

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

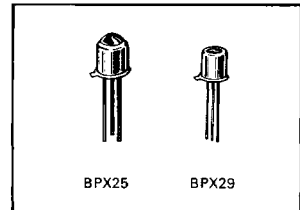
BPX25,29

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.



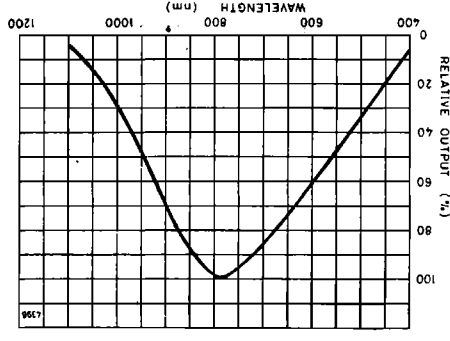
ABSOLUTE MAXIMUM RATINGS (both types) at 25°C ambient temperature.

Parameter	Symbol	Max.	Unit
Collector-Emitter Voltage	V_{CE0}	32	V
Collector-Base Voltage	V_{CB0}	32	V
Emitter-Base Voltage	V_{EB0}	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

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

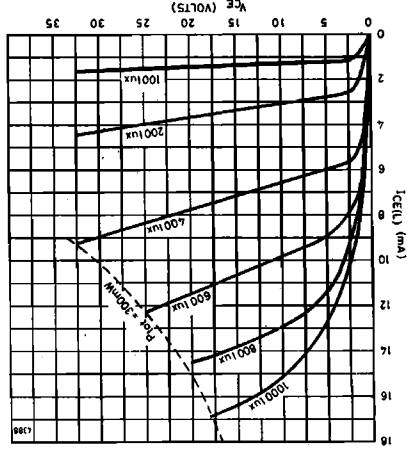
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector dark current	I_{CD}	0.25	0.1	8.0	μA	$V_{CE} = 24V$
Light current	I_{CEL}	5.0	13.0	0.8	mA	Tungsten source. Colour temp. = 2700°K. Light level = 1000 Lux. $V_{CE} = 6V$
Static forward current transfer ratio	h_{FE}		500			$V_{CE} = 6V, I_C =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

1 Gallium Arsenide lamp emitting modulated radiation at approximately 0.4 mW/cm², photo-transistor used under optimum load conditions (50 Ω 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 μs .
 3 At this and lower frequencies I_f noise predominates.



RELATIVE SPECTRAL RESPONSE BPX25 & BPX29

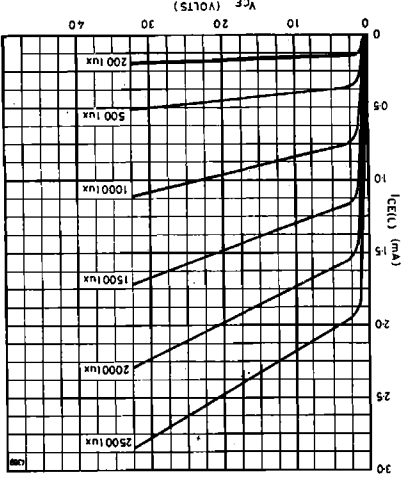
OE6



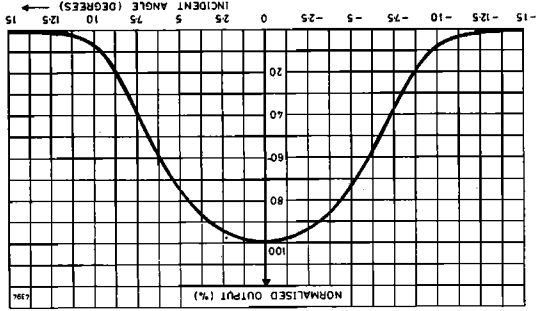
BPX25

TYPICAL OUTPUT CHARACTERISTICS

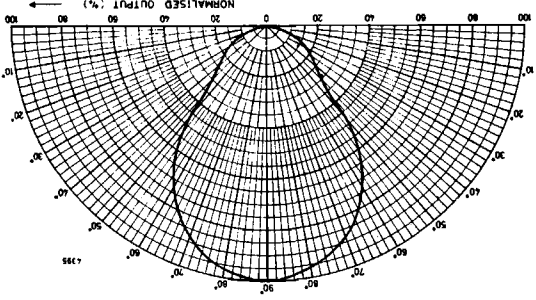
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BPX29



