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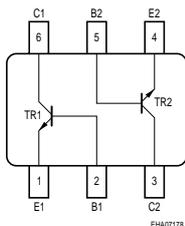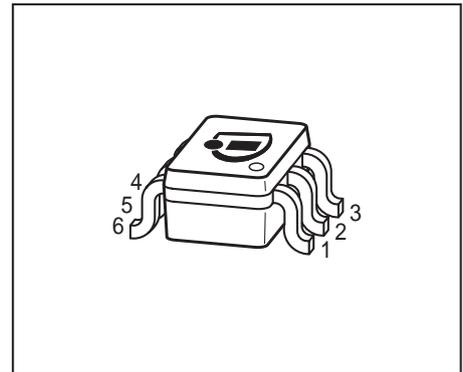
Type	Marking	Pin Configuration						Package
BCM846S	1Ms	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

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- $T_S = 115\ °C$	P_{tot}	250	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

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Thermal Resistance

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

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

Parameter	Symbol	min.	typ.	max.	Unit
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 V_{CB} = 30 V, I_E = 0 A V_{CB} = 30 V, I_E = 0 A, T_A = 150 °C	I_{CBO}	- -	- -	0.015 5	µA
DC current gain-[2] I_C = 10 µA, V_{CE} = 5 V I_C = 2 mA, V_{CE} = 5 V	h_{FE}	- 200	250 290	- 450	-
Collector-emitter saturation voltage[2] I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5 mA	V_{CEsat}	- -	90 200	300 650	mV
Base emitter saturation voltage[2] I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5 mA	V_{BEsat}	- -	700 900	- -	
Base-emitter voltage-[2] I_C = 2 mA, V_{CE} = 5 V I_C = 10 mA, V_{CE} = 5 V	$V_{BE(ON)}$	580 -	660 -	700 770	
Matching I_B = 1 µA, V_{CE1} = V_{CE2} = 1.0V I_B = 100 µA, V_{CE1} = V_{CE2} = 1.0V	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 < 300µs; D < 2%

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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}	-	0.95	-	pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	9	-	
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, Δf = 200 Hz, R_S = 2 kΩ	F	-	-	10	dB

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

$V_{CE} = 5V$

EHP00365

(graph: h_{FE} vs I_C, curves labeled 100 °C, 25 °C, -50 °C)
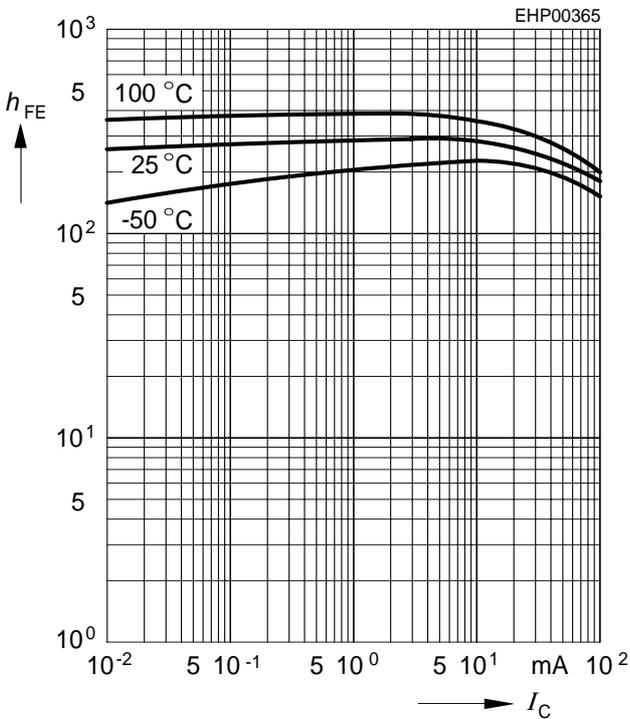
Collector-emitter saturation voltage

