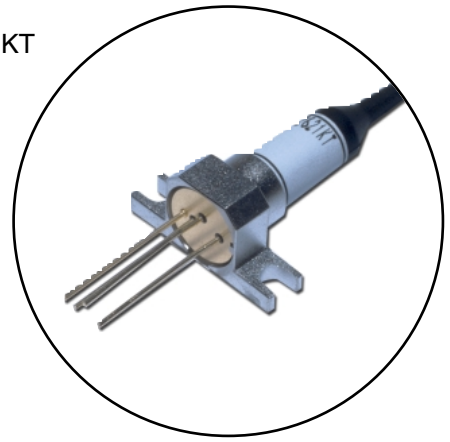
InGaAs-APD/Preamp Receiver

FRM5W62TKT/LT

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

KT



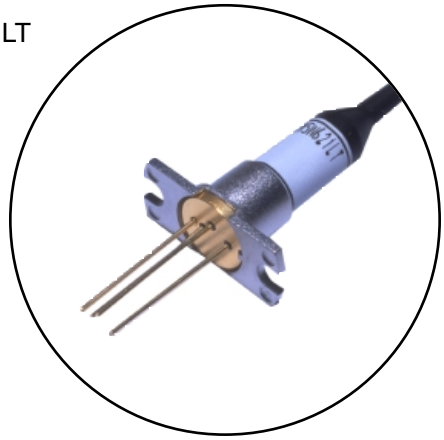
APPLICATIONS

- 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.

LT



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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 VB	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	R15	1,550nm, M=1	0.80	0.85	-	A/W
	R13	1,310nm, M=1	0.75	0.85	-	A/W
APD Breakdown Voltage	V_B	ID=10μA	40	50	70	V
Temperature Coefficient of VB	γ	(Note 3)	0.08	0.12	0.15	V/°C
AC Transimpedance	Z_t	AC-Coupled, f=10MHz, RL=50Ω, Pin <=-20dBm,	3.0	3.8	-	kΩ
Bandwidth	BW	AC-Coupled, RL=50Ω, M=3 to 15, -3dBm from 1MHz	467	550	-	MHz
Equivalent Input Noise Current Density	in	AC-Coupled, RL=50Ω, Average within BW	-	2.64	3.2	$pA/\sqrt{Hz}$
Sensitivity	P_r	622Mb/s NRZ, PRBS=2^{23}-1, B.E.R.=10^{-10}, VR is set at optimum value	-	-42	-40	dBm
		Tc=-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}, VR is set at optimum value	-5	-	-	dBm
		Tc=-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) VB differs from device to device. VB data is attached to each devices.
(2) CW condition
(3) γ=dVB/dTC

