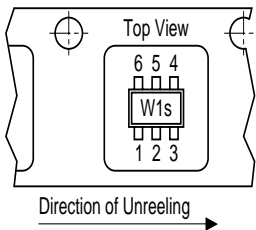


**NPN/PNP Silicon Digital Transistor Array**

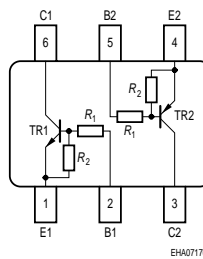
- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor  
 NPN:  $R_1 = 47k\Omega$ ,  $R_2 = 47k\Omega$   
 PNP:  $R_1 = 2.2k\Omega$ ,  $R_2 = 47k\Omega$
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Marking on SOT-363 package (for example W1s) corresponds to pin 1 of device

Position in tape: pin 1 opposite of feed hole side

EHA07193



Type	Marking	Pin Configuration				Package		
BCR48PN	WTs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Input forward voltage	NPN $V_{i(fwd)}$	80	
Input forward voltage	PNP $V_{i(fwd)}$	20	
Input reverse voltage	NPN $V_{i(rev)}$	10	
Input reverse voltage	PNP $V_{i(rev)}$	5	
DC collector current	NPN $I_C$	70	mA
DC collector current	PNP $I_C$	100	
Total power dissipation, $T_S = 115\text{ }^\circ\text{C}$	$P_{tot}$	250	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-65...+150	

**Thermal Resistance**

Junction - soldering point <sup>1)</sup>	$R_{thJS}$	$\leq 140$	K/W
--	------------	------------	-----

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics for NPN Type**

Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter cutoff current $V_{EB} = 10 \text{V}, I_C = 0$	$I_{EBO}$	-	-	164	$\mu\text{A}$
DC current gain 2) $I_C = 5 \text{mA}, V_{CE} = 5 \text{V}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage <sup>2)</sup> $I_C = 10 \text{mA}, I_B = 0.5 \text{mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{V}$	$V_{i(off)}$	0.8	-	1.5	
Input on Voltage $I_C = 2 \text{mA}, V_{CE} = 0.3 \text{V}$	$V_{i(on)}$	1	-	3	
Input resistor	$R_1$	32	47	62	$\text{k}\Omega$
Resistor ratio	$R_1/R_2$	0.9	1	1.1	-

**AC Characteristics for NPN Type**

Transition frequency $I_C = 10 \text{mA}, V_{CE} = 5 \text{V}, f = 100 \text{MHz}$	$f_T$	-	100	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{V}, f = 1 \text{MHz}$	$C_{cb}$	-	3	-	pF

