

BC817-16W/BC817-25W/BC817-40W**List**

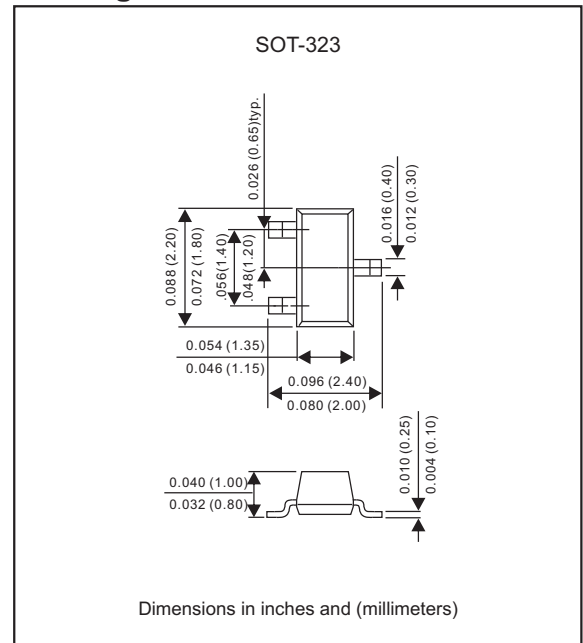
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BC817-16W/BC817-25W/BC817-40W**General Purpose Transistor
NPN Silicon****Features**

- Collector current capability I_C max 500mA
- Collector-emitter voltage V_{CE0} max 45V
- General purpose switching and amplification
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex. BC817-16W-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-323
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.006 gram

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

PARAMETER	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-base voltage	V_{CBO}			50	V
Collector-emitter voltage	V_{CEO}			45	V
Emitter-base voltage	V_{EBO}			5.0	V
Collector current — continuous	I_C			500	mA
Total device dissipation FR-5 board (1)	P_D			150	mW
$T_A = 25^\circ\text{C}$ Derate above 25°C				1.2	mW/ $^\circ\text{C}$
Thermal resistance Junction to ambient	$R_{\theta JA}$			833	$^\circ\text{C}/\text{W}$
Total device dissipation alumina substrate(2)	P_D			200	mW
$T_A = 25^\circ\text{C}$ Derate above 25°C				1.6	mW/ $^\circ\text{C}$
Thermal resistance Junction to ambient	$R_{\theta JA}$			625	$^\circ\text{C}/\text{W}$
Operation junction temperature range	T_J	-55		+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55		+150	$^\circ\text{C}$

1. FR-5 = 1.0 X 0.75 X 0.062 in.

2. Alumina = 0.4 X 0.3 X 0.024 in. 99.5% alumina.

BC817-16W/BC817-25W/BC817-40W**Electrical Characteristics** (AT $T_A = 25^\circ\text{C}$ unless otherwise noted)**Off characteristics**

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-emitter breakdown voltage	$I_C = 10\text{mA}$, $I_B = 0$	$V_{(BR)CEO}$	45			V
Collector-emitter breakdown voltage	$I_C = 10\mu\text{A}$, $V_{BE} = 0$	$V_{(BR)CES}$	50			V
Emitter-base breakdown voltage	$I_E = 1.0\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	5.0			V
Collector cutoff current	$V_{CB} = 20\text{Vdc}$	I_{CBO}			100	nA
	$V_{CB} = 20\text{Vdc}$, $T_A = 150^\circ\text{C}$	I_{CBO}			5.0	μA

On characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
DC current gain	BC817-16W $I_C = 100\text{mA}$, $V_{CE} = 1.0\text{V}$	h_{FE}	100		250	
	BC817-25W $I_C = 100\text{mA}$, $V_{CE} = 1.0\text{V}$		160		400	
	BC817-40W $I_C = 100\text{mA}$, $V_{CE} = 1.0\text{V}$		250		600	
	BC817-40W $I_C = 500\text{mA}$, $V_{CE} = 1.0\text{V}$		40			
Collector-emitter saturation voltage	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$	$V_{CE(sat)}$			0.7	V
Base-emitter saturation voltage	$I_C = 500\text{mA}$, $V_{CE} = 1.0\text{V}$	$V_{BE(on)}$			1.2	V

