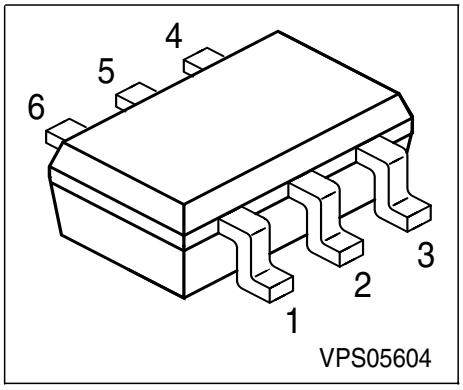
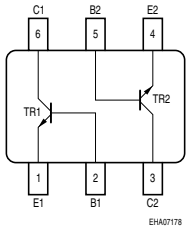
NPN Silicon AF Transistor Array



- Precision matched transistor pair: $\Delta I_C \leq 10\%$
- For current mirror applications
- Low collector-emitter saturation voltage
- Two (galvanic) internal isolated Transistors
- Complementary type: BCM856S



Type	Marking	Pin Configuration						Package
BCM846S	1Ms	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	65	V
Collector-emitter voltage	V_{CES}	80	
Collector-base voltage	V_{CBO}	80	
Emitter-base voltage	V_{EBO}	6	
Collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Total power dissipation- T_S = 115 °C	P_{tot}	250	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	140	K/W

[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A = 25°C, unless otherwise specified

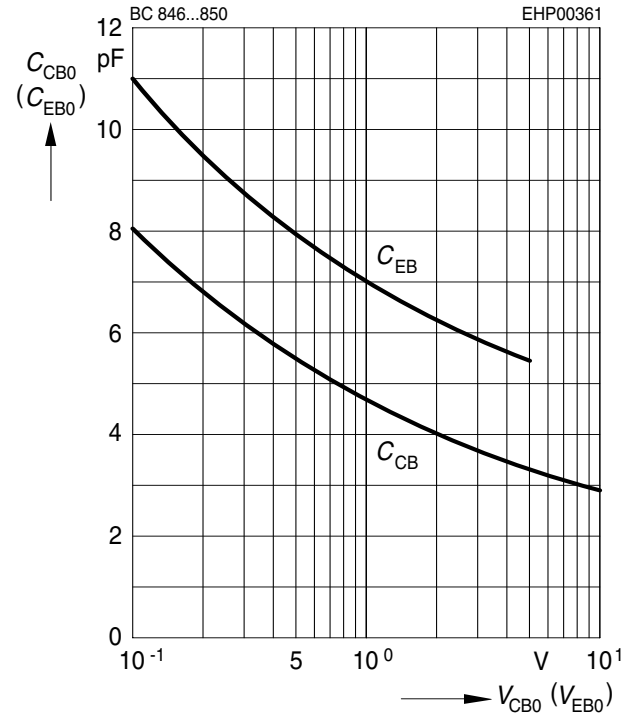
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 10 mA, I_B = 0 A	$V_{(BR)CEO}$	65	-	-	V
Collector-base breakdown voltage I_C = 10 µA, I_E = 0 A	$V_{(BR)CBO}$	80	-	-	
Collector-emitter breakdown voltage I_C = 10 µA, V_{BE} = 0 A	$V_{(BR)CES}$	80	-	-	
Emitter-base breakdown voltage I_E = 10 µA, I_C = 0 A	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current	I_{CBO}				nA
V_{CB} = 30 V, I_E = 0 A		-	-	15	
V_{CB} = 30 V, I_E = 0 A, T_A = 150 °C		-	-	5	
DC current gain-[1)]	h_{FE}				-
I_C = 10 µA, V_{CE} = 5 V		-	250	-	
I_C = 2 mA, V_{CE} = 5 V		200	290	450	
Collector-emitter saturation voltage[1)]	V_{CEsat}				mV
I_C = 10 mA, I_B = 0.5 mA		-	90	300	
I_C = 100 mA, I_B = 5 mA		-	200	650	
Base emitter saturation voltage[1)]	V_{BEsat}				
I_C = 10 mA, I_B = 0.5 mA		-	700	-	mV
I_C = 100 mA, I_B = 5 mA		-	900	-	mV
Base-emitter voltage-[1)]	$V_{BE(ON)}$				
I_C = 2 mA, V_{CE} = 5 V		580	660	750	
I_C = 10 mA, V_{CE} = 5 V		-	-	820	
Matching	ΔI_C				%
I_B = 1 µA, V_{CE1} = V_{CE2} = 1.0V		-10	-	10	
I_B = 100 µA, V_{CE1} = V_{CE2} = 1.0V		-10	-	10	

