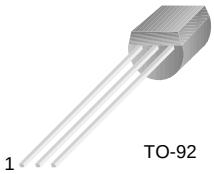
FAIRCHILD
SEMICONDUCTOR®

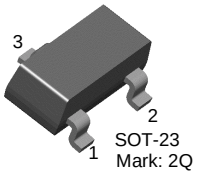
2N5086/2N5087/MMBT5087

PNP General Purpose Amplifier

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



1. Emitter 2. Base 3. Collector



1. Base 2. Emitter 3. Collector

Absolute Maximum Ratings* T_a=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	-3.0	V
I_C	Collector current - Continuous	-100	mA
T_J, T_{stg}	Junction and Storage Temperature	-55 ~ +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.

Electrical Characteristics T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition		Min.	Max.	Units
Off Characteristics						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	I_C = -1.0mA, I_B = 0		-50		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = -100µA, I_E = 0		-50		V
I_{CEO}	Collector Cutoff Current	V_{CB} = -10V, I_E = 0 V_{CB} = -35V, I_E = 0			-10 -50	nA nA
I_{CBO}	Emitter Cutoff Current	V_{EB} = -3.0V, I_C = 0			-50	nA
On Characteristics						
h_{FE}	DC Current Gain	I_C = -100µA, V_{CE} = -5.0V	5086	150	500	
			5087	250	800	
		I_C = -1.0mA, V_{CE} = -5.0V	5086	150		
			5087	250		
		I_C = -10mA, V_{CE} = -5.0V	5086	150		
			5087	250		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = -10mA, I_B = -1.0mA			-0.3	V
$V_{BE(on)}$	Base-Emitter On Voltage	I_C = -1.0mA, V_{CE} = -5.0V			-0.85	V
Small Signal Characteristics						
f_T	Current Gain Bandwidth Product	I_C = -500µA, V_{CE} = -5.0V, f = 20MHz		40		MHz
C_{cb}	Collector-Base Capacitance	V_{CB} = -5.0V, I_E = 0, f = 100KHz			4.0	pF
h_{fe}	Small-Signal Current Gain	I_C = -1.0mA, V_{CE} = -5.0V,	5086	150	600	
		f = 1.0KHz	5087	250	900	
NF	Noise Figure	I_C = -100µA, V_{CE} = -5.0V	5086		3.0	dB
		R_S = 3.0kΩ, f = 1.0KHz	5087		2.0	dB
		I_C = -20µA, V_{CE} = -5.0V	5086		3.0	dB
		R_S = 10kΩ	5087		2.0	dB
		f = 10Hz to 15.7KHz				

* Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2.0%

Thermal Characteristics T_a=25°C unless otherwise noted

Symbol	Parameter	Max.		Units
		2N5086 2N5087	*MMBT5087	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	mW 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

* Device mounted on FR-4 PCB 1.6" × 1.6" × 0.06."

