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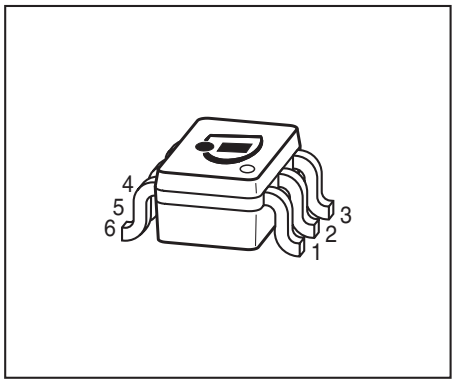
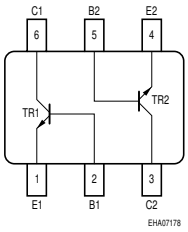
NPN Silicon AF Transistor Array



- 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

AEC Qualified RoHS



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	

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	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 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)

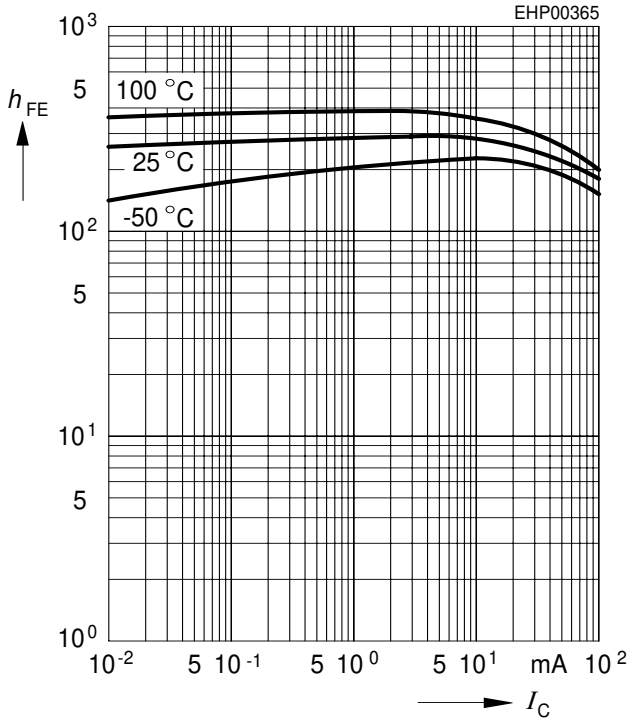
[2]Puls test: t < 300µs; D < 2%

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

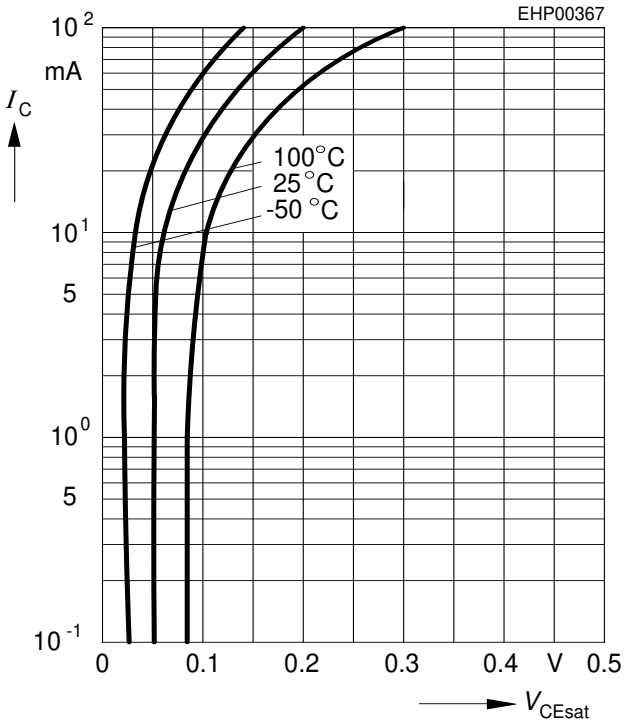
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 5V$



