High Speed Optocoupler

4. Description

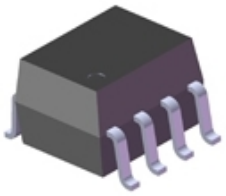
The SL0601 optocoupler consists of a single channel 850nm AlGaAS LED optically coupled to a very high speed integrated photodetector logic gate for fast output. The device is packaged in an 8-pin form factor package that conforms to a standard package profile.

4. Features

- High speed 10MBit/s
- High isolation voltage between input and output (Viso=3750Vrms)
- Operating temperature range: -40°C to 85°C
- Logic Gate Outputs
- VCC Maximum Voltage 5.5V

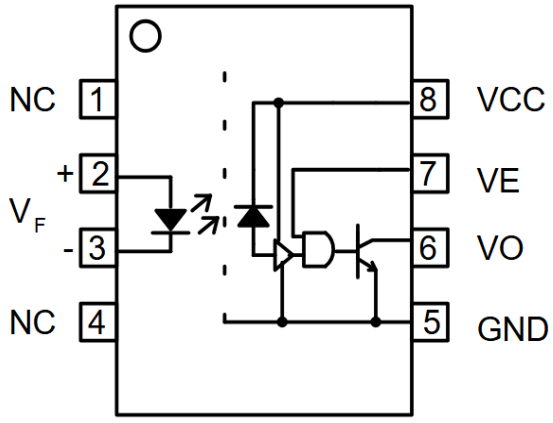
4. Applications

- PLC control
- LSTTL to TTL,LSTTL or 5V CMOS Industrial control, digital to analog conversion
- Data multiplexing using
- Switching power supply
- Line receivers that Data Transmission



SOP-8

4. Schematics and Packaging



Truth table (forward logic)		
Input	Enable	Output
H	H	L
L	H	H
H	L	H
L	L	H
H	NC	L
L	NC	H

5. Absolute maximum rated parameters (Ta=25°C)

Symbol	Parameters	Value	Unit
T_{STG}	Storage temperature	-55 to +125	℃
T_{OPR}	Operating temperature	-40 to +85	℃
T_{SOL}	Welding temperature	260 for 10 sec	℃
I_F	Forward Input Current	50	mA
V_E	Enable input voltage not to exceed VCC 500mV	5.5	V
V_R	Reverse Input Voltage	5.0	V
P_I	Power wastage	100	mW
V_{CC} (1 minute max)	Supply Voltage	7.0	V
I_O	Output Current	50	mA
V_O	Output voltage	7.0	V
P_O	Output power	85	mW

NOTE: Stresses greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. Prolonged exposure to absolute maximum rating conditions may affect device reliability.

6. Recommended operating conditions

Symbol	Parameters	Min	Max	Unit
I_{FL}	Input Current, Low	0	250	μA
I_{FH}	Input Current, High	6.3	15	mA
V_{CC}	Supply Voltage, Output	4.5	5.5	V
V_{EL}	Enable Voltage, Low	0	0.8	V
V_{EH}	Enable Voltage, High	2.0	V_{CC}	V
T_A	Operating temperature	-40	+85	℃

Note: Recommended operating conditions are specified to ensure optimum performance in accordance with data sheet specifications. We do not recommend exceeding them or designing to the absolute maximum rating.