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

EHP00367

(graph: I_C (mA) vs V_{CEsat}, curves labeled 100°C, 25°C, -50 °C)
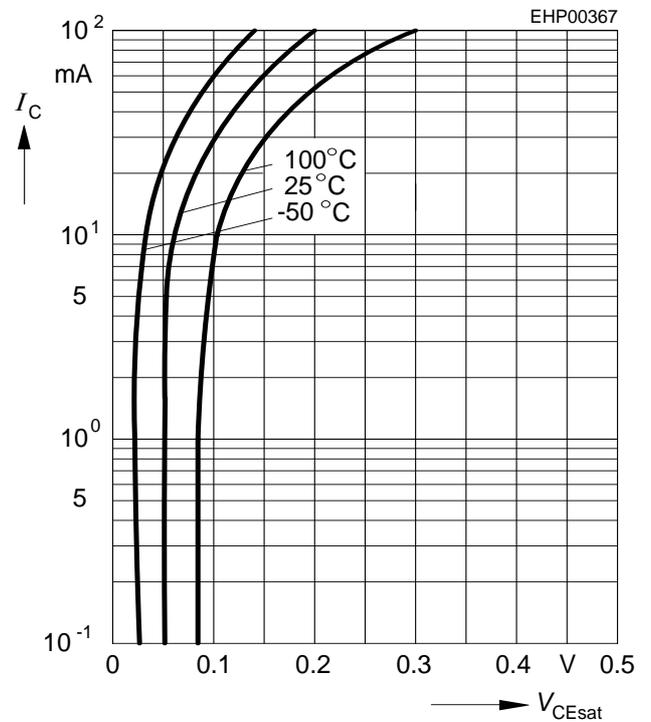
Base-emitter saturation voltage

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

EHP00364

(graph: I_C (mA) vs V_{BEsat}, curves labeled 100°C, 25 °C, -50°C)
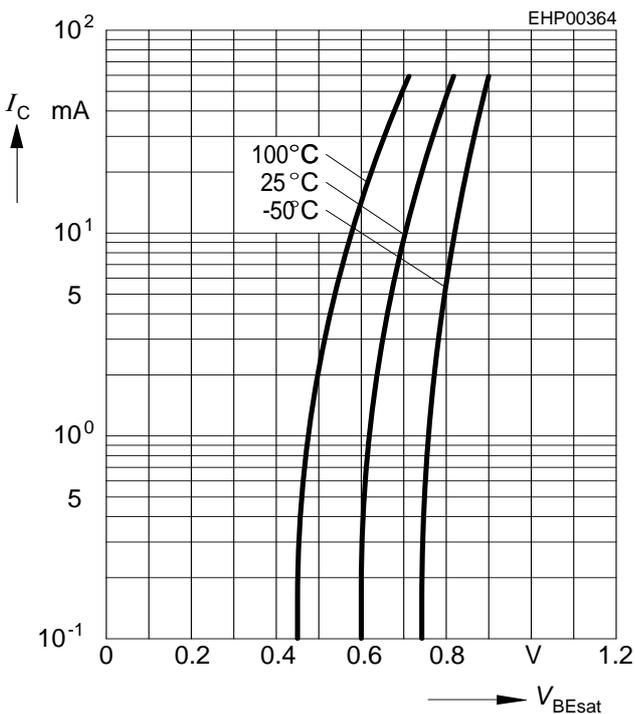
Output characteristics $I_C = f(V_{CE})$,

I_B = parameter

(graph: I_C (mA) vs V_{CE}, curves labeled:
IB = 40 uA
IB = 36 uA
IB = 32 uA
IB = 28 uA
IB = 24 uA
IB = 20 uA
IB = 16 uA
IB = 12 uA
IB = 8 uA
IB = 4uA)

