



DATA SHEET

O K I L A S E R P R O D U C T S

OD9601N (1.25 Gbps)
OD9602N (622 Mbps)
OD9604N (2.488 Gbps)
+ 3.3-V Photo Diode Preamp Modules

February 2000



Oki Semiconductor



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OD9601N, OD9602N, and OD9604N Photo Diode Preamp Module Family

InGaAs Technology (+ 3.3 V)

INTRODUCTION

Oki Semiconductor's OD9601N, OD9602N, and OD9604N PD Preamp Module Family are surface-mount 1.3- μm , InGaAs PIN photo diodes combined with a transimpedance amplifier. The OD9601N operates at 1.25 Gbps in STM4/OC12/OC24 environments. The OD9602N operates at 622 Mbps in STM4/OC12 environments. The OD9604N operates at 2.488 Gbps in STM16/OC48 environments.

The OD9601N, OD9602N, and OD9604N use a single + 3.3-V power supply, provide a differential output signal, and are available in an 8-pin Mini-Dil package. These photo diode preamp modules are coupled to a single-mode fiber with a pigtail.

GENERAL FEATURES

- Surface-mount Mini-Dil package
- Low cost
- Operating Performance:
 - OD9601N 1.25 Gbps operation
 - OD9602N 622 Mbps operation
 - OD9604N 2.488 Gbps operation
- Peak-sensitivity wavelength: 1300 nm

GENERAL APPLICATION

- Optical transmission systems
 - OD9601N 1.25 Mbps, STM4/OC12/OC24
 - OD9602N 622 Mbps, STM4/OC12
 - OD9604N 2.488 Gbps, STM16/OC48
- Optical transmission modules (receiver section)
- Optical receivers
- Inter-office interconnection
- Gigabit Ethernet (OD9601N / OD9604N)
- Ethernet (OD9602N)

Notes

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OD9601N Photo Diode Preamp Module

1.25-Gbps InGaAs Technology (+ 3.3 V)

INTRODUCTION

Oki Semiconductor's OD9601N PD Preamp Module is a surface-mount 1.3- μm , InGaAs PIN photo diode combined with a transimpedance amplifier. This OD9601N is designed to operate at 1.25 Gbps in STM4/OC12/OC24 environments. This photo diode uses a single + 3.3-V power supply and provides a differential output signal. It is available in an 8-pin Mini-Dil package and is coupled to a single-mode fiber with a pigtail.

FEATURES

- Surface-mount Mini-Dil package
- Low cost
- 1.25 Gbps operation
- Peak-sensitivity wavelength: 1300 nm

APPLICATION

- Optical transmission modules (receiver section)
- Optical receivers
- Inter-office interconnection
- Gigabit Ethernet

ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (ambient temperature Ta=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Units
Supply Voltage	V _S	6	mW
Incident Optical Power	P _{IOP}	-3	dBm
Operating Case Temperature	T _{opr}	-40 to +85	°C
Storage Temperature	T _{stg}	-40 to +85	°C
Soldering Profile	T _{sol}	230 (30)	°C (sec)

Exceeding these maximum ratings could cause immediate damage or lead to permanent deterioration of the device.

Optical and Electrical Characteristics (Ta=25°C, V_{CC}=3.3 V, λ=1310 nm unless otherwise noted)

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	-	+3.0	+3.3	+3.6	V
Supply Current	-	-	26	50	mA
Low Frequency Cutoff	-3 dBm Pin= -22 dBm, fr = 50 MHz	-	44	-	kHz
Rise / Fall Time	20% to 80% Pin= -3 dBm	-	-	300	ps
Sensitivity	BER < 10 ⁻¹² (See note 1)	-	-28	-	dBm
Differential Output Voltage	Pin= -3 dBm	185	250	415	mV
Optical Modulation Bandwidth	-3 dBm Pin= -22 dBm, fr = 50 MHz	750	820	1100	MHz
Differential Responsivity	Differential, measured with -22 dBm input signal	2.7	3.4	4.1	kV / W
Input Noise Equivalent Optical Power	BW=1500 MHz, Pin=0 mW	-	0.23	-	μW

Notes:

Data rate: 1.25 Gbps. Data sequence: PRBS 2²³ -1.

