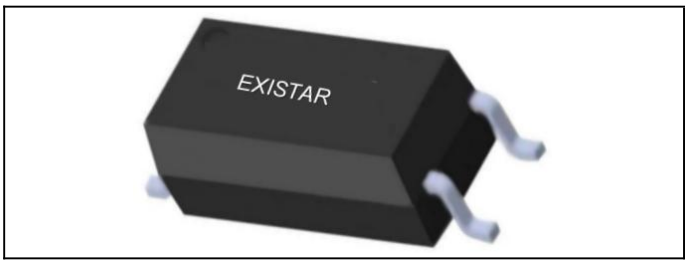
Photocoupler

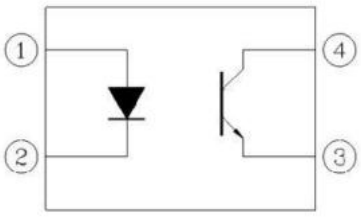
LSOP4



Product features

- Halogens free
  (Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Current transfer ratio
  (CTR: 50~600% at IF =5mA, VCE =5V)
  (CTR: 63~320% at IF =10mA, VCE =5V)
- High isolation voltage between inputs and output
  (Viso=5000 V rms)
- Compact 4 Pin SOP with a 2.1 mm profile
- Compliance with EU REACH
- Pb free and RoHS compliant

Schematic



PinConfiguration
1. Anode
2. Cathode
3. Emitter
4. Collector

Product Description

- EX101X series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector encapsulated with compound.
- They are packaged in a 4-pin small outline SMD package.
- Compound use free halogens and Sb_2O_3 .

Product Applications

- Measuring instruments
- System appliances
- Programmable controllers
- Home appliances
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances

Ordering Information

Part Number	Package	Units/ Reel
EX101X	LSOP4	3500

Electrical-Optical characteristics

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Rated Value	Unit
Input	Forward current	I_F	60	mA
	Peak forward current(1us pulse)	I_{FP}	1.5	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	100	mW
	Derating factor (above Ta=90°C)		-	mW/℃
Output	Power dissipation	P_c	150	mW
	Derating factor (above Ta = 70°C)		–	mW/℃
	Collector current	I_C	50	mA
	Collector and emitter Voltage	V_{CEO}	80	V
	Emitter and Collector Voltage	V_{ECO}	7	V
Total Power Dissipation		P_{TOT}	250	mW
Isolation Voltage(1*)		V_{iso}	5000	Vrms
Operating temperature		T_{OPR}	-55 to +110	℃
Storage temperature		T_{STG}	-55 to +125	℃
Soldering temperature(1*)		T_{SOL}	260	℃

Notes:

1* AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

2* Soldering time is 10 seconds

Electro-Optical Characteristics(Ta=25℃ unless specified otherwise)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
In put	Forward voltage	V_F	-	1.45	1.5	V	I_F=50mA
	Reverse current	I_R	-	-	10	μA	V_R=6V
	Input capacitance	C_{in}	-	50	-	pF	V=0,f=1kHz
Out put	Collector-Emitter dark current	I_{CEO}	-	-	100	nA	V_{CE}=20V I_F=0mA
	Collector-Emitter breakdown voltage	BV_{CEO}	80	-	-	V	Ic=0.1mA
	Emitter-Collector breakdown voltage	BV_{ECO}	7	-	-	V	I_E=0.1mA

Transfer Characteristics (Ta=25℃ unless specified otherwise)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Current Transferratio	EX1010	CTR	50	-	600	%	I_F=5mA V_{CE}=5V
	EX1017		80	-	160		
	EX1018		130	-	260		
	EX1019		200	-	400		
	EX1012	CTR	63	-	125	%	I_F=10mA V_{CE}=5V
	EX1013		100	-	200		
	EX1014		160	-	320		
	EX1012		22	-	-		I_F=1mA V_{CE}=5V
	EX1013		34	-	-		
	EX1014		56	-	-		
Collector-Emitter saturation voltage		$V_{CE(sat)}$	-	-	0.3	V	I_F=10mA Ic=1mA
Isolation resistance		R_{IO}	$5x10^{10}$	-	-	Ω	V_{IO}=500Vdc 40~60% RH.
Floating capacitance		C_{IO}	-	-	1.0	pF	V_{IO}=0,f=1MHz
Turn on time		Ton	-	4	-	μs	V_{CE}=5V, Ic=5mA, R_L=100Ω
Turn off time		Toff	-	3	-	μs	
Rise time		t_r	-	3	18	μs	V_{CE}=2V, Ic=2mA, R_L=100
Fall time		t_f	-	4	18	μs	

