Ambient Light Sensor

■ GENERAL DESCRIPTION

The NJL7502L is the photo transistor which spectral response is similar to human eye.

■ FEATURES

1. Peak wavelength 560 nm
2. Photo current 33 μA typ. Condition : White LED, 100Lux
3. Lead pin package

■ APPLICATIONS

Room light, Toy, TV, PDP, Clock, Refrigerator, etc.

to adjust the luminance of display

to control ON/OFF

Replacement of CdS

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

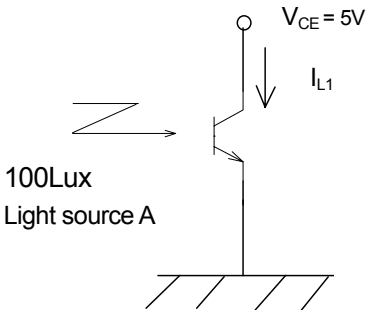
PARAMETER	SYMBOL	RATINGS	UNIT
Collector - Emitter Voltage	V_{CEO}	70	V
Emitter - Collector Voltage	V_{ECO}	10	V
Photocurrent	I_L	10	mA
Power Dissipation	P_D	150	mW
Operating Temperature	Topr	−40 to +85	°C
Storage Temperature	Tstg	−40 to +100	°C
Soldering Temperature	Tsol	260	°C

■ ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

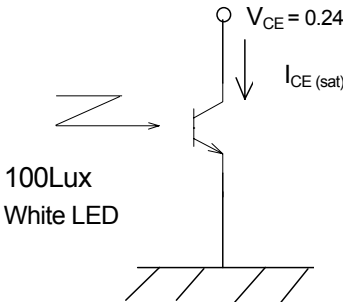
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Photocurrent 1	I_{L1}	V_{CE}=5V, Light source A, 100Lux	—	46	—	μA
Photocurrent 2	I_{L2}	V_{CE}=5V, White LED, 100Lux	15	33	73	μA
Dark Current	I_D	V_{CE}=20V	—	—	0.1	μA
Peak Wavelength	λ_P	—	—	560	—	nm
Collector - Emitter Saturation Current	$I_{CE(sat)}$	V_{CE}=0.24V, White LED, 100Lux	10	—	—	μA
Emitter - Collector Voltage	V_{ECL}	I_{ECL}=1μA , White LED, 100Lux	9	—	—	V
Half Angle	$\Theta_{1/2}$	—	—	±20	—	deg.
Rise Time	t_r	V_{CE}=5V, I_C=1mA, R_L=100Ω	—	10	—	μs
Fall Time	t_f	V_{CE}=5V, I_C=1mA, R_L=100Ω	—	10	—	μs

■ TEST CIRCUIT

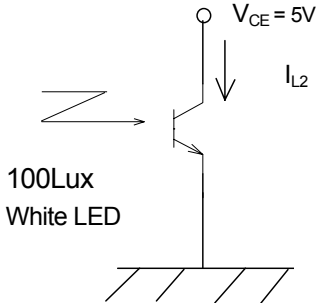
Photocurrent 1 I_{L1}



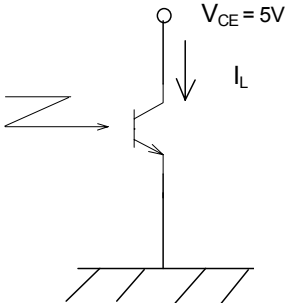
Collector - Emitter Saturation Current $I_{CE(sat)}$



