PNA4U17F (Tentative)

Photodiode with amplifier functions

For optical control systems

■ Features

- Small package, × 52 speed
- Reflow soldering possible

■ Absolute Maximum Ratings T_a = 25°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	°C
Storage temperature	T_{stg}	–40 to +85	°C

■ Operatong 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} = 5.0 V	1.60	1.70	1.80	V

■ Electrical Characteristics T_a = 25°C±3°C, V_{CC} = 5.0 V, R_L = 10 kΩ, C_L = 20 pF, V_R = 300 Ω

Parameter	Symbol		Conditions	Min	Typ	Max	Unit
SW change voltage range	V_{SW2}	CD	Gain1 / Gain2 → Gain1	2.4	—	V_{CC}	V
	V_{SW1}	DVD	Gain1 / Gain2 → Gain2	0	—	0.99	V
Output offset voltage	V_{OFF}		[V_OP – V_ON] No signal condition	–20	0	20	mV
Maximum output voltage *3	V_{OM}		[V_OP – V_ON] Max. Reference to GND	1.9	2.1	—	V
Output sensitivity *1, 2	Gain1		[V_OP – V_ON] λ = 780 nm	1.47	1.96	2.45	V/mW
	Gain2		[V_OP – V_ON] λ = 650 nm	3.00	3.99	4.98	V/mW
Supply current	I_{CC}		No signal condition	—	26.0	29.9	mA
Cutoff frequency *4	$f_{C(-3dB)}$	CD	Gain1 10 log (V_O (f_C MHz) / V_O (1 MHz)) = –3	65	75	—	MHz
		DVD	Gain2 10 log (V_O (f_C MHz) / V_O (1 MHz)) = –3	75	85	—	MHz
Rise time *4, 5	t_r	CD	V_OP – V_ON = 2 V[p-p], 10% to 90%, Gain1	—	7	(9.5)	ns
		DVD	V_OP – V_ON = 2 V[p-p], 10% to 90%, Gain2	—	6	(8.5)	ns
Fall time *4, 5	t_f	CD	V_OP – V_ON = 2 V[p-p], 10% to 90%, Gain1	—	7	(9.5)	ns
		DVD	V_OP – V_ON = 2 V[p-p], 10% to 90%, Gain2	—	6	(8.5)	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: Limitation to the difference of sensitivity will be defined individually after confirmation, when it is necessary.

*3: Full saturation value

*4: Guarantee item on design.

*5: The numerical in parenthesis is design reference value.

■ Electrical Characteristics (Continued) T_a = 25°C±3°C, V_{CC} = 5.0 V, R_L = 10 kΩ, C_L = 20 pF, V_R = 300 Ω

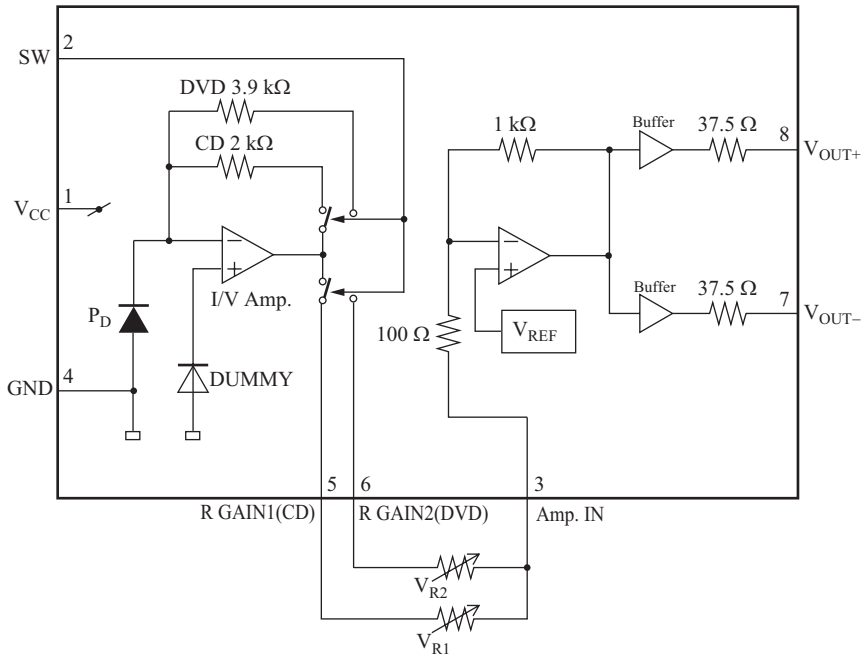
Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Slew rate *4	SR	CD	$V_OP - V_ON$ = 2 V[p-p] at Gain1	200	300	—	V/μs
		DVD	$V_OP - V_ON$ = 2 V[p-p] at Gain2	200	300	—	V/μs
Settling time *4, 5	t_{set}	CD	$V_OP - V_ON$ = 2 V[p-p] at Gain1, ±3%	—	12	(15)	ns
		DVD	$V_OP - V_ON$ = 2 V[p-p] at Gain2, ±3%	—	10	(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. *4: Guarantee item on design.

