

# SILICON PLANAR PHOTOTRANSISTORS

## GENERAL APPLICATIONS OF FERRANTI PHOTOTRANSISTORS

Alarm Systems, Process Control, Edge and Position Sensing, Optical Character Recognition, Tape Readers, Card Readers, Electronic Flash Control, etc.

## Silicon Planar Photo-transistor

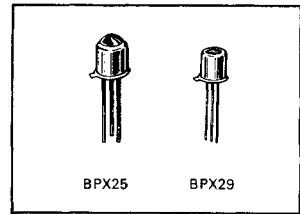
## BPX25,29

### DESCRIPTION

High sensitivity silicon planar photo-transistors in hermetic packages for general purpose applications.

The BPX25 has a glass lens.

The BPX29 has a plane glass window.



ABSOLUTE MAXIMUM RATINGS (both types) at 25°C ambient temperature.

Parameter	Symbol	Max.	Unit
Collector-Emitter Voltage	$V_{CEO}$	32	V
Collector-Base Voltage	$V_{CBO}$	32	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Collector Current	$I_{CM}$	200	mA
Collector Current	$I_C$	100	mA
Power Dissipation	BPX25 BPX29 $P_{tot}$	300 180	mW mW
Operating and Storage Temperature Range	BPX25 BPX29	-40 to +150 -40 to +100	°C °C

# BPX25/29

ELECTRICAL CHARACTERISTICS (at 25°C ambient temperature unless otherwise stated).

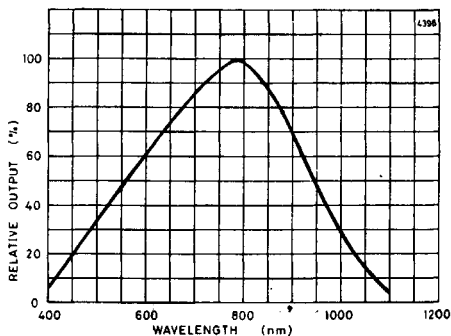
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector dark current	$I_{CE(D)}$		0.025 8.0	0.1 15.0	$\mu A$ $\mu A$	$V_{CE} = 24V$ $V_{CE} = 24V$ at 100°C ambient temp.
Light current	BPX25 BPX29 $I_{CE(L)}$	5.0 0.25	13.0 0.8		mA mA	Tungsten source. Colour temp. = 2700°K. Light level = 1000 Lux. $V_{CE} = 6V$
Static forward current transfer ratio	$h_{FE}$		500			$V_{CE} = 6V, I_C = 2mA$
Rise time (10 to 90%)	BPX25 BPX29 $t_r$	—	1.5 3.0	3.0 6.5	$\mu s$ $\mu s$	See notes 1 and 2 and graphs of switching characteristics
Fall time (90 to 10%)	BPX25 BPX29 $t_f$	—	1.5 3.8	4.0 8.0	$\mu s$ $\mu s$	
Wavelength of peak spectral response		—	0.8	—	$\mu m$	
Cut-off frequency	BPX25 BPX29	—	200 100	—	kHz kHz	See notes 1 and 2
Thermal characteristics	$\theta_{j-c}$ $\theta_{j-a}$	—	0.15 0.40	—	°C/mW °C/mW	
Noise equivalent illumination	BPX25 BPX29	—	0.5 1.5	—	mLux/Hz- $^{1/2}$ mLux/Hz- $^{1/2}$	1000lux., $V_{CE} = 5V, f = 800$ Hz See note 3

1 Gallium Arsenide lamp emitting modulated radiation at approximately 0.4 mW/cm<sup>2</sup>, photo-transistor used under optimum load conditions (50Ω load) with  $V_{CE} = 24V$ .

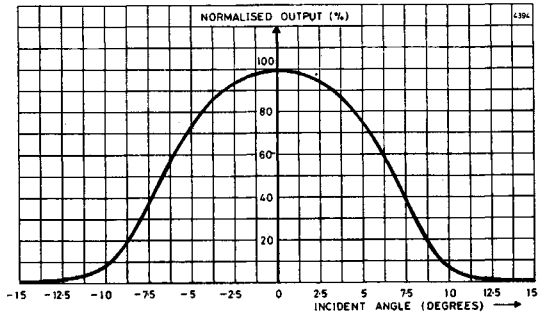
2 Improved switching times may be achieved by connecting the base lead to give a quiescent bias current. Typically, at  $I_B = 20\mu A$ ,  $t_d$  is reduced from 1.0 to < 0.2  $\mu s$ .

