TELEFUNKEN electronic
Creative Technologies

BPX 99

T-41-63

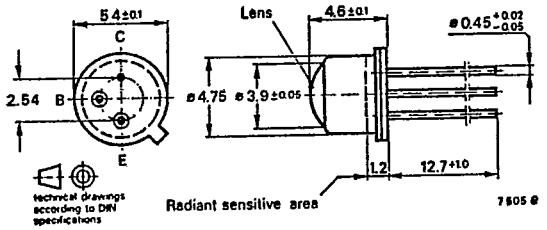
Monolithic Silicon NPN Epitaxial Photo Darlington Transistor

Applications: Direct driving of relays, magnetic valves, small motors etc.

Features:

- Hermetically sealed case
- Suitable for visible and near infrared radiation
- Collector current 0.5 A
- High sensitivity
- Base terminal is available

Dimensions in mm



Collector connected with case
Angle of half intensity:
$\pm\varphi = 12{,}5°$

≈ 18 A 3 DIN 41876
≈ JEDEC TO 52
Weight max. 0.5 g

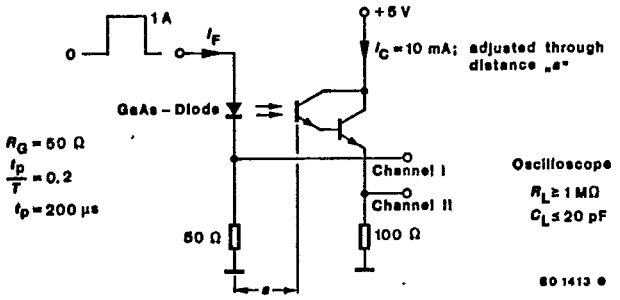
Absolute maximum ratings

Collector-emitter voltage	V_{CEO}	32	V
Emitter-base voltage	V_{EBO}	10	V
Collector current	I_C	0.5	A
Peak collector current $\frac{t_p}{T} = 0.05$, $t_p \leqq 10$ ms	I_{CM}	1	A
Total power dissipation $T_{amb} \leqq 25$ °C $T_{case} \leqq 45$ °C	P_{tot} P_{tot}	0.33 1.6	W W
Ambient temperature range	T_{amb}	−55...+125	°C
Case temperature	T_{case}	125	°C

BPX 99

T-41-63

		Min.	Typ.	Max.	
Thermal resistance					
Junction ambient	R_{thJA}			300	K/W
Junction case	R_{thJC}			50	K/W
Optical and electrical characteristics $T_{amb} = 25$ °C					
Collector dark current $V_{CE} = 20$ V, $E = 0$	I_{CEO} *)		10	200	nA
Collector light current $V_{CE} = 5$ V, $E_e = 0.3$ mW/cm², $\lambda_p = 950$ nm	I_{ca} *)	3	30		mA
Peak wavelength sensitivity	λ_p		800		nm
Range of spectral bandwidth (50%)	$\lambda_{0.5}$		600..900		nm
Collector-emitter breakdown voltage $I_C = 1$ mA,	$V_{(BR)CEO}$ *)	32			V
Collector-emitter saturation voltage $I_C = 0.1$ mA, $E_e = 0.3$ W/cm², $\lambda_p = 950$ nm	V_{CEsat} *)		0.75	1	V
Switching characteristics $V_S = 5$ V, $I_C = 10$ mA, $R_L = 100\ \Omega$, see test circuit					
Delay time	t_d		10		µs
Rise time	t_r		80		µs
Turn-on time	t_{on}		90		µs
Storage time	t_s		5		µs
Fall time	t_f		60		µs
Turn-off time	t_{off}		65		µs

