

InGaAs-APD/Preamp_____ **FRM5W621KT/LT** **Receiver**

FEATURES

- Data rate up to 622Mb/s
- High Responsibility: typ. 0.85A/W at 1,550nm
- 30µm active area APD chip with GaAs pre-amplifier
- High temperature operation up to +85°C
- Small co-axial package with single mode fiber

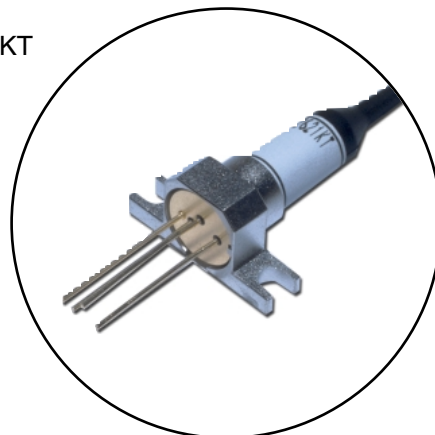
APPLICATIONS

- Medium bit rate long haul optical transmission systems at STM-4 (OC-12)

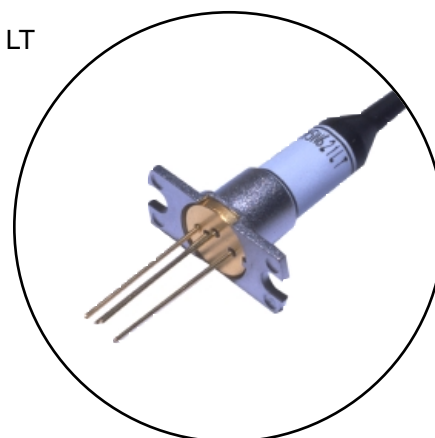
DESCRIPTION

These APD preamplifiers use an InGaAs APD chip with GaAs IC preamplifier. The KT package is designed for a horizontal PC board mount. The LT package is secured by a vertical flange. Each package is connected with single-mode fiber by Nd: YAG welding. The detector preamplifier is DC coupled and has a low electrical output when the APD is illuminated.

KT



LT



FRM5W621KT/LT InGaAs-APD/Preamplifier Receiver

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Parameter	Symbol	Ratings	Unit
Storage Temperature	T _{stg}	-40 to +85	°C
Operating Temperature	T _{op}	-40 to +85	°C
Supply Voltage	V _{SS}	-7 to 0	V
APD Supply Voltage	V _R (Note 1)	0 to V _B	V
APD Reverse Current	I _R (Note 2)	1.0	mA

OPTICAL & ELECTRICAL CHARACTERISTICS (T_C=25°C, λ=1,310/1,550nm, V_{SS}=-5.2V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
APD Responsivity	R ₁₅	1,550nm, M=1	0.80	0.85	-	A/W
	R ₁₃	1,310nm, M=1	0.75	0.85	-	A/W
APD Breakdown Voltage	V _B	I _D =10μA	40	50	70	V
Temperature Coefficient of V _B	γ	(Note 3)	0.08	0.12	0.15	V/°C
AC Transimpedance	Z _t	AC-Coupled, f=10MHz, R _L =50Ω, P _{in} ≤ -20dBm,	3.0	3.8	-	kΩ
Bandwidth	BW	AC-Coupled, R _L =50Ω, M=3 to 15, -3dBm from 1MHz	467	550	-	MHz
Equivalent Input Noise Current Density	i _n	AC-Coupled, R _L =50Ω, Average within BW	-	2.64	3.2	pA/√Hz
Sensitivity	P _r	622Mb/s NRZ, PRBS=2 ²³ -1, B.E.R.=10 ⁻¹⁰ , V _R is set at optimum value	-	-42	-40	dBm
		T _C =-40 to +85°C	-	-41	-39	dBm
Maximum Overload	P _o	622Mb/s NRZ, M=3, PRBS=2 ²³ -1, B.E.R.=10 ⁻¹⁰ , V _R is set at optimum value	-5	-	-	dBm
		T _C =-40 to +85°C, M=3	-7	-	-	dBm
Power Supply Current	I _{SS}	-	-	-	40	mA
Power Supply Voltage	V _{SS}	-	-5.46	-5.2	-4.94	V

Note: (1) V_B differs from device to device. V_B data is attached to each device.