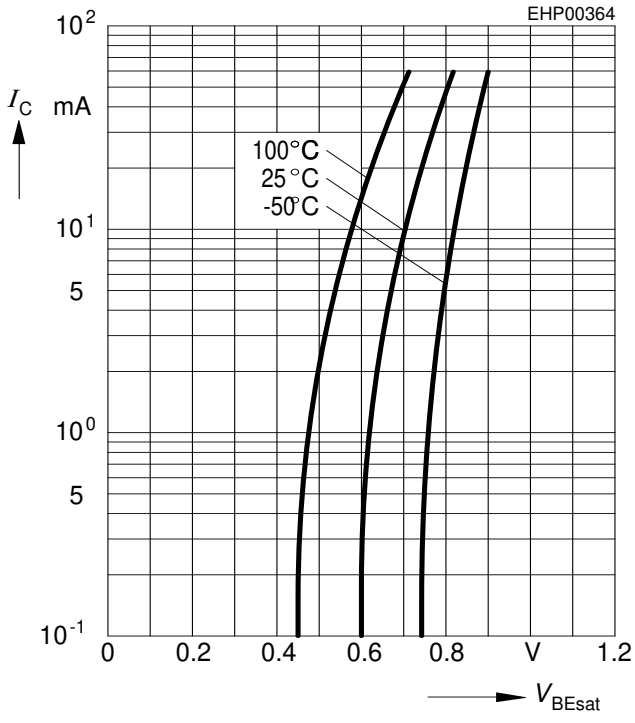
Collector-emitter saturation voltage

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



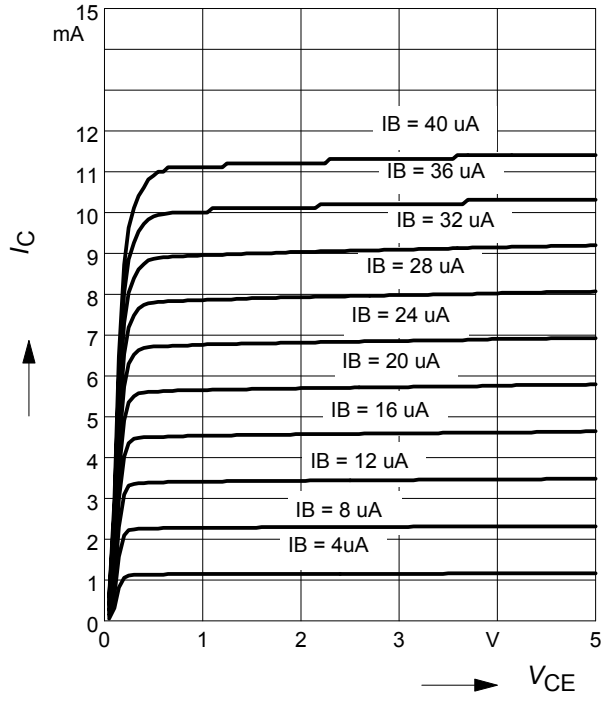
Base-emitter saturation voltage

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

