

$\phi 50 \mu\text{m}$ InGaAs APD RECEIVER FOR 2.5 Gb/s
ROSA WITH INTERNAL PRE-AMPLIFIER**DESCRIPTION**

The NR4510UR is a InGaAs APD ROSA with an internal pre-amplifier in a receptacle type package designed for SFF/SFP transceiver with LC duplex receptacle. This device is ideal as a receiver for Synchronous Digital Hierarchy (SDH) system, STM-16, ITU-T recommendations.

FEATURES

- Internal pre-amplifier
- Minimum receiver sensitivity $\bar{P}_r = -33 \text{ dBm}$
- Wide operating temperature range $T_c = -40 \text{ to } +85^\circ\text{C}$
- 50Ω differential output
- Small package $\phi 4.6 \text{ mm ROSA (Total length 12.0 mm MAX.)}$
- Based on Telcordia reliability



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ORDERING INFORMATION

Part Number	Package
NR4510UR	φ4.6 mm ROSA

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Forward Current	I _F	10	mA
Reverse Current	I _R	1.5	mA
Supply Voltage	V _{CC}	4.5	V
Operating Case Temperature	T _C	-40 to +85	°C
Storage Temperature	T _{stg}	-40 to +85	°C
Lead Soldering Temperature	T _{slid}	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

ELECTRO-OPTICAL CHARACTERISTICS

(T_C = -40 to +85°C, V_{CC} = 3.3 V, λ = 1.31 μm, 1.55 μm, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Reverse Break Down Voltage	V _{BR}	I _D = 100 μA	40	60	70	V
Temperature Coefficient of Reverse Breakdown Voltage	δ		0.09		0.15	%/°C
Dark Current	I _D	V _R = 0.9 V _{BR} , T _C = 85°C			500	nA
Minimum Receiver Sensitivity	\bar{P}_r	2.48832 Gb/s, BER = 10 ⁻¹⁰ , PRBS = 2 ²³ -1, ER = 10 dB, λ = 1.31 μm, NRZ, AC-coupled, Mopt		-33	-30	dBm
Maximum Optical Input Power	P _{ovl}	2.48832 Gb/s, BER = 10 ⁻¹⁰ , PRBS = 2 ²³ -1, ER = 10 dB, λ = 1.31 μm, NRZ, AC-coupled, M = 3	-6	-5		dBm
Sensitivity	S	M = 1, λ = 1.31 μm	0.80			A/W
		M = 1, λ = 1.55 μm	0.88			
Cut-off Frequency	f _c	AC-coupled, R _L = 50 Ω, M = 10, -3 dB Ref to 100 MHz	1.6	1.9		GHz
Optical Return Loss	ORL	SMF	27			dB
Transimpedance	Z _t	f = 100 MHz, 50 Ω single-ended, AC-coupled 50 Ω load	1.05	1.4		kΩ
Supply Voltage	V _{CC}		3.15	3.3	3.45	V
Supply Current	I _{CC}				45	mA

InGaAs APD/PD FAMILY

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics (T _c = 25°C)						Applications	Package
	T _c (°C)	T _{stg} (°C)	Detecting Area Size (μm)	I _D	f _c	S		V _R (V)		
				(nA)	(GHz)	(A/W)	@λ (nm)			
NR3470MU-CC	0 to +75	-40 to +85	φ 40	5	7.5	1.00	1 550	5	10 Gb/s: STM-64	17-pin mini-butterfly PD with an Internal pre-amplifier
NR3510UR	-40 to +85	-40 to +85	φ 50	0.1	1.8	0.80	1 310	3.3	2.5 Gb/s: STM-16	PIN ROSA with an Internal pre-amplifier
						0.85	1 550			
NR4270MU-CC	0 to +70	-40 to +85	φ 20	1.2 μA ⁻¹	7.0	0.63 ^{*2}	1 550	0.9 V _{BR}	10 Gb/s: STM-64	17-pin mini-butterfly APD with an Internal pre-amplifier
NR4500BP-CC NR4500CP-CC	0 to +85	-40 to +85	φ 50	-	2.5	0.94	1 310	0.9 V _{BR}	2.5 Gb/s: STM-16	Coaxial APD with an Internal pre-amplifier
						0.96	1 550			
NR4510UR	-40 to +85	-40 to +85	φ 50	-	1.6	0.80	1 310	0.9 V _{BR}	2.5 Gb/s: STM-16	APD ROSA with an Internal pre-amplifier
						0.88	1 550			
NR7500 Series	-40 to +85	-40 to +85	φ 50	0.1	2.5	0.89	1 310	5	2.5 Gb/s: STM-16	Coaxial PD
						0.94	1 550			
NR7800 Series	-40 to +85	-40 to +85	φ 80	0.1	2.5	0.89	1 310	5	≤ 622 Mb/s: STM-4, STM-1	Coaxial PD
						0.94	1 550			
NR8500 Series	-40 to +85	-40 to +85	φ 50	7	1	0.94	1 310	0.9 V _{BR}	≤ 622 Mb/s: STM-4, STM-1	Coaxial APD
						0.96	1 550			
NR8501 Series	-40 to +85	-40 to +85	φ 50	7	2.5	0.94	1 310	0.9 V _{BR}	2.5 Gb/s: STM-16	Coaxial APD
						0.96	1 550			

*1 MAX.

*2 MIN.

REFERENCE

Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

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