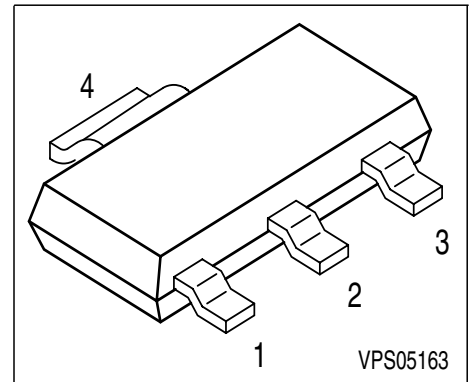


**PNP Silicon Darlington Transistors**

- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BSP 50 ... BSP 52 (NPN)



Type	Marking	Pin Configuration				Package
BSP 60	BSP 60	1 = B	2 = C	3 = E	4 = C	SOT-223
BSP 61	BSP 61	1 = B	2 = C	3 = E	4 = C	SOT-223
BSP 62	BSP 62	1 = B	2 = C	3 = E	4 = C	SOT-223

**Maximum Ratings**

Parameter	Symbol	BSP 60	BSP 61	BSP 62	Unit
Collector-emitter voltage	$V_{CEO}$	45	60	80	V
Collector-base voltage	$V_{CBO}$	60	80	90	
Emitter-base voltage	$V_{EBO}$	5	5	5	
DC collector current	$I_C$	1			A
Peak collector current	$I_{CM}$	2			
Base current	$I_B$	100			mA
Total power dissipation, $T_S = 124\text{ °C}$	$P_{tot}$	1.5			W
Junction temperature	$T_j$	150			°C
Storage temperature	$T_{stg}$	-65 ... 150			

**Thermal Resistance**

Junction ambient <sup>1)</sup>	$R_{thJA}$	≤72	K/W
Junction - soldering point	$R_{thJS}$	≤17	K/W

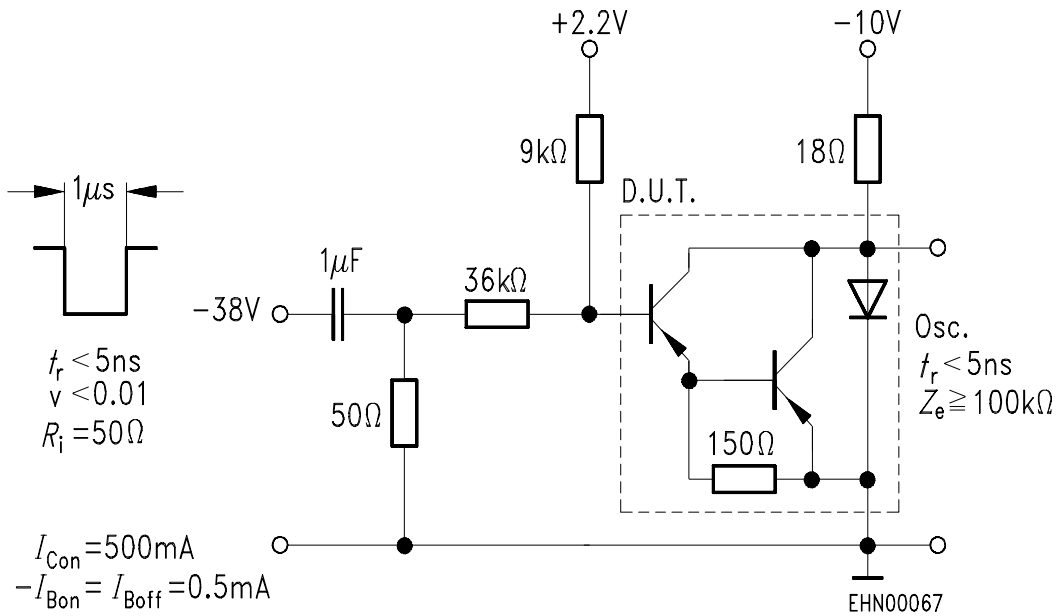
1) Package mounted on pcb 40mm x 40mm x 1.5mm / 6cm<sup>2</sup> Cu

