# imall

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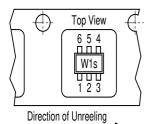
## BCR10PN

### 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 and PNP (R<sub>1</sub>=10 kΩ, R<sub>2</sub> =10 kΩ)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



#### **Tape loading orientation**



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

Position in tape: pin 1 opposite of feed hole side

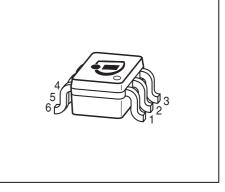
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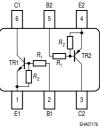
Туре	Marking	Pin Configuration					Package	
BCR10PN	W1s	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

#### Maximum Ratings for NPN and PNP Types

Parameter	Symbol	Value	Unit	
Collector-emitter voltage	V <sub>CEO</sub>	50	V	
Collector-base voltage	V <sub>CBO</sub>	50		
Input forward voltage	V <sub>i(fwd)</sub>	40		
Input reverse voltage	V <sub>i(rev)</sub>	10		
DC collector current	I <sub>C</sub>	100	mA	
Total power dissipation, $T_{\rm S}$ = 115 °C	P <sub>tot</sub>	250	mW	
Junction temperature	T <sub>j</sub>	150	°C	
Storage temperature	T <sub>stg</sub>	-65 150		
Thermal Resistance				
Junction - soldering point <sup>1)</sup>	R <sub>thJS</sub>	≤ <b>140</b>	K/W	

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







Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics for NPN and PNP Type	es				
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	50	-	-	V
<i>I</i> <sub>C</sub> = 100 μA, <i>I</i> <sub>B</sub> = 0					
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	50	-	-	
$I_{\rm C}$ = 10 µA, $I_{\rm E}$ = 0					
Collector cutoff current	I <sub>CBO</sub>	-	-	100	nA
$V_{\rm CB}$ = 40 V, $I_{\rm E}$ = 0					
Emitter cutoff current	I <sub>EBO</sub>	-	-	0.75	mA
V <sub>EB</sub> = 10 V, <i>I</i> <sub>C</sub> = 0					
DC current gain 1)	h <sub>FE</sub>	30	-	-	-
<i>I</i> <sub>C</sub> = 5 mA, <i>V</i> <sub>CE</sub> = 5 V					
Collector-emitter saturation voltage1)	V <sub>CEsat</sub>	-	-	0.3	V
<i>I</i> <sub>C</sub> = 10 mA, <i>I</i> <sub>B</sub> = 0.5 mA					
Input off voltage	V <sub>i(off)</sub>	0.8	-	1.5	
<i>I</i> <sub>C</sub> = 100 μA, <i>V</i> <sub>CE</sub> = 5 V					
Input on Voltage	V <sub>i(on)</sub>	1	-	2.5	
$I_{\rm C}$ = 2 mA, $V_{\rm CE}$ = 0.3 V					
Input resistor	<i>R</i> <sub>1</sub>	7	10	13	kΩ
Resistor ratio	$R_{1}/R_{2}$	0.9	1	1.1	-

## **Electrical Characteristics** at $T_A$ =25°C, unless otherwise specified

## AC Characteristics for NPN and PNP Types

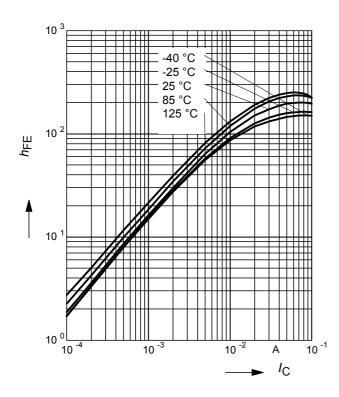
Transition frequency	f <sub>T</sub>	-	130	-	MHz
<i>I</i> <sub>C</sub> = 10 mA, <i>V</i> <sub>CE</sub> = 5 V, <i>f</i> = 100 MHz					
Collector-base capacitance	C <sub>cb</sub>	-	3	-	pF
V <sub>CB</sub> = 10 V, <i>f</i> = 1 MHz					



## **NPN** Type

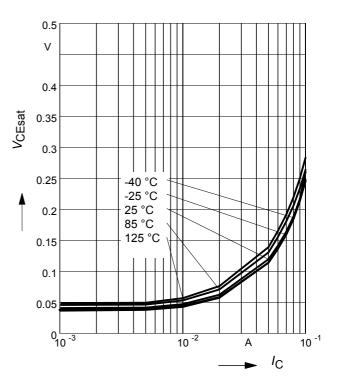
## **DC Current Gain** $h_{\text{FE}} = f(l_{\text{C}})$

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

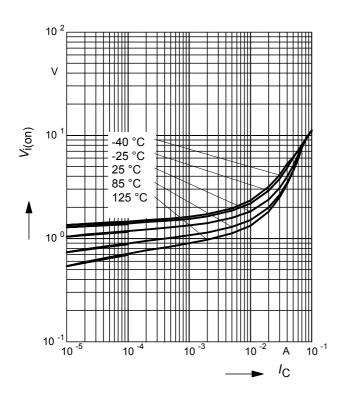


**Collector-Emitter Saturation Voltage** 

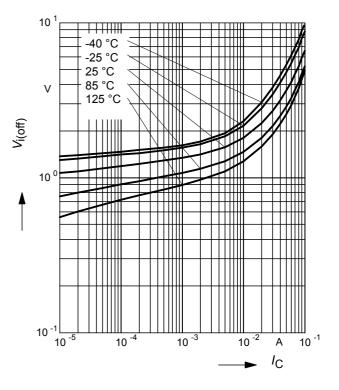
 $V_{\text{CEsat}} = f(I_{\text{C}}), h_{\text{FE}} = 20$ 



