

# Agilent 81663A DFB Laser 8165xA Fabry-Perot Lasers

## Data Sheet

### Introduction

The Agilent 81663A high power DFB Laser Source modules are best suited for optical amplifier test and DWDM system test applications.

The Agilent Fabry-Perot Laser Sources are available as single or dual wavelength sources, are insensitive to back reflections, and are stabilized for short and long term applications.

The DFB and FP Laser Source modules are part of the flexible Agilent Lightwave Solution platform and have a future-proof design that allows for easy firmware upgrades.



# Technical Specifications

## Fabry-Perot source module specifications (standard modules, 0 dBm)

Specifications apply to the end of a 2-m long fiber cable (as specified under fiber type) with Diamond® HMS-10/Agilent connectors attached. All specifications are valid for an attenuation setting of 0.0 dB. All modules require straight output connectors.

	Agilent 81650A	Agilent 81651A	Agilent 81654A
Type	Fabry-Perot Laser		
Center wavelength <sup>1</sup>	1310 nm ±15 nm	1550 nm ±15 nm	1310/1550 nm ± 15 nm
Fiber type	Single-mode 9/125 μm		
Spectral bandwidth (rms) <sup>1,2</sup>	< 3.5 nm	< 4.5 nm	< 3.5nm/ 4.5 nm
Output power	> 0 dBm (1 mW)		
CW power stability <sup>3,4</sup>			
Short term (15 minutes)	< ± 0.005 dB Typical < ±0.003 dB with coherence control active		
Long term (24 hours)	Typical ± 0.03 dB		
To back reflection (RL ≥ 14 dB)	Typical ± 0.003 dB		
Dimensions (H x W x D)			
	75 mm x 32 mm x 335 mm (2.8" x 1.3" x 13.2")		
Weight	0.5 kg		
Recalibration period	2 years		
Operating tempera- ture	0 °C to 45 °C		
Humidity	Non-condensing		
Warm-up time	60 minutes <sup>3</sup>		

Table 1. Technical specifications for Fabry-Perot source modules (standard modules, 0 dBm)

1. Center wavelength is shown on display
2. RMS: root mean square
3. Warm-up time 20 min, if previously stored at the same temperature.
4. Controlled environment ( $\Delta T = \pm 1\text{ }^{\circ}\text{C}$ )

## Supplementary Performance Specifications

### Internal digital modulation mode

270 Hz, 330 Hz, 1 kHz, 2 kHz  
and free selection 200 Hz to 10 kHz.  
All output signals are pulse shaped,  
duty cycle 50%.

Internal coherence control for line-  
width broadening.

### Output attenuation

The output power of all source mod-  
ules can be attenuated from 0 dB to  
6 dB in steps of 0.1 dB.

### Laser safety information

All laser sources listed above are  
classified as Class 1 according to  
IEC 60825 1 (2001). All laser sources  
comply with 21 CFR 1040.10 except  
for deviations pursuant to Laser  
Notice No. 50, dated 2001-July-26.

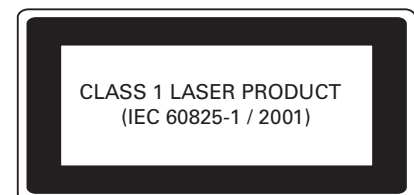


Figure 1. Laser classification label for Class 1

# Technical Specifications

## Fabry-Perot source module specifications (high-power modules, 13 dBm)

Specifications apply to the end of a 2 m long fiber cable (as specified under fiber type) with Diamond® HMS-10/Agilent connectors attached. All specifications are valid for an attenuation setting of 0.0 dB. All modules require straight output connectors.

	Agilent 81655A	Agilent 81656A	Agilent 81657A
Type	Fabry-Perot Laser		
Center wavelength <sup>1</sup>	1310 nm ±15 nm	1550 nm ±15 nm	1310/1550 nm ± 15 nm
Fiber type	Standard single-mode 9/125 μm		
Spectral bandwidth (rms) <sup>1,2</sup>	< 5.5 nm	< 7.5 nm	< 5.5nm/7.5 nm
Output power	> +13 dBm (20 mW)		
CW power stability <sup>3,4</sup>			
Short term (15 minutes)	< ± 0.005 dB Typical < ±0.003 dB with coherence control active		
Long term (24 hours)	Typical ± 0.03 dB		
To back reflection (RL ≥ 14 dB)	Typical ± 0.003 dB		
Dimensions (H x W x D)			
	75 mm x 32 mm x 335 mm (2.8" x 1.3" x 13.2")		
Weight	0.5 kg		
Recalibration period	2 years		
Operating temperature	0 °C to 45 °C		
Humidity	Non-condensing		
Warm-up time	60 minutes <sup>3</sup>		