(2) CW condition

(3) γ=dV_B/dT_C

Fig. 1 Output Characteristics

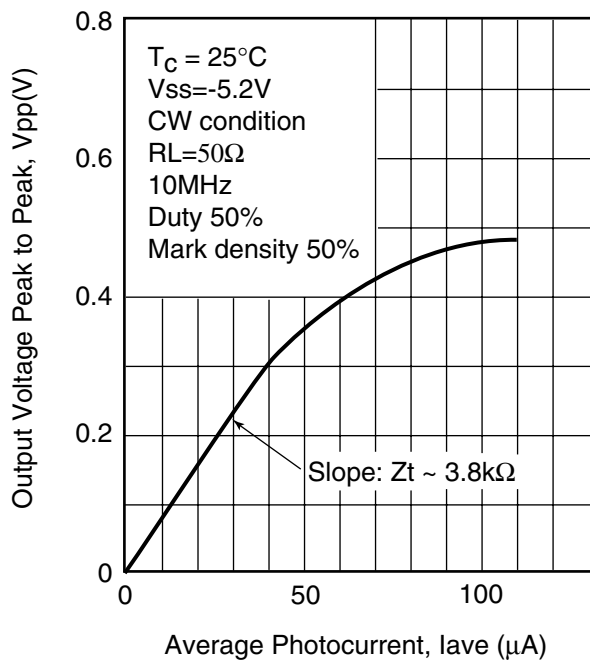


Fig. 2 Relative Frequency Response

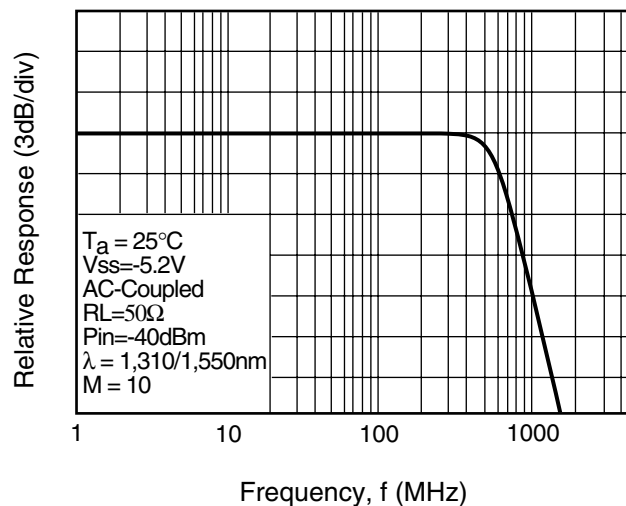


Fig.3 Equivalent Input Noise Current Density

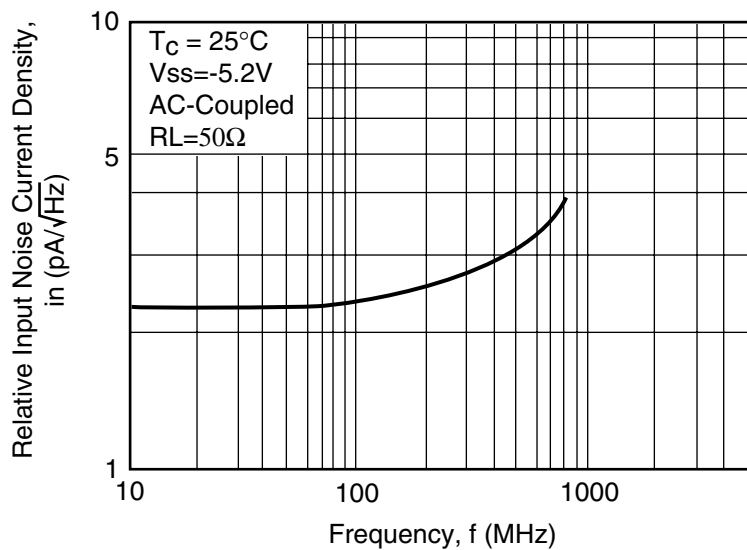
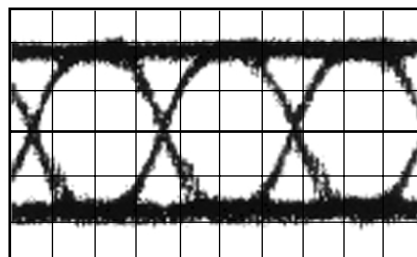
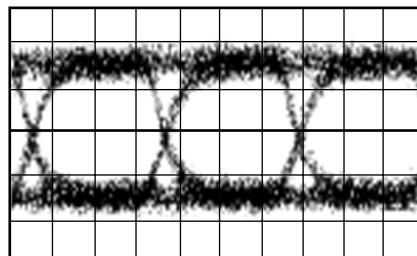


