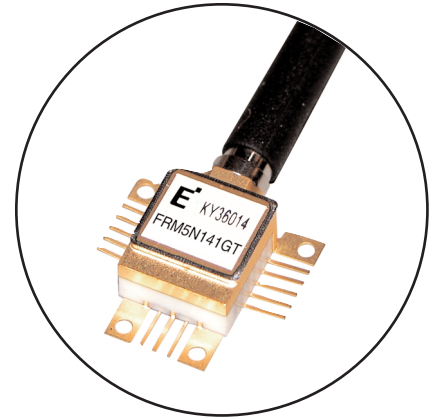


## FEATURES

- Board mount type “GT” package: 17 pins
- InGaAs-APD with pre-amplifier
- Integrated Design Optimizes Performance at Bit Rates up to 10.7Gb/s
- Electrical Differential Output
- High Sensitivity: -26.5dBm
- Operates in both C and L wavelength bands



## APPLICATIONS

This APD with preamplifier is intended to function as an optical receiver at 1,310nm or 1,530-1,610nm in SONET, SDH, DWDM or other optical fiber systems operating up to 10.7Gb/s. The typical transimpedance ( $Z_t$ ) value of 1,200 $\Omega$  optimizes the total bandwidth for 10Gb/s application. The detector preamplifier is DC coupled and has an electrical differential output.

## DESCRIPTION

The FRM5N141GT incorporates a high bandwidth InGaAs APD photo diode, a GaAs amplifier in a hermetically sealed board mount type package. The APD is processed with modern epitaxial techniques resulting in a reliable performance over a wide range of operating conditions.

### ABSOLUTE MAXIMUM RATINGS ( $T_c=25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Ratings		Unit
		Min.	Max.	
Storage Temperature	$T_{stg}$	-40	+85	$^\circ\text{C}$
Operating Temperature	$T_{op}$	-5	+75	$^\circ\text{C}$
Supply Voltage	$V_{ss}$	-6	0	V
APD Reverse Voltage	$V_R$	0	$V_B(\text{Note})$	V
APD Reverse Current	$I_R$	-	4(peak)	mA

