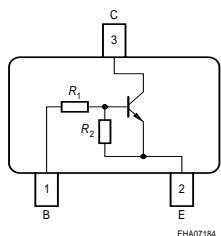
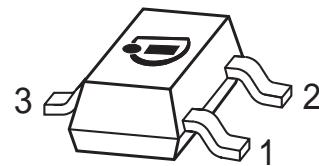


## NPN Silicon Digital Transistor

- Built in bias resistor ( $R_1 = 10 \text{ k}\Omega$ ,  $R_2 = 10 \text{ k}\Omega$ )
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration			Package
BCR533	XCs	1=B	2=E	3=C	SOT23

### Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Input forward voltage	$V_i(\text{fwd})$	50	
Input reverse voltage	$V_i(\text{rev})$	10	
Collector current	$I_C$	500	
Total power dissipation- $T_S \leq 79 \text{ }^\circ\text{C}$	$P_{\text{tot}}$	330	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-65 ... 150	

### Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup>	$R_{\text{thJS}}$	$\leq 215$	K/W

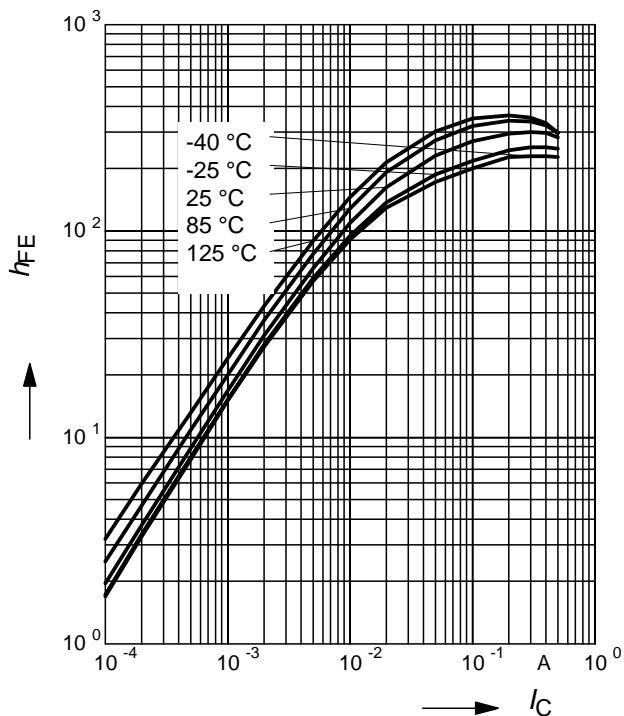
<sup>1)</sup>For calculation of  $R_{\text{thJA}}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

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

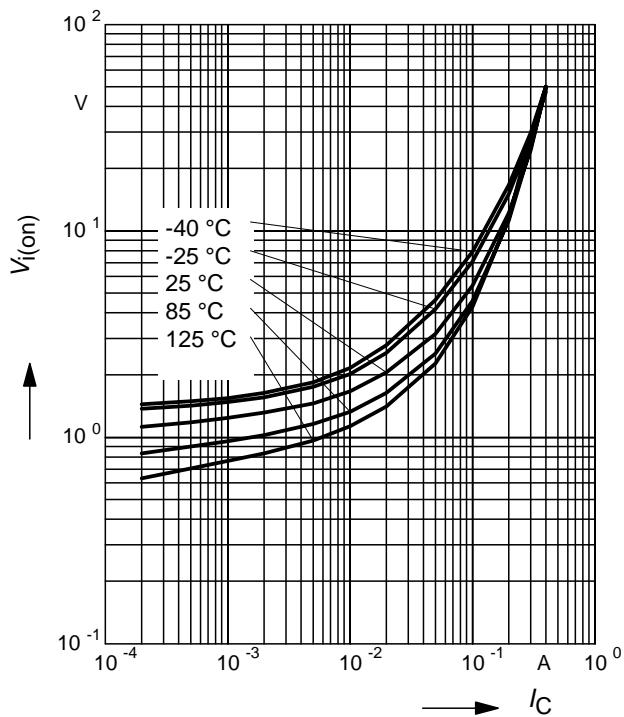
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(\text{BR})\text{CEO}}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(\text{BR})\text{CBO}}$	50	-	-	
Collector-base cutoff current $V_{CB} = 50 \text{ V}, I_E = 0$	$I_{\text{CBO}}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 10 \text{ V}, I_C = 0$	$I_{\text{EBO}}$	-	-	0.75	mA
DC current gain- $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{\text{FE}}$	70	-	-	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$	$V_{\text{CEsat}}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(\text{off})}$	0.6	-	1.5	
Input on voltage $I_C = 10 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(\text{on})}$	1	-	2.5	
Input resistor	$R_1$	7	10	13	kΩ
Resistor ratio	$R_1/R_2$	0.9	1	1.1	-
<b>AC Characteristics</b>					
Transition frequency $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	100	-	MHz