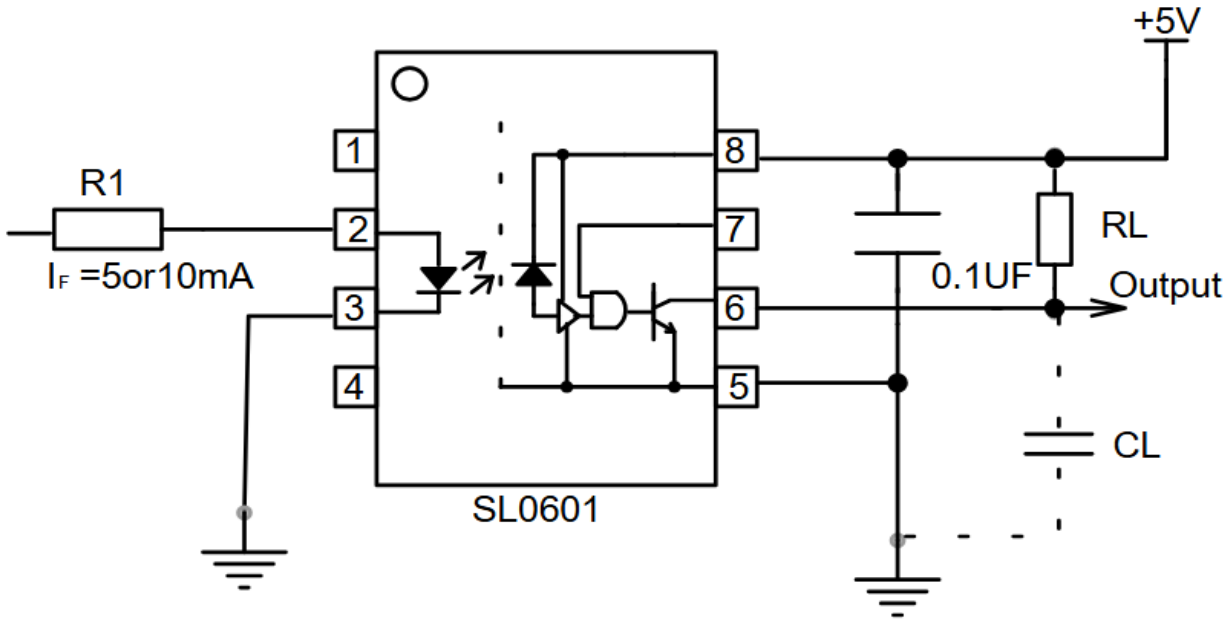
7.Product Characteristic Parameters(Ta=25℃)

Parameters		Symbol	Conditions	Min	Typ	Max	Unit
Input	Forward voltage	V_F	I_F=10mA	-	1.33	1.75	V
	Reverse breakdown voltage	B_{VR}	I_R=10μA	5	20	45	V
	Capacitors	C_{IN}	V=0,f=1kHz	-	70	-	pF
	Temperature coefficient of forward voltage	$\Delta V_F/\Delta T_A$	I_F=10mA	-	-1.4	-	mV/°C
Output	Temperature coefficient of forward voltage	I_{CCH}	V_{CC}=5.5V,I_F=0mA，VE=0.5V	-	6.5	10	mA
	Low Level Supply Current	I_{CCL}	V_{CC}=5.5V,I_F=10mA	-	9	13	mA
	Low Level Enable Current	I_{EL}	VCC=5.5V,VE=0.5V		-0.8	-1.6	mA
	High level enable current	I_{EH}	VCC=5.5V,VE=2.0V		-0.6	-1.6	mA
	High Enable Voltage	V_{EH}	V_{CC}=5.5V,I_F=10mA	2.0			V
	Low Level Enable Voltage	V_{EL}	V_{CC}=5.5V,I_F=10mA(1)			0.8	V
Transmission Characteristics	High Level Output Current	I_{OH}	V_{CC}=5.5V V_O=5.5V I_F= 250μA，VE=2V	-	-	100	μA
	Low Level Output Voltage	V_{OL}	V_{CC}=5.5V I_F=5mA I_{CL}=13mA,VE=2V	-	0.35	0.6	V
	Starting current	I_{FT}	V_{CC}=5.5V V_O=0.6V I_{OL}=13mA,VE=2V	-	3	5	mA
Isolated Voltage		V_{ISO}	R_H<50% T_A=25℃ I_{I-O}≤50μA	3750			V_{RMS}
Isolation Resistor		R_{I-O}	V_{I-O}=500V	10^{12}			Ω
Isolation Capacitors		C_{I-O}	f=1MHz		0.6		pF

