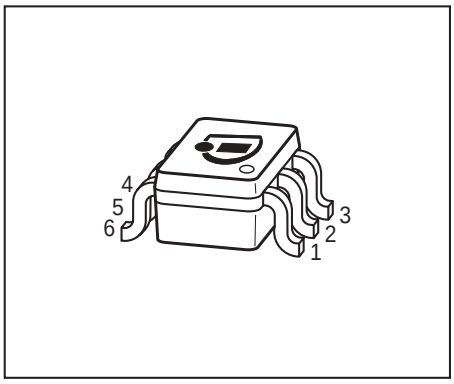
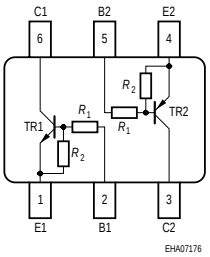
## NPN/PNP Silicon Digital Transistor Array

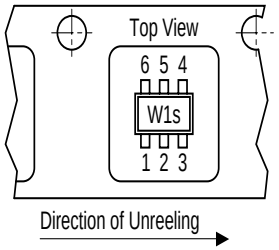



- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor NPN and PNP ($R_1$=2.2 kΩ, $R_2$=47 kΩ)
- Pb-free (RoHS compliant) package [1)]
- Qualified according AEC Q101




AEC Qualified RoHS

### 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

EHA07193

| Type | Marking | Pin Configuration | | | | | | Package |
|---|---|---|---|---|---|---|---|---|
| BCR08PN | WFs | 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 | $V_{CEO}$ | 50 | V |
| Collector-base voltage | $V_{CBO}$ | 50 | |
| Input forward voltage | $V_{i(fwd)}$ | 20 | |
| Input reverse voltage | $V_{i(rev)}$ | 5 | |
| DC collector current | $I_C$ | 100 | mA |
| Total power dissipation, $T_S$ = 115 °C | $P_{tot}$ | 250 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | -65 ... 150 | |
| **Thermal Resistance** | | | |
| Junction - soldering point [2)] | $R_{thJS}$ | ≤ 140 | K/W |

[1] Pb-containing package may be available upon special request

[2] For calculation of $R_{thJA}$ please refer to Application Note Thermal Resistance

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

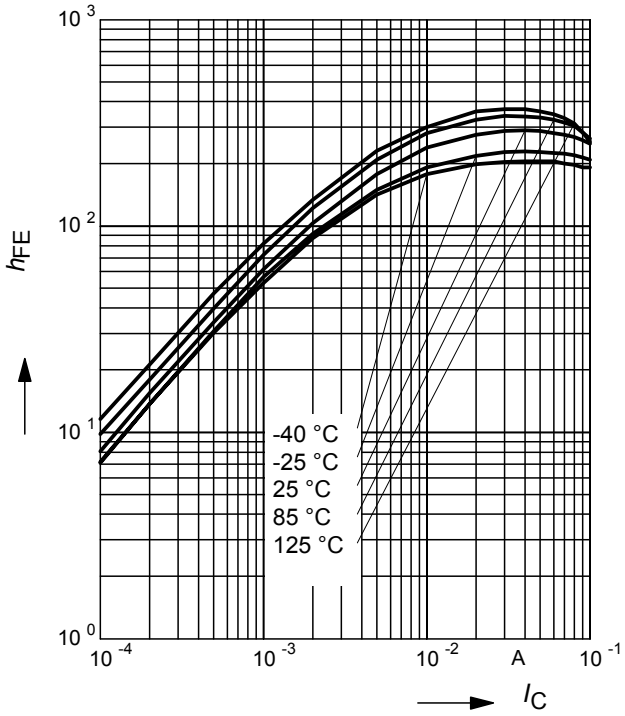
| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC Characteristics** for NPN and PNP Types | | | | | |
| Collector-emitter breakdown voltage<br>$I_C$ = 100 µA, $I_B$ = 0 | $V_{(BR)CEO}$ | 50 | - | - | V |
| Collector-base breakdown voltage<br>$I_C$ = 10 µA, $I_E$ = 0 | $V_{(BR)CBO}$ | 50 | - | - | |
| Collector cutoff current<br>$V_{CB}$ = 40 V, $I_E$ = 0 | $I_{CBO}$ | - | - | 100 | nA |
| Emitter cutoff current<br>$V_{EB}$ = 5 V, $I_C$ = 0 | $I_{EBO}$ | - | - | 164 | µA |
| DC current gain 1)<br>$I_C$ = 5 mA, $V_{CE}$ = 5 V | $h_{FE}$ | 70 | - | - | - |
| Collector-emitter saturation voltage1)<br>$I_C$ = 10 mA, $I_B$ = 0.5 mA | $V_{CEsat}$ | - | - | 0.3 | V |
| Input off voltage<br>$I_C$ = 100 µA, $V_{CE}$ = 5 V | $V_{i(off)}$ | 0.4 | - | 0.8 | |
| Input on Voltage<br>$I_C$ = 2 mA, $V_{CE}$ = 0.3 V | $V_{i(on)}$ | 0.5 | - | 1.1 | |
| Input resistor | $R_1$ | 1.5 | 2.2 | 2.9 | kΩ |
| Resistor ratio | $R_1/R_2$ | 0.042 | 0.047 | 0.052 | - |
| **AC Characteristics** for NPN and PNP Types | | | | | |
| Transition frequency<br>$I_C$ = 10 mA, $V_{CE}$ = 5 V, $f$ = 100 MHz | $f_T$ | - | 170 | - | MHz |
| Collector-base capacitance<br>$V_{CB}$ = 10 V, $f$ = 1 MHz | $C_{cb}$ | - | 2 | - | pF |

