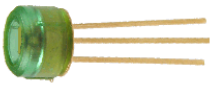
Fiber Optic Receiver

OPF520 Series



Features:

- Low Cost plastic cap package
- Designed to self align in the bore of standard fiber optic receptacles
- Press fit simplifies installation
- Optimized for fiber optic applications using 50 to 200 micron fiber

Description:

The OPF520 series fiber optic receiver is a high performance device packaged for data communications links. As such, it is designed to work with fiber core diameters from 50µm to 200µm and over a broad input power range. The construction contains a monolithic photo-IC comprised of a photodiode, biasing network, DC amplifier and an open collector output transistor. The output circuitry makes this device compatible with TTL and CMOS logic.

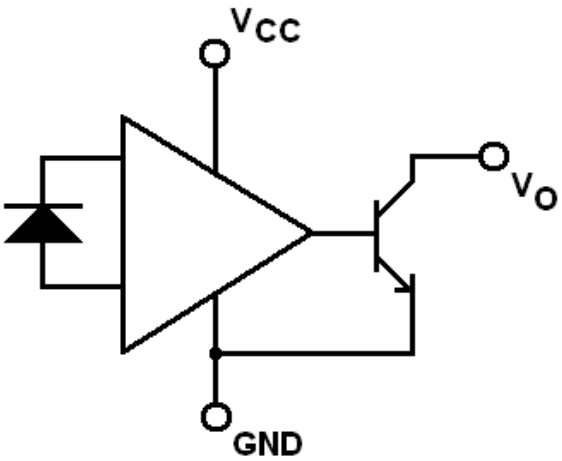
This receiver is designed to operate from a single 5V supply. It is essential that a bypass capacitor be connected from V_{CC} to GND in order to ensure the best possible operation.

Applications:

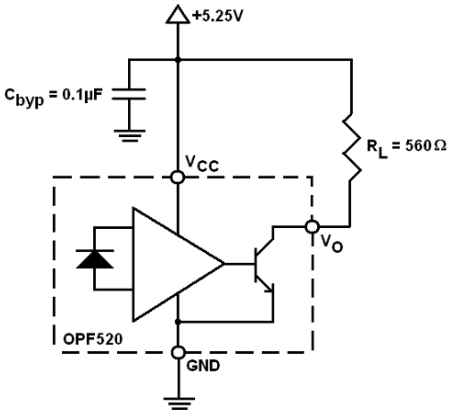
- Industrial Ethernet equipment
- Copper-to-fiber media conversion
- Intra-system fiber optic links
- Video surveillance systems