[1]Puls test: t < 300µs; D < 2%

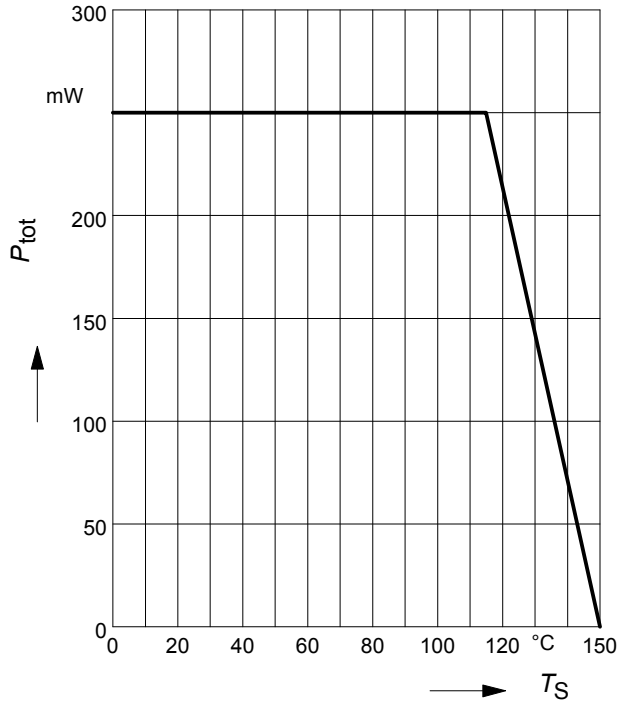
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 20 mA, V_{CE} = 5 V, f = 100 MHz	f_T	-	250	-	MHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	2	-	pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	10	-	
Short-circuit input impedance I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{11e}	-	4.5	-	kΩ
Open-circuit reverse voltage transf. ratio I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{12e}	-	2	-	10^{-4}
Short-circuit forward current transf. ratio I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{21e}	-	330	-	-
Open-circuit output admittance I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{22e}	-	30	-	µS
Noise figure I_C = 200 µA, V_{CE} = 5 V, f = 1 kHz, Δ f = 200 Hz, R_S = 2 kΩ	F	-	-	10	dB

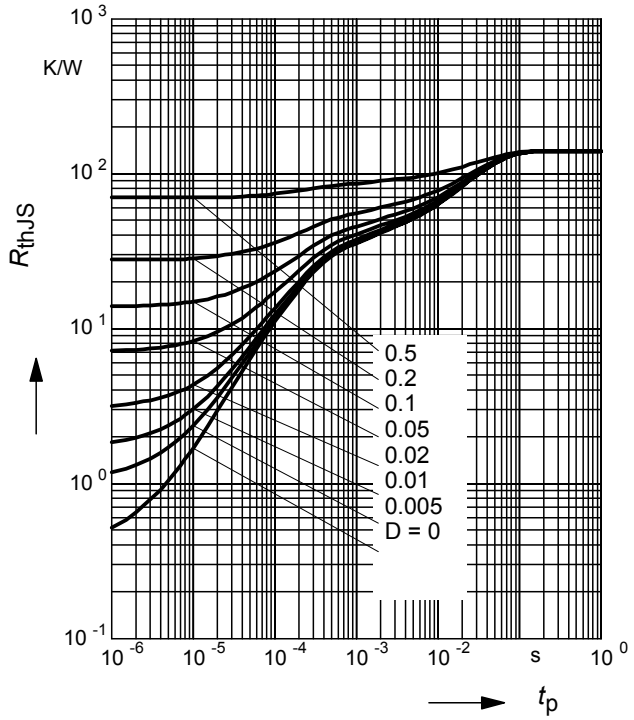
Collector-base capacitance $C_{CB} = f(V_{CB0})$
Emitter-base capacitance $C_{EB} = f(V_{EB0})$



