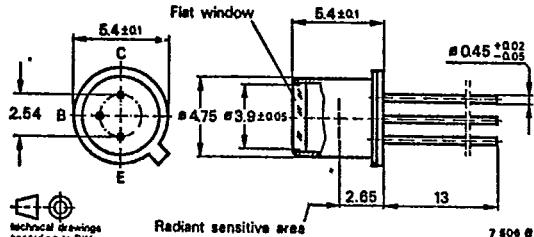
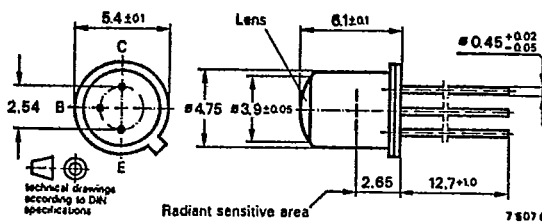


Silicon NPN Epitaxial Planar Phototransistors

Applications: Detector in electronic control and drive circuits

Features:

- Hermetically sealed case
- BPW 13 - flat window, BPW 14 - lens
- Suitable for visible and near infrared radiation
- Exact central chip alignment typ.: $\pm 50 \mu\text{m}$
- BPW 13 - Long range light barrier with an additional optics
- Base terminal is available
- Selected in groups

Dimensions in mm**BPW 13****BPW 14**

Angle of half sensitivity
 BPW 13 $\pm \phi = 40^\circ$
 BPW 14 $\pm \phi = 12.5^\circ$
 Collector connected with case

~ JEDEC TO 18
 ~ 18A3 DIN 41876
 ~ JEDEC TO 18
 Weight max. 0.5 g

BPW 13 · BPW 14

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Absolute maximum ratings

Collector-base voltage	V_{CBO}	32	V
Collector-emitter voltage	V_{CEO}	32	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	50	mA
Peak collector current $\frac{t_p}{T} = 0.5, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Total power dissipation $T_{amb} \leq 25^\circ\text{C}$	P_{tot}	310	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55...+150	$^\circ\text{C}$

Thermal resistance

	Min.	Typ.	Max.	
Junction ambient			400	K/W
Junction case			150	K/W

Optical and electrical characteristics

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

Collector dark current

 $V_{CE} = 20 \text{ V}, E = 0$

I_{CEO}	10	100	nA
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Collector light current

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

BPW 13 A	I_{ca}	0.30	mA
BPW 13 B	I_{ca}	0.45	mA
BPW 13 C	I_{ca}	1.0	mA
BPW 14 A	I_{ca}	3.0	mA
BPW 14 B	I_{ca}	4.5	mA
BPW 14 C	I_{ca}	10.0	mA

 $V_{CE} = 5 \text{ V}, E_s = 1 \text{ mW/cm}^2, \lambda_p = 950 \text{ nm}$

BPW 13 A	$I_{ca}^{*)}$	0.07	0.10	0.14	mA
BPW 13 B	$I_{ca}^{*)}$	0.10	0.15	0.20	mA
BPW 13 C	$I_{ca}^{*)}$	0.17	0.30		mA
BPW 14 A	$I_{ca}^{*)}$	0.7	1.0	1.4	mA
BPW 14 B	$I_{ca}^{*)}$	1.0	1.5	2.0	mA
BPW 14 C	$I_{ca}^{*)}$	1.7	3.0		mA

*) AQL = 0.65 % 1) Standard illuminant A (DIN 5033/IEC 306-1)

