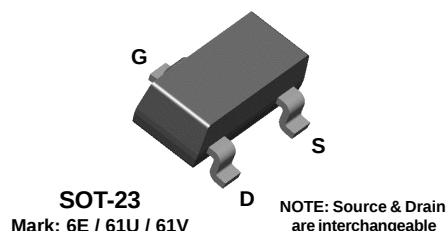
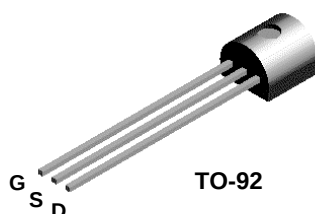


**2N5460**  
**2N5461**  
**2N5462**

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



## 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<br>Derate above 25°C | 350<br>2.8  | 225<br>1.8     | mW<br>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 <sub>(BR)GSS</sub> | Gate-Source Breakdown Voltage | I <sub>G</sub> = 10 µA, V <sub>DS</sub> = 0                         | 40   |  |     | V  |
| I <sub>GSS</sub>     | Gate Reverse Current          | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0                         |      |  | 5.0 | nA |
|                      |                               | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0, T <sub>A</sub> = 100°C |      |  | 1.0 | µA |
| V <sub>GS(off)</sub> | Gate-Source Cutoff Voltage    | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 1.0 µA                     | 0.75 |  | 6.0 | V  |
|                      |                               | <b>5460</b>                                                         | 1.0  |  | 7.5 | V  |
|                      |                               | <b>5461</b>                                                         | 1.8  |  | 9.0 | V  |
|                      |                               | <b>5462</b>                                                         |      |  |     |    |
| V <sub>GS</sub>      | Gate-Source Voltage           | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 0.1 mA                     | 0.5  |  | 4.0 | V  |
|                      |                               | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 0.2 mA                     | 0.8  |  | 4.5 | V  |
|                      |                               | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 0.4 mA                     | 1.5  |  | 6.0 | V  |

### ON CHARACTERISTICS

|                  |                                  |                                             |                                           |                         |                        |                |
|------------------|----------------------------------|---------------------------------------------|-------------------------------------------|-------------------------|------------------------|----------------|
| I <sub>DSS</sub> | Zero-Gate Voltage Drain Current* | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 | <b>5460</b><br><b>5461</b><br><b>5462</b> | - 1.0<br>- 2.0<br>- 4.0 | - 5.0<br>- 9.0<br>- 16 | mA<br>mA<br>mA |
|------------------|----------------------------------|---------------------------------------------|-------------------------------------------|-------------------------|------------------------|----------------|

### SMALL SIGNAL CHARACTERISTICS

|                  |                                              |                                                                                                         |                                           |                      |                      |                         |
|------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------|----------------------|-------------------------|
| g <sub>fs</sub>  | Forward Transfer Conductance                 | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0, f = 1.0 kHz                                                | <b>5460</b><br><b>5461</b><br><b>5462</b> | 1000<br>1500<br>2000 | 4000<br>5000<br>6000 | µmhos<br>µmhos<br>µmhos |
| g <sub>os</sub>  | Output Conductance                           | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0, f = 1.0 kHz                                                |                                           |                      | 75                   | µmhos                   |
| C <sub>iss</sub> | Input Capacitance                            | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0, f = 1.0 MHz                                                |                                           | 5.0                  | 7.0                  | pF                      |
| C <sub>rss</sub> | Reverse Transfer Capacitance                 | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0, f = 1.0 MHz                                                |                                           | 1.0                  | 2.0                  | pF                      |
| NF               | Noise Figure                                 | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0,<br>R <sub>G</sub> = 1.0 megohm, f = 100 Hz,<br>BW = 1.0 Hz |                                           | 1.0                  | 2.5                  | dB                      |
| e <sub>n</sub>   | Equivalent Short-Circuit Input Noise Voltage | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0, f = 100 Hz,<br>BW = 1.0 Hz                                 |                                           | 60                   | 115                  | nV/√Hz                  |