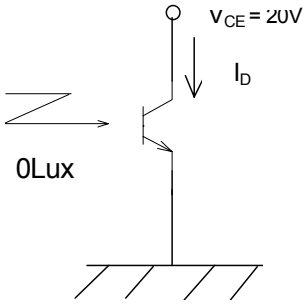
Photocurrent 2 I_{L2}



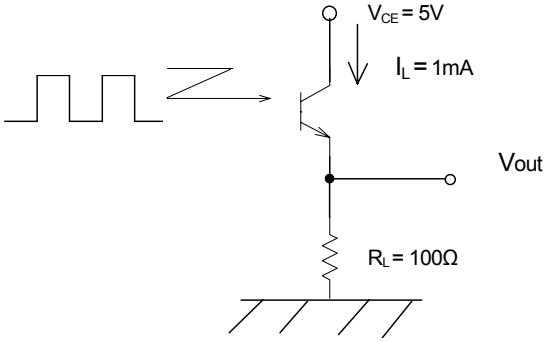
Half Angle $\Theta_{1/2}$

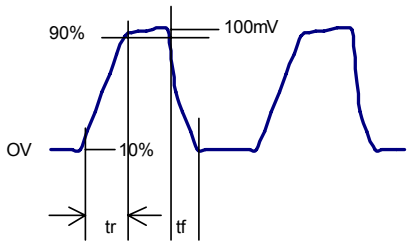


Dark Current I_{CEO}

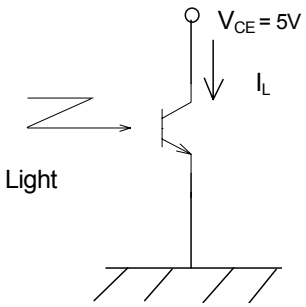


Rise Time tr
Fall Time tf

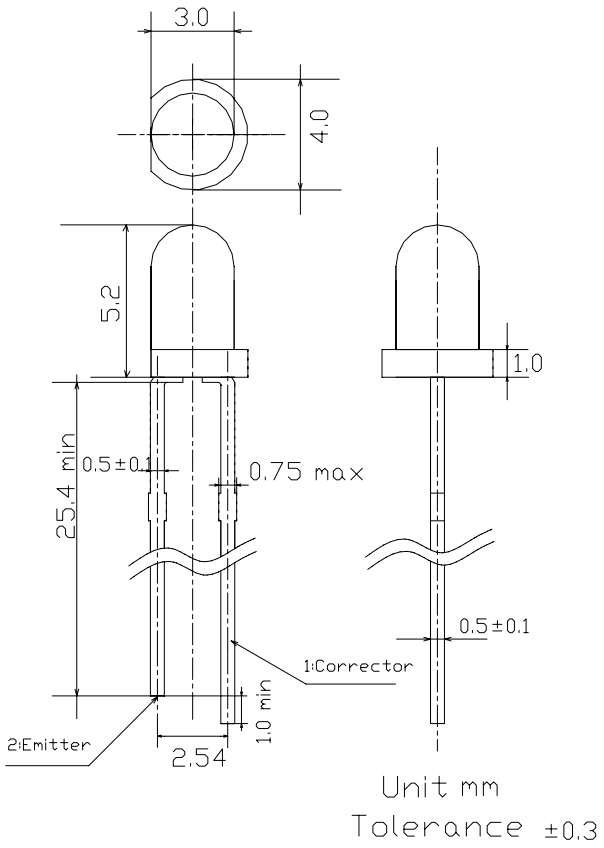




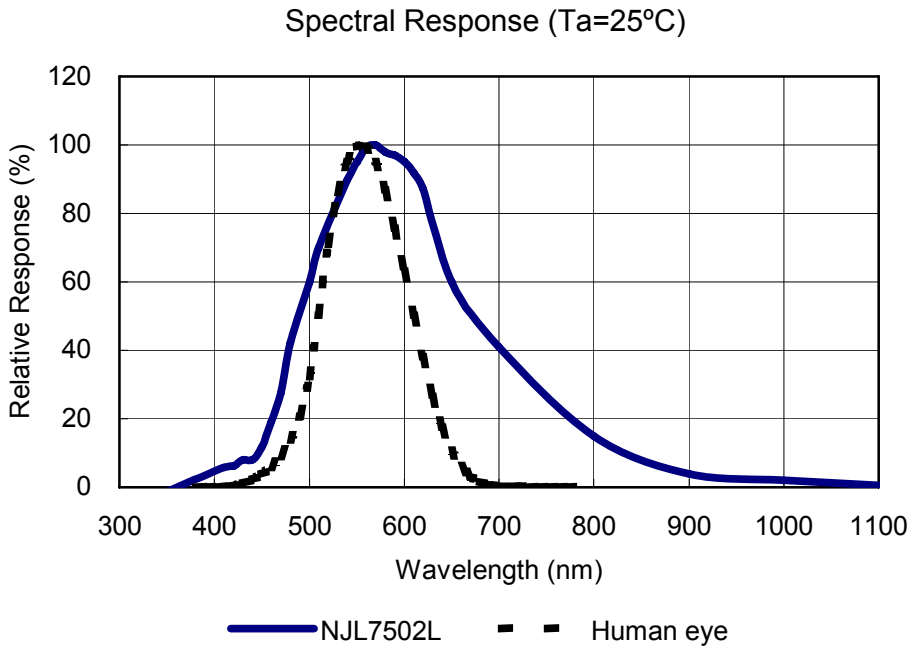
Peak Wavelength λ_P



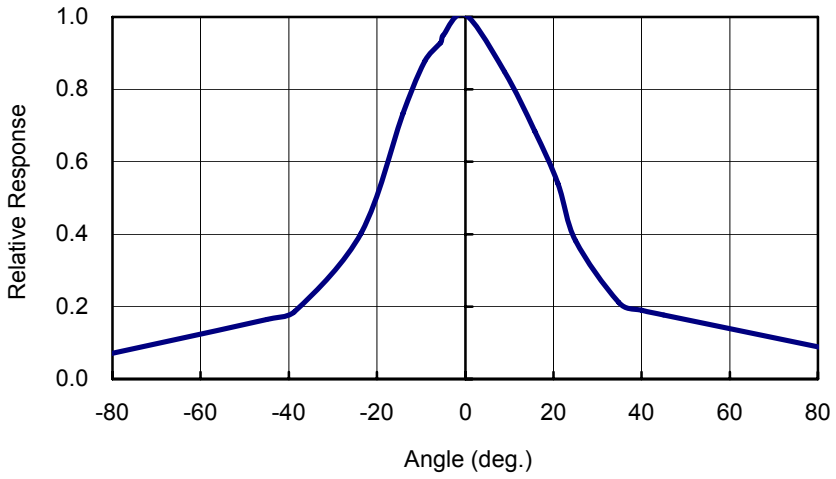
■ OUTLINE (TYP.)



