

BAL74

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BAL74

350mW Surface Mount Switching Diode 75V

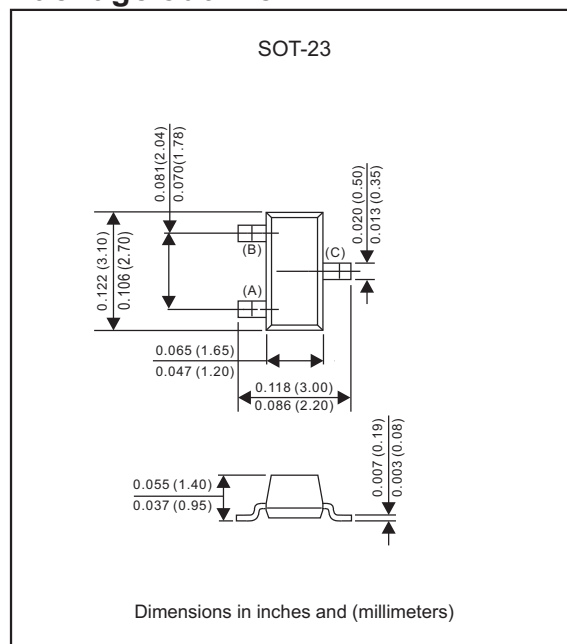
Features

- Fast speed switching
- For general purpose switching application
- High conductance
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex.BAL74-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline



Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	Symbol	Value	UNIT
Non-repetitive peak reverse voltage	V_{RM}	100	V
Peak repetitive reverse voltage	V_{RRM}	75	V
Working Peak Reverse voltage	V_{RWM}		
DC Blocking voltage	V_R		
Forward continuous current	I_F	300	mA
Average rectified output current	I_O	150	mA
Peak forward surge current @ $t < 1\mu\text{s}$	I_{FSM}	2	A
Power dissipation	P_D	350	mW
Typical thermal resistance junction to ambient	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$
Operating junction temperature range	T_J	-65 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-65 to +150	$^{\circ}\text{C}$

Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	CONDITION	Symbol	MIN.	MAX.	UNIT
Forward voltage	$I_F = 10\text{ mA}$ $I_F = 50\text{ mA}$	V_F		0.855 1.0	V
Reverse leakage current	$V_R = 75\text{ V}, T_J = 25^{\circ}\text{C}$	I_R		2.5	μA
Junction capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}$	C_J		2	pF
Reverse recovery time	$I_F = I_R = 10\text{ mA}, I_{rr} = 0.1 \times I_R, R_L = 100\Omega$	t_{rr}		6	ns

Rating and characteristic curves for each diode (BAL74)