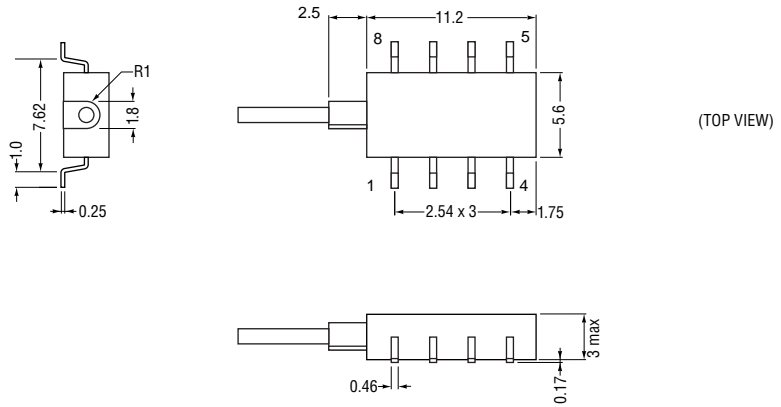
Contact Oki Semiconductor sales office for reliability report.

Connector and Fiber Specifications

Connector	FC-PC, SC-PC, MUJ-PC etc
Fiber	1.31-μm single-mode fiber Diameter: 0.9 mm Color: Dark blue Bending Radius: 20 mm (minimum) Heat resistant Length: Options (contact Oki Semiconductor)

PACKAGE DIMENSIONS

(Units: mm)



Pin Configuration

Pin No.	Description	Pin No.	Description
01	V _{CC}	05	Output (+)
02	GND	06	NC
03	GND	07	NC
04	Output (-)	08	GND

Notes:

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OD9602N Photo Diode Preamp Module

622 Mbps InGaAs Technology (+ 3.3 V)

introduction

Oki Semiconductor's OD9602N PD Preamp Module is a surface-mount 1.3- μ m, InGaAs PIN photo diode combined with a transimpedance amplifier. This OD9602N is designed to operate at 622 Mbps in STM4/OC12 environments. This photo diode uses a single + 3.3-V power supply and provides a differential output signal. It is available in an 8-pin Mini-Dil package and is coupled to a single-mode fiber with a pigtail.

FEATURES

- Surface-mount Mini-Dil package
- Low cost
- 622 Mbps operation
- Peak-sensitivity wavelength: 1300 nm

APPLICATION

- Optical transmission modules (receiver section)
- Optical receivers
- Inter-office interconnect
- Ethernet

ELECTICAL CHARACTERISTICS

Absolute Maximum Ratings (ambient temperature Ta=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Units
Supply Voltage	Vs	5.5	V
Incident Optical Power	P _{IOP}	4	dBm
Operating Case Temperature	Topr	- 40 to + 85	°C
Storage Temperature	Tstg	- 40 to + 85	°C
Soldering Profile	Tsol	230 (30)	°C (sec)

Exceeding these maximum ratings could cause immediate damage or lead to permanent deterioration of the device

Optical and Electrical Characteristics (Ta=25°C, V_{CC}=3.3 V, λ=1310 nm unless otherwise noted)

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	-	+3.0	+3.3	+3.6	V
Supply Current	-	12	25	35	mA
Low Frequency Cutoff	-3 dBm Pin= -23 dBm, fr = 50 MHz	-	-	150	kHz
Sensitivity	BER < 10 ⁻¹⁰ (See note 1)	-	-33.2	-	dBm
Differential Output Voltage	Pin= -3 dBm	-	-	950	mV
Optical Modulation Bandwidth	-3 dBm Pin= - 22 dBm, fr = 50 MHz	450	590	-	MHz
Differential Responsivity	Differential, measured with -22 dBm input signal	3.7	-	6.8	kV / W

Notes:

Data rate: 1.25 Gbps. Data sequence: PRBS 2²³ -1.

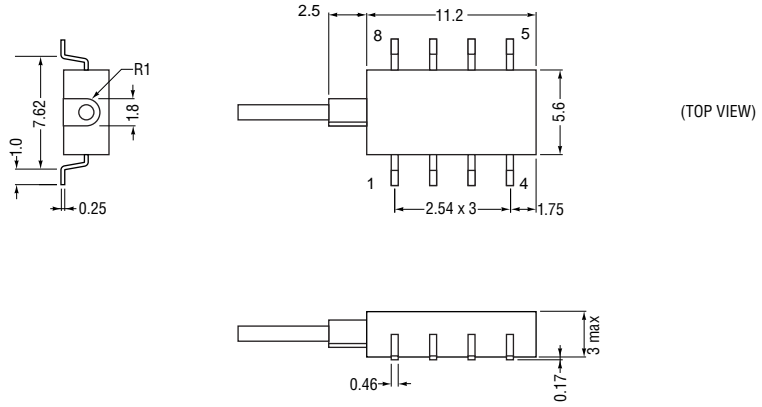
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Connector and Fiber Specifications

