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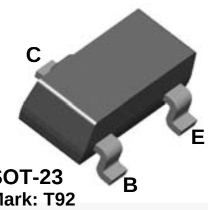
FAIRCHILD™

March 2014

BSR18A
PNP General-Purpose Amplifier

Description

This device is designed as a general-purpose amplifier for switching applications at collector currents of 10 µA to 100 mA. Sourced from process 66.



Ordering Information

Part Number	Marking	Package	Packing Method
BSR18A	T92	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings[1],[2]

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{CBO}	Collector-Base Voltage	-40	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current - Continuous	-200	mA
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Notes:

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics(3)

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation	350	mW
	Derate Above T_A = 25°C	2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

Note:
3. Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

Electrical Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = -10 μA, I_B = 0	-40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = -1.0 mA, I_E= 0	-40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = -10 μA, I_C = 0	-5.0		V
I_{CBO}	Collector Cut-Off Current	V_{CB} = -30 V, I_E = 0		-50	nA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = -3.0 V, I_C = 0		-50	nA
h_{FE}	DC Current Gain(4)	I_C = -0.1 mA, V_{CE} = -1.0 V	60		
		I_C = -1.0 mA, V_{CE} = -1.0 V	80		
		I_C = -10 mA, V_{CE} = -1.0 V	100	300	
		I_C = -50 mA, V_{CE} = -1.0 V	60		
		I_C = -100 mA, V_{CE} = -1.0 V	30		
V_{CE}(sat)	Collector-Emitter Saturation Voltage(4)	I_C = -10 mA, I_B = -1.0 mA		-0.25	V
		I_C = -50 mA, I_B = -5.0 mA		-0.40	
V_{BE}(sat)	Base-Emitter Saturation Voltage(4)	I_C = -10 mA, I_B = -1.0 mA	-0.65	-0.85	V
		I_C = -50 mA, I_B = -5.0 mA		-0.95	
f_T	Transition Frequency	I_C = -10 mA, V_{CE} = -20 V, f = 100 MHz	250		MHz
C_{cb}	Collector-Base Capacitance	V_{CB} = -5.0 V, I_E = 0, f = 100 kHz		4.5	pF
C_{eb}	Emitter-Base Capacitance	V_{EB} = -0.5 V, I_C = 0, f = 100 kHz		10	pF
h_{ie}	Input Impedance	V_{CE} = -10 V, I_C = -1.0 mA, f = 1.0 kHz	2	12	kΩ
h_{ie}	Small-Signal Current Gain	V_{CE} = -10 V, I_C = -1.0 mA, f = 1.0 kHz	100	400	
h_{ie}	Output Admittance	V_{CE} = -10 V, I_C = -1.0 mA, f = 1.0 kHz	3	60	μS
t_d	Delay Time	I_C = -10 mA, I_{B1} = -1.0 mA, V_{EB} = -0.5 V		35	ns
t_r	Rise Time			35	ns
t_s	Storage Time	I_C = -10 mA, I_{Bon} = I_{Boff} = -1.0 mA		275	ns
t_f	Fall Time			75	ns

Note:
4. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 0.01%.

