



**NEC's HIGH NOISE REDUCTION  
HIGH SPEED ANALOG OUTPUT  
5 PIN SOP OPTOCOUPLER**

**PS8101**

**FEATURES**

- **HIGH COMMON MODE TRANSIENT IMMUNITY:**  
CMH,CML:  $\pm 10$  kV/ $\mu$ s MIN
- **HIGH ISOLATION VOLTAGE:**  
BV: 2500 Vr.m.s.
- **HIGH SUPPLY VOLTAGE:**  
Vcc = 35 V
- **HIGH SPEED RESPONSE:**  
tPHL = 0.8  $\mu$ s MAX, tPLH = 1.2  $\mu$ s MAX
- **AVAILABLE IN TAPE AND REEL:**  
PS8101-F3, F4



ESD SENSITIVE

**DESCRIPTION**

NEC's PS8101 is an optically coupled isolator 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. Its small package makes it ideal for high density circuits and applications.

**APPLICATIONS**

- **COMPUTERS AND PERIPHERALS MANUFACTURES**
- **GENERAL PURPOSE INVERTER**
- **POWER SUPPLIES**
- **RELAY AND PULSE TRANSFORMER REPLACEMENTS**

**ELECTRICAL CHARACTERISTICS** (TA = 25°C)

PART NUMBER			PS8101			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
Diode	V <sub>F</sub>	Forward Voltage, I <sub>F</sub> = 16 mA	V	1.7	2.2	
	I <sub>R</sub>	Reverse Current, V <sub>R</sub> = 3 V	$\mu$ A		10	
	$\Delta V_F/\Delta T$	Forward Voltage Temp. Coefficient, I <sub>F</sub> = 16 mA	mV/°C	-1.6		
	C <sub>t</sub>	Terminal Capacitance, V = 0 V, f = 1.0 MHz	pF	60		
Detector	I <sub>OH(1)</sub>	High Level Output Current I <sub>F</sub> = 0 mA, V <sub>CC</sub> = V <sub>O</sub> = 5.5 V	nA	3	500	
	I <sub>OH(2)</sub>	High Level Output Current I <sub>F</sub> = 0 mA, V <sub>CC</sub> = V <sub>O</sub> = 30 V	$\mu$ A		100	
	V <sub>OL</sub>	Low Level Output Voltage I <sub>F</sub> = 16 mA, V <sub>CC</sub> = 4.5 V, I <sub>O</sub> = 1.2 mA	V	0.1	0.4	
	I <sub>CCL</sub>	Low Level Supply Current I <sub>F</sub> = 16 mA, V <sub>O</sub> = Open, V <sub>CC</sub> = 30 V	$\mu$ A	50		
	I <sub>CCH</sub>	High Level Supply Current I <sub>F</sub> = 0 mA, V <sub>O</sub> = Open, V <sub>CC</sub> = 30 V	$\mu$ A	0.01	2	
Coupled	CTR	Current Transfer Ratio, I <sub>F</sub> = 16 mA, V <sub>CC</sub> = 4.5 V, V <sub>O</sub> = 0.4 V	%	15	20	35
	R <sub>I-O</sub>	Isolation Resistance, V <sub>IN-OUT</sub> = 1k V <sub>DC</sub> , R <sub>H</sub> = 40 to 60 %	$\Omega$	10 <sup>11</sup>		
	C <sub>I-O</sub>	Isolation Capacitance, V = 0, f = 1.0 MHz	pF	0.4		
	t <sub>PHL</sub>	Propagation Delay Time, (High $\rightarrow$ Low) <sup>1</sup> I <sub>F</sub> = 16 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 2.2 k $\Omega$ , C <sub>L</sub> = 15 pF	$\mu$ s		0.5	0.8
	t <sub>PLH</sub>	Propagation Delay Time, (Low $\rightarrow$ High) <sup>1</sup> I <sub>F</sub> = 16 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 2.2 k $\Omega$ , C <sub>L</sub> = 15 pF	$\mu$ s		0.6	1.2
	CMH	Common Mode Transient Immunity at High Level Output <sup>2</sup> I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 4.1 k $\Omega$ , V <sub>CM</sub> = 1.5 kV	kV/ $\mu$ s	10		
	CML	Common Mode Transient Immunity at Low Level Output <sup>2</sup> I <sub>F</sub> = 16 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 4.1 k $\Omega$ , V <sub>CM</sub> = 1.5 kV	kV/ $\mu$ s	-10		

NOTES:

1. CTR rank  
K: 20 to 35 (%)  
N: 10 to 35 (%)

CONT'N ON NEXT PAGE.

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>A</sub> = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATING
Diode			
I <sub>F</sub>	Forward Current	mA	25
V <sub>R</sub>	Reverse Voltage	V	5.0
P <sub>D</sub>	Power Dissipation	mW	45
Detector			
V <sub>CC</sub>	Supply Voltage	V	35
V <sub>O</sub>	Output Voltage	V	35
I <sub>O</sub>	Output Current	mA	8.0
P <sub>C</sub>	Power Dissipation	mW	100
Coupled			
BV	Isolation Voltage <sup>2</sup>	V <sub>r.m.s.</sub>	2500
T <sub>A</sub>	Operating Ambient Temp.	°C	-55 to +100
T <sub>STG</sub>	Storage Temperature	°C	-55 to +125

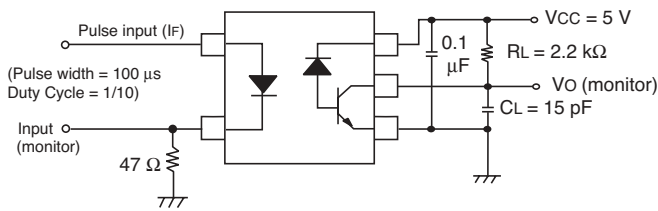
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for one minute at T<sub>A</sub> = 25°C, RH = 60% between input and output.

