

**HIGH NOISE REDUCTION  
10 Mbps OPEN COLLECTOR OUTPUT TYPE  
5 PIN SOP OPTOCOUPLER**

**PS9714**

**FEATURES**

- **HIGH COMMON MODE TRANSIENT IMMUNITY:**  
CMH, CML:  $\pm 20$  kV/ $\mu$ s TYP
- **HIGH SPEED RESPONSE:**  
10 Mbps
- **HIGH ISOLATION VOLTAGE:**  
BV: 2500 Vr.m.s.
- **OPEN COLLECTOR OUTPUT TYPE**
- **5 PIN SOP (SMALL OUTLINE PACKAGE)**
- **TAPE AND REEL AVAILABLE:**  
PS9714-F3, F4: 3500 Pcs/Reel

**DESCRIPTION**

The PS9714 is an optically coupled isolator containing a GaAIAs LED on the light emitting diode (input) side and a photodiode and a signal processing circuit on the detector (output) side on one chip. The PS9714 is in a plastic SOP (Small Outline Package) type for high density applications.

**APPLICATIONS**

- **MEASUREMENT EQUIPMENT**
- **PDP**
- **FACTORY AUTOMATION NETWORK**

**ELECTRICAL CHARACTERISTICS** (TA = -40 to +85°C unless otherwise specified)

PART NUMBER				PS9714			
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
Diode	VF	Forward Voltage, IF = 10 mA, TA = 25°C	V	1.4	1.65	1.9	
	IR	Reverse Current, VR = 3 V, TA = 25°C	$\mu$ A			10	
	Ct	Terminal Capacitance, V = 0 V, f = 1 MHz, TA = 25°C	pF		30		
Detector	IOH	High Level Output Current, VCC = VO = 5.5 V, VF = 0.8 V	$\mu$ A		2	250	
	VOL	Low Level Output Voltage, VCC = 5.5 V, IF = 5 mA, IO = 13 mA	V		0.2	0.6	
	ICCH	High Level Supply Current, VCC = 5.5 V, IF = 0 mA	mA		3	8	
	ICCL	Low Level Supply Current, VCC = 5.5 V, IF = 10 mA	mA		6.5	11	
	IFHL	Threshold Input Current, VCC = 5 V, VO = 0.8 V, RL = 350 $\Omega$	%		2.0	5.0	
Coupled	RI-O	Isolation Resistance, Vin-out = 1kVDC, RH = 40 to 60%, TA = 25°C	$\Omega$	10 <sup>11</sup>			
	CI-O	Isolation Capacitance, V = 0, f = 1 MHz, TA = 25°C	pF		0.9		
	tPHL	Propagation Delay Time, High $\rightarrow$ Low <sup>1</sup> , VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns				100
						40	75
	tPLH	Propagation Delay Time, Low $\rightarrow$ High <sup>1</sup> , VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns				100
						55	75
	tr	Rise Time, VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns		20		
	tf	Fall Time, VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns		10		
	PWD	Pulse Width Distortion, VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns		30	50	
	tPSK	Propagation Skew, VCC = 5 V, IF = 7.5 mA, RL = 350 $\Omega$	ns			60	
CMH	Common Mode Transient Immunity at High Level Output <sup>2</sup> VCC = 5 V, VCM = 1 kV, TA = 25°C, IF = 0 mA, VO (MIN) = 2 V	kV/ $\mu$ s	10	20			
CML	Common Mode Transient Immunity at Low Level Output <sup>2</sup> VCC = 5 V, VCM = 1 kV, TA = 25°C, IF = 7.5 mA, VO (MAX) = 0.8 V	kV/ $\mu$ s	10	20			

Please see notes on the next page.

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>**

(T<sub>A</sub> = 25°C unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I <sub>F</sub>	Forward Current	mA	30
V <sub>R</sub>	Reverse Voltage	V	3
Detector			
V <sub>CC</sub>	Supply Voltage	V	7
V <sub>O</sub>	Output Voltage	V	7
I <sub>O</sub>	Output Current	mA	25
P <sub>C</sub>	Power Dissipation <sup>2</sup>	mW	40
BV	Isolation Voltage <sup>3</sup>	V <sub>r.m.s.</sub>	2500
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +85
T <sub>STG</sub>	Storage Temperature	°C	-55 to +125

**RECOMMENDED OPERATING CONDITIONS**

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V <sub>FL</sub>	Low Level Input Voltage	V	0		0.8
I <sub>FH</sub>	High Level Input Current	mA	6.3		12.5
V <sub>CC</sub>	Supply Voltage	V	4.5	5	5.5
N	TTL (loads) (R <sub>L</sub> = 1kΩ)				5
R <sub>L</sub>	Pull-up Resistance	Ω	330		4k

