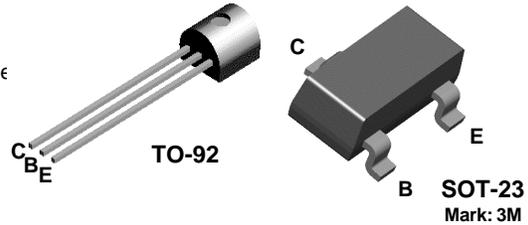


2N5210/MMBT5210

NPN General Purpose Amplifier

This device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1µA to 50 mA.



Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	50	V
V_{CBO}	Collector-Base Voltage	50	V
V_{EBO}	Emitter-Base Voltage	4.5	V
I_C	Collector Current - Continuous	100	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
		2N5210	MMBT5210	
P_D	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	°C/W

NPN General Purpose Amplifier (continued)

2N5210/MMBT5210

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
--------	-----------	-----------------	-----	-----	-------

OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 1.0 \text{ mA}, I_B = 0$	50		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 0.1 \text{ mA}, I_E = 0$	50		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 35 \text{ V}, I_E = 0$		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	$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}^*$	200 250 250	600	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$		0.7	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$		0.85	V

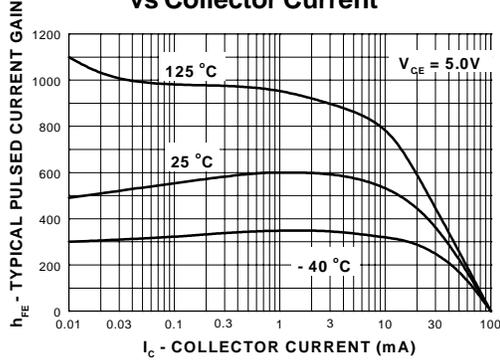
SMALL SIGNAL CHARACTERISTICS

f_T	Current Gain - Bandwidth Product	$I_C = 500 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $f = 20 \text{ MHz}$	30		MHz
C_{cb}	Collector-Base Capacitance	$V_{CB} = 5.0 \text{ V}, I_E = 0, f = 100 \text{ kHz}$		4.0	pF
h_{fe}	Small-Signal Current Gain	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$	250	900	
NF	Noise Figure	$I_C = 20 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $R_S = 22 \text{ k}\Omega, f = 10 \text{ Hz to } 15.7 \text{ kHz}$ $I_C = 20 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $R_S = 10 \text{ k}\Omega, f = 1.0 \text{ kHz}$		2.0 3.0	dB dB

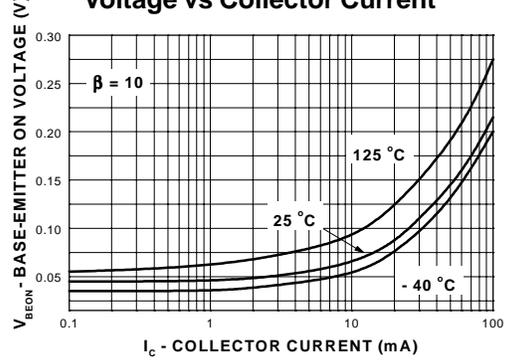
*Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$

Typical Characteristics

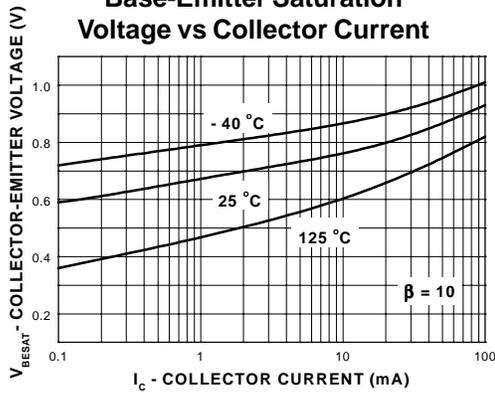
Typical Pulsed Current Gain vs Collector Current



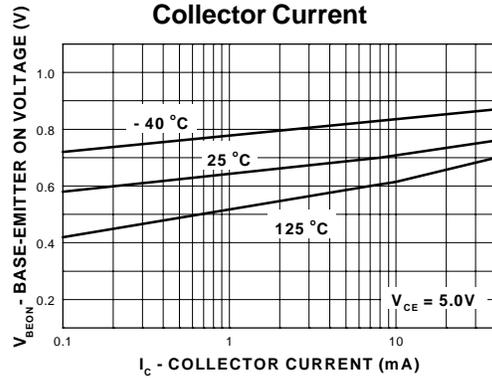
Collector-Emitter Saturation Voltage vs Collector Current



