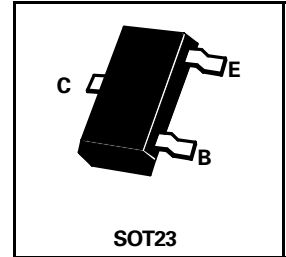


SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

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		



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°C	P _{tot}	330					mW
Operating and Storage Temperature Range	T _J :T _{stg}	-55 to +150					°C

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

PARAMETER	SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Collector Cut-Off Current	I_{CBO}	Max	15					nA	$V_{CB} = 30V$
		Max	5					μA	$V_{CB} = 30V$ $T_{amb}=150^{\circ}C$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Typ	90					mV	$I_C=10mA$,
		Max.	250					mV	$I_B=0.5mA$
		Typ	200					mV	$I_C=100mA$,
		Max.	600					mV	$I_B=5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	Typ	300					mV	$I_C=10mA^*$
		Max.	600					mV	
		Typ	700					mV	$I_C=10mA$,
Base-Emitter Voltage	V_{BE}	Typ	900					mV	$I_B=0.5mA$
		Max.	900					mV	$I_C=100mA$,
		Min	580					mV	$I_B=5mA$
		Typ	660					mV	$I_C=2mA$
		Max	700					mV	$V_{CE}=5V$
		Max	770					mV	$I_C=10mA$
								mV	$V_{CE}=5V$

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

BC846	BC847
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BC850	

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		
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	–	–		
	Group B	Max	260	260	260	–	–				
		Group C	Min	240							
	Typ		330								
	Max	500									
		Group VI	h _{oe}	Min	–	450	450	450	450		
Typ				–	600	600	600	600			
Max				–	900	900	900	900			
Group A				Typ	20	20	20	–	–	μs	
				Max	40	40	40	–	–	μs	
Group B	Typ	18	18	18	–	–	μs				
	Max	30	30	30	–	–	μs				
Group C	Typ	30					μs				
	Max	60					μs				
	Group VI	h _{oe}	Typ	–	–	60	60	60	μs		
			Max	–	–	110	110	110	μs		