

GaAs PIN photodiode with preamp G9845-14

ROSA type, 850 nm, 1.25 Gbps



Features

- $\phi 1.25$ mm sleeve type ROSA (Receiver Optical Sub-Assembly)
- High-speed response: 1.25 Gbps
- High gain with AGC (Auto Gain Control): 1.6 V/mW (at -20 dBm)
- Low power supply voltage: $V_{cc}=V_{pd}=3.3$ V
- Differential output
- Sensitivity: +2 to -26 dBm

Applications

- Gigabit Ethernet
- Fiber channel

■ Absolute maximum ratings ($T_a=25$ °C)

Parameter	Symbol	Value	Unit
Supply voltage	V_{cc}	-0.5, +5	V
Reverse voltage (photodiode)	V_R	7	V
Operating temperature	T_{opr}	-40 to +85 *1	°C
Storage temperature	T_{stg}	-40 to +85 *1	°C

*1: No condensation

■ Electrical and optical characteristics

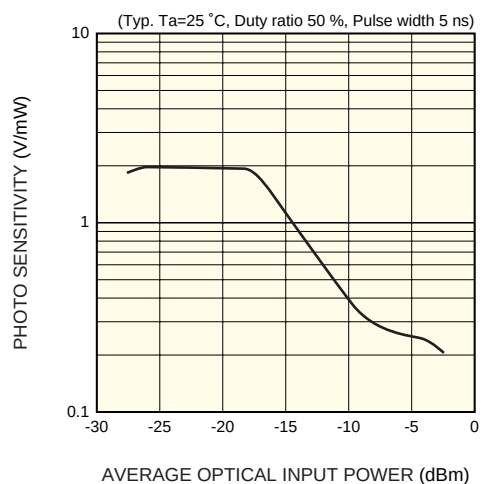
($T_a=25$ °C, $V_{cc}=3.0$ to 3.6 V, $V_{pd}=3.0$ to 5.0 V, $V_{ee}=0$ V, $R_L=50$ Ω *2, $\lambda=850$ nm, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Responsivity	R		0.4	0.5	-	A/W
Photo sensitivity	S	Pin= -20 dBm *3	1.1	1.6	-	V/mW
Supply current	I_{cc}	Dark state, $R_L=\infty$	-	45	60	mA
Cut-off frequency	f_c	Pin= -20 dBm, -3 dB	850	1000	-	MHz
Low cut-off frequency	f_{c-L}	Pin= -20 dBm, -3 dB	-	3.5	4.5	kHz
Noise equivalent power	NEP	Dark state, to 938 MHz *3	-	270	430	nW rms
Trans-impedance	T_z	$f=100$ MHz *3	2.0	3.3	-	k Ω
Minimum receivable sensitivity	P_{min}	1.25 Gbps, NRZ PN=23, BER= 10^{-10} Extinction ratio 10 dB	-	-26	-24	dBm
Maximum receivable sensitivity	P_{max}		0	+2	-	
Output amplitude	V_{omax}	Differential	-	-	330	mV p-p
Output resistance	R_{out}		-	50	-	Ω
Dark current	I_D	Dark state, $R_L=\infty$	-	0.05	1	nA
Optical return loss	ORL		12	13.5	-	dB

*2: Output: Capacitive coupling

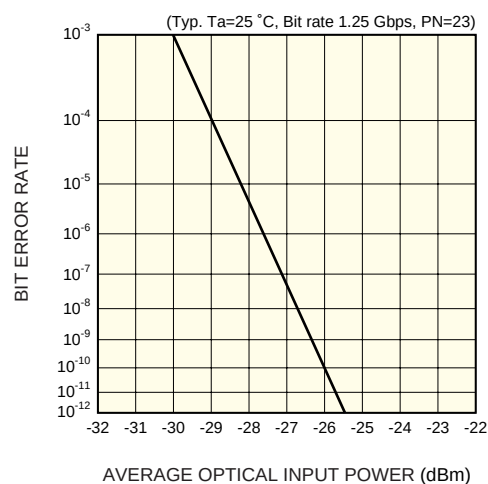
*3: Single-ended (V_{out+}) measurement

■ Photo sensitivity vs. average optical input power



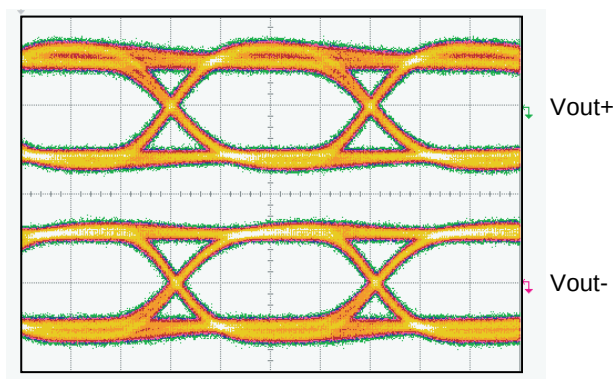
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■ Bit error rate



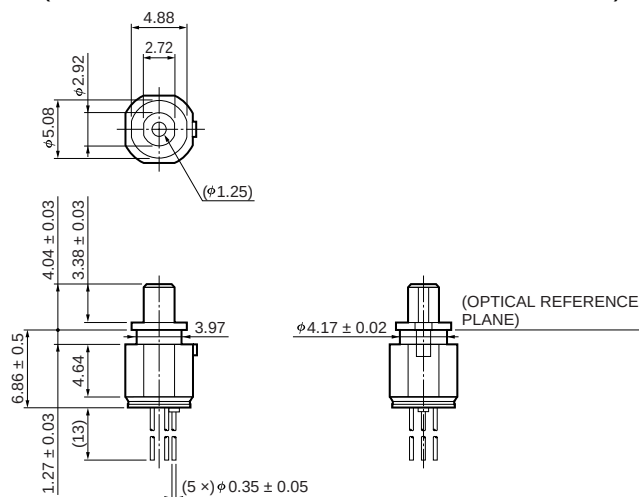
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■ Eye diagram

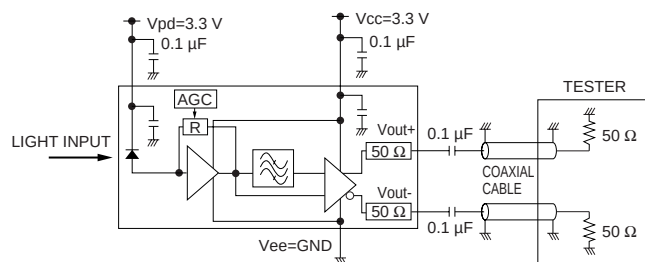


Bit rate 1.25 Gbps, PN=23
 $\lambda=850\text{ nm}$, Pin= -20 dBm, $V_{cc}=3.3\text{ V}$

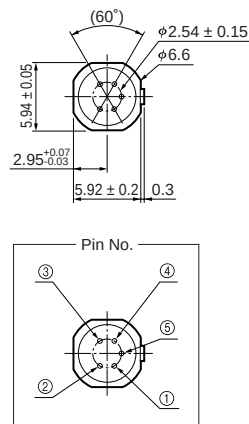
■ Dimensional outline

(unit: mm, tolerance unless otherwise noted: ± 0.1)

■ Operation circuit example



KGPDC0003EA



- ① Vpd (CATHODE)
- ② Vout-
- ③ Vout+
- ④ Vcc
- ⑤ Vee (GND)

KIRDA0188EA

HAMAMATSU

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