Characteristic Curves

Figure1. Forward Current vs Forward Voltage

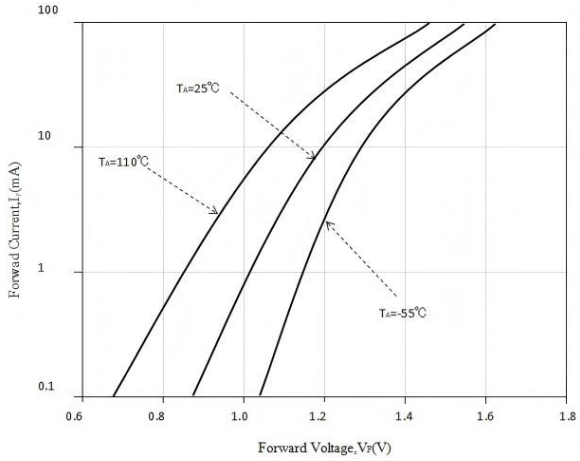


Figure2. Normalized Collector Current vs Forward Current

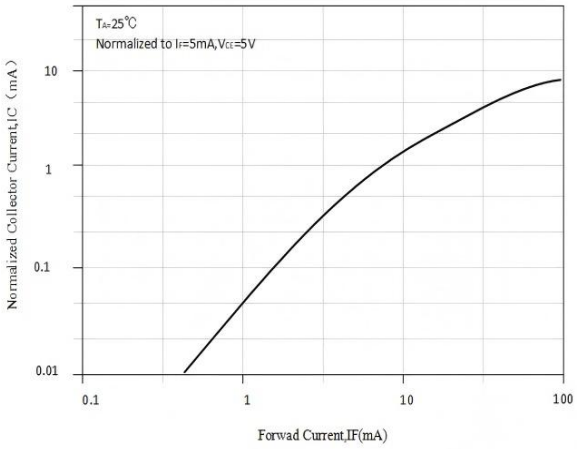


Figure3. Normalized Current Transfer Ratio vs Forward Current

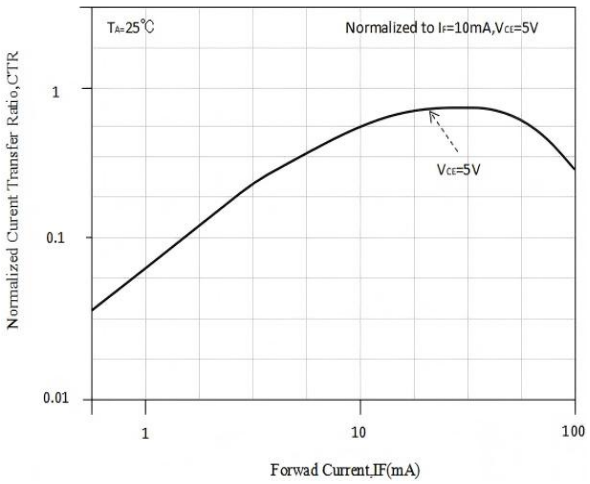


Figure4. Dark Current vs Ambient Temperature

