

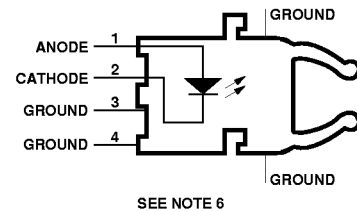
125 Megabaud Versatile Link Transmitter

HFBR-15X7 Series

Description

The HFBR-15X7 transmitters incorporate a 650 nanometer LED in a horizontal (HFBR-1527) or vertical (HFBR-1537) gray housing. The HFBR-15X7 transmitters are suitable for use with current peaking to decrease response time and can be used

with HFBR-25X6 receivers in data links operating at signal rates from 1 to 125 megabaud over 1 mm diameter plastic optical fiber or 200 μm diameter hard clad silica glass optical fiber. Refer to Application Note 1066 for details for recommended interface circuits.



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Reference
Storage Temperature	T_S	-40	85	$^{\circ}\text{C}$	
Operating Temperature	T_O	-40	70	$^{\circ}\text{C}$	
Lead Soldering Temperature			260	$^{\circ}\text{C}$	Note 1
Cycle Time			10	s	
Transmitter High Level Forward Input Current	$I_{F,H}$		120	mA	50% Duty Cycle $\geq 1 \text{ MHz}$
Transmitter Average Forward Input Current	$I_{F,AV}$		60	mA	
Reverse Input Voltage	V_R		3	V	

CAUTION: The small junction sizes inherent to the design of this component increase the component's susceptibility to damage from electrostatic discharge (ESD). It is advised that normal static precautions be taken in handling and assembly of this component to prevent damage and/or degradation which may be induced by ESD.

WARNING: WHEN VIEWED UNDER SOME CONDITIONS, THE OPTICAL PORT MAY EXPOSE THE EYE BEYOND THE MAXIMUM PERMISSIBLE EXPOSURE RECOMMENDED IN ANSI Z136.2, 1993. UNDER MOST VIEWING CONDITIONS THERE IS NO EYE HAZARD.

Electrical/Optical Characteristics 0 to 70°C, unless otherwise stated.

Parameter	Symbol	Min.	Typ. ^[2]	Max.	Unit	Condition	Note
Transmitter Output Optical Power, 1 mm POF	P_T	-9.5 -10.4	-7.0	-4.8 -4.3	dBm	$I_{F,dc} = 20 \text{ mA}$, 25°C 0-70°C	Note 3
Transmitter Output Optical Power, 1 mm POF	P_T	-6.0 -6.9	-3.0	-0.5 -0.0	dBm	$I_{F,dc} = 60 \text{ mA}$, 25°C 0-70°C	Note 3
Transmitter Output Optical Power, 200 μm HCS®	P_T	-14.6 -15.5	-13.0	-10.5 -10.0	dBm	$I_{F,dc} = 60 \text{ mA}$, 25°C 0-70°C	Note 3
Output Optical Power Temperature Coefficient	$\frac{\Delta P_T}{\Delta T}$		-0.02		dB/°C		
Peak Emission Wavelength	λ_{PK}	640	650	660	nm		
Peak Wavelength Temperature Coefficient	$\frac{\Delta \lambda}{\Delta T}$		0.12		nm/°C		
Spectral Width	FWHM		21		nm	Full Width, Half Maximum	
Forward Voltage	V_F	1.8	2.1	2.4	V	$I_F = 60 \text{ mA}$	
Forward Voltage Temperature Coefficient	$\frac{\Delta V_F}{\Delta T}$		-1.8		mV/°C		
Transmitter Numerical Aperture	NA		0.5				
Thermal Resistance, Junction to Case	θ_{jc}		140		°C/W		Note 4
Reverse Input Breakdown Voltage	V_{BR}	3.0	13		V	$I_{F,dc} = -10 \mu\text{A}$	
Diode Capacitance	C_O		60		pF	$V_F = 0 \text{ V}$, $f = 1 \text{ MHz}$	
Unpeaked Optical Rise Time, 10% - 90%	t_r		12		ns	$I_F = 60 \text{ mA}$ $f = 100 \text{ kHz}$	Figure 1 Note 5
Unpeaked Optical Fall Time, 90% - 10%	t_f		9		ns	$I_F = 60 \text{ mA}$ $f = 100 \text{ kHz}$	Figure 1 Note 5