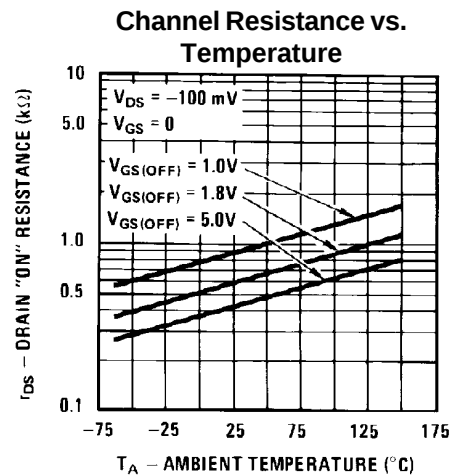
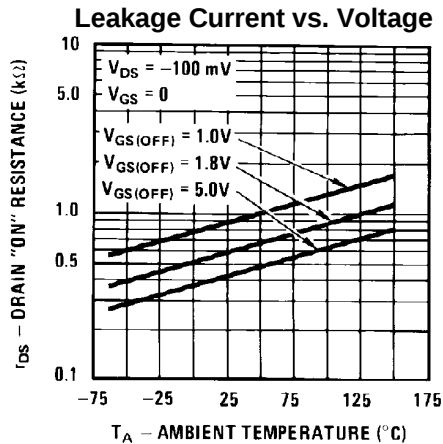
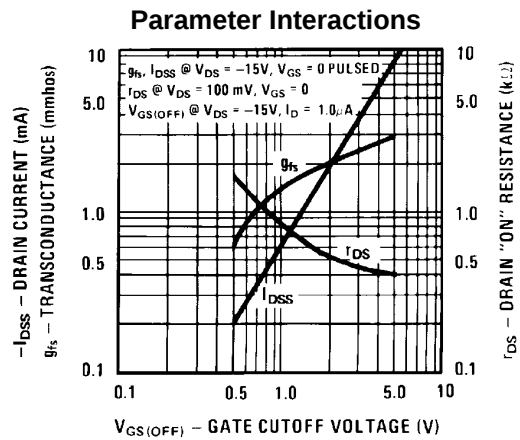
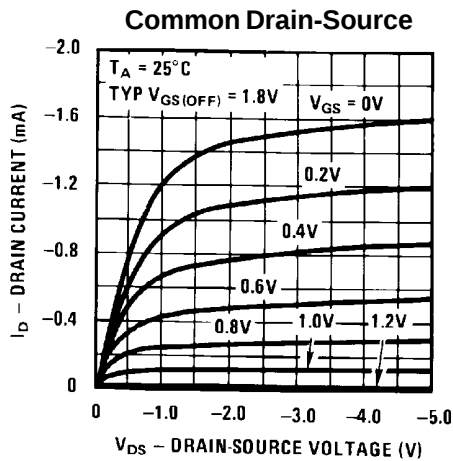
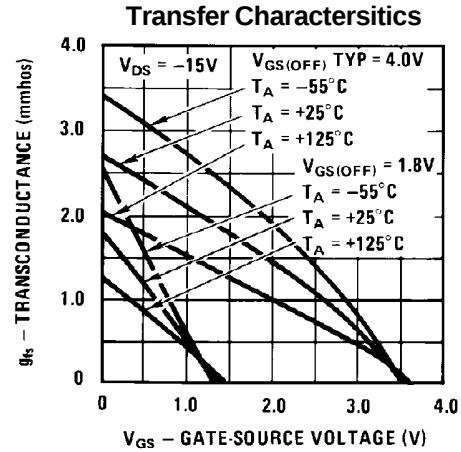
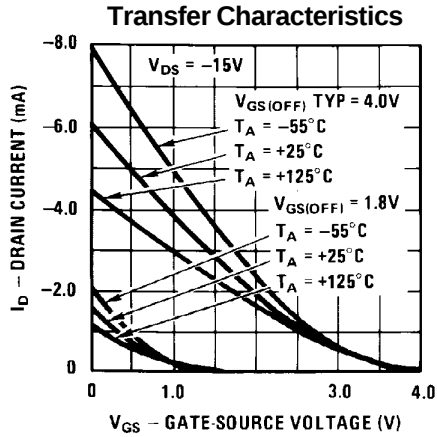
\*Pulse Test: Pulse Width ≤ 300 ms, Duty Cycle ≤ 2%