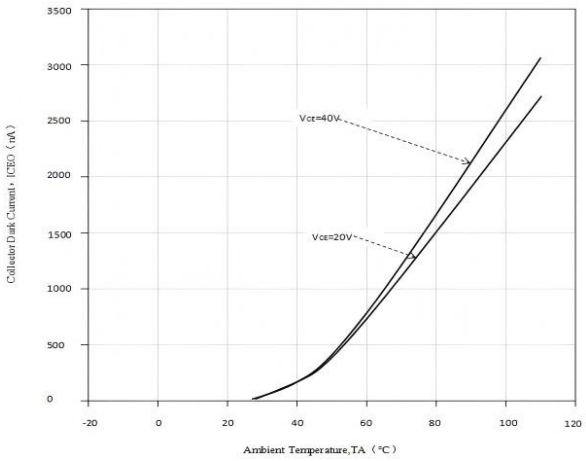


Figure5. Collector Current vs Collector-Emitter Voltage

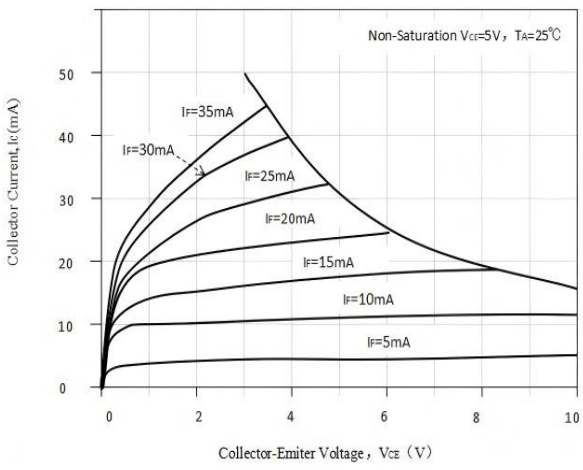


Figure6. Collector Current vs Collector-Emitter Voltage

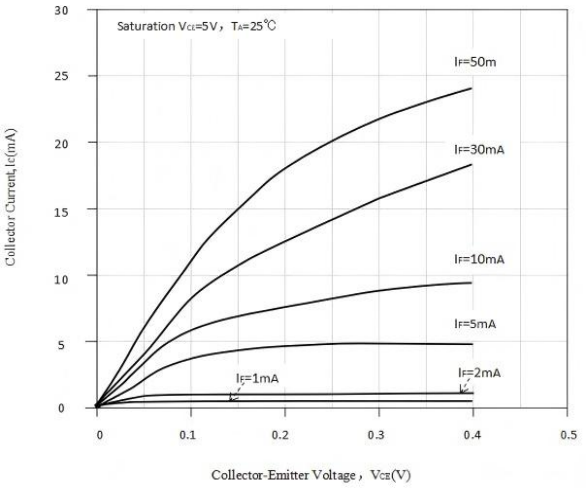


Figure7. Normalized Curent Tansfer Ratio vs Ambient Tempernture

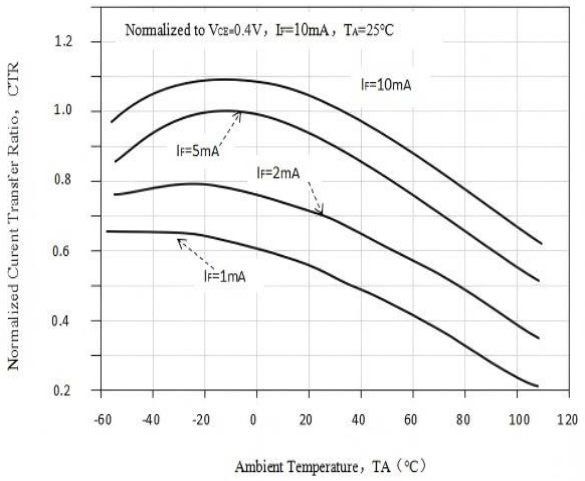


