PT431/PT431F Narrow Acceptance, High Sensitivity Phototransistor T-41-63

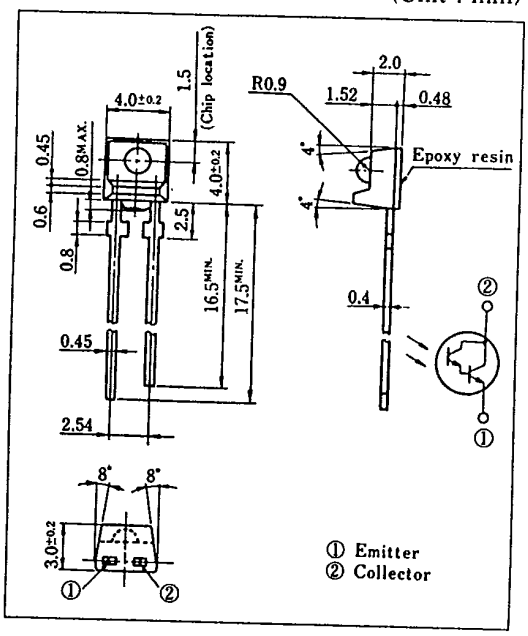
■ Features

1. Narrow acceptance epoxy resin package ($\Delta\theta$: TYP. ±13°)
2. High sensitivity (PT431 I_C : MIN. 2mA, PT431F I_C : MIN. 1.3mA at E_e=0.1mW/cm²)
3. Visible light cut-off type : PT431F

■ Applications

1. Copiers, Printers, automatic vending machines
2. VCRs, cassette decks
3. Optoelectronic switches, optoelectronic counters

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	35	V
Emitter-collector voltage	V_{ECO}	6	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	75	mW
Operating temperature	T_{opr}	−25~+85	°C
Storage temperature	T_{stg}	−40~+85	°C
*1Soldering temperature	T_{sol}	260	°C

*1 For 3 seconds at the position of 2.5mm from the bottom face of resin package

■ Electro-optical Characteristics (Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*2Collector current	PT431	I_C	V_{CE}=2V, E_e=0.1mW/cm²	2	—	—	mA
	PT431F			1.3	8.0	45	mA
Collector dark current		I_{CEO}	V_{CE}=10V, E_e=0	—	—	10^{-6}	A
*2Collector-emitter saturation voltage		$V_{CE(sat)}$	I_C=2.5mA, E_e=1mW/cm²	—	—	1.0	V
Peak sensitivity wavelength	PT431	λ_P		—	800	—	nm
	PT431F			—	860	—	nm
Response time (Rise)		t_r	V_{CE}=2V, I_C=10mA, R_L=100Ω	—	80	—	μs
Response time (Fall)		t_f		—	70	—	μs

*2 E_e : Irradiance by CIE standard light source A (tungsten lamp)

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Fig. 1 Collector Power Dissipation vs. Ambient Temperature

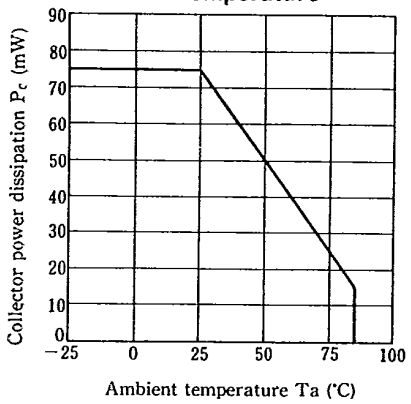

Fig. 2 Collector Dark Current vs. Ambient Temperature

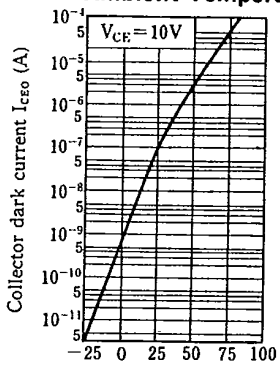

Fig. 3 Relative Collector Current vs. Ambient Temperature

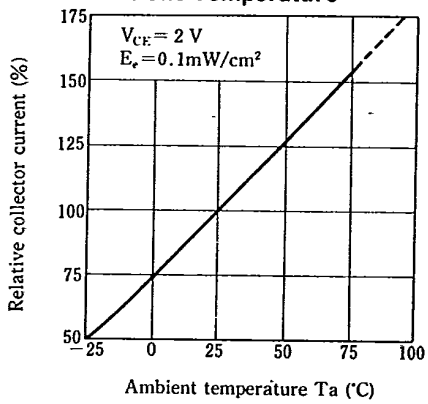

Fig. 4 Collector Current vs. Irradiance (PT431)

