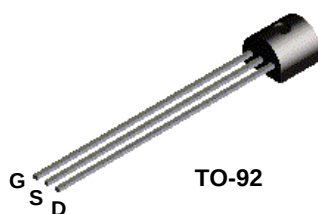


**2N5457  
2N5458  
2N5459**

**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 | *MMBF5457 |       |
| P <sub>D</sub>   | Total Device Dissipation                | 625    | 350       | mW    |
|                  | Derate above 25°C                       | 5.0    | 2.8       | mW/°C |
| R <sub>θJC</sub> | Thermal Resistance, Junction to Case    | 83.3   |           | °C/W  |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient | 200    | 357       | °C/W  |

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

2N5457 / 2N5458 / 2N5459 / MMBF5457 / MMBF5458 / MMBF5459

# N-Channel General Purpose Amplifier

(continued)

## Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol                     | Parameter                     | Test Conditions                                 | Min   | Typ   | Max   | Units |
|----------------------------|-------------------------------|-------------------------------------------------|-------|-------|-------|-------|
| <b>OFF CHARACTERISTICS</b> |                               |                                                 |       |       |       |       |
| $V_{(BR)GSS}$              | 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     |
|                            |                               | <b>2N5457</b>                                   | - 1.0 |       | - 7.0 | V     |
|                            |                               | <b>2N5458</b>                                   | - 2.0 |       | - 8.0 | V     |
| $V_{GS}$                   | 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     |

## ON CHARACTERISTICS

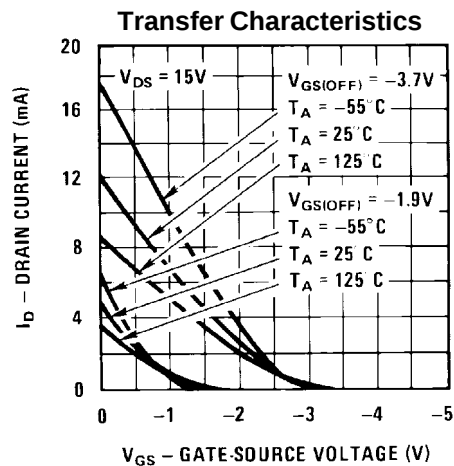
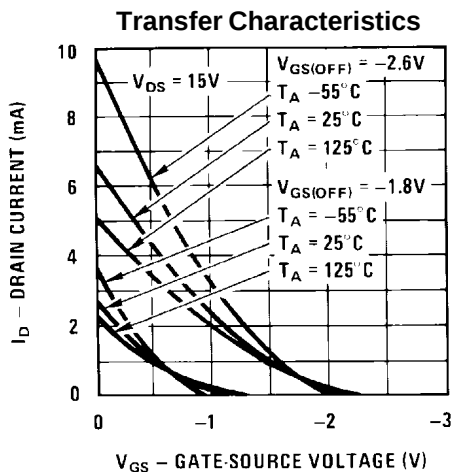
|           |                                  |                             |               |     |     |     |    |
|-----------|----------------------------------|-----------------------------|---------------|-----|-----|-----|----|
| $I_{DSS}$ | Zero-Gate Voltage Drain Current* | $V_{DS} = 15 V, V_{GS} = 0$ | <b>2N5457</b> | 1.0 | 3.0 | 5.0 | mA |
|           |                                  |                             | <b>2N5458</b> | 2.0 | 6.0 | 9.0 | mA |
|           |                                  |                             | <b>2N5459</b> | 4.0 | 9.0 | 16  | mA |

## SMALL SIGNAL CHARACTERISTICS

|           |                               |                                                                         |               |      |     |      |            |
|-----------|-------------------------------|-------------------------------------------------------------------------|---------------|------|-----|------|------------|
| $g_{fs}$  | Forward Transfer Conductance* | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz$                                | <b>2N5457</b> | 1000 |     | 5000 | $\mu mhos$ |
|           |                               |                                                                         | <b>2N5458</b> | 1500 |     | 5500 | $\mu mhos$ |
|           |                               |                                                                         | <b>2N5459</b> | 2000 |     | 6000 | $\mu mhos$ |
| $g_{os}$  | 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                  | $V_{DS} = 15 V, V_{GS} = 0, f = 1.0 kHz, R_G = 1.0 megohm, BW = 1.0 Hz$ |               |      |     | 3.0  | dB         |