Fig. 1 Output Characteristics

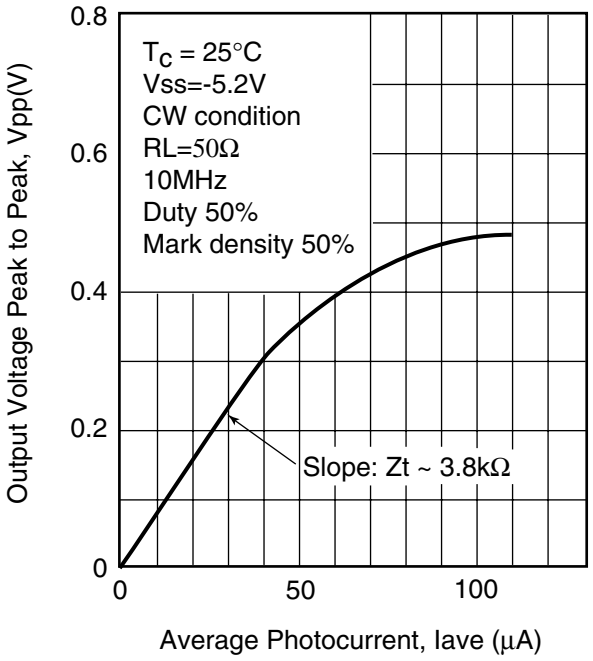


Fig. 2 Relative Frequency Response

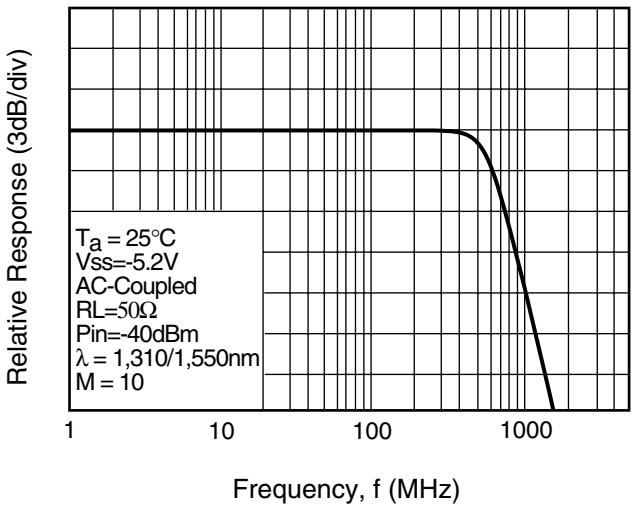


Fig.3 Equivalent Input Noise Current Density

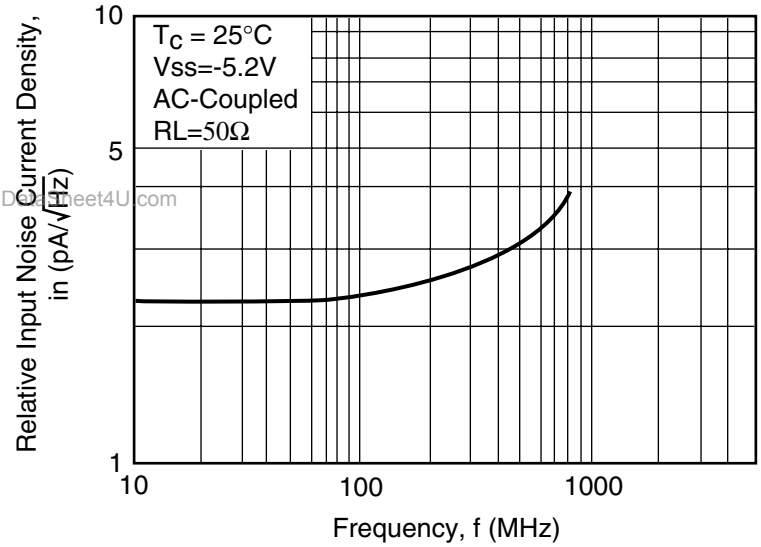
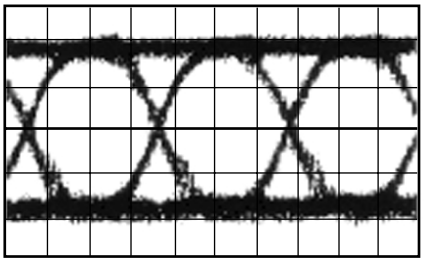
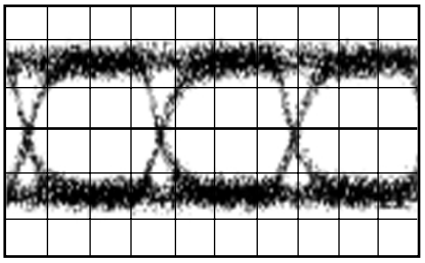


