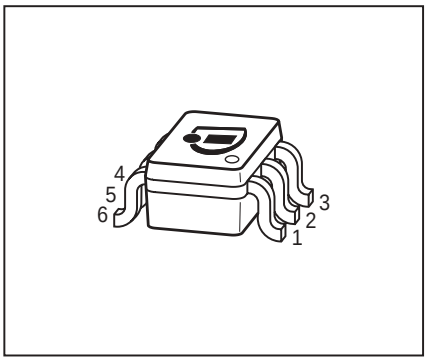
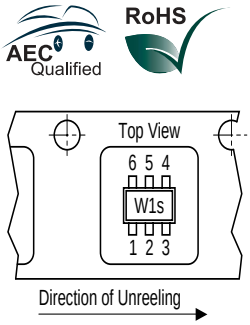
NPN/PNP Silicon Digital Transistor Array



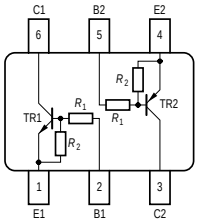
- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor
  NPN: R_1 = 47kΩ, R_2 = 47kΩ
  PNP: R_1= 2.2kΩ, R_2 = 47kΩ
- Pb-free (RoHS compliant) package[1)]
- Qualified according AEC Q101



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
BCR48PN	WTs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-emitter voltage		V_{CEO}	50	V
Collector-base voltage		V_{CBO}	50	
Input forward voltage	NPN	$V_{i(fwd)}$	80	
Input forward voltage	PNP	$V_{i(fwd)}$	20	
Input reverse voltage	NPN	$V_{i(rev)}$	10	
Input reverse voltage	PNP	$V_{i(rev)}$	5	
DC collector current	NPN	I_C	70	mA
DC collector current	PNP	I_C	100	
Total power dissipation, T_S = 115 °C		P_{tot}	250	mW
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-65...+150	

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

Thermal Resistance

Junction - soldering point[1)]	R_{thJS}	≤ 140	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics for NPN Type					
Collector-emitter breakdown voltage I_C = 100 µA, I_B = 0	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage I_C = 10 µA, I_E = 0	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current V_{CB} = 40 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter cutoff current V_{EB} = 10 V, I_C = 0	I_{EBO}	-	-	164	µA
DC current gain 2) I_C = 5 mA, V_{CE} = 5 V	h_{FE}	70	-	-	-
Collector-emitter saturation voltage2) I_C = 10 mA, I_B = 0.5 mA	V_{CEsat}	-	-	0.3	V
Input off voltage I_C = 100 µA, V_{CE} = 5 V	$V_{i(off)}$	0.8	-	1.5	
Input on Voltage I_C = 2 mA, V_{CE} = 0.3 V	$V_{i(on)}$	1	-	3	
Input resistor	R_1	32	47	62	kΩ
Resistor ratio	R_1/R_2	0.9	1	1.1	-
AC Characteristics for NPN Type					
Transition frequency I_C = 10 mA, V_{CE} = 5 V, f = 100 MHz	f_T	-	100	-	MHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	3	-	pF

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

2) Pulse test: t < 300µs; D < 2%

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

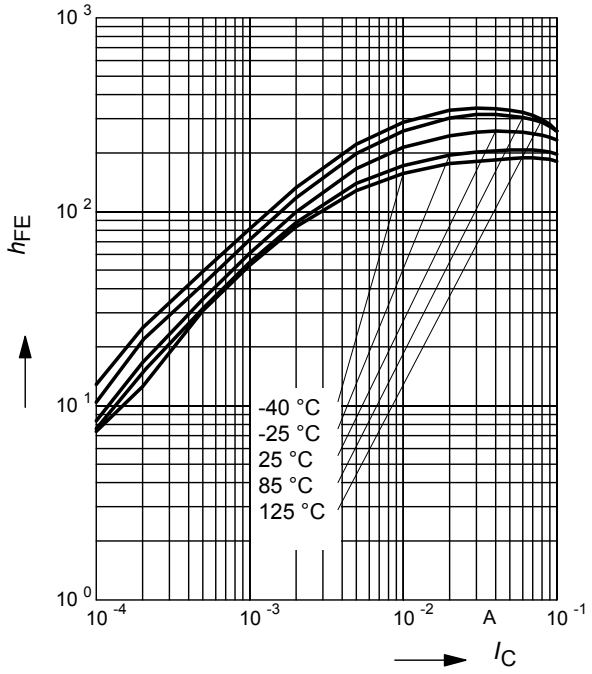
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics for PNP Type					
Collector-emitter breakdown voltage I_C = 100 µA, I_B = 0	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage I_C = 10 µA, I_E = 0	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current V_{CB} = 40 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter cutoff current V_{EB} = 5 V, I_C = 0	I_{EBO}	-	-	164	µA
DC current gain 1) I_C = 5 mA, V_{CE} = 5 V	h_{FE}	70	-	-	-
Collector-emitter saturation voltage 1) I_C = 10 mA, I_B = 0.5 mA	V_{CEsat}	-	-	0.3	V
Input off voltage I_C = 100 µA, V_{CE} = 5 V	$V_{i(off)}$	0.4	-	0.8	
Input on voltage 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 PNP Type					
Transition frequency I_C = 10 mA, V_{CE} = 5 V, f = 100 MHz	f_T	-	200	-	MHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	3	-	pF

