Optocoupler

1.Description

The SL3H7x is an optocoupler consisting of a light-emitting diode (LED) and a phototransistor. It comes in a four-pin SSOP (Shrink Small Outline Package).

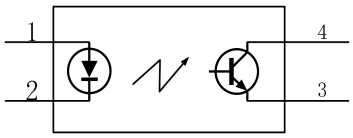
2.Features

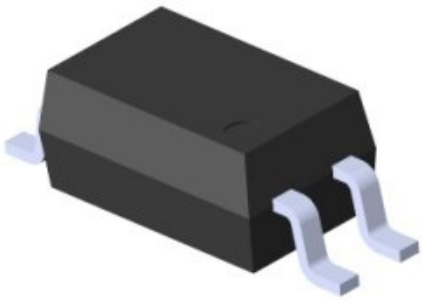
- Current Transfer Ratio (CTR)
  (CTR)range:50%~600%(I_F=5mA,V_{CE}=5V)
- Input-Output Isolation Voltage(Viso=3750Vrms)

3.Applications

- DC-DC Converter
- Communications equipment
- Programmable Controllers
- Signal transmission

4.Structural schematics and packaging





5.Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Value	Unit
Input	Forward current	I_F	50	mA
	Peak forward current(1us,pulse)	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	70	mW
	Derating factor (above Ta=90°C)	P_{DD}	2.0	mW/°C
	Thermal resistance (Junction-to-Ambient)	Rth_{J-A}	325	°C/W
	Thermal resistance (Junction-to-Case)	Rth_{J-C}	200	°C/W
Output	Collector power dissipation	P_C	150	mW
	Derating factor(aboveTa=70°C)	P_{CD}	3.1	mW/°C
	Collector current	I_C	50	mA
	Collector-emitter voltage	V_{CEO}	80	V
	Emitter-collector voltage	V_{ECO}	7	V
Total power dissipation		Ptot	200	mW
Isolation voltage		Viso	3750	Vrms
Operating temperature		Topr	-55~+110	°C
Storage temperature		Tstg	-55~+125	°C
Soldering temperature		Tsol	260	°C

6.Electrical optical characteristics (Ta=25°C)

Parameter		Symbol	Conditions	Min.	Type	Max.	Unit
Input	Forwrward voltage	V_F	I_F=20mA	-	1.2	1.4	V
	Reverse current	I_R	V_R=4V	-	-	10	μA
	Terminal capacitance	Ct	V=0,f=1kHz	-	30	250	pF
Output	Collector dark current	I_{CEO}	V_{CE}=20V	-	-	100	nA
	Collector-emitter breakdown voltage	BV_{CEO}	I_C=0.1mA, I_F=0	80	-	-	V
	Emitter-collector break down voltage	BV_{ECO}	I_E=0.1mA, I_F=0	7	-	-	V
Trans-mission charac-teristics	Current transfer ratio	CTR	I_F=5mA ,V_{CE}=5V	80	-	600	%
	Collector-emitter sat uration voltage	$V_{CE(sat)}$	I_F=10mA,I_C=1mA	-	0.1	0.2	V
	Isolation resistance	R_{ISO}	DC500V,40~60%R.H.	$5x10^{10}$	$1x10^{11}$	-	Ω
	Isolation capacitor	Cf	V=0, f=1MHz	-	0.3	1.0	pF
	Rise time	Tr	V_{CE}=2V I_C=2mA,R_L=100Ω	-	5	18	μs
	Fall time	Tf		-	3	18	μs

* CTR=I_C/I_Fx 100%

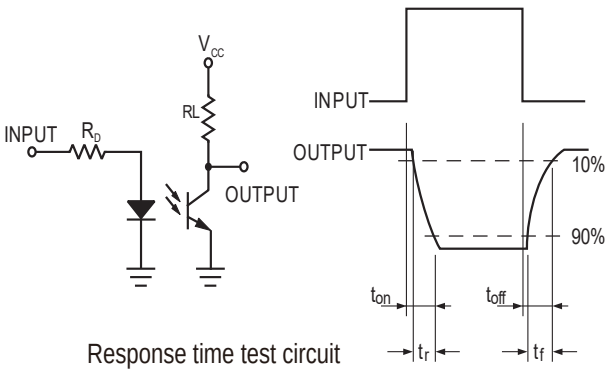
CTR Binning Table

Condition:(I_F=5mA,V_{CE}=5V)

