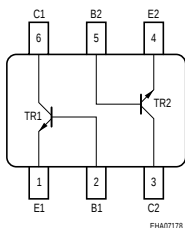
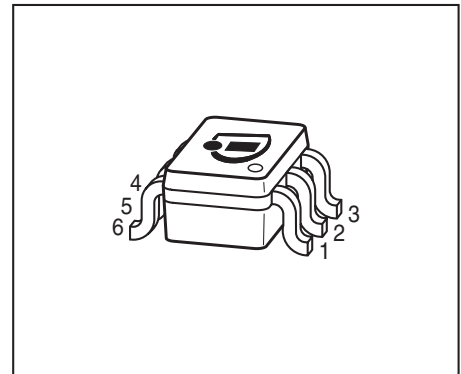


NPN Silicon AF Transistor Array

- 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
- BCM846S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



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, $t_p \leq 10$ ms	I_{CM}	200	
Total power dissipation- $T_S = 115^\circ\text{C}$	P_{tot}	250	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

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

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC Characteristics

Collector-emitter breakdown voltage $I_C = 10\text{ mA}, I_B = 0\text{ A}$	$V_{(BR)CEO}$	65	-	-	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_E = 0\text{ A}$	$V_{(BR)CBO}$	80	-	-	
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}, V_{BE} = 0\text{ A}$	$V_{(BR)CES}$	80	-	-	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0\text{ A}$	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current $V_{CB} = 30\text{ V}, I_E = 0\text{ A}$ $V_{CB} = 30\text{ V}, I_E = 0\text{ A}, T_A = 150\text{ }^\circ\text{C}$	I_{CBO}	- -	- -	0.015 5	μA
DC current gain ⁻²⁾ $I_C = 10\text{ }\mu\text{A}, V_{CE} = 5\text{ V}$ $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$	h_{FE}	- 200	250 290	- 450	-
Collector-emitter saturation voltage ²⁾ $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{CEsat}	- -	90 200	300 650	mV
Base emitter saturation voltage ²⁾ $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{BEsat}	- -	700 900	- -	
Base-emitter voltage ⁻²⁾ $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	580 -	660 -	700 770	
Matching $I_B = 1\text{ }\mu\text{A}, V_{CE1} = V_{CE2} = 1.0\text{ V}$ $I_B = 100\text{ }\mu\text{A}, V_{CE1} = V_{CE2} = 1.0\text{ V}$	ΔI_C	-10 -10	- -	10 10	%

¹⁾For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

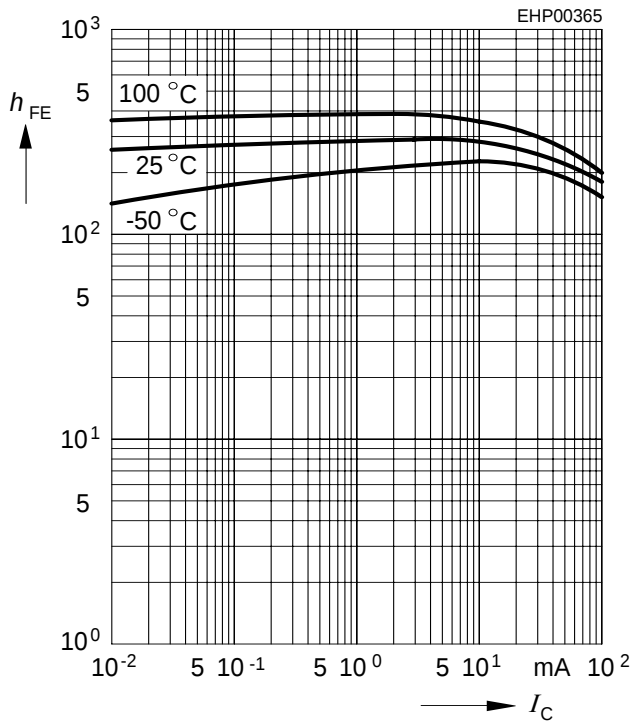
²⁾Puls test: $t < 300\mu\text{s}$; $D < 2\%$

