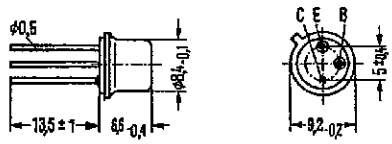
PNP Silicon Planar Transistors

BSV 15
BSV 16
BSV 17

BSV 15, BSV 16 and BSV 17 are epitaxial PNP silicon planar transistors in TO 39 case (5 C 3 DIN 41873). The collector is electrically connected to the case. The transistors are particularly suitable for use in AF amplifiers and for AF switching applications.

Type	Ordering code
BSV 15[1]	Q62702-S425
BSV 15-6	Q62702-S207
BSV 15-10	Q62702-S208
BSV 15-16	Q62702-S209
BSV 16[1]	Q62702-S426
BSV 16-6	Q62702-S210
BSV 16-10	Q62702-S211
BSV 16-16	Q62702-S212
BSV 17[1]	Q62702-S427
BSV 17-6	Q62702-S213
BSV 17-10	Q62702-S214



Approx. weight 1.5 g   Dimensions in mm

Maximum ratings		BSV 15	BSV 16	BSV 17	
Collector-emitter voltage	$-V_{CEO}$	40	60	80	V
Collector-emitter voltage	$-V_{CES}$	40	60	80	V
Emitter-base voltage	$-V_{EBO}$	5	5	5	V
Collector current	$-I_C$	1	1	1	A
Base current	$-I_B$	0.2	0.2	0.2	A
Junction temperature	T_j	200	200	200	°C
Storage temperature range	T_{stg}		−65 to +200		°C
Total power dissipation ($T_{case} \leq 25$ °C)	P_{tot}	5	5	5	W
Thermal resistance					
Junction to ambient air	R_{thJA}	≤ 200	≤ 200	≤ 200	K/W
Junction to case	R_{thJC}	≤ 35	≤ 35	≤ 35	K/W

1) In case of orders without an exact indication of the current amplification wanted, a transistor will be delivered of that current amplification group available at stock.

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BSV 17

Static characteristics (T_{amb} = 25°C)

The transistors BSV 15, BSV 16 and BSV 17 are grouped according to the DC current gain at $-I_C$ = 100 mA and marked with figures of the DIN R 5 standard series. At a voltage of V_{CE} = 1 V the following values apply:

Type	**BSV 15 BSV 16 BSV 17**	**BSV 15 BSV 16 BSV 17**	**BSV 15 BSV 16**	**BSV 15 BSV 16 BSV 17**
h_{FE} group	**6**	**10**	**16**	
I_C mA	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	V_{BE} V
0.1	44 (>15)	75 (>20)	120 (>30)	–
100	63 (40 to 100)	100 (63 to 160)	160 (100 to 250)	<1
500	40 (>20)	55 (>25)	85 (>35)	0.85 (0.7 to 1.4)

Static characteristics (T_{amb} = 25°C)		**BSV 15**	**BSV 16**	**BSV 17**	
Collector-emitter saturation voltage ($-I_C$ = 500 mA; I_B = 25 mA)	$-V_{CEsat}$	<1	<1	<1	V
Collector cutoff current ($-V_{CE}$ = 40 V)	$-I_{CES}$	<100	–	–	nA
Collector cutoff current ($-V_{CE}$ = 40 V; T_{amb} = 150°C)	$-I_{CES}$	<50	–	–	µA
Collector cutoff current ($-V_{CE}$ = 60 V)	$-I_{CES}$	–	<100	–	nA
Collector cutoff current ($-V_{CE}$ = 60 V; T_{amb} = 150°C)	$-I_{CES}$	–	<50	–	µA
Collector cutoff current ($-V_{CE}$ = 80 V)	$-I_{CES}$	–	–	<100	nA
Collector cutoff current ($-V_{CE}$ = 80 V; T_{amb} = 150°C)	$-I_{CES}$	–	–	<50	µA
Emitter cutoff current ($-V_{EB}$ = 4 V)	$-I_{EBO}$	<50	<50	<50	nA
Collector cutoff current ($-V_{CE}$ = 40 V; $-V_{BE}$ = 0.2 V; T_{amb} = 100°C)	$-I_{CEX}$	<50	–	–	µA
Collector cutoff current ($-V_{CE}$ = 60 V; $-V_{BE}$ = 0.2 V; T_{amb} = 100°C)	$-I_{CEX}$	–	<50	–	µA
Collector cutoff current ($-V_{CE}$ = 80 V; $-V_{BE}$ = 0.2 V; T_{amb} = 100°C)	I_{CEX}	–	–	<50	µA
Collector-emitter reverse voltage ($-I_{CE}$ = 50 mA; ν = 200 µs; 1%)	$-V_{CEO}$	>40	>60	>80	V
Collector-emitter voltage ($-I_{CE}$ = 10 µA)	$-V_{CES}$	>40	>60	>90	V
Emitter-base reverse voltage ($-I_{EBO}$ = 10 µA)	$-V_{EBO}$	>5	>5	>5	V