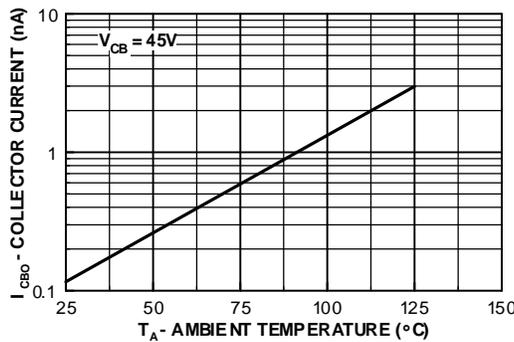
Base-Emitter Saturation Voltage vs Collector Current



Base-Emitter ON Voltage vs Collector Current



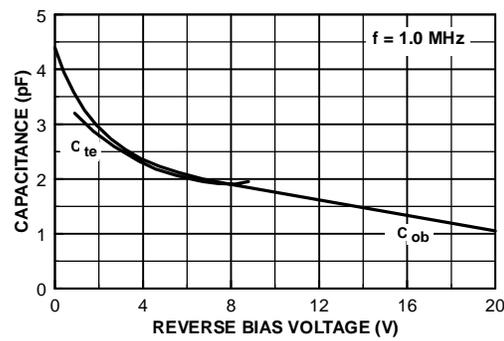
Collector-Cutoff Current vs Ambient Temperature



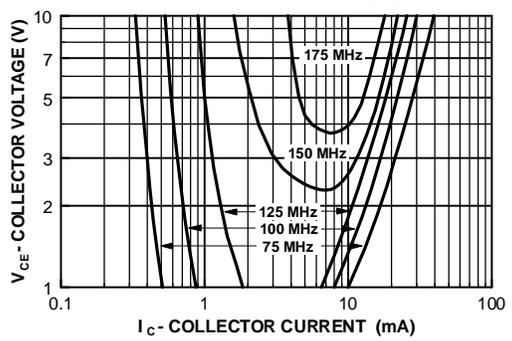
NPN General Purpose Amplifier
(continued)

Typical Characteristics (continued)

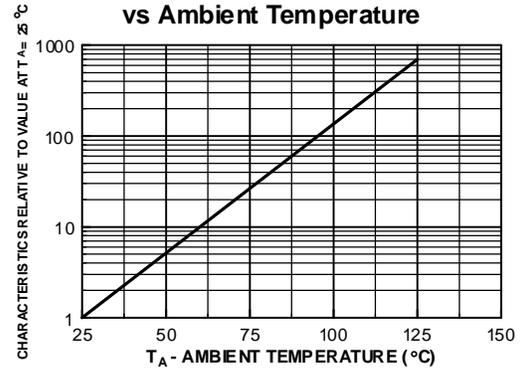
Input and Output Capacitance vs Reverse Bias Voltage



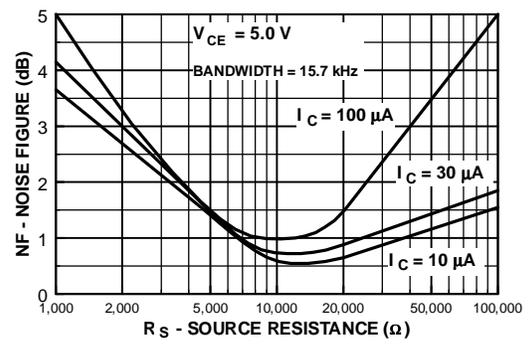
Contours of Constant Gain Bandwidth Product (f_T)



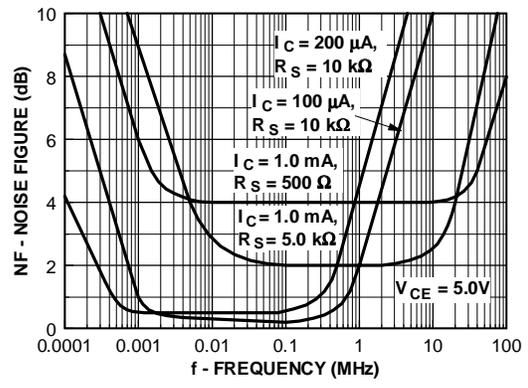
Normalized Collector-Cutoff Current vs Ambient Temperature



