DATA SHEET

NEC

PHOTOCOUPLER

PS8821-1,-2

1 Mbps ANALOG OUTPUT TYPE 8-PIN SSOP (SO-8) HIGH-SPEED PHOTOCOUPLER

–NEPOC Series–

DESCRIPTION

The PS8821-1, -2 are optically coupled isolators containing a GaAlAs LED on the light emitting diode (input side) and a PIN photodiode and a high-speed amplifier transistor on the output side on one chip.

The PS8821-2 is suitable for high density applications.

FEATURES

- 40% reduction of mounting area (5-pin SOP × 2)
- Low power consumption (V_{CC} = 3.3 V)
- High isolation voltage (BV = 2 500 Vr.m.s.)
- High-speed response (t_{PHL} = 0.6 μs MAX., t_{PLH} = 0.9 μs MAX.)
- Ordering number of tape product: PS8821-1-F3, F4: 1 500 pcs/reel
  : PS8821-2-F3, F4: 1 500 pcs/reel
- Pb-Free product

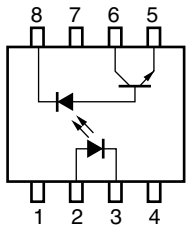
APPLICATIONS

- Power over Ethernet
- Computer and peripheral manufactures
- Substitutions for relays and pulse transformers
- Power supply

PIN CONNECTION

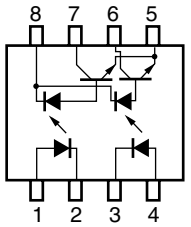
(Top View)

PS8821-1



1. NC
2. Anode
3. Cathode
4. NC
5. GND
6. V_O
7. NC
8. V_{CC}

PS8821-2



1. Anode1
2. Cathode1
3. Cathode2
4. Anode2
5. GND
6. V_O2
7. V_O1
8. V_{CC}

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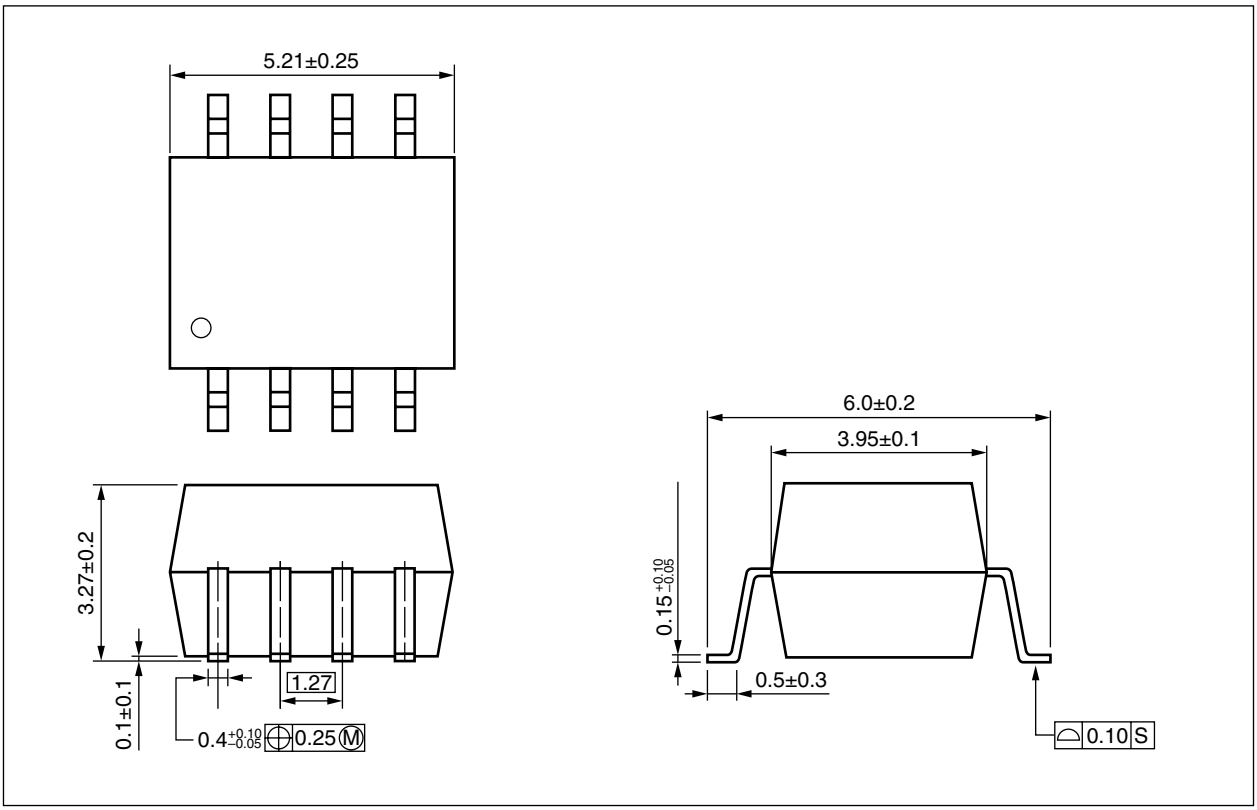
PACKAGE DIMENSIONS (UNIT: mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Diode	Forward Current*1	I_F	25	mA/ch
	Reverse Voltage	V_R	5.0	V/ch
Detector	Supply Voltage	V_{CC}	7	V
	Output Voltage	V_O	7	V/ch
	Output Current	I_O	8.0	mA/ch
	Power Dissipation	P_C	10	mW/ch
Isolation Voltage*2		BV	2 500	Vr.m.s.
Operating Ambient Temperature		T_A	–55 to +100	°C
Storage Temperature		T_{stg}	–55 to +125	°C