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

## OPTICAL &amp; ELECTRICAL CHARACTERISTICS

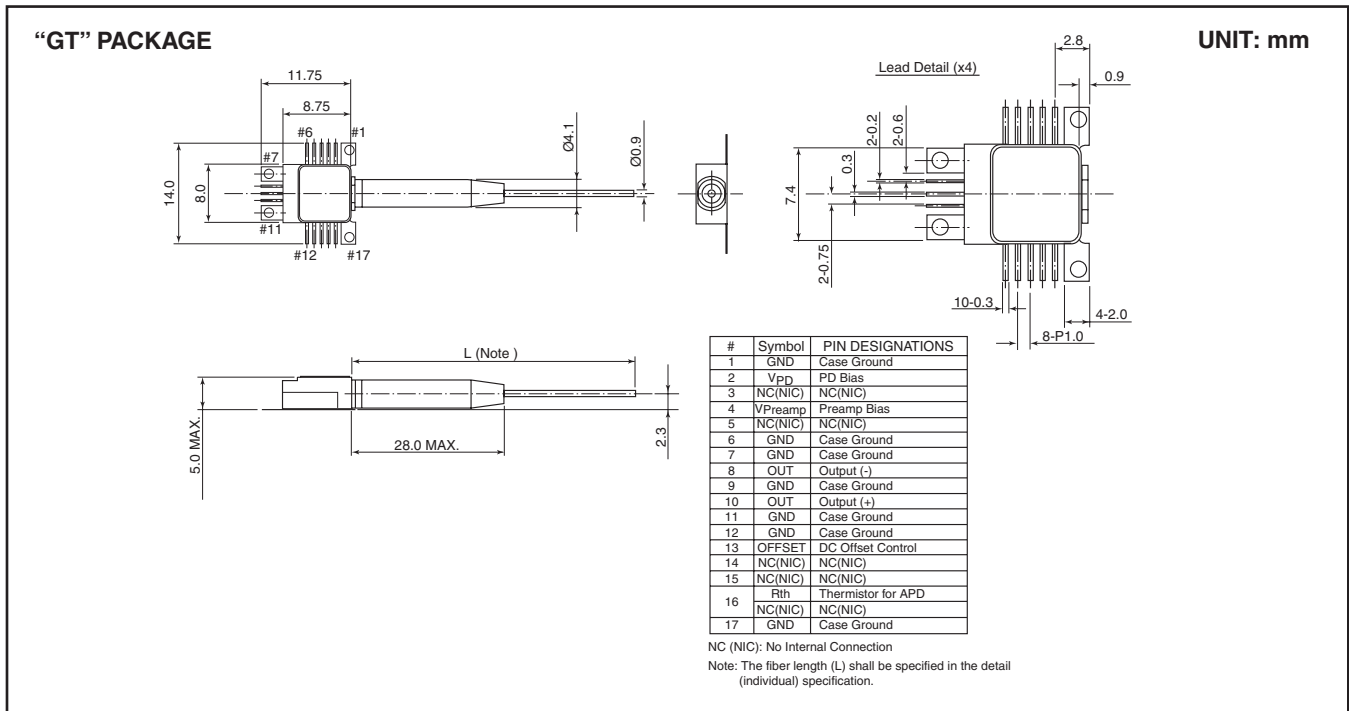
(T<sub>C</sub>=25°C, λ=1,550nm, V<sub>SS</sub>=-5.2V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Limits			Unit	
			Min.	Typ.	Max.		
APD Responsivity	R	λ = 1,310nm, M=1	0.75	0.85	-	A/W	
		λ = 1,550nm, M=1	0.75	0.90	-		
		λ = 1,610nm, M=1	-	0.80	-		
APD Breakdown Voltage	VB	ID = 10μA	20.0	25.0	30.0	V	
Temperature Coefficient of VB	Γ	Note (1)	0.03	0.05	0.07	V/°C	
AC Transimpedance	Z <sub>t</sub>	f = 750MHz, Single-end	800	1200	-	Ω	
Maximum Output Voltage Swing	V <sub>clip</sub>	Saturated Output Voltage	350	550	750	mV	
Bandwidth	BW	-3dB from 750MHz, Pin=-20dBm	M=9	6.0	7.5	8.5	GHz
			M=3	6.0	7.5	-	
Lower Cut-off Frequency	f <sub>cl</sub>	-3dB from 750MHz, Pin=-20dBm	-	40	100	kHz	
Peaking	d <sub>pk</sub>	130MHz to BW, Pin=-20dBm, M=9	-	0.5	-	dB	
Group Delay Deviation	GD	1GHz to 4GHz, Pin=-20dBm, M=9	-	30	-	ps <sub>p-p</sub>	
		1GHz to 6GHz, Pin=-20dBm, M=9	-	50	-		
Output Return Loss	S <sub>22</sub>	130MHz to 6GHz	-	12	-	dB	
		130MHz to 8GHz	-	7	-		
Minimum Sensitivity	P <sub>r</sub>	10Gb/s, NRZ, PRBS=2 <sup>31</sup> -1, B.E.R.=10 <sup>-12</sup> , VR=Optimum, Rext=13dB	25°C	-	-26.5	-25.0	dBm
			75°C	-	-25.5	-24.0	
Maximum Overload	P <sub>o</sub>	10Gb/s, NRZ, PRBS=2 <sup>31</sup> -1, B.E.R.=10 <sup>-12</sup> , M=3, Rext=13dB	-7	-5	-	dBm	
Optical Return Loss	ORL	λ = 1,550nm	27	-	-	dB	
		λ = 1,310nm	27	-	-		
Power Supply Current	I <sub>ss</sub>	-	-	110	130	mA	
Power Supply Voltage	V <sub>ss</sub>	-	-5.46	-5.20	-4.94	V	
Thermistor Resistance	R <sub>th</sub>	-	9.5	10.0	10.5	kΩ	
Thermistor B Constant	B	-	3800	3900	4000	K	

Note 1: Γ=ΔVB/dTc

Note: All the parameters are measured with 50Ω load through external coupling capacitor.

Notes



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](http://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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