Typical Performance Characteristics

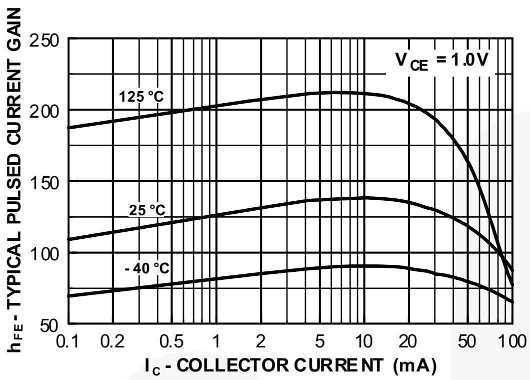


Figure 1. Typical Pulsed Current Gain vs. Collector Current

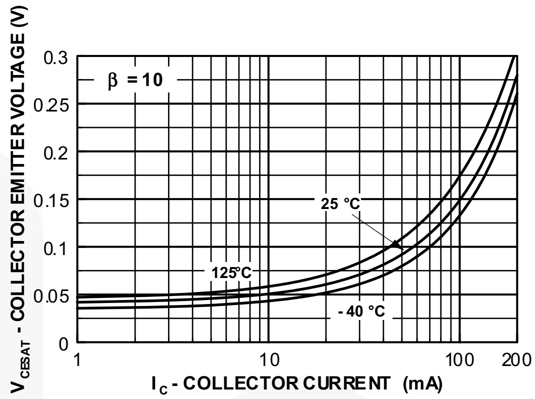


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

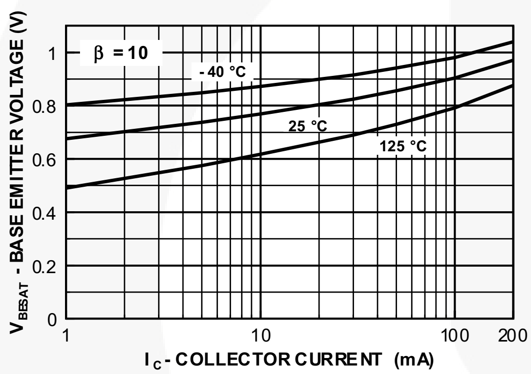


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

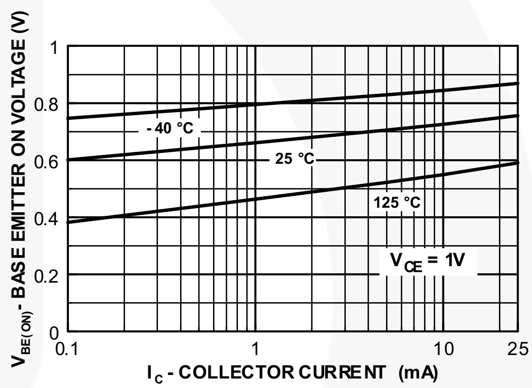


Figure 4. Base-Emitter On Voltage vs. Collector Current

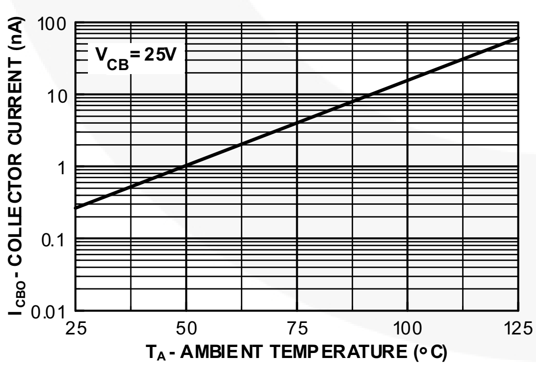


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

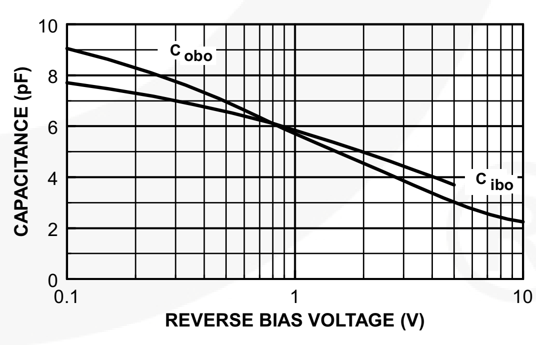


Figure 6. Common-Base Open Circuit Input and Output Capacitance vs. Reverse Bias Voltage

Typical Performance Characteristics (Continued)

