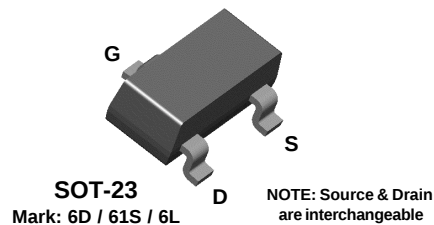
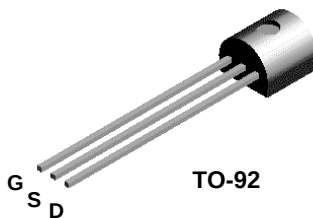


**2N5457**  
**2N5458**  
**2N5459**

**MMBF5457**  
**MMBF5458**  
**MMBF5459**



## N-Channel General Purpose Amplifier

This device is a low level audio amplifier and switching transistors, and can be used for analog switching applications. Sourced from Process 55.

### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

| Symbol                            | Parameter                                        | Value       | Units |
|-----------------------------------|--------------------------------------------------|-------------|-------|
| V <sub>DG</sub>                   | Drain-Gate Voltage                               | 25          | V     |
| V <sub>GS</sub>                   | Gate-Source Voltage                              | - 25        | 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       |
|------------------|-----------------------------------------------|-------------|----------------|-------------|
|                  |                                               | 2N5457-5459 | *MMBF5457-5459 |             |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 625<br>5.0  | 350<br>2.8     | 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."

2N5457 / 5458 / 5459 / MMBF5457 / 5458 / 5459

## N-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 | $I_G = 10 \mu A, V_{DS} = 0$                    | - 25  |       |       | V  |
| $I_{GSS}$     | Gate Reverse Current          | $V_{GS} = -15 V, V_{DS} = 0$                    |       |       | - 1.0 | nA |
|               |                               | $V_{GS} = -15 V, V_{DS} = 0, T_A = 100^\circ C$ |       |       | - 200 | nA |
| $V_{GS(off)}$ | Gate-Source Cutoff Voltage    | $V_{DS} = 15 V, I_D = 10 nA$                    | - 0.5 |       | - 6.0 | V  |
|               |                               | 5457                                            | - 1.0 |       | - 7.0 | V  |
|               |                               | 5458                                            | - 2.0 |       | - 8.0 | V  |
|               |                               | 5459                                            |       |       |       |    |
| $V_{GS}$      | Gate-Source Voltage           | $V_{DS} = 15 V, I_D = 100 \mu A$                |       | - 2.5 |       | V  |
|               |                               | $V_{DS} = 15 V, I_D = 200 \mu A$                |       | - 3.5 |       | V  |
|               |                               | $V_{DS} = 15 V, I_D = 400 \mu A$                |       | - 4.5 |       | V  |
|               |                               | 5457                                            |       |       |       |    |
|               |                               | 5458                                            |       |       |       |    |
|               |                               | 5459                                            |       |       |       |    |

## ON CHARACTERISTICS

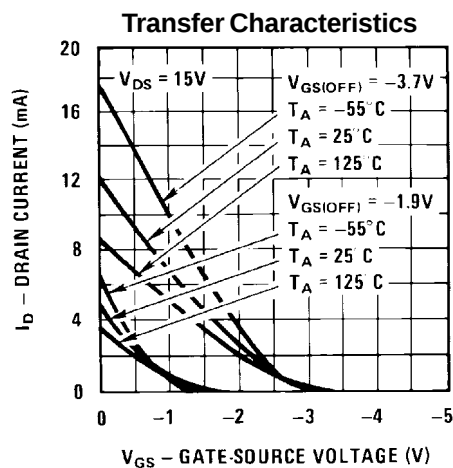
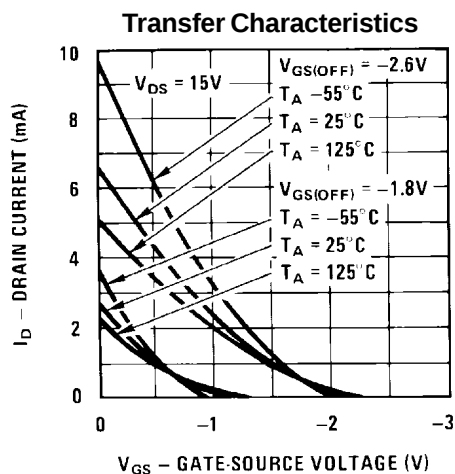
|           |                                  |                             |                      |                   |                   |                  |                |
|-----------|----------------------------------|-----------------------------|----------------------|-------------------|-------------------|------------------|----------------|
| $I_{DSS}$ | Zero-Gate Voltage Drain Current* | $V_{DS} = 15 V, V_{GS} = 0$ | 5457<br>5458<br>5459 | 1.0<br>2.0<br>4.0 | 3.0<br>6.0<br>9.0 | 5.0<br>9.0<br>16 | mA<br>mA<br>mA |
|-----------|----------------------------------|-----------------------------|----------------------|-------------------|-------------------|------------------|----------------|

