

Linear Systems replaces discontinued Toshiba 2SK170 with LSK170

The 2SK170 / LSK170 is an Ultra Low Noise Single N-Channel JFET

Optimized to provide low noise at both high and low frequency with a narrow range of IDSS and low capacitance. The 2SK170 / LSK170's low noise to capacitance ratio and narrow range of low value IDSS provide solutions for low noise applications which cannot tolerate high values of capacitance or wide ranges of IDSS

The narrow ranges of IDSS binning with the 2SK170 / LSK170 promote ease of design tolerancing, particularly in low voltage applications. The 2SK170 / LSK170 is ideal for portable battery operated applications, and features high BVDSS for maximum linear headroom in high transient program content amplifiers. The 2SK170 / LSK170 series has a uniquely linear VGS transfer function for a stability that is highly desirable, particularly for audio front-end preamplifiers.

2SK170 / LSK170 Applications:

Audio amplifiers and preamps, discrete low-noise operational amplifiers, battery-operated audio preamps, guitar pickups, effects pedals, microphones, audio mixer consoles, acoustic sensors, sonobuoys, hydrophones, chemical and radiation detectors, instrumentation amplifiers, accelerometers, CT scanners input stages, oscilloscope input stages, electrometers and vibrations detectors.

Surface mount SOT23 available (not offered by Toshiba 2SK170)
Improved pin for pin replacement for Toshiba 2SK170
Improved functional replacement for Interfet IF1320, IF1330, IF1331, and IF4500

FEATURES

| | |
|---|---------------------------------------|
| ULTRA LOW NOISE ($f = 1\text{kHz}$) | $e_n = 0.9\text{nV}/\sqrt{\text{Hz}}$ |
| HIGH BREAKDOWN VOLTAGE | $BV_{GSS} = 40\text{V max}$ |
| HIGH GAIN | $Y_{fs} = 22\text{mS (typ)}$ |
| HIGH INPUT IMPEDANCE | $I_G = -500\text{pA max}$ |
| LOW CAPACITANCE | 22pF max |
| IMPROVED SECOND SOURCE REPLACEMENT FOR 2SK170 | |

ABSOLUTE MAXIMUM RATINGS¹

@ 25 °C (unless otherwise stated)

Maximum Temperatures

| | |
|--------------------------------|----------------|
| Storage Temperature | -65 to +150 °C |
| Operating Junction Temperature | -55 to +135 °C |

Maximum Power Dissipation

| | |
|--|-------|
| Continuous Power Dissipation @ +125 °C | 400mW |
|--|-------|

Maximum Currents

| | |
|----------------------|--------------------------|
| Gate Forward Current | $I_{G(F)} = 10\text{mA}$ |
|----------------------|--------------------------|

Maximum Voltages

| | |
|----------------|------------------------|
| Gate to Source | $V_{GSS} = 40\text{V}$ |
| Gate to Drain | $V_{GDS} = 40\text{V}$ |

Available Packages:

2SK170 / LSK170 in TO-92
2SK170 / LSK170 in SOT-23
2SK170 / LSK170 available as bare die



Please contact Micross for package and die dimensions
Email: chipcomponents@micross.com Tel: +441603 788967

ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated)

| SYMBOL | CHARACTERISTIC | MIN | TYP | MAX | UNITS | CONDITIONS |
|---------------|-------------------------------------|---------|-----|-----|------------------------|---|
| BV_{GSS} | Gate to Source Breakdown Voltage | 40 | | | V | $V_{DS} = 0, I_D = 100\mu\text{A}$ |
| $V_{GS(OFF)}$ | Gate to Source Pinch-off Voltage | 0.2 | | 2 | V | $V_{DS} = 10\text{V}, I_D = 1\text{nA}$ |
| V_{GS} | Gate to Source Operating Voltage | | 0.5 | | V | $V_{DS} = 10\text{V}, I_D = 1\text{mA}$ |
| I_{DSS} | Drain to Source Saturation Current | LSK170A | 2.6 | 6.5 | mA | $V_{DG} = 10\text{V}, V_{GS} = 0$ |
| | | LSK170B | 6 | 12 | | |
| | | LSK170C | 10 | 20 | | |
| I_G | Gate Operating Current | | | 0.5 | nA | $V_{DG} = 10\text{V}, I_D = 1\text{mA}$ |
| I_{GSS} | Gate to Source Leakage Current | | | 1 | nA | $V_{DG} = 10\text{V}, V_{DS} = 0$ |
| Y_{fss} | Full Conduction Transconductance | | 22 | | mS | $V_{GD} = 10\text{V}, V_{GS} = 0, f = 1\text{kHz}$ |
| Y_{fs} | Typical Conduction Transconductance | | 10 | | mS | $V_{DG} = 15\text{V}, I_D = 1\text{mA}$ |
| e_n | Noise Voltage | | 0.9 | 1.9 | nV/ $\sqrt{\text{Hz}}$ | $V_{DS} = 10\text{V}, I_D = 2\text{mA}, f = 1\text{kHz}, \text{NBW} = 1\text{Hz}$ |
| e_n | Noise Voltage | | 2.5 | 4 | nV/ $\sqrt{\text{Hz}}$ | $V_{DS} = 10\text{V}, I_D = 2\text{mA}, f = 10\text{Hz}, \text{NBW} = 1\text{Hz}$ |
| C_{ISS} | Common Source Input Capacitance | | 20 | | pF | $V_{DS} = 15\text{V}, I_D = 500\mu\text{A}$ |
| C_{RSS} | Common Source Reverse Transfer Cap. | | 5 | | pF | |

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