

COBP PHOTO SENSOR with Red & IR LED**■ GENERAL DISCRIPTION**

NJL5510R is the compact surface mount type photo sensor, which is built in a RED LED, Infrared LED and a high sensitive photo diode. This product is suit for the application for Bio monitor as pulse rate, SpO₂.

■ FEATURES

- Peak wavelength : λ_p 660nm $\pm$ 3nm(RED) , 940nm $\pm$ 10nm(Infrared)
- Output current : 4 μ A typ (RED), 1 μ A typ (Infrared)
- Miniature, thin package: 2.4x3.75x0.8mm
- Pb free solder reflowing permitted: 260°C, 2times
- Halogen free, Pb free
- Compliant with RoHS directive

■ APPLICATION

- Bio monitor as pulse rate, SpO₂

■ ABSOLUTE MAXIMUM RATINGS (Ta=25deg.C)

PARAMETER	SYMBOL	RATINGS	UNIT
Emitter			
Forward Current (Continuous)	IF RED	50	mA
	IF IR	50	mA
Reverse Voltage (Continuous)	VR RED	5	V
	VR IR	5	V
Power Dissipation *1	PD	65	mW
Detector			
Reverse Voltage	VR	20	V
Forward Current	IF	10	mA
Power Dissipation	PD	20	mW
Coupled			
Total Power Dissipation	Ptot	85	mW
Operating Temperature	Topr	-20 to +70	°C
Storage Temperature	Tstg	-30 to +85	°C
Reflow Soldering Temperature	Tsol	260 peak	°C

*1 Prohibits that "RED LED" and "IR LED" turn on at the same time.

■ **ELECTRO-OPTICAL CHARACTERISTICS** (Ta=25deg.C)

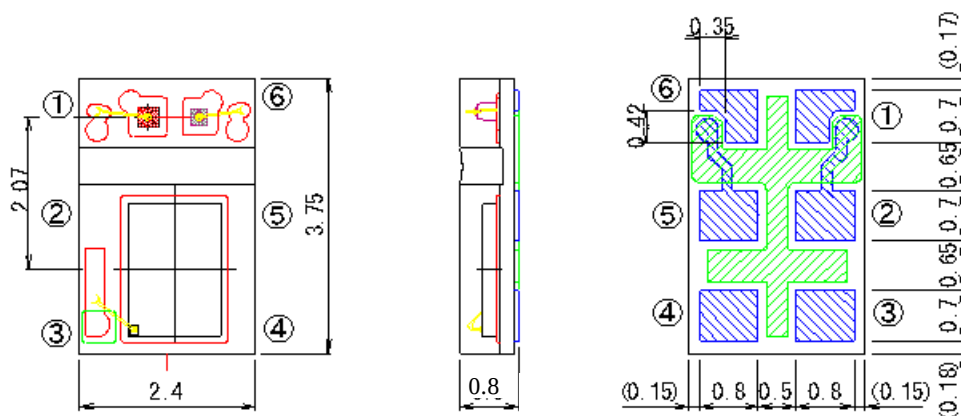
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Emitter						
DC Forward Voltage	V _F RED	I _F =10mA	—	1.9	2.2	V
	V _F IR	I _F =10mA	—	1.2	1.4	V
Pulse Forward Voltage * ¹	V _{FP} RED	I _{FP} =100mA	—	2.1	—	V
	V _{FP} IR	I _{FP} =100mA	—	1.4	—	V
Reverse Current	I _R RED	V _R =5V	—	—	10	μA
	I _R IR	V _R =5V	—	—	10	μA
Peak Wavelength	λ _P RED	I _F =10mA		660		nm
	λ _P IR	I _F =10mA		940		nm
Detector						
Reverse Current	I _R	V _R =5V	—	—	5	nA
Terminal Capacitance	C _t	V _R =0V, f=1MHz	—	25	—	pF
		V _R =2.5V, f=1MHz	—	12	—	pF
Peak Wavelength	λ _p	V _R =0V	—	800	—	nm
Coupled						
Output Current * ²	I _O RED	I _F =4mA, V _R =2.5V, d=1.2mm	—	4	—	μA
	I _O IR	I _F =4mA, V _R =2.5V, d=1.2mm	—	1	—	μA
Operating Dark Current * ³	I _D RED	I _F =4mA, V _R =2.5V	—	20	500	nA
	I _D IR	I _F =4mA, V _R =2.5V	—	20	500	nA
Response Time(Rise/Fall)	t _r , t _f RED	V _R =0V, R _L =1kΩ	—	400	—	ns
		V _R =2.5V, R _L =1kΩ	—	250	—	ns
	t _r , t _f IR	V _R =0V, R _L =1kΩ	—	700	—	ns
		V _R =2.5V, R _L =1kΩ	—	400	—	ns

*1 Pulse duty 10% (Pulse width 200us, Period 20ms)

*2 Please refer to "Output Current Test Condition".