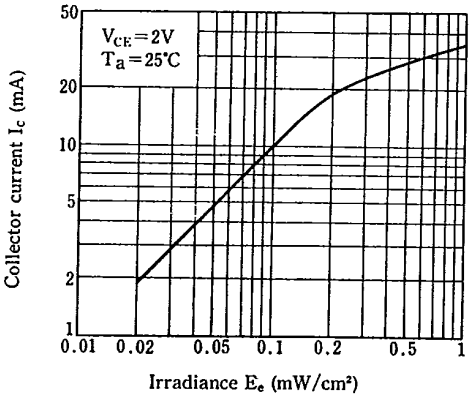

Fig. 5 Collector Current vs. Irradiance (PT431F)

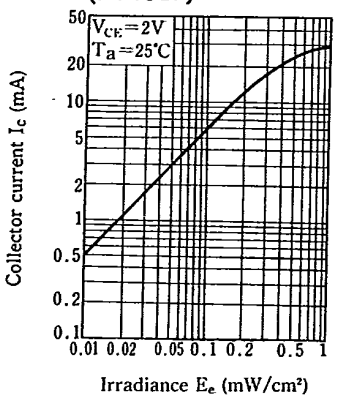

Fig. 6 Collector Current vs. Collector-emitter Voltage (PT431)

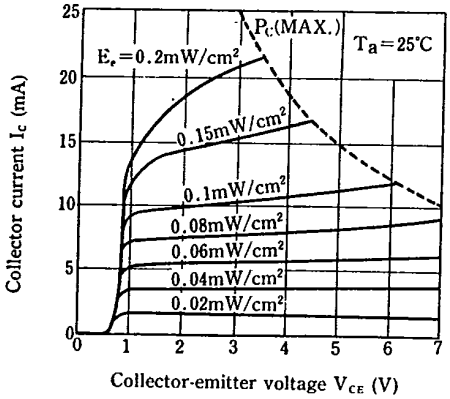

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Fig. 7 Collector Current vs. Collector-emitter Voltage (PT431F)

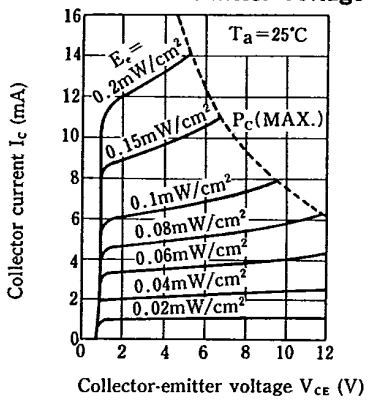


Fig. 8 Spectral Sensitivity (PT431)

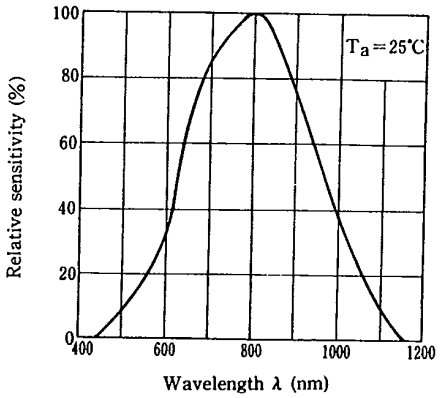


Fig. 9 Spectral Sensitivity (PT431F)

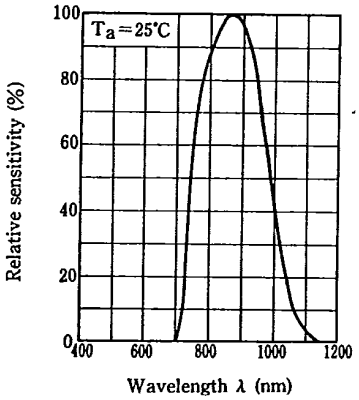
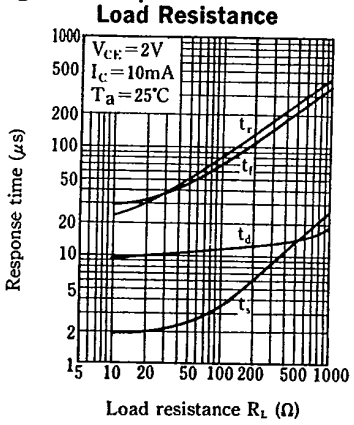