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Dynamic characteristics (T_{amb} = 25°C)		**BSV 15 BSV 16**	**BSV 17**	
Transition frequency (I_C = 50 mA; V_{CE} = 10 V, f = 20 MHz)	f_T	>50	>50	MHz
Collector-base capacitance (V_{CBO} = 10 V; I_E = 0; f = 1 MHz)	C_{CBO}	20 (<30)	15 (<25)	pF
Emitter-base capacitance (V_{EBO} = 0.5 V; I_C = 0; f = 1 MHz)	C_{EBO}	180	180	pF
Small-signal current gain (I_C = 1 mA; V_{CE} = 5 V; f = 1 kHz)	h_{fe}	>20	>20	–
Switching times:				
Turn-on time (I_C = 100 mA; I_{B1} approx. $-I_{B2}$ approx. 5 mA)	t_{on}	<500	<500	ns
Storage time (I_C = 100 mA; I_{B1} approx. $-I_{B2}$ approx. 5 mA)	t_s	<500	<500	ns
Fall time (I_C = 100 mA; I_{B1} approx. $-I_{B2}$ approx. 5 mA)	t_f	<150	<150	ns

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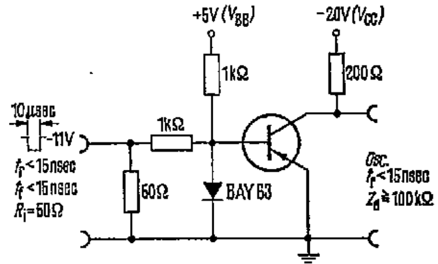
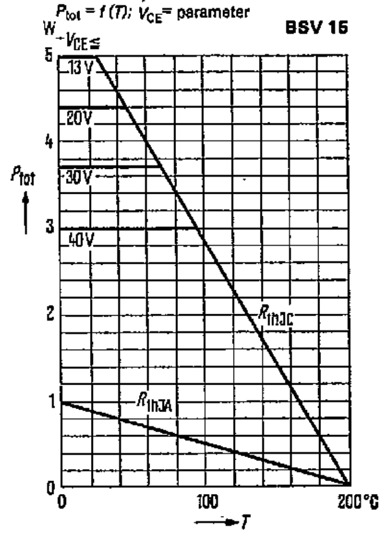
BSV 17

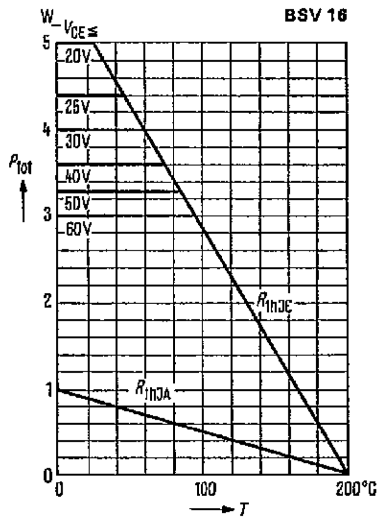
Test circuit for switching times
Test circuit for I_C = 100 mA



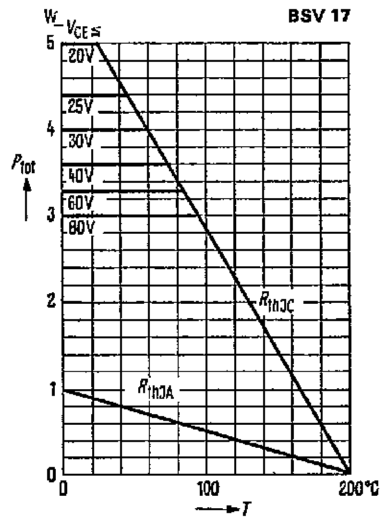
Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; V_{CE}= parameter



Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; V_{CE} = parameter



Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; V_{CE} = parameter



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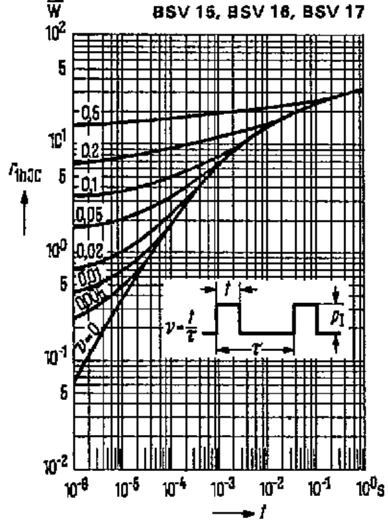
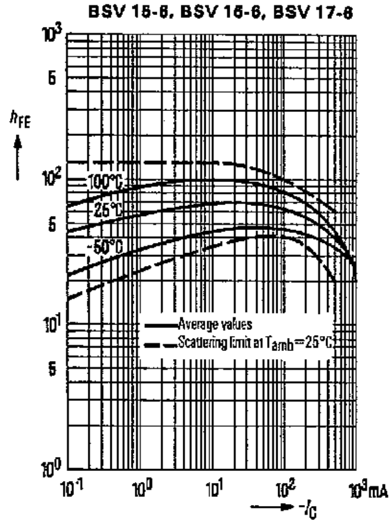
BSV 17

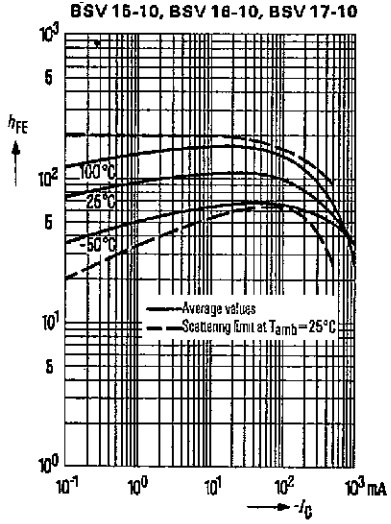
Permissible pulse load
$\frac{K}{W}$ $r_{thJC} = f(t)$; v = parameter
BSV 15, BSV 16, BSV 17



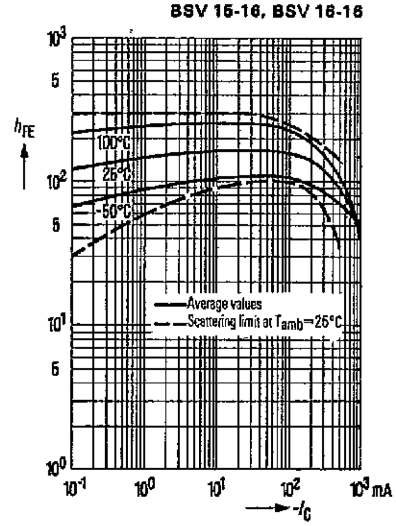
DC current gain $h_{FE} = f(I_C)$
$-V_{CE} = 1\,V$; T_{amb} = parameter
BSV 15-6, BSV 16-6, BSV 17-6



DC current gain $h_{FE} = f(I_C)$
$-V_{EC} = 1\,V$; T_{amb} = parameter
BSV 15-10, BSV 16-10, BSV 17-10



DC current gain $h_{FE} = f(I_C)$
$-V_{CE} = 1\,V$; T_{amb} = parameter
BSV 15-16, BSV 16-16