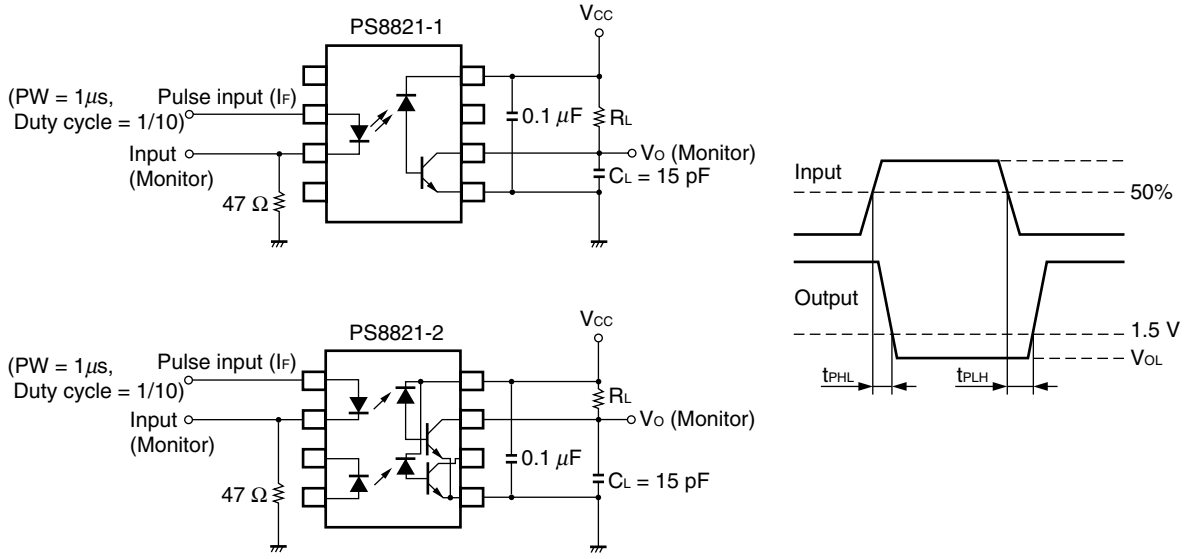
***1** Reduced to 0.63 mA/°C at T_A = 85°C or more.

