

# 2N4856-2N4861 2N4856-2N4858 JAN, JTX, JTXV\* N-Channel JFET

## FEATURES

- $r_{DS(ON)} < 25\Omega$  (2N4856, 2N4859)
- $I_{D(off)} < 250$  pA
- Switches  $\pm 10$  V Signals with  $\pm 15$  V Supplies (2N4858, 2N4861)

## ABSOLUTE MAXIMUM RATINGS

@25°C (unless otherwise noted)

### Maximum Temperatures

|                                                 |                 |
|-------------------------------------------------|-----------------|
| Storage Temperature TO18                        | -65°C to +200°C |
| Operating Junction Temperature TO18             | +200°C          |
| Lead Temperature (Soldering, 10 sec time limit) | +300°C          |

### Maximum Power Dissipation

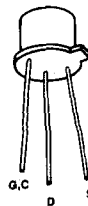
|                                           |         |
|-------------------------------------------|---------|
| Device Dissipation @ Free Air Temperature | 1.8w    |
| Linear Derating TO18                      | 10mW/°C |

### Maximum Voltages & Current

|                                 | 2N4856-58 | 2N4859-61 |
|---------------------------------|-----------|-----------|
| $V_{GS}$ Gate to Source Voltage | -40 V     | -30V      |
| $V_{GD}$ Gate to Drain Voltage  | -40 V     | -30 V     |
| $I_G$ Gate Current              | 50 mA     | 50 mA     |

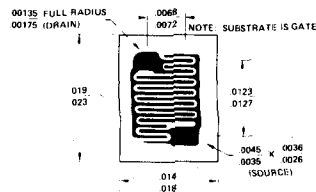
## PIN CONFIGURATION

TO-18



## CHIP TOPOGRAPHY

5001B



## ORDERING INFORMATION

| TO-18    | WAFER    | DICE     |
|----------|----------|----------|
| 2N4856 * | 2N4856/W | 2N4856/D |
| 2N4857 * | 2N4857/W | 2N4857/D |
| 2N4858 * | 2N4858/W | 2N4858/D |
| 2N4859   | 2N4859/W | 2N4859/D |
| 2N4860   | 2N4860/W | 2N4860/D |
| 2N4861   | 2N4861/W | 2N4861/D |

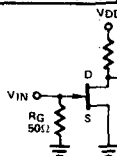
\*add JAN, JTX, JTXV, to basic part number to specify these devices.

## ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

| CHARACTERISTIC |                                            | 2N4856,59 |               | 2N4857,60 |              | 2N4858,61 |              | UNIT        | TEST CONDITIONS                                                                                  |
|----------------|--------------------------------------------|-----------|---------------|-----------|--------------|-----------|--------------|-------------|--------------------------------------------------------------------------------------------------|
|                |                                            | MIN       | MAX           | MIN       | MAX          | MIN       | MAX          |             |                                                                                                  |
| $BV_{GSS}$     | Gate-Source Breakdown Voltage              | 2N4856-58 | -40           | -40       | -40          |           |              | V           | $I_G = 1 \mu A, V_{DS} = 0$                                                                      |
|                |                                            | 2N4859-61 | -30           | -30       | -30          |           |              |             |                                                                                                  |
| $I_{GSS}$      | Gate Reverse Current                       | 2N4856-58 | -250          | -250      | -250         |           |              | pA          | $V_{GS} = -20 V, V_{DS} = 0$                                                                     |
|                |                                            | 2N4859-61 | -500          | -500      | -500         |           |              | nA          | $V_{GS} = -15 V, V_{DS} = 0$ 150°C                                                               |
| $I_{D(off)}$   | Drain Cutoff Current                       |           | 250           | 250       | 250          |           |              | pA          | $V_{DS} = 15 V, V_{GS} = -10 V$                                                                  |
|                |                                            |           | 500           | 500       | 500          |           |              | nA          | 150°C                                                                                            |
| $V_{GS(off)}$  | Gate-Source Cutoff Voltage                 | -4        | -10           | -2        | -6           | -0.8      | -4           | V           | $V_{DS} = 15 V, I_D = 0.5 nA$                                                                    |
| $I_{DSS}$      | Saturation Drain Current (Note 1)          | 50        |               | 20        | 100          | 8         | 80           | mA          | $V_{DS} = 15 V, V_{GS} = 0$                                                                      |
| $V_{DS(on)}$   | Drain-Source ON Voltage                    |           | 0.75 (20)     |           | 0.50 (10)    |           | 0.50 (5)     | V (mA)      | $V_{GS} = 0, I_D = ( )$                                                                          |
| $r_{DS(on)}$   | Drain-Source ON Resistance                 |           | 25            |           | 40           |           | 60           | ohm         | $V_{GS} = 0, I_D = 0$                                                                            |
| $C_{iss}$      | Common-Source Input Capacitance            |           | 18            |           | 18           |           | 18           | pF          | $V_{DS} = 0, V_{GS} = -10 V$ f = 1 kHz                                                           |
| $C_{rss}$      | Common-Source Reverse Transfer Capacitance |           | 8             |           | 8            |           | 8            |             | f = 1 MHz                                                                                        |
| $t_d$          | Turn-ON Delay Time                         |           | 6 (20) [-10]  |           | 6 (10) [-6]  |           | 10 (5) [-4]  | ns (mA) [V] | $V_{DD} = 10 V, R_L = 464 \Omega$ 2N4856,59<br>953 $\Omega$ 2N4857,60<br>1910 $\Omega$ 2N4858,61 |
| $t_r$          | Rise Time                                  |           | 3 (20) [-10]  |           | 4 (10) [-6]  |           | 10 (5) [-4]  | ns (mA) [V] | $V_{GS(on)} = 0$                                                                                 |
| $t_{off}$      | Turn-OFF Time                              |           | 25 (20) [-10] |           | 50 (10) [-6] |           | 100 (5) [-4] | ns (mA) [V] | $I_{D(on)} = ( )$<br>$V_{GS(off)} = ( )$                                                         |

### NOTE:

1. Pulse test required, pulsewidth = 100  $\mu s$ , duty cycle  $\leq 10\%$ .



### INPUT PULSE

RISE TIME 0.25 ns  
FALL TIME 0.75 ns  
PULSE WIDTH 100 ns  
PULSE DUTY CYCLE  $\leq 10\%$

### SAMPLING SCOPE

RISE TIME 0.75 ns  
INPUT RESISTANCE 1 M  
INPUT CAPACITANCE 2.5 pF