Optocoupler

1.Description

The SL851 is an optocoupler composed of a light-emitting diode (LED) and a phototransistor. It comes in a four-pin package and is available in three forms: DIP, DIP-M, and SMD.

2.Features

- Range of Current Transfer Ratio (CTR): 50%~600% (I_F=5mA,V_{CE}=5V)
- Input-output isolation voltage (Viso=5000Vrms)
- Collector-emitter breakdown voltage BV_{CEO} ≥ 350V

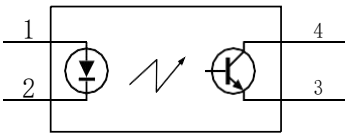
3.Applications

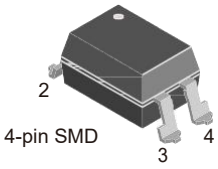
- Switching power supply, smart meter
- Industrial control, measuring instruments
- Office equipment, such as photocopiers
- Household appliances, such as air conditioners, fans, water heaters, etc

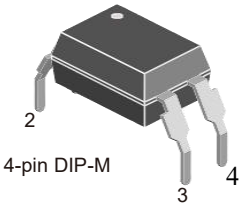
4.Product model description

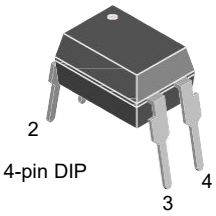
Product model	Description
SL851D	copper frame,DIP
SL851S	copper frame,SMD
SL851M	copper frame,DIP-M type

5.Structural schematics and packaging









6.Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Value	Unit
input	forward current	I_F	60	mA
	reverse voltage	V_R	6	V
	power dissipation	P_D	100	mW
	derating factor(above T_A = 100°C)	P_{DD}	2.9	mW/°C
	thermal resistance (junction-ambient)	Rth_{J-A}	325	°C/W
	thermal resistance (junction-case)	Rth_{J-C}	200	°C/W
output	collector power dissipation	P_C	150	mW
	collector current	I_C	50	mA
	collector-emitter voltage	V_{CEO}	350	V
	emitter-collector voltage	V_{ECO}	7	V
total power dissipation		P_{TOT}	200	mW
isolation voltage		V_{ISO}	5000	Vrms
operating temperature		T_{OPR}	-55~+100	°C
storage temperature		T_{STG}	-55~+125	°C
soldering temperature		T_{SOL}	260	°C

7.Electrical characteristics (Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
input	forward voltage	V_F	I_F=10mA	-	1.2	1.4	V
	reverse current	I_R	V_R=5V	-	-	10	μA
	terminal capacitance	Ct	V=0,f=1kHz	-	30	250	pF
output	collector dark current	I_{CEO}	V_{CE}=200V	-	-	100	nA
	collector-emitter breakdown voltage	BV_{CEO}	I_C=0.1mA, I_F=0	350	-	-	V
	emitter-collector breakdown voltage	BV_{ECO}	I_E=0.1mA, I_F=0	7	-	-	V
transmission characteristics	current transfer ratio	CTR*	I_F=5mA,V_{CE}=5V	50	-	600	%
	collector-emitter saturation voltage drop	$V_{CE(sat)}$	I_F=20mA,I_C=1mA	-	-	0.4	V
	isolation resistance	R_{ISO}	DC500V,40~60%R.H.	$1x10^{11}$	-	-	Ω
	isolation capacitor	C_f	V=0, f=1MHz	-	0.6	-	pF
	cut-off frequency	F_C	V_{CE}=5V, I_C=2mA, R_L=100Ω, -3dB	-	80	-	kHz
	rise time	T_r	V_{CE}=2V, I_C=2mA,R_L=100Ω	-	4	18	μs
	fall time	T_f	V_{CE}=2V, I_C=2mA,R_L=100Ω	-	5	18	μs