*5: The numerical in parenthesis is design reference value.

■ Block Diagram



Note: V_R recommends 50 Ω to 700 Ω

■ Package (Unit: mm)

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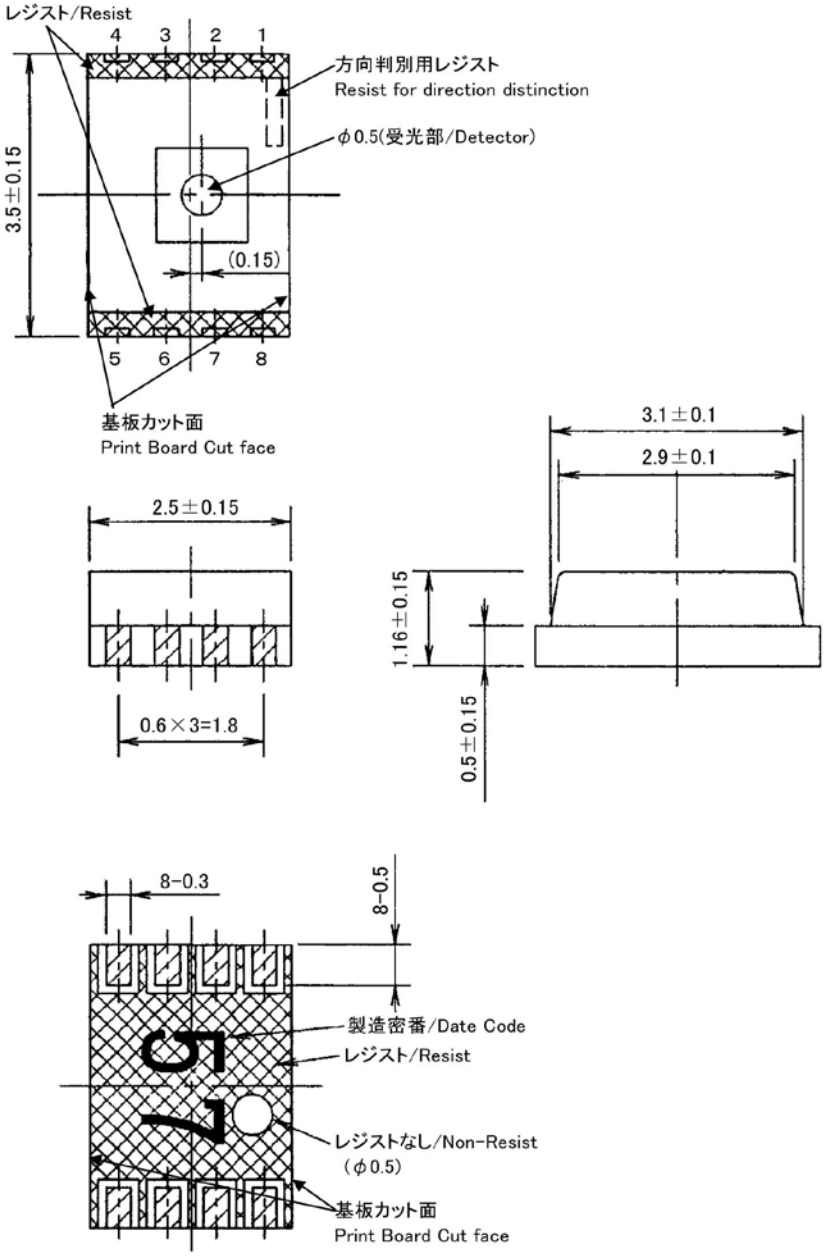

• Pin name

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

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