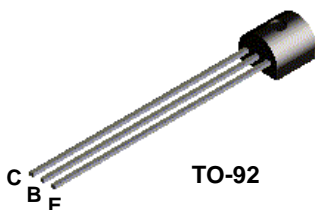


2N4123



NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 100 mA.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	30	V
V _{CB0}	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.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		2N4123	
P _D	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	°C/W

NPN General Purpose Amplifier

(continued)

2N4123

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*	$I_C = 1.0 \text{ mA}, I_B = 0$	30		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ }\mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ }\mu\text{A}, I_C = 0$	5.0		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 20 \text{ V}, I_E = 0$		50	nA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 3.0 \text{ V}, I_C = 0$		50	nA

ON CHARACTERISTICS*

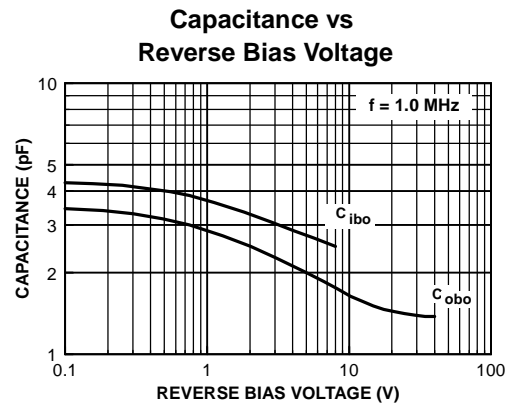
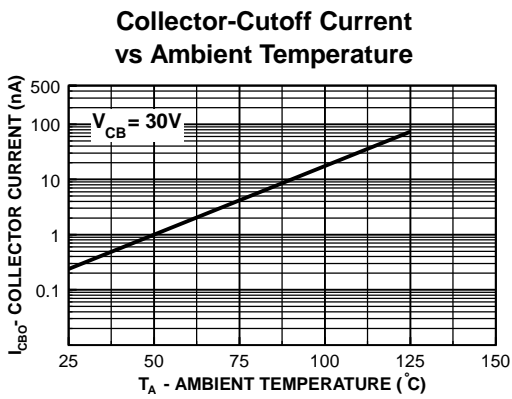
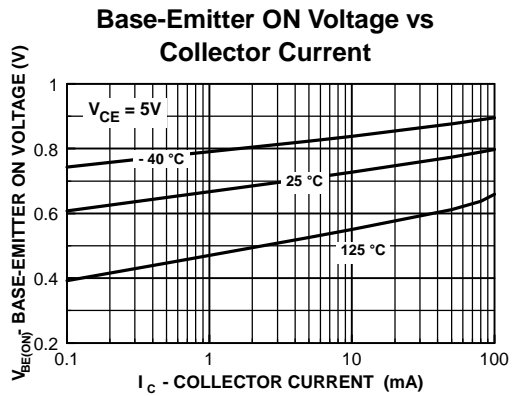
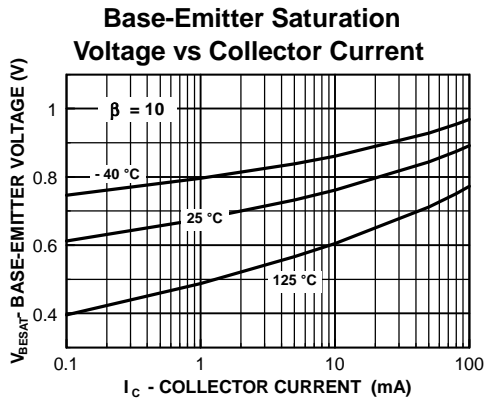
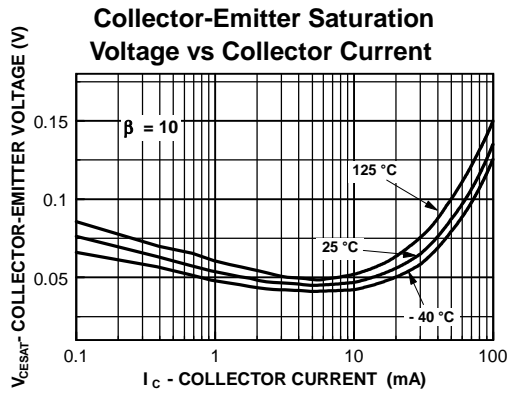
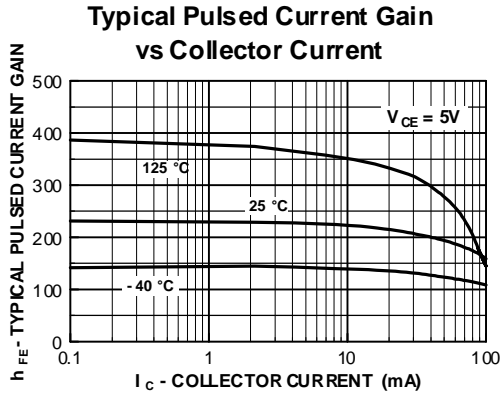
h_{FE}	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_C = 2.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 50 \text{ mA}$	50 25	150	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$		0.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$		0.95	V

