

# 3SK249

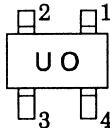
TV TUNER, UHF RF AMPLIFIER APPLICATIONS

- Superior Cross Modulation Performance.
- Low Reverse Transfer Capacitance :  $C_{RSS} = 20\text{fF}$  (Typ.)
- Low Noise Figure. :  $NF = 1.5\text{dB}$  (Typ.)

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTIC            | SYMBOL    | RATING         | UNIT             |
|---------------------------|-----------|----------------|------------------|
| Drain-Source Voltage      | $V_{DS}$  | 12.5           | V                |
| Gate 1-Source Voltage     | $V_{G1S}$ | $\pm 8$        | V                |
| Gate 2-Source Voltage     | $V_{G2S}$ | $\pm 8$        | V                |
| Drain Current             | $I_D$     | 30             | mA               |
| Drain Power Dissipation   | $P_D$     | 100            | mW               |
| Chanel Temperature        | $T_{ch}$  | 125            | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | $-55 \sim 125$ | $^\circ\text{C}$ |

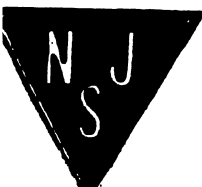
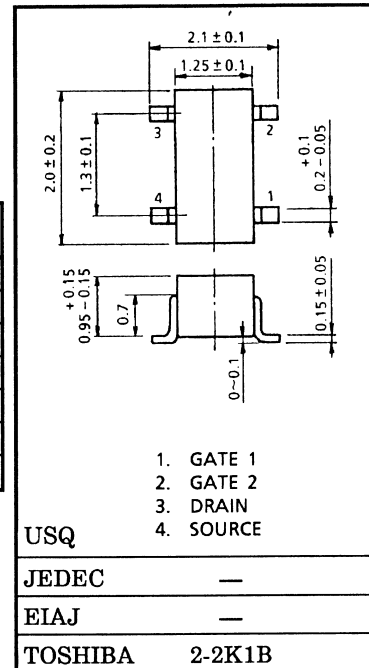
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ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTIC                | SYMBOL         | TEST CONDITION   | MIN. | TYP. | MAX.     | UNIT |
|-------------------------------|----------------|--|------|------|----------|------|
| Gate 1 Leakage Current        | $I_{G1SS}$     | $V_{DS} = 0, V_{G1S} = \pm 6\text{V}, V_{G2S} = 0$                                     | —    | —    | $\pm 50$ | nA   |
| Gate 2 Leakage Current        | $I_{G2SS}$     | $V_{DS} = 0, V_{G1S} = 0, V_{G2S} = \pm 6\text{V}$                                     | —    | —    | $\pm 50$ | nA   |
| Drain-Source Voltage          | $V_{(BR)DSX}$  | $V_{G1S} = -0.5\text{V}, V_{G2S} = -0.5\text{V}$<br>$I_D = 100\mu\text{A}$             | 12.5 | —    | —        | V    |
| Drain Current                 | $I_{DSS}$      | $V_{DS} = 6\text{V}, V_{G2S} = 4.5\text{V},$<br>$V_{G1S} = 0\text{V}$                  | 0    | —    | 0.1      | mA   |
| Gate 1-Source Cut-off Voltage | $V_{G1S(OFF)}$ | $V_{DS} = 6\text{V}, V_{G2S} = 4.5\text{V},$<br>$I_D = 100\mu\text{A}$                 | 0.4  | 0.9  | 1.4      | V    |
| Gate 2-Source Cut-off Voltage | $V_{G2S(OFF)}$ | $V_{DS} = 6\text{V}, V_{G1S} = 4.0\text{V},$<br>$I_D = 100\mu\text{A}$                 | 0.5  | 1.0  | 1.5      | V    |
| Forward Transfer Admittance   | $ Y_{fs} $     | $V_{DS} = 6\text{V}, V_{G2S} = 4.5\text{V},$<br>$I_D = 10\text{mA}, f = 1\text{kHz}$   | 17   | 21   | —        | mS   |
| Input Capacitance             | $C_{iss}$      | $V_{DS} = 6\text{V}, V_{G2S} = 4.5\text{V},$<br>$I_D = 10\text{mA}, f = 1\text{MHz}$   | 0.9  | 1.5  | 2.1      | pF   |
| Reverse Transfer Capacitance  | $C_{rss}$      |  | —    | 20   | 40       | fF   |
| Power Gain                    | $G_{ps}$       | $V_{DS} = 6\text{V}, V_{G2S} = 4.5\text{V},$<br>$I_D = 10\text{mA}, f = 800\text{MHz}$ | 18   | 20   | —        | dB   |
| Noise Figure                  | NF             |  | —    | 1.5  | 2.5      |      |