Part Ordering Information

Part Number	Description
OPF520	Plastic Cap Component
OPF522	Metal ST Receptacle



Recommended Test Circuit



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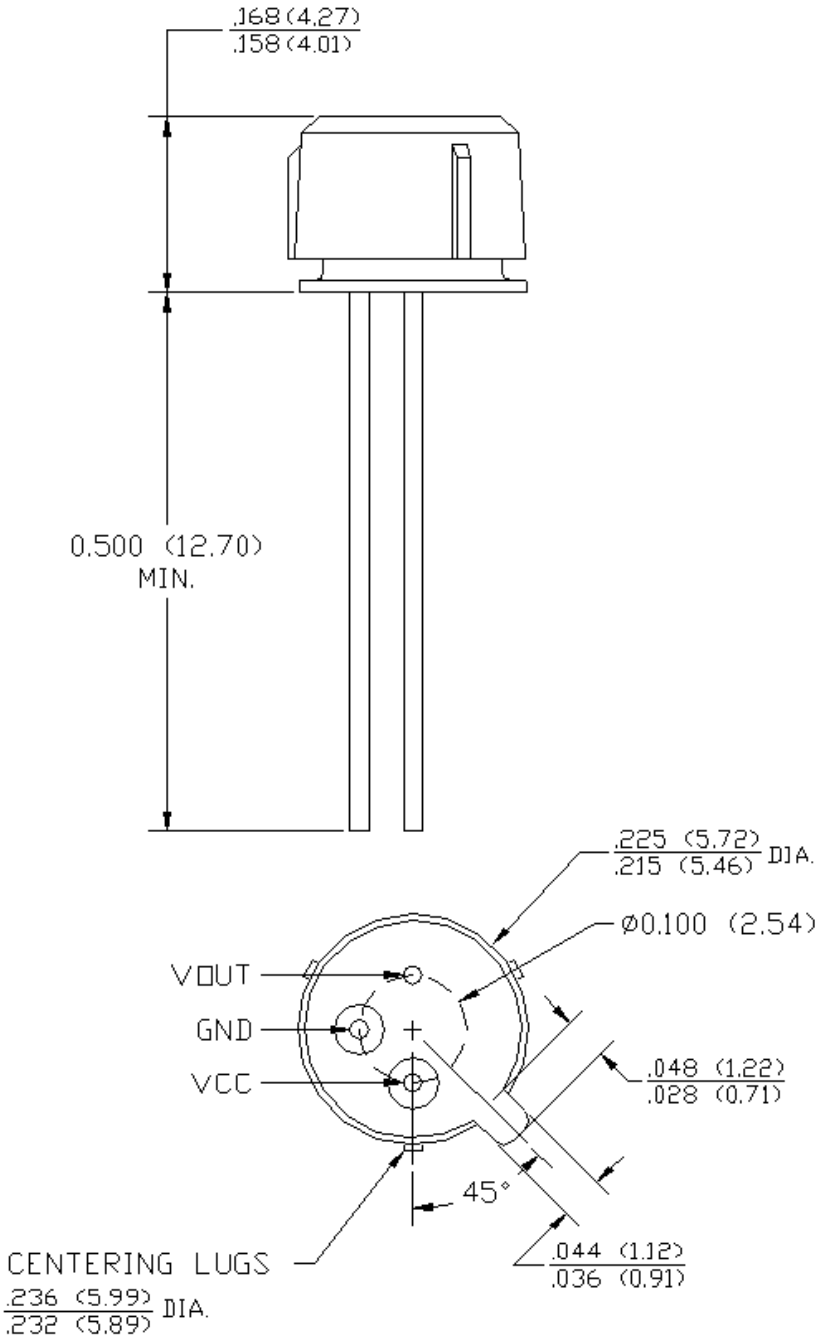
Mechanical Outline—OPF520



