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<u>[</u>]_	BC237.pdf	22-Dec-99	00:02	70K	
<u>-</u>	BC237_238_239.pdf	17-Apr-99	00:00	70K	
<u>[</u>]_	BC238.pdf	22-Dec-99	00:02	70K	
<u> </u>	BC239.pdf	22-Dec-99	00:02	70K	
<u> </u>	BC307.pdf	22-Dec-99	00:02	69K	
<u> </u>	BC307_308_309.pdf	17-Apr-99	00:00	69K	
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[``	BCW60D.pdf	22-Dec-99	00:02	31K
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BC237/238/239

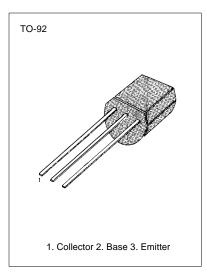
NPN EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

LOW NOISE: BC239

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V _{CES}		V
: BC237		50	V
: BC238/239		30	
Collector-Emitter Voltage	V _{CEO}		
: BC237		45	V
: BC238/239		25	V
Emitter-Base Voltage	V _{EBO}		
: BC237		6	V
: BC238/239		5	V
Collector Current (DC)	lc	100	mA
Collector Dissipation	Pc	500	mW
Junction Temperature	TJ	150	°C
Storage Temperature	T _{STG}	-55 ~ 150	°C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Мах	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C =2mA, I _B =0				
:BC237			45			V
: BC238/239	9		25			V
Emitter Base Breakdown Voltage	BV _{EBO}	$I_E=1\mu A$, $I_C=0$				
: BC237			6			V
: BC238/239	9		5			V
Collector Cut-off Current	ICES					
: BC237		V _{CE} =50V, I _B =0		0.2	15	nA
: BC238/23	9	V_{CE} =30V, I_{B} =0		0.2	15	nA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =2mA	120		800	
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =10mA, I _B =0.5mA		0.07	0.2	V
		$I_{C}=100$ mA, $I_{B}=5$ mA		0.2	0.6	V
Collector Base Saturation Voltage	V _{BE} (sat)	$I_{C}=10mA$, $I_{B}=0.5mA$		0.73	0.83	V
		$I_{\rm C}$ =100mA, $I_{\rm B}$ =5mA		0.87	1.05	V
Base Emitter On Voltage	V _{BE} (on)	$V_{CE}=5V, I_{C}=2mA$	0.55	0.62	0.7	V
Current Gain Bandwidth Product	f _T	$V_{CE}=3V$, $I_{C}=0.5mA$		85		MHz
		V _{CE} =5V, I _C =10mA	150	250		MHz
Collector Base Capacitance	C _{CBO}	V _{CB} =10V, f=1MHz		3.5	c	pF
Emitter Base Capacitance		$V_{EB}=0.5V$, f=1MHz		3.5	6	pF
Noise Figure : BC237/238		$V_{CE}=5V, I_{C}=0.2mA,$		2	10	dB
: BC239		$f=1KHz R_G=2kohm$		2	4	dB
: BC239	NF	$V_{CF}=5V, I_{C}=0.2mA$			4	dB
. 56203		$R_G=2$ kohm, f=30~15KHz			4	чD

hFE CLASSIFICATION

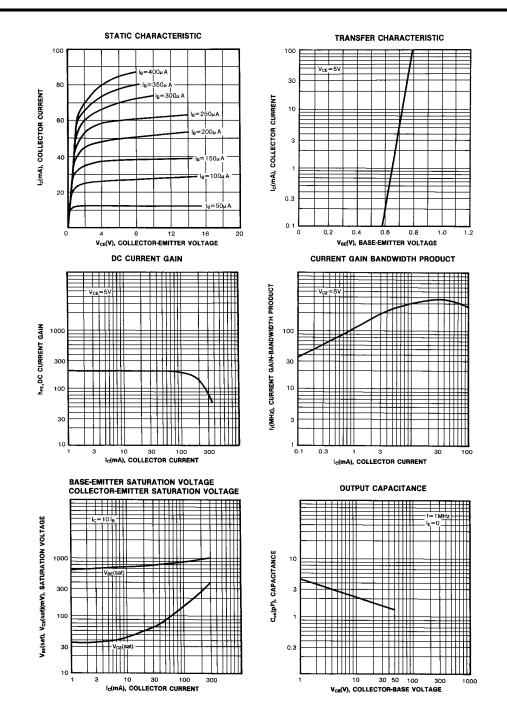
Classification	A	В	С
h _{FE}	120-220	180-460	380-800



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Rev. B

NPN EPITAXIAL SILICON TRANSISTOR



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PRODUCT STATUS DEFINITIONS

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
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BC307/308/309

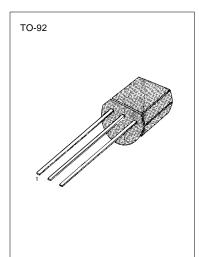
PNP EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

• LOW NOISE: BC309

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage : BC307 : BC308/309 Collector-Emitter Voltage : BC307 : BC307 : BC308/309 Emitter-Base Voltage Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CES} V _{CEO} V _{EBO} I _C P _C T _J T _{STG}	-50 -30 -45 -25 -5 -100 500 150 -55 ~ 150	∨∨ ∨∨×mA m°℃°



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Emitter Breakdown Voltage : BC307 : BC308/309	BV _{CEO}	$I_{\rm C}$ = -2mA, $I_{\rm B}$ =0	-45 -25			V V
Collector Emitter Breakdown Voltage : BC307 : BC308/309 Emitter Base Breakdown Voltage	BV _{CES}	I _C = -10μΑ, I _B =0 I _F = -10μΑ, I _B =0	-50 -30 -5			V V V
Collector Cut-off Current : BC307 : BC238/239	I _{CES}	V _{CE} = -45V, I _B =0 V _{CE} = -25V, I _B =0 V _{CF} = -5V, I _C = -2mA		-2 -2	-15 -15	nA nA
DC Current Gain Collector-Emitter Saturation Voltage Collector Base Saturation Voltage	h _{FE} V _{CE} (sat) V _{BE} (sat)	V_{CE} - 5V, V_{CE} - 2111A I_{C} - 10mA, I_{B} - 0.5mA I_{C} - 100mA, I_{B} - 5mA I_{C} - 10mA, I_{B} - 0.5mA	120	-0.5 -0.7	800 -0.3	V V V
Base Emitter On Voltage Current Gain Bandwidth Product	V _{BE} (on) f _T	$\begin{array}{l} I_{C}{=} -100 \text{mA}, \ I_{B}{=} -5 \text{mA} \\ V_{CE}{=} -5 \text{V}, \ I_{C}{=} -2 \text{mA} \\ V_{CE}{=} -5 \text{V}, \ I_{C}{=} -10 \text{mA} \end{array}$	-0.55	-0.85 -0.62 130	-0.7	V V MHz
Collector Base Capacitance Emitter Base Capacitance Noise Figure : BC237/238	C _{CBO} C _{EBO} NF	V_{CB} = -10V, f=1MHz V_{EB} = -0.5V, f=1MHz V_{CE} = -5V, I _C = -0.2mA, R_{G} =2K Ω , f=1KHz		12	6 10	pF pF dB
: BC239 : BC239	NF	$V_{CE} = -5V$, $I_C = -0.2mA$ $R_G = 2K\Omega$, f=30~15KHz		2	4 4	dB dB

h_{FE} CLASSIFICATION

Classification	Α	В	С
h _{FE}	120-220	180-460	380-800

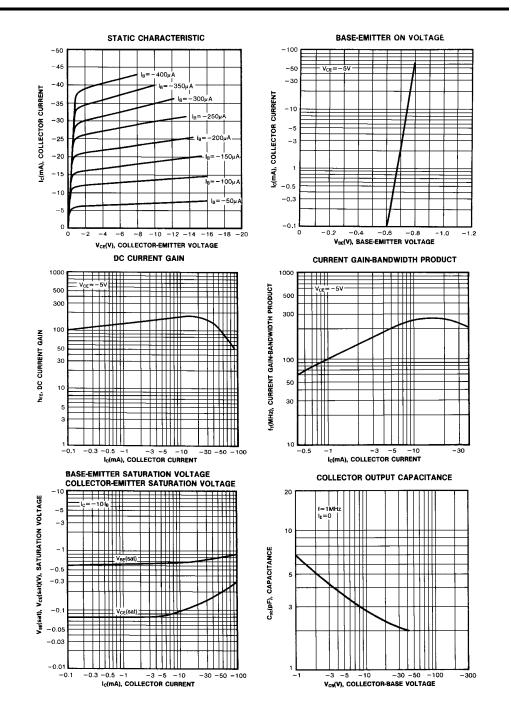


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BC307/308/309

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BC327/328

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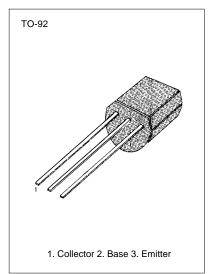
SWITCHING AND AMPLIFIER APPLICATIONS

• Suitable for AF-Driver stages and low power output stages

Complement to BC337/BC338

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage : BC327 : BC328 Collector-Emitter Voltage : BC327 : BC327 : BC328 Emitter-Base Voltage Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CES} V _{CEO} V _{EBO} I _C P _C T _J T _{STG}	-50 -30 -45 -25 -5 -800 625 150 -55 ~ 150	°°°°××××°°°°



ELECTRICAL CHARACTERISTICS (T_A=25°C)

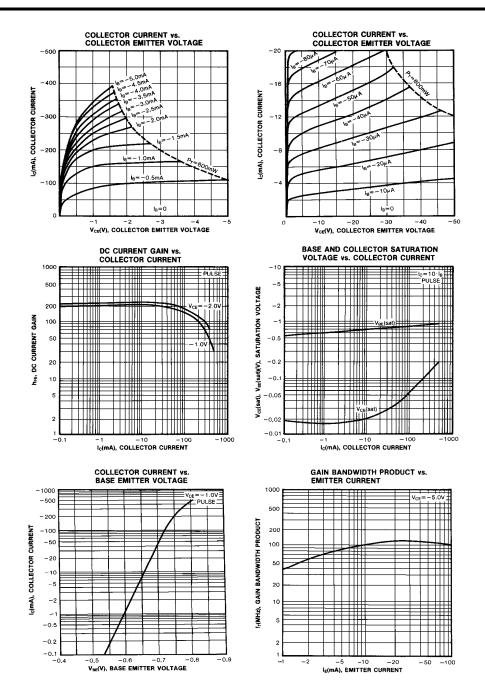
Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Emitter Breakdown Voltage	BV _{CEO}	I _C = -10mA, I _B =0				
: BC327 : BC328			-45 -25			V
Collector Emitter Breakdown Voltage	BV _{CES}	I _C = -0.1mA, I _B =0	20			v
: BC327	DICES		-50			V
: BC328			-30			V
Emitter Base Breakdown Voltage	BV _{EBO}	I _E = -10mA, I _C =0	-5			V
Collector Cut-off Current	ICES					
: BC307		$V_{CE} = -45V, I_{B} = 0$		-2	-100	nA
: BC338		V _{CE} = -25V, I _B =0		-2	-100	nA
DC Current Gain	h _{FE}	V_{CE} = -1V, I_{C} = -100mA	100		630	
	h _{FE} 2	V_{CE} = -1V, I_{C} = -30mA	60		07	
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I_{C} = -500mA, I_{B} = -50mA			-0.7	V
Base Emitter On Voltage	V _{BE} (on)	V_{CE} = -1V, I _C = -300mA			-1.2	V
Current Gain Bandwidth Product	f⊤	V_{CE} -5V, I_{C} -10mA		100		MHz
Collector Base Capacitance	C _{CBO}	V _{CB} = -10V, f=1MHz		12		pF

hFE CLASSIFICATION

Classification	Α	В	С
h _{FE}	100-250	160-400	250-630
h _{FE2}	60-	100-	170-



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PNP EPITAXIAL SILICON TRANSISTOR

###

-2 -5 -10 -20 -50 Vce(V), COLLECTOR TO EMITTER VOLTAGE

-1000

-500

-200 -100

-50 COLLECTOR

-20

-10

-8

-2

-1

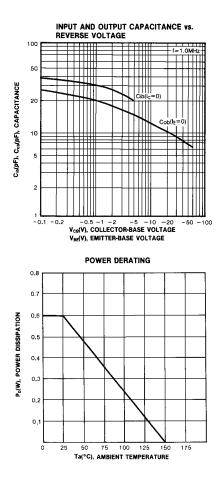
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SAFE OPERATING AREA

duty cycle≼29

-100





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BC337-16 / BC337-25

Discrete POWER & Signal **Technologies**



BC337-16 BC337-25



NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 500 mA. Sourced from Process 12. See TN3019A for characteristics.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CES}	Collector-Base Voltage	50	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	1.0	A
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

Symbol	Characteristic	Мах	Units
		BC337-16 / BC337-25	-
P _D	Total Device Dissipation	625	mW
	Derate above 25°C	5.0	mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
R _{0JA}	Thermal Resistance, Junction to Ambient	200	°C/W

Electrical Characteristics TA = 25°C unless otherwise noted					
Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHA	RACTERISTICS				
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	45		V
	Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \ \mu {\rm A}, \ I_{\rm E} = 0$	50		V
V _{(BR)CES}	Collector-base breakdown voltage	o			
V _{(BR)CES} V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_E = 100 \ \mu A, I_C = 0$	5.0		V
	•	· · ·	5.0	100 5.0	ν nA μA

ON

h _{FE}	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_{C} = 100 \text{ mA}$			
		337-16	100	250	
		337-25	160	400	
		$V_{CE} = 1.0 \text{ V}, I_{C} = 500 \text{ mA}$	40		
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$I_{\rm C} = 500$ mA, $I_{\rm B} = 50$ mA		0.7	V
V _{BE(on)}	Base-Emitter On Voltage	$V_{CE} = 1.0 \text{ V}, \text{ I}_{C} = 500 \text{ mA}$		1.2	V

BC337/338

NPN EPITAXIAL SILICON TRANSISTOR

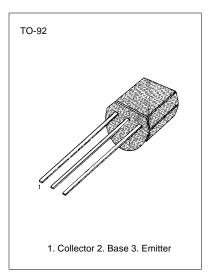
SWITCHING AND AMPLIFIER APPLICATIONS

Suitable for AF-Driver stages and low power output stages

Complement to BC337/BC328

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage : BC337 : BC338 Collector-Emitter Voltage : BC337 : BC337 : BC338 Emitter-Base Voltage Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CES} V _{CEO} V _{EBO} I _C P _C T _J T _{STG}	50 30 45 25 5 800 625 150 -55 ~ 150	∨ ∨ v v v mA mW°ç °



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Emitter Breakdown Voltage	BV _{CEO}	I _C =10mA, I _B =0				
: BC337			45			V
: BC338			25			V
Collector Emitter Breakdown Voltage	BV _{CES}	I _C =0.1mA, I _B =0				
: BC337			50			V
: BC338			30			V
Emitter Base Breakdown Voltage	BV _{EBO}	I _E =0.1mA, I _C =0	-5			V
Collector Cut-off Current	ICES					
: BC337		V _{CE} =45V, I _B =0		2	100	nA
: BC338		$V_{CF}=25V, I_{B}=0$		2	100	nA
DC Current Gain	h _{FE} 1	$V_{CF}=1V$, $I_{C}=100mA$	100		630	
	h _{FE} 2	V _{CF} =1V, I _C =300mA	60			
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =500mA, I _B =50mA			0.7	V
Base Emitter On Voltage	V _{BE} (on)	V _{CE} =1V, I _C =300mA			1.2	V
Current Gain Bandwidth Product	f⊤	V _{CE} =5V, I _C =10mA		100		MHz
Collector Base Capacitance	C _{CBO}	V _{CB} =10V, f=1MHz		12		pF

h_{FE} CLASSIFICATION

Classification	16	25	40
h _{FE}	100-250	160-400	250-630
h _{FE2}	60-	100-	170-



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BC368



NPN General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switches requiring collector currents to 1.5 A. Sourced from Process 37.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	20	V
V _{CES}	Collector-Base Voltage	25	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	2.0	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		BC368	
P _D	Total Device Dissipation	625	mW
	Derate above 25°C	5.0	mW/°C
$R_{\theta_{JC}}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	°C/W

