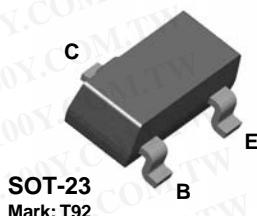


BSR18A



勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-54151736
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

PNP General Purpose Amplifier

This device is designed as a general purpose amplifier and switching applications at collector currents of 10 μ A to 100 mA. Sourced from Process 66.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	40	V
V _{CBO}	Collector-Base Voltage	40	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	200	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.
- 3) All voltages (V) and currents (A) are negative polarity for PNP transistors.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		*BSR18A	
P _D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
R _{θJA}	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 General Purpose Amplifier (continued)

BSR18A

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \mu A, I_B = 0$	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 1.0 \text{ mA}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu A, I_C = 0$	5.0		V
I_{CBO}	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}$		50	nA
I_{EBO}	Emitter-Cutoff Current	$V_{EB} = 3.0 \text{ V}, I_C = 0$		50	nA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$I_C = 0.1 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 1.0 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 50 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$	60 80 100 60 30	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$		0.25 0.4	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$	0.65	0.85 0.95	V V

SMALL SIGNAL CHARACTERISTICS

f_T	Transition Frequency	$I_C = 10 \text{ mA}, V_{CE} = 20, f = 100 \text{ MHz}$	250		MHz
C_{cb}	Collector-Base Capacitance	$V_{CB} = 5.0 \text{ V}, I_E = 0, f = 100 \text{ kHz}$		4.5	pF
C_{eb}	Emitter-Base Capacitance	$V_{EB} = 0.5 \text{ V}, I_C = 0, f = 100 \text{ kHz}$		10	pF
h_{ie}	Input Impedance	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}, f = 1.0 \text{ kHz}$	2.0	12	k Ω
h_{fe}	Small-Signal Current Gain	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}, f = 1.0 \text{ kHz}$	100	400	
h_{oe}	Output Admittance	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}, f = 1.0 \text{ kHz}$	3.0	60	μS

SWITCHING CHARACTERISTICS

t_d	Delay Time	$I_C = 10 \text{ mA}, I_{B1} = 1.0 \text{ mA},$		35	ns
t_r	Rise Time	$V_{EB} = 0.5 \text{ V}$		35	ns
t_s	Storage Time	$I_C = 10 \text{ mA}, I_{BON} = I_{BOFF} = 1.0 \text{ mA}$		275	ns
t_f	Fall Time			75	ns

*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 0.01\%$

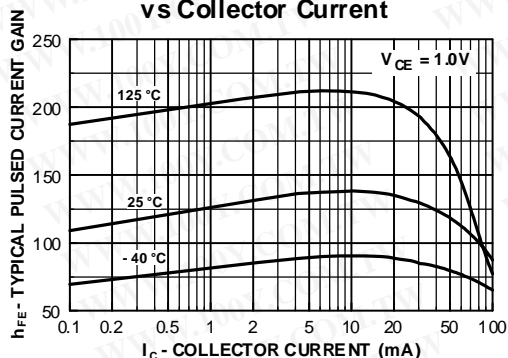
NOTE: All voltages (V) and currents (A) are negative polarity for PNP transistors.

Spice Model

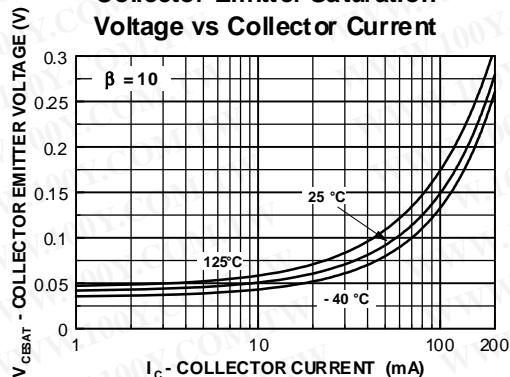
PNP (Is=1.41f Xti=3 Eg=1.11 Vaf=18.7 Bf=180.7 Ne=1.5 Ise=0 Ikf=80m Xtb=1.5 Br=4.977 Nc=2 Isc=0 Ikr=0 Rc=2.5 Cjc=9.728p Mjc=.5776 Vjc=.75 Fc=.5 Cje=8.063p Mje=.3677 Vje=.75 Tr=33.42n Tf=179.3p Itf=.4 Vtf=4 Xtf=6 Rb=10)