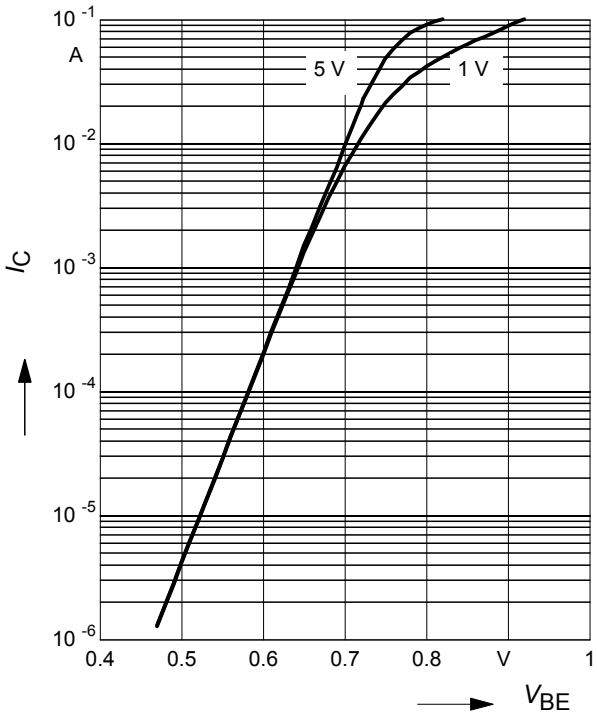


Output characteristics $I_C = f(V_{CE})$,

I_B = parameter

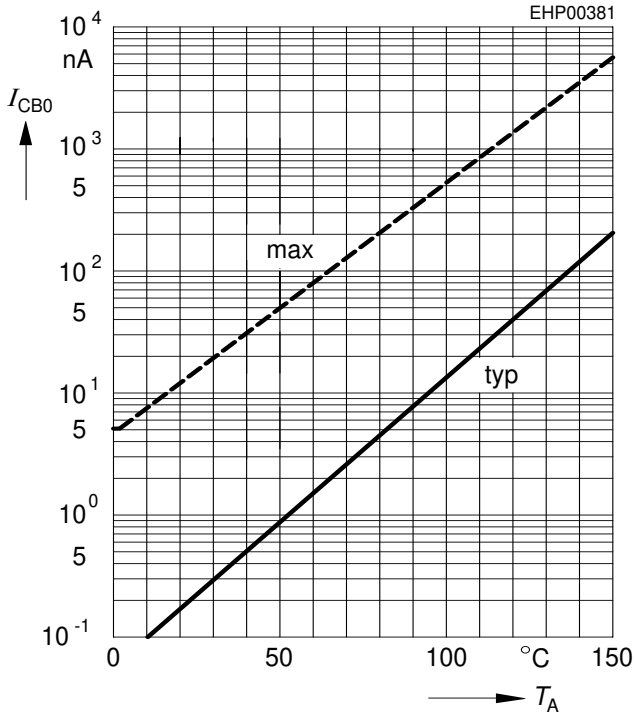


Collector current $I_C = f(V_{BE})$



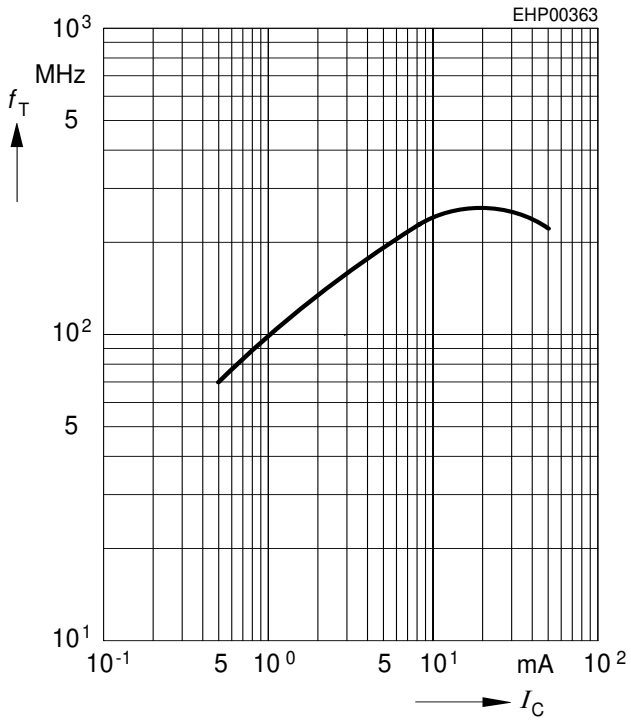
Collector cutoff current $I_{CBO} = f(T_A)$

