DATA SHEET

CEL

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.

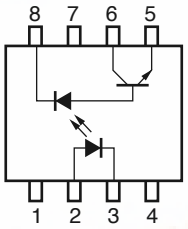
FEATURES

- 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

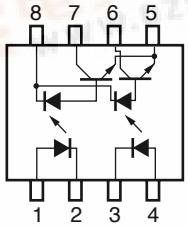
APPLICATIONS

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

PIN CONNECTION
(Top View)



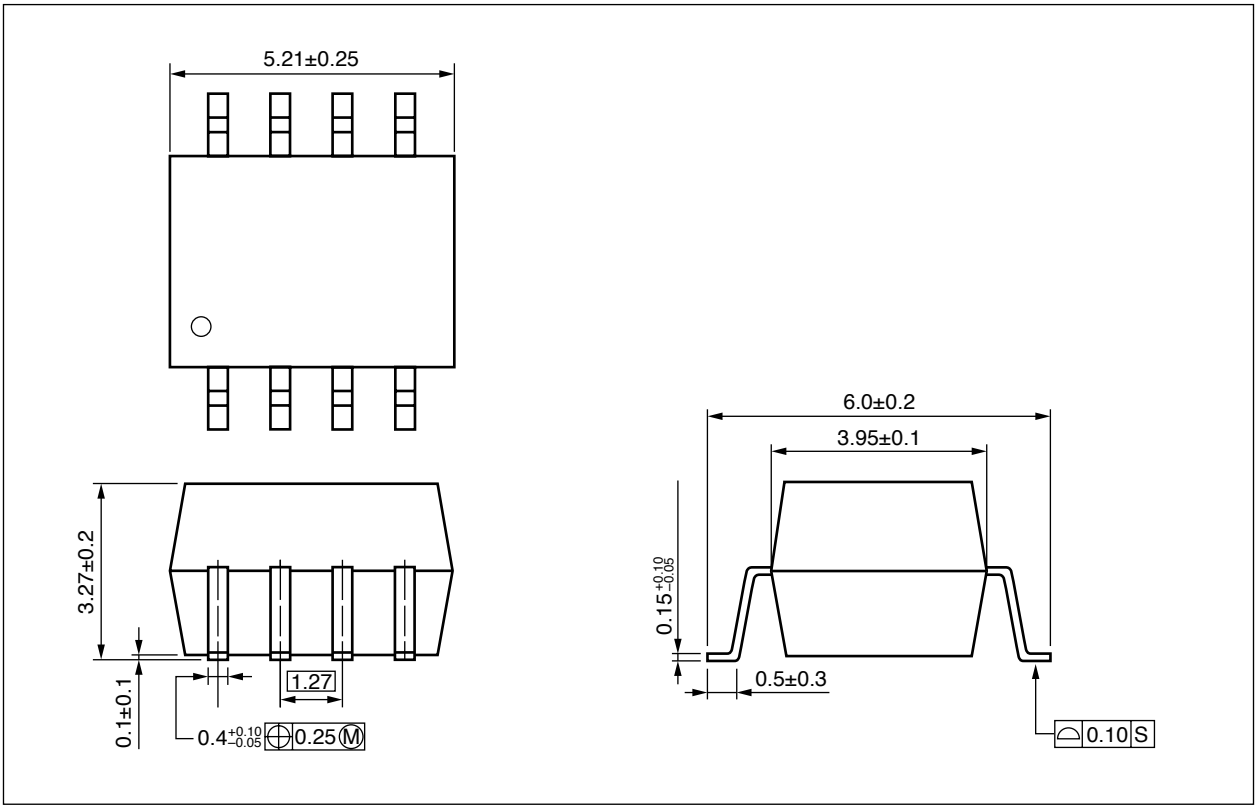
1. NC
2. Anode
3. Cathode
4. NC
5. GND
6. V_O
7. NC
8. V_{CC}



1. Anode1
2. Cathode1
3. Cathode2
4. Anode2
5. GND
6. V_{O2}
7. V_{O1}
8. V_{CC}

Document No. Preliminary
Date Published Feb 2005 CP(K)