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

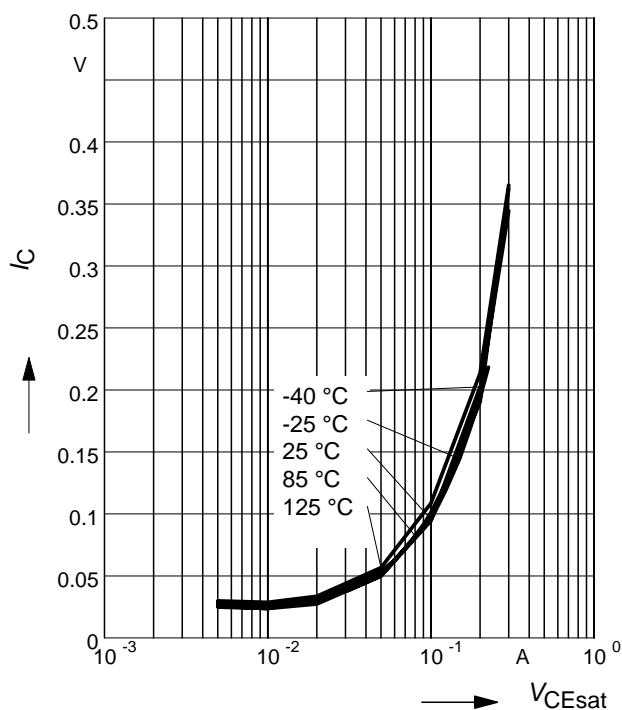
**DC current gain**  $h_{FE} = f(I_C)$   
 $V_{CE} = 5 \text{ V}$  (common emitter configuration)



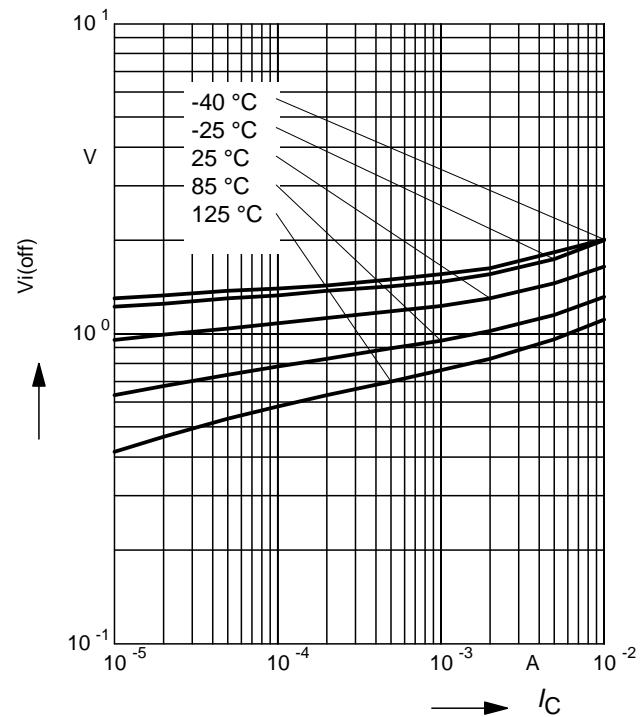
**Input on Voltage**  $V_{i(on)} = f(I_C)$   
 $V_{CE} = 0.3 \text{ V}$  (common emitter configuration)