Binning	A	B	C	D	L	Q	-
CTR	80~160	130~260	200~400	300~600	80~100	100~200	80~600

7.Typical photoelectric characteristic curves

Test circuits



Response time test circuit

Fig.1 Relative Current Transfer Ratio vs. Ambient Temperature

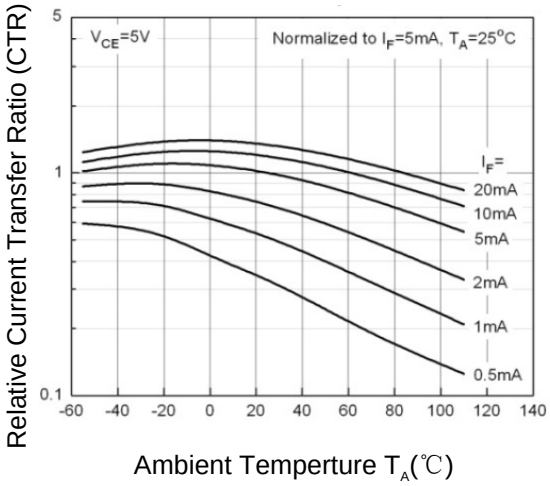


Fig.2 Forward Current vs. Forward Voltage

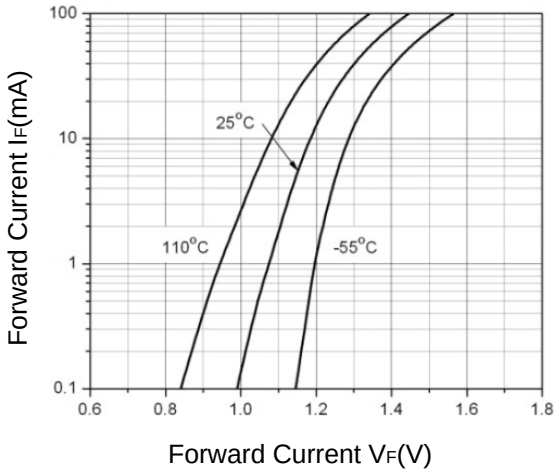


Fig.3 Relative Collector Current vs. Forward Current

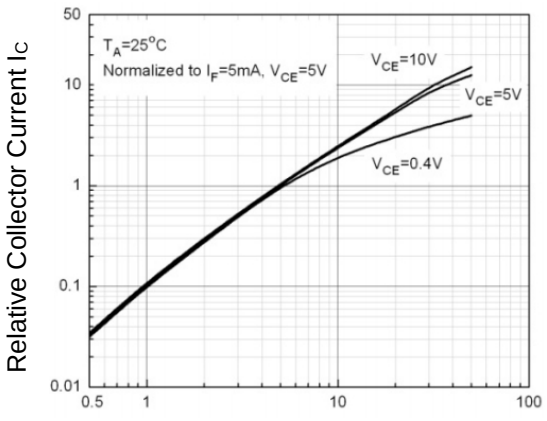


Fig.4 Relative Current Conversion Ratio vs. Forward Current