SMALL SIGNAL CHARACTERISTICS

C_{ob}	Output Capacitance	$V_{CB} = 5.0 \text{ V}, f = 100 \text{ kHz}$		4.0	pF
C_{ib}	Input Capacitance	$V_{EB} = 0.5 \text{ V}, f = 0.1 \text{ MHz}$		8.0	pF
h_{fe}	Small-Signal Current Gain	$I_C = 2.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 1.0 \text{ kHz}$ $I_C = 10 \text{ mA}, V_{CE} = 20 \text{ V},$ $f = 100 \text{ MHz}$	50 2.5	200	
f_T	Current Gain - Bandwidth Product	$I_C = 10 \text{ mA}, V_{CE} = 20 \text{ V}$ $f = 100 \text{ MHz}$	250		MHz
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 100 \text{ }\mu\text{A},$ $R_S = 1.0 \text{ k}\Omega,$ $B_W = 10 \text{ Hz to } 15.7 \text{ kHz}$		6.0	dB

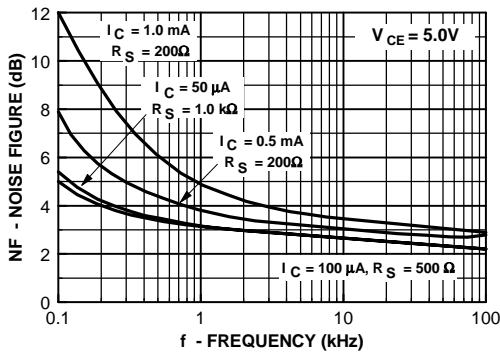
*Pulse Test: Pulse Width $\leq 300 \text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

Typical Characteristics

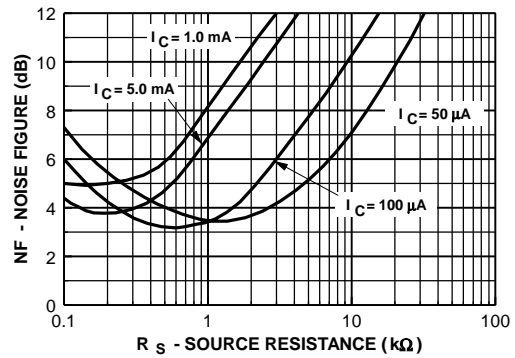


Typical Characteristics (continued)

Noise Figure vs Frequency



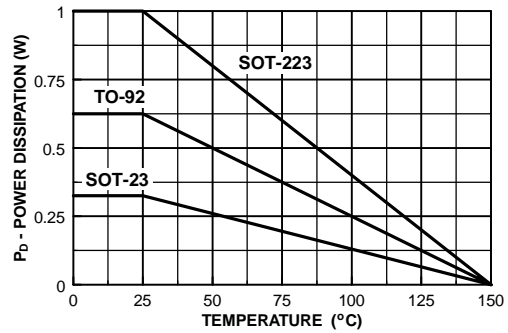
Noise Figure vs Source Resistance



Current Gain and Phase Angle vs Frequency



Power Dissipation vs Ambient Temperature



Turn-On Time vs Collector Current

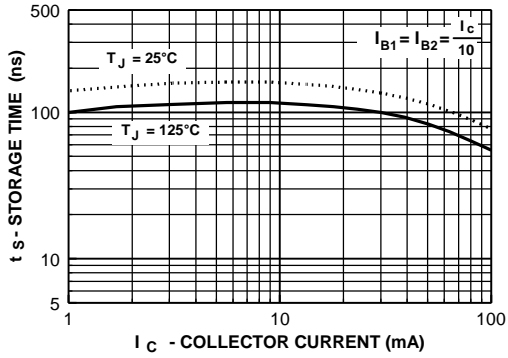


Rise Time vs Collector Current

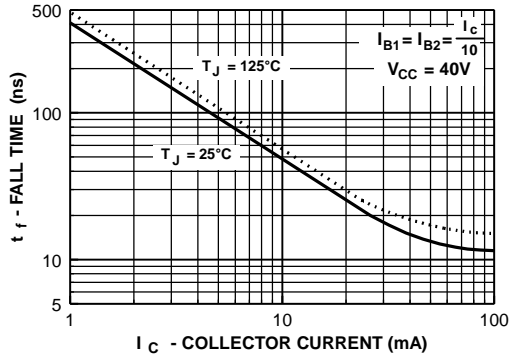


Typical Characteristics (continued)