* CTR=I_C/I_F x 100%

8.Typical photoelectric characteristic curves

Fig.1 Forward Current vs. Forward Voltage

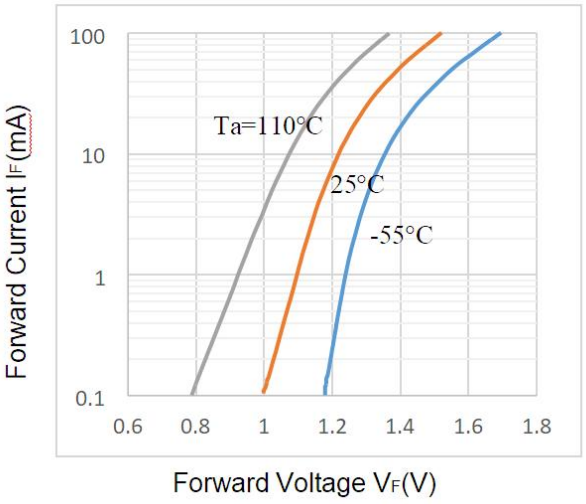


Fig.2 Relative Current Transfer Ratio vs. Forward Current

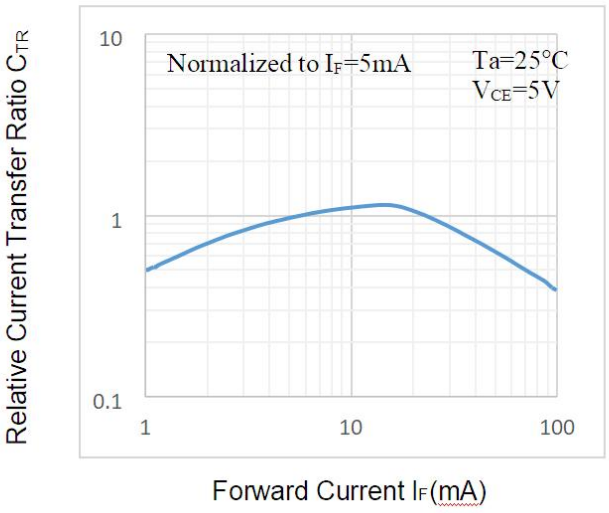


Fig.3 Collector-Emitter Current vs.Collector-Emitter Voltage

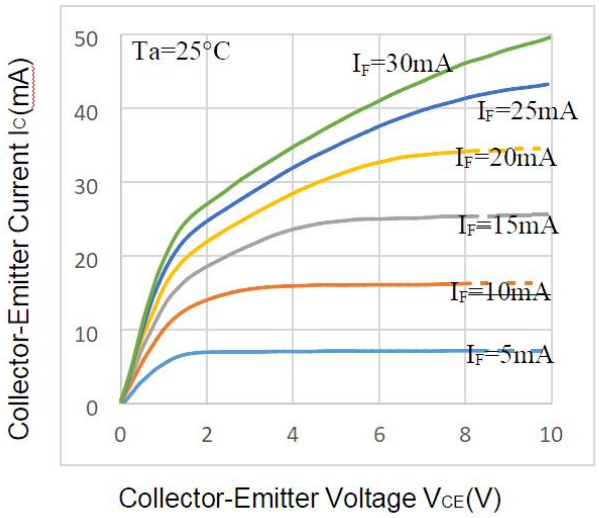


Fig.4 Relative Current Transfer Ratio vs.Ambient Temperature

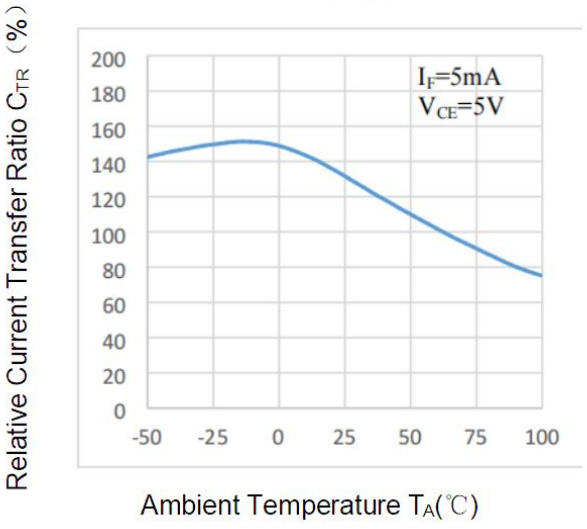