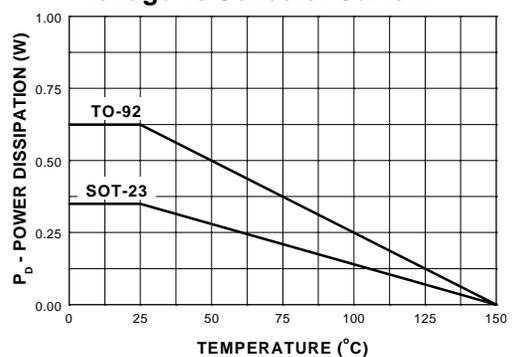
Wideband Noise Frequency vs Source Resistance



Noise Figure vs Frequency

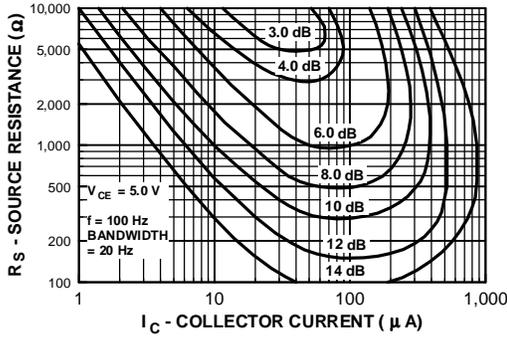


Base-Emitter Saturation Voltage vs Collector Current

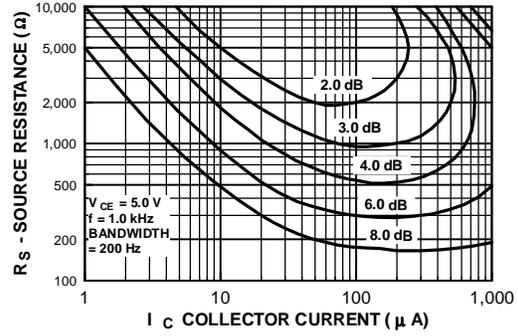


Typical Characteristics (continued)

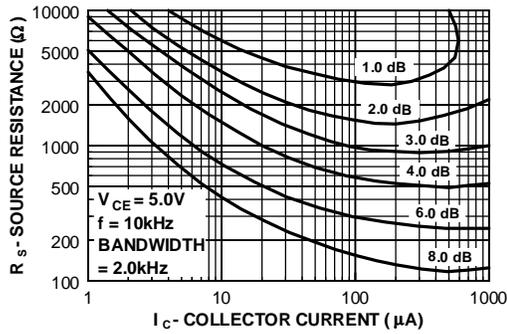
Contours of Constant
Narrow Band Noise Figure



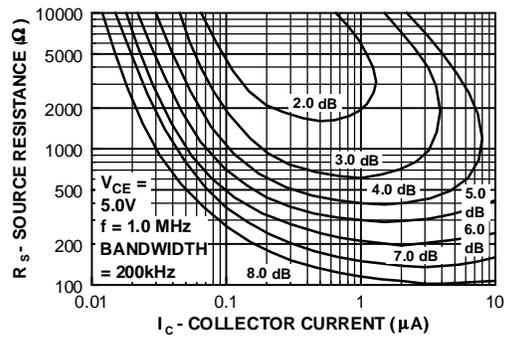
Contours of Constant
Narrow Band Noise Figure



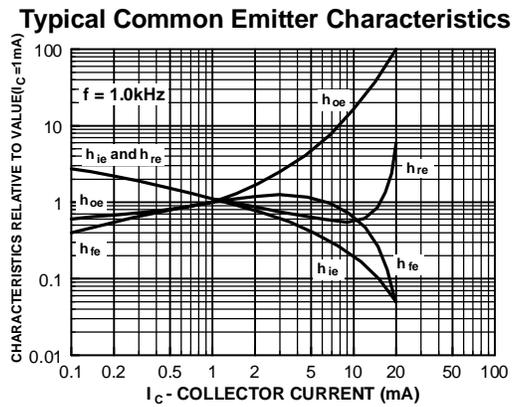
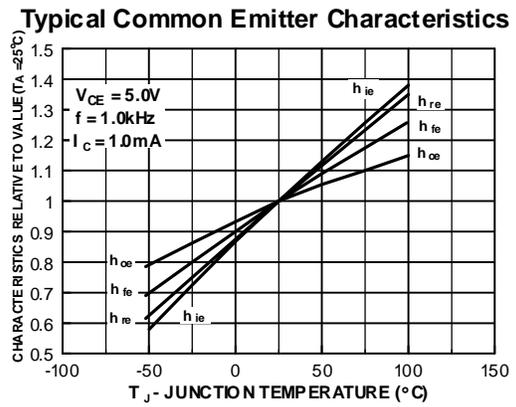
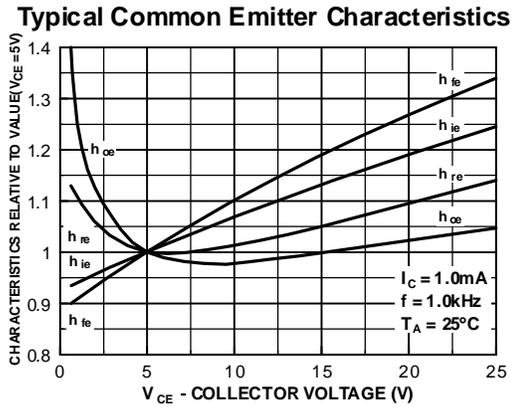
Contours of Constant
Narrow Band Noise Figure