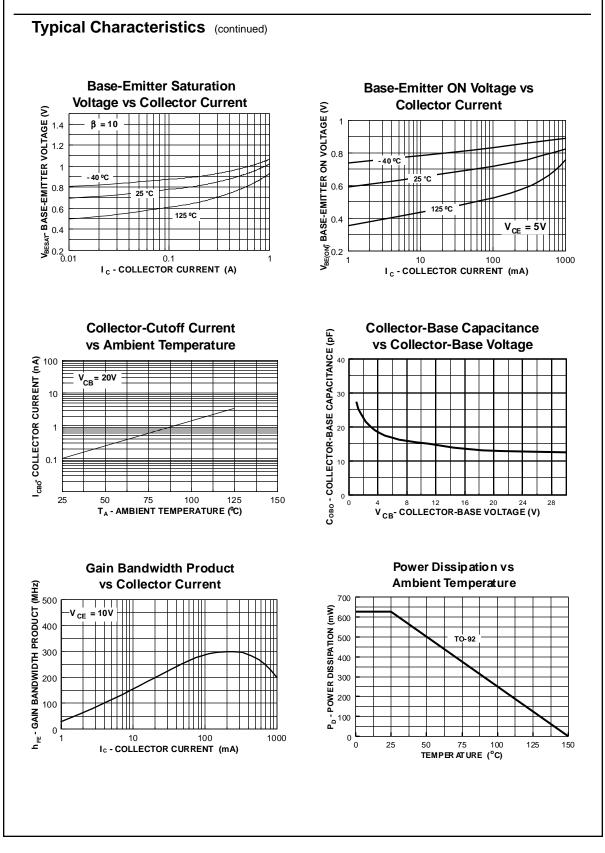
NPN General Purpose Amplifier (continued)

BC368

Symbol	Parameter	Test Conditions	Min	Max	Unit
OFF CHA	RACTERISTICS				
/ _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	20		V
/ _{(BR)CES}	Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \ \mu {\rm A}, \ I_{\rm E} = 0$	25		V
/ _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{E} = 10 \ \mu A, I_{C} = 0$	5.0		V
СВО	Collector-Cutoff Current	$V_{CB} = 25 \text{ V}, I_E = 0$ $V_{CB} = 25 \text{ V}, I_E = 0, T_A = 150^{\circ}\text{C}$		10 1.0	μA mA
EBO	Emitter-Cutoff Current	$V_{EB} = 5.0 \text{ V}, I_C = 0$		10	μA
	ACTERISTICS DC Current Gain	I _c = 5.0 mA, V _{ce} = 10 V	50		
FE		$I_{\rm C} = 0.5$ A, $V_{\rm CE} = 1.0$ V	85	375	
/	Collector-Emitter Saturation Voltage	$I_{\rm C} = 1.0$ A, $V_{\rm CE} = 1.0$ V $I_{\rm C} = 1.0$ A, $I_{\rm B} = 100$ mA	60	0.5	V
/ _{CE(sat)}	-	$I_{\rm C} = 1.0$ A, $V_{\rm CE} = 1.0$ V			V
DE(OD)	Base-Emitter On Voltage			1.0	
BE(ON)	Base-Emitter On Voltage	$T_{C} = 1.0 \text{ A}, V_{CE} = 1.0 \text{ V}$		1.0	v
	Base-Emitter On Voltage	$1C = 1.0 \text{ A}, \text{ V}_{CE} = 1.0 \text{ V}$		1.0	v
SMALL SI	GNAL CHARACTERISTICS Current Gain - Bandwidth Product	$I_{c} = 1.0 \text{ A}, V_{CE} = 1.0 \text{ V}$ $I_{c} = 10 \text{ mA}, V_{CE} = 5.0 \text{ V},$ f = 35 MHz	45	1.0	
MALL SI	GNAL CHARACTERISTICS Current Gain - Bandwidth Product	I _c = 10 mA, V _{CE} = 5.0 V, f = 35 MHz			MHz
⊤ Typica	GNAL CHARACTERISTICS Current Gain - Bandwidth Product	I _c = 10 mA, V _{ce} = 5.0 V,	Emitter S	aturatior	MH2

BC368

NPN General Purpose Amplifier (continued)



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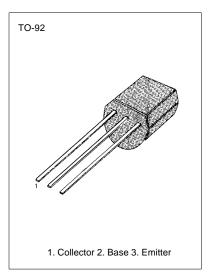
NPN EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER

- HIGH VOLTAGE: BC546, V_{CEO}=65V
- LOW NOISE: BC549, BC550
- Complement to BC556 ... BC560

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector Base Voltage : BC546 : BC547/550 : BC547/550 : BC548/549 Collector-Emitter Voltage : BC546 : BC547/550 : BC548/549/550 Emitter-Base Voltage : BC548/549/550 Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CEO} V _{CEO} V _{EBO} I _C P _C T _J T _{STG}	80 50 30 65 45 30 6 5 100 500 150 -65 ~ 150	V V V V V V V mA m °C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Charact	eristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Cut-off Curre DC Current Gain Collector Emitter Satu Collector Base Satura Base Emitter On Volta Current Gain Bandwid	ration Voltage tion Voltage ige		$\begin{array}{l} V_{CB}{=}30V, \ I_{E}{=}0 \\ V_{CE}{=}5V, \ I_{C}{=}2mA \\ I_{C}{=}10mA, \ I_{B}{=}0.5mA \\ I_{C}{=}10mA, \ I_{B}{=}5mA \\ I_{C}{=}10mA, \ I_{B}{=}0.5mA \\ I_{C}{=}100mA, \ I_{B}{=}5mA \\ V_{CE}{=}5V, \ I_{C}{=}2mA \\ V_{CE}{=}5V, \ I_{C}{=}10mA \\ V_{CE}{=}5V, \ I_{C}{=}10mA \end{array}$	110 580	90 200 700 900 660 300	15 800 250 600 700 720	nA mA mA mA mA MA MHz
Collector Base Capac Emitter Base Capacita Noise Figure		C _{CBO} C _{EBO} NF	$\begin{array}{l} V_{CB}{=}10V, f{=}1MHz \\ V_{EB}{=}0.5V, f{=}1MHz \\ V_{CE}{=}5V, I_{C}{=}200\mu A \\ f{=}1KHz, R_{G}{=}2K\Omega \\ V_{CE}{=}5V, I_{C}{=}200\mu A \\ R_{G}{=}2K\Omega, \\ f{=}30{-}15000MHz \end{array}$		3.5 9 2 1.2 1.4 1.4	6 10 4 3	pF pF dB dB dB dB

h_{FE} CLASSIFICATION

Classification	A	В	С
h _{FE}	110-220	200-450	420-800

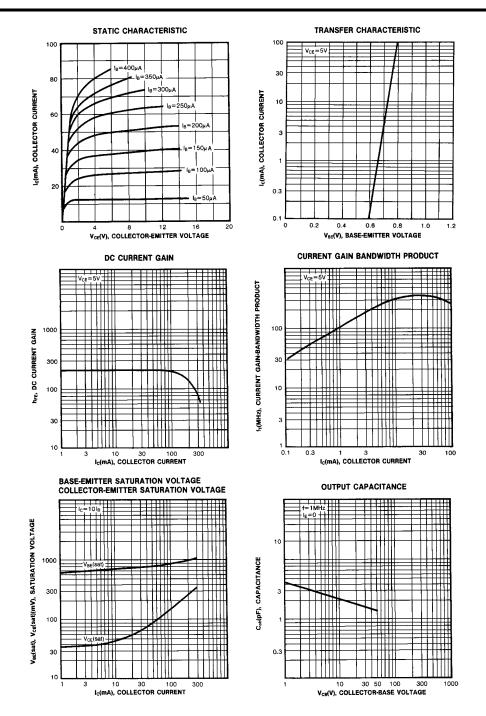


Rev. B

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BC546/547/548/549/550

NPN EPITAXIAL SILICON TRANSISTOR



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Discrete POWER & Signal **Technologies**



NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 10. See PN100A for characteristics.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	30	V
V _{CES}	Collector-Base Voltage	30	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	500	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		BC548 / A / B / C	-
P _D	Total Device Dissipation	625	mW
	Derate above 25°C	5.0	mW/∘C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	°C/W

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NPN General Purpose Amplifier

Symbol	Parameter	Test Conditions	Min	Max	Units
	RACTERISTICS		1	1	
/ _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	30		V
/ _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{C} = 10 \ \mu A, \ I_{E} = 0$	30		V
/ _{(BR)CES}	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \ \mu {\rm A}, \ I_{\rm E} = 0$	30		V
/ _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{\rm E} = 10 \ \mu {\rm A}, \ I_{\rm C} = 0$	5.0		V
СВО	Collector Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$ $V_{CB} = 30 \text{ V}, I_E = 0, T_A = +150 ^{\circ}\text{C}$		15 5.0	nA μA
				0.0	μ
	ACTERISTICS				
h _{FE}	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ 548	110	800	
		548A 548B	110 200	220 450	
		548C	420	800	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0.5 \text{ mA}$		0.25	V
\/	Base-Emitter On Voltage	$I_{C} = 100 \text{ mA}, I_{B} = 5.0 \text{ mA}$ $V_{CE} = 5.0 \text{ V}, I_{C} = 2.0 \text{ mA}$	0.58	0.60	V V
V _{BE(on)}	Dase-Emilier On Vollage	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ $V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ mA}$	0.50	0.70	v
SMALL S h _{fe} NF	IGNAL CHARACTERISTICS Small-Signal Current Gain Noise Figure	$I_{C} = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ f = 1.0 kHz $V_{CE} = 5.0 \text{ V}, I_{C} = 200 \mu\text{A},$	125	900	dB
INF	Noise Figure	$V_{CE} = 5.0 \text{ V}, \text{ I}_{C} = 200 \mu\text{A},$ $R_{S} = 2.0 k\Omega, f = 1.0 k\text{Hz},$ $B_{W} = 200 \text{Hz}$		10	uв

BC548 / BC548A / BC548B / BC548C

BC556/557/558/559/560

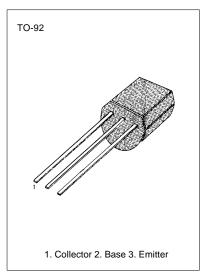
PNP EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER

- HIGH VOLTAGE: BC556, V_{CEO}= -65V
- LOW NOISE: BC559, BC560
- Complement to BC546 ... BC 550

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Capacitance : BC556 : BC557/560 : BC558/559 Collector-Emitter Voltage : BC556 : BC556 : BC556 : BC558/559 Emitter-Base Voltage Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CEO} V _{EBO} Ic Pc TJ TSTG	-80 -50 -30 -65 -45 -30 -5 -100 500 150 -65 ~ 150	∨ ∨ ∨ ∨ ∨ ∨ mA mW °C °C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Charae	cteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Cut-off Cur DC Current Gain Collector Emitter Sat Collector Base Satur Base Emitter On Vol Current Gain Bandw	uration Voltage ation Voltage tage	$\begin{array}{l} I_{CBO} \\ h_{FE} \\ V_{CE} \left(sat \right) \\ \end{array} \\ V_{BE} \left(on \right) \\ V_{BE} \left(on \right) \\ f_{T} \end{array}$	$\begin{array}{l} V_{CB} = -30V, \ I_E = 0 \\ V_{CE} = -5V, \ I_C = 2mA \\ I_C = -10mA, \ I_B = -0.5mA \\ I_C = -100mA, \ I_B = -5mA \\ I_C = -10mA, \ I_B = -5mA \\ I_C = -10mA, \ I_B = -5mA \\ V_{CE} = -5V, \ I_C = -2mA \\ V_{CE} = -5V, \ I_C = -10mA \\ V_{CE} = -5V, \ I_C = -10mA \end{array}$	110 -600	-90 -250 -700 -900 -660 150	-15 800 -300 -650 -750 -800	nA mV mV mV mV mV MHz
Collector Base Capa Noise Figure	citance : BC556/557/558 : BC559/560 : BC559 : BC560	C _{CBO} NF NF	$\begin{array}{l} V_{CB} = -10V, \ f = 1MHz \\ V_{CE} = -5V, \ I_{C} = -200 \mu A \\ f = 1KHz, \ R_{G} = 2K\Omega \\ V_{CE} = -5V, \ I_{C} = -200 \mu A \\ R_{G} = 2K\Omega \\ f = 30 \sim 15000 MHz \end{array}$		2 1 1.2 1.2	6 10 4 4 2	pF dB dB dB dB

h_{FE} CLASSIFICATION

Classification	Α	в	С
h _{FE}	110-220	200-450	420-800



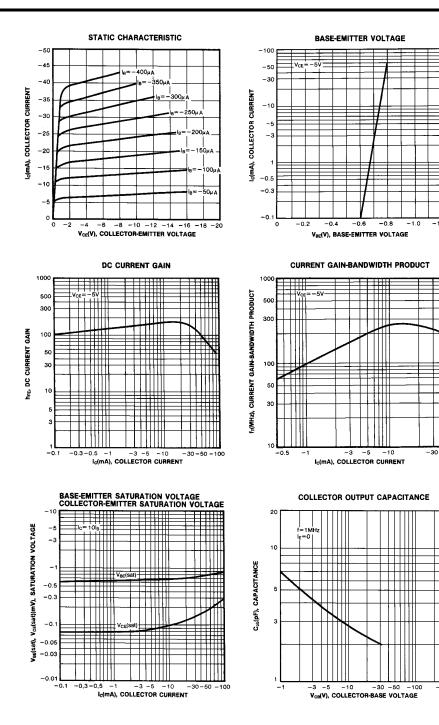
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BC556/557/558/559/560

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-1.2

-300



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BC635/637/639

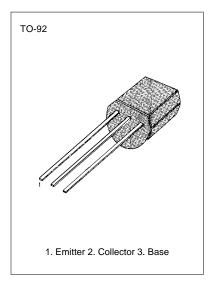
NPN EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

Complement to BC635/638/640

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic		Symbol	Rating	Unit
Collector Emitter Voltage	: BC635	V _{CER}	45	V
at R _{BE} =1Kohm	: BC637		60	V
	: BC639		100	V
Collector Emitter Voltage	: BC635	V _{CES}	45	V
	: BC637		60	V
	: BC639		100	V
Collector Emitter Voltage	: BC635	V _{CEO}	45	V
	: BC637		60	V
	: BC639		80	V
Emitter Base Voltage		V _{EBO}	5	V
Collector Current		I _C	1	A
Peak Collector Current		I _{CP}	1.5	A
Base Current		I _B	100	mA
Collector Dissipation		Pc	1	W
Junction Temperature		ŢJ	150	°C
Storage Temperature		T _{STG}	-65 ~ 150	°C