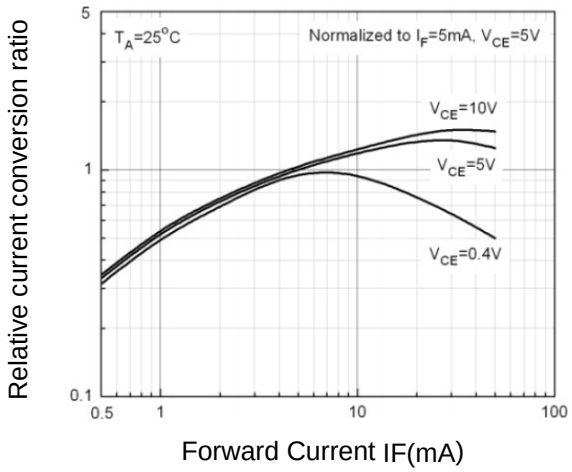


Fig.5 Relative Collector Current vs. Ambient Temperature

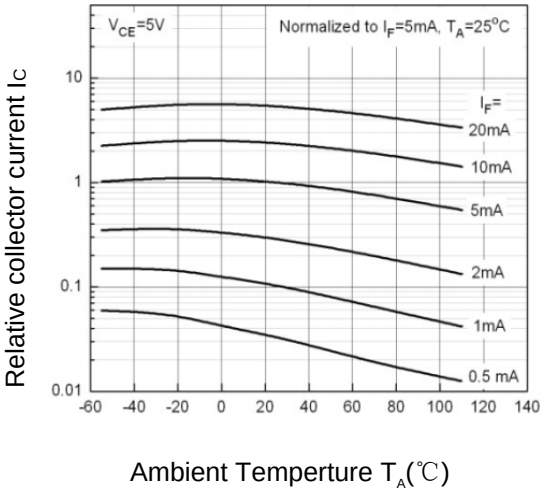


Fig.6 Collector Current vs. Collector-Emitter Voltage

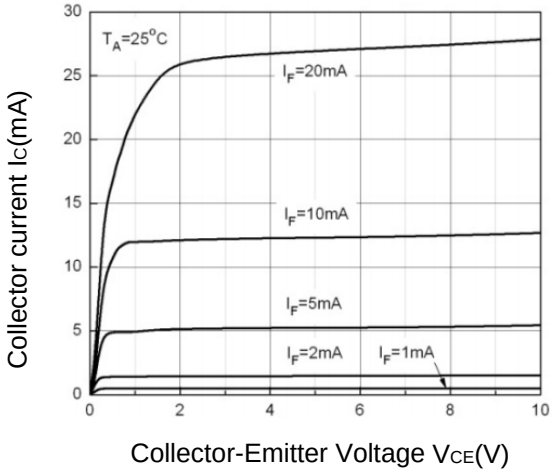


Fig.7 Response Time vs. Load Resistance

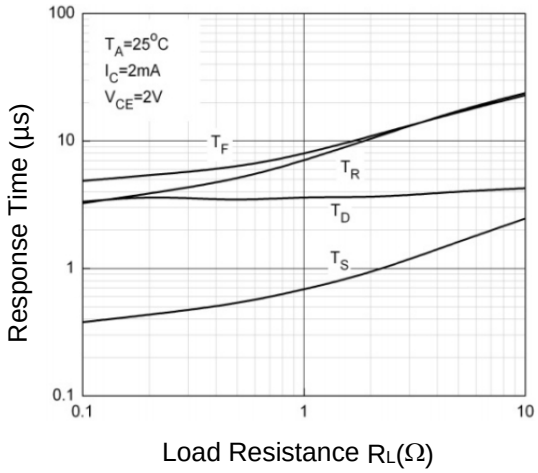


Fig.8 Collector Current vs. Collector-Emitter Voltage

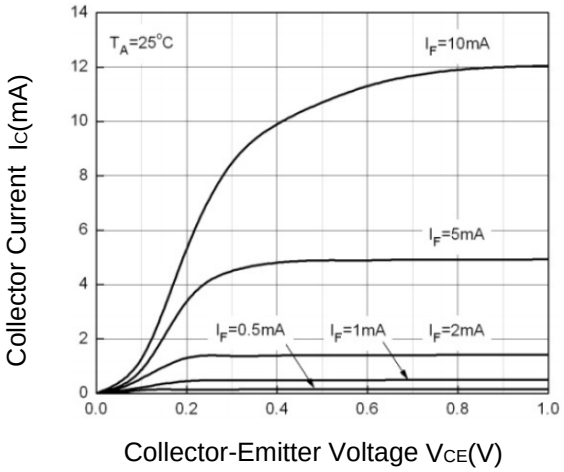


Fig.9 Collector Dark Current vs. Ambient Temperature

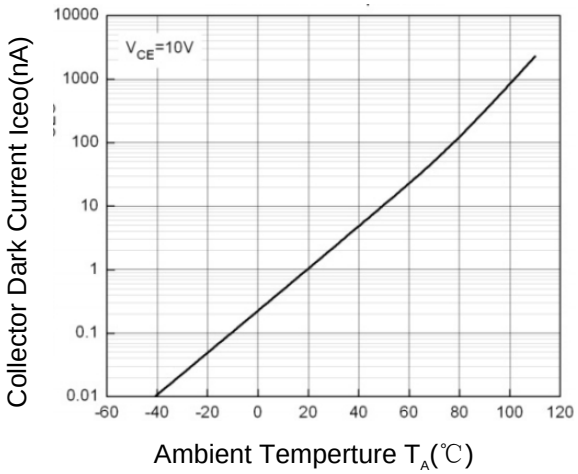
