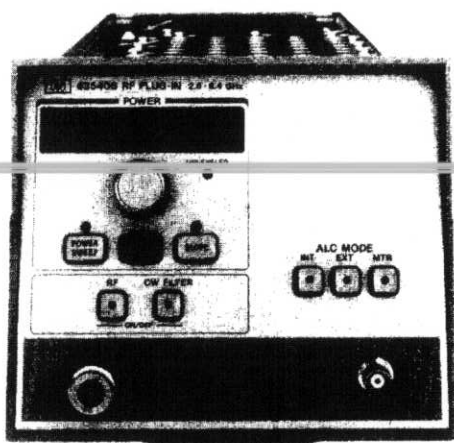


# SWEEP OSCILLATORS

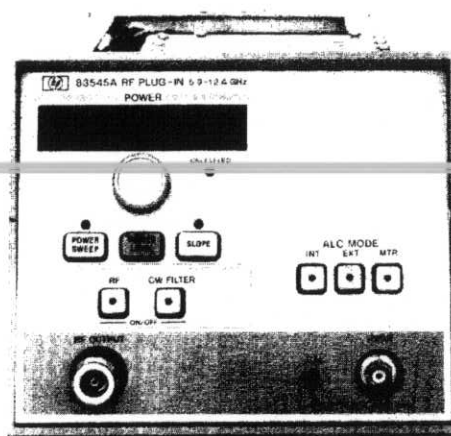
## Model 8350 Series: RF Plug-Ins

Models 83540A, 83540B and 83545A

- HP 83540A: 40 mW internally leveled 2–8.4 GHz output
- HP 83545A: 50 mW internally leveled 5.9–12.4 GHz output
- HP 83540B: < –45 dBc harmonics 2–8.4 GHz output
- Calibrated output power with 0.1 dB resolution
- Power sweep
- Complete HP-IB programmability



HP 83540B



HP 83545A

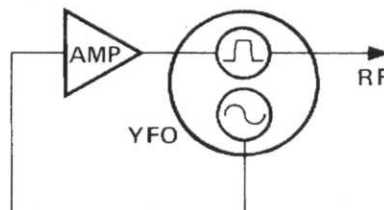


### HP 83540A/B

High power, high performance, straddle band frequency coverage from 2–8.4 GHz is provided by the HP 83540 plug-ins. The output power is leveled at a minimum of 16 dBm from the HP 83540A and 13 dBm from the HP 83540B with variations less than 1 dB. The calibrated power output range is 15 dB which may be extended to >80 dB with Option 002 (70 dB Step Attenuator). These plug-ins also feature Power Sweep which allows realtime power response measurements to be made in a single test. Another power function is slope compensation which adjusts for high frequency cable or test set losses. All plug-in features are completely HP-IB programmable. The frequency outputs are accurate within 8 MHz while maintaining a full band linearity typically within 0.1%. In addition to its sweeper functions, the HP 83540 is also directly compatible with the HP 8756A and the HP 8757A Scalar Network Analyzers, the HP 8510 and the HP 8410C Network Analyzers.

The HP 83540B gives emphasis to signal purity with 45 dBc harmonics for extended dynamic range in precision RF scalar measurement systems.

The clear, high power test signal of the HP 83540B is produced by employing a YIG-filtered oscillator (YFO). The YFO consists of a broadband, YIG-tuned, 2–8.4 GHz oscillator driving a 100 mW power amplifier followed by another YIG element to filter the signal. By incorporating both YIG elements within the same magnetic housing and controlling them simultaneously, a very accurate, pure and powerful RF test signal is achieved.



