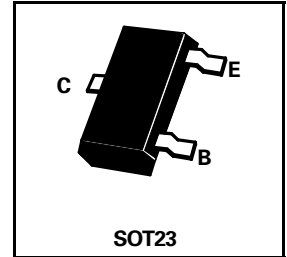


SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

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 $T_{amb}=25^{\circ}\text{C}$	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	$V_{CB} = 30\text{V}$
		Max	5					μA	$V_{CB} = 30\text{V}$ $T_{amb}=150^{\circ}\text{C}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Typ	90					mV	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$
		Max.	250					mV	$I_C=100\text{mA}$, $I_B=5\text{mA}$
		Typ	200					mV	$I_C=10\text{mA}^*$
		Max.	600					mV	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	Typ	700					mV	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$
		Typ	900					mV	$I_C=100\text{mA}$, $I_B=5\text{mA}$
Base-Emitter Voltage	V_{BE}	Min	580					mV	$I_C=2\text{mA}$
		Typ	660					mV	$V_{CE}=5\text{V}$
		Max	700					mV	
		Max	770					mV	$I_C=10\text{mA}$ $V_{CE}=5\text{V}$

* 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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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 =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	—	—	
	Group B	h _{FE}	Typ	120	120	120	—	—	I _C =100mA, V _{CE} =5V
			Typ	150					I _C =0.01mA, V _{CE} =5V
			Min	200					I _C =2mA, V _{CE} =5V
			Typ	290					
	Max	450							
Typ	200	200	200	—	—	I _C =100mA, V _{CE} =5V			
Group C	h _{FE}	Typ.	—	270	270	270	270	I _C =0.01mA, V _{CE} =5V	
		Min	—	420	420	420	420	I _C =2mA, V _{CE} =5V	
		Typ	—	500	500	500	500		
		Max	—	800	800	800	800		
Typ	—	—	400	—	—	I _C =100mA, V _{CE} =5V			
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								
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 =200μA, R _C =2kΩ, f=1kHz, Δf=200Hz
		Max	10	10	10	4	4		
		Typ	—	—	—	1.2	1	dB	V _{CE} = 5V, I _C =200μA, R _C =2kΩ, f=30Hz to 15kHz at -3dB points
		Max	—	—	—	4	3		
Equivalent Noise Voltage	e _n	Max.	—	—	—	110	110	nV	V _{CE} = 5V, I _C =200μA, R _C =2kΩ, f=10Hz 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 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		
Group VI Group A Group B Group C	h _{fe}	Typ	–	–	8.7	8.7	8.7	kΩ			
		Typ	–	–	15	15	15	kΩ			
		Max	–	–	15	15	15	kΩ			
		Max	–	–	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			
		Min	75	75	75	–	–				
	Group A Group B Group C	h _{oe}	Typ	110	110	110	–	–			
			Max	150	150	150	–	–			
			Min	125	125	125	–	–			
			Typ	220	220	220	–	–			
			Max	260	260	260	–	–			
Group A Group B Group C	h _{oe}	Min	240								
		Typ	330								
		Max	500								
		Min	–	450	450	450	450				
Group VI Group A Group B Group C	h _{oe}	Typ	–	600	600	600	600				
		Max	–	900	900	900	900				
		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							
Group A Group B Group C	h _{oe}	Typ	–	–	60	60	60	μs			
		Max	–	–	110	110	110	μs			

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