Performance Specifications

Specifications describe the instrument's warranted performance. They are measured at the end of a 2m long patchcord and are valid for the output power and the wavelength ranges stated below.
Supplementary performance characteristics describe the instrument's non-warranted typical performance.

	HP 8167B	HP 8168D	HP 8168E	HP 8168F
Wavelength Range	1255nm to 1365nm	1490nm to 1565nm	1475nm to 1575nm	1450nm to 1590nm
Absolute Wavelength Accuracy, typ[1]	±0.1nm	±0.2nm	±0.1nm	
Relative Wavelength Accuracy	±0.035nm (1310-1350nm) ±0.050nm (1255-1365nm) typ ±0.001nm[2]	±0.1nm	±0.035nm, typ ±0.001nm[2]	±0.035nm (1475-1575nm) ±0.050nm (1450-1590nm), typ ±0.001nm[2]
Wavelength Resolution	0.001nm, 170MHz at 1300nm	0.1nm	0.001nm, 125MHz at 1550nm	
Wavelength Stability (typ over 1 hour at constant temperature)	<±100MHz	±1GHz	<±100MHz	
Wavelength Repeatability	±0.035nm (1310-1350nm) ±0.050nm (1255-1365nm) typ ±0.001nm[2]	±0.1nm	±0.035nm, typ ±0.001nm[2]	±0.035nm (1475-1575nm) ±0.050nm (1450-1590nm), typ ±0.001nm[2]
Sidemode Suppression Ratio, typ[3]	>40dB (1260-1360nm at -3dBm)	*n/a*	>40dB (1500-1570nm at 0dBm)	>50dB (1475-1575nm at 1dBm)
Source Spontaneous Emission[4]	<-45dB/0.1nm (1310-1350nm) <-40dB/0.1nm (1260-1360nm) <-35dB/0.1nm (1255-1365nm)	<-40dB/0.1nm (1500-1565nm) <-35dB/0.1nm (1490-1565nm)	<-45dB/0.1nm (1500-1570nm) <-35dB/0.1nm (1475-1575nm)	<-55dB/0.1nm (1520-1570nm) <-45dB/0.1nm (1475-1575nm) <-35dB/0.1nm (1450-1590nm)
Relative Intensity Noise (RIN), typ	<-145dB/Hz			
Linewidth (typ), coherence control off	100kHz			
Effective Linewidth (typ), coherence control on[5]	10-500MHz (1260-1360nm)	30-500MHz (1500-1565nm)	50 to 500MHz (1500-1570nm)	50 to 500 MHz (1475-1575nm)

[1] Measured with a wavelength meter in a vacuum.
[2] Performance when controlled with appropriate wavelength meter.
[3] Measured by heterodyning method. Reduce output power if options are attached.
[4] Measured with optical spectrum analyzer at 0.1nm resolution bandwidth at maximum specified output power.
[5] At power levels larger than CC uncal value.

	HP 8167B	HP 8168D	HP 8168E	HP 8168F
Tuning Speed (typ for a 1/10/100nm step)[6] [7]	200ms/300ms/2s			
with #003[8]	250ms/300ms/2s	*n/a*	250ms/300ms/2s	
Output Power [9]	> + 4dBm peak typ	> -3dBm peak typ	> + 1dBm peak typ	> + 8dBm peak typ
	> + 3dBm (1310-1350nm)	> -4dBm (1500-1565nm)	> 0dBm (1500-1570nm)	> + 7dBm (1520-1570nm)
	> -3dBm (1260-1360nm)	> -10dBm (1490-1565nm)	> -10dBm (1475-1575nm)	> 1dBm (1475-1575nm)
	> -7dBm (1255-1365nm)			> -7dBm (1450-1590nm)
for #023[8]	reduce by 1dB	*n/a*	reduce by 1dB	
for #003[8]	reduce by 1.5dB	*n/a*	reduce by 1.5dB	
for #007[8]	reduce by 1dB	reduce by 1dB	reduce by 1dB	
for #023 and #003[8]	reduce by 2.5dB	*n/a*	reduce by 2.5dB	
Minimum Output Power	-7dBm	-10dBm		-7dBm
with #003[8]	-47dBm	*n/a*	-50dBm	-47dBm
Power Linearity	±0.1dB			±0.1dB[10]
with #003[8]	±0.3dB[11]	*n/a*	±0.3dB	±0.3dB[10]
Power Stability (over 1 hour)	±0.03dB[12] (typ ±0.01dB)	±0.03dB (typ ±0.01dB)		
Power Repeatability (typ)	±0.04dB[11]	±0.04dB		±0.04dB[10]
Power Flatness	±0.1dB	±0.2dB	±0.1dB	±0.1dB[10]
versus Wavelength		typ ±0.1dB		(1475-1575nm)
				±0.2dB[10]
				(1450-1590nm)
with #003[8]	±0.2dB[12]	*n/a*	±0.2dB	±0.2dB[10]
				(1475-1575nm)
				±0.3dB[10]
				(1450-1590nm)