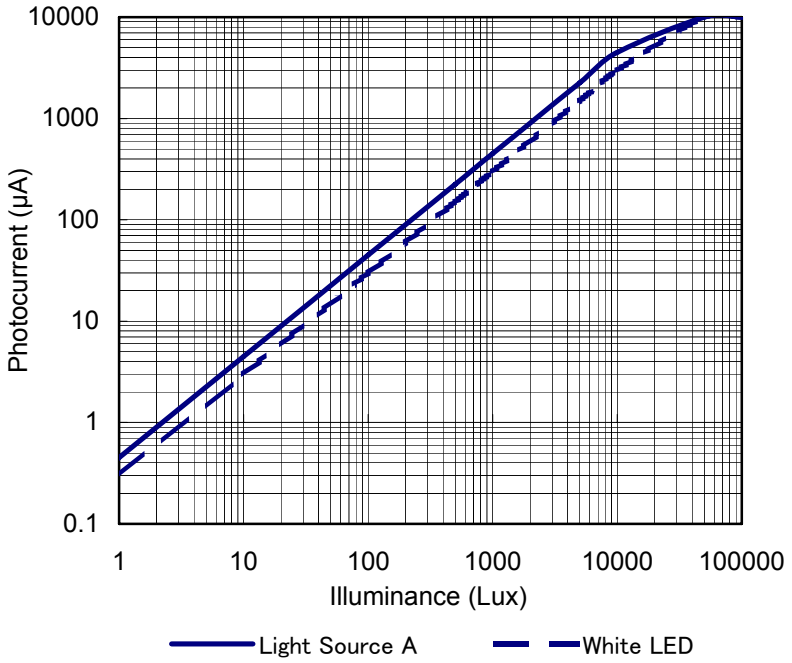
■ TYPICAL CHARACTERISTICS

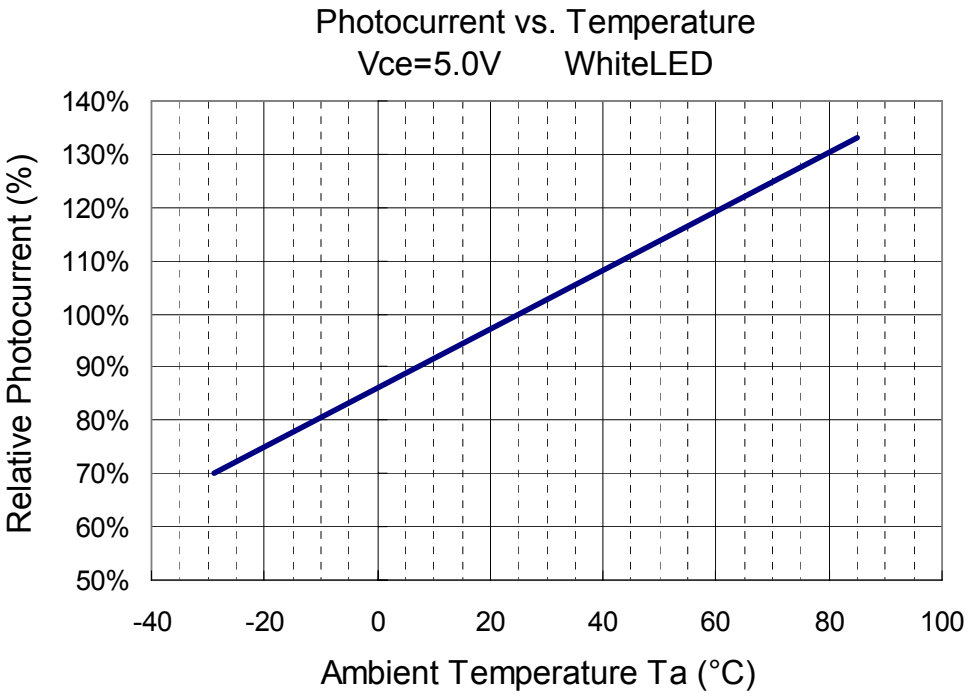


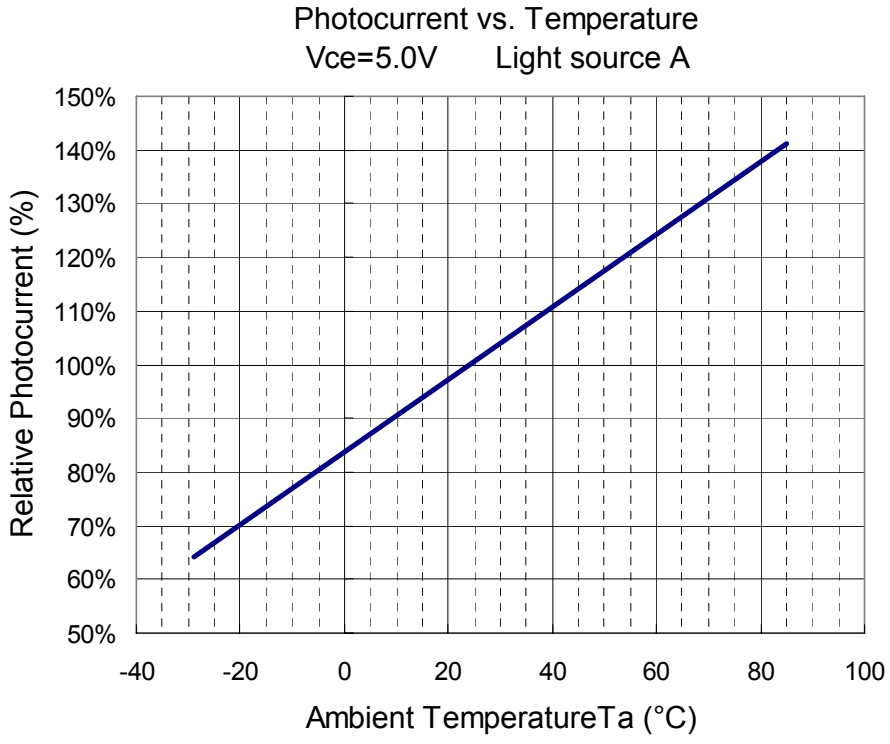
Directivity

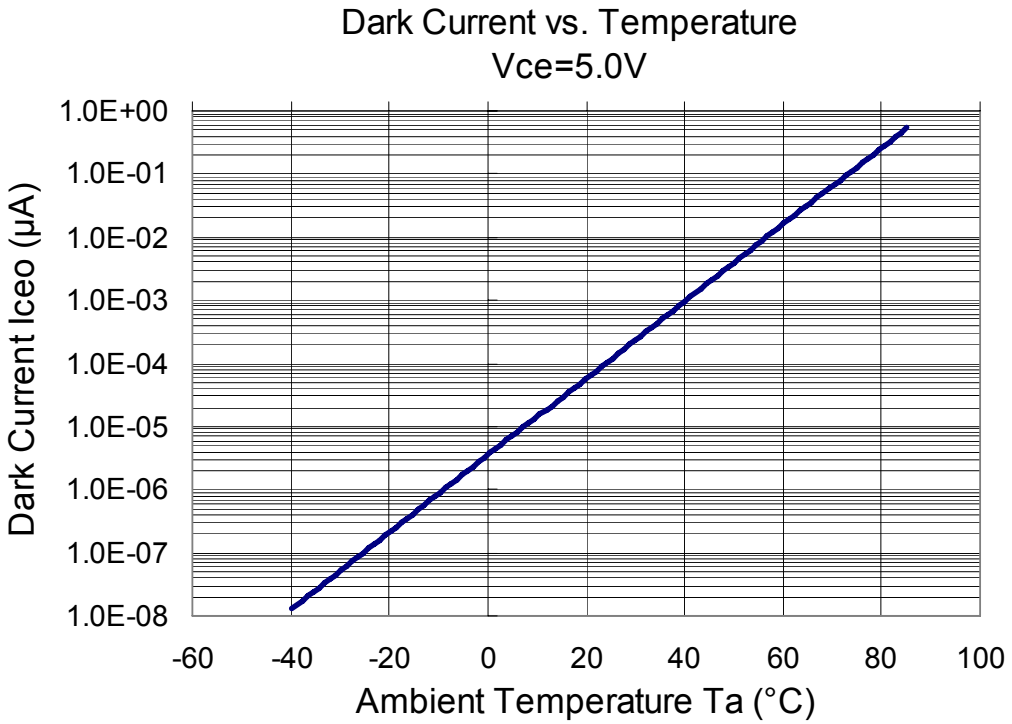


Photocurrent vs. Illuminance
(Ta=25°C)




Photocurrent vs. Temperature
Vce=5.0V WhiteLED
Relative Photocurrent (%)
140%
