

DESCRIPTION

HP 83596A RF Plug-in

The HP 83596A is an RF plug-in designed for use with the HP 8350 sweep oscillator. The standard HP 83596A covers the frequency range of 2.4 to 40 GHz, with a maximum leveled power of +4 dBm from 2.4 to 18.6 GHz, and 0 dBm from 18.6 to 40 GHz.

HP 83597A RF Plug-in

The HP 83597A is an RF plug-in designed for use with the HP 8350 sweep oscillator. The standard HP 83597A covers the frequency range of 0.01 to 40 GHz, with a maximum leveled power of +4 dBm from 0.01 to 18.6 GHz, and 0 dBm from 18.6 to 40 GHz.

Adapters Supplied With Plug-in

The adapters supplied with this plug-in are intended for use as RF output connector savers. Depending on which adapter is used, the RF output connector can be converted to 2.4 mm (f) or K (f). The 2.4 mm connector can only be mated with other 2.4 mm connectors; the K connector can be mated with either 3.5 mm or SMA connectors. Refer to the Microwave Connector Care Manual for information on cleaning and gaging the connectors.

OPTIONS

Option 004 – Rear Panel RF Output*

An Option 004 instrument has the RF output connector and the EXT/MTR ALC input connector on the rear panel instead of the front panel.

Option W30 – Extended Service

Option W30 adds two additional years of return-to-HP hardware support, to follow the first year of warranty. Option W30 can be ordered at the time of sale only. Instruments ordered with Option W30 are identified on the serial number label, or on a special identification label supplied with the instrument.

Option 910 – Extra Operating and Service Manual

A standard instrument is supplied with one operating and service manual. Option 910 provides an additional operating and service manual. To order extra manuals after the initial shipment, use the manual part number listed on the title page and rear cover of this manual.

Option 002 – 60 dB Attenuator*

Option 002 instruments have a digitally controlled attenuator positioned just before the RF output. Up to 60 dB of attenuation (in 10 dB steps) is automatically selected, as required, to obtain the output power indicated on the RF plug-in.

*Options 002 and 004 may not be combined.

SPECIFICATIONS

Table 1-1 lists instrument specifications. These specifications are the performance standards or limits against which the instrument is tested. Specifications apply after one hour warm-up. Table 1-2 lists supplemental performance characteristics. These are not specifications, but are intended to provide additional information useful to your application by giving typical (but not warranted) performance parameters.

The shaded areas in Table 1-1 and Table 1-2 show specifications and supplemental performance characteristics that apply to the HP 83597A *only*.

Table 1-1. Specifications (1 of 2)

	Band 0	Band 1	Band 2	Band 3	Band 4	Full Band
Frequency Characteristics¹						
Range HP 83597A HP 83596A	0.01-2.4 GHz	2.4-7.0 GHz 2.4-7.0 GHz	7.0-13.5 GHz 7.0-13.5 GHz	13.5-20.0 GHz 13.5-20.0 GHz	20.0-40.0 GHz 20.0-40.0 GHz	0.01-40.0 GHz 2.4-40.0 GHz
Accuracy (20 to 30°) CW Mode: All Sweep Modes ² : Frequency Markers ² :	± 5 MHz ± 15 MHz ± 15 MHz ± 0.5% of sweep width	± 5 MHz ± 20 MHz ± 20 MHz ± 0.5% of sweep width	± 10 MHz ± 25 MHz ± 25 MHz ± 0.5% of sweep width	± 10 MHz ± 30 MHz ± 30 MHz ± 0.5% of sweep width	± 20 MHz ± 50 MHz ± 50 MHz ± 0.5% of sweep width	± 75 MHz ± 75 MHz ± 0.5% of sweep width
Stability With 10 dB Power Change: Residual FM (peak)⁵:	± 100 kHz <5 kHz	± 100 kHz <5 kHz	± 100 kHz <7 kHz	± 100 kHz <9 kHz	± 200 kHz <18 kHz	—
Output Characteristics						
Maximum Leveled Power (20 to 30°C)^{6,11}	2.5 mW	2.5 mW	2.5 mW	2.5 mW (<18.6 GHz) 1 mW (>18.6 GHz)	1 mW	—
Power Level Accuracy (20 to 30°C)^{7,8}:	± 1.5 dB	± 1.3 dB	± 1.3 dB	± 1.4 dB	± 2.0 dB	± 2.0 dB
Power Variation (20 to 30°C)⁸:	± 0.9 dB	± 0.7 dB	± 0.7 dB	± 0.8 dB	± 1.2 dB	± 1.3 dB
Power Sweep Calibrated Range:	>19 dB	>19 dB	>19 dB	>19dB (<18.6 GHz) >15 dB (>18.6 GHz)	>15 dB	—
Spurious Signals⁹ Harmonics and Subharmonics:	<-25 dBc (<1.5 GHz) <-50 dBc (>1.5 GHz)	<-50 dBc	<-50 dBc	<-50 dBc	<-40 dBc	—
Non-harmonics:	<-25 dBc	<-50 dBc	<-50 dBc	<-50 dBc	<-50 dBc	—

