NPN Transistor for Switching Applications — BSV 65

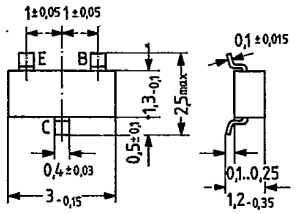
SIEMENS AKTIENGESELLSCHAF D

BSV 65 is an epitaxial NPN silicon planar switching transistor in TO 236 plastic package (23 A 3 DIN 41 869) designed for use in thick and thin film circuits.

It is particularly suitable for logic applications at the high packing density of microelectronic circuits and for hybrid units.

The type BSV 65 is marked with the code letter "F". The adjacent code letters A and B identify the DC current gain group. The transistor is also available upon request with changed terminal sequence (emitter and base terminal interchanged) under the designation BSV 65 R (mark "FY" and "FZ").

Type	Mark	Ordering code
BSV 65[2]		Q62702-S355
BSV 65 A	FA	Q62702-S347
BSV 65 B	FB	Q62702-S348
BSV 65 R[2]		Q62702-S428
BSV 65 RA	FY	Q62702-S407
BSV 65 RB	FZ	Q62702-S406



Approx. weight 0.02 g — Dimensions in mm

Maximum ratings (T_{amb} = 25 °C)

Collector-emitter voltage	V_{CEO}	15	V
Collector-base voltage	V_{CBO}	20	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	150	mA
Base current	I_B	30	mA
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to +125	°C
Total power dissipation (T_{amb} = 45 °C) on glass substrate (7 x 7 x 1 mm)	P_{tot}	150[1]	mW

Thermal resistance

Junction to ambient air if mounted on			
Glass substrate (7 x 7 x 1 mm)	R_{thJA}	≦ 700	K/W
Ceramic substrate (30 x 12 x 1 mm)	R_{thJA}	≦ 450	K/W
Glass-fiber substrate (30 x 12 x 1.5)	R_{thJA}	≦ 450	K/W

1) The permissible total power dissipation $P_{perm} \frac{T_{jmax} - T_{amb}}{R_{thJA}}$ is determined by the actual thermal resistance which depends on the installation.

2) 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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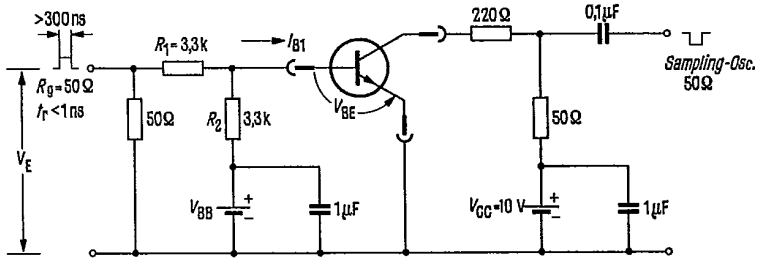
Static characteristics (T_{amb} = 25°C)

DC current gain			
(V_{CE} = 0.35 V; I_C = 10 mA) group A (FA)	h_{FE}	40 to 300	–
(V_{CE} = 0.35 V; I_C = 10 mA) group B (FB)	h_{FE}	75 to 300	–
Collector-emitter saturation voltage			
(I_C = 10 mA; I_B = 1 mA)	V_{CEsat}	<0.3	V
Base-emitter-saturation voltage			
(I_C = 10 mA; I_B = 1 mA)	V_{BEsat}	<0.9	V
Collector cutoff current (V_{CBO} = 15 V)	I_{CBO}	<500	nA
(V_{CBO} = 15 V, T_{amb} = 125°C)	I_{CBO}	<30	µA
Collector-emitter breakdown voltage			
(I_{CEO} = 10 mA)	$V_{(BR)CEO}$	>15	V
Collector-base breakdown voltage (I_{CBO} = 1 µA)	$V_{(BR)CBO}$	>20	V
Emitter-base breakdown voltage (I_{EBO} = 10 µA)	$V_{(BR)EBO}$	>5	V