Contours of Constant
Narrow Band Noise Figure



Typical Common Emitter Characteristics (f = 1.0 kHz)



TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACE _x TM	FAST [®]	OPTOLOGIC TM	SMART START TM	VCX TM
Bottomless TM	FAST _r TM	OPTOPLANAR TM	STAR*POWER TM	
CoolFET TM	FRFET TM	PACMAN TM	Stealth TM	
CROSSVOLT TM	GlobalOptoisolator TM	POP TM	SuperSOT TM -3	
DenseTrench TM	GTO TM	Power247 TM	SuperSOT TM -6	
DOMET TM	HiSeC TM	PowerTrench [®]	SuperSOT TM -8	
EcoSPARK TM	ISOPLANAR TM	QFET TM	SyncFET TM	
E ² CMOS TM	LittleFET TM	QST TM	TinyLogic TM	
EnSigna TM	MicroFET TM	QT Optoelectronics TM	TruTranslation TM	
FACT TM	MicroPak TM	Quiet Series TM	UHC TM	
FACT Quiet Series TM	MICROWIRE TM	SILENT SWITCHER [®]	UltraFET [®]	

STAR*POWER is used under license

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

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.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

Home >> Find products >>

2N5210

NPN General Purpose Amplifier

Contents

- [General description](#)
- [Product status/pricing/packageing](#)
- [Order Samples](#)
- [Models](#)
- [Qualification Support](#)

General description

This device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1µA to 50 mA.

[back to top](#)

Product status/pricing/packageing

BUY

Product	Product status	Pb-free Status	Pricing*	Package type	Leads	Packing method	Package Marking Convention**
2N5210BU	Full Production	 Full Production	\$0.0238	TO-92	3	BULK	Line 1: 2N Line 2: 5210 Line 3: -&3
2N5210NMBU	Full Production	 Full Production	\$0.0238	TO-92	3	BULK	N/A
2N5210TA	Full Production	 Full Production	\$0.0238	TO-92	3	AMMO	Line 1: 2N Line 2: 5210 Line 3: -&3
2N5210TAR	Full Production		\$0.0238	TO-92	3	AMMO	Line 1: 2N Line 2: 5210 Line 3: -&3

Related Links

[Request samples](#)

[How to order products](#)

[Product Change Notices \(PCNs\)](#)

[Support](#)

[Sales support](#)

[Quality and reliability](#)

[Design center](#)

BUY

Datasheet

[Download this datasheet](#)



[e-mail this datasheet](#)



This page

[Print version](#)

		 Full Production					
2N5210TF	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 5210 Line 3: -&3
2N5210TFR	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 5210 Line 3: -&3
2N5210_D81Z	Full Production	 Full Production	N/A	TO-92	3	TAPE REEL	Line 1: \$Y (Fairchild logo) & Z (Asm. Plant Code) & 3 (3-Digit Date Code) Line 2: 2N Line 3: 5210
2N5210_J05Z	Full Production	 Full Production	N/A	TO-92	3	BULK	Line 1: \$Y (Fairchild logo) & Z (Asm. Plant Code) & 3 (3-Digit Date Code) Line 2: 2N Line 3: 5210

* 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 2N5210 is available. [Click here for more information](#).

[back to top](#)

Models

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

[back to top](#)

Qualification Support

Click on a product for detailed qualification data



Product
2N5210BU
2N5210NMBU
2N5210TA
2N5210TAR
2N5210TF
2N5210TFR
2N5210_D81Z
2N5210_J05Z

[back to top](#)

© 2007 Fairchild Semiconductor



[Products](#) | [Design Center](#) | [Support](#) | [Company News](#) | [Investors](#) | [My Fairchild](#) | [Contact Us](#) | [Site Index](#) | [Privacy Policy](#) | [Site Terms & Conditions](#) | [Standard Terms & Conditions](#)