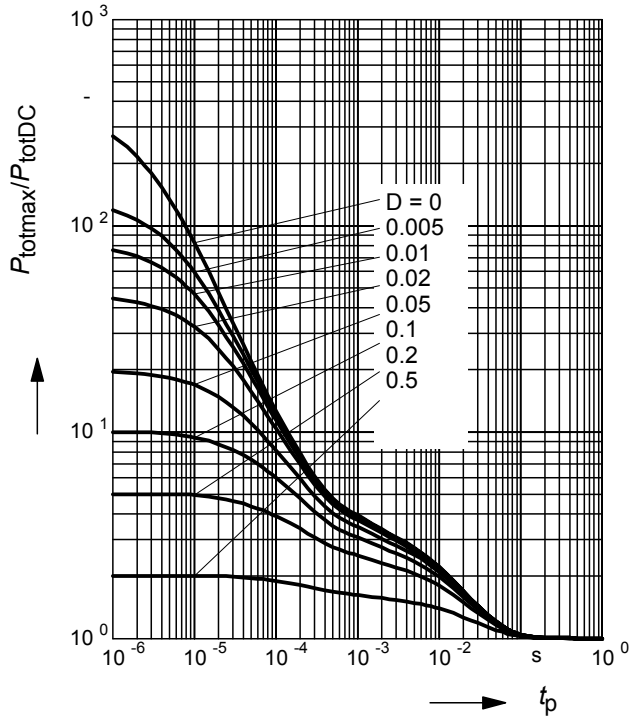
Total power dissipation $P_{tot} = f(T_S)$