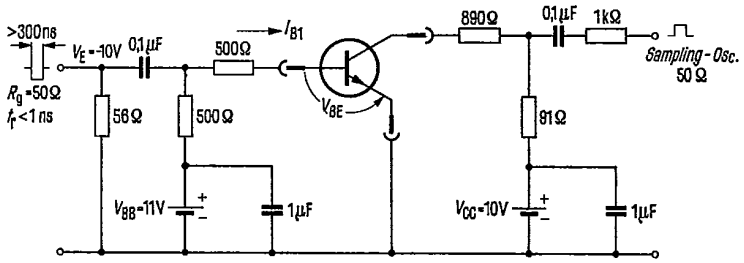
Dynamic characteristics (T_{amb} = 25°C)

Transition frequency			
(V_{CE} = 10 V; I_C = 10 mA; f = 100 MHz)	f_T	>280	MHz
Collector-base capacitance (V_{CBO} = 5 V)	C_{CBO}	<5	pF
Switching times (I_C = 10 mA; I_{B1} = 3 mA;	t_{on}	<20	ns
$-I_{B2}$ = 1.5 mA; R_L = 270 Ω)	t_{off}	<40	ns
Storage time (I_C = I_{B1} = 10 mA; R_{CC} = 1 kΩ)	t_s	<20	ns

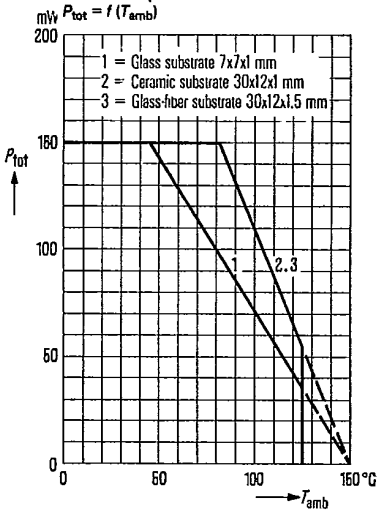
Test circuit for turn-on and turn-off time measurements Duty cycle <2%



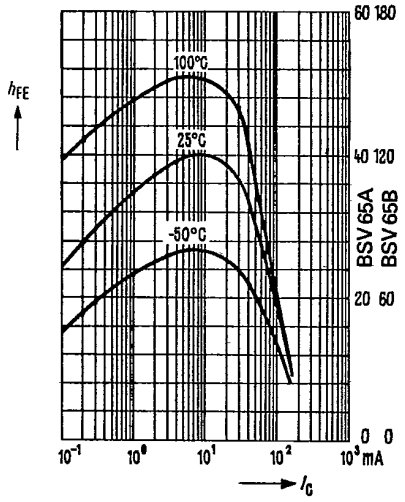
Test circuit for storage time measurement t_S Duty cycle <2%



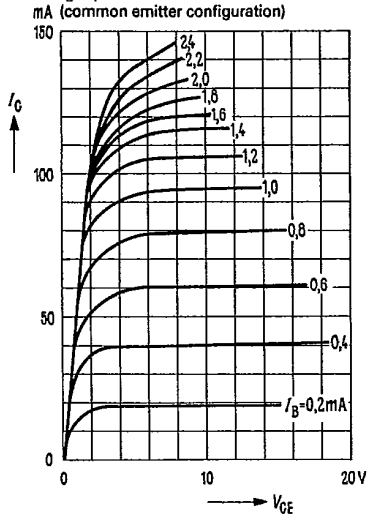
Total perm. power dissipation versus temperature
$P_{tot} = f(T_{amb})$



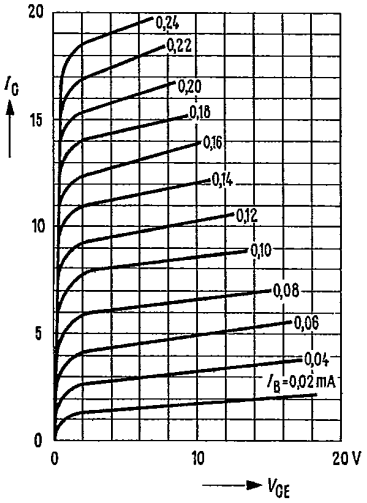
DC current gain $h_{FE} = f(I_C)$
V_{CE} = 1 V; T_{amb} = parameter
(common emitter configuration)