(Continued from previous page)

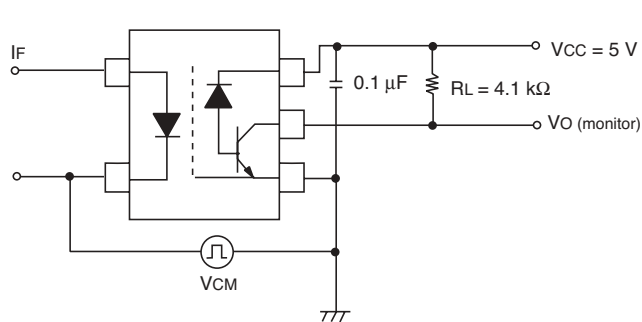
NOTES:

2. Test Circuit for Propagation Delay Time:



\*CL is approximately 15 pF which includes probe and stray wiring capacitance.

3. Test Circuit for Common Mode Transient Immunity:



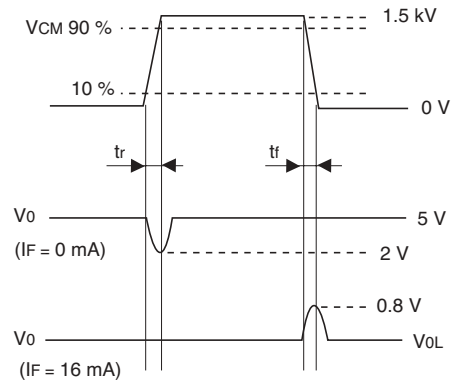
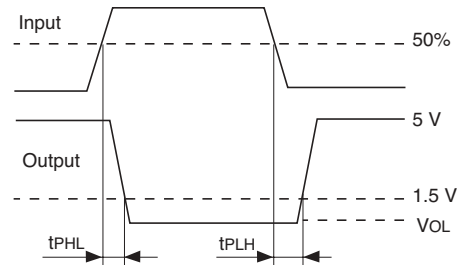
Usage Cautions:

1. When handling this product, precautions should be taken against static electricity.
2. A by-pass capacitor of ≥ 0.1 μF is used between V<sub>CC</sub> and GND.

**ORDERING INFORMATION**

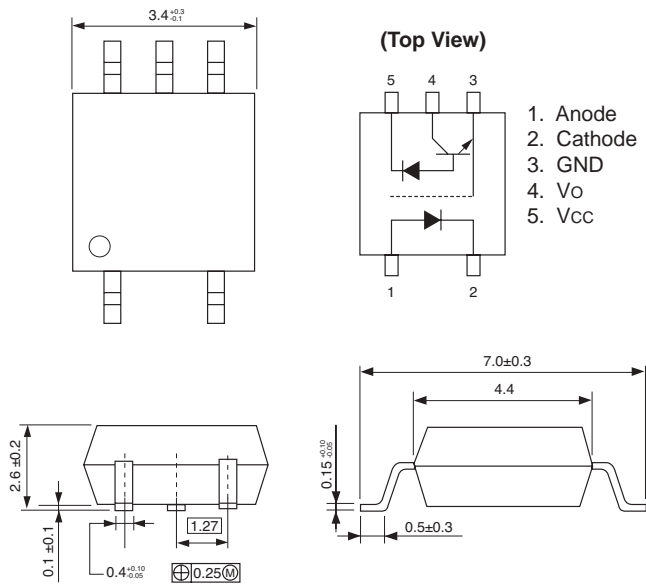
PART NUMBER	PACKAGE	PACKAGE STYLE	APPLICATION PART NUMBER*
PS8101	5-pin DIP	Magazine case 100 PCS	PS8101
PS8101-F3		Embossed Tape 2500 pcs/reel	
PS8101-F4			

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

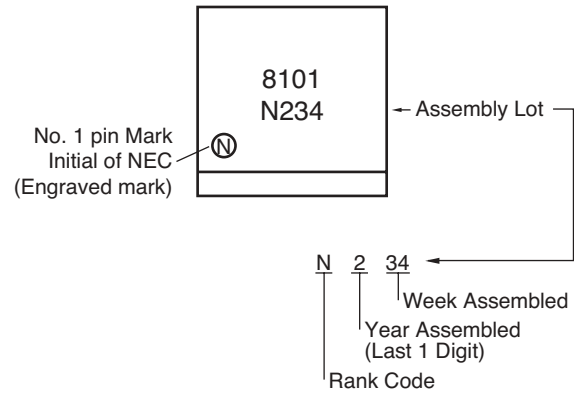


**OUTLINE DIMENSIONS** (Units in mm)

PS8101



**MARKING**



Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

**CEL** California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.

4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • FAX (408) 988-0279 • [www.cel.com](http://www.cel.com)

DATA SUBJECT TO CHANGE WITHOUT NOTICE

05/12/2003