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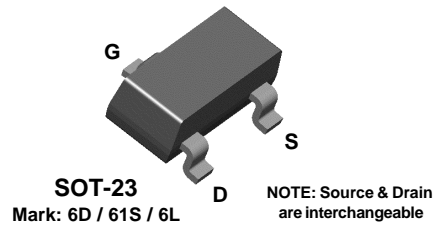
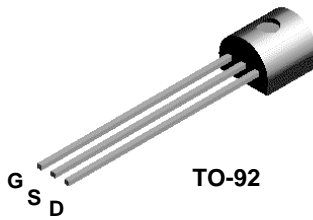
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2N5457
2N5458
2N5459

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 _{DG} | Drain-Gate Voltage | 25 | V |
| V _{GS} | Gate-Source Voltage | - 25 | V |
| I _{GF} | Forward Gate Current | 10 | mA |
| T _J , T _{stg} | 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 _D | Total Device Dissipation | 625 | 350 | mW |
| | Derate above 25°C | 5.0 | 2.8 | mW/°C |
| R _{θJC} | Thermal Resistance, Junction to Case | 125 | | °C/W |
| R _{θJA} | Thermal Resistance, Junction to Ambient | 357 | 556 | °C/W |

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

N-Channel General Purpose Amplifier

(continued)

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|----------------------------|-------------------------------|---|----------------------|-------------------------|-------------------------|-------|
| OFF CHARACTERISTICS | | | | | | |
| $V_{(BR)GSS}$ | Gate-Source Breakdown Voltage | $I_G = 10 \mu\text{A}$, $V_{DS} = 0$ | - 25 | | | V |
| I_{GSS} | Gate Reverse Current | $V_{GS} = -15 \text{ V}$, $V_{DS} = 0$ | | | - 1.0 | nA |
| | | $V_{GS} = -15 \text{ V}$, $V_{DS} = 0$, $T_A = 100^\circ\text{C}$ | | | - 200 | nA |
| $V_{GS(off)}$ | Gate-Source Cutoff Voltage | $V_{DS} = 15 \text{ V}$, $I_D = 10 \text{ nA}$ | 5457 5458 5459 | - 0.5 - 1.0 - 2.0 | - 6.0 - 7.0 - 8.0 | V |
| V_{GS} | Gate-Source Voltage | $V_{DS} = 15 \text{ V}$, $I_D = 100 \mu\text{A}$ | 5457 | - 2.5 | | V |
| | | $V_{DS} = 15 \text{ V}$, $I_D = 200 \mu\text{A}$ | 5458 | - 3.5 | | V |
| | | $V_{DS} = 15 \text{ V}$, $I_D = 400 \mu\text{A}$ | 5459 | - 4.5 | | V |

ON CHARACTERISTICS

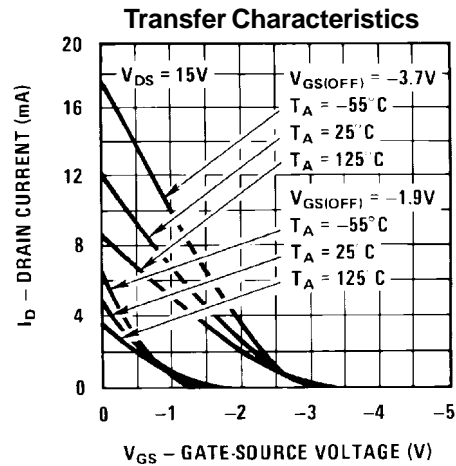
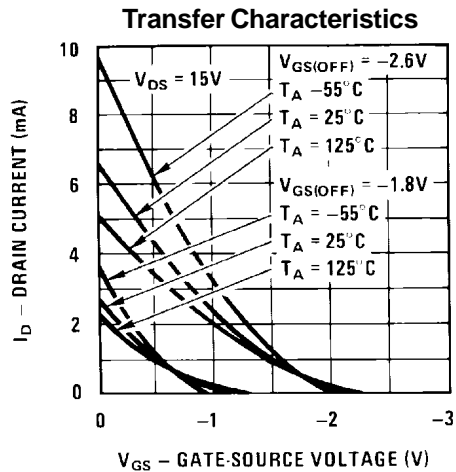
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|-----------|----------------------------------|--|----------------------|-------------------|-------------------|------------------|----------------|
| I_{DSS} | Zero-Gate Voltage Drain Current* | $V_{DS} = 15 \text{ V}$, $V_{GS} = 0$ | 5457 5458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