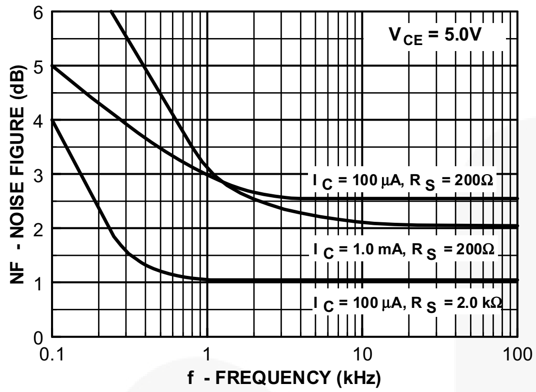


Figure 7. Noise Figure vs. Frequency

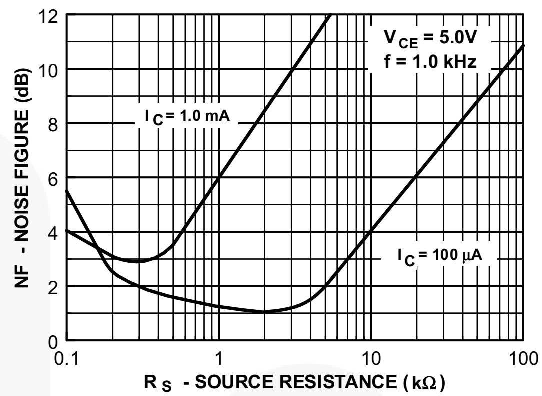


Figure 8. Noise Figure vs. Source Resistance

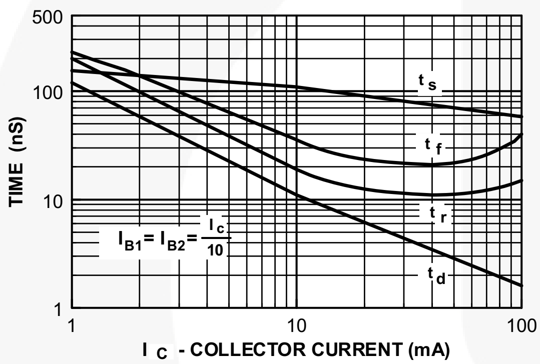


Figure 9. Switching Times vs. Collector Current

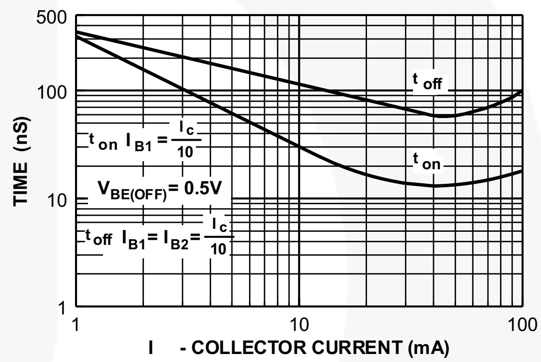


Figure 10. Turn-On and Turn-Off Times vs. Collector Current

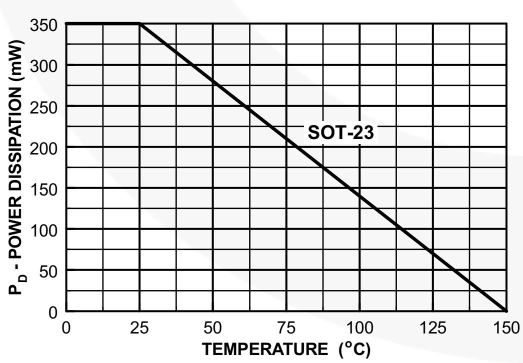


Figure 10. Power Dissipation vs. Ambient Temperature

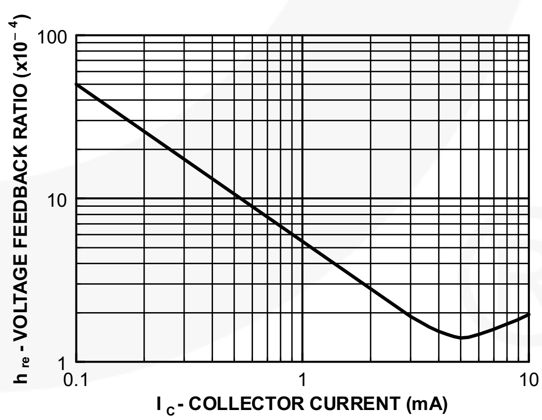


Figure 11. Voltage Feedback Ratio

Typical Performance Characteristics (Continued)