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

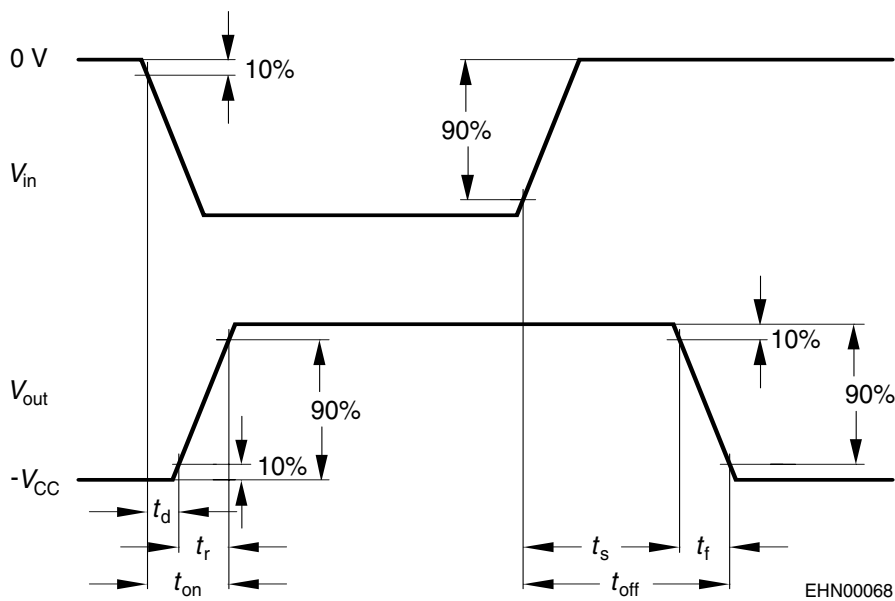
Parameter	Symbol	Values			Unit	
		min.	typ.	max.		
<b>DC Characteristics</b>						
Collector-emitter breakdown voltage $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	BSP 60	45	-	-	V
		BSP 61	60	-	-	
		BSP 62	80	-	-	
Collector-base breakdown voltage $I_C = 100\ \mu\text{A}, I_B = 0$	$V_{(BR)CBO}$	BSP 60	60	-	-	
		BSP 61	80	-	-	
		BSP 62	90	-	-	
Emitter-base breakdown voltage $I_E = 100\ \mu\text{A}, I_C = 0$	$V_{(BR)EBO}$		5	-	-	
Collector-emitter cutoff current $V_{CE} = V_{CE0max}, V_{BE} = 0$	$I_{CES}$		-	-	10	$\mu\text{A}$
Emitter cutoff current $V_{EB} = 4\text{ V}, I_C = 0$	$I_{EBO}$		-	-	10	
DC current gain 1) $I_C = 150\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 500\text{ mA}, V_{CE} = 10\text{ V}$	$h_{FE}$		1000	-	-	-
				2000	-	
Collector-emitter saturation voltage1) $I_C = 500\text{ mA}, I_B = 0.55\text{ mA}$ $I_C = 1\text{ A}, I_B = 1\text{ mA}$	$V_{CEsat}$		-	-	1.3	V
				-	-	
Base-emitter saturation voltage 1) $I_C = 500\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 1\text{ A}, I_B = 1\text{ mA}$	$V_{BEsat}$		-	-	1.9	
				-	-	
<b>AC Characteristics</b>						
Transition frequency $I_C = 100\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$	$f_T$		-	200	-	MHz
Turn-on time $I_C = 500\text{ mA}, I_{B1} = I_{B2} = 0.5\text{ mA}$	$t_{(on)}$		-	400	-	ns
Turn-off time $I_C = 500\text{ mA}, I_{B1} = I_{B2} = 0.5\text{ mA}$	$t_{(off)}$		-	1500	-	

