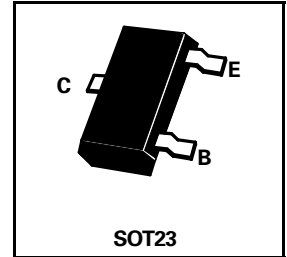


SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

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.						mV	$I_C=100mA$,
		Min						mV	$I_B=5mA$
		Max						mV	$I_C=2mA$ $V_{CE}=5V$
Base-Emitter Voltage	V_{BE}	Min	580					mV	$I_C=10mA$
		Max	770					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.

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

Spice parameter data is available upon request for this device

BC846	BC847
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ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER		SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.	
Dynamic Characteristics	Group VI Group A Group B Group C	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		
			Min	1.6	1.6	1.6	–	–	kΩ		
			Typ	2.7	2.7	2.7	–	–	kΩ		
	Group A Group B Group C	h _{re}	Max	4.5	4.5	4.5	–	–	kΩ		
			Min	3.2							kΩ
			Typ	4.5							kΩ
			Max	8.5							kΩ
			Min	–	–	6	6	6	kΩ		
			–	–	8.7	8.7	8.7	kΩ			
			–	–	15	15	15	kΩ			
Group VI Group A Group B Group C	h _{fe}	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 Group A Group B Group C	h _{fe}	Min	75	75	75	–	–				
		Typ	110	110	110	–	–				
		Max	150	150	150	–	–				
		Min	125	125	125	–	–				
		Typ	220	220	220	–	–				
		Max	260	260	260	–	–				
		Min	240								
		Typ	330								
		Max	500								
		Min	–	450	450	450	450				
	–	600	600	600	600						
	–	900	900	900	900						
Group VI Group A Group B Group C	h _{oe}	Typ	20	20	20	–	–	μs			
		Max	40	40	40	–	–	μs			
		Typ	18	18	18	–	–	μs			
		Max	30	30	30	–	–	μs			
		Typ	30						μs		
		Max	60						μs		
		Typ	–	–	60	60	60	μs			
		Max	–	–	110	110	110	μs			