

General Purpose Transistors

NPN Silicon

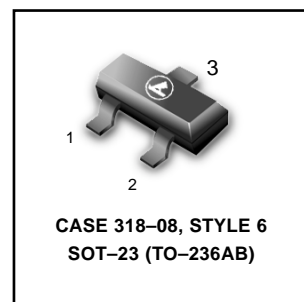
LBCW65ALT1G

Features

We declare that the material of product compliance with RoHS requirements.

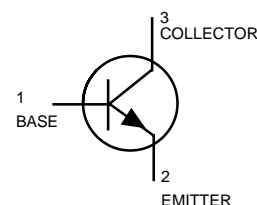
MAXIMUM RATINGS

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	$^\circ\text{C}/\text{W}$
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	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$



DEVICE MARKING

LBCW65ALT1G = 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 ($I_C = 10\ \mu\text{Adc}, V_{EB} = 0$)	$V_{(BR)CES}$	60	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10\ \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	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.

LBCW65ALT1G
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 100 \mu\text{Adc}$, $V_{CE} = 10 \text{Vdc}$)	h_{FE}	35	—	—	—
($I_C = 10 \text{mAdc}$, $V_{CE} = 1.0 \text{Vdc}$)		75	—	220	
($I_C = 100 \text{mAdc}$, $V_{CE} = 1.0 \text{Vdc}$)		100	—	250	
($I_C = 500 \text{mAdc}$, $V_{CE} = 2.0 \text{Vdc}$)		35	—	—	
Collector–Emitter Saturation Voltage ($I_C = 500 \text{mAdc}$, $I_B = 50 \text{mAdc}$)	$V_{CE(sat)}$	—	0.7	—	Vdc
($I_C = 100 \text{mAdc}$, $I_B = 10 \text{mAdc}$)		—	0.3	—	
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

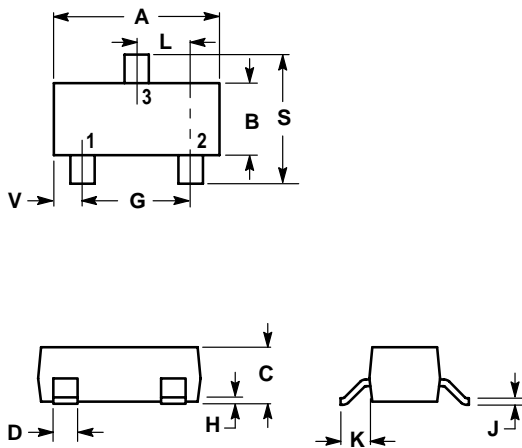
Ordering Information

Device	Marking	Shipping
LBCW65ALT1G	EA	3000/Tape&Reel
LBCW65ALT3G	EA	10000/Tape&Reel

SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