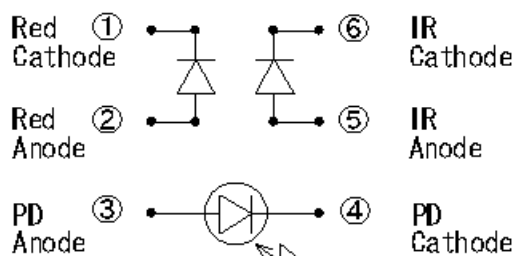
*3 I_D may increase according to the periphery situation of the surface mounted condition.

■ OUTLINE unit:mm

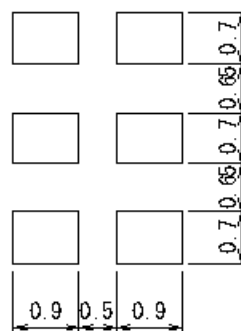


unit:mm

TOP VIEW

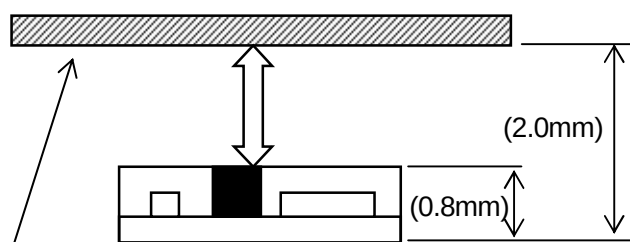


Foot Pattern



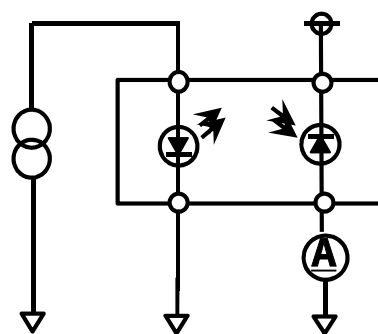
■ OUTPUT CURRENT TEST CONDITION

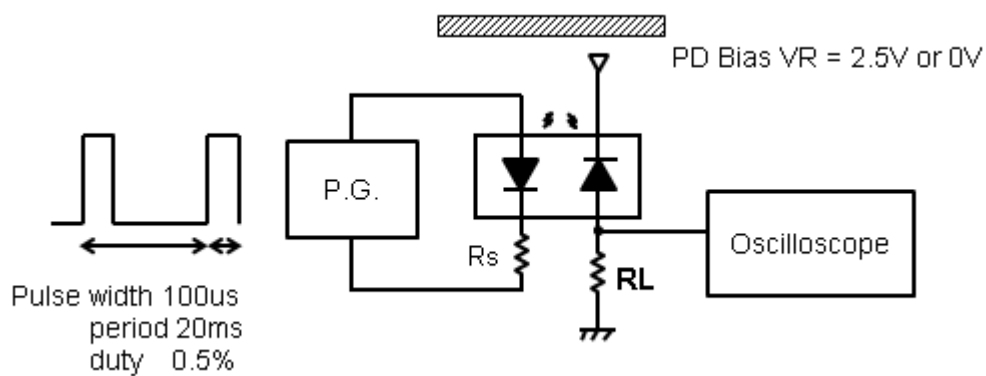
The signal from LED is reflected at the aluminum surface.



