# High Speed Analog Output Type
8 mm Creepage 8-Pin Photocoupler
# PS8502L1
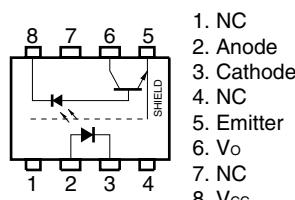
■ Features

● Long creepage distance

● High common mode transient immunity (CM_H, CM_L = $\pm$15 kV/μs MIN.)

● High supply voltage (V_{CC} = 35 V MAX.)

● High speed response (t_{PHL}, t_{PLH} = 0.8 μs MAX.)

● High isolation voltage (B_V = 5 000 Vr.m.s.)

● TTL, CMOS compatible with a resistor

■ Package Dimensions (In millimeters)

9.25$^{+0.5}_{-0.25}$

1.01$^{+0.4}_{-0.2}$

3.5±0.2

3.87±0.4

2.8 MIN.

0.5±0.15

0.25(M)

0.84±0.15

2.54

10.16

6.5$^{+0.5}_{-0.1}$

0 to 15°

PIN CONNECTION
(Top View)

SHIELD

8 7 6 5

1 2 3 4

1. NC
2. Anode
3. Cathode
4. NC
5. Emitter
6. V_O
7. NC
8. V_{CC}

KEXIN

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■ Absolute Maximum Ratings Ta = 25℃
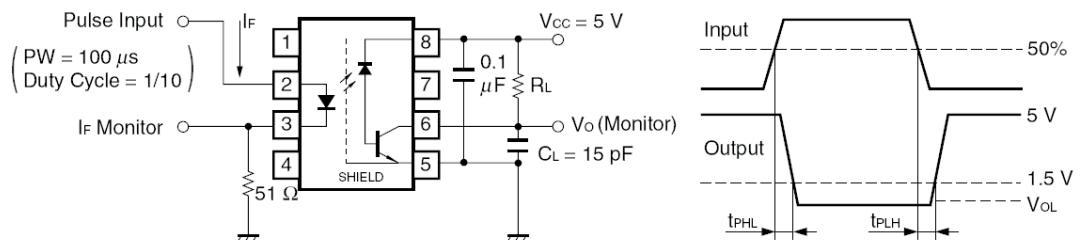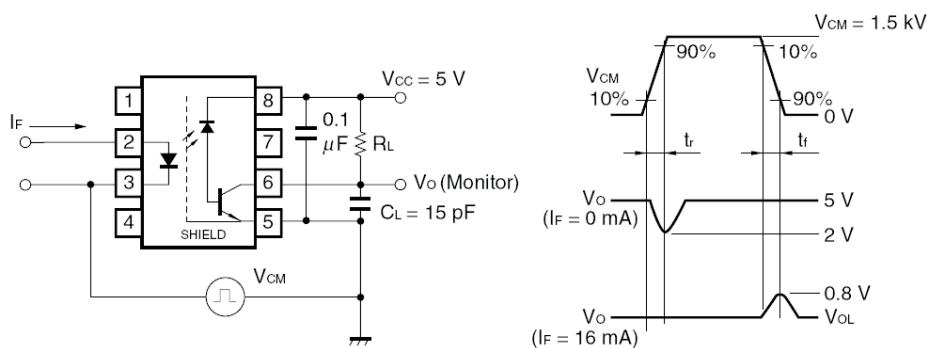
	Parameter	Symbol	Ratings	Unit
Diode	Forward Current *1	I_F	25	mA
	Reverse Voltage	V_R	5	V
Detector	Supply Voltage	V_{CC}	35	V
	Output Voltage	V_O	35	V
	Output Current	I_O	8	mA
	Power Dissipation *2	P_C	100	mW
Isolation Voltage *3		BV	5 000	Vr.m.s.
Operating Ambient Temperature		T_A	−55 to +100	°C
Storage Temperature		T_{stg}	−55 to +125	°C

*1 Reduced to 0.33 mA/°C at T_A = 70°C or more.

