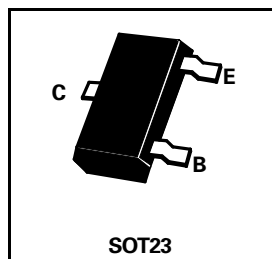


SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

BC846	BC847
BC848	BC849
BC850	

ISSUE 6 - JANUARY 1997

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 $T_{amb}=25^{\circ}C$	P_{tot}	330					mW
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150					$^{\circ}C$

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	$I_C = 10mA,$ $I_B = 0.5mA$
		Max.	250				mV	$I_C = 100mA,$ $I_B = 5mA$
		Typ	200				mV	$I_C = 100mA,$ $I_B = 5mA$
		Max.	600				mV	$I_C = 10mA^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	Typ	700				mV	$I_C = 10mA,$ $I_B = 0.5mA$
		Typ	900				mV	$I_C = 100mA,$ $I_B = 5mA$
Base-Emitter Voltage	V_{BE}	Min	580				mV	$I_C = 2mA$
		Typ	660				mV	$V_{CE} = 5V$
		Max	700				mV	
		Max	770				mV	$I_C = 10mA$ $V_{CE} = 5V$

* 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
BC848	BC849
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	-	-	$I_C=100mA, V_{CE}=5V$	
			Min	150					$I_C=0.01mA, V_{CE}=5V$	
200										
			Typ	290	290	290	-	-	$I_C=2mA, V_{CE}=5V$	
			Max	450	450	450	-	-		
Group C	h_{FE}	Typ	200	200	200	-	-	$I_C=100mA, V_{CE}=5V$		
		Typ	-	270	270	270	270	$I_C=0.01mA, V_{CE}=5V$		
			Min	-	420	420	420		420	
			Typ	500	500	500	500	$I_C=2mA, V_{CE}=5V$		
			Max	800	800	800	800			
Group C	h_{FE}	Typ	-	-	400	-	-	$I_C=100mA, V_{CE}=5V$		
		Max	-	-	-	-	-			
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			
			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		
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
BC848	BC849
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	–	–	k Ω
		Typ	1.2	1.2	1.2	–	–	k Ω
		Max	2.2	2.2	2.2	–	–	k Ω
		Min	1.6	1.6	1.6	–	–	k Ω
		Typ	2.7	2.7	2.7	–	–	k Ω
Group B	h_{ie}	Max	4.5	4.5	4.5	–	–	k Ω
		Min	3.2					k Ω
Group C	h_{ie}	Typ	4.5					k Ω
		Max	8.5					k Ω
Group VI Group A Group B Group C	h_{re}	Min	–	–	6	6	6	k Ω
		Typ	–	–	8.7	8.7	8.7	k Ω
		Max	–	–	15	15	15	k Ω
Group VI Group A Group B Group C	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 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	–	–	
Group B	h_{fe}	Max	260	260	260	–	–	
		Min	240					
Group C	h_{fe}	Typ	330					
		Max	500					
Group VI Group A Group B Group C	h_{fe}	Min	–	450	450	450	450	
		Typ	–	600	600	600	600	
		Max	–	900	900	900	900	
Group VI Group A Group B Group C	h_{oe}	Typ	20	20	20	–	–	μ s
		Max	40	40	40	–	–	μ s
		Typ	18	18	18	–	–	μ s
		Max	30	30	30	–	–	μ s
Group B	h_{oe}	Typ	30					μ s
		Max	60					μ s
Group C	h_{oe}	Typ	–	–	60	60	60	μ s
		Max	–	–	110	110	110	μ s

$V_{CE}=5V$
 $I_C=2mA$