1) Pulse test: t < 300µs; D < 2%

NPN Type

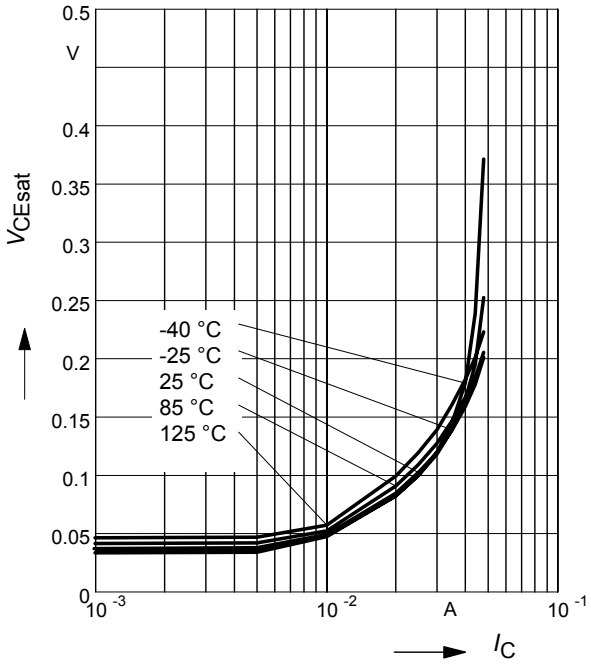
DC Current Gain $h_{FE} = f(I_C)$

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



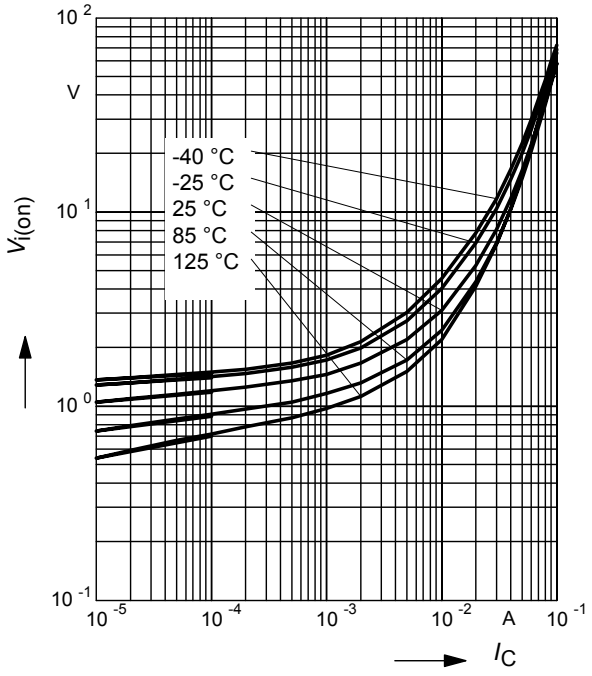
Collector-Emitter Saturation Voltage

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



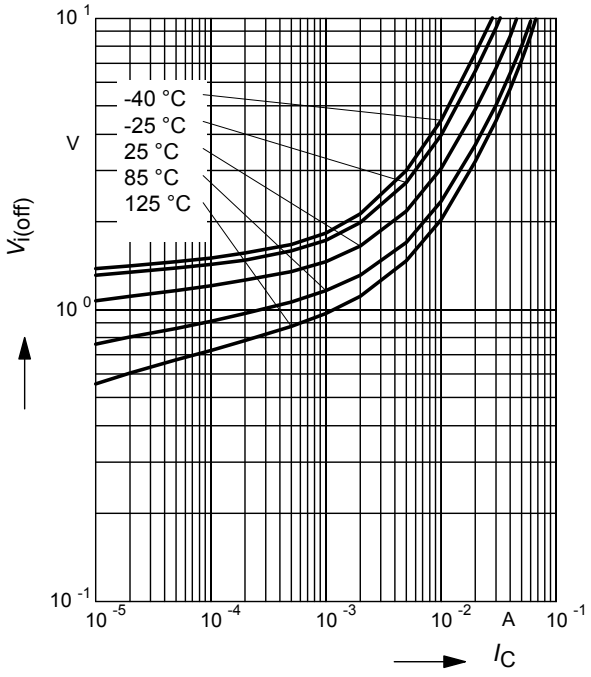
Input on Voltage $V_{i(on)} = f(I_C)$

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



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

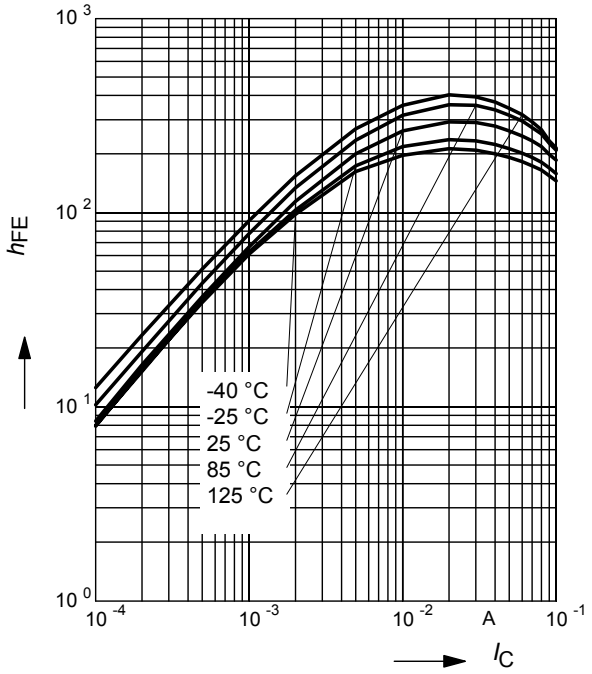
V_{CE} = 5V (common emitter configuration)



