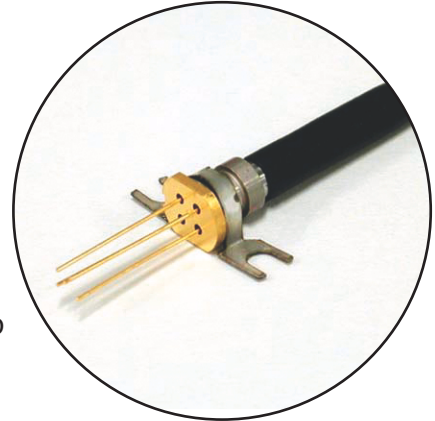


FEATURES

- Data Rates up to 2.7Gb/s
- High Sensitivity: -34 dBm (typ.)
- Differential Electrical Output
- Preamplifier Power Supply Voltage: +3.3V
- Wide operating temperature range: -40 to +85°C

APPLICATIONS

This APD detector preamp is intended to function as an optical receiver in long haul SONET, SDH, and DWDM systems operating up to 2.7Gb/s. The device operates in both the 1,310 and 1,550nm wavelength windows. The detector preamplifier is DC coupled with a differential electrical output.



DESCRIPTION

The FRM5W232HY incorporates an InGaAs Avalanche Photodiode (APD) detector, a GaAs IC transimpedance preamplifier. The APD is processed with modern MOVPE techniques resulting in reliable performance over a wide range of operating conditions. The lens coupling system and the single mode fiber are assembled using Nd: YAG welding. The HY package is secured by a horizontal flange.

ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Storage Temperature	T _{stg}	-40 to +85	°C
Operating Case Temperature	T _{op}	-40 to +85	°C
Supply Voltage	V _{DD}	0 to +4.5	V
APD Reverse Voltage	V _R	0 to V _B (Note)	V
APD Reverse Current	I _{R(peak)}	3	mA

Note: Since V_B may vary from device-to-device, V_B data is attached to each device for reference.

OPTICAL & ELECTRICAL CHARACTERISTICS

(T_C=25°C, λ=1,550nm, V_{DD}=+3.3V unless otherwise specified)

Parameter	Symbol	Test Conditions	Limits			Unit	
			Min.	Typ.	Max.		
APD Responsivity	R13	λ = 1,310nm, M=1	0.75	0.80	-	A/W	
	R15	λ = 1,550nm, M=1	0.80	0.85	-		
	R16	λ = 1,610nm, M=1	-	0.70	-		
APD Breakdown Voltage	VB	ID=10μA	40	50	65	V	
Temperature Coefficient of VB	γ	Note (1)	0.08	0.12	0.15	V/°C	
AC Transimpedance	Z _t	Pin=-30dBm, f=100MHz, Single-end	1800	2200	2600	Ω	
Bandwidth	BW	Pin=-30dBm, M=10, -3dB from 1MHz	2.2	2.5	-	GHz	
Lower Cut-Off Frequency	f _{cl}		-	50	75	kHz	
Peaking	d _{pk}	Pin=-30dBm, M=10, from 1MHz	-	-	+2	dB	
Group Delay Deviation	GD	Pin=-30dBm, M=10, from 500MHz to 1.75GHz	-	60	-	psec	
Output Return Loss	S22	up to 1.75GHz	10	-	-	dB	
		up to 2.5GHz	5	-	-		
Equivalent Input Noise Current Density	i _n	Average within 2.2GHz	-	9.5	11	pA/√Hz	
Minimum Sensitivity	P _r	Note (4)	Ta=25°C, Rext=14dB	-	-34.0	-33.0	dBm
			Ta=-40°C ~ 85°C, Rext=14dB	-	-33.0	-31.0	
			Ta=25°C, Rext=10dB	-	-33.0	-	
Maximum Overload	P _{max}	2.488Gb/s, NRZ, PRBS=2 ²³ -1, BER=10 ⁻¹⁰ , M=3	-5	-	-	dBm	
		M=3, Note (3)	-7	-	-		
Maximum Output Voltage Swing	V _{clip}	Saturated Output Voltage	450	550	800	mV	
Optical Return Loss	ORL	-	30	-	-	dB	
Power Supply Current	I _{DD}	-	-	45	70	mA	
Power Supply Voltage	V _{DD}	-	3.15	3.30	3.45	V	