Fig.5 Saturation Pressure Drop vs. Ambient Temperature

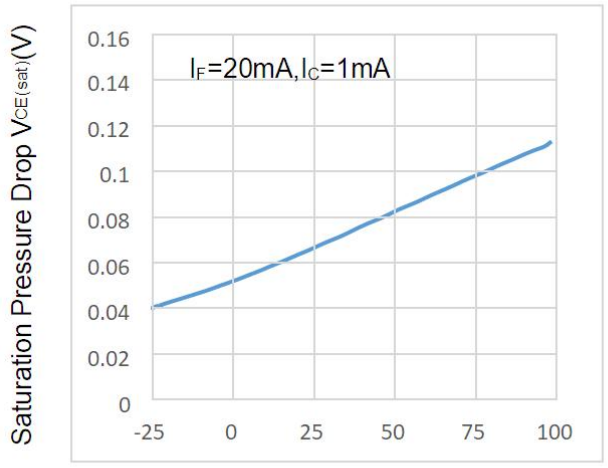


Fig.6 Dark Current vs. Ambient Temperature

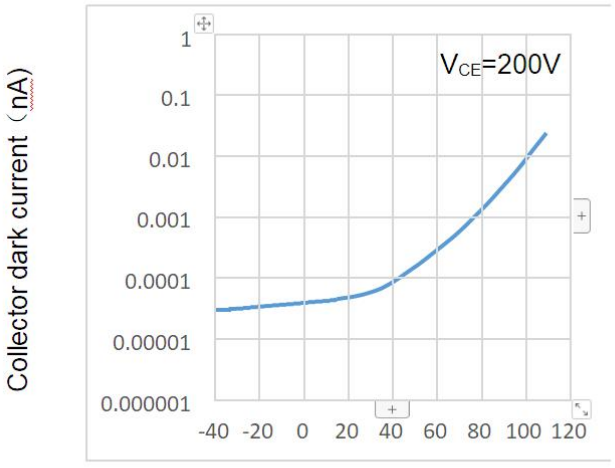


Fig.7 Response Time vs. Load Resistance

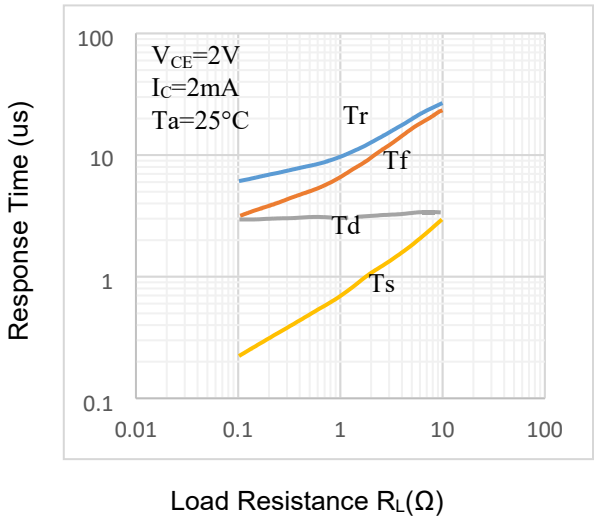


Fig.8 Saturation Voltage Drop vs. Forward Current

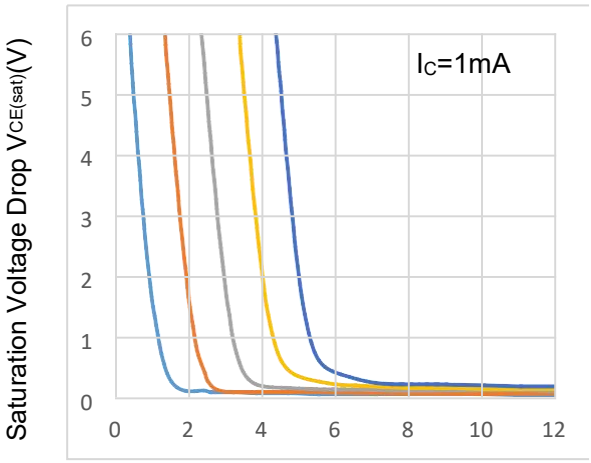
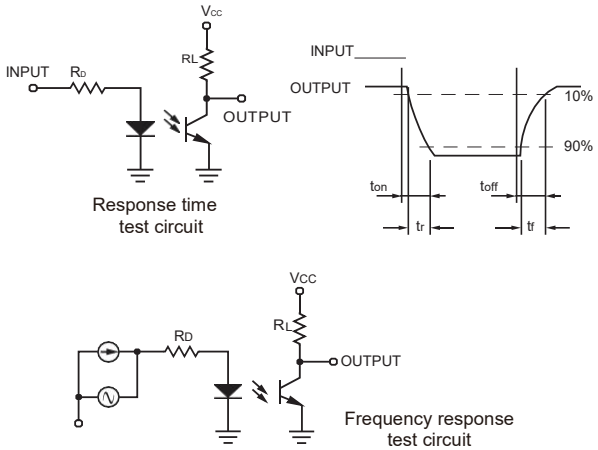
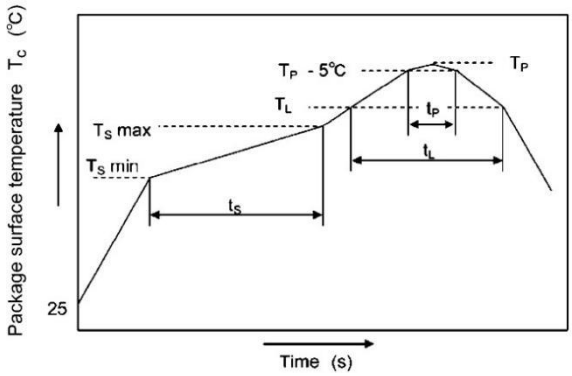


