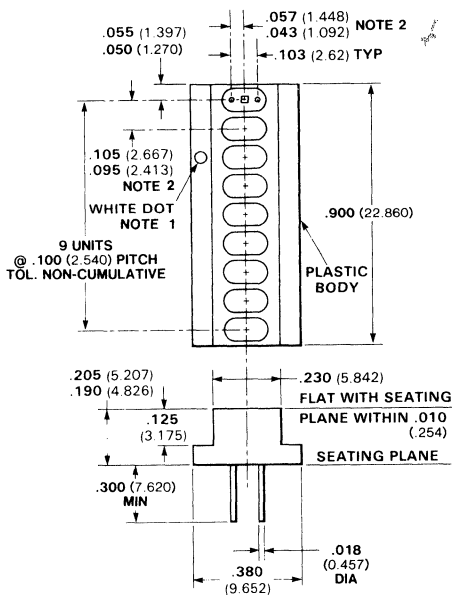


**FPA700**  
**FPA700A**

## General Description

## Package Outline



### Exhibits Stable Characteristics Under High Humidity

**Especially Designed for Punched or Marked Card Reading and Optical Encoder Applications**

### Absolute Maximum Ratings

### Maximum Temperature and Humidity

Storage Temperature	-40°C to +100°C
Operating Temperature	-40°C to +85°C
Pin Temperature (Soldering, 10 s)	260°C
Relative Humidity at 65°C	85%

### Maximum Power Dissipation

Total Dissipation at $T_C = 25^\circ\text{C}$	200 mW
Derate Linearly from $25^\circ\text{C}$	3.33 mW/ $^\circ\text{C}$
Total Dissipation at $T_A = 25^\circ\text{C}$	133 mW
Derate Linearly from $25^\circ\text{C}$	2.22 mW/ $^\circ\text{C}$

### Maximum Voltages and Currents (Note 1)

$V_{CE(sus)}$	Collector-to-Emitter Sustaining Voltage	20 V
$I_C$	Collector Current	25 mA

## Notes

1. Emitter terminal side of phototransistor (sensor array) or anode terminal side of diode (source array) defined by white dot.
2. The center of each element is aligned to  $\pm .010$  along the length and  $\pm .005$  across the width.
3. All dimensions in inches **bold** and millimeters (parentheses).
4. Tolerance unless specified =  $\pm 0.15$  (0.381).

# Typical Electrical Characteristics

## FPA700 FPA700A

### Electrical Characteristics $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
$V_{CE(sus)}$	Collector-to-Emitter Sustaining Voltage (Note 2)	20	35		V	$I_C = 1.0\text{ mA}$
$BV_{ECO}$	Emitter-to-Collector Breakdown Voltage (Note 2)		7.0		V	$I_{EC} = 100\text{ }\mu\text{A}$
$V_{CE(sat)}$	Collector-to Emitter Saturation Voltage		0.16	0.33	V	$I_C = 500\text{ }\mu\text{A}$ , $H = 20\text{ mW/cm}^2$
$I_{CEO}$	Collector Dark Current / Cell (Note 2)		4.0	100	nA	$V_{CE} = 5.0\text{ V}$
$I_{CE(lt)}$	Photo Current, Tungsten Source (Note 3)	200	750		$\mu\text{A}$	$V_{CE} = 5.0\text{ V}$ , $H = 5\text{ mW/cm}^2$
$I_{CE(lt)}$	Photo Current, Tungsten Source (Note 3)		1.75		mA	$V_{CE} = 5.0\text{ V}$ , $H = 10\text{ mW/cm}^2$
$I_{CE(lt)}$	Photo Current, GaAs Source (Note 4)		2.25		mA	$V_{CE} = 5.0\text{ V}$ , $H = 5\text{ mW/cm}^2$
$t_r$	Light Current Rise Time (Note 6)		4.0		$\mu\text{s}$	GaAs, $I_C = 2.0\text{ mA}$
$t_f$	Light Current Fall Time (Note 6)		4.0		$\mu\text{s}$	$R_L = 100\text{ }\Omega$ , $V_{CC} = 5.0\text{ V}$
$S_{min}/S_{max}$	Matching Factor (Notes 3 and 5) FPA700	0.5	0.65	1.0		$V_{CE} = 5.0\text{ V}$ , $H = \text{mW/cm}^2$
	FPA700A	0.75	0.85	1.0		$V_{CE} = 5.0\text{ V}$ , $H = \text{mW/cm}^2$