Unit in mm



## 2SK1358

### Electrical Characteristics (Ta = 25°C)

| CHARACTERISTIC                                  |               | SYMBOL        | TEST CONDITION  | MIN. | TYP. | MAX.      | UNIT     |
|---|---------------|---------------|---|------|------|-----------|----------|
| Gate Leakage Current                            |               | $I_{GSS}$     | $V_{GS} = \pm 25V, V_{DS} = 0V$   | -    | -    | $\pm 100$ | nA       |
| Drain Cut-off Current                           |               | $I_{DSS}$     | $V_{DS} = 720V, V_{GS} = 0V$  | -    | -    | 300       | $\mu A$  |
| Drain-Source Breakdown Voltage                  |               | $V_{(BR)DSS}$ | $I_D = 10mA, V_{GS} = 0V$   | 900  | -    | -         | V        |
| Gate Threshold Voltage                          |               | $V_{th}$      | $V_{DS} = 10V, I_D = 1mA$   | 1.5  | -    | 3.5       | V        |
| Drain-Source ON Resistance                      |               | $R_{DS(ON)}$  | $I_D = 4A, V_{GS} = 10V$  | -    | 1.1  | 1.4       | $\Omega$ |
| Forward Transfer Admittance                     |               | $ Y_{fs} $    | $V_{DS} = 20V, I_D = 4A$  | 2.0  | 4.0  | -         | S        |
| Input Capacitance                               |               | $C_{iss}$     | $V_{DS} = 25V, V_{GS} = 0V,$<br>$f = 1MHz$  | -    | 1300 | 1800      | pF       |
| Reverse Transfer Capacitance                    |               | $C_{rss}$     |   | -    | 100  | 150       |          |
| Output Capacitance                              |               | $C_{oss}$     |   | -    | 180  | 260       |          |
| Switching Time                                  | Rise Time     | $t_r$         | <p><math>V_{IN} : t_r, t_f &lt; 5ns, V_{DD} = 400V</math><br/>Duty <math>\leq 1\%, t_w = 10\mu s</math></p> | -    | 25   | 50        | ns       |
|   | Turn-on Time  | $t_{on}$      |   | -    | 40   | 80        |          |
|   | Fall Time     | $t_f$         |   | -    | 20   | 40        |          |
|   | Turn-off Time | $t_{off}$     |   | -    | 100  | 200       |          |
| Total Gate Charge (Gate-Source Plus Gate-Drain) |               | $Q_g$         | $V_{DD} = 400V, V_{GS} = 10V,$<br>$I_D = 9A$  | -    | 120  | 240       | nC       |
| Gate-Source Charge                              |               | $Q_{gs}$      |   | -    | 70   | -         |          |
| Gate-Drain ("Miller") Charge                    |               | $Q_{gd}$      |   | -    | 50   | -         |          |

### Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

| CHARACTERISTICS                  | SYMBOL    | TEST CONDITION             | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|----------------------------|------|------|------|------|
| Continuous Drain Reverse Current | $I_{DR}$  | -                          | -    | -    | 9    | A    |
| Pulse Drain Reverse Current      | $I_{DRP}$ | -                          | -    | -    | 27   | A    |
| Diode Forward Voltage            | $V_{DSF}$ | $I_{DR} = 9A, V_{GS} = 0V$ | -    | -    | -2.0 | V    |