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

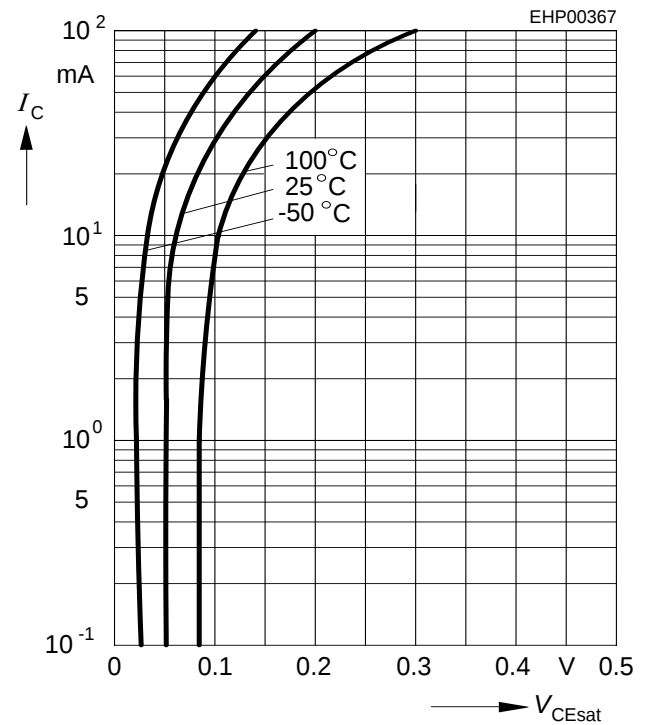
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency $I_C = 20\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 100\text{ MHz}$	f_T	-	250	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	0.95	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	9	-	
Short-circuit input impedance $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{11e}	-	4.5	-	kΩ
Open-circuit reverse voltage transf. ratio $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{12e}	-	2	-	10 ⁻⁴
Short-circuit forward current transf. ratio $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{21e}	-	330	-	-
Open-circuit output admittance $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{22e}	-	30	-	μS
Noise figure $I_C = 200\text{ μA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$, $\Delta f = 200\text{ Hz}$, $R_S = 2\text{ kΩ}$	F	-	-	10	dB