8. Switching characteristics (TA-40C~85C, VCC=5V, IF=7.5mA)

parameters	Symbol	Conditions	Min	Typ	Max	Unit
Output high level propagation delay	T_{PLH}	C_L=15pF R_L=350Ω T_A=25°C (Fig. 12)	20	41	75	ns
Output low level propagation delay	T_{PHL}		25	50	75	ns
Pulse width distortion	$\|T_{PHL}-T_{PLH}\|$		-	5	35	ns
Output Rise Time (10%-90%)	t_r		-	30	-	ns
Output fall time (90%-10%)	t_f		-	10	-	ns
Output high to enable propagation delay	t_{ELH}	IF=7.5mA, VEH=3.5V, RL=350Ω, CL=15pF (Fig. 13)		15		ns
Output low level enable propagation delay	t_{EHL}			40		ns
Output high level common-mode transient suppression	$\|CM_H\|$	T_A=25°C,I_F=0mA $\|V_{CM}\|$=50V(Peak) V_{OH}=2.0V,R_L=350Ω(Fig. 14)	5000	10000	-	V/μs
Output low level common-mode transient suppression	$\|CM_L\|$	I_F=7.5mA,V_{OL}=0.8V R_L=350Ω,T_A=25℃(Fig. 14)	5000	10000	-	V/μs