 1) Pulse test:  $t \leq 300\ \mu\text{s}$ ,  $D = 2\%$

### Switching time test circuit



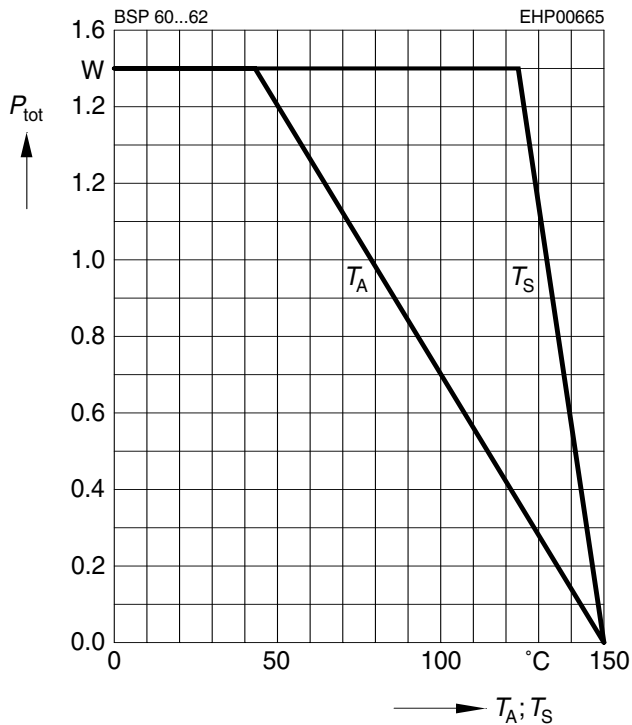
### Switching time waveform



1) Pulse test:  $t \leq 300\mu\text{s}$ ,  $D = 2\%$

**Total power dissipation  $P_{tot} = f(T_A^*; T_S)$**

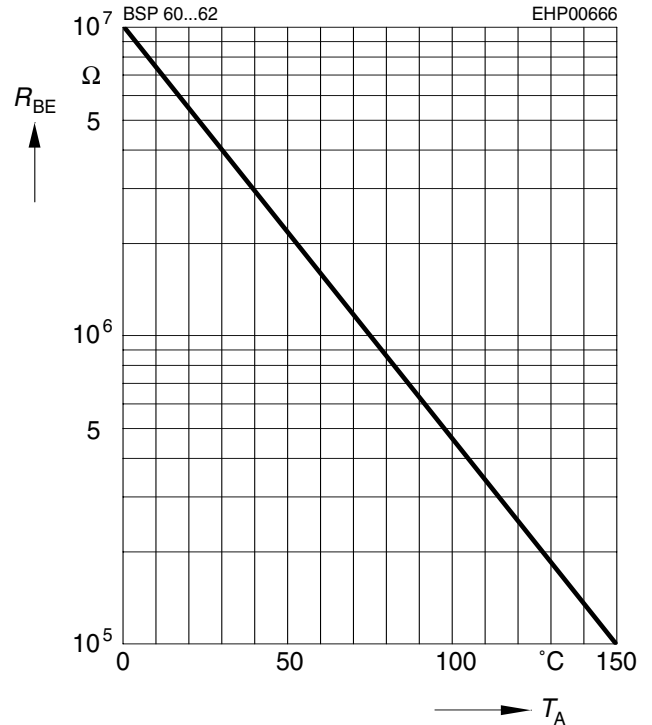
\* Package mounted on epoxy



**External resistance  $R_{BE} = f(T_A)^{**}$**

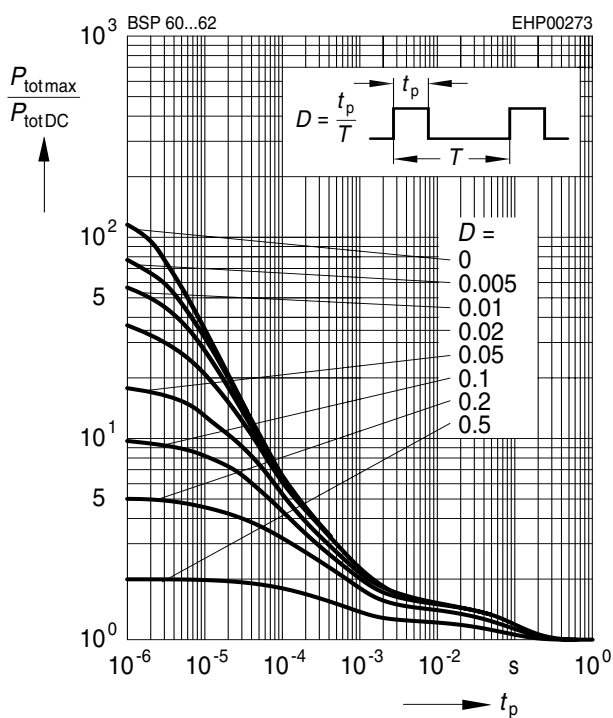
$V_{CB} = V_{CEmax}$

\*\*  $R_{BEmax}$  for thermal stability