PNP Type

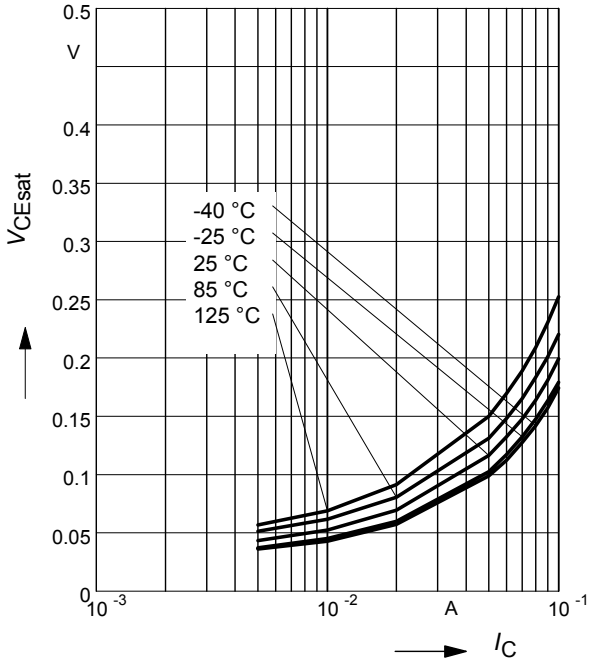
DC Current Gain $h_{FE} = f(I_C)$

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



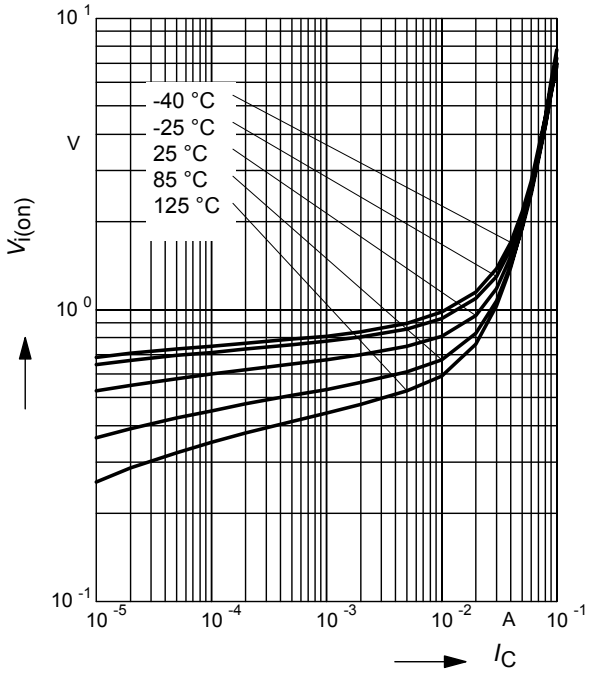
Collector-Emitter Saturation Voltage

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