Typical Characteristics

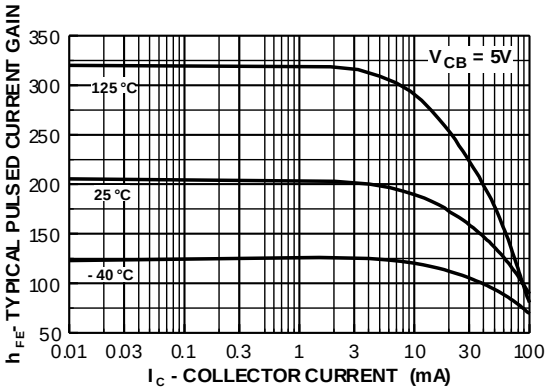


Figure 1. Typical Pulsed Current Gain vs Collector Current

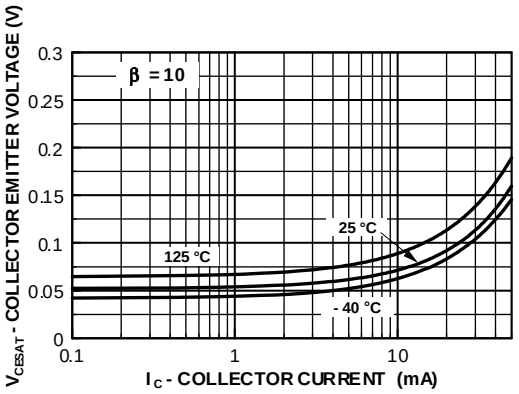


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

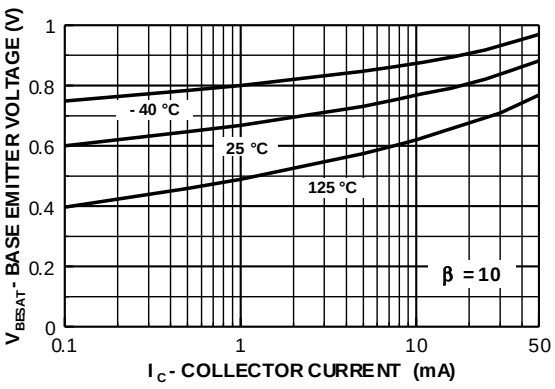


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

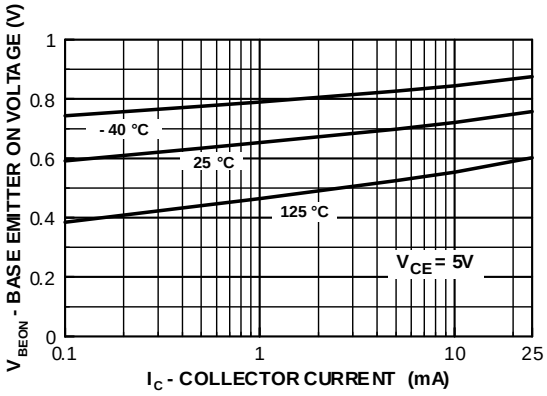


Figure 4. Base-Emitter On Voltage vs Collector Current

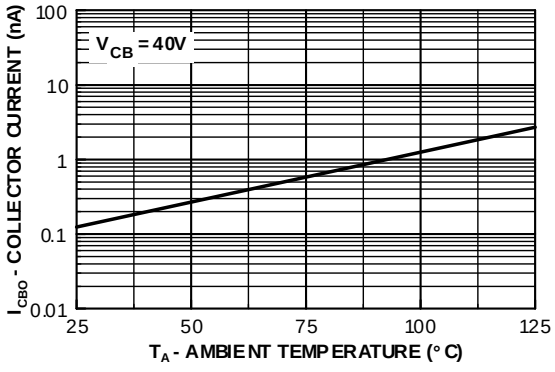


Figure 5. Collector Cutoff Current vs Ambient Temperature

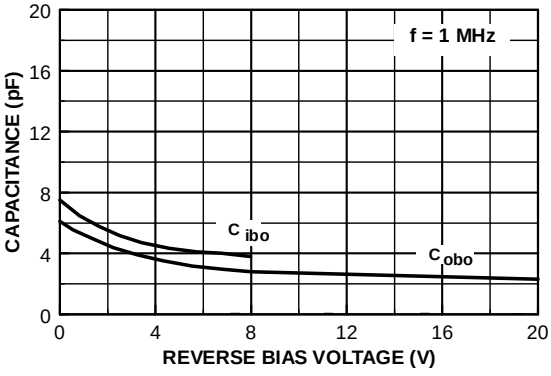


Figure 6. Input and Output Capacitance vs Reverse Voltag

Typical Characteristics(Continue)

