

PNA4U15F (Tentative)

Photodiode with amplifier functions

For optical control systems

■ Features

- Small package, × 52 speed
- Reflow soldering possible

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Operating supply voltage	V_{CC}	6	V
Power dissipation	P_D	250	mW
Operating ambient temperature	T_{opr}	-20 to +70	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to +85	$^\circ\text{C}$

■ Operating Condition

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating supply voltage	V_{CC}		4.5	5.0	5.5	V
Reference voltage	V_{REF}		$V_{CC}/2 - 0.1$	$V_{CC}/2$	$V_{CC}/2 + 0.1$	V

■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$, $R_L = 10\text{ k}\Omega$, $C_L = 20\text{ pF}$, $V_R = 300\text{ }\Omega$

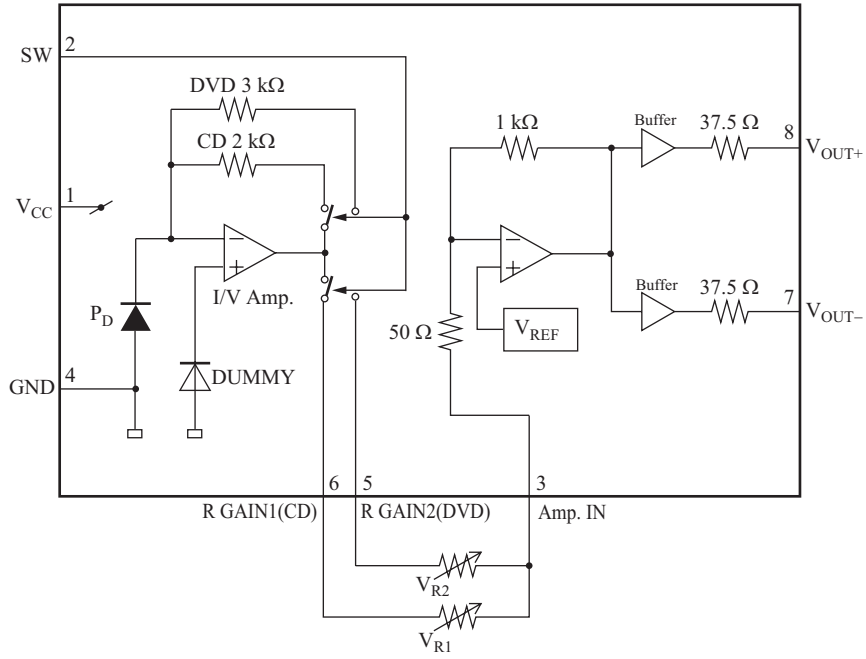
Parameter	Symbol	Conditions		Min	Typ	Max	Unit
SW change voltage range	V_{SW1}	CD	Gain1 / Gain2 → Gain1	0	—	0.99	V
	V_{SW2}	DVD	Gain1 / Gain2 → Gain2	2.4	—	V_{CC}	V
Output offset voltage	V_{OFF}	[$V_{OP} - V_{ON}$] No signal condition		-20	0	20	mV
Maximum output voltage *2	V_{OM}	[$V_{OP} - V_{ON}$] Max. Reference to GND		2.0	2.2	—	V
Output sensitivity *1	Gain1	[$V_{OP} - V_{ON}$] $\lambda = 780\text{ nm}$		2.1	2.8	3.5	V/mW
	Gain2	[$V_{OP} - V_{ON}$] $\lambda = 650\text{ nm}$		3.3	4.4	5.5	V/mW
Supply current	I_{CC}	No signal condition		—	26.0	29.9	mA
Cutoff frequency	$f_{C(-3dB)}$	CD	Gain1 $20 \log (V_O(f_C \text{ MHz}) / V_O(1 \text{ MHz})) = -3$	80	90	—	MHz
		DVD	Gain2 $20 \log (V_O(f_C \text{ MHz}) / V_O(1 \text{ MHz})) = -3$	70	80	—	MHz
Rise time	t_r	CD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$, 10% to 90%, Gain1	—	5	—	ns
		DVD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$, 10% to 90%, Gain2	—	5	—	ns
Fall time	t_f	CD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$, 10% to 90%, Gain1	—	5	—	ns
		DVD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$, 10% to 90%, Gain2	—	5	—	ns
Slew rate	SR			200	300	—	V/ μs
Settling time	t_{set}	CD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$ at Gain1, $\pm 3\%$	—	12	—	ns
		DVD	$V_{OP} - V_{ON} = 2\text{ V[p-p]}$ at Gain2, $\pm 3\%$	—	14	—	ns
Mode selecting time	t_{sel}	Gain-high ↔ Sleep ↔ Low		—	150	200	ns

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7031 measuring methods for diodes.

