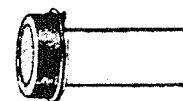




Silicon PN Planar Photovoltaic Cell/Photodiode

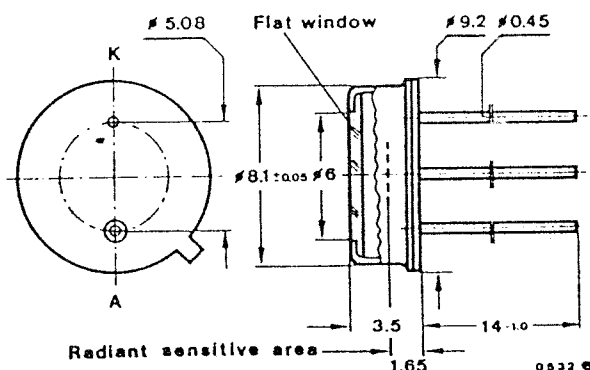


Application: Sensor in exposure and colour measuring purposes

Features:

- For photodiode and photovoltaic cell operation
- Hermetically sealed case
- Flat window with built-in colour correction filter (visible radiation)
- Log. correlation between open circuit voltage and illuminance from 10^{-2} till 10^5 lx in photovoltaic cell operation
- Linear correlation between short circuit current and illuminance from 10^{-2} till 10^5 lx in photovoltaic cell operation
- Activity 0.85 ... 1.15
- No light memory effect
- No pre-exposure ratio
- Also available as „Qualified semiconductor device“ BPW 21 M according to VG 95288

Dimensions in mm



Radiant sensitive area $A = 7.5 \text{ mm}^2$

Angle of half sensitivity $\alpha = 100^\circ$

Negative terminal/cathode connected with case

\approx JEDEC TO 56
 Weight max. 1.0 g

Absolute maximum ratings

Reverse voltage		V_R	10	V
Ambient temperature range	BPW 21	T_{amb}	-25 ... +100	$^\circ\text{C}$
	BPW 21 M	T_{amb}	-65 ... +100	$^\circ\text{C}$
Storage temperature range	BPW 21 M	T_{stg}	-65 ... +100	$^\circ\text{C}$

Thermal resistance

Junction ambient

	Min.	Typ.	Max.	
R_{thJA}			250	K/W

BPW 21

Optical and electrical characteristics

$$T_{amb} = 25^{\circ}\text{C}$$

Photovoltaic cell operation

Open circuit voltage

$$E_A = 1 \text{ klx}^1)$$

$V_o^*)$ 280 380 mV

Temperature coefficient of V_o

$$E_A = 1 \text{ klx}^1)$$

TK_{V_o} -2 mV/K

Short circuit current

$$E_A = 1 \text{ klx}^1), R_L = 100 \Omega$$

BPW 21 $I_k^*)$ 4.5 7.0 μA

BPW 21 M $I_k^*)$ 5.0 7.0 10 μA

Sensitivity, short circuit

$$E_A = 10^{-2} \dots 10^5 \text{ lx}^1)$$

BPW 21 S_k 7.0 nA/lx

BPW 21 M S_k 7.0 nA/lx

Temperature coefficient of I_k

$$E_A = 1 \text{ klx}^1), R_L = 100 \Omega$$

TK_{I_k} -0.05 %/K

Junction capacitance

$$V_R = 0, f = 1 \text{ MHz}, E = 0$$

C_j 1.2 nF

Switching characteristics

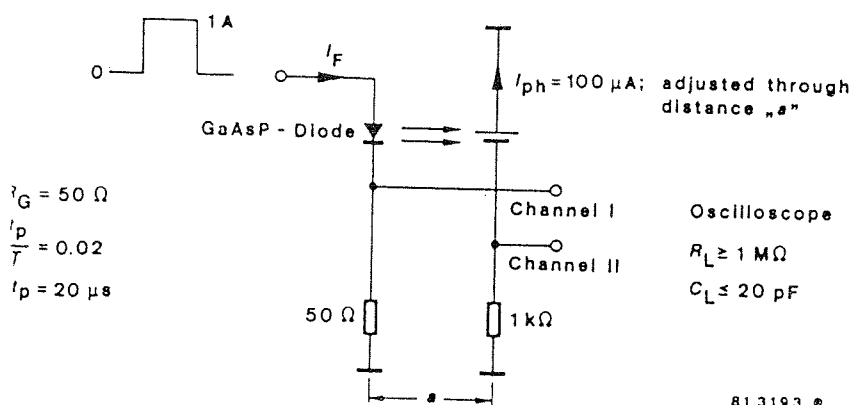
$$I_{ph} = 100 \mu\text{A}, R_L = 1 \text{ k}\Omega, \text{ see test circuit}$$