1) Pulse test: t < 300µs; D < 2%

## NPN Type

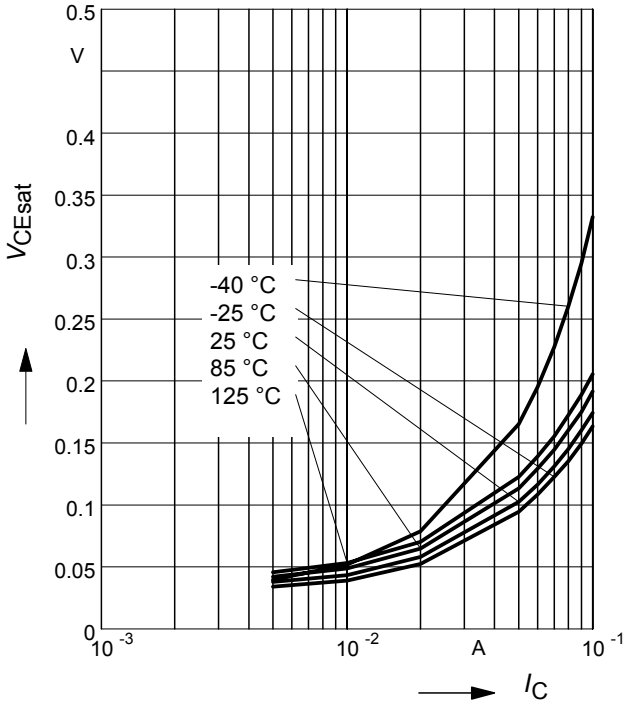
**DC Current Gain** $h_{FE} = f(I_C)$

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



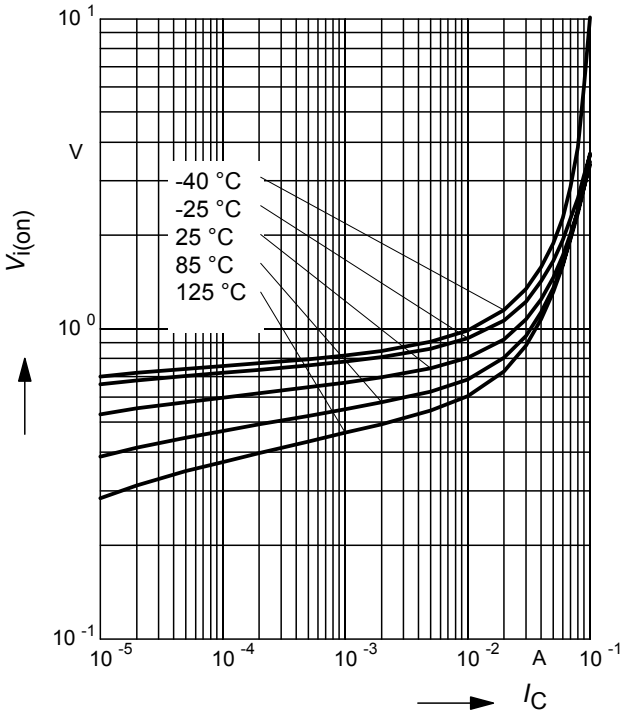

**Collector-Emitter Saturation Voltage**

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



