic shields (9 and 10). (Item numbers refer to Figure 1).

c. Remove the four Allen cap screws (1, 2, 3 and 4).

d. Remove the connector bulkhead assembly from the sensor body.

e. Remove and discard the Caution label on the connector barrel. (A new one is supplied.)

f. Place the bulkhead flange in a vise.

g. Using soft-jaw pliers, such as Utica 529-10C, loosen the RF connector assembly by grasping the connector barrel at point 5.

h. Remove the diode (8), and associated contacts.

i. Apply new contacts (6 and 7), supplied presoldered in the replacement kit, to the new diode. Insert the new diode and contacts into the bulkhead.

j. Reassemble by reversing steps a through d, f and g.

CAUTION

The four allen cap screws must not be torqued to greater than 13 in.–ozs. The connector barrel should be torqued to 30 in.–lbs maximum.

k. Apply the new Caution label (11), in the same location as the label removed in step e.

l. Apply the new Correction Factor label (12), over the existing label.

3. Check for proper operation of the Peak Power Sensor either by use or by performing the Performance Tests in the Operating and Service Manual.

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HP Part No. 84811-90008

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SERVICE

Service instructions consist of principles of operation, troubleshooting, and repairs. Test equipment which meets or exceeds the critical specifications in Table 2 may be used in place of the recommended instruments for troubleshooting the Peak Power Sensor.

Principles of Operation

For the following discussion, refer to the schematic diagram in Figure 5.

RF Detector. The rf signal is applied to the Schottky diode which produces a dc voltage that is proportional to the rf input.

Input Amplifier (A1). The main function of the Input Amplifier is to match the diode's output impedance to the 50Ω cable W1. The impedance must be matched to reduce ringing caused by any mismatch.

The diode output load helps to flatten the voltage-to-power response of the diode and reduce the effect of temperature variance.

The 20 MHz low pass filter prevents high frequency signals from changing the bias points of the differential amplifier. The differential amplifier has a gain of slightly less than 0.5. Q1 and Q2 amplify the current.

Troubleshooting

Troubleshooting the HP 84811A Peak Power Sensor consists of checking the amplifier, the detector diode, and the input capacitor. After a repair has been completed, refer to the Peak Power Sensor Performance Test to verify that the instrument meets specifications.

The amplifier circuitry is shown in Figure 5. Figure 4 is the printed circuit locator. To static check the amplifier, perform the following (refer to Figure 1):

1. Insert the blade of a small screwdriver between the two piece plastic shell at the rear of the Peak Power Sensor. Gently pry the two pieces apart. Pry the other side of the shell apart and remove the cover sections. (see Figure 3.)

2. Remove the four Allen screws from the bulkhead flange, then remove the flange and barrel assembly from the instrument.

3. Connect the Sensor to an 8900C/D Peak Power Meter.

4. Apply −1.27 volts to the spring contact (see Figure 3).

5. Check for approximately 100 milliwatts displayed on the 8900C/D. This indicates that the amplifier circuitry is functional.

If the amplifier circuitry is not functional, use Figures 4 and 5 to troubleshoot the Sensor. If the amplifier is functional, the problem is either the detector diode or the input capacitor.

Refer to the Diode Module Replacement Assembly instructions to remove diode U1 from the connector barrel, and to replace the diode. This diode can be tested using a curve tracer set to 5 millivolts and 5 microamps deflection. The origin resistance should be about 1 to 2k Ohms in the forward direction at room temperature.

If the amplifier and the diode are functioning, replace the RF connector assembly J1. This assembly, which includes the input capacitor, can be replaced as follows (refer to Figure 2):

1. Using a 9/16 inch wrench, remove the RF connector from the connector barrel. Use a spanner wrench to hold the connector barrel while removing the connector.

2. Connect the new RF connector to the connector barrel.

Diode Module Replacement

1. Disconnect the Peak Power Sensor from the Peak Power Meter.

2. Disassemble the Peak Power Sensor by performing the following steps:

   a. Insert the blade of a small screwdriver between the two piece plastic shell at the rear of the Peak Power Sensor. Gently pry the two pieces apart.

   b. Proceed to the other side of the connector and again pry the cover sections apart. Remove the shells and the magnetic shields (refer to Figure 5).

   c. Remove the four Allen cap screws.

d. Remove the connector bulkhead assembly from the sensor body.

e. Remove and discard the Caution label on the connector barrel. (A new one is supplied.)

f. Place the bulkhead flange in a vise.

g. Using soft-jaw pliers, such as Utica 529-10C, loosen the RF connector assembly by grasping the connector barrel.

h. Remove the diode module, and associated contacts.

i. Apply new contacts, supplied presoldered in the replacement kit, to the new diode. Insert the new diode and contacts into the bulkhead.

j. Reassemble by reversing steps a through d, f and g.

CAUTION

The four allen cap screws must not be torqued to greater than 13 in.-ozs. The connector barrel should be torqued to 30 in.-lbs. maximum.

k. Apply the new Caution label, in the same location as the label removed in step e.

l. Apply the new Correction Factor label, over the existing label.

3. Check for proper operation of the Peak Power Sensor either by use or by performing the Performance Tests in the Operating and Service Manual.

