

ST139

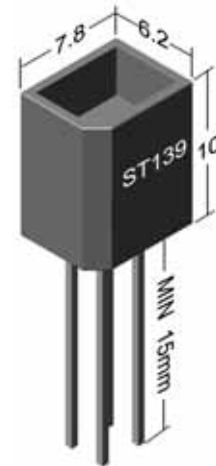
● Features

- Combines high output GaAs IRED with high sensitive phototransistor.
- Wide detecting range, the minimum range is 1mm
- Non-contact detecting manner.
- Reduce the effect of environmental radiation light.

● Applications

- IC card electric power meter.
- AMR system.
- Water meter.
- OA equipment: facsimile, printer, copier etc.
- Combined with direction detector IC(ST288A), it can be used as detecting direction of motion, speed of clockwise/ counterclockwise rotation and moving distance etc.

- Dimensions Unit:mm;
Unless otherwise specified, the tolerances are $\pm 0.2\text{mm}$.



● Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mV
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	75	mW
Output	Collector-Emitter Voltage	V_{CEO}	25	V
	Emitter-Collector Voltage	V_{ECO}	6	V
	Collector Power Dissipation	P_C	50	mW
*Operating Temperature		T_{opr}	-20~65	$^\circ\text{C}$
Storage Temperature		T_{stg}	-30~75	$^\circ\text{C}$
** Soldering Temperature		T_{sol}	260	$^\circ\text{C}$

*The special requirement could be met according to customer's request.

**Soldering time: 5s max. Soldering position: at least 1.5mm from the base of the package.

● Electro-Optical Characteristics($T_a=25^\circ\text{C}$)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	V_F	$I_F=20\text{mA}$	-	1.25	1.5	V	
	Reverse Current	I_R	$V_R=3\text{V}$	-	-	10	μA	
Output	Collector dark current	I_{CEO}	$V_{CE}=20\text{V}$	-	-	1	μA	
	Collector Light Current	I_L	$V_{CE}=5\text{V}$ $I_F=8\text{mA}$	L3	0.3	-	-	mA
				L4	0.4	-	-	
				L5	0.5	-	-	
Collector-Emitter Saturation voltage	$V_{CE(SAT)}$		$I_F=8\text{mA}$ $I_C=0.15\text{mA}$	-	-	0.4	V	
Transfer Character-istics	Response Time	Rise Time	T_r	$I_F=20\text{mA}$ $V_{CE}=5\text{V}$ $R_C=100\Omega$	-	10	-	μS
		Fall Time	T_f		-	10	-	

Notes: Collector light current I_L , Collector-emitter saturation voltage $V_{CE(SAT)}$, Relative current, Response time is measured within 2~5mm between photointerrupter's top and reflecting surface. The value is affected by the smooth of light reflecting surface.

Internal Circuit

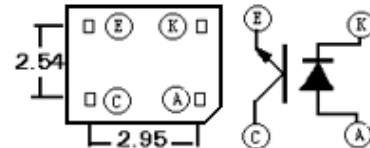


Fig.1 Forward current vs. forward voltage

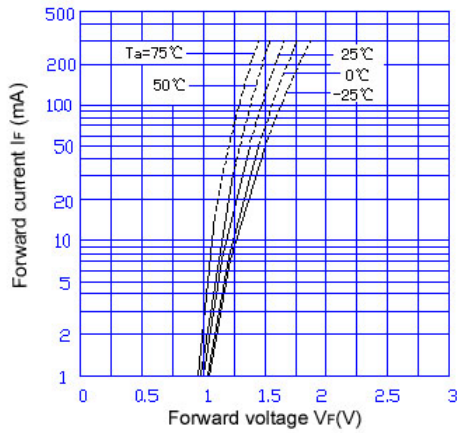
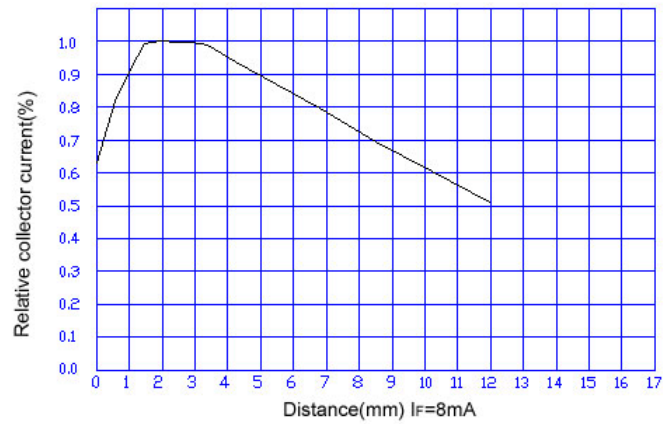


Fig.2 Relative collector current vs. distance



- Distance in Fig.2 is from photointerrupter's top to the reflecting surface.
- The reflecting surface is a sub-reflection aluminium plate. its surface is parallel to the top of photointerrupter.
- When relative collector current rises to 1.0, the conversion efficiency is the highest under this distance.
- The curves above are for you reference.