Fig.9 Test Circuit



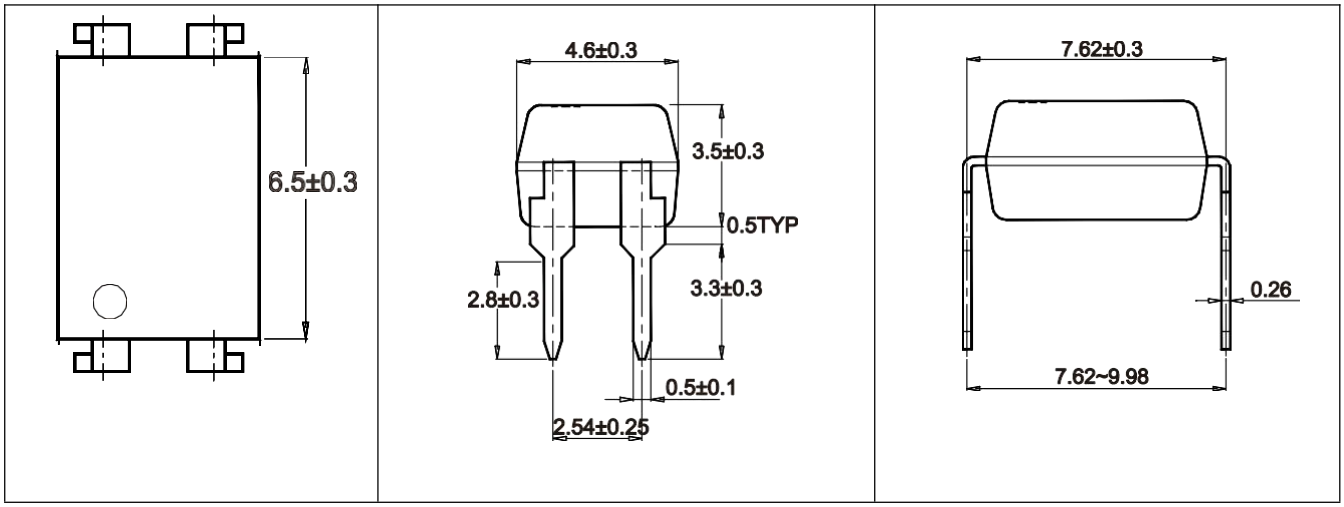
9.Reflow soldering temperature curves



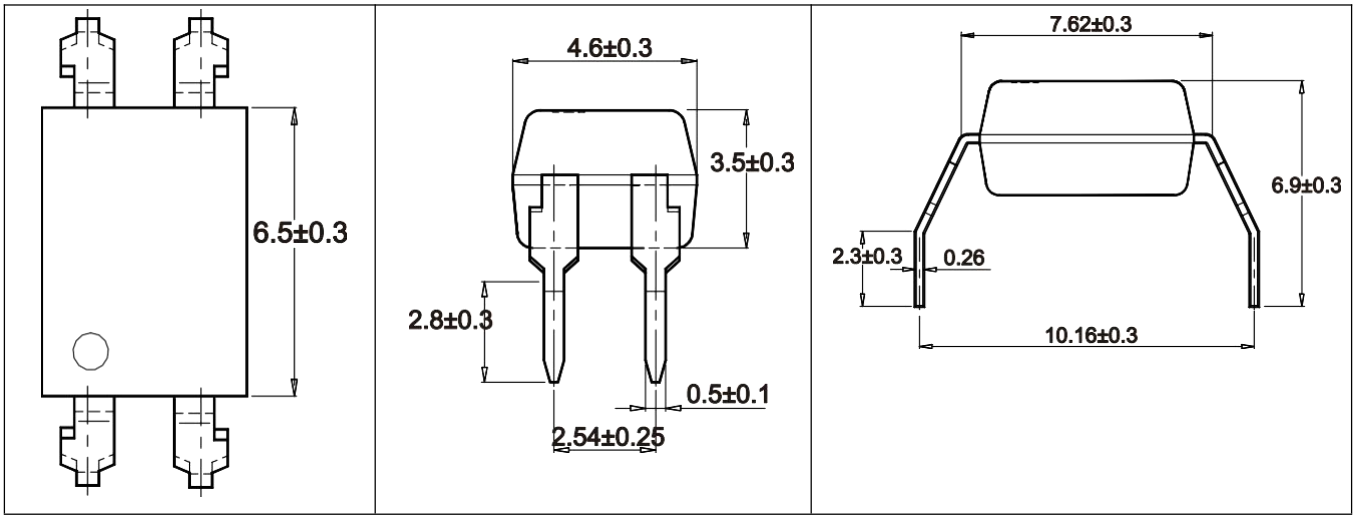
Parameter	Symbol	Min.	Max.	Unit
preheat temperature	T_S	150	200	℃
preheat time	t_S	60	120	s
ramp-up rate(T_L to T_P)			3	℃/s