Fig.4 Eye Diagram with a 1,550nm, 622Mb/s NRZ, 2^{23}-1 PRBS incident signal

Input optical wave form with Bessel filter



Equivalent output wave form at Pin=-42dBm, Tc=25°C, M=optimum



500ps/div

Fig.5 Sensitivity

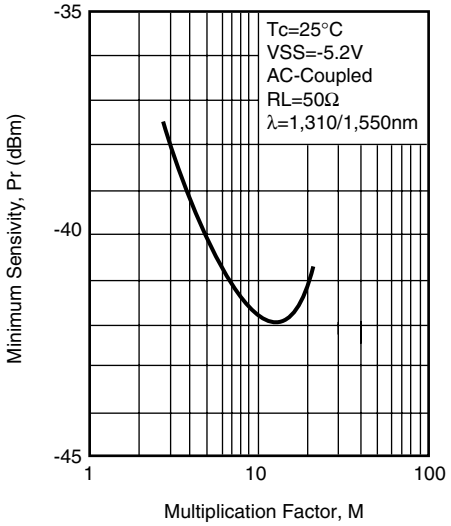
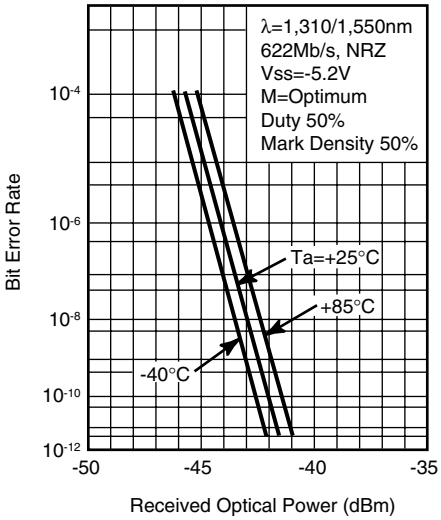
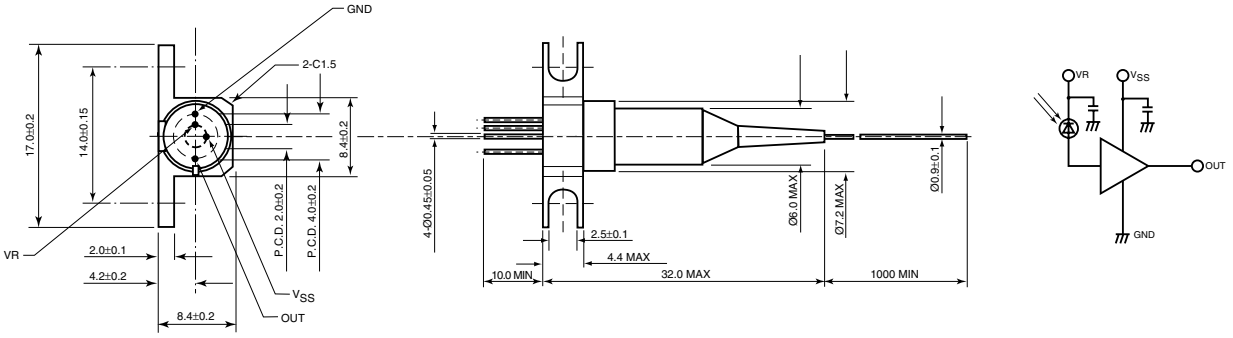


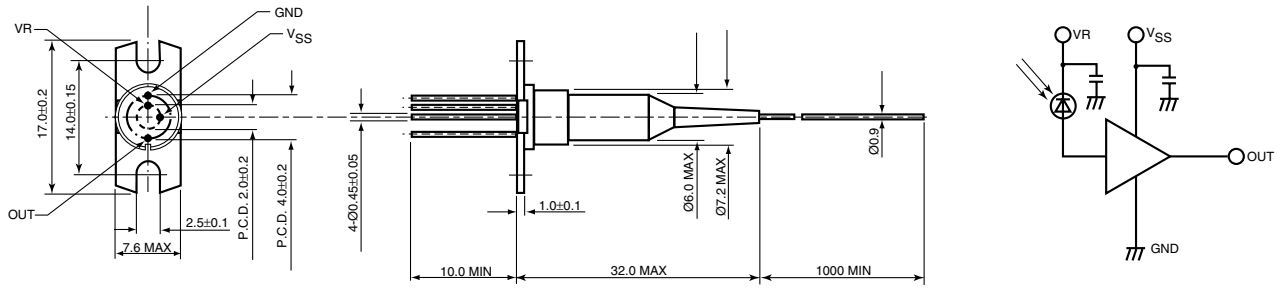
Fig.6 Bit Error Rate



"KT" PACKAGE **UNIT: mm**



"LT" PACKAGE **UNIT: mm**



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- **Do not put this product into the mouth.**
- **Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.**
- **Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.**

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