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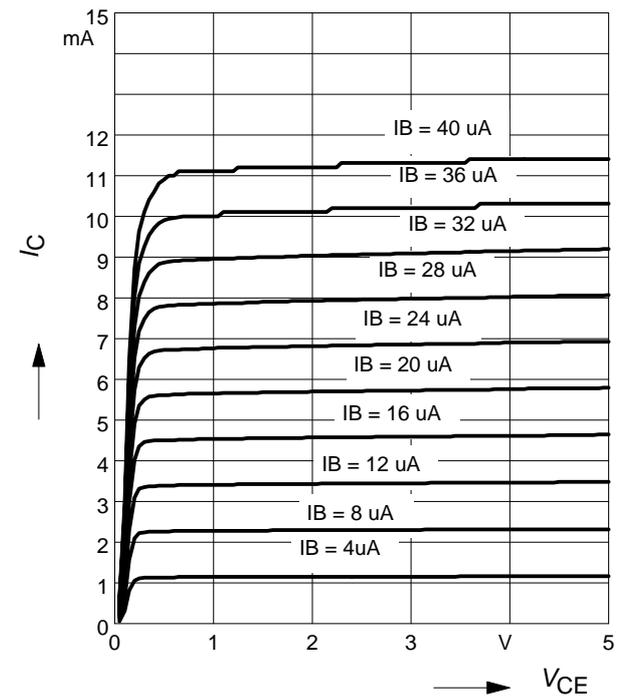
Collector current $I_C = f(V_{BE})$
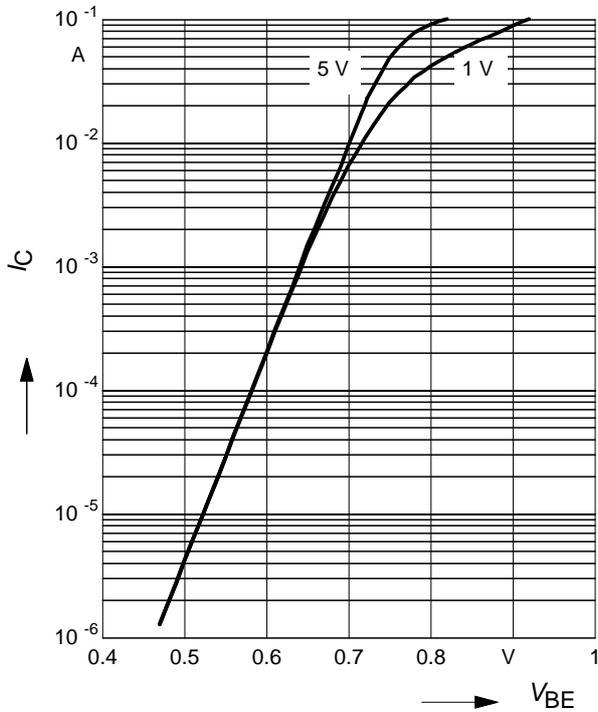
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CBO} = 30$ V
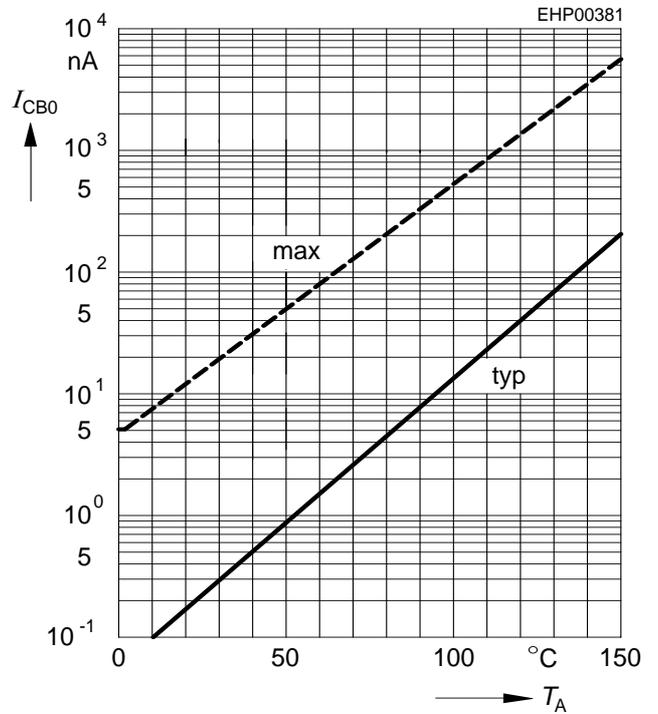
Transition frequency $f_T = f(I_C)$