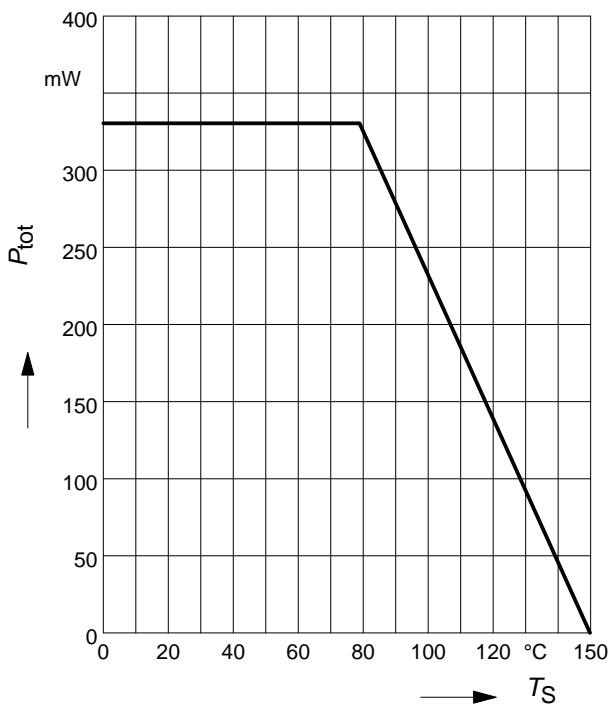
**Collector-emitter saturation voltage**  
 $V_{CEsat} = f(I_C)$ ,  $h_{FE} = 20$



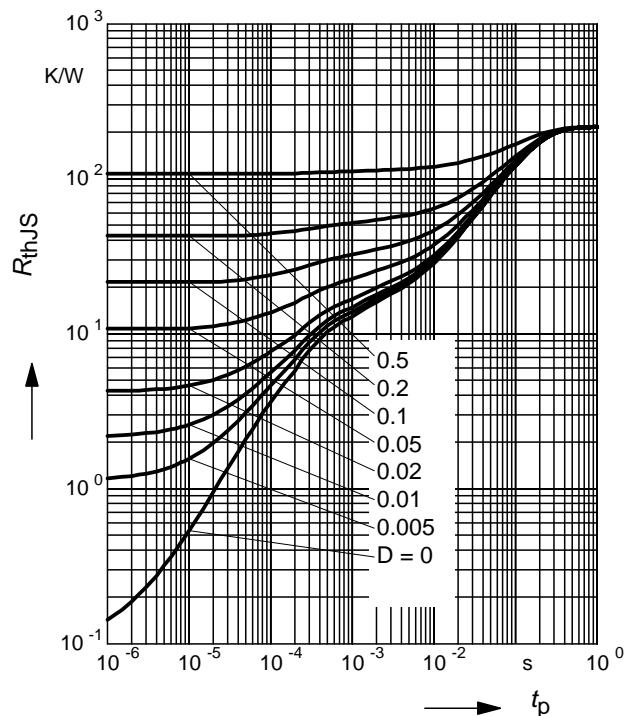
**Input off voltage**  $V_{i(off)} = f(I_C)$   
 $V_{CE} = 5 \text{ V}$  (common emitter configuration)