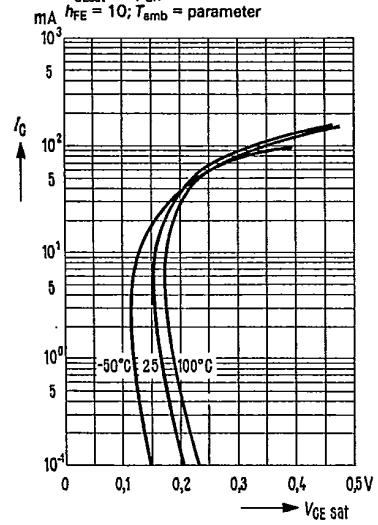
Output characteristics $I_C = f(V_{CE})$
I_B = parameter
(common emitter configuration)



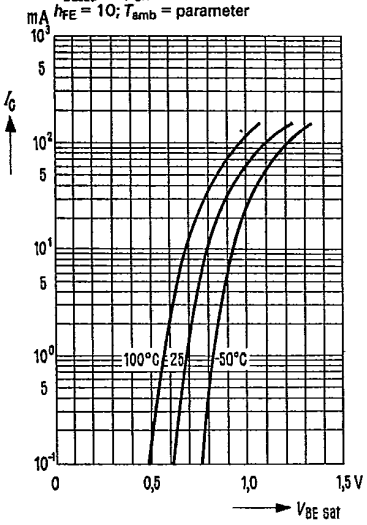
Output characteristics $I_C = f(V_{CE})$
I_B = parameter
(common emitter configuration)



Collector-emitter saturation voltage
$V_{CEsat} = f(I_C)$,
$h_{FE} = 10$; T_{amb} = parameter



Base-emitter saturation voltage
$V_{BEsat} = f(I_C)$,
$h_{FE} = 10$; T_{amb} = parameter



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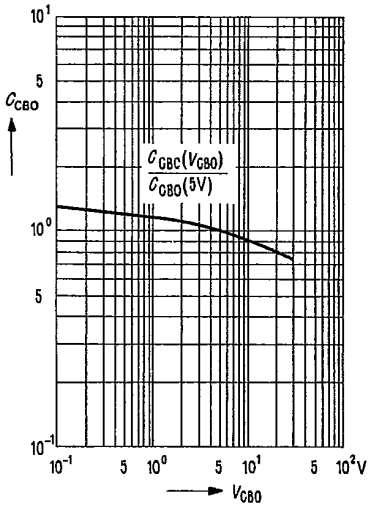
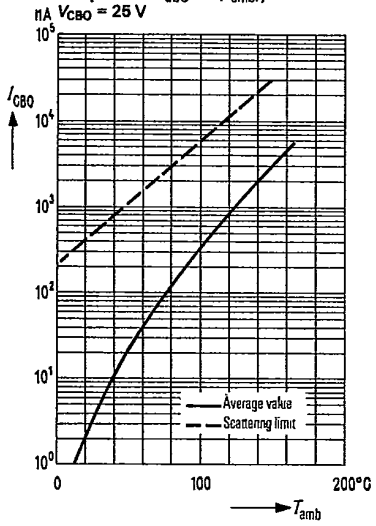
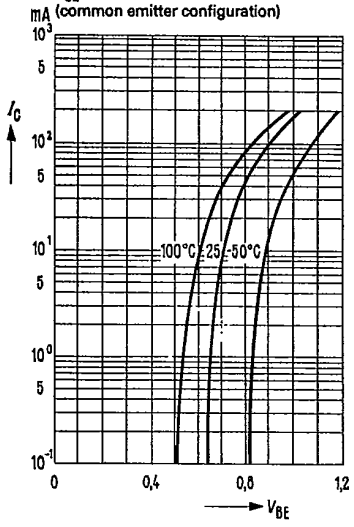
Collector-base capacitance
$C_{CBO} = f(V_{CBO})$



Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$; $V_{CBO} = 25$ V



Collector current $I_C = f(V_{BE})$
$V_{CE} = 1$ V
(common emitter configuration)



Transition frequency $f_T = f(I_C)$
$V_{CE} = 10$ V; $f = 100$ MHz; $T_{amb} = 25$ °C