Rise time

t_r 3.5 μs

Fall time

t_f 3.5 μs



test circuit

*) AQL = 0.65 %

1) Standard illuminant A (DIN 5033/IEC 306-1)

Photodiode operation

Breakdown voltage

$$I_{ro} = 100 \mu\text{A}, E = 0$$

$V_{(BR)^*}$

Min.

Typ.

Max.

V

Reverse continuous dark current

$$V_R = 5 \text{ V}, E = 0$$

I_{ro}^*

2

30

nA

Light reverse current

$$V_R = 5 \text{ V}, E_A = 1 \text{ klx}^1)$$

I_{ra}^*

4.5

7.0

μA

Sensitivity

$$V_R = 5 \text{ V}, E_A = 10^{-2} \dots 10^5 \text{ lx}^1)$$

s

7.0

nA/lx

Junction capacitance

$$V_R = 5 \text{ V}, f = 1 \text{ MHz}$$

C_j

400

pF

Photovoltaic cell and photodiode operation

Peak wavelength sensitivity

λ_p

565

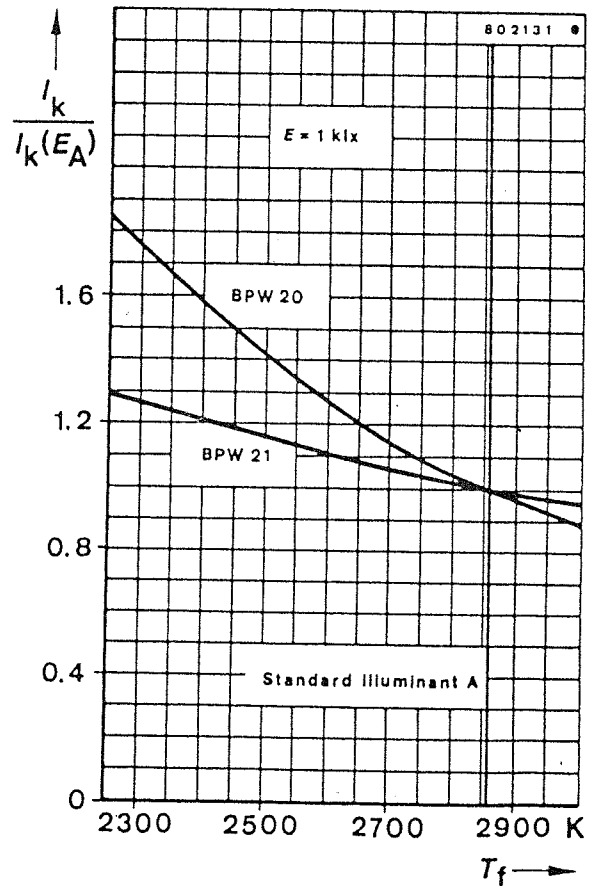
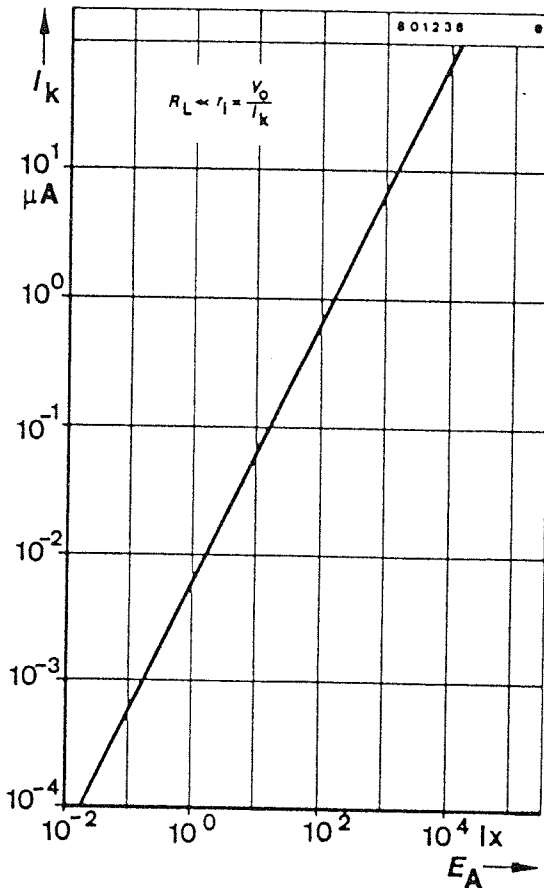
nm