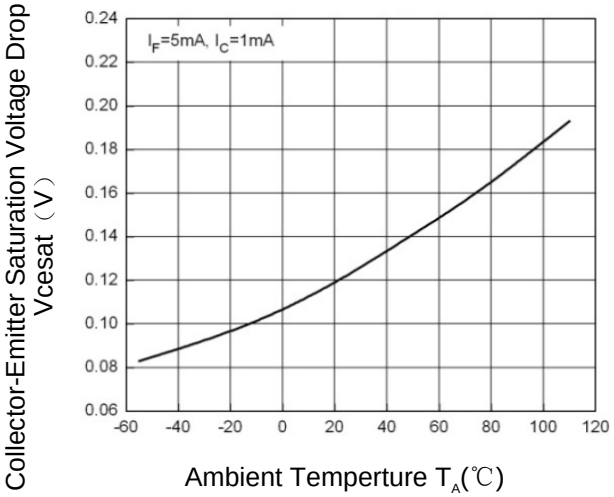
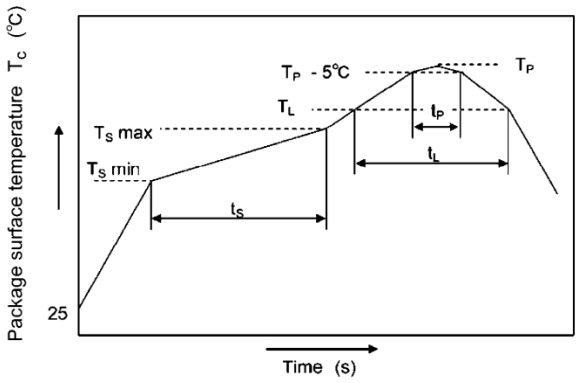


Fig.10 Collector-Emitter Saturation Voltage Drop vs. Ambient Temperature



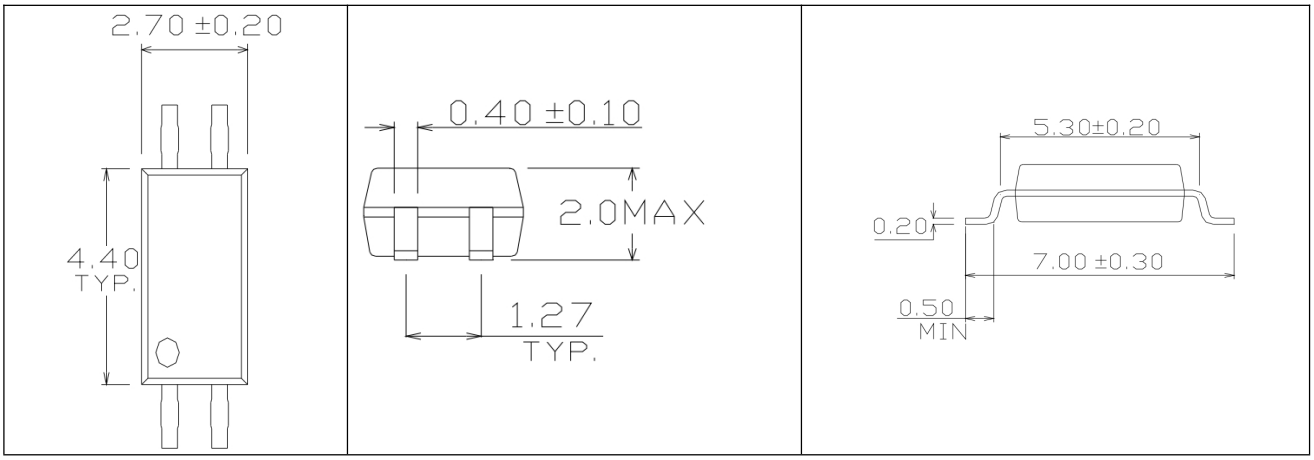
8.Reflow temperature curves



	Symbol	Min	Max	Unit
Preheat temperature	T_S	150	200	°C
Preheat time	t_S	60	120	s
Ramp-up rate (T_L to T_P)			3	°C/s
Liquidus temperature	T_L	217		°C
Time above T_L	t_L	60	150	s
Peak temperature	T_P		260	°C
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	°C/s

9.Package dimensions

Unit:mm



4-pin SSOP