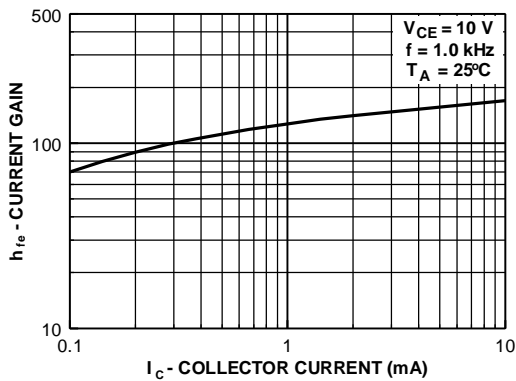
Storage Time vs Collector Current



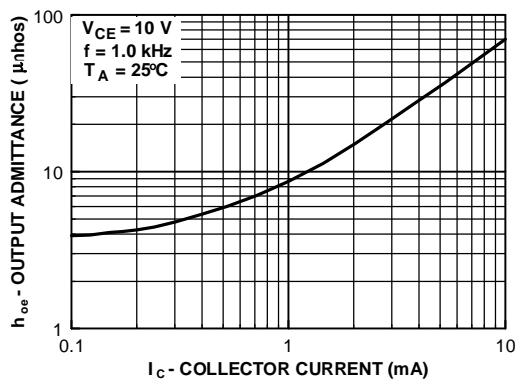
Fall Time vs Collector Current



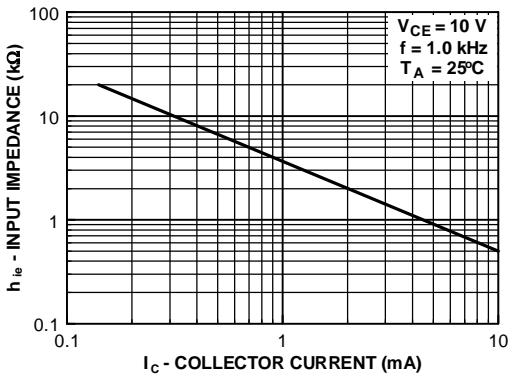
Current Gain



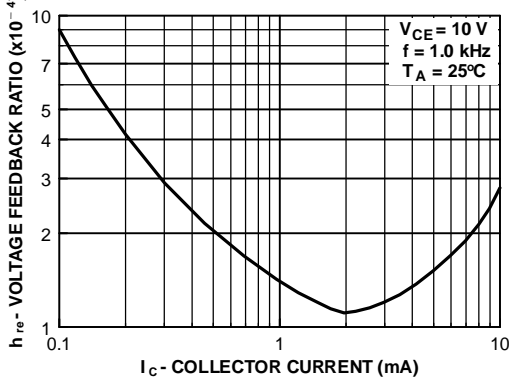
Output Admittance



Input Impedance



Voltage Feedback Ratio



Test Circuits

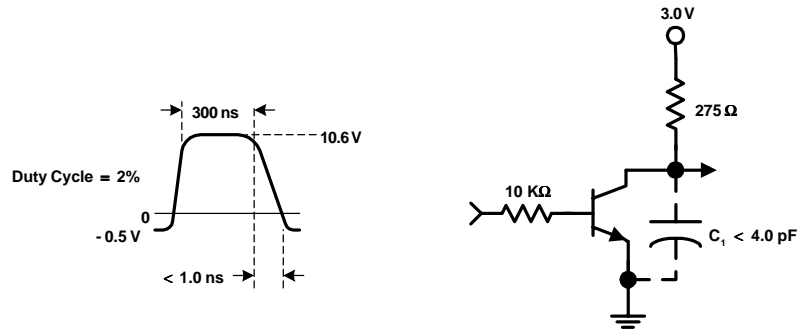


FIGURE 1: Delay and Rise Time Equivalent Test Circuit



FIGURE 2: Storage and Fall Time Equivalent Test Circuit

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2N4123

NPN General Purpose Amplifier

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BUY

Datasheet

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General description



This device is designed for use as general purpose amplifiers and switches requiring collector currents to 100 mA.

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Product status/pricing/packageing

BUY

Product	Product status	Pb-free Status	Pricing*	Package type	Leads	Packing method	Package Marking Convention**
2N4123BU	Full Production	Full Production	\$0.0245	TO-92	3	BULK	Line 1: 2N Line 2: 4123 Line 3: -&3
2N4123TA	Full Production	Full Production	\$0.0245	TO-92	3	AMMO	Line 1: 2N Line 2: 4123 Line 3: -&3
2N4123TAR	Full Production	Full Production	\$0.0245	TO-92	3	AMMO	Line 1: 2N Line 2: 4123 Line 3: -&3
2N4123TF	Full Production		\$0.0245	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 4123 Line 3: -&3

		 Full Production					
2N4123TFR	Full Production	 Full Production	\$0.0245	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 4123 Line 3: -&3

* Fairchild 1,000 piece Budgetary Pricing

** A sample button will appear if the part is available through Fairchild's on-line samples program. If there is no sample button, please contact a [Fairchild distributor](#) to obtain samples



Indicates product with Pb-free second-level interconnect. For more information [click here](#).

Package marking information for product 2N4123 is available. [Click here for more information](#).

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Models

Package & leads	Condition	Temperature range	Software version	Revision date
PSPICE				
TO-92-3	Electrical	25°C	N/A	N/A

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Qualification Support

Click on a product for detailed qualification data

Product
2N4123BU
2N4123TA
2N4123TAR
2N4123TF
2N4123TFR

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