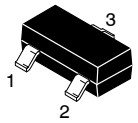
General Purpose Transistor

NPN Silicon

BCW65ALT1G, BCW65CLT1G



SOT−23
CASE 318
STYLE 6

Features

- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

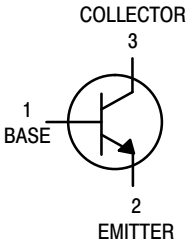
Symbol	Rating	Value	Unit
V_{CEO}	Collector − Emitter Voltage	32	Vdc
V_{CBO}	Collector − Base Voltage	60	Vdc
V_{EBO}	Emitter − Base Voltage	5.0	Vdc
I_C	Collector Current − Continuous	800	mAdc

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

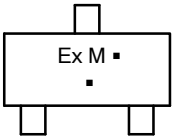
THERMAL CHARACTERISTICS

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

1. FR−5 = 1.0 × 0.75 × 0.062 in.
2. Alumina = 0.4 × 0.3 × 0.024 in 99.5% alumina.



MARKING DIAGRAMS



Ex = Device Code
x = A or C
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
BCW65ALT1G	SOT−23 (Pb−Free)	3,000/Tape & Reel
BCW65CLT1G	SOT−23 (Pb−Free)	3,000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

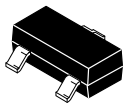
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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Symbol	Characteristic	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector – Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	32	–	–	Vdc
$V_{(BR)CES}$	Collector – Emitter Breakdown Voltage (I_C = 10 μAdc, V_{EB} = 0)	60	–	–	Vdc
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	5.0	–	–	Vdc
I_{CES}	Collector Cutoff Current (V_{CE} = 32 Vdc, I_E = 0) (V_{CE} = 32 Vdc, I_E = 0, T_A = 150°C)	 – –	 – –	 20 20	 nAdc μAdc
I_{EBO}	Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	–	–	20	nAdc
ON CHARACTERISTICS					
h_{FE}	DC Current Gain BCW65ALT1 (I_C = 100 μAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 1.0 Vdc) (I_C = 100 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 2.0 Vdc)	 35 75 100 35	 – – – –	 – – 250 –	–
h_{FE}	DC Current Gain BCW65CLT1 (I_C = 100 μAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 1.0 Vdc) (I_C = 100 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 2.0 Vdc)	 80 180 250 100	 – – – –	 – – 630 –	–
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 100 mAdc, I_B = 10 mAdc)	 – –	 0.7 0.3	 – –	Vdc
$V_{BE(sat)}$	Base – Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc)	–	–	2.0	Vdc
SMALL– SIGNAL CHARACTERISTICS					
f_T	Current – Gain — Bandwidth Product (I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	100	–	–	MHz
C_{obo}	Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	–	–	12	pF
C_{ibo}	Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	–	–	80	pF
NF	Noise Figure (V_{CE} = 5.0 Vdc, I_C = 0.2 mAdc, R_S = 1.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	–	–	10	dB
SWITCHING CHARACTERISTICS					
t_{on}	Turn–On Time (I_{B1} = I_{B2} = 15 mAdc)	–	–	100	ns
t_{off}	Turn–Off Time (I_C = 150 mAdc, R_L = 150 Ω)	–	–	400	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

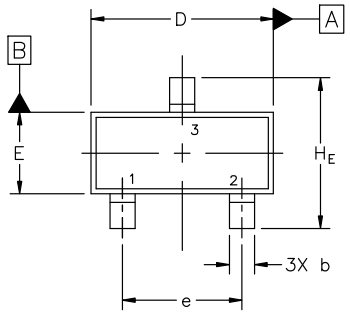
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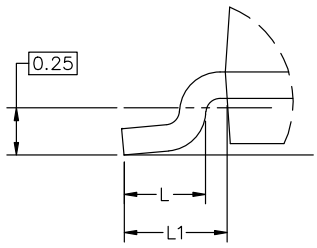
SCALE 4:1

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

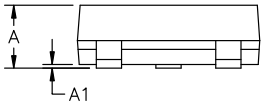
DATE 14 AUG 2024



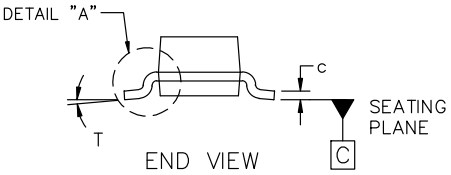
TOP VIEW



DETAIL "A"
Scale 3:1



SIDE VIEW

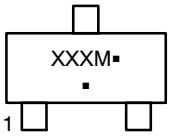


END VIEW

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
H_E	2.10	2.40	2.64
T	0°	−−−	10°

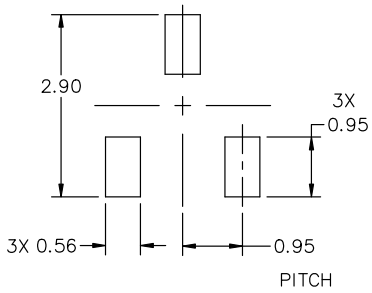
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED
MOUNTING FOOTPRINT

* For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

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CASE 318
ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5:
CANCELLED

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 7:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE−ANODE

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 17:
PIN 1. NO CONNECTION
2. ANODE
3. CATHODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE−ANODE

STYLE 20:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 24:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. GATE

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE

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