• PW=5ms, Duty Cycle=10%

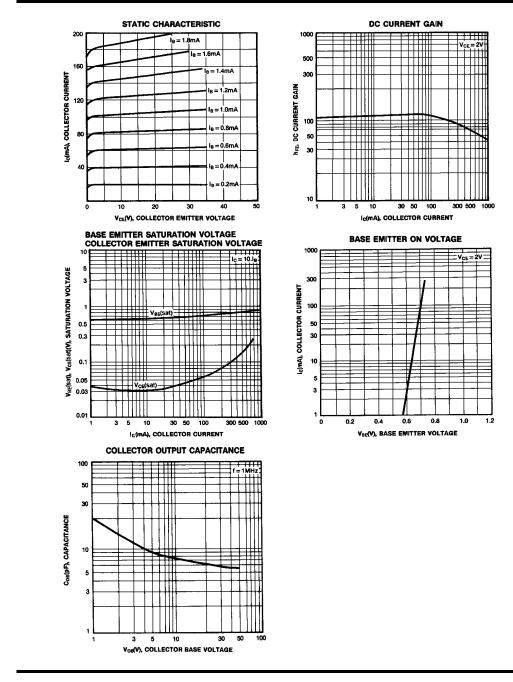
ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Emitter Breakdown Voltage : BC635 : BC736 : BC639 Collector Cut-off Current Emitter Cut-off Current	BV _{CEO} I _{CBO} I _{EBO}	I _C =10mA, I _B =0 V _{CB} =30V, I _E =0 V _{EB} =5V, I _C =0	45 60 80		0.1 0.1	V V μΑ μΑ
DC Current Gain :BC635 : BC637/BC639 Collector Emitter Saturation Voltage Base Emitter On Voltage Current Gain Bandwidth Product	h_{FE} $V_{CE}(sat)$ $V_{BE}(on)$ f_T	$\begin{array}{l} V_{CE}{=}2V,\ I_{C}{=}5mA \\ V_{CE}{=}2V,\ I_{C}{=}150mA \\ \end{array} \\ \begin{array}{l} V_{CE}{=}2V,\ I_{C}{=}500mA \\ I_{C}{=}500mA,\ I_{B}{=}50mA \\ V_{CE}{=}2V,\ I_{C}{=}500mA \\ \end{array} \\ \begin{array}{l} V_{CE}{=}5V,\ I_{C}{=}10mA,\ f{=}50MHz \end{array}$	25 40 40 25	100	250 160 0.5 1	V V MHz



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Rev. B



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BC636/638/640

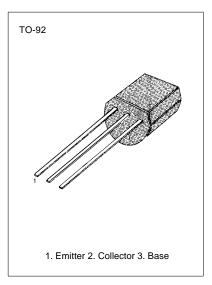
PNP EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

Complement to BC635/637/639

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit	
Collector Emitter Voltage	: BC636	V _{CER}	-45	V
at R _{BE} =1Kohm	: BC638		-60	V
	: BC640		-100	V
Collector Emitter Voltage	: BC636	V _{CES}	-45	V
	: BC638		-60	V
	: BC640		-100	V
Collector Emitter Voltage	: BC636	V _{CEO}	-45	V
	: BC638		-60	V
	: BC640		-80	V
Emitter Base Voltage		V _{EBO}	-5	V
Collector Current		I _C	-1	Α
Peak Collector Current		I _{CP}	-1.5	А
Base Current		IB	-100	mA
Collector Dissipation		Pc	1	W
Junction Temperature		TJ	150	°C
Storage Temperature		T _{STG}	-65 ~ 150	°C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

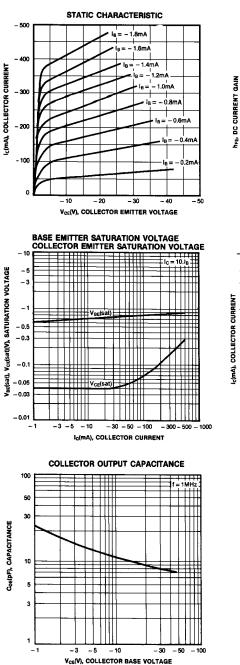
Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Emitter Breakdown Voltage : BC636 : BC638 : BC640 Collector Cut-off Current Emitter Cut-off Current DC Current Gain : BC635 : BC637/BC639 Collector Emitter Saturation Voltage Base Emitter On Voltage Current Gain Bandwidth Product	$\begin{array}{c} BV_{CEO} \\ \\ I_{CBO} \\ I_{EBO} \\ h_{FE} \end{array}$ $\begin{array}{c} V_{CE} \left(sat \right) \\ V_{BE} \left(on \right) \\ f_{T} \end{array}$	$\begin{split} I_{C} = -10 \text{mA}, \ I_{B} = 0 \\ \\ V_{CB} = -30 \text{V}, \ I_{C} = 0 \\ V_{CE} = -5 \text{V}, \ I_{C} = 0 \\ V_{CE} = -2 \text{V}, \ I_{C} = -5 \text{mA} \\ V_{CE} = -2 \text{V}, \ I_{C} = -150 \text{mA} \\ \\ V_{CE} = -2 \text{V}, \ I_{C} = -50 \text{mA} \\ I_{C} = -500 \text{mA}, \ I_{B} = -50 \text{mA} \\ V_{CE} = -2 \text{V}, \ I_{C} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA}, \ I_{D} = -50 \text{mA} \\ \\ V_{CE} = -50 \text{mA} \\ \\$	-45 -60 -80 25 40 40 25	100	-0.1 -0.1 250 160 -0.5 -1	V V μA μA V MHz

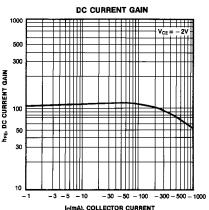


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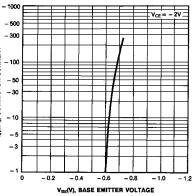
BC636/638/640

PNP EPITAXIAL SILICON TRANSISTOR











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PRODUCT STATUS DEFINITIONS

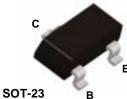
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BC807-16 / BC807-25 / BC807-40

Discrete POWER & Signal **Technologies**



BC807-16 BC807-25 BC807-40



Mark: 5A. / 5B. / 5C.

PNP General Purpose Amplifier

This device is designed for general purpose amplifier and switching applications at currents to 1.0 A. Sourced from Process 78.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CES}	Collector-Base Voltage	50	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	1.2	A
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

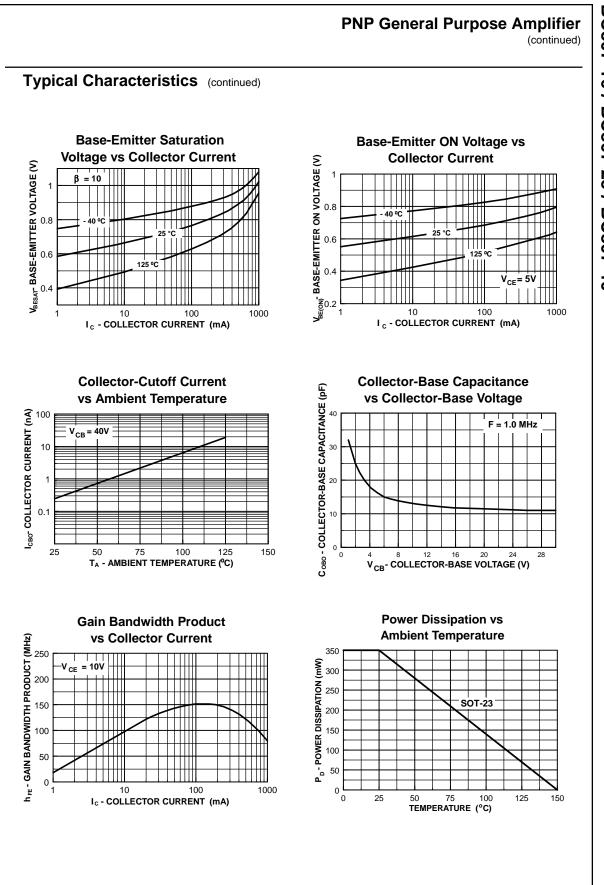
Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		*BC807-16 / -25 / -40	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/°C
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

Symbol	Parameter	Test Conditions	Min	Max	Units
			45		
BR)CEO BR)CES	Collector-Emitter Breakdown Voltage Collector-Base Breakdown Voltage	$I_{C} = 10 \text{ mA}, I_{B} = 0$ $I_{C} = 100 \mu \text{A}, I_{E} = 0$	45 50		V V
BR)CES BR)EBO	Emitter-Base Breakdown Voltage	$I_{c} = 100 \mu\text{A}, I_{c} = 0$ $I_{E} = 10 \mu\text{A}, I_{C} = 0$	5.0		V
BR)EBU BO	Collector-Cutoff Current	$V_{CB} = 20 V$ $V_{CB} = 20 V$, $T_A = 150^{\circ}C$	0.0	100 5.0	nA μA
N CHAR	ACTERISTICS				
E	DC Current Gain	$I_{C} = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$ - 16	100	250	
		- 25	160	400	
		- 40 I _C = 500 mA, V _{CE} = 1.0 V	250 40	600	
CE(sat)	Collector-Emitter Saturation Voltage	$I_{\rm C} = 500 \text{ mA}, I_{\rm B} = 50 \text{ mA}$		0.7	V
BE(on)	Base-Emitter On Voltage	$I_{C} = 500 \text{ mA}, V_{CE} = 1.0 \text{ V}$		1.2	V
Туріса	al Characteristics				
1	al Characteristics Typical Pulsed Current Gain vs Collector Current	Collector-E ହୁଁ Voltage vs			
	Typical Pulsed Current Gain	$ \begin{array}{c} $		25 °C	

BC807-16 / BC807-25 / BC807-40



BC807-16 / BC807-25 / BC807-40

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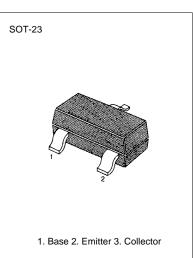
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SWITCHING AND AMPLIFIER APPLICATIONS

Suitable for AF-Driver stages and low power output stages
Complement to BC817/BC818

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

	Symbol	Rating	Unit
: BC807	V _{CES}	-50	V
: BC808		-30	V
: BC807	V_{CEO}	-45	V
: BC808		-25	V
	V _{EBO}	-5	V
	lc	-800	mA
	Pc	-310	mW
	Tj	150	°C
	Tstg	-65 ~ 150	℃
	: BC808 : BC807	: BC807 : BC808 : BC807 : BC808 : BC808 : BC808 V _{CEO} I _C P _C	BC807 V _{CES} -50 : BC808 -30 -30 : BC807 V _{CEO} -45 : BC808 -25 V _{EO} : BC808 -25 Ic V _{EC} -5 Ic Ic -800 Pc Pc -310 TJ TJ 150



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Emitter Breakdown Voltage : BC807 : BC808 Collector-Emitter Breakdown Voltage : BC807 : BC808	BV _{CEO} BV _{CES}	I _C = -10mA, I _B =0 I _C = -0.1mA, I _B =0	-45 -25 -50 -30			V V V V
Emitter-Base Breakdown Voltage Collector Cut-off Current Emitter Cut-off Current DC Current Gain	BV _{EBO} I _{CES} I _{EBO} h _{FE} 1 h _{FE} 2	I _E = -0.1mA, I _C =0 V _{CE} = -25V, I _B =0 V _{EB} = -4V, I _C =0 V _{CE} = -1V, I _C = -100mA V _{CE} = -1V, I _C = -300mA	-5 100 60		-100 -100 630	V nA nA
Collector-Emitter Saturation Voltage Base-Emitter On Voltage Current Gain Bandwidth Product	V_{CE} (sat) V_{BE} (on) f_{T}	$\label{eq:loss} \begin{array}{l} I_{c=} -500mA, \ I_{B=} -50mA \\ V_{cE=} -1V, \ I_{c=} -300mA \\ V_{cE=} -5V, \ I_{c=} -10mA \\ f=\!50MHz \end{array}$	00	100	-0.7 -1.2	V V MHz
Collector-Base Capacitance	C _{CBO}	V_{CB} = -10V, f=1MHz			12	pF

h_{FE} CLASSIFICATION

Classification	16	25	40
h _{FE} 1	100-250	160-400	250-630
h _{FE} 2	60-	100-	170-

MARKING CODE

TYPE	807-16	807-25	807-40	808-16	808-25	808-40
MARKING	9FA	9FB	9FC	9GA	9GB	9GC

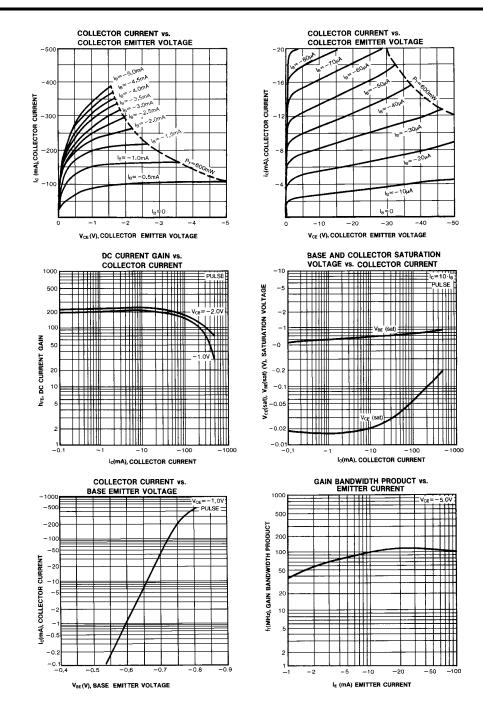


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Rev. B

BC807/BC808

PNP EPITAXIAL SILICON TRANSISTOR

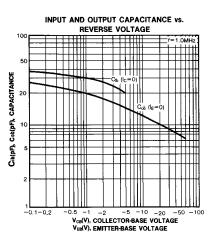




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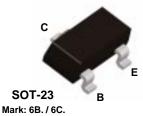
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Discrete POWER & Signal **Technologies**



BC817-25 BC817-40



NPN General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switches requiring collector currents to 1.2 A. Sourced from Process 38.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CES}	Collector-Base Voltage	50	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	1.5	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

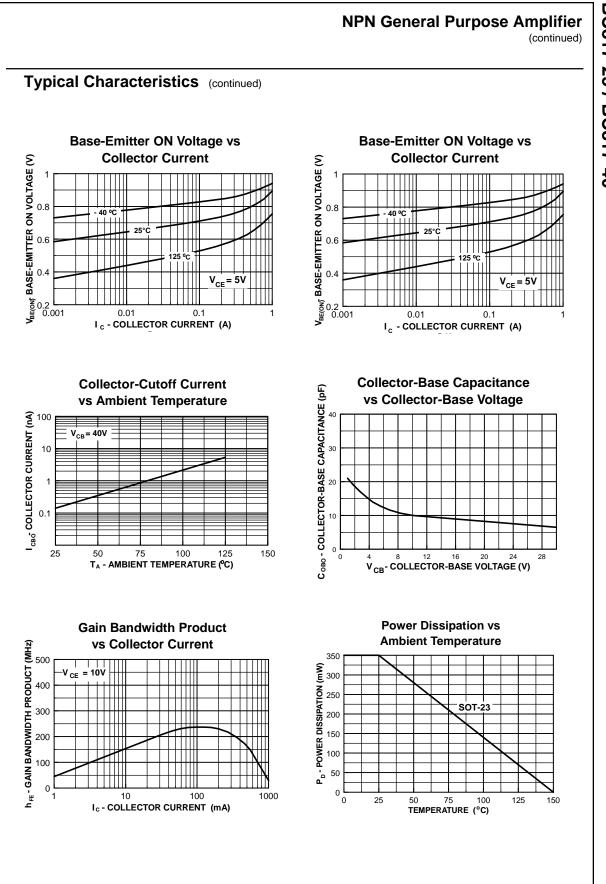
Symbol	Characteristic	Мах	Units
		*BC817-25 / BC817-40	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/°C
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

TA = 25°C unless otherwise noted

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

ymbol	Parameter	Test Conditions	Min	Max	Units
FF CHA	RACTERISTICS				
R)CEO	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	45		V
R)CES	Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \ \mu {\rm A}, \ I_{\rm E} = 0$	50		V
R)EBO	Emitter-Base Breakdown Voltage	$I_{E} = 10 \ \mu A, \ I_{C} = 0$	5.0		V
)	Collector-Cutoff Current	$V_{CB} = 20 V$ $V_{CB} = 20 V, T_A = 150^{\circ}C$		100 5.0	nA μA
I CHAF	ACTERISTICS DC Current Gain	$I_{C} = 100 \text{ mA}, V_{CE} = 1.0 \text{ V} - 25 - 40$	160 250	400 600	
		$I_{C} = 500 \text{ mA}, V_{CE} = 1.0 \text{ V}$	40	000	
(sat)	Collector-Emitter Saturation Voltage	$I_{\rm C} = 500 \text{ mA}, I_{\rm B} = 50 \text{ mA}$		0.7	V
	Base-Emitter On Voltage	I _C = 500 mA, V _{CE} = 1.0 V		1.2	V
:(on)		I _C = 500 mA, V _{CE} = 1.0 V		1.2	V
(on)	Base-Emitter On Voltage al Characteristics Typical Pulsed Current Gain vs Collector Current	$I{c} = 500 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $Collector-I Voltage vs 0.6 \beta = 10 \beta = 10 $		aturation	1

