

NEC

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

PS9714**FEATURES**

- **HIGH COMMON MODE TRANSIENT IMMUNITY:**
CMH, CML: ± 20 kV/ μ 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 GaAlAs 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 ($T_A = -40$ to $+85^\circ\text{C}$ unless otherwise specified)

PART NUMBER				PS9714		
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, $I_F = 10$ mA, $T_A = 25^\circ\text{C}$	V	1.4	1.65	1.9
	I_R	Reverse Current, $V_R = 3$ V, $T_A = 25^\circ\text{C}$	μA			10
	C_t	Terminal Capacitance, $V = 0$ V, $f = 1$ MHz, $T_A = 25^\circ\text{C}$	pF		30	
Detector	I_{OH}	High Level Output Current, $V_{CC} = V_O = 5.5$ V, $V_F = 0.8$ V	μA		2	250
	V_{OL}	Low Level Output Voltage, $V_{CC} = 5.5$ V, $I_F = 5$ mA, $I_O = 13$ mA	V		0.2	0.6
	I_{CCH}	High Level Supply Current, $V_{CC} = 5.5$ V, $I_F = 0$ mA	mA		3	8
	I_{CCL}	Low Level Supply Current, $V_{CC} = 5.5$ V, $I_F = 10$ mA	mA		6.5	11
	I_{FHL}	Threshold Input Current, $V_{CC} = 5$ V, $V_O = 0.8$ V, $R_L = 350$ Ω	%		2.0	5.0
Coupled	R_{i-o}	Isolation Resistance, $V_{in-out} = 1$ kVDC, $R_H = 40$ to 60% , $T_A = 25^\circ\text{C}$	Ω	10^{11}		
	C_{i-o}	Isolation Capacitance, $V = 0$, $f = 1$ MHz, $T_A = 25^\circ\text{C}$	pF		0.9	
	t_{PHL}	Propagation Delay Time, High $\rightarrow$ Low ¹ , $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω $T_A = 25^\circ\text{C}$	ns		40	100
	t_{PLH}	Propagation Delay Time, Low $\rightarrow$ High ¹ , $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω $T_A = 25^\circ\text{C}$	ns		55	100
	t_r	Rise Time, $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω	ns		20	
	t_f	Fall Time, $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω	ns		10	
	PWD	Pulse Width Distortion, $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω	ns		30	50
	t_{PSK}	Propagation Skew, $V_{CC} = 5$ V, $I_F = 7.5$ mA, $R_L = 350$ Ω	ns			60
	CMH	Common Mode Transient Immunity at High Level Output ² $V_{CC} = 5$ V, $V_{CM} = 1$ kV, $T_A = 25^\circ\text{C}$, $I_F = 0$ mA, $V_O(\text{MIN}) = 2$ V	kV/ μ s	10	20	
	CML	Common Mode Transient Immunity at Low Level Output ² $V_{CC} = 5$ V, $V_{CM} = 1$ kV, $T_A = 25^\circ\text{C}$, $I_F = 7.5$ mA, $V_O(\text{MAX}) = 0.8$ V	kV/ μ s	10	20	

Please see notes on the next page.

ABSOLUTE MAXIMUM RATINGS¹

(T_A = 25°C unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I _F	Forward Current	mA	30
V _R	Reverse Voltage	V	3
Detector			
V _{CC}	Supply Voltage	V	7
V _O	Output Voltage	V	7
I _O	Output Current	mA	25
P _C	Power Dissipation ²	mW	40
BV	Isolation Voltage ³	V _{r.m.s.}	2500
T _A	Operating Ambient Temp.	°C	-40 to +85
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. Applies to output pin V_O and power supply pin V_{CC}.
2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

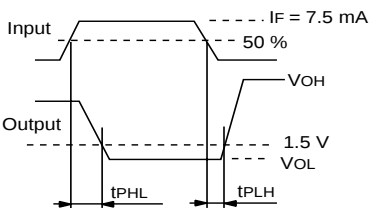
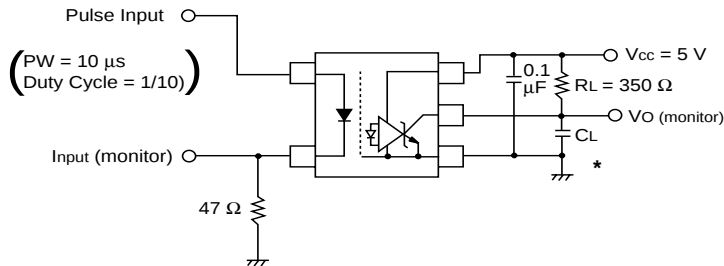
RECOMMENDED
OPERATING CONDITIONS