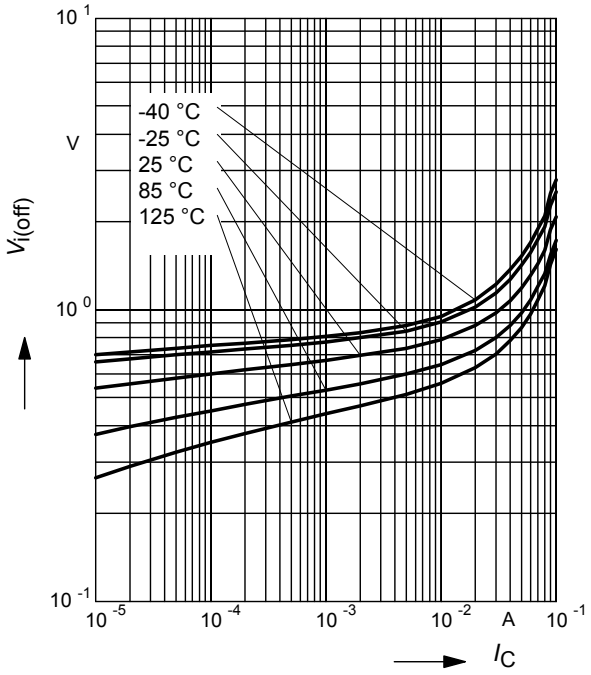
Input on Voltage $V_{i(on)} = f(I_C)$

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

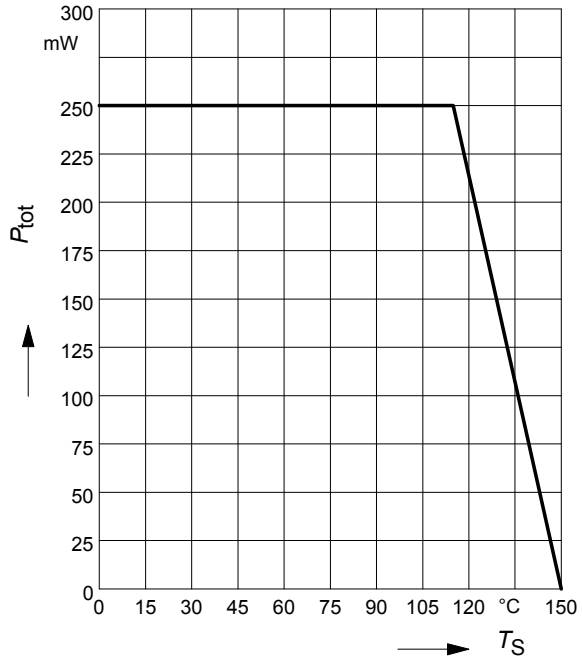


Input off voltage $V_{i(off)} = f(I_C)$

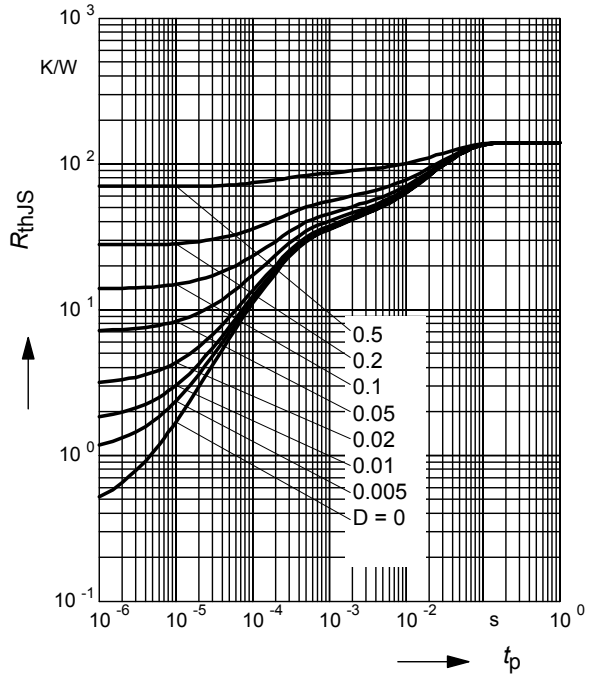
V_{CE} = 5V (common emitter configuration)



