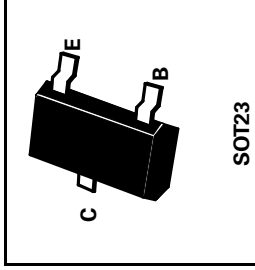


**SOT23 NPN SILICON PLANAR
GENERAL PURPOSE TRANSISTORS**
ISSUE 6 - JANUARY 1997

**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-ZZG	



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					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	
	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	$I_C = 10mA$, $I_B = 0.5mA$
		Max.	900				mV	$I_C = 100mA$, $I_B = 5mA$
		Min	580				mV	$I_C = 2mA$
Base-Emitter Voltage	V_{BE}	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.

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ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	SYMBOL	BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Dynamic Characteristics	h_{ie}	Min	0.4	0.4	-	-	k Ω	$V_{CE}=5V$ $I_C=2mA$
		Typ	1.2	1.2	-	-	k Ω	
		Max	2.2	2.2	-	-	k Ω	
Group A	h_{ie}	Min	1.6	1.6	-	-	k Ω	
		Typ	2.7	2.7	-	-	k Ω	
		Max	4.5	4.5	-	-	k Ω	
Group B	h_{ie}	Min	3.2	3.2	-	-	k Ω	
		Typ	4.5	4.5	-	-	k Ω	
		Max	8.5	8.5	-	-	k Ω	
Group C	h_{ie}	Min	6	6	6	6	k Ω	
		Typ	8.7	8.7	8.7	8.7	k Ω	
		Max	15	15	15	15	k Ω	
Group VI	h_{re}	Typ	2.5	2.5	-	-	$\times 10^{-4}$	
		Typ	1.5	1.5	-	-	$\times 10^{-4}$	
		Typ	2	2	2	2	$\times 10^{-4}$	
		Typ	2	3	3	3	$\times 10^{-4}$	
Group VI	h_{re}	Min	75	75	-	-		
		Typ	110	110	-	-		
		Max	150	150	-	-		
Group A	h_{re}	Min	125	125	-	-		
		Typ	220	220	-	-		
		Max	260	260	-	-		
Group B	h_{re}	Min	240	240	-	-		
		Typ	330	330	-	-		
		Max	500	500	-	-		
Group C	h_{re}	Min	450	450	450	450		
		Typ	600	600	600	600		
		Max	900	900	900	900		
Group VI	h_{oe}	Typ	20	20	-	-	μs	
		Max	40	40	-	-	μs	
		Typ	18	18	-	-	μs	
Group A	h_{oe}	Typ	30	30	-	-	μs	
		Max	60	60	-	-	μs	
		Typ	30	30	-	-	μs	
Group B	h_{oe}	Typ	60	60	60	60		
		Max	110	110	110	110		
		Typ	60	60	60	60		
Group C	h_{oe}	Typ	110	110	110	110		
		Max	110	110	110	110		
		Typ	110	110	110	110		

ELECTRICAL CHARACTERISTICS (Continued)

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

Spice parameter data is available upon request for this device

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ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	SYMBOL	BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Dynamic Characteristics	h_{ie}	Min	0.4	0.4	-	-	k Ω	$V_{CE}=5V$ $I_C=2mA$
		Typ	1.2	1.2	-	-	k Ω	
		Max	2.2	2.2	-	-	k Ω	
Group A	h_{ie}	Min	1.6	1.6	-	-	k Ω	
		Typ	2.7	2.7	-	-	k Ω	
		Max	4.5	4.5	-	-	k Ω	
Group B	h_{ie}	Min	3.2	3.2	-	-	k Ω	
		Typ	4.5	4.5	-	-	k Ω	
		Max	8.5	8.5	-	-	k Ω	
Group C	h_{ie}	Min	6	6	6	6	k Ω	
		Typ	8.7	8.7	8.7	8.7	k Ω	
		Max	15	15	15	15	k Ω	
Group VI	h_{re}	Typ	2.5	2.5	-	-	$\times 10^{-4}$	
		Typ	1.5	1.5	-	-	$\times 10^{-4}$	
		Typ	2	2	2	2	$\times 10^{-4}$	
		Typ	-	3	3	3	$\times 10^{-4}$	
Group VI	h_{re}	Min	75	75	-	-		
		Typ	110	110	-	-		
		Max	150	150	-	-		
Group A	h_{re}	Min	125	125	-	-		
		Typ	220	220	-	-		
		Max	260	260	-	-		
Group B	h_{re}	Min	240	240	-	-		
		Typ	330	330	-	-		
		Max	500	500	-	-		
Group C	h_{re}	Min	450	450	450	450		
		Typ	600	600	600	600		
		Max	900	900	900	900		
Group VI	h_{oe}	Typ	20	20	-	-	μs	
		Max	40	40	-	-	μs	
		Typ	18	18	-	-	μs	
Group A	h_{oe}	Typ	30	30	-	-	μs	
		Max	60	60	-	-	μs	
		Typ	30	30	-	-	μs	
Group B	h_{oe}	Typ	60	60	60	60		
		Max	110	110	110	110		
		Typ	60	60	60	60		
Group C	h_{oe}	Typ	110	110	110	110		
		Max	110	110	110	110		
		Typ	110	110	110	110		

ELECTRICAL CHARACTERISTICS (Continued)

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

Spice parameter data is available upon request for this device