

PLASTIC-ENCAPSULATE TRANSISTORS NPN SILICON

DESCRIPTION:



The ALPBC846A/B, ALPBC847A/B/C and ALPBC848A/B/C is Ideal and suited for automatic insertion. Its for switching and AF amplifier applications.

FEATURES:

- Ideally suited for automatic insertion
- For switching and AF amplifier applications
- Compliant to Halogen-free

APPLICATIONS:

- Switching
- AF amplifier application

MECHANICAL CHARACTERISTICS

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

MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25^\circ\text{C}$ unless otherwise specified				
PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base voltage	ALPBC846	V_{CBO}	80	V
	ALPBC847		50	
	ALPBC848		30	
Collector-Emitter voltage	ALPBC846	V_{CEO}	65	V
	ALPBC847		45	
	ALPBC848		30	
Emitter-Base voltage		V_{EBO}	6	V
Collector current-continuous		I_C	0.1	A

THERMAL CHARACTERISTICS

THERMAL CHARACTERISTICS					
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector Power Dissipation $T_C = 25^\circ\text{C}$	P_C			200	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$		625		$^\circ\text{C}/\text{W}$
Operating Junction Temperature	T_J	-55		+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55		+150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS @ T_A = 25 °C unless otherwise specified

PARAMETER		CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
OFF CHARACTERISTICS							
Collector-Base breakdown voltage	ALPBC846	$I_C = 10\mu A, I_E = 0$	$V_{(BR)CBO}$	80			V
	ALPBC847			50			
	ALPBC848			30			
Collector-Emitter breakdown voltage	ALPBC846	$I_C = 10mA, I_B = 0$	$V_{(BR)CEO}$	65			V
	ALPBC847			45			
	ALPBC848			30			
Emitter-Base breakdown voltage		$I_E = 10\mu A, I_C = 0$	$V_{(BR)EBO}$	6			V
Collect Cut-Off Current	ALPBC846	$V_{CB} = 70V, I_E = 0$	I_{CBO}			0.1	μA
	ALPBC847	$V_{CB} = 50V, I_E = 0$					
	ALPBC848	$V_{CB} = 30V, I_E = 0$					
Collect Cut-Off Current	ALPBC846	$V_{CE} = 60V, I_B = 0$	I_{CEO}			0.1	μA
	ALPBC847	$V_{CE} = 45V, I_B = 0$					
	ALPBC848	$V_{CE} = 30V, I_B = 0$					
Emitter Cut-Off Current		$V_{EB} = 5V, I_C = 0$	I_{EBO}			0.1	μA

ON CHARACTERISTICS							
PARAMETER		CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
DC current gain	ALPBC846A, ALPBC847A, ALPBC848A	$I_C = 2.0mA, V_{CE} = 5.0V$	h_{FE}	110		220	
	ALPBC846B, ALPBC847B, ALPBC848B			200		450	
	ALPBC847C, ALPBC848C			420		800	
Collector-Emitter Saturation voltage		$I_C = 100mA, I_B = 5.0mA$	$V_{CE(sat)}$			0.50	V
Base-Emitter Saturation voltage		$I_C = 100mA, I_B = 5.0mA$	$V_{BE(sat)}$			1.10	V

SMALL-SIGNAL CHARACTERISTICS							
PARAMETER	CONDITIONS		SYMBOL	MIN	TYP.	MAX	UNIT
Transition frequency	$I_C = 10mA, V_{CE} = 5.0V, f = 100MHz$		f_T	100			MHz
Collector Output Capacitance	$V_{CB} = 10V, f = 1.0MHz$		C_{ob}			4.5	pF