130%
120%
110%
100%
90%
80%
70%
60%
50%
-40
-20
0
20
40
60
80
100
Ambient Temperature Ta (°C)


Photocurrent vs. Temperature
Vce=5.0V Light source A
Relative Photocurrent (%)
150%
140%
130%
120%
110%
100%
90%
80%
70%
60%
50%
-40
-20
0
20
40
60
80
100
Ambient TemperatureTa (°C)


Dark Current vs. Temperature
Vce=5.0V
Dark Current Iceo (μA)
1.0E+00
1.0E-01
1.0E-02
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
-60
-40
-20
0
20
40
60
80
100
Ambient Temperature Ta (°C)

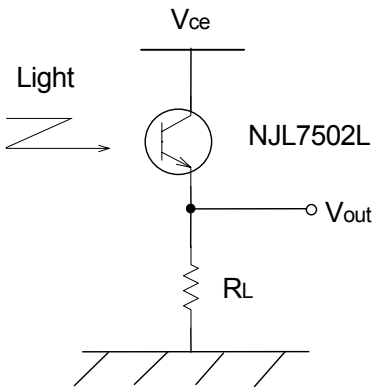
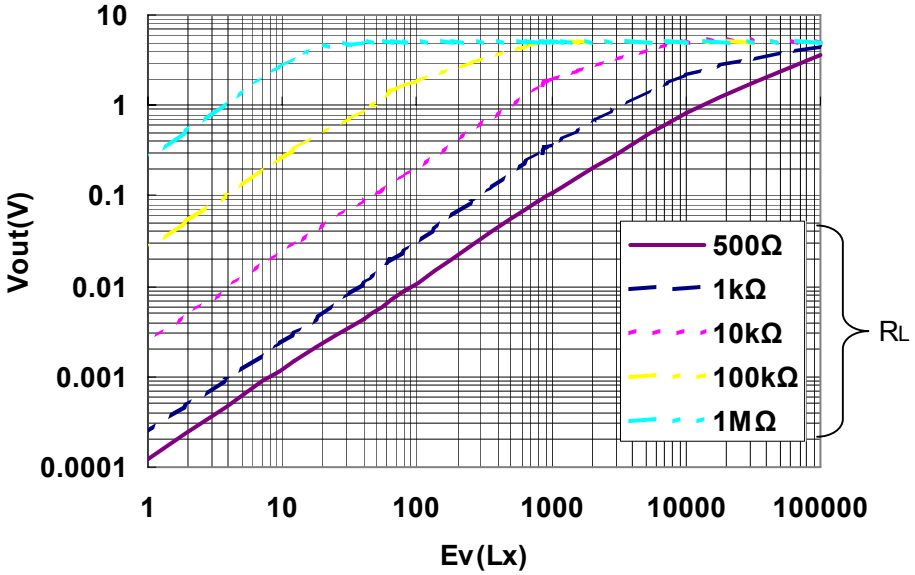


Fig1 Application Circuit

NJL7502L White LED Vce=5.0V



NJL7502L Light Source A Vce=5.0V