Fig.1 FORWARD CHARACTERISTICS

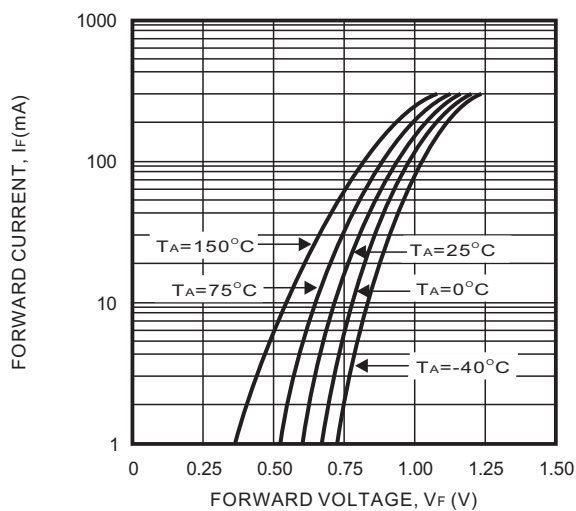


Fig.2 REVERSE CHARACTERISTICS

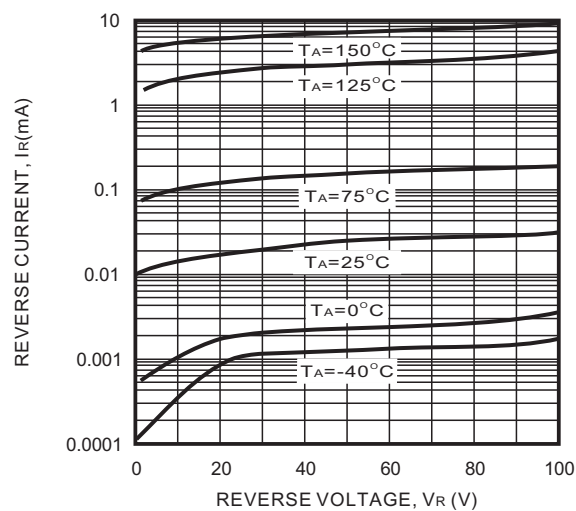


Fig.3 CAPACITANCE CHARACTERISTICS

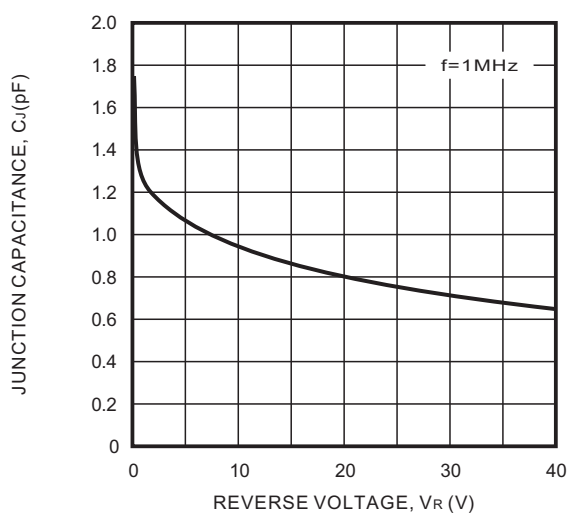
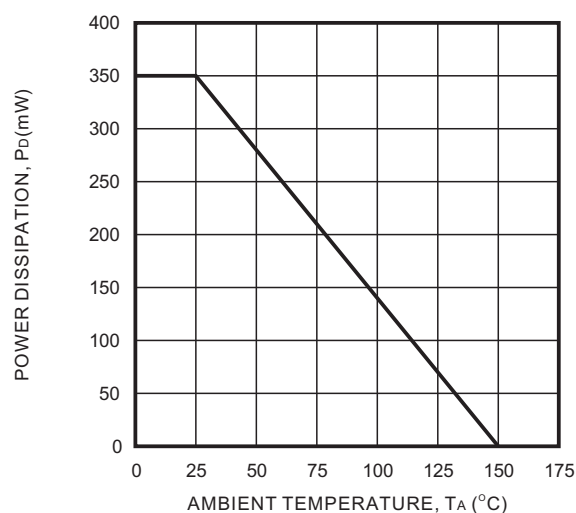
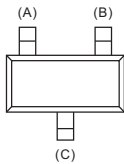
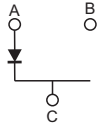
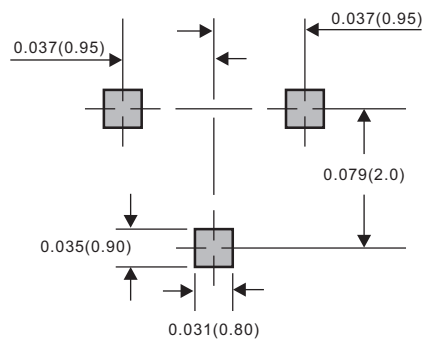