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

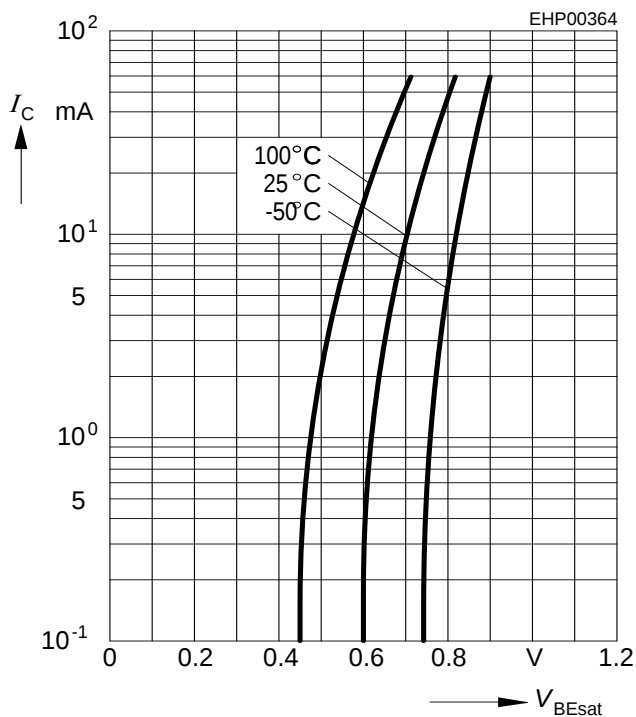
$$V_{CE} = 5V$$


Collector-emitter saturation voltage

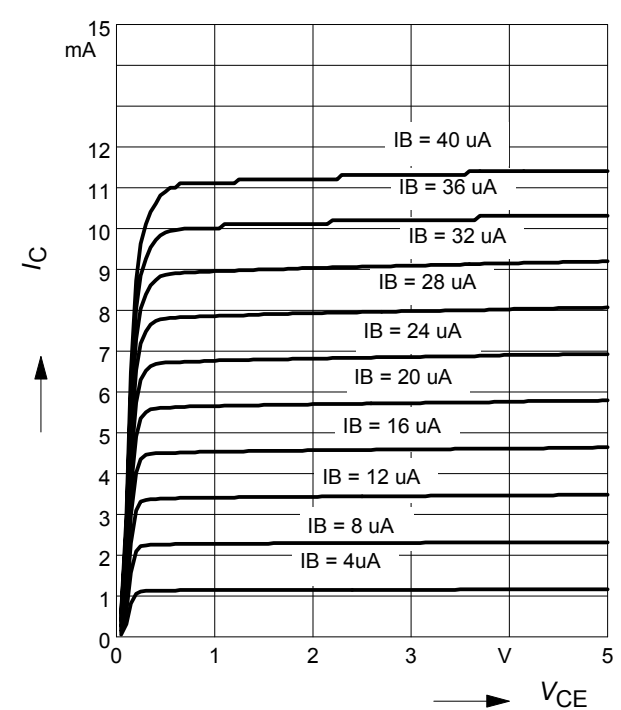
$$I_C = f(V_{CEsat}), h_{FE} = 20$$


Base-emitter saturation voltage

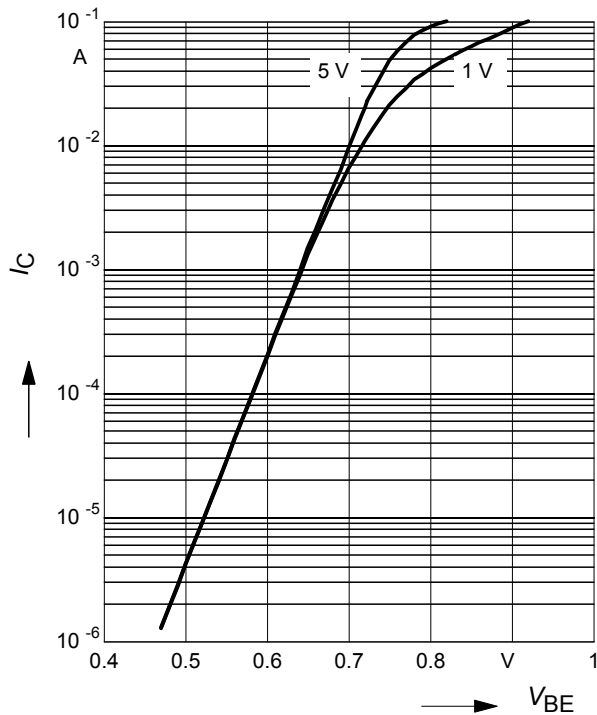
$$I_C = f(V_{BEsat}), h_{FE} = 20$$


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