Permissible Pulse Load $R_{thJS} = f(t_p)$

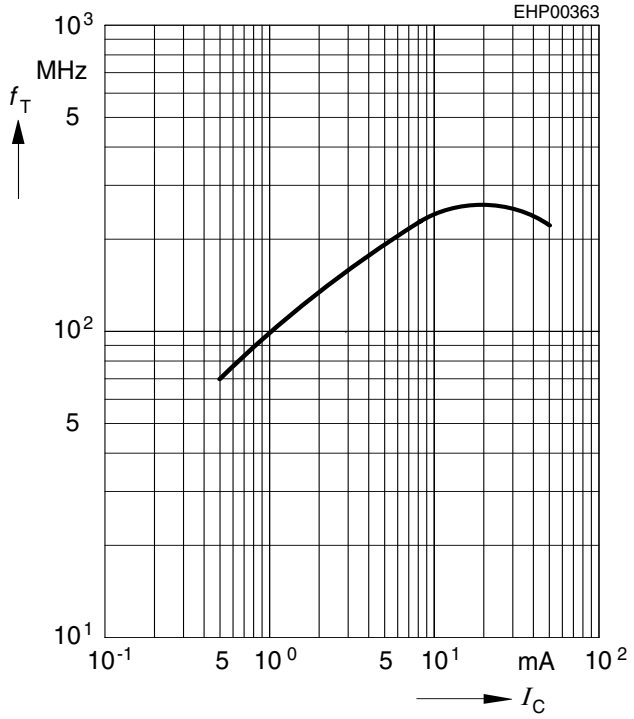


Permissible Pulse Load
$P_{totmax}/P_{totDC} = f(t_p)$



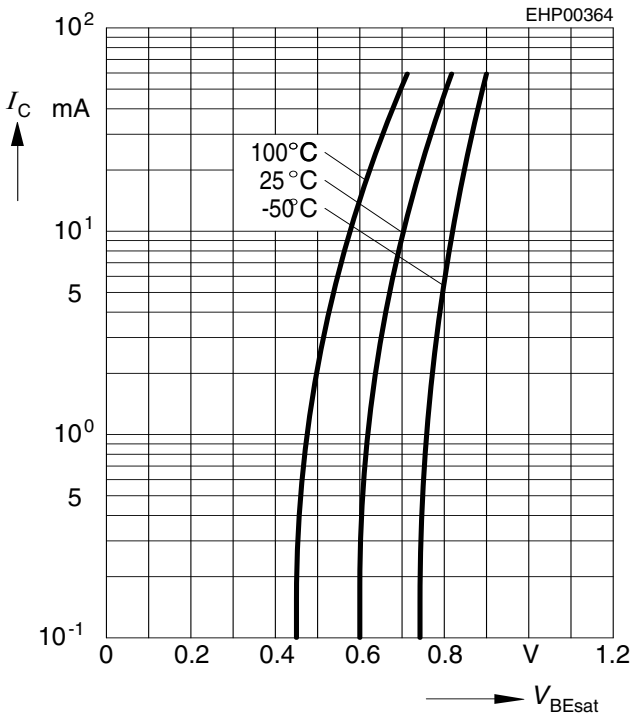
Transition frequency $f_T = f(I_C)$

V_{CE} = 5 V



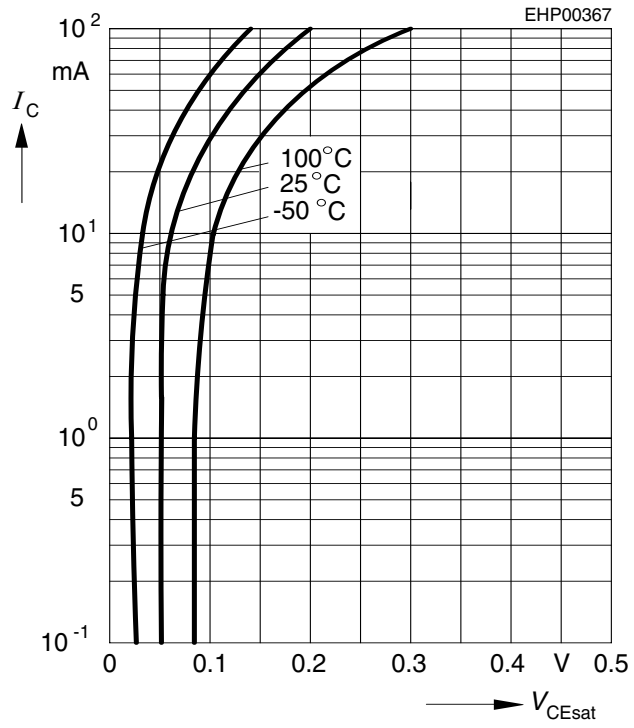
Base-emitter saturation voltage

$I_C = f(V_{BEsat})$, h_{FE} = 20

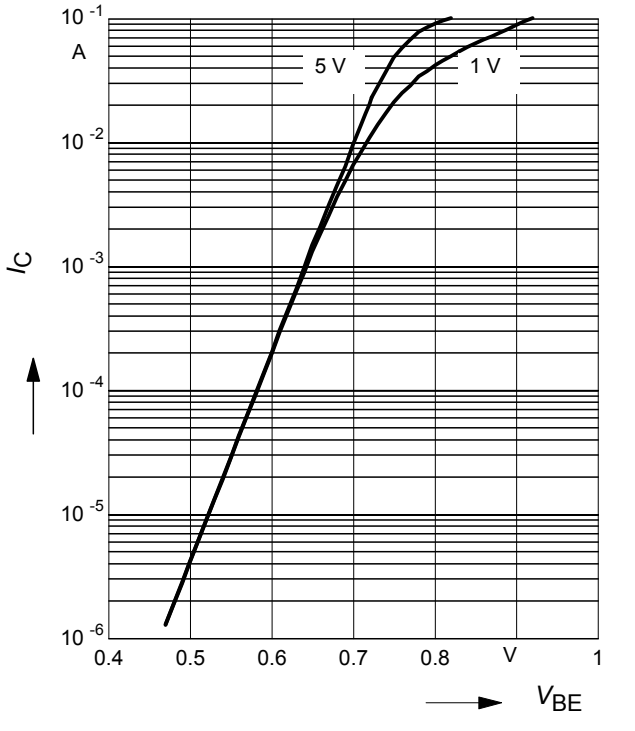


Collector-emitter saturation voltage