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

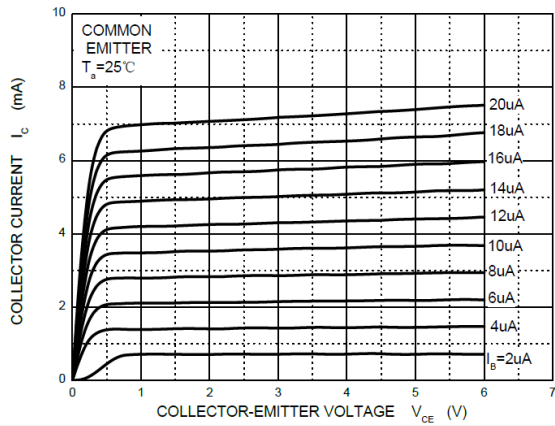


Fig.1 STATIC CHARACTERISTICS

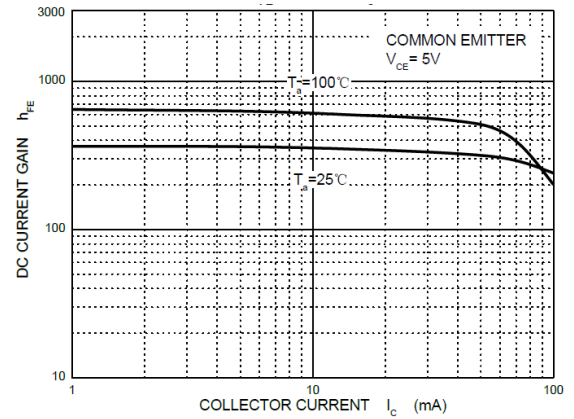


Fig.2 h_{FE} vs. I_c

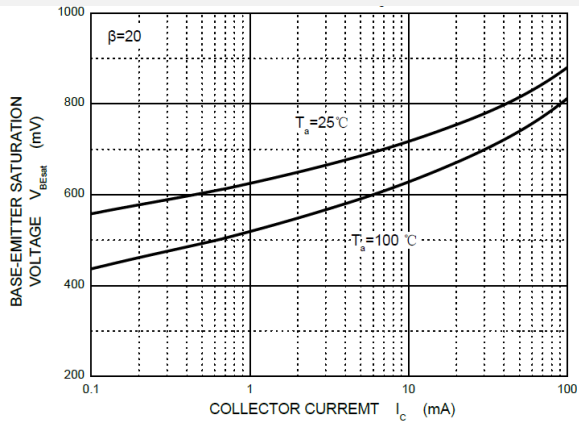


Fig.3 $V_{BE(sat)}$ vs. I_c

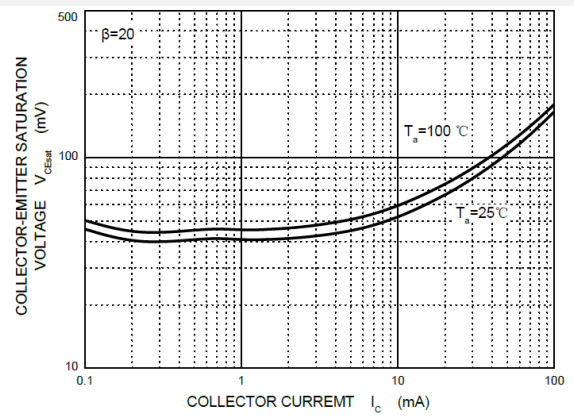


Fig.4 $V_{CE(sat)}$ vs. I_c

