CEL

PHOTOCOUPLER
PS9317L,PS9317L2

HIGH CMR, 10 Mbps, OPEN COLLECTOR OUTPUT TYPE, 8 mm CREEPAGE 6-PIN SDIP PHOTOCOUPLER –NEPOC Series–

DESCRIPTION

The PS9317L and PS9317L2 are optical coupled high-speed, active low type isolators containing a GaAlAs LED on the input side and a photodiode and a signal processing circuit on the output side on one chip.

The PS9317L and PS9317L2 are designed specifically for high common mode transient immunity (CMR) and low pulse width distortion.

The PS9317L is lead bending type (Gull-wing) for surface mounting.

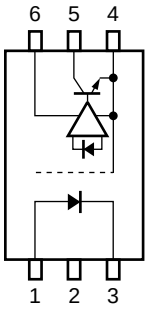
The PS9317L2 is lead bending type for long creepage distance (Gull-wing) for surface mount.

FEATURES

- Pulse width distortion ($|t_{PHL} - t_{PLH}|$ = 35 ns MAX.)
- High common mode transient immunity (CM_H, CM_L = ±15 kV/μs MIN.)
- Half size of 8-pin DIP
- Long creepage distance (8 mm MIN. : PS9317L2)
- High-speed (10 Mbps)
- High isolation voltage (BV = 5 000 Vr.m.s.)
- Open collector output
- Pb-Free product

<R>
- Safety standards
  - UL approved: File No. E72422
  - CSA approved: No. CA 101391
  - DIN EN60747-5-2 (VDE0884 Part2) approved: No. 40024069 (Option)

PIN CONNECTION
(Top View)



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

APPLICATIONS

- Measurement equipment
- PDP
- FA Network

TRUTH TABLE

LED	Output
ON	L
OFF	H

Document No. PN10690EJ02V0DS (2nd edition)
Date Published August 2008 NS

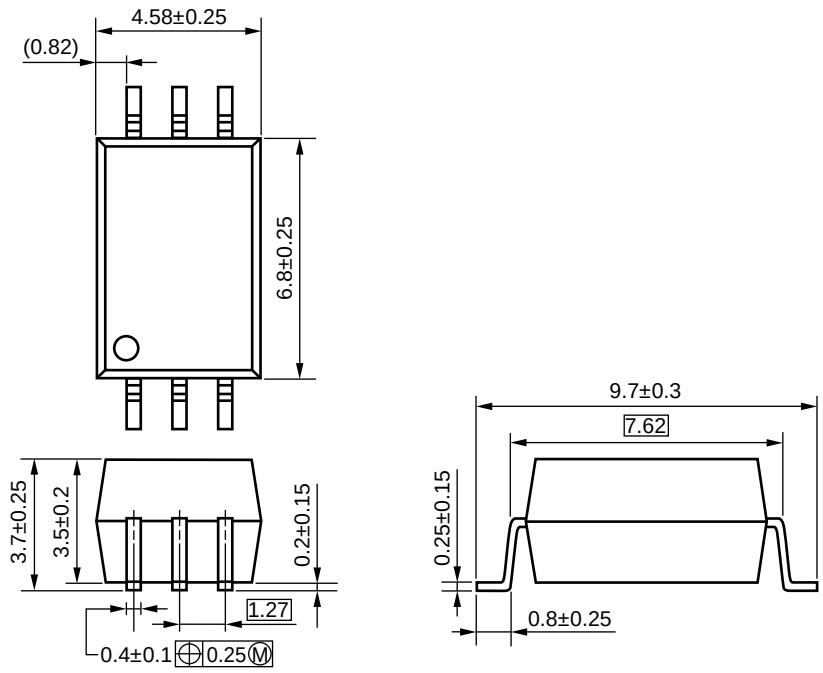
The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

PACKAGE DIMENSIONS (UNIT: mm)

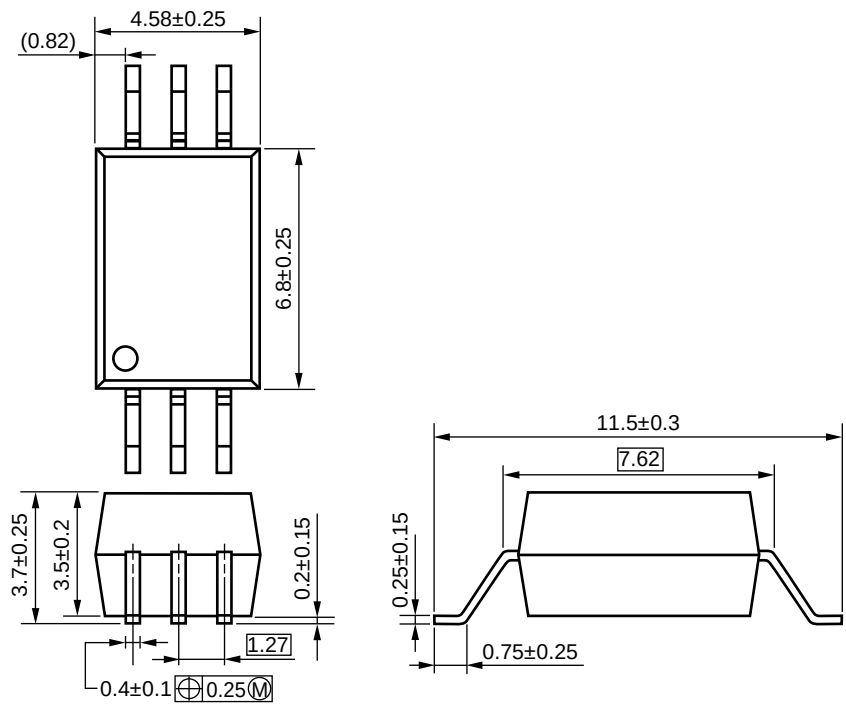
Lead Bending Type (Gull-wing) For Surface Mount

