

**FEATURES**

- Data rate up to 2.5Gb/s
- -32dBm typ. sensitivity
- 30µm active area APD chip with GaAs pre-amplifier
- Small co-axial package with single mode fiber

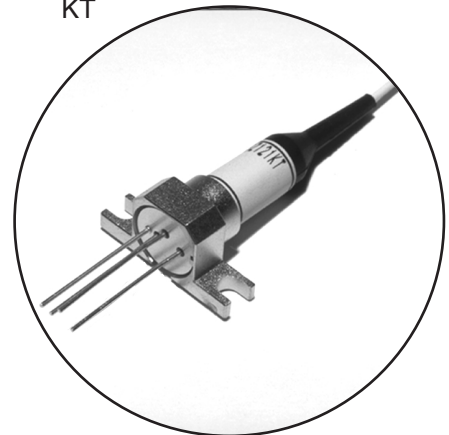
**APPLICATIONS**

- High bit rate long haul optical transmission systems operating at 2.5Gb/s

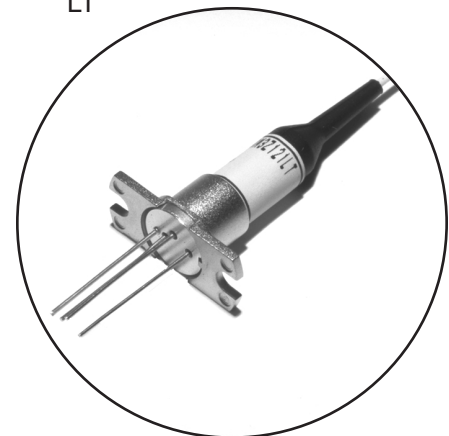
**DESCRIPTION**

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



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

Parameter	Symbol	Ratings	Unit
Storage Temperature	$T_{\text{stg}}$	-40 to +85	$^\circ\text{C}$
Operating Temperature	$T_{\text{op}}$	-40 to +85	$^\circ\text{C}$
Supply Voltage	$V_{\text{SS}}$	-7 to 0	V
APD Reverse Voltage	$V_{\text{R}}$ (Note 1)	0 to $V_{\text{B}}$	V
APD Reverse Current	$I_{\text{R}}$ (Note 2)	0.6	mA

OPTICAL & ELECTRICAL CHARACTERISTICS ( $T_C=25^\circ\text{C}$ ,  $\lambda=1,310/1,550\text{nm}$ ,  $V_{\text{SS}}=-5.2\text{V}$ , unless otherwise specified)

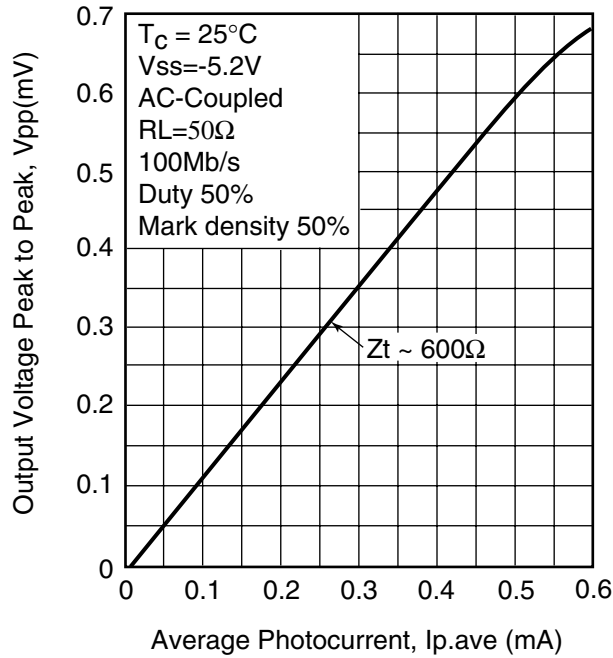
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
APD Responsivity	R15	1,550nm, M=1	0.80	0.85	-	A/W
	R13	1,310nm, M=1	0.75	0.85	-	A/W
APD Breakdown Voltage	$V_{\text{B}}$	$I_{\text{D}}=10\mu\text{A}$	40	50	65	V
Temperature Coefficient of $V_{\text{B}}$	$\gamma$	Note 3	0.08	0.12	0.15	$\text{V}/^\circ\text{C}$
AC Transimpedance	$Z_{\text{t}}$	AC-Coupled, $f=100\text{MHz}$ , $R_{\text{L}}=50\Omega$ , $P_{\text{in}} < -20\text{dBm}$ ,	400	600	-	$\Omega$
Bandwidth	BW	AC-Coupled, $R_{\text{L}}=50\Omega$ , M=3 to 15, -3dBm from 1MHz	1.8	2.0	-	GHz
Equivalent Input Noise Current Density	$i_{\text{n}}$	AC-Coupled, $R_{\text{L}}=50\Omega$ , Average within BW	-	6.5	8	$\text{pA}/\sqrt{\text{Hz}}$
Sensitivity	$P_{\text{r}}$	2.488Gb/s NRZ, PRBS= $2^{23}-1$ , B.E.R.= $10^{-10}$ , $V_{\text{R}}$ is set at optimum value	-	-32	-31	dBm
		$T_{\text{C}}=-40$ to $+85^\circ\text{C}$	-	-31	-30	dBm
Maximum Overload	$P_{\text{O}}$	2.488Gb/s NRZ, M=3, PRBS= $2^{23}-1$ , B.E.R.= $10^{-10}$ , $V_{\text{R}}$ is set at optimum value	-5	-	-	dBm
		$T_{\text{C}}=-40$ to $+85^\circ\text{C}$ , M=3	-7	-	-	dBm
Power Supply Current	$I_{\text{SS}}$	-	-	-	40	mA
Power Supply Voltage	$V_{\text{SS}}$	-	-5.46	-5.2	-4.94	V