BPW 13 · BPW 14

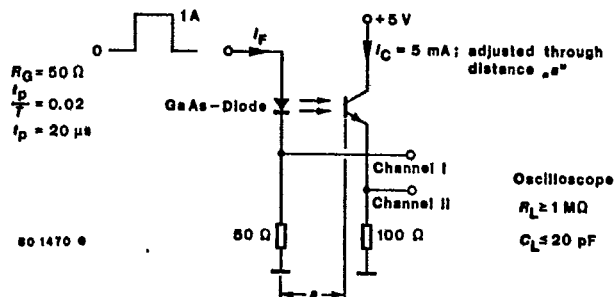
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		Min.	Typ.	Max.	
Peak wavelength sensitivity	λ_p		780		nm
Range of spectral bandwidth (50%)	$\lambda_{0.5}$		520...950		nm
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}$	$V_{(BR)CEO}^{*)}$	32			V
Collector-emitter saturation voltage $I_C = 0.1 \text{ mA}, I_B = 10 \mu\text{A}$ BPW 13	$V_{CEsat}^{*)}$			0.3	V
$I_C = 1.0 \text{ mA}, I_B = 100 \mu\text{A}$ BPW 14	$V_{CEsat}^{*)}$			0.3	V
Cut-off frequency $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	f_c		170		kHz
Capacitance, collector-emitter $V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$	C_{CEO}		4.5		pF

Switching characteristics

 $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$ $\lambda_p = 950 \text{ nm}$, see test circuit

Delay time	t_d	1.8	μs
Rise time	t_r	1.6	μs
Turn-on time	t_{on}	3.4	μs
Storage time	t_s	0.3	μs
Fall time	t_f	1.7	μs
Turn-off time	t_{off}	2.0	μs

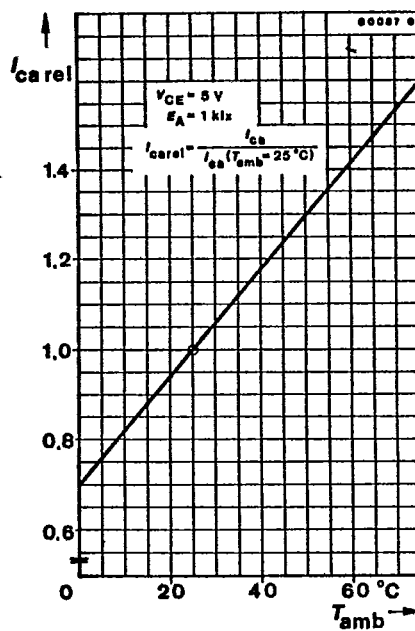
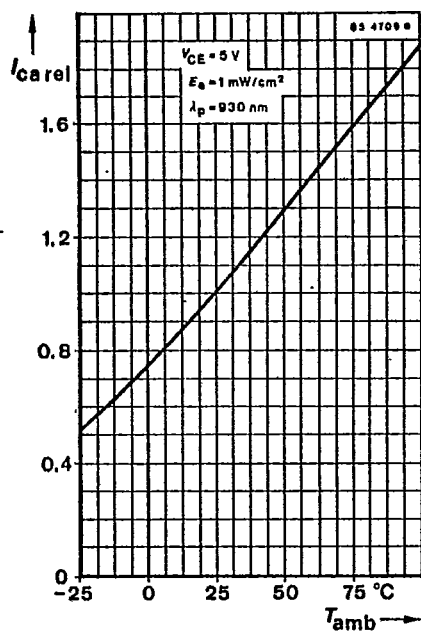
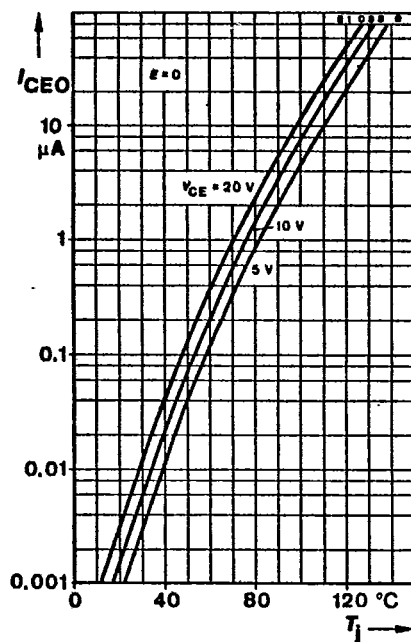
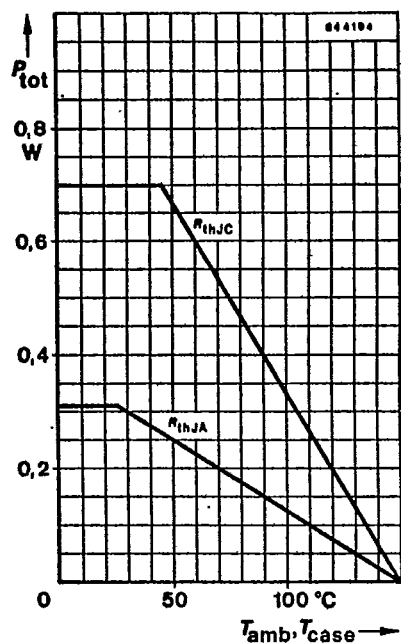