YIG-Tuned Oscillator



## HP 83545A

The HP 83545 plug-in features high performance 5.9-12.4 GHz frequency coverage with exceptionally high output power. The output power is internally leveled to at least 17 dBm, with power variations less than 0.6 dB. The calibrated output power has a range of 15 dB which is expandable to >80 dB with Option 002 (70 dB Step Attenuator). A power sweep function is available for power response measurements. In addition, the HP 83545 provides slope compensation and complete HP-IB programmability. The frequency output is accurate to 20 MHz with excellent stability and linearity (typically 0.1%). Network analysis is simplified since the HP 83545 provides 27.8 kHz internal modulation for direct compatibility with the HP 8756A and the HP 8757A Scalar Network Analyzers, and it is also directly compatible with the HP 8510 and the HP 8410C Network Analyzers.

### Frequency Characteristics

**Linearity:** (HP 83540A/B, 83545A)  $\pm 0.1\%$  typical

**Reference output:** (HP 83540A, 83545A) dc-coupled voltage proportional to RF frequency. Typically 1V/GHz with accuracy of  $\pm 25$  mV.

### Output Characteristics

**Power level accuracy:**  $\pm 1$  dB typical

**Option 002 (70 dB step attenuator):** (HP 83540A, 83545A)  $\pm 0.2$  dB/10 dB step typical

### RF Power Leveling

**Internal:** Selected by front panel switch; refer to chart for figures. Standard for HP 83540 and HP 83545.

#### External

**Crystal input:** approximately -10 to -200 mV for specified leveling at rated output; for use with negative polarity detectors such as HP 780 Series Directional Detectors, HP 423A/B and 424 series Crystal Detectors.

**Power meter input:** switch selects proper compensation for HP 432A/B/C, 436A, and 438A Power Meters.

**Indicator:** front panel indicator lights when RF power becomes unlevelled. Residual AM in 100 kHz bandwidth: >50 dBc

**Impedance:** 50  $\Omega$  nominal

### Power Sweep

**Calibrated range:**  $\geq 15$  dB

**With option 002:**  $\geq 14$  dB

**Accuracy:**  $\pm 1.5$  dB typical

**Resolution:** 0.1 dB

**Slope compensation:** compensates for high frequency power losses in external test sets by attenuating power at lower frequencies:

**Calibrated range:** up to 5 dB/GHz (10 dB max., typically 15 dB)

**Linearity:** <0.2 dB typical

**Resolution:** 0.01 dB/GHz

### General Specifications

**RF output connector:** type N female

**Sweep Time** (minimum over full band)

**HP 83540A/B** (2.0-8.4 GHz): 10 ms

**HP 83545A** (5.9-12.4 GHz): 10 ms

**Weight:** HP 83540A, 83545A: net, 4.5 kg (10 lb); shipping, 7.7 kg (17 lb).

### Improved Network Measurement Capabilities

The HP 83540A/B and 83545A are compatible with the:

HP 8510 Network Analyzer

HP 8410 Network Analyzer

HP 8755 Scalar Network Analyzer

HP 8756A Scalar Network Analyzer

HP 8757A Scalar Network Analyzer

HP 8970A Noise Figure Meter

HP 8709A Phase-lock Synchronizer

HP 5344S Source Synchronizer

### Frequency Characteristics

	HP 83540A	HP 83540B	HP 83545A
<b>Range:</b>	2-8.4 GHz	2-8.4 GHz	5.9-12.4 GHz
<b>Accuracy</b> (25°C $\pm 5^\circ$ C)			
CW Mode	$\pm 15$ MHz	$\pm 12$ MHz	$\pm 20$ MHz
Typical	$\pm 3.5$ MHz	$\pm 3.5$ MHz	$\pm 10$ MHz
All Sweep Modes: (for sweep time >100 msec)	$\pm 20$ MHz	$\pm 20$ MHz	$\pm 35$ MHz
<b>Stability</b>			
With Temperature:	$\pm 200$ kHz/ $^\circ$ C	$\pm 200$ kHz/ $^\circ$ C	$\pm 1.2$ MHz/ $^\circ$ C
With 10% Line Voltage Change:	$\pm 20$ kHz	$\pm 20$ kHz	$\pm 40$ kHz
With 10 dB Power Level Change:	$\pm 1$ MHz	$\pm 1$ MHz	$\pm 1.5$ MHz
With 3:1 Load SWR Change:	$\pm 250$ kHz	$\pm 250$ kHz	$\pm 250$ kHz
With Time: (in 10 minute time period after one hour warmup at the same frequency setting) Typ/10 min.	$\pm 200$ kHz	$\pm 200$ kHz	$\pm 200$ kHz
Residual FM: (in 10 Hz-10 kHz bandwidth, CW mode):	<9 kHz peak	<7 kHz	<15 kHz peak