V_{CBO} = 30 V



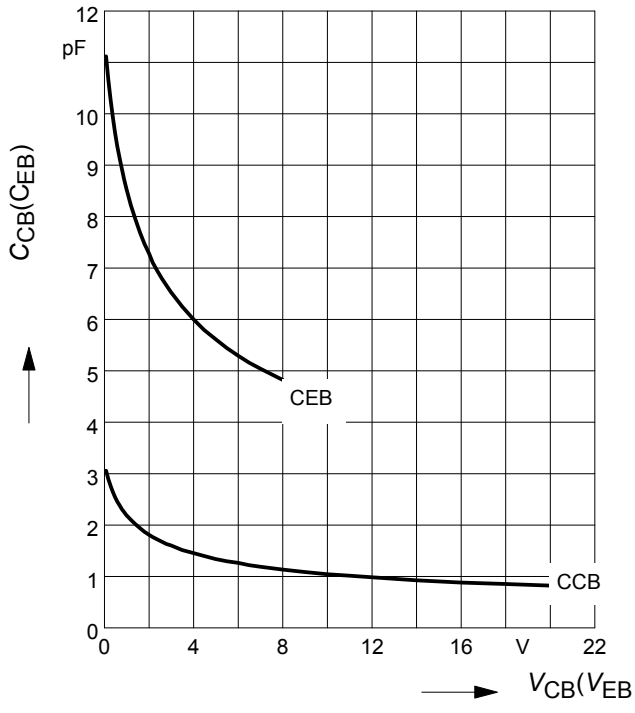
Transition frequency $f_T = f(I_C)$

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

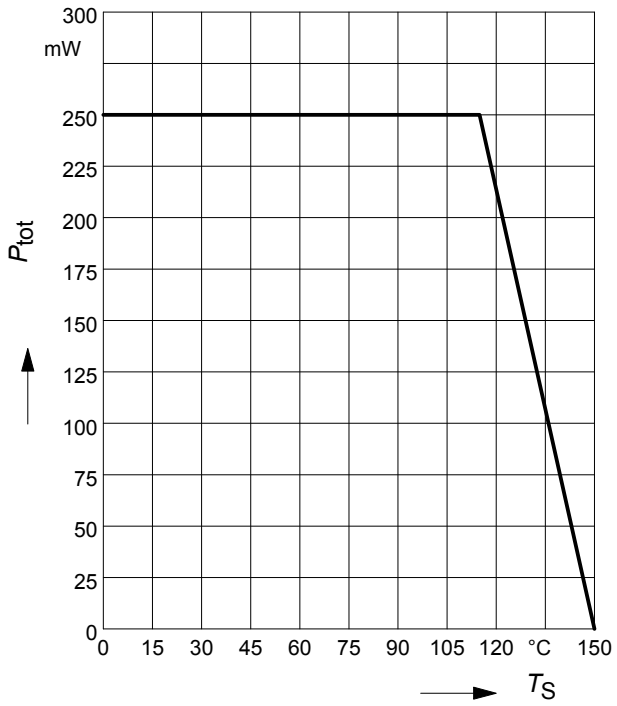


Collector-base capacitance $C_{cb} = f(V_{CB})$

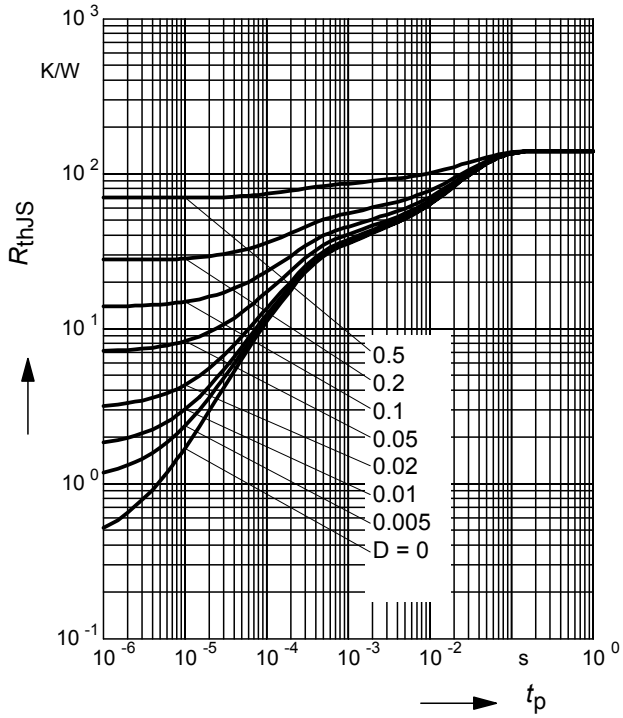
Emitter-base capacitance $C_{eb} = f(V_{EB})$



