

**NPN Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit driver circuit
- Built in bias resistor ( $R_1=10\text{ k}\Omega$ ,  $R_2=47\text{ k}\Omega$ )
- BCR135S: Two internally isolated transistors with good matching in one multichip package
- BCR135S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



**BCR135  
BCR135W**



**BCR135S**



Type	Marking	Pin Configuration						Package
		1=B	2=E	3=C	-	-	-	
BCR135	WJs	1=B	2=E	3=C	-	-	-	SOT23
BCR135S	WJs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363
BCR135W	WJs	1=B	2=E	3=C	-	-	-	SOT323

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Input forward voltage	$V_{i(fwd)}$	40	
Input reverse voltage	$V_{i(rev)}$	6	
Collector current	$I_C$	100	mA
Total power dissipation	$P_{tot}$		mW
BCR135, $T_S \leq 102^\circ\text{C}$		200	
BCR135S, $T_S \leq 115^\circ\text{C}$		250	
BCR135W, $T_S \leq 124^\circ\text{C}$		250	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup>	$R_{thJS}$		K/W
BCR135		$\leq 240$	
BCR135S		$\leq 140$	
BCR135W		$\leq 105$	

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

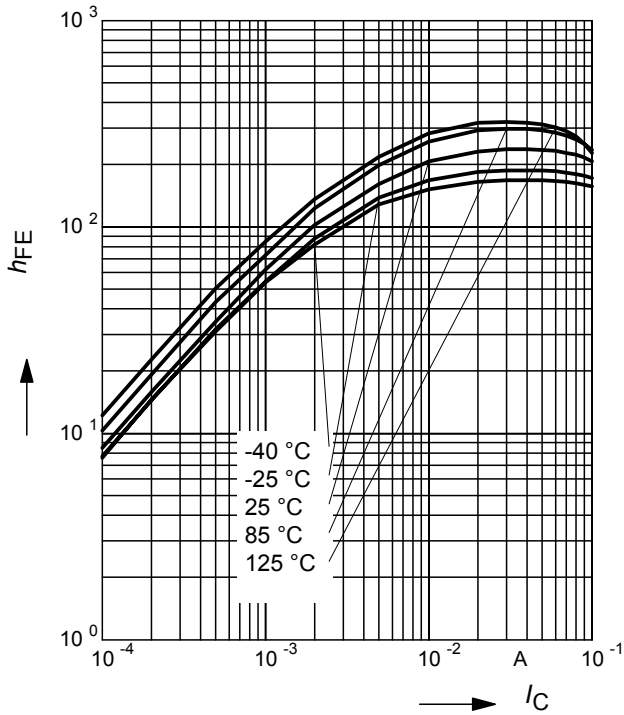
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector-base cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 6 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	167	$\mu\text{A}$
DC current gain <sup>1)</sup> $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.5	-	1	
Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	0.5	-	1.4	
Input resistor	$R_1$	7	10	13	$\text{k}\Omega$
Resistor ratio	$R_1/R_2$	0.19	0.21	0.24	-
<b>AC Characteristics</b>					
Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	150	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF