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

<sup>2)</sup>Pulse test:  $t < 300\mu\text{s}; D < 2\%$

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

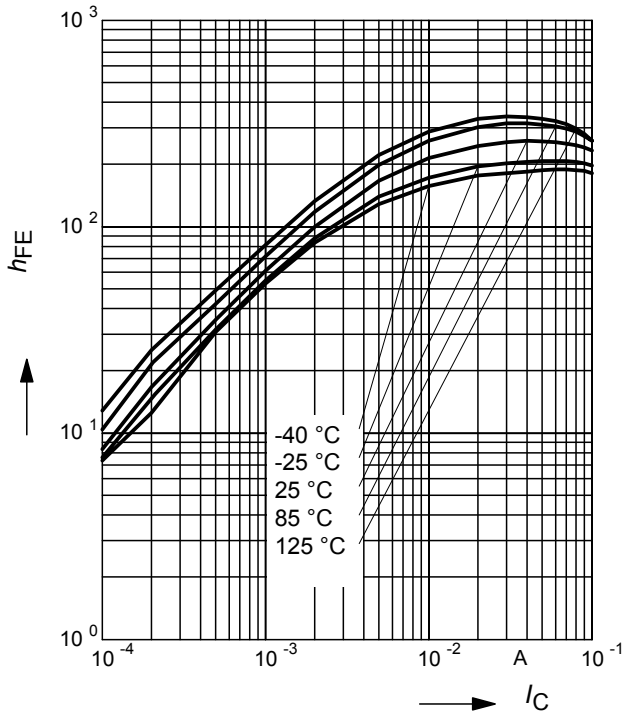
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics for PNP Type</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter cutoff current $V_{EB} = 5 \text{V}, I_C = 0$	$I_{EBO}$	-	-	164	$\mu\text{A}$
DC current gain 1) $I_C = 5 \text{mA}, V_{CE} = 5 \text{V}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage 1) $I_C = 10 \text{mA}, I_B = 0.5 \text{mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{V}$	$V_{i(off)}$	0.4	-	0.8	
Input on voltage $I_C = 2 \text{mA}, V_{CE} = 0.3 \text{V}$	$V_{i(on)}$	0.5	-	1.1	
Input resistor	$R_1$	1.5	2.2	2.9	$\text{k}\Omega$
Resistor ratio	$R_1/R_2$	0.042	0.047	0.052	-
<b>AC Characteristics for PNP Type</b>					
Transition frequency $I_C = 10 \text{mA}, V_{CE} = 5 \text{V}, f = 100 \text{MHz}$	$f_T$	-	200	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{V}, f = 1 \text{MHz}$	$C_{cb}$	-	3	-	pF

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

**NPN Type**

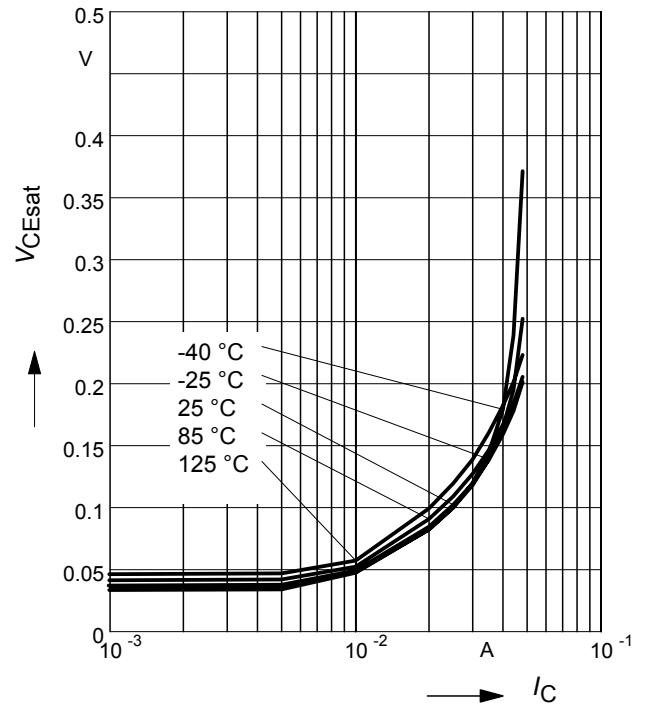
**DC Current Gain  $h_{FE} = f(I_C)$**

$V_{CE} = 5V$  (common emitter configuration)



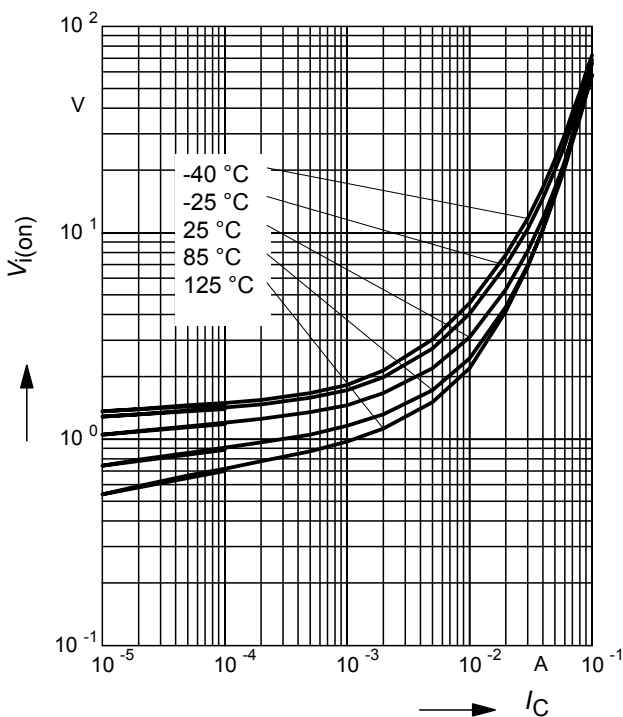
**Collector-Emitter Saturation Voltage**