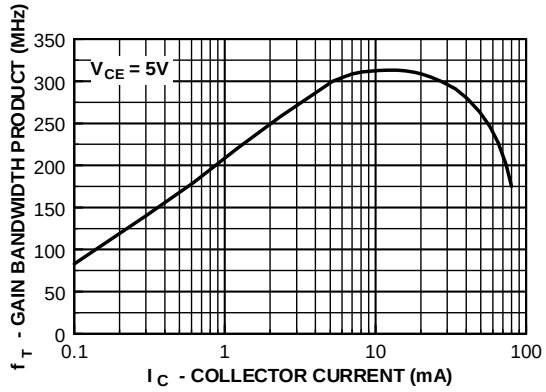


Figure 7. Gain Bandwidth Product vs Collector Current

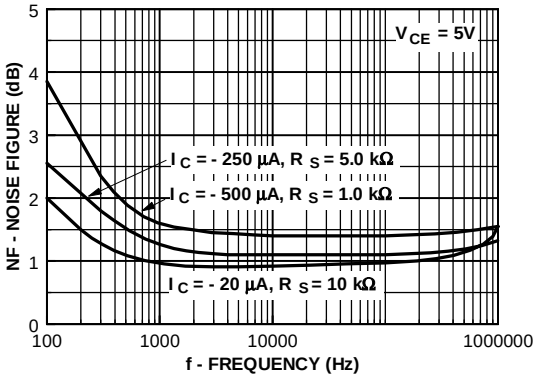


Figure 8. Noise Figure vs Frequency

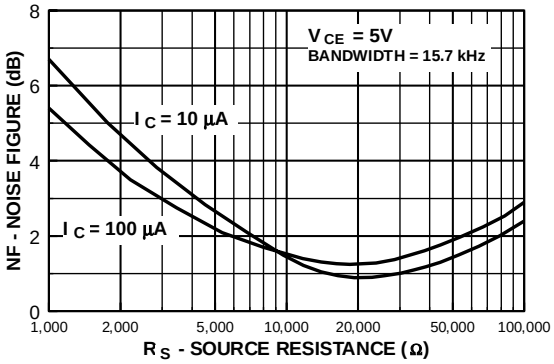


Figure 9. Wideband Noise Frequency vs Source Resistance

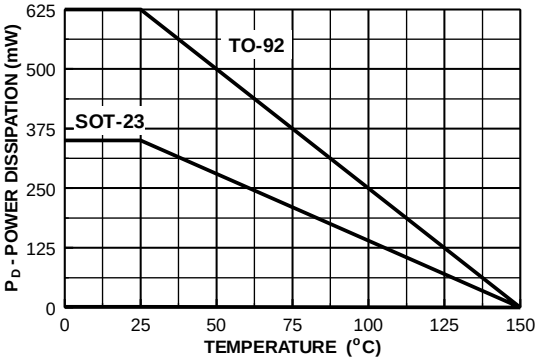


Figure 10. Power Dissipation vs Ambient Temperature

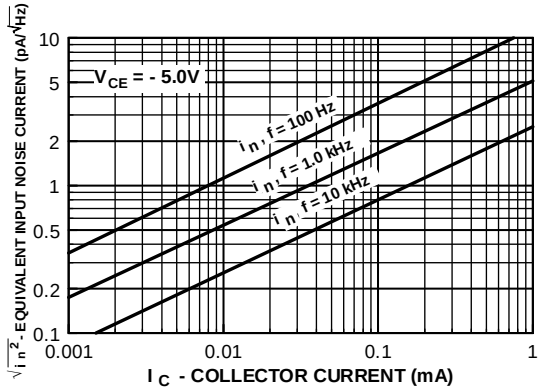


Figure 11. Equivalent Input Noise Current vs Collector Current

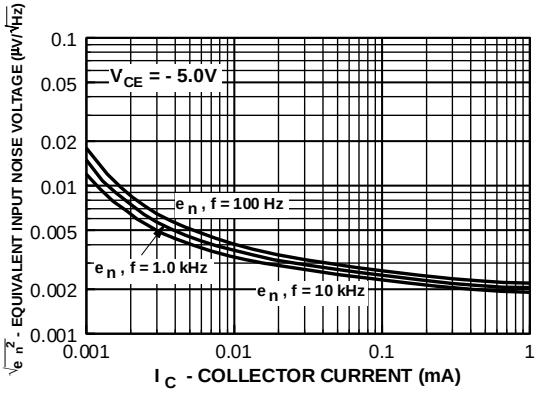


Figure 12. Equivalent Input Noise Voltage vs Collector Current

Typical Characteristics (Continuce)