9. Schematic and wiring diagram



10.Product characteristic curve

Fig.1 Switching Time vs Forward Current

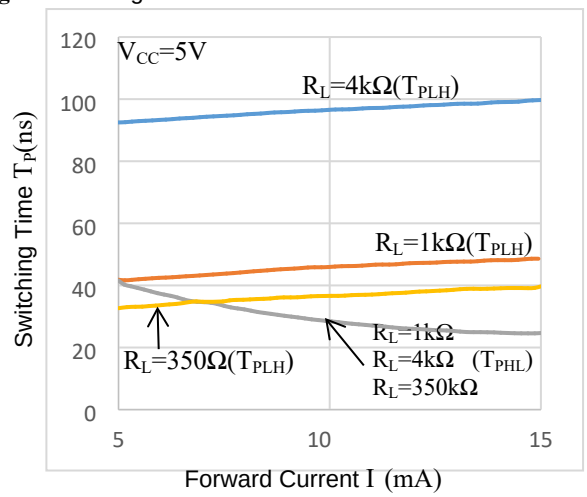


Fig.2 Low Level Output Current vs Ambient Temperature

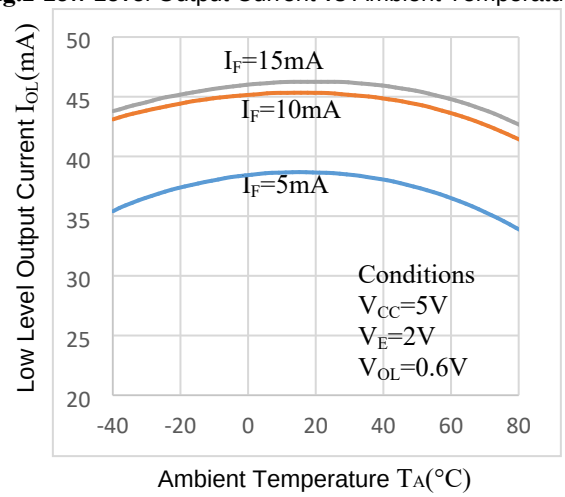


Fig.3 Rise and Fall times vs. Ambient Temperature

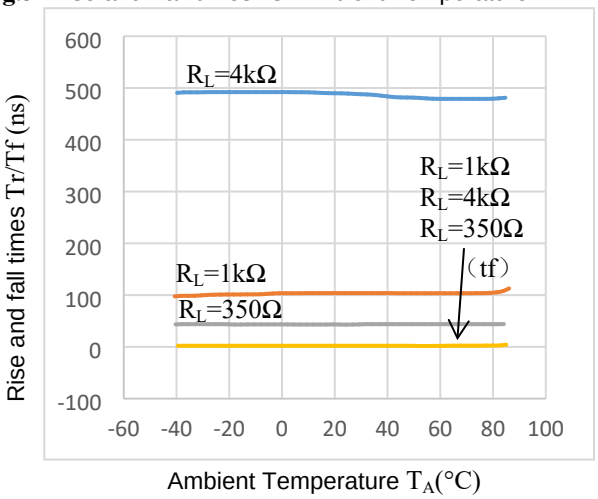


Fig.4 Pulse Width Distortion vs. Ambient Temperature

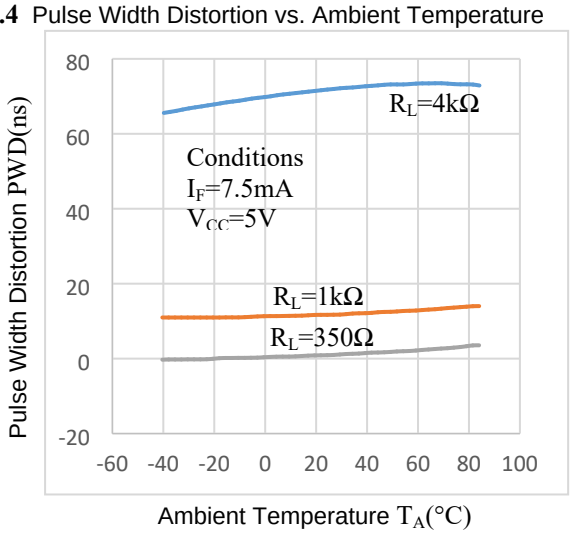
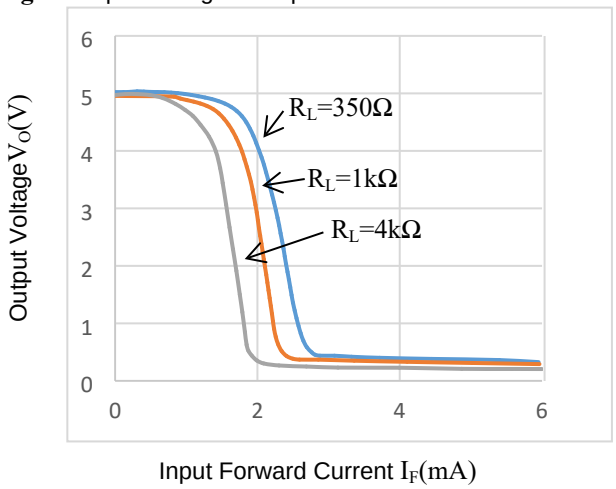


