

PHOTOCOUPLER PS8701

HIGH NOISE REDUCTION HIGH-SPEED ANALOG OUTPUT TYPE 5-PIN SOP PHOTOCOUPLER

DESCRIPTION

The PS8701 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.

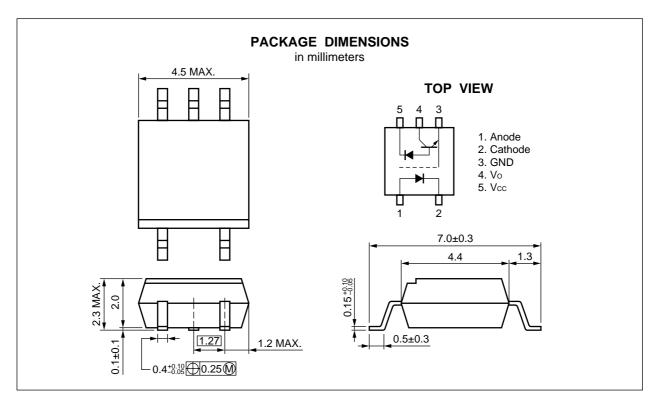
This is a plastic SOP (Small Out-line Package) type for high density applications.

FEATURES

- High common mode transient immunity (CMH, CML = $\pm 10 \text{ kV/}\mu\text{s MIN.}$)
- High supply voltage (Vcc = 35 V)
- High isolation voltage (BV = 2 500 Vr.m.s.)
- High-speed response (tphL = 0.8 μ s MAX., tpLH = 1.2 μ s MAX.)
- Taping product number (PS8701-E3, E4, F3, F4)

APPLICATIONS

- · Computer and peripheral manufactures
- General purpose inverter
- Substitutions for relays and pulse transformers
- · Power supply



The information in this document is subject to change without notice.



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

Parameter		Symbol	Ratings	Unit	
Diode	Forward Current	lF	25	mA	
	Reverse Voltage	VR	3.0	V	
	Power Dissipation	Po	45	mW	
Detector	Supply Voltage	Vcc	35	V	
	Output Voltage	Vo	35	V	
	Output Current	lo	8.0	mA	
	Power Dissipation	Pc	100	mW	
Isolation Voltage ¹		BV	2 500	Vr.m.s.	
Operating Ambient Temperature		TA	-55 to +100	°C	
Storage Temperature		T _{stg}	-55 to +125	°C	

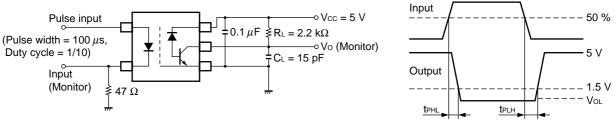
^{*1} AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output

ELECTRICAL CHARACTERISTICS (TA = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	VF	IF = 16 mA		1.7	2.2	V
	Reverse Current	lR	VR = 3 V			10	μΑ
	Forward Voltage Temperature Coefficient	$\Delta V_F/\Delta T$	I _F = 16 mA		-1.6		mV/°C
	Terminal Capacitance	Ct	V = 0 V, f = 1 MHz		60		pF
Detector	High Level Output Current	Іон (1)	IF = 0 mA, Vcc = Vo = 5.5 V		3	500	nA
	High Level Output Current	Іон (2)	IF = 0 mA, Vcc = Vo = 30 V			100	μΑ
	Low Level Output Voltage	Vol	IF = 16 mA, Vcc = 4.5 V, Io = 1.2 mA		0.1	0.4	٧
	Low Level Supply Current	ICCL	IF = 16 mA, Vo = open, Vcc = 30 V		50		μΑ
	High Level Supply Current	Іссн	IF = 0 mA, Vo = open, Vcc = 30 V		0.01	2	
Coupled	Current Transfer Ratio	CTR	IF = 16 mA, Vcc = 4.5 V, Vo = 0.4 V	15	20	35	%
	Isolation Resistance	R _{I-O}	V _{I-O} = 1 kV _{DC} , RH = 40 to 60 %	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1 MHz		0.4		pF
	Propagation Delay Time (H → L) 11	tрнL	$I_F = 16 \text{ mA, } V_{CC} = 5 \text{ V, } R_L = 2.2 \text{ k}\Omega,$ $C_L = 15 \text{ pF}$		0.5	0.8	μs
	Propagation Delay Time (L → H) ^{*1}	tрLН			0.6	1.2	
	Common Mode Transient Immunity at High Level Output ²	Смн	IF = 0 mA, Vcc = 5 V, RL = 4.1 k Ω , VcM = 1.5 kV	10			kV/μs
	Common Mode Transient Immunity at Low Level Output ²	Смь	IF = 16 mA, Vcc = 5 V, RL = 4.1 k Ω , VcM = 1.5 kV	-10			