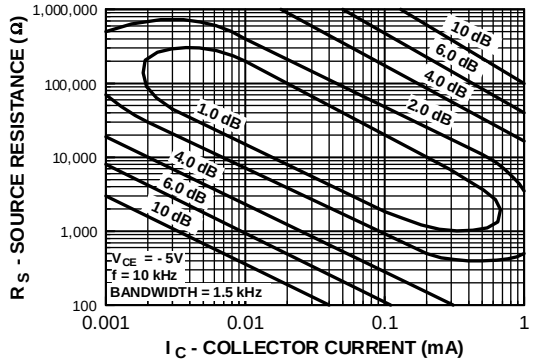


Figure 13. Contours of Constanct Narrow Band Noise Figure

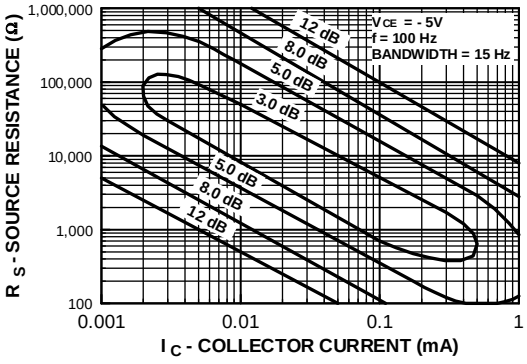


Figure 14. Contours of Constanct Narrow Band Noise Figure

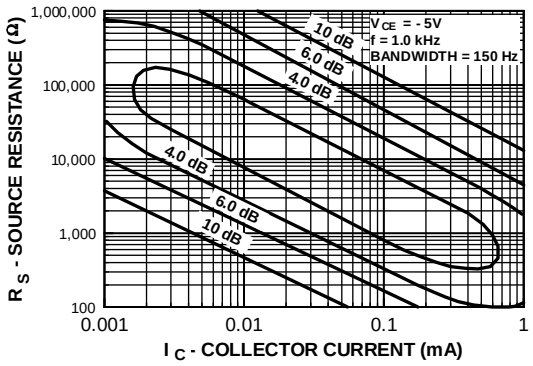


Figure 15. BContours of Constant Narrow Band Noise Figure

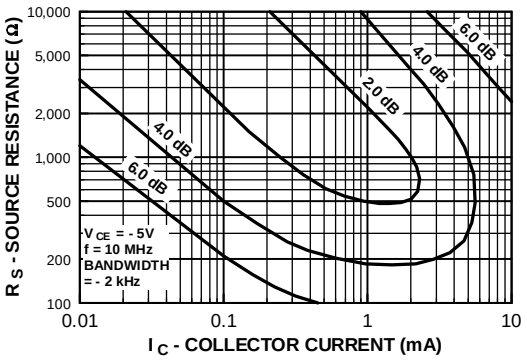
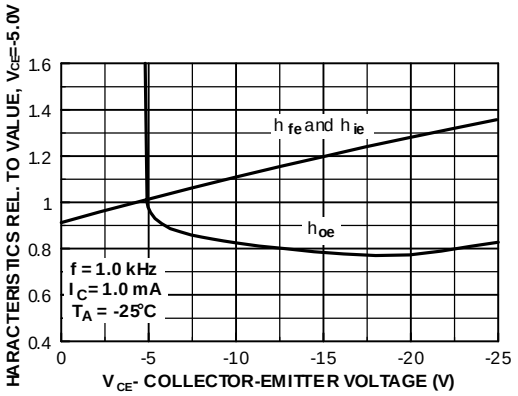
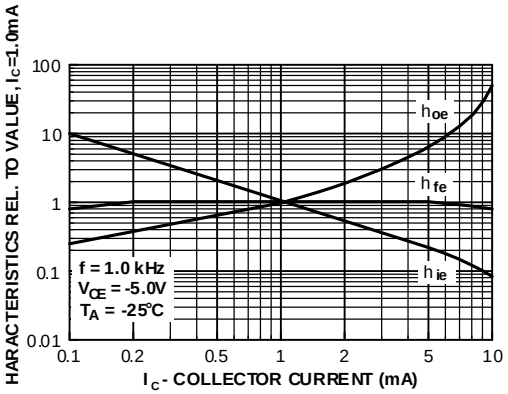