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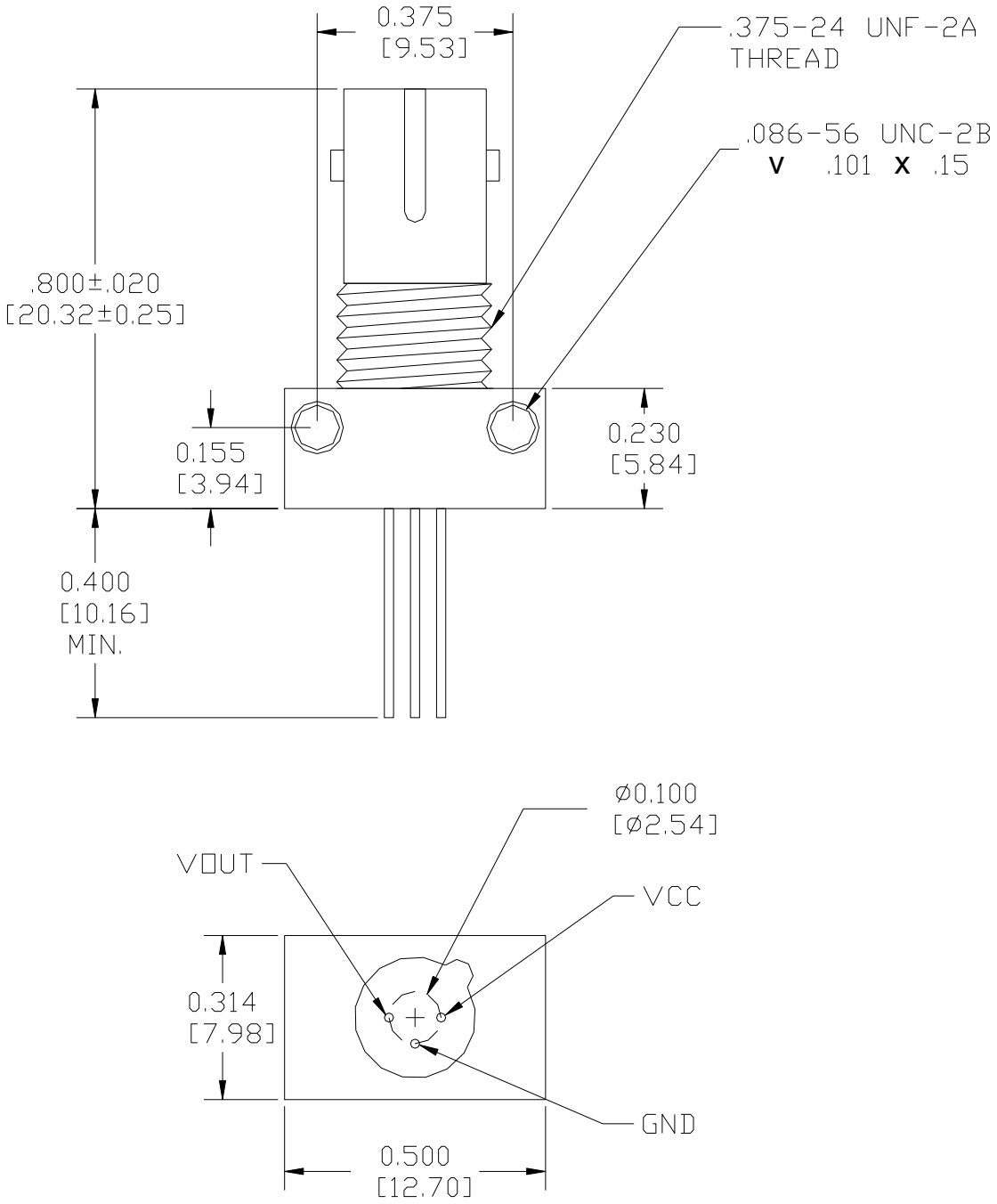
Mechanical Outline—OPF522



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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)	
Storage Temperature	55° C to +115° C
Operating Temperature	-40° C to +85° C
Lead Soldering Temperature (for 10 seconds)	260° C
Supply Voltage	-0.5 V to +7.0 V
Output Current	25 mA
Output Voltage	-0.5 V to +18.0 V
Open Collector Power Distribution	40mW
Fan Out (TTL)	5 (1)

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
I_{OH}	High Level Output Current		5	250	µA	V_O = 18V, P_{OC} < -40 dBm, See Note 2
V_{OL}	Low Level Output Voltage		0.2	0.5	V	I_O = 8 mA, P_{OC} > -24 dBm, See Note2
I_{CCH}	Supply Current, Output High		3.5	6.3	mA	V_{CC} = 5.25 V, P_{OC} < -40 dBm, See Note 2
I_{CCL}	Supply Current, Output Low		6.9	10	mA	V_{CC} = 5.25 V, P_{OC} < -24 dBm, See Note 2
$P_{OC(H)}$	Peak Input Power Level, Output High			-40	dBm	λp = 850 nm
	(Guaranteed Output High)			0.1	µW	
$P_{OC(L)}$	Peak Input Power Level, Output Low	-25.4		-9.2	dBm	λp = 850 nm, I_O = 8 mA
		2.9		120	µW	
	(Guaranteed Output Low)	-24		-10	dBm	λp = 850 nm, I_O = 8 mA
		4.0		100	µW	-40ºC ≤ T_A ≤ +85ºC
t_r, t_f	Rise, Fall Time		30		ns	P_{OC} = -20 dBm (peak), ƒ = 2.5 MHz, See Note 3
t_{PDHL}	Propagation Delay, Output High to Low		65		ns	
t_{PDLH}	Propagation Delay, Output Low to High		100		ns	
PWD	Pulse Width Distortion		±30		%	

Notes:
1. 8mA load (5 x 1.6 mA), R_L = 560 Ω
2. Use recommended test circuit below, but connect V_O to an independent voltage source with R_L = 0.
3. Use recommended test circuit below.