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

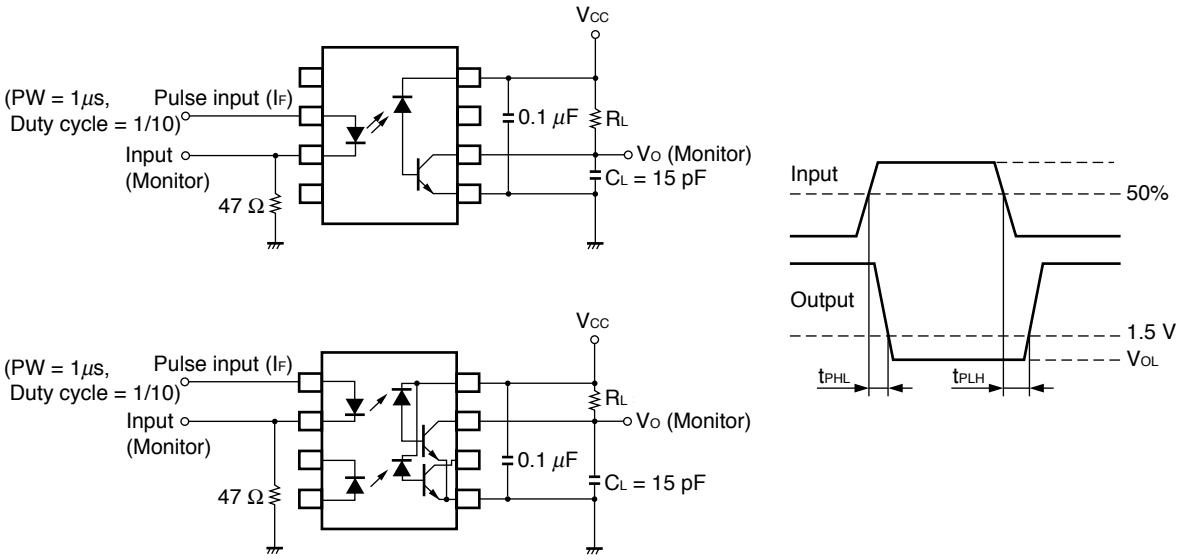
***1** Reduced to 0.63 mA/°C at T_A = 85°C or more.

***2** AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.

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

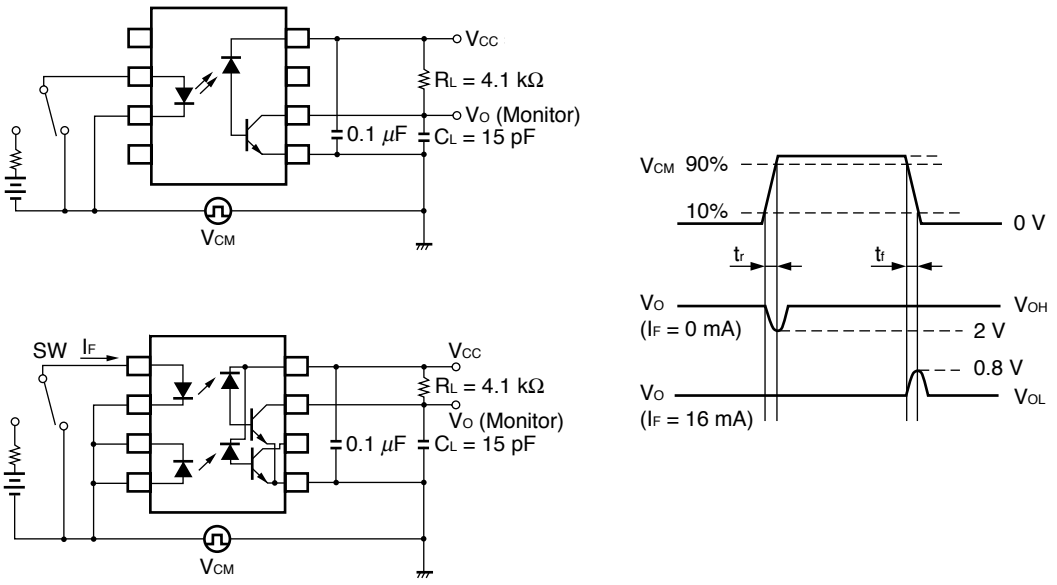
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 16 mA		1.7	2.2	V
	Reverse Current	I_R	V_R = 3 V			10	μA
	Forward Voltage Temperature Coefficient	$\Delta V_F/\Delta T_A$	I_F = 16 mA		–2.1		mV/°C
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		30		pF
Detector	High Level Output 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)				0.02	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} = 3.3V, 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 = 10mA, V_{CC} = 3.3 V, R_L = 1.8kΩ, C_L = 15 pF Ta=0~100℃		0.2	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} = 3.3V, R_L = 4.1 kΩ, V_{CM} = 10V		1		kV/μs
	Common Mode Transient Immunity at Low Level Output*2	C_{ML}	I_F = 16 mA, V_{CC} = 3.3V, R_L = 4.1 kΩ, V_{CM} = 10V		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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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.