Figure 16. Contours of Constant Narrow Band Noisd Figure

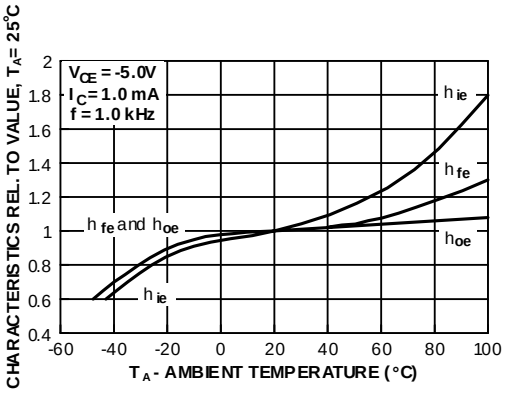
Typical Common Emitter Characteristics (f = 1.0KHz)



Typical Common Emitter Characteristics



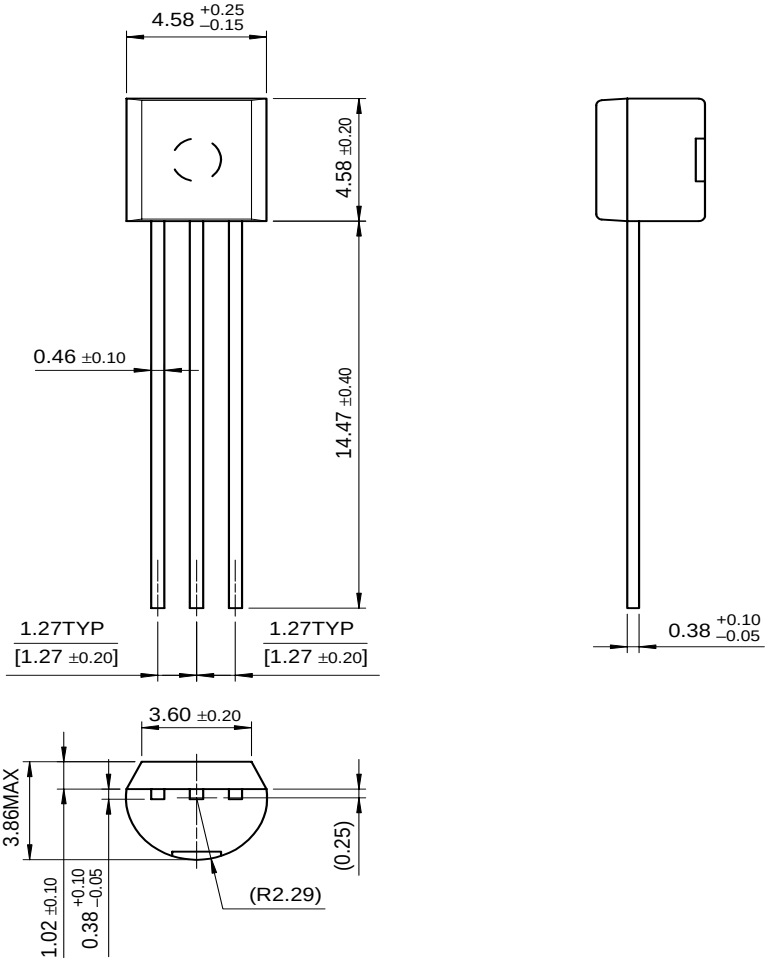
Typical Common Emitter Characteristics



Typical Common Emitter Characteristics

Package Dimensions

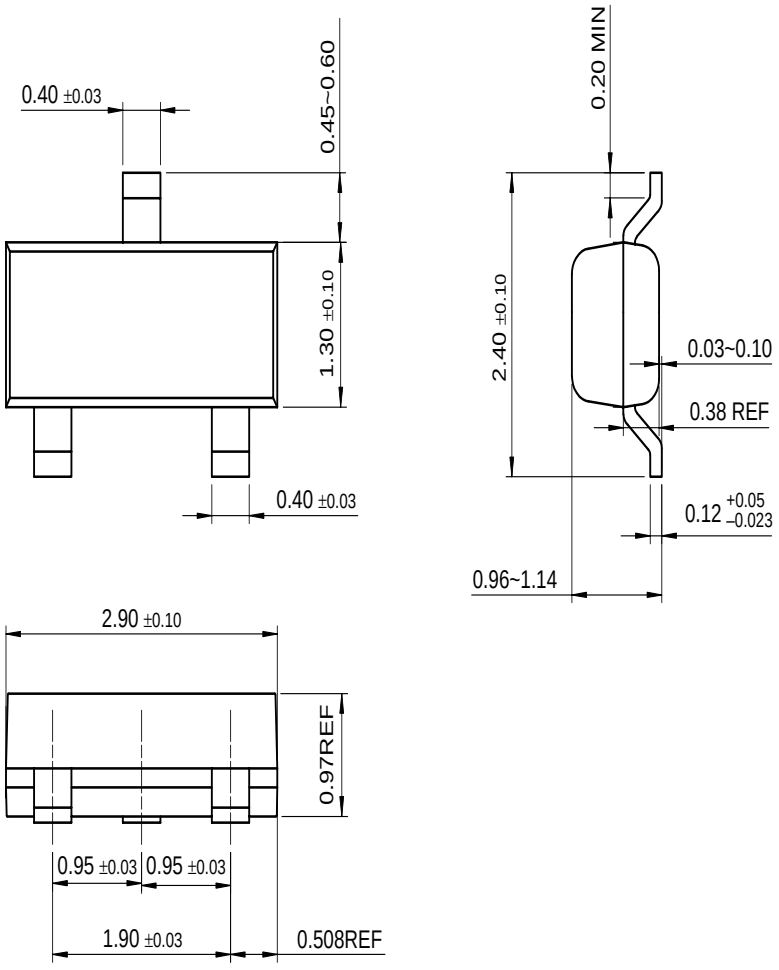
TO-92



Dimensions in Millimeters

Package Dimensions (Continued)

SOT-23



Dimensions in Millimeters

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.

ACEx™
ActiveArray™
Bottomless™
CoolFET™
CROSSVOLT™
DOME™
EcoSPARK™
E^2CMOS™
EnSigna™
FACT™
FACT Quiet Series™
FAST®
FASTr™
FRFET™
GlobalOptoisolator™
GTO™
HiSeC™
I^2C™
ImpliedDisconnect™
ISOPLANAR™
LittleFET™
MICROCOUPLER™
MicroFET™
MicroPak™
MICROWIRE™
MSX™
MSXPro™
OCX™
OCXPro™
OPTOLOGIC®
OPTOPLANAR™
PACMAN™
POP™
Power247™
PowerTrench®
QFET®
QS™
QT Optoelectronics™
Quiet Series™
RapidConfigure™
RapidConnect™
SILENT SWITCHER®
SMART START™
SPM™
Stealth™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SyncFET™
TinyLogic®
TINYOPTO™
TruTranslation™
UHC™
UltraFET®
VCX™
Across the board. Around the world.™
The Power Franchise™
Programmable Active Droop™

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.

2N5086

PNP General Purpose Amplifier

Contents

BUY

Datasheet

Download this datasheet

e-mail this datasheet

This page

