

Distributed by:



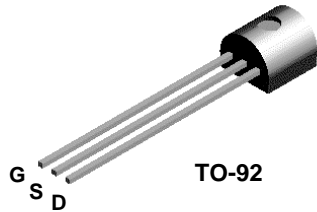
[www.Jameco.com](http://www.Jameco.com) ♦ 1-800-831-4242

The content and copyrights of the attached material are the property of its owner.

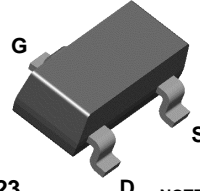


**2N5460**  
**2N5461**  
**2N5462**

**MMBF5460**  
**MMBF5461**  
**MMBF5462**



TO-92



SOT-23

Mark: 6E / 61U / 61V

NOTE: Source & Drain are interchangeable

### P-Channel General Purpose Amplifier

This device is designed primarily for low level audio and general purpose applications with high impedance signal sources. Sourced from Process 89.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>DG</sub>	Drain-Gate Voltage	- 40	V
V <sub>GS</sub>	Gate-Source Voltage	40	V
I <sub>GF</sub>	Forward Gate Current	10	mA
T <sub>J</sub> , T <sub>stg</sub>	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
		2N5460-5462	*MMBF5460-5462	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	350	225	mW
		2.8	1.8	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	125		°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	357	556	°C/W

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

2N5460 / 5461 / 5462 / MMBF5460 / MMBF5461 / MMBF5462

## P-Channel General Purpose Amplifier

(continued)

### Electrical Characteristics

TA = 25°C unless otherwise noted

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

#### OFF CHARACTERISTICS

$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = 10 \mu A, V_{DS} = 0$	40			V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = 20 V, V_{DS} = 0$			5.0	nA
		$V_{GS} = 20 V, V_{DS} = 0, T_A = 100^\circ C$			1.0	$\mu A$
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15 V, I_D = 1.0 \mu A$	<b>5460</b>	0.75	6.0	V
			<b>5461</b>	1.0	7.5	V
			<b>5462</b>	1.8	9.0	V
$V_{GS}$	Gate-Source Voltage	$V_{DS} = 15 V, I_D = 0.1 mA$	<b>5460</b>	0.5	4.0	V
			<b>5461</b>	0.8	4.5	V
			<b>5462</b>	1.5	6.0	V

#### ON CHARACTERISTICS

$I_{DSS}$	Zero-Gate Voltage Drain Current*	$V_{DS} = 15 V, V_{GS} = 0$	<b>5460</b>	- 1.0	- 5.0	mA
			<b>5461</b>	- 2.0	- 9.0	mA
			<b>5462</b>	- 4.0	- 16	mA

#### SMALL SIGNAL CHARACTERISTICS

$g_{fs}$	Forward Transfer Conductance	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$				
		<b>5460</b>	1000		4000	$\mu mhos$
		<b>5461</b>	1500		5000	$\mu mhos$
		<b>5462</b>	2000		6000	$\mu mhos$
$g_{os}$	Output Conductance	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$			75	$\mu mhos$
$C_{iss}$	Input Capacitance	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz$		5.0	7.0	pF
$C_{rss}$	Reverse Transfer Capacitance	$V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz$		1.0	2.0	pF
NF	Noise Figure	$V_{DS} = 15 V, V_{GS} = 0,$ $R_G = 1.0 megohm, f = 100 Hz,$ $BW = 1.0 Hz$		1.0	2.5	dB
$e_n$	Equivalent Short-Circuit Input Noise Voltage	$V_{DS} = 15 V, V_{GS} = 0, f = 100 Hz,$ $BW = 1.0 Hz$		60	115	$nV/\sqrt{Hz}$