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

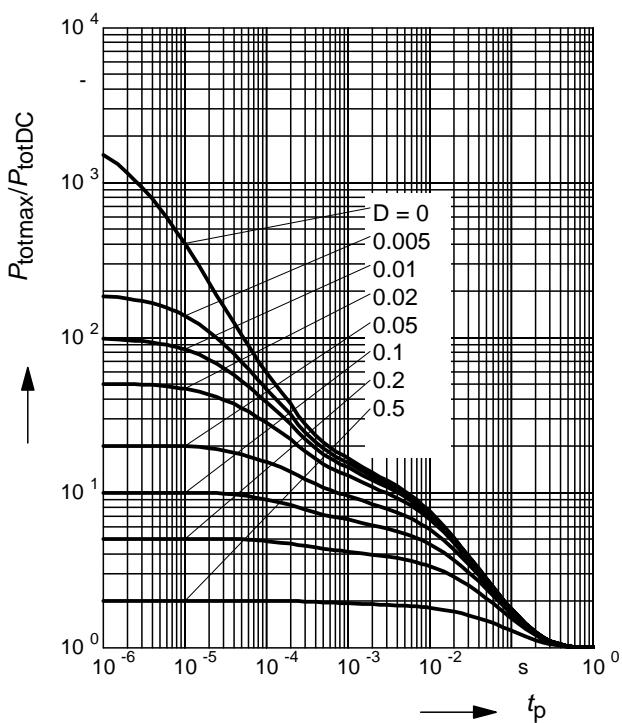


**Permissible Pulse Load**  $R_{\text{thJS}} = f(t_p)$

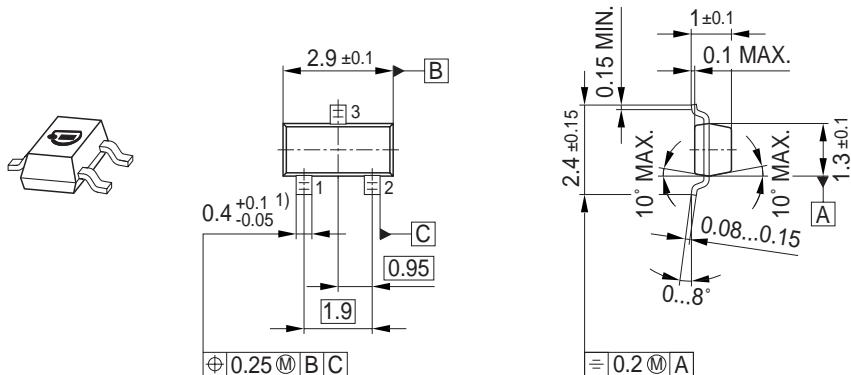


**Permissible Pulse Load**

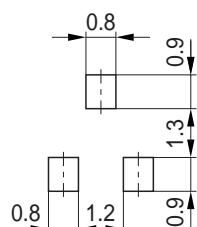
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



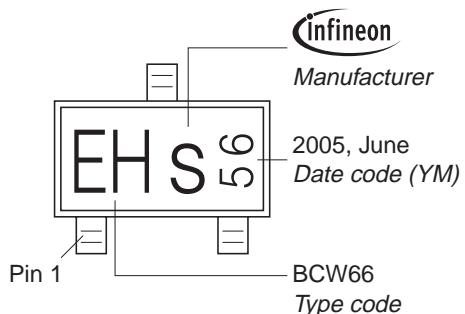
## Package Outline



## Foot Print

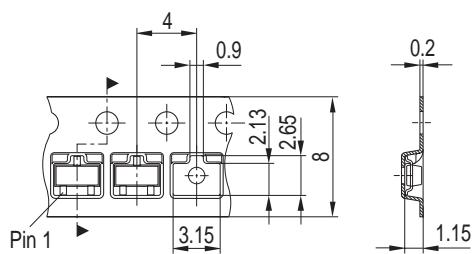


## Marking Layout (Example)



## Standard Packing

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



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