Note: (1)  $V_{\text{B}}$  differs from device to device.  $V_{\text{B}}$  data is attached to each devices.

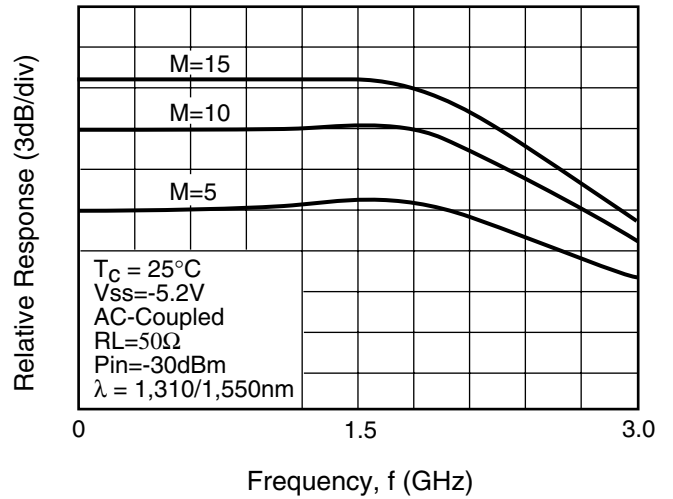
(2) CW condition

(3)  $\gamma=dV_{\text{B}}/dT_{\text{C}}$

**Fig. 1 Output Characteristics**

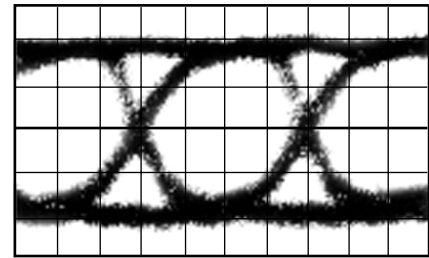


**Fig. 2 Relative Frequency Response**

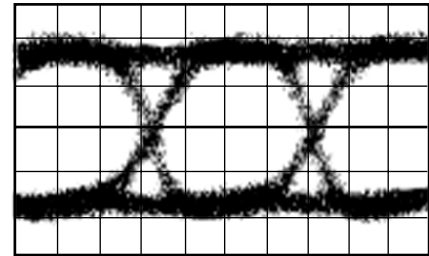


**Fig.4 Eye Diagram with a 1,550nm, 2.5Gb/s NRZ, 2<sup>23</sup>-1 