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)

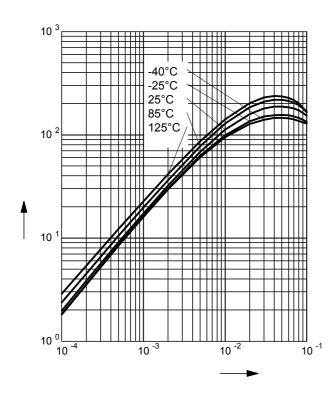




## **PNP** Type

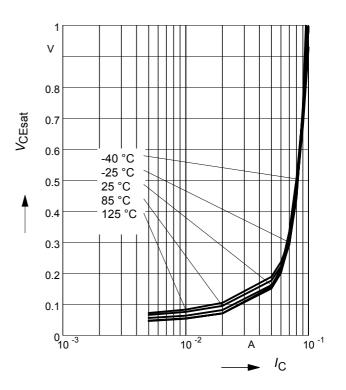
## **DC Current Gain** $h_{\text{FE}} = f(I_{\text{C}})$

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

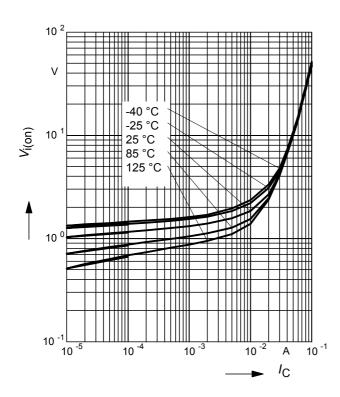


#### **Collector-Emitter Saturation Voltage**

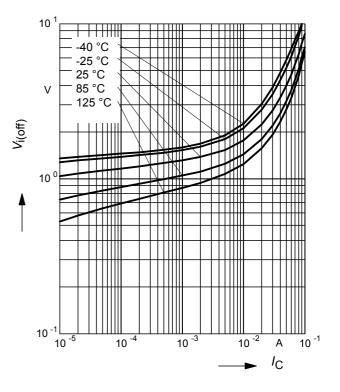
 $V_{\text{CEsat}} = f(I_{\text{C}}), h_{\text{FE}} = 20$ 



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

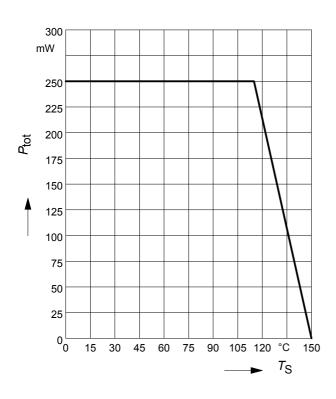


Input off voltage  $V_{i(off)} = f(I_C)$  $V_{CE} = 5V$  (common emitter configuration)





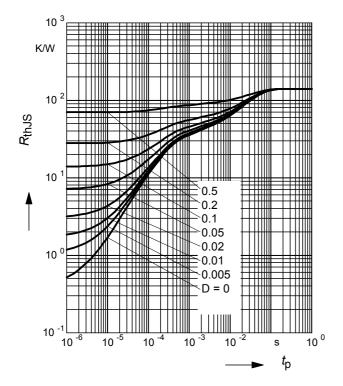


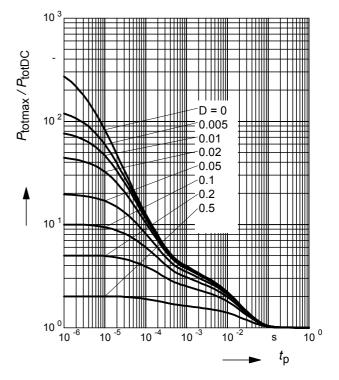


Permissible Pulse Load  $R_{thJS} = f(t_p)$ 

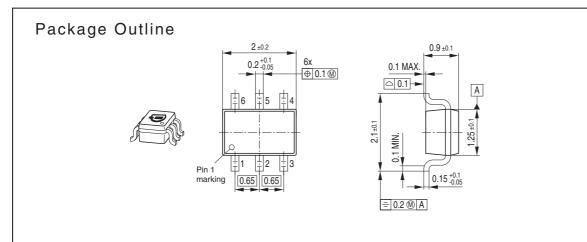
Permissible Pulse Load

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

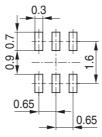






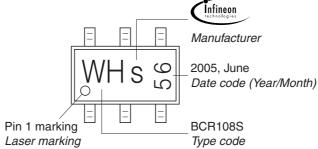


## Foot Print



## Marking Layout (Example)

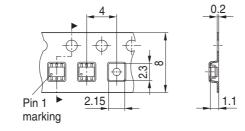
Small variations in positioning of Date code, Type code and Manufacture are possible.



### Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.





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