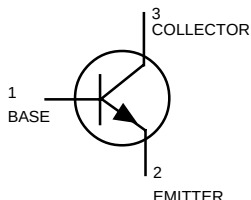


General Purpose Transistors

NPN Silicon



BCW65ALT1



CASE 318-08, STYLE 6
SOT-23 (TO-236AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	32	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current — Continuous	I_C	800	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (1) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

BCW65ALT1 = EA

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 10\text{mAdc}, I_E = 0$)	$V_{(BR)CEO}$	32	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 10\text{ }\mu\text{Adc}, V_{EB} = 0$)	$V_{(BR)CES}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 32\text{ Vdc}, I_E = 0$)	I_{CES}	—	—	20	nAdc
($V_{CE} = 32\text{ Vdc}, I_E = 0, T_A = 150^\circ\text{C}$)		—	—	20	μAdc
Emitter Cutoff Current ($V_{EB} = 4.0\text{ Vdc}, I_C = 0$)	I_{EBO}	—	—	20	nAdc

1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

2. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 100\ \mu\text{Adc}$, $V_{CE} = 10\ \text{Vdc}$) ($I_C = 10\ \text{mAdc}$, $V_{CE} = 1.0\ \text{Vdc}$) ($I_C = 100\ \text{mAdc}$, $V_{CE} = 1.0\ \text{Vdc}$) ($I_C = 500\ \text{mAdc}$, $V_{CE} = 2.0\ \text{Vdc}$)	h_{FE}	35 75 100 35	— — — —	— 220 250 —	—
Collector–Emitter Saturation Voltage ($I_C = 500\ \text{mAdc}$, $I_B = 50\ \text{mAdc}$) ($I_C = 100\ \text{mAdc}$, $I_B = 10\ \text{mAdc}$)	$V_{CE(sat)}$	— —	0.7 0.3	— —	Vdc
Base–Emitter Saturation Voltage ($I_C = 500\ \text{mAdc}$, $I_B = 50\ \text{mAdc}$)	$V_{BE(sat)}$	—	—	2.0	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product ($I_C = 20\ \text{mAdc}$, $V_{CE} = 10\ \text{Vdc}$, $f = 100\ \text{MHz}$)	f_T	100	—	—	MHz
Output Capacitance ($V_{CB} = 10\ \text{Vdc}$, $I_E = 0$, $f = 1.0\ \text{MHz}$)	C_{obo}	—	—	12	pF
Input Capacitance ($V_{EB} = 0.5\ \text{Vdc}$, $I_C = 0$, $f = 1.0\ \text{MHz}$)	C_{ibo}	—	—	80	pF
Noise Figure ($V_{CE} = 5.0\ \text{Vdc}$, $I_C = 0.2\ \text{mAdc}$, $R_s = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $BW = 200\ \text{Hz}$)	NF	—	—	10	dB
SWITCHING CHARACTERISTICS					
Turn–On Time ($I_{B1} = I_{B2} = 15\ \text{mAdc}$)	t_{on}	—	—	100	ns
Turn–Off Time ($I_C = 150\ \text{mAdc}$, $R_L = 150\ \Omega$)	t_{off}	—	—	400	ns