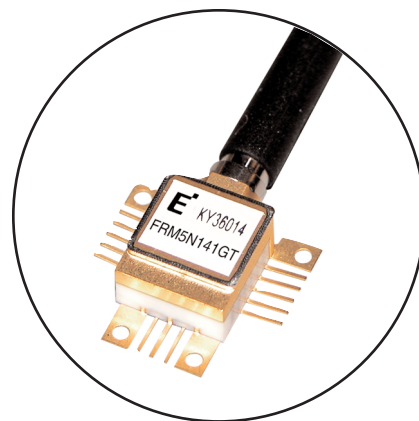


## FEATURES

- 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	$T_{\text{stg}}$	-40	+85	$^\circ\text{C}$
Operating Temperature	$T_{\text{op}}$	-5	+75	$^\circ\text{C}$
Supply Voltage	$V_{\text{ss}}$	-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

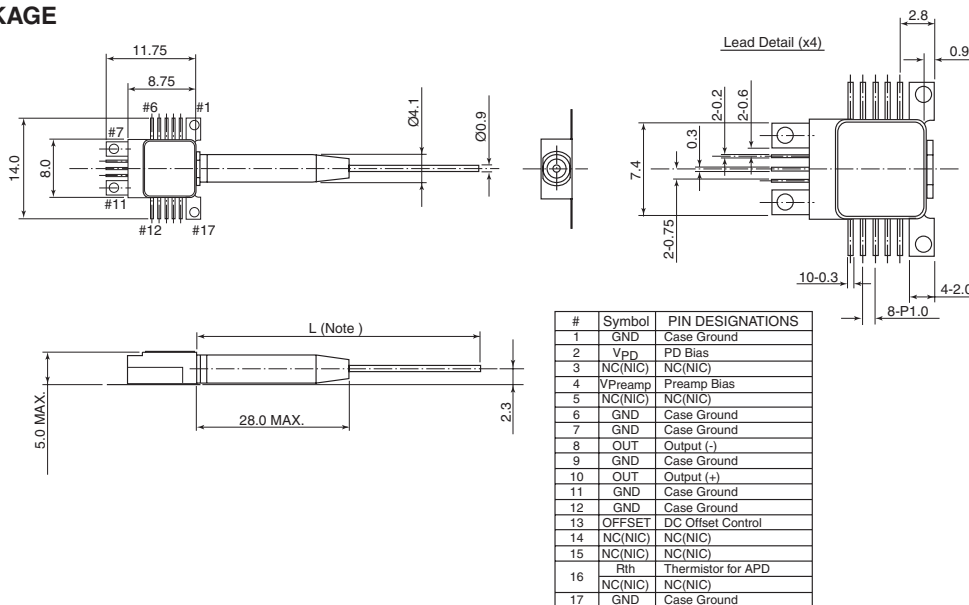
Note 1: Γ=ΔVB/dTc

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

Notes

## “GT” PACKAGE

UNIT: mm



NC (NIC): No Internal Connection

Note: The fiber length (L) shall be specified in the detail (individual) specification.

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