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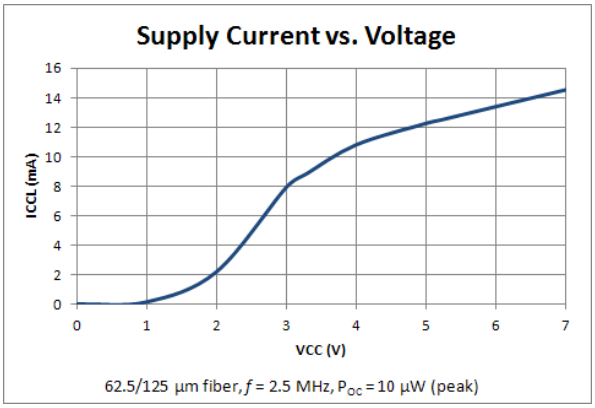
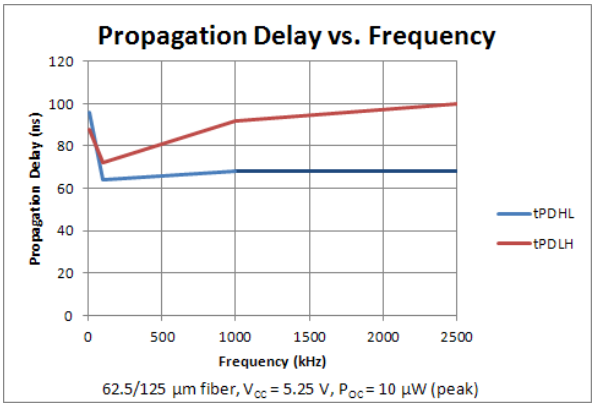
Performance

Switching Characteristics

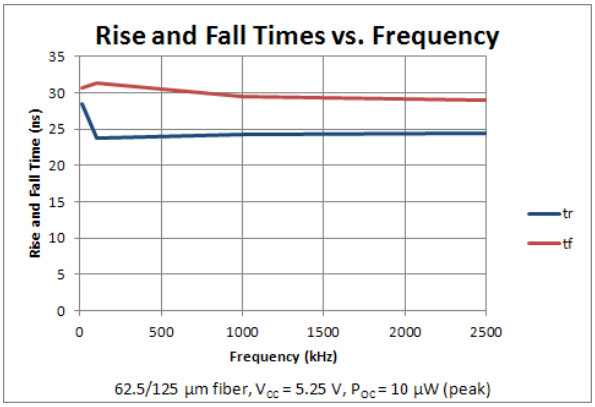
(See Recommended Test Circuit)



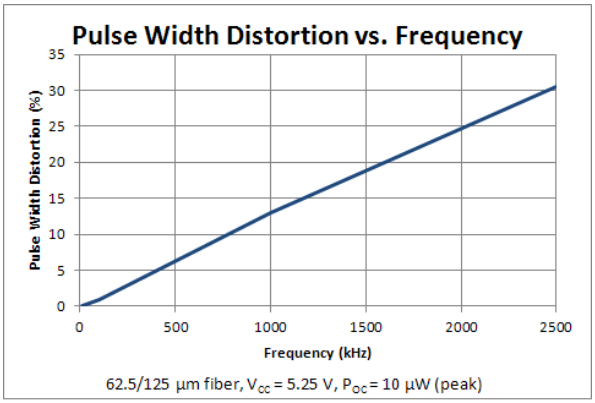
62.5/125 µm fiber, f = 2.5 MHz, P_{OC} = 10 µW (peak)



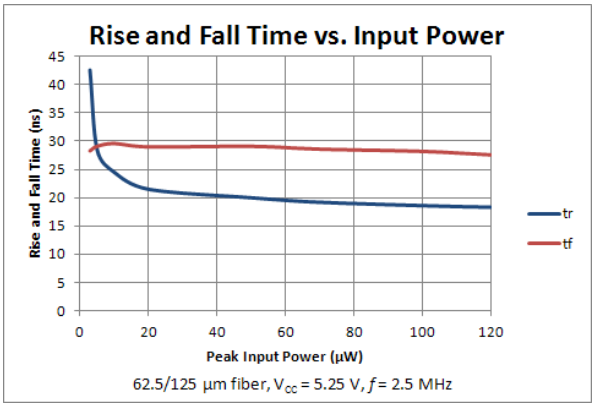
62.5/125 µm fiber, V_{CC} = 5.25 V, P_{OC} = 10 µW (peak)