Test circuit

^{*)} AQL = 0.65 % ¹⁾ Standard illuminant A (DIN 5033/IEC 306-1)

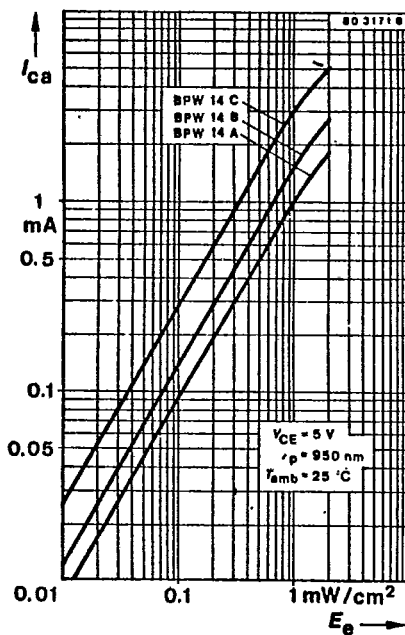
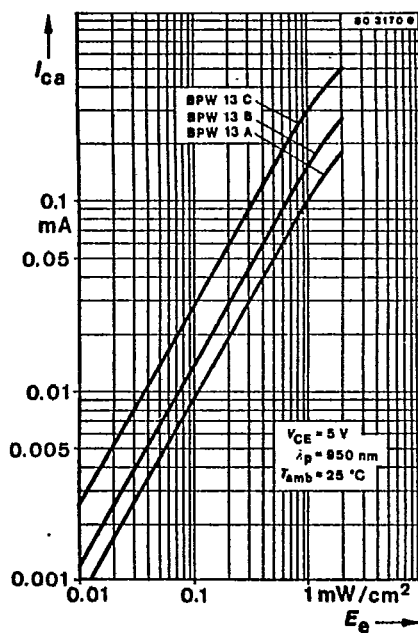
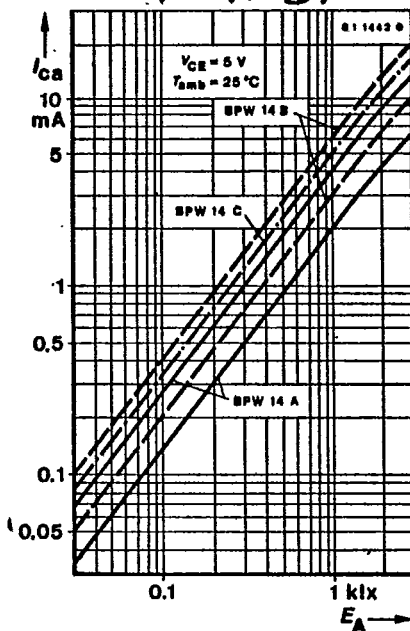
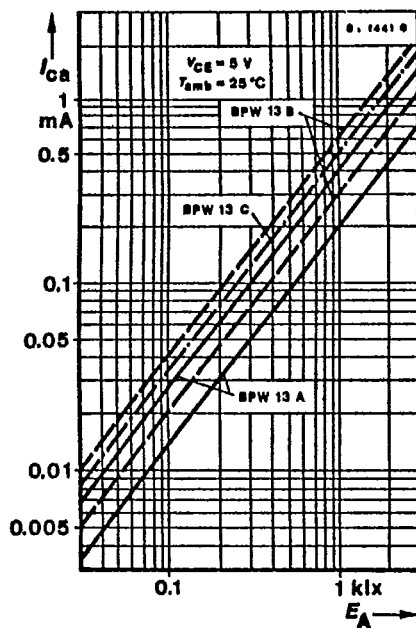
BPW 13 · BPW 14