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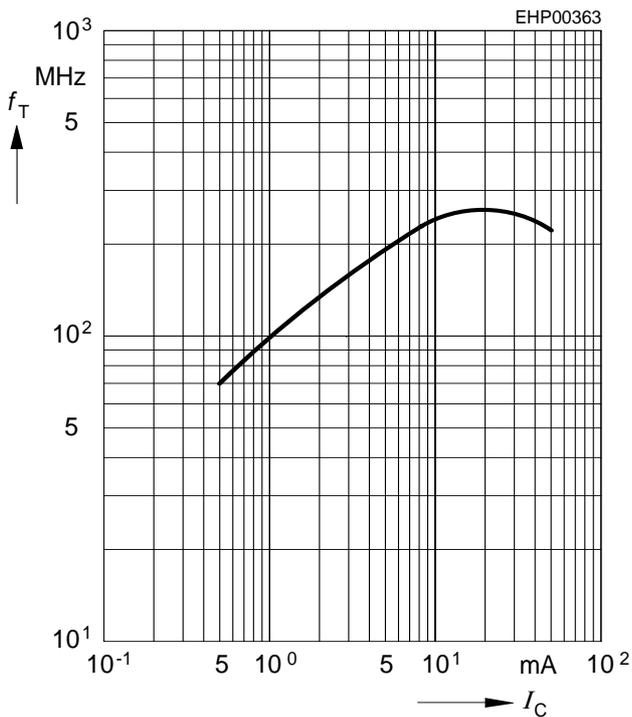