Fig.5 Output Voltage vs. Input Forward Current



F

Fig.6 Starting Current vs. Ambient Temperature

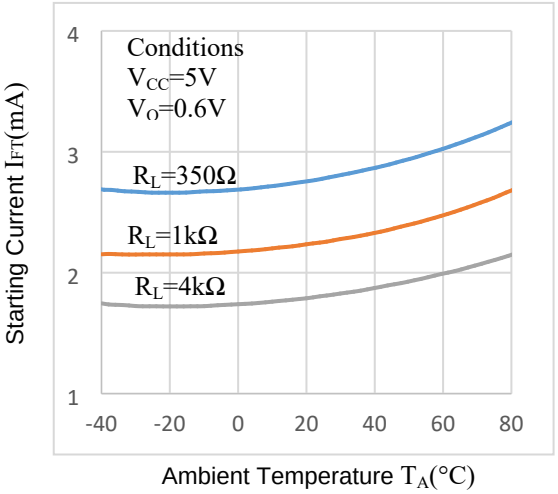


Fig.7 Forward Voltage vs. Forward Current

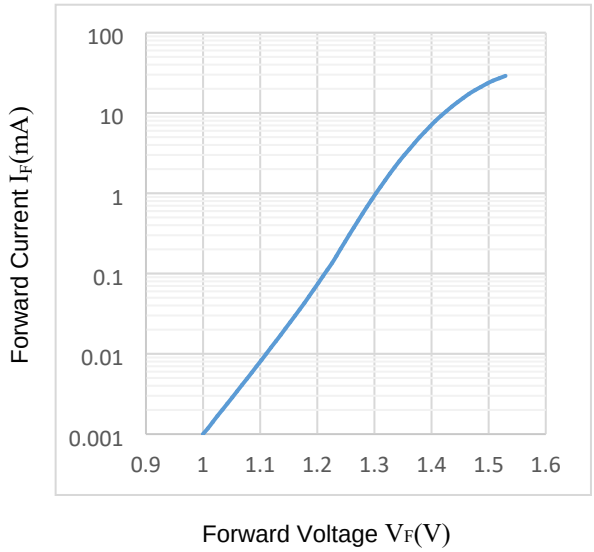


Fig.8 High Level Output Current vs Ambient Temperature

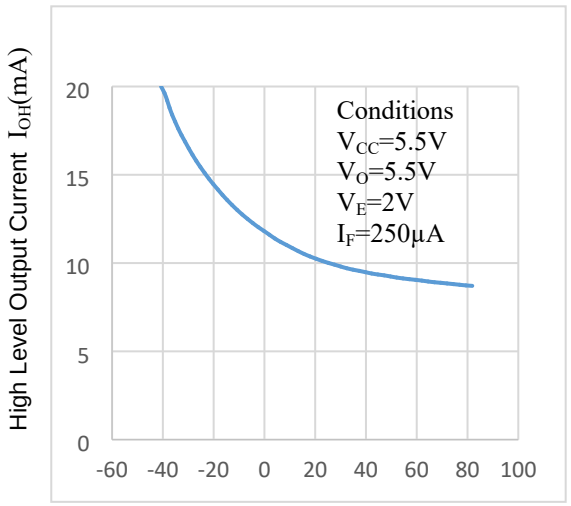


Fig.9 Low Level Voltage vs Ambient Temperature

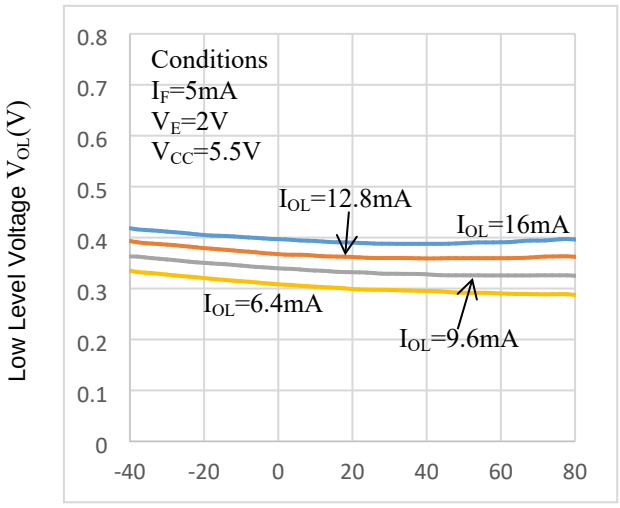