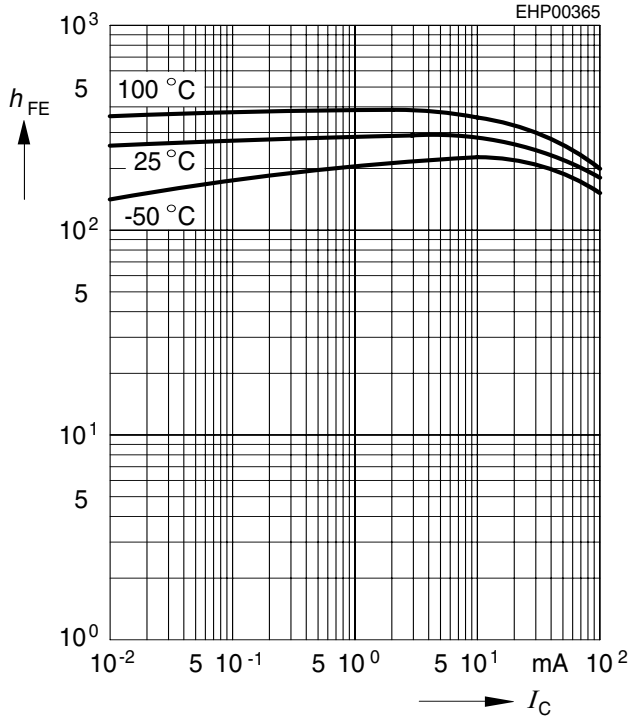
$I_C = f(V_{CEsat})$, h_{FE} = 20



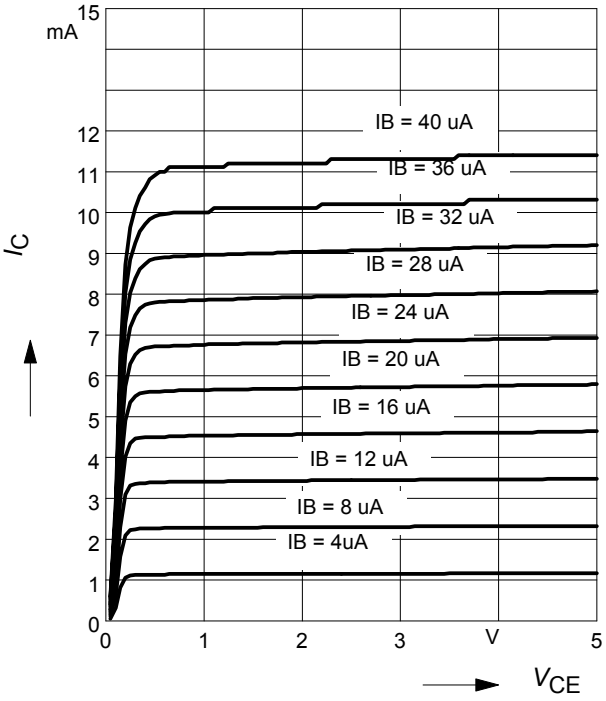
Collector current $I_C = f(V_{BE})$



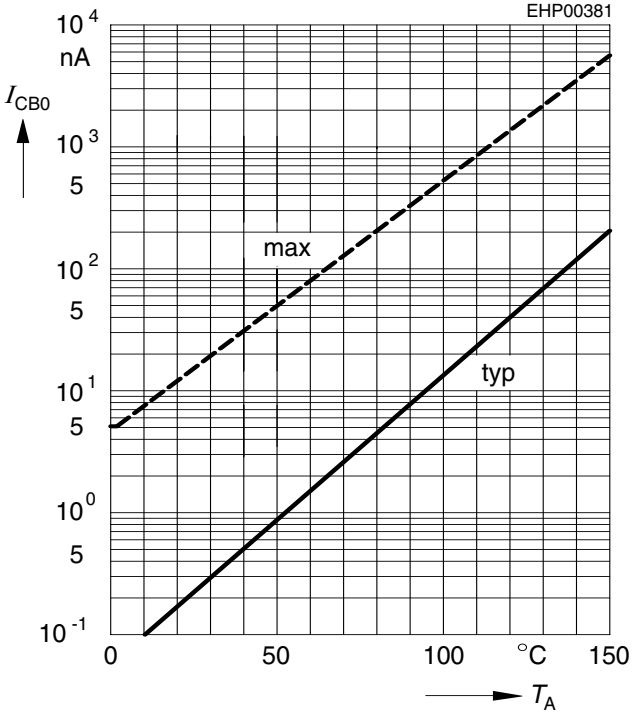
DC current gain $h_{FE} = f(I_C)$
$V_{CE} = 5V$



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



Collector cutoff current $I_{CBO} = f(T_A)$
V_{CBO} = 30 V



Definition of matching

$\Delta I_C = (I_{C2}-I_{C1})/I_{C1}$