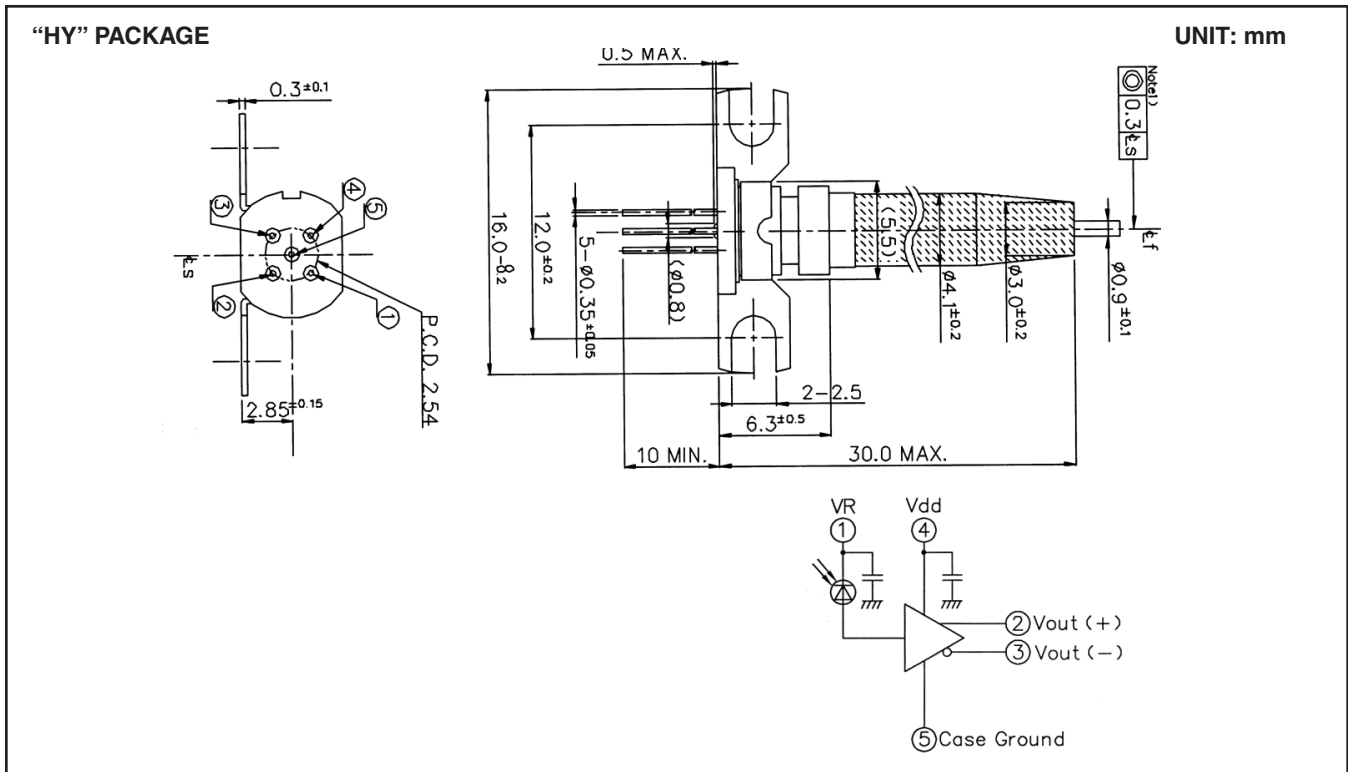
Note: (1) γ= VB/ Tc

Note: (2) All the parameters are measured with 50Ω AC-coupled.

Note: (3) Defined by 10% distortion of wave form.

Note: (4) Test condition is 2.488Gb/s, NRZ, PRBS=2²³-1, B.E.R.=10⁻¹⁰, VR=Optimum with f_c = 1866 MHz Bessel filter.

Notes



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