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

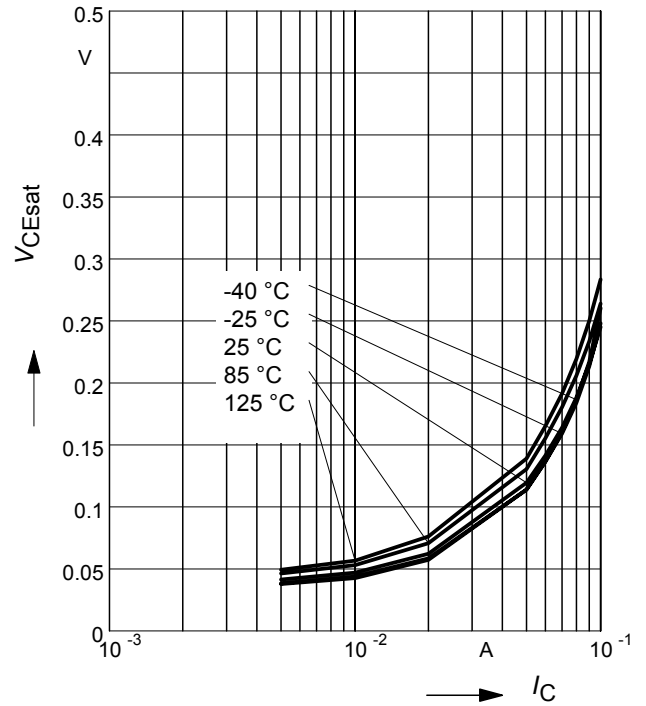
**DC current gain  $h_{FE} = f(I_C)$**

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



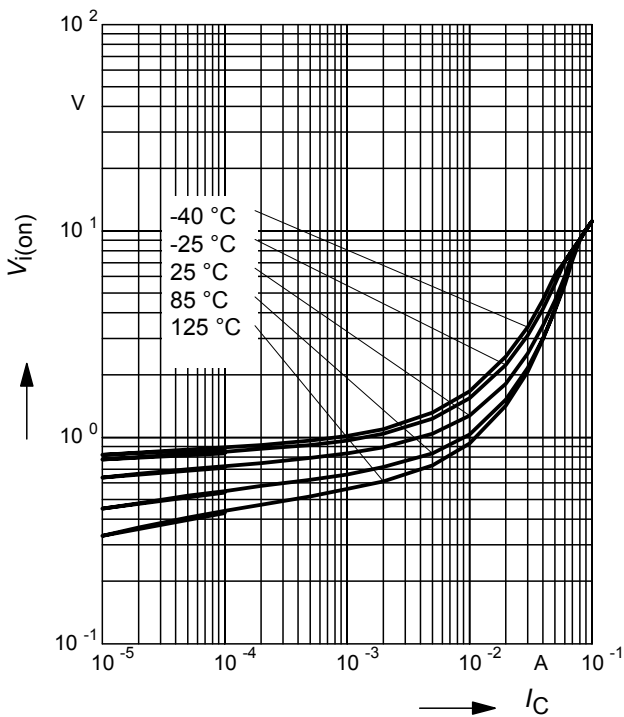
**Collector-emitter saturation voltage**

$V_{CEsat} = f(I_C), I_C/I_B = 20$



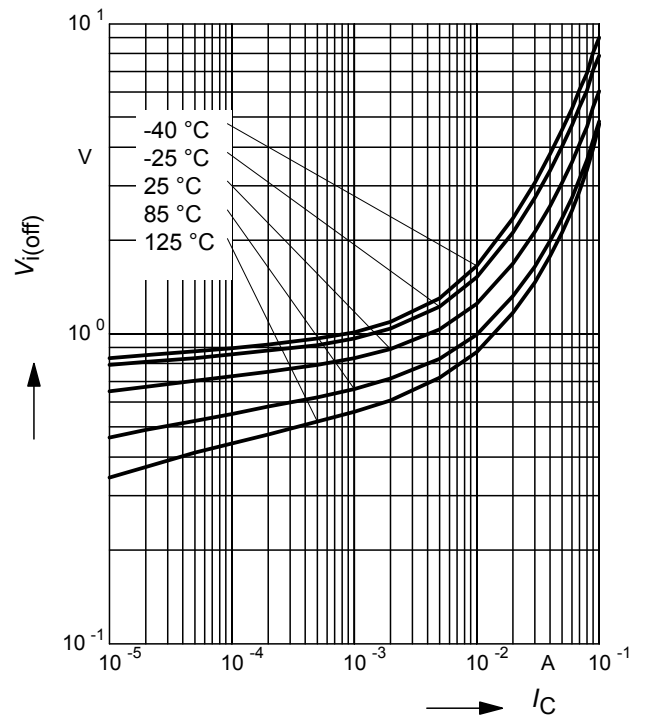
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



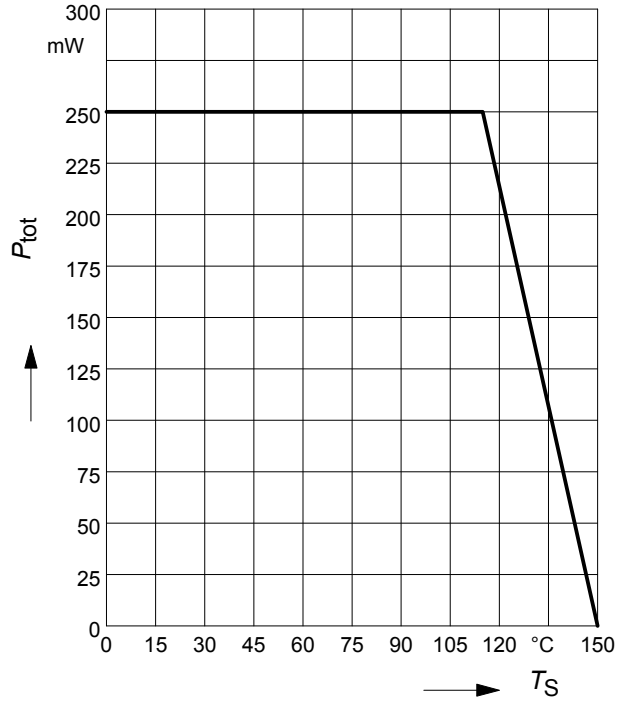
Total power dissipation  $P_{tot} = f(T_S)$