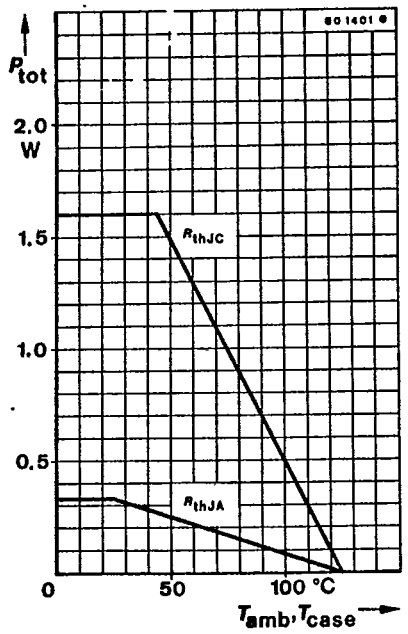


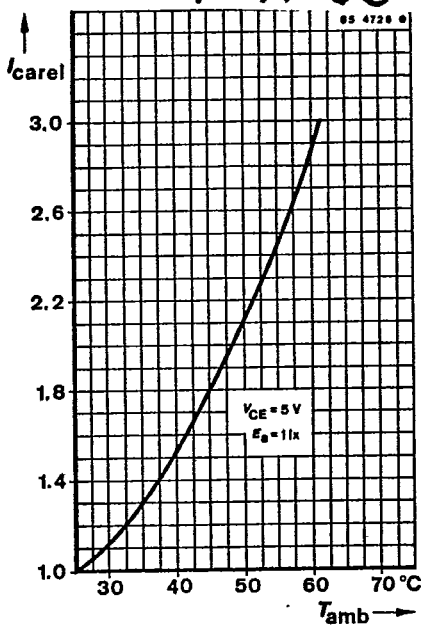
Test circuit

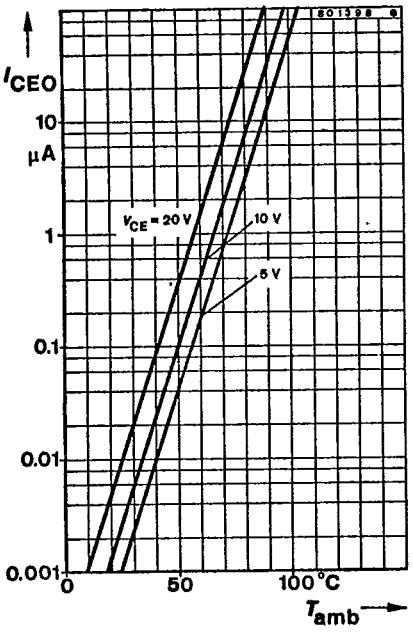
*) AQL = 0.65%

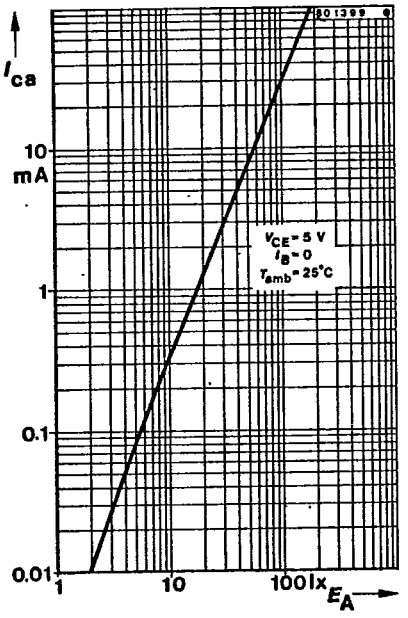
BPX 99

T-41-63


80 1401
P_{tot}
2.0
W
1.5
1.0
0.5
R_{thJC}
R_{thJA}
0
50
100 °C
T_{amb}, T_{case}

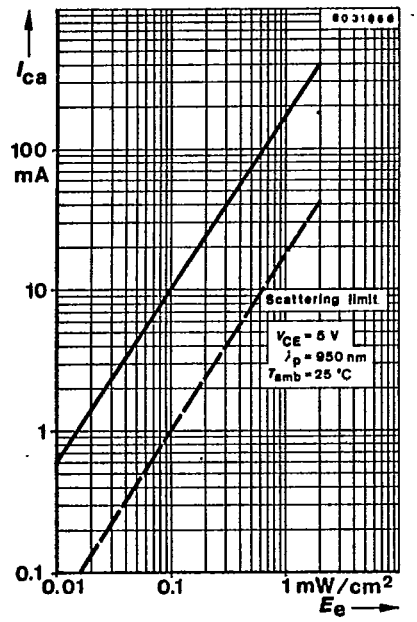

85 4728
I_{carel}
3.0
2.6
2.2
1.8
1.4
1.0
V_{CE} = 5 V
E_e = 1 lx
30
40
50
60
70 °C
T_{amb}