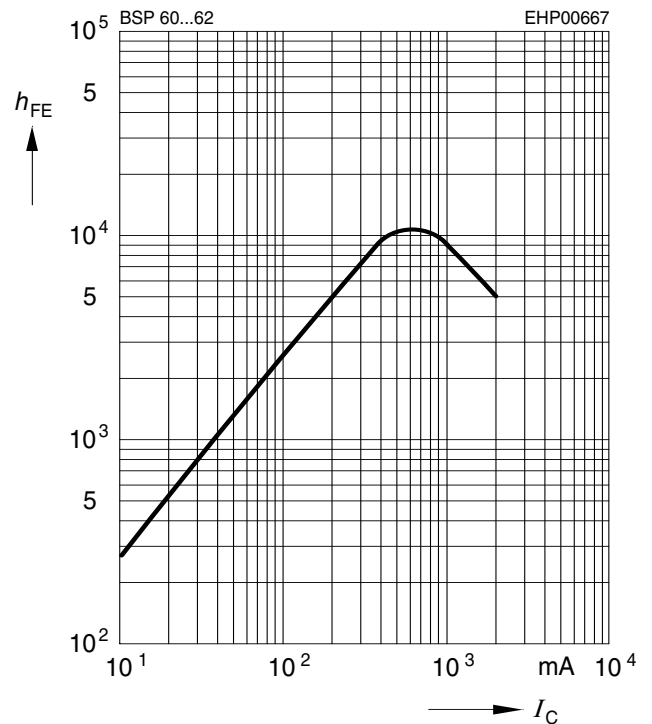
**Permissible pulse load**

$P_{totmax} / P_{totDC} = f(t_p)$



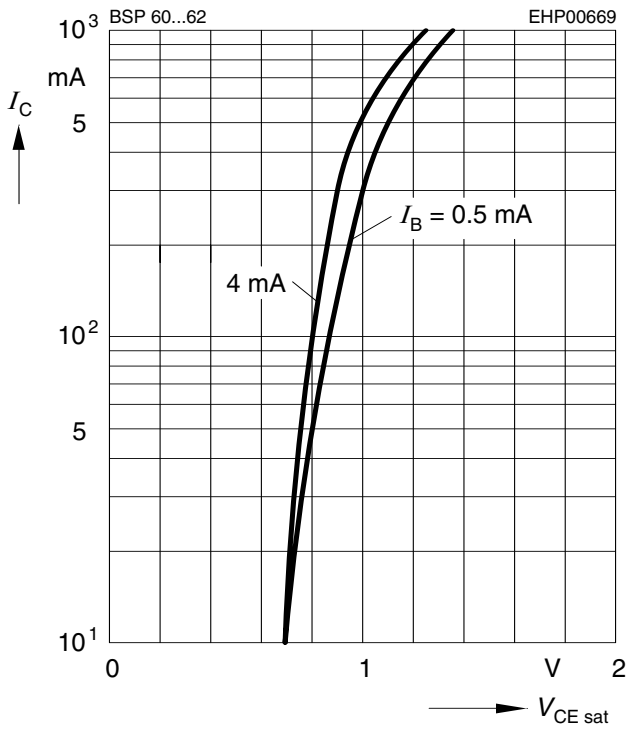
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 10V$



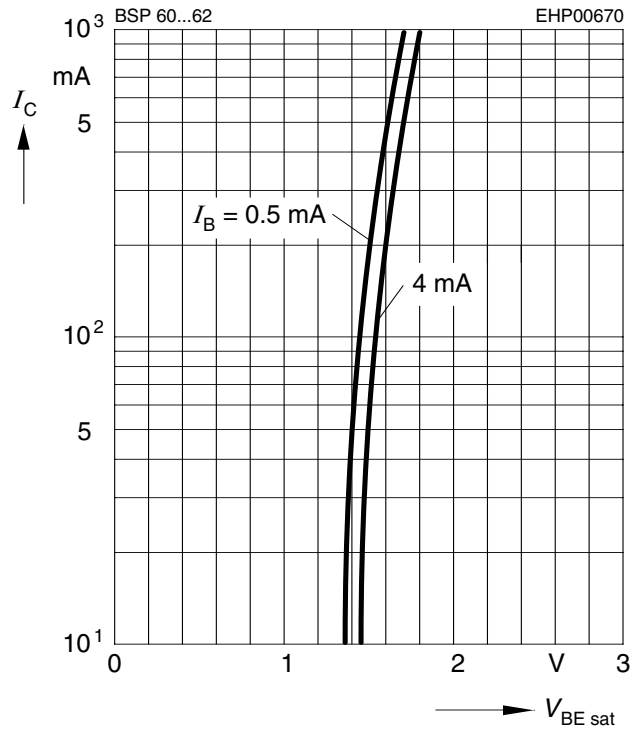
**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat}), I_B$  - parameter



**Base-emitter saturation voltage**

$I_C = f(V_{BEsat}), I_B$  - parameter



**Transition frequency  $f_T = f(I_C)$**

$V_{CE} = 10V, f = 100MHz$