1 Unless otherwise noted, all specifications are at the RF OUTPUT connector and at 0° to 55°C

2 For sweep times >100ms.

3 With respect to SWEEP OUT voltage

4 In 10 minute period after one hour warm-up at selected CW frequency

5 10 Hz to 10 kHz bandwidth, CW mode with CW filter on

6 Typically degrades 0.1 dB/°C above 25°C

7 Includes power level variations

8 Degrades typically ±0.05 dB/°C outside the 20° to 30°C range

9 At specified maximum leveled power

10 For sweep times >10 sec and >2.5 sec/GHz

11 Includes options 002 and 004

Table 1-1. Specifications (2 of 2)

Modulation¹		
External FM:		
Maximum Deviations for Modulation Frequencies		
Modulation Frequencies	Cross-Over Coupled	Direct Coupled
DC to 100 Hz	± 75 MHz	± 12 MHz
100 Hz to 1 MHz	+ 7 MHz	+ 7 MHz
1 MHz to 2 MHz	± 5 MHz	± 5 MHz
2 MHz to 10 MHz	± 1 MHz	± 1 MHz
External AM Maximum Input: 15V		
Internal AM Selectable (by internal jumper in HP 8350) to 1 kHz or 27.8 kHz square-wave modulation. On/Off Ratio: <30 dB below specified maximum leveled power Symmetry: 40/60		
Minimum Settable Power: -15 dBm		
Attenuator Accuracy: 0.01 to 40.0 GHz; + or - dB referenced from the 0 dB setting.		
Attenuator Step (dB)	Accuracy (dB)	
10	0.4	
20	0.4	
30	0.6	
40	0.7	
50	0.9	
60	1.1	
Note: There is no decrease in the specified output power of the plug-in when option 002 is installed. Option 002 and option 004 (rear panel output) may not be combined.		
General Specifications¹		
Minimum Sweep Time: 30 ms (single band) 75 ms (<20 GHz sweep width) 150 ms (>20 GHz sweep width)		
Band Switch Points: Internal band switch points at approximately 2.4 GHz (HP 83597A only), 7.0 GHz, 13.5 GHz, and 20.0 GHz		
RF Output Connector: 2.4 mm male		
<p>1 Unless otherwise noted, all specifications are at the RF OUTPUT connector and at 0° to 55°C</p> <p>2 For sweep times >100ms.</p> <p>3 With respect to SWEEP OUT voltage</p> <p>4 In 10 minute period after one hour warm-up at selected CW frequency</p> <p>5 10 Hz to 10 kHz bandwidth, CW mode with CW filter on</p> <p>6 Typically degrades 0.1 dB/°C above 25°C</p> <p>7 Includes power level variations</p> <p>8 Degrades typically ± 0.05 dB/°C outside the 20° to 30°C range</p> <p>9 At specified maximum leveled power</p> <p>10 For sweep times >10 sec and >2.5 sec/GHz</p>		

Table 1-2. Supplemental Characteristics (1 of 2)