## SMALL SIGNAL CHARACTERISTICS

|           |                               |                                                                              |                      |                      |                      |                                        |
|-----------|-------------------------------|------------------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------------------------|
| $g_{fs}$  | Forward Transfer Conductance* | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$                                     | 5457<br>5458<br>5459 | 1000<br>1500<br>2000 | 5000<br>5500<br>6000 | $\mu mhos$<br>$\mu mhos$<br>$\mu mhos$ |
| $g_{os}$  | Output Conductance*           | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$                                     |                      | 10                   | 50                   | $\mu mhos$                             |
| $C_{iss}$ | Input Capacitance             | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz$                                     |                      | 4.5                  | 7.0                  | pF                                     |
| $C_{rss}$ | Reverse Transfer Capacitance  | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 MHz$                                     |                      | 1.5                  | 3.0                  | pF                                     |
| NF        | Noise Figure                  | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz,$<br>$R_G = 1.0 megohm, BW = 1.0 Hz$ |                      |                      | 3.0                  | dB                                     |

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

## Typical Characteristics

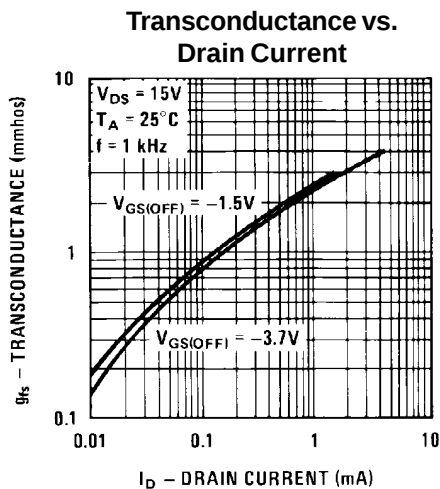
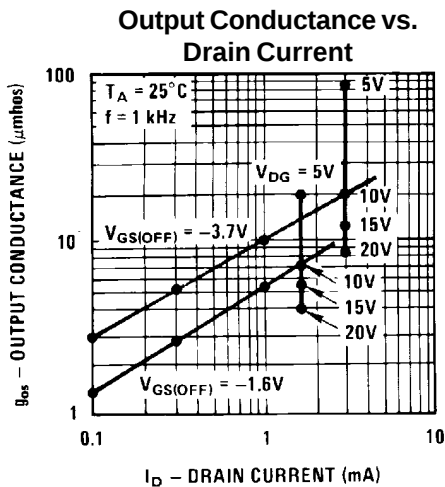
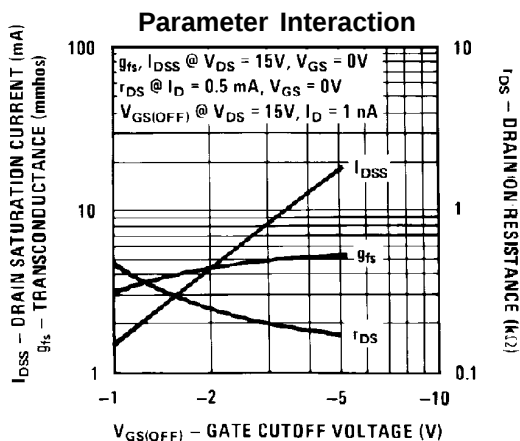
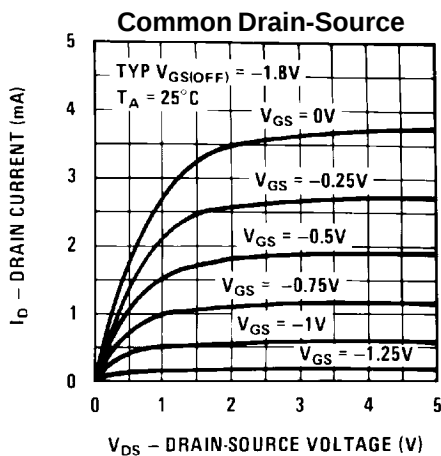
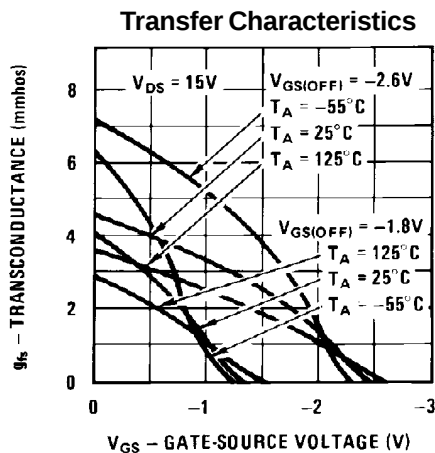
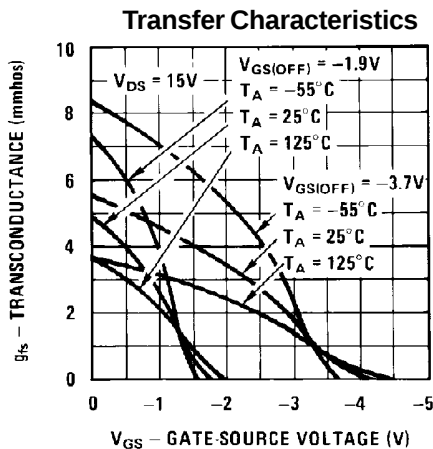