Figure8. Normalized Curent Tansfer Ratio vs Ambient Temperature

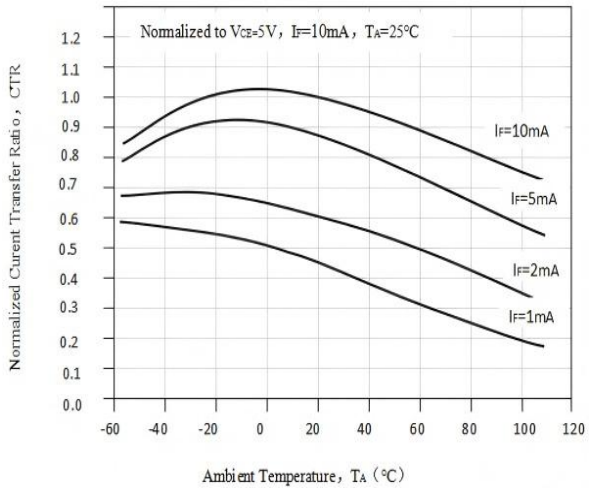


Figure9. Tum on/off Time vs Collector Current

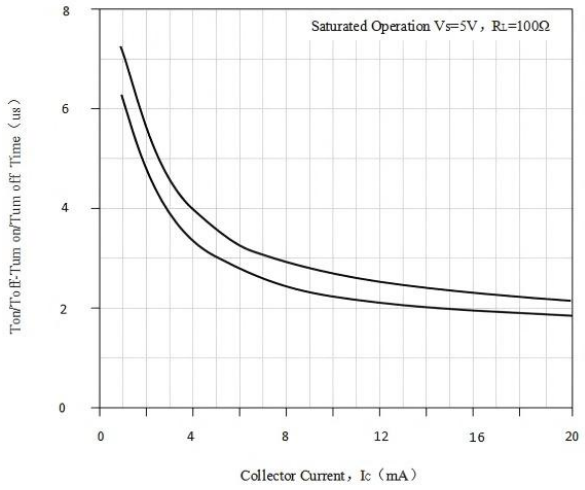


Figure10. Tum on/off Time vs Forwad Current

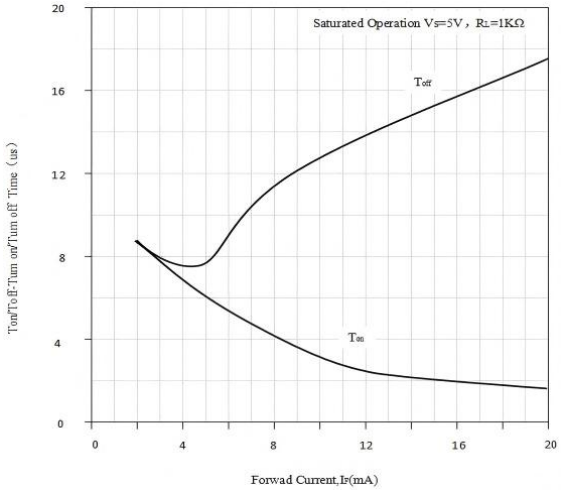
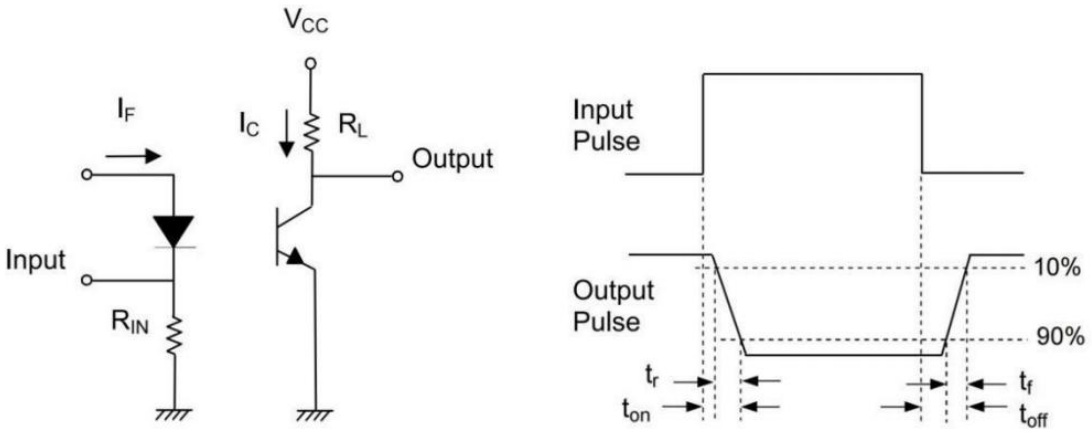
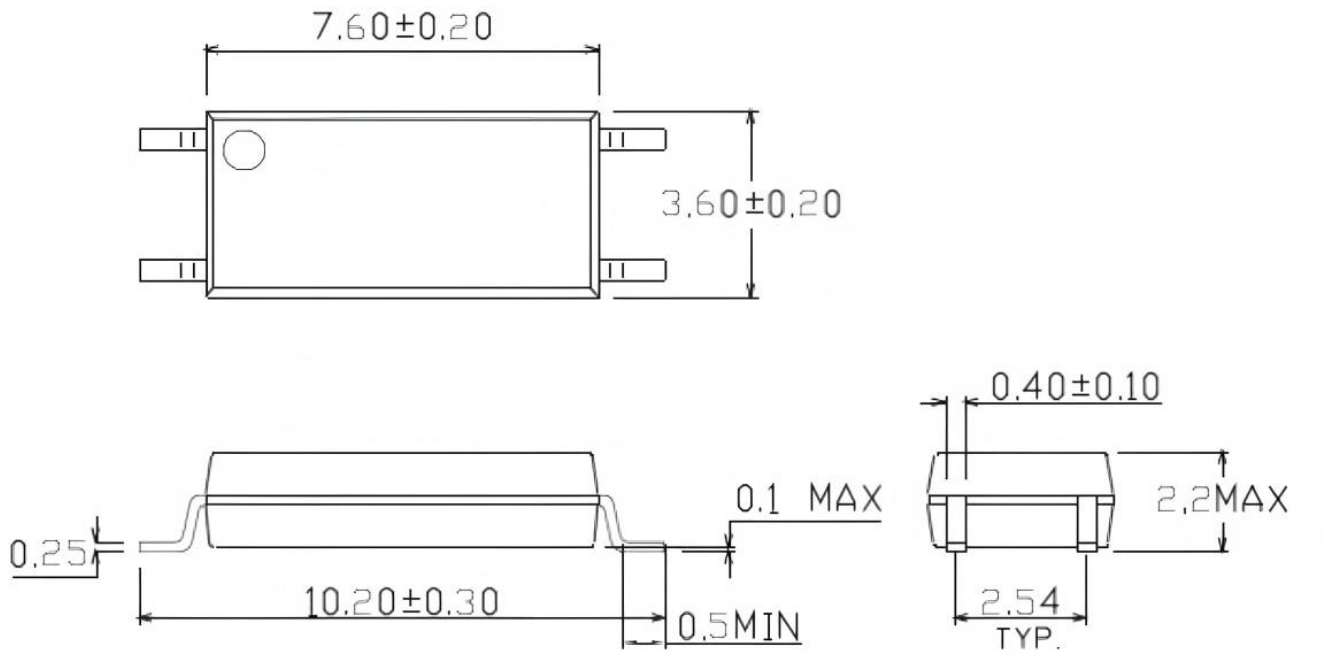