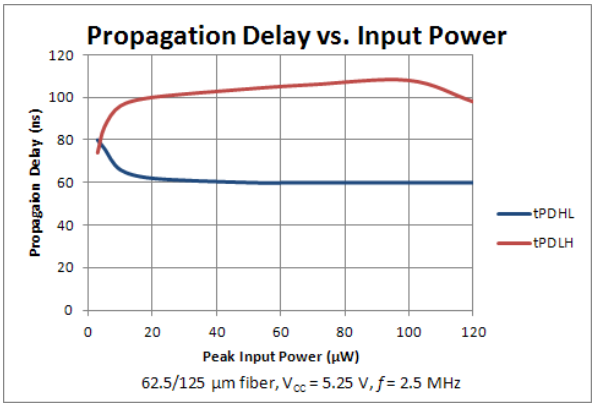
62.5/125 µm fiber, V_{CC} = 5.25 V, P_{OC} = 10 µW (peak)



62.5/125 µm fiber, V_{CC} = 5.25 V, P_{OC} = 10 µW (peak)



62.5/125 µm fiber, V_{CC} = 5.25 V, f = 2.5 MHz



62.5/125 µm fiber, V_{CC} = 5.25 V, f = 2.5 MHz

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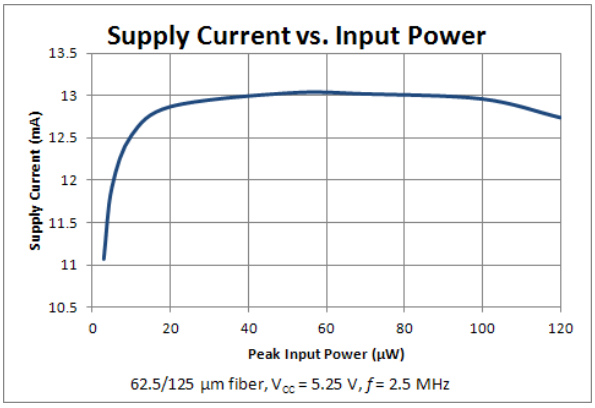
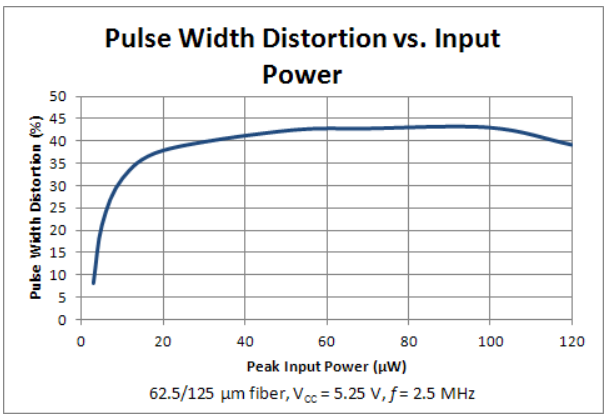
Performance

Switching Characteristics

(continued)