# N-Channel General Purpose Amplifier

(continued)

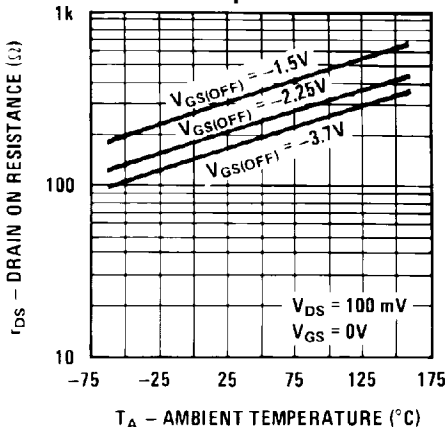
2N5457 / 5458 / 5459 / MMBF5457 / 5458 / 5459

## Typical Characteristics (continued)

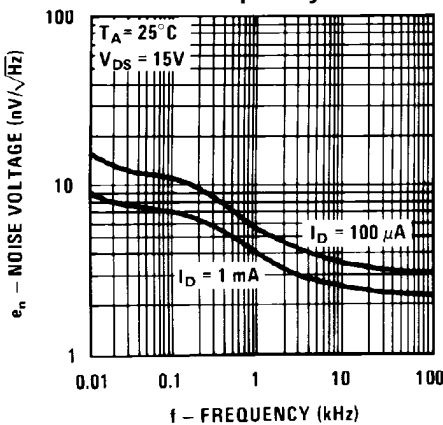


Typical Characteristics (continued)

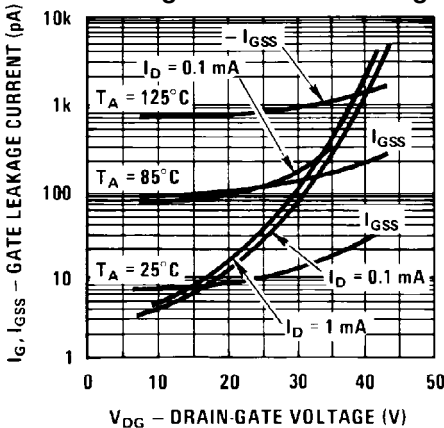
Channel Resistance vs.  
Temperature



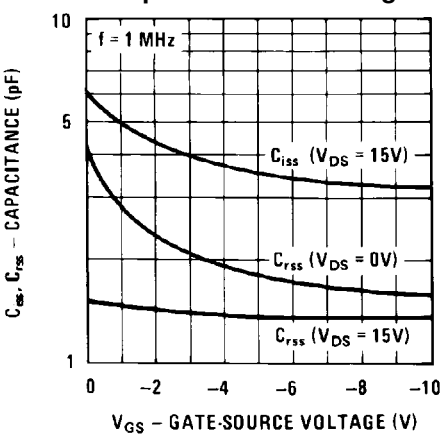
Noise Voltage vs.  
Frequency



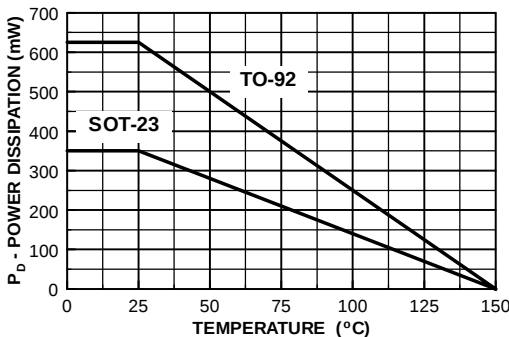
Leakage Current vs. Voltage



Capacitance vs. Voltage



Power Dissipation vs  
Ambient Temperature



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