Table 2. Technical specifications for Fabry-Perot source modules (high-power modules, 13 dBm)

- Center wavelength is shown on display
- RMS: root mean square
- Warm-up time 20 min, if previously stored at the same temperature.
- Controlled environment ( $\Delta T = \pm 1 \text{ }^\circ\text{C}$ )

### Supplementary Performance Specifications

#### Internal digital modulation mode

270 Hz, 330 Hz, 1 kHz, 2 kHz  
and free selection 200 Hz to 10 kHz.  
All output signals are pulse shaped,  
duty cycle 50%.

Internal coherence control for line-  
width broadening.

#### Output attenuation

The output power of all source mod-  
ules can be attenuated from 0 dB to  
6 dB in steps of 0.1 dB.

#### Laser safety information

All laser sources listed above are  
classified as Class 1M according to  
IEC 60825 1 (2001). All laser sources  
comply with 21 CFR 1040.10 except  
for deviations pursuant to Laser  
Notice No. 50, dated 2001-July-26.



Figure 2. Laser classification label for Class 1M

# Technical Specifications

## DFB source module specifications

Specifications apply to maximum power setting.

	Agilent 81663A Option 131	Agilent 81663A Option 149	Agilent 81663A Option 151	Agilent 81663A Option 155	Agilent 81663A Option 162
Center wavelength <sup>12</sup>	1310 nm ± 5 nm	1490 nm ± 3 nm	1510 nm ± 3 nm	1550 nm ± 3 nm	1625 nm ± 3 nm

Agilent 81663A Options 131, 149, 151, 155, and 162	
Type	CW DFB laser with built-in isolator
Tuning range	Typical > ± 500 pm
Display resolution	10 pm
Repeatability <sup>4</sup>	± 5 pm (typical ± 2 pm)
Stability (15 minutes) <sup>3,4</sup>	± 5 pm (typical ± 2 pm)
Stability (24 hours) <sup>3,4</sup>	typical ± 5 pm
Fiber type	Panda PMF 9 / 125 μm
Output connector <sup>6</sup>	Compatible to angled contact APC, ASC, DIN47256/4108
<b>Power</b>	
Maximum output <sup>5</sup>	Typical > +13 dBm (20 mW)
CW stability (15 minutes) <sup>4</sup>	Typical ±0.003 dB
CW stability (24 hours) <sup>3,4</sup>	Typical ±0.01 dB
Side mode suppression ratio (SMSR) <sup>5</sup>	Typical 45 dB
Polarization extinction ratio (PER)	Typical > 20 dB
<b>Dimensions</b>	
Dimensions (H x W x D)	75 mm H x 32 mm W x 335 mm D (2.8" x 1.3" x 13.2")
Weight	0.5 kg
Recalibration period	2 years
Operating temperature	15 °C to 35 °C
Warm-up time <sup>3</sup>	60 minutes

**Table 3. Technical specifications for DFB source modules**

- Center wavelength is shown on display as default.
- Via GPIB tuning resolution < 10 pm.
- If previously stored at the same temperature 20 minutes.
- Controlled environment ( $\Delta T = \pm 1$  °C).
- At maximum power setting and default wavelength at the end of a 2 m SM patchcord.
- Connector interface not included.

## Supplementary Performance Characteristics

- Internal digital modulation mode: Free selection 200 Hz to 100 kHz. All output signals are pulse shaped duty cycle 50%.
- Internal coherence control for linewidth broadening.
- ON-switching with fast output power stabilization < 20 s.
- Output power "attenuation" at default wavelength 6 dB in steps of 0.1 dB. Tuning speed over full range 30 s.
- Polarization maintaining fiber orientation: TE mode in slow axis, in line with connector key.

## Laser safety information

The 81663A DFB Laser Sources listed above are classified as Class 1M according to IEC 60825 1 (2001).

All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26.



**Figure 3. Classification label for 1M lasers**



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