

**NPN Silicon Digital Transistors**

- Switching circuit, inverter circuit, driver circuit
- Built in bias resistor ( $R_1= 1\text{ k}\Omega$ ,  $R_2= 10\text{ k}\Omega$ )
- BCR523U: Two (galvanic) internal isolated transistors with good matching in one package
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101


**BCR523**
**BCR523U**


Type	Marking	Pin Configuration						Package
BCR523	XGs	1=B	2=E	3=C	-	-	-	SOT23
BCR523U	XGs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SC74

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Input forward voltage	$V_{i(fwd)}$	12	
Input reverse voltage	$V_{i(rev)}$	5	
Collector current	$I_C$	500	mA
Total power dissipation-	$P_{tot}$		mW
$T_S \leq 79\text{ }^\circ\text{C}$ , BCR523		330	
$T_S \leq 115\text{ }^\circ\text{C}$ , BCR523U		330	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup> BCR523 BCR523U	$R_{thJS}$	$\leq 215$ $\leq 105$	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

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 $V_{CB} = 50 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	0.72	mA
DC current gain- $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage <sup>2)</sup> $I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.3	-	1	
Input on voltage $I_C = 10 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	0.4	-	1.4	
Input resistor	$R_1$	0.7	1	1.3	k $\Omega$
Resistor ratio	$R_1/R_2$	0.09	0.1	0.11	-

**AC Characteristics**

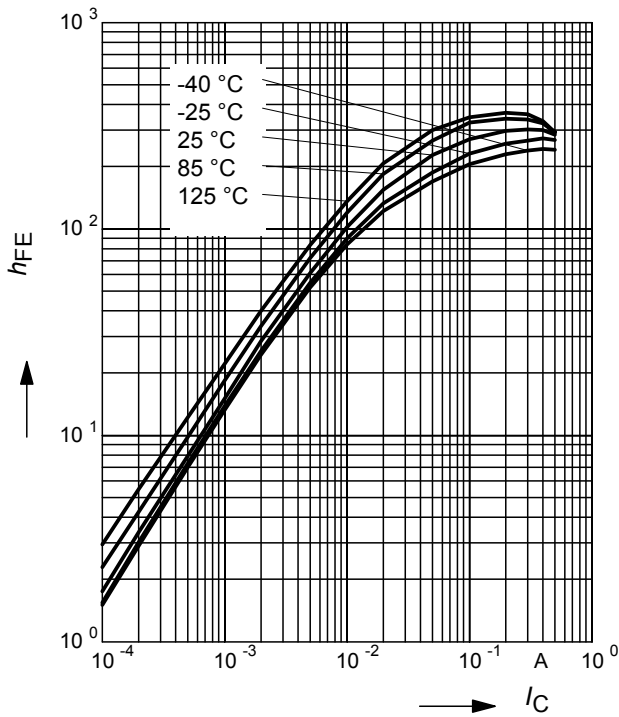
Transition frequency $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	100	-	MHz
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<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