PS9317L

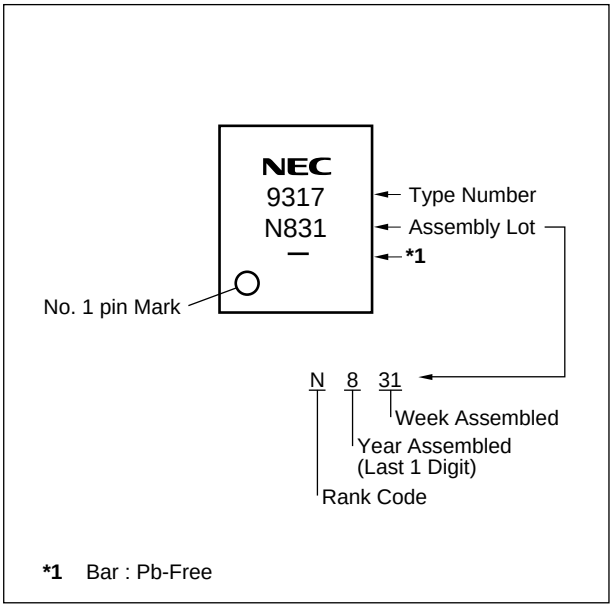


Lead Bending Type For Long Creepage Distance (Gull-wing) For Surface Mount

PS9317L2



<R> **MARKING EXAMPLE**



PHOTOCOUPLER CONSTRUCTION

Parameter	PS9317L	PS9317L2
Air Distance (MIN.)	7 mm	8 mm
Outer Creepage Distance (MIN.)	7 mm	8 mm
Isolation Distance (MIN.)	0.4 mm	0.4 mm

<R> **ORDERING INFORMATION**

Part Number	Order Number	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number*1
PS9317L	PS9317L-AX	Pb-Free	20 pcs (Tape 20 pcs cut)	Standard products	PS9317L
PS9317L-E3	PS9317L-E3-AX	(Ni/Pd/Au)	Embossed Tape 2 000 pcs/reel	(UL, CSA approved)	
PS9317L2	PS9317L2-AX		20 pcs (Tape 20 pcs cut)		PS9317L2
PS9317L2-E3	PS9317L2-E3-AX		Embossed Tape 2 000 pcs/reel		
PS9317L-V	PS9317L-V-AX		20 pcs (Tape 20 pcs cut)	DIN EN60747-5-2	PS9317L
PS9317L-E3-V	PS9317L-E3-V-AX		Embossed Tape 2 000 pcs/reel	(VDE0884 Part2)	
PS9317L2-V	PS9317L2-V-AX		20 pcs (Tape 20 pcs cut)	Approved (Option)	PS9317L2
PS9317L2-E3-V	PS9317L2-E3-V-AX		Embossed Tape 2 000 pcs/reel		

***1** For the application of the Safety Standard, following part number should be used.

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

Parameter		Symbol	Ratings	Unit
Diode	Forward Current*1	I_F	30	mA
	Reverse Voltage	V_R	5	V
Detector	Supply Voltage	V_{CC}	7	V
	Output Voltage	V_O	7	V
	Output Current	I_O	25	mA
	Power Dissipation*2	P_C	40	mW
Isolation Voltage*3		BV	5 000	Vr.m.s.
Operating Ambient Temperature		T_A	−40 to +85	°C
Storage Temperature		T_{stg}	−55 to +125	°C

***1** Reduced to 0.3 mA/°C at T_A = 25°C or more.

***2** Applies to output pin V_O (collector pin). Reduced to 1.5 mW/°C at T_A = 65°C or more.

***3** AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.
Pins 1-3 shorted together, 4-6 shorted together.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Low Level Input Voltage	V_{FL}	0		0.8	V
High Level Input Current	I_{FH}	6		12	mA
Supply Voltage	V_{CC}	4.5	5.0	5.5	V
TTL (R_L = 1 kΩ, loads)	N			5	
Pull-up Resistor	R_L	330		4 k	Ω

ELECTRICAL CHARACTERISTICS (T_A = –40 to +85°C, unless otherwise specified)