Aluminum
Evaporation
Surface

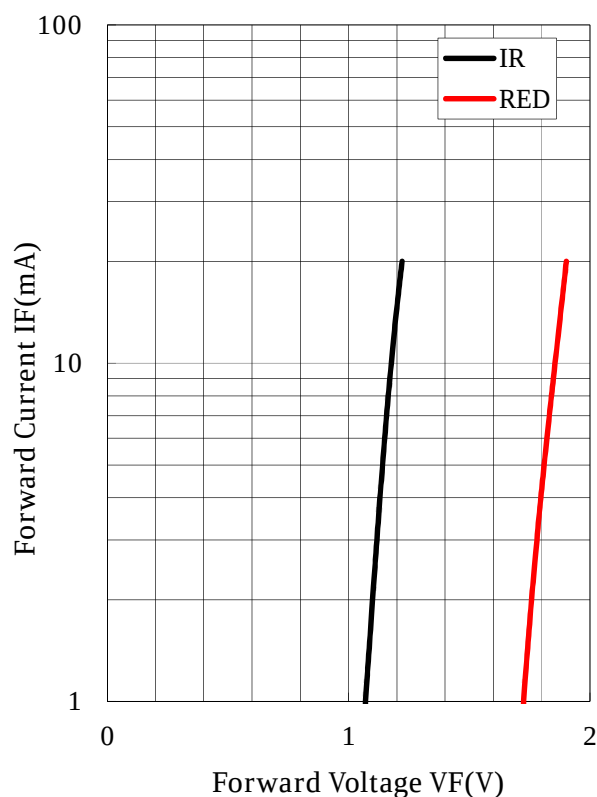
■ DARK CURRENT TEST CONDITION



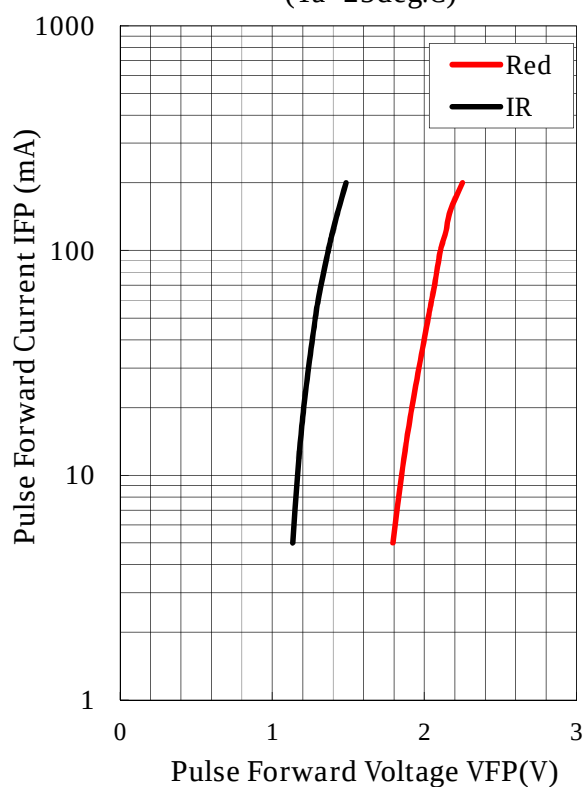
■ RESPONSE TIME TEST CONDITION

■ TYPICAL CHARACTERISTICS

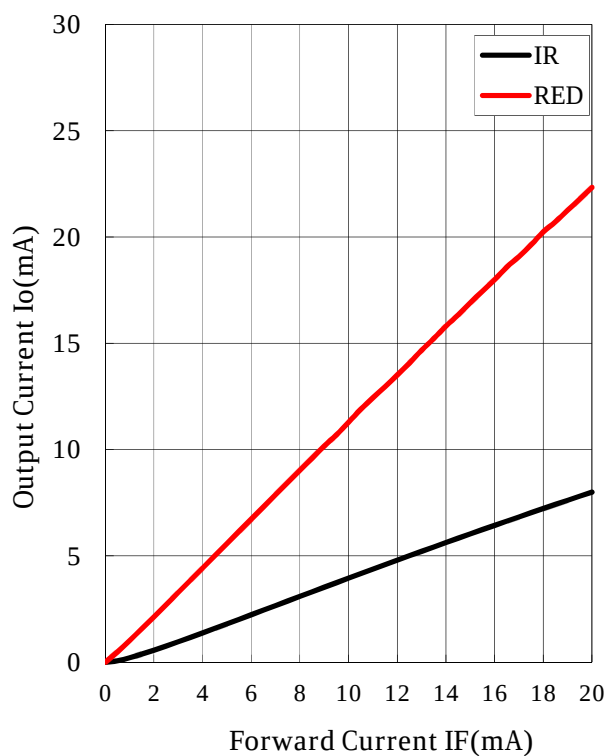
Forward Voltage vs. Forward Current
(Ta=25deg.C)