Range of spectral bandwidth (50 %)

$\lambda_{0.5}$

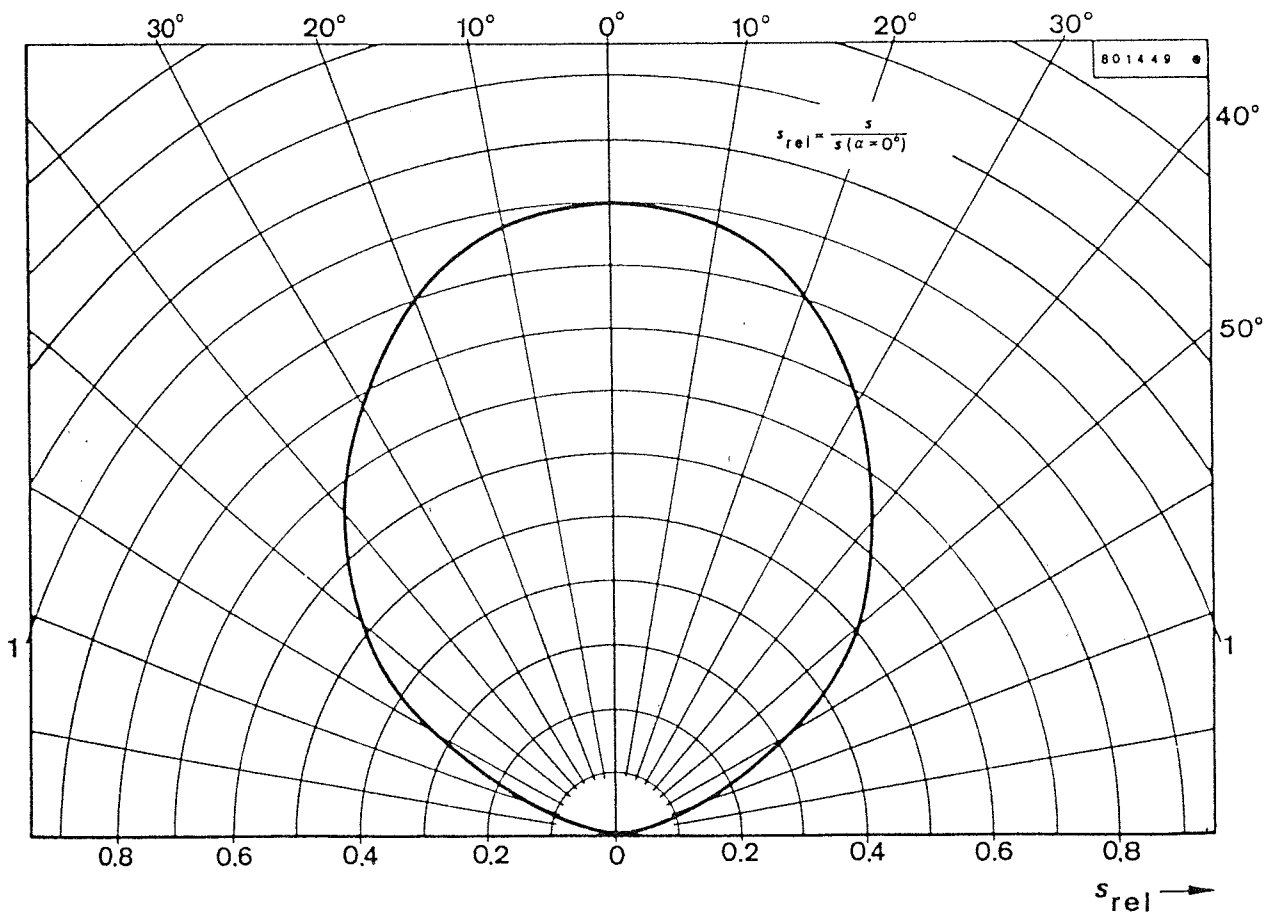
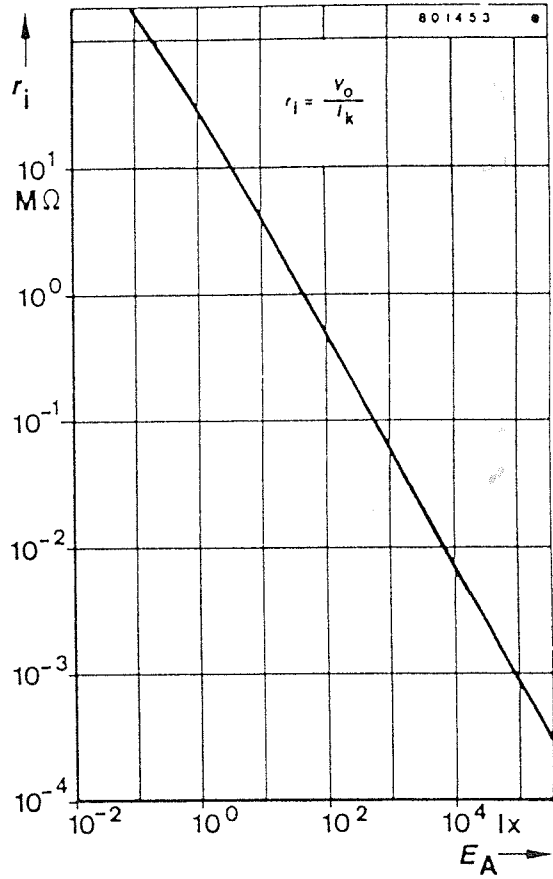