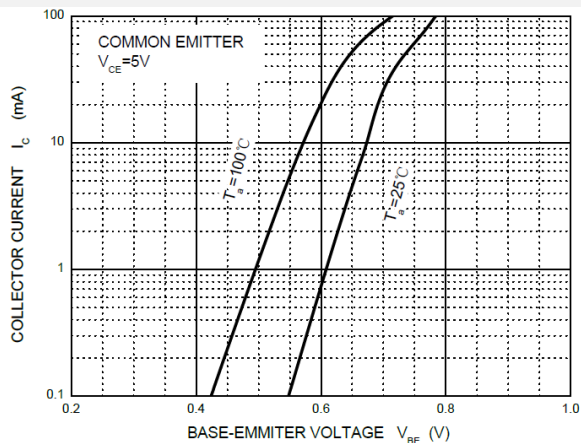


Fig.5 I_c vs. V_{BE}

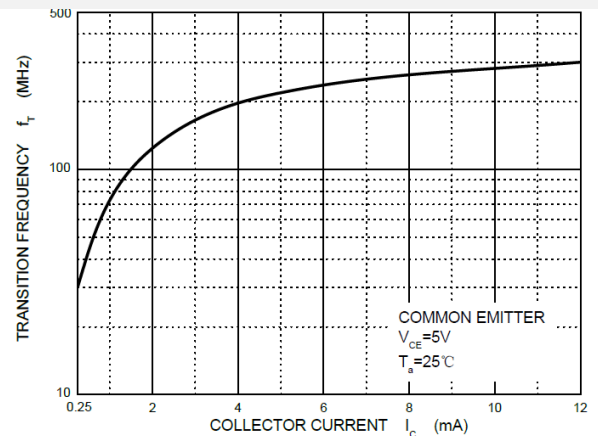


Fig.6 f_T vs. I_c

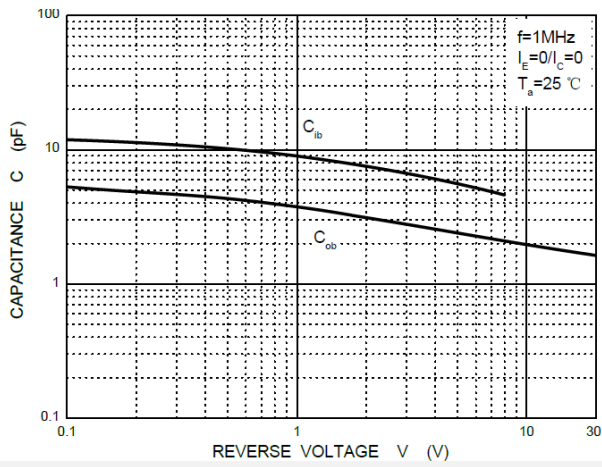


Fig.7 C_{ob} / C_{ib} vs. V_{CB} / V_{EB}

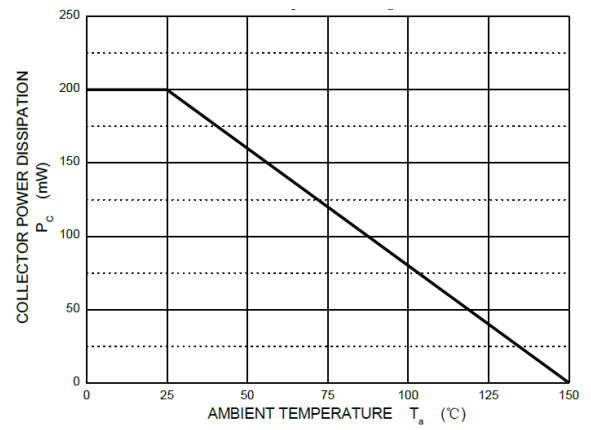
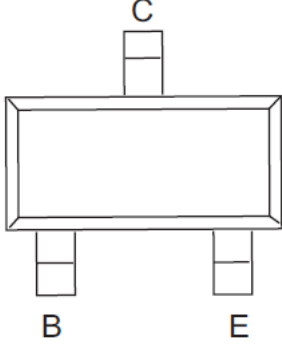
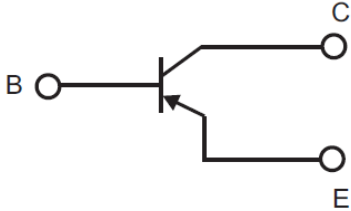