Collector-base capacitance $C_{cb} = f(V_{CB})$

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

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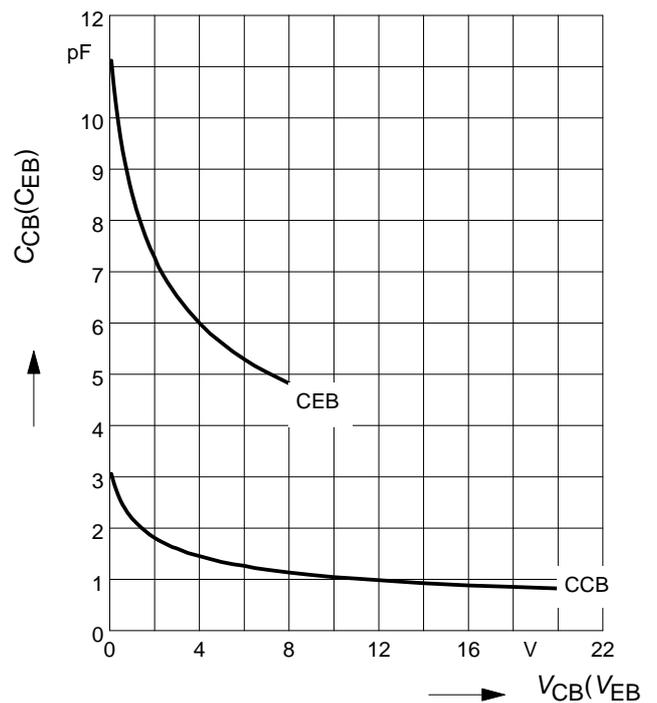
**Total power dissipation** $P_{tot} = f(T_S)$
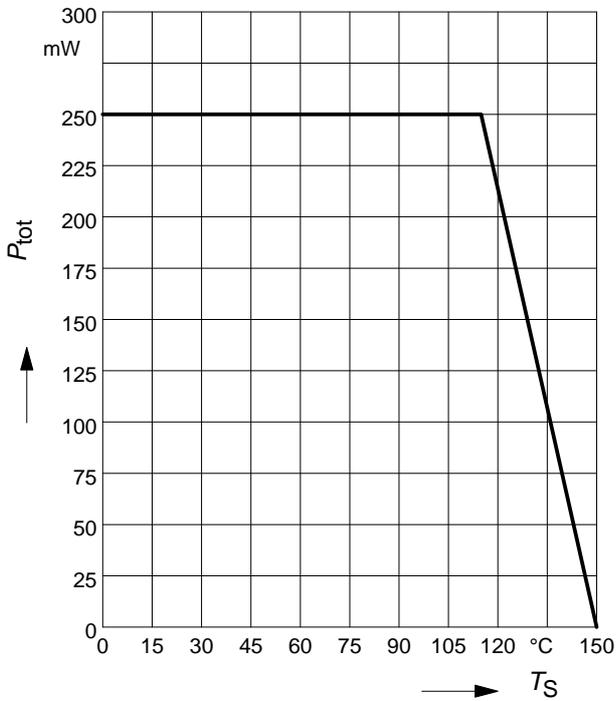
Permissible Pulse Load $R_{thJS} = f(t_p)$
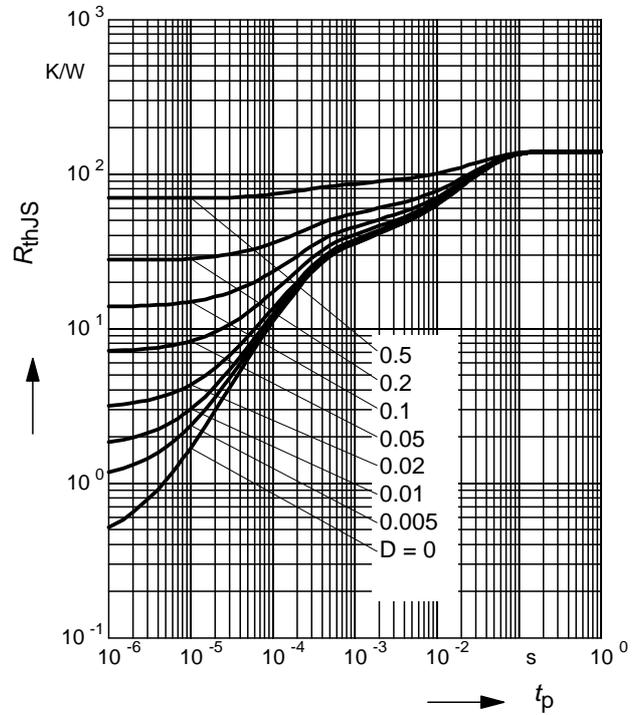
Permissible Pulse Load

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


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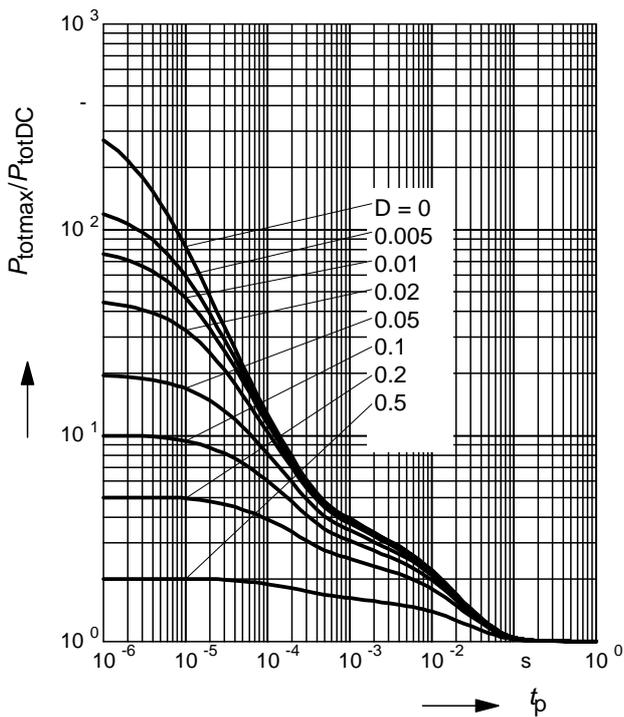
Definition of matching