Typical Characteristics

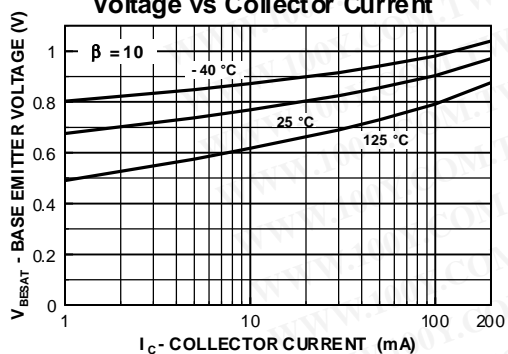
Typical Pulsed Current Gain
 vs Collector Current



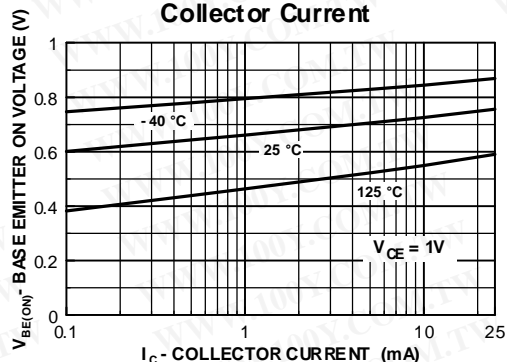
Collector-Emitter Saturation
 Voltage vs Collector Current



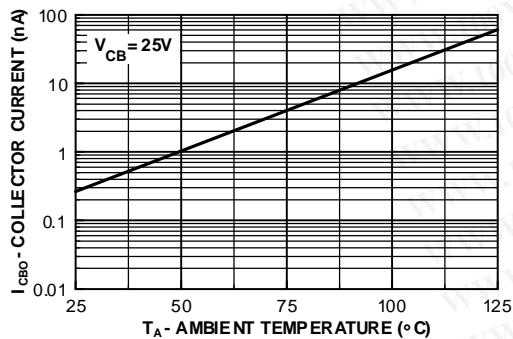
Base-Emitter Saturation
 Voltage vs Collector Current



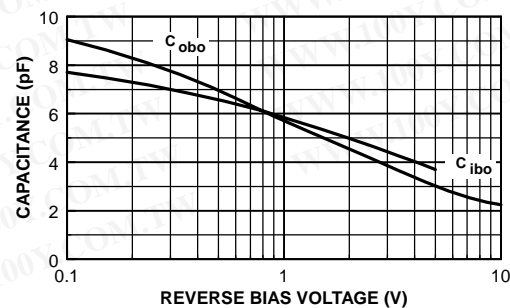
Base Emitter ON Voltage vs
 Collector Current



Collector-Cutoff Current
 vs Ambient Temperature

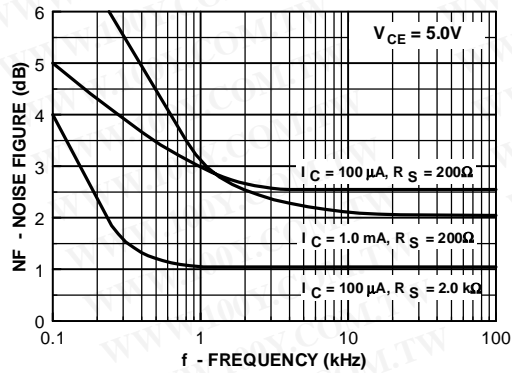


Common-Base Open Circuit
 Input and Output Capacitance
 vs Reverse Bias Voltage

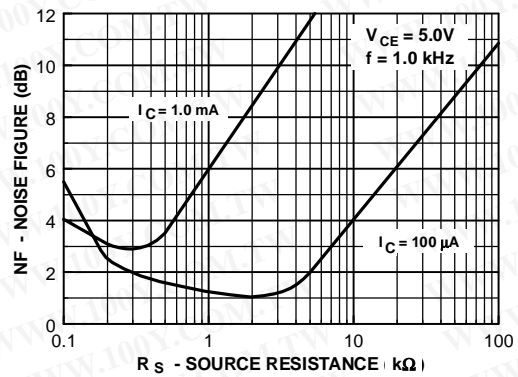


Typical Characteristics (continued)