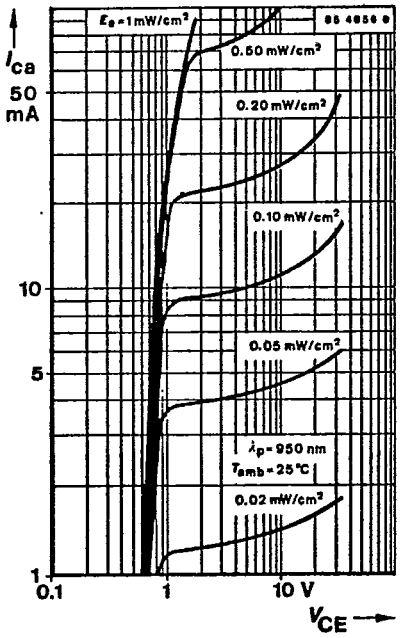

80 1398
I_{CEO}
10
µA
1
0.1
0.01
0.001
V_{CE} = 20 V
10 V
5 V
0
50
100 °C
T_{amb}

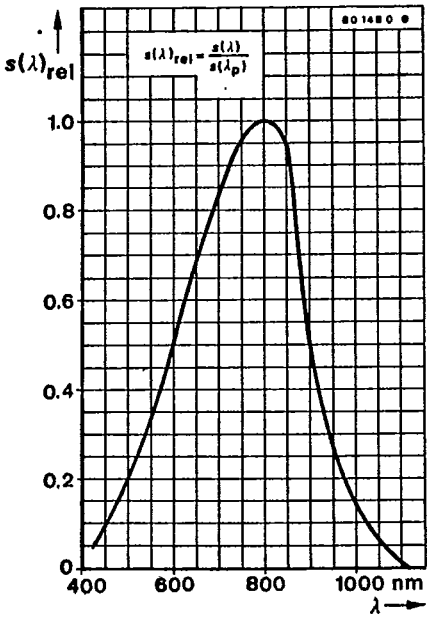

80 1399
I_{ca}
10
mA
1
0.1
0.01
V_{CE} = 5 V
I_B = 0
T_{amb} = 25°C
1
10
100 lx
E_A

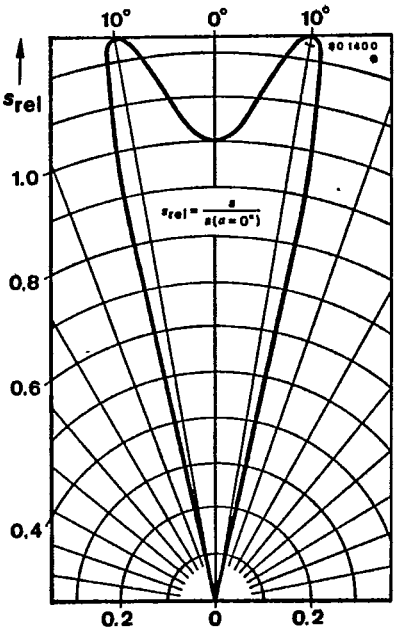
BPX 99

T-41-63


I_{ca}
100 mA
10
1
0.1
0.01
0.1
1 mW/cm²
E_e
Scattering limit
V_{CE} = 5 V
λ_p = 950 nm
T_{amb} = 25 °C


I_{ca}
50 mA
10
5
1
0.1
1
10 V
V_{CE}
E_e = 1 mW/cm²
0.50 mW/cm²
0.20 mW/cm²
0.10 mW/cm²
0.05 mW/cm²
0.02 mW/cm²
λ_p = 950 nm
T_{amb} = 25 °C


$s(\lambda)_{rel}$
$s(\lambda)_{rel} = \frac{s(\lambda)}{s(\lambda_p)}$
1.0
0.8
0.6
0.4
0.2
0
400
600
800
1000 nm
λ


10°
0°
10°
s_{rel}
1.0
0.8
0.6
0.4
$s_{rel} = \frac{s}{s(\alpha = 0°)}$
0.2
0
0.2