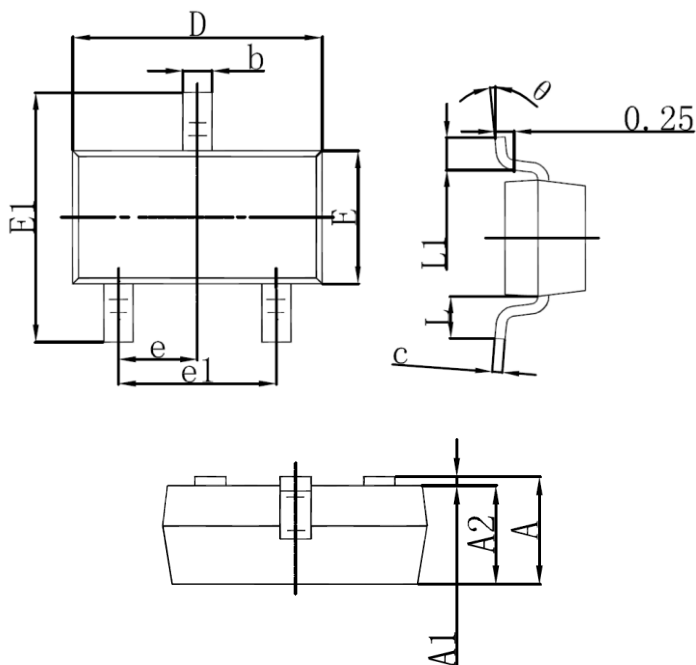
Fig.8 P_c vs. T_a

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
Pin B Base Pin C Collector Pin E Emitter		

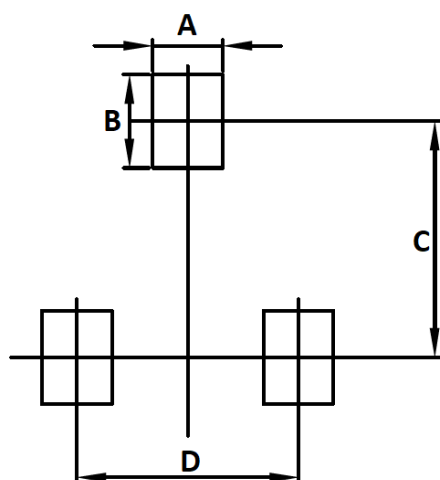
PACKAGE INFORMATION

SOT-23



OUTLINE DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

PAD LAYOUT

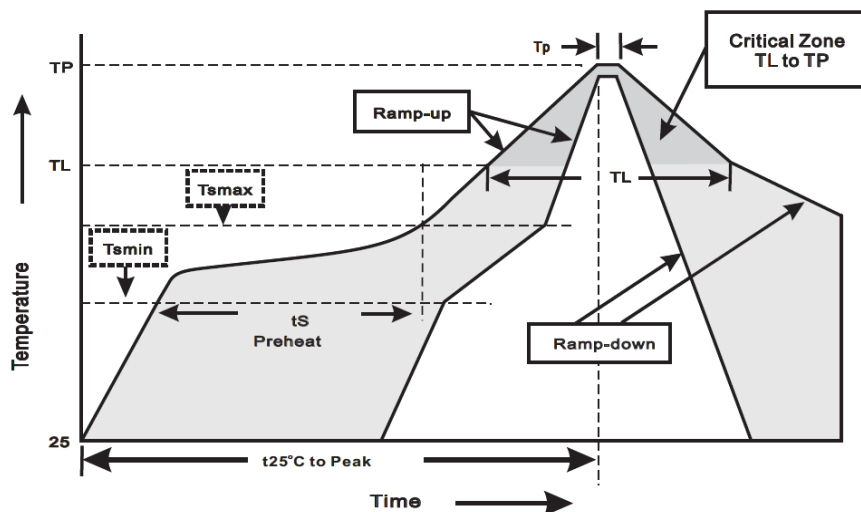


OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	INCHES
A	0.60	0.027
B	0.80	0.031
C	2.02	0.079
D	0.90	0.035

SOLDERING PARAMETERS

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_{smin})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 120 sec
T_{smax} to T_L	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_L)	217 °C
- Time(t_L)	60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes

CUSTOMER NOTE:

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1. ALPINESEMI™ Semiconductor Devices are RoHS compliant and hence customers are requested to dispose as per the prevailing Environmental Legislation put forth in their specific country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



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