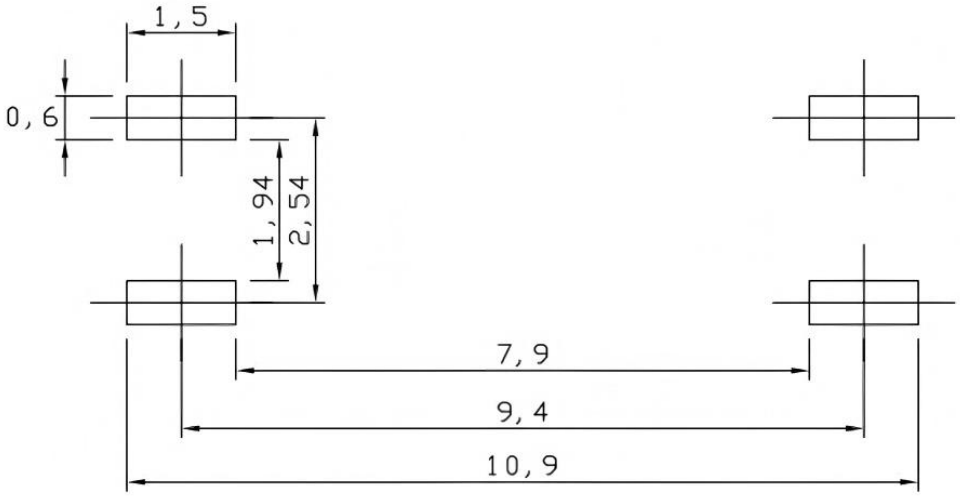
Figure11. Switching Time Test Circuit vs Waveforms



Package Drawing(Unit:mm)



Recommended pad layout for surface mount leadform



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