***2** AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.
Pins 1-4 shorted together, 5-8 shorted together.

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

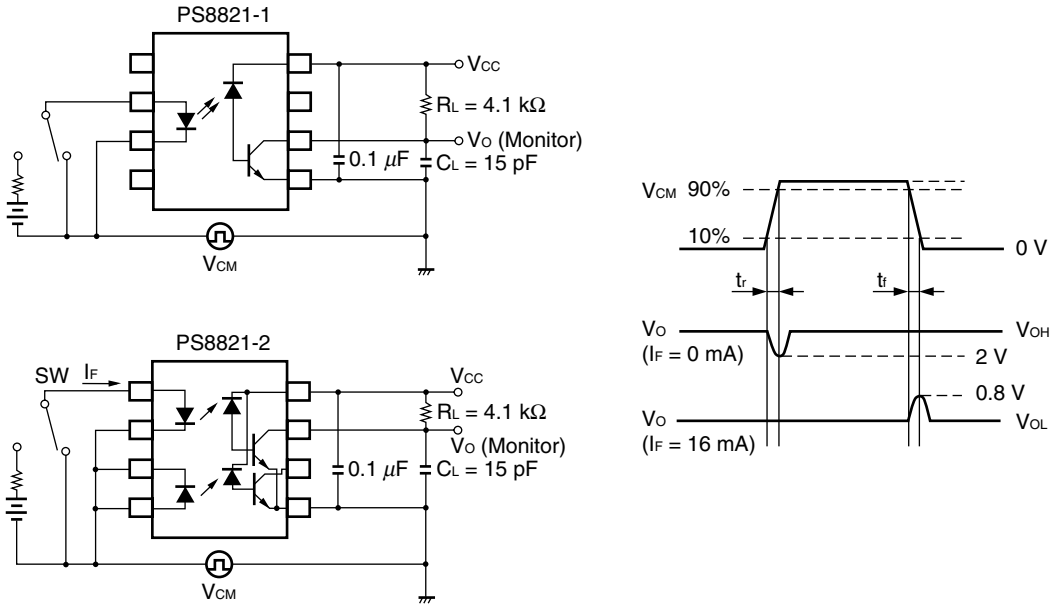
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 16 mA		1.7	2.2	V
	Reverse Current	I_R	V_R = 3 V			10	μA
	Forward Voltage Temperature Coefficient	$\Delta V_F/\Delta T_A$	I_F = 16 mA		–2.1		mV/°C
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		30		pF
Detector	High Level Output Current	I_{OH}	I_F = 0 mA, V_{CC} = V_O = 3.3 V		0.01	1	μA
	Low Level Output Voltage	V_{OL}	I_F = 16 mA, V_{CC} = 3.3 V, I_{OL} = 2.4 mA		0.1	0.4	V
	High Level Supply Current (PS8821-1)	I_{CCH}	I_F = 0 mA, V_O = open, V_{CC} = 3.3 V		0.1	10	μA
	High Level Supply Current (PS8821-2)				0.2	20	
	Low Level Supply Current (PS8821-1)	I_{CCL}	I_F = 16 mA, V_O = open, V_{CC} = 3.3 V		100		
	Low Level Supply Current (PS8821-2)				200		
Coupled	Current Transfer Ratio	CTR	I_F = 16 mA, V_{CC} = 3.3 V, V_O = 0.4 V	20	40		%
	Input-Output Isolation Resistance	R_{I-O}	V_{I-O} = 1 kV_{DC}, RH = 40 to 60%	10^{11}			Ω
	Insulation Resistance (Input-Input), (PS8821-2)	R_{I-I}	V_{I-I} = 5 V_{DC}, RH = 40 to 60%	10^{7}			
	Input-Output Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.6		pF
	Insulation Capacitance (Input-Input), (PS8821-2)	C_{I-I}			0.3		
	Propagation Delay Time (H → L)*1	t_{PHL}	I_F = 10 mA, V_{CC} = 3.3 V, R_L = 1.8 kΩ, C_L = 15 pF, T_A = 0 to 100°C		0.3	0.6	μs
	Propagation Delay Time (L → H)*1	t_{PLH}			0.5	0.9	
	Common Mode Transient Immunity at High Level Output*2	C_{MH}	I_F = 0 mA, V_{CC} = 3.3 V, R_L = 4.1 kΩ, V_{CM} = 10 V		1		kV/μs
	Common Mode Transient Immunity at Low Level Output*2	C_{ML}	I_F = 16 mA, V_{CC} = 3.3 V, R_L = 4.1 kΩ, V_{CM} = 10 V		1		

***1** Test circuit for propagation delay time



Remark C_L is approximately 15 pF which includes probe and stray wiring capacitance.

***2** Test circuit for common mode transient immunity



USAGE CAUTIONS

1. This product is weak for static electricity by designed with high-speed integrated circuit so protect against static electricity when handling.
2. By-pass capacitor of 0.1 μF is used between V_{CC} and GND near device. Also, ensure that the distance between the leads of the photocoupler and capacitor is no more than 10 mm.
3. Avoid storage at a high temperature and high humidity.

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M8E 00.4-0110

Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

▶**For further information, please contact**

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