$\Delta I_C = (I_{C2} - I_{C1})/I_{C1}$
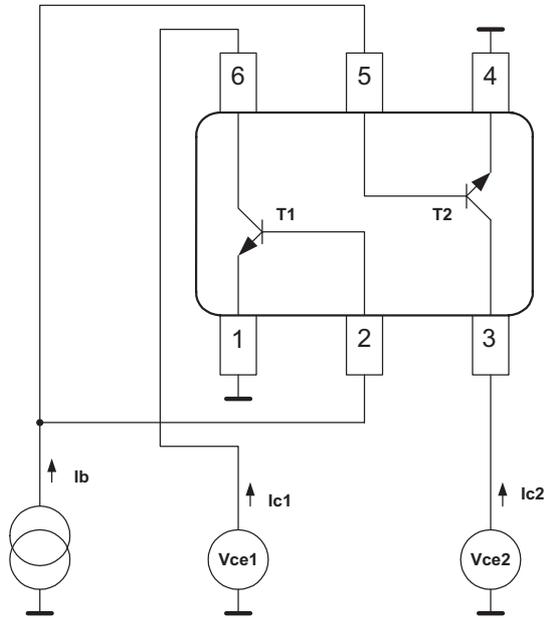
Package Outline
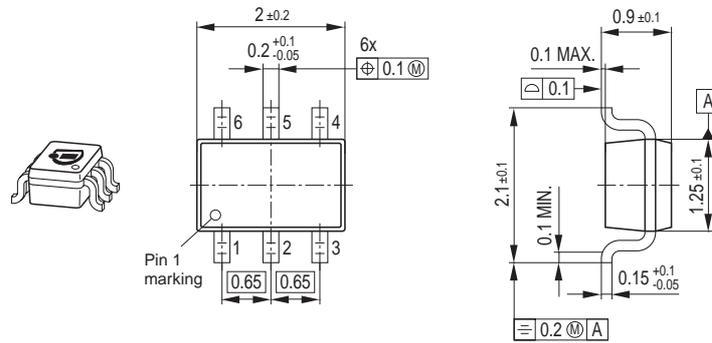
Foot Print
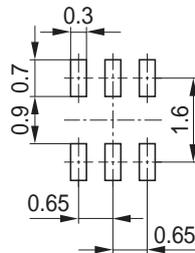
Marking Layout (Example)

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

Manufacturer

2005, June
Date code (Year/Month)

Pin 1 marking
Laser marking

BCR108S
Type code
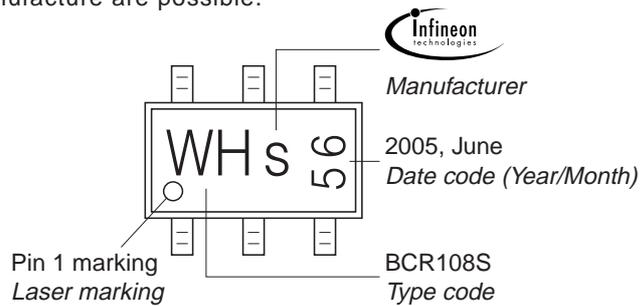
Standard Packing

Reel ⌀180 mm = 3.000 Pieces/Reel
Reel ⌀330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.
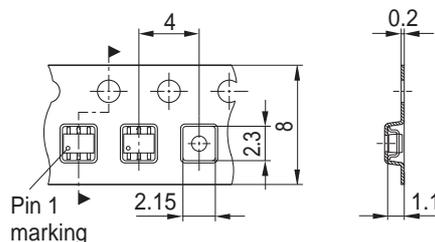
Pin 1
marking

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Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (<www.infineon.com>).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
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