

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 ¹⁾	R_{thJS}		K/W
BCR523		≤ 215	
BCR523U		≤ 105	

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 ²⁾ $I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$	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 Ω
Resistor ratio	R_1/R_2	0.09	0.1	0.11	-

AC Characteristics

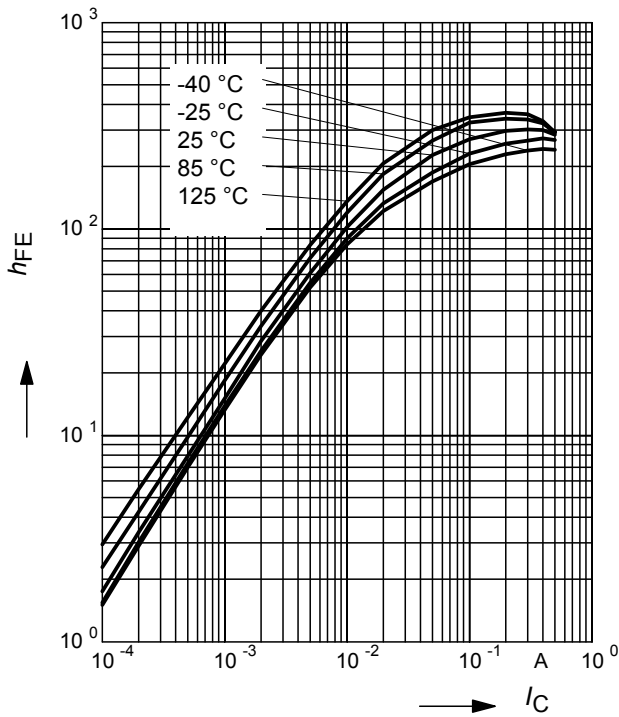
Transition frequency $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	f_T	-	100	-	MHz
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¹For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