BC817-25 / BC817-40



BC817-25 / BC817-40

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BC817/BC818

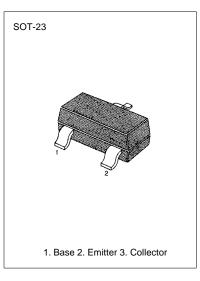
NPN EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

Suitable for AF-Driver stages and low power output stages
Complement to BC807/BC808

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic		Symbol	Rating	Unit
J	BC817 BC818	V _{CES}	50 30	V V
J	BC817 BC818	V _{CEO}	45 25	V V
Emitter-Base Voltage Collector Current (DC)		V _{EBO}	5 800	V mA
Collector Dissipation		lc Pc	310	mW
Junction Temperature Storage Temperature		TJ T _{STG}	150 -65 ~ 150	°C ℃



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C =10mA, I _B =0				
: BC817			45			V
: BC818			25			V
Collector-Emitter Breakdown Voltage	BV _{CES}	I _C =0.1mA, I _B =0				
: BC817			50			V
: BC818			30			V
Emitter-Base Breakdown Voltage	BV _{FBO}	I _E =0.1mA, I _C =0	5			V
Collector Cut-off Current	ICES	$V_{CF}=25V, I_{B}=0$			100	nA
Emitter Cut-off Current	I _{EBO}	$V_{EB}=4V, I_{C}=0$			100	nA
DC Current Gain	h _{FE} 1	$V_{CE}=1V$, $I_{C}=100mA$	100		630	
	h _{FE} 2	V _{CE} =1V, I _C =300mA	60			
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =500mA, I _B =50mA			0.7	V
Base-Emitter On Voltage	V _{BE} (on)	$V_{CE}=1V$, $I_{C}=300$ mA			1.2	V
Current Gain Bandwidth Product	f _T	V _{CE} =5V, I _C =10mA		100		MHz
		f=50MHz				
Collector-Base Capacitance	Ссво	V _{CB} =10V, f=1MHz			12	pF

h_{FE} CLASSIFICATION

Classification	16	25	40		
h _{FE} 1	100-250	160-400	250-630		
h _{FE} 2	h _{FE} 2 60-		170-		

MARKING CODE

TYPE	817-16	817-25	817-40	818-16	818-25	818-40
MARKING	8FA	8FB	8FC	8GA	8GB	8GC



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BC846/847/848/849/850

NPN EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

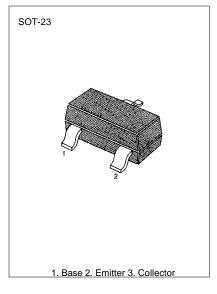
Suitable for automatic insertion in thick and thin-film circuits

• LOW NOISE: BC849, BC850

Complement to BC856 ... BC860

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector Base Voltage : BC846 : BC847/850 : BC848/849	V _{CBO}	80 50 30	V V V
Collector Emitter Voltage : BC846 : BC847/850 : BC848/849	V _{CEO}	65 45 30	V V V
Emitter-Base Voltage : BC846/847 : BC848/849/850 Collector Current (DC) Collector Dissipation Junction Temperature	V _{EBO} Ic Pc TJ	6 5 100 310 150	V V mA mW °C
Storage Temperature	T _{STG}	-65 ~ 150	°C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Chara	acteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Cut-off Current DC Current Gain		I _{CBO} h _{FE} V _{CE} (sat)	V _{CB} =30V, I _E =0 V _{CE} =5V, I _C =2mA I _C =10mA, I _B =0.5mA	110	90	15 800 250	nA mV
Collector Emitter Saturation Voltage Collector Base Saturation Voltage		V _{BE} (sat)	I_{c} =100mA, I_{B} =5mA I_{c} =10mA, I_{B} =0.5mA I_{c} =100mA, I_{B} =5mA		200 700 900	600	mV mV mV
Base Emitter On Voltage		V _{BE} (on)	V_{CE} =5V, I _C =2mA V _{CE} =5V, I _C =10mA	580	660	700 720	mV mV
Current Gain Band	Current Gain Bandwidth Product		V _{CE} =5V, I _C =10mA f=100MHz		300		MHz
Collector Base Cap	acitance	Ссво	V _{CB} =10V, f=1MHz		3.5	6	pF
Emitter Base Capa	citance	C _{EBO}	V _{EB} =0.5V, f=1MHz		9		pF
Noise Figure	: BC846/847/848	NF	V _{CE} =5V, I _C =200µA		2	10	dB
	: BC849/850		f=1KHz, R _G =2KΩ		1.2	4	dB
	: BC849	NF	V _{CE} =5V, I _C =200µA		1.4	4	dB
	: BC850		R _G =2KΩ f=30~15000Hz		1.4	3	dB

h_{FE} CLASSIFICATION

Classification	A	В	С	
h _{FE}	h _{FE} 110-220		420-800	

MARKING CODE

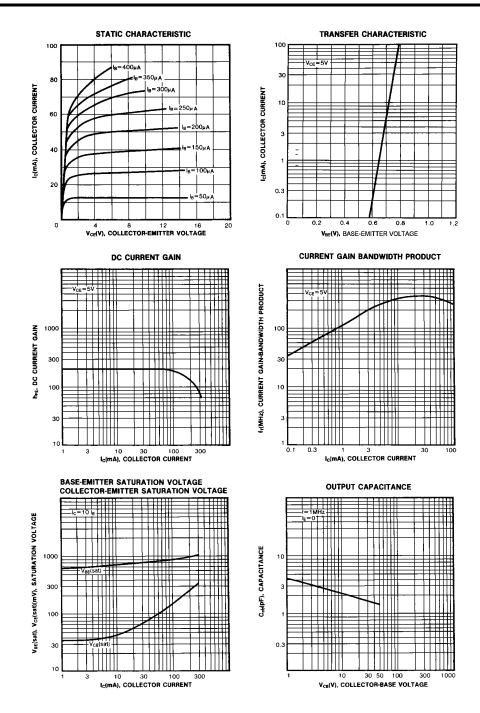
TYPE	846A	846B	846C	847A	847B	847C	848A	848B	848C	849A	849B	849C	850A	850B	850C
MARK	8AA	8AB	8AC	8BA	8BB	8BC	8CA	8CB	8CC	8DA	8DB	8DC	8EA	8EB	8EC



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BC846/847/848/849/850

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BC856/857/858/859/860

PNP EPITAXIAL SILICON TRANSISTOR

SWITCHING AND AMPLIFIER APPLICATIONS

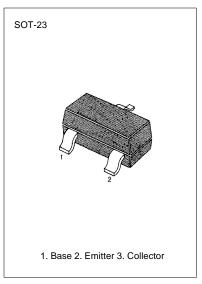
Suitable for automatic insertion in thick and thin-film circuits

• LOW NOISE: BC859, BC860

Complement to BC846 ... BC850

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage : BC856 : BC857/860 : BC858/859 Collector-Emitter Voltage : BC856 : BC856 : BC857/860 : BC858/859 Emitter-Base Voltage Collector Current (DC) Collector Dissipation Junction Temperature Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _J Tstg	-80 -50 -30 -65 -45 -30 -5 -100 310 150 -65 ~ 150	ô ô ≋ ≝ < < < < < < <



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Char	acteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector Cut-off Co DC Current Gain	urrent	l _{CBO} h _{FE}	V _{CB} = -30V, I _E =0 V _{CE} = -5V, I _C = -2mA	110		-15 800	nA
Collector-Emitter S	aturation Voltage	V _{CE} (sat)	I_{C} = -10mA, I_{B} = -0.5mA I_{C} = -100mA, I_{B} = -5mA		-90 -250	-300 -650	mV mV
Collector-Base Sat	uration Voltage	V _{BE} (sat)	I _C = -10mA, I _B = -0.5mA I _C = -100mA, I _B = -5mA		-700 -900		mV mV
Base-Emitter On V	oltage	V_{BE} (on)	V _{CE} = -5V, I _C = -2mA V _{CE} = -5V, I _C = -10mA	-600	-660	-750 -800	mV mV
Current Gain Bandwidth Product		f _T	V _{CE} = -5V, I _C = -10mA f=100MHz		150		MHz
Collector-Base Cap	pacitance	C _{CBO}	V _{CB} = -10V, f=1MHz			6	pF
Noise Figure	: BC856/857/858	NF	V_{CE} = -5V, I_{C} = -200 μ A		2	10	dB
	: BC859/860		$f=1KHz, R_G=2K\Omega$		1	4	dB
	: BC859	NF	V _{CE} = -5V, I _C = -200μA R _G =2KΩ		1.2	4	dB
	: BC860		f=30~15000Hz		1.2	2	dB

h_{FE} CLASSIFICATION

Classification	Α	В	С
h _{FE}	110-220	200-450	420-800

MARKING CODE

TYPE	856A	856B	856C	857A	857B	857C	858A	858B	858C	859A	859B	859C	860A	860B	860C
MARK	9AA	9AB	9AC	9BA	9BB	9BC	9CA	9CB	9CC	9DA	9DB	9DC	9EA	9EB	9EC

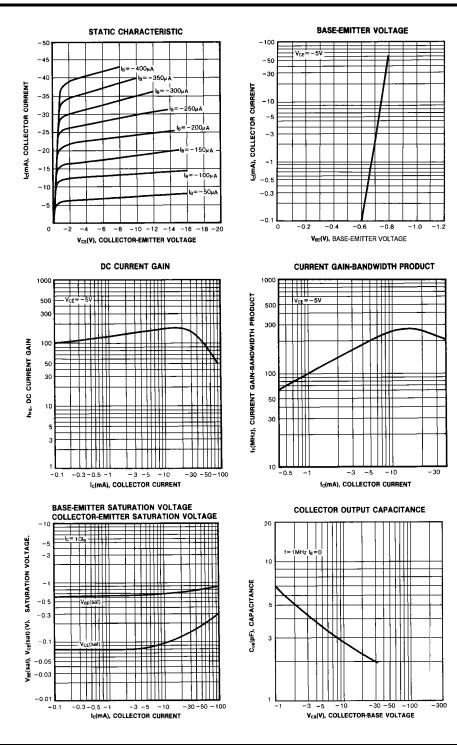


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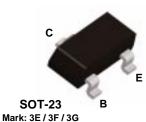
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PNP General Purpose Amplifier

This device is designed for general purpose amplifier applications at collector currents to 300 mA. Sourced from Process 68.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CBO}	Collector-Base Voltage	50	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	500	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units	
		*BC857A / B / C		
PD	Total Device Dissipation	350	mW	
	Derate above 25°C	2.8	mW/°C	
$R_{ ext{ hetaJA}}$	Thermal Resistance, Junction to Ambient	357	°C/W	

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

PNP General Purpose Amplifier

(continued)

Symbol	Parameter Test Conditions		Min	Мах	Units
OFF CHA	RACTERISTICS				
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	45		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \ \mu {\rm A}, \ I_{\rm E} = 0$	50		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_E = 1.0 \ \mu A, \ I_C = 0$	5.0		V
СВО	Collector-Cutoff Current	V _{CB} = 30 V		15	nA
		V _{CB} = 30 V, T _A = 150°C		4.0	μA

BC857A / BC857B / BC857C

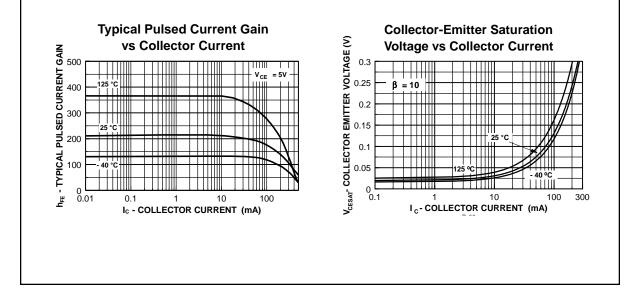
ON CHARACTERISTICS

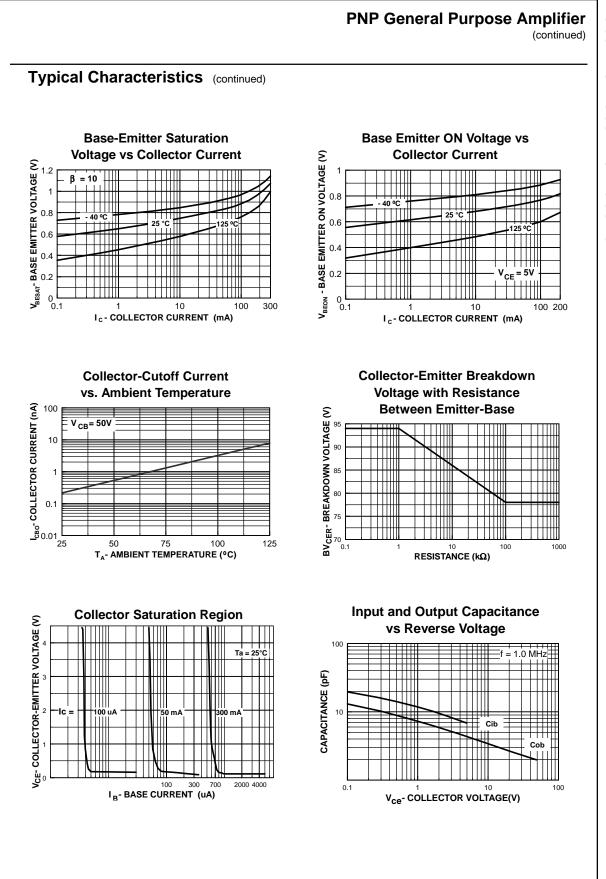
h _{FE}	DC Current Gain	$I_{\rm C} = 2.0 \text{ mA}, V_{\rm CE} = 5.0 \text{ V}$			
		BC857A	125	250	
		BC857B	220	475	
		BC857C	420	800	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0.5 \text{ mA}$		0.3	V
- (,		$I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 5.0 \text{ mA}$		0.65	V
V _{BE(on)}	Base-Emitter On Voltage	$I_{\rm C} = 2.0 \text{ mA}, V_{\rm CE} = 5.0 \text{ V}$	0.6	0.75	V
(314)		$I_{C} = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}$		0.82	V

