

InGaAs-APD/Preamp _____ FRM5W232LY

Receiver

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 FRM5W232LY incorporates a 30 micron 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 LY package is secured by a vertical 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)	2	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	$\lambda = 1,310\text{nm}$, M=1		0.75	0.80	-	A/W
	R15	$\lambda = 1,550\text{nm}$, M=1		0.80	0.85	-	
	R16	$\lambda = 1,610\text{nm}$, M=1		-	0.70	-	
APD Breakdown Voltage	VB	ID=10 μ A		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 $\sqrt{\text{Hz}}$
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=ΔVB/ΔTc

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

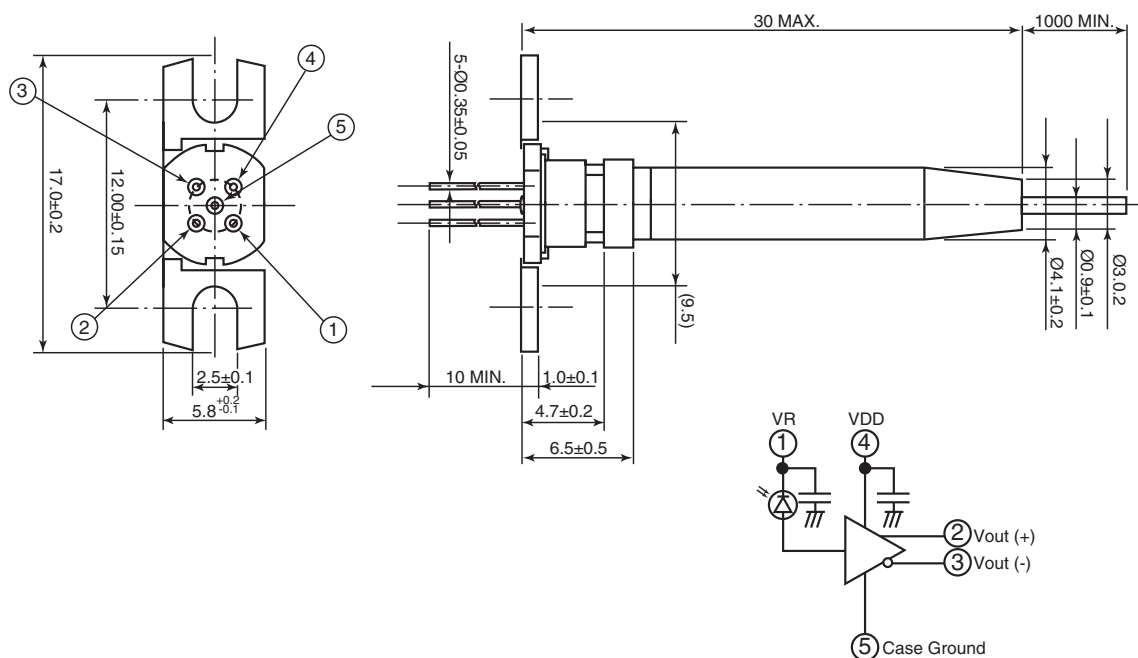
Note: (3) Defined by 10% distortion of wave form.

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

Notes

"LY" PACKAGE

UNIT: mm



For further information please contact:

Eudyna Devices USA Inc.

2355 Zanker Rd.
San Jose, CA 95131-1138, U.S.A.
TEL: (408) 232-9500
FAX: (408) 428-9111
www.us.eudyna.com

Eudyna Devices Europe Ltd.

Network House
Norreys Drive
Maidenhead, Berkshire SL6 4FJ
United Kingdom
TEL: +44 (0) 1628 504800
FAX: +44 (0) 1628 504888

Eudyna Devices Asia Pte Ltd.

Hong Kong Branch
Rm. 1101, Ocean Centre, 5 Canton Rd.
Tsim Sha Tsui, Kowloon, Hong Kong
TEL: +852-2377-0227
FAX: +852-2377-3921

Eudyna Devices Inc.

Sales Division
1, Kanai-cho, Sakae-ku
Yokohama, 244-0845, Japan
TEL: +81-45-853-8156
FAX: +81-45-853-8170

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