Small-signal characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Current-gain-bandwidth product	$I_C = 10\text{mA}$, $V_{CE} = 5\text{V}$, $f = 100\text{MHz}$	f_T	100			MHz
Output capacitance	$V_{CB} = 10\text{V}$, $f = 1.0\text{MHz}$	C_{obo}		10		pF

Rating and characteristic curves (BC817-25W)

FIG.1 DC Current Gain

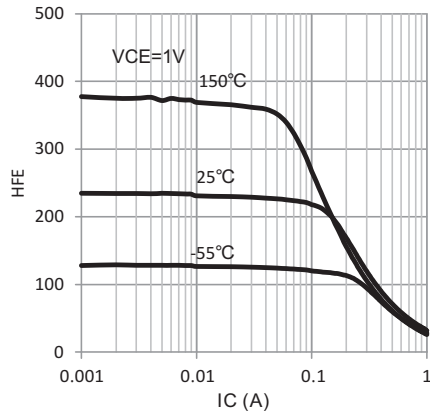


FIG.2 Collector Emitter Saturation Voltage vs. Collector Current

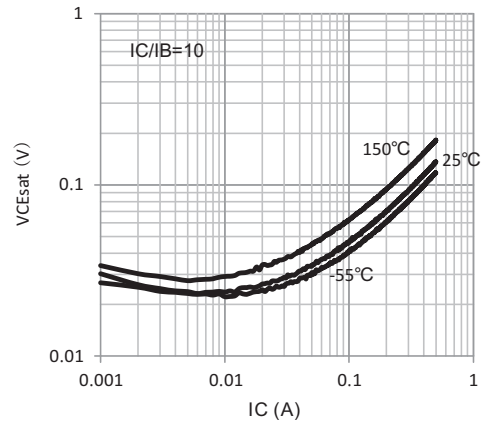


FIG.3 Base Emitter Saturation Voltage vs. Collector Current

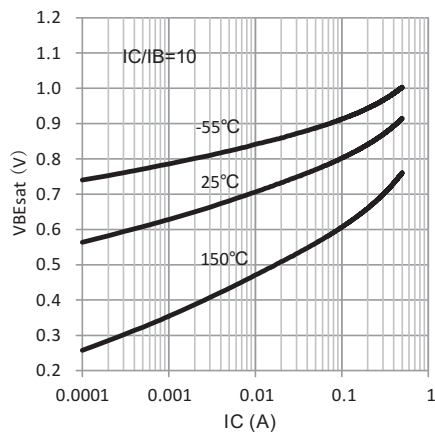


FIG.4 Saturation Region

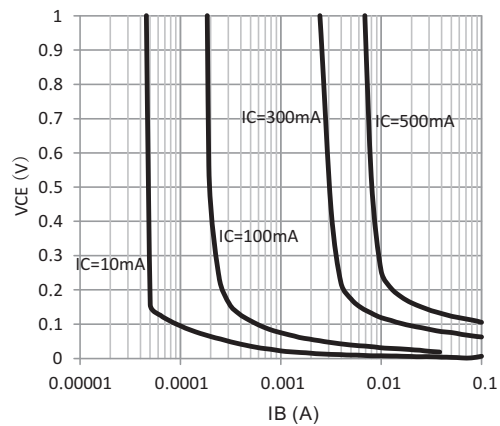


FIG.5 Base Emitter Saturation Voltage vs. Collector Current

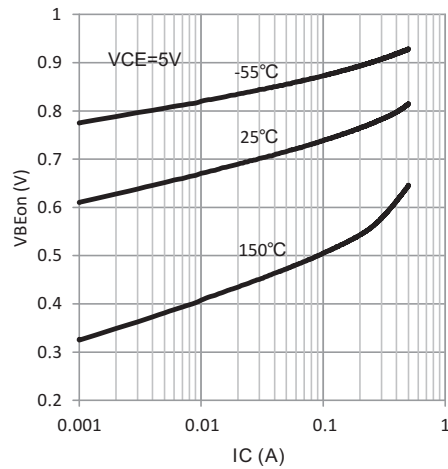
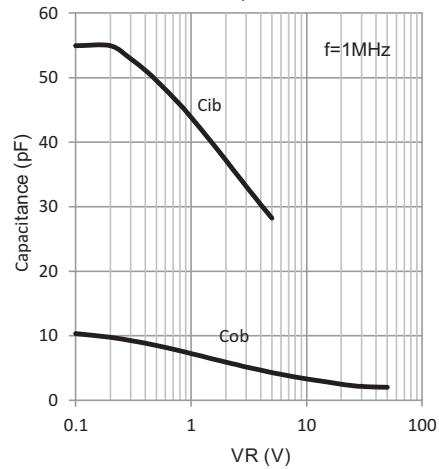
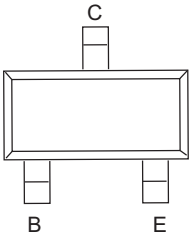
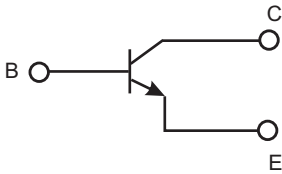


FIG.6 Capacitance

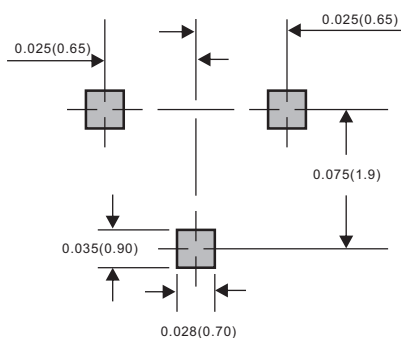


BC817-16W/BC817-25W/BC817-40W**Pinning information**

Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

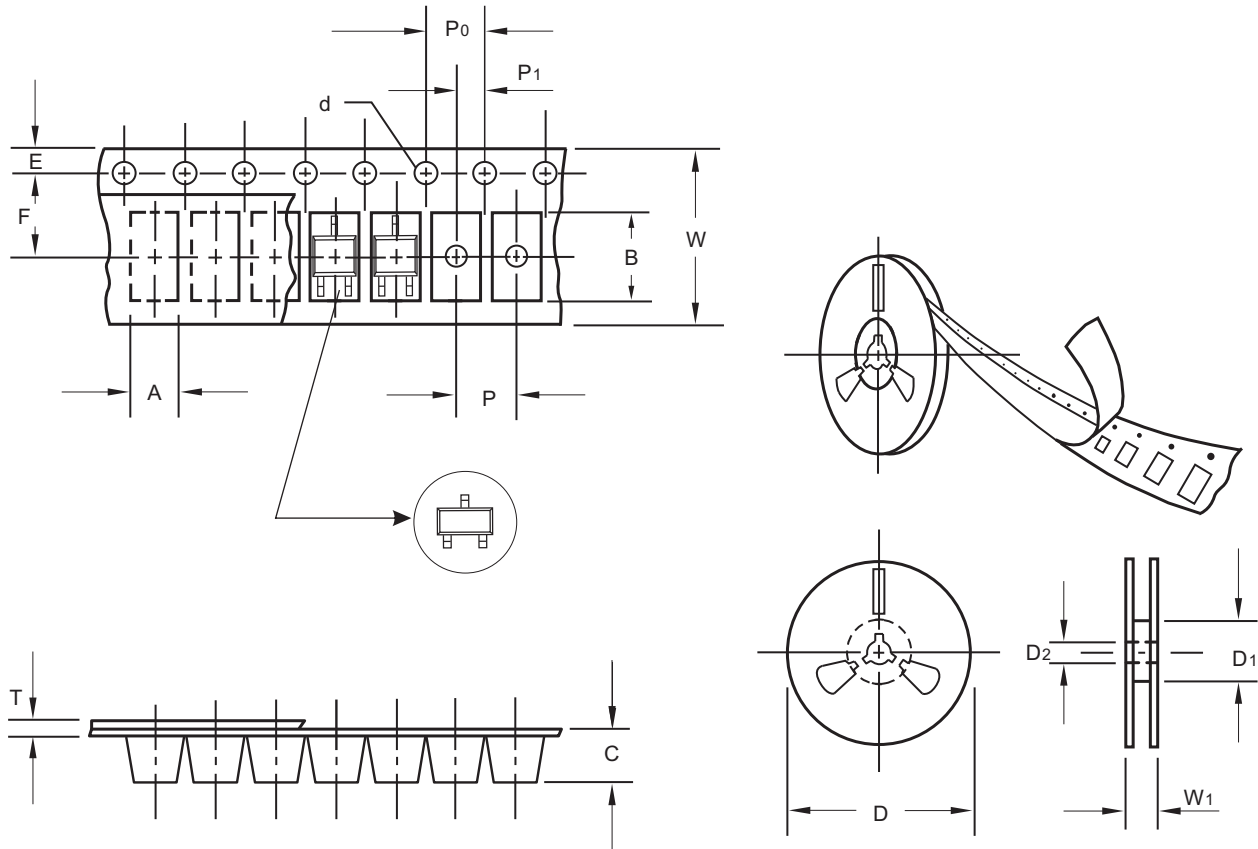
Type number	Marking code
BC817-16W	6A
BC817-25W	6B
BC817-40W	YM

Suggested solder pad layout**SOT-323**

Dimensions in inches and (millimeters)

BC817-16W/BC817-25W/BC817-40W

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.25
Carrier length	B	0.1	2.55
Carrier depth	C	0.1	1.19
Sprocket hole	d	0.1	1.55
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	11.40

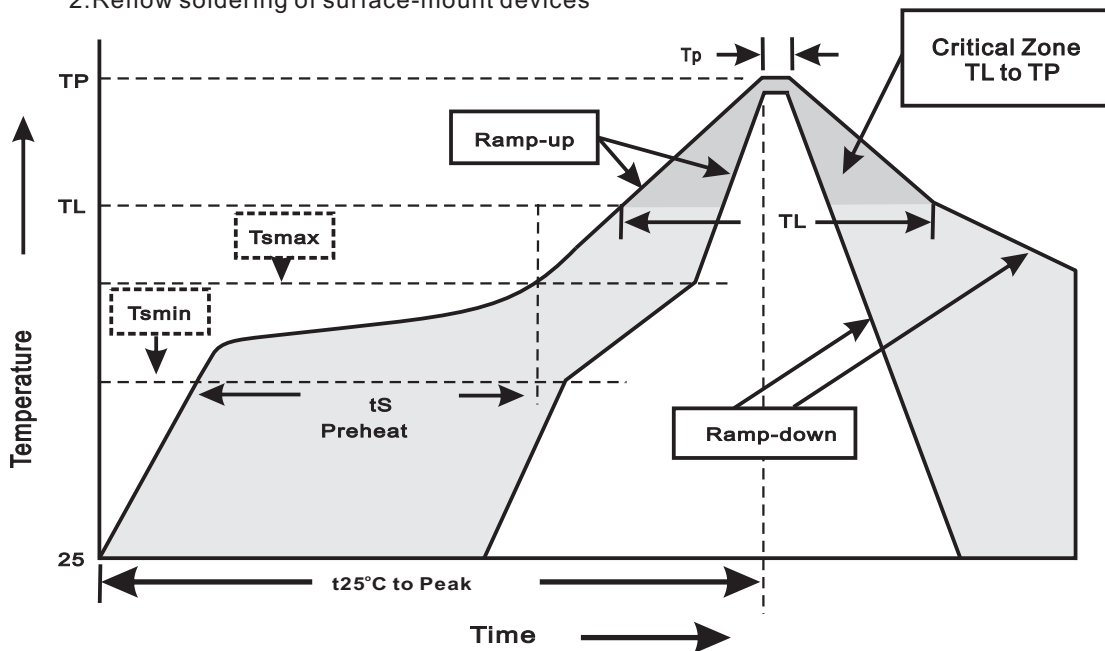
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

BC817-16W/BC817-25W/BC817-40W**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-323	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.50

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

BC817-16W/BC817-25W/BC817-40W**High reliability test capabilities**

Item Test	Conditions
1. Steady State Operating Life	$P_o=150\text{mW}$ Test Duration:1000hrs
2. High Temperature Reverse Bias	$T_j=150^\circ\text{C}$, $V_{ce}=80\%$ related volage, 1000hrs
3. Temperature Cycle	$-55^\circ\text{C}(15\text{min})$ to $150^\circ\text{C}(15\text{min})$ Air to Air Transition Time<20sec Test Cycles: 1000cycle
4. Autoclave	$P=2\text{atm}$ $T_a=121^\circ\text{C}$ $RH=100\%$ Test Duration: 96hrs
5. High Temperature Storage Life	$T_a=150^\circ\text{C}$ Test Duration: 1000hrs
6. Solderability	245°C ,5sec
7. High Temperature High Humidity Reverse Bias	$T_a=85^\circ\text{C}$, 85%RH, $V_{ce}=80\%$ related volage, 1000hrs
8. Resistance to Soldering Heat	260°C ,10sec