BCR135



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

BCR135S



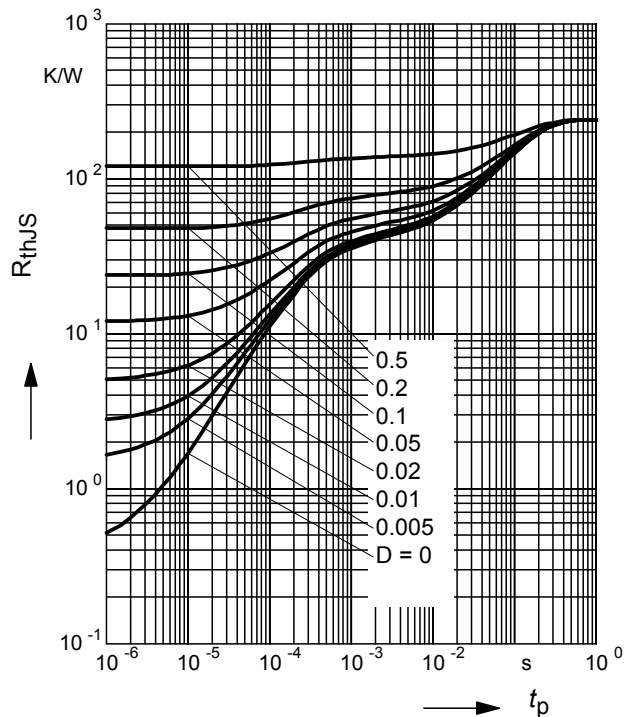
Total power dissipation  $P_{tot} = f(T_S)$

BCR135W



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

BCR135



**Permissible Pulse Load**

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

BCR135



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

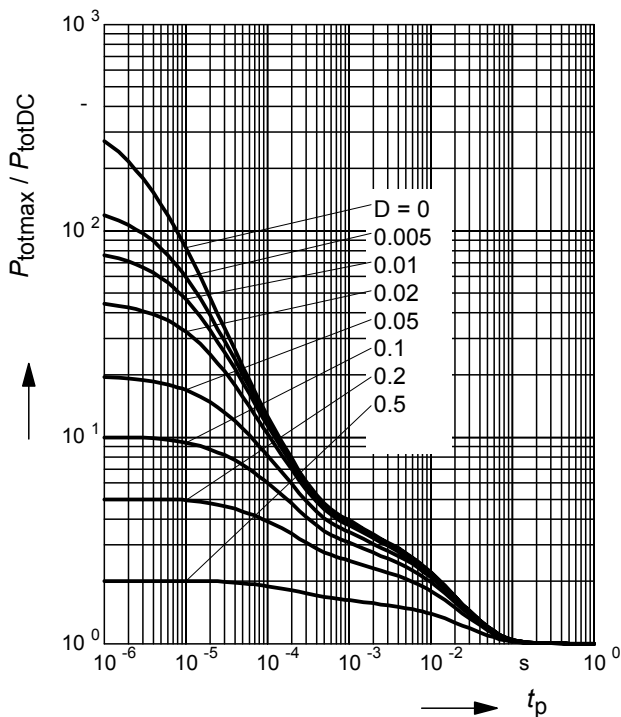
BCR135S



**Permissible Pulse Load**

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

BCR135S



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

BCR135W



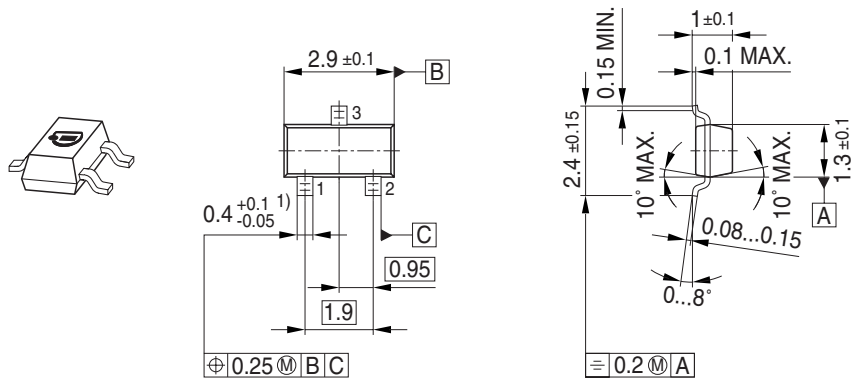
**Permissible Pulse Load**

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

BCR135W



Package Outline



1) Lead width can be 0.6 max. in dambar area

Foot Print



Marking Layout (Example)



Standard Packing

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





Package Outline



Foot Print



Marking Layout (Example)



Standard Packing

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



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 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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