PRBS incident signal**

Input optical wave form with Bessel filter



Equivalent output wave form at Pin=-32dBm, Tc=25°C, M=optimum



100ps/div

**Fig.3 Equivalent Input Noise Current Density**

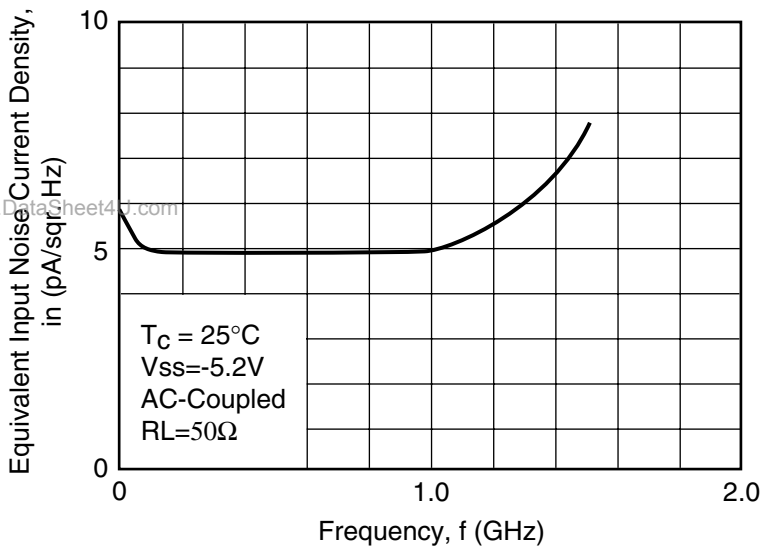
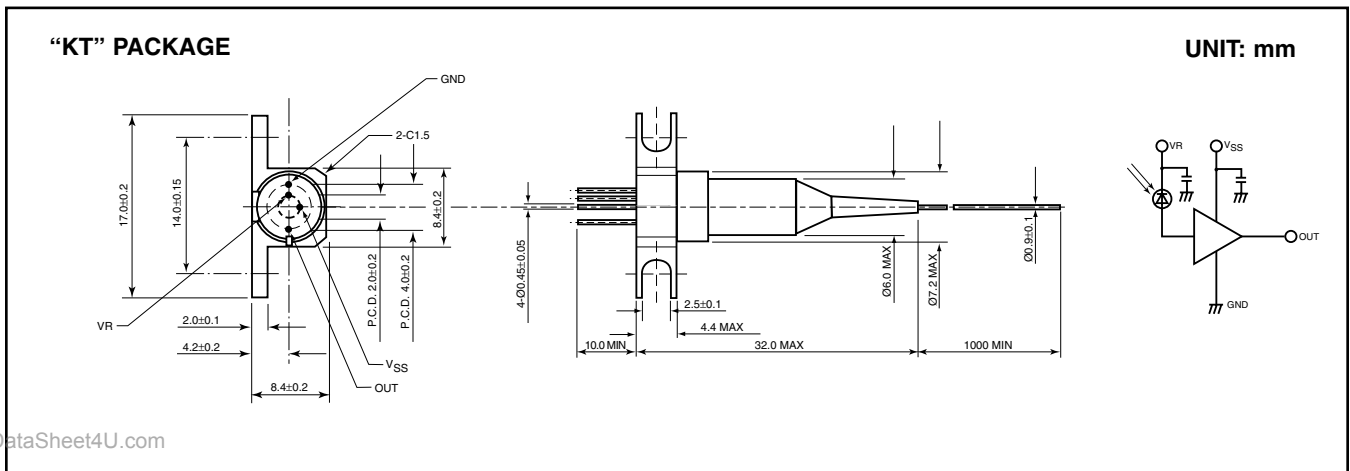
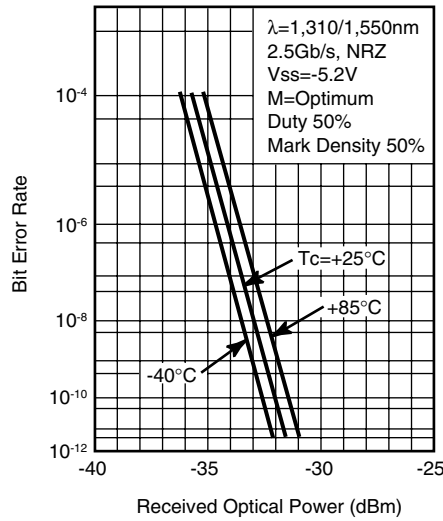
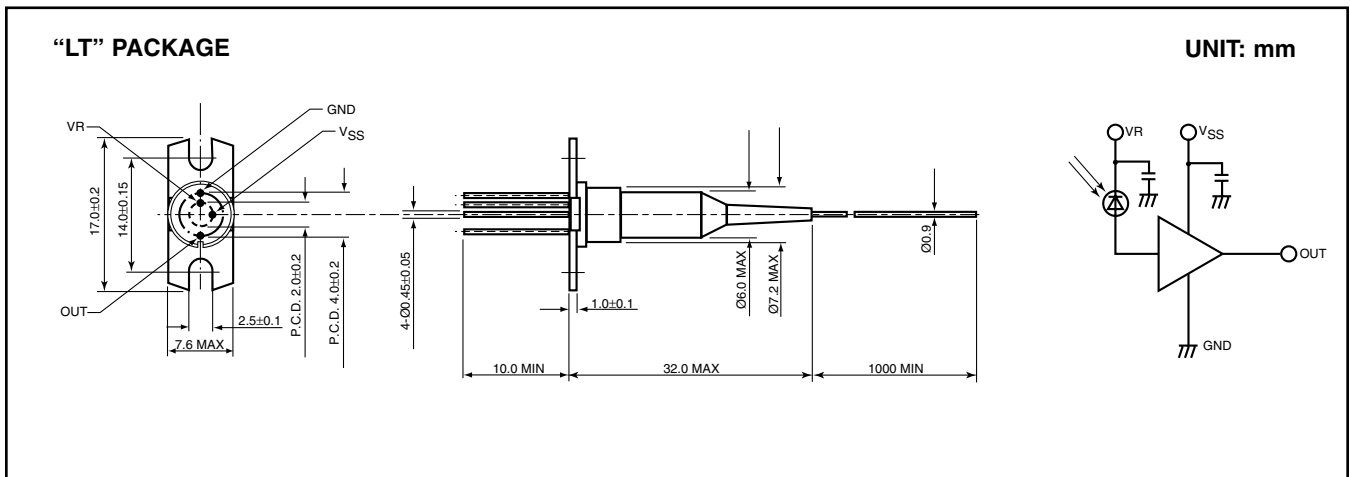


Fig.5 Bit Error Rate



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