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

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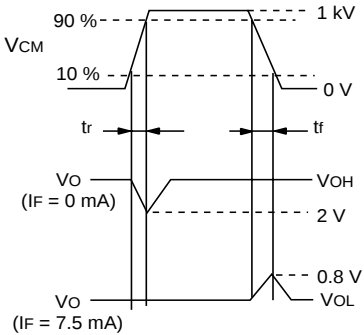
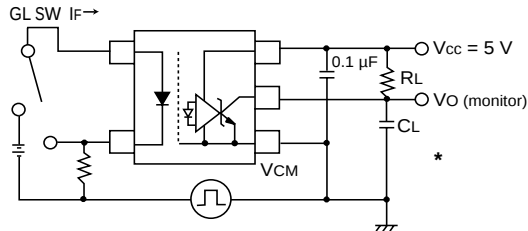
Notes:

1. Test Circuit for Propagation Delay Time:



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

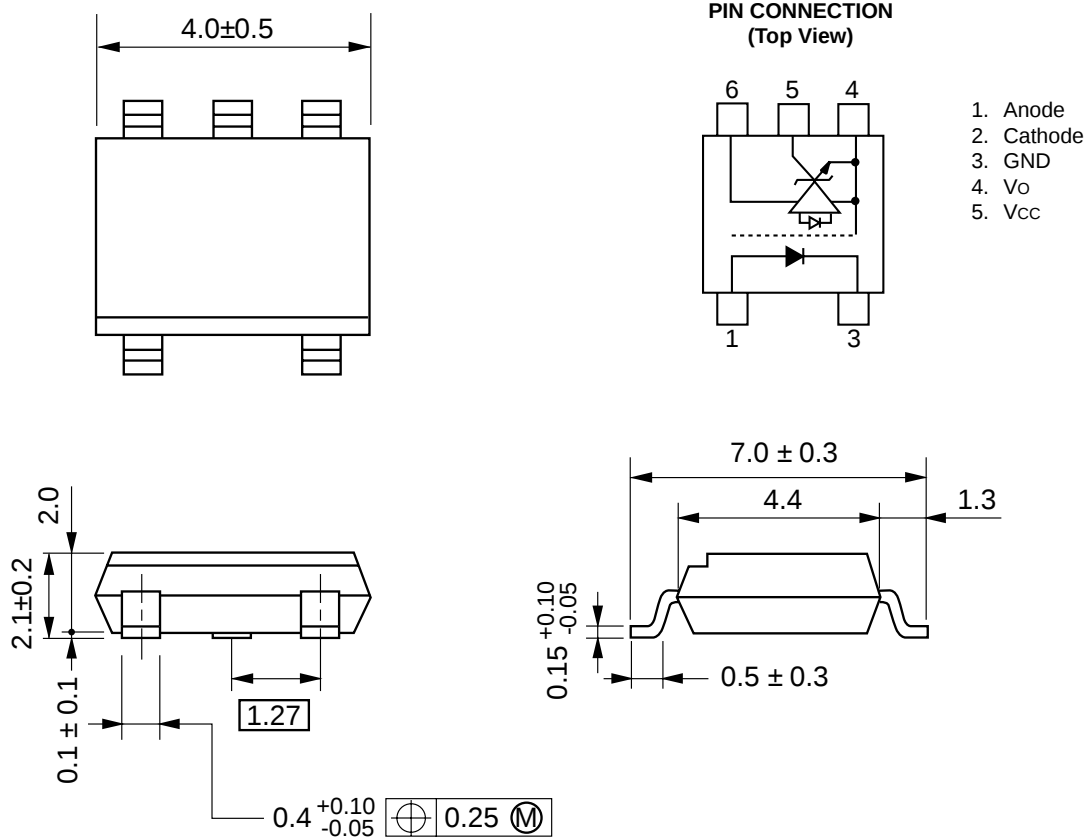
2. Test Circuit for Common Mode Transient Immunity:



USAGE CAUTIONS

1. Protect against static electricity when handling this product.
2. Bypass capacitor greater than 0.1 μF is used between V_{CC} 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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