$$I_B = \text{parameter}$$

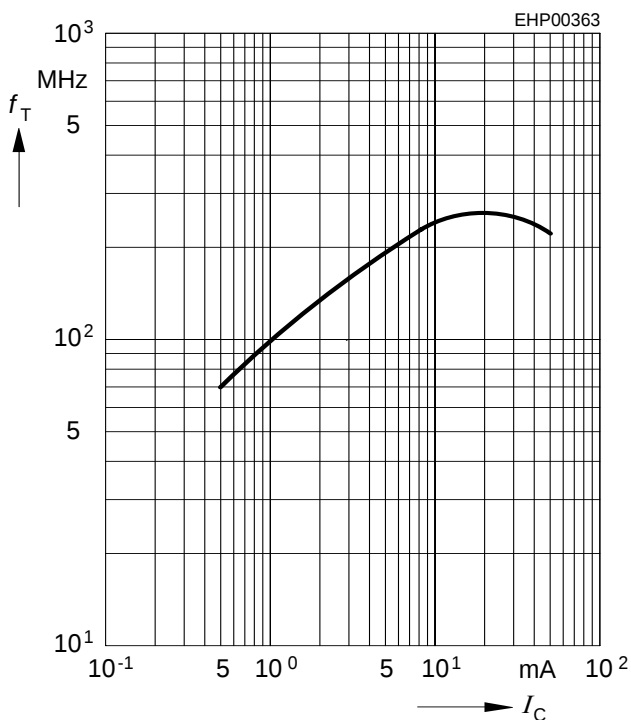


Collector current $I_C = f(V_{BE})$



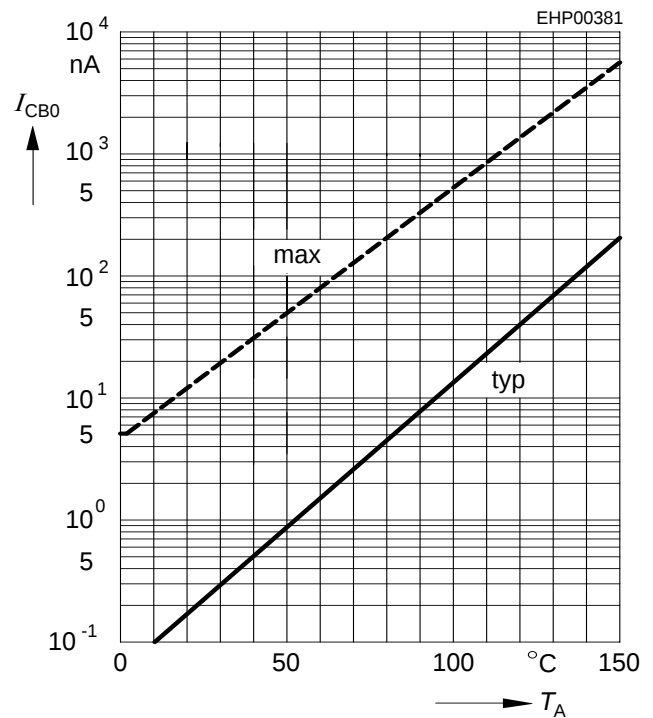
Transition frequency $f_T = f(I_C)$

$V_{CE} = \text{parameter in V, } f = 2\text{ GHz}$



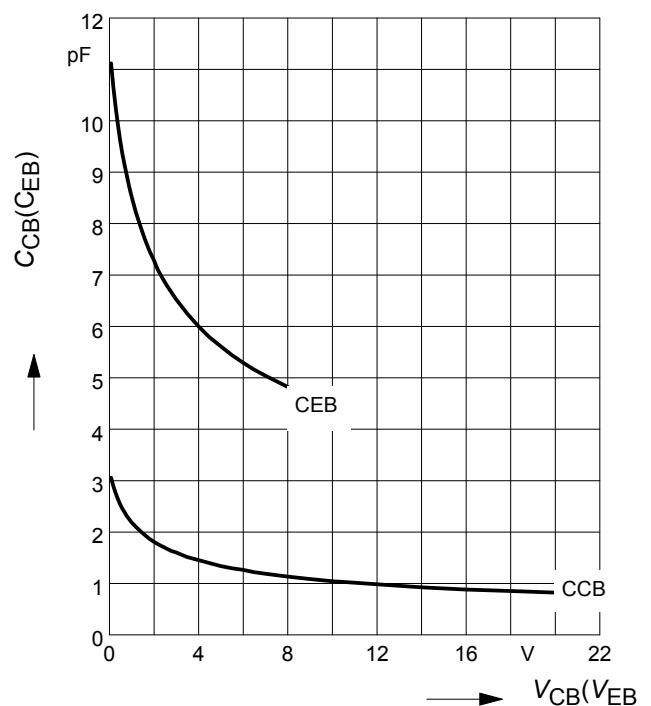
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CBO} = 30\text{ V}$