62.5/125 µm fiber, V_{CC} = 5.25 V, f = 2.5 MHz



62.5/125 µm fiber, V_{CC} = 5.25 V, f = 2.5 MHz

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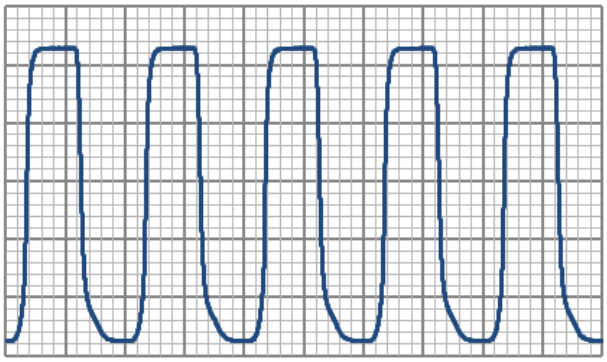
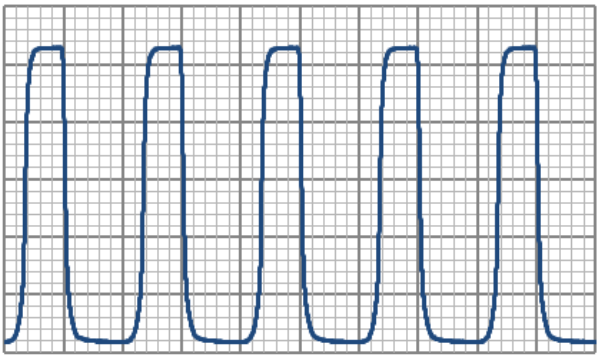
Performance

Typical Waveforms for Various Input Powers

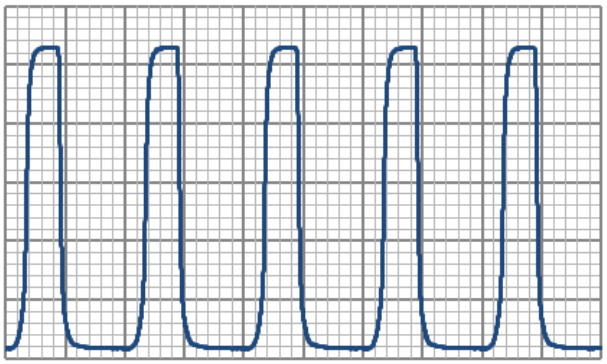
(62.5/125 µm fiber, V_{CC} = 5.25 V, ƒ = 2.5 MHz)
(See Recommended Test Circuit)



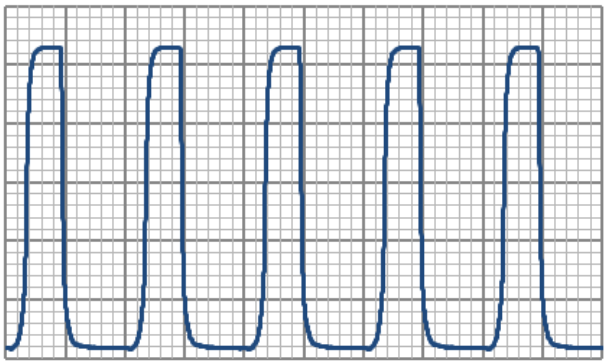
Vertical = 5V/div Horizontal = 200 ns/div
P_{OC} = 2.9 µW (peak)



Vertical = 5V/div Horizontal = 200 ns/div
P_{OC} = 10 µW (peak)



Vertical = 5V/div Horizontal = 200 ns/div
P_{OC} = 50 µW (peak)



Vertical = 5V/div Horizontal = 200 ns/div
P_{OC} = 120 µW (peak)

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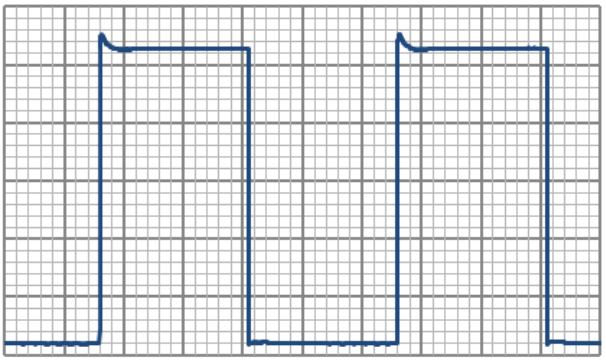
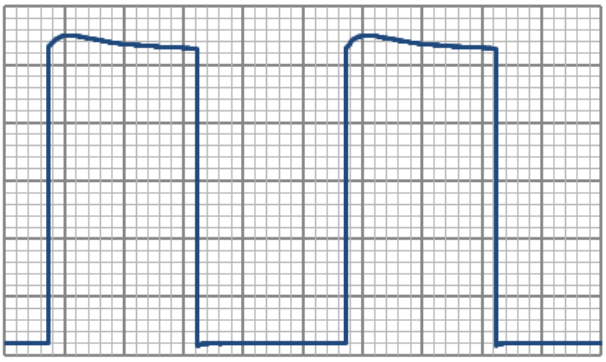
Performance