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

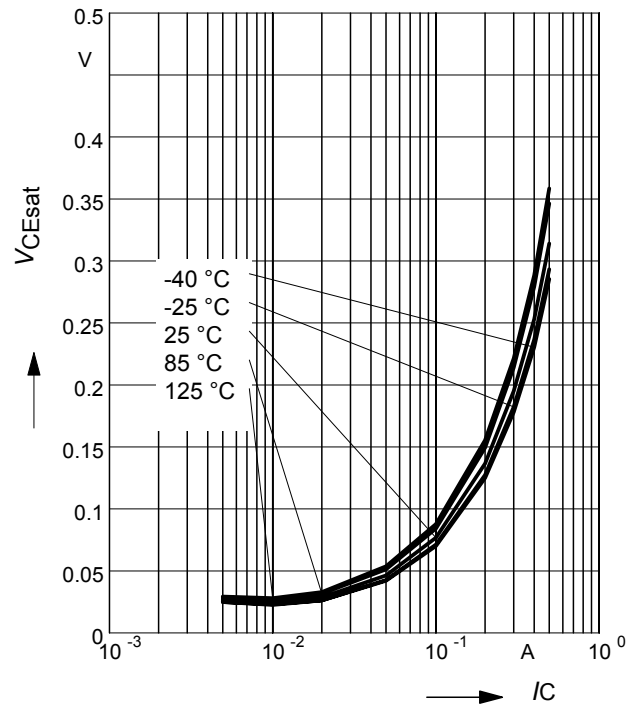
**DC current gain  $h_{FE} = f(I_C)$**

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



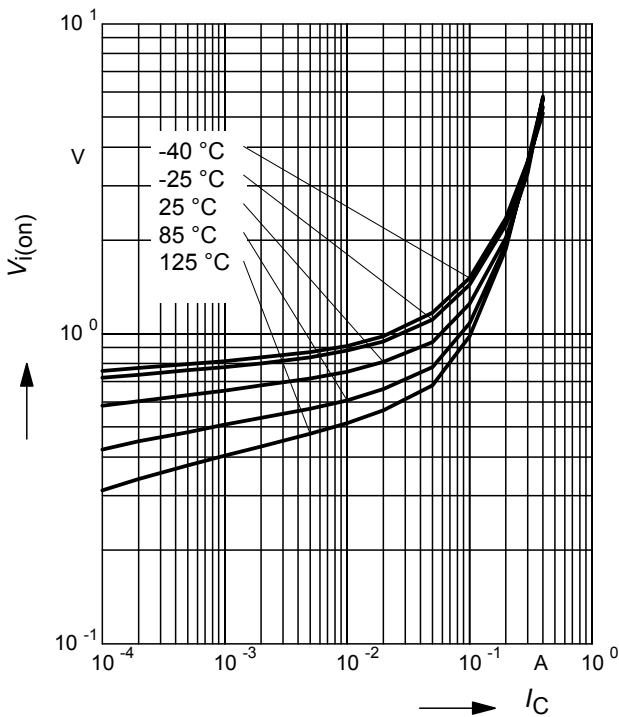
**Collector-emitter saturation voltage**

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



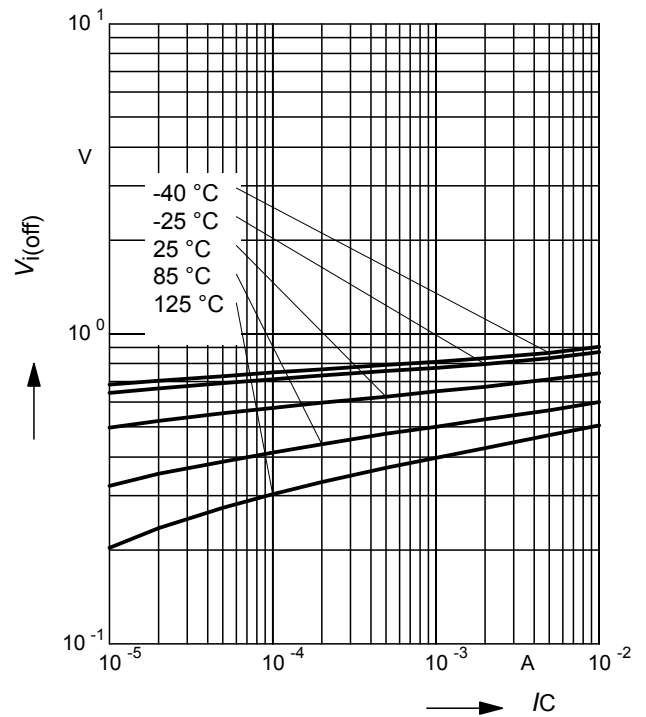
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