Print version

Related Links

- Request samples
- How to order products
- Product Change Notices (PCNs)
- Support
- Sales support
- Quality and reliability
- Design center

General description

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

back to top

Product status/pricing/packaging

BUY

Product	Product status	Pb-free Status	Pricing*	Package type	Leads	Packing method	Package Marking Convention**
2N5086BU	Full Production	Full Production	$0.025	TO-92	3	BULK	Line 1: 2N Line 2: 5086 Line 3: -&3
2N5086TA	Full Production	Full Production	$0.025	TO-92	3	AMMO	Line 1: 2N Line 2: 5086 Line 3: -&3
2N5086TAR	Full Production	Full Production	$0.025	TO-92	3	AMMO	Line 1: 2N Line 2: 5086 Line 3: -&3
2N5086TF	Full Production		$0.025	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 5086 Line 3: -&3

		Full Production					
2N5086TFR	Full Production	Full Production	$0.025	TO-92	3	TAPE REEL	Line 1: 2N Line 2: 5086 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 2N5086 is available. Click here for more information .

back to top

Models

Package & leads	Condition	Temperature range	Vcc range	Software version	Revision date
PSPICE					
TO-92-3	Electrical/Thermal	-55°C to 150°C	0V to -50V	9.2	Jan 3, 2003

back to top

Qualification Support

Click on a product for detailed qualification data

Product
2N5086BU
2N5086TA
2N5086TAR
2N5086TF
2N5086TFR

back to top