SMALL SIGNAL CHARACTERISTICS

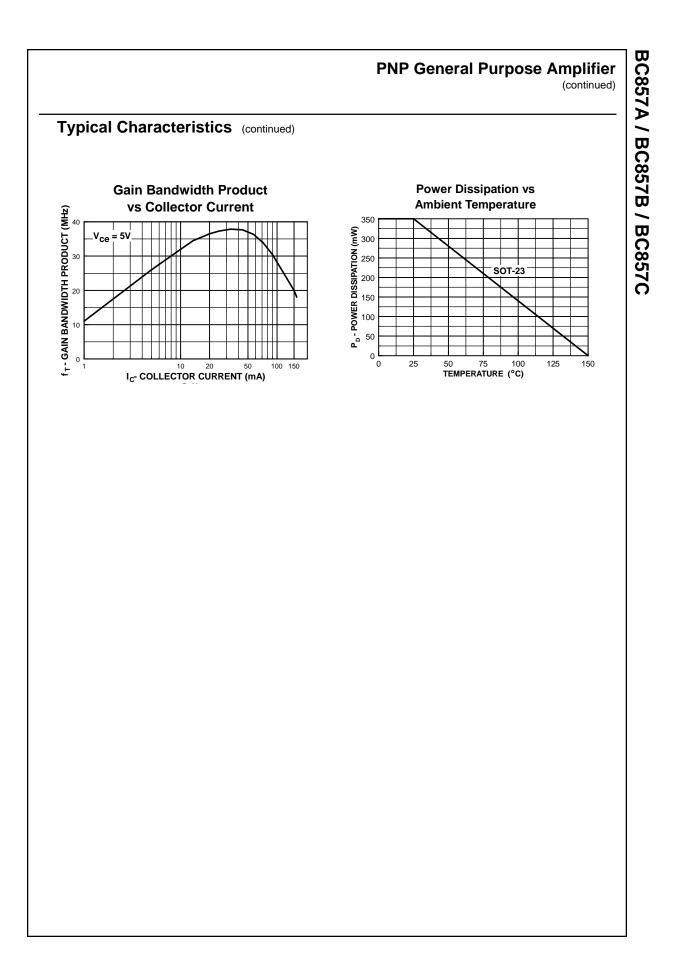
fT	Current Gain - Bandwidth Product	$I_{C} = 10 \text{ mA}, V_{CE} = 5.0,$ f = 100 mHz	100		MHz
C _{obo}	Output Capacitance	V _{CB} = 10 V, f = 1.0 MHz		4.5	pF
NF	Noise Figure	$ I_{C} = 0.2 \text{ mA}, V_{CE} = 5.0, \\ R_{S} = 2.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz}, \\ BW = 200 \text{ Hz} $		10	dB

Typical Characteristics





BC857A / BC857B / BC857C



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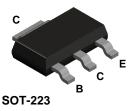
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Discrete POWER & Signal **Technologies**



BCP52



PNP General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switching circuits requiring collector currents to 1.0 A. Sourced from Process 78.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	60	V
V _{CBO}	Collector-Base Voltage	60	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	1.2	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

Symbol	Characteristic	Мах	Units	
		BCP52		
P _D	Total Device Dissipation	1.5	W	
	Derate above 25°C	12	mW/°C	
$R_{\theta_{JA}}$	Thermal Resistance, Junction to Ambient	83.3	°C/W	

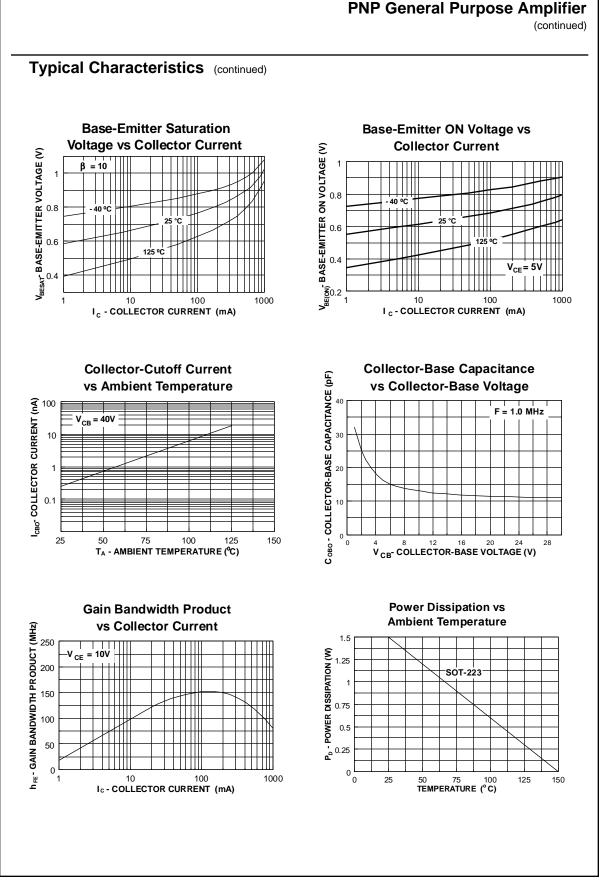
TA = 25°C unless otherwise noted

PNP General Purpose Amplifier (continued)

BCP52

Symbol	Parameter	Test Conditions	Min	Max	Units
	DAGTERIOTION				
	RACTERISTICS	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	60	1	V
(BR)CEO (BR)CBO	Collector-Emitter Breakdown Voltage Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \mu{\rm A}, I_{\rm B} = 0$ $I_{\rm C} = 100 \mu{\rm A}, I_{\rm E} = 0$	60		V
(BR)CBO (BR)EBO	Emitter-Base Breakdown Voltage	$I_c = 100 \mu\text{A}, I_c = 0$ $I_E = 10 \mu\text{A}, I_c = 0$	5.0		V
(BR)EBO	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$	0.0	100	nA
-		$V_{CB} = 30 \text{ V}, I_E = 0, T_A = 125^{\circ}\text{C}$		10	μA
BO	Emitter-Cutoff Current	$V_{EB} = 5.0 \text{ V}, I_C = 0$		10	μA
ON CHAR	ACTERISTICS			-	
FE	DC Current Gain	$I_{C} = 5.0 \text{ mA}, V_{CE} = 2.0 \text{ V}$ $I_{C} = 150 \text{ mA}, V_{CE} = 2.0 \text{ V}$	25 40	250	
		$I_{C} = 150 \text{ mA}, V_{CE} = 2.0 \text{ V}$ $I_{C} = 500 \text{ mA}, V_{CE} = 2.0 \text{ V}$	40 25	200	
CE(sat)	Collector-Emitter Saturation Voltage	$I_{C} = 500 \text{ mA}, I_{B} = 50 \text{ mA}$		0.5	V
BE(on)	Base-Emitter On Voltage	$I_{\rm C}$ = 500 mA, $V_{\rm CE}$ = 2.0 V		1.0	V
Туріса	al Characteristics				
1	Typical Pulsed Current Gain	Collector- E Voltage vs			
1					
1	Typical Pulsed Current Gain				
1	Typical Pulsed Current Gain vs Collector Current			r Current	:
1	Typical Pulsed Current Gain vs Collector Current				:
1	Typical Pulsed Current Gain vs Collector Current	$ \begin{array}{c} $		r Current	:
1	Typical Pulsed Current Gain vs Collector Current	$ \begin{array}{c} $		r Current	:
1	Typical Pulsed Current Gain vs Collector Current Vce = 5V	$ \begin{array}{c} $		r Current	
1	Typical Pulsed Current Gain vs Collector Current	$ \begin{array}{c} $		r Current	40 °C
PULSED CURRENT GAIN	Typical Pulsed Current Gain vs Collector Current Vce = 5V	$\sum_{\beta = 10 \\ \beta = 1$		25°C	
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	40 °C
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	40 °C
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	40 °C
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	
1	Typical Pulsed Current Gain vs Collector Current $V_{CE} = 5V$ $V_{CE} = 5V$	$ \begin{array}{c} $		25°C	40 °C

BCP52



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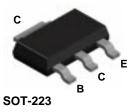
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Discrete POWER & Signal **Technologies**



BCP54



NPN General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switching circuits requiring collector currents to 1.2 A. Sourced from Process 38.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CBO}	Collector-Base Voltage	45	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	1.5	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES: 1) These ratings are based on a maximum junction temperature of 150 degrees C. 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

Symbol	Characteristic	Max	Units
		BCP54	
P _D	Total Device Dissipation	1.5	W
	Derate above 25°C	12	mW/∘C
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient	83.3	°C/W

TA = 25°C unless otherwise noted

NPN General Purpose Amplifier (continued)

d)

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHA	RACTERISTICS				
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	45		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \ \mu {\rm A}, \ I_{\rm E} = 0$	45		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{\rm E} = 10 \ \mu {\rm A}, \ I_{\rm C} = 0$	5.0		V
СВО	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$ $V_{CB} = 30 \text{ V}, I_E = 0, T_A = 125^{\circ}\text{C}$		100 10	nA μA
EBO	Emitter-Cutoff Current			10	μA
ON CHAF	RACTERISTICS				
٦ _{FE}	DC Current Gain	$I_{C} = 5.0 \text{ mA}, V_{CE} = 2.0 \text{ V}$	25	T	1
		$I_{C} = 150 \text{ mA}, V_{CE} = 2.0 \text{ V}$	40	250	
	Collector-Emitter Saturation Voltage	$I_{\rm C} = 500 \text{ mA}, V_{\rm CE} = 2.0 \text{ V}$ $I_{\rm C} = 500 \text{ mA}, I_{\rm B} = 50 \text{ mA}$	25	0.5	V
V _{CE(sat)} V _{BE(on)}	Base-Emitter On Voltage	$I_{\rm C} = 500$ mA, $V_{\rm CE} = 2.0$ V		1.0	V
Туріса	al Characteristics				
ſ	Typical Pulsed Current Gain vs Collector Current	$\sum_{\substack{\substack{\boldsymbol{\omega} \\ \boldsymbol{\omega} \\ $			
L PULSED CURRENT GAIN	Typical Pulsed Current Gain	Collector-E Voltage vs 0.6 $\beta = 10$ 0.5 $\beta = 10$ 0.4 0.3 0.2 0.2 0.1			t
AL PULSED CURRENT GAIN 000 00 00 00 00 00 00 00 00 00 00 00 0	Typical Pulsed Current Gain vs Collector Current	$ \begin{array}{c} $		25°C	t

BCP54

BCP54

NPN General Purpose Amplifier (continued) Typical Characteristics (continued) **Base-Emitter ON Voltage vs Base-Emitter ON Voltage vs Collector Current Collector Current** Vector 1 Provided (V) 40 °C 40 °C 25°Ċ 25°Ċ 25 ℃ |||| П V_{CE}= 5V V_{CE}=5V 0.01 0.1 0.01 0.1 I c - COLLECTOR CURRENT (A) I_c - COLLECTOR CURRENT (A) **Collector-Base Capacitance Collector-Cutoff Current** C_{0B0} - COLLECTOR-BASE CAPACITANCE (pF) vs Collector-Base Voltage vs Ambient Temperature 40 I CBO COLLECTOR CURRENT (nA) 100 V_{CB} = 40V 10 30 1 20 0.1 10 0 L 0 25 75 150 50 100 125 4 8 12 16 20 24 V_{CB}- COLLECTOR-BASE VOLTAGE (V) 28 T_A - AMBIENT TEMPERATURE (°C) Power Dissipation vs **Gain Bandwidth Product Ambient Temperature** vs Collector Current $h_{\rm FE}$ - Gain Bandwidth Product (MHz) 1.5 500 _{CE} = 10V P_D - POWER DISSIPATION (W) 1.25 400 SOT-223 1 300 Ш 0.75 Ш HT 200 0.5 100 0.25 0 0 1000 10 100 25 50 75 100 TEMPERATURE (°C) 125 150 Ic - COLLECTOR CURRENT (mA)

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Discrete POWER & Signal **Technologies**



BCV26



PNP Darlington Transistor

This device is designed for applications requiring extremely high current gain at currents to 800 mA. Sourced from Process 61.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	30	V
V _{CBO}	Collector-Base Voltage	40	V
V _{EBO}	Emitter-Base Voltage	10	V
I _C	Collector Current - Continuous	1.2	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		*BCV26	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/°C
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

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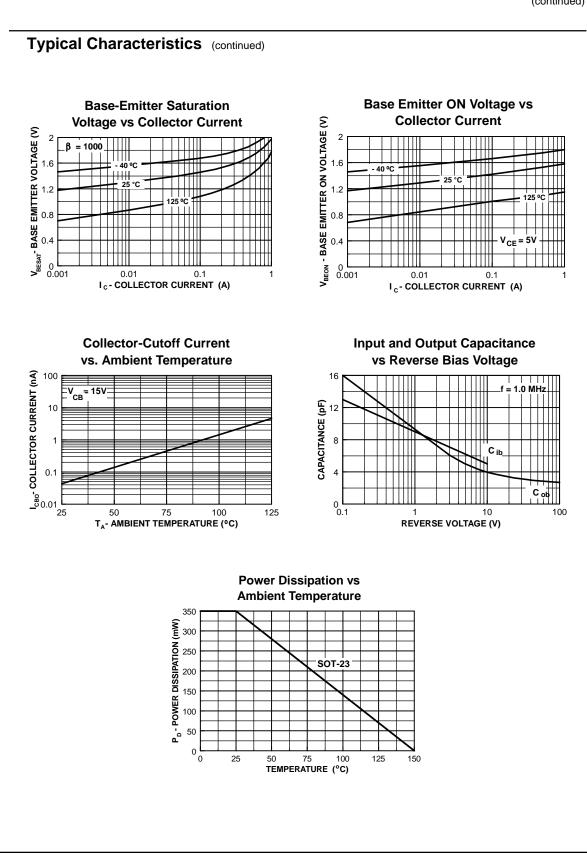
PNP Darlington Transistor (continued)

BCV26

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
OFF CHA	RACTERISTICS					
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	30			V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \ \mu {\rm A}, \ I_{\rm E} = 0$	40			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{\rm E} = 100 \text{ nA}, I_{\rm C} = 0$	10			V
СВО	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$			0.1	μA
EBO	Emitter-Cutoff Current	$V_{EB} = 10 \text{ V}, I_{C} = 0$			0.1	μA
ON CHAF	RACTERISTICS					
E	DC Current Gain	$I_{C} = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$	4,000			
		$I_{c} = 10 \text{ mA}, V_{ce} = 5.0 \text{ V}$ $I_{c} = 100 \text{ mA}, V_{ce} = 5.0 \text{ V}$	10,000			
CE(sat)	Collector-Emitter Saturation Voltage	$I_{\rm C} = 100 \text{ mA}, V_{\rm CE} = 5.0 \text{ V}$ $I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 0.1 \text{ mA}$	20,000		1.0	V
BE(sat)	Base-Emitter Saturation Voltage	$I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 0.1 \text{ mA}$			1.5	V
`	Collector Capacitance	f = 100 MHz V _{CB} = 30 V, I _E = 0, f = 1.0 MHz		3.5		pF
Cc		$V_{CB} = 30$ V, $I_E = 0$, $I = 1.0$ WHZ		0.0		p.
Туріса	al Characteristics Typical Pulsed Current Gain vs Collector Current	Collector-		Satura		P'
Туріса	al Characteristics Typical Pulsed Current Gain	Collector-		Satura		

PNP Darlington Transistor (continued)

BCV26



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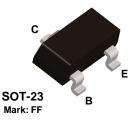
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BCV27



NPN Darlington Transistor

This device is designed for applications requiring extremely high current gain at collector currents to 1.0 A. Sourced from Process 05.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	30	V
V _{CBO}	Collector-Base Voltage	40	V
V _{EBO}	Emitter-Base Voltage	10	V
I _C	Collector Current - Continuous	1.2	A
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		*BCV27	
P _D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

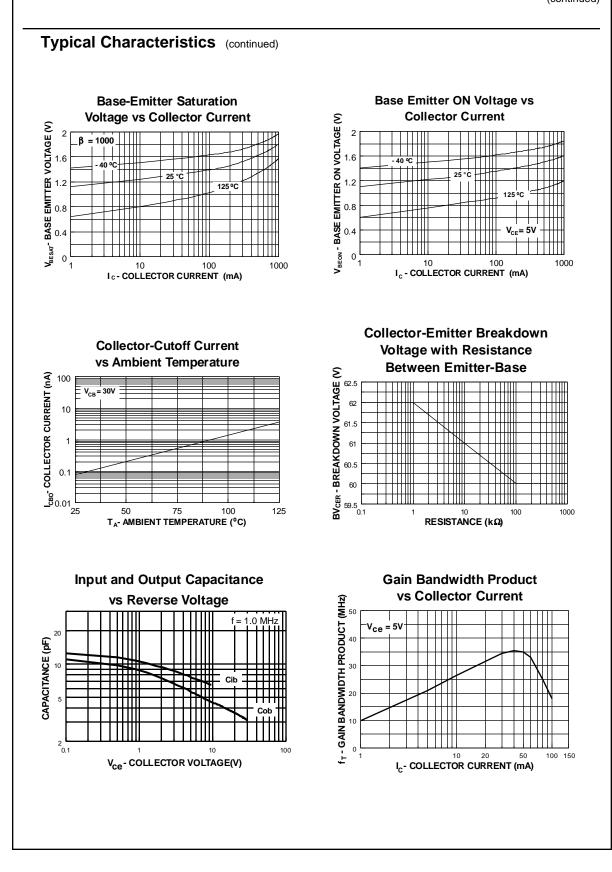
NPN Darlington Transistor (continued)