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

# P-Channel General Purpose Amplifier

(continued)

## Typical Characteristics (continued)

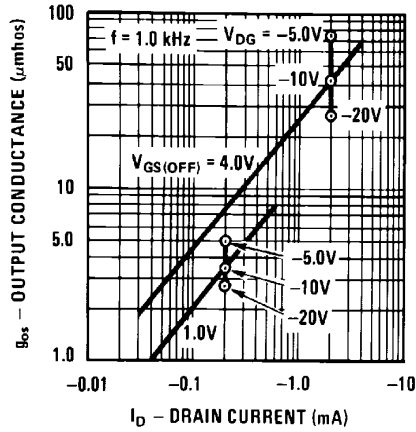


2N5460 / 5461 / 5462 / MMBF5460 / MMBF5461 / MMBF5462

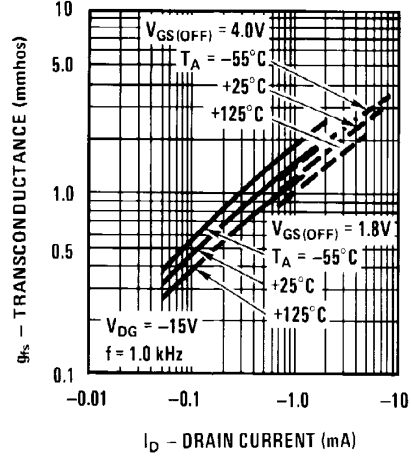
# P-Channel General Purpose Amplifier (continued)

## Typical Characteristics (continued)

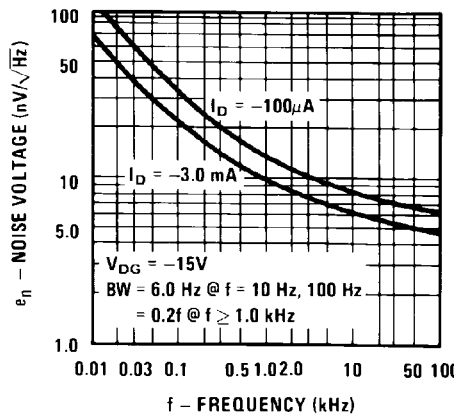
Output Conductance vs.  
Drain Current



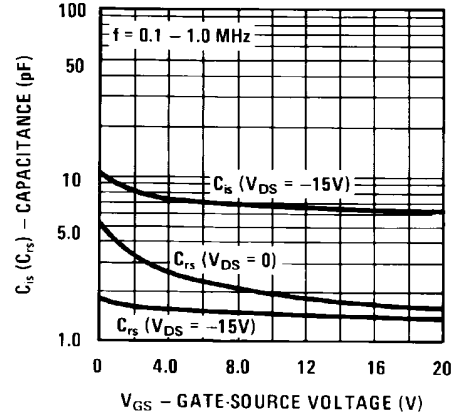
Transconductance vs.  
Drain Current



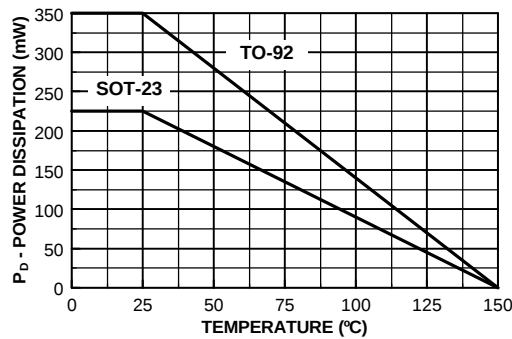
Noise Voltage vs. Frequency



Capacitance vs. Voltage



Power Dissipation vs.  
Ambient Temperature



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

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