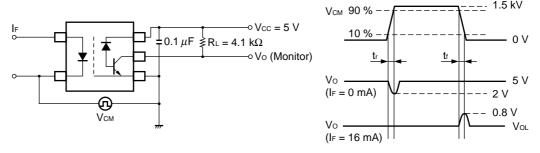


*1 Test circuit for propagation delay time



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

*2 Test circuit for common mode transient immunity

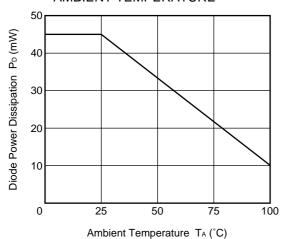


USAGE CAUTIONS

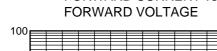
- 1. This product is weak for static electricity by designed with high-speed integrated circuit so protect against static electricity when handling.
- 2. By-pase capacitor of more than 0.1 μF is used between Vcc and GND near device.

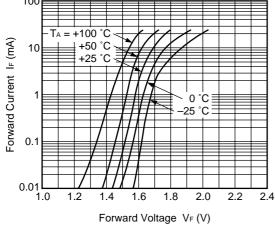
TYPICAL CHARACTERISTICS (TA = 25 °C, unless otherwise specified)

DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE

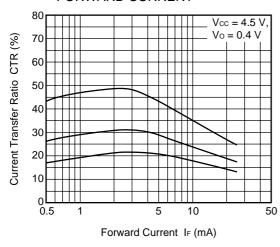


FORWARD CURRENT vs.

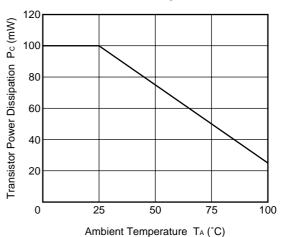




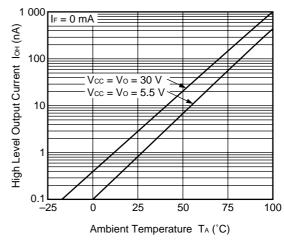
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



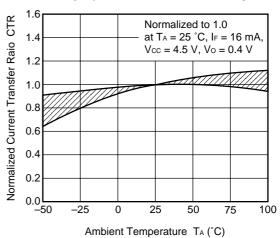
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



HIGH LEVEL OUTPUT CURRENT vs. AMBIENT TEMPERATURE

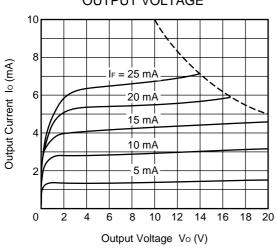


NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE

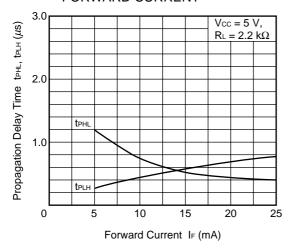


NEC

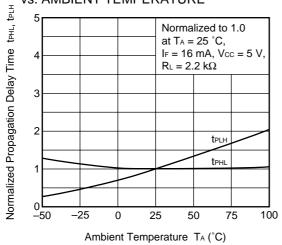
OUTPUT CURRENT vs. OUTPUT VOLTAGE



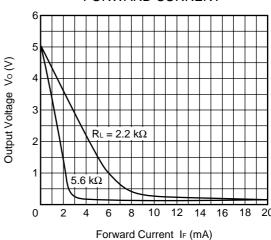
PROPAGATION DELAY TIME vs. FORWARD CURRENT