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
OFF CHA	RACTERISTICS					
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	30			V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \ \mu {\rm A}, I_{\rm E} = 0$	40			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{\rm E} = 100 \text{ nA}, I_{\rm C} = 0$	10			V
CBO	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$			0.1	μA
EBO	Emitter-Cutoff Current	$V_{EB} = 10 \text{ V}, \text{ I}_{C} = 0$			0.1	μA
	ACTERISTICS					
	DC Current Gain	I _C = 1.0 mA, V _{CE} = 5.0 V	4,000			1
FE		$I_{c} = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ $I_{c} = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}$	10,000			
		$I_{C} = 100 \text{ mA}, V_{CE} = 5.0 \text{ V}$	20,000			
CE(sat)	Collector-Emitter Saturation Voltage	$I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 0.1 \text{ mA}$			1.0	V
BE(sat)	Base-Emitter Saturation Voltage	$I_{C} = 100 \text{ mA}, I_{B} = 0.1 \text{ mA}$			1.5	V
SMALL SI	GNAL CHARACTERISTICS					
T	Current Gain - Bandwidth Product	$I_{C} = 30 \text{ mA}, V_{CE} = 5.0 \text{ V},$ f = 100 MHz		220		MHz
			-	0.5		
Cc	Collector Capacitance	V _{CB} = 30 V, I _E = 0, f = 1.0 MHz		3.5		pF
	Collector Capacitance	$V_{CB} = 30 \text{ V}, I_E = 0, t = 1.0 \text{ MHz}$		3.5		p r
Туріса	al Characteristics Typical Pulsed Current Gain	Collector-I	Emitter		tion	p٣
Туріса	al Characteristics	Collector-I		Satura		рг
Туріса	al Characteristics Typical Pulsed Current Gain	Collector-I		Satura		
Туріса	al Characteristics Typical Pulsed Current Gain vs Collector Current	Collector-I		Satura		
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current	$\sum_{\substack{\mathbf{v} \in \mathbf{v} \in $		Satura		
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $r_{E} = 5V$ $125 \circ C$ $125 \circ C$	$\sum_{\substack{\mathbf{v} \in \mathbf{v} \in $		Satura		
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current	$\sum_{\substack{\mathbf{v} \in \mathbf{v} \in $		Satura or Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $r_{e} = 5V$ $125 °C$ $125 °C$	$\sum_{\substack{\mathbf{v} \in \mathbf{v} \in $		Satura	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $r_{E} = 5V$ $125 \circ C$ $125 \circ C$	$\sum_{\substack{\mathbf{v} \in \mathbf{v} \in $		Satura or Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{125 \text{ °C}}{25 \text{ °C}}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{125 \text{ °C}}{25 \text{ °C}}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	рн 1000
PICAL PULSED CURRENT GAIN (K)	al Characteristics Typical Pulsed Current Gain vs Collector Current $r_{e} = 5V$ $125 °C$ $125 °C$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{1}{25 \circ C}$ $\frac{1}{25 \circ C}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{1}{25 \circ C}$ $\frac{1}{25 \circ C}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{1}{25 \circ C}$ $\frac{1}{25 \circ C}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
Typica 200 (K) 200 vo	al Characteristics Typical Pulsed Current Gain vs Collector Current $\frac{1}{25 \circ C}$ $\frac{1}{25 \circ C}$	Collector-I S Voltage vs 1.6 $\beta = 1000$ 1.2 $-40 \circ C$ 0.4 0.4 0.4		Satura cor Cur	rent	
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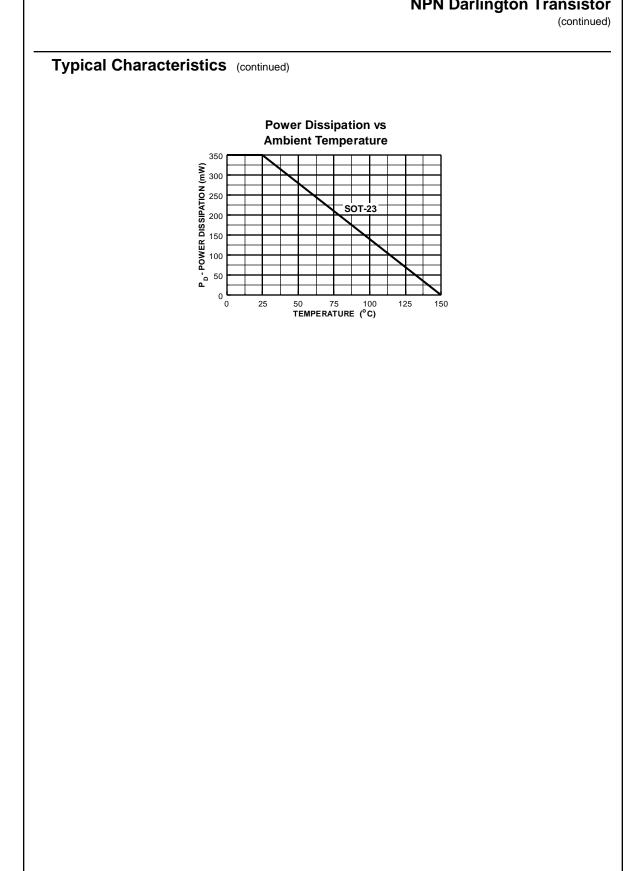
BCV27

NPN Darlington Transistor (continued)

BCV27



NPN Darlington Transistor



BCV27

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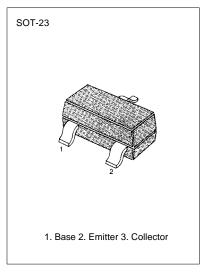
PNP EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Junction Temperature Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	-30 -20 -5.0 -100 350 150	V V mA mW °C

• Refer to KST5088 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Base Breakdown Voltage Collector-Emitter Breakdown Voltage Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter On Voltage Output Capacitance Noise Figures	$\begin{array}{c} BV_{CBO}\\ BV_{CEO}\\ BV_{CES}\\ BV_{EBO}\\ I_{CBO}\\ h_{FE}\\ V_{CE}(sat)\\ V_{BE}(sat)\\ C_{OB}\\ NF \end{array}$	$\begin{array}{l} l_{C}=-10\mu A, \ l_{E}=0 \\ l_{C}=-2mA, \ l_{B}=0 \\ l_{C}=-100\mu A, \ V_{EB}=0 \\ l_{E}=-10\mu A, \ l_{C}=0 \\ V_{CB}=-20V, \ l_{E}=0 \\ V_{CE}=-5V, \ l_{C}=-2mA \\ l_{C}=-10mA, \ l_{B}=-0.5mA \\ V_{CB}=-5V, \ l_{C}=-2mA \\ V_{CB}=-10V, \ l_{E}=0 \\ f=1MHz \\ V_{CE}=-5V, \ l_{C}=0.2mA \\ R_{G}=2K\Omega, \ f=1KHz \end{array}$	-30 -20 -30 -5 120 -0.6		-100 260 -0.3 -0.75 7 10	V V NA V pF dB

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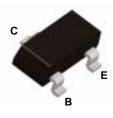
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Discrete POWER & Signal Technologies

BCW30



BCW30



SOT-23 Mark: C2

PNP General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 68. See BC857A for characteristics.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	32	V
V _{CES}	Collector-Emitter Voltage	32	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	500	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		*BCW30	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/°C
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

PNP General Purpose Amplifier (continued)

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHA	RACTERISTICS				
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{C} = 10 \ \mu A, \ I_{E} = 0$	32		V
/ _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 2.0 \text{ mA}, I_{\rm B} = 0$	32		V
/ _{(BR)CES}	Collector-Emitter Breakdown Voltage	$I_{C} = 10 \ \mu A, \ I_{E} = 0$	32		V
/ _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{E} = 10 \ \mu A, \ I_{C} = 0$	5.0		V
СВО	Collector-Cutoff Current	$V_{CB} = 32 V, I_E = 0$ $V_{CB} = 32 V, I_E = 0, T_A = +100 \text{ °C}$		100 10	nA μA
(BR)EBO	8	$V_{CB} = 32 \text{ V}, I_E = 0$	5.0		

h _{FE} DC Curre		$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$	215	500	
V _{CE(sat)} Collector	-Emitter Saturation Voltage	$I_{\rm C} = 10 \text{ mA}$, $I_{\rm B} = 0.5 \text{ mA}$		0.30	V
• OE(380)	nitter On Voltage	$V_{CE} = 5.0 \text{ V}, \text{ I}_{C} = 2.0 \text{ mA}$	0.60	0.75	V

SMALL SIGNAL CHARACTERISTICS

NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, \text{ I}_{C} = 200 \mu\text{A},$ $R_{S} = 2.0 k\Omega, \text{ f} = 1.0 k\text{Hz},$	10	dB
		$B_W = 200 \text{ Hz}$		

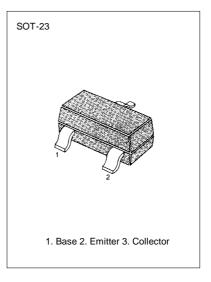
NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (TA=25 °C)

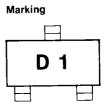
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	30 20 5 100 350 150	∨ ∨ mA mW ℃

Refer to KST5088 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25 °C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Base Breakdown Voltage Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter On Voltage Output Capacitance Noise Figures	$\begin{array}{c} BV_{CBO}\\ BV_{CEO}\\ BV_{EBO}\\ h_{FE}\\ V_{CE} \left(sat\right)\\ V_{BE} \left(on\right)\\ C_{OB}\\ NF \end{array}$	$\begin{array}{l} l_{c} = 10 \ / \ A, \ l_{E} = 0 \\ l_{c} = 2 m A, \ l_{B} = 0 \\ l_{E} = 10 \ / \ A, \ l_{C} = 0 \\ V_{CE} = 5 V, \ l_{C} = 2 m A \\ l_{C} = 10 m A, \ l_{B} = 0.5 m A \\ V_{CE} = 5 V, \ l_{C} = 2 m A \\ V_{CB} = 10 V, \ l_{E} = 0 \\ f = 1 M H z \\ V_{CE} = 5 V, \ l_{C} = 0.2 m A \\ R_{G} = 2 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	30 20 5 110 0.55		220 0.25 0.7 4 10	∨ ∨ ∨ pF dB





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UHC[™] VCX[™]

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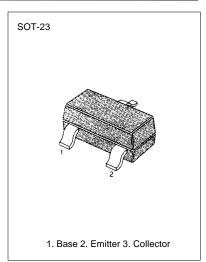
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NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} Ic P _C T _{STG}	32 32 5 100 350 150	V V mA mW °C



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C =2mA, I _B =0	32		V
Emitter-Base Breakdown Voltage	BV _{EBO}	$I_E=1\mu A$, $I_C=0$	5		V
Collector Cut-off Current	ICES	V _{CB} =32V, V _{BE} =0		20	nA
Emitter Cut-off Current	I _{EBO}	$V_{EB}=4V$, $I_{C}=0$		20	nA
DC Current Gain	h _{FE}				
: BCW60B		$V_{CE}=5V$, $I_{C}=10\mu A$	20		
: BCW60C			40		
: BCW60D			100		
: BCW60A		V _{CE} =5V, I _C =2mA	120	220	
: BCW60B			180	310	
: BCW60C			250	460	
: BCW60D			380	630	
: BCW60A		V _{CE} =1V, I _C =50mA	60		
: BCW60B			70		
: BCW60C			90		
: BCW60D			100		
Collector-Emitter Saturation Voltage	V _{CE} (sat)	$I_{C}=50mA$, $I_{B}=1.25mA$		0.55	V
		$I_{C}=10mA$, $I_{B}=0.25mA$		0.35	V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I _C =50mA, I _B =1.25mA	0.7	1.05	V
		$I_{C}=10mA$, $I_{B}=0.25mA$	0.6	0.85	V
Base-Emitter On Voltage	V _{BE} (sat)	$V_{CE}=5V, I_C=2mA$	0.55	0.75	V
Output Capacitance	C _{OB}	V _{CB} =10V, I _E =0 f=1MHz		4.5	pF
Current Gain-Bandwidth Product	f⊤	I_{C} =10mA, V_{CE} =5V	125		MHz
Noise Figure	NF	I _C =0.2mA, V _{CE} =5V		6	dB
		$R_G=2K\Omega$, f=1KHz			
Turn On Time	t _{ON}	I _C =10mA, I _B 1=1mA		150	ns
Turn Off Time	t _{OFF}	V _{BB} =3.6V, I _B 2=1mA		800	ns
	011	$R1=R2=5K\Omega, R_L=990\Omega$		000	113

MARKING CODE

TYPE	BCW60A	BCW60B	BCW60C	BCW60D
MARK.	AA	AB	AC	AD





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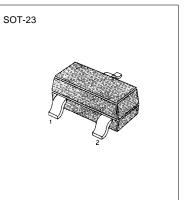
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ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} Ic Pc T _{STG}	-32 -32 -5.0 -100 350 -55 ~ 150	V V mA mW °C

• Refer to KS5086 for graphs



1. Base 2. Emitter 3. Collector

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C = -2mA, I _B =0	-32		V
Emitter-Base Breakdown Voltage	BV _{EBO}	I _E = -1μΑ, I _C =0	-5		V
Collector Cut-off Current	ICES	V _{CB} = -32V, V _{BE} =0		-20	nA
DC Current Gain	h _{FE}				
: BCW61B		V_{CE} = -5V, I_{C} = -10 μ A	20		
: BCW61C			40		
: BCW61D			100		
: BCW61A		V_{CE} = -5V, I_C = -2mA	120	220	
: BCW61B			140	310	
: BCW61C			250	460	
: BCW61D			380	630	
: BCW61A		V_{CE} = -5V, I_{C} = -50mA	60		
: BCW61B			80		
: BCW61C			100		
: BCW61D			100		
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I_{C} = -50mA, I_{B} = -1.25mA		-0.55	V
		I_{C} = -10mA, I_{B} = -0.25mA		-0.25	V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I_{C} = -50mA, I_{B} = -1.25mA	0.68	1.05	V
		$I_{\rm C}$ = -10mA, $I_{\rm B}$ = -0.25mA	0.6	0.85	V
Base-Emitter On Voltage	V _{BE} (on)	$V_{CE} = -5V, I_C = -2mA$	0.6	0.75	V
Output Capacitance	C _{OB}	V _{CB} = -10V, I _E =0 f=1MHz		6	pF
Noise Figure	NF	I _C = -0.2mA, V _{CE} = -5V		6	dB
		$R_{G}=20K\Omega$, f=1KHz		ů,	
Turn On Time	t _{ON}	I _C = -10mA, I _B 1= -1mA		150	ns
Turn Off Time	toff	V _{BB} = -3.6V, I _B 2= -1mA		800	ns
		R1=R2=50KΩ, R _L =990Ω		300	







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BCW65C



BCW65C



NPN General Purpose Amplifier

This device is designed for general purpose amplifier applications at collector currents to 500 mA. Sourced from Process 19.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	32	V
V _{CBO}	Collector-Base Voltage	60	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	1.0	А
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:1) These ratings are based on a maximum junction temperature of 150 degrees C.2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

5	TA = 25°C unless otherwise noted	
	TA = 25 0 unless otherwise noted	

Symbol	ol Characteristic Max		Units
		*BCW65C	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

