

**AT405-PD-01**

**DATA SHEET**

REV. : 1.0

DATE : 20-Apr.-2005

**■ FEATURES:**

- Fast Response Time.
- High Photo Sensitivity.
- Fast Switching Time.
- Lead Free product, in compliance with RoHS.

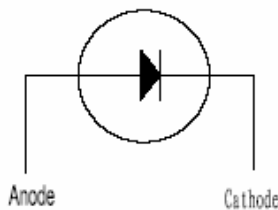
**■ DESCRIPTIONS:**

- AT405-PD-01 is a high speed and high sensitive silicon PIN photodiode with exceptionally stable characteristics and high illumination sensitivity.
- Mounted in 5mm diameter and black epoxy package.

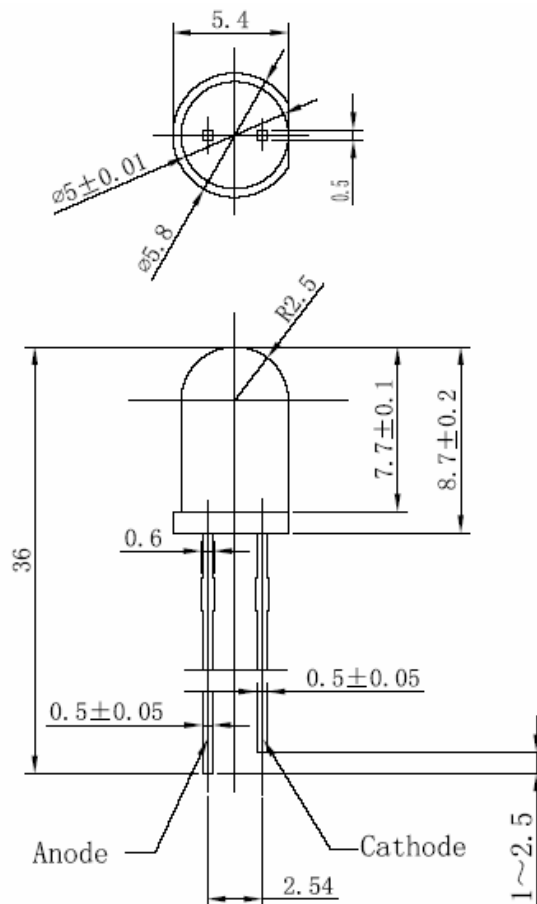
**■ APPLICATIONS:**

- High Speed Photo Detector.
- Security System.
- Camera.

**■ INTERNAL CIRCUIT:**



**■ DIMENSIONS:**



**NOTE:** 1. All dimensions are in millimeter, tolerance is  $\pm 0.25$  unless otherwise noted.  
 2. Epoxy meniscus extends  $\leq 1$  mm down to the lead is allowed.

**■ ABSOLUTE MAXIMUM RATINGS AT Ta=25°C**

Parameter	Symbol	Ratings	Unit
Power Dissipation	P <sub>D</sub>	100	mW
Reverse Breakdown Voltage	V <sub>(BR)</sub>	60	V
Operating Temperature	T <sub>opr</sub>	-40~+85	°C
Storage Temperature	T <sub>stg</sub>	-55~+100	°C
Soldering Temperature	T <sub>sol</sub>	270°C for 6 sec Max (2mm from Body)	

**■ TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS (Ta=25°C)**

Parameter	Symbol	Min.	Type	Max.	Unit	Test Condition
Reverse Light Current	I <sub>L</sub>		42		μA	V <sub>R</sub> =5V E <sub>e</sub> =1mW/cm <sup>2</sup>
Reverse Dark Current	I <sub>d</sub>			10	nA	V <sub>R</sub> =10V E <sub>e</sub> =0mW/cm <sup>2</sup>
Reverse Breakdown Voltage	V <sub>(BR)</sub>	33			V	I <sub>R</sub> =100μA E <sub>e</sub> =0mW/cm <sup>2</sup>
Rise Time	T <sub>r</sub>		40		nS	V <sub>R</sub> =20V λ <sub>p</sub> =850nm R <sub>L</sub> =50Ω
Fall Time	T <sub>f</sub>		40		nS	
Forward Voltage	V <sub>F</sub>			1.2	V	I <sub>F</sub> =1mA
Total Capacitance	C <sub>T</sub>		21		pF	V <sub>R</sub> =5V E <sub>e</sub> =0mW/cm <sup>2</sup> f=1.0MHz

**■ RELIABILITY TEST ITEMS AND CONDITIONS:**

<b>NO</b>	<b>Item</b>	<b>Test Conditions</b>	<b>Test Hours/Cycle</b>	<b>Sample Quantity</b>	<b>Test Result</b>
<b>1</b>	<b>Solder Heat</b>	<b>TEMP: 270°C ± 3°C</b>	<b>10 SEC</b>	<b>11 pcs</b>	<b>0 DEFECT</b>
<b>2</b>	<b>Temperature Cycle</b>	<b>H:+85°C 60min</b> $\updownarrow$ <b>10min</b> <b>L:-25°C 60min</b>	<b>16 cycles</b>	<b>22 pcs</b>	<b>0 DEFECT</b>
<b>3</b>	<b>Thermal Shock</b>	<b>H:+85°C 30min</b> $\updownarrow$ <b>30sec</b> <b>L:-25°C 30min</b>	<b>10 cycles</b>	<b>11 pcs</b>	<b>0 DEFECT</b>
<b>4</b>	<b>High Temperature Storage</b>	<b>TEMP: +85°C</b>	<b>1000 HRS</b>	<b>22 pcs</b>	<b>0 DEFECT</b>
<b>5</b>	<b>Low Temperature Storage</b>	<b>TEMP: -25°C</b>	<b>1000 HRS</b>	<b>22 pcs</b>	<b>0 DEFECT</b>
<b>6</b>	<b>High Temperature High Humidity Storage</b>	<b>85°C/93% RH</b>	<b>1000HRS</b>	<b>22 pcs</b>	<b>0 DEFECT</b>