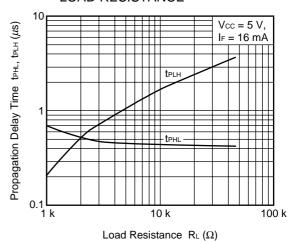
NORMALIZED PROPAGATION DELAY TIME vs. AMBIENT TEMPERATURE



OUTPUT VOLTAGE vs. FORWARD CURRENT

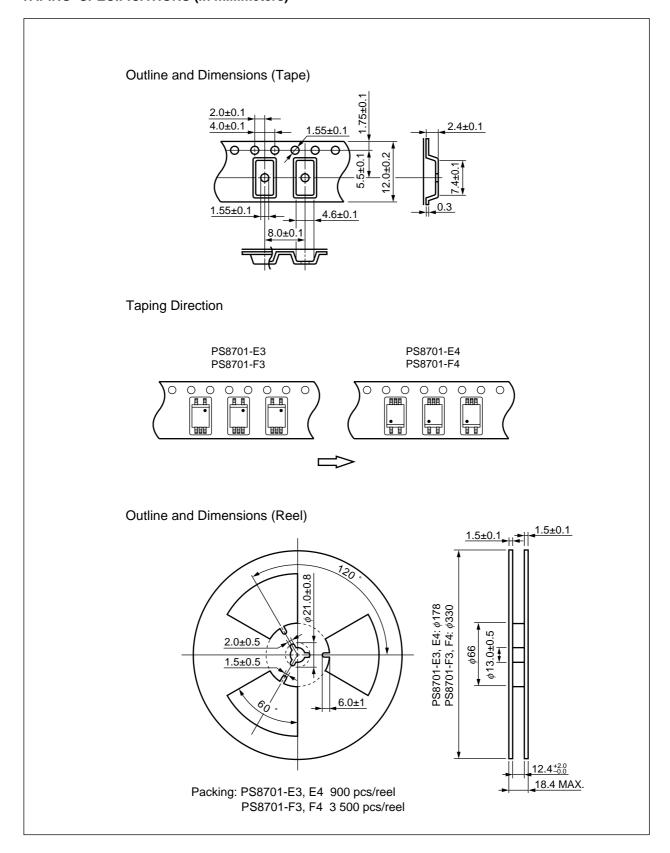


PROPAGATION DELAY TIME vs. LOAD RESISTANCE





TAPING SPECIFICATIONS (in millimeters)





RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

• Peak reflow temperature 235 °C (package surface temperature)

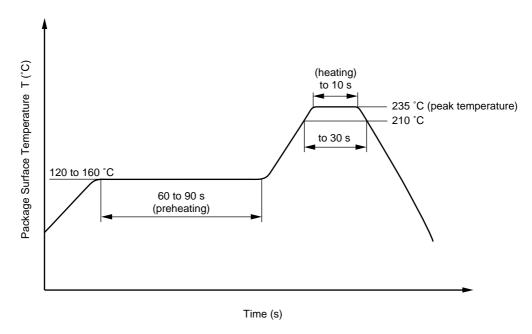
• Time of temperature higher than 210 °C 30 seconds or less

• Number of reflows Three

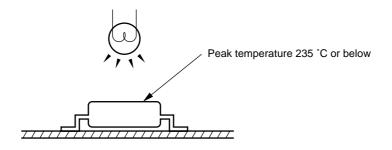
Flux
Rosin flux containing small amount of chlorine (The flux with a

maximum chlorine content of 0.2 Wt % is recommended.)

Recommended Temperature Profile of Infrared Reflow



Caution Please avoid to removed the residual flux by water after the first reflow processes.



(2) Dip soldering

• Temperature 260 °C or below (molten solder temperature)

• Time 10 seconds or less

• Number of times One

• Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of

0.2 Wt % is recommended.)

CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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Anti-radioactive design is not implemented in this product.

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