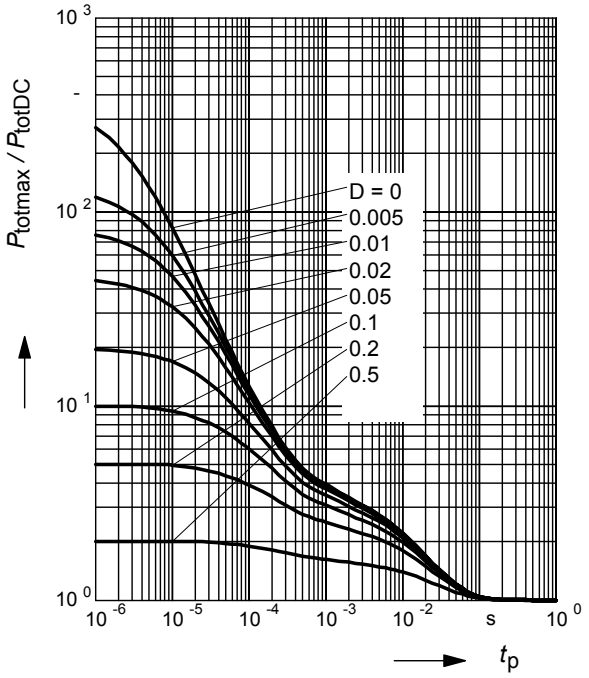
Total power dissipation $P_{tot} = f(T_S)$



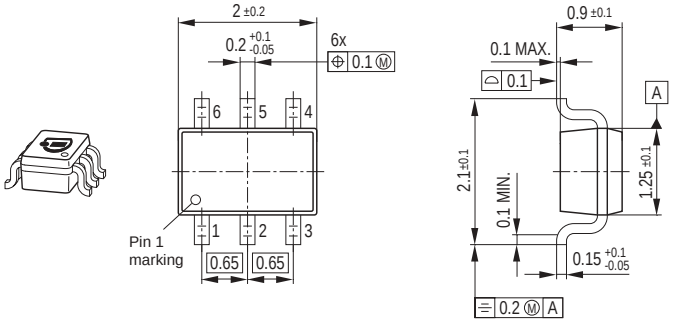
Permissible Pulse Load $R_{thJS} = f(t_p)$



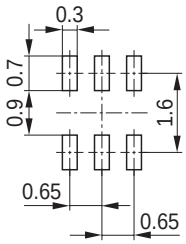
Permissible Pulse Load $P_{totmax} / P_{totDC} = f(t_p)$



Package Outline

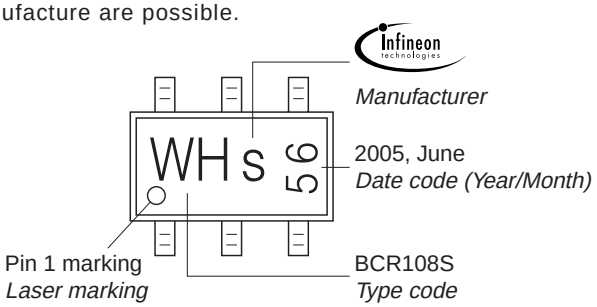


Foot Print



Marking Layout (Example)

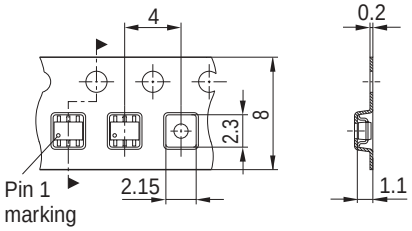
Small variations in positioning of
Date code, Type code and Manufacture are possible.



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.



Published by
Infineon Technologies AG
81726 München, Germany

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