*2 Reduced to 2.0 mW/°C at T_A = 75°C or more.

*3 AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.
   Pins 1-4 shorted together, 5-8 shorted together.
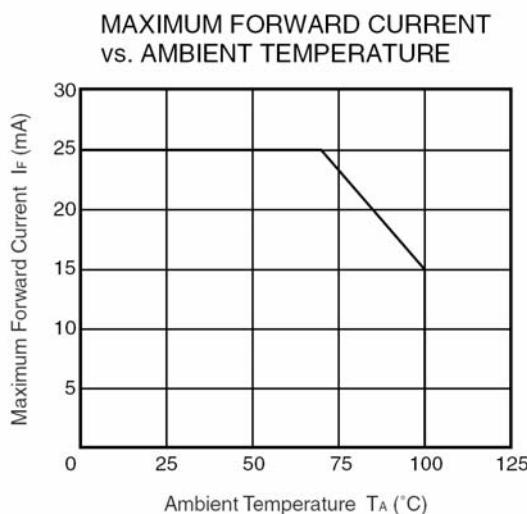
■ Electrical Characteristics Ta = 25℃

|	Parameter	Symbol	Conditions	MIN.	TYP.*1	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 16 mA		1.7	2.2	V
	Reverse Current	I_R	V_R = 3 V			10	μA
	Forward Voltage Temperature Coefficent	$\Delta V_F/\Delta T_A$	I_F = 16 mA		−2.1		mV/°C
	Terminal Capacitance	C_t	V = 0 V, f = 1 MHz		30		pF
Detector	High Level Output Current	$I_{OH}(1)$	I_F = 0 mA, V_{CC} = V_O = 5.5 V		3	500	nA
	High Level Output Current	$I_{OH}(2)$	I_F = 0 mA, V_{CC} = V_O = 35 V			100	μA
	Low Level Output Voltage	V_{OL}	I_F = 16 mA, V_{CC} = 4.5 V, I_O = 2.4 mA		0.15	0.4	V
	Low Level Supply Current	I_{CCL}	I_F = 16 mA, V_O = Open, V_{CC} = 35 V		150		μA
	High Level Supply Current	I_{CCH}	I_F = 0 mA, V_O = Open, V_{CC} = 35 V		0.01	1	μA
Coupled	Current Transfer Ratio	CTR	I_F = 16 mA, V_{CC} = 4.5 V, V_O = 0.4 V	15			%
	Isolation Resistance	R_{I-O}	V_{I-O} = 1 kVDC	10^{11}			Ω
	Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.7		pF
	Propagation Delay Time (H → L)*2	t_{PHL}	I_F = 16 mA, V_{CC} = 5 V, R_L = 1.9 kΩ		0.22	0.8	μs
	Propagation Delay Time (L → H)*2	t_{PLH}	I_F = 16 mA, V_{CC} = 5 V, R_L = 1.9 kΩ		0.35	0.8	μs
	Common Mode Transient Immunity at High Level Output*3	CM_H	I_F = 0 mA, V_{CC} = 5 V, V_{CM} = 1.5 kV, R_L = 4.1 kΩ	15			kV/μs
	Common Mode Transient Immunity at Low Level Output*3	CM_L	I_F = 16 mA, V_{CC} = 5 V, V_{CM} = 1.5 kV, R_L = 4.1 kΩ	−15			kV/μs
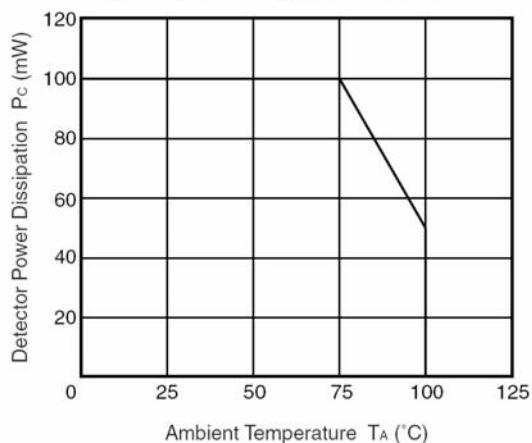
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*1 Typical values at $T_A = 25°C$