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



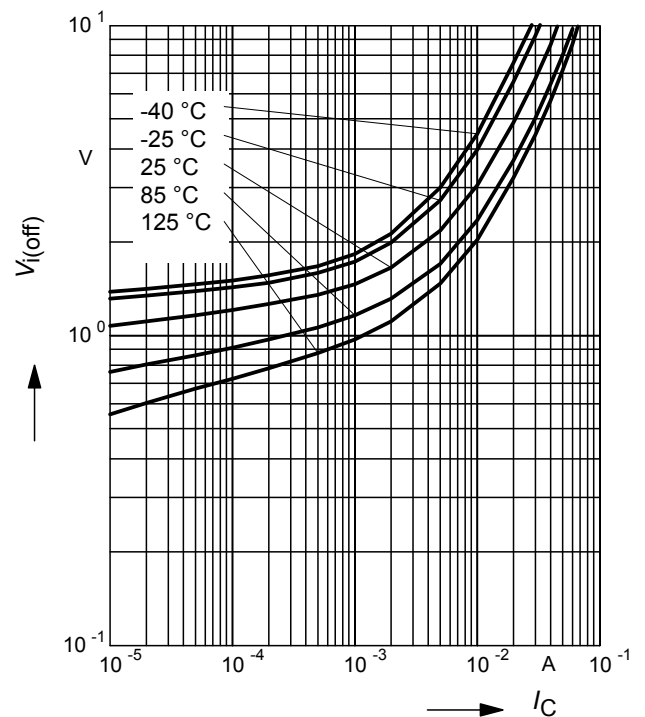
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3V$  (common emitter configuration)



**Input off voltage  $V_{i(off)} = f(I_C)$**

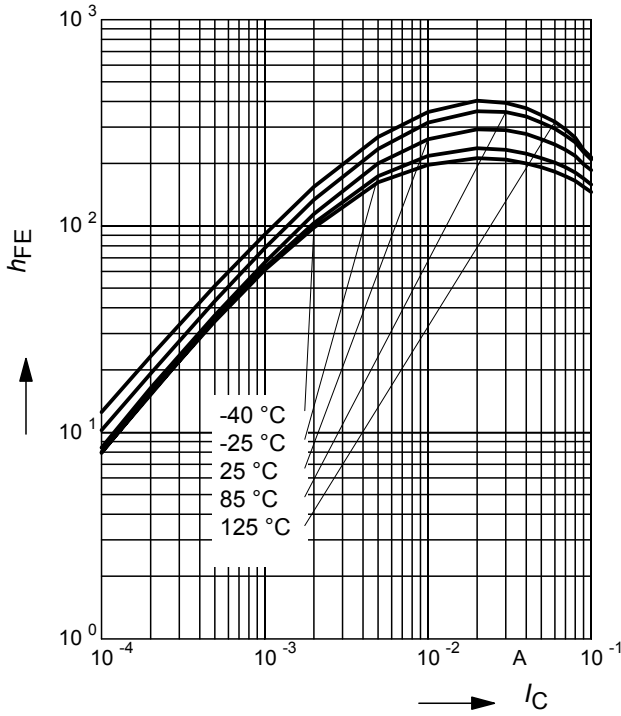
$V_{CE} = 5V$  (common emitter configuration)