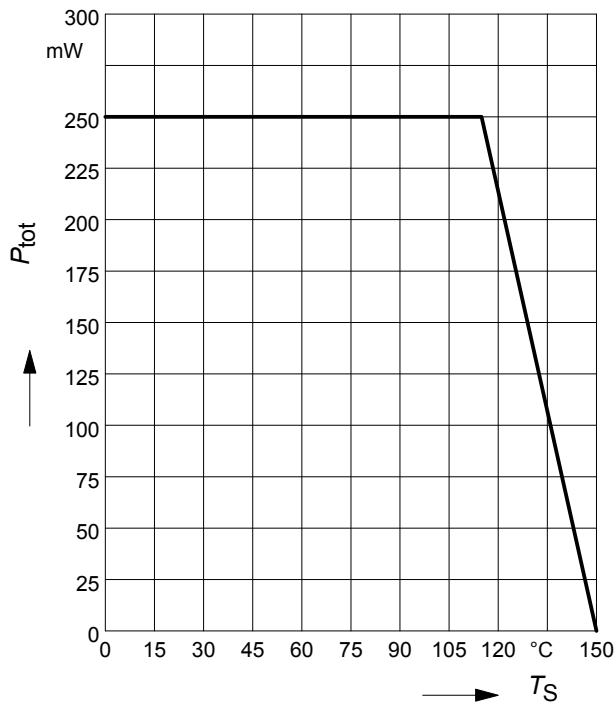


Collector-base capacitance $C_{cb} = f(V_{CB})$

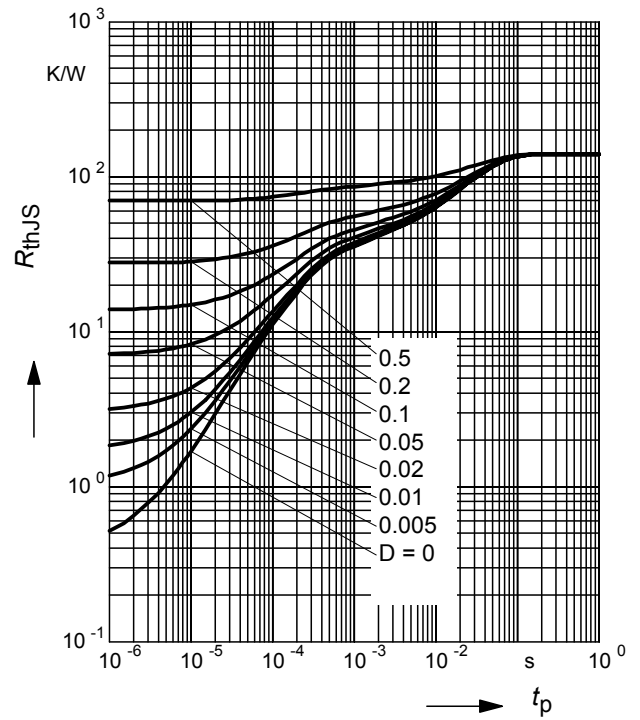
Emitter-base capacitance $C_{eb} = f(V_{EB})$