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

BCR523



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

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

BCR523



**Permissible Pulse Load**

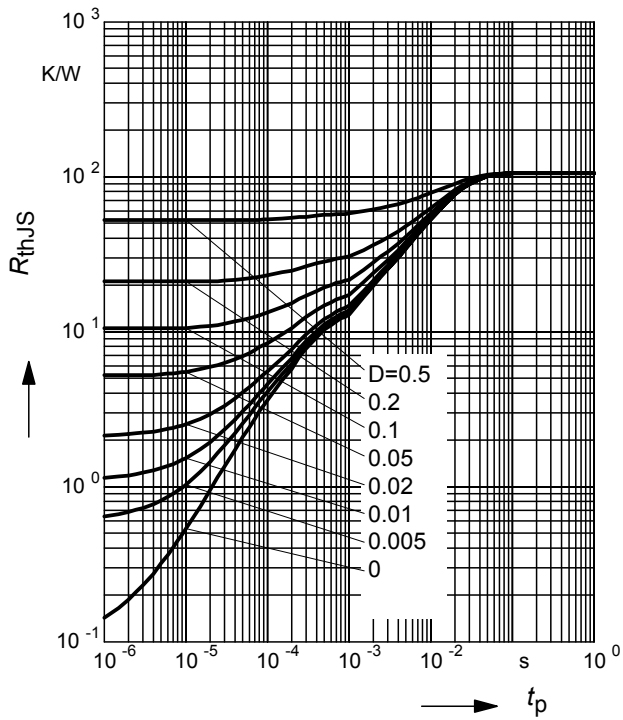
$P_{totmax}/P_{totDC} = f(t_p)$

BCR523



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

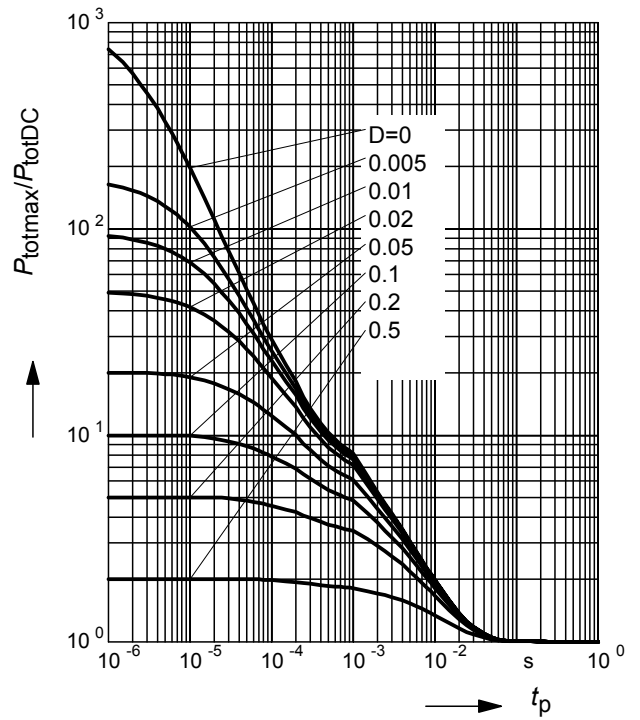
BCR523U



**Permissible Pulse Load**

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

BCR523U



Package Outline



Foot Print



Marking Layout (Example)

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



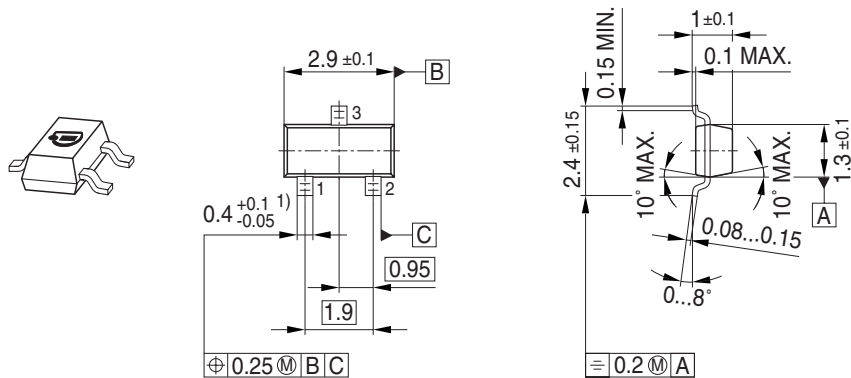
Standard Packing

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.



Package Outline



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

Foot Print



Marking Layout (Example)



Standard Packing

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