■ TYPICAL ELECTRO-OPTICAL CHARACTERISTICS CURVES:

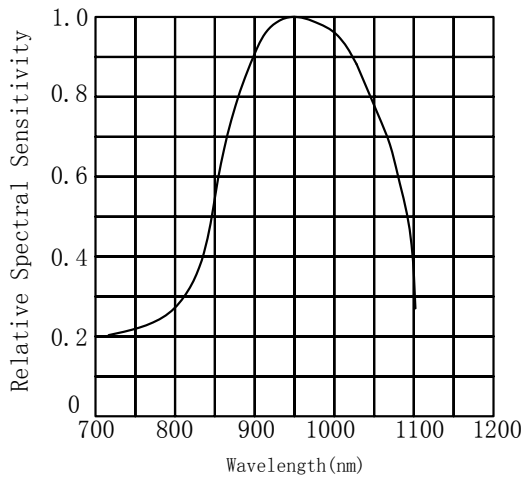


FIG. 1 Relative Spectral Sensitivity vs. Wavelength

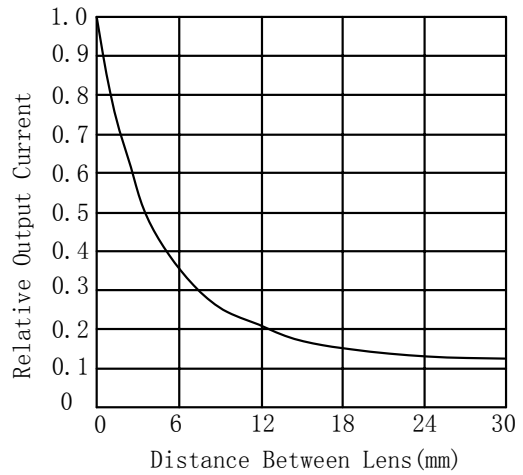


FIG. 2 Coupling Characteristics

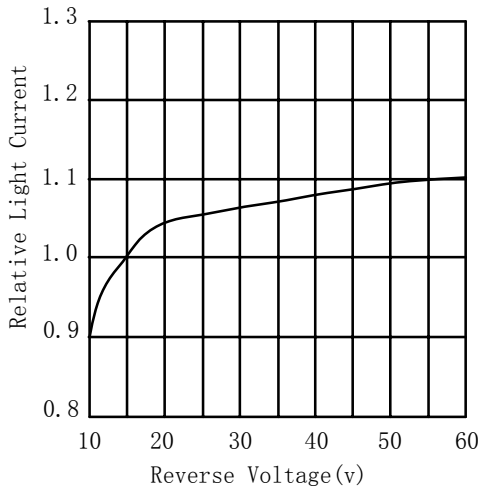


FIG. 3  $V_R$  vs Relative IL

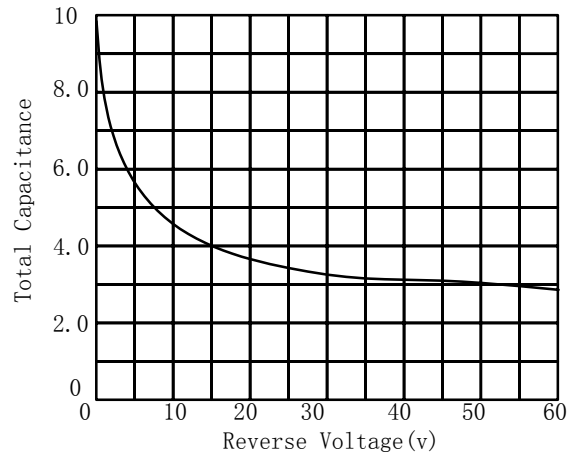


FIG. 4  $V_R$  vs  $C_T$

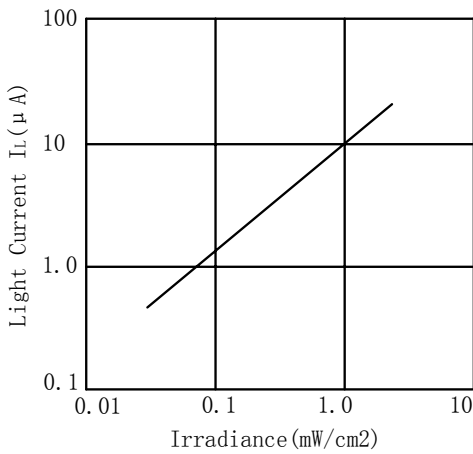


FIG. 5  $I_L$  vs  $I_v$

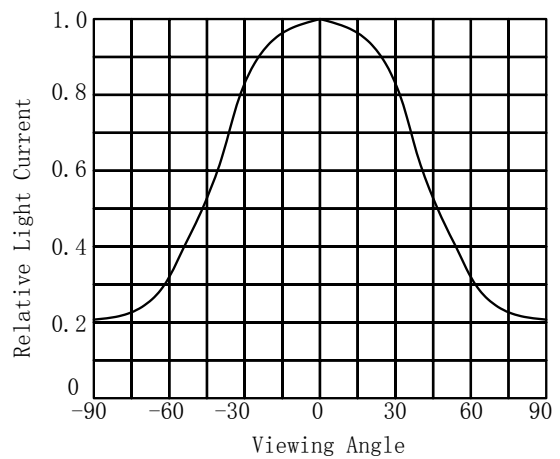


FIG. 6 Angle vs Relative  $I_L$