SMALL SIGNAL CHARACTERISTICS

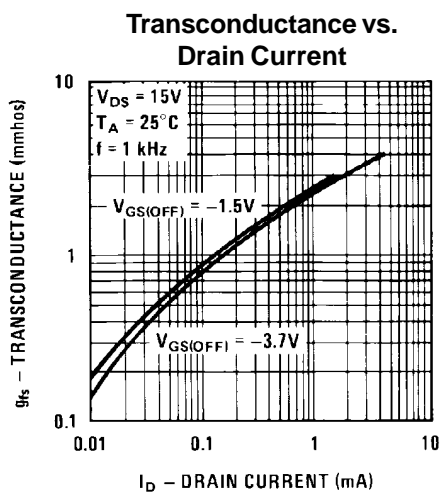
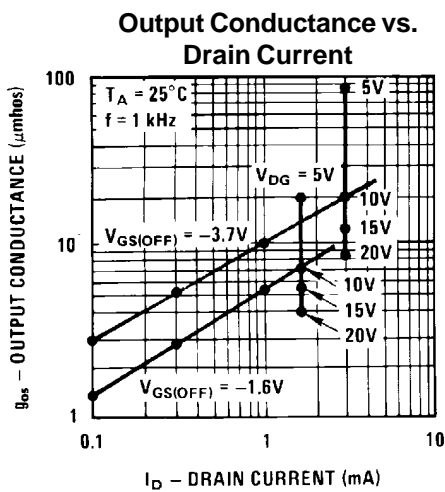
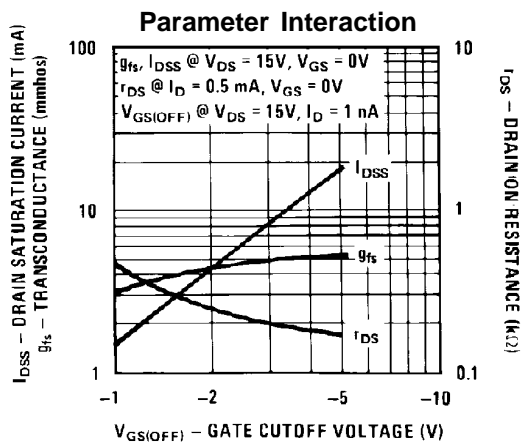
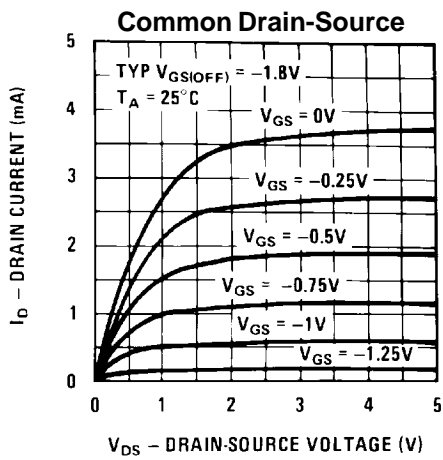
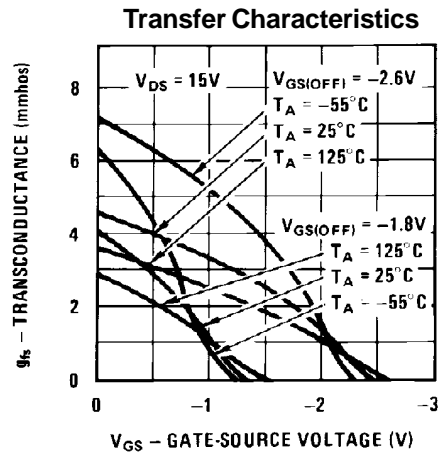
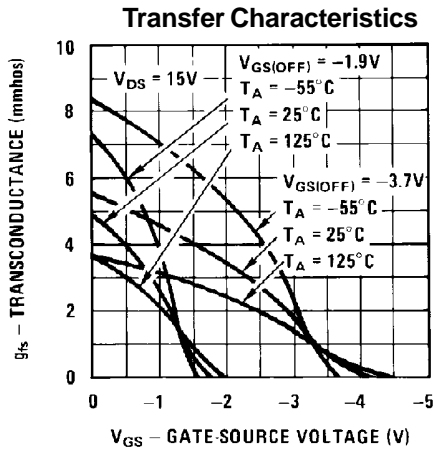
| | | | | | | |
|-----------|-------------------------------|--|----------------------|----------------------|----------------------|--|
| g_{fs} | Forward Transfer Conductance* | $V_{DS} = 15 \text{ V}$, $V_{GS} = 0$, $f = 1.0 \text{ kHz}$ | 5457 5458 5459 | 1000 1500 2000 | 5000 5500 6000 | μmhos μmhos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