\*Pulse Test: Pulse Width  $\leq 300 ms$ , Duty Cycle  $\leq 2\%$

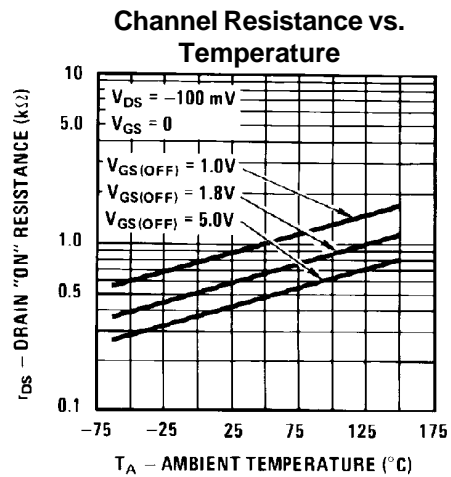
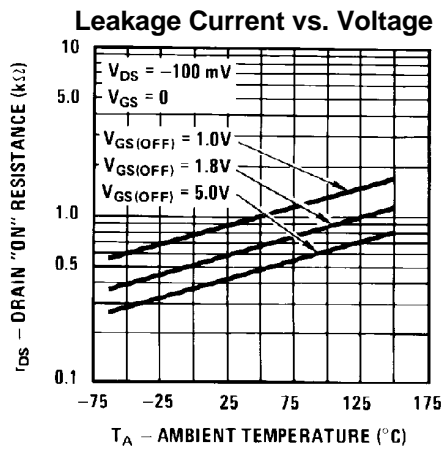
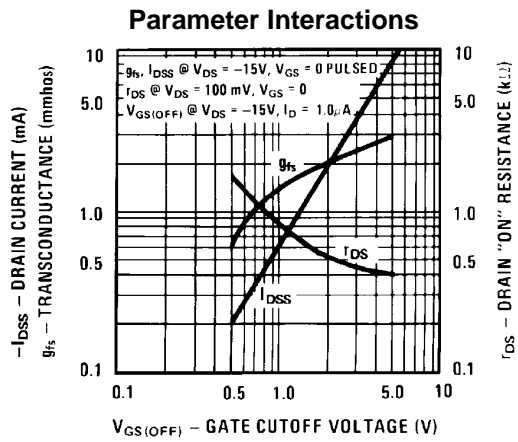
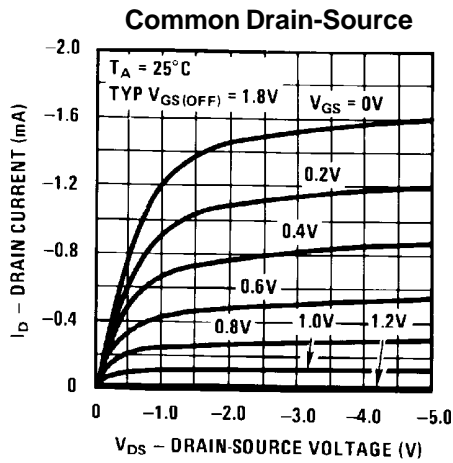
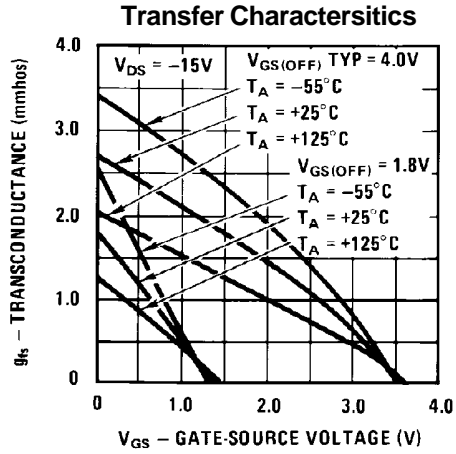
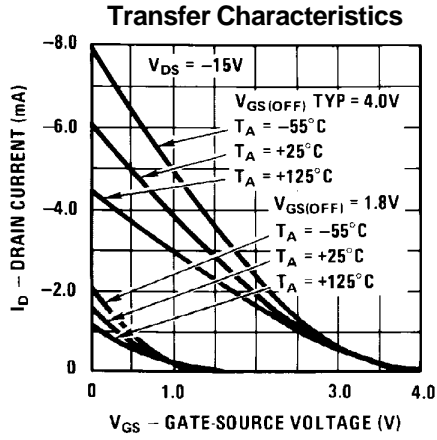
2N5460 / 5461 / 5462 / MMBF5460 / MMBF5461 / MMBF5462

# P-Channel General Purpose Amplifier

(continued)

2N5460 / 5461 / 5462 / MMBF5460 / MMBF5461 / MMBF5462

## Typical Characteristics (continued)



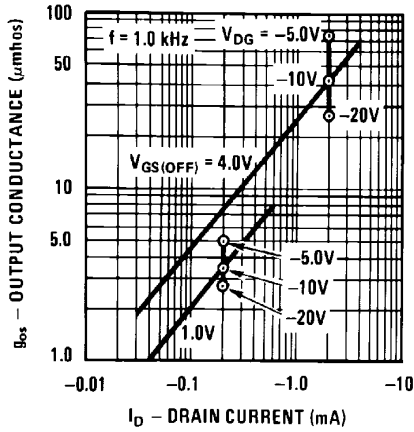
# P-Channel General Purpose Amplifier

(continued)