liquidus temperature	T_L	217		℃
time above TL	t_L	60	150	s
peak temperature	T_P		260	℃
time during which T_C is between(T_P-5)and T_P	t_P		30	s
ramp-down rate(T_P to T_L)			6	℃/s

10.Package dimensions

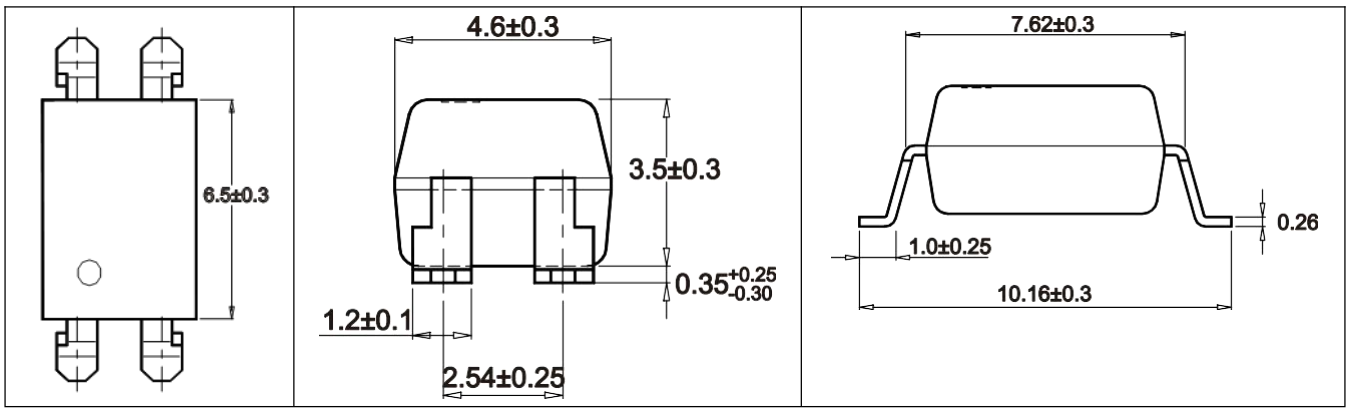
Unit:mm



4-pin DIP



4-pin DIP(Type M)



4-pin SMD