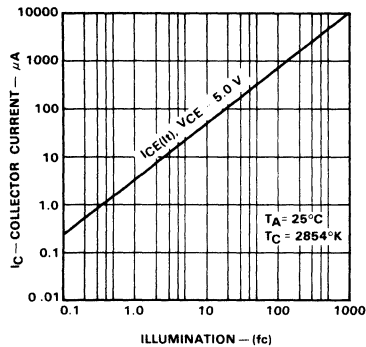
#### Notes

- These are steady-state limits. The factory should be consulted on applications involving pulsed or low duty cycle operation.
- Measured with radiation flux intensity of less than  $0.1\text{ }\mu\text{W/cm}^2$  over the spectrum from 0.1 micron to 1.5 microns.
- Measured at noted irradiance as emitted from a tungsten lamp at a color temperature of  $2854^\circ\text{K}$ . The effective photosensitive areas is  $(0.8\text{ mm}^2)$ .  
Illuminance (in lumens/ft<sup>2</sup>) = irradiance H (in mW/cm<sup>2</sup>)  $\times$  20 at a color temperature of  $2854^\circ\text{K}$ .
- Measured at an irradiance of  $5.0\text{ mW/cm}^2$  as emitted from a gallium arsenide diode.
- Matching factor is the ratio of minimum sensitivity to maximum sensitivity of any two cells.
- Rise time is defined as the time required for  $I_{CE}$  to rise from 10% to 90% of the peak value. Fall time is defined as the time required for  $I_{CE}$  to decrease from 90% to 10% of the peak value.
- The center of each element is aligned to  $\pm 0.010$ -inch along the length and  $\pm 0.005$ -inch across the width.
- Emitter-terminal side of phototransistor (sensor array) or anode-terminal side of diode (source array) defined by white dot.

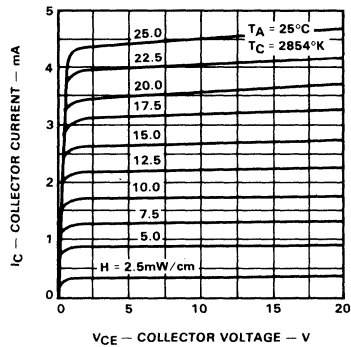
# Typical Electrical Characteristic Curves

## FPA700 FPA700A

### Photo Current Characteristics

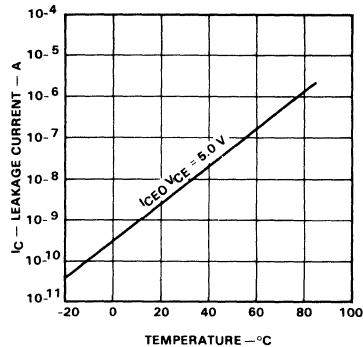


### Photo Current vs Collector

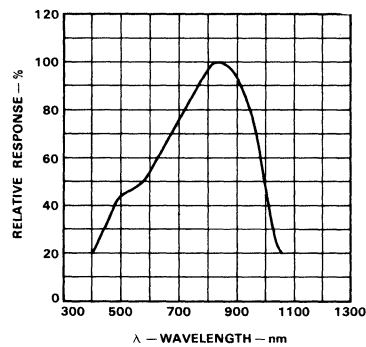


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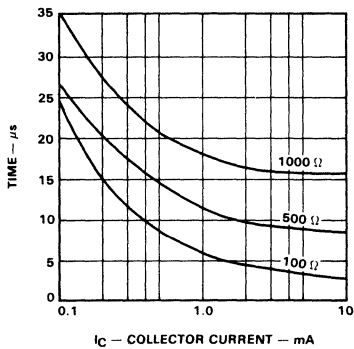
### Collector Dark Current vs Temperature



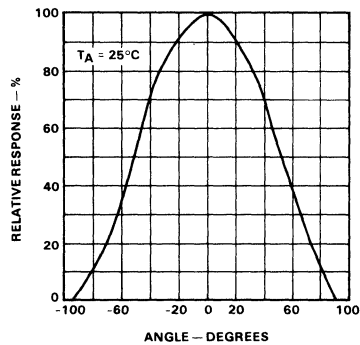
### Relative Spectral Response



### Rise and Fall Time vs Collector Current



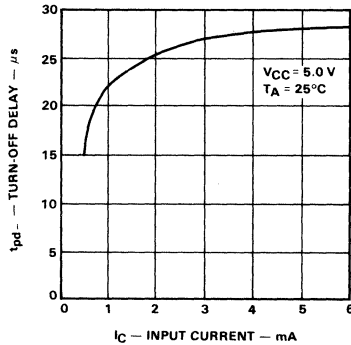
### Angular Response



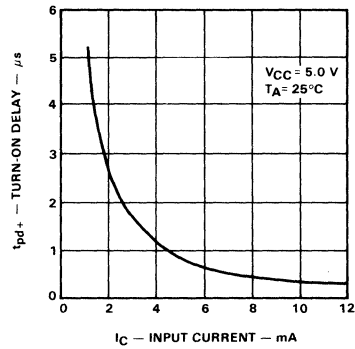
# Typical Electrical Characteristic Curves (Cont'd) Switching Test Circuits

FPA700  
FPA700A

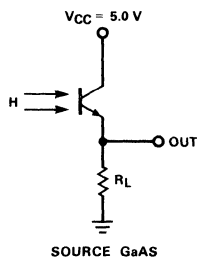
**Turn-Off Delay Times**



**Turn-On Delay Times**



**Rise And Fall Times**



**Turn-On And Turn-Off Delay**