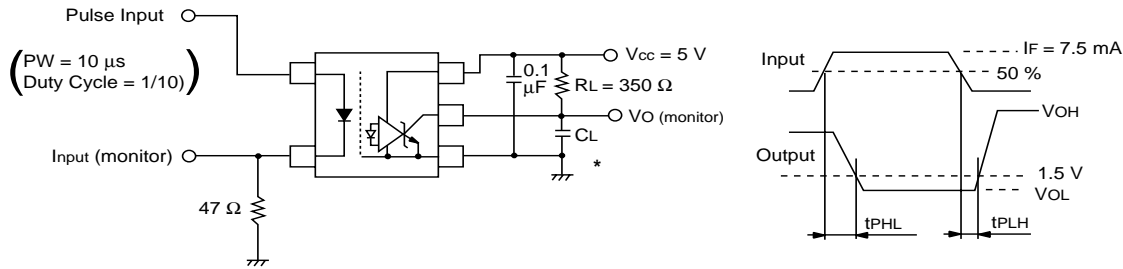
Notes:

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

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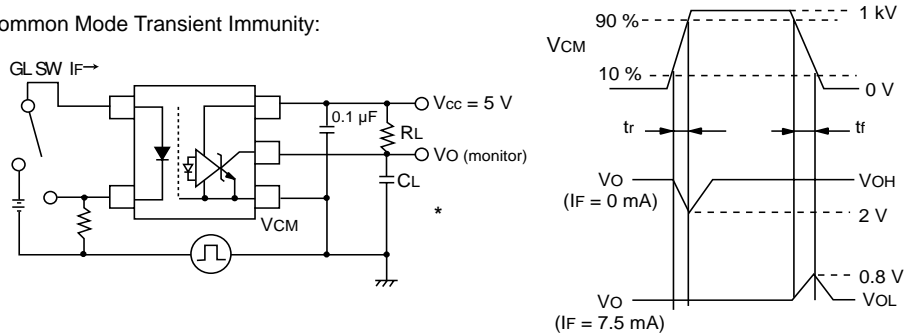
Notes:

1. Test Circuit for Propagation Delay Time:



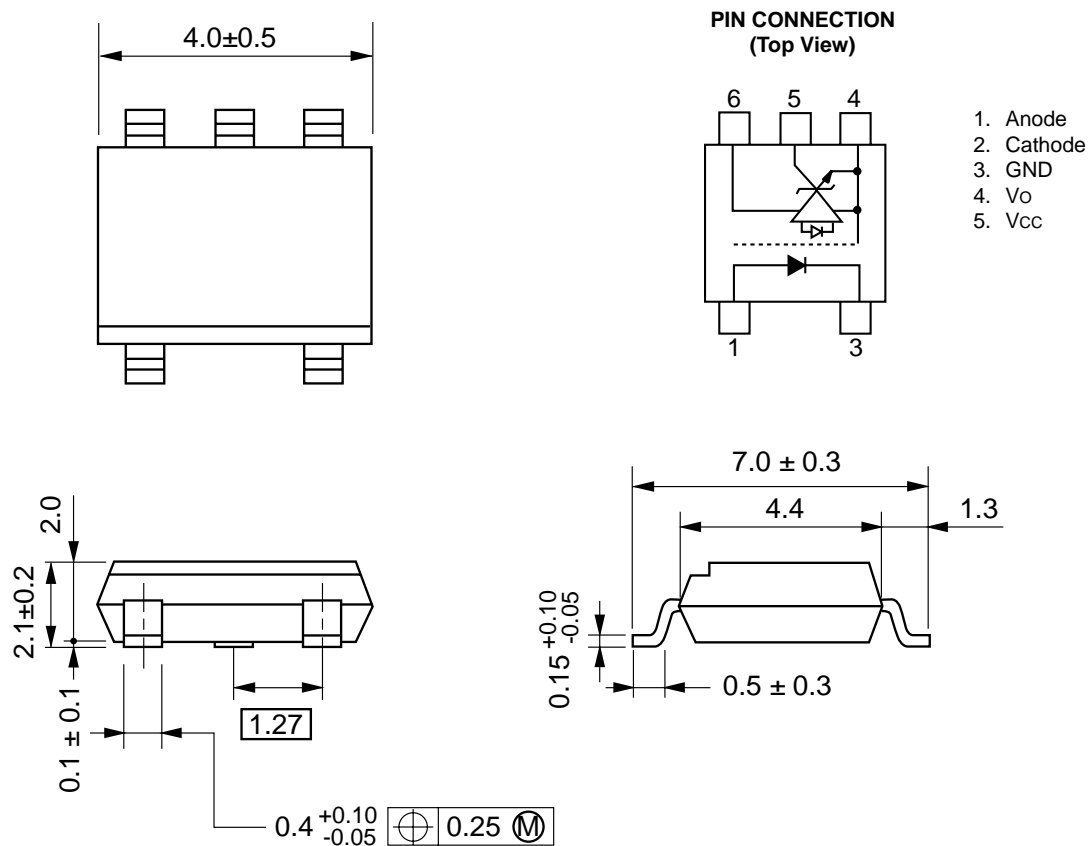
\*CL is approximately 15 pF which includes probe and stray wiring capacitance.

2. Test Circuit for Common Mode Transient Immunity:



**USAGE CAUTIONS**

1. Protect against static electricity when handling this product.
2. Bypass capacitor greater than 0.1 μF is used between V<sub>CC</sub> and GND near device (lead distance: 10 mm MAX).

**PACKAGE OUTLINE** (Units in mm)

**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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