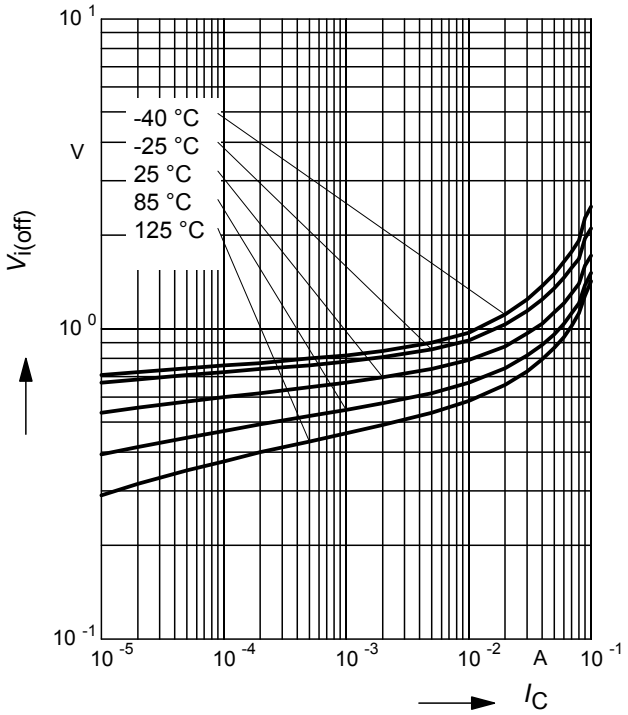

**Input on Voltage** $V_{i(on)} = f(I_C)$

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




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

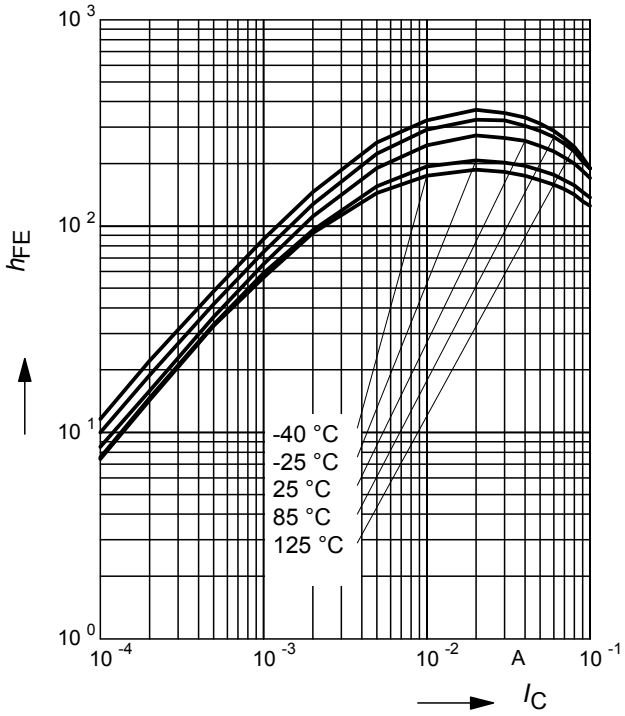
$V_{CE}$ = 5V (common emitter configuration)