**PNP Type**

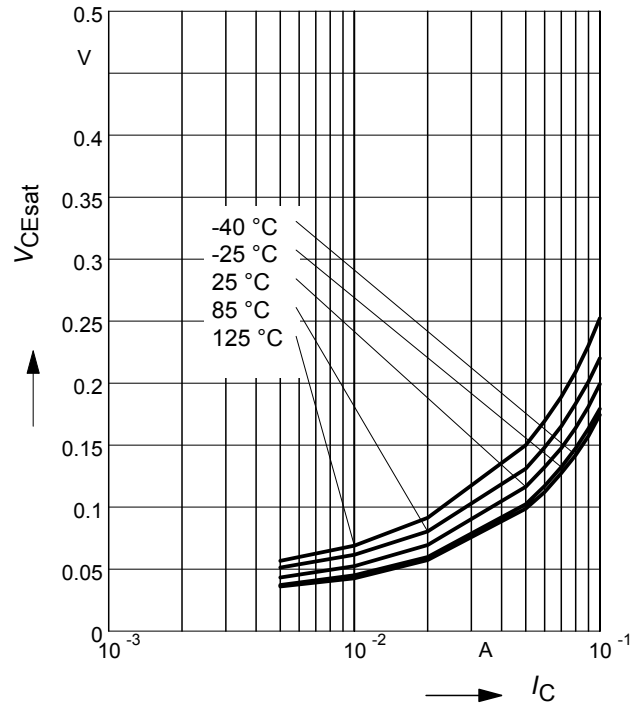
**DC Current Gain  $h_{FE} = f(I_C)$**

$V_{CE} = 5V$  (common emitter configuration)



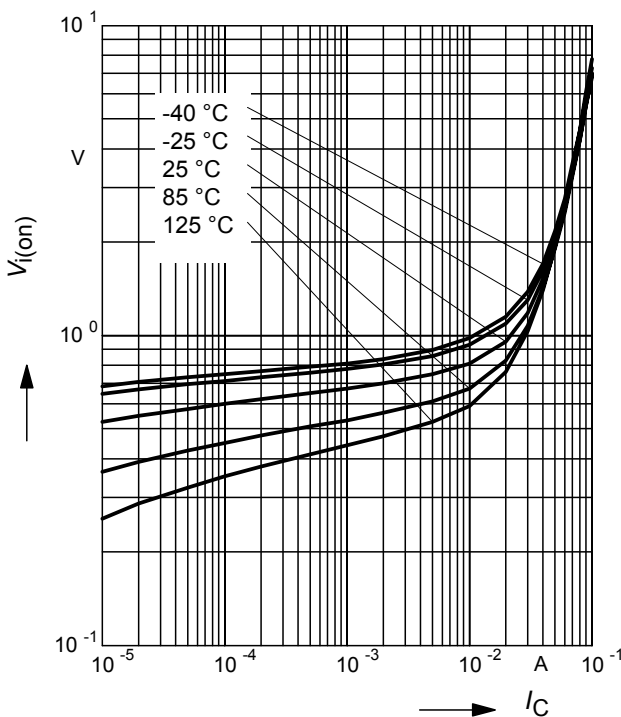
**Collector-Emitter Saturation Voltage**