Parameter		Symbol	Conditions	MIN.	TYP.*1	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA, T_A = 25°C	1.2	1.56	1.9	V
	Reverse Current	I_R	V_R = 3 V, T_A = 25°C			10	μA
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz, T_A = 25°C		60		pF
Detector	High Level Output Current	I_{OH}	V_{CC} = V_O = 5.5 V, V_F = 0.8 V		1	100	μA
	Low Level Output Voltage*2	V_{OL}	V_{CC} = 5.5 V, I_F = 5 mA, I_{OL} = 13 mA		0.2	0.6	V
	High Level Supply Current	I_{CCH}	V_{CC} = 5.5 V, I_F = 0 mA, V_O = open		4	7	mA
	Low Level Supply Current	I_{CCL}	V_{CC} = 5.5 V, I_F = 10 mA, V_O = open		6	10	mA
Coupled	Threshold Input Current (H → L)	I_{FHL}	V_{CC} = 5 V, V_O = 0.8 V, R_L = 350 Ω		2.5	5	mA
	Isolation Resistance	R_{I-O}	V_{I-O} = 1 kV_{DC}, RH = 40 to 60%, T_A = 25°C	10^{11}			Ω
	Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz, T_A = 25°C		0.7		pF
	Propagation Delay Time (H → L)	t_{PHL}	T_A = 25°C		40	75	ns
						100	
	Propagation Delay Time (L → H)	t_{PLH}	T_A = 25°C		35	75	
						100	
	Rise Time	t_r	V_{CC} = 5 V, R_L = 350 Ω, C_L = 15 pF,		20		
	Fall Time	t_f	I_F = 7.5 mA, V_{THHL} = V_{THLH} = 1.5 V		5		
	Pulse Width Distortion (PWD)	$\lvert t_{PHL} - t_{PLH} \rvert$			5	35	
	Propagation Delay Skew	t_{PSK}				40	
	Common Mode Transient Immunity at High Level Output	CM_H	V_{CC} = 5 V, R_L = 350 Ω, T_A = 25°C, I_F = 0 mA, V_O > 2 V, V_{CM} = 1.5 kV	15			kV/μs
	Common Mode Transient Immunity at Low Level Output	CM_L	V_{CC} = 5 V, R_L = 350 Ω, T_A = 25°C, I_F = 7.5 mA, V_O < 0.8 V, V_{CM} = 1.5 kV	15			kV/μs

***1** Typical values at T_A = 25°C.

***2** Because V_{OL} of 2 V or more may be output when LED current input and when output supply of V_{CC} = 2.6 V or less, it is important to confirm the characteristics (operation with the power supply on and off) during design, before using this device.

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.

NOTES ON HANDLING

Cautions regarding noise

Be aware that when voltage is applied suddenly between the photocoupler's input and output or between collector-emitters at startup, the output transistor may enter the on state, even if the voltage is within the absolute maximum ratings.

<R> SPECIFICATION OF VDE MARKS LICENSE DOCUMENT

Parameter		Symbol	Speck	Unit
Application classification (DIN EN 60664-1 VDE0110 Part 1) for rated line voltages ≤ 300 Vr.m.s. for rated line voltages ≤ 600 Vr.m.s.			 IV III	
Climatic test class (DIN EN 60664-1 VDE0110)			40/85/21	
Dielectric strength maximum operating isolation voltage Test voltage (partial discharge test, procedure a for type test and random test) $U_{pr} = 1.5 \times U_{IORM}$, $P_d < 5$ pC		 U_{IORM} U_{pr}	 1 130 1 695	 V_{peak} V_{peak}
Test voltage (partial discharge test, procedure b for all devices) $U_{pr} = 1.875 \times U_{IORM}$, $P_d < 5$ pC		U_{pr}	2 119	V_{peak}
Highest permissible overvoltage		U_{TR}	8 000	V_{peak}
Degree of pollution (DIN EN 60664-1 VDE0110 Part 1)			2	
Clearance distance	PS9317L		>7.0	mm
	PS9317L2		>8.0	
Creepage distance	PS9317L		>7.0	mm
	PS9317L2		>8.0	
Comparative tracking index (DIN IEC 112/VDE 0303 Part 1)		CTI	175	
Material group (DIN EN 60664-1 VDE0110 Part 1)			III a	
Storage temperature range		T_{stg}	–55 to +125	°C
Operating temperature range		T_A	–40 to +85	°C
Isolation resistance, minimum value V_{IO} = 500 V dc at T_A = 25°C V_{IO} = 500 V dc at T_A MAX. at least 100°C		 Ris MIN. Ris MIN.	 10^{12} 10^{11}	 Ω Ω
Safety maximum ratings (maximum permissible in case of fault, see thermal derating curve) Package temperature Current (input current I_F, Psi = 0) Power (output or total power dissipation) Isolation resistance V_{IO} = 500 V dc at T_A = Tsi		 Tsi Isi Psi Ris MIN.	 175 400 700 10^9	 °C mA mW Ω

- **The information in this document is current as of August, 2008. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC Electronics products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".

  The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.

  "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.

  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).

  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

(1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.

(2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

M8E 02. 11-1

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 i any way allow it to enter the mouth.

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru