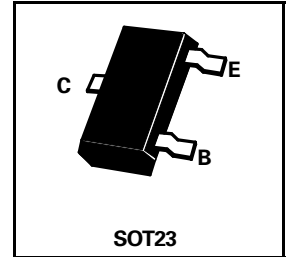


SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

ISSUE 6 - JANUARY 1997

BC846	BC847
BC848	BC849
BC850	

PARTMARKING DETAILS		COMPLEMENTARY TYPES	
BC846A-Z1A	BC848B-1K	BC846	BC856
BC846B-1B	BC848C-Z1L	BC847	BC857
BC847A-Z1E	BC849B-2B	BC848	BC858
BC847B-1F	BC849C-2C	BC849	BC859
BC847C-1GZ	BC850B-2FZ	BC850	BC860
BC848A-1JZ	BC850C-Z2G		



SOT23

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	BC846	BC847	BC848	BC849	BC850	UNIT
Collector-Base Voltage	V_{CBO}	80	50	30	30	50	V
Collector-Emitter Voltage	V_{CES}	80	50	30	30	50	V
Collector-Emitter Voltage	V_{CEO}	65	45	30	30	45	V
Emitter-Base Voltage	V_{EBO}	6		5			V
Continuous Collector Current	I_C	100					mA
Peak Collector Current	I_{CM}	200					mA
Peak Base Current	I_{BM}	200					mA
Peak Emitter Current	I_{EM}	200					mA
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$	P_{tot}	330					mW
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150					$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Collector Cut-Off Current	I_{CBO}	Max	15				nA	$V_{CB} = 30\text{V}$ $T_{amb} = 150^{\circ}\text{C}$	$V_{CB} = 30\text{V}$ $T_{amb} = 150^{\circ}\text{C}$
		Max	5				μA		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Typ	90				mV	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$
		Max.	250				mV		
		Typ	200				mV		
		Max.	600				mV		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Typ	300				mV	$I_C = 10\text{mA}$, $I_B = 5\text{mA}$	$I_C = 10\text{mA}$, $I_B = 5\text{mA}$
		Max.	600				mV		
		Typ	700				mV		
		Max.	900				mV		
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	Typ	10				mV	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$
		Max.	10				mV		
		Typ	10				mV		
		Max.	10				mV		
Base-Emitter Voltage	V_{BE}	Min	580				mV	$I_C = 2\text{mA}$, $V_{CE} = 5\text{V}$	$I_C = 2\text{mA}$, $V_{CE} = 5\text{V}$
		Typ	660				mV		
		Max	700				mV		
		Max	770				mV		

* Collector-Emitter Saturation Voltage at $I_C = 10\text{mA}$ for the characteristics going through the operating point $I_C = 11\text{mA}$, $V_{CE} = 1\text{V}$ at constant base current.

BC846	BC847
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ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Static Forward Current Ratio	Group VI	h_{FE}	Min	75	75	75	—	—	$I_C=2\text{mA}$, $V_{CE}=5\text{V}$
			Typ	110	110	110	—	—	
			Max	150	150	150	—	—	
	Group A	h_{FE}	Typ	90	90	90	—	—	$I_C=0.01\text{mA}$, $V_{CE}=5\text{V}$
			Min	110	110	110	—	—	$I_C=2\text{mA}$, $V_{CE}=5\text{V}$
			Typ	180	180	180	—	—	
			Max	220	220	220	—	—	$I_C=100\text{mA}$, $V_{CE}=5\text{V}$
	Group B	h_{FE}	Typ	120	120	120	—	—	
			Min	150					$I_C=0.01\text{mA}$, $V_{CE}=5\text{V}$
			Typ	200					$I_C=2\text{mA}$, $V_{CE}=5\text{V}$
			Max	290					$I_C=100\text{mA}$, $V_{CE}=5\text{V}$
			Typ	450					
Group C	h_{FE}	Typ.	—	270	270	270	270		$I_C=0.01\text{mA}$, $V_{CE}=5\text{V}$
			Min	—	420	420	420		$I_C=2\text{mA}$, $V_{CE}=5\text{V}$
			Typ	—	500	500	500		
			Max	—	800	800	800		$I_C=100\text{mA}$, $V_{CE}=5\text{V}$
			Typ	—	—	400	—	—	
Transition Frequency	f_T	Typ	300					MHz	$I_C=10\text{mA}$, $V_{CE}=5\text{V}$ $f=100\text{MHz}$
Collector-Base Capacitance	C_{obo}	Typ Max	2.5 4.5					pF pF	$V_{CB}=10\text{V}$ $f=1\text{MHz}$
Emitter-Base Capacitance	C_{ib0}	Typ	9					pF	$V_{EB}=0.5\text{V}$ $f=1\text{MHz}$
Noise Figure	N	Typ Max	2 10	2 10	2 10	1.2 4	1 4	dB dB	$V_{CE}=5\text{V}$, $I_C=200\mu\text{A}$, $R_C=2\text{k}\Omega$, $f=1\text{kHz}$, $\Delta f=200\text{Hz}$
		Typ Max	— —	— —	— —	1.2 4	1 3	dB dB	$V_{CE}=5\text{V}$, $I_C=200\mu\text{A}$, $R_C=2\text{k}\Omega$, $f=30\text{Hz}$ to 15kHz at -3dB points
Equivalent Noise Voltage	e_n	Max.	—	—	—	110	110	nV	$V_{CE}=5\text{V}$, $I_C=200\mu\text{A}$, $R_C=2\text{k}\Omega$, $f=10\text{Hz}$ to 50Hz at -3dB points

Spice parameter data is available upon request for this device

BC846	BC847
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BC850	

ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER		SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.	
Dynamic Characteristics	Group VI	h _{ie}	Min	0.4	0.4	0.4	–	–	kΩ	V _{CE} =5V I _C =2mA	
			Typ	1.2	1.2	1.2	–	–	kΩ		
			Max	2.2	2.2	2.2	–	–	kΩ		
			Group A	Min	1.6	1.6	1.6	–	–		kΩ
				Typ	2.7	2.7	2.7	–	–		kΩ
	Group B	Max	4.5	4.5	4.5	–	–	kΩ			
		Group C	Min	3.2					kΩ		
	Typ		4.5					kΩ			
	Max	8.5					kΩ				
	Group VI	h _{re}	Typ	2.5	2.5	2.5	–	–	x10 ⁻⁴		
Typ			1.5	1.5	1.5	–	–	x10 ⁻⁴			
Typ			2	2	2	2	2	x10 ⁻⁴			
Typ			–	–	3	3	3	x10 ⁻⁴			
Group VI	h _{fe}	Min	75	75	75	–	–				
		Typ	110	110	110	–	–				
		Max	150	150	150	–	–				
		Group A	Min	125	125	125	–	–			
			Typ	220	220	220	–	–			
		Max	260	260	260	–	–				
		Group B	Min	240							
			Typ	330							
		Group C	Max	500							
			Min	–	450	450	450	450			
Typ	–	600	600	600	600						
Max	–	900	900	900	900						
Group VI	h _{oe}	Typ	20	20	20	–	–	μs			
		Max	40	40	40	–	–	μs			
		Group A	Typ	18	18	18	–	–	μs		
			Max	30	30	30	–	–	μs		
		Group B	Typ	30					μs		
			Max	60					μs		
		Group C	Typ	–	–	60	60	60	μs		
			Max	–	–	110	110	110	μs		