*2 Test circuit for propagation delay time

**Remark** C_L includes probe and stray wiring capacitance.

*3 Test circuit for common mode transient immunity

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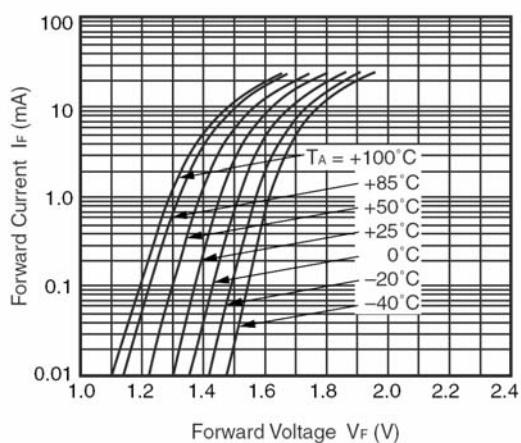
■ Typical Characteristics (TA = 25℃,unless otherwise specified)

MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE
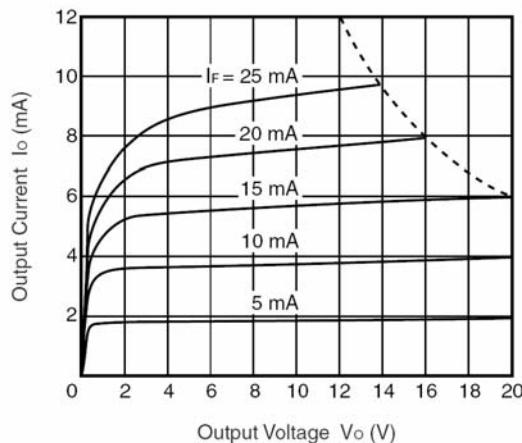
DETECTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE
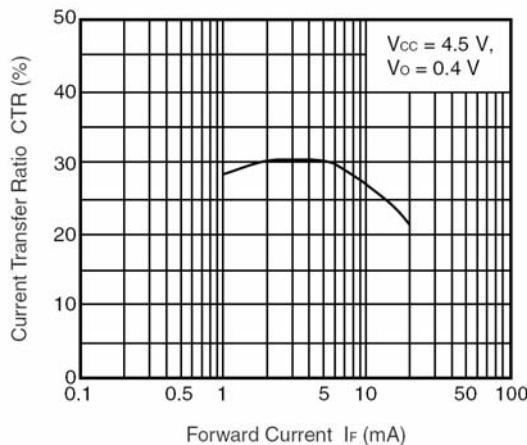
FORWARD CURRENT vs. FORWARD VOLTAGE
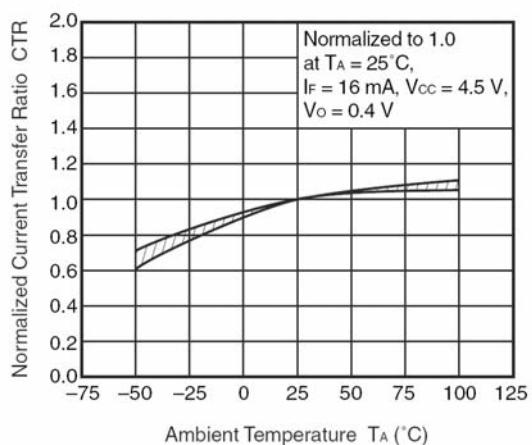
OUTPUT CURRENT vs. OUTPUT VOLTAGE
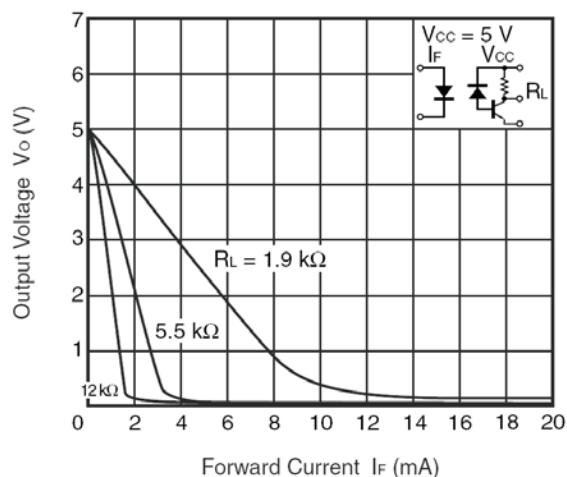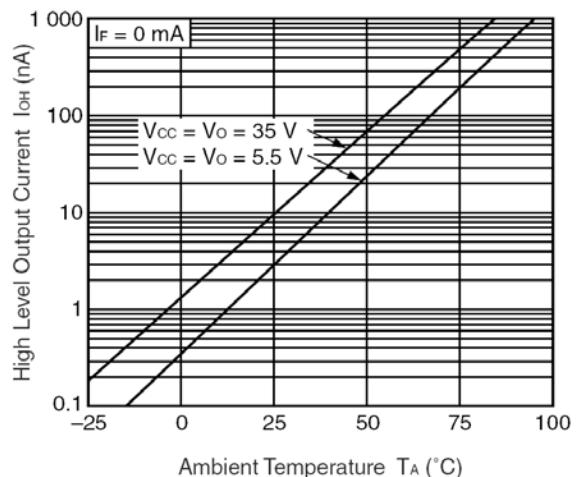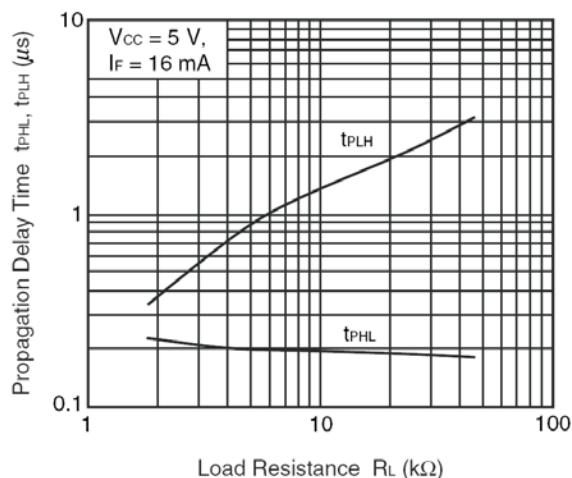
CURRENT TRANSFER RATIO vs. FORWARD CURRENT

NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE

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OUTPUT VOLTAGE vs. FORWARD CURRENT

$V_{CC} = 5\,V$

$R_L = 1.9\,k\Omega$

$5.5\,k\Omega$

$12\,k\Omega$

Output Voltage V_O (V)

Forward Current I_F (mA)

HIGH LEVEL OUTPUT CURRENT vs. AMBIENT TEMPERATURE

$I_F = 0\,mA$

$V_{CC} = V_O = 35\,V$

$V_{CC} = V_O = 5.5\,V$

High Level Output Current I_{OH} (nA)

Ambient Temperature T_A (°C)

PROPAGATION DELAY TIME, vs. LORD RESISTANCE

$V_{CC} = 5\,V$,

$I_F = 16\,mA$

t_{PLH}

t_{PHL}

Propagation Delay Time t_{PHL}, t_{PLH} (μs)

Load Resistance R_L (kΩ)

PROPAGATION DELAY TIME, vs. AMBIENT TEMPERATURE

$V_{CC} = 5\,V$,

$I_F = 16\,mA$,

$R_L = 1.9\,k\Omega$

t_{PLH}

t_{PHL}

Propagation Delay Time t_{PHL}, t_{PLH} (μs)

Ambient Temperature T_A (°C)