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

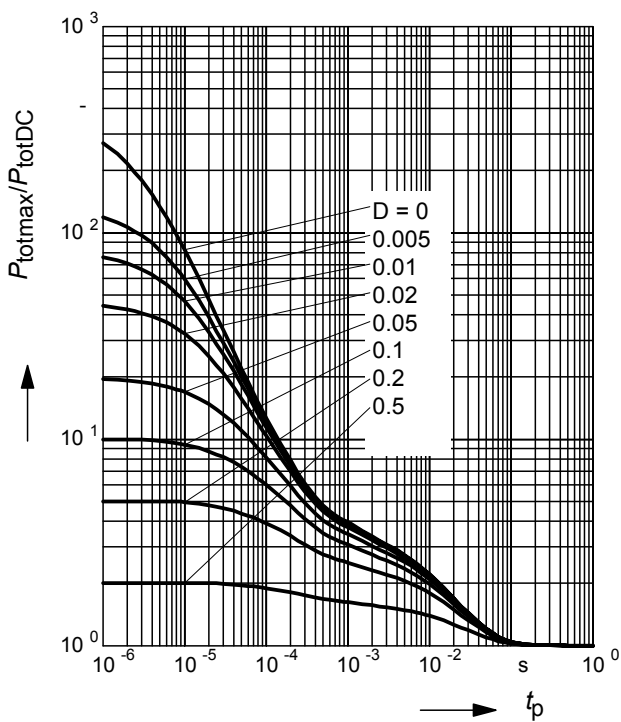


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



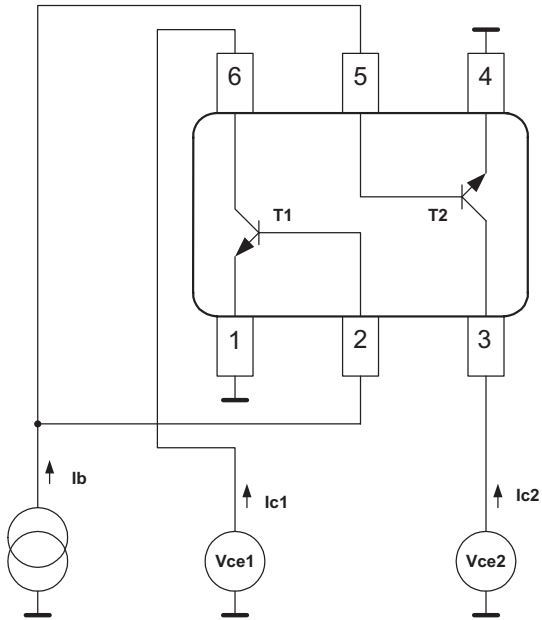
Permissible Pulse Load

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

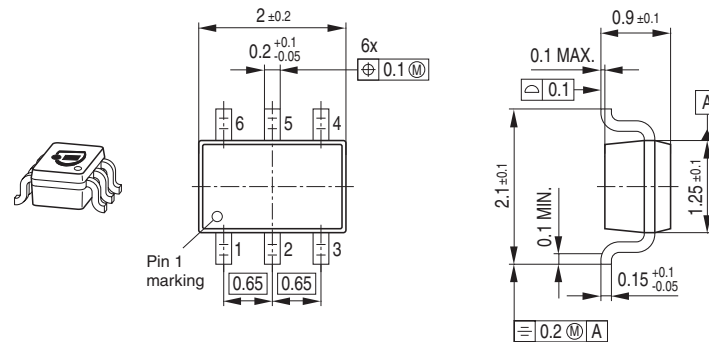


Definition of matching

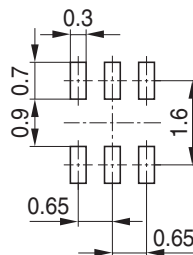
$$\Delta I_C = (I_{C2} - I_{C1}) / I_{C1}$$



Package Outline

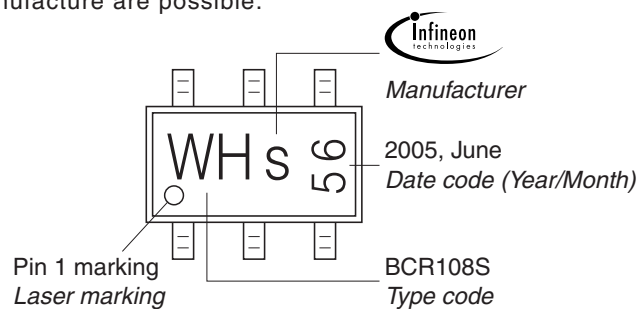


Foot Print



Marking Layout (Example)

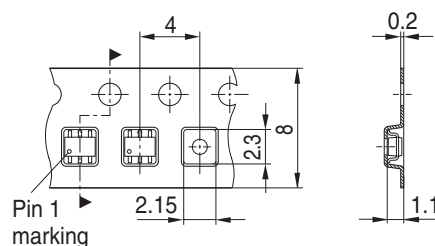
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel $\varnothing 180 \text{ mm}$ = 3.000 Pieces/Reel
Reel $\varnothing 330 \text{ mm}$ = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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