

PRELIMINARY DATA SHEET



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

PS8101

FEATURES

- **HIGH COMMON MODE TRANSIENT IMMUNITY:**
CMH,CML: ± 10 kV/ μ s MIN
- **HIGH ISOLATION VOLTAGE:**
BV: 2500 Vr.m.s.
- **HIGH SUPPLY VOLTAGE:**
Vcc = 35 V
- **HIGH SPEED RESPONSE:**
tPHL = 0.8 μ s MAX, tPLH = 1.2 μ 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 _F | Forward Voltage, I _F = 16 mA | V | 1.7 | 2.2 | |
| | I _R | Reverse Current, V _R = 3 V | μ A | | 10 | |
| | $\Delta V_F/\Delta T$ | Forward Voltage Temp. Coefficient, I _F = 16 mA | mV/°C | -1.6 | | |
| | C _t | Terminal Capacitance, V = 0 V, f = 1.0 MHz | pF | 60 | | |
| Detector | I _{OH(1)} | High Level Output Current I _F = 0 mA, V _{CC} = V _O = 5.5 V | nA | 3 | 500 | |
| | I _{OH(2)} | High Level Output Current I _F = 0 mA, V _{CC} = V _O = 30 V | μ A | | 100 | |
| | V _{OL} | Low Level Output Voltage I _F = 16 mA, V _{CC} = 4.5 V, I _O = 1.2 mA | V | 0.1 | 0.4 | |
| | I _{CCL} | Low Level Supply Current I _F = 16 mA, V _O = Open, V _{CC} = 30 V | μ A | 50 | | |
| | I _{CCH} | High Level Supply Current I _F = 0 mA, V _O = Open, V _{CC} = 30 V | μ A | 0.01 | 2 | |
| Coupled | CTR | Current Transfer Ratio, I _F = 16 mA, V _{CC} = 4.5 V, V _O = 0.4 V | % | 15 | 20 | 35 |
| | R _{I-O} | Isolation Resistance, V _{IN-OUT} = 1k V _{DC} , R _H = 40 to 60 % | Ω | 10 ¹¹ | | |
| | C _{I-O} | Isolation Capacitance, V = 0, f = 1.0 MHz | pF | 0.4 | | |
| | t _{PHL} | Propagation Delay Time, (High \rightarrow Low) ¹ I _F = 16 mA, V _{CC} = 5 V, R _L = 2.2 k Ω , C _L = 15 pF | μ s | 0.5 | 0.8 | |
| | t _{PLH} | Propagation Delay Time, (Low \rightarrow High) ¹ I _F = 16 mA, V _{CC} = 5 V, R _L = 2.2 k Ω , C _L = 15 pF | μ s | 0.6 | 1.2 | |
| | CMH | Common Mode Transient Immunity at High Level Output ² I _F = 0 mA, V _{CC} = 5 V, R _L = 4.1 k Ω , V _{CM} = 1.5 kV | kV/ μ s | 10 | | |
| | CML | Common Mode Transient Immunity at Low Level Output ² I _F = 16 mA, V _{CC} = 5 V, R _L = 4.1 k Ω , V _{CM} = 1.5 kV | kV/ μ s | -10 | | |

NOTES:

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

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ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

| SYMBOLS | PARAMETERS | UNITS | RATING |
|------------------|--------------------------------|---------------------|-------------|
| Diode | | | |
| I _F | Forward Current | mA | 25 |
| V _R | Reverse Voltage | V | 5.0 |
| P _D | Power Dissipation | mW | 45 |
| Detector | | | |
| V _{CC} | Supply Voltage | V | 35 |
| V _O | Output Voltage | V | 35 |
| I _O | Output Current | mA | 8.0 |
| P _C | Power Dissipation | mW | 100 |
| Coupled | | | |
| BV | Isolation Voltage ² | V _{r.m.s.} | 2500 |
| T _A | Operating Ambient Temp. | °C | -55 to +100 |
| T _{STG} | Storage Temperature | °C | -55 to +125 |