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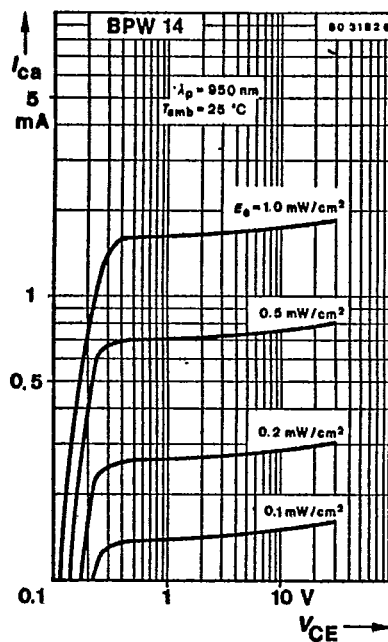
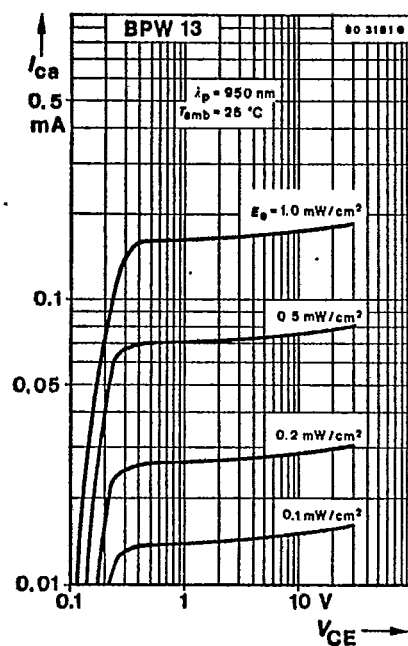
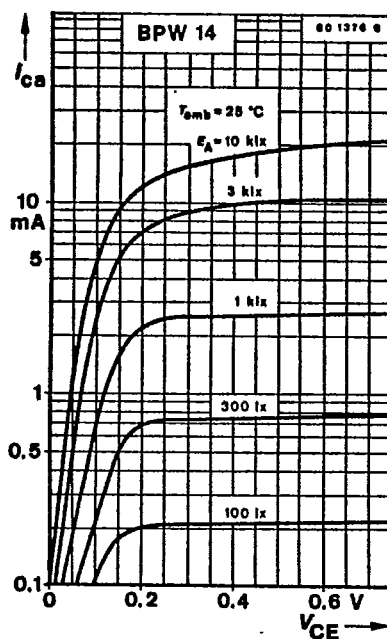
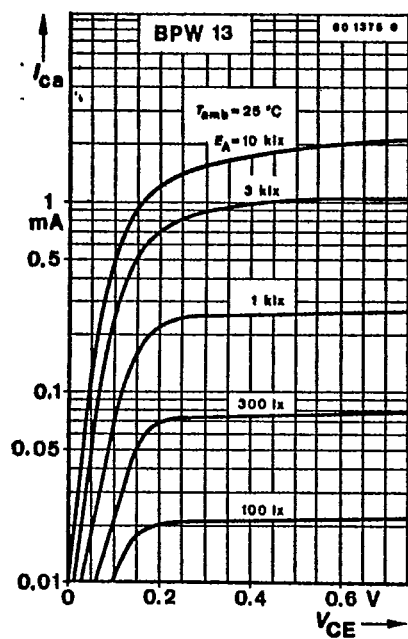