SUPPLEMENTAL CHARACTERISTICS						
NOTE: Values in this table are not specifications, but are typical characteristics included for user information.						
	Band 0	Band 1	Band 2	Band 3	Band 4	Full Band
Frequency Characteristics						
Linearity³	≤ ±2MHz	≤ ±2MHz	≤ ±4MHz	≤ ±6MHz	≤ ±10MHz	≤ ±15MHz
Stability						
With Temperature (per °C)	±200kHz	±200kHz	±400kHz	±600kHz	±1.2MHz	
With 3:1 Load SWR	±100kHz	±100kHz	±100kHz	±100kHz	±100kHz	
With Time ⁴	±100kHz	±100kHz	±200kHz	±300kHz	±600kHz	
Output Characteristics¹						
Power Output Resolution						
Displayed: 0.1 dB						
Programmable/settable: ±0.01 dB						
Power Variation						
Externally Leveled (excluding coupler/detector variation)						
Negative Crystal detector ^{2,8} or HP 432 A/B/C, 436A or 438A Power Meter: ±0.2dB ¹⁰						
Power Sweep						
Accuracy (including linearity): ±1.5 dB						
Resolution (displayed): 0.1 dB						
Power Slope						
Calibrated Range: up to 5 dB/GHz, up to 15 dB for full sweep						
Linearity: 0.2 dB						
Resolution (displayed): 0.01 dB/GHz						
Residual AM in 100 kHz Bandwidth: -50 dBc						
Source Output VSWR (50Ω, nominal impedance): <2.0:1						
<p>1 Unless otherwise noted, all specifications are at the RF OUTPUT connector and at 0° to 55°C</p> <p>2 For sweep times >100ms.</p> <p>3 With respect to SWEEP OUT voltage</p> <p>4 In 10 minute period after one hour warm-up at selected CW frequency</p> <p>5 10 Hz to 10 kHz bandwidth, CW mode with CW filter on</p> <p>6 Typically degrades 0.1 dB/°C above 25°C</p> <p>7 Includes power level variations</p> <p>8 Degrades typically ±0.05 dB/°C outside the 20° to 30°C range</p> <p>9 At specified maximum leveled power</p> <p>10 For sweep times >10 sec and >2.5 sec/GHz</p>						

Table 1-2. Supplemental Characteristics (2 of 2)

Modulation Characteristics¹	
External AM	
Frequency Response: 100 kHz	
Input Impedance: 25 k Ω	
Range of Amplitude Control: 15 dB	
Sensitivity: Typically 1 dB/V	
Pulse In	
TTL compatible: logic high = RF on, logic low = RF off	
Rise/Fall Time: typically 50 ns	
Minimum Pulse Width:	
Leveled: typically 1.5 μ s	
Unleveled Power level set to +15 dBm: 1 μ s	
On/off ratio: typically >60 dB	
External FM	
Frequency Response: ± 3 dB (DC to 2 MHz)	
Sensitivity (switch selectable)	Typically -20 MHz/V (FM Mode)
	Typically -6 MHz/V (Phase-Lock Mode)
Input Impedance: 2k Ω nominal	
General Characteristics¹	
Frequency Reference Output: selectable; 0.5V/GHz (0.01 to 38 GHz) or 0.25V/GHz (0.01 to 40 GHz), ± 25 mV (<2.4 GHz) or ± 100 mV (>2.4 GHz).	
Auxiliary Output: rear panel 2.3 to 7 GHz fundamental oscillator output, nominally 0 dBm.	
Weight: Net 6.5 kg (14.4 lb.); Shipping 9.5 kg (21 lb.)	
<p>1 Unless otherwise noted, all specifications are at the RF OUTPUT connector and at 0° to 55°C</p> <p>2 For sweep times >100ms.</p> <p>3 With respect to SWEEP OUT voltage</p> <p>4 In 10 minute period after one hour warm-up at selected CW frequency</p> <p>5 10 Hz to 10 kHz bandwidth, CW mode with CW filter on</p> <p>6 Typically degrades 0.1 dB/°C above 25°C</p> <p>7 Includes power level variations</p> <p>8 Degrades typically ± 0.05 dB/°C outside the 20° to 30°C range</p> <p>9 At specified maximum leveled power</p> <p>10 For sweep times >10 sec and >2.5 sec/GHz</p>	