Notes:

- 1.6 mm below seating plane.
- Typical data is at 25°C.
- Optical Power measured at the end of 0.5 meter of 1 mm diameter plastic or 200 μm diameter hard clad silica optical fiber with a large area detector.
- Typical value measured from junction to PC board solder joint for horizontal mount package, HFBR-1527. θ_{jc} is approximately 30°C/W higher for vertical mount package, HFBR-1537.
- Optical rise and fall times can be reduced with the appropriate driver circuit; refer to Application Note 1066.
- Pins 5 and 8 are primarily for mounting and retaining purposes, but are electrically connected; pins 3 and 4 are electrically unconnected. It is recommended that pins 3, 4, 5, and 8 all be connected to ground to reduce coupling of electrical noise.
- Refer to the Versatile Link Family Fiber Optic Cable and Connectors Technical Data Sheet for cable connector options for 1 mm plastic optical fiber and 200 μm HCS fiber.
- The LED current peaking necessary for high frequency circuit design contributes to electromagnetic interference (EMI). Care must be taken in circuit board layout to minimize emissions for compliance with governmental EMI emissions regulations. Refer to Application Note 1066 for design guidelines.

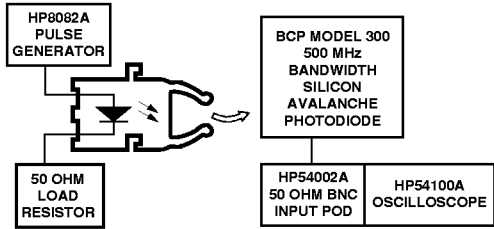


Figure 1. Test Circuit for Measuring Unpeaked Rise and Fall Times.

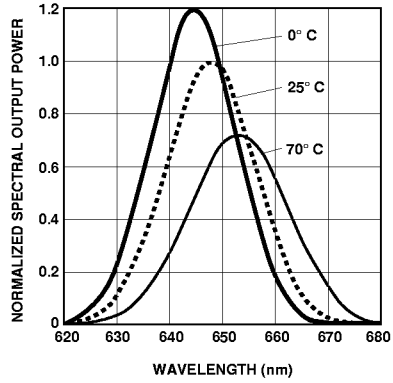


Figure 2. Typical Spectra Normalized to the 25°C Peak.

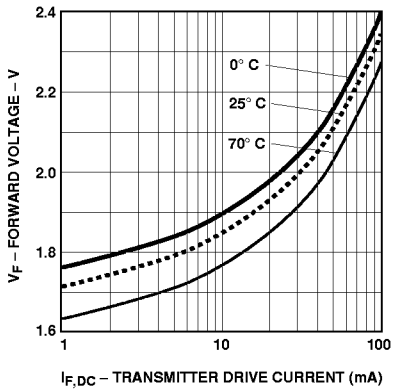


Figure 3. Typical Forward Voltage vs. Drive Current.

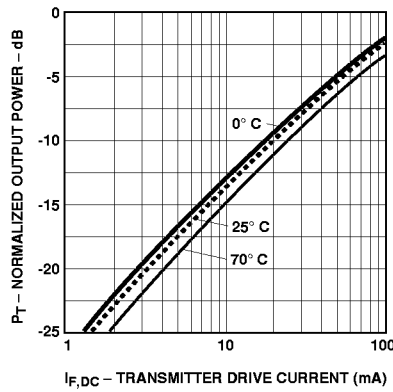


Figure 4. Typical Normalized Output Optical Power vs. Drive Current.