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

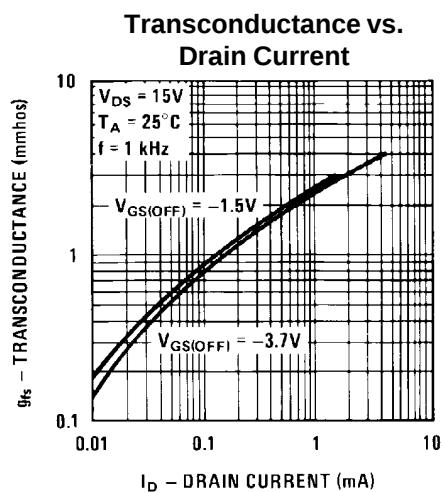
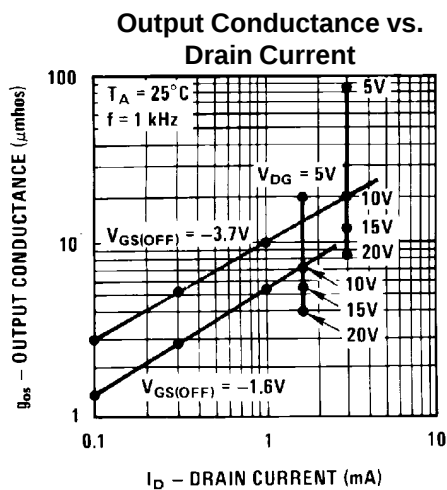
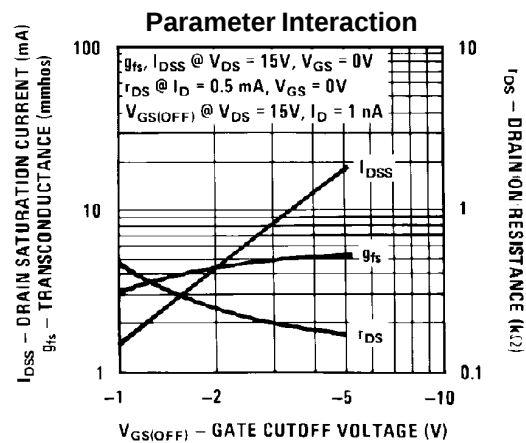
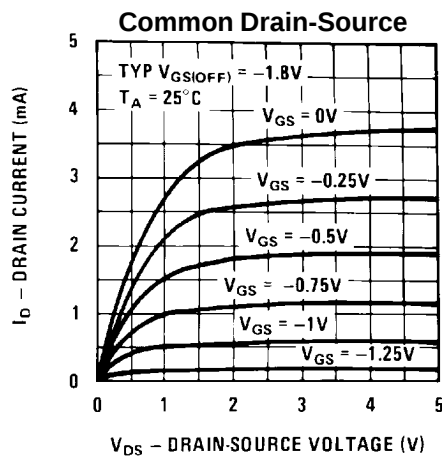
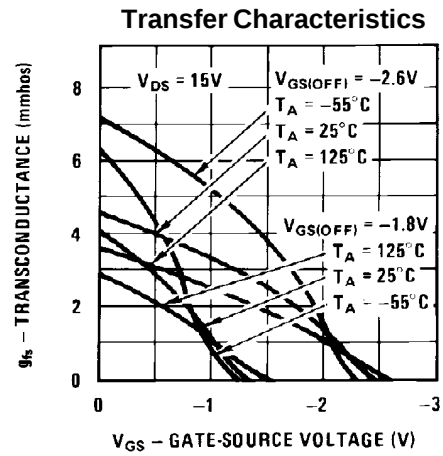
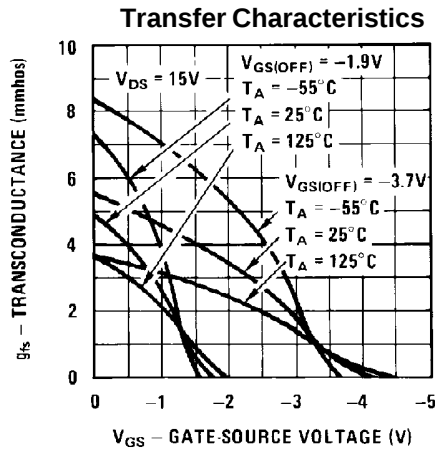
## Typical Characteristics