Fig. 10 Response Time vs. Load Resistance



Test Circuit for Response Time

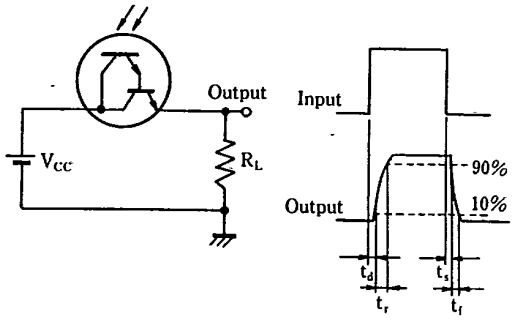


Fig. 11 Sensitivity Diagram (T_a=25°C)

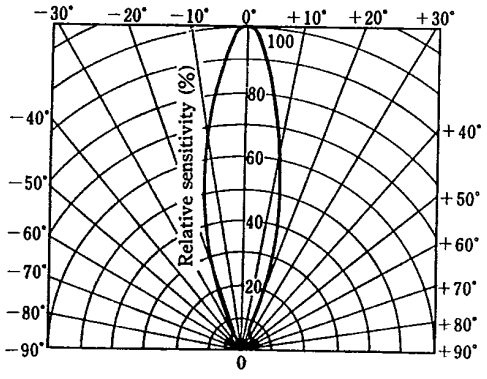


Fig. 12 Collector-emitter Saturation Voltage vs. Irradiance (PT431)

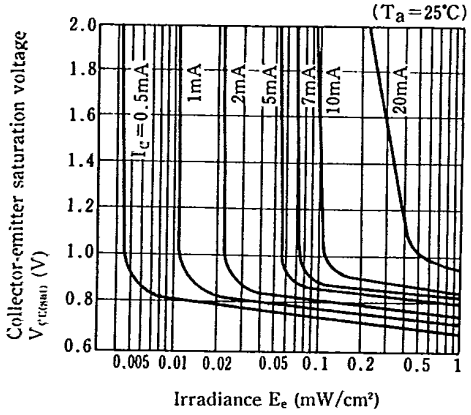


Fig. 13 Collector-emitter Saturation Voltage vs. Irradiance (PT431F)

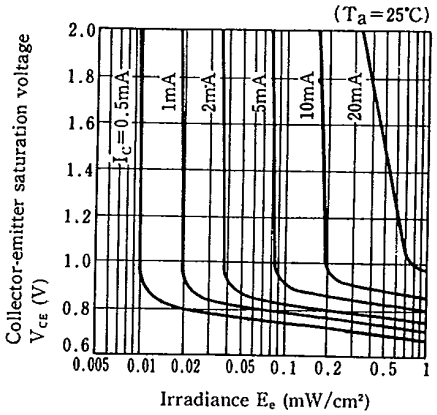


Fig. 14 Relative Output vs. Distance (Emitter : GL430)

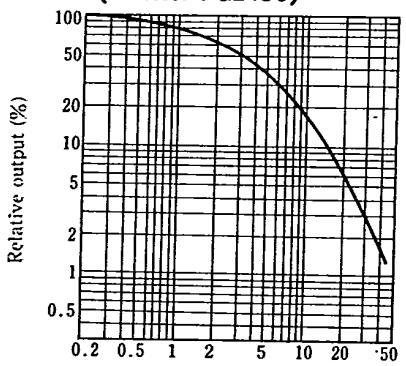
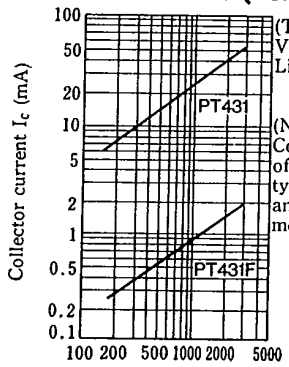


Fig. 15 Collector Current vs. Illuminance (Reference)



(Test Condition)
V_{CE}=2V Ta=25°C
Light source:
White fluorescent lamp
Sharp FLR-40 SW/M
(Note)
Comparison between outputs of transparent resin molded type phototransistor (PT431) and visible light cut-off resin molded type (PT431F)

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