3 At this and lower frequencies  $1/f_t$  noise predominates.

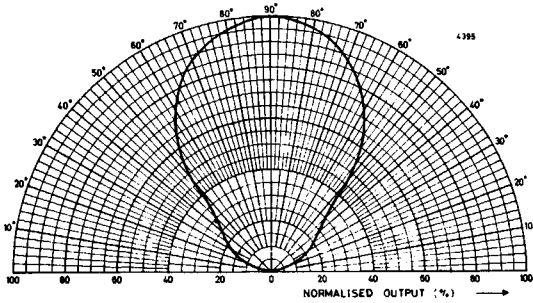
RELATIVE SPECTRAL RESPONSE BPX25 & BPX29



## TYPICAL POLAR RESPONSE BPX25



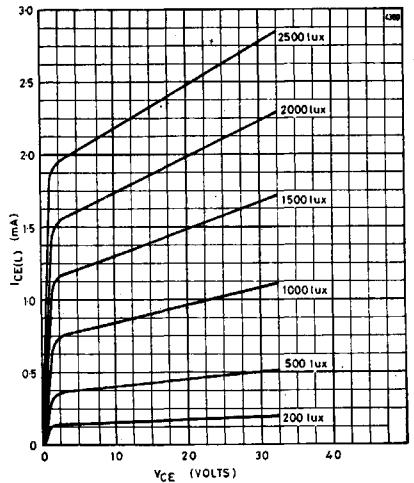
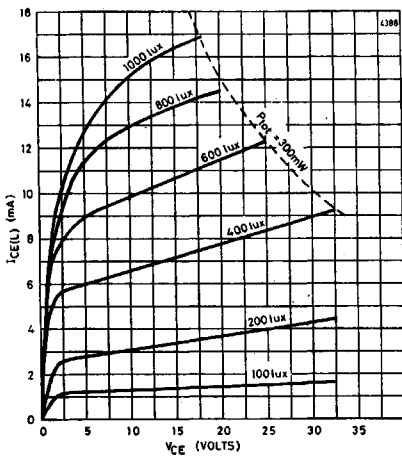
## TYPICAL POLAR RESPONSE BPX29



## TYPICAL OUTPUT CHARACTERISTICS

### BPX25

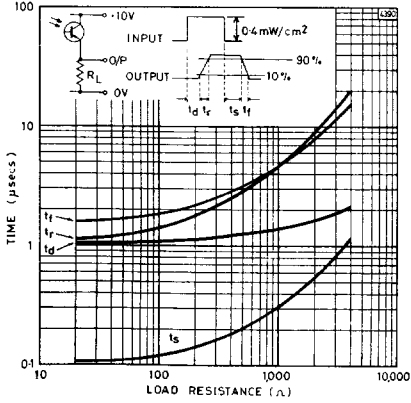
### BPX29



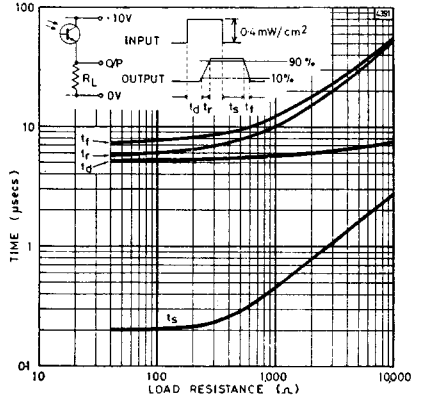
# BPX25, 29

## TYPICAL SWITCHING CHARACTERISTICS

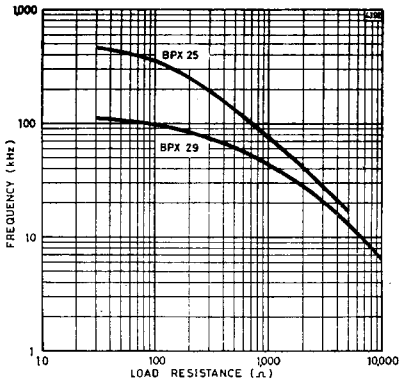
BPX25



BPX29



BPX25 & BPX29



BPX25 & BPX29