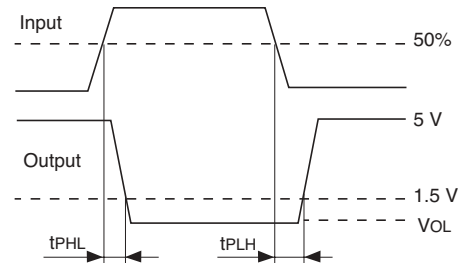
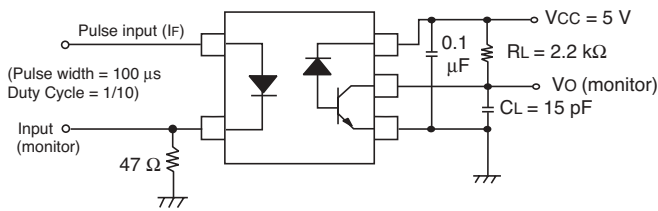
Notes:

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

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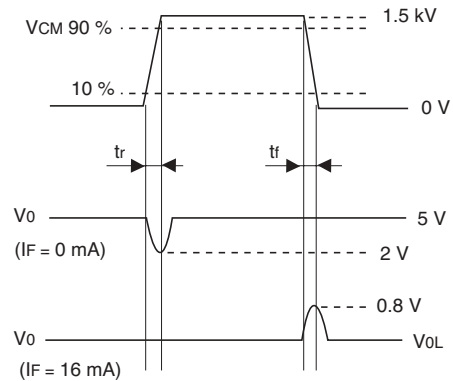
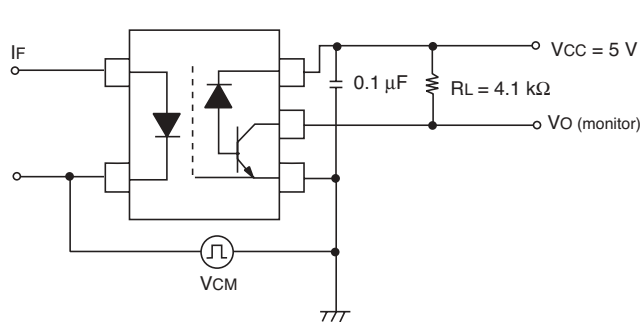
NOTES:

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_{CC} and GND.

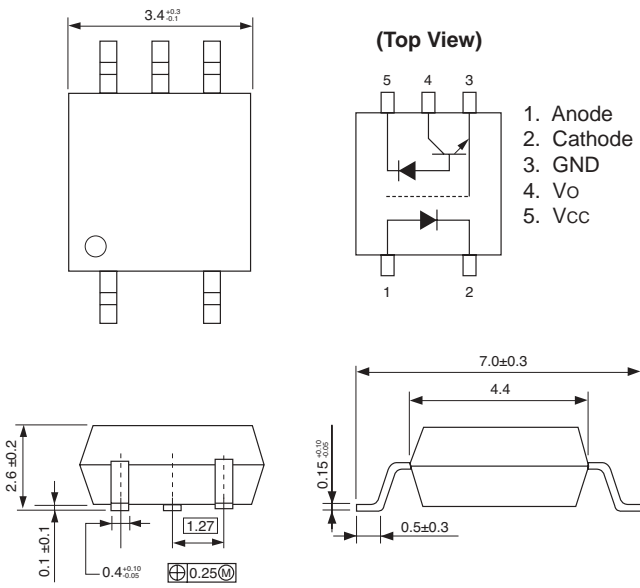
ORDERING INFORMATION

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

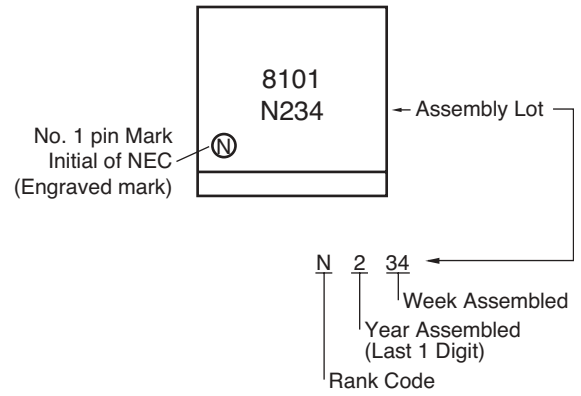
* For the application of the Safety Standard, following part number should be used.

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.

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

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