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



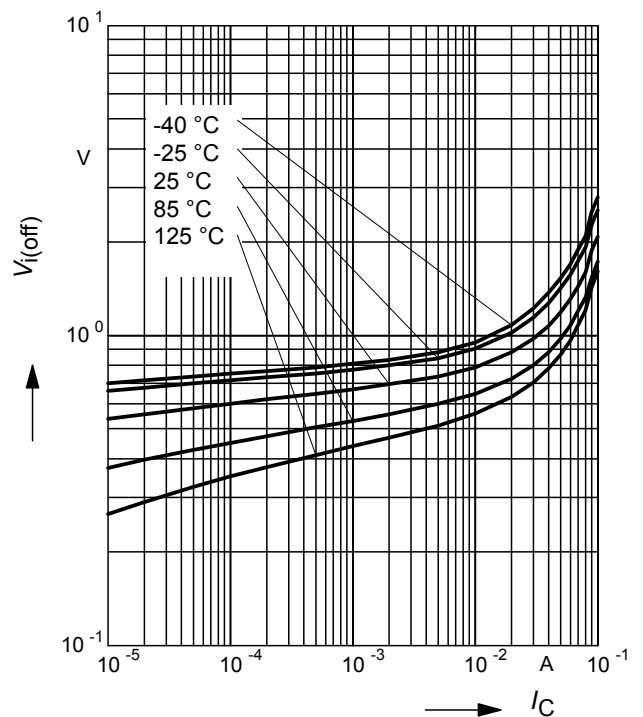
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3V$  (common emitter configuration)

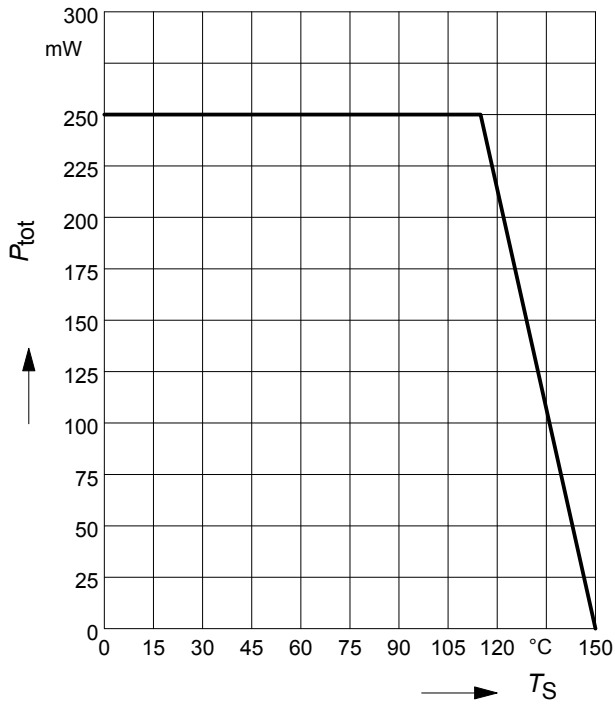


**Input off voltage  $V_{i(off)} = f(I_C)$**

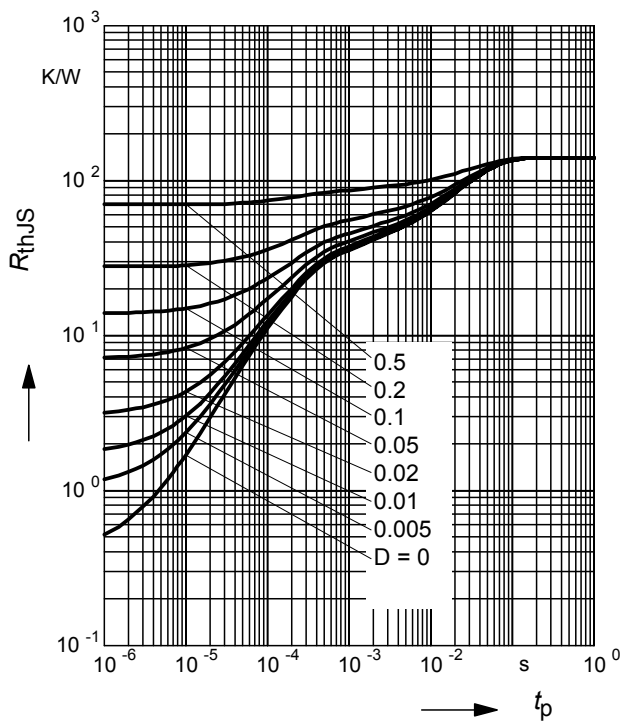
$V_{CE} = 5V$  (common emitter configuration)