### Output Characteristics

	>40 mW	>20 mW	>50 mW
Maximum Leveled Power (25°C $\pm 5^\circ$ C)	>40 mW	>20 mW	>50 mW
Opt 002 (70 dB step atten.)	>32 mW	>16 mW	>40 mW
<b>Power Variation</b> (At max. rated power)			
Internally Leveled:	< $\pm 1$ dB	< $\pm 1$ dB	< $\pm 0.6$ dB
Unleveled: Typically	< $\pm 2$ dB	< $\pm 2$ dB	< $\pm 3$ dB
Externally Leveled (Excluding coupler and detector variation):			
Crystal Detector or Power Meter	< $\pm 0.1$ dB	< $\pm 0.1$ dB	< $\pm 0.1$ dB
<b>Spurious Signals:</b> (Below fundamental at specified maximum power)			
Harmonically Related:	<-20 dBc	<-45 dBc	<-17 dBc
Typically:			
Non-Harmonics:	<-25 dBc	<-50 dBc	5.9-7 GHz
Source VSWR: 50 nominal impedance	<-60 dBc	<-60 dBc	<-30 dBc
Internally leveled:			
Unleveled: Typically	<1.6	<1.6	<1.6
	<2.5	<2.5	<2.5
<b>Modulation Characteristics</b>			
<b>External FM</b>			
Maximum Deviations for Modulation Frequencies			
DC to 100 Hz:	$\pm 75$ MHz	$\pm 75$ MHz	$\pm 75$ MHz
100 Hz to 1 MHz:	$\pm 7$ MHz	$\pm 7$ MHz	$\pm 7$ MHz
1 MHz to 2 MHz:	$\pm 5$ MHz	$\pm 5$ MHz	$\pm 5$ MHz
2 MHz to 10 MHz:	$\pm 1$ MHz	$\pm 1$ MHz	$\pm 1.5$ MHz
Sensitivity: Nominal			
FM Mode:	-20 MHz/V	-20 MHz/V	-20 MHz/V
Phase-lock Mode:	-6 MHz/V	-6 MHz/V	-6 MHz/V
<b>External AM</b>			
Input Impedance: nominal	10 k $\Omega$	10 k $\Omega$	10 k $\Omega$
Frequency Response: Typical	100 kHz	100 kHz	100 kHz
Range: Typical	15 dB	15 dB	15 dB
<b>Pulse Modulation</b>			
Rise/Fall Time: Typical	20 nsec	20 nsec	15 nsec
Minimum Pulse Width			
Leveled: Typical	1 $\mu$ sec	5 $\mu$ sec	1 $\mu$ sec
Unleveled: Typical	100 nsec	100 nsec	100 nsec
<b>Square Wave Response</b>			
On/Off Ratio: Typical	>30 dB	>30 dB	>40 dB
Symmetry: Typical	40/60	40/60	40/60
<b>Internal AM:</b>			
Selectable to 1 kHz or 27.8 kHz square wave (Guarantees HP 8755 Frequency Response Test Set compatibility)			
On/Off Ratio:	>30 dB	>30 dB	>40 dB

### Ordering Information

**HP 83540A** 2-8.4 GHz Plug-in

**HP 83540B** 2-8.4 GHz Plug-in

**HP 83545A** 5.9-12.4 GHz Plug-in

### Price

\$9,780

\$10,280

\$9,780

### Options

**002:** 70 dB Step Attenuator

**004:** Rear Panel RF Output Connector

add \$1,105

add \$200