[6] Applicable for CW operation.
[7] The Tuning Speed increases when Modulation is on.
[8] Listed options are described in the Supplementary Performance Characteristics
[9] The Maximum power is lower when Modulation is on.
[10] For power settings below -3dBm (with option 003:P_{REF} <-3dBm, independent of attenuator setting, or power setting below -43dBm), the values shown may increase by up to 5 times.
[11] with option #003: at constant Relative Humidity (±5%)
[12] with option #003: at 1355.0 nm and 1359.5 nm, power may vary by up to ±0.25 typically, depending on ambient relative humidity and related water absorption.

Supplementary Performance Characteristics

Characteristics

- Output isolation (typ): 50dB
- Return loss (typ): 60dB (except option 021).

Operating Modes

Internal Modulation

Modulation frequency: 250Hz to 300kHz (squarewave)

Duty cycle: 50% fixed

Modulation depth: 100% (on/off)

Modulation output: TTL reference signal. Max power reduced by 1dB.

External modulation

Modulation frequency: 200kHz to 20MHz (at 3dB optical bandwidth, typ)

Modulation depth (max, typ): ±15%

Coherence Control

Effective linewidth of 50 to 500Mhz typ (30-500MHz typ for HP 8167B and HP 8168D).

For measurements on components with 2m long patchcords and connectors with 14dB return loss, the effective linewidth results in a typical power stability of <±0.025dB (<±0.1dB for HP 8167B and HP 8168D) over 1 minute by drastically reducing interference effects in the test setup.

General

Polarization maintaining fiber

Fiber type: Panda

Orientation T_E mode in slow axis, in line with connector key.

Polarization Extinction Ratio:

>15dB for HP8167B between 1310 and 1350nm, (>12dB over the full wavelength range).

>15dB for HP8168D over the full wavelength range;

>15dB for HP8168E/F between 1490 and 1575nm, (>12dB over the full wavelength range).

HP-IB Interface

HP-IB Interface function code: SH1, AH1, T6, L4, SR1, RL1, PP0, DC2, DT0, C0

Passive Component Test Software

Files and data can be stored on memory cards according to PCMCIA type 1, standard PCMCIA 1.0/JEIDA 4.0. Type 1 cards are 3.3mm thick. Recommended card capacity 512kByte.

Laser Class

HP8168D/E: Class 1 according to FDA 21 CFR 1040.10, Class 3A according to IEC 825-1 (1993).

HP 8167B and **HP 8168F:** Class IIIb according to FDA 21 CFR 1040.10, Class 3A according to IEC 825-1 (1993).

Analog output: provides output voltage proportional to optical output power (except #003).

Recalibration period: 2 years.

Warm-up time: typically <1 hour, can be used with reduced power in this phase.

Environmental

Altitude: up to 4,600m (15,000 feet).

Storage temperature: -40°C to +70°C

Operating temperature: 10°C to 35°C

Humidity: <95%R.H. (10°C to 35°C)

Installation Category (IEC 664): II

Pollution Degree (IEC 664): 2

Specifications are valid at non-condensing conditions.

Power: 100 to 240V_{rms}, ±10%. 260VA maximum.

Dimensions: 145mm H, 426mm W, 545mm D (5.8"×16.9"×21.6")

Weight: net 18kg (40lbs), shipping 21kg (46lbs).

Listed options

Option 003: built-in attenuator

Option 007: polarization maintaining Panda fiber

Option 021: straight contact output connector

Option 023: angled non-contact output connector

Other Specifications

Acoustic Noise Emission:

For ambient temperature up to 30°C
L_p = 40.2dB(A)
L_w = 4.8 Bel
Typical operator position,
normal operation.

Data are results from type tests per ISO 7779 (EN 27779).

Geräuschemissionswerte:

Bei einer Umgebungstemperatur bis 30°C
L_p = 40.2dB(A)
L_w = 4.8 Bel
am Arbeitsplatz,
normaler Betrieb.

Die Angabe ist das Ergebnis einer Typprüfung gemäß ISO 7779 (EN 27779).