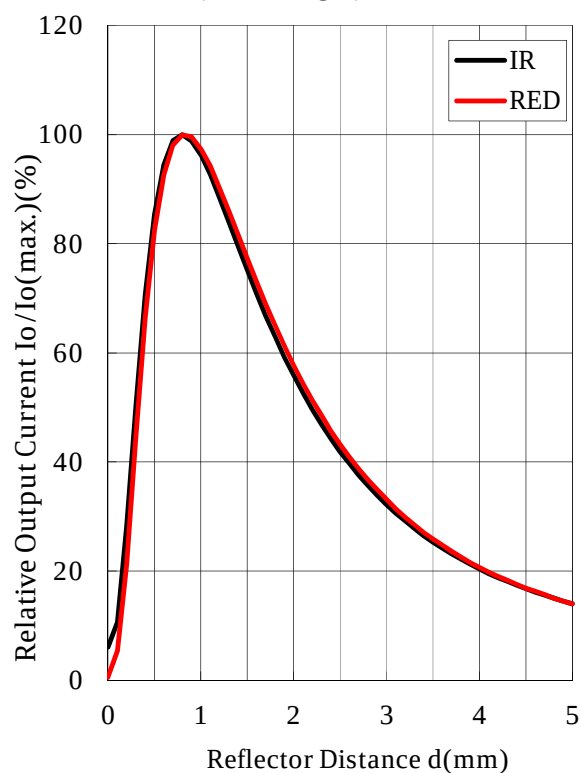
Pulse Drive
Forward Voltage vs. Forward Current
(Ta=25deg.C)



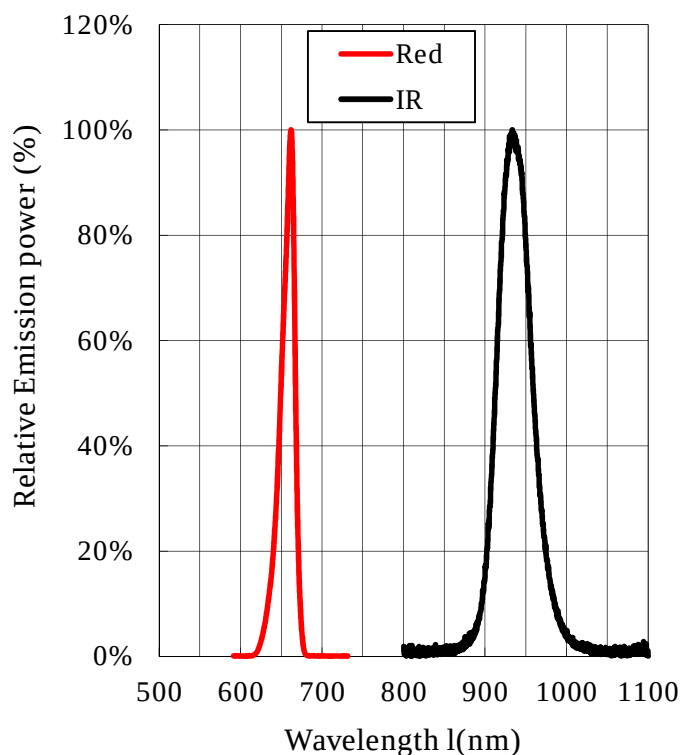
Output Current vs. Forward Current
(Ta=25deg.C)