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

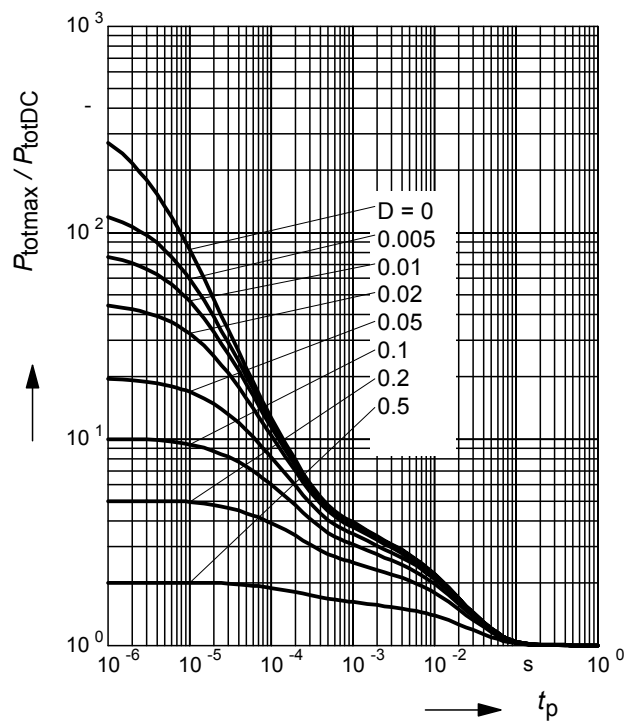


**Permissible Pulse Load  $R_{thJS} = f(t_p)$**

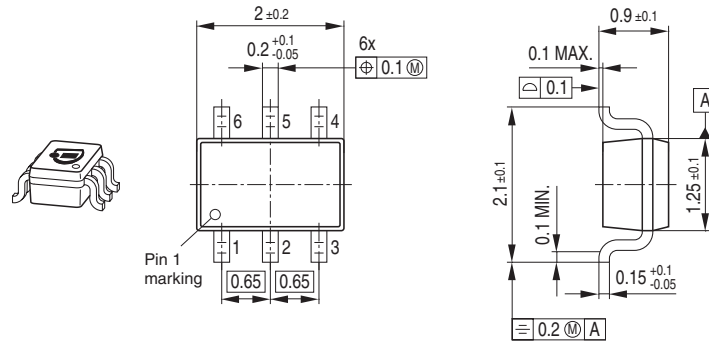


**Permissible Pulse Load**

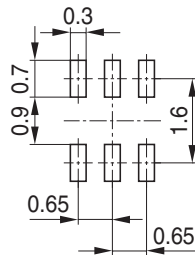
$P_{totmax} / P_{totDC} = f(t_p)$



Package Outline

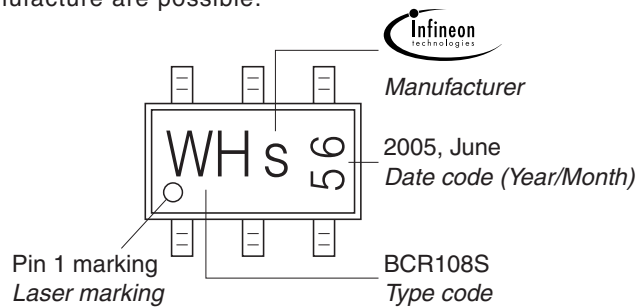


Foot Print



Marking Layout (Example)

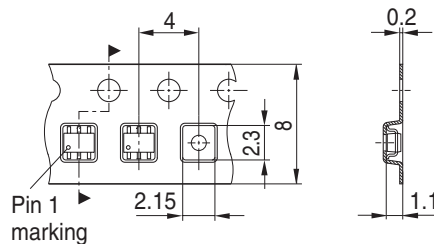
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



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