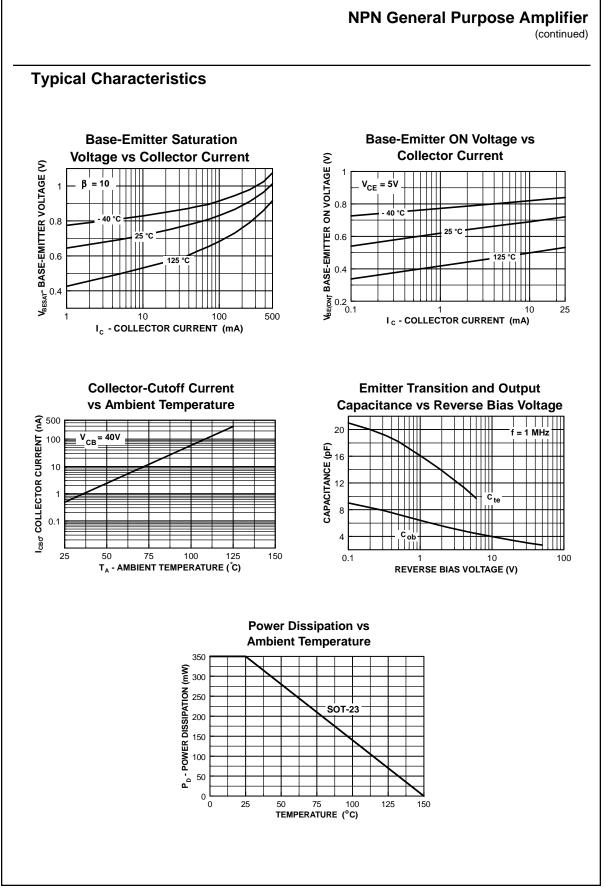
*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

NPN General Purpose Amplifier (continued)

Symbol	Parameter	Test Conditions	Min	Max	Units
	RACTERISTICS				
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	32		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \mu\text{A}, I_{\rm E} = 0$	60		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_{\rm E} = 10 \mu{\rm A}, I_{\rm C} = 0$	5.0		V
	Collector-Cutoff Current	$V_{CB} = 32 \text{ V}, I_E = 0$		20	nA
020		$V_{CB} = 32 \text{ V}, I_E = 0, T_A = 150^{\circ}\text{C}$ $V_{EB} = 4.0 \text{ V}, I_C = 0$		20	μA
ЕВО	Emitter-Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_{C} = 0$		20	nA
ON CHAF	RACTERISTICS				
h _{FE}	DC Current Gain	$I_{C} = 100 \ \mu A, V_{CE} = 10 \ V$	80		
		$I_{\rm C} = 10$ mA, $V_{\rm CE} = 1.0$ V	180		
		$I_{C} = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_{C} = 500 \text{ mA}, V_{CE} = 2.0 \text{ V}$	250 50	630	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 10 \text{ mA}$		0.3	V
02(001)		I _C = 500 mA, _B = 50 mA		0.7	
V _{BE(sat)}	Base-Emitter Saturation Voltage	$I_{\rm C} = 500 \text{ mA}, I_{\rm B} = 50 \text{ mA}$		2.0	V
T	IGNAL CHARACTERISTICS Current Gain - Bandwidth Product	$I_{\rm C} = 20 \text{ mA}, V_{\rm CE} = 10 \text{ V},$ f = 100 MHz	100	10	MHz
C _{obo}	Output Capacitance	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$		12	pF
C _{ibo}	Input Capacitance	$V_{EB} = 0.5 V$, $I_C = 0$, $f = 1.0 MHz$		80	pF
NF	Noise Figure	$ I_{C} = 0.2 \text{ mA}, V_{CE} = 5.0, \\ R_{S} = 1.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz}, \\ BW = 200 \text{ Hz} $		10	dB
Туріс	al Characteristics Typical Pulsed Current Gain	Collector-E			
		Collector-E Voltage vs 0.4 $\beta = 10$ 0.1 $\beta = 10$ 0.1 0.2 0.2 0.4 $\beta = 10$ 0.1 0.2 0.1 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.2 0.1 0.2 0.			

BCW65C

BCW65C



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PRODUCT STATUS DEFINITIONS

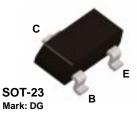
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Discrete POWER & Signal **Technologies**

BCW68G



BCW68G



PNP General Purpose Amplifier

This device is designed for general purpose amplifier and switching applications at currents to 500 mA. Sourced from Process 63.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CBO}	Collector-Base Voltage	60	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	800	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

These ratings are based on a maximum junction temperature of 150 degrees C.
 These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Мах	Units
		*BCW68C	
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/∘C
$R_{ heta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

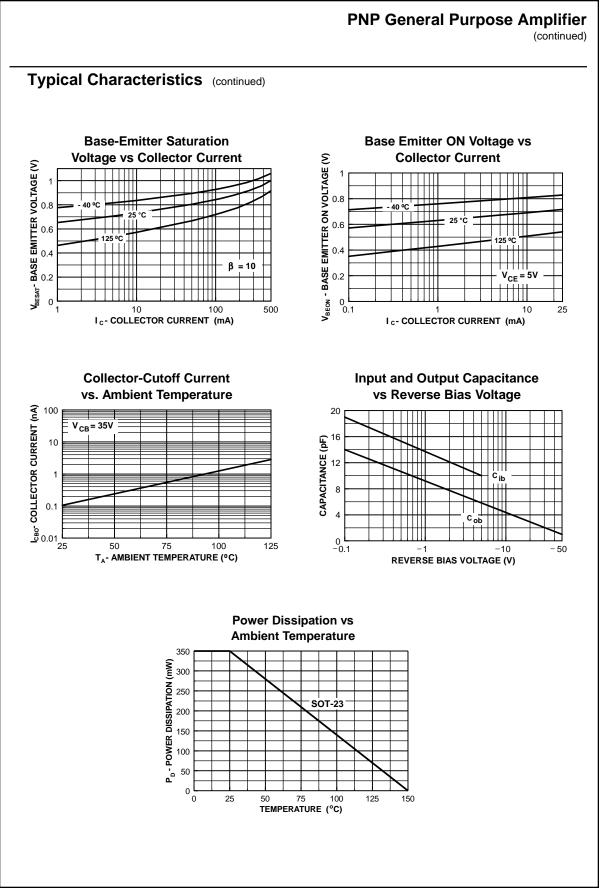
*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

PNP General Purpose Amplifier (continued)

Symbol	Parameter	Test Conditions	Min	Max	Units
	RACTERISTICS			1.15	
(BR)CEO	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$		45	V
(BR)CES	Collector-Base Breakdown Voltage	$I_{\rm C} = 10 \mu \text{A}$		60	V
(BR)CBO	Collector-Base Breakdown Voltage	$I_{\rm C} = 100 \ \mu {\rm A}, \ I_{\rm E} = 0$		60	V
(BR)EBO	Emitter-Base Breakdown Voltage	$I_{E} = 10 \ \mu A, I_{C} = 0$ $V_{CE} = 45 \ V$		5.0	V
ES	Collector-Cutoff Current	V _{CE} = 45 V V _{CE} = 45 V, T _A = 150 °C		20 10	nA μA
BO	Emitter-Cutoff Current	$V_{EB} = 4.0 V$		20	nA
	RACTERISTICS			-	,
FE	DC Current Gain	$I_{C} = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_{C} = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$	120 160	400	
		$I_{C} = 300 \text{ mA}, V_{CE} = 1.0 \text{ V}$	60	400	
CE(sat)	Collector-Emitter Saturation Voltage	$I_{C} = 300 \text{ mA}, I_{B} = 30 \text{ mA}$		1.5	V
BE(sat)	Base-Emitter Saturation Voltage	$I_{\rm C} = 500 \text{ mA}, I_{\rm B} = 50 \text{ mA}$		2.0	V
ibo F	Input Capacitance Noise Figure	$\begin{split} V_{EB} &= 0.5 \text{ V}, \ I_E = 0, \ f = 1.0 \ \text{MHz} \\ I_C &= 0.2 \ \text{mA} \ \text{V}, \ V_{CE} = 5.0 \ \text{V}, \\ R_S &= 1.0 \ \text{k}\Omega, \ f = 1.0 \ \text{kHz}, \\ B_W &= 200 \ \text{Hz} \end{split}$		105 10	pF dB
	al Characteristics Typical Pulsed Current Gain	Collector-E	mitter S	aturation	
	vs Collector Current	€ Voltage vs			
h _e - TYPICAL PULSED CURRENT GAIN 0000 0000	125 °C	$\sum_{i=1}^{n} Voltage vs$ $\beta = 10$		25 °C	

BCW68G

BCW68G



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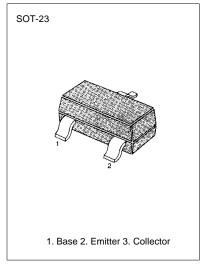
NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

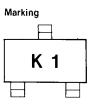
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V _{CBO}	50	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	5	V
Collector Current	I _C	100	mA
Collector Dissipation	Pc	350	mW
Storage Temperature	T _{STG}	150	°C

Refer to KST2222 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Тур	Max	Unit
Collector-Base Breakdown Voltage Collector-Emitter Breakdown Voltage Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current DC Current Gain Collector-Emitter Saturation Voltage	BV _{CBO} BV _{CEO} BV _{CES} BV _{EBO} I _{CBO} h _{FE} V _{CE} (sat)	$I_{C}=10\mu\text{A}, I_{E}=0$ $I_{C}=2\text{mA}, I_{B}=0$ $I_{C}=2\text{mA}, V_{EB}=0$ $I_{E}=10\mu\text{A}, I_{C}=0$ $V_{CB}=20\text{V}, I_{E}=0$ $V_{CE}=5\text{V}, I_{C}=2\text{mA}$ $I_{C}=10\text{mA}, I_{B}=0.5\text{mA}$ $I_{C}=50\text{mA}, I_{B}=2.5\text{mA}$	50 45 45 5 110	0.21	100 220 0.25	V V V nA V V
Base-Emitter Saturation Voltage Base-Emitter On Voltage Current Gain Bandwidth Product Output Capacitance Noise Figures	$V_{BE} (sat) \\ V_{BE} (on) \\ f_{T} \\ C_{OB} \\ NF$	$\label{eq:constraint} \begin{array}{l} c_{\rm S}=20mA, \ l_{\rm B}=2.5mA \\ l_{\rm C}=2mA, \ V_{\rm CE}=5V \\ V_{\rm CE}=5V, \ l_{\rm C}=10mA \\ f=35MHz \\ V_{\rm CB}=10V, \ l_{\rm E}=0 \\ f=1MHz \\ V_{\rm CE}=5V, \ l_{\rm C}=2.0mA \\ R_{\rm G}=2K\Omega, \ f=1KHz \end{array}$	0.6	0.21 0.85 300	0.75 4 10	v V MHz pF dB





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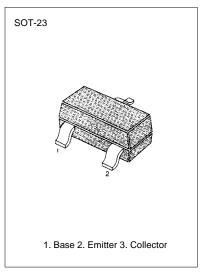
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GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	45 45 5 200 350 150	∨ ∨ mA mW °C

Refer to KS5088 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage	BVCEO	$I_{C}=2mA$, $I_{B}=0$	45		V
Emitter-Base Breakdown Voltage	BV _{FBO}	$I_E=1\mu A$, $I_C=0$	5		V
Collector Cut-off Current	ICES	V _{CE} =32V, V _{BE} =0		20	nA
Emitter Cut-off Current	IEBO	V _{EB} =4V, I _C =0		20	nA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =2mA	120	220	
		V _{CE} =1V, I _C =50mA	60		
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =10mA, I _B =0.25mA		0.35	V
		I _C =50mA, I _B =1.25mA		0.55	V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I _C =10mA, I _B =0.25mA	0.6	0.85	V
C C	. ,	I _C =50mA, I _B =1.25mA	0.7	1.05	V
Base-Emitter On Voltage	V _{BE} (on)	I _C =2mA, V _{CE} =5V	0.55	0.75	V
Current Gain Bandwidth Product	f _T	$V_{CE}=5V$, $I_{C}=10mA$	125		MHz
Output Capacitance	C _{OB}	V _{CB} =10V, I _E =0 f=1MHz		4.5	pF
Noise Figure	NF	I _C =0.2mA, V _{CE} =5V f=1KHz, R _S =2KΩ		6	dB
Turn On Time	Ton	I _C =10mA, I _{B1} =1mA		150	ns
Turn Off Time	TOFF	I _{B2} =1mA, V _{BB} =3.6V		800	ns
		$R_L=990\Omega R_1=R_2=5K\Omega$		500	

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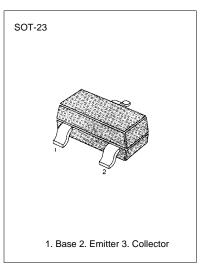
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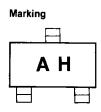
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	45 45 5 200 350 150	∨ ∨ mA mW ℃

• Refer to KS3904 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C =2.0mA, I _B =0	45		V
Emitter-Base Breakdown Voltage	BV _{EBO}	$I_{E}=1.0\mu A, I_{C}=0$	5		V
Collector Cut-off Current	ICES	$V_{CE}=32V, V_{BE}=0$		20	nA
Emitter Cut-off Current	EBO	$V_{EB}=4V$, $I_{C}=0$		20	nA
DC Current Gain	h _{FE}	$V_{CE}=5V$, $I_C=10\mu A$	120	210	
		V _{CE} =5V, I _C =2.0mA V _{CE} =1V, I _C =50mA	180	310	
		$V_{CE} = 10$, $I_C = 50$ mA $I_C = 10$ mA, $I_B = 0.25$ mA	70	0.35	.,
Collector-Emitter Saturation Voltage	V _{CE} (sat)	$I_{c}=50mA$, $I_{B}=1.25mA$		0.55	V V
Roop Emitter Seturation Voltage	V (pot)	$I_{\rm C}$ =10mA, $I_{\rm B}$ =0.25mA	0.0	0.35	V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I _C =50mA, I _B =1.25mA	0.6 0.7	1.05	v
Base-Emitter On Voltage	V _{BF} (on)	I _C =2.0mA, V _{CE} =5V	0.7	0.75	v
Current Gain Bandwidth Product	f _T	I _C =10mA, V _{CE} =5V	125	0.70	MHz
			120		
Output Capacitance	COB	$V_{CE}=10V, I_{E}=0$		4.5	pF
	-	f=1MHz			
Noise Figure	NF	$V_{CE}=5V$, $I_{C}=0.2mA$		6	dB
		R _S =2KΩ, f=1KHz I _C =10mA, I _{B1} =1.0mA			
Turn On Time	T _{ON}	$V_{BB}=3.6V, I_{B2}=1.0mA$		150	ns
Turn Off Time	TOFF	$R_1 = R_2 = 5K\Omega, R_1 = 990\Omega$		800	ns





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PRODUCT STATUS DEFINITIONS

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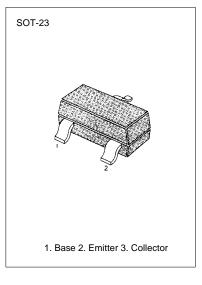
NPN EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

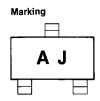
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	45 45 5 200 350 150	∨ ∨ mA mW °C