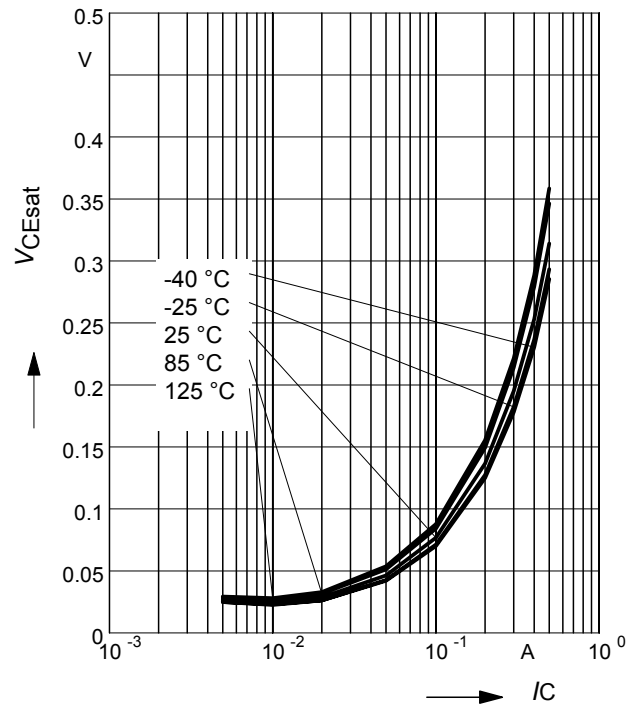
DC current gain $h_{FE} = f(I_C)$

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



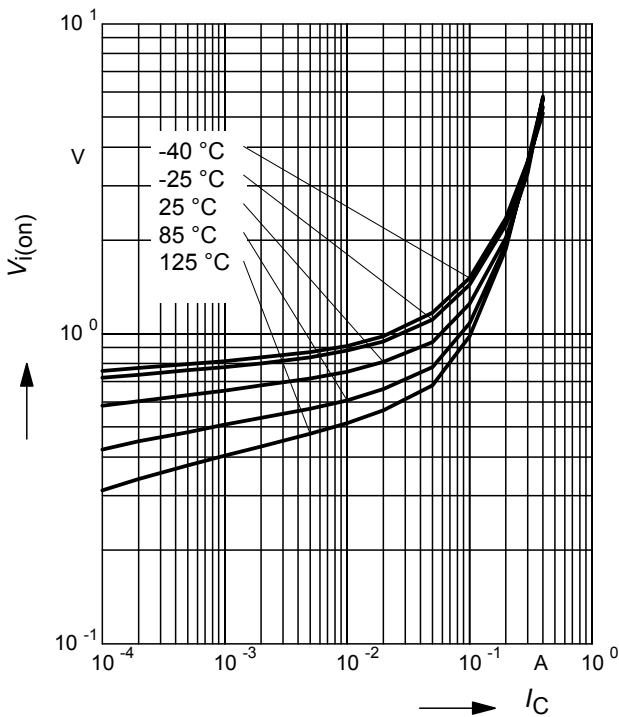
Collector-emitter saturation voltage

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



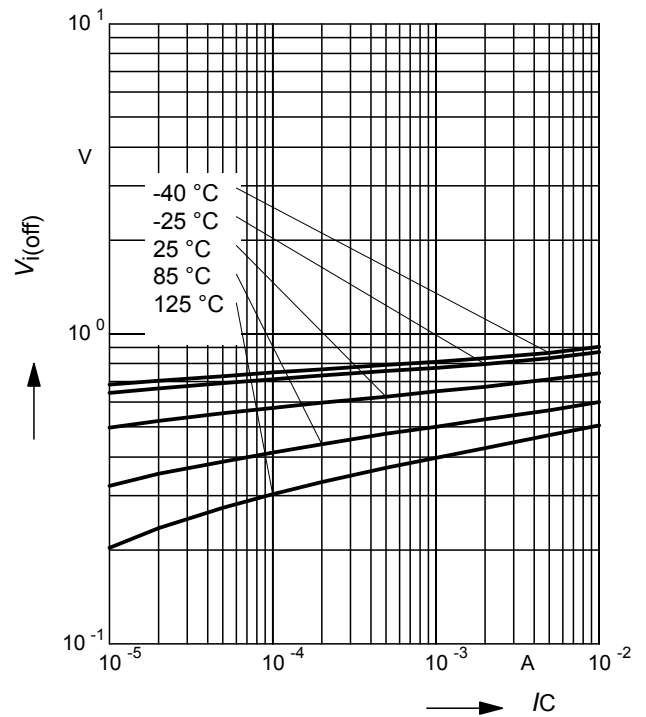
Input on Voltage $V_{i(on)} = f(I_C)$

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



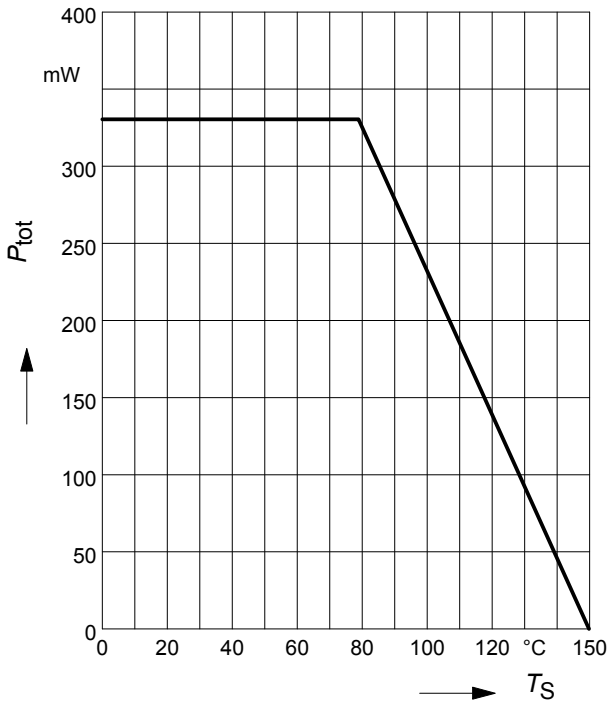
Input off voltage $V_{i(off)} = f(I_C)$

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



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

BCR523



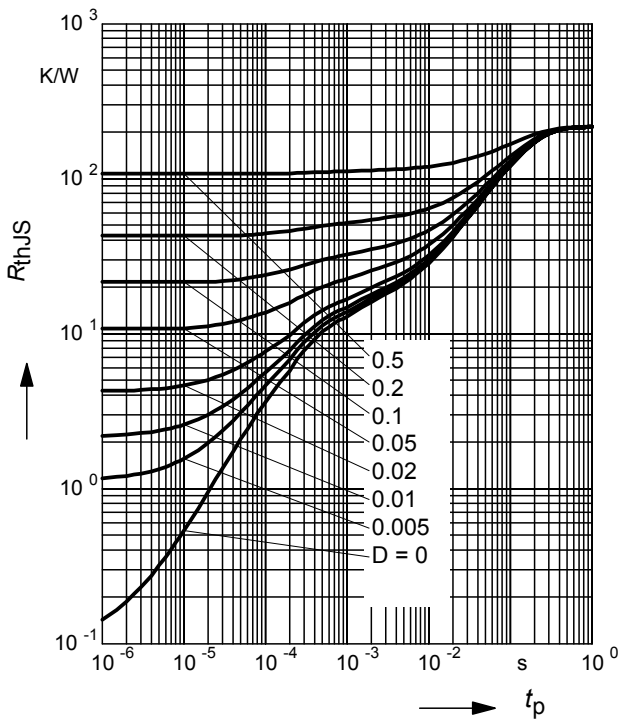
Total power dissipation $P_{tot} = f(T_S)$