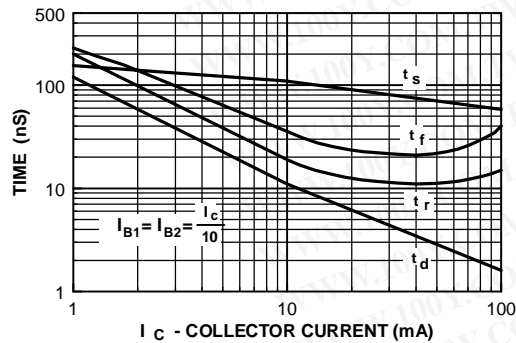
Noise Figure vs Frequency



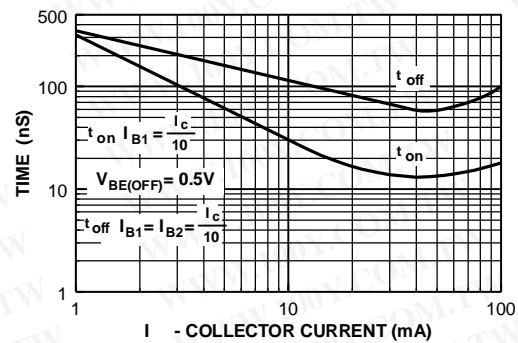
Noise Figure vs Source Resistance



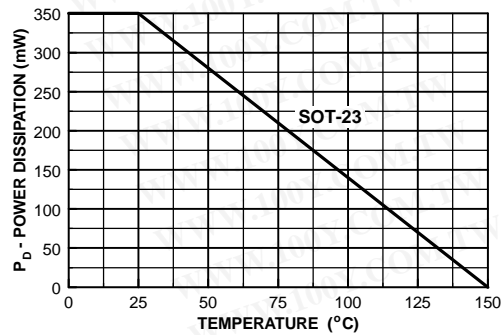
Switching Times
 vs Collector Current



Turn On and Turn Off Times
 vs Collector Current

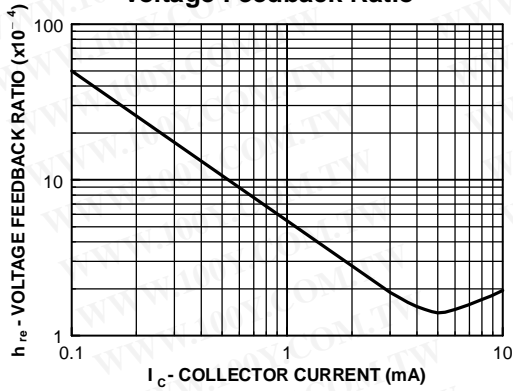


Power Dissipation vs
 Ambient Temperature

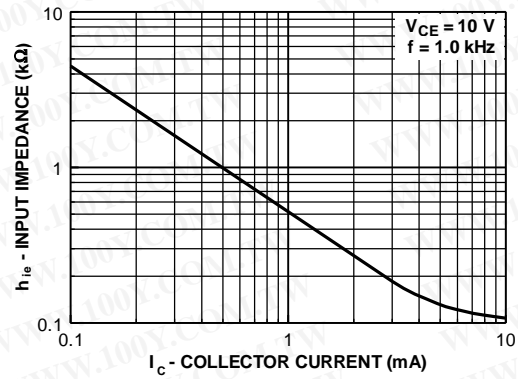


Typical Characteristics (continued)

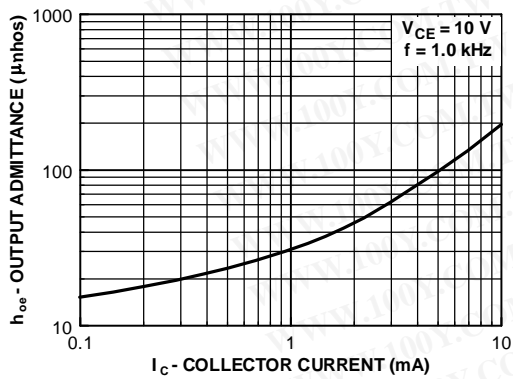
Voltage Feedback Ratio



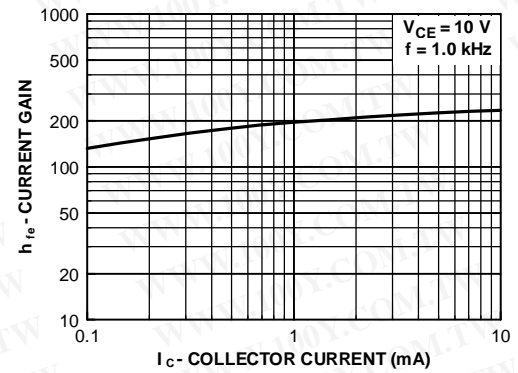
Input Impedance



Output Admittance



Current Gain



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EnSigna™	OPTOLOGIC™	SMART START™	
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FAST®	POP™	SuperSOT™-8	

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