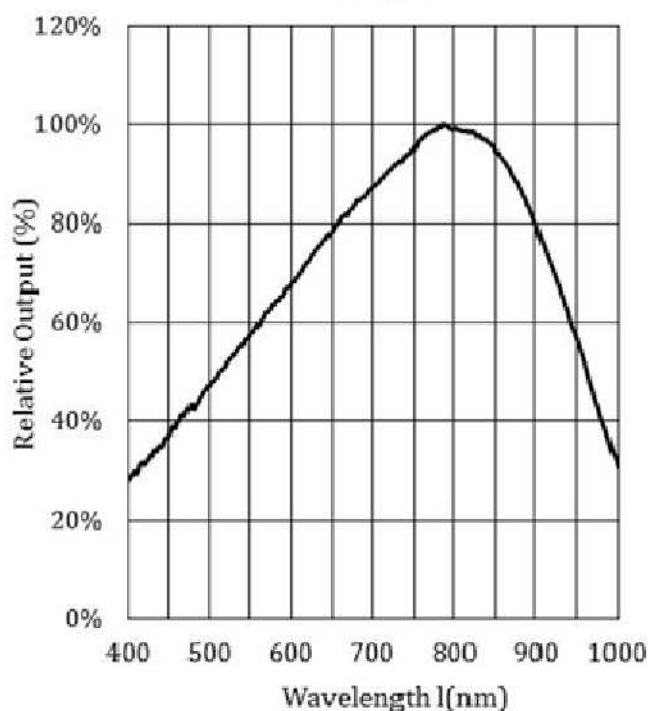
Output Current vs. Distance
(Ta=25deg.C)



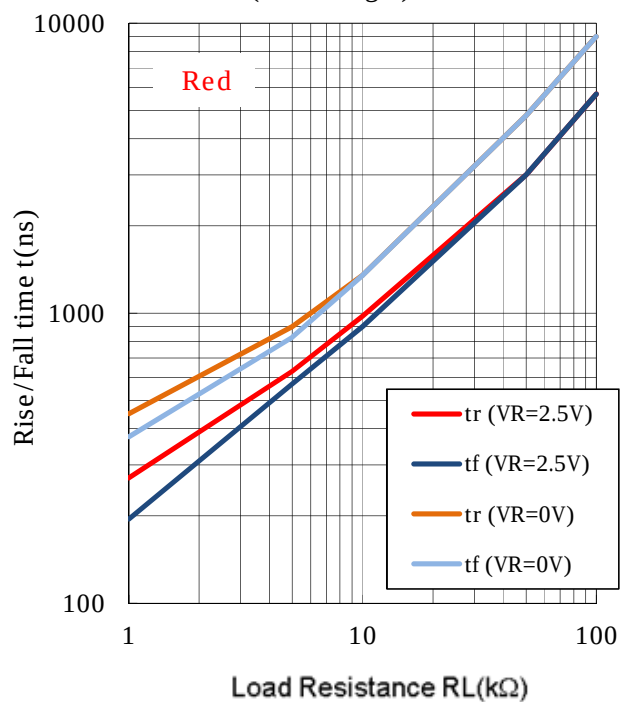
Spectral Response (Ta=25deg.C)
Emitter



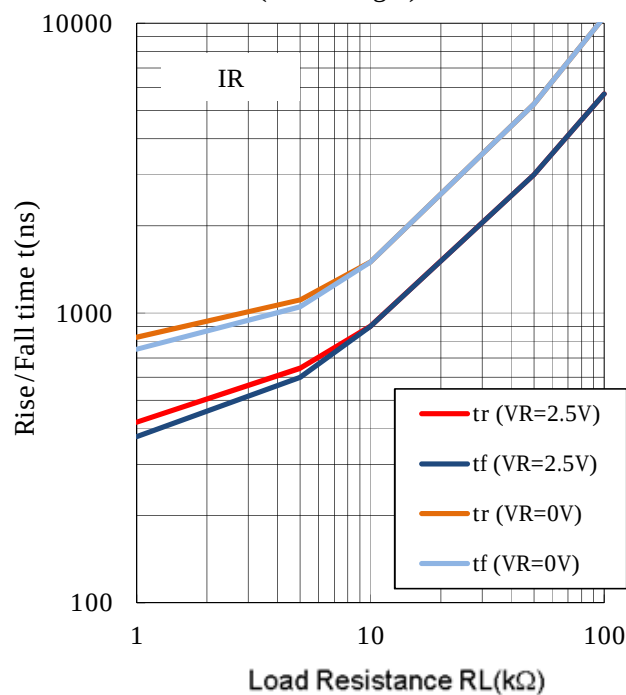
Spectral Response (Ta=25deg.C)
Detector



Pulse Response vs. Load Resistance
(Ta=25deg.C)



Pulse Response vs. Load Resistance
(Ta=25deg.C)



Attention: Please be aware that all data in the graph are just for reference and not for guarantee.

[CAUTION]

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