BSV 15
BSV 16

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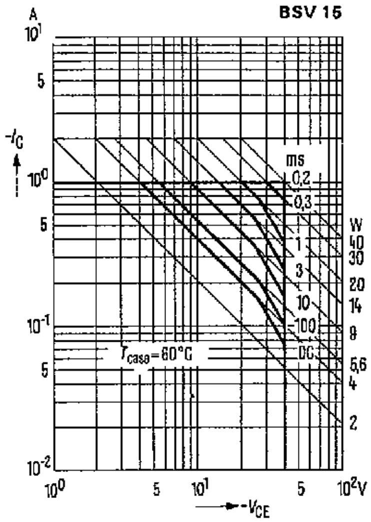
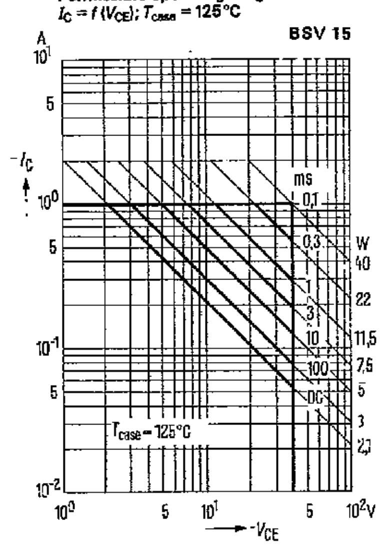
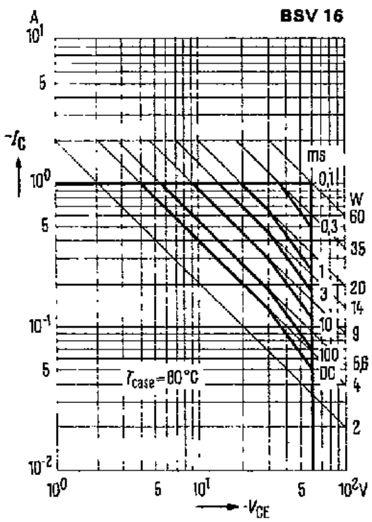
Permissible operating range
$I_C = f(V_{CE})$; $T_{case} = 60\,°C$



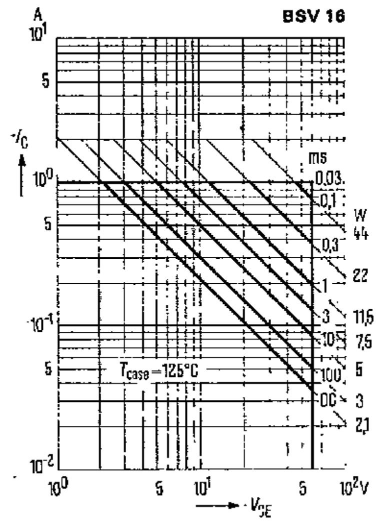
Permissible operating range
$I_C = f(V_{CE})$; $T_{case} = 125\,°C$



Permissible operating range
$I_C = f(V_{CE})$; $T_{case} = 60\,°C$



Permissible operating range
$I_C = f(V_{CE})$; ($T_{case} = 125\,°C$)



The permissible operating ranges apply to single pulses ($v = 0$). For pulse sequences the power dissipation has to be reduced in accordance with the diagram "permissible pulse load".

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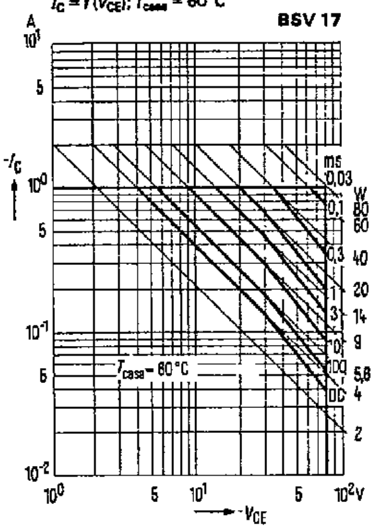
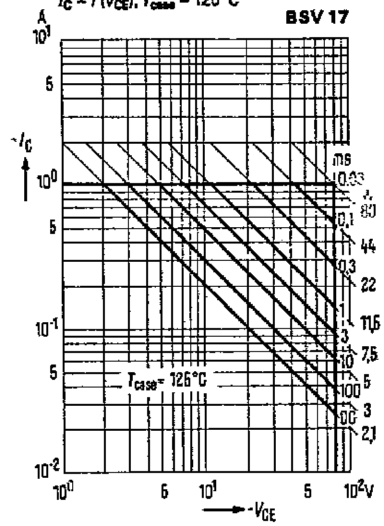
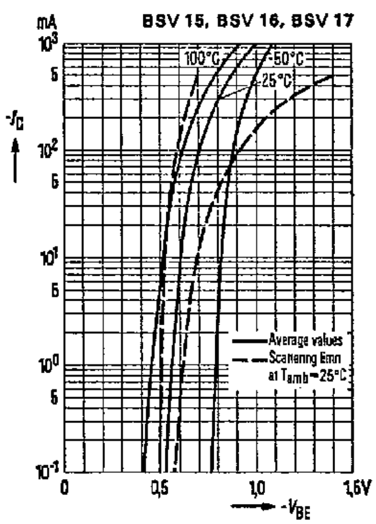
Permissible operating range
$I_C = f(V_{CE})$; $T_{case} = 60°C$