Fig.10 Switching Time vs. Ambient Temperature

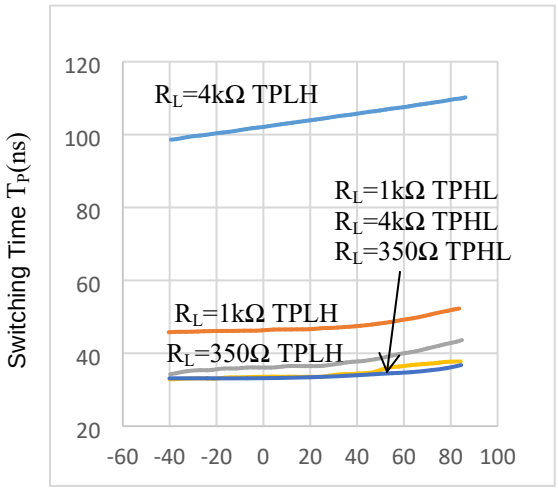
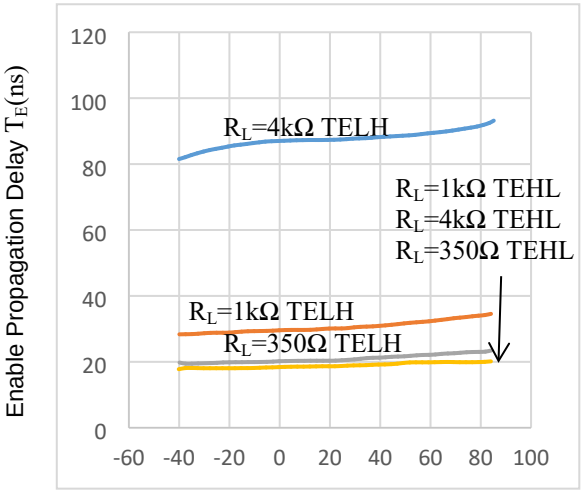
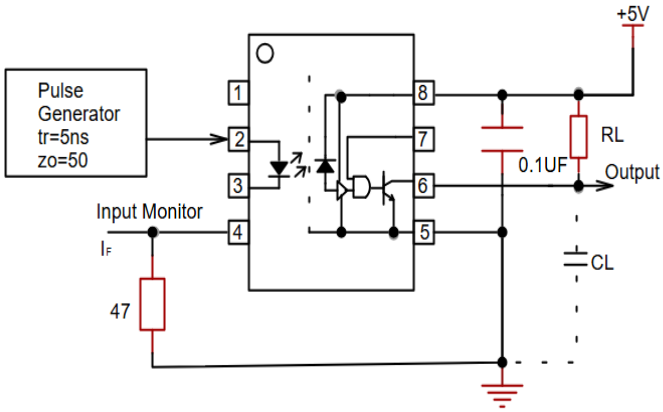


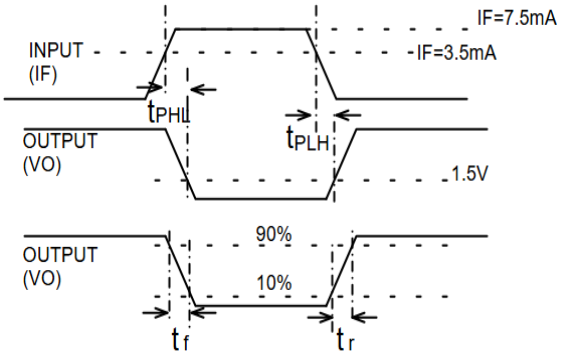
Fig.11 Enable Propagation Delay vs Ambient Temperature



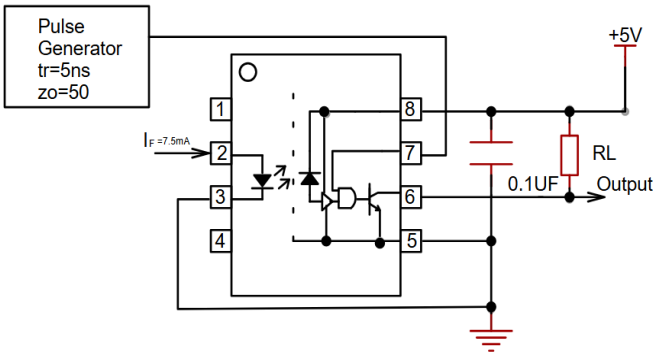
11.Test Circuit

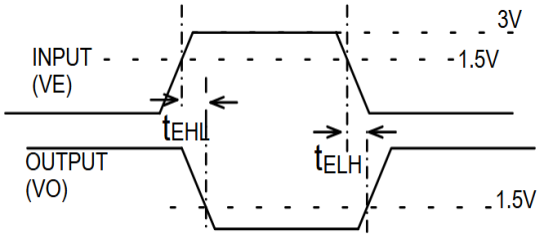
Flg.12 t_{PLH},t_{PHL},t_r and t_f Test circuits and waveforms