## PNP Type

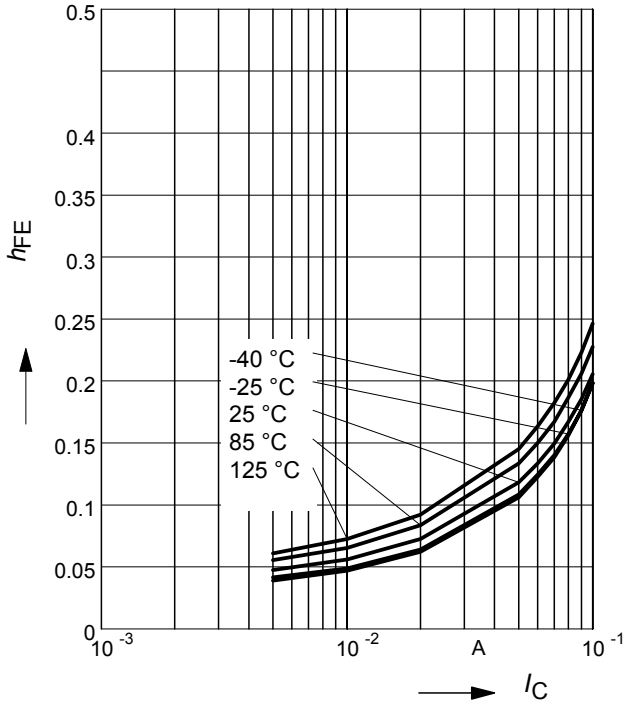
**DC Current Gain** $h_{FE} = f(I_C)$

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



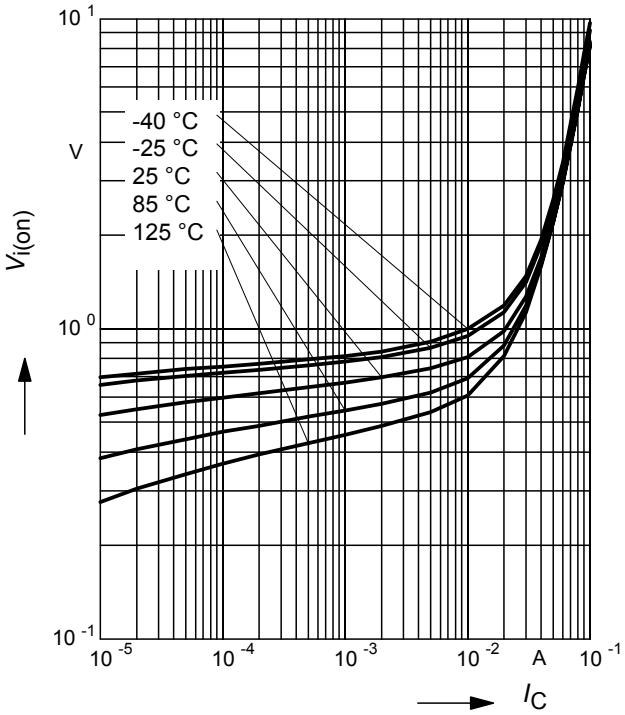

**Collector-Emitter Saturation Voltage**

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