Connector	FC-PC, SC-PC, MUJ-PC etc
Fiber	1.31-μm single-mode fiber Diameter: 0.9 mm Color: Dark blue Bending Radius: 20 mm (minimum) Heat resistant Length: Options (contact Oki Semiconductor)

PACKAGE DIMENSIONS

(Units: mm)



Pin Configuration

Pin No.	Description	Pin No.	Description
01	V_{CC}	05	Output (+)
02	GND	06	NC
03	GND	07	GND
04	Output (-)	08	GND

Notes:

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OD9604N Photo Diode Preamp Module

2.488 Gbps InGaAs Technology (+ 3.3 V)

INTRODUCTION

Oki Semiconductor's OD9604N PD Preamp Module is a surface-mount 1.3- μm , InGaAs PIN photo diode combined with a transimpedance amplifier. This OD9604N is designed to operate at 2.488 Gbps in STM16/OC48 environments. This photo diode uses a single + 3.3-V power supply and provides a differential output signal. It is available in an 8-pin Mini-Dil package and is coupled to a single-mode fiber with a pigtail.

FEATURES

- Surface mount Mini-Dil package
- Low cost
- 2.488 Gbps operation
- Peak-sensitivity wavelength: 1300 nm

APPLICATION

- High-speed optical transmission modules (receiver section)
- High-speed optical receivers
- Inter-office interconnect
- Gigabit Ethernet

ELECTICAL CHARACTERISTICS

Absolute Maximum Ratings (ambient temperature Ta=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Units
Supply Voltage	VS	6	V
Optical Input Power	P _{IOP}	4	mW
Operating Case Temperature (Ta)	T _{opr}	- 40 to + 85	°C
Storage Temperature	T _{stg}	- 40 to + 85	°C
Soldering Profile	T _{sol}	260 (10)	°C (sec)

Exceeding these maximum ratings could cause immediate damage or lead to permanent deterioration of the device.

Optical and Electrical Characteristics (Ta=25°C, V_{CC}=3.3 V, λ=1310 nm unless otherwise noted)

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	-	+3.0	+3.3	+3.6	V
Supply Current	-	-	26	50	mA
Optical Modulation Bandwidth	f _{3 dB}	1400	-	-	MHz
Responsivity	Differential, measured with -17 dBm input signal	1230	-	1860	V / W
Input Current before Clipping	-	-16	-	-	dBm
Differential Output Voltage	-	185	250	415	mVp-p
Sensitivity	BER < 10 ⁻¹⁰ (See note)	-	-23.0	-	dBm
Optical Overload	AC Input	-2	-	-	dBm
Low Frequency Cutoff	f _{3 dB}	-	44	-	kHz

Notes:

Data rate: 1.25 Gbps. Data sequence: PRBS 2²³-1.

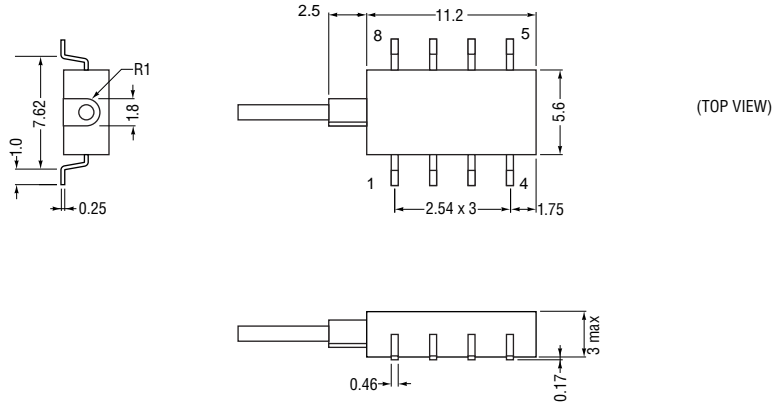
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Connector and Fiber Specifications

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Fiber	1.31-μm single-mode fiber Diameter: 0.9 mm Color: Dark blue Bending Radius: 20 mm (minimum) Heat resistant Length: Options (contact Oki Semiconductor)

PACKAGE DIMENSIONS

(Units: mm)



Pin Configuration

Pin No.	Description	Pin No.	Description
01	V _{CC}	05	Output (-)
02	GND	06	NC
03	GND	07	GND
04	Output (+)	08	GND

Notes:

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