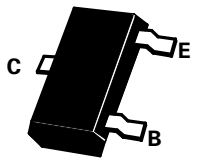
SOT23 NPN SILICON PLANAR GENERAL PURPOSE TRANSISTORS

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		



SOT23

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°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°C
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Typ Max.	90 250					mV mV	I_C=10mA, I_B=0.5mA
		Typ Max.	200 600					mV mV	I_C=100mA, I_B=5mA
		Typ Max.	300 600					mV 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 Typ Max	580 660 700					mV mV mV	I_C=2mA V_{CE}=5V
		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.

ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	SYMBOL		BC846	BC847	BC848	BC849	BC850	UNIT	CONDITIONS.
Static Forward Current Ratio Group VI	h_{FE}	Min Typ Max	75 110 150	75 110 150	75 110 150	– – –	– – –		I_C=2mA, V_{CE}=5V
Group A	h_{FE}	Typ	90	90	90	–	–		I_C=0.01mA, V_{CE}=5V
		Min Typ Max	110 180 220	110 180 220	110 180 220	– – –	– – –		I_C=2mA, V_{CE}=5V
		Typ	120	120	120	–	–		I_C=100mA, V_{CE}=5V
Group B	h_{FE}	Typ			150				I_C=0.01mA, V_{CE}=5V
		Min Typ Max			200 290 450				I_C=2mA, V_{CE}=5V
		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 Typ Max	– – –	420 500 800	420 500 800	420 500 800	420 500 800		I_C=2mA, V_{CE}=5V
		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 Max			2.5 4.5			pF pF	V_{CB}=10V f=1MHz
Emitter-Base Capacitance	C_{ib0}	Typ			9			pF	V_{EB}=0.5V f=1MHz
Noise Figure	N	Typ Max	2 10	2 10	2 10	1.2 4	1 4	dB dB	V_{CE} = 5V, I_C=200µA, R_G=2kΩ, f=1kHz, Δf=200Hz
		Typ Max	– –	– –	– –	1.2 4	1 3	dB dB	V_{CE} = 5V, I_C=200µA, R_G=2kΩ, f=30Hz to 15kHz at -3dB points
Equivalent Noise Voltage	e_n	Max.	–	–	–	110	110	nV	V_{CE} = 5V, I_C=200µA, R_G=2kΩ, f=10Hz to 50Hz at -3dB points

Spice parameter data is available upon request for this device

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 Ic=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	
		Max	4.5	4.5	4.5	–	–	kΩ	
Group B		Min			3.2			kΩ	
		Typ			4.5			kΩ	
Group C		Max			8.5			kΩ	
		Min	–	–	6	6	6	kΩ	
		Typ	–	–	8.7	8.7	8.7	kΩ	
		Max	–	–	15	15	15	kΩ	
Group VI	h_{re}	Typ	2.5	2.5	2.5	–	–	$x10^{-4}$	
Group A		Typ	1.5	1.5	1.5	–	–	$x10^{-4}$	
Group B		Typ	2	2	2	2	2	$x10^{-4}$	
Group C		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	–	–		
		Max	260	260	260	–	–		
Group B		Min			240				
		Typ			330				
Group C		Max			500				
		Min	–	450	450	450	450		
		Typ	–	600	600	600	600		
		Max	–	900	900	900	900		
Group VI	h_{oe}	Typ	20	20	20	–	–	µs	
		Max	40	40	40	–	–	µs	
Group A		Typ	18	18	18	–	–	µs	
		Max	30	30	30	–	–	µs	
Group B		Typ	30					µs	
		Max	60					µs	
Group C		Typ	–	–	60	60	60	µs	
		Max	–	–	110	110	110	µs	