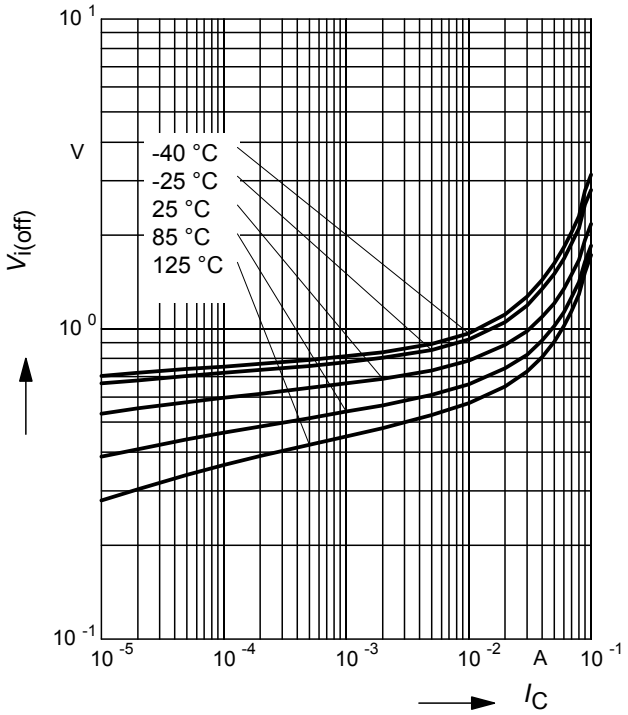

**Input on Voltage** $V_{i(on)} = f(I_C)$

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

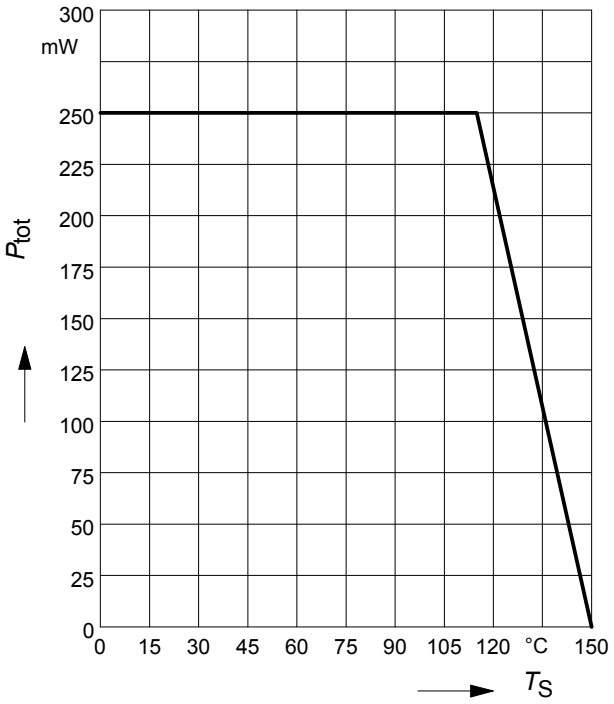



**Input off voltage** $V_{i(off)} = f(I_C)$

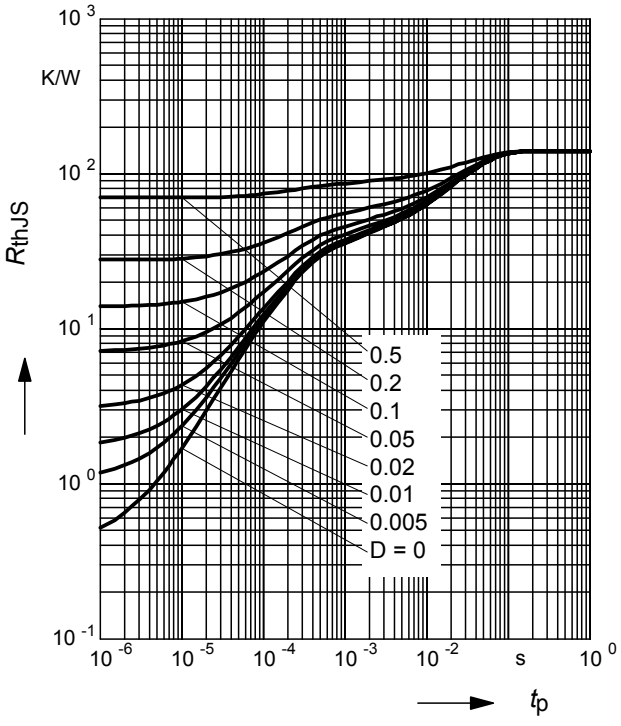
$V_{CE}$ = 5V (common emitter configuration)