Typical Waveforms for Various Frequencies

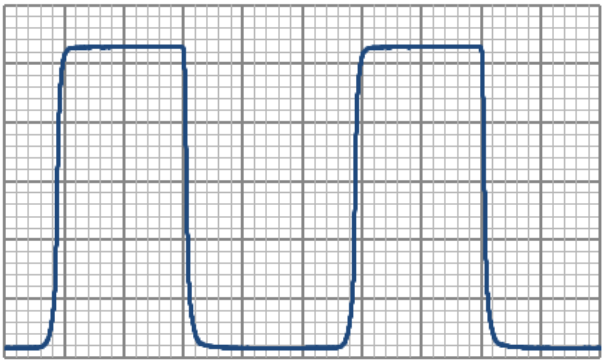
(62.5/125 µm fiber, V_{CC} = 5.25 V, P_{OC} = 10µW (peak)
(See Recommended Test Circuit)



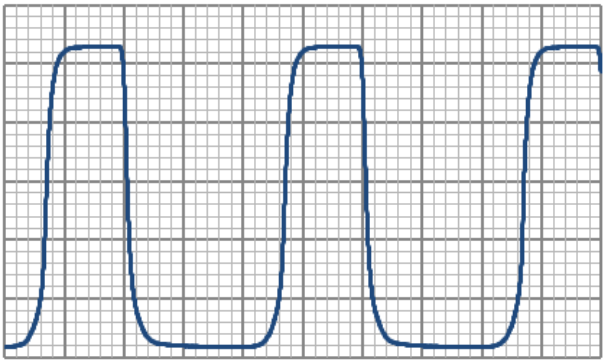
Vertical = 5V/div Horizontal = 200 µs/div
f = 1 kHz



Vertical = 5V/div Horizontal = 20 µs/div
f = 10 kHz



Vertical = 5V/div Horizontal = 200 ns/div
f = 1 MHz



Vertical = 5V/div Horizontal = 100 ns/div
f = 2.5 MHz

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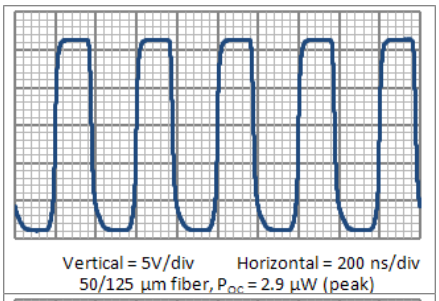
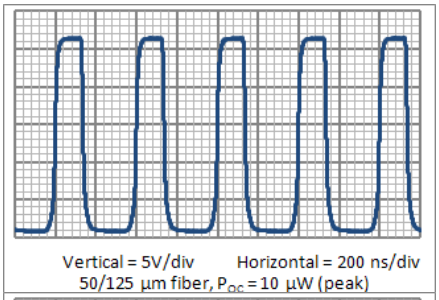
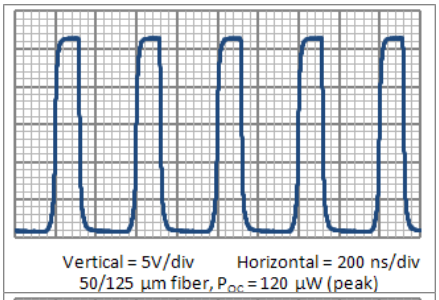
Performance

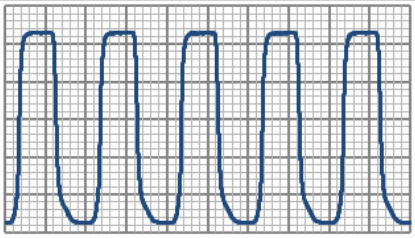
Typical Waveforms for Various Fiber Cables and Input Powers