Fig.4 Eye Diagram with a 1,550nm, 622Mb/s NRZ, $2^{23}-1$ PRBS incident signal

Input optical wave form with Bessel filter



Equivalent output wave form at $P_{in} = -42\text{dBm}$, $T_c = 25^\circ\text{C}$, $M = \text{optimum}$



500ps/div

Fig.5 Sensitivity

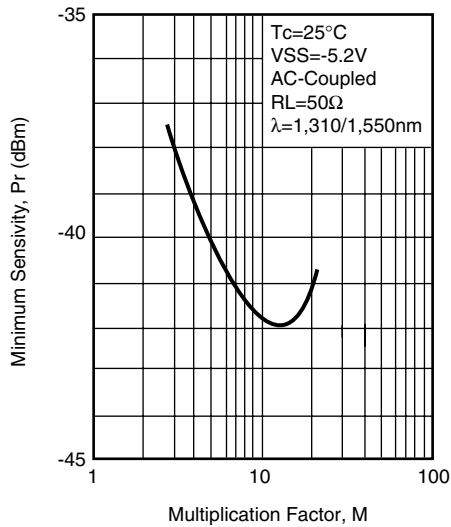
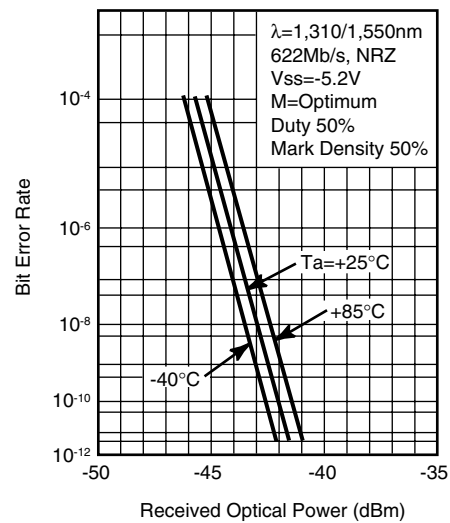
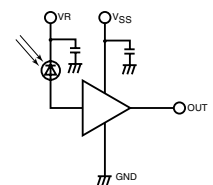
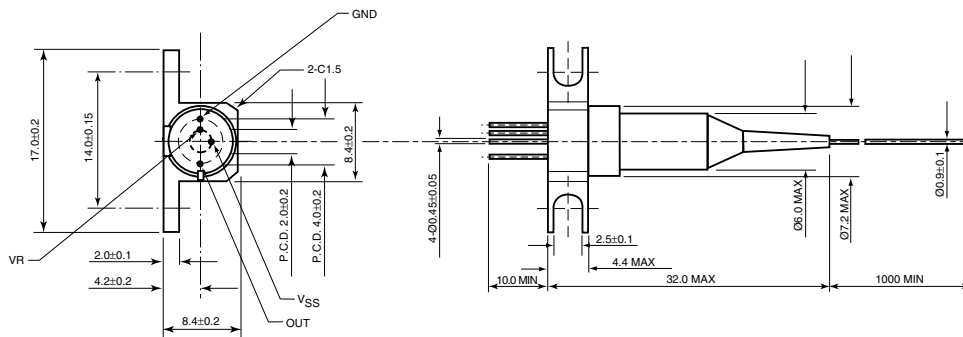


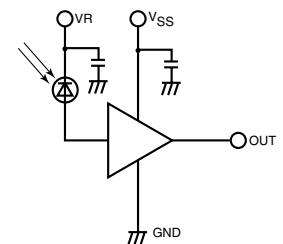
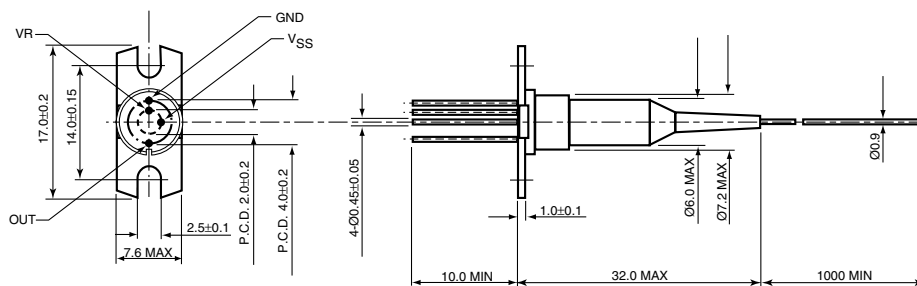
Fig.6 Bit Error Rate



“KT” PACKAGE



“LT” PACKAGE



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