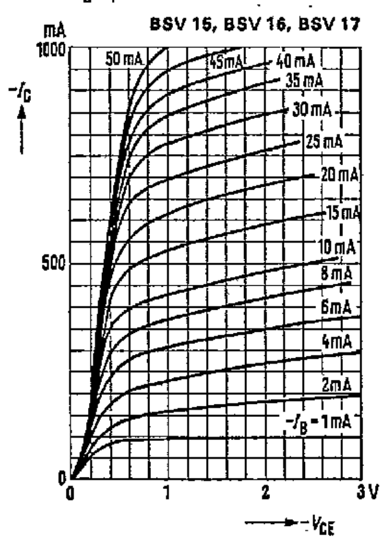
Permissible operating range
$I_C = f(V_{CE})$; $T_{case} = 125°C$



Collector current $I_C = f(V_{BE})$
$-V_{CE} = 1$ V; T_{amb} = parameter



Output characteristics $I_C = f(V_{CE})$
$-I_B$ = parameter



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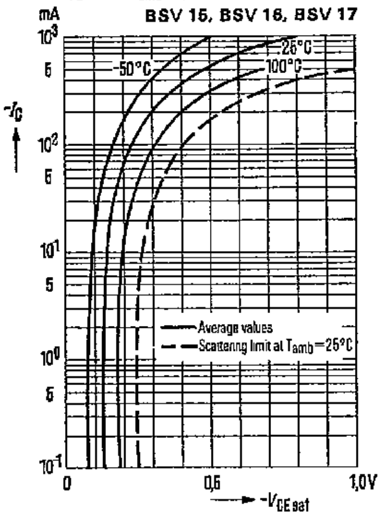
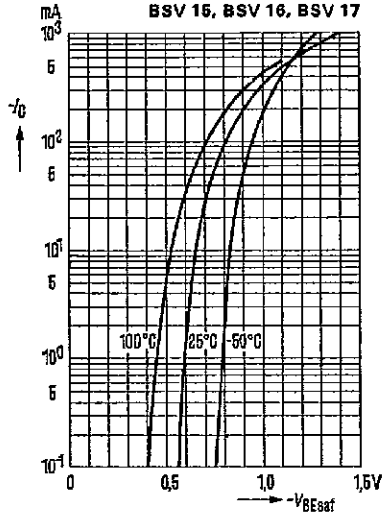
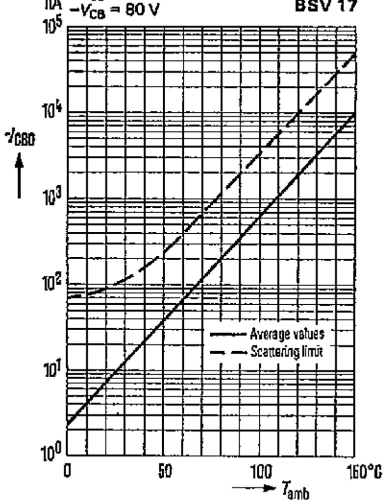
Collector-emitter saturation voltage
$-V_{CEsat} = f(I_C)$;
$h_{FE} = 20$, T_{amb} = parameter



Base-emitter saturation voltage
$-V_{BEsat} = f(I_C)$;
$h_{FE} = 20$; T_{amb} = parameter



Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$
$-V_{CB} = 40$ V BSV 15
$-V_{CB} = 60$ V BSV 16
$-V_{CB} = 80$ V BSV 17



Transition frequency $f_T = f(I_C)$;
$-V_{CE} \leq 10$ V (Average value)