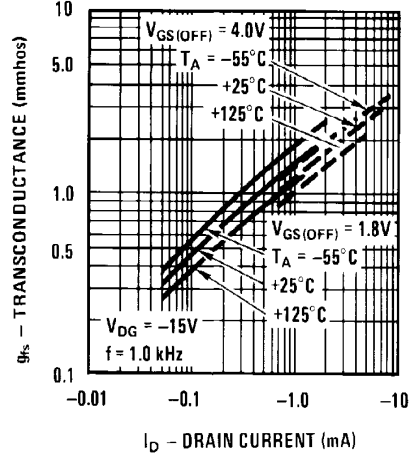
2N5460 / 5461 / 5462 / MMBF5460 / MMBF5461 / MMBF5462

## Typical Characteristics (continued)

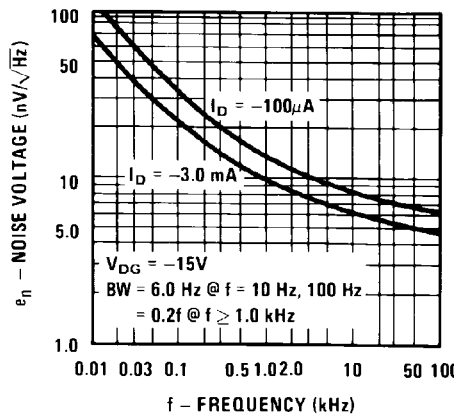
### Output Conductance vs. Drain Current



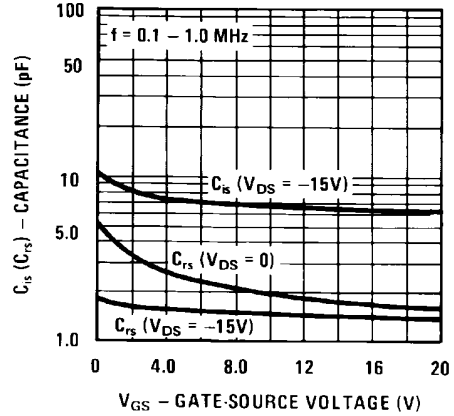
### Transconductance vs. Drain Current



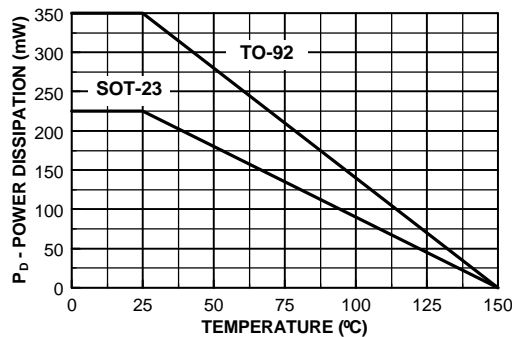
### Noise Voltage vs. Frequency



### Capacitance vs. Voltage



### Power Dissipation vs. Ambient Temperature



## 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 <sub>x</sub> <sup>TM</sup>	FAST <sup>®</sup>	OPTOPLANAR <sup>TM</sup>	SuperSOT <sup>TM</sup> -3
Bottomless <sup>TM</sup>	FAST <sub>r</sub> <sup>TM</sup>	PACMAN <sup>TM</sup>	SuperSOT <sup>TM</sup> -6
CoolFET <sup>TM</sup>	FRFET <sup>TM</sup>	POP <sup>TM</sup>	SuperSOT <sup>TM</sup> -8
CROSSVOLT <sup>TM</sup>	GlobalOptoisolator <sup>TM</sup>	PowerTrench <sup>®</sup>	SyncFET <sup>TM</sup>
DenseTrench <sup>TM</sup>	GTO <sup>TM</sup>	QFET <sup>TM</sup>	TinyLogic <sup>TM</sup>
DOMET <sup>TM</sup>	HiSeC <sup>TM</sup>	QS <sup>TM</sup>	UHC <sup>TM</sup>
EcoSPARK <sup>TM</sup>	ISOPLANAR <sup>TM</sup>	QT Optoelectronics <sup>TM</sup>	UltraFET <sup>®</sup>
E <sup>2</sup> CMOS <sup>TM</sup>	LittleFET <sup>TM</sup>	Quiet Series <sup>TM</sup>	VCX <sup>TM</sup>
EnSigna <sup>TM</sup>	MicroFET <sup>TM</sup>	SILENT SWITCHER <sup>®</sup>	
FACT <sup>TM</sup>	MICROWIRE <sup>TM</sup>	SMART START <sup>TM</sup>	
FACT Quiet Series <sup>TM</sup>	OPTOLOGIC <sup>TM</sup>	Stealth <sup>TM</sup>	

## 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.