A1 ASSEMBLY

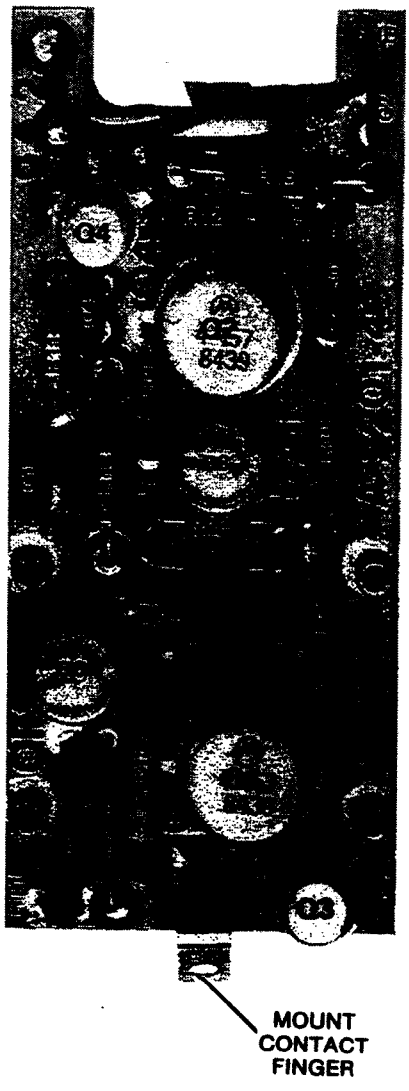

Figure 4. Component Locator

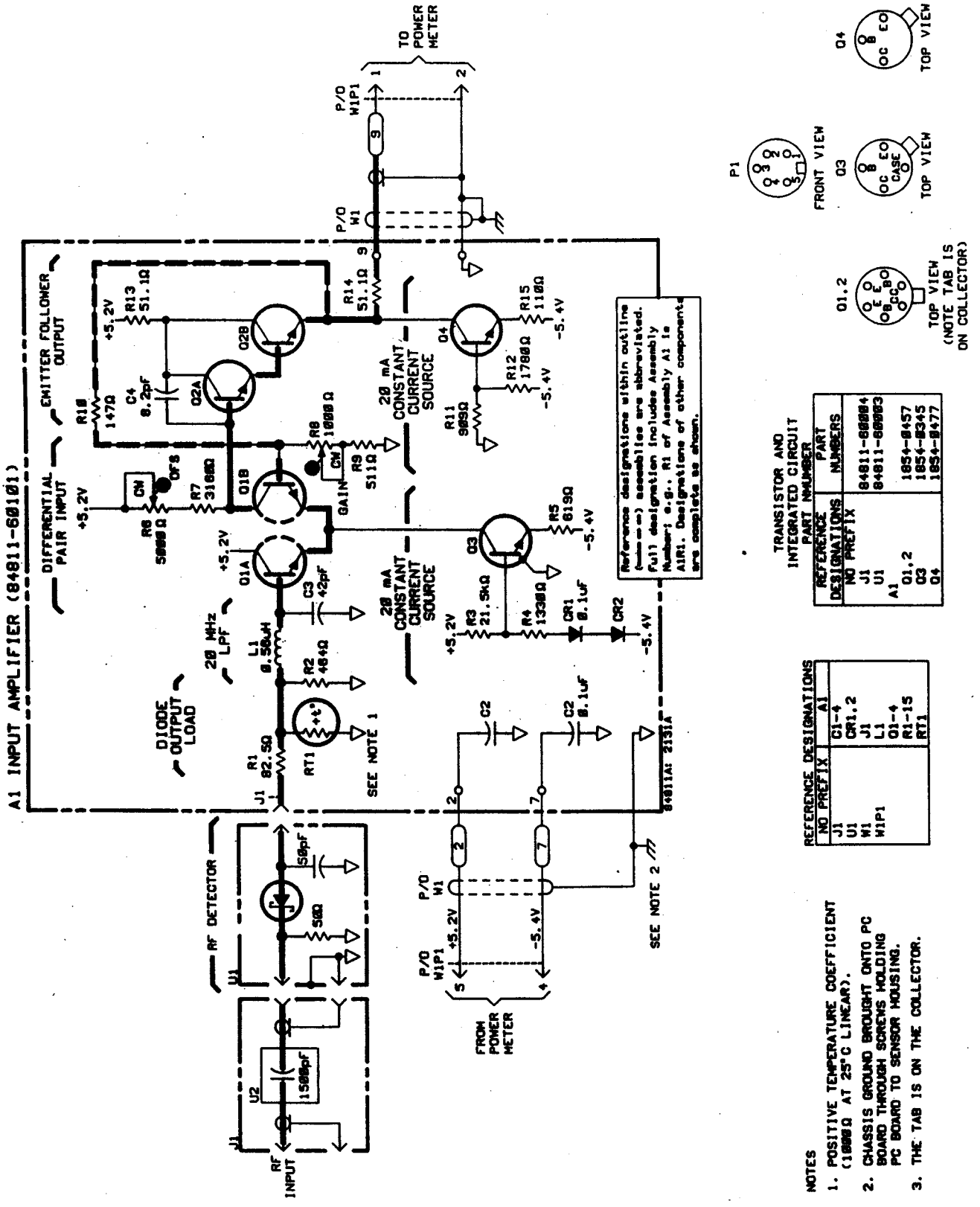

Figure 5. Peak Power Sensor Schematic Diagram

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