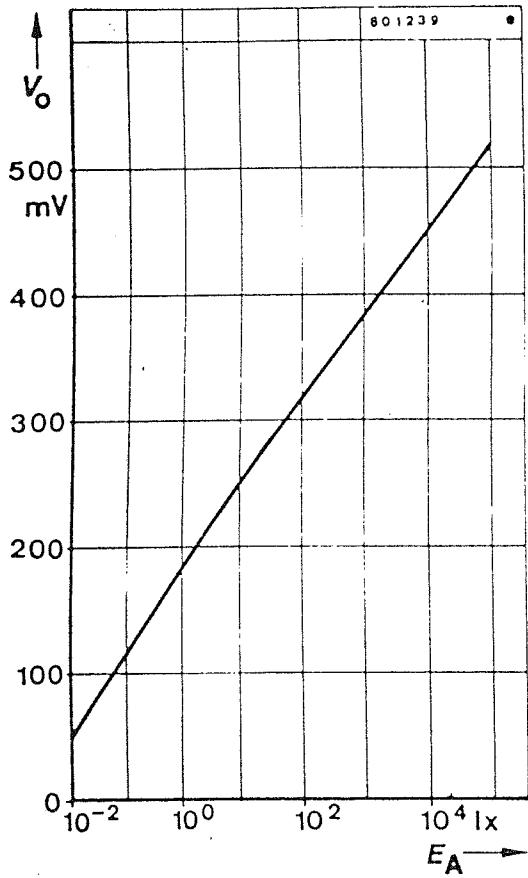
420...675

nm



*) AQL = 0.65 %

1) Standard illuminant A (DIN 5033/IEC 306-1)



BPW 21