Refer to KS3904 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Мах	Unit
Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current Emitter Cut-off Current DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage Base-Emitter On Voltage Current Gain Bandwidth Product	$\begin{array}{c} BV_{CEO}\\ BV_{EBO}\\ I_{CES}\\ I_{EBO}\\ h_{FE} \end{array}$	$\begin{array}{l} l_{c} = 2.0mA, \ l_{B} = 0 \\ l_{E} = 1.0\muA, \ l_{C} = 0 \\ V_{CE} = 32V, \ V_{BE} = 0 \\ V_{EB} = 4V, \ l_{C} = 0 \\ V_{CE} = 5V, \ l_{C} = 10\muA \\ V_{CE} = 5V, \ l_{C} = 2.0mA \\ V_{CE} = 1V, \ l_{C} = 50mA \\ l_{C} = 10mA, \ l_{B} = 0.25mA \\ l_{C} = 50mA, \ l_{B} = 1.25mA \\ l_{C} = 10mA, \ l_{B} = 0.25mA \\ l_{C} = 50mA, \ l_{B} = 1.25mA \\ l_{C} = 50mA, \ l_{B} = 1.25mA \\ l_{C} = 5VmA, \ l_{C} = 5V \\ l_{C} = 10mA, \ V_{CE} = 5V \\ l_{C} = 10mA, \ V_{CE} = 5V \\ \end{array}$	45 5 40 250 90 0.6 0.7 0.55 125	20 20 460 0.35 0.55 0.85 1.05 0.75	V NA NA V V V V MHz
Output Capacitance Noise Figure Turn On Time Turn Off Time	C _{OB} NF T _{ON} T _{OFF}	$\begin{array}{l} V_{CB}{=}10V, \ I_{E}{=}0 \\ f{=}1MHz \\ V_{CE}{=}5V, \ I_{C}{=}0.2mA \\ R_{S}{=}2K\Omega, \ f{=}1KHz \\ I_{C}{=}10mA, \ I_{B}{=}1.0mA \\ V_{BB}{=}3.6V, \ I_{B2}{=}1.0mA \\ R_{1}{=}R_{2}{=}5K\Omega, \ R_{L}{=}990\Omega \end{array}$		4.5 6 150 800	pF dB ns ns





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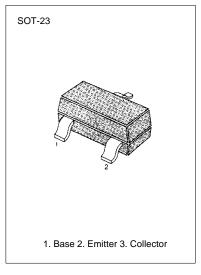
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GENERAL PURPOSE TRANSISTOR

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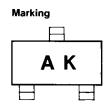
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	45 45 5 200 350 150	V V mA mW °C

Refer to KS3904 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current Emitter Cut-off Current DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage Base-Emitter On Voltage Current Gain Bandwidth Product	$\begin{array}{c} BV_{CEO}\\ BV_{EBO}\\ I_{CES}\\ I_{EBO}\\ h_{FE} \end{array}$ $V_{CE} \left(sat\right)\\ V_{BE} \left(sat\right)\\ V_{BE} \left(on\right)\\ f_{T} \end{array}$	$\begin{array}{l} l_{c}=2.0mA, \ l_{B}=0\\ l_{E}=1.0\muA, \ l_{C}=0\\ \forall_{CE}=32V, \ \forall_{BE}=0\\ \forall_{CE}=5V, \ l_{C}=10\muA\\ \forall_{CE}=5V, \ l_{C}=10\muA\\ \forall_{CE}=5V, \ l_{C}=2.0mA\\ l_{C}=10mA, \ l_{B}=0.25mA\\ l_{C}=50mA, \ l_{B}=1.25mA\\ l_{C}=50mA, \ l_{B}=1.25mA\\ l_{C}=2.0mA, \ \forall_{CE}=5V\\ l_{C}=10mA, \ \forall_{CE}=5V\\ \end{array}$	45 5 100 380 100 0.6 0.7 0.55 125	20 20 630 0.35 0.55 0.85 1.05 0.75	V NA NA V V V V MHz
Output Capacitance Noise Figure Turn On Time Turn Off Time	C _{OB} NF T _{ON} T _{OFF}	$\begin{array}{l} V_{CB}{=}10V, \ I_{E}{=}0 \\ f{=}1MHz \\ V_{CE}{=}5V, \ I_{C}{=}0.2mA \\ R_{S}{=}2K\Omega, \ f{=}1KHz \\ I_{C}{=}10mA, \ I_{B}{=}1.0mA \\ V_{BB}{=}3.6V, \ I_{B2}{=}1.0mA \\ R_{1}{=}R_{2}{=}5K\Omega, \ R_{L}{=}990\Omega \end{array}$		4.5 6 150 800	pF dB ns ns





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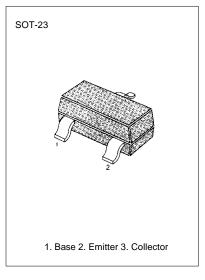
PNP EPITAXIAL SILICON TRANSISTOR

GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

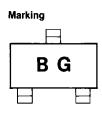
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	-45 -45 -5.0 -100 350 150	∨ ∨ mA mW °C

Refer to KS5086 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage	BV _{CEO} BV _{EBO}	I_{c} = -2mA, I_{B} =0 I_{E} = -1 μ A, I_{c} =0	-45 -5		V V
Collector Cut-off Current DC Current Gain	l _{CES} h _{FE}	V _{CE} = -32V, V _{BE} =0 V _{EB} = -5V, I _C = -2mA V _{CE} = -1V, I _C = -50μA	120 60	-20 220	nA
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I_{C} = -10mA, I_{B} = -0.25mA I_{C} = -50mA, I_{B} = -1.25mA		-0.25 -0.55	V V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I_{C} = -10mA, I_{B} = -0.25mA I_{C} = -50mA, I_{B} = -1.25mA	-0.6 -0.68	-0.85 -1.05	V V
Base-Emitter On Voltage Current Gain Bandwidth Product	V _{BE} (on) C _{OB}	I _C = -2mA, V _{CE} = -5V V _{CB} = -10V, I _E =0 f=1MHz	-0.6	-0.75 6	V pF
Noise Figure	NF	$I_c=0.2$ mA, $V_{ce}=5V$ R _s =2K Ω , f=1KHz		6	dB
Turn On Time Turn Off Time	T _{on} T _{off}	I_{C} = -10mA, I_{B1} = -1mA I_{B2} = -1mA, V_{BB} =3.6V R_{L} =990 Ω		150 800	ns ns





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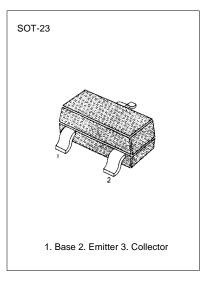
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GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

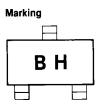
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	-45 -45 -100 350 150	V V mA mW °C

• Refer to KS5086 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage Base-Emitter On Voltage Current Gain Bandwidth Product Noise Figure Turn On Time Turn Off Time	BV_{CEO} BV_{EBO} I_{CES} h_{FE} $V_{CE} (sat)$ $V_{BE} (sat)$ $V_{BE} (sat)$ NF T_{ON} T_{OFF}	$\begin{array}{l} _{C=}-2mA, _{B}=0 \\ _{E=}-1\muA, _{C}=0 \\ \forall_{CE}=-32V, \forall_{BE}=0 \\ \forall_{CE}=-5V, _{C=}-10\muA \\ \forall_{CE}=-5V, _{C=}-2mA \\ \forall_{CE}=-1V, _{C=}-2mA \\ _{C=}-10mA, _{B}=-0.25mA \\ _{C}=-50mA, _{B}=-1.25mA \\ _{C}=-50mA, _{B}=-1.25mA \\ _{C}=-50mA, _{B}=-1.25mA \\ _{C}=-50mA, _{B}=-1.25mA \\ _{C}=-2mA, \forall_{CE}=-5V \\ \forall_{CB}=-10V, _{E}=0 \\ f=1MHz \\ _{C}=-0.2mA, \forall_{CE}=-5V \\ f=1KHz, R_{S}=2K\Omega \\ _{C}=-10mA, _{B_{1}}=-1mA \\ _{B_{2}}=-1mA, \forall_{B_{B}}=-3.6V \\ R_{L}=990\Omega \end{array}$	-45 -5 30 140 80 -0.6 -0.68 -0.6	-20 310 -0.25 -0.55 -0.85 -1.05 -0.75 6 6 150 800	V V nA V V V V PF dB ns ns





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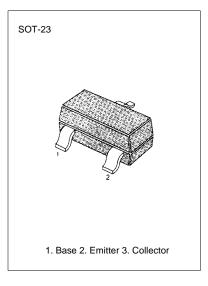
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Characteristic	Symbol	Test Conditions	Min	Max	Unit
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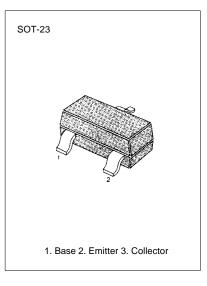
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GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

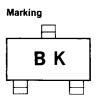
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage Collector-Emitter Voltage Emitter-Base Voltage Collector Current Collector Dissipation Storage Temperature	V _{CBO} V _{CEO} V _{EBO} I _C P _C T _{STG}	-45 -45 -5.0 -100 350 150	∨ ∨ mA mW °C

• Refer to KST5086 for graphs



ELECTRICAL CHARACTERISTICS (T_A=25°C)

Characteristic	Symbol	Test Conditions	Min	Max	Unit
Collector-Emitter Breakdown Voltage Emitter-Base Breakdown Voltage Collector Cut-off Current DC Current Gain	BV _{CEO} BV _{EBO} I _{CES} h _{FE}	$\begin{split} I_{C} &= -2mA, \ I_{B} = 0 \\ I_{E} &= -1\muA, \ I_{C} = 0 \\ V_{CE} &= -32V, \ V_{BE} = 0 \\ V_{CE} &= -5V, \ I_{C} = -10\muA \\ V_{CE} &= -5V, \ I_{C} = -2mA \\ V_{CE} &= -1V, \ I_{C} = -50mA \end{split}$	-45 -5 100 380 110	-20 630	V V nA
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I_{C} = -10mA, I_{B} = -0.25mA I_{C} = -50mA, I_{B} = -1.25mA	110	-0.25 -0.55	V V
Base-Emitter Saturation Voltage	V _{BE} (sat)	I _C = -10mA, I _B = -0.25mA I _C = -50mA, I _B = -1.25mA	-0.6	-0.85 -1.05	VV
Base-Emitter On Voltage Current Gain Bandwidth Product	V _{BE} (on) C _{OB}	I _C = -2mA, V _{CE} = -5V V _{CB} = -10V, I _E =0 f=1MHz	-0.68 -0.6	-0.75 6	V pF
Noise Figure	NF	l _C = -0.2mA, V _{CE} = -5V R _S =2KΩ, f=1KHz		6	dB
Turn On Time Turn Off Time	T _{ON} T _{OFF}	$\begin{array}{l} I_{C}\text{=-10mA},\ I_{B1}\text{=-1mA}\\ I_{B2}\text{=-1mA},\ V_{BB}\text{=-3.6V}\\ R_{L}\text{=990}\Omega \end{array}$		150 800	ns ns





Rev. B

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PRODUCT STATUS DEFINITIONS

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
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Discrete POWER & Signal **Technologies**



BCX79



PNP General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 68. See PN200A for characteristics.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CES}	Collector-Base Voltage	45	V
V _{EBO}	Emitter-Base Voltage	5.0	V
Ic	Collector Current - Continuous	500	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150 degrees C.
 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Character

TA = 25°C unless otherwis	se noted
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Symbol	Characteristic	Мах	Units
		BCX79	
P _D	Total Device Dissipation	625	mW
	Derate above 25°C	5.0	mW/⁰C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{ ext{ hetaJA}}$	Thermal Resistance, Junction to Ambient	200	°C/W

PNP General Purpose Amplifier (continued)

	Parameter	Test Conditions	Min	Max	Units
OFF CHA	RACTERISTICS				
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	$I_{\rm C} = 10 \text{ mA}, I_{\rm B} = 0$	45		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_E = 1.0 \ \mu A, \ I_C = 0$	5.0		V
I _{CEX}	Collector Cutoff Current	$V_{CE} = 45 \text{ V}, V_{BE} = 0.2 \text{ V},$ $T_A = +100 \text{ °C}$		20	μΑ
I _{CES}	Collector Cutoff Current	$ \begin{array}{l} V_{CE} = 45 \ V, \ I_E = 0, \\ V_{CE} = 45 \ V, \ I_E = 0, \ T_A = +125 \ ^\circ C \\ \end{array} \\ V_{EB} = 4.0 \ V, \ I_C = 0 \end{array} $		10 2.5	nA μA
I _{EBO}	Emitter Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_{C} = 0$		20	nA
ON CHAR	ACTERISTICS				
h _{FE}	DC Current Gain	$ \begin{array}{l} V_{CE} = 5.0 \; V, \; I_{C} = 2.0 \; mA \\ V_{CE} = 1.0 \; V, \; I_{C} = 10 \; mA \\ V_{CE} = 1.0 \; V, \; I_{C} = 100 \; mA \end{array} $	120 80 40	630 1,000	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$V_{CE} = 1.0$ V, $I_C = 100$ mA $I_C = 100$ mA, $I_B = 2.5$ mA	UT	0.6	V
V _{BE(sat)}	Base-Emitter Saturation Voltage	$I_{\rm C} = 100 \text{ mA}, I_{\rm B} = 2.5 \text{ mA}$		1.0	V
V _{BE(on)}	Base-Emitter On Voltage	$V_{CE} = 5.0 \text{ V}, I_{C} = 2.0 \text{ mA}$	0.6	0.7	V
BE(01)		$V_{CE} = 1.0 \text{ V}, I_{C} = 100 \text{ mA}$		0.9	V
	IGNAL CHARACTERISTICS			4.5	~
C _{cb}	Collector-Base Capacitance	$V_{CB} = 10 \text{ V}, \text{ f} = 1.0 \text{ MHz}$		4.5	pF
C _{eb}	Emitter-Base Capacitance	$V_{EB} = 0.5 V, f = 1.0 MHz$	4.0	15	pF
h _{ie}	Input Impedance Output Admittance	$I_{C} = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ f = 1.0 kHz $I_{C} = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$	1.6	8.5	kΩ
	Oulput Admittance	$f_{c} = 2.0 \text{ MA}, v_{ce} = 5.0 \text{ V},$ f = 1.0 kHz		100	μmhos
n _{oe}					
	Noise Figure	$V_{CE} = 5.0 \text{ V}, \text{ I}_{C} = 0.2 \text{ mA},$		6.0	dB
	Noise Figure			6.0	dB
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_{C} = 0.2 \text{ mA},$		6.0	dB
NF SWITCHI		$V_{CE} = 5.0 \text{ V}, I_C = 0.2 \text{ mA},$ $R_S = 2.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz}$ $V_{CC} = 10 \text{ V}, I_C = 10 \text{ mA},$		6.0	dB
NF SWITCHI	NG CHARACTERISTICS	$\begin{split} V_{CE} &= 5.0 \text{ V}, \text{ I}_{C} = 0.2 \text{ mA}, \\ R_{S} &= 2.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz} \end{split}$ $V_{CC} &= 10 \text{ V}, \text{ I}_{C} = 10 \text{ mA}, \\ V_{BB} &= 3.6 \text{ V}, \text{ I}_{B1} = \text{ I}_{B2} = 1.0 \text{ mA} \end{split}$		150	ns
NF SWITCHI	NG CHARACTERISTICS	$\begin{split} V_{CE} &= 5.0 \text{ V}, \text{ I}_{C} = 0.2 \text{ mA}, \\ R_{S} &= 2.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz} \end{split}$ $\begin{split} V_{CC} &= 10 \text{ V}, \text{ I}_{C} = 10 \text{ mA}, \\ V_{BB} &= 3.6 \text{ V}, \text{ I}_{B1} = \text{ I}_{B2} = 1.0 \text{ mA} \\ V_{CC} &= 10 \text{ V}, \text{ I}_{C} = 100 \text{ mA}, \end{split}$			<u> </u>
h _{oe} NF SWITCHI t _{on} t _{on}	NG CHARACTERISTICS	$\begin{split} V_{CE} &= 5.0 \text{ V}, \text{ I}_{C} = 0.2 \text{ mA}, \\ R_{S} &= 2.0 \text{ k}\Omega, \text{ f} = 1.0 \text{ kHz} \end{split}$ $V_{CC} &= 10 \text{ V}, \text{ I}_{C} = 10 \text{ mA}, \\ V_{BB} &= 3.6 \text{ V}, \text{ I}_{B1} = \text{ I}_{B2} = 1.0 \text{ mA} \end{split}$		150	ns

BCX79