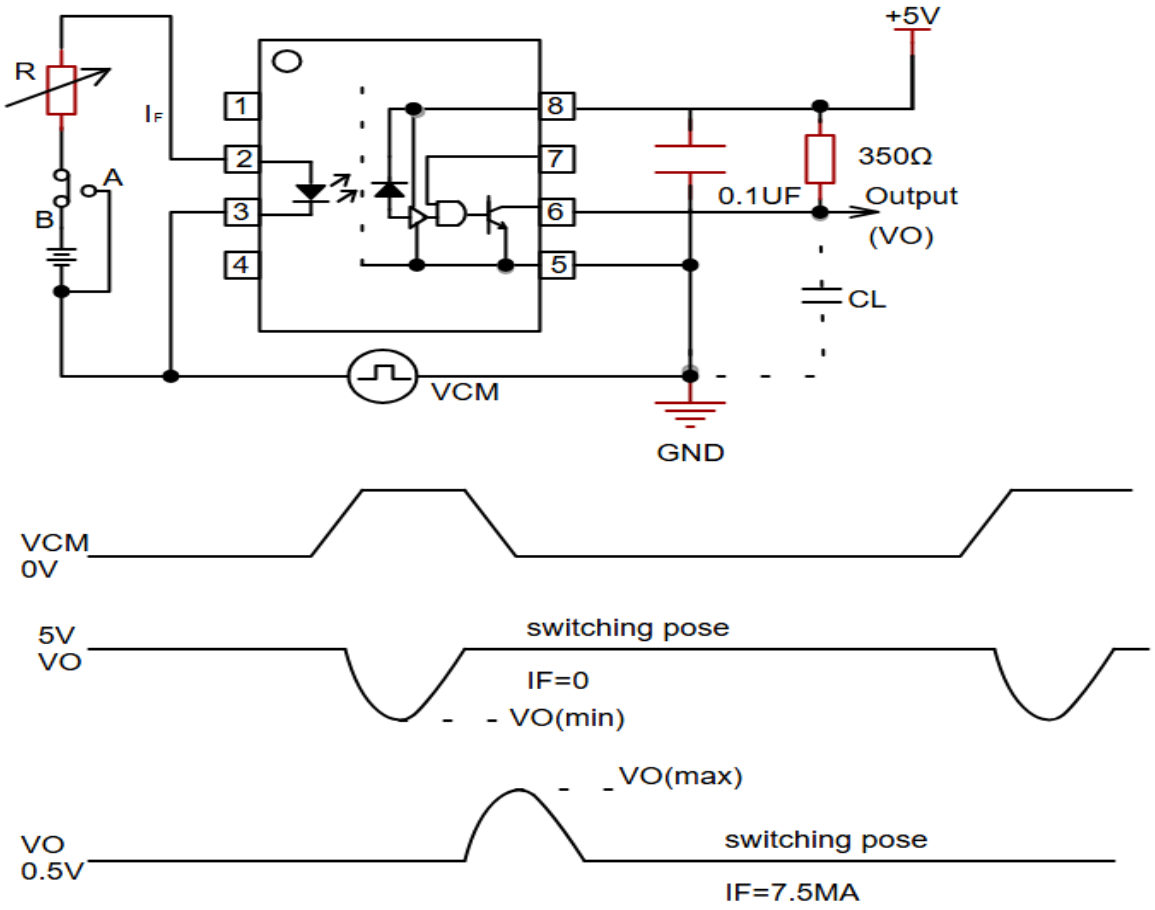


Flg.13 t_{EHL}和 t_{ELH} Test circuits and waveforms





Flg.14 Test Circuit Common Mode Transient Immunity



10. Dimensions

SOP8