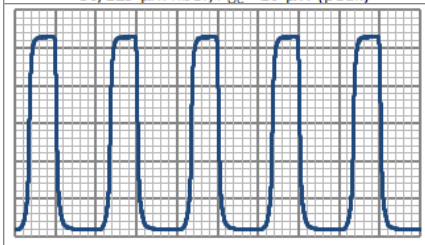
(V_{CC} = 5.25 V, ƒ = 2.5 MHz)
(See Recommended Test Circuit)

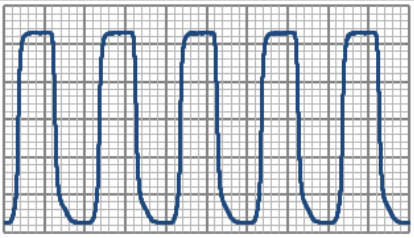

Vertical = 5V/div Horizontal = 200 ns/div
50/125 µm fiber, P_{OC} = 2.9 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
50/125 µm fiber, P_{OC} = 10 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
50/125 µm fiber, P_{OC} = 120 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
62.5/125 µm fiber, P_{OC} = 2.9 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
62.5/125 µm fiber, P_{OC} = 10 µW (peak)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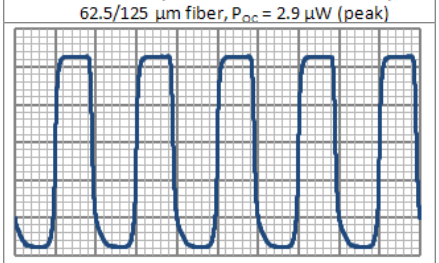
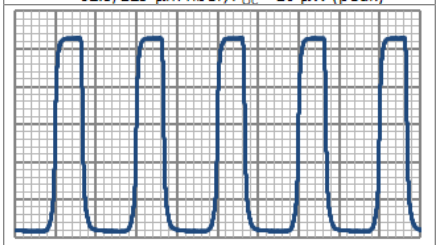
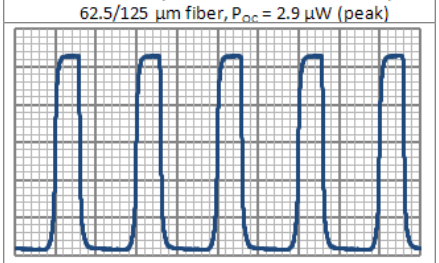
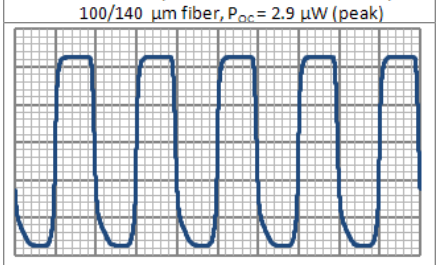
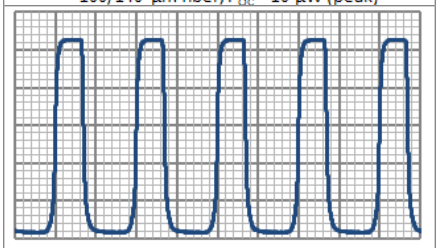
62.5/125 µm fiber, P_{OC} = 2.9 µW (peak)

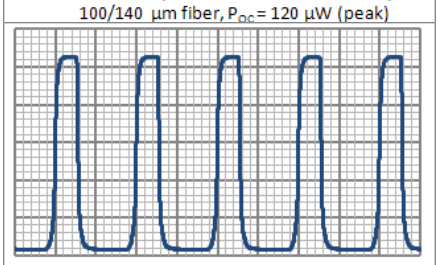

Vertical = 5V/div Horizontal = 200 ns/div
100/140 µm fiber, P_{OC} = 2.9 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
100/140 µm fiber, P_{OC} = 10 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
100/140 µm fiber, P_{OC} = 120 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
200/230 µm fiber, P_{OC} = 2.9 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
200/230 µm fiber, P_{OC} = 10 µW (peak)


Vertical = 5V/div Horizontal = 200 ns/div
200/230 µm fiber, P_{OC} = 120 µW (peak)

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