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

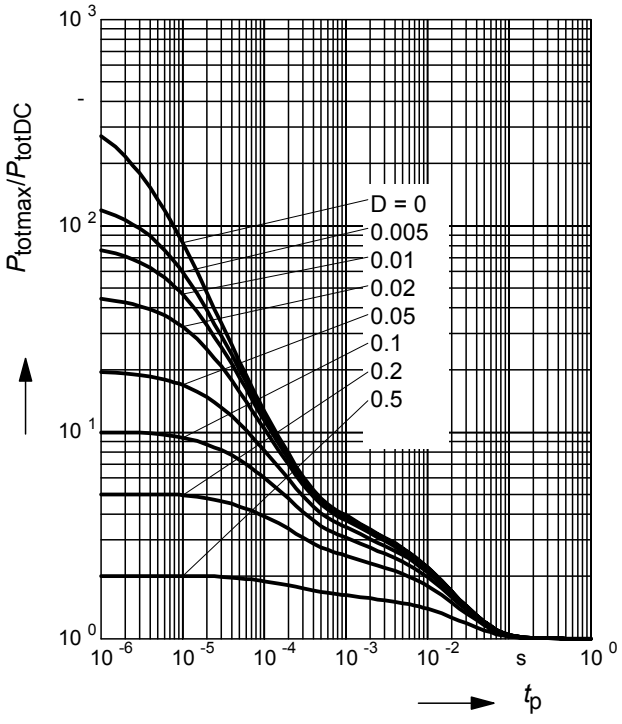


Permissible Pulse Load $R_{thJS} = f(t_p)$



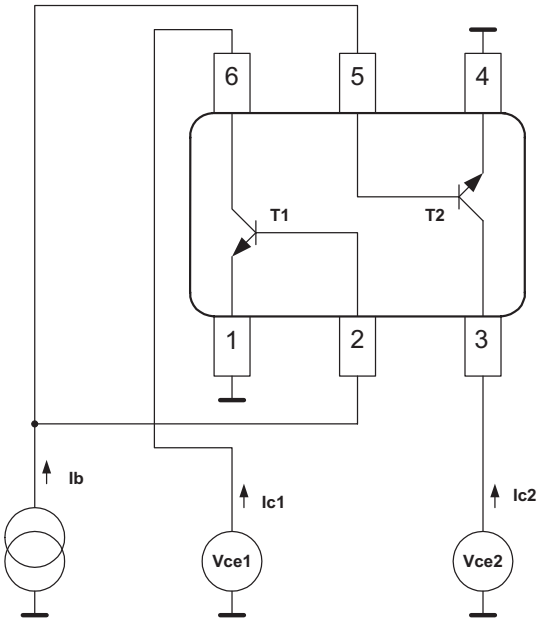
Permissible Pulse Load

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

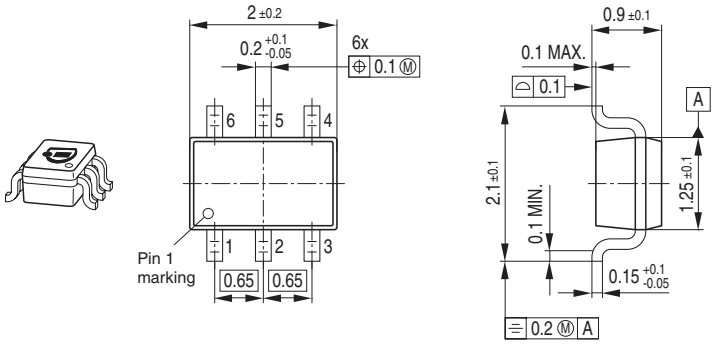


Definition of matching

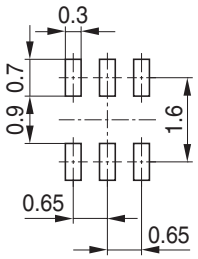
$\Delta I_C = (I_{C2}-I_{C1})/I_{C1}$



Package Outline

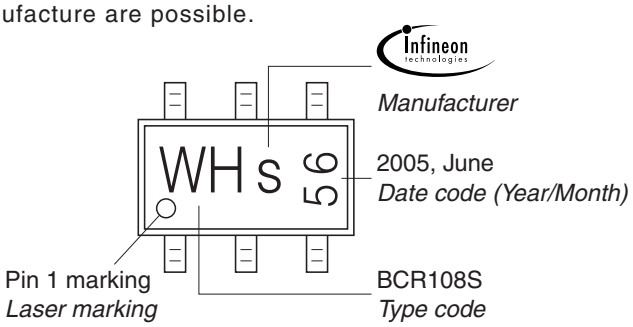


Foot Print



Marking Layout (Example)

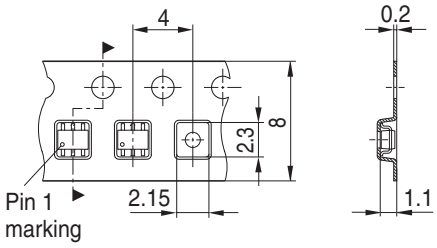
Small variations in positioning of
Date code, Type code and Manufacture are possible.



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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