Fig.4 POWER DERATING CURVE

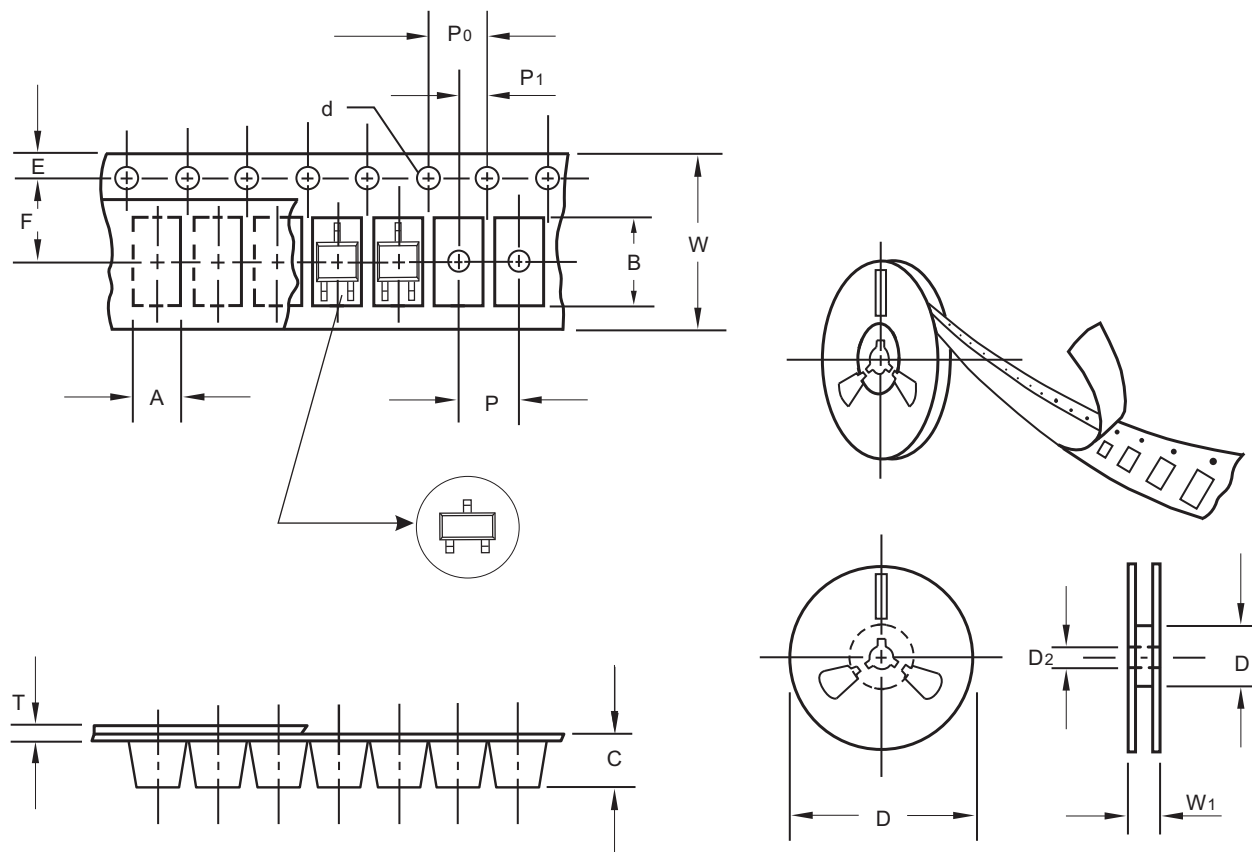


BAL74**Pinning information**

Type number	Marking code	Simplified outline	Symbol
BAL74	JC		

Suggested solder pad layout**SOT-23**

Dimensions in inches and (millimeters)

BAL74**Packing information**

unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.40
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

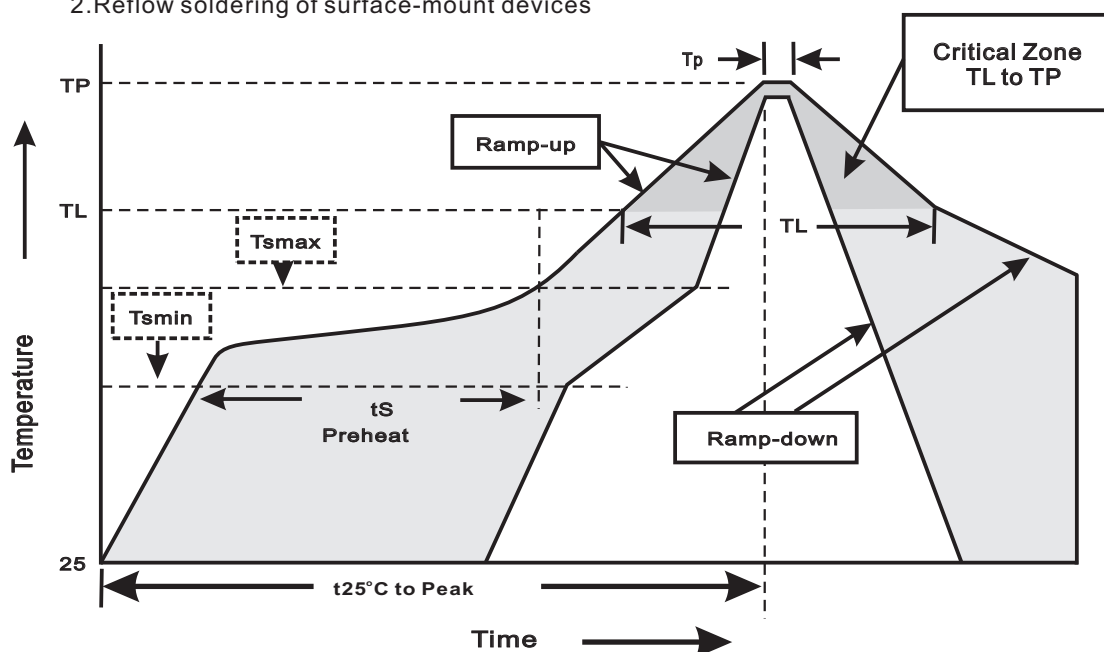
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

BAL74**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^\circ\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_O$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to $+125^\circ\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	Peak Forward Surge Current	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031