2N5457 / 2N5458 / 2N5459 / MMBF5457 / MMBF5458 / MMBF5459

# N-Channel General Purpose Amplifier (continued)

## Typical Characteristics (continued)



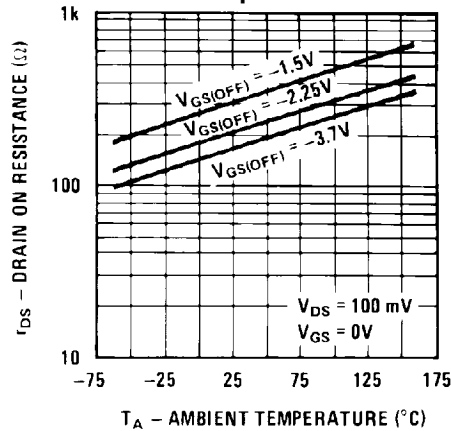
2N5457 / 2N5458 / 2N5459 / MMBF5457 / MMBF5458 / MMBF5459

# N-Channel General Purpose Amplifier

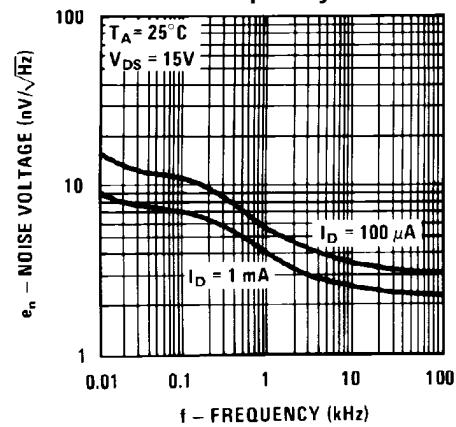
(continued)

## Typical Characteristics (continued)

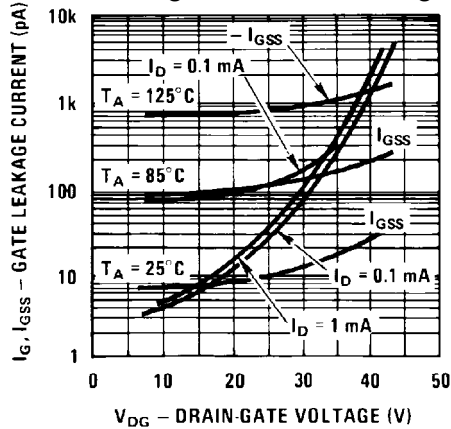
Channel Resistance vs. Temperature



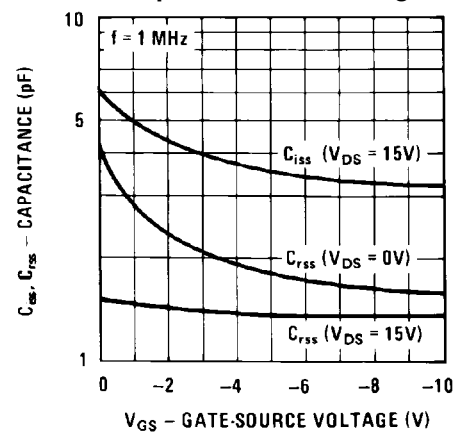
Noise Voltage vs. Frequency



Leakage Current vs. Voltage



Capacitance vs. Voltage



2N5457 / 2N5458 / 2N5459 / MMBF5457 / MMBF5458 / MMBF5459