TYPICAL POLAR RESPONSE BPX25

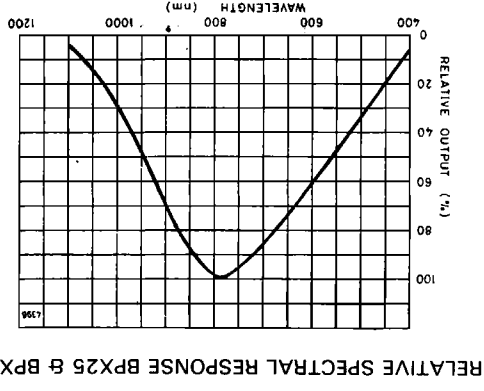


TYPICAL POLAR RESPONSE BPX29

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

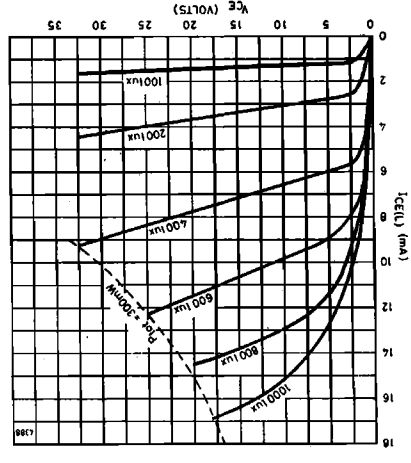
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
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Light current	I _{CEL}	5.0	13.0	0.25	mA	Tungsten source. Colour temp. = 2700°K. Light level = 1000 Lux. V _{CE} = 6V
Static forward current transfer ratio	h _{FE}		500			V _{CE} = 6V, I _C = 2mA
Rise time (10 to 90%)	t _r	—	1.5	3.0	μs	See notes 1 and 2 and graphs of switching characteristics
Fall time (90 to 10%)	t _f	—	1.5	4.0	μs	See notes 1 and 2 and graphs of switching characteristics
Wavelength of peak spectral response		—	0.8	—	μm	
Cut-off frequency	BPX25	—	200	—	kHz	
	BPX29	—	100	—	kHz	See notes 1 and 2
Thermal characteristics	θ _{jc}	—	0.15	—	°C/mW	
Noise equivalent illumination	BPX25	—	0.5	—	mLux/Hz-½	
	BPX29	—	1.5	—	mLux/Hz-½	See note 3

1 Gallium Arsenide lamp emitting modulated radiation at approximately 0.4 mW/cm², 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 = 20μA, t_r is reduced from 1.0 to < 0.2 μs.
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RELATIVE SPECTRAL RESPONSE BPX25 & BPX29

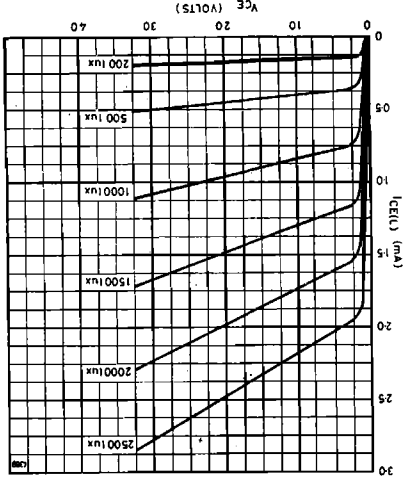
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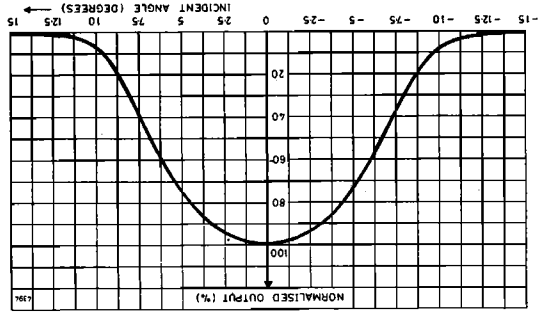
BPX25

TYPICAL OUTPUT CHARACTERISTICS

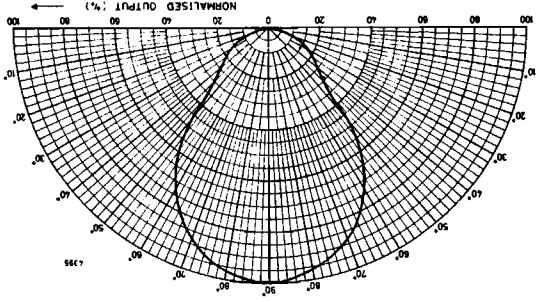
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BPX29



TYPICAL POLAR RESPONSE BPX25

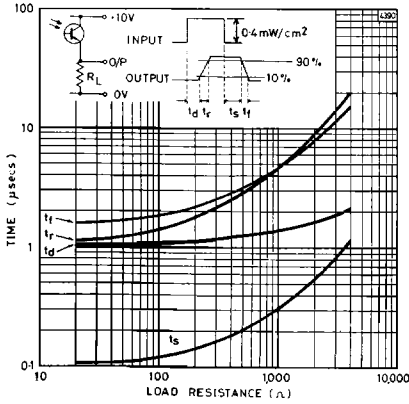


TYPICAL POLAR RESPONSE BPX29

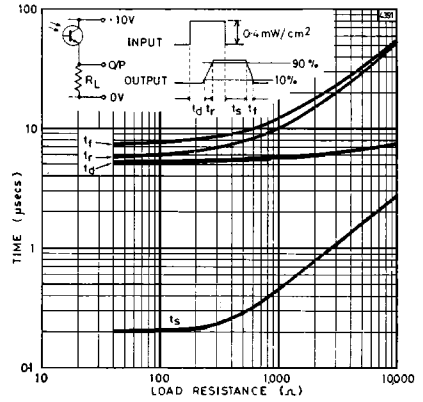
BPX25, 29

TYPICAL SWITCHING CHARACTERISTICS

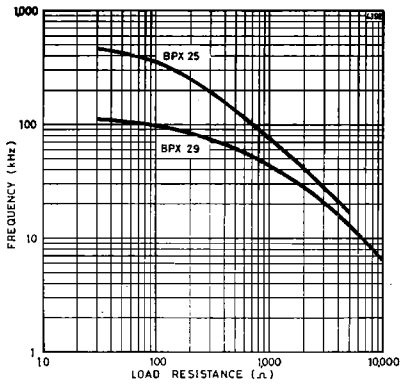
BPX25



BPX29



BPX25 & BPX29



BPX25 & BPX29