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

Typical Characteristics



Typical Characteristics (continued)



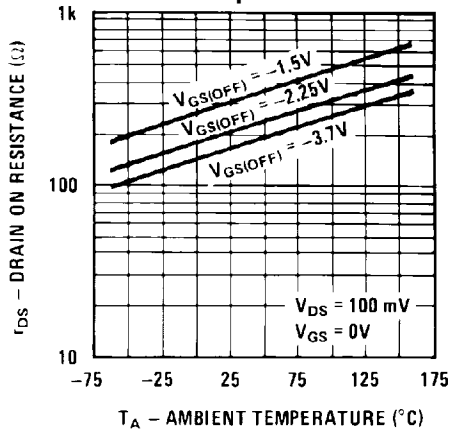
N-Channel General Purpose Amplifier

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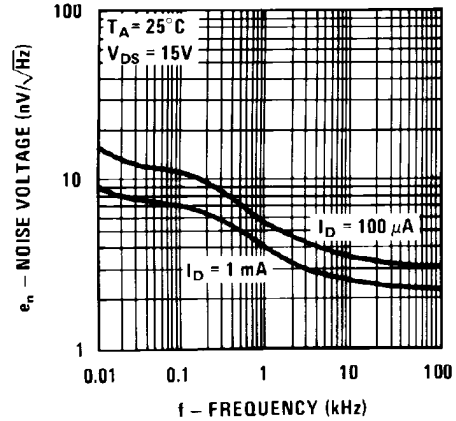
2N5457 / 5458 / 5459 / MMBF5457 / 5458 / 5459

Typical Characteristics (continued)

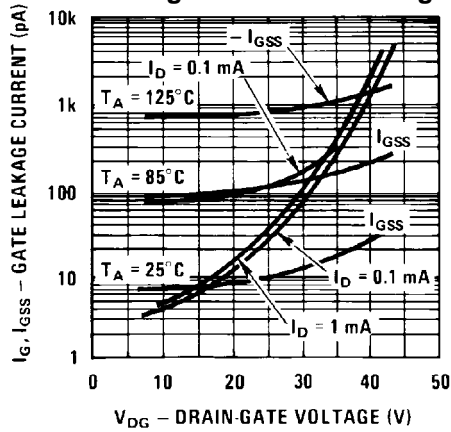
Channel Resistance vs. Temperature



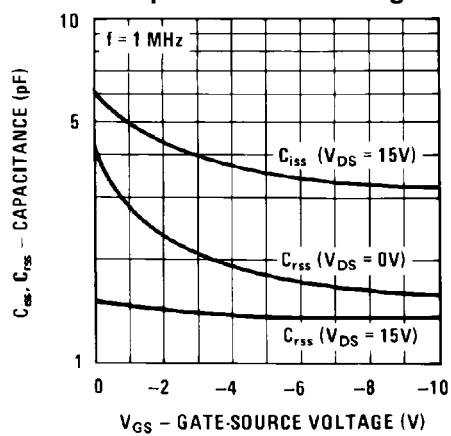
Noise Voltage vs. Frequency



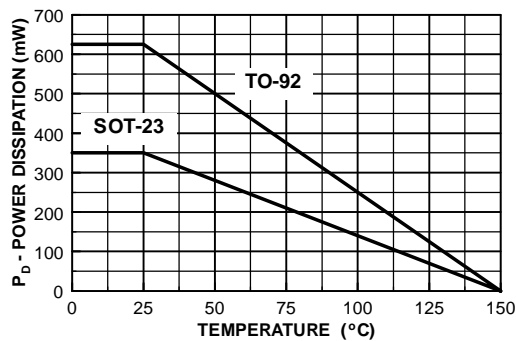
Leakage Current vs. Voltage



Capacitance vs. Voltage



Power Dissipation vs. Ambient Temperature



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