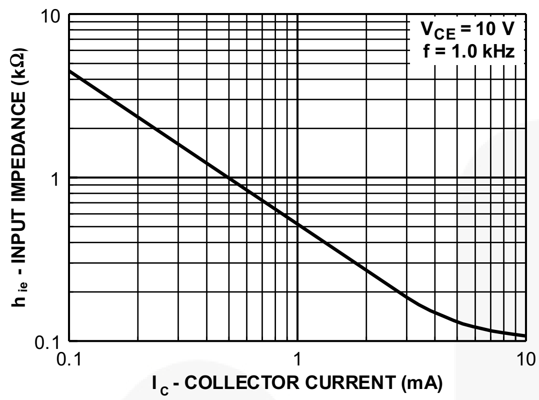


Figure 13. Input Impedance

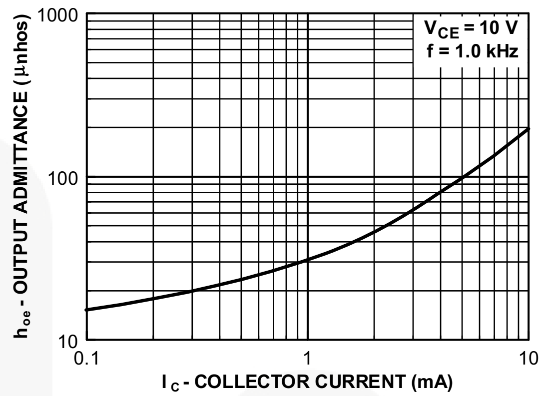


Figure 14. Output Admittance

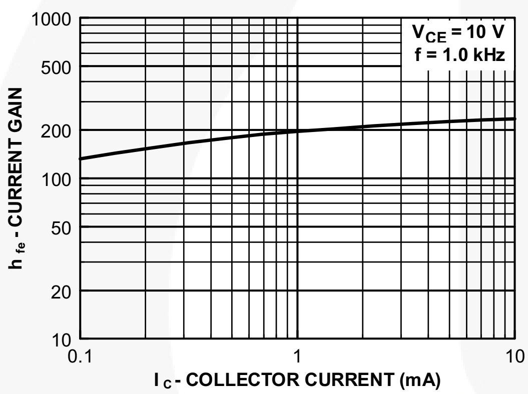


Figure 15. Current Gain

Physical Dimensions

SOT-23

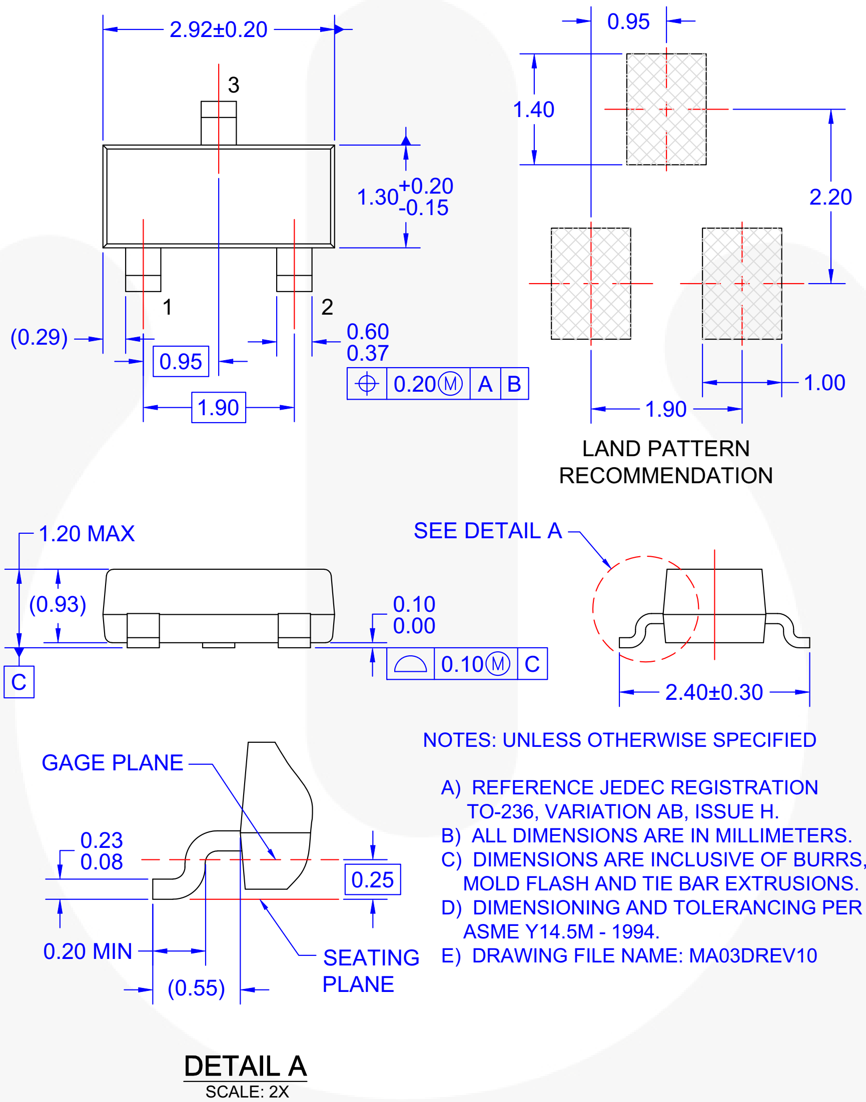


Figure 16. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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Rev. I68

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