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

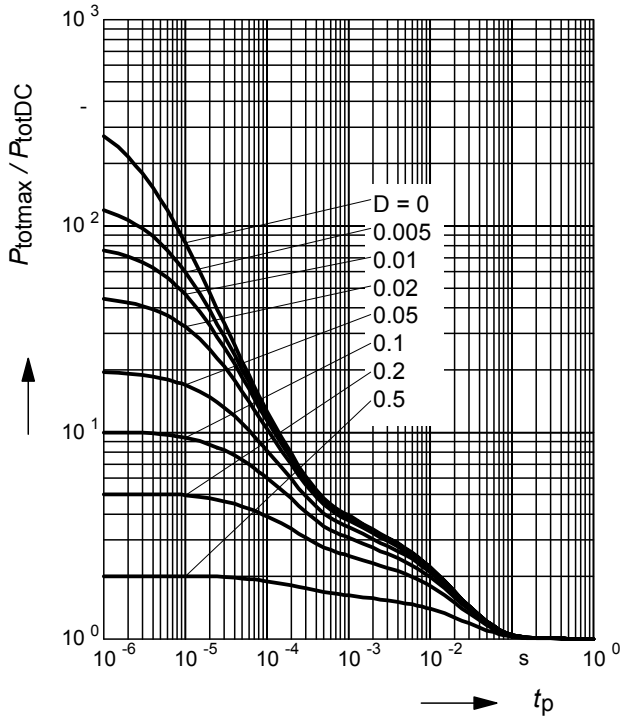



**Permissible Pulse Load $R_{thJS} = f(t_p)$**

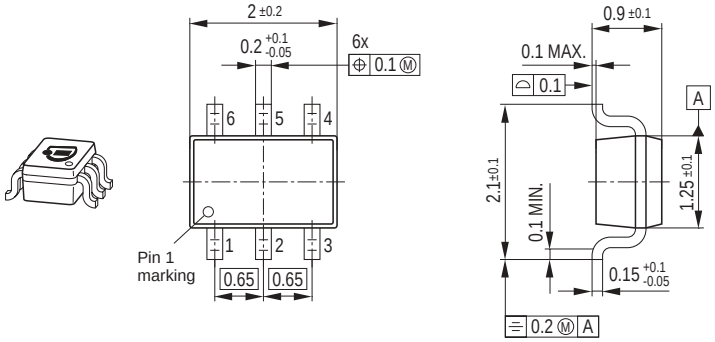



**Permissible Pulse Load**

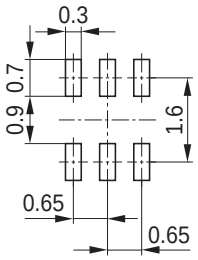
**$P_{totmax} / P_{totDC} = f(t_p)$**



## Package Outline

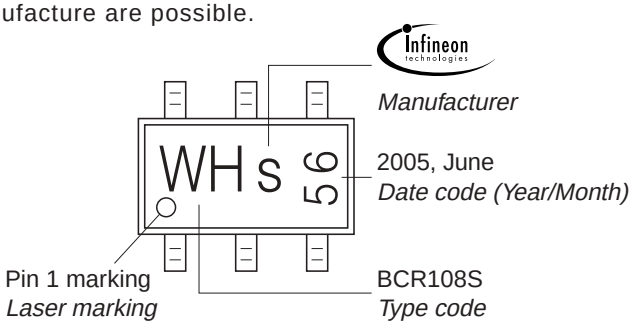



## Foot Print




## Marking Layout (Example)

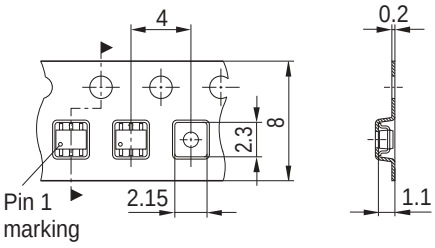
Small variations in positioning of
Date code, Type code and Manufacture are possible.




## 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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