2. *1: Standard voltage level; V_{REF} (Exclude output offset voltage)

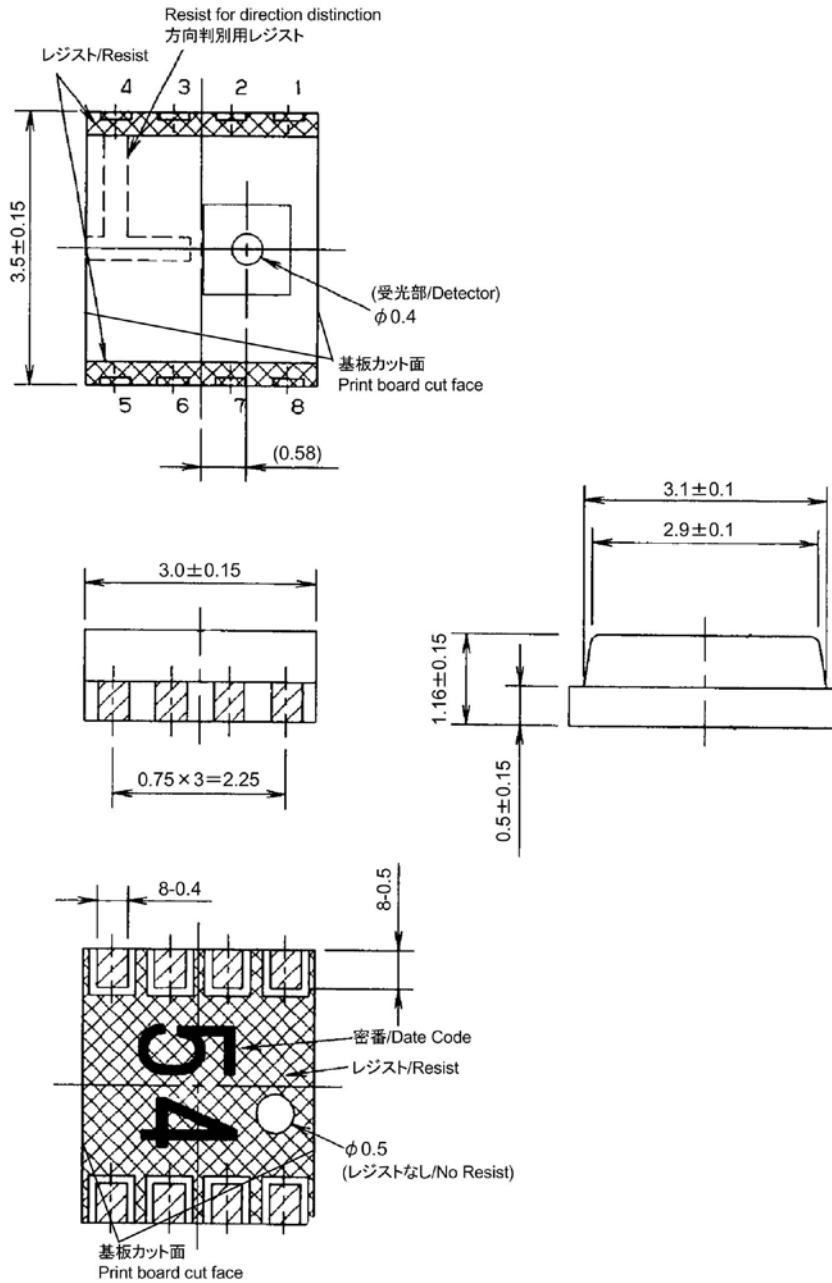
*2: Full saturation value

■ Block Diagram



■ Package (Unit: mm)

KPTFTN6K0004



• Pin name

1: V_{CC}	5: R GAIN2
2: SW	6: R GAIN1
3: Amp.IN	7: V_{OUT-}
4: GND	8: V_{OUT+}

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