BCR523U



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

BCR523



Permissible Pulse Load

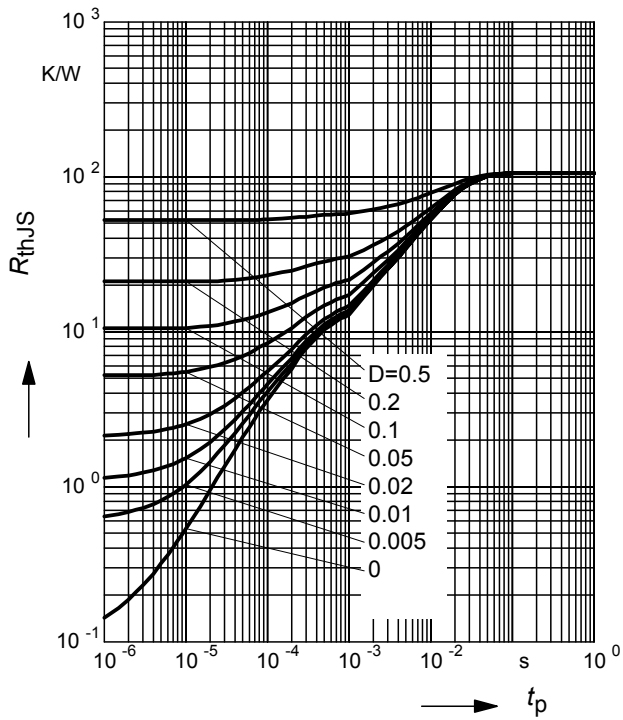
$P_{totmax}/P_{totDC} = f(t_p)$

BCR523



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

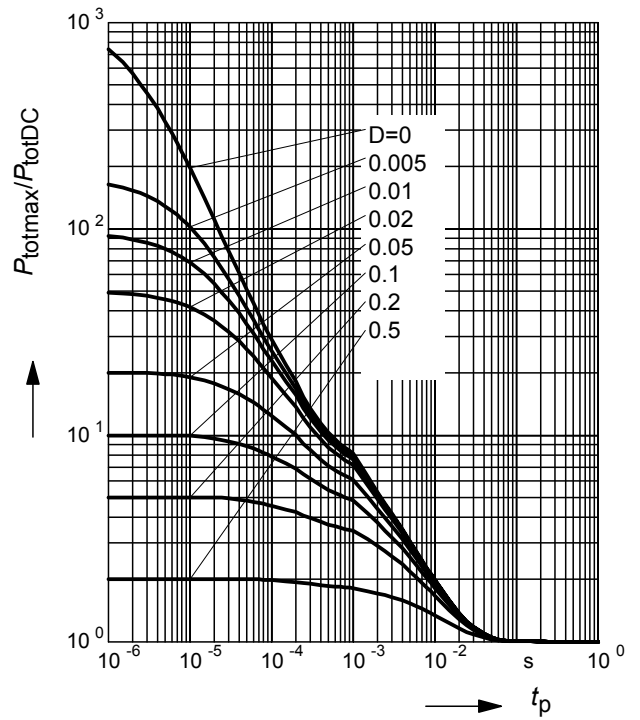
BCR523U



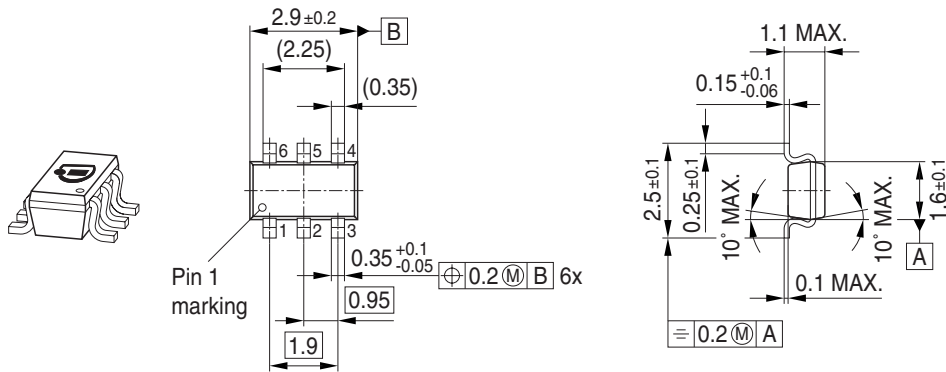
Permissible Pulse Load

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

BCR523U



Package Outline



Foot Print



Marking Layout (Example)

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



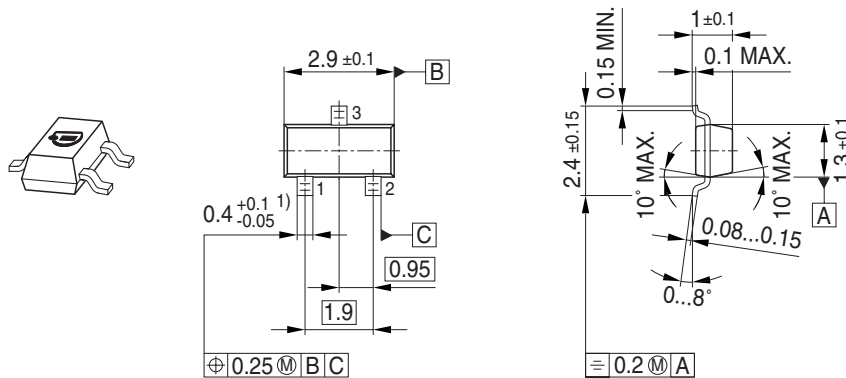
Standard Packing

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

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



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