BPW 13 · BPW 14

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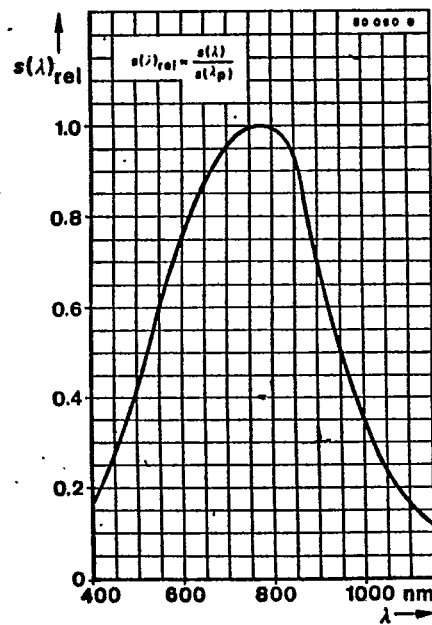
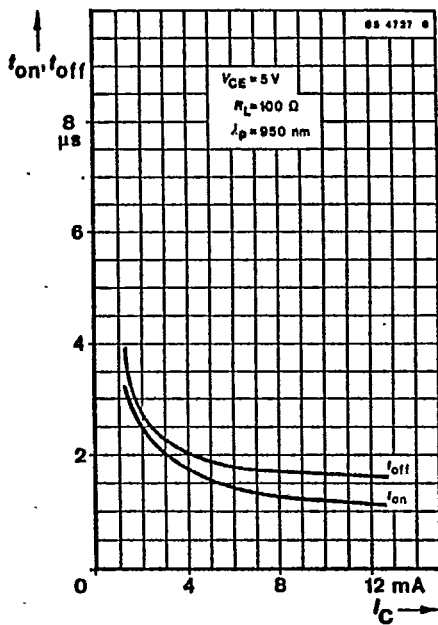
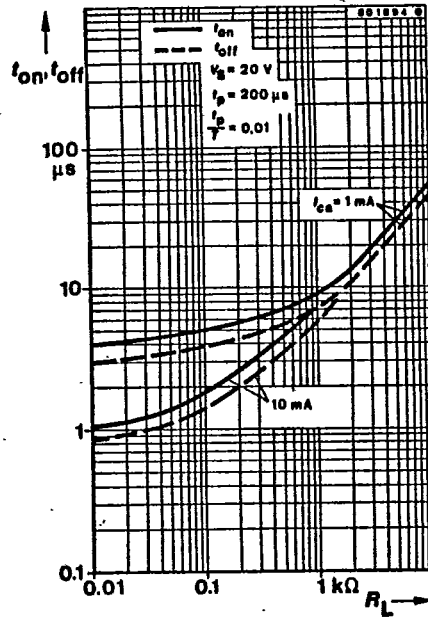
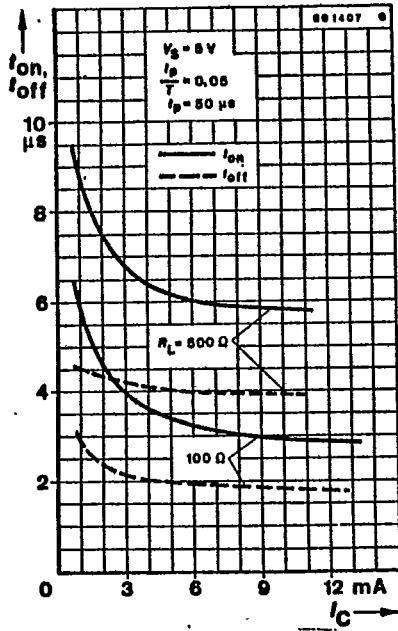


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BPW 13 · BPW 14

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BPW 13 · BPW 14

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